SUPERVERTER®
150W – 200W DC-DC CONVERTERS
MODEL: *SV28-5-150/175/200*
DATA SHEET

28VDC INPUT (18-36 VDC)

5 VDC @ 30A OUTPUT, 35A OUTPUT , or 40A OUTPUT

Designed for Vehicle, Airborne and other rugged environment applications

MADE IN USA

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 (-55°C to +100°C Optional)
- 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)
SV28-5-200-1(T)*	18-36	5	40
SV28-5-175-1(T)*	18-36	5	35
SV28-5-150-1(T)*	18-36	5	30

*An Optional Operating Temperature Rating of -55°C to +100°C is available. Simply add the suffix “T” to the end of the Model Number. For Example: SV28-5-200-1T

DESCRIPTION

The SuperVerter® series modules are high-density DC-DC converters designed for use in military and industrial applications such as on board vehicle and avionics electronic equipment. These are high power 28V input, 5V output, half brick modules that use insulated metal substrates, planar transformers, surface mount construction and thermally conductive potting to produce up to 200W of low noise, 5V output power.

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SUPERVERTER® DC-DC Converters
SV28-5-150/175/200

ABSOLUTE MAXIMUM RATINGS

Exceeding absolute maximum ratings may cause permanent damage or 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.

*An Optional Operating Temperature Rating of -55°C to +100°C is available. See Model Selection Chart on Page 1 for ordering instructions.

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	All models except -175 model
Maximum Input Current SV28-5-150 SV28-5-175 SV28-5-200			 11.0 13.0	 A A A	Full load (See Input Characteristic)
Inrush Transient			1	A^2sec	
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		50	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 SV28-5-150 SV28-5-175 SV28-5-200	 0.5 0.5 0.5		 30 35 40	 A	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.
Current Limit Inception SV28-5-150 SV28-5-175 SV28-5-200		 34.5 40 46	 39.5 44 50	 A	V_{out} = 90% V_{out} nominal
Short Circuit Current			170	% F.L.	V_{out} = 250 mV
Switching Frequency		370		kHz	
Transient Response Peak Deviation (0.1A/µsec slew rate)		3		% V_{out}	Load change from 50% to 75% or 50% to 25% full load
Transient Response Settling Time (0.1 A/µsec slew rate)			300	µsec	V_{in} = 28 V, T_{case} = 25 °C, V_{out} within 1% V_{out} nominal
Efficiency SV28-5-150 SV28-5-175 SV28-5-200	 83 81 80	 83.5 82.5 82		 % % %	V_{in} = 28 V, full load, T_{case} = 70 °C

FEATURE PARAMETERS	MIN	TYP	MAX	UNITS	CONDITIONS
Trim Range	60		110	%Vout	
Remote Sense Compensation			0.5	Vdc	
Over Voltage Clamp (Non-Shutdown, Auto. Recovery)	5.7		7.0	Vdc	
Over Temperature Shut-down		+105		°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 Von/off	0		1.2	V	@ Ion/off = 1mA
Ion/off			1.0	mA	@ Von/off = 0V
Logic High: Von/off			15	V	@ Ion/off = 1mA
Ion/off			50	µA	@ Von/off = 15V

** 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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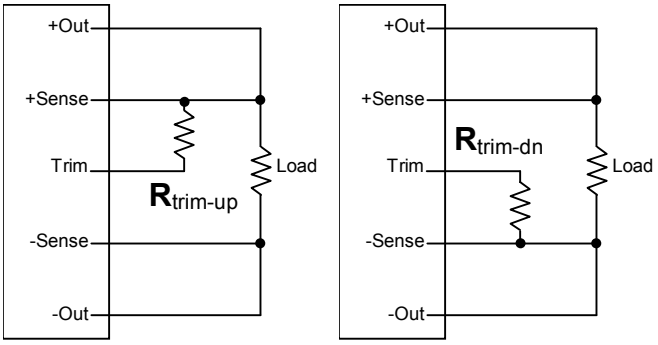
ELECTRICAL SPECIFICATIONS (continued)

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_{case} = 100 °C

TRIM CIRCUIT CONFIGURATIONS



Trim Up **Trim Down**

TRIM RESISTOR CALCULATIONS

$$R_{trim-up} = \left(\frac{5 \times (100 + \Delta\%)}{1.225 \times \Delta\%} - \frac{(100 + 2 \times \Delta\%)}{\Delta\%} \right) \text{kohms}$$

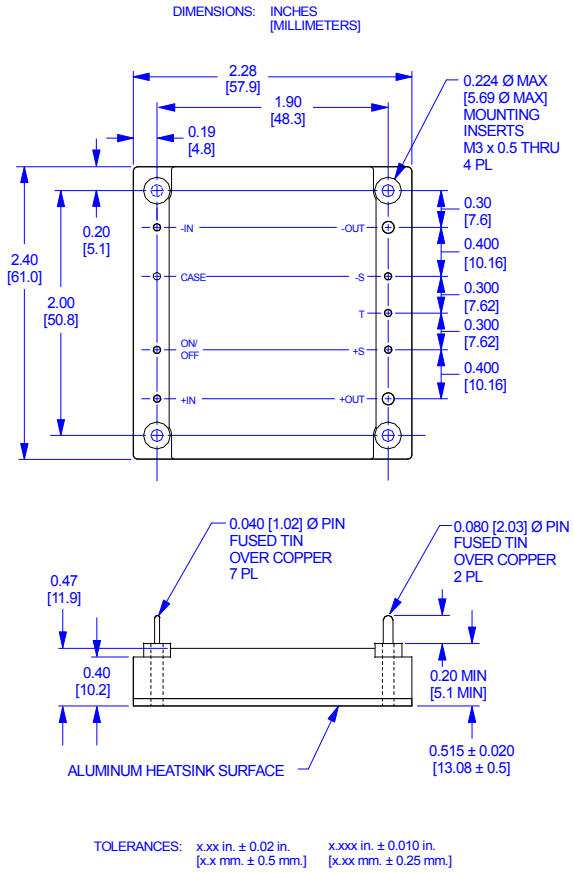
$$R_{trim-down} = \left(\frac{100}{\Delta\%} - 2 \right) \text{kohms}$$

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

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

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

OUTLINE DRAWING



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