



**Features**

Dimensions:

50.8×40.6×12.7 (mm)

- High efficiency: 80% typical
- Low output noise and ripple
- Output Over-current Protection
- Baseplate operating temperature range - 40°C to +85°C
- RoHS (2002/95/EC) complaint

**Numbering Convention:**

**SFL - 48 S 3V3 - 20W - C G5**  
 1            2   3            4            5            6   7

No.	Features	Descriptions
1	Product Series	SFL Series
2	Typical Input Voltage	48 -Typical Input Voltage: 48V
3	Number of Outputs	S - Single Output
		D - Dual Output
4	Typical Output Voltage	3V3 -Typical Output Voltage:3.3V
5	Typical Output Power	20 – Output Power: 20W
6	Sprayed conformal coating	C - Sprayed Conformal coating
		Default: No Sprayed Conformal coating
7	RoHS	G5 - ROHS5
		G - lead-free, ROHS6
		Default - lead

**1. Description**

The SFL48S3V3-20W-CG5 series power modules are DC-DC converters in an industry standard footprint, and can provide a 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.

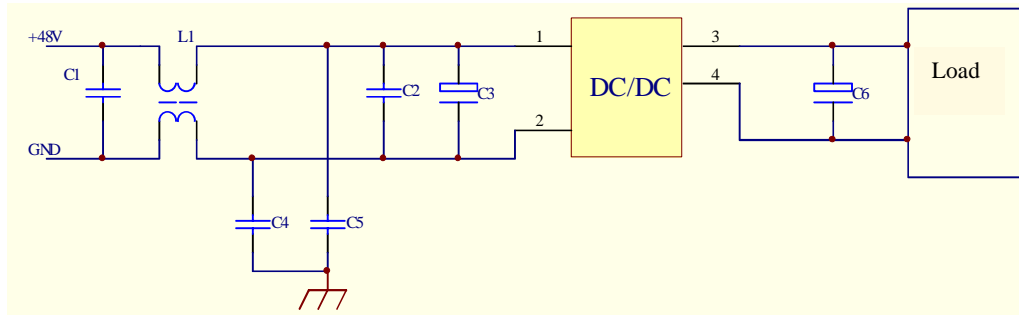
**2. Technical Specifications** (Unless otherwise stated, all specification are typical at nominal input voltage, full load and 25°C.)

Parameter		Test Condition	Min	Typ	Max	Unit
<b>2.1 Absolute Maximum Ratings</b>						
Input Voltage (Vin)		Continuous	36	—	75	Vdc
Input Transient Voltage (Vit)		100ms	—	—	100	Vdc
Max Output Power (Pomax)		Allowable operating conditions	—	—	20	W
<b>2.2 Input Specifications</b>						
Nominal Input Voltage(Vinom)		—	—	48	—	Vdc
Input Voltage Range		—	36	—	75	Vdc
Maximum Input Current (Iimax)		Vinom, Io=0	—	—	20	mA
No-load Input Current (Iio)		Vinom, remote output shutdown	—	—	5	mA
Input Current with Output Off (Iiof)		Vinom, , remote output shutdown	—	—	5	mA
Remote	On	High Level (5V to 20V, or open circuits, reference to -Vin)				
	Off	Low Level (0-0.8V or shorted to -Vin, referenced to -Vin)				
<b>2.3 Output Specifications</b>						
Output Voltage Set-point (Vonom)		Vinom,Ionom	3.27	3.30	3.33	Vdc
Typical Output Current (Ionom)		—	—	—	6	A
Output Current Range (Io)		—	0	—	6	A
Output Voltage Adjustment Range(Voadj)		Vinom	-10	—	+10	%
Line Regulation (Vov)		Vimin-Vimax,Ionom	—	—	±0.2	%Vo
Load Regulation (Vol)		10%-100%Ionom,Vinom	—	—	±0.5	%Vo
Output Over-voltage Protection		—	3.9	—	5	V
Output Over-current Protection	Protection Mode	Threshold power				—
	Threshold	Vinom	6.8	7.2	9	A
Output Short-circuit Protection	Protection Mode	Continuous, Auto-recovery				—
	Input Current	Vinom	—	—	120	mA
Dynamic Load Response	Peak Deviation	25%-50%-25%Ionom 50%-75%-50%Ionom	—	—	5	%Vo
	Settling Time		—	—	200	µs
Output Ripple and Noise Pk-tp-Pk (Vrp)		20MHz	—	—	50	mV(pk-pk)

Parameter	Test Condition	Min	Typ	Max	Unit	
External Output Capacitance(Co)		0	—	2200	μF	
Turn-on/off Peak Overshoot Amplitude	Vinom,Ionom	—	—	±10	%Vo	
<b>2.4 Safety Specifications</b>						
Insulation Strength	Input to output	Leak Current≤1mA, 1min	1500	—	—	Vdc
	Input to Case	Leak Current≤1mA, 1min	1000	—	—	Vdc
	Output to Case	Leak Current≤1mA, 1min	500	—	—	Vdc
Insulation Resistance (R <sub>ISO</sub> )	—	50	—	—	MΩ	
Safety Certificate	EN60950-1 Recognized					
<b>2.5 Reliability</b>						
Vibration Test(sine)	Frequency: 10~55Hz Amplitude: 0.35mm Acceleration: 10m/s <sup>2</sup> Cycle: X,Y,Z 30min each 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	Bellcore TR-332 40℃	1×10 <sup>6</sup> h				
<b>2.6 Environmental Specifications</b>						
Relative Humidity	(40±2) °C, Non-condensing	—	—	90	%RH	
Cooling	—	Forced-air cooling				
Operating Ambient Temperature	Case temp. See the derating curve	-40	—	85	°C	
Storage Temperature (Tst)	Non-operating, continuous	-55	—	125	°C	
<b>2.7 General Specifications</b>						
Switching Frequency	—	—	330	—	k Hz	
Weight	—	—	45	—	g	
Temperature Coefficient (Tcoeff)	—	—	—	±0.02	%/°C	
Efficiency (η)	Vinom,Ionom	78	80	—	%	
RoHS	RoHs (2002/95/EC) Directive					
Anti-sulfuration feature	Sprayed conformal coating					

### 3 Basic Application Circuit and Considerations

#### (1) Typical Application



Recommended:

L1: 1320uH

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

C2: 0.1 $\mu$ F/100V (ceramic capacitor)

C3: 47 $\mu$ F/100V (electrolytic capacitor)

C4, C5: 223C/1000V (Surface-Mounted Ceramic Capacitors)

C6: 220 $\mu$ F/10V (Tantalum Electrolytic Capacitor)

(2) Output will be on when iRem 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) Input Voltage up to 80Vdc for long time or reverse input polarity would cause the module damaged.

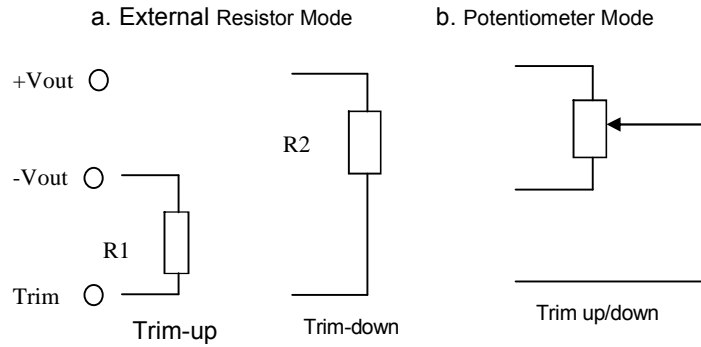
(4) Output over-voltage protection does not function when the output voltage feedback optocoupler loop is open circuit

(5) 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.

(6) 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 2.97V (trim down), or the converter can't work well. See "4. Output Voltage Adjustment (Trim)" for details.

### 4. Output Voltage Adjustment (Trim)

#### (1) Output Trim Circuit



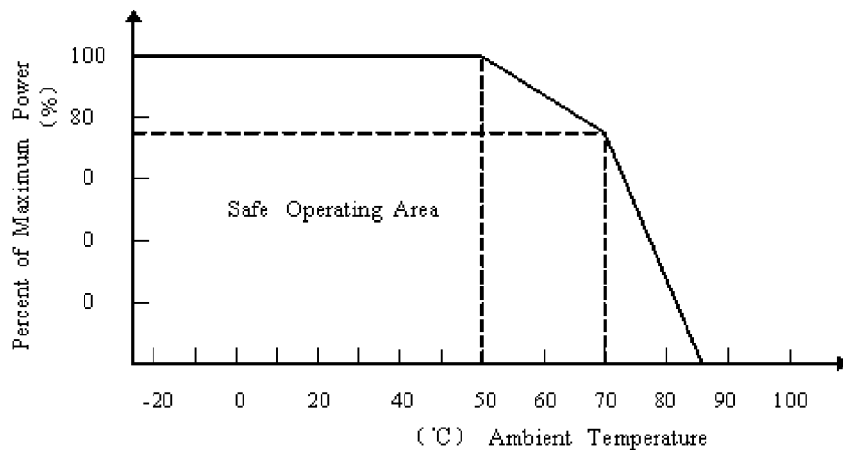
#### (2) Output Trim Equations

$$\text{Trim-up: } R_{trim-up} = \frac{1.55}{2y} (K\Omega)$$

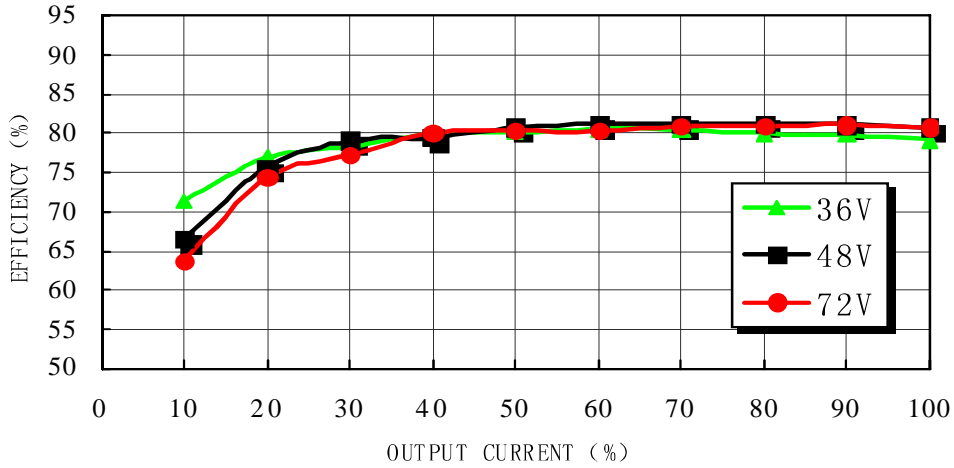
$$\text{Trim-down: } R_{trim-down} = \left( \frac{2.54}{y} - 4.08 \right) / 2 (K\Omega)$$

Where  $y = \frac{V_o - V_e}{V_e}$ ,  $V_o$  is the adjusted output voltage;  $V_e$  is the rated output voltage.

### 5. Thermal Derating Curve

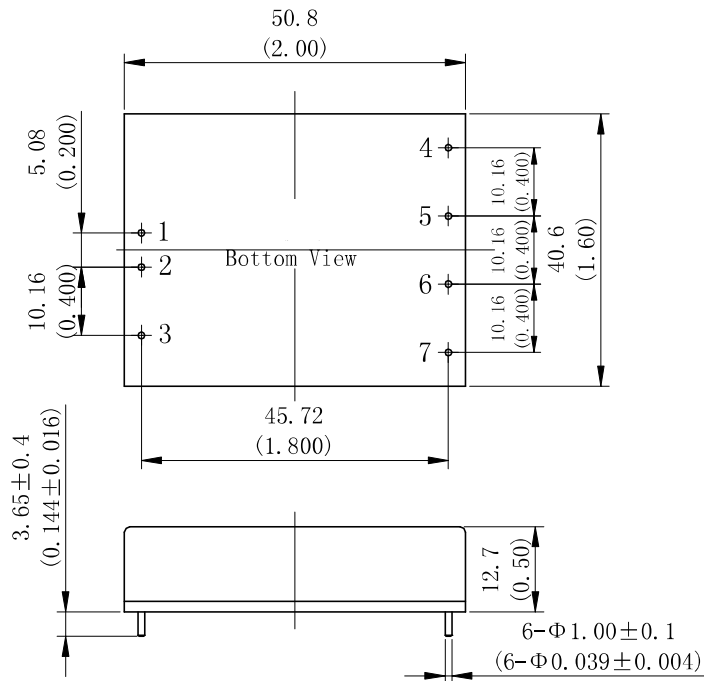


### 6. Efficiency Curve



### 7. Dimensions and Pin definition

7.1 Dimensions Unit: mm (inch) Tolerance: .X±0.5; .XX±0.25(.X X±0.02; .X X X ±0.010)



#### 7.2 Pin definition

No	1	2	3	4	5	6	7
Symbol	+Vin	-Vin	Rem	NP	+Vout	-Vout	Trim
Definition	Positive Input	Negative Input	Remote	Empty legs	Positive Output	Negative Output	Trim