

# VD-3W Series

3W 2:1 Regulated Single & Dual output

## Features

- Wide 2:1 Input Range
- 1500VDC Isolation, Up to 3500VDC
- Continuous Short Circuit Protection
- Efficiency up to 85%
- Operating Temperature Range -40 ~ 95°C max.



## PART NUMBER STRUCTURE

**VD** - **24** **05** **S** **3** **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-123R3S3	9-18	15	326	3.3	0	900	76	470
VD-1205S3	9-18	20	313	5	0	600	80	470
VD-127R2S3	9-18	18	309	7.2	0	416	81	220
VD-1209S3	9-18	18	305	9	0	333	82	220
VD-1212S3	9-18	18	302	12	0	250	83	220
VD-1215S3	9-18	22	302	15	0	200	83	22
VD-1218S3	9-18	25	309	18	0	166	81	22
VD-1224S3	9-18	22	305	24	0	125	82	22
VD-123R3D3	9-18	18	338	±3.3	0	±450	74	±1000
VD-1205D3	9-18	18	313	±5	0	±300	80	±220
VD-127R2D3	9-18	18	313	±7.2	0	±208	80	±100
VD-1209D3	9-18	20	302	±9	0	±167	83	±100
VD-1212D3	9-18	25	313	±12	0	±125	80	±47
VD-1215D3	9-18	25	313	±15	0	±100	80	±10
VD-1218D3	9-18	28	321	±18	0	±83	78	±100
VD-1224D3	9-18	30	305	±24	0	±63	82	±10
VD-243R3S3	18-36	12	159	3.3	0	900	78	1000
VD-2405S3	18-36	12	151	5	0	600	83	220
VD-247R2S3	18-36	15	151	7.2	0	416	83	220
VD-2409S3	18-36	15	151	9	0	333	83	220
VD-2412S3	18-36	15	148	12	0	250	85	100
VD-2415S3	18-36	15	149	15	0	200	84	1000
VD-2418S3	18-36	15	149	18	0	166	84	47
VD-2424S3	18-36	15	148	24	0	125	85	220

The information and specifications contained in this data sheet are believed to be correct at time of publication. However, **MOTIEN Technology** accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice. No rights under any patent accompany the sale of any such product(s) or information contained herein.

Model Number	Input Voltage Range (VDC)	Input Current		Output Voltage (VDC)	Output Current		Efficiency @FL (% , typ.)	Capacitive Load @FL ( $\mu$ F, max.)
		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VD-243R3D3	18-36	12	159	$\pm$ 3.3	0	$\pm$ 450	79	$\pm$ 330
VD-2405D3	18-36	15	155	$\pm$ 5	0	$\pm$ 300	81	$\pm$ 1000
VD-247R2D3	18-36	15	151	$\pm$ 7.2	0	$\pm$ 208	83	$\pm$ 100
VD-2409D3	18-36	15	153	$\pm$ 9	0	$\pm$ 167	82	$\pm$ 220
VD-2412D3	18-36	18	153	$\pm$ 12	0	$\pm$ 125	82	$\pm$ 100
VD-2415D3	18-36	18	153	$\pm$ 15	0	$\pm$ 100	82	$\pm$ 10
VD-2418D3	18-36	20	157	$\pm$ 18	0	$\pm$ 83	80	$\pm$ 22
VD-2424D3	18-36	20	155	$\pm$ 24	0	$\pm$ 63	81	$\pm$ 22
VD-483R3S3	36-72	10	80	3.3	0	900	78	1000
VD-4805S3	36-72	8	78	5	0	600	81	680
VD-487R2S3	36-72	10	76	7.2	0	416	83	470
VD-4809S3	36-72	10	75	9	0	333	84	330
VD-4812S3	36-72	10	75	12	0	250	84	220
VD-4815S3	36-72	10	76	15	0	200	83	100
VD-4818S3	36-72	10	75	18	0	166	84	47
VD-4824S3	36-72	15	75	24	0	125	84	47
VD-483R3D3	36-72	10	82	$\pm$ 3.3	0	$\pm$ 450	77	$\pm$ 680
VD-4805D3	36-72	10	77	$\pm$ 5	0	$\pm$ 300	82	$\pm$ 330
VD-487R2D3	36-72	10	77	$\pm$ 7.2	0	$\pm$ 208	82	$\pm$ 220
VD-4809D3	36-72	12	77	$\pm$ 9	0	$\pm$ 167	82	$\pm$ 100
VD-4812D3	36-72	12	76	$\pm$ 12	0	$\pm$ 125	83	$\pm$ 22
VD-4815D3	36-72	12	77	$\pm$ 15	0	$\pm$ 100	82	$\pm$ 22
VD-4818D3	36-72	15	78	$\pm$ 18	0	$\pm$ 83	81	$\pm$ 22
VD-4824D3	36-72	12	79	$\pm$ 24	0	$\pm$ 63	80	$\pm$ 10

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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	0.63			A
	24V Input	0.315			
	48V Input	0.16			
Note :					
1. Measured with a simulated source inductance of 12 $\mu$ H and a source capacitor Cin ( 47 $\mu$ F, ESR<1.0 $\Omega$ 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 1.0 $\mu$ F 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			

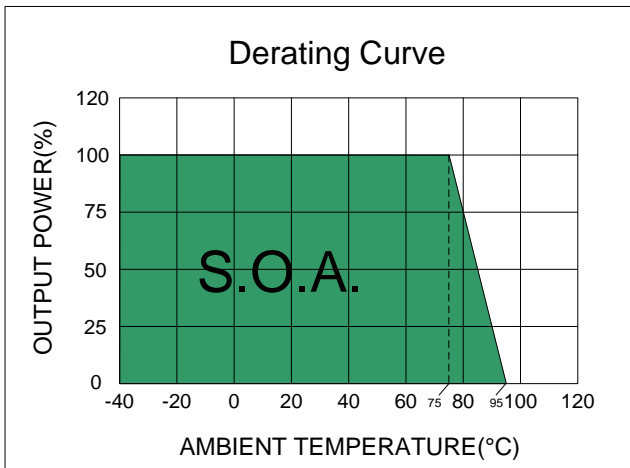
ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		95	°C
Maximum Case Temperature				100	°C
Thermal Impedance		25			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

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

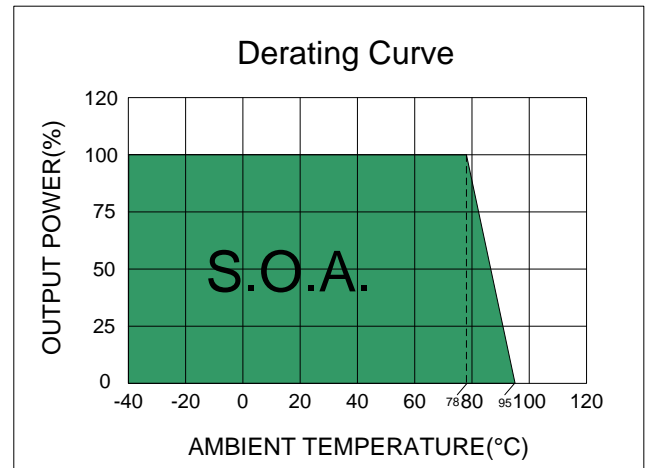
PHYSICAL SPECIFICATIONS	
Parameter	Value
Case Material	Aluminum
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy ( UL94V-0 rated )
Weight	13.0 g, typ.
Dimensions	1.25" x 0.8" x 0.4"

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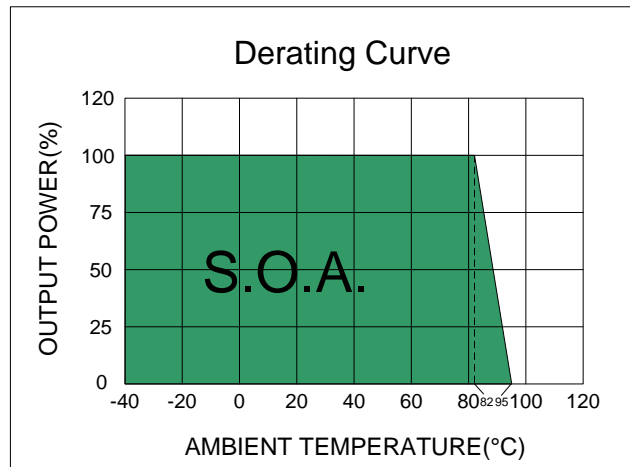
**ELECTRICAL CHARACTERISTIC CURVES**



Efficiency 74% ~ 79% Models



Efficiency 80% ~ 82% Models

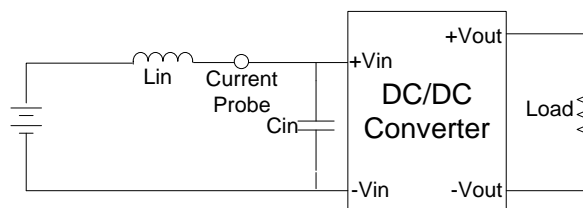


Efficiency 83% ~ 85% Models

**TEST CONFIGURATIONS**

**Input Reflected Ripple Current Test Step**

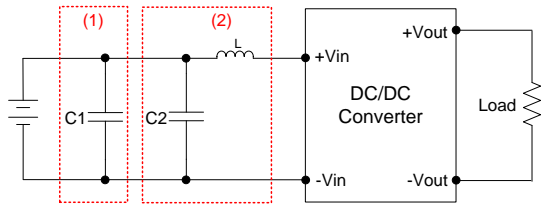
Input reflected ripple current is measured with a source inductor  $L_{in}$  ( 12 $\mu$ H ) and a source capacitor  $C_{in}$  ( 47 $\mu$ F, ESR<1.0 $\Omega$  at 100kHz ) at nominal input and full load.



**DESIGN & FEATURE CONFIGURATIONS**

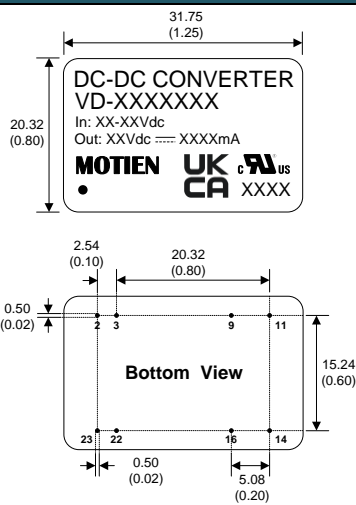
**EMC Filter**

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-12XXX3	NIPPON Chemi-con KY series 220μF, 100V	NIPPON Chemi-con KY series 100μF, 100V	12μH
VD-24XXX3			
VD-48XXX3			

**MECHANICAL SPECIFICATIONS**



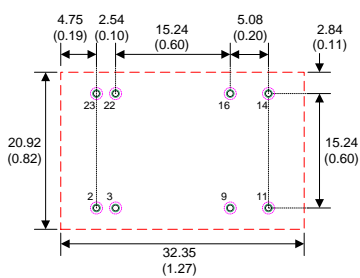
- Notes : All dimensions are typical in millimeters ( inches ).
1. Pin diameter: 0.5±0.05 ( 0.02±0.002 )
  2. Pin pitch and length tolerance: ±0.35 (±0.014 )
  3. Case Tolerance: ±0.5 (±0.02 )
  4. Stand-off tolerance: ±0.1 ( ±0.004 )

**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 )