

# High Output Power, High Efficiency Half Brick, SV24-32-400-B

**Module: 18Vdc to 36Vdc Input,  
32Vdc Output, Output Power Up to 400W.**

**World's Most Advanced High Power  
Density DC-DC Converters.**



## DESCRIPTION:

The SUPERVERTER™ module is a high density DC-DC converter designed for use in distributed power architectures, workstation, EDP equipment, and telecommunication applications. The surface-mount construction uses a metal baseplate and planar transformer to produce up to 400W in a half brick package. The SUPERVERTER™ module is a suitable replacement for all industry.

## OPTIONS

- Remote On/Off Logic Configuration
- Heat Sink Available for Extended Operation

## FEATURES:

- Miniature Size: 61.0mm x 57.9mm x 12.7mm (2.40in. x 2.28in. x 0.50in.) (Typical)
- High Power Density: Up to 146.2W/in.<sup>3</sup>
- High Efficiency: 92% Typical
- Low Output Noise
- Industry-Standard Size
- Metal Baseplate
- Thermal Protection
- Input Under Voltage Protection
- Output Over Voltage Protection
- Current Limit/Short Circuit Protection
- Adjustable Output Voltage: 90% to 110% of  $V_{o,set}$
- Remote Sense
- RoHS Compliant
- Safety: TBD

**SPECIFICATIONS:**
**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Input Voltage (+In to -In)	-0.3		50	V	<100ms
	-0.3		36	V	Continuous
Storage Temperature	-40		125	°C	
Storage Humidity	10		95	%	
Operating Temperature	-40		100	°C	Temperature measure shall be taken from the baseplate (Tb).
Operating Humidity	30		95	%	

**INPUT SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Operation Input Voltage (Vi)	18	24	36	V	
Maximum Input Current (Ii,max)			28	A	Vi=18V, Io =Io,max
Inrush Transient			2	A <sup>2</sup> s	
Input Reflected-Ripple Current: Peak-Peak		7	15	mAp-p	5HZ to 100MHZ, Io=Full Load, 12uH source impedance
Input Ripple Rejection		60		dB	120Hz
Input Under Voltage Protection: Turn-on Threshold		17	18	V	Vo=32V, Io =Io,max.
Turn-off Threshold	15	16		V	

**OUTPUT SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Set Point (Vo,set)	31.95	32	32.05	V	Initial Adjusted Tb=25°C, Vi=24V, Io=Io,max
Output Voltage Accuracy	31.7	32	32.3	V	Io=Io,max
Output Voltage Tolerance Band	-3		+3	%	All Operating Condition
Line Regulation			0.2	%	Vi=18V to 36V
Load Regulation			0.2	%	Io= Io,min to Io,max.
Temperature Drift			0.02	%/ °C	Tb= -40 to 100°C
Output Ripple and Noise Voltage Peak to Peak			350	mVp-p	Bandwidth 5Hz to 20MHz and with 0.1uF MLCC. Output Capacitor: 1000uF
Output Current Io,min Io,max	0		12.5	A A	At Vo<=32V, if Vo>32V, Output Power (Po) should be less than its rating power.
Output Current Limit	110		125	%Io,max	Current limit inception point Vo=90% of Vo,set
Output Short Circuit Current			10	Arms	Hiccup Mode
Output Over Voltage Protection	112		140	% Vo,set	Io=0.5A
External Capacitance		1000		uF	

**OUTPUT SPECIFICATIONS (CONTINUED):**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Efficiency		92		%	Vi=24V, Vo=32V, Io=80 % of Io,max, Tb=25 °C. Vi=24V, Vo=24V, Io=33 % of Io,max, Tb=25 °C.
Dynamic Response: 25% - 50% -75% load, $\Delta I_o/\Delta t=0.1A/us$ ; with Output Capacitor 220uF/50V,					Vi=24V, Tb=25°C
Peak Deviation Settling Time		3	300	% Vo,set us	Duration outside of Vo,set +/- 1.0% error band

**CONTROL SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Logic ON/OFF Remote:					
Positive:					
Off-State Voltage			0.8	V	
On-State Voltage	2.0			V	
Negative:					
Off-State Voltage	2.0			V	
On-State Voltage			0.8	V	
Turn-On Time		30		ms	Vo=90% of Vo,set
Output Voltage Trim Range	90		110	% Vo,set	Refer to Trim Circuit.
Over Temperature Protection Shutdown	100	105	110	°C	Refer to Fig.3 for location definition
Recovery	90			°C	Auto. Recovery

**ISOLATION SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Input to Output		1500		Vdc	60 seconds
Input to Case		1500		Vdc	60 seconds
Output to Case		500		Vdc	60 seconds
Input to Output Capacitance		2000		pF	
Isolation Resistance	100			Mohm	At Tb=25°C, 70%RH, Output to Baseplate 500VDC

**STRUCTURAL DYNAMICS:**

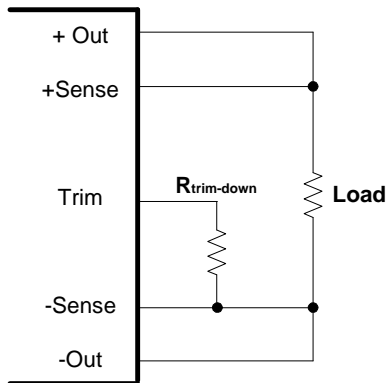
PARAMETER	CONDITIONS
Vibration	Sine Wave, 10-55Hz (Sweep for 1 min.), Amplitude 0.825mm Constant (Maximum 5g) X,Y,Z 1 Hour each, At No Operating,
Shock	20g, 166 in/sec, Square Wave

**GENERAL SPECIFICATIONS:**

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
MTBF		2		Mhrs	Tc=40°C, Io=80% of Io,max
Weight		TBD		g	
Size (WxHxD)		2.40x2.28x0.5		in.^3	

**TRIM CIRCUIT:**

A. Trim down: The resistor for output voltage trim-down function could be calculated with the following formula:

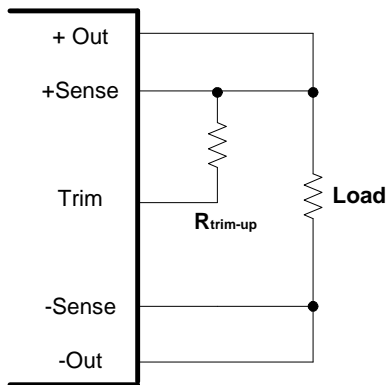


$$R_{trim-down} = \left( \frac{100}{\Delta\%} - 2 \right) (k\Omega)$$

$\Delta\%$ : Desired output voltage change.

Fig. 1 The schematic for output voltage trim down.

B. Trim up: The resistor for output voltage trim-up function could be calculated with the following formula



$$R_{trim-up} = \left[ \frac{V_o(100+\Delta\%)}{1.225\Delta\%} - \frac{(100+2\Delta\%)}{\Delta\%} \right] (k\Omega)$$

$V_o$ : The required output voltage.

$\Delta\%$ : Desired output voltage change.

Fig. 2 The schematic for output voltage trim up.

**OUTLINE DRAWING:**

NOTE:  
 1. UNIT: MM [INCH]  
 2. TOLERANCE: X.X[X.XX] ±0.5 [00.2]  
 X.XX[X.XXX] ±0.25 [0.010]

