

R6-4W 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%
- -25 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case



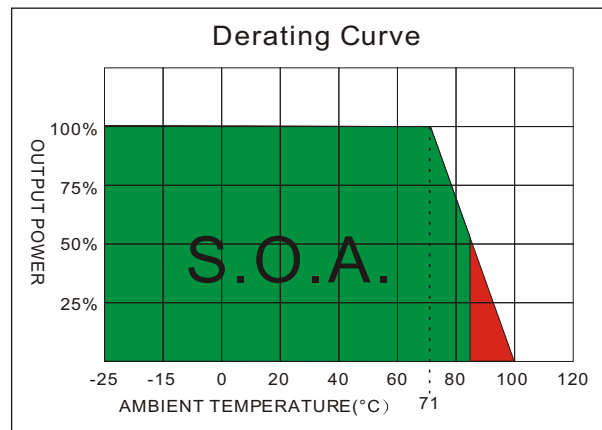
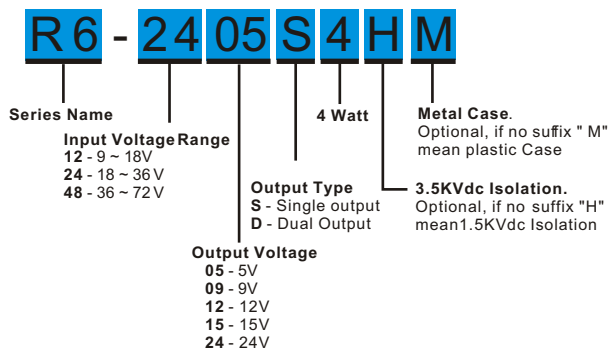
The R6 series is a family of cost effective 4W single & dual output DC-DC converters. These converters combine Plastic case in a 24-pin DIL package with high performance features such as 1500 VDC ~ 3500VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24 and 48 with output voltage of 5, 9, 12, 15, 24, ± 5 , ± 9 , ± 12 , ± 15 and ± 24 Vdc. High performance features include high efficiency operation up to 82% and output voltage accuracy of $\pm 1\%$ maximum.

All specifications typical at $T_a = 25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Voltage accuracy	$\pm 1\%$	Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Line regulation	$\pm 0.5\%$		Nickel-coated Copper
Load regulation	$\pm 0.5\%$	Base Material	Non-conductive Black Plastic (UL94V-0 rated)
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk	Pin Material	$\varnothing 0.5\text{mm}$ Brass Solder-coated
Short circuit protection	Continuous	Potting Material	Epoxy (UL94V-0 rated)
Temperature coefficient	$\pm 0.02\%/^\circ\text{C}$	Weight	12.5g (Plastic Case) / 15.0g (Metal Case)
Capacitor load(2)	See table	Dimensions	1.25"x0.8"x0.4"
INPUT SPECIFICATIONS		ABSOLUTE MAXIMUM RATINGS(4)	
Voltage Range	See table	These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
Max. Input Current	See table	Input Voltage (100ms)	
No-Load Input Current	See table	12 Modes	
Input Filter	PI Type	24 Modes	
Input Reflected Ripple Current(3)	35mA pk-pk	48 Modes	
		Soldering Temperature	
		(1.5mm from case 10sec.)	
GENERAL SPECIFICATIONS		260°C	
Efficiency	See table, typ		
I/O Isolation Voltage(3 sec)			
Input/Output	1500~3500Vdc		
Metal Case/Input & Output	1000Vdc		
I/O Isolation Capacitance	60 pF Typ.		
I/O Isolation Resistance	1000M Ohm		
Switching Frequency	100~400kHz		
Humidity	95% rel H		
Reliability Calculated MTBF (MIL-HDBK-217 F)	>2.199 Mhrs		
Safety Standard : (designed to meet)	IEC 60950-1		
ENVIRONMENT SPECIFICATIONS		EMC SPECIFICATIONS	
Operating Temperature	-25°C~85°C (See Derating Curve)	Radiated Emissions	EN55022 CLASS A
	-25°C~71°C (For 100% load)	Conducted Emissions (7)	EN55022 CLASS A
Maximum Case Temperature	100°C	ESD	IEC 61000-4-2 Perf. Criteria B
Storage Temperature	-40°C~125°C	RS	IEC 61000-4-3 Perf. Criteria A
Cooling	Nature Convection	EFT (8)	IEC 61000-4-4 Perf. Criteria B
		Surge (8)	IEC 61000-4-5 Perf. Criteria B
		CS	IEC 61000-4-6 Perf. Criteria A
		PFMF	IEC 61000-4-8 Perf. Criteria A

R6 - 4W 2:1 Regulated Single & Dual output

PARTNUMBER 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)		
R6-1205S4	9-18	20	432	5	200	800	77	2200
R6-1209S4	9-18	20	416	9	111	444	80	470
R6-1212S4	9-18	20	416	12	83.3	333	80	470
R6-1215S4	9-18	20	416	15	66.8	267	80	470
R6-1224S4	9-18	20	416	24	41.8	167	80	220
R6-1205D4	9-18	20	432	±5	±100	±400	77	±1000
R6-1209D4	9-18	20	416	±9	±55.5	±222	80	±220
R6-1212D4	9-18	20	416	±12	±41.8	±167	80	±220
R6-1215D4	9-18	20	416	±15	±33.3	±133	80	±220
R6-1224D4	9-18	20	416	±24	±20.8	±83	80	±100
R6-2405S4	18-36	12	210	5	200	800	79	2200
R6-2409S4	18-36	12	203	9	111	444	82	470
R6-2412S4	18-36	12	203	12	83.3	333	82	470
R6-2415S4	18-36	12	203	15	66.8	267	82	470
R6-2424S4	18-36	12	203	24	41.8	167	82	220
R6-2405D4	18-36	12	210	±5	±100	±400	79	±1000
R6-2409D4	18-36	12	203	±9	±55.5	±222	82	±220
R6-2412D4	18-36	12	203	±12	±41.8	±167	82	±220
R6-2415D4	18-36	12	203	±15	±33.3	±133	82	±220
R6-2424D4	18-36	12	203	±24	±20.8	±83	82	±100
R6-4805S4	36-72	8	106	5	200	800	78	2200
R6-4809S4	36-72	8	101	9	111	444	82	470
R6-4812S4	36-72	8	101	12	83.3	333	82	470
R6-4815S4	36-72	8	101	15	66.8	267	82	470
R6-4824S4	36-72	8	101	24	41.8	167	82	220
R6-4805D4	36-72	8	109	±5	±100	±400	76	±1000
R6-4809D4	36-72	8	101	±9	±55.5	±222	82	±220
R6-4812D4	36-72	8	101	±12	±41.8	±167	82	±220
R6-4815D4	36-72	8	101	±15	±33.3	±133	82	±220
R6-4824D4	36-72	8	101	±24	±20.8	±83	82	±100

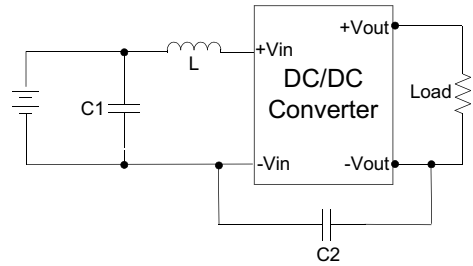
Suffix "H" means 3.5KVdc isolation

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

TEST CONFIGURATIONS

EMI Filter

Input filter components (C1, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

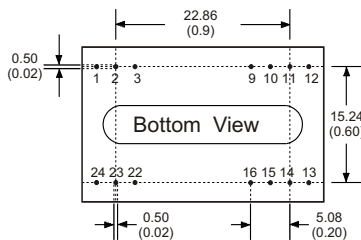
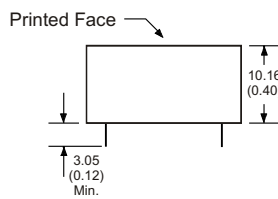
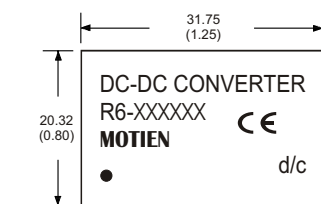


	C1	L	C2
R6-05XXXXX	220uF/100V	12uH	
R6-12XXXXX	220uF/100V	12uH	
R6-24XXXXX	220uF/100V	12uH	MLCC 471K
R6-48XXXXX	220uF/100V	12uH	MLCC 471K

NOTE

1. Typical value at nominal input voltage and full load.
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.
5. Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.
6. It's necessary to add minimum capacitor in output for some models, please check single model datasheet for detail value.
7. Input filter components are required to help meet conducted emission class A, which application refers to the EMI Filter of design & feature configuration.
8. An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5.
The filter capacitor Motien suggests: Nippon - chemi - con KY series, 220uF/100V.

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL



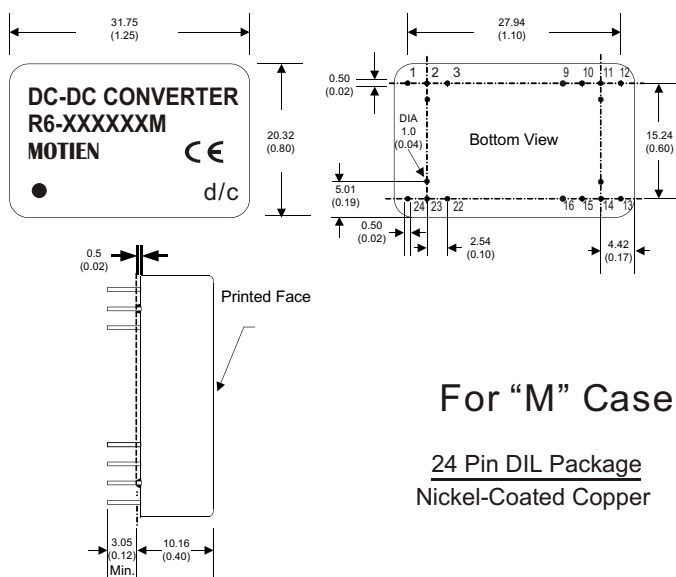
24 Pin DIL Package
Non-Conductive Plastic

- Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch 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.

MECHANICAL SPECIFICATIONS



Notes: All dimensions are typical in millimeters (inches).

1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
2. Pin pitch 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	+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.