

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



Specifications

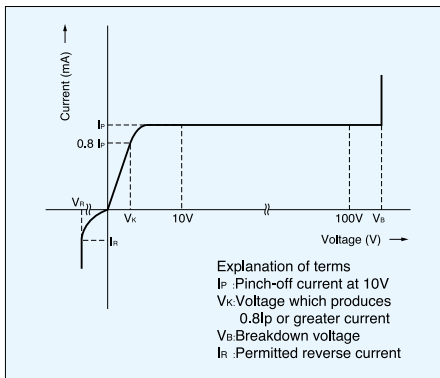
| Part No. | | Pinch-off current*1 | | Limiting current*2 | | Limiting current ratio I _{100V} /I _p *I _{30V} /I _p | Temperature*3 Coefficient (%/°C) |
|----------|-----------|---------------------|--------------------------------|--------------------|--------------------|---|--|
| SMD | With Lead | Test Voltage | I _p (mA) Typical | min~max | V _k (V) | | |
| S-101T | E-101 | 10V | 0.10 | 0.05~0.21 | 0.5 | 0.8I _{pmin} | +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

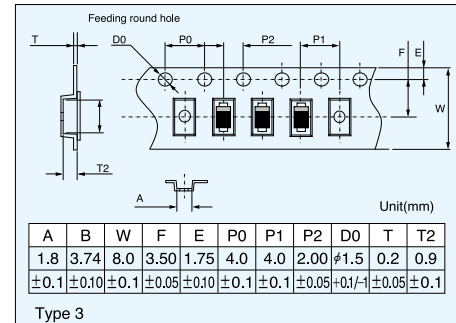
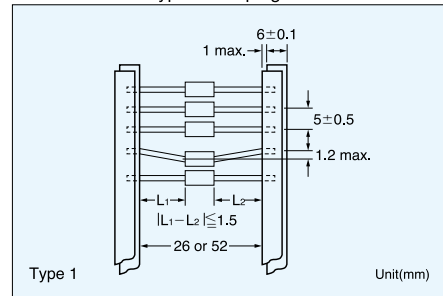
| | E series | S series |
|-----------------|-------------------|---------------------|
| Rating power | 300mW | 500mW |
| Rated voltage | 100V(E-101~E-562) | 100V(S-101T~S-562T) |
| (Pulse wave) | 50V(E-822~E-183) | 50V(S-822T~S-183T) |
| Reverse current | 50mA | |
| Junction temp | 150°C | |
| Operating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

Maximum rating voltage

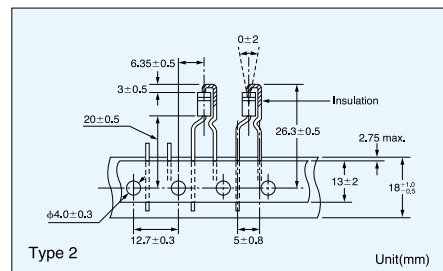
| Part No. | Voltage | Part No. | Voltage |
|------------|---------|---------------|---------|
| E101~E-562 | 100V | S-101T~S-562T | 100V |
| E-822 | 30 | S-822T | 50 |
| E-103 | | S-103T | |
| E-123 | | S-123T | |
| E-153 | 25 | S-153T | 40 |
| E-183 | | S-183T | |

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

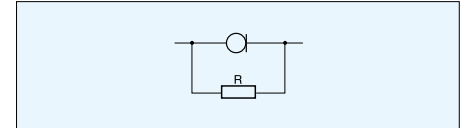
Connecting zener diodes in series with the line ensures that the current is constant in high-voltage area.



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 Ω | E-352 | 82k Ω |
| E-152 | 390k Ω | E-452 | 56k Ω |
| E-202 | 240k Ω | E-562 | 39k Ω |
| E-272 | 120k Ω | | |



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



Dynamic characteristics (saturation characteristics)

