Features

Regulated Converter

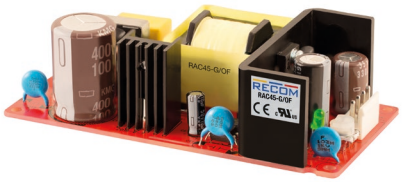
- Universal input 90-264VAC
- Efficiency up to 86%
- Short circuit and over voltage/current protected
- UL/EN60950 certified, CE marked
- Conformal coated product

RECOM
AC/DC Converter

RAC45-G/OF

45 Watt
4“ x 2“
Open Frame

3 YEAR Warranty



UL60950 certified
CAN/CSA C22.2 N.60950-1-07 certified
EN60950-1 certified
EN55032 compliant
EN55024 compliant

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.

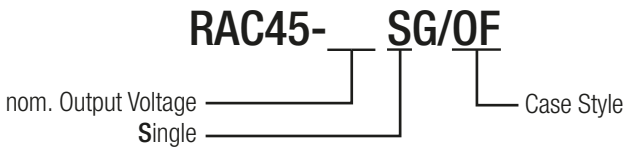
Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	max. Output Current [mA]	Efficiency typ. (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: Efficiency is tested at nominal input and full load at +25°C ambient

Model Numbering



Ordering Examples:

RAC45-24SG/OF	24Vout	Single	open frame version
RAC45-12SG/OF	12Vout	Single	open frame version

Specifications (measured @ Ta= 25°C, nom. Vin and full load unless otherwise stated)

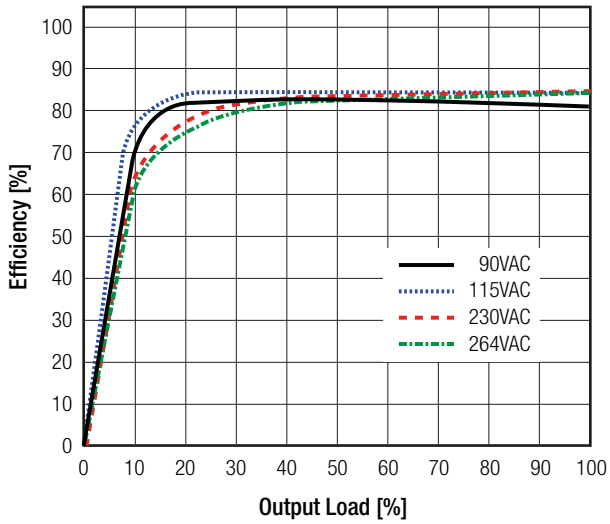
BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Output Power				48W
Input Voltage Range		90VAC	230VAC	264VAC
Input Current	115VAC 230VAC			1A 0.6A
Inrush Current	cold start at 25°C, 115VAC cold start at 25°C, 230VAC			20A 40A
No load Power Consumption	230VAC		0.5W	
Input Frequency Range		47Hz		63Hz
Output Voltage Trimming	12Vout 24Vout 48Vout	11.4VDC 22.8VDC 45.6VDC		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
Output Ripple and Noise (2)	20MHz BW		50mVp-p	120mVp-p

Notes:

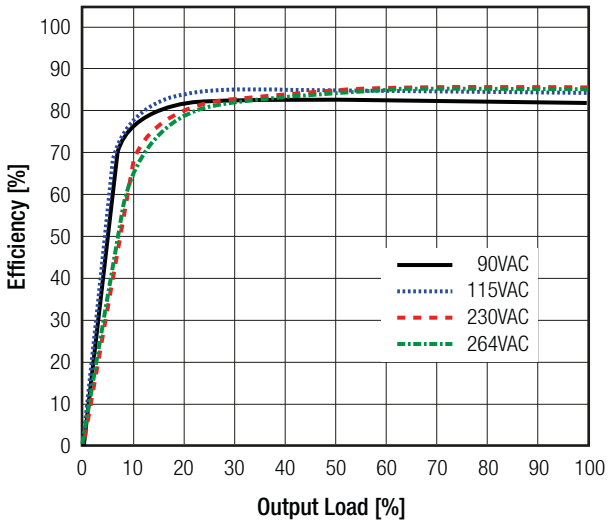
Note2: Measurements are made with a 1.0µF & 10µF parallel capacitor

Efficiency vs. Load

RAC45-12SG/OF



RAC45-24SG/OF



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

Specifications (measured @ Ta= 25°C, nom. Vin and full load unless otherwise stated)

PROTECTIONS

Parameter	Type		Value	
Input fuse	internal		T3.15A / 250V slow blow	
Short Circuit Protection (SCP)			continuous, auto recovery	
Over Voltage Protection (OVP)	115-135% of Vout nominal		Latch OFF	
Over Voltage Category			OVCII	
Over Current Protection (OCP)	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 PE O/P to PE	3kVAC 1.5kVAC 0.5kVDC	
Isolation Resistance	I/P to O/P		100MΩ min.	
Isolation Capacitance			2200pF max.	
Insulation Grade			reinforced	
Leakage Current	I/P to O/P O/P to FG		0.25mA max. 3.5mA max.	

Notes:

Note3: Refer to local safety regulations if input over-current protection is also required

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	-25°C to +50°C
		refer to derating graph	-25°C to +60°C
Temperature Coefficient			±0.05%/K typ.
Operating Altitude (4)			5000m
Operating Humidity	non-condensing		20% - 90% RH max.
Pollution Degree			PD2
Conformal Coating			provided
Shock			20G, 11ms, 3 times for X,Y and Z axis
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	200 x 10^3 hours

Notes:

Note4: Recognized by UL for safe operation up to 5000m. High altitude operation may impact the performance and lifetime
Contact RECOM techsupport for advice

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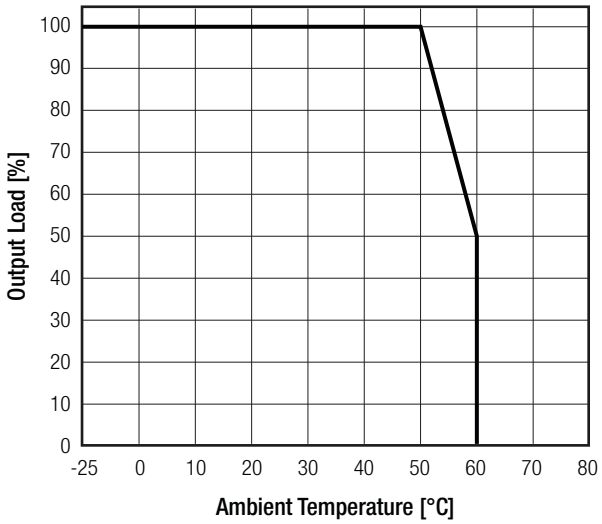
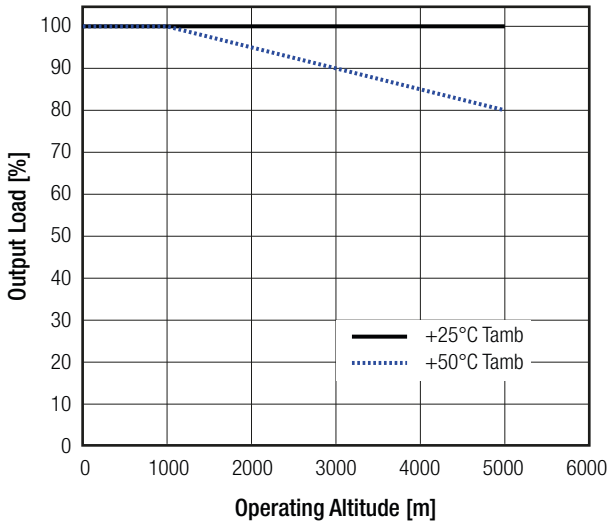
Specifications (measured @ Ta= 25°C, nom. Vin and full load unless otherwise stated)

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



Operating Altitude
(limitation E-Cap heitsink)



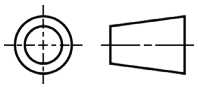
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Information Technology Equipment, General Requirements for Safety (LVD)	SA1406027L01001	EN60950-1, 2nd Edition, 2013
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS 2011/65/EU + AM2015/863

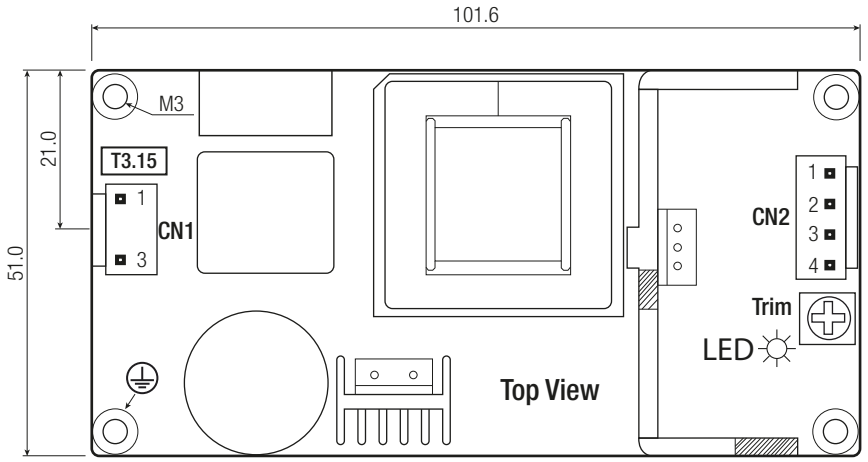
EMC Compliance	**Conditions**	**Standard / Criterion**
Electromagnetic compatibility of multimedia equipment – Emission Requirements	without external filter	EN55032:2015, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD 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: ±1.0kV	EN61000-4-4, Criteria A
Surge Immunity	AC Power Port: L-L ±1.0kV L-PE ±2.0kV N-PE ±2.0kV	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
Limits of Voltage Fluctuations & Flicker		EN61000-3-3

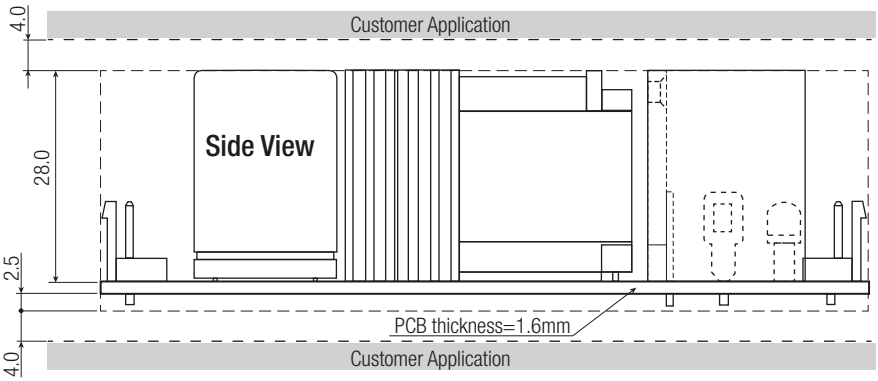
Specifications (measured @ Ta= 25°C, nom. Vin and full load unless otherwise stated)

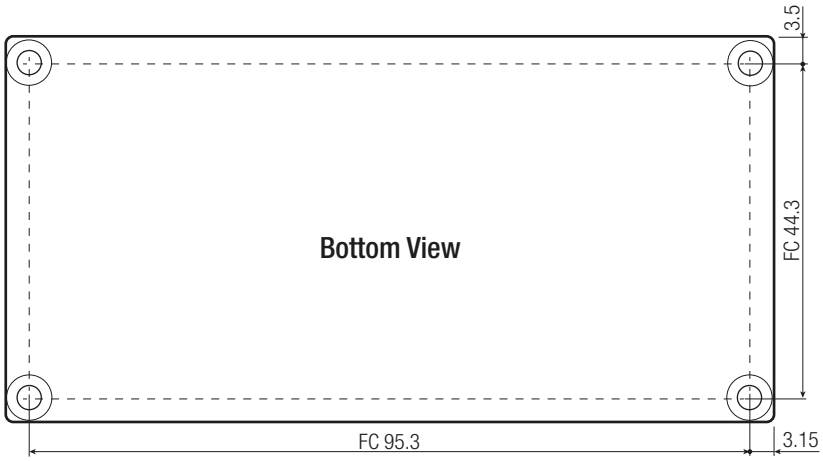
DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	PCB	FR4 (UL94-V0)
Dimension (LxWxH)		101.6 x 51.0 x 28.0mm
Weight		126g typ.

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 (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

Housing

Landwin 3960S Series
JST VHR
Molex 51144 Series

Crimp Terminal

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

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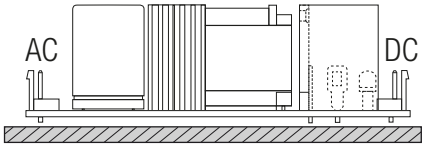
Specifications (measured @ Ta= 25°C, nom. Vin and full load unless otherwise stated)

APPLICATION and INSTALLATION

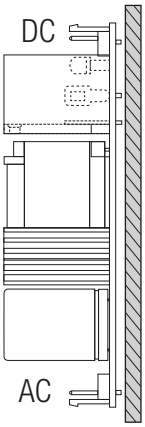
Mounting

horizontal (standard)

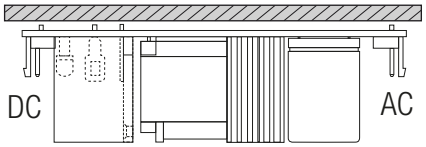


If module is mounted vertical or upside-down with natural convection cooling, the power must be derated ≥ 10%.

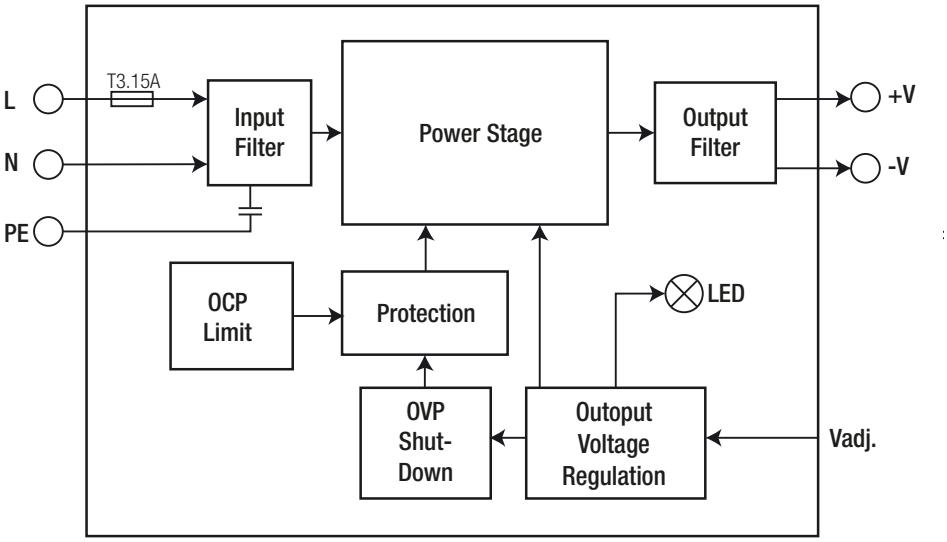
vertical



upside-down



Block diagram



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 max.