

Wall Industries, Inc.

SP24S12-75

75W DC-DC Converter
18-36 Vdc Input
12 Vdc Output a 6 25A
Half-Brick Package

**Features:**

- **84% 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:

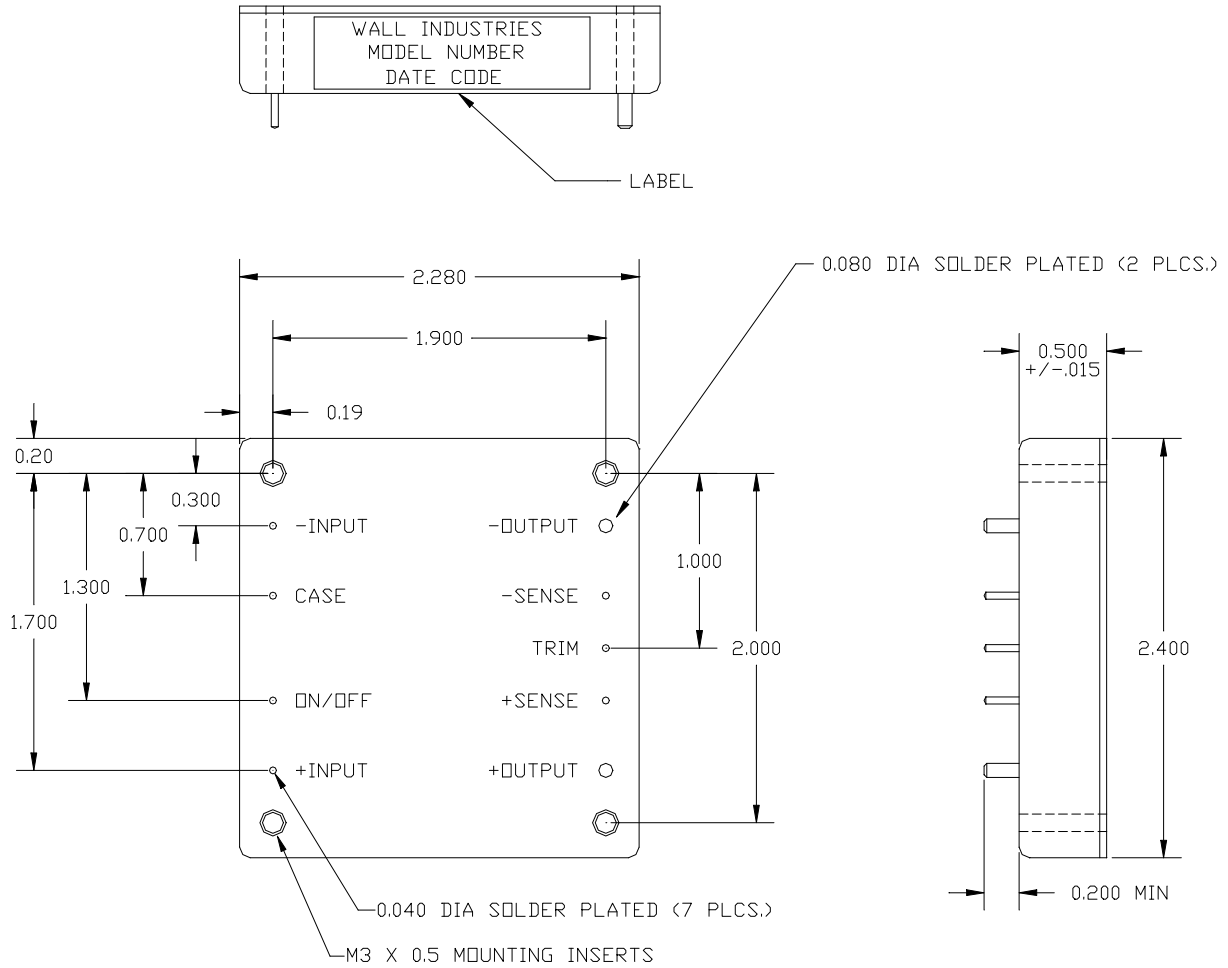
The SP & SPW series is a high-density half brick converter that incorporates the desired features required in today's demanding applications. When performance, reliability, and low cost are needed, the SP & SPW series delivers.

Technical Specifications		Model No. SP24S12-75					
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					17		Volt DC
Turn off at					16		Volt DC
Input Over voltage Shutdown							
Turn off at					38		Volt DC
Turn on at					37		Volt DC
Operating Voltage Range	Rated Input Voltage			18	24	36	Volt DC
Maximum Input Current	Low Line 100% load				5.2		A
No Load Input Current					63		mA
Input Current under "LOGIC OFF"					<1		mA
Inrush Current Transient Rating					1		A ² Sec
Reflected Ripple Current	12uH / 33uF input filter				19		mA
OUTPUT							
Output Voltage Set point				11.88	12	12.12	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					55		mV
Spikes P-P					105	180	mV
Output Current Ranges	Rated Output Current			0		6.25	A
Output Current Limit	Self Resetting			7.5	8.75	10.4	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 / Δ V	X	50 to 75%	50 to 100%		150		mV
Load step / Δ V	X	75 to 50%	100 to 50 %		160		mV
Recovery Time	To within 1% Rated Vo				180		μsec
Turn on Delay	From Vin(nom) to 90% Vout (nom)				345		msec
Overshoot of Output Voltage	Full Load Resistive				0		%
EFFICIENCY							
@ 100% load					84		%
@ 75% load					84		%
@ 50% load					84		%
@ 25% load					80		%
TEMPERATURE CONSIDERATIONS							
Thermal Resistance							
Normal Convection	R0c-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				10.8		13.2	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:

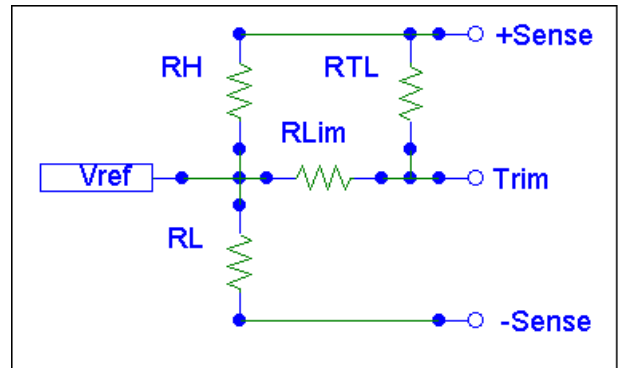
1. Determine the desired output voltage (Vo)
2. Select Equation. (Trim Low/Trim High)
3. Use the data in Table 1 to complete the equation.
4. Evaluate.

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.



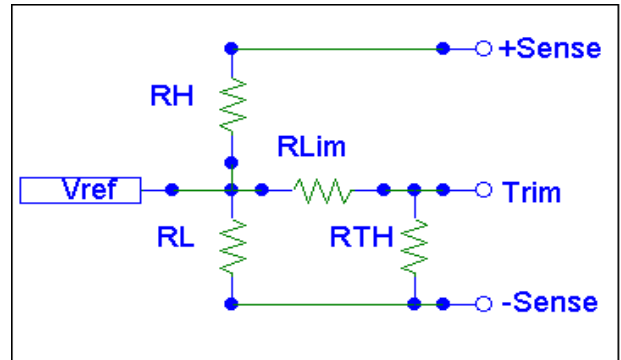
Schematic 1: Trim Low

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.

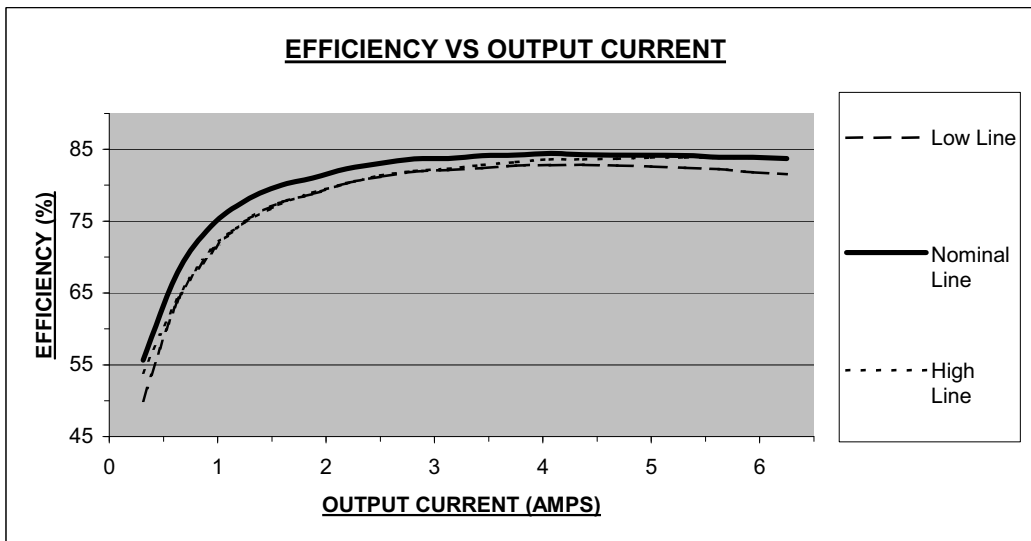
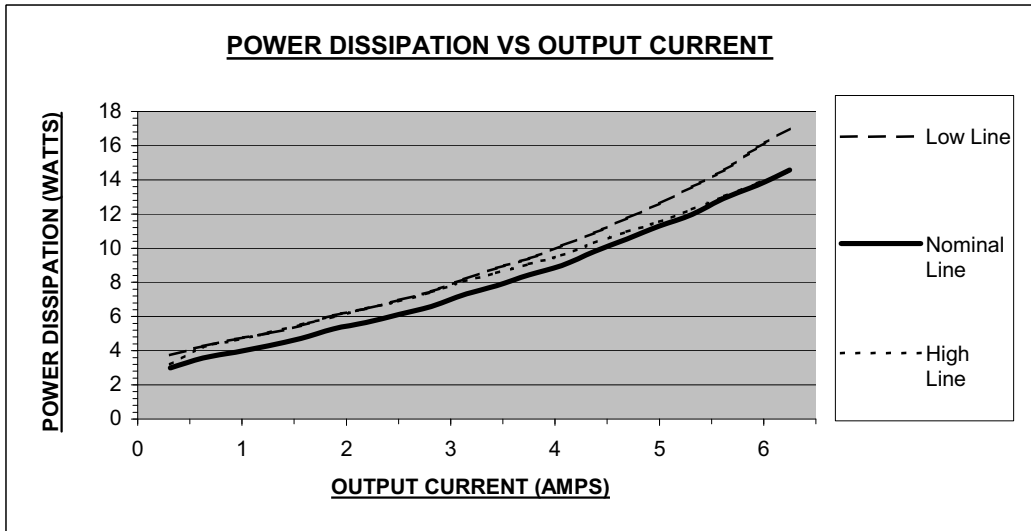
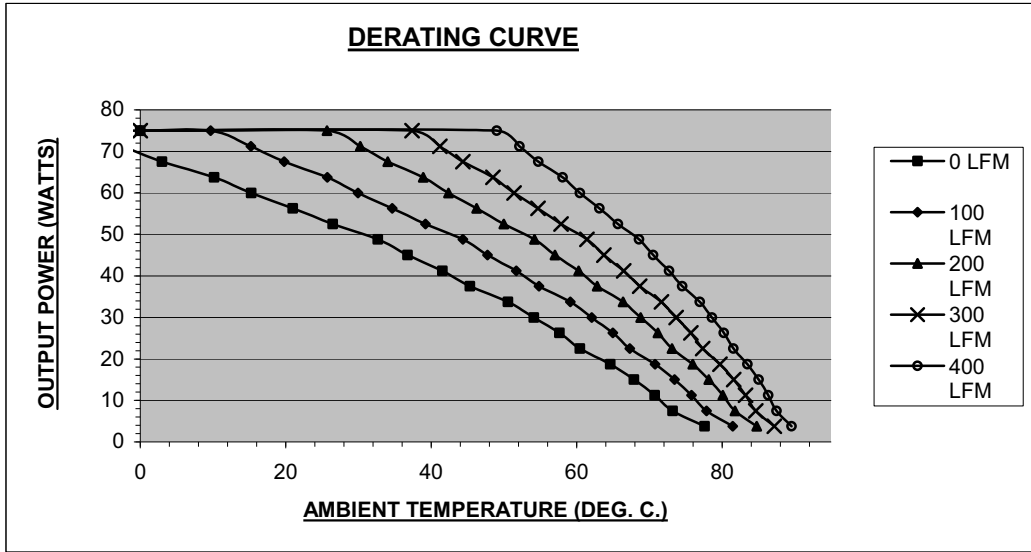


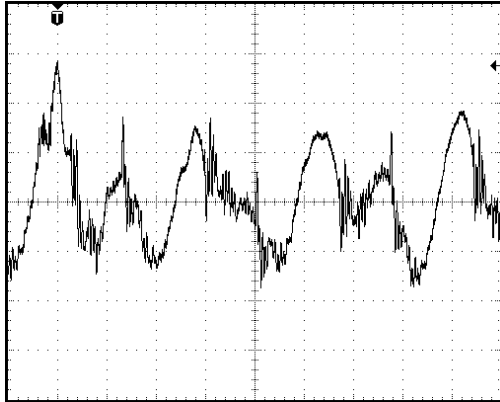
Schematic 2: Trim High

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

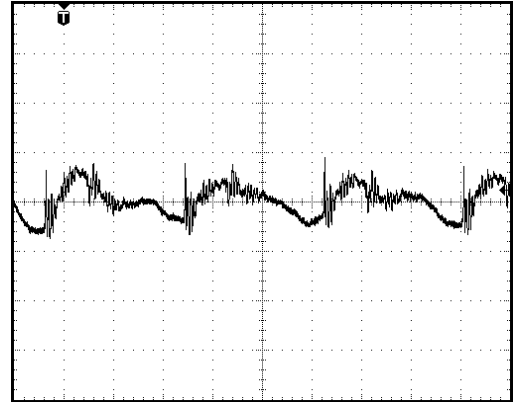
Table 1 : Trim Low/High Data Table.

Note: Output trim +/- 10% max.

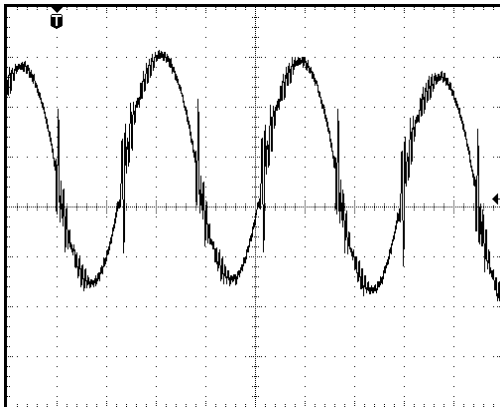




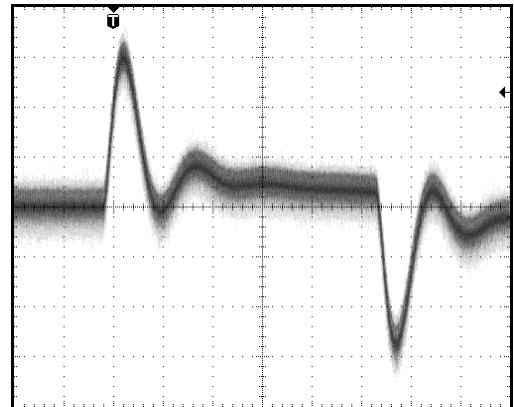
TYPICAL OUTPUT RIPPLE
20mV/div, 1uS/div, full load, 18Vin
10uF // 0.1uF decoupling cap at room temp



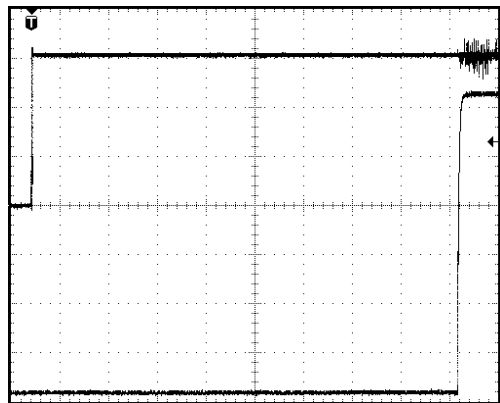
TYPICAL OUTPUT RIPPLE
50mV/div, 1uS/div, full load 36Vin
10uF // 0.1uF decoupling cap at room temp



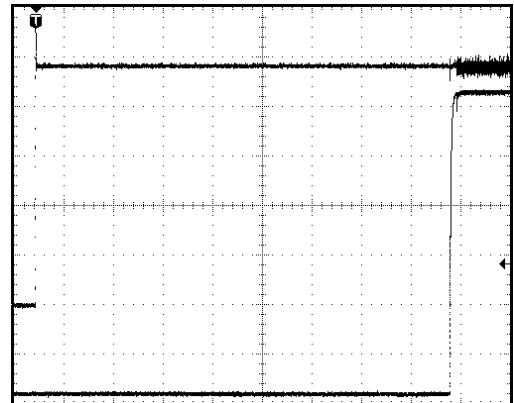
TYPICAL INPUT RIPPLE CURRENT
4mA/div, 1uS/div, full load 24Vin at
room temp with a 12uH / 33uF input filter



TYPICAL TRANSIENT RESPONSE
50mV/div, 200uS/div, 50% full load
to 75% full load 24Vin room temp



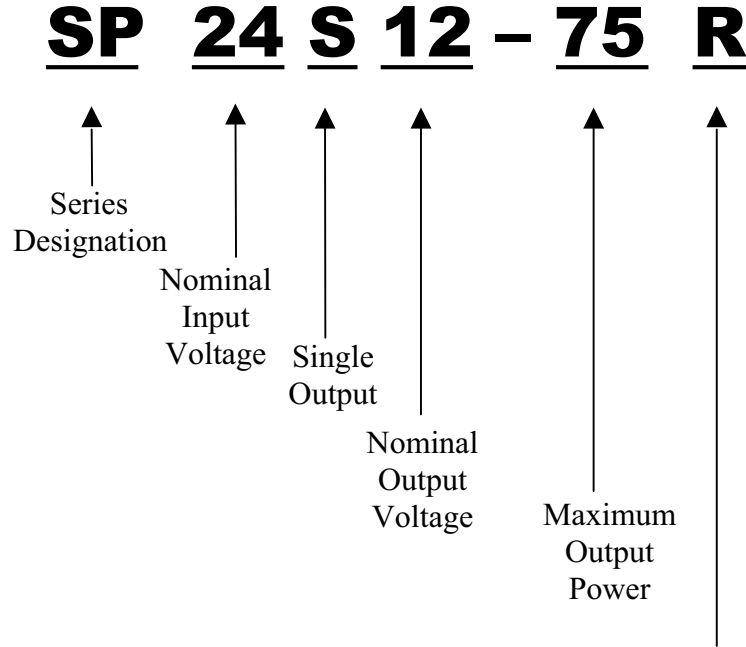
TYPICAL RISE TIME & TURN-ON DELAY
USING LOGIC ENABLE
2V/div, 40mS/div (Vout), 2V/div 40mS/div (logic
enable) 18Vin, full load at room temp



TYPICAL RISE TIME & TURN-ON DELAY
WITH Vin 0-24V
2V/div, 40mS/div (Vout), 5V/div, 40mS/div (Vin)
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:

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