

ZENER DIODES
200 mW 2-PIN SUPER MINI MOLD

DESCRIPTION

Type RD2.0S to RD150S series are 2 pin super mini mold package zener diodes possessing an allowable power dissipation of 200 mW.

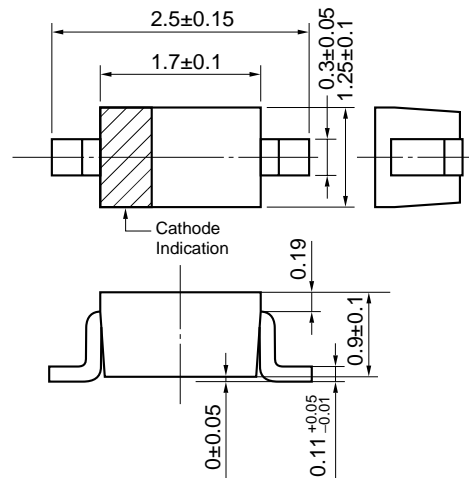
FEATURES

- Sharp breakdown characteristic
- V_z : Applied E24 standard

APPLICATIONS

Circuit for constant voltage, constant current, wave form clipper, surge absorber, etc.

PACKAGE DRAWING (Unit: mm)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

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

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<R> ELECTRICAL CHARACTERISTICS (T_A = 25 ±2°C)

(1/4)

| Type Number | Class | Zener Voltage | | | Dynamic Impedance | | Reverse Current | |
|-------------|-------|-------------------------------------|------|---------------------|-------------------------------------|---------------------|---------------------|--------------------|
| | | V _Z (V) ^{Note1} | | I _Z (mA) | Z _Z (Ω) ^{Note2} | | I _R (μA) | |
| | | MIN. | MAX. | | 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 | | | | | |
| | BX | 4.00 | 4.35 | | | | | |
| | BY | 4.14 | 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 | | | | | |
| | BX | 4.40 | 4.77 | | | | | |
| | BY | 4.53 | 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 | | | | | |
| | BX | 4.82 | 5.22 | | | | | |
| | BY | 4.96 | 5.39 | | | | | |

Note 1. V_Z is tested with pulsed (40 ms).

2. Z_Z is measured at I_Z by given a very small A.C. current signal.

Remark Suffix B is suffix B1, B2 or suffix B3.

(2/4)

| Type Number | Class | Zener Voltage | | | Dynamic Impedance | | Reverse Current | |
|-------------|-------|----------------------------|------|------------|-------------------------------------|------------|------------------|-----------|
| | | V_z (V) ^{Note1} | | I_z (mA) | Z_z (Ω) ^{Note2} | | I_R (μ A) | |
| | | MIN. | MAX. | | MAX. | I_z (mA) | MAX. | V_R (V) |
| 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 | | | | | |
| | BX | 5.29 | 5.57 | | | | | |
| | BY | 5.47 | 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 | | | | | |
| | BX | 5.84 | 6.35 | | | | | |
| | BY | 6.04 | 6.55 | | | | | |
| 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 | | | | | |
| | BX | 6.44 | 6.96 | | | | | |
| | BY | 6.62 | 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 | | | | | |
| | BX | 7.03 | 7.63 | | | | | |
| | BY | 7.25 | 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 | | | | | |
| | BX | 7.73 | 8.39 | | | | | |
| | BY | 7.98 | 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 | | | | | |
| | BX | 8.53 | 9.26 | | | | | |
| | BY | 8.81 | 9.58 | | | | | |

Note 1. V_z is tested with pulsed (40 ms).

2. Z_z is measured at I_z by given a very small A.C. current signal.

Remark Suffix B is suffix B1, B2 or suffix B3.

(3/4)

| Type Number | Class | Zener Voltage | | | Dynamic Impedance | | Reverse Current | |
|-------------|-------|----------------------------|-------|------------|-------------------------------------|------------|-------------------|-----------|
| | | V_z (V) ^{Note1} | | | Z_z (Ω) ^{Note2} | | I_R (μA) | |
| | | MIN. | MAX. | I_z (mA) | MAX. | I_z (mA) | MAX. | V_R (V) |
| 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 | | | | | |
| | BX | 9.42 | 10.24 | | | | | |
| | BY | 9.74 | 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 | | | | | |
| | BX | 10.40 | 11.26 | | | | | |
| | BY | 10.72 | 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 | | | | | |
| | BX | 11.38 | 12.28 | | | | | |
| | BY | 11.69 | 12.64 | | | | | |
| RD13S | B | 12.43 | 14.00 | 5 | 35 | 5 | 2 | 10 |
| | B1 | 12.43 | 13.07 | | | | | |
| | B2 | 12.87 | 13.53 | | | | | |
| | B3 | 13.33 | 14.00 | | | | | |
| RD15S | B | 13.80 | 15.56 | 5 | 40 | 5 | 2 | 11 |
| | B1 | 13.80 | 14.50 | | | | | |
| | B2 | 14.30 | 15.02 | | | | | |
| | B3 | 14.81 | 15.56 | | | | | |
| RD16S | B | 15.31 | 17.14 | 5 | 40 | 5 | 2 | 12 |
| | B1 | 15.31 | 16.07 | | | | | |
| | B2 | 15.78 | 16.58 | | | | | |
| | B3 | 16.30 | 17.14 | | | | | |
| RD18S | B | 16.89 | 19.08 | 5 | 45 | 5 | 2 | 13 |
| | B1 | 16.89 | 17.75 | | | | | |
| | B2 | 17.51 | 18.40 | | | | | |
| | B3 | 18.16 | 19.08 | | | | | |

Note 1. V_z is tested with pulsed (40 ms).

2. Z_z is measured at I_z by given a very small A.C. current signal.

Remark Suffix B is suffix B1, B2 or suffix B3.

(4/4)

| Type Number | Class | Zener Voltage V_z (V) ^{Note1} | | | Dynamic Impedance Z_z (Ω) ^{Note2} | | Reverse Current I_R (μA) | |
|-------------|-------|---|--------|------------|--|------------|--------------------------------------|-----------|
| | | MIN. | MAX. | I_z (mA) | MAX. | I_z (mA) | MAX. | V_R (V) |
| RD20S | B | 18.80 | 21.14 | 5 | 50 | 5 | 2 | 15 |
| | B1 | 18.80 | 19.76 | | | | | |
| | B2 | 19.46 | 20.45 | | | | | |
| | B3 | 20.15 | 21.14 | | | | | |
| RD22S | B | 20.81 | 23.25 | 5 | 55 | 5 | 2 | 17 |
| | B1 | 20.81 | 21.84 | | | | | |
| | B2 | 21.46 | 22.55 | | | | | |
| | B3 | 22.15 | 23.25 | | | | | |
| RD24S | B | 22.86 | 25.66 | 5 | 60 | 5 | 2 | 19 |
| | B1 | 22.86 | 24.03 | | | | | |
| | B2 | 23.65 | 24.85 | | | | | |
| | B3 | 24.45 | 25.66 | | | | | |
| 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 |
| 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 | 104.00 | 116.00 | 1 | 800 | 1 | 0.2 | 84 |
| RD120S | B | 114.00 | 126.00 | 1 | 900 | 1 | 0.2 | 91 |
| RD150S | B | 140.00 | 160.00 | 1 | 1500 | 1 | 0.2 | 120 |

Note 1. V_z is tested with pulsed (40 ms).

2. Z_z is measured at I_z by given a very small A.C. current signal.

Remark Suffix B is suffix B1, B2 or suffix B3.

TYPICAL CHARACTERISTICS (T_A = 25°C)

Fig.1 POWER DISSIPATION vs. AMBIENT TEMPERATURE

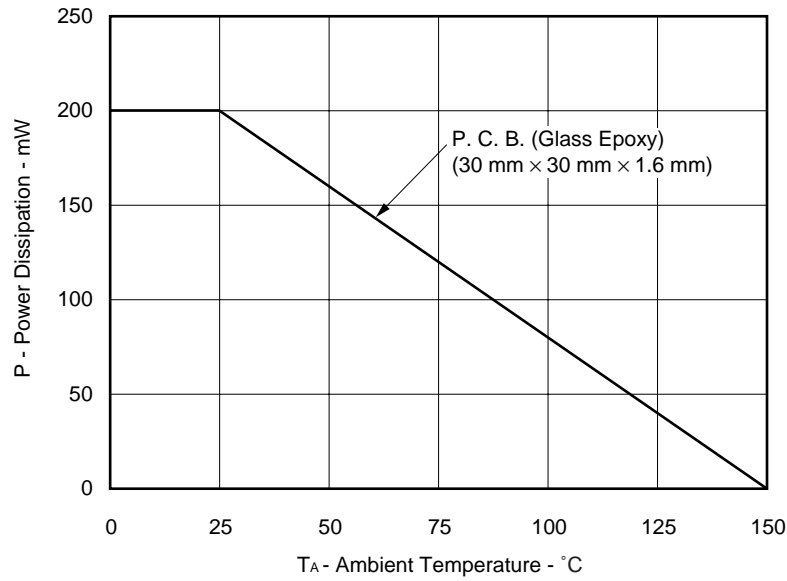


Fig.2 ZENER CURRENT vs. ZENER VOLTAGE

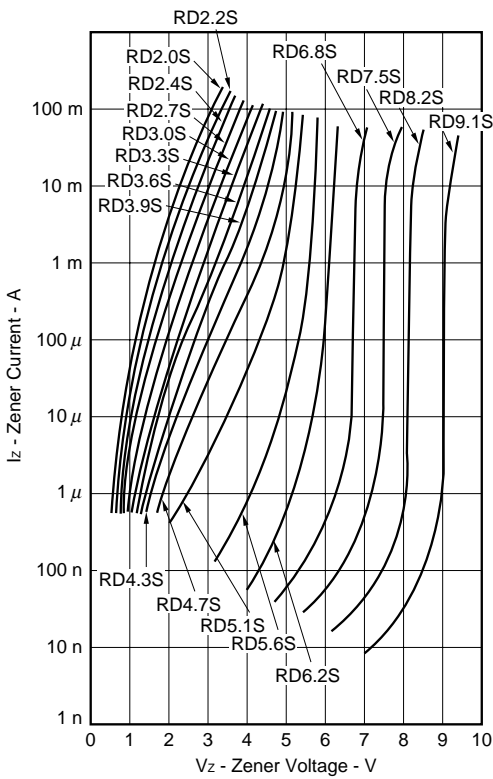


Fig.3 ZENER CURRENT vs. ZENER VOLTAGE

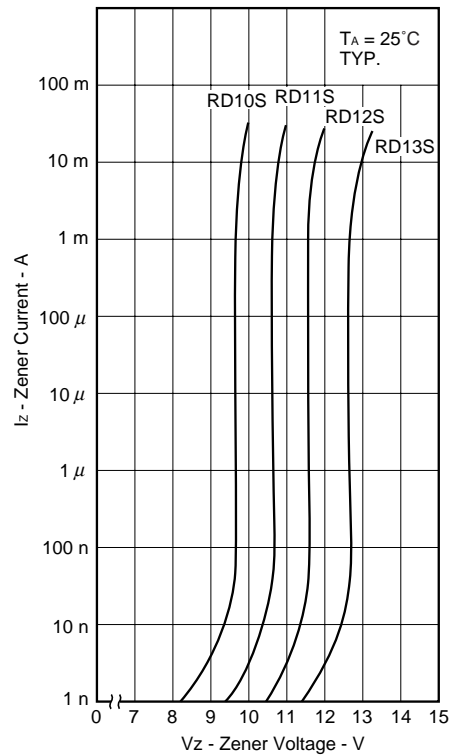


Fig.4 ZENER CURRENT vs. ZENER VOLTAGE

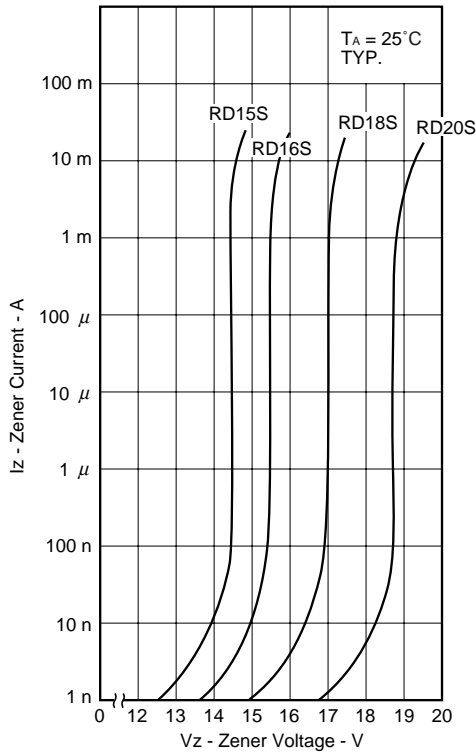


Fig.5 ZENER CURRENT vs. ZENER VOLTAGE

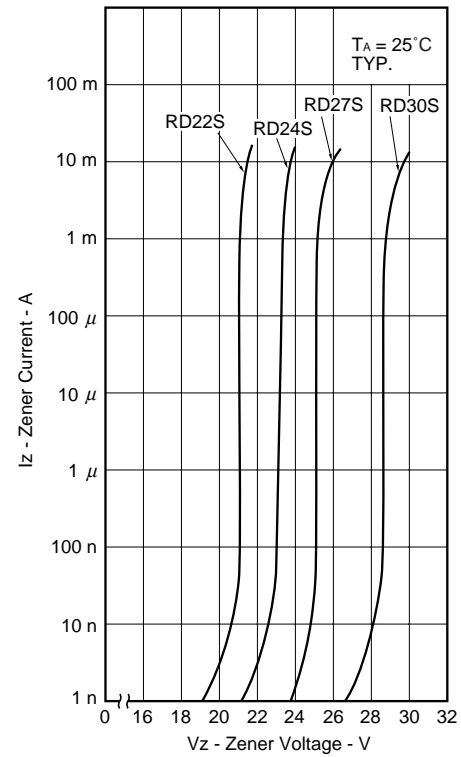


Fig.6 ZENER CURRENT vs. ZENER VOLTAGE

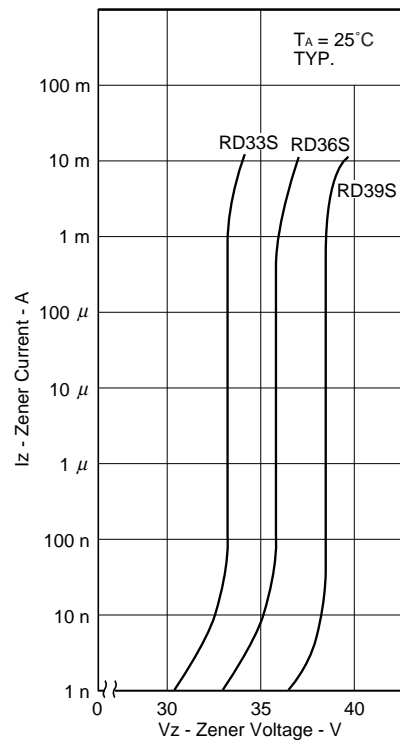


Fig.7 ZENER CURRENT vs. ZENER VOLTAGE

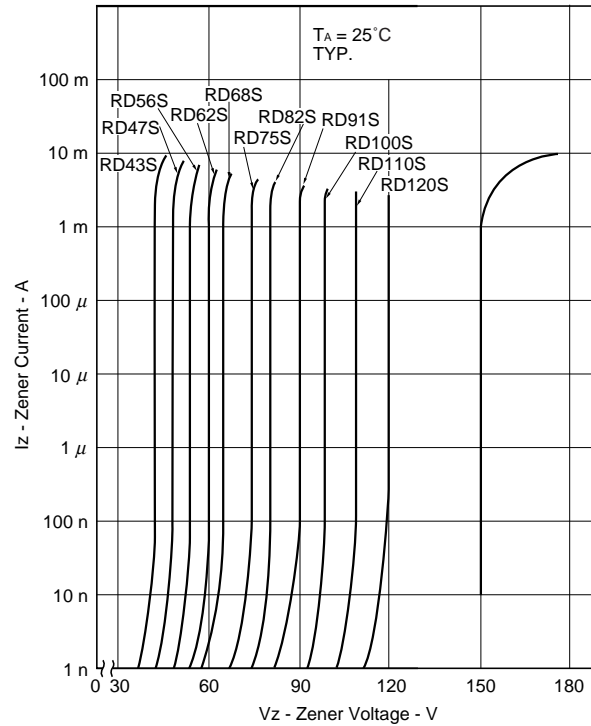


Fig.8 DYNAMIC IMPEDANCE vs. ZENER CURRENT

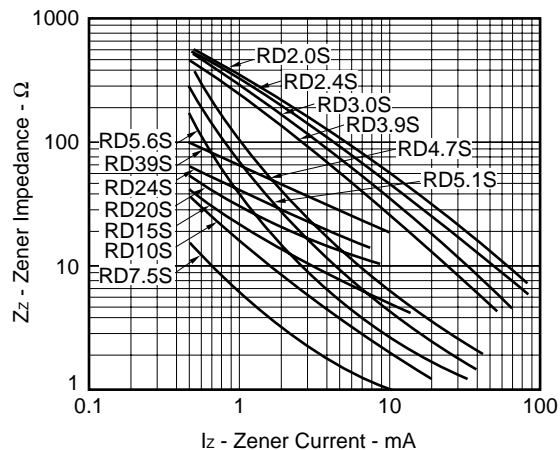


Fig.9 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE

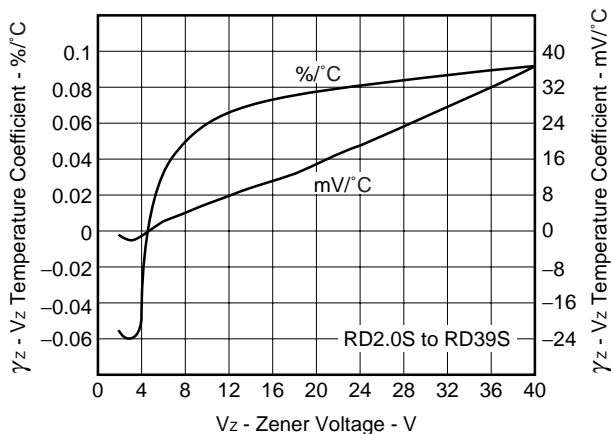


Fig.10 ZENER VOLTAGE TEMPERATURE COEFFICIENT vs. ZENER VOLTAGE

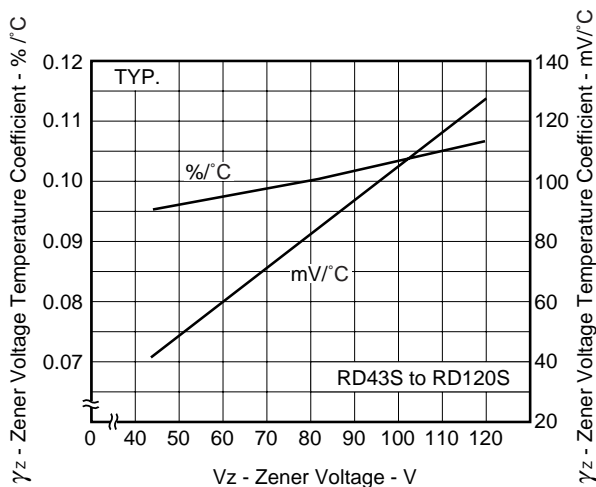


Fig.11 TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

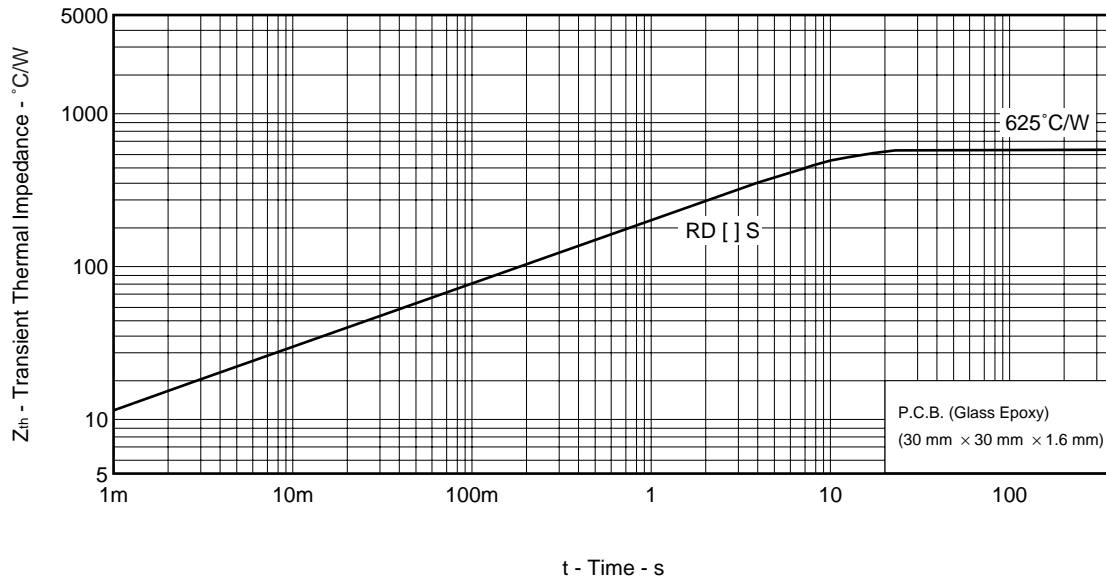
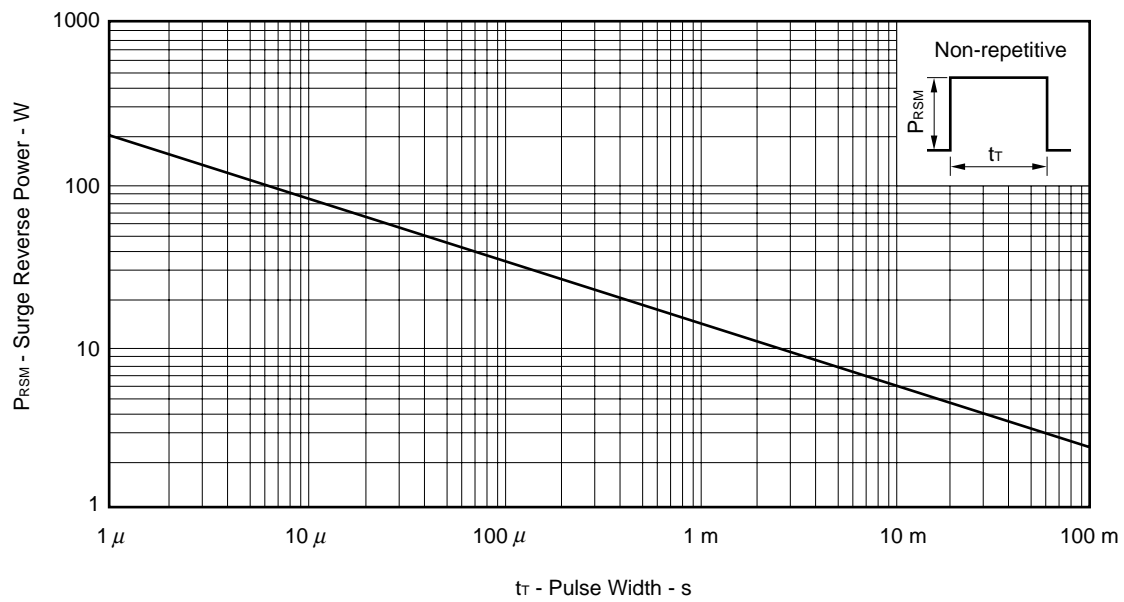


Fig.12 SURGE REVERSE POWER RATINGS



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