DATA SHEET

NEC

# ZENER DIODES
# RD2.0S to RD120S

## ZENER DIODES
## 200 mW 2 PINS SUPER MINI MOLD

### DESCRIPTION

Type RD2.0S to RD120S Series are 2 PIN Super Mini Mold Package zener diodes possessing an allowable power dissipation of 200 mW.

### FEATURES

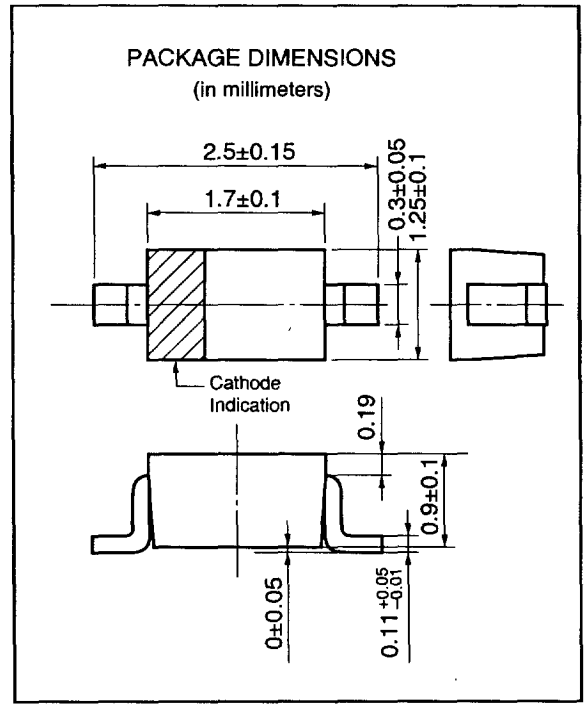
- Sharp Breakdown characteristic.
- Vz: Applied E24 standard.

### APPLICATIONS

Circuit for Constant Voltage, Constant Current, Wave form Clipper, Surge absorber, etc.

### PACKAGE DIMENSIONS

(in millimeter)




### ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25 °C)

| | | |
|---|---|---|
| Power Dissipation | P | 200 mW |
| Forward Current | $I_F$ | 100 mA |
| Reverse Surge Power | $P_{RSM}$ | 85 W (at t=10 μs/1 pulse) Show Fig. 12 |
| Junction Temperature | $T_j$ | 150 °C |
| Storage Temperature | $T_{stg}$ | –55 to +150 °C |



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## ELECTRICAL CHARACTERISTICS ($T_A$ = 25 ± 2 °C)

| Type Number | Class | Zener Voltage $V_Z$ (V)[Note 1] | | | Dynamic Impedance $Z_Z$ (Ω)[Note 2] | | Reverse Current $I_R$ (μA) | |
|---|---|---|---|---|---|---|---|---|
| | | MIN. | MAX. | $I_Z$ (mA) | MAX. | $I_Z$ (mA) | MAX. | $V_R$ (V) |
| RD2.0S | B | 1.90 | 2.20 | 5 | 100 | 5 | 120 | 0.5 |
| RD2.2S | B | 2.10 | 2.40 | 5 | 100 | 5 | 120 | 0.7 |
| RD2.4S | B | 2.30 | 2.60 | 5 | 100 | 5 | 120 | 1.0 |
| RD2.7S | B | 2.50 | 2.90 | 5 | 110 | 5 | 120 | 1.0 |
| | B1 | 2.50 | 2.75 | | | | | |
| | B2 | 2.65 | 2.90 | | | | | |
| RD3.0S | B | 2.80 | 3.20 | 5 | 120 | 5 | 50 | 1.0 |
| | B1 | 2.80 | 3.05 | | | | | |
| | B2 | 2.95 | 3.20 | | | | | |
| RD3.3S | B | 3.10 | 3.50 | 5 | 130 | 5 | 20 | 1.0 |
| | B1 | 3.10 | 3.35 | | | | | |
| | B2 | 3.25 | 3.50 | | | | | |
| RD3.6S | B | 3.40 | 3.80 | 5 | 130 | 5 | 10 | 1.0 |
| | B1 | 3.40 | 3.65 | | | | | |
| | B2 | 3.55 | 3.80 | | | | | |
| RD3.9S | B | 3.70 | 4.10 | 5 | 130 | 5 | 10 | 1.0 |
| | B1 | 3.70 | 3.97 | | | | | |
| | B2 | 3.87 | 4.10 | | | | | |
| RD4.3S | B | 4.00 | 4.49 | 5 | 130 | 5 | 10 | 1.0 |
| | B1 | 4.00 | 4.22 | | | | | |
| | B2 | 4.14 | 4.35 | | | | | |
| | B3 | 4.27 | 4.49 | | | | | |
| RD4.7S | B | 4.40 | 4.92 | 5 | 130 | 5 | 10 | 1.0 |
| | B1 | 4.40 | 4.63 | | | | | |
| | B2 | 4.53 | 4.77 | | | | | |
| | B3 | 4.67 | 4.92 | | | | | |
| RD5.1S | B | 4.82 | 5.39 | 5 | 130 | 5 | 5 | 1.5 |
| | B1 | 4.82 | 5.06 | | | | | |
| | B2 | 4.96 | 5.22 | | | | | |
| | B3 | 5.12 | 5.39 | | | | | |
| RD5.6S | B | 5.29 | 5.94 | 5 | 80 | 5 | 5 | 2.5 |
| | B1 | 5.29 | 5.57 | | | | | |
| | B2 | 5.47 | 5.75 | | | | | |
| | B3 | 5.65 | 5.94 | | | | | |
| RD6.2S | B | 5.84 | 6.55 | 5 | 50 | 5 | 2 | 3.0 |
| | B1 | 5.84 | 6.14 | | | | | |
| | B2 | 6.04 | 6.35 | | | | | |
| | B3 | 6.24 | 6.55 | | | | | |

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25 ± 2 °C)

| Type Number | Class | Zener Voltage Vz (V)[Note 1] | | | Dynamic Impedance Zz (Ω)[Note 2] | | Reverse Current $I_R$ (μA) | |
|---|---|---|---|---|---|---|---|---|
| | | MIN. | MAX. | Iz (mA) | MAX. | Iz (mA) | MAX. | $V_R$ (V) |
| RD6.8S | B | 6.44 | 7.17 | 5 | 30 | 5 | 2 | 3.5 |
| | B1 | 6.44 | 6.76 | | | | | |
| | B2 | 6.62 | 6.96 | | | | | |
| | B3 | 6.83 | 7.17 | | | | | |
| RD7.5S | B | 7.03 | 7.87 | 5 | 30 | 5 | 2 | 4.0 |
| | B1 | 7.03 | 7.39 | | | | | |
| | B2 | 7.25 | 7.63 | | | | | |
| | B3 | 7.49 | 7.87 | | | | | |
| RD8.2S | B | 7.73 | 8.67 | 5 | 30 | 5 | 2 | 5.0 |
| | B1 | 7.73 | 8.13 | | | | | |
| | B2 | 7.98 | 8.39 | | | | | |
| | B3 | 8.25 | 8.67 | | | | | |
| RD9.1S | B | 8.53 | 9.58 | 5 | 30 | 5 | 2 | 6.0 |
| | B1 | 8.53 | 8.96 | | | | | |
| | B2 | 8.81 | 9.26 | | | | | |
| | B3 | 9.12 | 9.58 | | | | | |
| RD10S | B | 9.42 | 10.58 | 5 | 30 | 5 | 2 | 7.0 |
| | B1 | 9.42 | 9.90 | | | | | |
| | B2 | 9.74 | 10.24 | | | | | |
| | B3 | 10.08 | 10.58 | | | | | |
| RD11S | B | 10.40 | 11.60 | 5 | 30 | 5 | 2 | 8.0 |
| | B1 | 10.40 | 10.92 | | | | | |
| | B2 | 10.72 | 11.26 | | | | | |
| | B3 | 11.06 | 11.60 | | | | | |
| RD12S | B | 11.38 | 12.64 | 5 | 35 | 5 | 2 | 9.0 |
| | B1 | 11.38 | 11.94 | | | | | |
| | B2 | 11.69 | 12.28 | | | | | |
| | B3 | 12.04 | 12.64 | | | | | |
| RD13S | B | 12.43 | 14.00 | 5 | 35 | 5 | 2 | 10 |
| RD15S | B | 13.80 | 15.56 | 5 | 40 | 5 | 2 | 11 |
| RD16S | B | 15.31 | 17.14 | 5 | 40 | 5 | 2 | 12 |
| RD18S | B | 16.89 | 19.08 | 5 | 45 | 5 | 2 | 13 |
| RD20S | B | 18.80 | 21.14 | 5 | 50 | 5 | 2 | 15 |
| RD22S | B | 20.81 | 23.25 | 5 | 55 | 5 | 2 | 17 |
| RD24S | B | 22.86 | 25.66 | 5 | 60 | 5 | 2 | 19 |
| RD27S | B | 25.10 | 28.90 | 2 | 70 | 2 | 2 | 21 |
| RD30S | B | 28.00 | 32.00 | 2 | 80 | 2 | 2 | 23 |
| RD33S | B | 31.00 | 35.00 | 2 | 80 | 2 | 2 | 25 |
| RD36S | B | 34.00 | 38.00 | 2 | 90 | 2 | 2 | 27 |

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25 ± 2 °C)

| Type Number | Class | Zener Voltage Vz (V)[Note 1] | | | Dynamic Impedance Zz (Ω)[Note 2] | | Reverse Current $I_R$ (μA) | |
|---|---|---|---|---|---|---|---|---|
| | | MIN. | MAX. | Iz (mA) | MAX. | Iz (mA) | MAX. | $V_R$ (V) |
| RD39S | B | 37.00 | 41.00 | 2 | 100 | 2 | 2 | 30 |
| RD43S | B | 40.00 | 45.00 | 2 | 130 | 2 | 2 | 33 |
| RD47S | B | 44.00 | 49.00 | 2 | 150 | 2 | 2 | 36 |
| RD51S | B | 48.00 | 54.00 | 2 | 180 | 2 | 1 | 39 |
| RD56S | B | 53.00 | 60.00 | 2 | 180 | 2 | 1 | 43 |
| RD62S | B | 58.00 | 66.00 | 2 | 200 | 2 | 0.2 | 47 |
| RD68S | B | 64.00 | 72.00 | 2 | 250 | 2 | 0.2 | 52 |
| RD75S | B | 70.00 | 79.00 | 2 | 300 | 2 | 0.2 | 57 |
| RD82S | B | 77.00 | 87.00 | 2 | 300 | 2 | 0.2 | 63 |
| RD91S | B | 85.00 | 96.00 | 1 | 700 | 1 | 0.2 | 69 |
| RD100S | B | 94.00 | 106.0 | 1 | 700 | 1 | 0.2 | 76 |
| RD110S | B | 104.0 | 116.0 | 1 | 800 | 1 | 0.2 | 84 |
| RD120S | B | 114.0 | 126.0 | 1 | 900 | 1 | 0.2 | 91 |

**Note 1.** Vz is tested with pulsed (40 ms).

**2.** Zz is measured at Iz by given a very small A.C. current signal.

## TYPICAL CHARACTERISTICS ($T_A$ = 25 °C)

**Fig. 1 POWER DISSIPATION vs. AMBIENT TEMPERATURE**

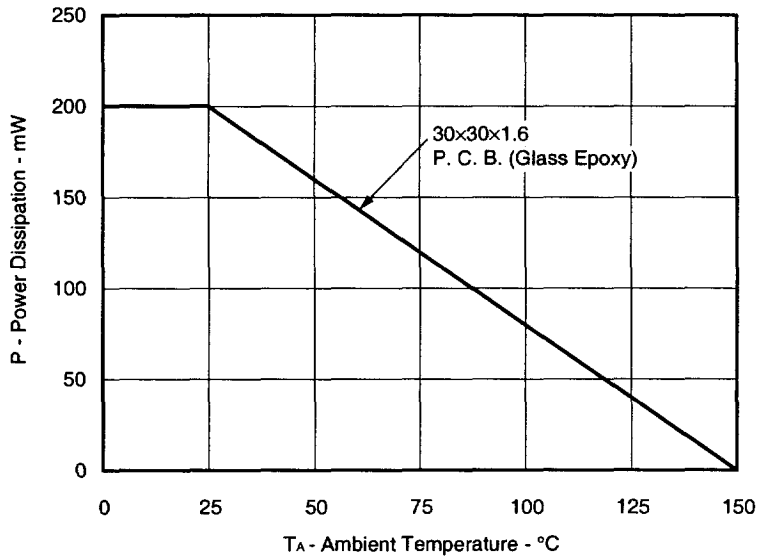



**Fig. 2 ZENER CURRENT vs. ZENER VOLTAGE**

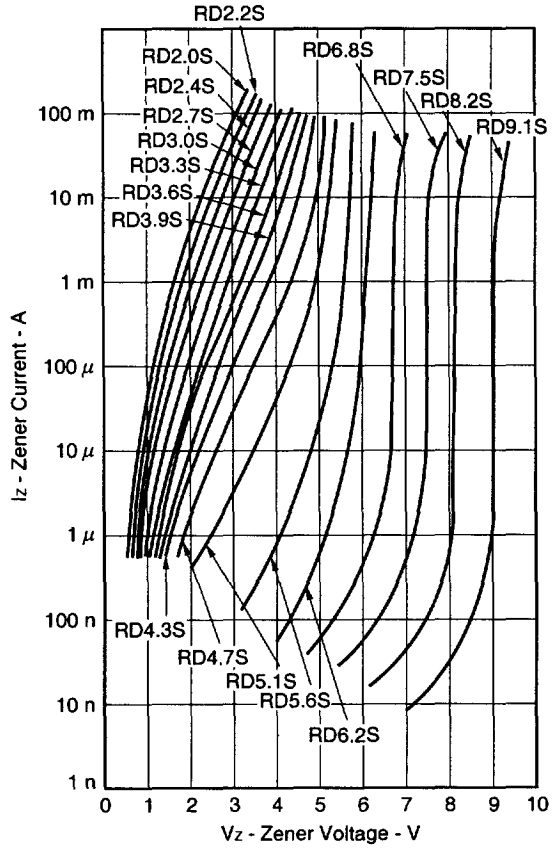



**Fig. 3 ZENER CURRENT vs. ZENER VOLTAGE**

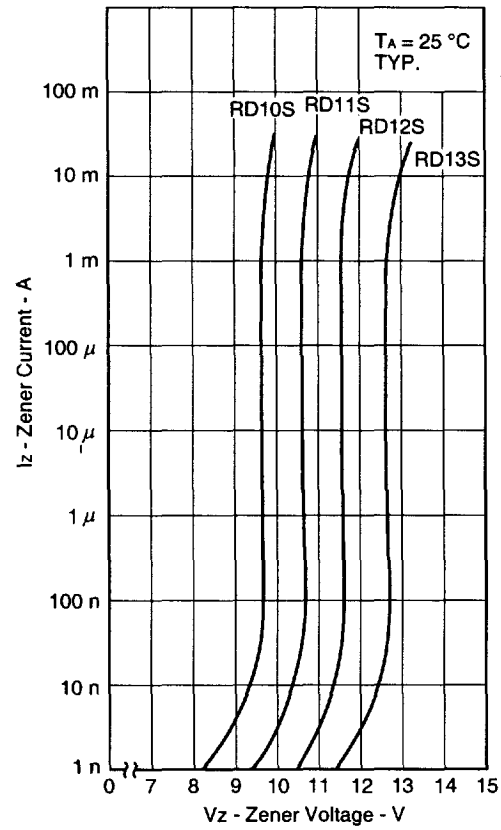


**Fig. 4 ZENER CURRENT vs. ZENER VOLTAGE**

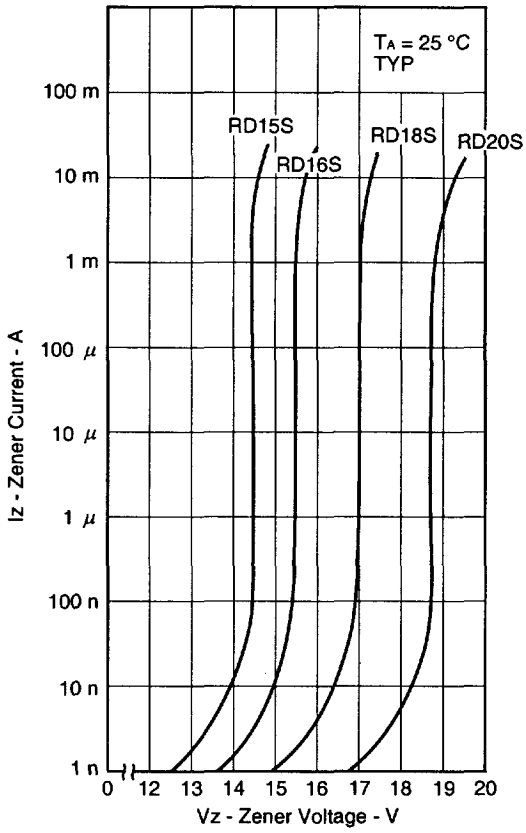



**Fig. 5 ZENER CURRENT vs. ZENER VOLTAGE**

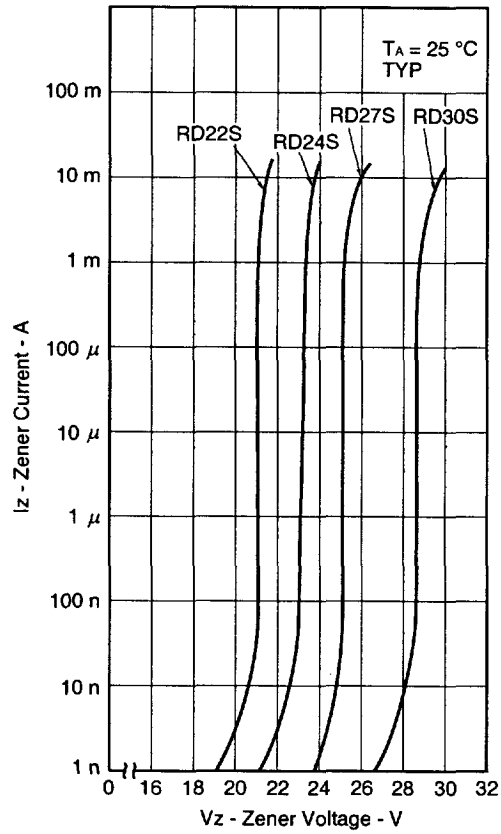



**Fig. 6 ZENER CURRENT vs. ZENER VOLTAGE**

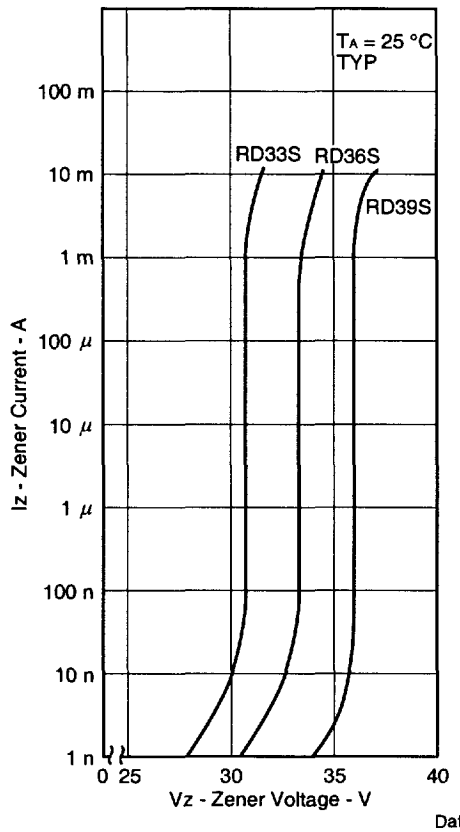



**Fig. 7 ZENER CURRENT vs. ZENER VOLTAGE**

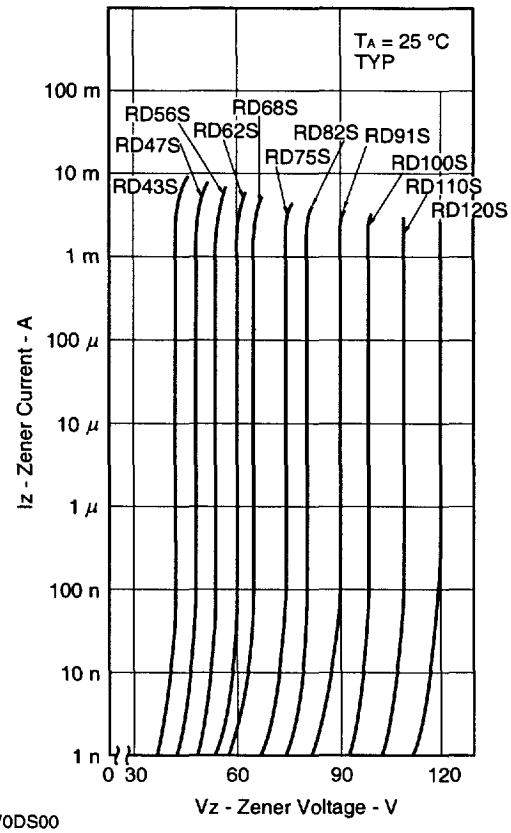


**Fig. 8 DYNAMIC IMPEDANCE vs. ZENER CURRENT**

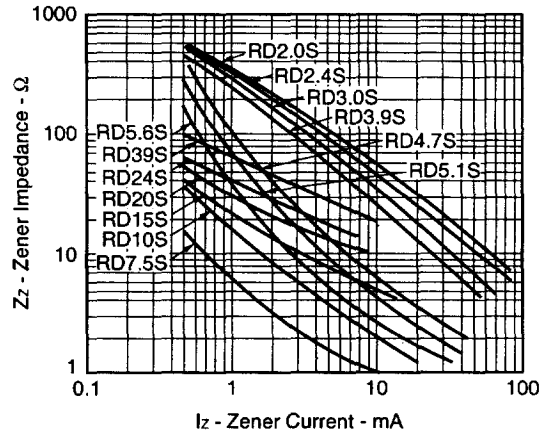



**Fig. 9 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE**

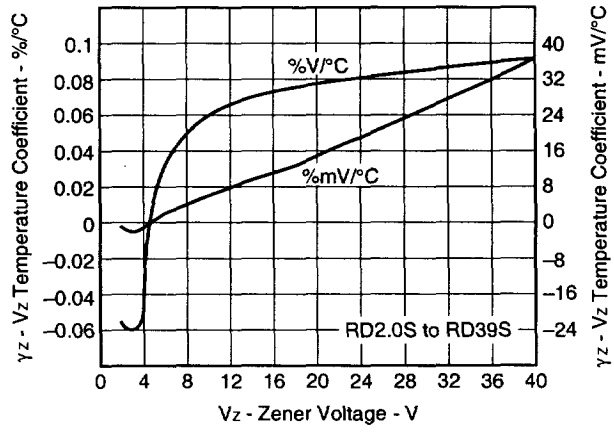



**Fig. 10 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE**

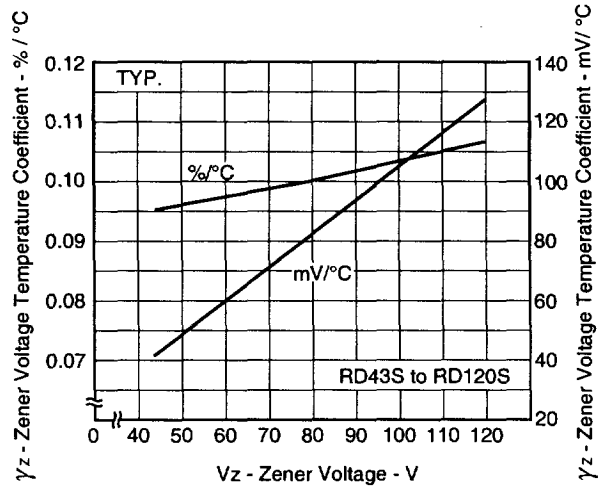


**Fig. 11 TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS**

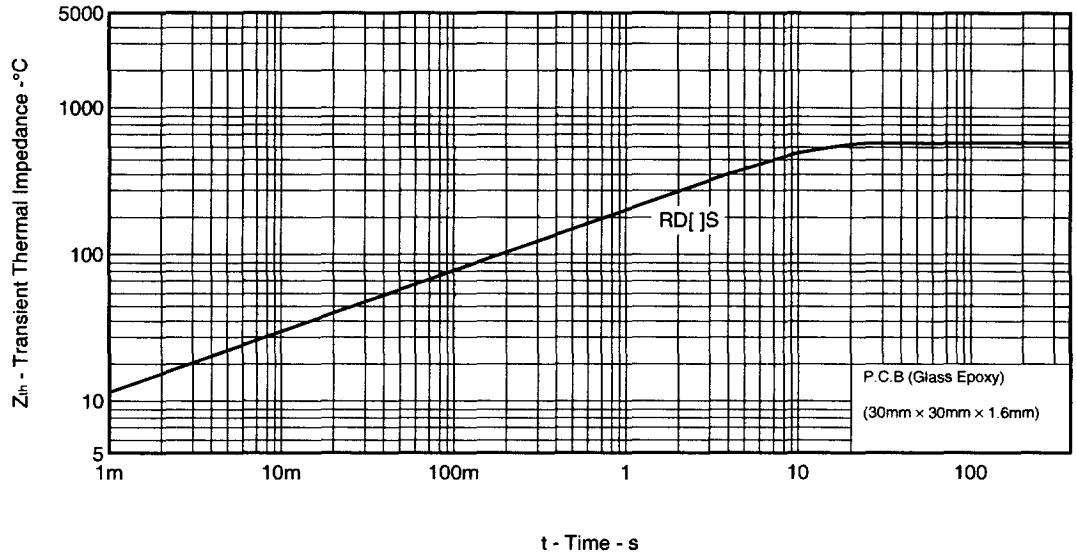
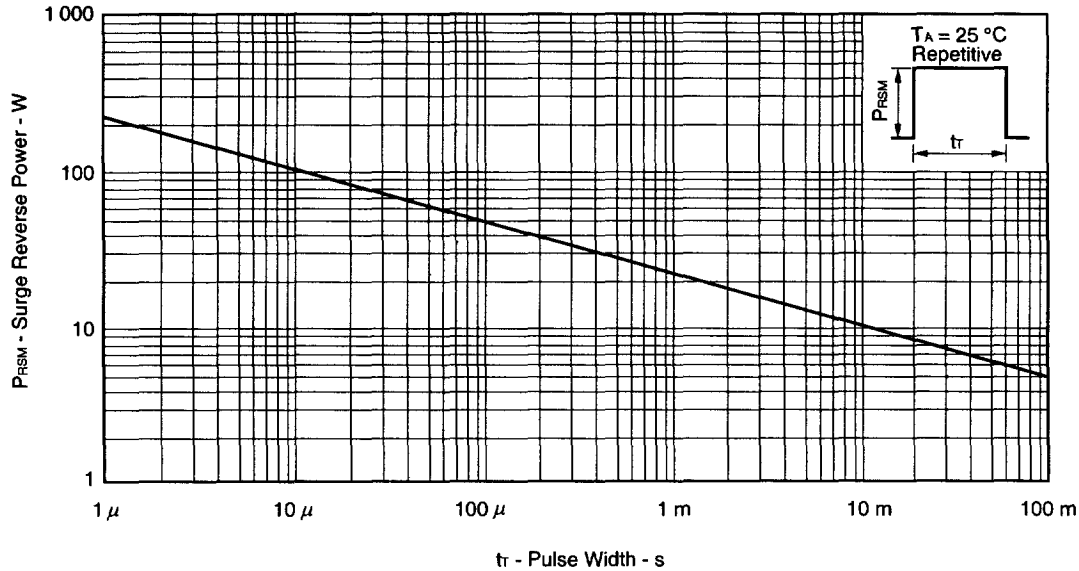



**Fig. 12 SURGE REVERSE POWER RATINGS**



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Discrete

What's

FET

Bipolar

Diode

Japanese

# Taping Specification

## SC-76 (SSP)

There are two types (-T1, -T2) of taping depending on the direction of the device.

-T1, -T2

Devices are taped in the direction as shown in the figure above, 3000 devices are w
one reel, as shown below.

Figure of Reel

You can get information about the dimensions of the taping and the reel by downlo
the PDF files below.

- Taping drawing
- Reel drawing

## Caution

The part number consists of a device name and a taping specification.
For example, if you want to buy a RD6.2S in -T1 taping, the part number is: **RD6.2**

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