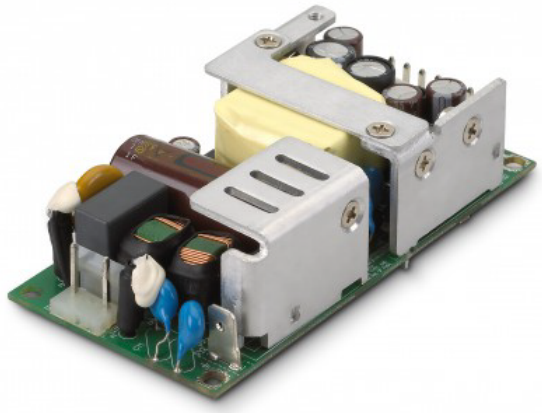
TECHNICAL DATASHEET

55-64W Medical Open Frame

FSP060 Series



FSP060 Series

FEATURES

- Compact size 2 x 4 x 1.18 inches
- Certified medical safety IEC 60601-1
- Wide operation voltage 90-264 VAC
- Wide operation temperature -10℃ to +70℃
- Low earth leakage current 150μA
- Meet EN55011 and FCC Class B
- Single and dual outputs
- Over voltage protection
- Over current protection
- Compliant with RoHS requirement

SAFETY STANDARD APPROVAL

E178020

DESCRIPTION

The FSP060 series is Class-I design in 2 x 4 inches, open PCB constructed, AC/DC switching power supplies are capable of delivering 55-64 watts of continuous output power at convection cooling. All models meet EN55011 and FCC class B emission limits, and are designed for medical applications.

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 μA @ 264 VAC, 63 Hz
Touch current:	< 100 μA @ 264 VAC, 63 Hz

OUTPUT SPECIFICATIONS

Output voltage/current:	See rating chart
Maximum output power:	See rating chart
Protection:	
Over voltage:	Provided on output #1 only. Set at 112% to 132% of its nominal output voltage.
Over current:	The power supply will shut down without damage and enter auto-recovery mode.
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 500μs after a 25% step load change.

ENVIRONMENTAL SPECIFICATIONS

Operating temperature:	-20℃ to +70℃
Storage temperature:	-40℃ to +85℃
Operating humidity:	10% to 90% RH non-condensing
Storage humidity:	5% to 95% RH non-condensing
Temperature derating:	Derate from 100% at +50℃ linearly to 50% at +70℃

GENERAL SPECIFICATIONS

Switching frequency:	62 K ±5 KHz
Efficiency:	See rating chart
Hold-up time:	12 ms minimum at 110 VAC
Line regulation:	±0.5% maximum at full load
Inrush current:	30 A @ 115 VAC, or 60 A @ 230 VAC, at 25℃ cold start
Operating altitude :	3000 meters
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℃ ambient , calculated per MIL-HDBK-217F
EMC Performance (IEC60601-1-2)	
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 and D
EN61000-3-3:	Line flicker
EN61000-4-2:	ESD, ±15 KV air and ±8 KV contact
EN61000-4-3:	Radiated immunity, 10 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, 60% reduction for 100 ms, and >95% reduction for 10 ms

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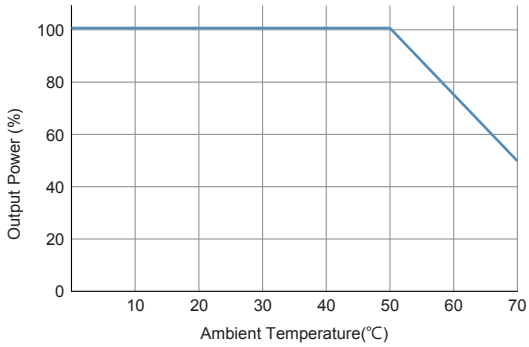
OUTPUT VOLTAGE/CURRENT RATING CHART

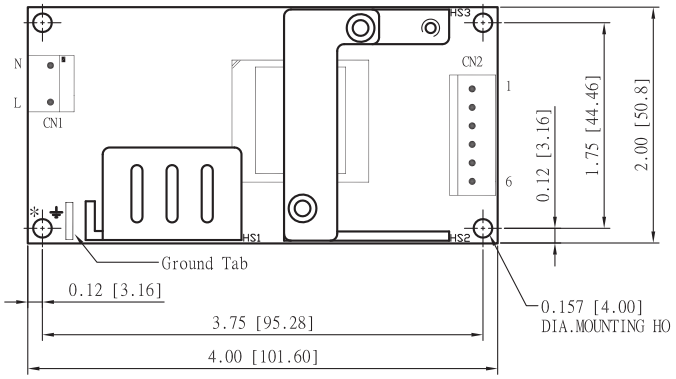
Model[1]	Output #1						Output #2					Max. Power	Average Active Efficiency (typical) @ 115 / 230 VAC
	V1	Min. Current	Max. Current at convection	Max. Current at 5 CFM[2]	Tolerance	Ripple & Noise[3]	V1	Min. Current	Max. Current	Tolerance	Ripple & Noise[3]		
FSP060-1K00M1	5 V	0 A	11.00 A	(N/A)	±2%	50 mV	(N/A)					55 W	80% / 81%
FSP060-1K20M1	12 V	0 A	5.00 A	(N/A)	±2%	120 mV	(N/A)					60 W	81% / 82%
FSP060-1K30M1	15 V	0 A	4.30 A	(N/A)	±2%	150 mV	(N/A)					64 W	82% / 84%
FSP060-1K40M1	24 V	0 A	2.70 A	(N/A)	±2%	240 mV	(N/A)					64 W	83% / 85%
FSP060-1K80M1	48 V	0 A	1.35 A	(N/A)	±2%	480 mV	(N/A)					64 W	85% / 86%
FSP060-2K30M1	+5 V	0 A	6.00 A	8.00 A	±3%	100 mV	+12 V	0.1 A	3.0 A	±5%	120 mV	55 W	79% / 81%
FSP060-2K50M1	+5 V	0 A	6.00 A	8.00 A	±3%	50 mV	+24 V	0.1 A	1.5 A	±5%	240 mV	55 W	82% / 83%

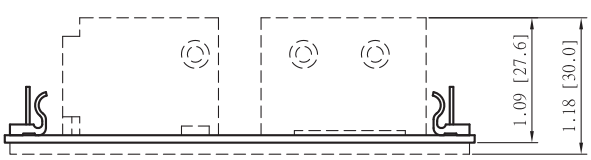
NOTES:
1. Safety approvals are for PCB form only. Please have suffix "-C" if cover fitted is ordering, e.g. FSP060-1K00M1-C.
2. Maximum current of output #1 of multi-output models can be 8 A at 5 CFM forced air provided by user.
3. Ripple and noise is maximum peak-to-peak voltage value measured at output 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.
4. 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.

OUTPUT POWER DERATING CURVE



MECHANICAL SPECIFICATIONS





NOTES:
1. Dimensions shown in inches [mm].
2. Tolerance 0.02 [0.5] maximum.
3. Connector CN1: Molex header 09-65-2038 or equivalent, mating with Molex housing 09-50-1031 or equivalent.
4. Connector CN2: Molex header 09-65-2068 or equivalent, mating with Molex housing 09-50-1061 or equivalent.
5. Ground tab is 0.25 [6.35] x 0.032 [0.8] fast-on connector.
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

Pin No.		1	2	3	4	5	6
Polarity	Single Output	+V1		V1 Return		N.C.	
	Dual Outputs	V1		Common Return		N.C.	V2