

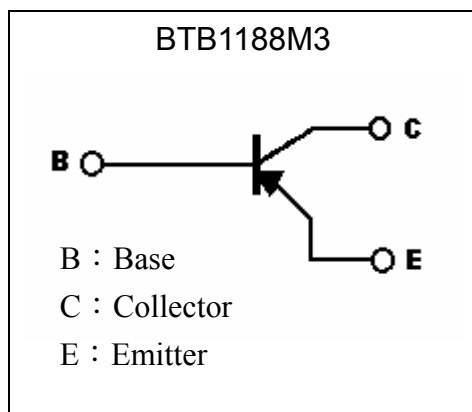
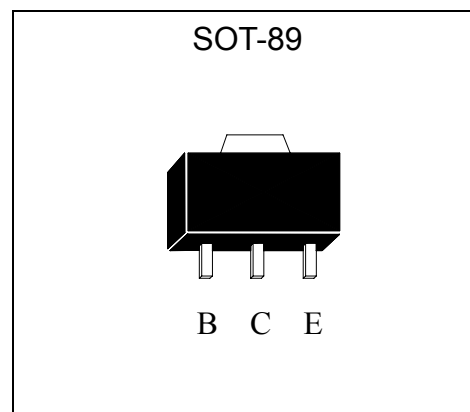
**Low Vcesat PNP Epitaxial Planar Transistor**

# BTB1188M3

$BV_{CEO}$	-30V
$I_C$	-2A
$R_{CESAT}(typ)$	0.22 $\Omega$

**Features**

- Low  $V_{CE}(sat)$ ,  $V_{CE}(sat)=-0.65$  V (typical), at  $I_C / I_B = -3A / -0.1A$
- Excellent current gain characteristics
- Complementary to BTB1766M3
- Pb-free lead plating package

**Symbol**

**Outline**

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-30	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current (DC)	$I_C$	-2	A
Collector Current (Pulse)	$I_{CP}$	-5 (Note 1)	A
Power Dissipation	$P_d$	0.5	W
Power Dissipation	$P_d$	2 (Note 2)	W
ESD susceptibility		4000 (Note 3)	V
Junction Temperature	$T_j$	150	$^{\circ}C$
Storage Temperature	$T_{stg}$	-55~+150	$^{\circ}C$

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



**Characteristics (Ta=25°C)**

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	-40	-	-	V	I <sub>C</sub> =-50μA, I <sub>E</sub> =0
BV <sub>CEO</sub>	-30	-	-	V	I <sub>C</sub> =-1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> =-50μA, I <sub>C</sub> =0
I <sub>CBO</sub>	-	-	-1	μA	V <sub>CB</sub> =-20V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	-1	μA	V <sub>EB</sub> =-4V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub>	-	-	-1	V	I <sub>C</sub> =-3A, I <sub>B</sub> =-0.1A
*h <sub>FE</sub>	180	-	560	-	V <sub>CE</sub> =-3V, I <sub>C</sub> =-0.5A
f <sub>T</sub>	-	100	-	MHz	V <sub>CE</sub> =-5V, I <sub>C</sub> =-0.1A, f=100MHz
C <sub>ob</sub>	-	50	-	pF	V <sub>CB</sub> =-10V, f=1MHz

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

**Classification Of hFE**

Rank	R	S
Range	180~390	270~560

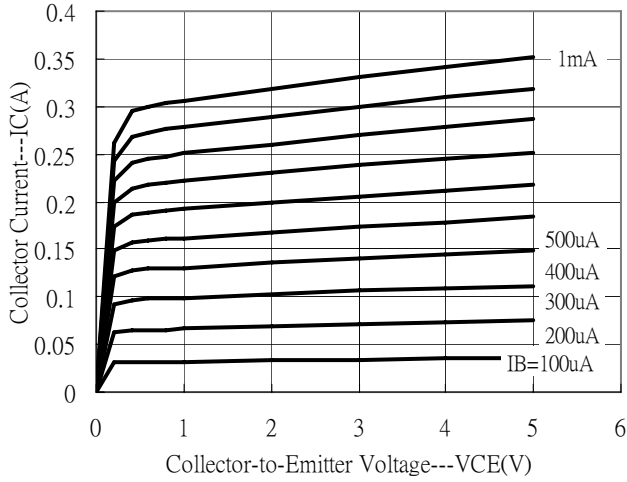
**Ordering Information**

Device	Package	Shipping
BTB1188M3	SOT-89 (Pb-free lead plating)	1000 pcs / Tape & Reel

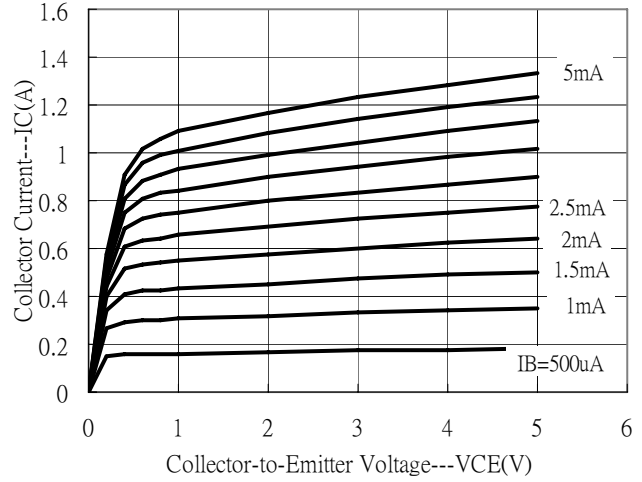


### Typical Characteristics

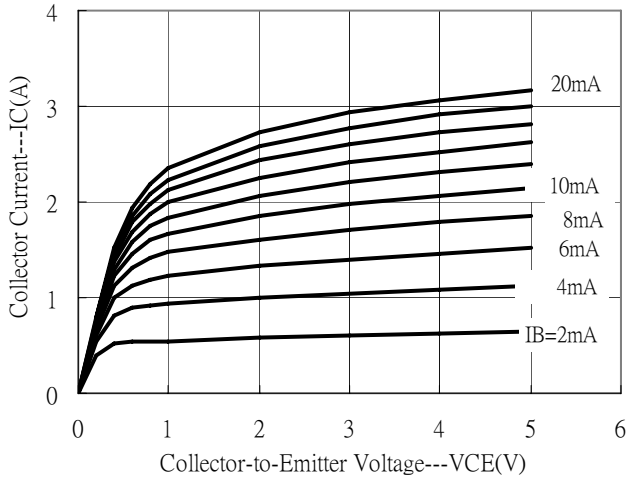
Emitter Grounded Output Characteristics



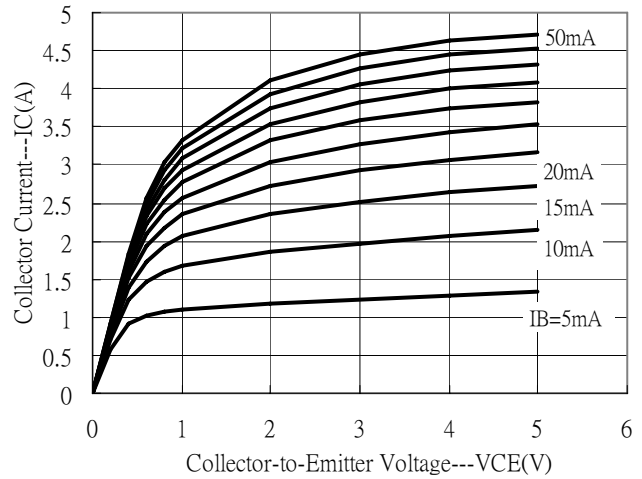
Emitter Grounded Output Characteristics



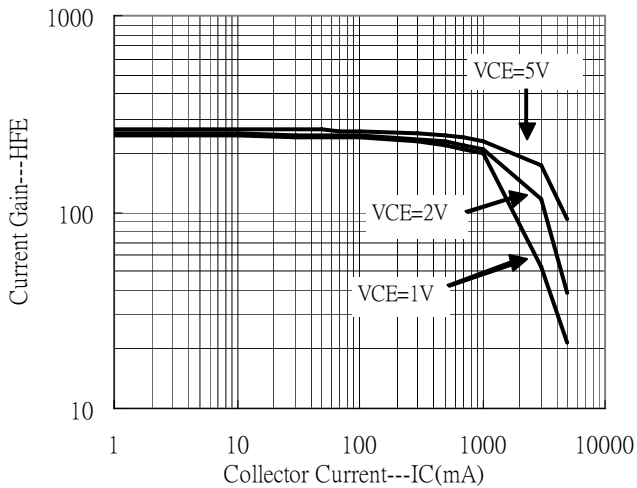
Emitter Grounded Output Characteristics



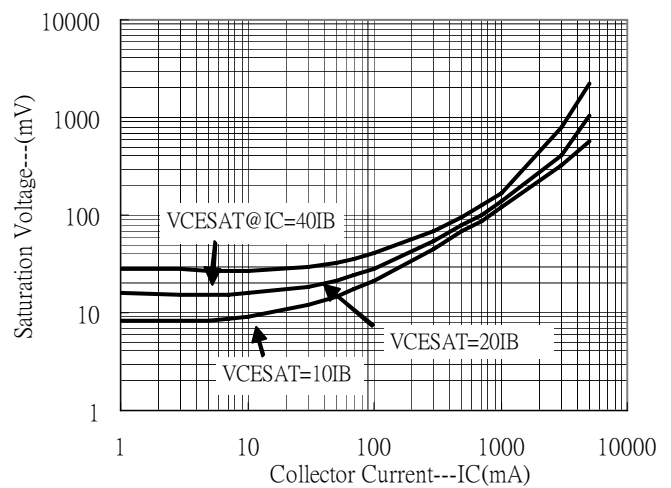
Emitter Grounded Output Characteristics



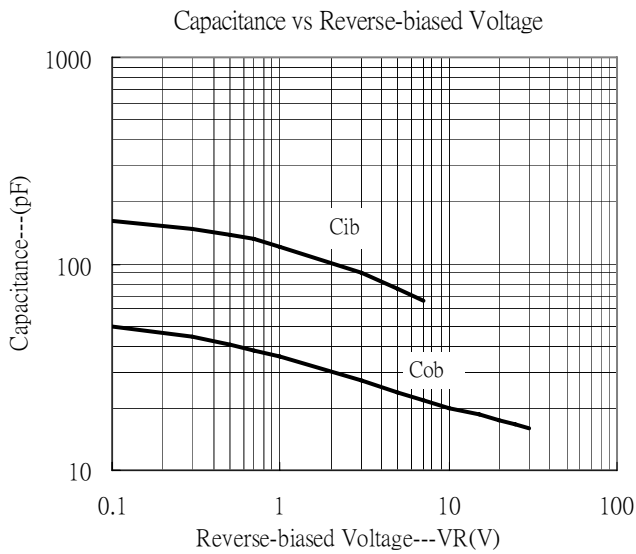
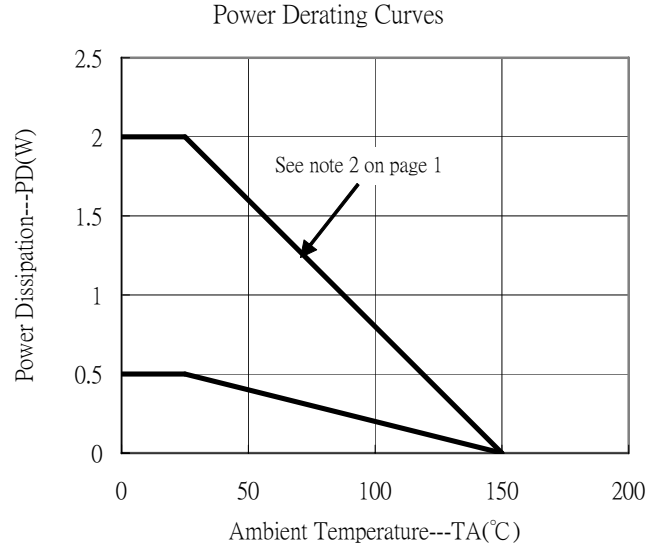
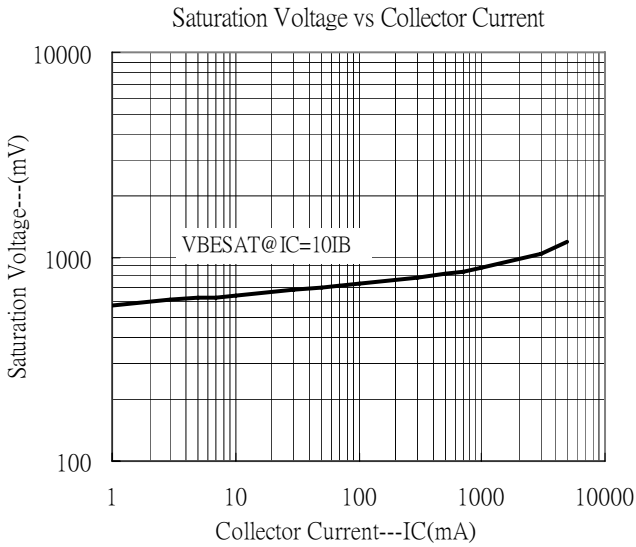
Current Gain vs Collector Current



Saturation Voltage vs Collector Current



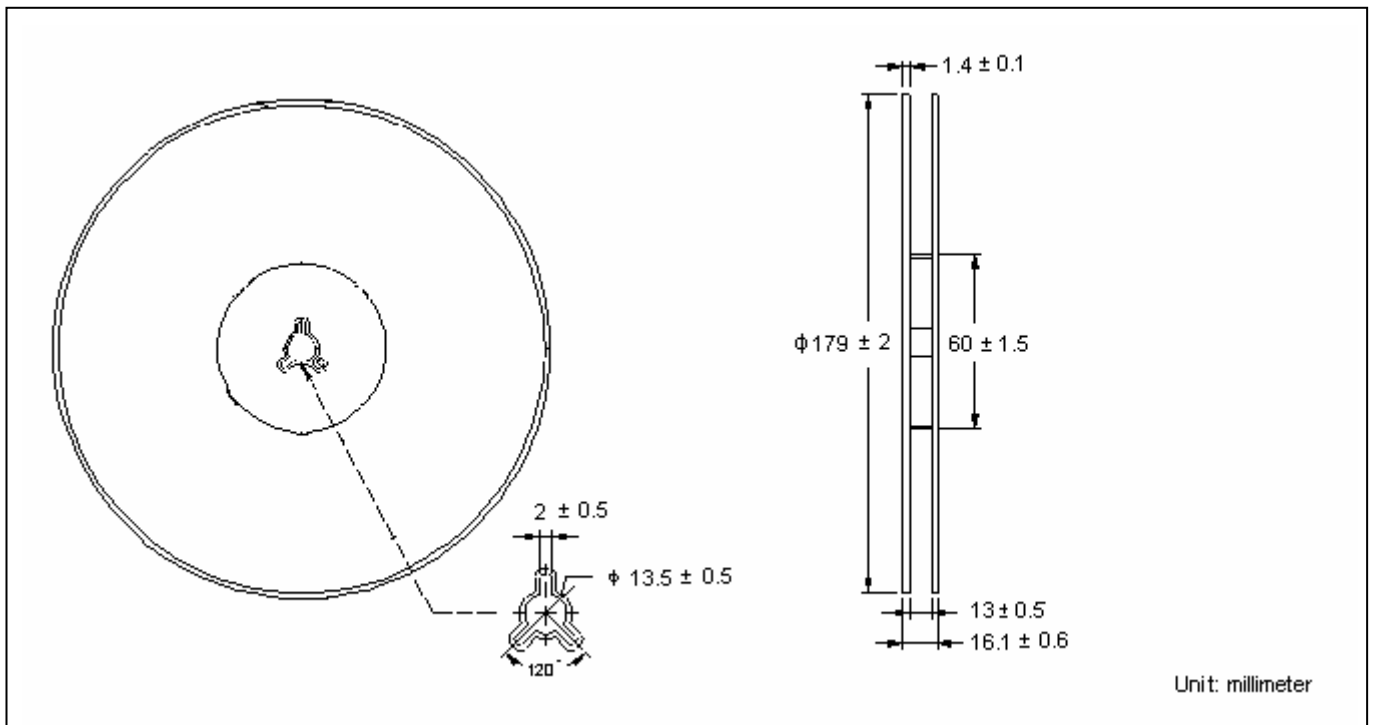
**Typical Characteristics(Cont.)**



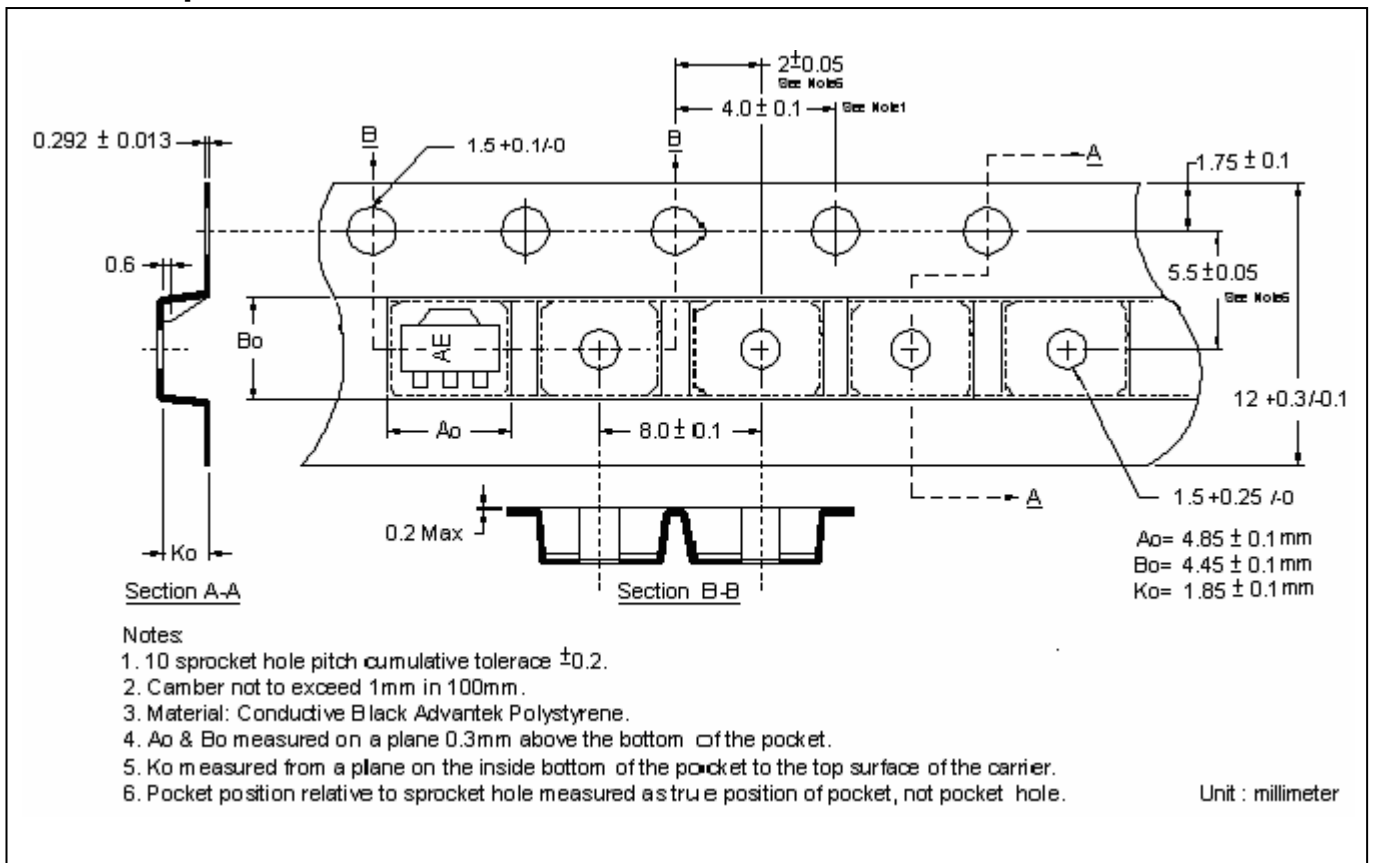
**Recommended Storage Condition:**

Temperature : 10~ 35 °C  
 Humidity : 30~ 60% RH

**Reel Dimension**



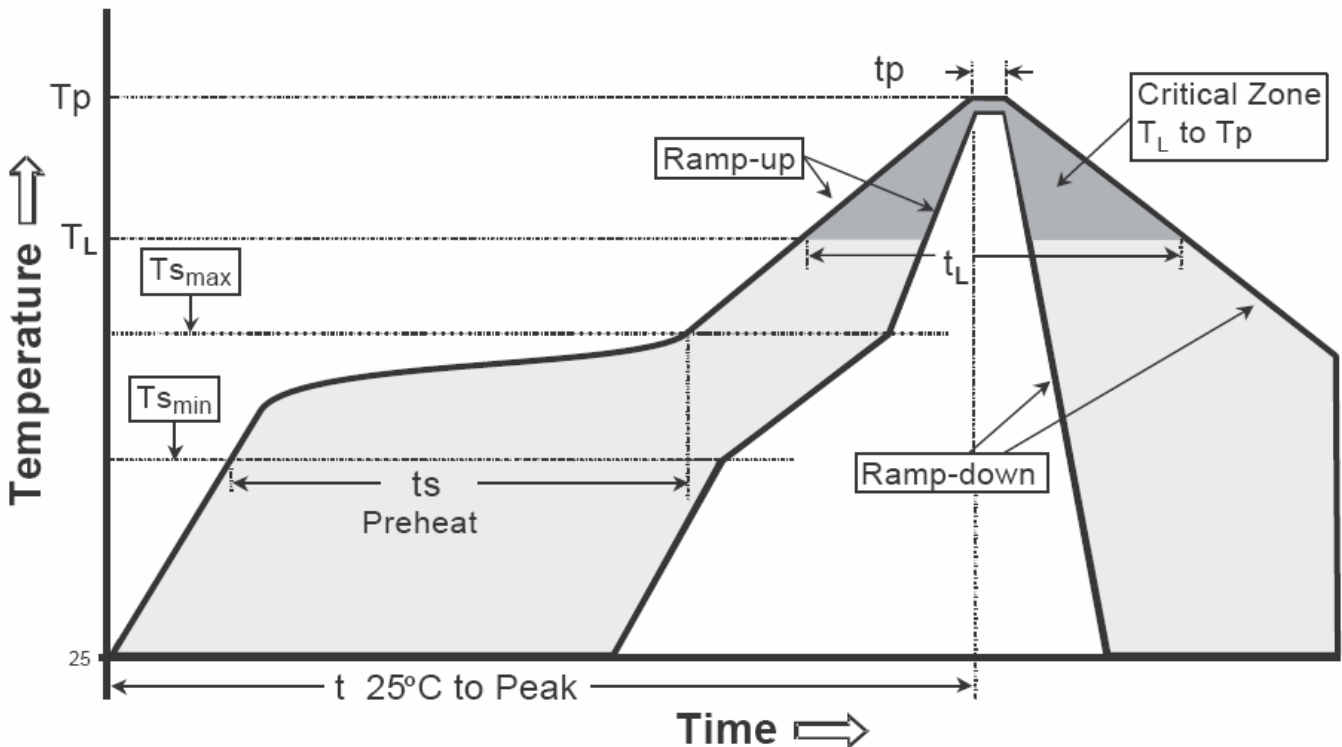
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

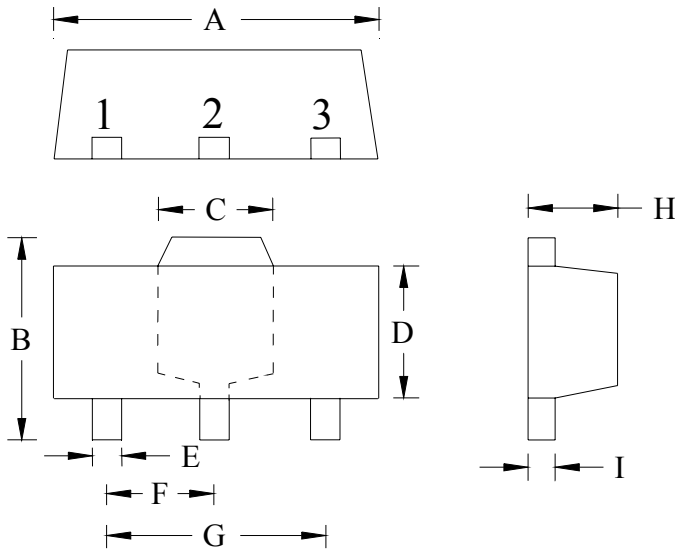
**Recommended temperature profile for IR reflow**



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(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(ts min to ts max)	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (TL)	183°C	217°C
- Time (tL)	60-150 seconds	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.

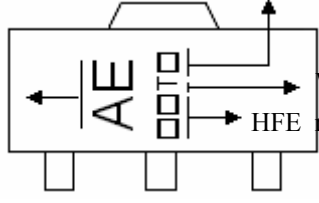
Note : All temperatures refer to topside of the package, measured on the package body surface.

**SOT-89 Dimension**



The diagram shows three views of the SOT-89 package: a top view with dimensions A, C, E, F, and G; a front view with dimensions B, D, and I; and a side view with dimension H. The top view also labels the three leads as 1, 2, and 3.

**Marking:**



month code: 1~9, A,B,C

Product Code ← | AE | → Wafer code

→ HFE rank

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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