

R6-2W Series

2W 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 80%
- -40 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case



The R6 series is a family of cost effective 2W 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 5, 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 80% and output voltage accuracy of $\pm 1\%$ maximum.

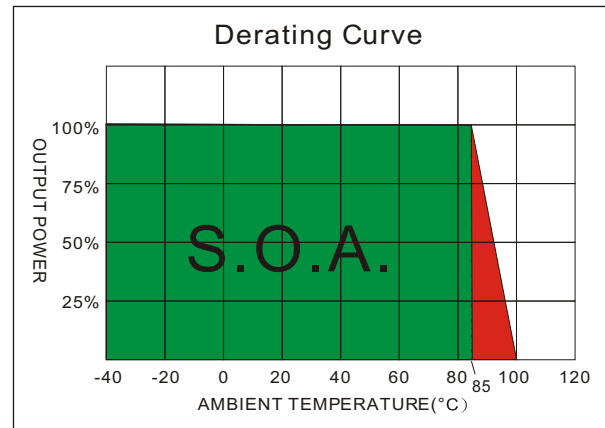
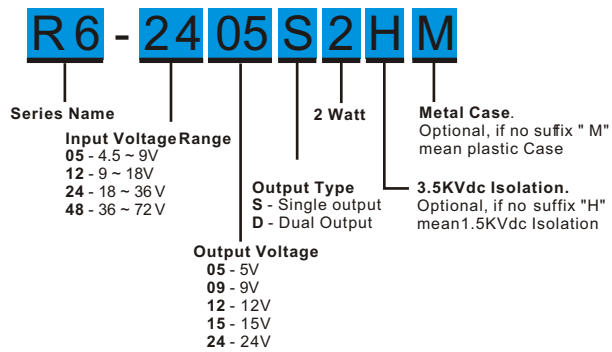
All specifications typical at $T_a=25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

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	5 Modes	
Input Filter	PI Type	12 Modes	
Input Reflected Ripple Current(3)	35mA pk-pk	24 Modes	
		48 Modes	
GENERAL SPECIFICATIONS		Soldering Temperature	
Efficiency	See table, typ	(1.5mm from case 10sec.)	
I/O Isolation Voltage(3 sec)		260°C	
Input/Output	1500~3500Vdc		
Metal Case/Input & Output	1000Vdc		
I/O Isolation Capacitance	60 pF Typ.	EMC SPECIFICATIONS	
I/O Isolation Resistance	1000M Ohm	Radiated Emissions	EN55022 CLASS A
Switching Frequency	100~400kHz	Conducted Emissions (7)	EN55022 CLASS A
Humidity	95% rel H	ESD	IEC 61000-4-2 Perf. Criteria B
Reliability Calculated MTBF(MIL-HDBK-217 F)	>2.199 Mhrs	RS	IEC 61000-4-3 Perf. Criteria A
Safety Standard : (designed to meet)	IEC 60950-1	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
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		

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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)		
R6-0505S2	4.5-9	40	588	5	100	400	68	2200
R6-0509S2	4.5-9	40	571	9	55.5	222	70	470
R6-0512S2	4.5-9	40	571	12	42.8	167	70	470
R6-0515S2	4.5-9	40	571	15	33.3	133	70	470
R6-0524S2	4.5-9	40	579	24	20.8	83	69	220
R6-0505D2	4.5-9	40	588	±5	±50	±200	68	±1000
R6-0509D2	4.5-9	40	571	±9	±27.8	±111	70	±220
R6-0512D2	4.5-9	40	571	±12	±20.8	±83	70	±220
R6-0515D2	4.5-9	40	571	±15	±16.8	±67	70	±220
R6-0524D2	4.5-9	40	579	±24	±10.5	±42	69	±100
R6-1205S2	9-18	20	222	5	100	400	75	2200
R6-1209S2	9-18	20	213	9	55.5	222	78	470
R6-1212S2	9-18	20	213	12	42.8	167	78	470
R6-1215S2	9-18	20	213	15	33.3	133	78	470
R6-1224S2	9-18	20	210	24	20.8	83	79	220
R6-1205D2	9-18	20	225	±5	±50	±200	74	±1000
R6-1209D2	9-18	20	225	±9	±27.8	±111	74	±220
R6-1212D2	9-18	20	219	±12	±20.8	±83	76	±220
R6-1215D2	9-18	20	216	±15	±16.8	±67	77	±220
R6-1224D2	9-18	20	219	±24	±10.5	±42	76	±100
R6-2405S2	18-36	12	106	5	100	400	78	2200
R6-2409S2	18-36	12	104	9	55.5	222	80	470
R6-2412S2	18-36	12	105	12	42.8	167	79	470
R6-2415S2	18-36	12	106	15	33.3	133	78	470
R6-2424S2	18-36	12	104	24	20.8	83	80	220
R6-2405D2	18-36	12	111	±5	±50	±200	75	±1000
R6-2409D2	18-36	12	111	±9	±27.8	±111	75	±220
R6-2412D2	18-36	12	105	±12	±20.8	±83	79	±220
R6-2415D2	18-36	12	105	±15	±16.8	±67	79	±220
R6-2424D2	18-36	12	106	±24	±10.5	±42	78	±100

Suffix "H" means 3.5KVdc isolation

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

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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)		
R6-4805S2	36-72	8	55.5	5	100	400	75	2200
R6-4809S2	36-72	8	53	9	55.5	222	78	470
R6-4812S2	36-72	8	52	12	42.8	167	79	470
R6-4815S2	36-72	8	52	15	33.3	133	80	470
R6-4824S2	36-72	8	52	24	20.8	83	80	220
R6-4805D2	36-72	8	56	±5	±50	±200	74	±1000
R6-4809D2	36-72	8	55.5	±9	±27.8	±111	75	±220
R6-4812D2	36-72	8	53	±12	±20.8	±83	78	±220
R6-4815D2	36-72	8	53	±15	±16.8	±67	78	±220
R6-4824D2	36-72	8	53	±24	±10.5	±42	79	±100

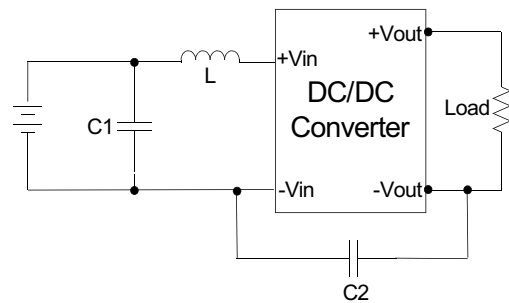
Suffix "H" means 3.5KVdc isolation

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.

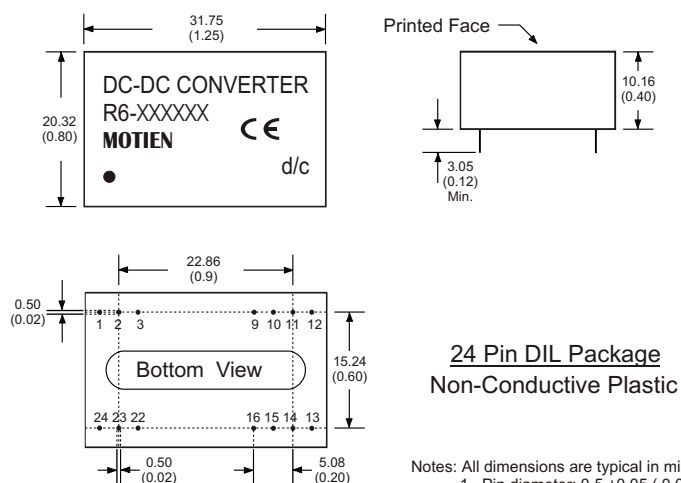


	C1	L	C2
R6-05XXXXX	220uF/100V	12uH	
R6-12XXXXX	220uF/100V	12uH	
R6-24XXXXX	220uF/100V	12uH	MLCC 471K
R6-48XXXXX	220uF/100V	12uH	MLCC 471K

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 suggest: Nippon - chemi - con KY series, 220uF/100V.

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL



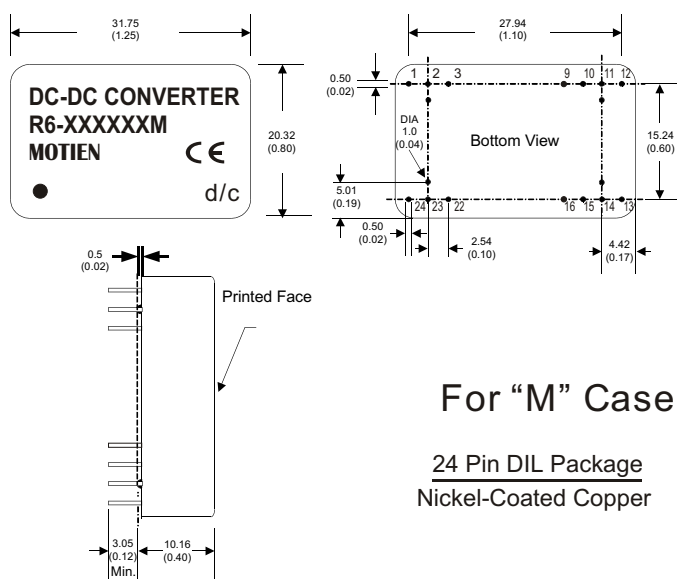
24 Pin DIL Package
Non-Conductive Plastic

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



For "M" Case
 24 Pin DIL Package
 Nickel-Coated Copper

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.