

# Features

- 300W baseplate-cooled, fan-less operation
- 550W peak power or forced air rating
- Industrial, household and medical 2MOPP ready
- Standby power consumption <0.5W
- Operating temperature -40°C to +70°C
- Signals: remote sensing and ON/OFF control

# Regulated Converter



## RACM550-G

550 Watt



5" x 3"

Open Frame or Enclosed Single Output



UL62368-1 (TÜV NRTL) certified  
 CAN/CAS C22.2 No. 62368-1 certified  
 IEC/EN62368-1 certified  
 ANSI/AAMI ES60601-1 certified  
 CSA/CAN 22.2 60950-1-14 certified  
 IEC/EN60335-1 certified  
 IEC/EN60601-1 (pending)  
 IEC/EN60950-1 (pending)  
 IEC/EN61558-1 (pending)  
 IEC/EN61558-2-16 (pending)  
 EN55032 compliant  
 EN55024 compliant  
 CB Report

### Description

The RACM550 Series is designed to support up to 300 Watt continuous output power without fan cooling. The compact 5" x 3" 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 suitable for BF-rated applied parts, household and industrial ITE applications.

### Selection Guide

Part Number	Input Voltage Range [VAC]	Nom. Output Voltage [VDC]	Max. Output Current <sup>(1)</sup> [A]	Efficiency typ. <sup>(2)</sup> [%]
RACM550-24SG <sup>(3)</sup>	80-264	24	22.92	93
RACM550-36SG <sup>(3)</sup>	80-264	36	15.28	93
RACM550-48SG <sup>(3)</sup>	80-264	48	11.46	93
RACM550-56SG <sup>(3)</sup>	80-264	56	9.82	94

**Notes:**

Note1: With forced air cooling (2.5m/s) + conduction cooling + refer to "Line Derating"  
 Note2: Efficiency is tested at nominal input and full load at +25°C ambient

### Model Numbering



**Notes:**

Note3: add suffix "/OF" for open frame version  
 add suffix "/ENC" for enclosed version (MOQ 1000pcs)

**Ordering Examples:**

RACM550-24SG/OF	24Vout	Single	open frame
RACM550-36SG/ENC	24Vout	Single	enclosed

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

**BASIC CHARACTERISTICS**

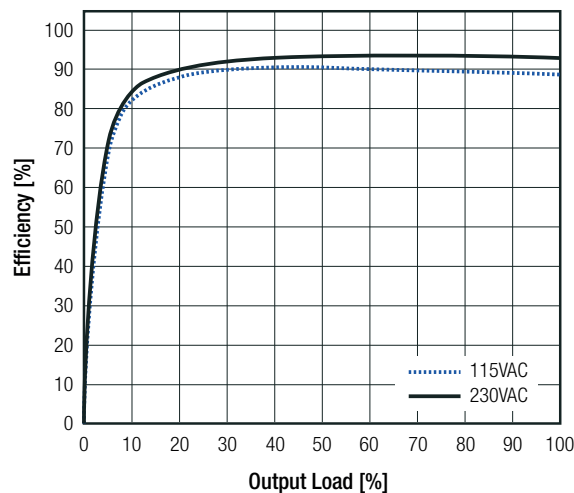
Parameter	Condition		Min.	Typ.	Max.
Nom. Input Voltage			100VAC		240VAC
Input Voltage Range <sup>(4)</sup>			80VAC 120VDC		264VAC 370VDC
Input Current	115VAC	230VAC			6.5A 3.0A
Inrush Current	115VAC	230VAC			40A 60A
No load Power Consumption					2W
Standby Power	main output OFF, VSB Output unloaded				0.5W
Input Frequency Range	AC input		47Hz		63Hz
ErP Lot 6 Standby Mode Conformity (VSB Output Load Capability)	Input Power= 1W (main output= standby mode)				450mW
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 <sup>(5)</sup>	20MHz BW @ 25°C	main output	1% of Vout nom. max.		
		VSB Output	120mVp-p		

**Notes:**

Note4: The products were submitted for safety files at AC-input operation. For DC-input make sure that sufficient fuses are used

Note5: Measurements are made with a 12" twisted pair-wire terminated with a 0.1µF and 10µF parallel capacitor

**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 <sup>(6)</sup>	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

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

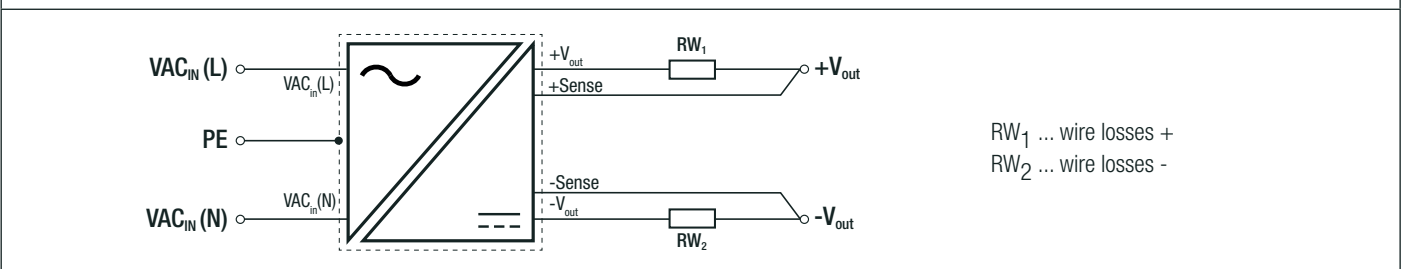
**ADDITIONAL FEATURES**

Parameter	Condition		Min.	Typ.	Max.
VSB Output Power	CTRL ON	115VAC/230VAC			5W
	CTRL OFF	230VAC 115VAC			5W 1W
Output Voltage Adjustability <sup>(7)</sup>	on-board potentiometer				±2VDC
ON/OFF CTRL	CON3, Pin3 (refer to <b>"VSB &amp; CTRL (CON3)"</b> )	main and FAN output ON main and 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 <sup>(8)</sup>					2VDC
Power OK LED	LED = green LED = red		working failure		

**Notes:**

- Note7: By trimming up, decrease output current to avoid exceeding rated output power. By trimming down, do not exceed maximum continuous output current  
 Note8: The output voltage can be adjusted by both ADJ (potentiometer) and Sense. The maximum combined adjustment range is ±2VDC

**REMOTE SENSE**



**PROTECTIONS (Fan output not protected)**

Parameter	Type		Value
Input Fuse <sup>(9)</sup>	internal		2x T6.3A, slow blow type
Over Voltage Category (OVC)			OVCII
Class of Equipment			Class I
Isolation Voltage (safety certified) <sup>(10)</sup>	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

**PROTECTIONS MAIN OUTPUT**

Short Circuit Protection (SCP)	below 100mΩ	P <sub>in</sub> =10W max.	hiccup mode, auto recovery
Over Voltage Protection (OVP)			110% - 120%, hiccup mode
Over Current Protection (OCP)			105% - 135%, hiccup mode
Over Temperature Protection (OTP)			auto recovery, internal temperature sensors

**PROTECTIONS AUX (VSB)**

Short Circuit Protection (SCP)	below 100mΩ		hiccup mode, auto recovery
Over Voltage Protection (OVP)			8-9VDC, hiccup mode
Over Current Protection (OCP)			2.5-3.5A, hiccup mode

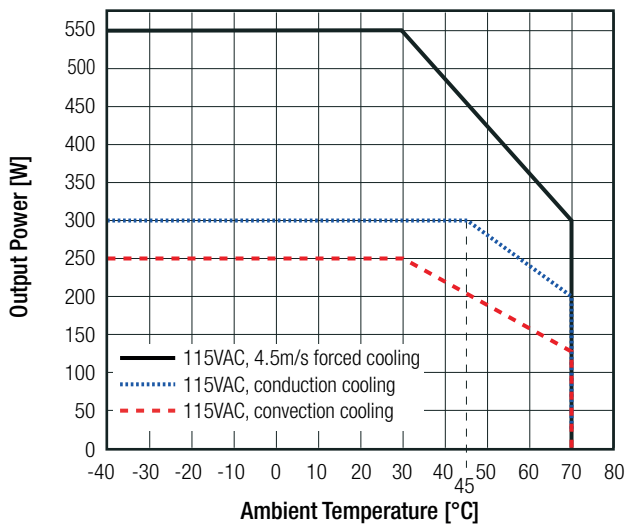
**Specifications** (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	refer to derating graphs (valid for /OF and /ENC)	-40°C to +70°C
Temperature Coefficient		±0.02%/K
Operating Altitude <sup>(11)</sup>		5000m
Operating Humidity	non-condensing	20% - 90% RH max.
Pollution Degree		PD2
Shock		250m/s <sup>2</sup> , 6ms; 3 times, each along x, y, z axes
Vibration		90-200Hz, 10m/s <sup>2</sup> ; 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) 200 x 10 <sup>3</sup> hours +45°C (forced air cooling) 50 x 10 <sup>3</sup> hours

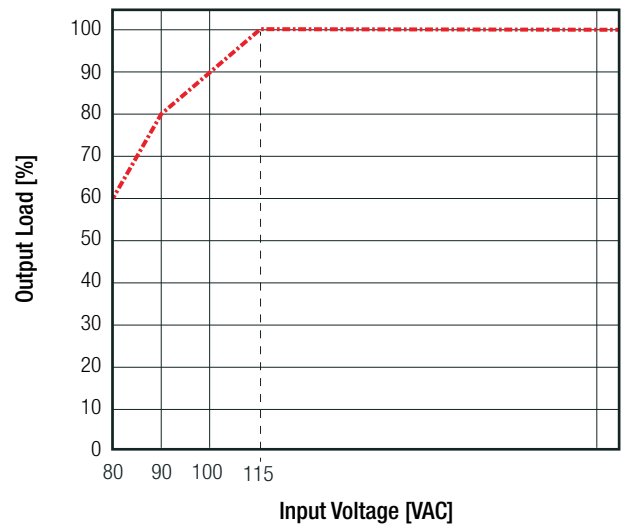
**Notes:**

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.

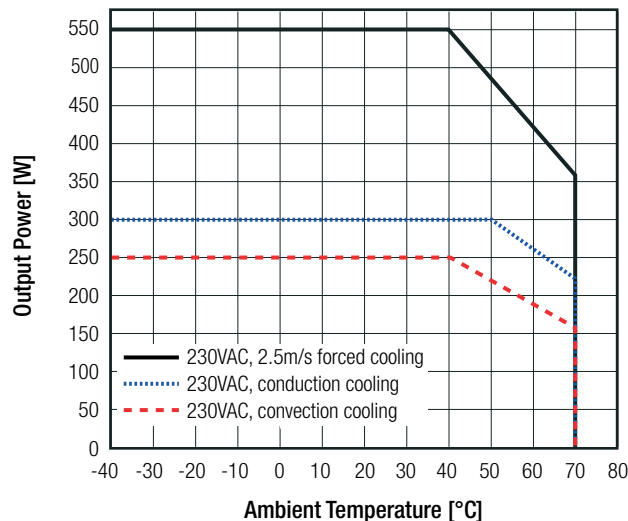
**Thermal Derating 115VAC**



**Line Derating (<115VAC)**



**Thermal Derating 230VAC**



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

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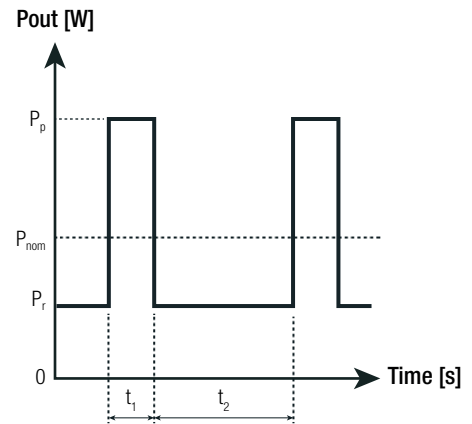
**Specifications** (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

**Peak Load Capability**

**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.  $4 \times t_1$ ) [s]
- $k$  = safety factor 1.7 [ ]

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



**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
- $P_p = 550W$
- $t_1 = 10s$
- $t_2 = 40s$
- $k = 1.7$

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

**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report / File Number	Standard
Audio/video, information and communication technology equipment - Safety requirements (CB)	211-700545-000	IEC62368-1:2014 2nd Edition
Audio/video, information and communication technology equipment - Safety requirements		EN62368-1:2014 + A11:2017
Audio/video, information and communication technology equipment - Safety requirements (TÜV NRTL)	65.250.19.032.02	UL62368-1:2014
		CAN/CSA C22.2 No.62368-1:2014
Information Technology Equipment, General Requirements for Safety	pending	IEC60950-1:2005, 2nd Edition + A2:2013 EN60950-1:2006 + A2:2013
Household and similar electrical appliances - Safety - Part 1: General requirements	SA1904214L 02001	EN60335-1:2012 + A11:2014
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure		EN62233:2008
Medical Electric Equipment, General Requirements for Safety and Essential Performance	E314885-D1001-1-A0-C0-UL	ANSI/AAMI ES60601-1:2005 CAN/CSA-C22.2 No. 6060-1:14
Medical Electric Equipment, General Requirements for Safety and Essential Performance (CB)	pending	IEC60601-1:2005, 3rd Edition + AM1:2012
Medical Electric Equipment, General Requirements for Safety and Essential Performance		EN60601-1:2006 + A12:2014
Safety of power transformers, power supplies, reactors and similar products - 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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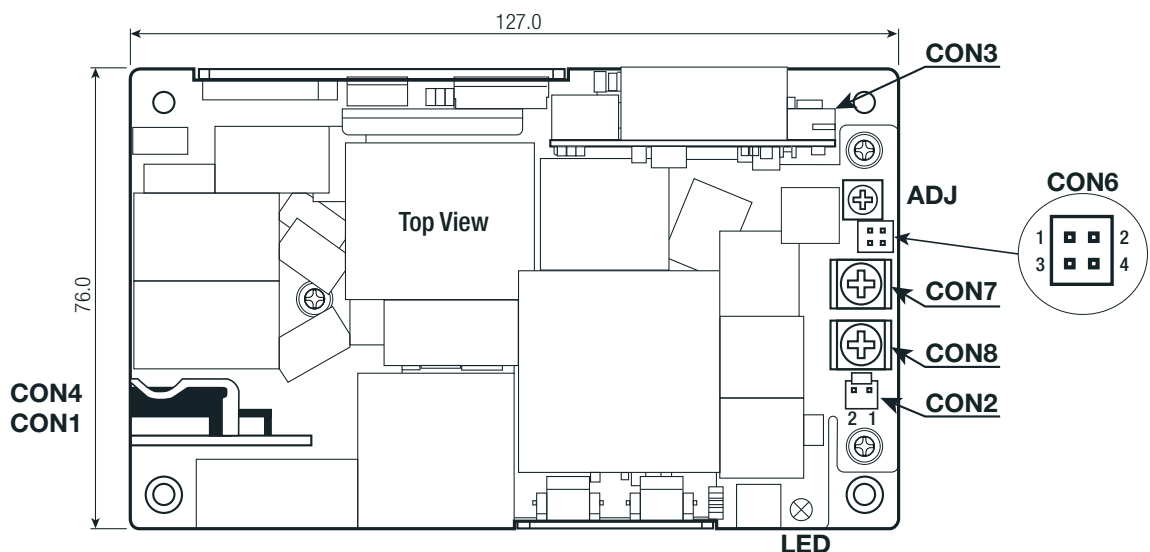
**Specifications** (measured @ Ta= 25°C, rated input, rated load unless otherwise stated)

EMC Compliance	Condition	Standard / Criterion
Electromagnetic compatibility of multimedia equipment - Emission requirements	without external filter	EN55032:2015, Class B
Electromagnetic compatibility of multimedia equipment - Immunity requirements		EN55035:2017
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
ESD Electrostatic discharge immunity test	Air ±8kV, Contact ±4kV	EN61000-4-2:2009, Criteria A
Radiated, radio-frequency, electromagnetic field immunity test	3V/m (80-5000MHz)	EN61000-4-3:2006+A2:2010, Criteria A
Fast Transient and Burst Immunity	AC Power Port: ±1kV	EN61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N ±1kV	EN61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V (0.15-10MHz) 3V to 1V (10-30MHz) 1V (30-80MHz)	EN61000-4-6:2014, Criteria A
Power Magnetic Field Immunity	50Hz/60Hz, 1A/m	EN61000-4-8:2010, Criteria A
Voltage Dips and Interruptions	Voltage Dips 100% at 50/60Hz	EN61000-4-11:2004, Criteria A
Voltage Dips and Interruptions	Voltage Dips 30% at 50Hz	EN61000-4-11:2004, Criteria A
Voltage Dips and Interruptions	Voltage Dips 30% at 60Hz	EN61000-4-11:2004, Criteria B
Voltage Dips and Interruptions	Voltage Interruptions > 95% at 50Hz	EN61000-4-11:2004, Criteria C
Voltage Dips and Interruptions	Voltage Interruptions > 95% at 60Hz	EN61000-4-11:2004, Criteria B
Limits of Harmonic Current Emissions	Class A	EN61000-3-2:2014
Limits of Voltage Fluctuations & Flicker	Clause 5	EN61000-3-3:2013

**DIMENSION AND PHYSICAL CHARACTERISTICS**

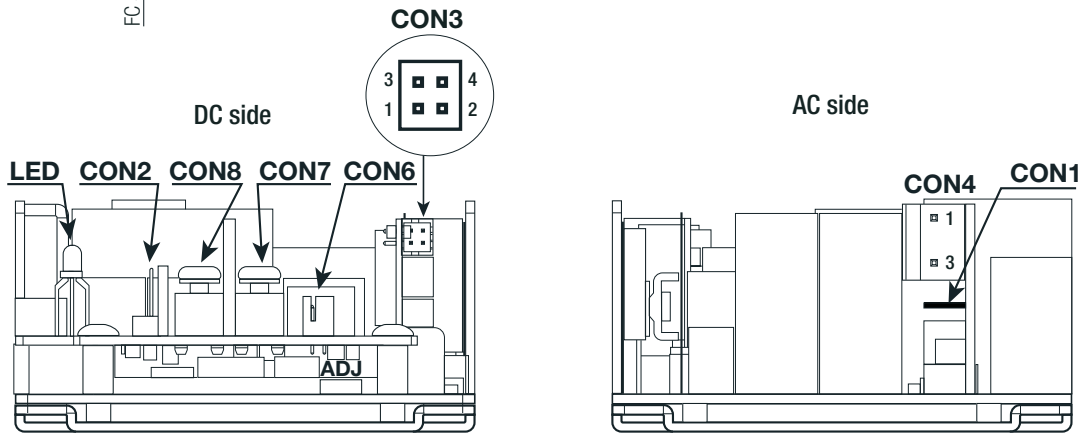
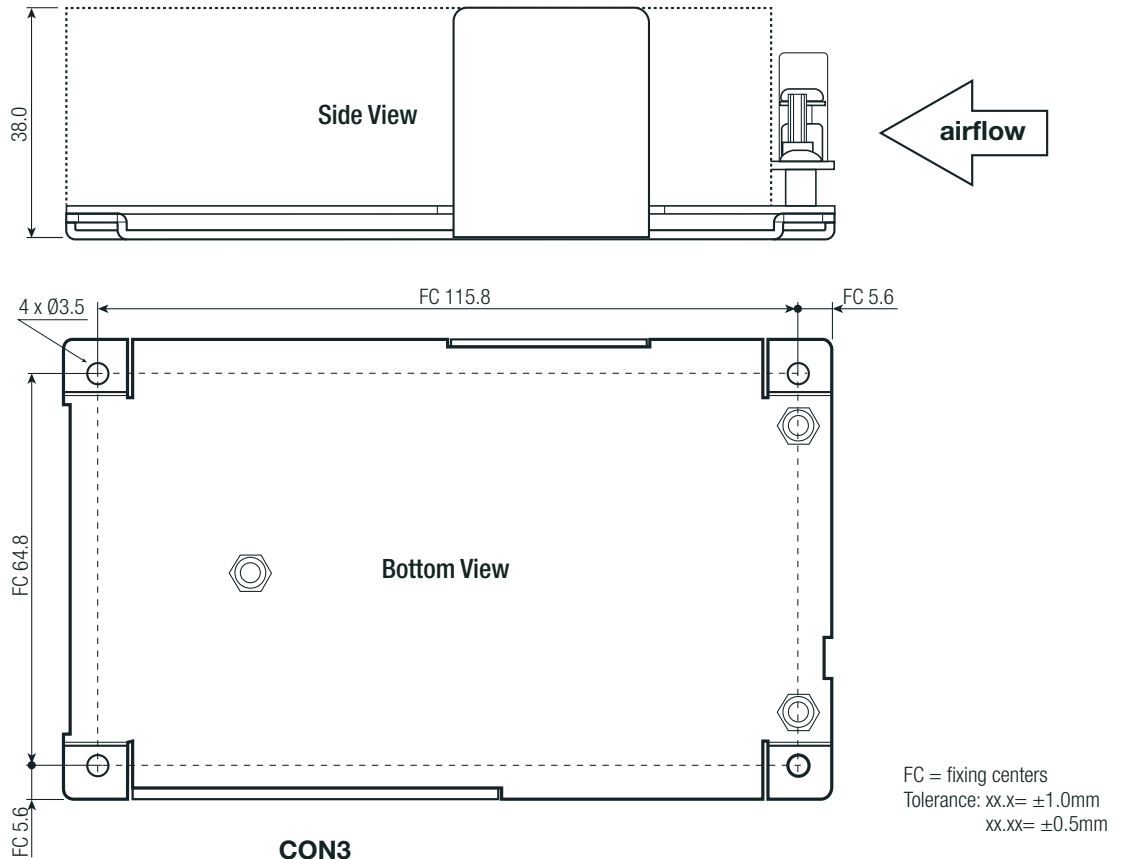
Parameter	Type	Value
Material	PCB baseplate / case ("ENC")	FR4, (UL94 V-0) aluminium
Dimension (LxWxH)	open frame version enclosed version	127.0 x 76.0 x 38.0mm 150.0 x 87.0 x 45.0mm
Weight	open frame version enclosed version	500g typ. 590g typ.

**Dimension Drawing Open Frame (mm)**



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



**Compatible Connector** (valid for open frame and enclosed version)

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	Molex 51110-0450 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	

NC= No connection

**MAIN Output Screw Terminal (CON7/8)**

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

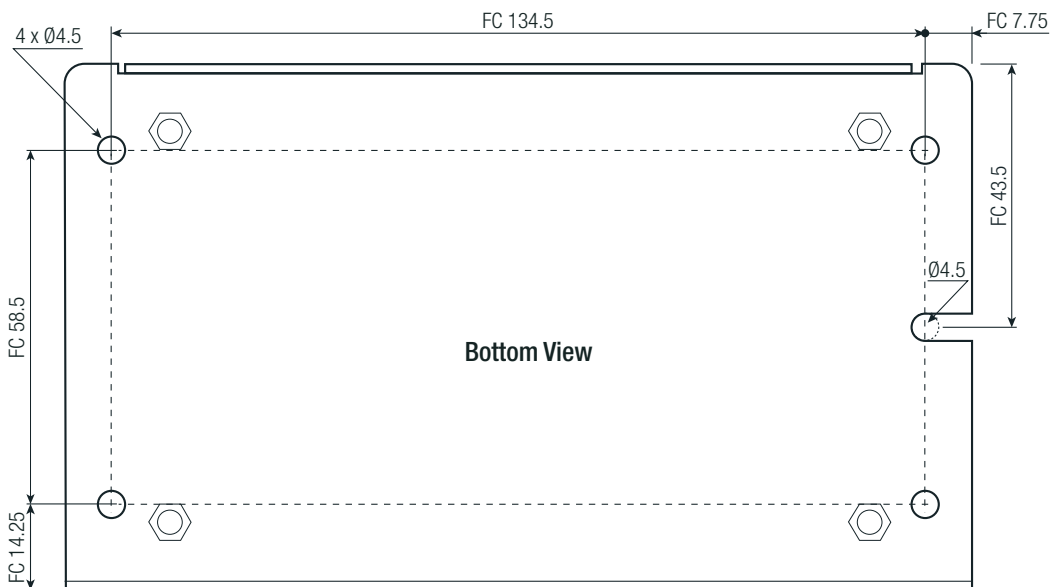
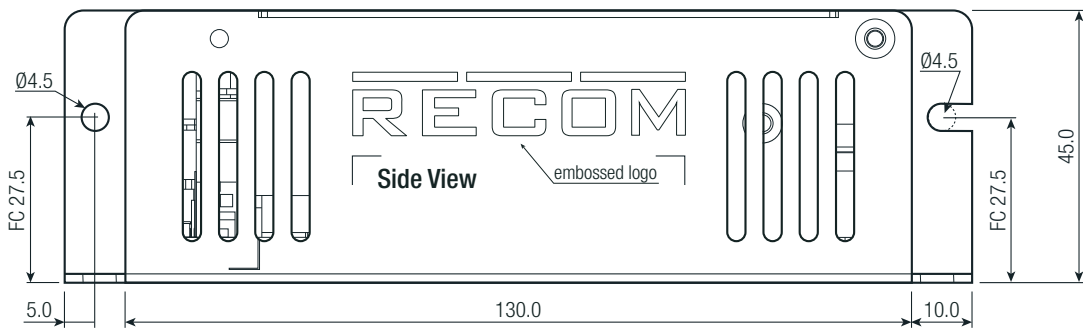
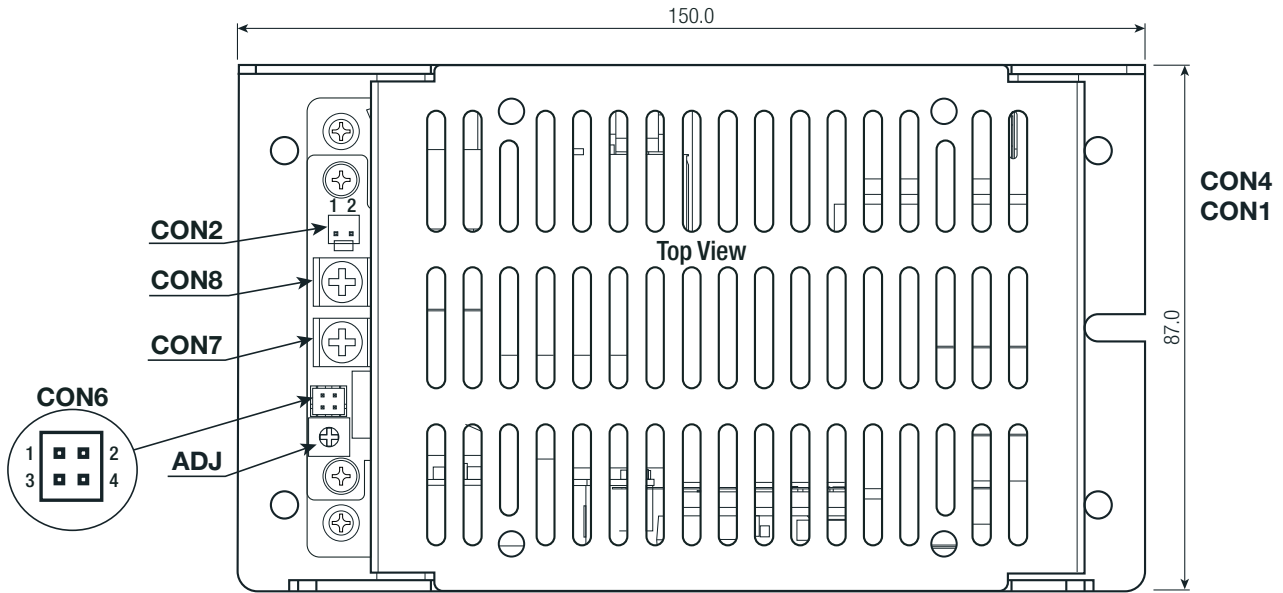
wire stripping length: 5.0mm  
recommended tightening torque: 0.8Nm

Maximum tightening torque for mounting: 0.3Nm  
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 Enclosed Version (mm)



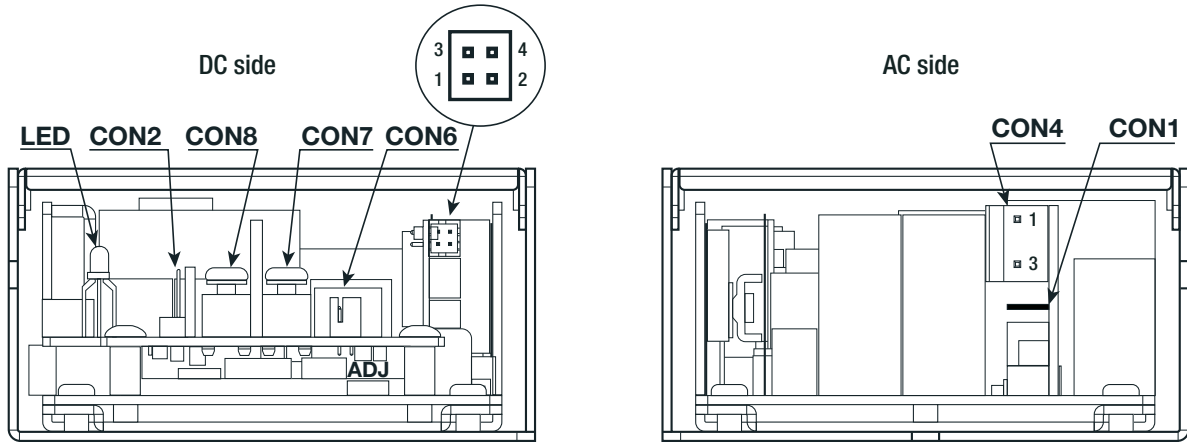
FC = fixing centers  
Tolerance: xx.x= ±1.0mm  
xx.xx= ±0.5mm

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

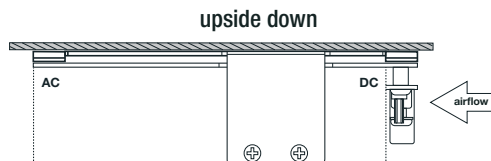
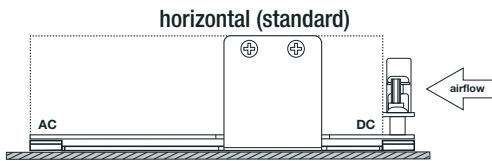
### Dimension Drawing Enclosed Version (mm)



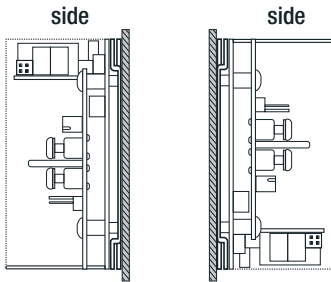
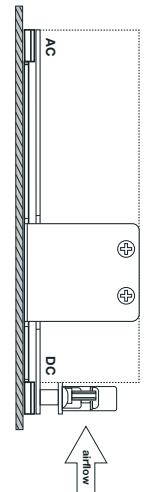
### INSTALLATION AND APPLICATION

#### Mounting

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



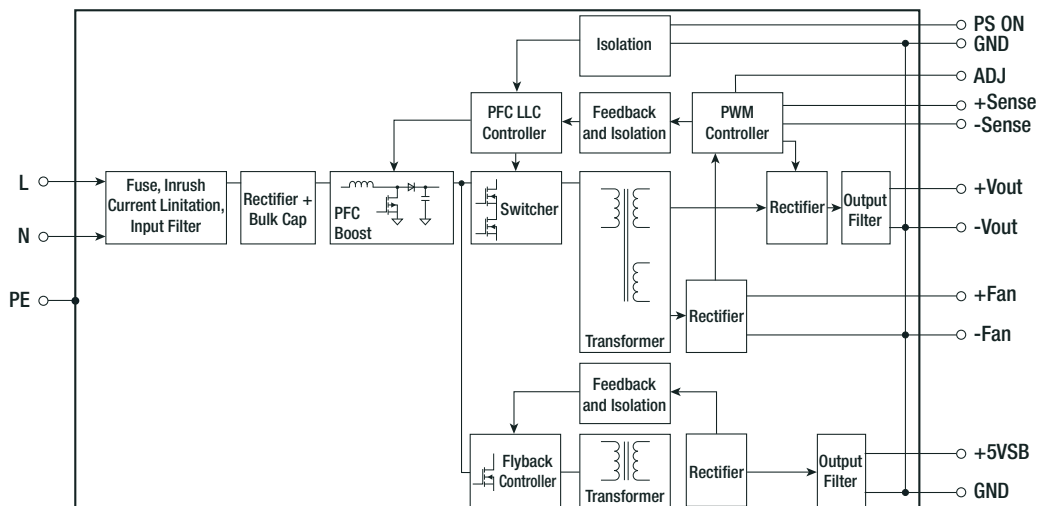
#### vertical



#### Notes:

Note12: 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%.  
 For convection cooling, ensure sufficient distance to adjacent components!  
 With forced air cooling, mounting orientation has no impact on output power.  
 Device should be fan cooled from DC side.  
 If thermal conduction cooling is suggested, use of heat sink compound is recommended for improved heat transfer via baseplate.

#### Block Diagram



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

PACKAGING INFORMATION			
Parameter	Type		Value
Packaging Dimension (LxWxH)	cardboard box	open frame version	134.0 x 86.0 x 45.0mm
		enclosed version	155.0 x 92.0 x 50.0mm
Packaging Quantity			1 pcs
Storage Temperature Range			-55°C to +85°C
Storage Humidity	non-condensing		95% RH max.

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