



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

**BASIC CHARACTERISTICS**

Parameter	Condition	Min.	Typ.	Max.
Input Voltage Range <sup>(2)</sup>	nom. Vin = 230VAC	85VAC 100VDC	230VAC	265VAC 370VDC
Input Current	115VAC 230VAC			2A 1A
Inrush Current	2ms max., cold start	115VAC 230VAC		30A 50A
No load Power Consumption	115VAC/230VAC			520mW
Input Frequency Range	AC Input	47Hz		63Hz
Output Voltage Trimming	please refer to Trim table	-10%		+10%
Minimum Load		1%		
Hold-up Time	115VAC/230VAC	10ms		
Internal Operating Frequency			100kHz	
Output Ripple and Noise <sup>(3)</sup>	20MHz limited			<0.5% Vout + 50mVp-p <0.2% Vout + 40mVp-p

**Notes:**

Note2: The products were submitted for safety files at AC-Input operation

Note3: Measurements are made with a 0.1µF and 47µF MLCC in parallel across output (low ESR)

**Output Voltage Trimming**

It allows the user to increase or decrease the output voltage of the module. This is accomplished by connecting an external resistor between the Trim pin and either the +Vout or -Vout pins. With an external resistor between the Trim and -Vout pin, the output voltage increases. With an external resistor between the Trim and +Vout pin, the output voltage decreases. The values for trim resistors shown in trim tables below, the specified percentage may slightly vary.

	5Vout		9Vout		12Vout		15Vout		24Vout		48Vout		
Trim up	+10	100	+10	100	+10	100	+10	100	+10	100	+10	100	[%]
R <sub>up</sub> =	500	1M	6k	1M	4k	1M	5k	1M	12k	1M	12k	1M	[Ω]

	5Vout		9Vout		12Vout		15Vout		24Vout		48Vout		
Trim down	100	-10	100	-10	100	-10	100	-10	100	-10	100	-10	[%]
R <sub>down</sub> =	1M	500	1M	20k	1M	40k	1M	60k	1M	110k	10M	290k	[Ω]

**REGULATIONS**

Parameter	Condition	Value
Output Accuracy		±2.0% max.
Line Regulation	low line to high line, full load	±1.0% typ.
Load Regulation <sup>(4)</sup>	5% to 100% load	1.0% typ.

**Notes:**

Note4: Operation below 5% load will not harm the converter, but specifications may not be met

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**PROTECTIONS**

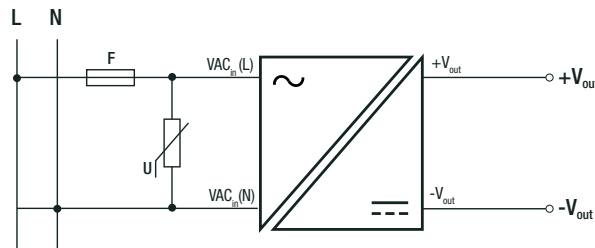
Parameter	Type		Value
Short Circuit Protection (SCP)			continuous, hiccup, auto recovery
Over Voltage Protection (OVP)			zener diode clamp
Over Current Protection (OCP)			auto recovery
Over Voltage Category			OVCII
Isolation Voltage	I/P to O/P	tested for 1 minute	4kVAC
Isolation Resistance			100MΩ max.
Leakage Current			0.5mA max.

**Notes:**

Note5: Refer to local safety regulations if input over-current protection is also required. Recommended fuse: slow blow type

Note6: An external MOV is recommended. The varistor should comply with IEC-61051-2. e.g. 14S471K series

**Protection Circuit**

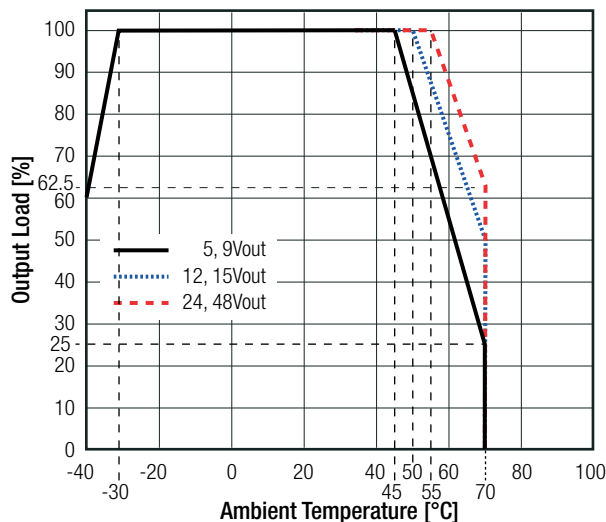


**ENVIRONMENTAL**

Parameter	Condition			Value
Operating Temperature Range	@ natural convection 0.1m/s	full load	5, 9Vout 12, 15Vout 24, 48Vout	-30°C to +45°C -30°C to +50°C -30°C to +55°C
		refer to derating graph		-40°C to +70°C
Temperature Coefficient				0.02%/K typ.
Operating Altitude				2000m
Pollution Degree				PD2
MTBF	according to MIL-HDBK-217F, G.B.	+25°C	>300 x 10 <sup>3</sup> hours	

**Derating Graph**

(@ Chamber and natural convection 0.1m/s)

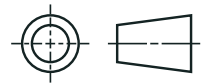
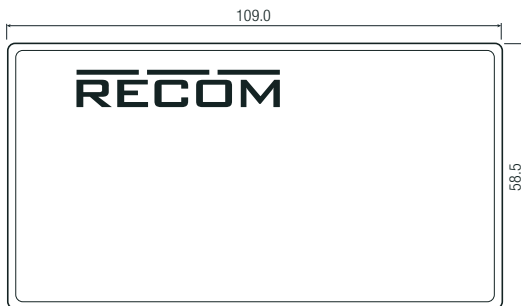


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SAFETY AND CERTIFICATIONS		
Certificate Type (Safety)	Report / File Number	Standard
Information Technology Equipment, General Requirements for Safety	E196683	UL60950-1, 2nd Edition, 2007 CAN/CSA-C22.2 No. 60950-1-07, 2nd Edition, 2007
Information Technology Equipment, General Requirements for Safety		EN60950-1:2006 + A2:2013
EAC Safety of Low Voltage Equipment	RU-AT.49.09571	TP TC 004/2011
RoHS2+		RoHS-2011/65/EU + AM-2015/863
EMC Compliance		
Condition	Standard / Criterion	
Electromagnetic compatibility of multimedia equipment – Emission Requirements	EN55032:2015	
Information technology equipment - Immunity characteristics - Limits and methods of measurement	EN55024:2010 + A1:2015	
Limitation of voltage fluctuations/flicker in low-voltage systems	EN61000-3-3: 2013	

DIMENSION AND PHYSICAL CHARACTERISTICS		
Parameter	Type	Value
Material	case	epoxy with fibreglas, (UL94V-0)
Dimension (LxWxH)		109.0 x 58.5 x 30.0mm
Weight		310g typ.

Dimension Drawing (mm)

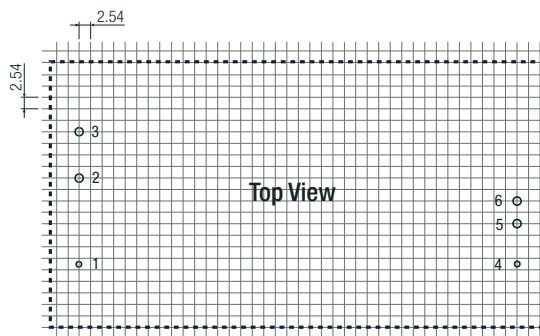
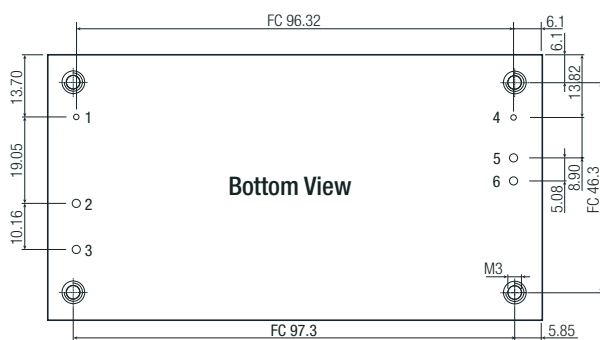
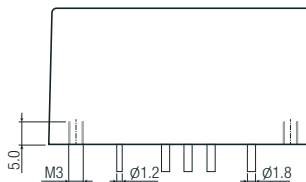


**Pinning information**

Pin #	Single	Dia. (mm)
1	FG	1.2
2	VAC in (L)	1.8
3	VAC in (N)	1.8
4	Trim	1.2
5	-VDC out	1.8
6	+VDC out	1.8

FC = Fixing Centers  
Tolerance: xx.x ± 0.5mm  
xx.xx ± 0.25mm

**Recommended Footprint Details**



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

Parameter	Type	Value
Packaging Dimension (LxWxH)	cardboard box	120.0 x 65.0 x 55.0mm
Packaging Quantity		1pcs
Storage Temperature Range		-50°C to +85°C
Storage Humidity	non-condensing	95% RH max.

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