



EN60335-1



ANSI/AAMI ES60601-1



EN60601-1



IEC60601-1 TPTC004



Features

- 1.93"x0.94" compact size
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/EN60601-1
- Suitable for BF application with appropriate system consideration
- No load power consumption < 0.1W
- Extremely low leakage current
- Wide operating temp. range -35 ~ +85°C
- EMI class B for class II configuration
- Protections:
Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- 3 years warranty

Applications

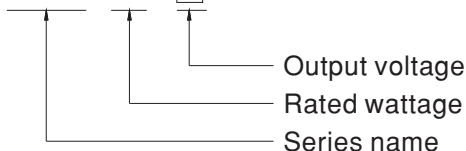
- Portable medical device
- Mobile clinical workstation
- Medical computer monitor
- Medical examination instrument

Description

MFM-15 is a 15W high density and small size (49*23.8*23mm) AC/DC on board type medical power supply series. It features the operation for 80~264VAC, a low no load power consumption less than 0.1W, a high efficiency up to 87%, Class II (no FG) double insulation, outstanding dissipation, 5G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/EN60601-1 and ANSI/AAMI ES60601-1 version three with 2xMOPP level and ultra-low leakage current (<80 μA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

Model Encoding

MFM - 15 - 5

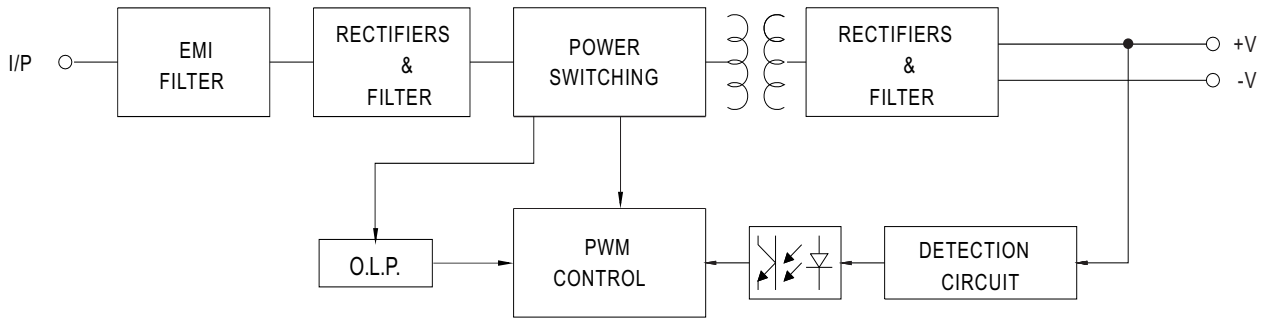


SPECIFICATION

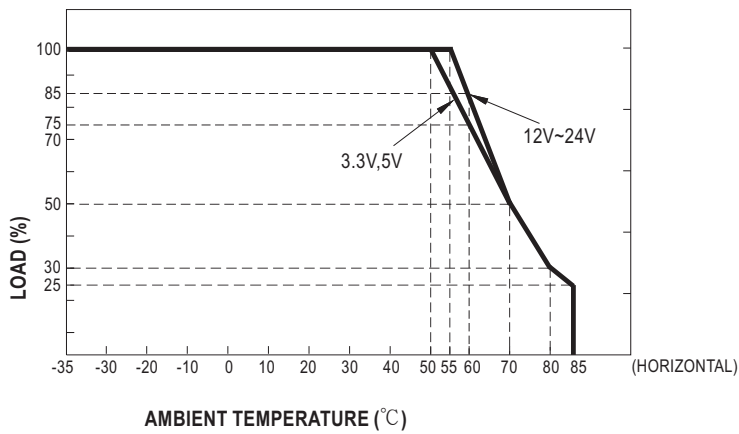
MODEL	MFM-15-3.3	MFM-15-5	MFM-15-12	MFM-15-15	MFM-15-24		
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	
	RATED CURRENT	3.5A	3A	1.25A	1A	0.63A	
	CURRENT RANGE <small>Note.2</small>	0 ~ 3.5A	0 ~ 3A	0 ~ 1.25A	0 ~ 1A	0 ~ 0.63A	
	PEAK CURRENT	3.85A	3.3A	1.38A	1.1A	0.69A	
	RATED POWER	11.6W	15W	15W	15W	15.1W	
	PEAK LOAD(10sec.) <small>Note.3</small>	12.7W	16.5W	16.6W	16.5W	16.6W	
	RIPPLE & NOISE (max.) <small>Note.4</small>	150mVp-p	150mVp-p	150mVp-p	180mVp-p	180mVp-p	
	VOLTAGE TOLERANCE <small>Note.5</small>	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%	±0.3%	
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
	SETUP, RISE TIME	1500ms, 30ms/230VAC 1500ms, 30ms/115VAC at full load					
HOLD UP TIME (Typ.)	40ms/230VAC 10ms/115VAC at full load						
INPUT	VOLTAGE RANGE <small>Note.6</small>	80 ~ 264VAC					
	FREQUENCY RANGE	47 ~ 440Hz					
	EFFICIENCY (Typ.)	83.5%	85.5%	86.5%	87%	86.5%	
	AC CURRENT (Typ.)	0.6A/115VAC 0.3A/230VAC					
	INRUSH CURRENT (Typ.)	COLD START 20A/115VAC 45A/230VAC					
LEAKAGE CURRENT (max.) <small>Note.7</small>	Touch current <80µA/264VAC						
PROTECTION	OVERLOAD	110% ~ 150% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	3.8 ~ 5V	5.8 ~ 6.8V	13.8 ~ 16.2V	17.3 ~ 20.3V	27.6 ~ 32.4V	
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
ENVIRONMENT	WORKING TEMP.	-35 ~ +85°C (Refer to "Derating Curve")					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH non-condensing					
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 55°C)					
	SOLDERING TEMPERATURE	260°C ±5°C/10sec.max.					
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes					
OPERATING ALTITUDE <small>Note.8</small>	5000 meters						
SAFETY & EMC (Note.9)	SAFETY STANDARDS	IEC60601-1, EN60601-1, IEC60335-1, EN60335-1, EAC TP TC 004, UL ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22 3 rd Edition approved					
	ISOLATION LEVEL	Primary-Secondary: 2xMOPP					
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC					
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25°C / 70% RH					
	EMC EMISSION	Parameter	Standard			Test Level / Note	
		Conducted emission	EN55011 (CISPR11)			Class B	
		Radiated emission	EN55011 (CISPR11)			Class B	
		Harmonic current	EN61000-3-2			Class A	
	Voltage flicker	EN61000-3-3			-----		
	EMC IMMUNITY	EN60601-1-2					
		Parameter	Standard			Test Level / Note	
ESD		EN61000-4-2			Level 4, 15KV air ; Level 4, 8KV contact		
RF field susceptibility		EN61000-4-3			Level 3, 10V/m(80MHz~2.7GHz) Table 9, 9~28V/m(385MHz~5.78GHz)		
EFT bursts		EN61000-4-4			Level 3, 2KV		
Surge susceptibility		EN61000-4-5			Level 3, 1KV/Line-Line		
Conducted susceptibility		EN61000-4-6			Level 3, 10V		
Magnetic field immunity		EN61000-4-8			Level 4, 30A/m		
Voltage dip, interruption	EN61000-4-11			100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods			
OTHERS	MTBF	1210Khrs min. MIL-HDBK-217F (25°C)					
	DIMENSION	49*23.8*23mm (L*W*H) or 1.93***0.94***0.91" inch					
	PACKING	0.028Kg; 200pcs/6.6Kg/0.94CUFT					
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. No minimum load required.</p> <p>3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.</p> <p>4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 µf & 47 µf parallel capacitor.</p> <p>5. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>6. Derating may be needed under low input voltages. Please check the derating curve for more details.</p> <p>7. Touch current was measured from primary input to DC output.</p> <p>8. The ambient temperature derating of 3.5°C/1000m with fanless models and of 5°C/1000m with fan models for operating altitude higher than 2000m(6500ft).</p> <p>9. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)</p>						

Block Diagram

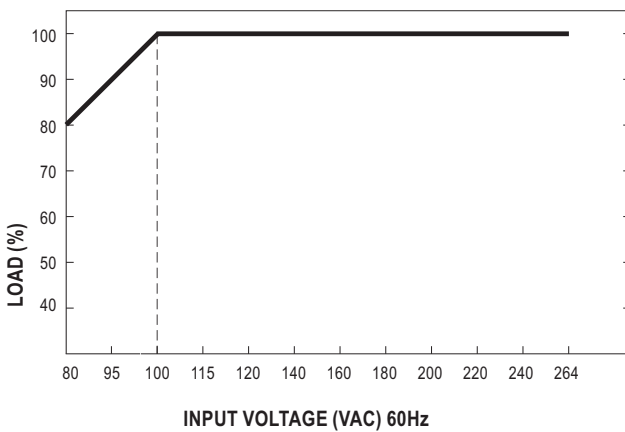
fosc: 100KHz



Derating Curve

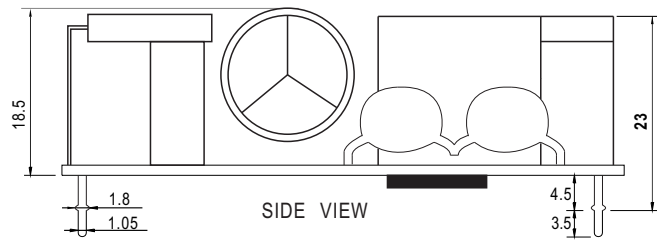
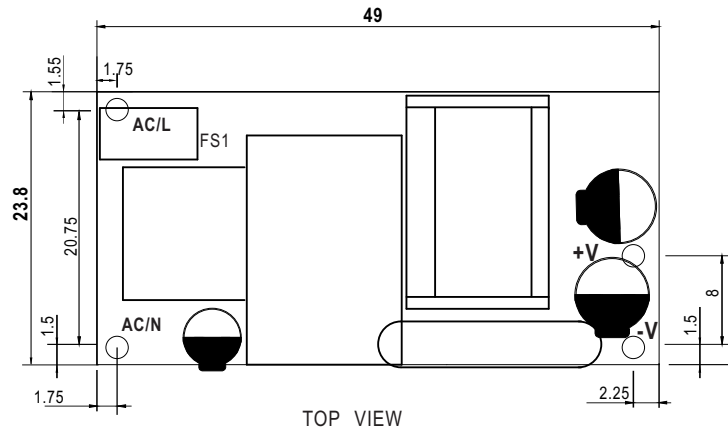


Output Derating VS Input Voltage



■ Mechanical Specification

Unit:inch(mm)



■ Installation Manual

Please refer to : <http://www.meanwell.com/manual.html>