VF-1.5W Series

1.5W Regulated Single output

MOTIEN TECHNOLOGY

Features

- 12 Pin SIL Package
- 1000 VDC Isolation
- Up to 5200 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 67%
- -25 ~ 71°C Operation Temperature Range

CE

The VF series is a family of cost effective 1.5W single output DC-DC converters. These converters combine miniature package in a 12-pin SIL compatible case with high performance features such as 1000 VDC~5200 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and hight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 5, 12, 24 with output voltage of 3.3, 5, 7.2, 9, 12, 15, 18, 24 Vdc. High performance features include high efficiency operation up to 67% and output voltage accuracy of ±2% maximum. Standard features include an input range of ±10% tolerance and low output noise and ripple.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage accuracy		±2% ,max.
Line regulation		±0.5% ,max.
Load regulation	(From 0% to 100% Load)	±0.5% ,max.
	(Output 3.3V Model)	±1.5% ,max.
Ripple & noise (20 MHz bandwidth)(1)		75mVpk-pk ,max.
Short Circuit Protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table ,max.

INPUT SPECIFICATIONS

Input Voltage Range	±10%
Input Current (No Load)	See table ,max.
Input Current (Full Load)	See table ,typ.
Input Filter	Capacitor
Input Reflected Ripple Current(3)	20mApk-pk ,typ.

GENERAL SPECIFICATIONS

Efficiency	See table ,max.
I/O Isolation Voltage(60sec)	
Input/Output	1000~5200Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000MΩ ,min.
Switching Frequency	50kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.12 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	7.0g
Dimensions	1.26"x0.32"x0.57"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-25°C ~ +85°C(See Derating Curve)
	-25°C ~ +71°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature (1.5mm from case 10sec max.)	260°C ,max.

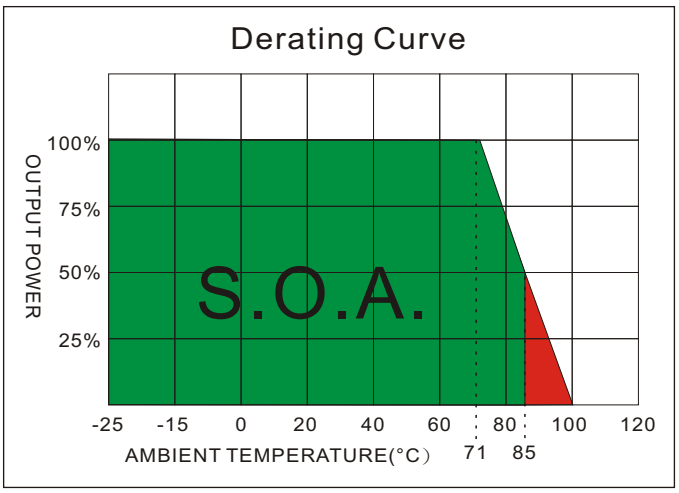
EMC SPECIFICATIONS

Radiated Emissions	EN55032	CLASS B
Conducted Emissions (6)	EN55032	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PART NUMBER STRUCTURE

VF - 24 05 S 1 H

- **Series Name**
- **Input Voltage**
  - **05** - 5V
  - **12** - 12V
  - **24** - 24V
- **Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **SIP Case**
- 1.5Watt
- **High Isolation**
  Optional, if no suffix "H" mean 1 KVDC Isolation
  - **H** - 3KVdc Isolation
  - **H4** - 4KVdc Isolation
  - **H5** - 5.2KVdc Isolation



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA ,max.)	INPUT Current Full Load (mA ,typ.)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (% ,typ.)	Capacitor Load @LF (µF ,max.)
VF-053R3S1	5	70	489	3.3	400	54	220
VF-0505S1	5	43	448	5	300	67	220
VF-057R2S1	5	70	469	7.2	208.3	64	220
VF-0509S1	5	70	462	9	166.6	65	220
VF-0512S1	5	80	448	12	125	67	220
VF-0515S1	5	85	462	15	100	65	220
VF-0518S1	5	100	448	18	83.3	67	220
VF-0524S1	5	130	500	24	62.5	60	220
VF-123R3S1	12	70	200	3.3	400	55	220
VF-1205S1	12	30	198	5	300	63	220
VF-127R2S1	12	40	198	7.2	208.3	63	220
VF-1209S1	12	40	195	9	166.6	64	220
VF-1212S1	12	33	195	12	125	64	220
VF-1215S1	12	36	189	15	100	66	220
VF-1218S1	12	40	187	18	83.3	67	220
VF-1224S1	12	55	187	24	62.5	67	220
VF-243R3S1	24	25	102	3.3	400	54	220
VF-2405S1	24	17	98	5	300	64	220
VF-247R2S1	24	25	96	7.2	208.3	65	220
VF-2409S1	24	25	96	9	166.6	65	220
VF-2412S1	24	25	93	12	125	67	220
VF-2415S1	24	25	98	15	100	64	220
VF-2418S1	24	25	96	18	83.3	65	220
VF-2424S1	24	19	95	24	62.5	66	220

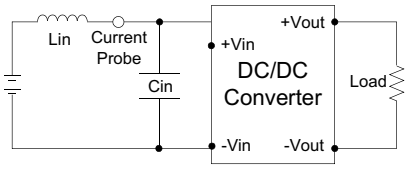
Suffix "H" means 3 KVdc isolation Suffix "H4" means 4 KVdc isolation Suffix "H5" means 5.2 KVdc isolation

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

TEST CONFIGURATIONS

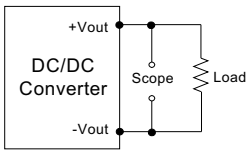
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor Lin(12μH) and a source capacitor Cin(47μF, ESR<1.0Ω at 100KHz) at nominal input and full load.



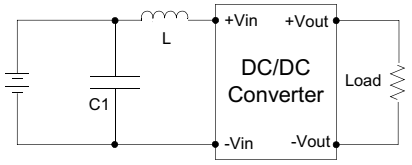
Output Ripple & Noise Measurement Test

The Scope measurement bandwidth is 20MHz .



EMI Filter

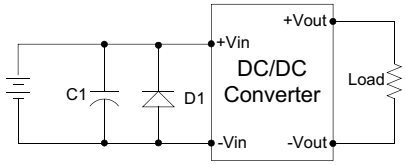
Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.



	C1	L
VF-05XXXXXX	220μF/100V	12μH
VF-12XXXXXX	220μF/100V	12μH
VF-24XXXXXX	220μF/100V	12μH

EFT/Surge Filter

Input filter components (C1,D1) are used to help meet IEC 61000-4-4 and IEC 61000-4-5 .



	C1	D1
VF-05XXXXXXX	1000uF,50V	SMAJ9A
VF-12XXXXXXX		SMAJ14A
VF-24XXXXXXX		SMAJ26A

NOTE

1.Ripple/Noise measured with 20MHz bandwidth.
2.Tested by minimal Vin and constant resistive load.
3.Measured Input reflected ripple current with a simulated source inductance of 12μH.
4.Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
5.Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
6. Input filter components are be required to help meet conducted emission class B, which application refer to the EMI Filter of design & feature configuration.
7. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5
The VF-Series recommended an aluminum electrolytic capacitor and TVS to connect in parallel.
Which application refer to the EFT/Surge Filter of design & feature configuration.

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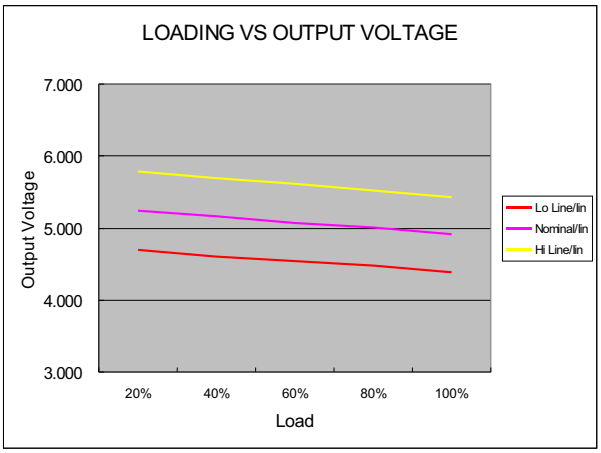
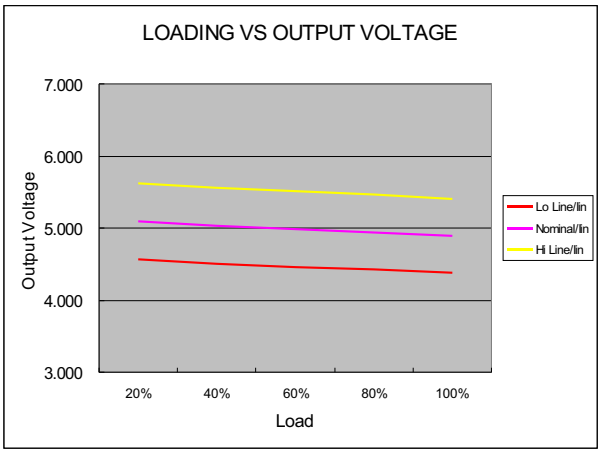
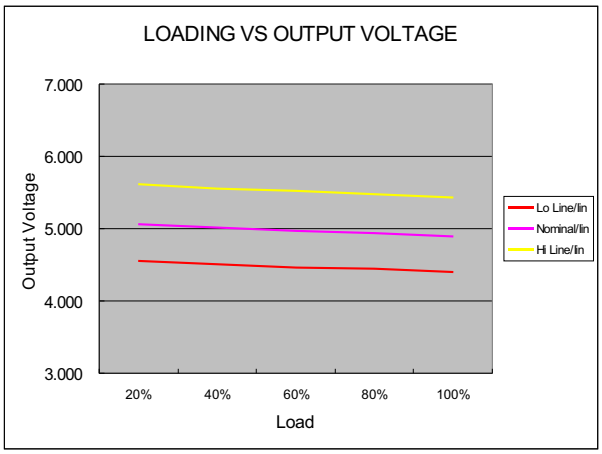


05 Models

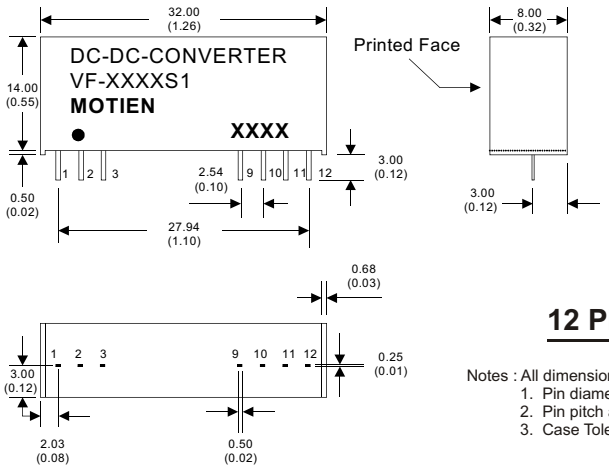


12 Models



24 Models

MECHANICAL SPECIFICATIONS



12 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	SINGLE-H
1	+V Input	+V Input
2	N.C.	−V Input
3	N.C.	N.C.
9	N.C.	N.C.
10	−V Output	−V Output
11	+V Output	+V Output
12	-V Input	N.C.

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