

# CRD

CRD is used for current stabilization and current limiting.

## □ 102 □

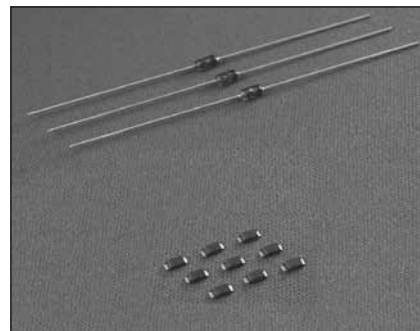
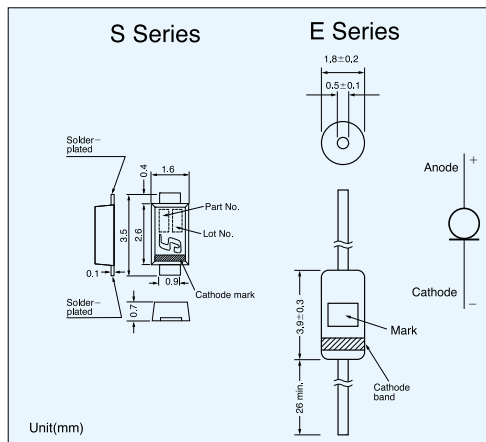
- Packing condition
  - None : E Series, Individually packed in a bag
- 26Z : E Series, 26mm wide axial taping winding type
- 26R : E Series, 26mm wide axial taping role type
- 52Z : E Series, 52mm wide axial taping winding type
- 52R : E Series, 52mm wide axial taping role type
- RE : E Series, Radial taping winding type
- T : S Series, Taping role
- Pinch off current  
e.g.) :  $301 \Rightarrow 30 \times 10^1 \mu\text{A} = 0.3\text{mA}$   
 $102 \Rightarrow 10 \times 10^2 \mu\text{A} = 1.0\text{mA}$   
 $452 \Rightarrow 45 \times 10^3 \mu\text{A} = 4.5\text{mA}$
- E : Lead wire type
- S : SMD type

Explanation of terms

- $I_P$  : Pinch-off current at 10V
- $V_K$  : Voltage which produces 0.8 $I_P$  or greater current
- $V_B$  : Breakdown voltage
- $I_R$  : Permitted reverse current

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

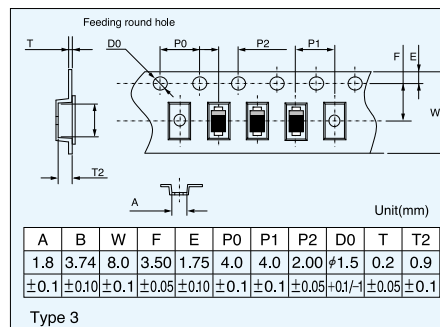
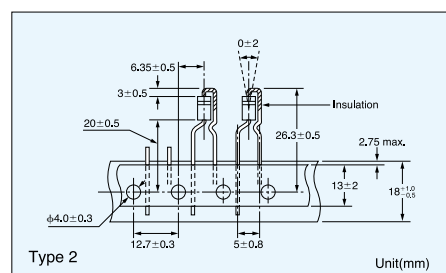
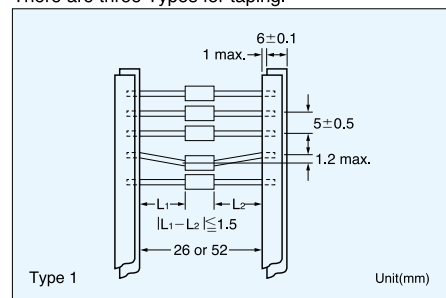
| Part No.   | Voltage | Part No.      | Voltage |
|------------|---------|---------------|---------|
| E101~E-562 | 100V    | S-101T~S-562T | 100V    |
| E-822      | 30      | S-822T        | 50      |
| E-103      |         | S-103T        |         |
| E-123      |         | S-123T        |     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



| Part No. |           | Pinch-off current* <sup>1</sup> |                                | Limiting current* <sup>2</sup> |                    | Limiting current ratio<br>I <sub>100V</sub> /I <sub>p</sub> *I <sub>30V</sub> /I <sub>p</sub> | Temperature* <sup>3</sup><br>Coefficient<br>(% / °C) |
|----------|-----------|---------------------------------|--------------------------------|--------------------------------|--------------------|---|--|
| SMD      | With Lead | Test Voltage                    | I <sub>p</sub> (mA)<br>Typical | min~max                        | V <sub>K</sub> (V) |   |  |
| S-101T   | E-101     | 10V                             | 0.10                           | 0.05~0.21                      | 0.5                | 0.8I <sub>pmin</sub>  | +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  |
|          |           |                                 |                                |                                |                    | *1.0max   |  |

\*I30/Ip

There are three Types for taping.

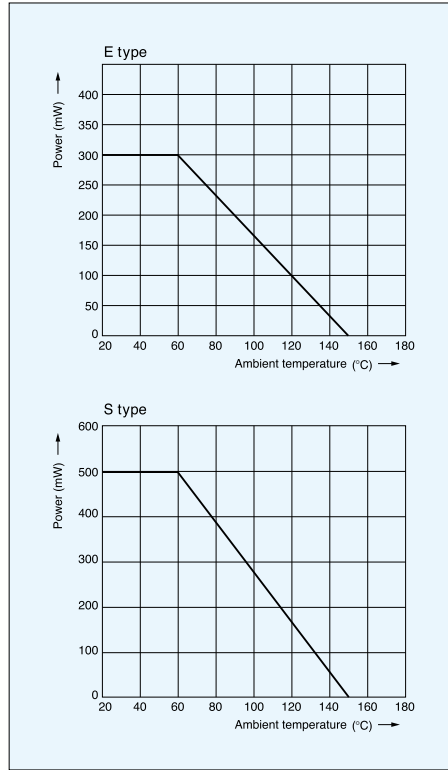


\*In principal elements are set with cathode side on the round hole side.

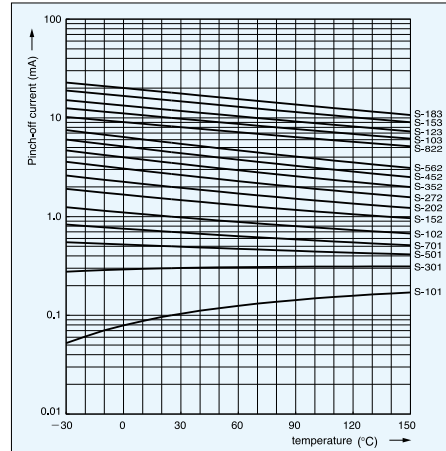
Type 1 Roll.....5000pcs  
Box.....2500pcs

|        |         |
|--------|---------|
| Type 2 | 4000pcs |
| Type 3 | 3000pcs |

## Power derating



## Pinch-off current Temperature

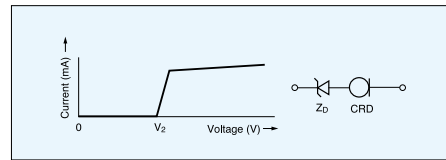


## CRD in parallel

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

## Increasing the voltage range using a zener diode

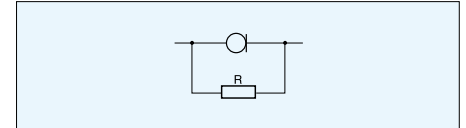
Connecting zener diodes in series with the line ensures that the current is constant in high-voltage area.



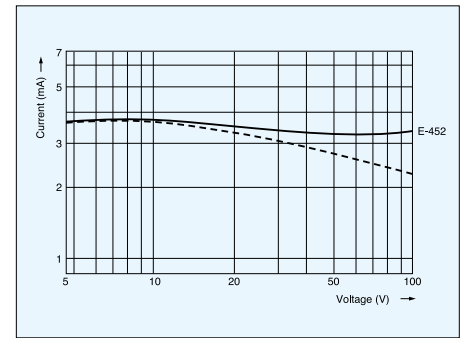
## The compensation of current reduction due to self heating

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

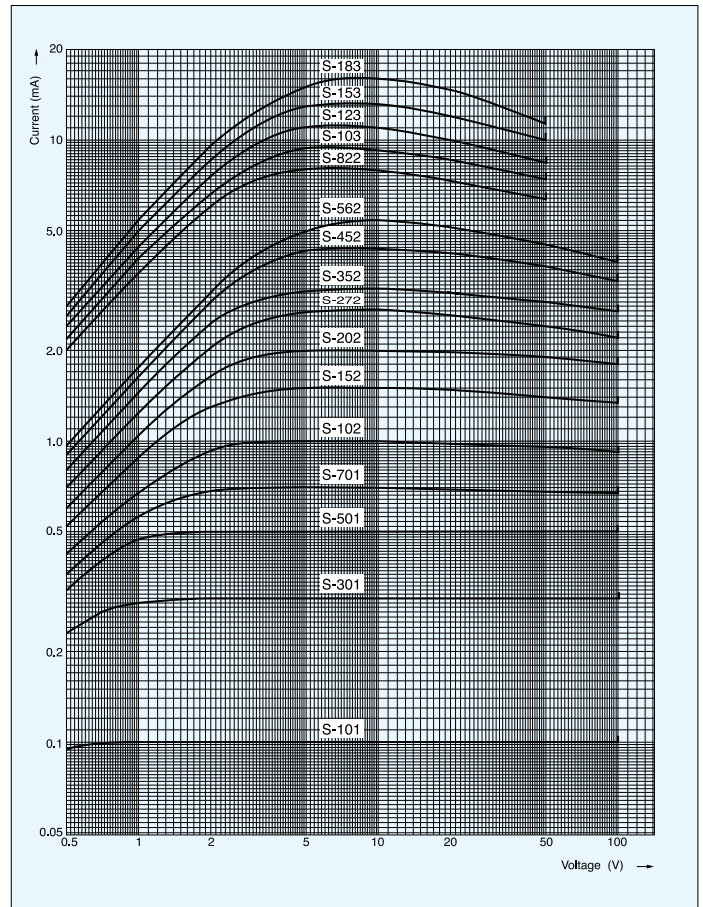
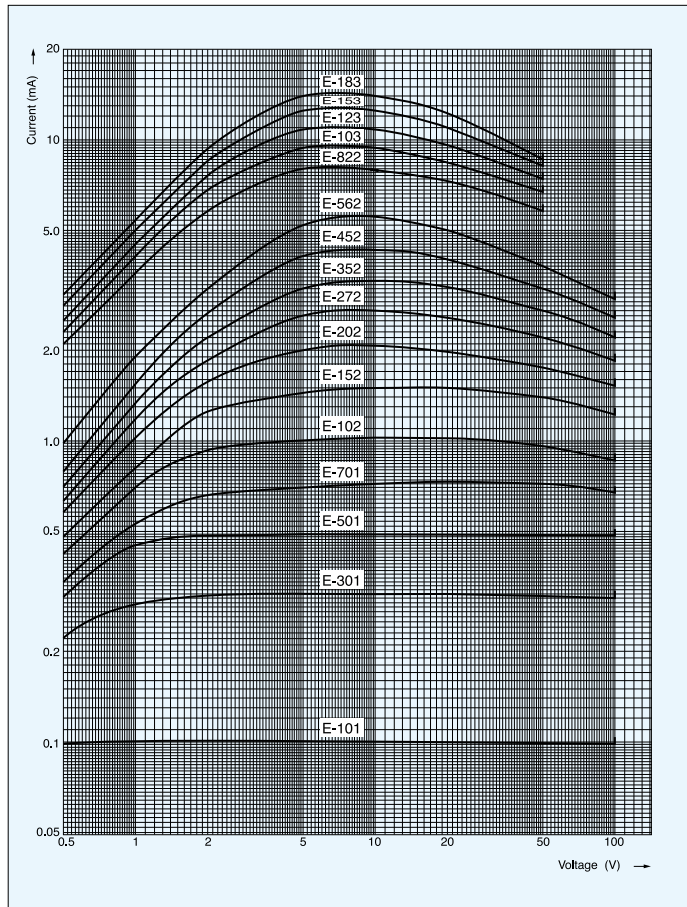
|       |               |       |              |
|-------|---------------|-------|--------------|
| E-102 | 1M $\Omega$   | E-352 | 82k $\Omega$ |
| E-152 | 390k $\Omega$ | E-452 | 56k $\Omega$ |
| E-202 | 240k $\Omega$ | E-562 | 39k $\Omega$ |
| E-272 | 120k $\Omega$ |       |              |



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



## Dynamic characteristics (saturation characteristics)



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Semitec:

[E-101](#) [E-102](#) [E-103](#) [E-123](#) [E-152](#) [E-153](#) [E-183](#) [E-202](#) [E-272](#) [E-301](#) [E-352](#) [E-452](#) [E-501](#) [E-562](#) [E-701](#) [E-822](#)  
[S-101T](#) [S-102T](#) [S-103T](#) [S-123T](#) [S-152T](#) [S-153T](#) [S-183T](#) [S-202T](#) [S-272T](#) [S-301T](#) [S-352T](#) [S-452T](#) [S-501T](#) [S-562T](#) [S-701T](#) [S-822T](#)