

WPA50

50 Watt Single Output Eighth Brick DC/DC Converter



- Industry Standard Footprint & Size - 2.3" x 0.9" x 0.35" (58.42mm x 22.86mm x 9.0mm)
- High Efficiency - Up To 91%
- Wide Input Voltage Range: 36 – 75VDC
- Output Voltages: 1.2V, 1.5V, 1.8V, 2.2V, 2.5V, 3.3V & 5.0V
- Remote Output Sense
- Remote ON/OFF (Positive or Negative Logic)
- Output Overcurrent Protection - Hiccup Mode
- Input Side "L" Filter
- No Minimum Load Required
- Isolation Voltage of 1500 VDC
- High Reliability
- Fixed Frequency Operation
- Safety per UL/CUL 60950, EN 60950, Operational Insulation Meets TNV-SELV Isolation Requirements
- Meets Conducted Emissions Requirements of FCC Class B and EN55022 Class B with External Filter
- C&D Technologies, Power Electronics Division is ISO9001:2000 Certified
- No Heatsinks
- Low Profile and Low Weight
- Thermal Shutdown

The WPA50 Series is a 50 Watt single output, low-profile DC-DC converter in an industry standard package of 2.3" x 0.9" x 0.35" (58.42mm x 22.86mm x 9.0mm). The WPA50 uses unique proprietary technologies to deliver ultra-high efficiencies and excellent thermal performance. It includes extensive control and protection features for maximum flexibility and provides a

versatile solution for a whole range of applications with its input voltage range of 36-75 VDC and output voltages between 1.2VDC and 5.0VDC.

The power dissipation of the WPA50 series is so low that a heat sink is not required. The product features fast dynamic response characteristics and low output ripple critical for low voltage

applications. WPA DC-DC converter modules are certified to UL/CUL 60950, and VDE to EN60950. It meets CISPR22/EN55022/FCC15J Class B specs for EMI levels with external filtering.

This high quality and highly reliable product is competitively priced and an ideal solution for distributed power, telecoms and datacom applications.

PRODUCT SELECTION CHART

| MODEL | NOMINAL INPUT VOLTAGE (VDC) | RATED OUTPUT VOLTAGE (VDC) | OUTPUT CURRENT | | INPUT CURRENT RATED LOAD (A) | EFFICIENCY (%) MIN |
|--------------|-----------------------------|----------------------------|----------------|------------------|------------------------------|--------------------|
| | | | MIN LOAD(A) | RATED OUTPUT (A) | | |
| WPA50R48S012 | 48 | 1.2 | 0.0 | 18 | 0.58 | 80 |
| WPA50R48S015 | 48 | 1.5 | 0.0 | 18 | 0.70 | 82 |
| WPA50R48S018 | 48 | 1.8 | 0.0 | 18 | 0.80 | 85 |
| WPA50R48S022 | 48 | 2.2 | 0.0 | 18 | 0.99 | 85 |
| WPA50R48S025 | 48 | 2.5 | 0.0 | 18 | 1.11 | 85 |
| WPA50R48S033 | 48 | 3.3 | 0.0 | 15 | 1.20 | 88 |
| WPA50R48S050 | 48 | 5.0 | 0.0 | 10 | 1.17 | 90 |

ABSOLUTE MAXIMUM RATINGS

| | |
|--|-------------------|
| Output Short-Circuit Duration | Continuous |
| Internal Power Dissipation | As low as 5 Watts |
| Lead Temperature (soldering, 10 seconds max) | +300°C |
| Continuous Input Voltage | 75 VDC |
| Storage Temperature | +125°C |
| Input to Output Isolation | 1500 VDC |

SPECIFICATIONS, ALL MODELS

Specifications are at $T_A = +25^\circ\text{C}$, Airflow = 300LFM (1.5m/s) at nominal input voltage unless otherwise specified.

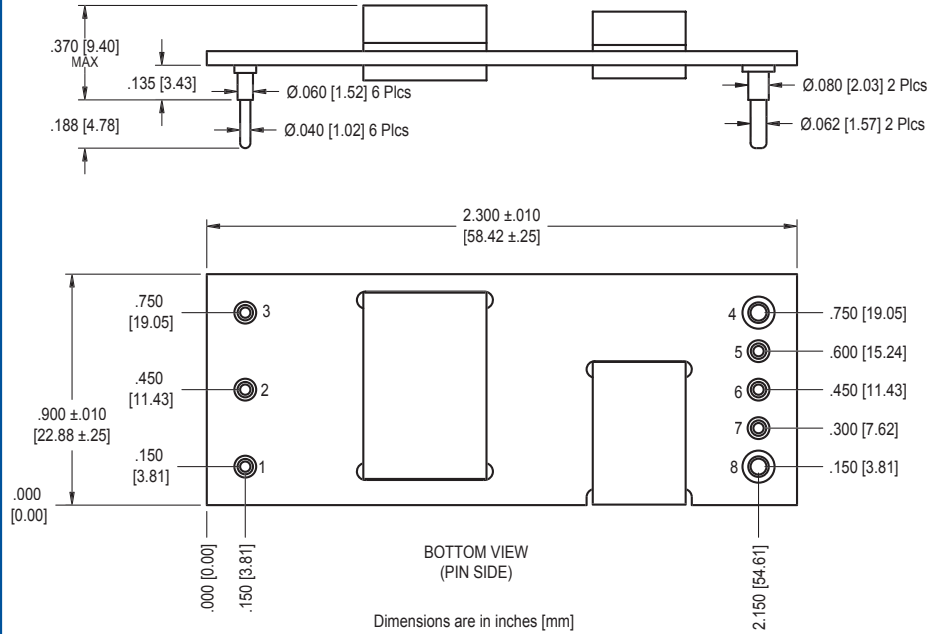
| | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS | |
|------------------------------------|--|---|-------|-------------|----------------|---------------------|---|
| INPUT | INPUT | | | | | | |
| | Voltage Range | $V_{in} = 48\text{V}$, $I_o = I$ Rated | 36 | 48 | 75 | V_{DC} | |
| | Reflected Ripple Current | $V_{in} = 48\text{V}$, $I_o = I$ Rated | | 450 | 600 | mApk-pk | |
| | Inrush Charge | | | 42 | | μC | |
| | Maximum Input Current | $V_{in} = 36\text{V}$ | | | | | |
| | 1.2 Vout | | | 0.75 | | A | |
| | 1.5 Vout | | | 0.93 | | A | |
| | 1.8 Vout | | | 1.10 | | A | |
| | 2.2 Vout | | | 1.31 | | A | |
| | 2.5 Vout | | | 1.50 | | A | |
| | 3.3 Vout | | | 1.60 | | A | |
| | 5.0 Vout | | | 1.55 | | A | |
| | INPUT CONTROL | | | | | | |
| | Temperature Shutdown | | | | 115 | $^\circ\text{C}$ | |
| | Temperature Hysteresis | | | | 5 | $^\circ\text{C}$ | |
| | Quiescent Standby Current | $V_{in} = 48\text{V}$ | | 3 | 4 | mA | |
| | Power Dissipation | No Load, Remote On/Off Disabled, $V_{in} = 48\text{Vdc}$ | | | 2.00 | W | |
| | Undervoltage Shutdown | | 31.50 | 32.5 | 35.0 | V | |
| | Undervoltage Hysteresis | | 0.50 | 2 | 3.00 | V | |
| OUTPUT | ISOLATION | | | | | | |
| | Input/Output Isolation Voltage | | | 1500 | 2250 | V_{DC} | |
| | Resistance | | | 10 | | $M\Omega$ | |
| | Capacitance | | | 1.5 | | nF | |
| | Leakage Current | 240 Vrms, 50Hz | | 100 | | μA | |
| | OUTPUT | | | | | | |
| | Rated Power | WPA50R48S012 | | | 22 | | W |
| | | WPA50R48S015 | | | 27 | | W |
| | | WPA50R48S018 | | | 33 | | W |
| | | WPA50R48S022 | | | 40 | | W |
| | | WPA50R48S025 | | | 45 | | W |
| | | WPA50R48S033 | | | 50 | | W |
| | | WPA50R48S050 | | | 50 | | W |
| | Voltage Setpoint Accuracy | | | 1.0 | 1.5 | % of V_{NOM} | |
| | Output Voltage Trim Range | | -5.0 | | +8.0 | % of V_{NOM} | |
| | Temperature Coefficient | | | ± 0.002 | ± 0.005 | %/ $^\circ\text{C}$ | |
| | Output Voltage Regulation | | | | | | |
| | Line Regulation | $V_{in} = 36\text{V} - 75\text{V}$, $I_{out} = \text{Max}$ | | 0.30 | 0.50 | % | |
| | Load Regulation | $V_{in} = 48\text{V}$, $I_{out} = 0\text{-Max}$ | | 0.30 | 0.60 | % | |
| Ripple & Noise (NOTE 1) | $V_{in} = 48\text{V}$, < 20Mhz bandwidth | | | 75 | mVp-p | | |
| Transient Response | | | | | | | |
| | Step change in output current (50%-100% Step @ 0.2A/ μs) | | | | | | |
| 1.2 - 2.5 Vout | $V_{in} = 48\text{V}$ | | | 8 | % of V_{NOM} | | |
| 3.3 - 5.0 Vout | $V_{in} = 48\text{V}$ | | | 6 | % of V_{NOM} | | |
| Turn-On Time | $V_{in} = 48\text{V}$ | | 200 | 500 | mS | | |
| Remote Sense Compensation | | | | 8 | % | | |
| Overcurrent Protection | $V_{in} = 48\text{V}$ | 105 | | 140 | % | | |
| GENERAL | | | | | | | |
| Switching Frequency | | 380 | 400 | 420 | KHz | | |
| MTTF per ML-HDBK-217 Ground Benign | Circuit Stress Method $T_A = +25^\circ$ | | TBD | | Hrs | | |

NOTE 1: Measured at 20 MHz bandwidth across a 10 μf multi layer ceramic capacitor located approximately 1" from output terminals.

PERFORMANCE CURVES

Rev B1 of the WPA50 Datasheet will include extensive performance curves and graphs.

MECHANICAL



| PIN FUNCTIONS | |
|---------------|---------------|
| 1 | +Vin |
| 2 | Remote On/Off |
| 3 | -Vin |
| 4 | -Vout |
| 5 | - Sense |
| 6 | Trim |
| 7 | + Sense |
| 8 | +Vout |

NOTES:
 Pin placement tolerance: +.010
 Pin material: Brass
 Pin Finish: Tin/Lead over Nickel
 Converter weight: [16g]

ORDERING INFORMATION

To Find Model Number

WPA5048S **y** **-**

Device Family _____
 50 Watt, Single Output,
 Eighth Brick, 48VDC Input Range
 Model Number _____
 Selected from Product Selection Chart (above)
 y = 012 = 1.2V, 015 = 1.5V, 018 = 1.8V, 022 = 2.2V,
 025 = 2.5V, 033 = 3.3V, 050 = 5.0V,
 Remote On/Off Logic
 No Number = Positive Logic
 1 = Negative Logic _____

| Model Numbers | Part Numbers |
|----------------|--------------|
| WPA50R48S012 | 6064958 |
| WPA50R48S015 | 6064959 |
| WPA50R48S018 | 6064960 |
| WPA50R48S022 | 6064961 |
| WPA50R48S025 | 6064962 |
| WPA50R48S033 | 6064963 |
| WPA50R48S050 | 6064964 |
| WPA50R48S012-1 | 6064967 |
| WPA50R48S015-1 | 6064968 |
| WPA50R48S018-1 | 6064969 |
| WPA50R48S022-1 | 6064970 |
| WPA50R48S025-1 | 6064971 |
| WPA50R48S033-1 | 6064972 |
| WPA50R48S050-1 | 6064973 |

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