

General Purpose NPN Epitaxial Planar Transistor

BTC3906N3

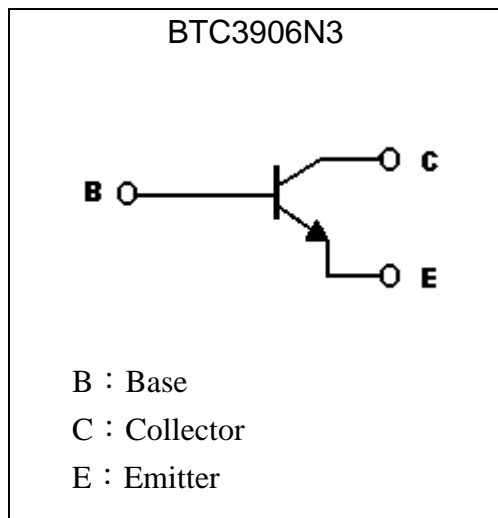
Description

The BTC3906N3 is designed for general purpose applications requiring high breakdown voltage.

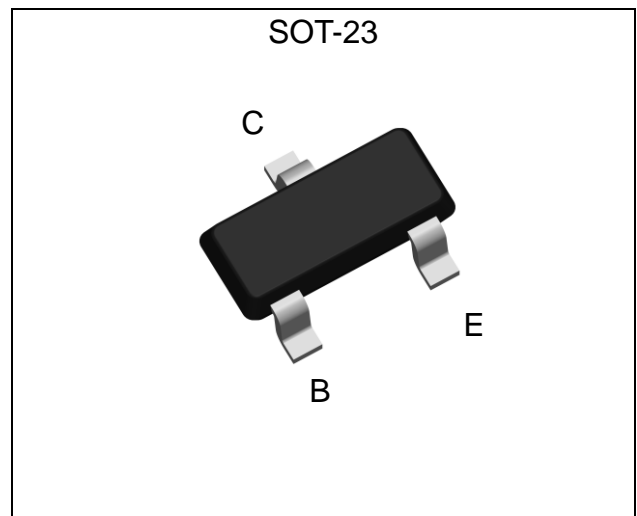
Features

- High collector-emitter breakdown voltage. ($BV_{CEO}=160V @ I_C=1mA$)
- Complement to BTA1514N3
- Pb-free and Halogen-free package

Symbol

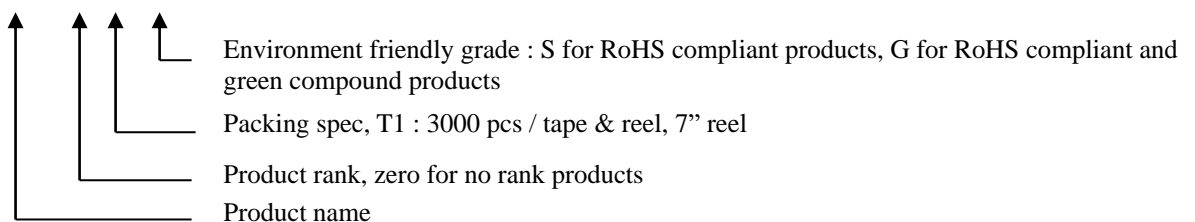


Outline



Ordering Information

Device	Package	Shipping
BTC3906N3-Q-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}	180	V
Collector-Emitter Voltage	V _{CEO}	160	V
Emitter-Base Voltage	V _{EBO}	6	V
Collector Current	I _C	600	mA
Power Dissipation (T _A =25°C)	P _D	225 (Note)	mW
Power Dissipation (T _C =25°C)	P _D	560	mW
Thermal Resistance, Junction to Ambient (Note)	R _{θJA}	556 (Note)	°C/W
Thermal Resistance, Junction to Case	R _{θJC}	223	°C/W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55~+150	°C

Note : Free air condition.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	180	-	-	V	I _C =100μA
BV _{CEO}	160	-	-	V	I _C =1mA
BV _{EBO}	6	-	-	V	I _E =10μA
I _{CB0}	-	-	50	nA	V _{CB} =120V
I _{EBO}	-	-	50	nA	V _{EB} =4V
*V _{CE(sat)1}	-	0.1	0.15	V	I _C =10mA, I _B =1mA
*V _{CE(sat)2}	-	-	0.2	V	I _C =50mA, I _B =5mA
*V _{BE(sat)1}	-	-	1	V	I _C =10mA, I _B =1mA
*V _{BE(sat)2}	-	-	1	V	I _C =50mA, I _B =5mA
*h _{FE1}	100	-	-	-	V _{CE} =5V, I _C =1mA
*h _{FE2}	100	-	-	-	V _{CE} =5V, I _C =10mA
*h _{FE3}	50	-	-	-	V _{CE} =5V, I _C =50mA
*h _{FE4}	120	-	270	-	V _{CE} =6V, I _C =2mA
f _T	100	-	-	MHz	V _{CE} =20V, I _C =10mA, f=100MHz
C _{ob}	-	-	6	pF	V _{CB} =20V, I _E =0A, f=1MHz

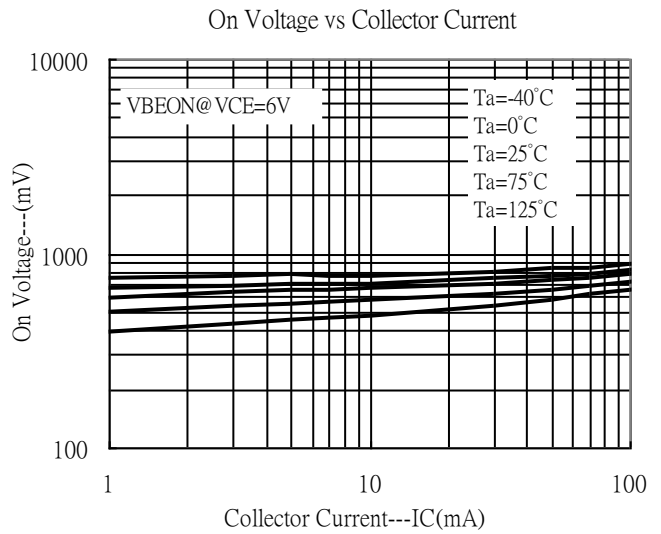
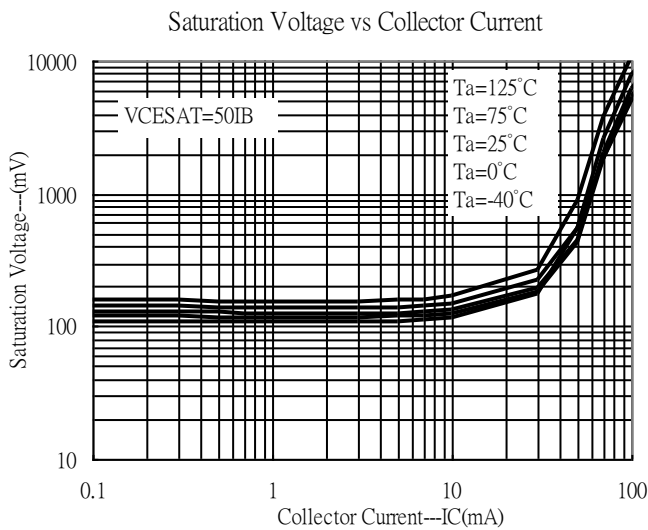
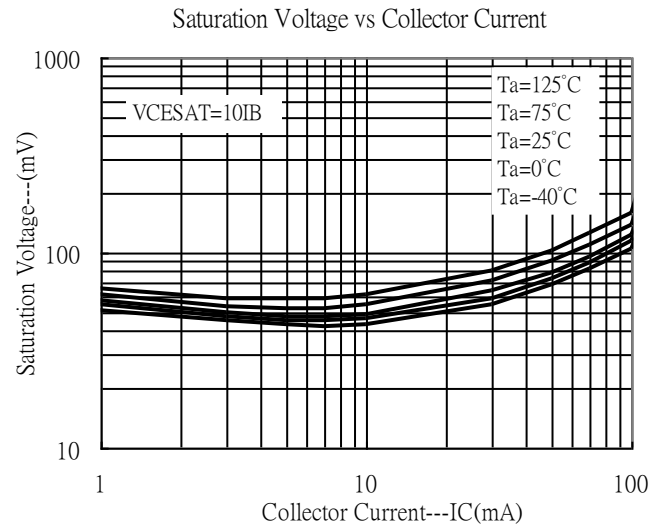
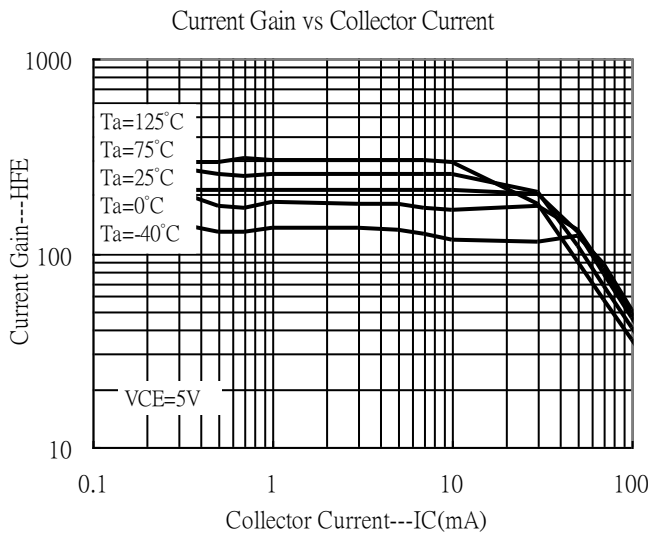
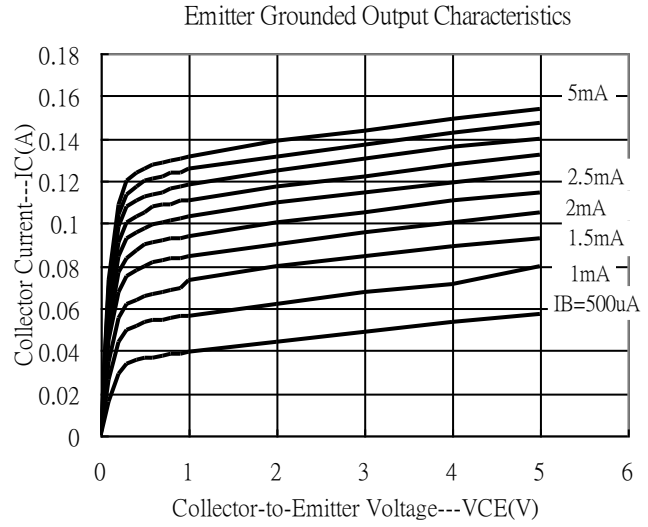
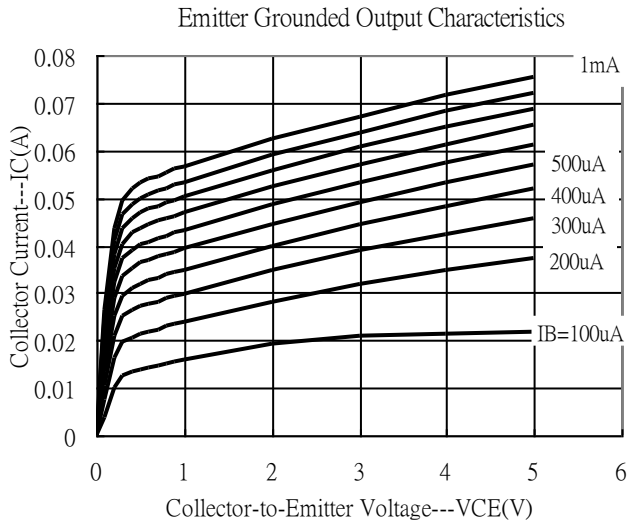
*Pulse Test: Pulse Width ≤380us, Duty Cycle ≤2%

Classification Of h_{FE} 4

Rank	Q
Range	120~270



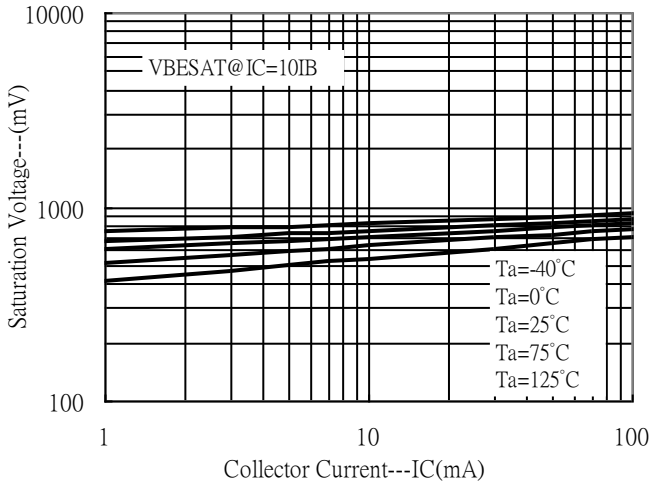
Typical Characteristics



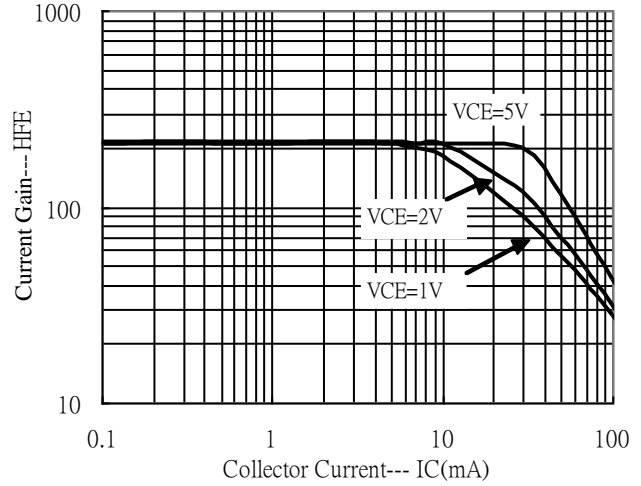


Typical Characteristics(Cont.)

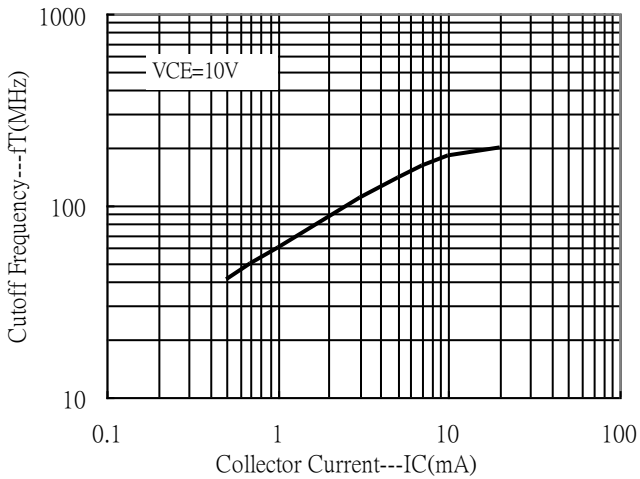
Saturation Voltage vs Collector Current



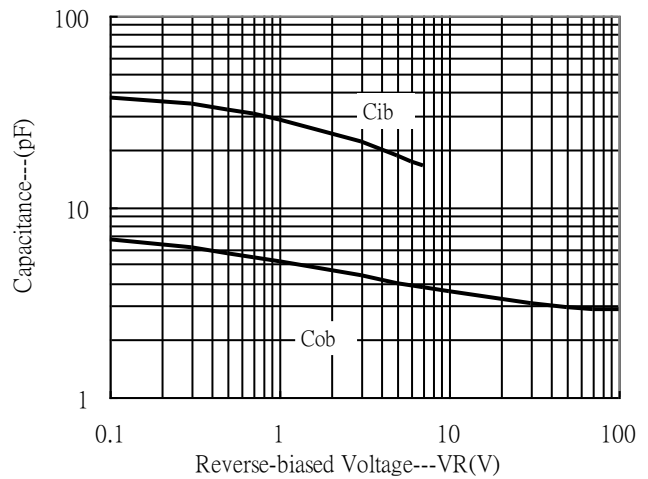
Current Gain vs Collector Current



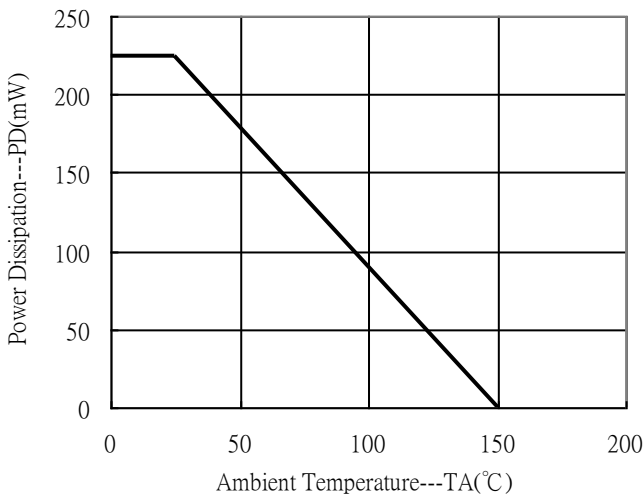
Cutoff Frequency vs Collector Current



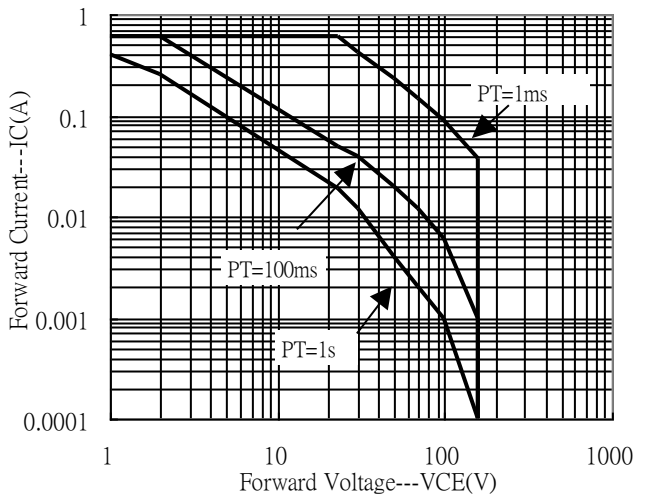
Capacitance vs Reverse-biased Voltage



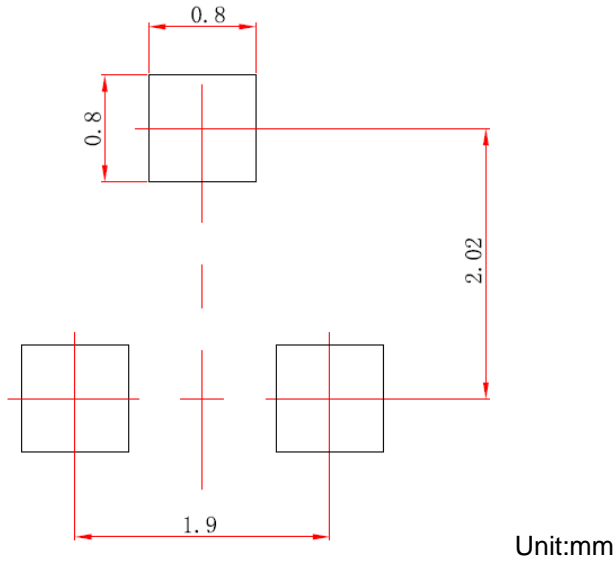
Power Derating Curve



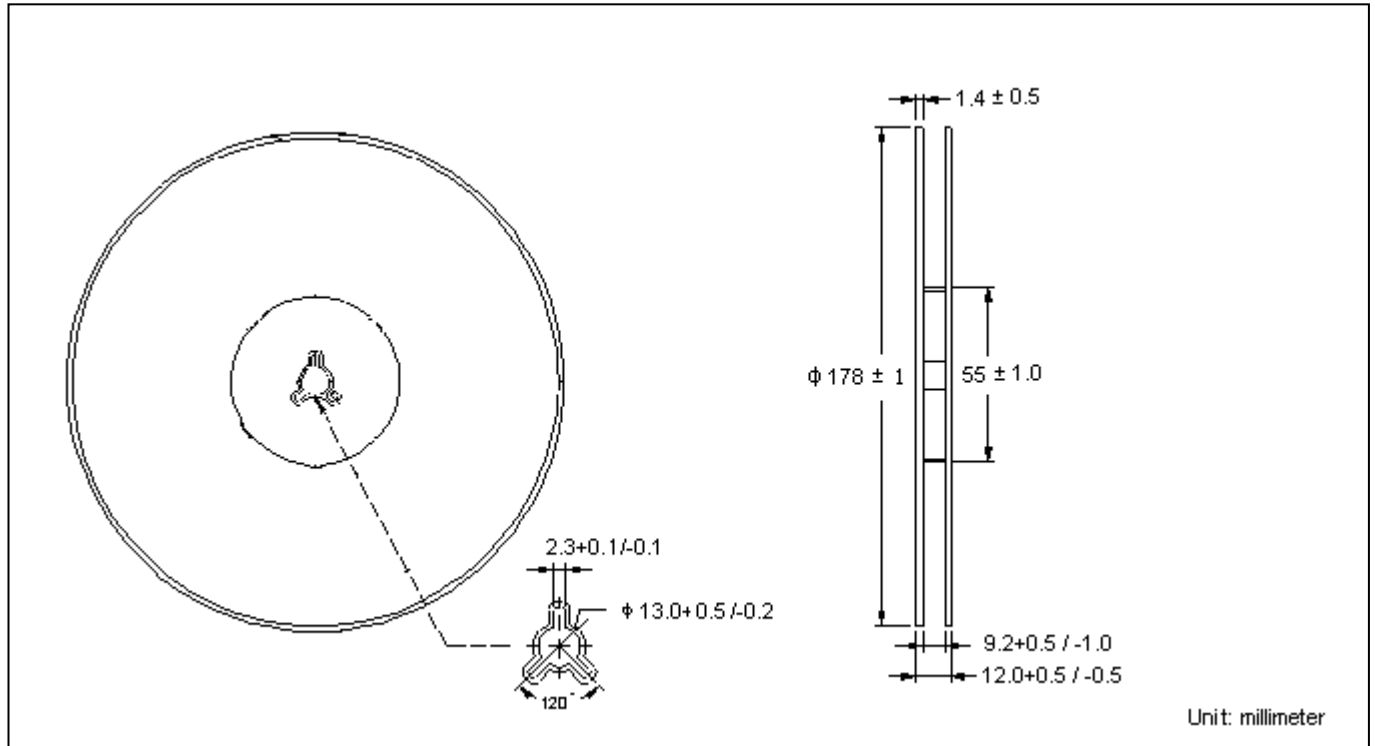
Safe Operating Area



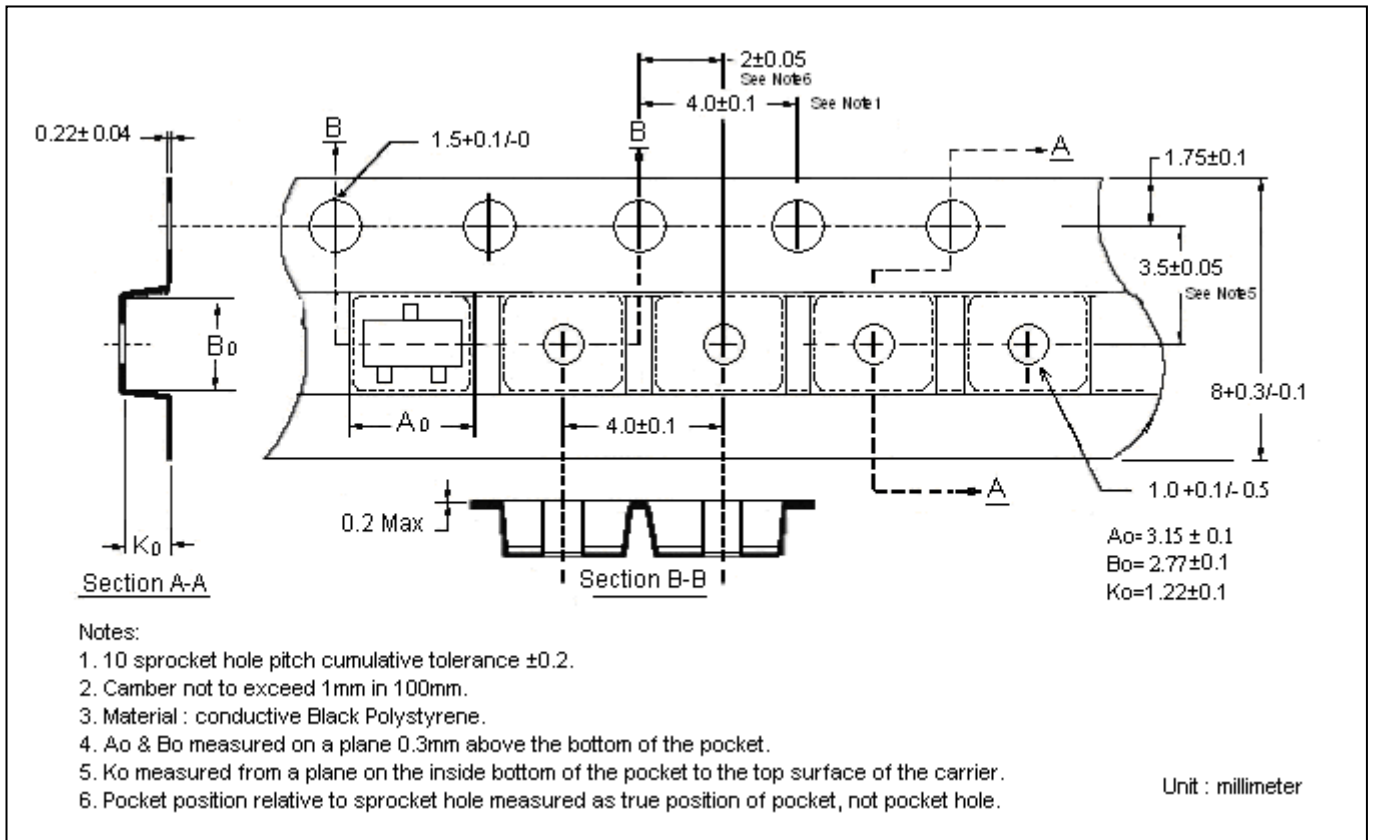
Recommended Soldering Footprint



Reel Dimension



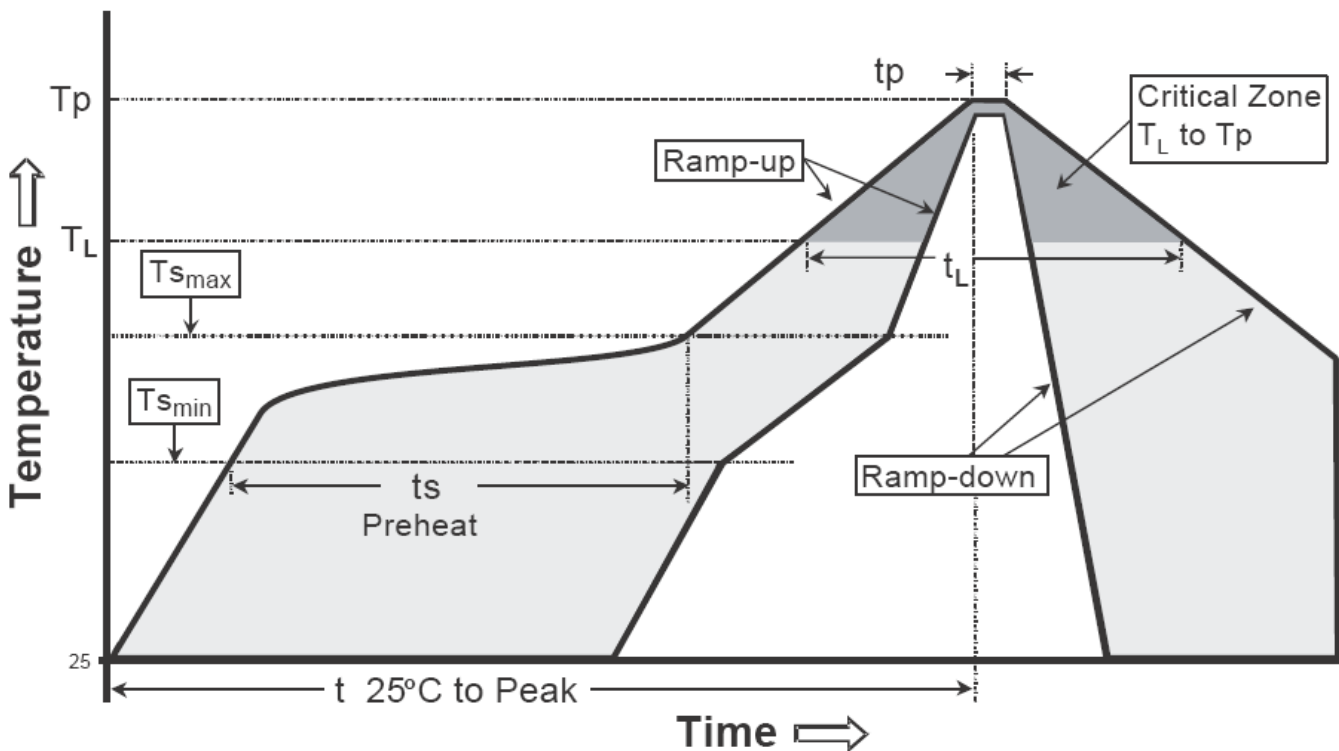
Carrier Tape Dimension



Recommended wave soldering condition

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

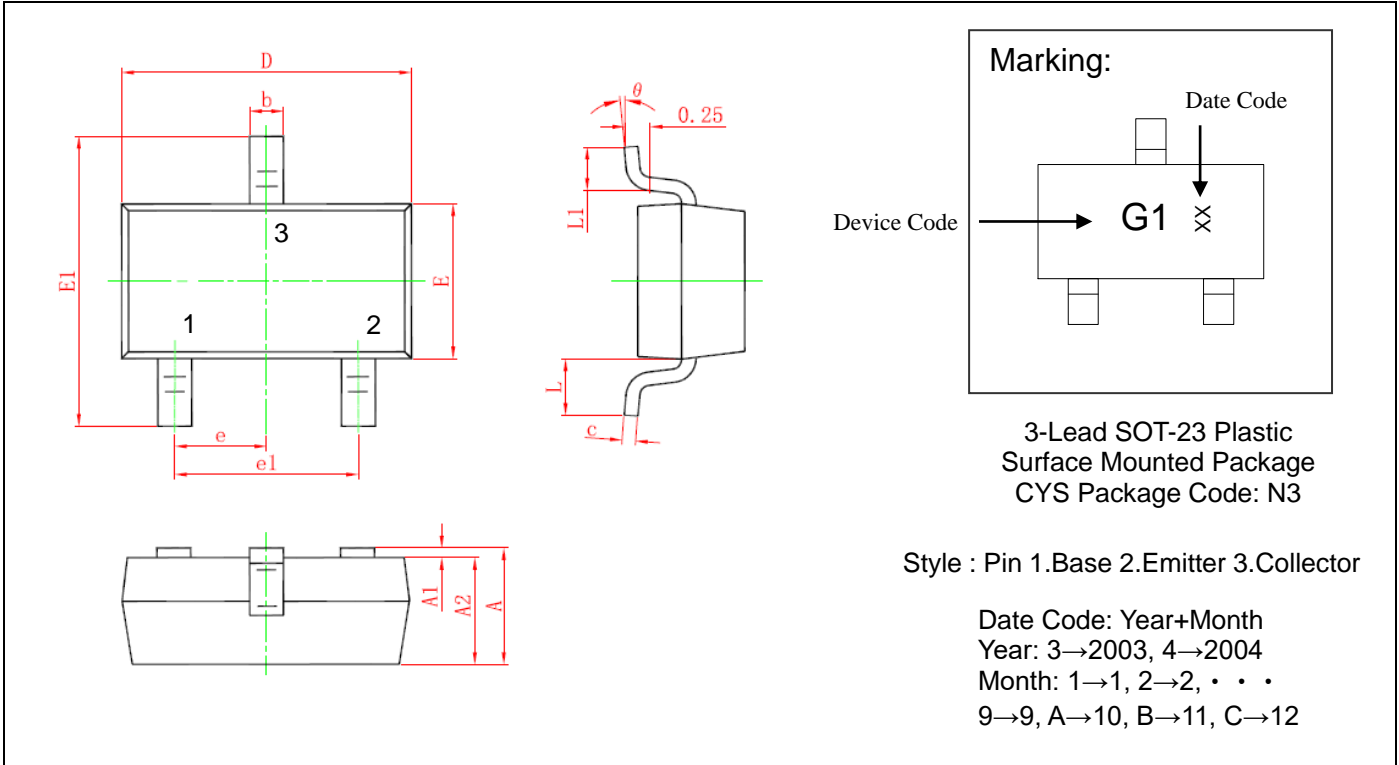
Recommended temperature profile for IR reflow



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



Marking:

Date Code

Device Code → **G1** ×

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

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

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

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.045	0.900	1.150	E1	0.089	0.100	2.250	2.550
A1	0.000	0.004	0.000	0.100	e	0.037 TYP		0.950 TYP	
A2	0.035	0.041	0.900	1.050	e1	0.071	0.079	1.800	2.000
b	0.012	0.020	0.300	0.500	L	0.022 REF		0.550 REF	
c	0.003	0.006	0.080	0.150	L1	0.012	0.020	0.300	0.500
D	0.110	0.118	2.800	3.000	θ	0°	8°	0°	8°
E	0.047	0.055	1.200	1.400					

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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