



AcBel Product Specification

Acbel Part No.	TBD
Model Name	SV24-12-150
Description	DC-DC Converter 24Vdc Input, 12Vdc Output, 150W Output Power, Positive ON/OFF control
Revision	Draft Rev 1
Date Issued	02/18/2009

High Output Power, High Efficiency Half Brick, SV24-12-150

**Module: 18Vdc to 36Vdc Input,
12Vdc Output, Output Power Up to 150W.**

**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 planar transformer to produce up to 150W 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:

- Industry Standard Half Brick:
61.0mm x 57.9mm x 12.7mm
(2.40in. x 2.28in. x 0.50in.) (Typical)
- High Power Density: Up to 55W/in.³
- High Efficiency: 91% Typical,
- Low Output Noise
- Thermal Protection
- Input Under Voltage Protection
- Output Over Voltage Protection
- Current Limit Protection: Step down mode
- Short Circuit Protection
- Adjustable Output Voltage: 60% to 100% of .Vo,set
- Remote Sense
- Remote On/Off Control: Positive Logic
- RoHS Compliant

**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
Logic ON/OFF Voltage (ON/OFF to -In)	-0.3		15	V	
Storage Temperature	-40		125	°C	
Storage Humidity	10		95	%	
Operating Temperature	-40		85	°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)			10	A	Vi=18V, Io =Io,max
Inrush Transient			2	A ² s	
Input Reflected-Ripple Current: Peak-Peak		40	60	mA _{p-p}	5HZ to 20MHZ, Vin=24V, Io= Io,max, 12uH source Impedance, Cin=690uF, Tb=25°C
Input Ripple Rejection		60		dB	120Hz
Input Under Voltage Protection: Turn-on Threshold		17.5	18	V	Vo=12V, Io =Io,max.
Turn-off Threshold	15.5	16		V	
Hysteresis	1	1.5		V	

OUTPUT SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Output Set Point (Vo,set)	11.95	12	12.05	V	Initial Adjusted Tb=25°C, Vi=24V, Io=Io,max
Output Voltage Tolerance Band			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			250	mV _{p-p}	Bandwidth 5Hz to 20MHz and with 0.1uF MLCC. Output Capacitor: 880uF, Tb=25°C
Output Current (Io,max)	0		12.5	A	At Vo<=12V, if Vo>12V, Output Power (Po) should be less than its rating power.
Output Current Limit	105		165	%Io,max	Current limit inception point Vo=90% of Vo,set,
Output Short Circuit Current			20	Arms	Hiccup Mode
Output Over Voltage Protection	112		140	%Vo,set	Io=0.5A
External Capacitance		880	3000	uF	
Output Power			150	W	



OUTPUT SPECIFICATIONS (CONTINUED):

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
Efficiency		91		%	Vi=24V, Vo=12V, Io=80% of Io,max Tb=25 °C.
Dynamic Response: Peak Deviation Settling Time		3	500	%Vo,set us	Vi=24V, Tb=25°C 25% - 50% -75% load, Δ Io/Δ t=0.1A/us; with Output Capacitor 880uF, 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 On-State Voltage	2.0		0.8	V V	
Negative: Off-State Voltage On-State Voltage	2.0		0.8	V V	
Turn-On Time		50		ms	Vo=90% of Vo,set
Output Voltage Trim Range	60		100	%	Refer to Trim Circuit
Over Temperature Protection Shutdown Recovery		95 80		°C °C	Refer to Fig.3 for loca- tion definition 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:

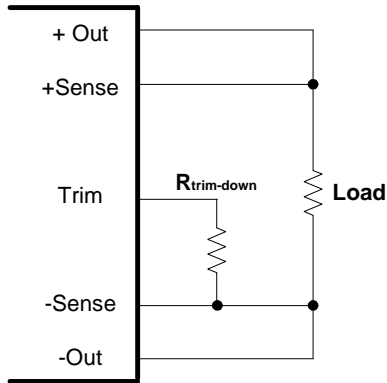
PARAMETER	CONDITIONS
Vibration	Sine Wave, 10-55Hz (Sweep for 1 min.), Amplitude 0.825mm Constant (Maximum 5g) X,Y,Z 1 Hour each, At No Operating,
Shock	20g, 166 in/sec, Square Wave

GENERAL SPECIFICATIONS:

PARAMETER	MIN	TYP	MAX	UNITS	CONDITIONS
MTBF		TBD		Mhrs	Tb=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:

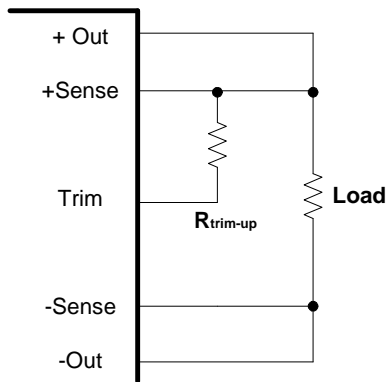


$$R_{trim-down} = \left(\frac{100\%}{\Delta\%} - 2 \right) (k\Omega)$$

$\Delta\%$: Output voltage change rate against nominal output voltage.

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 nominal output voltage..

$\Delta\%$: Output voltage change rate against nominal output voltage.

Fig. 2 The schematic for output voltage trim up.

BASEPLATE MEASURE POINT:

UNIT: mm

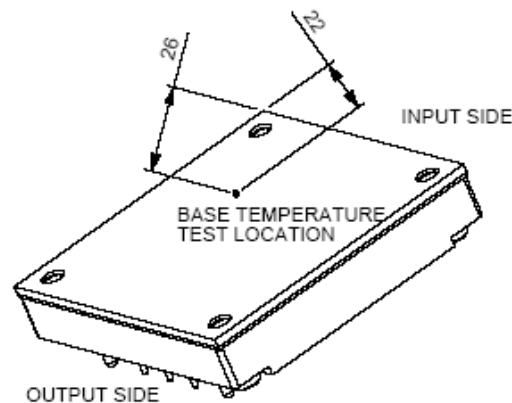


Fig. 3 Baseplate Temperature Measure Point.

EFFICIENCY CURVE :

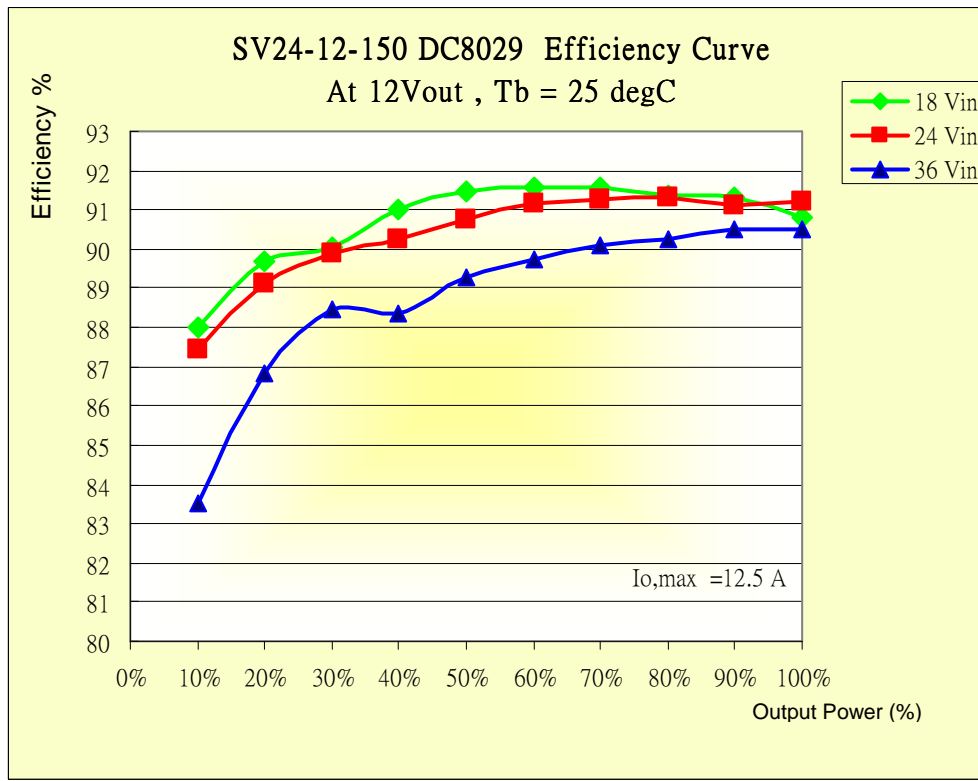


Fig. 4 Efficiency Curve

DERATING CURVE :

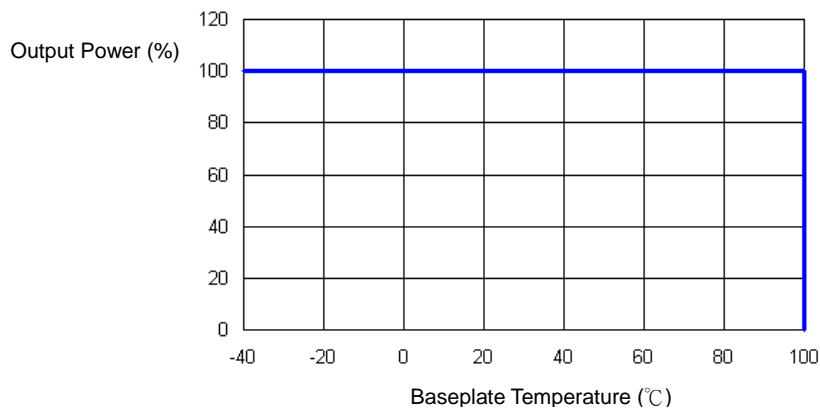


Fig. 5 Derating Curve

OUTLINE DRAWING :

- NOTES:
 1. UNIT : mm [INCH]
 2. TOLERANCE: X.X[.XX] +/- 0.5 [0.02]
 X.XX[.XXX] +/- 0.25 [0.10]
 3. WEIGHT: 100 +/- 10g

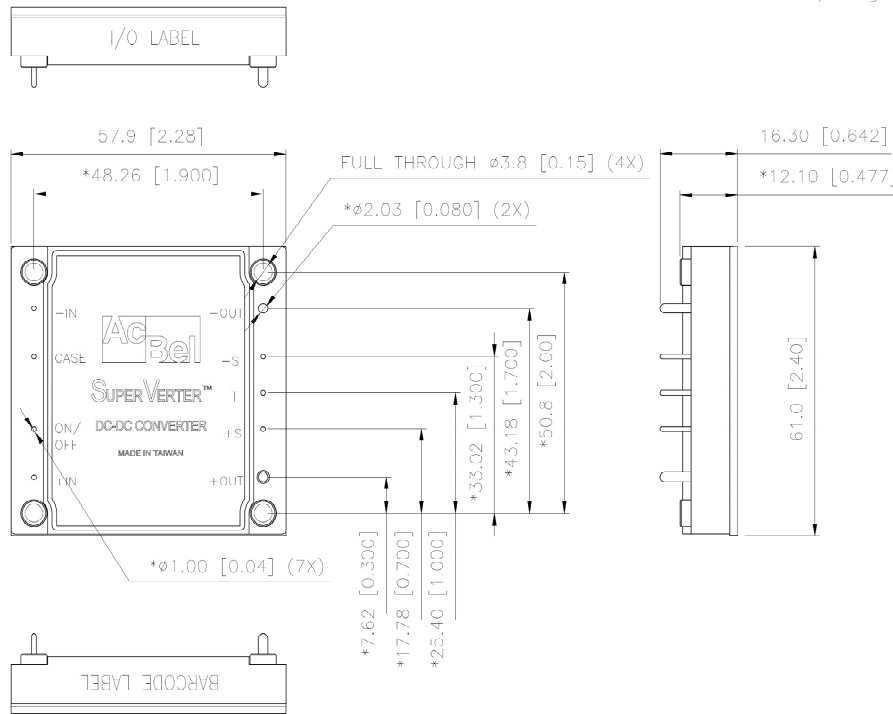


Fig. 6 Outline Drawing