

**500mW Zener Diode Series**

# ZD5229ASH thru ZD5267ASH

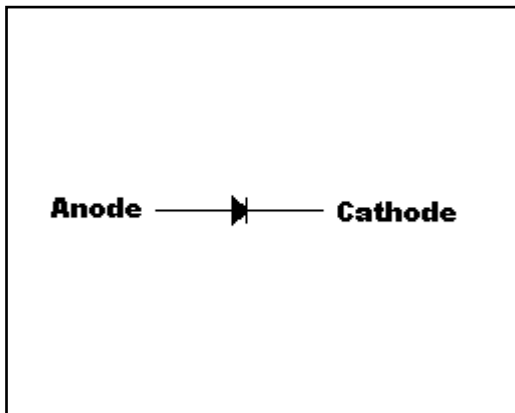
**Description**

The ZD5229ASH thru ZD5267ASH series covers zener voltage range from 4.3V to 75V, and is encapsulated in SOD-123 package, very suitable for low cost, low power voltage regulation application.

**Features**

- $V_Z$  tolerance :  $\pm 2\%$
- Ultra small surface mount package
- General purpose, medium current
- Planar die construction
- Pb-free lead plating and halogen-free package

**Symbol**

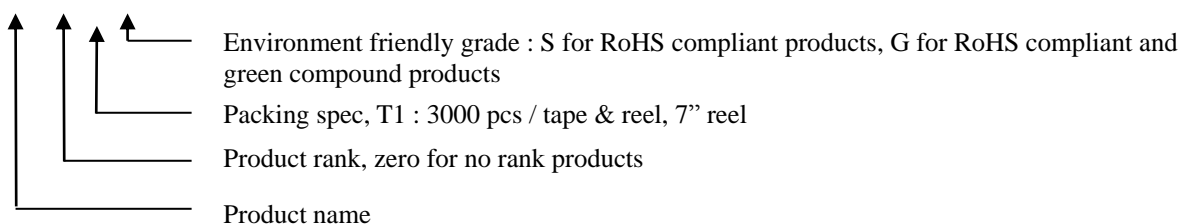


**Outline**



**Ordering Information**

| Device           | Package  | Shipping               |
|------------------|--|------------------------|
| ZD52XXASH-0-T1-G | SOD-123<br>(Pb-free lead plating and halogen-free package) | 3000 pcs / tape & reel |





**Absolute Maximum Ratings**(Tj=25°C, unless otherwise specified)

- Maximum Temperatures  
 Operating and Storage Temperature Range Tj, Tstg ..... -65~+150 °C
- Maximum Forward Voltage @ If=10mA .....0.9V
- Maximum Power Dissipation  
 Total Power Dissipation @TA=25 °C Ptot (Note 1) .....500 mW
- Thermal Resistance, Junction to Ambient RθJA .....250°C/W  
 Thermal Resistance, Junction to Case RθJC .....150°C/W
- Maximum Z-current..... Ptot/Vz mA

Note : 1. Parts mounted on FR-5 board with area of 1inch × 1inch.

**Electrical Characteristic** (Ta=25°C, unless otherwise noted)

| Device  | Type Code | Nom. Zener Voltage |       |       | Max. Zener Impedance |      |      |      | Max. Zener Current | Max. Reverse Leakage Current |     |
|---------|-----------|--------------------|-------|-------|----------------------|------|------|------|--------------------|------------------------------|-----|
|         |           | Vz@IZT (V)         |       |       | ZZT                  | IZT  | ZZK  | IZK  | IZM@Ta             | IR                           | VR  |
|         |           | Nom.               | Min.  | Max.  | (Ω)                  | (mA) | (Ω)  | (mA) | (mA)               | (μA)                         | (V) |
| ZD5229A | G4        | 4.3                | 4.21  | 4.39  | 22                   | 20   | 2000 | 0.25 | 106                | 5.0                          | 1.0 |
| ZD5230A | G5        | 4.7                | 4.61  | 4.79  | 19                   | 20   | 1900 | 0.25 | 97                 | 5.0                          | 2.0 |
| ZD5231A | E1        | 5.1                | 5.00  | 5.20  | 17                   | 20   | 1600 | 0.25 | 89                 | 5.0                          | 2.0 |
| ZD5232A | E2        | 5.6                | 5.49  | 5.71  | 11                   | 20   | 1600 | 0.25 | 81                 | 5.0                          | 3.0 |
| ZD5233A | E3        | 6.0                | 5.88  | 6.12  | 7.0                  | 20   | 1600 | 0.25 | 76                 | 5.0                          | 3.5 |
| ZD5234A | E4        | 6.2                | 6.08  | 6.32  | 7.0                  | 20   | 1000 | 0.25 | 73                 | 5.0                          | 4.0 |
| ZD5235A | E5        | 6.8                | 6.66  | 6.94  | 5.0                  | 20   | 750  | 0.25 | 67                 | 3.0                          | 5.0 |
| ZD5236A | F1        | 7.5                | 7.35  | 7.65  | 6.0                  | 20   | 500  | 0.25 | 61                 | 3.0                          | 6.0 |
| ZD5237A | F2        | 8.2                | 8.04  | 8.36  | 8.0                  | 20   | 500  | 0.25 | 55                 | 3.0                          | 6.5 |
| ZD5238A | F3        | 8.7                | 8.53  | 8.87  | 8.0                  | 20   | 600  | 0.25 | 55                 | 3.0                          | 6.5 |
| ZD5239A | F4        | 9.1                | 8.92  | 9.28  | 10                   | 20   | 600  | 0.25 | 50                 | 3.0                          | 7.0 |
| ZD5240A | F5        | 10                 | 9.80  | 10.20 | 17                   | 20   | 600  | 0.25 | 45                 | 3.0                          | 8.0 |
| ZD5241A | H1        | 11                 | 10.78 | 11.22 | 22                   | 20   | 600  | 0.25 | 41                 | 2.0                          | 8.4 |
| ZD5242A | H2        | 12                 | 11.76 | 12.24 | 30                   | 20   | 600  | 0.25 | 38                 | 1.0                          | 9.1 |
| ZD5243A | H3        | 13                 | 12.74 | 13.26 | 13                   | 9.5  | 600  | 0.25 | 35                 | 0.5                          | 9.9 |
| ZD5244A | H4        | 14                 | 13.72 | 14.28 | 15                   | 9    | 600  | 0.25 | 32                 | 0.1                          | 10  |
| ZD5245A | H5        | 15                 | 14.70 | 15.30 | 16                   | 8.5  | 600  | 0.25 | 30                 | 0.1                          | 11  |
| ZD5246A | J1        | 16                 | 15.68 | 16.32 | 17                   | 7.8  | 600  | 0.25 | 28                 | 0.1                          | 12  |
| ZD5248A | J3        | 18                 | 17.64 | 18.36 | 21                   | 7.0  | 600  | 0.25 | 25                 | 0.1                          | 14  |
| ZD5250A | J5        | 20                 | 19.60 | 20.40 | 25                   | 6.2  | 600  | 0.25 | 23                 | 0.1                          | 15  |
| ZD5251A | K1        | 22                 | 21.56 | 22.44 | 29                   | 5.6  | 600  | 0.25 | 21                 | 0.1                          | 17  |
| ZD5252A | K2        | 24                 | 23.52 | 24.48 | 33                   | 5.2  | 600  | 0.25 | 19.1               | 0.1                          | 18  |
| ZD5254A | K4        | 27                 | 26.46 | 27.54 | 41                   | 5.0  | 600  | 0.25 | 16.8               | 0.1                          | 21  |
| ZD5255A | K5        | 28                 | 27.44 | 28.56 | 44                   | 4.5  | 600  | 0.25 | 16.2               | 0.1                          | 21  |
| ZD5256A | M1        | 30                 | 29.40 | 30.60 | 49                   | 4.2  | 600  | 0.25 | 15.1               | 0.1                          | 23  |
| ZD5257A | M2        | 33                 | 32.34 | 33.66 | 58                   | 3.8  | 700  | 0.25 | 13.8               | 0.1                          | 25  |
| ZD5258A | M3        | 36                 | 35.28 | 36.72 | 70                   | 3.4  | 700  | 0.25 | 12.6               | 0.1                          | 27  |



|         |    |    |       |       |     |     |      |      |      |     |    |
|---------|----|----|-------|-------|-----|-----|------|------|------|-----|----|
| ZD5259A | M4 | 39 | 38.22 | 39.78 | 80  | 3.2 | 800  | 0.25 | 11.6 | 0.1 | 30 |
| ZD5260A | M5 | 43 | 42.14 | 43.86 | 93  | 3   | 900  | 0.25 | 10.6 | 0.1 | 33 |
| ZD5261A | N1 | 47 | 46.06 | 47.94 | 105 | 2.7 | 1000 | 0.25 | 9.6  | 0.1 | 36 |
| ZD5262A | N2 | 51 | 49.98 | 52.02 | 125 | 2.5 | 1100 | 0.25 | 8.8  | 0.1 | 39 |
| ZD5263A | N3 | 56 | 54.88 | 57.12 | 150 | 2.2 | 1300 | 0.25 | 8.0  | 0.1 | 43 |
| ZD5264A | N4 | 60 | 58.8  | 61.2  | 170 | 2.1 | 1400 | 0.25 | 7.5  | 0.1 | 46 |
| ZD5265A | N5 | 62 | 60.76 | 63.24 | 185 | 2.0 | 1400 | 0.25 | 7.3  | 0.1 | 47 |
| ZD5266A | P1 | 68 | 66.64 | 69.36 | 230 | 1.8 | 1600 | 0.25 | 6.6  | 0.1 | 52 |
| ZD5267A | P2 | 75 | 73.5  | 76.5  | 270 | 1.7 | 1700 | 0.25 | 6.0  | 0.1 | 56 |

**Recommended Soldering Footprint**



## Typical Characteristics

Typical Temperature Coefficient



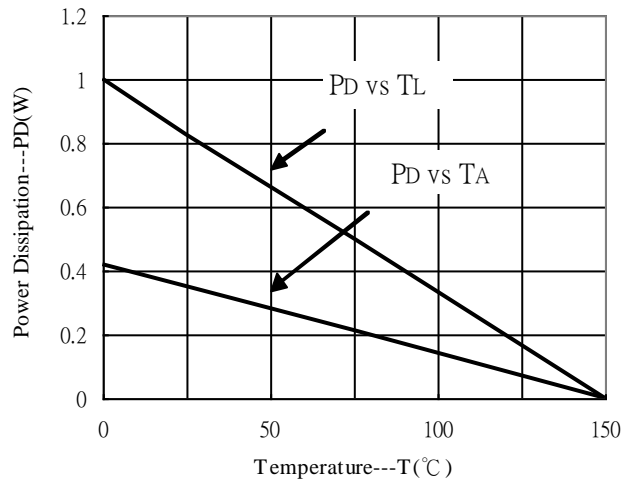
Dynamic Impedance



Typical Capacitance

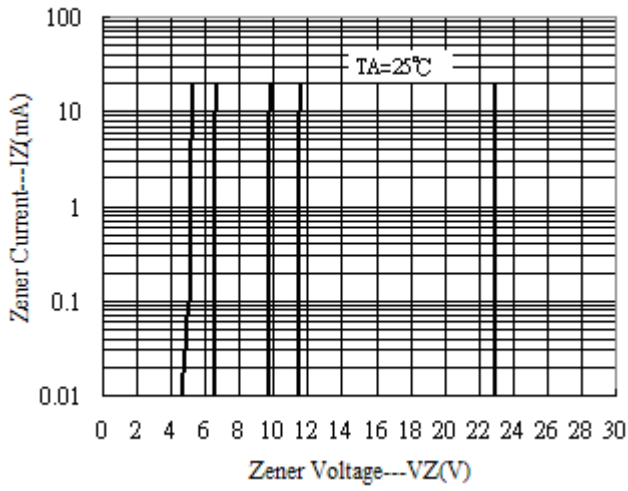


Power Derating Curve

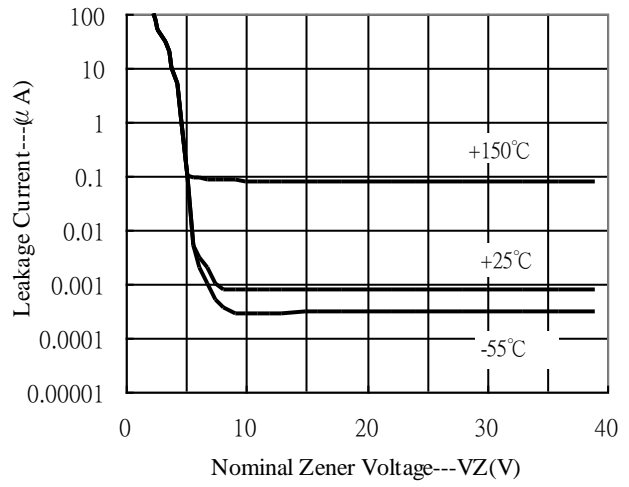




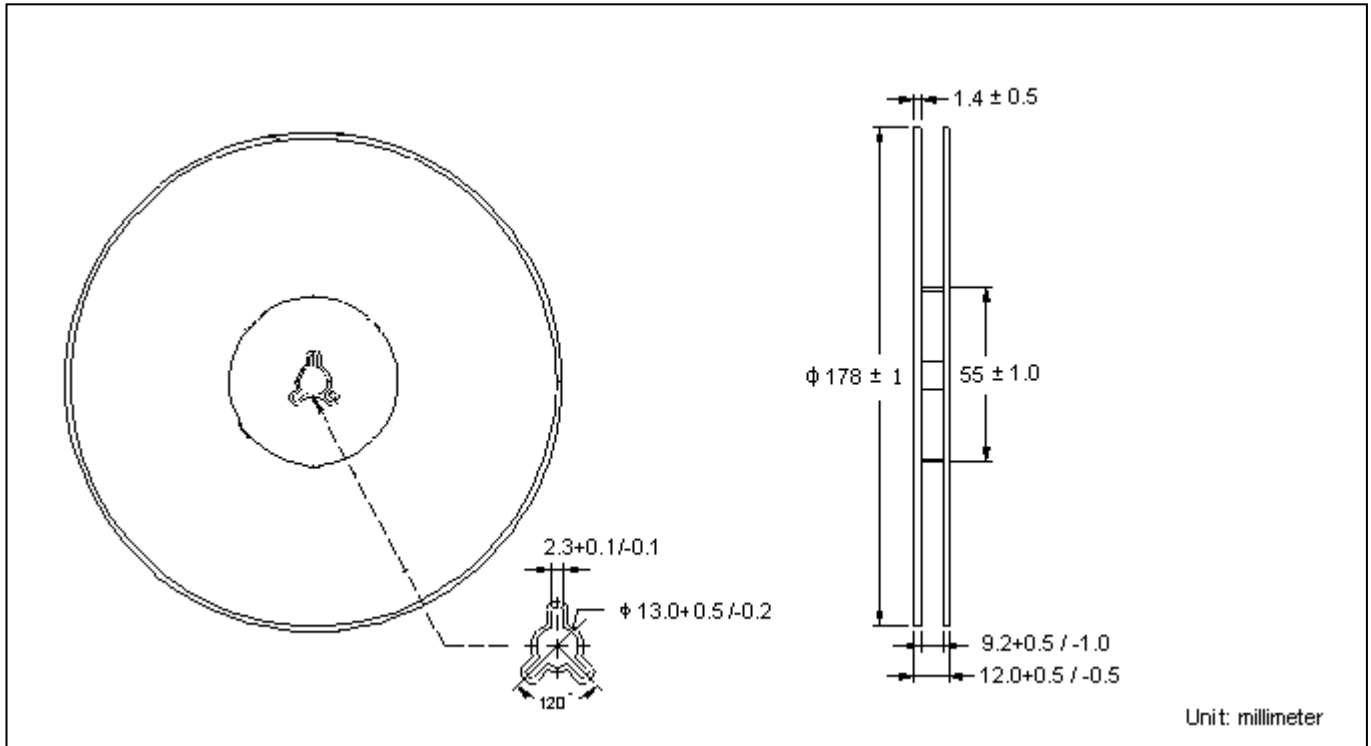
Zener Current vs Zener Voltage



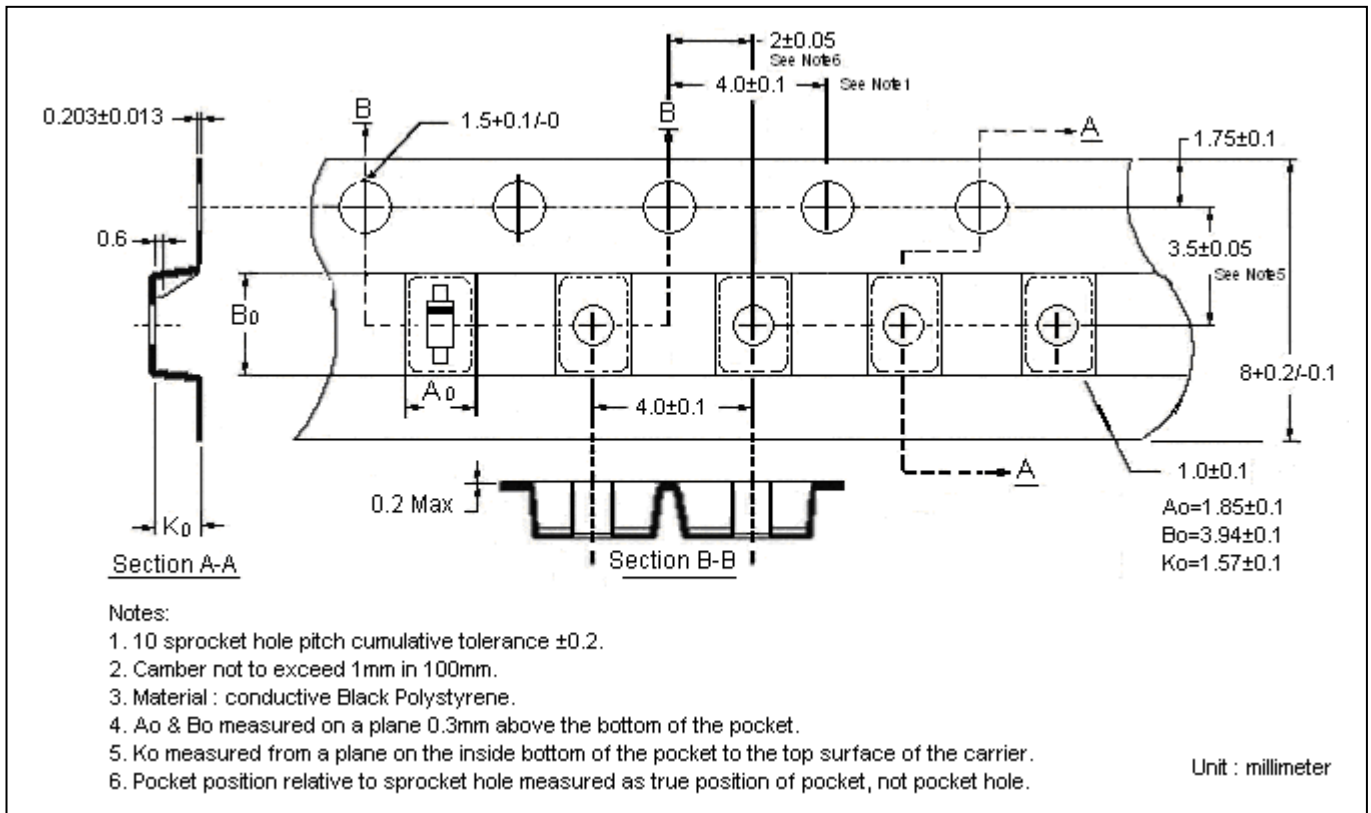
Typical Leakage Current



**Reel Dimension**



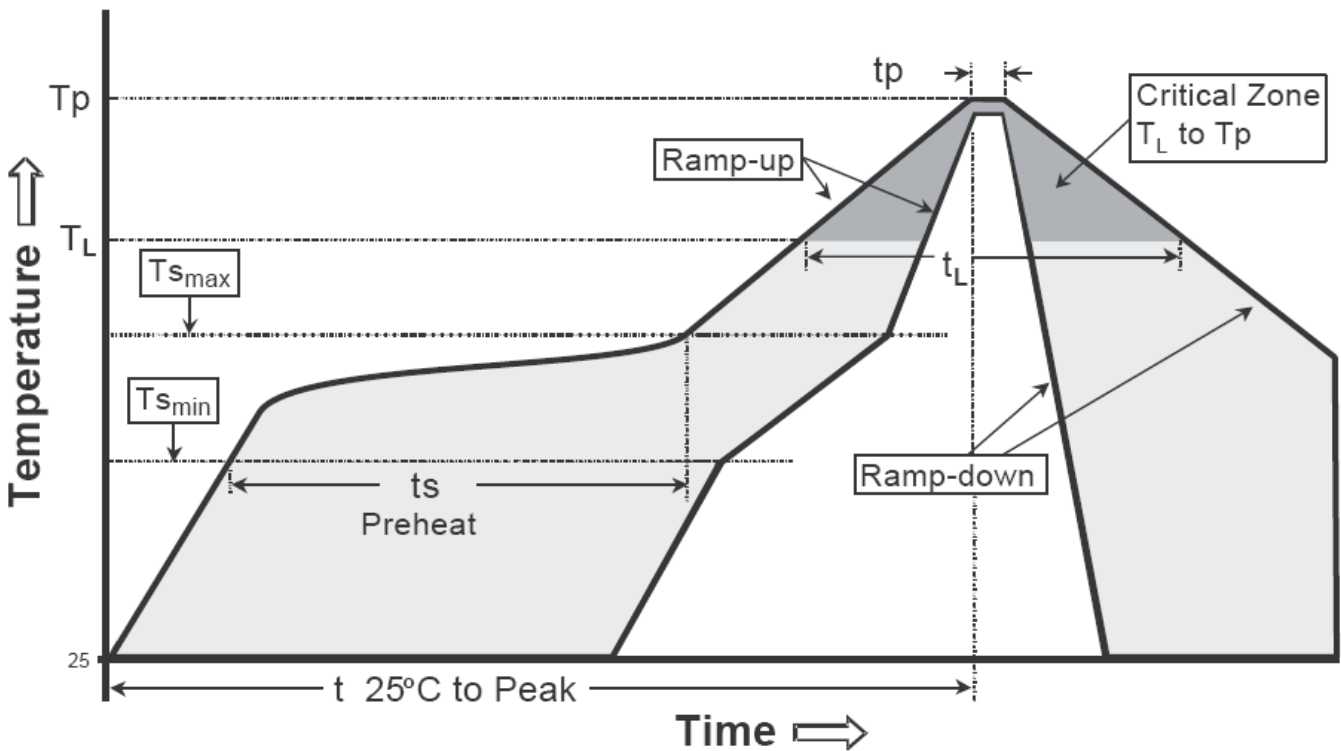
**Carrier Tape Dimension**



**Recommended wave soldering condition**

|                 |                  |                 |
|-----------------|------------------|-----------------|
| Product         | Peak Temperature | Soldering Time  |
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

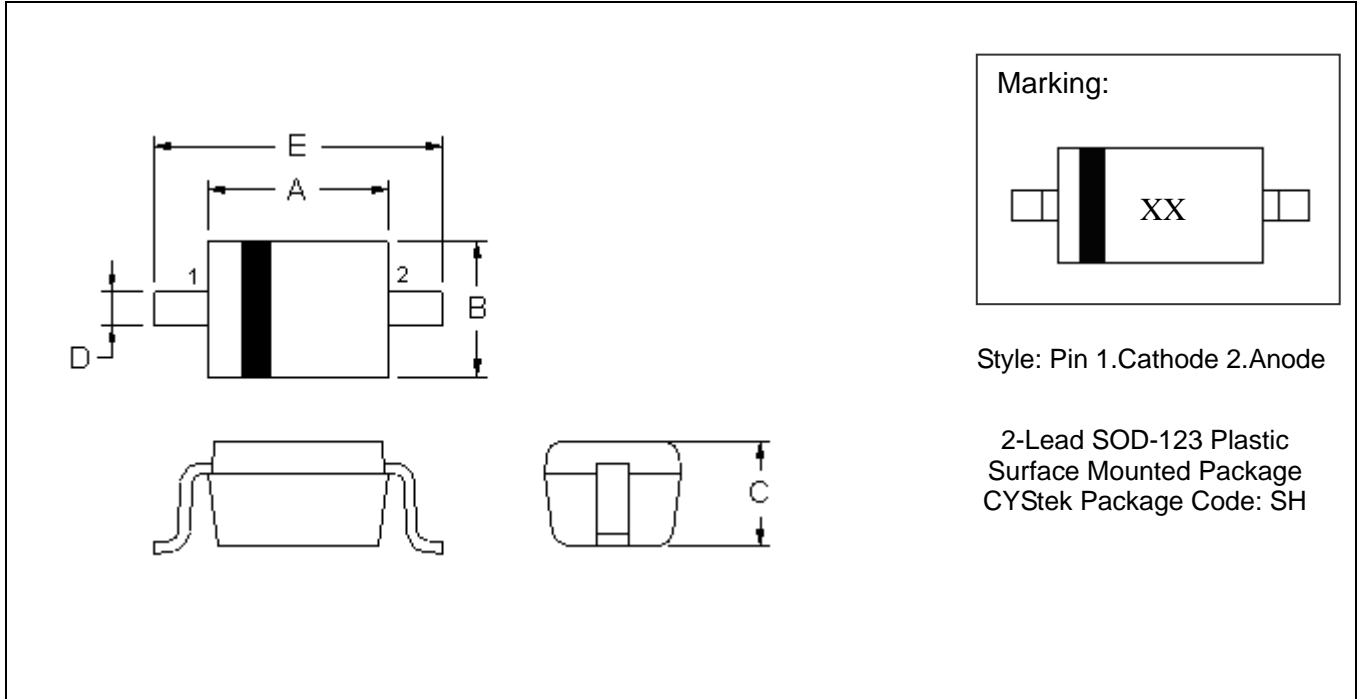
**Recommended temperature profile for IR reflow**



| Profile feature                                | Sn-Pb eutectic Assembly | Pb-free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (Tsmax to Tp)             | 3°C/second max.         | 3°C/second max.  |
| Preheat  |                         |                  |
| -Temperature Min(Ts min)                       | 100°C                   | 150°C            |
| -Temperature Max(Ts max)                       | 150°C                   | 200°C            |
| -Time(ts min to ts max)                        | 60-120 seconds          | 60-180 seconds   |
| Time maintained above:                         |                         |                  |
| -Temperature (Tl)                              | 183°C                   | 217°C            |
| - Time (tl)                                    | 60-150 seconds          | 60-150 seconds   |
| Peak Temperature(Tp)                           | 240 +0/-5 °C            | 260 +0/-5 °C     |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds           | 20-40 seconds    |
| Ramp down rate                                 | 6°C/second max.         | 6°C/second max.  |
| Time 25 °C to peak temperature                 | 6 minutes max.          | 8 minutes max.   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

**SOD-123 Dimension**



\*: Typical

| DIM | Inches |       | Millimeters |       | DIM | Inches |       | Millimeters |       |
|-----|--------|-------|-------------|-------|-----|--------|-------|-------------|-------|
|     | Min.   | Max.  | Min.        | Max.  |     | Min.   | Max.  | Min.        | Max.  |
| A   | 0.102  | 0.110 | 2.600       | 2.800 | E   | 0.140  | 0.152 | 3.550       | 3.850 |
| B   | 0.059  | 0.067 | 1.500       | 1.700 |     |        |       |             |       |
| C   | 0.041  | 0.049 | 1.050       | 1.250 |     |        |       |             |       |
| D   | 0.018  | 0.026 | 0.450       | 0.650 |     |        |       |             |       |

Notes: 1.Controlling dimension : millimeters.  
 2.Lead thickness specified per L/F drawing with solder plating.  
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

**Material:**

- Lead: Pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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