



## ■ Features

- 1.65"x0.88" 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 < 0.075W
- Extremely low leakage current
- Wide operating temp. range -40 ~ +85°C
- EMI class B for class II configuration
- Protections:  
Short circuit / Overload / Over voltage / Over temperature
- No minimum load required
- Typical lifetime > 52K hours
- 3 years warranty

## ■ Applications

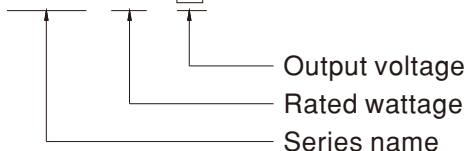
- Portable medical device
- Mobile clinical workstation
- Medical computer monitor
- Medical examination instrument

## ■ Description

MFM-05 is a 5W high density and small size (42\*22.3\*20.5mm) AC/DC on board type medical grade power supply series. It features the operation for 80~264VAC, a low no load power consumption less than 0.075W, a high efficiency up to 82%, 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

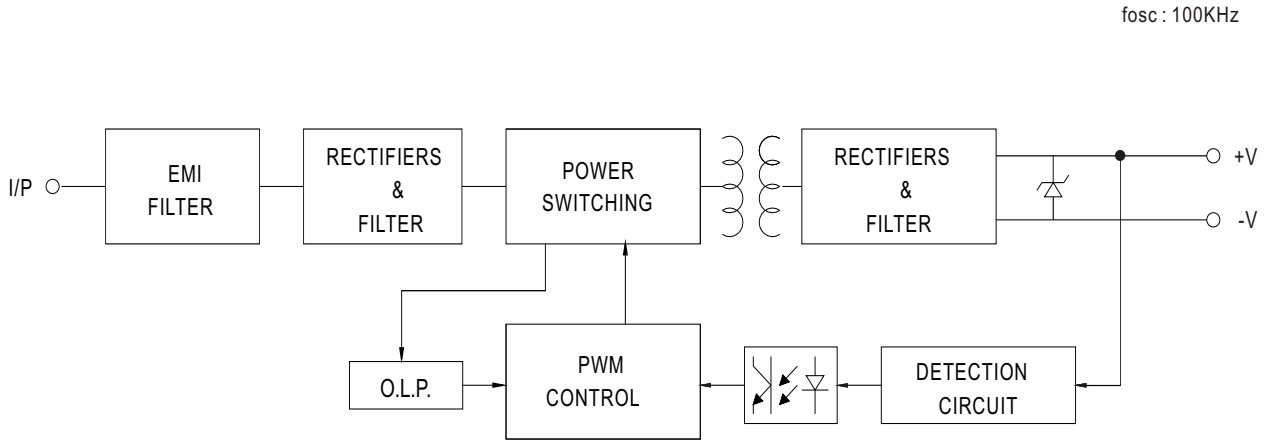
MFM - 05 - 5



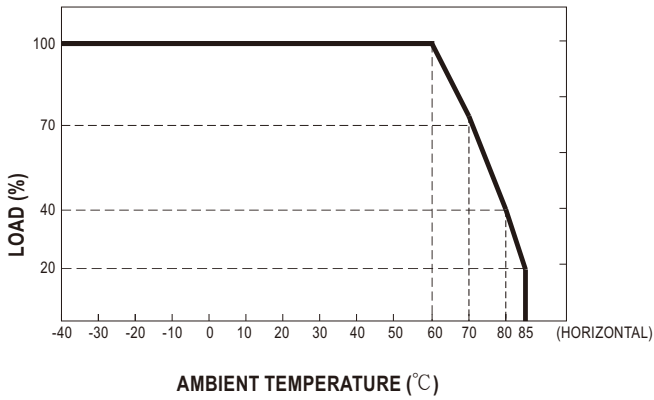
**SPECIFICATION**

MODEL		MFM-05-3.3	MFM-05-5	MFM-05-12	MFM-05-15	MFM-05-24			
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V			
	RATED CURRENT	1.25A	1A	0.42A	0.33A	0.23A			
	CURRENT RANGE <small>Note.2</small>	0 ~ 1.25A	0 ~ 1A	0 ~ 0.42A	0 ~ 0.33A	0 ~ 0.23A			
	PEAK CURRENT	1.38A	1.1A	0.46A	0.36A	0.25A			
	RATED POWER	4.1W	5W	5W	5W	5.5W			
	PEAK LOAD(10sec.) <small>Note.3</small>	4.6W	5.5W	5.5W	5.4W	6W			
	RIPPLE & NOISE (max.) <small>Note.4</small>	100mVp-p	100mVp-p	150mVp-p	150mVp-p	180mVp-p			
	VOLTAGE TOLERANCE <small>Note.5</small>	±2.5%	±2.5%	±2.5%	±2.5%	±2.5%			
	LINE REGULATION	±0.3%	±0.3%	±0.3%	±0.3%	±0.3%			
	LOAD REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%			
	SETUP, RISE TIME	1000ms, 30ms/230VAC    1000ms, 30ms/115VAC at full load							
HOLD UP TIME (Typ.)	40ms/230VAC    12ms/115VAC at full load								
INPUT	VOLTAGE RANGE <small>Note.6</small>	80 ~ 264VAC							
	FREQUENCY RANGE	47 ~ 440Hz							
	EFFICIENCY (Typ.)	74%	80%	80%	81%	82%			
	AC CURRENT (Typ.)	0.2A/115VAC    0.1A/230VAC							
	INRUSH CURRENT (Typ.)	COLD START    25A/115VAC    45A/230VAC							
	LEAKAGE CURRENT (max.) <small>Note.7</small>	Touch current <80µA/264VAC							
PROTECTION	OVERLOAD	110% ~ 180% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed							
	OVER VOLTAGE	3.8 ~ 5V	5.75 ~ 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.	-40 ~ +85°C (Refer to "Derating Curve")							
	WORKING HUMIDITY	20 ~ 90% RH non-condensing							
	STORAGE TEMP., HUMIDITY	-40 ~ +100°C, 10 ~ 95% RH non-condensing							
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 60°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, EAC TP TC 004, UL ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22 3 <sup>rd</sup> Edition approved ; Design refer to EN60335-1							
	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	EN55011 (CISPR11)			Class B			
		Radiated	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	1799.5Khrs min.    MIL-HDBK-217F (25°C)							
	DIMENSION	42*22.3*20.5mm (L*W*H) or 1.65**0.88*0.80" inch							
	PACKING	0.018Kg; 270pcs/5.8Kg/0.97CUFT							
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 &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1µf &amp; 47µf 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 <a href="http://www.meanwell.com">http://www.meanwell.com</a>)</p>								

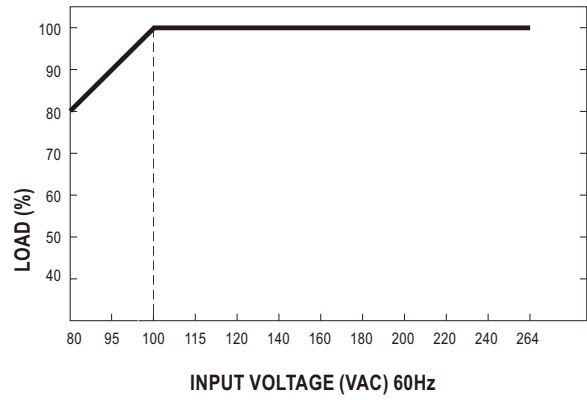
■ Block Diagram



■ Derating Curve

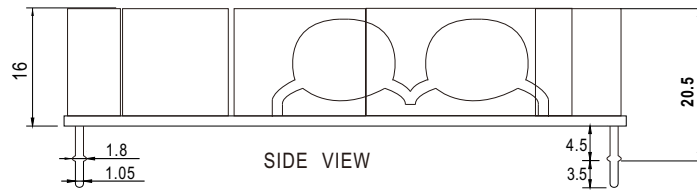
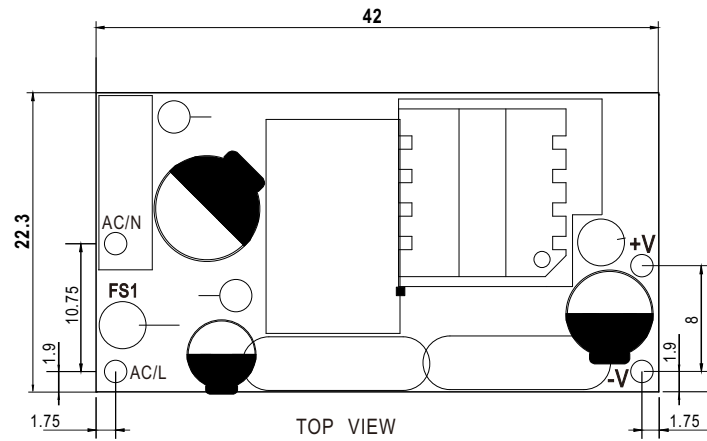


■ Output Derating VS Input Voltage



## ■ Mechanical Specification

Unit: mm



## ■ Installation Manual

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