

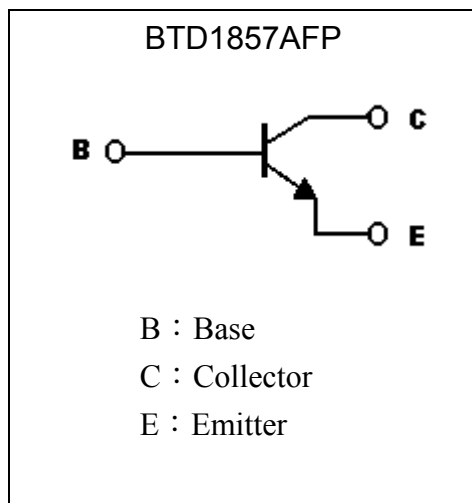
Silicon NPN Epitaxial Planar Transistor

BTD1857AFP

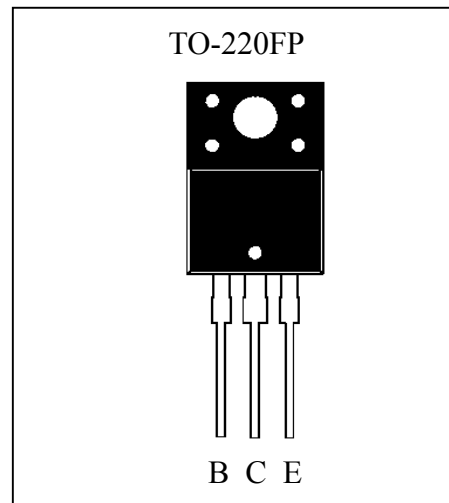
Description

- High BV_{CEO}
- High current capability
- Complementary to BTB1236AFP
- Pb-free lead plating package

Symbol

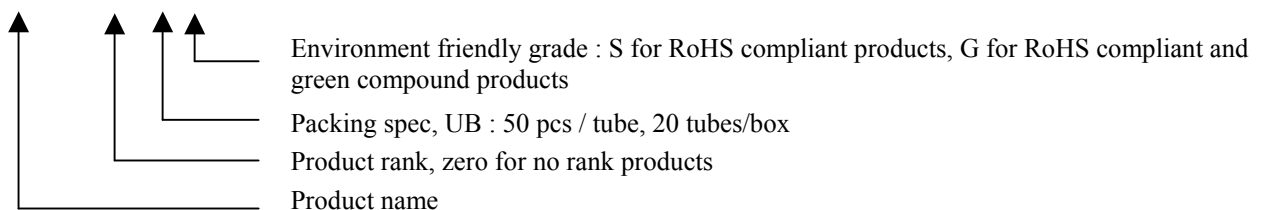


Outline



Ordering Information

Device	Package	Shipping
BTD1857AFP-0-UB-X	TO-220FP (RoHS compliant package)	50 pcs/tube, 20 tubes/box, 4 boxes / carton



**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°C	P _D	2	W
Power Dissipation @T _C =25°C		20	W
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55~+150	°C

Characteristics (Ta=25°C)

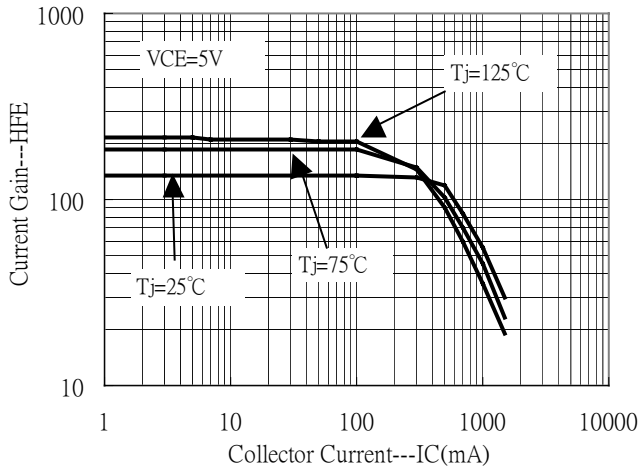
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	180	-	-	V	I _C =50μA, I _E =0
BV _{CEO}	160	-	-	V	I _C =1mA, I _B =0
BV _{EBO}	5	-	-	V	I _E =50μA, I _C =0
I _{CBO}	-	-	1	μA	V _{CB} =160V, I _E =0
I _{EBO}	-	-	1	μA	V _{EB} =4V, I _C =0
*V _{CE(sat)}	-	-	0.6	V	I _C =1A, I _B =100mA
*V _{BE(on)}	-	-	1.5	V	V _{CE} =5V, I _C =150mA
h _{FE1}	160	-	320	-	V _{CE} =5V, I _C =150mA
h _{FE2}	30	-	-	-	V _{CE} =5V, I _C =500mA
f _T	-	140	-	MHz	V _{CE} =5V, I _C =150mA
C _{ob}	-	27	-	pF	V _{CB} =10V, I _E =0, f=1MHz

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

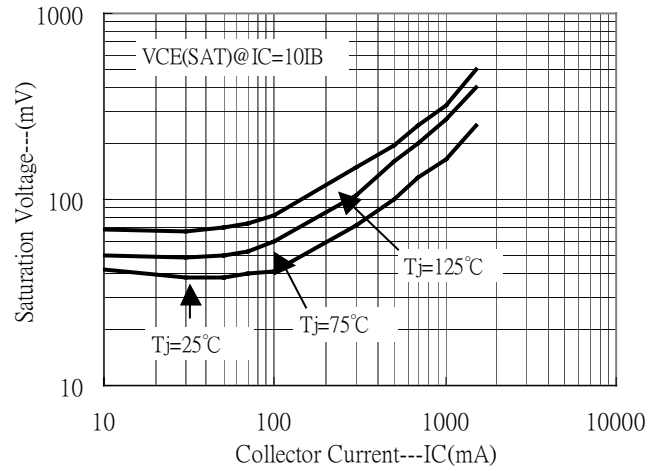


Typical Characteristics

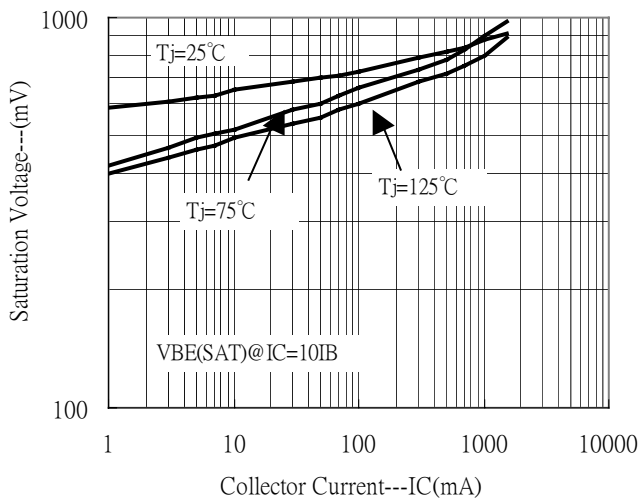
Current Gain vs Collector Current



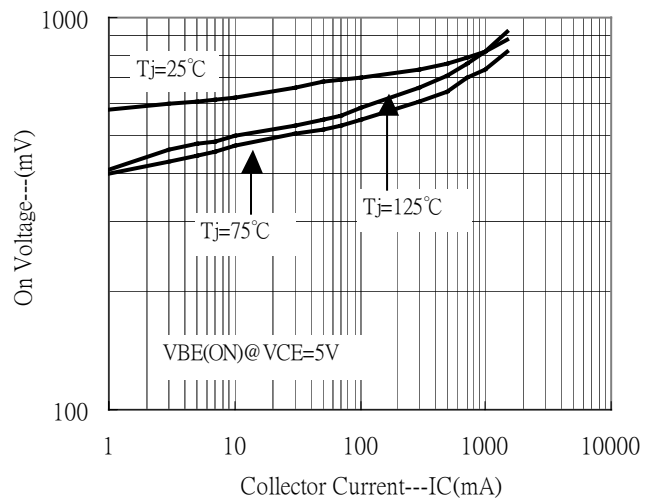
Saturation Voltage vs Collector Current



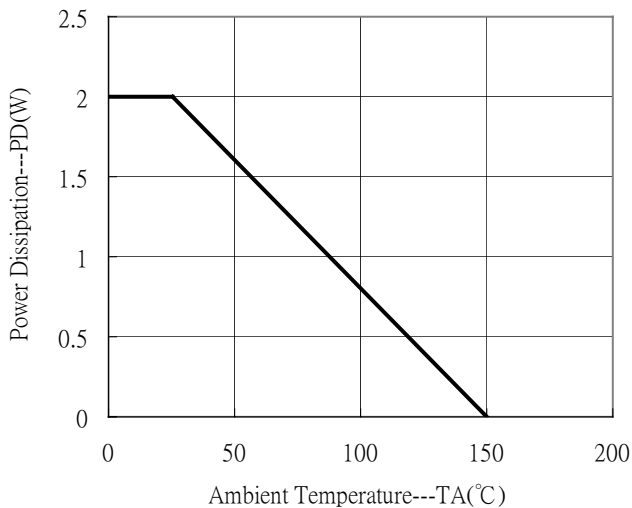
Saturation Voltage vs Collector Current



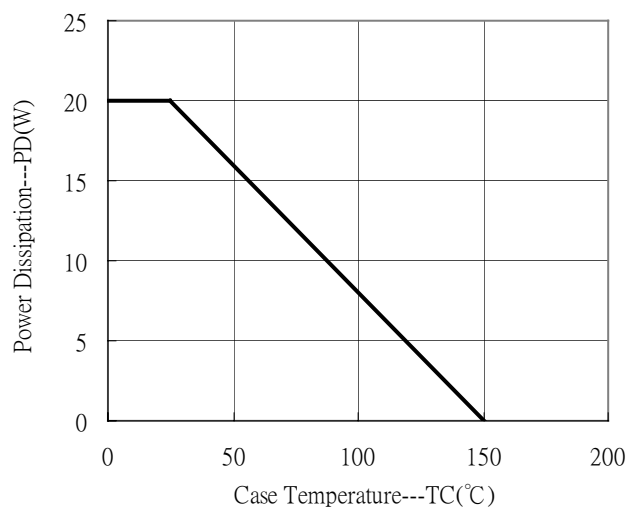
On Voltage vs Collector Current



Power Derating Curve



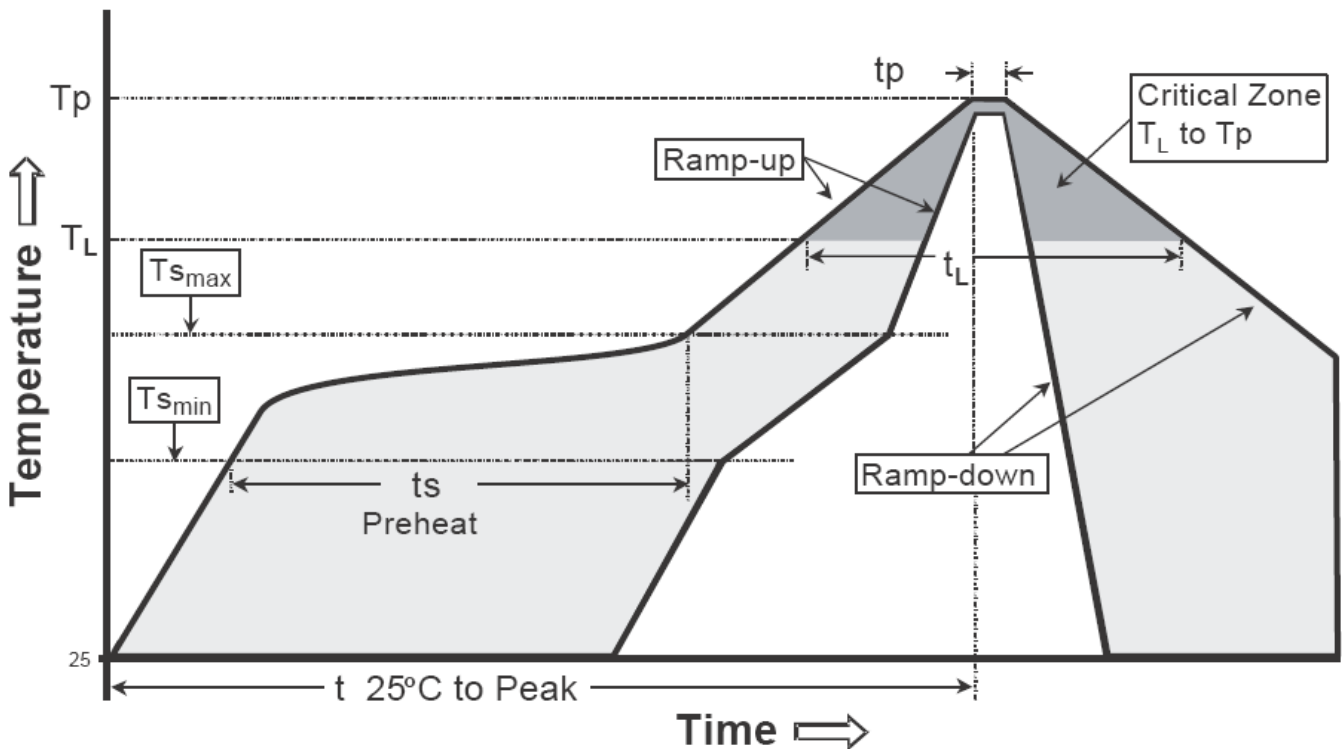
Power Derating Curve



Recommended wave soldering condition

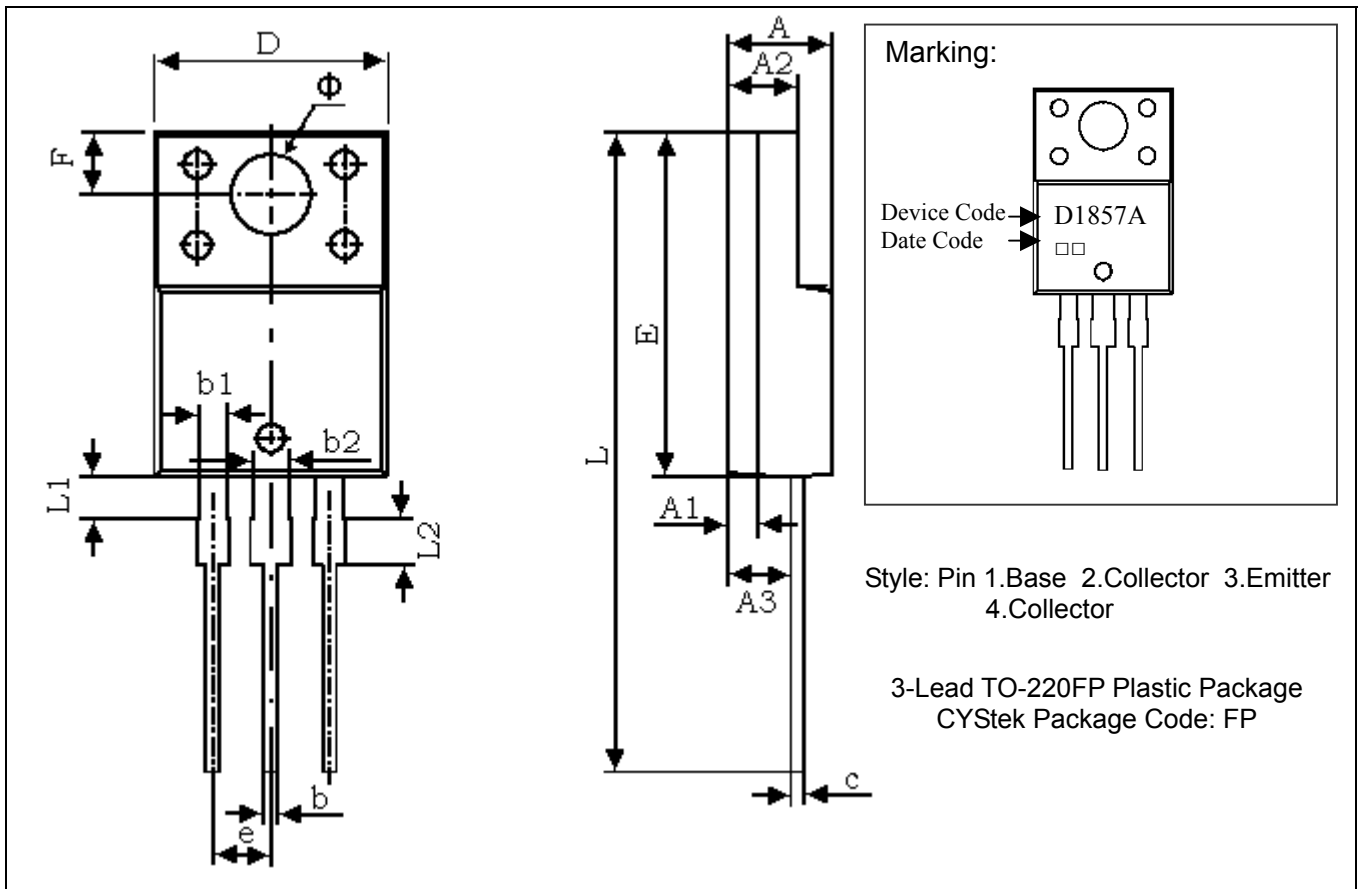
Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

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.

TO-220FP Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.169	0.185	4.300	4.700	D	0.392	0.408	9.960	10.360
A1	0.051 REF		1.300 REF		E	0.583	0.598	14.800	15.200
A2	0.110	0.126	2.800	3.200	e	0.100 TYP		2.540 TYP	
A3	0.098	0.114	2.500	2.900	F	0.106 REF		2.700 REF	
b	0.020	0.030	0.500	0.750	Φ	0.138 REF		3.500 REF	
b1	0.043	0.053	1.100	1.350	L	1.102	1.118	28.000	28.400
b2	0.059	0.069	1.500	1.750	L1	0.067	0.075	1.700	1.900
c	0.020	0.030	0.500	0.750	L2	0.075	0.083	1.900	2.100

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: 42 Alloy ; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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