



The **SuperVerter** family of DC-DC converters may be used as form, fit, function replacements for industry standard half-brick modules.

FEATURES

- Direct Replacement for Industry Standard
- High Efficiency
- High MTBF (1.8 million hours)
- Constant Frequency
- Clamp Over Voltage Protection
- Remote Sense
- Trim Range: 60% to 110%
- Encapsulated
- High Power Density: up to 87 W/cu.in.
- Low Noise
- -40° to +100° C Baseplate Operation
- Choice of On/Off Logic
- Safety Agency Compliant
- Threaded or Thru Mounting Holes
- Optional Pin lengths
- Over Temperature Protection

OPTIONAL FEATURES

For the optional features listed below, simply list the appropriate digit(s) for the features you want in ascending order in the suffix following -150 or -200 in the part number.

Feature Options	Suffix
Negative Logic On/Off is standard	include "1" in the suffix
Positive Logic On/Off is optional	delete "1" from the suffix
Threaded mounting holes, as shown in the outline drawing (p.9) are standard	no suffix digit required
Optional thru mounting holes (without threads) of 0.130" inside diameter*	include "4" in the suffix
Pin length of 0.20" (5.1mm) is standard	no suffix digit required
Pin length of 0.145" (3.68mm)*	include "6" in the suffix
Pin length of 0.110" (2.79mm)*	include "8" in the suffix

* Minimum order quantities apply.

EXAMPLES:

- SV48-5-200-1 Standard module negative logic, threaded inserts, & 0.20 inch pins.
 SV48-5-200-48 Positive logic, through hole inserts, & 0.110 inch pins.
 SV48-5-200-146 Negative logic, through hole inserts, & 0.145 inch pins.

Heat Sinks for SuperVerter modules, of several heights and fin arrangements, are available from RO.

Model Selection Guide

Model Number	Input Voltage	Output Voltage	Output Current
SV48-2.5-150-1	36-75Vdc	2.5Vdc	30A
SV48-2.5-200-1	36-75Vdc	2.5Vdc	50A
SV48-3-150-1	36-75Vdc	3.3Vdc	30A
SV48-3-200-1	36-75Vdc	3.3Vdc	45A
SV48-5-150-1	36-75Vdc	5Vdc	30A
SV48-5-200-1	36-75Vdc	5Vdc	40A
SV48-12-150-1	36-75Vdc	12Vdc	12.5A
SV48-12-200-1	36-75Vdc	12Vdc	20A
SV48-15-150-1	36-75Vdc	15Vdc	10A
SV48-15-200-1	36-75Vdc	15Vdc	16A
SV48-24-150-1	36-75Vdc	24Vdc	6.2A
SV48-24-200-1	36-75Vdc	24Vdc	10A
SV48-28-150-1	36-75Vdc	28Vdc	5.35A
SV48-28-200-1	36-75Vdc	28Vdc	8.6A

Negative logic On/Off is standard. For optional positive logic delete -1 suffix from model number (see below).

Absolute Maximum Ratings

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

Parameter	Min	Max	Units	Conditions
Input Voltage		80	Vdc	Continuous
Transient Input Voltage		100	Vdc	100 msec max.
Input/Output Isolation		1500	Vdc	
Operating Case Temperature	-40	100	°C	
Storage Temperature	-40	110	°C	

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	36	48	75	Vdc	
Maximum Input Current					
SV48-2.5-150			3.5	A	See Input Characteristic Curves for each model starting on page 10
SV48-2.5-200			6.0	A	
SV48-3-150			4.5	A	
SV48-3-200			6.5	A	
SV48-5-150			6.5	A	
SV48-5-200			8.7	A	
SV48-12-150			6.5	A	
SV48-12-200			10.5	A	
SV48-15-150			6.5	A	
SV48-15-200			10.5	A	
SV48-24-150			6.5	A	
SV48-24-200			10.5	A	
SV48-28-150			5.6	A	
SV48-28-200			9.0	A	
Input Ripple Rejection		60		dB	@ 120 Hz

Output Parameters	Min	Typ	Max	Units	Conditions
Voltage Set Point					
SV48-2.5-150 or 200	2.46	2.50	2.55	Vdc	48Vin, 25°C, Full Load
SV48-3-150 or 200	3.25	3.30	3.35	Vdc	
SV48-5-150 or 200	4.92	5.0	5.08	Vdc	
SV48-12-150 or 200	11.78	12.0	12.22	Vdc	
SV48-15-150 or 200	14.73	15.0	15.27	Vdc	
SV48-24-150 or 200	23.55	24.0	24.45	Vdc	
SV48-28-150 or 200	27.72	28.0	28.28	Vdc	
Load Regulation		0.05	0.2	%	
Line Regulation		0.01	0.1	%	Over Vin Range
Voltage Drift w/Temperature					
SV48-2.5-150 or 200		15	50	mV	-40 to +100°C
SV48-3-150 or 200		15	50	mV	
SV48-5-150 or 200		15	50	mV	
SV48-12-150 or 200		50	150	mV	
SV48-15-150 or 200		50	150	mV	
SV48-24-150 or 200		100	300	mV	
SV48-28-150 or 200		100	300	mV	


Electrical Specifications (Continued)

Output Parameter	Min	Typ	Max	Units	Conditions
Ripple					
SV48-2.5-150 or 200			150	mVp-p	5 Hz to 20 MHz (limits may be exceeded at I _{out} < 0.5A)
SV48-3-150 or 200			150	mVp-p	
SV48-5-150 or 200			150	mVp-p	
SV48-12-150 or 200			200	mVp-p	
SV48-15-150 or 200			250	mVp-p	
SV48-24-150 or 200			400	mVp-p	
SV48-28-150 or 200			400	mVp-p	
Current:					
SV48-2.5-150	0.5*		30	A	See Output Characteristic Curves for each model starting on page 10 *No minimum load requirement, but ripple spec may be exceeded @ I _{out} < 0.5A
SV48-2.5-200	0.5		50	A	
SV48-3-150	0.5		30	A	
SV48-3-200	0.5		45	A	
SV48-5-150	0.5		30	A	
SV48-5-200	0.5		40	A	
SV48-12-150	0.3		12.5	A	
SV48-12-200	0.3		20	A	
SV48-15-150	0.3		10	A	
SV48-15-200	0.3		16	A	
SV48-24-150	0.3		6.2	A	
SV48-24-200	0.3		10	A	
SV48-28-150	0.3		5.35	A	
SV48-28-200	0.3		8.6	A	
Current Limit Inception		115	130	% I _{out} max.	V _{out} = 90% V _{out} nominal, See Output Characteristic Curves
Short Circuit Current			170	% I _{out} max	V _{out} = 250 mV, See Output Characteristic Curves
Transient Response Peak Deviation (0.1A/μsec slew rate)		1		% V _{out}	50 to 75% or 50 to 25% Load Change
Transient Response Settling Time (0.1A/μsec slew rate)		100		μsec	V _{out} within 1% V _{out} nominal
Efficiency:					
SV48-2.5-150		79		%	V _{in} =48V, Full Load, 70°C Case, See Efficiency Curves
SV48-2.5-200		76.5		%	
SV48-3-150		81		%	
SV48-3-200		79.5		%	
SV48-5-150		85		%	
SV48-5-200		83		%	
SV48-12-150		87.5		%	
SV48-12-200		85		%	
SV48-15-150		88		%	
SV48-15-200		87		%	
SV48-24-150		88		%	
SV48-24-200		86		%	
SV48-28-150		87		%	
SV48-28-200		86		%	
External Load Capacitance	0		10,000	μF	
Isolation Parameters					
Input to Output Capacitance		2000		pF	
Input to Output Resistance	10			M ohms	

SUPERVERTER™ Specifications (Continued)

Electrical Specifications (Continued)

Mechanical Parameters	Typical	Units	Conditions
Weight	118 (4.2)	g (oz.)	
Size	0.5 x 2.4 x 2.28	inches	See Outline Drawing below
Thermal Resistance Case to Ambient	6.6	°C/W	Case Temperature = 100°C

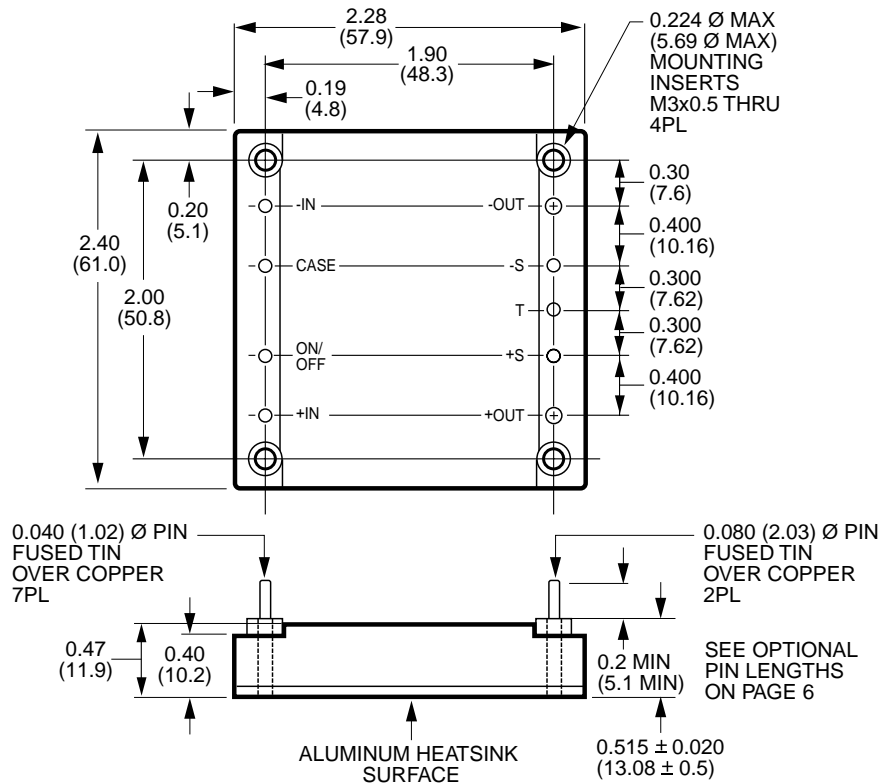
Feature Parameters	Min	Typ	Max	Units	Conditions
Trim Range	60		110	%Vout	See page 19
Remote Sense Compensation			0.5	V	
Over Voltage Clamp					
SV48-2.5-150 or 200	3.0		4.0	Vdc	
SV48-3-150 or 200	4.0		5.0	Vdc	
SV48-5-150 or 200	5.7		7.0	Vdc	
SV48-12-150 or 200	13.2		16.0	Vdc	
SV48-15-150 or 200	16.5		20.0	Vdc	
SV48-24-150 or 200	26.5		33.0	Vdc	
SV48-28-150 or 200	30.9		38.5	Vdc	
Over Temperature Shut-down		105		°C	Case Temperature
Logic On/Off*					
Logic Low: Von/off	0		1.2	V	@ Ion/off = 1 mA
Ion/off			1.0	mA	@ Von/off = 0V
Logic High: Von/off			15	V	@ Ion/off = 1 mA
Ion/off			50	µA	@ Von/off = 15V
Turn-on Time		8	35	msec	80% load, Vout within 1% Vout nominal

* 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.

OUTLINE DRAWING

DIMENSIONS:
INCHES
(MILLIMETERS)

TOLERANCES:
X.XX IN. ± 0.02 IN X.XXX IN ± 0.010 IN
(X.X MM ± 0.05 MM) (X.XX MM ± 0.25 MM)

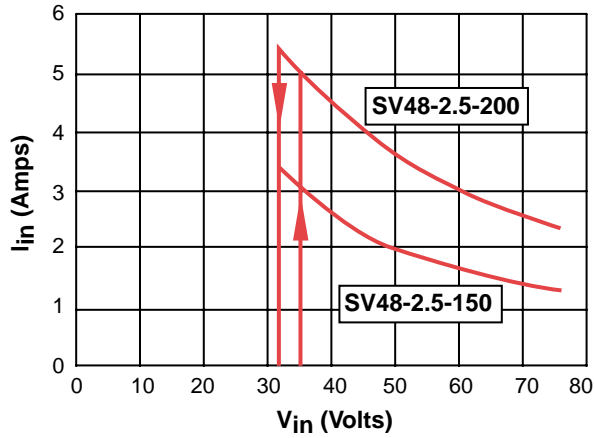




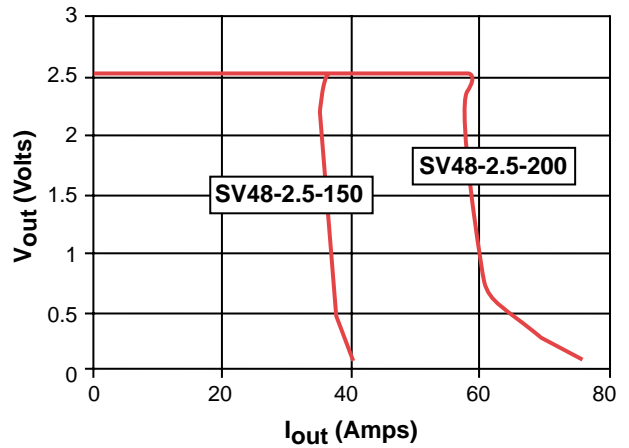
2.5V Output Models

SV48-2.5-150 SV48-2.5-200

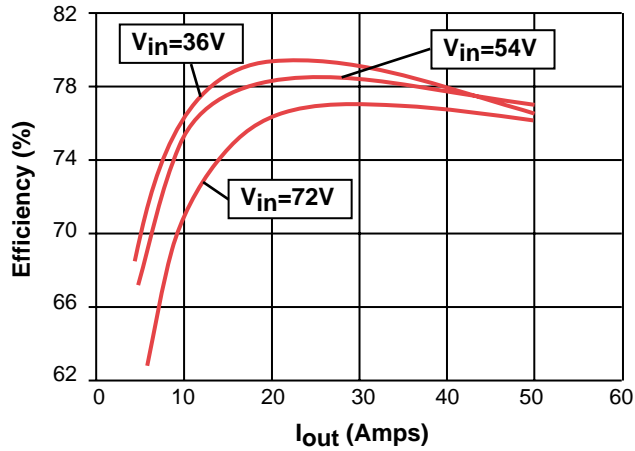
Input Characteristic
(room temperature, full load)



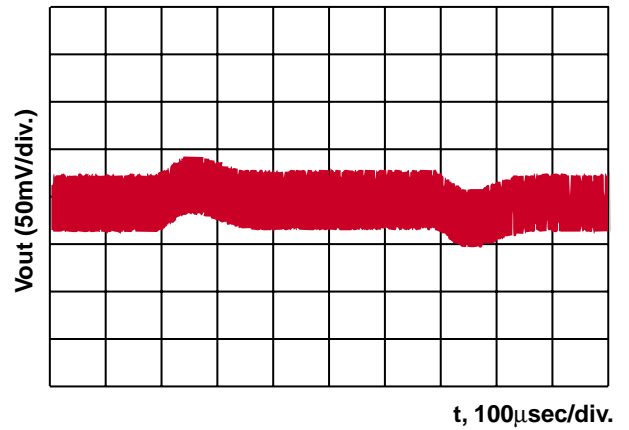
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



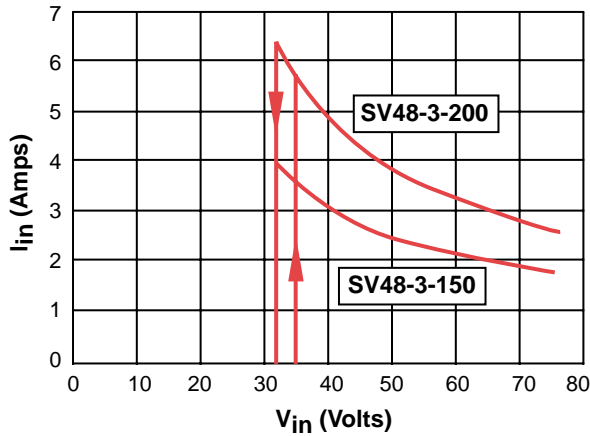
Transient Response



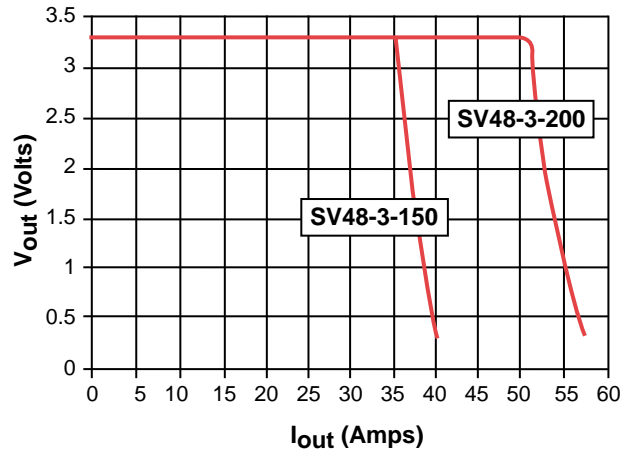
$I_{out} = 22.5A-15A-22.5A$
Current Slew Rate $0.1A/\mu sec.$
SV48-2.5-150

3.3V Output Models SV48-3-150 SV48-3-200

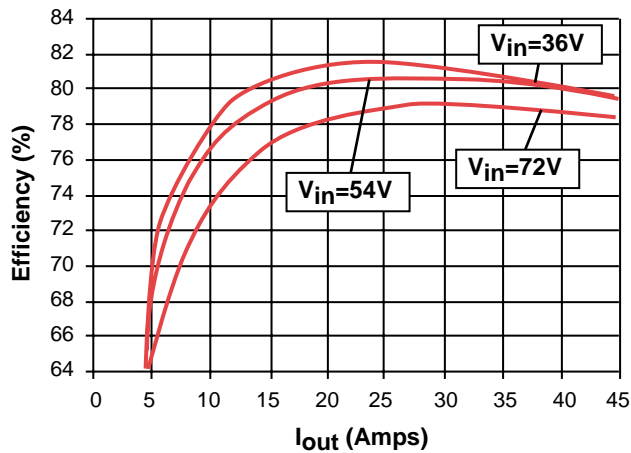
Input Characteristic
(room temperature, full load)



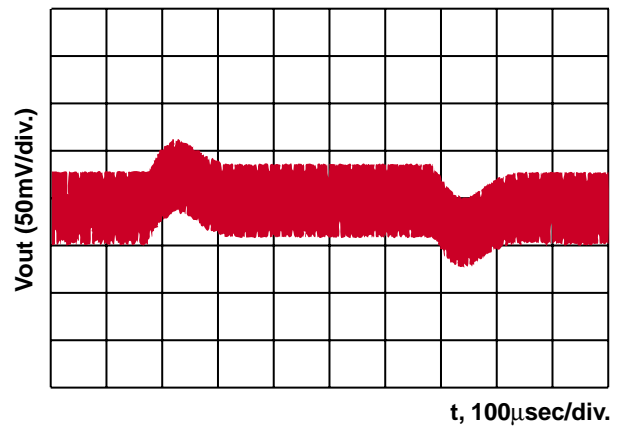
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



Transient Response



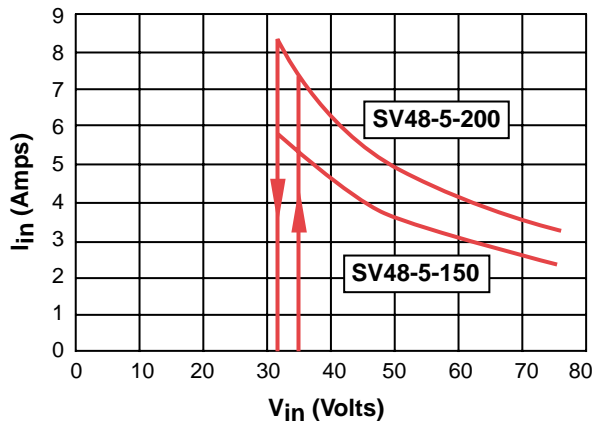
$I_{out} = 22.5A-15A-22.5A$
Current Slew Rate $0.1A/\mu sec.$
SV48-3-150



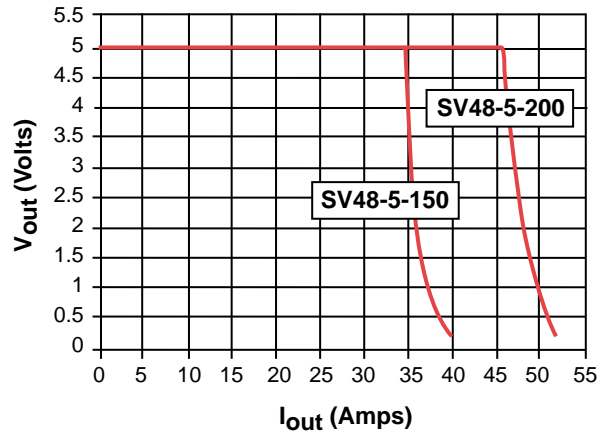
SUPERVERTER™ Performance Data

5V Output Models SV48-5-150 SV48-5-200

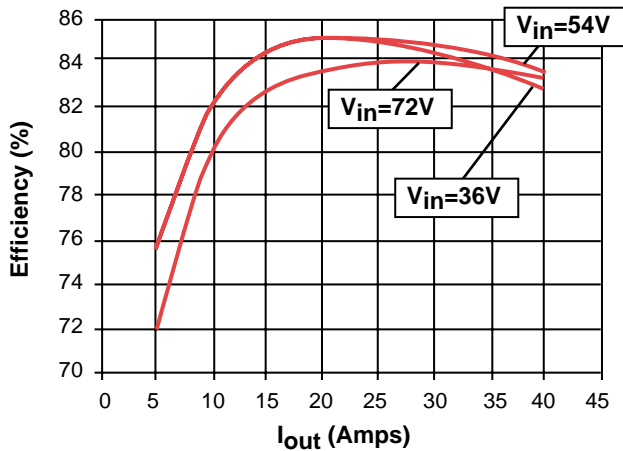
Input Characteristic
(room temperature, full load)



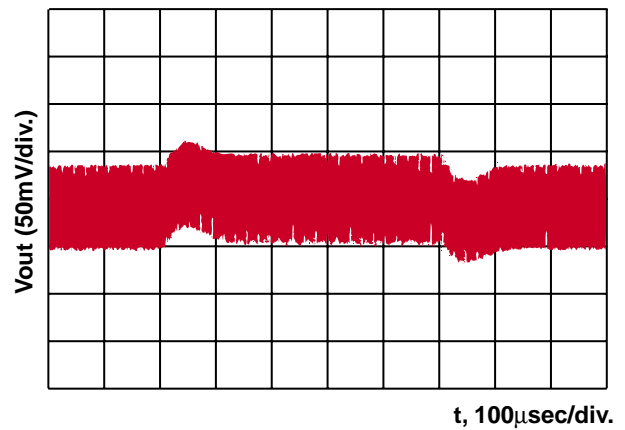
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



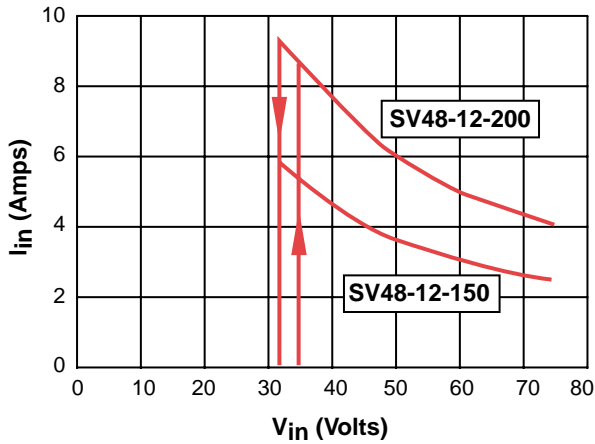
Transient Response



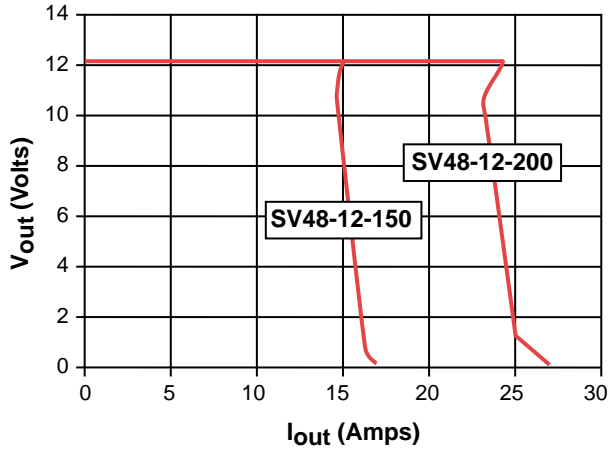
$I_{out} = 22.5A-15A-22.5A$
Current Slew Rate $0.1A/\mu sec.$
SV48-5-150

12V Output Models SV48-12-150 SV48-12-200

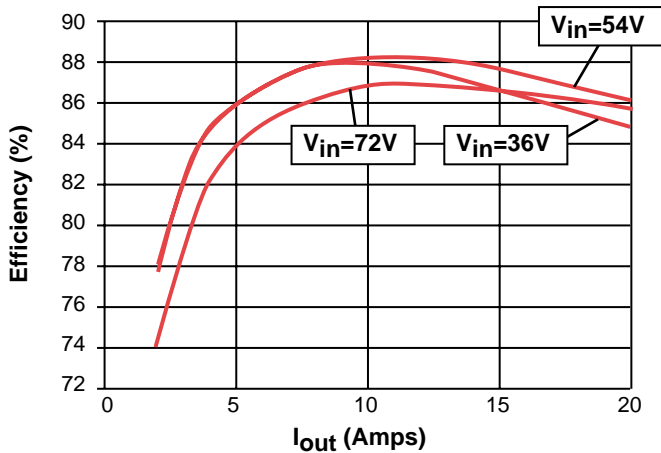
Input Characteristic
(room temperature, full load)



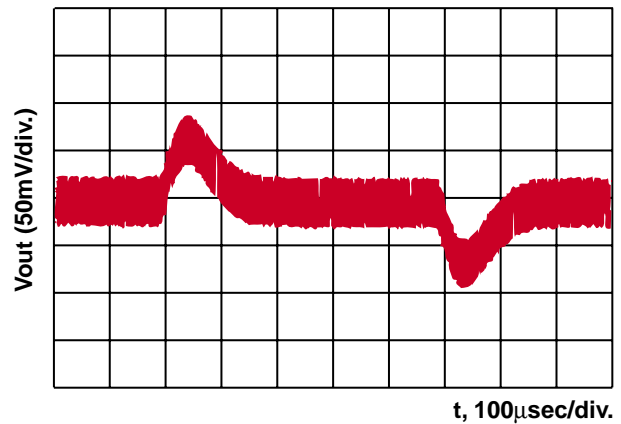
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



Transient Response



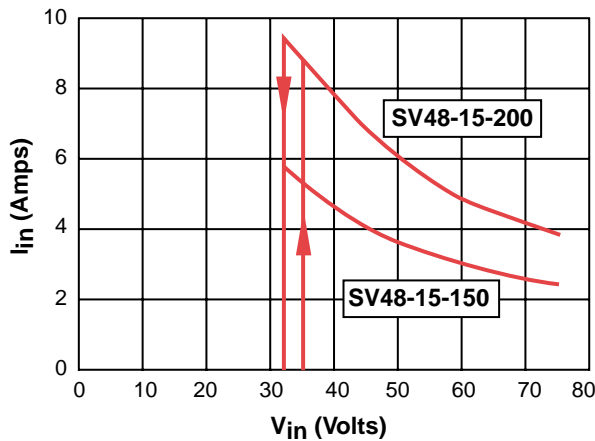
$I_{out} = 9.37A-6.25A-9.37A$
Current Slew Rate $0.1A/\mu sec.$
SV48-12-150



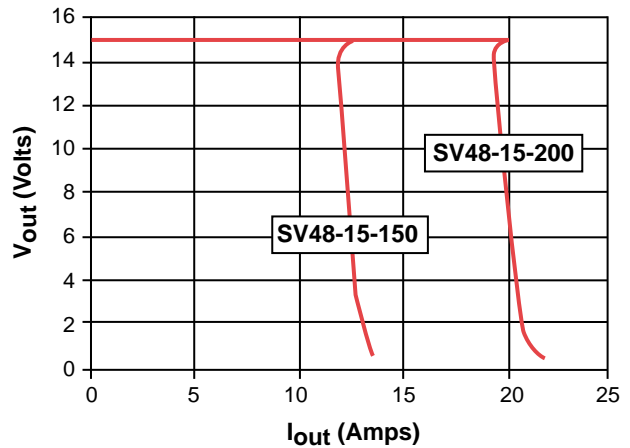
SUPERVERTER™ Performance Data

15V Output Models SV48-15-150 SV48-15-200

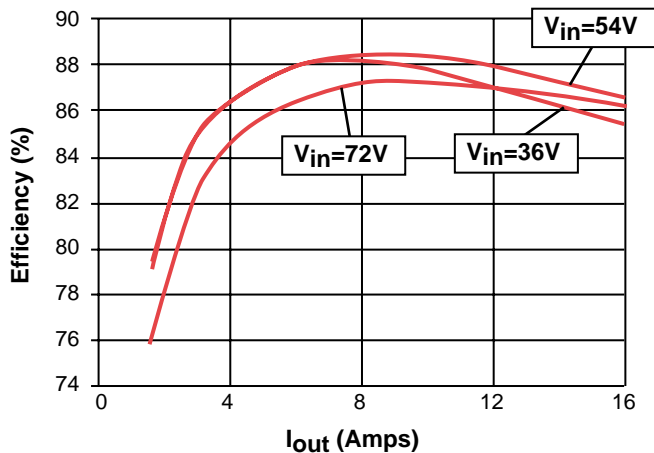
Input Characteristic
(room temperature, full load)



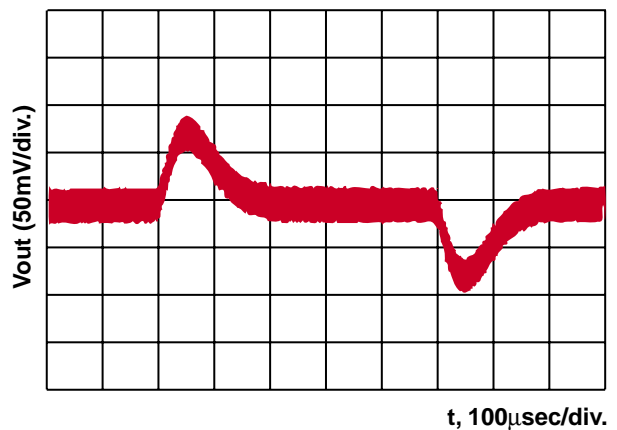
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



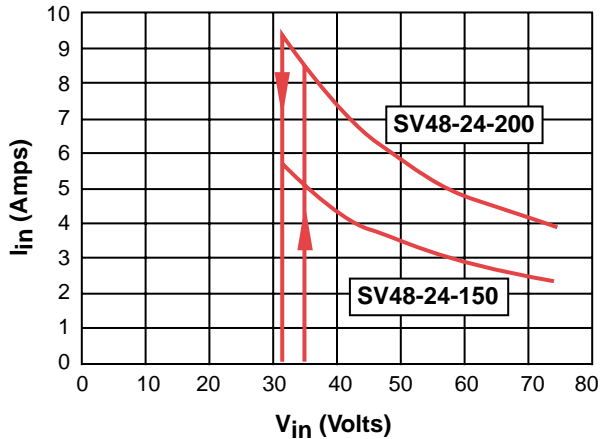
Transient Response



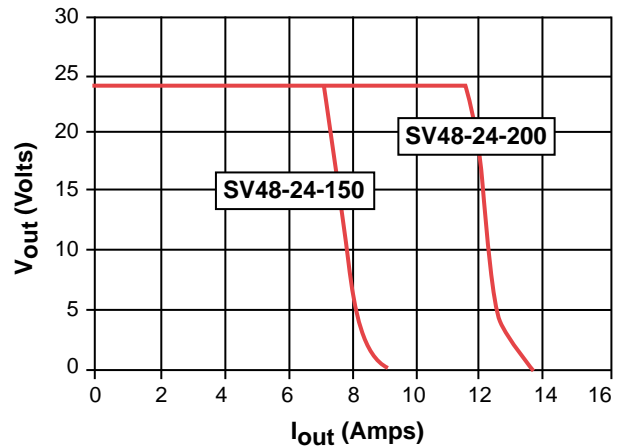
$I_{out} = 7.5A-5A-7.5A$
Current Slew Rate $0.1A/\mu sec.$
SV48-15-150

24V Output Models SV48-24-150 SV48-24-200

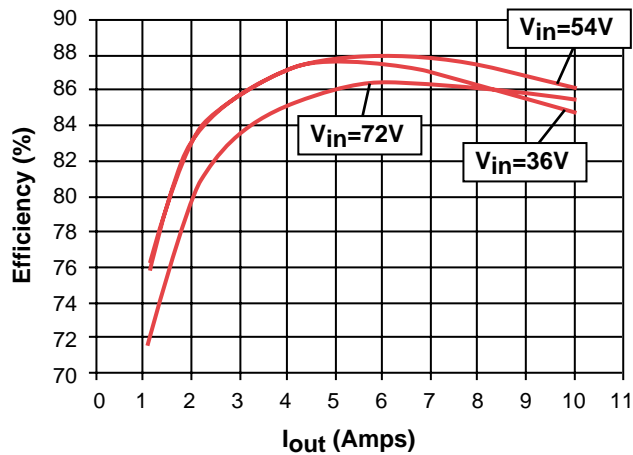
Input Characteristic
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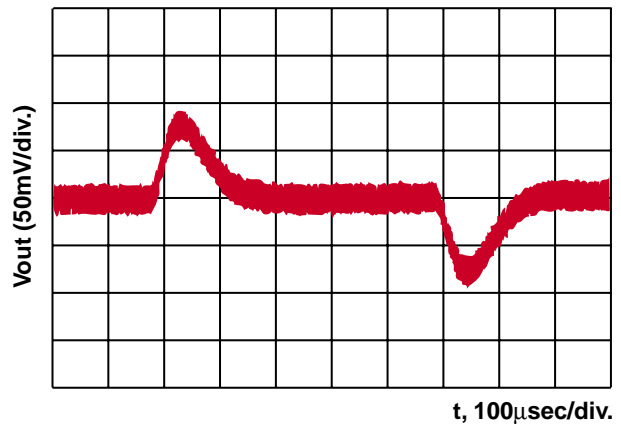
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



Transient Response



$I_{out} = 4.65A-3.1A-4.65A$
Current Slew Rate $0.1A/\mu sec.$
SV48-24-150

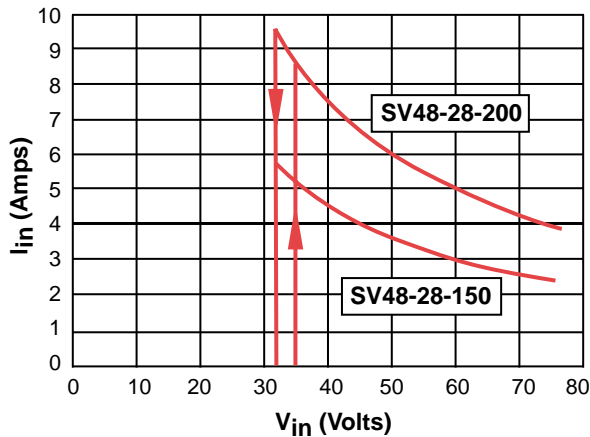


SUPERVERTER™ Performance Data

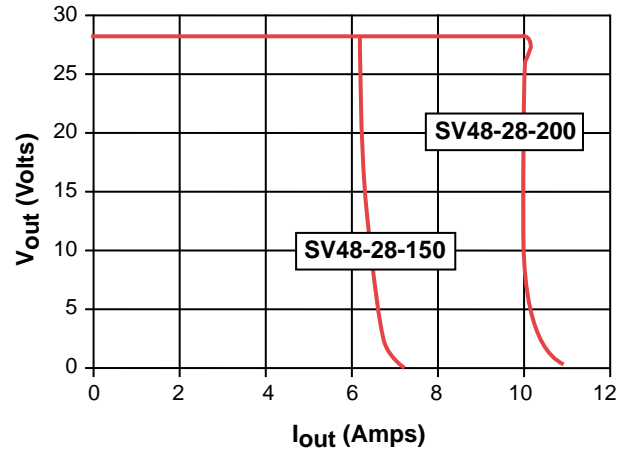
28V Output Models

SV48-28-150 SV48-28-200

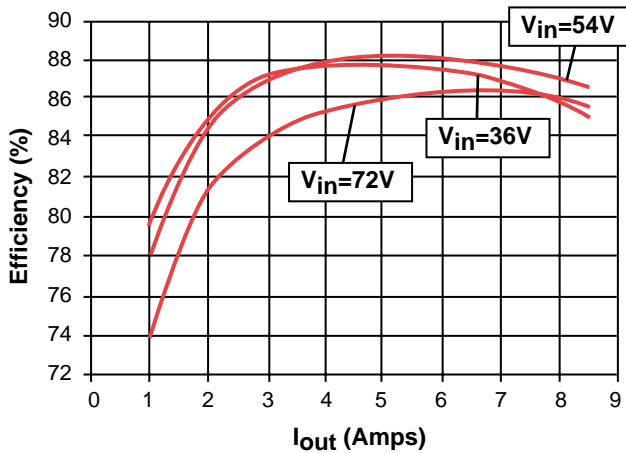
Input Characteristic
(room temperature, full load)



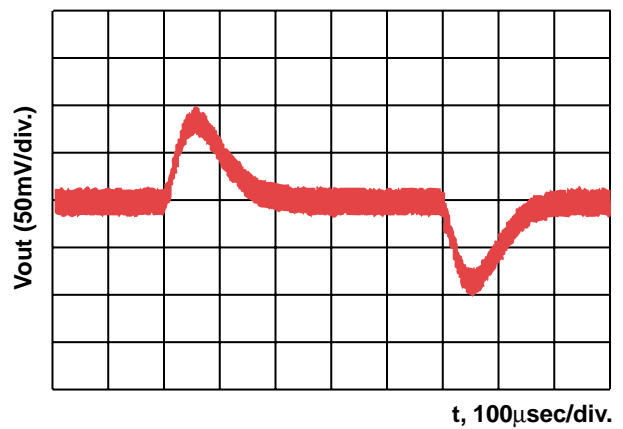
Output Characteristic
(room temperature, $V_{in} = 48V$)



Efficiency



Transient Response



$I_{out} = 4.875A-3.25A-4.875A$
Current Slew Rate $0.1A/\mu sec.$
SV48-28-150