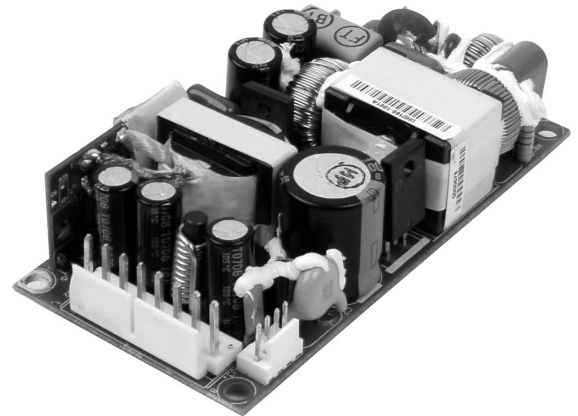


**PART NUMBER:** VMS-160 series

**DESCRIPTION:** open frame switching power supply

**features**

- industry standard 2x4" footprint
- 18 W/in<sup>3</sup> power density
- universal input: 90~264 V ac
- active PFC
- 90% typical efficiency
- 12 V auxillary fan output
- full medical and ITE safety approvals



MODEL	output voltage	current max. <sup>1,2</sup> (convection)	current max. <sup>1,2</sup> (forced air)	ripple & noise <sup>3</sup> (mVp-p max.)	initial voltage set-point
VMS-160-5	5 V dc	16 A	20 A	50 mV	±1%
VMS-160-12	12 V dc	8.3 A	13.3 A	120 mV	±1%
VMS-160-24	24 V dc	4.16 A	6.66 A	240 mV	±1%
VMS-160-48	48 V dc	2.08 A	3.33 A	480 mV	±1%
ALL 12 V fan aux.	12 V dc	0.5 A	0.5 A	500 mV	±20%

notes:

1. total continuous output power will not exceed 160 W forced air (400LFM), 100 W without fan
2. total continuous output power will not exceed 100 W forced air (400LFM), 80 W without fan for 5 V model
3. measured at 20MHz, twisted pair with 0.47µF and 22µF parallel capacitors

**INPUT**

parameter	conditions/description	min	nom	max	units
input frequency		47		63	Hz
input voltage		90	100~240	264	V ac
		125		373	V dc
input current	AC input of 100 VAC			2.5	A
	AC input of 200 VAC			1.25	A
inrush current	no damage at 230 V ac cold start				
power factor	when measured at full rated load and at 115 V ac / 60 Hz and 230 V ac / 50 Hz input source input will be less than 25 Ω compliant to EN61000-3-2 for harmonic currents		0.98		
leakage current	when measured per IEC 60950-1, paragraph 5.1 test voltage of 120 V ac / 60 Hz			275	µA

**OUTPUT**

parameter	conditions/description	min	nom	max	units
minimum loading		0			A
efficiency	at 20%, 50%, and 100% of max. rated load (forced air ratings)	80	90		%
voltage adjust			±10		%
line regulation	at 90~264 V ac		±1		%
load regulation	5, 12, 24, or 48 V outputs		±1		%
	12 V aux. output		±20		%
transient response	25% I <sub>max</sub> to I <sub>max</sub> , 0.1A/µs slew rate, ±5% max. deviation, 1 ms recovery				
start up time			500		mS
rise		0.2		20	mS

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## RELIABILITY

parameter	conditions/description
MTBF	235K hours min convection, 300K hours typical with 400 LFM forced air (MIL-HDBK-217E-1, 75% of rated full load, 25°C ambient)

## PROTECTION CIRCUITS

parameter	conditions/description
over current	130% max., auto recovery
output over-voltage	130% max.
short circuit	the power supply will auto recover with no damage from a short on any output.

## GENERAL & SAFETY

parameter	conditions/description	min	nom	max	units
isolation voltage (HI-POT)	applied for 1 minute.				
	primary to secondary:	4250			V dc
	primary to earth ground:	2150			V dc
EMI/EMC	EN55022:1998 (CISPR 22 class B conducted), EN61000-3-2: 2000, EN61000-3-3: A1:2001, EN55024 (IEC61000-4-2: 1995, IEC61000-4-3: 1995, IEC61000-4-4: 1995, IEC61000-4-5: 1995, IEC61000-4-6: 1996, IEC61000-4-11: 1994),				
safety	CSA C 22.2 No. 60950-1/60601-1, UL 60950-1/60601-1, NEMKO EN60950-1/EN60601-1, CE-MARK				
RoHS	yes				
warranty	standard warranty length			1	year

## ENVIRONMENTAL

parameter	conditions/description	min	nom	max	units
operating temperature	derate linearly to 50% load at 70°C	-20		50	°C
storage temperature		-40		80	°C
relative humidity	non-condensing operating	8		90	%
	non-condensing non-operating			95	%
temperature coefficient			0.25		mV/°C
shock	operating (11mS, half sine, for a total of 6 shock inputs)		10		G
	non-operating (2mS, half sine, for a total of 6 shock inputs)		140		G
vibration	operating (10~300Hz, 1 hour per axis, 3 hours total)		1		Grms
	non-operating (10~500Hz, 1 hour per axis, 3 hours total)		2		Grms

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**DESCRIPTION:** open frame switching power supply

**MECHANICAL DRAWING**

