

### FEATURES AND APPLICATIONS

- 4 Pin SIL Package
- Low Ripple and Noise
- Ultra Miniature Package
- Cost Effective; RoHS ✓
- Mobile Applications
- Portable Equipments
- Ultra Miniature Package
- Mixed Analog / Digital Subsystems



### GENERAL DESCRIPTION

The VML series is a family of cost effective 2 W single output DC-DC converters with 1 or 3 kVDC isolation. These converters achieve low cost and miniature SIP 4 pin size without compromising performance or field reliability.

Models operate from an input bus voltage of 3.3, 5, 12, 24 and 48 VDC offering output voltage levels of 3.3, 5, 7.2, 9, 12, 15, 18, 24 VDC.

SIL 4 Package - Standard Types			
Type Number	Input Voltage [VDC]	Output Voltage [VDC]	Output Current [mA]
VML-xx3R3S	3.3 5 12 24 48	3.3	400
VML-xx05S		5.0	400
VML-xx7R2S		7.2	278
VML-xx09S		9.0	222
VML-xx12S		12.0	167
VML-xx15S		15.0	133
VML-xx18S		18.0	111
VML-xx24S		24.0	83

xx = input voltage (33, 05, 12, 24, 48)

33	3.3 Vdc ± 10%
05	5.0 Vdc ± 10%
12	12 Vdc ± 10%
24	24 Vdc ± 10%
48	48 Vdc ± 10%

Options :

Suffix P	continuous short circuit protection
Suffix H	3kVDC isolation

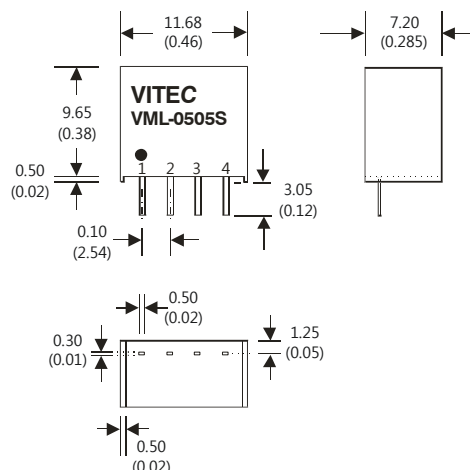
\* 3.3V input : H-option on request

\*\* Non-standard output voltages on request

### PACKAGE AND PINNING

#### SIL 4 Package

1 & 3kVdc Isolation	
Pin	Single Output
1	- V Input
2	+ V Input
3	- V Output
4	+ V Output



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### ELECTRICAL SPECIFICATIONS

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

#### Input Specifications

Voltage Range	±10%
Filter	Capacitors

#### Isolation Specification

Rated Voltage	1000 VDC, Standard 3000 VDC, H-Option
Leakage Current	1 x 10 <sup>-6</sup> A
Resistance	10 <sup>9</sup> Ω
Capacitance	60 pF, typ.

#### General Specifications

Efficiency	72% to 84%
Switching Frequency	var. 70 kHz
Reliability Calculated MTBF	>1.121 Mhrs (MIL-HDBK-217 F)
Safety Standard	IEC 60950-1 (designed to meet)

#### EMC Characteristics

Radiated Emissions	EN55022 Class B FCC 47 CFP Part 15 Subpart B Class B
EN61000-4-2 (ESD)	Perf. Criteria B
EN61000-4-3 (RS)	Perf. Criteria A

#### Output Specifications

Voltage Accuracy	±3%, max.
Ripple and Noise (20 MHz BW)	150 mVp-p, max.
Short Circuit Protection	1 sec ltd max
Option P:	continuous (on request)
Line Voltage Regulation	±1.2% / 1.0% of Vin
Load Voltage Regulation	±10%, load=20~100% ±20% (3.3V output)
Temperature Coefficient	±0.02%/°C
Max. Capacitor Load	Single Output: 220 μF

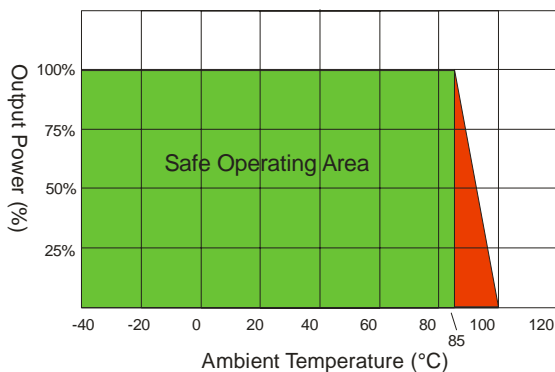
#### Environmental Specification

Operating Temperature	-40°C to +85°C
Max. Case Temperature	+100°C
Storage Temperature	-40°C to +125°C
Derating	None required
Humidity	95% rel. H
Cooling	Free-air convection

#### Physical Characteristics

Dimension SIP	11.68 x 6.00 x 10.16 mm 0.24 x 0.46 x 0.38 inches
Weight	1.8 g
Case Material	Non-conductive plastic

#### Derating Curve



#### 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

#### EMI and Ripple & Noise Filter

To reduce converter's ripple & noise, it is recommended to add a 4.7 μF ~ 220 μF 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.

