

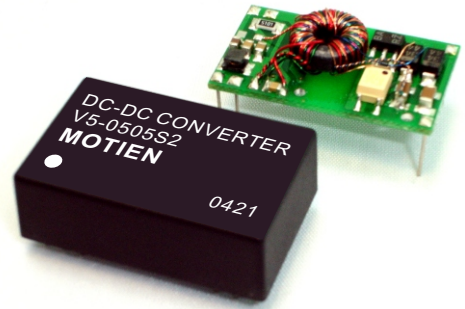
V5-2W Series

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 80%
- -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 tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 5, 12, 24 with output voltage of 3.3, 5, 9, 12, 15, 24, ± 3.3 , ± 5 , ± 9 , ± 12 , ± 15 and ± 24 Vdc. High performance features include high efficiency operation up to 80% 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	$\pm 2\%$
Line regulation	Single & Dual: $\pm 0.5\%$, max
Load regulation	Single (0% to 100%): $\pm 0.5\%$, max Dual (0% to 100%): $\pm 0.5\%$, max (balanced load) Single & Dual (Output 3.3V Model): $\pm 1.0\%$, max
Ripple & noise(20 MHz bandwidth)(1)	75mV pk-pk, max
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	$\pm 0.02\%/^\circ\text{C}$
Capacitor load(2)	See table

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(3)	35mA pk-pk

GENERAL SPECIFICATIONS	
Efficiency	See table
I/O Isolation Voltage(3 sec)	
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 300kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>3.072 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 $\varnothing 0.5\text{mm}$ Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g(Metal Case)
Dimensions	1.25"x0.8"x0.4"

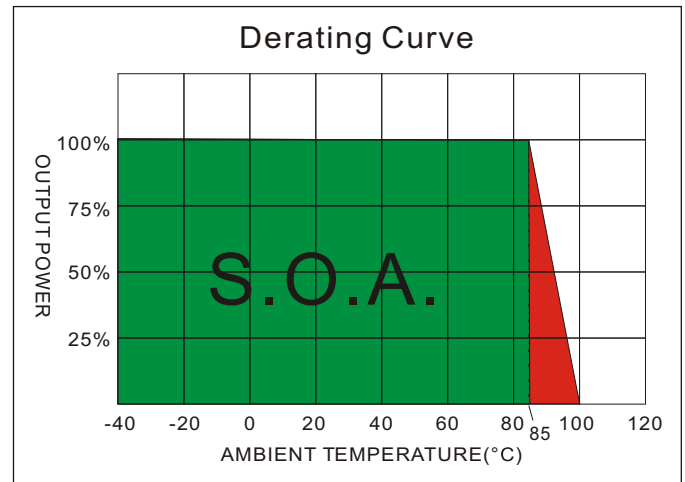
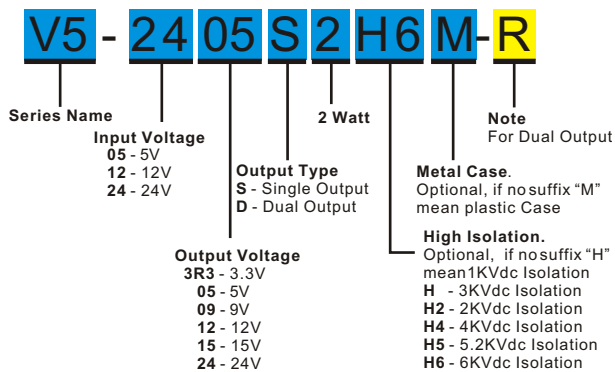
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)	
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Voltage(100ms)	
5 Models	0~7 Vdc
12 Models	0~15 Vdc
24 Models	0~28 Vdc
Soldering Temperature (1.5mm from case 10sec.)	260°C max.

EMC SPECIFICATIONS		
Radiated Emissions	EN55022	CLASS A
Conducted Emissions (6)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria B
Surge (7)	IEC 61000-4-5	Perf. Criteria B
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		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load (mA)			
V5-053R3S2	5	75	622	3.3	500	53	330	
V5-0505S2	5	75	615	5	400	65	330	
V5-0509S2	5	75	597	9	222	67	330	
V5-0512S2	5	75	571	12	166	70	330	
V5-0515S2	5	75	588	15	133	68	330	
V5-0524S2	5	75	615	24	83.3	65	330	
V5-053R3D2-R	5	30	638	±3.3	±300	62	±1000	
V5-0505D2-R	5	30	588	±5	±200	68	±1000	
V5-0509D2-R	5	40	571	±9	±111	70	±470	
V5-0512D2-R	5	40	571	±12	±83	70	±470	
V5-0515D2-R	5	40	571	±15	±67	70	±470	
V5-0524D2-R	5	50	579	±24	±42	69	±220	
V5-123R3S2	12	70	245	3.3	500	56	330	
V5-1205S2	12	70	260	5	400	64	330	
V5-1209S2	12	70	245	9	222	68	330	
V5-1212S2	12	70	238	12	166	70	330	
V5-1215S2	12	70	252	15	133	66	330	
V5-1224S2	12	70	256	24	83.3	65	330	

Suffix "H" means 3KVdc isolation

Suffix "H5" means 5.2KVdc isolation

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

Suffix "H2" means 2KVdc isolation

Suffix "H6" means 6KVdc isolation

Suffix "H4" means 4KVdc isolation

V5 - 2W Regulated Single & Dual output

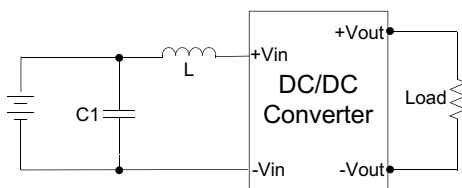
MODEL NUMBER	INPUT UT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current	EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load (mA)		
V5-123R3D2-R	12	20	250	±3.3	±300	66	±1000
V5-1205D2-R	12	20	228	±5	±200	73	±1000
V5-1209D2-R	12	20	222	±9	±111	75	±470
V5-1212D2-R	12	20	213	±12	±83	78	±470
V5-1215D2-R	12	35	216	±15	±67	77	±470
V5-1224D2-R	12	35	219	±24	±42	76	±220
V5-243R3S2	24	25	144	3.3	600	57	330
V5-2405S2	24	25	132	5	400	63	330
V5-2409S2	24	25	132	9	222	63	330
V5-2412S2	24	25	122	12	166	68	330
V5-2415S2	24	25	122	15	133	68	330
V5-2424S2	24	25	122	24	83.3	68	330
V5-243R3D2-R	24	15	121	±3.3	±300	68	±1000
V5-2405D2-R	24	15	114	±5	±200	73	±1000
V5-2409D2-R	24	15	111	±9	±111	75	±470
V5-2412D2-R	24	15	104	±12	±83	80	±470
V5-2415D2-R	24	20	108	±15	±67	77	±470
V5-2424D2-R	24	20	111	±24	±42	75	±220

Suffix "H" means 3KVdc isolation Suffix "H2" means 2KVdc 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

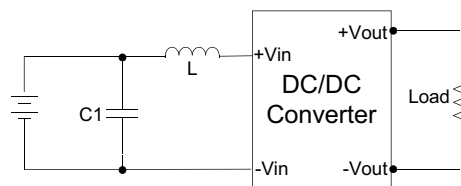
EMI Filter

Input filter components (C1, 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
V5-05XXXXX	220uF/100V	12uH
V5-12XXXXX	220uF/100V	12uH
V5-24XXXXX	220uF/100V	12uH

Single Output



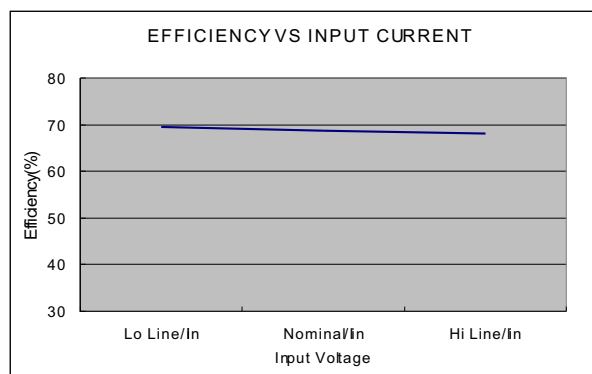
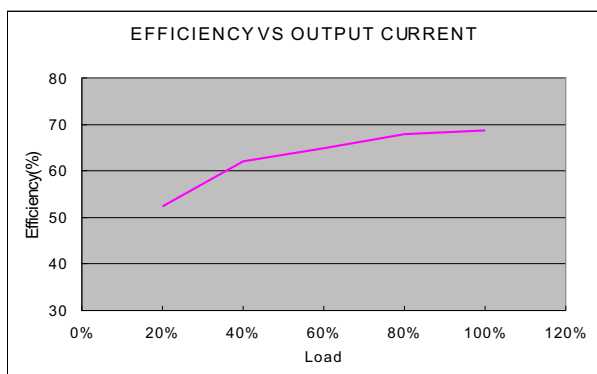
	C1	L
V5-05XXXXX-R	220uF/100V	22uH
V5-12XXXXX-R	220uF/100V	22uH
V5-24XXXXX-R	220uF/100V	22uH

Dual Output

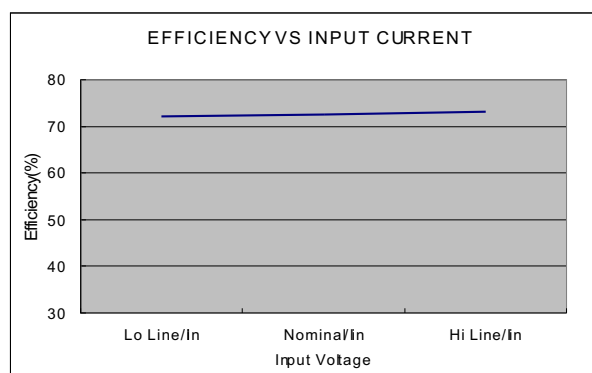
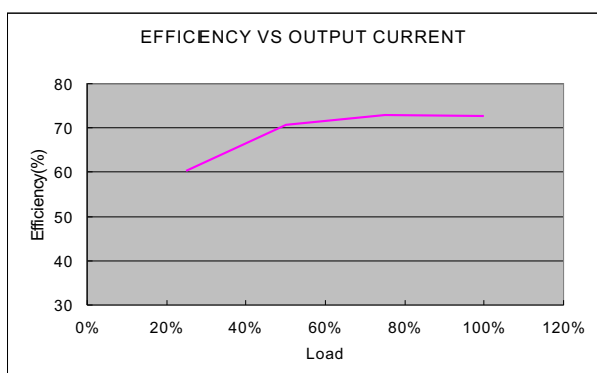
NOTE

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 12uH.
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 required to help meet conducted emission class A, which application refer to the EMI Filter of design & feature configuration.
7. An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
 The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220uF/100V.

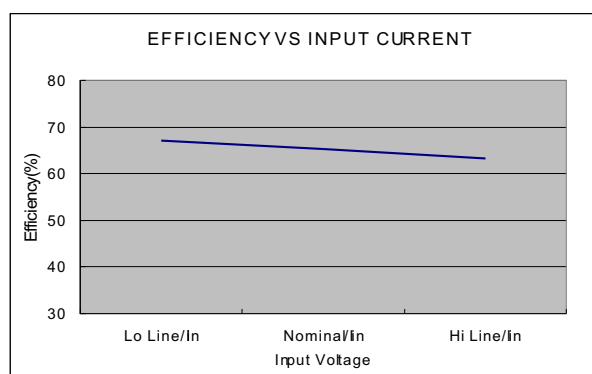
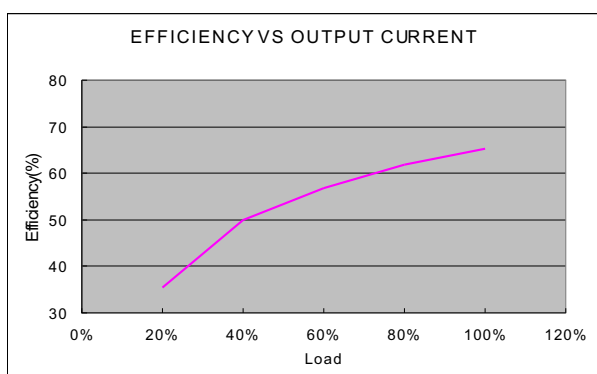
The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw



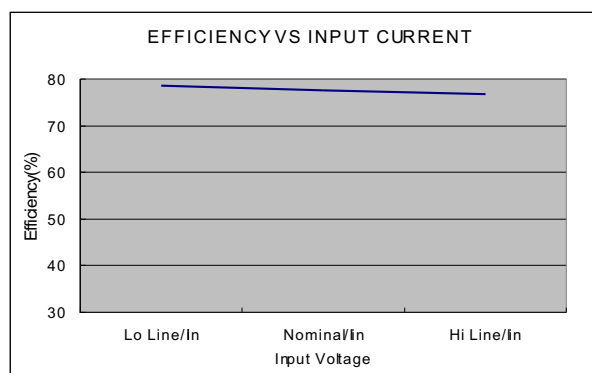
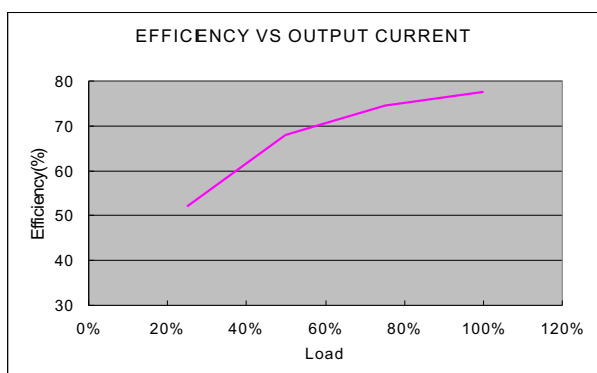
05 Single Output Models



05 Dual Output Models



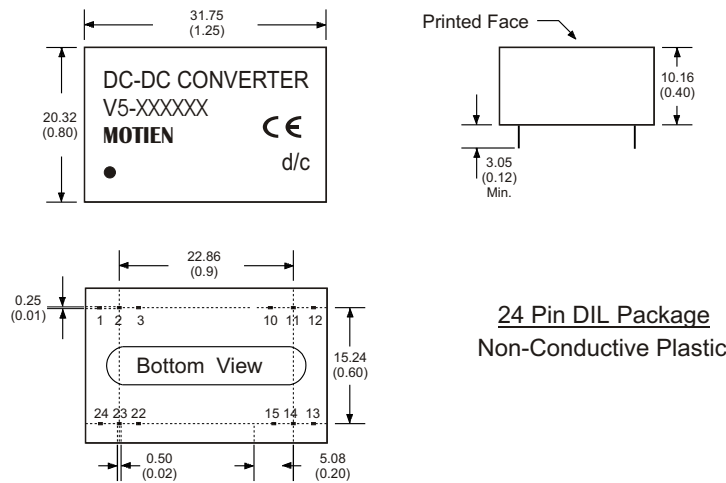
24 Single Output Models



24 Dual Output Models

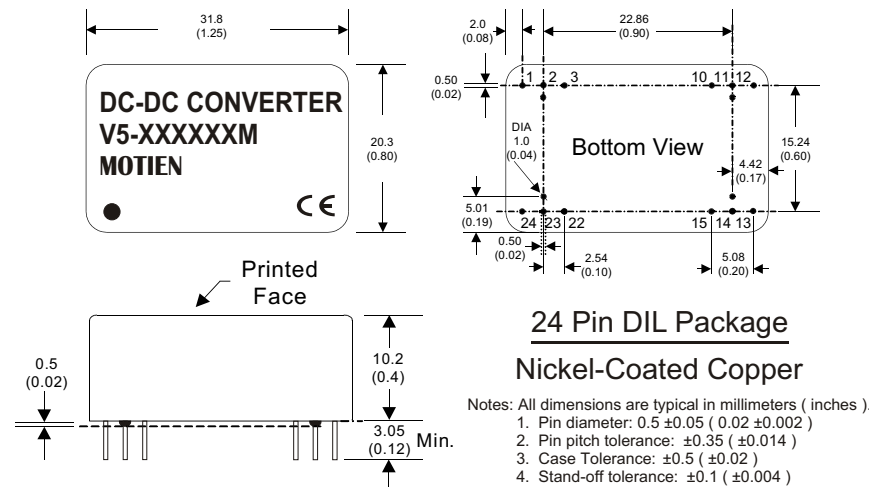
V5 - 2W Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



Notes : All dimensions are typical in millimeters (inches).
 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch 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



Notes: All dimensions are typical in millimeters (inches).
 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
 4. Stand-off tolerance: ± 0.1 (± 0.004)

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

For "M" Case