

# General Purpose PPN Epitaxial Planar Transistor

## BC857N3

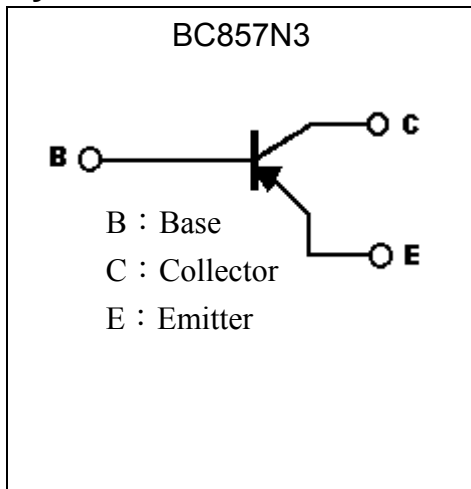
### Description

- The BC857N3 is designed for general purpose switching and amplification applications.
- Complementary to BC847N3.
- Pb-free lead plating and halogen-free package

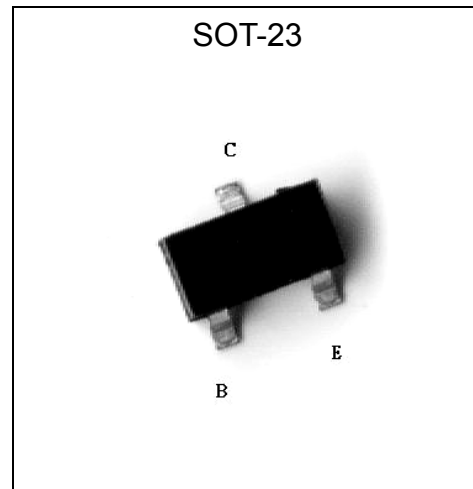
### Features

- Low current,  $I_{C(max)}=-200mA$
- Low voltage,  $BV_{CEO}=-50V$ .

### Symbol

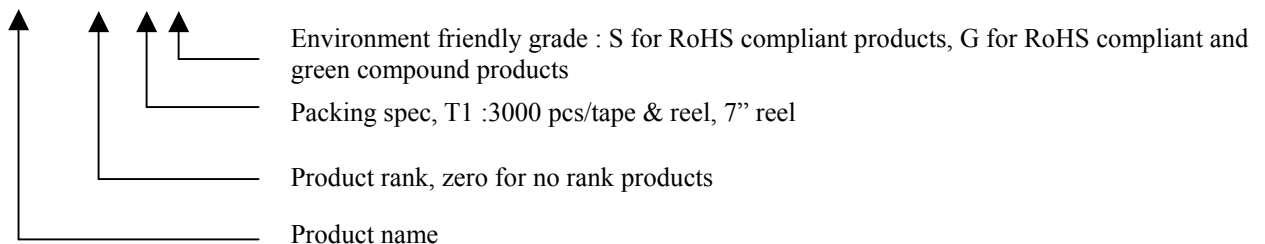


### Outline



### Ordering Information

Device	Package	Shipping
BC857N3-0-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>CB0</sub>	-50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-50	V
Emitter-Base Voltage	V <sub>EBO</sub>	-6	V
Collector Current (DC)	I <sub>C</sub>	-200	mA
Collector Current (Pulse)	I <sub>CP</sub>	-500	mA
Base Current (Pulse)	I <sub>BP</sub>	-200	mA
Power Dissipation	P <sub>D</sub>	250	mW
Operating Junction Temperature Range	T <sub>j</sub>	-55~+150	°C
Storage Temperature Range	T <sub>stg</sub>	-55~+150	°C

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-ambient, max	R <sub>θJA</sub>	500	°C/W

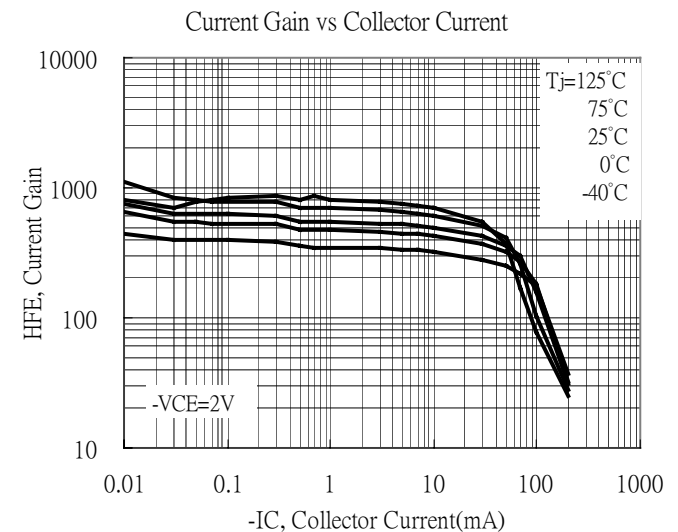
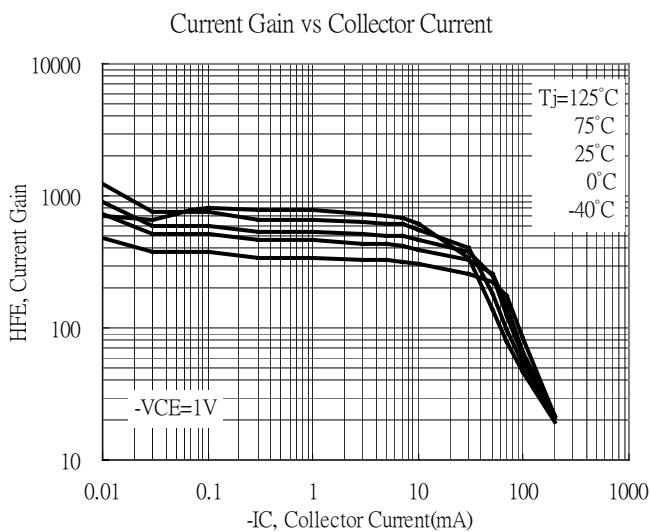
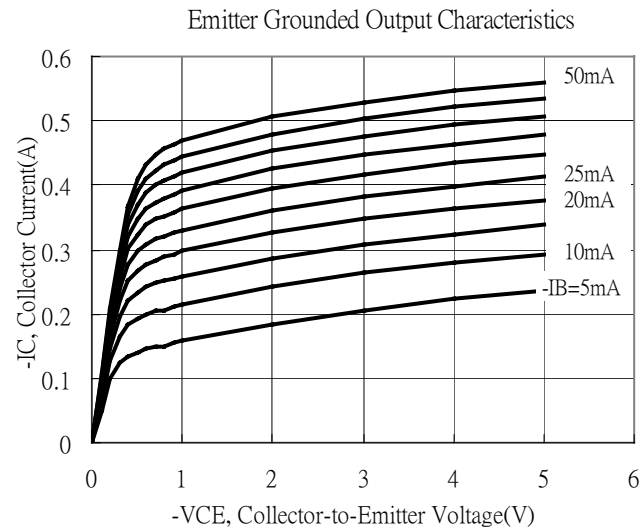
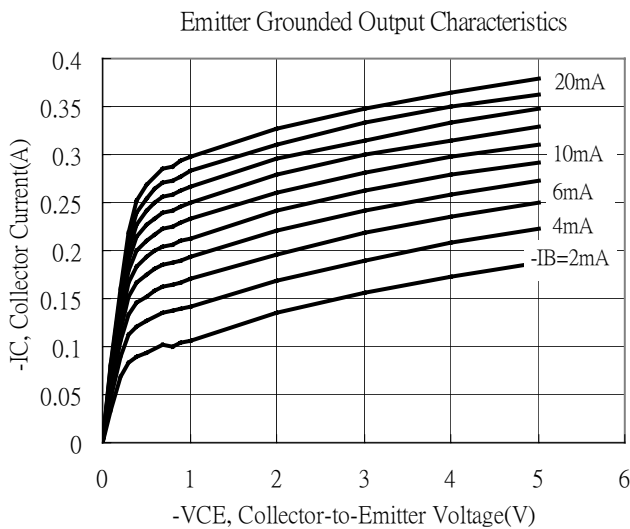
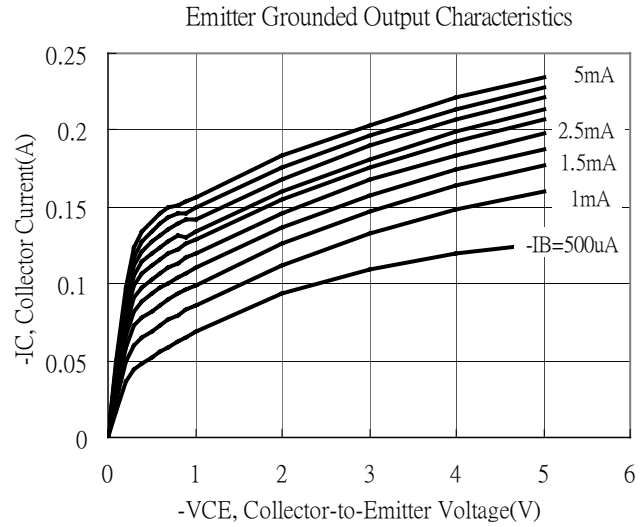
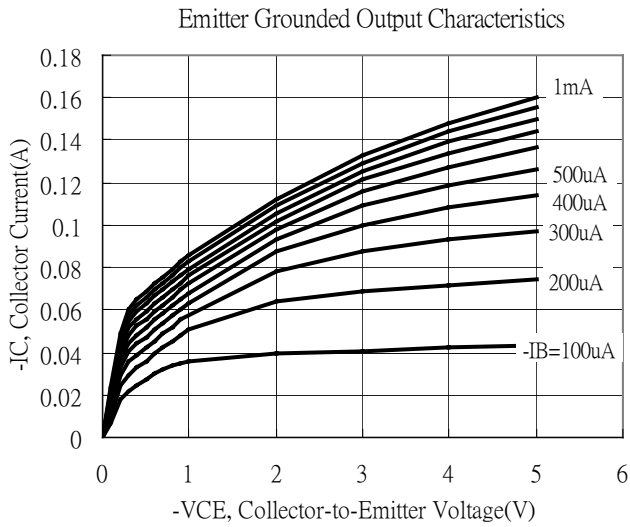
**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	-50	-	-	V	I <sub>C</sub> =-100μA
BV <sub>CEO</sub>	-50	-	-	V	I <sub>C</sub> =-1mA
BV <sub>EBO</sub>	-6	-	-	V	I <sub>E</sub> =-10μA
I <sub>CB0</sub>	-	-	-15	nA	V <sub>CB</sub> =-30V
I <sub>EBO</sub>	-	-	-100	nA	V <sub>EB</sub> =-6V
*V <sub>CE(sat) 1</sub>	-	-72	-200	mV	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA
*V <sub>CE(sat) 2</sub>	-	-220	-400	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA
*V <sub>BE(sat) 1</sub>	-	-700	-	mV	I <sub>C</sub> =-10mA, I <sub>B</sub> =-0.5mA
*V <sub>BE(sat) 2</sub>	-	-830	-	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-5mA
*V <sub>BE(on) 1</sub>	-600	-640	-750	mV	V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA
*V <sub>BE(on) 2</sub>	-	-	-770	mV	V <sub>CE</sub> =-5V, I <sub>C</sub> =-10mA
*h <sub>FE</sub>	420	-	800	-	V <sub>CE</sub> =-5V, I <sub>C</sub> =-2mA
f <sub>T</sub>	100	-	-	MHz	V <sub>CE</sub> =-5V, I <sub>E</sub> =-10mA, f=100MHz
Cob	-	3.7	-	pF	V <sub>CB</sub> =-10V, I <sub>E</sub> =0A, f=1MHz

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



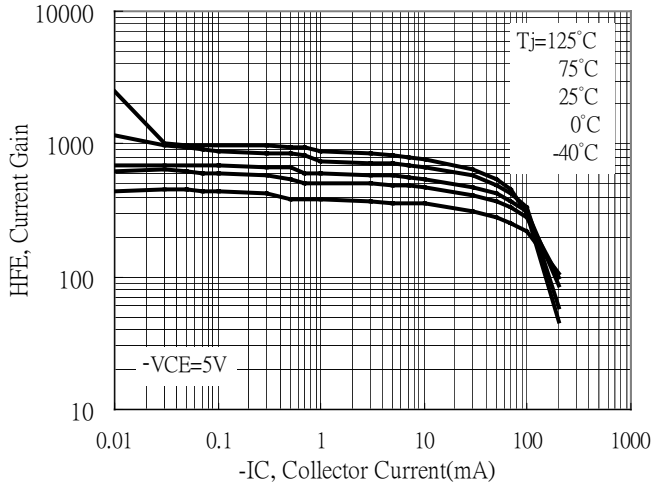
### Typical Characteristics



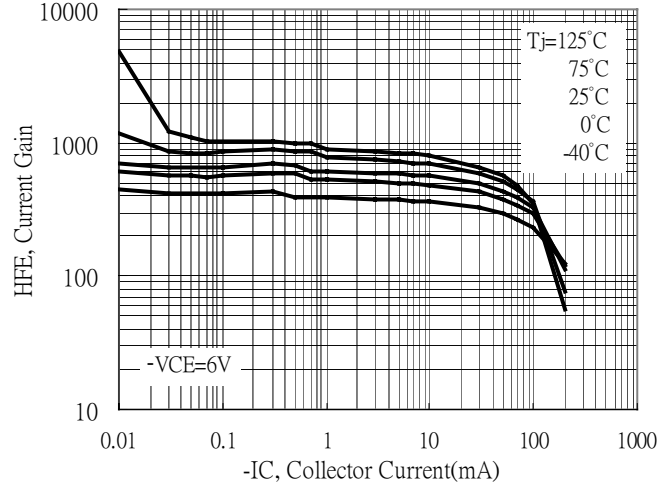


### Typical Characteristics(Cont.)

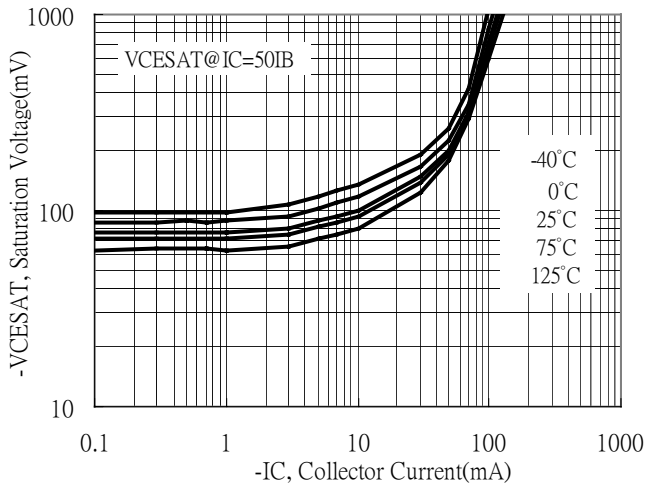
Current Gain vs Collector Current



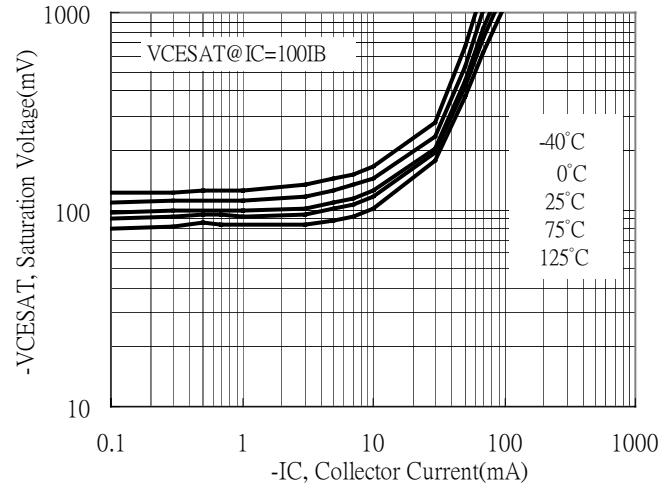
Current Gain vs Collector Current



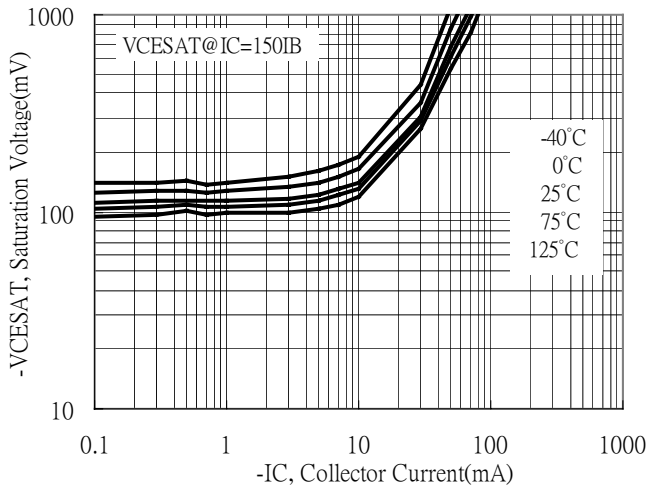
Saturation Voltage vs Collector Current



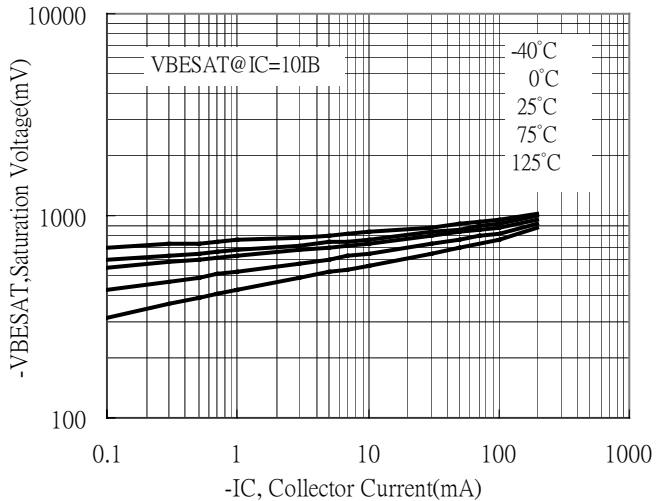
Saturation Voltage vs Collector Current



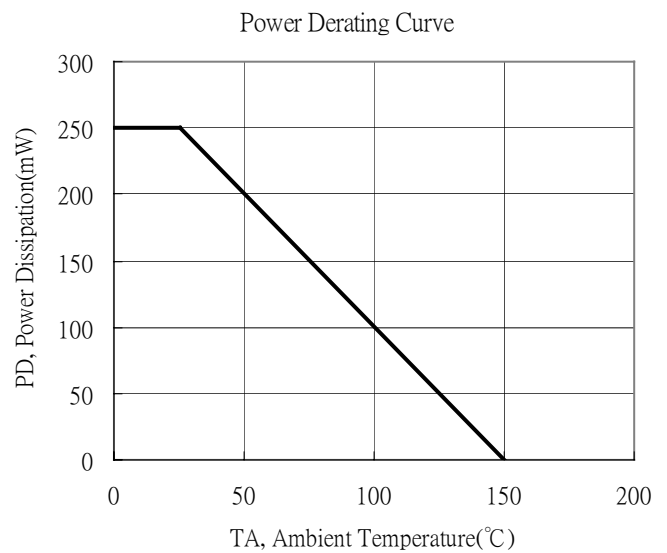
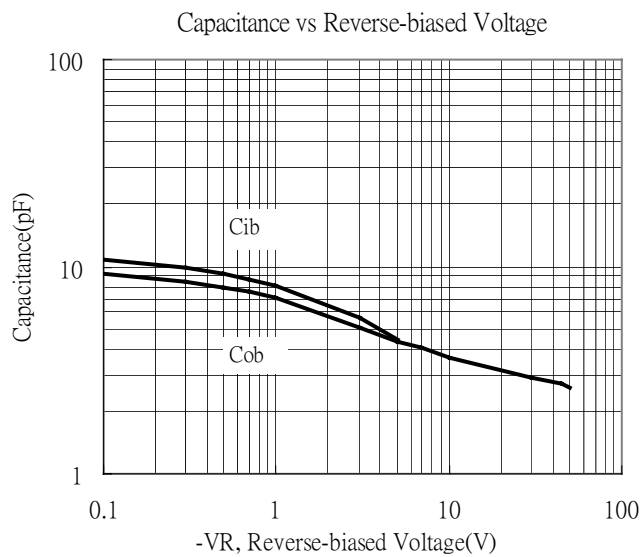
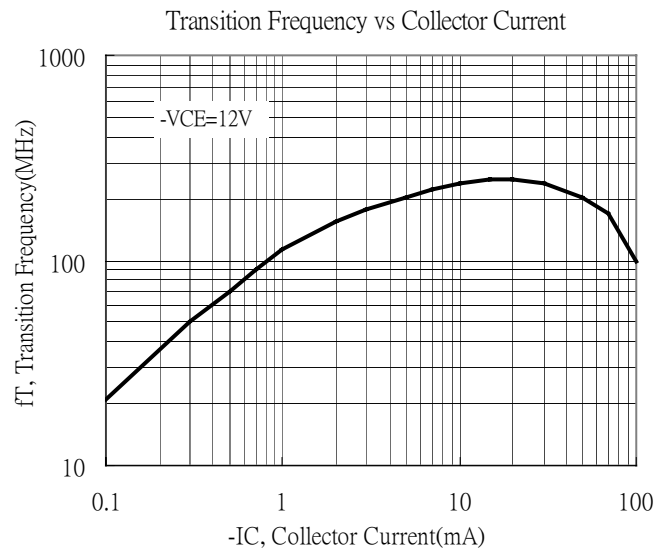
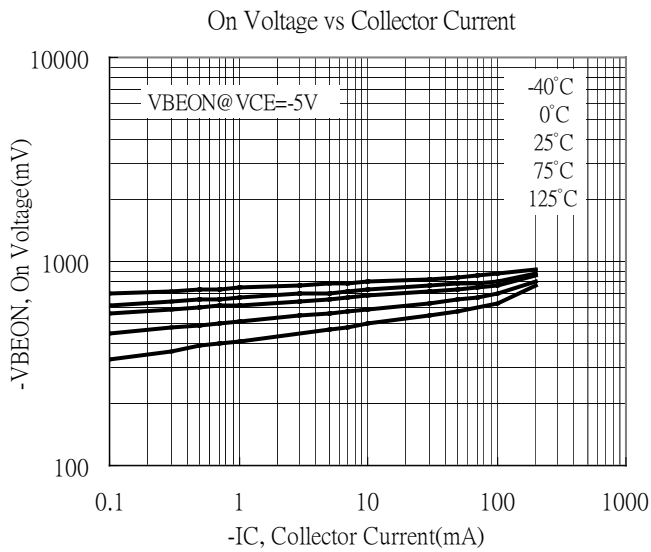
Saturation Voltage vs Collector Current



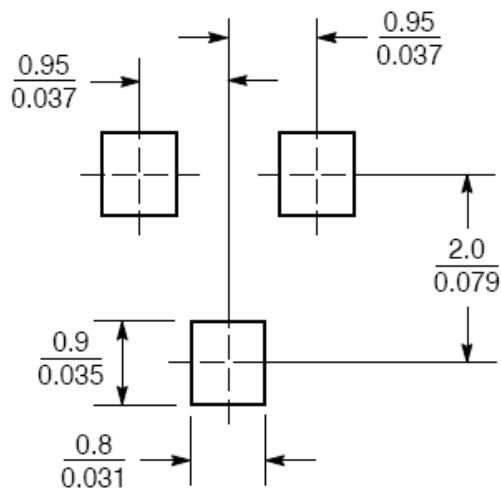
Saturation Voltage vs Collector Current



**Typical Characteristics(Cont.)**

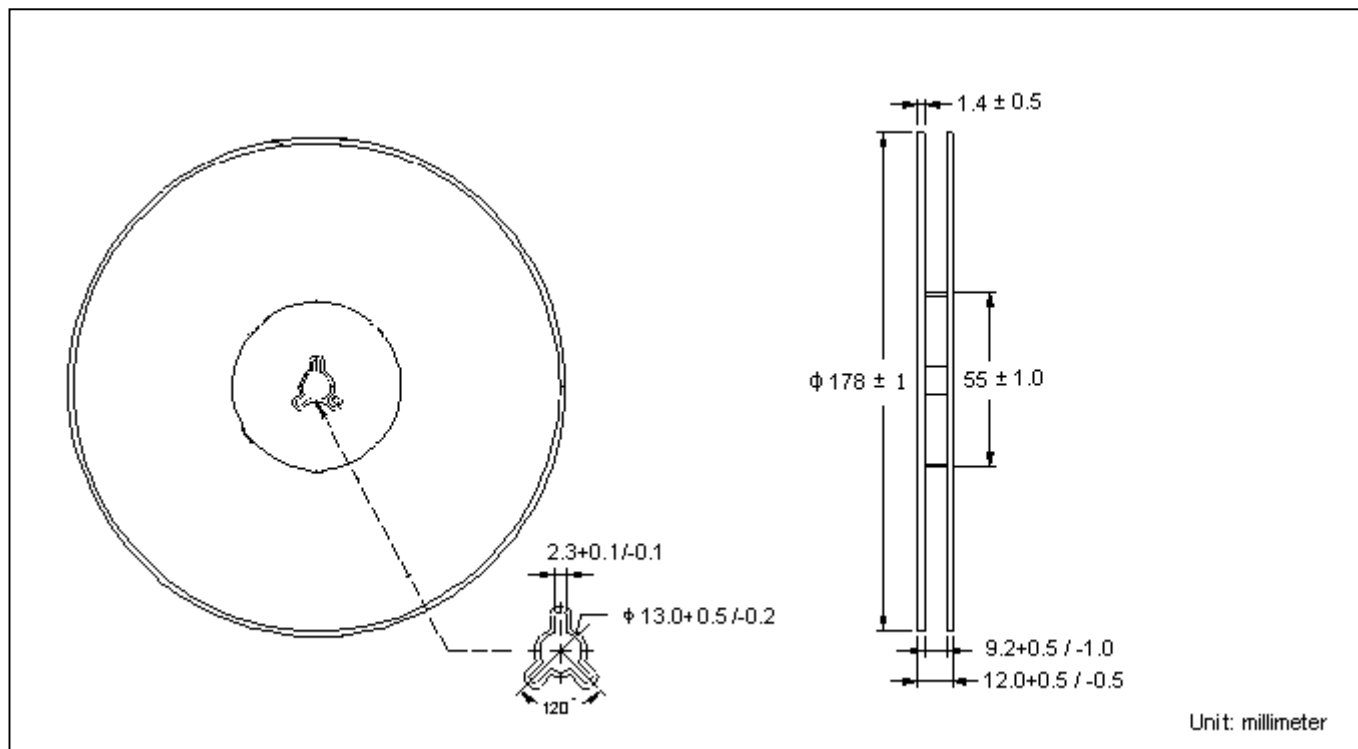


**Recommended Soldering Footprint**

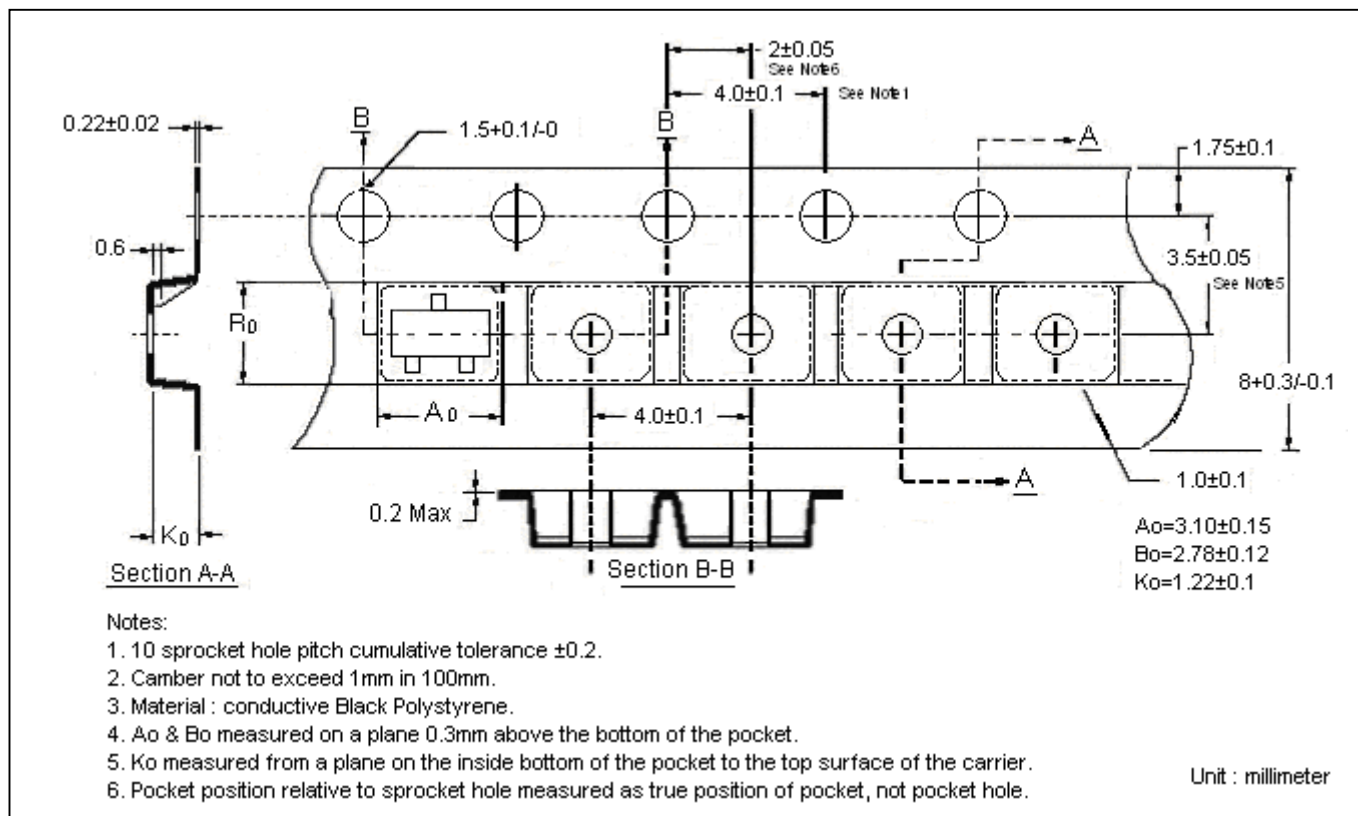


Unit :  $\frac{\text{mm}}{\text{inches}}$

### Reel Dimension



### Carrier Tape Dimension



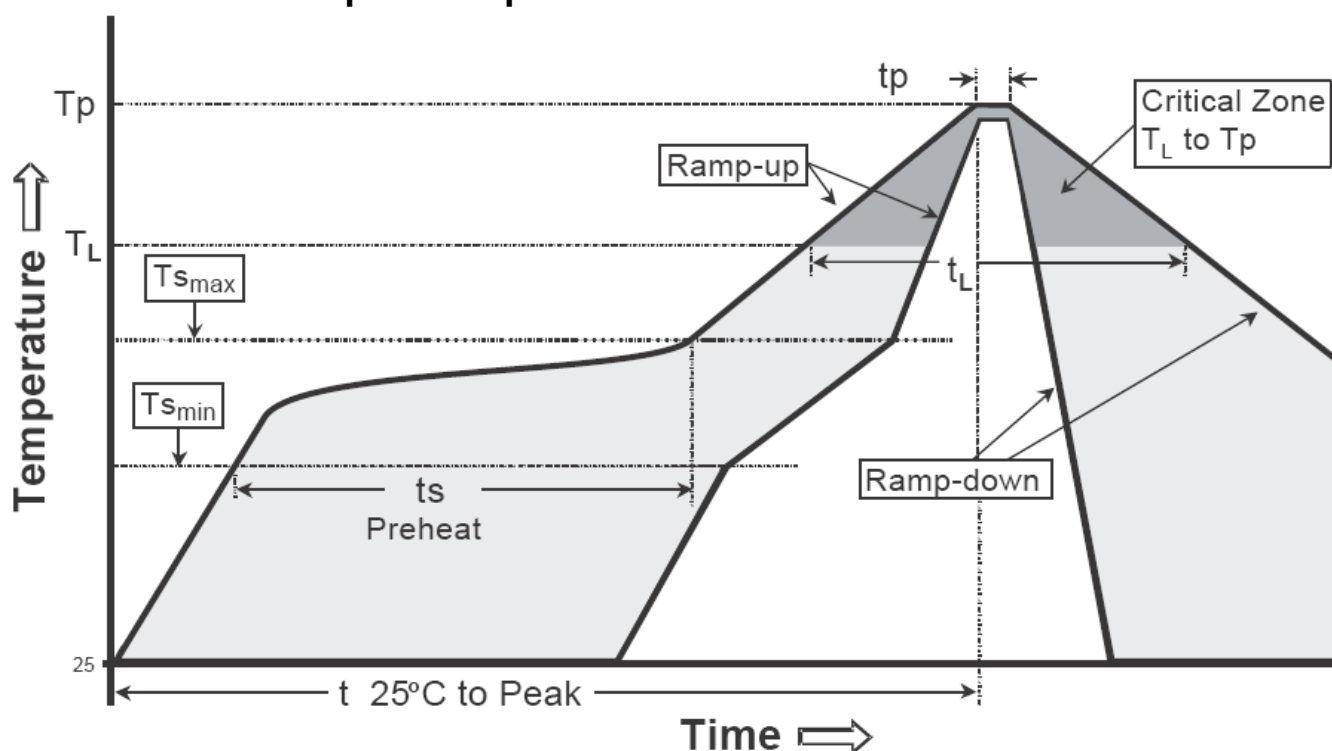
**Notes:**

1. 10 sprocket hole pitch cumulative tolerance  $\pm 0.2$ .
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4.  $A_0$  &  $B_0$  measured on a plane 0.3mm above the bottom of the pocket.
5.  $K_0$  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.

**Recommended wave soldering condition**

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

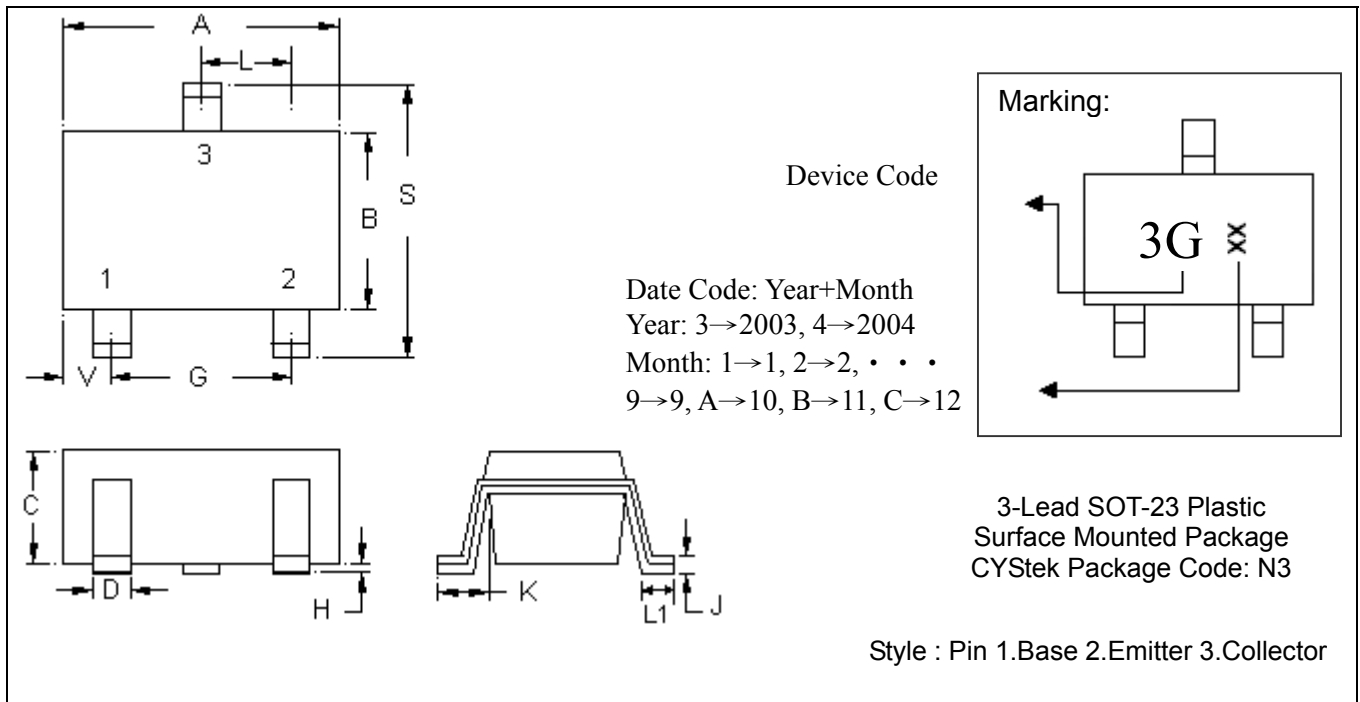
**Recommended temperature profile for IR reflow**



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.

**SOT-23 Dimension**



\*:Typical

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.

**Important Notice:**

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of CYStek.
- CYStek reserves the right to make changes to its products without notice.
- CYStek **semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.