

500mW Zener Diode Series

ZD52XXBSH

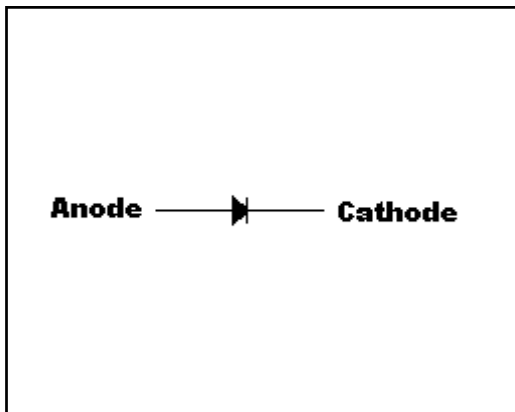
Description

The ZD52XXBSH series covers zener voltage range from 2.4V to 75V, and is encapsulated in SOD-123 package, very suitable for low cost, low power voltage regulation application.

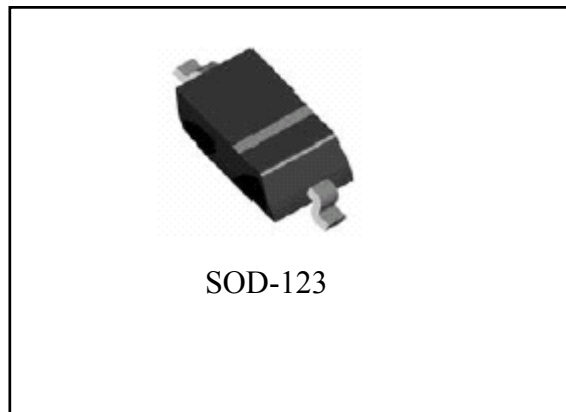
Features

- Ultra small surface mount package
- General purpose, medium current
- Planar die construction
- Pb-free lead plating and halogen-free package

Symbol

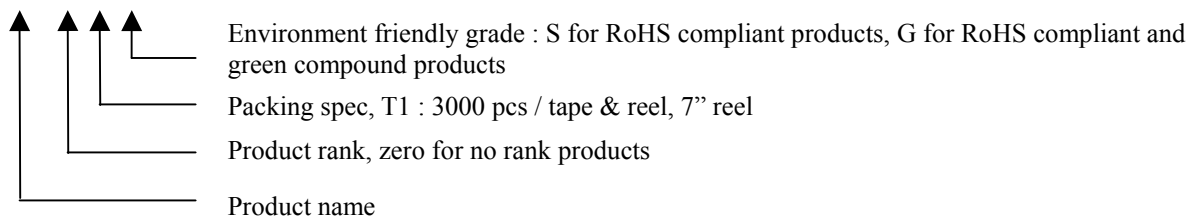


Outline



Ordering Information

| Device | Package | Shipping |
|------------------|--|------------------------|
| ZD52XXBSH-0-T1-G | SOD-123 (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=10mA0.9V
- Maximum Power Dissipation
 Total Power Dissipation @TL=75 °C Ptot (Note 1)500 mW
- Thermal Resistance, Junction to Ambient Air RθJL (Note 1).....150°C/W
- Maximum Z-current..... Ptot/Vz mA
- ESD susceptibility (Note 2)..... 30KV

Note : 1. Parts mounted on FR-5 board with area of 3.5inch × 1.5inch.
 2. Human body model.

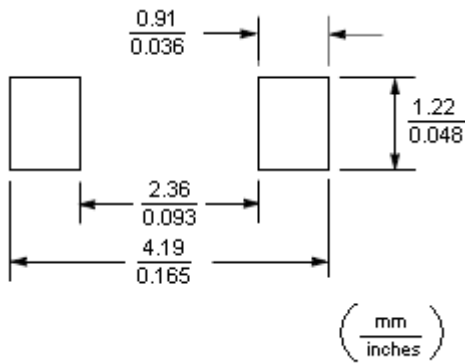
Electrical Characteristic (Ta=25°C, unless otherwise noted)

| Device | Type Code | Nom. Zener Voltage | | | | Max. Zener Impedance | | | | Max. Zener Current | Max. Reverse Leakage Current | |
|---------|-----------|--------------------|-------|-------|------|----------------------|------|----------|------|--------------------|------------------------------|-----|
| | | Vz@IzT | | | | ZZT@ IzT | | ZZK@ IzK | | | IzM@Ta | IR |
| | | Nom. | Min. | Max. | IzT | ZZT | IzT | ZZK | IzK | (mA) | | |
| (V) | (V) | (V) | (mA) | (Ω) | (mA) | (Ω) | (mA) | | | | | |
| ZD5221B | C1 | 2.4 | 2.28 | 2.52 | 20 | 30 | 20 | 1200 | 0.25 | 188 | 100 | 1.0 |
| ZD5223B | C3 | 2.7 | 2.57 | 2.84 | 20 | 30 | 20 | 1300 | 0.25 | 167 | 75 | 1.0 |
| ZD5225B | C5 | 3.0 | 2.85 | 3.15 | 20 | 30 | 20 | 1600 | 0.25 | 150 | 50 | 1.0 |
| ZD5226B | G1 | 3.3 | 3.14 | 3.47 | 20 | 28 | 20 | 1600 | 0.25 | 138 | 25 | 1.0 |
| ZD5227B | G2 | 3.6 | 3.42 | 3.78 | 20 | 24 | 20 | 1700 | 0.25 | 126 | 15 | 1.0 |
| ZD5228B | G3 | 3.9 | 3.71 | 4.10 | 20 | 23 | 20 | 1900 | 0.25 | 115 | 10 | 1.0 |
| ZD5229B | G4 | 4.3 | 4.09 | 4.52 | 20 | 22 | 20 | 2000 | 0.25 | 106 | 5.0 | 1.0 |
| ZD5230B | G5 | 4.7 | 4.47 | 4.94 | 20 | 19 | 20 | 1900 | 0.25 | 97 | 5.0 | 2.0 |
| ZD5231B | E1 | 5.1 | 4.85 | 5.36 | 20 | 17 | 20 | 1600 | 0.25 | 89 | 5.0 | 2.0 |
| ZD5232B | E2 | 5.6 | 5.32 | 5.88 | 20 | 11 | 20 | 1600 | 0.25 | 81 | 5.0 | 3.0 |
| ZD5233B | E3 | 6.0 | 5.70 | 6.30 | 20 | 7.0 | 20 | 1600 | 0.25 | 76 | 5.0 | 3.5 |
| ZD5234B | E4 | 6.2 | 5.89 | 6.51 | 20 | 7.0 | 20 | 1000 | 0.25 | 73 | 5.0 | 4.0 |
| ZD5235B | E5 | 6.8 | 6.46 | 7.14 | 20 | 5.0 | 20 | 750 | 0.25 | 67 | 3.0 | 5.0 |
| ZD5236B | F1 | 7.5 | 7.13 | 7.88 | 20 | 6.0 | 20 | 500 | 0.25 | 61 | 3.0 | 6.0 |
| ZD5237B | F2 | 8.2 | 7.79 | 8.61 | 20 | 8.0 | 20 | 500 | 0.25 | 55 | 3.0 | 6.5 |
| ZD5238B | F3 | 8.7 | 8.27 | 9.14 | 20 | 8.0 | 20 | 600 | 0.25 | 55 | 3.0 | 6.5 |
| ZD5239B | F4 | 9.1 | 8.65 | 9.56 | 20 | 10 | 20 | 600 | 0.25 | 50 | 3.0 | 7.0 |
| ZD5240B | F5 | 10 | 9.5 | 10.5 | 20 | 17 | 20 | 600 | 0.25 | 45 | 3.0 | 8.0 |
| ZD5241B | H1 | 11 | 10.45 | 11.55 | 20 | 22 | 20 | 600 | 0.25 | 41 | 2.0 | 8.4 |
| ZD5242B | H2 | 12 | 11.4 | 12.6 | 20 | 30 | 20 | 600 | 0.25 | 38 | 1.0 | 9.1 |
| ZD5243B | H3 | 13 | 12.35 | 13.65 | 9.5 | 13 | 9.5 | 600 | 0.25 | 35 | 0.5 | 9.9 |
| ZD5245B | H5 | 15 | 14.25 | 15.75 | 8.5 | 16 | 8.5 | 600 | 0.25 | 30 | 0.1 | 11 |
| ZD5246B | J1 | 16 | 15.2 | 16.8 | 7.8 | 17 | 7.8 | 600 | 0.25 | 28 | 0.1 | 12 |
| ZD5248B | J3 | 18 | 17.1 | 18.9 | 7.0 | 21 | 7.0 | 600 | 0.25 | 25 | 0.1 | 14 |
| ZD5250B | J5 | 20 | 19 | 21 | 6.2 | 25 | 6.2 | 600 | 0.25 | 23 | 0.1 | 15 |
| ZD5251B | K1 | 22 | 20.9 | 23.1 | 5.6 | 29 | 5.6 | 600 | 0.25 | 21 | 0.1 | 17 |



| | | | | | | | | | | | | |
|---------|----|----|-------|-------|-----|-----|-----|------|------|------|-----|----|
| ZD5252B | K2 | 24 | 22.8 | 25.2 | 5.2 | 33 | 5.2 | 600 | 0.25 | 19.1 | 0.1 | 18 |
| ZD5254B | K4 | 27 | 25.65 | 28.35 | 5.0 | 41 | 5.0 | 600 | 0.25 | 16.8 | 0.1 | 21 |
| ZD5255B | K5 | 28 | 26.6 | 29.4 | 4.5 | 44 | 4.5 | 600 | 0.25 | 16.2 | 0.1 | 21 |
| ZD5256B | M1 | 30 | 28.5 | 31.5 | 4.2 | 49 | 4.2 | 600 | 0.25 | 15.1 | 0.1 | 23 |
| ZD5257B | M2 | 33 | 31.35 | 34.65 | 3.8 | 58 | 3.8 | 700 | 0.25 | 13.8 | 0.1 | 25 |
| ZD5258B | M3 | 36 | 34.2 | 37.8 | 3.4 | 70 | 3.4 | 700 | 0.25 | 12.6 | 0.1 | 27 |
| ZD5259B | M4 | 39 | 37.05 | 40.95 | 3.2 | 80 | 3.2 | 800 | 0.25 | 11.6 | 0.1 | 30 |
| ZD5260B | M5 | 43 | 40.85 | 45.15 | 3 | 93 | 3 | 900 | 0.25 | 10.6 | 0.1 | 33 |
| ZD5261B | N1 | 47 | 44.65 | 49.35 | 2.7 | 105 | 2.7 | 1000 | 0.25 | 9.6 | 0.1 | 36 |
| ZD5262B | N2 | 51 | 48.45 | 53.55 | 2.5 | 125 | 2.5 | 1100 | 0.25 | 8.8 | 0.1 | 39 |
| ZD5263B | N3 | 56 | 53.20 | 58.80 | 2.2 | 150 | 2.2 | 1300 | 0.25 | 8.0 | 0.1 | 43 |
| ZD5264B | N4 | 60 | 57.00 | 63.00 | 2.1 | 170 | 2.1 | 1400 | 0.25 | 7.5 | 0.1 | 46 |
| ZD5265B | N5 | 62 | 58.90 | 65.10 | 2.0 | 185 | 2.0 | 1400 | 0.25 | 7.3 | 0.1 | 47 |
| ZD5266B | P1 | 68 | 64.60 | 71.40 | 1.8 | 230 | 1.8 | 1600 | 0.25 | 6.6 | 0.1 | 52 |
| ZD5267B | P2 | 75 | 71.25 | 78.75 | 1.7 | 270 | 1.7 | 1700 | 0.25 | 6.0 | 0.1 | 56 |

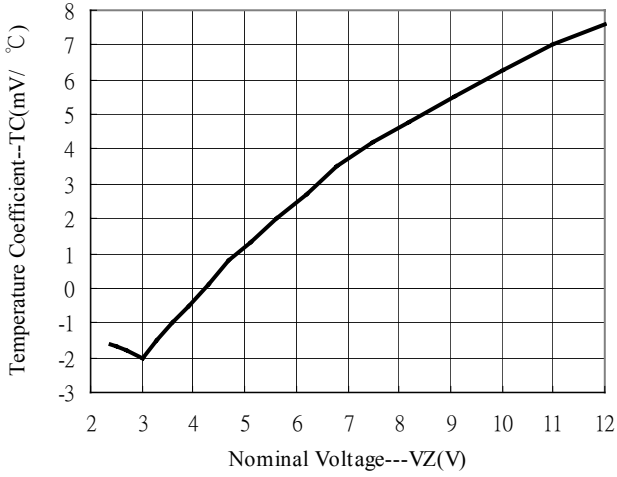
Recommended Soldering Footprint



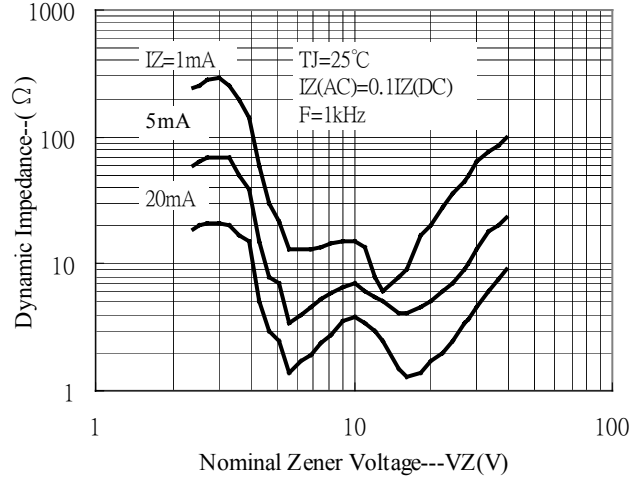


Typical Characteristics

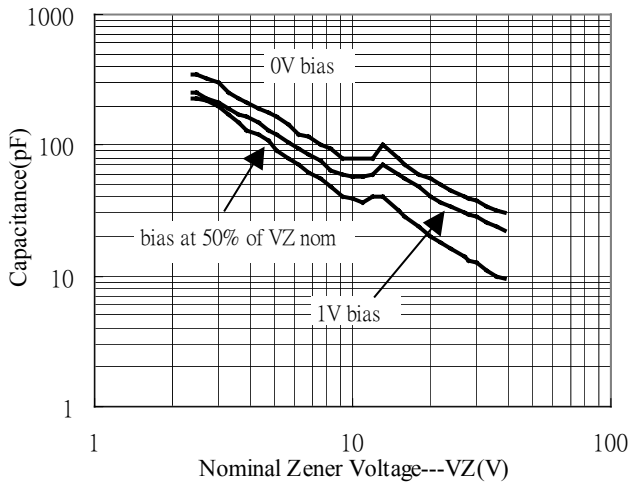
Typical Temperature Coefficient



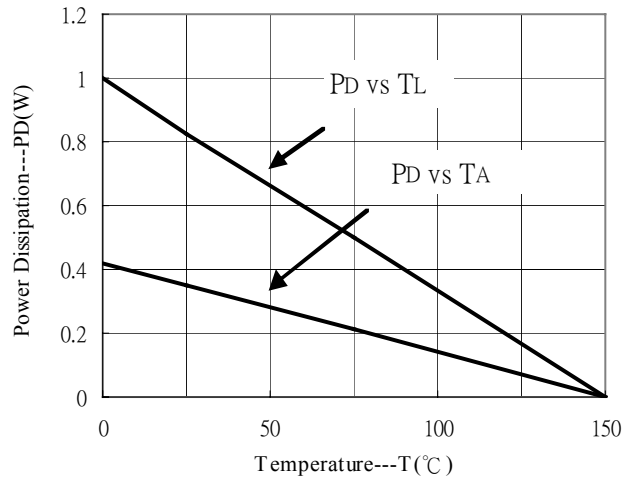
Dynamic Impedance



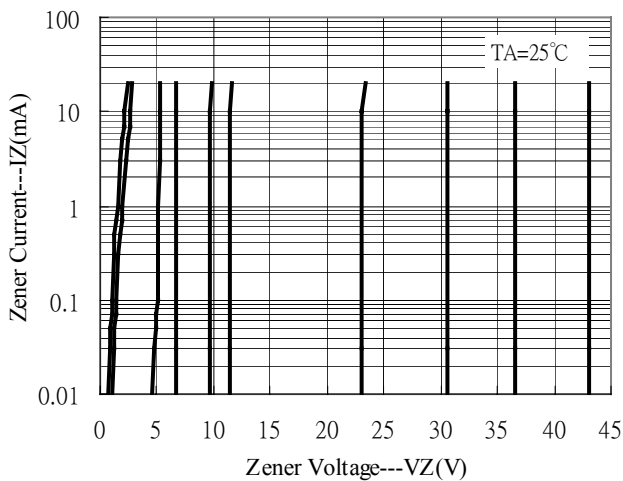
Typical Capacitance



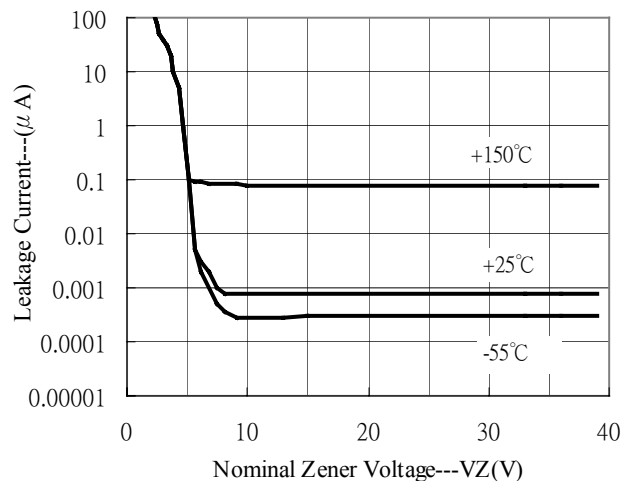
Power Derating Curve



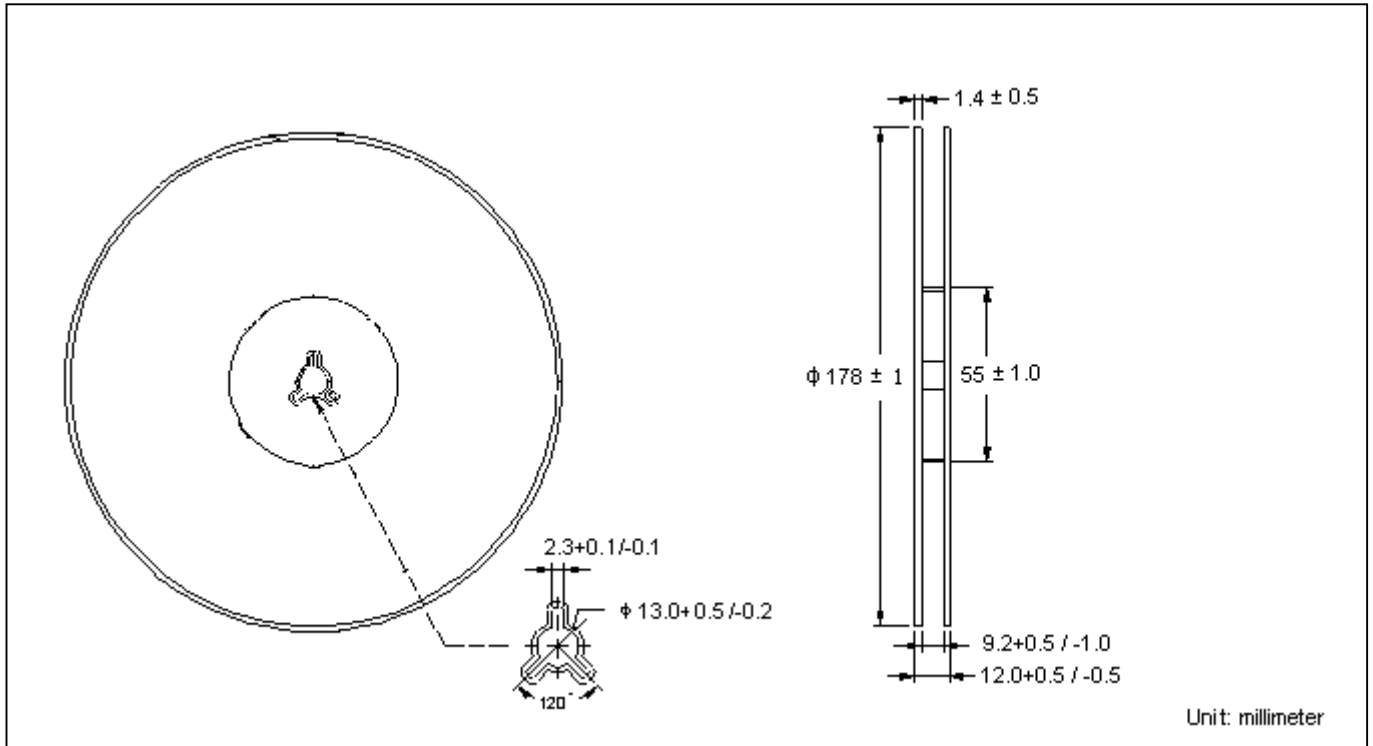
Zener Current vs Zener Voltage



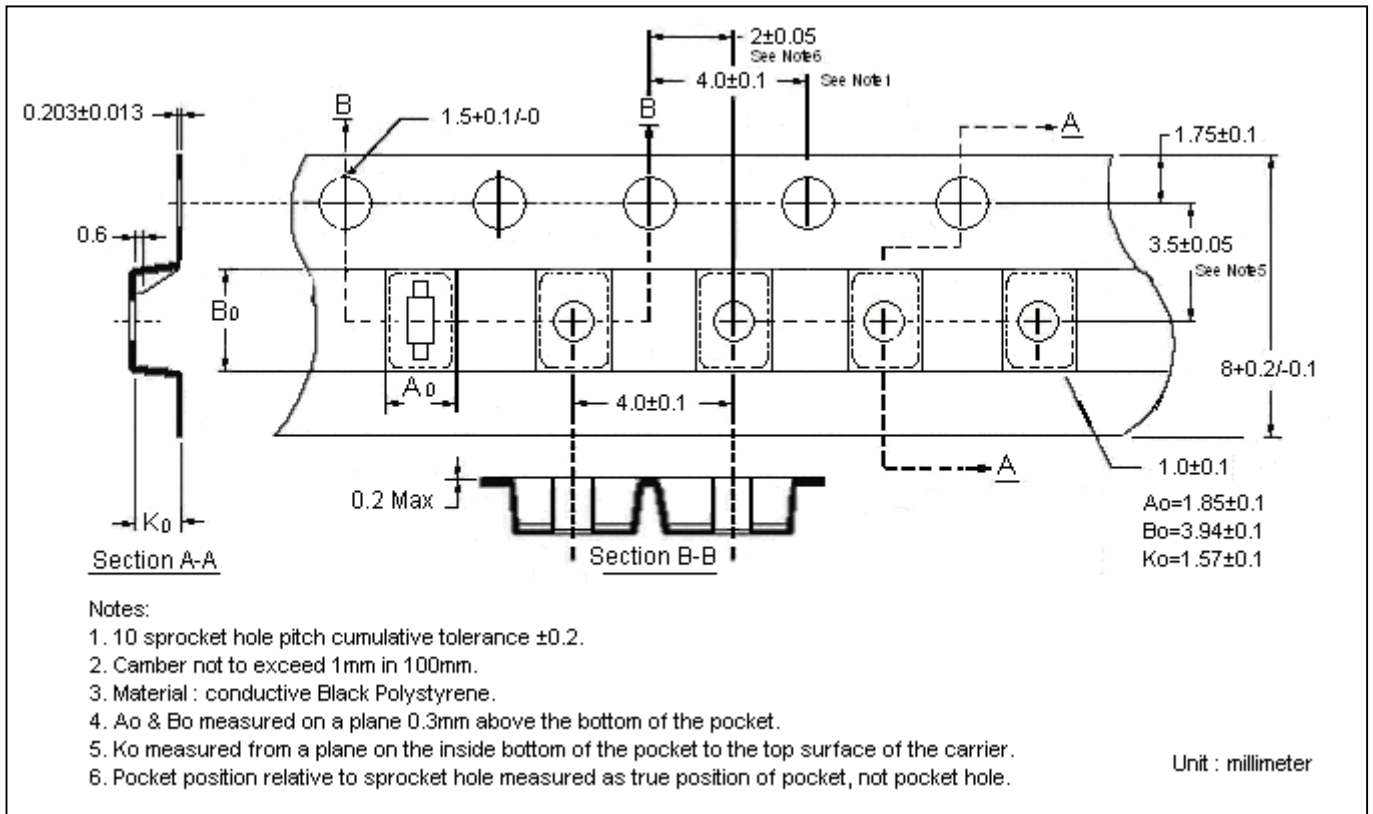
Typical Leakage Current



Reel Dimension



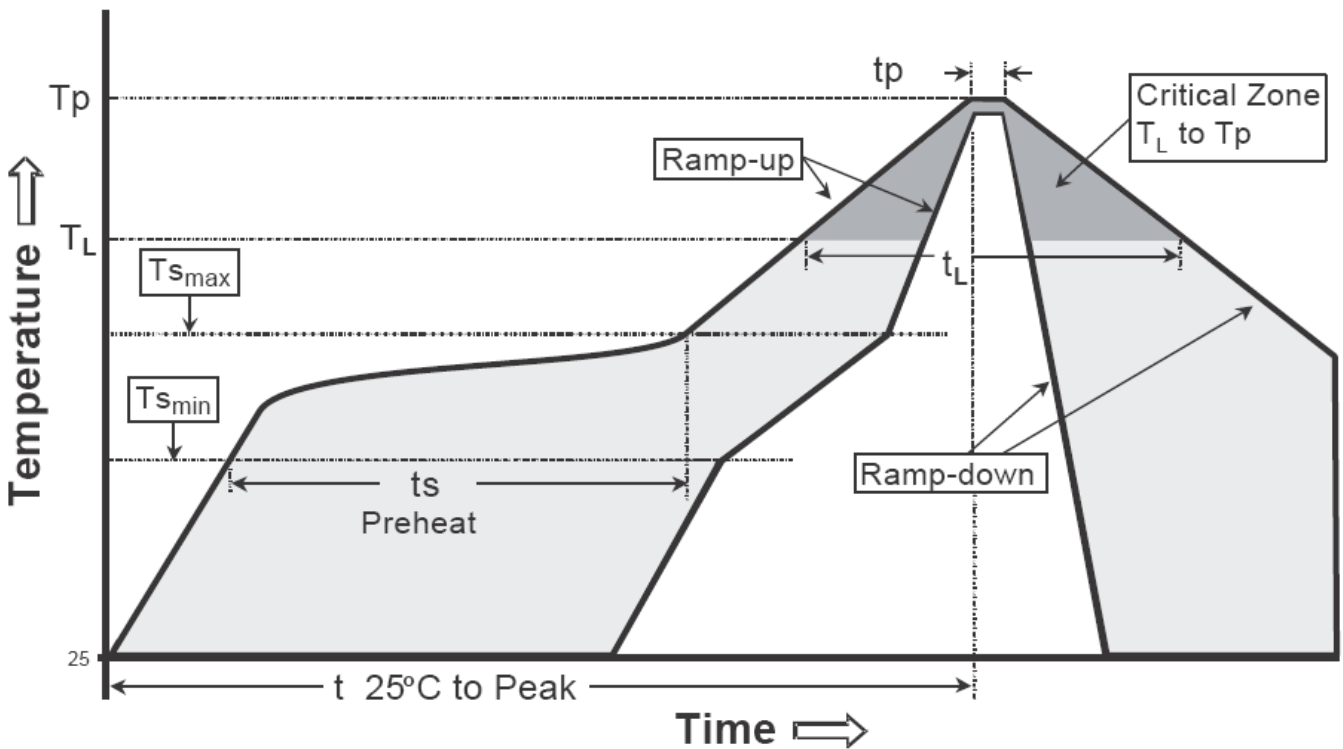
Carrier Tape Dimension



Recommended wave soldering condition

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

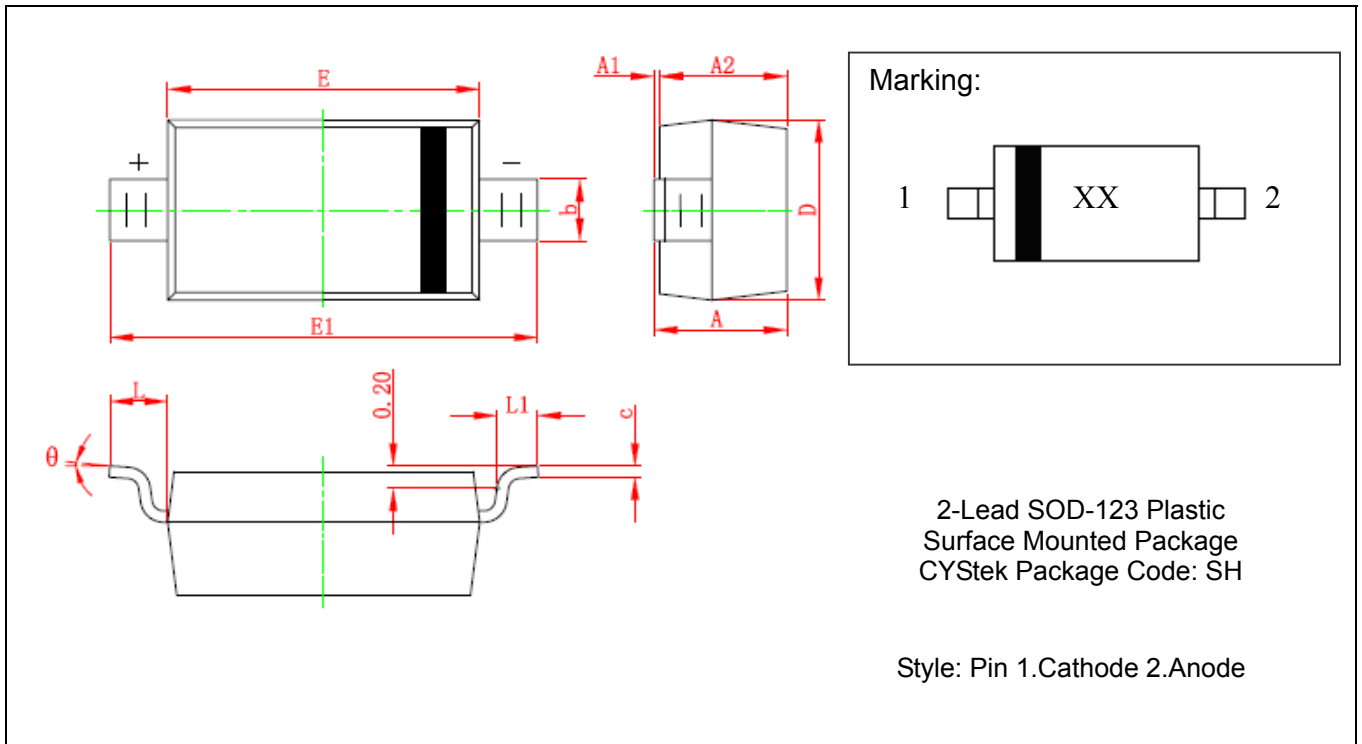
Recommended temperature profile for IR reflow



| 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



| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|-------|--------|-------|-----|-------------|-------|-----------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 | E | 2.600 | 2.800 | 0.102 | 0.110 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 | E1 | 3.550 | 3.850 | 0.140 | 0.152 |
| A2 | 1.050 | 1.115 | 0.041 | 0.045 | L | 0.500 REF | | 0.020 REF | |
| b | 0.450 | 0.650 | 0.018 | 0.026 | L1 | 0.250 | 0.450 | 0.010 | 0.018 |
| c | 0.080 | 0.150 | 0.003 | 0.006 | θ | 0° | 8° | 0° | 8° |
| D | 1.500 | 1.700 | 0.059 | 0.067 | | | | | |

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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