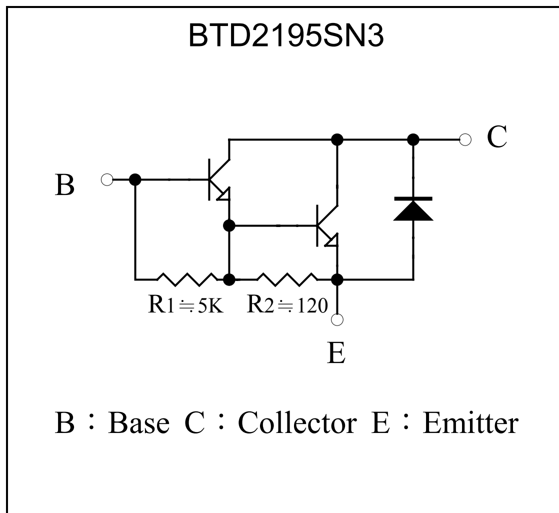
## NPN Epitaxial Planar Transistor

# BTD2195SN3

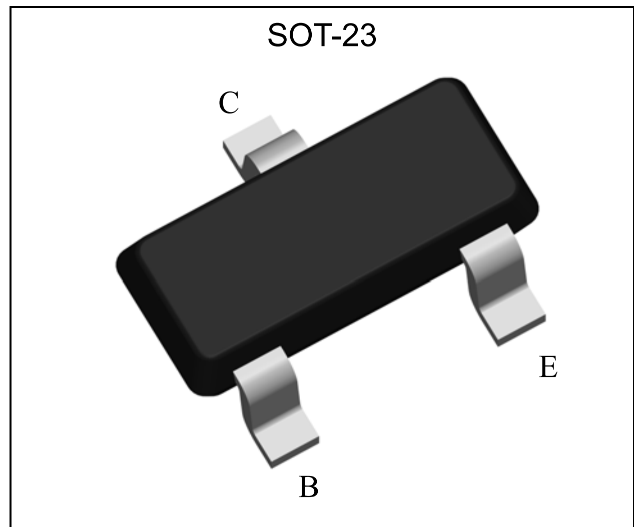
## Description

The BTD2195SN3 is designed for use in general purpose amplifier and low speed switching application. Pb-free lead plating package process is adopted.

## Equivalent Circuit

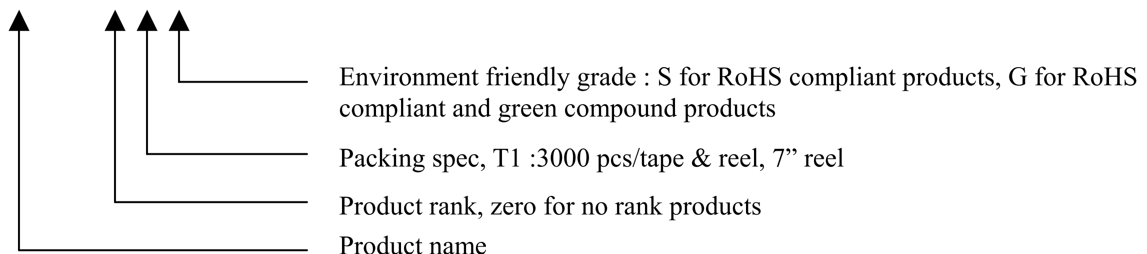



## Outline




## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| BTD2195SN3-0-T1-G | SOT-23<br>(Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel |



## Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 150 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 150 | |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | |
| Collector Current (DC) | $I_C$ | 2 | A |
| Collector Current (Pulse) | $I_{CP}$ | 4 (Note 1) | |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 500 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 100 | |
| Power Dissipation @ $T_A$=25°C | $P_D$ | 0.3 | W |
| Power Dissipation @ $T_C$=25°C | | 1.5 | |
| Opeearting Junction Temperature Range | Tj | -55~+175 | °C |
| Storage Temperature Range | Tstg | -55~+175 | |

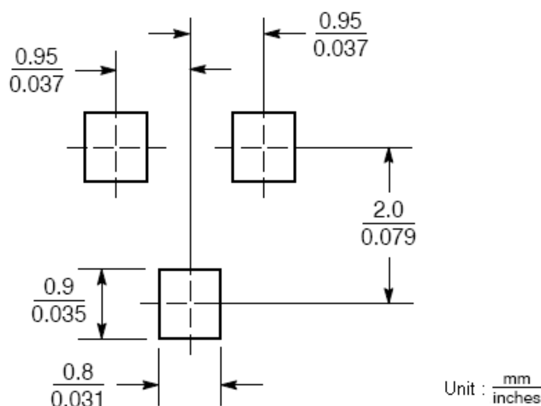
Note : 1. Single Pulse Pw≦350μs, Duty≦2%.

## Characteristics (Ta=25°C)

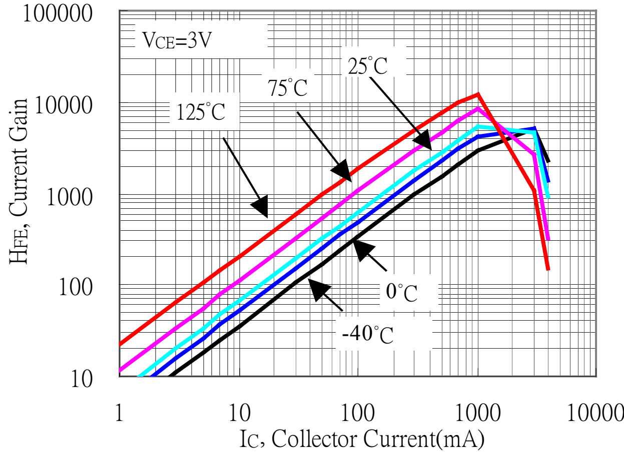
| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| $BV_{CBO}$ | 150 | - | - | V | $I_C$=100μA, $I_E$=0 |
| $I_{CBO}$ | - | - | 100 | nA | $V_{CB}$=150V, $I_E$=0 |
| $I_{CEO}$ | - | - | 1 | μA | $V_{CE}$=150V, $I_B$=0 |
| $I_{EBO}$ | - | - | 2 | mA | $V_{EB}$=5V, $I_C$=0 |
| *$V_{CE(sat)}$ | - | - | 1.2 | V | $I_C$=2A, $I_B$=2mA |
| *$V_{BE(on)}$ | | | 2.2 | V | $V_{CE}$=4V, $I_C$=2A |
| *$h_{FE}$1 | 2000 | - | - | - | $V_{CE}$=4V, $I_C$=1A |
| *$h_{FE}$2 | 1000 | - | - | - | $V_{CE}$=4V, $I_C$=2A |
| Cob | - | | 200 | pF | $V_{CB}$=10V, $I_E$=0A, f=1MHz |

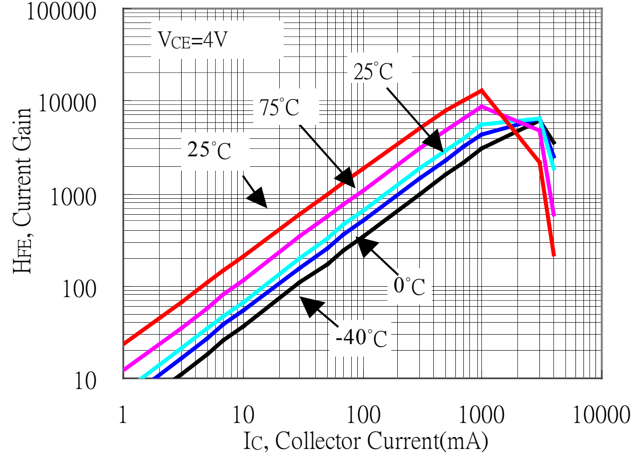
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

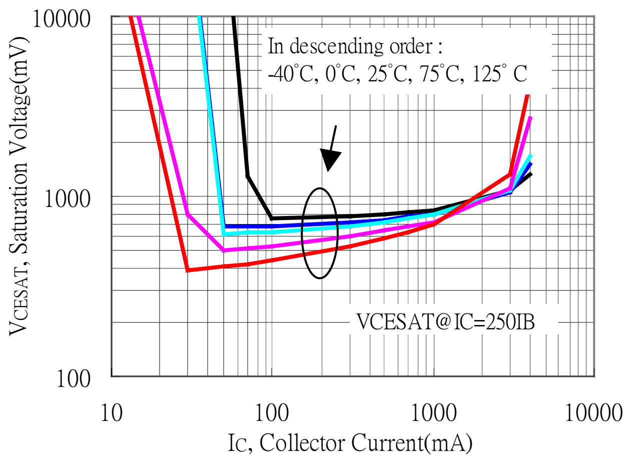
## Recommended Soldering Footprint

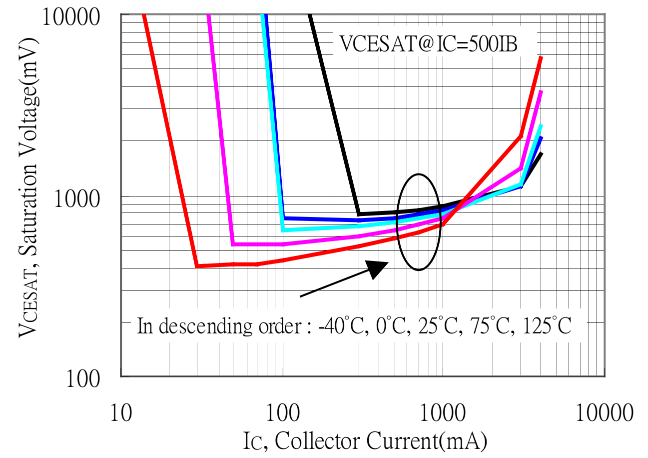


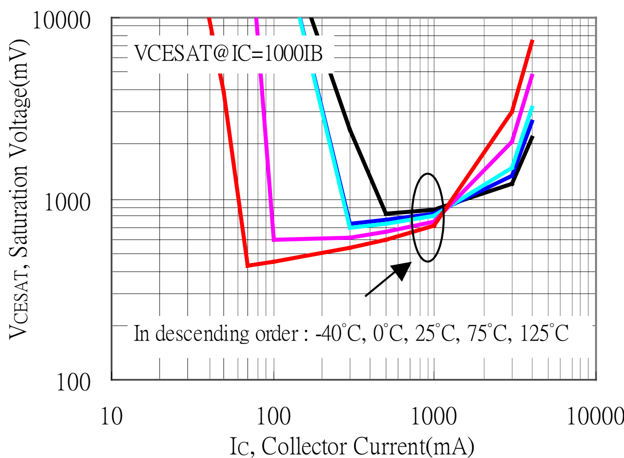
## Typical Characteristics

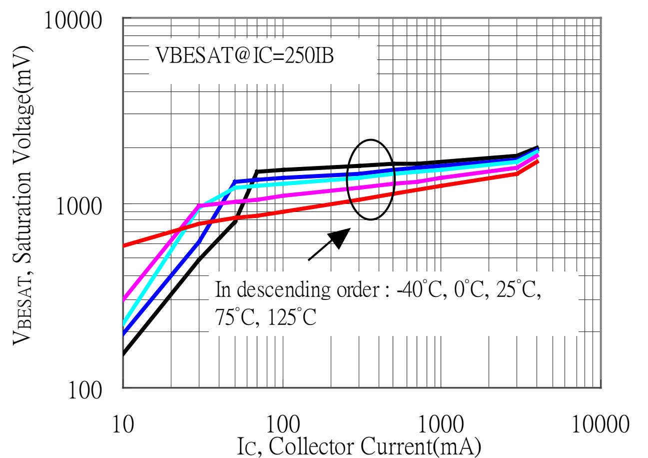


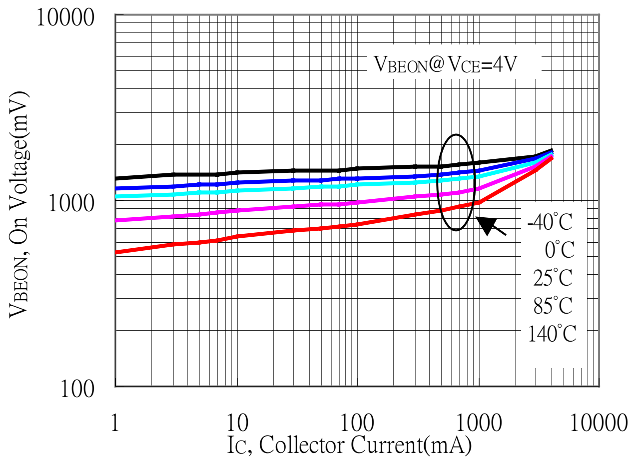



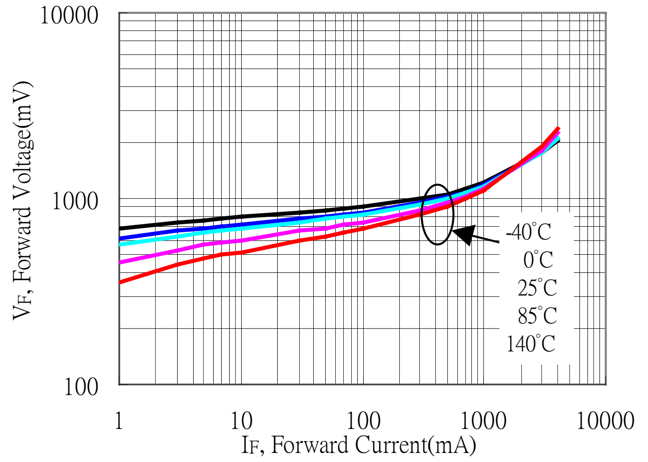



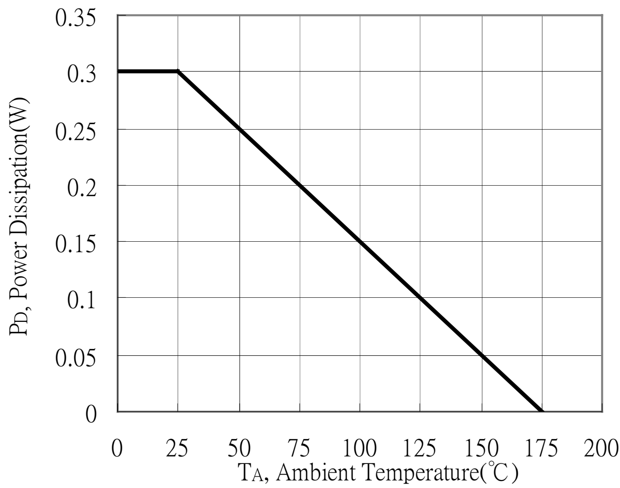



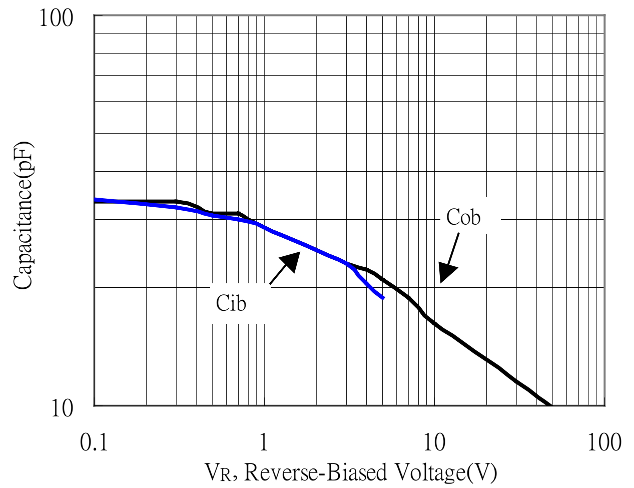



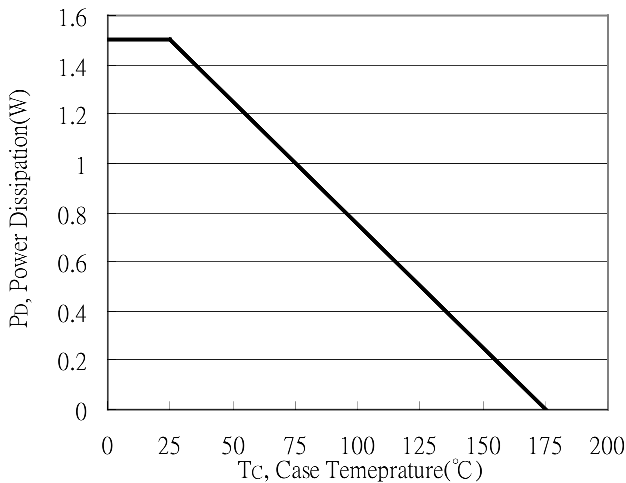
## Typical Characteristics(Cont.)



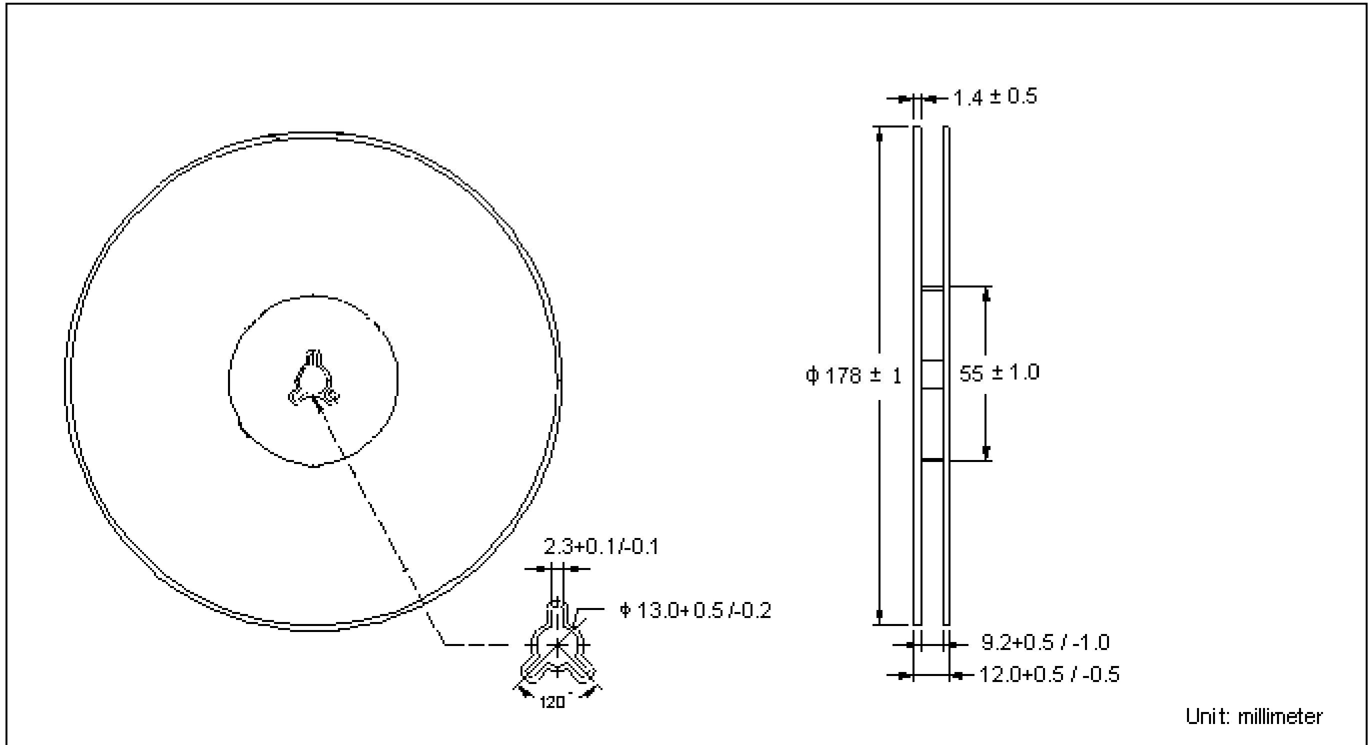



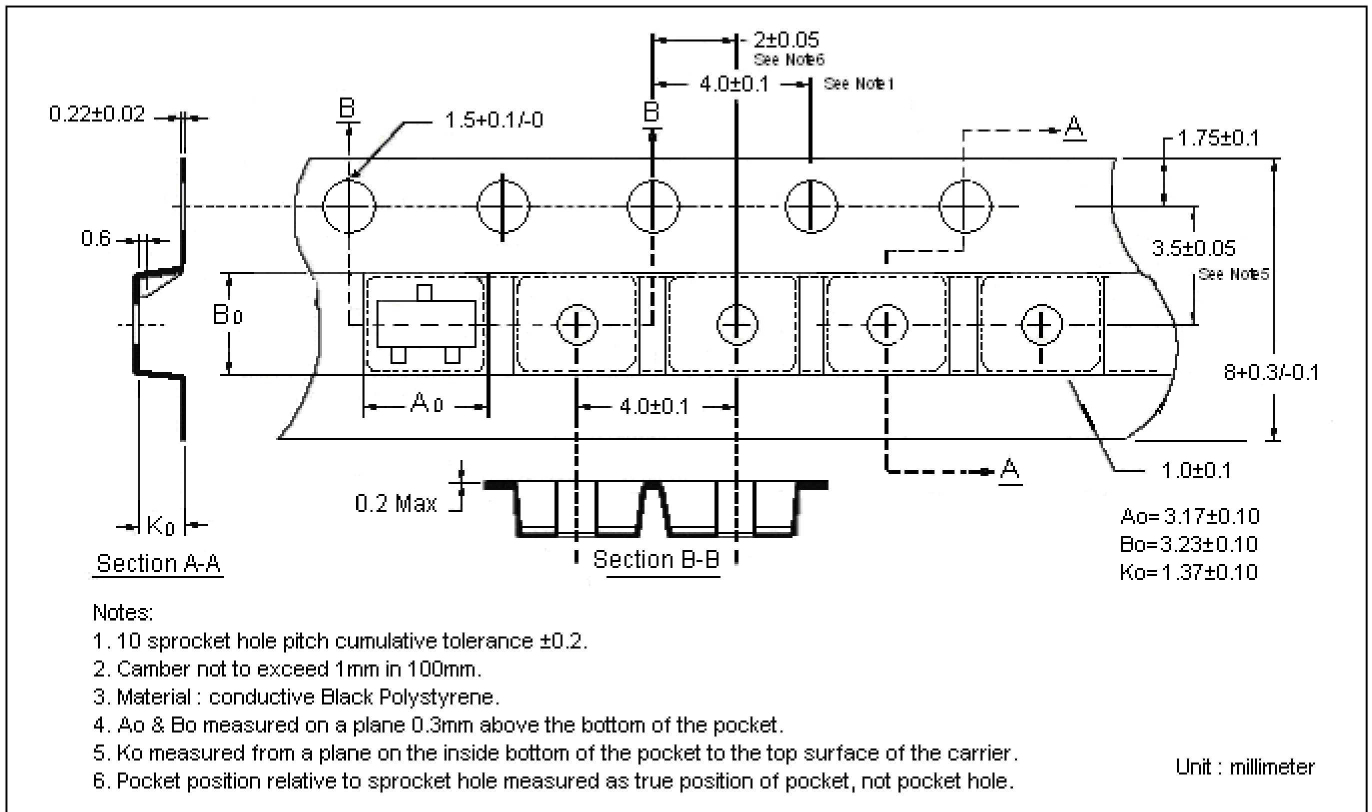



## Reel Dimension




## Carrier Tape Dimension



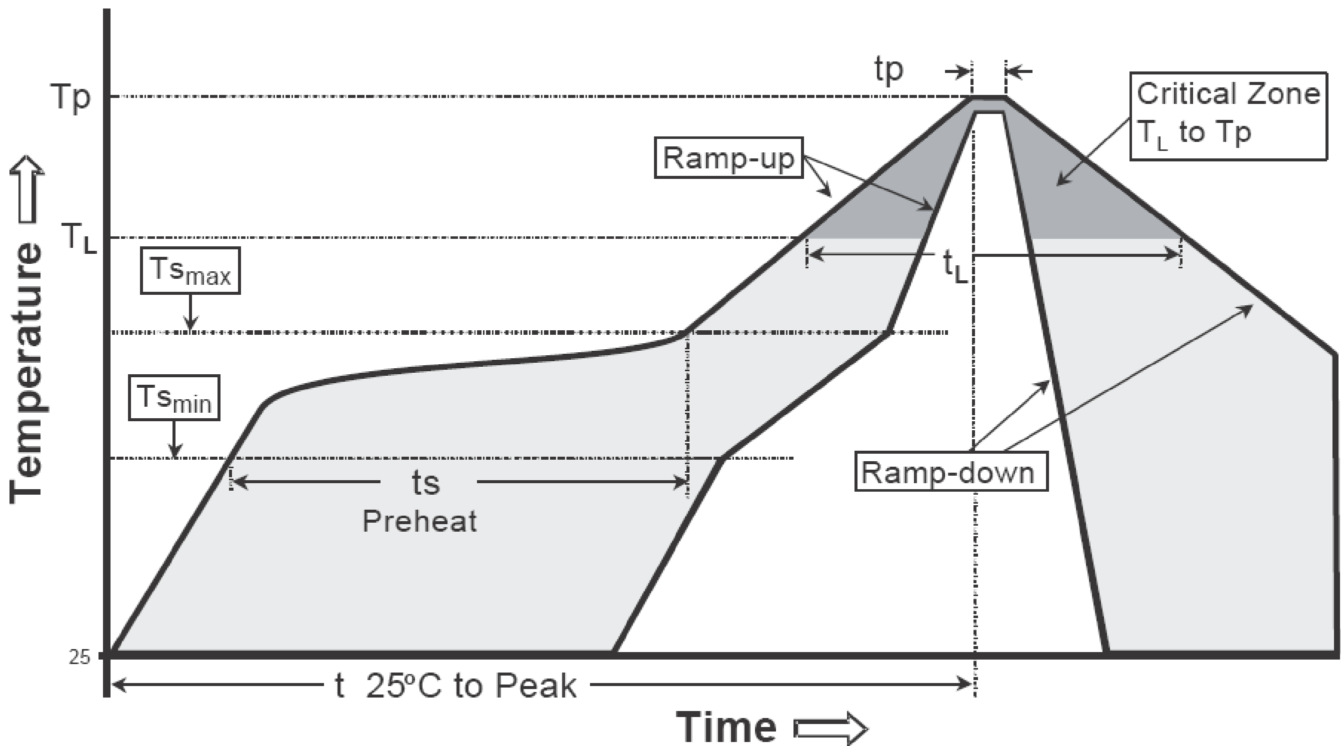

Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

## Recommended wave soldering condition

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

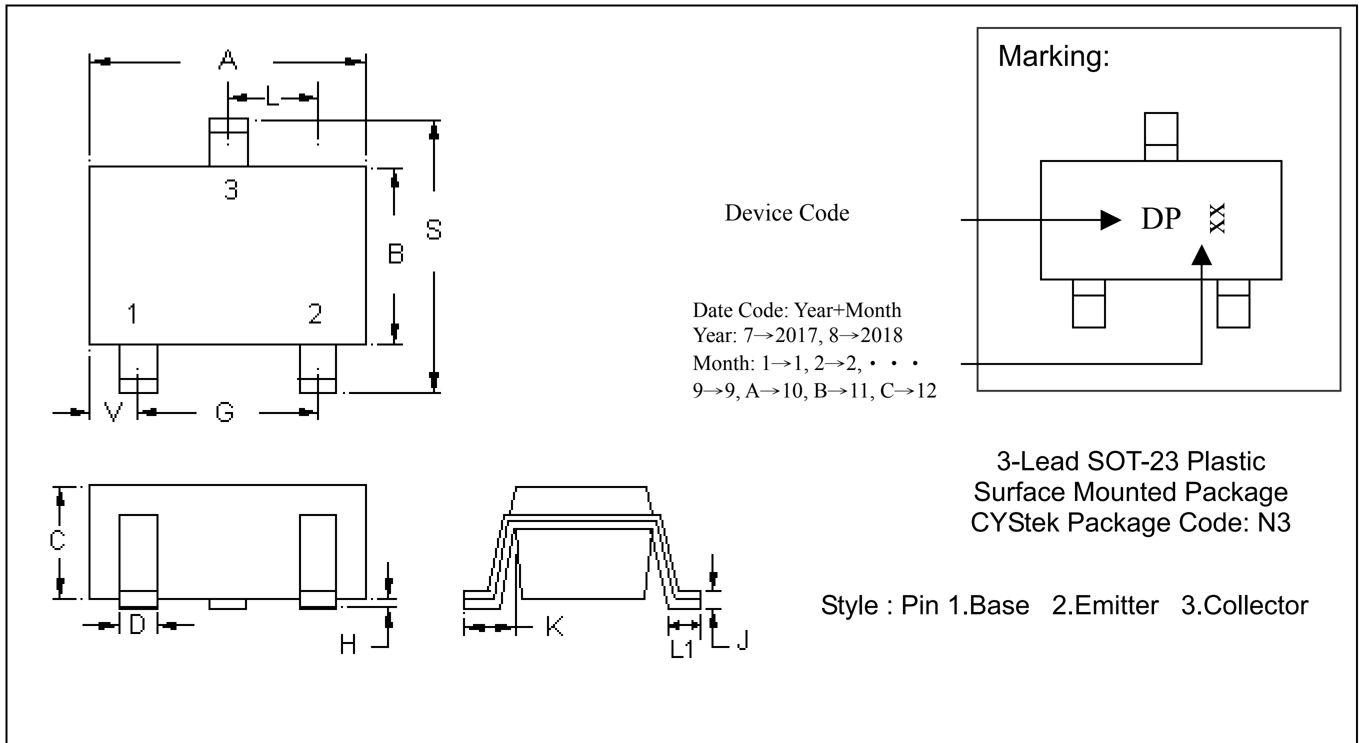
## Recommended temperature profile for IR reflow




| 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<br>−Temperature Min(Ts min)<br>−Temperature Max(Ts max)<br>−Time(ts min to ts max) | <br>100°C<br>150°C<br>60-120 seconds | <br>150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>−Temperature (TL)<br>− Time (tL) | <br>183°C<br>60-150 seconds | <br>217°C<br>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.

## SOT-23 Dimension




| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.1102 | 0.1204 | 2.80 | 3.04 | J | 0.0032 | 0.0079 | 0.08 | 0.20 |
| B | 0.0472 | 0.0669 | 1.20 | 1.70 | K | 0.0118 | 0.0266 | 0.30 | 0.67 |
| C | 0.0335 | 0.0512 | 0.89 | 1.30 | L | 0.0335 | 0.0453 | 0.85 | 1.15 |
| D | 0.0118 | 0.0197 | 0.30 | 0.50 | S | 0.0830 | 0.1161 | 2.10 | 2.95 |
| G | 0.0669 | 0.0910 | 1.70 | 2.30 | V | 0.0098 | 0.0256 | 0.25 | 0.65 |
| H | 0.0000 | 0.0040 | 0.00 | 0.10 | L1 | 0.0118 | 0.0197 | 0.30 | 0.50 |

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