

Features

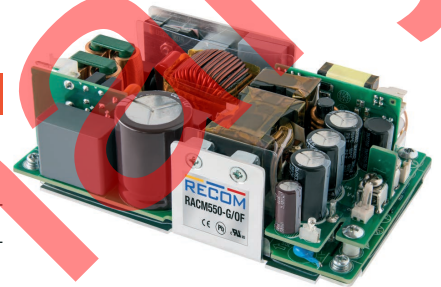
Regulated Converter

- 300W baseplate-cooled, fan-less operation
- 550W peak power or forced air rating
- Universal AC input range (80~264VAC)
- Standby power consumption <0.5W
- Operating temperature -40°C to +70°C
- Signals: remote sensing and ON/OFF control

RECOM AC/DC Converter

RACM550-G

550 Watt
5" x 3"
Open Frame
Single Output



Description

The RACM550 Series is designed to support up to 300 Watt continuous output power without fan cooling. The compact 3" x 5" baseplate design enables direct heat dissipation through metal housings in the application. Up to 550 watts are available to drive dynamic loads for several seconds of peak power or with forced air for even longer time frames. A smart fan output is on board as standard as well as a 5V/1A VSB output for applications with housekeeping circuits and on/off control. A wide input range of 80 to 264VAC, up to 5000m operating altitude and international safety agency certifications make the series worldwide compliant for medical 2 MOPP, household and industrial ITE applications.

Selection Guide

Part Number	Input Voltage Range [VAC]	Nom. Output Voltage [VDC]	Max. Output Current ⁽¹⁾ [A]	Efficiency typ. ⁽²⁾ [%]
RACM550-24SG/OF	80-264	24	22.92	93

Notes:

Note1: With 2.5m/s forced air cooling, refer to "Derating Graph 230VAC"

Note2: Efficiency is tested at nominal input and full load at +25°C ambient

Selection Guide (not released, available in Q4/2019)

Part Number	Input Voltage Range [VAC]	nom. Output Voltage [VDC]	max. Output Current ⁽¹⁾ [A]	Efficiency typ. ⁽²⁾ [%]
RACM550-36SG/OF	80-264	36	15.28	93
RACM550-48SG/OF	80-264	48	11.46	93
RACM550-56SG/OF	80-264	56	9.82	94

Model Numbering



Ordering Examples:

RACM550-24SG/OF 24Vout Single open Frame

- IEC/EN60950-1 (pending)
- IEC/EN62368-1 (pending)
- IEC/EN60335-1 (pending)
- IEC/EN60601-1 (pending)
- ANSI/AAMI ES60601-1 (pending)
- CSA/CAN 22.2 60950-1-14 (pending)
- IEC/EN61558-1 (pending)
- IEC/EN61558-2-16 (pending)
- EN55032 compliant
- EN55024 compliant

Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

BASIC CHARACTERISTICS

Parameter	Condition		Min.	Typ.	Max.
Input Voltage Range ⁽³⁾	nom. Vin= 230VAC		80VAC 120VDC	230VAC	264VAC 370VDC
Input Current	115VAC 230VAC				6.5A 3.0A
Inrush Current	115VAC 230VAC				40A 60A
No load Power Consumption					2W
Standby Power	main output OFF, VSB Output unloaded				0.5W
Input Frequency Range	AC input		47Hz		63Hz
Minimum Load			0%		
Power Factor	115VAC 230VAC		0.98 0.95	0.99 0.97	
Start-up Time	main output	115VAC/230VAC		400ms	
	VSB Output	115VAC/230VAC		140ms	
Rise Time	main output	115VAC/230VAC		15ms	
	VSB Output	115VAC/230VAC		5ms	
Hold-up Time	main output	115VAC/230VAC, 550W		15ms	
	VSB Output	115VAC/230VAC		130ms	
Output Ripple and Noise ⁽⁴⁾	20MHz BW @ 25°C	main output	1% of Vout nom. max.		
		VSB Output			120mVp-p

Notes:

Note3: The products were submitted for safety files at AC-input operation. For DC-input make sure that sufficient fuses are used

Note4: Measurements are made with a 12" twisted pair-wire terminated with a 0.1µF and 10µF parallel capacitor

Peak Load Capability

Peak Load Calculation

P_{nom} = nom. output power [W]

P_p = peak output power ($\leq 550W$) [W]

P_r = recovery output power [W]

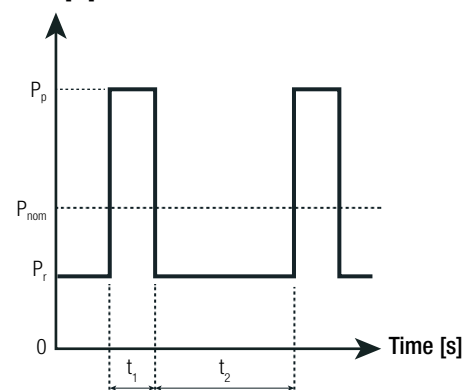
t_1 = peak time set (10s max.) [s]

t_2 = recovery time (min. 4 x t_1) [s]

k = safety factor 1.7 []

$$P_r = \frac{P_{nom} \times (t_{1set} + t_2) - (P_p \times t_{1set})}{t_2 \times k}$$

Pout [W]



Practical Example (RACM550-24SG/OF):

Take the RACM550-24SG/OF at 100VAC input voltage and $T_{AMB} = 60^\circ C$ (220W) with conduction cooling.

P_{nom} = refer to derating graphs= 245W with line derating 220W

$P_p = 550W$

$t_1 = 10s$

$t_2 = 40s$

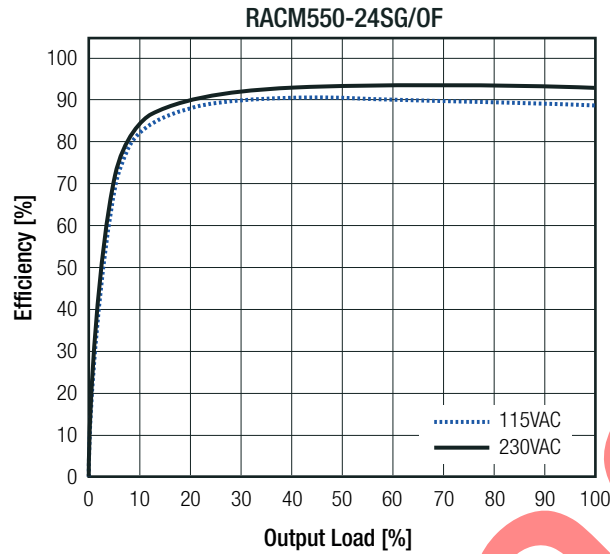
$k = 1.7$

$$P_r = \frac{220 \times (10 + 40) - (550 \times 10)}{40 \times 1.7} = \underline{80.9W}$$

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Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

Efficiency vs. Load



REGULATIONS

Parameter	Condition	Value
Output Accuracy	main output	±3.0% max.
	VSB output	±4.0% max.
Line Regulation	low line to high line, full load	main output / VSB output ±1.0% max.
Load Regulation ⁽⁶⁾	10% to 100% load	main output / VSB output 1.0% max.

Notes:

Note6: Operation below 10% load will not harm the converter, but specifications may not be met

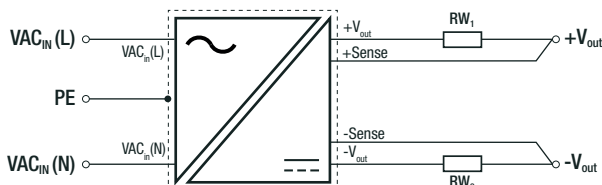
ADDITIONAL FEATURES

Parameter	Condition	Min.	Typ.	Max.
VSB Output Power	CTRL ON	115VAC/230VAC		5W
	CTRL OFF	230VAC 115VAC		5W 1W
Output Voltage Adjustability ⁽⁵⁾	on-board potentiometer			±2VDC
ON/OFF CTRL	CON3, Pin3 (refer to "VSB & CTRL (CON3)")	main + FAN output ON main + FAN output OFF		2.4VDC - 5VDC or open 0VDC - 0.8VDC or shorted to GND
Fan Output Power	@ +50°C (not protected)	continuous peak (1s)	250mA	500mA
Remote Sense ⁽⁷⁾				2VDC
Power OK LED	LED = green LED = red			working failure

Notes:

- Note5: By trimming up, decrease output current to avoid exceeding rated output power
By trimming down, do not exceed maximum continuous output current
- Note7: The output voltage can be adjusted by both ADJ (potentiometer) and Sense.
The maximum combined adjustment range is ±2VDC

Remote Sense



RW₁ ... wire losses +
RW₂ ... wire losses -

Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

PROTECTIONS

Parameter	Type		Value
Input Fuse ⁽⁹⁾	internal		2x T6.3A, slow blow type
Short Circuit Protection (SCP)	below 100mΩ	$P_{in} = 10W$ max.	hiccup mode, auto recovery
Over Voltage Protection (OVP)			110% - 120%, hiccup mode
Over Voltage Category (OVC)			OVCII
Over Current Protection (OCP)			105% - 135%, hiccup mode
Over Temperature Protection (OTP)			auto recovery, internal temperature sensors
Class of Equipment			Class I
Isolation Voltage (safety certified) ⁽¹⁰⁾	I/P to O/P	1 minute	4kVAC
Isolation Resistance			10MΩ min.
Insulation Grade			reinforced
Leakage Current			0.25mA max.
Means of Protection	250VAC working voltage		2MOPP

Notes:

Note9: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

Note10: For repeat Hi-Pot testing, reduce the time and/or the test voltage

ENVIRONMENTAL

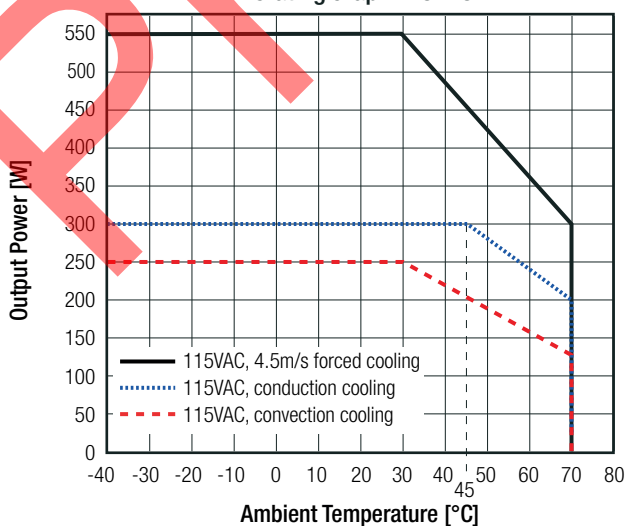
Parameter	Condition		Value
Operating Temperature Range	refer to derating graphs		-40°C to +70°C
Temperature Coefficient			±0.02%/K
Operating Altitude ⁽¹¹⁾			5000m
Operating Humidity	non-condensing		20% - 90% RH max.
Pollution Degree			PD2
Shock			250m/s ² , 6ms; 3 times, each along x, y, z axes
Vibration			90-200Hz, 10m/s ² ; 3.5min./1cycle, 5 periods, each along x, y, z axes
MTBF	according to MIL-217F Method 2 Components Stress Method	+25°C (forced air cooling) +45°C (forced air cooling)	200 x 10 ³ hours 50 x 10 ³ hours

Notes:

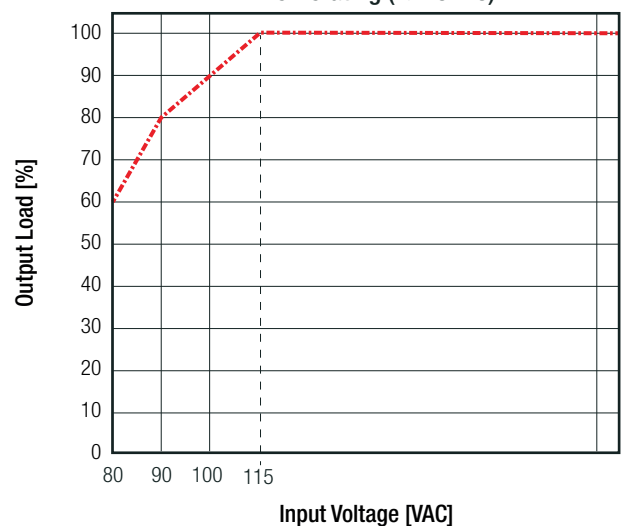
Note11: Recognized by safety agency for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Please contact RECOM tech support for advice.

RACM550-24SG/OF

Derating Graph 115VAC



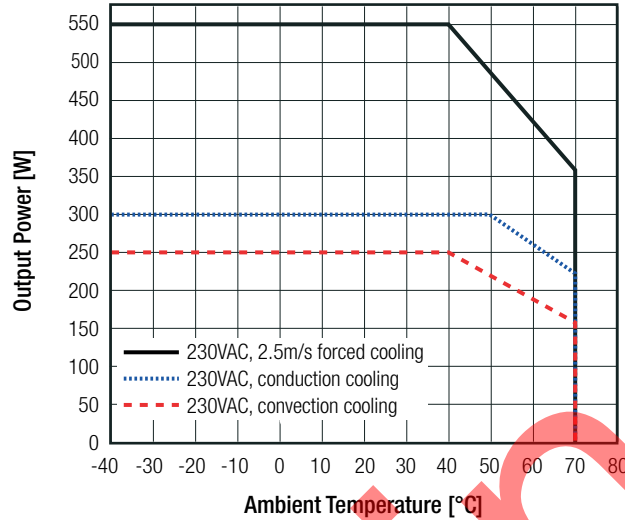
Line Derating (<115VAC)



Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

RACM550-24SG/OF

Derating Graph 230VAC



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

SAFETY AND CERTIFICATIONS

Certificate Type (Safety)	Report / File Number	Standard
Audio/video, information and communication technology equipment - Safety requirements (CB)	pending	IEC62368-1:2014 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements	pending	EN62368-1:2014 + A11:2017
Household and similar electrical appliances - Safety - Part 1: General requirements	SES180815002001E	EN60335-1:2012 + A11:2014
Medical Electric Equipment, General Requirements for Safety and Essential Performance	pending	ANSI/AAMI ES60601-1:2005 CAN/CSA-C22.2 No. 6060-1:14
Medical Electric Equipment, General Requirements for Safety and Essential Performance (LVD)	pending	IEC60601-1:2005, 3rd Edition + AM1:2014
Medical Electric Equipment, General Requirements for Safety and Essential Performance (CB)	pending	EN60601-1:2006 + A12:2014
Information Technology Equipment, General Requirements for Safety	pending	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Safety of transformers, reactors, power supply units and combinations thereof Part 1: General requirements and tests	pending	IEC61558-1:2005, 2nd Edition + A1:2009 EN61558-1:2005 + A1:2009
Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1100 V - Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units (CB)	pending	IEC61558-2-16:2009, 1st Edition + A1:2013
Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1100 V - Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units (LVD)	pending	EN61558-2-16:2009 + A1:2013
RoHS2		RoHS 2011/65/EU + AM2015/863

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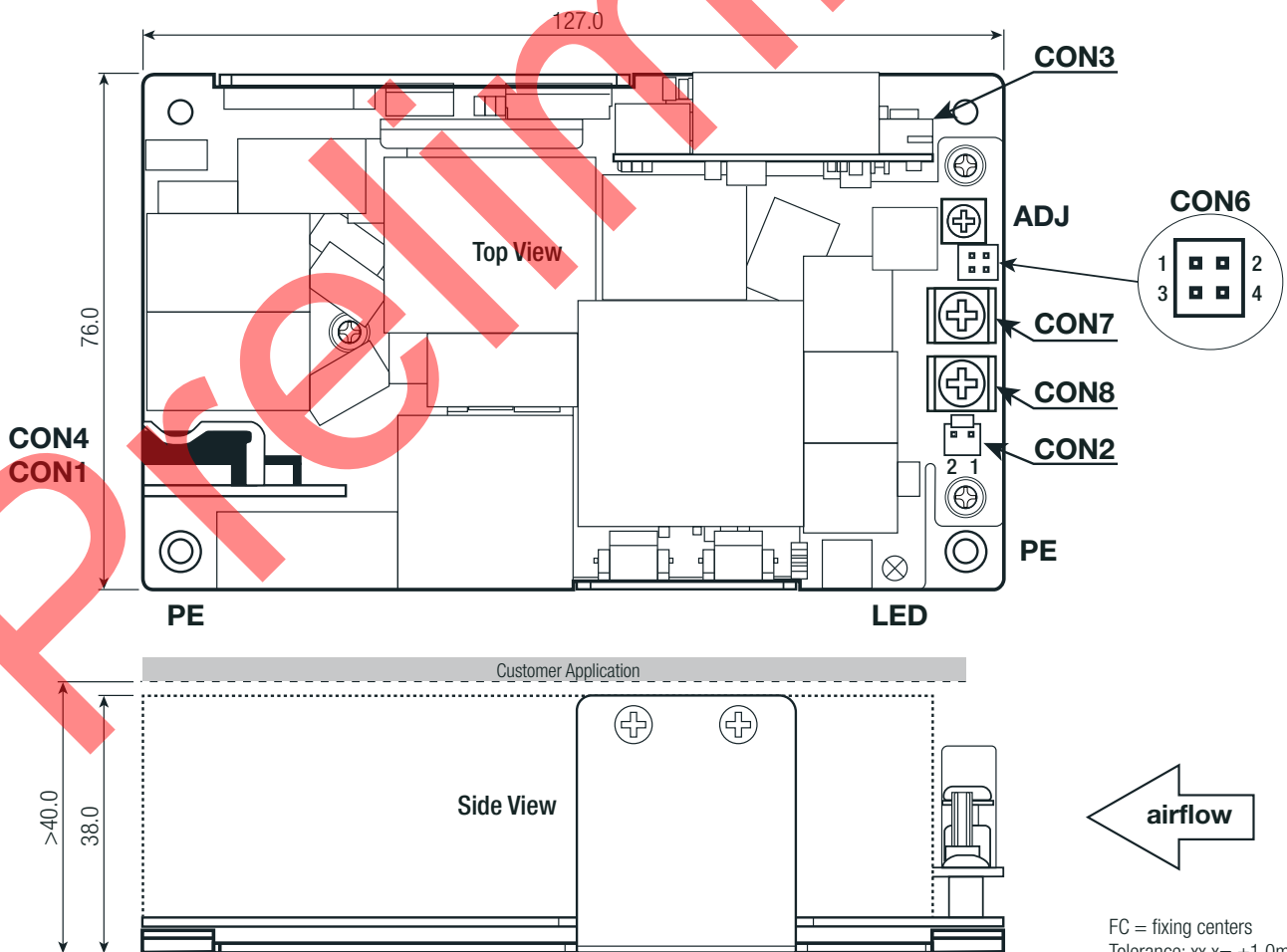
Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	without external filter	EN55032, Class B
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic Discharge Immunity Test		IEC/EN61000-4-2
Radiated, Radio-Frequency, Electromagnetic Field Immunity Test		IEC/EN61000-4-3
Fast Transient and Burst Immunity		IEC/EN61000-4-4
Surge Immunity		IEC/EN61000-4-5
Immunity to Conducted Disturbances, Induced by Radio-Frequency Fields		IEC/EN61000-4-6
Power Magnetic Field Immunity		IEC/EN61000-4-8
Voltage Dips and Interruptions		IEC/EN61000-4-11

DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	PCB baseplate	FR4, (UL94 V-0) aluminium
Dimension (LxWxH)		127.0 x 76.0 x 38.0mm
Weight		500g typ.

Dimension Drawing (mm)

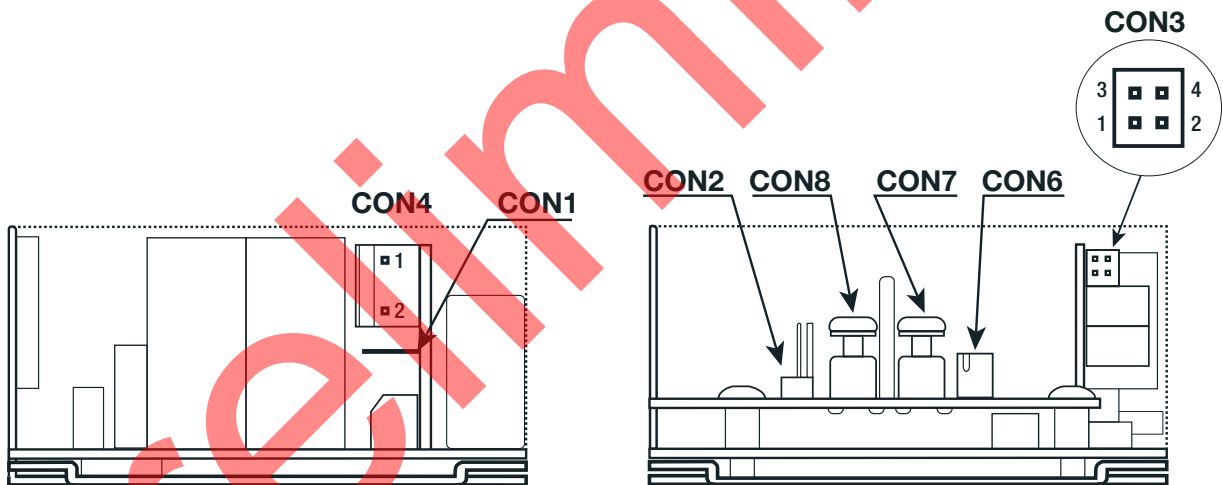
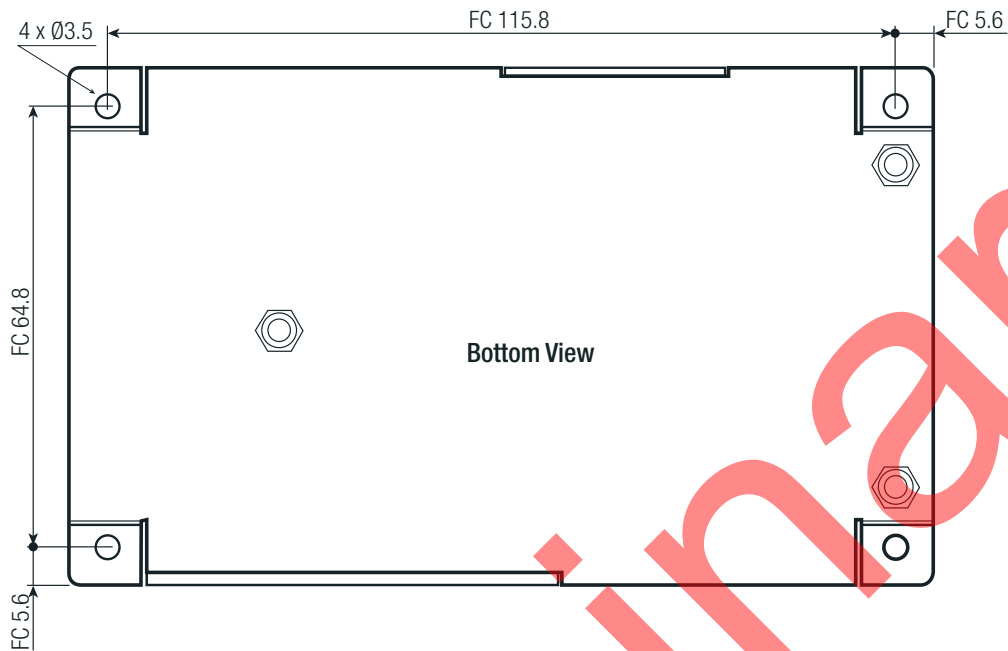


FC = fixing centers
Tolerance: xx.x= ±1.0mm
xx.xx= ±0.5mm

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Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

Dimension Drawing (mm)



Compatible Connector

PE (CON1)			AC INPUT (CON4)			FAN (CON2)			VSB & CTRL (CON3)				Sense (CON6)		
#	Function	Connector	#	Function	Connector	#	Function	Connector	#	Function	Connector	#	Function	Connector	
1	PE	TE Connectivity PIDG series with positive lock .250EX	1	AC/N	Molex 09-50-1031 or similar	1	-FAN	Molex 22-01-1022 or similar	1	+5VSB	Molex51110-0450 or similar	1	-Sense	Molex 51110-0450 or similar	
			3	AC/L		2	+FAN		2	GND		2	NC		
									3	PS ON		3	+Sense		
									4	GND		4	NC		

MAIN INPUT Screw Terminal (CON7/8)

#	Function	AWG
CON7	-Vout	14-26
CON8	+Vout	14-26

wire stripping length: 5.0mm
recommended tightening torque: 0.8Nm

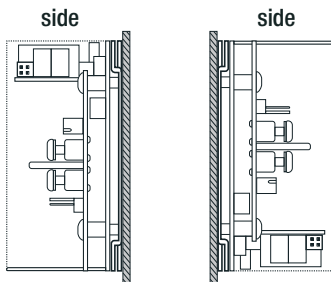
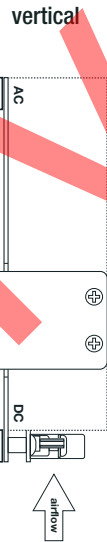
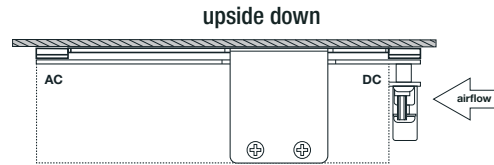
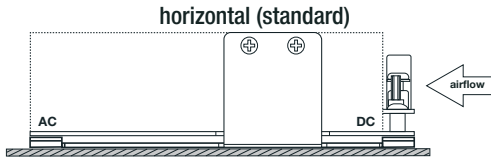
NC= No connection
FC= fixing centers
Tolerance: xx.x= ±1.0mm
xx.xx= ±0.5mm

Specifications (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

INSTALLATION AND APPLICATION

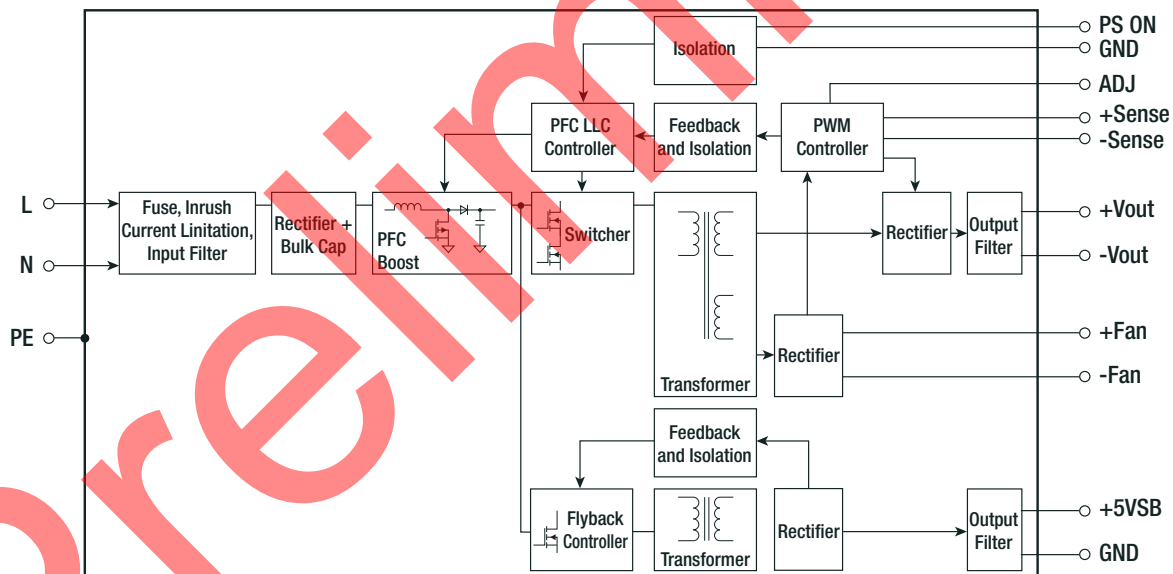
Mounting

Forced air conditions as specified are valid for indicated airflow direction only!



If module is horizontal or side mounted no derating is required.
 If module is mounted vertically or upside down with natural convection cooling, the power must be derated at least 10%.
 With forced air cooling, mounting orientation has no impact on output power.
 Device should be fan cooled from DC side.

Block Diagramm



PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	134.0 x 86.0 x 45.0mm
Packaging Quantity		1pc
Storage Temperature Range		-55°C to +85°C
Storage Humidity	non-condensing	95% RH max.

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