# VM20W SERIES

**20 Watt DC/DC Converter**
**Single and Dual Output**
**1500 or 3500 VDC Isolation**

vitec dc conversion

## FEATURES AND APPLICATIONS

- 4:1 Input Range
- High Efficiency up to 91%
- 1500 Vdc Isolation, 3500 on request
- Low Ripple and Noise
- Continuous Short Circuit Protection
- 2 x 1 x 0.4 inches
- RoHS ✓

## GENERAL DESCRIPTION

The VM20W series is a family of 20W single and dual output DC-DC converters. These converters combine a nickel-coated copper package in a compatible case (50.8 x 25.4 x 10.2 mm) with high performance features such as 1500 VDC or 3500 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line and load regulation. Ultra wide range VM20W devices operate over 4:1 input voltage range providing stable output voltage.

Models operate with input voltages of 24 and 48Vdc offering output voltage levels of 3.3, 5, 12, 15 , ±5, ±12 and ±15Vdc. Cooling is by free-air convention.

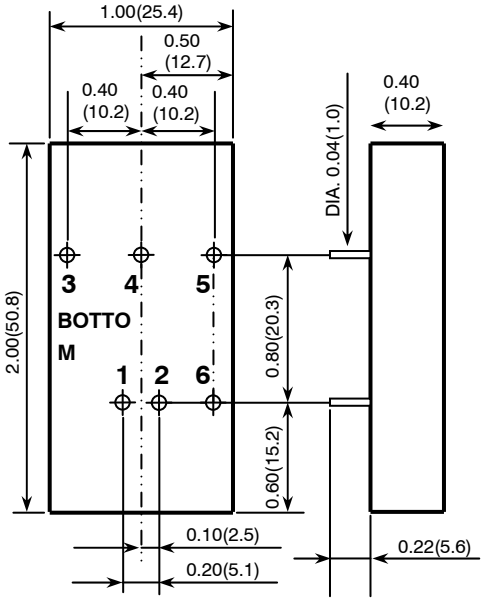
**4:1 Input single and dual Output**

| Model Number | Input Voltage Range [VDC] | Output Voltage [VDC] | Input Current No-Load [mA] 24/48 | Input Current Full Load [mA] 24/48 | Full Load Output Current [mA] | max. Capacitor Load [uF] | Efficiency [%] 24/48 |
|---|---|---|---|---|---|---|---|
| **VM20W-xx3R3S** | 9-36 18-72 | 3.3 | 50/30 | 879/440 | 5500 | 10000 | 89/89 |
| **VM20W-xx05S** | | 5 | 50/30 | 957/473 | 4000 | 6800 | 91/91 |
| **VM20W-xx12S** | | 12 | 22/15 | 980/484 | 1670 | 1000 | 89/89 |
| **VM20W-xx15S** | | 15 | 22/15 | 968/484 | 1330 | 680 | 89/89 |
| **VM20W-xx05D** | 9-36 18-72 | ± 5 | 65/40 | 969/484 | ± 2000 | ± 2000 | 89/89 |
| **VM20W-xx12D** | | ± 12 | 25/15 | 980/490 | ± 835 | ± 470 | 88/88 |
| **VM20W-xx15D** | | ± 15 | 25/15 | 980/490 | ± 665 | ± 330 | 89/89 |

* non standard output voltages on request

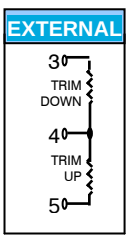
**xx** **nominal Input voltage:**
**24 (9 – 36VDC)**
**48 (18 – 75VDC)**

**Suffix H** **3,5 kVDC Isolation, on request**




## PIN Connections

| Standard | | |
|---|---|---|
| Pin | Single Output | Dual Output |
| 1 | +V Input | +V Input |
| 2 | - V Input | -V Input |
| 3 | +V Output | +V Output |
| 4 | Trim | Common |
| 5 | -V Output | -V Output |
| 6 | Remote On/Off | Remote On/Off |

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## ELECTRICAL SPECIFICATIONS

Specifications typical at +25°C, nominal Input voltage, rated output current unless otherwise specified.

### Input Specifications

| | |
|---|---|
| 4:1 Input Voltage Range | see table |
| Input Filter | Pi-Type |
| Start up Time | 20mS, typ. |
| Under Voltage Lockout | on / off |
| 24V input | 8.6 Vdc / 7.9 Vdc, typ. |
| 48V input | 17.8 Vdc / 16.0 Vdc, typ. |
| Input Current | see table |
| Input Reflected Ripple Currents | 20mA pk-pk * |

* measured with a simulated source inductance of 12uH

Remote ON/OFF Control

ON 3 to 12 Vdc or open circuit

OFF 0 to 1,2 Vdc or Short circuit Pin2 and Pin6

(OFF idle current 5mA typ.)

Control voltage referenced to negative input (Pin2)

### General Specifications

| | |
|---|---|
| Efficiency | 88% to 91%, see table |
| Switching Frequency | 330 kHz, typ. |
| Isolation Voltage | 1500 VDC, Standard |
| | 3500 VDC, H-Option (on request) |
| Isolation Capacitance | 1.2 nF, typ. |
| Isolation Resistance | $10^9$ Ohms, min. |
| MTBF (MIL-HDBK-217 F) | >560 khrs |

### Physical Characteristics

| | |
|---|---|
| Dimensions | 50.8 x 25.4 x 10.2 mm |
| | 2.0 x 1.0 x 0.4 inches |
| Case Material | Nickel-Coated Copper with Non-conductive Base |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | 30g |

### Output Specifications

| | |
|---|---|
| Output Voltage Accuracy | ±1%, max. |
| Output Voltage Trim | ±10%, max.; (Single output only) |
| Ripple and Noise (20 MHz BW) | 75 mVp-p, max. (measured with 1uF ceramic capacitor) |
| Line Voltage Regulation | ±0.5%, max. |
| Load Voltage Regulation | (0% to 100% Loading) |
| | Single output: ±0,5%, max. |
| | Dual output: ±1% (balanced output) |
| Cross Regulation (Dual Output) | ±5%, (25% to 100% Loading) |
| Temperature Coefficient | ±0.02%/°C |
| Short Circuit Protection | Continuous (Automatic Recovery) |
| Over Current Protection | 120% of Full Load, typ. |
| Max. Capacitve Load | see table |
| Over Voltage Protection | Zener Diode |

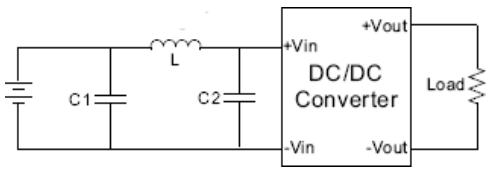
### Environmental Specification (Reference)

| | |
|---|---|
| Operating Temperature | -40°C to +85°C |
| | derating above 65°C |
| Max. Case Temperature | +105°C |
| Storage Temperature | -40°C to +125°C |
| Cooling | Free-air Convection |
| EMI/RFI * | EN55022 Class A |
| ESD | EN61000-4-2, Perf. Criteria B |
| RS | EN61000-4-3, Perf. Criteria A |
| EFT** | EN61000-4-4, Perf. Criteria B |
| Surge** | EN61000-4-5, Perf. Criteria B |
| CS | EN61000-4-6, Perf. Criteria A |
| PFMF | EN61000-4-8, Perf. Criteria A |

* with external input filter (see below)

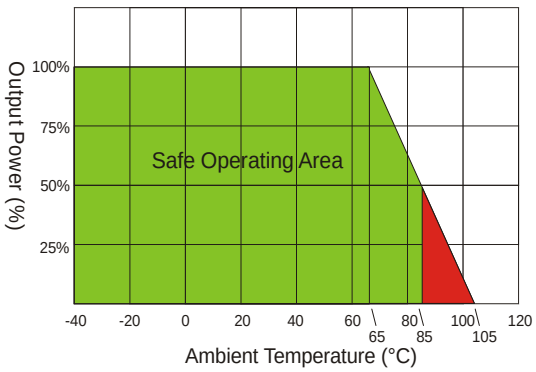
** an external filter capacitor is required: Nippon KY series, 220uF/100

Suggest adding external input filter to meet conducted emissions:




| | L | C1 | C2 |
|---|---|---|---|
| VM20W-Series | 12uH | 2.2uF/100V | 2.2uF/100V |

Derating VM20W:




Specifications can be changed without prior notice

Products are not intended for and must not be used in life support systems, human implantation, nuclear facilities or systems or any other application where product failure or malfunction of the component could lead to loss of life or catastrophic property damage

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