# 1 Watt 8 Pin SIL Package Z8

- **Wide 2:1 Input Range**
- **Regulated Output**
- **1000 VDC Isolation**
  **3000 VDC Isolation add Suffix „H3“ (only for Plastic Case)**
- **Single & Dual Outputs**
- **Continuous Short Circuit Protection**
- **Plastic Case Standard, add Suffix „M“ for Metal Case**
- **For Remote ON/OFF Control add Suffix „C“**


| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | | INPUT CURRENT | | % EFF | CAPACITIVE LOAD |
|---|---|---|---|---|---|---|---|---|
| | | | MIN. LOAD | FULL LOAD | NO LOAD | FULL LOAD | | |
| 1Z8RS5W3.3M | 4.5-9 VDC | 3.3 VDC | 76 mA | 303 mA | 15 mA | 298 mA | 67 | 3300 µF |
| 1Z8RS5W5M | | 5 VDC | 50 mA | 200 mA | | | | |
| 1Z8RS5W9M | | 9 VDC | 28 mA | 111 mA | 40 mA | 285 mA | 70 | 470 µF |
| 1Z8RS5W12M | | 12 VDC | 21 mA | 83 mA | 55 mA | | | |
| 1Z8RS5W15M | | 15 VDC | 17 mA | 67 mA | | | | |
| 1Z8RS5W24M | | 24 VDC | 10 mA | 42 mA | 70 mA | 294 mA | 68 | 220 µF |
| 1Z8RD5W3.3M | | ±3.3 VDC | ±38 mA | ±152 mA | 15 mA | 285 mA | 70 | ±1000 µF |
| 1Z8RD5W5M | | ±5 VDC | ±25 mA | ±100 mA | | 270 mA | 74 | |
| 1Z8RD5W9M | | ±9 VDC | ±14 mA | ±56 mA | 20 mA | | | ±220 µF |
| 1Z8RD5W12M | | ±12 VDC | ±10 mA | ±42 mA | 20 mA | 266 mA | 75 | |
| 1Z8RD5W15M | | ±15 VDC | ±8 mA | ±33 mA | 40 mA | 285 mA | 70 | |
| 1Z8RD5W24M | | ±24 VDC | ±5 mA | ±21 mA | 70 mA | 298 mA | 67 | ±100 µF |
| 1Z8RS12W3.3M | 9-18 VDC | 3.3 VDC | 76 mA | 303 mA | 15 mA | 119 mA | 70 | 3300 µF |
| 1Z8RS12W5M | | 5 VDC | 50 mA | 200 mA | | 115 mA | 72 | |
| 1Z8RS12W9M | | 9 VDC | 28 mA | 111 mA | | 108 mA | 77 | 470 µF |
| 1Z8RS12W12M | | 12 VDC | 21 mA | 83 mA | | | | |
| 1Z8RS12W15M | | 15 VDC | 17 mA | 67 mA | | | | |
| 1Z8RS12W24M | | 24 VDC | 10 mA | 42 mA | | 114 mA | 73 | 220 µF |
| 1Z8RD12W3.3M | | ±3.3 VDC | ±38 mA | ±152 mA | | 119 mA | 70 | ±1000 µF |
| 1Z8RD12W5M | | ±5 VDC | ±25 mA | ±100 mA | | 115 mA | 72 | |
| 1Z8RD12W9M | | ±9 VDC | ±14 mA | ±56 mA | | 109 mA | 76 | ±220 µF |
| 1Z8RD12W12M | | ±12 VDC | ±10 mA | ±42 mA | | | | |
| 1Z8RD12W15M | | ±15 VDC | ±8 mA | ±33 mA | | 112 mA | 74 | |
| 1Z8RD12W24M | | ±24 VDC | ±5 mA | ±21 mA | 40 mA | 124 mA | 67 | ±100 µF |

**SPECIFICATIONS**

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | | INPUT CURRENT | | % EFF | CAPACITIVE LOAD |
|---|---|---|---|---|---|---|---|---|
| | | | MIN. LOAD | FULL LOAD | NO LOAD | FULL LOAD | | |
| 1Z8RS24W3.3M | 18-36 VDC | 3.3 VDC | 76 mA | 303 mA | 8 mA | 59 mA | 70 | 3300 µF |
| 1Z8RS24W5M | | 5 VDC | 50 mA | 200 mA | | 57 mA | 72 | 3300 µF |
| 1Z8RS24W9M | | 9 VDC | 28 mA | 111 mA | | 55 mA | 75 | 470 µF |
| 1Z8RS24W12M | | 12 VDC | 21 mA | 83 mA | | | | |
| 1Z8RS24W15M | | 15 VDC | 17 mA | 67 mA | | | | |
| 1Z8RS24W24M | | 24 VDC | 10 mA | 42 mA | | | | 220 µF |
| 1Z8RD24W3.3M | | ±3.3 VDC | ±38 mA | ±152 mA | | 59 mA | 70 | ±1000 µF |
| 1Z8RD24W5M | | ±5 VDC | ±25 mA | ±100 mA | | | | |
| 1Z8RD24W9M | | ±9 VDC | ±14 mA | ±56 mA | | 54 mA | 76 | ±220 µF |
| 1Z8RD24W12M | | ±12 VDC | ±10 mA | ±42 mA | | | 77 | |
| 1Z8RD24W15M | | ±15 VDC | ±8 mA | ±33 mA | | 55 mA | 75 | |
| 1Z8RD24W24M | | ±24 VDC | ±5 mA | ±21 mA | 20 mA | 59 mA | 70 | ±100 µF |
| 1Z8RS48W3.3M | 36-72 VDC | 3.3 VDC | 76 mA | 303 mA | 6 mA | 31 mA | 66 | 3300 µF |
| 1Z8RS48W5M | | 5 VDC | 50 mA | 200 mA | | 30 mA | 68 | |
| 1Z8RS48W9M | | 9 VDC | 28 mA | 111 mA | | 29 mA | 70 | 470 µF |
| 1Z8RS48W12M | | 12 VDC | 21 mA | 83 mA | | | | |
| 1Z8RS48W15M | | 15 VDC | 17 mA | 67 mA | | | | |
| 1Z8RS48W24M | | 24 VDC | 10 mA | 42 mA | | 30 mA | 68 | 220 µF |
| 1Z8RD48W3.3M | | ±3.3 VDC | ±38 mA | ±152 mA | | 30 mA | 70 | ±1000 µF |
| 1Z8RD48W5M | | ±5 VDC | ±25 mA | ±100 mA | | | | |
| 1Z8RD48W9M | | ±9 VDC | ±14 mA | ±56 mA | | 28 mA | 74 | ±220 µF |
| 1Z8RD48W12M | | ±12 VDC | ±10 mA | ±42 mA | | 27 mA | 76 | |
| 1Z8RD48W15M | | ±15 VDC | ±8 mA | ±33 mA | | 29 mA | 72 | |
| 1Z8RD48W24M | | ±24 VDC | ±5 mA | ±21 mA | 12 mA | 30 mA | 70 | ±100 µF |

## SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

| INPUT SPECIFICATIONS | | |
|---|---|---|
| Input Voltage Range | | 2:1 |
| Input Filter | | Capacitor Type |
| Input Reflected Ripple Current[4)] | | 35 mA p-p |
| Remote ON/OFF Control | ON | 0 to 0.8 VDC max. (Short Circuit Pin1 and Pin3) or open circuit |
| | OFF | 4.5 to 15 VDC max. |
| | OFF idle current | 3.5 to 15 mA max. |

| OUTPUT SPECIFICATIONS | |
|---|---|
| Voltage Accuracy | ±2% |
| Temperature Coefficient | ±0.02%/°C |
| Capacitive Load[5)] | see table |
| Ripple & Noise 20MHz BW[6)] | 80 mV p-p max. |
| Short Circuit Protection | Indefinite (Automatic Recovery) |
| Line Regulation | ±0.5% |
| Load Regulation (25% to 100% Load) | ±1.0% |
| Cross Regulation (Dual Output) [7)] | ±5% |

**NOTE:**

1. Maximum value at nominal input voltage and full load.
2. Typical value at nominal input voltage and full load.
3. 25% minimum loading is needed.
4. Measured input reflected ripple current with a simulated source inductance of 12 µH.
5. Test by nominal input voltage and constant resistor load.
6. Ripple & Noise is measured with 20 MHz bandwidth.
7. One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.

## SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

| GENERAL SPECIFICATION | | |
|---|---|---|
| Efficiency | | see table |
| Isolation Voltage<br>Suffix "H3"<br>Suffix "M" | Input/Output 1 min (flash tetsed for 3 sec)<br><br>Metal Case - Input/Output | 1000 VDC<br>3000 VDC<br>1000 VDC |
| I/O Isolation Resistance | | 1000 Mohms min. |
| I/O Isolation Capacitance | | 60 pF |
| Switching Frequency | | 100 to 650 kHz |
| Operating Temperature Range | | -40°C to +85°C (see Derating Curve) |
| Storage Temperature Range | | -40°C to +125°C |
| Case Temperature | | +100°C max. |
| Cooling | | Natural Convection |
| Humidity | | 95% rel H |
| Reliability Calculated MTBF (MIL-HDBK-217F) | | >2.732 Mhrs |
| Safety Standard (designed to meet) | | IEC 60950-1:2001 |
| Dimensions | | 21.85 x 9.2 x 11.1 mm (0.86 x 0.36 x 0.44 Inches) |
| Case Material<br>Suffix "M" | | Non-conductive black plastic (UL94V-0 rated)<br>Nickel-coated Copper |
| Pin Material | | Alloy42 Solder-coated |
| Potting Material | | Epoxy (UL94V-0 rated) |
| Weight<br>Suffix "M" | | 4.5 g<br>6.5 g |

| ABSOLUTE SPECIFICATIONS | | |
|---|---|---|
| These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. | | |
| Input Voltage (100 mS) | 5 V<br>12 V<br>24 V<br>48 V | -0.7 VDC to 12 VDC<br>-0.7 VDC to 24 VDC<br>-0.7 VDC to 40 VDC<br>-0.7 VDC to 80 VDC |
| Models Lead Soldering Temperature (1.5 mm from case 10 sec.) | | +260°C |

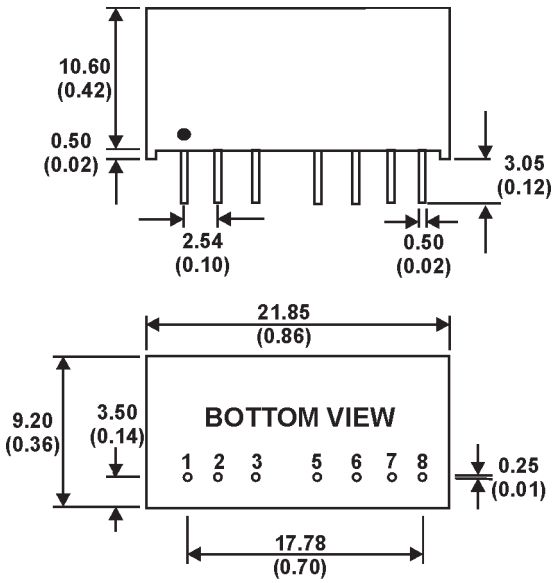
NOTE:
Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
Operation under no-load conditions will not damage these devices, however they may not meet all listed specifications.

## SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

## MECHANICAL SPECIFICATIONS

CASE "Z8" (Plastic)

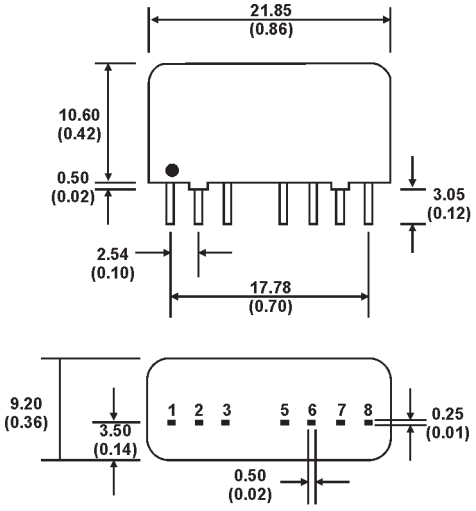



**All Dimensions in mm (Inches)**
**Tolerances: Pin Diameter: 0.5 ±0.05 (0.02 ±0.002)**
**Pin Pitch: ±0.35 (±0.014)**
**Case: ±0.5 (±0.02)**

| *PIN CONNECTIONS* | | |
|---|---|---|
| | *Single* | *Dual* |
| 1 | -INPUT | -INPUT |
| 2 | +INPUT | +INPUT |
| 3 | PIN CONNECTED | |
| 5 | PIN CONNECTED | |
| 6 | +OUTPUT | +OUTPUT |
| 7 | -OUTPUT | -OUTPUT |
| 8 | NOT CONNECTED | COMMON |

| *PIN CONNECTIONS FOR REMOTE CONTROL* | | |
|---|---|---|
| | *Single* | *Dual* |
| 1 | -INPUT | -INPUT |
| 2 | +INPUT | +INPUT |
| 3 | REMOTE CONTROL | REMOTE CONTROL |
| 5 | NOT CONNECTED | NOT CONNECTED |
| 6 | +OUTPUT | +OUTPUT |
| 7 | -OUTPUT | -OUTPUT |
| 8 | NOT CONNECTED | COMMON |

CASE "Z8" (Metal)




All Dimensions are typical in mm (inches)
Tolerances: Pin Diamater: 0.5 ±0.05 (0.02 ±0.002)
Pin Pitch: ±0.35 (±0.014)
Case: ±0.5 (±0.02)

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**SPECIFICATIONS**

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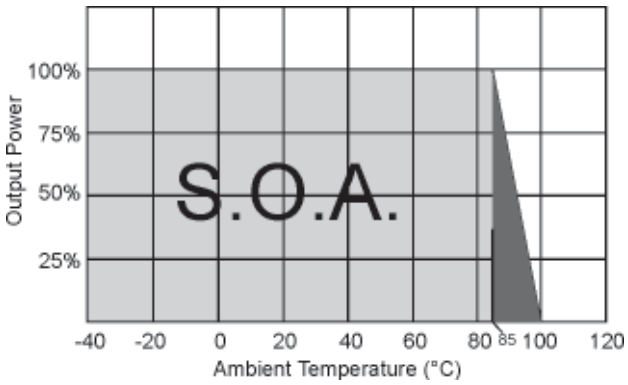
## DIAGRAMS & APPLICATION NOTES

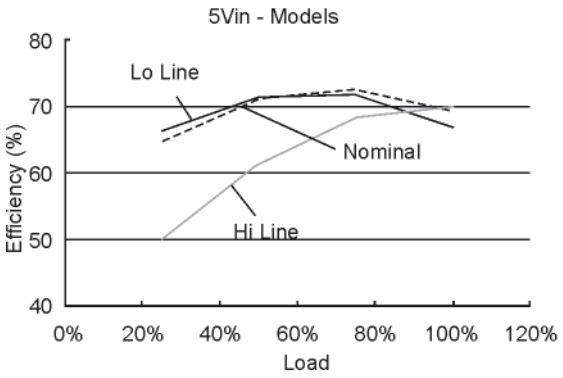
MCU (Master Control Unit)
The MCU Pin Voltage is referenced to -Vin (Pin1)
ON: 0 to 0.8 VDC max.
(Short Circuit Pin1 and Pin3) or open Circuit
OFF: 4.5 to 15 VDC max.
OFF idle current: 3.5 mA to 15 mA max.

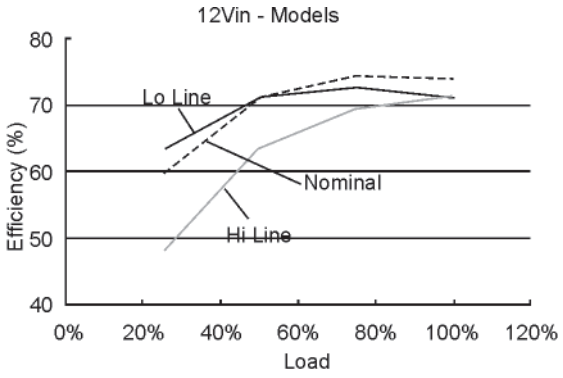
Connection for Remote Control

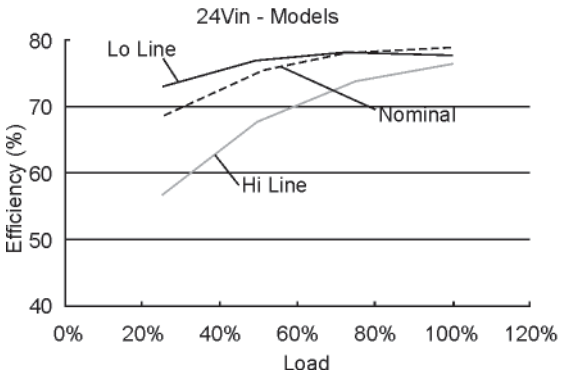

### Derating Curve




### Efficiency vs Output Current



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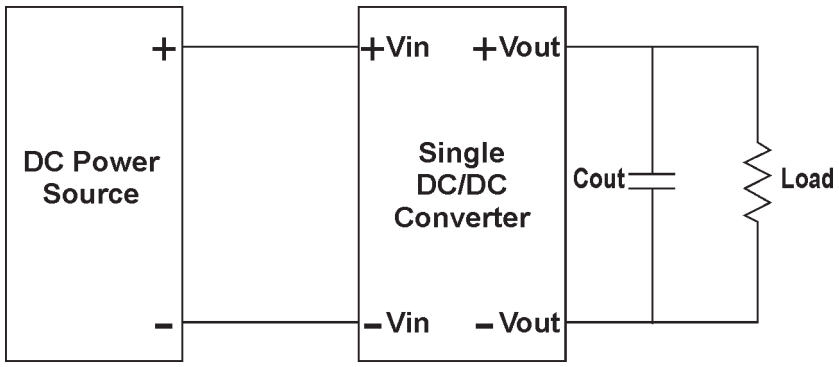
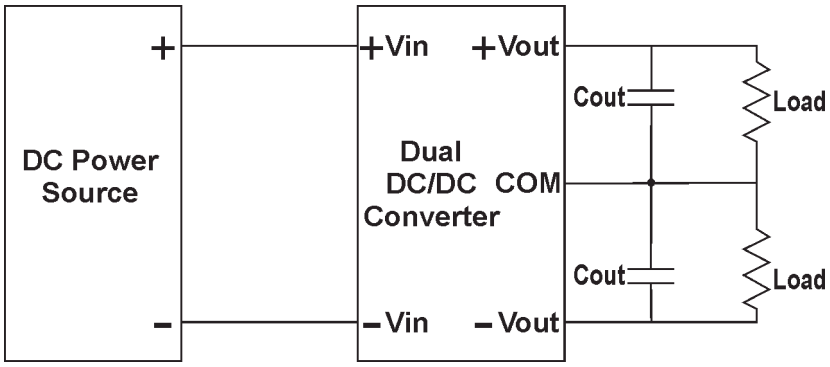
## Recommendation for Filtering Ripple & Noise

### Single




### Dual



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