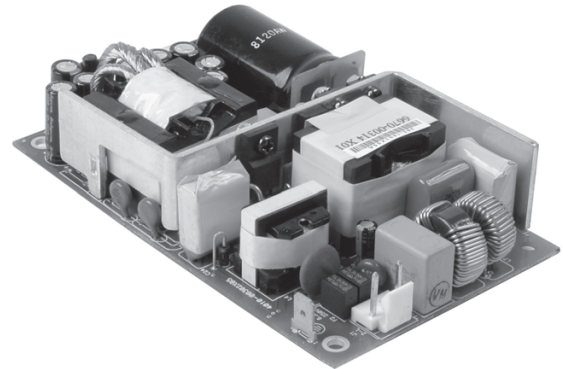


**PART NUMBER:** VMS-365 series

**DESCRIPTION:** open frame switching power supply

**features**

- industry standard 3x5" footprint
- 19 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
- meets the requirements (80+) of the Energy Star 4.0 documents and the anticipated 90+ requirement for 2010



MODEL	output voltage	current max. <sup>1</sup> (convection)	current max. <sup>1,3</sup> (400 LFM forced air)	ripple & noise <sup>2</sup> (mVp-p max.)	initial voltage set-point
VMS-365-12	12 V dc	16.6 A	30.4 A	120 mV	±3%
VMS-365-24	24 V dc	8.3 A	15.2 A	240 mV	±3%
VMS-365-48	48 V dc	4.16 A	7.6 A	480 mV	±3%
ALL 12 V fan aux.	12 V dc	0.5 A	1 A	240 mV	±15%
5 V standby	5 V dc	1 A	2 A	50 mV	±5%

notes:

1. total continuous output power will not exceed 365 W forced air, 200 W without fan
2. measured at 20MHz, twisted pair with 0.47μF ceramic and 22μF tantalum parallel capacitors
3. forced air will be sufficient to keep heat sink temperatures below 110°C at 50°C ambient operation

**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 90 VAC			5	A
	AC input of 180 VAC			2.5	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			110	μA
	test voltage of 230 V ac / 60 Hz			275	μA

**OUTPUT**

parameter	conditions/description	min	nom	max	units
minimum loading		0			A
efficiency	at 20% and 100% of max. rated load	88			%
	at 50% of max. rated load	90			%
line regulation	at 90~264 V ac		±1		%
load regulation	12, 24, or 48 V outputs		±1		%
	12 V aux. output		±15		%
transient response	25% I <sub>max</sub> to I <sub>max</sub> , 0.1A/μs slew rate, ±5% max. deviation, 10 ms recovery				
start up time		500			mS
rise		200μ		5m	S
hold up time			16		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	150% max., auto recovery
output over-voltage	125% max. (for 12, 24, 48 V)
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
(HI-POT)	primary to secondary: primary to earth ground:	4250			V dc 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, CB 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 non-condensing non-operating	8		90 95	% %
temperature coefficient			0.25		mV/°C
shock	operating (11mS, half sine, for a total of 6 shock inputs) non-operating (2mS, half sine, for a total of 6 shock inputs)		10 140		G G
vibration	operating (10~300Hz, 1 hour per axis, 3 hours total) non-operating (10~500Hz, 1 hour per axis, 3 hours total)		1 2		Grms Grms

## P/S ON

P/S ON is an active low, +5 V tolerant TTL signal that allows the motherboard to remotely control the power supply in models with the standby option. Once an AC input voltage has been applied to the power supply, an internal pull-up resistor inside the power supply will provide a TTL high output logic level.

PS-ON OK Signal Characteristics		
Signal Description	Minimum	Maximum
Input Low Voltage	0.0 V	2.5 V
Input Low Current (Vin=0.4 V)		-1.6 mA
Input High Voltage (Iin=200 µA)	2.5 V	
Max. Low Level Surge Current	- 56 mA for 5µS with a 500 mS on/150 mS off duty cycle	

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## POWER OK

The POK pin of J3 shall change from the low STATE (<400mV) to the high STATE (>4.5V) 100 – 500 mS after the main outputs are within the regulation limits. Conversely, the POK should be de-asserted to a low state when any of the main output voltages fall below its under-voltage threshold, or when the main power has been removed for a time sufficiently long such that the power supply operation cannot be guaranteed beyond the power-down warning time. The power-down warning time must be 1mS minimum. The electrical characteristics for the Power OK output driver are shown below:

Power OK Signal Characteristics	
Signal Type	+5 V TTL Compatible
Logic Level Low	< 0.4 V While Sinking a maximum of 10 mA
Logic Level High	Between 2.4 V and 5 V Output While Sourcing 200 $\mu$ A
High-State Output Impedance	1 K Pull-Up From +5 Vsb To Termination Point
Max. Low Level Surge Current	56 mA for 5 $\mu$ S with a 500 mS on/150 mS off duty cycle

## MECHANICAL DRAWING

