

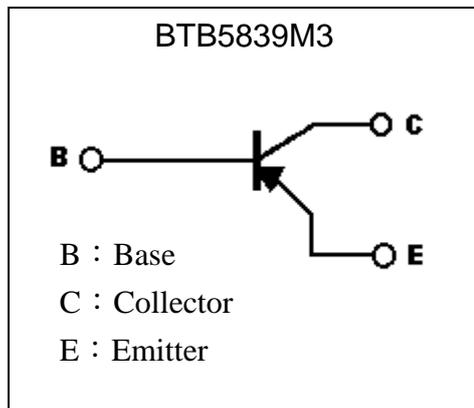
Low Vcesat PNP Epitaxial Planar Transistor

BTB5839M3

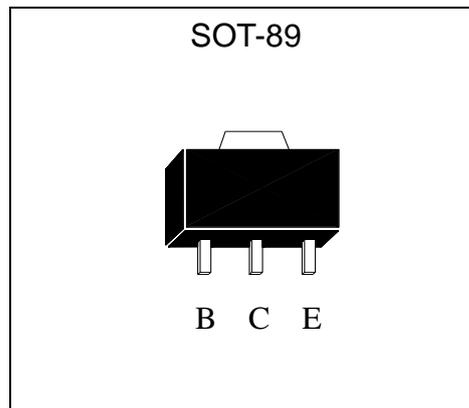
Features

- Low VCE(sat), VCE(sat)=-0.3 V (max), at IC / IB = -2A / -0.1A
- Excellent current gain characteristics
- Pb-free lead plating and halogen-free package

Symbol

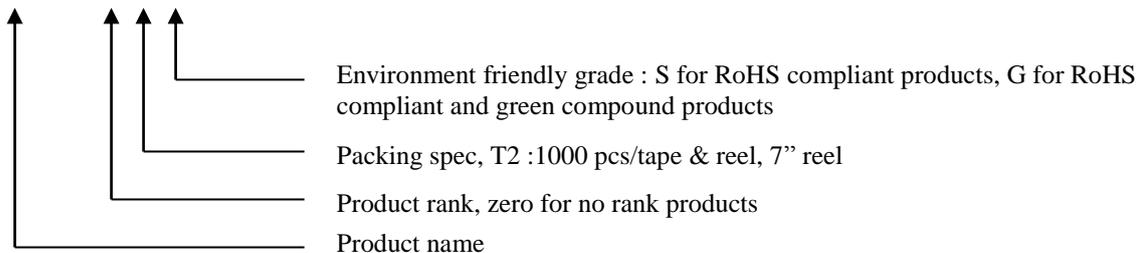


Outline



Ordering Information

Device	Package	Shipping
BTB5839M3-0-T2-G	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel



**Absolute Maximum Ratings** (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V _{CB0}	-50	V
Collector-Emitter Voltage	V _{CEO}	-30	V
Emitter-Base Voltage	V _{EBO}	-7	V
Collector Current (DC)	I _C	-3	A
Collector Current (Pulse)	I _{CP}	-5 (Note 1)	A
Power Dissipation	P _d	0.6	W
Power Dissipation	P _d	2 (Note 2)	W
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{th,j-c}	30.4	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{th,j-a}	208	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 2)	R _{th,j-a}	62.5	°C/W

- Note : 1. Single Pulse , P_w=10ms
 2. When mounting on a 40 x40 x0.7 mm ceramic board.
 3. Human body model, 1.5kΩ in series with 100pF

Characteristics (Ta=25°C)

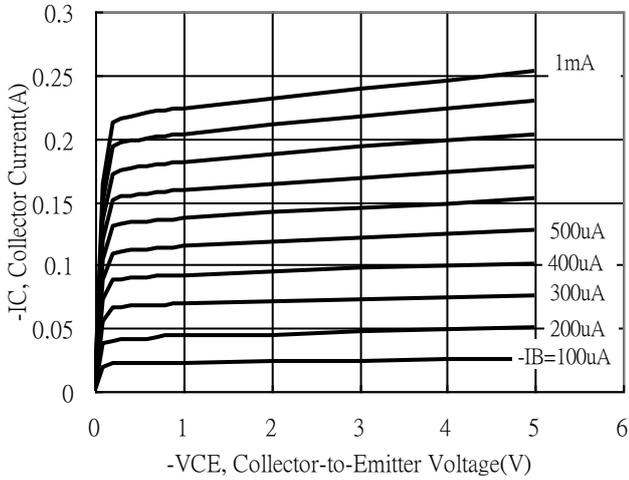
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CB0}	-50	-	-	V	I _C =-50μA, I _E =0
BV _{CEO}	-30	-	-	V	I _C =-1mA, I _B =0
BV _{EBO}	-7	-	-	V	I _E =-50μA, I _C =0
I _{CB0}	-	-	-100	nA	V _{CB} =-50V, I _E =0
I _{EBO}	-	-	-100	nA	V _{EB} =-7V, I _C =0
*V _{CE(sat)}	-	-0.05	-0.2	V	I _C =-400mA, I _B =-20mA
*V _{CE(sat)}	-	-0.2	-0.3	V	I _C =-2A, I _B =-100mA
*R _{CE(sat)}	-	0.1	0.15	Ω	I _C =-2A, I _B =-100mA
*V _{BE(sat)}	-	-1	-1.2	V	I _C =-2A, I _B =-200mA
*h _{FE 1}	160	-	-	-	V _{CE} =-2V, I _C =-100mA
*h _{FE 2}	180	-	390	-	V _{CE} =-2V, I _C =-500mA
*h _{FE 3}	150	-	-	-	V _{CE} =-2V, I _C =-1A
f _T	-	190	-	MHz	V _{CE} =-10V, I _C =-0.5A, f=100MHz
Cob	-	33	-	pF	V _{CB} =-10V, f =1MHz

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

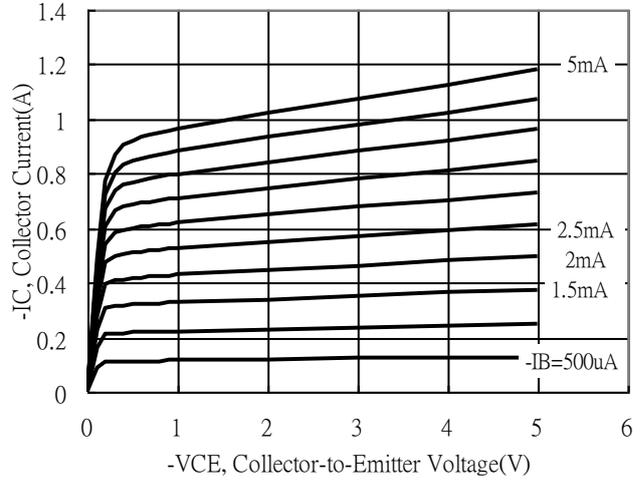


Typical Characteristics

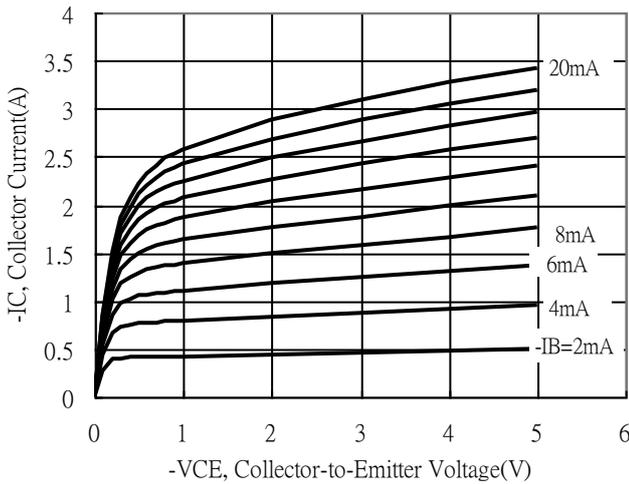
Emitter Grounded Output Characteristics



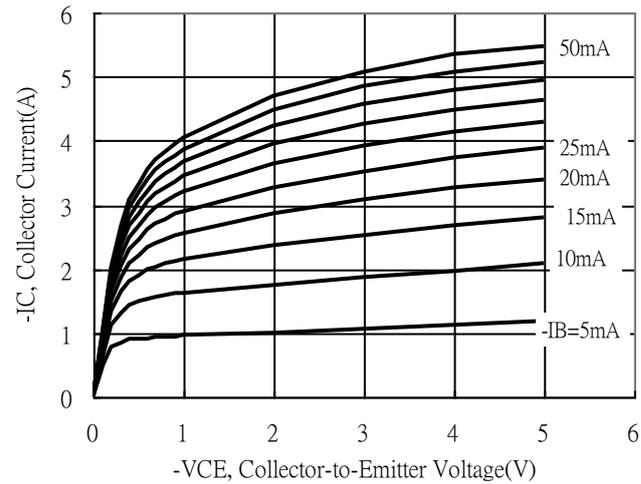
Emitter Grounded Output Characteristics



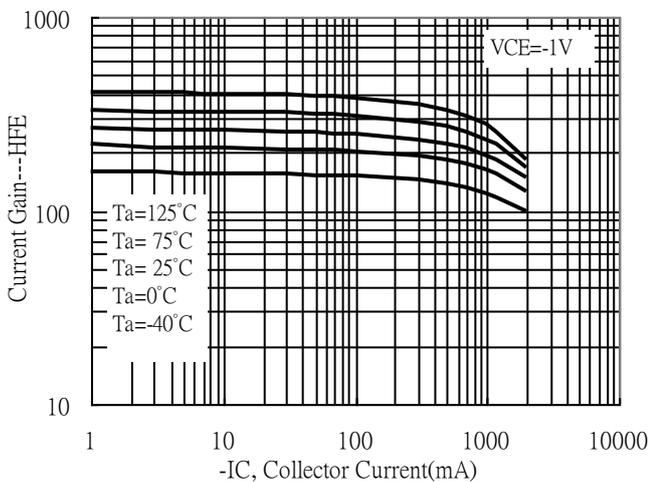
Emitter Grounded Output Characteristics



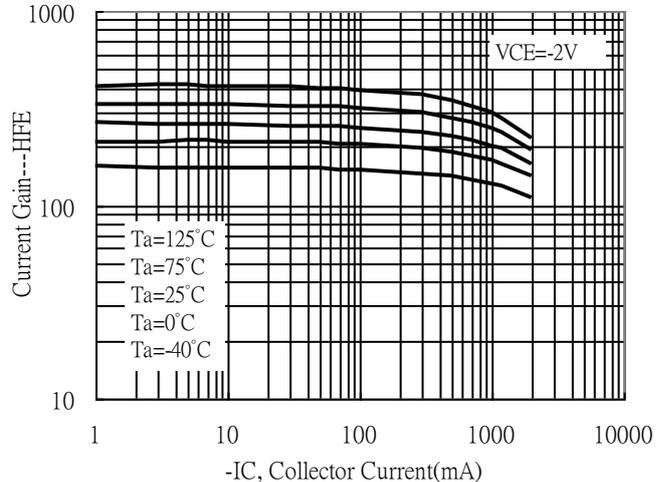
Emitter Grounded Output Characteristics



Current Gain vs Collector Current



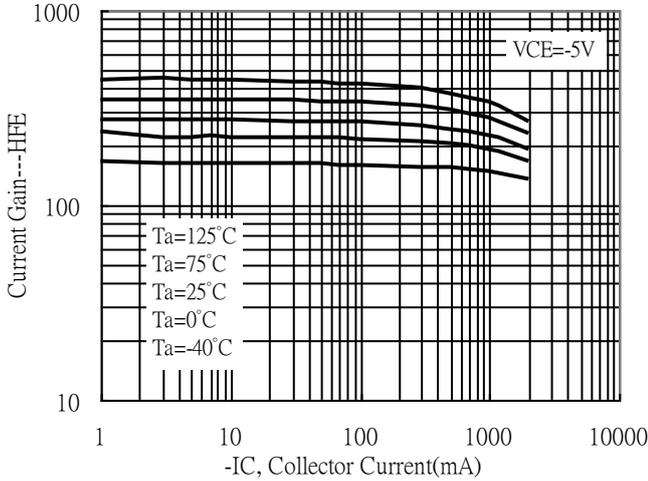
Current Gain vs Collector Current



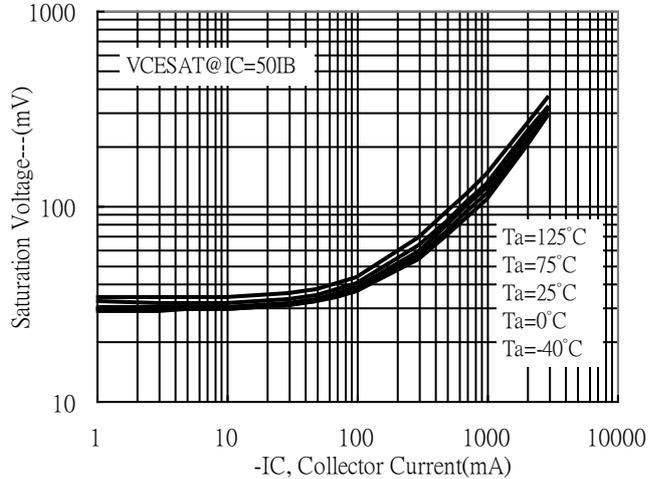


Typical Characteristics(Cont.)

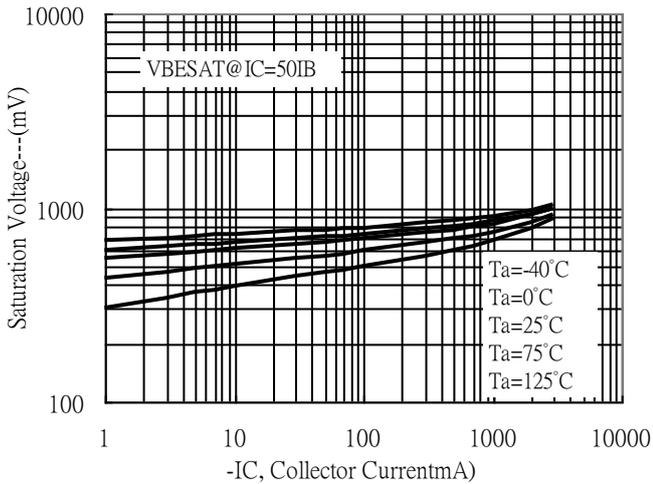
Current Gain vs Collector Current



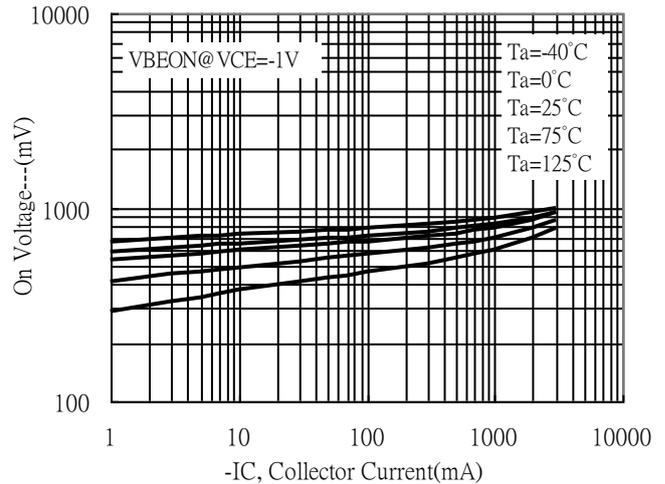
Saturation Voltage vs Collector Current



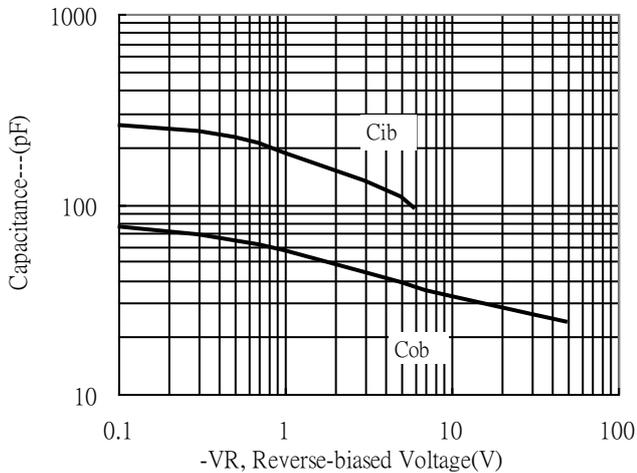
Saturation Voltage vs Collector Current



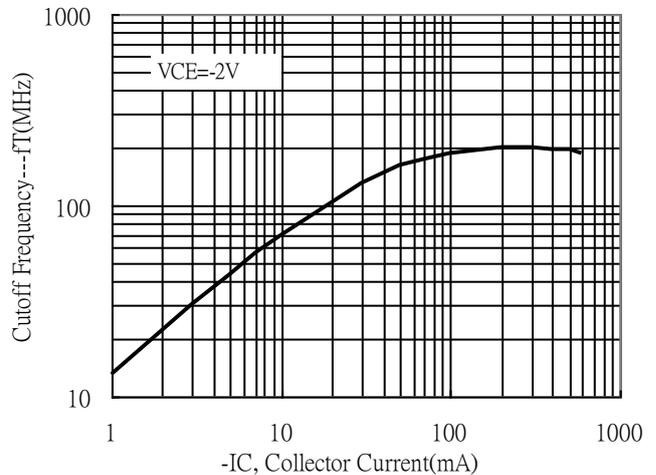
On Voltage vs Collector Current



Capacitance vs Reverse-biased Voltage

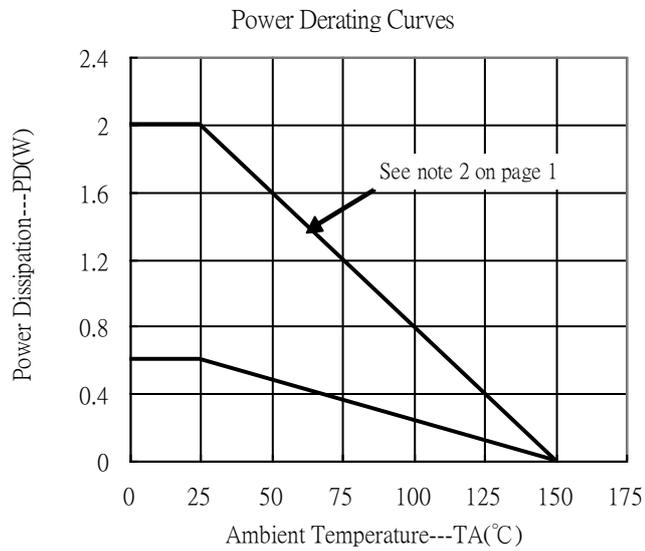


Cutoff Frequency vs Collector Current

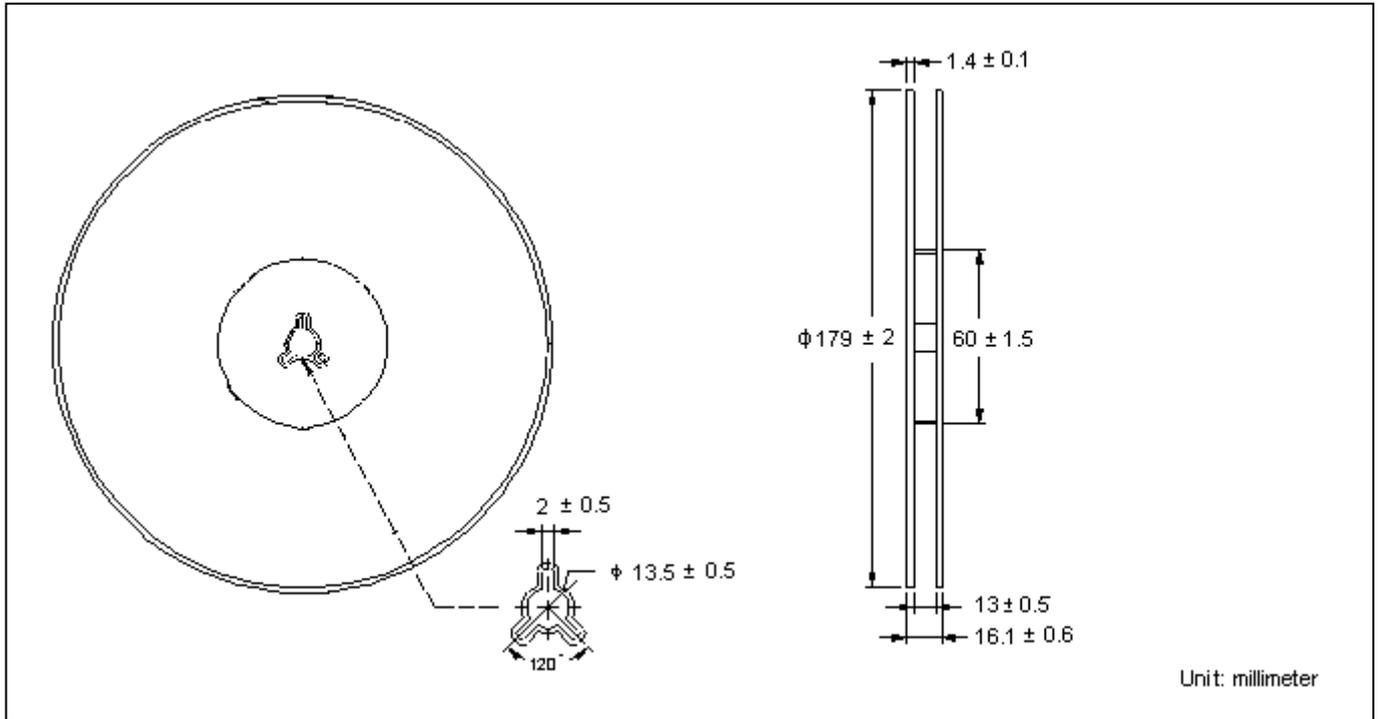




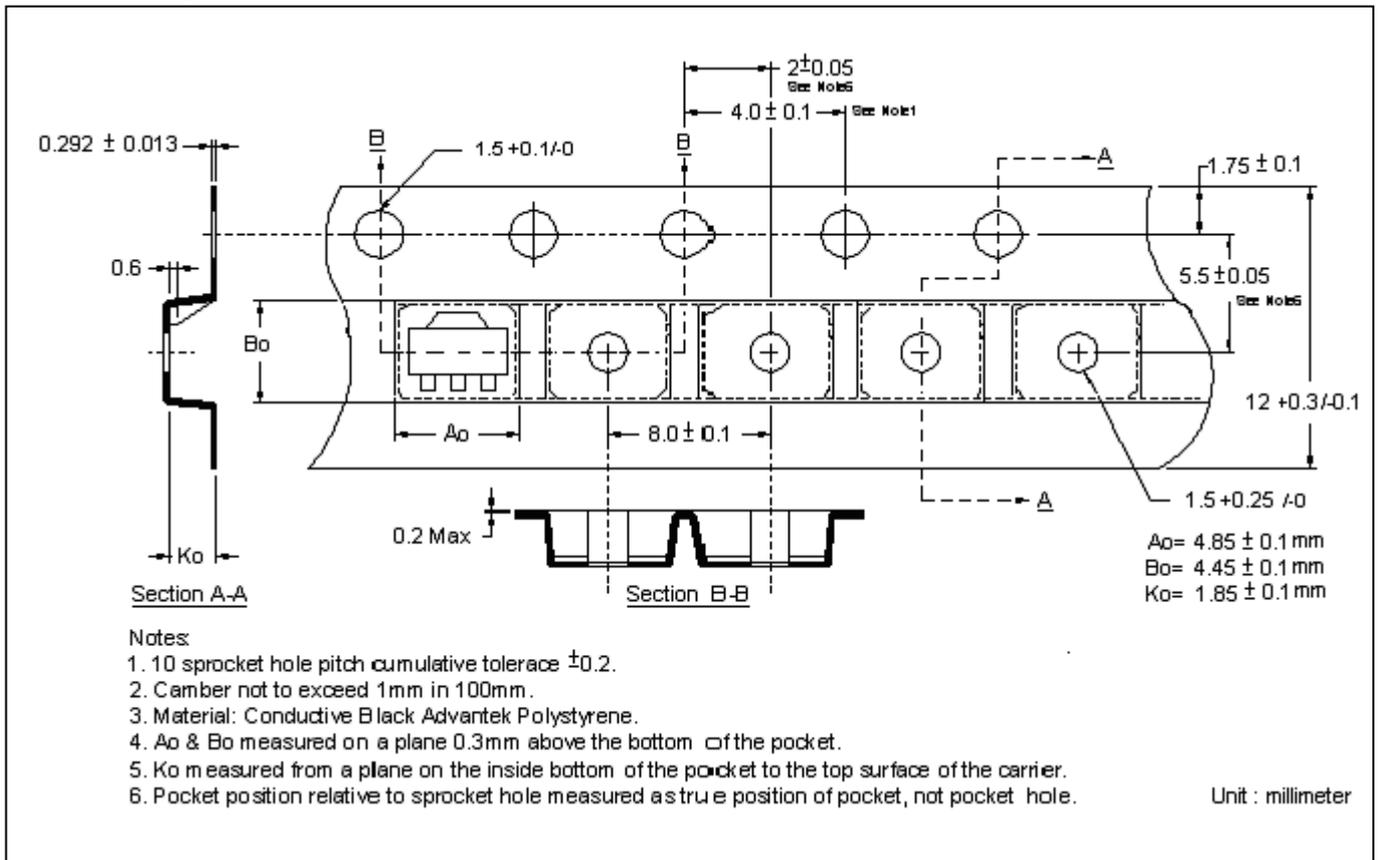
Typical Characteristics(Cont.)



Reel Dimension



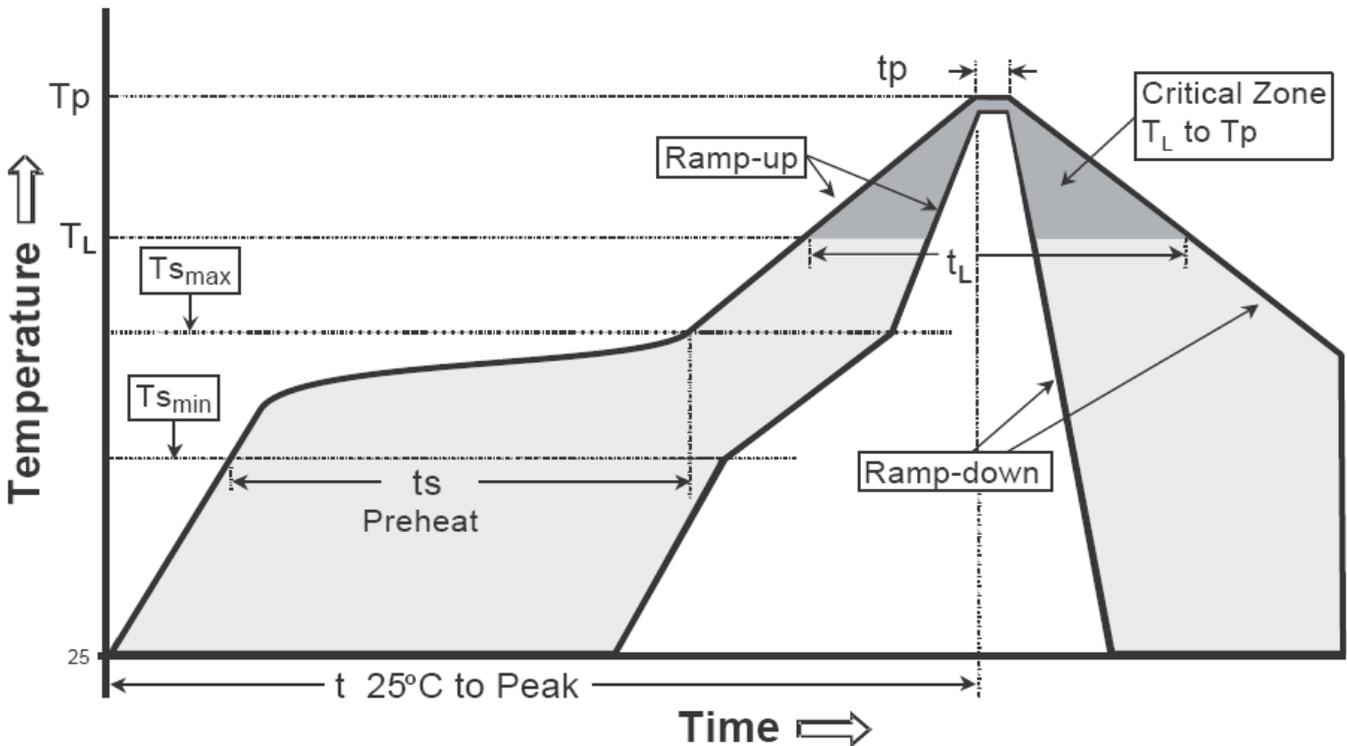
Carrier Tape Dimension



Recommended wave soldering condition

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

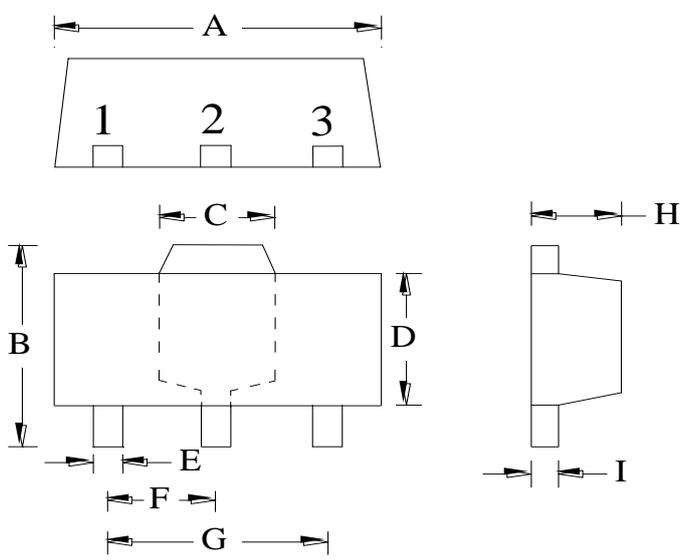
Recommended temperature profile for IR reflow



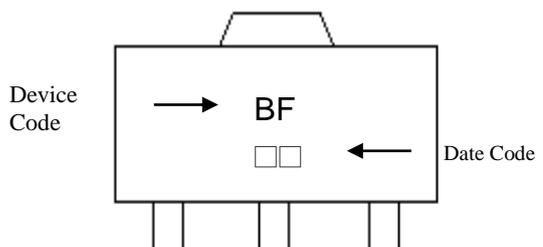
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-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-89 Dimension



Marking:



Device Code → BF ← Date Code

Style: Pin 1. Base 2. Collector 3. Emitter

3-Lead SOT-89 Plastic
 Surface Mounted Package
 CYStek Package Code: M3

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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