

Wall Industries, Inc.

SP48S48-100

100W DC-DC Converter
36-75 Vdc Input
48 Vdc Output at 2.08A
Half-Brick Package



Features:

- **90% Efficient at Full Load**
- **Fast Transient Response**
- **Operation to No Load**
- **100% Burn In**
- **Remote ON/OFF (Active High/Low)**
- **Remote Sense Compensation**
- **UL 1950 Listed - CE Mark**
- **Low Output Ripple**
- **Fixed Switching Frequency**
- **Output Over Current Protection**
- **Output Short Circuit Protection**
- **Over Temperature Protection**
- **1500 Vdc Isolation**
- **Test Board Available**

Description:

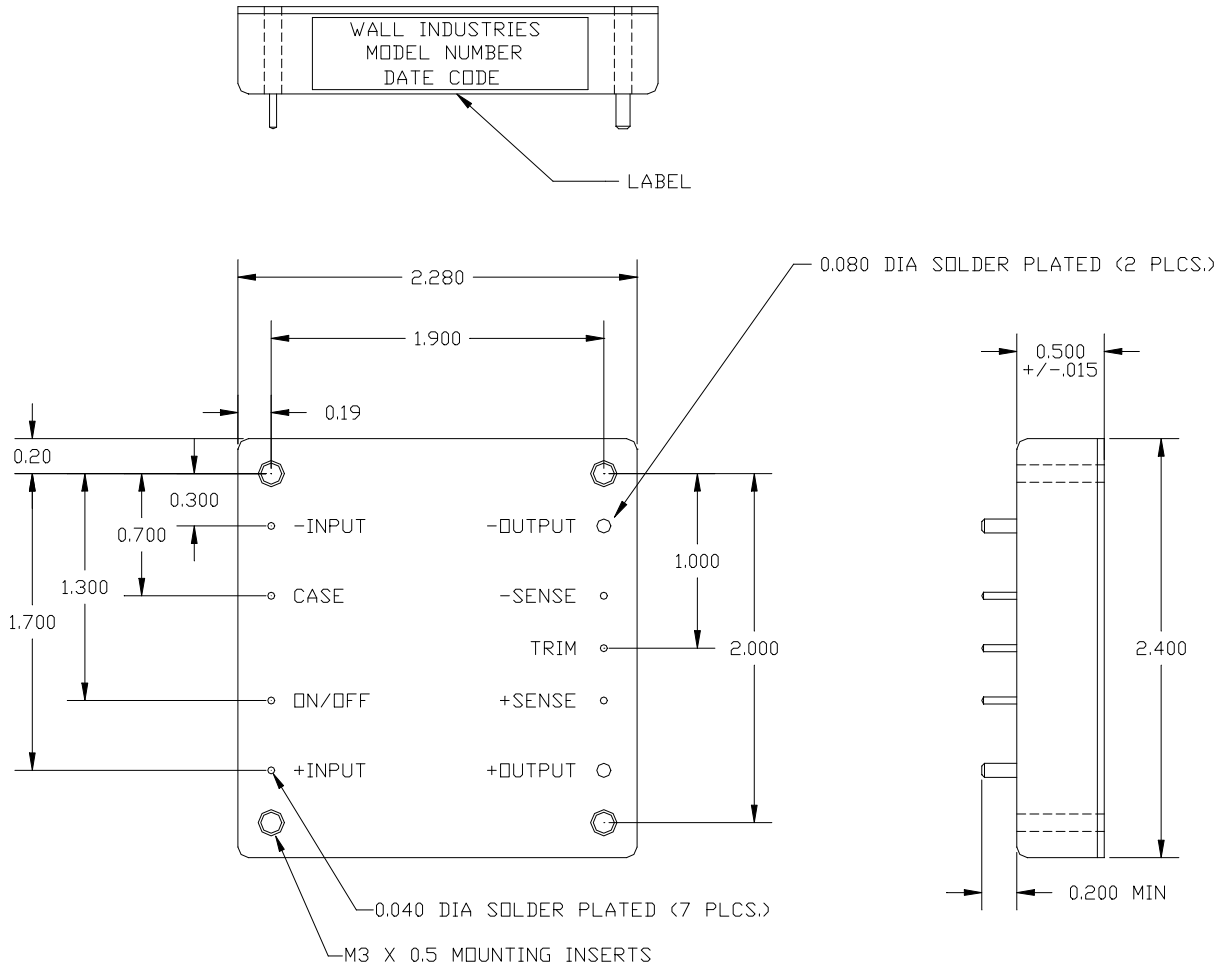
The SP & SPW series is a high-density half brick converter that incorporates the desired features required in today's demanding applications. When performance, reliability, and low cost are needed, the SP & SPW series delivers.

Technical Specifications		Model No.		SP48S48-100			
All specifications are based on 25C, Nominal Line and Full Load unless otherwise noted. We reserve the right to change specifications based on technological advances.							
SPECIFICATION		Related condition		MIN	NOM	MAX	Unit Measured
INPUT							
Turn on at					36		Volt DC
Turn off at					35		Volt DC
Input Over voltage Shutdown							
Turn off at					80		Volt DC
Turn on at					78		Volt DC
Operating Voltage Range		Rated Input Voltage		36	48	75	Volt DC
Maximum Input Current		Low Line 100% load			2.75		A
No Load Input Current					37		mA
Input Current under "LOGIC OFF"					1		mA
Inrush Current Transient Rating					1		A ² Sec
Reflected Ripple Current		12uH / 33uF input filter			43		mA
OUTPUT							
Output Voltage Set point				47.52	48	48.48	Volt DC
Output Voltage Regulation							
Over Load					± 0.1		%
Over Line					± 0.1		%
Over Temperature					0.02		% / °C
Output Voltage Ripple and Noise							
Basic Ripple					75		mV
Spikes P-P					370	720	mV
Output Current Ranges		Rated Output Current		0		2.08	A
Output Current Limit		Self Resetting		2.5	2.92	3.33	A
Short Term Output Current Surge							A/sec
DYNAMIC CHARACTERISTICS							
Input Voltage Ripple Rejection		120 Hz			60		dB
Output Transient and Load Changes							
Load step / ΔV		X	50 to 75%		50 to 100%	530	mV
Load step / ΔV		X	75 to 50%		100 to 50 %	450	mV
Recovery Time		To within 1% Rated Vo			75		μsec
Turn on Delay		From Vin(nom) to 90% Vout (nom)			370		msec
Overshoot of Output Voltage		Full Load Resistive			0		%
EFFICIENCY							
@ 100% load					90		%
@ 75% load					90		%
@ 50% load					89		%
@ 25% load					83		%
TEMPERATURE CONSIDERATIONS							
Thermal Resistance							
Normal Convection		Rθc-a			7.5		°C/Watt
100 lfm					6.2		°C/Watt
200 lfm					5.1		°C/Watt
300 lfm					4.3		°C/Watt
400 lfm					3.5		°C/Watt
Heatsink Considerations		Available, Contact Factory					
General Technical Data							
Switching Frequency		Fixed			400		KHz
Remote ON OFF Control (See Note Below)		Active HIGH, Open Collector					TTL
Trimmability				43.2		52.8	Volt DC
Over Temperature Shutdown		Case Temperature				105	°C
MTBF							
		Bellcore TR-332			3.51E6		Hours

Note: Positive Remote ON/OFF control is standard. To order negative logic Remote ON/OFF control add the suffix "R" to the part number.

Figure 1: Mechanical Dimensions

Unit: inches



Tolerance: X.XX ± 0.020
 X.XXX ± 0.010

Output Voltage Trim

The following information is provided to allow quick calculation of the trim resistor value for a desired output voltage. The general procedure for calculating a trim resistor is as follows:

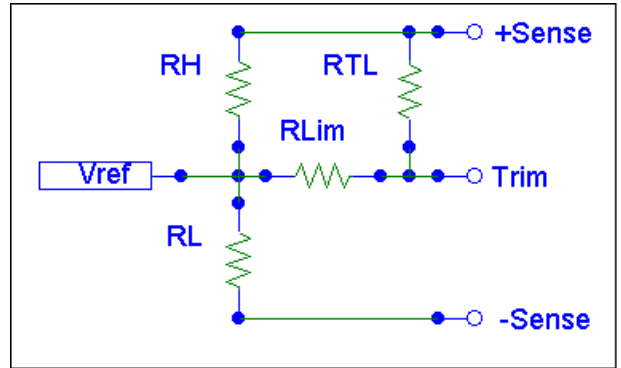
1. Determine the desired output voltage (Vo)
2. Select Equation. (Trim Low/Trim High)
3. Use the data in Table 1 to complete the equation.
4. Evaluate.

In order to trim low use Equation 1 and Table 1 to calculate resistor RTL for the desired output voltage.

Equation 1: Trim Low

$$RT_L = \left[\frac{V_o - V_{REF}}{\left(\frac{V_{REF}}{R_L}\right) - \left(\frac{1}{R_H} \cdot (V_o - V_{REF})\right)} \right] - R_{LIM}$$

*Vo - Desired output voltage.
All resistor values in K ohms.*



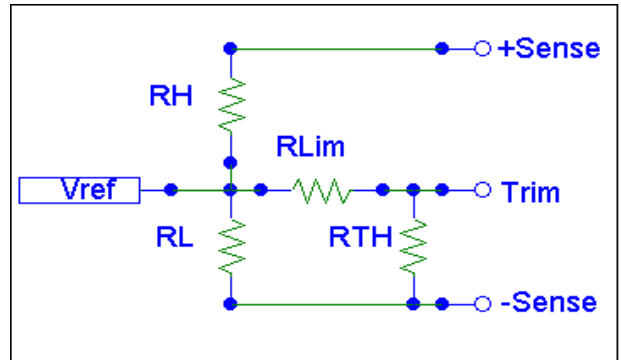
Schematic 1: Trim Low

In order to trim high use Equation 2 and Table 1 to calculate resistor RTH for the desired output voltage.

Equation 2: Trim High

$$RT_H = \left[\frac{V_{REF}}{\left(\frac{V_o - V_{REF}}{R_H}\right) - \left(\frac{V_{REF}}{R_L}\right)} \right] - R_{LIM}$$

*Vo - Desired output voltage.
All resistor values in K ohms.*

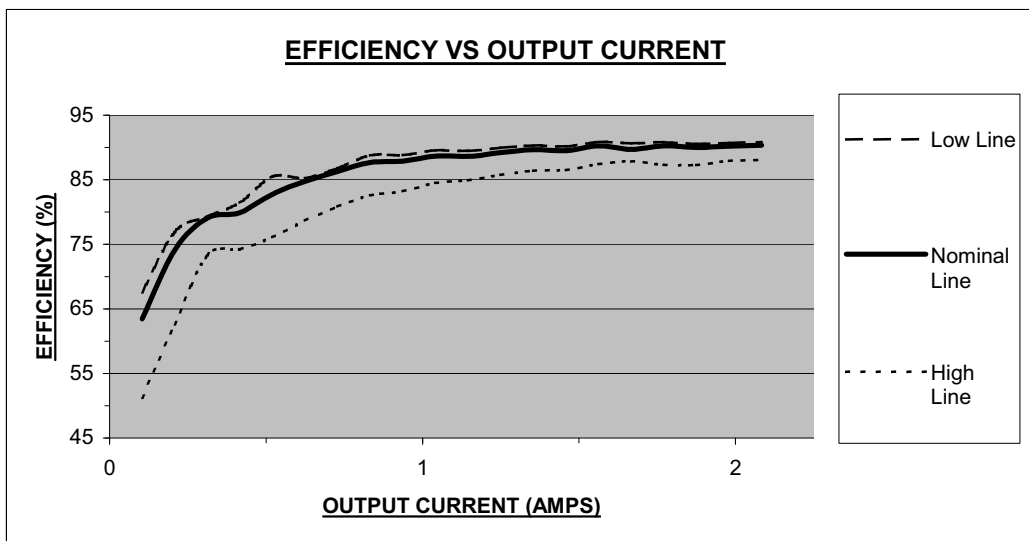
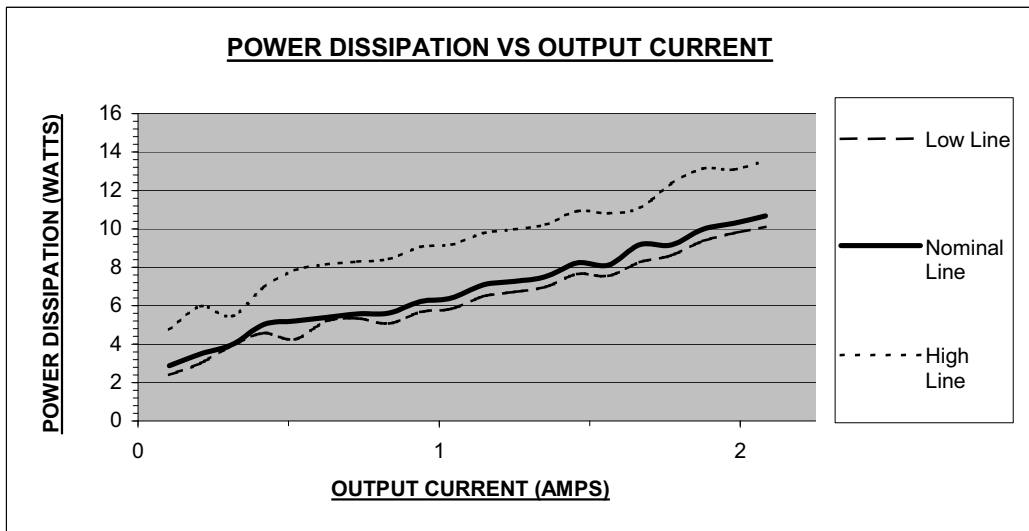
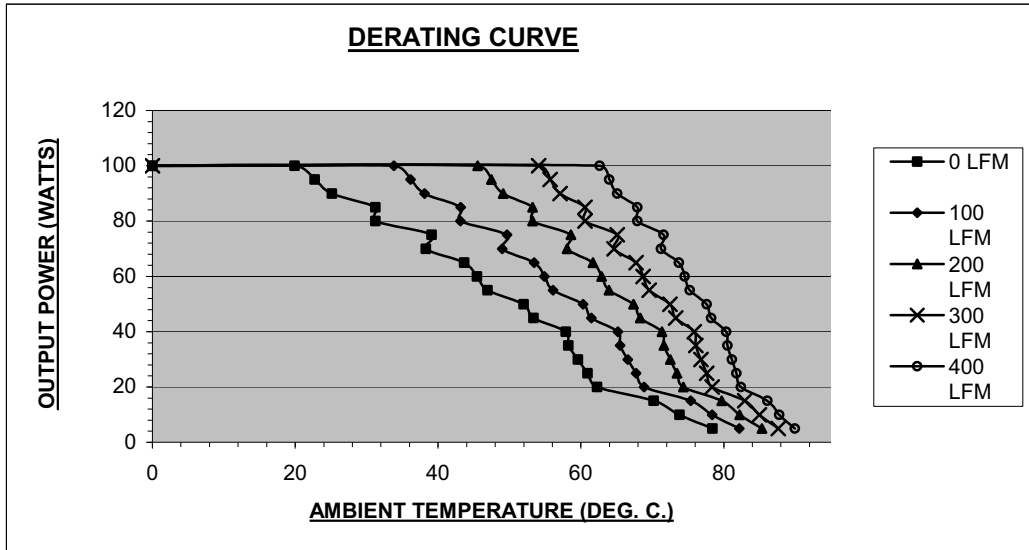


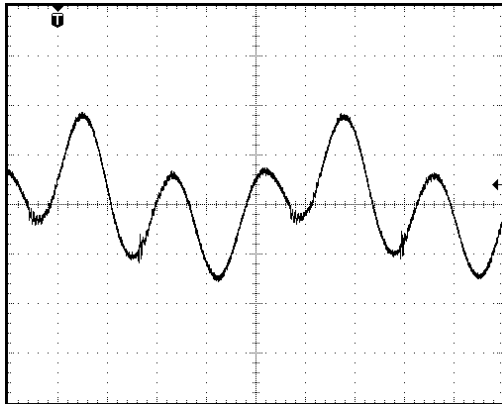
Schematic 2: Trim High

MODEL (Output Voltage)	R _H (K OHMS)	R _{LIM} (K OHMS)	R _L (K OHMS)	V _{REF} (VOLTS)
3.3V	0.750	0.499	2.32	2.495
5.0V	2.49	10.0	2.49	2.495
8.0V	5.49	10.0	2.49	2.495
9.0V	6.49	10.0	2.49	2.495
12.0V	9.53	13.7	2.49	2.495
15.0V	12.4	13.7	2.49	2.495
24.0V	21.5	15.4	2.49	2.495
26.0V	17.6	15.4	1.87	2.495
32.0V	23.7	12.7	2.00	2.495

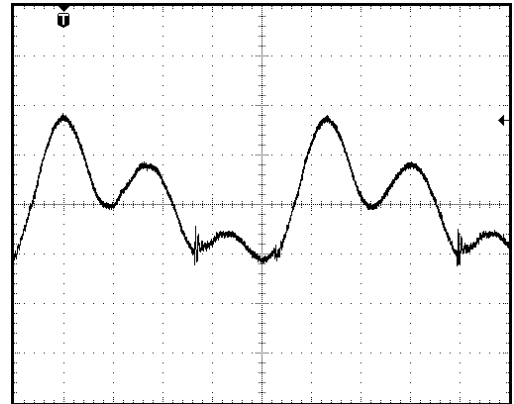
Table 1 : Trim Low/High Data Table.

Note: Output trim +/- 10% max.

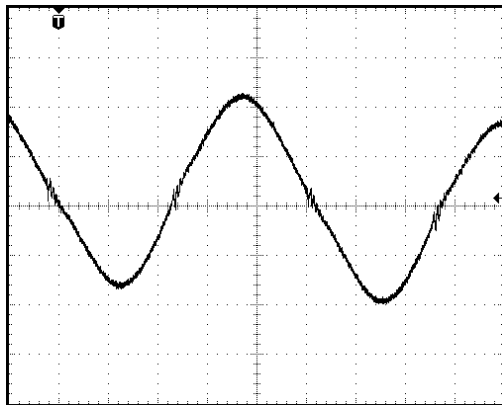




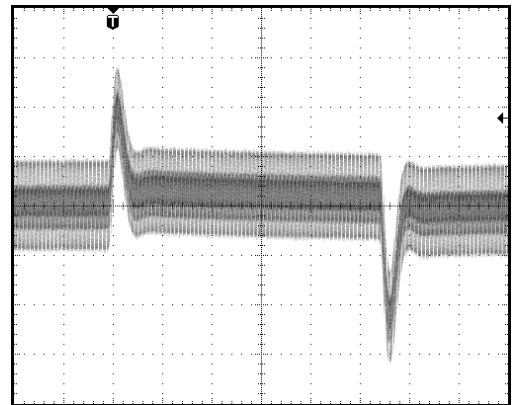
TYPICAL OUTPUT RIPPLE
 100mV/div, 1uS/div, full load, 40V_{in}
 10uF // 0.1uF decoupling cap at room temp



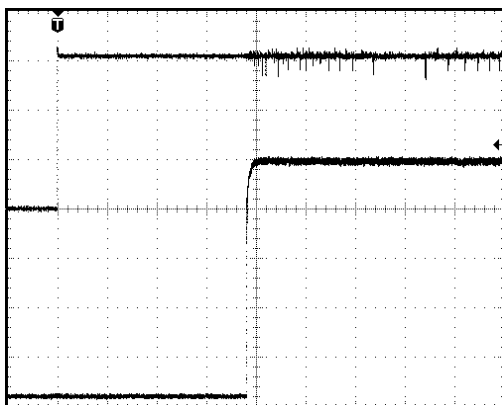
TYPICAL OUTPUT RIPPLE
 100mV/div, 1uS/div, full load 75V_{in}
 10uF // 0.1uF decoupling cap at room temp



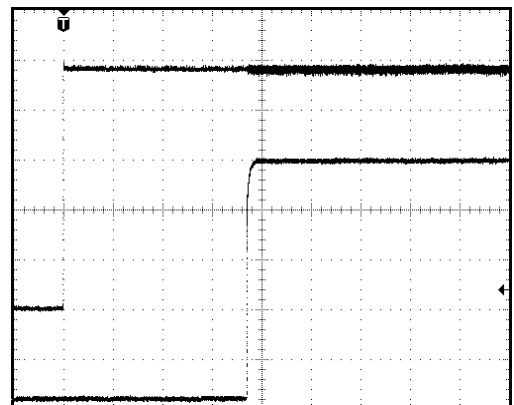
TYPICAL INPUT RIPPLE CURRENT
 10mA/div, 1uS/div, full load 48V_{in} at
 room temp with a 12uH / 33uF input filter



TYPICAL TRANSIENT RESPONSE
 200mV/div, 200uS/div, 50% full load
 to 75% full load 48V_{in} room temp



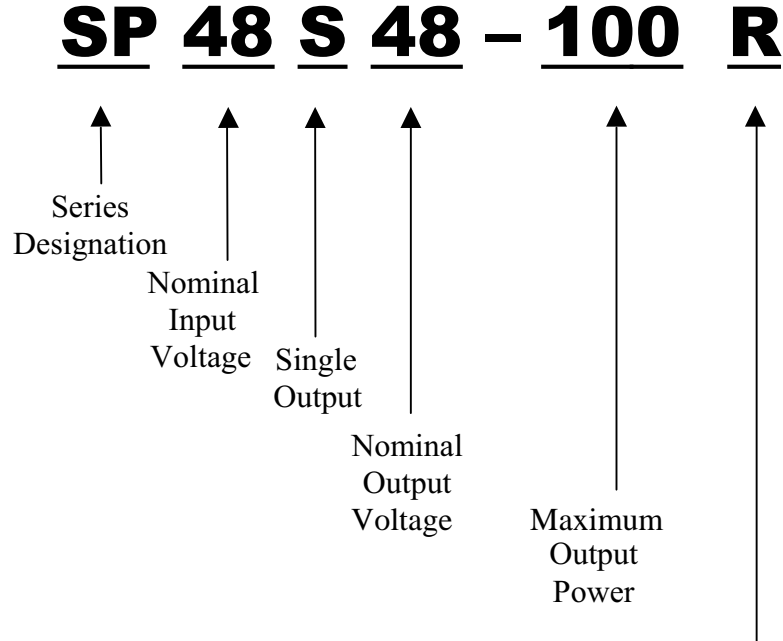
TYPICAL RISE TIME & TURN-ON DELAY
 USING LOGIC ENABLE
 10V/div, 100mS/div (V_{out}), 2V/div 100mS/div (logic
 enable) 36V_{in}, full load at room temp



TYPICAL RISE TIME & TURN-ON DELAY
 WITH V_{in} 0-48V
 10V/div, 100mS/div (V_{out}), 10V/div, 100mS/div (V_{in})
 at room temp

Ordering Information:

Part Number Example:



Options	
Blank	Leave Blank for Active High Enable
R	Active Low Enable

Company Information:

Wall Industries, Inc. has created custom and modified units for over 40 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on time and on budget. Our ISO9001-2000 certification is just one example of our commitment to producing a high quality, well documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎ (603)778-2300
Toll Free: ☎ (888)587-9255
Fax: ☎ (603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 5 Watson Brook Rd.
 Exeter, NH 03833