

V5-2W Series

2W Regulated Single & Dual output



Features

- Regulated 24 Pin DIL Package
- Full SMD Technology
- 1000 VDC Isolation, Up to 6000 VDC(Metal Case Up To 3000Vdc)
- Continuous Short Circuit Protection
- Efficiency up to 81%
- -40 ~ 85°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case



The V5 series is a family of cost effective 2W single & dual output DC-DC converters. These converters combine miniature package in a 24-pin DIL compatible case with high performance features such as 1000 VDC~6000 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and high 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, 24, ± 3.3 , ± 5 , ± 7.2 , ± 9 , ± 12 , ± 15 and ± 24 Vdc. High performance features include high efficiency operation up to 81% and output voltage accuracy of $\pm 2\%$ maximum. Standard features include an input range of $\pm 10\%$ tolerance and low output noise and ripple.

All specifications typical at $T_a = 25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 2\%$, max.
Line regulation	Single & Dual : $\pm 0.5\%$, max.
Load regulation	Single (0% to 100%) : $\pm 1.0\%$, max. Dual (0% to 100%) : $\pm 0.5\%$, max(balanced load) Single & Dual (Output 3.3V Model) : $\pm 2.0\%$, max.
Ripple & noise (20 MHz bandwidth)(1)	75mVpk-pk, max.
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	
Capacitor load(2)	$\pm 0.02\%/^\circ\text{C}$
Transient Recovery Time(3)	See table
Transient Response	$\pm 3\%$, max.

INPUT SPECIFICATIONS	
Voltage Range	$\pm 10\%$
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI type
Input Reflected Ripple Current(4)	35mA _{pk-pk}

GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(60sec)	
Input/Output	1000~6000Vdc
Metal Case/Input&Output	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Single 40kHz typ Dual 250kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS	
Case Material	Non-conductive Black Plastic(UL94V-0 rated) Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated $\Phi 0.5\text{mm}$ Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/17.0g(Metal Case)
Dimensions	1.25"x0.8"x0.4"

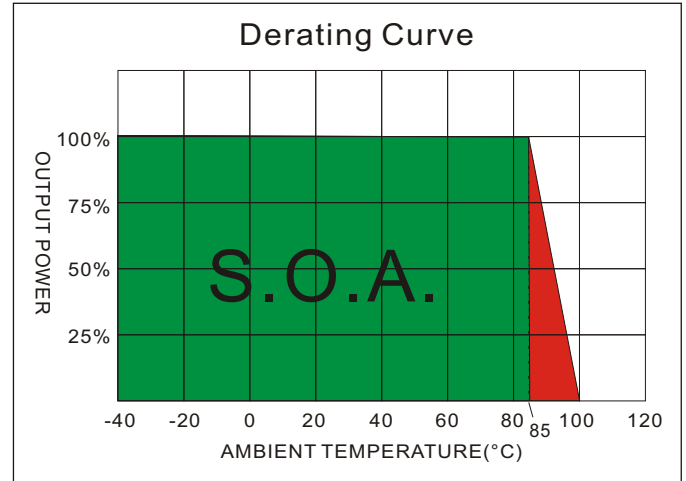
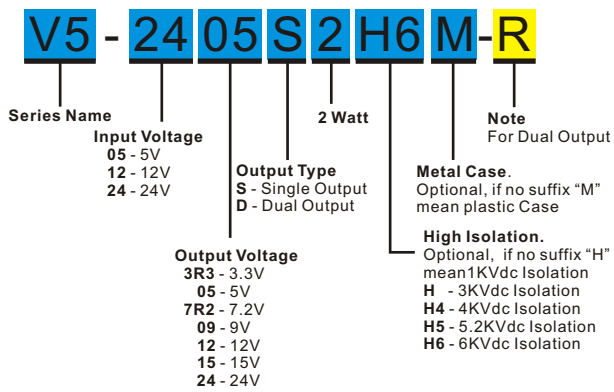
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	$-40^\circ\text{C} \sim 85^\circ\text{C}$
Maximum Case Temperature	100°C
Storage Temperature	$-40^\circ\text{C} \sim 125^\circ\text{C}$
Cooling	Nature Convection

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

V5 - 2W Regulated Single & Dual output

PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (% typ.)	Capacitor Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
V5-053R3S2	5	65	569	3.3	500	58	330
V5-0505S2	5	42	588	5	400	68	330
V5-057R2S2	5	50	588	7.2	278	68	330
V5-0509S2	5	55	571	9	222	70	330
V5-0512S2	5	52	563	12	167	71	330
V5-0515S2	5	55	588	15	133	68	330
V5-0518S2	5	55	597	18	111	67	330
V5-0524S2	5	95	606	24	83.3	66	330
V5-123R3S2	12	35	225	3.3	500	61	330
V5-1205S2	12	20	256	5	400	65	330
V5-127R2S2	12	25	256	7.2	278	65	330
V5-1209S2	12	31	238	9	222	70	330
V5-1212S2	12	30	231	12	167	72	330
V5-1215S2	12	35	238	15	133	70	330
V5-1218S2	12	40	238	18	111	70	330
V5-1224S2	12	40	235	24	83.3	71	330
V5-243R3S2	24	15	139	3.3	600	60	330
V5-2405S2	24	15	121	5	400	69	330
V5-247R2S2	24	20	126	7.2	278	66	330
V5-2409S2	24	25	128	9	222	65	330
V5-2412S2	24	20	121	12	167	69	330
V5-2415S2	24	20	121	15	133	69	330
V5-2418S2	24	20	121	18	111	69	330
V5-2424S2	24	20	116	24	83.3	72	330
V5-053R3D2-R	5	13	606	±3.3	±300	66	±1000
V5-0505D2-R	5	15	548	±5	±200	73	±1000
V5-057R2D2-R	5	20	548	±7.2	±278	73	±470
V5-0509D2-R	5	60	526	±9	±111	76	±470
V5-0512D2-R	5	20	563	±12	±83.3	71	±470
V5-0515D2-R	5	25	556	±15	±67	72	±470
V5-0518D2-R	5	42	556	±18	±111	72	±220

Suffix "H" means 3KVdc isolation Suffix "H4" means 4KVdc isolation Suffix "H5" means 5.2KVdc isolation
 Suffix "H6" means 6KVdc isolation
 Suffix "M" means Metal Case Up To 3KVdc 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

V5 - 2W Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (% , typ.)	Capacitor Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)				
V5-0524D2-R	5	40	556	±24	±42	72	±220
V5-123R3D2-R	12	6	231	±3.3	±300	72	±1000
V5-1205D2-R	12	7	219	±5	±200	76	±1000
V5-127R2D2-R	12	10	222	±7.2	±278	75	±470
V5-1209D2-R	12	10	208	±9	±111	80	±470
V5-1212D2-R	12	12	208	±12	±83.3	80	±470
V5-1215D2-R	12	15	208	±15	±67	80	±470
V5-1218D2-R	12	20	222	±18	±111	75	±220
V5-1224D2-R	12	20	216	±24	±42	77	±220
V5-243R3D2-R	24	5	114	±3.3	±300	73	±1000
V5-2405D2-R	24	5	107	±5	±200	78	±1000
V5-247R2D2-R	24	6	104	±7.2	±278	80	±470
V5-2409D2-R	24	6	103	±9	±111	81	±470
V5-2412D2-R	24	6	103	±12	±83.3	81	±470
V5-2415D2-R	24	10	107	±15	±67	78	±470
V5-2418D2-R	24	10	110	±18	±111	76	±220
V5-2424D2-R	24	15	107	±24	±42	78	±220

Suffix "H" means 3KVdc isolation

Suffix "H4" means 4KVdc isolation

Suffix "H5" means 5.2KVdc isolation

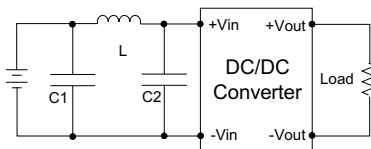
Suffix "H6" means 6KVdc isolation

Suffix "M" means Metal Case Up To 3KVdc isolation

TEST CONFIGURATIONS

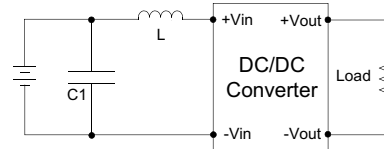
EMI Filter

Input filter components (C1,C2, 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	C2
V5-05XXXXX	220μF/100V	12μH	220μF/100V
V5-12XXXXX	220μF/100V	12μH	220μF/100V
V5-24XXXXX	220μF/100V	12μH	220μF/100V

Single Output

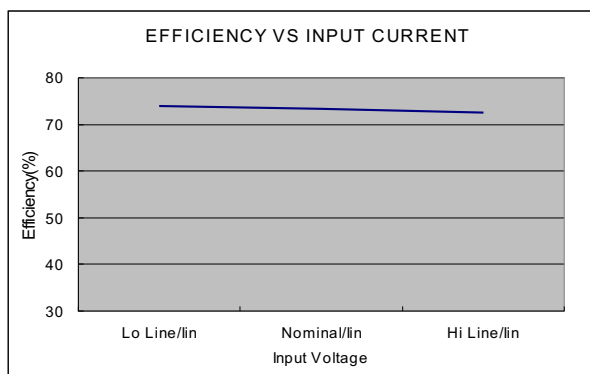
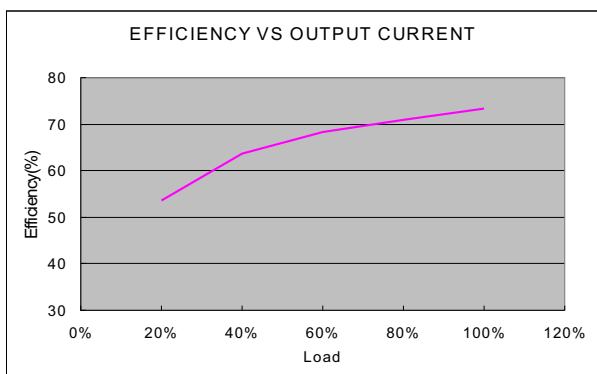


	C1	L
V5-05XXXXX	220μF/100V	12μH
V5-12XXXXX	220μF/100V	12μH
V5-24XXXXX	220μF/100V	12μH

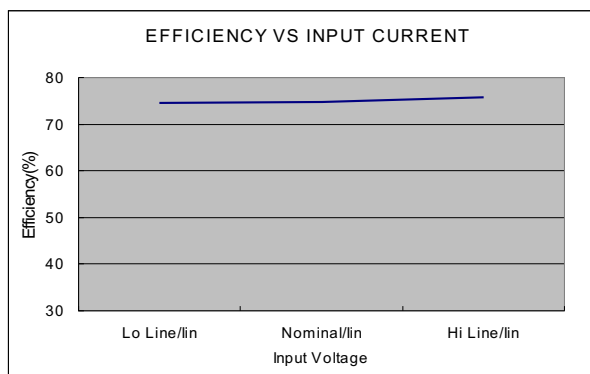
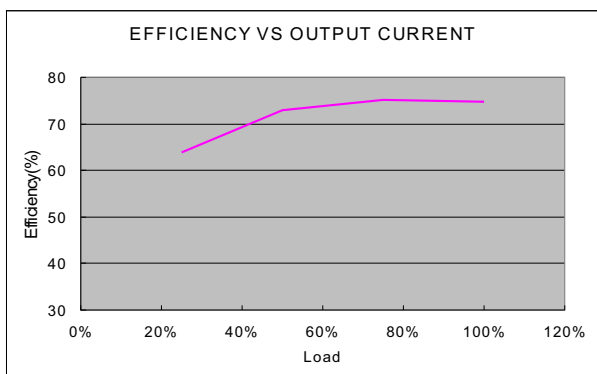
Dual Output

NOTE

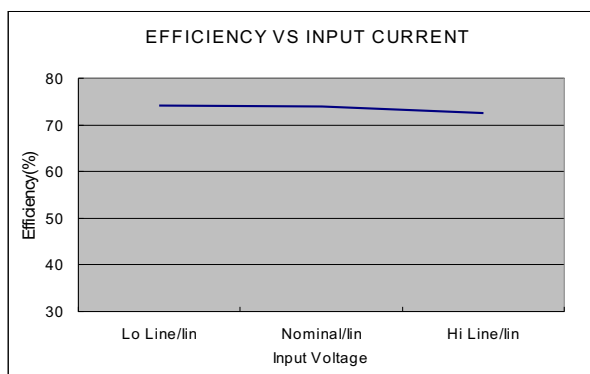
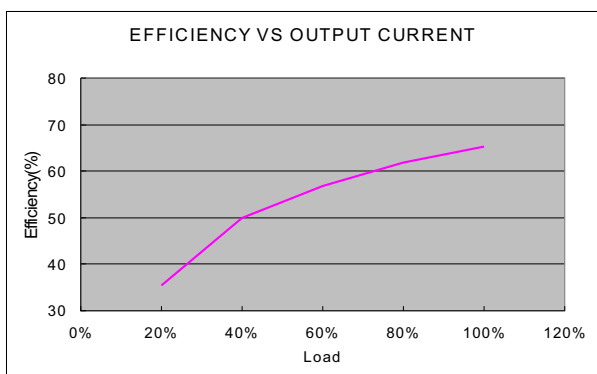
1. Ripple/Noise measured with 20MHz bandwidth.
2. Tested by minimal Vin and constant resistive load.
3. Tested by normal Vin and 25% load step change (75%-50%-25% of Io)
4. Measured Input reflected ripple current with a simulated source inductance of 12μH.
5. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
6. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
7. Input filter components are required to help meet conducted emission class A, which application refer to the EMI Filter of design & feature configuration.
8. An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220μF/100V.



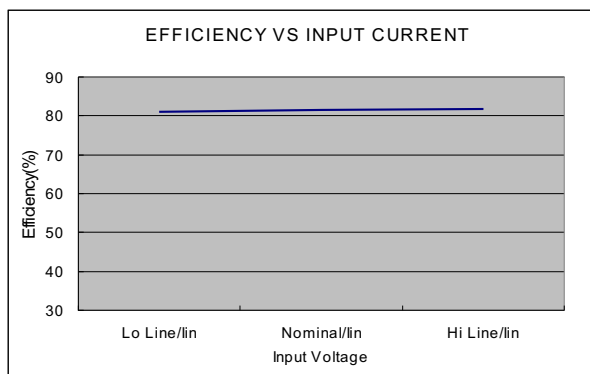
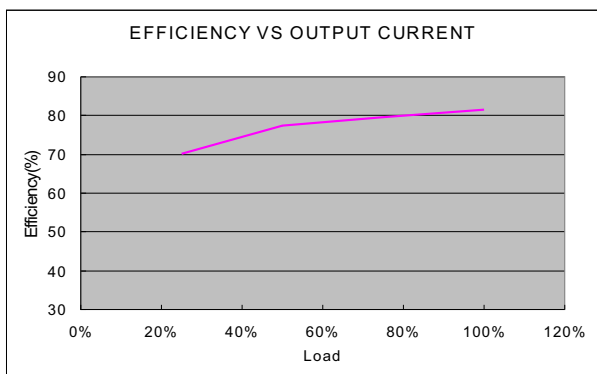
05 Single Output Models



05 Dual Output Models

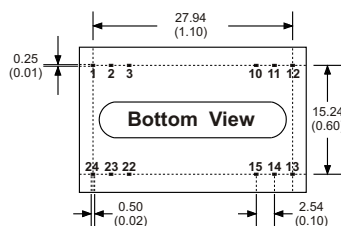
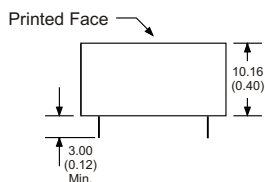
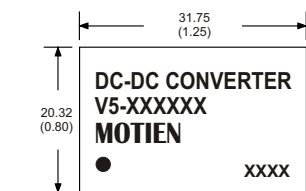


24 Single Output Models



24 Dual Output Models

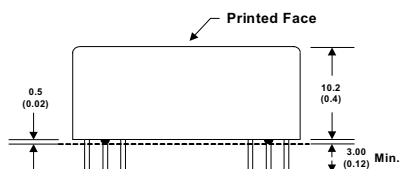
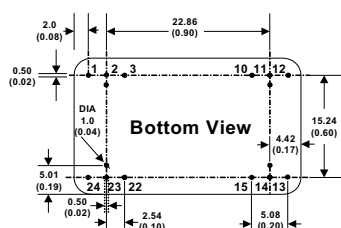
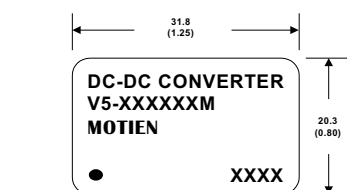
MECHANICAL SPECIFICATIONS



24 Pin DIL Package Non-Conductive Plastic

- 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	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	-V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	-V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	-V Input	-V Input	-V Output	N.P.
13	-V Input	-V Input	+V Output	-V Output
14	+V Output	+V Output	N.P.	N.P.
15	-V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	-V Output	-V Input	-V Input
24	+V Input	+V Input	-V Input	-V Input



24 Pin DIL Package Nickel-Coated Copper

- 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)
 4. Stand-off tolerance: ± 0.1 (± 0.004)

For "M" Case

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	-V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	-V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	-V Input	-V Input	-V Output	N.P.
13	-V Input	-V Input	+V Output	-V Output
14	+V Output	+V Output	N.P.	N.P.
15	-V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	-V Output	-V Input	-V Input
24	+V Input	+V Input	-V Input	-V Input