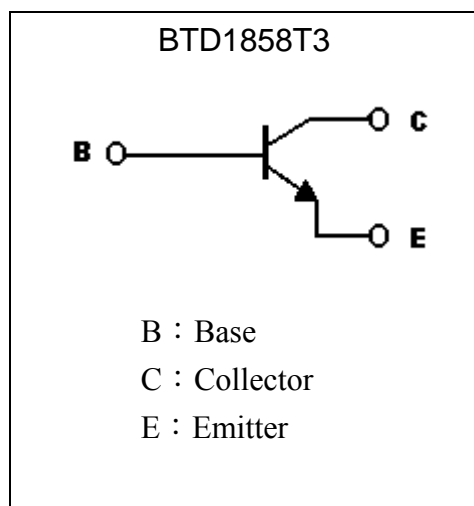
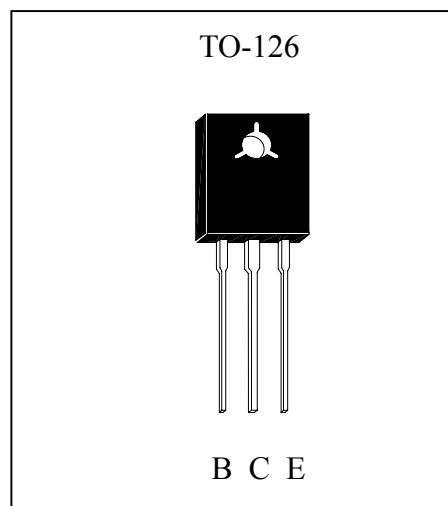


**Silicon NPN Epitaxial Planar Transistor**

# BTD1858T3

**Description**

- High  $BV_{CEO}$
- High current capability
- Pb-free package

**Symbol**

**Outline**

**Absolute Maximum Ratings** ( $T_a=25^\circ\text{C}$ )

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 (Note)	A
Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	1	W
Power Dissipation @ $T_c=25^\circ\text{C}$	$P_D$	15	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	8.33	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_j$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$

 Note : Single Pulse ,  $P_w \leq 380\mu\text{s}$ , Duty  $\leq 2\%$ .

**Characteristics** (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	180	-	-	V	I <sub>C</sub> =50μA, I <sub>E</sub> =0
BV <sub>CEO</sub>	180	-	-	V	I <sub>C</sub> =1mA, I <sub>B</sub> =0
BV <sub>EBO</sub>	5	-	-	V	I <sub>E</sub> =50μA, I <sub>C</sub> =0
I <sub>CB0</sub>	-	-	1	μA	V <sub>CB</sub> =160V, I <sub>E</sub> =0
I <sub>EBO</sub>	-	-	1	μA	V <sub>EB</sub> =4V, I <sub>C</sub> =0
*V <sub>CE(sat)</sub>	-	0.15	0.3	V	I <sub>C</sub> =1A, I <sub>B</sub> =100mA
*V <sub>CE(sat)</sub>	-	-	0.4	V	I <sub>C</sub> =1A, I <sub>B</sub> =50mA
*V <sub>BE(on)</sub>	-	-	0.8	V	V <sub>CE</sub> =5V, I <sub>C</sub> =5mA
h <sub>FE1</sub>	180	-	560	-	V <sub>CE</sub> =5V, I <sub>C</sub> =200mA
h <sub>FE2</sub>	30	-	-	-	V <sub>CE</sub> =5V, I <sub>C</sub> =500mA
f <sub>T</sub>	-	140	-	MHz	V <sub>CE</sub> =5V, I <sub>C</sub> =150mA
Cob	-	27	-	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0, f=1MHz

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

**Classification of h<sub>FE</sub> 1**

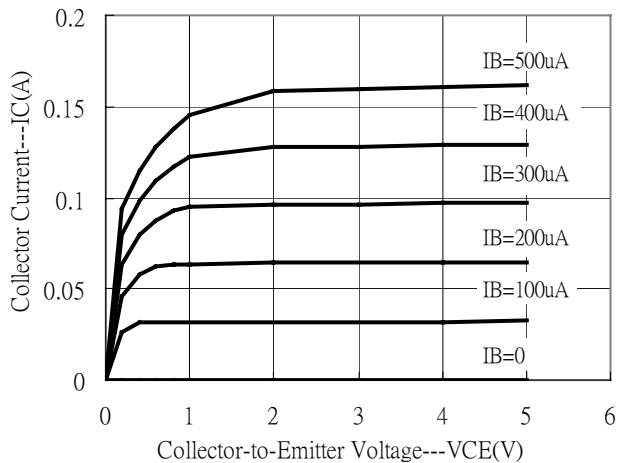
Rank	R	S
Range	180~390	270~560

**Ordering Information**

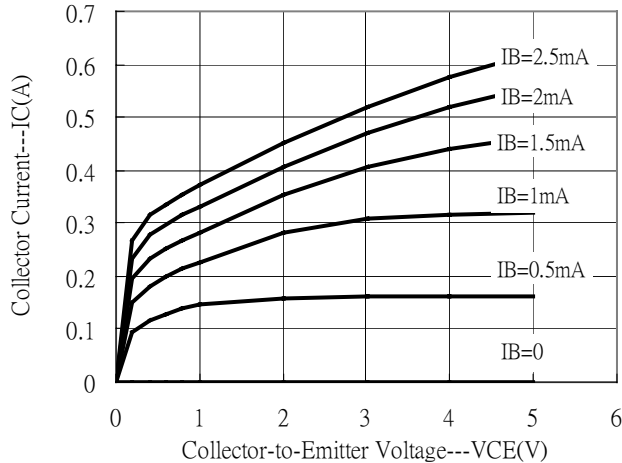
Device	Package	Shipping	Marking
BTD1858T3	TO-126 (Pb-free)	250 pcs / bag, 10 bags / box	D1858

**Characteristic Curves**

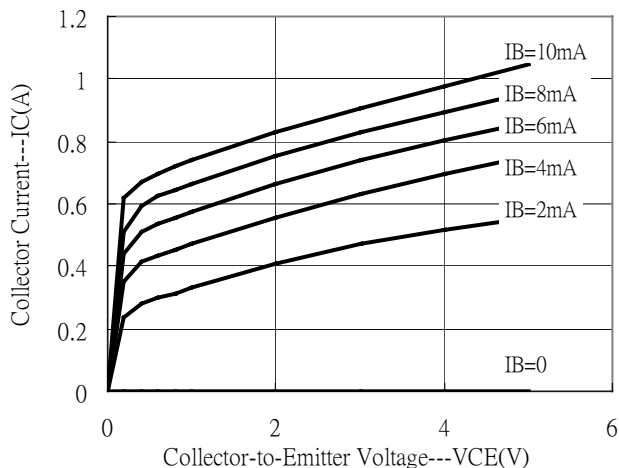
Output Characteristics



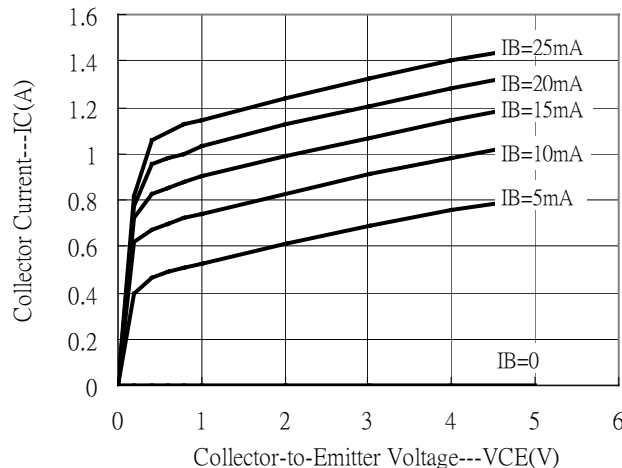
Output Characteristics



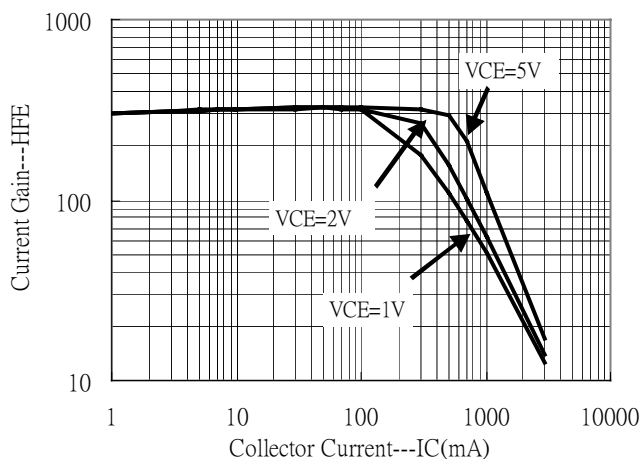
Output Characteristics



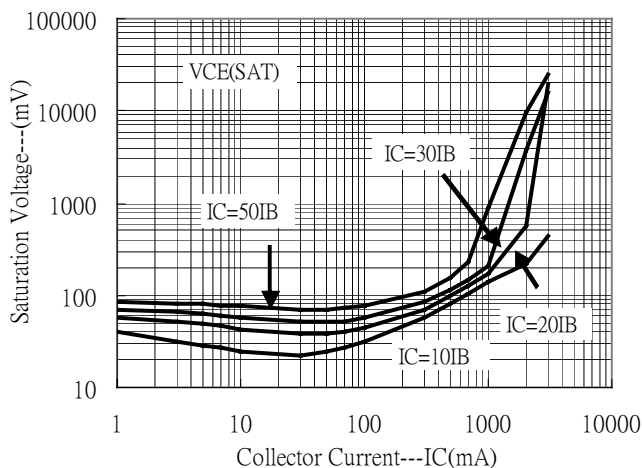
Output Characteristics



Current Gain vs Collector Current



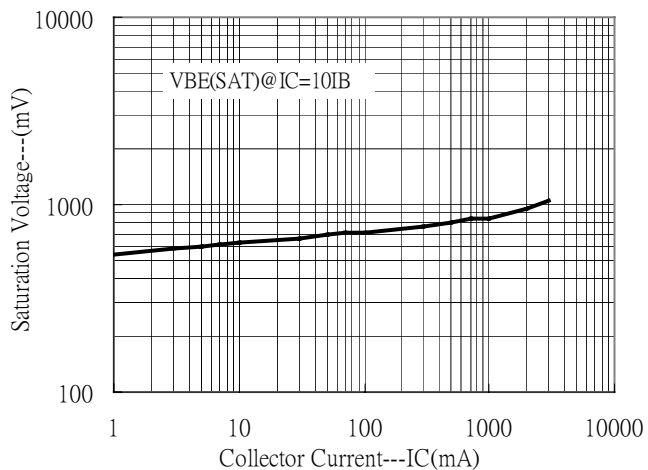
Saturation Voltage vs Collector Current



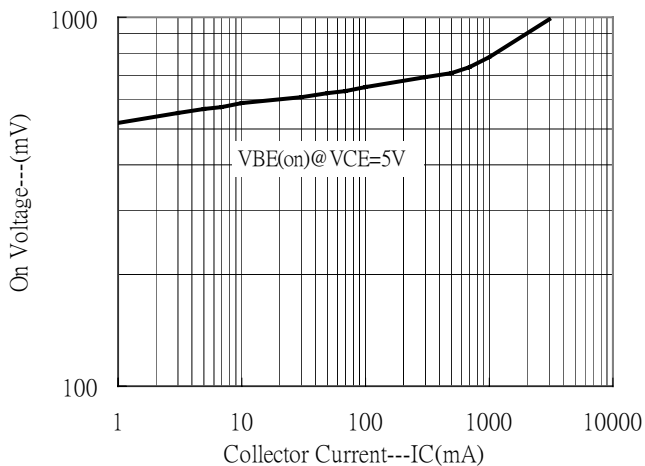


### Characteristic Curves(Cont.)

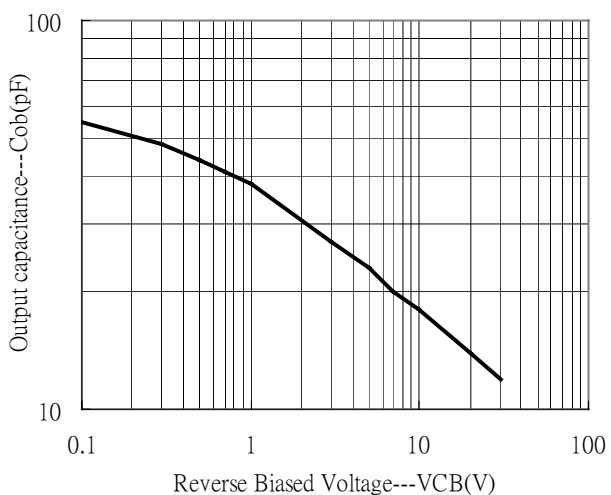
Saturation Voltage vs Collector Current



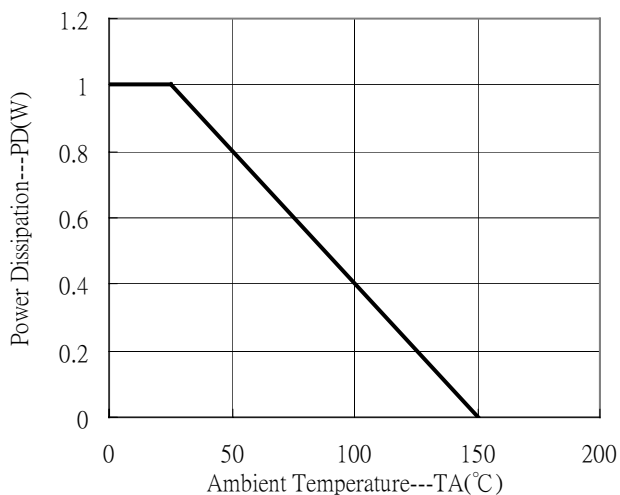
On Voltage vs Collector Current



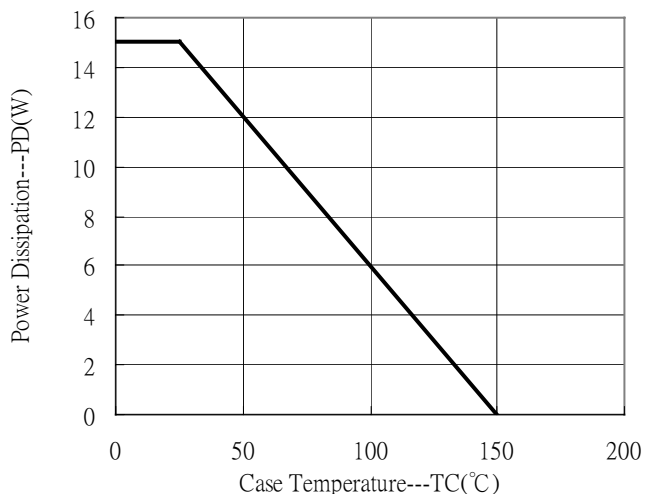
Output Capacitance vs Reverse Biased Voltage



Power Derating Curve



Power Derating Curve





## Product Designation

<u>BT</u>	<u>X</u>	<u>XXXX</u>	<u>XX</u>
(1)	(2)	(3)	(4)

(1) Indicates that transistor is bipolar

(2) Indicates polarity

A, B, P . . . . PNP

C, D, N . . . . 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

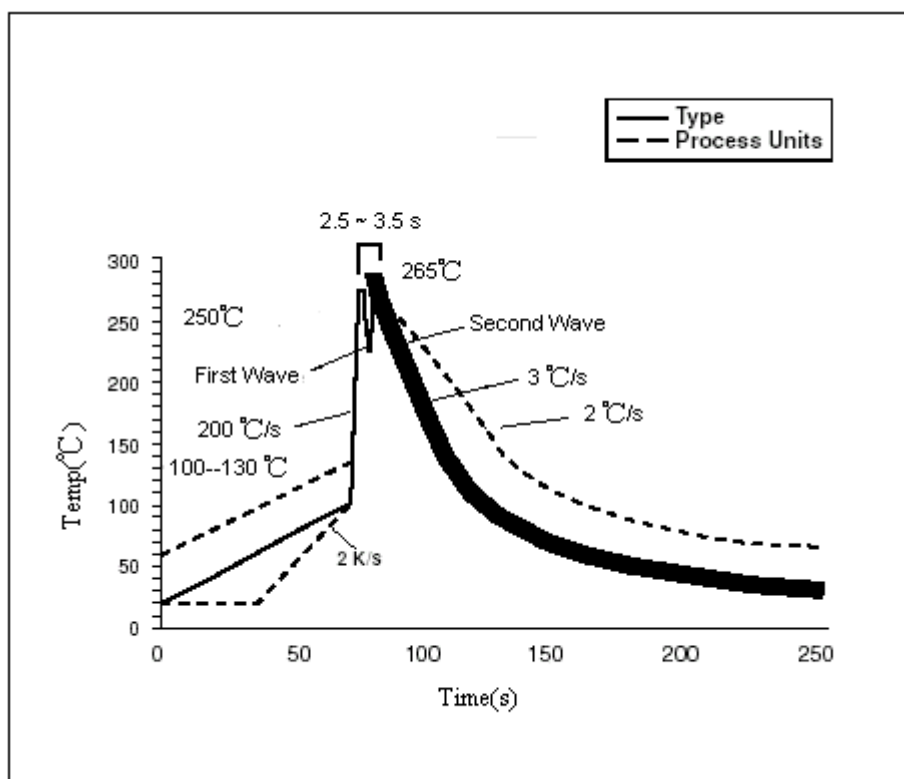
T3 . . . TO-126

L3 . . . SOT-223

M3 . . . SOT-89

S3 . . . SOT-323

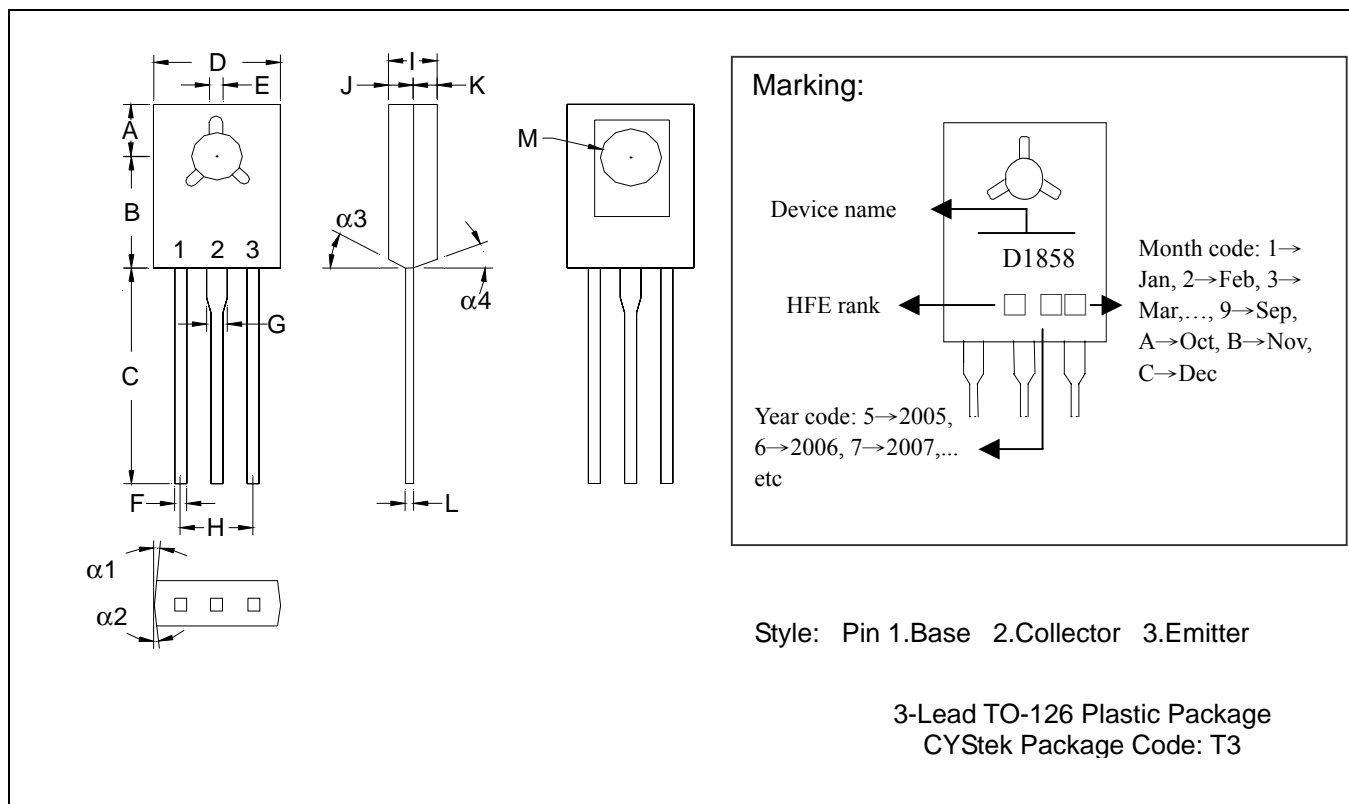
Recommended temperature profile for wave soldering



Recommendation:

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

**TO-126 Dimension**



\*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
$\alpha 1$	-	*3°	-	*3°	F	0.0280	0.0319	0.71	0.81
$\alpha 2$	-	*3°	-	*3°	G	0.0480	0.0520	1.22	1.32
$\alpha 3$	-	*3°	-	*3°	H	0.1709	0.1890	4.34	4.80
$\alpha 4$	-	*3°	-	*3°	I	0.0950	0.1050	2.41	2.66
A	0.1500	0.1539	3.81	3.91	J	0.0450	0.0550	1.14	1.39
B	0.2752	0.2791	6.99	7.09	K	0.0450	0.0550	1.14	1.39
C	0.5315	0.6102	13.50	15.50	L	-	*0.0217	-	*0.55
D	0.2854	0.3039	7.52	7.72	M	0.1378	0.1520	3.50	3.86
E	0.0374	0.0413	0.95	1.05					

**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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