

NPN High Voltage Planar Transistor

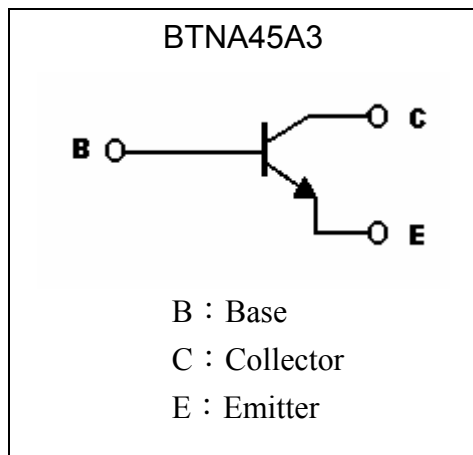
BTNA45A3

BV_{CEO}	500V
I_C	150mA
V_{CESAT}	150mV (max)

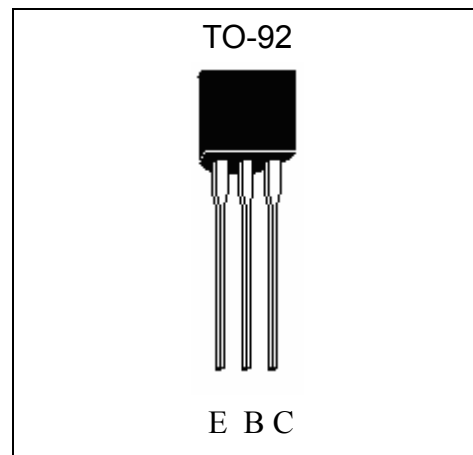
Description

- High breakdown voltage. ($BV_{CEO}=500V$)
- Low collector-emitter saturation voltage V_{CESAT} .
- High collector current capability I_C and I_{CM} .
- High collector current gain H_{FE} at high collector current I_C .
- Low collector output capacitance. (Typ. 5pF at $V_{CB} =20V$)
- Pb-free lead plating and halogen-free package.

Symbol

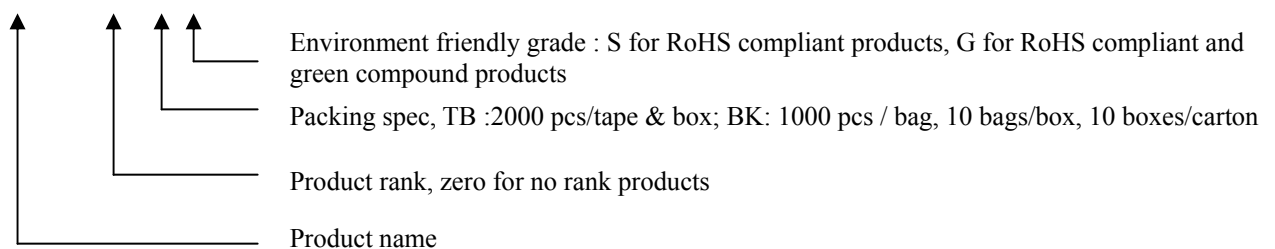


Outline



Ordering Information

Device	Package	Shipping
BTNA45A3-0-TB-G	TO-92 (Pb-free lead plating and halogen-free package)	2000 pcs / Tape & Box
BTNA45A3-0-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 _{CBO}	500	V
Collector-Emitter Voltage	V _{CES}	500	
Collector-Emitter Voltage	V _{CEO}	500	
Emitter-Base Voltage	V _{EBO}	7	
Collector Current (DC)	I _C	150	mA
Peak Collector Current, single pulse, pulse width<1ms	I _{CM}	500	
Peak Base Current, single pulse, pulse width<1ms	I _{BM}	200	
Power Dissipation	P _d	625	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55~+150	°C

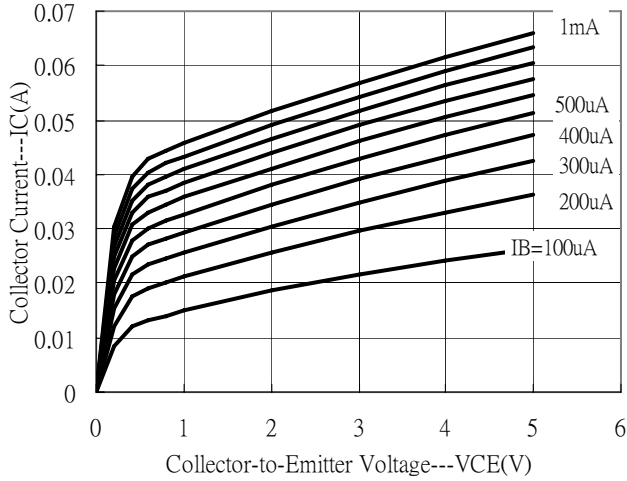
Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
*BV _{CBO}	500	-	-	V	I _C =50μA
*BV _{CEO}	500	-	-		I _C =10mA
*BV _{CEO}	500	-	-		I _C =50μA
BV _{EBO}	7	-	-		I _E =50μA
I _{CBO}	-	-	100	nA	V _{CB} =500V
I _{CES}	-	-	100		V _{CE} =500V
I _{EBO}	-	-	100		V _{EB} =5V
*V _{CE(sat)} 1	-	-	90	mV	I _C =20mA, I _B =2mA
*V _{CE(sat)} 2	-	-	150		I _C =50mA, I _B =6mA
*V _{BE(sat)}	-	-	0.9	V	I _C =50mA, I _B =5mA
*V _{BE(on)}	-	-	0.9		V _{CE} =10V, I _C =50mA
*h _{FE} 1	120	-	-	-	V _{CE} =10V, I _C =1mA
*h _{FE} 2	120	-	300	-	V _{CE} =10V, I _C =30mA
*h _{FE} 3	120	-	-	-	V _{CE} =10V, I _C =50mA
*h _{FE} 4	30	-	-	-	V _{CE} =10V, I _C =100mA
f _T	50	-	-	MHz	V _{CE} =20V, I _C =10mA, f=100MHz
C _{ob}	-	5	8	pF	V _{CB} =20V, I _E =0A, f=1MHz
ton	-	110	-	ns	V _{CE} =100V, I _C =50mA, I _{B1} =5mA, I _{B2} =-10mA
toff	-	1500	-		

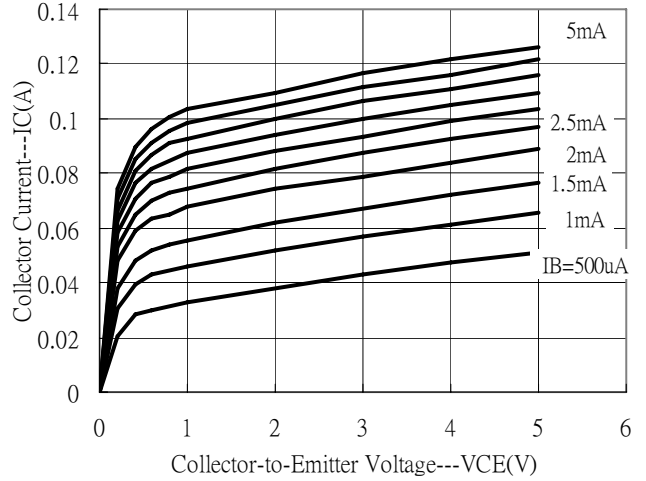
*Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%

Typical Characteristics

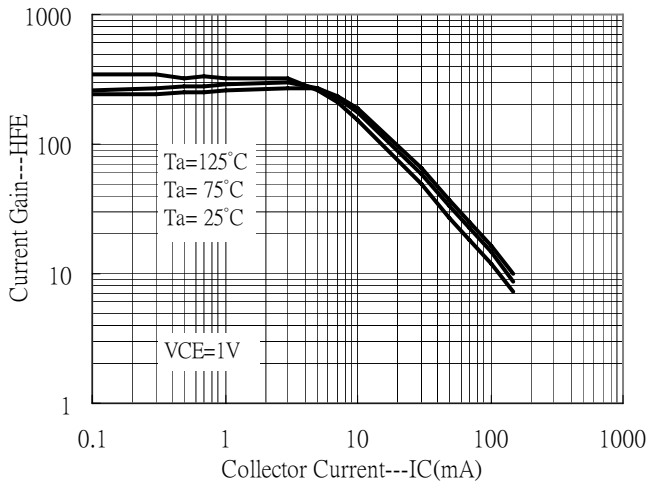
Emitter Grounded Output Characteristics



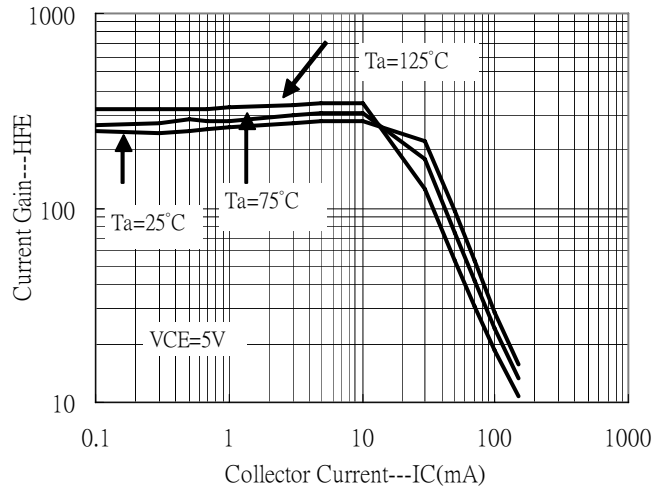
Emitter Grounded Output Characteristics



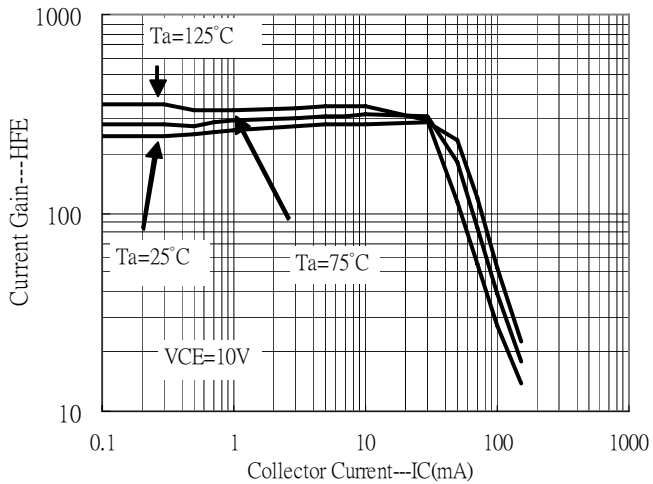
Current Gain vs Collector Current



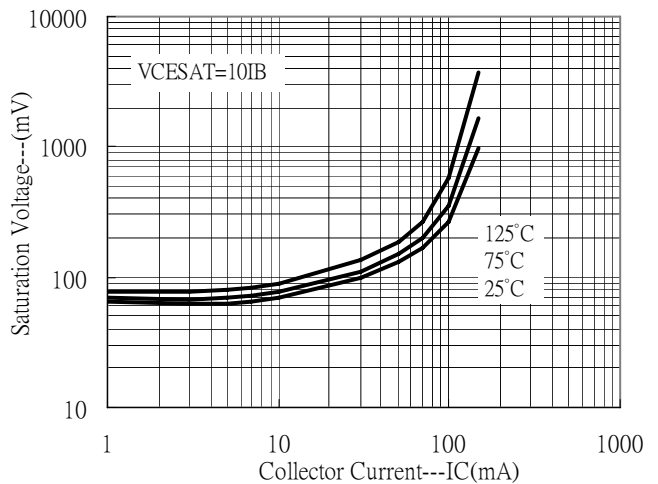
Current Gain vs Collector Current



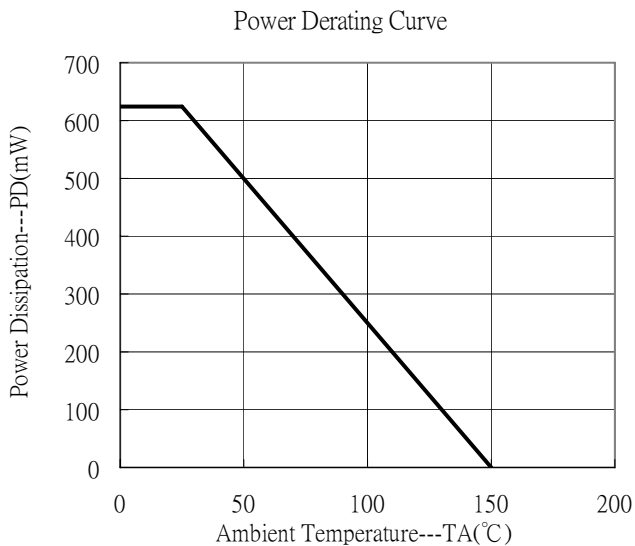
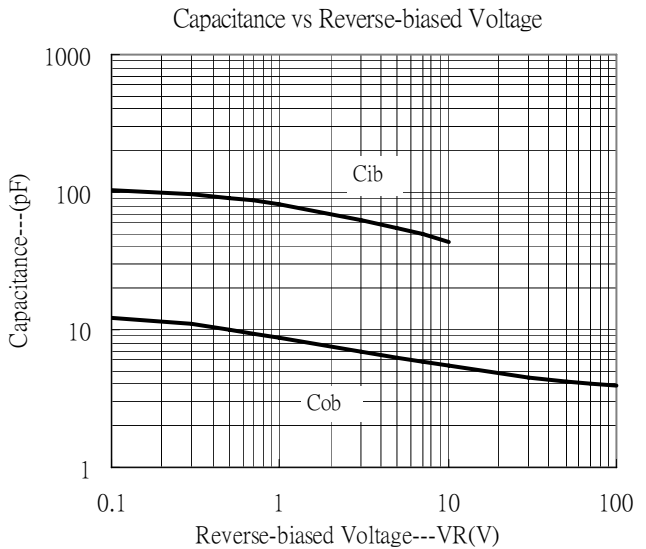
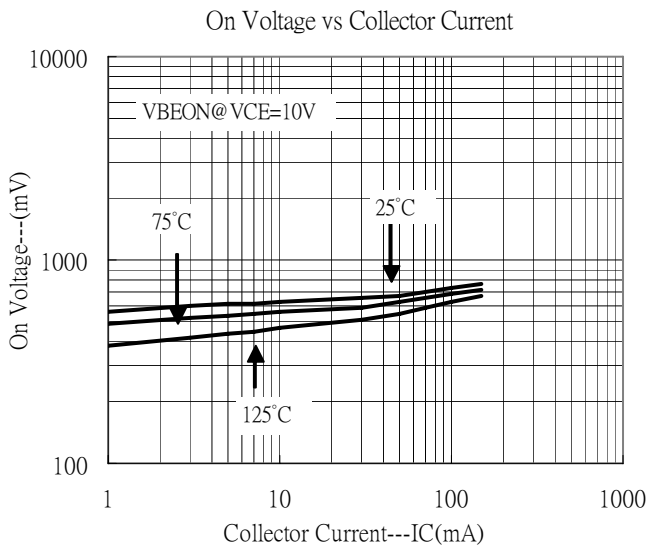
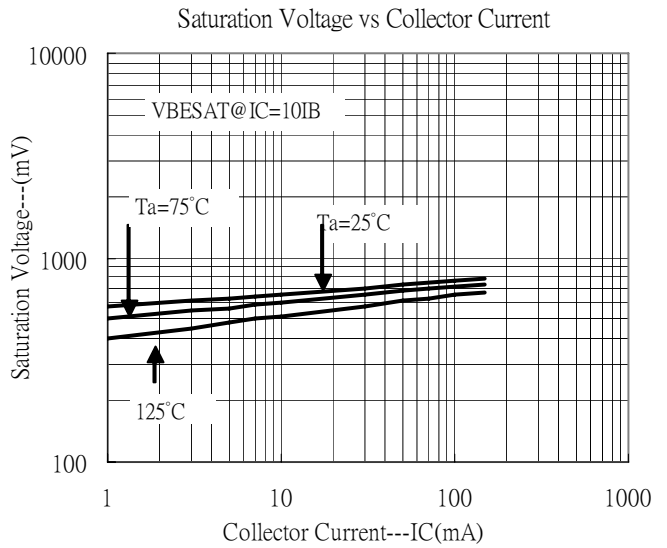
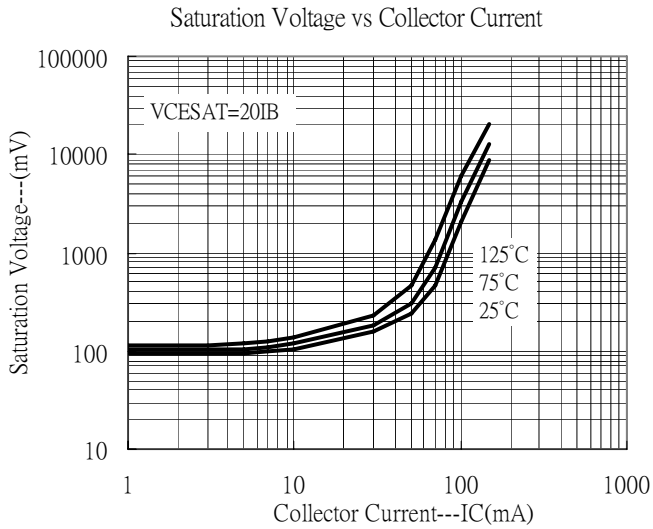
Current Gain vs Collector Current



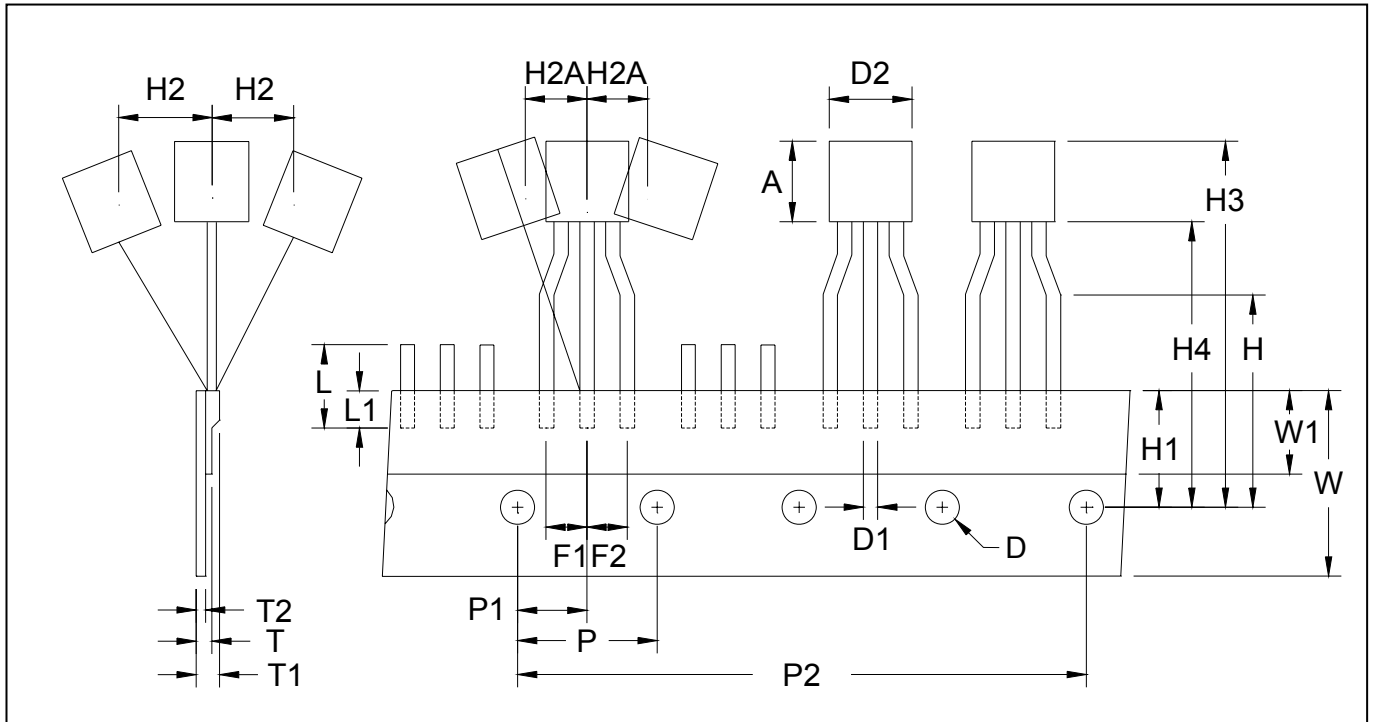
Saturation Voltage vs Collector Current



Typical Characteristics(Cont.)



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
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

Recommended wave soldering condition

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

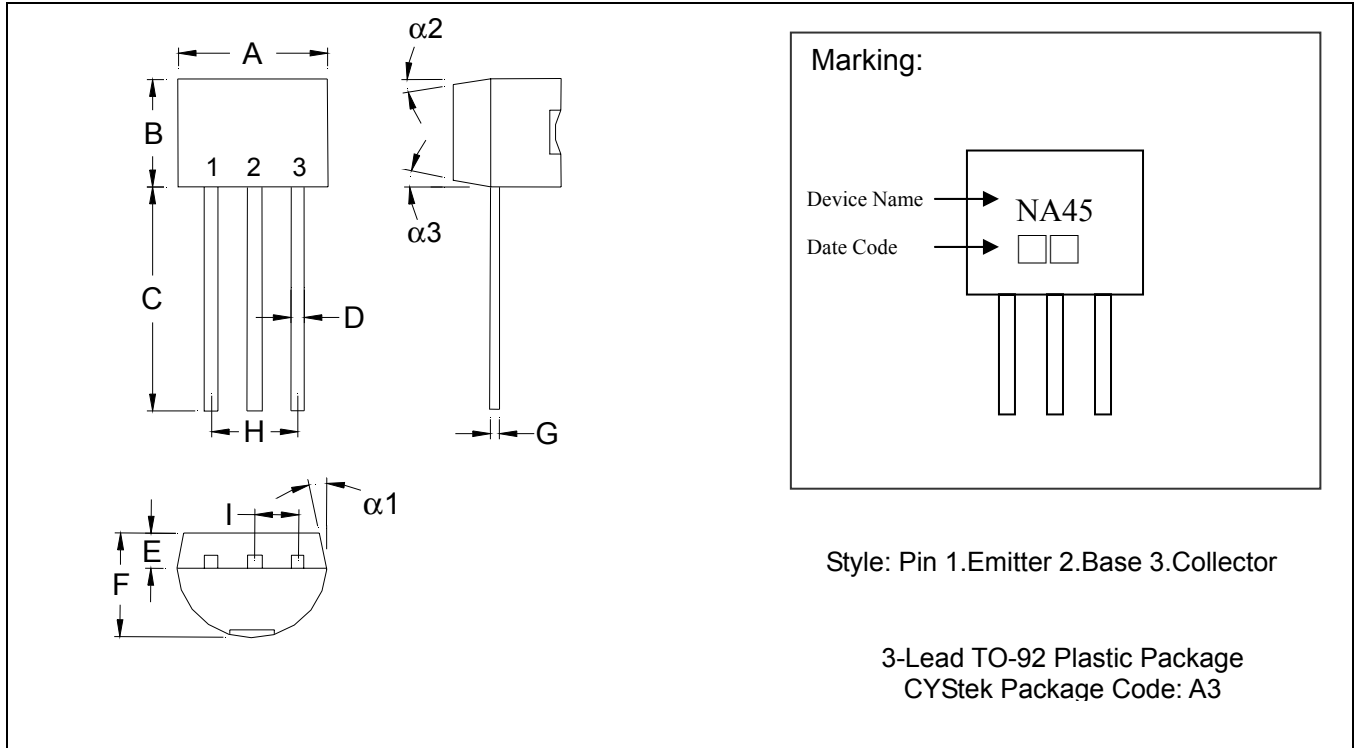
Recommended temperature profile for IR reflow



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.

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

TO-92 Dimension



*: 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	$\alpha 1$	-	*5°	-	*5°
E	-	*0.0500	-	*1.27	$\alpha 2$	-	*2°	-	*2°
F	0.1323	0.1480	3.36	3.76	$\alpha 3$	-	*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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