PROTEK POWER

72-110 WATT MEDICAL SWITCHING POWER SUPPLIES

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 to 110 watts of continuous power at 25 CFM forced air cooling or 80 watts at convection cooling. They operate at 85-264 VAC input voltage without the need of changing jumper. All models meet the safety requirements of UL, CSA and IEC for non-patient contact medical equipment.

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

INPUT SPECIFICATIONS

Input voltage：	85-264 VAC
Input frequency：	47-63 Hz
Input current：	3.20 A (rms) for 115 VAC 1.80 A (rms) for 230 VAC
Earth leakage current：	90 uA max. @ 115 VAC, 60 Hz 150 uA max. @ 230 VAC, 50 Hz

OUTPUT SPECIFICATIONS

Output voltage/current：	See rating chart
Total output power：	110 watts maximum at 25 CFM forced air cooling or 80 watts maximum at convection cooling
Ripple and 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/℃ 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
PFD signal:	TTL logic high for normal operation and TTL logic low upon loss of input power. This signal appears at least 1ms prior to +5V output dropping 5% below its nominal value. This signal also provides a minimum delay of 100ms after +5V is within regulation

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	0℃ to +70℃
Storage temperature:	-40℃ to +85℃
Relative humidity:	5% to 95% non-condensing
Derating:	Derate from 100% at +50℃ linearly to 50% at +70℃
Cooling:	110 watts continuous output power at 25 CFM forced air cooling or 80 watts at convection cooling

PM110 SERIES

CE (LVD)
RoHS

SAFETY STANDARD APPROVALS

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

TÜV EN60601-1

GENERAL SPECIFICATIONS

Switching frequency：	20-250 KHz, varies with load and line
Efficiency：	70% minimum on single output model with Vo ≧12V, 65% minimum on the others
Hold-up time：	12 msec minimum at 110 VAC
Line regulation：	±0.5% maximum at full load
Inrush current：	15 A @ 115 VAC or 30 A @ 230 VAC, at 25℃ 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℃ ambient , calculated per MIL-HDBK-217F

EMC Performance (EN60601-1-2: 2001)

EN55011:	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
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±8 KV air and ±6 KV contact
EN61000-4-3:	Radiated immunity, 3 V/m @ 80-2500 MHz
EN61000-4-4:	Fast transient/burst, ±2 KV
EN61000-4-5:	Surge, ±1 KV diff., ±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 and >95% reduction for 10 ms

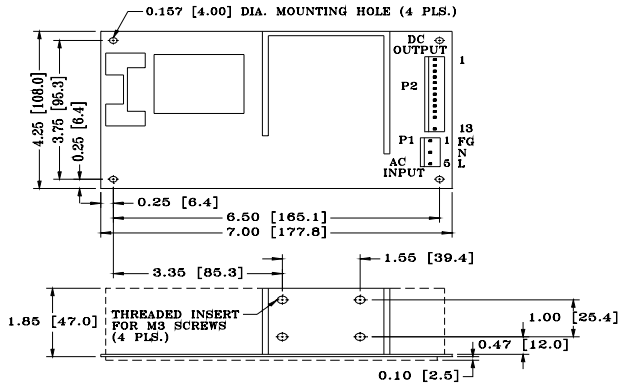
UNIVERSAL INPUT PM110 MEDICAL SERIES

OUTPUT VOLTAGE/CURRENT RATING CHART

MODEL	Output #1 Vnom.	Output #1 Imin.	Output #1 Imax.	Output #1 Tol.	Output #2 Vnom.	Output #2 Imin.	Output #2 Imax.	Output #2 Tol.	Output #3 Vnom.	Output #3 Imin.	Output #3 Imax.	Output #3 Tol.	Output #4 Vnom.	Output #4 Imin.	Output #4 Imax.	Output #4 Tol.	Maximum Output Power
PM110-10-1A	3.3 V	0 A	22 A	3%		(N/A)				(N/A)				(N/A)			72 W
PM110-10A	5.0 V	0 A	22 A	3%		(N/A)				(N/A)				(N/A)			110 W
PM110-12A	12 V	0 A	9.0 A	2%		(N/A)				(N/A)				(N/A)			110 W
PM110-13A	15 V	0 A	7.5 A	2%		(N/A)				(N/A)				(N/A)			110 W
PM110-14A	24 V	0 A	4.5 A	2%		(N/A)				(N/A)				(N/A)			110 W
PM110-16A	30 V	0 A	3.6 A	3%		(N/A)				(N/A)				(N/A)			110 W
PM110-23A	+5.1 V	0 A	10 A	3%	+12 V	0 A	5 A	3%		(N/A)				(N/A)			110 W
PM110-31A	+5.1 V	0 A	10 A	3%	+12 V	0 A	5 A	3%	-12 V	0 A	1 A	4%		(N/A)			110 W
PM110-32A	+5.1 V	0 A	10 A	3%	+15 V	0 A	4 A	3%	-15 V	0 A	1 A	4%		(N/A)			110 W
PM110-40A	+5.1 V	0 A	10 A	3%	+12 V	0 A	5 A	3%	-12 V	0 A	1 A	4%	-5 V	0 A	1 A	4%	110 W
PM110-41A	+5.1 V	0 A	10 A	3%	+15 V	0 A	4 A	3%	-15 V	0 A	1 A	4%	+24 V	0 A	1 A	4%	110 W
PM110-42A	+5.1 V	0 A	10 A	3%	+12 V	0 A	5 A	3%	-12 V	0 A	1 A	4%	+12 V	0 A	1 A	4%	110 W
PM110-45A	+5.1 V	0 A	10 A	3%	+12 V	0 A	5 A	3%	-12 V	0 A	1 A	4%	+24 V	0 A	1 A	4%	110 W
PM110-45-1A	+5.1 V	2 A	10 A	3%	+12 V	0 A	5 A	3%	-12 V	0 A	1 A	4%	+24 V	1.5 A	3 A	10%	110 W
PM110-45-2A	+5.1 V	0 A	10 A	3%	+24 V	0 A	3 A	3%	-12 V	0 A	1 A	4%	+12 V	0 A	1A	4%	110 W
PM110-46A	+5.1 V	0 A	10 A	3%	+15 V	0 A	4 A	3%	-15 V	0 A	1 A	4%	-5 V	0 A	1 A	4%	110 W

NOTES:
1. Peak output current with 10% maximum duty cycle for less than 60 seconds. Total peak power must not exceed 130 watts.
2. 110 watts maximum 25 CFM forced air cooling or 80 watts maximum at convection cooling, except model PM110-10-1A which is rated at maximum 60 watts at convection cooling or 72 watts at 25 CFM forced air cooling.
3. 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 format to the model number (mechanical details shown in page 71-72), e.g. PM110-14C.
4. The output#1 of model PM110-45-1A needs a minimum current of 2A to support the outputs at the maximum rated load.

MECHANICAL SPECIFICATIONS



NOTES:
1. Dimensions shown in inches [mm]
2. Tolerance 0.02 [0.5] maximum
3. Input connector mates with Molex housing 09-50-3051 and Molex 2878 series crimp terminal
4. Output connector mates with Molex housing 09-50-3031 and Molex 2878 series crimp terminal
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 (PCB format)

PIN CHART

MODEL \ PIN	1, 2, 3	4, 5	6, 7	8, 9	10	11	12	13
PM110-10-1A PM110-10A PM110-12A PM110-13A PM110-14A PM110-16A	OUTPUT #1	RETURN	RETURN	OUTPUT #1	P.F.D	N.C.	KEY	N.C.
PM110-23A	OUTPUT #1	COMMON RETURN	COMMON RETURN	OUTPUT #2	P.F.D	N.C.	KEY	N.C.
PM110-31A PM110-32A	OUTPUT #1	COMMON RETURN	COMMON RETURN	OUTPUT #2	P.F.D	OUTPUT #3	KEY	N.C.
PM110-40A PM110-41A PM110-42A PM110-45A PM110-45-1A PM110-45-2A PM110-46A	OUTPUT #1	COMMON RETURN	COMMON RETURN	OUTPUT #2	P.F.D	OUTPUT #3	KEY	OUTPUT #4

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