RR4-S/D10

10W Regulated Single & Dual Output DC/DC Converter

Picture similar

RoHS

- **24 Pin DIL Package**
- **Wide 2:1 Input Range**
- **1500VDC Isolation**
- **High Power Density**
- **Efficiency up to 90%**
- **Operating Temperature Range -40°C ~ +85°C**
- **Continuous Short Circuit Protection**
- **Over Voltage Protection**
- **Metal Case**
- **Soft Start**

Output Specifications	
Voltage Accuracy	±1%, max.
Output Voltage Adjustability (Trim)	–
Maximum Output Current	See table
Line Regulation	±0.5% max.
Load Regulation	from 0% to 100% Load: ±0.5 ~ 1% max. (Output 3.3V/±3.3V Model) ±1.0%
Cross Regulation (Dual Output)	±5%
Over Voltage Protection	118 ~ 125% of Vout typ.
Over Current Protection	150% of FL typ.
Short Circuit Protection	Indefinite (Automatic Recovery)
Ripple & Noise (20 MHz bandwidth)	75mV pk-pk
Temperature Coefficient	±0.02%/°C
Transient Recovery Time	200µs typ.
Transient Response Deviation	±3% max.

Input Specifications	
Voltage Range	See table
Start-up Time	20ms typ.
No-Load/Full-Load Input Current	See table
Input Filter	C/L (see filter details on following pages)
Input Reflected Ripple Current	20mA pk-pk typ.
Remote ON	–
Remote OFF	–
OFF Idle Current	–
Surge Voltage (100 ms) †)	
12V Models 24V Models 48V Models	25VDC max. 50VDC max. 100VDC max.

General Specifications	
I/O Isolation Voltage (60 sec)	1500VDC
Isolation Voltage Case/Input&Output	1000VDC
I/O Isolation Capacitance	1000pF typ.
I/O Isolation Resistance	1000M Ohm, min.
Switching Frequency	330kHz typ.
Humidity	95% rel H
Reliability Calculated MTBF	>1.00MHrs (MIL-HDBK-217 f)
Safety Standard(s)	UL62368-1 approval

Environmental Specifications	
Operating Temperature Range	-40°C ~ +85°C (see Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C ~ +125°C
Cooling	Natural Convection
Soldering Profile and Peak Temperature	Wave Flow: 260°C (1.5 mm from case), 10s, max.

Physical Specifications	
Case Material	Nickel-coated Copper –
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g
Case Dimensions	1.25" x 0.80" x 0.40"

EMC Specifications	
Radiated / Conducted Emissions	EN55032 Class A see EMI Filter
ESD	IEC 61000-4-2 Perf.Criteria A
Rad. RF	IEC 61000-4-3 Perf.Criteria A
EFT	IEC 61000-4-4 Perf.Criteria A
Surge	IEC 61000-4-5 Perf.Criteria A
Cond. RF	IEC 61000-4-6 Perf.Criteria A
PFMF	IEC 61000-4-8 Perf.Criteria A
VD/SI/VV	–

†) These are stress ratings; exposure of devices to any of these conditions may adversely affect long-term reliability.
All specifications typical at T_A = 25 °C, nominal input voltage and full load, unless otherwise specified.
The information and specification contained in this data sheet are believed to be correct at time of publication. However, Acal BFi accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.

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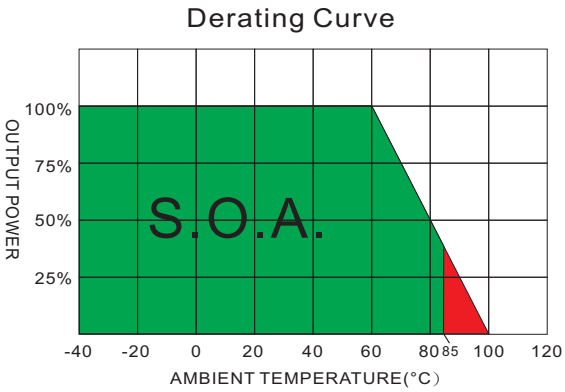
RR4-S10/D10

NUMBER STRUCTURE

RR4	-	XX	XX	S/D	XX	A	X
Name/Package		Input	Output	Type	Power (W)	Code	Isolation (kVDC)
RR4=DIL24		12= 9-18V 24=18-36V 48=36-75 V	02=2.5V 03=3.3V 05=5.0V 12=12V 15=15V	S= Single-Outp. D= Dual-Outp.	10=10.00	internal	1= 1.5

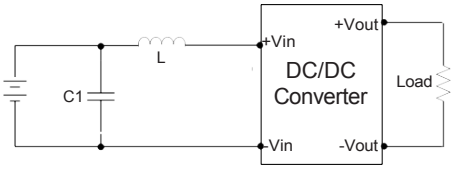


MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (VDC)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (VDC)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
RR4-1202S10A1	9-18	10	791	2.5	0	3000	81	2200
RR4-1203S10A1	9-18	10	1006	3.3	0	3000	84	2200
RR4-1205S10A1	9-18	10	992	5	0	2000	86	2200
RR4-1212S10A1	9-18	10	980	12	0	833	87	820
RR4-1215S10A1	9-18	10	958	15	0	667	89	470
RR4-1212D10A1	9-18	10	980	± 12	0	±416	87	±220
RR4-1215D10A1	9-18	10	969	± 15	0	±333	88	±150
RR4-2402S10A1	18-36	10	381	2.5	0	3000	84	2200
RR4-2403S10A1	18-36	10	497	3.3	0	3000	85	2200
RR4-2405S10A1	18-36	10	479	5	0	2000	89	2200
RR4-2412S10A1	18-36	10	485	12	0	833	88	820
RR4-2415S10A1	18-36	10	485	15	0	667	88	470
RR4-2412D10A1	18-36	10	485	± 12	0	±416	88	±220
RR4-2415D10A1	18-36	10	474	± 15	0	±333	90	±150
RR4-4802S10A1	36-75	10	191	2.5	0	3000	84	2200
RR4-4803S10A1	36-75	10	249	3.3	0	3000	85	2200
RR4-4805S10A1	36-75	10	242	5	0	2000	88	2200
RR4-4812S10A1	36-75	10	245	12	0	833	87	820
RR4-4815S10A1	36-75	10	242	15	0	667	88	470
RR4-4812D10A1	36-75	10	245	± 12	0	±416	87	±220
RR4-4815D10A1	36-75	10	245	± 15	0	±333	87	±150

NOTE

1. Operation between no-load and 10% load conditions will not damage the module, but it may not meet all specifications listed.
2. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
3. Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
4. Tested by minimal Vin and constant resistive load.
5. Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
6. Measured Input reflected ripple current with a simulated source inductance of 12uH.
7. Exceeding the absolute ratings of the unit could cause damage.
   It is not allowed for continuous operating.
8. 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.
9. An external filter capacitor is required if the module has to meet EN61000-4-5.
   The filter capacitor RSG suggest: Nippon - chemi - con KY series, 220uF/100V.



	C1	L
RR4-12XXXXX	100uF, 100V	12uH
RR4-24XXXXX	100uF, 100V	12uH
RR4-48XXXXX	100uF, 100V	12uH

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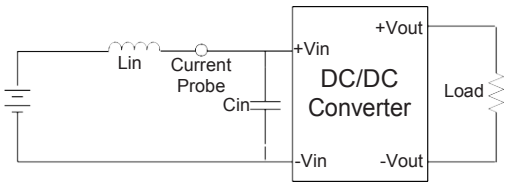
TEST CONFIGURATIONS

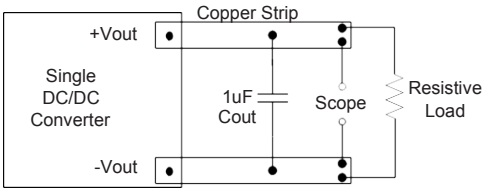
Input Reflected Ripple Current Test Step

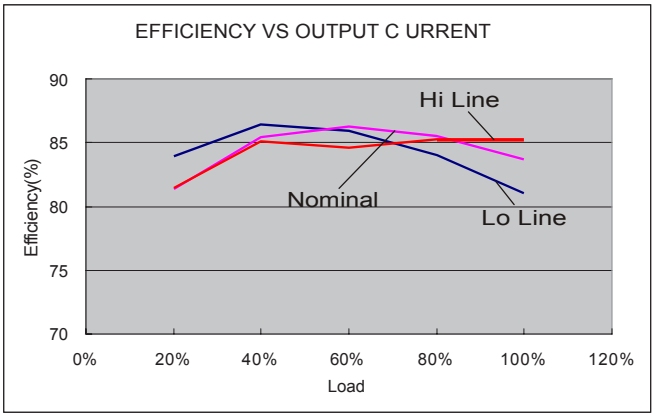
Input reflected ripple current is measured through a source inductor Lin(12uH) and a source capacitor Cin(47uF, ESR<1.0Ù at 100KHz) at nominal input and full load.



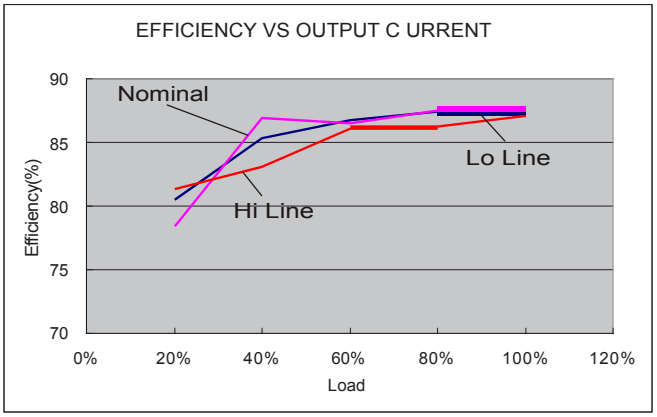
Output Ripple & Noise Measurement Test

Use a capacitor Cout(1.0uF) measurement.
The Scope measurement bandwidth is 0-20MHz.

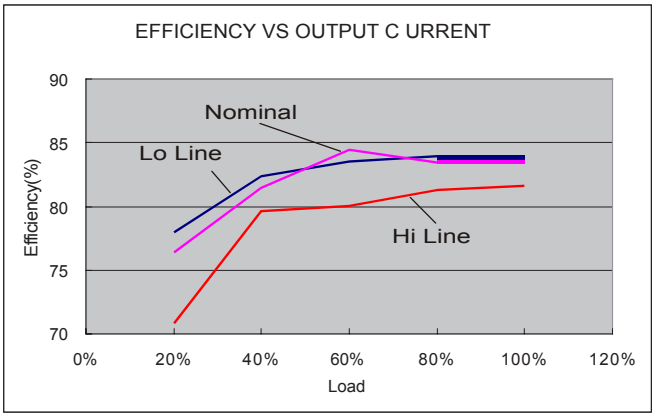




12 Models



24 Models



48 Models

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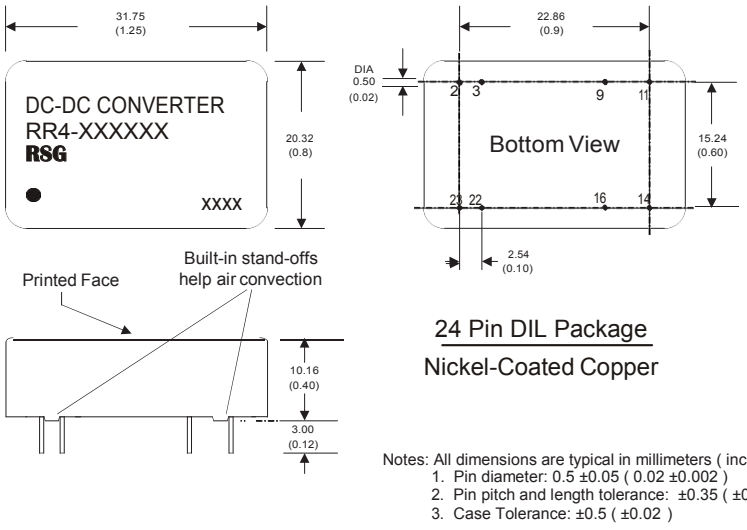
MECHANICAL SPECIFICATIONS



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 and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	– V Input	– V Input
3	– V Input	– V Input
9	N.P.	Common
11	N.C.	– V Output
14	+V Output	+V Output
16	– V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

The models listed here are just standard type. If you need a product with special specification or you have questions regarding packing standards (Tube oder Tape/Reel) as well as application support, please contact our specialists: sales@rsg-electronic.de or +49 69-984047-41/-28

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