

# V6-6W Series



6W 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 83%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case



The V6 series is a family of cost effective 6W 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, ±3.3, ±5, ±9, ±12, ±15 and ±24 Vdc. High performance features include high efficiency operation up to 83% and output voltage accuracy of ±1% maximum.

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

OUTPUT SPECIFICATIONS	
Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°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	Typical 266kHz
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
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	Ø0.5mm 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"

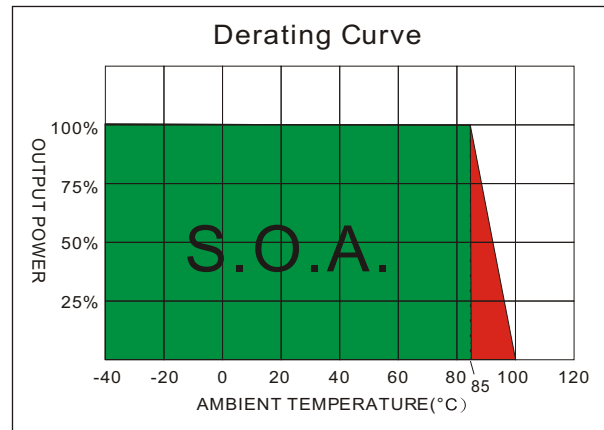
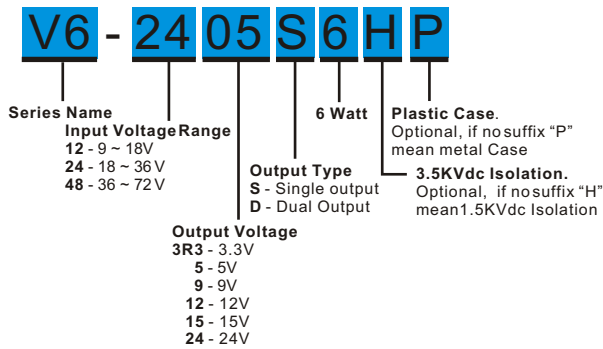
ENVIRONMENT SPECIFICATIONS	
Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

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	260°C, max.
(1.5mm from case 10sec. max.)	

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## V6 - 6W 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)		
V6-123R3S6	9-18	30	527	3.3	0	1400	73	1000
V6-1205S6	9-18	30	649	5	0	1200	77	1000
V6-1209S6	9-18	30	641	9	0	666	78	680
V6-1212S6	9-18	30	617	12	0	500	81	330
V6-1215S6	9-18	30	625	15	0	400	80	220
V6-1224S6	9-18	30	625	24	0	250	80	68
V6-123R3D6	9-18	30	527	±3.3	0	±909	73	±680
V6-1205D6	9-18	30	649	±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	632	±15	0	±200	79	±47
V6-1224D6	9-18	30	625	±24	0	±125	80	±33
V6-243R3S6	18-36	20	256	3.3	0	1400	75	1000
V6-2405S6	18-36	20	313	5	0	1200	80	1000
V6-2409S6	18-36	20	304	9	0	666	82	680
V6-2412S6	18-36	20	313	12	0	500	80	330
V6-2415S6	18-36	20	304	15	0	400	82	220
V6-2424S6	18-36	20	305	24	0	250	82	68
V6-243R3D6	18-36	20	333	±3.3	0	±909	75	±680
V6-2405D6	18-36	20	321	±5	0	±600	78	±330
V6-2409D6	18-36	20	301	±9	0	±333	83	±220
V6-2412D6	18-36	20	312	±12	0	±250	80	±100
V6-2415D6	18-36	20	312	±15	0	±200	80	±47
V6-2424D6	18-36	20	312	±24	0	±125	80	±33
V6-483R3S6	36-72	12	128	3.3	0	1400	75	1000
V6-4805S6	36-72	12	156	5	0	1200	80	1000
V6-4809S6	36-72	12	152	9	0	666	82	680
V6-4812S6	36-72	12	156	12	0	500	80	330
V6-4815S6	36-72	12	151	15	0	400	83	220
V6-4824S6	36-72	12	151	24	0	250	83	68

Suffix "H" means 3.5KVdc isolation

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

## V6 - 6W 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)		
V6-483R3D6	36-72	12	171	±3.3	0	±909	73	±680
V6-4805D6	36-72	12	158	±5	0	±600	79	±330
V6-4809D6	36-72	12	158	±9	0	±333	79	±220
V6-4812D6	36-72	12	156	±12	0	±250	80	±100
V6-4815D6	36-72	12	156	±15	0	±200	80	±47
V6-4824D6	36-72	12	156	±24	0	±125	80	±33

Suffix "H" means 3.5KVdc isolation

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

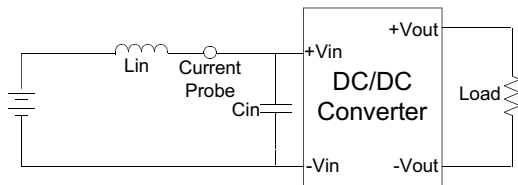
### NOTE

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

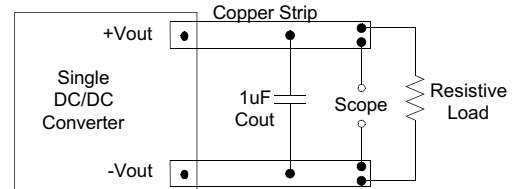
#### Input Reflected Ripple Current Test Step

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.

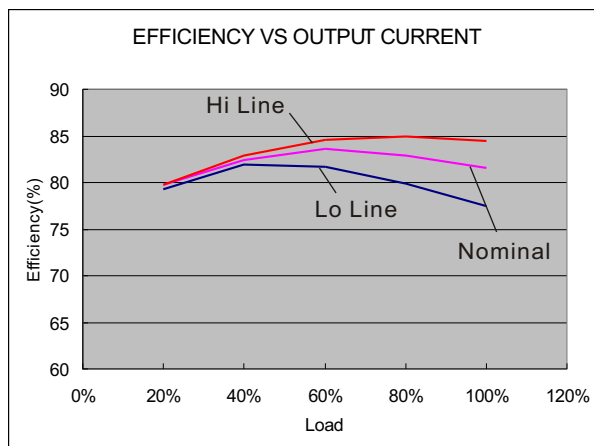


#### Output Ripple & Noise Measurement Test

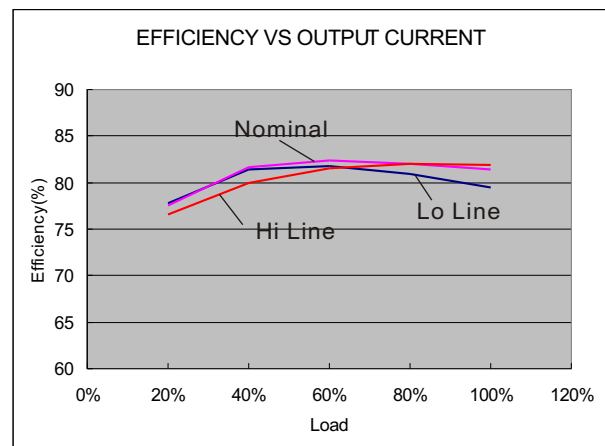
Use a capacitor  $C_{out}$  (1.0uF) measurement. The Scope measurement bandwidth is 0-20MHz.



### ELECTRICAL CHARACTERISTIC CURVES

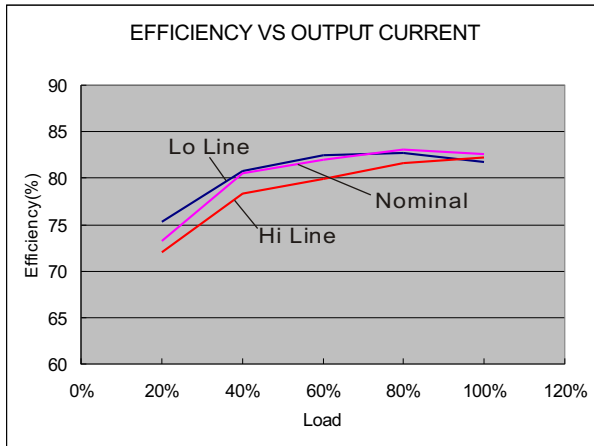


12 Models



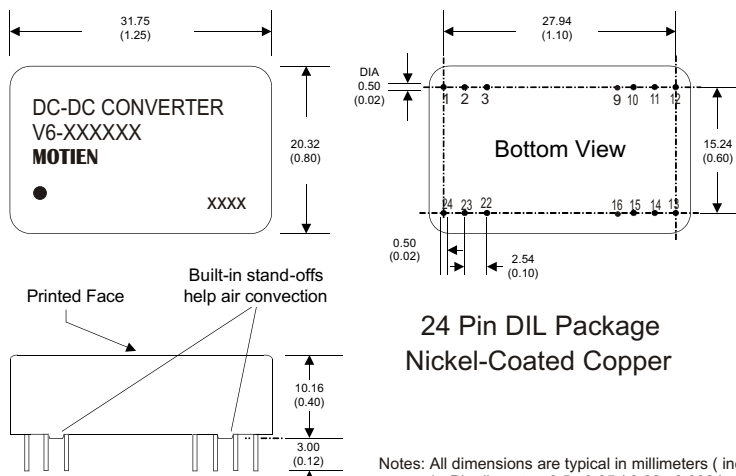
24 Models

# V6 - 6W 2:1 Regulated Single & Dual output



48 Models

## MECHANICAL SPECIFICATIONS



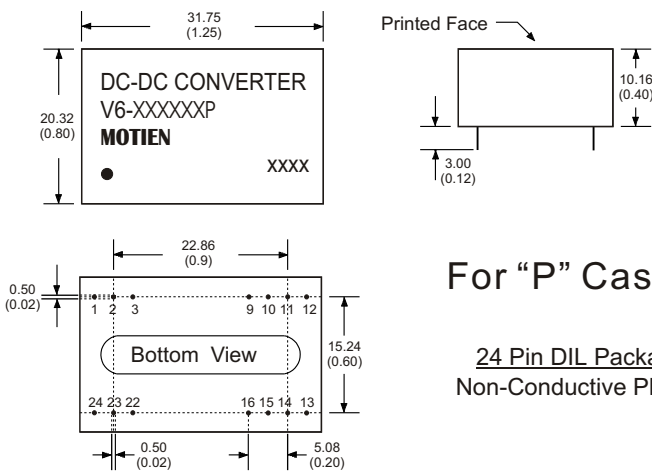
**24 Pin DIL Package  
Nickel-Coated Copper**

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

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



**For "P" Case**

**24 Pin DIL Package  
Non-Conductive Plastic**

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

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.)