

## 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 EN 60601-1 and EN 60950-1 safety standards improves design-in time and reduces end equipment compliance costs.

## FEATURES

- Medical and industrial approvals
- Compact size 2" x 4" x 1.18"
- Single, dual and triple outputs
- Class I and Class II construction
- Low earth leakage current
- Level B emissions
- RoHS compliant

## 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 uA max. @ 264 VAC, 63 Hz

## OUTPUT SPECIFICATIONS

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

## ENVIRONMENTAL SPECIFICATIONS

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

## PM60 SERIES

 (LVD)  
RoHS



## SAFETY STANDARD APPROVALS



**UL 60601-1, CSA C22.2 No. 601.1**  
File No. E178020



**TÜV EN60601-1**



**UL 60950-1, CSA C22.2 No. 60950-1**  
(except PM60-31-3A by UL)



**TÜV EN60950-1**

## GENERAL SPECIFICATIONS

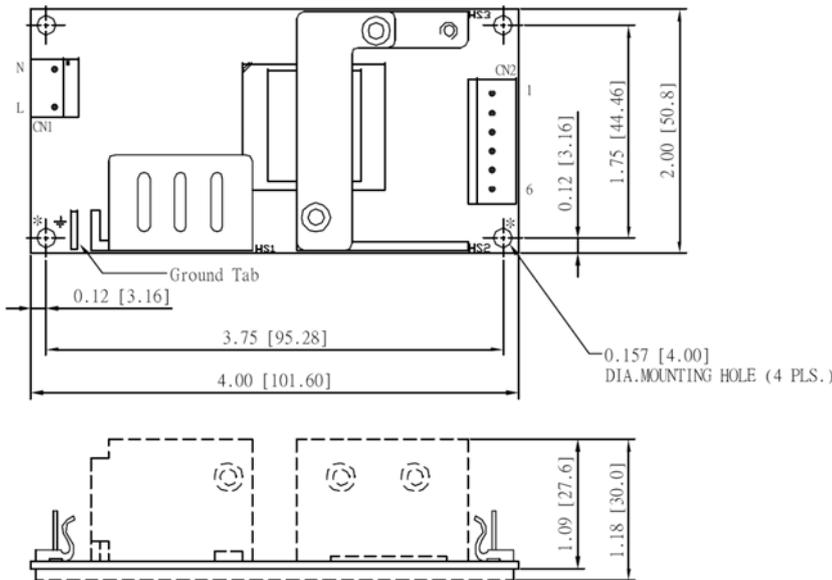
Switching frequency:	62 K $\pm$ 5 KHz
Efficiency:	80-88% typical except PM60-31-3A and PM60-31-5A at 75% typical
Hold-up time:	12 msec minimum at 110 VAC
Line regulation:	$\pm 0.5\%$ maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 A @ 230 VAC, at 25 $^{\circ}\text{C}$ cold start
Withstand voltage:	4000 VAC from input to output 1500 VAC from input to ground 500 VAC from output to ground
MTBF:	400,000 hours at full load at 25 $^{\circ}\text{C}$ ambient, calculated per MIL-HDBK-217F
EMC Performance	
EN55011 / EN55022:	Class B conducted, class B radiated
FCC:	Class B conducted, class B radiated
VCCI:	Class B conducted, class B radiated
EN61000-3-2:	Harmonic distortion, class A and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, $\pm 8$ KV air and $\pm 6$ KV contact
EN61000-4-3:	Radiated immunity, 3 V/m
EN61000-4-4:	Fast transient/burst, $\pm 2$ KV
EN61000-4-5:	Surge, $\pm 1$ KV diff., $\pm 2$ KV com.
EN61000-4-6:	Conducted immunity, 3 Vrms
EN61000-4-8:	Magnetic field immunity, 3 A/m
EN61000-4-11:	Voltage dips, 30% reduction for 500 ms 60% reduction for 100 ms >95% reduction for 10 ms

## OUTPUT VOLTAGE/CURRENT RATING CHART

MODEL(1)	Output #1				Output #2				Output #3				Maximum Output(3)
	Vnom	Min.-Max.Current at convection	Min.-Max.Current at forced air (2)	Tol.	Vnom	Imin	Imax	Tol.	Vnom	Imin	Imax	Tol.	
PM60-10A	5 V	0-11 A	(N/A)	2%		(N/A)				(N/A)			55 W
PM60-12A	12 V	0-5 A	(N/A)	2%		(N/A)				(N/A)			60 W
PM60-13A	15 V	0-4.3 A	(N/A)	2%		(N/A)				(N/A)			64 W
PM60-14A	24 V	0-2.7 A	(N/A)	2%		(N/A)				(N/A)			64 W
PM60-18A	48 V	0-1.35 A	(N/A)	2%		(N/A)				(N/A)			64 W
PM60-23A	+5 V	0.5-6 A	0.5-8 A	3%	+12 V	0.1 A	3 A	5%		(N/A)			55 W
PM60-25A	+5 V	0.5-6 A	0.5-8 A	3%	+24 V	0.1 A	1.5 A	5%		(N/A)			55 W
PM60-31A	+5 V	0.5-6 A	0.5-8 A	3%	+12 V	0.1 A	3 A	5%	-12 V	0 A	0.5 A	4%	55 W
PM60-31-3A	+3.3 V	0.8-6 A	0.5-8 A	3%	+5.2 V	0.1 A	3 A	5%	+12 V	0 A	0.5 A	4%	37.5 W
PM60-31-5A	+5 V	0.5-6 A	0.5-8 A	3%	+3.3 V	0 A	1.5 A	5%	+12 V	0 A	0.5 A	4%	37.5/47.5W(4)
PM60-32A	+5 V	0.5-6 A	0.5-8 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	0.5-6 A	0.5-8 A	3%	+24 V	0.1 A	1.5 A	5%	-12 V	0 A	0.5 A	4%	55 W

- NOTES:
1. Safety approvals are for PCB form only. To order unit with cover fitted, change suffix "A" to "C".
  2. Maximum current of output #1 of multi-output models can be 8 A at 5 CFM forced air provided by user.
  3. The maximum output power shown is convection rating.
  4. 47.5 W with 5 CFM forced air provided by user
  5. 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.
  6. Ripple and noise: Peak to peak with 20 MHz bandwidth and 10 uF tantalum capacitor in parallel with a 0.1 uF ceramic capacitor at rated line voltage and load ranges.

## MECHANICAL SPECIFICATIONS



### NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal.
4. Output connector mates with Molex housing 09-50-3061 and Molex 2878 series crimp terminal.
5. Ground tab is 0.25 [6.35] x 0.032 [0.8]
6. To ensure compliance with level B emissions, connect the two "\*" marked mounting holes with metallic standoffs to chassis.
7. Weight: 205 grams (0.45 lbs.) approx

## PIN CHART

MODEL	PIN		1	2	3	4	5	6
PM60-10A PM60-14A	PM60-12A PM60-19A	PM60-13A	+V1	+V1	RTN	RTN	N.C.	N.C.
PM60-23A	PM60-25A		+V1	+V1	RTN	RTN	N.C.	+V2
PM60-31A	PM60-32A	PM60-39A	+V1	+V1	RTN	RTN	-V3	+V2
PM60-31-3A	PM60-31-5A		+V1	+V1	RTN	RTN	+V3	+V2