Low Vcesat NPN Epitaxial Planar Transistor

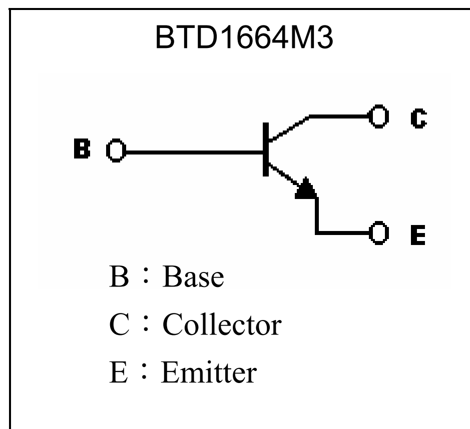
BTD1664M3

BV_{CEO}	25V
I_C	1.5A
R_{CESAT}	0.31Ω (typ.)

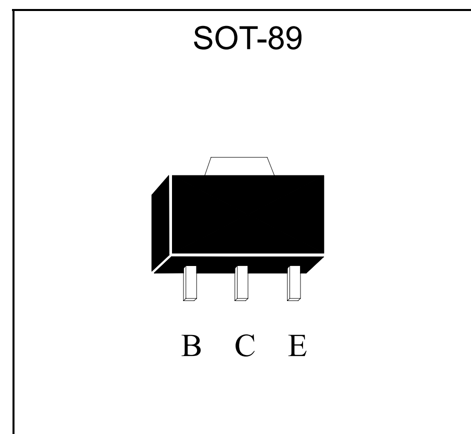
Features

- The BTD1664M3 is designed for general purpose low frequency power amplifier applications.
- Low $V_{CE}(sat)$, $V_{CE}(sat)$=0.15V (typical), at I_C / I_B = 400mA / 20mA
- Complementary to BTB1132M3
- Pb-free lead plating and halogen-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	45	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current (DC)	I_C	1.5	A
Collector Current (Pulse)	I_{CP}	3 (Note 1)	A
Power Dissipation	P_D	0.5	W
		2 (Note 2)	W
Junction Temperature and Storage Temperature Range	Tj ; Tstg	-55~+150	°C

Note : 1. Single pulse, Pw = 20ms, duty ≤ 2%.
2. When mounted on a 40 ×40 ×0.7 mm ceramic board.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	45	-	-	V	I_C=10μA, IE=0
BV_{CEO}	25	-	-	V	I_C=1mA, IB=0
BV_{EBO}	5	-	-	V	I_E=10μA, IC=0
I_{CBO}	-	-	100	nA	V_{CB}=40V. IE=0
I_{EBO}	-	-	100	nA	V_{EB}=4V,IC=0
*$V_{CE(sat)}$1	-	0.15	0.3	V	I_C=400mA, I_B=20mA
*$V_{CE(sat)}$2	-	0.2	0.4	V	I_C=500mA, I_B=50mA
*$V_{CE(sat)}$3	-	0.25	0.5	V	I_C=800mA, I_B=80mA
*$R_{CE(sat)}$	-	0.31	0.62	Ω	I_C=800mA, I_B=80mA
*$V_{BE(on)}$	-	-	1	V	V_{CE}=2V, I_C=500mA
*h_{FE}1	100	-	-	-	V_{CE}=2V, I_C=100mA
*h_{FE}2	120	-	390	-	V_{CE}=2V, I_C=500mA
*h_{FE}3	80	-	-	-	V_{CE}=2V, I_C=800mA
f_T	-	150	-	MHz	V_{CE}=5V, I_E=50mA, f=100MHz
Cob	-	15	-	pF	V_{CB}=10V, f=1MHz

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

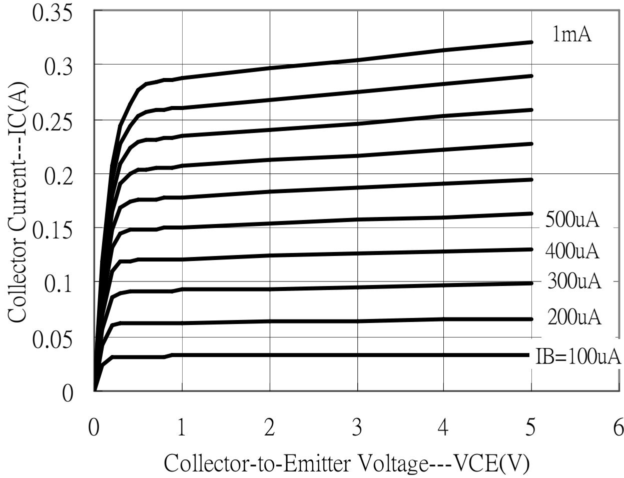
Classification Of h_{FE}2

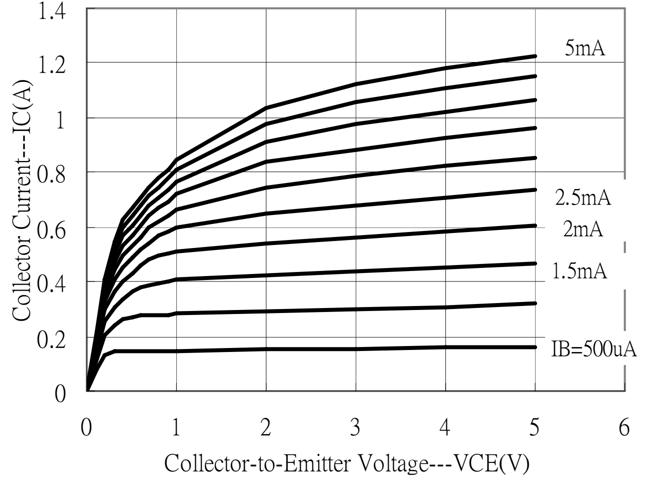
Rank	Q	R
Range	120~270	180~390

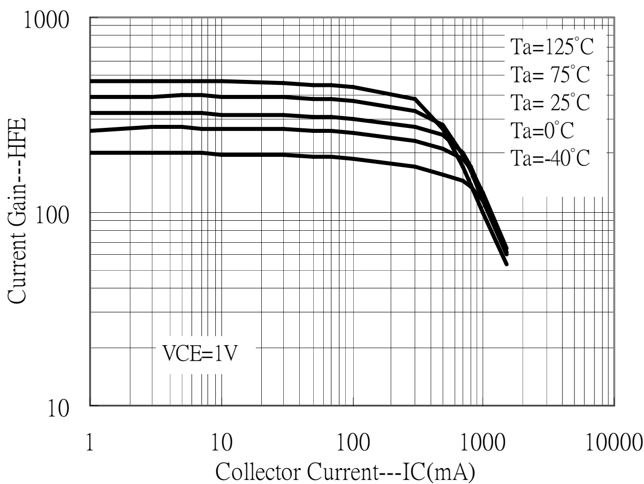
Ordering Information

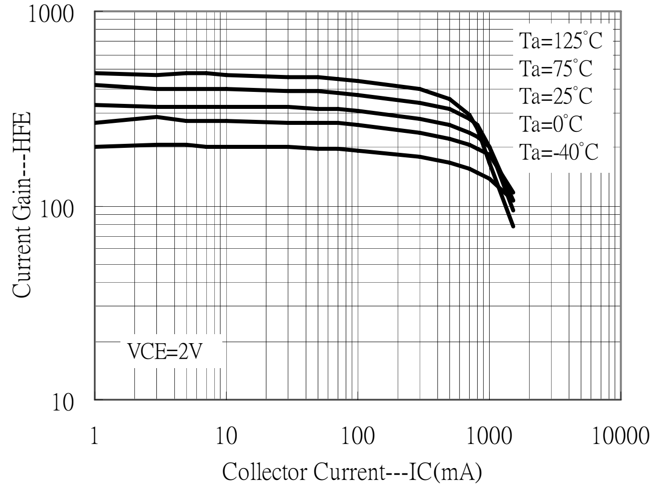
Device	HFE rank	Package	Shipping
BTD1664M3-Q-T2-G	Q	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel
BTD1664M3-R-T2-G	R	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel

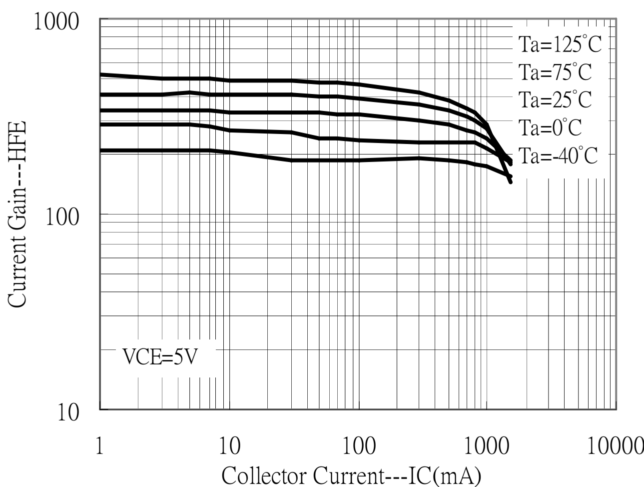
Typical Characteristics

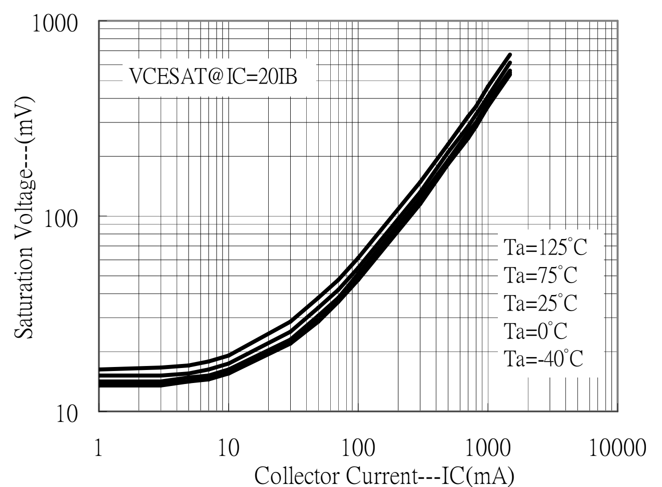




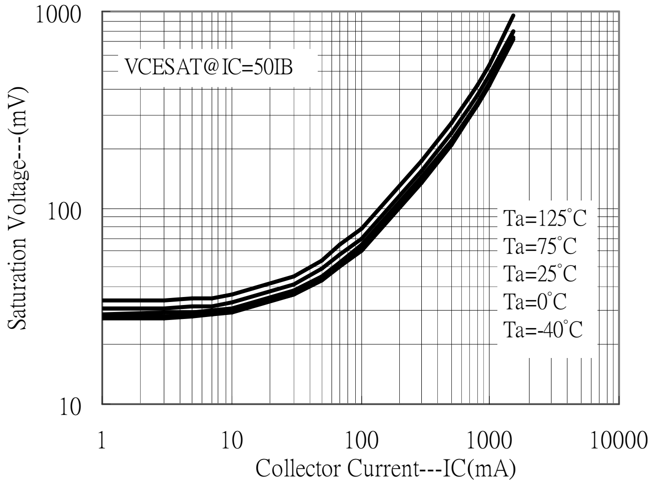


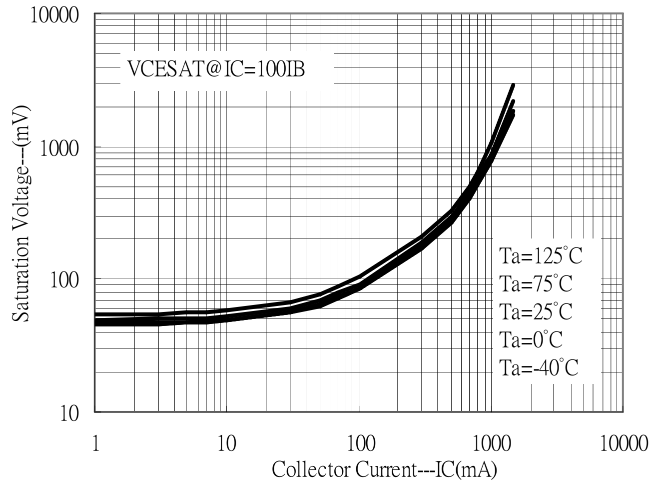


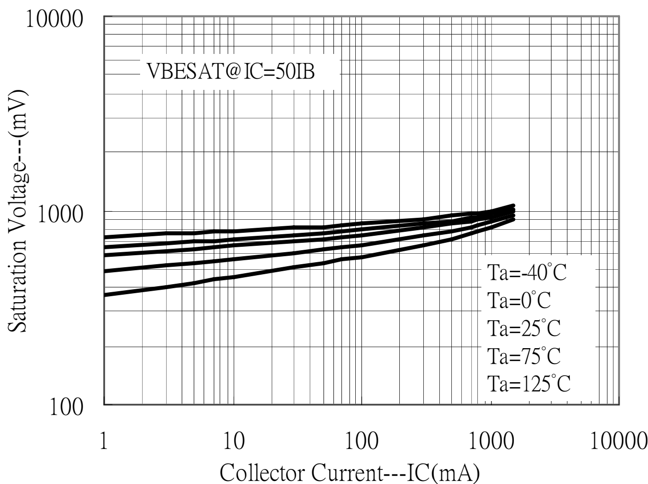


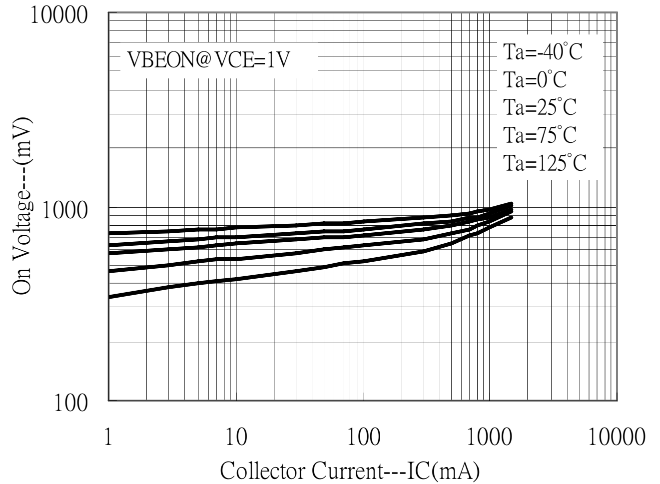


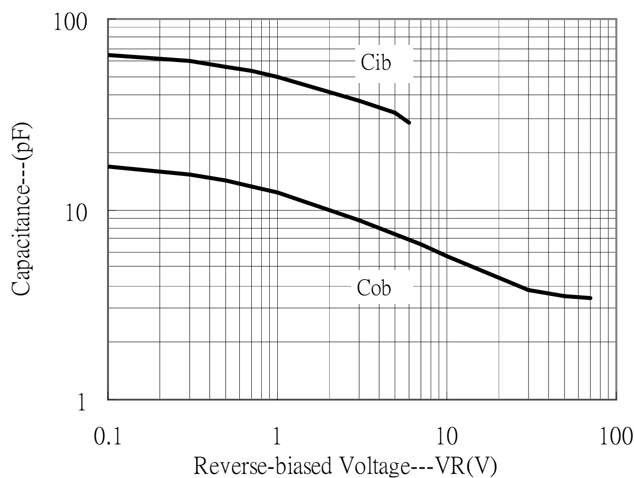
Typical Characteristics(Cont.)

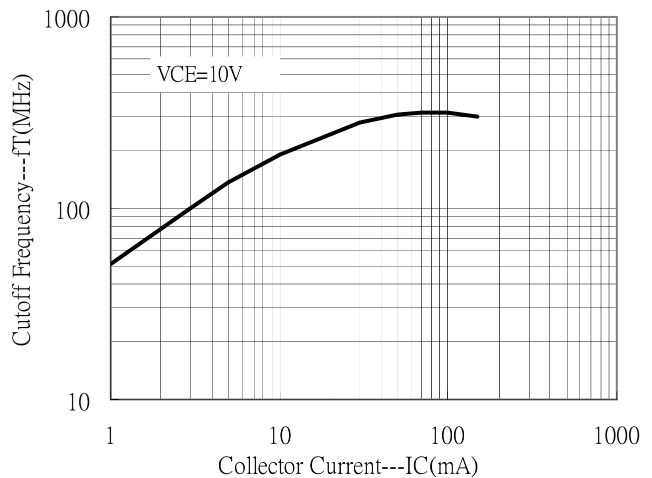




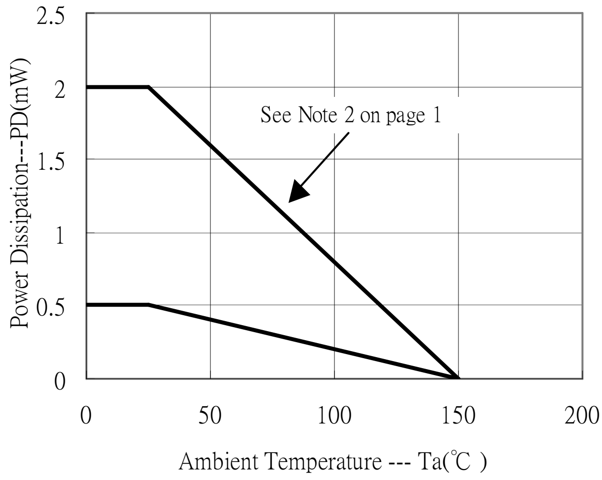




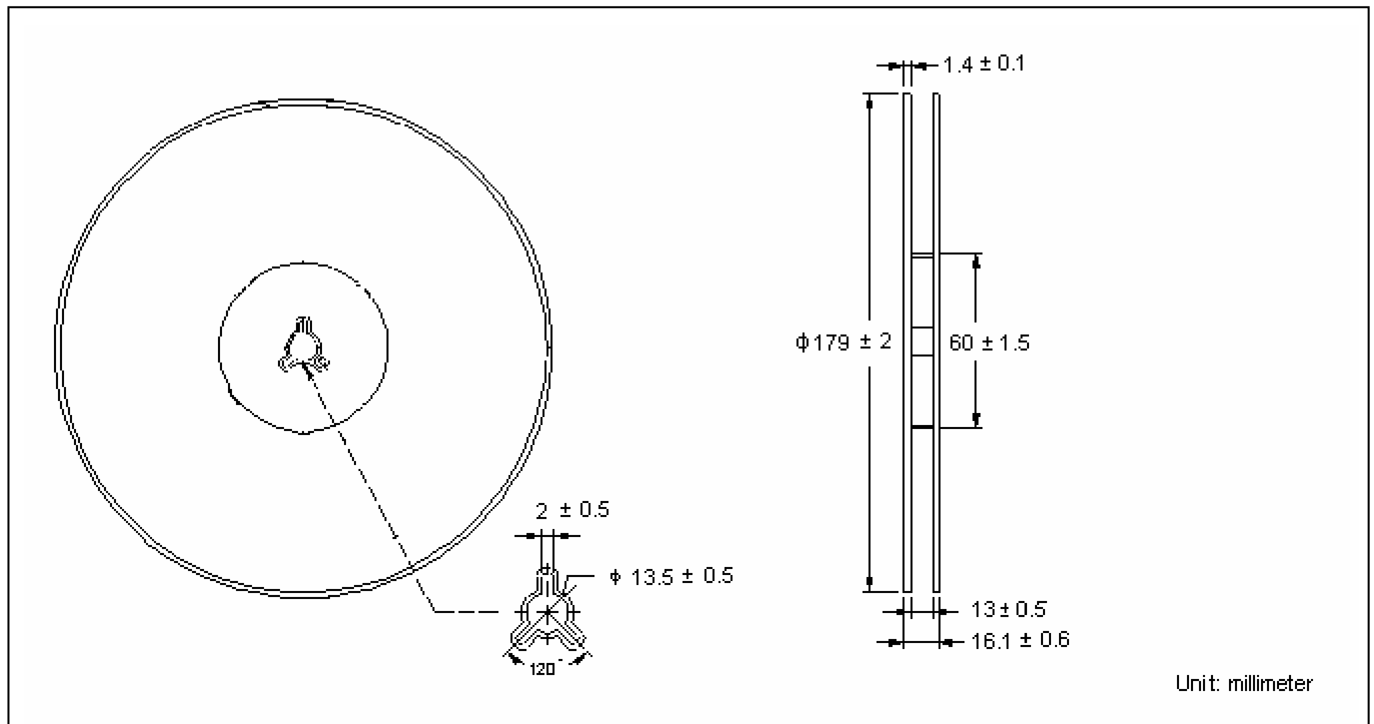




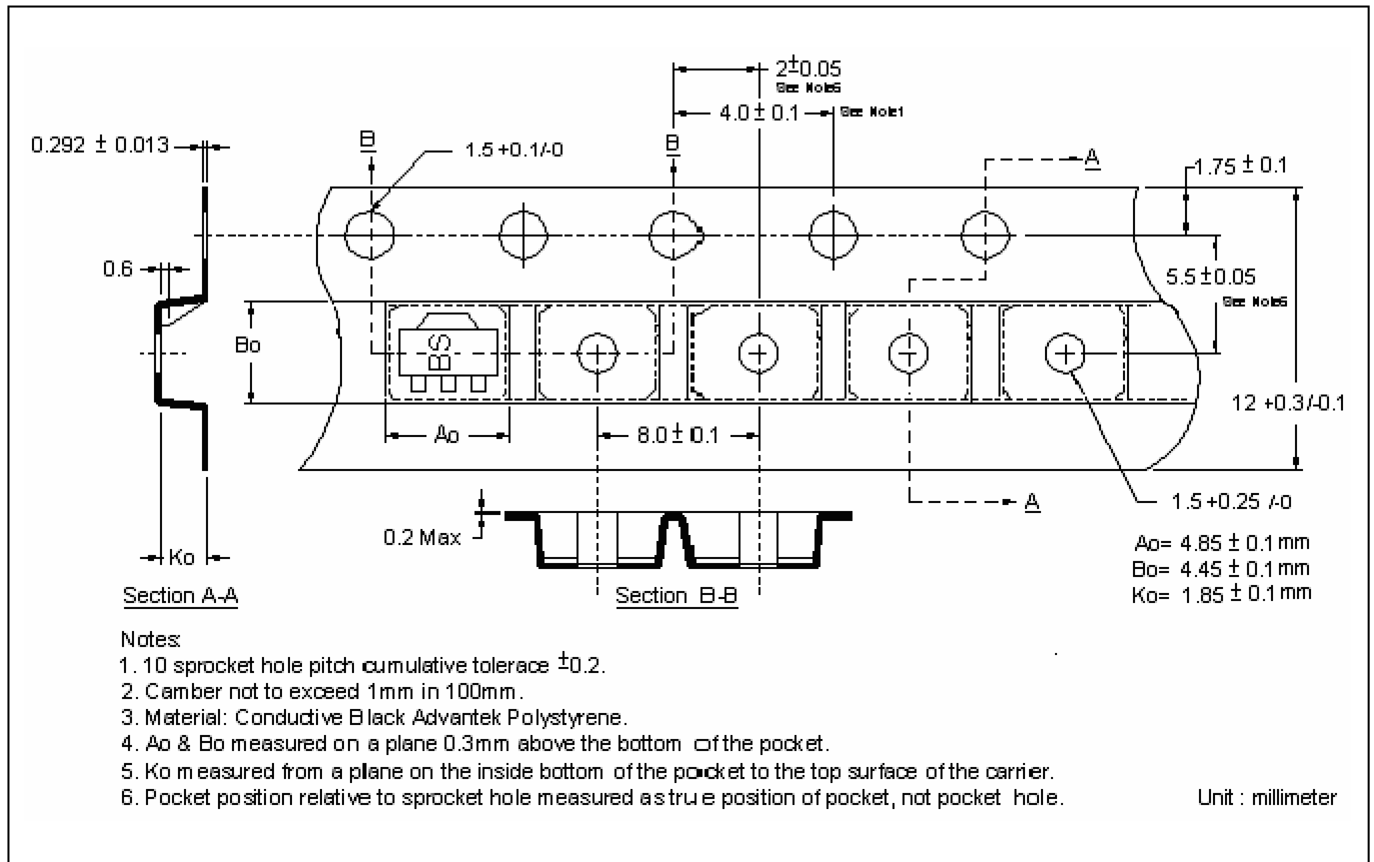
Typical Characteristics(Cont.)



Reel Dimension



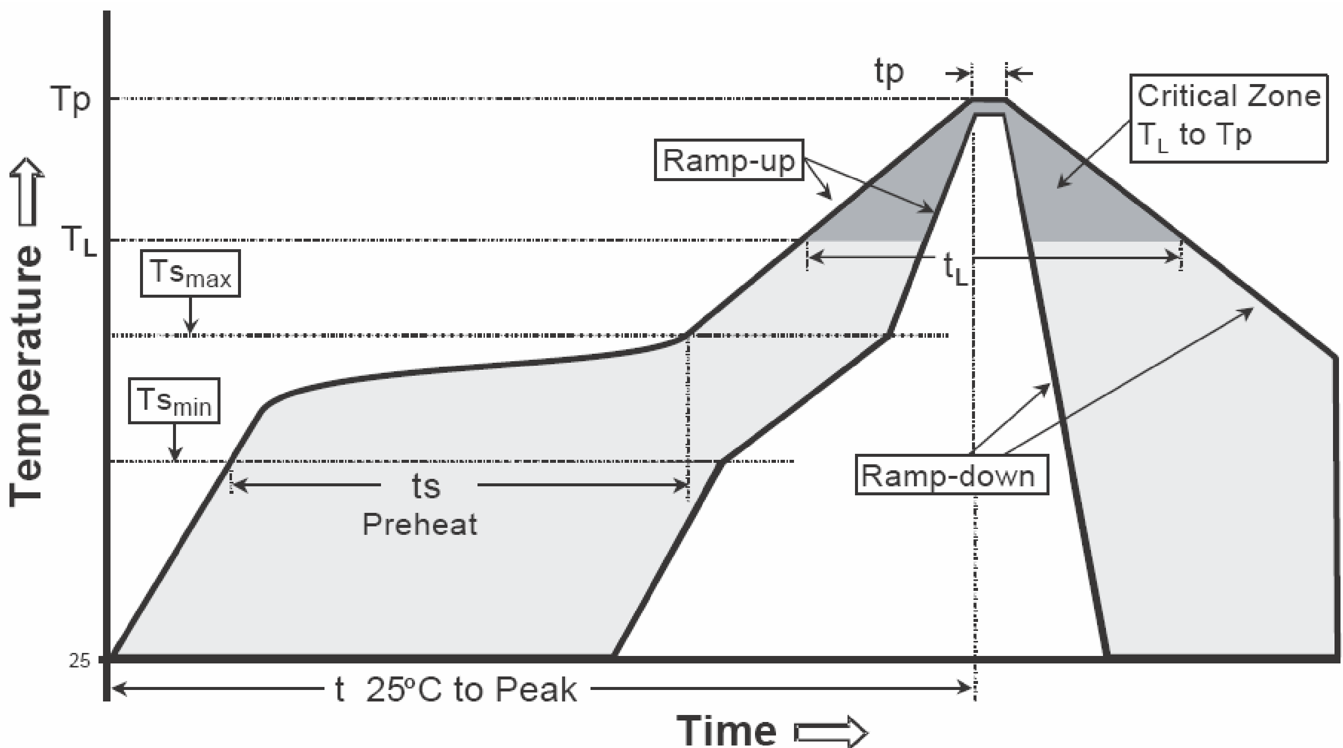
Carrier Tape Dimension



Recommended wave soldering condition

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

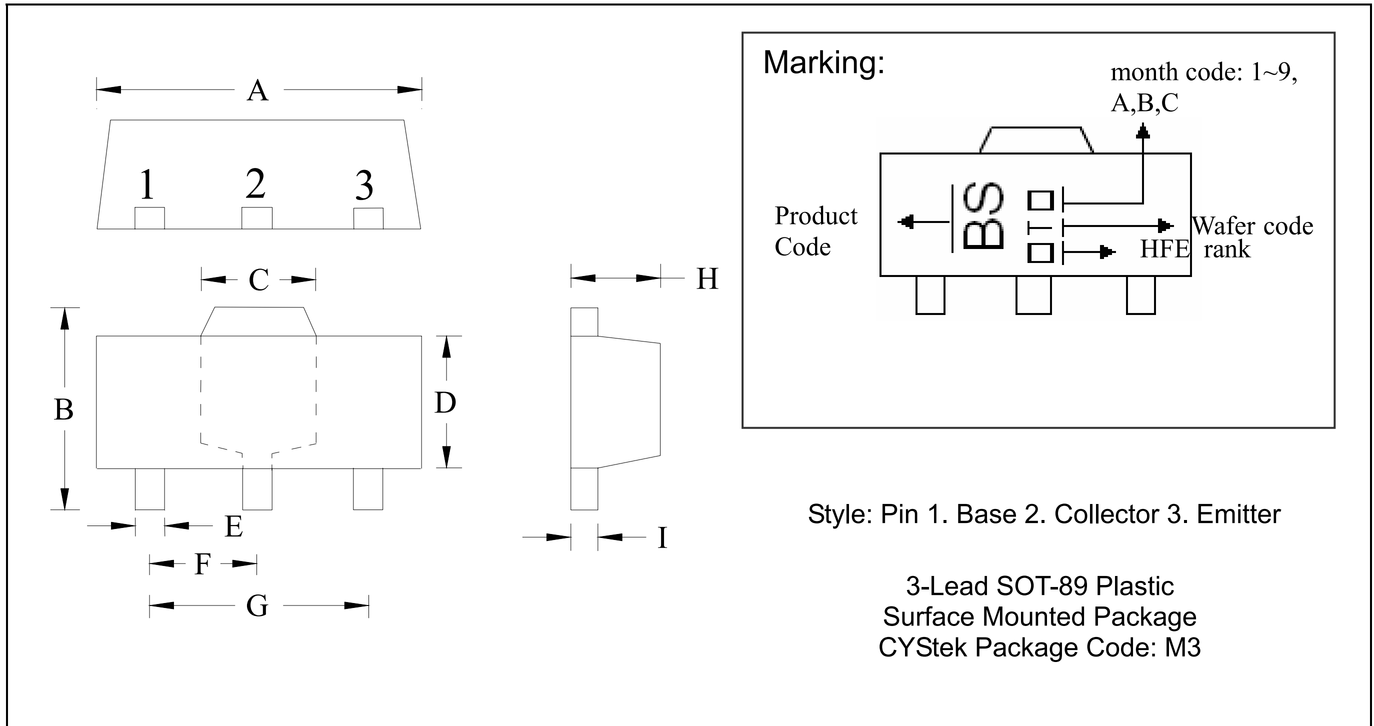
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S 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 (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-89 Dimension



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0591	TYP	1.50	TYP
B	0.1551	0.1673	3.94	4.25	G	0.1181	TYP	3.00	TYP
C	0.0610	REF	1.55	REF	H	0.0551	0.0630	1.40	1.60
D	0.0906	0.1024	2.30	2.60	I	0.0138	0.0173	0.35	0.44
E	0.0126	0.0205	0.32	0.52					

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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