NPN Epitaxial Planar Transistor
AUDIO MUTING APPLICATION

BTD1304N3

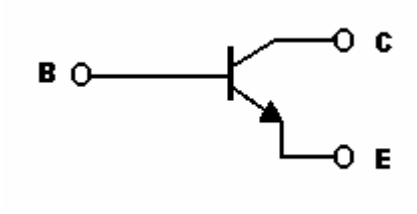
BV_{CEO}	20V
I_C	500mA
$R_{CE(SAT)}$	0.3Ω(typ)

Features

- High Emitter-Base voltage, V_{EBO}=12V(min).
- High reverse h_{FE}, reverse h_{FE}=20(min.) @V_{CE}=2V, I_C=4mA.
- Low On-resistance, Ron=0.6Ω(max)@I_B=1mA.
- Pb-free and halogen-free package.

Symbol

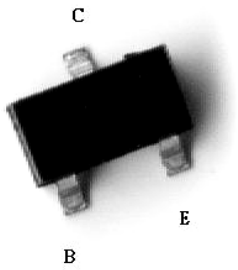
BTD1304N3



B：Base
C：Collector
E：Emitter

Outline

SOT-23



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Base Voltage	V_{EBO}	12	V
Collector Current	I_C	500	mA
Base Current	I_B	50	mA
Power Dissipation	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Characteristics (Ta=25°C)

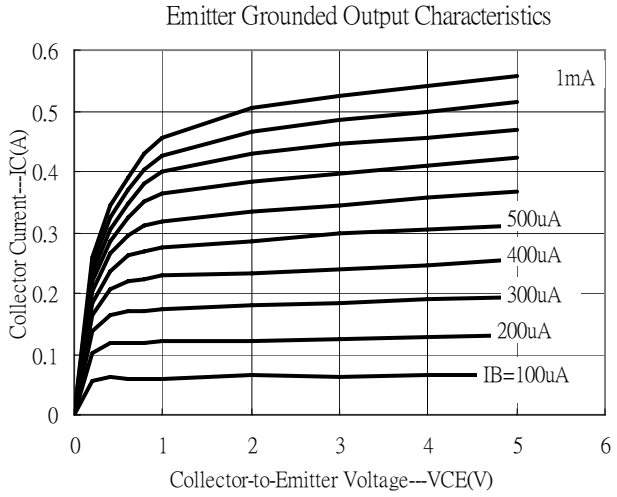
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	50	-	-	V	I_C=100μA, I_E=0
BV_{CEO}	20	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	12	-	-	V	I_E=10μA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=40V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=12V, I_C=0
*$V_{CE(sat)}$	-	34	100	mV	I_C=100mA, I_B=10mA
*$V_{CE(sat)}$	-	0.15	0.3	V	I_C=500mA, I_B=20mA
*$R_{CE(sat)}$	-	0.3	0.6	Ω	I_C=500mA, I_B=20mA
*$V_{BE(sat)}$	-	0.67	1	V	I_C=100mA, I_B=10mA
*h_{FE}1(FOR)	200	-	800	-	V_{CE}=2V, I_C=4mA
*h_{FE}2(FOR)	400	-	-	-	V_{CE}=3V, I_C=100mA
*h_{FE} 3(REV)	20	-	-	-	V_{CE}=2V, I_C=4mA
f_T	-	250	-	MHz	V_{CE}=10V, I_C=50mA, f=100MHz
Cob	-	10	-	pF	V_{CB}=10V, f=1MHz
Ron	-	-	0.6	Ω	Vin=0.3V, I_B=1mA, f=1KHz

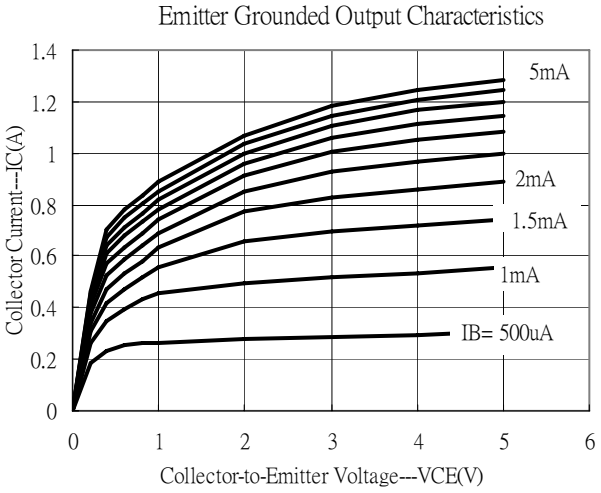
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

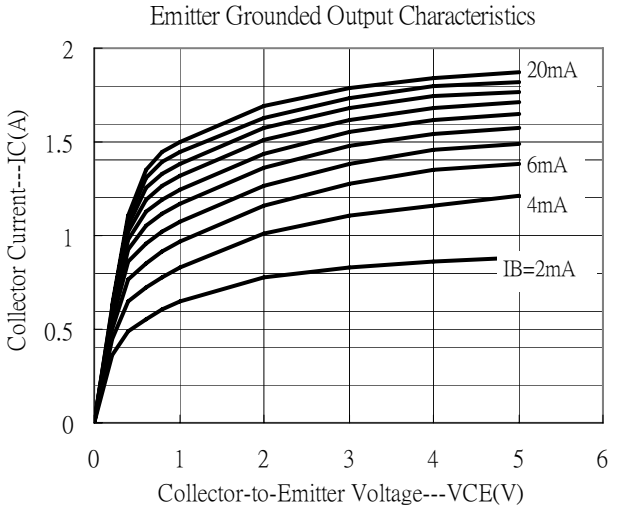
Ordering Information

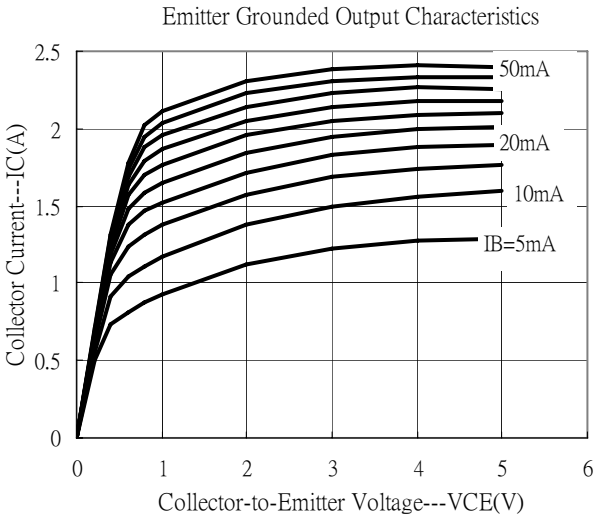
Device	Package	Shipping	Marking
BTD1304N3	SOT-23 (Pb-free and halogen-free package)	3000 pcs / Tape & Reel	MAX

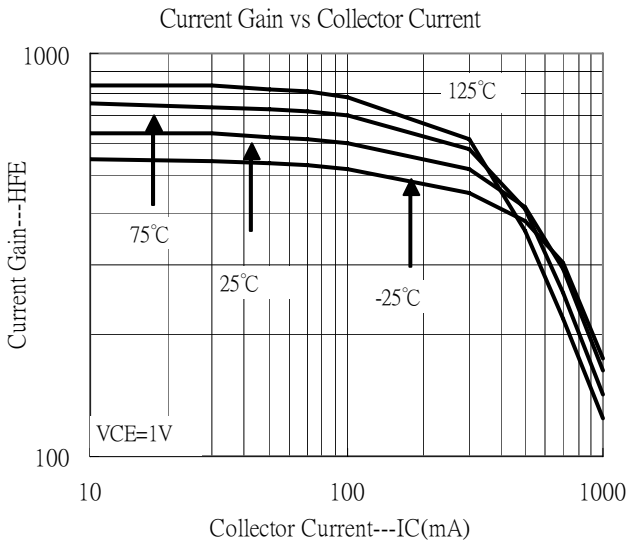
Typical Characteristics

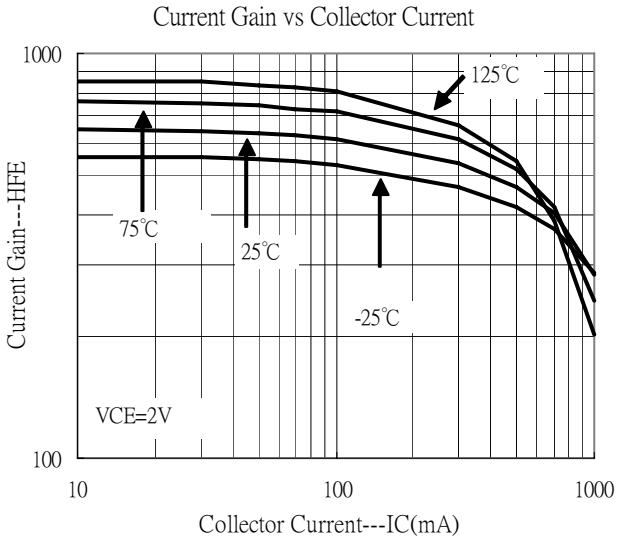




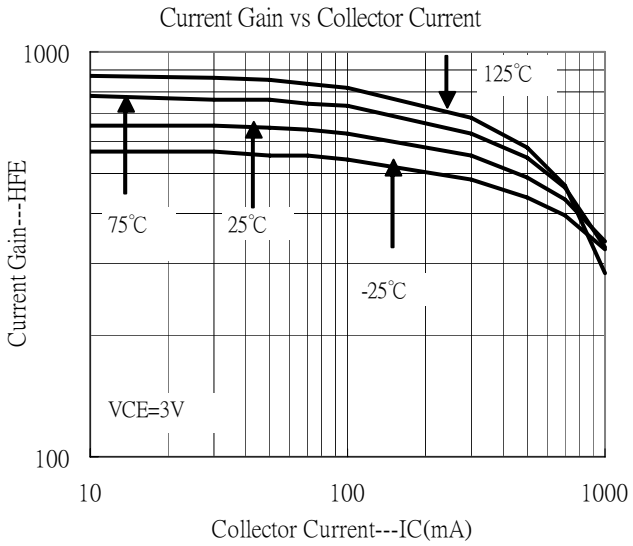


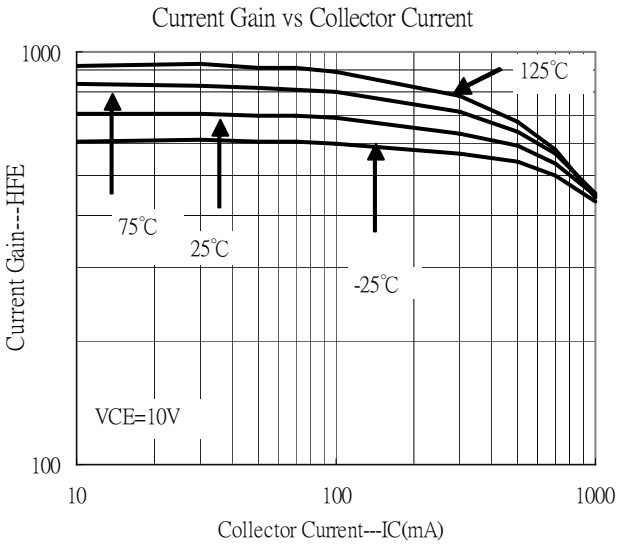


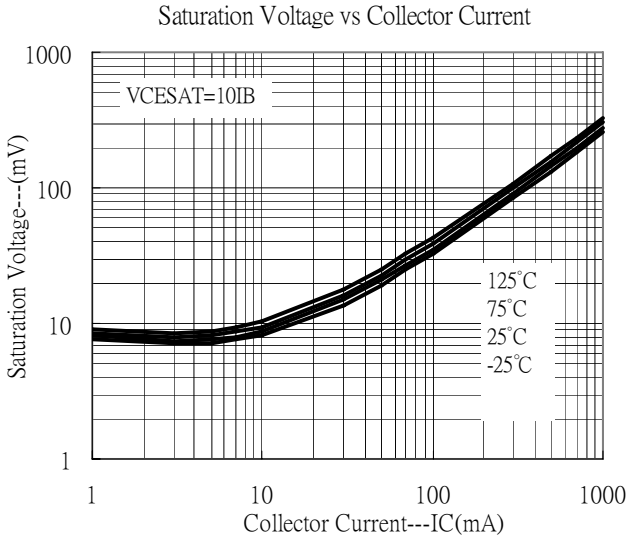


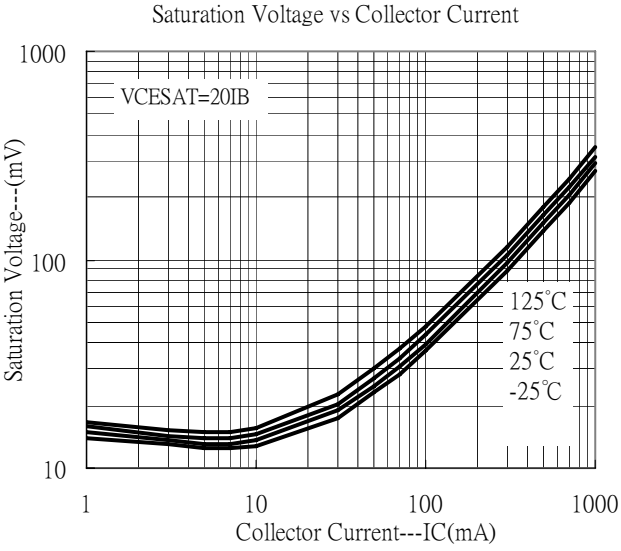


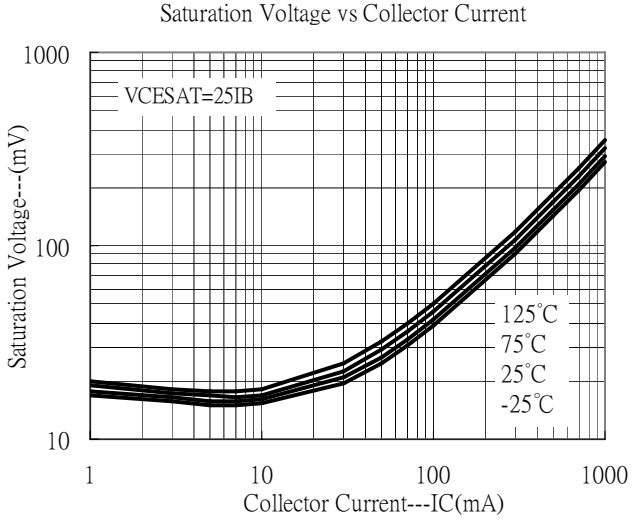
Typical Characteristics(Cont.)

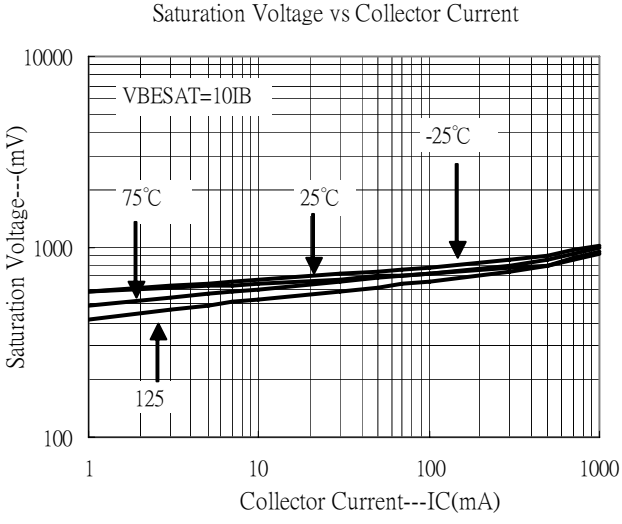




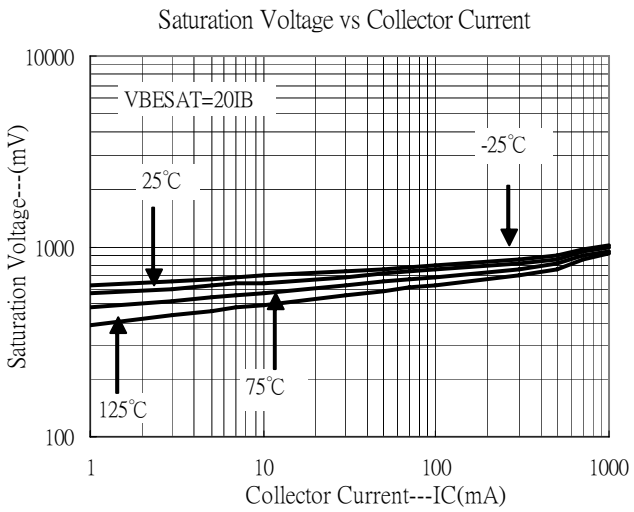


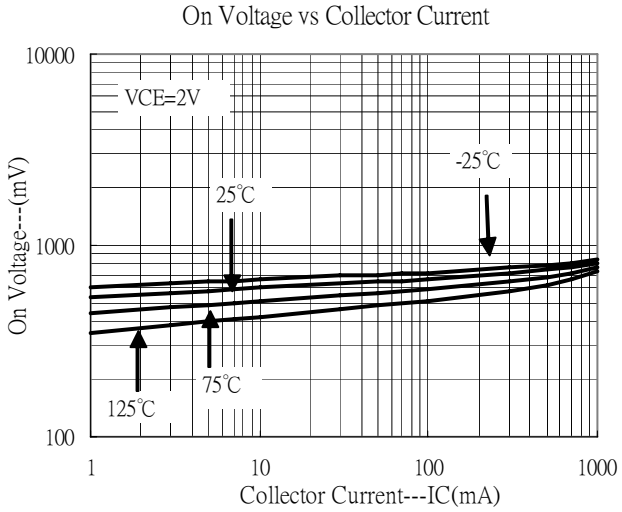


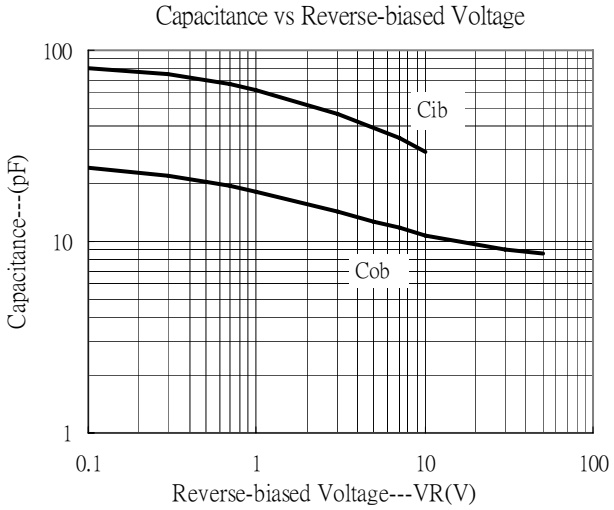




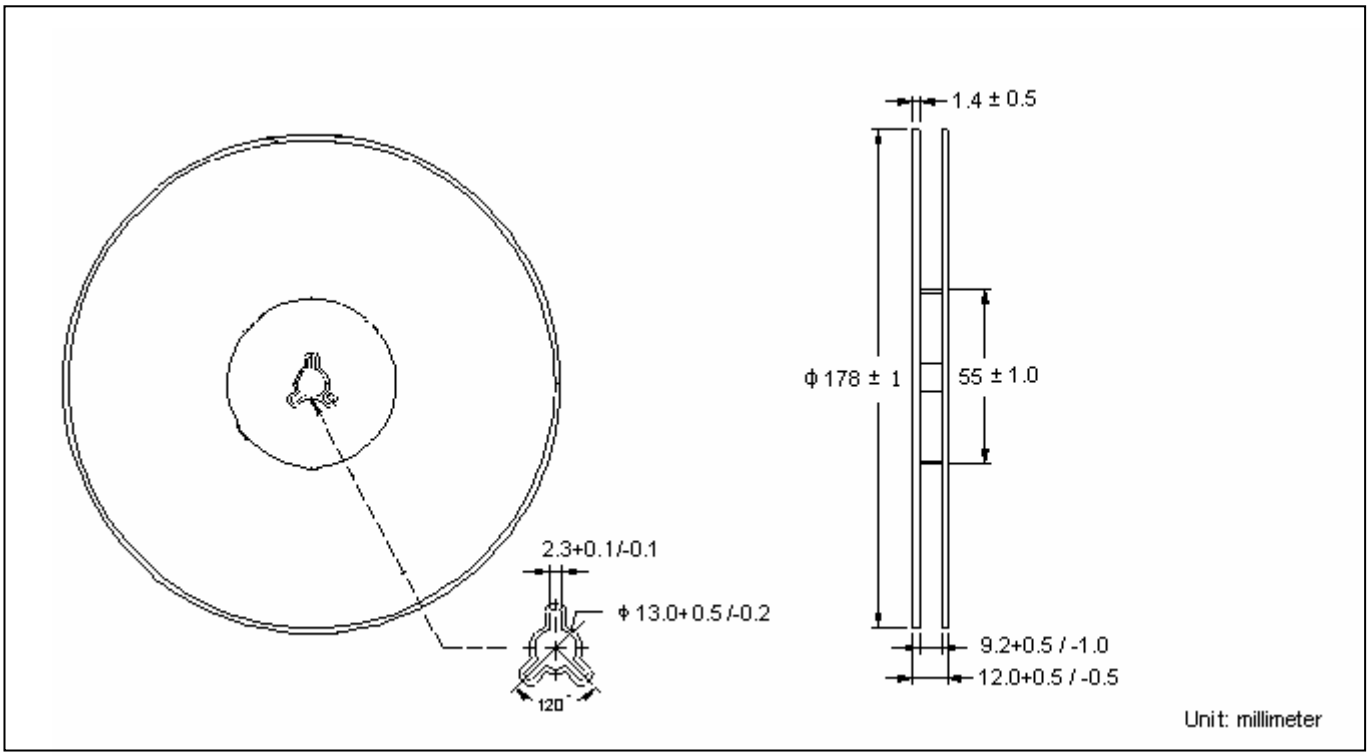
Typical Characteristics(Cont.)



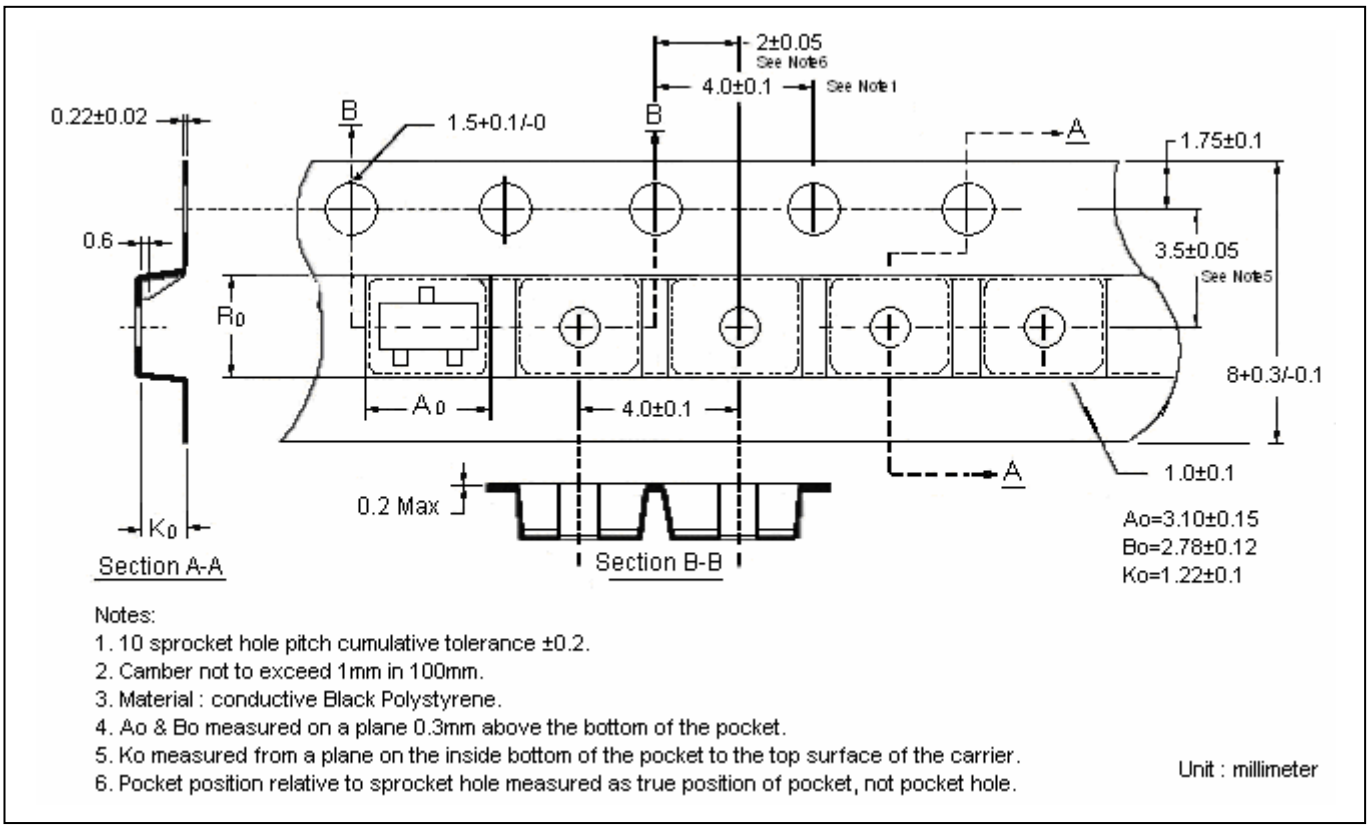




Reel Dimension



Carrier Tape Dimension



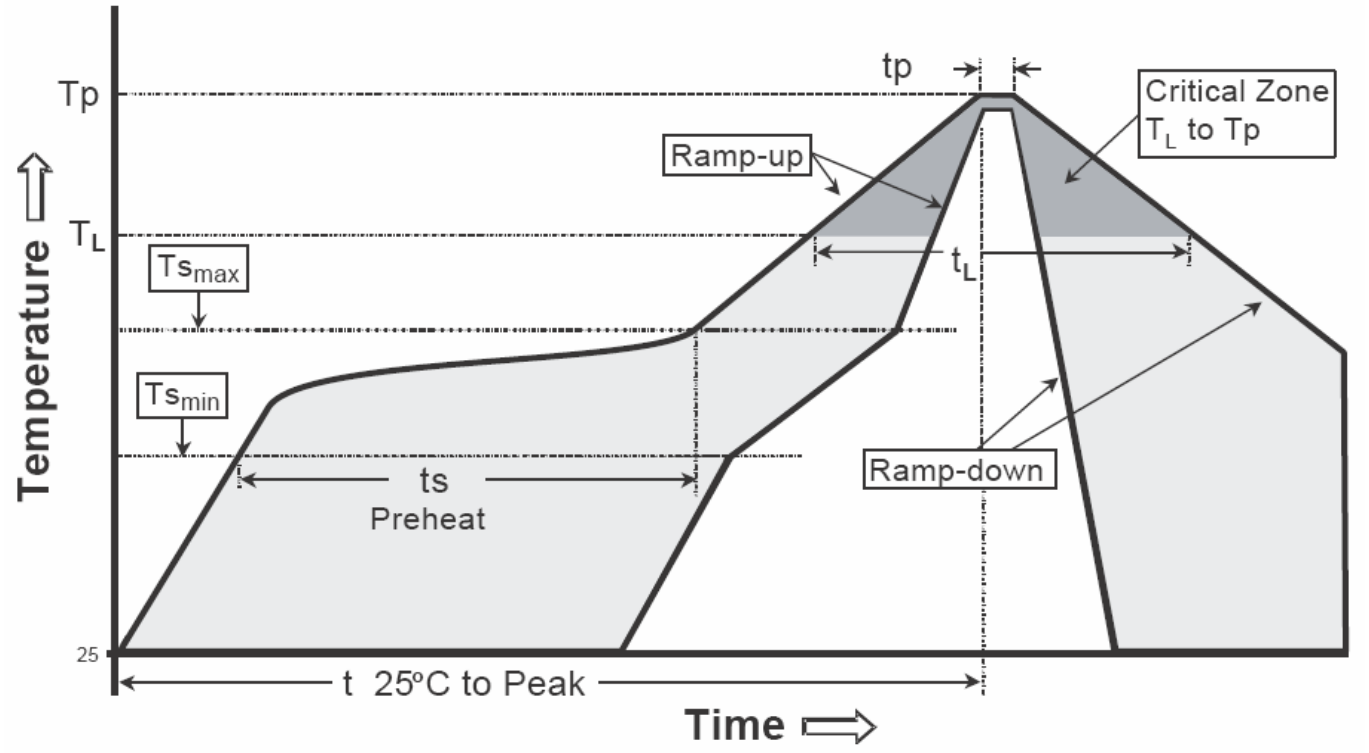
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

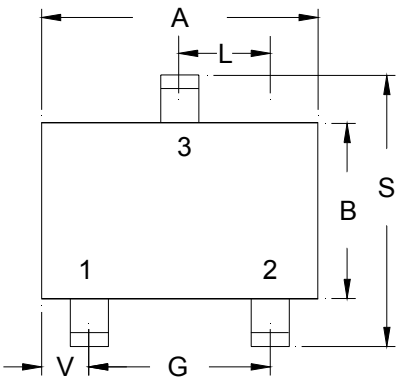
Recommended temperature profile for IR reflow



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.

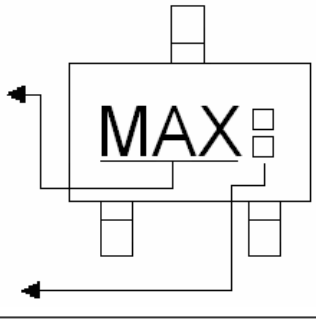
SOT-23 Dimension

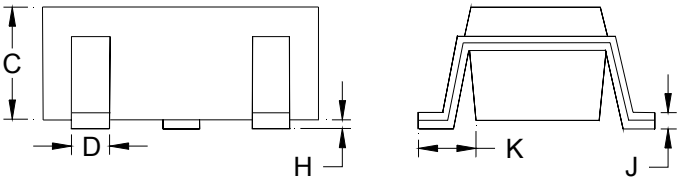


Product Code

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

*: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	0.0034	0.0070	0.085	0.177
B	0.0472	0.0630	1.20	1.60	K	0.0128	0.0266	0.32	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	0.1083	2.10	2.75
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	0.0040	0.013	0.10					

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.