

# OBSOLETE PRODUCT

Contact factory for replacement model



## 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 with 100V100mS Input Voltage Transient Protection
- Output Voltages: 1.2 V, 1.5V, 1.8V, 2.2V, 2.5V, 3.3V & 5.0V
- Output Trim Function with Industry Standard Equations
- Remote Output Sense
- Remote ON/OFF (Positive or Negative Logic)
- Output Overvoltage Protection
- Output Overcurrent Protection - Hiccup Mode
- Input Side "L" Filter
- No Minimum Load Required
- No Heatsinks
- Low Profile and Low Weight
- Thermal Shutdown
- Remote On/Off Control
- Isolation Voltage of 1500 VDC
- Soft Start
- High Reliability
- Fixed Frequency Operation
- Safety per UL/CUL 60950, EN 60950, Operational Isolation Meets TNV-SELV Isolation Requirements
- Meets Conducted Emissions Requirements of FCC Class B and EN55022 Class B

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		
WPA50R48S015	48	1.5	0.0	18	0.72	79
WPA50R48S018	48	1.8	0.0	18	0.82	83
WPA50R48S022	48	2.2	0.0	18	0.99	84
WPA50R48S025	48	2.5	0.0	18	1.11	85
WPA50R48S033	48	3.3	0.0	15	1.20	89
WPA50R48S050	48	5.0	0.0	10	1.18	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.

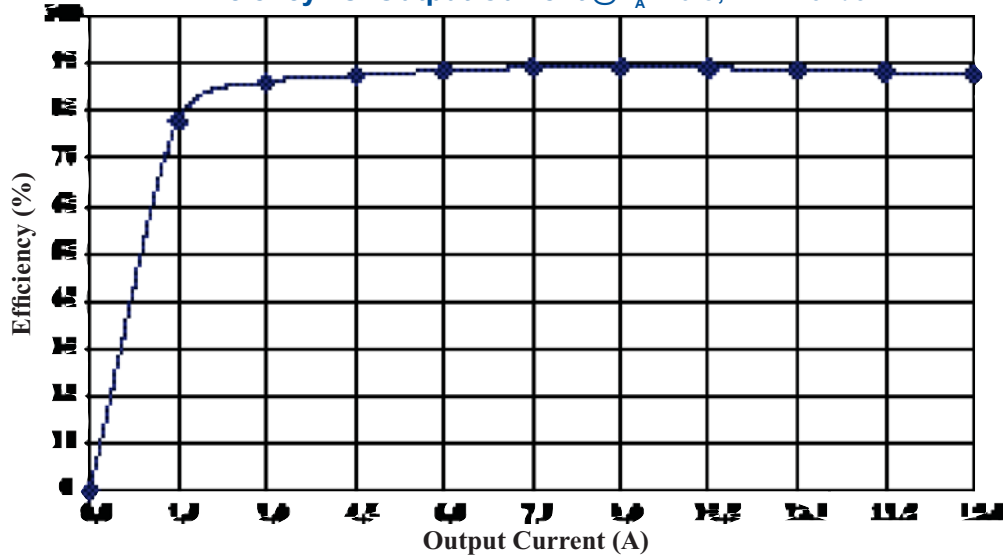
	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS	
<b>INPUT</b>	<b>INPUT</b>						
	Voltage Range	$V_{in} = 48\text{V}$ , $I_o = I$ Rated	36	48	75	V <sub>Dc</sub>	
	Reflected Ripple Current	$V_{in} = 48\text{V}$ , $I_o = I$ Rated		420	550	mApk-pk	
	Transient Withstand (Susceptibility)	100ms			100	V	
	Inrush Charge			42		mC	
	Maximum Input Current	$V_{in} = 36\text{V}$					
	1.2 Vout			0.75		A	
	1.5 Vout			0.925		A	
	1.8 Vout			1.10		A	
	2.2 Vout			1.31		A	
	2.5 Vout			1.5		A	
	3.3 Vout			1.6		A	
	5.0 Vout			1.55		A	
	<b>INPUT CONTROL</b>						
	Temperature Shutdown					115	°C
	Temperature Hysteresis					5	°C
	Quiescent Standby Current	$V_{in} = 48\text{V}$		3		4	mA
	Power Dissipation	No Load, Remote On/Off Disabled, $V_{in} = 48\text{Vdc}$				300	mW
	Undervoltage Shutdown			31.50	32.5	35.0	V
	Undervoltage Hysteresis			0.50	2	3.00	V
<b>OUTPUT</b>	<b>ISOLATION</b>						
	Input/Output Isolation Voltage			1500	2250	V <sub>Dc</sub>	
	Resistance			10		MΩ	
	Capacitance			1.5		nF	
	Leakage Current	240 Vrms, 50Hz		100		mA	
	<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 <sub>NOM</sub>
	Output Voltage Trim Range	WPA50R48S012		1.08		1.32	V
		WPA50R48S015		1.35		1.65	V
		WPA50R48S018		1.62		1.98	V
		WPA50R48S022		1.98		2.42	V
		WPA50R48S025		2.25		2.75	V
		WPA50R48S033		3.00		3.63	V
WPA50R48S050			4.50		5.50	V	
Temperature Coefficient				±0.002	±0.005	%/°C	
Output Voltage Regulation							
Line Regulation	$V_{in} = 36\text{V} - 75\text{V}$ , $I_{out} = \text{Max}$			0.1	0.2	%	
Load Regulation	$V_{in} = 48\text{V}$ , $I_{out} = 0\text{-Max}$			0.1	0.2	%	
Ripple & Noise (NOTE 1)	$V_{in} = 48\text{V}$ , ≤ 20Mhz bandwidth				75	mVp-p	
Transient Response	Step change in output current (50%-100% Step @ 1A/mS)						
1.2 Vout	$V_{in} = 48\text{V}$			100		mV	
5.0 Vout	$V_{in} = 48\text{V}$			100		mV	
Turn-On Time	$V_{in} = 48\text{V}$			200	500	mS	
Remote Sense Compensation					10	%	
Overcurrent Protection	$V_{in} = 48\text{V}$		105		140	%	
<b>GENERAL</b>							
Switching Frequency			380	400	420	KHz	
MTTF per ML-HDBK-217	Circuit Stress Method						
Ground Benign	$T_A = +25^\circ$			TBD		Hrs	

**NOTE 1:** Measured at 20 MHz bandwidth across a 6mf multi layer ceramic capacitor located approximately 1" from output terminals.

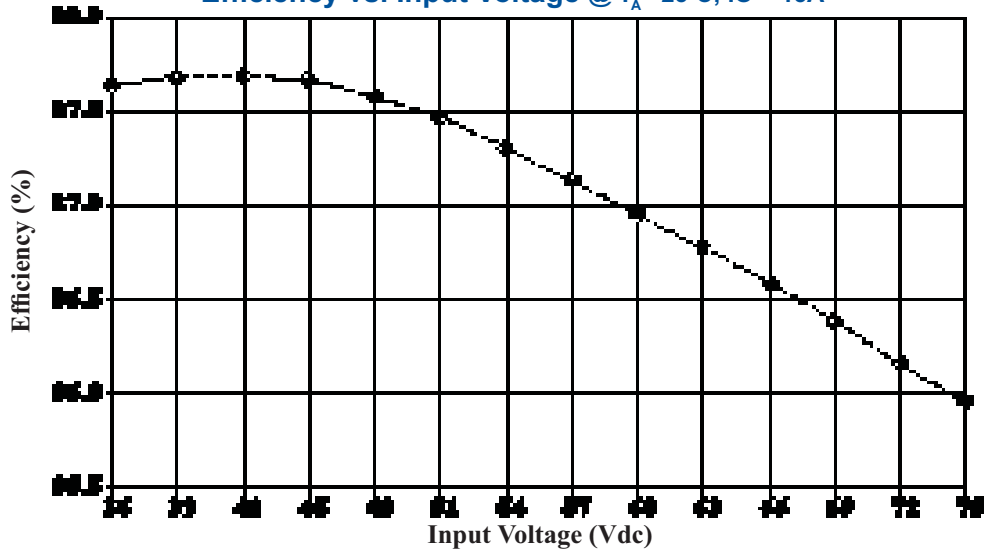
# PERFORMANCE CURVES: MODEL WPA50R48033

## MODEL WPA50R48033

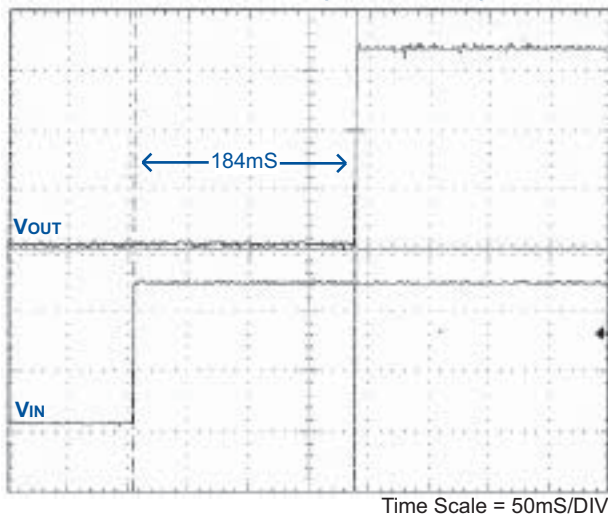
Efficiency vs. Output Current @  $T_A +25^\circ\text{C}$ ;  $V_{in} = 48\text{Vdc}$



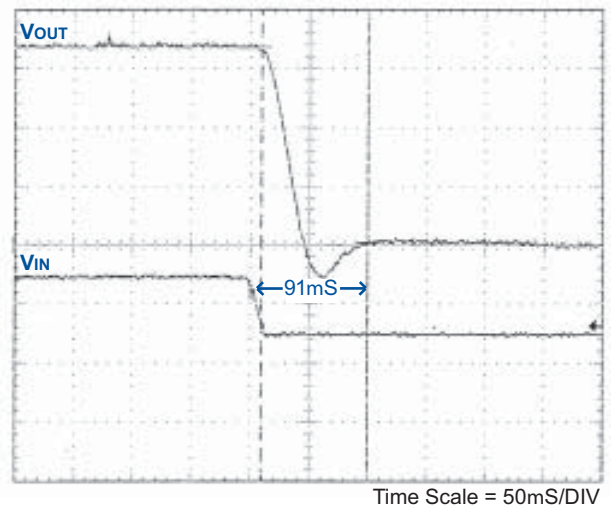
Efficiency vs. Input Voltage @  $T_A +25^\circ\text{C}$ ;  $I_O = 15\text{A}$



Turn On Time ( $V_{in}$  to  $V_{out}$ )

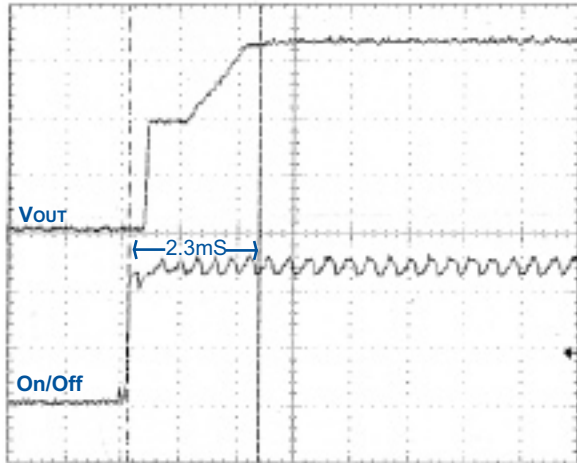


Turn Off Time ( $V_{in}$  to  $V_{out}$ )



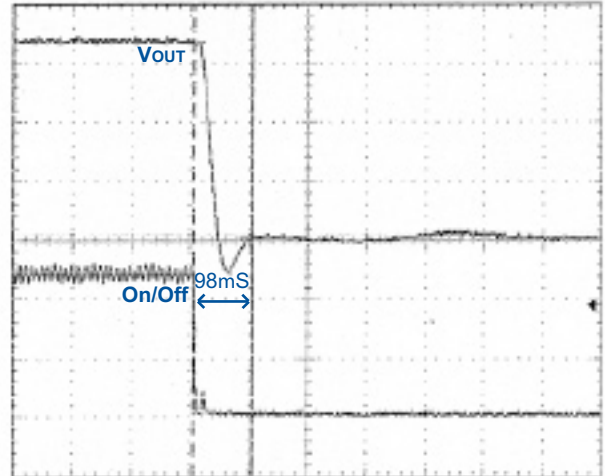
MODEL WPA50R48033

Primary On Time (Primary Remote to V<sub>OUT</sub>)



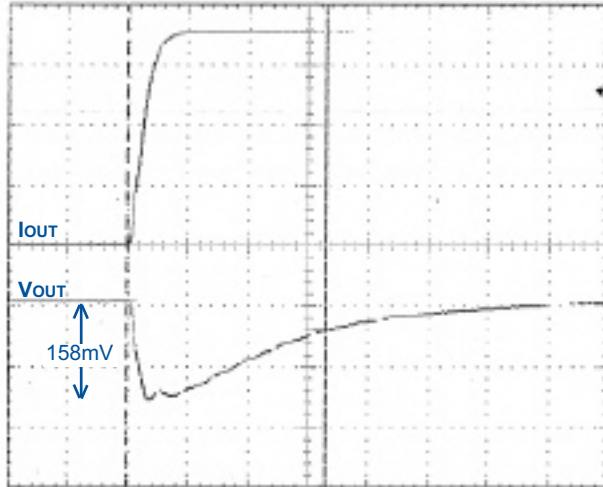
Time Scale = 1mS/DIV

Primary Off Time (Primary Remote to V<sub>OUT</sub>)



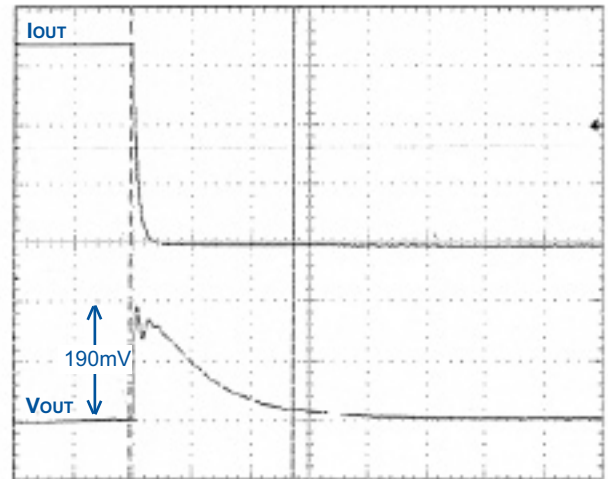
Time Scale = 100mS/DIV

Transient Response, 50% to 100% Load Step



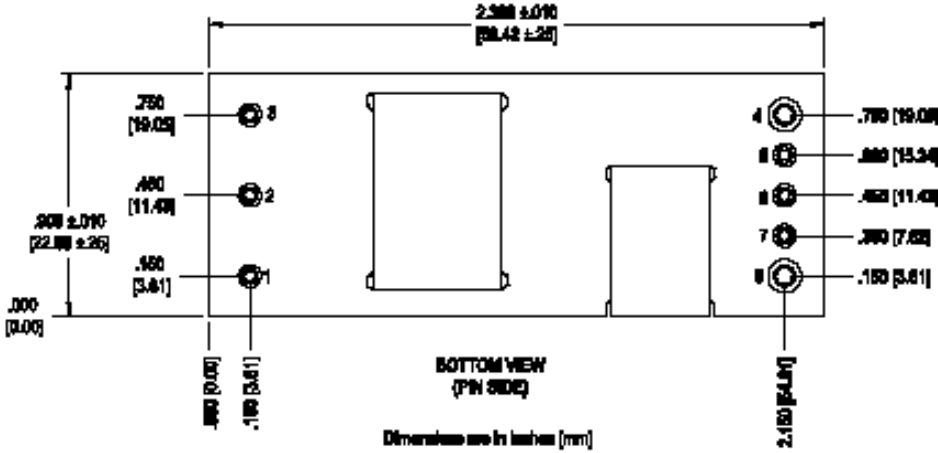
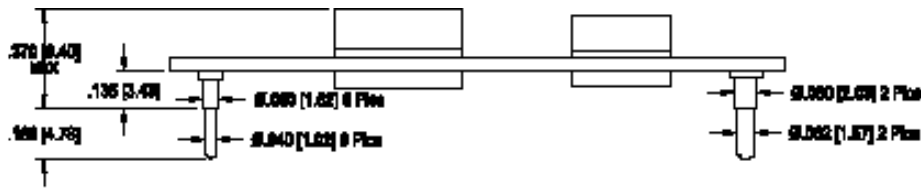
Voltage Scale = 100mV/DIV; Time Scale = 100mS/DIV  
 Settling Time = 330mS; Rate Change in I<sub>OUT</sub> = 0.18A/mS;  
 Voltage Transient = 158mV

Transient Response, 100% to 50% Load Step



Voltage Scale = 100mV/DIV; Time Scale = 200mS/DIV  
 Settling Time = 556ms; Rate Change in I<sub>OUT</sub> = 0.19A/mS  
 Voltage Transient = 190mV

# 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:  $\pm 0.10$

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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