



# **SUPERVERTER™**

## **50W – 175W DC-DC CONVERTERS** **MODEL: SV28-5-50/75/100/150/175** **PRELIMINARY DATA SHEET**

### **28VDC INPUT**

**5 VDC @ 10A OUTPUT,  
15A OUTPUT,  
20A OUTPUT,  
30A OUTPUT, or  
35A 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)
SV28-5-175-1	18-36	5	35
SV28-5-150-1	18-36	5	30
SV28-5-100-1	18-36	5	20
SV28-5-75-1	18-36	5	15
SV28-5-50-1	18-36	5	10

#### **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 SV28-5 is a family of 28V input, 5V output, half brick modules compatible with the industry standard footprint. These modules may be used as form, fit, and function replacements for industry standard, 5V half brick modules. All SuperVerter modules use metal baseplates, planar transformers, and surface mount construction to produce up to 175W of low noise, 5V 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	20	28	36	Vdc	
Brownout Voltage	18			Vdc	85% of full load
Maximum Input Current					Over $V_{in}$ range @ full load
SV28-5-50			3.8	A	
SV28-5-75			5.2	A	
SV28-5-100			6.9	A	
SV28-5-150			11.0	A	
SV28-5-175			13.0	A	
Inrush Transient			1	A <sup>2</sup> sec	
Input Reflected Ripple Current		5		mAp-p	5Hz to 20MHz, 12μH source impedance
Input Ripple Rejection		60		dB	@120 Hz

OUTPUT PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Voltage Set Point	4.92	5.00	5.08	Vdc	28 $V_{in}$ , 25°C, full load
Load Regulation		0.05	0.2	%	0.5 A to full load
Line Regulation		0.01	0.1	%	Over $V_{in}$ range
Voltage Drift w/Temperature		15	50	mV	-40 to +100 °C
Total Regulation			1.5	%	
Ripple			150	mV p-p	5 Hz to 20 MHz, ripple may exceed spec below minimum load
External Load Capacitance	0		10,000	μF	Electrolytic Capacitor

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### ELECTRICAL SPECIFICATIONS (continued)

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.
SV28-5-50	0.5		10	A	
SV28-5-75	0.5		15	A	
SV28-5-100	0.5		20	A	
SV28-5-150	0.5		30	A	
SV28-5-175	0.5		35	A	
Current Limit Inception					$V_{out} = 90\% V_{out\ nominal}$
SV28-5-50		11.5	13.2	A	
SV28-5-75		17.3	20	A	
SV28-5-100		23	26.5	A	
SV28-5-150		34.5	39.5	A	
SV28-5-175		43	46	A	
Short Circuit Current			170	% F.L.	$V_{out} = 250\ mV$
Switching Frequency		370		kHz	
Transient Response Peak Deviation (0.1A/ $\mu$ sec slew rate)		3		% $V_{out}$	Load change from 50% to 75% or 50% to 25% full load
Transient Response Settling Time (0.1 A/ $\mu$ sec slew rate)			300	$\mu$ sec	$V_{in} = 28\ V$ , $T_{case} = 25\ ^\circ C$ , $V_{out}$ within 1% $V_{out\ nominal}$
Efficiency					$V_{in} = 28\ V$ , full load, $T_{case} = 70\ ^\circ C$
SV28-5-50	82	84		%	
SV28-5-75	83	85		%	
SV28-5-100	83	85		%	
SV28-5-150	81	83.5		%	
SV28-5-175	80	82		%	

FEATURE PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Trim Range	60		110	% $V_{out}$	
Remote Sense Compensation			0.5	Vdc	
Over Voltage Clamp (Non-Shutdown, Auto. Recovery)	5.7		7.0	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	$\mu A$	@ $V_{on/off} = 15\ V$

\* 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.

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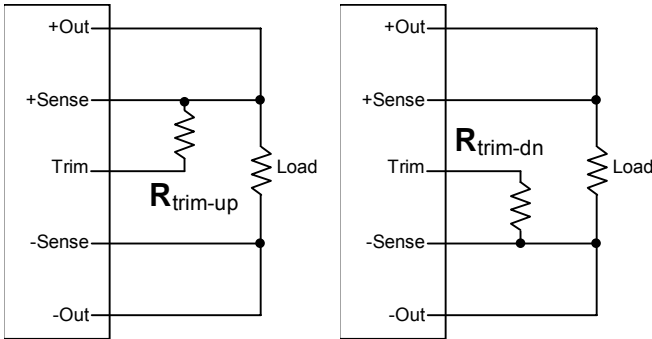
### ELECTRICAL SPECIFICATIONS (continued)

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

### 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 <sub>case</sub> = 100 °C

#### TRIM CIRCUIT CONFIGURATIONS



Trim Up

Trim Down

#### TRIM RESISTOR CALCULATIONS

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

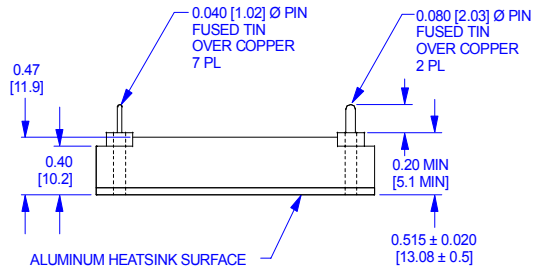
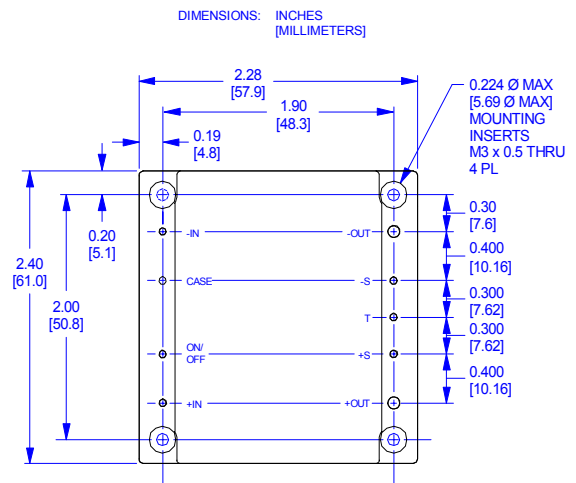
$$R_{\text{trim-down}} = \left( \frac{100}{\Delta\%} - 2 \right) \text{kohms}$$

$\Delta\%$  = 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  $V_o$

#### OUTLINE DRAWING



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.]

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