

## Varistors (ZNR Surge Absorber)

D type

E series



Varistors (ZNR Surge Absorber), Series E, Type D features large surge current and energy handling capability for absorbing transient overvoltage in a compact size.

### Features

- Large withstanding surge current capability in compact sizes
- Large "Energy Handling Capability" absorbing transient overvoltages in compact sizes
- Wide range of varistor voltages
- RoHS compliant

### Recommended applications

- Transistor, diode, IC, thyristor or triac semiconductor protection
- Surge protection in consumer electronic equipment
- Surge protection in communication, measuring or controller electronics
- Surge protection in electronic home appliances, gas or petroleum appliances

### Applicable standards

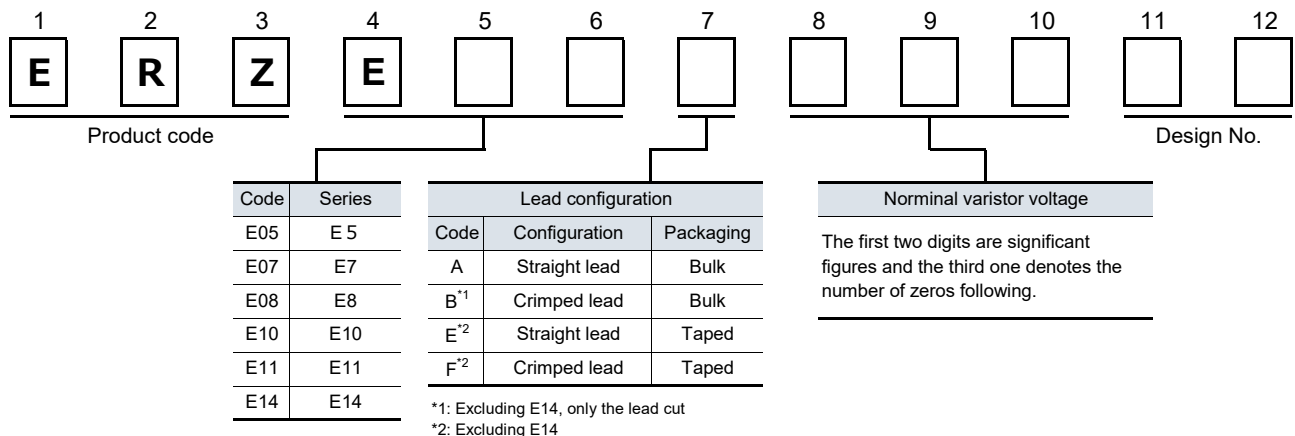
- UL1449 (VZCA2/UL, VZCA8/C-UL)
- VDE IEC61051-1, -2, -2-2, IEC60950-1 Annex.Q, IEC62368-1 G8.2
- CQC (GB/T10193, GB/T10194, GB4943.1, GB8898)

Refer to "Standard Products" , and "Application Note for Safety Standards" , for the details.

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■ As for handling precautions and minimum quantity / Packing unit please see related information.

### Explanation of part numbers



## Reference guide to standard products

| Part No.   | Applicable standards |           | Varistor voltage at 1 mA<br>(V) | Maximum allowable voltage |        | Clamping voltage at 8/20 $\mu$ s |        | Maximum peak current at 8/20 $\mu$ s (A) |         |
|------------|----------------------|-----------|---------------------------------|---------------------------|--------|----------------------------------|--------|------------------------------------------|---------|
|            | Type name            | Approvals |                                 | Ac rms (V)                | DC (V) | max.(V)                          | Ip (A) | 1 time                                   | 2 times |
| ERZE05A201 | E201                 | ○☆☆◇      | 200<br>(185 to 225)             | 130                       | 170    | 340                              | 10     | 1200                                     | 600     |
| ERZE07A201 | E7201                | ○☆☆◇      |                                 |                           |        | 340                              | 25     | 2500                                     | 1250    |
| ERZE08A201 | E8201                | ○☆☆◇      |                                 |                           |        | 340                              | 25     | 3500                                     | 2500    |
| ERZE10A201 | E10201               | ○☆☆◇      |                                 |                           |        | 340                              | 50     | 4500                                     | 3000    |
| ERZE11A201 | E11201               | ○☆☆◇◆     |                                 |                           |        | 340                              | 50     | 6000                                     | 5000    |
| ERZE14A201 | E14201               | ○☆☆◇◆     |                                 |                           |        | 340                              | 100    | 10000                                    | 7000    |
| ERZE05A221 | E221                 | ○☆☆◇      | 220<br>(198 to 242)             | 140                       | 180    | 360                              | 10     | 1200                                     | 600     |
| ERZE07A221 | E7221                | ○☆☆◇      |                                 |                           |        | 360                              | 25     | 2500                                     | 1250    |
| ERZE08A221 | E8221                | ○☆☆◇      |                                 |                           |        | 360                              | 25     | 3500                                     | 2500    |
| ERZE10A221 | E10221               | ○☆☆◇      |                                 |                           |        | 360                              | 50     | 4500                                     | 3000    |
| ERZE11A221 | E11221               | ○☆☆◇◆     |                                 |                           |        | 360                              | 50     | 6000                                     | 5000    |
| ERZE14A221 | E14221               | ○☆☆◇◆     |                                 |                           |        | 360                              | 100    | 10000                                    | 7000    |
| ERZE05A241 | E241                 | ○☆☆◇      | 240<br>(216 to 264)             | 150                       | 200    | 395                              | 10     | 1200                                     | 600     |
| ERZE07A241 | E7241                | ○☆☆◇      |                                 |                           |        | 395                              | 25     | 2500                                     | 1250    |
| ERZE08A241 | E8241                | ○☆☆◇      |                                 |                           |        | 395                              | 25     | 3500                                     | 2500    |
| ERZE10A241 | E10241               | ○☆☆◇      |                                 |                           |        | 395                              | 50     | 4500                                     | 3000    |
| ERZE11A241 | E11241               | ○☆☆◇◆     |                                 |                           |        | 395                              | 50     | 6000                                     | 5000    |
| ERZE14A241 | E14241               | ○☆☆◇◆     |                                 |                           |        | 395                              | 100    | 10000                                    | 7000    |
| ERZE05A271 | E271                 | ○☆☆◇      | 270<br>(247 to 303)             | 175                       | 225    | 455                              | 10     | 1200                                     | 600     |
| ERZE07A271 | E7271                | ○☆☆◇      |                                 |                           |        | 455                              | 25     | 2500                                     | 1250    |
| ERZE08A271 | E8271                | ○☆☆◇      |                                 |                           |        | 455                              | 25     | 3500                                     | 2500    |
| ERZE10A271 | E10271               | ○☆☆◇      |                                 |                           |        | 455                              | 50     | 4500                                     | 3000    |
| ERZE11A271 | E11271               | ○☆☆◇◆     |                                 |                           |        | 455                              | 50     | 6000                                     | 5000    |
| ERZE14A271 | E14271               | ○☆☆◇◆     |                                 |                           |        | 455                              | 100    | 10000                                    | 7000    |
| ERZE05A331 | E331                 | ○☆☆◇      | 330<br>(297 to 363)             | 210                       | 270    | 545                              | 10     | 1200                                     | 600     |
| ERZE07A331 | E7331                | ○☆☆◇      |                                 |                           |        | 545                              | 25     | 2500                                     | 1250    |
| ERZE08A331 | E8331                | ○☆☆◇      |                                 |                           |        | 545                              | 25     | 3500                                     | 2500    |
| ERZE10A331 | E10331               | ○☆☆◇      |                                 |                           |        | 545                              | 50     | 4500                                     | 3000    |
| ERZE11A331 | E11331               | ○☆☆◇◆     |                                 |                           |        | 545                              | 50     | 6000                                     | 4500    |
| ERZE14A331 | E14331               | ○☆☆◇◆     |                                 |                           |        | 545                              | 100    | 10000                                    | 6500    |
| ERZE05A361 | E361                 | ○☆☆◇      | 360<br>(324 to 396)             | 230                       | 300    | 595                              | 10     | 1200                                     | 600     |
| ERZE07A361 | E7361                | ○☆☆◇      |                                 |                           |        | 595                              | 25     | 2500                                     | 1250    |
| ERZE08A361 | E8361                | ○☆☆◇      |                                 |                           |        | 595                              | 25     | 3500                                     | 2500    |
| ERZE10A361 | E10361               | ○☆☆◇      |                                 |                           |        | 595                              | 50     | 4500                                     | 3000    |
| ERZE11A361 | E11361               | ○☆☆◇◆     |                                 |                           |        | 595                              | 50     | 6000                                     | 4500    |
| ERZE14A361 | E14361               | ○☆☆◇◆     |                                 |                           |        | 595                              | 100    | 10000                                    | 6500    |
| ERZE05A391 | E391                 | ○☆☆◇      | 390<br>(351 to 429)             | 250                       | 320    | 650                              | 10     | 1200                                     | 600     |
| ERZE07A391 | E7391                | ○☆☆◇      |                                 |                           |        | 650                              | 25     | 2500                                     | 1250    |
| ERZE08A391 | E8391                | ○☆☆◇      |                                 |                           |        | 650                              | 25     | 3500                                     | 2500    |
| ERZE10A391 | E10391               | ○☆☆◇      |                                 |                           |        | 650                              | 50     | 4500                                     | 3000    |
| ERZE11A391 | E11391               | ○☆☆◇◆     |                                 |                           |        | 650                              | 50     | 6000                                     | 4500    |
| ERZE14A391 | E14391               | ○☆☆◇◆     |                                 |                           |        | 650                              | 100    | 10000                                    | 6500    |
| ERZE05A431 | E431                 | ○☆☆◇      | 430<br>(387 to 473)             | 275                       | 350    | 710                              | 10     | 1200                                     | 600     |
| ERZE07A431 | E7431                | ○☆☆◇      |                                 |                           |        | 710                              | 25     | 2500                                     | 1250    |
| ERZE08A431 | E8431                | ○☆☆◇      |                                 |                           |        | 710                              | 25     | 3500                                     | 2500    |
| ERZE10A431 | E10431               | ○☆☆◇      |                                 |                           |        | 710                              | 50     | 4500                                     | 3000    |
| ERZE11A431 | E11431               | ○☆☆◇◆     |                                 |                           |        | 710                              | 50     | 6000                                     | 4500    |
| ERZE14A431 | E14431               | ○☆☆◇◆     |                                 |                           |        | 710                              | 100    | 10000                                    | 6500    |

○: UL1449 (VZCA2/UL, VZCA8/C-UL), ☆: VDE (IEC61051-1, -2, -2-2) ★: VDE (IEC60950-1 Annex.Q, IEC62368-1 G8.2),

◇: CQC (GB/T10193, GB/T10194), ◆: CQC (GB4943.1, GB8898)

※Approval number (File No.) of safety regulations are subject to revision without notice. Ask factory for a copy of the latest file No.

## Reference guide to standard products

| Part No.   | Applicable standards |           | Varistor voltage at 1 mA | Maximum allowable voltage |        | Clamping voltage at 8/20 $\mu$ s |        | Maximum peak current at 8/20 $\mu$ s (A) |         |
|------------|----------------------|-----------|--------------------------|---------------------------|--------|----------------------------------|--------|------------------------------------------|---------|
|            | Type name            | Approvals | (V)                      | Ac rms (V)                | DC (V) | max.(V)                          | Ip (A) | 1 time                                   | 2 times |
| ERZE05A471 | E471                 | ○☆☆◇      | 470<br>(423 to 517)      | 300                       | 385    | 775                              | 10     | 1200                                     | 600     |
| ERZE07A471 | E7471                | ○☆☆◇      |                          |                           |        | 775                              | 25     | 2500                                     | 1250    |
| ERZE08A471 | E8471                | ○☆☆◇◆     |                          |                           |        | 775                              | 25     | 3500                                     | 2500    |
| ERZE10A471 | E10471               | ○☆☆◇◆     |                          |                           |        | 775                              | 50     | 4500                                     | 3000    |
| ERZE11A471 | E11471               | ○☆☆◇◆     |                          |                           |        | 775                              | 50     | 6000                                     | 4500    |
| ERZE14A471 | E14471               | ○☆☆◇◆     |                          |                           |        | 775                              | 100    | 10000                                    | 6500    |
| ERZE07A511 | E7511                | ○☆☆◇      | 510<br>(459 to 561)      | 320                       | 410    | 845                              | 25     | 2500                                     | 1250    |
| ERZE08A511 | E8511                | ○☆☆◇◆     |                          |                           |        | 845                              | 25     | 3500                                     | 2500    |
| ERZE10A511 | E10511               | ○☆☆◇◆     |                          |                           |        | 845                              | 50     | 4500                                     | 3000    |
| ERZE11A511 | E11511               | ○☆☆◇◆     |                          |                           |        | 845                              | 50     | 6000                                     | 4500    |
| ERZE14A511 | E14511               | ○☆☆◇◆     |                          |                           |        | 845                              | 100    | 10000                                    | 6500    |
| ERZE07A561 | E7561                | ○☆☆◇      | 560<br>(504 to 616)      | 350                       | 450    | 930                              | 25     | 2500                                     | 1250    |
| ERZE08A561 | E8561                | ○☆☆◇◆     |                          |                           |        | 930                              | 25     | 3500                                     | 2500    |
| ERZE10A561 | E10561               | ○☆☆◇◆     |                          |                           |        | 930                              | 50     | 4500                                     | 3000    |
| ERZE11A561 | E11561               | ○☆☆◇◆     |                          |                           |        | 930                              | 50     | 6000                                     | 4500    |
| ERZE14A561 | E14561               | ○☆☆◇◆     |                          |                           |        | 930                              | 100    | 10000                                    | 6500    |
| ERZE07A621 | E7621                | ○☆☆◇      | 620<br>(558 to 682)      | 385                       | 505    | 1025                             | 25     | 2500                                     | 1250    |
| ERZE08A621 | E8621                | ○☆☆◇◆     |                          |                           |        | 1025                             | 25     | 3500                                     | 2500    |
| ERZE10A621 | E10621               | ○☆☆◇◆     |                          |                           |        | 1025                             | 50     | 4500                                     | 3000    |
| ERZE11A621 | E11621               | ○☆☆◇◆     |                          |                           |        | 1025                             | 50     | 5000                                     | 4500    |
| ERZE14A621 | E14621               | ○☆☆◇◆     |                          |                           |        | 1025                             | 100    | 7500                                     | 6500    |
| ERZE08A681 | E8681                | ○☆☆◇◆     | 680<br>(612 to 748)      | 420                       | 560    | 1120                             | 25     | 3500                                     | 2500    |
| ERZE10A681 | E10681               | ○☆☆◇◆     |                          |                           |        | 1120                             | 50     | 4500                                     | 3000    |
| ERZE11A681 | E11681               | ○☆☆◇◆     |                          |                           |        | 1120                             | 50     | 5000                                     | 4500    |
| ERZE14A681 | E14681               | ○☆☆◇◆     |                          |                           |        | 1120                             | 100    | 7500                                     | 6500    |
| ERZE08A751 | E8751                | ○☆☆◇◆     | 750<br>(675 to 825)      | 460                       | 615    | 1240                             | 25     | 3500                                     | 2500    |
| ERZE10A751 | E10751               | ○☆☆◇◆     |                          |                           |        | 1240                             | 50     | 4500                                     | 3000    |
| ERZE11A751 | E11751               | ○☆☆◇◆     |                          |                           |        | 1240                             | 50     | 5000                                     | 4500    |
| ERZE14A751 | E14751               | ○☆☆◇◆     |                          |                           |        | 1240                             | 100    | 7500                                     | 6500    |
| ERZE10A821 | E10821               | ○☆☆◇◆     | 820<br>(738 to 902)      | 510                       | 670    | 1355                             | 50     | 4500                                     | 3000    |
| ERZE11A821 | E11821               | ○☆☆◇◆     |                          |                           |        | 1355                             | 50     | 5000                                     | 4500    |
| ERZE14A821 | E14821               | ○☆☆◇◆     |                          |                           |        | 1355                             | 100    | 7500                                     | 6500    |
| ERZE10A911 | E10911               | ○☆☆◇◆     | 910<br>(819 to 1001)     | 550                       | 745    | 1500                             | 50     | 4500                                     | 3000    |
| ERZE11A911 | E11911               | ○☆☆◇◆     |                          |                           |        | 1500                             | 50     | 5000                                     | 4500    |
| ERZE14A911 | E14911               | ○☆☆◇◆     |                          |                           |        | 1500                             | 100    | 7500                                     | 6500    |
| ERZE10A102 | E10102               | ○☆☆◇◆     | 1000<br>(900 to 1100)    | 625                       | 825    | 1650                             | 50     | 4500                                     | 3000    |
| ERZE11A102 | E11102               | ○☆☆◇◆     |                          |                           |        | 1650                             | 50     | 5000                                     | 4500    |
| ERZE14A102 | E14102               | ○☆☆◇◆     |                          |                           |        | 1650                             | 100    | 7500                                     | 6500    |
| ERZE10A112 | E10112               | ○☆☆◇◆     | 1100<br>(990 to 1210)    | 680                       | 895    | 1815                             | 50     | 4500                                     | 3000    |
| ERZE11A112 | E11112               | ○☆☆◇◆     |                          |                           |        | 1815                             | 50     | 5000                                     | 4500    |
| ERZE14A112 | E14112               | ○☆☆◇◆     |                          |                           |        | 1815                             | 100    | 7500                                     | 6500    |

○: UL1449 (VZCA2/UL, VZCA8/C-UL), ☆: VDE (IEC61051-1, -2, -2-2) ★: VDE (IEC60950-1 Annex.Q, IEC62368-1 G8.2),

◇: CQC (GB/T10193, GB/T10194), ◆: CQC (GB4943.1, GB8898)

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## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

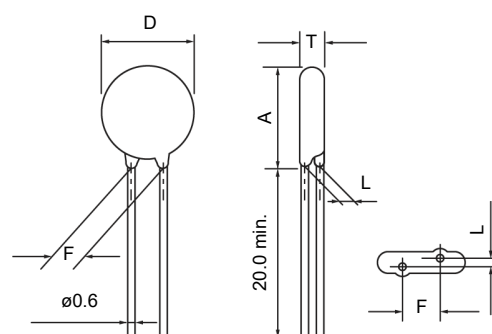
●Storage temperature range : -40 to 125 °C

| Part No.   | Varistor voltage<br>at 1 mA | Maximum<br>allowable voltage |           | Clamping<br>voltage<br>(max.) **Ip | Rated<br>power | Maximum energy |        | Maximum<br>peak current<br>(8/20 μs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|------------------------------|-----------|------------------------------------|----------------|----------------|--------|--------------------------------------|---------|-----------------------------------|
|            |                             |                              |           |                                    |                | (10/1000 μs)   | (2 ms) | 1 time                               | 2 times |                                   |
|            | (V)                         | ACrms<br>(V)                 | DC<br>(V) | (V)                                | (W)            | (J)            | (J)    | (A)                                  | (A)     | (pF)                              |
| ERZE05A201 | 200(185 to 225)             | 130                          | 170       | 340                                | 0.25           | 13             | 9.5    | 1200                                 | 600     | 200                               |
| ERZE05A221 | 220(198 to 242)             | 140                          | 180       | 360                                | 0.25           | 14             | 10     | 1200                                 | 600     | 190                               |
| ERZE05A241 | 240(216 to 264)             | 150                          | 200       | 395                                | 0.25           | 15             | 11     | 1200                                 | 600     | 170                               |
| ERZE05A271 | 270(247 to 303)             | 175                          | 225       | 455                                | 0.25           | 18             | 13     | 1200                                 | 600     | 150                               |
| ERZE05A331 | 330(297 to 363)             | 210                          | 270       | 545                                | 0.25           | 21             | 15     | 1200                                 | 600     | 130                               |
| ERZE05A361 | 360(324 to 396)             | 230                          | 300       | 595                                | 0.25           | 23             | 17     | 1200                                 | 600     | 130                               |
| ERZE05A391 | 390(351 to 429)             | 250                          | 320       | 650                                | 0.25           | 26             | 19     | 1200                                 | 600     | 130                               |
| ERZE05A431 | 430(387 to 473)             | 275                          | 350       | 710                                | 0.25           | 29             | 21     | 1200                                 | 600     | 120                               |
| ERZE05A471 | 470(423 to 517)             | 300                          | 385       | 775                                | 0.25           | 32             | 23     | 1200                                 | 600     | 100                               |

\*Ip Measuring current of clamping voltage : 10 A

## Dimensions in mm (not to scale)

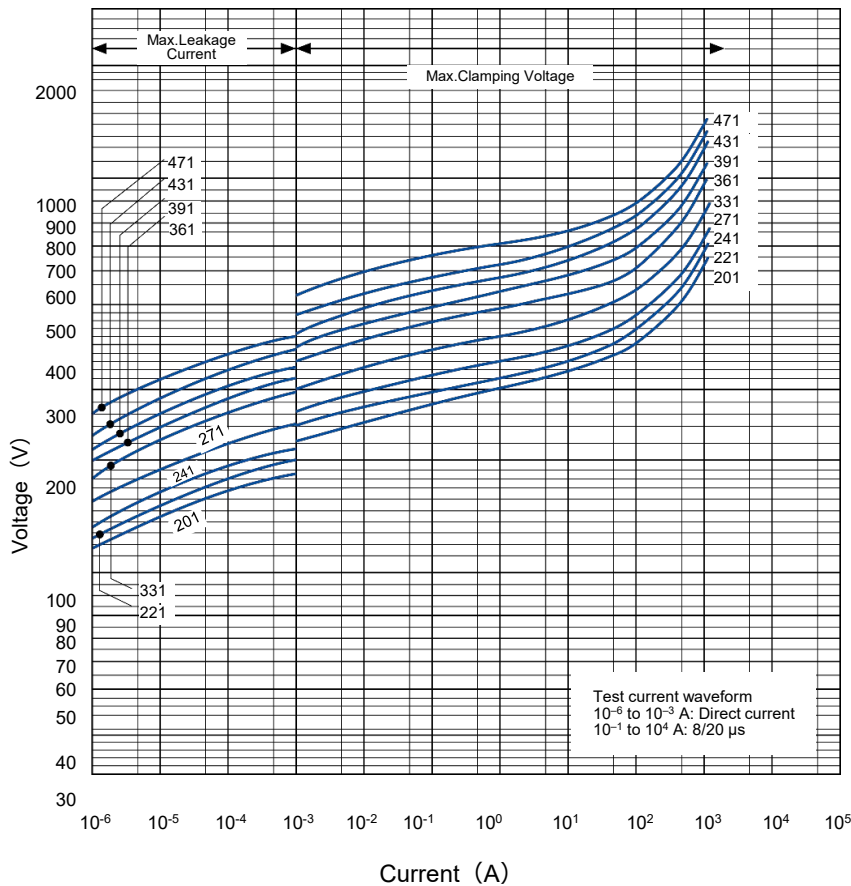
| Part No.   | D max. | T max. | F±1.0 | A max. | Unit : mm |
|------------|--------|--------|-------|--------|-----------|
|            |        |        |       |        | L±1.0     |
| ERZE05A201 | 7.0    | 4.8    | 5.0   | 10.0   | 2.1       |
| ERZE05A221 | 7.0    | 4.9    | 5.0   | 10.0   | 2.3       |
| ERZE05A241 | 7.0    | 5.0    | 5.0   | 10.0   | 2.4       |
| ERZE05A271 | 7.0    | 5.2    | 5.0   | 10.0   | 2.5       |
| ERZE05A331 | 7.0    | 5.5    | 5.0   | 10.0   | 2.9       |
| ERZE05A361 | 7.0    | 5.8    | 5.0   | 10.0   | 3.1       |
| ERZE05A391 | 7.0    | 5.9    | 5.0   | 10.0   | 3.2       |
| ERZE05A431 | 7.0    | 6.1    | 5.0   | 10.0   | 3.3       |
| ERZE05A471 | 7.0    | 6.3    | 5.0   | 10.0   | 3.5       |



## Typical characteristics

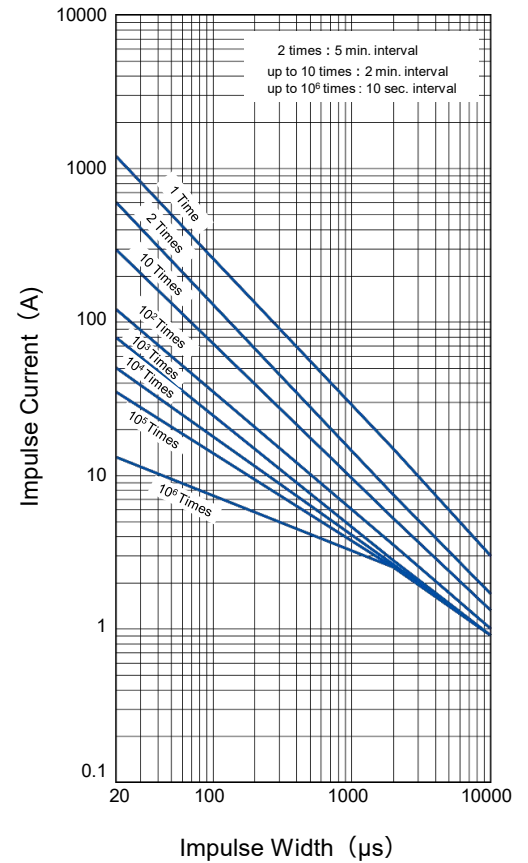
### Voltage vs. Current

ERZE05A201 to ERZE05A471



### Impulse Derating (Relation between impulse width and impulse current multiple)

ERZE05A201 to ERZE05A471



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

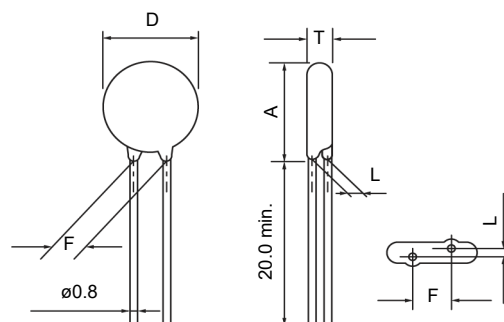
| Part No.   | Varistor voltage<br>at 1 mA | Maximum<br>allowable voltage |           | Clamping<br>voltage<br>(max.) **Ip | Rated<br>power | Maximum energy |        | Maximum<br>peak current<br>(8/20 µs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|------------------------------|-----------|------------------------------------|----------------|----------------|--------|--------------------------------------|---------|-----------------------------------|
|            |                             |                              |           |                                    |                | (10/1000 µs)   | (2 ms) | 1 time                               | 2 times |                                   |
|            | (V)                         | ACrms<br>(V)                 | DC<br>(V) | (V)                                | (W)            | (J)            | (J)    | (A)                                  | (A)     | (pF)                              |
| ERZE07A201 | 200(185 to 225)             | 130                          | 170       | 340                                | 0.3            | 26             | 19     | 2500                                 | 1250    | 360                               |
| ERZE07A221 | 220(198 to 242)             | 140                          | 180       | 360                                | 0.3            | 30             | 22     | 2500                                 | 1250    | 350                               |
| ERZE07A241 | 240(216 to 264)             | 150                          | 200       | 395                                | 0.3            | 33             | 24     | 2500                                 | 1250    | 340                               |
| ERZE07A271 | 270(247 to 303)             | 175                          | 225       | 455                                | 0.3            | 39             | 28     | 2500                                 | 1250    | 310                               |
| ERZE07A331 | 330(297 to 363)             | 210                          | 270       | 545                                | 0.3            | 44             | 32     | 2500                                 | 1250    | 280                               |
| ERZE07A361 | 360(324 to 396)             | 230                          | 300       | 595                                | 0.3            | 50             | 36     | 2500                                 | 1250    | 260                               |
| ERZE07A391 | 390(351 to 429)             | 250                          | 320       | 650                                | 0.3            | 53             | 38     | 2500                                 | 1250    | 240                               |
| ERZE07A431 | 430(387 to 473)             | 275                          | 350       | 710                                | 0.3            | 60             | 43     | 2500                                 | 1250    | 210                               |
| ERZE07A471 | 470(423 to 517)             | 300                          | 385       | 775                                | 0.3            | 65             | 47     | 2500                                 | 1250    | 170                               |
| ERZE07A511 | 510(459 to 561)             | 320                          | 410       | 845                                | 0.3            | 70             | 50     | 2500                                 | 1250    | 140                               |
| ERZE07A561 | 560(504 to 616)             | 350                          | 450       | 930                                | 0.3            | 75             | 55     | 2500                                 | 1250    | 140                               |
| ERZE07A621 | 620(558 to 682)             | 385                          | 505       | 1025                               | 0.3            | 80             | 60     | 2500                                 | 1250    | 135                               |

\*Ip Measuring current of clamping voltage : 25 A

## Dimensions in mm (not to scale)

Unit : mm

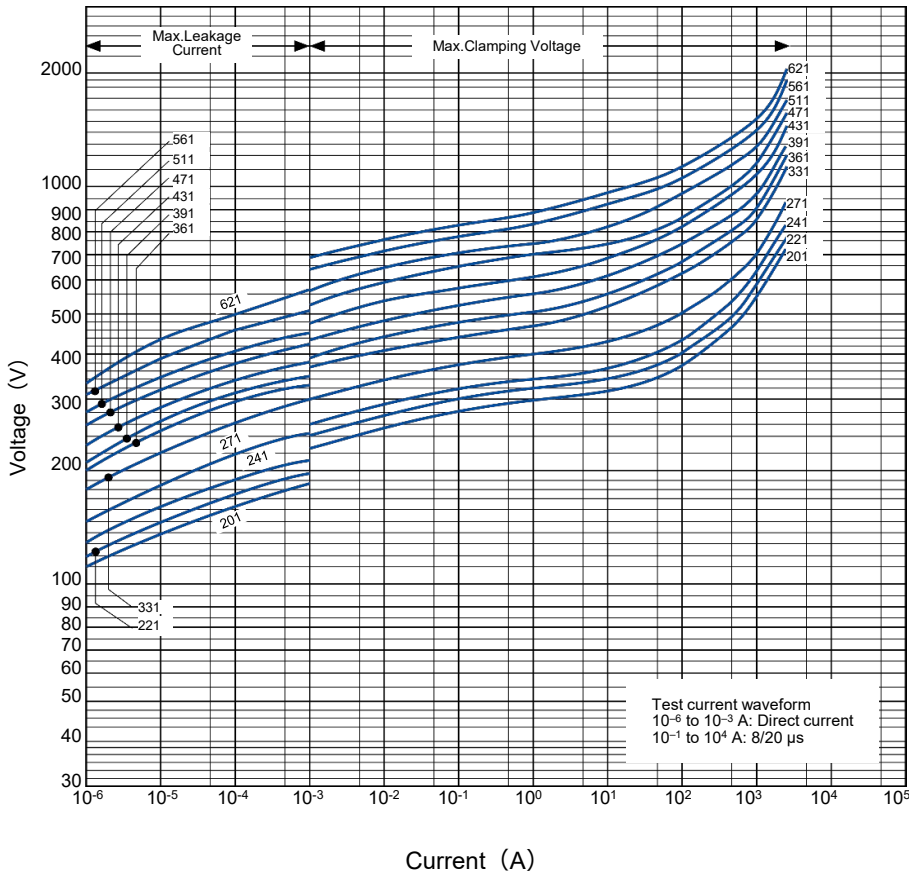
| Part No.   | D max. | T max. | F±1.0 | A max. | L±1.0 |
|------------|--------|--------|-------|--------|-------|
| ERZE07A201 | 9.0    | 5.3    | 7.5   | 12.5   | 2.1   |
| ERZE07A221 | 9.0    | 5.4    | 7.5   | 12.5   | 2.3   |
| ERZE07A241 | 9.0    | 5.5    | 7.5   | 12.5   | 2.4   |
| ERZE07A271 | 9.0    | 5.7    | 7.5   | 12.5   | 2.5   |
| ERZE07A331 | 9.0    | 6.0    | 7.5   | 12.5   | 2.8   |
| ERZE07A361 | 9.0    | 6.2    | 7.5   | 12.5   | 2.9   |
| ERZE07A391 | 9.0    | 6.3    | 7.5   | 12.5   | 3.0   |
| ERZE07A431 | 9.0    | 6.5    | 7.5   | 12.5   | 3.1   |
| ERZE07A471 | 9.0    | 6.8    | 7.5   | 12.5   | 3.3   |
| ERZE07A511 | 9.0    | 7.0    | 7.5   | 12.5   | 3.5   |
| ERZE07A561 | 9.0    | 7.4    | 7.5   | 13.5   | 3.8   |
| ERZE07A621 | 10.0   | 7.8    | 7.5   | 13.5   | 4.0   |



## Typical characteristics

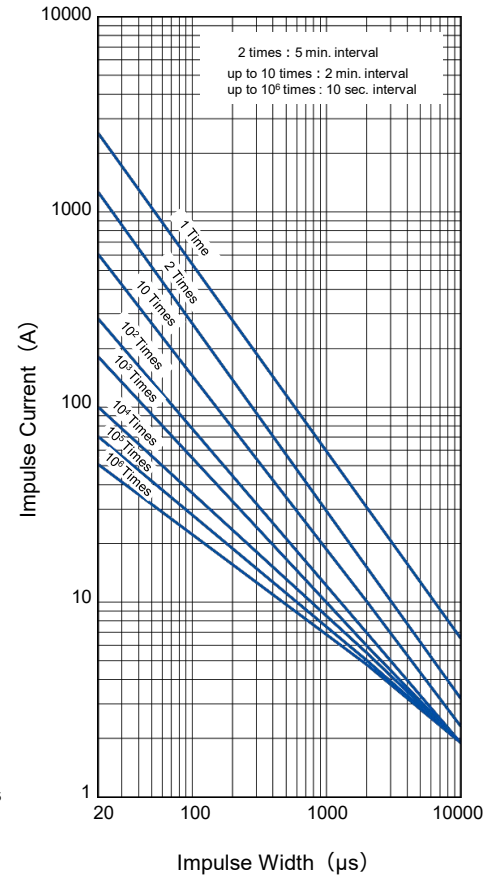
### Voltage vs. Current

ERZE07A201 to ERZE07A621



### Impulse Derating (Relation between impulse width and impulse current multiple)

ERZE07A201 to ERZE07A621



## Ratings and characteristics

● Operating temperature range : -40 to 85 °C ● Storage temperature range : -40 to 125 °C

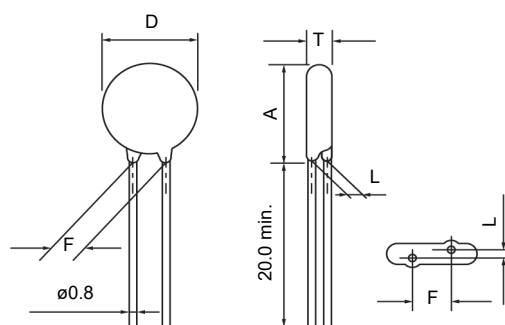
| Part No.   | Varistor voltage<br>at 1 mA | Maximum allowable voltage |           | Clamping voltage<br>(max.) **Ip | Rated power | Maximum energy |        | Maximum peak current<br>(8/20 μs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|---------------------------|-----------|---------------------------------|-------------|----------------|--------|-----------------------------------|---------|-----------------------------------|
|            |                             | ACrms<br>(V)              | DC<br>(V) |                                 |             | (10/1000 μs)   | (2 ms) | 1 time                            | 2 times |                                   |
|            | (V)                         |                           |           | (V)                             | (W)         | (J)            | (J)    | (A)                               | (A)     | (pF)                              |
| ERZE08A201 | 200(185 to 225)             | 130                       | 170       | 340                             | 0.4         | 35             | 25     | 3500                              | 2500    | 390                               |
| ERZE08A221 | 220(198 to 242)             | 140                       | 180       | 360                             | 0.4         | 39             | 27.5   | 3500                              | 2500    | 380                               |
| ERZE08A241 | 240(216 to 264)             | 150                       | 200       | 395                             | 0.4         | 42             | 30     | 3500                              | 2500    | 360                               |
| ERZE08A271 | 270(247 to 303)             | 175                       | 225       | 455                             | 0.4         | 49             | 35     | 3500                              | 2500    | 330                               |
| ERZE08A331 | 330(297 to 363)             | 210                       | 270       | 545                             | 0.4         | 58             | 42     | 3500                              | 2500    | 300                               |
| ERZE08A361 | 360(324 to 396)             | 230                       | 300       | 595                             | 0.4         | 65             | 45     | 3500                              | 2500    | 280                               |
| ERZE08A391 | 390(351 to 429)             | 250                       | 320       | 650                             | 0.4         | 70             | 50     | 3500                              | 2500    | 260                               |
| ERZE08A431 | 430(387 to 473)             | 275                       | 350       | 710                             | 0.4         | 80             | 55     | 3500                              | 2500    | 230                               |
| ERZE08A471 | 470(423 to 517)             | 300                       | 385       | 775                             | 0.4         | 85             | 60     | 3500                              | 2500    | 180                               |
| ERZE08A511 | 510(459 to 561)             | 320                       | 410       | 845                             | 0.4         | 92             | 67     | 3500                              | 2500    | 150                               |
| ERZE08A561 | 560(504 to 616)             | 350                       | 450       | 930                             | 0.4         | 92             | 67     | 3500                              | 2500    | 150                               |
| ERZE08A621 | 620(558 to 682)             | 385                       | 505       | 1025                            | 0.4         | 92             | 67     | 3500                              | 2500    | 140                               |
| ERZE08A681 | 680(612 to 748)             | 420                       | 560       | 1120                            | 0.4         | 92             | 67     | 3500                              | 2500    | 130                               |
| ERZE08A751 | 750(675 to 825)             | 460                       | 615       | 1240                            | 0.4         | 100            | 70     | 3500                              | 2500    | 130                               |

\*Ip Measuring current of clamping voltage : 25 A

## Dimensions in mm (not to scale)

Unit : mm

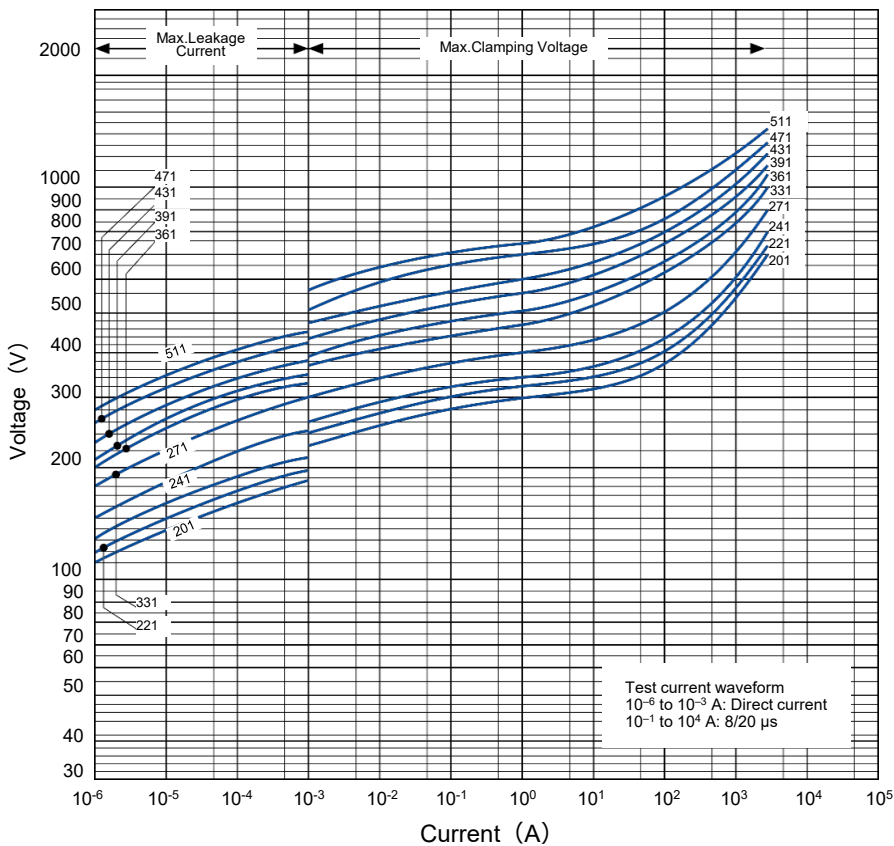
| Part No.   | D max. | T max. | F±1.0 | A max. | L±1.0 |
|------------|--------|--------|-------|--------|-------|
| ERZE08A201 | 10.5   | 5.1    | 7.5   | 13.5   | 1.9   |
| ERZE08A221 | 10.5   | 5.2    | 7.5   | 13.5   | 2.0   |
| ERZE08A241 | 10.5   | 5.3    | 7.5   | 13.5   | 2.1   |
| ERZE08A271 | 10.5   | 5.5    | 7.5   | 13.5   | 2.3   |
| ERZE08A331 | 10.5   | 5.9    | 7.5   | 13.5   | 2.6   |
| ERZE08A361 | 10.5   | 6.1    | 7.5   | 13.5   | 2.8   |
| ERZE08A391 | 10.5   | 6.3    | 7.5   | 13.5   | 2.9   |
| ERZE08A431 | 10.5   | 6.5    | 7.5   | 13.5   | 3.1   |
| ERZE08A471 | 10.5   | 7.3    | 7.5   | 13.5   | 3.6   |
| ERZE08A511 | 10.5   | 7.8    | 7.5   | 13.5   | 4.0   |
| ERZE08A561 | 10.5   | 8.1    | 7.5   | 13.5   | 4.3   |
| ERZE08A621 | 11.5   | 8.7    | 7.5   | 14.5   | 4.7   |
| ERZE08A681 | 11.5   | 9.0    | 7.5   | 14.5   | 5.0   |
| ERZE08A751 | 11.5   | 9.7    | 7.5   | 14.5   | 5.6   |



## Typical characteristics

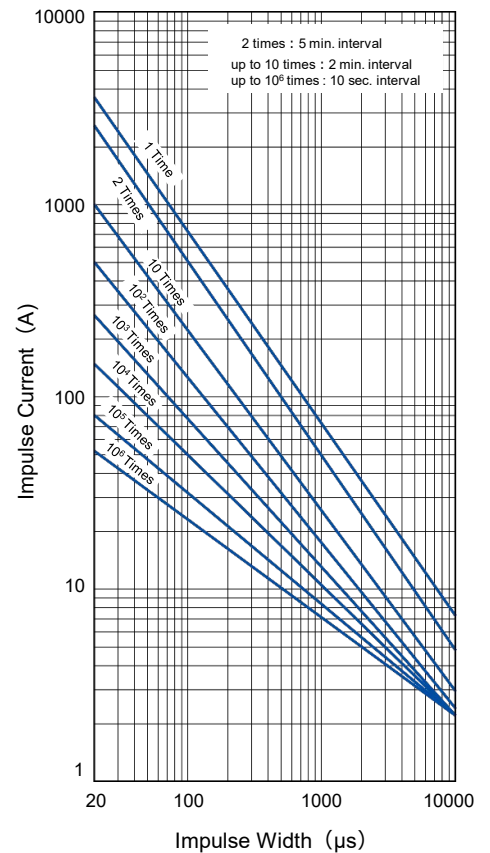
### Voltage vs. Current

ERZE08A201 to ERZE08A511

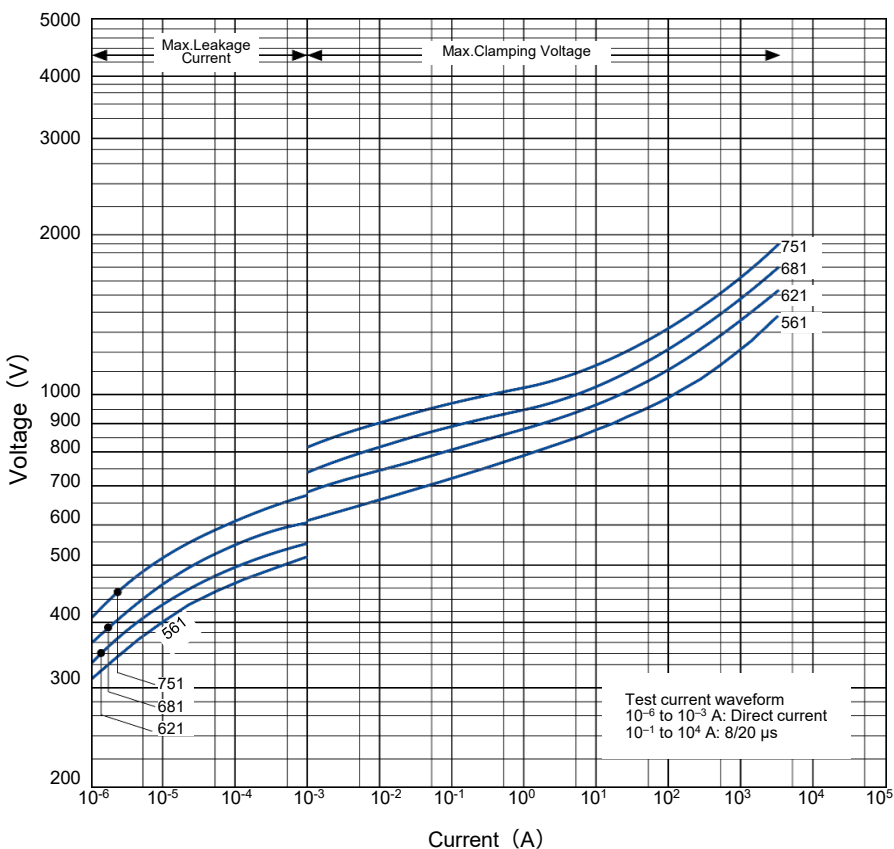


### Impulse Derating (Relation between impulse width and impulse current multiple)

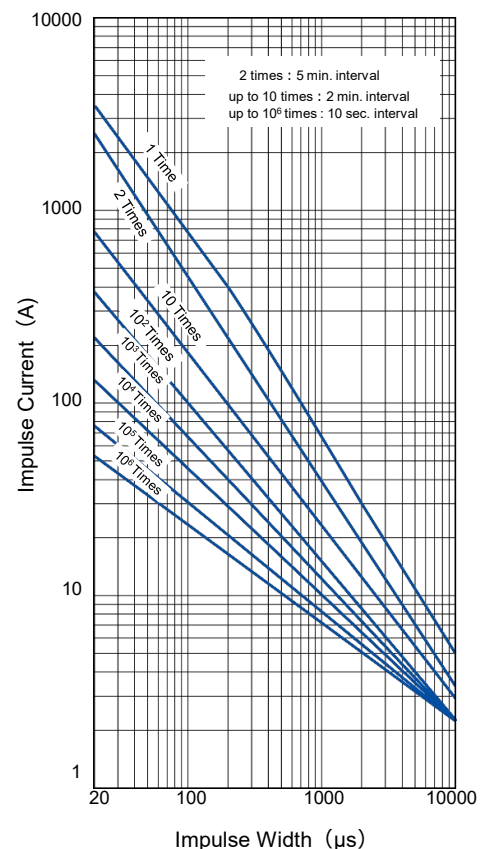
ERZE08A201 to ERZE08A511



ERZE08A561 to ERZE08A751



ERZE08A561 to ERZE08A751



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

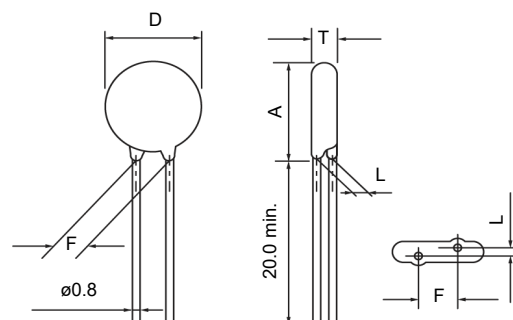
| Part No.   | Varistor voltage<br>at 1 mA | Maximum<br>allowable voltage |           | Clamping<br>voltage<br>(max.) **Ip | Rated<br>power | Maximum energy |        | Maximum<br>peak current<br>(8/20 μs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|------------------------------|-----------|------------------------------------|----------------|----------------|--------|--------------------------------------|---------|-----------------------------------|
|            |                             |                              |           |                                    |                | (10/1000 μs)   | (2 ms) | 1 time                               | 2 times |                                   |
|            | (V)                         | ACrms<br>(V)                 | DC<br>(V) | (V)                                | (W)            | (J)            | (J)    | (A)                                  | (A)     | (pF)                              |
| ERZE10A201 | 200(185 to 225)             | 130                          | 170       | 340                                | 0.5            | 47             | 34     | 4500                                 | 3000    | 630                               |
| ERZE10A221 | 220(198 to 242)             | 140                          | 180       | 360                                | 0.5            | 50             | 36     | 4500                                 | 3000    | 600                               |
| ERZE10A241 | 240(216 to 264)             | 150                          | 200       | 395                                | 0.5            | 56             | 40     | 4500                                 | 3000    | 570                               |
| ERZE10A271 | 270(247 to 303)             | 175                          | 225       | 455                                | 0.5            | 64             | 46     | 4500                                 | 3000    | 530                               |
| ERZE10A331 | 330(297 to 363)             | 210                          | 270       | 545                                | 0.5            | 72             | 52     | 4500                                 | 3000    | 470                               |
| ERZE10A361 | 360(324 to 396)             | 230                          | 300       | 595                                | 0.5            | 84             | 60     | 4500                                 | 3000    | 430                               |
| ERZE10A391 | 390(351 to 429)             | 250                          | 320       | 650                                | 0.5            | 91             | 65     | 4500                                 | 3000    | 400                               |
| ERZE10A431 | 430(387 to 473)             | 275                          | 350       | 710                                | 0.5            | 99             | 71     | 4500                                 | 3000    | 350                               |
| ERZE10A471 | 470(423 to 517)             | 300                          | 385       | 775                                | 0.5            | 106            | 76     | 4500                                 | 3000    | 320                               |
| ERZE10A511 | 510(459 to 561)             | 320                          | 410       | 845                                | 0.5            | 117            | 84     | 4500                                 | 3000    | 300                               |
| ERZE10A561 | 560(504 to 616)             | 350                          | 450       | 930                                | 0.5            | 120            | 86     | 4500                                 | 3000    | 290                               |
| ERZE10A621 | 620(558 to 682)             | 385                          | 505       | 1025                               | 0.5            | 126            | 88     | 4500                                 | 3000    | 280                               |
| ERZE10A681 | 680(612 to 748)             | 420                          | 560       | 1120                               | 0.5            | 133            | 95     | 4500                                 | 3000    | 260                               |
| ERZE10A751 | 750(675 to 825)             | 460                          | 615       | 1240                               | 0.5            | 140            | 100    | 4500                                 | 3000    | 250                               |
| ERZE10A821 | 820(738 to 902)             | 510                          | 670       | 1355                               | 0.5            | 154            | 110    | 4500                                 | 3000    | 230                               |
| ERZE10A911 | 910(819 to 1001)            | 550                          | 745       | 1500                               | 0.5            | 168            | 112    | 4500                                 | 3000    | 220                               |
| ERZE10A102 | 1000(900 to 1100)           | 625                          | 825       | 1650                               | 0.5            | 182            | 130    | 4500                                 | 3000    | 200                               |
| ERZE10A112 | 1100(990 to 1210)           | 680                          | 895       | 1815                               | 0.5            | 196            | 140    | 4500                                 | 3000    | 180                               |

\*Ip Measuring current of clamping voltage : 50 A

## Dimensions in mm (not to scale)

Unit : mm

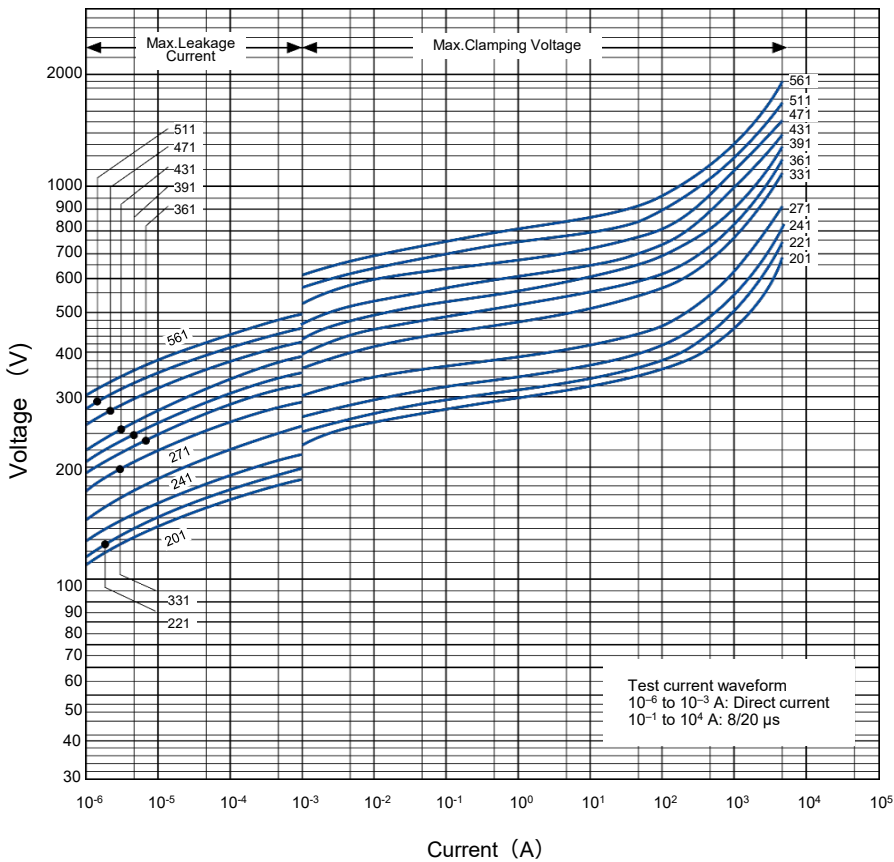
| Part No.   | D max. | T max. | F±1.0 | A max. | L±1.0 |
|------------|--------|--------|-------|--------|-------|
| ERZE10A201 | 11.5   | 5.3    | 7.5   | 15.0   | 2.1   |
| ERZE10A221 | 11.5   | 5.4    | 7.5   | 15.0   | 2.3   |
| ERZE10A241 | 11.5   | 5.5    | 7.5   | 15.0   | 2.4   |
| ERZE10A271 | 11.5   | 5.7    | 7.5   | 15.0   | 2.5   |
| ERZE10A331 | 11.5   | 6.0    | 7.5   | 15.0   | 2.8   |
| ERZE10A361 | 11.5   | 6.2    | 7.5   | 15.0   | 2.9   |
| ERZE10A391 | 11.5   | 6.3    | 7.5   | 15.0   | 3.0   |
| ERZE10A431 | 11.5   | 6.5    | 7.5   | 15.0   | 3.1   |
| ERZE10A471 | 11.5   | 6.8    | 7.5   | 15.0   | 3.3   |
| ERZE10A511 | 11.5   | 7.0    | 7.5   | 15.0   | 3.5   |
| ERZE10A561 | 11.5   | 7.4    | 7.5   | 15.0   | 3.8   |
| ERZE10A621 | 12.5   | 7.8    | 7.5   | 16.0   | 4.0   |
| ERZE10A681 | 12.5   | 8.1    | 7.5   | 16.0   | 4.2   |
| ERZE10A751 | 12.5   | 8.6    | 7.5   | 16.0   | 4.6   |
| ERZE10A821 | 12.5   | 8.9    | 7.5   | 16.0   | 5.0   |
| ERZE10A911 | 12.5   | 9.5    | 7.5   | 16.0   | 5.7   |
| ERZE10A102 | 12.5   | 10.0   | 7.5   | 16.0   | 6.2   |
| ERZE10A112 | 12.5   | 10.6   | 7.5   | 16.0   | 6.8   |



## Typical characteristics

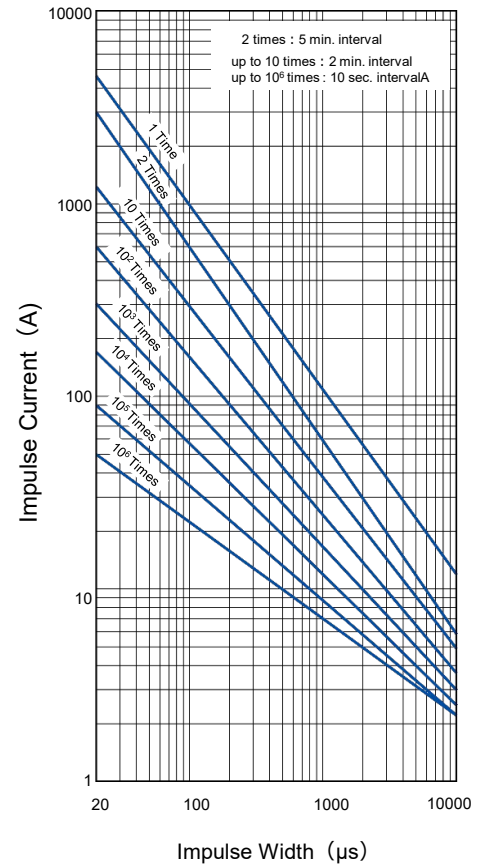
### Voltage vs. Current

ERZE10A201 to ERZE10A561

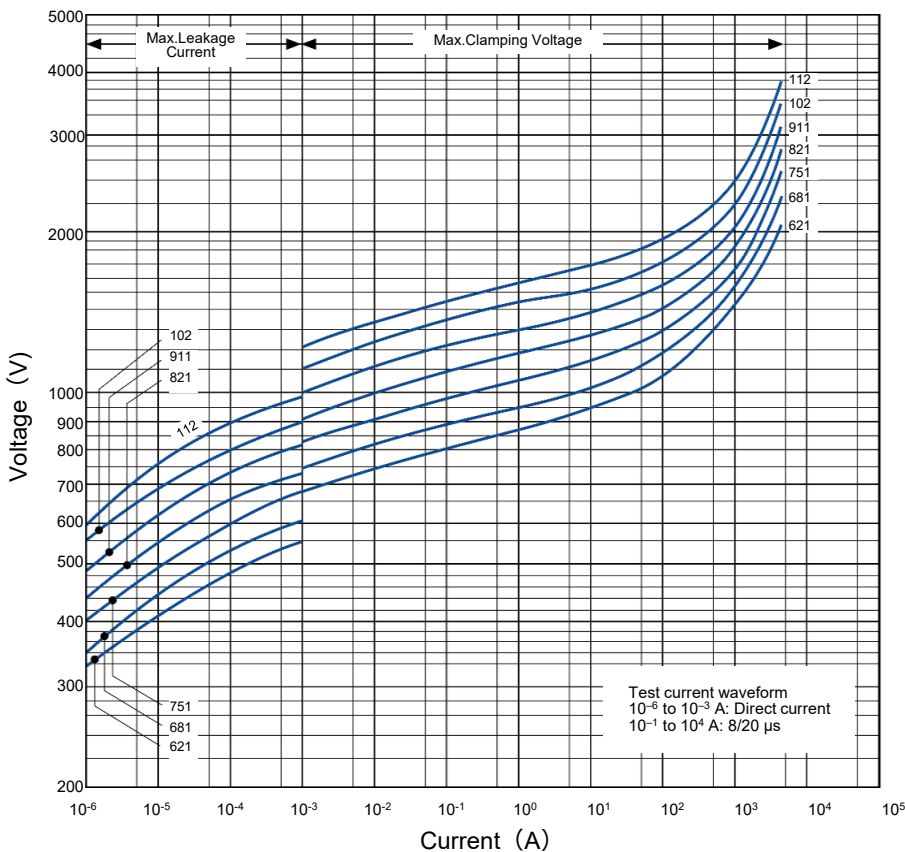


### Impulse Derating (Relation between impulse width and impulse current multiple)

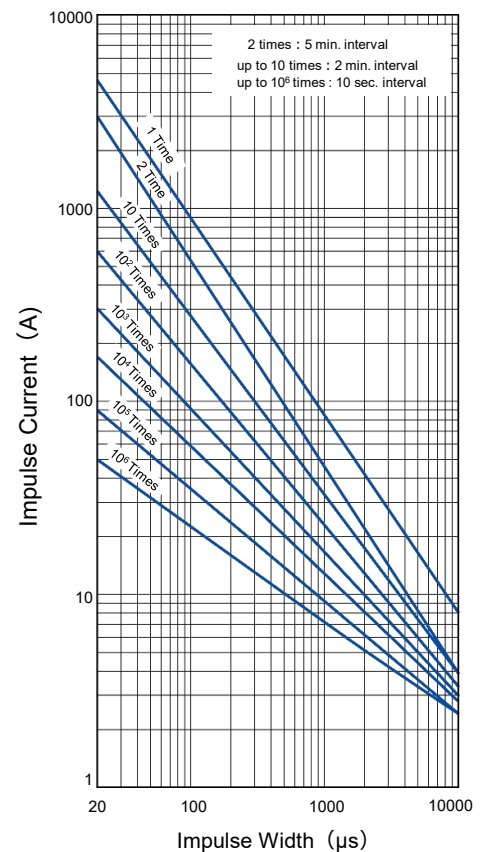
ERZE10A201 to ERZE10A561



ERZE10A621 to ERZE10A112



ERZE10A621 to ERZE10A112



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

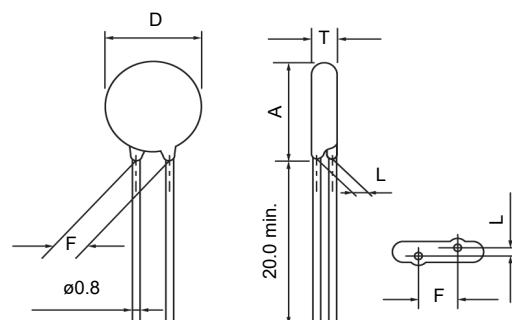
| Part No.   | Varistor voltage<br>at 1 mA | Maximum<br>allowable voltage |           | Clamping<br>voltage<br>(max.) **Ip | Rated<br>power | Maximum energy |        | Maximum<br>peak current<br>(8/20 μs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|------------------------------|-----------|------------------------------------|----------------|----------------|--------|--------------------------------------|---------|-----------------------------------|
|            |                             | ACrms<br>(V)                 | DC<br>(V) |                                    |                | (10/1000 μs)   | (2 ms) | 1 time                               | 2 times |                                   |
|            | (V)                         |                              |           | (V)                                | (W)            | (J)            | (J)    | (A)                                  | (A)     | (pF)                              |
| ERZE11A201 | 200(185 to 225)             | 130                          | 170       | 340                                | 0.6            | 70             | 50     | 6000                                 | 5000    | 690                               |
| ERZE11A221 | 220(198 to 242)             | 140                          | 180       | 360                                | 0.6            | 78             | 55     | 6000                                 | 5000    | 660                               |
| ERZE11A241 | 240(216 to 264)             | 150                          | 200       | 395                                | 0.6            | 84             | 60     | 6000                                 | 5000    | 620                               |
| ERZE11A271 | 270(247 to 303)             | 175                          | 225       | 455                                | 0.6            | 99             | 70     | 6000                                 | 5000    | 580                               |
| ERZE11A331 | 330(297 to 363)             | 210                          | 270       | 545                                | 0.6            | 115            | 80     | 6000                                 | 4500    | 520                               |
| ERZE11A361 | 360(324 to 396)             | 230                          | 300       | 595                                | 0.6            | 130            | 90     | 6000                                 | 4500    | 480                               |
| ERZE11A391 | 390(351 to 429)             | 250                          | 320       | 650                                | 0.6            | 140            | 100    | 6000                                 | 4500    | 450                               |
| ERZE11A431 | 430(387 to 473)             | 275                          | 350       | 710                                | 0.6            | 155            | 110    | 6000                                 | 4500    | 400                               |
| ERZE11A471 | 470(423 to 517)             | 300                          | 385       | 775                                | 0.6            | 175            | 125    | 6000                                 | 4500    | 360                               |
| ERZE11A511 | 510(459 to 561)             | 320                          | 410       | 845                                | 0.6            | 190            | 136    | 6000                                 | 4500    | 310                               |
| ERZE11A561 | 560(504 to 616)             | 350                          | 450       | 930                                | 0.6            | 190            | 136    | 6000                                 | 4500    | 310                               |
| ERZE11A621 | 620(558 to 682)             | 385                          | 505       | 1025                               | 0.6            | 190            | 136    | 5000                                 | 4500    | 300                               |
| ERZE11A681 | 680(612 to 748)             | 420                          | 560       | 1120                               | 0.6            | 190            | 136    | 5000                                 | 4500    | 290                               |
| ERZE11A751 | 750(675 to 825)             | 460                          | 615       | 1240                               | 0.6            | 210            | 150    | 5000                                 | 4500    | 280                               |
| ERZE11A821 | 820(738 to 902)             | 510                          | 670       | 1355                               | 0.6            | 235            | 165    | 5000                                 | 4500    | 260                               |
| ERZE11A911 | 910(819 to 1001)            | 550                          | 745       | 1500                               | 0.6            | 255            | 180    | 5000                                 | 4500    | 240                               |
| ERZE11A102 | 1000(900 to 1100)           | 625                          | 825       | 1650                               | 0.6            | 280            | 200    | 5000                                 | 4500    | 220                               |
| ERZE11A112 | 1100(990 to 1210)           | 680                          | 895       | 1815                               | 0.6            | 310            | 220    | 5000                                 | 4500    | 200                               |

\*Ip Measuring current of clamping voltage : 50 A

## Dimensions in mm (not to scale)

Unit : mm

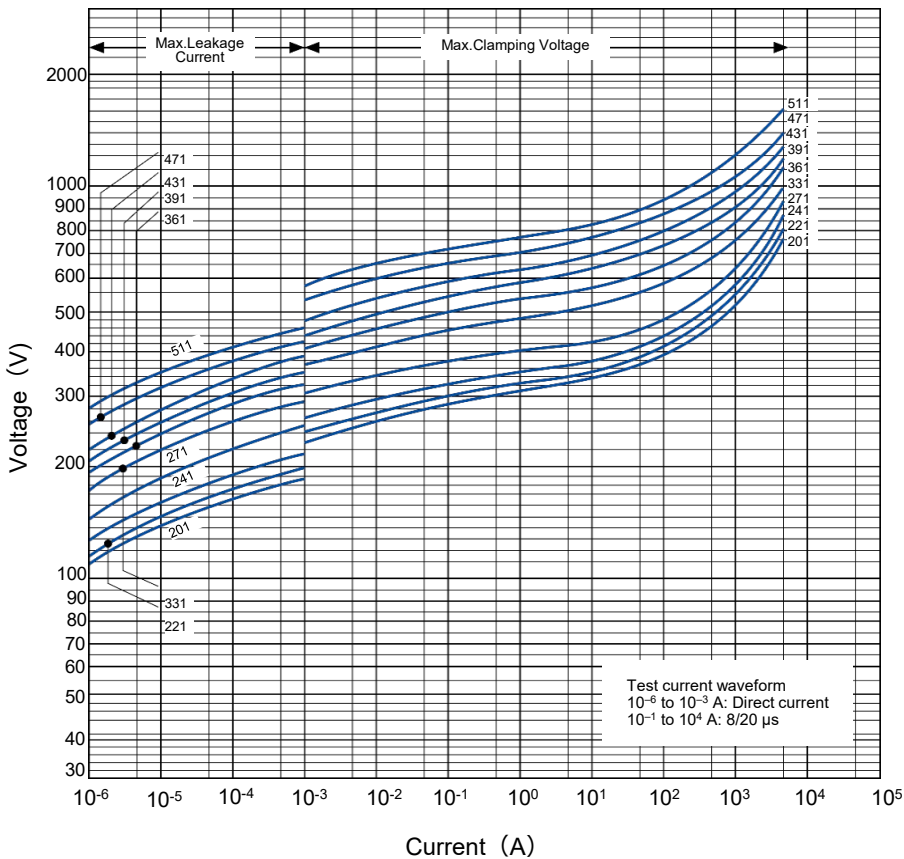
| Part No.   | D max. | T max. | F±1.0 | A max. | L±1.0 |
|------------|--------|--------|-------|--------|-------|
| ERZE11A201 | 13.0   | 5.2    | 7.5   | 17.0   | 1.9   |
| ERZE11A221 | 13.0   | 5.3    | 7.5   | 17.0   | 2.0   |
| ERZE11A241 | 13.0   | 5.4    | 7.5   | 17.0   | 2.1   |
| ERZE11A271 | 13.0   | 5.6    | 7.5   | 17.0   | 2.3   |
| ERZE11A331 | 13.0   | 5.9    | 7.5   | 17.0   | 2.6   |
| ERZE11A361 | 13.0   | 6.1    | 7.5   | 17.0   | 2.8   |
| ERZE11A391 | 13.0   | 6.2    | 7.5   | 17.0   | 2.9   |
| ERZE11A431 | 13.0   | 6.4    | 7.5   | 17.0   | 3.1   |
| ERZE11A471 | 13.0   | 6.6    | 7.5   | 17.0   | 3.3   |
| ERZE11A511 | 13.0   | 6.8    | 7.5   | 17.0   | 3.5   |
| ERZE11A561 | 13.0   | 7.2    | 7.5   | 17.0   | 3.8   |
| ERZE11A621 | 14.0   | 7.5    | 7.5   | 18.0   | 4.2   |
| ERZE11A681 | 14.0   | 7.8    | 7.5   | 18.0   | 4.5   |
| ERZE11A751 | 14.0   | 8.2    | 7.5   | 18.0   | 4.9   |
| ERZE11A821 | 14.0   | 8.5    | 7.5   | 18.0   | 5.2   |
| ERZE11A911 | 14.0   | 9.0    | 7.5   | 18.0   | 5.7   |
| ERZE11A102 | 14.0   | 9.5    | 7.5   | 18.0   | 6.2   |
| ERZE11A112 | 14.0   | 10.1   | 7.5   | 18.0   | 6.8   |



## Typical characteristics

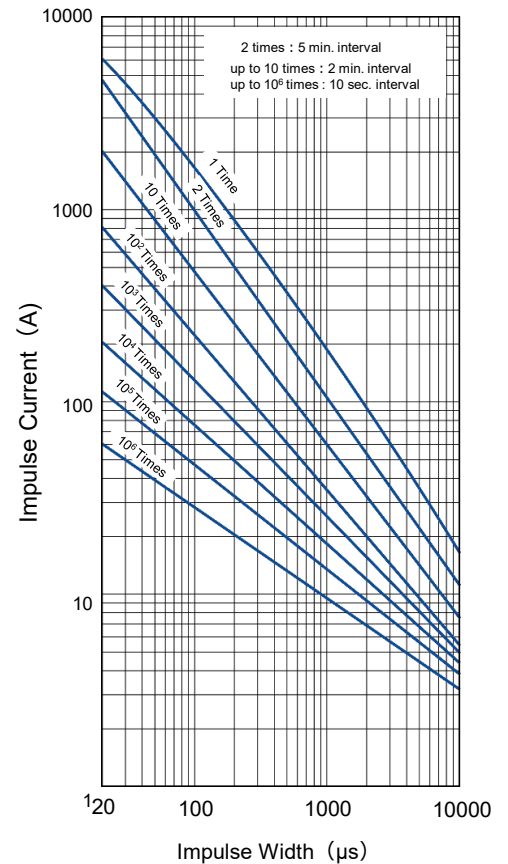
### Voltage vs. Current

ERZE11A201 to ERZE11A511

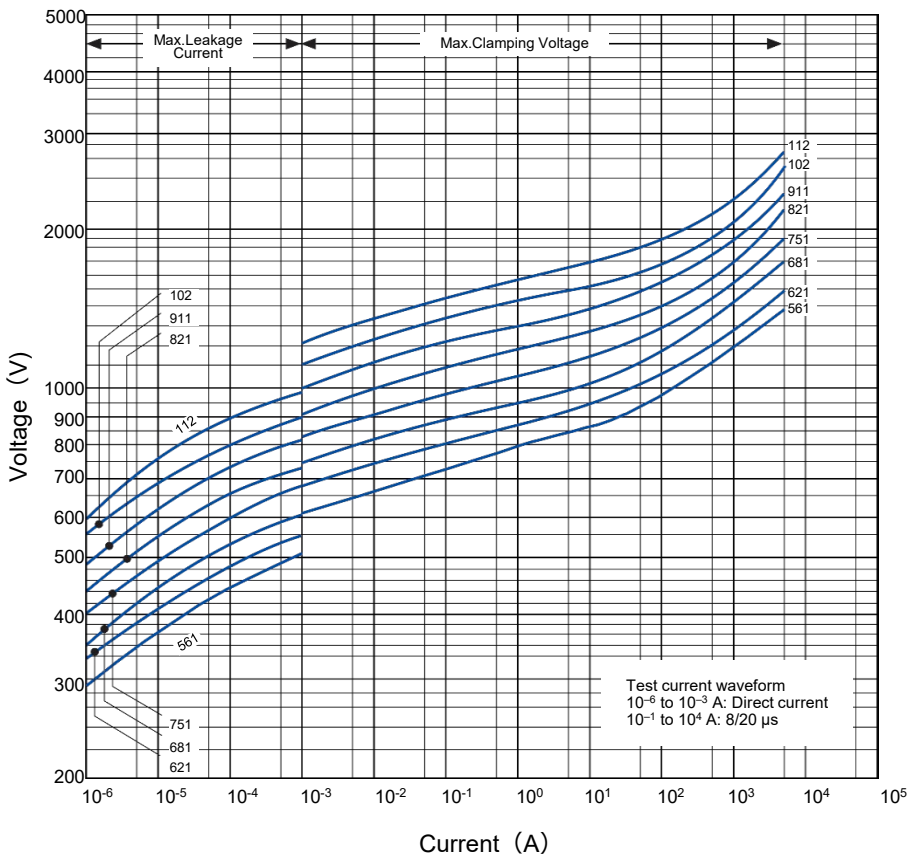


### Impulse Derating (Relation between impulse width and impulse current multiple)

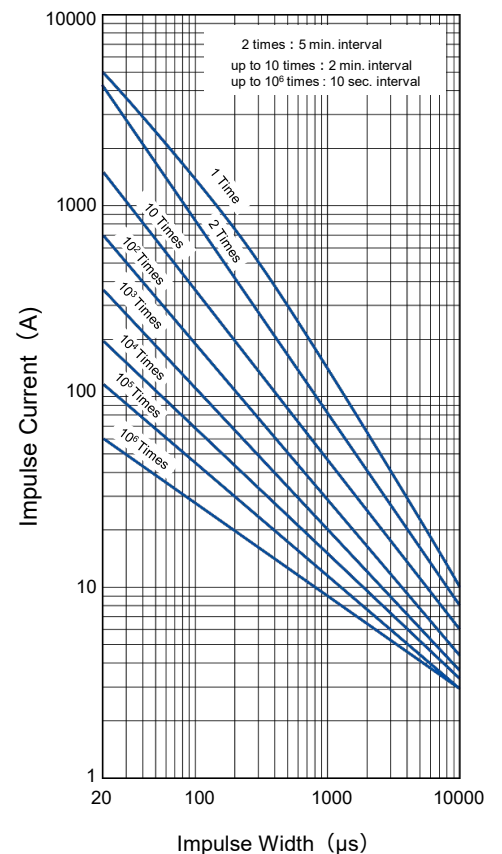
ERZE11A201 to ERZE11A511



ERZE11A561 to ERZE11A112



ERZE11A561 to ERZE11A112



## Ratings and characteristics

●Operating temperature range : -40 to 85 °C

●Storage temperature range : -40 to 125 °C

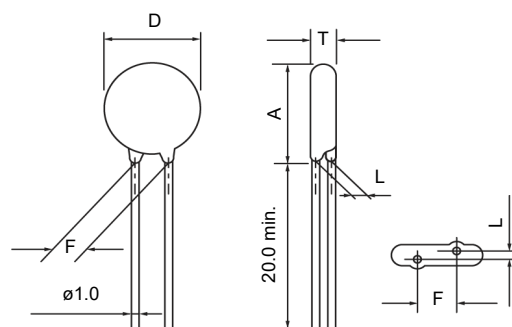
| Part No.   | Varistor voltage<br>at 1 mA | Maximum<br>allowable voltage |           | Clamping<br>voltage<br>(max.) **Ip | Rated<br>power | Maximum energy |        | Maximum<br>peak current<br>(8/20 μs) |         | Capacitance<br>(max.)<br>at 1 kHz |
|------------|-----------------------------|------------------------------|-----------|------------------------------------|----------------|----------------|--------|--------------------------------------|---------|-----------------------------------|
|            |                             | ACrms<br>(V)                 | DC<br>(V) |                                    |                | (10/1000 μs)   | (2 ms) | 1 time                               | 2 times |                                   |
|            | (V)                         |                              |           | (V)                                | (W)            | (J)            | (J)    | (A)                                  | (A)     | (pF)                              |
| ERZE14A201 | 200(185 to 225)             | 130                          | 170       | 340                                | 1.0            | 140            | 100    | 10000                                | 7000    | 1300                              |
| ERZE14A221 | 220(198 to 242)             | 140                          | 180       | 360                                | 1.0            | 155            | 110    | 10000                                | 7000    | 1200                              |
| ERZE14A241 | 240(216 to 264)             | 150                          | 200       | 395                                | 1.0            | 168            | 120    | 10000                                | 7000    | 1100                              |
| ERZE14A271 | 270(247 to 303)             | 175                          | 225       | 455                                | 1.0            | 190            | 135    | 10000                                | 7000    | 1000                              |
| ERZE14A331 | 330(297 to 363)             | 210                          | 270       | 545                                | 1.0            | 228            | 160    | 10000                                | 6500    | 900                               |
| ERZE14A361 | 360(324 to 396)             | 230                          | 300       | 595                                | 1.0            | 255            | 180    | 10000                                | 6500    | 900                               |
| ERZE14A391 | 390(351 to 429)             | 250                          | 320       | 650                                | 1.0            | 275            | 195    | 10000                                | 6500    | 800                               |
| ERZE14A431 | 430(387 to 473)             | 275                          | 350       | 710                                | 1.0            | 303            | 215    | 10000                                | 6500    | 800                               |
| ERZE14A471 | 470(423 to 517)             | 300                          | 385       | 775                                | 1.0            | 350            | 250    | 10000                                | 6500    | 750                               |
| ERZE14A511 | 510(459 to 561)             | 320                          | 410       | 845                                | 1.0            | 382            | 273    | 10000                                | 6500    | 700                               |
| ERZE14A561 | 560(504 to 616)             | 350                          | 450       | 930                                | 1.0            | 382            | 273    | 10000                                | 6500    | 700                               |
| ERZE14A621 | 620(558 to 682)             | 385                          | 505       | 1025                               | 1.0            | 382            | 273    | 7500                                 | 6500    | 650                               |
| ERZE14A681 | 680(612 to 748)             | 420                          | 560       | 1120                               | 1.0            | 382            | 273    | 7500                                 | 6500    | 600                               |
| ERZE14A751 | 750(675 to 825)             | 460                          | 615       | 1240                               | 1.0            | 420            | 300    | 7500                                 | 6500    | 530                               |
| ERZE14A821 | 820(738 to 902)             | 510                          | 670       | 1355                               | 1.0            | 460            | 325    | 7500                                 | 6500    | 500                               |
| ERZE14A911 | 910(819 to 1001)            | 550                          | 745       | 1500                               | 1.0            | 510            | 360    | 7500                                 | 6500    | 400                               |
| ERZE14A102 | 1000(900 to 1100)           | 625                          | 825       | 1650                               | 1.0            | 565            | 400    | 7500                                 | 6500    | 400                               |
| ERZE14A112 | 1100(990 to 1210)           | 680                          | 895       | 1815                               | 1.0            | 620            | 440    | 7500                                 | 6500    | 350                               |

\*Ip Measuring current of clamping voltage : 100 A

## Dimensions in mm (not to scale)

Unit : mm

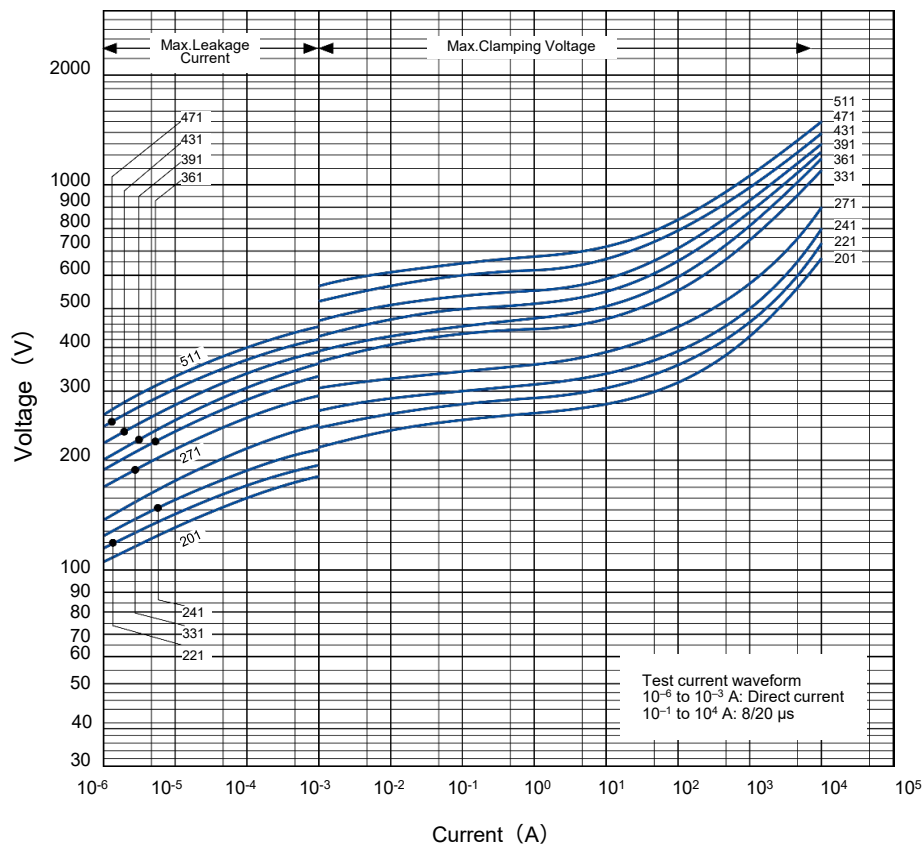
| Part No.   | D max. | T max. | F±1.0 | A max. | L±1.0 |
|------------|--------|--------|-------|--------|-------|
| ERZE14A201 | 16.5   | 5.2    | 10.0  | 20.0   | 2.1   |
| ERZE14A221 | 16.5   | 5.3    | 10.0  | 20.0   | 2.2   |
| ERZE14A241 | 16.5   | 5.4    | 10.0  | 20.0   | 2.3   |
| ERZE14A271 | 16.5   | 5.6    | 10.0  | 20.0   | 2.5   |
| ERZE14A331 | 16.5   | 5.9    | 10.0  | 20.0   | 2.8   |
| ERZE14A361 | 16.5   | 6.1    | 10.0  | 20.0   | 3.0   |
| ERZE14A391 | 16.5   | 6.2    | 10.0  | 20.0   | 3.1   |
| ERZE14A431 | 16.5   | 6.4    | 10.0  | 20.0   | 3.3   |
| ERZE14A471 | 16.5   | 6.6    | 10.0  | 20.0   | 3.5   |
| ERZE14A511 | 16.5   | 6.8    | 10.0  | 20.0   | 3.7   |
| ERZE14A561 | 16.5   | 7.2    | 10.0  | 20.0   | 4.0   |
| ERZE14A621 | 17.5   | 7.5    | 10.0  | 20.5   | 4.4   |
| ERZE14A681 | 17.5   | 7.8    | 10.0  | 20.5   | 4.7   |
| ERZE14A751 | 17.5   | 8.2    | 10.0  | 20.5   | 5.1   |
| ERZE14A821 | 17.5   | 8.5    | 10.0  | 20.5   | 5.4   |
| ERZE14A911 | 17.5   | 9.0    | 10.0  | 20.5   | 5.9   |
| ERZE14A102 | 17.5   | 9.5    | 10.0  | 20.5   | 6.4   |
| ERZE14A112 | 17.5   | 10.1   | 10.0  | 20.5   | 7.2   |



## Typical characteristics

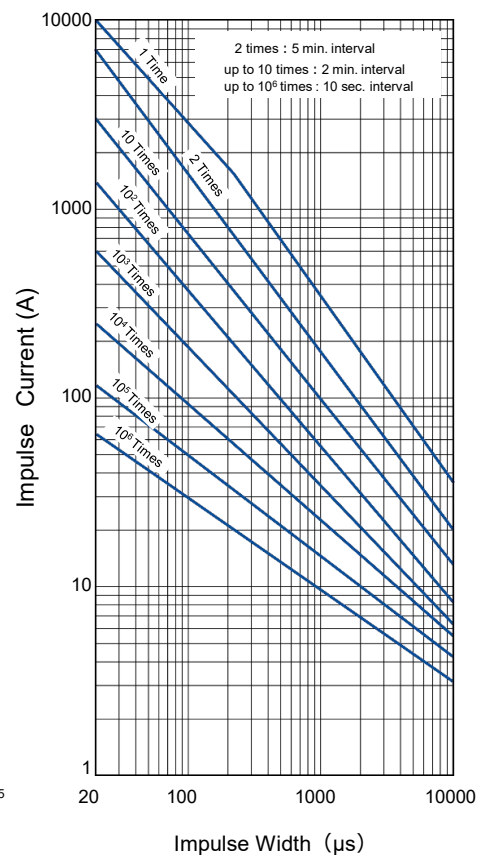
### Voltage vs. Current

ERZE14A201 to ERZE14A511

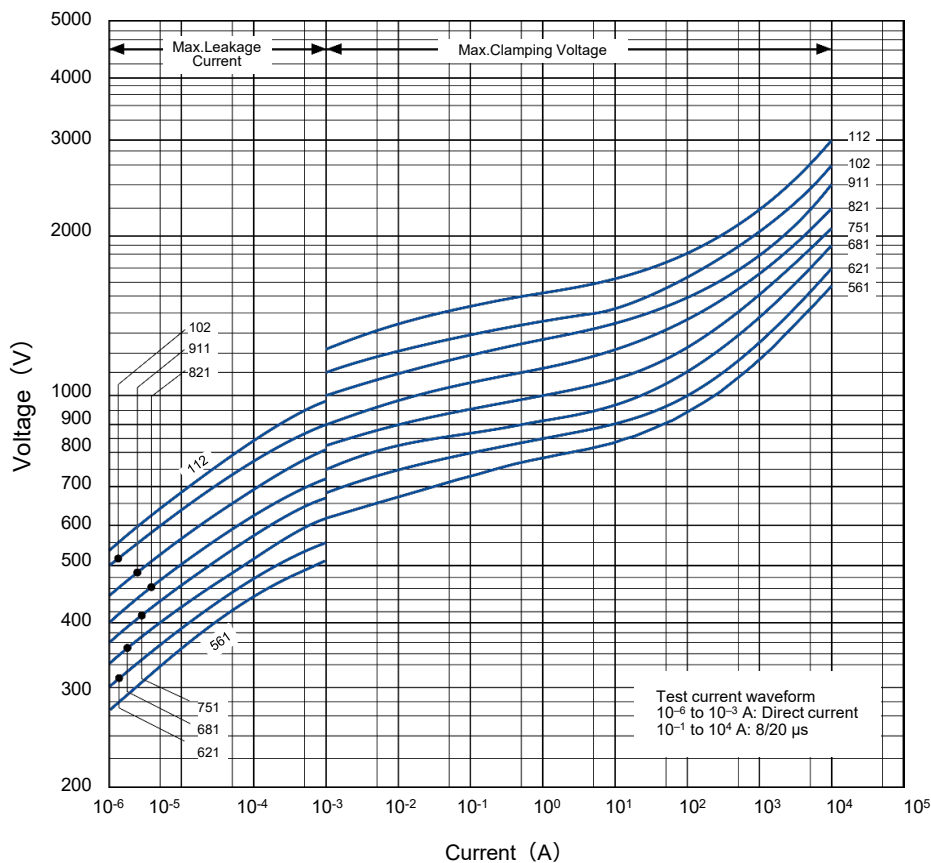


### Impulse Derating (Relation between impulse width and impulse current multiple)

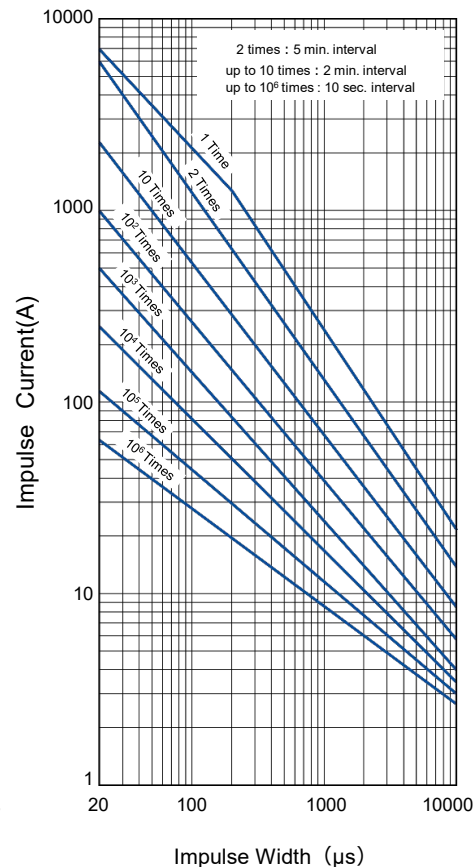
ERZE14A201 to ERZE14A511



ERZE14A561 to ERZE14A112

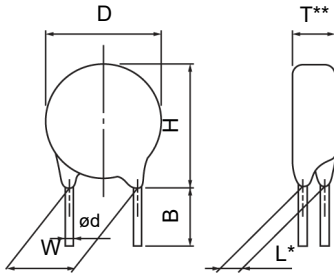


ERZE14A561 to ERZE14A112



**Straight leads cut type (Bulk type)**

※ Ratings and characteristics is refer to bulk standard type.

**Dimensions in mm (not to scale)**

notes \* Dimension "L": Conforms to each individual specification.

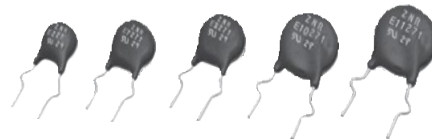
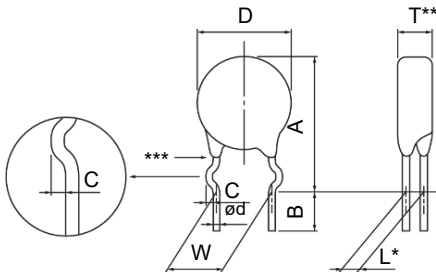
\*\* Dimension "T": Conforms to each individual specification.

Unit : mm

| <div><div>Standard products</div><div>Varister Voltage</div></div> | E5                         | E7                                     |                                        |                                        |                                        | E8                                     |                                        | E10                                    |                                        | E11                                    |                                        |
|--------------------------------------------------------------------|----------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
|                                                                    | 201 to 471                 | 201 to 511                             | 561                                    | 621                                    | 201 to 561                             | 621 to 751                             | 201 to 561                             | 621 to 112                             | 201 to 561                             | 621 to 112                             |                                        |
|                                                                    | D                          | 7.0 max.                               | 9.0 max.                               | 9.0 max.                               | 10.0 max.                              | 10.5 max.                              | 11.5 max.                              | 11.5 max.                              | 12.5 max.                              | 13.0 max.                              | 14.0 max.                              |
|                                                                    | H                          | 10.0 max.                              | 12.5 max.                              | 13.5 max.                              | 13.5 max.                              | 13.5 max.                              | 14.5 max.                              | 15.0 max.                              | 16.0 max.                              | 17.0 max.                              | 18.0 max.                              |
|                                                                    | W                          | 5.0±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                | 7.5±1.0                                |
|                                                                    | ø d                        | 0.60 <sup>+0.06</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> |
|                                                                    | B                          | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                | 4.0±1.0                                |
|                                                                    | Standard products part No. | ERZE05A□□□CS                           |                                        |                                        |                                        | ERZE08A□□□CS                           |                                        | ERZE10A□□□CS                           |                                        | ERZE11A□□□CS                           |                                        |

**Crimped leads cut type (Bulk Type)**

※ Ratings and characteristics is refer to bulk standard type.

**Dimensions in mm (not to scale)**

notes \* Dimension "L": Conforms to each individual specification.

\*\* Dimension "T": Conforms to each individual specification.

\*\*\* Resin extenytions : No resin below the center of the hook.

Unit : mm

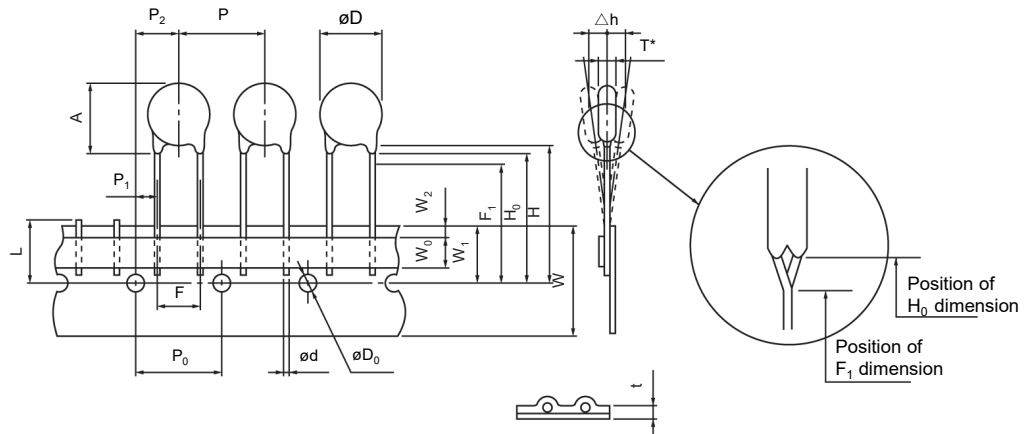
| <div>Series</div> <div>Varister Voltage</div> <div>Symbol</div> | E5                  | E7                  |                     |                     | E8                  |                     | E10                 |                     |                     | E11                 |                     |
|-----------------------------------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                                                                 | 201 to 471          | 201 to 511          | 561                 | 621                 | 201 to 561          | 621 to 751          | 201 to 561          | 621 to 681          | 751 to 112          | 201 to 561          | 621 to 112          |
| D                                                               | 7.0 max.            | 9.0 max.            | 9.0 max.            | 10.0 max.           | 10.5 max.           | 11.5 max.           | 11.5 max.           | 12.5 max.           | 12.5 max.           | 13.0 max.           | 14.0 max.           |
| A                                                               | 13.0 max.           | 15.5 max.           | 16.5 max.           | 16.5 max.           | 17.0 max.           | 18.0 max.           | 18.0 max.           | 19.5 max..          | 20.5 max.           | 20.5 max.           | 21.5 max.           |
| C                                                               | 1.2±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             | 1.4±1.4             |
| W                                                               | 5.0±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             | 7.5±1.0             |
| ø d                                                             | 0.60 +0.06<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 | 0.80 +0.08<br>-0.05 |
| B                                                               | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             | 4.0±1.0             |
| Standard products part No.                                      | ERZE05B□□□CS        | ERZE07B□□□CS        |                     |                     | ERZE08B□□□CS        |                     | ERZE10B□□□CS        |                     |                     | ERZE11B□□□CS        |                     |

## D type / E series (Taping specifications)

### Taping specifications for automated assembly (Straight leads and taping)

※ Ratings and characteristics is refer to bulk standard type.

### Dimensions in mm (not to scale)



※ Dimension "T": Conforms to each individual specification.

Unit : mm

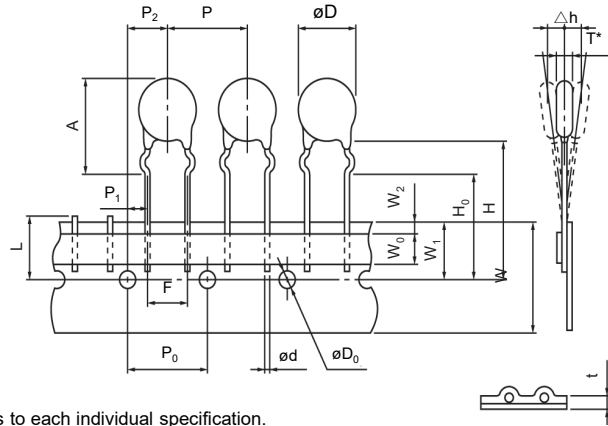
| Series<br><br>Symbol      | E5<br><br>Varister<br>Voltage | E7                                     |                                        |                                        |                                        | E8                                     |                                        |                                        | E10                                    |                                        |                                        | E11                                    |                                        |                                        |                                        |
|---------------------------|-------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
|                           |                               | 201 to 471                             | 201 to 271                             | 331 to 551                             | 561                                    | 621                                    | 201 to 221                             | 241 to 561                             | 621 to 751                             | 201 to 221                             | 241 to 561                             | 621 to 112                             | 201 to 221                             | 241 to 561                             | 621 to 112                             |
| P                         |                               | 12.7±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               |
| P <sub>0</sub>            |                               | 12.7±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               |
| P <sub>1</sub>            |                               | 3.85±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              |
| P <sub>2</sub>            |                               | 6.36±1.30                              | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                |
| ø d                       |                               | 0.60 <sup>+0.06</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> |
| F                         |                               | 5.0±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                |
| △ h                       |                               | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    |
| W                         |                               | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   |
| W <sub>0</sub>            |                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               |
| W <sub>1</sub>            |                               | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                |
| W <sub>2</sub>            |                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               |
| H                         |                               | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             |
| H <sub>0</sub>            |                               | 17.0±0.5                               | 18.0 <sup>+2.0</sup> <sub>0</sub>      | —                                      | —                                      | —                                      | 18.0 <sup>+2.0</sup> <sub>0</sub>      | —                                      | —                                      | 18.0 <sup>+2.0</sup> <sub>0</sub>      | —                                      | —                                      | 18.0 <sup>+2.0</sup> <sub>0</sub>      | —                                      | —                                      |
| F <sub>1</sub>            |                               | —                                      | —                                      | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | —                                      | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | —                                      | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | —                                      | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> | 16.0 <sup>+0.75</sup> <sub>-0.50</sub> |
| ø D <sub>0</sub>          |                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               |
| t                         |                               | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                |
| L                         |                               | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              |
| ø D                       |                               | 7.0 max.                               | 9.0 max.                               | 9.0 max.                               | 9.0 max.                               | 10.0 max.                              | 10.5 max.                              | 10.5 max.                              | 11.5 max.                              | 11.5 max.                              | 11.5 max.                              | 12.5 max.                              | 13.0 max.                              | 13.0 max.                              | 14.0 max.                              |
| A                         |                               | 10.0 max.                              | 12.5 max.                              | 12.5 max.                              | 13.5 max.                              | 13.5 max.                              | 13.5 max.                              | 13.5 max.                              | 14.5 max.                              | 15.0 max.                              | 15.0 max.                              | 16.0 max.                              | 17.0 max.                              | 17.0 max.                              | 18.0 max.                              |
| Standard<br>products part | ERZE05E □□                    | ERZE07E □□□                            |                                        |                                        |                                        | ERZE08E □□□                            |                                        |                                        | ERZE10E □□□                            |                                        |                                        | ERZE11E □□□                            |                                        |                                        |                                        |

## D type / E series (Taping specifications)

### Taping specifications for automated assembly (Crimped leads and taping)

※ Ratings and characteristics is refer to bulk standard type.

### Dimensions in mm (not to scale)



\* Dimension "T": Conforms to each individual specification.

Unit : mm

| Series<br><br>Symbol   | E5                                     | E7                                     |                                        |                                        |                                        | E8                                     |                                        |                                        | E10                                    |                                        |                                        | E11                                    |                                        |  |
|------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|--|
|                        | 201 to 471                             | 201 to 551                             | 561                                    | 621                                    | 201 to 221                             | 241 to 561                             | 621 to 751                             | 201 to 561                             | 621 to 681                             | 751 to 112                             | 201 to 221                             | 241 to 561                             | 621 to 112                             |  |
| P                      | 12.7±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               | 15.0±1.0                               |  |
| P <sub>0</sub>         | 12.7±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               | 15.0±0.3                               |  |
| P <sub>1</sub>         | 3.85±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              | 3.75±0.70                              |  |
| P <sub>2</sub>         | 6.36±1.30                              | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                | 7.5±1.3                                |  |
| ø d                    | 0.60 <sup>+0.06</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> | 0.80 <sup>+0.08</sup> <sub>-0.05</sub> |  |
| F                      | 5.0±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                | 7.5±0.5                                |  |
| △ h                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    | 0±2                                    |  |
| W                      | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   | 18.0 <sup>+1.0</sup> <sub>-0.5</sub>   |  |
| W <sub>0</sub>         | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               | 5.0 min.                               |  |
| W <sub>1</sub>         | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                | 9.0±0.5                                |  |
| W <sub>2</sub>         | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               | 3.0 max.                               |  |
| H                      | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             | Approx. 22                             |  |
| H <sub>0</sub>         | 17.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               | 16.0±0.5                               |  |
| ø D <sub>0</sub>       | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               | ø4.0±0.2                               |  |
| t                      | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                | 0.6±0.3                                |  |
| L                      | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              | 11.0 max.                              |  |
| ø D                    | 7.0 max.                               | 9.0 max.                               | 9.0 max.                               | 10.0 max.                              | 10.5 max.                              | 10.5 max.                              | 11.5 max.                              | 11.5 max.                              | 12.5 max.                              | 12.5 max.                              | 13.0 max.                              | 13.0 max.                              | 14.0 max.                              |  |
| A                      | 13.0 max.                              | 15.5 max.                              | 16.5 max.                              | 16.5 max.                              | 17.0 max.                              | 17.0 max.                              | 18.0 max.                              | 18.0 max.                              | 19.5 max.                              | 20.5 max.                              | 20.5 max.                              | 20.5 max.                              | 21.5 max.                              |  |
| Standard products part | ERZE05F□□□                             | ERZE07F□□□                             |                                        |                                        |                                        | ERZE08F□□□                             |                                        |                                        | ERZE10F□□□                             |                                        |                                        | ERZE11F□□□                             |                                        |  |

## Application note for safety standards

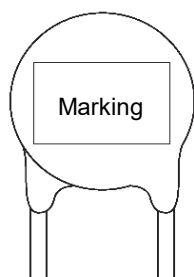
- Approvals products lists in "Reference Guide to Standard Products."
- UL and VDE : Registered in "Type name", it isn't registered in "Panasonic Part No."
- CQC : Registered in "Panasonic Part No."
- "Rated Voltages" are specified for UL recognized components in list shown below.

## The AC rated voltage and maximum allowable voltage

| Type name | Maximum allowable voltage |        | Rated voltage (Vrms) |
|-----------|---------------------------|--------|----------------------|
|           | ACrms (V)                 | DC (V) | UL1449               |
| E*201     | 130                       | 170    | 118                  |
| E*221     | 140                       | 180    | 127                  |
| E*241     | 150                       | 200    | 136                  |
| E*271     | 175                       | 225    | 159                  |
| E*331     | 210                       | 270    | 189                  |
| E*361     | 230                       | 300    | 209                  |
| E*391     | 250                       | 320    | 227                  |
| E*431     | 275                       | 350    | 250                  |
| E*471     | 300                       | 385    | 272                  |
| E*511     | 320                       | 410    | 291                  |
| E*561     | 350                       | 450    | 320                  |
| E*621     | 385                       | 505    | 350                  |
| E*681     | 420                       | 560    | 381                  |
| E*751     | 460                       | 615    | 418                  |
| E*821     | 510                       | 670    | 463                  |
| E*911     | 550                       | 745    | 500                  |
| E*102     | 625                       | 825    | 568                  |
| E*112     | 680                       | 895    | 600                  |

\* : 5 Series is blank, 7 series is 7, 8 series is 8, 10 series is 10, 11 series is 11, 14 series is 14

## Explanation of the contents



| Mark            | Explanation of the content           |                                                                |
|-----------------|--------------------------------------|----------------------------------------------------------------|
| E*□□□           | Abbreviation of part No. (Type Name) | <div> <div>□□□</div> <div>Nominal varistor volage</div> </div> |
| ○               | Factory identification mark          | None : Japan<br>Q : Indonesia                                  |
| ◆ <sup>*1</sup> | Year code                            | 2019 : 9, 2020 : K, 2021 : A<br>2022 : B, 2023 : C, 2024 : D   |
| ◇               | Monthly code                         | Jan : 1 to Sep : 9,<br>Oct. : 0, Nov. : N, Dec. : D            |
| UL              | UL Recognized components mark        |                                                                |

\* : 5 series is blank, 7 series is 7, 8 series is 8, 10 series is 10, 11 series is 11, 14 series is 14

\*1: If the 10's digit of a Christian year is an even year, as an end abbreviation, an alphabetic character is used.

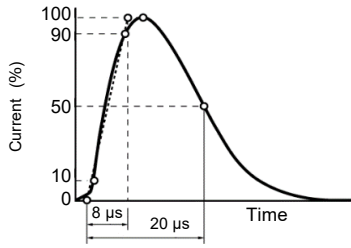
1 : A, 2 : B, 3 : C, 4 : D, 5 : E, 6 : F, 7 : G, 8 : H, 9 : J, 0 : K

If the 10's digit of a Christian year is an odd year, as an end abbreviation, a number is used.

## Marking contents

| Series<br>(Example)<br>Varistor voltage | 5<br>(ERZE05A□□□)    | 7<br>(ERZE07A□□□)     | 8<br>(ERZE08A□□□)     | 10<br>(ERZE10A□□□)     | 11<br>(ERZE11A□□□)     | 14<br>(ERZE14A□□□)     |
|-----------------------------------------|----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|
| 201 or more                             | ZNR<br>E□□□<br>UL○◆◆ | ZNR<br>E7□□□<br>UL○◆◆ | ZNR<br>E8□□□<br>UL○◆◆ | ZNR<br>E10□□□<br>UL○◆◆ | ZNR<br>E11□□□<br>UL○◆◆ | ZNR<br>E14□□□<br>UL○◆◆ |

## Performance characteristics

| Characteristics                        |                                                   | Test methods / description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Specifications               |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|----------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------|-------------------|--------------------|-------|---------------------|---------------------|---------|-----------------|--|--------------------------|--|---------------------|---------------------|--------------------------|--|----------------------|---------------------|--------------------------|--|----------------------|---------------------|--------------------------|--|----------------------|---------------------|--------------------------|--|----------------------|----------------------|--------------------------|--|----------------------|----------------------|---------------------------------------------------|
| Standard test condition                |                                                   | Electrical measurements (initial/after tests) shall be conducted at temperature of 5 to 35°C, relative humidity of maximum 85 %.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | —                            |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| Electrical                             | Varistor voltage                                  | The voltage between two terminals with the specified measuring current 1mA DC applied is called $V_1$ or $V_{1mA}$ . The measurement shall be made as fast as possible to avoid heat affection.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | To meet the specified value. |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Maximum allowable voltage                         | The maximum sinusoidal RMS voltage or maximum DC voltage that can be applied continuously.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Clamping voltage                                  | The maximum voltage between two terminals with the specified standard impulse current (8/20 $\mu$ s) illustrated below applied.<br>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Rated power                                       | The power that can be applied in the specified ambient temperature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Maximum energy                                    | The maximum energy within the varistor voltage change of $\pm 10$ % when a single impulse current of 2 ms or 10/1000 $\mu$ s is applied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Maximum peak current (Withstanding surge current) | 2 times<br>The maximum current within the varistor voltage change of $\pm 10$ % when a standard impulse current of 8/20 $\mu$ s is applied two times with an interval of 5 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | To meet the specified value. |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        |                                                   | 1 time<br>The maximum current within the varistor voltage change of $\pm 10$ % with a single standard impulse current of 8/20 $\mu$ s is applied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Temperature coefficient of varistor voltage       | $\frac{V_{1mA} \text{ at } 85^\circ\text{C} - V_{1mA} \text{ at } 25^\circ\text{C}}{V_{1mA} \text{ at } 25^\circ\text{C}} \times \frac{1}{60} 100(\%/^\circ\text{C})$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Capacitance                                       | Capacitance shall be measured at 1 kHz $\pm 10$ %, 1 Vrms max. (1 MHz $\pm 10$ % below 100 pF), 0 V bias and $20 \pm 2^\circ\text{C}$ .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| Withstanding voltage (Body insulation) |                                                   | AC 1500 Vrms shall be applied between both terminals of the specimen connected together and metal foil closely wrapped round its body for 1 minute.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No breakdown                 |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| Impulse life                           |                                                   | <p>The change of VC shall be measured after the impulse current listed below is applied 10000 or 100000 times continuously with the interval of 10 seconds at room temperature.</p> <table border="1"> <thead> <tr> <th rowspan="3">Part No.</th><th>Item</th><th>Impulse Life( I )</th><th>Impulse Life( II )</th></tr> <tr> <th>Times</th><th><math>\times 10^4</math> Times</th><th><math>\times 10^5</math> Times</th></tr> <tr> <th>Current</th><th colspan="2">Impulse Current</th></tr> </thead> <tbody> <tr> <td>ERZE05A201 to ERZE05A471</td><td></td><td>50 A (8/20 <math>\mu</math>s)</td><td>35 A (8/20 <math>\mu</math>s)</td></tr> <tr> <td>ERZE07A201 to ERZE07A471</td><td></td><td>100 A (8/20 <math>\mu</math>s)</td><td>70 A (8/20 <math>\mu</math>s)</td></tr> <tr> <td>ERZE08A201 to ERZE08A751</td><td></td><td>150 A (8/20 <math>\mu</math>s)</td><td>85 A (8/20 <math>\mu</math>s)</td></tr> <tr> <td>ERZE10A201 to ERZE10A112</td><td></td><td>170 A (8/20 <math>\mu</math>s)</td><td>90 A (8/20 <math>\mu</math>s)</td></tr> <tr> <td>ERZE11A201 to ERZE11A112</td><td></td><td>200 A (8/20 <math>\mu</math>s)</td><td>110 A (8/20 <math>\mu</math>s)</td></tr> <tr> <td>ERZE14A201 to ERZE14A112</td><td></td><td>250 A (8/20 <math>\mu</math>s)</td><td>120 A (8/20 <math>\mu</math>s)</td></tr> </tbody> </table> | Part No.                     | Item                | Impulse Life( I ) | Impulse Life( II ) | Times | $\times 10^4$ Times | $\times 10^5$ Times | Current | Impulse Current |  | ERZE05A201 to ERZE05A471 |  | 50 A (8/20 $\mu$ s) | 35 A (8/20 $\mu$ s) | ERZE07A201 to ERZE07A471 |  | 100 A (8/20 $\mu$ s) | 70 A (8/20 $\mu$ s) | ERZE08A201 to ERZE08A751 |  | 150 A (8/20 $\mu$ s) | 85 A (8/20 $\mu$ s) | ERZE10A201 to ERZE10A112 |  | 170 A (8/20 $\mu$ s) | 90 A (8/20 $\mu$ s) | ERZE11A201 to ERZE11A112 |  | 200 A (8/20 $\mu$ s) | 110 A (8/20 $\mu$ s) | ERZE14A201 to ERZE14A112 |  | 250 A (8/20 $\mu$ s) | 120 A (8/20 $\mu$ s) | $\Delta V_{1mA}/V_{1mA} \leq 0 \text{ to } +20\%$ |
| Part No.                               | Item                                              | Impulse Life( I )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              | Impulse Life( II )  |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Times                                             | $\times 10^4$ Times                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              | $\times 10^5$ Times |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
|                                        | Current                                           | Impulse Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE05A201 to ERZE05A471               |                                                   | 50 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 35 A (8/20 $\mu$ s)          |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE07A201 to ERZE07A471               |                                                   | 100 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 70 A (8/20 $\mu$ s)          |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE08A201 to ERZE08A751               |                                                   | 150 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 85 A (8/20 $\mu$ s)          |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE10A201 to ERZE10A112               |                                                   | 170 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 90 A (8/20 $\mu$ s)          |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE11A201 to ERZE11A112               |                                                   | 200 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 110 A (8/20 $\mu$ s)         |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |
| ERZE14A201 to ERZE14A112               |                                                   | 250 A (8/20 $\mu$ s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 120 A (8/20 $\mu$ s)         |                     |                   |                    |       |                     |                     |         |                 |  |                          |  |                     |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                     |                          |  |                      |                      |                          |  |                      |                      |                                                   |

## Performance characteristics

| Characteristics                     |                                                                                                                                                                                                                                                                                 | Test methods / description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Specifications                         |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------|------------------|-------|---------|--------|---------------------------------|------------------|------|---|-------|------|---|------------------|------|---------------------------------------------------------------------------|
| Mechanical                          | Robustness of terminations (Tensile)                                                                                                                                                                                                                                            | After gradually applying the force specified below and keeping the unit fixed for 10 seconds, the terminal shall be visually examined for any damage.<br><br><table><tr><td>Terminal diameter</td><td>Force</td></tr><tr><td>ø0.6 mm, ø0.8 mm</td><td>9.8 N</td></tr><tr><td>ø1.0 mm</td><td>19.6 N</td></tr></table>                                                                                                                                                                                         | Terminal diameter                      | Force           | ø0.6 mm, ø0.8 mm | 9.8 N | ø1.0 mm | 19.6 N | No remarkable mechanical damage |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Terminal diameter                                                                                                                                                                                                                                                               | Force                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | ø0.6 mm, ø0.8 mm                                                                                                                                                                                                                                                                | 9.8 N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | ø1.0 mm                                                                                                                                                                                                                                                                         | 19.6 N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Robustness of terminations (Bending)                                                                                                                                                                                                                                            | The unit shall be secured with its terminal kept vertical and the force specified below shall be applied in the axial direction. The terminal shall gradually be bent by 90 ° in one direction, then 90 ° in the opposite direction, and again back to the original position. The damage of the terminal shall be visually examined.<br><br><table><tr><td>Terminal diameter</td><td>Force</td></tr><tr><td>ø0.6 mm, ø0.8 mm</td><td>4.9 N</td></tr><tr><td>ø1.0 mm</td><td>9.8 N</td></tr></table>           | Terminal diameter                      | Force           | ø0.6 mm, ø0.8 mm | 4.9 N | ø1.0 mm | 9.8 N  |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| Terminal diameter                   | Force                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| ø0.6 mm, ø0.8 mm                    | 4.9 N                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| ø1.0 mm                             | 9.8 N                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| Vibration                           | After repeatedly applying a single harmonic vibration (amplitude: 0.75 mm, double amplitude: 1.5 mm) with 1 minute vibration frequency cycles (10 Hz to 55 Hz to 10 Hz) to each of three perpendicular directions for 2 hours. Thereafter, the unit shall be visually examined. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| Solderability                       | After dipping the terminals to a depth of approximately 3 mm from the body in a soldering bath of 235±5℃ for 2±0.5 seconds, the terminal shall be visually examined.                                                                                                            | Approximately 95 % of the terminals shall be covered with new solder uniformly.                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Resistance to soldering heat                                                                                                                                                                                                                                                    | After each lead shall be dipped into a solder bath having a temperature of 260±5℃ to a point 2.0 to 2.5 mm from the body of the unit, using shielding board (t=1.5 mm), be held there for 10±1 s and then be stored at room temperature and normal humidity for 1 to 2 hours. The change of VCmA and mechanical damages shall be examined.                                                                                                                                                                    | $\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$ |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| Environmental                       | High temperature storage/Dry heat                                                                                                                                                                                                                                               | The specimen shall be subjected to 125±2℃ for 1000 hours in a thermostatic bath without load and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of VCmA shall be measured.                                                                                                                                                                                                                                                                                      | $\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$ |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Humidity                                                                                                                                                                                                                                                                        | The specimen shall be subjected to 40±2℃, 90 to 95 % RH for 1000 hours without load and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of VCmA shall be measured.                                                                                                                                                                                                                                                                                               | $\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$ |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Temperature cycle                                                                                                                                                                                                                                                               | The temperature cycle shown below shall be repeated five cycles and then stored at room temperature and normal humidity for 1 to 2 hours. The change of VCmA and mechanical damage shall be examined.<br><table><tr><th>Step</th><th>Temperature (℃)</th><th>Period (minutes)</th></tr><tr><td>1</td><td>-40±3</td><td>30±3</td></tr><tr><td>2</td><td>Room temperature</td><td>15±3</td></tr><tr><td>3</td><td>125±2</td><td>30±3</td></tr><tr><td>4</td><td>Room temperature</td><td>15±3</td></tr></table> | Step                                   | Temperature (℃) | Period (minutes) | 1     | -40±3   | 30±3   | 2                               | Room temperature | 15±3 | 3 | 125±2 | 30±3 | 4 | Room temperature | 15±3 | $\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$<br>No remarkable mechanical damage |
|                                     | Step                                                                                                                                                                                                                                                                            | Temperature (℃)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Period (minutes)                       |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | 1                                                                                                                                                                                                                                                                               | -40±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30±3                                   |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | 2                                                                                                                                                                                                                                                                               | Room temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 15±3                                   |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| 3                                   | 125±2                                                                                                                                                                                                                                                                           | 30±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| 4                                   | Room temperature                                                                                                                                                                                                                                                                | 15±3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| High temperature load/Dry heat load | After being continuously applied the Maximum Allowable Voltage at 85±2℃ for 1000 hours, the specimen shall be stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of VCmA shall be measured.                                                | $\Delta V_{1mA}/V_{1mA} \leq \pm 10 \%$                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
| Damp heat load/ Humidity load       | The specimen shall be subjected to 40±2℃, 90 to 95 % RH and the Maximum Allowable Voltage for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of VCmA shall be measured.                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |
|                                     | Low temperature storage/Cold                                                                                                                                                                                                                                                    | The specimen shall be subjected to -40±2℃ without load for 1000 hours and then stored at room temperature and normal humidity for 1 to 2 hours. Thereafter, the change of VCmA shall be measured.                                                                                                                                                                                                                                                                                                             | $\Delta V_{1mA}/V_{1mA} \leq \pm 5 \%$ |                 |                  |       |         |        |                                 |                  |      |   |       |      |   |                  |      |                                                                           |

## Minimum quantity / Packing unit

| Product                        | Series / Type      |                             | Part number              | Minimum quantity / Packing unit | Packing quantity in carton | Carton (about) L×W×H (mm) |
|--------------------------------|--------------------|-----------------------------|--------------------------|---------------------------------|----------------------------|---------------------------|
| Varistors (ZNR Surge Absorber) | D type<br>E series | Straight leads<br><Bulk>    | ERZE05A201 to 471        | 100                             | 10000                      | 210×340×180               |
|                                |                    |                             | ERZE07A201 to 391        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE07A431 to 621        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE08A201 to 331        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE08A361 to 511        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE08A561 to 751        | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE10A201 to 241        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE10A271 to 431        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE10A471 to 112        | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE11A201 to 361        | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE11A391 to 561        | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE11A621 to 112        | 50                              | 1000                       | 210×340×110               |
|                                |                    |                             | ERZE14A201 to 221        | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE14A241 to 431        | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE14A471 to 112        | 50                              | 1000                       | 210×340×110               |
|                                |                    | Leads cut type<br><Bulk>    | ERZE05A(B)201CS to 471CS | 100                             | 10000                      | 210×340×180               |
|                                |                    |                             | ERZE07A(B)201CS to 391CS | 100                             | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE07A(B)431CS to 621CS | 50                              | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE08A(B)201CS to 331CS | 100                             | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE08A(B)361CS to 511CS | 50                              | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE08A(B)561CS to 751CS | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE10A(B)201CS to 241CS | 100                             | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE10A(B)271CS to 431CS | 50                              | 4000                       | 210×340×110               |
|                                |                    |                             | ERZE10A(B)471CS to 112CS | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE11A(B)201CS to 361CS | 50                              | 3000                       | 210×340×110               |
|                                |                    |                             | ERZE11A(B)391CS to 561CS | 50                              | 2000                       | 210×340×110               |
|                                |                    |                             | ERZE11A(B)621CS to 112CS | 50                              | 2000                       | 210×340×110               |
|                                |                    | Straight leads<br>and taped | ERZE05E201 to 471        | 1000                            | 10000                      | 400×360×260               |
|                                |                    |                             | ERZE07E201 to 271        | 1000                            | 10000                      | 400×360×260               |
|                                |                    |                             | ERZE07E331 to 471        | 1000                            | 10000                      | 470×360×260               |
|                                |                    |                             | ERZE07E511 to 621        | 500                             | 5000                       | 400×360×260               |
|                                |                    |                             | ERZE08E201 to 271        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08E331 to 431        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08E471 to 511        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08E561 to 751        | 500                             | 500                        | 360×270×320               |
|                                |                    |                             | ERZE10E201 to 241        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10E271 to 471        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10E511 to 561        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10E621 to 112        | 500                             | 500                        | 360×270×320               |
|                                |                    |                             | ERZE11E201 to 271        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE11E331 to 511        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE11E561 to 112        | 500                             | 500                        | 360×270×320               |
|                                |                    | Crimped lead<br>and taped   | ERZE05F201 to 471        | 1000                            | 10000                      | 400×360×260               |
|                                |                    |                             | ERZE07F201 to 271        | 1000                            | 10000                      | 400×360×260               |
|                                |                    |                             | ERZE07F331 to 471        | 1000                            | 10000                      | 470×360×260               |
|                                |                    |                             | ERZE07F511 to 621        | 500                             | 5000                       | 400×360×260               |
|                                |                    |                             | ERZE08F201 to 271        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08F331 to 431        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08F471 to 511        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE08F561 to 751        | 500                             | 500                        | 360×270×320               |
|                                |                    |                             | ERZE10F201 to 241        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10F271 to 471        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10F511 to 561        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE10F621 to 112        | 500                             | 500                        | 360×270×320               |
|                                |                    |                             | ERZE11F201 to 271        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE11F331 to 511        | 1000                            | 5000                       | 360×310×320               |
|                                |                    |                             | ERZE11F561 to 112        | 500                             | 500                        | 360×270×320               |

Part No., quantity and country of origin are designated on outer packages in English.

※Please contact local sales office about packing specifications.

## **Guidelines and precautions regarding the technical information and use of our products described in this online catalog.**

- If you want to use our products described in this online catalog for applications requiring special qualities or reliability, or for applications where the failure or malfunction of the products may directly jeopardize human life or potentially cause personal injury (e.g. aircraft and aerospace equipment, traffic and transportation equipment, combustion equipment, medical equipment, accident prevention, anti-crime equipment, and/or safety equipment), it is necessary to verify whether the specifications of our products fit to such applications. Please ensure that you will ask and check with our inquiry desk as to whether the specifications of our products fit to such applications use before you use our products.
- The quality and performance of our products as described in this online catalog only apply to our products when used in isolation. Therefore, please ensure you evaluate and verify our products under the specific circumstances in which our products are assembled in your own products and in which our products will actually be used.
- Please ensure the safety by means of protection circuit, redundant circuit etc. in your system design in order to prevent the occurrence of life crisis and other serious damages due to the failure of our products.
- The products and product specifications described in this online catalog are subject to change for improvement without prior notice. Therefore, please be sure to request and confirm the latest product specifications which explain the specifications of our products in detail, before you finalize the design of your applications, purchase, or use our products.
- The technical information in this online catalog provides examples of our products' typical operations and application circuits. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right, or interest in our intellectual property.
- If any of our products, product specifications and/or technical information in this online catalog is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially with regard to security and export control, shall be observed.

## **<Regarding the Certificate of Compliance with the EU RoHS Directive/REACH Regulations>**

- The switchover date for compliance with the RoHS Directive/REACH Regulations varies depending on the part number or series of our products.
- When you use the inventory of our products for which it is unclear whether those products are compliant with the RoHS Directive/REACH Regulation, please select "Sales Inquiry" in the website inquiry form and contact us.

**Please note that we do not owe any liability and responsibility if our products are used beyond the description of this catalog or without complying with precautions in this catalog.**

**Handling Precautions (D type / E, E-S1 series)****1. Safety precautions**

In case that a Varistors (ZNR Surge Absorber) (hereafter referred to as the ZNR, or product name) is used, if an abnormality takes place because of peripheral conditions of the ZNR(material, environments, power source conditions, circuit conditions, etc. in equipment design), fire, electric shock, burn, or product failure may occur. The precautions for this product are described below, understand the content thoroughly before usage. For more questions, contact us.

If there's any uncertainty/doubt/products safety items, please contact us. When a dogma shall be occurred about safety for this products, be sure to inform us rapidly, operate your technical examination.

**2. Precautions to be strictly observed****2.1 Confirmation of performance ratings**

Use the ZNR within its rated range of performance such as the Max. allowable voltage, withstanding surge current, withstanding energy, impulse life(surge life), average pulse power, and operating temperature range. If used outside the range, the ZNR can be degrade and have element fracture, which may result in smoking and ignition.

**2.2 To avoid accidents due to unexpected phenomena, take the following measures**

- In the event of fracture of the ZNR, its pieces may scatter ; hence, put the case or cover of the set product in place.
- Do not install the ZNR near combustible substances(polyvinyl chloride wires, resin moldings, etc.). If it is difficult to do, install a nonflammable cover.
- Across-the-line use  
When the ZNR is used across a line, put a current fuse in series with the ZNR(Refer to Item 3.1-1). (4) .
- Use between line to ground
  - (1) If the case that the ZNR is used between a line to the ground, the short-circuit of the ZNR may not blow the current fuse because of grounding resistance, which may cause smoking and ignition of the ZNR's exterior resin.  
As the measure against it, install an earth leakage breaker on the power supply side of the ZNR position. If no earth leakage breaker is installed, use a thermal fuse together with a current fuse in series. (Refer to Table 1.)
  - (2) If the case that the ZNR is used between a live part to metal case, an electric shock may develop at a shortcircuit of the ZNR ; hence, ground the metal case to the ground or keep it from the human body.

**2.3 If ZNR is shorted out and happen smoke or ignition, please cut provided current to ZNR immediately.****3. Application notes****3.1 Pay attention to the following items to avoid the shortened life and failure of the ZNR****3.1-1 Circuit conditions**

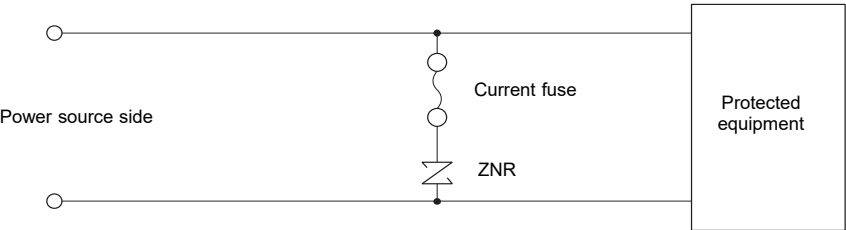
- (1) Select a ZNR of which the maximum voltage including fluctuations in source voltage allows for the maximum permissible circuit voltage. (Refer to Table 1.)
- (2) In cases that surges are intermittently applied at short intervals(for example, in case that the voltage of the noise simulator test is implemented etc.), do not let them exceed the ZNR's rated power.
- (3) Select a ZNR recommended in Table 1.
  - ① Across-the-line use  
If possible, use a Part No. marked with \* in case of voltage temporarily rises load unbalance of separately-wired loads, short between hot and neutral-line, open of neutral line in single-phase-three-wired system, and due to resonance at switching for a capacitive, inductive load.
  - ② Used between line to ground  
Use a different Part No. from "Across-the-line use" as table 1, because of raising voltage in case of "Line to Ground Fault".  
Use a Part No. marked with \*\*in table 1, in case of the insulation resistance test(500 VDC) for equipment.  
When using a Part of the varistor voltage that the insulation efficiency examination can not be cleared, there is a case where the surge absorber can be done by removing it from the circuit depending on the circuit condition(Refer examination of Japan Domestic Safety Regulations).
- (4) Concerning current fuse
  - ① We recommend selecting a ZNR and the rated current of a current fuse as follows.  
Finally, please be sure that there is no danger if the ZNR mounted on the equipment breaks.

●D type / E, E-S1 series

| Standard Part No.  | ERZE05A□□□ | ERZE07A□□□ | ERZE08A□□□ | ERZE10A□□□ | ERZE11A□□□ | ERZE14A□□□ |
|--------------------|------------|------------|------------|------------|------------|------------|
| Fuse rated current | 5 A max.   | 7 A max.   | 7 A max.   | 10 A max.  | 10 A max.  | 10 A max.  |

◆ Fuses shall use rated voltages appropriate for circuits.

- ② The recommended fuse position is shown in table 1, “Example of ZNR application”, however, if the load current of protected equipment is larger than that of the above recommended fuse rated current, install a current fuse at the position shown below.



- (5) Concerning thermal fuse
- ① Set a thermal fuse to get high thermal

Table 1 Example of ZNR application

| Connections example                                   | <div>Across-the-Line use</div> <div>DC/AC<br/>Single-phase</div>                                                                                                                                                                                                                                                                                                                                    | <div>Use between Line to ground</div> <div>DC/AC<br/>Single-phase</div> |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------|--------------------------|----------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-----------|-------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------------|--------------------------|--|----------------|----------------|-----|-----|-----|---|------|---|----------------|---|----------------|-----|---|------|---|----------------|---|-------|---|
|                                                       | <div>AC 3-phase</div>                                                                                                                                                                                                                                                                                                                                                                               | <div>AC 3-phase</div>                                                   |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
| Example of varistor voltage                           | <table><tr><th>ZNR</th><th>Source voltage [AC]</th><th>Nominal varistor voltage</th></tr><tr><td rowspan="6">ZNR 1<br/>ZNR 3</td><td>100 V</td><td>201 to 361*</td></tr><tr><td>120 V</td><td>241 to 431*</td></tr><tr><td>200 V</td><td>471 to 621*</td></tr><tr><td>220 V</td><td>471 to 621*</td></tr><tr><td>240 V</td><td>511, 621*</td></tr><tr><td>380 V</td><td>751, 821*</td></tr></table> | ZNR                                                                     | Source voltage [AC]      | Nominal varistor voltage | ZNR 1<br>ZNR 3 | 100 V | 201 to 361* | 120 V | 241 to 431* | 200 V | 471 to 621* | 220 V | 471 to 621* | 240 V | 511, 621* | 380 V | 751, 821* | <table><tr><th>ZNR</th><th>Source voltage [AC]</th><th colspan="2">Nominal varistor voltage</th></tr><tr><td rowspan="8">ZNR 2<br/>ZNR 4</td><td rowspan="4">100 V<br/>220 V</td><td>471</td><td>471</td></tr><tr><td>511</td><td>-</td></tr><tr><td>621*</td><td>-</td></tr><tr><td>821 and more**</td><td>-</td></tr><tr><td rowspan="4">230 V<br/>240 V</td><td>511</td><td>-</td></tr><tr><td>621*</td><td>-</td></tr><tr><td>821 and more**</td><td>-</td></tr><tr><td>112**</td><td>-</td></tr></table> | ZNR | Source voltage [AC] | Nominal varistor voltage |  | ZNR 2<br>ZNR 4 | 100 V<br>220 V | 471 | 471 | 511 | - | 621* | - | 821 and more** | - | 230 V<br>240 V | 511 | - | 621* | - | 821 and more** | - | 112** | - |
|                                                       | ZNR                                                                                                                                                                                                                                                                                                                                                                                                 | Source voltage [AC]                                                     | Nominal varistor voltage |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
| ZNR 1<br>ZNR 3                                        | 100 V                                                                                                                                                                                                                                                                                                                                                                                               | 201 to 361*                                                             |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 120 V                                                                                                                                                                                                                                                                                                                                                                                               | 241 to 431*                                                             |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 200 V                                                                                                                                                                                                                                                                                                                                                                                               | 471 to 621*                                                             |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 220 V                                                                                                                                                                                                                                                                                                                                                                                               | 471 to 621*                                                             |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 240 V                                                                                                                                                                                                                                                                                                                                                                                               | 511, 621*                                                               |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 380 V                                                                                                                                                                                                                                                                                                                                                                                               | 751, 821*                                                               |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
| ZNR                                                   | Source voltage [AC]                                                                                                                                                                                                                                                                                                                                                                                 | Nominal varistor voltage                                                |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
| ZNR 2<br>ZNR 4                                        | 100 V<br>220 V                                                                                                                                                                                                                                                                                                                                                                                      | 471                                                                     | 471                      |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 511                                                                     | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 621*                                                                    | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 821 and more**                                                          | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       | 230 V<br>240 V                                                                                                                                                                                                                                                                                                                                                                                      | 511                                                                     | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 621*                                                                    | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 821 and more**                                                          | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                     | 112**                                                                   | -                        |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |
| Note : Element size is selected by impulse condition. |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                         |                          |                          |                |       |             |       |             |       |             |       |             |       |           |       |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |                     |                          |  |                |                |     |     |     |   |      |   |                |   |                |     |   |      |   |                |   |       |   |

## (6) On use for equipment

The catalog guarantees the quality as individual component.

Before you use the products, please make sure to check and evaluate the products in the circumstance where they are installed in your product.

**3.1-2 Operating environments**

## (1) The ZNR is designed and manufactured for application in general purpose electronic devices.

The ZNR shall not be exposed to the weather, except for usage inside unit.

## (2) Do not use the ZNR in places exposed to temperatures beyond the operating temperature range, such as places exposed to sunlight and vicinities of heating equipment.

## (3) Do not use the ZNR in places exposed to high temperatures and high humidity, such as places exposed directly to rain, wind, dew condensation, and vapor.

## (4) Do not use the ZNR in dusty and salinity environment and atmospheres polluted by corrosive gases, in liquids such as water, oil, chemical, organic solvent.

**3.1-3 Processing conditions**

## (1) Do not wash the ZNR by such solvents(thinner, acetone, etc.) as its exterior resin deteriorates.

## (2) Do not apply a strong vibration or shock (by falling, etc.) to the ZNR, cracking to its exterior resin and element may occur.

## (3) When coating the ZNR with resin(including molding), do not use such resin.

## (4) Do not bend the ZNR type D lead wires at the position close to its ZNR type D exterior resin, or apply external force to the position.

## (5) When soldering the ZNR lead wires, follow the recommended conditions and do not melt the solder and insulating materials constituting the ZNR.

## (6) When designing lead-wire-terminal land-hole of circuit board, please check actual ZNR by reference specification about center value of lead-wire terminal pitch.

|        | Soldering method | Recommended condition      | Attention item                              |
|--------|------------------|----------------------------|---------------------------------------------|
| D type | Flow soldering   | 260 °C, within 10 seconds. | D type is not reflow soldering object part. |

\*1: Soldering iron temperature should not exceed 400 °C and should not be applied for more than 5 seconds.

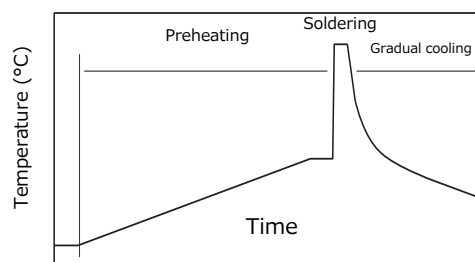
\*2: Profile be careful because there is a margin of error in the way of measuring.

\*3: The temperature depends on the size and the package density of the substrate.

Therefore, confirm every kind of the substrate.

## ●Soldering temperature-time profile to recommend

Flow soldering



|                 |                      |            |
|-----------------|----------------------|------------|
| Preheating      | The normal to 130 °C | max. 120 s |
| Soldering       | max. 260 °C          | max. 10 s  |
| Gradual cooling | Gradual cooling      |            |

**3.1-4 Long-term storage**

## (1) Do not store the ZNR under high temperature and high humidity. Store it indoor environment at a temperature up to 40 °C and at humidity below 75 %RH, and use it within two years.

Before using the ZNR that has been stored for a long period(two years or longer), confirm the solderability.

## (2) Avoid atmospheres full of corrosive gases (hydrogen sulfide, sulfurous acid, chlorine, ammonia, etc.).

## (3) Avoid direct sunlight and dew condensation.

**3.1-5 Rated Voltage for UL or other safety certifications**

Our ZNR define “ Max. Allowable Voltage ” and “ Rated Voltage “ to keep leakage current specification and others.

If you getting certificate of safety approval about your equipment with our ZNR, please follow our “ Rated Voltage ”.

**3.1-6 Dropped product**

Do not drop this product on the floor. If this product is dropped, it can be damaged mechanically or electrically.

Avoid using the dropped product.

#### 4. Notices

- Our ZNR was designed and manufactured for standard applications such as general electronics devices, office equipment, information and communications equipment, measuring instruments, household appliances and audio-video equipment.
- For applications in which special quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or cause threat of personal injury (such as for aircraft and aerospace equipment, traffic and transport equipment, combustion equipment, medical equipment, accident prevention and anti-theft devices, and safety equipment), please be sure to consult with our sales representative in advance and to exchange product specifications which conform to such applications.
- Applications in which special quality and reliability are required, or if the failure or malfunction of the products may.
- Note that we do not take any responsibility for faults and abnormalities resulting from the use not in conformity with the contents of entries in the delivery specification.
- There is a possibility that the ZNR will unexpectedly cause smoke or ignite because of an abnormal rise of the circuit voltage and invasion of excessive surge. To prevent that accident from spreading over the equipment and not to expand the damage, use multiplex protection such as the adoption of flame-retardant materials for housing parts and structural parts.

#### 5. Applicable laws and regulations , others

- This product not been manufactured with any ozone depleting chemical controlled under the Montreal Protocol.
- This product comply with RoHS (Restriction of the use of certain Hazardous Substance in electrical and electronic equipment) (DIRECTIVE 2011/65/EU and (EU)2015/863).
- All the materials used in this part are registered material under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substance.
- If you need the notice by letter of "A preliminary judgement on the Laws of Japan foreign exchange and Foreign Trade Control", be sure to let us know.
- These products are not dangerous goods on the transportation as identified by UN(United nations) numbers or UN classification.

#### 6. Others

- As to the disposal of ZNR, check the method of disposal in each country or origin where the ZNR are incorporated in your products to be used.
- The technical information in this specification provides example of our products' typical operations and application circuit. We do not guarantee the non-infringement of third party's intellectual property rights and we do not grant any license, right or interest in our intellectual property.