

FEATURES AND APPLICATIONS

- ±20% Input range
- Minimum creepage and clearance distance > 8 mm**
- 24 Pin DIL Package
- 5 kVdc Isolation
- Regulated Output Voltage
- Low Cost



GENERAL DESCRIPTION

The VMI series is a family of 3.5 Watt single output DC-DC converters with 5 kVdc input/output isolation. These converters achieve miniature package in a 24-pin DIL compatible case with high performance features and a short circuit protection with automatic restart and tight line/load regulation. Devices operate over a ±20% Input voltage range providing stable output voltage. Models operate from an input bus voltage of 5 or 12 Vdc offering output voltage levels of 3.3, 5, 12, or 15 Vdc.

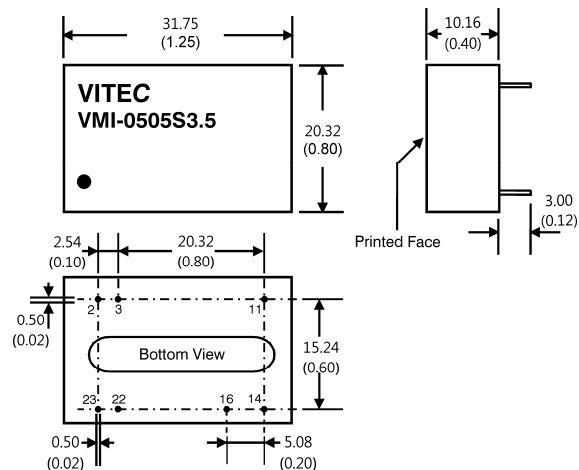
±20% Input Single Output								
Model Number	Input Voltage Range [Vdc]	Output Voltage [Vdc]	Input Current		Full Load Output Current [mA]	max. Capacitor Load [µF]	Output Ripple & Noise [mV]	Efficiency [%]
			No-Load [mA]	Full Load [mA]				
VMI-053R3S3.5H5	5	3.3	70	633	700	470	75	73
VMI-0505S3.5H5		5.0	85	909	700	470	75	77
VMI-0512S3.5H5		12.0	95	884	291	220	85	79
VMI-0515S3.5H5		12.0	115	896	233	220	75	78
VMI-123R3S3.5H5	12	3.3	30	257	700	470	75	75
VMI-1205S3.5H5		5.0	35	369	700	470	75	79
VMI-1212S3.5H5		12.0	50	364	291	220	85	80
VMI-1215S3.5H5		12.0	60	364	233	220	75	80

* non-standard output voltages on request

DIL 24 Package

5 kVdc Isolation	
Pin	Single Output
2	-V Input
3	-V Input
11	N.C.
14	+V Output
16	-V Output
22	+V Input
23	+V Input

N.C. ...not connected



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ELECTRICAL SPECIFICATIONS

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

Input Specifications

Voltage Range	±20%
Input Filter	Capacitors
Start up Time	70 mS, typ.
Input Current (No Load/Full Load)	see table
Input Reflected Ripple Current	35mA pk-pk
<small>(Measured with a simulated source inductance of 12 µH)</small>	

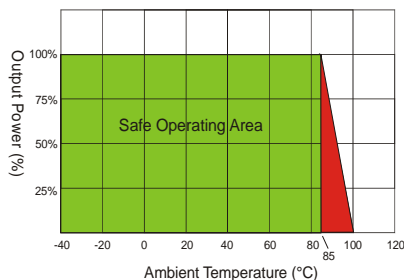
Output Specifications

Voltage Accuracy	±2%, max.
Output Current (Full Load)	see table, max.
Ripple and Noise (20 MHz BW)	see table, max.
<small>(Io=3% to 100%, measured with a 1µS ceramic capacitor)</small>	
Short Circuit Protection	Continuous (Automatic Recovery)
Line Voltage Regulation	±0.2%, max.
Load Voltage Regulation	±0.5%, max. (Io=10% to 100%)
Temperature Coefficient	±0.02%/°C
Max Capacitive Load	see table, max.
<small>(Tested by minimal Vin and constant resistive load)</small>	
Transient Recovery Time	250 µS, typ.
<small>(Tested by normal Vin and 25% load step change: 75% - 50% - 25% of Io)</small>	
Transient Response Deviation	±3%, max.
<small>(Tested by normal Vin and 25% load step change: 75% - 50% - 25% of Io)</small>	

General Specifications

Reinforced Isolation: PCB Creepage & Clearance Distance	8 mm, min.
Efficiency (full load)	see table, min.
I/O Isolation Voltage (3 sec.)	5000 kVdc
I/O Isolation Capacitance	50 pF, max.
I/O Isolation Resistance	1000 MΩ, min.
Switching Frequency	570 kHz, typ.
Humidity	95% rel H
MTBF (MIL-HDBK-217 F)	> 1.0 Mhrs
Safety Standard	IEC/EN 60950-1 (designed to meet)

Derating



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.

Environmental Specification

Max. Case Temperature	+100°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +125°C
Cooling	Free-air convection

Physical Characteristics

Dimension DIL24	31.75 x 20.32 x 10.16 mm 1.25 x 0.80 x 0.40 inches
Weight	12.5 g
Case Material (UL94V-0 rated)	Non-conductive Black Plastic
Base Material (UL94V-0 rated)	Non-conductive Black Plastic
Potting Material	Epoxy (UL94V-0 rated)
Pin Material	φ 0.5 mm, Brass Solder-coated
Soldering Temperature	260°C, max. (1.5 mm from case, 10 sec. max.)

EMC Characteristics

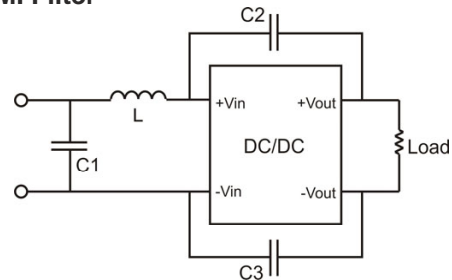
EMI/RFI *	EN55022 Class A with External Input Filter
EN61000-4-2 (ESD)	Perf. Criteria A
EN61000-4-3 (RS)	Perf. Criteria A
EN61000-4-4 (EFT) **	Perf. Criteria A
EN61000-4-5 (Surge) **	Perf. Criteria A
EN61000-4-6 (CS)	Perf. Criteria A
EN61000-4-8 (PFMF)	Perf. Criteria A

* Suggest adding external input filter to meet conducted and radiated emissions (EN55022 Class A). All components should be mounted as close as possible to the module.

** An external filter capacitor is required if the module has to meet IEC 61000-4-4 and IEC 61000-4-5.

We suggest a filter capacitor: Nippon-chemi – con KY series, 470 µF / 25 V

EMI Filter *



	L	C1	C2 & C3
VMI Series	12µH	47µF, 25V	150pF, 250Vac
<small>C2 & C3: Y5P Safety Standard Recognized Ceramic Capacitors foot distance 10 mm!</small>			