

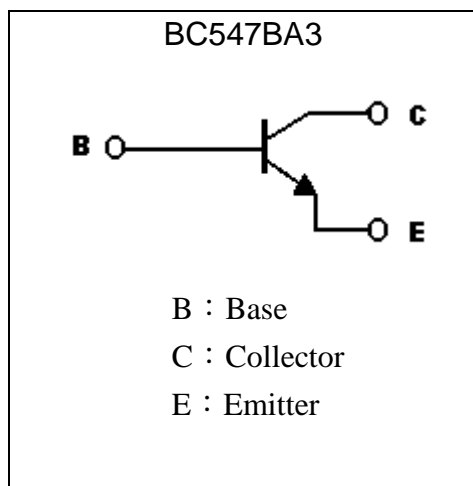
**General Purpose NPN Epitaxial Planar Transistor**

# BC547BA3

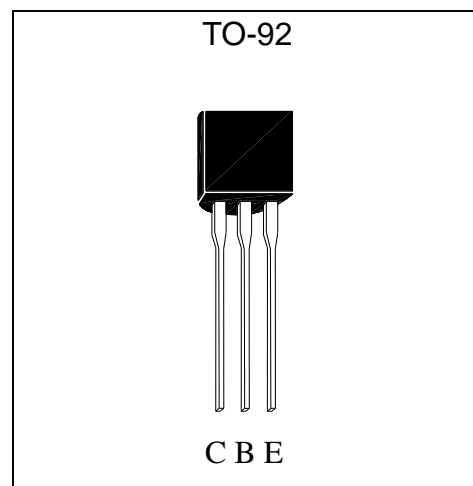
## Description

- The BC547BA3 is designed for use in driver stage of AF amplifier and low speed switching.
- Complementary to BC557BA3.
- Pb-free package

## Symbol

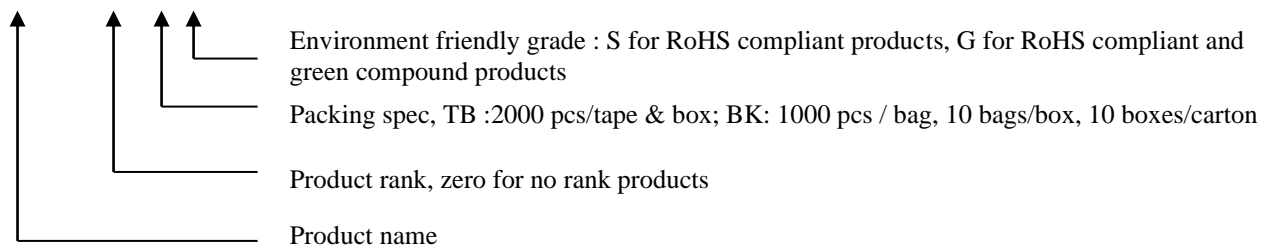


## Outline



## Ordering Information

Device	Package	Shipping
BC547BA3-0-TB-G	TO-92 (Pb-free lead plating and halogen-free package)	2000 pcs / Tape & Box
BC547BA3-0-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 <sub>CB0</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	200	mA
Base Current	I <sub>B</sub>	100	mA
Power Dissipation @Ta=25°C	P <sub>d</sub>	625	mW
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	200	°C/W
Operating Junction Temperature Range	T <sub>j</sub>	-55~+150	°C
Storage Temperature Range	T <sub>stg</sub>	-55~+150	°C

**Characteristics** (Ta=25°C)

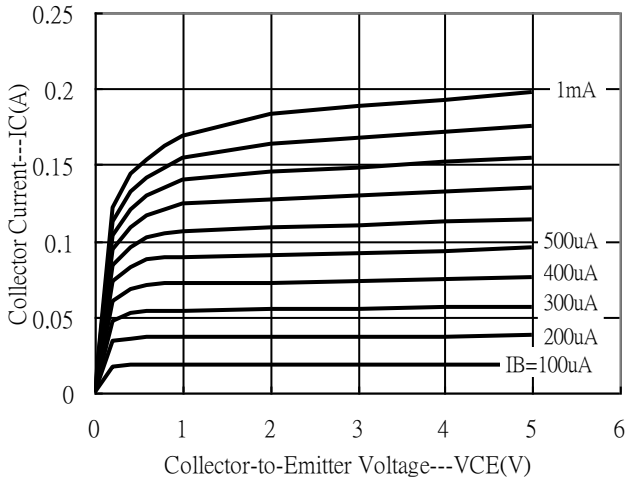
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CB0</sub>	60	-	-	V	I <sub>C</sub> =100μA
BV <sub>CEO</sub>	50	-	-	V	I <sub>C</sub> =1mA
BV <sub>EBO</sub>	6	-	-	V	I <sub>E</sub> =10μA
I <sub>CB0</sub>	-	-	100	nA	V <sub>CB</sub> =60V
I <sub>EBO</sub>	-	-	100	nA	V <sub>EB</sub> =5V
*V <sub>CE(sat)</sub> 1	-	58	200	mV	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA
*V <sub>CE(sat)</sub> 2	-	150	500	mV	I <sub>C</sub> =100mA, I <sub>B</sub> =5mA
*V <sub>BE(sat)</sub> 1	-	720	900	mV	I <sub>C</sub> =10mA, I <sub>B</sub> =0.5mA
*V <sub>BE(sat)</sub> 2	-	860	1.2	V	I <sub>C</sub> =100mA, I <sub>B</sub> =5mA
V <sub>BE</sub> 1	0.58	0.65	0.7	V	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA
V <sub>BE</sub> 2	-	0.7	0.77	V	V <sub>CE</sub> =5V, I <sub>C</sub> =10mA
h <sub>FE</sub> 1	120	-	-	-	V <sub>CE</sub> =5V, I <sub>C</sub> =10μA
h <sub>FE</sub> 2	200	-	450	-	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA
h <sub>FE</sub> 3	100	-	-	-	V <sub>CE</sub> =5V, I <sub>C</sub> =100mA
h <sub>FE</sub> 4	50	-	-	-	V <sub>CE</sub> =6V, I <sub>C</sub> =150mA
f <sub>T</sub>	100	-	-	MHz	V <sub>CE</sub> =5V, I <sub>C</sub> =10mA, f=100MHz
C <sub>ob</sub>	-	2.1	-	pF	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz

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

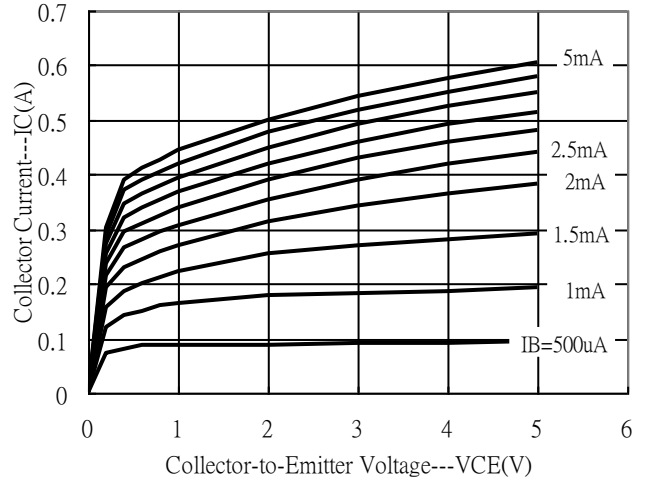


### Typical Characteristics

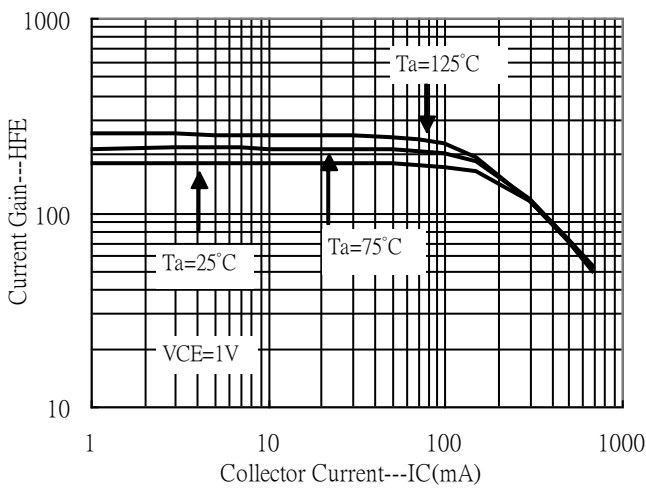
Emitter Grounded Output Characteristics



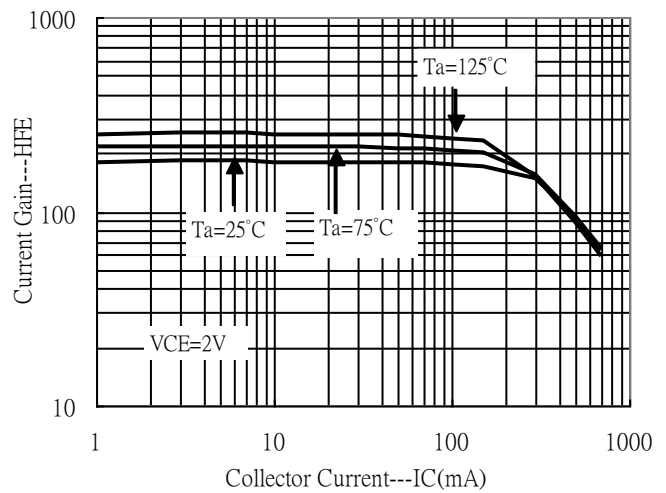
Emitter Grounded Output Characteristics



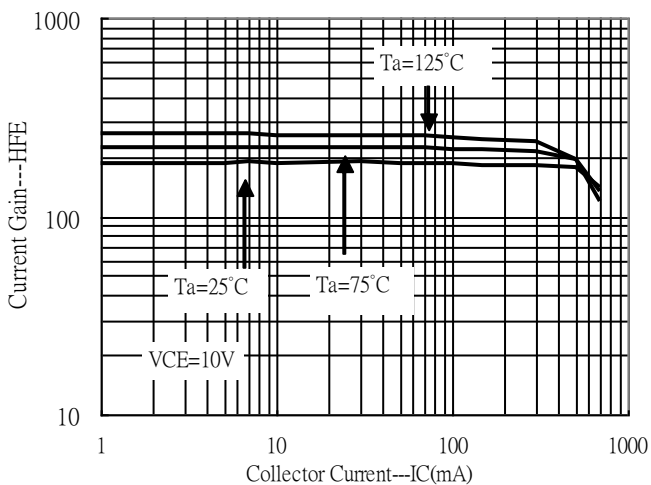
Current Gain vs Collector Current



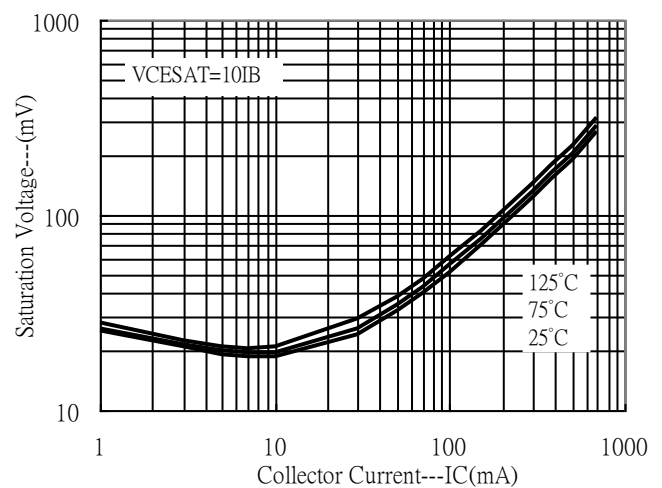
Current Gain vs Collector Current



Current Gain vs Collector Current



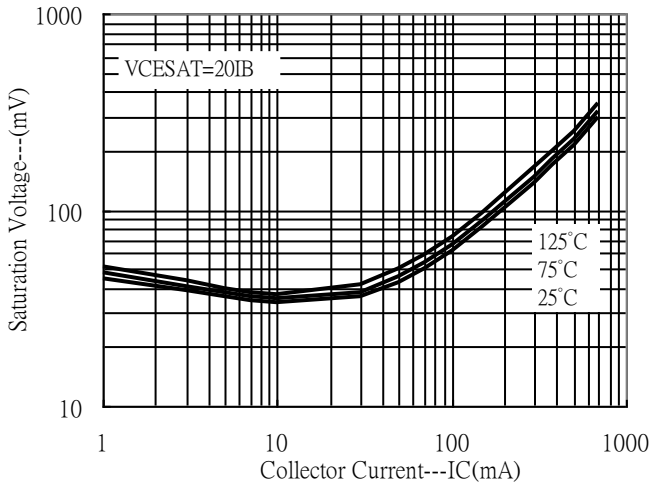
Saturation Voltage vs Collector Current



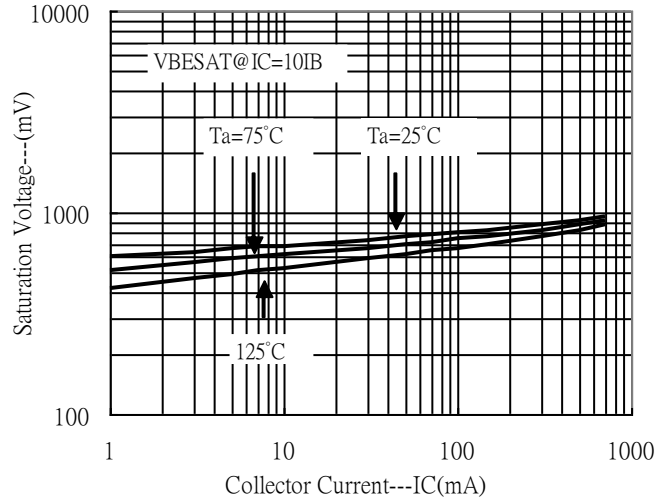


**Typical Characteristics(Cont.)**

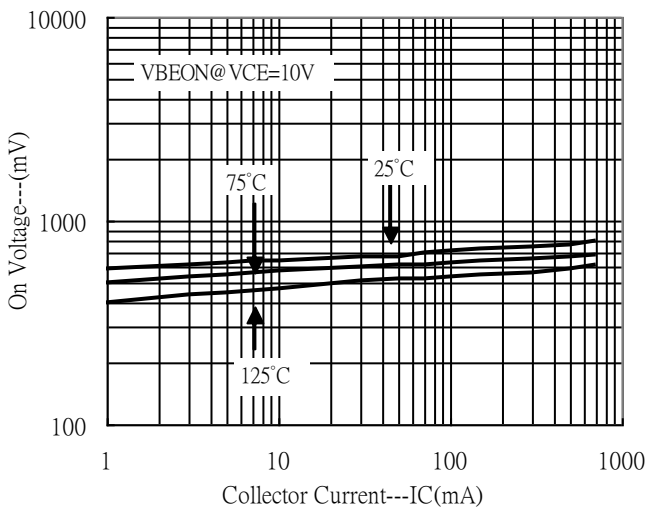
Saturation Voltage vs Collector Current



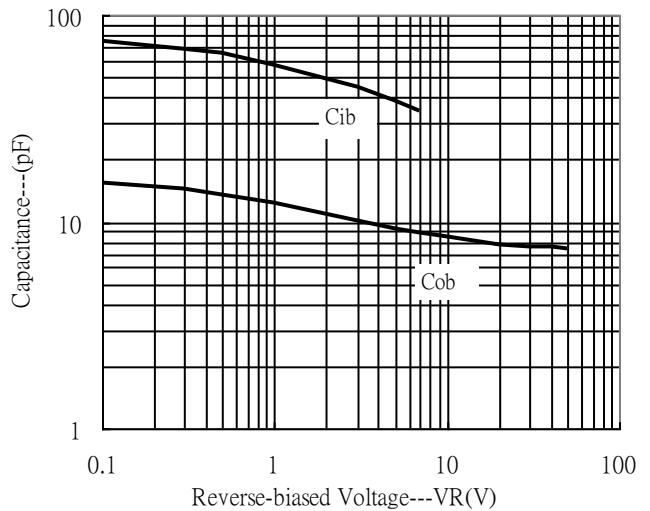
Saturation Voltage vs Collector Current



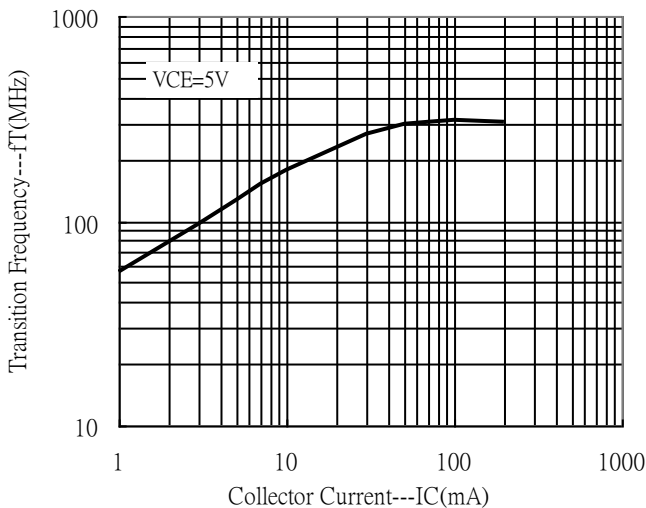
On Voltage vs Collector Current



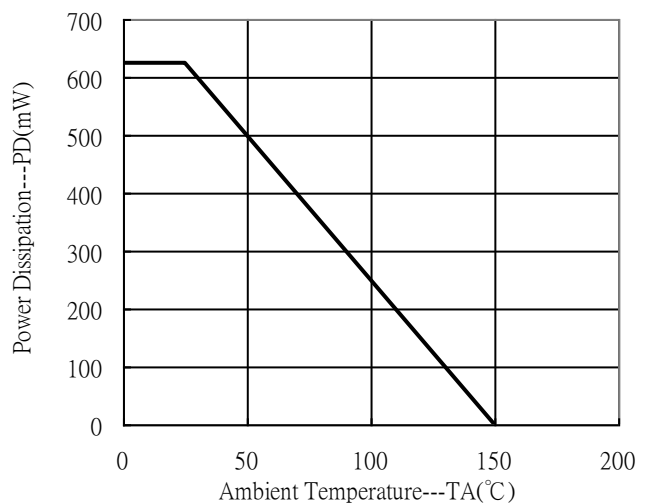
Capacitance vs Reverse-biased Voltage



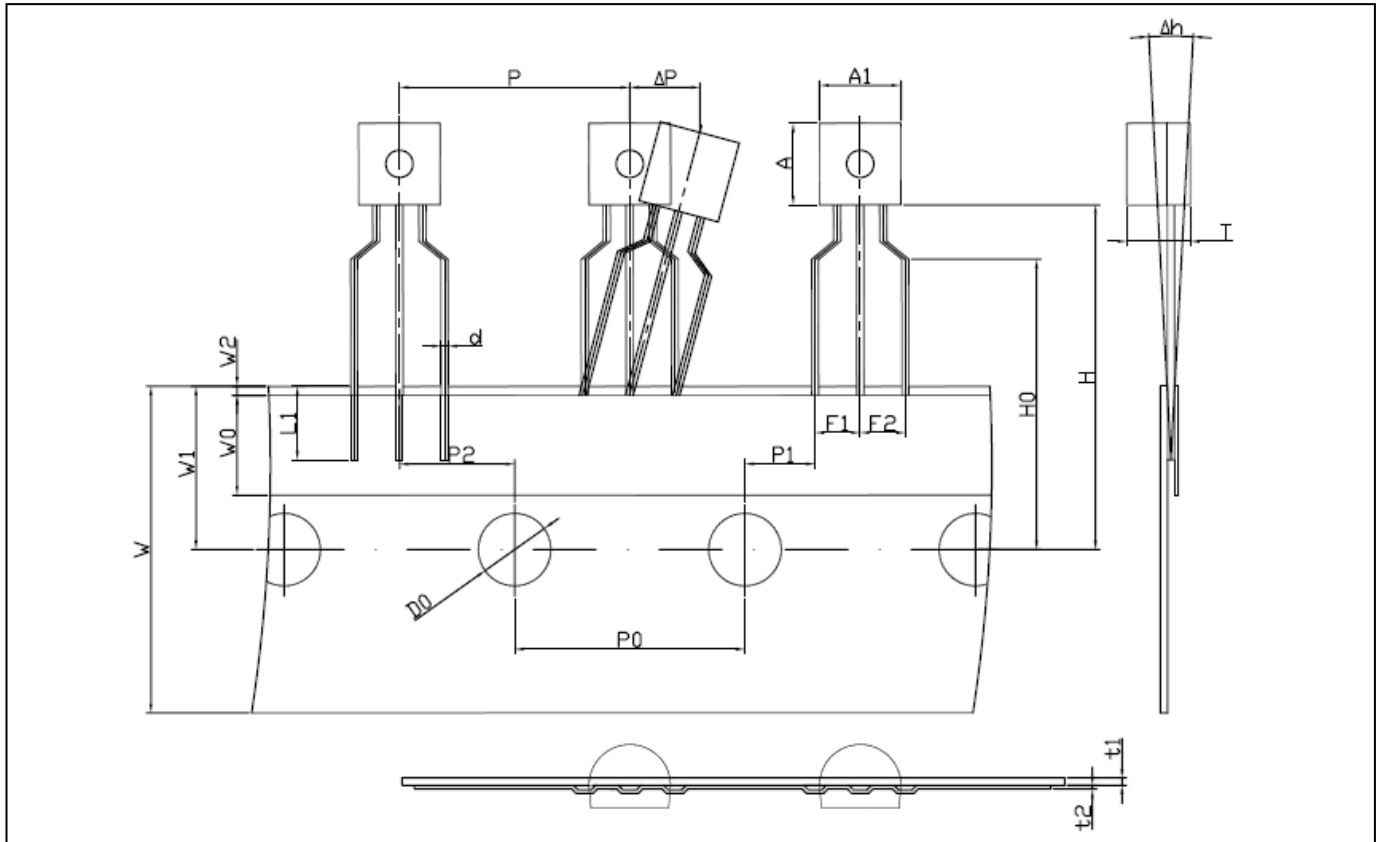
Transition Frequency vs Collector Current



Power Derating Curve



**TO-92 Taping Outline**



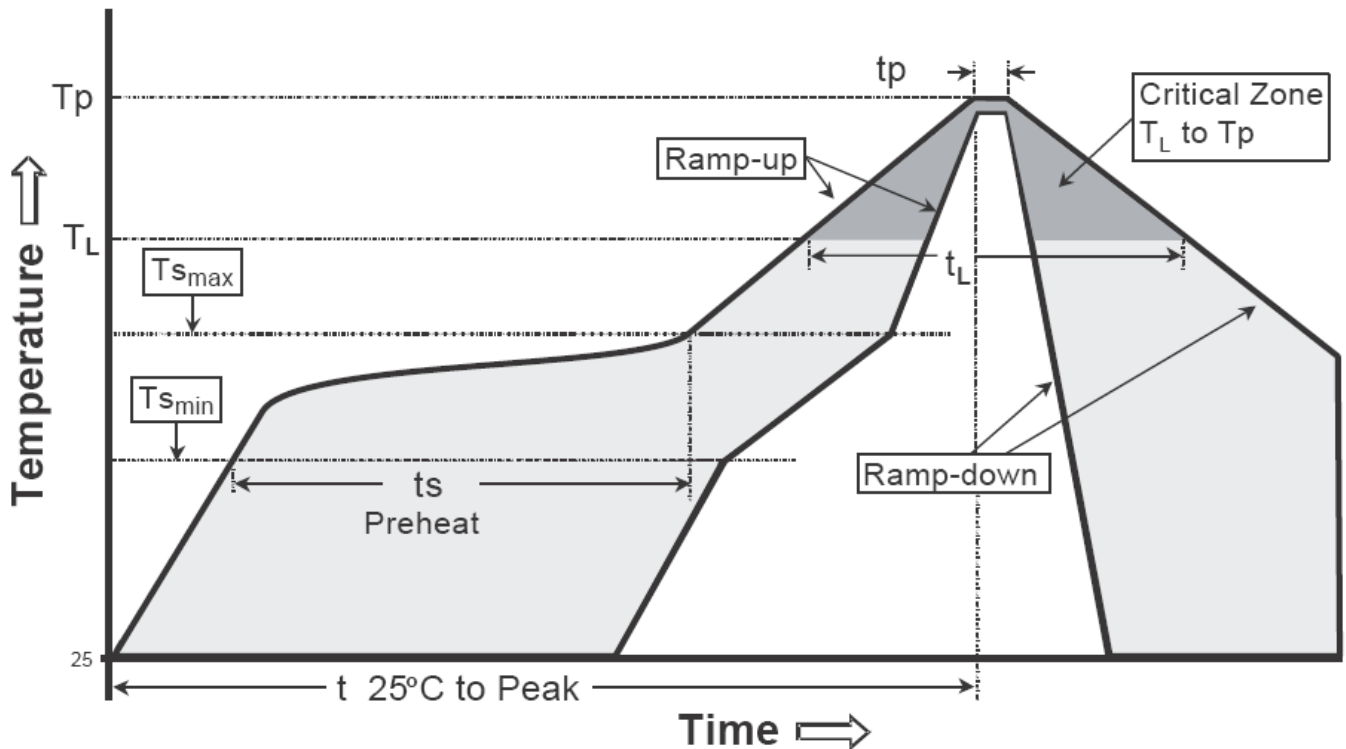
DIM	Item	Millimeters	
		Min.	Max.
A1	Body width	4.3	4.7
A	Body height	4.3	4.7
T	Body thickness	3.3	3.7
d	Lead wire diameter	0.38	0.55
P	Pitch of component	12.4	13
P0	Feed hole pitch	12.5	12.9
P2	Hole center to component center	6.05	6.65
F1,F2	Lead to lead distance	2.2	2.8
Δh	Component alignment, F-R	-1	1
W	Type width	17.5	19
W0	Hole down tape width	5.5	6.5
W1	Hole position	8.5	9.5
W2	Hole down tape position	-	1
H	Height of component from tape center	18	21
H0	Lead wire clinch height	15.5	16.5
L1	Lead wire(tape portion)	2.5	-
D0	Feed hole diameter	3.8	4.2
t1	Taped Lead Thickness	0.35	0.45
t2	Carrier Tape Thickness	0.15	0.25
P1	Position of hole	3.55	4.15
ΔP	Component alignment	-0.1	0.1



**Recommended wave soldering condition**

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

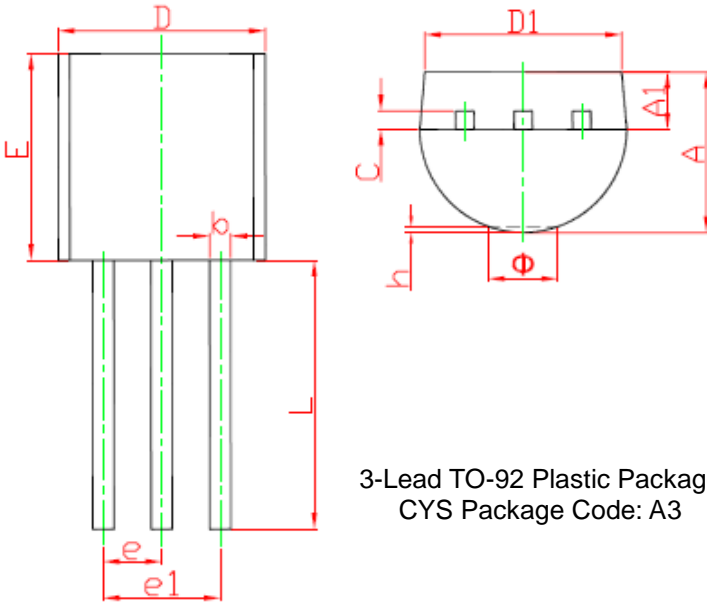
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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.

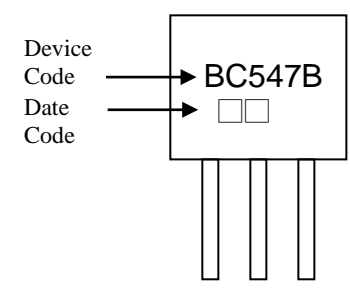
Note : All temperatures refer to topside of the package, measured on the package body surface.

**TO-92 Dimension**



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

**Marking:**



Device Code → BC547B  
 Date Code → □ □

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

Date Code: Year+Month  
 Year: 2→2022, 3→2023  
 Month: 1→1, 2→2, . . .  
 9→9, A→10, B→11, C→12

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.130	0.146	3.300	3.700	E	0.169	0.185	4.300	4.700
A1	0.043	0.055	1.100	1.400	e	0.050 TYP.		1.270 TYP.	
b	0.015	0.022	0.380	0.550	e1	0.096	0.104	2.440	2.640
c	0.014	0.020	0.360	0.510	L	0.555	0.571	14.100	14.500
D	0.169	0.185	4.300	4.700	Φ	-	0.063	-	1.600
D1	0.135	-	3.430	-	h	0.000	0.015	0.000	0.380

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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