

# 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	<b>INPUT</b>					
	Voltage Range	$V_{in} = 48\text{V}$ , $I_o = I_{\text{Rated}}$	36	48	75	$V_{DC}$
	Reflected Ripple Current	$V_{in} = 48\text{V}$ , $I_o = I_{\text{Rated}}$		450	600	mApk-pk
	Inrush Charge			42		$\mu\text{C}$
	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
	<b>INPUT CONTROL</b>					
	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	<b>ISOLATION</b>				
Input/Output Isolation Voltage				1500	2250	$V_{DC}$
Resistance				10		$M\Omega$
Capacitance				1.5		nF
Leakage Current		240 Vrms, 50Hz		100		$\mu\text{A}$
<b>OUTPUT</b>						
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				$\pm 0.002$	$\pm 0.005$	%/ $^\circ\text{C}$
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/ $\mu\text{s}$ )					
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	%	
<b>GENERAL</b>						
Switching Frequency		380	400	420	KHz	
MTTF per ML-HDBK-217 Ground Benign	Circuit Stress Method $T_A = +25^\circ$		TBD		Hrs	

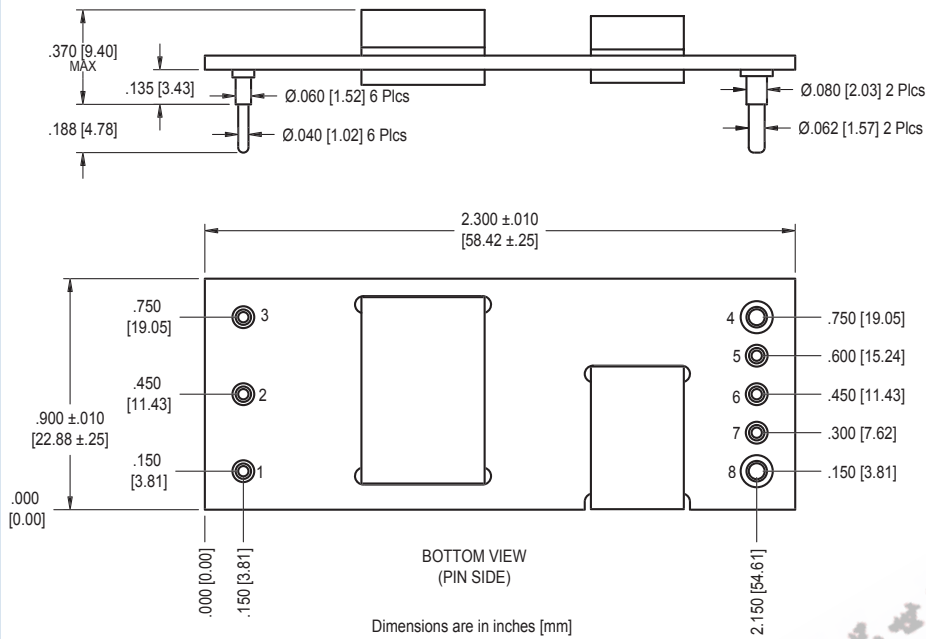
NOTE 1: Measured at 20 MHz bandwidth across a 10 $\mu\text{f}$  multi layer ceramic capacitor located approximately 1" from output terminals.

## PERFORMANCE CURVES

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

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## 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

Device Family WPA5048S y -  
 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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