Silicon NPN Epitaxial Planar Transistor

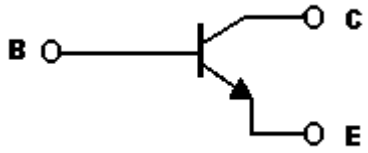
BTD1857AI3

Description

- High BV_{CEO}
- High current capability
- Complementary to BTB1236AI3
- RoHS compliant package

Symbol

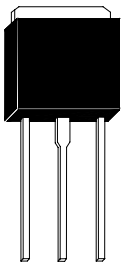
BTD1857AI3



B：Base
C：Collector
E：Emitter

Outline

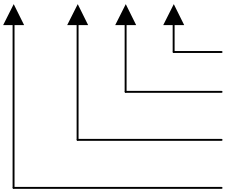
TO-251



B C E

Ordering Information

Device	Package	Shipping
BTD1857AI3-0-UA-G	TO-251 (Pb-free lead plating and halogen-free package)	80 pcs/tube, 50 tubes/box



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

Packing spec,UA : 80 pcs / tube, 50 tubes/box

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 @T_A=25℃	P_D	1	W
Power Dissipation @T_C=25℃		10	W
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	12.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	125	°C/W

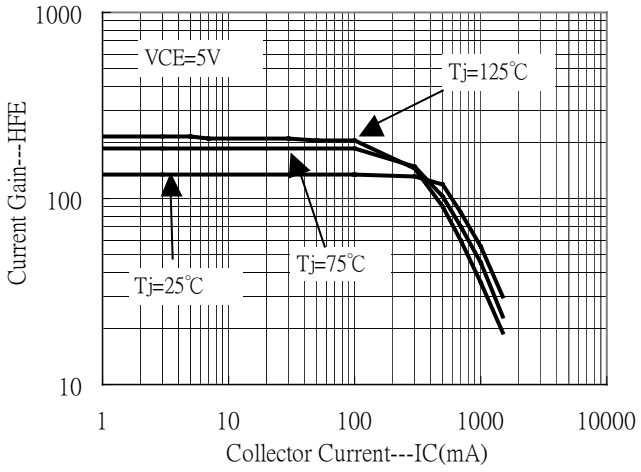
Characteristics (Ta=25°C)

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
*$V_{CE(sat)}$	-	-	0.6	V	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
$h_{FE}2$	80	-	-	-	V_{CE}=5V, I_C=500mA
f_T	-	200	-	MHz	V_{CE}=5V, I_C=150mA
Cob	-	13	-	pF	V_{CB}=10V, I_E=0, f=1MHz

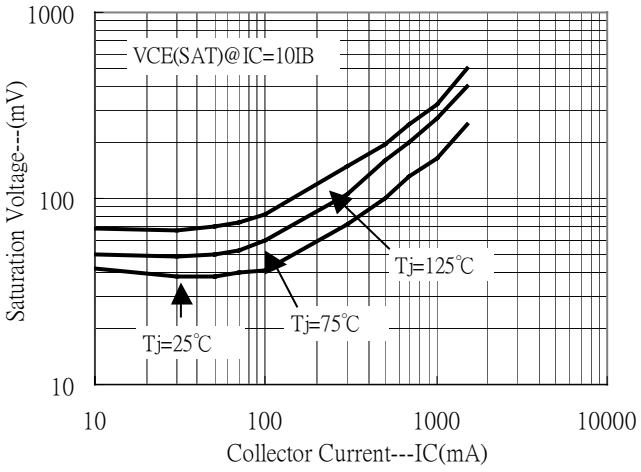
*Pulse Test: Pulse Width ≤380μs, Duty Cycle≤2%

Typical Characteristics

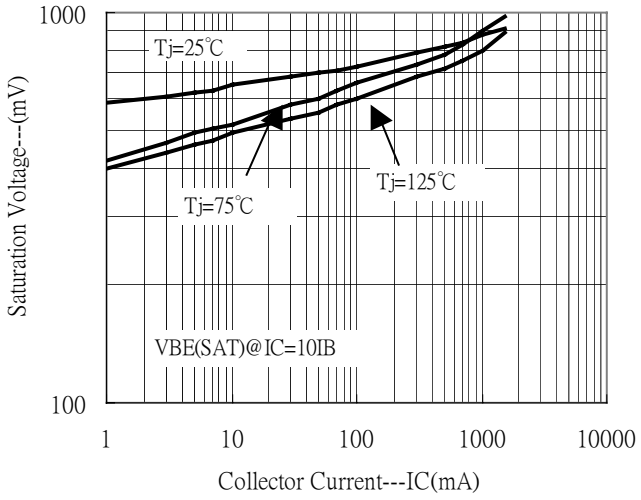
Current Gain vs Collector Current



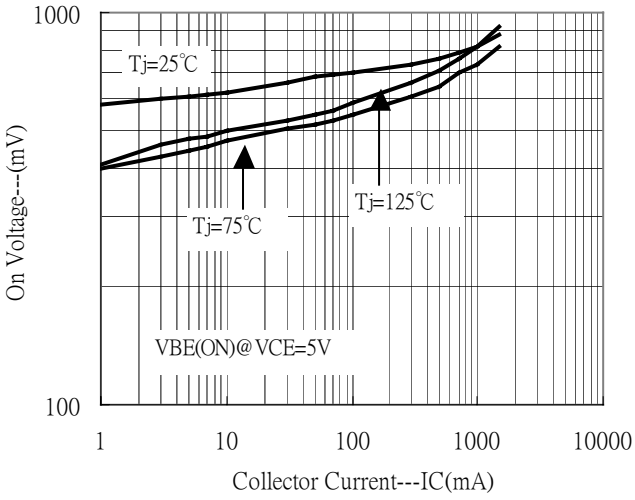
Saturation Voltage vs Collector Current



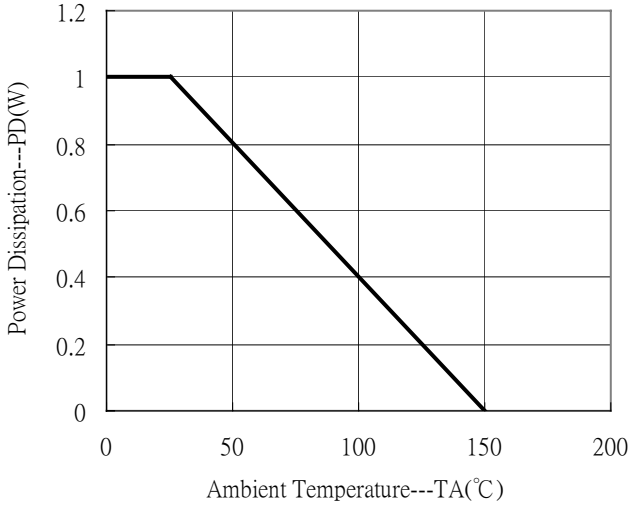
Saturation Voltage vs Collector Current



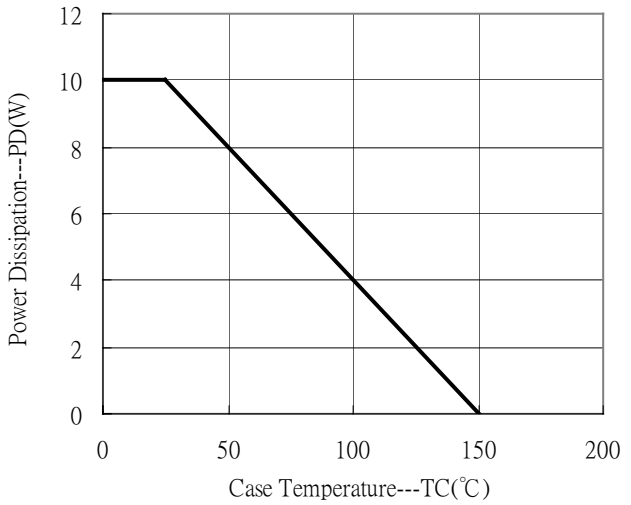
On Voltage vs Collector Current



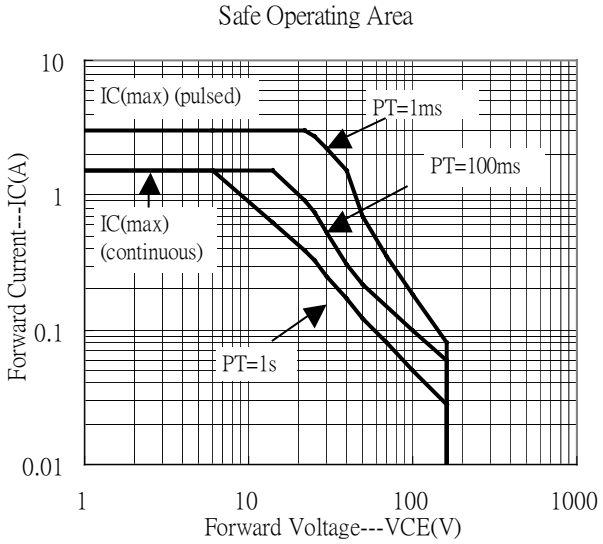
Power Derating Curve



Power Derating Curve



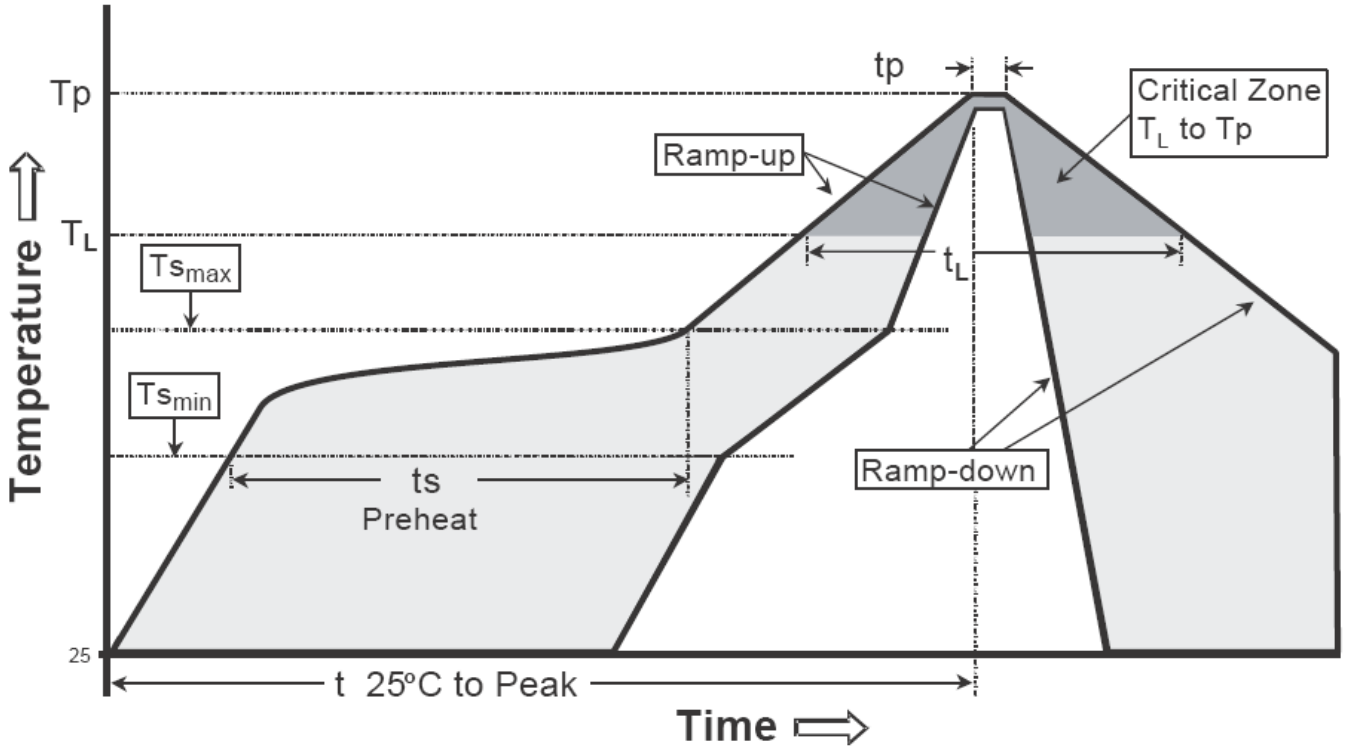
Typical Characteristics(Cont.)



Recommended wave soldering condition

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

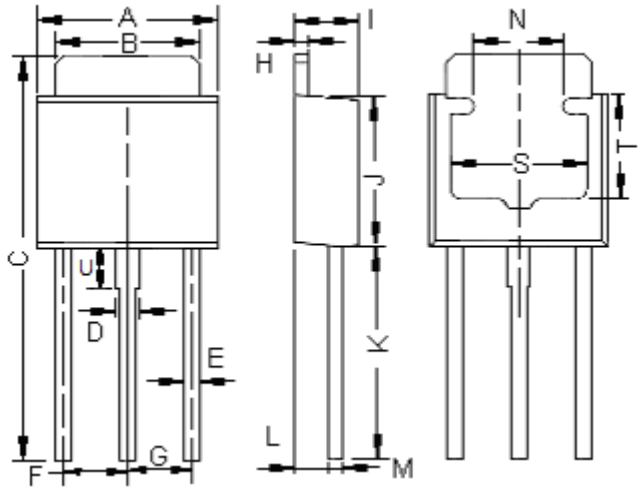
Recommended temperature profile for IR reflow

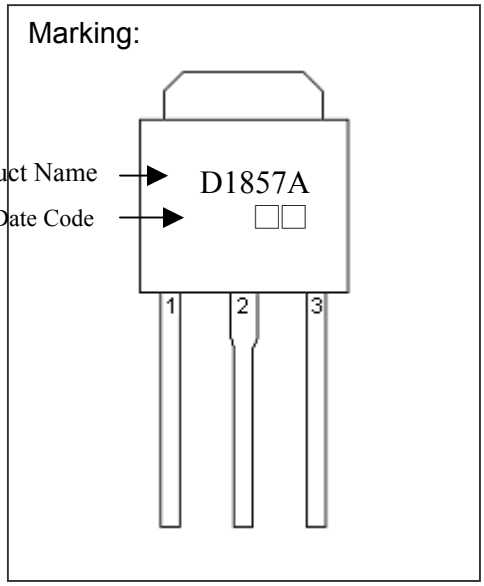


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature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

TO-251 Dimension





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

3-Lead TO-251 Plastic Package
CYStek Package Code: I3

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.250	0.262	6.350	6.650	J	0.213	0.224	5.400	5.700
B	0.205	0.213	5.200	5.400	K	0.295	0.311	7.500	7.900
C	0.571	0.587	14.500	14.900	L	0.042	0.054	1.050	1.350
D	0.028	0.035	0.700	0.900	M	0.017	0.023	0.430	0.580
E	0.020	0.028	0.500	0.700	N	0.118 REF		3.000 REF	
F	0.091 TYP		2.300 TYP		S	0.197 REF		5.000 REF	
G	0.091 TYP		2.300 TYP		T	0.150 REF		3.800 REF	
H	0.017	0.023	0.430	0.580	U	0.055 REF		1.400 REF	
I	0.087	0.094	2.200	2.400					

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.