

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

BASIC CHARACTERISTICS

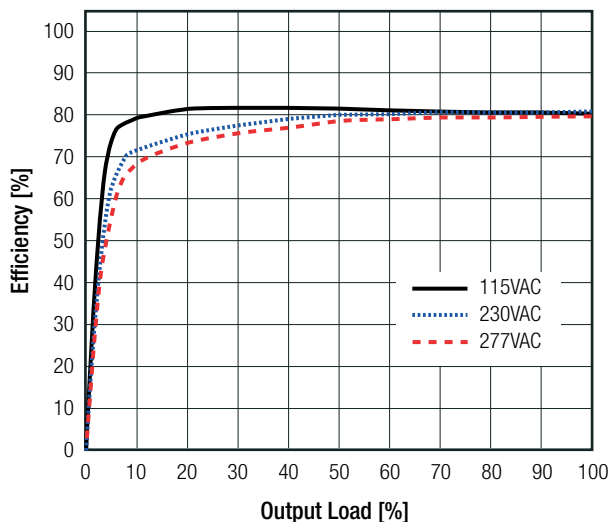
Parameter	Condition		Min.	Typ.	Max.
Internal Input Filter			Pi type		
Input Voltage Range ^(4,5)	nom. Vin = 277VAC		85VAC 120VDC	277VAC	305VAC 430VDC
Input Current	115VAC 230VAC 277VAC				150mA 100mA 75mA
Inrush Current	cold start at +25°C	115VAC 230VAC 277VAC			15A 30A 35A
No Load Power Consumption					100mW
Input Frequency Range			47Hz		63Hz
ErP Lot 6 Standby Mode Conformity (Output Load Capability)	Input Power= 0.5W 1.0W				0.34W 0.70W
Minimum Load			0%		
Power Factor	115VAC 230VAC 277VAC		0.60 0.45 0.40		
Start-up Time				20ms	
Rise Time				10ms	
Hold-up Time	115VAC 230VAC 277VAC			20ms 60ms 80ms	
Internal Operating Frequency	100% load at nominal Vin			130kHz	
Output Ripple and Noise ⁽⁶⁾	20MHz BW	3.3, 5Vout others		60mVp-p 1% of Vout	

Notes:

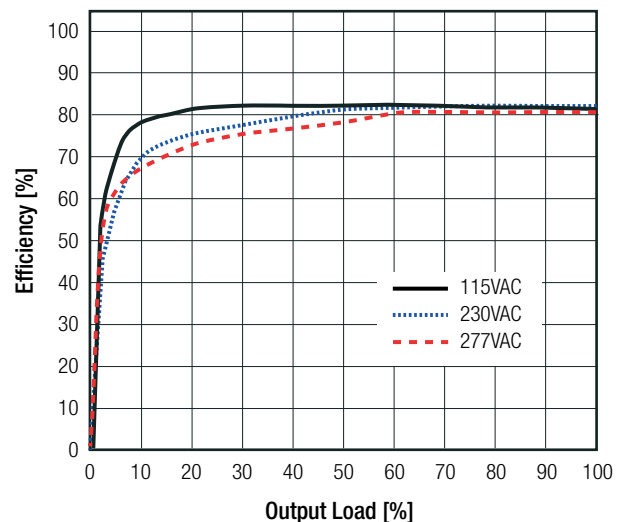
- Note4: The products were submitted for safety files at AC-Input operation
- Note5: Refer to „Line Derating“
- Note6: Measurements are made with a 0.1µF MLCC & 10µF E-cap in parallel across output. (low ESR)

Efficiency vs. Load

RAC05-05SK/277



RAC05-12SK/277



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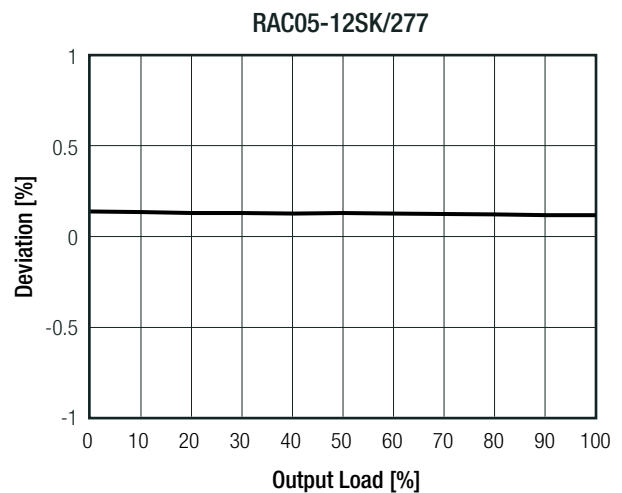
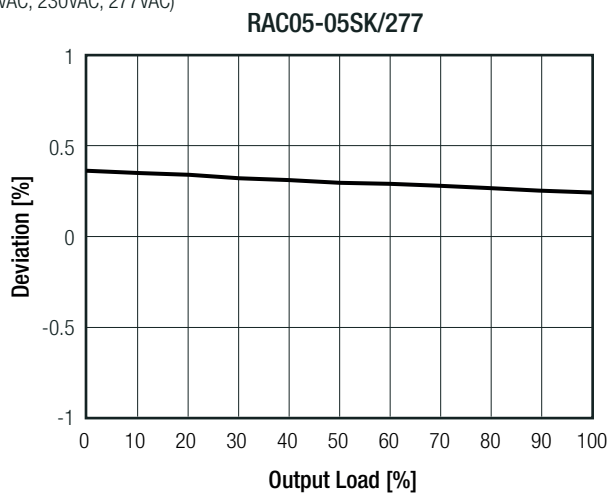
REGULATIONS		
Parameter	Condition	Value
Output Accuracy		±1.0% typ.
Line Regulation	low line to high line, full load	±0.5% typ.
Load Regulation ⁽⁷⁾	10% to 100% load	1.0% typ.
Transient Response	25% load step change	4.0% max.
	recovery time	500µs typ.

Notes:

Note7: Operation below 10% load will not harm the converter, but specifications may not be met

Deviation vs. Load

(at 115VAC, 230VAC, 277VAC)



PROTECTIONS		
Parameter	Type	Value
Input Fuse ⁽⁸⁾	internal	T1A, slow blow
Short Circuit Protection (SCP)	below 100mΩ	hiccup, automatic restart
Over Voltage Protection (OVP)		125% - 195%, latch of mode
Over Voltage Category		OVCII
Over Current Protection (OCP)		125% - 195%, hiccup mode
Class of Equipment		Class II
Isolation Voltage (safety certified) ⁽⁹⁾	I/P to O/P	1 minute
Isolation Resistance		Isolation Voltage 500VDC
Isolation Capacitance		100pF max.
Insulation Grade		reinforced
Leakage Current		0.25mA max.

Notes:

Note8: Refer to local safety regulations if input over-current protection is also required

Note9: For repeat Hi-Pot testing, reduce the time and/or the test voltage

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Peak Load Capability

Peak Load Calculation

P_{nom} = please refer to derating graph

$P_p = 1.2 \times P_{nom}$

$t_1 \leq 30s$

$t_2 \geq 2 \times t_1$

$$P_r = \frac{P_{nom} \times (t_1 + t_2) - P_p \times t_1}{t_2}$$

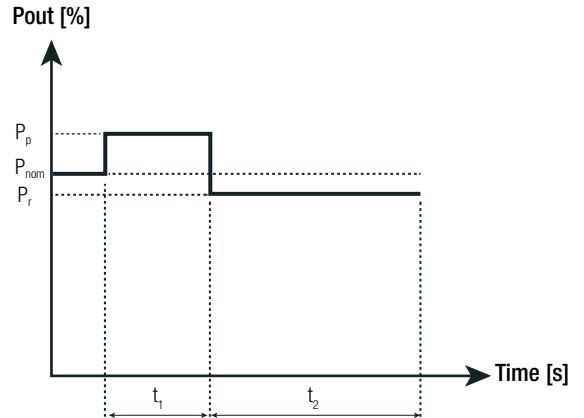
P_{nom} = nom. output power [W]

P_p = peak output power [W]

P_r = recovery power [W]

t_1 = peak time [s]

t_2 = recovery time [s]



Practical Example:

$$P_r = \frac{5W (30s + 60s) - (6W \times 30s)}{60s} = 4.5W$$

ENVIRONMENTAL

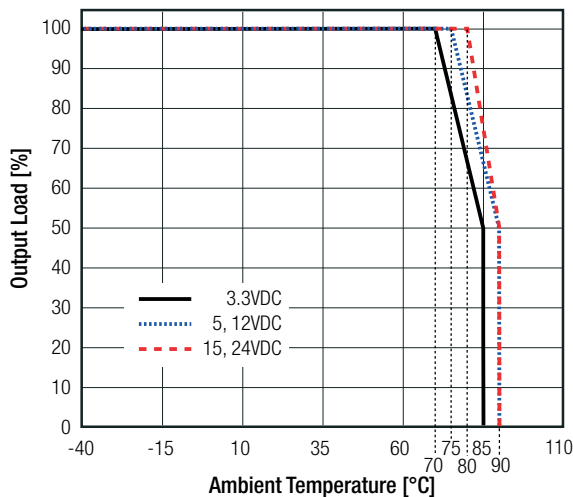
Parameter	Condition		Value	
Operating Temperature Range	@ natural convection 0.1m/s	full load	3.3Vout	-40°C to +70°C
			5, 12Vout	-40°C to +75°C
			15, 24Vout	-40°C to +80°C
	refer to „Derating Graph“	3.3Vout	-40°C to +85°C	
		all others	-40°C to +90°C	
Maximum Case Temperature			+95°C	
Temperature Coefficient			0.05%/K	
Operating Altitude ⁽¹⁰⁾			5000m	
Operating Humidity	non-condensing		5% - 95% RH max.	
Pollution Degree			PD2	
Vibration	according to MIL-STD-202G		10-500Hz, 2G 10min./1cycle, period 60min. each along x,y,z axis	
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	>450 x 10 ³ hours	
Design Lifetime	230VAC	+25°C	125 x 10 ³ hours	
		+70°C	23 x 10 ³ hours	
	277VAC	+25°C	105 x 10 ³ hours	
		+70°C	18 x 10 ³ hours	

Notes:

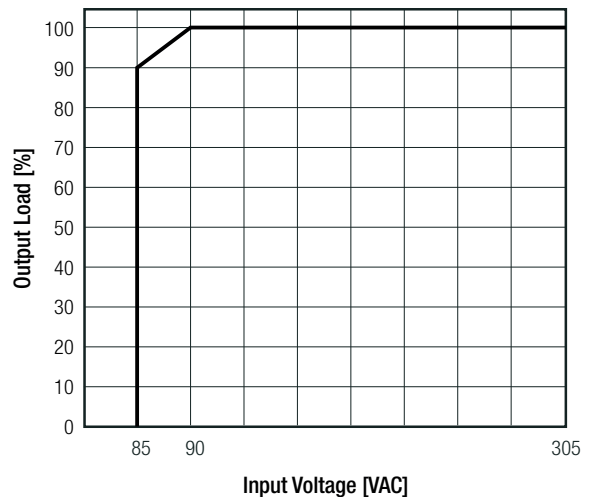
Note10: Recognized by UL for safe operation up to 5000m. High altitude operation may impact the performance and lifetime. Contact RECOM tech support for advice

Derating Graph

(@ Chamber and natural convection 0.1m/s)



Line Derating



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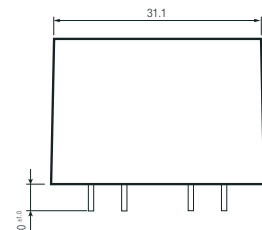
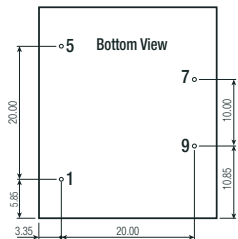
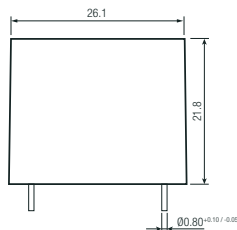
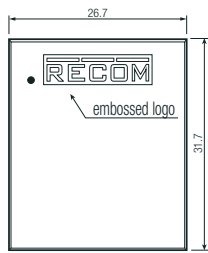
SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Audio/Video, information and communication technology equipment - Part 1: Safety requirements	E491408-A6004-UL	UL62368-1, 2nd Edition, 2014-12-01 CAN/CSA-C22.2 No. 62368-1-14, 2nd Edt., 2014-12
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (CB Scheme)	E491408-A6007-CB-1	IEC62368-1:2014 2nd Edition
Audio/Video, information and communication technology equipment - Part 1: Safety requirements (LVD)		EN62368-1:2014 + A11:2017
Household and similar electrical appliances - Safety - Part 1: General requirements	LCS190308001CS	IEC60335-1:2010 + A2:2016 + C1:2016, 5th Edt. EN60335-1:2012 + A13:2017
Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure		EN62233:2008
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V (CB Scheme)	50230493 001	IEC61558-1:2005 2nd Edition + A1:2009
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements (CB Scheme)		IEC61558-2-16:2009 1st Edition + A1:2013
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V		EN61558-1:2005 + A1:2009
Safety of power transformers, power supplies, reactors and similar products for supply voltages up to 1100 V Part 2: Particular requirements		EN61558-2-16:2009 + A1:2013
RoHS2		RoHS-2011/65/EU + AM-2015/863
EMC Compliance		
EMC Compliance	Conditions	Standard / Criterion
Low-voltage power supplies DC output - Part 3: Electromagnetic compatibility		EN61204-3: 2018, Class B
Electromagnetic compatibility of multimedia equipment - Emission requirements ⁽¹⁾		EN55032:2015, Class B
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 1: Emission		EN55014-1:2006 + A2:2011
Information technology equipment - Immunity characteristics - Limits and methods of measurement		EN55024:2010 + A1:2015
Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity		EN55014-2:2015
ESD Electrostatic discharge immunity test	Air: ±2, 4, 8kV Contact: ±2, 4kV	EN61000-4-2: 2009, Criteria B
Radiated, radio-frequency, electromagnetic field immunity test	10V/m, 80MHz-1GHz 3V/m, 1.4GHz-2GHz 1V/m, 2GHz-2.7GHz	EN61000-4-3: 2006 + A1, 2009, Criteria A
Fast Transient and Burst Immunity	AC and DC Port: ±2kV	EN61000-4-4: 2012, Criteria B
Surge Immunity	AC In Port (L-N): ±1kV DC Output Port: ±0.5kV	EN61000-4-5: 2014 + A1:2017, Criteria B
Immunity to conducted disturbances, induced by radio-frequency fields	AC and DC Port: 10V	EN61000-4-6: 2014, Criteria A
Power Magnetic Field Immunity	50Hz, 30A/m	EN61000-4-8: 2010, Criteria A
Voltage Dips and Interruptions	Voltage Dips: 30% Voltage Dips: 60% Voltage Dips: 100% Interruptions: >95%	EN61000-4-11:2004 + A1:2017, Criteria C EN61000-4-11:2004 + A1:2017, Criteria C EN61000-4-11:2014 + A1:2017, Criteria B EN61000-4-11: 2014 + A1:2017, Criteria C
Voltage Fluctuations and Flicker in Public Low-Voltage Systems ≤16A per phase		EN61000-3-3: 2013
Limitations on the amount of electromagnetic interference allowed from digital and electronic devices		FCC 47 CFR Part 15 Subpart B, Class B
Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		ANSI C63.4-2014, Class B
<p>Notes:</p> <p>Note11: If output is connected to GND, please contact RECOM tech support for advice</p>		

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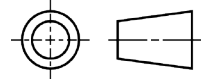
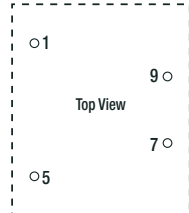
DIMENSION AND PHYSICAL CHARACTERISTICS

Parameter	Type	Value
Material	case, baseplate potting PCB	plastic, (UL94 V-0) silicone, (UL94 V-0) FR4, (UL94 V-0)
Dimension (LxWxH)	THT/wired	31.7 x 26.7 x 21.8mm
Weight	THT wired	31.5g typ. 37.0g typ.

Dimension Drawing THT (mm)



Recommended Footprint Details

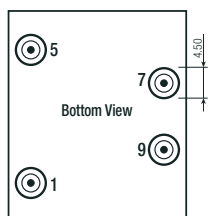
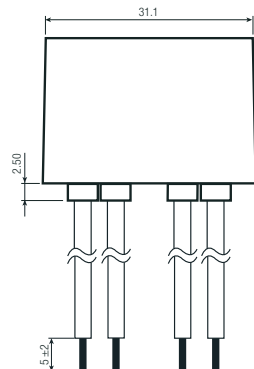
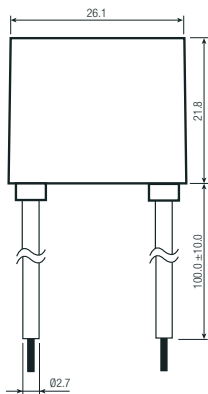


Pin Connections

Pin #	Single
1	VAC in (N)
5	VAC in (L)
7	+Vout
9	-Vout

Tolerance: xx.x= ±0.8mm
xx.xx= ±0.25mm

Dimension Drawing Wired (mm)



Wired information

#	Function	Wire color	Type	AWG
1	VAC in (N)	blue	UL-1015	18
5	VAC in (L)	brown	UL-1015	18
7	+Vout	red	UL-1015	18
9	-Vout	black	UL-1015	18

Tolerance: xx.x= ±0.8mm
xx.xx= ±0.25mm

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PACKAGING INFORMATION			
Parameter	Type		Value
Packaging Dimension (LxWxH)	THT	tube	466.0 x 30.4 x 29.3mm
	wired	tray	468.0 x 198.0 x 46.0mm
Packaging Quantity	THT		12pcs
	wired		24pcs
Storage Temperature Range			-40°C to +85°C
Storage Humidity	non-condensing		20% to 90% RH max.

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