

ANSI/AAMI ES60601-1



EN60601-1



IEC60601-1



■ Features

- 2.58"x1.38" 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
- No minimum load required
- 3 years warranty

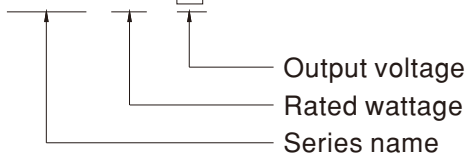
■ Applications

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

■ 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, 5G anti-vibration, high EMC performance, 4KVAC isolation, etc. The design observes IEC/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

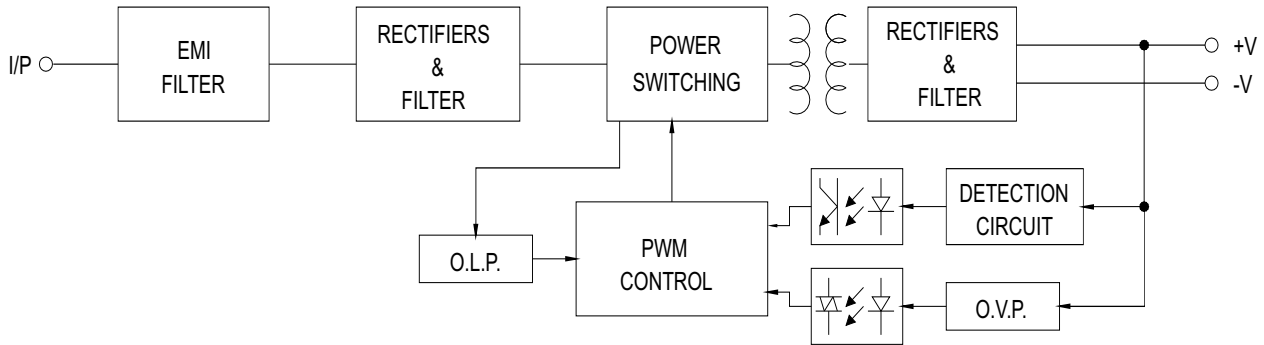
MFM - 30 - 5

SPECIFICATION

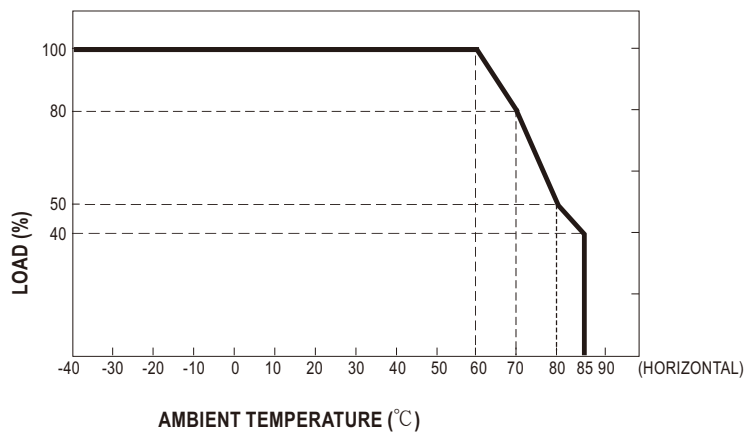
| MODEL | MFM-30-3.3 | MFM-30-5 | MFM-30-12 | MFM-30-15 | MFM-30-24 | MFM-30-48 | |
|--------------------------------------|---|--|-------------------|---|------------------------|--|------------|
| OUTPUT | DC VOLTAGE | 3.3V | 5V | 12V | 15V | 24V | 48V |
| | RATED CURRENT | 6A | 6A | 2.5A | 2A | 1.3A | 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 <80µA/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°C (Refer to "Derating Curve") | | | | | |
| | WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH | | | | | |
| | 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 <small>(Note 9)</small> | SAFETY STANDARDS | IEC60601-1, EN60601-1, EAC TP TC 004, UL ANSI/AAMI ES60601-1(3.1 version), CAN/CSA-C22 3 rd 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 | 779Khrs min. MIL-HDBK-217F (25°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 | <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 & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1 µf & 47 µf 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 http://www.meanwell.com)</p> | | | | | | |

Block Diagram

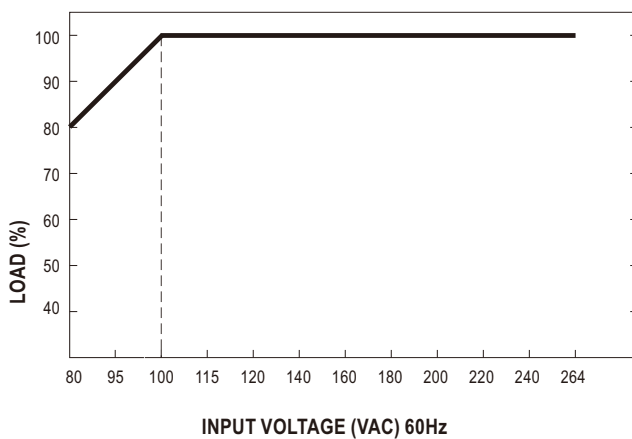
fosc : 65KHz



Derating Curve

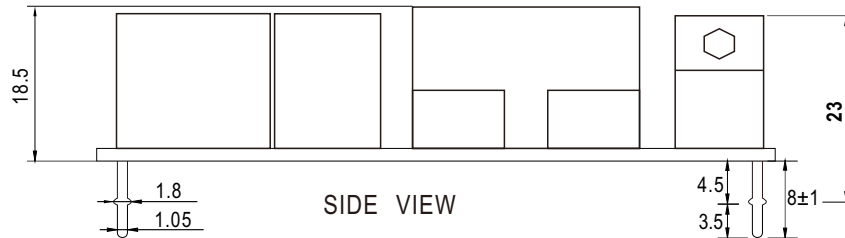
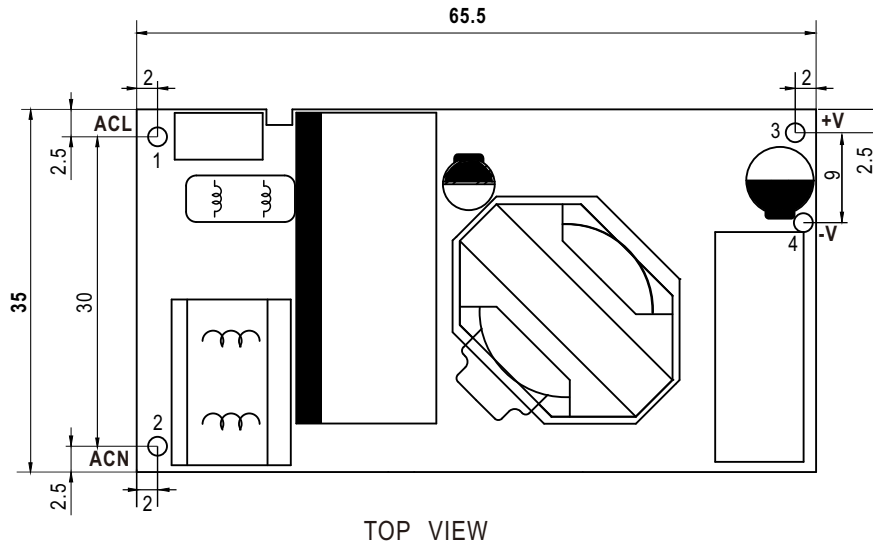


Output Derating VS Input Voltage



■ Mechanical Specification

Unit:inch(mm)



■ Installation Manual

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