

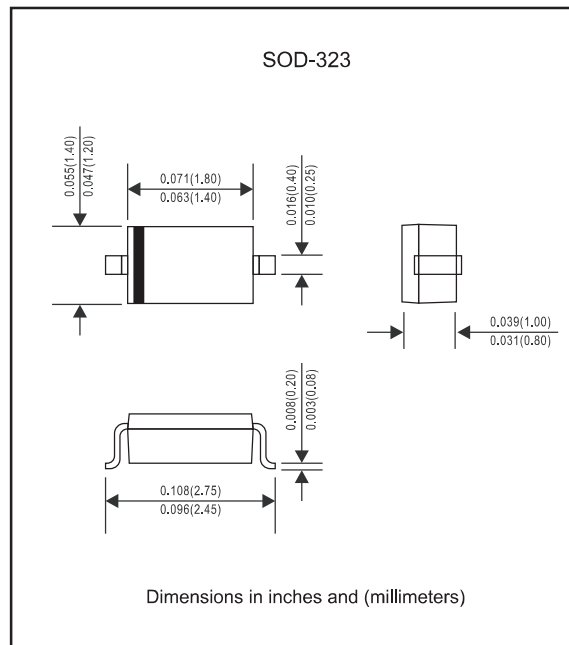
### Features

- ◆ The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- ◆ For surface mounted applications
- ◆ Fast switching for high efficiency
- ◆ Low reverse leakage
- ◆ Built-in strain relief, ideal for automated placement
- ◆ High forward surge current capability
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals
- ◆ Compliant to Halogen-free

### Mechanical data

- ◆ **Case:** JEDEC SOD-323 molded plastic body
- ◆ **Terminals:** Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ **Polarity:** Color band denotes cathode end
- ◆ **Mounting Position:** Any

### Package outline



### Maximum ratings and Electrical Characteristics (AT $T_A=25^\circ\text{C}$ unless otherwise noted)

|                                                                                                        | SYMBOLS         | FR101<br>WS | FR102<br>WS | FR103<br>WS | FR104<br>WS | FR105<br>WS | FR106<br>WS | FR107<br>WS | UNITS |
|--------------------------------------------------------------------------------------------------------|-----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| Maximum repetitive peak reverse voltage                                                                | $V_{RRM}$       | 50          | 100         | 200         | 400         | 600         | 800         | 1000        | V     |
| Maximum RMS voltage                                                                                    | $V_{RMS}$       | 35          | 70          | 140         | 280         | 420         | 560         | 700         | V     |
| Maximum DC blocking voltage                                                                            | $V_{DC}$        | 50          | 100         | 200         | 400         | 600         | 800         | 1000        | V     |
| Maximum average forward rectified current<br>0.375"(9.5mm) lead length at TA=75°C                      | $I_{(AV)}$      | 1.0         |             |             |             |             |             |             | A     |
| Peak forward surge current<br>8.3ms single half sine-wave superimposed on<br>rated load (JEDEC Method) | $I_{FSM}$       | 15.0        |             |             |             |             |             |             | A     |
| Maximum instantaneous forward voltage at 1.0A                                                          | $V_F$           | 1.3         |             |             |             |             |             |             | V     |
| Maximum DC reverse current     TA=25°C<br>at rated DC blocking voltage    TA=100°C                     | $I_R$           | 5.0<br>50.0 |             |             |             |             |             |             | μA    |
| Maximum reverse recovery time    (NOTE 1)                                                              | $t_{rr}$        | 150         |             |             |             | 250         | 500         |             | ns    |
| Typical junction capacitance (NOTE 2)                                                                  | $C_J$           | 5.0         |             |             |             |             |             |             | pF    |
| Typical thermal resistance (NOTE 3)                                                                    | $R_{\theta JA}$ | 80.0        |             |             |             |             |             |             | °C/W  |
| Operating junction and storage temperature range                                                       | $T_J, T_{STG}$  | -55 to +150 |             |             |             |             |             |             | °C    |

**Note:** 1.Reverse recovery condition  $I_F=0.5\text{A}, I_R=1.0\text{A}, I_{rr}=0.25\text{A}$

2.Measured at 1MHz and applied reverse voltage of 4.0V D.C.

3.Thermal resistance from junction to ambient at 0.375"(9.5mm)lead length,P.C.B. mounted

### Rating and characteristic curves

FIG.1-TYPICAL FORWARD  
CHARACTERISTICS

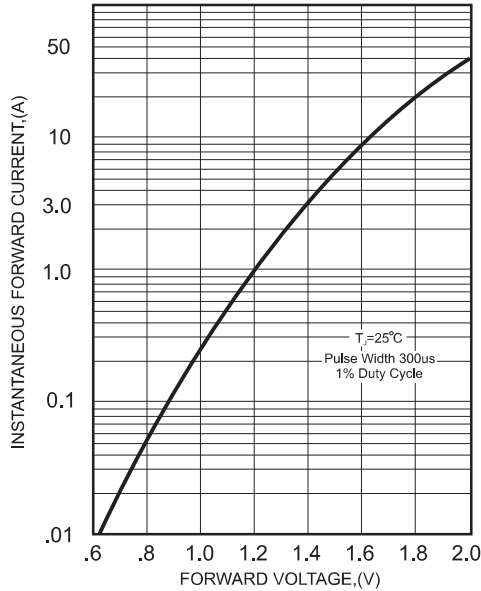


FIG.2-TYPICAL FORWARD CURRENT DERATING CURVE

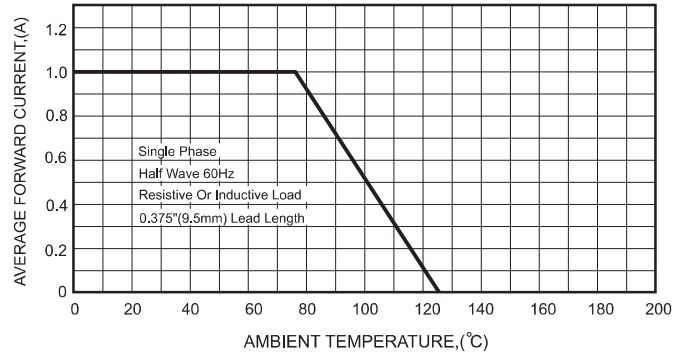


FIG.4-MAXIMUM NON-REPETITIVE FORWARD  
SURGE CURRENT

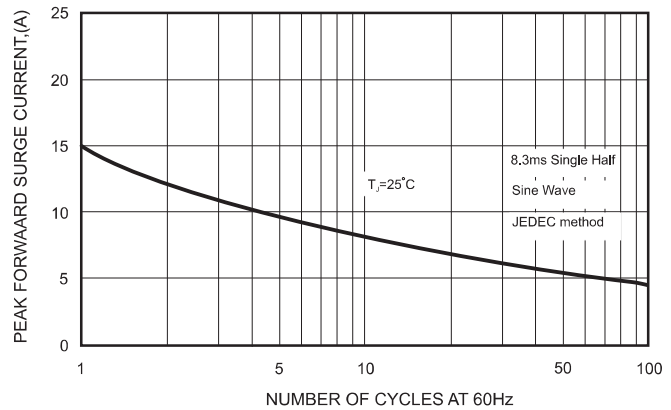
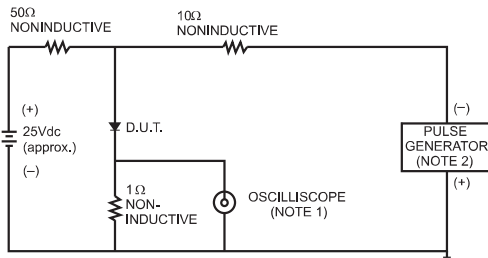
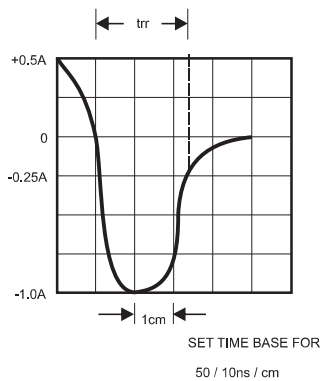


FIG.3- TEST CIRCUIT DIAGRAM AND REVERSE  
RECOVERY TIME CHARACTERISTICS



NOTES: 1. Rise Time= 7ns max., Input Impedance= 1 megohm, 22pF.

2. Rise Time= 10ns max., Source Impedance= 50 ohms.



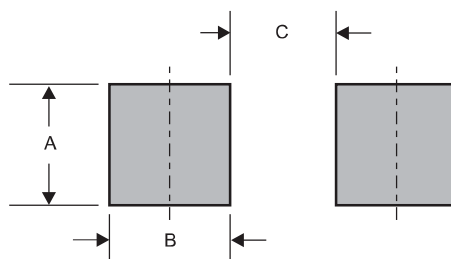
## Pinning information

| Pin                        | Simplified outline                                                                | Symbol                                                                              |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin1 cathode<br>Pin2 anode |  |  |

## Marking

| Type number | Marking code |
|-------------|--------------|
| FR101WS     | 1R           |
| FR102WS     | 2R           |
| FR103WS     | 3R           |
| FR104WS     | 4R           |
| FR105WS     | 5R           |
| FR106WS     | 6R           |
| FR107WS     | 7R           |

## Suggested solder pad layout

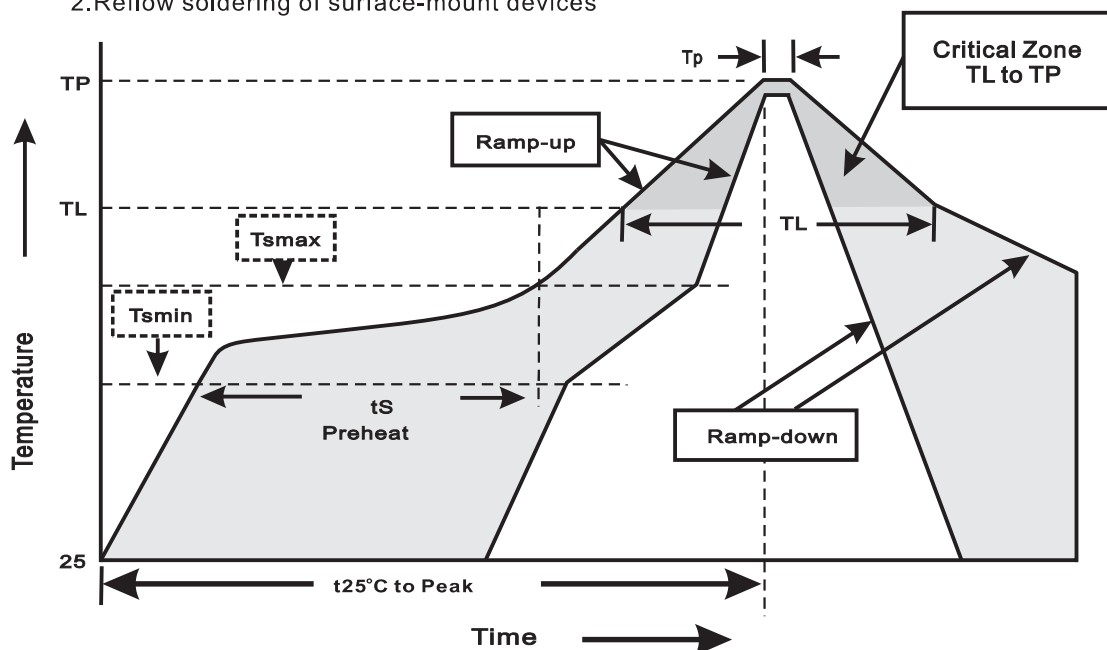


Dimensions in inches and (millimeters)

| PACKAGE | A            | B            | C            |
|---------|--------------|--------------|--------------|
| SOD-323 | 0.047 (1.20) | 0.047 (1.20) | 0.055 (1.40) |

### Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



### 3.Reflow soldering

| Profile Feature                                                                                                               | Soldering Condition         |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Average ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )                                                                       | <3°C/sec                    |
| Preheat<br>-Temperature Min(T <sub>smin</sub> )<br>-Temperature Max(T <sub>smax</sub> )<br>-Time(min to max)(t <sub>s</sub> ) | 150°C<br>200°C<br>60~120sec |
| T <sub>smax</sub> to T <sub>L</sub><br>-Ramp-upRate                                                                           | <3°C/sec                    |
| Time maintained above:<br>-Temperature(T <sub>L</sub> )<br>-Time(t <sub>L</sub> )                                             | 217°C<br>60~260sec          |
| Peak Temperature(T <sub>P</sub> )                                                                                             | 255°C-0/+5°C                |
| Time within 5°C of actual Peak Temperature(t <sub>P</sub> )                                                                   | 10~30sec                    |
| Ramp-down Rate                                                                                                                | <6°C/sec                    |
| Time 25°C to Peak Temperature                                                                                                 | <6minutes                   |