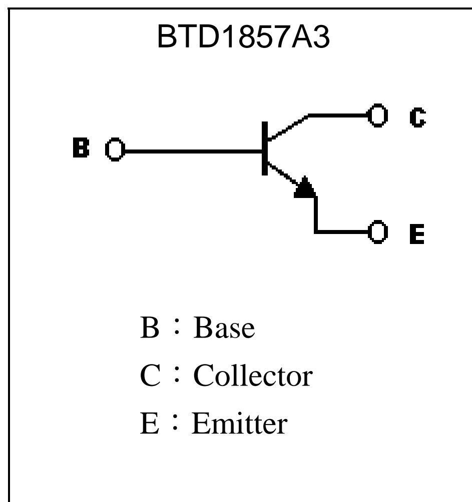
Silicon NPN Epitaxial Planar Transistor

BTD1857A3

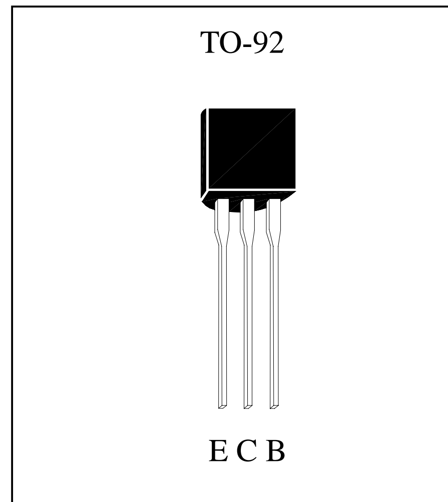
Description

- High BV_{CEO}
- High current capability
- Complementary to BTB1236A3
- Pb-free lead plating and halogen-free package

Symbol

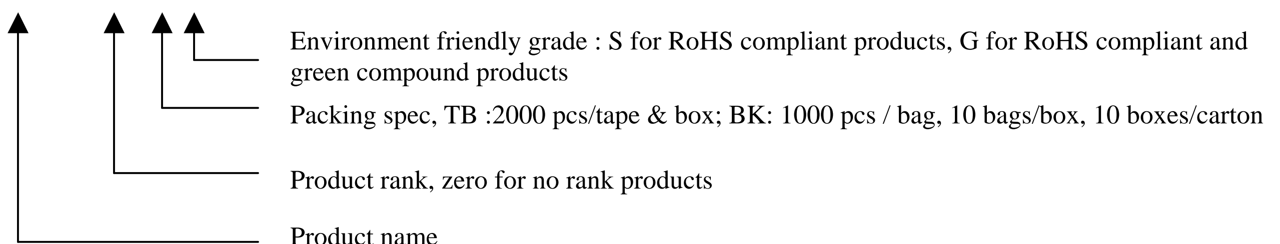


Outline



Ordering Information

Device	Package	Shipping
BTD1857A3-X-TB-G	TO-92 (Pb-free lead plating and halogen-free package)	2000 pcs / Tape & Box
BTD1857A3-X-BK-G	TO-92 (Pb-free lead plating and halogen-free package)	1000 pcs/ bag, 10 bags/box, 10boxes/carton



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	180	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 @T_A=25℃	P_D	750	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Characteristics (Ta=25°C)

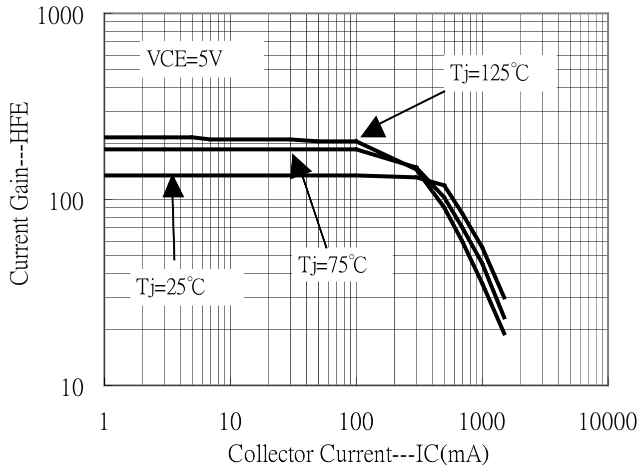
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	180	-	-	V	I_C=50μA, I_E=0
BV_{CEO}	180	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	5	-	-	V	I_E=50μA, I_C=0
I_{CBO}	-	-	1	μA	V_{CB}=160V, I_E=0
I_{EBO}	-	-	1	μA	V_{EB}=4V, I_C=0
*$V_{CE(sat)}$	-	-	0.6	V	I_C=1A, I_B=100mA
*$V_{BE(on)}$	0.45	-	0.8	V	V_{CE}=5V, I_C=5mA
$h_{FE}1$	180	-	400	-	V_{CE}=5V, I_C=200mA
$h_{FE}2$	30	-	-	-	V_{CE}=5V, I_C=500mA
f_T	-	140	-	MHz	V_{CE}=5V, I_C=150mA
Cob	-	18	-	pF	V_{CB}=10V, I_E=0, f=1MHz

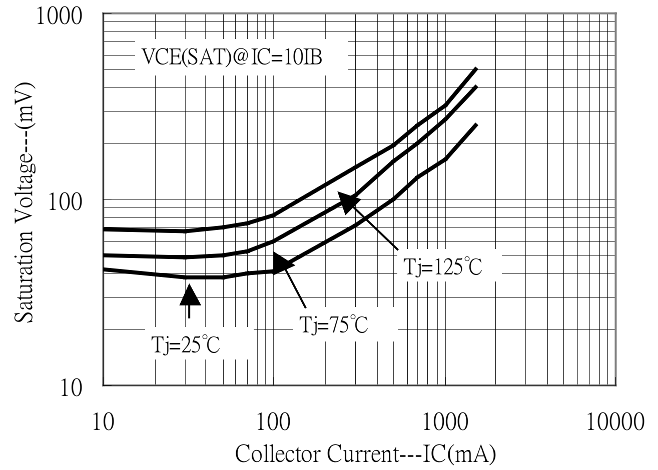
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

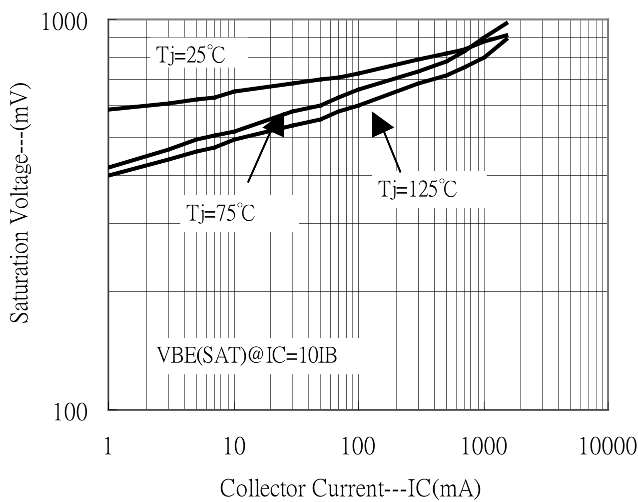
Classification of H_{FE} 1

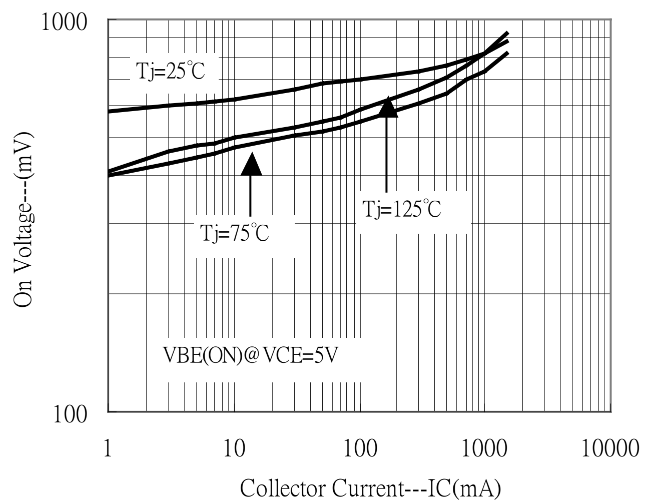
Rank	Range
R	180~400

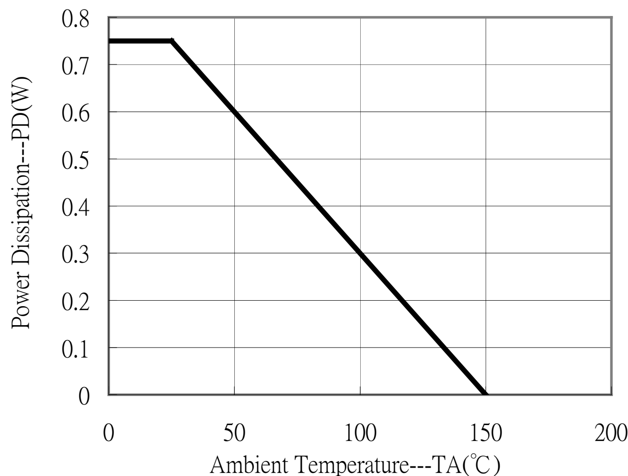
Typical Characteristics



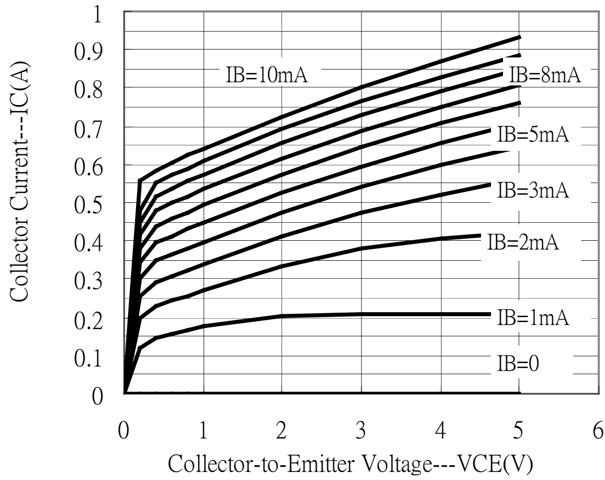


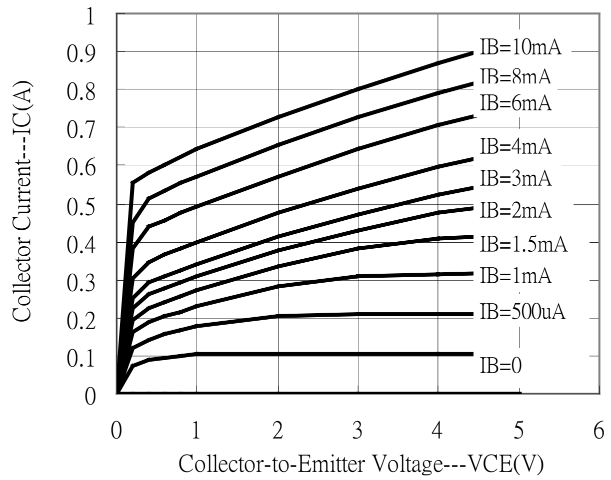


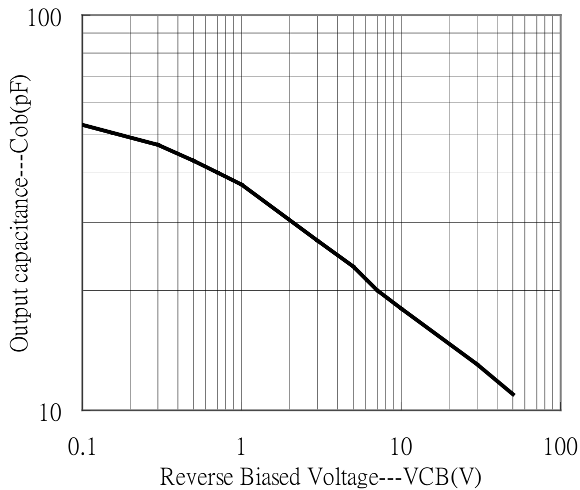


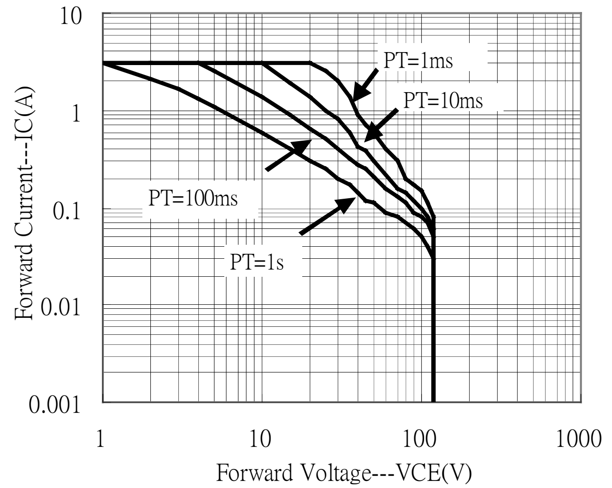


Typical Characteristics (Cont.)









Product Designation

BT X XXXX XX

(1) (2) (3) (4)

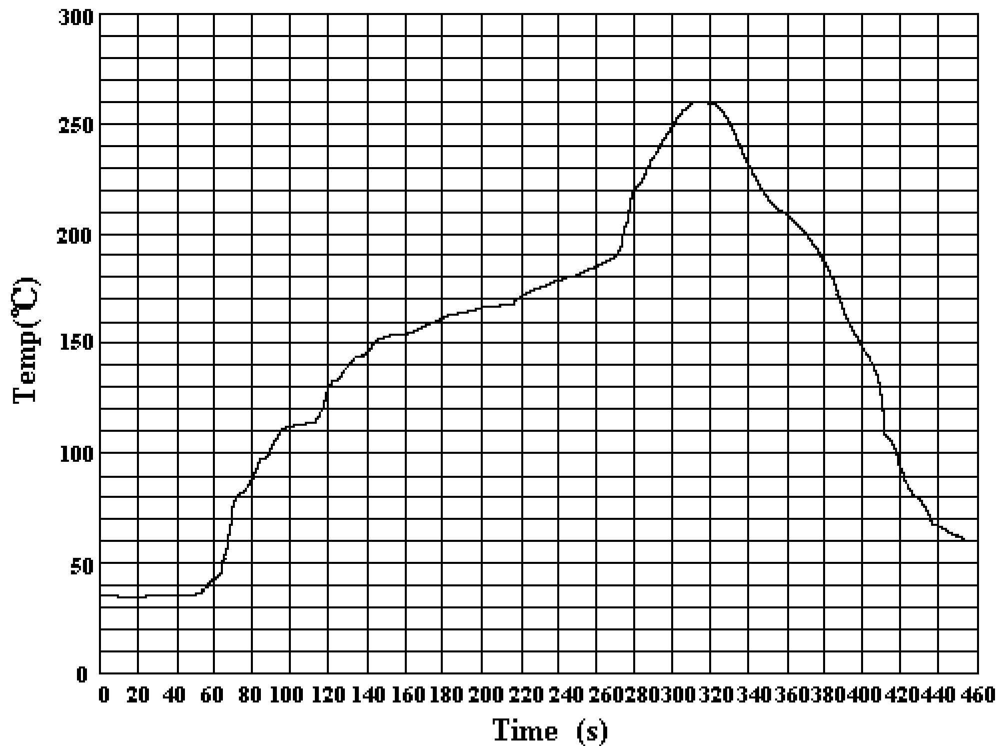
(1) Indicates that transistor is bipolar

(2) Indicates polarity
A, B • • • • PNP
C, D • • • • NPN

(3) Indicates device random number

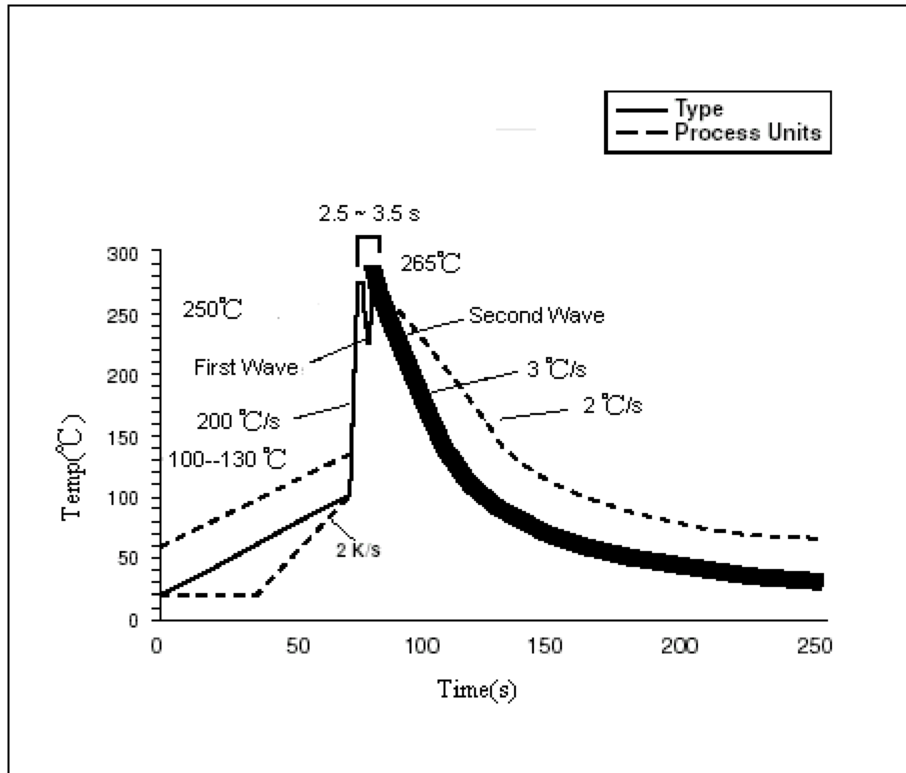
(4) Indicates package shape
N3 • • • SOT-23
A3 • • • TO-92
E3 • • • TO-220AB
FP • • • TO-220FP
J3 • • • TO-252
I3 • • • TO-251
F3 • • • TO-263
D3 • • • TO-126ML
T3 • • • TO-126
L3 • • • SOT-223
M3 • • • SOT-89
S3 • • • SOT-323

Recommended IR reflow profile



Average ramp-up rate(25 to 150℃)	1~4 ℃/second
Preheat temperature 150~180℃	60~90 seconds
Temperature maintained above 220℃	30 seconds min.
Time within 5℃ of actual peak temperature	3~5 seconds
Peak temperature range	255+0/-5℃
Ramp-down rate	2~10 ℃/second
Time 25℃ to peak temperature	6 minutes max.

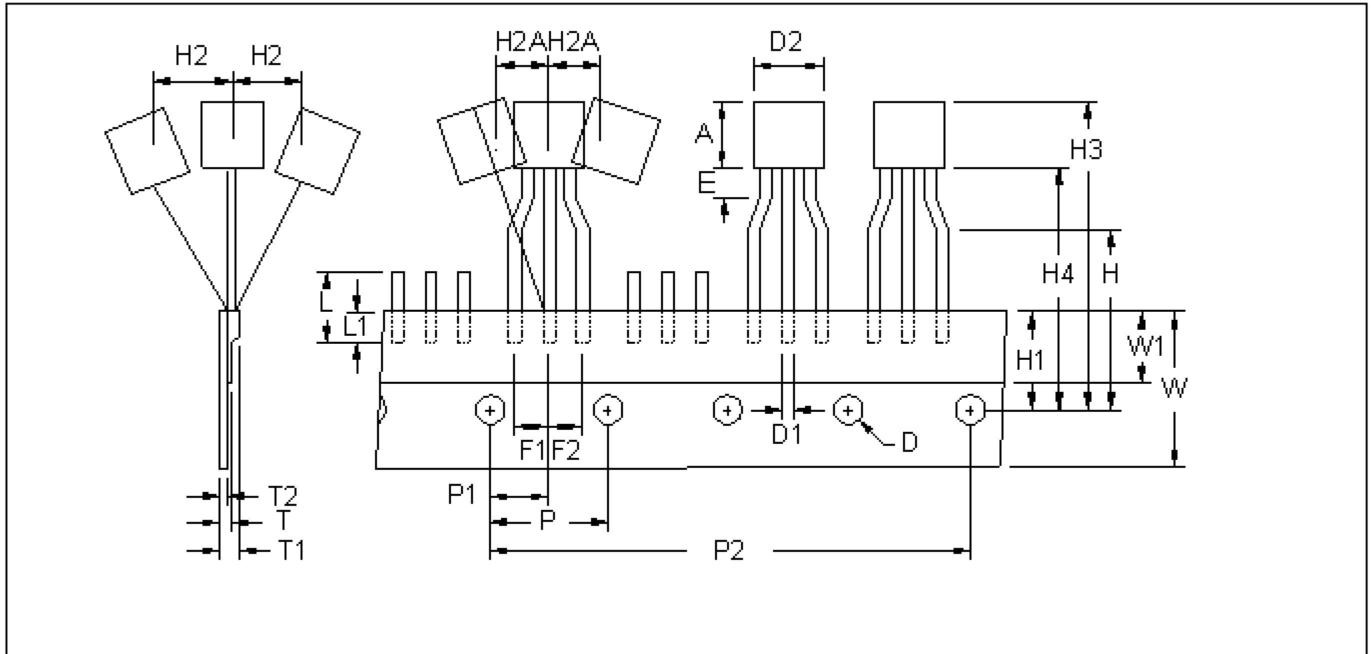
Recommended temperature profile for wave soldering



Recommendation:

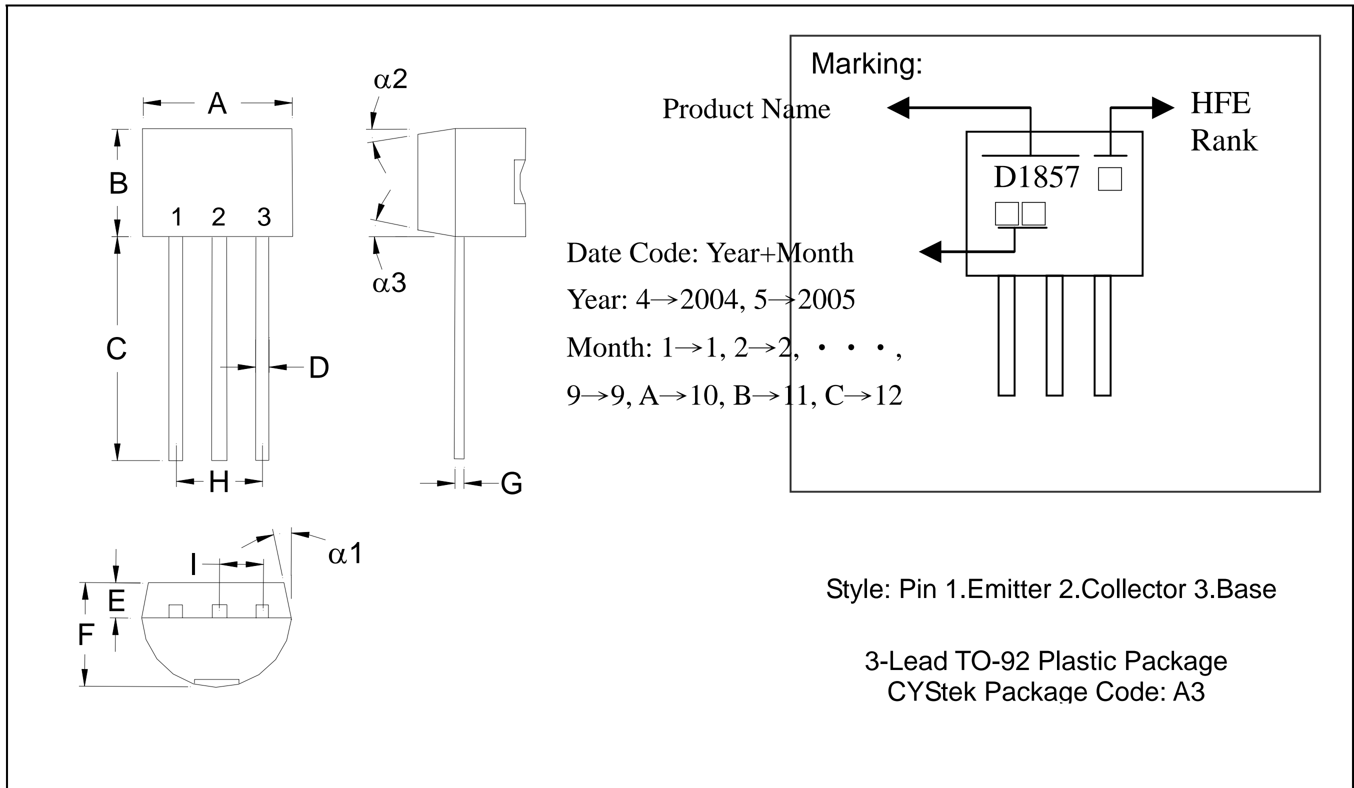
1. Preheat temperature at solder side must be between 100 and 130 ℃ for 80 to 100 seconds.
2. Temperature ramp-up rate : 1~2 ℃/s
3. The temperature gradient between preheat and wave soldering must be smaller than +100℃.
4. Terminations must go through the wave simultaneously.
5. Travel through the wave from 255 to 260℃ for 2.5 to 3.5 seconds
6. Temperature ramp-down rate : 2~3 ℃/s

TO-92 Taping Outline



DIM	Item	Millimeters	
		Min.	Max.
A	Component body height	4.33	4.83
D	Tape Feed Diameter	3.80	4.20
D1	Lead Diameter	0.36	0.53
D2	Component Body Diameter	4.33	4.83
E		1.5	2.0
F1,F2	Component Lead Pitch	2.40	2.90
F1,F2	F1-F2	-	±0.3
H	Height Of Seating Plane	15.50	16.50
H1	Feed Hole Location	8.50	9.50
H2	Front To Rear Deflection	-	1
H2A	Deflection Left Or Right	-	1
H3	Component Height	-	27
H4	Feed Hole To Bottom Of Component	-	21
L	Lead Length After Component Removal	-	11
L1	Lead Wire Enclosure	2.50	-
P	Feed Hole Pitch	12.50	12.90
P1	Center Of Seating Plane Location	5.95	6.75
P2	4 Feed Hole Pitch	50.30	51.30
T	Over All Tape Thickness	-	0.55
T1	Total Taped Package Thickness	-	1.42
T2	Carrier Tape Thickness	0.36	0.68
W	Tape Width	17.50	19.00
W1	Adhesive Tape Width	5.00	7.00
-	20 pcs Pitch	253	255

TO-92 Dimension



Style: Pin 1.Emitter 2.Collector 3.Base

3-Lead TO-92 Plastic Package
CYStek Package Code: A3

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1704	0.1902	4.33	4.83	G	0.0142	0.0220	0.36	0.56
B	0.1704	0.1902	4.33	4.83	H	-	*0.1000	-	*2.54
C	0.5000	-	12.70	-	I	-	*0.0500	-	*1.27
D	0.0142	0.0220	0.36	0.56	α1	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	α2	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	α3	-	*2°	-	*2°

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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