

FEATURES AND APPLICATIONS

- Ultra Wide 4:1 Input Range
- 1" x 1" Package
- Regulated Output Voltage
- High Efficiency up to 89%
- 1500 Vdc Isolation, 3500 Vdc on request
- RoHS ✓
- Mobile/Battery Driven Applications
- Distributed Power Networks
- Data Communications Equipments
- Telecommunication Instruments
- Process/Machine Control Equipments

GENERAL DESCRIPTION

The VM15QW series is a family of 15W single & dual output DC-DC converters with 1.5kVdc isolation. These converters achieve miniature package in a 1" x 1" 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 48Vdc offering output voltage levels of 3.3, 5, 12, 15, ±5, ±12 or ±15Vdc.

4:1 Input single and dual Output							
Model Number	Input Voltage Range [Vdc]	Output Voltage [Vdc]	Input Current		Full Load Output Current [mA]	max. Capacitor Load [µF]	Efficiency [%] 24/48
			No-Load [mA] 24/48	Full Load [mA] 24/48			
VM15QW-xx3R3S	9-36 18-75	3.3	15/10	647/331	4000	1000	86/84
VM15QW-xx05S		5.0	15/10	727/368	3000	1000	87/86
VM15QW-xx12S		12.0	15/10	747/378	1300	330	88/87
VM15QW-xx15S		15.0	15/10	710/360	1000	220	89/88
VM15QW-xx05D	9-36 18-75	± 5.0	15/10	744/376	± 1500	± 470	85/84
VM15QW-xx12D		± 12.0	15/10	718/363	± 625	± 220	88/87
VM15QW-xx15D		± 15.0	15/10	710/359	± 500	± 100	89/88

* non standard output voltages on request

xx nominal input voltage:
 24 (9 – 36 Vdc)
 48 (18 – 75 Vdc)
 Suffix H 3.5 kVdc isolation, on request

ELECTRICAL SPECIFICATIONS

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

Input Specifications

Voltage Range	24Vdc, 9-36Vdc 48Vdc, 18-75Vdc
Under Voltage Lockout (On/Off)	24Vdc: 8.5Vdc/7Vdc typ. 48Vdc: 17Vdc/15Vdc typ.
Filter	Pi-Network
Start up Time	20mSec, typ.
Input Reflected Ripple Currents	20mA pk-pk
<small>(Measured with a simulated source inductance of 12 μH and a source capacitor C_{in} = 47 μF)</small>	

Output Specifications

Voltage Accuracy	$\pm 1\%$, max.
Output Voltage Adjustability (Trim)	$\pm 10\%$, max. (Single Output only)
Ripple and Noise (20 MHz BW)	100 mVp-p, max. <small>(Measured with a 1.0 μF ceramic capacitor and 10 μF tantalum capacitor.)</small>
Short Circuit Protection	Continuous
Short Circuit Restart	Automatic
Current Limiting	170% of max. Iout, typ.
Over Voltage Protection	Zener Diode Clamp
Line Voltage Regulation	$\pm 0.2\%$, max.
Load Voltage Regulation	$\pm 0.5\%$, max. (Single Models) $\pm 1.0\%$, max. (Dual Models)
Cross Regulation (Dual Output)	$\pm 5.0\%$, max. <small>(One load is 25% to 100%, the other load is 100% load)</small>
Transient Recovery Time	250 μ s, typ.
Transient Response Deviation	$\pm 3.0\%$, max.

EMC Characteristics

EMI/RFI *	EN55022 Class A
<small>*with External Input Filter – see Filter Schematic below</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

Remote ON/OFF Control

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

Environmental Specification

Operating Temperature	-40°C to +85°C derating above 66°C
Max. Case Temperature	+105°C
Storage Temperature	-40°C to +125°C
Cooling	Free-air convection

General Specification

Efficiency	see table
Switching Frequency	375 kHz, typ.
I/O Isolation Voltage	1500 Vdc (3 sec.)
Isolation Capacitance	1200 pF, max.
Resistance	$10^9 \Omega$, min.
Safety Standard	IEC/EN 60950-1 (designed to meet)
MTBF (MIL-HDBK-217 F)	> 560 khrs
Humidity	95% rel H

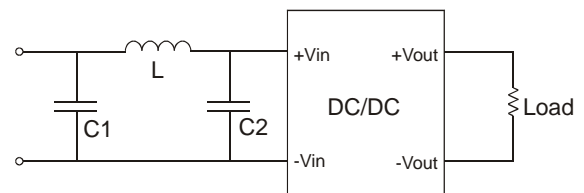
Physical Characteristics

Dimension	25.4 x 25.4 x 10.16 mm 1.0 x 1.0 x 0.4 inches
Weight	18.0 g
Case Material	Nickel-Coated Copper Metal
Base Material (UL94V-0 rated)	Non-conductive Black Plastic
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.)

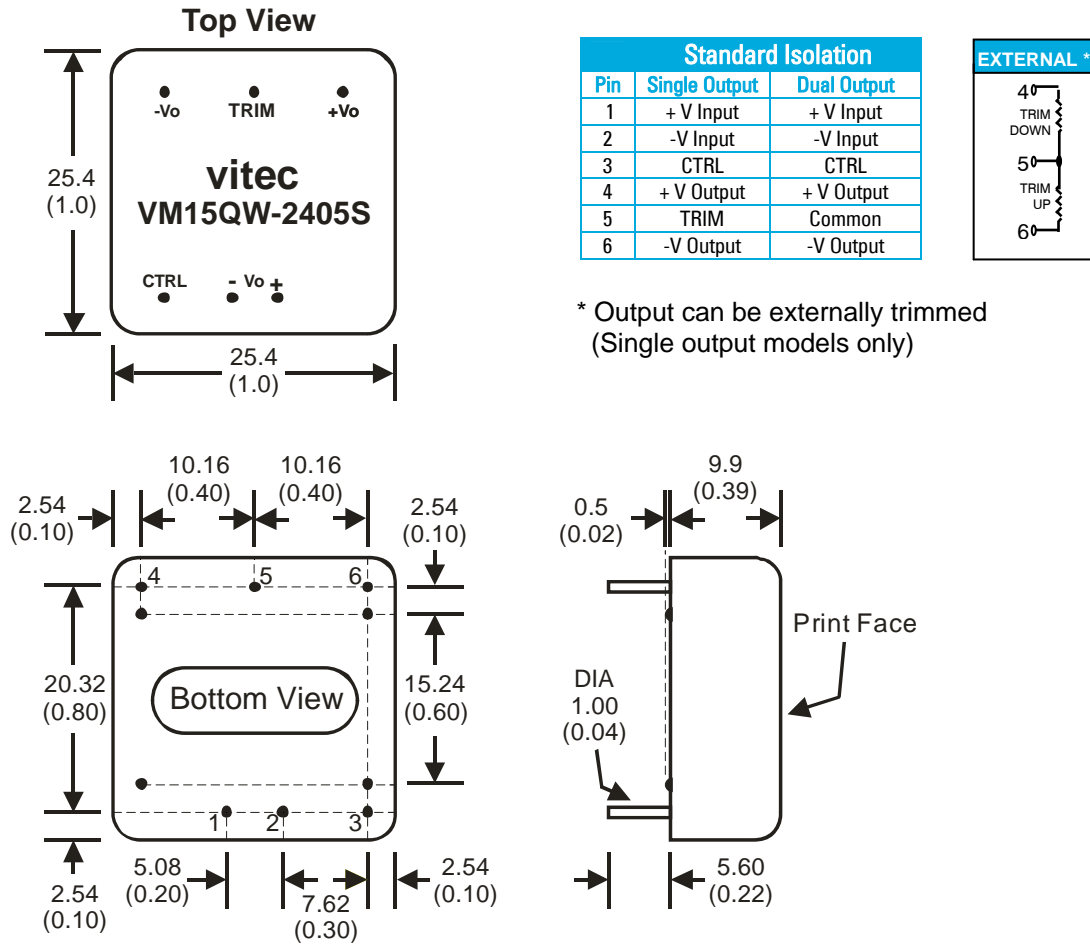
EMI/RFI-Filter

Suggest adding external input filter to meet emissions (EN55022 Class A)

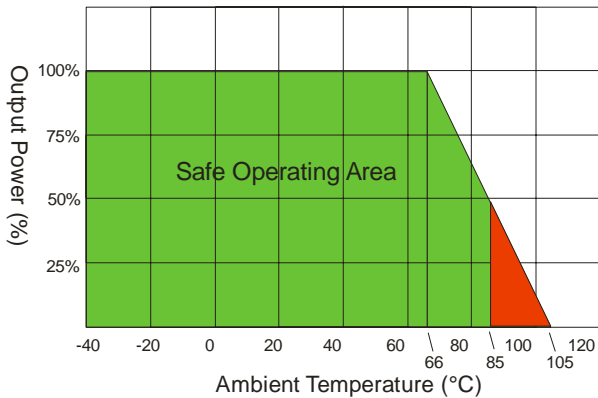
VM15QW-Series	L	C1, C2
24V-Input	12 μ H	2.2 μ F, 100V (1210)
48V-Input	12 μ H	2.2 μ F, 100V (1210)



MECHANICAL SPECIFICATIONS



Derating VM15QW-Series



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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