VD-4W Series

MOTIEN TECHNOLOGY

4W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case
- CB & UL Certified Available For Metal Case Models

FC CE cULus CB

The VD series is a family of cost effective 4.0W single & dual output DC-DC converters. These converters are consisted with Nickle-coated copper in a 24-pin DIL package with high performance features such as 1500 VDC ~ 3500VDC 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 12,24 and 48 with output voltage of 3.3,5,7.2,9,12,15,18,24, ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18 and ±24 Vdc. High performance features include high efficiency operation up to 75% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
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, typ.
I/O Isolation Voltage(60sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard	UL/cUL 60950-1 , 62368-1
	IEC/EN 60950-1 , 62368-1
Safety Approvals	UL/cUL 60950-1 , 62368-1
	IEC/EN 60950-1 , 62368-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Φ0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g(Metal Case)/13.5g(Plastic Case)
Dimensions	1.25"x0.8"x0.4"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

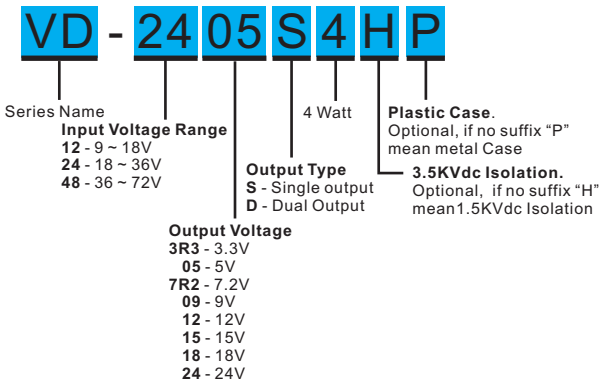
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

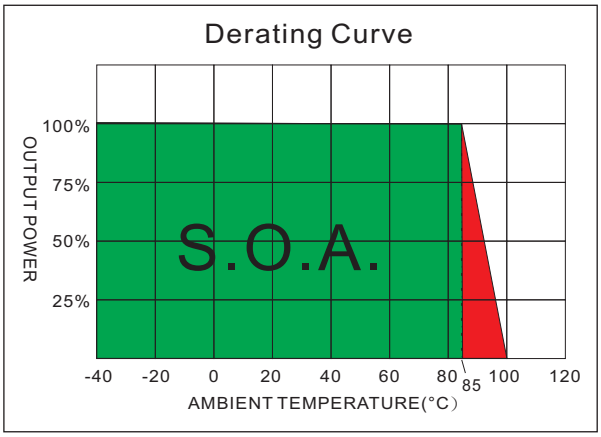
Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10sec max.)	260°C, max.

EMC SPECIFICATIONS

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





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 Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (%, typ.)	Capacitor Load @FL (μF, max.)
VD-123R3S4	9-18	30	463	3.3	0	1200	72	3300
VD-1205S4	9-18	30	428	5	0	800	78	1000
VD-127R2S4	9-18	30	428	7.2	0	555	78	470
VD-1209S4	9-18	30	428	9	0	444	78	470
VD-1212S4	9-18	30	417	12	0	333	80	220
VD-1215S4	9-18	30	417	15	0	266	80	100
VD-1218S4	9-18	30	417	18	0	222	80	47
VD-1224S4	9-18	30	417	24	0	166	80	47
VD-123R3D4	9-18	30	452	±3.3	0	±600	73	±680
VD-1205D4	9-18	30	428	±5	0	±400	78	±470
VD-127R2D4	9-18	30	417	±7.2	0	±277	80	±220
VD-1209D4	9-18	30	417	±9	0	±220	80	±220
VD-1212D4	9-18	30	417	±12	0	±166	80	±100
VD-1215D4	9-18	30	417	±15	0	±133	80	±47
VD-1218D4	9-18	30	421	±18	0	±111	79	±22
VD-1224D4	9-18	30	421	±24	0	±83	79	±22
VD-243R3S4	18-36	20	223	3.3	0	1200	75	3300
VD-2405S4	18-36	20	209	5	0	800	80	1000
VD-247R2S4	18-36	20	209	7.2	0	555	80	470
VD-2409S4	18-36	20	209	9	0	444	80	470
VD-2412S4	18-36	20	201	12	0	333	83	220
VD-2415S4	18-36	20	209	15	0	266	80	100
VD-2418S4	18-36	20	196	18	0	222	85	47
VD-2424S4	18-36	20	196	24	0	166	85	47
VD-243R3D4	18-36	20	226	±3.3	0	±600	73	±680
VD-2405D4	18-36	20	211	±5	0	±400	79	±470
VD-247R2D4	18-36	20	209	±7.2	0	±277	80	±220
VD-2409D4	18-36	20	209	±9	0	±220	80	±220
VD-2412D4	18-36	20	204	±12	0	±166	82	±100
VD-2415D4	18-36	20	209	±15	0	±133	80	±47
VD-2418D4	18-36	20	214	±18	0	±111	78	±22
VD-2424D4	18-36	20	214	±24	0	±83	78	±22

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

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

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA, max.)	INPUT Current Full Load (mA, typ.)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL (%, typ.)	Capacitor Load @FL (μF, max.)
VD-483R3S4	36-72	15	112	3.3	0	1200	75	3300
VD-4805S4	36-72	15	105	5	0	800	80	1000
VD-487R2S4	36-72	15	102	7.2	0	555	82	470
VD-4809S4	36-72	15	102	9	0	444	82	470
VD-4812S4	36-72	15	105	12	0	333	80	220
VD-4815S4	36-72	15	103	15	0	266	81	100
VD-4818S4	36-72	15	102	18	0	222	82	47
VD-4824S4	36-72	15	102	24	0	166	82	47
VD-483R3D4	36-72	15	116	±3.3	0	±600	72	±680
VD-4805D4	36-72	15	107	±5	0	±400	78	±470
VD-487R2D4	36-72	15	107	±7.2	0	±277	78	±220
VD-4809D4	36-72	15	107	±9	0	±220	78	±220
VD-4812D4	36-72	15	105	±12	0	±166	80	±100
VD-4815D4	36-72	15	105	±15	0	±133	80	±47
VD-4818D4	36-72	15	105	±18	0	±111	80	±22
VD-4824D4	36-72	15	105	±24	0	±83	80	±22

Suffix “H” means 3.5KVdc isolation
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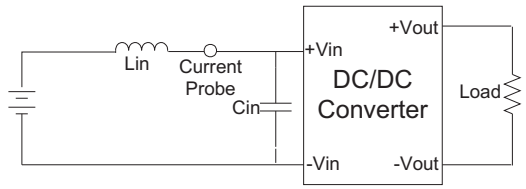
NOTE

1. Ripple/Noise measured with a 1uF ceramic capacitor.
2. Test by nominal input voltage and constant resistor 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. Input filter components are be required to help meet conducted emission class A, which application refer to the EMI Filter of design & feature configuration.
6. An external filter capacitor is required if the module has to meet IEC 61000-4-4 and IEC 61000-4-5.
   The filter capacitor Motien suggest: Nippon - chemi - con KY series, 220uF/100V.

TEST CONFIGURATIONS

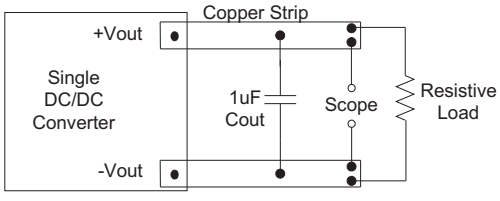
Input Reflected Ripple Current Test Step

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



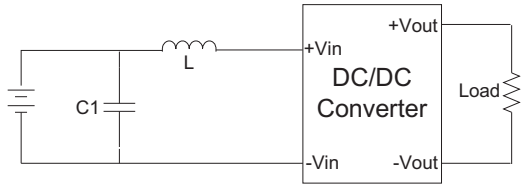
Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.



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
100uF, 100V	12uH

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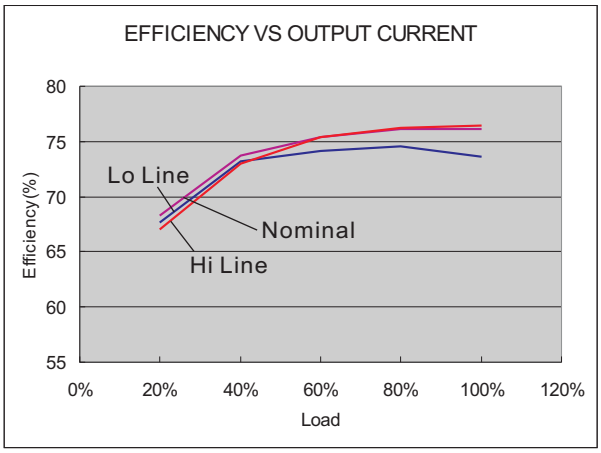
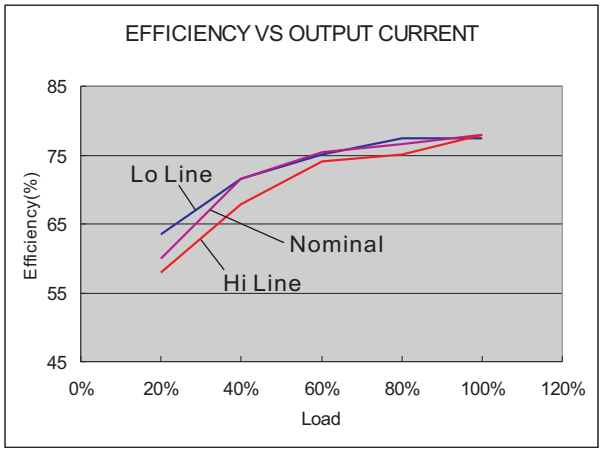
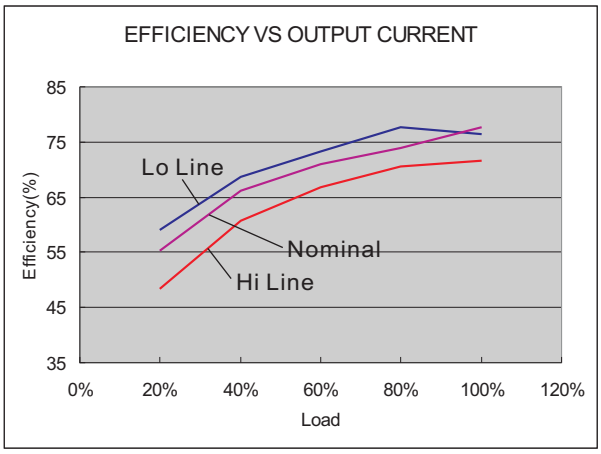
ELECTRICAL CHARACTERISTIC CURVES



12 Models

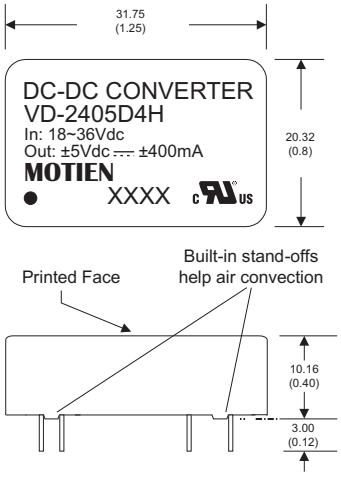


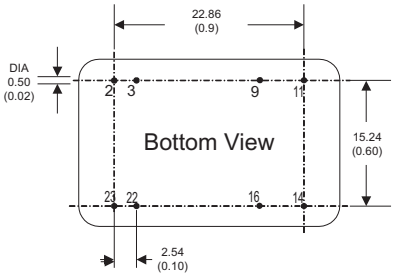
24 Models



48 Models

MECHANICAL SPECIFICATIONS





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)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

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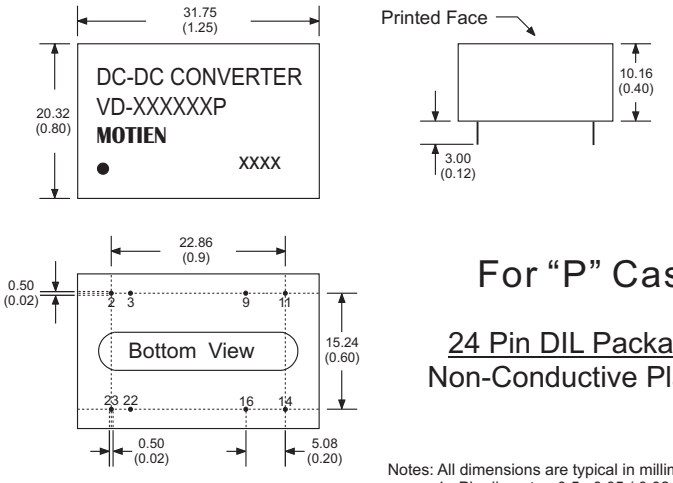
MECHANICAL SPECIFICATIONS



For "P" Case

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
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)