



SUPERVERTER™

50W – 150W DC-DC CONVERTERS

MODEL: SV28-12-50/75/100/150

PRELIMINARY DATA SHEET

28VDC INPUT

**12 VDC @ 4.2A OUTPUT,
6.3A OUTPUT,
8.3A OUTPUT, or
12.5A OUTPUT**



**Designed for Telecom, Wireless,
& Computer Applications**

FEATURES

- Industry Standard Half-brick Package
- High Efficiency
- Constant Frequency
- Clamp Over-Voltage Protection
- Remote Sense
- Trim Range: -40 to +10%
- Encapsulated
- High Power Density: up to 54 W/cu.in.
- Low Noise
- -40 to +100°C Operation
- 105°C Over Temperature Protection
- Choice of On/Off Logic
- UL/CSA/TUV & CE Compliant
- Threaded Mounting Holes

MODEL SELECTION

Model Number	Input Voltage (Vdc)	Output Voltage (Vdc)	Output Current (A)
SV28-12-150-1	18-36	12	12.5
SV28-12-100-1	18-36	12	8.3
SV28-12-75-1	18-36	12	6.3
SV28-12-50-1	18-36	12	4.2

DESCRIPTION

The SuperVerter series modules are high-density DC-DC converters designed for use in telecom and other centralized, modular, and distributed power applications. The SV28-12 is a family of 28V input, 12V output, half brick modules compatible with the industry standard footprint. These modules may be used as form, fit, and function replacements for industry standard, 12V half brick modules. All SuperVerter modules use metal baseplates, planar transformers, and surface mount construction to produce up to 150W of low noise, 12V output power.

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ABSOLUTE MAXIMUM RATINGS

Exceeding absolute maximum ratings may cause permanent damage and may reduce reliability.

PARAMETER	MIN	MAX	UNITS	CONDITIONS
Input Voltage (+In to -In)		40	Vdc	Continuous
Transient Input Voltage (+In to -In)		50	Vdc	100 msec. max.
Input/ Case Isolation		1500	Vdc	
Output/ Case Isolation		500	Vdc	
Input/ Output Isolation		1500	Vdc	
Storage Temperature	-40	+110	°C	
Operating Temperature	-40	+100	°C	Baseplate
Soldering Temperature (Wave Solder)		260	°C	< 5 sec.
Soldering Temperature (Hand Solder)		390	°C	< 7 sec.

ELECTRICAL SPECIFICATIONS

Electrical specifications apply over the entire range of input voltage, output current, and temperature unless indicated.

INPUT PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Input Voltage	18	28	36	Vdc	
Maximum Input Current					Over V_{in} range @ full load
SV28-12-50			4.7	A	
SV28-12-75			6.7	A	
SV28-12-100			8.7	A	
SV28-12-150			10.6	A	
Inrush Transient			1	A ² sec	
Input Reflected Ripple Current		5		mAp-p	5Hz to 20MHz, 12 μ H source impedance
Input Ripple Rejection		60		dB	@ 120 Hz

OUTPUT PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Voltage Set Point	11.78	12.00	12.22	Vdc	28 V_{in} , 25°C, full load
Load Regulation		0.05	0.2	%	0.3 A to full load
Line Regulation		0.01	0.1	%	Over V_{in} range
Voltage Drift w/Temperature		50	150	mV	-40 to +100 °C
Total Regulation			1.5	%	
Ripple			50 200	mV rms mV p-p	5 Hz to 20 MHz, ripple may exceed spec below minimum load
Rated Output Current					At $I_{out} < I_{out}(min)$, the output ripple may exceed the specification. All other aspects of the unit will function properly at no load.
SV28-12-50	0.3		4.2	A	
SV28-12-75	0.3		6.3	A	
SV28-12-100	0.3		8.3	A	
SV28-12-150	0.3		12.5	A	

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ELECTRICAL SPECIFICATIONS (continued)

Current Limit Inception					$V_{out} = 90\% V_{out\ nominal}$
SV28-12-50		4.8	5.8	A	
SV28-12-75		7.2	8.8	A	
SV28-12-100		9.6	10.8	A	
SV28-12-150		14.4	16.3	A	
Short Circuit Current			170	% F.L.	$V_{out} = 250\ mV$
Switching Frequency		370		kHz	
Transient Response Peak Deviation (0.1A/ μ sec slew rate)		2		% V_{out}	Load change from 50% to 75% or 50% to 25% full load
Transient Response Settling Time (0.1 A/ μ sec slew rate)			300	μ sec	$V_{in} = 28\ V, T_{case} = 25\ ^\circ C, V_{out}$ within 1% $V_{out\ nominal}$
Efficiency					$V_{in} = 28\ V, \text{full load}, T_{case} = 70\ ^\circ C$
SV28-12-50	83	86		%	
SV28-12-75	84	86		%	
SV28-12-100	84	86		%	
SV28-12-150	84	86		%	
External Load Capacitance	0		5,000	μ F	Electrolytic Capacitor

ISOLATION PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Input-to-Output Capacitance		2000		pF	
Input-to-Output Resistance	10			M Ohms	

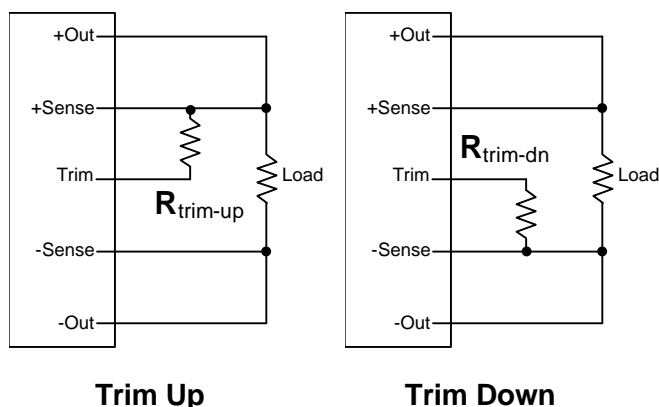
FEATURE PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Trim Range	60		110	% V_{out}	
Remote Sense Compensation			1.2	Vdc	
Over Voltage Clamp (Non-Shutdown, Auto. Recovery)	13.2		16	Vdc	
Over Temperature Shut-down		+105		$^\circ C$	100W & 150W models only
Turn-On Time		20	35	msec	80% load, V_{out} within 1% of steady state
Logic On/Off *					
Logic Low $V_{on/off}$	0		1.2	V	@ $I_{on/off} = 1\ mA$
$I_{on/off}$			1.0	mA	@ $V_{on/off} = 0\ V$
Logic High: $V_{on/off}$			15	V	@ $I_{on/off} = 1\ mA$
$I_{on/off}$			50	μ A	@ $V_{on/off} = 15\ V$

* Negative logic on/off is standard, positive logic is optional (delete the "-1" suffix from model number for positive logic). With negative logic, logic low turns module on, logic high turns it off. The reverse is true for positive logic.

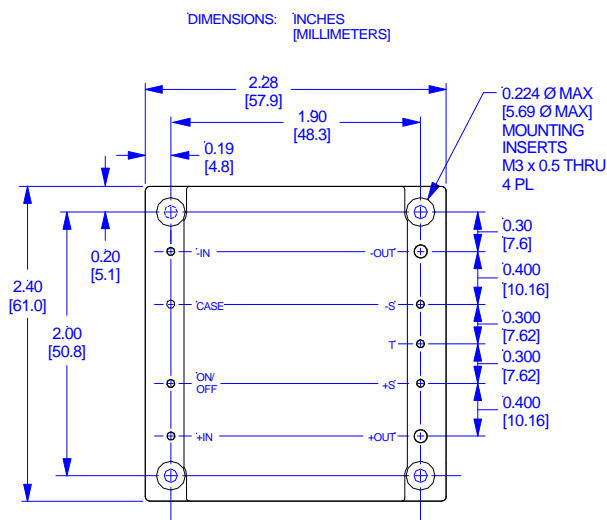
MECHANICAL SPECIFICATIONS

MECHANICAL PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Weight		118 (4.2)		g (oz.)	
Size		0.5 x 2.4 x 2.28		Inches	See Outline Drawing
Thermal Resistance, Case-to-Ambient		6.6		°C/W	T _{case} = 100 °C

TRIM CIRCUIT CONFIGURATIONS



OUTLINE DRAWING



TRIM RESISTOR CALCULATIONS

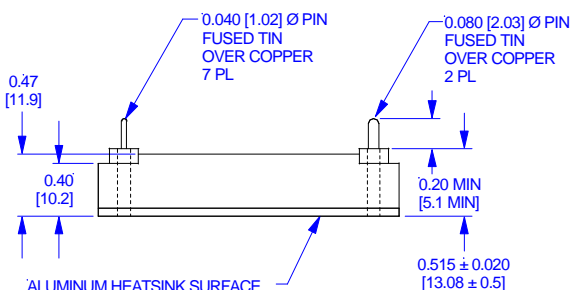
$$R_{\text{trim-up}} = \left(\frac{12 \times (100 + \Delta\%)}{1.225 \times \Delta\%} - \frac{(100 + 2 \times \Delta\%)}{\Delta\%} \right) \text{ kohms}$$

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

$\Delta\%$ = Desired Output Voltage Change ($\Delta\% > 0$)

$R_{\text{trim-up}}$ = External Resistor Value to Increase V_o

$R_{\text{trim-down}}$ = External Resistor Value to Decrease V_o



TOLERANCES: x.xx in. ± 0.02 in. [x.x mm. ± 0.5 mm.]
 x.xxx in. ± 0.010 in. [x.xx mm. ± 0.25 mm.]