# RR1-S02/D02

**2.0 Watt regulated**
**single & dual output**

RSG.
ELECTRONIC COMPONENTS


- 24 Pin DIP24 package
- 1000 VDC isolation
- Up to 6000 VDC isolation (3000 VDC for metal case)
- Continuous short circuit protection
- Efficiency up to 80%
- -40°C~85°C operation temperature range
- Optional metal case

## OUTPUT SPECIFICATIONS

| | | |
|---|---|---|
| Voltage accuracy | | ± 2% |
| Line regulation | | ± 0.5% |
| Load regulation (From 0% to 100% Load) | | ± 0.5% |
| (3.3 V output model) | | ± 1.5% |
| Ripple & Noise (20 MHz bandwith) (1) | | 75 mV pk-pk |
| Short circuit protection | Indefinite (automatic recovery) | |
| Temperature coefficient | | ± 0.02%/°C |
| Capacitor load (2) | | See table |

## INPUT SPECIFICATIONS

| | | |
|---|---|---|
| Voltage range | | ± 10% |
| Max. input current | | See table |
| No-load input current | | See table |
| Input filter | | PI type |
| Input reflected ripple current (3) | | 35 mA pk-pk |

## GENERAL SPECIFICATIONS

| | | |
|---|---|---|
| Efficiency | | See table |
| I/O isolation voltage (3 sec.) | Input/Output | 1000 ~ 6000 VDC |
| Metal case / Input & Output | | 1000 VDC |
| I/O isolation capacitance | | 60 pF typ. |
| I/O isolation resistance | | 1000 M Ohm |
| Switching frequency | Single | 40 kHz typ. |
| | Dual | 300 kHz typ. |
| Humidity | | 95% rel. H |
| Reliability calculated MTBF (MIL-HDBK-217F) | | > 3.072 Mhrs. |
| Safety standard (designed to meet) | | IEC 60950-1 |

## PHYSICAL SPECIFICATIONS

| | |
|---|---|
| Case material | Non-conductive black plastic (UL94V-0 rated)<br>Nickel-coated copper |
| Base material | Non-conductive black plastic (UL94V-0 rated) |
| Pin material | 0.5mm Alloy42 solder-coated<br>Ø 0.5mm brass solder-coated |
| Potting material | Epoxy (UL94V-0 rated) |
| Weight | Plastic >12.5 g, Metal >15 g |
| Dimensions | 1.25" x 0.8" x 0.4" |

## ENVIRONMENT SPECIFICATIONS

| | |
|---|---|
| Operating temperature (See derating curve) | -40°C~ 85°C |
| Maximum case temperature | 100°C |
| Storage temperature | -40°C~125°C |
| Cooling | Nature convection |

## ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

| | | |
|---|---|---|
| Input voltage (100 mS) | 5 modes | 0 ~ 7 VDC |
| | 12 modes | 0 ~ 15 VDC |
| | 24 modes | 0 ~ 28 VDC |
| Lead soldering temperature (1.5 mm from case 10 sec.) | 260°C | |

*All specifications typical at Ta = 25°C, nominal input voltage and full load unless otherwise specified.*
*The information and specifications contained in this data sheet are believed to be correct at time of publication. However, we accept no responsibility for consequences arising from printing errors or inaccuracies.*
*Subject to change without notice.*

## NOTE

1) Ripple / Noise measured with 20 MHz bandwith.
2) Tested by minimal Vin and constant resistive 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.

*The models listed are just for standard type. If you need a special specification product, please contact our service.*
*Phone: +49 69 984047-0, mail to: info@rsg-electronic.de or use the forms on www.rsg-electronic.de („Kontakt").*

# RR1-S02/D02

## 2.0 Watt regulated single & dual output

## NUMBER STRUCTURE

**RR1 - XX XX S/D 02 A X (M)***

**Name/Package**
RR1=DIL24

**Input**
05=5V
12=12V
24=24V

**Output**
03=3.3V
05=5V
12=12V
15=15V
24=24V

**Type**
S=Single
D=Dual

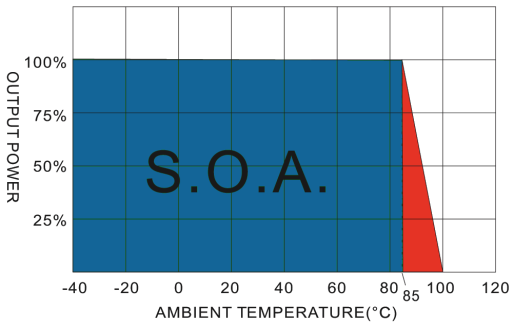
**Power**
02=2W

**Code**
internal

**Isolation**
1=1.0kVDC
2=2.0kVDC
3=3.0kVDC
4=4.0kVDC
5=5.2kVDC
6=6.0kVDC

Add suffix **M** at the end for Metal Case > up to 3.0kVDC

## DERATING CURVE



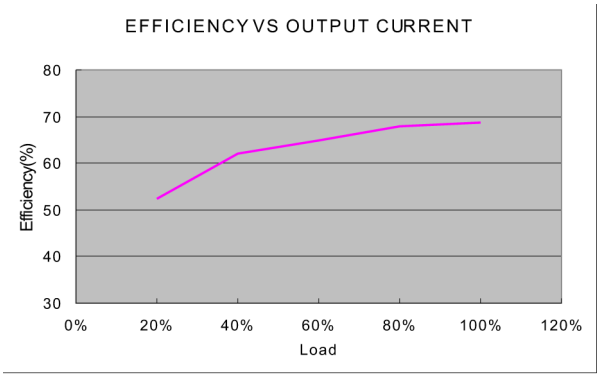

## MODEL SELECTION GUIDE

| Model Number | Input Range VDC | Input current (mA) No Load / Full Load | Output VDC | Output current Full Load (mA) | Efficiency @FL (%) | Capacitor Load (µF) |
|---|---|---|---|---|---|---|
| RR1-0503S02AX | 5 | 75 / 622 | 3.3 | 500 | 53 | 330 |
| RR1-0505S02AX | 5 | 75 / 615 | 5 | 400 | 65 | 330 |
| RR1-0509S02AX | 5 | 75 / 597 | 9 | 222 | 67 | 330 |
| RR1-0512S02AX | 5 | 75 / 571 | 12 | 166 | 70 | 330 |
| RR1-0515S02AX | 5 | 75 / 588 | 15 | 133 | 68 | 330 |
| RR1-0524S02AX | 5 | 75 / 615 | 24 | 83.3 | 65 | 330 |
| RR1-0503D02AX | 5 | 30 / 638 | ±3.3 | ±300 | 62 | ±1000 |
| RR1-0505D02AX | 5 | 30 / 588 | ±5 | ±200 | 68 | ±1000 |
| RR1-0509D02AX | 5 | 40 / 571 | ±9 | ±111 | 70 | ±470 |
| RR1-0512D02AX | 5 | 40 / 571 | ±12 | ±83 | 70 | ±470 |
| RR1-0515D02AX | 5 | 40 / 571 | ±15 | ±67 | 70 | ±470 |
| RR1-0524D02AX | 5 | 50 / 579 | ±24 | ±42 | 69 | ±220 |
| RR1-1203S02AX | 12 | 70 / 245 | 3.3 | 500 | 56 | 330 |
| RR1-1205S02AX | 12 | 70 / 260 | 5 | 400 | 64 | 330 |
| RR1-1209S02AX | 12 | 70 / 245 | 9 | 222 | 68 | 330 |
| RR1-1212S02AX | 12 | 70 / 238 | 12 | 166 | 70 | 330 |
| RR1-1215S02AX | 12 | 70 / 252 | 15 | 133 | 66 | 330 |
| RR1-1224S02AX | 12 | 70 / 256 | 24 | 83.3 | 65 | 330 |
| RR1-1203D02AX | 12 | 20 / 250 | ±3.3 | ±300 | 66 | ±1000 |
| RR1-1205D02AX | 12 | 20 / 228 | ±5 | ±200 | 73 | ±1000 |
| RR1-1209D02AX | 12 | 20 / 222 | ±9 | ±111 | 75 | ±470 |
| RR1-1212D02AX | 12 | 20 / 213 | ±12 | ±83 | 78 | ±470 |
| RR1-1215D02AX | 12 | 35 / 216 | ±15 | ±67 | 77 | ±470 |
| RR1-1224D02AX | 12 | 35 / 219 | ±24 | ±42 | 76 | ±220 |
| RR1-2403S02AX | 24 | 25 / 120 | 3.3 | 500 | 57 | 330 |
| RR1-2405S02AX | 24 | 25 / 132 | 5 | 400 | 63 | 330 |
| RR1-2409S02AX | 24 | 25 / 132 | 9 | 222 | 63 | 330 |
| RR1-2412S02AX | 24 | 25 / 122 | 12 | 166 | 68 | 330 |
| RR1-2415S02AX | 24 | 25 / 122 | 15 | 133 | 68 | 330 |
| RR1-2424S02AX | 24 | 25 / 122 | 24 | 83.3 | 68 | 330 |
| RR1-2403D02AX | 24 | 15 / 121 | ±3.3 | ±300 | 68 | ±1000 |
| RR1-2405D02AX | 24 | 15 / 114 | ±5 | ±200 | 73 | ±1000 |
| RR1-2409D02AX | 24 | 15 / 111 | ±9 | ±111 | 75 | ±470 |
| RR1-2412D02AX | 24 | 15 / 104 | ±12 | ±83 | 80 | ±470 |
| RR1-2415D02AX | 24 | 20 / 108 | ±15 | ±67 | 77 | ±470 |
| RR1-2424D02AX | 24 | 20 / 111 | ±24 | ±42 | 75 | ±220 |

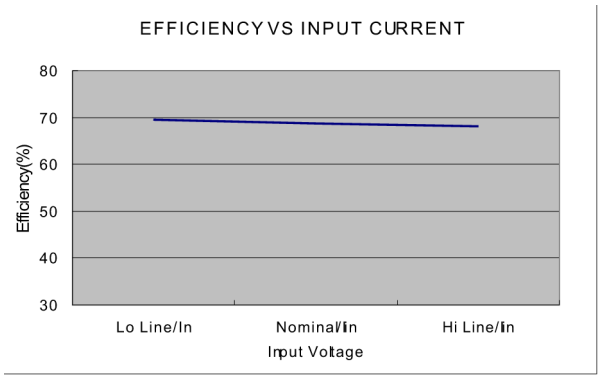
# RR1-S02/D02

## 2.0 Watt regulated
## single & dual output

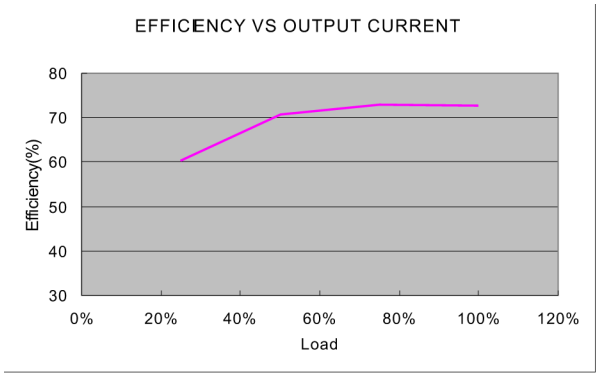
### EFFICIENCY VS OUTPUT CURRENT 05 SINGLE



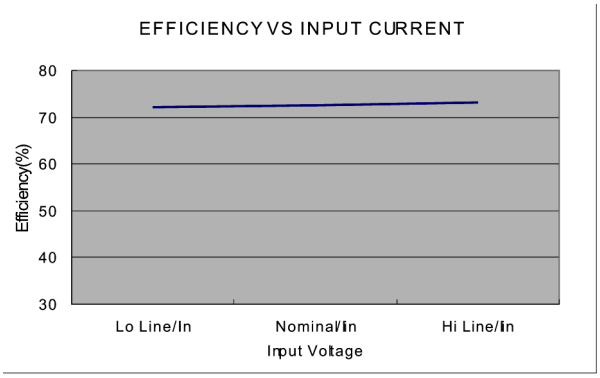

### EFFICIENCY VS INPUT CURRENT 05 SINGLE



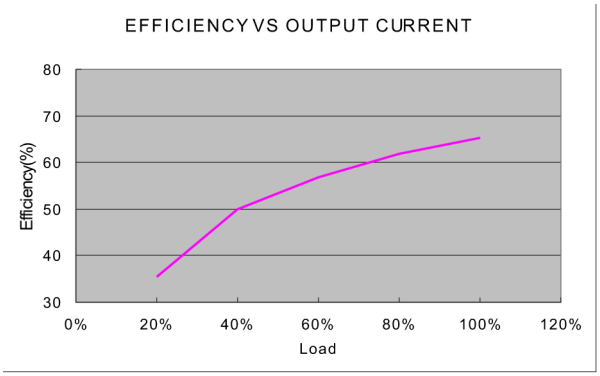

### EFFICIENCY VS OUTPUT CURRENT 05 DUAL



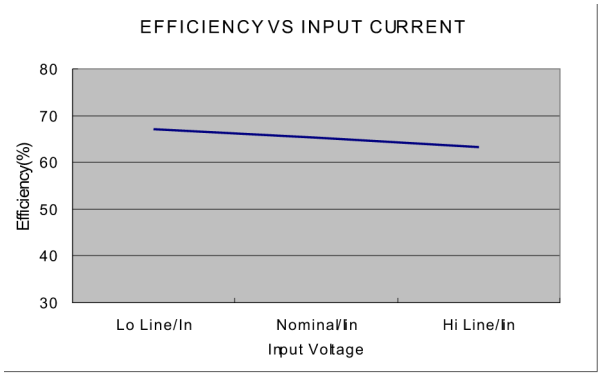

### EFFICIENCY VS INPUT CURRENT 05 DUAL



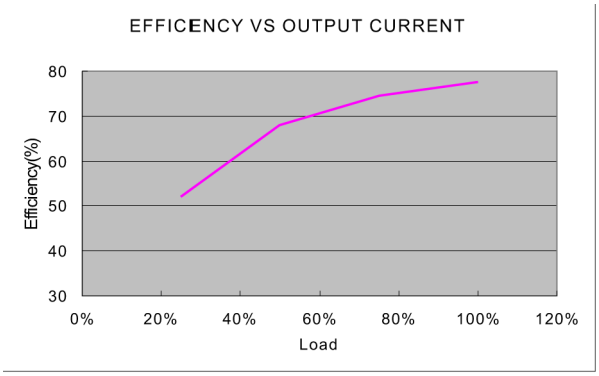

### EFFICIENCY VS OUTPUT CURRENT 24 SINGLE



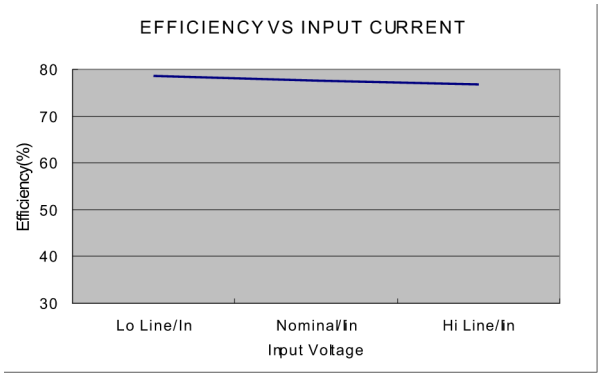

### EFFICIENCY VS INPUT CURRENT 24 SINGLE




### EFFICIENCY VS OUTPUT CURRENT 24 DUAL




### EFFICIENCY VS INPUT CURRENT 24 DUAL



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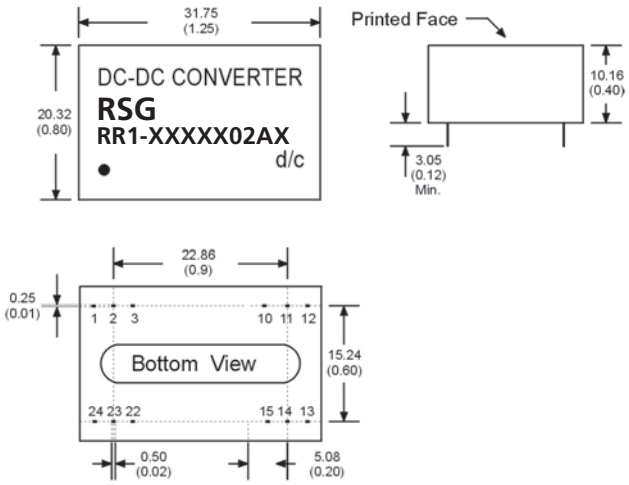
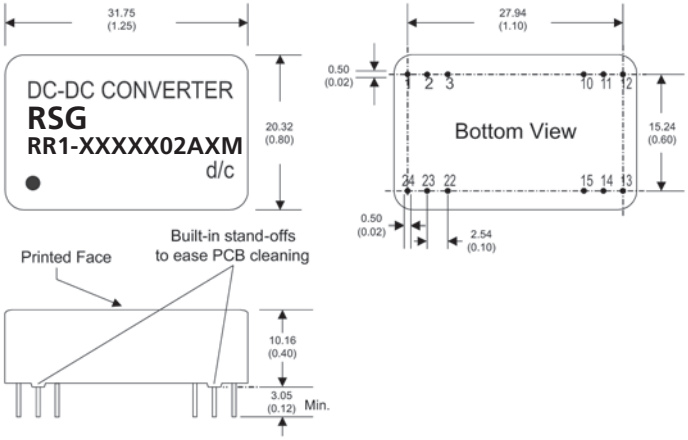
## MECHANICAL SPECIFICATIONS

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




**24 Pin DIL package**
**Nickel Coated Copper**
**„M" Case**




## PIN CONNECTIONS

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

*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)*



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