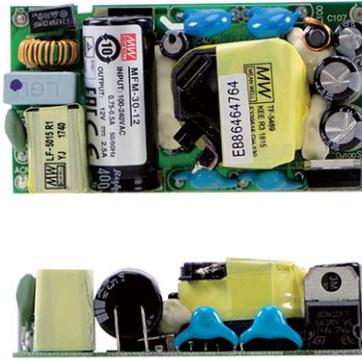




30W High Reliable Green Medical On Board Type

MFM-30 series



User's Manual



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



■ Features

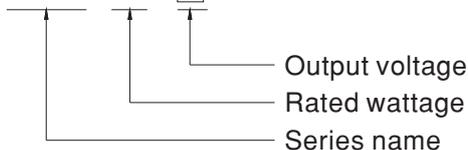
- 2.58"x1.38" compact size
- Medical safety approved (2 x MOPP) according to ANSI/AAMI ES60601-1 and IEC/BS EN/EN60601-1
- Suitable for BF application with appropriate system consideration
- No load power consumption < 0.075W
- Extremely low leakage current
- Wide operating temp. range -40 ~ +85°C
- EMI class B for class II configuration
- Protections: Short circuit / Overload / Over voltage
- No minimum load required
- 3 years warranty

■ Description

MFM-30 is a 30W high density and small size (65.5x35x23mm) AC/DC on board type medical power supply series offered in pin type . It features the operation for 80~264VAC, a low no load power consumption less than 0.075W, a high efficiency up to 91%, Class II (no FG) double insulation, outstanding dissipation, 3G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/BS EN/EN60601-1 and ANSI/AAMI ES60601-1 version three with 2 x MOPP level and ultra-low leakage current (<80µA). It is very suitable for BF (patient contact) type medical device or relevant equipment.

■ Model Encoding

MFM - 30 - 5



■ Applications

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

■ GTIN CODE

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



SPECIFICATION

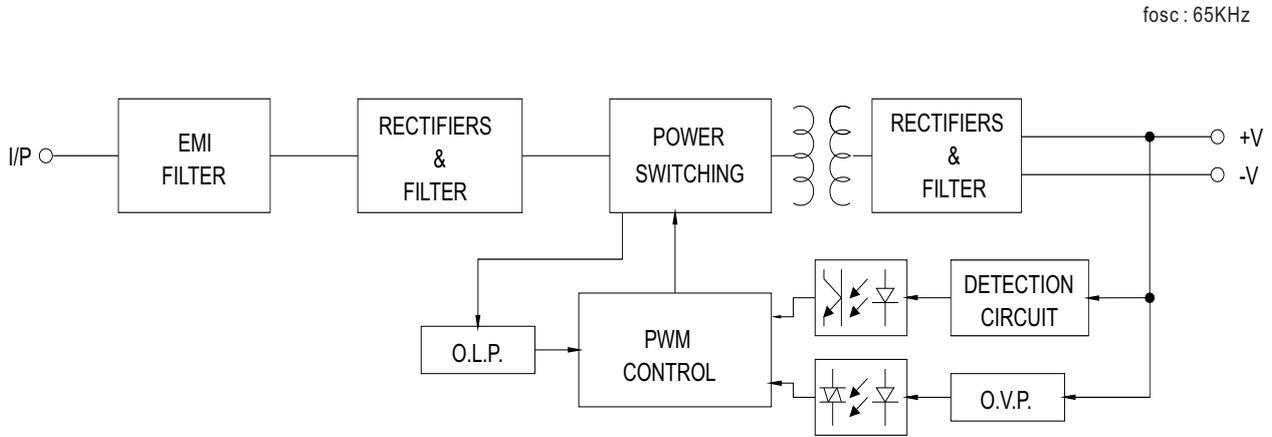
MODEL	MFM-30-3.3	MFM-30-5	MFM-30-12	MFM-30-15	MFM-30-24	MFM-30-48		
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V	
	RATED CURRENT	6A	6A	2.5A	2A	1.3A	0.63A	
	CURRENT RANGE <small>Note.2</small>	0 ~ 6A	0 ~ 6A	0 ~ 2.5A	0 ~ 2A	0 ~ 1.3A	0 ~ 0.63A	
	PEAK CURRENT	7.8A	6.9A	2.9A	2.3A	1.5A	0.73A	
	RATED POWER	19.8W	30W	30W	30W	31.2W	30.2W	
	PEAK LOAD(10sec.) <small>Note.3</small>	25.7W	34.5W	34.8W	34.5W	36W	35W	
	RIPPLE & NOISE (max.) <small>Note.4</small>	80mVp-p	80mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p	
	VOLTAGE TOLERANCE <small>Note.5</small>	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
	LOAD REGULATION	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	
	SETUP, RISE TIME	500ms, 30ms/230VAC 500ms, 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 ~ 63Hz						
	EFFICIENCY (Typ.)	82.5%	86.5%	90%	89%	90%	91%	
	AC CURRENT (Typ.)	0.75A/115VAC 0.5A/230VAC						
	INRUSH CURRENT (Typ.)	COLD START	25A/115VAC	45A/230VAC				
LEAKAGE CURRENT (max.) <small>Note.7</small>	Touch current <80 μ A/264VAC							
PROTECTION	OVERLOAD	115% ~ 165% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER VOLTAGE	3.5 ~ 4.5V	5.3 ~ 6.8V	12.6 ~ 16.2V	15.8 ~ 20.3V	25.2 ~ 32.4V	50.4 ~ 64V	
ENVIRONMENT	WORKING TEMP.	-40 ~ +85 $^{\circ}$ C (Refer to "Derating Curve")						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing						
	STORAGE TEMP., HUMIDITY	-40 ~ +85 $^{\circ}$ C, 10 ~ 95% RH						
	TEMP. COEFFICIENT	±0.03%/ $^{\circ}$ C (0 ~ 60 $^{\circ}$ C)						
	SOLDERING TEMPERATURE	Wave soldering: 265 $^{\circ}$ C, 5s (max.); Manual soldering: 390 $^{\circ}$ C, 3s (max.)						
	VIBRATION	10 ~ 500Hz, 3G 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	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 $^{\circ}$ 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	6325.8K hrs min. Telcordia SR-332 (Bellcore) ; 778.9K hrs min. MIL-HDBK-217F (25 $^{\circ}$ C)						
	DIMENSION	65.5*35*23mm (L*W*H) or 2.58**1.38**0.90" inch						
	PACKING	0.053Kg; 144pcs/8.6Kg/0.97CUFT						
NOTE	<ol style="list-style-type: none"> All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25$^{\circ}$C of ambient temperature. No minimum load required. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power. 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. Tolerance : includes set up tolerance, line regulation and load regulation. Derating may be needed under low input voltages. Please check the derating curve for more details. Touch current was measured from primary input to DC output. The ambient temperature derating of 3.5$^{\circ}$C/1000m with fanless models and of 5$^{\circ}$C/1000m with fan models for operating altitude higher than 2000m(6500ft). 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 https://www.meanwell.com/Upload/PDF/EMI_statement_en.pdf) <p>※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx</p>							



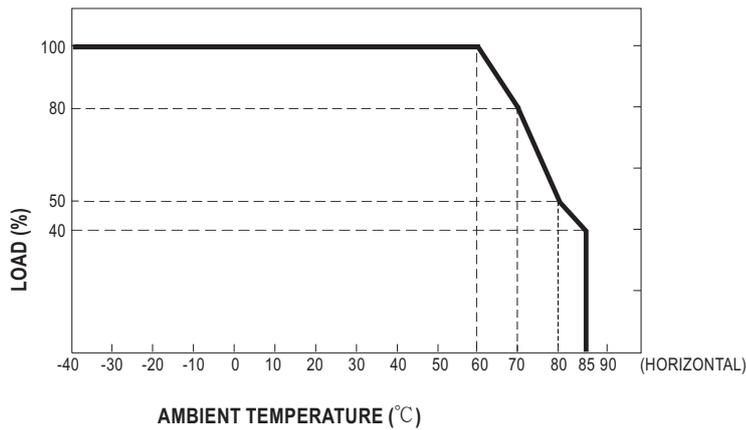
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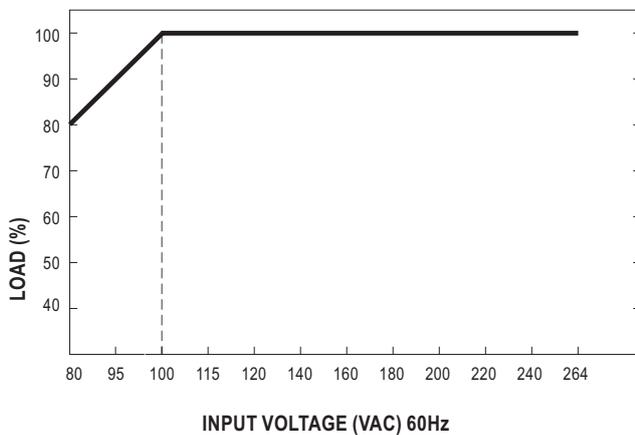
■ Block Diagram



■ Derating Curve



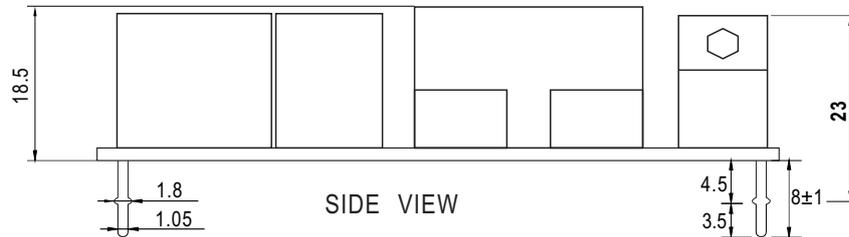
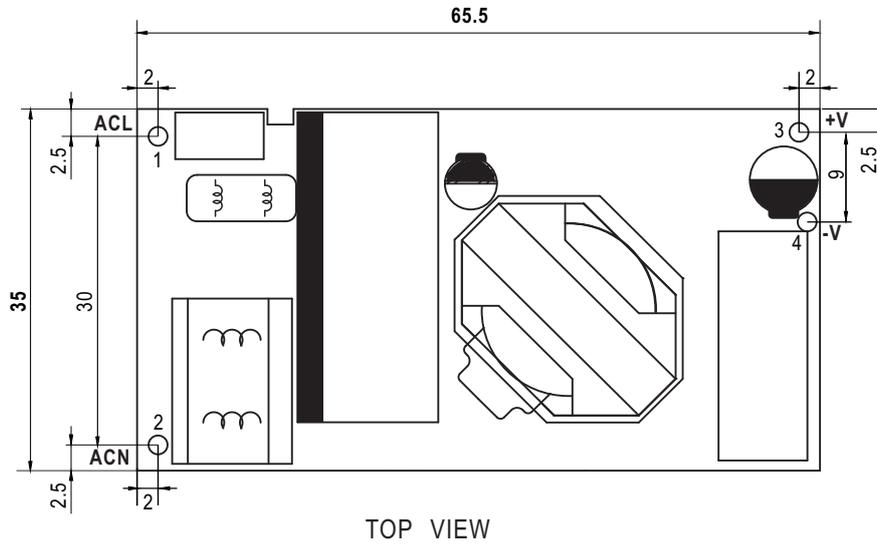
■ Output Derating VS Input Voltage





■ **Mechanical Specification**

(Unit: mm , tolerance ± 1 mm)



■ **Installation Manual**

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