

# CURRENT REGULATIVE DIODE

## CRD

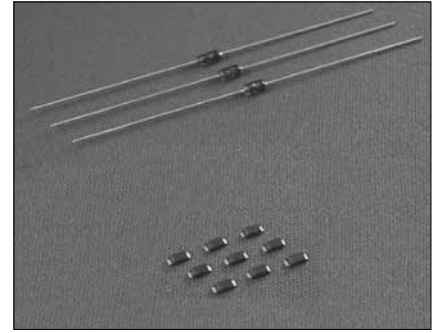
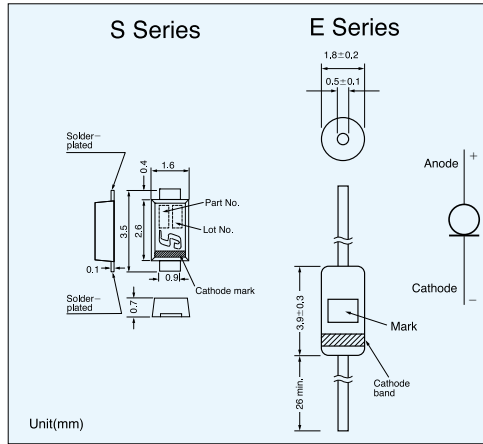
CRD is a diode which supplies constant current to an electric circuit, even when power supply voltage fluctuations or load impedance fluctuations occur.

CRD is used for current stabilization and current limiting.

### Part number

**102**

- Packing condition
  - None : E Series, Individually packed in a bag
  - 26Z : E Series, 26mm wide axial tapping winding type
  - 26R : E Series, 26mm wide axial tapping role type
  - 52Z : E Series, 52mm wide axial tapping winding type
  - 52R : E Series, 52mm wide axial tapping role type
  - RE : E Series, Radial tapping winding type
  - T : S Series, Taping role
- Pinch off current
  - e.g.) : 301 →  $30 \times 10^1 \mu\text{A} = 0.3\text{mA}$
  - 102 →  $10 \times 10^2 \mu\text{A} = 1.0\text{mA}$
  - 452 →  $45 \times 10^2 \mu\text{A} = 4.5\text{mA}$
- E : Lead wire type
- S : SMD type



### Specifications

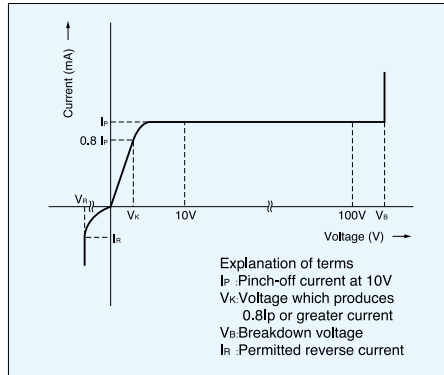
| Part No. |           | Pinch-off current*1 |                       | Limiting current*2 |             | Limiting current ratio<br>$I_{100V}/I_{p*}I_{30V}/I_p$ | Temperature Coefficient<br>(%/°C) |
|----------|-----------|---------------------|-----------------------|--------------------|-------------|--|-----------------------------------|
| SMD      | With Lead | Test Voltage        | $I_p$ (mA)<br>Typical | min~max            | $V_k$ (V)   |  |                                   |
| S-101T   | E-101     | 10V                 | 0.10                  | 0.05~0.21          | 0.5         | 1.1max   | +2.10~+0.10                       |
| S-301T   | E-301     |                     | 0.30                  | 0.20~0.42          | 0.8         |  | +0.40~-0.20                       |
| S-501T   | E-501     |                     | 0.50                  | 0.40~0.63          | 1.1         |  | +0.15~-0.25                       |
| S-701T   | E-701     |                     | 0.70                  | 0.60~0.92          | 1.4         |  | 0.00~-0.32                        |
| S-102T   | E-102     |                     | 1.00                  | 0.88~1.32          | 1.7         |  | -0.10~-0.37                       |
| S-152T   | E-152     |                     | 1.50                  | 1.28~1.72          | 2.0         |  | -0.13~-0.40                       |
| S-202T   | E-202     |                     | 2.00                  | 1.68~2.32          | 2.3         | -0.15~-0.42  |                                   |
| S-272T   | E-272     |                     | 2.70                  | 2.28~3.10          | 2.7         | -0.18~-0.45  |                                   |
| S-352T   | E-352     |                     | 3.50                  | 3.00~4.10          | 3.2         | -0.20~-0.47  |                                   |
| S-452T   | E-452     |                     | 4.50                  | 3.90~5.10          | 3.7         | -0.22~-0.50  |                                   |
| S-562T   | E-562     |                     | 5.60                  | 5.00~6.50          | 4.5         | -0.25~-0.53  |                                   |
| S-822T   | E-822     |                     | 8.20                  | 6.56~9.84          | 3.1         | -0.25~-0.45  |                                   |
| S-103T   | E-103     |                     | 10.0                  | 8.00~12.0          | 3.5         | -0.25~-0.45  |                                   |
| S-123T   | E-123     |                     | 12.0                  | 9.60~14.4          | 3.8         | -0.25~-0.45  |                                   |
| S-153T   | E-153     |                     | 15.0                  | 12.0~18.0          | 4.3         | -0.25~-0.45  |                                   |
| S-183T   | E-183     | 18.0                | 16.0~20.0             | 4.6                | -0.25~-0.45 |  |                                   |

\*1,\*2 Pinch-off current limiting current are measured by impulse wave at 25°C

\*3 Temperature coefficient is measured between 25°C and 50°C.

\* $I_{30V}/I_p$

### Basic characteristics



### Ratings

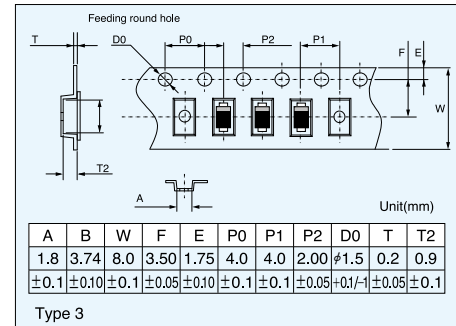
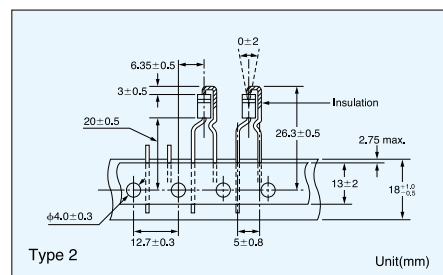
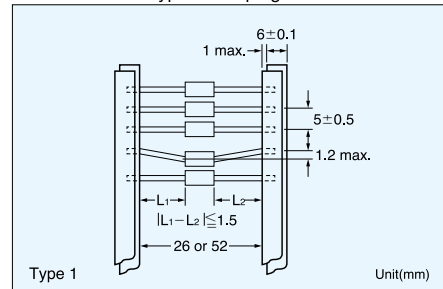
|                 | E series          | S series            |
|-----------------|-------------------|---------------------|
| Rating power    | 300mW             | 500mW               |
| Rated voltage   | 100V(E-101~E-562) | 100V(S-101T~S-562T) |
| (Pulse wave)    | 50V(E-822~E-183)  | 50V(S-822T~S-183T)  |
| Reverse current | 50mA              |                     |
| Junction temp   | 150°C             |                     |
| Operating temp  | -30°C~150°C       | -40°C~150°C         |

### Maximum rating voltage

| Part No.   | Voltage | Part No.      | Voltage |
|------------|---------|---------------|---------|
| E101~E-562 | 100V    | S-101T~S-562T | 100V    |
| E-822      | 30      | S-822T        | 50      |
| E-103      |         | S-103T        |         |
| E-123      |         | S-123T        |         |
| E-153      | 25      | S-153T        | 40      |
| E-183      |         | S-183T        |         |

### Taping

There are three Types for taping.



\*In principal elements are set with cathode side on the round hole side.

### Minimum taping quantity for

- Type 1 Roll.....5000pcs
- Box.....2500pcs
- Type 2 4000pcs
- Type 3 3000pcs

### Power derating



### Pinch-off current Temperature



### CRD in parallel

The use of CRD in parallel increases their current handling capabilities.

### Increasing the voltage range using a zener diode

Connecting zener diodes in series with the line ensures that the current is constant in high-voltage area.



### The compensation of current reduction due to self heating

Placing resistors in parallel with CRD can correct any current decrease when the applied voltage increases. The following values are typical for correction resistors.

|       |               |       |              |
|-------|---------------|-------|--------------|
| E-102 | 1M $\Omega$   | E-352 | 82k $\Omega$ |
| E-152 | 390k $\Omega$ | E-452 | 56k $\Omega$ |
| E-202 | 240k $\Omega$ | E-562 | 39k $\Omega$ |
| E-272 | 120k $\Omega$ |       |              |



Compensative resistor is not necessary if the current value is less than 1 mA.



### Dynamic characteristics (saturation characteristics)

