

FEATURES AND APPLICATIONS

- 2:1 Input Range
- Efficiency up to 84%
- Full SMD Technology
- Continuous Short Circuit Protection
- 1500 Vdc Isolation
- VMG also available with 1 and 2 Watts
- Optional Remote On/Off Control
- RoHS ✓



GENERAL DESCRIPTION

The VMG series is a family of 3 Watt single & dual output DC-DC converters with 1.5 kVdc isolation. These converters achieve miniature package in a SIL8 compatible case without compromising performance or field reliability. Wide range devices operate over 2:1 Input voltage range providing stable regulated output voltage.

Models operate from an input bus voltage of 5, 12, 24 and 48 Vdc offering output voltage levels of 3.3, 5, 12, 15, ± 5 , ± 12 or ± 15 Vdc.

2:1 Input single and dual Output							
Model Number	Input Voltage Range [Vdc]	Output Voltage [Vdc]	Input Current		Full Load Output Current [mA]	max. Capacitor Load [μ F]	Efficiency [%] 5/12/24/48
			No-Load [mA] 5/12/24/48	Full Load [mA] 5/12/24/48			
VMG-xx3R3S3	5 12 24 48	3.3	65/25/15/10	640/260/133/66	700	2200	74/76/74/75
VMG-xx05S3		5.0	70/15/15/10	800/320/160/82	600	1000	76/81/79/78
VMG-xx12S3		12.0	75/35/20/15	750/305/156/78	250	470	82/84/82/81
VMG-xx15S3		15.0	75/35/20/15	750/305/152/78	200	220	82/84/84/81
VMG-xx05D3		± 5.0	90/45/20/15	800/320/160/82	± 300	± 470	77/80/80/78
VMG-xx12D3		± 12.0	90/45/20/20	760/308/154/80	± 125	± 220	81/83/83/80
VMG-xx15D3		± 15.0	90/45/20/15	750/312/154/78	± 100	± 100	82/82/83/81

* non standard output voltages on request

xx nominal input voltage:
 05 (4.5 – 9 Vdc)
 12 (9 – 18 Vdc)
 24 (18 – 36 Vdc)
 48 (36 – 72 Vdc)

Suffix C Remote On/Off
 Suffix -T for alternative Pinning

ELECTRICAL SPECIFICATIONS

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

Input Specifications

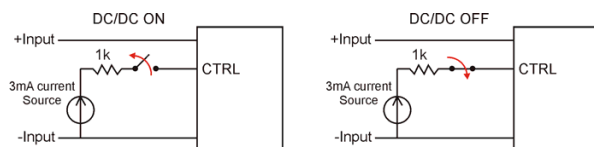
2:1 Input Voltage Range	5V: 4.5 to 9 Vdc
	12V: 9 to 18 Vdc
	24V: 18 to 36 Vdc
	48V: 36 to 75 Vdc
Input Filter	Capacitor
Input Reflected Ripple Current	35 mApp
Start Up Time	20 mS, typ.
No Load Input Current	see table
Max. Input Current	see table

Output Specifications

Output Power	3 Watts, max.
Output Voltage Accuracy	±1%
Min. Load for specified Regulation	25%
Ripple and Noise (20 MHz BW)	75 mVpp, max.
Capacitive Load	see table
Line Voltage Regulation	±0.5%
Load Voltage Regulation	±1.0%
Cross Voltage Regulation	±5.0% (Dual Output)
Temperature Coefficient	±0.02%/°C, max.
Short Circuit Protection	Continuous (Hiccup)
Transient Recovery Time	300 μS, typ.
Transient Response Deviation	±3%, max.

Remote ON/OFF Control (Optional)

Control Voltage referenced to negative (-) input
 DC/DC ON: Open or high impedance
 DC/DC OFF: 3~6 mA input current (via 1 kΩ)



General Specifications

Efficiency	see table
Switching Frequency	100~650 kHz
Isolation Voltage (Input / Output)	1500 Vdc, min. (3 sec)
Isolation Resistance	10 ⁹ Ohms, min.
Isolation Capacitance	680 pF, typ.
Approvals	IEC/EN60950-1 (designed to meet)
Soldering Temperature	260°C (1.5 mm from case; 10 sec.)

Environmental Specification

Operating Temperature	-40°C to +85°C
	Derating above +71°C
Max. Case Temperature	+100°C
Storage Temperature	-40°C to +125°C
Cooling	Free-air Convection
MTBF	MIL-HDBK-217F: >1.34 x 10 ⁶ Hrs
Relative Humidity	95% RH

EMC Characteristics

Radiated Emissions	EN55022	Class A
Conducted Emissions	EN55022	Class A *
* Input filter components are required to help meet conducted emission class A; find recommended EMI filter on page 3		
ESD	EN61000-4-2	Perf. Criteria B
Radiated Im.	EN61000-4-3	Perf. Criteria A
F. Transients.	EN61000-4-4	Perf. Criteria B **
Surge	EN61000-4-5	Perf. Criteria B **
** An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5. Recommended: 220 μF/100 V, ERS 48 mΩ		
Conducted I.	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

Physical Characteristics

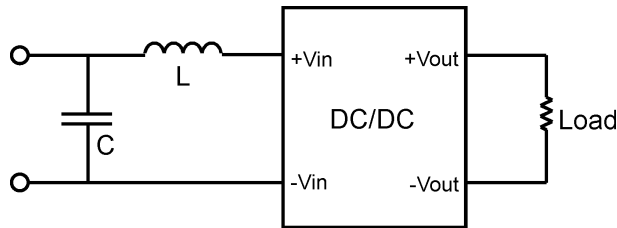
Dimensions	21.85 x 9.20 x 10.60 mm
	0.86 x 0.36 x 0.44 inches
Case Material	Non conductive black plastic
Pin Material	C5191R-H Solder-coated
Potting Material	Epoxy (UL94-V0)
Weight	4.8 g

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

Recommended Filter for EN55022 Class A Compliance

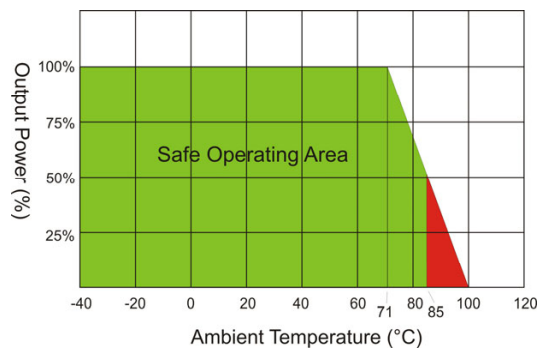
Input filter components (C, L) are used to help meet conducted emissions requirements for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

Recommended Components as follows:



	C	L
VMG-05xxxxxx	220 μ F / 25V	5.6 μ H
VMG-12xxxxS3	100 μ F / 100V	5.6 μ H
VMG-12xxxxD3	2.2 μ F / 100V	5.6 μ H
VMG-24xxxxxx	220 μ F / 25V	5.6 μ H
VMG-48xxxxxx	220 μ F / 25V	5.6 μ H

Derating VMG-3W-Series



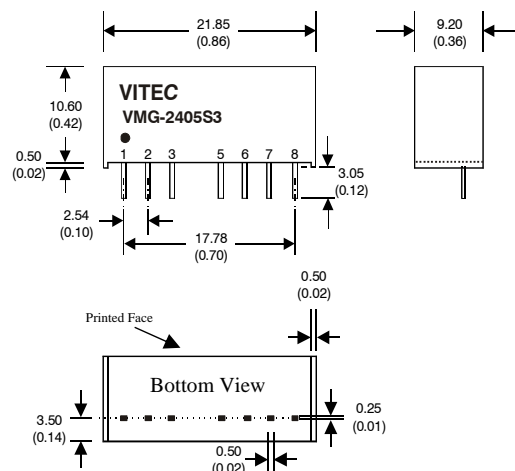
PIN Connections SIL8 Package

Single & Dual Output, 1.5 kVdc Isolation				
Pin	Single Output	Dual Output	Single Output "C" Option	Dual Output "C" Option
1	-V Input	-V Input	-V Input	-V Input
2	+V Input	+ V Input	+V Input	+V Input
3	N.P.	N.C.	Remote On/Off	Remote On/Off
5	N.P.	N.C.	N.C.	N.C.
6	+V Output	+V Output	+V Output	+V Output
7	-V Output	-V Output *	-V Output	-V Output *
8	N.C.	Common *	N.C.	Common *

N.C. ... Not Connected

N.P. ... No Pin

* Add Suffix "-T" for alternative Pinning, where the function of Pin 7 and Pin 8 are replaced



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