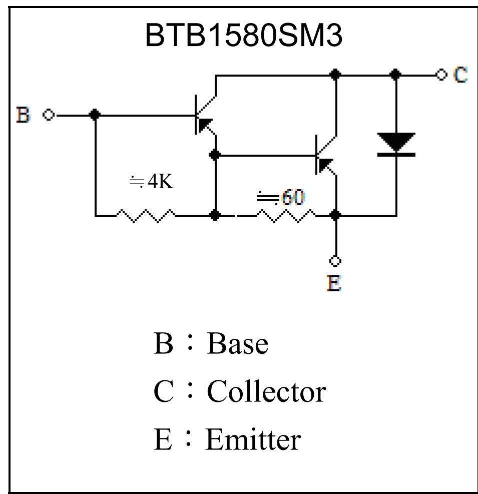
PNP Epitaxial Planar Transistor

BTB1580SM3

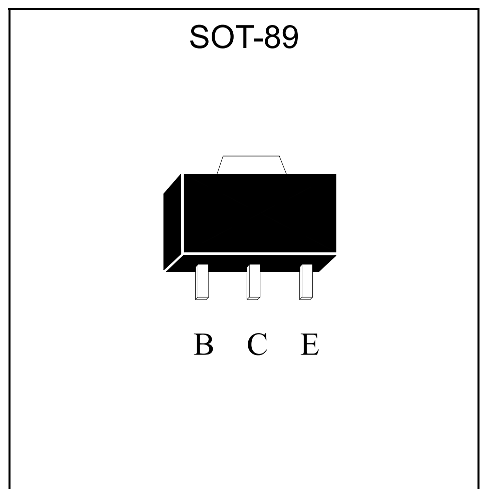
Description

The BTB1580SM3 is a PNP Darlington transistor, designed for use in general purpose amplifier and low speed switching application. Pb-free package process is adopted.

Equivalent Circuit

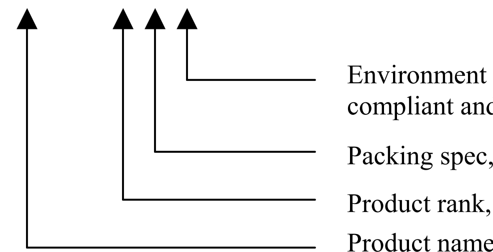


Outline



Ordering Information

Device	Package	Shipping
BTB1580SM3-0-T2-G	SOT-89 (Pb-free lead plating and halogen-free package)	1000 pcs / Tape & Reel



Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products

Packing spec, T2 :1000 pcs/tape & reel, 7” reel

Product rank, zero for no rank products

Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	-120	V
Collector-Emitter Voltage	V_{CEO}	-120	
Emitter-Base Voltage	V_{EBO}	-5	
Collector Current (DC)	I_C	-4	A
Collector Current (Pulse)	I_{CP}	-6 (Note 1)	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	208	°C/W
		125 (Note 2)	
		62.5 (Note 3)	
		85 (Note 4)	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	43	
Power Dissipation	P_D	0.7	W
		1.2 (Note 2)	
		2.4 (Note 3)	
		1.8 (Note 4)	
Power Dissipation @ T_C=25°C		3.5	
Opeearting Junction Temperature Range	Tj	-55~+175	°C
Storage Temperature Range	Tstg	-55~+175	

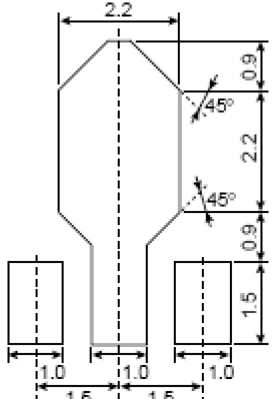
Note : 1. Single Pulse Pw≦350μs, Duty≦2%.
2. When mounted on a FR-4 PCB with area measuring 10×10×1 mm.
3. When mounted on a ceramic board with area measuring 40×40×1mm.
4. When mounted on a FR-4 PCB with area measuring 30×30×1 mm.

Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CEO}	-120	-	-	V	I_C=-1mA, I_B=0
BV_{CBO}	-120	-	-	V	I_C=-100μA, I_E=0
I_{CBO}	-	-	-100	nA	V_{CB}=-120V, I_E=0
I_{CEO}	-	-	-1	μA	V_{CE}=-120V, I_B=0
I_{EBO}	-	-	-2	mA	V_{EB}=-5V, I_C=0
*$V_{CE(sat)}$	-	-	-1.8	V	I_C=-2A, I_B=-2mA
*$V_{BE(on)}$			-2.2	V	V_{CE}=-4V, I_C=-2A
*$h_{FE}1$	1000	-	-	-	V_{CE}=-4V, I_C=-1A
*$h_{FE}2$	1000	-	-	-	V_{CE}=-4V, I_C=-2A
Cob	-		200	pF	V_{CB}=-10V, I_E=0A, f=1MHz

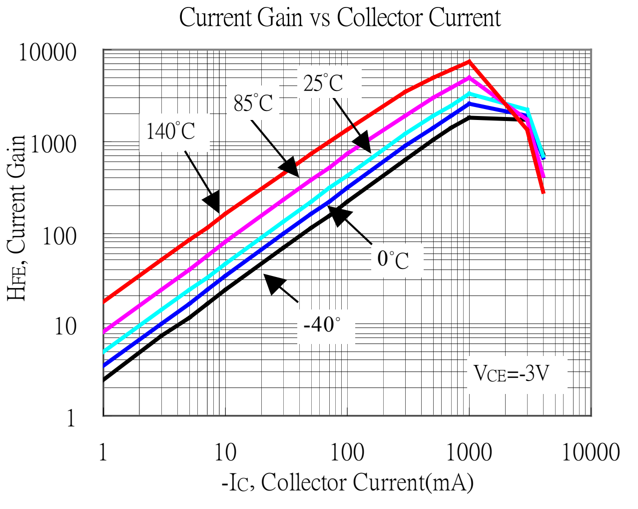
*Pulse Test : Pulse Width ≤380μs, Duty Cycle≤2%

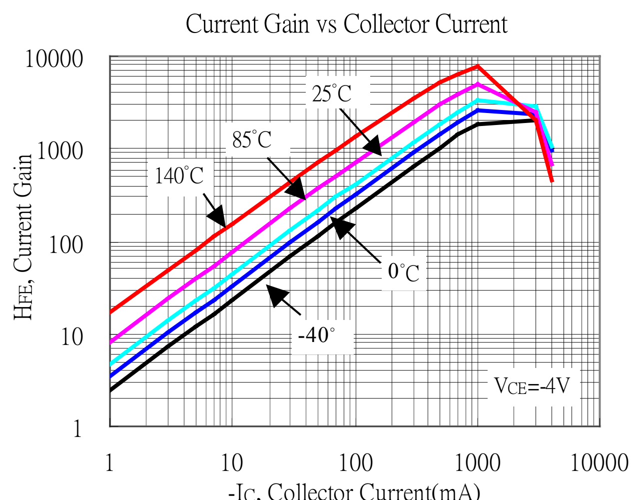
Recommended soldering footprint

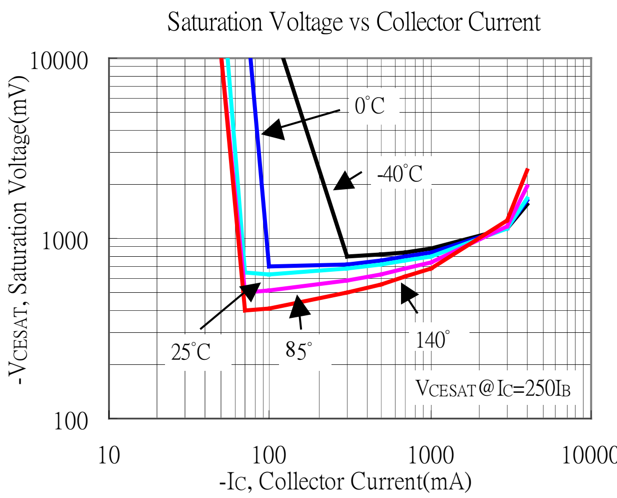


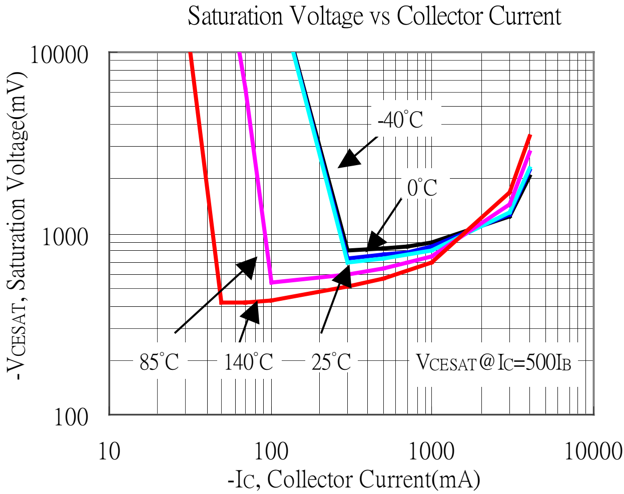
unit : mm

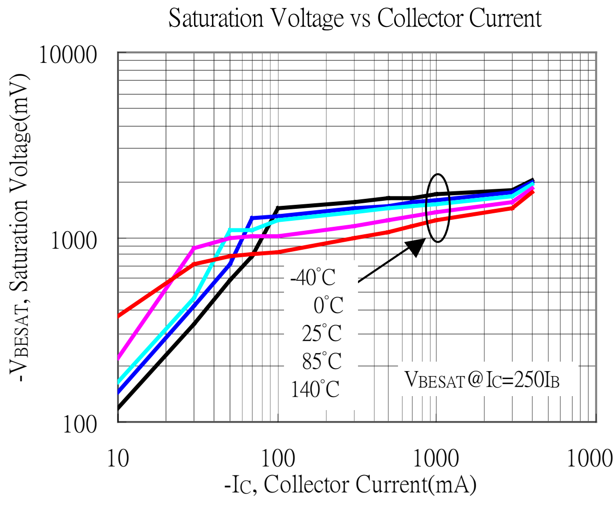
Typical Characteristics

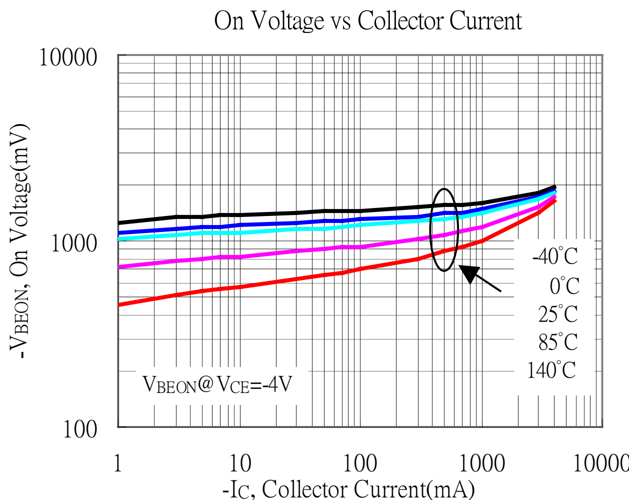




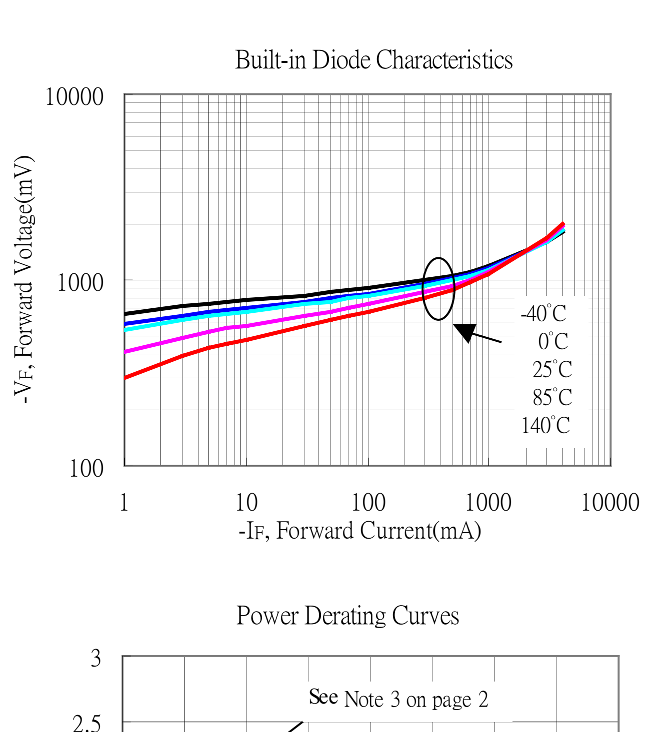


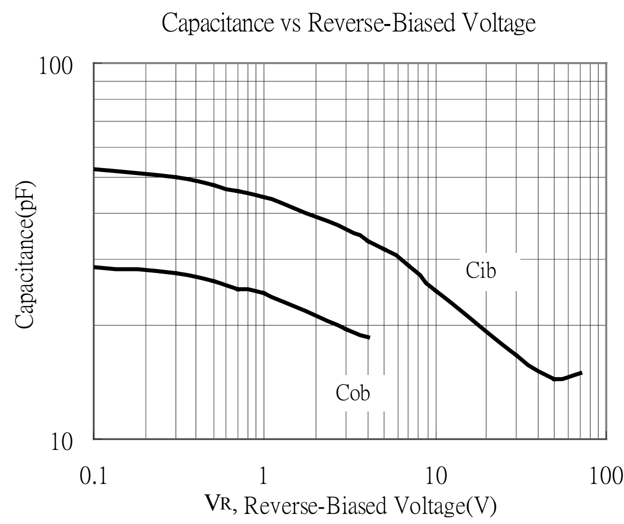


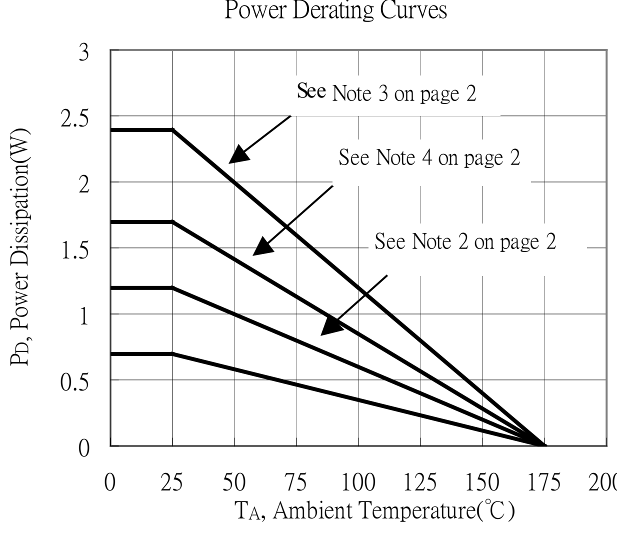


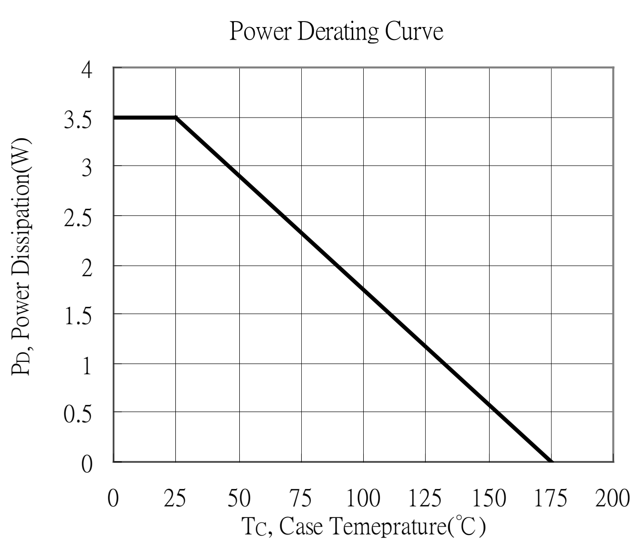


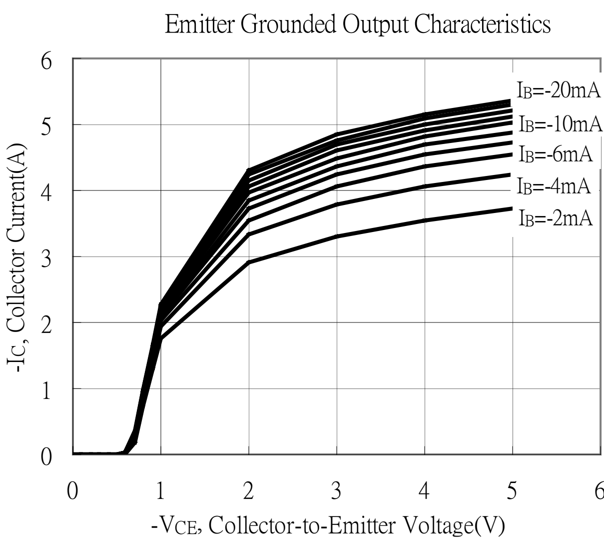
Typical Characteristics(Cont.)

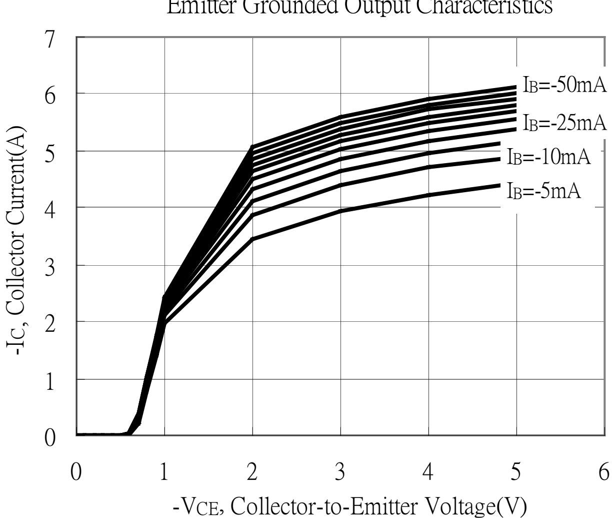




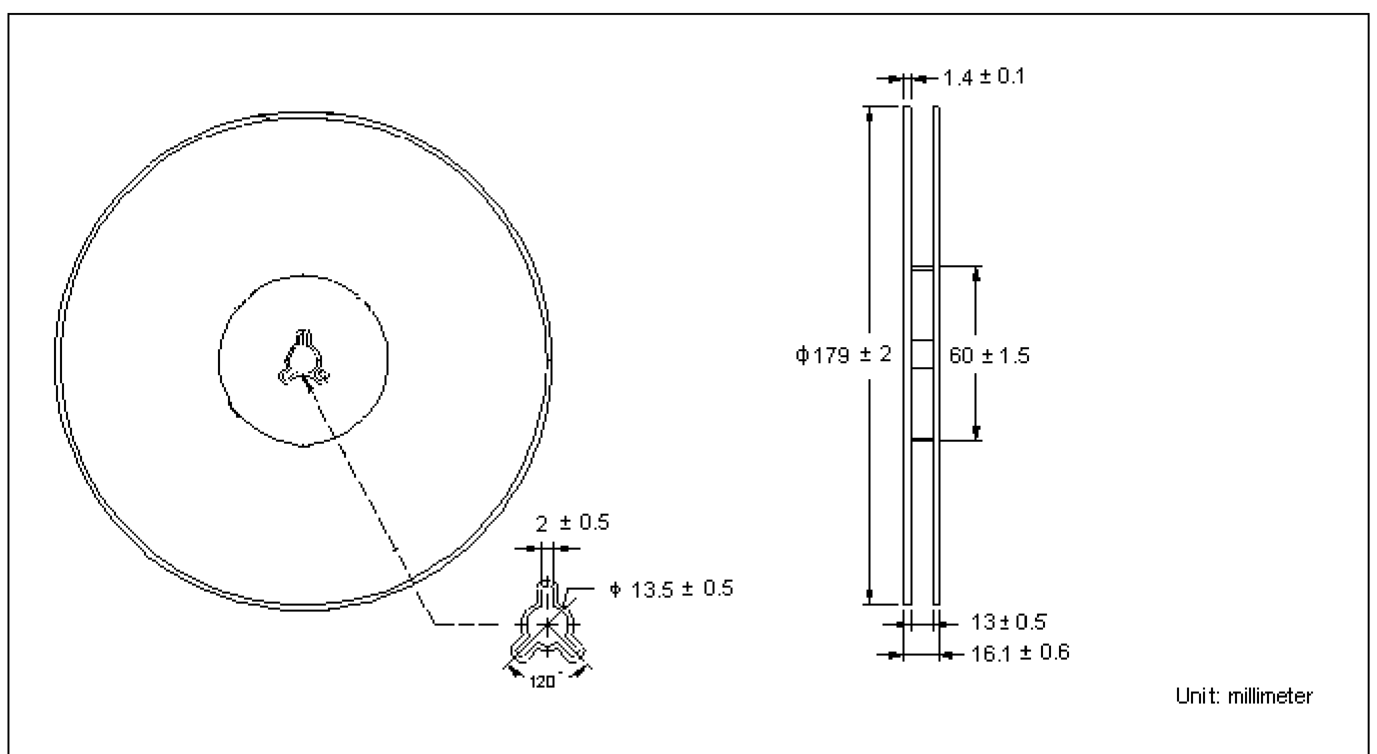




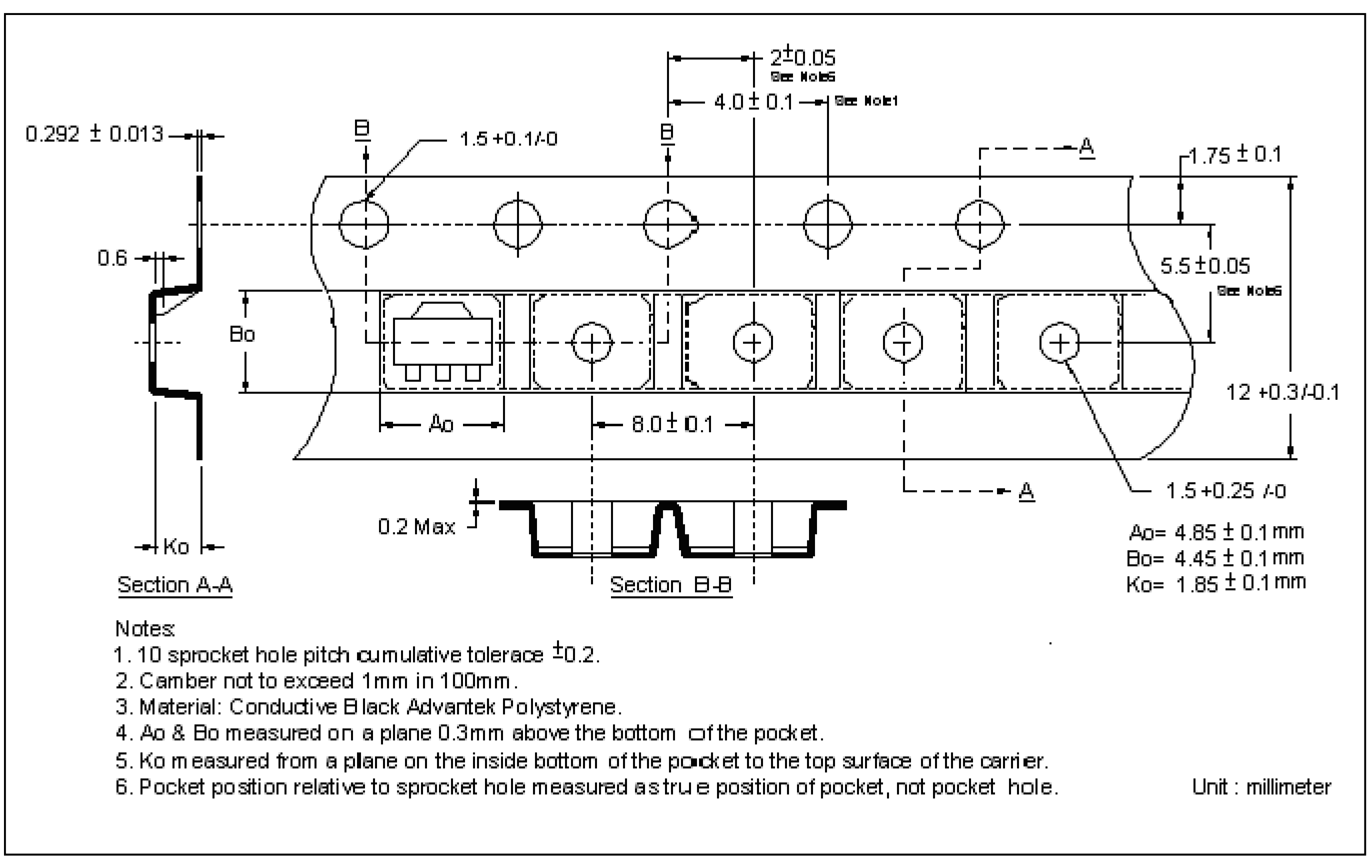




Reel Dimension



Carrier Tape Dimension



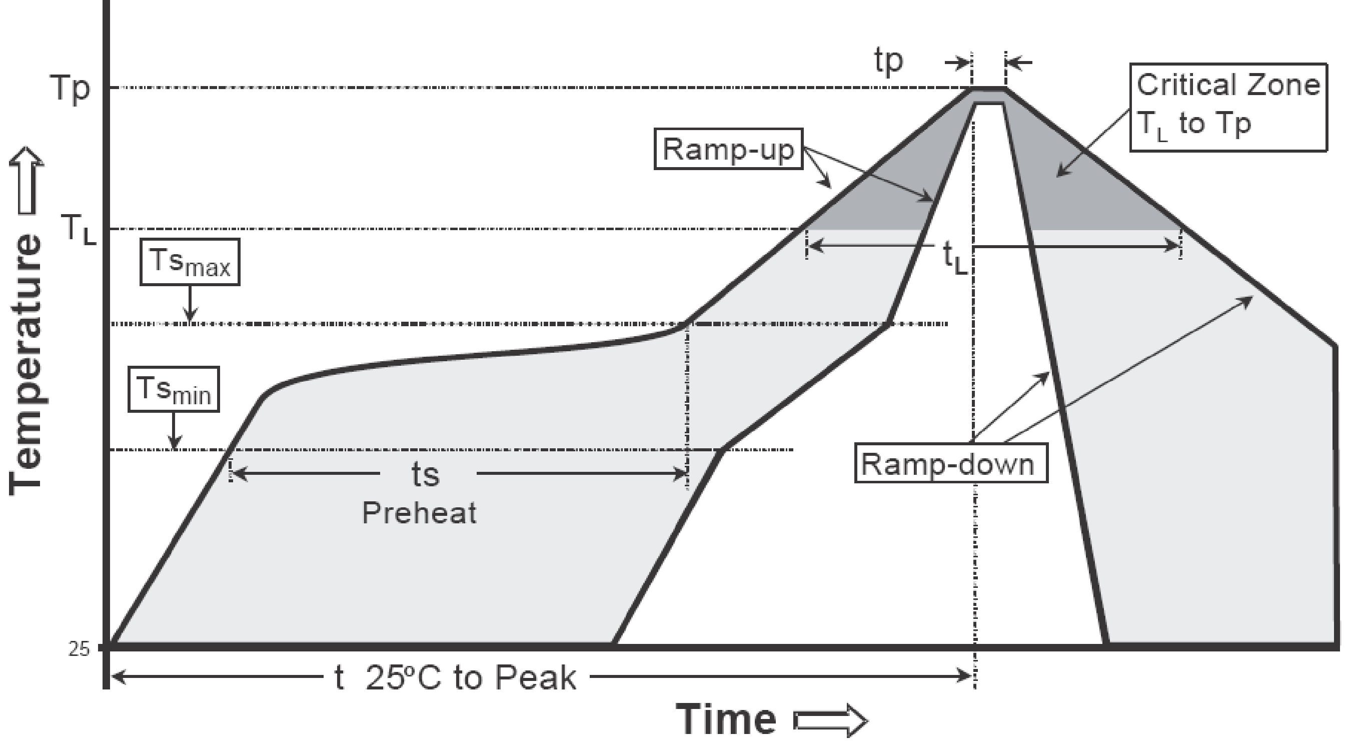
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

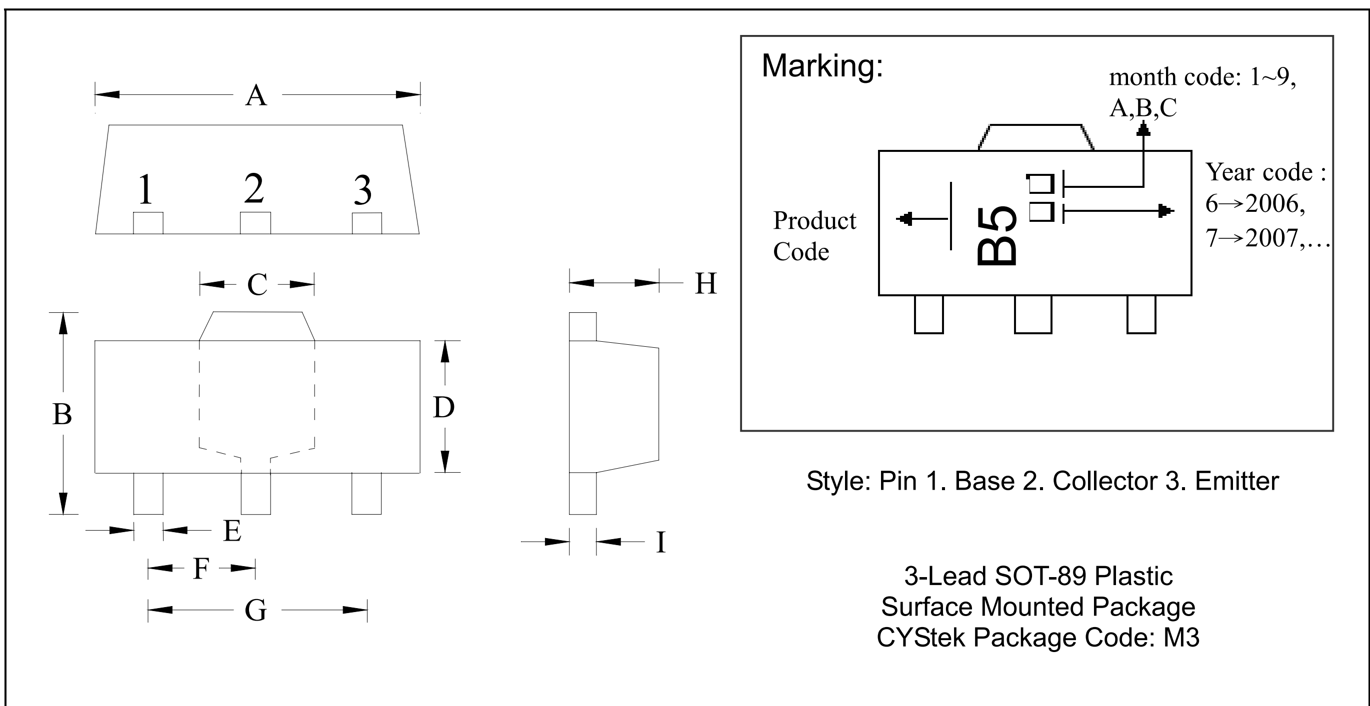
Recommended temperature profile for IR reflow



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) −Temperature Max(Ts 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 (TL) − Time (tL)	 183°C 60-150 seconds	 217°C 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 :1. All temperatures refer to topside of the package, measured on the package body surface.
2. For devices mounted on FR-4 PCB of 1.6mm or equivalent grade PCB. If other grade PCB is used, care should be taken to match the coefficients of thermal expansion between components and PCB. If they are not matched well, the solder joints may crack or the bodies of the parts may crack or shatter as the assembly cools.

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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