

General Purpose NPN Epitaxial Planar Transistor

BTC3906M3

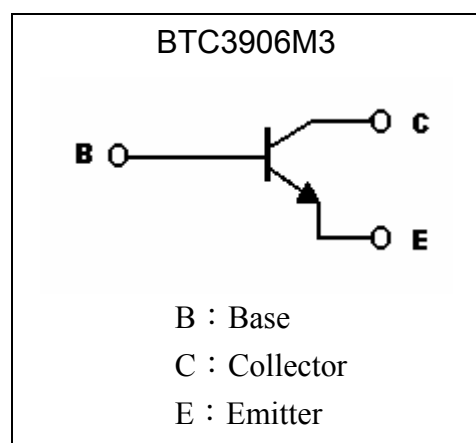
Description

The BTC3906M3 is designed for general purpose applications requiring high breakdown voltage.

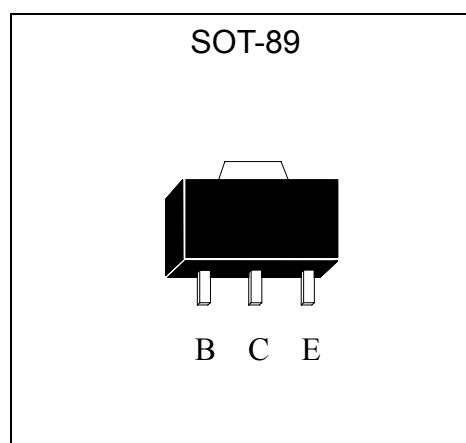
Features

- High collector-emitter breakdown voltage. ($BV_{CEO}=160V @ I_C=1mA$)
- Complement to BTA1514M3
- Pb-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	600	mA
Power Dissipation	P_d	0.6	W
		1 (Note 1)	W
		2 (Note 2)	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55~+150	°C

Note : 1. When mounted on FR-4 PCB with area measuring 10×10×1 mm

2 . When mounted on ceramic with area measuring 40×40×1 mm



Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	180	-	-	V	I _C =100μA
BV _{CEO}	160	-	-	V	I _C =1mA
BV _{EBO}	6	-	-	V	I _E =10μA
I _{CBO}	-	-	50	nA	V _{CB} =120V
I _{EBO}	-	-	50	nA	V _{EB} =4V
*V _{CE(sat)1}	-	0.1	0.15	V	I _C =10mA, I _B =1mA
*V _{CE(sat)2}	-	-	0.2	V	I _C =50mA, I _B =5mA
*V _{BE(sat)1}	-	-	1	V	I _C =10mA, I _B =1mA
*V _{BE(sat)2}	-	-	1	V	I _C =50mA, I _B =5mA
*h _{FE1}	50	-	-	-	V _{CE} =5V, I _C =1mA
*h _{FE2}	60	-	-	-	V _{CE} =5V, I _C =10mA
*h _{FE3}	50	-	-	-	V _{CE} =5V, I _C =50mA
*h _{FE4}	120	-	390	-	V _{CE} =6V, I _C =2mA
f _T	100	-	-	MHz	V _{CE} =20V, I _C =10mA, f=100MHz
Cob	-	-	6	pF	V _{CB} =20V, I _E =0A, f=1MHz

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

Classification Of hFE 4

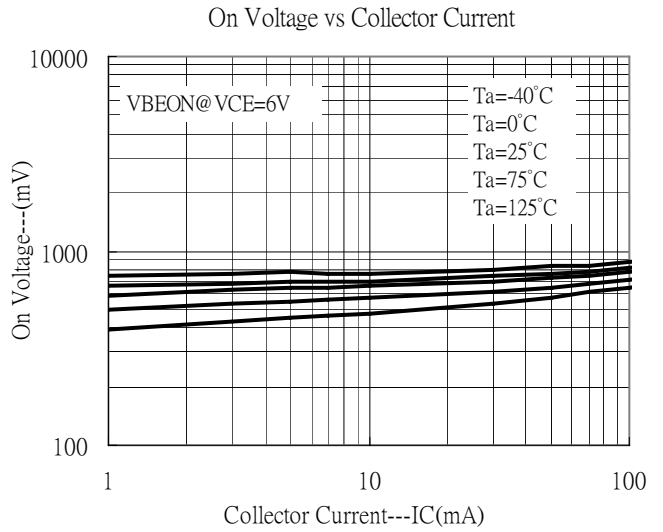
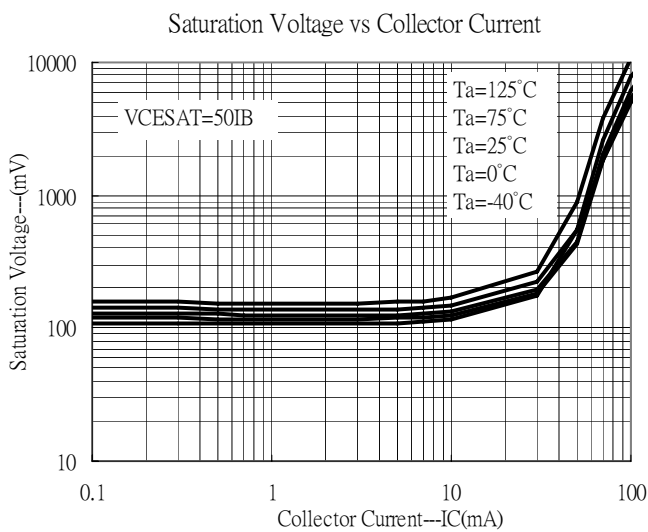
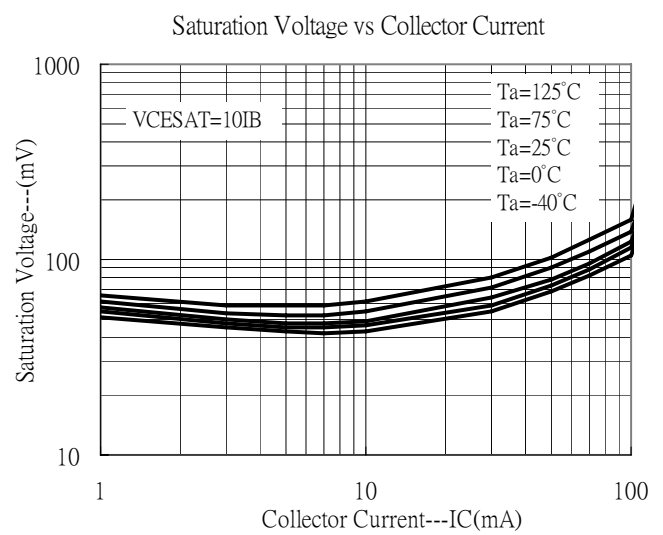
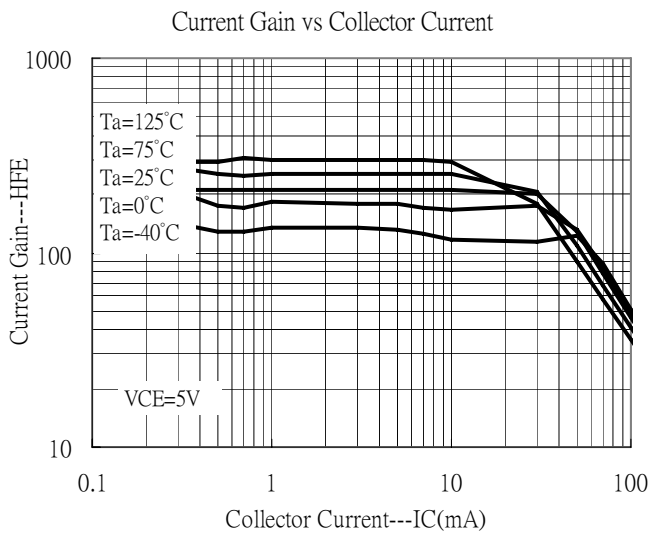
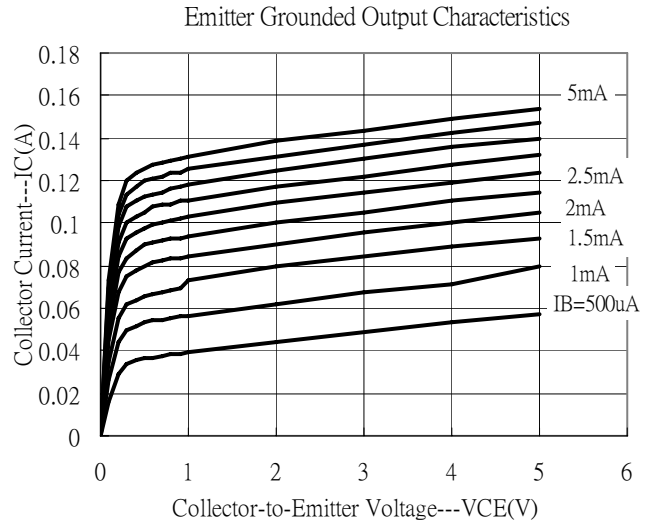
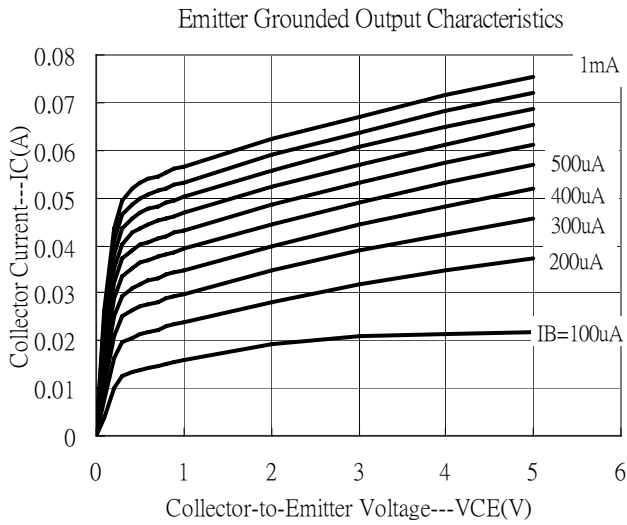
Rank	Q	R
Range	120~270	180~390

Ordering Information

Device	HFE rank	Package	Shipping
BTC3906M3-T2-G	Q / R	SOT-89 (Pb-free lead plating and halogen-free)	1000 pcs / Tape & Reel

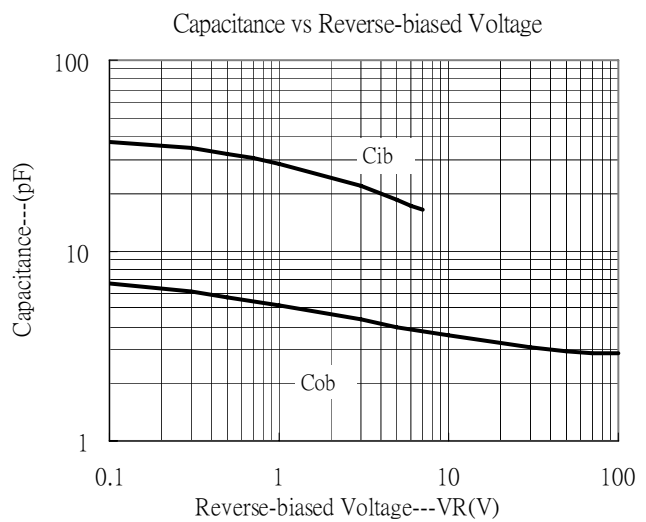
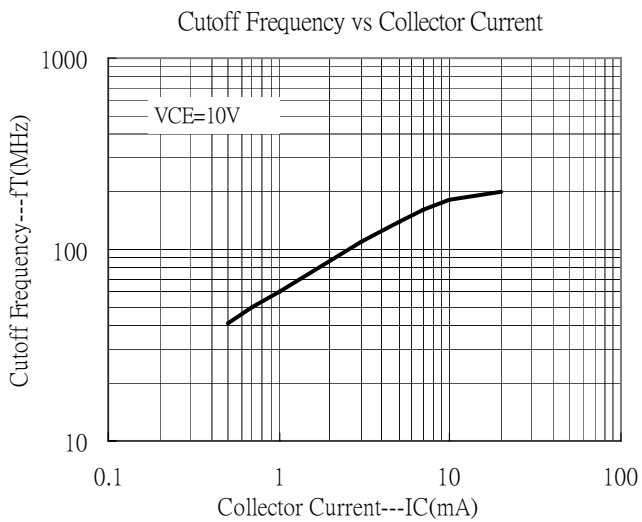
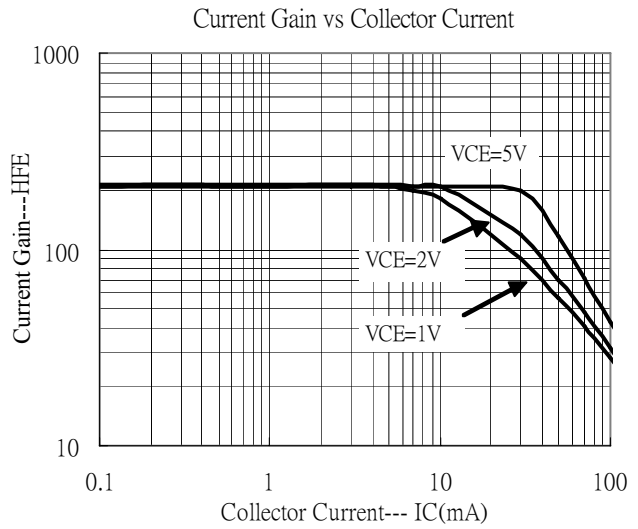
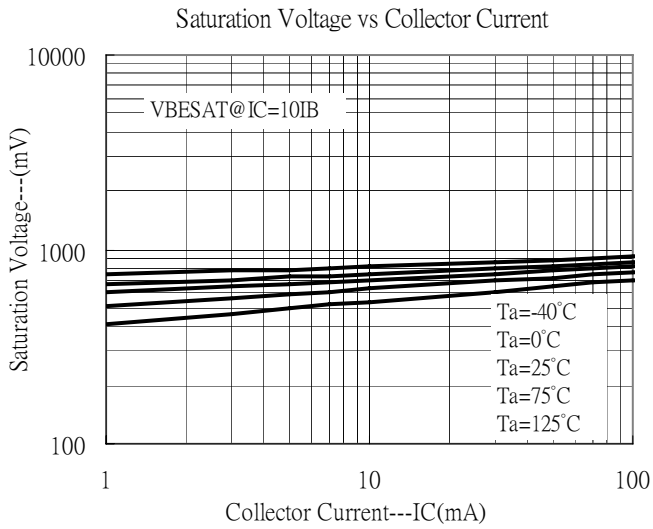


Typical Characteristics

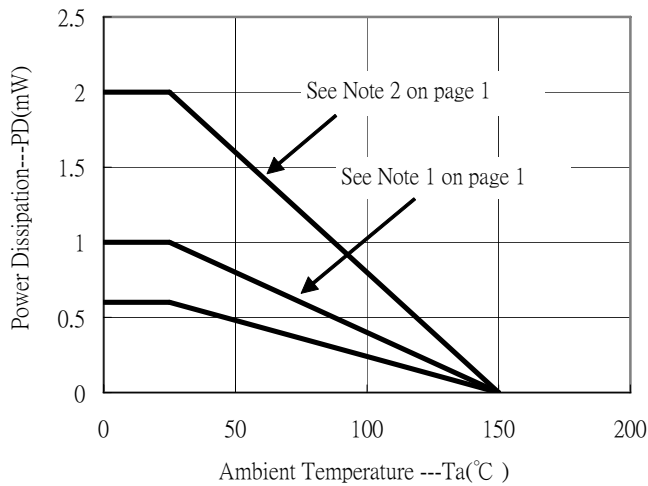




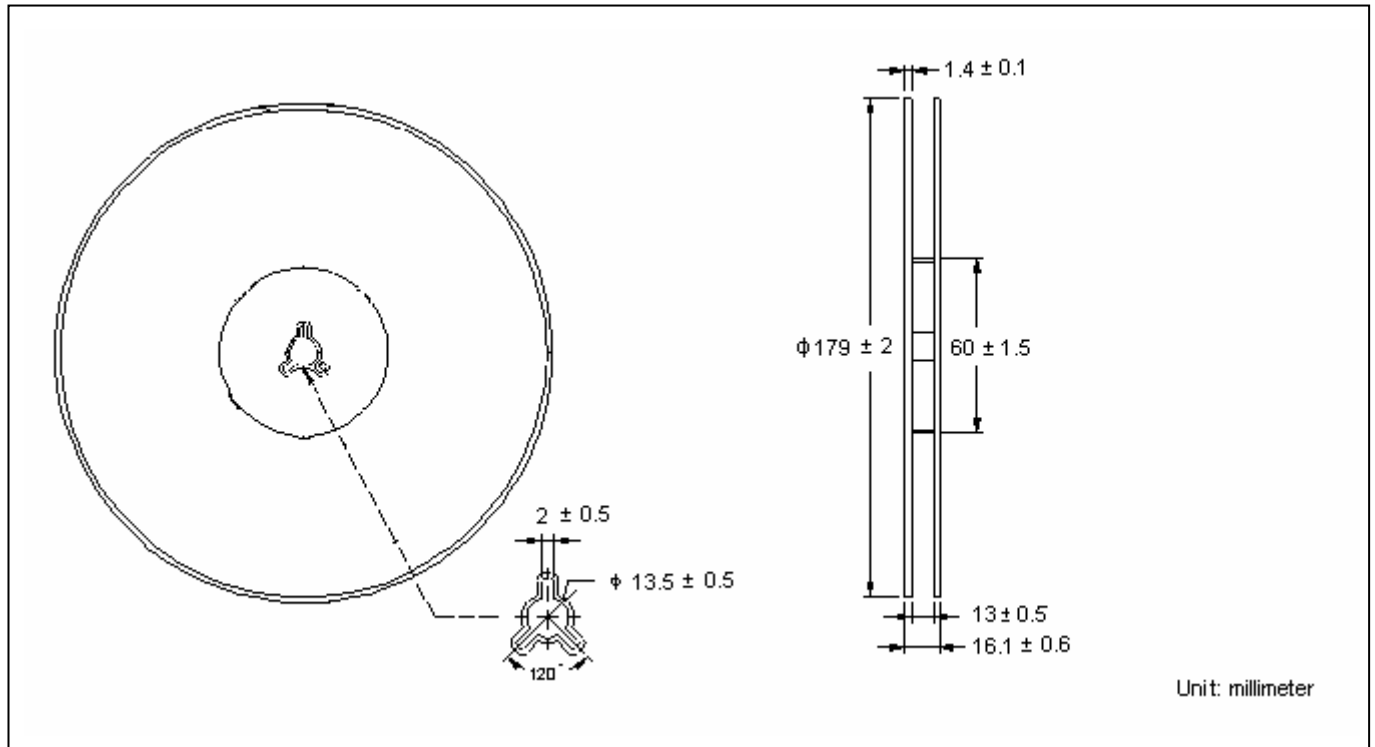
Typical Characteristics(Cont.)



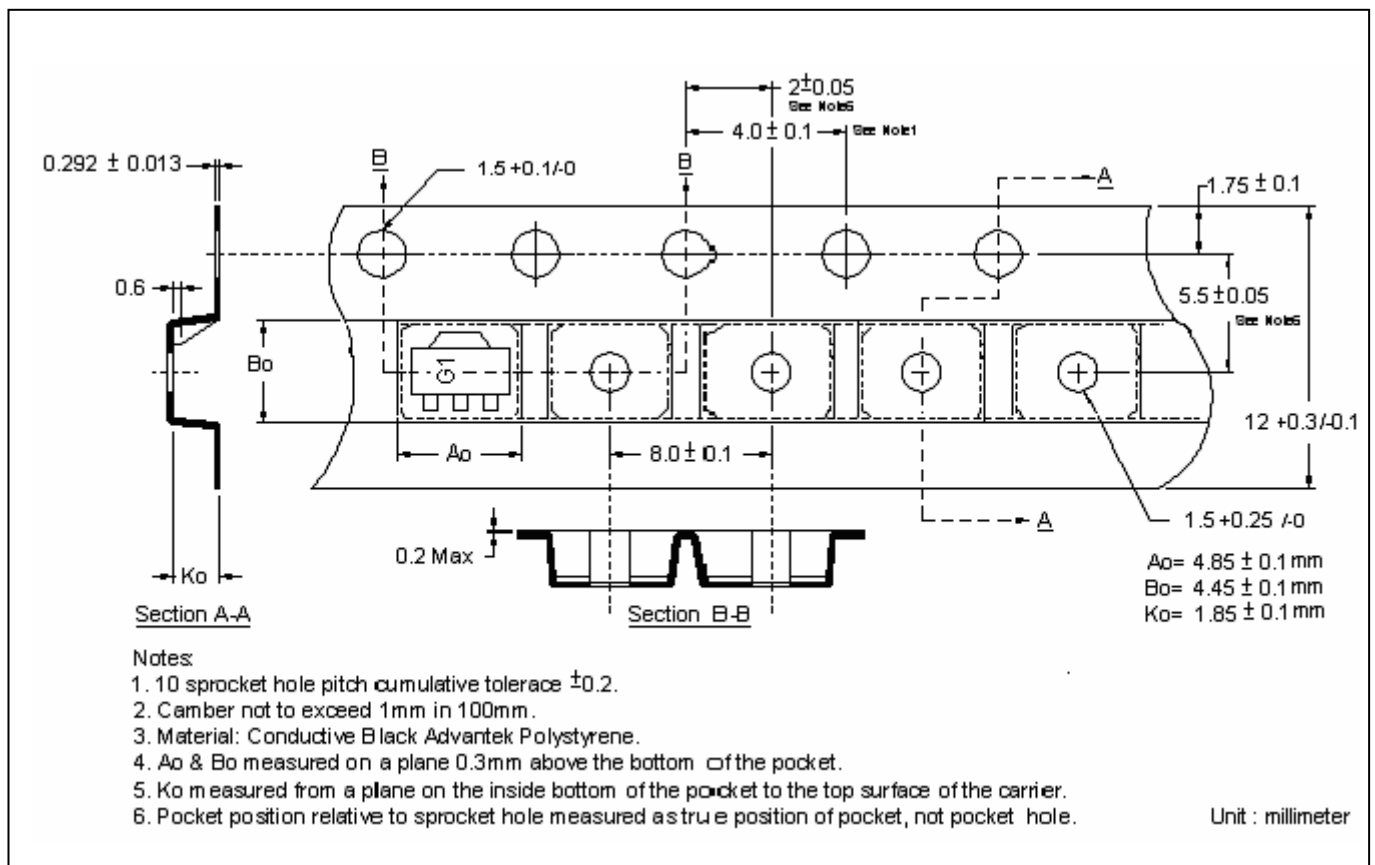
Power Derating Curves



Reel Dimension



Carrier Tape Dimension



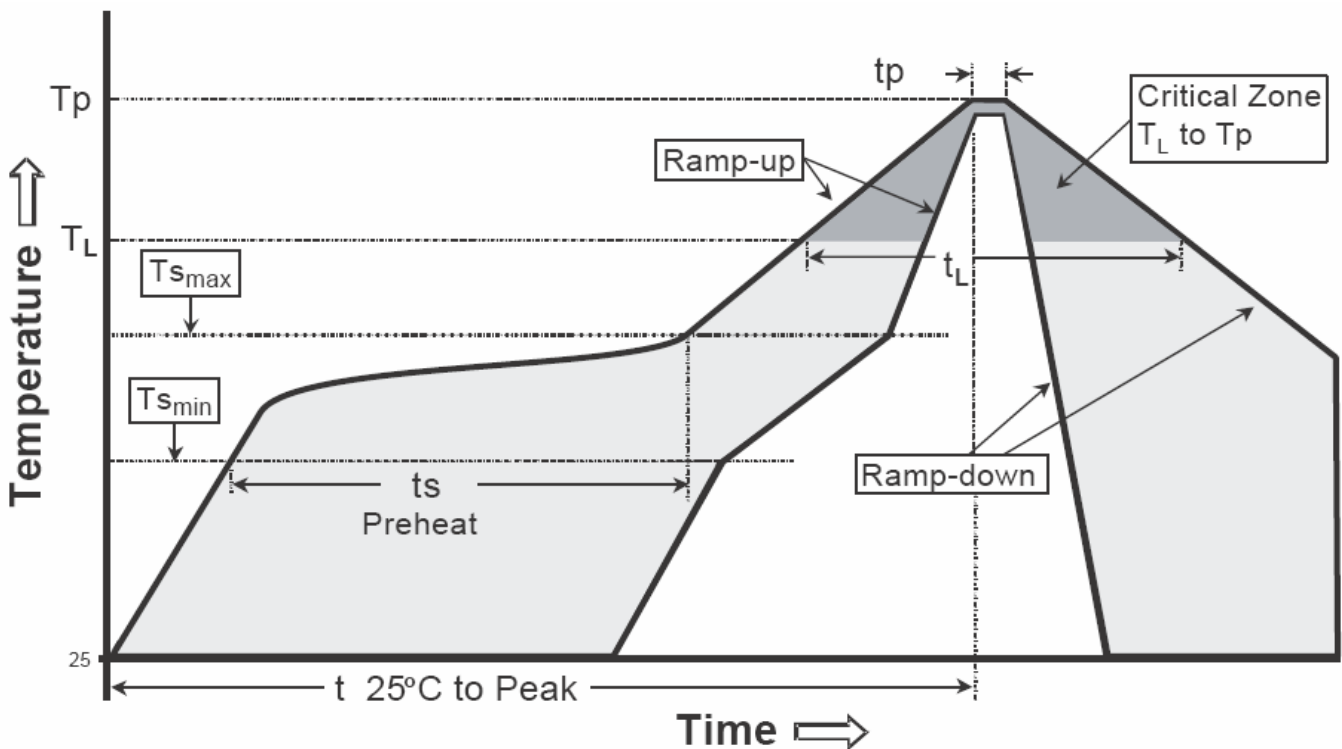
Notes:

1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. A_0 & B_0 measured on a plane 0.3mm above the bottom of the pocket.
5. K_0 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.

Recommended wave soldering condition

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

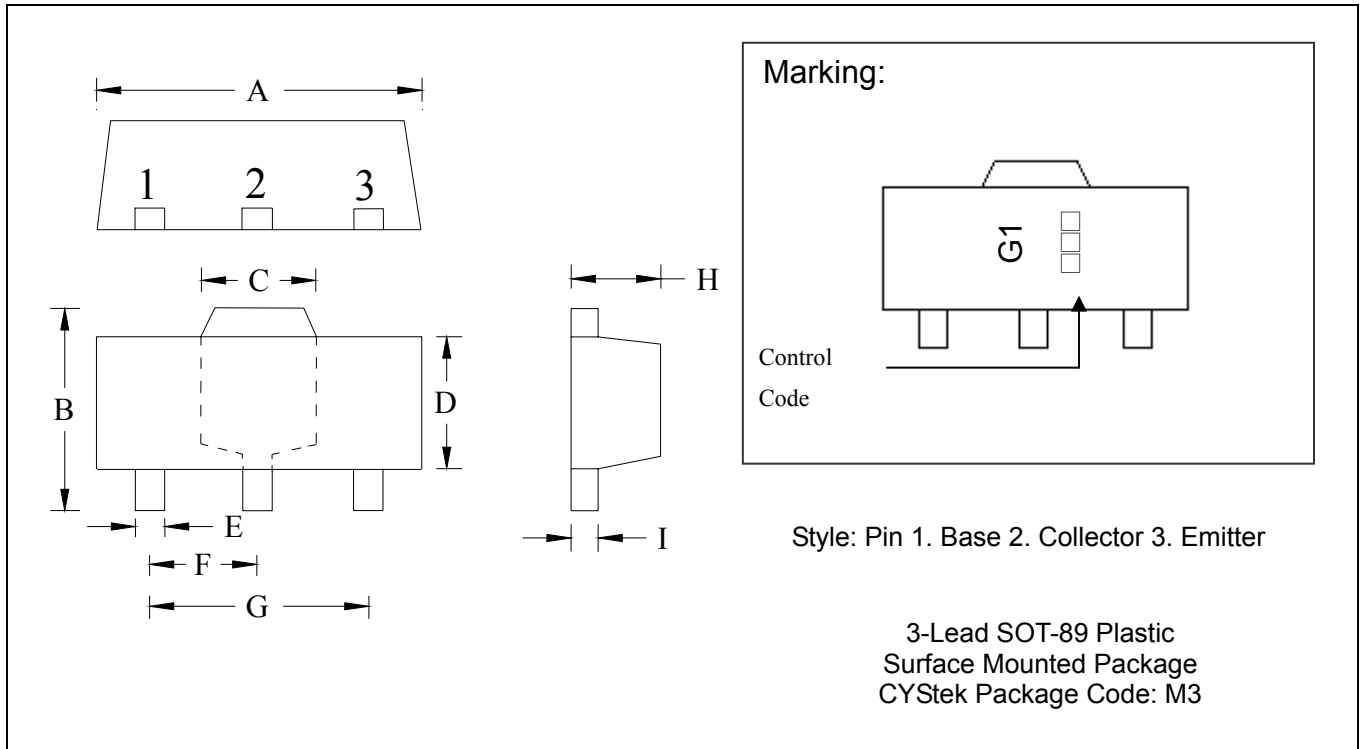
Recommended temperature profile for IR reflow



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



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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