

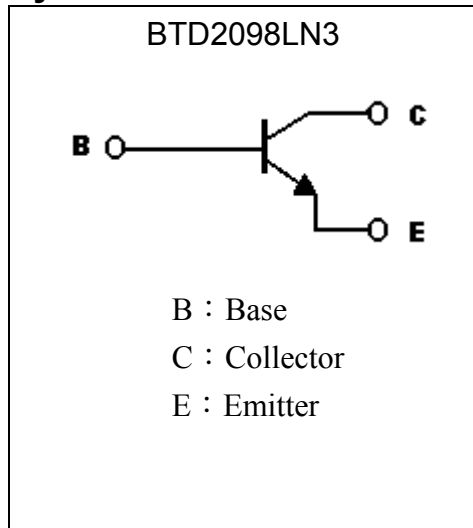
# Low Vcesat NPN Epitaxial Planar Transistor

## BTD2098LN3

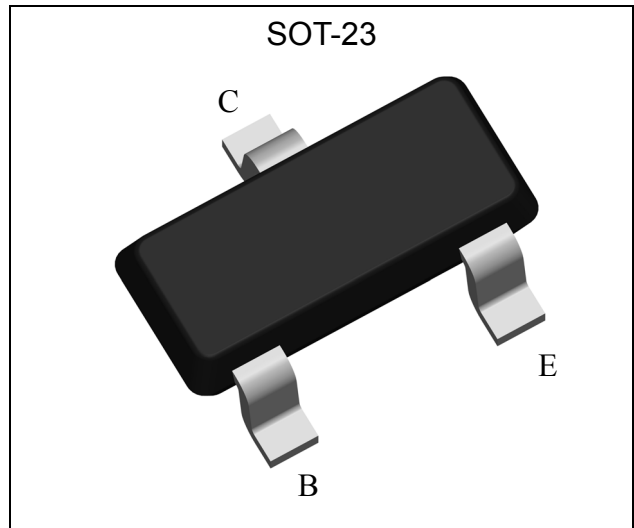
### Features

- Low  $V_{CE(sat)}$ ,  $V_{CE(sat)}=0.25\text{ V}$  (typical), at  $I_C / I_B = 3\text{ A} / 0.1\text{ A}$
- Excellent DC current gain characteristics
- Complementary to BTB1386LN3
- Pb-free lead plating and halogen-free package

### Symbol

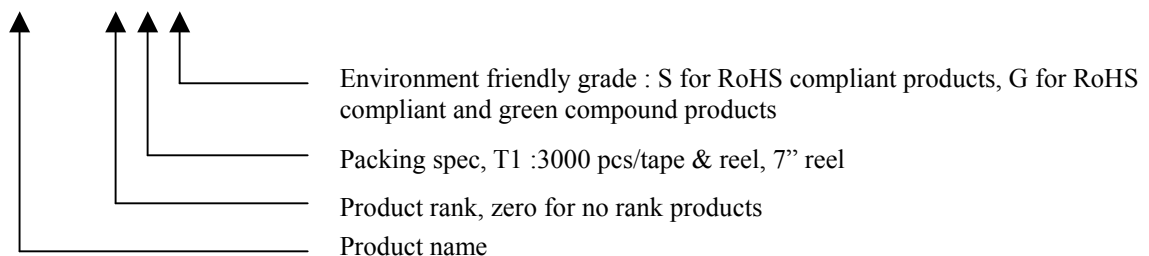


### Outline



### Ordering Information

Device	Package	Shipping
BTD2098LN3-0-T1-G	SOT-23 (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 <sub>CBO</sub>	25	V
Collector-Emitter Voltage	V <sub>CEO</sub>	15	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current (DC)	I <sub>C</sub>	5	A
Collector Current (Pulse)	I <sub>CP</sub>	8 (Note 1)	A
Power Dissipation	P <sub>D</sub>	0.9 (Note 2)	W
Thermal Resistance, junction to ambient	R <sub>θJA</sub>	138	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	100	°C/W
Junction Temperature	T <sub>j</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

Note : 1. Single Pulse Pw ≤ 350μs, Duty ≤ 2%.  
 2. When mounted on a ceramic board with area of 600mm<sup>2</sup>×0.8mm

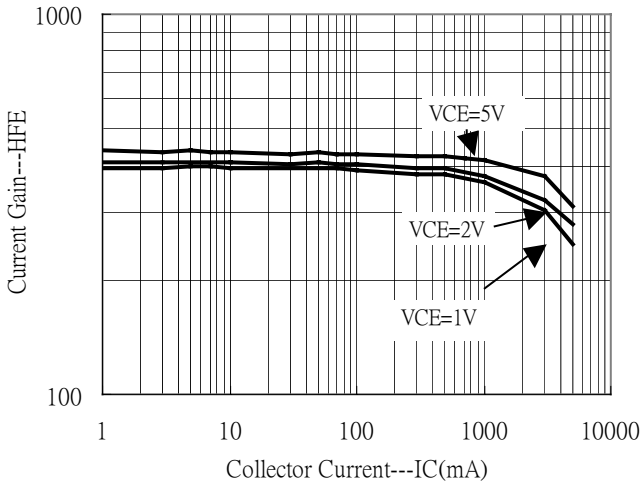
**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	25	-	-	V	I <sub>C</sub> =50μA, I <sub>B</sub> =0
BV <sub>CEO</sub>	15	-	-	V	I <sub>C</sub> =1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	6	-	-	V	I <sub>E</sub> =50μA, I <sub>C</sub> =0
I <sub>CBO</sub>	-	-	0.1	μA	V <sub>CB</sub> =20V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	0.1	μA	V <sub>EB</sub> =5V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub>	-	0.25	0.5	V	I <sub>C</sub> =3A, I <sub>B</sub> =0.1A
*h <sub>FE1</sub>	270	-	820	-	V <sub>CE</sub> =2V, I <sub>C</sub> =500mA
*h <sub>FE2</sub>	160	-	-	-	V <sub>CE</sub> =2V, I <sub>C</sub> =2A
f <sub>T</sub>	-	150	-	MHz	V <sub>CE</sub> =6V, I <sub>C</sub> =50mA, f=200MHz
Cob	-	-	50	pF	V <sub>CB</sub> =20V, I <sub>E</sub> =0A, f=1MHz

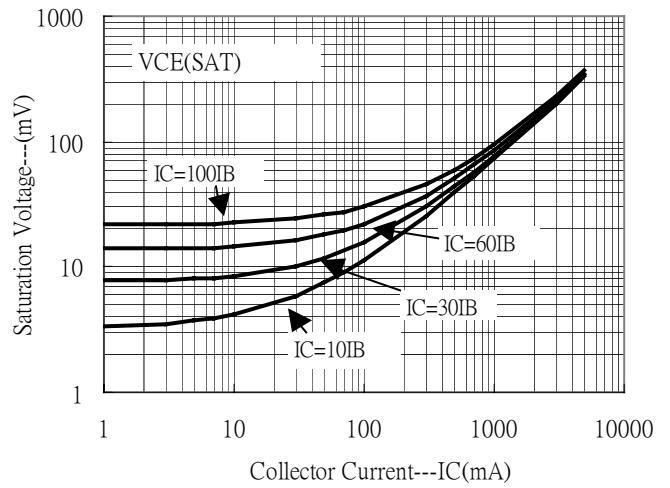
\*Pulse Test : Pulse Width ≤ 380μs, Duty Cycle ≤ 2%

**Typical Characteristics**

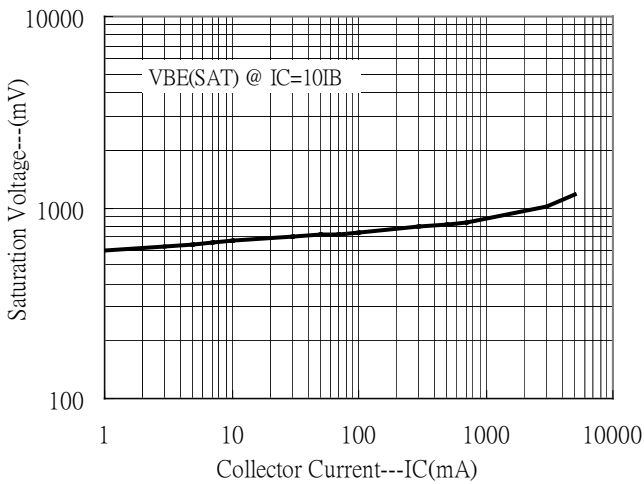
Current Gain vs Collector Current



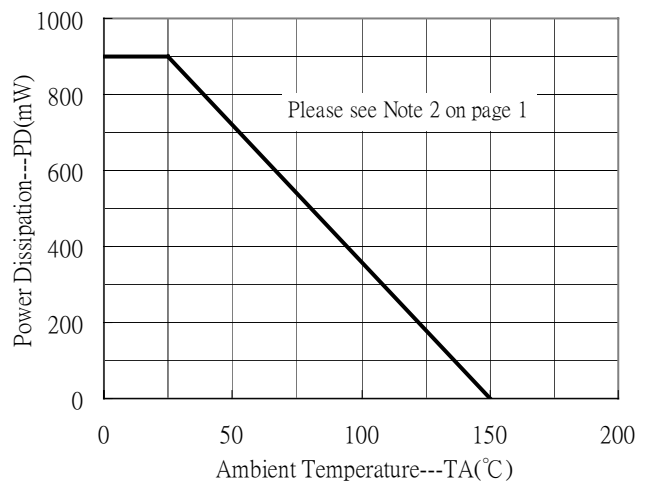
Saturation Voltage vs Collector Current



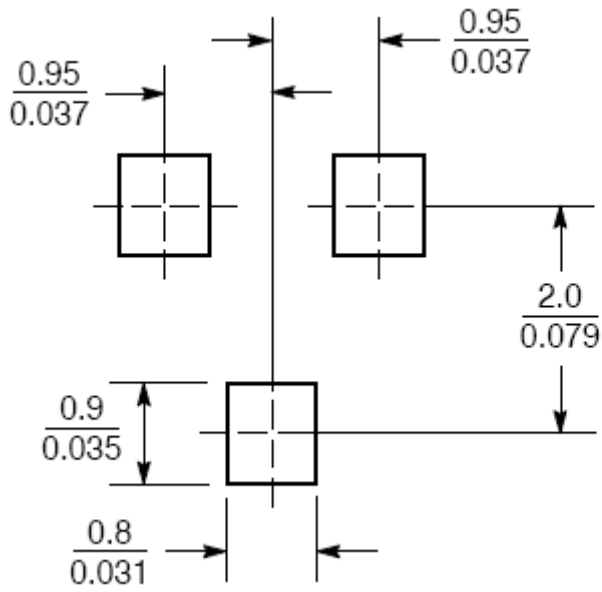
Saturation Voltage vs Collector Current



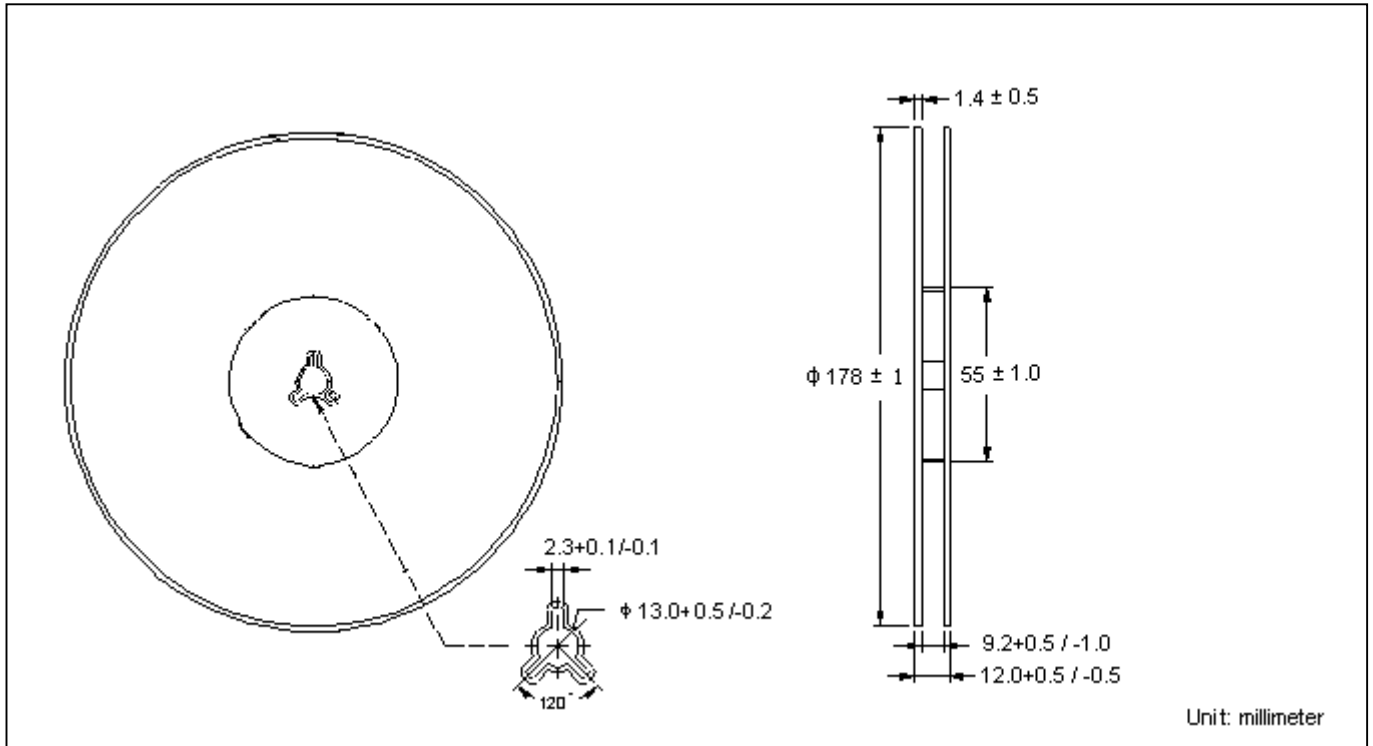
Power Derating Curve



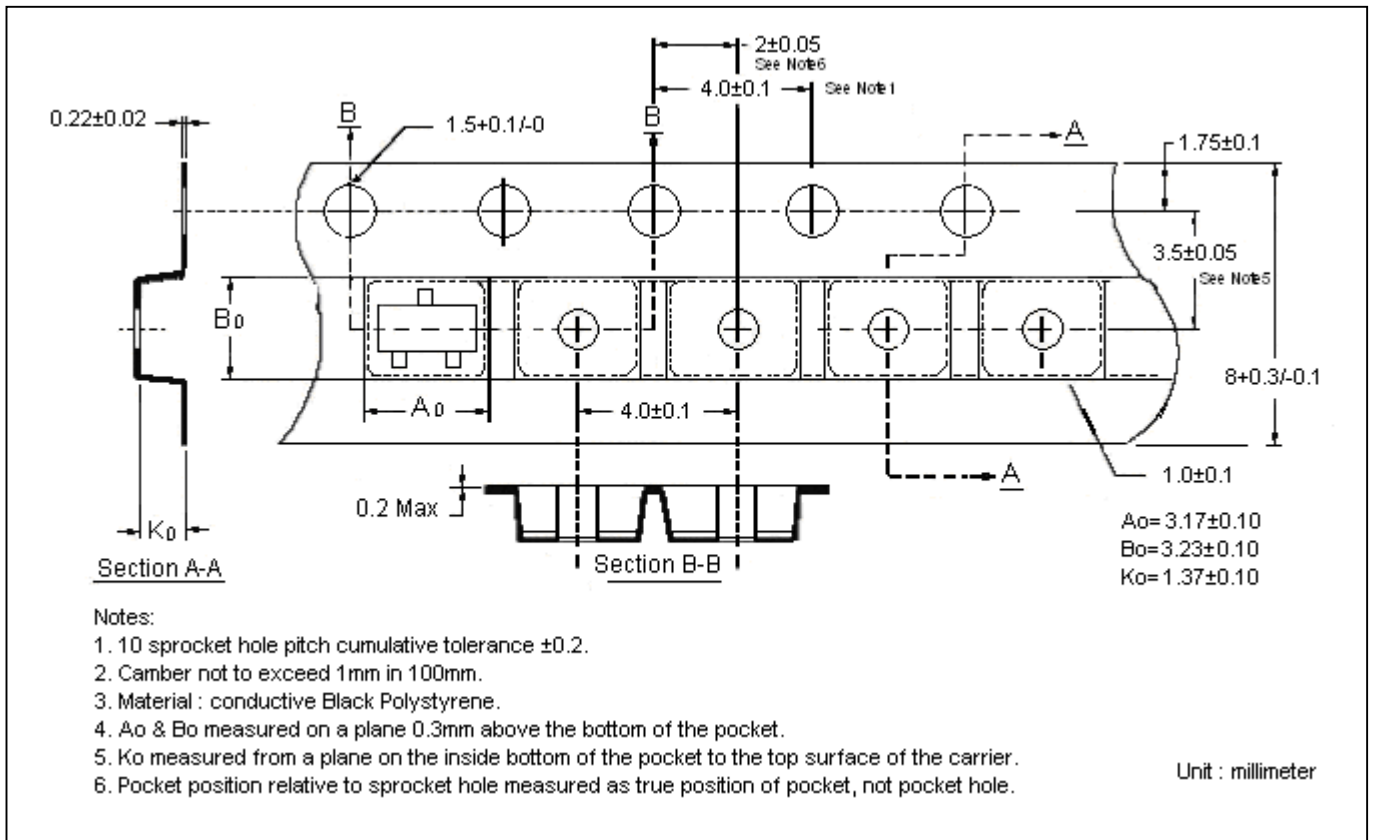
### Recommended Soldering Footprint



**Reel Dimension**



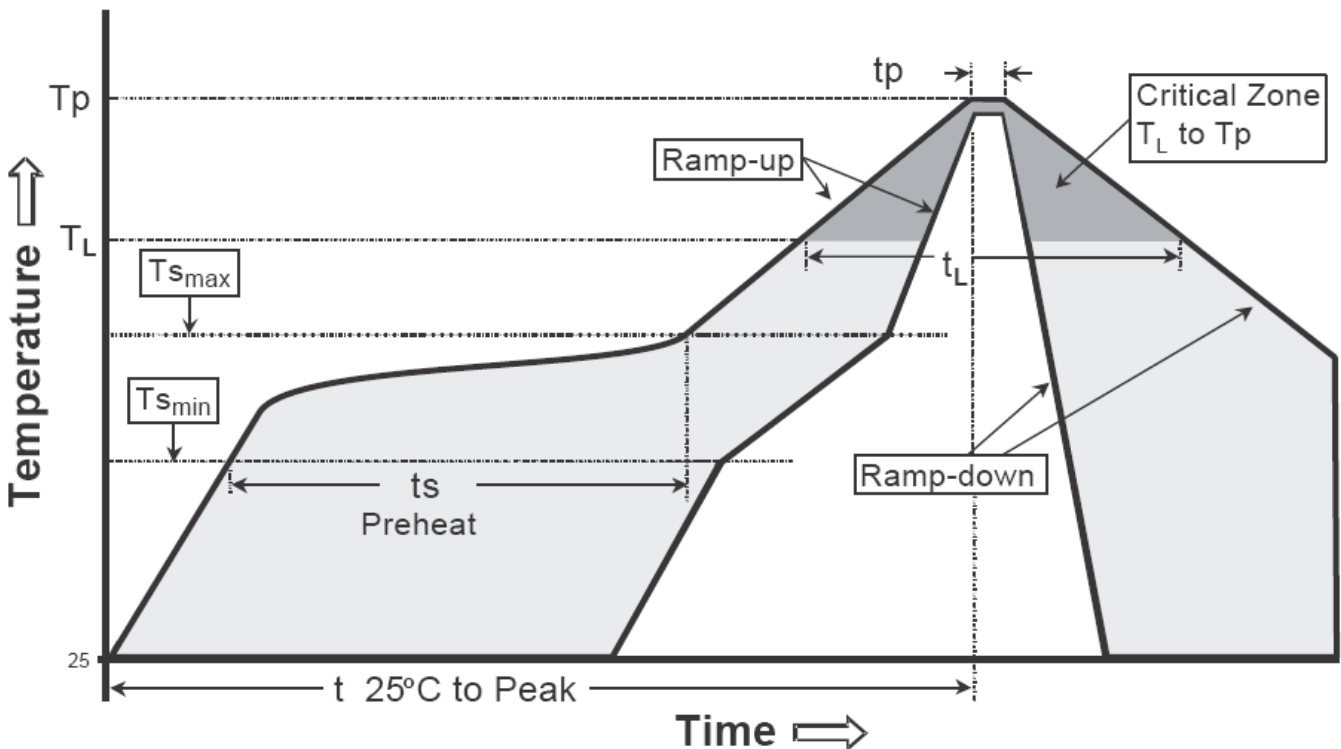
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

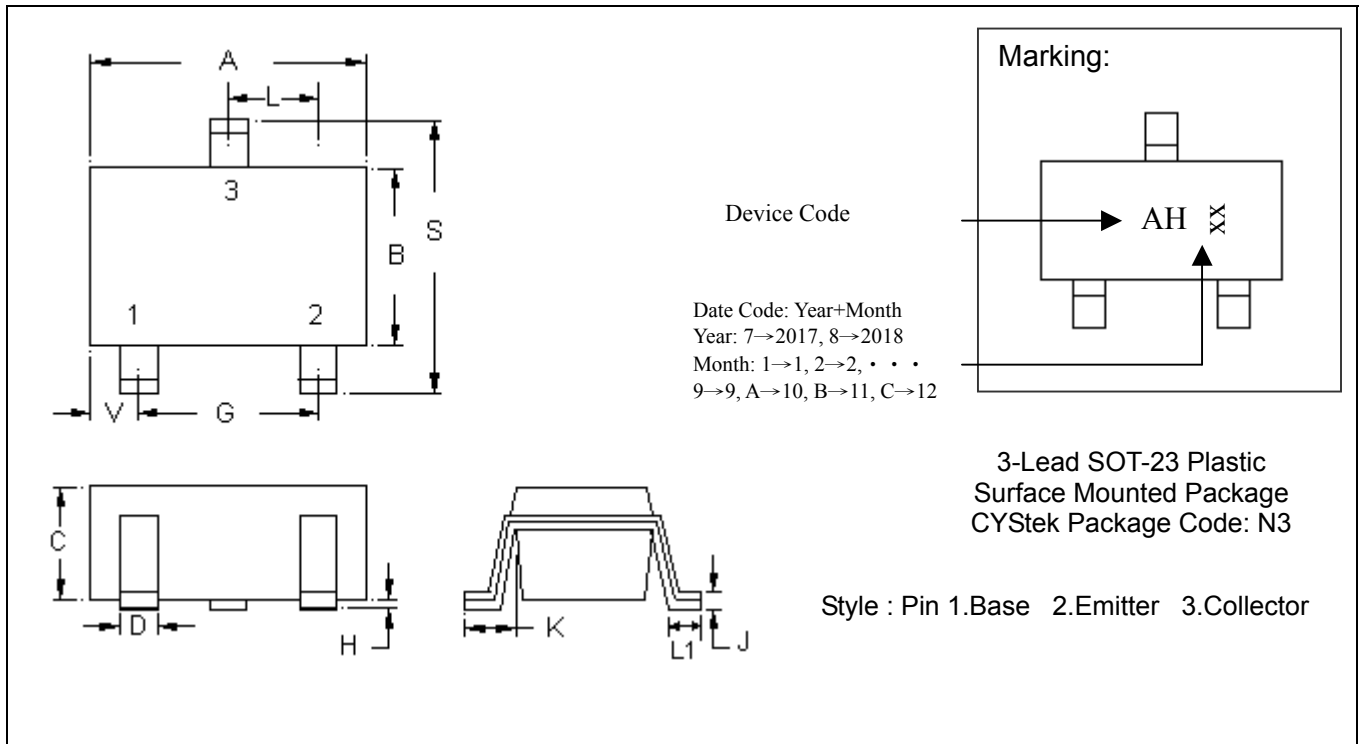
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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	0.0197	0.0283	0.50	0.72
C	0.0335	0.0453	0.89	1.15	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	0.0787	1.70	2.00	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0236	0.30	0.60

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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