

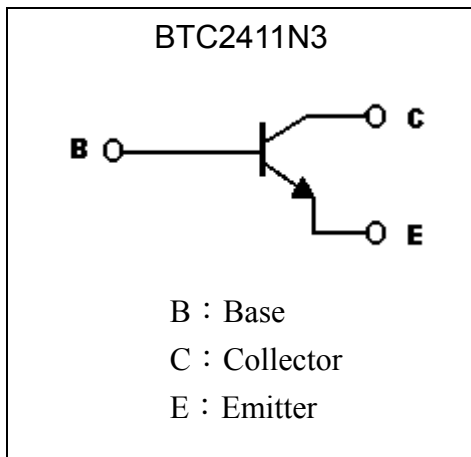
# General Purpose NPN Epitaxial Planar Transistor

## BTC2411N3

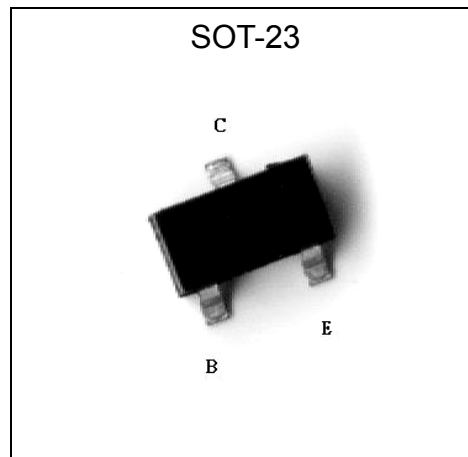
### Description

- The BTC2411N3 is designed for using in driver stage of AF amplifier and general purpose switching application.
- High  $I_{C(Max)}$ ,  $I_{C(Max)} = 0.6A$ .
- Low  $V_{CE(sat)}$ , Typ.  $V_{CE(sat)} = 0.2V$  at  $I_C/I_B = 500mA/50mA$ .  
 Optimal for low Voltage operation.
- Complementary to BTA1036N3.
- Pb-free lead plating and halogen-free package.
- AEC-Q101 qualified.

### Symbol

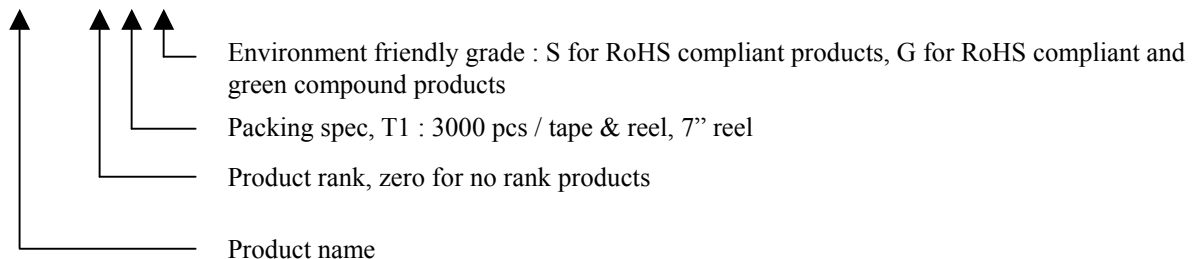


### Outline



### Ordering Information

Device	Package	Shipping
BTC2411N3-0-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>	75	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	0.6	A
Power Dissipation (T <sub>A</sub> =25°C)	P <sub>D</sub>	225 (Note)	mW
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	560	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	556 (Note)	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	223	°C/W
Operating Junction Temperature Range	T <sub>j</sub>	-55~+150	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

Note : Free air condition

**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	75	-	-	V	I <sub>C</sub> =10μA
BV <sub>CEO</sub>	50	-	-	V	I <sub>C</sub> =10mA
BV <sub>EBO</sub>	6	-	-	V	I <sub>E</sub> =10μA
I <sub>CBO</sub>	-	-	10	nA	V <sub>CB</sub> =60V
I <sub>CEX</sub>	-	-	10	nA	V <sub>CE</sub> =60V, V <sub>BE</sub> =-3V
I <sub>EBO</sub>	-	-	10	nA	V <sub>EB</sub> =3V
*V <sub>CE(sat)1</sub>	-	-	0.5	V	I <sub>C</sub> =380mA, I <sub>B</sub> =10mA
*V <sub>CE(sat)2</sub>	-	-	0.25	V	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA
*V <sub>CE(sat)3</sub>	-	0.2	0.45	V	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA
*V <sub>BE(sat)1</sub>	0.7	-	1.0	V	I <sub>C</sub> =150mA, I <sub>B</sub> =15mA
*V <sub>BE(sat)2</sub>	-	-	1.2	V	I <sub>C</sub> =500mA, I <sub>B</sub> =50mA
*h <sub>FE1</sub>	85	-	-		V <sub>CE</sub> =1V, I <sub>C</sub> =0.1mA
*h <sub>FE2</sub>	90	-	-		V <sub>CE</sub> =1V, I <sub>C</sub> =1mA
*h <sub>FE3</sub>	95	-	-		V <sub>CE</sub> =1V, I <sub>C</sub> =10mA
*h <sub>FE4</sub>	100	-	300		V <sub>CE</sub> =1V, I <sub>C</sub> =150mA
*h <sub>FE5</sub>	40	-	-		V <sub>CE</sub> =2V, I <sub>C</sub> =500mA
f <sub>T</sub>	-	230	-	MHz	V <sub>CE</sub> =5V, I <sub>C</sub> =20mA, f=100MHz
Cob	-	9.3	-	pF	V <sub>CB</sub> =5V, f=1MHz

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

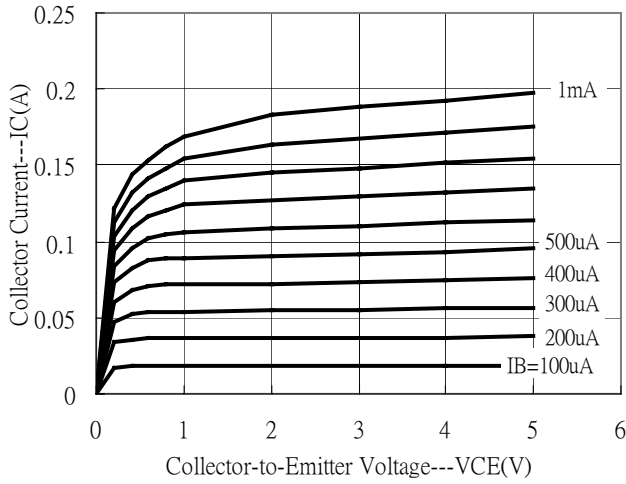
**Recommended Storage Condition:**

Temperature : ≤ 30 °C

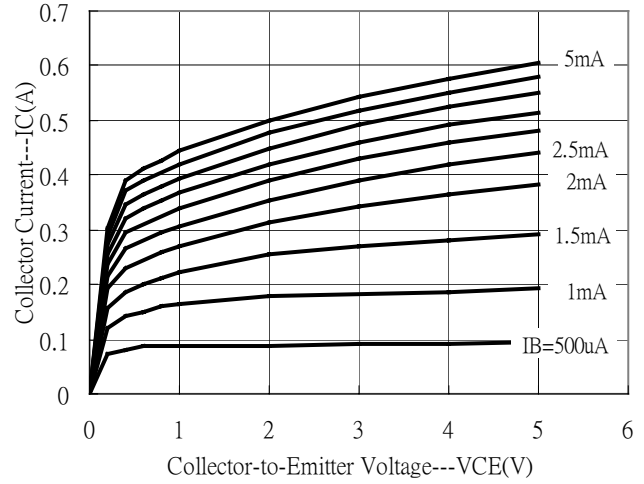
Humidity : ≤ 60% RH

**Typical Characteristics**

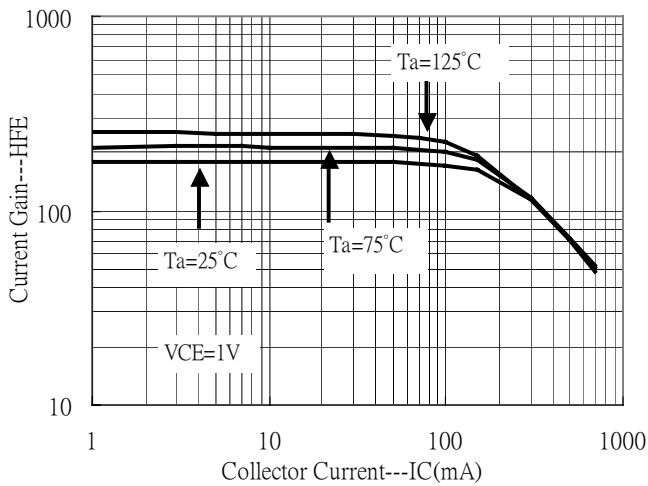
Emitter Grounded Output Characteristics



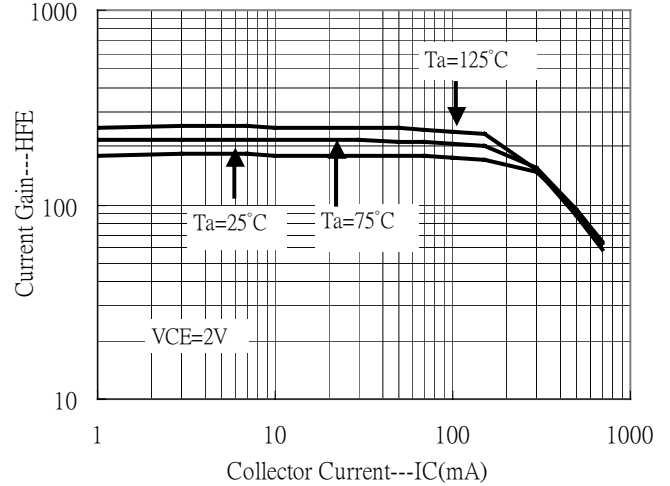
Emitter Grounded Output Characteristics



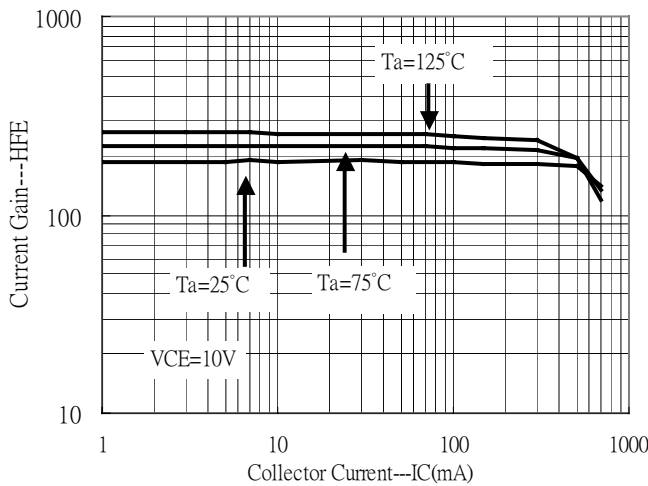
Current Gain vs Collector Current



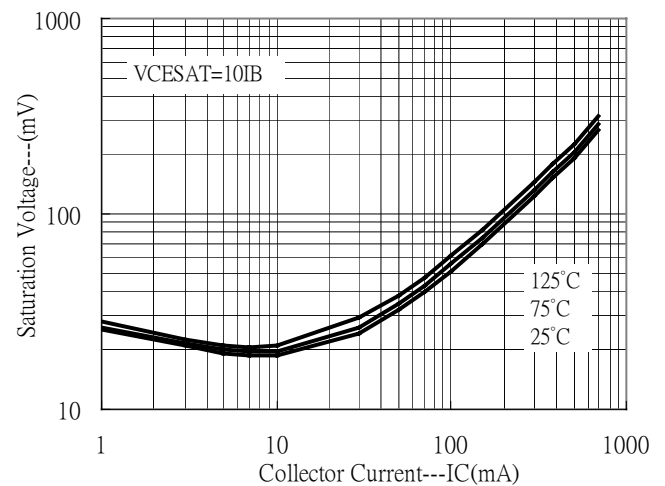
Current Gain vs Collector Current



Current Gain vs Collector Current

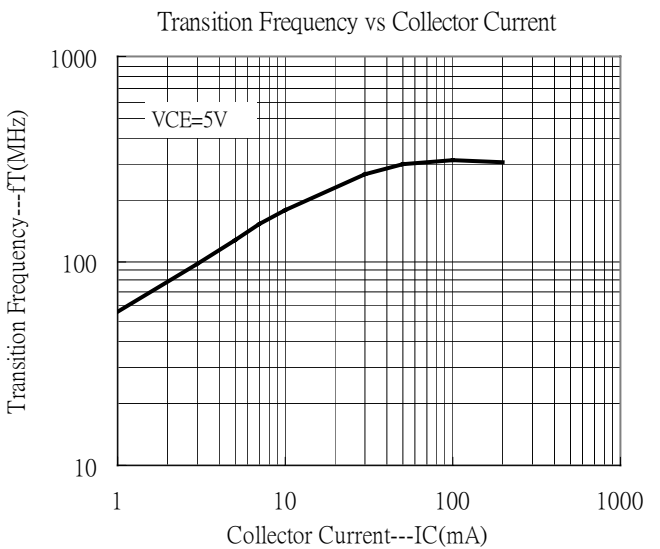
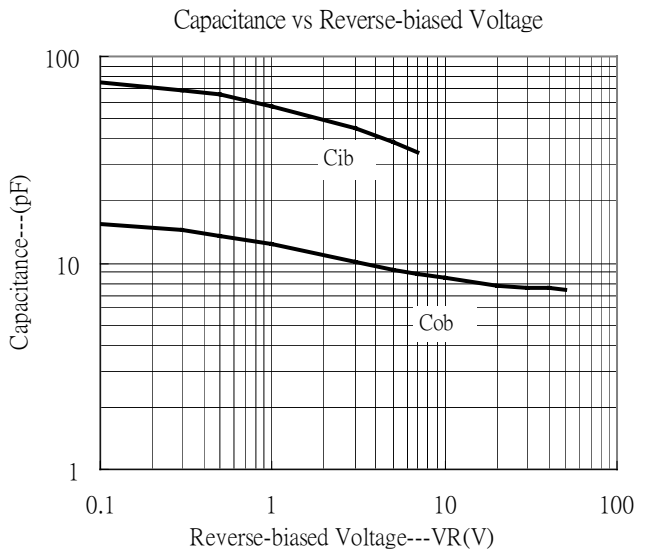
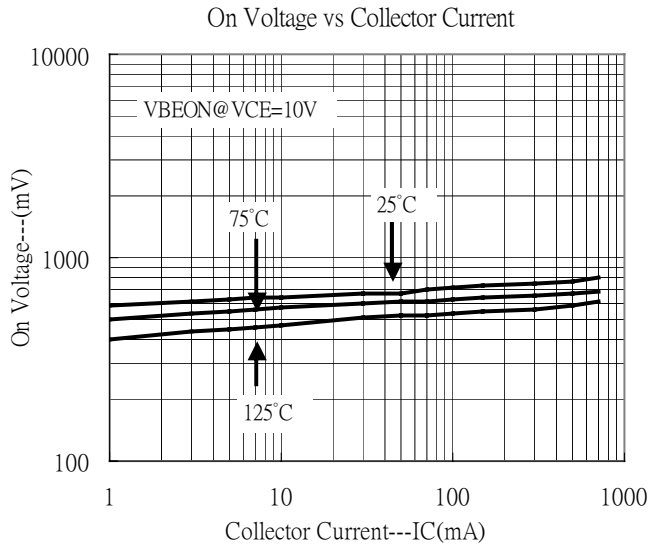
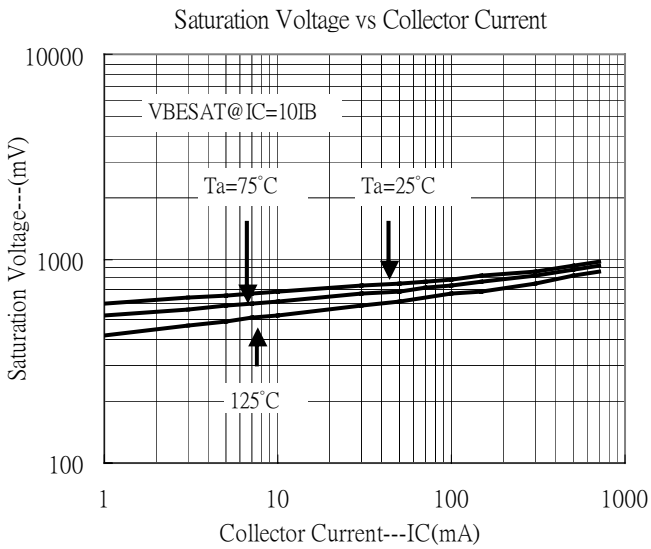
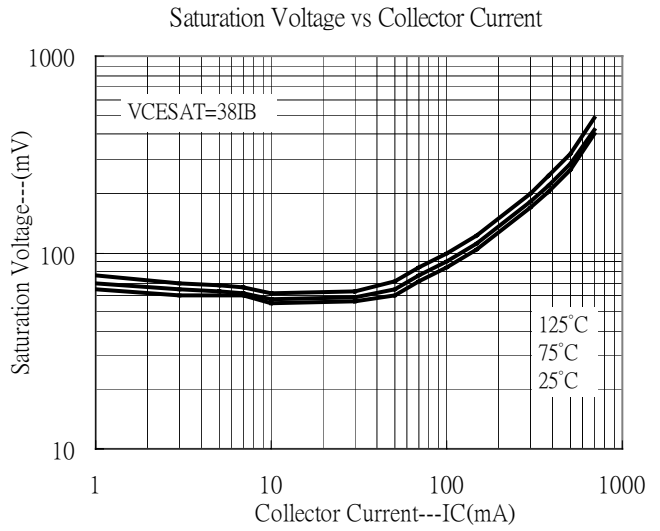
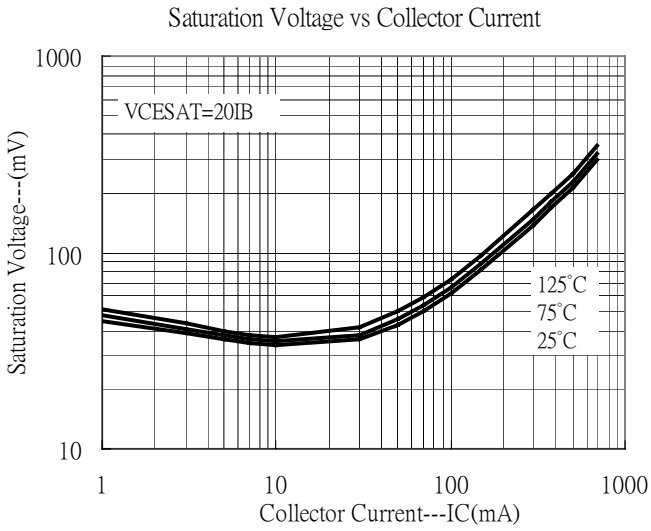


Saturation Voltage vs Collector Current

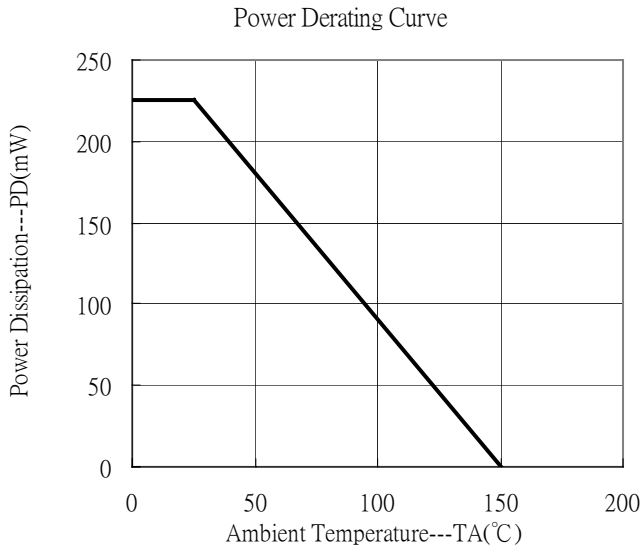




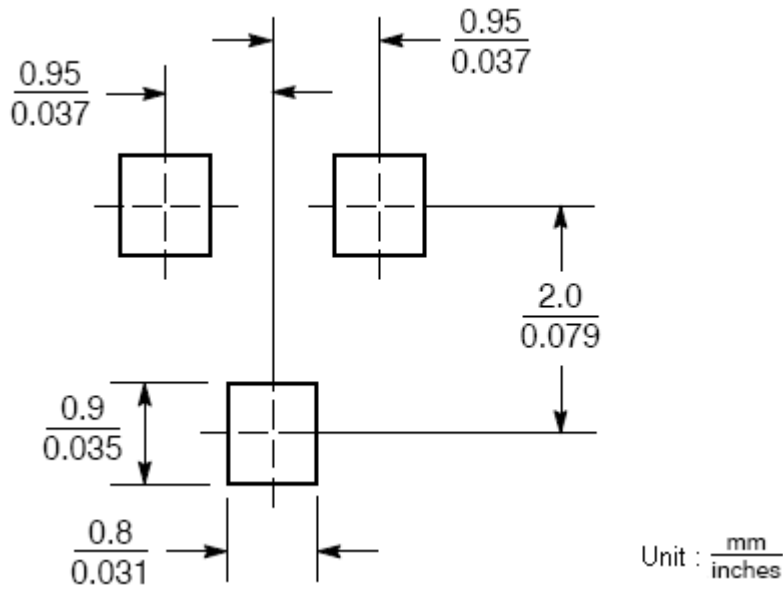
Typical Characteristics(Cont.)



**Typical Characteristics(Cont.)**



**Recommended Soldering Footprint**

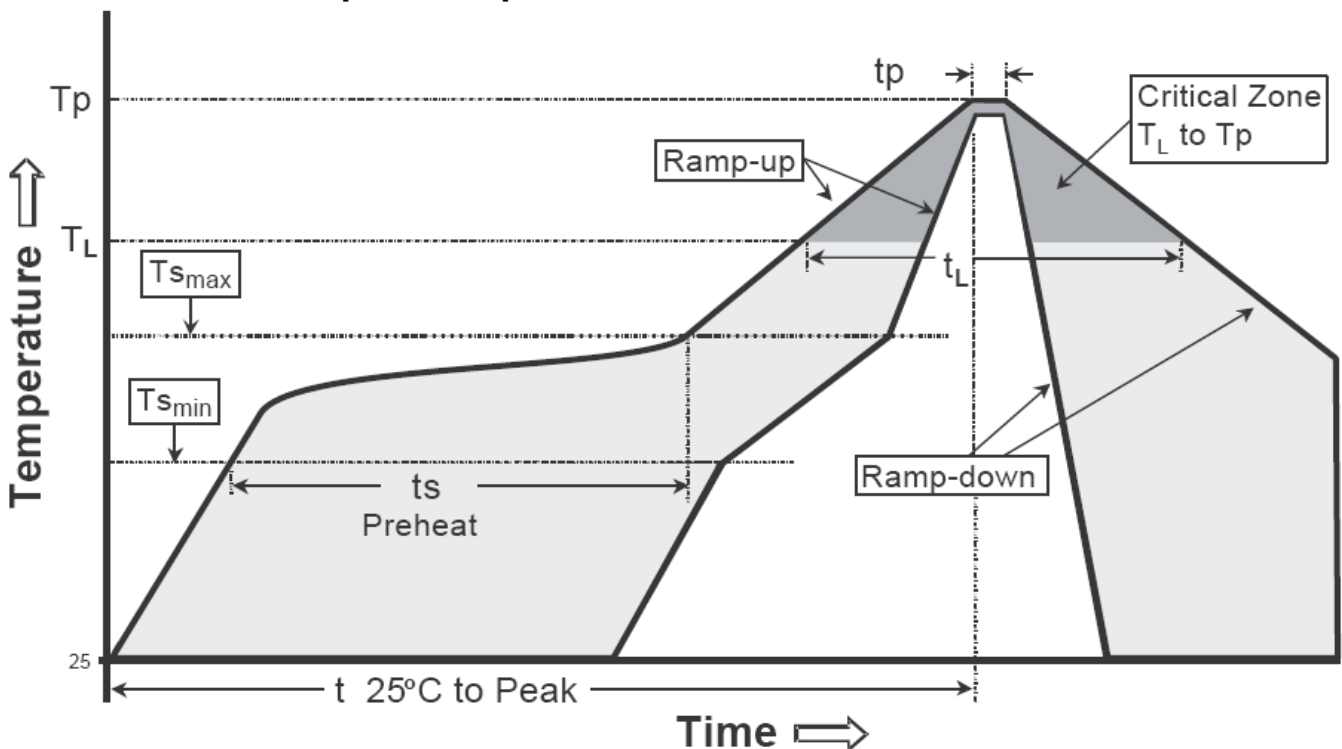




**Recommended wave soldering condition**

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

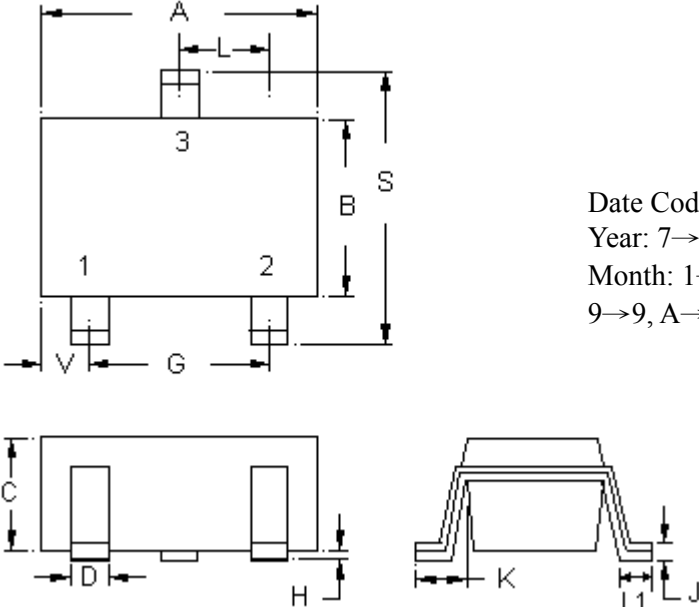
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmmax 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**

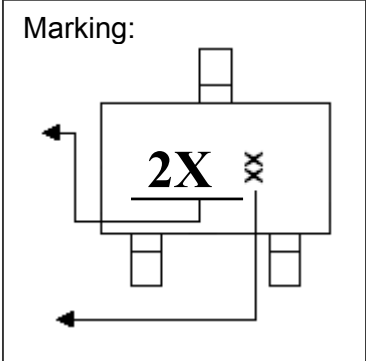


The diagram shows three views of the SOT-23 package: a top view with dimensions A, L, B, S, 1, 2, 3, V, and G; a side view with dimensions C, D, H, and J; and a perspective view with dimensions K, L1, and L2. The top view labels 1, 2, and 3 correspond to Pin 1, Base, and Collector respectively.

**Marking:**

Product Code

Date Code: Year+Month  
 Year: 7→2017, 8→2018  
 Month: 1→1, 2→2, . . .  
 9→9, A→10, B→11, C→12



The marking diagram shows a rectangular package with three leads. The top lead is labeled '2X' with a horizontal line below it. To the right of the '2X' is a small square symbol with an 'X' inside. Arrows point to the top and bottom leads.

3-Lead SOT-23 Plastic Surface Mounted Package  
 CYStek Package Code: N3

Style : Pin 1.Base 2.Emitter 3.Collector

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	0.0551	1.20	1.40	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	0.1004	2.10	2.55
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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