



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

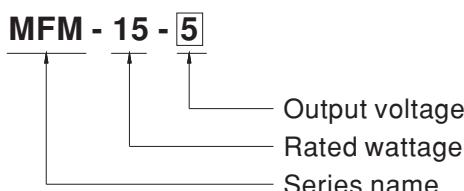
■ Applications

- 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 μ A). It is very suitable for BF (patient contact) type medical device or relevant equipment.

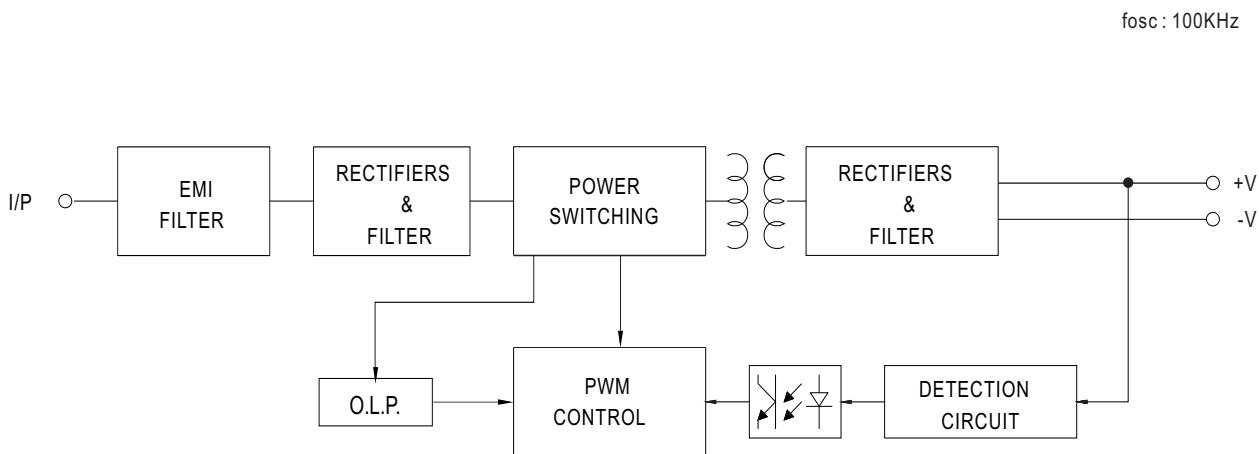
■ Model Encoding



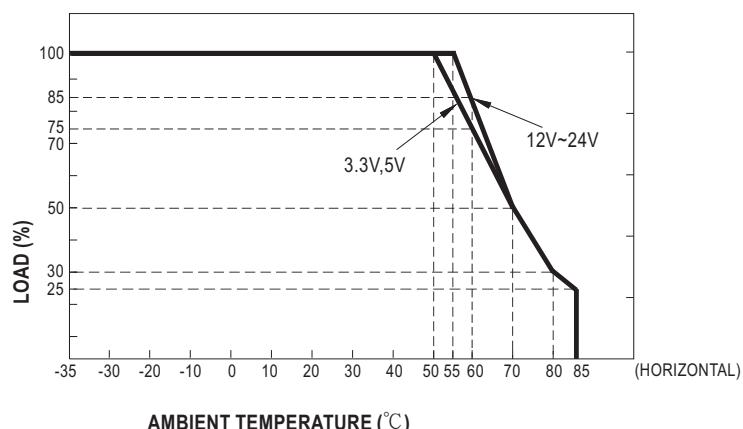
SPECIFICATION

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				
	RATED CURRENT	3.5A	3A	1.25A	1A				
	CURRENT RANGE Note.2	0 ~ 3.5A	0 ~ 3A	0 ~ 1.25A	0 ~ 1A				
	PEAK CURRENT	3.85A	3.3A	1.38A	1.1A				
	RATED POWER	11.6W	15W	15W	15.1W				
	PEAK LOAD(10sec.) Note.3	12.7W	16.5W	16.6W	16.6W				
	RISSLE & NOISE (max.) Note.4	150mVp-p	150mVp-p	150mVp-p	180mVp-p				
	VOLTAGE TOLERANCE Note.5	±2.0%	±2.0%	±2.0%	±2.0%				
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%				
	LOAD REGULATION	±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 Note.6	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						
PROTECTION	LEAKAGE CURRENT (max.) Note.7	Touch current <80 μ A/264VAC							
	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 off o/p voltage, clamping by zener diode							
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							
SAFETY & EMC (Note.9)	OPERATING ALTITUDE Note.8	5000 meters							
	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					
	EMC IMMUNITY	Voltage flicker	EN61000-3-3	-----					
		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					
OTHERS	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					
	DIMENSION	49*23.8*23mm (L*W*H) or 1.93 "/*0.94"/*0.91" inch							
NOTE	PACKING	0.028Kg; 200pcs/6.6Kg/0.94CUFT							
	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature. 2. No minimum load required. 3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power. 4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 μ f & 47 μ f parallel capacitor. 5. Tolerance : includes set up tolerance, line regulation and load regulation. 6. Derating may be needed under low input voltages. Please check the derating curve for more details. 7. Touch current was measured from primary input to DC output. 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). 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)								

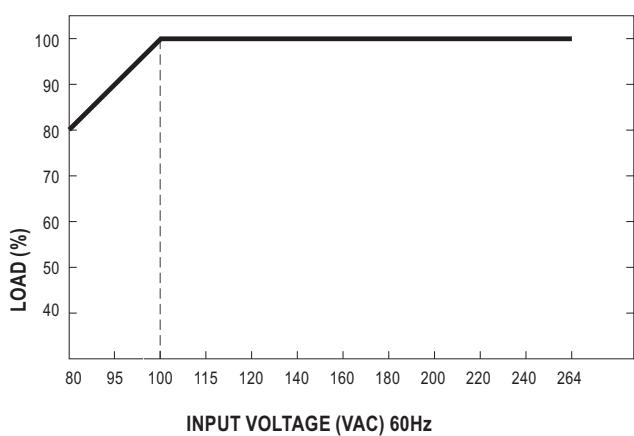
■ Block Diagram



■ Derating Curve

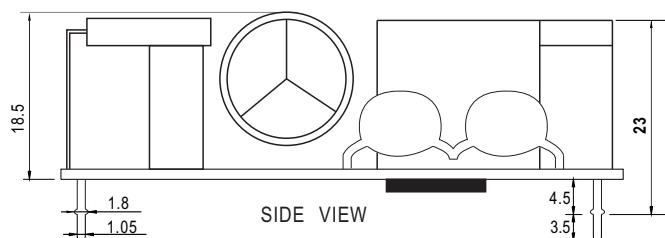
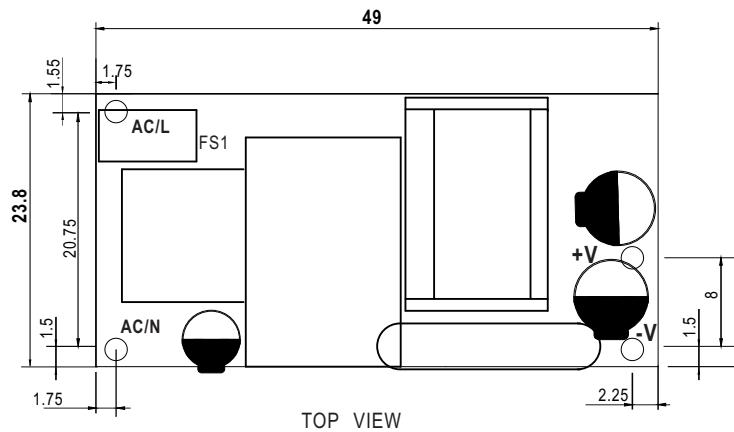


■ Output Derating VS Input Voltage



■ Mechanical Specification

Unit:inch(mm)

**■ Installation Manual**

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