Low Vcesat NPN Epitaxial Planar Transistor

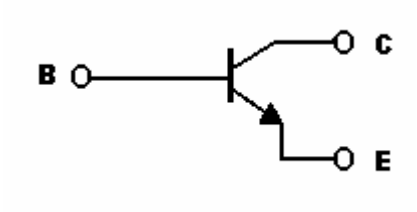
BTD965N3

Features

- Low V_{CE}(sat), V_{CE}(sat)=0.35 V (typical), at I_C / I_B = 3A / 0.1A
- Excellent DC current gain characteristics
- Complementary to BTB1386N3

Symbol

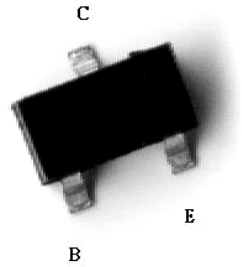
BTD965N3



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}	20	V
Emitter-Base Voltage	V_{EBO}	7	V
Collector Current (DC)	I_C	5	A
Collector Current (Pulse)	I_{CP}	8 (Note)	A
Power Dissipation	Pd	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Note : Single Pulse Pw≦350μs, Duty≦2%.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CEO}	20	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	7	-	-	V	I_E=10μA, I_C=0
I_{CBO}	-	-	0.1	μA	V_{CB}=10V, I_E=0
I_{CEO}	-	-	1	μA	V_{CB}=10V, I_E=0
I_{EBO}	-	-	0.1	μA	V_{EB}=7V,I_C=0
*$V_{CE(sat)}$	-	0.35	1.0	V	I_C=3A, I_B=0.1A
*$h_{FE}1$	230	-	800	-	V_{CE}=2V, I_C=500mA
*$h_{FE}2$	150	-	-	-	V_{CE}=2V, I_C=2.00A
f_T	-	150	-	MHz	V_{CE}=6V, I_E=50mA, f=200MHz
Cob	-	-	50	pF	V_{CB}=20V, I_E=0A, f=1MHz

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

Classification Of $h_{FE}1$

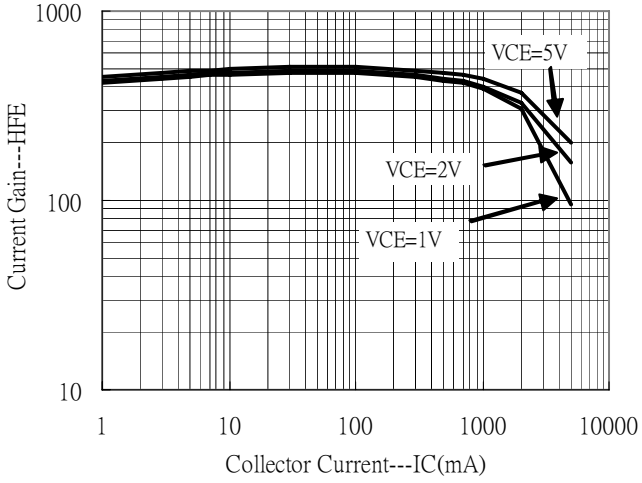
Rank	Q	R	S
Range	230~380	340~600	400~800

Ordering Information

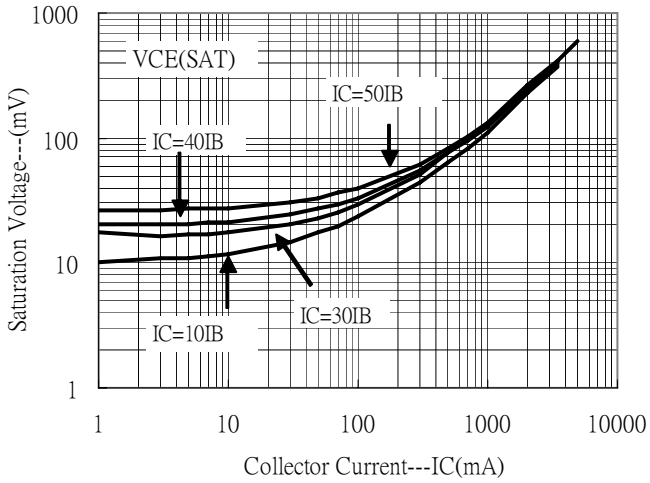
Device	HFE Rank	Package	Shipping
BTD965N3-Q-T1-G	Q	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel
BTD965N3-R-T1-G	R	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel
BTD965N3-S-T1-G	S	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Characteristic Curves

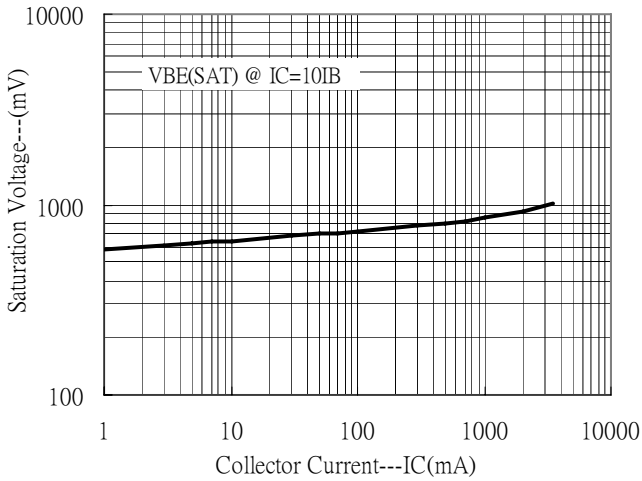
Current Gain vs Collector Current



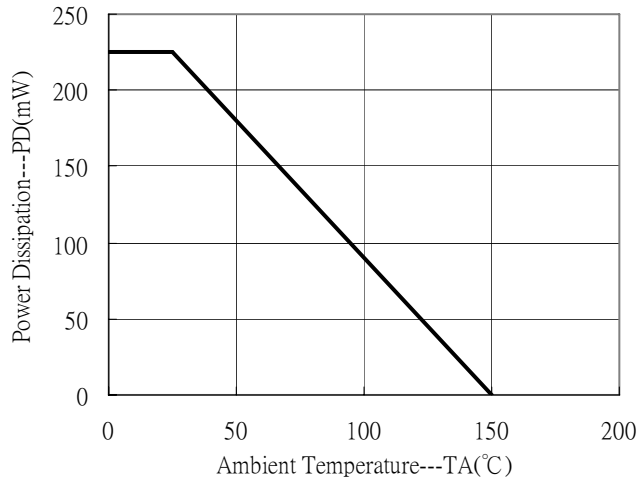
Saturation Voltage vs Collector Current



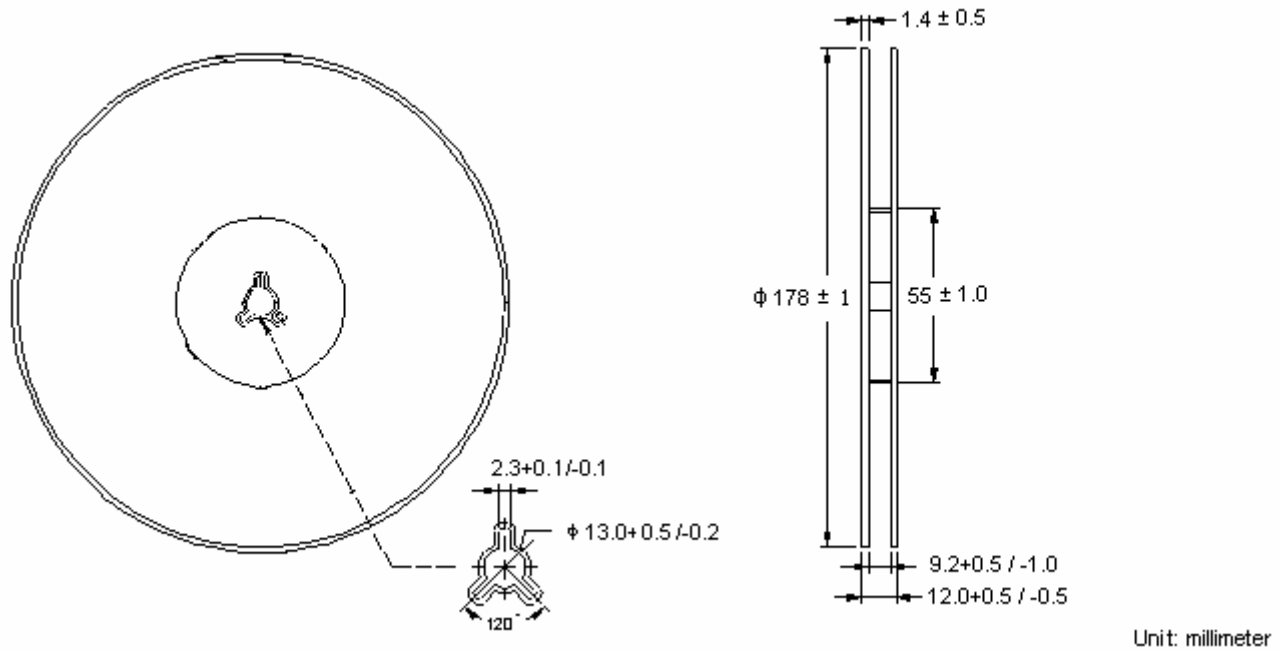
Saturation Voltage vs Collector Current



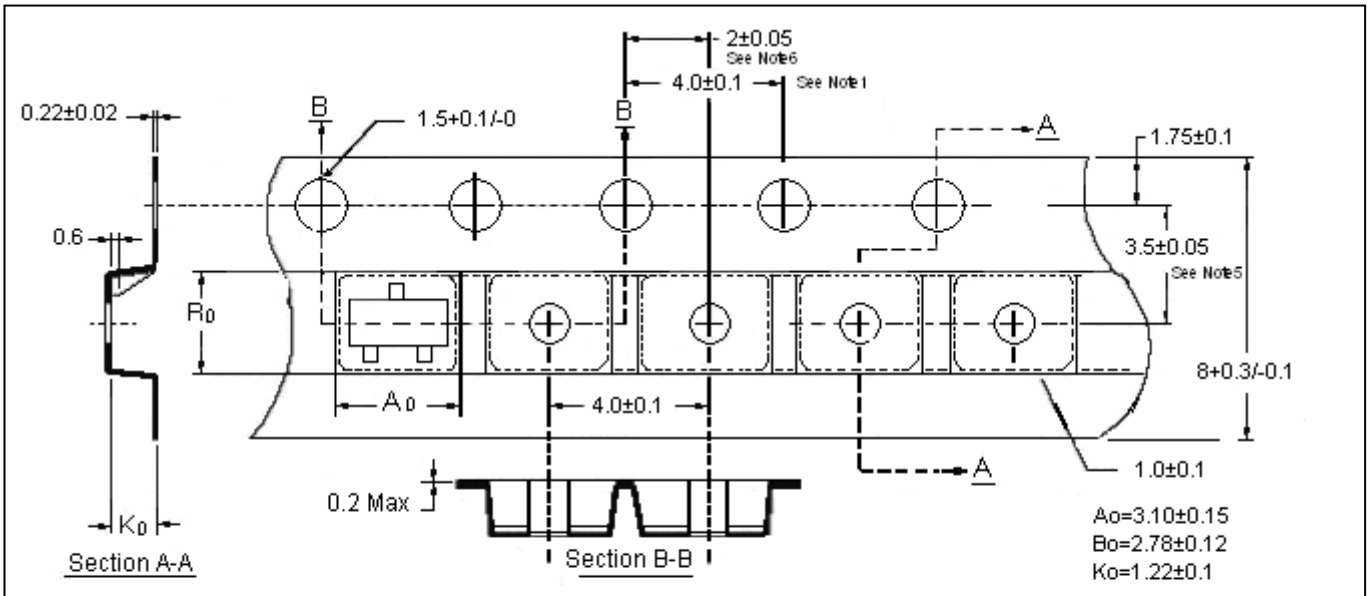
Power Derating Curve



Reel Dimension



Carrier Tape Dimension



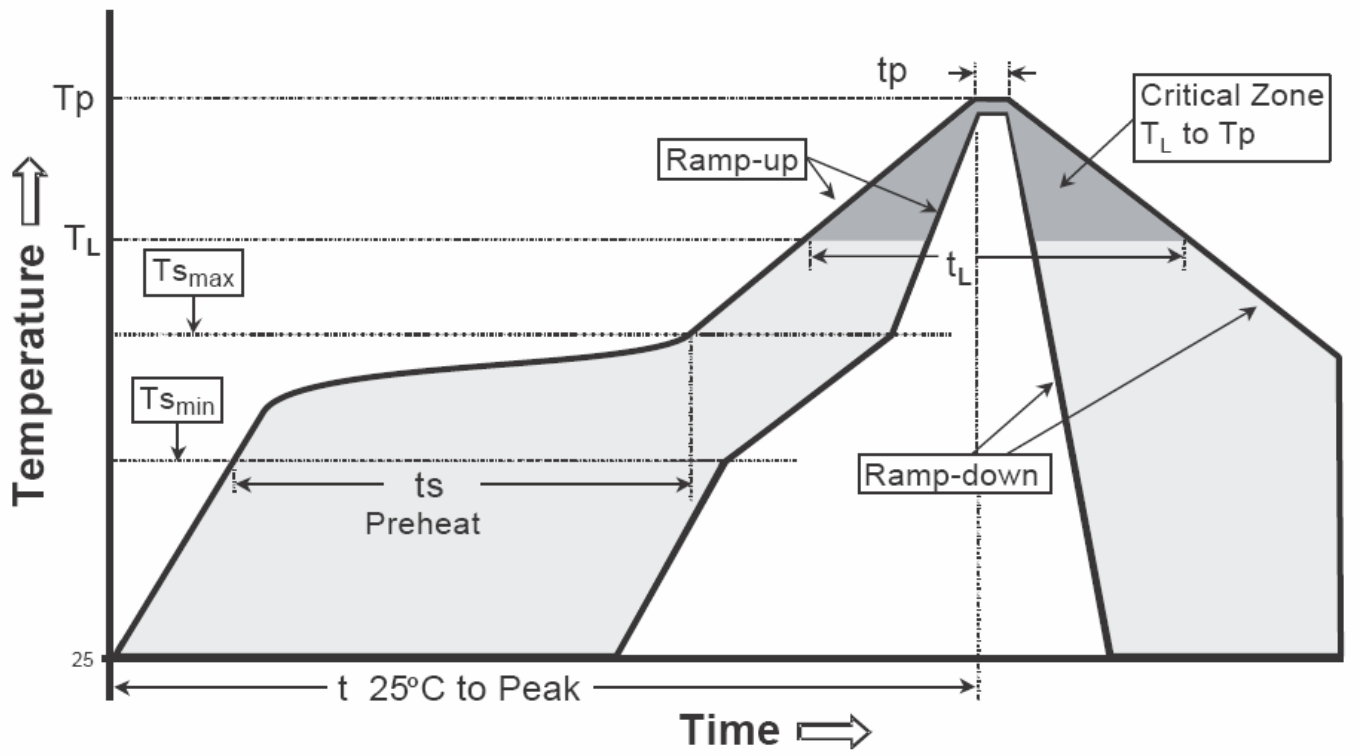
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

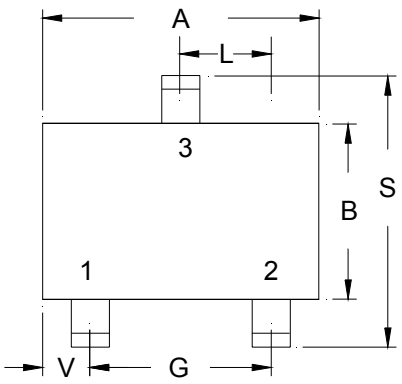
Recommended temperature profile for IR reflow

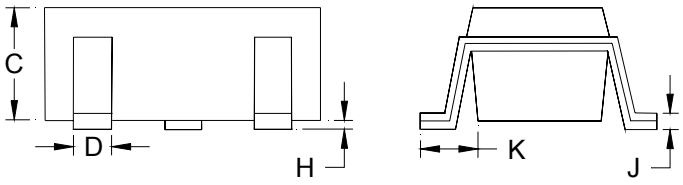


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL)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

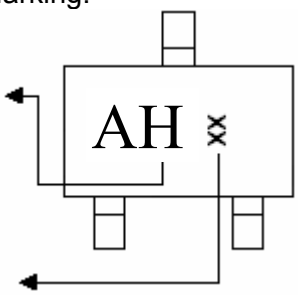




Product Code

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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