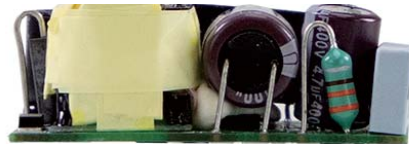




**THE DATASHEET OF  
MFM-10-24**





User's Manual



ANSI/AAMI ES60601-1 BS EN/EN60601-1 IEC60601-1 TPTC004



## Features

- 1.65"x0.88" compact size
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/BS EN/EN60601-1
- Suitable for BF application with appropriate system consideration
- No load power consumption < 0.075W
- Extremely low leakage current
- Wide operating temp. range -30 ~ +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

## GTIN CODE

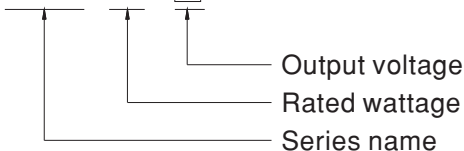
MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

## Description

MFM-10 is a 10W 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 84%, Class II (no FG) double insulation, outstanding dissipation, 5G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/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

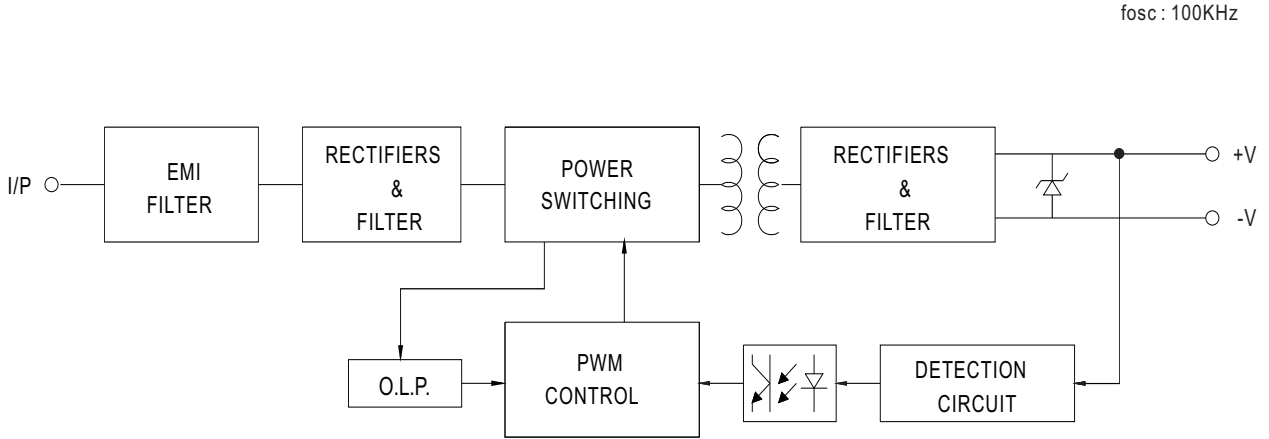
MFM - 10 - 5



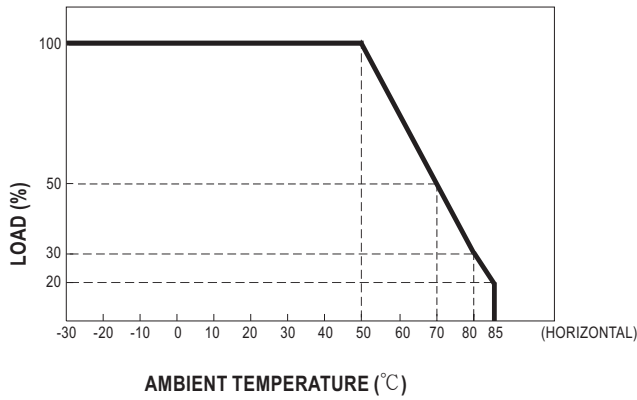
**SPECIFICATION**

MODEL	MFM-10-3.3	MFM-10-5	MFM-10-12	MFM-10-15	MFM-10-24	
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	2.5A	2A	0.85A	0.67A	0.42A
	CURRENT RANGE <small>Note.2</small>	0 ~ 2.5A	0 ~ 2A	0 ~ 0.85A	0 ~ 0.67A	0 ~ 0.42A
	PEAK CURRENT	2.75A	2.2A	0.94A	0.74A	0.46A
	RATED POWER	8.3W	10W	10.2W	10W	10W
	PEAK LOAD(10sec.) <small>Note.3</small>	9W	11W	11.3W	11.1W	11W
	RIPPLE & NOISE (max.) <small>Note.4</small>	120mVp-p	100mVp-p	180mVp-p	180mVp-p	200mVp-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    8ms/115VAC at full load					
INPUT	VOLTAGE RANGE <small>Note.6</small>	80 ~ 264VAC    113V~370VDC				
	FREQUENCY RANGE	47 ~ 440Hz				
	EFFICIENCY (Typ.)	78%	81%	83%	83%	84%
	AC CURRENT (Typ.)	0.3A/115VAC    0.2A/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.	-30 ~ +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 ~ 50°C)				
	SOLDERING TEMPERATURE	Wave soldering: 265°C, 5s (max.); Manual soldering: 390°C, 3s (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 <small>(Note 9)</small>	SAFETY STANDARDS	IEC 60601-1:2005+A1, TUV BS EN/ EN 60601-1:2006+A1+A12+A2, ANSI/AAMI ES60601-1:2005+A2 CAN/CSA C22.2 No. 60601-1:2014+A2, EAC TP TC 004 approved; Design refer to BS EN/EN60335-1 (by request)				
	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	BS EN/EN55011 (CISPR11)		Class B	
		Radiated	BS EN/EN55011 (CISPR11)		Class B	
		Harmonic Current	BS EN/EN61000-3-2		Class A	
		Voltage Flicker	BS EN/EN61000-3-3		-----	
	EMC IMMUNITY	BS EN/EN55035, BS EN/EN60601-1-2				
		Parameter	Standard		Test Level / Note	
		ESD	BS EN/EN61000-4-2		Level 4, 15KV air ; Level 4, 8KV contact	
		RF field susceptibility	BS EN/EN61000-4-3		Level 3, 10V/m (80MHz~2.7GHz) Table 9, 9~28V/m (385MHz~5.78GHz)	
		EFT bursts	BS EN/EN61000-4-4		Level 3, 2KV	
Surge susceptibility		BS EN/EN61000-4-5		Level 3, 1KV/Line-Line		
Conducted susceptibility		BS EN/EN61000-4-6		Level 3, 10V		
Magnetic field immunity		BS EN/EN61000-4-8		Level 4, 30A/m		
Voltage dip, interruption	BS EN/EN61000-4-11		100% dip 1 periods, 30% dip 25 periods, 100% interruptions 250 periods			
OTHERS	MTBF	9314.1K hrs min.    Telcordia SR-332 (Bellcore) ; 1756.2K hrs 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/0.94CUFT				
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 &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 µ F &amp; 47 µ F 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="https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf">https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf</a>)</p> <p>※ Product Liability Disclaimer : For detailed information, please refer to <a href="https://www.meanwell.com/serviceDisclaimer.aspx">https://www.meanwell.com/serviceDisclaimer.aspx</a></p>					

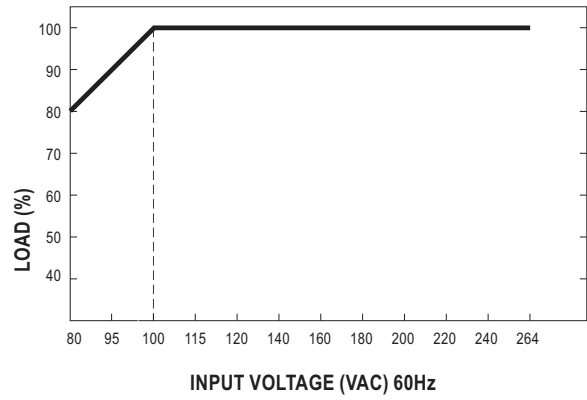
■ Block Diagram



■ Derating Curve

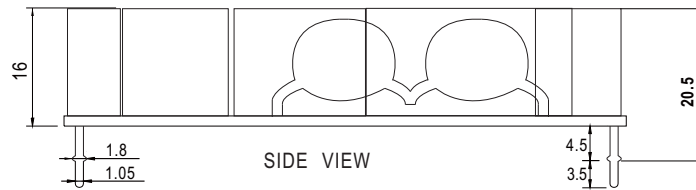
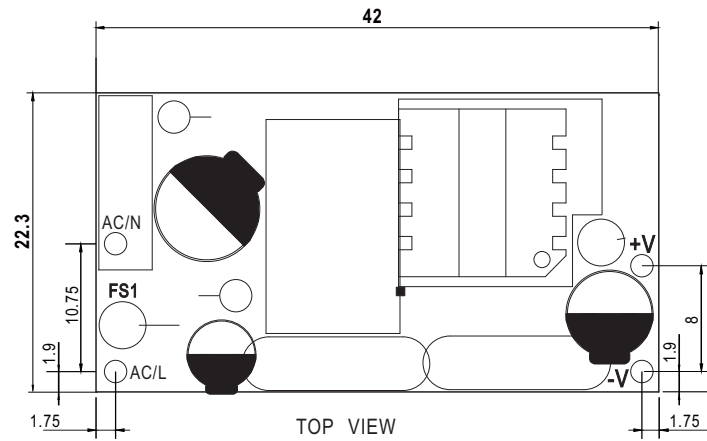


■ Output Derating VS Input Voltage



## ■ Mechanical Specification

(Unit: mm , tolerance  $\pm 0.5\text{mm}$ )



## ■ Installation Manual

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

## Looking for pricing, stock, or lifecycle information?

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