

FEATURES AND APPLICATIONS

- 7 Pin SIL Package
- Physical Clearance of Isolation Barrier 2.5 mm**
- 6000 VDC Isolation
- Cost Effective; RoHS ✓
- Low Ripple and Noise
- 100% Safety Production Test
- Long Term Short Circuit Protection



GENERAL DESCRIPTION

The VMI series is a family of cost effective 1 W single & dual output DC-DC converters. These converters achieve low cost and miniature SIL7 size without compromising performance. The bigger case ensures the physical clearance of isolation barrier of 2.5 mm, which increases the reliability under high pot from 6 kVdc. Devices are encapsulated with flame retardant resin.

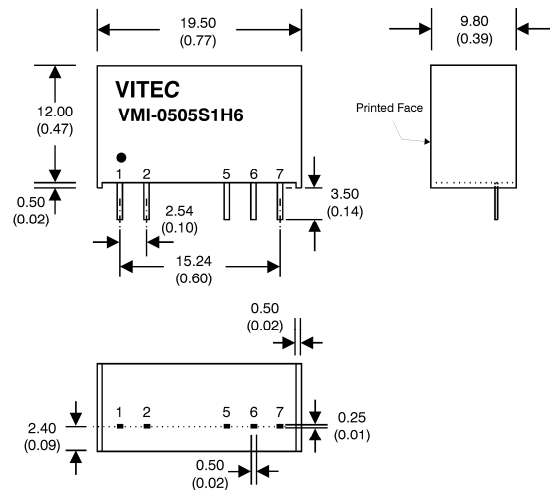
Models operate from an input bus voltage of 5, 9, 12, 15 and 24 Vdc offering output voltage levels of 3.3, 5, 9, 12, 15, ±3.3, ±5, ±9, ±12 or ±15 Vdc.

SIL 7 Package – 6 kVdc Types

Type Number	Input Voltage [Vdc]	Output Voltage [Vdc]	Output Current [mA]	Efficiency [% typ.]	Capacitor Load [µF]
VMI-xx3R3SS1H6	5	3.3	303	69 - 75	220
VMI-xx05SS1H6	9	5	200	70 - 77	220
VMI-xx09SS1H6	12	9	111	70 - 80	220
VMI-xx12SS1H6	15	12	84	70 - 80	220
VMI-xx15SS1H6	24	15	67	70 - 80	220
VMI-xx3R3S1H6	5	± 3.3	± 150	68 - 75	± 100
VMI-xx05S1H6	9	± 5	± 100	70 - 78	± 100
VMI-xx09S1H6	12	± 9	± 56	70 - 81	± 100
VMI-xx12S1H6	15	± 12	± 42	72 - 81	± 100
VMI-xx15S1H6	24	± 15	± 34	70 - 81	± 100

* non-standard output voltages on request

xx	input voltage	
33	3.3 Vdc ± 10%	
05	5.0 Vdc ± 10%	
09	9.0 Vdc ± 10%	
12	12 Vdc ± 10%	
15	15 Vdc ± 10%	



SIL 7 Package

6 kVDC Isolation		
Pin	Single Output	Dual Output
1	+V Input	+V Input
2	- V Input	- V Input
5	- V Output	- V Output
6	N.P.	Common
7	+V Output	+V Output

N.P. ... No Pin

ELECTRICAL SPECIFICATIONS

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

Input Specifications

Voltage Range	±10%
Filter	Capacitors
Input Reflected Ripple	20 mA,rms
<small>(rms thru 12 µH inductor, 5 Hz to 20 MHz)</small>	

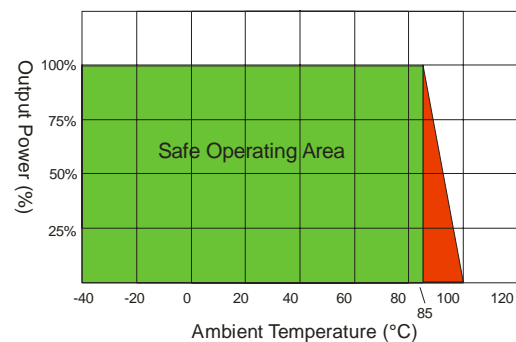
Environmental Specification

Operating Temperature	-40°C to +85°C
Max. Case Temperature	+100°C
Storage Temperature	-40°C to +125°C
Cooling	Free-air convection

Output Specifications

Voltage Accuracy	±3%, max.
Ripple and Noise (20 MHz BW)	200 mVp-p, max.
Short Circuit Protection	Continuous (Automatic Recovery)
Line Voltage Regulation	±1.2% / 1.0% of Vin
Load Voltage Regulation	±10%, Load=10-100%
Temperature Coefficient	±0.02%/°C
Max. Capacitor Load	see table

Derating Curve



General Specifications

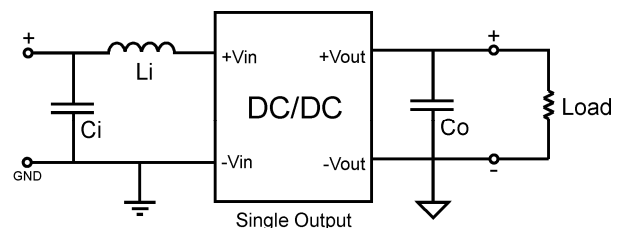
Efficiency	see table
I/O Isolation Voltage 1 Minute	6000 Vdc
I/O Isolation Capacitance	10 pF
I/O Isolation Resistance	1000 MOhm
Switching Frequency	20 ~50 kHz, var.
Humidity	95% rel H
Reliability Calculated MTBF	>2.39 Mhrs (MIL-HDBK-217 F)
Safety Standard	IEC 60950-1:2001 (designed to meet)
Soldering Temperature	260°C (1.5 mm from case 10 sec.)

Additional Ripple & Noise Filter

To reduce converter's ripple & noise, it is recommended to add a 4.7 µF ~ 100 µF (±4.7µF ~ ±68µF for dual output) capacitor in output end. For EMI performance improvement, it is recommended to add a 12 µH inductor and a 10 µF ~ 100 µF capacitor at input side.

Physical Characteristics

Clearance Distance	2.5 mm (Input to Output)
Dimension SIL7	19.50 x 9.80 x 12.50 mm
	0.77 x 0.39 x 0.49 inches
Weight	4.2 g
Case Material	Epoxy encapsulated (UL94V-0 rated)
Potting Material	Epoxy (UL94V-0 rated)
Pin Material	0.5 mm Alloy 42 Solder-coated



Notes: All dimensions in millimeters (inches). Tolerance ±0.25mm (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!