Features

Regulated Converters

- Universal Input 90-264VAC
- Efficiency 91%
- Short Circuit And Over Voltage Protected
- Active PFC Function, PF>0.95
- Power Indicator LED
- UL, CE Marked (CB Report)
- Conformal Coated Product
- RECOM Connector Set Available

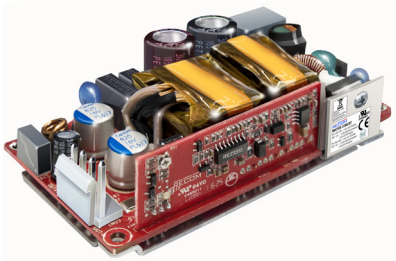
RECOM

AC/DC Converter

RAC150-G

150 Watt
4“ x 2“
Open Frame or Enclosed Case

3 YEAR warranty



UL62368-1 Certified
CAN/CSA C22.2 No. 62368-1-14 Certified
UL60950 Certified
CAN/CSA C22.2 N.60950-1-07 Certified
IEC/EN60950-1 Certified
EN55022/55024
FCC Part 15
CB Report

Description

The RAC150 series are cost-efficient 150 Watt AC/DC power supplies in a standard 2”x4” footprint with a universal input range of 90-264VAC for worldwide usage. They are built to deliver up to 125 Watt with natural air convection for use in tight, space-critical housings with low available airflow. UL and CE marks with CB-reports include the new 62368 safety standard as well as the usual 60950 safety standard. The RAC150 series offers tightly regulated 12V, 24V and 48VDC outputs with 3kVAC isolation and Class B EMC certifications and come with a three year warranty.

Selection Guide

Part Number	Input Voltage Range [VAC]	Output Voltage [VDC]	max. Output Current (1) [mA]	typ. Efficiency (2) [%]	Max. Capacitive Load (3) [µF]
RAC150-12SG (4)	90-264	12	12500	91	2000
RAC150-24SG (4)	90-264	24	6250	91	1000
RAC150-48SG (4)	90-264	48	3125	91	500

Notes:

Note1: With forced air cooling, refer to derating graph.
Note2: Typ. efficiency is tested @ 230VAC and full load.
Note3: Max. cap load is tested @ 90-264VAC and full resistive load.

Model Numbering

RAC150-__SG/__

Output Voltage
Single
Case Option (4)

Notes:

Note4: add suffix “OF” for open frame version
add suffix “ENC” for enclosed version

Ordering Examples:

RAC150-24SG/OF, 24Vout Single, open frame version.
RAC150-12SG/ENC, 12Vout Single, enclosed version.

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

BASIC CHARACTERISTICS				
Parameter	**Condition**	**Min.**	**Typ.**	**Max.**
Output Power	90-264VAC, with forced airflow 230VAC, natural convection 115VAC, natural convection			150W 125W 120W
	90-115VAC	refer to derating guidlines (PA-4)		
Internal Input Filter				Pi type
Input Voltage Range		90VAC	230VAC	264VAC
Input Current				2A
Inrush Current	cold start, 115VAC cold start, 230VAC			40A 60A
Input Frequency Range		47Hz		63Hz

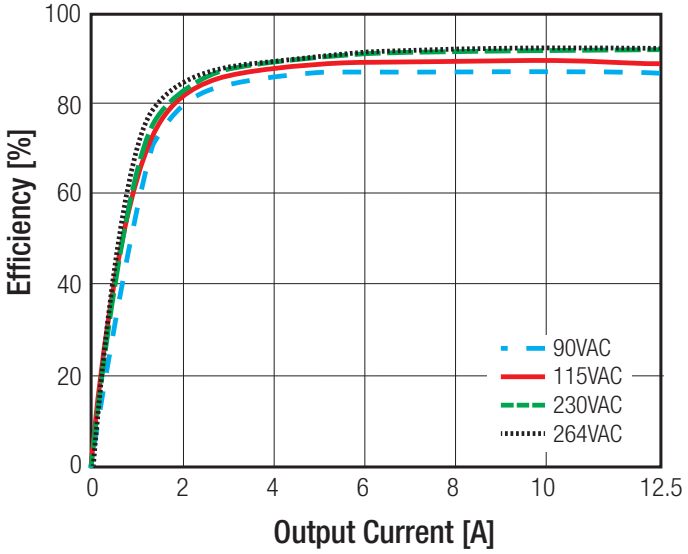
continued on next page

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

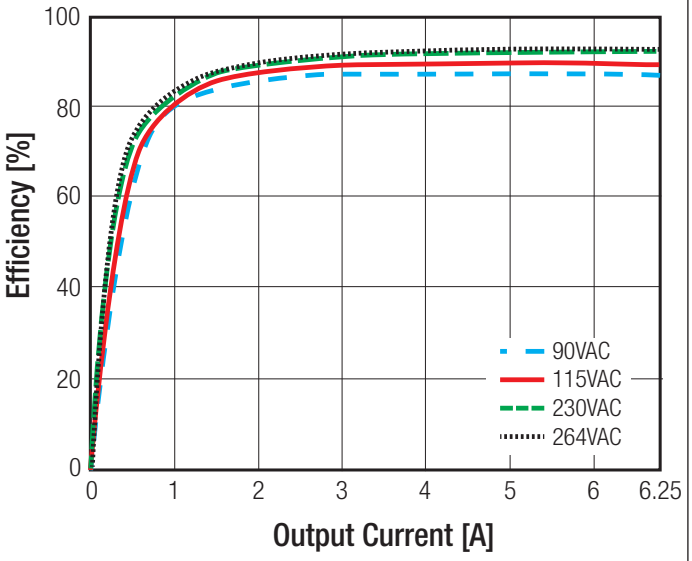
Parameter	Condition		Min.	Typ.	Max.
Rise Time	115VAC/230VAC				50ms
Hold-up Time	115VAC / 230VAC	100% load 50% load	6ms	20ms	
Minimum Load			0%		
Internal Operating Frequency				132kHz	
Output Ripple & Noise	+70°C	12VDC 24VDC 48VDC			150mVp-p 240mVp-p 360mVp-p
	-30°C	12VDC 24VDC 48VDC			300mVp-p 480mVp-p 720mVp-p
Power Factor	115VAC 230VAC		0.98 0.95		

Efficiency vs. Load

RAC150-12SG

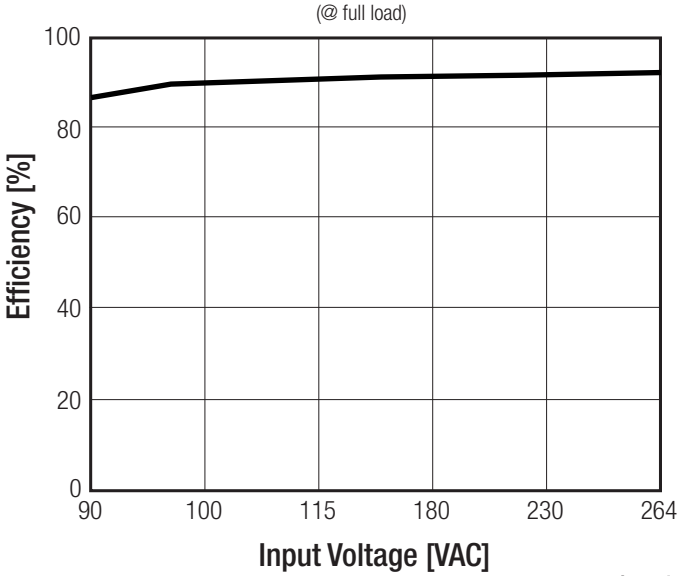


RAC150-24SG

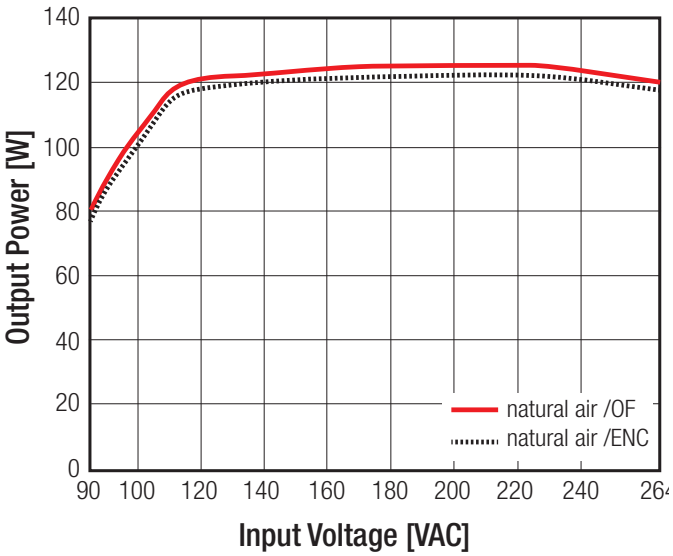


Efficiency vs. Input Voltage

(@ full load)



Output Power vs. Input Voltage



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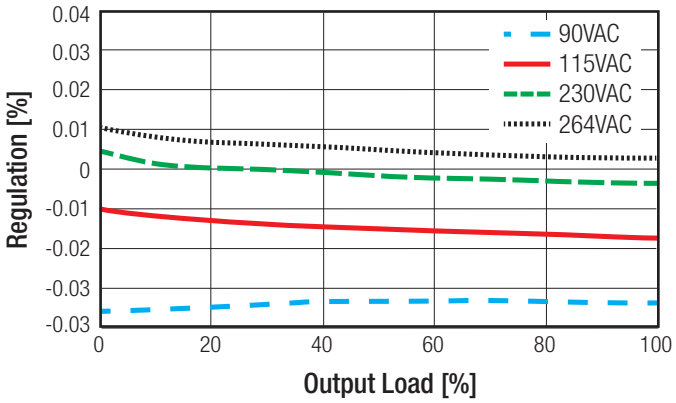
Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

REGULATIONS

Parameter	Condition		Value
Output Accuracy	-30°C to +70°C		±2.0% max.
Load Regulation	-30°C to +70°C, 0%-100% load		±0.2% typ.
Line Regulation	-30°C to +70°C		±0.1% typ.
Transient Response	-30°C to +70°C	25% load step change recovery time	±5.0% Vout max. 200µs max.

Normalized Output Regulation



PROTECTIONS

Parameter	Type		Value
Input Fuse	internal		T3.15A
Short Circuit Protection	below 100mΩ		continuous, Hiccup Mode, auto recovery
Over Voltage Protection (OVP)	105%-150% of Vout nominal		Latch OFF
Over Voltage Category			OVC II
Class of Equipment			Class I
Isolation Voltage (5)	tested for 1 minute	I/P to O/P I/P to FG O/P to FG	3kVAC 1.5kVAC 0.5kVDC
Isolation Capacitance			3300pF typ.
Isolation Resistance	I/P to O/P; I/P to FG; O/P to FG		10MΩ min.
Leakage Current	240VAC, 63Hz		0.25mA max.
Insulation Grade			reinforced

Notes:

Note5: For repeat Hi-Pot testing, reduce the time and/or the test voltage

ENVIRONMENTAL

Parameter	Condition		Value
Operating Temperature Range	with derating (see graph on next page)		-30°C to +70°C
Temperature Coefficient			±0.02%/°C
Operating Humidity	non-condensing		20% - 90% RH
Operating Altitude (6)			5000m
Pollution Degree			PD2
Conformal Coating			conformal coated product
Shock			20G, 11ms, 3 times for X,Y,Z axis
Vibration			10-500Hz, 3G, 10min. for each, 6cycles for each X,Y,Z
MTBF	MIL-HDBK-217F G.B. +25°C	natural convection (125W) forced cooling (150W)	100 x 10^3 hours 200 x 10^3 hours

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

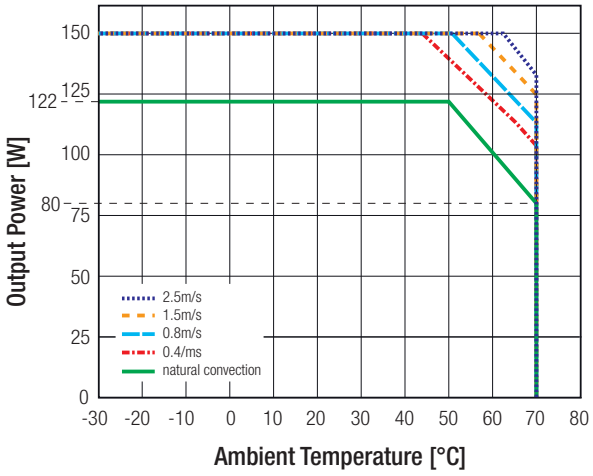
Notes:

Note6: Recognized by UL for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Contact RECOM tech support for advice

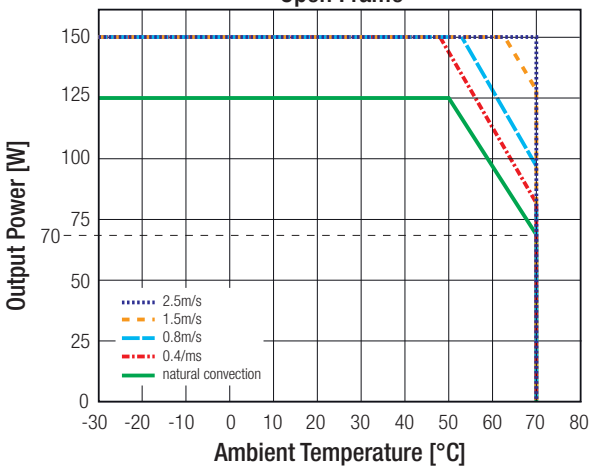
Derating Graph

@ 230VAC, horizontal mount

Enclosed

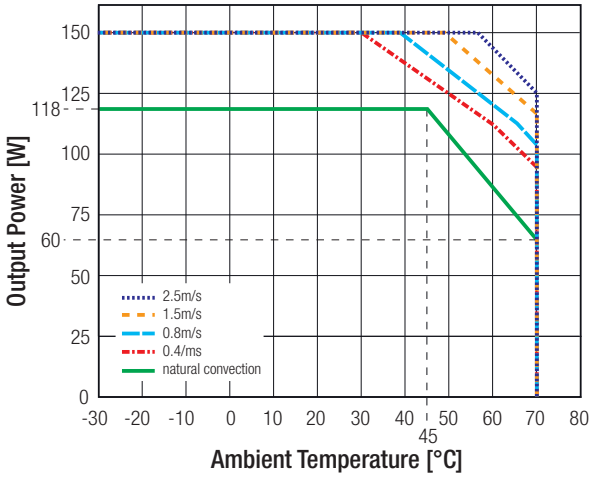


Open Frame



@ 115VAC, horizontal mount

Enclosed



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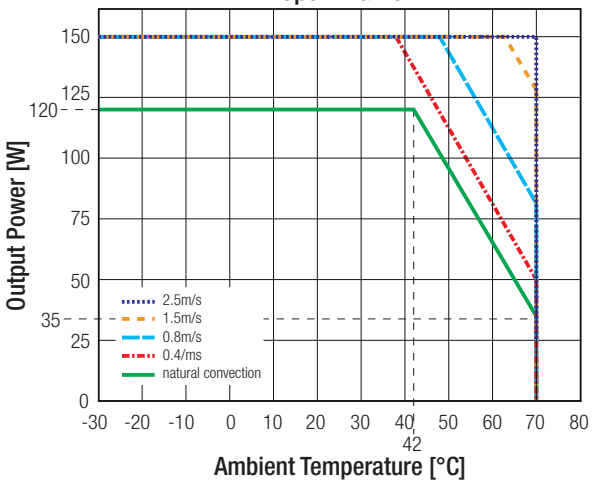
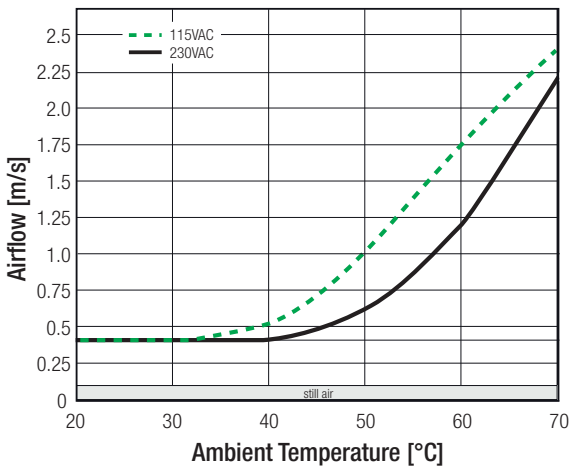
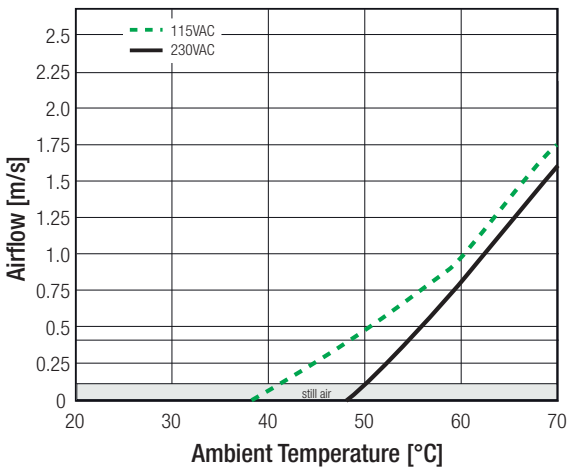


Required Airflow

150W



120W



<0.1m/s = still air
0.1 - 0.2m/s = natural convection

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

SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	**Report / File Number**	**Standard**
Information Technology Equipment, General Requirements for Safety	E196683-A2	UL60950-1, 2nd Edition, 2014 CSA C22.2 No. 60950-1-07, 2nd Ed. 2014
Audio/Video, information and communication technology equipment - Safety requirements		UL62368-1, 2nd Edition, 2014 CSA C22.2 Nr. 62368-1-14, 2nd Ed. 2014
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	16BCS07071821	IEC62368-1, 2nd Edition, 2014 EN62368-1, 2014
Audio/video, information and communication technology equipment - Safety requirements (CB Scheme)	16BAS07018 11	IEC60950-1, 2nd Edition + AM2, 2013 EN60950-1, 2nd Edition + A2:2013
RoHS2		RoHS 2011/65/EU + AM2015/863

EMC Compliance	**Conditions**	**Standard / Criterion**
Information technology equipment - Immunity characteristics - Limits and methods of measurement	16EAS07018 11	EN55022, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024, 2015
Limitations on the amount of electromagnetic intererence allowed from digital and electronic devices		47 CFR FCC Part 15, Subpart, Class B
ESD Electrostatic discharge immunity test	±8kV Air; ±4kV Contact	EN61000-4-2, Criteria B
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 B
Surge Immunity	AC Power Port: L-N ±1kV L-PE & 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
Voltage Dips and Interruptions	Dips: >95% reduction Interruption: >95%	EN61000-4-11, Criteria B 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

DIMENSIONS and PHYSICAL CHARACTERISTICS		
Parameter	**Type**	**Value**
Material	PCB Case/Baseplate	FR4 (UL94-V0) Aluminium
Package Dimension (LxWxH)	OF -version ENC-version	101.6 x 50.8 x 30.0mm 105.0 x 62.0 x 35.0mm
Package Weight	OF -version ENC-version	200g 265g

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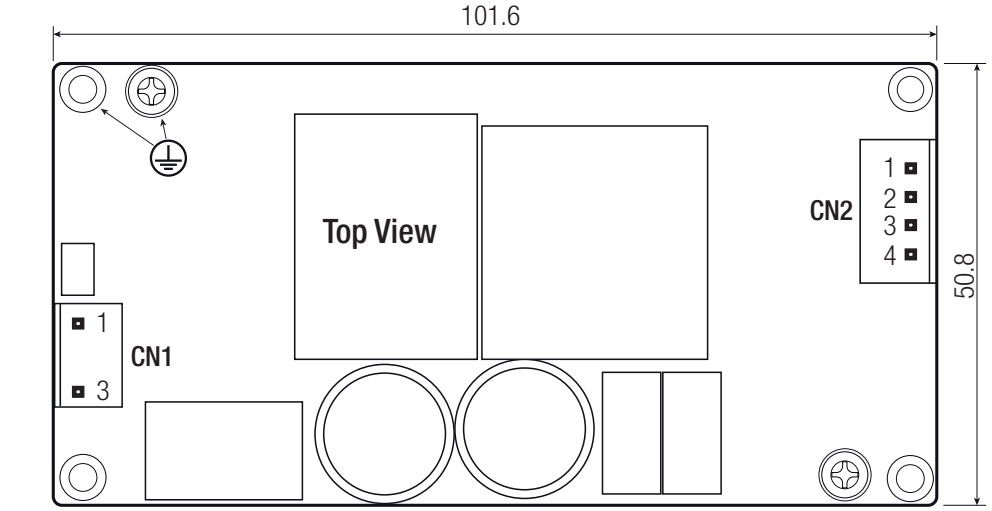
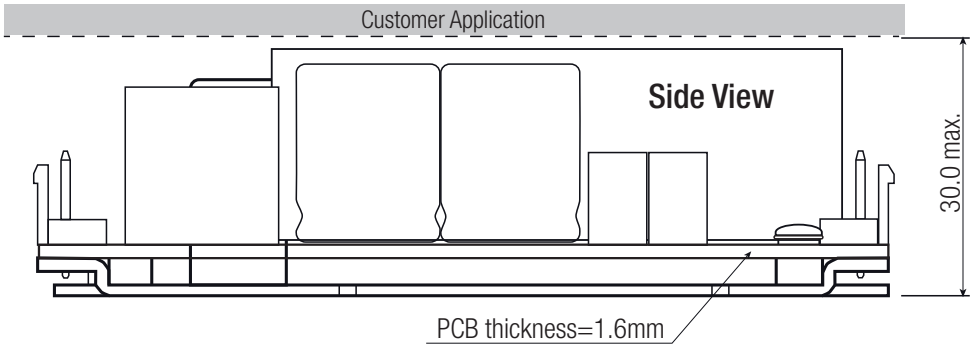
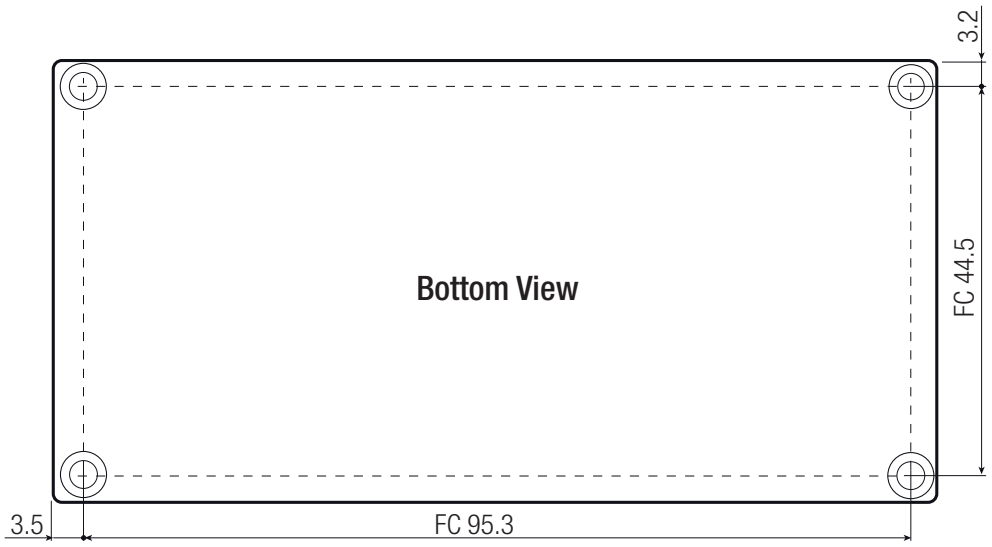
Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

Dimension Drawing Open Frame (mm)







Connections

AC Input (CN1)

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

DC Output Connector (CN2)

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

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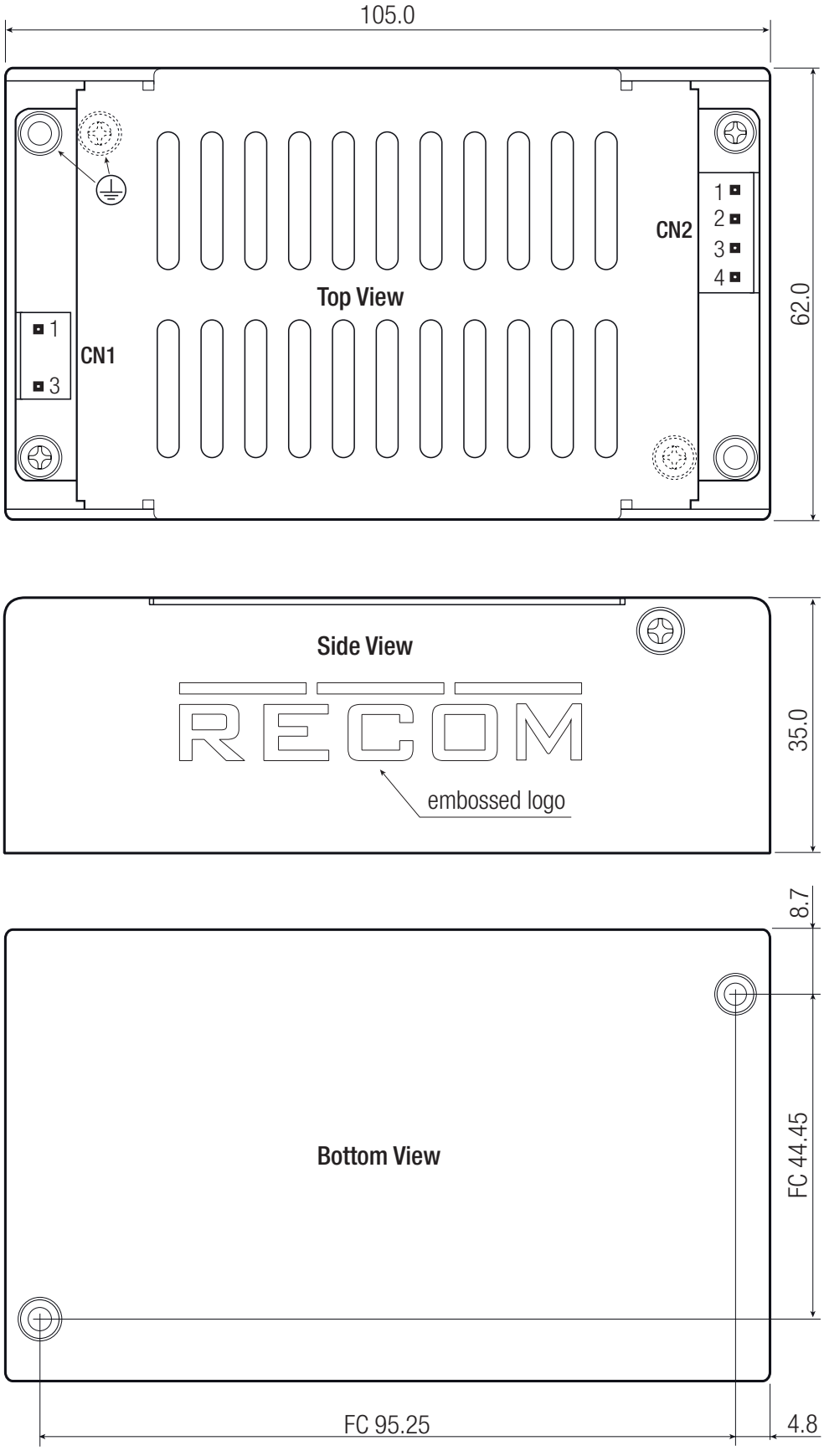
Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

Dimension Drawing Enclosed Case (mm)



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Crimp Terminal

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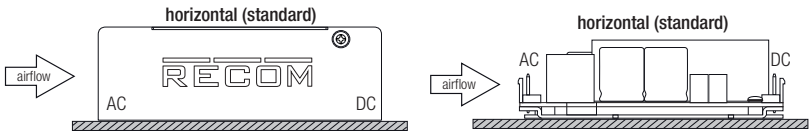
JST SVH-21T-P1.1
Molex 50539

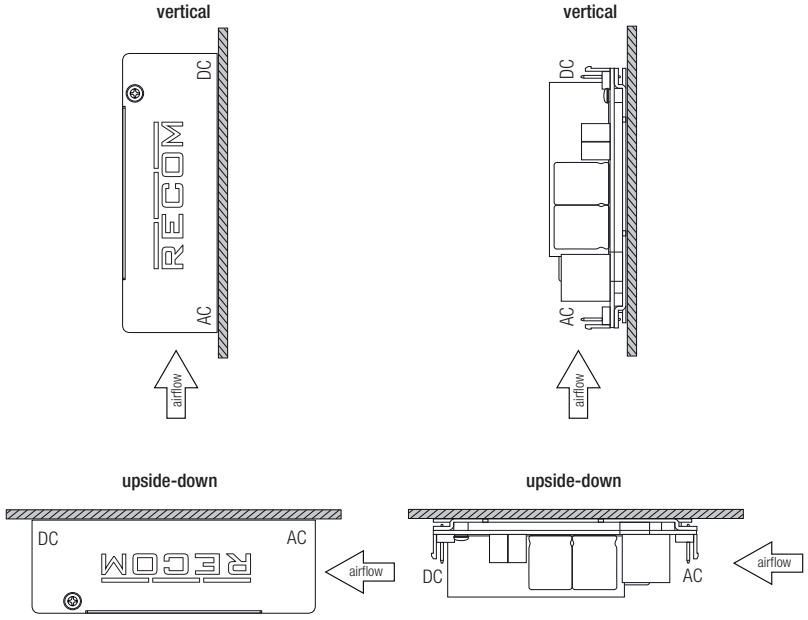
Specifications (measured @ ta = 25°C, nominal input voltage, full load otherwise noted)

APPLICATION and INSTALLATION

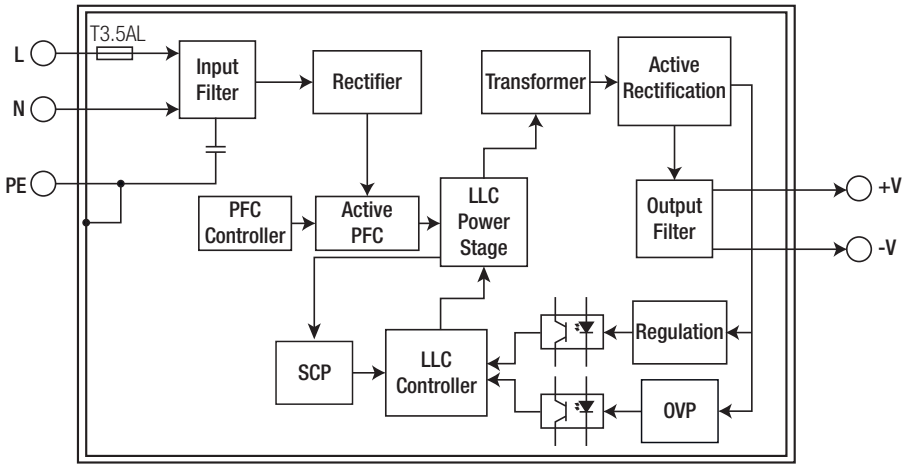
Mounting



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



Block Diagram



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	112.0 x 80.0 x 50.0mm
Packaging Quantity		1pcs
Storage Temperature Range		-40°C to +85°C
Storage Humidity	non-condensing	10% - 95% RH