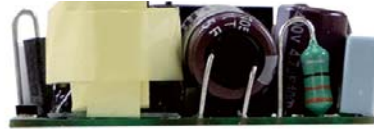




5W High Reliable Green Medical On Board Type

MFM-05 series



■ 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 -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

■ GTIN CODE

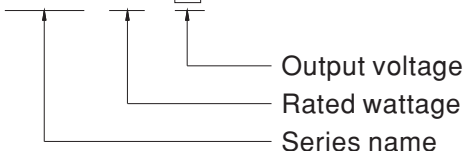
MW Search: <https://www.meanwell.com/serviceGTIN.aspx>

■ 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/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 - 05 - 5





SPECIFICATION

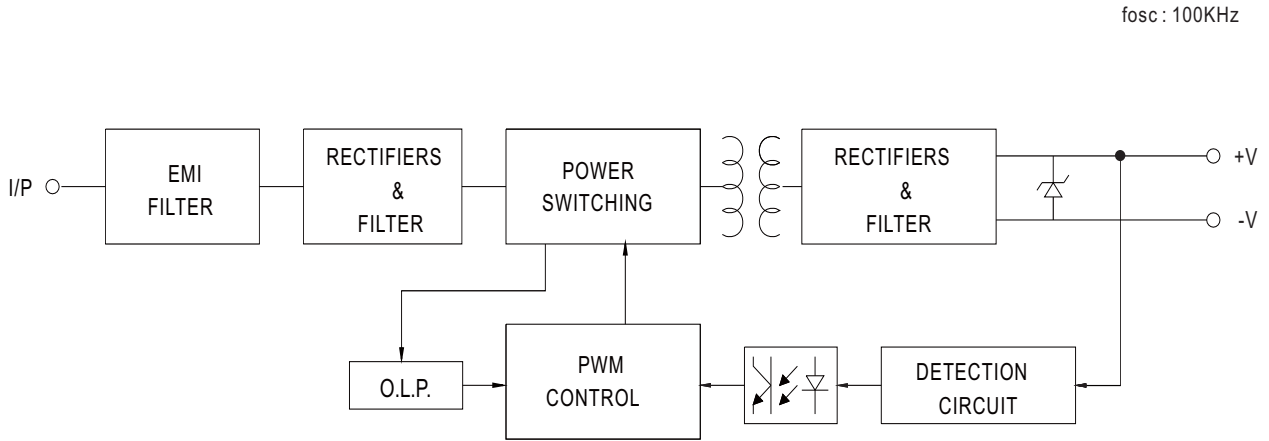
| MODEL | | MFM-05-3.3 | MFM-05-5 | MFM-05-12 | MFM-05-15 | MFM-05-24 | |
|--|--|--|-------------------------|---|------------------------|--|--|
| OUTPUT | DC VOLTAGE | 3.3V | 5V | 12V | 15V | 24V | |
| | RATED CURRENT | 1.25A | 1A | 0.42A | 0.33A | 0.23A | |
| | CURRENT RANGE <small>Note.2</small> | 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 | 113V~370VDC | | | | |
| | FREQUENCY RANGE | 47 ~ 440Hz | | | | | |
| | EFFICIENCY (Typ.) | 74% | 78% | 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 | 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+A2+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 | 9337.3K hrs min. Telcordia SR-332 (Bellcore) ; 1799.5K 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 | <ol style="list-style-type: none"> All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°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°C/1000m with fanless models and of 5°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) | | | | | | |
| ※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx | | | | | | | |



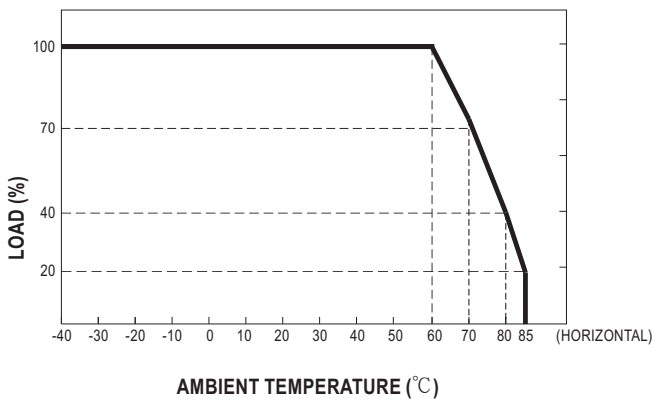
5W High Reliable Green Medical On Board Type

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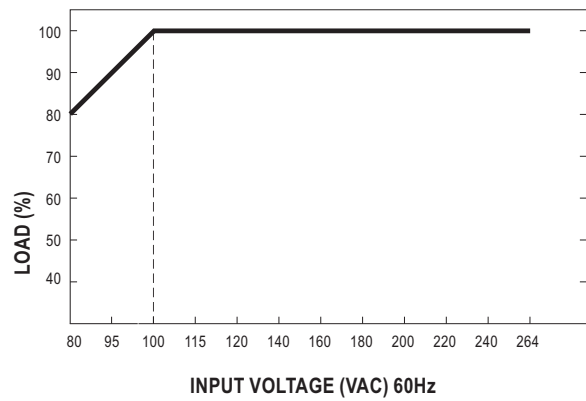
■ Block Diagram



■ Derating Curve



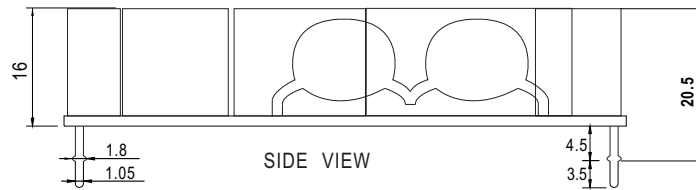
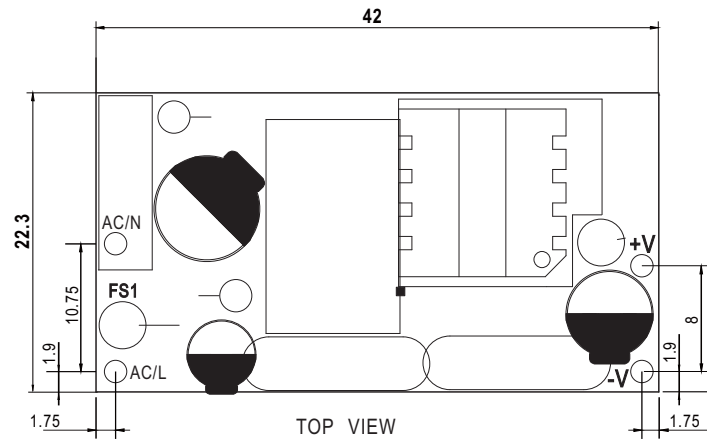
■ Output Derating VS Input Voltage





■ **Mechanical Specification**

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



■ **Installation Manual**

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