

DESCRIPTION

The PM60 series of compact, open PCB constructed, AC-DC switching power supplies are capable of delivering 37.5-64 watts of continuous output power at convection cooling. They operate at 90-264 VAC input voltage without the need of voltage selection, and are suited for medical, information technology and industrial applications. Approval to both EN60601-1 and EN62368-1 safety standards improves design-in time and reduces end equipment compliance costs.

PM60 SERIES

CE
RoHS



FEATURES

- BF Class insulation
- Medical and ITE approvals
- Compact size 2" x 4" x 1.18"
- Single, dual and triple outputs
- Wide-range input 90-264 VAC
- Low earth leakage current
- Level B emissions
- RoHS compliant

SAFETY STANDARD APPROVALS



UL ES 60601-1, CSA C22.2 No. 60601-1
File No. E178020



TÜV EN 60601-1



UL 62368-1, CSA C22.2 No. 62368-1



TÜV EN 62368-1

INPUT SPECIFICATIONS

Input voltage:	90-264 VAC
Input frequency:	47-63 Hz
Input current:	1.3 A (rms) for 100 VAC 0.7 A (rms) for 240 VAC
Earth leakage current:	150 μ A max. @ 264 VAC, 63 Hz
Touch current:	100 μ A max. @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart.
Maximum output power:	See rating chart.
Ripple and noise:	100 mV peak to peak on 3.3 V & 5.0 V models, 1% peak to peak on other models
Over voltage protection:	Provided on output #1 only; set at 112-132% of its nominal output voltage, automatic recovery
Short circuit protection:	Automatic recovery
Temperature coefficient:	All outputs $\pm 0.04\%$ / $^{\circ}$ C maximum
Transient response:	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 μ s after a 25% step load change

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-10 $^{\circ}$ C to +70 $^{\circ}$ C
Storage temperature:	-40 $^{\circ}$ C to +85 $^{\circ}$ C
Relative humidity:	5% to 95% non-condensing
Temperature derating:	Derate from 100% at +50 $^{\circ}$ C linearly to 50% at +70 $^{\circ}$ C

GENERAL SPECIFICATIONS

Switching frequency:	62 K ± 5 KHz
Efficiency:	80-88% typical except PM60-31-3A and PM60-31-5 A at 75% typical
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 A @ 230 VAC, at 25 $^{\circ}$ C cold start
Withstand voltage:	4000 VAC from input to output (2 MOPP) 1500 VAC from input to ground (1 MOPP) 1500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}$ C ambient, calculated per MIL-HDBK-217F
EMC Performance (EN60601-1-2)	
EN55011/ EN55032:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN60601-1-2, EN55035	
EN61000-4-2:	ESD, ± 15 KV air and ± 8 KV contact
EN61000-4-3:	Radiated immunity, 9-28 V/m
EN61000-4-4:	Fast transient/burst, ± 2 KV
EN61000-4-5:	Surge, ± 1 KV diff., ± 2 KV com
EN61000-4-6:	Conducted immunity, 10 Vrms
EN61000-4-8:	Magnetic field immunity, 30 A/m
EN61000-4-11:	Voltage dip immunity, 30% reduction for 500 ms, 100% reduction for 10 ms

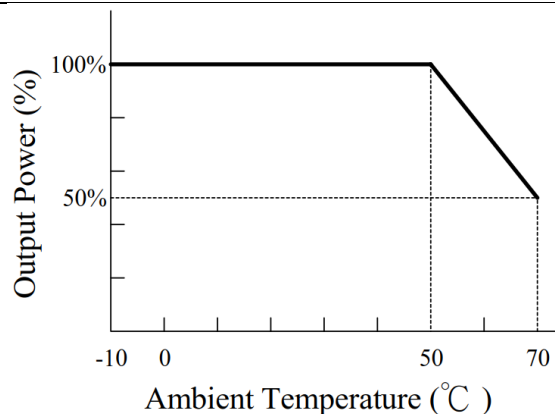
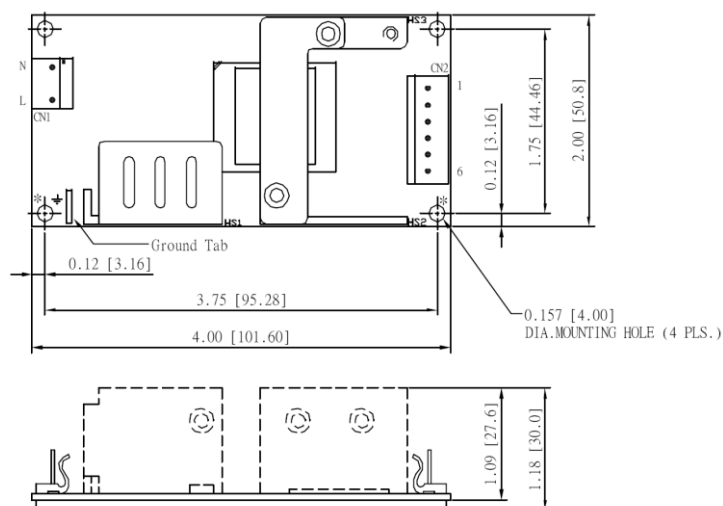
OUTPUT VOLTAGE/CURRENT RATING CHART

Model ⁽¹⁾	Output #1					Output #2				Output #3				Max. Output Power ⁽³⁾
	V1	Min. Current	Max. Current at convection	Max. Current at 5 CFM ⁽²⁾	Tol.	V2	Min. Current	Max. Current	Tol.	V3	Min. Current	Max. Current	Tol.	
PM60-10A	5 V	0 A	11.0 A	11.0 A	±2%	(N/A)				(N/A)				55 W
PM60-12A	12 V	0 A	5.0 A	5.0 A	±2%	(N/A)				(N/A)				60 W
PM60-13A	15 V	0 A	4.3 A	4.3 A	±2%	(N/A)				(N/A)				64 W
PM60-14A	24 V	0 A	2.7 A	2.7 A	±2%	(N/A)				(N/A)				64 W
PM60-18A	48 V	0 A	1.35 A	1.35 A	±2%	(N/A)				(N/A)				64 W
PM60-23A	+5 V	0.5 A	6.0 A	8 A	±3%	+12 V	0.1 A	3.0 A	±5%	(N/A)				55 W
PM60-25A	+5 V	0.5 A	6.0 A	8 A	±3%	+24 V	0.1 A	1.5 A	±5%	(N/A)				55 W
PM60-31A	+5 V	0.5 A	6.0 A	8 A	±3%	+12 V	0.1 A	3.0 A	±5%	-12 V	0 A	0.5 A	±4%	55 W
PM60-31-5A	+5 V	0.5 A	6.0 A	8 A	±3%	+3.3 V	0 A	1.5 A	±5%	+12 V	0 A	0.5 A	±4%	37.5 W/47.5W
PM60-32A	+5 V	0.5 A	6.0 A	8 A	±3%	+15 V	0.1 A	2.4 A	±5%	-15 V	0 A	0.5 A	±4%	55 W
PM60-39A	+5 V	0.5 A	6.0 A	8 A	±3%	+24 V	0.1 A	1.5 A	±5%	-12 V	0 A	0.5 A	±4%	55 W

- NOTES:
- Safety approvals are for PCB form only. To order unit with cover fitted, change suffix "A" to "C".
 - Maximum current of output #1 of multi-output models can be 8 A at 5 CFM forced air provided by user.
 - It is rated at 37.5 W maximum at convection cooling or 47.5 W maximum at 5 CFM forced air cooling by user.
 - The output voltages of a multiple output model may go outside of the stated tolerance when an output load current is out of stated limits. All models may be operated at no-load without damage.
 - Ripple and noise is maximum peak to peak voltage value measured at output within 20 MHz bandwidth, at rated line voltage and output load ranges, and with a 10 μ F tantalum capacitor in parallel with a 0.1 μ F ceramic capacitor across the output.

MECHANICAL SPECIFICATIONS

OUTPUT POWER DERATING CURVE



NOTES:

- Dimensions shown in inches [mm]
- Tolerance 0.02 [0.5] maximum
- Connector CN1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
- Connector CN2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
- Ground tab is 0.25 [6.35] x 0.032 [0.8] fast-on connector.
- To ensure compliance with level B emissions, connect the two "*" marked mounting holes with metallic standoffs to chassis.
- Weight: 205 grams (0.45 lbs.) approx.

PIN CHART

MODEL	PIN		1	2	3	4	5	6
PM60-10A	PM60-12A	PM60-13A	+V1	+V1	V1 Return	V1 Return	N.C.	N.C.
PM60-14A	PM60-18A							
PM60-23A	PM60-25A		V1	V1	Common Return		N.C.	V2
PM60-31A	PM60-32A	PM60-39A	V1	V1	Common Return		V3	V2
PM60-31-5A			V1	V1	Common Return		V3	V2