

RS3/RD3-S20/D20

2.0 Watt unregulated
single & dual output



- 7 Pin SIL / 14 Pin DIL package
- 1000 VDC isolation up to 6000 VDC isolation
- Low ripple and noise
- Efficiency up to 82%
- -40°C~85°C operation temperature range
- Non-conductive black plastic case

OUTPUT SPECIFICATIONS

| | |
|---|----------------|
| Voltage accuracy | ± 3% |
| Line regulation (Per 1% Vin Charge) | ± 1.2% |
| Load regulation (From 20% to 100% Load) (Output 3.3 V Model) | ± 10% ± 20% |
| Ripple & Noise (20 MHz bandwidth) (1) | 75 mV pk-pk |
| 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 | Capacitors |
| Input reflected ripple current (3) | 20 mA pk-pk |

GENERAL SPECIFICATIONS

| | |
|--|-----------------|
| Efficiency | See table |
| I/O isolation voltage (3 sec.) Input / output | 1000 ~ 6000 VDC |
| I/O isolation capacitance | 60 pF typ. |
| I/O isolation resistance | 1000 M Ohm |
| Switching frequency | variable 80 kHz |
| Humidity | 95% rel. H |
| Reliability calculated MTBF (MIL-HDBK-217F) | > 1.121 Mhrs. |
| Safety standard (designed to meet) | IEC 60950-1 |

PHYSICAL SPECIFICATIONS

| | |
|------------------|--|
| Case material | Non-conductive black plastic (UL94V-0 rated) |
| Pin material | 0.5 mm Alloy42 solder-coated |
| Potting material | Epoxy (UL94V-0 rated) |
| Weight | SIP > 2.3 g, DIP > 2.6 g |
| Dimensions | SIP > 0.76" x 0.24" x 0.39" DIP > 0.80" x 0.40" x 0.27" |

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

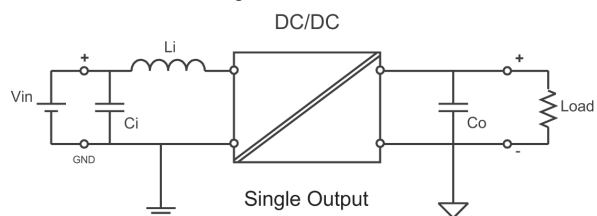
| | |
|----------------------------|-------------------------------------|
| Input voltage (100 mS) | |
| 5 modes | 0 ~ 7 VDC |
| 12 modes | 0 ~ 15 VDC |
| 24 modes | 0 ~ 28 VDC |
| 48 modes (SIP) | 0 ~ 54 VDC |
| Lead soldering temperature | 260°C (1.5 mm from case 10 sec.) |

All specifications typical at $T_a = 25^\circ\text{C}$, 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 bandwidth.
- 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.
- 6) To reduce converter's Ripple & Noise it is recommended to add a 4.7µF ~ 220µF ($\pm 4.7\mu\text{F} \sim \pm 100\mu\text{F}$ for dual output) capacitor in output end. For EMI performance improvement it is recommended to add a 12µH inductor and a 10µF ~ 100µF capacitor in input end.

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“).



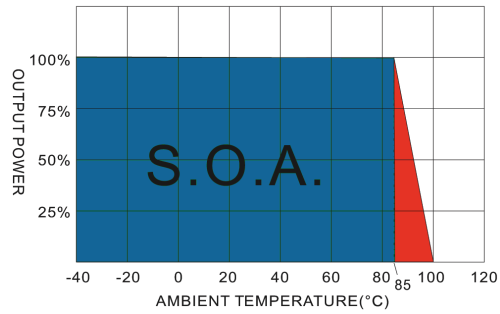
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NUMBER STRUCTURE

| RS3/RD3 - XX | XX | S/D | 20 | A | X |
|---------------------------------------|--|----------------------------|------------------|------------------|---|
| Name/Package RS3=SIL7 RD3=DIL14 | Output 03=3.3V 05=5V 07=7.2V 09=9V 12=12V 15=15V 18=18V 24=24V | Type S=Single D=Dual | Power 20=2.0W | Code internal | Isolation 1=1.0 kVDC 2=2.0 kVDC 3=3.0 kVDC 4=4.0 kVDC 5=5.2 kVDC 6=6.0 kVDC |
| | Input 05=5V 12=12V 24=24V 48=48V | | | | |

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) |
|---------------|-----------------|---|------------|-------------------------------|--------------------|---------------------|
| RS3-0503D20AX | 5 | 30 / 406 | +3.3 | ±200 | 65 | ±220 |
| RS3-0505D20AX | 5 | 30 / 555 | +5 | ±200 | 72 | ±220 |
| RS3-0507D20AX | 5 | 30 / 555 | +7.2 | ±138.8 | 72 | ±220 |
| RS3-0509D20AX | 5 | 30 / 519 | +9 | ±111.1 | 77 | ±220 |
| RS3-0512D20AX | 5 | 30 / 512 | +12 | ±83.3 | 78 | ±220 |
| RS3-0515D20AX | 5 | 30 / 500 | +15 | ±66.67 | 80 | ±220 |
| RS3-0518D20AX | 5 | 30 / 500 | +18 | ±55.55 | 80 | ±220 |
| RS3-0524D20AX | 5 | 30 / 500 | +24 | ±41.67 | 80 | ±220 |
| RS3-1203D20AX | 12 | 20 / 164 | +3.3 | ±200 | 67 | ±220 |
| RS3-1205D20AX | 12 | 20 / 222 | +5 | ±200 | 75 | ±220 |
| RS3-1207D20AX | 12 | 20 / 219 | +7.2 | ±138.8 | 76 | ±220 |
| RS3-1209D20AX | 12 | 20 / 216 | +9 | ±111.1 | 77 | ±220 |
| RS3-1212D20AX | 12 | 20 / 203 | +12 | ±83.3 | 82 | ±220 |
| RS3-1215D20AX | 12 | 20 / 203 | +15 | ±66.67 | 82 | ±220 |
| RS3-1218D20AX | 12 | 20 / 203 | +18 | ±55.55 | 82 | ±220 |
| RS3-1224D20AX | 12 | 20 / 203 | +24 | ±41.67 | 82 | ±220 |
| RS3-2403D20AX | 24 | 10 / 80 | +3.3 | ±200 | 68 | ±220 |
| RS3-2405D20AX | 24 | 10 / 111 | +5 | ±200 | 75 | ±220 |
| RS3-2407D20AX | 24 | 10 / 111 | +7.2 | ±138.8 | 75 | ±220 |
| RS3-2409D20AX | 24 | 10 / 104 | +9 | ±111.1 | 80 | ±220 |
| RS3-2412D20AX | 24 | 10 / 101 | +12 | ±83.3 | 82 | ±220 |
| RS3-2415D20AX | 24 | 10 / 101 | +15 | ±66.67 | 82 | ±220 |
| RS3-2418D20AX | 24 | 10 / 101 | +18 | ±55.55 | 82 | ±220 |
| RS3-2424D20AX | 24 | 10 / 101 | +24 | ±41.67 | 82 | ±220 |
| RS3-4803D20AX | 48 | 6 / 45 | +3.3 | ±200 | 60 | ±220 |
| RS3-4805D20AX | 48 | 6 / 57 | +5 | ±200 | 73 | ±220 |
| RS3-4807D20AX | 48 | 6 / 54 | +7.2 | ±138.8 | 77 | ±220 |
| RS3-4809D20AX | 48 | 6 / 54 | +9 | ±111.1 | 77 | ±220 |
| RS3-4812D20AX | 48 | 6 / 52 | +12 | ±83.3 | 80 | ±220 |
| RS3-4815D20AX | 48 | 6 / 52 | +15 | ±66.67 | 80 | ±220 |
| RS3-4818D20AX | 48 | 6 / 52 | +18 | ±55.55 | 80 | ±220 |
| RS3-4824D20AX | 48 | 6 / 52 | +24 | ±41.67 | 80 | ±220 |



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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 (μ F) |
|---------------|-----------------|---|------------|-------------------------------|--------------------|---------------------------|
| RD3-0503D20AX | 5 | 30 / 406 | \pm 3.3 | \pm 200 | 65 | \pm 220 |
| RD3-0505D20AX | 5 | 30 / 555 | \pm 5 | \pm 200 | 72 | \pm 220 |
| RD3-0507D20AX | 5 | 30 / 555 | \pm 7.2 | \pm 138.8 | 72 | \pm 220 |
| RD3-0509D20AX | 5 | 30 / 519 | \pm 9 | \pm 111.1 | 77 | \pm 220 |
| RD3-0512D20AX | 5 | 30 / 512 | \pm 12 | \pm 83.3 | 78 | \pm 220 |
| RD3-0515D20AX | 5 | 30 / 500 | \pm 15 | \pm 66.67 | 80 | \pm 220 |
| RD3-0518D20AX | 5 | 30 / 500 | \pm 18 | \pm 55.55 | 80 | \pm 220 |
| RD3-0524D20AX | 5 | 30 / 500 | \pm 24 | \pm 41.67 | 80 | \pm 220 |
| RD3-1203D20AX | 12 | 20 / 164 | \pm 3.3 | \pm 200 | 67 | \pm 220 |
| RD3-1205D20AX | 12 | 20 / 222 | \pm 5 | \pm 200 | 75 | \pm 220 |
| RD3-1207D20AX | 12 | 20 / 219 | \pm 7.2 | \pm 138.8 | 76 | \pm 220 |
| RD3-1209D20AX | 12 | 20 / 216 | \pm 9 | \pm 111.1 | 77 | \pm 220 |
| RD3-1212D20AX | 12 | 20 / 203 | \pm 12 | \pm 83.3 | 82 | \pm 220 |
| RD3-1215D20AX | 12 | 20 / 203 | \pm 15 | \pm 66.67 | 82 | \pm 220 |
| RD3-1218D20AX | 12 | 20 / 203 | \pm 18 | \pm 55.55 | 82 | \pm 220 |
| RD3-1224D20AX | 12 | 20 / 203 | \pm 24 | \pm 41.67 | 82 | \pm 220 |
| RD3-2403D20AX | 24 | 10 / 80 | \pm 3.3 | \pm 200 | 68 | \pm 220 |
| RD3-2405D20AX | 24 | 10 / 111 | \pm 5 | \pm 200 | 75 | \pm 220 |
| RD3-2407D20AX | 24 | 10 / 111 | \pm 7.2 | \pm 138.8 | 75 | \pm 220 |
| RD3-2409D20AX | 24 | 10 / 104 | \pm 9 | \pm 111.1 | 80 | \pm 220 |
| RD3-2412D20AX | 24 | 10 / 101 | \pm 12 | \pm 83.3 | 82 | \pm 220 |
| RD3-2415D20AX | 24 | 10 / 101 | \pm 15 | \pm 66.67 | 82 | \pm 220 |
| RD3-2418D20AX | 24 | 10 / 101 | \pm 18 | \pm 55.55 | 82 | \pm 220 |
| RD3-2424D20AX | 24 | 10 / 101 | \pm 24 | \pm 41.67 | 82 | \pm 220 |
| RS3-0503S20AX | 5 | 30 / 367 | 3.3 | 400 | 72 | 470 |
| RS3-0505S20AX | 5 | 30 / 512 | 5 | 400 | 78 | 470 |
| RS3-0507S20AX | 5 | 30 / 500 | 7.2 | 277.7 | 80 | 470 |
| RS3-0509S20AX | 5 | 30 / 500 | 9 | 222.2 | 80 | 470 |
| RS3-0512S20AX | 5 | 30 / 487 | 12 | 166.7 | 82 | 470 |
| RS3-0515S20AX | 5 | 30 / 487 | 15 | 133.3 | 82 | 470 |
| RS3-0518S20AX | 5 | 30 / 487 | 18 | 111.1 | 82 | 470 |
| RS3-0524S20AX | 5 | 30 / 487 | 24 | 83.3 | 82 | 470 |
| RS3-1203S20AX | 12 | 36 / 169 | 3.3 | 400 | 65 | 470 |
| RS3-1205S20AX | 12 | 20 / 216 | 5 | 400 | 77 | 470 |
| RS3-1207S20AX | 12 | 20 / 208 | 7.2 | 277.7 | 80 | 470 |
| RS3-1209S20AX | 12 | 20 / 208 | 9 | 222.2 | 80 | 470 |
| RS3-1212S20AX | 12 | 20 / 203 | 12 | 166.7 | 82 | 470 |
| RS3-1215S20AX | 12 | 20 / 203 | 15 | 133.3 | 82 | 470 |
| RS3-1218S20AX | 12 | 20 / 208 | 18 | 111.1 | 80 | 470 |
| RS3-1224S20AX | 12 | 20 / 208 | 24 | 83.3 | 80 | 470 |
| RS3-2403S20AX | 24 | 10 / 76 | 3.3 | 400 | 72 | 470 |
| RS3-2405S20AX | 24 | 10 / 105 | 5 | 400 | 79 | 470 |
| RS3-2407S20AX | 24 | 10 / 104 | 7.2 | 277.7 | 80 | 470 |
| RS3-2409S20AX | 24 | 10 / 104 | 9 | 222.2 | 80 | 470 |
| RS3-2412S20AX | 24 | 10 / 102 | 12 | 166.7 | 80 | 470 |
| RS3-2415S20AX | 24 | 10 / 101 | 15 | 133.3 | 82 | 470 |
| RS3-2418S20AX | 24 | 10 / 101 | 18 | 111.1 | 82 | 470 |
| RS3-2424S20AX | 24 | 10 / 104 | 24 | 83.3 | 80 | 470 |

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MODEL SELECTION GUIDE

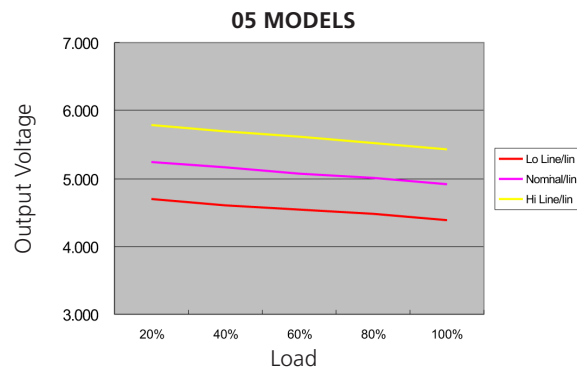
| Model Number | Input Range VDC | Input current (mA) No Load / Full Load | Output VDC | Output current Full Load (mA) | Efficiency @FL (%) | Capacitor Load (μ F) |
|---------------|-----------------|---|------------|-------------------------------|--------------------|---------------------------|
| RS3-4803S20AX | 48 | 6 / 45 | 3.3 | 400 | 60 | 470 |
| RS3-4805S20AX | 48 | 6 / 54 | 5 | 400 | 77 | 470 |
| RS3-4807S20AX | 48 | 6 / 54 | 7.2 | 277.7 | 77 | 470 |
| RS3-4809S20AX | 48 | 6 / 54 | 9 | 222.2 | 77 | 470 |
| RS3-4812S20AX | 48 | 6 / 53 | 12 | 166.7 | 78 | 470 |
| RS3-4815S20AX | 48 | 6 / 53 | 15 | 133.3 | 78 | 470 |
| RS3-4818S20AX | 48 | 6 / 53 | 18 | 111.1 | 78 | 470 |
| RS3-4824S20AX | 48 | 6 / 55 | 24 | 83.3 | 75 | 470 |
| RD3-0503S20AX | 5 | 30 / 367 | 3.3 | 400 | 72 | 470 |
| RD3-0505S20AX | 5 | 30 / 512 | 5 | 400 | 78 | 470 |
| RD3-0507S20AX | 5 | 30 / 500 | 7.2 | 277.7 | 80 | 470 |
| RD3-0509S20AX | 5 | 30 / 500 | 9 | 222.2 | 80 | 470 |
| RD3-0512S20AX | 5 | 30 / 487 | 12 | 166.7 | 82 | 470 |
| RD3-0515S20AX | 5 | 30 / 487 | 15 | 133.3 | 82 | 470 |
| RD3-0518S20AX | 5 | 30 / 487 | 18 | 111.1 | 82 | 470 |
| RD3-0524S20AX | 5 | 30 / 487 | 24 | 83.3 | 82 | 470 |
| RD3-1203S20AX | 12 | 20 / 152 | 3.3 | 400 | 72 | 470 |
| RD3-1205S20AX | 12 | 20 / 216 | 5 | 400 | 77 | 470 |
| RD3-1207S20AX | 12 | 20 / 208 | 7.2 | 277.7 | 80 | 470 |
| RD3-1209S20AX | 12 | 20 / 208 | 9 | 222.2 | 80 | 470 |
| RD3-1212S20AX | 12 | 20 / 208 | 12 | 166.7 | 80 | 470 |
| RD3-1215S20AX | 12 | 20 / 208 | 15 | 133.3 | 80 | 470 |
| RD3-1218S20AX | 12 | 20 / 208 | 18 | 111.1 | 80 | 470 |
| RD3-1224S20AX | 12 | 20 / 208 | 24 | 83.3 | 80 | 470 |
| RD3-2403S20AX | 24 | 10 / 76 | 3.3 | 400 | 72 | 470 |
| RD3-2405S20AX | 24 | 10 / 105 | 5 | 400 | 79 | 470 |
| RD3-2407S20AX | 24 | 10 / 115 | 7.2 | 277.7 | 72 | 470 |
| RD3-2409S20AX | 24 | 10 / 104 | 9 | 222.2 | 80 | 470 |
| RD3-2412S20AX | 24 | 10 / 104 | 12 | 166.7 | 80 | 470 |
| RD3-2415S20AX | 24 | 10 / 104 | 15 | 133.3 | 80 | 470 |
| RD3-2418S20AX | 24 | 10 / 104 | 18 | 111.1 | 80 | 470 |
| RD3-2424S20AX | 24 | 10 / 104 | 24 | 83.3 | 80 | 470 |



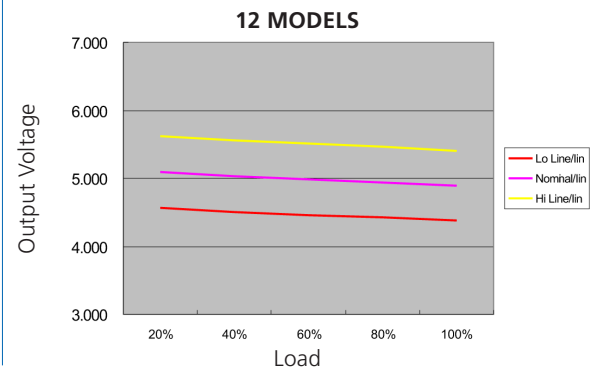
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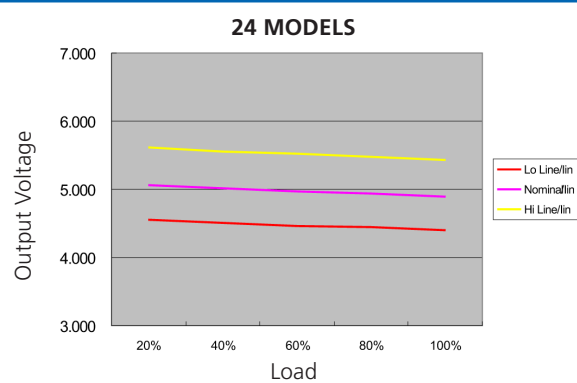
LOADING VS OUTPUT VOLTAGE 05



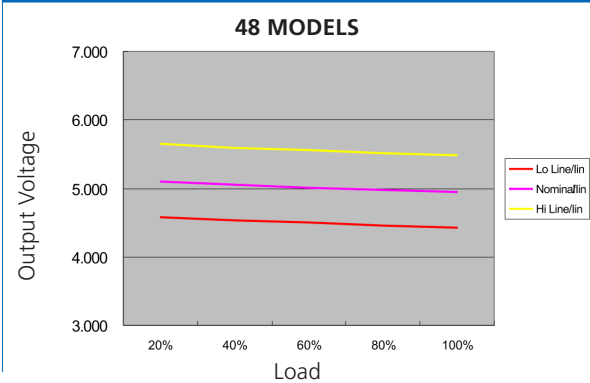
LOADING VS OUTPUT VOLTAGE 12



LOADING VS OUTPUT VOLTAGE 24

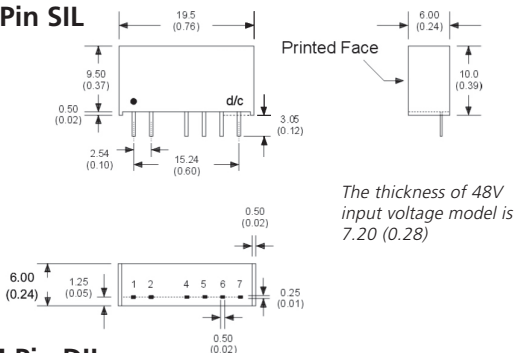


LOADING VS OUTPUT VOLTAGE 48

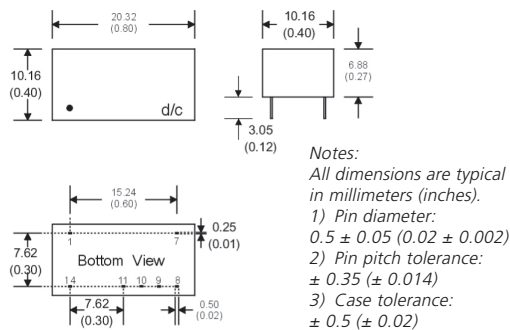


MECHANICAL SPECIFICATIONS

7 Pin SIL



14 Pin DIL



PIN CONNECTIONS

| PIN | SINGLE | DUAL | SINGLE-H | DUAL-H |
|-----|-----------|-----------|-----------|-----------|
| 1 | +V Input | +V Input | +V Input | +V Input |
| 2 | -V Input | -V Input | -V Input | -V Input |
| 4 | -V Output | -V Output | N.P. | N.P. |
| 5 | N.P. | Common | -V Output | -V Output |
| 6 | +V Output | +V Output | N.P. | Common |
| 7 | N.P. | N.P. | +V Output | +V Output |

| PIN | SINGLE | DUAL | SINGLE-H | DUAL-H |
|-----|-----------|-----------|-----------|-----------|
| 1 | -V Input | -V Input | -V Input | -V Input |
| 7 | N.C. | N.C. | N.C. | N.C. |
| 8 | N.P. | Common | +V Output | +V Output |
| 9 | +V Output | +V Output | N.P. | Common |
| 10 | N.P. | N.P. | -V Output | -V Output |
| 11 | -V Output | -V Output | N.P. | N.P. |
| 14 | +V Input | +V Input | +V Input | +V Input |