

**Features**

Dimensions:

50.8×50.8×12.7 (mm)

- High efficiency :85% typical
- Low output noise and ripple
- Output Over-current Protection
- Baseplate operating temperature range - 25°C to +85°C
- RoHS (2002/95/EC) complaint

**Numbering Convention**

SR - 48 S 3V3 - 33W G  
 ①      ②    ③    ④                      ⑤    ⑥

No	Features	Descriptions
①	Product Series	SR Series
②	Typical Input Voltage	C – Input Voltage: 48V
③	Number of Outputs	S – Single Output
④	Typical Output Voltage	3.3 – Output Voltage: 3V3
⑤	Typical Output Power	33 – Output Power: 33W
⑥	RoHS feature	G – lead-free, RoHS6

## 1. Description

The SFL48S3V3-33WG series power modules are DC-DC converters in an industry standard footprint, and can provide up to 3.3V output voltage. The converters feature wide input voltage range, high efficiency, excellent thermal performance and high input-output isolation voltage, and are well suited for telecommunications, industrial automation and test equipments that require low-voltage power supply.

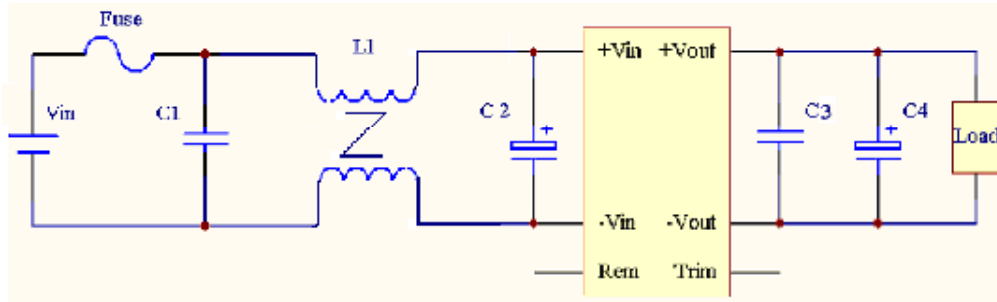
**2. Technical Specifications** (Unless otherwise stated, all specification are typical at nominal input voltage, full load and 25°C.)

Parameter		Test Condition	Min	Typ	Max	Unit
<b>2.1 Absolute Maximum Ratings</b>						
Input Voltage (Vin)		Continuous	0	—	80	Vdc
Input Transient Voltage (Vit)		100ms	—	—	100	Vdc
Max Output Power (Pomax)		Allowable operating conditions	—	—	33	W
<b>2.2 Input Specifications</b>						
Nominal Input Voltage(Vinom)		—	—	48	—	Vdc
Input Voltage Range		—	36	—	72	Vdc
Maximum Input Current (Iimax)		Vimin, Ionom, ηmin	—	—	1.2	A
Unload Input Current (Iio)		Vinom, I <sub>o</sub> =0	—	—	60	mA
Output-off Input Current (Iiof)		Vinom, Remote output shutdown	—	—	10	mA
Input Under-voltage Threshold (Vishl)		Ionom	30	—	35	Vdc
Output Anti-irrigation Interference Current (Iinr)		Vinom, Ionom, add a 1μF capacitor to output	—	—	20	mA(pk-pk)
Remote	On	High level (3.6V~72V or open circuits, referenced to -Vin)				
	Off	Low level (0~1.0V, referenced to -Vin), or shorted to -Vin				
<b>2.3 Output Specifications</b>						
Output Voltage Set-point (Vonom)		Vinom, Ionom	3.25	3.30	3.35	Vdc
Typical Output Current (Ionom)		—	—	—	10.0	A
Output Current Range (Io)		—	0	—	10.0	A
Output Voltage Trim (Voadj)		Vinom	-6	—	+10	%
Line Regulation (Vov)		Vimin-Vimax, Ionom	—	—	±0.5	%Vo
Load Regulation (Vol)		10%-100%Ionom, Vinom	—	—	±1.0	%Vo
Output Over-voltage Protection		—	3.8	—	4.62	V
Output Over-current Protection	Protection Mode	—	Threshold power			—
	Threshold	Vinom	11	12	14	A
Output Short-circuit Protection	Protection Mode	—	Continuous, Auto-recovery			—
	Input Current	Vinom	—	25	50	mA

Parameter		Test Condition	Min	Typ	Max	Unit
Dynamic Load Response	Peak Deviation	25%-50%-25%I <sub>nom</sub>	—	—	0.165	V
	Settling Time	50%-75%-50%I <sub>nom</sub>	—	—	200	μs
Output Ripple & Noise P-to-P (V <sub>rp</sub> )		20MHz	—	30	75	mV(pk-pk)
Output Ripple and Noise Rms (V <sub>rr</sub> )		—	—	10	15	mV
External Output Capacitance(C <sub>o</sub> )		—	0	—	6800	μF
Turn-on/off Peak Overshoot Amplitude		V <sub>in</sub> o <sub>m</sub> , I <sub>o</sub> nom	—	—	±10	%V <sub>o</sub>
<b>2.4 Safety Specifications</b>						
Insulation Strength	Input to output	Leak Current≤5mA, 1min	1000	—	—	Vdc
	Input to Case	Leak Current≤5mA, 1min	500	—	—	Vdc
	Output to Case	Leak Current≤5mA, 1min	500	—	—	Vdc
Insulation Resistance (R <sub>iso</sub> )		—	50	—	—	MΩ
Safety Certificate		EN60950-1:2001 Recognized				
<b>2.5 Reliability</b>						
Vibration Test(sine)		Frequency: 10~55Hz Amplitude: 0.35mm Acceleration: 50m/s <sup>2</sup> Cycle: 30min for X,Y,Z axis	After being tested, no damage to the converter and its components, the appearance, output voltage and output ripple and noise (p-p) meet the data sheet requirements.			
Impact Test (half-sine)		Peak Acceleration: 300m/s <sup>2</sup> Duration: 6ms 6 times for three perpendicular directions	After being tested, no damage to the converter and its components, the appearance, output voltage and output ripple and noise (p-p) meet the data sheet requirements.			
MTBF		—	1×10 <sup>6</sup> h			
<b>2.6 Environmental Specifications</b>						
Relative Humidity		(40±2) °C, Non-condensing	—	—	90	%RH
Cooling		—	Natural Convection			
Operating Ambient Temperature		See the derating curve	-25	—	85	°C
Storage Temperature (T <sub>st</sub> )		Non-operating,	-40	—	125	°C
Altitude		—	—	—	2000	m
<b>2.7 General Specifications</b>						
Switching Frequency		—	—	300	—	k Hz
Typical Weight		—	—	70	—	g
Temperature Coefficient (T <sub>coeff</sub> )		—	—	—	±0.02	%/°C
Efficiency (η)		V <sub>in</sub> o <sub>m</sub> , I <sub>o</sub> nom	85	—	—	%
RoHS		RoHS (2002/95/EC) Directive				

### 3. Basic Application Circuit and Considerations

#### 3.1 Typical Application



Recommended:

Fuse: 3A

L1: 1mH

C1: 1 $\mu$ F/100V (ceramic capacitor)

C2: >47 $\mu$ F/100V( electrolytic capacitor)

C3: 1 $\mu$ F/10V( ceramic capacitor)

C4: <4700 $\mu$ F/10V( electrolytic Capacitors)

3.2 Output will be on when Rem is at high level (referenced to -Vin) or keeps open circuits; Output will be off when Rem is at low level (or shorted to -Vin).

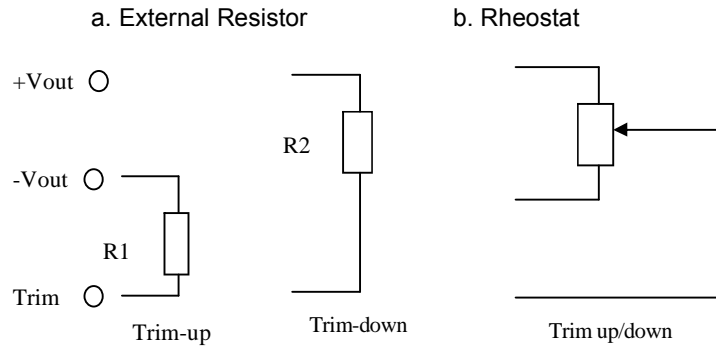
3.3 Input Voltage up to 80Vdc for long time or reverse input polarity would cause the module damaged.

3.4 Output short-circuit protection mode is continuous, automatic recovery. But it is not recommended to make the module operate under this condition for long time.

3.5 Output Trim: exceed the maximum output power (trim up) or the maximum output current (trim down) may cause the converter operates abnormally. The output voltage shall not exceed 3.63V (trim up) or be lower than 3.1V (trim down), or the converter can't work well. See "4. Output Voltage Adjustment (Trim)" for details.

### 4. Output Voltage Adjustment (Trim)

### 4.1 Output Trim Circuit



### 4.2 Output Trim Equations

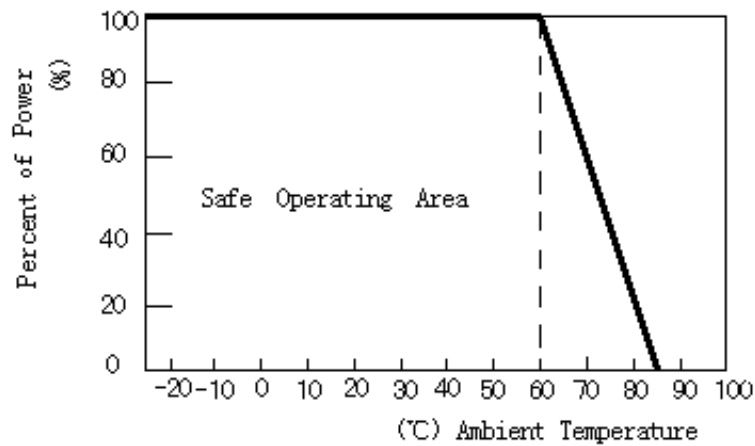
External Resistor Mode:

$$\text{Trim-up: } R_{\text{trim-up}} = \frac{7.16}{\Delta V} - 18$$

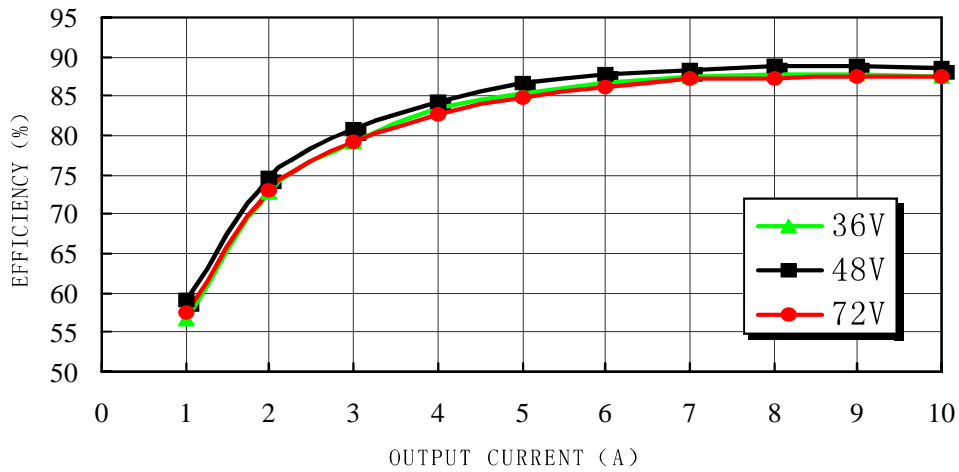
$$\text{Trim-down: } R_{\text{trim-down}} = \frac{5.15}{\Delta V} - 21.73$$

Where ① $\Delta V$ : changes of output voltage ② $R_{\text{trim-up}}$ ,  $R_{\text{trim-down}}$ —Unit: k $\Omega$ ;  $\Delta V$ —Unit: Vdc

### 5. Thermal Derating Curve

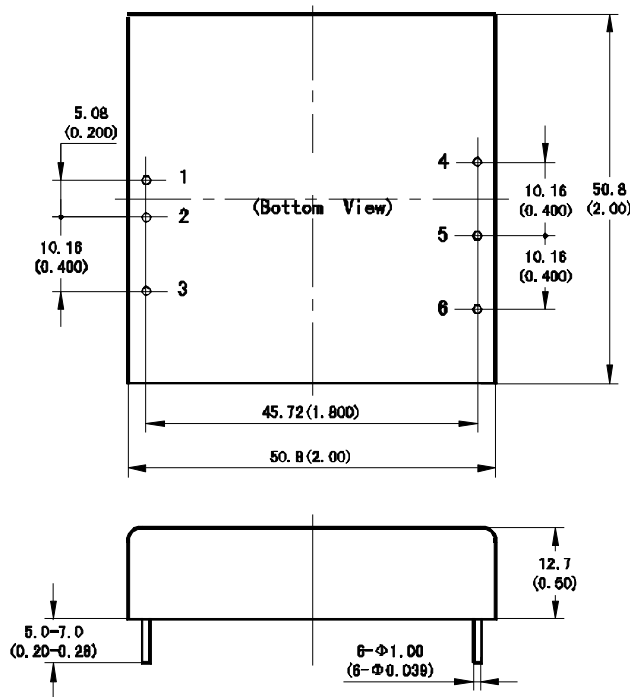


### 6. Efficiency Curve



### 7. Dimensions and Pin definition

#### 7.1 Dimensions



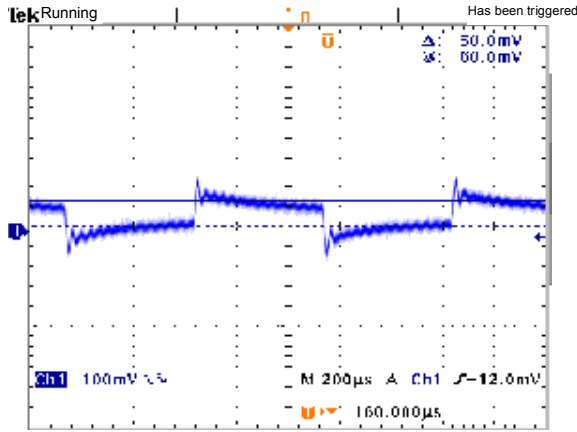
Unit: mm (inch) Tolerance: .X±0.5 ; .XX±0.13(.X X±0.02; .X X X ±0.005)

#### 7.2 Pin Definition

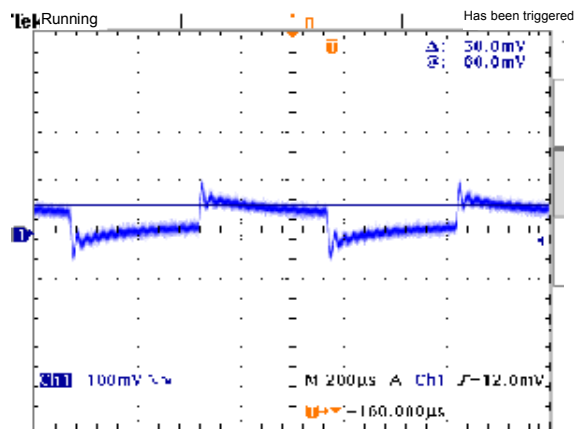
No.	1	2	3	4	5	6
Symbol	+Vin	-Vin	Rem	+Vout	-Vout	Trim
Definition	Positive Input	Negative Input	Remote	Positive Output	Negative Output	Output Trim

### 8. Typical Characteristic Curves

#### 8.1 Load Transient Response (Vinom)

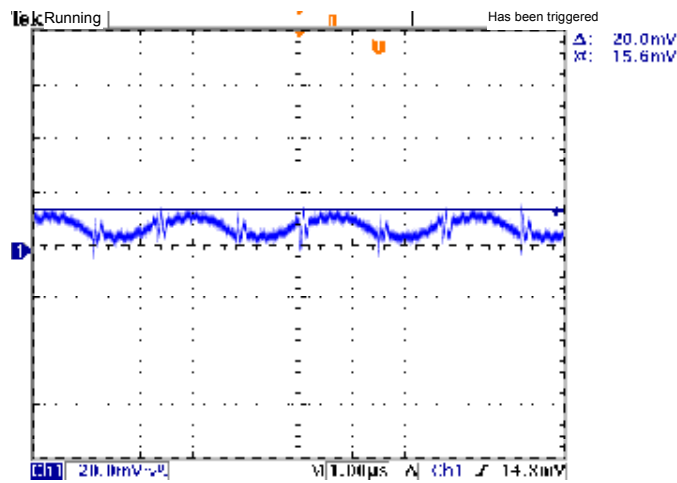


25%~50%~25%Io

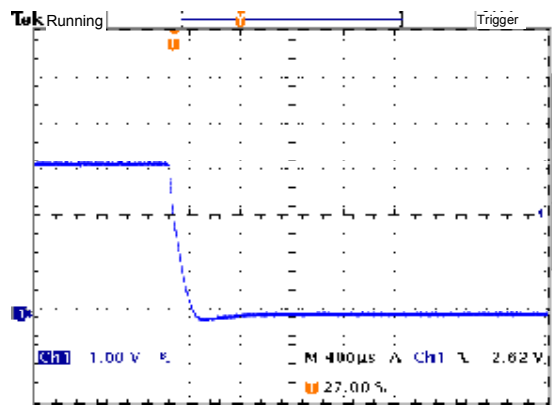
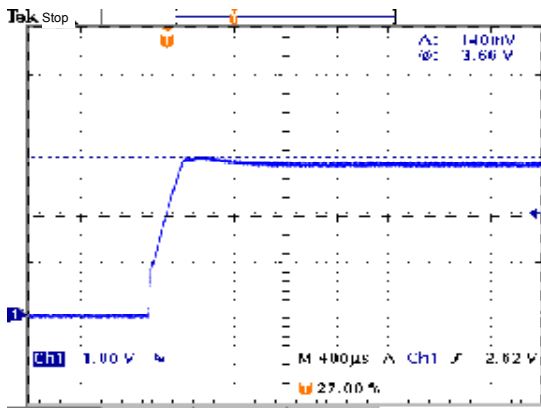


50%~75%~50%Io

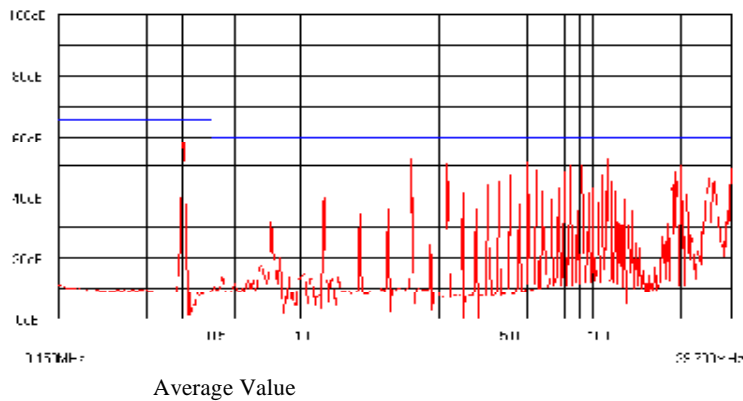
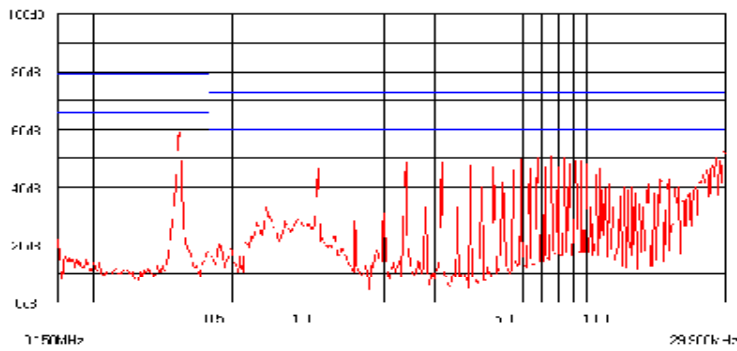
#### 8.2 Output Ripple & Noise Pk-to-Pk (Vinom, Ionom: 20MHz)



#### 8.3 Turn-on/off Waves (Vinom)



### 8.4 Conduction Wave for EMI (Vinom, Ionom)



Test Condition: C1, C3: 0.22 $\mu$ F/1kV; C2, C4: 47 $\mu$ F/100V; See 3.1 Typical Application (no L1)