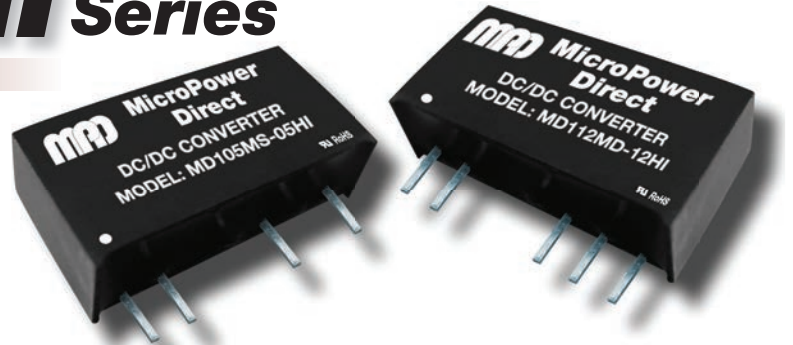


MD100MHI Series

Miniature, 1W SIP Medical Approved DC/DC Converters



Key Features:

- 1W Output Power
- 3 kVAC rms Isolation
- Reinforced Insulation
- Miniature SIP Case
- Single & Dual Outputs
- 12 Standard Models
- 2.0 MH MTBF
- Industry Standard Pin-Out
- EN 60950 Approved
- EN 60601 Approved



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Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|--------------------------------|--------------|------|------|------|-------|
| Input Voltage Range | 5 VDC Input | 4.5 | 5.0 | 5.5 | VDC |
| | 12 VDC Input | 10.8 | 12.0 | 13.2 | |
| Input Filter | LC Filter | | | | |
| Reverse Polarity Input Current | | | | 0.3 | A |

Output

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-------------------------------------|-----------------------------|------|-------|-------|----------|
| Output Voltage Accuracy | | | ±1.0 | ±3.0 | % |
| Output Voltage Balance | Dual Output, Balanced Loads | | ±0.1 | ±1.0 | % |
| Line Regulation | For Vin Change of 1% | | ±1.2 | ±1.5 | % |
| Load Regulation, See Note 1 | See Model Selection Guide | | | | |
| Ripple & Noise (20 MHz), See Note 2 | | | 100 | 150 | mV P - P |
| Ripple & Noise (20 MHz) | Over Line, Load & Temp. | | | 200 | mV P - P |
| Ripple & Noise (20 MHz) | | | | 15 | mV rms |
| Temperature Coefficient | | | ±0.01 | ±0.02 | %/°C |
| Output Short Circuit | Momentary (0.5 Sec.) | | | | |

General

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------------|------------------------|-------|------|------|---------|
| Isolation Voltage | 60 Seconds | 3,000 | | | VAC rms |
| Isolation Test Voltage | Flash Tested for 1 Sec | 4,500 | | | VPk |
| Isolation Resistance | 500 VDC | 10 | | | GΩ |
| Isolation Capacitance | 100 kHz, 1V | | 15 | 20 | pF |
| Switching Frequency | | 50 | 80 | 100 | kHz |

Environmental

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|---------------------|------|------|------|-------|
| Operating Temperature Range | Ambient | -25 | | +85 | °C |
| Operating Temperature Range | Case | | | +90 | °C |
| Storage Temperature Range | | -50 | | +125 | °C |
| Cooling | Free Air Convection | | | | |
| Humidity | RH, Non-condensing | | | 95 | % |

Physical

| | | | | | |
|---------------|--|--|--|--|--|
| Case Size | 0.87 x 0.30 x 0.49 Inches (22.0 x 7.5 x 12.5 mm) | | | | |
| Case Material | Non-Conductive Black Plastic (UL94-V0) | | | | |
| Weight | 0.13 Oz (3.9g) | | | | |

Reliability Specifications

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------|--|------|------|------|--------|
| MTBF | MIL HDBK 217F, 25°C, Gnd Benign | 2.0 | | | MHours |
| Safety Approvals | UL 60601, UL 60950, EN 60601, EN 60950 | | | | |

Absolute Maximum Ratings

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|-----------------------------|-----------------------------|------|------|------|-------|
| Input Voltage Surge (1 Sec) | 5 VDC Input | -0.7 | | 9.0 | VDC |
| | 12 VDC Input | -0.7 | | 29.0 | |
| Lead Temperature | 1.5 mm From Case For 10 Sec | | | 260 | °C |
| Internal Power Dissipation | All Models | | | 650 | mW |

Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

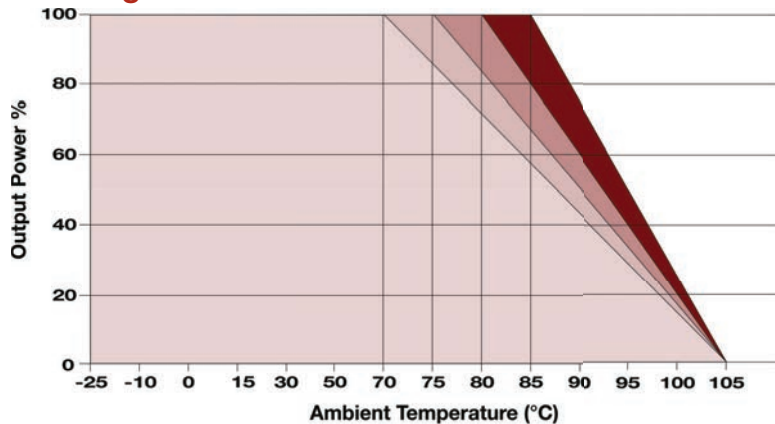
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| Model Number | Input | | | | Output | | | Load Regulation (% Max) | Efficiency (% Typ) | Fuse Rating Slow-Blow (mA) |
|--------------|---------------|-------------|--------------|---------|---------------|-------------------|-------------------|-------------------------|--------------------|----------------------------|
| | Voltage (VDC) | | Current (mA) | | Voltage (VDC) | Current (mA, Max) | Current (mA, Min) | | | |
| | Nominal | Range | Full-Load | No-Load | | | | | | |
| MD105MS-05HI | 5 | 4.5 - 5.5 | 303 | 55 | 5.0 | 200.0 | 4.0 | 10 | 66 | 500 |
| MD105MS-12HI | 5 | 4.5 - 5.5 | 291 | 55 | 12.0 | 80.0 | 2.0 | 8 | 66 | 500 |
| MD105MS-15HI | 5 | 4.5 - 5.5 | 295 | 55 | 15.0 | 65.0 | 1.0 | 8 | 66 | 500 |
| MD105MD-05HI | 5 | 4.5 - 5.5 | 303 | 55 | ±5.0 | ±100.0 | ±2.0 | 10 | 66 | 500 |
| MD105MD-12HI | 5 | 4.5 - 5.5 | 267 | 55 | ±12.0 | ±40.0 | ±1.0 | 8 | 72 | 500 |
| MD105MD-15HI | 5 | 4.5 - 5.5 | 287 | 55 | ±15.0 | ±35.0 | ±1.0 | 8 | 73 | 500 |
| MD112MS-05HI | 12 | 10.8 - 13.2 | 126 | 30 | 5.0 | 200.0 | 4.0 | 10 | 66 | 200 |
| MD112MS-12HI | 12 | 10.8 - 13.2 | 121 | 30 | 12.0 | 80.0 | 2.0 | 8 | 66 | 200 |
| MD112MS-15HI | 12 | 10.8 - 13.2 | 123 | 30 | 15.0 | 65.0 | 1.0 | 8 | 66 | 200 |
| MD112MD-05HI | 12 | 10.8 - 13.2 | 126 | 30 | ±5.0 | ±100.0 | ±2.0 | 10 | 66 | 200 |
| MD112MD-12HI | 12 | 10.8 - 13.2 | 108 | 30 | ±12.0 | ±40.0 | ±1.0 | 8 | 74 | 200 |
| MD112MD-15HI | 12 | 10.8 - 13.2 | 117 | 30 | ±15.0 | ±35.0 | ±1.0 | 8 | 75 | 200 |

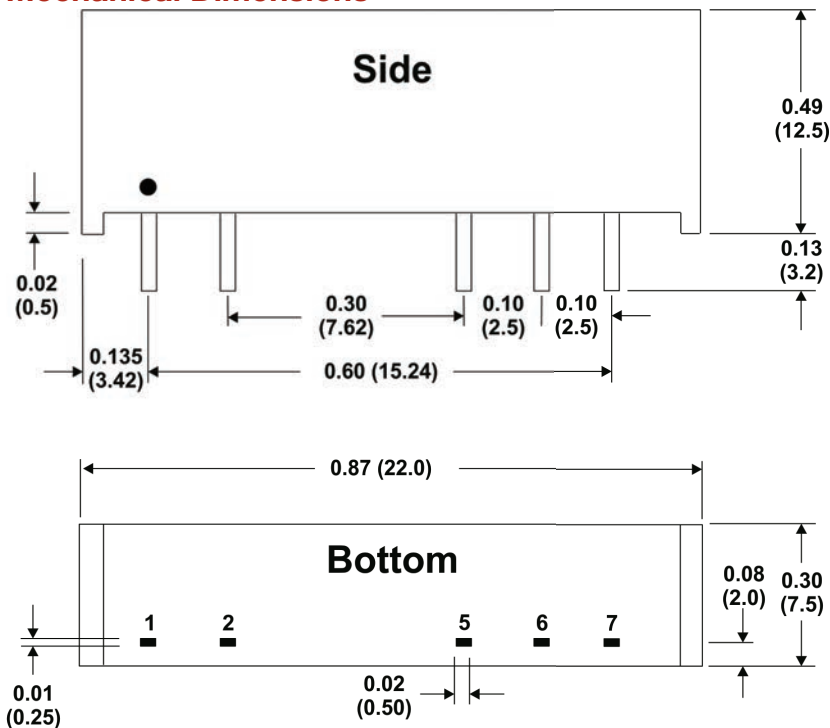
Notes:

- Output load regulation is specified for a load change of 20% to 100%.
- When measuring output ripple, it is recommended that an external 0.33 μF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- Dual output units may be connected to provide a 10 VDC, 24 VDC or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common.
- It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

Derating Curve



Mechanical Dimensions



Free Air 100 LFM 200 LFM 400 LFM

Pin Connections

| Pin | Single | Dual |
|-----|--------|--------|
| 1 | +Vin | +Vin |
| 2 | -Vin | -Vin |
| 5 | -Vout | -Vout |
| 6 | No Pin | Common |
| 7 | +Vout | +Vout |

NC: No Connection

Capacitive Load

| Single Output μF Max | Dual Output μF Max |
|----------------------|--------------------|
| 680 | ±220 |

Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)



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