

# Features

## Regulated Converter

- 300W baseplate-cooled, fan-less operation
- 550W peak power or forced air rating
- Industrial, household and medical 2MOPP ready
- Standby power consumption <0.5W
- Aux Output: 5VSB / 1A
- Signals: remote sensing and ON/OFF control

**RECOM**  
AC/DC Converter

## RACM550-G

### 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 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.

**550 Watt**



**5" x 3"**

**Open Frame or  
Enclosed  
Single Output**



### 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

UL62368-1 (TÜV NRTL) certified  
CAN/CAS C22.2 No. 62368-1 certified  
IEC/EN62368-1 certified  
ANSI/AAMI ES60601-1 (ed 3.1) certified  
CAN/CSA-C22.2 No. 60601-1:14 certified  
IEC/EN60335-1 certified  
IEC/EN60950-1 certified  
IEC/EN60601-1 (ed. 3.1)  
EN60601-1-2 (ed. 4) (pending)  
IEC/EN61558-1 (pending)  
IEC/EN61558-2-16 (pending)  
EN55032 compliant  
EN55024 compliant  
CB Reports

## Specifications (measured @ $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

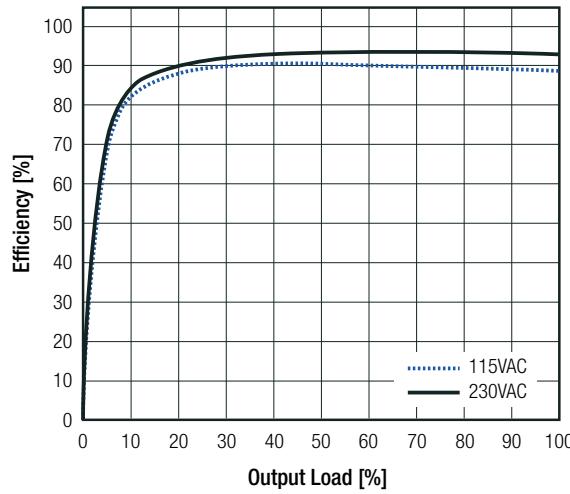
BASIC CHARACTERISTICS					
Parameter	Condition		Min.	Typ.	Max.
Nom. Input Voltage			100VAC		240VAC
Input Voltage Range <sup>(4)</sup>			80VAC 120VDC		264VAC 370VDC
Input Current	115VAC 230VAC				6.5A 3.0A
Inrush Current	115VAC 230VAC				40A 60A
No load Power Consumption					2W
Standby Power	main output 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 VSB Output	115VAC/230VAC 115VAC/230VAC		400ms 140ms	
Rise Time	main output VSB Output	115VAC/230VAC 115VAC/230VAC		15ms 5ms	
Hold-up Time	main output VSB Output	115VAC/230VAC, 550W 115VAC/230VAC		15ms 130ms	
Output Ripple and Noise <sup>(5)</sup>	20MHz BW @ $25^\circ\text{C}$	main output VSB Output			1% of $V_{\text{out nom. max.}}$ 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  $0.1\mu\text{F}$  and  $10\mu\text{F}$  parallel capacitor

### Efficiency vs. Load



### REGULATIONS

Parameter	Condition		Value
Output Accuracy	main output VSB output		$\pm 3.0\%$ max. $\pm 4.0\%$ max.
Line Regulation	low line to high line, full load	main output / VSB output	$\pm 1.0\%$ 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 @  $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

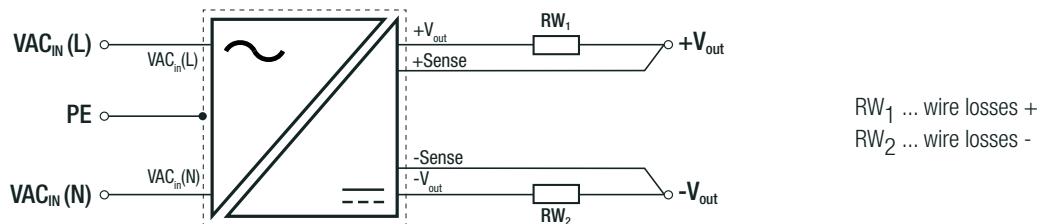
**ADDITIONAL FEATURES**

Parameter	Condition		Min.	Typ.	Max.
VSB Output Voltage	CTRL ON	115VAC/230VAC			5VDC
VSB Output Power		230VAC 115VAC			5W 1W
Output Voltage Adjustability <sup>(7)</sup>	on-board potentiometer				$\pm 2\text{VDC}$
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 OVDC - 0.8VDC or shorted to GND		
Fan Output Voltage					12VDC
Fan Output Current	@ $+50^\circ\text{C}$ (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  $\pm 2\text{VDC}$

**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	$P_{in} = 10\text{W}$ 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

**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

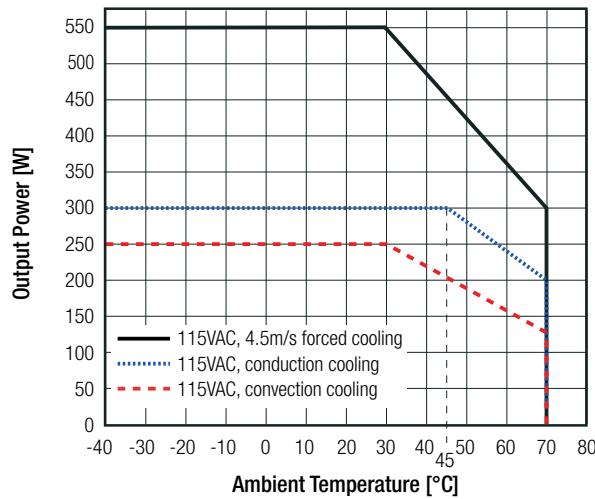
PROTECTIONS AUX (VSB)		
Short Circuit Protection (SCP)	below 100mΩ	hiccup mode, auto recovery
Over Voltage Protection (OVP)		8-9VDC, hiccup mode
Over Current Protection (OCP)		2.5-3.5A, hiccup mode

ENVIRONMENTAL		
Parameter	Condition	Value
Operating Temperature Range	refer to below graphs (valid for /OF and /ENC)	-40°C to +70°C
Temperature Coefficient		±0.02%/K
Operating Altitude <sup>(1)</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	200 x 10 <sup>3</sup> hours 50 x 10 <sup>3</sup> hours

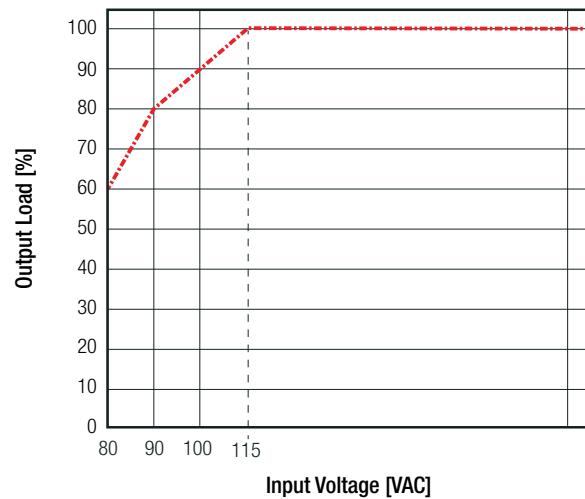
**Notes:**

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.

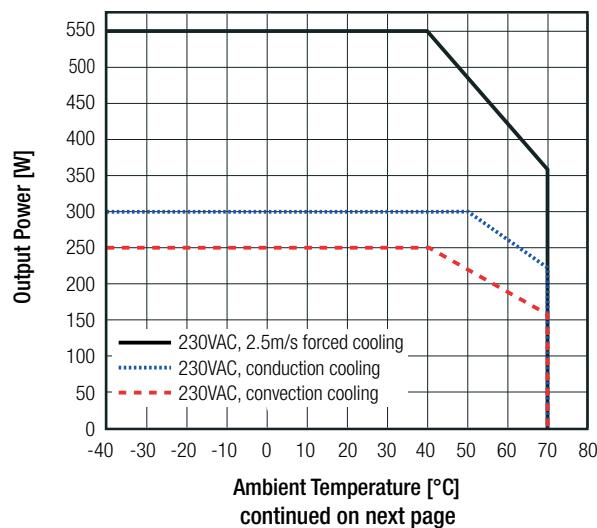
Thermal Derating 115VAC



Line Derating (<115VAC)



Thermal Derating 230VAC



**Conduction Cooling:**  
ground plane ref.: 2mm alloy; size A4

**Convection Cooling:**  
<0.1m/s = still air  
0.1 - 0.2m/s = natural convection

**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

**Peak Load Capability**

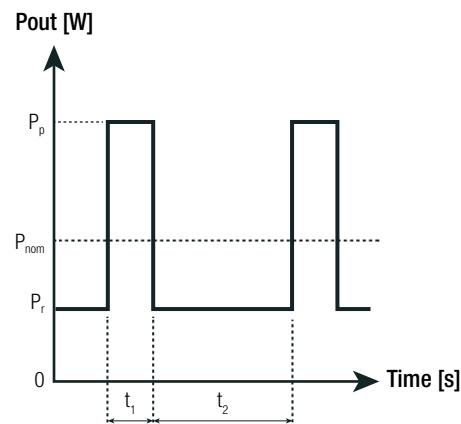
**Calculation**

$P_{\text{nom}}$  = nom. output power [W]  
 $P_p$  = peak output power ( $\leq 550\text{W}$ ) [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 []

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

**Practical Example (RACM550-24SG/OF):**

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



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

$P_p = 550\text{W}$

$t_1 = 10\text{s}$

$t_2 = 40\text{s}$

$k = 1.7$

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

**SAFETY AND CERTIFICATIONS**

Certificate Type (Safety)	Report / File Number	Standard
Audio/video, information and communication technology equipment - Safety requirements (CB)	211-700554-000	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 (CB)	211-700555-000	IEC60950-1:2005, 2nd Edition + A2:2013
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
Household and similar electrical appliances - Safety - Part 1: General requirements		EN60335-1:2012 + A11:2014
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure	SA1904214L 02001	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. 60601-1:14
Medical Electric Equipment, General Requirements for Safety and Essential Performance (CB Class I)		IEC60601-1:2005, 3rd Edition + AM1:2012
Medical Electric Equipment, General Requirements for Safety and Essential Performance (CB Class II)	(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 (CB)		IEC61558-1:2005, 2nd Edition + 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)		IEC61558-2-16:2009, 1st Edition + A1:2013
Safety of power transformers, power supplies, reactors and similar products - Part 1: General requirements and tests (LVD)		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 (LVD)	(pending)	EN61558-2-16:2009 + A1:2013
RoHS2		RoHS 2011/65/EU + AM2015/863

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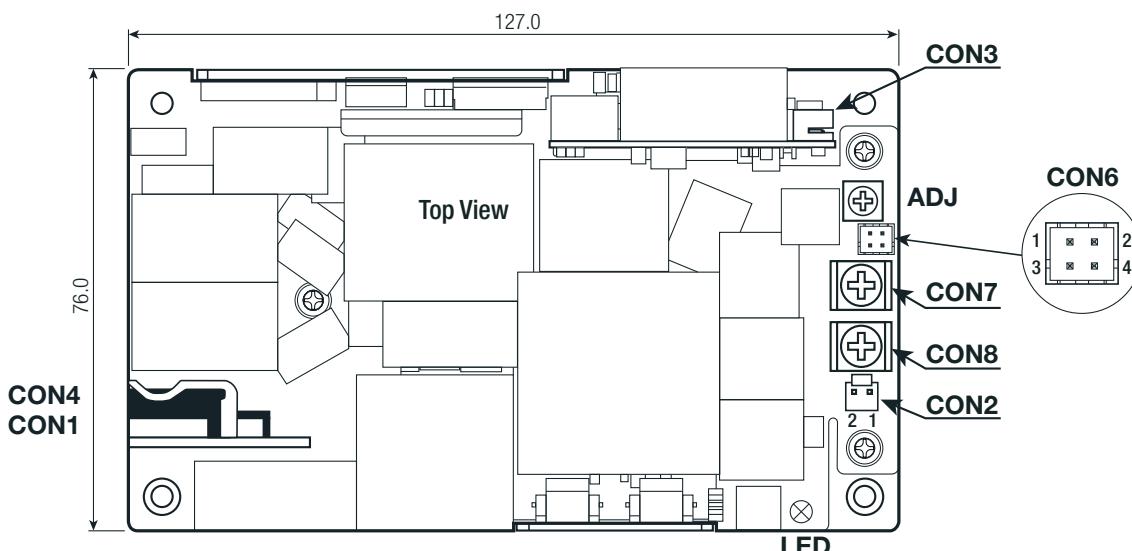
**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

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 $\pm 8\text{kV}$ , Contact $\pm 4\text{kV}$	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: $\pm 1\text{kV}$	EN61000-4-4:2012, Criteria A
Surge Immunity	AC Power Port: L-N $\pm 1\text{kV}$	EN61000-4-5:2014, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC Power Port: 3V (0.15-80MHz) 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**

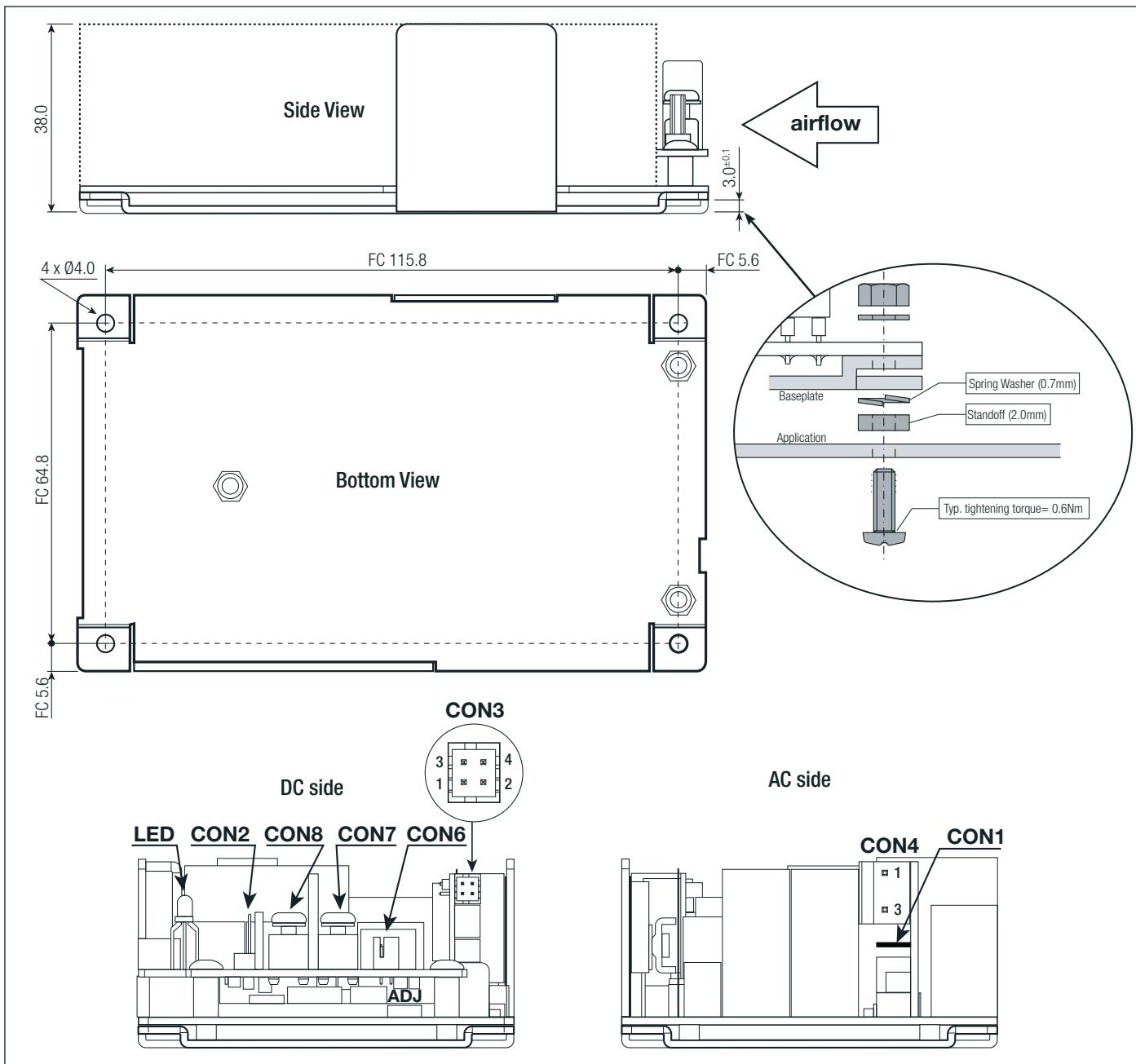
Parameter	Type	Value
Material	PCB baseplate / case ("/ENC")	FR4, (UL94 V-0) aluminum
Dimension (LxWxH)	open frame version enclosed version	127.0 x 76.0 x 38.0mm 150.0 x 87.0 x 45.0mm
Weight	open frame version enclosed version	500g typ. 590g typ.

**Dimension Drawing Open Frame (mm)**



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**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , 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			
1	PE	TE Connectivity PIDG series with positive lock .250EX	1 3	AC/N AC/L	Molex 09-50- 1031 or similar	1 2	-FAN +FAN	Molex 22-01- 1022 or similar	1 2 3 4	+5VSB GND PS ON GND	Molex 51110- 0450 or similar	1 2 3 4	-Sense NC +Sense NC	Molex 51110- 0450 or similar

NC= No connection

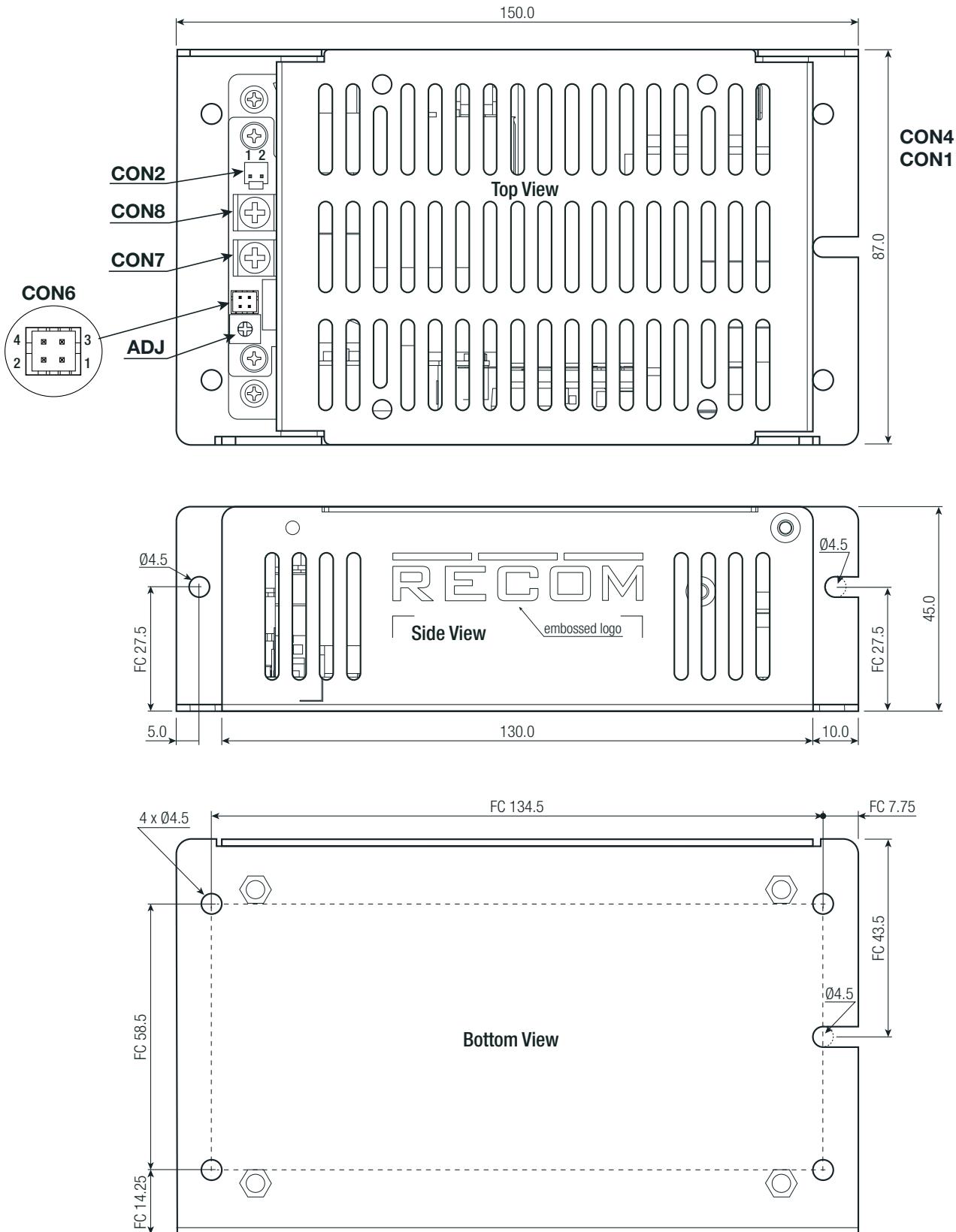
MAIN Output Screw Terminal (CON7/8)		
#	Function	AWG
CON7	-Vout	14-26
CON8	+Vout	14-26
wire stripping length: 5.0mm recommended tightening torque: 0.8Nm		

Maximum tightening torque for mounting without standoffs: 0.3Nm  
FC= fixing centers  
Tolerance: ISO-2768-M (unless otherwise stated)

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**Specifications** (measured @  $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

Dimension Drawing Enclosed Version (mm)

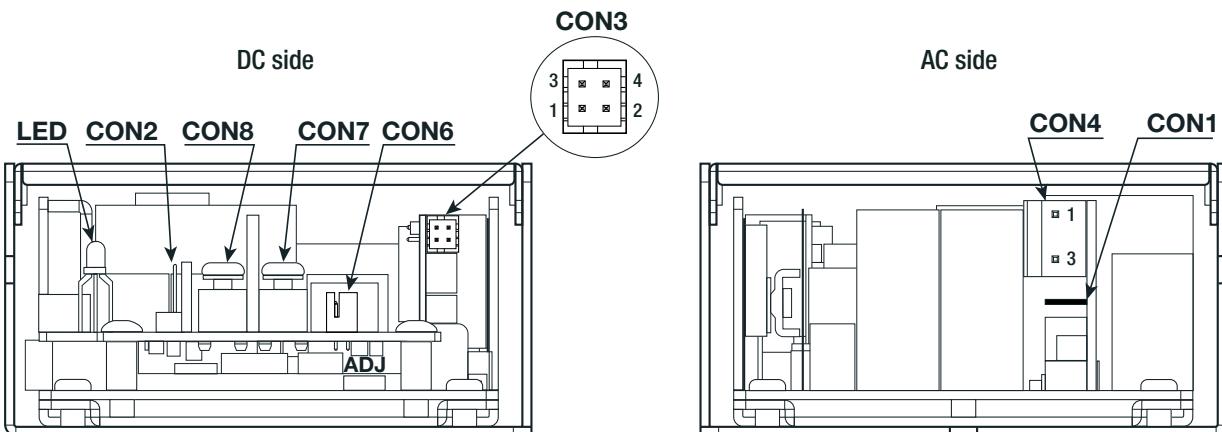


Maximum tightening torque for mounting: 0.6Nm  
FC = fixing centers  
Tolerance: ISO-2768-M (unless otherwise stated)

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## Specifications (measured @ $T_a = 25^\circ\text{C}$ , rated input, rated load unless otherwise stated)

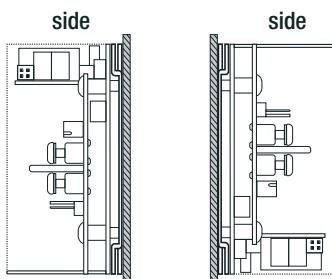
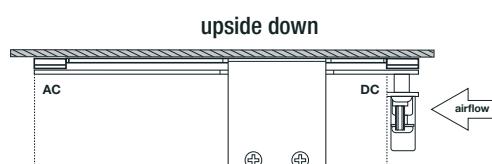
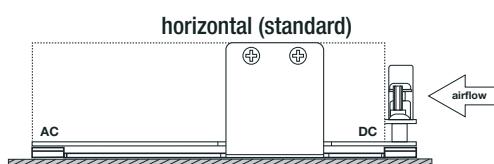
### Dimension Drawing Enclosed Version (mm)



## INSTALLATION AND APPLICATION

## Mounting Direction

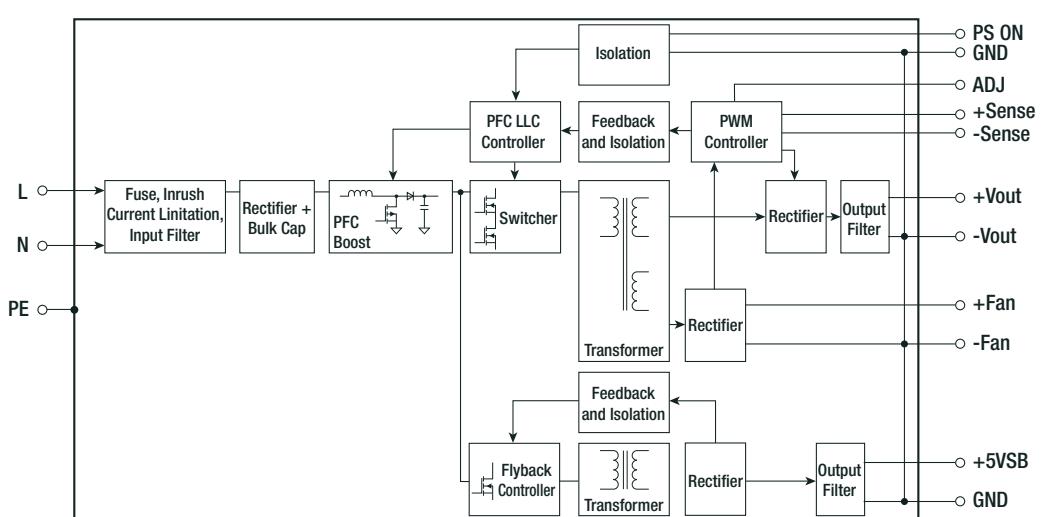
Forced air conditions as specified are valid for indicated airflow direction only!



## 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 enclosed version	134.0 x 86.0 x 45.0mm 155.0 x 92.0 x 50.0mm
Packaging Quantity			1pcs
Storage Temperature Range			-55°C to +85°C
Storage Humidity	non-condensing		95% RH max.

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