

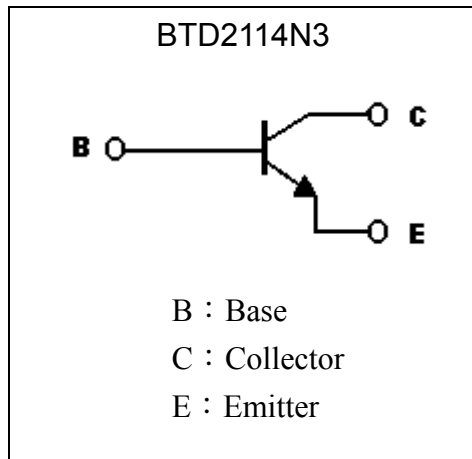
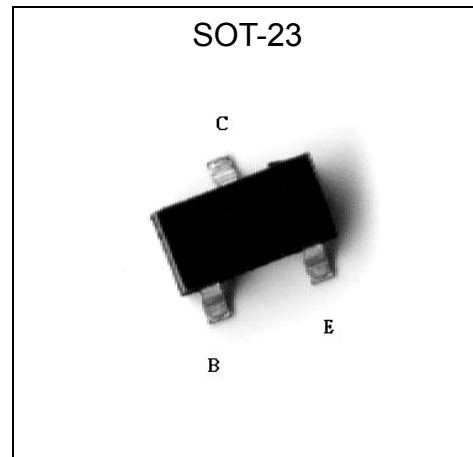
High Current Gain Medium Power NPN Epitaxial Planar Transistor
AUDIO MUTING APPLICATION

BTD2114N3

V_{CE0}	20V
I_C	500mA
$R_{CE(SAT)}$	0.32 Ω (typ)

Features

- High Emitter-Base voltage, $V_{EBO}=12V(\text{min})$.
- High DC current gain, $h_{FE}=1200(\text{min.}) @ V_{CE}=3V, I_C=10mA$.
- Low V_{CESAT} , $V_{CESAT}=0.16V \text{ typ. } @ I_C=500mA, I_B=20mA$.
- Pb-free and halogen-free package.

Symbol

Outline

Absolute Maximum Ratings ($T_a=25^\circ\text{C}$)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CB0}	30	V
Collector-Emitter Voltage	V_{CE0}	20	V
Emitter-Base Voltage	V_{EBO}	12	V
Collector Current (DC)	I_C	500	mA
Collector Current (Pulse)	I_{CP}	1	A
Base Current	I_B	50	mA
Power Dissipation	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	$T_j ; T_{stg}$	-55~+150	$^\circ\text{C}$

**Characteristics (Ta=25°C)**

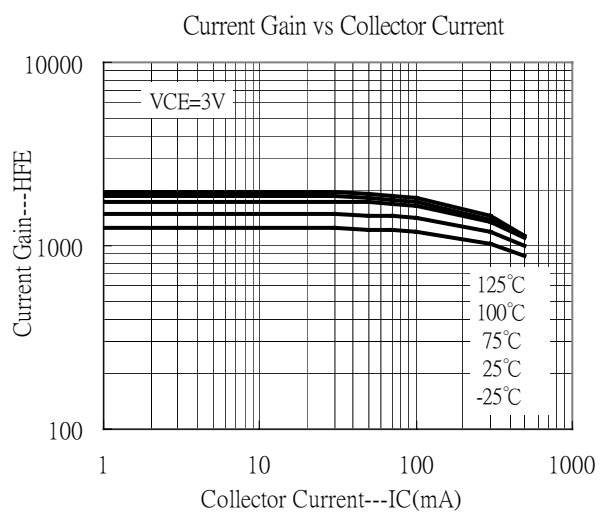
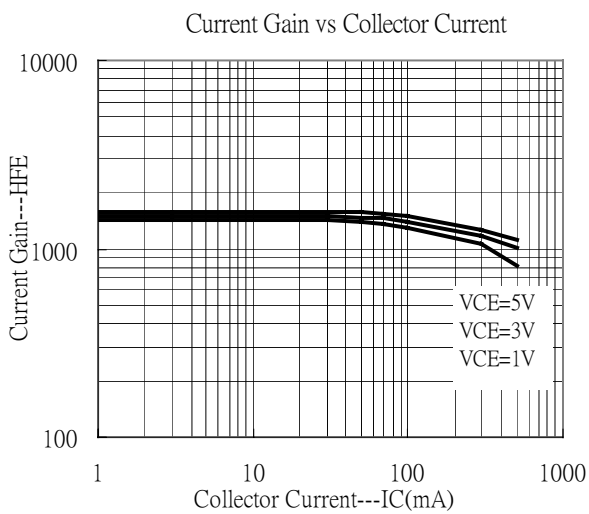
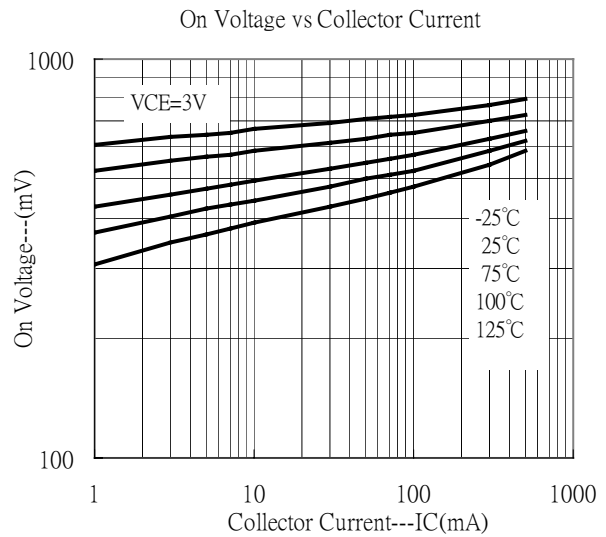
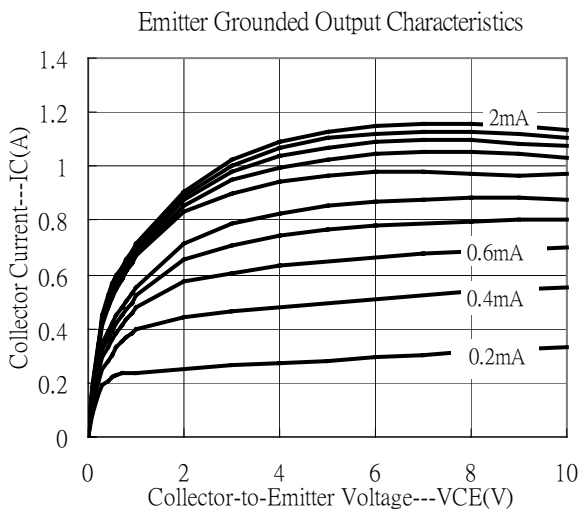
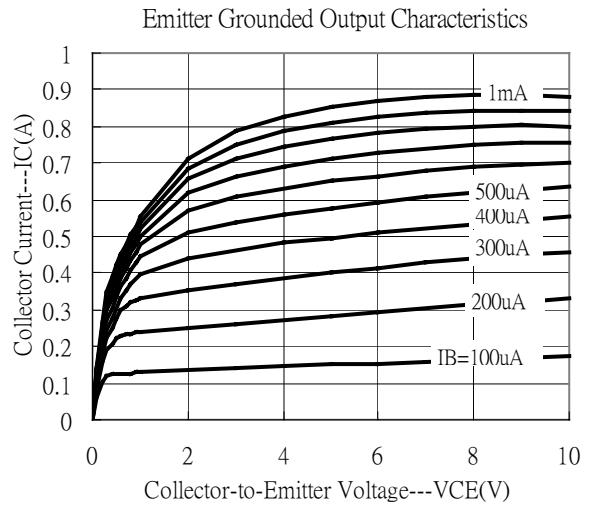
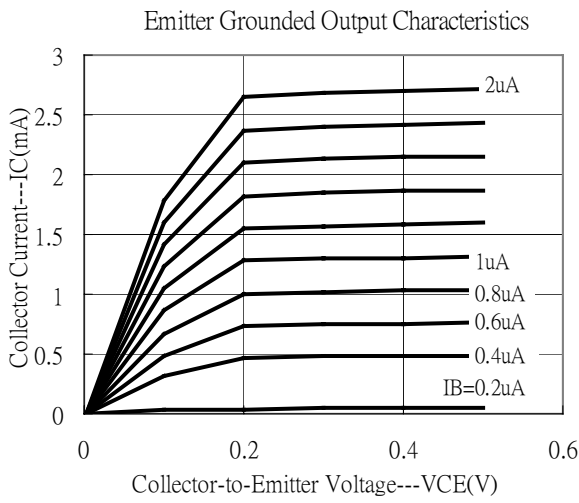
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CB0}	30	-	-	V	$I_C=100\mu A, I_E=0$
BV_{CE0}	20	-	-	V	$I_C=1mA, I_B=0$
BV_{EB0}	12	-	-	V	$I_E=10\mu A, I_C=0$
I_{C0}	-	-	100	nA	$V_{CB}=30V, I_E=0$
I_{E0}	-	-	100	nA	$V_{EB}=12V, I_C=0$
* $V_{CE(sat)}$	-	35	100	mV	$I_C=100mA, I_B=10mA$
* $V_{CE(sat)}$	-	0.16	0.3	V	$I_C=500mA, I_B=20mA$
* $R_{CE(sat)}$	-	0.32	0.6	Ω	$I_C=500mA, I_B=20mA$
* $V_{BE(sat)}$	-	0.79	1	V	$I_C=100mA, I_B=10mA$
* h_{FE1}	1200	-	2700	-	$V_{CE}=3V, I_C=10mA$
* h_{FE2}	900	-	-	-	$V_{CE}=3V, I_C=100mA$
f_T	-	300	-	MHz	$V_{CE}=10V, I_C=50mA, f=100MHz$
Cob	-	9	-	pF	$V_{CB}=10V, f=1MHz$
Ron	-	0.8	-	Ω	$I_B=1mA, V_i=100mV(rms), f=1KHz$

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$ **Ordering Information**

Device	Package	Shipping	Marking
BTD2114N3	SOT-23 (Pb-free and halogen-free package)	3000 pcs / Tape & Reel	BBW

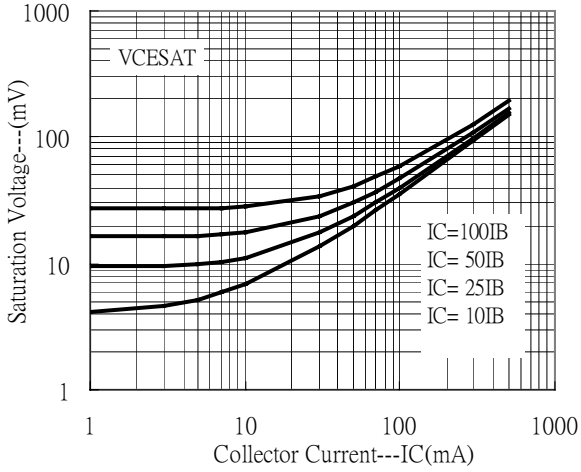


Typical Characteristics

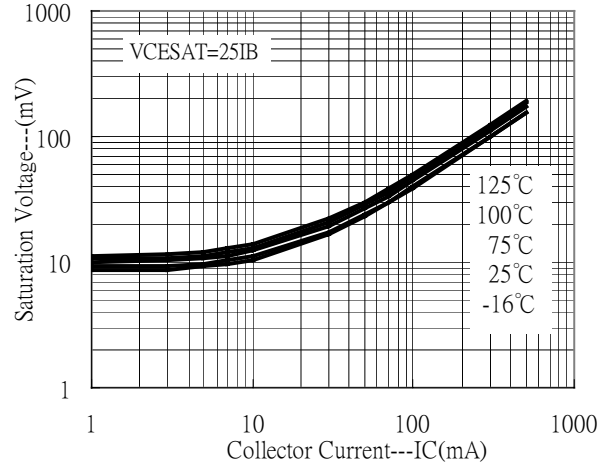


Typical Characteristics(Cont.)

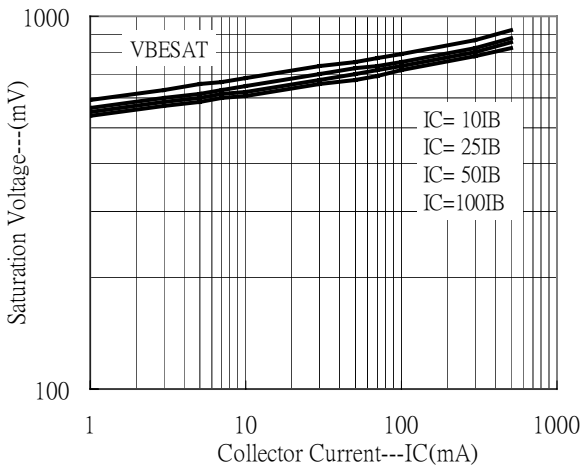
Saturation Voltage vs Collector Current



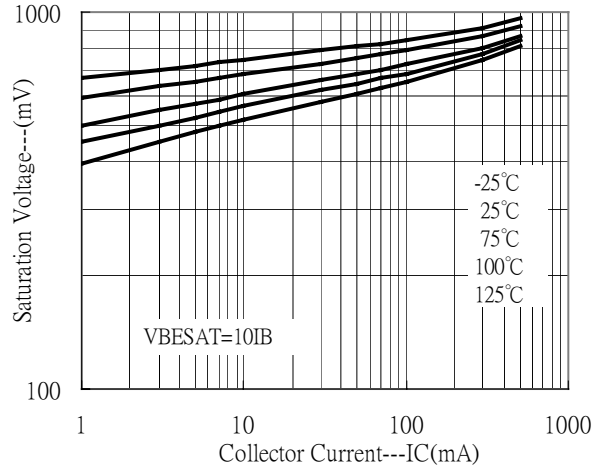
Saturation Voltage vs Collector Current



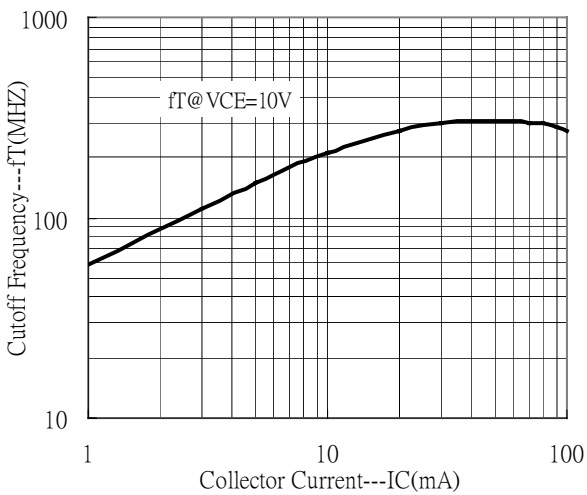
Saturation Voltage vs Collector Current



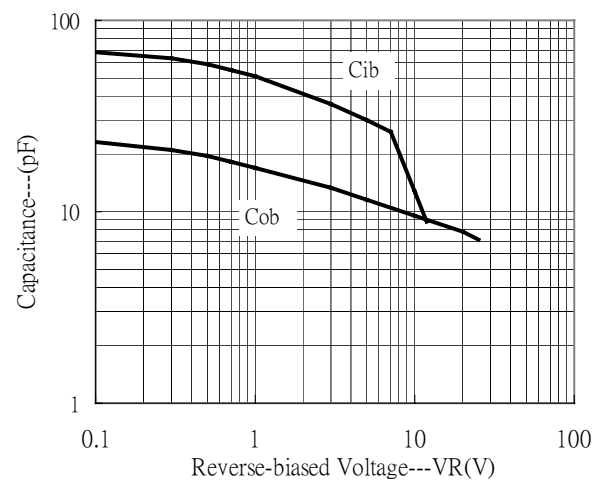
Saturation Voltage vs Collector Current



Cutoff Frequency vs Collector Current

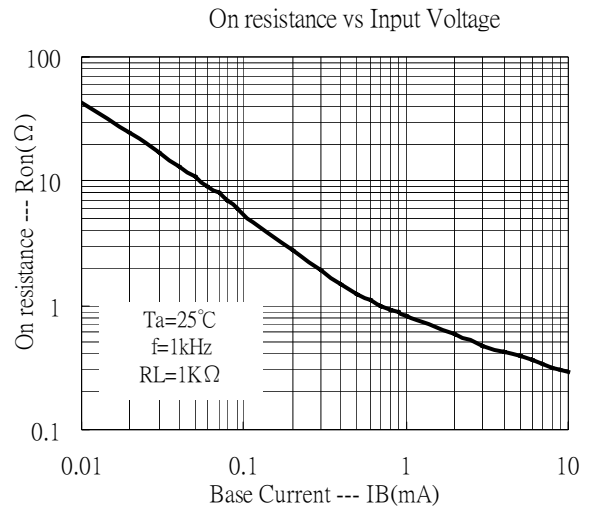
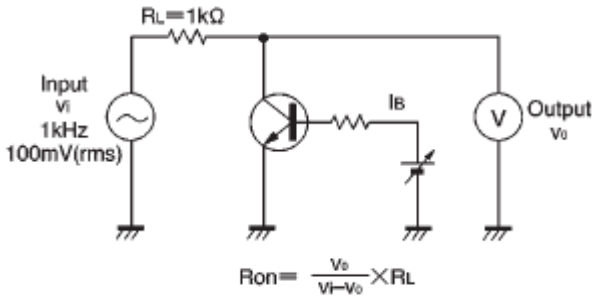


Capacitance vs Reverse-biased Voltage

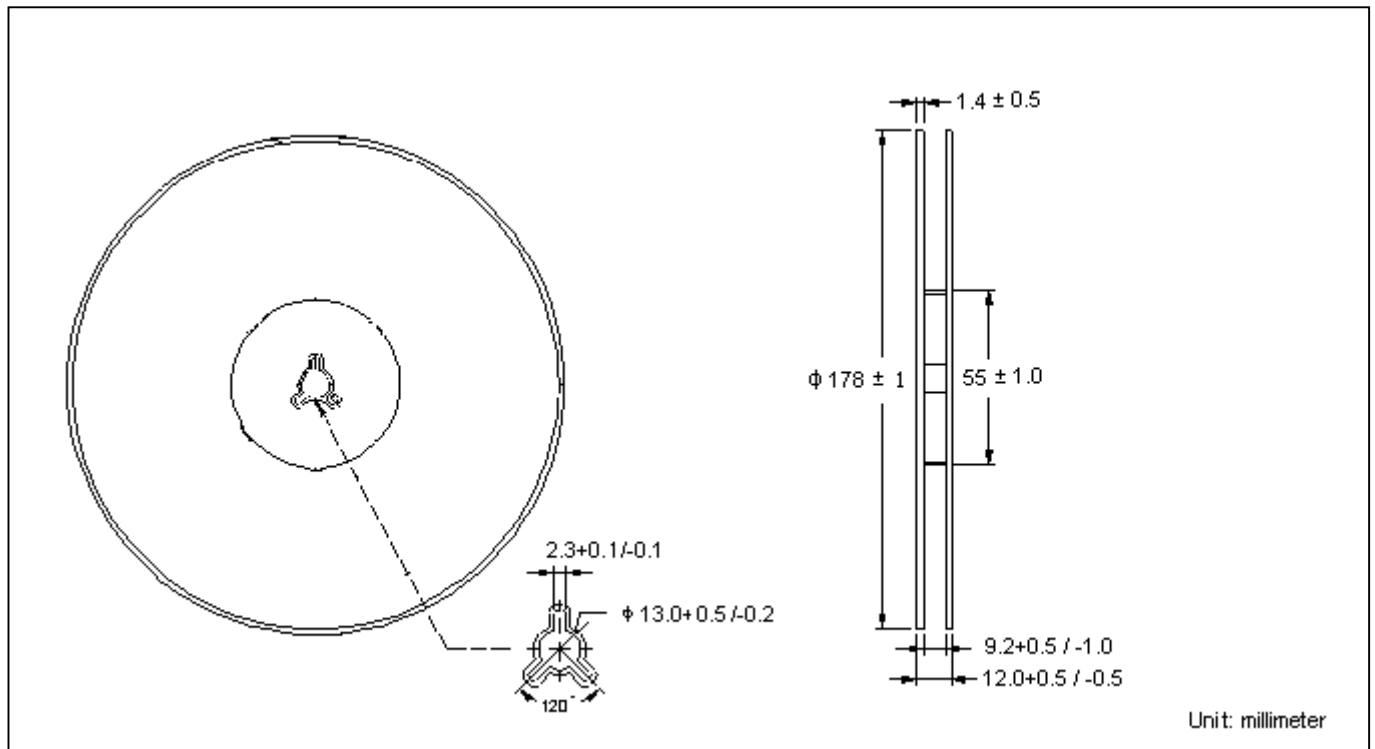


Typical Characteristics(Cont.)

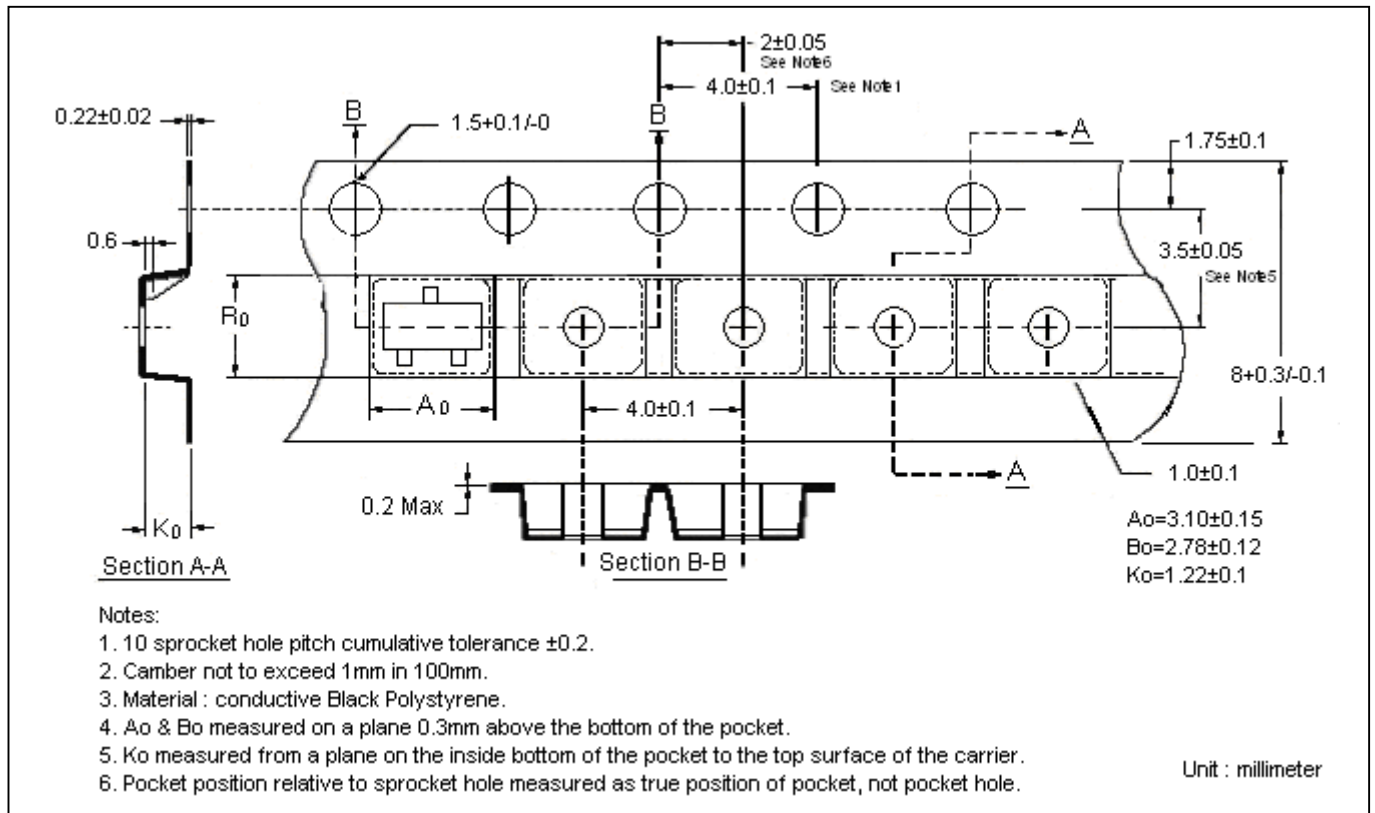
•Ron measurement circuit



Reel Dimension



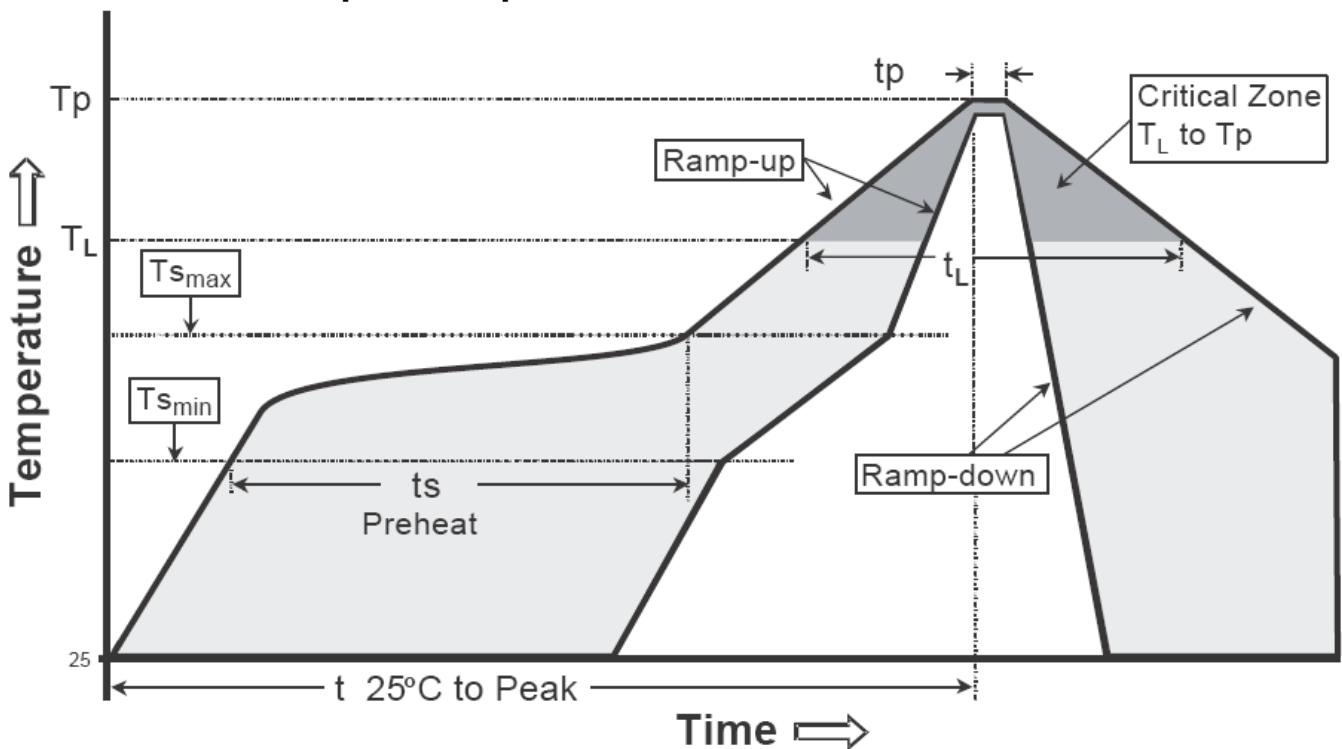
Carrier Tape Dimension



Recommended wave soldering condition

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

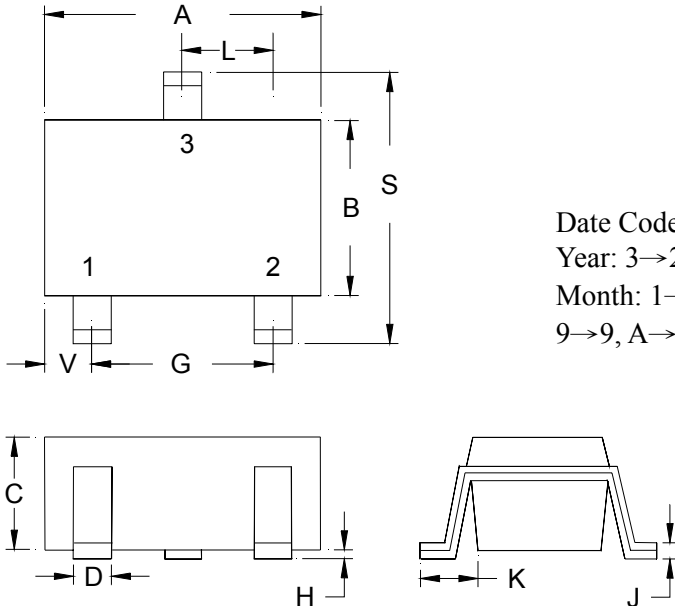
Recommended temperature profile for IR reflow



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.

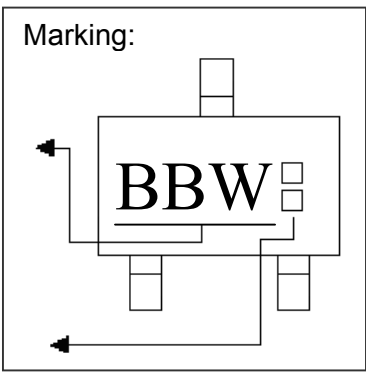
Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-23 Dimension



The diagram shows 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, and H; and a perspective view with dimensions K and J. The top view labels 1, 2, and 3 correspond to the pins Base, Emitter, and Collector respectively.

Marking:



The marking diagram shows the top of the package with the letters "BBW" and arrows pointing to the pins. The arrows indicate that Pin 1 is on the left, Pin 2 is on the right, and Pin 3 is on the top.

Product Code

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

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.

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