

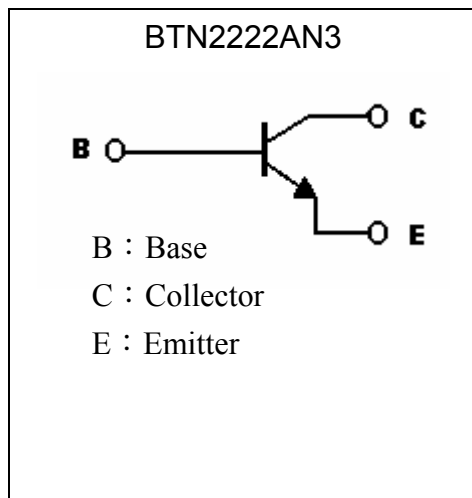
General Purpose NPN Epitaxial Planar Transistor

BTN2222AN3

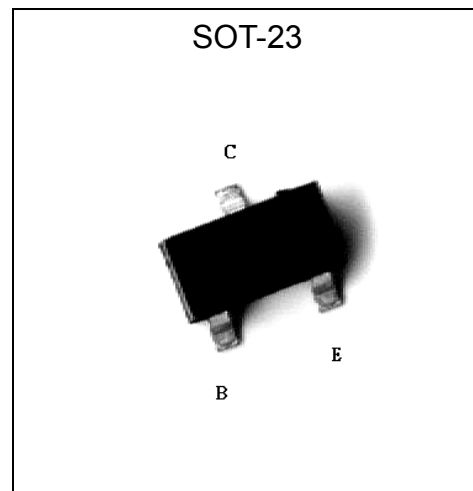
Description

- The BTN2222AN3 is designed for general purpose amplifier applications. It is housed in the SOT-23 package which is designed for low power surface mount applications.
- Low $V_{CE(sat)}$
- Low leakage current
- High cutoff frequency
- Complementary to BTP2907AN3
- Pb-free package

Symbol

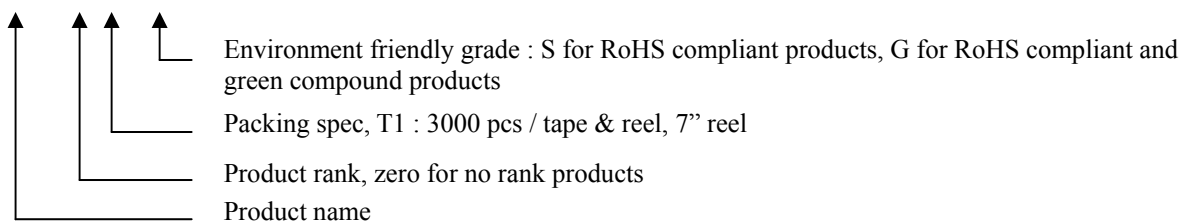


Outline



Ordering Information

Device	Package	Shipping
BTN2222AN3-0-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 _{CB0}	75	V
Collector-Emitter Voltage	V _{CEO}	50	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	600	mA
Power Dissipation @Ta=25°C Derate above 25°C	P _D	225 (Note 1) 1.8	mW mW/°C
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C

Note 1: when mounted on a FR-5 board with area measuring 1.0×0.75×0.062 in.

Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
R _{th,j-c}	thermal resistance from junction to case		223	°C/W
R _{th, j-a}	thermal resistance from junction to ambient	(Note)	556	°C/W

Note : Free air condition

Characteristics (Ta=25°C)

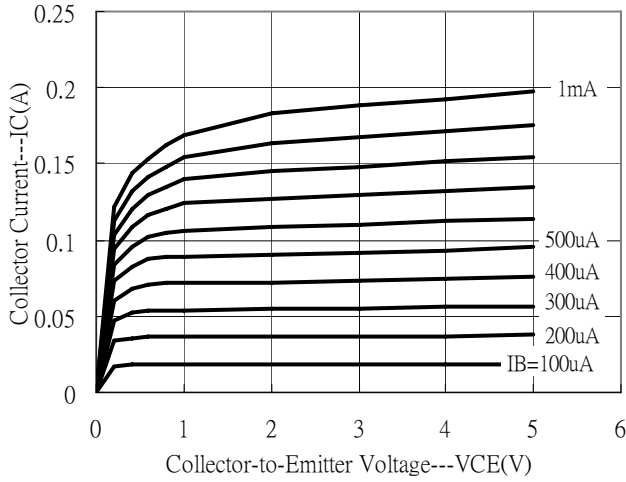
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	75	-	-	V	I _C =10μA
BV _{CEO}	50	-	-	V	I _C =1mA
BV _{EBO}	6	-	-	V	I _E =10μA
I _{CB0}	-	-	10	nA	V _{CB} =60V
I _{CEx}	-	-	10	nA	V _{CE} =60V, V _{EB(off)} =3V
I _{EBO}	-	-	100	nA	V _{EB} =3V
*V _{CE(sat)1}	-	-	0.25	V	I _C =150mA, I _B =15mA
*V _{CE(sat)2}	-	0.2	0.45	V	I _C =500mA, I _B =50mA
*V _{BE(sat)1}	-	-	1.0	V	I _C =150mA, I _B =15mA
*V _{BE(sat)2}	-	-	1.2	V	I _C =500mA, I _B =50mA
h _{FE1}	35	-	-	-	V _{CE} =10V, I _C =0.1mA
h _{FE2}	50	-	-	-	V _{CE} =10V, I _C =1mA
h _{FE3}	75	-	-	-	V _{CE} =10V, I _C =10mA
*h _{FE4}	100	-	300	-	V _{CE} =10V, I _C =150mA
*h _{FE5}	40	-	-	-	V _{CE} =10V, I _C =500mA
f _T	-	230	-	MHz	V _{CE} =5V, I _C =20mA, f=100MHz
C _{ob}	-	8.3	-	pF	V _{CB} =10V, I _E =0A, f=1MHz

*Pulse Test: Pulse Width ≤300μs, Duty Cycle≤2%

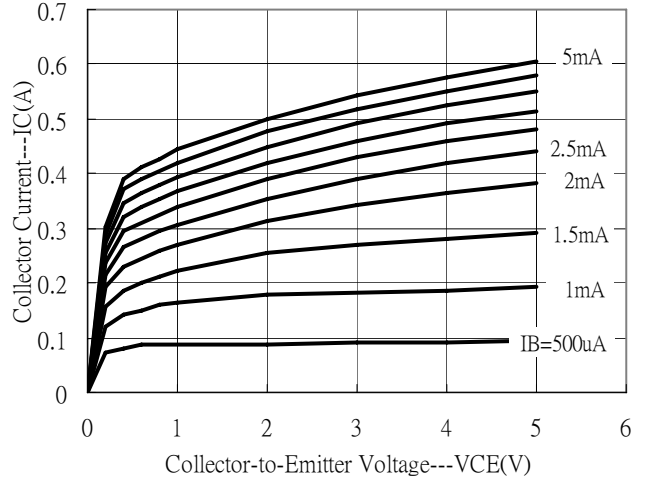


Typical Characteristics

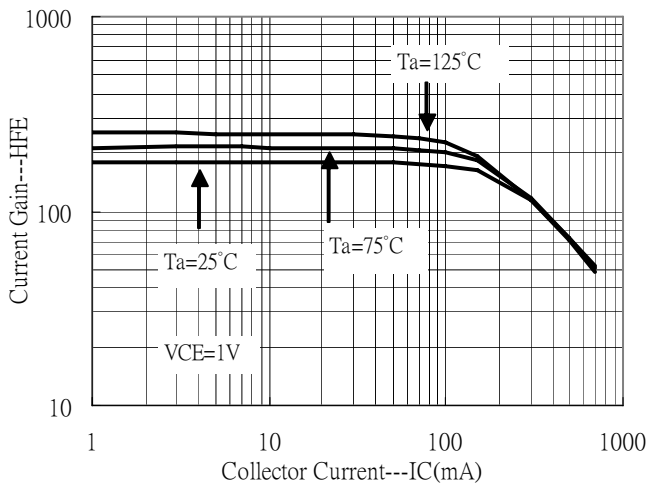
Emitter Grounded Output Characteristics



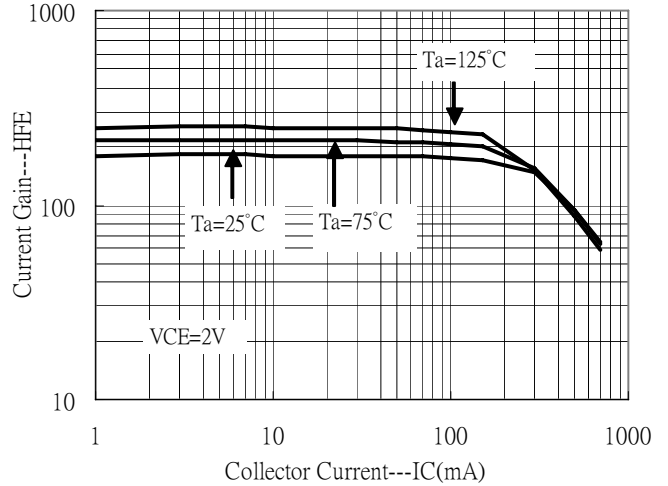
Emitter Grounded Output Characteristics



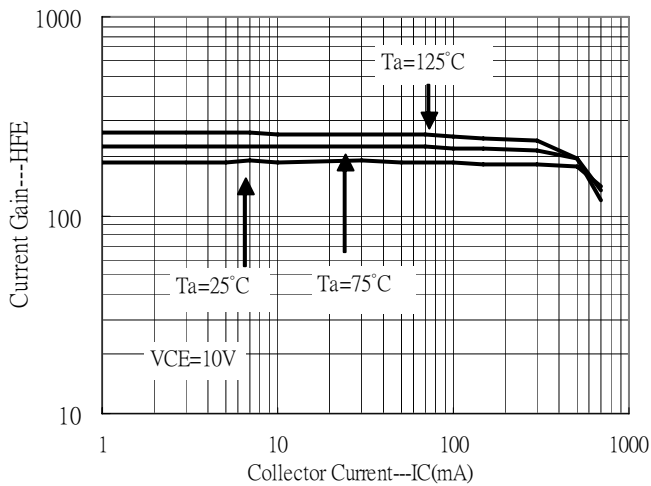
Current Gain vs Collector Current



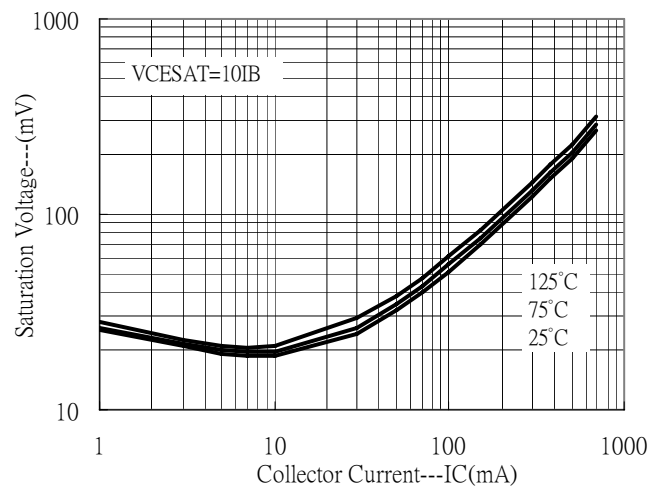
Current Gain vs Collector Current



Current Gain vs Collector Current

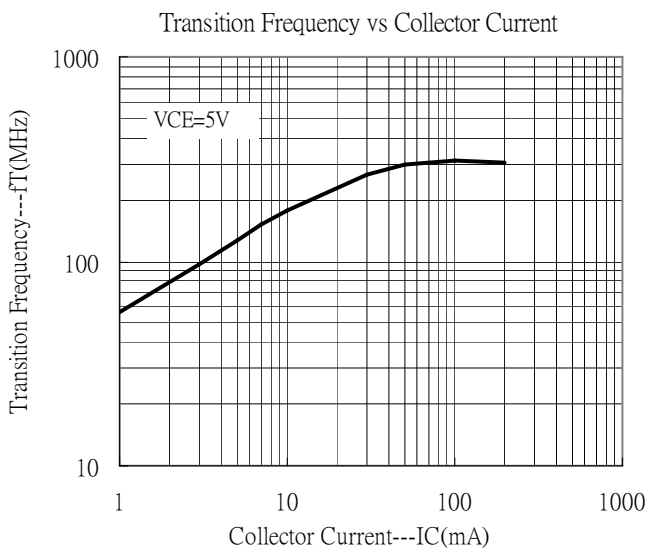
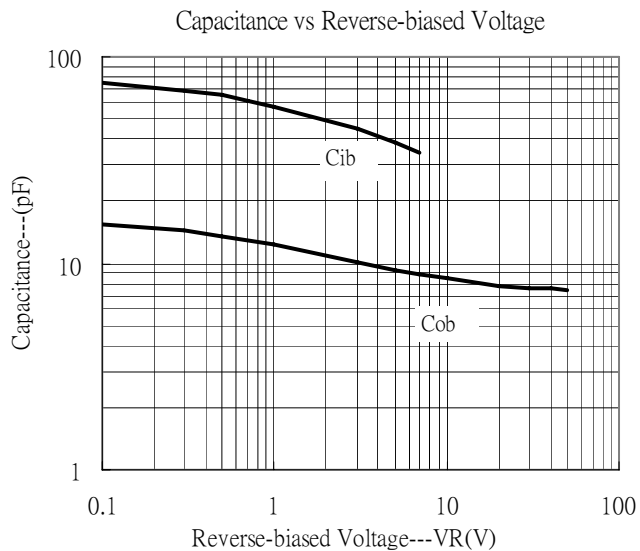
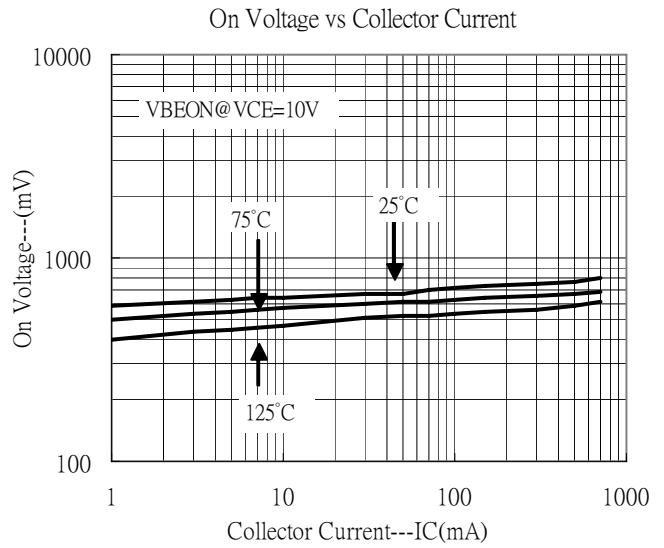
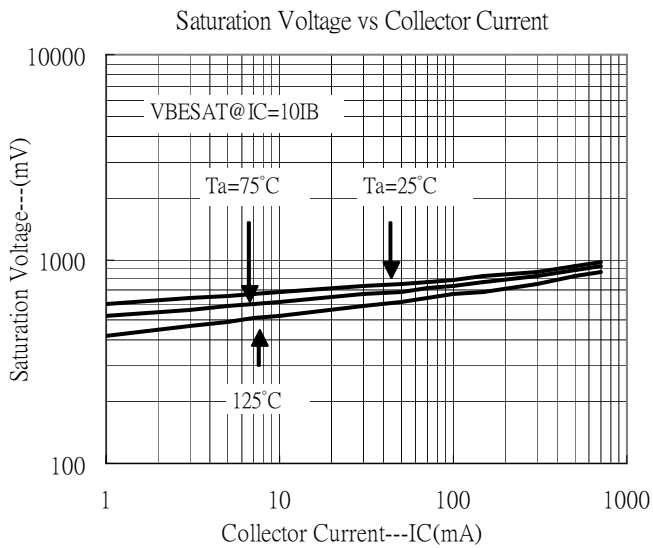
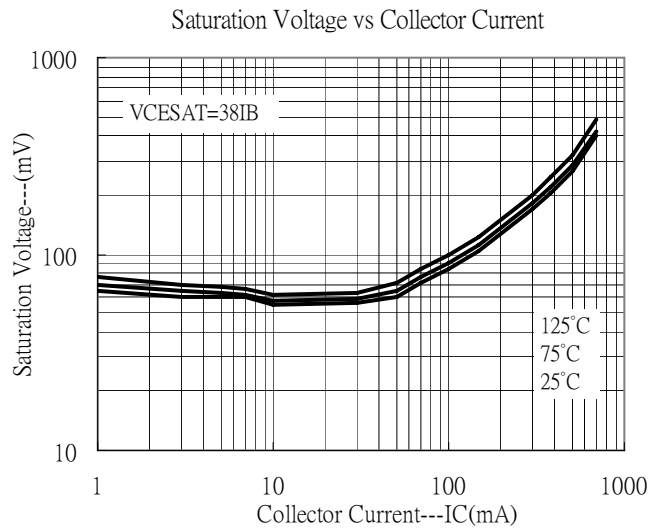
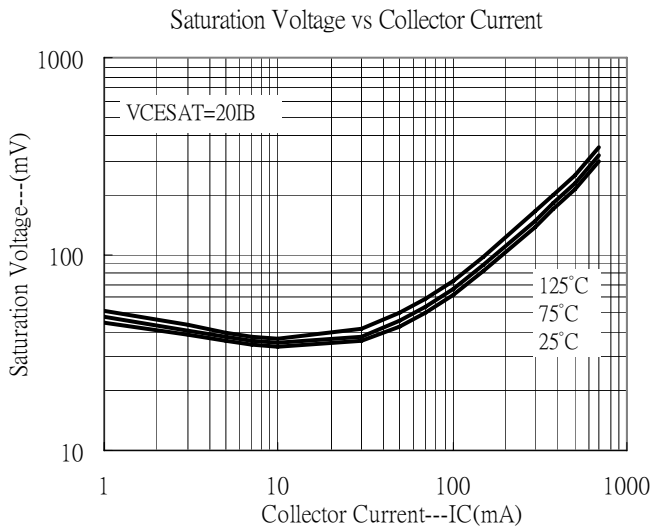


Saturation Voltage vs Collector Current

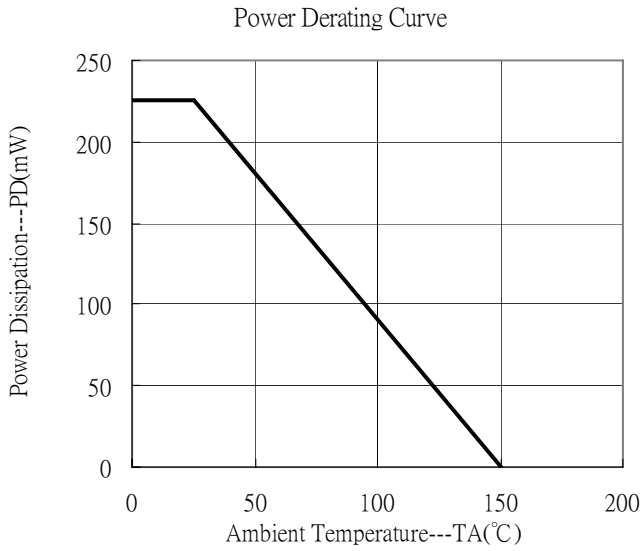




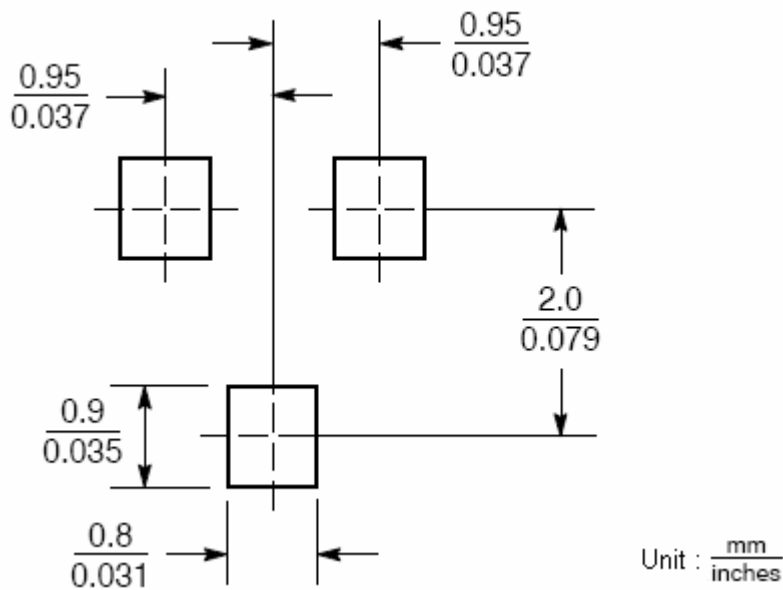
Typical Characteristics(Cont.)



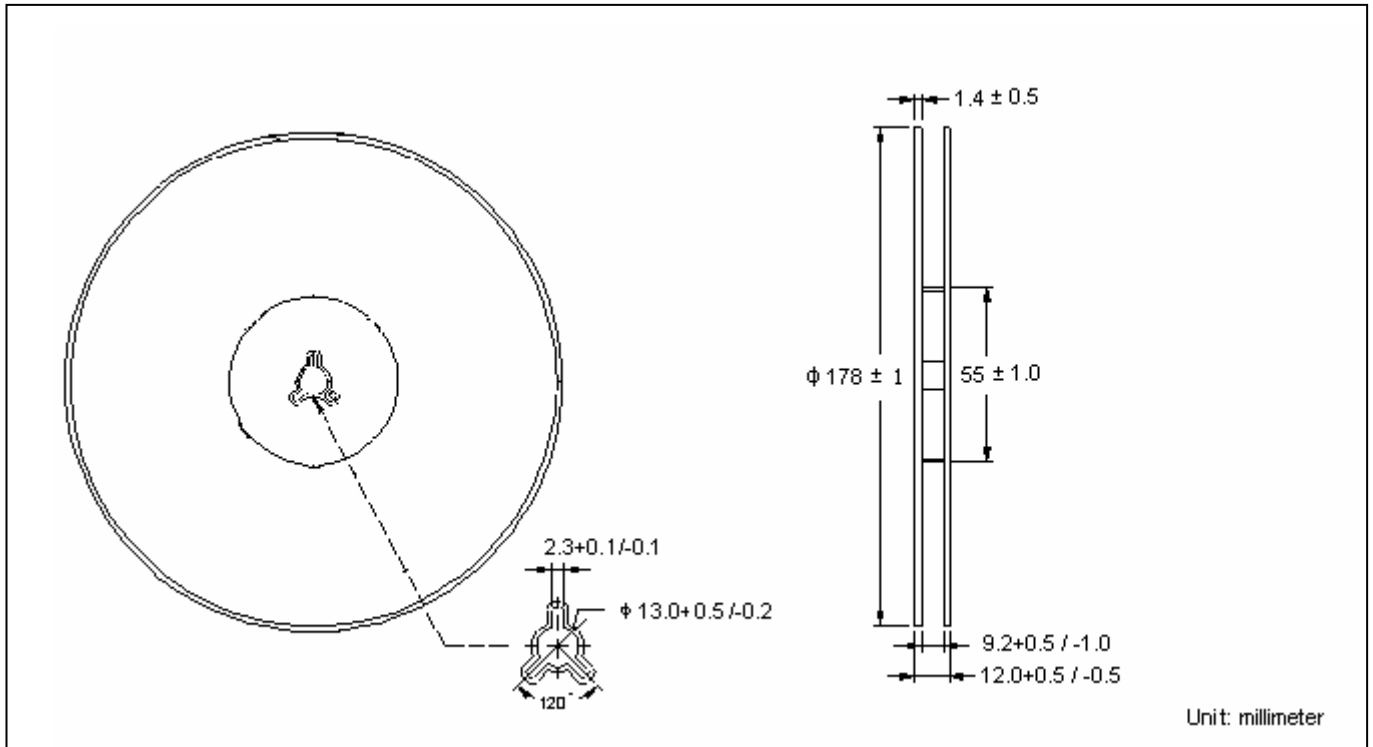
Typical Characteristics(Cont.)



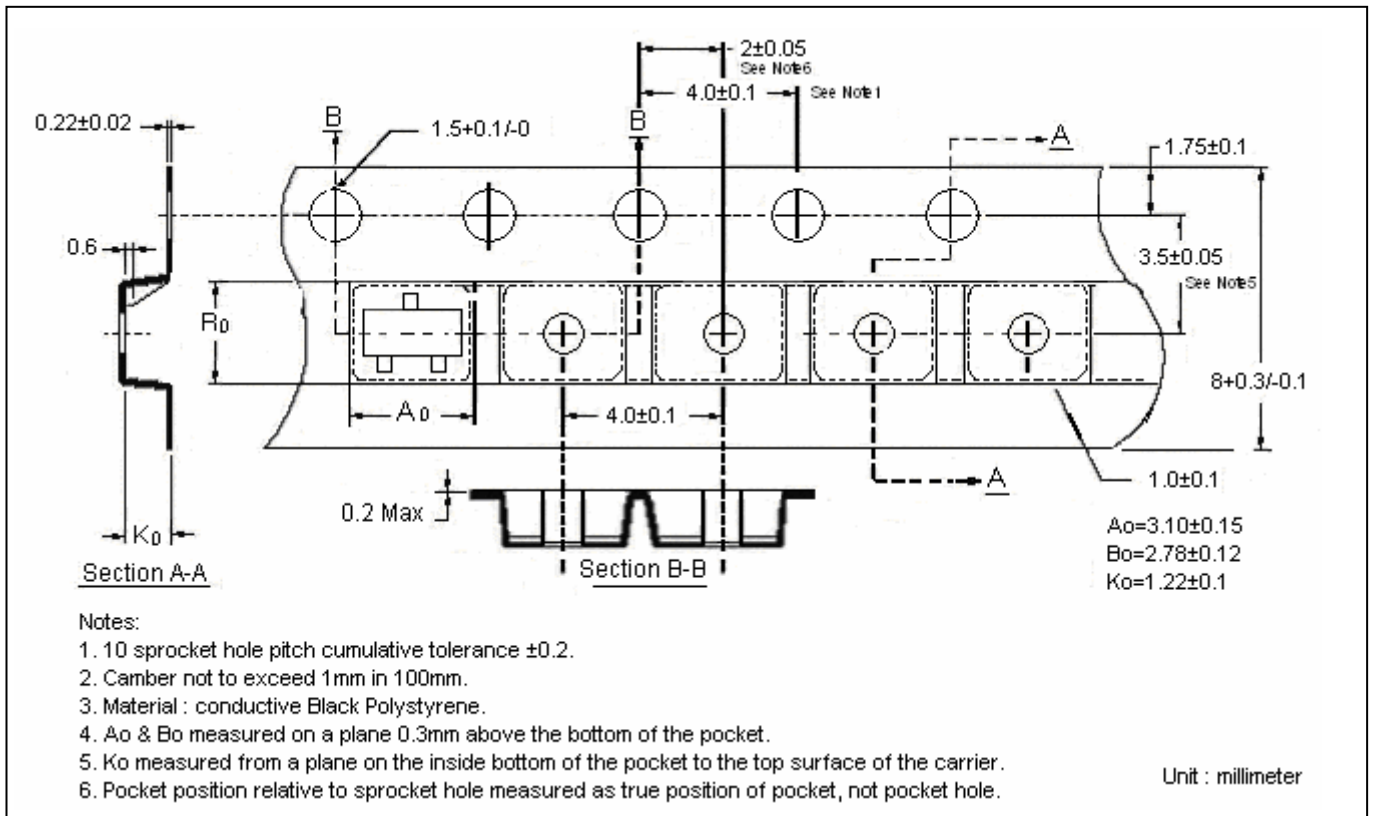
Recommended Soldering Footprint



Reel Dimension



Carrier Tape Dimension

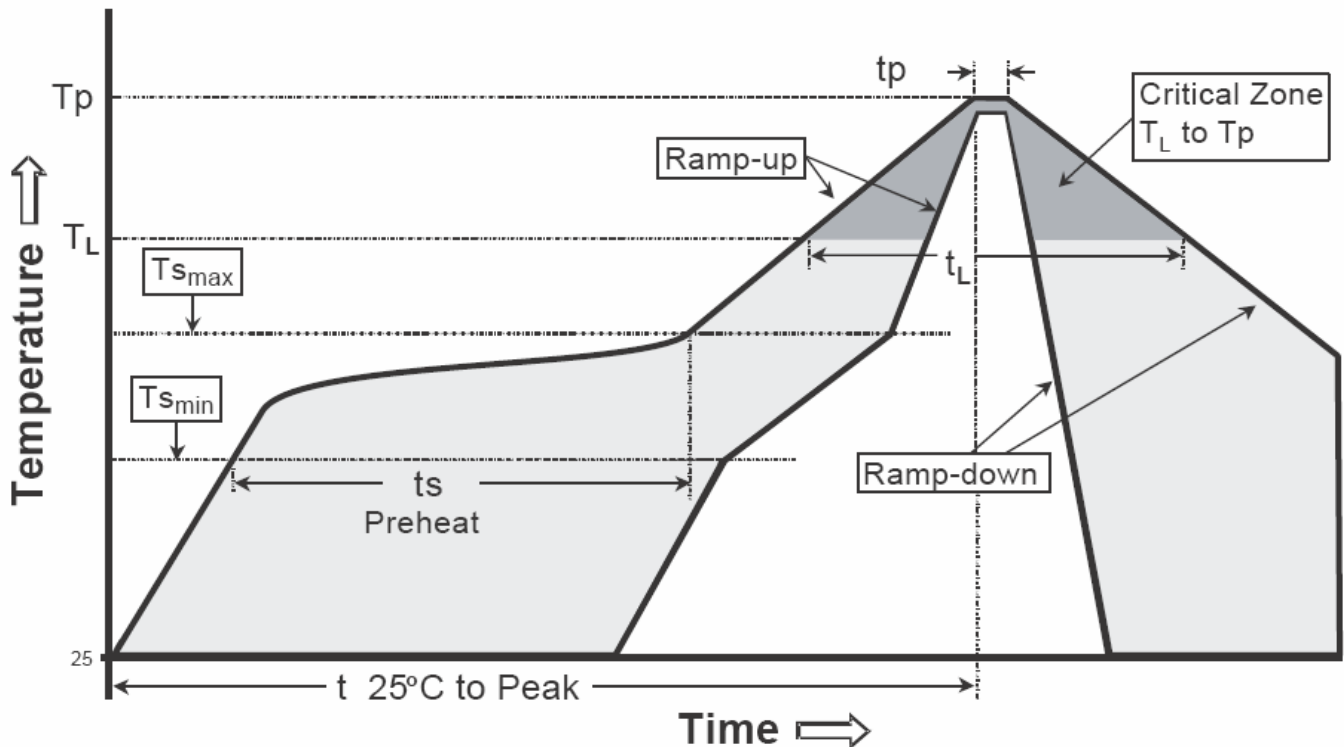




Recommended wave soldering condition

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

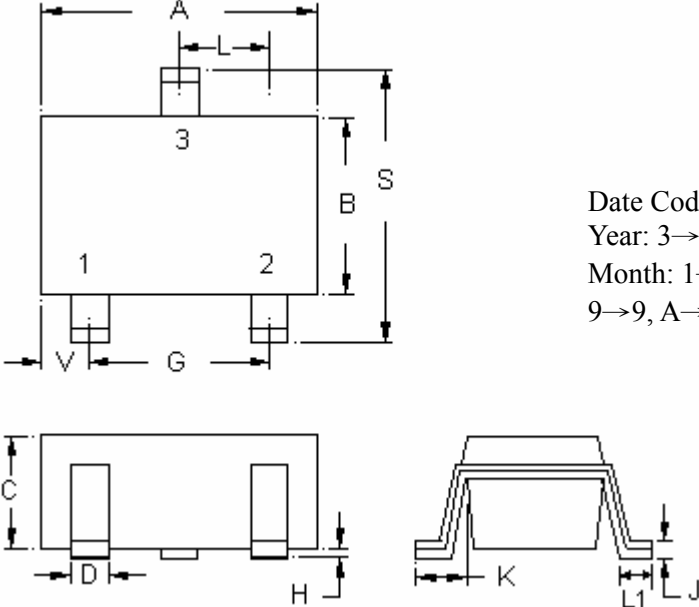
Recommended temperature profile for IR reflow



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(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 various views of the SOT-23 package. The top view shows dimensions A, L, B, S, 1, 2, 3, V, and G. The side view shows dimensions C, D, H, and J. The lead view shows dimensions K, L1, and L2. The marking diagram shows a rectangular package with three leads and the marking '1P' and a cross symbol.

Product Code

Date Code: Year+Month
 Year: 3→2003, 4→2004
 Month: 1→1, 2→2, . . .
 9→9, A→10, B→11, C→12

Marking:

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	0.0669	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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