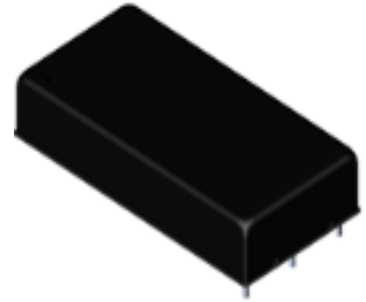


Features

- High efficiency 60W power in compact size 2x1" package
- Wide operating temperature range from -40°C to +105°C
- Six-sided continuous shield
- Continuous Short Circuit Protection
- No minimum load required
- Over load protection/ Over temperature protection/ Over voltage protection
- EN 50155, EN 45545-2 railway standard approvals

Application

- Industry control application
- Telecom/Datacom application
- Save space solution
- Industrial application
- Railway Application



Selection Guide

Part number	Input voltage	Output voltage	Output current @ full load	Input current @ no load	Efficiency ⁽¹⁾ (typ.)	Capacitive load ⁽²⁾ (max.)
RCB60WR4-11005J	40-160VDC Nom. 110VDC	5VDC	12000mA	10 mA	89%	28000µF
RCB60WR4-11012J		12VDC	5000mA	10 mA	90%	5850µF
RCB60WR4-11024J		24VDC	2500mA	10 mA	90%	2000µF
RCB60WR4-11048J		48VDC	1250mA	10 mA	88.5%	390µF

1. The efficiency is test by nominal input and max. full load @25°C.
2. The capacitive load is test by minimum input and constant resistive load.
3. All specifications valid at nominal input voltage, full load and 25°C after warm-up time unless otherwise stated.
4. The product information and specifications are subject to change without prior notice.

Part Number



Specifications

	Parameter	Conditions	Min.	Typ.	Max.	Unit	
	Input filter			Pi type			
	Input voltage range		40		160	VDC	
Input	Start-up time	100% Load at Nominal Vin			50	mS	
	Start-up voltage	0%~100% load			40	VDC	
	Under voltage lockout	0%~100% load		34		VDC	
	Input surge voltage	1s			200	VDC	
	Remote ON/OFF	DC-DC ON DC-DC OFF		Open or 3V < Vr < 12V Short or 0V < Vr < 1.2V			
	Output	Voltage accuracy	100% Load at Nominal Vin		±1		%
Ripple& noise (20MHZ BW at Vin range 10%~100% load With a 47μF X7R MLCC)		5V 12V			100 150	mVp-p	
(20MHZ BW at Vin range 10%~100% load with a 10μF X7R MLCC)		24V 48V			150 200	mVp-p	
Line regulation		LL-HL at 100% load		±0.2		%	
Load regulation		0-100% Load		±0.5		%	
Operating frequency		100% Load at Nominal Vin		250		KHz	
Environment		Operating temperature	With derating	-40		105	°C
	Storage temperature		-55		125	°C	
	Max case temperature				110	°C	
	Relative Humidity		5		95	%RH	
	MTBF	25°C		205		KHours	
	Vibration			EN61373			
Function	Isolation voltage	60sec. Input to Output	3			KVDC	
	Isolation resistance	500VDC	1000			MΩ	
	Isolation capacitance			1500		pF	
	Over load protection		130	175	210	%	
	Over voltage protection Zener diode clamp	5V output		5.6		8.0	VDC
		12V output		13.4		19.2	VDC
		24V output		26.9		38.4	VDC
		48V output		53.8		76.8	VDC
	Over temperature protection	Tc (Case Temperature)			115	°C	
	Short Circuit Protection			Continuous, Automatic recovery			
	Safety			EN62368-1/ EN50155			
Physical	Dimension	(L x W x H)		50.80x25.40x10.50 mm			

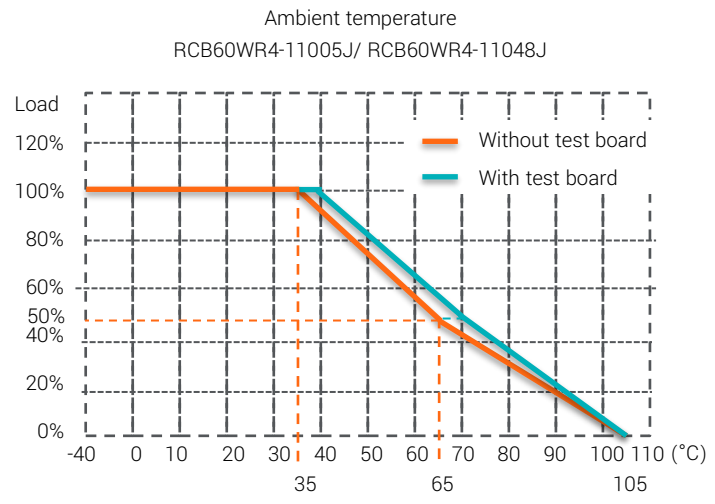
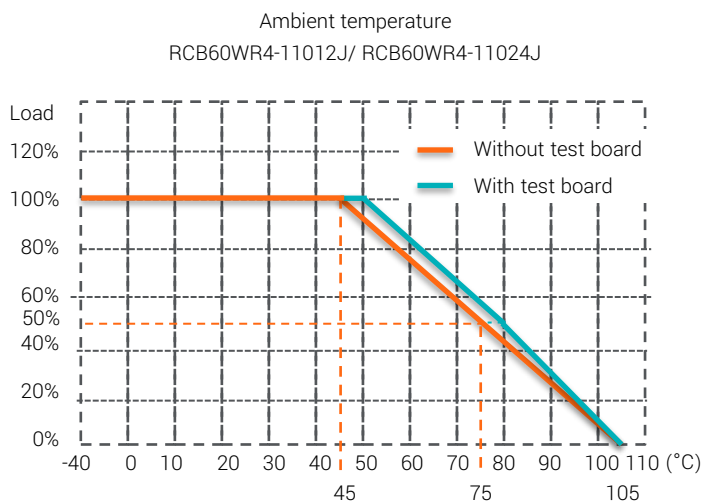
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The products were used in Computers, Industrial controls, Medical equipment, Transportation, EV, ECO-power, Aero-space application and communication.

Weight	45	g	
Case material	Metal case		
Potting material	Silicon (UL94V-0)		
Cooling method	Natural convection		
EMC	EMI	EN 55032, EN55011	CLASS A/ B
	ESD	EN61000-4-2, Air ± 8kV Contact ± 6kV	Criteria A
	Fast transient	EN61000-4-4, ±2kV	Criteria A
	Surge	EN61000-4-5, ±2kV	Criteria A
	Conducted immunity	EN61000-4-6, 10 V/rms	Criteria A
	Magnetic field immunity	EN61000-4-8, 10 A/m	Criteria A

1. All specifications valid at nominal input voltage, full load and 25°C after warm-up time unless otherwise stated.
2. The product information and specifications are subject to change without prior notice.
3. Derating measured with nominal line. Mounted test board (90 x 80 mm and each power pin with 43 x 40 mm, 20z double layer)

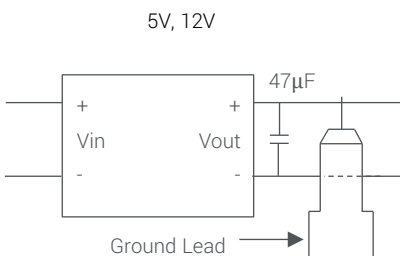
Derating Curve



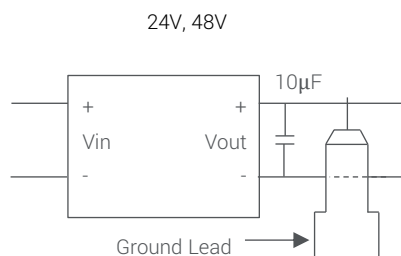
— The derating curve was measured at nominal V_{in} in chamber with nature convection.

— The derating curve was measured with nominal line. Mounted test board.

Ripple & Noise Measure Method



Measured with 20MHz bandwidth and 47µF capacitor capacitor.

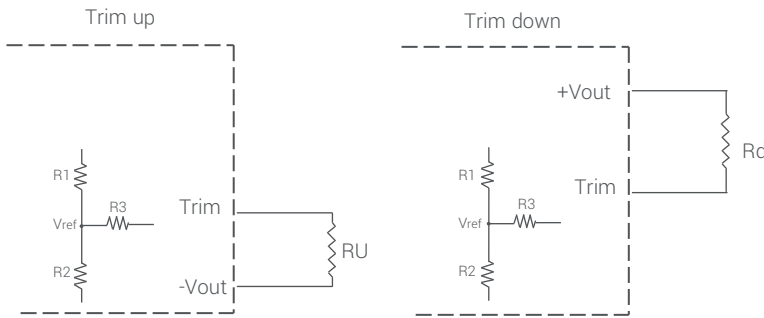


Measured with 20MHz bandwidth and 10µF capacitor capacitor.

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External Output Voltage Trimming



Formula for trim resistor:

$$\text{UP: } R_u = \frac{aR_2}{R_2 - a} - R_3 \quad a = \frac{V_{ref}}{V'_o - V_{ref}} \cdot R_1$$

$$\text{DOWN: } R_d = \frac{bR_1}{R_1 - b} - R_3 \quad b = \frac{V'_o - V_{ref}}{V_{ref}} \cdot R_2$$

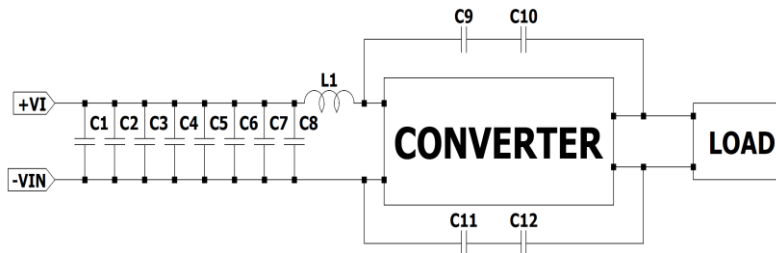
Note:

1. R_u, R_d is mean trim resistor, please check the formula.
2. a & b : user define parameter, no actual meanings.
3. V'_o is mean trim up/down voltage.

Vin	Vout	Vref	R1	R2	R3
110V	5V	1.24V	15.47kΩ	5.1kΩ	30.0kΩ
110V	12V	2.50V	38.0kΩ	10.0kΩ	68.0kΩ
110V	24V	2.50V	86.0kΩ	10.0kΩ	76.8kΩ
110V	48V	2.50V	182.0kΩ	10.0kΩ	80.6kΩ

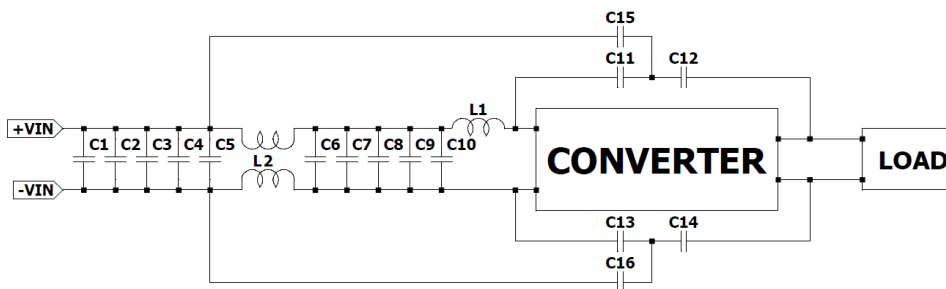
EMI Recommended Circuit

EN55032 CLASS A



Vin	L1	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
110V	68μH	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	4700PF	4700PF	4700PF	4700PF

EN55032 CLASS B



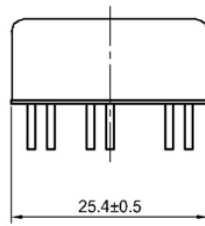
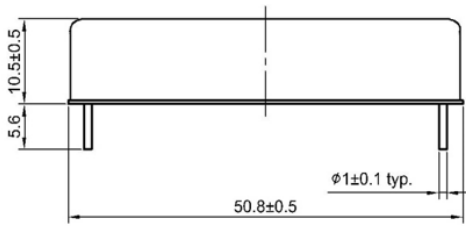
Vout	L1	L2	C1	C2	C3	C4	C5	C6	C7
05/ 12V	68μH	2.2mH	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF
24/ 48V	68μH	2.2mH	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF	0.68μF

Vout	C8	C9	C10	C11	C12	C13	C14	C15	C16
05/ 12V	0.68μF	0.68μF	0.68μF	4700PF	4700PF	4700PF	4700PF	47PF	47PF
24/ 48V	0.68μF	0.68μF	0.68μF	4700PF	4700PF	4700PF	4700PF	33PF	33PF

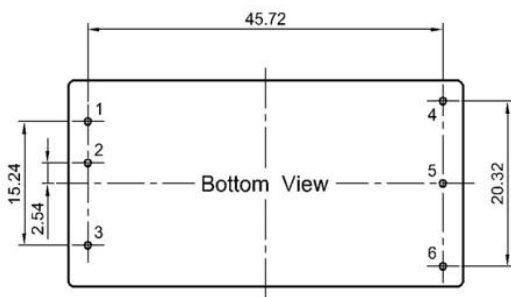
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Mechanical Dimension & Pinning

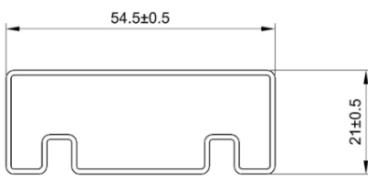


Pin	Single
1	+Vin
2	-Vin
3	Ctrl
4	+Vout
5	-Vout
6	Trim



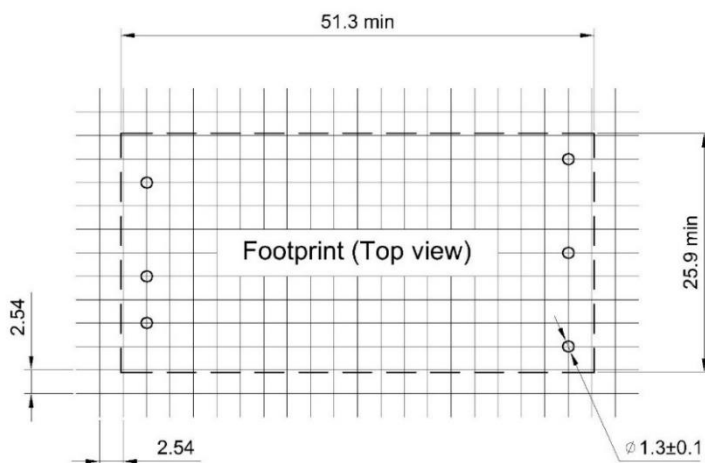
Projection : Third angle projection
 Unit : mm
 Tolerance : ±0.35mm

Package



UNIT:mm
 1 Tube = 18 pcs
 Length:520±2mm

Recommend Footprint



Unit: mm

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