Power Supplies & Converters

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Electromagnetic Compatibility - Component Power

Definition of Use
Component Power Supplies are designed to be incorporated in other equipment. They are not intended for use in free standing applications or to be accessible to the final user of the equipment. They are classed as components in the context of the EMC Directive.

All items within this section are deemed to be components with the exception of both the plug top adaptors and the bench power supplies.

The enclosure of the final equipment shall provide:
(i) protection against Electrostatic Discharge (ESD);
(ii) protection against personal contact with live parts,
(iii) some screening of radiated Electromagnetic Interference

Component Power Supplies will not be ‘CE’ marked under the EMC Directive, but information on EMC performance will be provided.

This follows the guidelines of the United Kingdom Power Supply Manufacturers’ Association (PSMA).

250mW - DC/DC Converters
Subminiature - 1kV Isolation

- High efficiency for low power applications
- 1kVdc isolation in a SIL plastic package
- Power Density 0.36W/cm³
- No heatsink required
- UL94V-0 fully encapsulated package material
- No external components required
- Output voltage accuracy +10%, -7.5% (10% to 100% load)
- Output ripple and noise 50mV pk to pk
- Efficiency up to 75%

Order Code 1+ 5+ 10+ 25+
Price Each

3197

213448

World’s Smallest 5 & 10 Watt AC-DC Power Supplies

ECE05 & ECE10 Series
- 5 & 10 Watts
- Ultra compact from 1” x 1”
- Encapsulated PCB mount
- Single outputs
- <0.3 Watts no load input power

Single Output

Mftrs. List No. Input Voltage Output Voltage Output Current Order Code
IK0505SC 5V 3.3V 75.7mA 185-9045
IK0509SC 5V 9V 50mA 185-9046
IK0512SC 5V 12V 20.83mA 185-9047
IK0515SC 5V 15V 16.67mA 185-9048
IK0524SC 5V 24V 10.41mA 185-9049
IK1203SC 12V 3.3V 75.7mA 185-9050
IK1205SC 12V 5V 50mA 185-9051
IK1212SC 12V 12V 20.83mA 185-9052
IK1215SC 12V 15V 16.67mA 185-9053
IK1224SC 12V 24V 10.41mA 185-9054

Order Code 1+ 5+ 10+ 25+
Price Each

IK1224SA 12V 24V 10.41mA 185-9051
IK1215SA 12V 15V 16.67mA 185-9052
IK1212SA 12V 12V 20.83mA 185-9053
IK1205SA 12V 5V 50mA 185-9054
IK1203SA 12V 3.3V 75.7mA 185-9055
IK0524SA 5V 24V 10.41mA 185-9049
IK0515SA 5V 15V 16.67mA 185-9050
IK0512SA 5V 12V 20.83mA 185-9051
IK0505SA 5V 5V 50mA 185-9052
IK0503SA 5V 3.3V 75.7mA 185-9053

2 Year Warranty

PCB Mount - DC to DC Converters
0.25 Watt Single Output DC/DC Converters

Miniature Package

Dimensions (mm): H=10.16, W=11.68, D=6.1

- Single Output
- SIP Package
- 1000 VDC Isolation

Input Voltage Range
Line Regulation
Load Regulation
Ripple & Noise
Isolation Voltage
Operating Temperature
MTBF
Nominal ±10%
1.2%/1% ±0.5 V
±10% for 20% to 100% load change (3.3V models ±20%)
100 mA pk-pk max, 20 MHz bandwidth
1000 VDC input to output
-40°C to +85°C
>1.1 Mftrs to MIL-HDBK-217F at 25°C, 88H

NEW

1 Watt Single Output DC/DC Converters

- Industry standard pinout
- 1000 VDC isolation
- Short circuit protection
- Single Output
- SIP or DIP Package
- 40°C to +85°C Operation
- 2 Year Warranty

Input Range
Line Regulation
Load Regulation
Ripple & Noise
Operating Temperature
Storage Temperature
Isolation Voltage
Nominal ±10%
1.2%/1% ±0.5 V
±10% for 20% to 100% load change
100 mA pk-pk max, 20 MHz bandwidth
-40°C to +85°C
-40°C to +125°C
1000 VDC

NEW

Power Supplies & Converters

Power, Test and Measurement

Power Supplies & Converters

farnell.com element14.com
1 Watt Single Output DC/DC Converters - continued

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Current</th>
<th>SIP Package</th>
<th>Order Code</th>
<th>Order Code</th>
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<td>66mA</td>
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</table>

1 Watt Dual Output DC/DC Converters

- Short circuit protection
- 1000 VDC isolation
- Dual output
- Industry standard pinout
- SIP or DIP Package
- 40°C to +85°C Operation
- MTBF >1.1 MHrs
- 2 Year Warranty

<table>
<thead>
<tr>
<th>Input Range</th>
<th>Line Regulation</th>
<th>Ripple &amp; Noise</th>
<th>Operating Temperature</th>
<th>Storage Temperature</th>
<th>Isolation Voltage</th>
<th>Load Regulation</th>
<th>Short Circuit Protection</th>
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</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Voltage ±10%</td>
<td>75 mV pk-pk max, 20 MHz bandwidth</td>
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<td>5V, 12V</td>
<td>1.2% / ±1.7% V</td>
<td>75 mV pk-pk max, 20 MHz bandwidth</td>
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<td>12V, 15V</td>
<td>0.5% / ±1.2% V</td>
<td>75 mV pk-pk max, 20 MHz bandwidth</td>
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</table>

1 Watt Single Output DC/DC Converters

- Single output
- Ultra Slim SMD Package
- Industry standard pinout
- 1500 VDC isolation
- MTBF >3.5 MHrs
- -40°C to +85°C Operation
- 3 Year Warranty

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Output Current</th>
<th>Efficiency</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
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<td>73%</td>
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</table>

1 Watt Single Output DC/DC Converters - Ultra Slim DIP Package

- Single output
- Ultra Slim DIP Package
- Industry standard pinout
- 1500 VDC isolation
- MTBF >3.5 MHrs
- -40°C to +85°C Operation
- 3 Year Warranty

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Output Current</th>
<th>Efficiency</th>
<th>Order Code</th>
</tr>
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<td>200mA</td>
<td>73%</td>
<td>186-0937</td>
</tr>
</tbody>
</table>
1 Watt Isolated Single Output DC/DC Converters

- Footprint over pins 0.69cm²
- Single isolated output
- 1KVDC isolation
- Efficiency to 78%
- 3V, 5V, 12V & 15V output
- Toroidal magnetics
- 5V, 9V, 12V & 15V output
- UL 94V-0 Package material
- Lead free compatible
- Lead frame technology

1 Watt Single and Dual Output DC/DC Converters

- Single & Dual Output
- SIP Package
- 1000 VDC isolation
- Semi regulated
- -40°C to +85°C Operation
- MTBF >1.1 Mhrs
- 3 Year Warranty

Isolated 1W Single Output Surface Mount NTE Series

- Wide temperature performance at full load -40°C to 85°C
- Single isolated output
- 1KVDC isolation
- Efficiency to 78%
- 3V, 5V & 12V input
- 5V, 9V, 12V & 15V output

NTE Series All Order Codes

1 Watt Single Output DC/DC Converters

- Regulated Single Output
- SMD Package
- Industry Standard Pinout
- 1000 VDC Isolation
- Short Circuit Protection
- MTBF >3.5 Mhrs
- 3 Year Warranty

- Input Voltage Range: Nominal ±5%
- Line Regulation: ±0.25%
- Load Regulation: 1% ±100% load change
- Ripple & Noise: 100 mV pk-pk max, 20 MHz bandwidth
- Isolation Voltage: 1000 VDC
- Operating Temperature: -40°C to +85°C
- Short Circuit Protection: Continuous
- MTBF >3.5 Mhrs to MIL-HDBK-217F at 25°C, GB

PIN CONNECTIONS

- Pin: 1 = Vin, 2 = Vin, 3 = -Vin, 4 = -Vout, 5 = -Vout
- Efficiency: 78%

Dimensions (mm): H=10, W=19.5, D=6 - All Other Models

- MTBF >1.1 Mhrs to MIL-HDBK-217F at 25°C, GB
- Nominal Input Output Voltage Output Current MTBF List No. Order Code
- IQ0515S 5V 15V, 67mA -15V, -32mA 186-0964
- IQ0512S 5V 12V, 41mA -12V, -41mA 186-0961
- IQ0509S 5V 9V, 55mA -9V, -55mA 186-0959
- IQ0505S 5V 5V, 100mA -5V, -100mA 186-0939
- IQ1515S 15V 15V, 67mA -15V, -32mA 186-0962
- IQ1512S 15V 12V, 41mA -12V, -41mA 186-0954
- IQ1509S 15V 9V, 55mA -9V, -55mA 186-0950
- IQ1505S 15V 5V, 200mA -5V, -100mA 186-0949
- IQ1215S 12V 15V, 33mA -15V, -33mA 186-0955
- IQ1212S 12V 12V, 41mA -12V, -41mA 186-0952
- IQ1209S 12V 9V, 55mA -9V, -55mA 186-0949
- IQ1205S 12V 5V, 100mA -5V, -100mA 186-0953
- IQ0515SA 5V 15V, 67mA
- IQ0512SA 5V 12V, 83mA
- IQ0509SA 5V 9V, 83mA
- IQ0505SA 5V 5V, 100mA
- IQ1515SA 15V 15V, 67mA
- IQ1512SA 15V 12V, 83mA
- IQ1509SA 15V 9V, 83mA
- IQ1505SA 15V 5V, 200mA
- IQ1215SA 12V 15V, 33mA
- IQ1212SA 12V 12V, 83mA
- IQ1209SA 12V 9V, 83mA
- IQ1205SA 12V 5V, 100mA
- IQ0515S 5V 15V, 67mA
- IQ0512S 5V 12V, 83mA
- IQ0509S 5V 9V, 83mA
- IQ0505S 5V 5V, 100mA
- IQ1515S 15V 15V, 67mA
- IQ1512S 15V 12V, 83mA
- IQ1509S 15V 9V, 83mA
- IQ1505S 15V 5V, 200mA
- IQ1215S 12V 15V, 33mA
- IQ1212S 12V 12V, 83mA
- IQ1209S 12V 9V, 83mA
- IQ1205S 12V 5V, 100mA
- IQ0515SA 5V 15V, 67mA
- IQ0512SA 5V 12V, 83mA
- IQ0509SA 5V 9V, 83mA
- IQ0505SA 5V 5V, 100mA
- IQ1515SA 15V 15V, 67mA
- IQ1512SA 15V 12V, 83mA
- IQ1509SA 15V 9V, 83mA
- IQ1505SA 15V 5V, 200mA
- IQ1215SA 12V 15V, 33mA
- IQ1212SA 12V 12V, 83mA
- IQ1209SA 12V 9V, 83mA
- IQ1205SA 12V 5V, 100mA

1 Watt Single and Dual Output DC/DC Converters - continued

Semi-regulated - continued

<table>
<thead>
<tr>
<th>Code</th>
<th>Voltage (V)</th>
<th>Current (mA)</th>
<th>Efficiency</th>
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<td>15, 6</td>
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<td>15, 6</td>
<td>85%</td>
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</table>

All Order Codes

Order Code | Price Each
-----------|-------------
1           | N/A         |
5           | 10          |
10          | 25          |
25          | 50          |

181-8311

1 Watt Single and Dual Output DC/DC Converters

Industry Standard SMD Package

- Single & Dual Output
- SMD Package
- Industry Standard Pinout
- 1000 VDC Isolation
- Short Circuit Protection
- MTBF > 3.5 Mhrs
- 3 Year Warranty

Input Voltage Range: ±10% Nominal
Line Regulation: ±1.2%/1%
Load Regulation: ±7.5%/±1%
 Ripple & Noise: Single output: 100 mV pk-pk, 20 MHz bandwidth
Dual output: 75 mV pk-pk, 20 MHz bandwidth
Isolation: 1000 VDC
Operating Temperature: -40°C to +85°C, full load
MTBF: > 3.5 Mhrs to MIL-HDBK-217F at 25°C, 60 hr

Price Each

Order Code | 1+ | 5+ | 10+ | 25+ |
-----------|----|----|-----|-----|
Single Output All Order Codes
Dual Output All Order Codes

3kVDC Isolated 1 W Dual Output SMD

NTV Series

- Efficiency to 82%
- 3kVDC isolation (1 minute)
- 5V & 12V input
- 5V, 9V, 12V and 15V output
- Dual isolated outputs
- Wide temperature range at full 1W load -40°C to 85°C
- Internal SMD construction

Voltage | Output | Output current | Mhrs | Order Code
--------|--------|---------------|------|-------------
| (V)     | (V)    | (mA)          |      |             |
5        | 5      | ±100          | NTV0509MC | 102-1606 |
9        | 9      | ±55           | NTV0909MC | 102-1609 |
12       | 12     | ±42           | NTV1209MC | 102-1610 |
15       | 15     | ±33           | NTV1509MC | 102-1611 |
24       | 24     | ±83           | NTV2415MC | 102-1612 |
30       | 30     | ±100          | NTV3009MC | 102-1613 |

3kVDC Isolated 1 W Single Output

NTV Series

- Efficiency to 82%
- 3kVDC isolation (1 minute)
- 5V & 12V input
- 5V, 9V, 12V and 15V output
- Dual isolated outputs
- Wide temperature range at full 1W load -40°C to 85°C
- Internal SMD construction

Voltage | Output | Mhrs | Order Code
--------|--------|------|-------------
| (V)     | (V)    |      |             |
5        | 5      |      | NTV0509MC   | 102-1606 |
9        | 9      |      | NTV0909MC   | 102-1609 |
12       | 12     |      | NTV1209MC   | 102-1610 |
15       | 15     |      | NTV1509MC   | 102-1611 |
24       | 24     |      | NTV2415MC   | 102-1612 |
30       | 30     |      | NTV3009MC   | 102-1613 |

1 Watt Isolated DC/DC Converters

The MEA series offers improved regulation performance ≤5% for applications where a wide output voltage variation cannot be tolerated. They are ideally suited for providing dual rail supplies with the added benefit of galvanic isolation to reduce switching noise. All of the rated power may be drawn from a single output providing the total load does not exceed 1 watt.

- Power density 0.85W/cm³
- Wide temperature performance at full 1 Watt load -40°C to 85°C
- UL60950 recognised
- No heat sink required
- Industry standard pinout

Price Each

Order Code | 1+ | 5+ | 10+ | 25+ |
-----------|----|----|-----|-----|
Single Output All Order Codes
Dual Output All Order Codes

- Power sharing on output
- 5V, 12V, 15V, 24V & 48V input
- Full encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors

3300 VDC Isolated 1 W Single Output SMD

NTV Series

- Efficiency to 82%
- 3kVDC isolation (1 minute)
- 5V & 12V input
- 5V, 9V, 12V and 15V output
- Dual isolated outputs
- Wide temperature range at full 1W load -40°C to 85°C
- Internal SMD construction

Voltage | Output | Mhrs | Order Code
--------|--------|------|-------------
| (V)     | (V)    |      |             |
5        | 5      |      | NTV0509MC   | 102-1606 |
9        | 9      |      | NTV0909MC   | 102-1609 |
12       | 12     |      | NTV1209MC   | 102-1610 |
15       | 15     |      | NTV1509MC   | 102-1611 |
24       | 24     |      | NTV2415MC   | 102-1612 |
30       | 30     |      | NTV3009MC   | 102-1613 |

3300 VDC Isolated 1 W Dual Output SMD

NTV Series

- Efficiency to 82%
- 3kVDC isolation (1 minute)
- 5V & 12V input
- 5V, 9V, 12V and 15V output
- Dual isolated outputs
- Wide temperature range at full 1W load -40°C to 85°C
- Internal SMD construction

Voltage | Output | Mhrs | Order Code
--------|--------|------|-------------
| (V)     | (V)    |      |             |
5        | 5      |      | NTV0509MC   | 102-1606 |
9        | 9      |      | NTV0909MC   | 102-1609 |
12       | 12     |      | NTV1209MC   | 102-1610 |
15       | 15     |      | NTV1509MC   | 102-1611 |
24       | 24     |      | NTV2415MC   | 102-1612 |
30       | 30     |      | NTV3009MC   | 102-1613 |

1 Watt Isolated DC/DC Converters

The MEA series offers improved regulation performance ≤5% for applications where a wide output voltage variation cannot be tolerated. They are ideally suited for providing dual rail supplies with the added benefit of galvanic isolation to reduce switching noise. All of the rated power may be drawn from a single output providing the total load does not exceed 1 watt.

Price Each

Order Code | 1+ | 5+ | 10+ | 25+ |
-----------|----|----|-----|-----|
Single Output All Order Codes
Dual Output All Order Codes

- Power density 0.85W/cm³
- Wide temperature performance at full 1 Watt load -40°C to 85°C
- UL60950 recognised
- No heat sink required
- Industry standard pinout

Price Each

Order Code | 1+ | 5+ | 10+ | 25+ |
-----------|----|----|-----|-----|
Single Output All Order Codes
Dual Output All Order Codes

- Power sharing on output
- 5V, 12V, 15V, 24V & 48V input
- Fully encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors

181-8300
The MEV series is a high performance DC/DC converter. Offering improved regulation performance ≤5% for applications where a wide output voltage variation can not be tolerated.

- **Power density 0.85W/cm²**
- **Wide temperature performance at full load, -40°C to 85°C**
- **UL60950 recognized**
- **No heat sink required**
- **Industry standard pinout**
- **3kVDC galvanic isolation to reduce switching noise.**

### 1 Watt Isolated DC/DC Converters

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
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**Mfrs. Input Ouput Ouput Style Order Code**

- **List No.**
- **Voltage 1 2 Style**
- **Order Code**

**Power Supplies & Converters**

INTELLIGENT ONLINE BUYING SYSTEM PROVIDING Complete cost control, reduced administration time, visibility of your spend, flexibility and personalised to your company’s needs. farnell.com/buy
### PCB Mount - DC to DC Converters - continued

#### TSM Series, 1 Watt
- DC/DC converter in SMD package (SOIC-14/18)
- Lead frame construction
- High accuracy of pin co-planarity
- Single and dual output models
- 3 year manufacturer’s warranty

#### Isolated 1W Dual Output Surface Mount
- Toroidal magnetics
- 5V & 12V inputs
- 1KVDC isolation
- Dual isolated output
- Wide temperature performance at full load
- Internal SMD construction
- No heatsink required
- UL 94V-0 package material
- SIP package style

### 1W DC/DC Converters - Single O/P

**NMJ Series**
- UL60950 Recognised
- Single output
- 5.2KDC isolation
- 5V & 12V input
- 5V, 9V, 12V and 15V output
- Toroidal magnetics
- Internal SMD construction
- No heatsink required
- UL 94V-0 package material
- SIP package style

#### Pin out specification
- Pin out configuration
- Voltage (V)
- Input Current (mA)
- List No.
- Order Code

#### Order Code
- 1+ 10+ 25+ 50+ 100+

#### Price Each
- NMJ Series
- All Order Codes

### 1W DC/DC Converters - Dual O/P

**NMJ Series**
- UL60950 Recognised
- Dual output
- 5.2KDC isolation
- Efficiency to 70%
- 5V & 12V inputs
- 5V, 9V, 12V and 15V output
- Power sharing
- Toroidal magnetics
- Internal SMD construction
- No heatsink required
- UL 94V-0 package material
- SIP package style

#### Pin out specification
- Pin out configuration
- Voltage (V)
- Current (mA)
- List No.
- Order Code

#### Order Code
- 1+ 10+ 25+ 50+ 100+

#### Price Each
- NMJ Series
- All Order Codes

### 1W - Single Output NME Series

**Subminiature - 1KV Isolation**
- SIL and DIL package styles
- Power density 1.45W cm²
- 1KVDC isolation single output
- UL 94V-0 package material
- Efficency to 80%
- No heatsink or external components required

#### Single In-Line Package
- Toroidal magnetics
- 5V, 9V, 12V, and 15V output
- Internal SMD construction
- No heatsink required
- UL 94V-0 package material
- Lead compatible
- Lead frame technology

#### Nominal Input Voltage
- Voltage (V)
- Output Voltage (V)
- Current (mA)
- List No.
- Order Code

#### Order Code
- 1+ 10+ 25+ 50+ 100+

#### Price Each
- NME Series
- All Order Codes

---

**NME Series**
- All Order Codes

---

**SIP package style**
- Lead frame technology
- UL 94V-0
- No heatsink or external components required

#### Dual In-Line Package
- Nominal input voltage
- Voltage range
- Load regulation
- Output ripple and noise
- +10%, -7.5%
- 10% @ 100% load
- 110mV pk to pk (5, 12, 24V)
1W Isolated DC/DC Converters
Single Output - IE Series

A range of 1W isolated dc/dc converters. The IE series has single outputs ranging from 5 Vdc to 15 Vdc with 5, 12, or 24 Vdc. The units are available in both SIP and DIP package styles and feature short circuit protection.

- Low cost
- Industry standard pin-out
- +40°C to +85°C @ full load
- 1 kVdc isolation
- 3 year warranty

SIP - Dimensions (mm): L=11.68, W=8.1, H=10.15
DIP - Dimensions (mm): L=13.7, W=10.14, H=6.86

Input Range
Nominal ±10%

Line Regulation
1.2%/1% /V

Load Regulation
±10% 20-100% load

Ripple & Noise
300 mV pk-pk, 20 MHz BW

Short Circuit Protection
1.5 sec max

Operating Temperature
-40°C to 85°C

Storage Temperature
-40°C to 125°C

Isolation Voltage
1000 Vdc min

Efficiency
Up to 78%

MTBF
>1 million hours

Product Information
All Order Codes

1W 3kV Isolated DC/ DC Converters
Single Output - IE-H Series

An industry standard SIP pinout converter, offering 3000VDC input to output isolation as standard and a high MTBF of >1.1 million hours. Nominal input voltages of 3.3, 5, 12 & 24VDC and output voltages from 3.3VDC to 24VDC makes this a very versatile converter.

- Nominal input voltage 3.3, 5, 12 & 24VDC
- Output voltage 3.3 to 24VDC
- Short Circuit Protection
- 3000VDC Isolation
- Industry standard pin out
- 3 year warranty

Input Voltage Range
Nominal ±10%
Line Regulation
1.2%/1% change of Vin
Load Regulation
±10% 20-100% load change (3.3 V models ±20%)
Ripple & Noise
60 mV pk-pk, 20 MHz BW
Isolation Voltage
3000 VDC
MTBF
>1.1 Mhrs to MIL-HDBK-217F at 25°C, GB
Operating Temperature
-40°C to +60°C
Storage Temperature
-40°C to +125°C

Power Supplies & Converters
Power, Test and Measurement

1W Isolated Single Output DC/DC Converters
NKE Series

- Industry standard pinout
- 3.3V, 5V, 9V, 12V and 15V output
- Internal SMD construction
- Fully encapsulated with toroidal magnetism
- No Electrolytic or Tantalum capacitors
- MTBF up to 2.4 million hours

PIN CONNECTIONS

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Order Codes
All Order Codes

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PCB Mount - DC to DC Converters - continued

TME Series
1 Watt

Further specifications:
- Regulation
- Input variation: unregulated
- Load variation: ±10% range
- Ripple and noise: 10mV pk-pk typ. (20 MHz Bandwidth)
- I/O Isolation: 1kV
- Operating temperature: -40°C to +85°C (without power reduction)

- DC/DC converter in Single-in-Line package (SIP)
- Single output
- High efficiency up to 80%
- Industry standard pinout
- 3 year product warranty

Plug and Play - IF Series

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NMF series 1W DC/DC converters
Regulated Output - 1kV Isolation

Specific versions are available for use with flash memory devices. All units feature a control pin, used to control the flash memory programming voltage.

- 1kVdc isolation
- UL 94V-0 package material
- Fully encapsulated

Nominal input voltage 5.1 to 24V
Input range ±5%
Load voltage regulation (10% to 100% full load)

- Compact size
- No heatshrink or external components required
- Power density 0.85W/cm²

Pinout specification: Pin 1: +Vin, Pin 2: -Vin, Pin 4: +Vout, Pin 6: -Vout

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NMR Series 1W DC/DC Converters

- Full 1 watt output power
- 1kVDC isolation
- Efficiency from 80%
- 5V, 12V & 24V input
- 5V, 12V & 15V output
- Industry standard pinout
- No electrolytic or tantalum capacitors
- UL 94V-0 package material
- Fully encapsulated with toroidal magnets
- Pin compatible with NMG series

1W Regulated DC/DC Converters
Single Output - IF Series

A range of isolated and fully regulated DC/DC converters, with output voltages of 3.3V to 15V from nominal input voltages of 5V, 12V and 24V. These converters have 1000VDC input to output isolation and operate from -40°C to +85°C without derating.

- Fully Regulated Output
- Industry Standard Pinout
- MTBF >2million hours
- Low Ripple and Noise
- 3 year warranty

Pin Connections

Note: Pin 5 should be NC when not used

Dimensions (mm): L = 19.5, W = 7.2, H = 10
### 1 Watt Isolated DC/DC Converters

The MER1 series is a high performance version of the 1W NMR series. The MER1 series is more efficient and offers improved regulation performance for applications where a wide output voltage variation can not be tolerated. They are ideally suited for providing local supplies on control system boards with the added benefit of 1kVDC galvanic isolation to reduce switching noise.

- No heat sink required
- Industry standard pinout
- 1kVDC isolation
- 5V, 12V, 15V, 24V, & 48V inputs
- 5V, 9V, 12V, & 15V output
- Fully encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors
- UL60950 recognised

### NMR Series 1W DC/DC Converters

**1kV Isolation, Input to Output & Output to Output**

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### NMD Series 1W DC/DC Converters

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### Power, Test and Measurement

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### Power, Test and Measurement

- Voltage Range: 3000V dc	- Input/Output isolation
- Load regulation: 10% @ 5V DC OPD
- Operating temperature: -40°C to +85°C
1W 3kV Isolation DC/DC Converters

A range of 1W 3kV isolated dc/dc converters. The IV series is available in both single and dual output versions ranging from 5 Vdc to 15 Vdc with inputs of 5 or 12 Vdc.

- Low cost
- ±40°C to ±85°C @ full load
- Industry standard pin-out
- 3 year warranty

Dimensions (mm):
L = 19.5, W = 6, H = 9.5

Power Supplies & Converters

INTELLIGENT ONLINE BUYING SYSTEM PROVIDING

Complete cost control, reduced administration time, visibility of your spend, flexibility and personalisation to your company’s needs.

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PCB Mount - DC to DC Converters - continued

NMV Series 1W DC/DC Converters - continued

3kV Isolation - continued

Single and Dual Output - IV Series

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<td>15 ±10%</td>
<td>15</td>
<td>65</td>
<td>80</td>
<td>100-7512</td>
</tr>
<tr>
<td>TMA 1515S</td>
<td>15 ±10%</td>
<td>15</td>
<td>65</td>
<td>80</td>
<td>100-7513</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>TMA 2405S</td>
<td>24 ±10%</td>
<td>24</td>
<td>80</td>
<td>78</td>
<td>100-7512</td>
</tr>
<tr>
<td>TMA 2412S</td>
<td>24 ±10%</td>
<td>24</td>
<td>80</td>
<td>78</td>
<td>100-7512</td>
</tr>
<tr>
<td>TMA 2415S</td>
<td>24 ±10%</td>
<td>24</td>
<td>80</td>
<td>78</td>
<td>100-7512</td>
</tr>
</tbody>
</table>

Further specifications:
- Single-in-Line Package (SIP)
- Single and Dual Output Models
- High Efficiency up to 81%
- Industry Standard Pinout
- 100% Burn-In (8 h)
- 3 year product warranty

TMA Series 1 Watt

Further specifications:
- Regulation: unregulated ±10% max.
- Ripple and noise: 75mV pk-pk typ. (20 MHz Bandwidth)
- Efficiency: up to 81%
- Industry Standard Pinout
- 100% Burn-In (8 h)
- 3 year product warranty

Input Range            Nominal ±10%
Load Regulation        ±10% 20-100% load
Ripple & Noise         75 mV pk-pk max. 20 MHz BW
Short Circuit Protection: 1 s max
Operating Temperature  -40°C to +85°C
Storage Temperature    -40°C to +125°C
Isolation Voltage      3000 Vdc min
Efficiency             Up to 78%

Dimensions (mm):
L = 19.5, W = 6, H = 9.5

Additional specifications:
- 3 year product warranty
- Industry Standard Pinout
- High Efficiency up to 81%
- Single-in-Line Package (SIP)
- Single and Dual Output Models
- Input Range: 5 Vdc to 15 Vdc with inputs of 5 or 12 Vdc
- Load Regulation ±10% 20-100% load
- Ripple & Noise: 75 mV pk-pk max. 20 MHz BW
- Short Circuit Protection: 1 s max
- Operating Temperature: -40°C to +85°C
- Storage Temperature: -40°C to +125°C
- Isolation Voltage: 3000 Vdc min
- Efficiency: Up to 78%
- Industry Standard Pinout
- High Efficiency up to 81%
- Single-in-Line Package (SIP)
- Single and Dual Output Models
1W Wide Input DC/DC Converters
Regulated Single Output - 1W Series

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vin</td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>No Pin</td>
</tr>
<tr>
<td>5</td>
<td>No Pin</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
</tr>
<tr>
<td>7</td>
<td>-Vout</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

A range of fully isolated and regulated DC/DC convertors with output voltages of 3.3V to 24V. The wide 2:1 input range covers 4.5-9V, 9-18V and 18-36V. Input to output isolation is 1000VDC as standard and all models have continuous short circuit protection.

- Fully Regulated Output
- Wide Input Range (2:1)
- Continuous Short Circuit Protection
- 1000VDC Isolation
- Industry standard pinout
- 3 year warranty

**Input Voltage Range**
2:1 Nominal 5V, 12V, 24V

**Line Regulation**
±0.5% max

**Load Regulation**
±1% max from 25-100% load

**Ripple & Noise**
80 mV pk-pk max, 20MHz bandwidth

**Efficiency**
67-75%

**Isolation Voltage**
1000VDC standard

**Operating Temperature**
-40°C to +100°C

**Storage Temperature**
-40°C to +125°C

---

### TSR-1 series, Switching Regulator

**1A**

- High performance switching regulator
- High efficiency up to 96%
- Low standby current
- Wide input voltage range
- Operating temperature range: -40°C to +85°C
- Pin compatible with LM78XX linear regulator
- Short circuit protection
- 3 years product warranty

**Regulation**
- Line variation: 0.2%
- Load variation: +10% to -5% max.

**Ripple & Noise**
0.5% for models up to 6.5VDC output, 2% for models higher 6.5VDC output

**Input Filter**
Internal capacitors

**Short Circuit Protection**
Continuous, automatic recovery

**Operating Temperature Range**
-40°C to +85°C, above 60°C derate 2.4%/K

**Voltage (V)\(\) Voltage (V)\(\) Current (mA)\(\)

---

### TES-1 series, Switching Regulator

**SMD, 1Watt**

- Small SMD package with industry standard footprint
- Single and dual output models
- Operating temperature range: 40°C to +85°C
- High accuracy of pin co-planarity
- 3 years product warranty

**Regulation**
- Line variation: 1.2%
- Load variation: ±1% change Vin (non regulated)

**Short Circuit Protection**
Limited 0.5 sec. max

**Operating Temperature Range**
-40°C to +85°C

---

**Power, Test and Measurement**

---

**Price Each**

---

**3 Year Warranty**

---

**Dimensions (mm):**
H=10.16, W=11.68, D=7.5

---

**NEW**

---

**Pin Connections**

---

**Price Each**

---

**All Order Codes**

---

**Dimensions:**
L=21.85, W=9.2, H=11.1
PCB Mount - DC to DC Converters - continued

0.5-1 Amp Single Output Switching Regulator - continued

<table>
<thead>
<tr>
<th>Order Code</th>
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<th>5+</th>
<th>10+</th>
<th>25+</th>
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</thead>
<tbody>
<tr>
<td>S905 Series All Order Codes</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR10 Series All Order Codes</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

1.5W DC/DC Converters - 12V Input, 200V to 1500V Output - Non-Isolated

The GM Series are general purpose high voltage dc to dc converters which provide positive or negative output voltages up to ±1500V from a single 12V supply.

The converters are vacuum encapsulated in an ABS case to ensure maximum reliability and safety with 100,000 hours MTBF.

Output power 3W surge, 1.5W continuous. Operating temperature 0°C to 40°C. Line regulation ±0.5% max. from 10% to 100% load. Ripple & Noise 50 mV pk-pk, 20MHz BW. Isolation Voltage 1500V DC. Safety Approvals EN60950-1, UL60950-1, CSA C22-2 No. 60950-1-03. 3 Year Warranty.

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>7</td>
<td>N.C</td>
<td>Common</td>
</tr>
<tr>
<td>8</td>
<td>N.C</td>
<td>N.C</td>
</tr>
<tr>
<td>9</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
</tbody>
</table>

Input Voltage Range

- See table

Load Regulation

- ±0.5% max.

Ripple & Noise

- 50 mV pk-pk, 20MHz BW

Isolation Voltage

- 1500V DC

Operating Temperature

- -40°C to +100°C

Continuous output power at typical efficiencies of 60%.

Dimensions (mm): H=12.5, W=28, D=9.2

2 Watt Regulated DC/DC Converters

4:1 Input, SIP

- Regulated Single & Dual Output
- Wide 4:1 Input Range
- SIP Package
- 1500 VDC Isolation
- Remote On/Off
- Continuous Short Circuit Protection
- 3 Year Warranty

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
<td>+Vin</td>
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<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>7</td>
<td>N.C</td>
<td>Common</td>
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<tr>
<td>8</td>
<td>N.C</td>
<td>N.C</td>
</tr>
<tr>
<td>9</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
</tbody>
</table>

Input Voltage Range

- See table

Load Regulation

- ±0.5% max. from 10% to 100% load

Ripple & Noise

- 50 mV pk-pk, 20MHz BW

Isolation Voltage

- 1500V DC

Operating Temperature

- -40°C to +100°C, derate from 100% load at 75°C to 0% load at 100°C

Short Circuit Protection

- Continuous with auto recovery

MTBF

- >1.2 Mhrs to MIL-HDBK-217F at 25°C, GB

Price Each

<table>
<thead>
<tr>
<th>Order Code</th>
<th>1+</th>
<th>5+</th>
<th>10+</th>
<th>25+</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2403SA</td>
<td>9 to 36 Vdc</td>
<td>3.3V, 500mA</td>
<td>–</td>
<td>75%</td>
</tr>
<tr>
<td>M2404SA</td>
<td>9 to 36 Vdc</td>
<td>5V, 400mA</td>
<td>–</td>
<td>81%</td>
</tr>
<tr>
<td>M2412SA</td>
<td>9 to 36 Vdc</td>
<td>12V, 165mA</td>
<td>–</td>
<td>84%</td>
</tr>
<tr>
<td>M2415SA</td>
<td>9 to 36 Vdc</td>
<td>15V, 135mA</td>
<td>–</td>
<td>85%</td>
</tr>
<tr>
<td>M2425S</td>
<td>9 to 36 Vdc</td>
<td>5V, 200mA</td>
<td>5V, -200mA</td>
<td>81%</td>
</tr>
<tr>
<td>M2412S</td>
<td>9 to 36 Vdc</td>
<td>12V, 85mA</td>
<td>-12V, -85mA</td>
<td>83%</td>
</tr>
<tr>
<td>M2415S</td>
<td>9 to 36 Vdc</td>
<td>15V, 65mA</td>
<td>-15V, -65mA</td>
<td>82%</td>
</tr>
<tr>
<td>M4803SA</td>
<td>18 to 75 Vdc</td>
<td>3.3V, 500mA</td>
<td>–</td>
<td>75%</td>
</tr>
<tr>
<td>M4805SA</td>
<td>18 to 75 Vdc</td>
<td>5V, 400mA</td>
<td>–</td>
<td>80%</td>
</tr>
<tr>
<td>M4812SA</td>
<td>18 to 75 Vdc</td>
<td>12V, 85mA</td>
<td>-12V, -85mA</td>
<td>81%</td>
</tr>
<tr>
<td>M4815SA</td>
<td>18 to 75 Vdc</td>
<td>15V, 65mA</td>
<td>-15V, -65mA</td>
<td>84%</td>
</tr>
<tr>
<td>M48185S</td>
<td>18 to 75 Vdc</td>
<td>200V, -200mA</td>
<td>80%</td>
<td>173-8194</td>
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<tr>
<td>M4812S</td>
<td>18 to 75 Vdc</td>
<td>12V, 85mA</td>
<td>-12V, -85mA</td>
<td>81%</td>
</tr>
<tr>
<td>M48185S</td>
<td>18 to 75 Vdc</td>
<td>15V, 65mA</td>
<td>-15V, -65mA</td>
<td>84%</td>
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Price Each

<table>
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<tr>
<th>Order Code</th>
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<td>GMA12-200-PE</td>
<td>118-7129</td>
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<td>GMA1000P</td>
<td>118-7172</td>
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<tr>
<td>GMA500N</td>
<td>118-7170</td>
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</tr>
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<td>GMA4815S</td>
<td>118-7174</td>
<td>–</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Watt Single and Dual Output DC/DC Converters

Industry Standard Pinout, Smaller Package Size

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>8</td>
<td>N.C</td>
<td>N.C</td>
</tr>
</tbody>
</table>

Input Voltage Range

- 5V (4.5-8.0 VDC), 12V (9-18 VDC), 24V (18-36 VDC), 48V (36-75 VDC)

Undervoltage Lockout

- Turn On at -5% to -10% of rated input. Turn Off at -20% of rated input

Line Regulation

- ±0.3% max. (high line to low line)

Load Regulation

- ±1% for all models from 10% to 100% load

Ripple & Noise

- 50 mV pk-pk, 20MHz BW

Isolation Voltage

- 1500V DC

Operating Temperature

- -40°C to +100°C, output power derates from 100% load at +75°C linearly to 0% load at +100°C

Safety Approvals

- EN60950-1, US60950-1, CSA C22-2 No. 60950-1-03

Emissions

- EN55022 level B

Price Each

<table>
<thead>
<tr>
<th>Order Code</th>
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<th>10+</th>
<th>25+</th>
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<tbody>
<tr>
<td>ET0505A</td>
<td>5V</td>
<td>5V</td>
<td>400mA</td>
<td>78%</td>
</tr>
<tr>
<td>ET0612A</td>
<td>5V</td>
<td>12V</td>
<td>60mA</td>
<td>99%</td>
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<td>ET0615A</td>
<td>5V</td>
<td>15V</td>
<td>33mA</td>
<td>73%</td>
</tr>
<tr>
<td>ET1205A</td>
<td>12V</td>
<td>5V</td>
<td>400mA</td>
<td>78%</td>
</tr>
<tr>
<td>ET1212A</td>
<td>12V</td>
<td>12V</td>
<td>60mA</td>
<td>83%</td>
</tr>
<tr>
<td>ET1215A</td>
<td>12V</td>
<td>15V</td>
<td>33mA</td>
<td>81%</td>
</tr>
<tr>
<td>ET2405A</td>
<td>24V</td>
<td>5V</td>
<td>400mA</td>
<td>80%</td>
</tr>
<tr>
<td>ET2412A</td>
<td>24V</td>
<td>12V</td>
<td>60mA</td>
<td>83%</td>
</tr>
<tr>
<td>ET2415A</td>
<td>24V</td>
<td>15V</td>
<td>33mA</td>
<td>81%</td>
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Price Each

<table>
<thead>
<tr>
<th>Order Code</th>
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<th>5+</th>
<th>10+</th>
<th>25+</th>
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</thead>
<tbody>
<tr>
<td>JC005035</td>
<td>4.5 to 9 Vdc</td>
<td>3.3V, 600mA</td>
<td>–</td>
<td>128-9145</td>
</tr>
<tr>
<td>JC01055S</td>
<td>4.5 to 9 Vdc</td>
<td>5V, 400mA</td>
<td>–</td>
<td>128-9146</td>
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<tr>
<td>JC01255S</td>
<td>4.5 to 9 Vdc</td>
<td>12V, 170mA</td>
<td>–</td>
<td>128-9147</td>
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<tr>
<td>JC01555S</td>
<td>4.5 to 9 Vdc</td>
<td>15V, 140mA</td>
<td>–</td>
<td>128-9149</td>
</tr>
<tr>
<td>JC020501</td>
<td>4.5 to 9 Vdc</td>
<td>5V, 200mA</td>
<td>-5V, -200mA</td>
<td>128-9150</td>
</tr>
</tbody>
</table>
NMG Series 2W DC/DC Converters

- Full 2 watt output power
- 1KVDC isolation
- Efficiency from 81%
- 5V, 9V, 12V, & 15V output
- Industry standard pinout
- No electrolytic or tantalum capacitors
- UL 94V-0 package material
- No external components required
- Fully encapsulated with toroidal magnets
- Pin compatible with NMI series

Pin out specification
Pin 1 +Vin, Pin 2 -Vin, Pin 4 -Vout, Pin 6 +Vout

<table>
<thead>
<tr>
<th>Nominal Input Voltage (V)</th>
<th>Output Voltage (V)</th>
<th>Output Current (mA)</th>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
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<tbody>
<tr>
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<td>400</td>
<td>248505</td>
<td>NMG5005SC</td>
<td>101-5942</td>
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<tr>
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<td>12</td>
<td>167</td>
<td>NMG2412SC</td>
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<tr>
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<td>15</td>
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<tr>
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<td>500</td>
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<tr>
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<td>167</td>
<td>NMG1212SC</td>
<td>101-5929</td>
<td></td>
</tr>
</tbody>
</table>

Price Each

NML Series 2W DC/DC Converters

- Fully regulated outputs
- Internal SMD construction
- No heatank required
- UL 94V-0 package material
- SIP package style
- No external components required
- Pin compatible with LME and NME Series

Pin out specification
Pin 1 +Vin, Pin 2 -Vin, Pin 3 30V, Pin 4 5V

<table>
<thead>
<tr>
<th>Nominal Input Voltage (V)</th>
<th>Output Voltage (V)</th>
<th>Output Current (mA)</th>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
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<td>248505</td>
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<td>102-1519</td>
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<td>9</td>
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<td>NML5009SC</td>
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<td>167</td>
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<td>15</td>
<td>133</td>
<td>NML1515SC</td>
<td>102-1526</td>
<td></td>
</tr>
</tbody>
</table>

Price Each

2W Isolated DC/DC Converters Single Output - IL Series

- Single Output
- 1000 VDC Isolation
- Efficiency from 81%
- Operating Temperature: -40°C to +85°C
- 3 Year Warranty

Pin Connections

- Single Output
- Dual Output
- Single Output
- Dual Output
PCB Mount - DC to DC Converters - continued

2 Watt Single and Dual Output DC/DC Converters - continued

Low Cost - continued

- Voltage Range: Nominal ±10%
- Line Regulation: ±0.5% max
- Load Regulation: ±0.5% max (±0.5% max for 35V versions)
- Ripple & Noise: 75 mV pk-pk, 20 MHz bandwidth
- Isolation Voltage: 1000 VDC Input to Output
- Outputs: 1000 VDC Input to Case
- Operating Temperature: -40°C to +100°C, see datasheet for derating
- Short Circuit Protection: Trip & restart (hipps mode), auto recovery
- MTBF: >300k hrs to MIL-HDBK-217F at 25°C, GB

Miniature 2W dc isolation
- Efficiency: >86%
- 1kV dc isolation
- Power density: 1.42W/cm³
- Sil- and DL packages styles
- No heatsink or external components required

2W - Dual Output NMH Series

1kV dc isolation
- Single & Dual Regulated Outputs
- 1 kV Input Range
- Standard SMD Package
- Industry Standard Pin-out
- 1500 VDC Isolation
- Operating Temperature: -40°C to +85°C Operation
- 3 Year Warranty

PIN CONNECTIONS

Dimensions(mm): H=7.5, W=23.86, D=13.7

Price Each

Order Code 1+ 10+ 25+ 50+ 100+

2W Isolated DC/DC Converters

Output Levels: ±5V, ±12V, ±15V

UL94V-0 material

Pinout - ±5V, ±12V, ±15V

Order Code

1 -V ±5V 1 ±12V 1 ±15V

N.C N.C. 78% 76% 74%

Dimensions(mm): H=7.5, W=23.86, D=13.7

Price Each

Order Code 1+ 10+ 25+ 50+ 100+

2W Isolated DC/DC Converters

Dual Output - NMH Series

Input voltage range: ±10% or ±5V

Output ripple and noise: ±1.0%

Power Supplies & Converters
Dual Output - IH-H Series

Output voltage 3.3 to 24VDC

°C to +125°C

Isolation Voltage 3000 VDC

NMK Series 2W DC/DC Converters

Input Voltage Range Nominal ±10%

Line Regulation ±1% 20-100% load

 Ripple & Noise 75 mV pk-pk max, 20 MHz BW

Short Circuit Protection 1 second

Operating Temperature -40°C to +85°C

Storage Temperature -40°C to +125°C

Efficiency 1000 VDC

SIP Package

DIP Package

5 Vdc ±5 Vdc ±200 mA IH0505S 872-7846 IH0505S 872-7866
5 Vdc ±12 Vdc ±64 mA IH0512S 872-7902 IH0512S 872-7999
4 Vdc ±15 Vdc ±66 mA IH0515S 872-7929 IH0515S 872-7910
12 Vdc ±5 Vdc ±200 mA IH1205S 872-7745 IH1205S 872-7790
12 Vdc ±12 Vdc ±84 mA IH1212S 872-7888 IH1212S 872-7890
24 Vdc ±5 Vdc ±200 mA IH2405S 872-8000 IH2405S 872-8011
24 Vdc ±12 Vdc ±84 mA IH2412S 872-8042 IH2412S 872-8054
24 Vdc ±15 Vdc ±66 mA IH2415S 872-8089 IH2415S 88070

Order Code

Price Each
1+ 5+ 10+ 25+ 100+

H05 Series All Order Codes
H12 Series All Order Codes
H24 Series All Order Codes

2W Isolated DC/DC Converter
Dual Output - IH-H Series

Dimensions (mm): L=19.5, W=7.62, H=10.16

- Nominal input voltage 5, 12 & 24VDC
- Output voltage 3.3 to 24VDC
- Short Circuit Protection

An industry standard SIP pinout converter, offering 3000VDC input to output isolation as standard and a high MTBF of >1 million hours. Nominal input voltages of 5, 12 & 24VDC and output voltages from 3.3VDC to 24VDC makes this a very versatile converter.

Input Voltage Range Nominal ±10%

Line Regulation 1.2%/1% change of Vin

Ripple & Noise 60 mV pk-pk, 20 MHz BW

Isolation Voltage 3000 VDC

MTBF >1.1 times to MIL-HDBK-217 at 25°C, GB

Operating Temperature -40°C to +85°C

Storage Temperature -40°C to +125°C

Mfrs. List No. Order Code 1+ 5+ 10+ 25+ 100+
IH0505S-H 5 +3 3 +200 143-6411
IH0506S-H 5 +5 3 +200 143-6412
IH0509S-H 5 ±8 +111 143-6413
IH0512S-H 5 ±12 3 +84 143-6414
IH0515S-H 5 ±15 3 +66 143-6416
IH0524S-H 5 ±24 3 +42 143-6417
IH1205S-H 12 +5 +200 143-6419
IH1206S-H 12 ±8 +200 143-6420
IH1209S-H 12 ±11 3 +111 143-6450
IH1215S-H 12 ±15 3 +96 143-6454
IH1224S-H 12 ±24 3 +42 143-6456
IH2405S-H 24 +3 3 +200 143-6514
IH2406S-H 24 ±5 3 +200 143-6515
IH2412S-H 24 ±12 3 +84 143-6518
IH2415S-H 24 ±15 3 +66 143-6519
IH2424S-H 24 ±24 3 +42 143-6520

Order Code

Price Each
1+ 5+ 10+ 25+ 100+

All Order Codes

NMS Series 2W DC/DC Converters

- 60V dc input/output isolation
- High efficiency (typical 75%)
- Fully encapsulated
- No heat sink required for rated performance
- Low profile package

Price Each

Order Code

Price Each
1+ 10+ 25+ 50+ 100+

All Order Codes

TEL-2 Series, 2 Watt

- DC/DC converter in SMD design
- Wide 2:1 input range
- Input filter meets EN55022, Class A
- High efficiency
- Indefinite short circuit protection
- Ultra compact 16-pin plastic package
- 3 year manufacturer’s warranty

Input Variation ±5% Max.

Load variation ±5% Max. (Single output models)

Efficiency 75% typ.

Conducted EMI EN55022, Class A

Pin out specification
Pin 1 = Vin; Pin 2 = Vin; Pin 3 = Vout; Pin 4 = Vout
PCB Mount - DC to DC Converters - continued

TEL-2 Series, 2 Watt - continued

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
<th>Price Each</th>
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<tbody>
<tr>
<td>TEL-2-0511</td>
<td>100-7025</td>
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<td>TEL-2-4822</td>
<td>100-7038</td>
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</table>

**TES 2N Series**

- **SMD - 2 watts, Single/Dual**
- **Power Supplies & Converters**
- **Power, Test and Measurement**
- **2 Watt Single Output DC/DC Converters**
  - **Industry Standard SMD Package**
  - **3 Year Warranty**
  - **Dimensions (mm): H=8, W=23.86, D=13.7**

**PIN CONNECTIONS**
- **Pin 1**: +Vin
- **Pin 2**: -Vin
- **Pin 3**: +Uout
- **Pin 4**: -Uout
- **Pin 5**: +Vin
- **Pin 6**: +Uout

**Technical Specifications**
- **Input Voltage Range**: Nominal ±10%
- **Line Regulation**: 1.2%/1%
- **Load Regulation**: 7.5% ±10% load change
- **Ripple & Noise**: 200 mV pk-pk max, 20 MHz bandwidth
- **Isolation Voltage**: 6000 VDC
- **Operating Temperature**: -40°C to +85°C
- **MTBF**: >3.5 Mhrs
- **I/O Isolation**: 1kV
- **Input Voltage**: 200 mV pk-pk typ. (12/24V models)
- **Ripple and noise**: 75 mV pk-pk typ. (5V Vin models)
- **Bandwidth**: 75mV pk-pk typ. (5V Vin models)

**Order Codes**

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
<th>Price Each</th>
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<tbody>
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<td>100-7047</td>
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<td>TES 2N-0513</td>
<td>100-7049</td>
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<td>TES 2N-0521</td>
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<td>TES 2N-0522</td>
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<td>100-7057</td>
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**TMH Series**

- **2 Watt**
- **DC/DC converter in a Single-in-Line package**
- **Isolated single and dual output**
- **High efficiency up to 83%**
- **Industry standard pinout**
- **3 year product warranty**

**Further specifications**
- **Regulation**: unregulated
- **Load variation**: ±10% max.
- **Ripple and noise** (20MHz bandwidth): 575mV pk-pk typ. (5Vin models)
- **I/O isolation**: 150mV pk-pk typ. (12/24Vin models)
- **Operating temperature**: -40°C to +85°C above 70°C, 3.5% power reduction
### 2W Wide Input DC/DC Converters

#### Regulated Single Output - IU Series

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>TMH 0505S</td>
<td>5 V dc</td>
<td>±12 ±60</td>
<td>±77 ±38</td>
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<tr>
<td>TMH 0512S</td>
<td>12 ±10%</td>
<td>±12 ±60</td>
<td>±77 ±38</td>
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<tr>
<td>TMH 0515S</td>
<td>15 ±10%</td>
<td>±12 ±60</td>
<td>±77 ±38</td>
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<tr>
<td>TMH 0565D</td>
<td>5 ±200</td>
<td>±12 ±60</td>
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<td>TMH 0572D</td>
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<td>±12 ±60</td>
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<td>TMH 0575D</td>
<td>5 ±200</td>
<td>±12 ±60</td>
<td>±77 ±38</td>
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</table>

#### Pin Connections

- **Pin**: +Vin (Vcc)
- **Function**: 1

#### Dimensions (mm):

- **L**: 27.80
- **W**: 9.2
- **H**: 11.1

### 2W - Single Output NDL Series

#### Wide Input

- 1xV dc input/output isolation
- Miniature SIP package
- Short circuit protection
- Continuous short circuit protection with current foldback
- ±2:1 wide input range
- External control
- Low noise
- Power density 0.9W/cm³
- Packaged to UL94V-0

<table>
<thead>
<tr>
<th>(Nom) Vin</th>
<th>Output Mfrs. List No.</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>5-4.5 V</td>
<td>NDL0505SC</td>
<td>100-7551</td>
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<tr>
<td>4.5-9 V</td>
<td>NDL0512S</td>
<td>100-7552</td>
</tr>
<tr>
<td>9-15 V</td>
<td>NDL0515S</td>
<td>100-7553</td>
</tr>
<tr>
<td>5-200 mA</td>
<td>NDL0565D</td>
<td>100-754</td>
</tr>
<tr>
<td>200 mA</td>
<td>NDL0572D</td>
<td>100-7556</td>
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<tr>
<td>200 mA</td>
<td>NDL0575D</td>
<td>100-7557</td>
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</tbody>
</table>

#### Pin Connections

- **Pin**: +Vin (Vcc)
- **Function**: 1

#### Specifications

- **Input Voltage Range**: 2.1 Nominal 3V, 12V, 24V, 48V
- **Line Regulation**: ±1% for 25-100% load change
- **Ripple & Noise**: 80 mV pk-pk max, 20MHz BW
- **Load Regulation**: ±0.5% maximum
- **Efficiency**: 67-80%
- **Isolation Voltage**: 1000 VDC standard
- **Operating Temperature**: -40°C to +125°C
- **Storage Temperature**: -40°C to +125°C

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Input Voltage (V)</th>
<th>Output Voltage (V)</th>
<th>Current (mA)</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>IU0503SA</td>
<td>4.5 - 9</td>
<td>3.3</td>
<td>500</td>
<td>143-5408</td>
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<td>IU0505SA</td>
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<td>IU0512SA</td>
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<td>167</td>
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</table>

### Power, Test and Measurement

- Farnell P 3113 Date: 07-09-12 time:08:48
- C = CYAN M = Magenta Y = Yellow B = Black/UKBK1

---

For all order codes, contact our Data Department.

<table>
<thead>
<tr>
<th>Power, Test and Measurement</th>
<th>All Order Codes</th>
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<th>5+</th>
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</tbody>
</table>

---

For full specification and further pin-out details contact our Data Department.
**PCB Mount - DC to DC Converters - continued**

**TMR Series - continued**

Regulation:  
- Input variation: Vin: ±0.5% max.  
- Load variation: ±0.75% max. (Single output models) / ±1.0% max. (Dual output models)

Ripple & Noise:  
- Short Circuit Protection: Continuous, auto-recovery
- Isolation Voltage (I/O): 1000 VDC
- Efficiency: 78% typ.
- Ripple & Noise: 50 mV pk-pk (20 MHz BW)

**2 Watt Single and Dual Output DC/DC Converters - continued**

- Models with 5 V Input: 78% typ.
- ±Load variation: ±0.75% max.

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin Single</th>
<th>Dual</th>
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<tbody>
<tr>
<td>1 - Vin (GND)</td>
<td>- Vin (GND)</td>
</tr>
<tr>
<td>2 + Vin (Vcc)</td>
<td>+ Vin (Vcc)</td>
</tr>
<tr>
<td>3 No function</td>
<td>Common</td>
</tr>
<tr>
<td>4 No function</td>
<td>Common</td>
</tr>
<tr>
<td>5 + Vin (Vcc)</td>
<td>- Vin (GND)</td>
</tr>
<tr>
<td>6 - Vin (GND)</td>
<td>+ Vin (Vcc)</td>
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**Pinning**

<table>
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<tr>
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<td>1</td>
<td>- Vin (GND)</td>
<td>- Vin (GND)</td>
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<tr>
<td>2</td>
<td>+ Vin (Vcc)</td>
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</tr>
<tr>
<td>6</td>
<td>- Vin (GND)</td>
<td>+ Vin (Vcc)</td>
</tr>
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</table>

**Regulation**

- Input variation:  
  - Single output models: ±0.75% max.
  - Dual output models: ±1.0% max.
- Ripple & Noise: 50 mV pk-pk (20 MHz BW)
- I/O isolation: 1.5 kV
- Efficiency: 81% ±0.75% max. (single model)
- Residual ripple: 30 mV pk-pk typ. (20 MHz BW)
- Operating temperature range: -40°C to 85°C (with no derating)
- Remote on/off: Compartment design in DIP-14 package

**New Features**

- Ultra wide 4:1 input range:  
- No minimum load required
- Short circuit protection
- Fully regulated outputs
- Remote on/off: Safety standards: UL/cUL 60950-1, EN 60950-1 and IEC 60950-1

**2 Year product warranty**

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**TMR 2W series**

- 2W DC/DC Converter in a miniature SIL housing
- Very wide 4:1 input voltage range
- Regulated output: Input filter according to EN 55022, Class A and FCC, Level A
- Low residual ripple
- Resistant to sustained short circuits
- External IN/OUT
- 3 year guarantee

**Further specifications:**

- Control deviations:  
  - Change in input: ±0.75% max.
  - Change in power: ±0.75% max. (single model)
- Residual ripple: 50 mV pk-pk typ. (20 MHz bandwidth)
- I/O isolation: 1 kV
- Operating temperature range: -40°C to +125°C (without power reduction)

**Current consumption in the shut-down state:** 0.2 mA
3 Watt Single and Dual Output DC/DC Converters

### 2:1 Input Range

- **Low cost**
- **Fully regulated outputs**
- **1500 VDC isolation**
- **3 Year Warranty**
- **Operating Temperature: -40°C to +100°C**
- **Input Voltage Range:** 5 V (4.5-5.9 VDC), 12 V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-72 VDC)

#### PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>+Vin</td>
<td>13</td>
<td>-Vin</td>
<td>-Vin</td>
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<tr>
<td>2</td>
<td>N.C.</td>
<td>-Vout</td>
<td>14</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>3</td>
<td>N.C.</td>
<td>Common</td>
<td>15</td>
<td>-Vout</td>
<td>+Vout</td>
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<tr>
<td>9</td>
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<tr>
<td>10</td>
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<td>Common</td>
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<td>Common</td>
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<tr>
<td>11</td>
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<td>-Vout</td>
<td>23</td>
<td>N.C.</td>
<td>Common</td>
</tr>
<tr>
<td>12</td>
<td>-Vout</td>
<td>+Vout</td>
<td>24</td>
<td>+Vin</td>
<td>-Vin</td>
</tr>
</tbody>
</table>

### Technical Specifications

- **Load Regulation:** ±0.5% max.
- **Ripple & Noise:** 50 mV pk-pk max, 20 MHz bandwidth
- **Isolation Voltage:** 1500 VDC input to output, 1500 VDC input to case
- **Operating Temperature:** -40°C to +100°C, see datasheet for derating
- **MTBF:** >2 MHrs to MIL-HDBK-217F at 25°C, GB

#### Order Codes

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Input Voltage 1</th>
<th>Output Voltage 1</th>
<th>Output Voltage 2</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>JCB305505</td>
<td>4.5V to 9V</td>
<td>5V, 600mA</td>
<td>-</td>
<td>185-9099</td>
</tr>
<tr>
<td>JCB305509</td>
<td>4.5V to 9V</td>
<td>9V, 333mA</td>
<td>-</td>
<td>185-9097</td>
</tr>
<tr>
<td>JCB305512</td>
<td>4.5V to 9V</td>
<td>12V, 250mA</td>
<td>-</td>
<td>186-1106</td>
</tr>
<tr>
<td>JCB305524</td>
<td>4.5V to 9V</td>
<td>24V, 125mA</td>
<td>-</td>
<td>185-9099</td>
</tr>
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<td>JCB305605</td>
<td>4.5V to 9V</td>
<td>5V, 300mA</td>
<td>-5V,-300mA</td>
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<tr>
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<td>-9V,-167mA</td>
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<tr>
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<td>-24V,-63mA</td>
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<td>5V, 600mA</td>
<td>-</td>
<td>185-9105</td>
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<tr>
<td>JCB301209</td>
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<td>9V, 333mA</td>
<td>-</td>
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<td>-9V,-167mA</td>
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<td>-12V,-125mA</td>
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<td>24V, 125mA</td>
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<td>-5V,-300mA</td>
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<tr>
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<td>24V, 63mA</td>
<td>-24V,-63mA</td>
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</tbody>
</table>

### Troubleshooting Tips

Chat online to one of our technical engineers at farnell.com
3 Watt Regulated DC/DC Converters

- **4:1 Input, SIP**
- **Regulated Single & Dual Output**
- **Wide 4:1 Input Range**
- **SIP Package**
- **1500 VDC Isolation**
- **–40°C to 100°C Operation**
- **Remote On/Off**
- **3 Year Warranty**

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>2</td>
<td>-Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>7</td>
<td>N.C. Common</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>N.C. Common</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>-Vout Common</td>
<td>-Vout</td>
</tr>
</tbody>
</table>

**Dimensions (mm):**

- **H=12.5, W=26, D=9.2**

**3 Watt Single and Dual Output DC/DC Converters**

- **Industry Standard Pinout, Smaller Package Size**
- **24pin DIL pinout configuration but have a smaller package size, whilst providing the same power.**

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>-Vin (GND)</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>+Vin (GND)</td>
<td>+Vin</td>
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<tr>
<td>9</td>
<td>No pin</td>
<td>Common</td>
</tr>
<tr>
<td>11</td>
<td>N.C.</td>
<td>-Vout</td>
</tr>
<tr>
<td>14</td>
<td>+Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>16</td>
<td>-Vout</td>
<td>Common</td>
</tr>
<tr>
<td>22</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
<tr>
<td>23</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
</tbody>
</table>

**Dimensions (mm):**

- **L=25.4, W=20.3, H=10.0**

**3 Year Warranty**

- **An innovative range of space saving DC/DC converters which have industry standard 24pin DIL pinout configuration but have a smaller package size, whilst providing the same power.**

- **Wide 2:1 input range**
- **Fully regulated outputs**
- **24 Pin metal case**
- **1.5kVDC isolation**
- **Undervoltage lockout**
- **Indeterminate short circuit protection**
- **Input Pi filter to ENS50022 level A**
- **UL & TUV approval**
- **3 year warranty**

**Order Code**

- **Price Each**
  - **Single Output All Order Codes**
  - **Dual Output All Order Codes**

**Price Each**

- **Order Code**
  - **1**
  - **5**
  - **10**
  - **25**

**Power Supplies & Converters**
### 3W NDH Series Miniature Dual Output DC/DC Converters

The NDH Series is a range of high performance miniature DC/DC converters. The outputs are re-ruled over a wide temperature range. The input voltage range is 2:1 with input to output isolation of 1kVdc. The series includes:

- **Compact SIP form factor**
- **2:1 wide range voltage input**
- **Continuous short circuit protection with current foldback**
- **Operating temperature: -40°C to 85°C**

#### Features

- **0.5% Load Regulation**
- **Power density 1.00W/cm²**
- **Remote on/off**
- **No electrolytic capacitors**
- **Low Noise**

#### Specifications

- **Efficiency:**
  - Single Output: 94%
  - Dual Output: 92%

- **Input Voltage:**
  - Single: 18 to 72 VDC
  - Dual: 9 to 36 VDC and 18-72VDC

- **Output Voltage:**
  - Single: 12V, ±12V
  - Dual: ±12V

- **Current:**
  - Single: 500mA
  - Dual: 200mA

- **Isolation Voltage:**
  - 5kVAC

- **Operating Temperature:**
  - -40°C to 85°C

### Product Overview

- **Order Code:**
  - Single Output: 1+ 5+ 10+ 25+
  - Dual Output: 1+ 10+ 25+ 50+ 100+

### Table of Specifications

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>NDH0412SC</td>
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<td>NDH0424SC</td>
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<td>NDH0436SC</td>
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<tr>
<td>NDH0448SC</td>
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</tbody>
</table>

### Pin Configurations

Pin | Single Output | Dual Output |
--- |---------------|-------------|
1   | +Vin          | +Vin        |
2   | N/C           | -Vout       |
3   | N/C           | Common      |
9   | No Pin        | No Pin      |
10  | -Vin          | -Vin        |
11  | +Vout         | +Vout       |
12  | N/C           | Common      |
13  | +Vout         | +Vout       |
14  | +Vout         | +Vout       |
15  | -Vin          | -Vin        |
16  | No Pin        | No Pin      |
22  | N/C           | N/C         |
23  | N/C           | -Vout       |
24  | +Vin          | +Vin        |

### DC/DC Converters

3W NDT Series Single & Dual Output DC/DC Converters

The NDTS series are a range of low profile, isolated DC/DC Converters over a 2:1 input voltage range. They deliver 3W output power across a wide temperature range, without overheating. A flyback oscillator design with isolated feedback is used to give regulation over the full operating range of 25% to 100% of full load.

- **Industry standard footprint**
- **Single or dual isolated output**
- **Industry standard footprint**
- **Compact SIP form factor**
- **Remote on/off**
- **No heatsink required**
- **Fully encapsulated**

#### Specifications

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
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<tr>
<td>NDTD0515C</td>
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<tr>
<td>NDTD0518C</td>
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<tr>
<td>NDTD0521C</td>
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<tr>
<td>NDTD0524C</td>
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<tr>
<td>NDTD0527C</td>
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<tr>
<td>NDTD0530C</td>
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<tr>
<td>NDTD0533C</td>
<td></td>
<td></td>
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<tr>
<td>NDTD0536C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NDTD0539C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pin Configurations

Pin | Single Output | Dual Output |
--- |---------------|-------------|
1   | +Vin          | +Vin        |
2   | -Vin          | -Vin        |
3   | +Vout         | +Vout       |
4   | +Vout         | +Vout       |
5   | -Vin          | -Vin        |
6   | No Pin        | No Pin      |
7   | +Vout         | +Vout       |
8   | -Vin          | -Vin        |
9   | No Pin        | No Pin      |
10  | +Vout         | +Vout       |
11  | +Vout         | +Vout       |
12  | -Vin          | -Vin        |
13  | No Pin        | No Pin      |
14  | +Vout         | +Vout       |
15  | -Vin          | -Vin        |
16  | No Pin        | No Pin      |
17  | +Vout         | +Vout       |
18  | -Vin          | -Vin        |
19  | No Pin        | No Pin      |
20  | +Vout         | +Vout       |
21  | -Vin          | -Vin        |
22  | No Pin        | No Pin      |
23  | +Vout         | +Vout       |
24  | -Vin          | -Vin        |

### Price Each

<table>
<thead>
<tr>
<th>Single Output</th>
<th>1+ 5+ 10+ 25+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Output</td>
<td>1+ 10+ 25+ 50+ 100+</td>
</tr>
</tbody>
</table>
**3W NDT Series Single & Dual Output DC/DC Converters - continued**

- **Power, Test and Measurement**
- C to 0% load at 100°C
- Operating Temperature: -40°C to 100°C, derate from 100% load at 70°C
- Isolation Voltage: 1600 VDC
- Ripple & Noise: 75 mV pk-pk, 20MHz BW
- ±1% Load Regulation
- Input Voltage Range:
  - 5 V (4.5 - 9.0 V), 12 V (9.0 - 18.0 V), 24 V (18.0 - 36.0 V), 48 V (36.0 - 72.0 V)
- Wide 2:1 Input Range
- Continuous Short Circuit Protection
- Temperature: -40°C to 70°C Operating Temperature
- Efficiency: up to 84%

### Dimensions (mm):
- H = 10.66, W = 21.85, D = 9.20

### Price Each
- C, GB

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Price Each</th>
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<tbody>
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### Pin Connections

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<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>-Vin</td>
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<td>+Vin</td>
<td>+Vin</td>
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<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>5</td>
<td>N.C.</td>
<td>N.C.</td>
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<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
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<tr>
<td>7</td>
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<td>-Vout</td>
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<tr>
<td>8</td>
<td>N.C.</td>
<td>-Vout</td>
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</table>

### Mftrs. List No.
- Input Voltage: 5 V (4.5 - 9.0 V), 12 V (9.0 - 18.0 V), 24 V (18.0 - 36.0 V), 48 V (36.0 - 72.0 V)
- Line Regulation: ±0.5% max.
- Ripple & Noise: 75 mV pk-pk, 20MHz BW
- Isolation Voltage: 1600 VDC
- Operating Temperature: -40°C to 100°C, derate from 100% load at 70°C to 0% load at 100°C
- Short Circuit Protection: Continuous with auto recovery

### MTBF
- ≥1.34 Mhrs to MIL-HDBK-217F @ 25°C

---

**NDY Series 3W DC/DC Converters**

- **1kV dc input/output isolation**
- **Low profile package**
- **Short circuit protection**
- **High efficiency to 83%**
- **Power density 0.90W/cm²**
- **Packaged to UL94-V0**

**NDY3 Series**

<table>
<thead>
<tr>
<th>Mftrs. List No.</th>
<th>Input Voltage (V)</th>
<th>Output Voltage (V)</th>
<th>Current (mA)</th>
<th>Efficiency (%)</th>
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**NDY4 Series**

<table>
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<tr>
<th>Mftrs. List No.</th>
<th>Input Voltage (V)</th>
<th>Output Voltage (V)</th>
<th>Current (mA)</th>
<th>Efficiency (%)</th>
<th>Order Code</th>
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### Price Each
- Order Code: 1 + 10+ 25+ 50+ 100+

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**NDY8 Series**

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<th>Output Voltage (V)</th>
<th>Current (mA)</th>
<th>Efficiency (%)</th>
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<td>102-1434</td>
<td>181-8392</td>
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<td></td>
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</tbody>
</table>

**Price Each**
- Order Code: 1 + 10+ 25+ 50+ 100+

---

**TEL-3 Series, 3 Watt**

- DC/DC converter in SMD design
- Wide 2:1 input range
- High efficiency
- Input Variation: ±0.5 Max.
- Load Variation: ±0.5 Max. (single output models)
- Ripple & Noise: 1mV pk-pk typ.
- Efficiency: 78% typ.
- V/O Isolation: 1.5kV
- Operating Temperature: -25°C to 75°C (re derating)
- Safety Standards/Approval: EN/IEC 60950, UL/cUL 1950 Recognised

**Price Each**
- Order Code: 1 + 5+ 10+ 25+ 100+

---

**3W Isolated DC/DC Converters**

- The MEV3 series is a high performance 3W DC/DC converters, offering 3W of available output power in a previously rated 2W package capable of operation over the full industrial temperature range of -40°C to 85°C. Available in an industry standard SIP package, they are ideally suited for providing local supplies on control system boards with the added benefit of 3kVDC galvanic isolation.
- Power density: 1.9W/cm²
- UL60950 recognised
- No heat sink required
- Industry standard pinout
- 3kVDC isolation (1 minute)
- 5V & 12V input
- 5V, 9V, 12V, & 15V output
- Fully encapsulated with toroidal magnetics
- No external components required
- No electrolytic or tantalum capacitors
- No heat sink required
- Package to UL94-V0

**Price Each**
- Order Code: 1 + 10+ 25+ 50+ 100+
THB 3 Series
3 Watt, High Isolation

- Ultra wide 4:1 input ranges
- Input voltages up to 160 V dc
- I/O isolation 4000 V ac
- Basic, supplementary and reinforced in-
sulation for working voltages up to 420V
dc / 300V ac
- Safety standards for the medical and
railway industries
- Clearance and creepage distances min.
2.0mm
- Plastic package
- Input filter meets EN 55022, Class A
and FCC, Level A without external com-
ponents
- Continuous short circuit protection
- Safety standards: cUL/UL 60950, IEC/
EN 60950, EN 50124-1&2, IEC/EN/UL
60061-1, CSA C22.2 No. 601-1
- 3 year product warranty

Further specifications:
Regulation:
Input variation: ±0.5%/5%/max.
Load variation: ±0.5% max.
Ripple and noise: 100mV pk-pk typ. (20 MHz Bandwidth)
I/O Isolation: 4kV eff. (60 sec., 50 Hz)
Operating temperature: -40°C to +85°C; above 75°C
power reduction 4%/K

<table>
<thead>
<tr>
<th>THP 3 Series DC/DC Conductor</th>
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</thead>
<tbody>
<tr>
<td>3 Watt, High Isolation</td>
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</table>

- Wide 2:1 Input voltage ranges
- I/O isolation 4000 VAC
- Reinforced insulation rated for 300 VAC/420 VDC working voltage
- Complies with industrial and medical safety standards
- Input filter to meet EN55022, Class A and FCC, Level A without external components
- Short circuit protection
- 3 Year product warranty

Further specifications:
Regulation:
Input variation: ±0.5% max.
Load variation: ±0.75% max.
Ripple & Noise: 100mV pk-pk typ. (20 MHz Bandwidth)
I/O Isolation: 4kV eff. (60 sec., 50 Hz)
Operating Temperature: -40°C to +85°C; above 75°C power reduction 4%/K

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<td>18 - 80 5 600 78 100-7502</td>
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<td>THP 3-7223 100-7509</td>
</tr>
<tr>
<td>±15 ±100 83 100-7510</td>
</tr>
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</table>
PCB Mount - DC to DC Converters - continued

TMR 3 Series
3 watts, SIL housing

- 3W DC/DC Converter in a miniature SIL housing
- 2:1 Input voltage range
- Regulated output
- No external capacitors required
- Low residual ripple
- Resistant to sustained short circuits
- External In/Out
- 3 year guarantee

Further specifications:
- Control deviations:
  - ±0.2% max.
  - ±0.5% max. (single model)
- Residual ripple:
  - ±0.01% max. (dual model)
- I/O isolation:
  - 1500 VDC
- Operating temperature range:
  - -40°C to +70°C (without power reduction)
- Ripple & Noise:
  - 30 mVpk-pk typ. (20 MHz bandwidth)
- Line deviation:
  - ±0.1% max. (Dual output models)
  - ±0.2% max. (Single output models)
- Remote on/off
- Safety standards: UL/cUL 60950-1, EN 60950-1 and IEC 60950-1

3 Watt DC/DC Converters
4:1 Input, DIP

- Compact design in DIP-14 package
- Ultra wide 4:1 input range
- No minimum load required
- Short circuit protection
- Fully regulated outputs
- Remote on/off
- 3 year product warranty

Power Supplies & Converters

INTELLIGENT ONLINE BUYING SYSTEM PROVIDING
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3W DC/DC Converter - Single O/P

- 7:1 Wide input voltage range
- 9-60VDC
- Operating temperature range -40°C to 85°C
- 0.05% Typical load regulation
- 10kV Isolation
- Efficiency from 79% at 36V input
- UL94V-0 Package
- Dimensions: L=31.75, W=20.32, H=10.7

4 Watt Single and Dual Output DC/DC Converters

An innovative range of space saving DC/DC converters which have industry standard 24pin DIL pinout configuration but have a smaller package size, whilst providing the same power.

- Wide 2:1 input range
- Fully regulated outputs
- 24 Pin metal case
- 1.5kVDC isolation
- Undervoltage lockout
- Indefinite short cct protection
- Input Pt filter
- UL & TUV approval
- 3 year warranty

4 Watt Ultra Wide Input DC/DC Converters

A range of high specification converters with an ultra wide, ±1 input range and output voltages from ±3.3 to 12VDC with extremely low ripple and noise compared to many DC/DC converters. The metal case reduces radiated emissions and ensures an even heat dissipation in all directions and helps ensure stable operation at high ambient temperatures. 1500VDC input to output isolation and continuous short circuit protection are standard.

- Ultra Wide Input Range (±1)
- Fully Regulated Outputs
- DIP2 Metal Case
- High MTBF >1 million hours
- Continuous Short Circuit Protection
- 1500VDC Isolation
- 3 year warranty

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>+Vin</td>
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<tr>
<td>24</td>
<td>+Vin</td>
<td>+Vin</td>
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</table>

Input Voltage Range

-24V (±9-36 VDC), 48V (±18-72 VDC)

Line Regulation

±0.5% max

Load Regulation

±0.5% max, ±1.5% max for ±3.3V and ±3.3V models

Ripple & Noise

±60 mV pk-pk for ±3.3V and ±3.3V models, ±20 MHz BW

Short Circuit Protection

Trip & restart (hiccup) with auto recovery

Efficiency

75-83%

Isolation Voltage

1500VDC Input to Output

MTBF

1 Million hours

Operating Temperature

±0°C to +100°C, derate from 100% load at +85°C to no load at +125°C

Case Temperature

+100°C max

Power, Test and Measurement
**5 Watt Ultra Wide Input DC/DC Converters**

**Single and Dual Output - JTB05 Series**

A high specification, high reliability DC/DC converter featuring ultra wide 4:1 input ranges (9-36VDC and 18-72VDC) and MTBF > 1 million hours. The 5 sided metal case reduces radiated emissions and ensures even dissipation of heat into the air around the converter and aids long term reliability. Continuous short circuit protection is a standard feature.

- **Ultra Wide Input Range (4:1)**
- **Industry Standard Pinout**
- **DIP 24 Metal Case**
- **Fully Regulated Outputs**
- **High MTBF > 1 million hours**
- **3 year warranty**

**Power, Test and Measurement**

**Dimensions:** (mm): L = 31.8, W = 20.3, H = 10.2

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No Pin</td>
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<tr>
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<td>-Vin</td>
<td>-Vin</td>
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<tr>
<td>3</td>
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<td>-Vin</td>
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<tr>
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<td>Common</td>
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<td>14</td>
<td>+Vin</td>
<td>+Vin</td>
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<tr>
<td>16</td>
<td>-Vin</td>
<td>Common</td>
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<tr>
<td>22</td>
<td>+Vin</td>
<td>+Vin</td>
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<tr>
<td>23</td>
<td>+Vin</td>
<td>+Vin</td>
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<tr>
<td>24</td>
<td>No Pin</td>
<td>No Pin</td>
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</tbody>
</table>

**Input Voltage Range:** 24V (9-36VDC), 48V (18-72VDC)

- **Line Regulation:** ±0.5% (high line to low line)
- **Load Regulation:** ±0.5% max for dual output models
- **Ripple & Noise:** 100 mV pk-pk, whichever is greater, 20 MHz BW
- **Short Circuit Protection:** Continuous with auto recovery
- **Isolation Voltage:** 1500 VDC Input to Output
- **Operating Temperature:** -25°C to +100°C (see derating curve)
- **Storage Temperature:** -40°C to +100°C

**3 Year Warranty**

**Order Code**

<table>
<thead>
<tr>
<th>Single Output</th>
<th>All Order Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Code</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
</tbody>
</table>

**NMXU Series 5W DC/DC Converters**

**Small Outline**

- Fully encapsulated
- Industry standard pinout
- Pin compatible with NMX50 series
- 1 KV dc isolation
- Single or dual output
- Low profile package
- Efficiency to 85%
- 5.88cm² footprint
- No heatsink required
- UL/1940-VD package
- No external components required
- Internal SMD construction

**Connections**

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<th>Dual G/P</th>
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<td>+G</td>
</tr>
<tr>
<td>4</td>
<td>0V</td>
</tr>
<tr>
<td>5</td>
<td>0P</td>
</tr>
</tbody>
</table>

**Underside View**

**Input Voltage Range (nominal 5.0V)**

- ±10% load regulation
- 5V output types
- 12 and 10V output types
- Line voltage regulation (10% to 100% full load)
- Output voltage accuracy
- Output ripple and noise
- Operating temperature

**Dimensions:** (mm): L = 31.8, W = 20.3, H = 10.2

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>24</td>
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<td>No Pin</td>
</tr>
</tbody>
</table>

**Input Voltage Range:** 24V (9-36VDC), 48V (18-72VDC)

- **Line Regulation:** ±0.5% (high line to low line)
- **Load Regulation:** ±0.5% max for dual output models
- **Ripple & Noise:** 100 mV pk-pk, whichever is greater, 20 MHz BW
- **Short Circuit Protection:** Continuous with auto recovery
- **Isolation Voltage:** 1500 VDC Input to Output
- **Operating Temperature:** -25°C to +100°C (see derating curve)
- **Storage Temperature:** -40°C to +100°C

**3 Year Warranty**

**Order Code**

<table>
<thead>
<tr>
<th>Single Output</th>
<th>All Order Codes</th>
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<tr>
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</table>

**Improvised Back Order Delivery**

Receive email updates with the exact status, due date and dispatch information of all your back order items.
### 5 Watt Single and Dual Output DC/DC Converters

**Compact DIP Package**

- **MTBF:** 1600 VDC Isolation
- **High power density**
- **High efficiency up to 85%**
- **Screened metal housing with insulated baseplate**
- **UL/UL1950-, EN60950- and cUL/UL**

#### Input Voltage Range
- 5VDC (4.5-9VDC), 12VDC (9-18VDC), 24VDC (18-36VDC), 48VDC (36-72VDC)

#### Line Regulation
- ±0.5% max.

#### Ripple & Noise
- 60 mV pk-pk max, 20 MHz bandwidth

#### Isolation Voltage
- 1600 VDC

#### Operating Temperature
- -40°C to +85°C

#### Short Circuit Protection
- Indefinite with auto recovery

#### Input Filter
- To meet EN55022, class A

#### Remote on/off
- Pin-out

#### Pin-out
- Pin Single Dual
- 1 Remote on/off Remote on/off
- 2 +Vin +Vin
- 3 -Vin -Vin
- 4 +Vout +Vout
- 5 -Vout Common
- 6 Common
- 11 N.C.
- 14 +Vout +Vout
- 15 +Vout
- 16 +Vout Common
- 17 +Vout

#### Load Regulation
- ±1.0% max. (Single output models)
- ±0.5% max. (Dual output models)

#### Line Regulation
- ±1.5% for S3V3 & D03 models
- ±1.0% max. (Single outputs)
- ±0.5% max.

#### Order Codes
- Dual Output: NMXD0505UC
- Single Output: NMXS0505UC

#### Order Code Price Each
- NMXD0515UC 206-1556
- NMXS0515UC 206-1557

#### 3 Year Warranty

---

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**3 Year product warranty**

---

**Further specifications:**

- **Compact SMD Package**
- **Wide 2:1 Input range**
- **Short circuit protection**
- **High efficiency up to 85%**
- **Reflow solder profile according IPC/JEDEC-J-STD-020C**
- **Input filter to meet EN 55022, class A**

#### Operating temperature range:
- -40°C to +85°C above 70°C derating: 3.5%/K

#### Isolation Voltage
- 100V/4kV ac

#### Dimensions (mm): H=10.4, W=31.75, D=0.22

---

**Single Output**

- **Order Code:** All Order Codes

**Dual Output**

- **Order Code:** All Order Codes
Power Supplies & Converters

6 Watt Single Output DC/DC Converters

- 4.1 Wide range voltage input
- Operating temperature range: -40°C to 85°C
- 0.06% Typical load regulation
- 1.5%DC isolation
- 12V & 48V Nominal input
- Low noise
- Under voltage lockout
- Current fold back

Dimensions (mm): H=10.0, W=20.3, D=20

6 Watt Single and Dual Output DC/DC Converters

- Medical 3rd Edition Safety Approvals
- 1600VAC Basic Isolation
- 60°C Operation with no derating
- 2µA Patient leakage current
- 24 Watt Metal Package
- EN55011 Level A with no external components
- 3 Year Warranty

Dimensions (mm): L=31.75, H=10.4, D=20.32

Price Each

<table>
<thead>
<tr>
<th>Mftrs. List No.</th>
<th>Input Voltage</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Efficiency</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>JHM06123125</td>
<td>12 to 17 V</td>
<td>12V, 500mA</td>
<td>-12V, -500mA</td>
<td>78%</td>
<td>167-3365</td>
</tr>
<tr>
<td>JHM06123130</td>
<td>12 to 17 V</td>
<td>250mA</td>
<td>-125mA, -250mA</td>
<td>83%</td>
<td>167-3376</td>
</tr>
<tr>
<td>JHM06123135</td>
<td>12 to 17 V</td>
<td>400mA</td>
<td>-200mA, -400mA</td>
<td>83%</td>
<td>167-3377</td>
</tr>
<tr>
<td>JHM06123140</td>
<td>12 to 17 V</td>
<td>600mA</td>
<td>-300mA, -600mA</td>
<td>83%</td>
<td>167-3378</td>
</tr>
</tbody>
</table>

Dimensions (mm): L=31.75, H=10.4, D=20.32

6 Watt Single and Dual Output DC/DC Converters

- Industry Standard Pinout, Smaller Package Size
- 4.1 Wide range voltage input
- Full regulated outputs
- 24 pin metal case
- 1.5% DC isolation
- Undervoltage lockout
- Input Pi filter
- UL & TUV approval
- Definite short cct protection
- 3 year warranty

Dimensions (mm): L=25.4, W=20.3, H=18.0

Price Each

<table>
<thead>
<tr>
<th>Mftrs. List No.</th>
<th>Input Voltage</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Efficiency</th>
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<td>-200mA, -400mA</td>
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<td>600mA</td>
<td>-300mA, -600mA</td>
<td>83%</td>
<td>167-3378</td>
</tr>
</tbody>
</table>
**6 Watt Ultra Wide Input DC/DC Converters**

**Single and Dual Output - JTC06 Series**

- **Input Voltage Range:** 5 V (4.5-9 VDC), 12 V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-72 VDC)
- **MTBF:** 300 hours
- **Isolation Voltage:** 1500 VDC Input to Output
- **High Efficiency:** 94-84%
- **Short Circuit Protection:** Trip & restart (hiccup) with auto recovery
- **Ripple & Noise:** 60 mV pk-pk for 3.3 V to 15 V models, 100 mV pk-pk for 18 V models
- **Load Regulation:** ±0.5% max.
- **Line Regulation:** ±0.5% max.
- **Temperature Range:** -40°C to +100°C
- **Order Code:**
  - Single Output: JTC0605S, JTC0612D, JTC0624D, JTC0648D
  - Dual Output: JTC0605S03, JTC0612D01, JTC0624D03, JTC0648D05

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vin</td>
<td>-Vin</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
<td>+Vin</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-Vin</td>
<td>-Vin</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>+Vin</td>
<td>+Vin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>None</td>
<td>Common</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>N/C</td>
<td>-Vout</td>
<td></td>
</tr>
</tbody>
</table>

**Price Each**

- Single Output: All Order Codes $1+5+10+25$
- Dual Output: All Order Codes $1+5+10+25$

**Dimensions (mm):** L=31.5, W=21.35, H=10.5

**Power, Test and Measurement**
PCB Mount - DC to DC Converters - continued

6 Watt Ultra Wide Input DC/DC Converters - continued
Single and Dual Output - 2TC86 Series - continued

- Encapsulated
- Wide 4.1 Input range
- 1500 Vdc i/o isolation
- DIP package
- Single and Dual output available

Line Regulation 0.5%
Load Regulation ±0.5%
Operating Temperature -40°C to +77°C
Isolation Voltage 1.5 Vdc min
Efficiency 81%

Mfrs. List No. Input Voltage Output Voltage Output Current
ASA01A1-L 9Vdc - 36Vdc 5V, 1A — — 121-4851
ASA02A1-L 9Vdc - 36Vdc 12V, 500mA — — 126-1943
ASA00C1-L 9Vdc - 36Vdc 5V, 500mA -5V, 500mA — — 126-1945
ASA00B1-L 9Vdc - 36Vdc 12V, 250mA -12V, 250mA — — 126-1946
ASA00C7-L 9Vdc - 36Vdc 5V, 1A — — 126-1947
ASA00B3-L 9Vdc - 36Vdc 12V, 250mA — — 126-1948
ASA00B4-L 9Vdc - 36Vdc 5V, 500mA — — 126-1949
ASA00C6-L 9Vdc - 36Vdc 12V, 250mA — — 126-1950
ASA00C3-L 9Vdc - 36Vdc 5V, 500mA — — 126-1951
ASA00C2-L 9Vdc - 36Vdc 12V, 250mA — — 126-1952
ASA00B5-L 9Vdc - 36Vdc 5V, 500mA — — 126-1953

Mfrs. List No. Order Code
ASA01A1-L 121-4851
ASA02B1-L 126-1943
ASA00C1-L 126-1945
ASA00B1-L 126-1946
ASA00C7-L 126-1947
ASA00B3-L 126-1948
ASA00B4-L 126-1949
ASA00C6-L 126-1950
ASA00B4-L 126-1951
ASA00C3-L 126-1952
ASA00C2-L 126-1953

TEN SWI Series DC/DC Converter
6 Watt, 4:1 Input

- Ultra wide 4:1 input voltage range
- High efficiency up to 84%
- Input filter meets EN 55022, Class A and FCC, Level A without external components
- Inductive short-circuit protection
- Industry standard pinout
- Shielded Metal Case with insulated baseplate
- UL/cUL 60950, EN60950 and EC09505 approved (to 60 V dc)
- 3 year product warranty

Further specifications:
- Regulation: ±0.3% max.
- Load variation: ±2.0% max.
- Ripple and noise: 75µV pk-pk typ. (20 MHz Bandwidth)
- I/O Isolation: 1.5kV
- Operating temperature: -40°C bis +85°C, above 70°C power reduction 3.5% / K

TEL-5-2410W 9 - 36 3.3 1.2A 75 100-7472
TEL-5-2411W 5 1A 78 100-7473
TEL-5-2421W ±5 ±500mA 83 100-7474
TEL-5-2422W ±15 ±500mA 84 100-7475
TEL-5-2423W ±15 ±500mA 82 100-7476
TEL-5-4810W 18 - 75 3.3 ±1.2A 76 100-7479
TEL-5-4811W 5 ±1A 78 100-7480
TEL-5-4821W ±5 ±500mA 84 100-7482
TEL-5-4822W ±15 ±500mA 79 100-7484
TEL-5-4823W ±15 ±500mA 83 100-7486

Mfrs. List No. Order Code
TEL-5-2410W 100-7472
TEL-5-2411W 100-7473
TEL-5-2421W 100-7474
TEL-5-2422W 100-7475
TEL-5-2423W 100-7476
TEL-5-4810W 100-7479
TEL-5-4811W 100-7480
TEL-5-4821W 100-7482
TEL-5-4822W 100-7484
TEL-5-4823W 100-7486

3126 RoHS Compliant Non-compliant
farnell.com element14.com

Power, Test & Measurement
49 Power Supplies & Converters

TEN SWI Series, 6 Watt

- DC/DC converter in SMD design
- Wide 2:1 input range
- High efficiency
- Inductive short-circuit protection
- 24-pin plastic package
- 3 year manufacturer’s warranty

Input Variation ±0.3% Max.
Load Variation ±1.0% Max. (single output models)
Ripple & Noise 75µV pk-pk typ.
Efficiency 77 typ.
I/O Isolation 1.5kV
Operating Temperature -20°C to +77°C (no derating)
Safety Standards/Approval EN/IEC 60950, UL/cUL 1950 recognised

115100

Price Each

8 Watt Single and Dual Output DC/DC Converters

- Ultra wide 4:1 input range
- High efficiency up to 88%
- Input filter meets EN50222, Class A and FCC, level A with external capacitor
- Short circuit protection
- Six-side shielded metal case, with insulated base plate
- Remote On/Off
- Industry standard pin out
- 3 year product warranty

Regulation
- Line regulation: ±0.2% max.
- Load regulation: ±0.5% (single output models)
- ±1.0% (multiple output models)
- Ripple & Noise: 85 mV pk-pk, 20 MHz
- Input voltage range: 1500 VDC
- Safety standards/approvals: UL60609-1, IEC60950-1
- Operating temperature range: -40°C to +105°C
- Remote On/Off: Shutdown input for low current (2.5 mA) in standby operation

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>2</td>
<td>-Vin (GND)</td>
<td>-Vin (GND)</td>
</tr>
<tr>
<td>3</td>
<td>-Vin (GND)</td>
<td>-Vin (GND)</td>
</tr>
<tr>
<td>9</td>
<td>No con.</td>
<td>Common</td>
</tr>
<tr>
<td>11</td>
<td>No con.</td>
<td>-/Vout</td>
</tr>
<tr>
<td>14</td>
<td>+/Vin</td>
<td>+/Vin</td>
</tr>
<tr>
<td>16</td>
<td>-/Vout</td>
<td>Common</td>
</tr>
<tr>
<td>22</td>
<td>+/Vin (dec)</td>
<td>+/Vin (dec)</td>
</tr>
<tr>
<td>23</td>
<td>+/Vin (dec)</td>
<td>+/Vin (dec)</td>
</tr>
</tbody>
</table>

Price Each

Mfrs. List No. | Order Code | 1+ | 5+ | 10+ | 25+ | 50+
--- | --- | --- | --- | --- | --- | ---
TEN-8-1211 | 120-5015+ | --- | --- | --- | --- | ---
TEN-8-1212 | 120-5017+ | --- | --- | --- | --- | ---
TEN-8-2411 | 120-5023 | --- | --- | --- | --- | ---
TEN-8-2412 | 120-5023 | --- | --- | --- | --- | ---
TEN-8-2421 | 120-5026 | --- | --- | --- | --- | ---
TEN-8-2422 | 120-5026 | --- | --- | --- | --- | ---
TEN-8-4810 | 119-6456 | --- | --- | --- | --- | ---
TEN-8-4811 | 120-5027+ | --- | --- | --- | --- | ---
TEN-8-4812 | 120-5028 | --- | --- | --- | --- | ---
TEN-8-4820 | 120-5028 | --- | --- | --- | --- | ---
TEN-8-4821 | 120-5028 | --- | --- | --- | --- | ---
TEN-8-7211 | 208-0683 | --- | --- | --- | --- | ---
TEN-8-7212 | 208-0684 | --- | --- | --- | --- | ---
TEN-8-7213 | 208-0685 | --- | --- | --- | --- | ---
TEN-8-7214 | 208-0686 | --- | --- | --- | --- | ---
TEN-8-7215 | 208-0687 | --- | --- | --- | --- | ---
TEN-8-7216 | 208-0688 | --- | --- | --- | --- | ---
TEN-8-7217 | 208-0689 | --- | --- | --- | --- | ---
TEN-8-7218 | 208-0690 | --- | --- | --- | --- | ---
TEN-8-7219 | 208-0691 | --- | --- | --- | --- | ---
TEN-8-7220 | 208-0692 | --- | --- | --- | --- | ---
TEN-8-7221 | 208-0693 | --- | --- | --- | --- | ---
TEN-8-7222 | 208-0694 | --- | --- | --- | --- | ---
TEN-8-7223 | 208-0695 | --- | --- | --- | --- | ---

Dimensions (mm): H=10.16, W=31.75, D=20.32
8-10 Watt Single and Dual Output DC/DC Converters - continued

Compact DIP-24 Package, 4/1 Input - continued

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UWR-3.3/4250-D24A-C</td>
<td>3.3V</td>
<td>4.25A</td>
<td>24V (18 - 36V dc)</td>
<td>15W</td>
<td>25.4x24x11.4</td>
</tr>
<tr>
<td>UWR-3.3/4250-D24ACT-C</td>
<td>3.3V</td>
<td>4.25A</td>
<td>24V (18 - 36V dc)</td>
<td>15W</td>
<td>25.4x24x11.4</td>
</tr>
<tr>
<td>UWR-3.3/4250-D48A-C</td>
<td>3.3V</td>
<td>4.25A</td>
<td>48V (36 - 75V dc)</td>
<td>15W</td>
<td>25.4x24x11.4</td>
</tr>
<tr>
<td>UWR-3.3/4250-D48ACT-C</td>
<td>3.3V</td>
<td>4.25A</td>
<td>48V (36 - 75V dc)</td>
<td>15W</td>
<td>25.4x24x11.4</td>
</tr>
<tr>
<td>UWR-3.9/8A-C</td>
<td>3.9V</td>
<td>8A</td>
<td>48V (36 - 75V dc)</td>
<td>30W</td>
<td>50.8x48x9.5</td>
</tr>
<tr>
<td>UWR-5/1600-D5A-C</td>
<td>5V</td>
<td>1.6A</td>
<td>5V (4.7 - 7.25V dc)</td>
<td>10W</td>
<td>50.8x48x9.5</td>
</tr>
<tr>
<td>UWR-5/1600-D5A-C</td>
<td>5V</td>
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<td>10W</td>
<td>50.8x48x9.5</td>
</tr>
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8 Watt Single and Dual Output DC/DC Converters

Compact DIP-24 Package

- Input Voltage Range: 12V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-75 VDC)
- Line Regulation: ±0.0% max
- Load Regulation: ±0.5% for 3.3V models, ±0.5% for all other models
- Ripple & Noise: 75 µV pk-pk, 22mV RMS
- Isolation Voltage: 1500 VDC Input to Output, 1000 VDC Input to Case, 1000 VDC Output to Case
- Operating Temperature: -40°C to +100°C, derate from 100% load at +60°C to no load at +100°C
- Short Circuit Protection: Trip & restart (hiccup) with auto recovery
- MTBF: 479375 hours to MIL-HDBK-217F @ 25°C

TROUBLESHOOTING TIPS
Chat online to one of our technical engineers at farnell.com
### Non-Isolated Wide Input DC/DC Converters

**NGA Series**
- Industry standard footprint
- Short circuit protection
- Efficiency to 95%
- Wide input range
- 5V output
- Line regulation 0.2% typ., 0.5% max.
- Load regulation 1.5% typ., 2.0% max.
- Ripple & noise <40 mVpk-pk typ., 70 mVpk-pk max. (20MHz Bandwidth)
- Operating temperature range -40°C to 85°C
- SMD construction

#### Power Output Min. Load Full Load (WxHxD)

<table>
<thead>
<tr>
<th>Power Output Min.</th>
<th>Load</th>
<th>Full Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+</td>
<td>10+</td>
<td>25+</td>
</tr>
<tr>
<td>50+</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Efficiency
- Efficiency 79-87%

#### Output Ripple & Noise
- 70mV (typ.)

#### Operating Temperature
- 110°C

#### Load Regulation
- ±1.5% typ. 2.0% max.

#### Line Regulation
- ±0.2% typ. 0.5% max.

#### Input Voltage Range
- 117-5761 NPH10S2403IC
- 24VDC (18-36 VDC) 5V 0.0A 2.0A 21x21.5x5.6
- NGA10S15050SC 117-5766
- 15VDC (7-28V dc) 5V 0.0A 2.0A 21x21.5x5.6

#### Order Code
- NGA10S15050SC
- 117-5766
- NGA10S15030SC
- 117-5765

#### Mfrs.
- Price Each

<table>
<thead>
<tr>
<th>Mfrs. No.</th>
<th>Order Code</th>
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<tr>
<td>NGA10S15050SC</td>
<td>117-5766</td>
</tr>
<tr>
<td>NGA10S15030SC</td>
<td>117-5765</td>
</tr>
</tbody>
</table>

### Isolated 10W Single Output DC/DC Converters

**NPH10S Series**
- Surge rating to 12W
- Output voltage adjust
- Versatile control options
- Uses no electrolytic capacitors
- Fixed frequency
- High efficiency
- Output voltage trim, remote on/off and synchronization
- Industry standard pinout
- NPH10S "EI" range offers two additional pins with the functionalities of voltage trim, remote on/off and synchronisation

#### Power, Test and Measurement
- Power, Test and Measurement

#### Dimensions(mm): L=50.8, W=25.4, H=10.16
**10 Watt Single and Dual Output DC/DC Converters - continued**

**Compact DIP-24 Package - continued**

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Voltage</th>
<th>Output</th>
<th>Current</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>163-2705</td>
<td>5.5V</td>
<td>1A</td>
<td>550mA</td>
<td>12W</td>
</tr>
<tr>
<td>163-2710</td>
<td>12V</td>
<td>1A</td>
<td>1200mA</td>
<td>22W</td>
</tr>
<tr>
<td>163-2715</td>
<td>15V</td>
<td>1A</td>
<td>1500mA</td>
<td>30W</td>
</tr>
</tbody>
</table>

**10 Watt DC/DC Converter**

- **PCB Mount - DC to DC Converters**
- **Order Code**
- **List No.**
- **Input Voltage**
- **Output 1**
- **Output 2**
- **Output Power**
- **Dual Output**
- **Single Output**

**10-22W DC/DC Converters - Triple O/P**

**TWR Series**

- **List No.**
- **Voltage**
- **Output**
- **Current**
- **Power (W)**

**Medical Approvals**

- **Medical 3rd Edition Safety Approvals**
- **x2 MOPP**
- **4000 VAC Reinforced Insulation**
- **2-pA Patient Leakage Current**
- **2-pin Package**
- **Operating temperature: -40°C to +80°C**
- **EN55011 Level With No External Components**
- **3 Year Warranty**

**5-30W Industry Standard Single Output**

- **Single output 10-20W (PXD Series)**
- **and 20-30W DC/DC converters**
- **Industry standard 2 20x20 footprint (PXD Series), 2x1.6 (PKE Series), 2x0.6 (PXP Series)**
- **Six sided shielding**
- **Agency approval**
- **Nominal 12V and 24V inputs**
- **Up to 4.1 input range available**
- **Applications include Telecom, Datacom and Point of Load**
Compact DIP-24 Package

12 Watt Single and Dual Output DC/DC Converters

- Low cost single and dual outputs
- Wide input voltage
- Input filter built in
- Short circuit proof
- High efficiency up to 82%
- Operating temperature -25 to +71°C
- 2 x 2 metal case
- Emissions EN50022 Level B safety EN60950

List No. (nominal) Vin Output 1 Output 2 Order Code

| JTF1248D15 | 18 to 75 VDC | 3.3V, 3A | -0.3V, -1.5A | 163-7931 |
| JTF1248D12 | 18 to 75 VDC | 12V, 1A | -12V, -0.5A | 163-7925 |
| JTF1248S15 | 18 to 75 VDC | 15V, 800mA | -15V, -800mA | 163-7933 |
| JTF1248S05 | 18 to 75 VDC | 5.1V, 2.4A | -5.1V, -2.4A | 163-7922 |
| JTF1248S2V5 | 18 to 75 VDC | 2.5V, 3.5A | 2.5V, 3.5A | 163-7923 |

Dimensions (mm): H=10.40, W=31.75, D=50.8mm

Input Voltage Range: 12 V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-75 VDC)

- Continuous Short Circuit Protection
- High Power Density
- High efficiency up to 90%
- 3 year warranty

Further specifications:
- THD 12WI series DC/DC Converters
  - 12 Watt, 4:1 input, DIL-24 housing
  - Maximum power density in the DIL-24 metal housing
  - Very wide 4:1 input voltage range
  - High efficiency up to 85%
  - Resistant to sustained short circuits
  - Undervoltage switch-off
  - Remote on/off

Industry standard pinning
3 year guarantee

Farnell P 3131 Date: 07-09-12 time:08:53
PCB Mount - DC to DC Converters - continued

THD 12WI series DC/DC Converters - continued

12 Watt, 4:1 input, DIL-24 housing - continued

- High efficiency - up to 89%
- Power density 20W/in^3
- 1.5KV input to output isolation
- Protection against all load faults
- Internal over temperature protection
- Over load to zero load
- Versatile control options
- Industry standard pinout
- Non-latching current limit

Nominal input voltage: 24 - 48V
Input range: 24 - 36V (48/53-72V)
Load regulation: 0.5% (0-100% rated load)
Case temperature: -40°C to +100°C
Temperature coefficient: 0.5% max dual
Input voltage range: 12 V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-75 VDC)
Line Regulation: ±0.5% max
Load Regulation: ±0.5% max for single and dual outputs except ±0.8% for D00 versions
Ripple & Noise: 75 mV pk-pk, 20 MHz BW
Isolation Voltage: 1600 VDC Input to Output
Operating Temperature: -40°C to +100°C, derate from 100% load at +70°C to 0% load at +100°C
Short Circuit Protection: Trip & restart (hiccup) with auto recovery
MTBF: >1.1 Mhrs to MIL-HDBK-217F at 25°C, GB

15 Watt Single and Dual Output DC/DC Converters

Industry Standard Package

- High Power Density
- 2:1 Input Range
- Operating Temperature: -40°C to +100°C
- Metal Case
- Efficiency up to 91%
- Remote On/Off
- 1600 VDC Isolation
- 3 Year Warranty

Dimensions (m/m): H=10.16, W=31.75, D=20.32

PIN CONNECTIONS

- 1 Remote On/Off
- 2 -Vin
- 3 -Vin
- 9 No Pin
- 14 +Vout
- 20 +Vout
- 22 +Vout
- 23 +Vout

All Order Codes

15 Watt Single and Dual Output DC/DC Converters

- 2:1 Input Range
- Industry Standard Package
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- High Efficiency - up to 89%
- -40°C to +100°C Operating Temperature
- 3 Year Warranty

Dimensions (m/m): H=10.16, W=50.9, D=25.4

PIN CONNECTIONS

- 1 +Vin
- 2 -Vin
- 3 +Vout
- 4 No Pin
- 5 -Vout
15 Watt Single and Dual Output DC/DC Converters
Compact DIP-24 Package

Dimensions (mm): H=10.16, W=31.75, D=20.32

<table>
<thead>
<tr>
<th>PIN CONNECTIONS</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin Single Output</td>
<td>DUAL Output</td>
</tr>
<tr>
<td>1 Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>2 +Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>3 +Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>9 No Pin</td>
<td>Common</td>
</tr>
<tr>
<td>11 Not Connected</td>
<td>-Vin</td>
</tr>
<tr>
<td>14 +Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>16 +Vout</td>
<td>Common</td>
</tr>
<tr>
<td>22 +Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>23 +Vin</td>
<td>+Vin</td>
</tr>
</tbody>
</table>

- **High Power Density**
- **Wide 4:1 Input Range**
- **Operating Temperature: -40°C to +105°C**
- **Metal Case**
- **Standard Remote On/Off**
- **3 Year Warranty**

**Input Voltage Range:** 24 V (9-36 VDC), 48 V (18-75 VDC)

**Line Regulation:** ±0.2% max., ±0.5% max. dual

**Load Regulation:** ±0.5% max. single, ±1.0% max. dual

**Ripple & Noise:** 60 mV pk-pk, 20kHz BW

**Efficiency:** Up to 90%

**Isolation Voltage:** 1600 VDC Input to Output

**15 Watt Single and Dual Output DC/DC Converters**

**Input DC-OK indicator**

**Reliable snap-on for DIN rail TS-35/7.5 or TS-35/15**

**I/O-isolation 1600 VDC**

**Output DC-OK indicator**

**3 Year Warranty**

**Features:**
- High power density in DIP 24 package
- Ultra wide 4:1 input range
- Very high efficiency up to 90%
- Input filter meets EN 55022, class A without external components
- Short circuit protection
- No minimum load required
- Six-side shielded metal case, with insulated base plate
- Remote On/Off
- Industry standard pin out
- 3 year product warranty

**Order Codes**

- **Single Output**
- **All Order Codes**

<table>
<thead>
<tr>
<th>Mftrs. List No.</th>
<th>Input Voltage</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>JTF1524S15 18V to 75V 12V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-12V, -125mA</td>
<td>209-9484</td>
</tr>
<tr>
<td>JTF1524S12 18V to 75V 12V, 1.25A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-12V, -625mA</td>
<td>209-9481</td>
</tr>
<tr>
<td>JTF1548S15 18V to 75V 15V, 500mA</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -500mA</td>
<td>208-0640</td>
</tr>
<tr>
<td>JTF1548S12 18V to 75V 15V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -625mA</td>
<td>208-0639</td>
</tr>
<tr>
<td>JTF1548S05 18V to 75V 5.1V, 3A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-5V, -1.5A</td>
<td>208-0630</td>
</tr>
<tr>
<td>JTF1524S15 18V to 75V 15V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -500mA</td>
<td>208-0637</td>
</tr>
<tr>
<td>JTF1524S12 18V to 75V 15V, 1.25A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -625mA</td>
<td>208-0635</td>
</tr>
<tr>
<td>JTF1548S15 18V to 75V 15V, 500mA</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -500mA</td>
<td>208-0634</td>
</tr>
<tr>
<td>JTF1548S12 18V to 75V 15V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -625mA</td>
<td>208-0632</td>
</tr>
<tr>
<td>JTF1548S05 18V to 75V 5.1V, 3A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-5V, -1.5A</td>
<td>208-0631</td>
</tr>
<tr>
<td>JTF1524S15 18V to 75V 15V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -500mA</td>
<td>208-0630</td>
</tr>
<tr>
<td>JTF1524S12 18V to 75V 15V, 1.25A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -625mA</td>
<td>208-0629</td>
</tr>
<tr>
<td>JTF1548S15 18V to 75V 15V, 500mA</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -500mA</td>
<td>208-0628</td>
</tr>
<tr>
<td>JTF1548S12 18V to 75V 15V, 1A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -625mA</td>
<td>208-0627</td>
</tr>
<tr>
<td>JTF1548S05 18V to 75V 5.1V, 3A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-5V, -1.5A</td>
<td>208-0626</td>
</tr>
</tbody>
</table>

**Order Codes**

- **All Order Codes**

<table>
<thead>
<tr>
<th>Mftrs. List No.</th>
<th>Voltage Range</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPX-15-2422WIN 9V to 36V 15V, 500mA -15V, -500mA</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-15V, -125mA</td>
<td>208-0640</td>
</tr>
<tr>
<td>DPX-15-2411WIN 9V to 36V 3.3V, 4A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-3.3V, -4A</td>
<td>208-0639</td>
</tr>
<tr>
<td>DPX-15-2422WIN 9V to 36V 5.1V, 3A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-5V, -1.5A</td>
<td>208-0638</td>
</tr>
<tr>
<td>DPX-15-2411WIN 9V to 36V 3.3V, 4A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-3.3V, -4A</td>
<td>208-0637</td>
</tr>
<tr>
<td>DPX-15-2411WIN 9V to 36V 3.3V, 4A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-3.3V, -4A</td>
<td>208-0636</td>
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<td>+Vin</td>
<td>-3.3V, -4A</td>
<td>208-0635</td>
</tr>
<tr>
<td>DPX-15-2411WIN 9V to 36V 3.3V, 4A</td>
<td>+Vin</td>
<td>+Vin</td>
<td>-3.3V, -4A</td>
<td>208-0634</td>
</tr>
</tbody>
</table>

**Order Codes**

- **All Order Codes**

**Price Each**

- **Single Output**
- **All Order Codes**

- **Dual Output**
- **All Order Codes**

**15 - 60 Watt Single & Dual Output DC/DC Converters**

**Input fuse protection**

**Input reverse polarity protection**

**Input in-rush current protection**

**Overload and short circuit protection**

**Over voltage protection**

**Available snap-on for DIN rail TS-35/7.5 or TS-35/15**

**I/O-isolation 1600 VDC**

**Data sheet**

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PCB Mount - DC to DC Converters - continued

15-20 Watt Single and Dual Output DC/DC Converters
Ultra Compact Package

Dimensions: W=25.4, L=25.4, H=9.9 mm
- High Power Density - 1”x1” Package
- 1 year Input Range
- Operating Temperature -40°C to +105°C
- Single & Dual Outputs
- Remote On/Off
- Single Output Trim of ±10%
- 1600 VDC Isolation
- High Efficiency - up to 89%
- 3 Year Warranty

Input Voltage Range: 12 V (9-18 VDC), 24 V (18-36 VDC), 48 V (36-75 VDC)
Line Regulation: ±0.3% max
Load Regulation: ±0.5% max single, ±1% max dual
 Ripple & Noise: 100 mV pk-pk, 20 MHz BW
Isolation Voltage: 1600 VDC Input to Output
Operating Temperature: -40°C to +100°C

Short Circuit Protection:
- Trip & restart (Hiccup mode), auto recovery
- MTBF: >500 khrs to MIL-HDBK-217F at 25°C, GB

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>2</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>4</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>5</td>
<td>Trim</td>
<td>Trim</td>
</tr>
<tr>
<td>6</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
</tbody>
</table>

15-20 Watt Single and Dual Output DC/DC Converters
Ultra Wide Input

Dimensions (mm): L=50.8, W=25.4, H=10.16
- Wide 4.1 Input Range
- High Power Density - 1”x1” Package
- Operating Temperature: -40°C to +100°C
- Single & Dual Outputs
- 1600 VDC Isolation
- High Efficiency - up to 89%
- 3 Year Warranty

Input Voltage Range: 24 V (9-36 VDC), 48 V (18-75 VDC)
Line Regulation: ±0.3% max
Load Regulation: ±0.5% max single, ±1% max dual
Ripple & Noise: 100 mV pk-pk, 20 MHz bandwidth
Isolation Voltage: 1600 VDC Input to Output, 1600 VDC Input to Case, 1600 VDC Output to Case
Operating Temperature: -40°C to +100°C, JTK15: derate from 100% load at +65°C to no load at +100°C, JTK20: derate from 100% load at +55°C to no load at +100°C

Short Circuit Protection:
- Trip & restart (Hiccup mode) with auto recovery
- MTBF: >500 khrs to MIL-HDBK-217F at 25°C, GB

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>2</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>Remote On/Off</td>
</tr>
<tr>
<td>4</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>5</td>
<td>Trim</td>
<td>Trim</td>
</tr>
<tr>
<td>6</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
</tbody>
</table>

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**15W AEE Series DC/DC Converters**

**Single and Dual Output**

- Encapsulated
- Wide 4:1 input range
- 1500 V dc I/O isolation
- Single and Dual output available

**Line Regulation**

0.5%

**Load Regulation**

±1%

**Operating Temperature**

-40°C to +71°C

**Mttrs. List No.**

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>9Vdc - 36Vdc</td>
<td>5V, 3A</td>
<td>—</td>
<td>124-8447</td>
</tr>
<tr>
<td>9Vdc - 36Vdc</td>
<td>12V, 1.25A</td>
<td>—</td>
<td>124-8459</td>
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<tr>
<td>9Vdc - 36Vdc</td>
<td>15V, 1A</td>
<td>—</td>
<td>126-1962</td>
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<tr>
<td>9Vdc - 36Vdc</td>
<td>5V, 1.5A</td>
<td>—</td>
<td>126-1963</td>
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<tr>
<td>9Vdc - 36Vdc</td>
<td>12V, 625mA</td>
<td>-12V, 625mA</td>
<td>124-8442</td>
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<tr>
<td>9Vdc - 36Vdc</td>
<td>15V, 500mA</td>
<td>-15V, 500mA</td>
<td>124-8444</td>
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<td>18Vdc - 75Vdc</td>
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<td>—</td>
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<tr>
<td>18Vdc - 75Vdc</td>
<td>5V, 1.5A</td>
<td>—</td>
<td>126-1967</td>
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<tr>
<td>18Vdc - 75Vdc</td>
<td>12V, 625mA</td>
<td>-12V, 625mA</td>
<td>124-8447</td>
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<tr>
<td>18Vdc - 75Vdc</td>
<td>15V, 500mA</td>
<td>-15V, 500mA</td>
<td>124-8449</td>
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**Price Each**

Single Output

<table>
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<th>Order Code</th>
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<th>10+</th>
<th>25+</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1+</td>
<td>5+</td>
<td>10+</td>
<td>25+</td>
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**Dual Output**

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>1+</td>
<td>5+</td>
<td>10+</td>
<td>25+</td>
</tr>
</tbody>
</table>

**TEL15 Series**

15 watts

- Wide 2:1 input voltage range
- Very high power density
- Operating temperature range -40°C to +71°C
- Short-circuit proof
- I/O isolation 1500 V DC
- Industry standard pinning
- Screened metal housing with insulated baseplate
- Cost-optimized design
- 3 years guarantee

**Mttrs. List No.**

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>Voltage VDC</th>
<th>Voltage VDC</th>
<th>Current Max.</th>
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<td>9-18</td>
<td>5</td>
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<td>9-18</td>
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<td>1.25A</td>
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<td>9-18</td>
<td>±12</td>
<td>±625mA</td>
<td>124-2683</td>
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<tr>
<td>9-18</td>
<td>±15</td>
<td>±500mA</td>
<td>124-2685</td>
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<td>9-18</td>
<td>5</td>
<td>3A</td>
<td>124-2686</td>
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<td>±15</td>
<td>±500mA</td>
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**Price Each**

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<td></td>
<td>1+</td>
<td>5+</td>
<td>10+</td>
<td>25+</td>
</tr>
</tbody>
</table>

**TEN 15W Series**

15 Watt, 4:1 Input

- Ultra wide 4:1 input voltage range
- High efficiency up to 86%
- Input filter meets EN 55022, Class A and FCC, Level A without external components
- Indefinite short-circuit protection
- Remote on/off
- Industry standard pinout
- Six-sided shielded case with isolated base plate
- UL/CUL 60950, EN60950 and IEC60950 approved (60 Hz DC)
- 3 year product warranty

**Further specifications:**

- Regulation: ±0.5% max.
- Load variation: ±5%
- Ripple and noise: ±0.1% max.
- I/O isolation: 1.5kV
- Operating temperature: -40°C to +75°C above 70°C power reduction 3.5% / K

**Price Each**

<table>
<thead>
<tr>
<th>Order Code</th>
<th>1+</th>
<th>5+</th>
<th>10+</th>
<th>25+</th>
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<tbody>
<tr>
<td></td>
<td>1+</td>
<td>5+</td>
<td>10+</td>
<td>25+</td>
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### 15 Watt Single and Dual Output DC/DC Converters - THN 15WI Series

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>THN-15-2412WI</td>
<td>100-8708</td>
<td>1 + 5 + 10 + 25+</td>
</tr>
<tr>
<td>THN-15-4812WI</td>
<td>100-8706</td>
<td>1 + 5 + 10 + 25+</td>
</tr>
<tr>
<td>THN-15-2422WI</td>
<td>100-8709</td>
<td>1 + 5 + 10 + 25+</td>
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#### Pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single</th>
<th>Dual</th>
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<tr>
<td>1+</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>2-</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>3+</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
</tbody>
</table>

#### Pin Configurations

- **Single Output**: +Vout
- **Dual Output**: +Vout, -Vout

#### Voltage

- +Vout: 15V
- -Vout: 5V

#### Efficiency

- 87% max

#### Load Regulation

- ± 0.2% max

#### Efficiency

- 90% max

#### Operating Temperature

- -40°C to 105°C

#### Dimensions

- 9.9 x 25.4 x 24.4mm

#### Features

- Ultra wide 4:1 input range
- Very high efficiency up to 87%
- Short circuit protection
- Industry standard pin-out
- Remote on/off
- Safety standards/approvals to meet UL60950-1, EN60950-1 and IEC60950-1
- 3 Year product warranty

### DC/DC Converters Heatsinks

#### Contents
- Heatsink, Thermal pad and 5 Clamps.

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>For Converter</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>THN-HS1</td>
<td>TEN15, TEN15WI, TEN20</td>
<td>100-8695</td>
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<tr>
<td>THN-HS3</td>
<td>TEN40, TEN40WI, TEN60</td>
<td>208-0690</td>
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<td>THN-HS4</td>
<td>TEN90, TEN90WI, TEN95</td>
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<tr>
<td>THN-HS5</td>
<td>TEN25, TEN25WI</td>
<td>208-0693</td>
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#### Price Each

<table>
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<th>Price Each</th>
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<td>1 + 5 + 10 + 25+</td>
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<tr>
<td>THN-HS3</td>
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<tr>
<td>THN-HS5</td>
<td>200-8693</td>
<td>1 + 5 + 10 + 25+</td>
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</tbody>
</table>

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#### Notes

- Smallest 15W converter in an open frame design (27.9x23.9x5.5 mm)
- 2:1 input voltage range
- Ultra high efficiency up to 87%
- Indefinite short-circuit protection
- Input filter meets EN55022, Class A and FCC, Level A with external components
- Remote on/off
- Adjustable output voltage (± 10% with external resistance)
- UL/cUL 60950-1, EN60950-1 and IEC60950-1 approved
- 3 year product warranty

#### Further Specifications

- Regulation:
  - Input variation: ±0.2% max
  - Load variation: ±0.2% max
- Ripple and noise:
  - 3.3V<sub>dc</sub> models: 75mV pk-pk typ. (20 MHz Bandwidth)
  - 5V<sub>dc</sub> models: 100mV pk-pk typ. (20 MHz Bandwidth)
- I/O Isolation: 2250V
- Operating temperature: -40°C to +85°C above 70°C
- Power reduction 3%/K
Non-Isolated DC/DC Converters

- Wide input voltage ranges: 3 to 13.8V
- Wide output voltage trim/adjustability: 0.59 to 5.1V
- Output current: 3 A to 10A
- High efficiency up to 94%
- Remote on/off
- Current sink capability for termination applications
- Operating temperature range: -40°C to 70°C

- Overcurrent & short-circuit protection
- No added input or output capacitors needed for ripple current capability or stability
- Safety approvals UL, CSA, TUV & CB Report

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Input Voltage</th>
<th>Output Voltage</th>
<th>Current</th>
<th>Price Each</th>
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<tbody>
<tr>
<td>LDO03C-050W05-SJ</td>
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<td>3.0V - 13.8V</td>
<td>0.59V - 5.1V</td>
<td>3A</td>
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<tr>
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<td>3.0V - 13.8V</td>
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Isolated DC/DC Converters

- High efficiency
- No added input or output capacitors needed for ripple current capability or stability
- Safety approvals UL, CSA, TUV & CB Report

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<th>Mfrs.</th>
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<th>Output Voltage</th>
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<td>3.0V - 13.8V</td>
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<td>163-2915</td>
<td>3.0V - 13.8V</td>
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<td>LDO03C-050W05-SJ</td>
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<td>3.0V - 13.8V</td>
<td>0.59V - 5.1V</td>
<td>10A</td>
<td>50W</td>
</tr>
</tbody>
</table>

15 Watt Isolated DC/DC Converters

- High efficiency
- Low output ripple and noise
- Small Size and low profile: 27.9 mm x 20.6 mm x 8.5mm
- Industry Standard pin-out
- Surface mount or Through hole
- Remote On/Off (optional pin on TH version)
- Output overcurrent/output voltage protection
- Single Tightly regulated output voltage
- Output voltage adjustment trim ±10%
- Wide operating temperature range: -40°C to 85°C
- GE Energy formerly Lineage Power

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
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<td>SC003A5F91Z</td>
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</table>

Isolated DC/DC Sixteenth Brick Converters

- High efficiency
- Small size and low profile: 33 x 22.9 x 10. mm
- Industry standard DODA footprint
- Remote on/off
- Over temperature protection
- Output overcurrent/overvoltage protection
- Wide operating temperature range: -40°C to 85°C
- GE Energy formerly Lineage Power

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Voltage</th>
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</table>

Isolated DC/DC Quarter Brick Converters

- Constant switching frequency
- QBWV is a digitally controlled converter with an analog pinout
- QBDV is a digitally controlled converter with PMBus interface
- Output Voltage adjustment trim
- High Efficiency
- Optional integral metal base-plate
- 2:1 input voltage range
- Single, tightly regulated output voltage
- Over temperature protection
- GE Energy formerly Lineage Power

<table>
<thead>
<tr>
<th>Mfrs.</th>
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Power Supplies & Converters
**PCB Mount - DC to DC Converters - continued**

**Isolated DC/DC Quarter Brick Converters - continued**

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**With Heat Plate**

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**With Heat Plate and Forced Droop Output**

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</tbody>
</table>

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**Isolated DC/DC Half Brick Converters**

- Output voltage adjustment trim:
  - +10%/-40%
- High efficiency
- Integral metal baseplate
- Optional Tunable Loop™ for minimised output cap
- Industry standard half-brick footprint: 57.7 x 67.7 x 12.7mm
- Industry standard half-brick pin-out
- High power density
- Low output ripple and noise
- Remote Sense
- 2:1 input voltage range
- Single tightly regulated output

<table>
<thead>
<tr>
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<th>List No.</th>
<th>Order Code</th>
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<th>5+</th>
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**With Tunable Loop™**

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<tbody>
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<td>28V</td>
<td>12.5A</td>
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<td>JRCW010A041-17</td>
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**Without Tunable Loop™**

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**Without Tunable Loop**

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</tr>
</tbody>
</table>

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**Isolated DC/DC Eighth-Brick Converters**

- Constant switching frequency
- Positive remote On/Off logic
- Output over voltage and over current protection
- Remote sense
- Adjustable output voltage
- Wide operating temperature range (-40°C to 85°C)
- High efficiency from 28%
- GE Energy formerly Lineage Power

<table>
<thead>
<tr>
<th>Mfrs.</th>
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<th>1+</th>
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</tbody>
</table>

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**Isolated DC/DC Full Brick Converter**

- High power density
- Industry standard pin-out
- Low output ripple and noise
- Industry standard full brick footprint: 116.8 x 60.7 x 12.7mm
- Remote Sense
- Input range: 36V to 75V dc
- 2:1 input voltage range
- Single tightly regulated main output
- Constant switching frequency
- Latch after fault shutdown
- Over temperature protection auto restart
- Loosely regulated auxiliary output
- Power good signal
- Output voltage adjustment trim: +10%/-40%

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
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<tr>
<td>GW060A041-FZ</td>
<td>36V to 75V</td>
<td>5</td>
<td>20</td>
<td>100</td>
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<tr>
<td>GW060A041-Z</td>
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<td>5</td>
<td>30</td>
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<td>30</td>
<td>150</td>
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<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

---

**TROUBLESHOOTING TIPS**

Chat online to one of our technical engineers at farnell.com
1.5 - 10 Watt Single & Dual Output DC/DC Converters

- **Ultra Compact**
- **Low Profile**
- **Through Hole or SMT Versions**
- **5V, 12V & 24V Inputs**
- **Output Voltage Adjustment**
- **Input - Output Isolation**
- **5 Year Warranty**

### Surface Mount
- **Extensive self-protection, voltage limits and short circuit features**
- **Outstanding thermal performance and derating**
- **Outline dimensions less than one square inch**
- **Surface-mount or through-hole small footprint package**

### Through Hole
- **Industry Standard Footprint & Pinouts**
- **Wide Adjustable Output Range**
- **Full power at +100°C baseplate**
- **Input range: 9-36 and 18-75 Vdc**

### Surface Mount
- **-40°C to +85°C operating range**
- **Extensive self-protection, voltage limits and short circuit features**

### Isolated DC/DC Half Brick Converters

- **Industry Standard Footprint & Pinouts**
- **Safety Approved**
- **Full power at +100°C baseplate**
- **Wide Adjustible Output Range**

### Non-isolated

- **Compact footprint**
- **Surface-mount or through-hole small footprint packages**
- **Three nominal input range products to support 0.5V to 5.5V input voltages**
- **Outline dimensions less than one square inch**
- **3.3V, 5V and 12V DC nominal inputs**
- **High efficiency up to 95% typical**
- **Tracking input for sequenced startup/shutdown**
- **Outstanding thermal performance and derating**
- **-40°C to +85°C operating range**
- **Extensive self-protection, voltage limits and short circuit features**

### DC/DC Converters - Single O/P

With wide range 4:1 inputs these converters are ideal for battery-powered and telecom equipment. Applications include small instruments, area-limited microcontrollers, computer-based systems, data communications equipment, remote sensor systems, vehicle and portable electronics. Excellent ripple and noise specifications assure compatibility to circuits using CPU’s, ASIC’s, programmable logic and FPGA’s for systems requiring controlled startup/shutdown, an external remote On/Off control may use a switch, transistor or digital logic.

- **Small footprint DC/DC converter**
- **Ideal for high current applications**
- **Industry standard open frame package and pinout**
- **Input range: 9-36 and 18-75 Vdc**
- **2250 Volt Basic Isolation (Q48 models)**

### Power, Test and Measurement
PCB Mount - DC to DC Converters - continued

TOS Series
Point-of-Load (POL) Converter

- Delivers up to 16A with minimal derating
- Output Voltages trim from 0.75V dc to 5.0V dc
- Ultra high efficiency to 96%
- Fast transient response
- Under voltage lockout
- Remote on/off control
- SIP version or SMD package (DOSA compatible)

Further specifications:
- Regulation:
  - ±0.3% max.
  - ±0.4% max.
- Ripple and noise: 5V, Models: 50MHz pk-pk typ. (20 MHz Bandwidth), 12V, Models: 75MHz pk-pk typ. (20 MHz Bandwidth)
- Dynamic load response 50 μs typ. (Load change 50%)
- Operating temperature: -40°C to +85°C

<table>
<thead>
<tr>
<th>Mfrs. List No. Voltage (V) Current (A) Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOS 06-05SM 0.7525 - 5.5 6 94 100-7583</td>
</tr>
<tr>
<td>TOS 06-12SM 0.7525 - 5.5 6 89 100-7586</td>
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<tr>
<td>TOS 10-12SM 0.7525 - 5.5 5 10 100-7587</td>
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<tr>
<td>TOS 16-12SM 0.7525 - 5.5 5 16 100-7588</td>
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<tr>
<td>TOS 06-05SL 0.7525 - 5.5 6 94 100-7589</td>
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<tr>
<td>TOS 10-12SL 0.7525 - 5.5 6 89 100-7591</td>
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</table>

<table>
<thead>
<tr>
<th>Mfrs. List No. Voltage (V) Current (A) Order Code</th>
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</thead>
<tbody>
<tr>
<td>TOS 06-05SL 0.7525 - 5.5 6 94 100-7592</td>
</tr>
<tr>
<td>TOS 10-12SL 0.7525 - 5.5 6 89 100-7593</td>
</tr>
</tbody>
</table>

* The maximum selected output voltage must be at least 0.5 V dc under the applied input voltage.

DC/DC Converter - Adjustable O/P

The OKY-T/3 and -T/5 series are miniature nonisolated Point-of-Load (POL) switch mode DC/DC power converters for embedded applications. The module is fully compatible with Distributed-power Open Standards Alliance (DOSA) industry-standard specifications. Applications include powering CPU’s, datacom/telecom systems, distributed bus architectures (DBA), programmable logic and mixed voltage systems.

- Non-isolated SMT POL DC/DC power module
- Drives 1000 μA capacitive loads
- Over temperature and over current protection
- On/Off control
- Industry-standard (DOSA) surface-mount package

**Okami Series**

**DC/DC Converter - Adjustable O/P**

<table>
<thead>
<tr>
<th>Mfrs. List No. Voltage (V) Current (A) Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKY-7/S-12P-C 0.7525 - 5.5 12 P √ 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-7/S-24P-C 0.7525 - 5.5 12 N × 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-7/S-12N-C 0.7525 - 5.5 12 N × 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-7/S-24N-C 0.7525 - 5.5 12 N × 33x13.5x4.4</td>
</tr>
</tbody>
</table>

* N = Negative polarity, P = Positive polarity.

**Okami Series**

**DC/DC Converter - Adjustable O/P**

The OKY-T/10 and -T/16 series are miniature SMT non-isolated Point-of-Load (POL) DC/DC power converters for embedded applications. The module is fully compatible with Distributed-power Open Standards Alliance (DOSA) industry-standard specifications. Applications include powering CPU’s, datacom/telecom systems, distributed bus architectures (DBA), programmable logic and mixed voltage systems.

- Point-of-Load (POL) converters for distributed bus architectures
- Wide 8.3-14 VDC input range
- High efficiency up to 94.5% with no heatsink
- Fully protected against temperature and voltage limits

**Okami Series**

**DC/DC Converter - Adjustable O/P**

<table>
<thead>
<tr>
<th>Mfrs. List No. Voltage (V) Current (A) Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKY-10/12-D12P-C 0.7525 - 5.5 12 P √ 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-10/12-D12N-C 0.7525 - 5.5 12 N × 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-10/12-D24P-C 0.7525 - 5.5 12 P √ 33x13.5x4.4</td>
</tr>
<tr>
<td>OKY-10/12-D24N-C 0.7525 - 5.5 12 N × 33x13.5x4.4</td>
</tr>
</tbody>
</table>

* N = Negative polarity, P = Positive polarity.


DC/DC Converter - Adjustable O/P

Okami Series

- Non-isolated SMT LGA POL DC/DC power module
- Programmable output voltage range from 0.75 to 5.5Vdc
- Over current protection

Mfrs.

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OKX-T/10-D12N-C</td>
<td>0.75 - 5.5</td>
<td>10</td>
<td>12</td>
<td>N</td>
</tr>
<tr>
<td>OKX-T/10-D12P-C</td>
<td>0.75 - 5.5</td>
<td>10</td>
<td>12</td>
<td>P</td>
</tr>
</tbody>
</table>

Price Each

Mfrs. List No. | Order Code | 1+ | 5+ | 10+ | 25+ | 50+ |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OKX-T/10-D12N-C</td>
<td>170-5262</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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<tr>
<td>OKX-T/10-D12P-C</td>
<td>170-5263</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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<tr>
<td>OKX-T/16-D12N-C</td>
<td>170-5264</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
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<td>OKX-T/16-D12P-C</td>
<td>170-5265</td>
<td>1+</td>
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<td>25+</td>
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<tr>
<td>OKX-T/20-D12N-C</td>
<td>170-5266</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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<tr>
<td>OKX-T/20-D12P-C</td>
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<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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<tr>
<td>OKX-T/20-D16N-C</td>
<td>170-5268</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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<tr>
<td>OKX-T/20-D16P-C</td>
<td>170-5269</td>
<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
<td></td>
</tr>
</tbody>
</table>

DC/DC Converter - Adjustable O/P

Okami Series

- 600KHz operation
- 4.5-14Vdc input voltage range
- Programmable output voltage range from 0.591 to 6.0VDC
- Over current protection
- High power conversion efficiency
- Over temperature protection
- On/Off control

Mfrs.

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Voltage (V)</th>
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<tbody>
<tr>
<td>OKR-T/3-W12C</td>
<td>0.591 - 6</td>
<td>3</td>
<td>12</td>
</tr>
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</table>

Price Each

Mfrs. List No. | Order Code | 1+ | 10+ | 25+ | 50+ |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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</thead>
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<td>1+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
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</table>

Non-Isolated DC/DC Converters

- Tunable Loop™ to optimize dynamic output voltage response
- Fixed switching frequency
- Over temperature protection
- Remote On/Off
- Digital interface through the PMBus™ protocol (9PD Series only)
- GE Energy formerly Lineage Power

Mfrs.

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Voltage (V)</th>
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<tbody>
<tr>
<td>APX/ATS/UDT/VT</td>
<td>8.3V to 14V</td>
<td>800μA to 6.5mA</td>
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<tr>
<td>AT016A0X8</td>
<td>3V to 14V</td>
<td>0.5V to 5.5V</td>
<td></td>
</tr>
</tbody>
</table>

Price Each

Mfrs. List No. | Order Code | 1+ | 5+ | 10+ | 25+ | 50+ |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>AT016A0X8</td>
<td>207-6825</td>
<td>1+</td>
<td>5+</td>
<td>10+</td>
<td>25+</td>
<td>50+</td>
</tr>
</tbody>
</table>
Non-Isolated DC/DC Converters - continued

- Remote On/Off
- GE Energy formerly Lineage Power applications
- Distributed power architectures
- Intermediate bus voltage applications
- Telecommunications equipment
- Servers and storage applications
- Networking equipment

Non-Isolated DC/DC Converters

- Delivers up to 30A of output current
- High efficiency
- Monotonic start-up into pre-biased output
- Remote On/Off
- Remote Sense
- Over current and Over temperature protection
- P option: Paralleling with active current share
- PH option: Additional GND pins for improved thermal derating
- GE Energy formerly Lineage Power

Non-Isolated DC/DC Converters

- Input voltage from 4.5V to 14Vdc
- Output voltage programmable from 0.7 Vdc to 2.0Vdc via external resistor
- Output current up to 50A
- Tunable control loop for fast transient response
- True differential remote sense
- Negative remote On/Off logic
- Output voltage sequencing
- Output over current protection (non-latching)
- Over temperature protection
- Monotonic startup under pre-bias conditions
- Parallel operation with active current sharing
- Small size and low profile: 33 x 22.9 x 10mm
- Wide operating temperature range: -40°C to 105°C
- GE Energy formerly Lineage Power

Non-Isolated DC/DC Converter

Applications
- Distributed power architectures
- Intermediate bus voltage applications
- Telecommunications equipment
- Servers and storage applications
- Networking equipment

Digital Power Insight™ GUI

The Lineage Power Digital Power Insight™ GUI software package provides power engineers with a user interface that delivers control flexibility over their digital products. The Digital Power Insight™ GUI communicates with PMBus™ enabled products, specifically DLynx POLs, via a USB to I2C adapter. The software features continuous monitoring (polling) of input voltage, output voltage and current, as well as module status. Status changes are automatically time stamped and logged by the software and are easily exported. A Command Line Interface (CLI) is also available for a more in-depth analysis of the transmitted data across the I2C bus. The CLI is a useful tool for creating and executing user-defined routines and scripts, as well as the logging of data for future review or plotting. In addition to its monitoring capabilities, designers can use Lineage Power’s Digital Power Insight™ GUI to configure and reconfigure voltages, thresholds, warnings and settings for individual power modules as well as save configuration specs. Users can also use the software’s built-in auto-detect functionality to identify modules on the I2C bus. The software also gives engineers the ability to create custom configuration files to fine-tune and optimize a variety of parameters to ensure the highest levels of performance and efficiency.

- GE Energy formerly Lineage Power

Contents: Evaluation board (12A POL PDT012), Ribbon cable, USB Interface adapter, USB cable and Software.

Non-Isolated Adjustable DC/DC Converters

- High performance switching regulator
- High efficiency up to 95%
- Low profile open frame design
- Adjustable output voltage
- Remote On/Off
- Wide input voltage ranges 2.5-5.5, 4.5-14 and 10-30 VDC
- Output voltages from 0.6 to 15 VDC
- Short circuit protection
- 3 years product warranty
Ultra Wide 4:1 Input Range

DC/DC Converter - Selectable Output

LSN2 Series

- User-selectable outputs
- Selectable phased start-up sequencing and tracking
- Wide Vin range
- Very high efficiency up to 95%
- Starts up into pre-biased load
- Fast settling, high di/dt tout slew rate

These miniature point-of-load (POL) switching DC/DC converters are ideal regulation and supply elements for distributed power and intermediate bus architectures. Fully compatible with the Distributed-power Open Standards Alliance specification. The LSN2’s can power CPU’s, programmable logic and mixed-voltage systems with little heat and low noise. The LSN2’s can deliver very high power in a tiny area without heat sinking or external components.

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Nominal Input Voltage</th>
<th>Voltage</th>
<th>Current</th>
<th>Power Rating</th>
<th>Dimensions (WxHxD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSN2-T/6-W3-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>6A</td>
<td>19.8W</td>
<td>25.4x12.7x6.98</td>
</tr>
<tr>
<td>LSN2-T/6-W3N-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>6A</td>
<td>19.8W</td>
<td>25.4x12.7x6.98</td>
</tr>
<tr>
<td>LSN2-T/6-D12-C</td>
<td>12V dc</td>
<td>0.75V - 3.3V</td>
<td>6A</td>
<td>30W</td>
<td>25.4x12.7x6.98</td>
</tr>
<tr>
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<td>30W</td>
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</tr>
<tr>
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<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>10A</td>
<td>33W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/10-W3N-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>10A</td>
<td>33W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/10-D12-C</td>
<td>12V dc</td>
<td>0.75V - 3.3V</td>
<td>10A</td>
<td>50W</td>
<td>25.4x12.7x8.13</td>
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<tr>
<td>LSN2-T/10-D12N-C</td>
<td>12V dc</td>
<td>0.75V - 3.3V</td>
<td>10A</td>
<td>50W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/16-W3-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>16A</td>
<td>80W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/16-W3N-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>16A</td>
<td>80W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
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<td>12V dc</td>
<td>0.75V - 3.3V</td>
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<td>80W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/16-D12N-C</td>
<td>12V dc</td>
<td>0.75V - 3.3V</td>
<td>16A</td>
<td>80W</td>
<td>25.4x12.7x8.13</td>
</tr>
<tr>
<td>LSN2-T/20-W3-C</td>
<td>5V dc</td>
<td>0.75V - 3.3V</td>
<td>30A</td>
<td>150W</td>
<td>25.4x12.7x11.4</td>
</tr>
</tbody>
</table>

20 Watt Single and Dual Output DC/DC Converters

Ultra Wide 4:1 Input Range

- 4:1 Input Range
- Overvoltage & Overcurrent Protection
- Undervoltage Lockout
- 1600 VDC Isolation
- Efficiency up to 91%
- Remote On/Off
- 3 year warranty

| Dimensions (mm): H=10.16, W=50.8, D=25.4 |

20 Watt DC/DC converter in an industry standard 2x1 inch metal package with an extra wide 4:1 input range, single and dual outputs, featuring 1600VDC isolation, continuous short circuit protection and remote off. This robust, high reliability, industrial grade product is suitable for a wide range of applications.

Input Voltage Range: 24 V (9-36 VDC), 48 V (18-75 VDC)
Load Regulation: ±0.5% max.
Load Regulation: ±0.5% max single, ±1% max dual
Ripple & Noise: 75 mV pk-pk, 20MHz BW
Isolation Voltage: 1600 VDC Input to Output, 1600 VDC Input to Case, 1600 VDC Output to Case
Operating Temperature: -10°C to 150°C, derate from 100% load at 60°C to no load at 105°C
Short Circuit Protection: Trip & restart (hiccup mode), auto recovery
MTBF: >680 kilohrs minimum to MIL-HDBK-217F at 25°C, GB

Price Each

Single Output: All Order Codes

Dual Output: All Order Codes

20 Watt Single and Dual Output DC/DC Converters

Industry Standard Package

- 2:1 Input Range
- -40°C to +100°C Operating Temperature
- Single & Dual Outputs
- Overvoltage & Overcurrent Protection
- High Efficiency - up to 93%
- 1500 VDC Isolation
- 3 Year Warranty

| Dimensions (mm): H=10.16, W=50.8, D=25.4 |

20 Watt Single and Dual Output DC/DC Converters

4.1 Input Range

- 4.1 Input Range
- Operating Temperature: -40°C to +100°C
- Output voltage trim
- Overvoltage & Overcurrent Protection
- UL Safety Approvals
- Remote On/Off
- 3 Year Warranty

Dimensions (mm): H=11.43, W=40.8, D=50.8
PCB Mount - DC to DC Converters - continued

20 Watt Single and Dual Output DC/DC Converters - continued

4:1 Input Range - continued

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>On/Off Control</td>
<td>On/Off Control</td>
</tr>
<tr>
<td>2</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>3</td>
<td>Trim</td>
<td>Trim</td>
</tr>
<tr>
<td>4</td>
<td>-VOut</td>
<td>-VOut</td>
</tr>
<tr>
<td>5</td>
<td>+VOut</td>
<td>+VOut</td>
</tr>
<tr>
<td>6</td>
<td>No Pin</td>
<td>No Pin</td>
</tr>
</tbody>
</table>

Input Voltage Range: 24 V (9-36 VDC), 48 V (18-75 VDC)
Line Regulation: ±1%
Load Regulation: Single output models: ±0.5 max Dual output models: ±0.2 max for 10-100% load change
Ripple & Noise: Single output models: 50 mV pk-pk, Dual output models: 75 mL pk-pk typical at 20 MHz bandwidth
Isolation Voltage: 1500 VDC Input to Output
Short Circuit Protection: Continuous with auto recovery
MTBF: >1.0 Mhrs to MIL-883K-217F at 25°C, 68
Safety Approvals: UL60950-1
Emissions: EN55022 level B conducted (-25°C to 100°C), level A radiated

3 year product warranty

---

20 Watt DC/DC Converters

4:1 Input, DIP

- Smallest encapsulated 20 W converter
- Ultra compact size: 1" x 1" x 0.4" metal package
- Ultra wide 4:1 input voltage ranges
- No minimum load required
- Short circuit protection
- Adjustable output voltage
- Remote on/off
- Safety standards: UL60950-1, EN60950-1
- 3 year product warranty

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
<tr>
<td>2</td>
<td>-Vin (GND)</td>
<td>-Vin (GND)</td>
</tr>
<tr>
<td>3</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>4</td>
<td>Trim</td>
<td>Common</td>
</tr>
<tr>
<td>5</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>6</td>
<td>Remote on/off</td>
<td>Remote on/off</td>
</tr>
</tbody>
</table>

**Output Voltage Adjustment**

- ± Input variation
- ±0.2% max.
- ±0.5% max. (Single output models)
- ±1.0% max. (Dual output models)

**Operating Temperature Range**

- -40°C to +85°C, above 60°C derating 2.5°F/K

Safety Approvals: UL60950-1, EN60950-1

---

25W DC/DC Converters

**NPHE2 Series**

- Efficiency to 89%
- 2V & 4V input
- 3V, 5V, 12V and 15V output
- Industry standard pinout
- Non latching current limit
- El version includes optional control pins (output adj., synchronisation and shutdown)
- Internal over temperature protection
- UL 94V-0 package material
- Isolated output

---

20 Watt Single and Dual Output DC/DC Converters

4:1 input

- High power density
- Ultra wide 4:1 input range
- High efficiency up to 88%
- Short circuit protection
- Remote on/off
- Industry standard pin-out
- Metal case with insulated base plate
- 3 Years product warranty

---

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single</th>
<th>Dual</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin (+Vcc)</td>
<td>+Vin (+Vcc)</td>
</tr>
<tr>
<td>2</td>
<td>-Vin (-GND)</td>
<td>-Vin (-GND)</td>
</tr>
<tr>
<td>3</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>4</td>
<td>Trim</td>
<td>Common</td>
</tr>
<tr>
<td>5</td>
<td>-Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>6</td>
<td>Remote on/off</td>
<td>Remote on/off</td>
</tr>
</tbody>
</table>

**Input Voltage**

9V to 36V 12V, 1.67A
9V to 36V 12V, 183mA
9V to 36V 12V, 67mA
10V to 75V 5V, 4A
10V to 75V 5V, 5A
10V to 75V 5V, 1.67A
10V to 75V 5V, 67mA
10V to 75V 5V, 7mA
10V to 75V 5V, 1.67mA
4 Trim
4 Trim
4 Trim
4 Trim
4 Trim
4 Trim
4 Trim
25/30W DC/DC Converters

**TEN 25 Series**

- 2:1 wide-range inputs
- Very high efficiency up to 89%
- Operating temperature range -40°C to +70°C
- Resistant to sustained short circuits
- Overvoltage protection
- I/O isolation 1500 Vdc
- Overvoltage protection
- Resistant to sustained short circuits
- Operating temperature range -40°C to +2:1 wide-range inputs
- Input filter in accordance with EN 55022, Class A and FCC, Level A without external components
- Industry standard pin-out
- Low height
- Metal housing screened on 6 sides with isolated baseplate
- 3 year guarantee

**DC/DC Converters - Single O/P**

**UHE Series**

- The most Iout/Pout in this format
- Five input ranges from 8-75 Volts
- Efficiencies as high as 91.5%
- Stable no-load operation
- Optional sense pins for low Vout
- Thermal shutdown, I/O protected
- 1500 Vdc I/O BASIC insulation
- Output configurations: 3.3/5Vout @ 25 Watts 5/12/5Vout @ 30 Watts

**Nominal Input Voltage (V) | Output Voltage (V) | Output Current (A) | Mfrs. List No. | Order Code**
--- | --- | --- | --- | ---
24 | 9-18 | 12 | TEN 25-1211 | 120-4993
24 | 9-18 | 12 | TEN 25-1212 | 120-4999
24 | 9-18 | 12 | TEN 25-1222 | 120-4990
24 | 9-18 | 15 | TEN 25-2411 | 89-4999
24 | 18-36 | 5 | TEN 25-4811 | 120-4997
24 | 36-75 | 7.5 | TEN 25-4812 | 120-4998
24 | 36-75 | 15 | TEN 25-4822 | 120-4999

**Price Each**

**Order Code**

| Code | 1+ | 5+ | 10+ |
--- | --- | --- | ---
TEN 25-1211 | 120-4993 | 88 | 6A 89% |
TEN 25-1212 | 120-4999 | 88 | 6A 89% |
TEN 25-1222 | 120-4990 | 88 | 6A 89% |
TEN 25-2411 | 89-4999 | 89 | 6A 89% |
TEN 25-4811 | 120-4997 | 89 | 6A 89% |
TEN 25-4812 | 120-4998 | 89 | 6A 89% |
TEN 25-4822 | 120-4999 | 89 | 6A 89% |

**Heatink**

- TEN-HS5 $28.063$

-TEN SERIES - All Order Codes

**25/30W DC/DC Converters - Single O/P**

**UHE Series**

- The most Iout/Pout in this format
- Five input ranges from 8-75 Volts
- Efficiencies as high as 91.5%
- Stable no-load operation
- Optional sense pins for low Vout
- Thermal shutdown, I/O protected
- 1500 Vdc I/O BASIC insulation
- Output configurations: 3.3/5Vout @ 25 Watts 5/12/5Vout @ 30 Watts

**Nominal Input Voltage (V) | Output Voltage (V) | Output Current (A) | Mfrs. List No. | Order Code**
--- | --- | --- | --- | ---
UHE-3.3/7500-Q12-C | 3.3V | 24V dc (9-36V dc) | TEN 30-1211 | 177-2200
UHE-3.3/7500-Q12-C | 3.3V | 48V dc (18-75V dc) | TEN 30-3011 | 177-2200
UHE-3.3/7500-Q12-C | 3.3V | 12V (9-36V dc) | TEN 30-1222 | 177-2200
UHE-3.3/7500-Q12-C | 3.3V | 24V (9-36V dc) | TEN 30-1212 | 177-2200
UHE-3.3/7500-Q12-C | 3.3V | 12V (9-36V dc) | TEN 30-1222 | 177-2200

**Price Each**

**Order Code**

| Code | 1+ | 5+ | 10+ |
--- | --- | --- | ---
TEN 30-1211 | 177-2200 | 6A 87% |
TEN 30-1212 | 177-2200 | 6A 87% |
TEN 30-1222 | 177-2200 | 6A 87% |
TEN 30-1212 | 177-2200 | 6A 87% |
TEN 30-1222 | 177-2200 | 6A 87% |
TEN 30-1212 | 177-2200 | 6A 87% |
TEN 30-1222 | 177-2200 | 6A 87% |

**Pin Single Output**

**Pin Connections**

| PIN當地 | Single Output | Dual Output | Vout | Common |
--- | --- | --- | --- | ---
1 | +Vin (Vcc) | +Vin (Vcc) | 6A 87% |
2 | -Vin (GND) | -Vin (GND) | 6A 87% |
3 | Remote On/Off | Remote On/Off | Trim | Vout | Common |

**Rs 10% (with ext. resistor, only single outputs models)**
**Rs ± 1.0% max. (Dual output models)**

**Regulation**
- Line regulation ± 0.5% max.
- Load regulation ± 0.5% max.

**Adjustable output voltage ±10% with (ext. resistor, only single outputs models)**

**Conducted EMI**
- EN 55022, Class A and FCC, Level A, with ext. capacitor

**Safety standards / approvals**
- UL/cUL 60950-1, IECEN 60950-1

**Operating temperature range**
- -40°C to +85°C, above 60°C derating 3.3%/K
**PCB Mount - DC to DC Converters - continued**

### 30 Watt Single and Dual Output DC/DC Converters

**High Power Density**

- **2:1 Input Range**
- **High Power Density**
- **Single and Dual Outputs**
- **High Efficiency Up to 92%**
- **Remote On/Off**
- **1600 VDC Isolation**
- **3 Year Warranty**

**Dimensions:** H=10.16, W=5.08, D=25.4mm

<table>
<thead>
<tr>
<th>PIN CONNECTIONS</th>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-Vin</td>
<td>+Vin</td>
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<td>3</td>
<td>Remote On/Off</td>
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</tr>
<tr>
<td>4</td>
<td>+Vout</td>
<td>+Vout</td>
<td>+Vout</td>
</tr>
<tr>
<td>5</td>
<td>Com</td>
<td>Com</td>
<td>Com</td>
</tr>
<tr>
<td>6</td>
<td>Trim</td>
<td>Trim</td>
<td>Trim</td>
</tr>
</tbody>
</table>

**Input Voltage Range:**
- 12 VDC (3-18 VDC), 24 VDC (18-36 VDC), 48 VDC (36-75 VDC)

**Line Regulation:** ±0.5% max.

**Load Regulation:** Single output models: ±0.15% max

**Ripple & Noise:**
- Dual output: ±65 mV pk-pk (±0.1%)
- Single output: ±100 mV pk-pk (±0.5%)

**Operating Temperature:** -40°C to +85°C

**I/O Isolation:** 1.5kV

**Efficiency:**
- 87% typ.

**MTBF:** 430 kHrs min to MIL-HDBK-217F at 25°C to +105°C

**Input Voltage Range:**
- ±1% max.

**Dual Output Models:**
- ±1% / 5% max. (Triple models, main/auxiliary)

**Load Variation:**
- ±0.5% max. (Single output models)
- ±3% (Dual output models)

**Remote On/Off:**
- ±10% (with external resistance)

**Indefinite short circuit protection**

**Safety standards/Approvals:**
- UL/cUL 60950-1, IEC/EN60950-1
- UL/cUL 1950 recognized

**Power, Test and Measurement**

- Remote On/Off
- Input filter meets EN55022, Class A
- 20 x 4 x 10 mm shielded metal case
- 3 year manufacturer’s warranty

**Further specifications:**
- **Regulation:** ±0.3% max.
- **Load variation:** ≥10% (with external resistance)
- **Ripple and noise:** 100mV pk-pk typ. (20 MHz Bandwidth)
- **I/O Isolation:** 1.5kV
- **Operating Temperature:** -25°C to +71°C above 60°C derating 3.5 K/C
- **50x41x10mm shielded metal case**
- 3 year product warranty

### TEN 30WI Series, 30 Watt

**30 Watt, 4:1 Input**

- Smallest encapsulated 30 W converter
- 1” x 1” x 0.4” shielded metal package
- Ultra wide 4:1 input voltage range
- Single- dual- and triple output models
- Very high efficiency up to 91%

**PIN CONNECTIONS**

- **Short circuit protection**
- **Remote On/Off**
- **Adjustable output voltage**
- **3 years product warranty**

**Regulation:**
- Line variation: ±0.2% max. (Single- and dual-models)
- ±1% / 5% max. (Triple models, main/auxiliary)

**Adjustable Output Voltage:**
- ±1% max. (Single models)
- ±0.5% max. (Dual output models)
- ±1% / 5% max. (Triple-Models, main/auxiliary)

**I/O Isolation:**
- 1500 VDC

**Conducted EMI:**
- EN61000-6-3

**Operating temperature range:**
- -40°C to +75°C above 60°C derating 3.5 K/C

**Safety standards/approvals:**
- UL/cUL 60950-1, IEC/EN60950-1

**Price Each**

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEN 30-2411WIN</td>
<td>163-5230</td>
<td>1+</td>
</tr>
<tr>
<td>TEN 30-2411WIN</td>
<td>163-5231</td>
<td>5+</td>
</tr>
<tr>
<td>TEN 30-2412WIN</td>
<td>163-5236</td>
<td>10+</td>
</tr>
<tr>
<td>TEN 30-2413WIN</td>
<td>163-5255</td>
<td>25+</td>
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<tr>
<td>TEN 30-4812WIN</td>
<td>163-5240</td>
<td>10+</td>
</tr>
<tr>
<td>TEN 30-4813WIN</td>
<td>163-5241</td>
<td>25+</td>
</tr>
<tr>
<td>TEN 30-4814WIN</td>
<td>163-5242</td>
<td>1+</td>
</tr>
<tr>
<td>TEN 30-4822WIN</td>
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<td>TEN 30-4823WIN</td>
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<td>TEN 30-4824WIN</td>
<td>163-5245</td>
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</tr>
<tr>
<td>TEN 30-4831WIN</td>
<td>163-5246</td>
<td>1+</td>
</tr>
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<td>TEN 30-4832WIN</td>
<td>163-5247</td>
<td>5+</td>
</tr>
<tr>
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<td>163-5248</td>
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</tr>
<tr>
<td>TEN 30-4834WIN</td>
<td>163-5249</td>
<td>25+</td>
</tr>
</tbody>
</table>

**TEN 30WI Series, 30 Watt**

- **30 Watt, Highest Power Density**

**Price Each**

<table>
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<tr>
<td>TEN 30-4834WIN</td>
<td>163-5249</td>
<td>25+</td>
</tr>
</tbody>
</table>

**TEL30 Series**

30 Watt, Highest Power Density

- 2:1 wide input range
- Ultra high efficiency to 88%
- Indefinite short circuit protection
- Operating temperature: -25°C to +71°C
- Adjustable output voltage
- Cost efficient design
- Under voltage lockout
- Industry standard pinout
- Six-sided shielded metal case with isolated base plate
- (UL/cUL 60950, IEC60950 and IEC60950 approved)(to 60 V dc)
- 3 year product warranty

**Further specifications:**

**Regulation:**
- Input variation: ±0.3% max.
- Load variation: ±10% max.
- Adjustable input voltage: ±10% (with external resistance)
- Ripple and noise: 100mV pk-pk typ. (20 MHz Bandwidth)
- I/O Isolation: 1.5kV
- Operating temperature: -25°C to +71°C above 60°C derating 3.5 K/C
- Power reduction 2% / K

**Price Each**

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</tr>
<tr>
<td>TEN 30-2434WIN</td>
<td>163-5249</td>
<td>25+</td>
</tr>
</tbody>
</table>

**TEC Electric**

- Compliant
- Non-compliant

**RoHS**

3146

3146

3146

3146

3146

3146
15 - 33W Non-Isolated DC/DC Converters

**PTH Series**

- Wide-output voltage adjust (0.8 Vdc to 5.5 Vdc)
- Auto-track™ sequencing
- Pre-bias start-up capability
- Efficiencies up to 95%
- Output On/Off inhibit
- Output voltage sense
- Point-of-Load-Aliance (POLA) compatible
- Six-sided metal case minimises EMC emissions and helps even dissipation of heat.

**Dimensions (mm):** L = 50.8, W = 50.8, H = 10.2

---

**40 Watt Compact DC/DC Converters**

Single, Dual and Triple Output - JCP40 Series

A high specification DC/DC converter with very low ripple and noise, high efficiency and
-40 to +100°C Operating Temperature
-3 Year Warranty

**Input Voltage Range**
- 12 VDC (9-18 VDC)
- 24 VDC (18-36 VDC)
- 48 VDC (36-75 VDC)

**Undervoltage Lockout**: Turn on at 1% nominal input

**Line Regulation**: ±0.5% max for single & dual outputs

**Load Regulation**: ±0.5% max & ±10% max for single & triple outputs

**Ripple & Noise**:
- ±0.1% max for V1 & V2 outputs
- ±0.5% max for V1 & V2 outputs
- 2.5, 3.3 & 5.0 V models 50 mV pk-pk max
- 12.0 & 15.0 V models 75 mV pk-pk max

**Short Circuit Protection**: Continuous, trip & restart (Hiccup mode)

---

**40 Watt Single and Dual Output DC/DC Converters**

**Ultra Compact Package**

**PIN CONNECTIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single</th>
<th>Dual</th>
<th>Triple</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin</td>
<td>+Vin</td>
<td>+Vin</td>
</tr>
<tr>
<td>2</td>
<td>-Vin</td>
<td>-Vin</td>
<td>-Vin</td>
</tr>
<tr>
<td>3</td>
<td>On/Off</td>
<td>On/Off</td>
<td>On/Off</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
<td>NC</td>
<td>Aux Output</td>
</tr>
<tr>
<td>5</td>
<td>Sense</td>
<td>+Vtrim</td>
<td>-Vtrim</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>+Vout</td>
<td>-Vout</td>
</tr>
<tr>
<td>7</td>
<td>+Vout</td>
<td>+Vtrim</td>
<td>+Vtrim</td>
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<tr>
<td>8</td>
<td>+Vtrim</td>
<td>+Vtrim</td>
<td>+Vtrim</td>
</tr>
<tr>
<td>9</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>

**Efficiencies**
- 92% at 100°C

**Operational Temperature**: 
-40°C to +100°C

---

**Mfrs.**

<table>
<thead>
<tr>
<th>List No.</th>
<th>Order Code</th>
<th>Input Voltage</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTH00050WAD</td>
<td>143-5501</td>
<td>5V/6A</td>
<td>12V/0.3A</td>
<td>-12V/0.3A</td>
<td></td>
</tr>
<tr>
<td>PTH0050WAD</td>
<td>143-5508</td>
<td>5V/6A</td>
<td>12V/0.4A</td>
<td>-12V/0.4A</td>
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</tr>
<tr>
<td>PTH10050WAD</td>
<td>143-5509</td>
<td>5V/6A</td>
<td>12V/0.4A</td>
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<tr>
<td>PTH12050WAD</td>
<td>143-5510</td>
<td>5V/6A</td>
<td>12V/0.4A</td>
<td>-12V/0.4A</td>
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**Price Each**

<table>
<thead>
<tr>
<th>Single</th>
<th>Dual</th>
<th>Triple</th>
</tr>
</thead>
<tbody>
<tr>
<td>$492280</td>
<td>$415066</td>
<td>$337088</td>
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</table>

---

**Dimensions (mm):** H = 10.16, W = 50.8, D = 25.44 mm

---

**New**

---

**MTBF**: 330 khrs min to MIL-HDBK-217F at 25°C
40 Watt Single and Dual Output DC/DC Converters

Ultra Wide Input

- 4:1 Input Range
- High Power Density
- Single and Dual Outputs
- High Efficiency - Up to 92%
- Remote on/off
- 1500 VDC Isolation
- 3 Year Warranty

Input Voltage Range: 24 VDC (9-36 VDC), 48 VDC (18-75 VDC)
Line Regulation: ±0.5% max.
Load Regulation: Single output models: ±0.5% max
Dual output models: ±1% max
Ripple & Noise: 50 mV pk-pk max for 3.3 V & 5 V models
75 mV pk-pk max for other single output models
Isolation Voltage: 150 VDC pk-pk max for dual output models, 20 MHz BW
1600 VDC Input to Output
1600 VDC Input to Case
1600 VDC Output to Case
Operating Temperature: -40°C to +85°C, see dataset for derating
Short Circuit Protection: Trip & restart (hiccup mode), auto recovery
MTBF: 150 M hrs min MIL-HDBK-217F at 25°C, 6GB

TEN 40-4811WI 18V to 75V 5V, 6A — 208-3557
TEN 40-4813WI 18V to 75V 12V, 3.35A — 208-3558
TEN 40-4813WI 18V to 75V 15V, 2.5A — 208-3559
TEN 40-4822WI 18V to 75V 12V, 1.65A -12V, -1.65A 208-3560
TEN 40-4828WI 18V to 75V 15V, 1.35A -15V, -1.35A 208-3561

40 Watt Single, Dual and Triple Output DC/DC Converters

TEN Series

- Highest power density
- Wide 2:1 input range
- Short circuit protection
- 3 year guarantee

Line Regulation: 1.0% max.
Ripple & Noise: Single O/P: ±0.5% max.
Dual O/P: ±1.0% max
Triple O/P: ±0.4% max.
Order Code
- 124-2627
- 124-2628

PCB Mount - DC to DC Converters - continued

40 Watt Single and Dual Output DC/DC Converters

- High power density: 40 W in 50.8 x 50.8 x 10.2 mm metal package
- Single and Dual output models
- Ultra wide 4:1 input range
- Very high efficiency up to 97%
- Operating temperature range: -40°C to +85°C
- Over temperature protection
- I/O isolation 1500 VDC
- Short circuit protection
- Remote on/off
- 3 year guarantee

Line Regulation: ±0.2% max.
Load Regulation: ±0.5% max. (Single output models)
±1.0% max. (Dual output models)
Adjustable Output Voltage: ±10% (with ext. resistor, only single output models)
Conducted EMI: EN 55022: class A and FCC, level A (with ext. capacitor)
Ripple & Noise: <150 mVpk-pk typ. (20 MHz BW)
Isolation Voltage: 1500 VDC (60 sec)
Operating Temperature: -40°C to +85°C, above 50°C derating 2%/C
Thermal protection: Shutoff at 110°C
Safety Approvals: UL cUL 60950-1, IEC60950-1, CE report

Mtrrs. List No. Order Code 1+ 5+ 10+ 25+
TEN 40-2410WI 18V to 75V 3.3V, 10A — 208-3550
TEN 40-2411WI 18V to 75V 5V, 8A — 208-3551
TEN 40-2412WI 18V to 75V 12V, 3.3A — 208-3552
TEN 40-2413WI 18V to 75V 15V, 2.5A — 208-3553
TEN 40-2422WI 18V to 75V 12V, 1.65A -12V, -1.65A 208-3554
TEN 40-2428WI 18V to 75V 15V, 1.35A -15V, -1.35A 208-3555
TEN 40-4810WI 18V to 75V 3.3V, 10A — 208-3556

PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>Dual Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+Vin (Vcc)</td>
<td>+Vin (Vcc)</td>
</tr>
<tr>
<td>2</td>
<td>-Vin (GND)</td>
<td>-Vin (GND)</td>
</tr>
<tr>
<td>3</td>
<td>Remote Off</td>
<td>Remote Off</td>
</tr>
<tr>
<td>4</td>
<td>-Sense</td>
<td>+Vout</td>
</tr>
<tr>
<td>5</td>
<td>+Sense</td>
<td>Common</td>
</tr>
<tr>
<td>6</td>
<td>+Vout</td>
<td>Common</td>
</tr>
<tr>
<td>7</td>
<td>-Vout</td>
<td>Trim</td>
</tr>
<tr>
<td>8</td>
<td>Trim</td>
<td>Trim</td>
</tr>
</tbody>
</table>

Price Each

3 Year Guarantee

Mtrrs. List No. Order Code 1+ 5+ 10+ 25+
TEN 40-2410WI 18V to 75V 3.3V, 10A — 208-3550
TEN 40-2411WI 18V to 75V 5V, 8A — 208-3551
TEN 40-2412WI 18V to 75V 12V, 3.3A — 208-3552
TEN 40-2413WI 18V to 75V 15V, 2.5A — 208-3553
TEN 40-2422WI 18V to 75V 12V, 1.65A -12V, -1.65A 208-3554
TEN 40-2428WI 18V to 75V 15V, 1.35A -15V, -1.35A 208-3555
TEN 40-4810WI 18V to 75V 3.3V, 10A — 208-3556

DC/DC Converters - Single O/P

With wide range 4:1 inputs these convertors are ideal for battery-powered and telecom equipment. Applications include small instruments, computer-based systems, data communications equipment, remote sensor systems, vehicle and portable electronics. For connection to digital systems, the outputs offer fast settling to current step loads and tolerance of higher capacitive loads. Excel-
lent ripple and noise specifications assure compatibility to circuits using CPU’s, ASIC’s, programmable logic and FPGA’ s. No minimum load is required. For systems requiring controlled start-up/shutdown, an external remote On/Off control may use a switch, transistor or digital logic.

- Ideal for high current applications
- Industry standard open frame package and proof
- Input range: 9-36 and 18-75Vdc
- 2250V Basic isolation (48V models)

### DC/DC Step Down Converter
**SDC Series**

- Adjustable output voltage
- Short circuit protection
- Connecting in parallel
- Stand-by function
- Remote On/Off
- High efficiency

#### Specifications:
- Input Voltage Range: 4.5VDC to 15VDC
- Operating Temperature: 0°C to 50°C
- Switching frequency: 25kHz
- Ripple & Noise: 50mVpp
- Efficiency: 75% typical

#### Dimensions:
- Dimensions: H=10.2, W=55.8, D=50.8mm

#### PIN CONNECTIONS:

<table>
<thead>
<tr>
<th>Pin Function</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 +Vin</td>
<td>JCK6048S3V3</td>
</tr>
<tr>
<td>2 -Vin</td>
<td>JCK6024S12</td>
</tr>
<tr>
<td>3 Remote On/Off</td>
<td>JCK6048S05</td>
</tr>
<tr>
<td>4 +Sense</td>
<td>JCK6048S15</td>
</tr>
<tr>
<td>5 +Sense</td>
<td>JCK6024S15</td>
</tr>
<tr>
<td>6 +Vout</td>
<td>JCK6024S12</td>
</tr>
<tr>
<td>7 +Vout</td>
<td>JCK6024S05</td>
</tr>
<tr>
<td>8 Trim</td>
<td>JCK6024S05</td>
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#### Price Each:

<table>
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<tr>
<th>Order Code</th>
<th>1+</th>
<th>5+</th>
<th>10+</th>
<th>25+</th>
</tr>
</thead>
<tbody>
<tr>
<td>JCK6048S3V3</td>
<td>209-9475</td>
<td></td>
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<td>JCK6024S12</td>
<td>209-9474</td>
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<td>JCK6048S05</td>
<td>209-9473</td>
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<tr>
<td>JCK6048S15</td>
<td>209-9472</td>
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</tr>
</tbody>
</table>

---

**50, 75 and 100 Watt Single Output DC/DC Converters**

- Continuous Short Circuit Protection
- Five sided metal case
- 1500 VDC Isolation
- Industry standard Half-Brick
- 3 Year Warranty

#### Specifications:
- Input Voltage Range: See tables
- Line Regulation: ±0.2% max.
- Load Regulation: ±0.5% max.
- Ripple & Noise: 50mVpp
- Isolation Voltage: 1600 VDC
- Operating Temperature: -40°C to +100°C
- Width 2:1 input range
- Very high efficiency up to 90%
- Under- and over voltage lockout
- Input filter according to EN 55022, class A and FCC, level A (with external capacitor)
- Output voltage adjustment: ±10% (by external resistor)
- Short circuit protection
- Remote on/off
- 3 Years warranty

#### PIN CONNECTIONS:

<table>
<thead>
<tr>
<th>Pin Function</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 +Vin (Vcc)</td>
<td>JCK6024S3V3</td>
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<tr>
<td>2 -Vin</td>
<td>JCK6024S12</td>
</tr>
<tr>
<td>3 Remote off</td>
<td>JCK600650</td>
</tr>
<tr>
<td>4 +Sense</td>
<td>JCK6024S15</td>
</tr>
<tr>
<td>5 +Sense</td>
<td>JCK60048S3V3</td>
</tr>
<tr>
<td>6 +Vout</td>
<td>JCK60048S05</td>
</tr>
<tr>
<td>7 +Vout</td>
<td>JCK60048S15</td>
</tr>
<tr>
<td>8 Trim</td>
<td>JCK60048S15</td>
</tr>
</tbody>
</table>

#### Price Each:

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<th>10+</th>
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<th>100+</th>
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<tr>
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<td>209-9468</td>
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<td>JCK6024S12</td>
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</tr>
<tr>
<td>JCK6024S15</td>
<td>209-9473</td>
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<tr>
<td>JCK60048S3V3</td>
<td>209-9475</td>
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<td>JCK60048S05</td>
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<td>JCK60048S15</td>
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</table>

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**60 Watt DC/DC Converters**

- Maximum power density 60 W in a 51x110x10 mm (2"x4.3",4") metal case
- Wide 2:1 input range
- Very high efficiency up to 90%
- Under- and over voltage lockout
- Input filter according to EN 55022, class A and FCC, level A (with external capacitor)
- Output voltage adjustment: ±10% (by external resistor)
- Short circuit protection
- Remote on/off
- 3 Years warranty

#### PIN CONNECTIONS:

<table>
<thead>
<tr>
<th>Pin Function</th>
<th>Order Code</th>
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</thead>
<tbody>
<tr>
<td>1 +Vin (Vcc)</td>
<td>ICM25S3-V5</td>
</tr>
<tr>
<td>2 -Vin</td>
<td>ICM25S12-V5</td>
</tr>
<tr>
<td>3 Remote off</td>
<td>ICM0650</td>
</tr>
<tr>
<td>4 +Sense</td>
<td>ICM25S15-V5</td>
</tr>
<tr>
<td>5 +Sense</td>
<td>ICM048S3-V5</td>
</tr>
<tr>
<td>6 +Vout</td>
<td>ICM048S05-V5</td>
</tr>
<tr>
<td>7 +Vout</td>
<td>ICM048S15-V5</td>
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<tr>
<td>8 Trim</td>
<td>ICM048S15-V5</td>
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#### Price Each:

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<td>ICM25S3-V5</td>
<td>209-9455</td>
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<td>ICM25S12-V5</td>
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<td>ICM0650</td>
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<td>ICM25S15-V5</td>
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</table>
PCB Mount - DC to DC Converters - continued

60 Watt DC/DC Converters - continued

Maximum Power Density, 2:1 Input - continued

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<thead>
<tr>
<th>U/V insulation:</th>
<th>1.5kV</th>
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<tbody>
<tr>
<td>Operating temperature range:</td>
<td>-40°C + 85°C; above 50°C power reduction 2.5%/K</td>
</tr>
<tr>
<td>Safety standards/licences:</td>
<td>UL/UL 60950-1, IEC/EN60950-1</td>
</tr>
<tr>
<td>Remote on/off:</td>
<td>Power consumption in the shut-down state: 3 mA</td>
</tr>
<tr>
<td>Reliability, calculated MTBF:</td>
<td>&gt;100,000h at +25°C</td>
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</table>

Mfrs. List No. | Voltage Input (V) | Current (max.) | Efficiency | Order Code |
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<tbody>
<tr>
<td>TEN-60-2410</td>
<td>18V to 36V</td>
<td>3.3</td>
<td>89</td>
<td>128-4534</td>
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<tr>
<td>TEN-60-2411</td>
<td>18V to 36V</td>
<td>5</td>
<td>89</td>
<td>128-4535</td>
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<tr>
<td>TEN-60-2412</td>
<td>18V to 36V</td>
<td>12</td>
<td>90</td>
<td>128-4536</td>
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<td>TEN-60-2413</td>
<td>18V to 36V</td>
<td>15</td>
<td>90</td>
<td>156-2781</td>
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<td>TEN-60-4810</td>
<td>36V to 75V</td>
<td>5</td>
<td>90</td>
<td>186-9110</td>
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<tr>
<td>TEN-60-4811</td>
<td>36V to 75V</td>
<td>12</td>
<td>90</td>
<td>186-9111</td>
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<tr>
<td>TEN-60-4812</td>
<td>36V to 75V</td>
<td>15</td>
<td>90</td>
<td>186-9112</td>
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</table>

Price Each

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
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<th>5+</th>
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<th>25+</th>
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<td>123-4254</td>
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<td>TEN-60-2413</td>
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<td>TEN-60-4810</td>
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HeatSink

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<tr>
<td>TEN-HS3</td>
<td>208-0690</td>
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</tbody>
</table>

### PCB Mount - DC to DC Converters - continued

#### TEP 75W Series, 75 Watt, 4:1 Input Range

- **Rugged, compact metal case**
- **Easy chassis mount**
- **Ultra wide 4:1 input voltage range**
- **Full load operation up to 60°C with convection cooling**
- **Soft start and reverse input voltage protection**
- **Short circuit protection**
- **Remote On/Off**
- **Adjustable output voltage**
- **3 years warranty**

#### PIN CONNECTIONS

<table>
<thead>
<tr>
<th>Pin</th>
<th>Single Output</th>
<th>5</th>
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<th>Vout</th>
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<tbody>
<tr>
<td>1</td>
<td>- Vin</td>
<td>6</td>
<td>-</td>
<td>Sense*</td>
</tr>
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<td>2</td>
<td>-</td>
<td>7</td>
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<td>Trim</td>
</tr>
<tr>
<td>3</td>
<td>Remote On/Off</td>
<td>8</td>
<td>+</td>
<td>+ Sense*</td>
</tr>
<tr>
<td>4</td>
<td>+ Vin</td>
<td>9</td>
<td></td>
<td>Vout</td>
</tr>
</tbody>
</table>

#### Specifications

- **Input voltage range:** 9-36V or 18-75V wide range inputs
- **Output voltage adjustment:** Up to 1500 VDC isolation using Basic in-derating (56.4x12.7x36.8)
- **Output regulation:** ±0.2% max. Ordering accuracy ±0.3% max.
- **Input voltage regulation:** ±10% (with external resistor)
- **Input current:** 1A
- **Efficiency:** ≥98%
- **Power dissipation:** ≈30W
- **Insulation:** 2250 VDC Input - Output (BASIC)
- **Life time:** 50,000 hours
- **Remote On/Off:** True
- **Input overvoltage protection:** Fully isolated, up to 2250Vdc (BASIC)
- **Output overvoltage protection:** Fully isolated, up to 2250Vdc (BASIC)
- **Thermal shutdown:** Fully I/O protected; Thermal shutdown
- **Unidad de seguridad:** Safety standards UL 60950-1, IEC/EN 60950-1

### DC/DC Converters - Single O/P

#### UQQ Series

- **Output voltage:** 5/12V, 18/36V, 5/12V
- **Output current:** 1A, 2A, 3A
- **Order Code:** 123-4256

#### Eighth-Brick DC/DC Converter

#### UWE Series

- **Input voltage:** 9-36V
- **Output voltage:** 5V
- **Current:** 15A
- **Efficiency:** 88%
- **Order Code:** 123-4257

---

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100 Watt DC/DC Converters

**TEP 100 Series**

- **Rugged, compact metal case**
- **Easy chassis mount**
- **Wide 2:1 input voltage range**
- **Full load operation up to 60°C with convection cooling**
- **Soft start & reverse input voltage protection**
- **Short circuit protection**
- **Remote On/Off**
- **Adjustable output voltage**
- **3 years warranty**

*Sense line to be connected to output either at the module or at the load.*

**Regulation**
- **Input variation:** 0.2% max.
- **Load variation:** 0.3% max.
- **Output voltage adjustment:** ±10% to ±20% (with ext. resistor)
- **Minimum load:** Not required
- **Conducted immunity:** EN 61000-4-6, 10 Vrms.
- **Ripple & Noise:** (20 MHz Bandwidth) 75 mVpk-pk (5 VDC models), 100 mVpk-pk (12 & 15 VDC models), 200 mVpk-pk (24 & 28 VDC models), 300 mVpk-pk (48 VDC models).

**List No. Voltage Range Voltage Current Efficiency Order Code**

| TEP 100-1211 | 9V to 18V | 5V | 20A | 91% | 208-0694 |
| TEP 100-1212 | 9V to 18V | 12V | 8.4A | 91% | 208-0695 |
| TEP 100-1213 | 9V to 18V | 15V | 6.7A | 91% | 208-0696 |
| TEP 100-1214 | 9V to 18V | 24V | 4.2A | 90% | 208-0697 |
| TEP 100-1215 | 9V to 18V | 28V | 3.6A | 90% | 208-0698 |
| TEP 100-1216 | 9V to 18V | 48V | 2.1A | 90% | 208-0699 |
| TEP 100-2411 | 18V to 36V | 5V | 20A | 93% | 186-9113 |
| TEP 100-2412 | 18V to 36V | 12V | 8.4A | 93% | 186-9114 |
| TEP 100-2413 | 18V to 36V | 15V | 6.7A | 93% | 186-9115 |
| TEP 100-2414 | 18V to 36V | 24V | 4.2A | 93% | 186-9116 |
| TEP 100-2415 | 18V to 36V | 28V | 3.6A | 92% | 186-9117 |
| TEP 100-2416 | 18V to 36V | 48V | 2.1A | 93% | 186-9118 |
| TEP 100-4811 | 36V to 75V | 5V | 20A | 93% | 186-9120 |
| TEP 100-4812 | 36V to 75V | 12V | 8.4A | 93% | 186-9121 |
| TEP 100-4813 | 36V to 75V | 15V | 6.7A | 93% | 186-9122 |
| TEP 100-4814 | 36V to 75V | 24V | 4.2A | 92% | 186-9123 |
| TEP 100-4815 | 36V to 75V | 28V | 3.6A | 92% | 186-9124 |
| TEP 100-4816 | 36V to 75V | 48V | 2.1A | 92% | 186-9125 |

**List No. Order Code**

| TEP 100-1211 | 208-0694 |
| TEP 100-1212 | 208-0695 |
| TEP 100-1213 | 208-0696 |
| TEP 100-1214 | 208-0697 |
| TEP 100-1215 | 208-0698 |
| TEP 100-1216 | 208-0699 |
| TEP 100-2411 | 186-9113 |
| TEP 100-2412 | 186-9114 |
| TEP 100-2413 | 186-9115 |
| TEP 100-2414 | 186-9116 |
| TEP 100-2415 | 186-9117 |
| TEP 100-2416 | 186-9118 |
| TEP 100-4811 | 186-9120 |
| TEP 100-4812 | 186-9121 |
| TEP 100-4813 | 186-9122 |
| TEP 100-4814 | 186-9123 |
| TEP 100-4815 | **186-9124** |
| TEP 100-4816 | **186-9125** |
| **Heat Sink** | **177-2238** |

**DIN / Chassis Mount Bracket**

These special mounting brackets have been developed to accept a wide range of standard DC/DC converters for applications requiring either DIN Rail or Chassis mounting where a bespoke circuit board is not available. All units come complete with input and output terminals and the provision to fit an LED across the output. See website for compatible DC/DC Converter.

**DC/DC LED Driver**

- **Constant Current Output**
- **PWM & Analog Dimming Control**
- **High Efficiency - up to 95%**
- **Open or Short Circuit LED Protection**
- **LED Drive Current up to 1000mA**
- **LED strings from 2V to 57V**
- **Remote On/Off**
- **3 Year Warranty**

**List No. Order Code**

| TEP 150-2412W | 177-2249 |
| TEP 150-2413W | 177-2250 |
| TEP 150-2415W | 177-2251 |
| TEP 150-2416W | 177-2252 |
| TEP 150-4812W | 177-2244 |
| TEP 150-4813W | 177-2253 |
| TEP 150-4815W | 177-2255 |
| TEP 150-4816W | 177-2256 |

**List No. Order Code**

| OF177A | 162-3269 |

**Price Each**

| 1 | 5 | 10 | 25 | 50 |

**Power, Test and Measurement**
## LED Drivers - continued

### DC/DC LED Driver - continued

#### Pin Connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>LDU05/07/14</th>
<th>Pin</th>
<th>LDU08/20</th>
<th>Pin</th>
<th>LDU24</th>
<th>Function</th>
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<td>- Vin</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>- Vin</td>
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<tr>
<td>5</td>
<td>- Vout</td>
<td>7</td>
<td>7 &amp; 8</td>
<td>- Vout</td>
<td>LED Cathode Connection</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>+ Vout</td>
<td>8</td>
<td>9 &amp; 10</td>
<td>+ Vout</td>
<td>LED Anode Connection</td>
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</tr>
<tr>
<td>7</td>
<td>V Adj</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Dimming Control</td>
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#### Input Voltage

<table>
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<th>Voltage</th>
<th>Efficiency</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>2V</td>
<td>Up to 97%</td>
<td></td>
</tr>
</tbody>
</table>

#### Ripple & Noise

950Hz to 3.8MHz (see datasheet) to MIL-HDBK-217F at 25°C

#### MTBF

950kHrs to 3.3MHrs (see datasheet) to MIL-HDBK-217F at 25°C

#### Operating Temperature

-20°C to +65°C

#### Efficiency

Up to 97%

### Power Supplies

#### AC/DC Single Output Power Supply

- Constant voltage design
- Protection: Short circuit, Over load, Over voltage
- Class II power unit: IP20 rating
- Pass LPS
- Fully isolated plastic case
- Suitable for LED lighting and moving sign applications
- 2 year warranty

#### AC/DC Single Output Power Supplies

- Constant current design
- Withstand 300VAC surge input for 5 seconds
- Protection: Short circuit, Over voltage
- IP67 rating
- Class II power unit
- Pass LPS
- 100% full load burn-in test
- Suitable for LED lighting and moving sign applications
- 2 years warranty

### LDU05/07/14: See datasheet

### LDU08/20: See datasheet

### LDU24: See datasheet

### LDU48: See datasheet

---

**Image:**

- [Image 1](#)
- [Image 2](#)
- [Image 3](#)
- [Image 4](#)
- [Image 5](#)
- [Image 6](#)
- [Image 7](#)
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- [Image 9](#)
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- [Image 14](#)
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- [Image 16](#)
- [Image 17](#)
- [Image 18](#)
- [Image 19](#)
- [Image 20](#)
- [Image 21](#)
- [Image 22](#)
- [Image 23](#)
- [Image 24](#)
- [Image 25](#)
- [Image 26](#)
- [Image 27](#)
- [Image 28](#)
- [Image 29](#)
- [Image 30](#)
- [Image 31](#)
- [Image 32](#)
- [Image 33](#)
- [Image 34](#)
- [Image 35](#)
- [Image 36](#)
- [Image 37](#)
- [Image 38](#)
- [Image 39](#)
- [Image 40](#)
- [Image 41](#)
- [Image 42](#)
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- [Image 48](#)
- [Image 49](#)
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- [Image 66](#)
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- [Image 68](#)
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- [Image 72](#)
- [Image 73](#)
- [Image 74](#)
- [Image 75](#)
- [Image 76](#)
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- [Image 78](#)
- [Image 79](#)
- [Image 80](#)
- [Image 81](#)
- [Image 82](#)
- [Image 83](#)
- [Image 84](#)
- [Image 85](#)
- [Image 86](#)
- [Image 87](#)
- [Image 88](#)
- [Image 89](#)
- [Image 90](#)
- [Image 91](#)
- [Image 92](#)
- [Image 93](#)
- [Image 94](#)
- [Image 95](#)
- [Image 96](#)
- [Image 97](#)
- [Image 98](#)
- [Image 99](#)
- [Image 100](#)
AC/DC Single Output Power Supplies

- Fully encapsulated
- Constant current mode power supply
- Protection: Short circuit, Over current, Over voltage, Over temperature
- Over load (LPH only)
- Class II power unit
- Pass LPS
- 100% full load burn-in test
- Suitable for LED lighting and moving sign application
- 2 years warranty

Dimensions (mm): H=22, W=30, D=140

Input Voltage: 190-264 VAC, 254-370 VDC
Line Regulation: ±1.0%
Load Regulation: ±3.0% (LPHC version), ±2.0% (LPH version)
Operating Temperature: -30°C to 70°C

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPH112-12</td>
<td>211-4222</td>
<td>19.2W</td>
</tr>
<tr>
<td>LPHC-18-350</td>
<td>211-4223</td>
<td>17.5W</td>
</tr>
<tr>
<td>LPHC-18-700</td>
<td>211-4233</td>
<td>17.0W</td>
</tr>
</tbody>
</table>

Price Each

AC/DC Single Output Power Supplies

- Protection: Short circuit, Over current, Over voltage, Over temperature
- Built-in constant limiting circuit with adjustable OCP level (PLC-30/60/100 versions only)
- Built-in active PFC function
- IP64 rating
- Class II power unit
- 100% full load burn-in test
- Suitable for LED lighting and moving sign application
- 2 year warranty

Dimensions (mm): H=29.6, W=50.8, D=162.5

Input Voltage: 90-264 VAC
Line Regulation: ±1.0% (PLC-100 versions), ±3.0% (PLC-30/60 versions), ±5.0% (PLN-30/60/100 versions), ±10% (PLN-20 versions)
Load Regulation: ±2.0% (PC-100 version), ±3.0% (PLC-100 version), ±5.0% (LPHC-18 version), ±10% (LPH version)
Operating Temperature: -30°C to 60°C (PLN-30/60 versions), -30°C to 50°C (PLN-20 version)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-20-24</td>
<td>211-4234</td>
<td>24V</td>
<td>800mA</td>
<td>19.2W</td>
<td>82.5%</td>
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<tr>
<td>PLC-30-24</td>
<td>211-4235</td>
<td>24V</td>
<td>1.25A</td>
<td>30W</td>
<td>84%</td>
</tr>
<tr>
<td>PLC-60-12</td>
<td>211-4236</td>
<td>12V</td>
<td>5A</td>
<td>60W</td>
<td>85%</td>
</tr>
<tr>
<td>PLC-100-24</td>
<td>211-4237</td>
<td>24V</td>
<td>4A</td>
<td>96W</td>
<td>88.5%</td>
</tr>
</tbody>
</table>

Price Each

AC/DC Single Output Power Supplies

- Protection: Short circuit, Over current, Over voltage
- Built-in active PFC function
- Class II power unit
- Output current level adjustable
- 100% full load burn-in test
- Suitable for built-in applications of LED lighting
- 2 year warranty

Dimensions (mm): H=29.6, W=50.8, D=101.6

Input Voltage: 90-264 VAC
Line Regulation: ±1.0%
Load Regulation: ±5.0% (PLN-30/60/100 versions), ±10% (PLN-20 versions)
Operating Temperature: -30°C to 70°C

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-60-48</td>
<td>211-4240</td>
<td>48V</td>
<td>1.3A</td>
<td>62.4W</td>
<td>89%</td>
</tr>
</tbody>
</table>

Price Each

AC/DC Single Output Power Supplies

- Fully encapsulated
- Adjustable output voltage and current
- Constant voltage design
- Withstand 3000VAC surge input for 5 seconds
- Protection: Short circuit, Over load, Over voltage
- IP67 rating
- Class II power unit
- Pass LPS
- 100% full load burn-in test
- Suitable for LED lighting and moving sign application
- 2 year warranty

Dimensions (mm): H=35, W=62, D=200.5

Input Voltage: 90-264 VAC
Line Regulation: ±0.5%
Load Regulation: ±5.0% (PLC-30/60 versions), ±10% (PLC-100 versions)
Operating Temperature: -30°C to 50°C

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC-30-100</td>
<td>211-4239</td>
<td>24V</td>
<td>4A</td>
<td>96W</td>
<td>88.5%</td>
</tr>
</tbody>
</table>

Price Each
AC/DC Single Output Power Supplies

- LPV-2: H=26, W=35, D=114mm
- LPV-3: H=30, W=40, D=144mm
- LPV-6: H=32, W=42.5, D=156.5mm
- LPV-100: H=37, W=52, D=190mm

Input Voltage: 90-364 VAC, 127-370 VDC
Line Regulation: ±0.5% (LPV-35 versions)
Load Regulation: ±0.5% (LPV-100 versions)

List No. Voltage Current Power Efficiency Code
LPV-100-12 12V 8.5A 100W 85% 211-4224
LPV-100-24 24V 2.0A 24W 85% 211-4225
LPV-20-12 12V 1.67A 20W 81% 211-4226
LPV-20-24 24V 840mA 20W 83% 211-4227
LPV-35-12 12V 3A 36W 84% 211-4228
LPV-35-24 24V 1.5A 36W 85% 211-4229
LPV-60-12 12V 5A 60W 83% 211-4331
LPV-60-24 24V 2.5A 60W 86% 211-4332

Price Each

AC/DC LED Driver

- AC Input LED Driver
- Constant Voltage & Current Operation
- High Power Factor
- High Efficiency
- Water Proof to IP67
- High Input Voltage Range
- 3 Year Warranty

High Efficiency

List No. Voltage Current in Constant Current Mode Power Efficiency Code
DLG50PS12 12V 4.2A 8.5V to 12V 50W 86% 196-1510
DLG50PS36 36V 1.4A 24V to 36V 50W 88% 196-1510
DLG50PS48 48V 1.05A 30V to 48V 50W 88% 196-1111
DLG75PS12 12V 4.8A 8.5V to 12V 59W 84% 196-1513
DLG75PS24 24V 3.15A 24V to 36V 70W 88% 196-1514
DLG75PS36 36V 2.1A 24V to 36V 75W 88% 196-1515
DLG75PS48 48V 1.4A 35V to 48V 67W 88% 196-1516
DLG100PS12 12V 11A 9V to 12V 75W 88% 196-1517
DLG100PS24 24V 6.3A 14V to 24V 100W 90% 196-1518
DLG100PS36 36V 2.8A 26V to 36V 100W 90% 196-1519
DLG100PS48 48V 2.1A 34V to 48V 100W 90% 196-1030
DLG150PS12 12V 11A 9V to 12V 100W 88% 196-1517
DLG150PS24 24V 6.3A 14V to 24V 150W 90% 196-1518
DLG150PS36 36V 4.2A 26V to 36V 150W 90% 196-1522
DLG150PS48 48V 3.2A 35V to 48V 150W 90% 196-1528

Price Each

12 Watt LED Drivers

- Universal Input (90 - 277VAC)
- Small Size
- Light Weight
- Double Insulated Input & Output Wires
- Wide AC Input Range 90 to 277 VAC (47 to 63 Hz)
- Constant Current and Constant Voltage Models
- IP66 rated
- Conservative Component Ratings for Long Life
- Excellent E-CapLife Values: 6.4Y ALC, 7.5Y ALV

List No. Voltage Current in Constant Current Mode Power Efficiency Code
ALC12-4205 5V 210mA 10W 84% 199-5985
ALC12-4206 5V 420mA 21W 89% 199-5988
ALC12-4207 5V 840mA 42W 89% 199-5987

Price Each
Low Profile AC/DC Power Modules for Chassis and DIN-Rail Mount

TMP and TMPM Models: 4 to 60 Watt

- Single-, dual-, and triple output models
- UL508 and UL60950-1 and IEC/EN60950-1 safety approvals
- Fully encapsulated plastic casing
- Easy connection via screw terminal block (15 – 60 Watt models)
- Also available for PCB mount (4 – 60 Watt models)
- Universal input 85 – 264 VAC or 120 – 370 VDC
- Output voltages from 3.3 VDC up 48 VDC
- Protection class II, double insulation
- Short circuit protection and overload protection
- EMC compliance for commercial, residential and industrial applications
- 3 year product warranty

www.tracopower.com
1W Encapsulated AC-DC Converter
Low Noise Linear, 240V or 110V ac Input

A range of low power PCB mounting encapsulated power supplies available with 110V or 240V ac input, 5V, 12V, ±12V or ±15V dc output. They are encapsulated in chemical resistant plastic epoxy resin. The supplies incorporate overcurrent and reverse voltage protection. Overloads will cause the supply to shut down to a trickle current, removal of the overload allows the supply to recover without loss from 0 to 100%. The input and output pins are on 2.54mm (0.1”) centres for easy PCB mounting.

- High reliability linear
- Isolation 3kV input to output
- Approved to EN60950

PCB Mount - AC to DC Converters

List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code

<table>
<thead>
<tr>
<th>List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code</th>
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</thead>
<tbody>
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</tr>
<tr>
<td>118-6389</td>
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<td>118-6390</td>
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<td>118-6391</td>
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<tr>
<td>118-6396</td>
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<tr>
<td>118-6397</td>
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</tbody>
</table>

5W, Encapsulated
Low Noise Linear, 240V or 110V ac Input

A range of PCB mounting encapsulated power supplies available with single or multi output voltage options. The 5V supply has crowbar overvoltage protection. The regulated dc output makes them ideal for powering microprocessors, T1, CMOS, Op Amps, etc. The supplies are poted in a glass filled nylon case giving optimum protection. It is possible to mechanically mount the supplies by using the two M3 bushes located within the base of each supply. Available in 240V ac and 110V ac mains input versions.

List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code

<table>
<thead>
<tr>
<th>List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code</th>
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<tbody>
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<td>118-6408</td>
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<td>118-6409</td>
</tr>
<tr>
<td>118-6410</td>
</tr>
<tr>
<td>118-6411</td>
</tr>
</tbody>
</table>

5 and 10 Watt Single Output PCB Mount

- Ultra Compact Size, from T1x1
- Single Output from 3.3 to 48 V
- Encapsulated PCB Mount
- Class II Construction
- ±0.3 W Load Input Power
- Peak Load Capability
- 3 Year Warranty

List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code

<table>
<thead>
<tr>
<th>List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code</th>
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<tbody>
<tr>
<td>118-6412</td>
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<td>118-6413</td>
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</tr>
<tr>
<td>118-6416</td>
</tr>
<tr>
<td>118-6417</td>
</tr>
</tbody>
</table>

5-20W Single Output Encapsulated Medical PSUs

- Universal AC input/full range
- Ultra Low Profile
- No load power consumption <0.5W
- Short Circuit, Overload, and Over Voltage protection
- Fixed switching frequency at 67kHz
- Medical Safety approvals
- Cooling by free air convection
- Industrial
- Non-patient contact medical

List No. Voltage (V) Current (A) Power (W) (max) (mV) Regulation Regulation Efficiency Order Code

<table>
<thead>
<tr>
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<tbody>
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<td>129-9054</td>
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<td>129-9055</td>
</tr>
</tbody>
</table>

Free Global Legislation Support

RoHS, REACH, WEEE, Erp, Batteries Directive - latest updates, free white papers and live online Q&A at element14.com/legislation
# 40-40 Watt AC/DC Power Modules

## Encapsulated
- Single, Dual and triple output models
- Universal input 85-264VAC
- EMI meets EN 55022, Class B
- Low ripple and noise
- Short circuit protection
- Fully encapsulated AC/DC power modules
- 3 versions available:
  - for PCB mounting with solder pins, ultra compact (TML Series)
  - for PCB mounting with solder pins (TML Series)
  - for chassis mounting with screw terminals, denoted by (c) (TML Series)

## Specifications
- Input Voltage: 85-264VAC 50/60Hz
- Line Regulation: ±0.3% Max.
- Load Regulation: ±1.0% Max. (dual/triple output models) ±2.5% Max.
- Ripple & Noise: <1% @ (3.3 and 5V models) <0.5%
- Conducted EMI: EN 55022, Class B
- Short Circuit Protection: Current limit at 120-180% input max. (failback)
- ISO 26000:1998
- Operating Temperature: -25°C to +60°C (above 50°C derating 3°C)
- Efficiency: 72-80% (depends on type)
- Safety Standards/Approvals: UL/cUL 1950 recognized, CE/EN60950, CB Report
- Safety Class II (30W models only)
- Worldwide safety approvals denoted by (c) (TML Series)

## List of Models

<table>
<thead>
<tr>
<th>TML Series - PCB Mount</th>
<th>Power</th>
<th>Voltage</th>
<th>Dimensions</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>TML 05105 5W</td>
<td>5V/1A</td>
<td>45.5x5x20.5</td>
<td>120-5039</td>
<td></td>
</tr>
<tr>
<td>TML 05112 5W</td>
<td>12V/416mA</td>
<td>45.5x5x20.5</td>
<td>120-5040</td>
<td></td>
</tr>
<tr>
<td>TML 05124 5W</td>
<td>24V/320mA</td>
<td>45.5x5x20.5</td>
<td>120-5041</td>
<td></td>
</tr>
<tr>
<td>TML 05212 5W</td>
<td>12V/200mA</td>
<td>45.5x5x20.5</td>
<td>119-6508</td>
<td></td>
</tr>
<tr>
<td>TML 05225 5W</td>
<td>15V/160mA</td>
<td>45.5x5x20.5</td>
<td>119-6508</td>
<td></td>
</tr>
<tr>
<td>TML 10105 10W</td>
<td>5V/2A</td>
<td>45.5x4x20.5</td>
<td>120-5042</td>
<td></td>
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## Size and Dimensions

- **Power and Test and Measurement**
- **farnell.com**
- **element14.com**
4-40 Watt AC/DC Power Modules - continued

**Encapsulated - continued**

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7-10W Encapsulated AC/DC PSUs

**KAM Series**

- High reliability compact size
- Isolation 3kVA input to output electric strength test
- Outputs fully protected against short circuit
- Class II equipment (double insulation)
- Single / Dual outputs
- Operating temperature -20°C to +70°C
- Universal wide input range
- Approvals IEC/EN60950

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<td>Np</td>
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- Input voltage: 85 to 265V AC
- Frequency: 47 to 63Hz
- Load regulation: ±2%
- Adjustable voltage range: 10%
- Dimensions HxWxD: 18.0 x 43.5 x 5.0 mm
- Weight: 190 g
- Weight: 22.6 x 50.8 x 19.2 mm

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**DIN Rail Mounting Kit**

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**7-30 Watt AC/DC Encapsulated Modules**

- Fully encapsulated low profile plastic case
- 2 versions available:
  - for PCB mount with solder pins
  - for chassis mount with screw terminal block
- Single-, Dual- and Triple output models
- Universal input 85-264 VAC, 47-440 Hz
- Safety class II
- 3 years warranty

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**EMI Immunity**

- EN 61000-6-2
- EN 55011, class B, EN 55022, class B and FCC, level B

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<td>15W</td>
<td>48V</td>
<td>310mA</td>
<td>3A</td>
<td>167-2149</td>
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<tr>
<td>TMP 10109</td>
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<td>5V</td>
<td>3A</td>
<td>-15V</td>
<td>±300mA</td>
<td>167-21613</td>
</tr>
<tr>
<td>TMP 10108</td>
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<td>48V</td>
<td>310mA</td>
<td>3A</td>
<td>167-2150</td>
<td></td>
</tr>
</tbody>
</table>

**Line Regulation**

- ±1.0 % typ.
- ±2.0 % max.

**Load Regulation**

- ±1.0 % typ.
- ±2.0 % max.

**Ripple & noise**

- < 1.0% of Vout ([mV pk-pk max] for 3.3 & 5.0 VDC outputs)
- < 1.0% of Vout ([mV pk-pk max] for other outputs)

**Safety Approvals**

- cUL/cUS, UL 60950-1, IEC/EN60950-1, CB-report

**Operating Temperature**

- -25°C to +70°C, above 50°C derating 3.5%/K

**Efficiency**

- 83% typ.

**Case**

- Plastic (UL94V-0)
## 5-25 Watt Single Output PCB Mount PSUs

**Miniature AC/DC Power Supply**

- Low cost
- PCB mount
- Open frame or encapsulated
- Ultra compact size
- 3.3V to 48V output
- Class II
- Peak Load Capability
- No Load Power Input
- 3 year warranty

### Technical Specifications

**Input Voltage:** 85-264 VAC (130-370 VDC)

**Input Frequency:** 47-63 Hz

**Line Regulation:** ±0.1% maximum

**Load Regulation:** ±1% maximum

**No Load Input Power:** <0.3W

**Transient Response:** 4% max. deviation, recovery to within 1% in 500 µs for a 25% load change

** Ripple & Noise:**
- 3.3-5 V versions: 50 µV pk-pk, 12-15 V versions: 120 mV pk-pk, 24-48 V versions: 200 mV pk-pk, 20MHz BW

**Efficiency:**
- Up to 84%

**Operating Temperature:**
- -20°C to +70°C
- derate from 100% load at +50°C to 50% load at +70°C

**MTBF:**
- 400 kHrs per MIL-HDBK-217F at 25°C, GB

**Safety Approvals:**
- 200 mV pk-pk, 20MHz BW

This next generation of miniature AC/DC power supplies offering 5, 10, 15 or 25 Watts of output power. They are available in open frame or encapsulated PCB mount styles with outputs of 3.3 - 48V.

### Accessories

- TMP-MK 1
- TMP-MK 2

### List of Available Accessories

<table>
<thead>
<tr>
<th>Accessory Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMP-10105</td>
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<tr>
<td>TMP-10112</td>
<td>Encapsulated</td>
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<tr>
<td>TMP-10115</td>
<td>PCB Mount</td>
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<td>TMP-11012</td>
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<td>TMP-11015</td>
<td>Encapsulated</td>
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<td>TMP-11018</td>
<td>PCB Mount</td>
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### Price Each

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</tr>
<tr>
<td>186-0712</td>
<td></td>
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</tbody>
</table>

---

## 15-30 Watt Dual and Triple Output PCB Mount PSUs

### Ultra Compact Design

- Ultra Compact Size
- Dual & Triple Outputs
- PCB Mount
- Encapsulated or Open Frame
- Class II Construction
- Peak Load Capability
- 3 Year Warranty

### Technical Specifications

- **Input Voltage:** 85-264 VAC
- **Line Regulation:** ±0.5% max for output 1, ±0.5% max for output 2 & output 3
- **Ripple & Noise:** 1% pk-pk on any output, 20 MHz bandwidth
- **Isolation Voltage:** 3000 VAC Input to Output
- **Efficiency:** Up to 84%
- **Operating Temperature:** -20°C to +70°C
- **No Load Power Input:** <0.3W
- **MTBF:** 400 kHrs per MIL-HDBK-217F at 25°C, GB
- **Safety Approvals:** EN60950-1, IEC60950-1, UL60950-1, CSA22.2 No. 234 per cUL
- **Emissions:** EN50022 level I conducted & radiated

### Price Each

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<th>Price Each</th>
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<table>
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<th>Series</th>
<th>Order Code</th>
<th>Price Each</th>
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### List of Available Models

<table>
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<tr>
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<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
<th>Efficiency</th>
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<tr>
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<td>15V</td>
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<td>1A</td>
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<td>KM1515-10</td>
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<td>15V</td>
<td>10A</td>
<td>1A</td>
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<td>15V</td>
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<td>15W</td>
<td>15V</td>
<td>20A</td>
<td>1A</td>
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</tr>
</tbody>
</table>

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## 15W Encapsulated Medical PSUs

### KM Series

- PCB Board Mountable
- Wide Range Input
- Minimises PCB Space
- High Efficiency
- Class II (No ground needed)
- Medical Safety Certifications (4kVAC Input - Output)

### Technical Specifications

- **Input Voltage:** 85-264 VAC
- **Line Regulation:** ±0.5% max for output 1, ±0.5% max for output 2 & output 3
- **Ripple & Noise:** 1% pk-pk on any output, 20 MHz bandwidth
- **Isolation Voltage:** 3000 VAC Input to Output
- **Efficiency:** Up to 84%
- **Operating Temperature:** -20°C to +70°C
- **No Load Power Input:** <0.3W
- **MTBF:** 400 kHrs per MIL-HDBK-217F at 25°C, GB
- **Safety Approvals:** EN60950-1, IEC60950-1, UL60950-1, CSA22.2 No. 234 per cUL
- **Emissions:** EN50022 level I conducted & radiated

### Price Each

<table>
<thead>
<tr>
<th>Mfrs. No.</th>
<th>Power Rating</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
<th>Efficiency</th>
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## List of Available Models

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<th>Output 2</th>
<th>Output 3</th>
<th>Efficiency</th>
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<tr>
<td>KM1515-5</td>
<td>15W</td>
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15W Encapsulated Medical PSUs - continued

KM Series - continued

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<th>Output 2</th>
<th>Output 3</th>
<th>Efficiency</th>
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<tbody>
<tr>
<td>KM15-24</td>
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<td>12V / 600mA</td>
<td>-12V / 600mA</td>
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<td>-5V / 5.5A</td>
<td>-5V / 5.5A</td>
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20-40 Watt Single Output Encapsulated PSU's

Ultra Compact Design - PCB & Chassis Mount Versions

<table>
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<tr>
<th>List No.</th>
<th>Power Rating</th>
<th>Voltage</th>
<th>Current</th>
<th>Peak Current</th>
<th>Order Code</th>
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<tbody>
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<td>ECE40US09-SD</td>
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<td>2.22A</td>
<td>2.89A</td>
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<tr>
<td>ECE40US09-S</td>
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<td>9V</td>
<td>2.22A</td>
<td>2.89A</td>
<td>186-0877</td>
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</tbody>
</table>

300-1000 Watt Full-Brick AC-DC PSU

PFE Series

- Low Profile, Small Size
- 100°C Basepalte Temperature
- High Power Density
- High Efficiency
- Power Factor Corrected (PFC)
- Operation up to 100% Basepalte
- Operates in Harsh Environments

40W Encapsulated Medical PSUs

KM Series

- PCB Board Mountable
- Wide Range Input
- Minimises PCB Space
- High Efficiency
- Class II (No ground needed)
- Medical Safety Certifications (4kV AC Input - Output)

Power Supply Modules - AC/DC

- Compact low profile design
- Simple screw terminal connections
- Over current and over temperature protection
- 207-585 selectable 120/240Vac input
- Encapsulated mains transformer
- CE marked to LVD
Power Supply Modules - AC/DC

List of Power Supplies

<table>
<thead>
<tr>
<th>Model</th>
<th>Order Code</th>
<th>Description</th>
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<tbody>
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<td>PSU010B</td>
<td>118-3261</td>
<td>Single Fixed Output</td>
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<td>PSU020B</td>
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<td>PSU030</td>
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<td>PSU100B</td>
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<td>PSU101B</td>
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<tr>
<td>PSU103</td>
<td>118-3267</td>
<td>Single Fixed Output</td>
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</table>

Power Supplies Specifications

- **Output Voltage**: ±5, ±15, ±25, ±100
- **Output Current**: 100 mA, 500 mA
- **Load Regulation**: ±1% per 500 mA
- **Line Regulation**: ±1% per 100 mA
- **Ripple**: ±50 mV
- **Input Voltage**: 120 VAC, 240 VAC
- **Operating Temperature**: -40°C to 70°C
- **Load Regulation**: ±2% max, 0-100% load
- **Efficiency**: >95%
- **Safety**: EN 55022, Level B conducted & radiated
- **EMI**: EN 61000-6-2, EN 55022, class B and EN 61000-3-3
- **Dimensions**: 84x40x84mm (GNC24-2.5), 84x40x168mm (GNC24-5)
- **Weight**: 4.9g (GNC24-2.5), 8.3g (GNC24-5)
- **3 years warranty**

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Log on, research, refine and design
Modular PSUs - Switch Mode - continued

5-25 Watt Single Output Chassis Mount PSUs

Miniature AC/DC Power Supply

- Low Cost
- Ultra Compact Size
- Open Frame
- <0.3W No Load Input Power
- Peak Load Capability
- Class II
- 3 Year Warranty

Emissions
- EN55022, Level B conducted and radiated
- GB, ±20°C, derate linearly from 100% at +50°C

Input Voltage
- 85-264 VAC (120-370 VDC)

Input Frequency
- 47-63 Hz

Line Regulation
- ±0.5% maximum

Load Regulation
- ±1% maximum

No Load Input Power
- <0.3W

Ripple & Noise
- 3.3-5 V versions: 50 mV pk-pk, 12-15 V versions: 120 mV pk-pk, 24-48 V versions: 200 mV pk-pk, 20MHz BW

Efficiency
- 72-82%

Operating Temperature
- -20°C to +70°C, derate linearly from 100% at +50°C to 50% at +70°C

MTBF
- >500,000 hours per MIL-HDBK-217F at 25°C. GB

Safety Approvals
- CSA22.2 No. 234 per cUL, EN60950-1, IEC60950-1
- EN50022, Level B conducted and radiated

Miniature AC/DC power supplies offering 5, 10, 15 or 25 Watts of output power. They are available in chassis mount styles with outputs of 3.3 - 48V.

TOF Series - 10-150 W

Open Frame Design

- Small and compact open frame power supplies
- Screw terminal or pin connection version
- Overload protection
- EMI/EMC complies with EN 55022 and EN 61000
- Compliance to EN 61000-3-2 (FHH)
- Worldwide safety approvals
- 3 years warranty

Input voltage range:
- 85-264 VAC

Line regulation:
- ±0.5% max.

Load regulation:
- ±0.5% max.

Ripple and noise:
- <1% Vout + 50 mV pk-pk (20MHz BW)

 Conducted EMI:
- EN5522, class B and FCC part 15, level B

Short circuit protection:
- Current limit at 105% of max.

Operating temperature:
- -10°C to +60°C, above 50°C derating 5%/K

Safety standards/approvals:
- IEC60950-1, UL60950, GB-report

Connection:
- Screw terminal block
- Motor pin connector - suffix M (mating connectors included)

TOF Series

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Power (W)</th>
<th>Voltage (V)</th>
<th>Nominal Peak</th>
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<td>12</td>
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Series Order Code Price Each
ECL0-T All Order Codes 5+ 10+ 25+
ECL10-T All Order Codes
ECL15-T All Order Codes
ECL25-T All Order Codes

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<thead>
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<td>TOF 10-05-S</td>
<td>10W 5V 2A 100x25x50 124-2654</td>
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<td>12W 12V 900mA 105x25x55 124-2658</td>
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<td>TOF 10-15-S</td>
<td>15W 17V 1A 120x25x60 124-2664</td>
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<td>TOF 15-05-S</td>
<td>15W 5V 3A 125x25x55 124-2654</td>
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<td>TOF 15-24-S</td>
<td>24V 15W 700mA 125x25x60 124-2661</td>
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<tr>
<td>TOF 30-05-S</td>
<td>30W 5V 6A 130x25x65 124-2662</td>
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| TOF 15-12-S    | 12W 12V 900mA 124-2659 |
| TOF 15-15-S    | 15W 15V 1A 125x25x60 124-2665 |
| TOF 15-24-S    | 24V 15W 700mA 125x25x60 124-2662 |
| TOF 30-15-S    | 15W 24V 1A 125x25x60 124-2666 |

15-25 Watt Single Output Encapsulated PSU's

- Ultra Compact Size
- Single Outputs from 3.3 to 48 V
- Encapsulated Chassis Mount
- Screw Terminals
- <0.3W No Load Input Power
- Class II Construction
- Peak Load Capability
- 3 Year Warranty

ECL15-5 (mm): H=26.4, W=84, D=34.5
ECL25-5 (mm): H=28.5, W=96, D=40
15-30 Watt Dual and Triple Output AC/DC PSUs

Ultra Compact Design

- Ultra Compact Size
- Dual & Triple Outputs
- Optional DIN Rail Mounting
- <0.3W No Load Input Power
- Chassis Mount
- Encapsulated or Open Frame
- Class II Construction
- Peak Load Capability
- 3 Year Warranty

ECL15 (mm): W=65, D=33.3, H=24.4 (-E); W=62, D=30.7, H=24.4 (-P)

MTBF
- Operating Temperature: -20°C to +70°C, derate linearly from 100% at +50°C to 50% at +70°C
- Ripple & Noise: 1% pk-pk on any output, 20 MHz bandwidth
- Isolation Voltage: 3000 VAC Input to Output
- Efficiency: Up to 84%

No Load Input Power
- ±0.3W

MTBF
- Operating Temperature: -20°C to +70°C, derate from 100% load at +50°C to 50% load at +70°C
- Ripple & Noise: 1% pk-pk on any output, 20 MHz bandwidth
- Isolation Voltage: 3000 VAC Input to Output
- Efficiency: Up to 84%

No Load Input Power
- ±0.3W

** Isolated Output

Price Each

<table>
<thead>
<tr>
<th>Series</th>
<th>Order Code</th>
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<th>5+</th>
<th>10+</th>
<th>25+</th>
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15/30 Watt Modular PSUs - Switch Mode

- Open frame
- Wide range universal input 85 to 265V
- Single output
- Compact design
- High efficiency
- Over-voltage and Over-current Protection

Price Each

<table>
<thead>
<tr>
<th>Series</th>
<th>Order Code</th>
<th>1+</th>
<th>5+</th>
<th>10+</th>
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NEW

- Ultra Compact Size
- Dual & Triple Outputs
- Optional DIN Rail Mounting
- <0.3W No Load Input Power
- Chassis Mount
- Encapsulated or Open Frame
- Class II Construction
- Peak Load Capability
- 3 Year Warranty

ECL15 (mm): W=48, D=34.5, H=26.4 (-E); W=38.7, D=23.1, H=23.1 (-T)

MTBF
- Operating Temperature: -20°C to +70°C, derate linearly from 100% at +50°C to 50% at +70°C
- Ripple & Noise: 1% pk-pk on any output, 20 MHz bandwidth
- Isolation Voltage: 3000 VAC Input to Output
- Efficiency: Up to 84%

No Load Input Power
- ±0.3W

** Isolated Output

Price Each

<table>
<thead>
<tr>
<th>Series</th>
<th>Order Code</th>
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15-30 Watt Dual and Triple Output PCB Mount PSUs

Ultra Compact Design

- Ultra Compact Size
- Dual & Triple Outputs
- <0.3W No Load Input Power
- PCB Mount
- Encapsulated or Open Frame
- Class II Construction
- Peak Load Capability
- 3 Year Warranty

ECL15 (mm): W=65, D=33.3, H=24.4 (-E); W=62, D=30.7, H=24.4 (-P)

MTBF
- Operating Temperature: -20°C to +70°C, derate linearly from 100% at +50°C to 50% at +70°C
- Ripple & Noise: 1% pk-pk on any output, 20 MHz bandwidth
- Isolation Voltage: 3000 VAC Input to Output
- Efficiency: Up to 84%

No Load Input Power
- ±0.3W

** Isolated Output

Price Each

<table>
<thead>
<tr>
<th>Series</th>
<th>Order Code</th>
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</table>

15/30 Watt Modular PSUs - Switch Mode

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- Wide range universal input 85 to 265V
- Single output
- Compact design
- High efficiency
- Over-voltage and Over-current Protection

Price Each

<table>
<thead>
<tr>
<th>Series</th>
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<td>ZWS30-12</td>
<td>118-46248</td>
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</tbody>
</table>
## Modular PSUs - Switch Mode - continued

### Single Output Industrial Power Supplies

**NLP Series**
- Single output 15-150W industrial power supplies
- Output voltages from 5V to 24Vdc
- High efficiency and power density
- Universal input 85-265Vac
- UL508 approval
- SEMI F47 compliant
- Typical applications include process control, automotive, packaging equipment, instrumentation and measurement
- Lifetime Warranty

### Power Supplies & Converters
- Power, Test and Measurement
- NLP Series
- 25 Watt Single, Dual & Triple Switch Mode PSUs

#### 25 - 60 Watt Single Output Industrial and Medical PSUs

**Ultra Compact Design**
- IF & Medical 3rd Edition Safety Approvals
- 2 x MOPP with Risk Management File
- Very Small 3" x 2" x 0.95" Package
- 0.3 W No Load Input Power
- 25, 45 & 60 W - Convection Cooled
- Class I & Class II Installations
- 3 Year Warranty

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<tr>
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</table>

#### 25 to 60 Watt Single & Triple Output

- Universal input
- High efficiency (70% typical)
- Wide choice of outputs
- Open PCB industry standard 3 x 5. in format
- Over voltage and over load protection
- 100% burn in
- CE marked in accordance with EN60950 (Low voltage directive)
- VDE, UL, CSA, NEMKO, BABT Approvals
- Optional cover kit available for additional safety
- Connectors are not provided

**ECS Series**
- Overvoltage protection and short circuit protection
- 25 W with free air convection cooling
- EN55022, EN55011 conducted emissions level B
- UL, VDE, CSA and CCC safety approvals

**Accessories**
- ECS60-60 Cover Kit
- ECS60US48 48V 1.25A 60W 186-0933
- ECS60US15 15V 4A 60W 186-0931
- ECS60US12 12V 5A 60W 186-0930
- ECS60US05 5V 8A 40W 209-9498
- ECS45US24 24V 1.9A 45W 182-1527
- ECS45US12 12V 3.75A 45W 182-1525
- ECS45US05 5V 6A 30W 182-1524
- ECS25US48 48V 520mA 25W 182-1522
- ECS25US24 24V 1.04A 25W 182-1521
- ECS25US15 15V 1.67A 25W 182-1518
- ECS25US12 12V 2.08A 25W 182-1517

### Power Supplies & Converters
- Power, Test and Measurement
- NLP Series
- 25 Watt Single, Dual & Triple Switch Mode PSUs

#### 25 Watt Single, Dual & Triple Switch Mode PSUs

**NLP Series**
- Overvoltage protection and short circuit protection
- 25 W with free air convection cooling
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<table>
<thead>
<tr>
<th>Mfrs.</th>
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<th>Current</th>
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**Farnell.com Element14.com**
25-1000 Watt Enclosed PSUs

TXL Series

- Encased power supplies with screw terminals
- Multi-output models with isolated outputs
- Output voltage adjustable ±10%
- Universal input 85-264 VAC, 50/60 Hz
- EMC compliance with EN 61000-6-3:61000-6-1
- Compliance to EN 61000-3-2 (PFC)
- Short circuit and overload protection
- Industrial grade components
- 3 Years warranty

Input Voltage: 85-264VAC, 47-63Hz
Line Regulation: ±0.5% Max.
Load Regulation: ±1% Max. (main output)
±2.5% max. (output 2/3)
Ripple & Noise: <5% p-p
Conducted EMI: EN 55011, Class B, EN 55022, Class B, EN 61000-3-2

TXL Series

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Output Power</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>TXL 015-1S</td>
<td>10W</td>
<td>3.3V, 1A</td>
<td>28 x 51 x 92 mm</td>
<td>186-9166</td>
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<tr>
<td>TXL 015-2S</td>
<td>15W</td>
<td>5V, 3A</td>
<td>28 x 51 x 92 mm</td>
<td>186-9167</td>
</tr>
<tr>
<td>TXL 015-15S</td>
<td>15W</td>
<td>15V, 1A</td>
<td>28 x 51 x 92 mm</td>
<td>186-9168</td>
</tr>
<tr>
<td>TXL 015-24S</td>
<td>15W</td>
<td>24V, 1.1A</td>
<td>28 x 51 x 92 mm</td>
<td>186-9170</td>
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<tr>
<td>TXL 025-3S</td>
<td>35W</td>
<td>3.3V, 9A</td>
<td>82 x 35 x 92 mm</td>
<td>208-0728</td>
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<tr>
<td>TXL 025-7S</td>
<td>35W</td>
<td>7V, 9A</td>
<td>82 x 35 x 92 mm</td>
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<td>35W</td>
<td>12V, 9A</td>
<td>82 x 35 x 92 mm</td>
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<td>TXL 035-4S</td>
<td>48W</td>
<td>48V, 800mA</td>
<td>82 x 35 x 92 mm</td>
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<td>5V, 10A</td>
<td>38 x 95 x 159 mm</td>
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<td>82 x 35 x 92 mm</td>
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<tr>
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<td>50W</td>
<td>5V, 10A</td>
<td>38 x 95 x 159 mm</td>
<td>208-0726</td>
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</table>

40 Watt Single Output PSUs

Power Supplies & Converters

40 Watt Single, Dual & Triple Output Switch Mode PSUs

NFS Series

- Industry standard package
- Overvoltage and short circuit protection
- 40 W with free air convection
- EN50522, EN50511 conducted noise level A
- UL, VDE and CSA safety approvals
**Modular PSUs - Switch Mode - continued**

### 40 Watt Single, Dual & Triple Output Switch Mode PSUs - continued

**NFS Series - continued**

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Order Code</th>
<th>Price Each</th>
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<td>151-64065</td>
<td>1+</td>
<td>5+</td>
</tr>
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<td>NFS40-7615J</td>
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<td>5+</td>
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<td>151-64096</td>
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<td>NFS40-7610J</td>
<td>151-64010</td>
<td>1+</td>
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### Accessories

<table>
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<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Price Each</th>
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<tbody>
<tr>
<td>NFS40 Cover Kit</td>
<td>151-64116</td>
<td>1+</td>
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</table>

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**40 Watt Single, Dual and Triple Output**

**Ultra Compact Design**

- IT & Medical 3rd Edition Safety Approvals
- 2 X MOPP with Risk Management File
- 3 x MOPP Compact Size - 3" x 2" x 1.5"
- ±<3.0 W No Load Input Power
- Peak Load Capability
- 3 Year Warranty

**ECP400U (mm): H=26, W=88.9, D=50.8**

**ECP400UT (mm): H=26, W=88.9, D=50.8**

**Input Voltage:** 85-264 Vac

**Efficiency:** Up to 92%

**Line Regulation:** ±0.5% max.

**Load Regulation:** ±1.0% max.

**Isolation:** Input to Output: 2 x MOPP

**Ripple & Noise:** 1% pk-pk, 20 MHz bandwidth

**Operating Temperature:** -10°C to +70°C, derate from 100% load at 50°C to 50% load at 70°C

---

**40-60 Watt Single Output**

- Single Outputs from 5 V to 24 V
- Universal Input
- Connection Cooled
- ±<0.5 W No Load Input Power
- ±2% x ±4% Foot Print
- Fits 1U Applications

**Dimensions:** H=24.1, W=101.6, D=50.8mm

---

**40-60 Watt Compact Single and Multi Output**

**Industrial and Medical Approvals**

- Industry Standard 2x4” Package
- IT & 3rd Edition Medical Approvals
- MOPP with Risk Management File
- Class I & Construction
- Level B Conducted Emissions
- 3 Year Warranty

**Dimensions:** H = 30.5, W = 50.8, L = 110.8mm

---

**40 Watt Switch Mode PSU**

**NLP Series**

- Overvoltage and short circuit protection
- 40 W with free air convection
- EN60522, EN55011 conducted emission level B
- EN61000-4-2, -3, -4, -5, -6 immunity compliant
- UL, VDE and CSA safety approvals

---

**40 Watt Switch Mode PSU - continued**

**NLP Series**

- Single Outputs from 5 V to 24 V
- Universal Input
- Connection Cooled
- ±<0.5 W No Load Input Power
- Fits 1U Applications

**Dimensions:** H=24.1, W=101.6, D=50.8mm
### 50 - 100 Watt Single Output Industrial Power Supplies

- **Chassis Mount Industrial Supplies**
- **<0.5W no load input power**
- **Convection Cooled**
- **Class B Conducted & Radiated Emissions**
- **Output Voltages from 5V to 48V**

**Input Voltage**: 85-264VAC (127-370VDC)  
**Input Frequency**: 47-63Hz  
**Efficiency**: Up to 88%  
**Load Regulation**: ±0.5% (1% for 5V & 12V versions)

#### 50 - 150 Watt Single Output PSUs

- **Universal Input (85 - 265VAC)**
- **Power Factor Corrected**
- **Convection Cooled**
- **5 year warranty**
- **Compact Design**

### 40 - 65 Watt AC/DC Medical PSUs

- **Industry standard footprint**
- **Wide Range AC Input**
- **Dual input fuses**

#### 40W - 65W AC/DC Medical PSUs

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS-65-5</td>
<td>5V</td>
<td>8A</td>
<td>40W</td>
<td>81%</td>
</tr>
<tr>
<td>CSS-65-12</td>
<td>12V</td>
<td>5A</td>
<td>60W</td>
<td>86%</td>
</tr>
<tr>
<td>CSS-65-15</td>
<td>15V</td>
<td>4A</td>
<td>60W</td>
<td>86%</td>
</tr>
<tr>
<td>CSS-65-24</td>
<td>24V</td>
<td>2.7A</td>
<td>65W</td>
<td>87%</td>
</tr>
<tr>
<td>CSS-65-48</td>
<td>48V</td>
<td>1.36A</td>
<td>65W</td>
<td>87%</td>
</tr>
</tbody>
</table>

### 47W Enclosed PSU - Switch Mode/Triple O/P

- **Universal input range**
- **Fully enclosed with on/off switch**
- **High efficiency (70% typical)**
- **Overvoltage protection**

#### 47W Enclosed PSU - Switch Mode/Triple O/P

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSS-65-5</td>
<td>5V</td>
<td>4.5V to 5.5V</td>
<td>10A</td>
<td>50W</td>
</tr>
<tr>
<td>ZWS-50BAF-4</td>
<td>24V</td>
<td>21.6V to 26.4V</td>
<td>4.3A</td>
<td>101.2W</td>
</tr>
<tr>
<td>ZWS-50BAF-5</td>
<td>24V</td>
<td>21.6V to 26.4V</td>
<td>10A</td>
<td>151.2W</td>
</tr>
</tbody>
</table>

### Dimensions:

- **CSS-50US**: H=36, W=110, D=78mm  
- **CSS-100US**: H=42, W=159, D=98.2mm  
- **ZWS100BAF**: W=62, H=33, D=155mm  
- **ZWS150BAF**: W=75, H=37, D=160mm
Modular PSUs - Switch Mode - continued

50 - 200 Watt Single Output PSUs

- High MTBF up to 700,000 hours
- Operating temperature up to 70 °C
- Very high efficiency up to 87%
- Compact
- Withstands 3000VAC surges (5s)

Applications
- Test & Measurement
- General Purpose
- Automated Service
- LED Lighting & Displays
- Factory Automation

Input Voltage: 88-264 VAC, except LS150 Switch selectable for 115 or 230VAC
Input Frequency: 47-63 Hz
Leakage Current < 1mA
Operating Temperature: -25°C to +70°C, Derate linearity to 50% load from -50°C to +70°C

EMI Approvals
- UL, recognized, IEC, EN, CE
- EMI: EN50024-2, FCC Conducted & Radiated

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Voltage (V)</th>
<th>Output Current (A)</th>
<th>Power (W)</th>
<th>Efficiency (%)</th>
<th>Ripple Noise (mV)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS50-3-3</td>
<td>3.3</td>
<td>10</td>
<td>33</td>
<td>75</td>
<td>80</td>
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<tr>
<td>LS50-3-3</td>
<td>3.3</td>
<td>10</td>
<td>33</td>
<td>75</td>
<td>80</td>
<td>35x99x97</td>
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<tr>
<td>LS50-3-5</td>
<td>5</td>
<td>10</td>
<td>50</td>
<td>80</td>
<td>80</td>
<td>35x99x97</td>
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<tr>
<td>LS50-12-12</td>
<td>12</td>
<td>4.2</td>
<td>58.4</td>
<td>84</td>
<td>120</td>
<td>35x99x97</td>
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<tr>
<td>LS50-15-15</td>
<td>15</td>
<td>3.4</td>
<td>51</td>
<td>85</td>
<td>120</td>
<td>35x99x97</td>
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<tr>
<td>LS50-24-24</td>
<td>24</td>
<td>2.2</td>
<td>52.8</td>
<td>86</td>
<td>120</td>
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</tr>
<tr>
<td>LS50-36-36</td>
<td>36</td>
<td>1.4</td>
<td>58</td>
<td>86</td>
<td>150</td>
<td>35x99x97</td>
</tr>
<tr>
<td>LS50-48-48</td>
<td>48</td>
<td>1.1</td>
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<tr>
<td>LS75-3.3</td>
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<td>49.5</td>
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<tr>
<td>LS75-12-12</td>
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<td>6.6</td>
<td>72</td>
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<td>LS75-15-15</td>
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<td>LS75-24-24</td>
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<tr>
<td>LS75-36-36</td>
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<td>2.1</td>
<td>75.6</td>
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<tr>
<td>LS100-5-5</td>
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<td>16</td>
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<tr>
<td>LS100-12-12</td>
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<td>8.5</td>
<td>102</td>
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<tr>
<td>LS100-15-15</td>
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<td>7</td>
<td>105</td>
<td>84</td>
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<tr>
<td>LS100-24-24</td>
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<td>35x99x97</td>
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<tr>
<td>LS100-36-36</td>
<td>36</td>
<td>3</td>
<td>108</td>
<td>86</td>
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<td>35x99x97</td>
</tr>
<tr>
<td>LS150-12-12</td>
<td>12</td>
<td>6.3</td>
<td>120</td>
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<td>35x99x97</td>
</tr>
<tr>
<td>LS150-15-15</td>
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</tr>
<tr>
<td>LS150-24-24</td>
<td>24</td>
<td>4.5</td>
<td>120</td>
<td>86</td>
<td>120</td>
<td>35x99x97</td>
</tr>
<tr>
<td>LS150-36-36</td>
<td>36</td>
<td>3.3</td>
<td>120</td>
<td>86</td>
<td>150</td>
<td>35x99x97</td>
</tr>
</tbody>
</table>

No Cover or Fan (U Channel)

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS200-12/1</td>
<td>12</td>
<td>199-5936</td>
</tr>
<tr>
<td>LS200-24/L</td>
<td>24</td>
<td>199-5937</td>
</tr>
</tbody>
</table>

JWS AC/DC PSUs - Switch Mode 50-150W

- 5 year warranty
- Highly cost competitive
- OVP and OCP fitted as standard
- Meets EN60950, UL1950 recognised, CSA690, EN61010-1
- IEC fitted as standard

<table>
<thead>
<tr>
<th>Output (V)</th>
<th>Output Current (A)</th>
<th>Power (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-150W</td>
<td>(-10 to +50°C)</td>
<td>(-60°C)</td>
</tr>
</tbody>
</table>

Input Voltage: 85-265V ac or 120-330V dc
Input Frequency: 47-63Hz
Ripple and noise: 130mV on 5V outputs
Line Regulation: 20mV on 5V outputs
Temperature co-efficient: Less than 0.02%/°C
Over current protection: Constant current limit with automatic recovery
Output: Over voltage protection Circuit will shut down output. Manual reset
Efficiency: 65-80% typical voltage dependent
Leakage current: 0.75mA max, 0.2mA (typ) at 1000V ac, 0.4mA (typ) at 230V ac
Remote sensing possible on JWS100 and JWS150
Series operation possible on all models
Operating temperature: -10°C to +50°C = 100%
Operating humidity: 90% RH (non-condensing)

Safety Approvals
- UL1950, CSA690, EN60950, VDE0610/10, CE marked for LVD
- Meets EN50024-2, FCC Class B, VCCI Class-B for conducted and radiated emission
- 6 years including parts and labour

Dimensions: L=40mm, W=7mm for Terminal

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>JWS50-10/12</td>
<td>12</td>
<td>118-4591</td>
</tr>
<tr>
<td>JWS50-24</td>
<td>24</td>
<td>118-4594</td>
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<tr>
<td>JWS75-15/15</td>
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<td>118-4597</td>
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<td>JWS75-24</td>
<td>24</td>
<td>118-4599</td>
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<tr>
<td>JWS100-10/12</td>
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<td>118-4602</td>
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<td>JWS100-24</td>
<td>24</td>
<td>118-4603</td>
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<td>JWS100-5/5</td>
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<td>118-4604</td>
</tr>
<tr>
<td>JWS150-15/15</td>
<td>15</td>
<td>118-4606</td>
</tr>
<tr>
<td>JWS150-24</td>
<td>24</td>
<td>118-4607</td>
</tr>
</tbody>
</table>

Single Output General Purpose Power Supplies

- Active power factor correction on selected models
- Universal input 85 - 265V ac or 120-370V dc (47-66Hz)
- Input transient protected IEC 61000-4
- Overcurrent protection more than 105%, constant current style
60 Watt Single Output PSUs

60 Watt Single and Multi Output

**Low Profile**

A series of general purpose 60 Watt power supplies. All models are adjustable and feature many output voltages from 3.0 to 48 V. Quad output models are also available in this industry standard footprint. Accessories include a metal case, connector kits and loom kits.

- Universal AC input
- Low 1.2” profile
- Fits 1U applications
- Quad output versions
- Industry standard footprint
- 3 year warranty

**Specifications**

- Dimensions: H=25.6, W=101.6, D=50.0mm
- Medical and ITE Safety Approvals
- Universal input
- 2’ x 4’ footprint
- Remote sense
- Overload and short circuit protection
- Adjustable output voltage
- High MTBF
- Input Voltage: 90-264 VAC / 127-300 VDC
- Input Frequency: 47-63 Hz
- Output: 60 W
- Line Regulation: ±1%
- Load Regulation: ±1% typical
- Ripple & Noise: ±1% pk- pk max.
- Operating Temperature: 0°C to +70°C, derate from 40°C to 50% at 70°C
- Safety Approvals: EN60950-1, UL60950-1, CSA60950-1 and cUL

**Order Code**

- 1+ 5+ 10+ 25+

**Price Each**

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS60US09</td>
<td>90V/10A</td>
<td>120mV</td>
<td>110-9914</td>
</tr>
<tr>
<td>SDS60US12</td>
<td>120V/10A</td>
<td>150mV</td>
<td>110-9922</td>
</tr>
<tr>
<td>SDS60US15</td>
<td>150V/10A</td>
<td>200mV</td>
<td>110-9925</td>
</tr>
</tbody>
</table>

**Price Each**

- 1+ 5+ 10+ 25+

**Accessories**

- Connector Kit
- Input power < 74 watts
- UL Class I approved
- Class II approved (with Class A EMI)
- Dual AC fuses
- Efficiency: 87%
- Adjustment range ±20% minimum

**Dimensions**

- H=25.6, W=101.6, D=50.0mm

**Order Code**

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS60US09</td>
<td>110-9914</td>
</tr>
<tr>
<td>SDS60US12</td>
<td>110-9922</td>
</tr>
<tr>
<td>SDS60US15</td>
<td>110-9925</td>
</tr>
</tbody>
</table>

---

**Power, Test and Measurement**

**Agency approvals:**

- CE mark, EN62301-1, UL60950-1, CSA60950-1
- Conducted and radiated emission: EN55022 Class A, VCCI-B
- Enclosed unit
- 2 Year manufacturers warranty

**L = Low Profile**

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Load</th>
<th>Ripple</th>
<th>Eff</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS50US12</td>
<td>3V/25A</td>
<td>50mA</td>
<td>100mV</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>SDS50US15</td>
<td>5V/25A</td>
<td>100mA</td>
<td>150mV</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>SDS50US24</td>
<td>9V/25A</td>
<td>200mA</td>
<td>250mV</td>
<td>87%</td>
<td></td>
</tr>
<tr>
<td>SDS50US30</td>
<td>12V/25A</td>
<td>300mA</td>
<td>350mV</td>
<td>92%</td>
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<tr>
<td>SDS50US40</td>
<td>15V/25A</td>
<td>400mA</td>
<td>450mV</td>
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</tr>
<tr>
<td>SDS50US60</td>
<td>24V/25A</td>
<td>600mA</td>
<td>650mV</td>
<td>99%</td>
<td></td>
</tr>
</tbody>
</table>

---

**Price Each**

- 1+ 5+ 10+ 25+
60 Watt Single, Dual and Triple Output PSUs

**IT & Medical Approvals**
- IT & Medical 3rd Edition Safety Approvals
- 2 x MOPP with Risk Management File
- Low Profile Design
- Compact Size: 4" x 2"
- <0.5 W No Load Input Power
- Peak Load Capability
- 3 Year Warranty

Dimensions (mm): H=30.4, W=101.6, D=50.8

| Input Voltage | 85 - 264VAC |
| Input Frequency | 47 - 63Hz |
| Isolation | Input to output: 2 x MOPP |
| Input to ground: 1 x MOPP |
| No Load Input Power | <0.5W |
| Total Regulation | Output 1: 1% from 0% load to 100% load |
| Output 2: 2% from 20% load to 100% load |
| Output 3: 3% from 10% load to 100% load |
| Ripple & Noise | 1% peak - peak (2% for USG version), 50 MHz bandwidth |
| Efficiency | 88% typical at 230VAC and full load |
| Operating Temperature | -20°C to 70°C, derate from 100% load at 50°C to 50% load at 70°C |
| MTBF | >400,000 hrs at MIL-HDBK-217F at 27°C, 50% |
| Safety Approvals | EN60950-1, UL/CSA60950-1, EEC60950-1, EN60601-1, ANSI/UL60601-1, CSA22.2 No.60601-1 including Risk Management, EN60601-1 |
| Emissions | EN55011/22, level B conducted & level A radiated |

### LPS50 Series
- 60W Single Output
- 5V, 6A (8A) 2 12V, 3A
- 24V, 2.5A 18-6200
- 48V, 1.25A 18-6201

#### LPS50 Series
- Universal input
- 2.5" x 4" footprint
- Remote sense
- Overload and short circuit protection
- Adjustable output voltage
- High MTBF
- Less than 300 mW no load power consumption
- 0°C to +80°C operation
- Input power < 74 watts
- Class I approved
- Class II approved (with Class A EMI)
- Dual AC fuses

#### 60 Watt Single Output
- LPX50

#### 60 Watt Open Frame AC/DC PSUs
- 4" x 2" footprint
- Supplies 60 W with convection cooling
- Single, dual and triple output models
- Highest efficiency up to 88%
- Universal input 90-264 VAC
- Operating temperature range -10°C to +70°C
- Compliance with EN 61000-3-2 (PFC)

**Line Variation**
0.5% max

**Load Variation**
2 to 5% max. (depends on the model)

**Ripple & Noise**
< 100 mVp-pk (3.3 & 5 VDC models); 1% Vout (other models)

**EMC Emission**
EN55022, class A & D

**EMI Immunity**
EN 61000-6-1

**Operating Temperature**
-10°C to +70°C, above 50°C derating 5% per K

**Overvoltage Protection**
110 - 135% Vout nominal (only output 1)

**Overload Protection**
110% load max, hold back, automatic recovery

**Safety Approvals**
IEC/EN 60601-1, UL/UL60601-1, GB-report

---

**60 Watt Single, Dual and Triple Output PSUs**

- [Farnell P 3170](https://www.farnell.com)
- [Date: 07-09-12](https://www.element14.com)
- [element14.com](https://www.element14.com)
- [RoHS](https://www.farnell.com)
- [Compliant](https://www.element14.com)
- [Non-compliant](https://www.element14.com)
65 Watt Single Output PSUs

**Green Energy Design**
- IT & 3rd Edition Medical Safety Approvals
- 2 x MOPP with Risk Management File
- <0.5 W No Load Input Power
- 65 W - Convection Cooled
- Industry Standard 2 x 4" Package
- Class I & Class II Construction
- 3 Year Warranty

**Dimensions:** H=26.7, W=101.6, D=50.8mm

- Input Voltage: 85-265V AC (120-370V DC)
- Input Frequency: 47-63Hz
- Line Regulation: ±0.5%
- Ripple & Noise: 1% pk-pk, 20MHz BW
- Isolation: Input to output: 2 x MOPP
- No Load Input Power: <0.5W
- Load Regulation: ±1%
- Operating Temperature: -20°C to +70°C derate from 100% load at 50°C to 50% load at 70°C
- Cooling: Convection
- Efficiency: Up to 89%
- Safety Approvals: EN60950-1, UL60950-1, EN60601-1, Including Risk Management File

**List No. | Power | Voltage | Current | Order Code**
--- | --- | --- | --- | ---
EC65US12 | 65W | 12V | 5.4A | 182-1421
EC65US15 | 65W | 15V | 4.3A | 182-1422
EC65US18 | 65W | 18V | 3.4A | 209-8409
EC65US24 | 65W | 24V | 2.7A | 182-1423
EC65US28 | 65W | 28V | 2.3A | 182-1424
EC65US48 | 65W | 48V | 1.4A | 182-1425

**Price Each**

---

65 W - Convection Cooled

- Medical

**Safety Approvals:** IEC60950-1, CSA 22.2 No. 60950-1, UL60950-1, EN60950-1, IEC60601-1, Emissions: EN55022, Level B conducted. EN55022, Level A radiated.

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75 and 100 Watt DC Standby System

- Medical

**Safety Approvals:** EN60950-1, UL60950-1

---

80 - 150 Watt Single Output PSUs

**Low Cost**
- Single Outputs from 5 V to 48 V
- <0.5 W No Load Input Power
- Fits 1U Applications
- 2x4” & 3x5” footprints
- Convection & forced-cooled ratings
- Built-in fan supply (150W version)
**Modular PSUs - Switch Mode - continued**

### 80 - 150 Watt Single Output PSUs - continued

**Low Cost - continued**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VT140US05</td>
<td>5V</td>
<td>8A</td>
<td>12A</td>
<td>80%</td>
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<tr>
<td>VT180US15</td>
<td>12V</td>
<td>5A</td>
<td>6.7A</td>
<td>87%</td>
</tr>
<tr>
<td>VT180US15</td>
<td>15V</td>
<td>4A</td>
<td>5.33A</td>
<td>87%</td>
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<tr>
<td>VT180US24</td>
<td>24V</td>
<td>2.5A</td>
<td>3.33A</td>
<td>88%</td>
</tr>
<tr>
<td>VT150PS05</td>
<td>5V</td>
<td>16A</td>
<td>24A</td>
<td>83%</td>
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<td>VT150PS12</td>
<td>12V</td>
<td>8.3A</td>
<td>12.5A</td>
<td>88%</td>
</tr>
<tr>
<td>VT150PS15</td>
<td>15V</td>
<td>6.66A</td>
<td>10A</td>
<td>87%</td>
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<tr>
<td>VT150PS24</td>
<td>24V</td>
<td>4.2A</td>
<td>6.25A</td>
<td>92%</td>
</tr>
<tr>
<td>VT150PS48</td>
<td>48V</td>
<td>2.1A</td>
<td>3.13A</td>
<td>92%</td>
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**List No. | Voltage (convection) (15 CFM airflow) | Efficiency | Order Code**
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<tr>
<td>HWS100-12/EA</td>
<td>12V to 14.4V</td>
<td>9.5%</td>
<td>102-6039</td>
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<tr>
<td>HWS100-24/EA</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6040</td>
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<tr>
<td>HWS100-24/HD</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6041</td>
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<td>HWS100-24/ME</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6042</td>
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<tr>
<td>HWS100-24/NE</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6043</td>
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<tr>
<td>HWS100-24/SE</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6044</td>
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<tr>
<td>HWS100-24/WE</td>
<td>24V to 28.8V</td>
<td>9.5%</td>
<td>102-6045</td>
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</table>

**100 Watt Single Output Ultra Compact Design**

- IT & Medical 3rd Edition Safety Approvals
- 2 x MOPP with Risk Management File
- <0.5 W No Load Input Power
- 80W - Convection-cooled
- 100W - Forced Cooled
- Class I & Class II Construction
- Industry Standard 2" x 4" Package
- 3 Year Warranty

**100 Watt Ultra Compact Single, Triple & Quad Output PSUs**

**IT and Medical Approvals**

- Compact Size
- IT & Medical 3rd Edition Approvals
- Convection & Forced Cooled Rating
- MOPP with Risk Management File
- Class I & Construction
- 3 Year Warranty

**Dimensions**: H=31.8, W=101.6, D=50.8

**Input Voltage**: 90-264 Vac
**Efficiency**: Up to 90%
**No Load Input Power**: <0.5W
**Line Regulation**: <0.5% max.
**Ripple & Noise**: 1% pk-pk, 20 MHz bandwidth
**Load Regulation**: ±1%

**Operating Temperature**: -20°C to +70°C derated linearly from -50°C to 75°C at 50°C load at +70°C
**Input Frequency**: 45 to 63Hz
**Input Voltage**: 85 to 265V AC
**Safety class II**
**Power Factor**: > 0.98
**Efficiency**: 80-85%
**High Efficiency**: 80-85%
**Conformally coated PCB’s**:

**List No. | Voltage Range | Current | Power | Efficiency | Order Code**
<table>
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<tr>
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<tr>
<td>ECM100UT31</td>
<td>5V, 10A, 12V</td>
<td>3A</td>
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<td>90%</td>
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<td>ECM100UT32</td>
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<td>120W</td>
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<td>ECM100UT41</td>
<td>5V, 3.3V, 5A</td>
<td>12V</td>
<td>80W</td>
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<td>ECM100UT42</td>
<td>5V, 24V, 2A</td>
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<td>50W</td>
<td>90%</td>
<td>128-9217</td>
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<tr>
<td>ECM100UT43</td>
<td>5V, 24V, 2A</td>
<td>12V</td>
<td>50W</td>
<td>90%</td>
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<td>ECM100UT44</td>
<td>5V, 24V, 2A</td>
<td>12V</td>
<td>50W</td>
<td>90%</td>
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<tr>
<td>ECM100UT45</td>
<td>5V, 10A, 15V</td>
<td>3A</td>
<td>120W</td>
<td>90%</td>
<td>208-4315</td>
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</tbody>
</table>

**3 Year product warranty**

**Further Specifications**

- **Regulation**: ±1% max.
- **Load variation**: ±1% V1 & V2, 1% Single Output, 5% V3 & V4 Multi Output
- **Ripple & Noise**: 100μV pk-pk typ. (20 MHz Bandwidth)
- **Overload protection by**: Internal thermal shutdown
- **EMI suppression**: EN 55022, Class B
- **Safety standards/approvals**: IEC / EN 60950-1, UL 60950-1, CSA-C22.2 Nr. 60950-1-03 (in prep.)
- **Overload protection at**: 120% load, Max. 50°C derating
- **Efficiency**: 90% typ.
125 Watt Single Output Power Supply
Ultra Compact Design
- <0.5 W No Load Input Power
- Industry Standard 2x4" Package
- 125 W Forced-cooled Rating
- Low Profile 1.25"
- 12 V Fan Supply
- 3 Year Warranty

Input Voltage: 85-264 Vac (120-370 Vdc)
Efficiency: 88% typical
Line Regulation: ±0.5% max.
Load Regulation: ±1%
Ripple & Noise: 1% pk-pk V1, 20 MHz bandwidth

Dimensions (mm): H=31.8, W=101.6, D=50.8

130 Watt Triple Output PSUs

- Medical and ITE safeties
- Active power factor correction
- 2" x 4" footprint
- Remote sense
- Power fail

Input Voltage: 90-264 VAC. 127-300 VDC
Efficiency: 87%
Adjustment range: ±10% minimum on the main outputs
Remote sense

Dimensions: H=33, W=101.6, D=50.8 mm

150 Watt Single Output PSUs

- Medical and ITE safeties
- Adjustable main output
- Overvoltage protection
- Overload protection
- Thermal overload protection

Input Voltage: 90-264 VAC. 120-300 VDC
Efficiency: 88% typical at full load
Adjustment range: ±10% minimum on the main outputs

ZWS 150W Modular PSUs - Single Output

- Open frame
- Power factor corrected
- Peak power capability
- Input transient protected
- 2 Year warranty
- Can drive high current start up devices
- Wide range universal input 85 to 265VAC

110 Watt Single & Quad Output Switch Mode PSUs

- Overvoltage and short circuit protection
- 110 W with 20 CFM
- Adjustable outputs
- EN60502, EN60511 conducted emissions level B
- UL, VDE and CSA safety approvals
- CE mark

Price Each

List No. Voltage Power Output Current
LPS101-M 5V 8.3A 12.5A 188-6183 188-6183 151-6412
LPS104-M 15V 6.7A 10A 188-6184 188-6184 151-6413
LPS105-M 24V 4.2A 6.3A 188-6185 188-6185 151-6414
LPS109-M 48V 2.1A 3.1A 188-6187 188-6187 151-6415

Price Each

List No. Voltage Power Output Current
LP101-M 5V 8.3A 12.5A 188-6209 188-6209 151-6416
LP102-M 5V 18A 12V / 9A 12V / 1.5A 188-6210 188-6210 151-6417
LP103-M 5V 18A 15V / 2.3A 15V / 1.5A 188-6211 188-6211 151-6418
LP104-M 5V 18A 24V / 3.3A 12V / 1.5A 188-6212 188-6212 151-6419

Price Each

List No. Voltage Power Output Current
CLC125US48 125W 48V 2.6A 186-0853 186-0853 151-6420

Price Each

List No. Voltage Power Output Current
ZWS150AF-24 24 6.3 150 135-1694
ZWS150AF-12 12 6.3 150 135-1693
120-360 Watt Single Output PSUs

TXH Series

- Compact U-bracket and enclosed power supplies
- Screw terminal block
- Very high efficiency up to 93%
- No internal fan for 120 W & 240 W models
- Universal input 80-264 VAC, 47-63 Hz
- Fixed output voltage
- EMI/EMC compliance with EN 61000-6-3 / IEC 61000-6-1
- 3 Years warranty

Regulation
- Line Regulation: 1.0 % max.
- Load Regulation: 1.0 % max.
- Ripple & Noise: < 0.1% of Vout norm.
- EMU suppression: EN 61000-6-1, class B, class C and FCC, part 15.
- EMI immunity: EN 61000-6-1
- Output current limitation: >110% of Iout max.
- Output voltage limitation: >110% of Vout norm.
- Safety standards/approvals: cULus, ES60950-1, IEC/EN60950-1, CB-report
- Operating temperature: -10°C to +70°C, above 50°C derating 2.5 %/K
- Efficiency: 90% typ.

Case
- 120-240 W models: U-bracket (optional with cover), 360 W models: metal enclosure

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power (W)</th>
<th>Output Voltage (V)</th>
<th>Current (A)</th>
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<tr>
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<td>TXH 120-124</td>
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<tr>
<td>TXH 120-148</td>
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<td>48</td>
<td>2.5</td>
<td>138.8x68.2</td>
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<td>177.8x56.106</td>
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<td>TXH 240-148</td>
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<td>10</td>
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<td>5</td>
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<td>TXH 480-124</td>
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<td>20</td>
<td>177.8x56.106</td>
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<td>TXH 480-124</td>
<td>480</td>
<td>48</td>
<td>13.33</td>
<td>177.8x56.106</td>
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Cover Kit

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<tr>
<td>TXH 120-CDV</td>
<td>TXH 120 Models</td>
<td>TXH 120-CDV</td>
</tr>
<tr>
<td>TXH 240-CDV</td>
<td>TXH 240 Models</td>
<td>TXH 240-CDV</td>
</tr>
</tbody>
</table>

Contents: Cover and Screws.

3174 RoHS Compliant
140 Watt Single Output PSUs
Industrial and Medical Approvals

- IT & 3rd edition medical approvals
- 2 x MOPP with risk management file
- 120/148 W - Convection/Focused-cooled
- Additional 12V Fan Output
- Remote Sense as Standard
- Class I & II construction
- 3 year warranty

Dimensions: H = 33, W = 127, D = 76.2mm

Input Voltage: 50-264 VAC (120-370 VDC, Derate at <90 VAC input
Line Regulation: ±0.5% max.
Load Regulation: ±1% ± 5% fan output
Isolation: Input to Output: 2 x MOPP
Isolation: Input to Ground: 1 x MOPP
Ripple & Noise: 1% pk-pk, 20 MHz BW
Efficiency: Typically 88%

Operating Temperature: 0°C to 70°C consult datasheet for derating
Safety Approvals: UL60950-1, IEC60950-1, EN60950-1, ANSI/AAMI ES60601-1, IEC60601-1, CSA60601-1, EN60601-1

Remote Sense
No Load Input Power
± 0.5% max for LCL150,
0.3% for LCL300 & LCL500

± 0.5% max, 0.5% typical

± 0.5% maximum, 0.5% typical

± 0.5% maximum, 0.5% typical

0.5 W No Load Input Power

Remote Sense

3 Year Warranty

Fits 1U applications

The first online technical portal for design engineers
Log on, research, refine and design

150 Watt Single Output PSUs
Convection Cooled

A compact range of 150 Watt single output power supplies in U-channel design with no need for fan cooling.

- 150 Watt convection cooled
- 3% footprint
- Up to 90% efficiency
- Fits TU applications
- 3 year warranty

Dimensions (mm): H = 41.2, W = 81.5, L = 127

Input Voltage: 90 - 264VAC (120-370 VDC)
Input Frequency: 47 - 63Hz
Output Power: 150W

Line Regulation: ±0.5% maximum, 0.5% typical
Load Regulation: ±3% maximum, 0.3% typical
Ripple & Noise: 1% Max pk-pk typical
Efficiency: 88%

Operating Temperature: 0 to 70°C, derate linearly from 100% load at 50°C to 50% at 70°C
Safety Approvals: UL60950-1, EN60950-1, UL60950-1

Efficiency 85% - 90%
Ripple & Noise
Line Regulation
Remote Sense

3 Year Warranty

Fits 1U applications

3 Year Warranty

150 Watt Single Output PSUs
Ultra Compact Design

茬 IT & Medical 3rd Edition Safety Approvals
- 100 W Convection, 150 W Force-cooled Ratings
- Built-in Fan Supply
- -0.5 W No Load Input Power
- 2 x 4" Foot Print
- Fits TU Applications
- 3 Year Warranty

Dimensions: H=33.8, W=101.6, D=50.8mm

Input Voltage: 90-264 VAC
Input Frequency: 47 - 63 Hz
Line Regulation: ±0.5% max.
Load Regulation: ±0.5% max.
No Load Input Power: ±0.5W
Efficiency: Up to 92%

Operating Temperature: -20°C to +70°C, derate from 100% load at 50°C to 50% load at 70°C
Safety Approvals: UL60950-1, IEC60950-1, ANSI/AAMI ES60601-1, EN60601-1

EMC: EN55022 Level B conducted, EN55022 Level A radiated

Ripple & Noise: 1% max, pk-pk, 20 MHz BW

Operating Temperature: -20°C to +70°C, derate from 100% load at 50°C to 50% load at 70°C

Safety Approvals: EN60601-01, ANSI/AAMI ES60601-1, CSA60601-1

Rated Power, Test and Measurement

The first online technical portal for design engineers
Log on, research, refine and design

150 - 500 Watt Single Output Industrial PSU’s

- Single Output Industrial Supplies
- 300 W & 500 W with Internal Fans
- Outputs from 12 V to 48 V
- 3 Year Warranty

Input Voltage: 85-264 V
Efficiency: 85% - 96%
Line Regulation: ±0.5% max for LCL150, ±0.3% for LCL300 & LCL500
Load Regulation: ±1% max

Isolation Voltage: 3000 VAC Input to Output, 1500 VAC Input to Ground, 500 VAC Output to Ground

Operating Temperature -10°C to +70°C, derate from 100% load at 50°C to 50% load at 70°C

Short Circuit Protection and restart (hiccup mode), auto recovery
Safety Approvals: EN60601-01, UL60950-1, CSA60950-1, EN60601-1, CSA60950-1, CLC175US: H=33, W=76.2, D=127mm

- High Efficiency Resonant Topology
- 300 W & 500 W with Internal Fans
- 150 W Convection Cooled
- 150 Watt convection cooled
- No need for fan cooling.
- Fits 1U applications
- 3 year warranty
- 120/148 W - Convection/Focused-cooled
- Additional 12 V Fan Output
- Remote Sense
- 3 Year Warranty

175 Watt Single Output PSUs
Industrial & Medical Approvals

- Ultra Compact 3x5” Package
- High Efficiency Resonant Topology
- Industrial & 3rd Edition Medical Safety Approvals
- 2 x MOPP with Risk Management File (-M)
- Additional 12 V Fan output
- Remote Sense
- 3 Year Warranty

The first online technical portal for design engineers
Log on, research, refine and design
175 Watt Single Output PSUs - continued

Industrial & Medical Approvals - continued

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<td>CLC175SUS12</td>
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<td>12</td>
<td>13.6</td>
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<td>3.5</td>
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</table>

* Requires 10CFM Forced Cooling

TF = Top Fan

M = Medical

MTF = Medical & Top Fan

PBM200 Series have exceptionally low earth leakage current and compact size for demanding medical applications. Floating V4 allows for cold start or connection. These units come complete with integral temperature controlled fan, cover and screw terminals.

- Medical 3rd edition safety approvals
- 2 x MOPP
- Output 4, floating
- Temperature controlled fan
- Remote on/off
- Both Line and neutral fused
- 3 year warranty

Dimensions (mm): L=177.8, W=101.6, H=38.1

<table>
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<tr>
<td>PBM200PS15-C</td>
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<td>–</td>
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<td>–</td>
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<td>LPQ202-M</td>
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<td>–</td>
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Power Supplies & Converters

C = CYAN
M = Magenta
Y = Yellow
B = Black/UK

3176 RoHS Compliant  ▲ Non-compliant

farnell.com element14.com
200 Watt Open Frame AC/DC Power Supplies

TOP 200 Series

- Highest power density in 5.0” x 3.0” footprint
- Supplies 200 W (convection cooling)
- High efficiency up to 95%
- Universal input 85-264 VAC
- Compliance with EN 61000-3-2 (PFC)
- Power back immunity
- Protection class I and II
- 3-year product warranty

Regulation:
- Line variation 0.5% max.
- Load variation 1.0% max.
- Ripple & Noise <120mVp-p @ 20 MHz Bandwidth
- EMI suppression EN 61000-6-1
- Overvoltage protection >100 V
- Overload protection >120-150% load max. (with push, automatic recovery
- Safety standards/approvals IEC/EN 60950-1, UL/cUL 60950-1, CB-report
- Operating temperature range -25°C to 70°C, above 50°C derating 2.0%/K
- Safety Approvals EN60950-1, ANSI/UL60950-1, CSA22.2 #60601-1 per cUL BF Rated, Including Risk Management, EN60601-1
- Overvoltage Protection 33V C; (Iout norm.) +70°C to 60°C, 2.5%/K derating above 60°C
- EMI Immunity EN 61000-6-2 (industrial environment)
- EMI Emission EN 55011, class B, EN 55022, class B, EN 61000-6-3

Pricing:

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>TOP 200-112</td>
<td>12V</td>
<td>16A</td>
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<td>186-9143</td>
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<td>TOP 200-115</td>
<td>15V</td>
<td>13A</td>
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<td>TOP 200-124</td>
<td>24V</td>
<td>8.3A</td>
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<td>TOP 200-148</td>
<td>48V</td>
<td>4.2A</td>
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<td>186-9146</td>
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</tbody>
</table>

Dimensions:
- H=33.6, W=127, D=76.2mm

All open frame models include 12V/0.6A fan supply

240-960 Watt Single Output PSUs

- 3-phase input 3 AC 400 V or 3 AC 550 VAC
- 200% boost power for up to 5 seconds
- Alternative to AC transformers
- Fully regulated 24 VDC outputs with 10 A, 20 A or 40 A
- High efficiency up to 92%
- Industrial safety approvals
- Cost effective design
- 3 years warranty

Input Voltage Range:
- 400 VAC models: 320 - 440 VAC
- 500 VAC models: 400 - 550 VAC

Line Regulation
- 1% max.

Load Regulation
- ≤1% max.

Ripple & Noise
- 100 mV/peak (typical)

EMC Emission
- EN 61000-6-1

EMC Immunity
- EN 61000-6-3

Operating Temperature
- 25°C to 70°C, >70°C derating 2.0%/K

Safety Approvals
- EN60950-1, ANSI/UL60950-1, CSA22.2 #60601-1 per cUL BF Rated, Including Risk Management, EN60601-1

Protection Class
- I and II

Power Back Immunity
- EN61000-3-2 (PFC)

List No.

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
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<tr>
<td>TSP-WMK02</td>
<td>208-0661</td>
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<td>TSP-WMK03</td>
<td>208-0664</td>
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<td>TSP-WMK04</td>
<td>208-0667</td>
<td>208-0668</td>
<td>208-0669</td>
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</tbody>
</table>

3% x 5” footprint

250 and 350 Watt Single Output PSUs

Ultra Compact Design

- Industry Standard 3” x 5” Format
- IT & 3rd Edition Medical (BF) Approvals
- 2 x MOPP with Risk Management File
- 80V - 275VAC Operation
- Signals Options (EMH505) 5V Standby (EMH505) & 12V Fan Supply
- 3 Year Warranty

EMH505/500 Open Frame: H=36.3, W=127, D=76.2

EMH503 Top Fan Cover: H=76.3, W=127, D=90.4

Input Voltage
- 80-275V AC, derate -90V AC

Input Frequency
- 47-63Hz

Earth Leakage Current
- 250 μA max, 264 VAC, 60 Hz

Line Regulation
- ≤0.5% max.

Load Regulation
- ≤1% V1, ≤5% V2

Ripple & Noise
- ≤1% pk-pk, 20 MHz bandwidth

Efficiency
- 87% typical

Isolation
- Input to output: 2 x MOPP

Overvoltage Protection
- 500V @ 20 MHz Bandwidth

Protection Class
- I and II

Power back Immunity
- EN61000-3-2 (PFC)

List No.

<table>
<thead>
<tr>
<th>List No.</th>
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<th>Current</th>
<th>Power</th>
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<tbody>
<tr>
<td>EMH505P12</td>
<td>12V</td>
<td>21A</td>
<td>252W</td>
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<tr>
<td>EMH505PS18</td>
<td>18V</td>
<td>14A</td>
<td>252W</td>
</tr>
<tr>
<td>EMH505PS24</td>
<td>24V</td>
<td>10.5A</td>
<td>252W</td>
</tr>
<tr>
<td>EMH505PS48</td>
<td>48V</td>
<td>5.2A</td>
<td>250W</td>
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<td>EMH505P12</td>
<td>12V</td>
<td>29.2A</td>
<td>354W</td>
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<td>EMH505PS18</td>
<td>18V</td>
<td>15.9A</td>
<td>354W</td>
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<td>EMH505PS24</td>
<td>24V</td>
<td>14.6A</td>
<td>355W</td>
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<tr>
<td>EMH505PS48</td>
<td>48V</td>
<td>7.3A</td>
<td>354W</td>
</tr>
</tbody>
</table>

Top Fan Cover

- EMH505P12-01 | 12V | 29.2A | 354W |
- EMH505PS18-01 | 18V | 15.9A | 354W |
- EMH505PS24-01 | 24V | 14.6A | 355W |
- EMH505PS48-01 | 48V | 7.3A | 354W |

All open frame models include 12V/0.6A fan supply

Dimensions:
- H=33.6, W=127, D=76.2mm

Medical and ITE safety standards:
- Adjustable main output
- Active power factor correction
- 3” x 5” footprint
- Remote sense
- Power fail
- Overvoltage protection
- Thermal overload protection

List No.

<table>
<thead>
<tr>
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<th>Voltage</th>
<th>Current</th>
<th>Order Code</th>
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<td>5V</td>
<td>20A</td>
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<td>LPS201-M</td>
<td>12V</td>
<td>10.3A</td>
<td>208-6186</td>
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<tr>
<td>LPS204-M</td>
<td>15V</td>
<td>8.3A</td>
<td>188-6190</td>
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<tr>
<td>LPS205-M</td>
<td>24V</td>
<td>5.2A</td>
<td>188-6191</td>
</tr>
<tr>
<td>LPS208-M</td>
<td>48V</td>
<td>2.6A</td>
<td>188-6192</td>
</tr>
</tbody>
</table>
250 Watt Single Output PSUs - Switch Mode - continued

- Standby Power Draw <0.5 Watt
- Built to meet EN 61010-1 and EN 55011
- Convection cooled
- 5V / 300mA Aux Supply
- Output Remote Programming
- Allows use in Lighting equipment
- Five Year Warranty

Input Voltage: 85 to 264V AC, 120 to 373V DC
Input Frequency: 45 to 63Hz
Inrush Current: 20A @ 115V AC, 40A @ 230V AC
Operating Temperature: 0°C to 50°C

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>GWS-250-12</td>
<td>12V to 12.3V</td>
<td>21A</td>
<td>92%</td>
<td>199-6023</td>
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<tr>
<td>GWS-250-24</td>
<td>24V to 28.8V</td>
<td>10.5A</td>
<td>92%</td>
<td>199-6024</td>
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<tr>
<td>GWS-250-36</td>
<td>32V to 40V</td>
<td>7A</td>
<td>93%</td>
<td>199-6025</td>
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<tr>
<td>GWS-250-48</td>
<td>48V to 57.6V</td>
<td>5.3A</td>
<td>93%</td>
<td>199-6026</td>
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</tbody>
</table>

2% O/P

PBM300PQ03-C 5.1V, 35A 15V, 8A 15V, 4A 24V, 2.5A 128-9120
PBM300PS12-C 12V, 25A


EFE300-12-ECMDS 12V 25A 300W 858
EFE300-24-ECMDS 24V 16.7A 400W 858

300 Watt Single and Quad Output PSUs - Medical Approval

- Medical 3rd edition safety approvals
- 2 x MOPP
- Floating auxillary outputs
- Power fail, remote on/off and remote sense
- High reliability
- Temperature controlled integral fan
- 3 year warranty

Input Voltage: 90-264V AC
Input Frequency: 47-63Hz
Earth Leakage Current: 150 μA max at 115 VAC / 60Hz, 220 μA max at 230 VAC / 50Hz
Line Regulation: ±0.5% max
Transient Response: 4% max. deviation, recovery to within 1% in 500 μs for a 25A load change
Ripple & Noise: 2% peak max
Isolation: Input To Output: 2 x MOPP, Input To Ground: 1 x MOPP
Efficiency: Up to 80%
Operating Temperature: 0°C to +70°C, derate linearly from 100% power at 50°C to 50% power at 70°C

MTBF: 300,000 hours per MIL-HDBK-217F at 27°C
Safety Approvals: ANSI/AAMI ES60601-1, IEC60601-1, EN60601-1

MTBF: 300,000 hours per MIL-HDBK-217F at 27°C
Safety Approvals: ANSI/AAMI ES60601-1, IEC60601-1, EN60601-1

Emissions: EN55011 and FCC Class B conducted and radiated

Medical Approval: EFE300-12-ECMDS-YT 12V 25A 300W 858a × 199-6059
Medical Approval: EFE300-24-ECMDS-YT 24V 12.5A 300W 858a × 199-6059
Medical Approval: EFE400-12-ECMDS-YT 12V 33.3A 400W 858a × 199-6059
Medical Approval: EFE400-24-ECMDS-YT 24V 16.7A 400W 858a × 199-6059
Medical Approval: EFE500-12-ECMDS-YT 12V 41.6A 500W 858a × 199-6059
Medical Approval: EFE500-24-ECMDS-YT 24V 20.8A 500W 858a × 199-6059
Medical Approval: EFE600-12-ECMDS-YT 12V 56A 600W 858a × 199-6059
Medical Approval: EFE600-24-ECMDS-YT 24V 28A 600W 858a × 199-6059
Medical Approval: EFE700-12-ECMDS-YT 12V 70A 700W 858a × 199-6059
Medical Approval: EFE700-24-ECMDS-YT 24V 35A 700W 858a × 199-6059
Medical Approval: EFE800-12-ECMDS-YT 12V 85A 800W 858a × 199-6059
Medical Approval: EFE800-24-ECMDS-YT 24V 42.5A 800W 858a × 199-6059
Medical Approval: EFE900-12-ECMDS-YT 12V 100A 900W 858a × 199-6059
Medical Approval: EFE900-24-ECMDS-YT 24V 50A 900W 858a × 199-6059
Medical Approval: EFE1000-12-ECMDS-YT 12V 125A 1000W 858a × 199-6059
Medical Approval: EFE1000-24-ECMDS-YT 24V 62.5A 1000W 858a × 199-6059
Medical Approval: EFE1200-12-ECMDS-YT 12V 150A 1200W 858a × 199-6059
Medical Approval: EFE1200-24-ECMDS-YT 24V 75A 1200W 858a × 199-6059

Troubleshooting Tips
Chat online to one of our technical engineers at farnell.com
300 - 600 Watt Single Output PSUs

- 300% Peak Power Capability
- Small Package Size
- Universal Input (85 - 265VAC)
- High Efficiency

HWS300P: W=61, H=82, D=165mm
HWS600P: W=100, H=82, D=165mm

Input Voltage: 85 to 265V AC, 120 to 330V DC
Input Frequency: 45 to 63Hz
Operating Temperature: -10°C to 70°C

Efficiency: 65 - 80% typical output voltage dependent
Output Over voltage protection: Circuit will shut down output.
Over current protection: Constant current limit with automatic recovery

Enclosed Industrial PSUs - Switch Mode

- 300-600W JWS Series PSU
- 5 year warranty
- Highly cost competitive
- OPP and OCP fitted as standard
- PFC fitted as standard
- Meets EN61050, UL1950 listed, CSA60950-1, VDE0160, EN50178, UL508

HWS Series

- Lifetime Warranty
- UL508 Approved
- SEMI F47 Compliant (high line AC)
- Universal Input (85 - 265VAC)
- High Efficiency
- Wide Range AC input
- Easier System Cooling

350 Watt Ultra Compact Single Output PSUs

- Exceptional Power Density
- High Power Density - 11.1W/in³
- 86% Typical Efficiency
- 5V standby, 12V fan output
- Remote On/Off, AC OK and DC OK
- Active current share
- 3 year warranty

U Channel Dimensions (mm): H=38.1, W=172.7, D=81.3
Top Fan Dimensions (mm): H=50.79, W=172.72, D=84.5
End Fan Dimensions (mm): H=44.45, W=210.31, D=84.48

The MFA350 is a class leading 350 Watt, single output AC/DC switcher with exceptional power density. It is designed for communications applications and was developed to meet the needs of networking equipment, voice over IP systems, wireless LAN’s, servers, storage area networks and post production broadcast equipment. The MFA350 delivers 350 watts across all the usual AC industrial input range and features overcurrent, overvoltage and short circuit protection as standard. The MFA meets all major international specifications for safety and EMC.

Input Voltage: 90-264VAC (85VAC derated by 10%)
Input Frequency: 47-63Hz

Load Regulation: V1 ±1%, V2 ±5%, V3 ±10%
Ripple & Noise: V1 ±1%, ±2% pk-pk, 20kHz 8W
Efficiency: 85% minimum at 230VAC
Modular PSUs - Switch Mode - continued

350 Watt Ultra Compact Single Output PSUs - continued

Exceptional Power Density - continued

- Operating Temperature: -10°C to +70°C, derate linearly from 50°C at 2.5%/°C to 50% at 70°C
- Cooling: 110CFM required for non-covered versions
- Safety Approvals: EN60950-1, UL/cUL60950
- Emissions: EN55022/11 Level B Conducted, Level A Radiated
- Line Regulator
- Input Voltage: 80-275 VAC
- Dimensions: 81.7 x 101.6 x 49 mm
- Isolation Input to Output: 2 x MOPP
- Output Power: 350W
- Load Regulation: ±1% V1, ±5% V2, 350W: ±1% V1, ±5% V2
- Ripple & Noise: 1% pk-pk, 20 MHz bandwidth
- Efficiency: 85% typical
- Operating Temperature: 0 to 50°C
- Safety Approvals: IEC60950-1, CSA 22.2 No. 60950-1, UL60950-1, TUV, EN60950-1, SEMI F47
- EMI: EN55022 Level B conducted. EN55022, Level A radiated.
- Cooling: 13CFM required for non-covered versions
- C, to +70°C, derate linearly from 50°C at 70°C to 50% load at +70°C
- Operating Temperature: -20°C to +70°C
- Input Frequency: 47-63 Hz
- Input Voltage: 85-264 VAC (120-300 VDC)
- I2C interface, built-in fan and a 5V standby auxiliary output. The CEF400-112 provides reliable 12V bus power for Information Technology Equipment and Industrial Applications.
- Safety Approvals: IEC60950-1, CSA 22.2 No. 60950-1, UL60950-1, TUV, EN60950-1, SEMI F47
- EMG: EN55022 Level B conducted, EN55022 Level A radiated
- C, to 50% load at +70°C
- 3 Year Warranty
- Active current sharing mode for redundant (N+1) operation.
- Additional features include I2C interface, built-in fan and a 5V standby auxiliary output. The CEF400-112 provides reliable 12V bus power for Information Technology Equipment and Industrial Applications.

400 Watt Single Output PSUs

Industrial & Medical Approvals

- IT & Medical 3rd Edition Safety Approvals
- 2 x MOPP with Risk Management File
- 400 W Continuous, 600 W Peak
- 80 V - 275 VAC Operation
- AC OK and Remote On/Off
- Low Noise Fan
- 5 V Standby
- 3 Year Warranty

Dimensions: H=48, W=152.4, D=101.6mm
- Input Voltage: 80-275 VAC
- Input Frequency: 47-63 Hz
- Line Regulation: ±0.5% max.
- Load Regulation: V1= ±1%, V2= ±5%
- Isolation Input to Output: 2 x MOPP
- Ripple & Noise: 1% pk-pk, 20 MHz bandwidth
- Efficiency: 85% typical
- Operating Temperature: -10°C to +70°C, derate linearly from +50°C at 2.5%/°C to 50% load at +70°C
- Cooling: forced cooled with integral fan
- Safety Approvals: IEC60950-1, UL60950-1, EN60950-1, TUV, EN60950-1, ANSI/AAMI ES60601-1, EN60601-1, including Risk Management
- Emissions: EN55022/11 Level B conducted, Level A radiated

400W Single Output PSU

- Remote sense compensation
- Remote inhibit control
- Droop current share
- 5V Standby
- Low profile (1U)
- Integrated cooling fan
- Over-voltage protection
- Over-current protection
- Thermal overload protection

The CEF400-112C is a 400W active power-factor-corrected (PFC) front-end power supply. It is designed for distributed power architecture (DPA) systems requiring high power density in a 1U low profile package. The built-in OR-ing FET allows the power supply to operate in active current sharing mode for redundant (N+1) operation. Additional features include I2C interface, built-in fan and a 5V standby auxiliary output. The CEF400-112 provides reliable 12V bus power for Information Technology Equipment and Industrial Applications.

460 Watt Single Output PSUs

- Active power factor correction
- Active AC inrush control
- 1U X 2U form factor
- +12 Vdc stand-by
- Hot plug operation
- N+1 redundant
- Active current sharing
- Built-in cooling fan
- I2C communication interface bus
- PMBus compliant
- EEPROM for FRU data

Dimensions: H=40.5, W=244, D=86.4mm
- Active power factor correction
- Active AC inrush control
- 1U X 2U form factor
- +12 Vdc stand-by
- Hot plug operation
- N+1 redundant
- Active current sharing
- Built-in cooling fan
- I2C communication interface bus
- PMBus compliant
- EEPROM for FRU data

350/650 Watt Single Output

Compact Industrial PSU

- Rugged Industrial Construction
- Variable Fan Speed for Noise Reduction
- Operating temperature: -40°C to +70°C
- AC OK, Remote On/Off and Active Current Share
- 5 V Standby
- Screw Terminals
- 3 Year Warranty

400W Single Output PSU

- Remote sense compensation
- Remote inhibit control
- Drop current share
- 5V Standby
- Low profile (1U)
- Integrated cooling fan
- Over-voltage protection
- Over-current protection
- Thermal overload protection
600 Watt Enclosed Single Output PSUs

- **600W output power**
- **7.41 W/°C-in**
- **Industrial/Medical safety**
- **Optional 5 V @ 2 A Housekeeping**
- **High Efficiency: 89% typical**

**Input Voltage:** 85-264V ac
**Input Frequency:** 47-48 Hz
**Inrush Current:** ≤50% peak, either hot or cold start
**Efficiency:** ≥89% at full load
**Leakage Current:** ≤0.3mA at 264V ac
**Power Line Transient:** MOPP directly after the fuse

**Operating Temperature:** -40°C to +70°C, linear derating to 50°C from 70°C

**IEC Input**
- **LCM600U:** 12V 9.6V to 14.4V 52A 211-5738
- **LCM600Q:** 24V 19.2V to 28.8V 27A 188-6217
- **LCM600W:** 48V 38.4V to 57.6V 14A 186-6218

**Terminal Block Input**
- **LCM600U-T:** 12V 9.6V to 14.4V 52A 211-5740
- **LCM600Q-T:** 24V 19.2V to 28.8V 27A 188-6217
- **LCM600W-T:** 48V 38.4V to 57.6V 14A 186-6218

**Dimensions:** H=61, W=190.5, D=114.3

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650 Watt Single Output PSUs

- **Medical 3rd Edition Safety Approvals**
- **2 x MOPP with Risk Management**
- **-20°C to +70°C Operation**
- **AC OK, Remote On/Off and Active Current Share**
- **Screw Terminals**
- **Load Dependent Variable Speed Fan**
- **3 Year Warranty**

**Dimensions:** H=63.5, W=233.2, D=101.6mm

**Input Voltage:** 80-264 VAC (derate <90°C)
**Input Frequency:** 47 - 63 Hz
**Isolation:** Input to Output: 2 x MOPP
**Input to Ground:** 1 x MOPP
**Line Regulation:** ≤0.5% max.
**Load Regulation:** ≤1% Output Voltage, ≤5%/Standby Current

**Earth Leakage Current:** 250µA max 264V 60 Hz
** Ripple & Noise:** 1% max. pk-pk, 20 MHz BW

**Operating Temperature:** -20°C to +70°C, derate linearly from +50°C at 2.5°C / °C to 50°C at +70°C

**Emissions:** EN55022 level B conducted, EN55022 level A radiated

**Safety Approvals:** IEC60601-1 CB report, CSA 22.2 No. 60601-1, TUV, EN60601-1, SEMI F47

**IEC Input**
- **LCM600U:** 12V 9.6V to 14.4V 52A 211-5738
- **LCM600Q:** 24V 19.2V to 28.8V 27A 188-6217
- **LCM600W:** 48V 38.4V to 57.6V 14A 186-6218

**Terminal Block Input**
- **LCM600U-T:** 12V 9.6V to 14.4V 52A 211-5740
- **LCM600Q-T:** 24V 19.2V to 28.8V 27A 188-6217
- **LCM600W-T:** 48V 38.4V to 57.6V 14A 186-6218

**Order Code:**
- **1+ 5+ 10+ 25+ 50+**

---

850 - 2500 Watt Front End PSUs

- **High power density**
- **Compact 1U profile**
- **Remote On/Off**
- **Remote sense**
- **Active current sharing**
- **GE Energy formerly Lineage Power**

**Medical Approvals**
- **Medical 3rd Edition Safety Approval**
- **2 x MOPP with Risk Management File**
- **Variable Fan Speed for Noise Reduction**
- **-20°C to +70°C Operation**
- **AC OK, Remote On/Off and Active Current Share**
- **Screw Terminals**
- **5 V Standby**
- **3 Year Warranty**

**Dimensions:** H=61, W=242.64, D=149.8mm

**Input Voltage:** 85-264 VAC (derate <90°C)
**Input Frequency:** 47 - 440 Hz
**Line Regulation:** ≤0.5% max.
**Load Regulation:** ≤1% V1, ≤5% V2

**Ripple & Noise:** 1% max. pk-pk, 20 MHz BW

**Operating Temperature:** -20°C to +70°C, derate linearly from +50°C at 2.5°C / °C to 50°C at +70°C

**Emissions:** EN55022 level B conducted, EN55022 level A radiated

**Safety Approvals:** IEC60601-1 CB report, CSA 22.2 No. 60601-1, TUV, EN60601-1, SEMI F47

**IEC Input**
- **SHP1000PS24:** 24V 42A (48A)* 1.013kW 182-1488
- **SHP1000PS12:** 12V 67A 1kW 182-1485
- **SHP1000PS15:** 15V 67A 1.013kW 182-1486

**Terminal Block Input**
- **SHP1000PS24-T:** 24V 42A (48A)* 1.013kW 182-1487
- **SHP1000PS12-T:** 12V 67A 1kW 182-1489
- **SHP1000PS15-T:** 15V 67A 1.013kW 182-1490

**Order Code:**
- **1+ 5+ 10+ 25+ 50+**

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1000 Watt Single Output PSUs

- **Compact Industrial Design**
- **Rugged Industrial Construction**
- **Variable Fan Speed for Noise Reduction**
- **-20°C to +70°C Operation**
- **5 V Standby**
- **AC OK, Remote On/Off and Active Current Share**
- **Screw Terminals**
- **3 Year Warranty**

**Dimensions:** H=61, W=242.64, D=149.8mm

**Input Voltage:** 85-264 VAC (derate <90°C)
**Input Frequency:** 47 - 63 Hz
**Line Regulation:** ≤0.5% max.
**Load Regulation:** ≤1% V1, ≤5% V2

**Ripple & Noise:** 1% max. pk-pk, 20 MHz BW

**Operating Temperature:** -20°C to +70°C, derate linearly from +50°C at 2.5°C / °C to 50°C at +70°C

**Emissions:** EN55022 level B conducted, EN55022 level A radiated

**Safety Approvals:** IEC60601-1 CB report, CSA 22.2 No. 60601-1, TUV, EN60601-1, SEMI F47

**IEC Input**
- **SHP1000PS24:** 24V 42A (48A)* 1.013kW 182-1488
- **SHP1000PS12:** 12V 67A 1kW 182-1485
- **SHP1000PS15:** 15V 67A 1.013kW 182-1486

**Terminal Block Input**
- **SHP1000PS24-T:** 24V 42A (48A)* 1.013kW 182-1487
- **SHP1000PS12-T:** 12V 67A 1kW 182-1489
- **SHP1000PS15-T:** 15V 67A 1.013kW 182-1490

**Order Code:**
- **1+ 5+ 10+ 25+ 50+**

---

EXP

<https://farnell.com/element14.com>
1000 Watt Single Output PSUs - continued

Medical Approvals - continued

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MHP1000PS12</td>
<td>12V</td>
<td>83A</td>
<td>1.01kW</td>
<td>88%</td>
<td>199-5866</td>
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<tr>
<td>MHP1000PS15</td>
<td>15V</td>
<td>67A</td>
<td>1.01kW</td>
<td>88%</td>
<td>182-1440</td>
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<tr>
<td>MHP1000PS48</td>
<td>48V</td>
<td>21A</td>
<td>1.2kW</td>
<td>88%</td>
<td>199-5967</td>
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</table>

Price Each

Order Code 1+ 5+ 10+ 25+

MHP1000 Series All Order Codes

1000 Watt Front End PSUs

- Universal Input (85 - 265VAC)
- 1U high
- Utilizes less system space
- Suitable for N+1 redundancy
- Current Share
- Can be paralleled for higher power
- Full array of signals
- Easier system monitoring

Dimensions (mm): L=305, W=127, H=41mm

1200 - 2000 Watt Single Output PSUs

DIU Series

- Internal cooling fans
- 12 or 48V Mains Input, 3.3 or 5V DC Standby Output
- Active Current Sharing on main output
- Over-voltage, Over-current, Over-temperature protection
- FC Bus Interface with Status Indicators

Dimensions (mm): L=304.9, W=120.6, H=40.7

The DIU is a power-factor-corrected (PFC) front-end power supply for hot-swapping redundant systems. The main outputs are 12 or 48V and standby output of either 12V, 5V or 3.3V. Packaged in 1U low profile, it is designed to deliver reliable bulk power to servers, workstations, storage systems or any 12 or 48V distributed power architecture systems requiring high power density. The highly efficient electrical and thermal design with internal cooling fans supports reliable operation conditions. The S1U-3X is a Rack Mount Power Shelf designed for holding three 12V or 48V DIU Front End Power Supplies in current sharing applications. It is intended for distributed power architecture applications in the Servers, Storage Networking and Data Communications markets.

Input Voltage 90-264 VAC
Input Frequency 47-63 Hz
Efficiency 90.6%
MTBF 200k
Emissions FCC E2, C95.3C Parts 15/CISPR 22, EN55022
Safety Approvals c-ULus (CSA 60950-1-03/UL 60950-1, First Edition)

1500 Watt Industrial and Medical PSUs

1U Bulk Power

- IT & Medical 3rd Edition Approvals
- 2 x MOPP with Risk Management File
- Variable Fan Speed to Reduce Audible Noise
- -20°C to +70°C Operation
- AC OK, DC OK, Inhibit & 5V standby
- Fan Fail & Overtemperature Signals
- Active Current Share
- 3 Year Warranty

Input Voltage 85-264 VAC
Input Frequency 47-63 Hz
Efficiency 90% typical
Isolation Input to output: 2 X MOPP
Input to ground: 1 X MOPP
Line Regulation ±0.5% maximum
Load Regulation V1: ±0.5%, V2: ±5%
Operating Temperature -20°C to 70°C, derate linearly from 50°C at 2.5°C / °C to 50°C at load at 70°C
Ripple & Noise 24-48 V models: 1% max. pk-pk, 12 V models: 2% max. pk-pk, V Standby: 3%

Safety Approvals EN60601-1, ANSI/AAMI ES60601-1, CSA22.2 No. 60601-1 per cUL, Including Risk Management -M Versions, EN60950, UL60950

Ripple & Noise 24-48 V models: 1% max. pk-pk, 12 V models: 2% max. pk-pk, V Standby: 3% max. pk-pk, 20 MHz bandwidth

1500W Single Output Industrial Power Supplies

HWS Series

- Lifetime Warranty
- High Power Density
- SEMI F47 Compliant (high line AC)
- Universal Input (85 - 265VAC)
- High Efficiency
- Wide Range AC Input
- Easier System Cooling

- Power Factor corrected
- Operating Temperature -70°C to +70°C, derate linearly to 50% load from 50°C to 70°C
- Input Voltage 85-265V(47/63Hz)
- Output Voltage 15V(12.0 - 18.0) 100A 100A 5V / 1A
- Ripple & Noise 24-48 V models: 1% max. pk-pk, 12 V models: 2% max. pk-pk, V Standby: 3%
- Remote on/off Yes (Isolated from output)
- Cooling Internal Fan
- Dimensions 360 x 125 x 170 (mm)

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power</th>
<th>Voltage</th>
<th>Adjustment</th>
<th>Efficiency</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>HPS1K5PS12-M</td>
<td>12W</td>
<td>12V</td>
<td>11V - 14V</td>
<td>88%</td>
<td>159-9465</td>
<td></td>
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<tr>
<td>HPS1K5PS12</td>
<td>12W</td>
<td>12V</td>
<td>11V - 14V</td>
<td>88%</td>
<td>159-9465</td>
<td></td>
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<tr>
<td>HPS1K5PS48-M</td>
<td>48W</td>
<td>48V</td>
<td>45V - 52V</td>
<td>85%</td>
<td>159-9467</td>
<td></td>
</tr>
<tr>
<td>HPS1K5PS48</td>
<td>48W</td>
<td>48V</td>
<td>45V - 52V</td>
<td>85%</td>
<td>159-9467</td>
<td></td>
</tr>
</tbody>
</table>

Price Each

Order Code 1+ 5+ 10+ 25+

HPS1K5 Series All Order Codes
2000-2725 Watt Front End PSUs

CP2000 and CP2725 rectifiers are single phase, constant power rectifiers that provide 2000 Watts and 2725 Watts (respectively) of highly reliable DC power. The constant output power characteristics, extended temperature range, universal AC input, and compact size are some of the key attributes. These models are high efficiency rectifiers provide significantly improved operational efficiency and are fully backwards compatible with currently deployed CPL energy systems. These high-density front-to-back airflow rectifiers are designed for minimal space utilization and are highly expandable for future growth.

- Compact 1U form factor
- MiniBus compliant dual 2C and RS485 serial bus communications
- Front panel LED indicators
- Internal variable-speed fan control
- GE Energy formerly Lineage Power

5-480W Single Output DIN Rail PSUs

Mfrs. List No. | Order Code | 1+ | 5+ | 10+ | 25+ | 50+
---|---|---|---|---|---|---
CP2000AC54TE2 | 207-6843E | | | | | |
CP2000DC54-PE | 207-6844E | | | | | |
CP2725AC54TE2 | 207-6847E | | | | | |

CP2000 and CP2725 rectifiers are single phase, constant power rectifiers that provide 2000 Watts and 2725 Watts (respectively) of highly reliable DC power. The constant output power characteristics, extended temperature range, universal AC input, and compact size are some of the key attributes. These models are high efficiency rectifiers provide significantly improved operational efficiency and are fully backwards compatible with currently deployed CPL energy systems. These high-density front-to-back airflow rectifiers are designed for minimal space utilization and are highly expandable for future growth.

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- MiniBus compliant dual 2C and RS485 serial bus communications
- Front panel LED indicators
- Internal variable-speed fan control
- GE Energy formerly Lineage Power

5-480W Single Output DIN Rail PSUs

Mfr. List No. | Order Code | 1+ | 5+ | 10+ | 25+ | 50+
---|---|---|---|---|---|---
CP2000AC54TE2 | 207-6843E | | | | | |
CP2000DC54-PE | 207-6844E | | | | | |
CP2725AC54TE2 | 207-6847E | | | | | |

6W to 60W, Unregulated Din Rail PSU's

DCT Series

- 230V ac input, 12 or 24V dc (nom) output power supply/safety isolating transformer
- Manufactured to EN61558, VDE0570
- Fully encapsulated in a plastic housing
- Designed for easy installation on DIN 48383 rails
- 2.75KV input/output flash tested
- Screw terminals for both input and output
- Efficiency 75% typical

- Integral fuse and thermal cut-out to give protection against overload and short circuits

Input Voltage Range
90-240V ac, 12 or 24V dc (nom)

Line Regulation
1%

Ripple & Noise
50mV pk-pk

Load Regulation
1%

Overvoltage Protection
120-145%

Current Range
15-50A

Efficiency
75% typical

- Wide range AC/DC input
- High efficiency
- Short circuit protection
- Internal input filter
- Trimable output voltage
- Operation -10 to +70°C (full power to +60°C)
- DC OK LED Indication
- DC OK relay control line (models 30W and above)
- Parallel operation facility
- UL 1310 Class II
- Class 2 Double Insulation

Input Voltage Range
90-264VAC, 120-370VDC (5-18W, 480W)

Current Range
20-25A

Efficiency
75% typical

- Wide range AC input
- To +71°C Operation
- Convective Cooled
- UL Class II
- Class 2 Double Insulation

Input Voltage Range
90-264VAC 47/63Hz, 120-370V dc

Line Regulation
1%

Ripple & Noise
50mV pk-pk

Overvoltage Protection
120-145%

Operating Temperature
-25°C to +71°C (derate linearly 2.5%/°C)

Safety Standards/Approval
UL1310 Class II, UL508 Listed, UL60950-1, EN60950-1, CE

Input Voltage Range
90-264VAC, 120-370VDC (5-18W, 480W)

Current Range
20-25A

Efficiency
75% typical

- Wide range AC/DC input
- High efficiency
- Short circuit protection
- Internal input filter
- Trimable output voltage
- Operation -10 to +70°C (full power to +60°C)
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- Class 2 Double Insulation

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Efficiency
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- Trimable output voltage
- Operation -10 to +70°C (full power to +60°C)
- DC OK LED Indication
- DC OK relay control line (models 30W and above)
- Parallel operation facility
- UL 1310 Class II
- Class 2 Double Insulation
**Modular PSUs - DIN Rail Mount - continued**

**DIN Rail Mounting PSUs**

3SVS ‘Micro’ Series

- Small case size to help reduce panel size
- Mounting in any plain so can be anywhere convenient within the panel
- No re-rating of power up to 60°C enables use in hot environments
- 5 year warranty, to give peace of mind when selecting an Omron power supply
- Available with a choice of output voltages (5, 12 or 24V dc) to meet your requirements
- Meets latest European legislation on EMI & EMS and is CE marked
- Global approvals to allow use anywhere in the world

Using Omron’s latest development of ‘Lead frame technology’ in the 3SVS ‘Micro’, Omron has been able to dramatically reduce the size of the latest addition to the 3SVS range, with the 30W model and 15W models both available in the industrial standard housing of only 22.5mm wide. In addition the new technology means that there is no de-rating of the power upto 60°C and can be mounted in any plain.

**Power, Test and Measurement**

- Suitable for use in small distribution boards
- Adjustable output voltage
- Output voltages of 5V-24V to suit a variety of applications
- Primary switching regulator with wide range input
- Compact lightweight rugged design
- Can be mounted in any plain.
- 22.5mm wide. In addition the new technology means that there is no de-rating of the power up to 60°C and can be mounted in any plain.

**DIN Rail Mounting PSUs**

Single Phase Input

- Low profile case, module height only 55mm
- Fits into flat control panels used in building automation
- Safety class II, double insulation
- Short circuit and overload protection
- Adjustable output voltage
- UL 508 listed, UL 1310 approvals
- 3 years product warranty

**15-150 Watt Industrial Power Supplies**

**Low profile**

- Low profile case, module height only 55mm
- Fits into flat control panels used in building automation
- Safety class II, double insulation
- Short circuit and overload protection
- Adjustable output voltage
- UL 508 listed, UL 1310 approvals
- 3 years product warranty

**Input Voltage**

- 85-264 VAC, 47-63 Hz

**Output regulation**

- ± 1 % max.

**Output voltage adjustment range**

- 5 VDC models: 5.0-5.2 VDC, 12 V models: 12-16 VDC, 24 V models: 24-28 VDC

**Ripple & noise**

- <100 mV peak/peak (20 kHz BW)

**EMI emission**

- EN 55011, class B, EN 55022, class B, EN 61000-4-8

**EMC immunity**

- EN 61000-4-4

**Over current limitation**

- 100-150 % Imax. (automatic recovery)

**Over voltage protection**

- At 140 % of Vout norm.

**Efficiency**

- 85 % typ.

**Operating temperature**

- -25°C to +70°C above 60°C derating 2.5 %/K

**Safety standards / approvals**

- UL 1310, IEC 60950-1, C-B Report, UL 508 listed, EN 50178, EN 50024, EN 61558-2-8

**Vibration/Shock**

- IEC 60068-2-6, IEC 60068-2-27

**Case**

- Plastic, IP 20 (IEC 529)

**Mounting**

- Snap-on mounting on 35 mm DIN-rails as per EN 50022-35x15/7.5

**Connection**

- Screw terminals with combi-type screw heads for wire size 0.5-1.5 mm²

**TDK-Lambda**

- 5V, 12V, 15V, 24V or 48V Outputs
- Wide Range AC Input
- Parallel Function Switch (240 & 480W)
- Current Share (960W)
- -40°C to +77°C Operation

**NEW**
10-30 Watt AC/DC Power Modules

TMT Series

- Ultra compact, fully encapsulated power supplies
- 2 Versions available: PCB mounting with solder pins and chassis mounting with screw terminal block
- DIN Rail mounting with additional Adaptor

Operating Temperature -25°C to +60°C

Safety Approvals
- cUL/UL 60950-1
- IEC/EN 60950-1
- UL 60601-1
- IEC 60601-1

DIN Rail mounting with additional Adaptor

Line Regulation
20 mV/Max.

Load Regulation
50 mV/Max. (Models with Single-Output)

 Ripple & Noise
- <100 mV/peak-pk typ. (20 MHz Bandwidth)
- Conducted EMI EN 55011, Class B, EN 55022, Class B and FCC, Level B

Over Current Limitation >105% norm. feedback, automatic recovery

Efficiency
- 83% typ.

Dimensions

<table>
<thead>
<tr>
<th>Mfrs. List</th>
<th>Power</th>
<th>Width (mm)</th>
<th>Height (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT 1005</td>
<td>10W</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TMT 1012</td>
<td>10W</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TMT 1151</td>
<td>15W</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TMT 1251</td>
<td>15W</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TMT 3003</td>
<td>30W</td>
<td>50</td>
<td>25</td>
</tr>
<tr>
<td>TMT 5012</td>
<td>50W</td>
<td>50</td>
<td>25</td>
</tr>
</tbody>
</table>

*Add C to the end of the mfrs. list no. for chassis mount versions.

Power Supplies & Converters

5-960 W Single Output DIN Rail PSUs

Single & Three phase Inputs DNN Series

- Universal Input 85-264 VAC
- ENUL 60661-1 Medical Safety Standard
- Short Circuit and Overload Protection
- 3 Years Warranty

- International Safety Approvals
- Rugged Design for Industrial Applications
- Full Power to +60°C
- Overvoltage and Overload Protection
- Up to 92% Efficiency
- Parallel Function
- Wide Input Range
- Three-Phase versions available
- Wide Adjustment Range

Input voltage
- ±2.0% (5/10/18 Watt models)
- ±1.0% (120/120TS/240/240TS/480/960 Watt models)

Input Frequency
47-63 Hz, 440 Hz

Power Factor
Meets EN61000-3-2 for Class A equipment

Ripple & Noise
- <50 mV/peak-pk typ. (60 W models)

Safety Approvals
- UL, CSA, EN, CE

EMC
- EN55022 level B
## Modular PSUs - DIN Rail Mount - continued

### 5-960 W Single Output DIN Rail PSUs - continued

**Single & Three phase inputs DINR Series - continued**

<table>
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<tr>
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<tbody>
<tr>
<td>DIN240</td>
<td>120W</td>
<td>186-9155</td>
<td>230/400Vac</td>
<td>12V</td>
<td>1.2A</td>
<td>60W</td>
<td>125-2702</td>
<td>0.5</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>DIN240</td>
<td>120W</td>
<td>186-9156</td>
<td>230/400Vac</td>
<td>12V</td>
<td>5A</td>
<td>60W</td>
<td>125-2703</td>
<td>1.2</td>
<td>1+ 5+ 10+ 25+</td>
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<tr>
<td>DIN240</td>
<td>120W</td>
<td>186-9157</td>
<td>230/400Vac</td>
<td>12V</td>
<td>2A</td>
<td>24W</td>
<td>125-2704</td>
<td>0.4</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>DIN240</td>
<td>120W</td>
<td>186-9158</td>
<td>230/400Vac</td>
<td>12V</td>
<td>1A</td>
<td>6W</td>
<td>125-2705</td>
<td>0.2</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
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</table>

### 24W & 72W Linear, Stabilised Output

**QLS Series**

- 230V ac input, 24V dc stabilised output
- Safety isolating transformer to VDE0551, EN60742
- 4KV input/output flash tested
- Finger safe easy accessible screw terminals
- Double screw terminals on the output
- Input and output fuse protection
- LED output voltage indicator

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Output Voltage</th>
<th>Power</th>
<th>Current</th>
<th>Dimensions (WxHxD)</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>TCL 060-124DC</td>
<td>24V</td>
<td>2.5A</td>
<td>60W</td>
<td>167-2129</td>
<td>1.2</td>
</tr>
<tr>
<td>TCL 060-124C</td>
<td>24V</td>
<td>5A</td>
<td>120W</td>
<td>167-2130</td>
<td>2.0</td>
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<tr>
<td>TCL 024-124DC</td>
<td>24V</td>
<td>1A</td>
<td>24W</td>
<td>124-2610</td>
<td>0.6</td>
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<tr>
<td>TCL 024-124C</td>
<td>24V</td>
<td>2A</td>
<td>60W</td>
<td>167-2128</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### 24-240 Watt Industrial PSUs

**TCL Series**

- DIN-Rail mounting
- Ultra compact plastic case
- Adjustable output voltage
- DC-OK signal
- Parallel operation possible
- Models with plugable screw terminals or with clamp type connections (Version D)
- Worldwide safety approvals
- 3 year manufacturer’s warranty

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TCL 012 &amp; 024</td>
<td>W=27, H=75, D=100mm</td>
<td>85-264Vac 50/60Hz or 85-375V dc</td>
<td>12V</td>
<td>4A</td>
<td>60W</td>
<td>124-0461</td>
<td>1.5</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>TCL 060</td>
<td>W=110, H=110, D=125mm</td>
<td>85-264Vac 50/60Hz or 85-375V dc</td>
<td>24V</td>
<td>2.5A</td>
<td>60W</td>
<td>124-0462</td>
<td>2.0</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>TCL 120</td>
<td>W=85, H=110, D=100mm</td>
<td>85-264Vac 50/60Hz or 85-375V dc</td>
<td>24V</td>
<td>5A</td>
<td>120W</td>
<td>124-0463</td>
<td>2.5</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
</tbody>
</table>

### Single Output Din Rail 25-45W

**DR-4S Series**

- Full range AC input
- High efficiency, low working temperature
- Built-in EMI filter
- Low ripple & noise
- Compact size, light weight
- Short circuit/Overload protection
- Installed on DIN rail T55/7.5 or 15
- Approvals: UL listed, TUV/CE pending

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Output Voltage</th>
<th>Power</th>
<th>Current</th>
<th>Dimensions (WxHxD)</th>
<th>Weight</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-4505</td>
<td>5V</td>
<td>2W</td>
<td>100mA</td>
<td>125-4956</td>
<td>0.5</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>DR-4512</td>
<td>12V</td>
<td>3.5A</td>
<td>200mA</td>
<td>125-4957</td>
<td>1.0</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>DR-4515</td>
<td>15V</td>
<td>2.8A</td>
<td>240mA</td>
<td>125-4958</td>
<td>1.2</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
<tr>
<td>DR-4524</td>
<td>24V</td>
<td>2.6A</td>
<td>460mA</td>
<td>125-4959</td>
<td>1.5</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
</tbody>
</table>

---

**Troubleshooting tips**

Chat online to one of our technical engineers at farne1.com

---

**Technical specifications**

- **Input Voltage**: 85 - 264Vac, 120 - 370Vac
- **Input Frequency**: 47 - 60Hz
- **Irish Current**: Cold Start, 30%+15%, 60%+20%
- **Overload Protection**: 150% to 155% output constant current limiting
- **Setup, Rise, Hold up time**: 800ms, 60ms, 20ms
- **Whitstand Voltage**: 1000V ac, 1500V dc
- **Working Temperature**: 0 - +50°C/10°C, -50°C/+88°F/1°C/86°F
- **Connection**: 4 P/7.5mm pitch terminal block

---

**Technical recommendations**

- Contact our technical engineers at farne1.com for more information on specific product requirements.
SITOP Smart DIN Rail Mounting PSUs

Narrow Universal Power Supply

- Narrow design with 33, 50 and 70 mm
- For standard applications with 2.5, 5 and 10 A
- Stabilised 24 V dc Output
- Snap Mounting on DIN rail 33, 50 and 70 mm
- Certified to CE, UL, CSA, GL

Output
24V/2.5A
24V/5A
24V/10A

Mfrs. List No. Voltage (WxHxD) Order Code
6EP1333-2BA04.. 24V/10A 600W 54x110x110 124-2649
6EP1333-2BA40.. 24V/10A 600W 54x110x110 124-2643

Power Voltage Current (WxHxD) List No. Order Code
600W 24V (24-48) 25A 165x125x125 124-2648
500W 24V (24-48) 20A 120x103x83 124-2580
300W 24V (24-48) 12A 207x114.6x83 124-2580
150W 24V (24-48) 6A 157x114.6x56.7 124-2579
75W 24V (24-48) 3A 90x114.6x56.7 124-2578
50W 24V (24-48) 2A 75x100x56.7 124-2577

Efficiency 90% 91%

Ambient Temperature 0°C to +70°C

Dimensions (W x H x D) in mm 70 x 125 x 125 70 x 125 x 125

Weight 750g 80g

80-480 Watt Industrial DIN Rail Mount Power Supplies

TSPC Series

- Cost optimized design in rugged, compact metal casing for harsh industrial environments
- Operating temperature range -25°C to +70°C
- Boost power up to 120%
- Industrial safety approval package
- Power Good signal
- Overload and over temperature protection
- Vibration and shock proof
- Screw terminals
- 3 years warranty

Input Voltage 85V AC to 122V AC, 220V AC to 246V AC

Line regulation ±0.1% max.

Load regulation ±10% max.

Ripple & Noise < 100 mV pp pk max.

EMI suppression EN 6100-3-2, EN 6100-3-3

Output 85-132/187-264V AC, 12V/24V

TSP-REM360 (2x 360W 24V) 200ms typ 8x12A 2x control inputs

List No. Voltage Input Voltage (WxHxD) Order Code
6EP1334-2AA01.. 24V / 5A 6EP1333-2BA04.. 24V / 10A 121-6629
6EP1334-2BA01.. 24V / 10A 121-6630
6EP1334-2B01.. 24V / 10A 121-6631
6EP1333-2BA04.. 24V / 10A 121-6632

Price Each
1 2 5 10 25

Cost effective design, prewired, ready for use in harsh industrial environments
### Modular PSUs - DIN Rail Mount - continued

#### 80-480 Watt Industrial DIN Rail Mount Power Supplies - continued

**TPC Series - continued**

<table>
<thead>
<tr>
<th>Power Supplies &amp; Converters</th>
<th>Power, Test and Measurement</th>
<th>Single Output Din Rail 76-480W</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN Rail Mount Power Supplies</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Farnell P 3188 Date: 07-09-12 time:09:11</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TDK-Lambda</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Modular DIN Rail Mounting PSUs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Siemens</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### DIN Rail Mount Power Supplies

- Convection cooled
- Conducted and radiated EMI, Class B
- Input transient protection, IEC61000-4
- Supports global use
- 3 year manufacturers warranty
- UL508 Listed

**Output Voltage**

<table>
<thead>
<tr>
<th>Power</th>
<th>Voltage</th>
<th>Dimensions (WxHxD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24V 3.1A</td>
<td>75W</td>
<td>50x97x110mm</td>
</tr>
<tr>
<td>24V 5A</td>
<td>120W</td>
<td>70x125x125</td>
</tr>
<tr>
<td>24V 7.5A</td>
<td>180W</td>
<td>80x97x110mm</td>
</tr>
<tr>
<td>24V 10A</td>
<td>240W</td>
<td>120x97x110mm</td>
</tr>
</tbody>
</table>

**DIN Rail Mounting PSUs**

**Siemens first modular power supplies**

- Flexible and cost-effective function upgrades
- Ultra-wide input voltage ranges AC 85 - 132 V and 176 - 550 V
- 5 A and 10 A two phase versions run on three phase supplies
- Robust design, high power density
- Selectable short-circuit behaviour: constant current or latching shutdown
- Overvoltage protection with autorecovery
- Over temperature protection (DR-240 Series only)
- Short circuit, over voltage, over load protection
- Built-in EMI filter
- Limiting AC surge current
- Soft start circuit
- Supports global use
- 5 year manufacturers warranty
- UL508 Listed

**Order Codes**

- **DRP-240-124**
- **DRP-480-124**

**Price Each**

- **24V / 10A**
- **24V / 15A**
- **24V / 20A**

**Efficiency**

- 90% Typ.
- 95% at 1 phase (at 120/230 V)
- 97% at 2 phase (at 120/230 V)

**IEC61000-4**

- Level 3

**Certifications**

- CE, UL/cUL

---

**NEW**

**120-480 Watt Single Output Din Rail PSUs**

- **International input range**
- **Installed on DIN rail TS35/7.5 or 15**
- **Soft start circuit**
- **Limited AC surge current**
- **Built in EMI filter**
- **Low ripple & noise**
- **Short circuit, over voltage, over load protection**
- **Over temperature protection (DR-240 Series only)**
- **100% full load in for 24 hours**
- **LED indication**
- **UL listed, cUL, TUV, BCB, CE certified**

**Input Voltage**

- 85 - 264V AC, 120 - 370V DC

**Input Frequency**

- 47 - 63Hz

**Insult Current**

- <1mA at 240V AC

**Leakage Current**

- <1mA at 240V AC

**Overload Protection**

- 105% to 150% output constant current limiting

**Setup, Rack, Hold up time**

- 100ms, 60ms, 30ms or 200V AC

---

**Output Voltage**

- 24V 3.1A: 75W
- 24V 5A: 120W
- 24V 7.5A: 180W
- 24V 10A: 240W

---

**Dimensions**

- **70x125x125**
- **90x125x125**

---

**Price Each**

- **24V / 10A**
- **24V / 15A**
- **24V / 20A**

---

**Efficiency**

- 90% Typ.
- 95% at 1 phase (at 120/230 V)
- 97% at 2 phase (at 120/230 V)

**IEC61000-4**

- Level 3

**Certifications**

- CE, UL/cUL

---

**NEW**

**120-480 Watt Single Output Din Rail PSUs**

- **International input range**
- **Installed on DIN rail TS35/7.5 or 15**
- **Soft start circuit**
- **Limited AC surge current**
- **Built in EMI filter**
- **Low ripple & noise**
- **Short circuit, over voltage, over load protection**
- **Over temperature protection (DR-240 Series only)**
- **100% full load in for 24 hours**
- **LED indication**
- **UL listed, cUL, TUV, BCB, CE certified**

**Input Voltage**

- 85 - 264V AC, 120 - 370V DC

**Input Frequency**

- 47 - 63Hz

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- 24V 3.1A: 75W
- 24V 5A: 120W
- 24V 7.5A: 180W
- 24V 10A: 240W

---

**Dimensions**

- **70x125x125**
- **90x125x125**

---

**Price Each**

- **24V / 10A**
- **24V / 15A**
- **24V / 20A**

---

**Efficiency**

- 90% Typ.
- 95% at 1 phase (at 120/230 V)
- 97% at 2 phase (at 120/230 V)

**IEC61000-4**

- Level 3

**Certifications**

- CE, UL/cUL

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- **Limited AC surge current**
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- **Low ripple & noise**
- **Short circuit, over voltage, over load protection**
- **Over temperature protection (DR-240 Series only)**
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- **LED indication**
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- <1mA at 240V AC

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**Overload Protection**

- 105% to 150% output constant current limiting

**Setup, Rack, Hold up time**

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---

**Output Voltage**

- 24V 3.1A: 75W
- 24V 5A: 120W
- 24V 7.5A: 180W
- 24V 10A: 240W

---

**Dimensions**

- **70x125x125**
- **90x125x125**

---

**Price Each**

- **24V / 10A**
- **24V / 15A**
- **24V / 20A**
DIN Rail Switch Mode PSUs

- Output current: 5A, 10A, and 20A
- Integrated power reserve of up to 50%
- 5 A and 10 A devices with pluggable connecting terminals
- Wide input range: 85 to 264V AC, 100 to 370V DC
- Output voltage adjustable in a range of 18 to 28V DC
- Parallel operation for increased capacity and redundancy
- Function module pluggable onto the front side

Messaging module
- LED for status indication
- Relay outputs "Input OK" and "Output OK"

Redundancy unit
- Redundancy unit with 2 inputs / channels for decoupling power supplies
- True redundancy by 100% decoupling with 2 integrated diodes

Control module
- Pluggable onto redundancy unit
- One relay output per monitored input / channel
- Threshold values adjustable (14 to 28V)

Regulated Switch Mode PSUs

- Digital output
- Output voltages 5V, 12V, 24V, 48V DC
- Adjustable output voltages
- High efficiency up to 90%
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- LED(s) for status indication

DIN Rail Switch Mode PSUs

- Output currents: 5A, 10A, and 20A
- Integrated power reserve of up to 50%
- 5A and 10A devices with pluggable connecting terminals
- Wide input range: 85 to 264V AC, 100 to 370V DC
- Output voltage adjustable in a range of 18 to 28V DC
- Parallel operation for increased capacity and redundancy
- Function module pluggable onto the front side

Messaging module
- LED for status indication
- Relay outputs "Input OK" and "Output OK"
- REMOTE ON/OFF function to switch on and off the power supply externally
- Output voltage monitoring is only possible in decoupled parallel operation

Redundancy unit
- Redundancy unit with 2 inputs / channels for decoupling power supplies
- True redundancy by 100% decoupling with 2 integrated diodes

Control module
- Pluggable onto redundancy unit
- One relay output per monitored input / channel
- Threshold values adjustable (14 to 28V)
- Indicate the presence of both input voltages via LEDs and energized output relays

Regulated Switch Mode PSUs

- Using the electronic technique of chopping, these power supplies guarantee the required quality of output current, allowing optimized costs. Their high efficiency enables us to offer power supplies among the most compact on the market, considerably reducing the space required in cabinets and cubicles.
- Providing an output of 5.5 A to 60 A and usable in single-phase and three-phase installations
- Energy reserves: 50% of extra current for at least 5 seconds
- Redundancy diode incorporated (DIN-ABLERMSM24200 model)
- Advanced diagnostics by LED and relay contact.
- Snap-on to the Omega rail
- Plug-in terminals up to and including the 240 W model

Applications
- No voltage drop for temporary output overload
- Continuity of operation if one phase is lost (ABLERM4W)
- Reduced consumption and component heating
- Protections against output overloads, voltage surges, abnormal rises in ambient temperature

Power Supplies & Converters
### Modular PSUs - DIN Rail Mount - continued

#### Regulated Switch Mode PSUs - continued

**Power Supplies - continued**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLRED24020</td>
<td>207-0135</td>
<td>1+ 5+ 10+ 25+</td>
<td>209-0128</td>
<td>ABL8RED24000</td>
<td>207-0130</td>
<td>1+ 5+ 10+ 25+</td>
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<td>ABLRED24050</td>
<td>207-0136</td>
<td>1+ 5+ 10+ 25+</td>
<td>209-0129</td>
<td>ABL8RED24020</td>
<td>207-0131</td>
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<td>209-0132</td>
<td>ABL8RED24030</td>
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<td>ABL8RED24040</td>
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<td>1+ 5+ 10+ 25+</td>
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#### DC/DC Converter Modules

<table>
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<tbody>
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<td>ABL8BUF24000</td>
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<td>1+ 5+ 10+ 25+</td>
<td>209-0134</td>
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#### Accessories

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</thead>
<tbody>
<tr>
<td>ABLRBUF24000</td>
<td>207-0135</td>
<td>1+ 5+ 10+ 25+</td>
<td>209-0136</td>
</tr>
</tbody>
</table>

### DC to DC Converters

#### Vehicle DC to DC Converters

**Regulated**

- A compact vehicle DC to DC converter that plugs directly into a 12V car cigar lighter
- 1.5, 3, 4.5, 6, 7.5, 9, 12V selectable output
- Flush voltage selector switch to prevent any accidental switching of the output voltage
- Fully IC regulated output
- Current rating 1.5V-300mA, 4.5V-500mA, 7.5V-800mA, 12V-1.2A
- Outputs via 6 interchangeable output connectors
- Short circuit protection
- Automatic thermal and overload cut-off

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 708000</td>
<td>211-0200</td>
</tr>
</tbody>
</table>

### In Car Universal Laptop / Notebook Power Supply

**NEW**

- Including 6 different adaptor plugs for Dell, Samsung, Sony, Fujitsu, HP, IBM, Lenovo, Acer and Compaq
- Input voltage: 10.8V to 14.4V dc
- Max. current rating: 4A
- Adjustable output voltage from 15V to 24V dc
- Maximum output current: 4A @ 15V-22V, 3.75A @ 24V

<table>
<thead>
<tr>
<th>List No.</th>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200-0000</td>
<td>188-0035</td>
<td>1+ 5+ 10+ 25+</td>
</tr>
</tbody>
</table>

### 75 Watt DC/DC Vehicular PSU

**NEW**

- Adjustable output voltage
- Input voltage: 10.8V to 14.4V dc
- Variable output: 15,16,18,19,20,22,24V dc
- Max. current rating: 4A
- Correct polarity adjustable with alternate connector
- Includes exchangeable multi-tip connectors
- Universal power supply for laptop computers
- IP40 rated
- Operating temperature: 0°C to 25°C

#### Dimensions (mm): H=32, W=53, D=100

### DC/DC Linear Converters

**NEW**

- Protected against reversed polarity
- Protected against overvoltage
- 6.3mm push-on terminals
- Common negative connection for input and output
- Designed for operating car stereo equipment
- Compact design
- Meets E marked vehicle directive ref. (95/54/EC)

<table>
<thead>
<tr>
<th>Output Voltage (Vdc)</th>
<th>Max. Load (W)</th>
<th>Output Voltage (Vdc)</th>
<th>Max. Load (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>3.0 (1A Backup)</td>
<td>12</td>
<td>40 (12W Backup)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>118-3903</td>
</tr>
<tr>
<td>118-9936</td>
</tr>
<tr>
<td>249279</td>
</tr>
</tbody>
</table>

### Intelligent DC/DC Converters - 24V dc/12V dc

**NEW**

- A range of professional quality, DC-DC convertors allowing 12V dc operated equipment to be powered by 24V batteries commonly found on diesel engined vehicles and vessels. The units provide high performance and reliability and include many additional protection features that prevent damage to the units and the vehicle wiring system when operated under fault or overload conditions. Supplied with a connector kit and a snap on mounting bracket allowing the units to be fixed to panels and bulkheads.
- Switch mode technology
- High efficiency, cool running
- Soft shut down to prevent fuses being blown or damage caused by short circuit, overload, reverse polarity and wiring faults
- Rugged and compact with anodised aluminium/polycarbonate cases
- Fast and easy installation with push on terminals
- Over current and overheat
- LED output and status indicators

<table>
<thead>
<tr>
<th>Input Voltage Range</th>
<th>5 to 38V dc</th>
<th>Input Voltage Range</th>
<th>5 to 38V dc</th>
</tr>
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<tbody>
<tr>
<td>Current Rating Cont/Surge</td>
<td>121-4891</td>
<td>74x31x9mm</td>
<td></td>
</tr>
<tr>
<td>121-4892</td>
<td>74x31x9mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>121-4894</td>
<td>74x31x9mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions (WxHxD)</th>
<th>75/9V=800mA, 12V=1.2A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5, 3, 4.5, 6, 7.5, 9, 12V selectable output</td>
<td></td>
</tr>
<tr>
<td>Flush voltage selector switch to prevent any accidental switching of the output voltage</td>
<td></td>
</tr>
<tr>
<td>Fully IC regulated output</td>
<td></td>
</tr>
<tr>
<td>Current rating 1.5V-300mA, 4.5V-500mA, 7.5V-800mA, 12V-1.2A</td>
<td></td>
</tr>
<tr>
<td>Outputs via 6 interchangeable output connectors</td>
<td></td>
</tr>
<tr>
<td>Short circuit protection</td>
<td></td>
</tr>
<tr>
<td>Automatic thermal and overload cut-off</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>231183</td>
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<td>231181</td>
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### Power Supplies

**Power Supplies**

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<tr>
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<tr>
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<tr>
<td>ABLRED24050</td>
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<tr>
<td>ABLRED24090</td>
<td>207-0137</td>
<td>1+ 5+ 10+ 25+</td>
<td>209-0132</td>
</tr>
</tbody>
</table>

#### DC-DC Converters

**Regulated**

A compact vehicle DC to DC converter that plugs directly into a 12V car cigar lighter

- 1.5, 3, 4.5, 6, 7.5, 9, 12Vdc selectable output
- Flush voltage selector switch to prevent any accidental switching of the output voltage
- 12V or 24V dc input
- Fully regulated output
- 2A Current rating
- Outputs via 6 interchangeable output connectors
- Short circuit protection
- Automatic thermal and overload cut-off

<table>
<thead>
<tr>
<th>Order Code</th>
<th>Price Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 708000</td>
<td>211-0200</td>
</tr>
</tbody>
</table>
Battery Converter - Installed
24 Vdc - 12 Vdc
- High quality vehicle voltage converter 24 V to 12 V dc
- Range of switch mode and isolated converters
- Fast easy installation
- Suits cellular, PMR, PAMR and mobile
- Meets petrochemical Specifications
- Output voltage indicator
- Inherent fault isolation circuit
- CE marked

DC to DC Converters
DD Series
- Compact, light weight and rugged
- Switch mode technology
- Casing sealed to IP 533
- Low off load current consumption (<50mA typical)
- Inherent reliability with no quibble manufactures life time guarantee
- CE and E marked
- Red output LED ensures the units operation and eases fault finding
- High efficiency. Typically 90% of non isolated units and 85% for isolated units
- Suitable for mounting in confined spaces without overheating

**Continuous**

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage (Vdc)</th>
<th>Current (A)</th>
<th>Power (W)</th>
<th>Ripple &amp; Noise (mV)</th>
<th>Regulation (±%)</th>
<th>Efficiency (Typ.)</th>
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<tbody>
<tr>
<td>6A PV67</td>
<td>9.2 to 18</td>
<td>4 to 7</td>
<td>54 to 72</td>
<td>±0.5%</td>
<td>67%</td>
<td>84%</td>
</tr>
<tr>
<td>12A PV12</td>
<td>9.2 to 18</td>
<td>8 to 13</td>
<td>80 to 120</td>
<td>±0.5%</td>
<td>67%</td>
<td>84%</td>
</tr>
<tr>
<td>3A PV35</td>
<td>9.2 to 18</td>
<td>1 to 2</td>
<td>27 to 40</td>
<td>±0.5%</td>
<td>67%</td>
<td>84%</td>
</tr>
<tr>
<td>6A PV65</td>
<td>9.2 to 18</td>
<td>4 to 7</td>
<td>54 to 72</td>
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<td>67%</td>
<td>84%</td>
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<tr>
<td>12A PV12</td>
<td>9.2 to 18</td>
<td>8 to 13</td>
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<tr>
<td>24A PV24E</td>
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<td>12 to 18</td>
<td>135 to 240</td>
<td>±0.5%</td>
<td>67%</td>
<td>84%</td>
</tr>
</tbody>
</table>

**Output Noise**

- <100mA
- >400Vrms between input, output and case, on isolated products only
- 30 to 70°C de-rate linearly to 0A
- 15mA

**Storage Temperature**

- -25°C to +100°C

**Case Material**

- Non conductive aluminium/Glass filled polycarbonate

**Built in EMI filter, low ripple noise**

**Compact, light weight and rugged**

**High efficiency**

**Inherent reliability with no quibble manufactures life time guarantee**

**CE marked**

**Input Voltage**

- 8.4 to 15.6V

**Suitable for mounting in confined spaces without overheating**

**Input Voltage**

- 27.2V
- 72W
- 89 87 50

**DD12-24-072 072 118-4210 227657**

**Price Each**

- 118-4210

**Output Voltage**

- 13.6V
- 108W
- 127 87 50

**DD12-24-072 151-1260**

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**DC to DC Switch Mode Converters**

**8662/9260/9970 Series:**

- Protected against reversed polarity and overvoltage
- Fixed input
- Automatic shutdown on over/under voltage at input
- 90/54/EC
- CE marked

**Continuous**

<table>
<thead>
<tr>
<th>List No.</th>
<th>Voltage (Vdc)</th>
<th>Current (A)</th>
<th>Power (W)</th>
<th>Ripple &amp; Noise (mV)</th>
<th>Regulation (±%)</th>
<th>Efficiency (Typ.)</th>
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<tbody>
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<td>67%</td>
<td>84%</td>
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</table>

**Output Voltage**

- 50mA typical)

**15W Single Output DC/DC Converter**

- 2.1 wide input range
- 3000Vdc U/O Isolation
- Short Circuit, Overload, Over Voltage and Over Temperature protection
- Built in EMI filter, low ripple noise
- 100% full load burn-in test
- Fixed switching frequency at 83kHz
- Cooling by free air convection
- Miniature profile

**Applications:**

- General electrical engineering
- Automotive
- Battery back-up

**Order Code**

- 151-1260

**Price Each**

- 118-4210

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Dimensions (mm)**

- 27.2Vdc - 12Vdc
- 350050

**Price Each**

- 151-1260

**Order Code**

- 151-1260

**Specifications**

- Security
- Battery back-up
- Power on LED
- Built in EMI filter, low ripple noise
- 100% full load burn-in test
- Fixed switching frequency at 83kHz
- Cooling by free air convection
- Miniature profile

**Applications:**

- General electrical engineering
- Automotive
- Battery back-up

**Order Code**

- 156-2000

**Price Each**

- 156-2000

**Order Code**

- 156-2000

**Specifications**

- Security
- Battery back-up
- Power on LED
### DC to DC Converters - continued

#### 30W - 100W Enclosed DC-DC Power Supplies - continued

<table>
<thead>
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<td>6V, 6A</td>
<td>8 - 18</td>
<td>70</td>
<td>SDS-030B05</td>
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<td>9V, 6A</td>
<td>11 - 18</td>
<td>70</td>
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<td>70</td>
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<td>17 - 18</td>
<td>70</td>
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<tr>
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<td>24V, 6A</td>
<td>28 - 36</td>
<td>70</td>
<td>SDS-060A06</td>
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<tr>
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<td>24V, 6A</td>
<td>28 - 36</td>
<td>70</td>
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<td>70</td>
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<td>24V, 6A</td>
<td>28 - 36</td>
<td>70</td>
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<td>70</td>
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<td>24VDC</td>
<td>70</td>
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#### 60W

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<tbody>
<tr>
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<td>66</td>
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<td>15 - 18</td>
<td>66</td>
<td>SDS-060B12</td>
<td>125-4998</td>
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<td>12V, 5A</td>
<td>15 - 18</td>
<td>66</td>
<td>SDS-060C12</td>
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<tr>
<td></td>
<td>12V, 5A</td>
<td>15 - 18</td>
<td>66</td>
<td>SDS-060D12</td>
<td>125-4995</td>
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<tr>
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<td>12V, 5A</td>
<td>15 - 18</td>
<td>66</td>
<td>SDS-060E12</td>
<td>125-4993</td>
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<tr>
<td></td>
<td>24V, 2A</td>
<td>29 - 36</td>
<td>68</td>
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<td>24V, 2A</td>
<td>29 - 36</td>
<td>68</td>
<td>SDS-060B24</td>
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<td>29 - 36</td>
<td>68</td>
<td>SDS-060C24</td>
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<td>24VDC</td>
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#### 100W

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<td>30 - 36</td>
<td>78</td>
<td>SDS-100B24</td>
<td>125-5001</td>
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#### Dimensions (WxHxD)

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions (mm)</th>
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<tbody>
<tr>
<td>SDS-030A05</td>
<td>125-4988</td>
</tr>
<tr>
<td>SDS-030B05</td>
<td>125-4999</td>
</tr>
<tr>
<td>SDS-030C05</td>
<td>125-4991</td>
</tr>
<tr>
<td>SDS-030D05</td>
<td>125-4997</td>
</tr>
<tr>
<td>SDS-030E05</td>
<td>125-4995</td>
</tr>
<tr>
<td>SDS-060A06</td>
<td>125-4999</td>
</tr>
<tr>
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<td>125-4998</td>
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<td>125-4989</td>
</tr>
<tr>
<td>SDS-060E24</td>
<td>125-4988</td>
</tr>
</tbody>
</table>

#### Chassis Mount DC/DC Converters

**HDD Series**

The HDD series is an extremely robust range of wide input DC-DC converters that are specifically designed for use in chassis mount applications where a stable, isolated output is required. Incorporating reverse polarity protection, a wide trim range and a shut down facility as standard this flexible product can be used in a diverse range of industrial, transport and battery powered applications.

- Wide 2:1 input voltage range
- Regulated outputs
- Output can be adjusted by ±10% using external resistors
- 1.5k output isolation
- PI input filter, meets EN 55022 Class A with external filter
- Remote On/Off Control
- Continuous short circuit protection
- Internally fitted shunt diode, provides reverse polarity protection when used in conjunction with external fuses
- Built for chassis mounting, fitted with screw terminal connectors

### DC to AC Inverters

**SINERGEX Modified Sinewave Inverters**

A range of high quality, DC/AC inverters that simply and silently convert 12 or 24 voltage battery power to 230 V AC mains. Suitable for running everything from notebook computers to microwaves and power tools to hairdryers in vehicles, boats, caravans etc.

#### Specification

- **Input Voltage**: 24V, 36V, 48V
- **Output Voltage**: 225V, 110V, 120V, 230V
- **Rated Frequency**: 50Hz, 60Hz
- **Rated Power**: 150W, 300W, 500W
- **Inrush Current**: 16Arms
- **Efficiency**: 90% - 95%
- **Weight**: 0.6kg - 0.9kg
- **Dimensions**: (WxHxD) 116.8x12.7x61

#### Model List

<table>
<thead>
<tr>
<th>Model</th>
<th>List No.</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDD60-12501</td>
<td>AH1030L-01L</td>
<td>164-3209</td>
</tr>
<tr>
<td>HDD60-25012</td>
<td>AH10120L-01L</td>
<td>164-3210</td>
</tr>
</tbody>
</table>

#### Unit Connection Method

- **Connection**: Parallel operation the total input current must be <16Ams, requires external rectifiers
- **Output Surge**: 300W, 600W, 1.2kW
- **Output Cont.**: 150W, 270W, 550W
- **Weight**: 0.6kg - 0.9kg
- **Dimensions**: (WxHxD) 116.8x12.7x61
Operating Temperature: 0°C to 40°C
Protection Type: One-Shot Thermal Fuse
- V-0 Rated Enclosure
- Operating Temperature: 0°C to 40°C
- Input voltage: 230V/240V @ 50/60Hz

Mains Adaptors - Linear

AC/DC CCTV Power Supply

An AC/DC power supply suitable for use with CCTV systems.

Mains Adaptors - Switch Mode

Regulated AC/DC 300mA Power Adaptor

A Regulated plug-in power supply with 7 output voltages. Polarity can be changed by reversing the plug connection. Interchangeable DC plugs with 6 common sizes included.

Technical Data
- Input Voltage: 230Vac 50Hz
- Output Voltage: 1.5, 3, 4.5, 6, 7.5, 9 & 12Vdc
- Max. Load: 300mA max
- Dimensions: 90x56x44mm

Unregulated 3/4.5/6/7.5/9/12V dc Power Adaptor

A non-regulated plug-in power supply with 6 output voltages. Polarity can be changed by reversing the plug connection. Interchangeable DC plugs with 6 common sizes included.

Technical Data
- Input Voltage: 230Vac 50Hz
- Output Voltage: 3, 4.5, 6, 7.5, 9 & 12Vdc
- Max. Load: 300mA max
- Dimensions: 90x56x44mm

3 Watt Single Output Plug-In PSUs

- USB Switching wall-mount power supply
- Universal AC input
- Regulated output
- Overload and short circuit protection
- Constant voltage, constant current
- Efficiency Level V

Technical Data
- Input range: 100-250 VAC
- Frequency: 47-67 Hz
- Output Voltage: 5V (4.75-5.25 V)
- Output Current: 0.55 A
- Output Power: 5 W

Price Each

Order Code
1+ 5+ 10+ 25+
151-4347

AC/DC Switch Mode PSUs

An ultra-compact range of UK plug top switch mode power supplies providing a regulated output voltage and providing up to 7.5 watts of continuous output power. These power supplies meet CEC and Energy Efficiency Level IV requirements.

- Wide range input 90-264V AC
- Automatic built-in short circuit, over voltage and over current protection
- Meets CEC Energy Efficiency Level IV (63% typical)

Technical Data
- Input Voltage: 90-264V ac 47-63Hz
- Load Regulation: +/–5%
- EMI: FCC Class B conduction & radiation
- Efficiency: 63% typical
- MeanTime Between Failures: 50000 hours at 25°C full load
- Safety: CE, CB

Price Each

Order Code
1+ 5+ 10+ 25+
123-45678
Mains Adaptors - Switch Mode - continued

AC/DC Switch Mode PSUs - continued

<table>
<thead>
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<th>Voltage</th>
<th>Current</th>
<th>Order Code</th>
<th>Price Each</th>
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<tr>
<td>2.1mm DC Plug</td>
<td>5V</td>
<td>1.5A</td>
<td>206-0972</td>
<td>1+</td>
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<tr>
<td></td>
<td>9V</td>
<td>600mA</td>
<td>206-0973</td>
<td>5+</td>
</tr>
<tr>
<td></td>
<td>9V</td>
<td>1A</td>
<td>206-0981</td>
<td>10+</td>
</tr>
<tr>
<td></td>
<td>12V</td>
<td>206-0974</td>
<td>25+</td>
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<td></td>
<td>24V</td>
<td>600mA</td>
<td>206-0975</td>
<td>10+</td>
</tr>
</tbody>
</table>

- Input Voltage: 100 - 240VAC
- Input Current: 0.15A
- Input Frequency: 50-60Hz
- Operating Temperature: 0°C to 40°C at maximum load
- Weight: 90g
- Mftrs.: 117-6575

---

Regulated AC/DC Plug-in Euro Power Supplies

A range of Euro plug top switch mode power supplies supplying up to 12 watts continuously with full CB, CE and LPS safety approvals. This ultra compact range is RoHS compliant and meets CEC Energy Efficiency level IV requirements for no load power consumption. These units provide a reliable, single regulated output voltage. Models range from 5Vdc up to 24Vdc as standard.

<table>
<thead>
<tr>
<th>Order Code</th>
<th>List No.</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Output</th>
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<td>117-6514</td>
<td>5V</td>
<td>500mA</td>
<td>3W</td>
<td>12W</td>
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<tr>
<td>206-0935</td>
<td>117-6515</td>
<td>6V</td>
<td>500mA</td>
<td>3W</td>
<td>12W</td>
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<td>117-6516</td>
<td>9V</td>
<td>750mA</td>
<td>4.5W</td>
<td>18W</td>
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<td>206-0937</td>
<td>117-6517</td>
<td>12V</td>
<td>500mA</td>
<td>6W</td>
<td>24W</td>
</tr>
</tbody>
</table>

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3-12V Universal Power Supply

- Regulated output voltage
- Short circuit proof
- Different output connectors included which can be connected to the output cable with the desired polarity
- Selectable output voltages by a rotary switch
- Supplied with changeable input plugs for Europe, UK, USA and Australia

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<thead>
<tr>
<th>Mftrs.</th>
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<th>Output Voltage</th>
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<th>Output Power</th>
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<td>24V/500mA</td>
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<td>SW4303</td>
<td>117-6588</td>
<td>12V/1A</td>
<td>1.2A</td>
<td>12W</td>
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<td>1.2A</td>
<td>12W</td>
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<td>SW4305</td>
<td>117-6590</td>
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<td>1.2A</td>
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<td>117-6591</td>
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<td>1.5A</td>
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<td>3V/4A</td>
<td>1.5A</td>
<td>12W</td>
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6W Ultra Compact Switch Mode

A series of 6W ultra compact switchmode power supplies. Ideal for applications such as PDA’s, MPEG players, digital cameras etc.

- Universal input 100-240V ac
- Interchangeable primary adaptors
- Constant voltage, current limited
- Low leakage current <10μA
- Low standby power <0.3 Watt

Dimensions (WxHxD): 61x37x11.3

Note: Plug Adaptors available separately

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<td>3.6W</td>
<td>24V</td>
<td>500mA</td>
<td>75%</td>
<td>50-60Hz</td>
<td>100%</td>
<td>1814933</td>
<td>117-6581</td>
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<td></td>
</tr>
</tbody>
</table>

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The first online technical portal for design engineers

Log on, research, refine and design
Regulated AC/DC PSU

- Regulated output voltage
- Short circuit proof
- World wide application possible due to wide range input
- Selectable output voltage by a rotary switch: 3, 4.5, 5, 6, 7.5, 9, 12V DC
- Maximum output current: 600mA
- Maximum output power: 7.2W
- Selectable output voltage by a rotary switch: 3, 4.5, 5, 6, 7.5, 9, 12V DC
- Load Regulation ±5%
- Line Regulation Eff 74% min
- Operating Temperature 0°C to 40°C
- No Load Input Power <0.3W
- Input Voltage 80 - 264VAC

8 Watt Single Output Plug-Top PSUs

- IT & Medical 3rd Edition Safety Approvals
- CEC2008 & EISA 2007 Compliant
- <0.3W No Load Input Power
- Interchangeable Input Connectors
- Class II Construction
- Low Cost
- Output via 2.5mm plug

10 Watt Single Output Plug-In PSUs

- Energy Star Level V
- CEC 2008 & EISA 2007 Compliant
- Output Voltages from 5 to 24 VDC
- No Load Input Power < 0.3 W
- Energy Star Level V
- CEC 2008 & EISA 2007 Compliant
- Output Voltages from 5 to 24 VDC
- No Load Input Power < 0.3 W

8W Switch Mode AC/DC PSUs

- FRIWO® Power Supplies & Converters
- PP9 Series
- A range of fixed voltage plug-in power supplies with a space saving design that is the same width as a standard mains plug allowing four units to be used side by side on a common 4 gang mains extension lead.
- Fixed, regulated output voltage
- Wide input range
- Switch mode technology for high power to weight and size ratio
- High efficiency and reliability
- Lightweight
- Supplied with 2m lead exchangeable output plug adapters available

- Reversible polarity
- BABT approved

Universal adaptor set (5 piece)

- Price Each
- Dimensions: H=26.8, W=72, D=42.4mm
- Input Voltage 90 - 264V ac, 47 to 63Hz
- Dimensions (WxHxD) 48x74x50mm
- Input Current 0.3 A max at 90 VAC
- Load Regulation ±5%
- Line Regulation Eff 74% min
- Efficiency 74% typical
- No Load Input Power <0.3W
- EU Plug 171-6986

Price Each

- Price Each
- Dimensions: H=26.8, W=72, D=42.4mm
- Input Voltage 90 - 264V ac, 47 to 63Hz
- Dimensions (WxHxD) 48x74x50mm
- Input Current 0.3 A max at 90 VAC
- Load Regulation ±5%
- Line Regulation Eff 74% min
- Efficiency 74% typical
- No Load Input Power <0.3W
- EU Plug 171-6986

Price Each
15W Medical

A series of 15W medically approved power supplies.

- Universal input 100-240V ac
- Interchangeable primary adapters
- Constant voltage, current limited
- Green LED indicating power On
- Low leakage current <0.5 μA
- Low standby power <0.5 Watt

Dimensions (WxHxD): 51.5x87.5x34mm

Input Voltage: 100-240V ac
Input Current: 0.4A
Input Frequency: 50-60Hz
Efficiency: 80% typ. at full load
Weight: 130g

List No. | Voltage | Current | Power | Ripple & Emissions |
---------|---------|--------|-------|--------------------|
135-4821 | 9V | 1.2A | 20W | EN55022, level B conducted & radiated |
135-4822 | 12V | 1A | 24W | EN55022, level B conducted & radiated |
135-4823 | 15V | 0.8A | 30W | EN55022, level B conducted & radiated |

20-30W AC/DC Interchangeable Power Supplies
HP Series

Comprehensive range of 20 to 30W compact switch mode, regulated output, Desk Top Power Supplies, with the unique ability to change to plug-in models with the UK, US, Euro & Australian plugs included. Approvals to International standards and supplied with a variety of 8 common output connectors on 1.8m output cable.

- Over voltage and short circuit protected (Auto Recovery)
- Operating Temperature 0°C to 40°C
- Input voltage: 90V to 264V ac
- Can be used as either Desk Top or Plug Top
- Available with DC socket with a variety of 8 common connectors

---------|---------|--------|-------|--------|------------|
25HK-AJ-090A266-CP | 9V | 2.66A | 22.5W | 77% | 171-6982 |
25HK-AJ-090A266-CP | 12V | 2A | 24W | 78% | 171-6982 |
25HK-AJ-090A240-CP | 15V | 1.5A | 30W | 77% | 171-6982 |
25HK-AJ-090A240-CP | 24V | 1A | 30W | 78% | 171-6982 |

24 Watt Single Output Plug-Top PSUs

- IT & Medical 3rd Edition Safety Approvals
- CEC2008 & EISA2007 Compliant
- Interchangeable Input Connectors
- Class II Construction
- Low Cost
- Output Voltages from 5 V to 24 V
- Output via a 2.5mm plug

---------|---------|--------|-------|--------|------------|
25HK-HP30-A15 | 15V | 1A | 15W | 78% | 171-6982 |
25HK-HP30-A24 | 24V | 1A | 30W | 78% | 171-6982 |

Exchanging Input Plug Adaptors

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<thead>
<tr>
<th>Country</th>
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Exchanging Output Plug Adaptors

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<td>2.1x6.5x11.5 Coax</td>
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<td>2.5 Jack</td>
<td>117-6598</td>
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<tr>
<td>3.5 Jack</td>
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</table>

15-18W AC/DC Interchangeable Power Supplies
IP Series

Over voltage and short circuit protected (Auto Recovery)
Operating Temperature 0°C to 40°C
Input voltage: 90V to 264V ac
Can be used as either Desk Top or Plug Top
Available with DC socket with a variety of 8 common connectors

List No. | Voltage | Current | Power | Order Code |
---------|---------|--------|-------|------------|
25HK-AJ-090A200-CP | 9V | 1.2A | 18W | 211-2010 |
25HK-AJ-090A240-CP | 12V | 1A | 18W | 211-2010 |
25HK-AJ-090A240-CP | 24V | 0.5A | 18W | 211-2010 |

Power Supplies & Converters

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Complete cost control, reduced administration time, visibility of your spend, flexibility and personalised to your company’s needs.
farnell.com/ibuy
Mains Adaptors - Switch Mode - continued

12W Desktop Medical PSU

- Energy Efficiency Level V
- CE/CSA 2008 and EISA 2007 Compliant
- Interchangeable Input Connectors
- <0.3W No Load Input Power
- Low Cost
- Output Voltages from 9 V to 24 V
- Output via 2.5mm plug

Dimensions: H=36, W=91, D=38mm
- No Load Input Power
- Input Frequency 47 - 63 Hz
- Efficiency Up to 84%
- Ripple & Noise 1% pk-pk, 20 MHz bandwidth
- No Load Input Power <0.5W
- Operating Temperature -30°C to +40°C, no derating
- Safety Approvals EN60950-1: UL/cUL60950-1, CE Mark
- Emissions EN55022: EN55022, Level B Conducted & Radiated

List No. Power Rating Voltage Current Model
VPE12US09 12W 9V 2A 182-7423
VPE12US12 12W 12V 1A 182-7424
VPE12US15 12W 15V 0.8A 182-7425
VPE12US18 12W 18V 0.67A 182-7426
VPE12US24 12W 24V 0.5A 182-7427

12 Watt Switch Mode AC/DC PSU

- Energy Star Level V
- CE/CSA 2008 and EISA 2007 Compliant
- High Efficiency
- No Load Input Power <0.5 W
- International Safety Approvals
- Compact Dimensions
- Class I & II Versions
- Class II - IEC 320-C8 INLET

- Input Voltage 90 - 264VAC
- Input Frequency 47 - 63 Hz
- Efficiency 87% typical
- Ripple & Noise 1% pk-pk max, 20 MHz bandwidth
- No Load Input Power <0.5W
- Operating Temperature -30°C to +40°C, no derating
- Safety Approvals EN60950-1: UL/cUL60950-1, CE Mark
- Emissions EN55022: EN55022, Level B Conducted & Radiated

List No. Power Voltage Current Model
AEL15US08 15W 8V 1.87A 163-3346
AEL15US12 15W 12V 1A 163-3347
AEL15US15 15W 15V 0.6A 163-3348
AEL15US18 15W 18V 0.5A 163-3349
AEL15US24 15W 24V 0.31A 163-3350

18 Watt Switch Mode PSU

- Energy Efficiency level V
- CE/CSA 2008 and EISA 2007 Compliant
- <0.5W no load input power
- Approved as LPS
- Operation to +70°C
- CCC qualified
- 3 year warranty

- Input Voltage 90 - 264VAC
- Input Frequency 47 - 63 Hz
- Efficiency Up to 82%
- Ripple & Noise 1% pk-pk max
- Total Regulation +3.7% model dependent
- Operating Temperature -20°C to 70°C, derate from 40°C
- Safety Approvals EN60950-1: UL/cUL60950-1, CEC, C-PS, CE
- Emissions EN55022: EN55022, Level B Conducted & Radiated

List No. Power Voltage Current Model
AEL18US03 18W 3.3V 5.5A 163-3351
AEL18US05 18W 5V 3.6A 163-3352
AEL18US09 18W 9V 2A 163-3353
AEL18US12 18W 12V 1.5A 163-3354
AEL18US15 18W 15V 1A 163-3355
AEL18US18 18W 18V 0.83A 163-3356
AEL18US24 18W 24V 0.75A 163-3357
AEL18US30 18W 30V 0.6A 163-3358
AEL18US36 18W 36V 0.5A 163-3359
AEL18US48 18W 48V 0.31A 163-3360
Universal Power Supply

- Supplied with changeable input plugs for Europe, UK, USA and Australia
- Energy efficiency level V
- CEC 2008 and EESA 2007 compliant
- >0.5W No Load Input Power
- Over operation to +70°C
- Fully regulated output
- Overcurrent and overvoltage protection
- CCC qualified
- Class II
- Approved as LPS
- CE marked
- High efficiency
- Certificate of Compliance:
  - CEC 2008
  - EISA 2007
- Universal AC input
- CE certified

20 Watt Single Output Desktop PSUs

- Energy efficiency level V
- CEC 2008 and EESA 2007 compliant
- >0.5W No Load Input Power
- Operation to +70°C
- Fully regulated output
- Overcurrent and overvoltage protection
- CCC qualified
- Class II
- Approved as LPS
- High efficiency
- Adjustable output voltage
- Adjustable input voltage
- Input voltage: 100V to 240V ac
- Overvoltage protection
- Short circuit proof
- Universal input voltage
- Short circuit proof
- Overvoltage protection
- Compact design
- Medical approved

AC/DC Desktop PSUs

- Adjustable output voltage
- Input voltage: 100V to 240V ac
- Variable output selected by jumpers (supplied): 5.6, 7.8, 9, 10, 11, 12V dc
- Protection class: II
- Includes exchangeable multi-tip connectors
- IP00 rated
- Operating temperature: 0°C to 40°C
- Supplied with UK adapter plug and Euro plug lead (1.2m)

40/60W Desktop PSU Medical Approved

- Universal input voltage
- Short circuit proof
- Overvoltage protection
- Compact design
- Medical approved

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Mains Adaptors - Desktop/Portable - continued

**25 Watt Single Output Desktop PSUs**

- Energy Star Level V
- CEC 2008 and EISA 2007 Compliant
- High Efficiency
- No Load Input Power <0.5 W
- International Safety Approvals
- Compact Dimensions

Dimensions: H=31, W=104.4, D=42mm

**Output Connector:** Barrel type with 11mm length, 5.5mm dia. outer, 2.5mm dia. inner with centre (+) and outer shell (-) polarity.

**Input Voltage:** 90 - 264VAC

**Input Frequency:** 47 - 63 Hz

**Efficiency:** 87% typical

**Ripple & Noise:** 1% peak-to-peak, 20 MHz bandwidth

**No Load Input Power:** <0.5W

**Operating Temperature:** 0°C to +40°C, no derating

**Safety Approvals:** EN60950-1, UL/cUL60950-1, CE Mark

**Emissions:** EN55022 Level B conducted & radiated

**No Load Input Power:** <0.5 W

**Ripple & Noise:** 1% pk-pk max, 20 MHz bandwidth

**Efficiency:** 87% typical

**Input Frequency:** 47 - 63 Hz

**Output Voltage:** 0.5 V to 30 V

**Current:** 0.25 A rms @ 230 VAC; 0.125 A @ 115 VAC

**Inrush Current:** 50A @ 230 VAC, cold start @ 25°C

**Line Regulation:** ±1% max.

**Temperature Range:** 0°C to +70°C

**40 Watt Single Output Desktop PSUs**

- Medical and ITE safety
- Universal AC input
- Fully regulated output
- Overload and short circuit protection
- Constant voltage
- High efficiency
- High MTRF

**Input Voltage:** 90-264 VAC, 127-300 VDC

**Input Range:** 90VAC)

**Frequency:** 47-63 Hz

**Ripple & Noise:** 1% max pk-pk, 20 MHz BW

**Efficiency:** 88% typical

**Operating Temperature:** 0°C to +70°C, derate linearly from 100% power at +40°C to 60% power at +70°C

**Safety Approvals:** CEC & EISA Compliant

**Emissions:** EN60950-1, UL60950-1, IEC60950-1, EN60601-1, UL60601-1, IEC60601-1, ENS50522 Level II conducted & radiated

**48-60 Watt Single Output Desktop PSUs**

- IT & Medical 3rd Edition Safety Approvals
- <0.5W No Load Input Power
- Energy Efficiency Level V
- CEC2008 and EISA2007 Compliant
- 3 Year Warranty

**Input Voltage:** 90-264 VAC (denote <90VAC)

**Input Frequency:** 47-63 Hz

**Efficiency:** >86% typical

**Ripple & Noise:** 1% max pk-pk, 20 MHz BW

**Operating Temperature:** 0°C to +70°C, derate linearly from 100% power at +40°C to 60% power at +70°C

**Safety Approvals:** AFM45US: H=36, W=121, D=50mm

**Emissions:** EN60950-1, UL60950-1, IEC60950-1, EN60601-1, UL60601-1, ENS50601-1, ENS51001/22/FCC Class II, ENS51001/22/FCC Class B radiated
AC/DC Desktop PSUs

- Adjustable output voltage
- Input voltage: 100V to 240V ac
- Variable output selected by jumpers (supplied): 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24V dc
- Protection class: II
- Includes exchangeable multi-tip connectors
- IP40 rated
- Overcurrent, overvoltage and thermal protection
- Complies with Blue Angel requirement
- AC Input fuse
- Built in EMI filter

Dimensions (mm): H = 30.5, W = 58, D = 132.1mm

50 - 100 Watt Single Output DC/DC Converters

- Universal AC input
- Fully regulated output
- Overload and short circuit protection
- Internal remote sense
- Constant voltage
- High MTBF
- EEC20 AC receptacle, 3 pin (type C14)
- Built in EMI filter (CISPR 22 Class B)
- LED power good indicator
- Approvals CE (EMC&LVD), UL listed, CSA, VDE

60W DC Desktop/AC Power Supplies

- Medical 3rd Edition Safety Approvals
- 2 x MOPP
- CE & ESHA Compliant ≥12V
- 480 VAC isolation
- Class II Construction
- Single Outputs from 5 V to 48 V
- 3 Year Warranty

- Medical 3rd Edition Safety Approvals
- 2 x MOPP
- CE & ESHA Compliant ≥12V
- 480 VAC isolation
- Class II Construction
- Single Outputs from 5 V to 48 V
- 3 Year Warranty
50 Watt Triple Output AC/DC Power Supplies - continued

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
<th>Medical</th>
<th>Dimensions (WxHxD)(mm)</th>
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<tbody>
<tr>
<td>DPT52</td>
<td>164-3222</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
<td>133x41x61</td>
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<tr>
<td>DPT53</td>
<td>164-3223</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
<td>133x41x61</td>
</tr>
<tr>
<td>DPT54</td>
<td>164-3224</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
<td>133x41x61</td>
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<tr>
<td>DPT52-M</td>
<td>164-3219</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
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<td>DPT53-M</td>
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<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
<td>133x41x61</td>
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<td>DPT54-M</td>
<td>164-3221</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
<td>133x41x61</td>
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</tbody>
</table>

60 Watt Single Output Desktop PSUs

- Energy Star Level V > 15 V
- EISA & CECE 2008 Compliant
- Level V compliant (>15V)
- China Compulsory Certification (CCC) Qualified
- Single Outputs from 12 V to 24 V
- No Load Input Power <0.5 W
- Compact Dimensions
- High Power Density
- Low Cost

Dimensions (mm): H=32, W=117, D=53

Output Connector: Barrel type with 11mm length, 5.5mm dia. outer, 2.5mm dia. inner with centre (+) and outer shell (-) polarity

Input Voltage: 90 - 264VAC
Input Frequency: 47 - 63 Hz
Efficiency: 87% typical
Ripple & Noise: 200mV pk-pk max, 20 MHz bandwidth
Line Regulation: ±1% max.
Load Regulation: ±1% max.
No Load Input Power: <0.5W
Operating Temperature: 0°C to +60°C, derate from 40°C
Safety Approvals: EN60950-1, UL/cUL60950-1, CE Mark
Emissions EN55022 Level B conducted & radiated

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power (W)</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
<th>Order Code</th>
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<tr>
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65 Watt AC/DC Switch Mode Power Supply

- Input Voltage: 110-240 VAC
- Input Frequency: 50-60 Hz
- Input Current: 3.5A Max
- Ripple & Noise: 5% pk-pk of output voltage
- Efficiency: 87% Min. at full load condition
- Operating Temperature: 0°C to +30°C
- Dimensions (WxHxD): 44.5 x 110 x 30.5 mm

Universal AC/DC power supply with detachable DC plugs

<table>
<thead>
<tr>
<th>Type</th>
<th>Output Voltage</th>
<th>Output Current</th>
<th>Pin Dia. (mm)</th>
<th>Length (mm)</th>
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<td>C18</td>
<td>18V</td>
<td>5.5</td>
<td>2.5</td>
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<td>D19</td>
<td>19V</td>
<td>4.75</td>
<td>1.7</td>
<td>11</td>
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</table>

70 Watt Single Output Desktop PSUs

- CEC and EISA compliant
- Energy Efficiency Level V
- <0.5W No Load Input Power
- Low Profile
- Single outputs from 12 to 48VDC
- High Power Density
- Operation to +60°C
- CCC qualified
- 3 year warranty

Dimensions (mm): H = 30.5, W = 58, D = 132mm

Input Voltage: 90 - 264VAC
Input Frequency: 47 - 63 Hz
Input Current: 1.5A Max
No Load Input Power: <0.5W
Efficiency: 87% max
Line Regulation: ±1%
Load Regulation: ±5%, model dependent
Ripple & Noise: 1% max pk-pk, 20 MHz BW
Operating Temperature: 0°C to 60°C, derate from 40°C
Safety Approvals: EN60950-1, UL/cUL60950-1, CCC, CE
Emissions EN55022 Level B conducted & radiated

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power Rating (W)</th>
<th>Voltage (V)</th>
<th>Current (A)</th>
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<td>163-4822</td>
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</table>

75 Watt AC/DC Desktop PSU

- Adjustable output voltage
- Input voltage: 100V to 240V ac
- Variable output: 15,16,18,19,20,22,24V dc
- Max. output current: 3.5A
- Protection class: II
- Correct polarity adjustable with alternate connector
- Includes exchangeable multi-tip connectors
- Universal power supply for laptop computers
- IP40 rated
- Operating temperature: 0°C to 25°C

Dimensions (mm): H=32, W=33, D=100

Supply with UK adapter

Correct polarity adjustable with alternate connector

Protection class: II

Includes exchangeable multi-tip connectors

Universal power supply for laptop computers

IP40 rated

Operating temperature: 0°C to 25°C

Price Each

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
<th>1+ 5+ 10+ 25+</th>
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</table>

All Order Codes

Mains Adaptors - Desktop/Portable - continued

60 Watt Single Output AC/DC Power Supplies - continued

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Power</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Medical</th>
<th>Dimensions (WxHxD)(mm)</th>
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</thead>
<tbody>
<tr>
<td>DPT52</td>
<td>164-3222</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
<tr>
<td>DPT53</td>
<td>164-3223</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
<tr>
<td>DPT54</td>
<td>164-3224</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
<tr>
<td>DPT52-M</td>
<td>164-3219</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
<tr>
<td>DPT53-M</td>
<td>164-3220</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
<tr>
<td>DPT54-M</td>
<td>164-3221</td>
<td>50W</td>
<td>5V/8A</td>
<td>12V/5A</td>
<td>15V/2.5A</td>
<td>50mA</td>
</tr>
</tbody>
</table>

60 Watt Single Output Desktop PSUs

- EISA & CECE 2008 Compliant
- Level V Compliant (>15V)
- China Compulsory Certification (CCC) Qualified
- Single Outputs from 12 V to 24 V
- No Load Input Power <0.5 W
- High Power Density
- Low Cost

Dimensions (mm): L= 117.4, W=53.0, H=32.0

Input Voltage: 90-264 VAC
Input Frequency: 47-63 Hz
No Load Input Power: <0.5W
Efficiency: Up to 87%
Output Power: 60 W
Line Regulation: ±1%
Load Regulation: ±1%
Ripple & Noise: 200mV pk-pk max, 20 MHz BW
Operating Temperature: 0°C to +60°C, derate linearly from 100°C load at +40°C to 50°C load at +60°C
Safety Approvals: EN60950-1, UL/cUL60950-1, ENS50022, Level B conducted & radiated

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>List No.</th>
<th>Output Voltage (V)</th>
<th>Current (A)</th>
<th>Order Code</th>
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<tbody>
<tr>
<td>VEH00US12</td>
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<td>85</td>
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<td>4</td>
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<td>VEH00US24</td>
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<td>2.5</td>
<td>87</td>
<td>167-3384</td>
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</table>

All Order Codes
80 Watt Single Output Desktop PSUs
Compact External

- Energy Efficiency Level V
- CECC and EISA compliant
- Approved as LPS
- <0.5W No Load Input Power
- Operation to +70°C
- High Efficiency
- Single outputs from 12 to 48VDC
- CCC qualified
- 3 year warranty

H = 43, W = 76, D = 146mm

Input Voltage: 90 - 264VAC
Input Frequency: 47 - 63 Hz
Input Current: 1.14A Max
No Load Input Power: <0.5W
Efficiency: 88% max
Ripple & Noise: 1.5% max pk-pk
Operating Temperature: 0°C to 70°C, derate from 40°C
Safety Approvals: EN60601-1, UL60601-1, CCC
Emissions: EN55022 Level B Conducted & Radiated

<table>
<thead>
<tr>
<th>Mfrs.</th>
<th>Power</th>
<th>Output Voltage (V)</th>
<th>Output Current (A)</th>
<th>Order Code</th>
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<tbody>
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<td>AEL80US12</td>
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<td>AEL80US24</td>
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<td>3.33</td>
<td>163-3349</td>
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<tr>
<td>AEL80US30</td>
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<td>30</td>
<td>2.66</td>
<td>163-3350</td>
</tr>
<tr>
<td>AEL80US36</td>
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<td>163-3352</td>
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<td>AEL80US48</td>
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<td>48</td>
<td>1.66</td>
<td>163-3353</td>
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</tbody>
</table>

85 - 250 Watt Single Output Desktop PSUs
Industrial and Medical Approvals

- IT & Medical 3rd Edition Safety Approvals
- 2 x MOPP with Risk Management
- >0.5W No Load Input Power
- Energy Efficiency Level V

AHM85: H=37, W=150, D=64mm
AHM100: H=37, W=200, D=64mm
AHM150: H=37, W=200, D=80mm
AHM200: H=37, W=218, D=88.5mm
AHM250: H=37, W=200, D=80mm
AHM300: H=37, W=160, D=64mm
AHM350: H=37, W=150, D=64mm
AHM85: H=37, W=150, D=64mm
AHM100: H=37, W=200, D=64mm
AHM150: H=37, W=200, D=80mm
AHM200: H=37, W=218, D=88.5mm
AHM250: H=37, W=200, D=80mm
AHM300: H=37, W=160, D=64mm
AHM350: H=37, W=150, D=64mm

Input Voltage: 90 - 264VAC
Input Frequency: 47 - 63 Hz
Input Current: 1.14A Max
No Load Input Power: <0.5W
Efficiency: 88% max
Ripple & Noise: 1.5% max pk-pk
Operating Temperature: 0°C to 70°C, derate from 40°C
Safety Approvals: EN60601-1, ANSI/AAMI ES60601-1, CSA22.2 No.60601-1 per cUL, including
CEC2008 & EISA2007 Compliant
Class I & Class II (85W & 100W)
High Efficiency
IP/×1 Environmental Rating
3 Year Warranty

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
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<tbody>
<tr>
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<td>AHM100PS48</td>
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<tr>
<td>AHM300PS48</td>
<td>2026-222648V</td>
</tr>
</tbody>
</table>

Universal Laptop / Notebook Power Supply

- Including 6 different adapter plugs for Dell, Samsung, Sony, Fujitsu, HP, IBM, Lenovo, Acer, Compaq and others
- Regulated output voltage independent from the input voltage or load
- Max output power: 90W
- Adjustable output voltage from 15-24V dc
- Maximum output current: -400mA at 15-22V, 375mA at 24V
- For world wide use (100-240V ac)
- Supplied with changeable inputs for Europe and UK

AHM65: H=37, W=150, D=64mm
AHM85: H=37, W=150, D=64mm
AHM100: H=37, W=200, D=64mm
AHM150: H=37, W=200, D=80mm
AHM200: H=37, W=300, D=80mm
AHM250: H=37, W=300, D=80mm
AHM300: H=37, W=300, D=80mm
AHM350: H=37, W=300, D=80mm

Input Voltage: 90 - 264VAC
Input Frequency: 47 - 63 Hz
Input Current: 1.14A Max
No Load Input Power: <0.5W
Efficiency: 84% Min. at full load condition
Ripple & Noise: 5% pk-pk of output voltage
Line Regulation ±2%
Output Power: 96 W
Inrush Current: 40A peak at 120Vac
Input Frequency: 50-60 Hz
Input Voltage: 110-240V AC
Input Current: 9A peak at 120Vac
Output Power: 96 W
Line Regulation ±2%
Load Regulation ±5%
Ripple & Noise: 5% pk-pk of output voltage
Efficiency: 84% Min. at full load condition
Operating Temperature: 0°C to +30°C
Dimensions (WxHxD): 58 x 133 x 31 mm

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
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</thead>
<tbody>
<tr>
<td>ATD96W</td>
<td>161-4089</td>
</tr>
</tbody>
</table>

96 Watt AC/DC Switch Mode Power Supply

- Universal AC/DC power supply with detachable DC plug’s
- C19, A19, B16, E19, tip type
- Outside Dia. (mm), Pin Dia. (mm), Length (mm)

<table>
<thead>
<tr>
<th>Mfrs. List No.</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATD96W96</td>
<td>161-4089</td>
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</tbody>
</table>

96 Watt AC/DC Power Supplies
Medical Approved

- Universal input voltage
- Medical approved (EN 60601)
- IEC320 input connector
- Short circuit protection
- Rugged Steel case
90 Watt Single Output PSUs
Compact External

- Energy Efficiency Level V
- CEC 2008 & ESA 2007 Compliant
- CCC Qualified
- No Load Input Power <0.5 W
- High Power Density
- Low Cost

Dimensions: H=30, W=58, L=133mm

Input Voltage 90-264 VAC
Input Frequency 47-63 Hz
Efficiency Up to 89%
No Load Input Power <0.5W
Output Power 90 W
Line Regulation ±0.5%
Load Regulation ±5%
Ripple & Noise 240mV pk-pk max. 20 MHz BW
Operating Temperature 0°C to +60°C, derate linearly from 100% load at +40°C to 50% load at +60°C
Safety Approvals
EMC EN55022, Level B conducted & radiated

Table: Mains Adaptors - Desktop/Portable - continued

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<tr>
<th>Order Code</th>
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<th>5+</th>
<th>10+</th>
<th>25+</th>
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<td>426-6389</td>
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</tr>
</tbody>
</table>

European to UK PSU Convertor Plugs

Useful mains adaptors allowing 2-pin European plug-in power adaptors to be used with UK sockets. The adaptors feature specially designed pads to grip onto the plug body of power adaptors for a secure attachment. the pads are engaged by tightening two screws and maintain their integrity over time.

- Quick and easy to fit
- Suitable for power adaptors with a weight of up to 450g
- Converts European equipment for use in the UK
- Compact design
- External fuse access
- Available in black or white
- BS approved

Table: Price Each

<table>
<thead>
<tr>
<th>Colour</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>426-6389</td>
</tr>
</tbody>
</table>

DC Power Extension Leads

A range of DC type, socket to plug extension leads with the most common 2.1mm or 2.5mm connector sizes.

Table: Price Each

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1mm DC Socket to Plug</td>
<td>120-9175</td>
</tr>
<tr>
<td>3m</td>
<td>120-9176</td>
</tr>
<tr>
<td>5m</td>
<td>120-9177</td>
</tr>
<tr>
<td>10m</td>
<td>120-9178</td>
</tr>
<tr>
<td>2.5mm DC Socket to Plug</td>
<td>120-9180</td>
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<tr>
<td>1.5m</td>
<td>120-9181</td>
</tr>
<tr>
<td>3m</td>
<td>120-9182</td>
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<tr>
<td>5m</td>
<td>120-9183</td>
</tr>
</tbody>
</table>

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