

V6-6W 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

V6 - **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

(4) Output Type

S - Single Output
D - Dual Output

(5) Watt

(3) Output Voltage

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

(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)		
V6-123R3S6	9-18	30	488	3.3	0	1400	79	1000
V6-1205S6	9-18	20	650	5	0	1200	77	1000
V6-1209S6	9-18	20	610	9	0	666	82	680
V6-1212S6	9-18	22	610	12	0	500	82	470
V6-1215S6	9-18	30	625	15	0	400	80	220
V6-1224S6	9-18	30	603	24	0	250	83	47
V6-123R3D6	9-18	30	658	±3.3	0	±909	76	±680
V6-1205D6	9-18	30	650	±5	0	±600	77	±330
V6-1209D6	9-18	30	625	±9	0	±333	80	±220
V6-1212D6	9-18	30	625	±12	0	±250	80	±100
V6-1215D6	9-18	30	633	±15	0	±200	79	±47
V6-1224D6	9-18	30	625	±24	0	±125	80	±33
V6-243R3S6	18-36	12	250	3.3	0	1400	77	1000
V6-2405S6	18-36	8	309	5	0	1200	81	1000
V6-2409S6	18-36	18	298	9	0	666	84	680
V6-2412S6	18-36	15	291	12	0	500	86	470
V6-2415S6	18-36	18	291	15	0	400	86	470
V6-2424S6	18-36	18	291	24	0	250	86	330
V6-243R3D6	18-36	20	329	±3.3	0	±909	76	±680
V6-2405D6	18-36	20	321	±5	0	±600	78	±330
V6-2409D6	18-36	18	295	±9	0	±333	85	±220
V6-2412D6	18-36	18	295	±12	0	±250	85	±220
V6-2415D6	18-36	18	291	±15	0	±200	86	±68
V6-2424D6	18-36	22	291	±24	0	±125	86	±68
V6-483R3S6	18-36	12	122	3.3	0	1400	79	1000
V6-4805S6	18-36	12	157	5	0	1200	80	1000
V6-4809S6	18-36	12	153	9	0	666	82	680
V6-4812S6	18-36	12	157	12	0	500	80	330
V6-4815S6	18-36	12	151	15	0	400	83	220
V6-4824S6	18-36	12	151	24	0	250	83	68
V6-483R3D6	18-36	12	165	±3.3	0	±909	76	±680
V6-4805D6	18-36	12	159	±5	0	±600	79	±330
V6-4809D6	18-36	12	159	±9	0	±333	79	±220
V6-4812D6	18-36	12	157	±12	0	±250	80	±100
V6-4815D6	18-36	12	157	±15	0	±200	80	±47
V6-4824D6	18-36	12	157	±24	0	±125	80	±33

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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)		
V6-123R3S6H	9-18	18	507	3.3	0	1400	76	220
V6-1205S6H	9-18	20	642	5	0	1200	78	1000
V6-1209S6H	9-18	20	618	9	0	666	81	680
V6-1212S6H	9-18	22	596	12	0	500	84	1000
V6-1215S6H	9-18	18	596	15	0	400	84	100
V6-1224S6H	9-18	25	603	24	0	250	83	100
V6-123R3D6H	9-18	18	658	±3.3	0	±909	76	±1000
V6-1205D6H	9-18	20	633	±5	0	±600	79	±680
V6-1209D6H	9-18	18	610	±9	0	±333	82	±22
V6-1212D6H	9-18	25	610	±12	0	±250	82	±330
V6-1215D6H	9-18	25	610	±15	0	±200	82	±100
V6-1224D6H	9-18	32	610	±24	0	±125	82	±10
V6-243R3S6H	18-36	8	250	3.3	0	1400	77	1000
V6-2405S6H	18-36	12	309	5	0	1200	81	1000
V6-2409S6H	18-36	15	295	9	0	666	85	680
V6-2412S6H	18-36	15	291	12	0	500	86	1000
V6-2415S6H	18-36	10	295	15	0	400	85	680
V6-2424S6H	18-36	15	291	24	0	250	86	470
V6-243R3D6H	18-36	15	321	±3.3	0	±909	78	±1000
V6-2405D6H	18-36	12	305	±5	0	±600	82	±680
V6-2409D6H	18-36	15	295	±9	0	±333	85	±220
V6-2412D6H	18-36	18	295	±12	0	±250	85	±470
V6-2415D6H	18-36	20	295	±15	0	±200	85	±220
V6-2424D6H	18-36	25	298	±24	0	±125	84	±100
V6-483R3S6H	18-36	8	123	3.3	0	1400	78	2200
V6-4805S6H	18-36	8	153	5	0	1200	82	1000
V6-4809S6H	18-36	8	146	9	0	666	86	1000
V6-4812S6H	18-36	8	146	12	0	500	86	470
V6-4815S6H	18-36	8	149	15	0	400	84	1000
V6-4824S6H	18-36	10	144	24	0	250	87	220
V6-483R3D6H	18-36	12	159	±3.3	0	±909	79	±1000
V6-4805D6H	18-36	15	153	±5	0	±600	82	±680
V6-4809D6H	18-36	12	146	±9	0	±333	86	±680
V6-4812D6H	18-36	12	146	±12	0	±250	86	±330
V6-4815D6H	18-36	10	149	±15	0	±200	84	±330
V6-4824D6H	18-36	15	149	±24	0	±125	84	±150

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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	1.25			A
	24V Input	0.63			
	48V Input	0.315			
Note :					
1. Measured with a simulated source inductance of 12uH and a source capacitor Cin (47uF, 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 Standard	IEC / EN / UL 62368-1		Designed to meet			
Environmental compliance			RoHS			

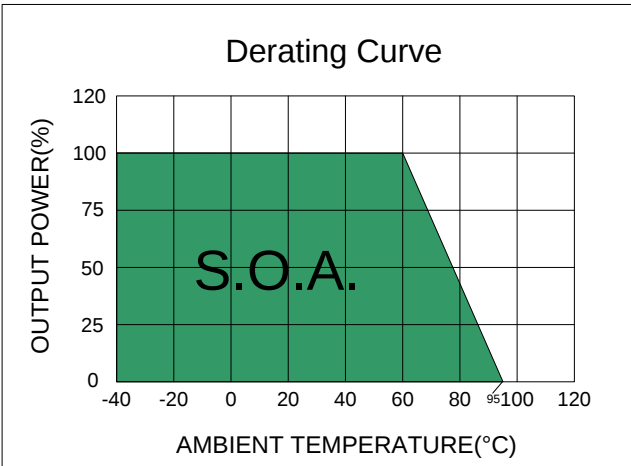
ENVIRONMENT SPECIFICATIONS					
Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating Ambient Temperature	See the Derating Curve	-40		95	°C
Maximum Case Temperature				100	°C
Thermal Impedance		23			°C/W
Storage Humidity				95	% rel. H
Storage Temperature		-55		125	°C
Cooling	Natural Convection	30-65 LFM			

EMC SPECIFICATIONS			
Parameter	Standard	Condition	Criterion
Conducted Emissions	EN55032	with external components	A
Radiated Emissions	EN55032	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

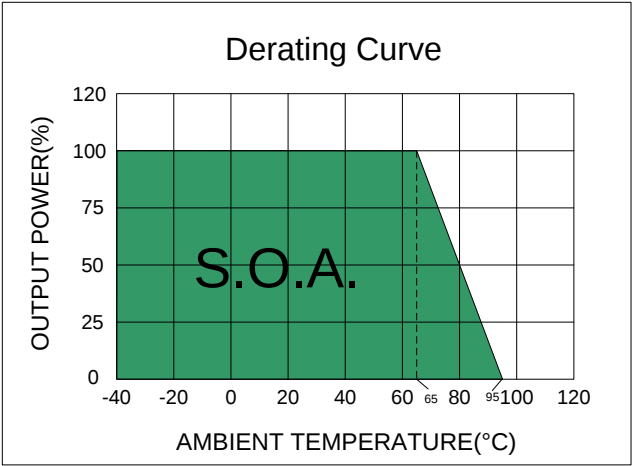
PHYSICAL SPECIFICATIONS	
Parameter	Value
Case Material	Aluminum
Pin Material	Ø0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	13.0 g, typ.
Dimensions	1.25" x 0.8" x 0.4"

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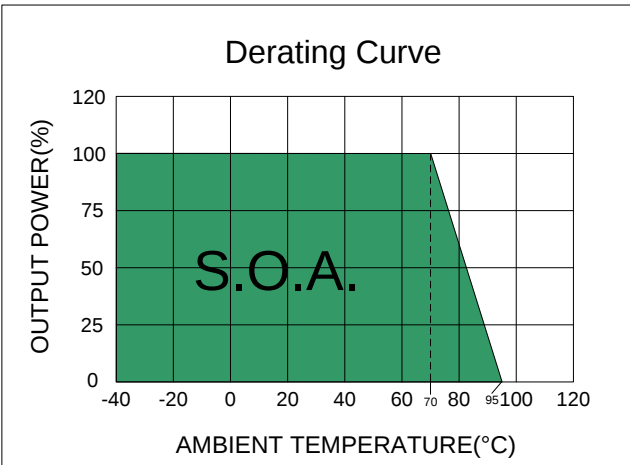
ELECTRICAL CHARACTERISTIC CURVES



Efficiency 76% ~ 80% Models



Efficiency 81% ~ 83% Models



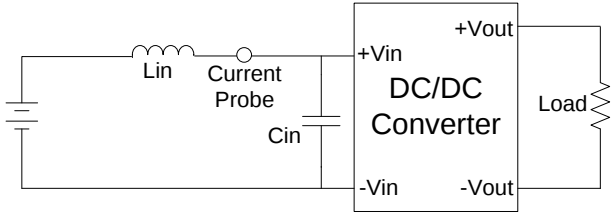
Efficiency 84% ~ 87% Models

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TEST CONFIGURATIONS

Input Reflected Ripple Current Test Step

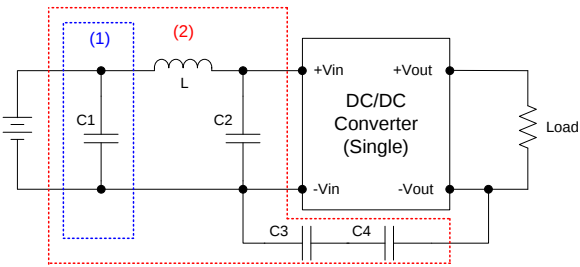
Input reflected ripple current is measured with a source inductor L_{in} ($12\mu H$) and a source capacitor C_{in} ($47\mu F$, $ESR<1.0\Omega$ at $100kHz$) at nominal input and full load.



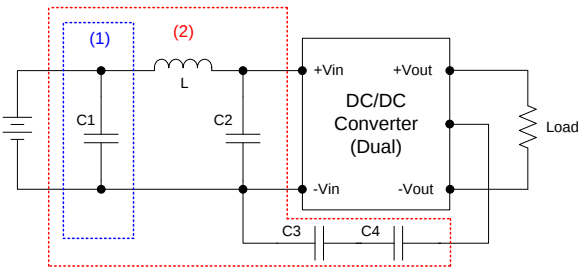
DESIGN & FEATURE CONFIGURATIONS

EMC Filter

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



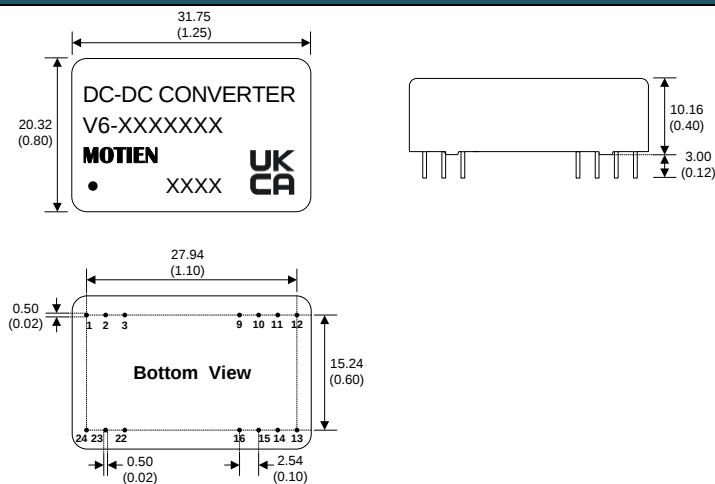
	C1	L	C2	C3	C4
V6-12XXS6	NIPPON Chemi-con KY series 220 μ F, 100V	15 μ H	Nichicon PW series 10 μ F, 100V	MLCC 1000pF, 2kV	
V6-24XXS6					
V6-48XXS6				MLCC 2200pF, 2kV	MLCC 2200pF, 2kV
V6-12XXS6H					
V6-24XXS6H					
V6-48XXS6H					



	C1	L	C2	C3	C4
V6-12XXD6	NIPPON Chemi-con KY series 220 μ F, 100V	15 μ H	Nichicon PW series 10 μ F, 100V	MLCC 1000pF, 2kV	
V6-24XXD6					
V6-48XXD6				MLCC 2200pF, 2kV	MLCC 2200pF, 2kV
V6-12XXD6H					
V6-24XXD6H					
V6-48XXD6H					

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MECHANICAL SPECIFICATIONS

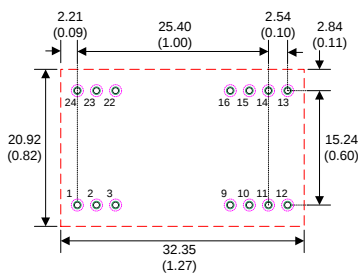


- Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Case Tolerance: ± 0.5 (± 0.02)
 4. Stand-off tolerance: ± 0.1 (± 0.004)

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)