

# V6-4W Series

4W 2:1 Regulated Single & Dual output

## Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case



The V6 series is a family of cost effective 4W single & dual output DC-DC converters. These converters are consisted with Nickle-coated copper in a 24-pin DIL package with high performance features such as 1500 VDC ~ 3500VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 12,24 and 48 with output voltage of 3.3,5,9,12,15, 24,  $\pm 3.3$ ,  $\pm 5$ ,  $\pm 9$ ,  $\pm 12$ ,  $\pm 15$  and  $\pm 24$  Vdc. High performance features include high efficiency operation up to 82% and output voltage accuracy of  $\pm 1\%$  maximum.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS	
Voltage accuracy	$\pm 1\%$
Line regulation	$\pm 0.5\%$
Load regulation	$\pm 0.5\%$ (Output 3.3V / $\pm 3.3$ V Model) $\pm 1.5\%$
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	$\pm 0.02\%/^{\circ}\text{C}$
Capacitor load(2)	See table

INPUT SPECIFICATIONS	
Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS	
Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	$\varnothing 0.5$ mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g(Metal Case)/13.5g(Plastic Case)
Dimensions	1.25"x0.8"x0.4"

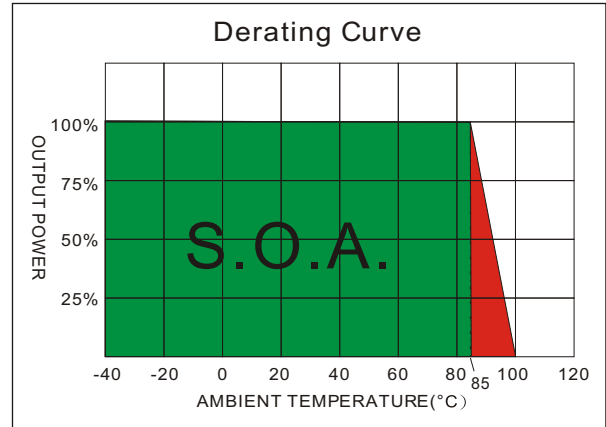
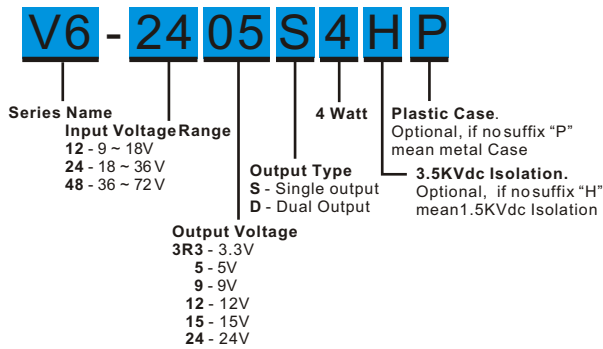
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)	
These are stressratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Input Surge Voltage(100mS)	
12 Models	24 Vdc max.
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10sec.max.)	260°C max.

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## V6 - 4W 2:1 Regulated Single & Dual output

### PART NUMBER STRUCTURE



### MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
V6-123R3S4	9-18	30	463	3.3	0	1200	72	3300
V6-1205S4	9-18	30	428	5	0	800	78	1000
V6-1209S4	9-18	30	428	9	0	444	78	470
V6-1212S4	9-18	30	417	12	0	333	80	220
V6-1215S4	9-18	30	417	15	0	266	80	100
V6-1224S4	9-18	30	417	24	0	166	80	47
V6-123R3D4	9-18	30	452	±3.3	0	±600	73	±680
V6-1205D4	9-18	30	428	±5	0	±400	78	±470
V6-1209D4	9-18	30	417	±9	0	±220	80	±220
V6-1212D4	9-18	30	417	±12	0	±166	80	±100
V6-1215D4	9-18	30	417	±15	0	±133	80	±47
V6-1224D4	9-18	30	421	±24	0	±83	79	±22
V6-243R3S4	18-36	20	223	3.3	0	1200	75	3300
V6-2405S4	18-36	20	209	5	0	800	80	1000
V6-2409S4	18-36	20	209	9	0	444	80	470
V6-2412S4	18-36	20	201	12	0	333	83	220
V6-2415S4	18-36	20	209	15	0	266	80	100
V6-2424S4	18-36	20	196	24	0	166	85	47
V6-243R3D4	18-36	20	226	±3.3	0	±600	73	±680
V6-2405D4	18-36	20	211	±5	0	±400	79	±470
V6-2409D4	18-36	20	209	±9	0	±220	80	±220
V6-2412D4	18-36	20	204	±12	0	±166	82	±100
V6-2415D4	18-36	20	209	±15	0	±133	80	±47
V6-2424D4	18-36	20	214	±24	0	±83	78	±22
V6-483R3S4	36-72	15	112	3.3	0	1200	75	3300
V6-4805S4	36-72	15	105	5	0	800	80	1000
V6-4809S4	36-72	15	102	9	0	444	82	470
V6-4812S4	36-72	15	105	12	0	333	80	220
V6-4815S4	36-72	15	103	15	0	266	81	100
V6-4824S4	36-72	15	102	24	0	166	82	47

Suffix "H" means 3.5KVdc isolation

Suffix "P" means Plastic case instead of standard Metal Case

## V6 - 4W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
V6-483R3D4	36-72	15	116	±3.3	0	±600	72	±680
V6-4805D4	36-72	15	107	±5	0	±400	78	±470
V6-4809D4	36-72	15	107	±9	0	±220	78	±220
V6-4812D4	36-72	15	105	±12	0	±166	80	±100
V6-4815D4	36-72	15	105	±15	0	±133	80	±47
V6-4824D4	36-72	15	105	±24	0	±83	80	±22

Suffix "H" means 3.5KVdc isolation

Suffix "P" means Plastic case instead of standard Metal Case

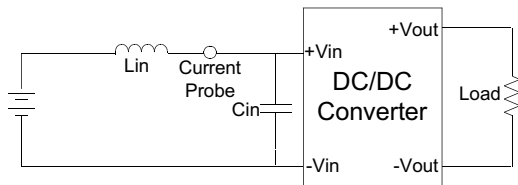
### NOTE

1. Ripple/Noise measured with a 1uF ceramic capacitor.
2. Test by nominal input voltage and constant resistor load.
3. Measured Input reflected ripple current with a simulated source inductance of 12uH.
4. Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.

### TEST CONFIGURATIONS

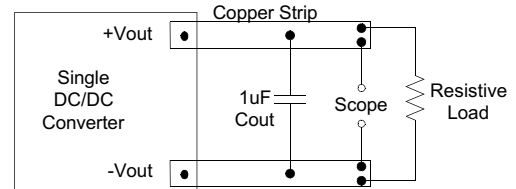
#### Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor  $L_{in}$  (12uH) and a source capacitor  $C_{in}$  (47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.

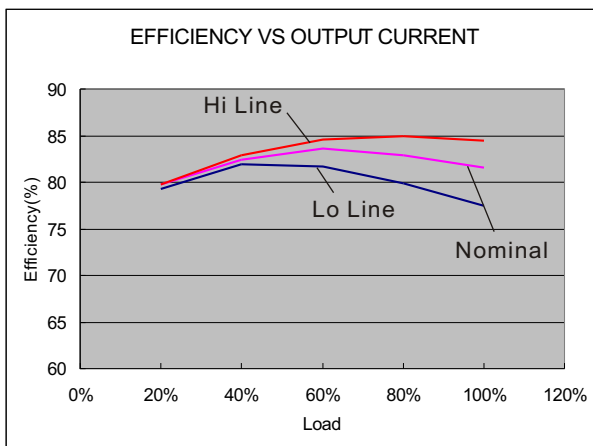


#### Output Ripple & Noise Measurement Test

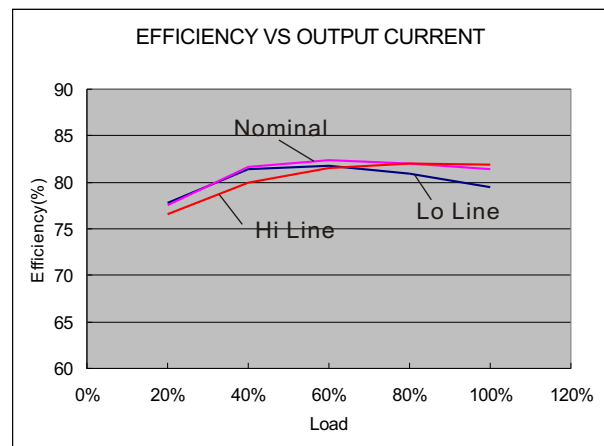
Use a capacitor  $C_{out}$  (1.0uF) measurement. The Scope measurement bandwidth is 0-20MHz.



### ELECTRICAL CHARACTERISTIC CURVES

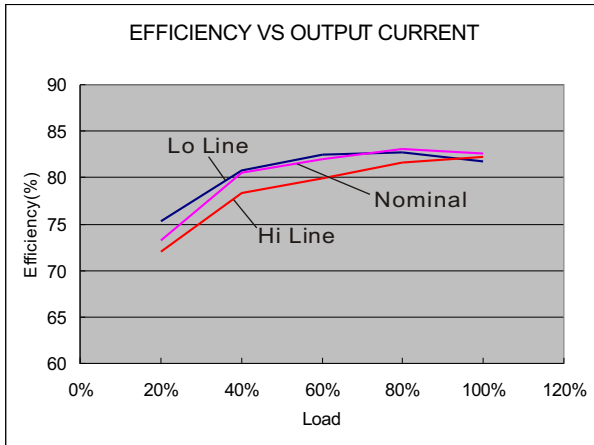


12 Models



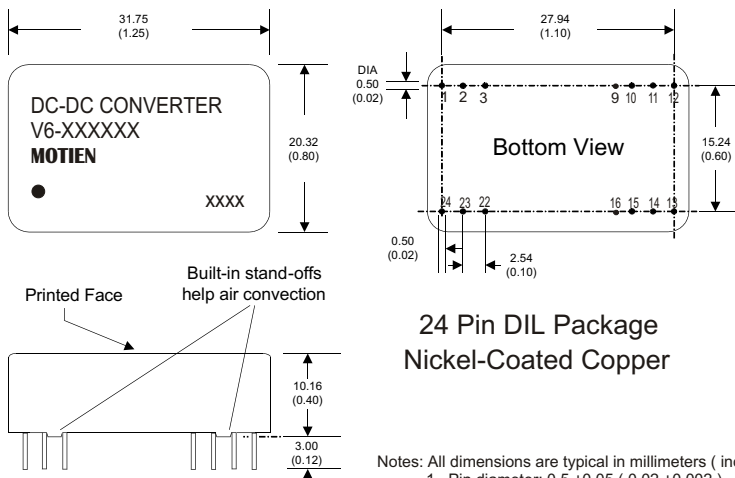
24 Models

# V6 - 4W 2:1 Regulated Single & Dual output



48 Models

## MECHANICAL SPECIFICATIONS

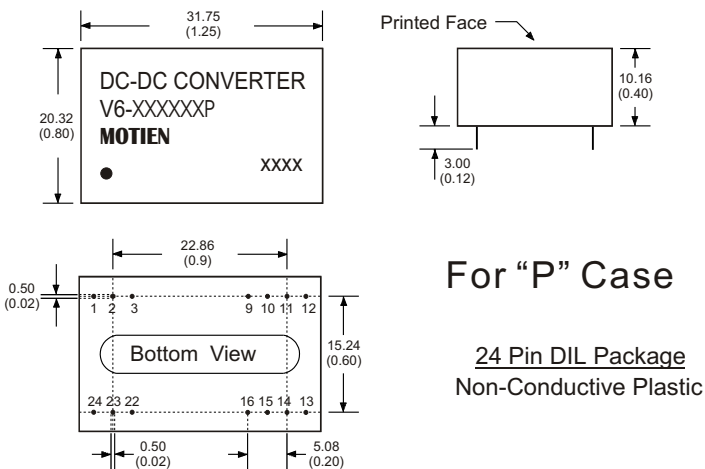


Notes: All dimensions are typical in millimeters ( inches ).  
 1. Pin diameter: 0.5 ±0.05 ( 0.02 ±0.002 )  
 2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )  
 3. Case Tolerance: ±0.5 ( ±0.02 )

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	-V Output	-V Input	-V Input
3	N.C.	Common	-V Input	-V Input
9	N.P.	N.P.	N.P.	Common
10	-V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	-V Output
12	-V Input	-V Input	N.P.	N.P.
13	-V Input	-V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	-V Output	Common	N.P.	N.P.
16	N.P.	N.P.	-V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	-V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

## MECHANICAL SPECIFICATIONS



Notes: All dimensions are typical in millimeters ( inches ).  
 1. Pin diameter: 1.0 ±0.05 ( 0.02 ±0.002 )  
 2. Pin pitch and length tolerance: ±0.35 ( ±0.014 )  
 3. Case Tolerance: ±0.5 ( ±0.02 )

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	-V Output	-V Input	-V Input
3	N.C.	Common	-V Input	-V Input
9	N.P.	N.P.	N.P.	Common
10	-V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	-V Output
12	-V Input	-V Input	N.P.	N.P.
13	-V Input	-V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	-V Output	Common	N.P.	N.P.
16	N.P.	N.P.	-V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	-V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)



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