Features

Regulated Converters

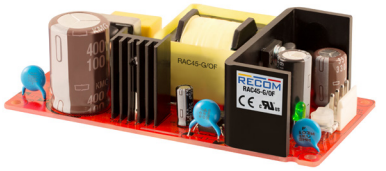
- Universal Input 90-264VAC
- Efficiency Up To 86%
- Short Circuit And Over Voltage/Current Protected
- UL/EN60950 Certified, CE Marked
- Conformal Coated Product
- RECOM Connector Set Available

RECOM

AC/DC Converter

RAC45-G/OF

45 Watt 4“ x 2“ Open Frame



Description

The RAC45-xxG/OF series are low cost, 4”x2” AC/DC power supplies with universal inputs (90-264VAC) and fully protected and isolated DC outputs in the range of 12V up to 48V. The converters are offered in open frame (/OF) version. The outputs are trimmable to compensate for cable losses and are short circuit and overload protected. The converters work over a wide temperature range of -25°C to +60°C (with derating), are UL60950, EN60950 and CE certified and comply with Class B EMC limits. The RAC45-G series come with a three year warranty.

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	max. Output Current [mA]	typ. Efficiency (1) [%]
RAC45-12SG/OF	90-264	12	3700	84
RAC45-24SG/OF	90-264	24	1900	85
RAC45-48SG/OF	90-264	48	1000	86

Notes:

Note1: Typ. efficiency is tested @ 230VAC and full load

Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Output Power				48W
Input Voltage Range		90VAC	230VAC	264VAC
Input Current	115VAC 230VAC			1A 0.6A
Inrush Current	cold start, 115VAC cold start, 230VAC			20A 45A
No Load Power Consumption	230VAC		0.5W	
Input Frequency Range		47Hz		63Hz
Output Voltage Trimming	12Vout 24Vout 48Vout	11.4VDC 22.8VDC 45.6VDC	12VDC 24VDC 48VDC	13.2VDC 26.4VDC 52.8VDC
Minimum Load		0%		
Power Factor	115VAC 230VAC		0.6 0.5	
Start-up Time	115VAC 230VAC			2s 0.8s
Rise Time	115VAC 230VAC		10ms 8ms	
Hold-up Time	115VAC 230VAC		16ms 80ms	
Internal Operating Frequency		65kHz		100kHz
Ripple and Noise (2)	20Mhz BW		50mVp-p	120mVp-p

Notes:

Note2: Measured with a 0.1µF & 10µF parallel capacitor.

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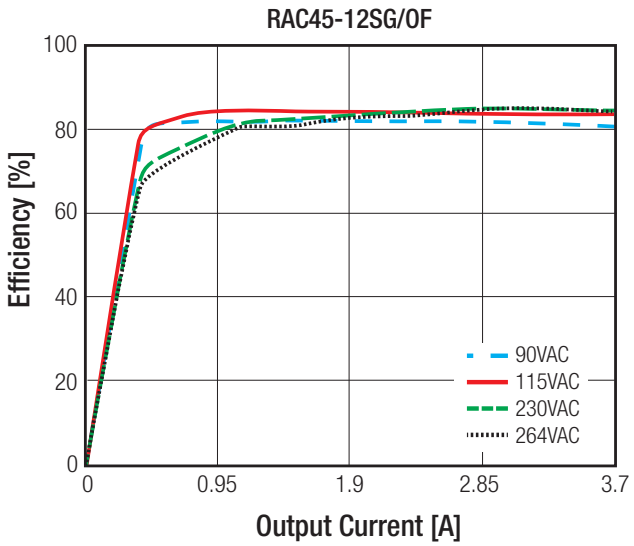
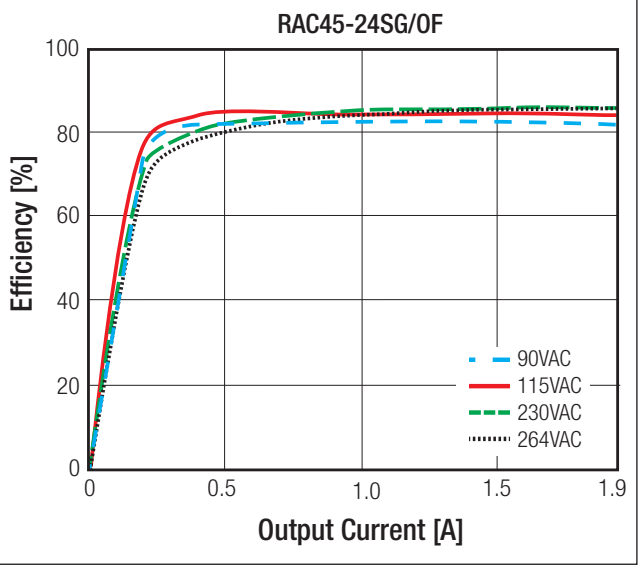
E196683

UL60950 Certified
CAN/CSA C22.2 N.60950-1-07 Certified
EN60950-1 Certified
EN55022/55024 compliant

Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

Efficiency vs. Load





REGULATIONS

Parameter	Condition	Value
Output Accuracy		±1.0% typ. / ±3.0% max.
Load Regulation	10%-100% load	±0.5% typ. / ±3.0% max.
Line Regulation		±0.2% typ. / ±1.0% max.

PROTECTIONS

Parameter	Condition		Value	
Input Fuse	internal		T3.15A / 250V slow blow	
Short Circuit Protection			continuous, auto recovery	
Over Voltage Protection (OVP)	115-135% of Vout nominal		Latch OFF	
Over Voltage Category			OVC II	
Over Current Protection (OCP)	nom. Vout=	12VDC 24VDC 48VDC	3.9 - 6.2A 2.0 - 3.2A 1.1 - 1.56A	Hiccup Mode, auto recovery
Class of Equipment			Class I	
Isolation Voltage	tested for 1 minute	I/P to O/P I/P to FG O/P to FG	3kVAC 1.5kVAC 0.5kVDC	
Isolation Capacitance			2200pF max.	
Isolation Resistance	I/P to O/P		100MΩ min.	
Leakage Current	I/P to O/P O/P to FG		0.25mA max. 3.5mA max.	
Insulation Grade			reinforced	

ENVIRONMENTAL

Parameter	Condition	Value
Operating Temperature Range	with derating (see graph)	-25°C to +60°C
Temperature Coefficient		±0.05%/°C typ.

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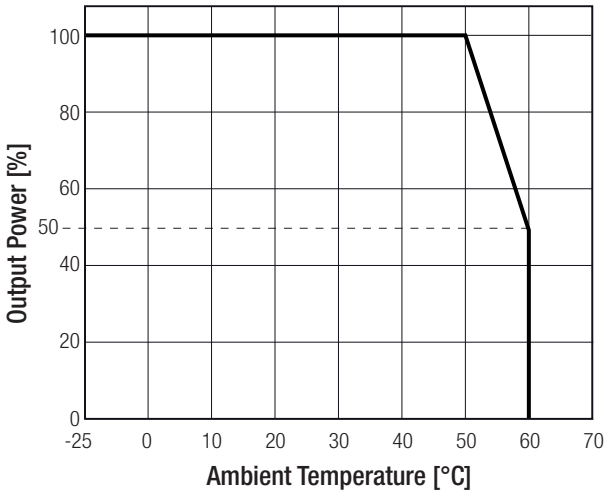
Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

Parameter	Condition	Value
Operating Humidity	non-condensing	20% - 90% RH
Operating Altitude (3)		5000m
Pollution Degree		PD2
Conformal Coating		provided
Shock		20G, 11ms, 3 times for X,Y and Z axis
MTBF	MIL-HDBK-217F G.B. +25°C	200 x 10^3 hours

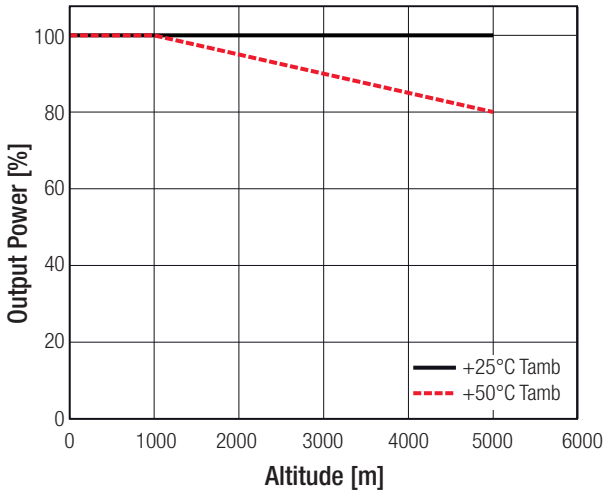
Notes:

Note2: Recognized by UL for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Contact RECOM tech support for advice

Derating Graph
(@ Chamber and natural convection 0.1m/s)



Operating Altitude
(limitation E-Cap heatsink)



SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Information Technology Equipment, General Requirements for Safety (LVD)	16BAS07018 11	EN60950-1, 2nd Edition, 2013
RoHS2		RoHS 2011/65/EU + AM2015/863

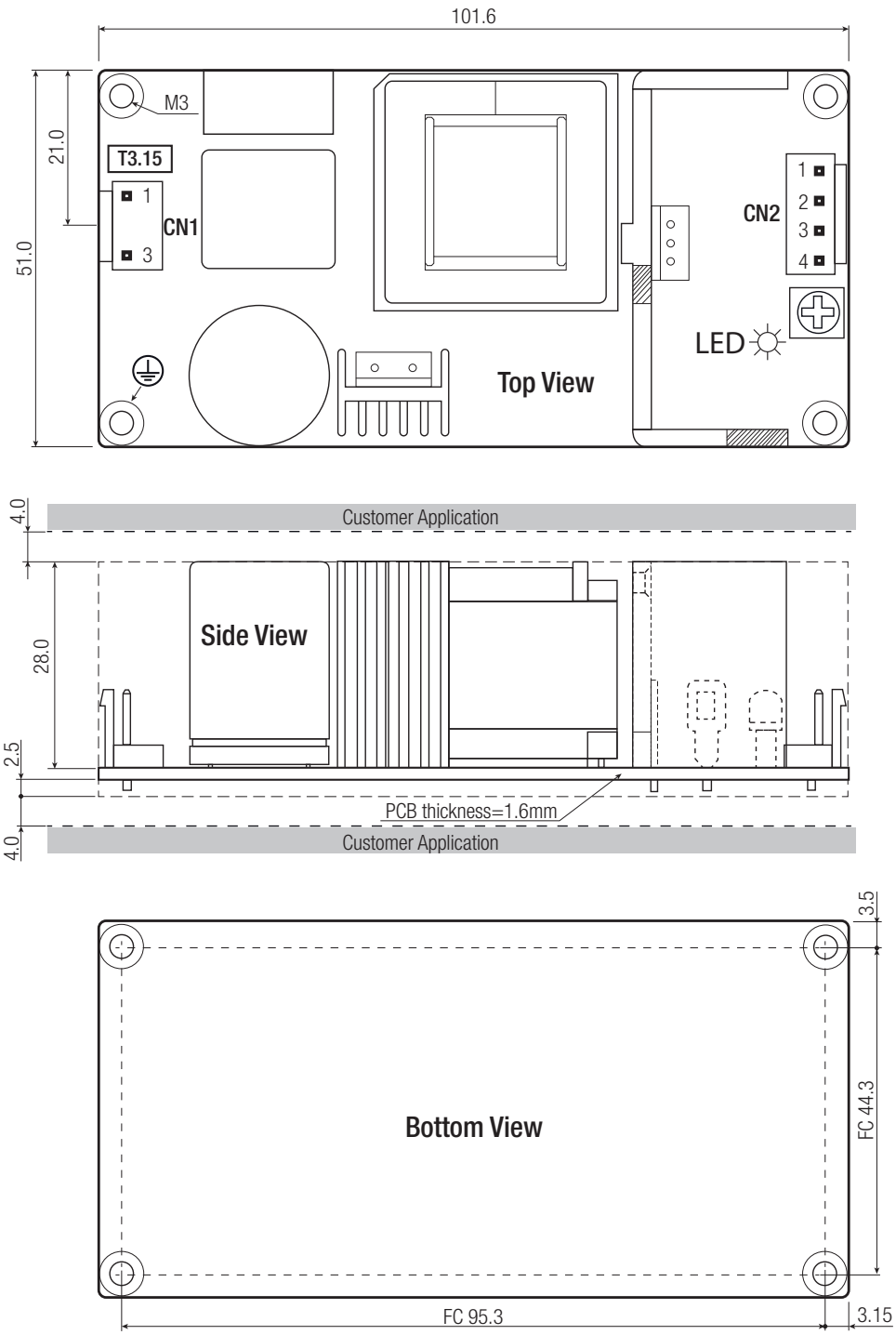
EMC Compliance	Conditions	Standard / Criterion
Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement	without external filter	EN55022, A2:2011, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2010
ESD Electrostatic discharge immunity test	±8kV Air; ±4kV Contact	EN61000-4-2, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m	EN61000-4-3, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1kV	EN61000-4-4, Criteria A
Surge Immunity	AC Power Port: L-L ±1kV, L-PE ±2kV, N-PE ±2kV	EN61000-4-5, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V	EN61000-4-6, Criteria A
Power Magnetic Field Immunity	50Hz, 1A/m	EN61000-4-8, Criteria A
Voltage Dips and Interruptions	Dips: >95% reduction Interruption: >95%	EN61000-4-11, Criteria A EN61000-4-11, Criteria C
Limits of Harmonic Current Emissions		EN61000-3-2, Criteria A
Voltage Fluctuations and Flicker in Public Low-Voltage Systems <=16A per phase		EN61000-3-3

Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

DIMENSIONS and PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	PCB	FR4 (UL94-V0)
Package Dimension (LxWxH)		101.6 x 51.0 x 28.0mm
Package Weight		126g typ.

Dimension Drawing Open Frame (mm)



Connections

AC Input (CN1)

Pin #	Terminal
1 AC/L 3 AC/N	3 Pins (Pin2 removed) with 3.96mm pitch

DC Output Connector (CN2)

Pin #	Terminal
1,2 V+ 3,4 V-	4 Pins with 3.96mm pitch

FC= fixing centers
Crimp Terminal AWG Range: 18-22AWG
Tolerance: xx.x= ±1.0mm
xx.xx= ±0.5mm

Compatible Connectors

Connector Set available: **20900009**

Housing

Landwin 3960S Series
JST VHR
Molex 51144 Series

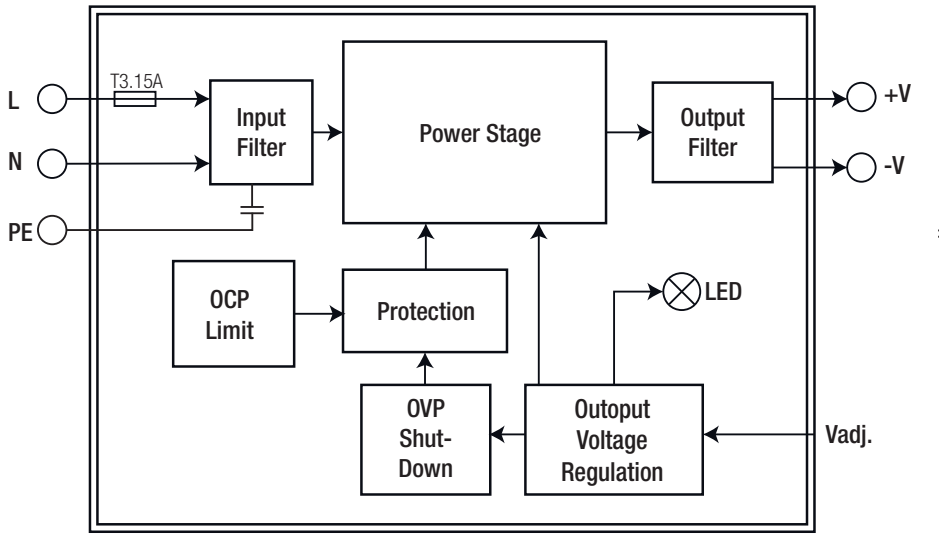
Crimp Terminal

Landwin 3963T011R
JST SVH-21T-P1.1
Molex 50539

Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

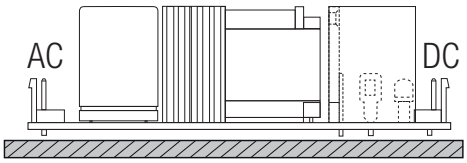
APPLICATION and INSTALLATION

Functional diagram



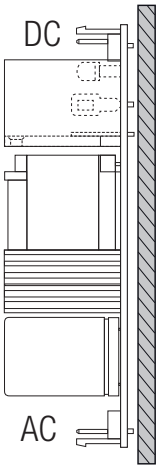
Mounting

horizontal (standard)

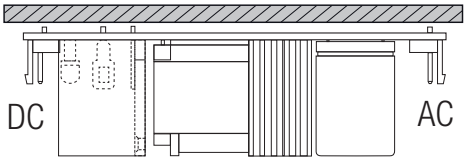


If module is mounted vertical or upside-down with natural convection cooling, the power must be derated ≥ 10%.

vertical



upside-down



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	174.0 x 125.0 x 266.0mm
Packaging Quantity		10pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	10% - 95% RH

The product information and specifications are subject to change without prior notice. RECOM products are not authorized for use in safety-critical applications (such as life support) without RECOM's explicit written consent. A safety-critical application is defined as an application where a failure of a RECOM product may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The buyer shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.