

FEATURES AND APPLICATIONS

- Ultra Wide 4:1 Input range
- 2" x 2" Package
- Regulated Output Voltage
- High Efficiency up to 92%
- 1500 Vdc Isolation
- Adjustable Output Voltage
- Remote On/Off Control
- Continuous Short Circuit Protection
- Overvoltage and Overcurrent Protection
- Over Temperature Protection
- Soft Start
- RoHS ✓



GENERAL DESCRIPTION

The VM40W series is a family of 40 W single output DC-DC converters with 1.5 kVdc isolation. These converters achieve miniature package in a 2" x 2" compatible case with high performance features and a short circuit protection with automatic restart and tight line/load regulation. Wide range devices operate over 4:1 Input voltage range providing stable output voltage. Models operate from an input bus voltage of 24 and 48 Vdc offering output voltage levels of 3.3, 5, 12, 15, ± 12 or ± 15 Vdc.

4:1 Input, Single and Dual Output								
Model Number	Input Voltage Range [Vdc]	Output Voltage [Vdc]	Input Current		Full Load Output Current [mA]	Ripple & Noise max. [mVpp]	Capacitor Load max. [μ F]	Efficiency [%] 24/48
			No-Load [mA] 24/48	Full Load [mA] 24/48				
VM40W-xx3R3S	9-36 18-75	3.3	80/60	1598/799	10000	50	25000	89/89
VM40W-xx05S		5.0	100/60	1893/936	8000	50	13000	91/92
VM40W-xx12S		12.0	50/30	1925/963	3350	75	2300	90/90
VM40W-xx15S		15.0	50/30	1904/941	2650	75	1500	90/91
VM40W-xx12D		± 12.0	60/30	1919/948	± 1650	150	± 1200	89/90
VM40W-xx15D		± 15.0	60/30	1962/970	± 1350	150	± 750	89/90

* non-standard output voltages on request

xx ... nominal input voltage:

24 (9 – 36Vdc)
48 (18 – 75Vdc)

Suffix -HS Heat Sink Option

ELECTRICAL SPECIFICATIONS

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

Input Specifications

Voltage Range	24 Vdc, 9-36 Vdc 48 Vdc, 18-75 Vdc
Under Voltage Lockout (On/Off)	24 Vdc: 8.6 Vdc / 7.9 Vdc typ. 48 Vdc: 17.8 Vdc / 16.0 Vdc typ.
Filter	Pi-Network
Start up Time	25mSec, typ.
Input Reflected Ripple Currents	20mA pk-pk <small>(Measured with a simulated source inductance of 12 µH)</small>
Input Surge Voltage (100 ms)	24V input: -0.7 to 50 Vdc, max. 48V input: -0.7 to 100 Vdc, max.

Output Specifications

Voltage Accuracy	±1%, max.
Output Voltage Adjustability (Trim)	±10%, max. (Details see Page 3)
Ripple and Noise (20 MHz BW)	see Table <small>(Measured with a 1.0 µF ceramic capacitor)</small>
Short Circuit Protection	Continuous (Hiccup)
Short Circuit Restart	Automatic
Over Load Protection	130% of FL, typ.
Over Voltage Protection (Zener Diode Clamp)	3.3 Vout: 3.9 V 15 Vout: 18 V 5 Vout: 6.2 V ±12 Vout: ±15 V 12 Vout: 15 V ±15 Vout: ±18 V
Line Voltage Regulation	±0.5%, max.
Load Voltage Regulation	±0.5%, max. (single output) ±1.0%, max. (dual output)
Cross Regulation	±5.0%, max.
Temperature Coefficient	±0.2%/°C
Transient Recovery Time	250 µs, typ.
Transient Response Deviation	±3.0%, max.

Remote ON/OFF Control

Control voltage referenced to negative (-) input (Pin 2)	
ON-Control	3V-12Vdc or open
OFF-Control	0V-1.2V or short Pin 2 and Pin 3
Off Idle Current: 5 mA typ.	

EMC Characteristics

Radiated Emissions	EN55022 Class A
Conducted Emissions *	EN55022 Class A
<small>*The VM40W series can meet EN55022 Class A with an external filter in parallel to the input pins</small>	
EN61000-4-2 (ESD)	Perf. Criteria A
EN61000-4-3 (RS)	Perf. Criteria A
EN61000-4-4 (EFT)*	Perf. Criteria A
EN61000-4-5 (Surge) *	Perf. Criteria A
<small>*An external Capacitor is required; Suggestion Nippon chemi-con KY series, 220µF/100V</small>	
EN61000-4-6 (CS)	Perf. Criteria A
EN61000-4-8 (PFMF)	Perf. Criteria A

Environmental Specification

Operating Temperature	-40°C to +85°C derating above +55°C
Max. Case Temperature	+105°C
Storage Temperature	-40°C to +125°C
Over Temp. Protection	110°C, typ. (Case)
Cooling	Free-air convection

General Specification

Efficiency	see table
Switching Frequency	270 kHz, typ.
I/O Isolation Voltage	1500 Vdc (3 sec.)
Isolation Capacitance	2500 pF, max.
Isolation Resistance	10 ⁹ Ω, min.
Safety Standard	IEC/EN 60950-1 (designed to meet)
MTBF (MIL-HDBK-217 F)	> 151 khrs
Humidity	95% rel H

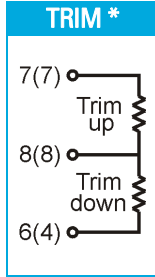
Physical Characteristics

Dimension	50.8 x 50.8 x 10.2 mm 2.0 x 2.0 x 0.40 inches
Weight	60.0 g
Case Material	Nickel-Coated Copper Metal
Pin Material	Dia 1.0 mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Soldering Temperature	260°C max. (1.5mm from case 10 sec. max.)

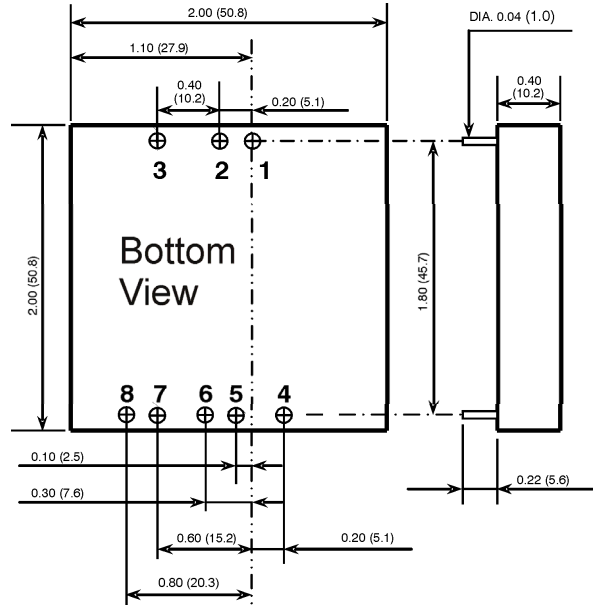
CAUTION: This power module is not internally fused. An input line fuse must always be used!

MECHANICAL SPECIFICATIONS

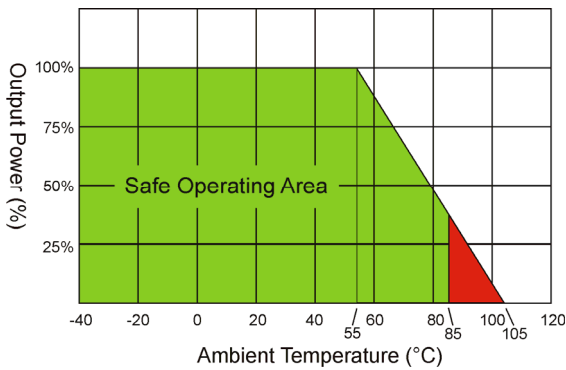
Standard Isolation		
Pin	Single Output	Dual Output
1	+ V Input	+ V Input
2	-V Input	-V Input
3	CTRL	CTRL
4	- Sense	+ V Output
5	+Sense	COM
6	+ V Output	COM
7	-V Output	-V Output
8	TRIM	TRIM



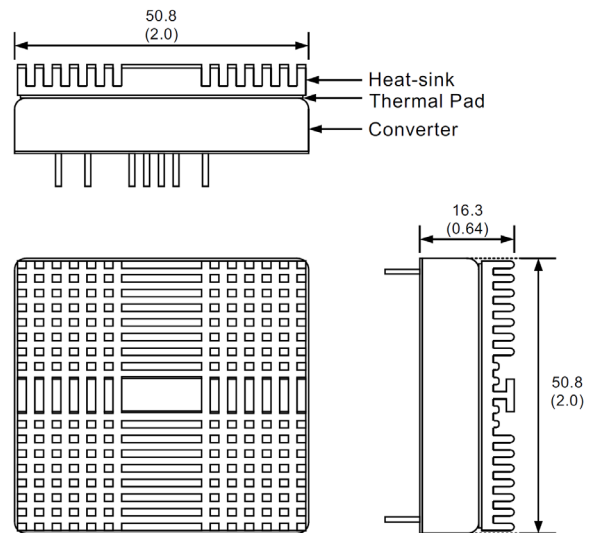
* Output can be externally trimmed. Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +sense should be connected to its corresponding +OUTPUT and likewise the -sense should be connected to its corresponding -OUTPUT.



Derating VM40W-Series



Heat Sink Option (Suffix -HS)



Weight: 22g (without converter)

Notes:

All dimensions in millimeters (inches).

Tolerance $\pm 0.25\text{mm}$ (0.01).

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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