

RS5/RD5-S20/D20

2.0 Watt 2:1 regulated
single & dual output



- 8 Pin SIL / 16 Pin DIL package
- Wide 2:1 input range
- 1000 VDC isolation, up to 3000 VDC
- Continuous short circuit protection
- Efficiency up to 80%
- -40°C~85°C operation temperature range
- Metal case, Remote On/Off optional

OUTPUT SPECIFICATIONS

| | |
|---|---------------------------------|
| Voltage accuracy | ± 2% |
| Line regulation | ± 0.5% |
| Load regulation (From 25% to 100% Load) | ± 1% |
| Ripple & Noise (20 MHz bandwidth) (1) | 80 mV pk-pk |
| Short circuit protection | Indefinite (automatic recovery) |
| Temperature coefficient | ± 0.02%/°C |
| Capacitor load (2) | See table |

INPUT SPECIFICATIONS

| | |
|------------------------------------|-------------|
| Voltage range | See table |
| Max. input current | See table |
| No-load input current | See table |
| Input filter | Capacitors |
| Input reflected ripple current (3) | 35 mA pk-pk |

GENERAL SPECIFICATIONS

| | |
|---|------------------|
| Efficiency | See table |
| I/O isolation voltage (3 sec.) | |
| Input / output | 1000 ~ 3000 VDC |
| Metal case / input & output | 1000 VDC |
| I/O isolation capacitance | 60 pF typ. |
| I/O isolation resistance | 1000 M Ohm |
| Switching frequency | 100~650 kHz |
| Humidity | 95% rel. H |
| Reliability calculated MTBF (MIL-HDBK-217F) | > 2.732 Mhrs. |
| Safety standard (designed to meet) | IEC 60950-1:2001 |
| Remote on/off (CTRL) | see note 11 |

PHYSICAL SPECIFICATIONS

| | |
|------------------|--|
| Case material | Non-conductive black plastic (UL94V-0 rated) |
| | Nickel-coated copper |
| Pin material | SIP > Alloy42 solder-coated |
| | DIP > Ø 0.5 mm brass solder-coated |
| Potting material | Epoxy (UL94V-0 rated) |
| Weight | SIP > 4.5 g, DIP > 6 g |
| Metal case | SIP > 6.5 g, DIP > 8 g |
| Dimensions | SIP > 0.86" x 0.36" x 0.44" |
| | DIP > 0.92" x 0.55" x 0.40" |

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 ~ 12 VDC |
| 12 modes | -0.7 ~ 24 VDC |
| 24 modes | -0.7 ~ 40 VDC |
| 48 modes (SIP) | -0.7 ~ 80 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 nominal V_{in} 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) It's necessary to add minimum capacitor in output for some models. Please check single model datasheet for detail value.
- 7) It is needed to add 100 uF capacitor in output end to keep the Ripple & Noise spec.
- 8) MCU (Master Control Unit) >
The MCU Pin voltage is referenced to $-V_{in}$ (Pin 1)
ON: 0~0.8 VDC max.
(Short circuit Pin 1 and Pin 3) or open circuit
OFF: 5.0 VDC
OFF idle current: 5.0 mA typ.

Connection example



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“).

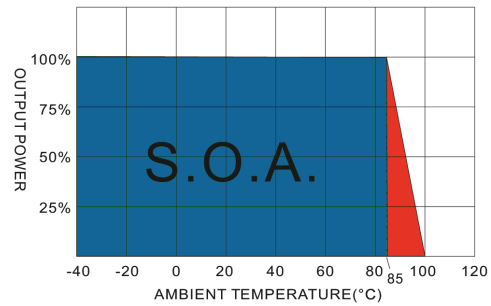
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NUMBER STRUCTURE

| RS5/RD5 - XX | XX | R/RD 20 | A | X |
|---|--|-------------------------|-------------------------|--|
| Name/Package RS5=SIL8 RD5=DIL16 | Output 03=3.3V 05=5V 09=9V 12=12V 15=15V 24=24V | Power 20=2.0W | Code internal | Isolation 1=1.0 kVDC 3=3.0 kVDC |
| Input 05=4.5-9V 12=9-18V 24=18-36V 48=36-72V | Type R=Single regulated RD=Dual regulated | | | |

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) |
|---------------|-----------------|---|------------|-------------------------------|--------------------|---------------------|
| RS5-0503R20AX | 4.5-9 | 15 / 492 | 3.3 | 500 | 67 | 3300 |
| RS5-0505R20AX | 4.5-9 | 15 / 571 | 5 | 400 | 70 | 3300 |
| RS5-0509R20AX | 4.5-9 | 30 / 555 | 9 | 222 | 72 | 470 |
| RS5-0512R20AX | 4.5-9 | 30 / 555 | 12 | 167 | 72 | 470 |
| RS5-0515R20AX | 4.5-9 | 30 / 547 | 15 | 133 | 73 | 470 |
| RS5-0524R20AX | 4.5-9 | 60 / 533 | 24 | 83 | 75 | 220 |
| RS5-1203R20AX | 9-18 | 15 / 205 | 3.3 | 500 | 67 | 3300 |
| RS5-1205R20AX | 9-18 | 15 / 216 | 5 | 400 | 77 | 3300 |
| RS5-1209R20AX | 9-18 | 15 / 213 | 9 | 222 | 78 | 470 |
| RS5-1212R20AX | 9-18 | 15 / 208 | 12 | 167 | 80 | 470 |
| RS5-1215R20AX | 9-18 | 15 / 213 | 15 | 133 | 78 | 470 |
| RS5-1224R20AX | 9-18 | 15 / 208 | 24 | 83 | 80 | 220 |
| RS5-2403R20AX | 18-36 | 8 / 98 | 3.3 | 500 | 70 | 3300 |
| RS5-2405R20AX | 18-36 | 8 / 108 | 5 | 400 | 77 | 3300 |
| RS5-2409R20AX | 18-36 | 8 / 104 | 9 | 222 | 80 | 470 |
| RS5-2412R20AX | 18-36 | 8 / 104 | 12 | 167 | 80 | 470 |
| RS5-2415R20AX | 18-36 | 8 / 104 | 15 | 133 | 80 | 470 |
| RS5-2424R20AX | 18-36 | 8 / 104 | 24 | 83 | 80 | 220 |
| RS5-4803R20AX | 36-72 | 6 / 48 | 3.3 | 500 | 71 | 3300 |
| RS5-4805R20AX | 36-72 | 6 / 56 | 5 | 400 | 74 | 3300 |
| RS5-4809R20AX | 36-72 | 6 / 53 | 9 | 222 | 78 | 470 |
| RS5-4812R20AX | 36-72 | 6 / 53 | 12 | 167 | 78 | 470 |
| RS5-4815R20AX | 36-72 | 6 / 53 | 15 | 133 | 78 | 470 |
| RS5-4824R20AX | 36-72 | 6 / 52 | 24 | 83 | 80 | 220 |
| RD5-0503R20AX | 4.5-9 | 15 / 492 | 3.3 | 500 | 67 | 3300 |
| RD5-0505R20AX | 4.5-9 | 15 / 571 | 5 | 400 | 70 | 3300 |
| RD5-0509R20AX | 4.5-9 | 30 / 555 | 9 | 222 | 72 | 470 |
| RD5-0512R20AX | 4.5-9 | 30 / 555 | 12 | 167 | 72 | 470 |
| RD5-0515R20AX | 4.5-9 | 30 / 547 | 15 | 133 | 73 | 470 |
| RD5-0524R20AX | 4.5-9 | 60 / 533 | 24 | 83 | 75 | 220 |
| RD5-1203R20AX | 9-18 | 15 / 205 | 3.3 | 500 | 67 | 3300 |
| RD5-1205R20AX | 9-18 | 15 / 216 | 5 | 500 | 77 | 3300 |
| RD5-1209R20AX | 9-18 | 15 / 213 | 9 | 222 | 78 | 470 |
| RD5-1212R20AX | 9-18 | 15 / 208 | 12 | 167 | 80 | 470 |
| RD5-1215R20AX | 9-18 | 15 / 213 | 15 | 133 | 78 | 470 |
| RD5-1224R20AX | 9-18 | 15 / 208 | 24 | 83 | 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) |
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| RD5-4809R20AX | 36-72 | 6 / 53 | 9 | 222 | 78 | 470 |
| RD5-4812R20AX | 36-72 | 6 / 53 | 12 | 167 | 78 | 470 |
| RD5-4815R20AX | 36-72 | 6 / 53 | 15 | 133 | 78 | 470 |
| RD5-4824R20AX | 36-72 | 6 / 53 | 24 | 83 | 80 | 220 |
| RS5-0503RD20AX | 4.5-9 | 20 / 471 | \pm 3.3 | \pm 250 | 70 | \pm 1000 |
| RS5-0505RD20AX | 4.5-9 | 20 / 571 | \pm 5 | \pm 200 | 70 | \pm 1000 |
| RS5-0509RD20AX | 4.5-9 | 20 / 540 | \pm 9 | \pm 111 | 74 | \pm 220 |
| RS5-0512RD20AX | 4.5-9 | 25 / 533 | \pm 12 | \pm 83 | 75 | \pm 220 |
| RS5-0515RD20AX | 4.5-9 | 25 / 533 | \pm 15 | \pm 67 | 75 | \pm 220 |
| RS5-0524RD20AX | 4.5-9 | 60 / 563 | \pm 24 | \pm 42 | 71 | \pm 100 |
| RS5-1203RD20AX | 9-18 | 15 / 188 | \pm 3.3 | \pm 250 | 73 | \pm 1000 |
| RS5-1205RD20AX | 9-18 | 15 / 222 | \pm 5 | \pm 200 | 75 | \pm 1000 |
| RS5-1209RD20AX | 9-18 | 15 / 210 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RS5-1212RD20AX | 9-18 | 15 / 208 | \pm 12 | \pm 83 | 80 | \pm 220 |
| RS5-1215RD20AX | 9-18 | 15 / 210 | \pm 15 | \pm 67 | 79 | \pm 220 |
| RS5-1224RD20AX | 9-18 | 30 / 219 | \pm 24 | \pm 42 | 76 | \pm 1000 |
| RS5-2403RD20AX | 18-36 | 8 / 94 | \pm 3.3 | \pm 250 | 73 | \pm 1000 |
| RS5-2405RD20AX | 18-36 | 8 / 106 | \pm 5 | \pm 200 | 78 | \pm 1000 |
| RS5-2409RD20AX | 18-36 | 8 / 105 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RS5-2412RD20AX | 18-36 | 8 / 104 | \pm 12 | \pm 83 | 80 | \pm 220 |
| RS5-2415RD20AX | 18-36 | 8 / 104 | \pm 15 | \pm 67 | 80 | \pm 220 |
| RS5-2424RD20AX | 18-36 | 20 / 106 | \pm 24 | \pm 42 | 78 | \pm 100 |
| RS5-4803RD20AX | 36-72 | 6 / 47 | \pm 3.3 | \pm 250 | 73 | \pm 1000 |
| RS5-4805RD20AX | 36-72 | 6 / 56 | \pm 5 | \pm 200 | 74 | \pm 1000 |
| RS5-4809RD20AX | 36-72 | 6 / 53 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RS5-4812RD20AX | 36-72 | 6 / 53 | \pm 12 | \pm 83 | 79 | \pm 220 |
| RS5-4815RD20AX | 36-72 | 6 / 52 | \pm 15 | \pm 67 | 80 | \pm 220 |
| RS5-4824RD20AX | 36-72 | 12 / 55 | \pm 24 | \pm 42 | 75 | \pm 100 |
| RD5-0503RD20AX | 4.5-9 | 20 / 471 | \pm 3.3 | \pm 250 | 70 | \pm 1000 |
| RD5-0505RD20AX | 4.5-9 | 20 / 571 | \pm 5 | \pm 200 | 70 | \pm 1000 |
| RD5-0509RD20AX | 4.5-9 | 20 / 540 | \pm 9 | \pm 111 | 74 | \pm 220 |
| RD5-0512RD20AX | 4.5-9 | 25 / 533 | \pm 12 | \pm 83 | 75 | \pm 220 |
| RD5-0515RD20AX | 4.5-9 | 25 / 533 | \pm 15 | \pm 67 | 75 | \pm 220 |
| RD5-0524RD20AX | 4.5-9 | 60 / 563 | \pm 24 | \pm 42 | 71 | \pm 100 |
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| RD5-1205RD20AX | 9-18 | 15 / 222 | \pm 5 | \pm 200 | 75 | \pm 1000 |
| RD5-1209RD20AX | 9-18 | 15 / 210 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RD5-1212RD20AX | 9-18 | 15 / 208 | \pm 12 | \pm 83 | 80 | \pm 220 |
| RD5-1215RD20AX | 9-18 | 15 / 210 | \pm 15 | \pm 67 | 79 | \pm 220 |
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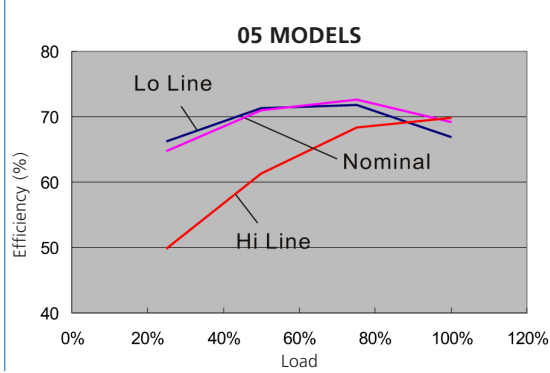
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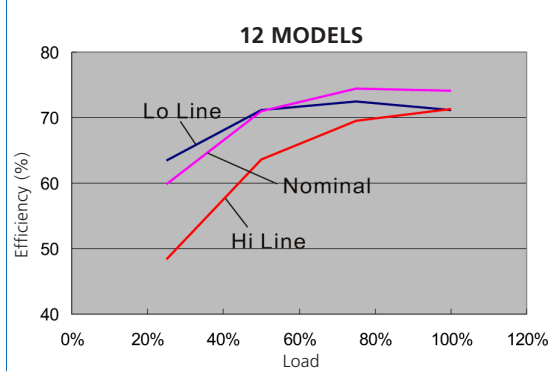
MODEL SELECTION GUIDE

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|----------------|-----------------|---|------------|-------------------------------|--------------------|---------------------------|
| RD5-2403RD20AX | 18-36 | 8 / 94 | \pm 3.3 | \pm 250 | 73 | \pm 1000 |
| RD5-2405RD20AX | 18-36 | 8 / 106 | \pm 5 | \pm 200 | 78 | \pm 1000 |
| RD5-2409RD20AX | 18-36 | 8 / 105 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RD5-2412RD20AX | 18-36 | 8 / 104 | \pm 12 | \pm 83 | 80 | \pm 220 |
| RD5-2415RD20AX | 18-36 | 8 / 104 | \pm 15 | \pm 67 | 80 | \pm 220 |
| RD5-2424RD20AX | 18-36 | 20 / 106 | \pm 24 | \pm 42 | 78 | \pm 100 |
| RD5-4803RD20AX | 36-72 | 6 / 47 | \pm 3.3 | \pm 250 | 73 | \pm 1000 |
| RD5-4805RD20AX | 36-72 | 6 / 56 | \pm 5 | \pm 200 | 74 | \pm 1000 |
| RD5-4809RD20AX | 36-72 | 6 / 53 | \pm 9 | \pm 111 | 79 | \pm 220 |
| RD5-4812RD20AX | 36-72 | 6 / 53 | \pm 12 | \pm 83 | 79 | \pm 220 |
| RD5-4815RD20AX | 36-72 | 6 / 52 | \pm 15 | \pm 67 | 80 | \pm 220 |
| RD5-4824RD20AX | 36-72 | 12 / 55 | \pm 24 | \pm 42 | 75 | \pm 100 |

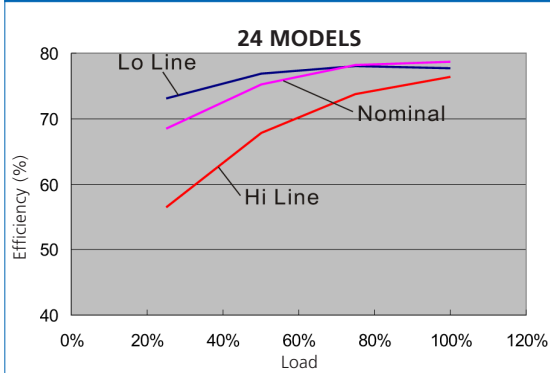
EFFICIENCY VS OUTPUT CURRENT 05



EFFICIENCY VS OUTPUT CURRENT 12



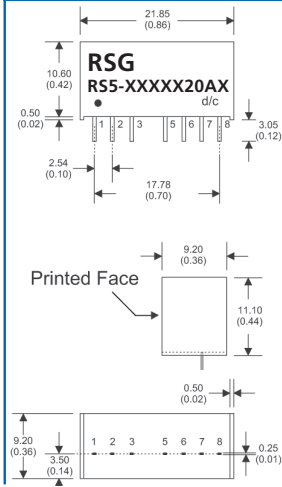
EFFICIENCY VS OUTPUT CURRENT 24



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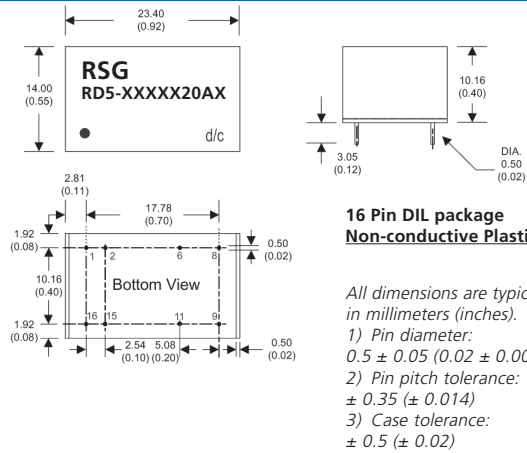
MECHANICAL SPECIFICATIONS 8 Pin SIL



8 Pin SIL package
Non-conductive Plastic

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)

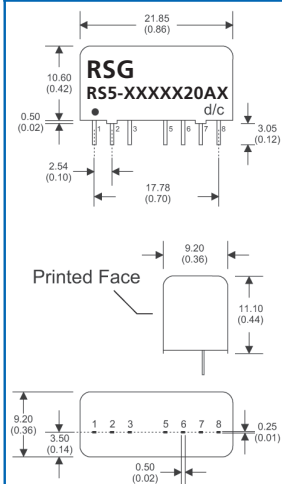
MECHANICAL SPECIFICATIONS 16 Pin DIL



16 Pin DIL package
Non-conductive Plastic

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)

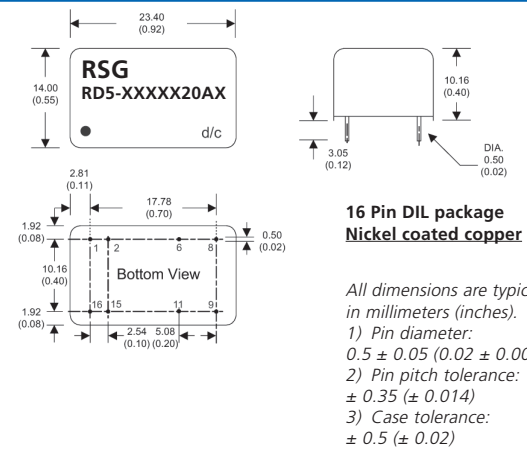
MECHANICAL SPECIFICATIONS 8 Pin SIL



8 Pin SIL package
Nickel coated copper

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)

MECHANICAL SPECIFICATIONS 16 Pin DIL



16 Pin DIL package
Nickel coated copper

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 > 8 Pin SIL

| NUMBER | SINGLE | DUAL/(SD) | DUAL/(SZ) | NUMBER | SINGLE+C | DUAL/(SD+C) | DUAL/(SZ+C) |
|--------|-----------|-----------|-----------|--------|---------------|---------------|---------------|
| 1 | -V Input | -V Input | -V Input | 1 | -V Input | -V Input | -V Input |
| 2 | +V Input | +V Input | +V Input | 2 | +V Input | +V Input | +V Input |
| 3 | N.P. | N.C. | N.C. | 3 | Remote On/Off | Remote On/Off | Remote On/Off |
| 5 | N.P. | N.C. | N.C. | 5 | N.C. | N.C. | N.C. |
| 6 | +V Output | +V Output | +V Output | 6 | +V Output | +V Output | +V Output |
| 7 | -V Output | -V Output | Common | 7 | -V Output | -V Output | Common |
| 8 | N.C. | Common | -V Output | 8 | N.C. | Common | -V Output |

> 16 Pin DIL

| NUMBER | SINGLE | DUAL |
|--------|-----------|-----------|
| 1 | -V Input | -V Input |
| 2 | -V Input | -V Input |
| 6 | N.C. | Common |
| 8 | N.C. | -V Output |
| 9 | +V Output | +V Output |
| 11 | -V Output | Common |
| 15 | +V Input | +V Input |
| 16 | +V Input | +V Input |