

150mW SOD-523 Zener Voltage Regulators**ZD5221BC2 thru ZD5260BC2****Description**

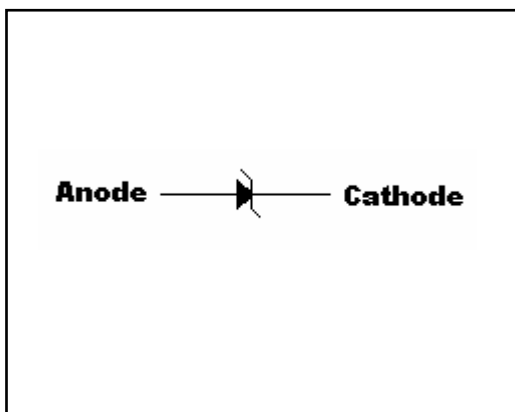
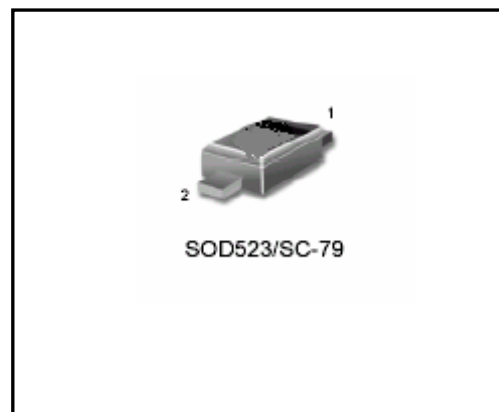
The ZD5221BC2 series zener diodes are packaged in a SOD-523 surface mount package that has a power dissipation of 200mW. They are designed to provide voltage regulation protection and are especially attractive in situations where space is at a premium. They are well suited for applications such as cellular phones, hand held portables, and high density PC boards.

Features

- Standard zener breakdown voltage range : 2.4V to 43V
- Steady state power rating of 200mW..
- Small body outline dimensions
- Low body height : 0.031 inches (0.77mm) max.

Mechanical Data

- Case : SOD-523 , molded plastic
- Terminals : Solderable per MIL-STD-750 method 2026
- Polarity : Cathode indicated by polarity band.
- Flammability rating : UL94 V-0
- Mounting position : Any

Symbol**Outline**



Absolute Maximum Ratings($T_A=25^{\circ}\text{C}$, unless otherwise specified)

- Maximum Temperatures
 - Storage Temperature T_{stg} -65~+150 °C
 - Junction Temperature T_j -65~ +150 °C
- Maximum Power Dissipation
 - Total Power Dissipation P_{tot} (Note 1) 200 mW
- Thermal Resistance, Junction to Ambient Air $R_{\theta JA}$625°C/W

Note 1: Parts mounted on ceramic board with area of 25mm².

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted, $V_F=0.9\text{V Max}$ @ $I_F=10\text{mA}$ for all types.)

| Symbol | Parameter |
|-----------------|---|
| V _Z | Reverse zener voltage @ I _{ZT} |
| I _{ZT} | Reverse current |
| Z _{ZT} | Maximum zener impedance @ I _{ZT} |
| I _{ZK} | Reverse current |
| Z _{ZK} | Maximum zener impedance @ I _{ZK} |
| I _R | Reverse leakage current @ V _R |
| V _R | Reverse voltage |

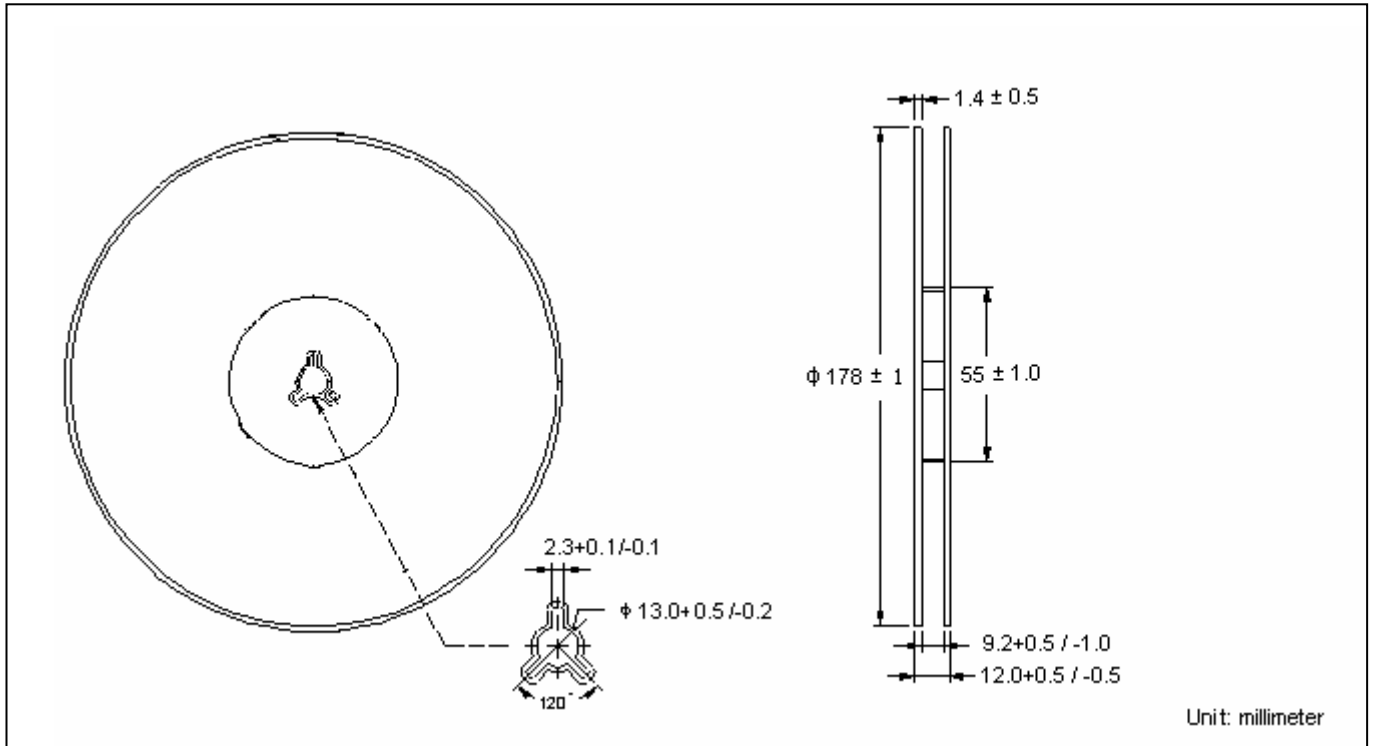


Electrical Characteristic (Ta=25°C, unless otherwise noted)

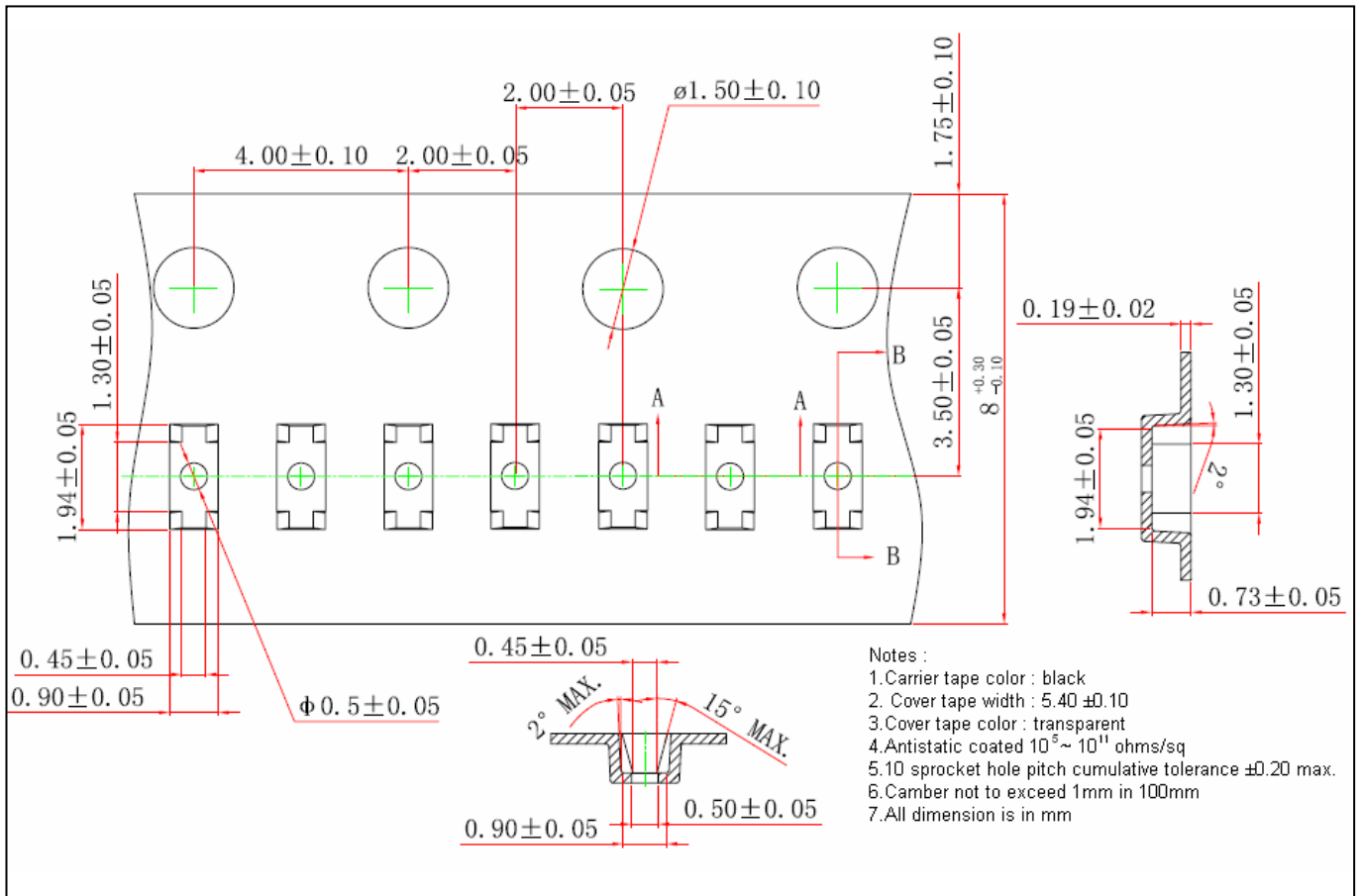
| Device | Type Code | Nom. Zener Voltage | | | | Max. Zener Impedance | | | | Max. Zener Current | Max. Reverse Leakage Current | |
|---------|-----------|--------------------|-------|-------|------|----------------------|------|----------|------|--------------------|------------------------------|-----|
| | | Vz@IzT | | | | ZZT@ IzT | | ZZK@ IzK | | | IzM@Ta | IR |
| | | Nom. | Min. | Max. | IzT | ZZT | IzT | ZZK | IzK | | | |
| | | (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 |

Note 2: Zener voltage is measured with a pulse test current Iz at an ambient temperature of 25°C.

Reel Dimension



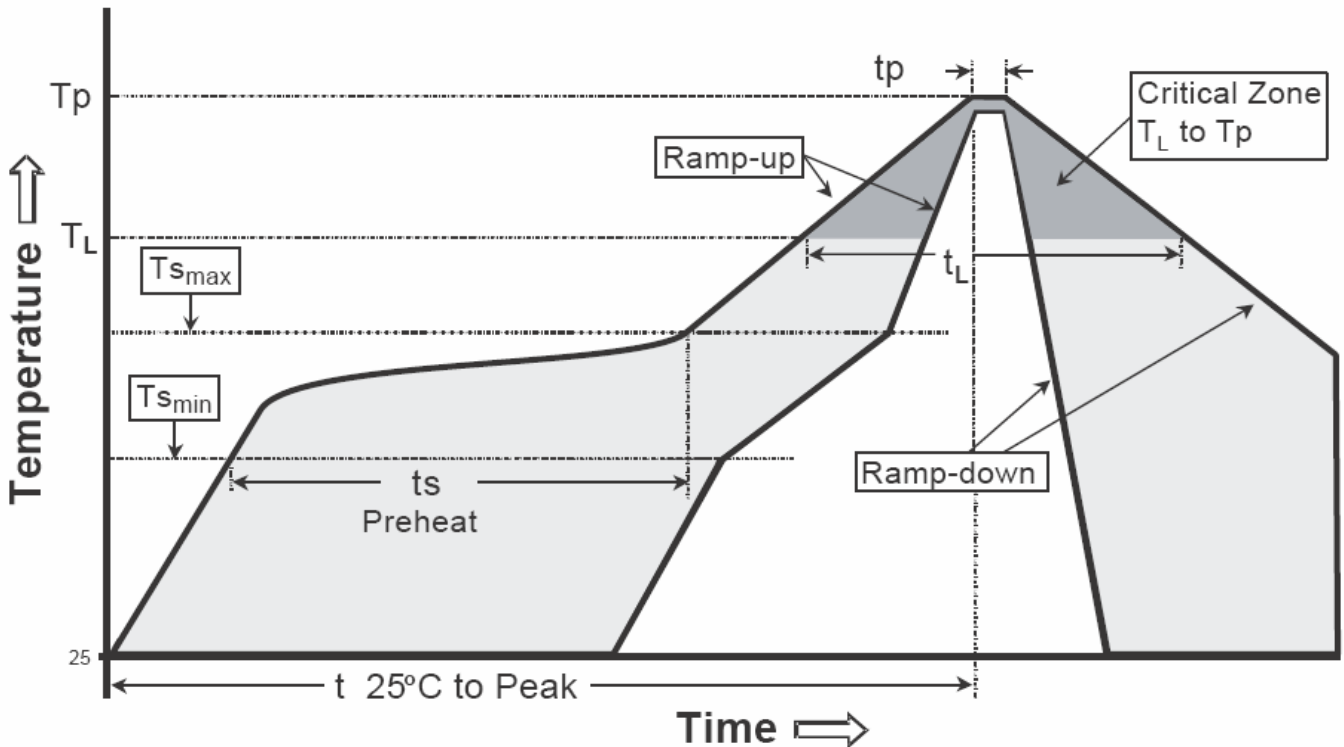
Carrier Tape Dimension



Recommended wave soldering condition

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

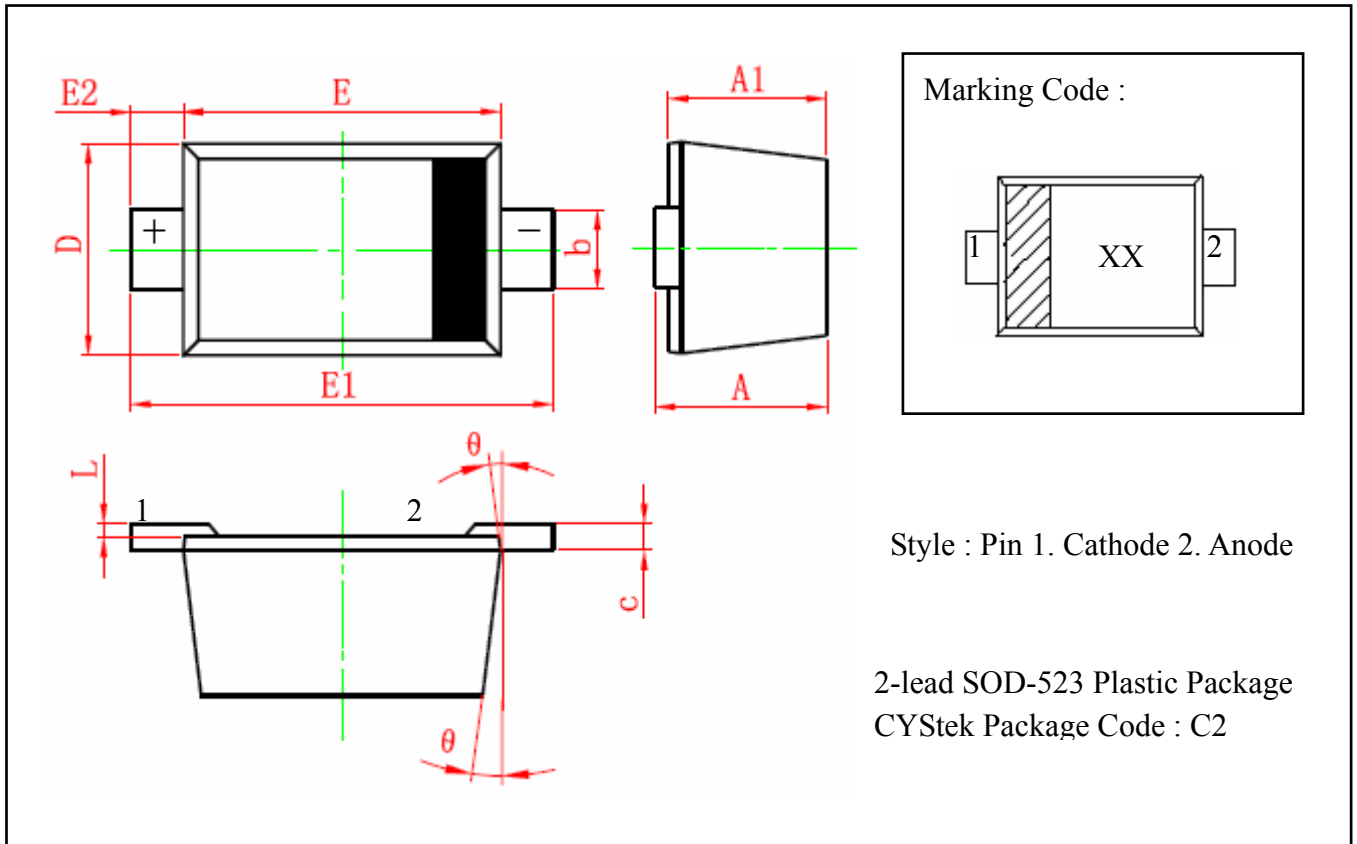
Recommended temperature profile for IR reflow



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|---|-------------------------|------------------|
| Average ramp-up rate (T _{smax} to T _p) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(T _{s min}) | 100°C | 150°C |
| -Temperature Max(T _{s max}) | 150°C | 200°C |
| -Time(t _{s min} to t _{s max}) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| -Temperature (T _L) | 183°C | 217°C |
| - Time (t _L) | 60-150 seconds | 60-150 seconds |
| Peak Temperature(T _P) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(t _p) | 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-523 Dimension



*: Typical

| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|-------|--------|-------|----------|-------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.510 | 0.770 | 0.020 | 0.031 | E | 1.100 | 1.300 | 0.043 | 0.051 |
| A1 | 0.500 | 0.700 | 0.020 | 0.028 | E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| b | 0.250 | 0.350 | 0.010 | 0.014 | E2 | 0.200 | REF | 0.008 | REF |
| c | 0.080 | 0.150 | 0.003 | 0.006 | L | 0.010 | 0.070 | 0.001 | 0.003 |
| D | 0.750 | 0.850 | 0.030 | 0.033 | θ | 7° REF | | 7° REF | |

Notes: 1.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 2.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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