Low $V_{CE(sat)}$ PNP Epitaxial Planar Transistor

BTB5240N3

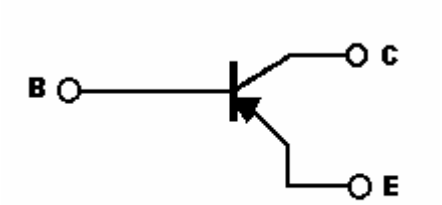
BV_{CEO}	-40V
I_C	-2A
$R_{CESAT(typ.)}$	0.106Ω

Features

- Excellent DC current gain characteristics
- Low Saturation Voltage
  $V_{CE(sat)}$=-0.18V(typ)(I_C=-2A, I_B=-200mA).
- Pb-free lead plating and halogen-free package

Symbol

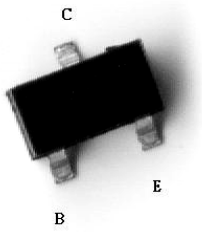
BTB5240N3



B：Base
C：Collector
E：Emitter

Outline

SOT-23



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}	-7	V
Collector Current(DC)	I_C	-2	A
Collector Current(Pulsed)(Note 1)	I_{CP}	-3	
Power Dissipation	P_D	300 (Note 2)	mW
		480 (Note 3)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
		260	
Operating Junction Temperature Range	Tj	-65~+150	°C
Storage Temperature Range	Tstg	-65~+150	°C

Note 1: Single pulse, Pw≤10ms, Duty Cycle≤30%.
2. Device mounted on a FR-4 board of 2 oz, single sided copper, with area of minimum pad size.
3. Device mounted on a FR-4 board of 2 oz, single sided copper, with area of 1 cm².

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-40	-	-	V	I_C=-50μA
BV_{CEO}	-40	-	-	V	I_C=-1mA
BV_{EBO}	-7	-	-	V	I_E=-50μA
I_{CBO}	-	-	-100	nA	V_{CB}=-40V
I_{EBO}	-	-	-100	nA	V_{EB}=-5V
*$V_{CE(sat)}$ 1	-	-53	-80	mV	I_C=-100mA, I_B=-1mA
*$V_{CE(sat)}$ 2	-	-53	-80	mV	I_C=-500mA, I_B=-50mA
*$V_{CE(sat)}$ 3	-	-105	-160	mV	I_C=-750mA, I_B=-15mA
*$V_{CE(sat)}$ 4	-	-106	-160	mV	I_C=-1A, I_B=-50mA
*$V_{CE(sat)}$ 5	-	-180	-230	mV	I_C=-2A, I_B=-200mA
*R_{CESAT}	-	106	160	mΩ	I_C=-500mA, I_B=-50mA
*$V_{BE(sat)}$	-	-0.96	-1.1	V	I_C=-2A, I_B=-200mA
*$V_{BE(on)}$	-	-0.65	-0.75	V	V_{CE}=-2V, I_C=-100mA
*h_{FE} 1	300	-	600	-	V_{CE}=-2V, I_C=-100mA
*h_{FE} 2	260	-	-	-	V_{CE}=-2V, I_C=-500mA
*h_{FE} 3	210	-	-	-	V_{CE}=-2V, I_C=-1A
*h_{FE} 4	100	-	-	-	V_{CE}=-2V, I_C=-2A
f_T	100	190	-	MHz	V_{CE}=-10V, I_C=-100mA, f=100MHz
Cob	-	26	-	pF	V_{CB}=-10V, I_E=0A, f=1MHz

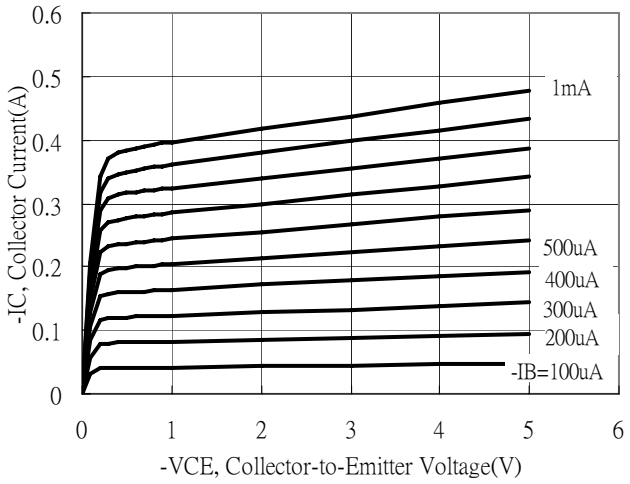
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Ordering Information

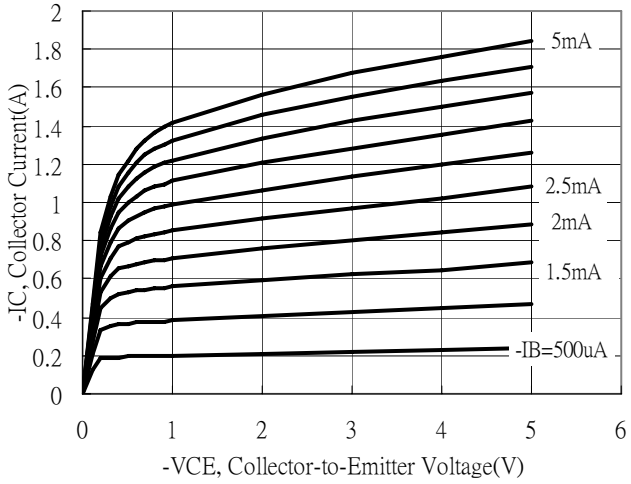
Device	Package	Shipping
BTB5240N3-0-T1-G	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Typical Characteristics

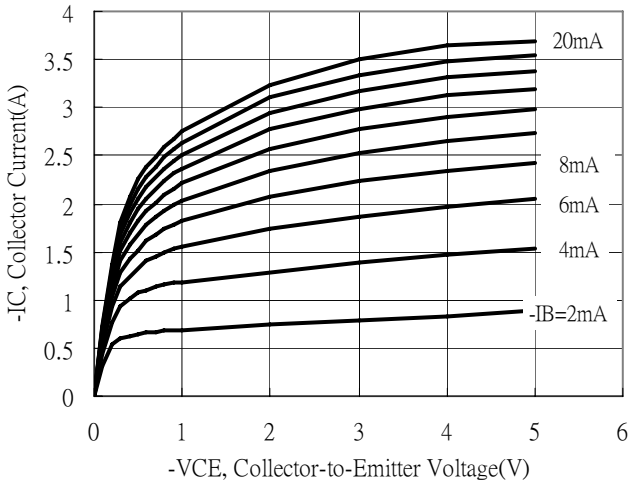
Emitter Grounded Output Characteristics



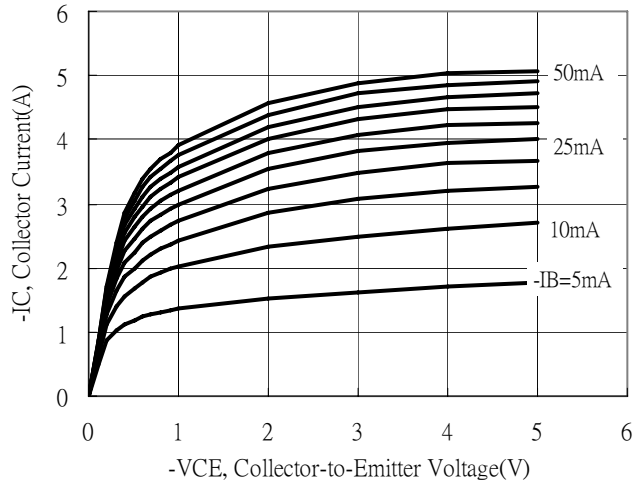
Emitter Grounded Output Characteristics



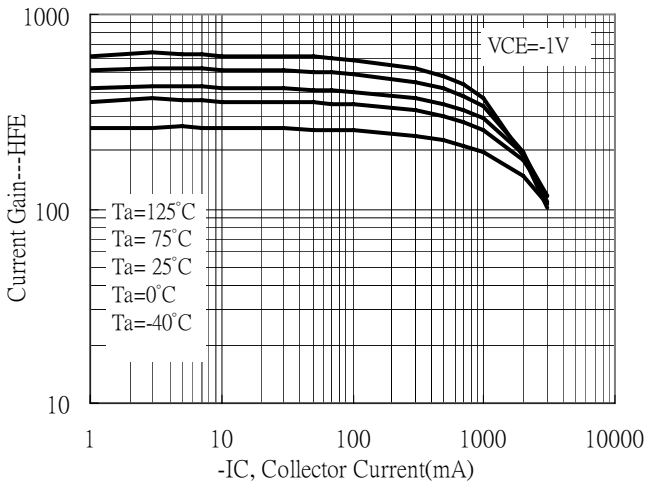
Emitter Grounded Output Characteristics



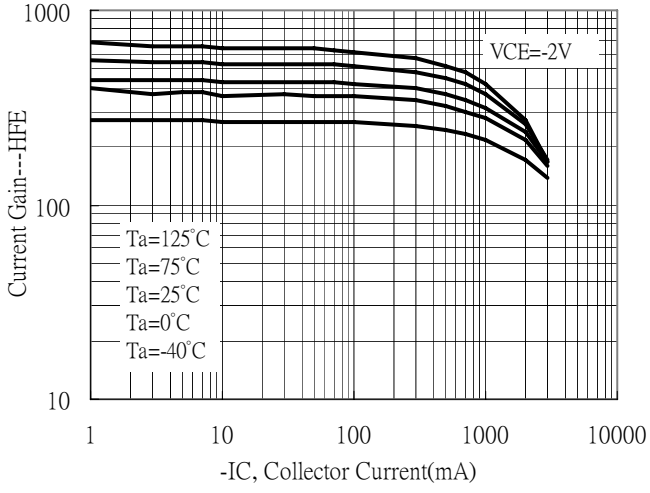
Emitter Grounded Output Characteristics



Current Gain vs Collector Current

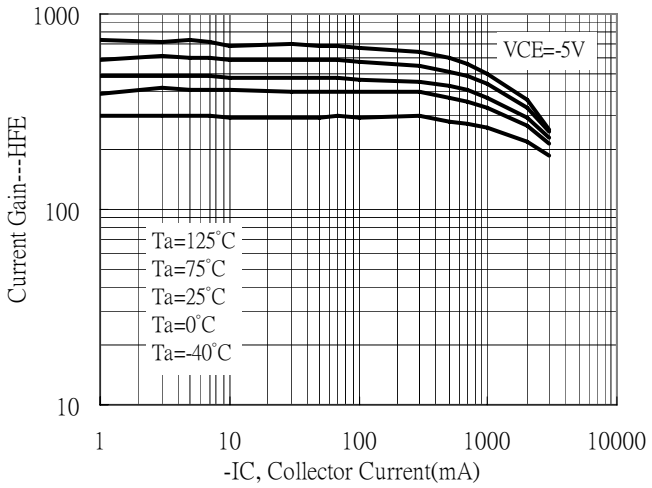


Current Gain vs Collector Current

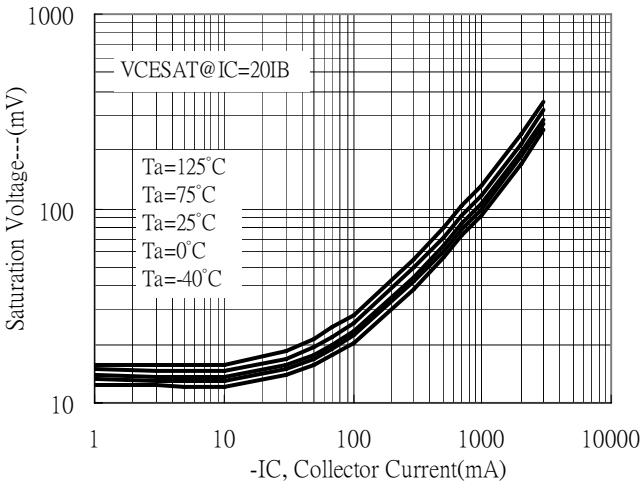


Typical Characteristics(Cont.)

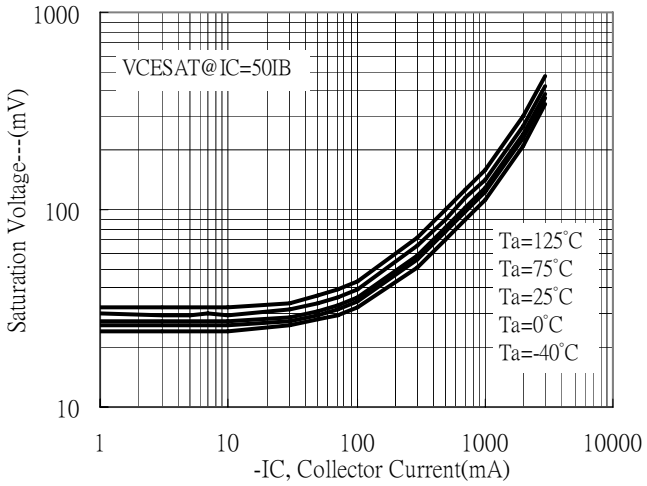
Current Gain vs Collector Current



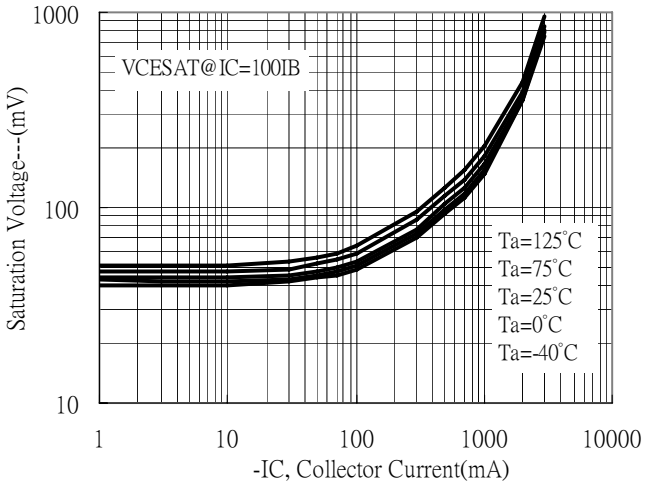
Saturation Voltage vs Collector Current



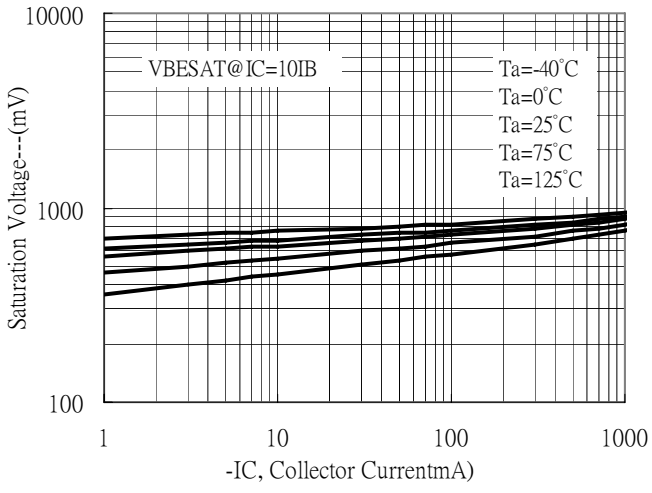
Saturation Voltage vs Collector Current



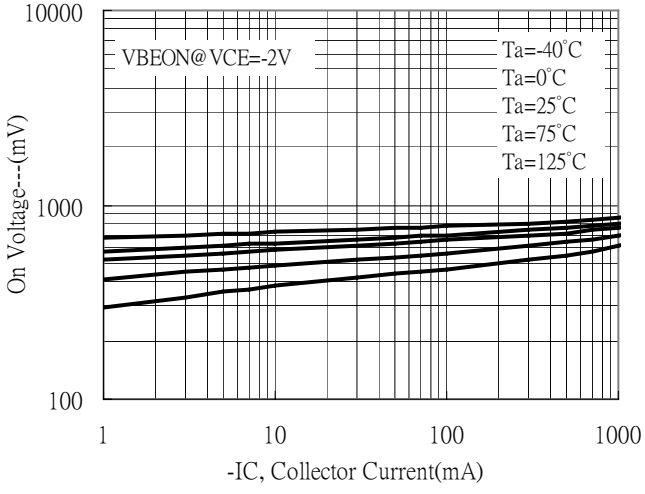
Saturation Voltage vs Collector Current



Saturation Voltage vs Collector Current

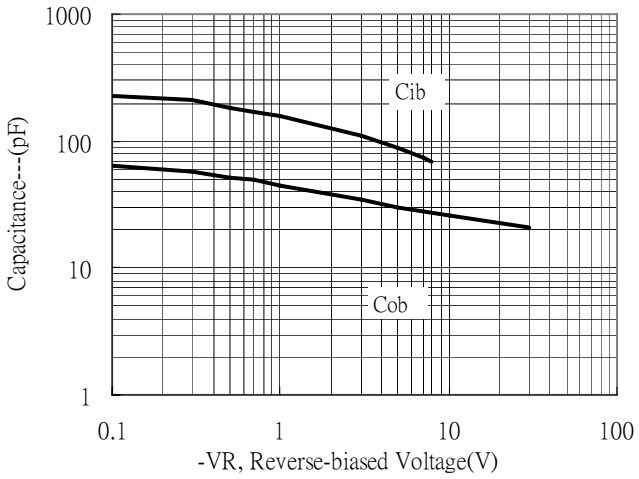


On Voltage vs Collector Current

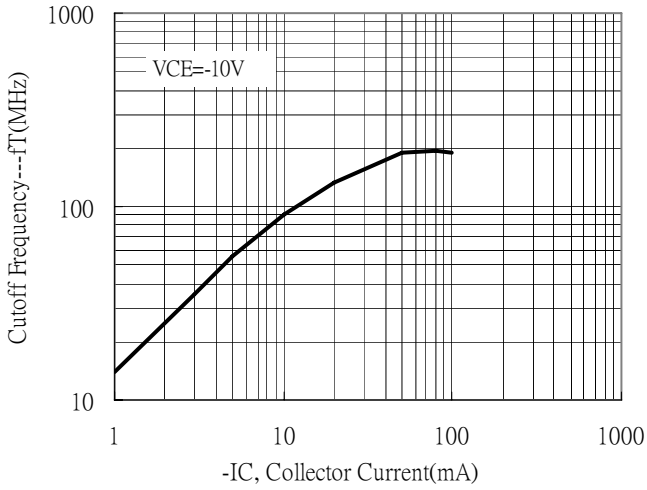


Typical Characteristics(Cont.)

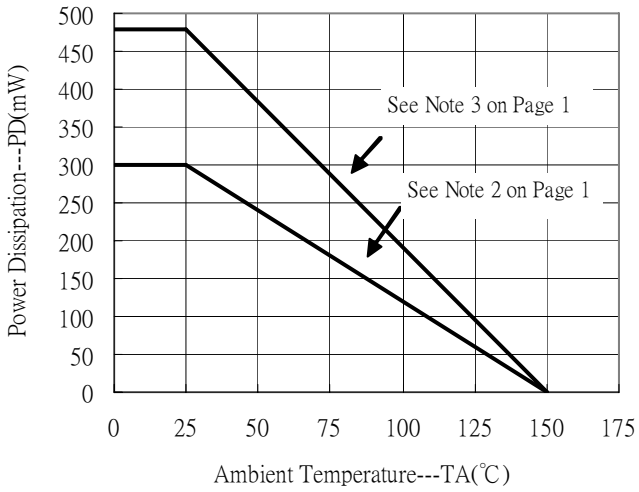
Capacitance vs Reverse-biased Voltage



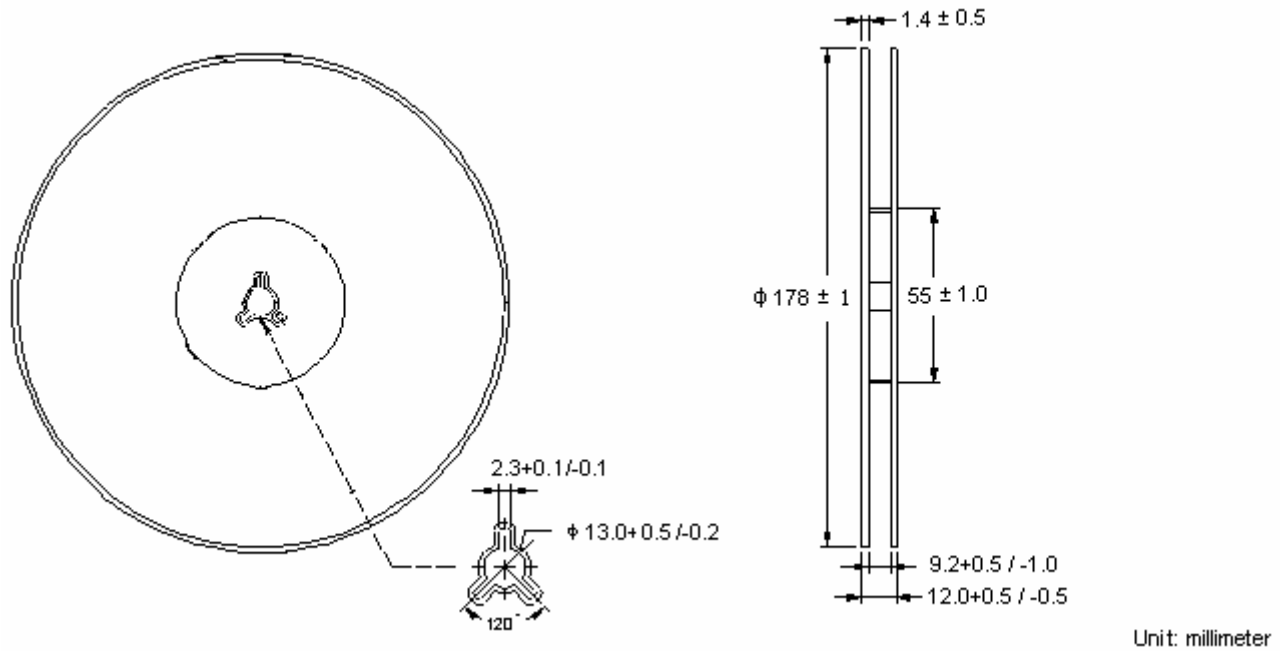
Cutoff Frequency vs Collector Current



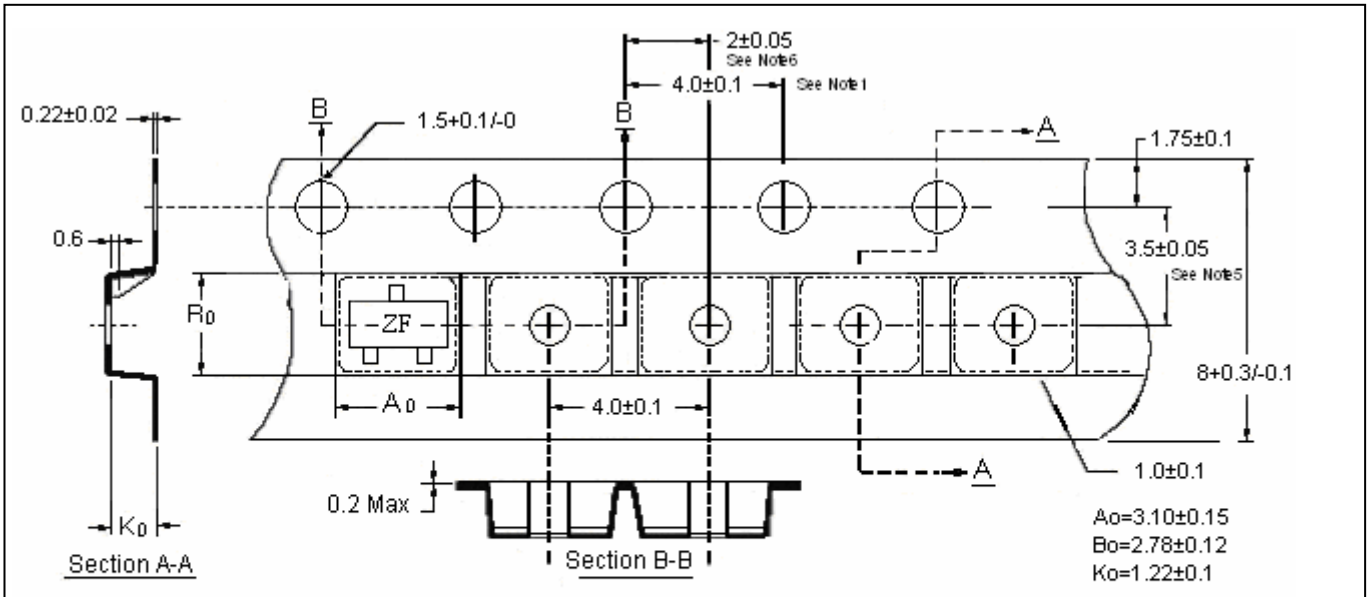
Power Derating Curve



Reel Dimension



Carrier Tape Dimension



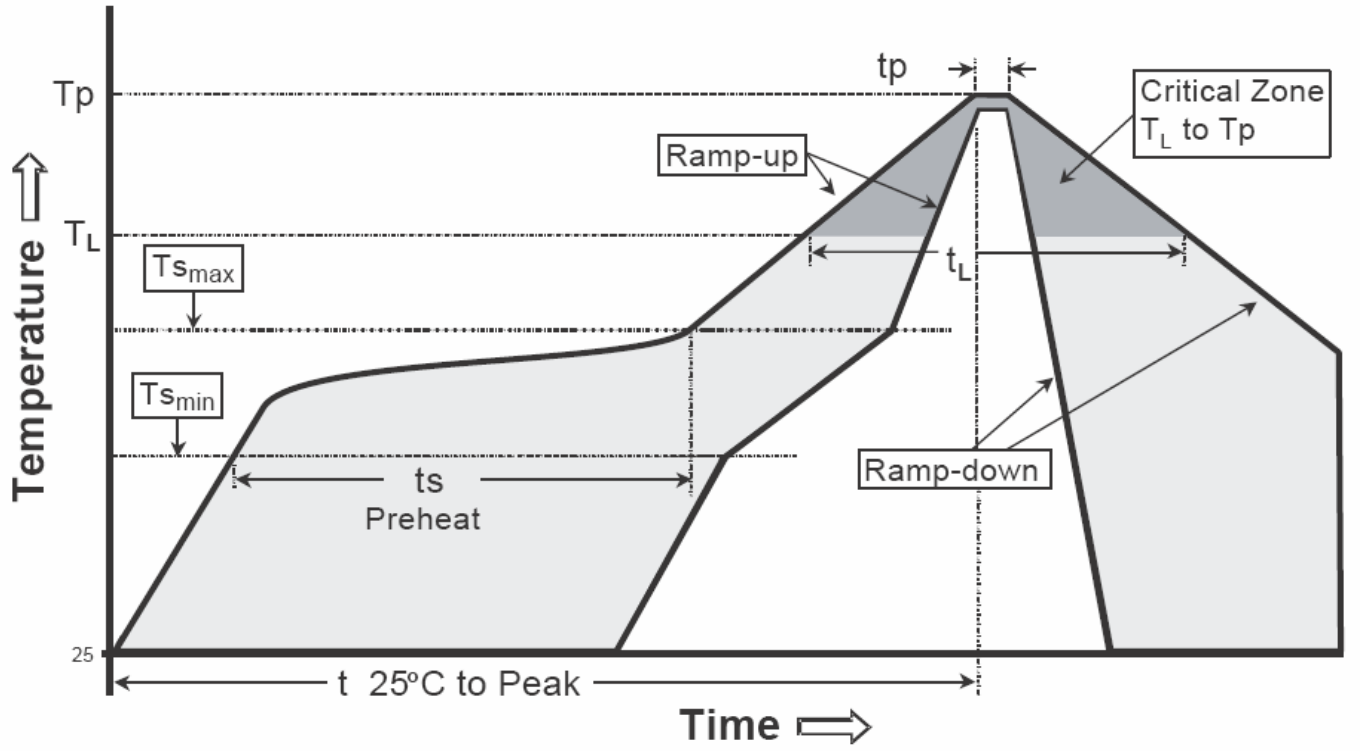
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

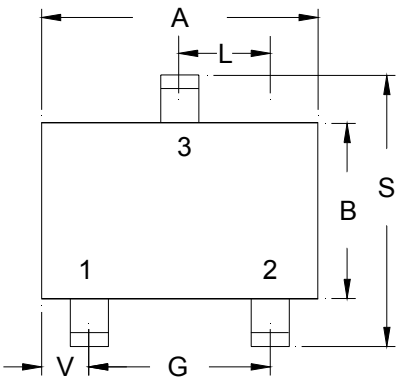
Recommended temperature profile for IR reflow

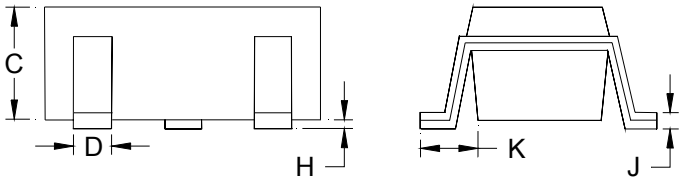


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(TP)	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

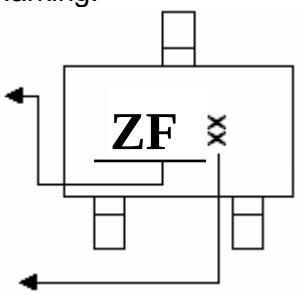




Product Code

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	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0005	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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