General Purpose PNP Epitaxial Planar Transistor

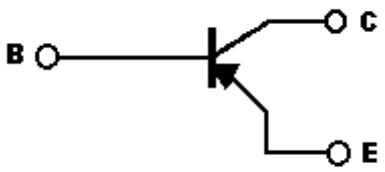
BTP3906N3

Description

- Complementary to BTN3904N3.
- Pb-free lead plating and halogen-free package

Symbol

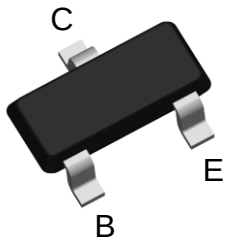
BTP3906N3



B：Base
C：Collector
E：Emitter

Outline

SOT-23



Ordering Information

Device	Package	Shipping
BTP3906N3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / tape & reel

Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T1 : 3000 pcs / tape & reel, 7” reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-200	mA
Power Dissipation (T_A=25°C)	P_D	225 (Note)	mW
Power Dissipation (T_C=25°C)	P_D	560	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
Rth,j-c	thermal resistance from junction to case		223	℃/W
Rth, j-a	thermal resistance from junction to ambient	(Note)	556	℃/W

Note : Free air condition

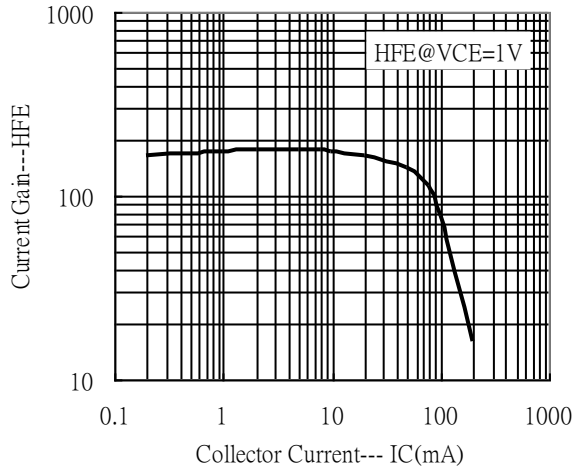
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-40	-	-	V	I_C=-10μA
BV_{CEO}	-40	-	-	V	I_C=-1mA
BV_{EBO}	-5	-	-	V	I_E=-10μA
I_{CEX}	-	-	-50	nA	V_{CE}=-30V, V_{BE}=3V
I_{EBO}	-	-	-50	nA	V_{EB}=-4V
*$V_{CE(sat)}$	-	-0.05	-0.25	V	I_C=-10mA, I_B=-1mA
*$V_{CE(sat)}$	-	-0.12	-0.4	V	I_C=-50mA, I_B=-5mA
*$V_{BE(sat)}$	-0.65	-0.76	-0.85	V	I_C=-10mA, I_B=-1mA
*$V_{BE(sat)}$	-	-0.88	-0.95	V	I_C=-50mA, I_B=-5mA
*h_{FE}	60	-	-		V_{CE}=-1V, I_C=-100μA
*h_{FE}	80	-	-		V_{CE}=-1V, I_C=-1mA
*h_{FE}	100	-	300		V_{CE}=-1V, I_C=-10mA
*h_{FE}	60	-	-		V_{CE}=-1V, I_C=-50mA
*h_{FE}	30	-	-		V_{CE}=-1V, I_C=-100mA
f_T	250	-	-	MHz	V_{CE}=-20V, I_C=-10mA, f=100MHz
Cob	-	-	4.5	pF	V_{CB}=-5V, I_E=0A,f=1MHz

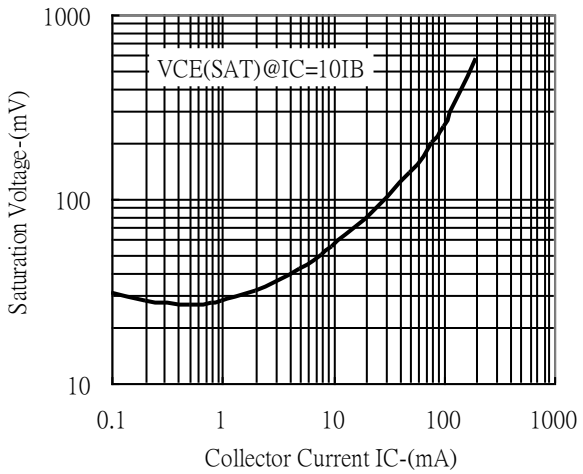
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Characteristic Curves

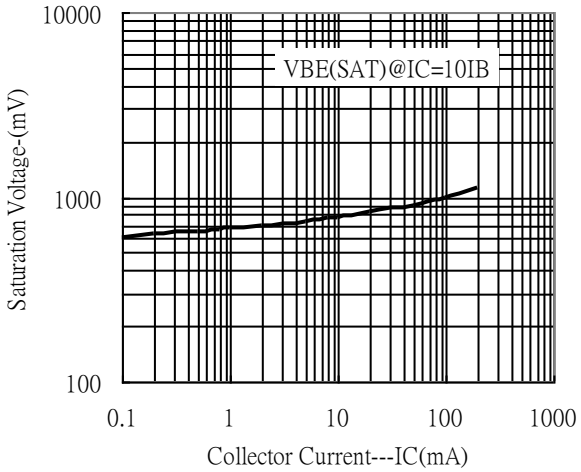
Current Gain vs Collector Current



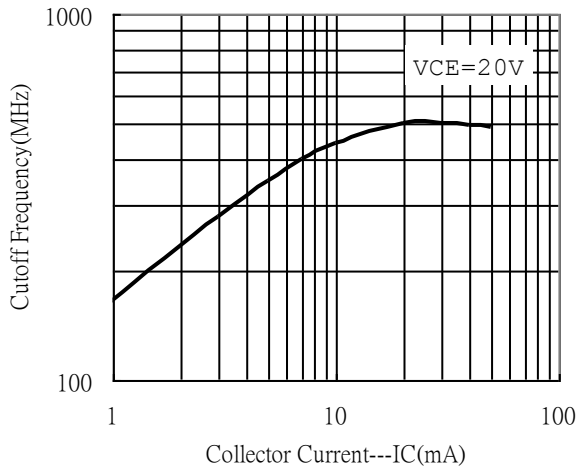
Saturation Voltage vs Collector Current



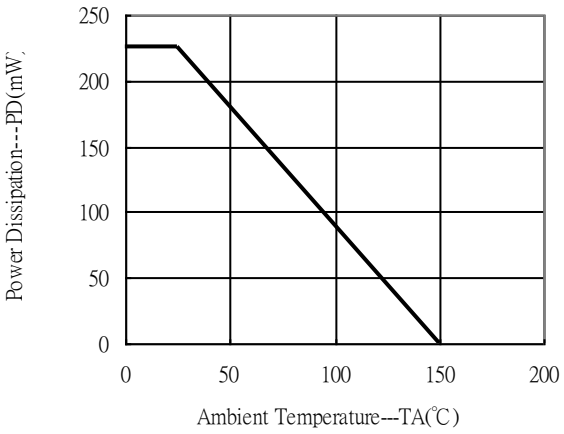
Saturation Voltage vs Collector Current



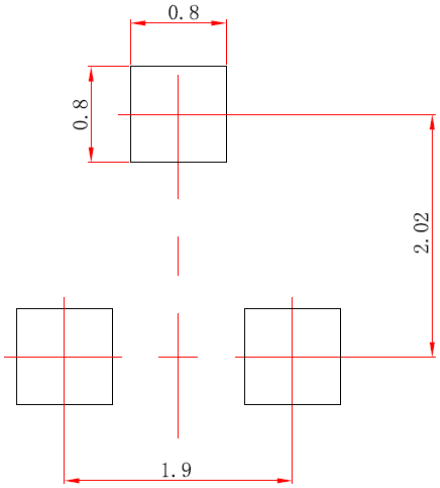
Cutoff Frequency vs Collector Current



Power Derating Curve

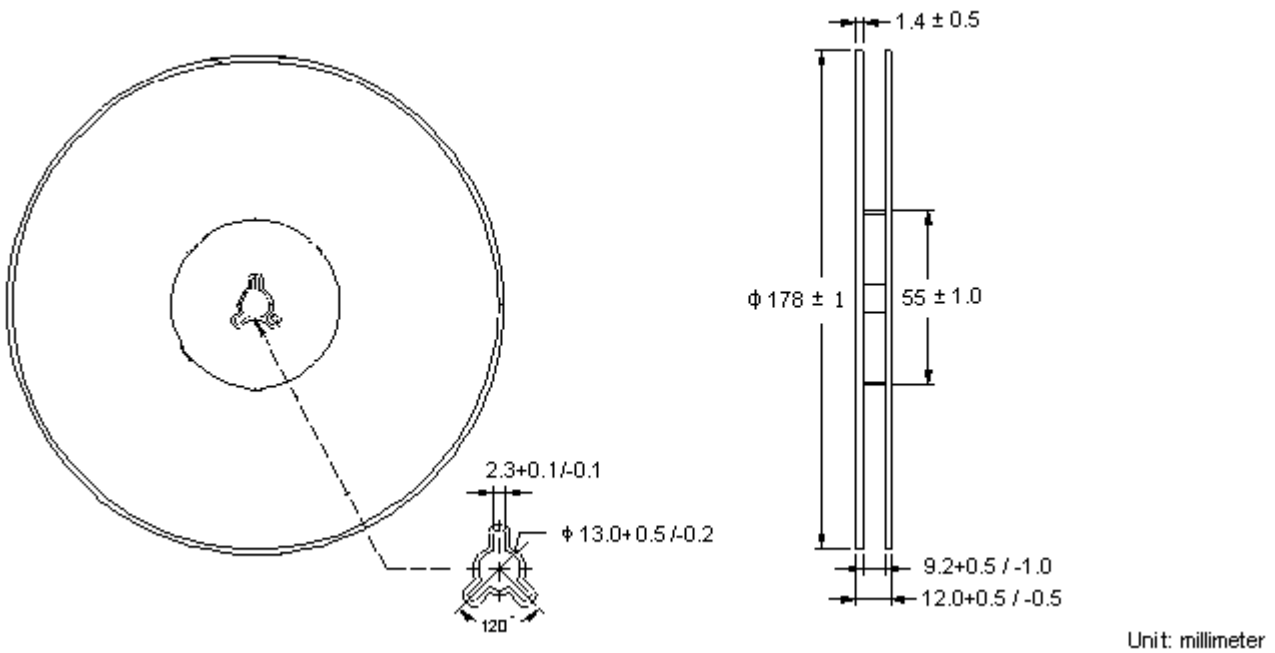


Recommended Soldering Footprint

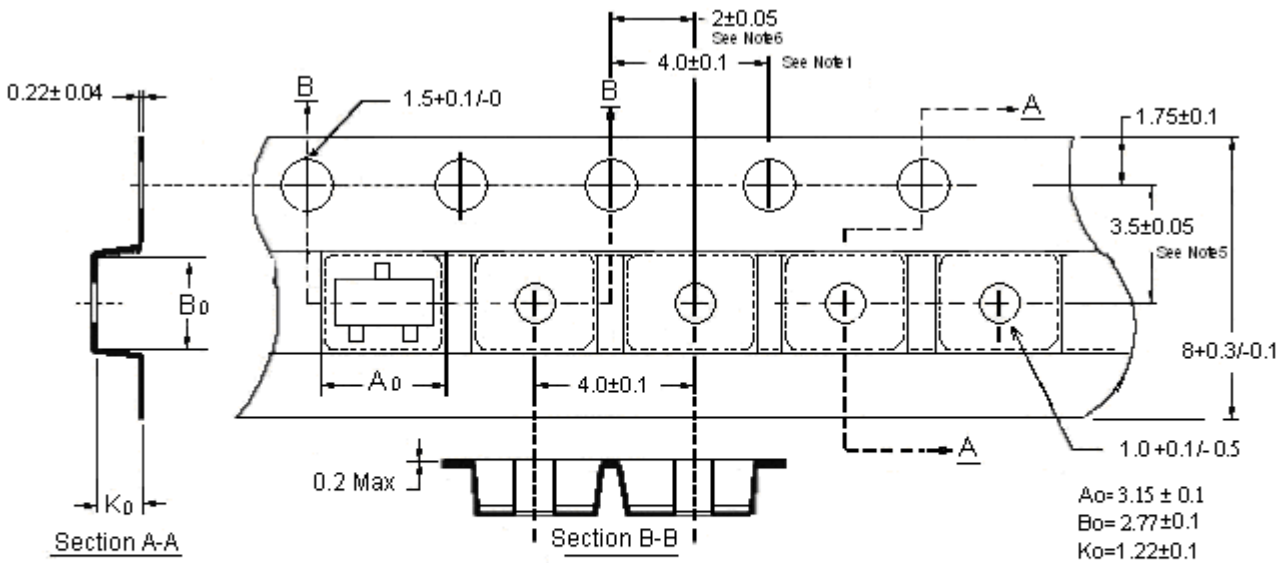


Unit : mm

Reel Dimension



Carrier Tape Dimension



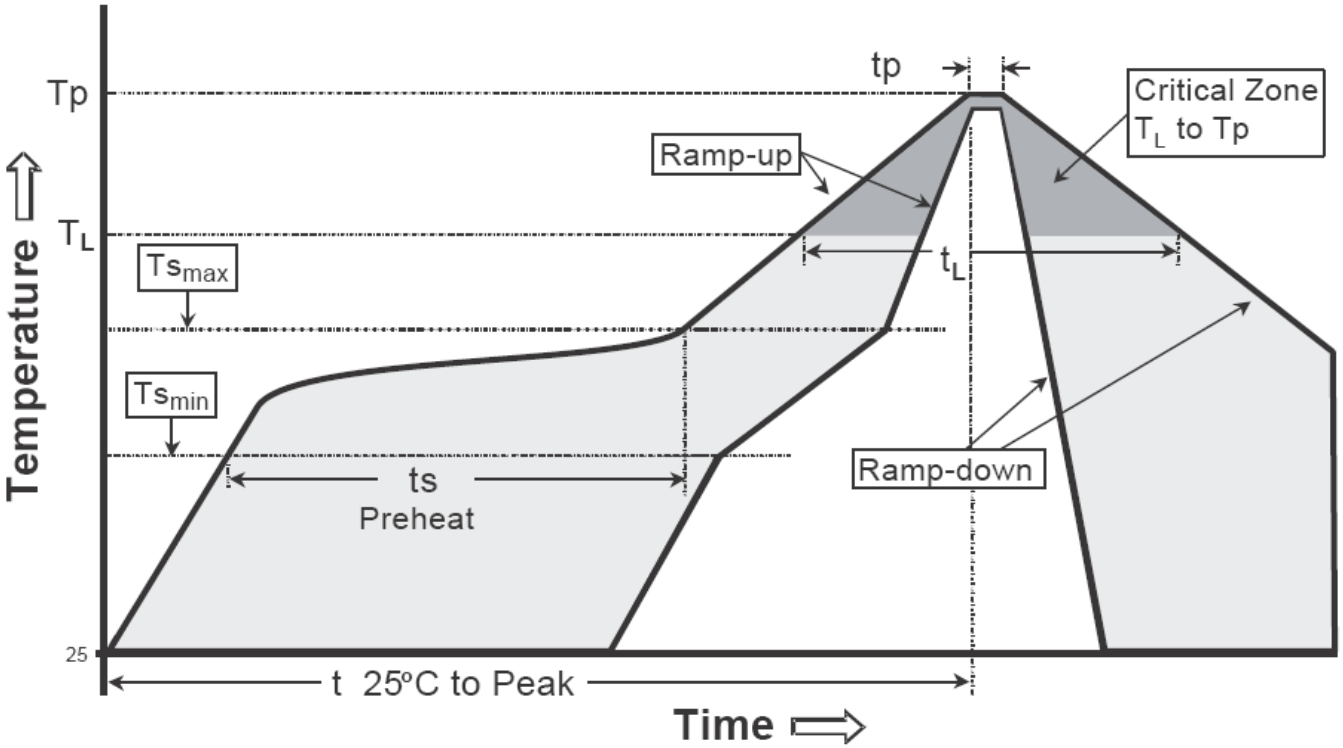
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

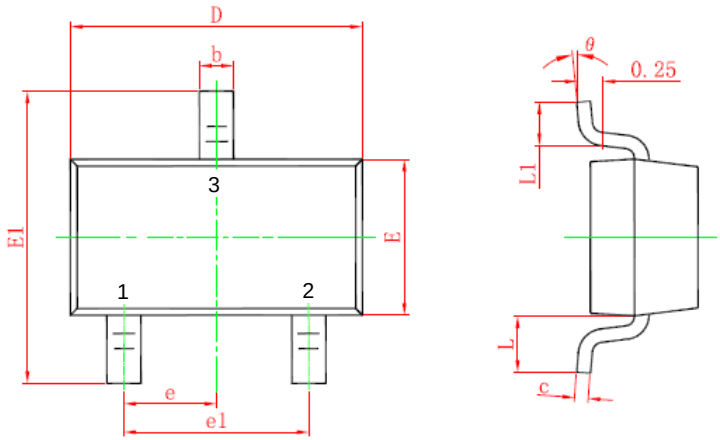
Recommended temperature profile for IR reflow

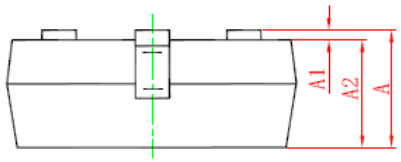


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\,min}$ to $t_{s\,max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 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.

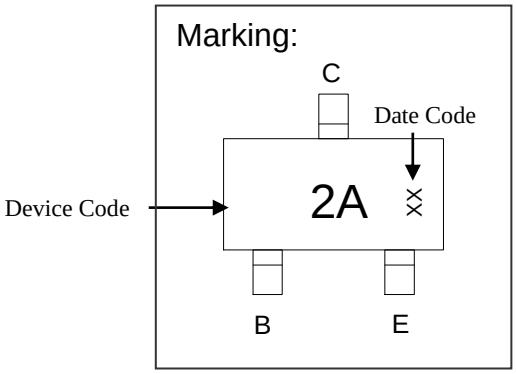
Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-23 Dimension





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



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

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

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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