Features

- Industrial standard 1/8 brick package and footprint：
  57.9×22.8×9.8mm(2.28*0.90*0.38inch)
- Operating temperature:-40~85°C
- input voltage range: 2:1
- Output voltage adjustment:－10％~＋10％
- Isolation voltage: 1500Vdc (input-output)
- High efficiency at least 91%
- High power density
- Low output voltage ripple and noise
- Remote On/Off
- Input under-voltage protection
- Output over-voltage protection
- Output over-current protection
- Thermal shutdown protection

Options：

- Remote on/off Logic
- RoHS

Numbering Convention

ESR 06 – 48 S 8 – L G
① ② ③④⑤ ⑥⑦

No	Features	Descriptions
①	Product Series	ESR-1/8brick
②	Output current	6-Max. output current 6A
③	Typical input voltage	Input voltage is 48V
④	Number of Outputs	S-single Output
		D-double Output
⑤	Output voltage	8-output voltage is 8V
⑥	Remote on/off Logic	L-Negative
		H or Default-positive
⑦	RoHS feature	G – lead-free products, RoHS6
		Default -lead

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1. Description

The ESR06-48S8-LG power modules are open-frame DC-DC converters in an industry 1/8 brick packaging & footprint, and provide up to 8.0V output voltage and 6A output current. All components of the converter are surface mounted. The converters feature high power density, remote on/off, over-temperature protection and current limit, etc.

2 Specifications (All specifications are typical at nominal input, full load at 25°C and 200LFM unless otherwise stated.)

Parameter		Test Condition	Min	Typ	Max	Unit
2.1 Absolute Maximum Ratings						
Input Voltage (Vi)		at no operating, continuous	0	—	80	Vdc
Input Transient Voltage (Vit)		100ms	—	—	100	Vdc
Max Output Power (Pomax)		allowable operating conditions	—	—	48	W
2.2 Input Specifications						
Typical Input Voltage(Vinom)		—	—	48	—	Vdc
Input Voltage Range ①		—	36	—	75	Vdc
Input Under-voltage Protection (Vishl)		Ionom	31	—	35	Vdc
Maximum Input Current (Iimax)		Vimin, Vonom,Ionom	—	—	1.5	A
No-load Input Current (Iio)		Vinom, Io＝0A	—	—	100	mA
Static Input Current (Iiof)		Vinom, remote output shutdown	—	—	10	mA
Remote	On	Low Level: ≤0.4V (reference to -Vin) or connected to -Vin				
	Off	High Level: 2.4V~48V (reference to -Vin) or open circuit				
2.3 Output Specifications						
Output Voltage Set-point (Vonom)		Vinom, Ionom	7.92	8.00	8.08	Vdc
Nominal Load (Ionom)		—	—	—	6	A
Output Current Range (Io)		Po≤72W	0	—	6	A
Line Regulation (Vov)		Vimin-Vimax, Ionom	—	—	±0.2	%Vo
Load Regulation (Vol)		0-100%Ionom,Vinom	—	—	±0.5	%Vo
Output Voltage Trim Range (Voadj) ②		Io≤Ionom,Po≤64W	-10	—	+10	%Vo
Output Over-voltage Protection		Po<Pomax	9.36		10.16	Vdc
Output Over-current protection	Protection Mode	——	Hiccup, auto recovery			—
	Protection Range	Vinom	105		140	%Ionom

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Parameter		Test Condition	Min	Typ	Max	Unit
Output Short-circuit protection	Protection Mode	——	Hiccup, auto recovery			—
Dynamic Load Response (externally add a 22μF tantalum capacitor and a 1μF ceramic capacitor to output)	Peak Deviation	25%-50%-25%Ionom 50%-75%-50%Ionom slope:1A/μS,Vinom	—	250	—	mV
	Settling Time		—	100	—	μs
Output Ripple & Noise		Vinom,20MHz, externally add a 22μF tantalum capacitor and a 1μF ceramic capacitor to output	—	—	80	mV
External Output Capacitance (Co)		—	0	—	2200	μF
Turn-on/off Peak Deviation		Vinom, Ionom	—	—	±10	%Vo
2.4 Safety Specifications						
Isolation Voltage	Input to output	Leak Current ≤ 1mA, 1min	1500	—	—	Vdc
Isolation Resistance (RISO)		—	50	—	—	MΩ
Safety Certificate		EN 60950—1: 2001 Recognized				
2.5 Reliability						
Vibration Test(sine)		Frequency: 10~55Hz Amplitude: 0.35mm Acceleration: 50m/s^2 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^2 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		2×10^6 h Bellcore TR-332				
2.6 Environmental Specifications						
Relative Humidity		(40±2) ℃, No dew	—	—	90	%RH
Cooling		——	forced-air cooling			
Operating Ambient Temperature (Ta)		See the derating curves	-40	—	+85	℃
Over-temperature Protection		——	+115℃(Auto-recovery, see test points shown in Figure 7)			
Storage Temperature (Tst)		No operating	-55	—	+125	℃
2.7 General Specifications						
Switching Frequency		——	—	300	—	k Hz
Temperature Coefficient (Tcoeff)		——	—	—	±0.02	%/℃
Efficiency (η)		Vinom,Ionom	90	91	—	%
RoHS		According to 2002/95/EC Directive				

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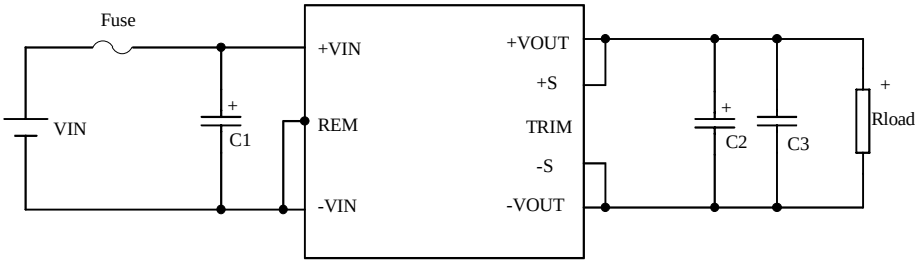
Note①: No over-voltage protection in the module, so an input voltage over 80Vdc may cause the module permanently damaged.

Note②: It shall not exceed the maximum allowable power (trim up) or exceed the nominal output current (trim down). See the circuit to trim output voltage and the formulas. When trimming the output voltage, it shall not exceed the specification, or the indicators and reliability of the module may be affected.

3. Basic Application Circuit and Considerations

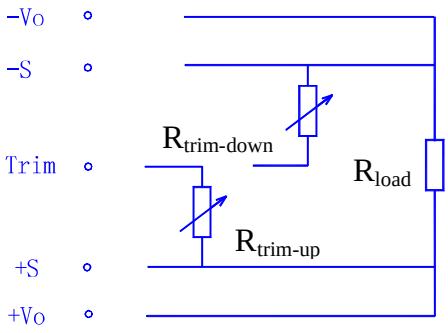
3.1 Typical Application



Fuse: 5.0A C1≥33μF/100V (Low ESR capacitor) C2: 22μF/25V (tantalum Capacitor)
C3: 1μF /16V (Monolithic capacitor)

4. Output Voltage Adjustment (Trim)

4.1 Output Voltage Trim Circuit



Trim up Trim down

4.2 Output Trim Equations

(1) To increase the output voltage, the value of the external resistor should be

$$R_{Trim-up} = \left(\frac{5.11 \times Vo(100(\%) + \Delta(\%))}{1.225 \times \Delta(\%)} - \frac{5.11 \times 100(\%)}{\Delta(\%)} - 10.22 \right) (k\Omega)$$

(2) To decrease the output voltage, the value of the external resistor should be

$$R_{Trim-down} = \left(\frac{5.11 \times 100(\%)}{\Delta(\%)} - 10.22 \right) (k\Omega)$$

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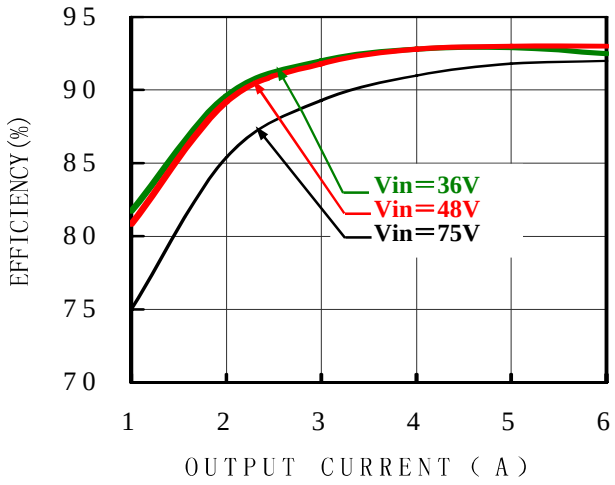
Where V_O : rated output voltage,

$R_{Trim-up}$、$R_{Trim-down}$: external adjusting resistance,

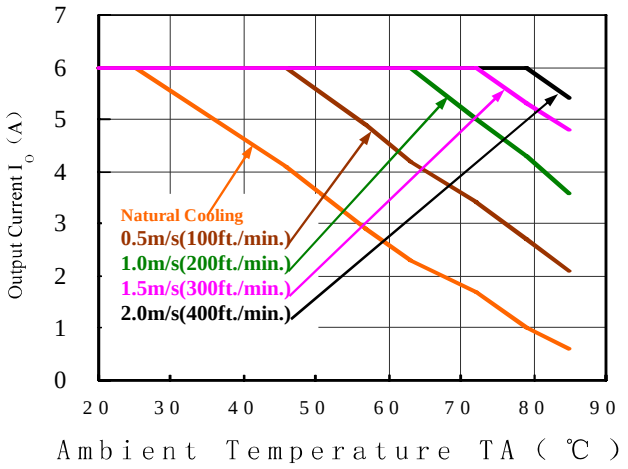
$\Delta(\%)$: Ratio of output voltage changes to nominal output voltage.

5. Efficiency Data: Ta＝＋25℃, airflow is 1m/S (200ft./min.)



6. Thermal Derating Curve

When the converter operates at high temperature, the following derating curves shall be used:



Derating Curve at Vin=48.0V

Note: Natural cooling refers that the air speed is 0.05m/S to 0.1m/S

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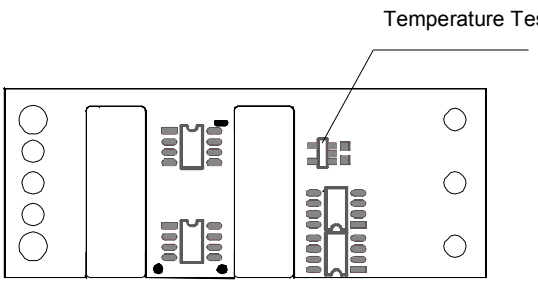
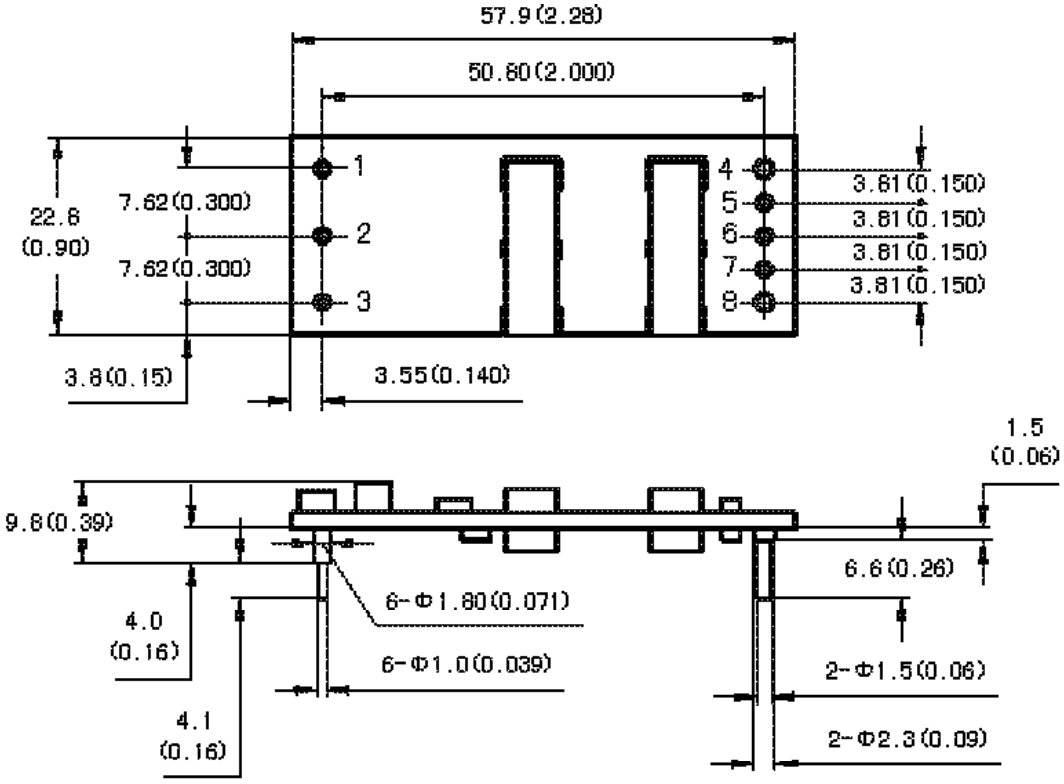
7. Temperature Test Point: Ta＝＋25℃,air speed is 1m/S (200ft./min.)



8. Dimensions and Pin definition

8.1 Dimensions



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

8.2 Pin Definition

No	1	2	3	4	5	6	7	8
Symbol	-Vin	Rem	+Vin	-Vout	-S	Trim	+S	+Vout
Definition	Negative input	Remote	Positive input	Negative output	Negative Remote Sense	Trim	Positive Remote Sense	Positive output

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