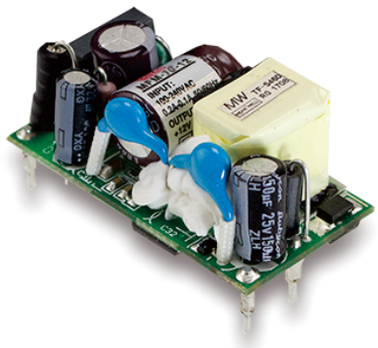
10W High Reliable Green Medical On Board Type

MFM-10 series



ANSI/AAMI ES60601-1 EN60601-1 IEC60601-1

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 -30 ~ +85℃
- 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-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/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

- 5 — Output voltage
- 10 — Rated wattage
- MFM — Series name

SPECIFICATION

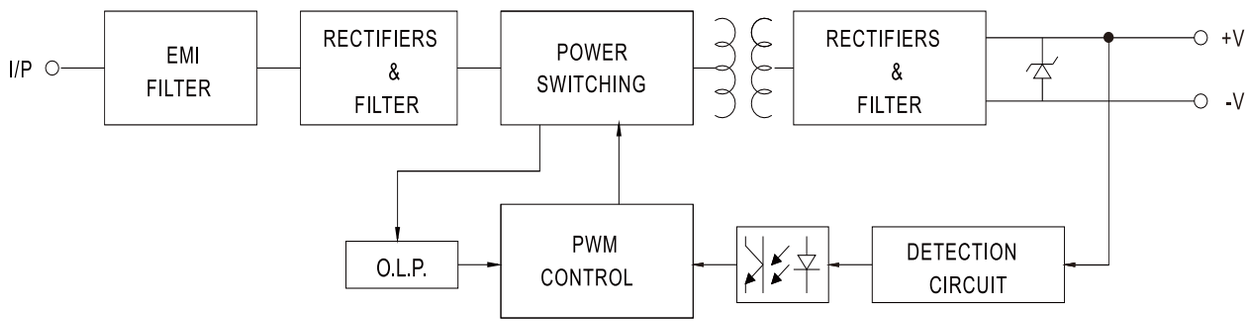
MODEL		MFM-10-3.3	MFM-10-5	MFM-10-12	MFM-10-15	MFM-10-24
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V
	RATED CURRENT	2.5A	2A	0.85A	0.67A	0.42A
	CURRENT RANGE Note.2	0 ~ 2.5A	0 ~ 2A	0 ~ 0.85A	0 ~ 0.67A	0 ~ 0.42A
	PEAK CURRENT	2.75A	2.2A	0.94A	0.74A	0.46A
	RATED POWER	8.3W	10W	10.2W	10W	10W
	PEAK LOAD(10sec.) Note.3	9W	11W	11.3W	11.1W	11W
	RIPPLE & NOISE (max.) Note.4	120mVp-p	100mVp-p	180mVp-p	180mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.5	±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 Note.6	80 ~ 264VAC				
	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.) Note.7	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
		Protection type : Shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down				
ENVIRONMENT	WORKING TEMP.	-30 ~ +85℃ (Refer to "Derating Curve")				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-40 ~ +100℃, 10 ~ 95% RH non-condensing				
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)				
	SOLDERING TEMPERATURE	260℃ ±5℃/10sec.max.				
	VIBRATION	10 ~ 500Hz, 5G 10min./1cycle, period for 60min. each along X, Y, Z axes				
	OPERATING ALTITUDE Note.8	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 3rd 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℃/ 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	1756.2Khrs min. MIL-HDBK-217F (25℃)				
	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

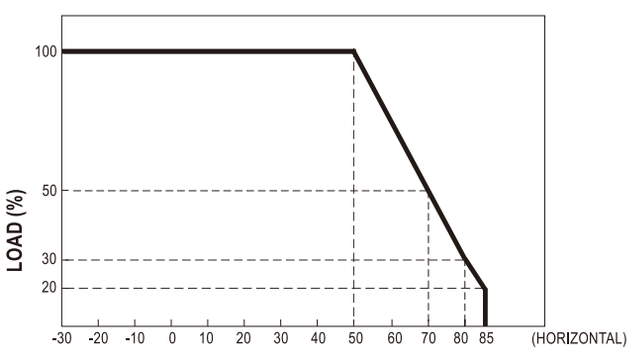
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.
2. No minimum load required.
3. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power
4. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μf & 47μf 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℃/1000m with fanless models and of 5℃/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

fosc : 100KHz

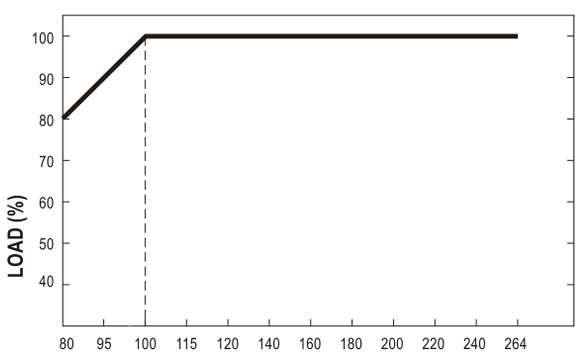


■ Derating Curve



AMBIENT TEMPERATURE (℃)

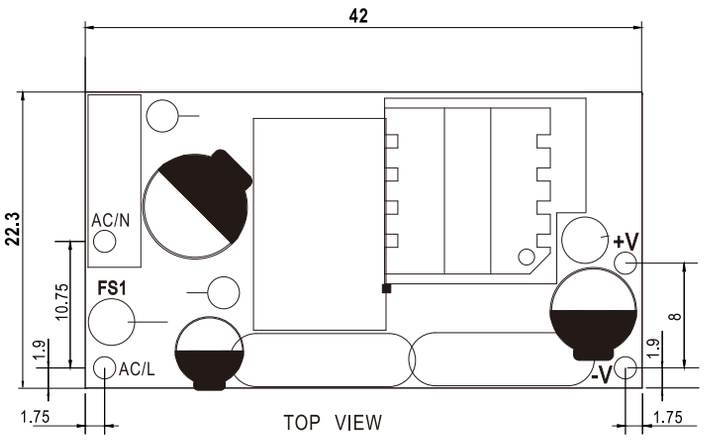
■ Output Derating VS Input Voltage

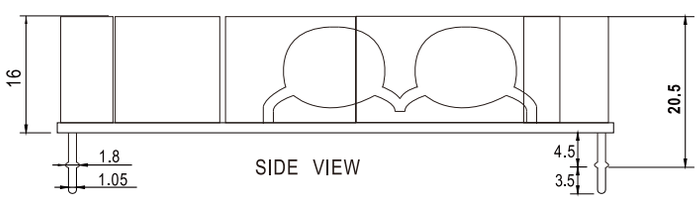


INPUT VOLTAGE (VAC) 60Hz

■ Mechanical Specification

Unit:mm





■ Installation Manual

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