

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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# RD4.7UJ to RD39UJ

## LOW NOISE SHARP BREAKDOWN CHARACTERISTICS ZENER DIODES 2PIN ULTRA SUPER MINI MOLD

### DESCRIPTION

Type RD4.7UJ to RD39UJ Series are 2PIN Ultra Super Mini Mold Package zener diodes possessing an allowable power dissipation of 150 mW featuring low noise and sharp breakdown characteristic. They are intended for use in audio equipment, instrument equipment.

### FEATURES

- Low Noise
- Sharp Breakdown characteristics
- $V_z$ ; Applied E24 standard

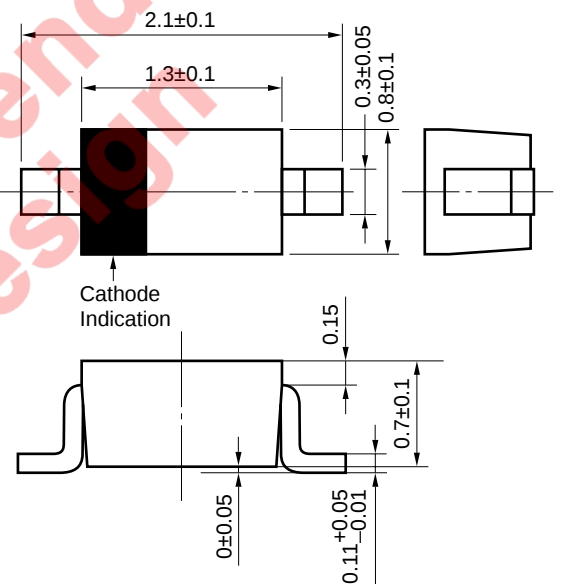
### APPLICATIONS

Circuits for Constant Voltage, Constant Current, Waveform clipper, Surge absorber, etc.

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

|                      |           |                                                  |
|----------------------|-----------|--------------------------------------------------|
| Power Dissipation    | P         | 150 mW                                           |
| Forward Current      | $I_F$     | 100 mA                                           |
| Reverse Surge Power  | $P_{RSM}$ | 2.2 W                                            |
|                      |           | (at $t = 10\text{ }\mu\text{s}/1\text{ pulse}$ ) |
|                      |           | Show Fig. 6                                      |
| Junction Temperature | $T_j$     | 150 $^{\circ}\text{C}$                           |
| Storage Temperature  | $T_{stg}$ | -55 to +150 $^{\circ}\text{C}$                   |

### PACKAGE DIMENSIONS (Unit: mm)



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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

ELECTRICAL CHARACTERISTICS ( $T_A = 25 \pm 2 \text{ }^\circ\text{C}$ )

| Type Number | Class | Zener Voltage<br>$V_Z$ (V) <sup>Note 1</sup> |       |            | Dynamic Impedance<br>$Z_Z$ ( $\Omega$ ) <sup>Note 2</sup> |            | Reverse Current<br>$I_R$ ( $\mu\text{A}$ ) |           |
|-------------|-------|----------------------------------------------|-------|------------|-----------------------------------------------------------|------------|--------------------------------------------|-----------|
|             |       | MIN.                                         | MAX.  | $I_Z$ (mA) | MAX.                                                      | $I_Z$ (mA) | MAX.                                       | $V_R$ (V) |
| RD4.7UJ     | N     | 4.39                                         | 4.91  | 0.5        | 800                                                       | 0.5        | 2                                          | 1.0       |
|             | N1    | 4.39                                         | 4.62  |            |                                                           |            |                                            |           |
|             | N2    | 4.52                                         | 4.76  |            |                                                           |            |                                            |           |
|             | N3    | 4.66                                         | 4.91  |            |                                                           |            |                                            |           |
| RD5.1UJ     | N     | 4.81                                         | 5.36  | 0.5        | 500                                                       | 0.5        | 2                                          | 1.5       |
|             | N1    | 4.81                                         | 5.05  |            |                                                           |            |                                            |           |
|             | N2    | 4.95                                         | 5.20  |            |                                                           |            |                                            |           |
|             | N3    | 5.10                                         | 5.36  |            |                                                           |            |                                            |           |
| RD5.6UJ     | N     | 5.26                                         | 5.91  | 0.5        | 200                                                       | 0.5        | 1                                          | 2.5       |
|             | N1    | 5.26                                         | 5.54  |            |                                                           |            |                                            |           |
|             | N2    | 5.44                                         | 5.73  |            |                                                           |            |                                            |           |
|             | N3    | 5.63                                         | 5.91  |            |                                                           |            |                                            |           |
| RD6.2UJ     | N     | 5.81                                         | 6.53  | 0.5        | 100                                                       | 0.5        | 1                                          | 3.0       |
|             | N1    | 5.81                                         | 6.11  |            |                                                           |            |                                            |           |
|             | N2    | 6.01                                         | 6.32  |            |                                                           |            |                                            |           |
|             | N3    | 6.21                                         | 6.53  |            |                                                           |            |                                            |           |
| RD6.8UJ     | N     | 6.41                                         | 7.14  | 0.5        | 60                                                        | 0.5        | 0.5                                        | 3.5       |
|             | N1    | 6.41                                         | 6.74  |            |                                                           |            |                                            |           |
|             | N2    | 6.60                                         | 6.94  |            |                                                           |            |                                            |           |
|             | N3    | 6.80                                         | 7.14  |            |                                                           |            |                                            |           |
| RD7.5UJ     | N     | 7.00                                         | 7.83  | 0.5        | 60                                                        | 0.5        | 0.5                                        | 4.0       |
|             | N1    | 7.00                                         | 7.35  |            |                                                           |            |                                            |           |
|             | N2    | 7.21                                         | 7.60  |            |                                                           |            |                                            |           |
|             | N3    | 7.46                                         | 7.83  |            |                                                           |            |                                            |           |
| RD8.2UJ     | N     | 7.69                                         | 8.61  | 0.5        | 60                                                        | 0.5        | 0.5                                        | 5.0       |
|             | N1    | 7.69                                         | 8.08  |            |                                                           |            |                                            |           |
|             | N2    | 7.94                                         | 8.34  |            |                                                           |            |                                            |           |
|             | N3    | 8.20                                         | 8.61  |            |                                                           |            |                                            |           |
| RD9.1UJ     | N     | 8.47                                         | 9.51  | 0.5        | 60                                                        | 0.5        | 0.5                                        | 6.0       |
|             | N1    | 8.47                                         | 8.91  |            |                                                           |            |                                            |           |
|             | N2    | 8.76                                         | 9.21  |            |                                                           |            |                                            |           |
|             | N3    | 9.06                                         | 9.51  |            |                                                           |            |                                            |           |
| RD10UJ      | N     | 9.35                                         | 10.51 | 0.5        | 60                                                        | 0.5        | 0.1                                        | 7.0       |
|             | N1    | 9.35                                         | 9.82  |            |                                                           |            |                                            |           |
|             | N2    | 9.66                                         | 10.16 |            |                                                           |            |                                            |           |
|             | N3    | 10.00                                        | 10.51 |            |                                                           |            |                                            |           |
| RD11UJ      | N     | 10.32                                        | 11.50 | 0.5        | 60                                                        | 0.5        | 0.1                                        | 8.0       |
|             | N1    | 10.32                                        | 10.84 |            |                                                           |            |                                            |           |
|             | N2    | 10.64                                        | 11.17 |            |                                                           |            |                                            |           |
|             | N3    | 10.97                                        | 11.50 |            |                                                           |            |                                            |           |
| RD12UJ      | N     | 11.28                                        | 12.52 | 0.5        | 80                                                        | 0.5        | 0.1                                        | 9.0       |
|             | N1    | 11.28                                        | 11.83 |            |                                                           |            |                                            |           |
|             | N2    | 11.59                                        | 12.17 |            |                                                           |            |                                            |           |
|             | N3    | 11.93                                        | 12.52 |            |                                                           |            |                                            |           |
| RD13UJ      | N     | 12.29                                        | 13.86 | 0.5        | 80                                                        | 0.5        | 0.1                                        | 10.0      |
|             | N1    | 12.29                                        | 12.95 |            |                                                           |            |                                            |           |
|             | N2    | 12.72                                        | 13.40 |            |                                                           |            |                                            |           |
|             | N3    | 13.17                                        | 13.86 |            |                                                           |            |                                            |           |

| Type Number | Class | Zener Voltage<br>$V_Z$ (V) <sup>Note 1</sup> |       |            | Dynamic Impedance<br>$Z_Z$ ( $\Omega$ ) <sup>Note 2</sup> |            | Reverse Current<br>$I_R$ ( $\mu$ A) |           |
|-------------|-------|----------------------------------------------|-------|------------|-----------------------------------------------------------|------------|-------------------------------------|-----------|
|             |       | MIN.                                         | MAX.  | $I_Z$ (mA) | MAX.                                                      | $I_Z$ (mA) | MAX.                                | $V_R$ (V) |
| RD15UJ      | N     | 13.63                                        | 15.38 | 0.5        | 80                                                        | 0.5        | 0.1                                 | 11        |
|             | N1    | 13.63                                        | 14.35 |            |                                                           |            |                                     |           |
|             | N2    | 14.12                                        | 14.85 |            |                                                           |            |                                     |           |
|             | N3    | 14.62                                        | 15.38 |            |                                                           |            |                                     |           |
| RD16UJ      | N     | 15.13                                        | 16.91 | 0.5        | 80                                                        | 0.5        | 0.1                                 | 12        |
|             | N1    | 15.13                                        | 15.87 |            |                                                           |            |                                     |           |
|             | N2    | 15.58                                        | 16.36 |            |                                                           |            |                                     |           |
|             | N3    | 16.07                                        | 16.91 |            |                                                           |            |                                     |           |
| RD18UJ      | N     | 16.63                                        | 18.81 | 0.5        | 80                                                        | 0.5        | 0.1                                 | 13        |
|             | N1    | 16.63                                        | 17.52 |            |                                                           |            |                                     |           |
|             | N2    | 17.24                                        | 18.15 |            |                                                           |            |                                     |           |
|             | N3    | 17.87                                        | 18.81 |            |                                                           |            |                                     |           |
| RD20UJ      | N     | 18.51                                        | 20.79 | 0.5        | 100                                                       | 0.5        | 0.1                                 | 15        |
|             | N1    | 18.51                                        | 19.42 |            |                                                           |            |                                     |           |
|             | N2    | 19.14                                        | 20.12 |            |                                                           |            |                                     |           |
|             | N3    | 19.80                                        | 20.79 |            |                                                           |            |                                     |           |
| RD22UJ      | N     | 20.46                                        | 22.82 | 0.5        | 100                                                       | 0.5        | 0.1                                 | 17        |
|             | N1    | 20.46                                        | 21.47 |            |                                                           |            |                                     |           |
|             | N2    | 21.09                                        | 22.15 |            |                                                           |            |                                     |           |
|             | N3    | 21.76                                        | 22.82 |            |                                                           |            |                                     |           |
| RD24UJ      | N     | 22.42                                        | 25.17 | 0.5        | 120                                                       | 0.5        | 0.1                                 | 19        |
|             | N1    | 22.42                                        | 23.59 |            |                                                           |            |                                     |           |
|             | N2    | 23.19                                        | 24.38 |            |                                                           |            |                                     |           |
|             | N3    | 23.98                                        | 25.17 |            |                                                           |            |                                     |           |
| RD27UJ      | N     | 24.75                                        | 27.95 | 0.5        | 150                                                       | 0.5        | 0.1                                 | 21        |
|             | N1    | 24.75                                        | 26.04 |            |                                                           |            |                                     |           |
|             | N2    | 25.56                                        | 26.96 |            |                                                           |            |                                     |           |
|             | N3    | 26.46                                        | 27.95 |            |                                                           |            |                                     |           |
| RD30UJ      | N     | 27.38                                        | 31.04 | 0.5        | 200                                                       | 0.5        | 0.1                                 | 23        |
|             | N1    | 27.38                                        | 29.00 |            |                                                           |            |                                     |           |
|             | N2    | 28.35                                        | 30.04 |            |                                                           |            |                                     |           |
|             | N3    | 29.37                                        | 31.04 |            |                                                           |            |                                     |           |
| RD33UJ      | N     | 30.30                                        | 33.97 | 0.5        | 250                                                       | 0.5        | 0.1                                 | 25        |
|             | N1    | 30.30                                        | 32.02 |            |                                                           |            |                                     |           |
|             | N2    | 31.21                                        | 32.98 |            |                                                           |            |                                     |           |
|             | N3    | 32.14                                        | 33.97 |            |                                                           |            |                                     |           |
| RD36UJ      | N     | 33.08                                        | 36.83 | 0.5        | 300                                                       | 0.5        | 0.1                                 | 27        |
|             | N1    | 33.08                                        | 34.92 |            |                                                           |            |                                     |           |
|             | N2    | 33.95                                        | 36.85 |            |                                                           |            |                                     |           |
|             | N3    | 34.87                                        | 36.83 |            |                                                           |            |                                     |           |
| RD39UJ      | N     | 35.78                                        | 39.67 | 0.5        | 360                                                       | 0.5        | 0.1                                 | 30        |
|             | N1    | 35.78                                        | 37.75 |            |                                                           |            |                                     |           |
|             | N2    | 36.63                                        | 38.69 |            |                                                           |            |                                     |           |
|             | N3    | 37.56                                        | 39.67 |            |                                                           |            |                                     |           |

**Note 1.** Tested with pulse (40 ms)

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

TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

Fig. 1 P -  $T_A$  RATING

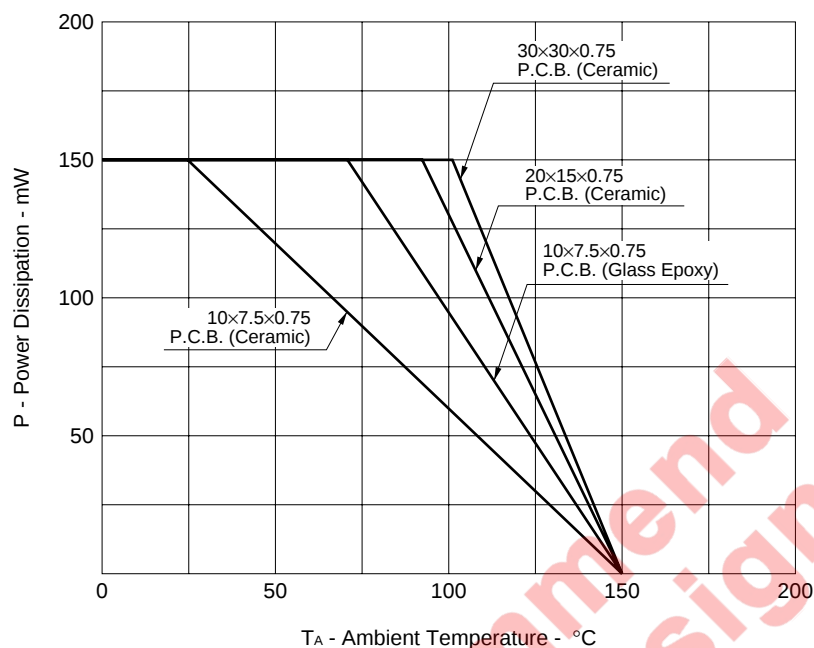
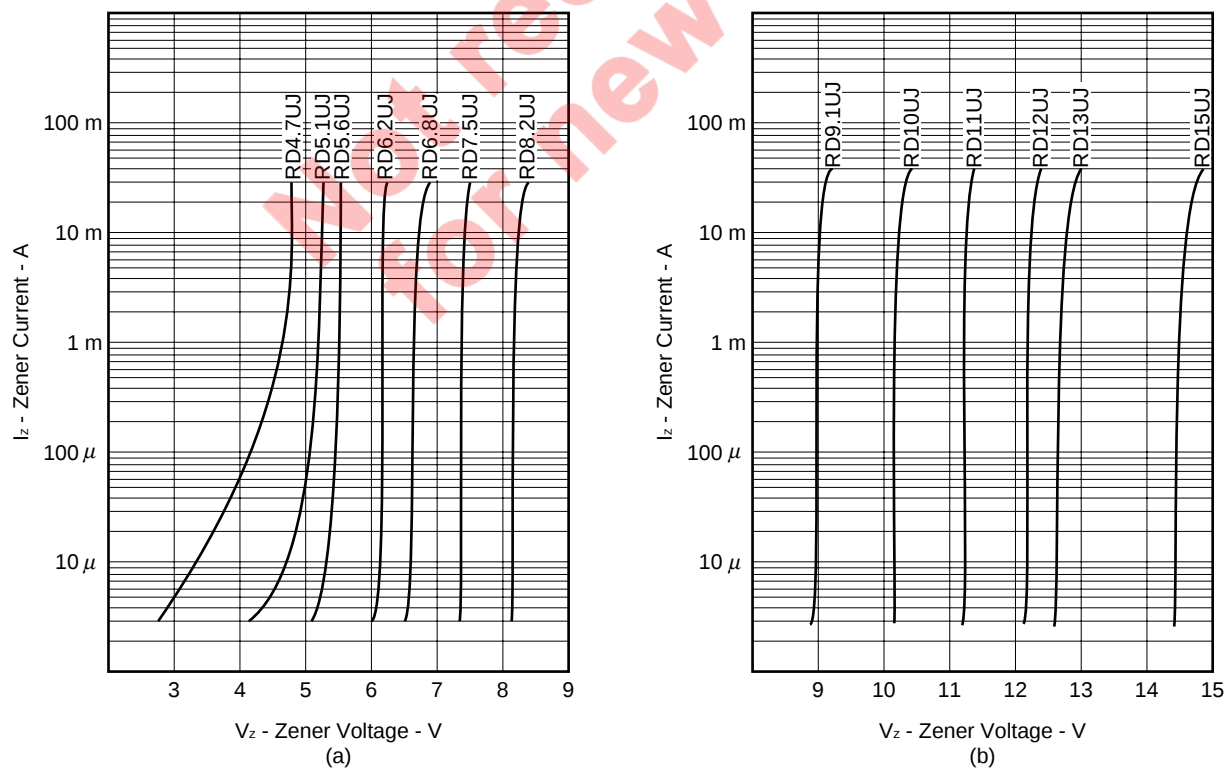


Fig. 2  $I_Z$  -  $V_Z$  CHARACTERISTICS (a to d)



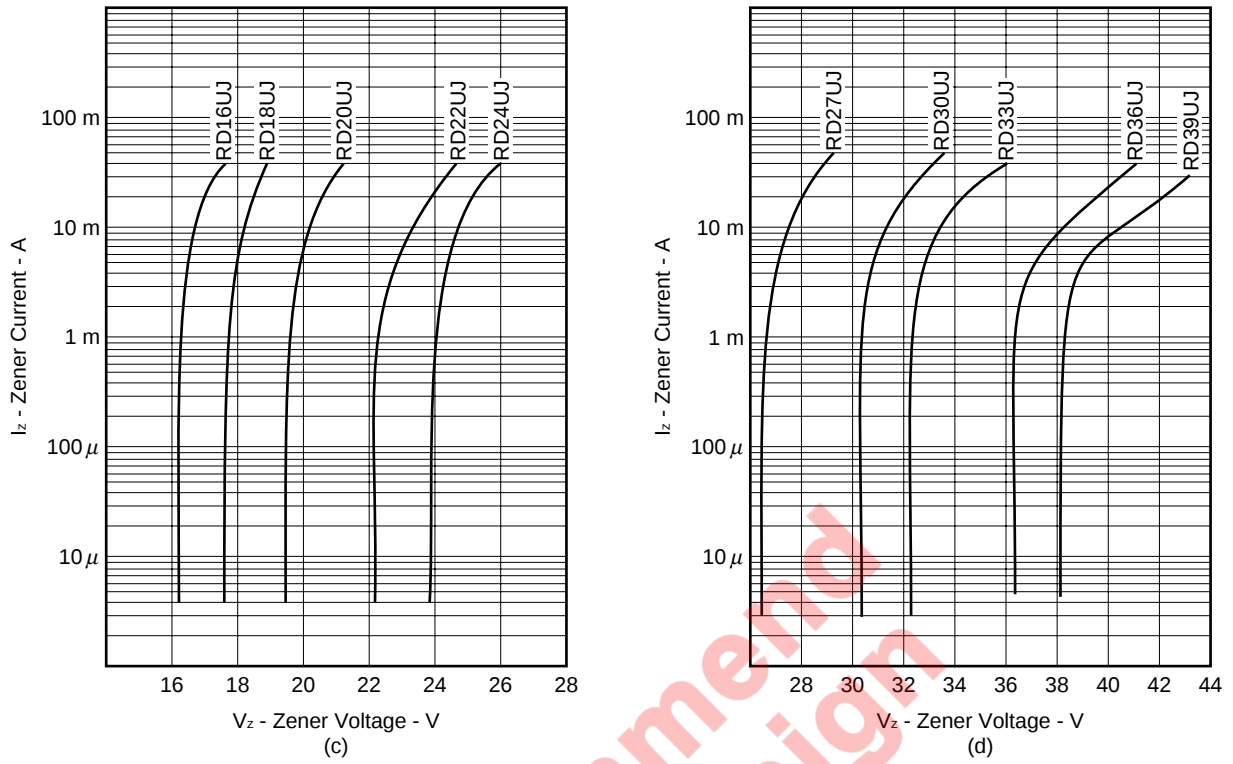


Fig. 3  $\gamma_z - V_z$  CHARACTERISTICS

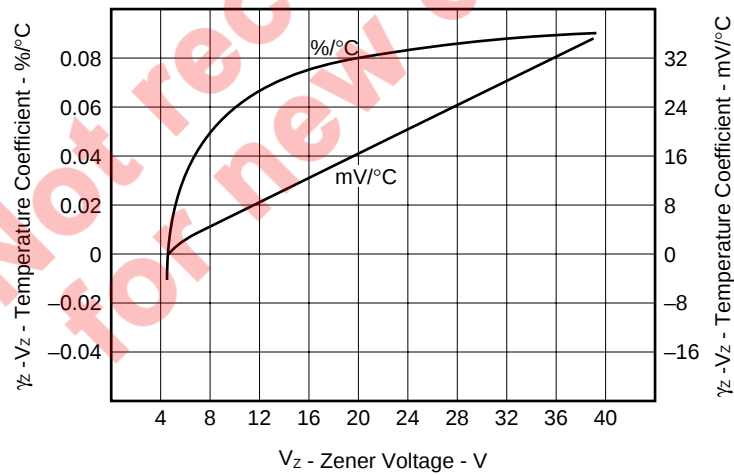


Fig. 4 TRANSIENT THERMAL IMPEDANCE CHARACTERISTIC

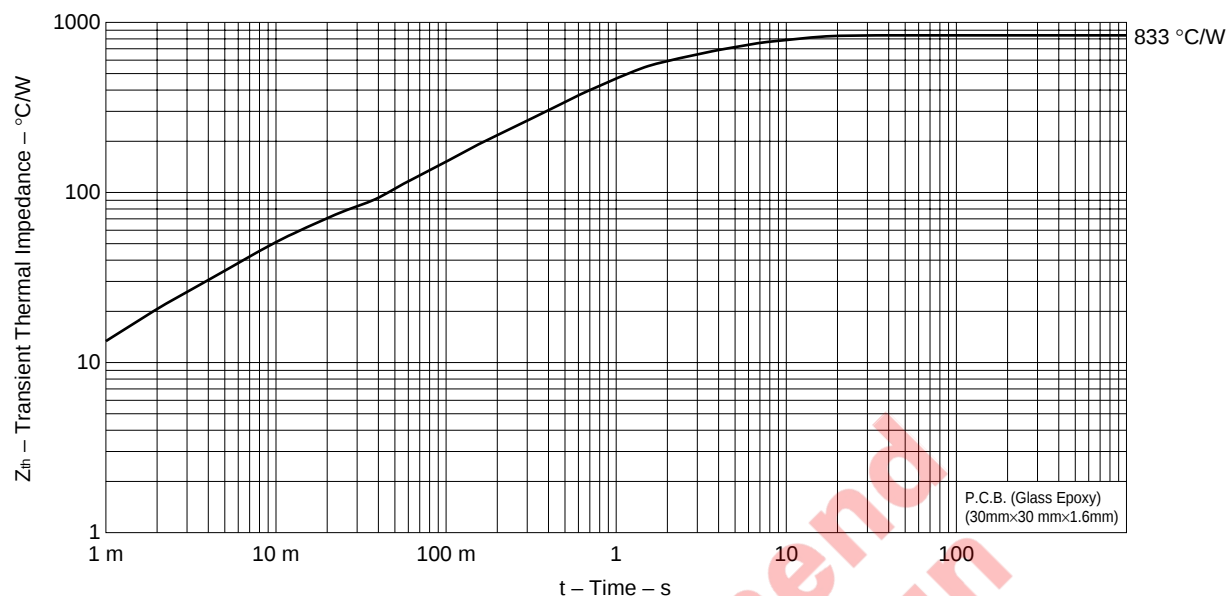
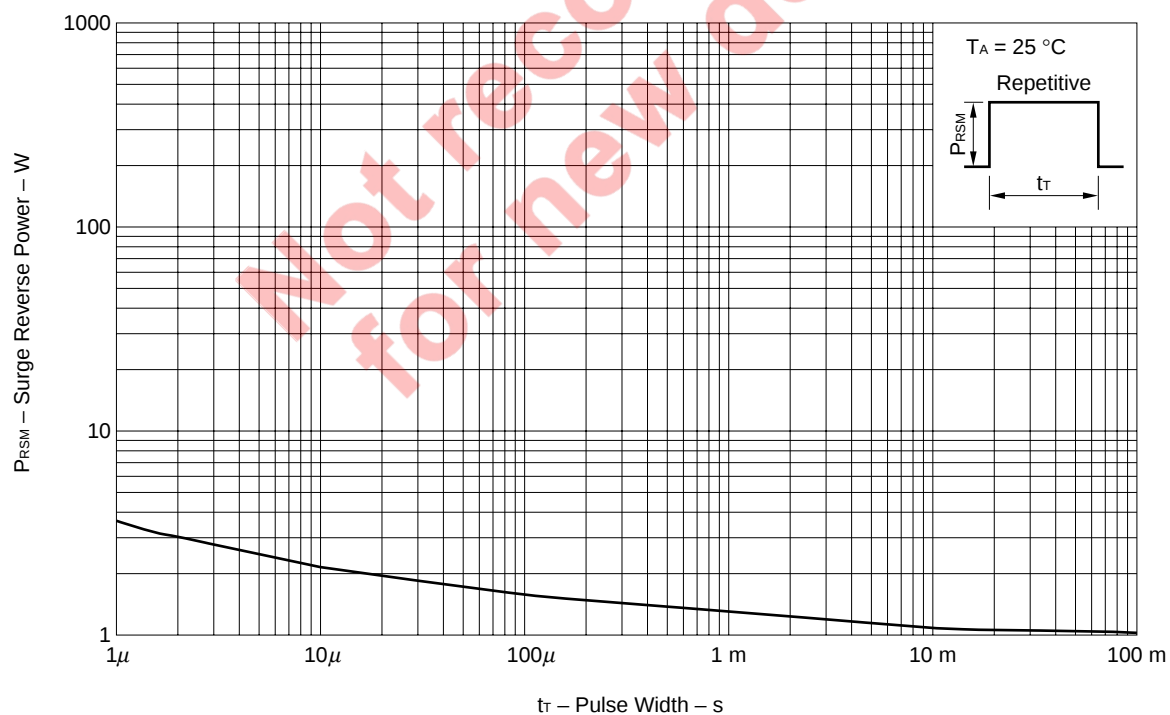


Fig. 5 SURGE REVERSE POWER RATINGS



[MEMO]

Not recommend  
for new design

[MEMO]

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