

VP-2W Series



2W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- 1500VDC Isolation, Up to 3500VDC
- Continuous Short Circuit Protection
- Efficiency up to 81%
- Operating Temperature Range -40 ~ 95°C max.



PART NUMBER STRUCTURE

VP - **24** **05** **S** **2** **H**
(1) (2) (3) (4) (5) (6)

(1) Series

(2) Input Voltage Range

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

(4) Output Type

S - Single Output
D - Dual Output

(3) Output Voltage

3R3 - 3.3 V
05 - 5.0 V
09 - 9.0 V
12 - 12 V
15 - 15 V
24 - 24 V

(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)		
VP-243R3S2	9-36	15	110	3.3	0	600	75	470
VP-2405S2	9-36	12	107	5	0	400	78	470
VP-2409S2	9-36	12	110	9	0	222	76	68
VP-2412S2	9-36	15	107	12	0	166	78	47
VP-2415S2	9-36	15	103	15	0	133	81	47
VP-2424S2	9-36	20	103	24	0	83	81	10
VP-243R3D2	9-36	15	112	±3.3	0	±303	75	±220
VP-2405D2	9-36	15	107	±5	0	±200	78	±220
VP-2409D2	9-36	15	107	±9	0	±111	78	±33
VP-2412D2	9-36	15	107	±12	0	±83	78	±22
VP-2415D2	9-36	18	105	±15	0	±66	80	±10
VP-2424D2	9-36	30	107	±24	0	±41	78	±10
VP-483R3S2	18-72	12	55	3.3	0	600	75	470
VP-4805S2	18-72	8	54	5	0	400	78	330
VP-4809S2	18-72	12	54	9	0	222	78	68
VP-4812S2	18-72	8	53	12	0	166	80	100
VP-4815S2	18-72	12	54	15	0	133	78	22
VP-4824S2	18-72	18	55	24	0	83	77	68
VP-483R3D2	18-72	12	56	±3.3	0	±303	75	±220
VP-4805D2	18-72	12	55	±5	0	±200	76	±100
VP-4809D2	18-72	12	54	±9	0	±111	78	±33
VP-4812D2	18-72	12	54	±12	0	±83	78	±22
VP-4815D2	18-72	12	54	±15	0	±66	78	±10
VP-4824D2	18-72	12	54	±24	0	±41	78	±10

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.

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		No-Load (mA, max.)	Full Load (mA, typ.)		Min. load (mA)	Full load (mA)		
VP-243R3S2H	9-36	15	110	3.3	0	600	75	470
VP-2405S2H	9-36	12	106	5	0	400	79	330
VP-2409S2H	9-36	15	107	9	0	222	78	68
VP-2412S2H	9-36	15	107	12	0	166	78	47
VP-2415S2H	9-36	15	107	15	0	133	78	22
VP-2424S2H	9-36	15	107	24	0	83	78	10
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VP-2405D2H	9-36	15	110	±5	0	±200	76	±100
VP-2409D2H	9-36	15	107	±9	0	±111	78	±33
VP-2412D2H	9-36	20	105	±12	0	±83	80	±22
VP-2415D2H	9-36	15	107	±15	0	±66	78	±10
VP-2424D2H	9-36	15	107	±24	0	±41	78	±10
VP-483R3S2H	18-72	12	55	3.3	0	600	75	470
VP-4805S2H	18-72	10	53	5	0	400	80	330
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VP-4812D2H	18-72	12	54	±12	0	±83	78	±22
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INPUT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	24V Input	9	24	36	VDC
	48V Input	18	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)	24V Input	0.4			A
	48V Input	0.2			
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)	24V Input			40	VDC
	48V Input			80	
Soldering Temperature	1.5mm from case 10sec max.			260	$^{\circ}$ C
Note : These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.					

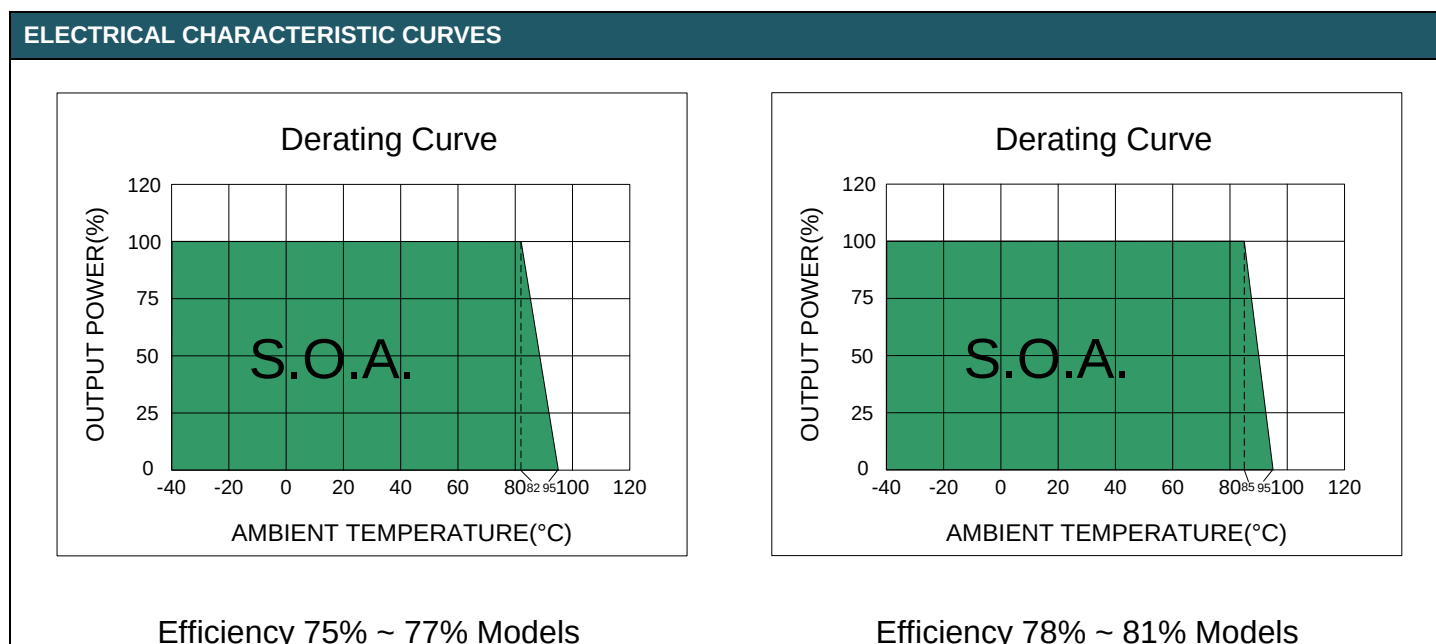
GENERAL SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, and rated for 60sec	Standard Type	1500		VDC
		Suffix "H"	3500		
	Case-I/O, and rated for 60sec	1000			
Isolation Resistance	Input-output	1000			M Ω
Isolation Capacitance	Input-output		500		pF
Switching Frequency			266		kHz
MTBF	MIL-HDBK-217 F @ 25 $^{\circ}$ C	1121			k hours
Safety Standard	IEC / EN / UL 62368-1	Designed to meet			
Environmental compliance		RoHS			

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ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		85	°C
Maximum Case Temperature				100	°C
Thermal Impedance		26			°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	with external components	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

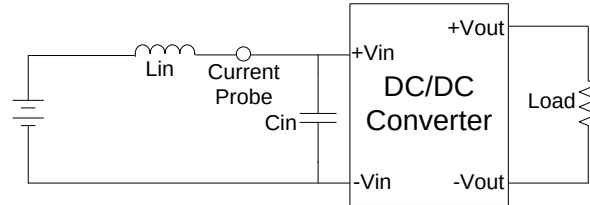
PHYSICAL SPECIFICATIONS	
Parameter	Value
Case Material	Aluminum
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	13.0 g, typ.
Dimensions	1.25" x 0.8" x 0.4"



TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

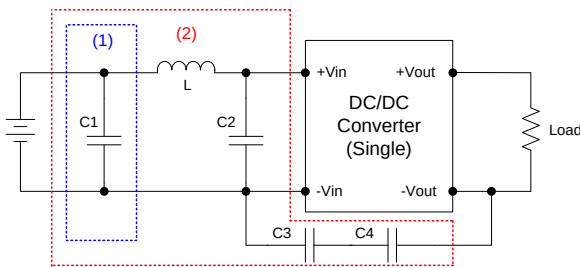
Input reflected ripple current is measured with a source inductor L_{in} ($12\mu H$) and a source capacitor C_{in} ($47\mu F$, $ESR < 1.0\Omega$ at $100kHz$) at nominal input and full load.



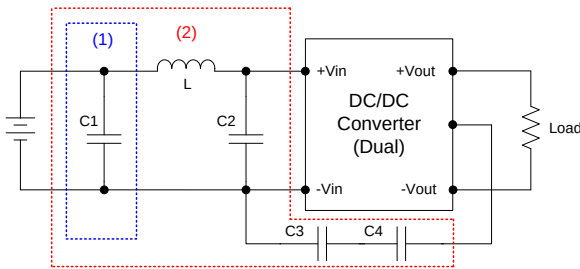
DESIGN & FEATURE CONFIGURATIONS

EMC Filter

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

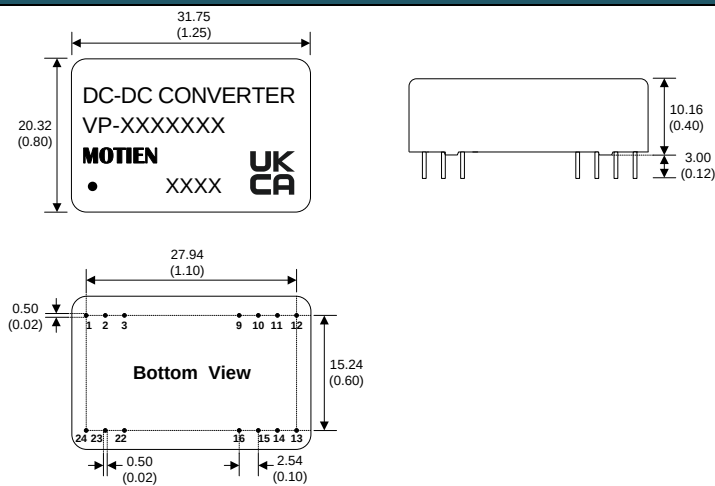


	C1	L	C2	C3	C4
VP-24XXS2	NIPPON Chemi-con KY series 220μF, 100V	15μH	Nichicon PW series 10μF, 100V	MLCC 1000pF, 2kV	
VP-48XXS2					
VP-24XXS2H				MLCC 2200pF, 2kV	MLCC 2200pF, 2kV
VP-48XXS2H					



	C1	L	C2	C3	C4	
VP-24XXD2	NIPPON Chemi-con KY series 220μF, 100V	15μH	Nichicon PW series 10μF, 100V	MLCC 1000pF, 2kV		
VP-48XXD2						
VP-24XXD2H				MLCC 2200pF, 2kV		MLCC 2200pF, 2kV
VP-48XXD2H						

MECHANICAL SPECIFICATIONS

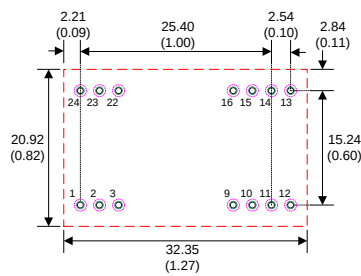


- Notes : All dimensions are typical in millimeters (inches).
- 1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 - 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 - 3. Case Tolerance: ± 0.5 (± 0.02)
 - 4. Stand-off tolerance: ± 0.1 (± 0.004)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+Vin	+Vin	N.P.	N.P.
2	N.C.	-Vout	-Vin	-Vin
3	N.C.	COM	-Vin	-Vin
9	N.P.	N.P.	N.P.	COM
10	-Vout	COM	N.P.	N.P.
11	+Vout	+Vout	N.C.	-Vout
12	-Vin	-Vin	N.P.	N.P.
13	-Vin	-Vin	N.P.	N.P.
14	+Vout	+Vout	+Vout	+Vout
15	-Vout	COM	N.P.	N.P.
16	N.P.	N.P.	-Vout	COM
22	N.C.	COM	+Vin	+Vin
23	N.C.	-Vout	+Vin	+Vin
24	+Vin	+Vin	N.P.	N.P.

*N.P. : No PIN
*N.C. : No Connection

RECOMMENDED FOOTPRINT DETAILS



- Notes : 1. All dimensions are typical in millimeters (inches).
- Through hole (black) 1 ~ 24: $\varnothing 0.80$ (0.031)
 - Top view pad (green) 1 ~ 24: $\varnothing 1.00$ (0.039)
 - Bottom view pad (pink) 1 ~ 24: $\varnothing 1.60$ (0.063)