Silicon NPN Epitaxial Planar Transistor

BTD1857AM3

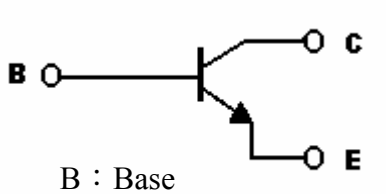
BV_{CEO}	160V
I_C	1.5A
$R_{CESAT(MAX)}$	0.3Ω

Description

- High BV_{CEO}
- High current capability
- Complementary to BTB1236AM3
- Pb-free lead plating and halogen-free package

Symbol

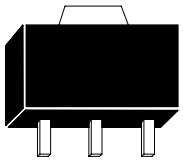
BTD1857AM3



B：Base
C：Collector
E：Emitter

Outline

SOT-89



B C E

Ordering Information

Device	Package	Shipping
BTD1857AM3-X-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}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	5	V
Collector Current (DC)	I_C	1.5	A
Collector Current (Pulse)	I_{CP}	3	A
Power Dissipation	P_D	0.6	W
		1 (Note 1)	
		2 (Note 2)	
Operating Junction and Storage Temperature Range	Tj ; Tstg	-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

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	208	°C/W
		125 (Note 1)	
		62.5 (Note 2)	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	39.3	°C/W

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=50μA, I_E=0
BV_{CEO}	160	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	5	-	-	V	I_E=50μA, I_C=0
I_{CBO}	-	-	1	μA	V_{CB}=160V, I_E=0
I_{EBO}	-	-	1	μA	V_{EB}=4V, I_C=0
*$V_{CE(sat)}$	-	-	0.3	V	I_C=1A, I_B=100mA
*$R_{CE(sat)}$	-	-	0.3	Ω	I_C=1A, I_B=100mA
*$V_{BE(on)}$	-	-	1.5	V	V_{CE}=5V, I_C=150mA
$h_{FE}1$	180	-	390	-	V_{CE}=5V, I_C=150mA
$h_{FE}2$	30	-	-	-	V_{CE}=5V, I_C=500mA
f_T	-	140	-	MHz	V_{CE}=5V, I_C=150mA
Cob	-	27	-	pF	V_{CB}=10V, I_E=0, f=1MHz

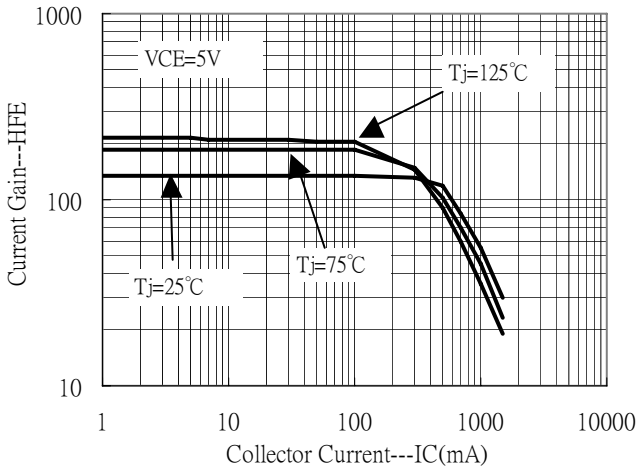
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Classification Of h_{FE} 1

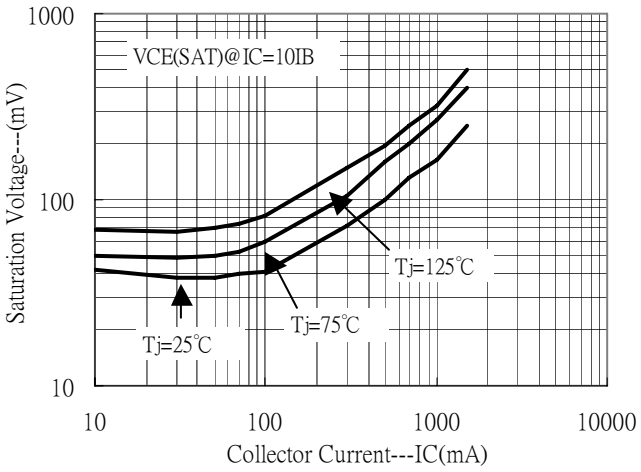
Rank	R
Range	180~390

Characteristic Curves

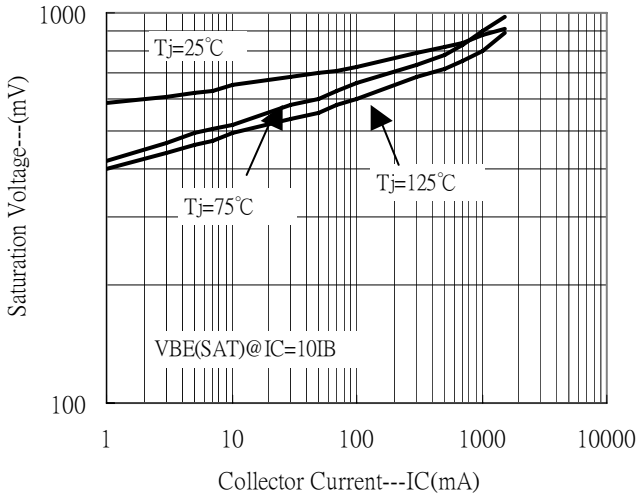
Current Gain vs Collector Current



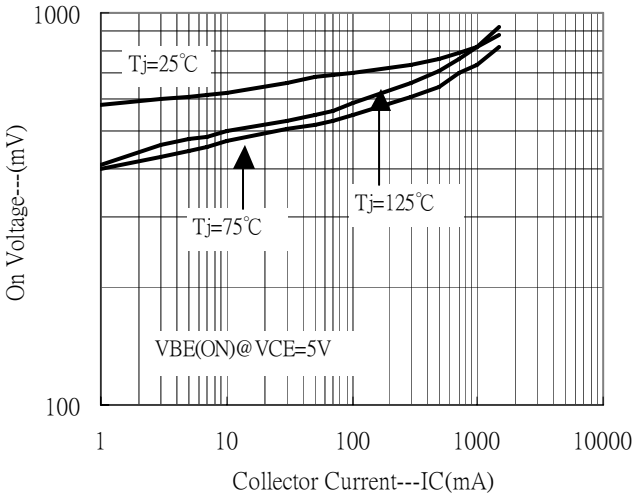
Saturation Voltage vs Collector Current



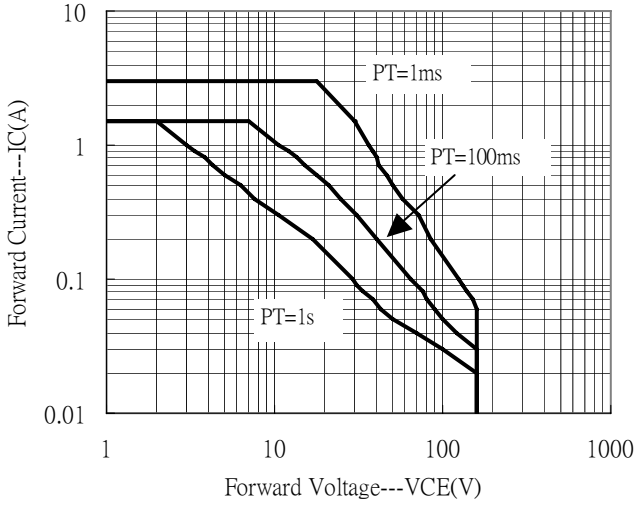
Saturation Voltage vs Collector Current



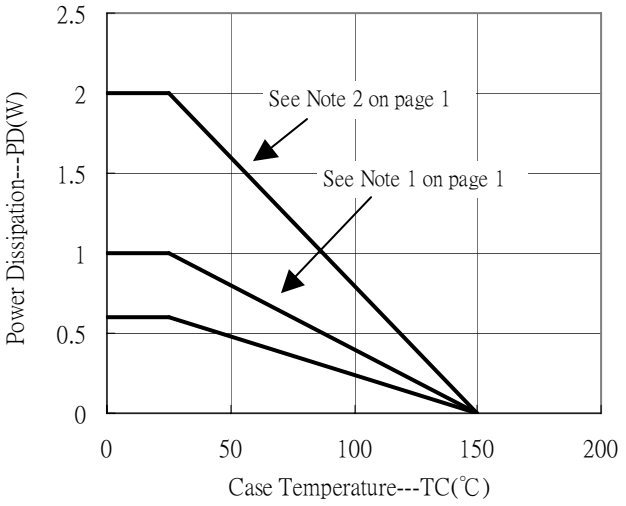
On Voltage vs Collector Current



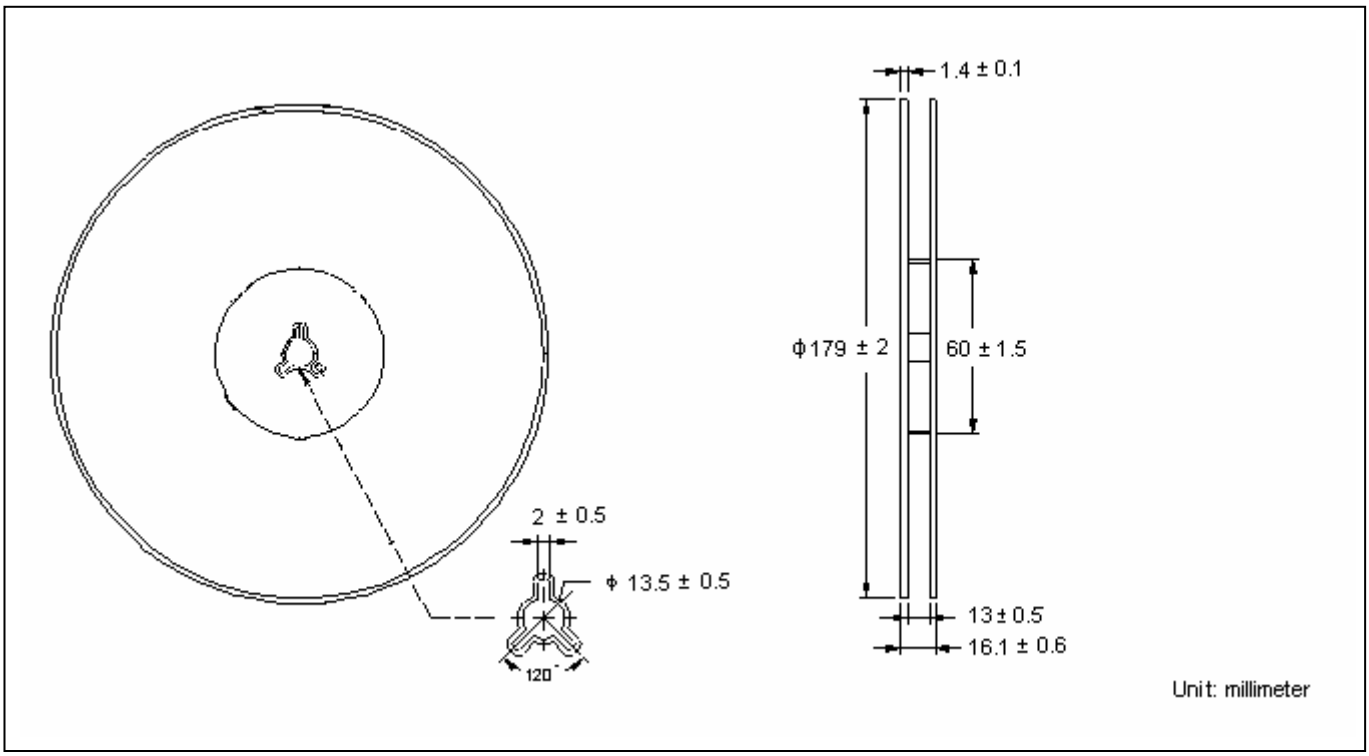
Safe Operationg Area



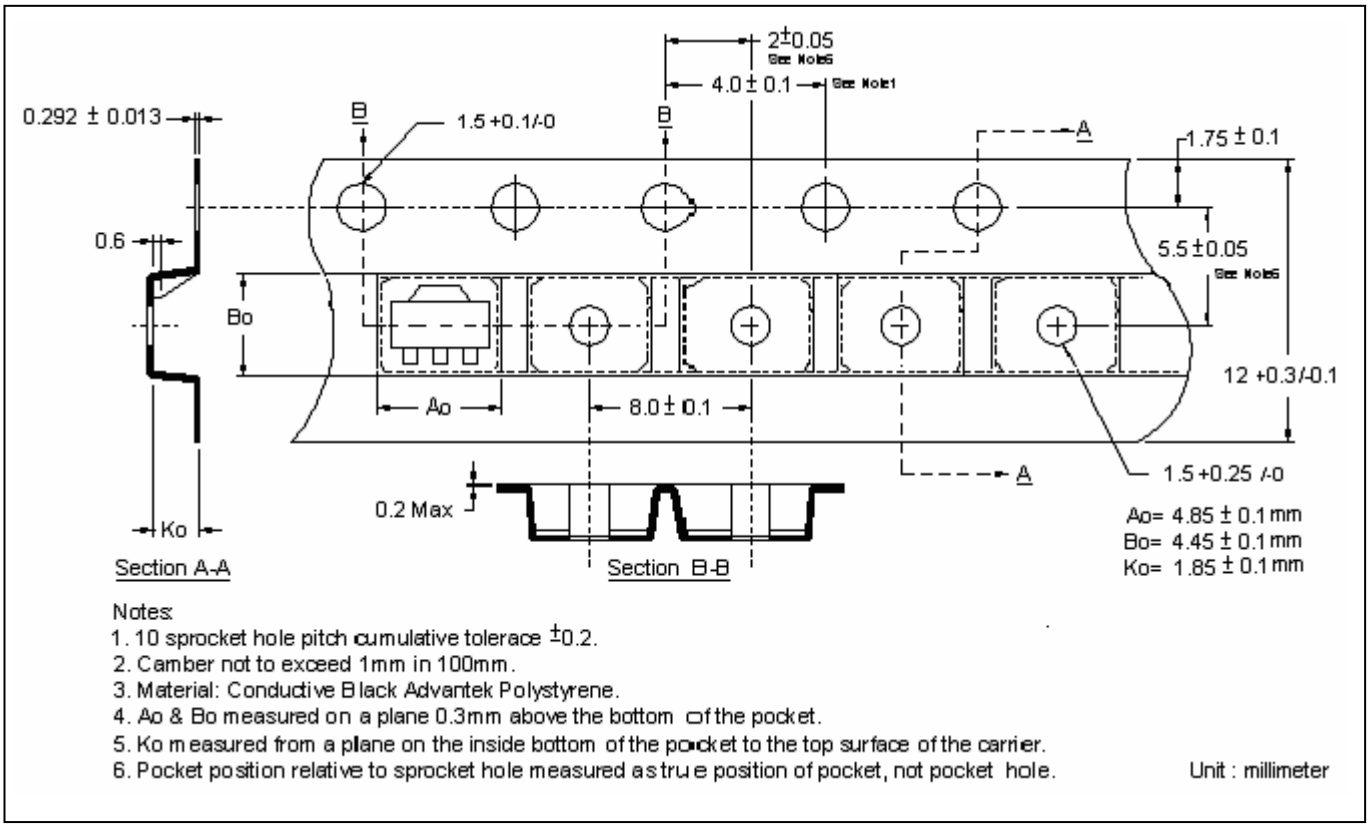
Power Derating Curve



Reel Dimension



Carrier Tape Dimension



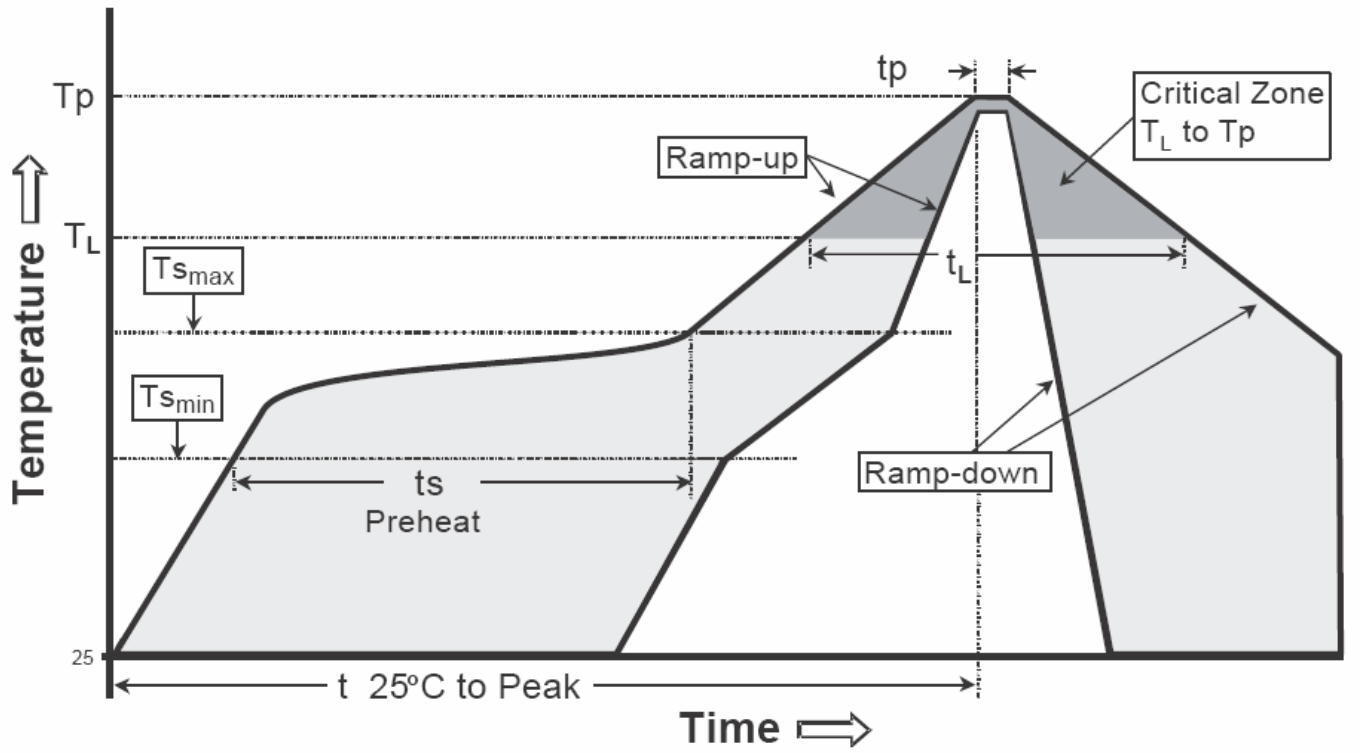
Notes:
1. 10 sprocket hole pitch cumulative tolerace ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of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

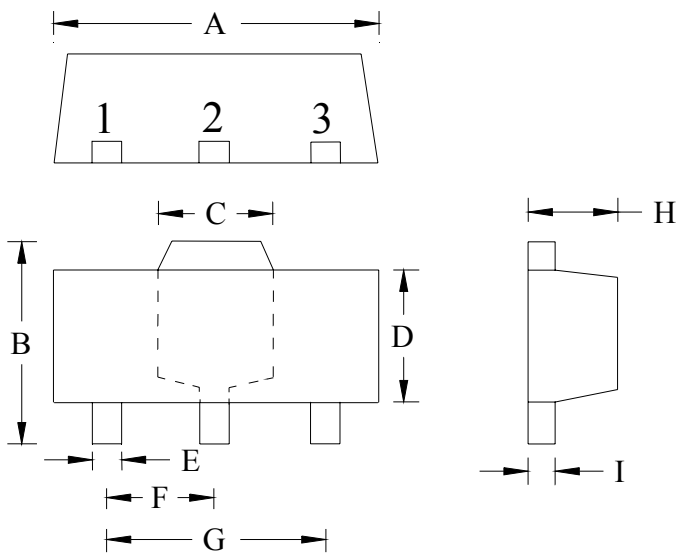
Recommended temperature profile for IR reflow

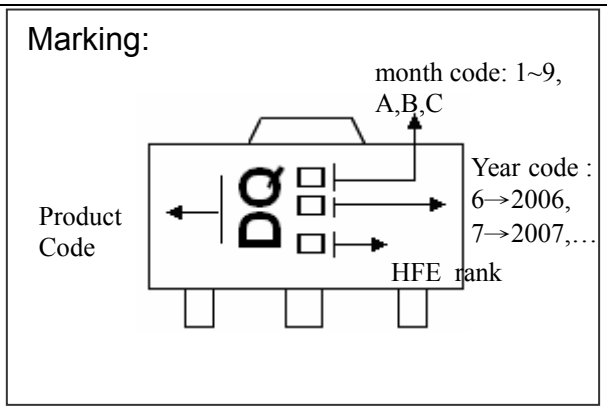


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 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





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