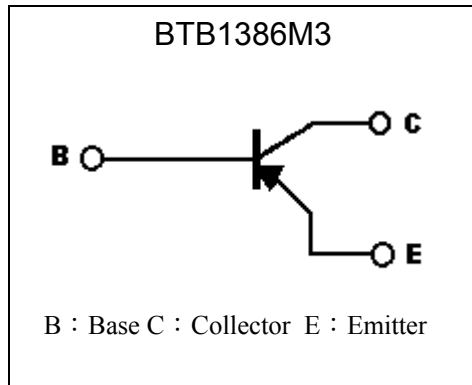
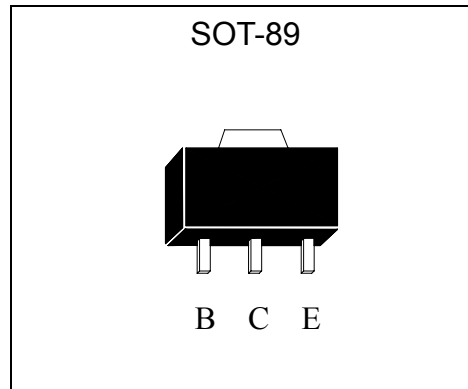


Low Vcesat PNP Epitaxial Planar Transistor

BTB1386M3

Features

- Low $V_{CE(sat)}$, $V_{CE(sat)} = -0.25$ V (typical), at $I_C / I_B = -3$ A / -60 mA
- Excellent DC current gain characteristics
- Complementary to BTB2098M3
- Pb-free lead plating and halogen-free package

Symbol

Outline

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

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	-30	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-6	V
Collector Current	I_C	-5	A
	I_{CP}	-10 (Note 1)	
Power Dissipation	P_d	0.6	W
	P_d	2 (Note 2)	
Operating Junction and Storage Temperature Range	$T_j ; T_{stg}$	-55~+150	$^\circ\text{C}$

 Note : 1. Single Pulse $P_w = 10$ ms

2. When mounted on a 40 x 40 x 0.7 mm ceramic board.

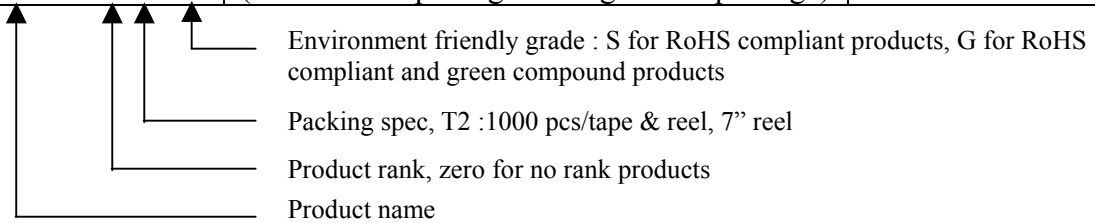
Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	15	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	208	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-ambient, max (Note)	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

Note : When mounting on a 40 x 40 x 0.7 mm ceramic board.

Ordering Information

Device	Package	Shipping
BTB1386M3-0-T2-G	SOT-89 (Pb-free lead plating & halogen-free package)	1000 pcs / Tape & Reel

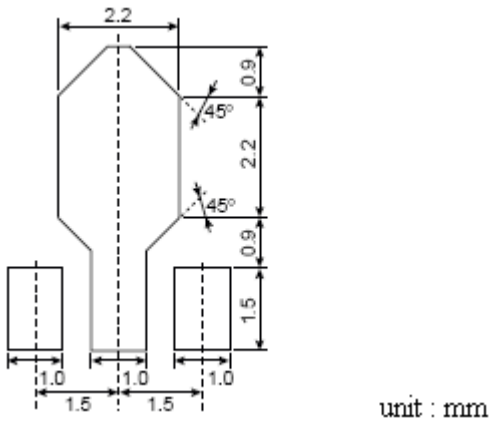


Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-30	-	-	V	$I_C = -50\mu A, I_E = 0$
BV_{CEO}	-20	-	-	V	$I_C = -1mA, I_B = 0$
BV_{EBO}	-6	-	-	V	$I_E = -50\mu A, I_C = 0$
I_{CBO}	-	-	-0.5	μA	$V_{CB} = -25V, I_E = 0$
I_{EBO}	-	-	-0.5	μA	$V_{EB} = -5V, I_C = 0$
* $V_{CE(sat)}$	-	-0.25	-0.4	V	$I_C = -3A, I_B = -60mA$
* $V_{CE(sat)}$	-	-0.3	-0.5	V	$I_C = -4A, I_B = -0.1A$
* $V_{BE(sat)}$	-	-1.0	-1.3	V	$I_C = -3A, I_B = -60mA$
* h_{FE}	180	-	390	-	$V_{CE} = -2V, I_C = -0.5A$
f_T	-	120	-	MHz	$V_{CE} = -6V, I_C = -50mA, f = 30MHz$
Cob	-	60	-	pF	$V_{CB} = -20V, f = 1MHz$

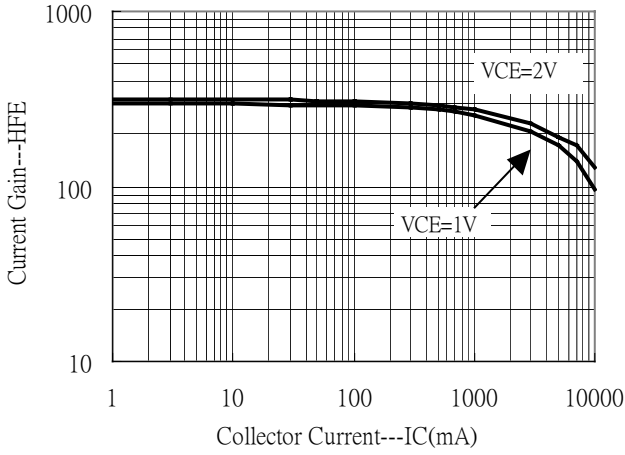
*Pulse Test : Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$

Recommended soldering footprint

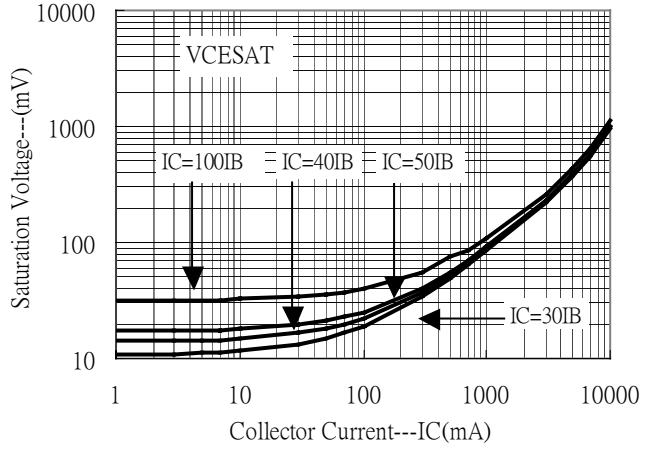


Typical Characteristics

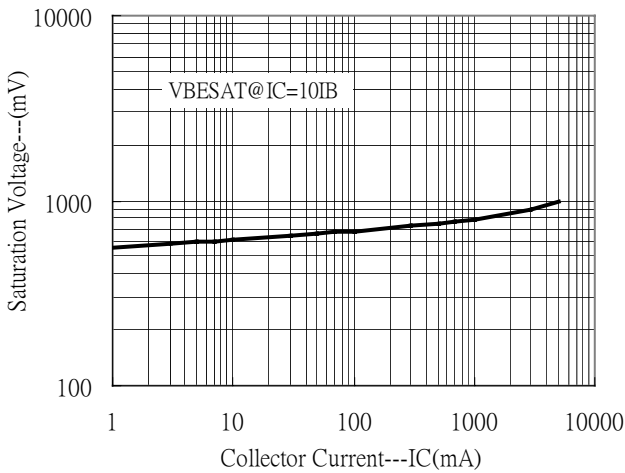
Current Gain vs Collector Current



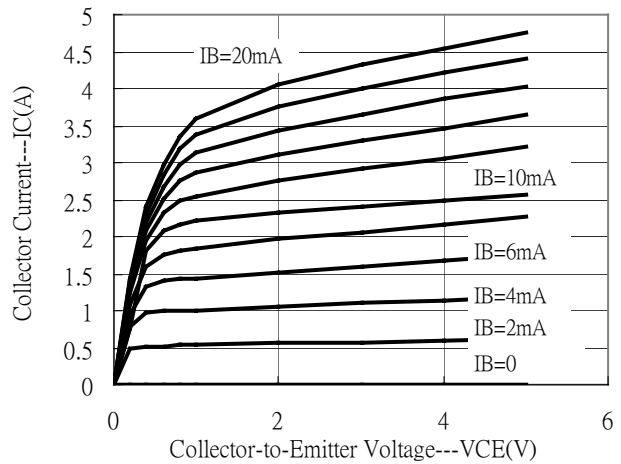
Saturation Voltage vs Collector Current



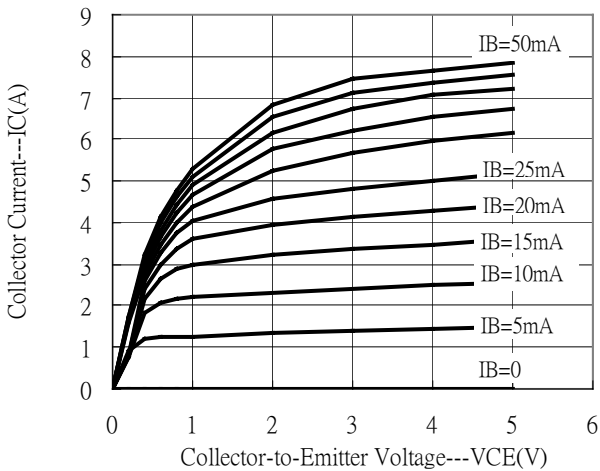
Saturation Voltage vs Collector Current



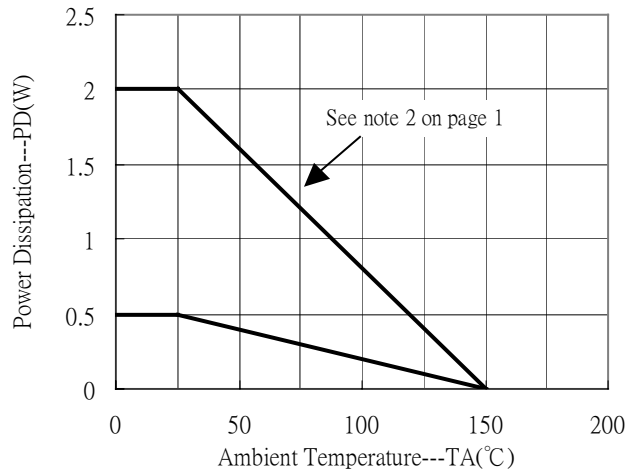
Output Characteristics



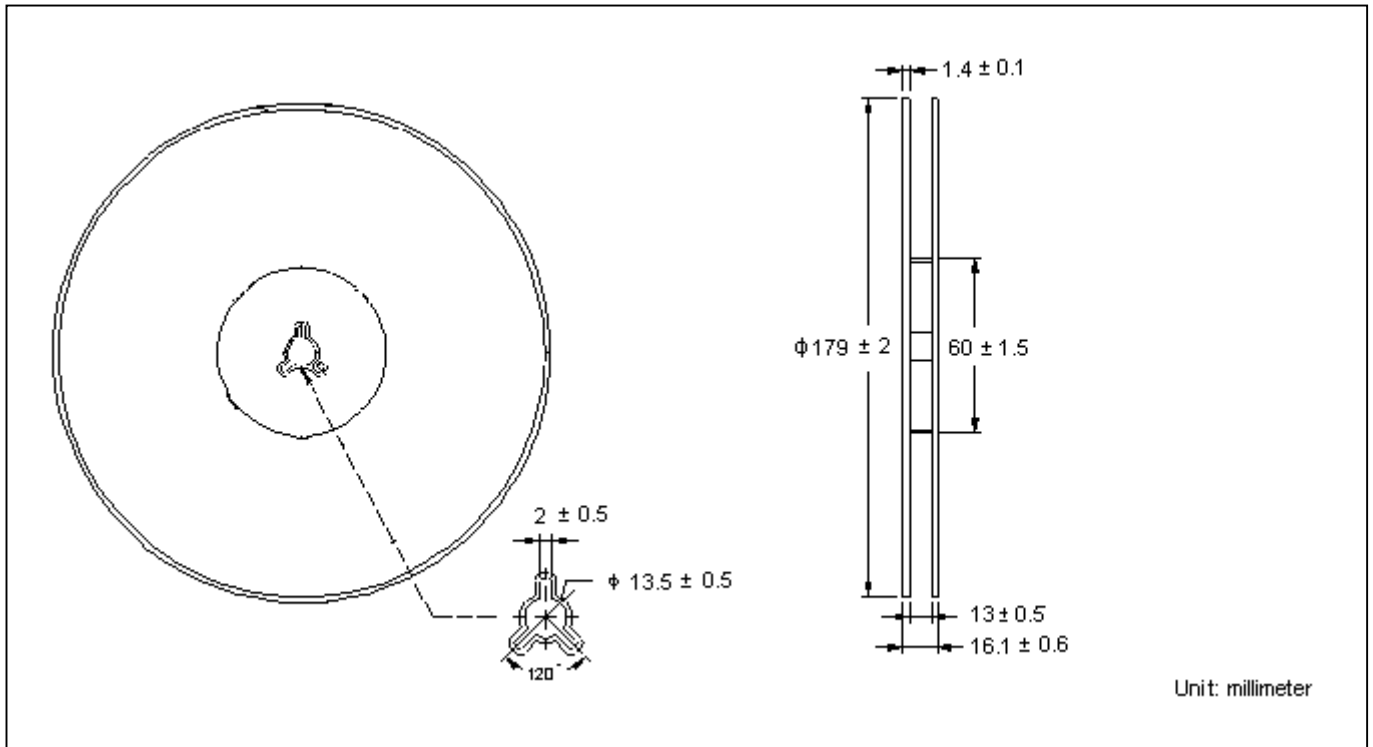
Output Characteristics



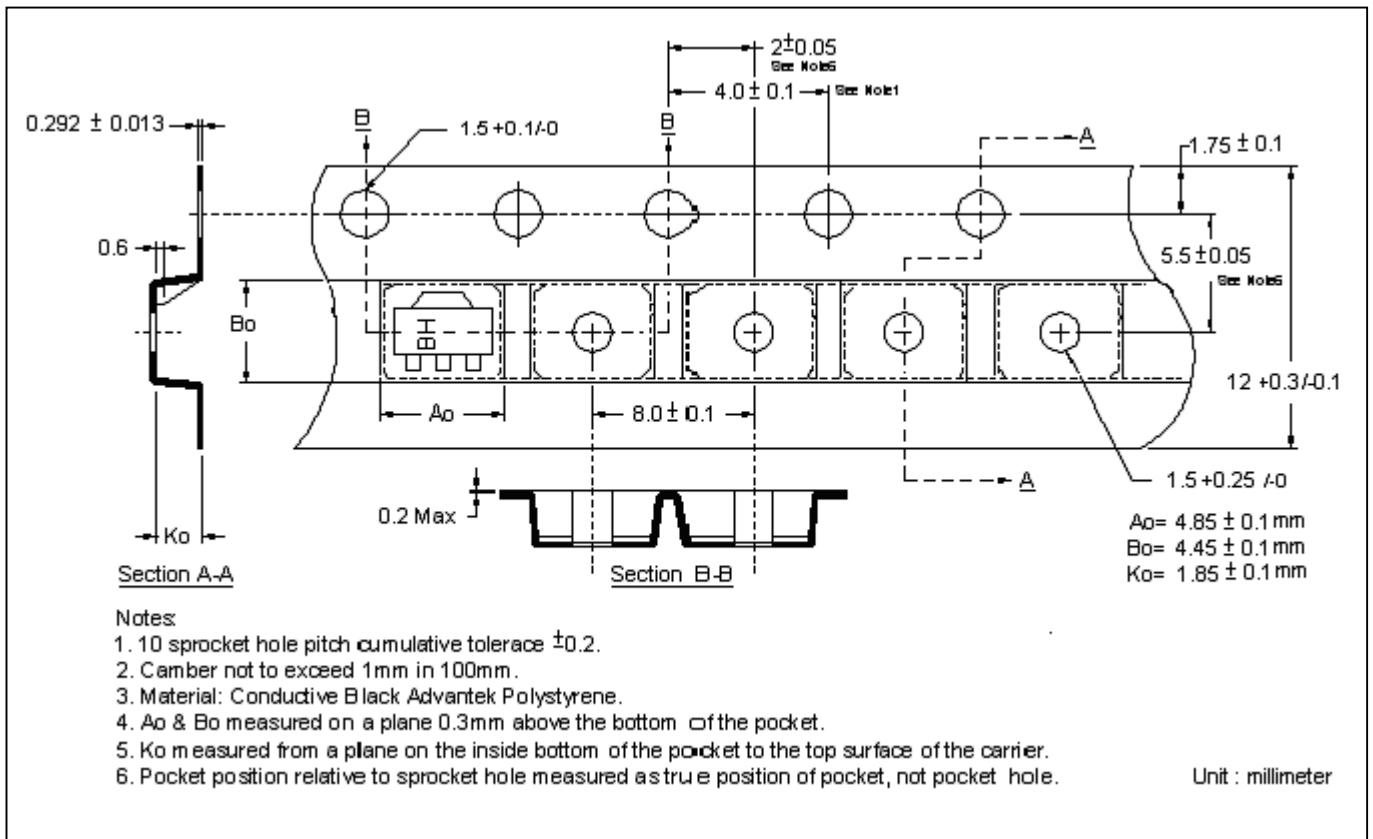
Power Derating Curves



Reel Dimension



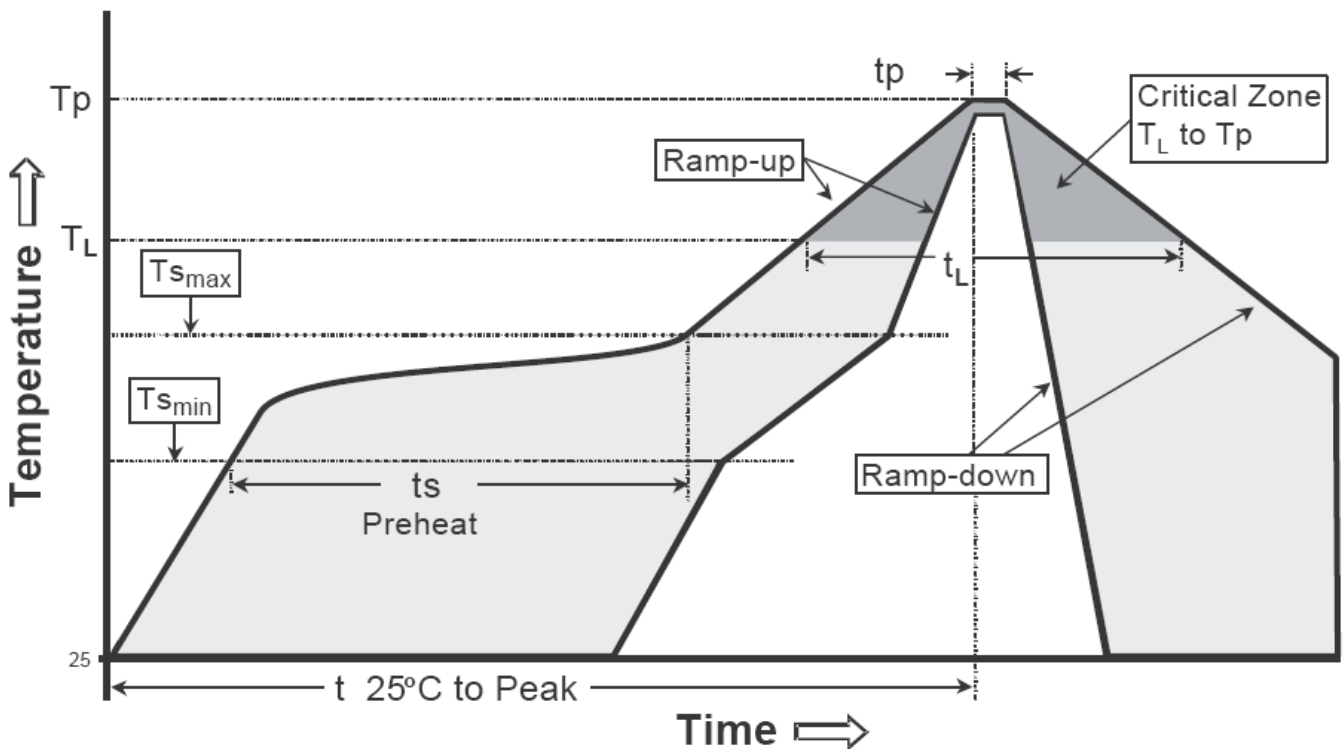
Carrier Tape Dimension



Recommended wave soldering condition

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

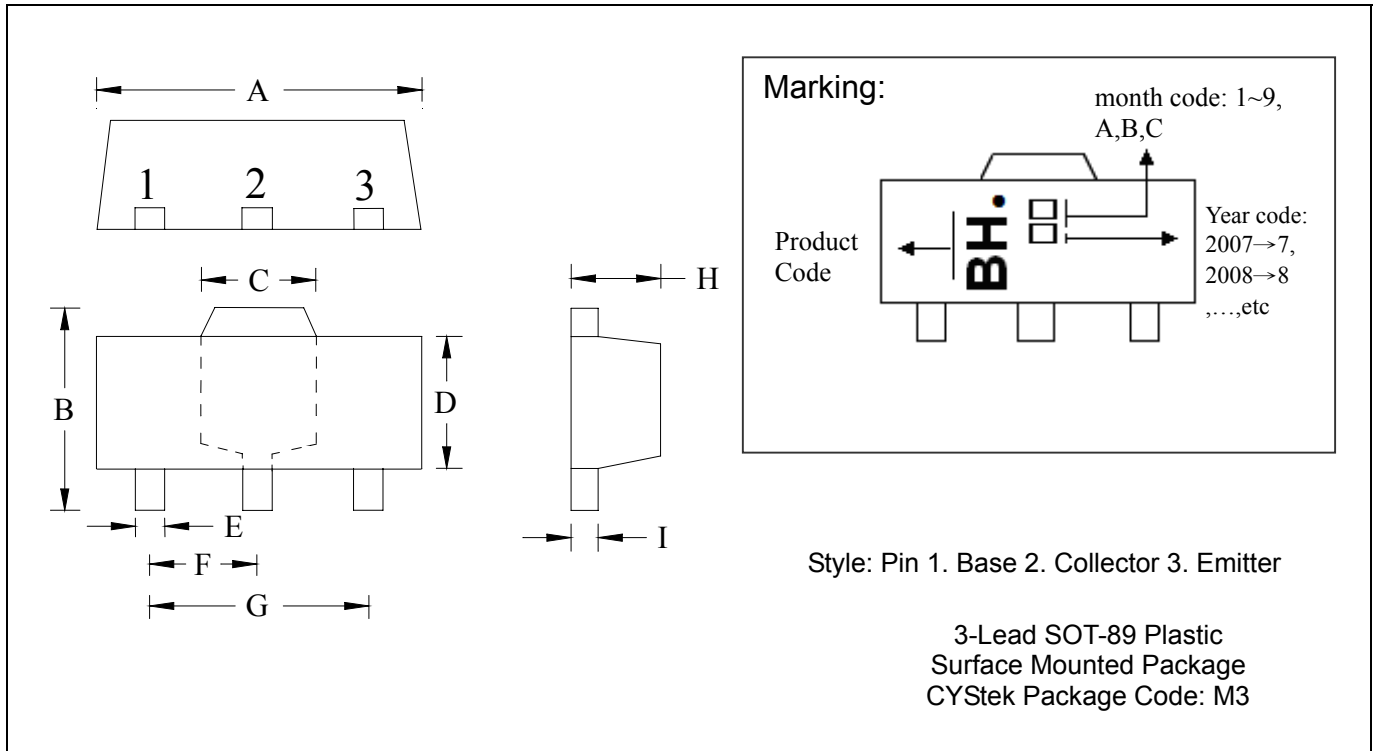
Recommended temperature profile for IR reflow



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(t _p)	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



*: Typical

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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