

V6-1.5W Series

1.5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- 1500VDC Isolation, Up to 3500VDC
- Continuous Short Circuit Protection
- Efficiency up to 80%
- Operating Temperature Range -40 ~ 95°C max.



PART NUMBER STRUCTURE

V6 - **24** **05** **S** **1** **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
09 - 9.0 V
12 - 12 V
15 - 15 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)		
V6-123R3S1	9-18	25	174	3.3	0	454	75	470
V6-1205S1	9-18	18	163	5	0	300	77	470
V6-1209S1	9-18	25	159	9	0	167	79	100
V6-1212S1	9-18	25	167	12	0	125	75	47
V6-1215S1	9-18	25	159	15	0	100	79	47
V6-1224S1	9-18	25	167	24	0	63	75	10
V6-123R3D1	9-18	25	167	±3.3	0	±227	75	±220
V6-1205D1	9-18	25	167	±5	0	±150	75	±220
V6-1209D1	9-18	25	167	±9	0	±84	75	±33
V6-1212D1	9-18	25	167	±12	0	±63	75	±22
V6-1215D1	9-18	25	163	±15	0	±50	77	±10
V6-1224D1	9-18	25	167	±24	0	±32	75	±10
V6-243R3S1	18-36	12	84	3.3	0	454	75	470
V6-2405S1	18-36	12	82	5	0	300	77	330
V6-2409S1	18-36	12	84	9	0	167	75	68
V6-2412S1	18-36	20	80	12	0	125	79	47
V6-2415S1	18-36	12	84	15	0	100	75	22
V6-2424S1	18-36	12	80	24	0	63	79	47
V6-243R3D1	18-36	12	84	±3.3	0	±227	75	±220
V6-2405D1	18-36	12	83	±5	0	±150	76	±220
V6-2409D1	18-36	12	84	±9	0	±84	75	±33
V6-2412D1	18-36	20	83	±12	0	±63	76	±47
V6-2415D1	18-36	12	82	±15	0	±50	77	±10
V6-2424D1	18-36	12	84	±24	0	±32	75	±10
V6-483R3S1	36-72	8	42	3.3	0	454	75	470
V6-4805S1	36-72	8	41	5	0	300	78	220
V6-4809S1	36-72	8	42	9	0	167	75	68
V6-4812S1	36-72	12	40	12	0	125	79	100
V6-4815S1	36-72	8	42	15	0	100	75	22
V6-4824S1	36-72	8	42	24	0	63	75	10
V6-483R3D1	36-72	8	42	±3.3	0	±227	75	±220
V6-4805D1	36-72	8	42	±5	0	±150	75	±220
V6-4809D1	36-72	8	42	±9	0	±84	75	±33
V6-4812D1	36-72	8	42	±12	0	±63	75	±22
V6-4815D1	36-72	8	42	±15	0	±50	75	±10
V6-4824D1	36-72	8	42	±24	0	±32	75	±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.

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)		
V6-123R3S1H	9-18	25	167	3.3	0	454	75	470
V6-1205S1H	9-18	18	159	5	0	300	79	330
V6-1209S1H	9-18	25	167	9	0	167	75	68
V6-1212S1H	9-18	25	167	12	0	125	75	47
V6-1215S1H	9-18	25	163	15	0	100	77	22
V6-1224S1H	9-18	25	167	24	0	63	75	10
V6-123R3D1H	9-18	25	167	±3.3	0	±227	75	±220
V6-1205D1H	9-18	25	167	±5	0	±150	75	±220
V6-1209D1H	9-18	25	167	±9	0	±84	75	±33
V6-1212D1H	9-18	25	167	±12	0	±63	75	±22
V6-1215D1H	9-18	25	165	±15	0	±50	76	±10
V6-1224D1H	9-18	25	167	±24	0	±32	75	±10
V6-243R3S1H	18-36	12	84	3.3	0	454	75	470
V6-2405S1H	18-36	12	80	5	0	300	79	330
V6-2409S1H	18-36	12	84	9	0	167	75	68
V6-2412S1H	18-36	12	84	12	0	125	75	47
V6-2415S1H	18-36	12	84	15	0	100	75	22
V6-2424S1H	18-36	12	84	24	0	63	75	10
V6-243R3D1H	18-36	12	87	±3.3	0	±227	72	±220
V6-2405D1H	18-36	12	84	±5	0	±150	75	±220
V6-2409D1H	18-36	12	84	±9	0	±84	75	±33
V6-2412D1H	18-36	20	79	±12	0	±63	80	±10
V6-2415D1H	18-36	12	84	±15	0	±50	75	±10
V6-2424D1H	18-36	12	84	±24	0	±32	75	±10
V6-483R3S1H	36-72	8	42	3.3	0	454	75	470
V6-4805S1H	36-72	10	41	5	0	300	77	470
V6-4809S1H	36-72	8	42	9	0	167	75	68
V6-4812S1H	36-72	8	42	12	0	125	75	47
V6-4815S1H	36-72	8	42	15	0	100	75	22
V6-4824S1H	36-72	8	42	24	0	63	75	10
V6-483R3D1H	36-72	8	42	±3.3	0	±227	75	±220
V6-4805D1H	36-72	8	42	±5	0	±150	75	±220
V6-4809D1H	36-72	8	42	±9	0	±84	75	±33
V6-4812D1H	36-72	8	42	±12	0	±63	75	±22
V6-4815D1H	36-72	8	42	±15	0	±50	75	±10
V6-4824D1H	36-72	8	42	±24	0	±32	75	±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	0.315			A
	24V Input	0.16			
	48V Input	0.1			
Note :					
1. Measured with a simulated source inductance of 12 μ H and a source capacitor Cin (47 μ F, ESR<1.0 Ω 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 μ 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 Standard	IEC / EN / UL 62368-1		Designed to meet			
Environmental compliance			RoHS			

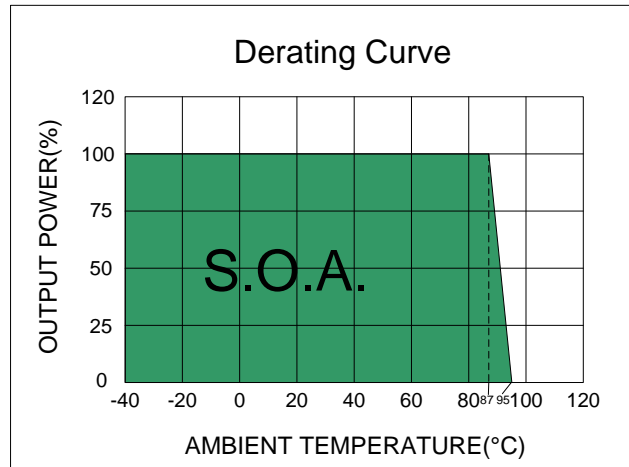
ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		95	°C
Maximum Case Temperature				100	°C
Thermal Impedance		26			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

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"

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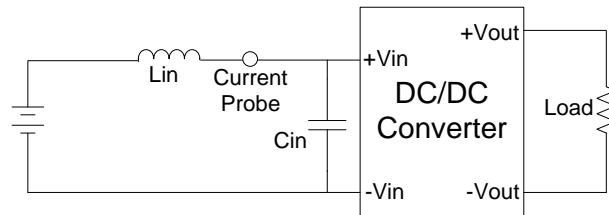
ELECTRICAL CHARACTERISTIC CURVES



TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

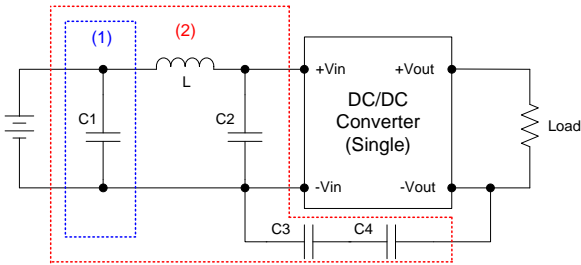
Input reflected ripple current is measured with a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ω at 100kHz) at nominal input and full load.



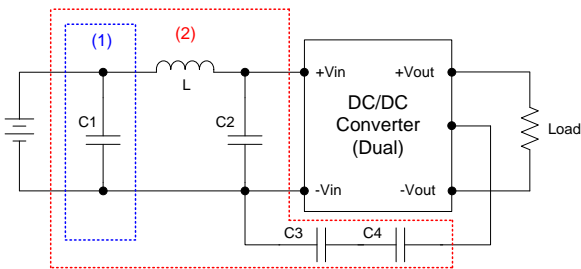
DESIGN & FEATURE CONFIGURATIONS

EMC Filter

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

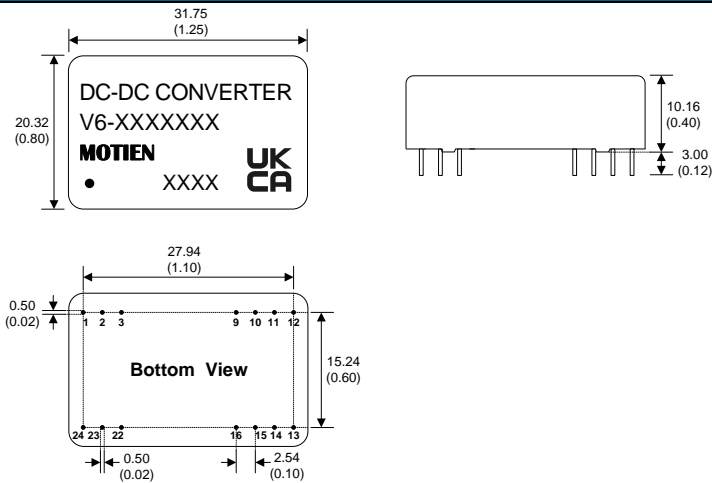


	C1	L	C2	C3	C4
V6-12XXS1	NIPPON Chemi-con KY series 220μF, 100V	15μH	Nichicon PW series 10μF, 100V	MLCC 1000pF, 2kV	
V6-24XXS1					
V6-48XXS1					
V6-12XXS1H				MLCC 2200pF, 2kV	MLCC 2200pF, 2kV
V6-24XXS1H					
V6-48XXS1H					



	C1	L	C2	C3	C4
V6-12XXD1	NIPPON Chemi-con KY series 220μF, 100V	15μH	Nichicon PW series 10μF, 100V	MLCC 1000pF, 2kV	
V6-24XXD1					
V6-48XXD1					
V6-12XXD1H				MLCC 2200pF, 2kV	MLCC 2200pF, 2kV
V6-24XXD1H					
V6-48XXD1H					

MECHANICAL SPECIFICATIONS



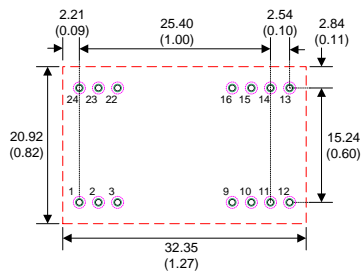
- Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
 4. Stand-off tolerance: ± 0.1 (± 0.004)

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)