

**ESD PROTECTION DIODE**

**VOLTAGE RANGE 5 to 24 Volts POWER RATING 350 Watts**

**FEATURES**

- \* IEC61000-4-2(ESD) $\pm$ 15kV(air), $\pm$ 8kV(CONTACT)
- \* IEC61000-4-2(EFT)40A(5/50ns)
- \* 350Watts Peak Pulse Power per (tp=8/20us)
- \* Protects one I/O line(bidirectional)
- \* Low clamping voltage
- \* Working voltages:5V,12V,15V,24V
- \* Low leakage current
- \* Material:Halogen free

**MECHANICAL DATA**

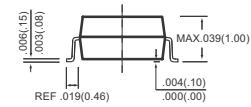
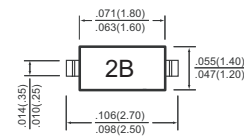
- \* SOD-323 package
- \* Flammability Rating:UL 94V-0
- \* Packaging:Tape and Reel
- \* High temperature soldering guaranteed:260°C/10s
- \* Reel size:7 inch

**MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS**

Ratings at 25°C ambient temperature unless otherwise specified.



**SOD-323**



Marking :SD05C-----2B ,SD12C-----12C  
SD15C-----15C ,SD24C-----24C

Dimensions in inches and (millimeters)

MAXIMUM RATING @ Ta=25 °C unless otherwise specified

| Parameter                                  | Symbol           | Limits        | Unit |
|--|------------------|---------------|------|
| Peak pulse power(tp=8/20 μs)               | P <sub>pk</sub>  | 350           | W    |
| Peak pulse current(tp=8/20 μs)             | I <sub>PP</sub>  | 24            | A    |
| ESD voltage(HBM waveform per IEC 6100-4-2) | V <sub>PP</sub>  | 30            | kV   |
| Lead soldering temperature                 | T <sub>L</sub>   | 260 (10 sec.) | °C   |
| Operating temperature                      | T <sub>j</sub>   | -55 to+125    | °C   |
| Storage temperature                        | T <sub>STG</sub> | -55 to+150    | °C   |

ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

| SD05C TVS for 5V Lines    |             |      |      |             |         |   |
|---------------------------|-------------|------|------|-------------|---------|---|
| Parameter                 | Symbol      | Min. | Typ. | Max.        | Unit    | Conditions  |
| Reverse stand-off voltage | $V_{RWM}$   |      |      | 5           | V       |   |
| Reverse breakdown voltage | $V_{(BR)R}$ | 6    |      |             | V       | $I_R=1mA$   |
| Clamping voltage          | $V_C$       |      |      | 9.8<br>14.5 | V       | $I_{PP}=5A, t_p=8/20\mu s$<br>$I_{PP}=24A, t_p=8/20\mu s$ |
| Reverse leakage current   | $I_R$       |      |      | 10          | $\mu A$ | $V_{RWM}=5V$  |
| Junction Capacitance      | $C_J$       |      |      | 200         | pF      | $V_R=0V, f=1MHz$  |

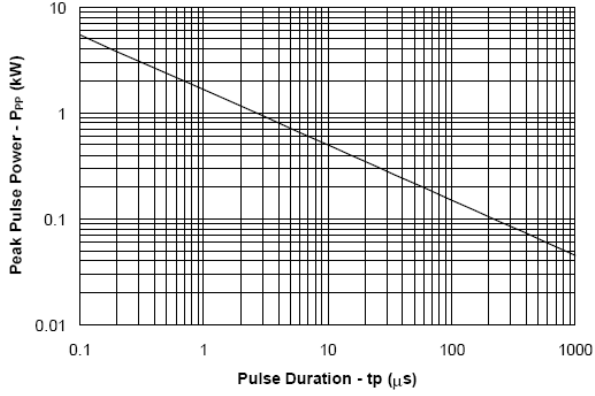
| SD12C TVS for 12V Lines   |             |      |      |          |         |   |
|---------------------------|-------------|------|------|----------|---------|---|
| Parameter                 | Symbol      | Min. | Typ. | Max.     | Unit    | Conditions  |
| Reverse stand-off voltage | $V_{RWM}$   |      |      | 12       | V       |   |
| Reverse breakdown voltage | $V_{(BR)R}$ | 13.3 |      |          | V       | $I_R=1mA$   |
| Clamping voltage          | $V_C$       |      |      | 19<br>24 | V       | $I_{PP}=5A, t_p=8/20\mu s$<br>$I_{PP}=15A, t_p=8/20\mu s$ |
| Reverse leakage current   | $I_R$       |      |      | 1        | $\mu A$ | $V_{RWM}=12V$   |
| Junction Capacitance      | $C_J$       |      |      | 100      | pF      | $V_R=0V, f=1MHz$  |

| <b>SD15C TVS for 15V Lines</b> |               |             |             |             |             |   |
|--------------------------------|---------------|-------------|-------------|-------------|-------------|---|
| <b>Parameter</b>               | <b>Symbol</b> | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b> | <b>Unit</b> | <b>Conditions</b>   |
| Reverse stand-off voltage      | $V_{RWM}$     |             |             | 15          | V           |   |
| Reverse breakdown voltage      | $V_{(BR)R}$   | 16.7        |             |             | V           | $I_R=1mA$   |
| Clamping voltage               | $V_C$         |             |             | 24<br>29    | V           | $I_{PP}=5A, t_p=8/20\mu s$<br>$I_{PP}=12A, t_p=8/20\mu s$ |
| Reverse leakage current        | $I_R$         |             |             | 1           | $\mu A$     | $V_{RWM}=15V$   |
| Junction Capacitance           | $C_J$         |             |             | 75          | pF          | $V_R=0V, f=1MHz$  |

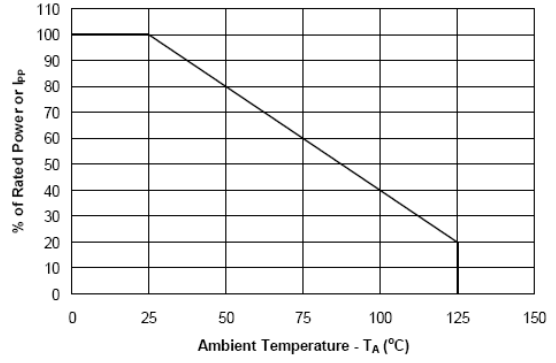
| <b>SD24C TVS for 24V Lines</b> |               |             |             |             |             |  |
|--------------------------------|---------------|-------------|-------------|-------------|-------------|--|
| <b>Parameter</b>               | <b>Symbol</b> | <b>Min.</b> | <b>Typ.</b> | <b>Max.</b> | <b>Unit</b> | <b>Conditions</b>  |
| Reverse stand-off voltage      | $V_{RWM}$     |             |             | 24          | V           |  |
| Reverse breakdown voltage      | $V_{(BR)R}$   | 26.7        |             |             | V           | $I_R=1mA$  |
| Clamping voltage               | $V_C$         |             |             | 40<br>44    | V           | $I_{PP}=5A, t_p=8/20\mu s$<br>$I_{PP}=8A, t_p=8/20\mu s$ |
| Reverse leakage current        | $I_R$         |             |             | 1           | $\mu A$     | $V_{RWM}=24V$  |
| Junction Capacitance           | $C_J$         |             |             | 50          | pF          | $V_R=0V, f=1MHz$   |

# RATING AND CHARACTERISTICS CURVES (SD05C THRU SD24C )

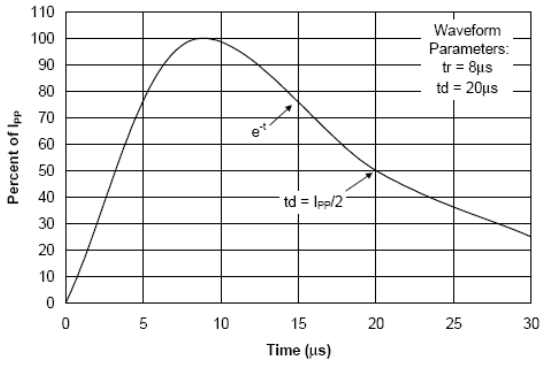
**Non-Repetitive Peak Pulse Power vs. Pulse Time**



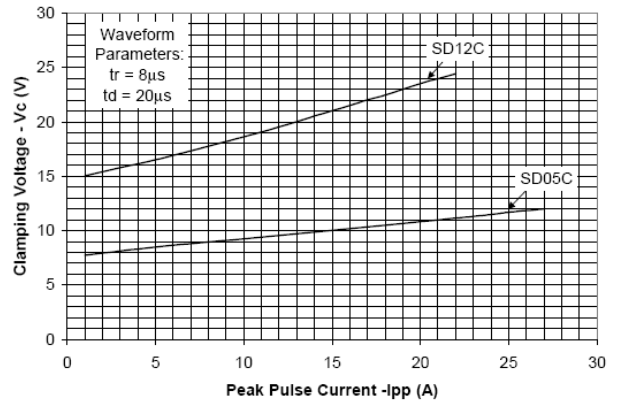
**Power Derating Curve**



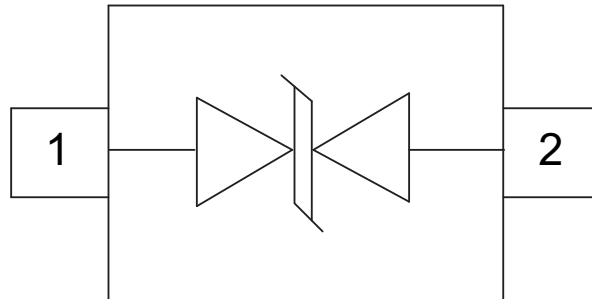
**Pulse Waveform**



**Clamping Voltage vs. Peak Pulse Current**

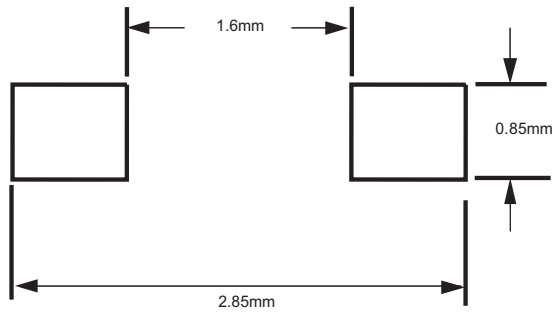


# Schematic & PIN Configuration



**SOD-323 (Top View)**

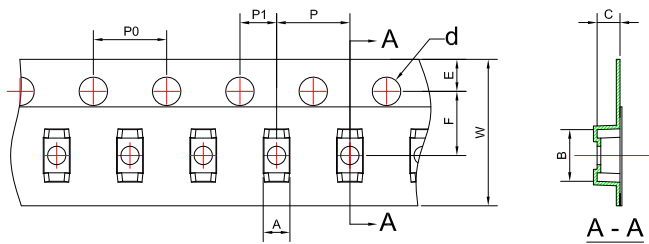
## Recommended Pad Layout



Dimensions in inches and (millimeters)

# SOD-323 Tape and Reel

## SOD-323 Embossed Carrier Tape

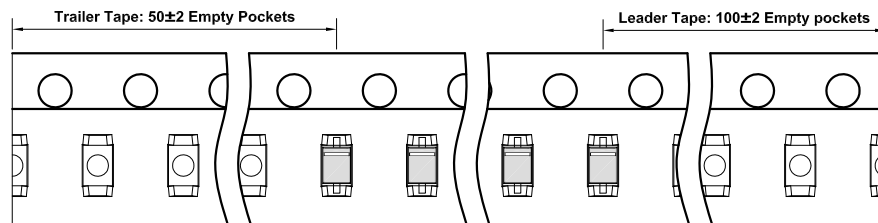


## Packaging Description:

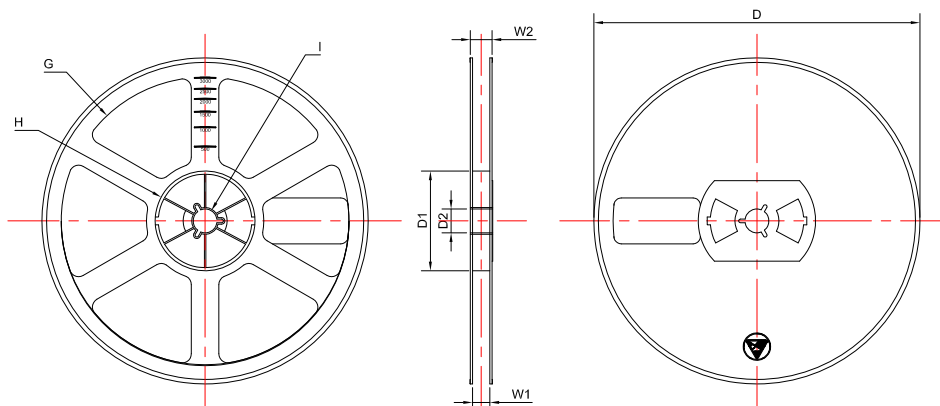
SOD-323 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. The reels are blue in color and made of recyclable plastic.

| Dimensions are in millimeter |       |       |       |       |      |      |      |      |      |           |
|------------------------------|-------|-------|-------|-------|------|------|------|------|------|-----------|
| Pkg Type                     | A     | B     | C     | d     | E    | F    | P0   | P    | P1   | W         |
| SOD-323                      | 1.46  | 2.90  | 1.25  | Ø1.50 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00      |
| (Tolerance)                  | ±0.05 | ±0.05 | ±0.05 | ±0.1  | ±0.1 | ±0.1 | ±0.1 | ±0.1 | ±0.1 | +0.3/-0.1 |

## SOD-323 Tape Leader and Trailer



## SOD-323 Reel



Unit: mm

| Reel Option | D       | D1    | D2    | G      | H      | I     | W1   | W2    |
|-------------|---------|-------|-------|--------|--------|-------|------|-------|
| 7" Dia      | Ø178.00 | 54.40 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 12.30 |
| Tolerance   | ±2      | ±1    | ±1    | ±1     | ±1     | ±1    | ±1   | ±1    |

## Packaging Quantity

| Reel  | Reel Size | Box    | Box Size(mm) | Carton  | Carton Size(mm) |
|-------|-----------|--------|--------------|---------|-----------------|
| 3,000 | 7 inch    | 45,000 | 210*208*203  | 180,000 | 440*440*230     |