PROTEK POWER

TT Electronics
POWER PARTNERS

PM110 Medical Power Supplies (72-110W)

Features:

- Low safety ground leakage current
- Meet EN55011 and FCC Class B
- Small size, light weigh
- 100% burn-in
- Wide input range 85-264 VAC
- Input surge current protection
- Overvoltage protection
- Overcurrent protection
- Compliant with RoHS requirements

CE

RoHS

c UL us

IEC 60601-1

Description:

The PM110 series of compact, open PCB constructed, AC-DC switching power supplies are specially designed for medical applications. They are capable of delivering 72-110 watts of continuous power at 25 CFM forced air cooling or 60-80 watts at convection cooling. They operate at 85-264VAC input voltage without the need of a selector strap. All models meet the safety requirements of UL, CSA and IEC for medical equipment.

Model[1]	Output #1[2]				Output #2					Output #3				Output #4				Max. Output Power[3]
	V1	Imin	Imax	Tol.	V2	Imin	Imax	Ipeak[4]	Tol.	V3	Imin	Imax	Tol.	V4	Imin	Imax	Tol.	
PM110-10-1A	3.3V	0A	22A	±3%						(N/A)								60/72W
PM110-10A	5V	0A	22A	±3%						(N/A)								80/110W
PM110-12A	12V	0A	9A	±2%						(N/A)								80/110W
PM110-13A	15V	0A	7.5A	±2%						(N/A)								80/110W
PM110-14A	24V	0A	4.5A	±2%						(N/A)								80/110W
PM110-16A	30V	0A	3.6A	±3%						(N/A)								80/110W
PM110-23A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	(N/A)								80/110W
PM110-31A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	-12V	0A	1A	±4%	(N/A)				80/110W
PM110-32A	5.1V	0A	10A	±3%	15V	0A	4A	7.5A	±3%	-15V	0A	1A	±4%	(N/A)				80/110W
PM110-40A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	-12V	0A	1A	±4%	-5V	0A	1A	±4%	80/110W
PM110-41A	5.1V	0A	10A	±3%	15V	0A	4A	7.5A	±3%	-15V	0A	1A	±4%	24V	0A	1A	±4%	80/110W
PM110-42A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	-12V	0A	1A	±4%	12V	0A	1A	±4%	80/110W
PM110-45A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	-12V	0A	1A	±4%	24V	0A	1A	±4%	80/110W
PM110-45-1A	5.1V	0A	10A	±3%	12V	0A	5A	9A	±3%	-12V	0A	1A	±4%	24V	1.5A	3A	±10%	80/110W
PM110-45-2A	5.1V	0A	10A	±3%	24V	0A	3A	5A	±3%	-12V	0A	1A	±4%	12V	0A	1A	±4%	80/110W
PM110-46A	5.1V	0A	10A	±3%	15V	0A	4A	7.5A	±3%	-15V	0A	1A	±4%	-5V	0A	1A	±4%	80/110W

NOTES:

1. Safety agency approvals are for the above listed models in PCB format. To order a model with a metallic L-bracket or box, change suffix “A” to “B” for L-bracket format, to “C” for enclosed form with cover, e.g. PM110-14C. (mechanical details shown in Annex H)
2. The output #1 of model PM110-45-1A needs a minimum current of 2A to support the other outputs at their maximum rated load.
3. 110 watts maximum at 25 CFM forced air cooling or 80 watts maximum at convection cooling, except model PM110-10-1A which is rated at 60 watts maximum at convection cooling or 72 watts maximum at 25 CFM forced air cooling.
4. Peak output current with 10% maximum duty cycle for less than 60 seconds. Total peak power must not exceed 130 watts.
5. All models may be operated at no-load. At no-load, output voltage tolerance increases to ±10%.
6. 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 µF tantalum capacitor in parallel with a 0.1 µF ceramic capacitor across the output.

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Specifications	
Safety Standards & EMC Specifications	
Safety Standard Approvals	UL ES 60601-1, CSA C22.2 No. 60601-1 File No. E178020 TÜV EN 60601-1
EMI Standard	EN55011/EN55022, FCC & VCCI Class B (radiated and conducted)
EMC Performance	EN61000-3-2: Harmonic distortion, Class A EN61000-3-3: Line flicker EN61000-4-2: ESD, ±15 KV air and ± 8KV contact EN61000-4-3: Radiated immunity, 10V/m EN61000-4-4: Fast transient/burst, ±2KV EN61000-4-5: Surge, ±1 KV diff., ±2 KV com. EN61000-4-6: Conducted immunity, 10Vrms EN61000-4-8: Magnetic field immunity, 30 A/m EN61000-4-11: Voltage dip immunity, 30% reduction for 500ms, and 100% reduction for 10ms
*Consult with TT Electronics for information on additional country safety approvals	
Input Specifications	
Input Voltage Range	85 to 264VAC
Input Frequency Range	47 to 63Hz
Input Current	3.2A (rms) @115VAC, 60 Hz 1.8A (rms) @240VAC, 50 Hz
Earth Leakage Current	220µA max. @ 264VAC, 63Hz
Touch Current	100µA max. @ 264VAC, 63Hz
Output Specifications	
Ripple & Noise	1% peak to peak maximum
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 ±0.04%/°C maximum
Transient Response	Maximum excursion of 4% or better on all models, recovering to 1% of final value within 500 µs after a 25% step load change
Environmental Specifications	
Operating Temperature	-10°C to +70°C
Storage Temperature	-40°C to +85°C
Relative Humidity	5% to 95% non-condensing
Temperature Derating	De-rate from 100% at +50°C linearly to 50% at +70°C
Cooling	72-110 watts continuous output power at 25 CFM forced air cooling or 60-80 watts at convection cooling
General Specifications	
Switching Frequency	20-250 KHz, varied with load and line
Power Factor	>0.9
Efficiency	70% minimum on single output model with Vo ≥12 V, 65% minimum on the others
Hold-up Time	12ms minimum at 110 VAC
Line Regulation	±0.5% maximum at full load
Inrush Current	15A @ 115 Vac or 30A @ 230 Vac at 25°C cold start
Withstand Voltage	5600 VDC from input to output (2 MOPP) 2100 VDC from input to ground (1 MOPP) 700 VDC from output to ground (To verify AC strength, get correct test method to avoid power supply damage.)
MTBF	400,000 hours at full load at 25°C ambient, calculated per MIL-HDBK-217F
Interface Signals	
PFD:	TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1 ms prior to V1 output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after V1 is within regulation

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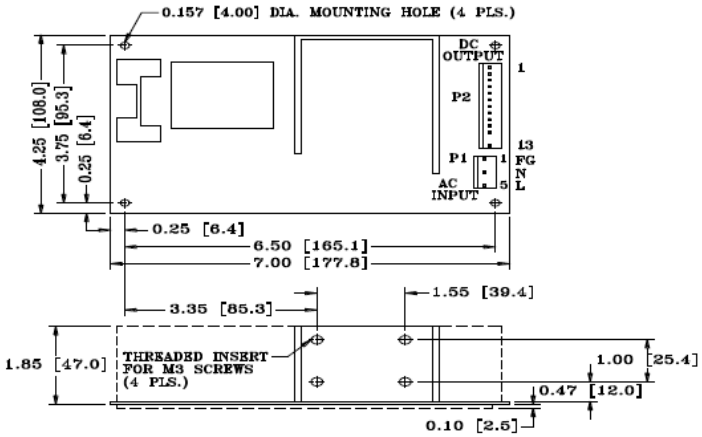
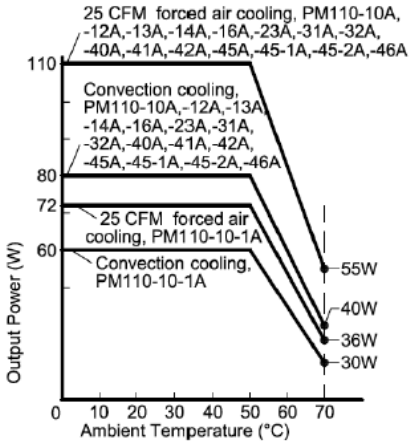
Diagrams

MECHANICAL SPECIFICATIONS



OUTPUT POWER DERATING CURVE



NOTES:

1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Connector P1: Molex header 09-65-2058 or equivalent, mating with Molex housing 09-50-1051 or equivalent.
4. Connector P2 mates with Molex 09-50-3131 or equivalent.
5. The copper pad of the mounting hole near P1 is for system grounding through a metallic stand-off to system chassis.
6. Weight : 640 grams (1.408 lbs.)

PIN CHART

MODEL / PIN	1, 2, 3	4, 5	6, 7	8, 9	10	11	12	13
PM110-10-1A PM110-13A PM110-10A PM110-14A PM110-12A PM110-16A	+V1	V1 Return	V1 Return	+V1	PFD	N.C.	KEY	N.C.
PM110-23A	V1	Common Return	Common Return	V2	PFD	N.C.	KEY	N.C.
PM110-31A PM110-32A	V1	Common Return	Common Return	V2	PFD	V3	KEY	N.C.
PM110-40A PM110-45-1A PM110-41A PM110-45-2A PM110-42A PM110-46A PM110-45A	V1	Common Return	Common Return	V2	PFD	V3	KEY	V4

INTERFACE SIGNALS

PFD: TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1 ms prior to V1 output dropping 5% below its nominal value. This signal also provides a minimum delay of 100 ms after V1 is within regulation