VD-6W Series

6W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- 1500VDC Isolation, Up to 3500VDC
- Continuous Short Circuit Protection
- Efficiency up to 87%
- Operating Temperature Range -40 ~ 95°C max.

PART NUMBER STRUCTURE

VD - 24 05 S 6 H

(1) (2) (3) (4) (5) (6)

(1) Series

(2) Input Voltage Range

- **12 -** 9-18 V
- **24 -** 18-36 V
- **48 -** 36-72 V

(3) Output Voltage

- **3R3 -** 3.3 V
- **05 -** 5.0 V
- **7R2 -** 7.2 V
- **09 -** 9.0 V
- **12 -** 12 V
- **15 -** 15 V
- **18 -** 18 V
- **24 -** 24 V

(4) Output Type

- **S -** Single Output
- **D -** Dual Output

(5) Watt

(6) Isolation Voltage

- **Blank -** 1500 VDC
- **H -** 3500 VDC

ALL SPECIFICATIONS ARE TYPICAL AT 25°C, NOMINAL INPUT AND FULL LOAD UNLESS OTHERWISE NOTED

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (%, typ.)	Capacitive Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VD-123R3S6	9-18	18	507	3.3	0	1400	76	220
VD-1205S6	9-18	20	642	5	0	1200	78	1000
VD-127R2S6	9-18	20	610	7.2	0	833	82	1000
VD-1209S6	9-18	20	618	9	0	666	81	680
VD-1212S6	9-18	22	596	12	0	500	84	1000
VD-1215S6	9-18	18	596	15	0	400	84	100
VD-1218S6	9-18	30	603	18	0	333	83	100
VD-1224S6	9-18	25	603	24	0	250	83	100
VD-123R3D6	9-18	18	658	±3.3	0	±909	76	±1000
VD-1205D6	9-18	20	633	±5	0	±600	79	±680
VD-127R2D6	9-18	18	618	±7.2	0	±416	81	±470
VD-1209D6	9-18	18	610	±9	0	±333	82	±22
VD-1212D6	9-18	25	610	±12	0	±250	82	±330
VD-1215D6	9-18	30	610	±15	0	±200	82	±100
VD-1218D6	9-18	28	610	±18	0	±166	82	±100
VD-1224D6	9-18	32	610	±24	0	±125	82	±10
VD-243R3S6	18-36	8	250	3.3	0	1400	77	1000
VD-2405S6	18-36	12	309	5	0	1200	81	1000
VD-247R2S6	18-36	12	295	7.2	0	833	85	1000
VD-2409S6	18-36	15	295	9	0	666	85	680
VD-2412S6	18-36	15	291	12	0	500	86	1000
VD-2415S6	18-36	10	295	15	0	400	85	680
VD-2418S6	18-36	18	291	18	0	333	86	330
VD-2424S6	18-36	15	291	24	0	250	86	470

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (%, typ.)	Capacitive Load @FL (μF, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VD-243R3D6	18-36	15	321	±3.3	0	±909	78	±1000
VD-2405D6	18-36	12	305	±5	0	±600	82	±680
VD-247R2D6	18-36	15	298	±7.2	0	±416	84	±220
VD-2409D6	18-36	15	295	±9	0	±333	85	±220
VD-2412D6	18-36	18	295	±12	0	±250	85	±470
VD-2415D6	18-36	20	295	±15	0	±200	85	±220
VD-2418D6	18-36	20	295	±18	0	±166	85	±100
VD-2424D6	18-36	25	298	±24	0	±125	84	±100
VD-483R3S6	36-72	8	123	3.3	0	1400	78	2200
VD-4805S6	36-72	8	153	5	0	1200	82	1000
VD-487R2S6	36-72	12	151	7.2	0	833	83	1000
VD-4809S6	36-72	8	146	9	0	666	86	1000
VD-4812S6	36-72	8	146	12	0	500	86	470
VD-4815S6	36-72	8	149	15	0	400	84	1000
VD-4818S6	36-72	10	144	18	0	333	87	330
VD-4824S6	36-72	10	144	24	0	250	87	220
VD-483R3D6	36-72	12	159	±3.3	0	±909	79	±1000
VD-4805D6	36-72	15	153	±5	0	±600	82	±680
VD-487R2D6	36-72	12	149	±7.2	0	±416	84	±330
VD-4809D6	36-72	12	146	±9	0	±333	86	±680
VD-4812D6	36-72	12	146	±12	0	±250	86	±330
VD-4815D6	36-72	10	149	±15	0	±200	84	±330
VD-4818D6	36-72	12	157	±18	0	±166	80	±33
VD-4824D6	36-72	15	149	±24	0	±125	84	±150

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	12V Input	9	12	18	VDC
	24V Input	18	24	36	
	48V Input	36	48	72	
Input Filter		Pi Type			
Input Reflected Ripple Current (1)			35		mApk-pk
Start up Time	Nominal Vin and constant resistive load		500		ms
Recommended input fuse (slow blow)	12V Input	1.25			A
	24V Input	0.63			
	48V Input	0.315			

Note：
1. Measured with a simulated source inductance of 12μH and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz).

OUTPUT SPECIFICATIONS

Parameter	Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V Output		-2.0		+2.0	%
	Other Output		-1.0		+1.0	
Line Regulation			-0.5		+0.5	%
Load Regulation	From 0% to 100% Load	3.3V Output	-1.5		+1.5	%
		Other Output	-0.5		+0.5	
Cross Regulation	Asymmetrical Load 25% / 100% for Dual Output		-5		+5	%
Ripple & Noise (1)	20MHz bandwidth	24V Output			150	mVpk-pk
		Other Output			60	
Short Circuit Protection			Indefinite (Automatic Recovery)			
Temperature Coefficient			-0.02		+0.02	%/°C
Maximum Capacitive Load	Nominal Vin and constant resistive load		See Table			

Note：
1. Measured with a 1.0μF MLCC.

ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (100 ms)	12V Input			24	VDC
	24V Input			40	
	48V Input			80	
Soldering Temperature	1.5mm from case 10sec max.			260	°C

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

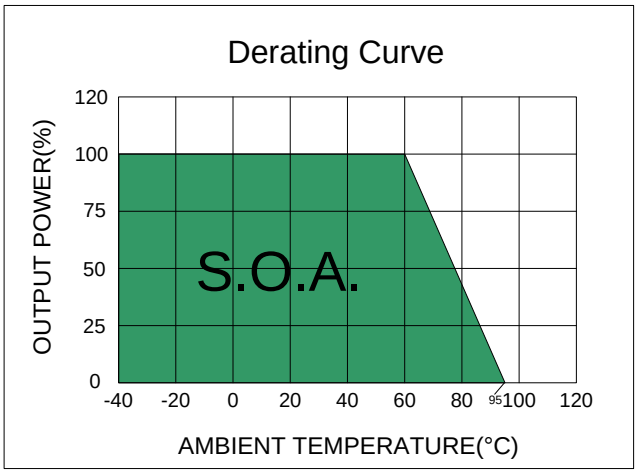
GENERAL SPECIFICATIONS						
Parameter	**Conditions**		**Min.**	**Typ.**	**Max.**	**Unit**
Isolation Voltage	Input-output, and rated for 60sec	Standard Type	1500			VDC
		Suffix “H”	3500			
	Case-I/O, and rated for 60sec		1000			
Isolation Resistance	Input-output		1000			MΩ
Isolation Capacitance	Input-output			500		pF
Switching Frequency				266		kHz
MTBF	MIL-HDBK-217 F @ 25°C		1121			k hours
Safety Approval	IEC / EN / UL 62368-1		DK-64825-UL, E252573			
Environmental compliance			RoHS			

ENVIRONMENT SPECIFICATIONS					
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Operating Ambient Temperature	See the Derating Curve	-40		95	°C
Maximum Case Temperature				100	°C
Thermal Impedance		23			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

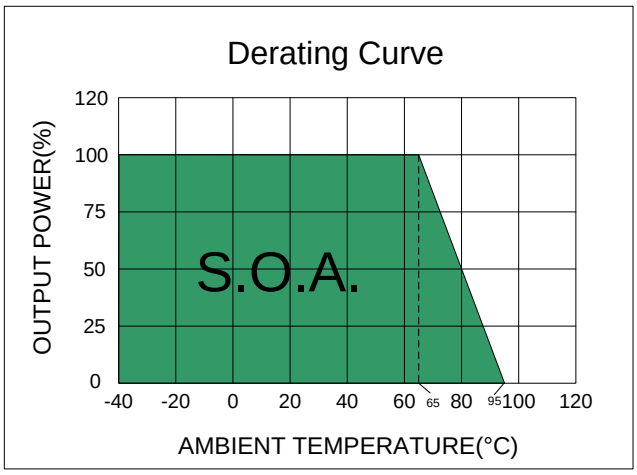
EMC SPECIFICATIONS			
Parameter	**Standard**	**Condition**	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032		A
ESD	IEC 61000-4-2	Air: ±8kV / Contact: ±6kV	A
RS	IEC 61000-4-3	10V/m	A
EFT	IEC 61000-4-4	±2kV with external components	A
Surge	IEC 61000-4-5	±1kV with external components	A
CS	IEC 61000-4-6	10Vrms	A
PFMF	IEC 61000-4-8	1A/m	A

PHYSICAL SPECIFICATIONS	
Parameter	**Value**
Case Material	Aluminum
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	13.0 g, typ.
Dimensions	1.25" x 0.8" x 0.4"

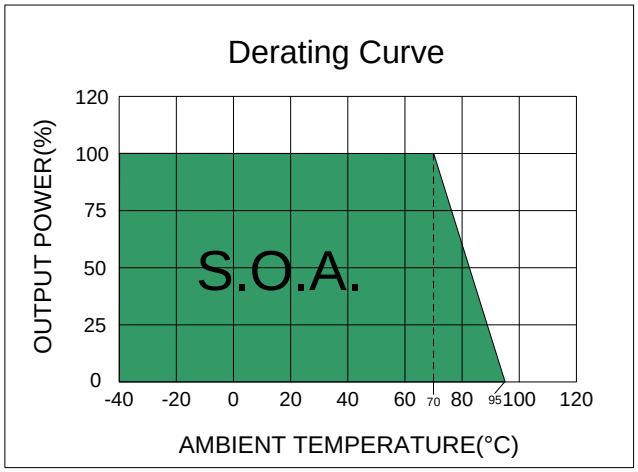
ELECTRICAL CHARACTERISTIC CURVES



Efficiency 76% ~ 80% Models



Efficiency 81% ~ 83% Models

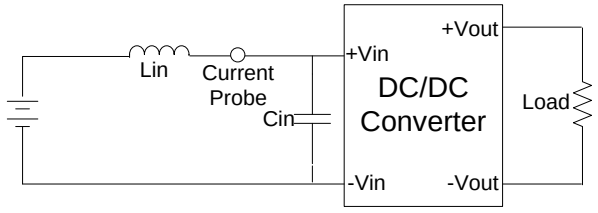


Efficiency 84% ~ 87% Models

TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

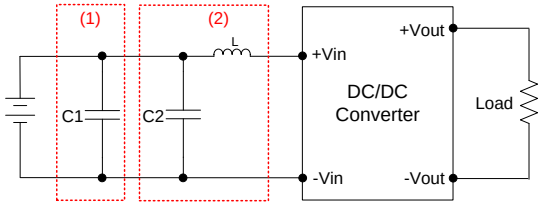
Input reflected ripple current is measured with a source inductor Lin (12μH) and a source capacitor Cin (47μF, ESR<1.0Ω at 100kHz) at nominal input and full load.



DESIGN & FEATURE CONFIGURATIONS

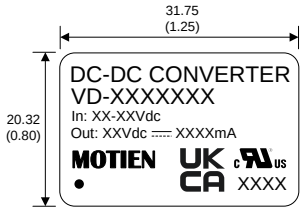
EMC Filter

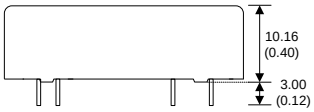
The part (1) Circuit is used to meet Surge & EFT test, and the part (2) Circuit is used to meet EMI test.

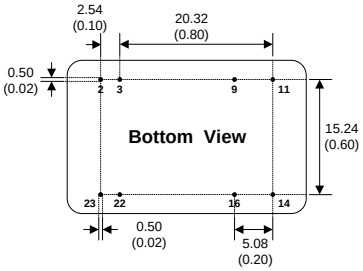


	C1	C2	L
VD-12XXX6	NIPPON Chemi-con KY series 220μF, 100V	NIPPON Chemi-con KY series 100μF, 100V	12μH
VD-24XXX6			
VD-48XXX6			

MECHANICAL SPECIFICATIONS





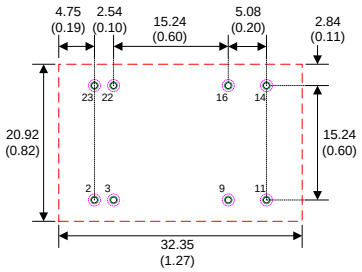


Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-Vin	-Vin
3	-Vin	-Vin
9	N.P.	COM
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	COM
22	+Vin	+Vin
23	+Vin	+Vin

*N.P.：No PIN
*N.C.：No Connection

RECOMMENDED FOOTPRINT DETAILS



Notes：1. All dimensions are typical in millimeters (inches).
Through hole (black) 2 ~ 23: Ø0.80 (0.031)
Top view pad (green) 2 ~ 23: Ø1.00 (0.039)
Bottom view pad (pink) 2 ~ 23: Ø1.60 (0.063)

MOTIEN
ISO 9001 . ISO 14001 . IECQ QC080000
No. 9, Keji 2nd Rd., Tainan Technology Industrial Park, Tainan City 709031, Taiwan
Tel: 886-6-384 2366 (Rep.) Fax: 886-6-384 2399
Website : http://www.motien.com.tw Email : sales@motien.com.tw

Last Update：05.Jul.2024