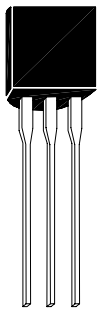
HBC546

NPN EPITAXIAL PLANAR TRANSISTOR



TO-92

Description

The HBC546 is primarily intended for use in driver stage of audio amplifiers.

Features

- High Breakdown Voltage: 65V
- High DC Current Gain: 110-800 at I_C=2mA, V_{CE}=5V

Absolute Maximum Ratings

- Maximum Temperatures
  Storage Temperature ..... -55 ~ +150 °C
  Junction Temperature ..... +150 °C Maximum
- Maximum Power Dissipation
  Total Power Dissipation (T_A=25°C) ..... 625 mW
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage ..... 80 V
  V_{CEO} Collector to Emitter Voltage ..... 65 V
  V_{EBO} Emitter to Base Voltage ..... 6 V
  I_C Collector Current ..... 100 mA

Electrical Characteristics (T_A=25°C)

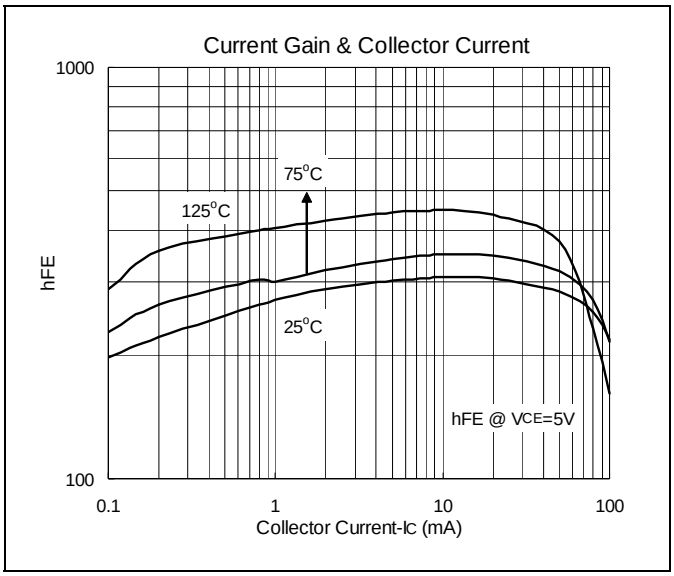
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	80	-	-	V	I_C=100uA, I_E=0
BV_{CEO}	65	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	6	-	-	V	I_E=10uA, I_C=0
I_{CBO}	-	-	15	nA	V_{CB}=30V, I_E=0
$V_{BE(on)1}$	-	-	770	mV	I_C=10mA, V_{CE}=5V
$V_{BE(on)2}$	580	-	700	mV	I_C=2mA, V_{CE}=5V
*$V_{CE(sat)1}$	-	-	250	mV	I_C=10mA, I_B=0.5mA
*$V_{CE(sat)2}$	-	-	600	mV	I_C=100mA, I_B=5mA
*$V_{BE(sat)1}$	-	700	-	mV	I_C=10mA, I_B=0.5mA
*$V_{BE(sat)2}$	-	900	-	mV	I_C=100mA, I_B=5mA
*h_{FE}	110	-	800		V_{CE}=5V, I_C=2mA
f_T	-	300		MHz	V_{CE}=5V, I_C=10mA, f=100MHz
Cob	-	-	4.5	PF	V_{CB}=10V, I_E=0, f=1MHz

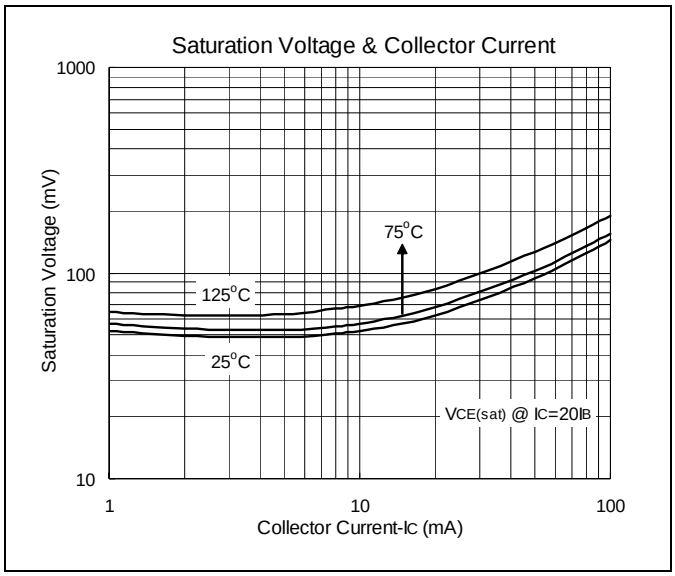
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

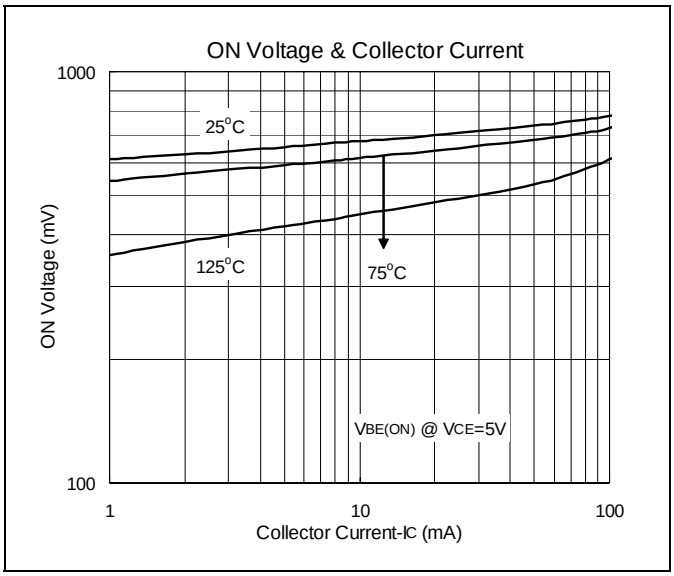
Classification of hFE

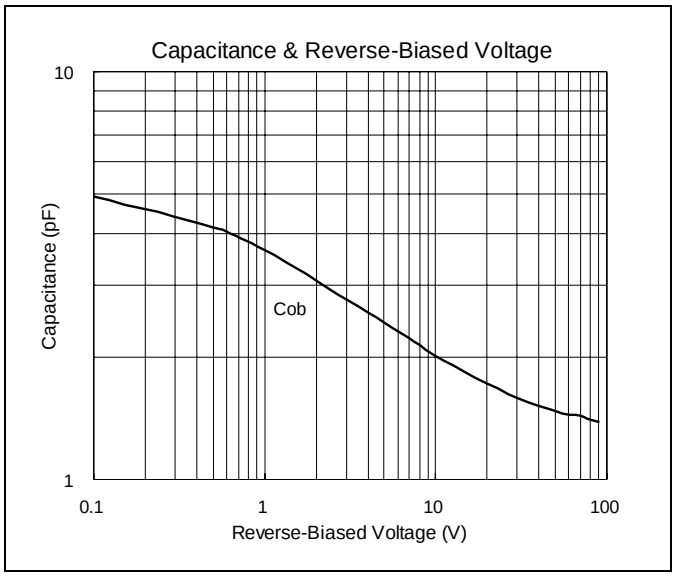
Rank	A	B	C
Range	110-220	200-450	420-800

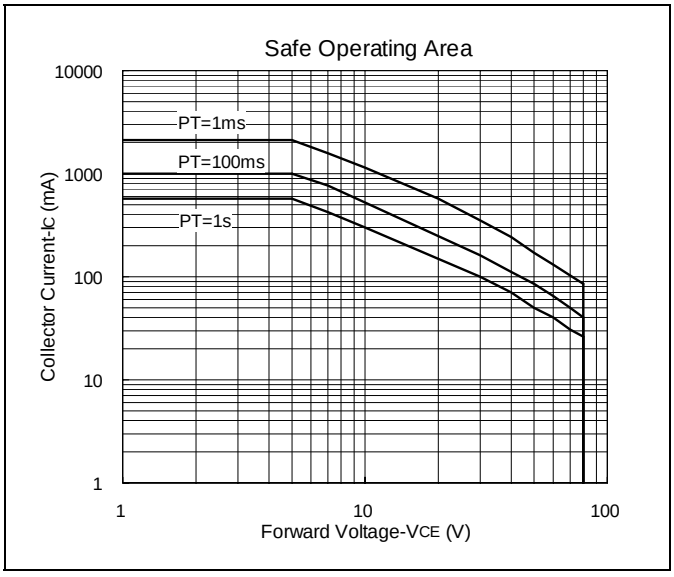
Characteristics Curve

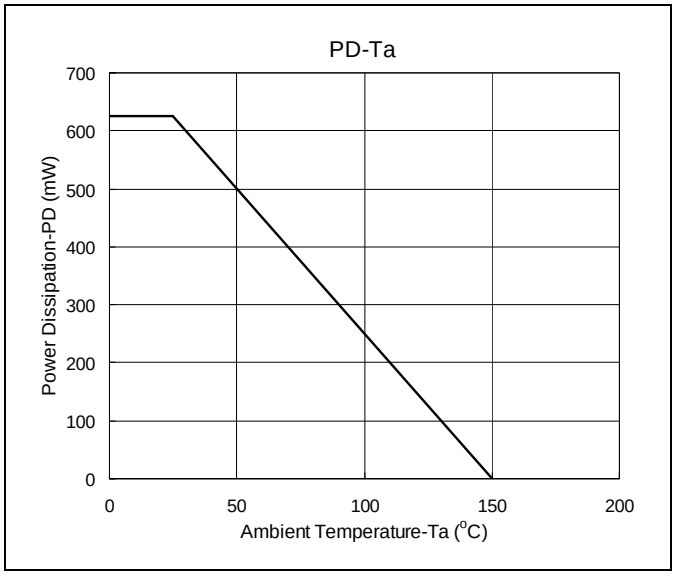




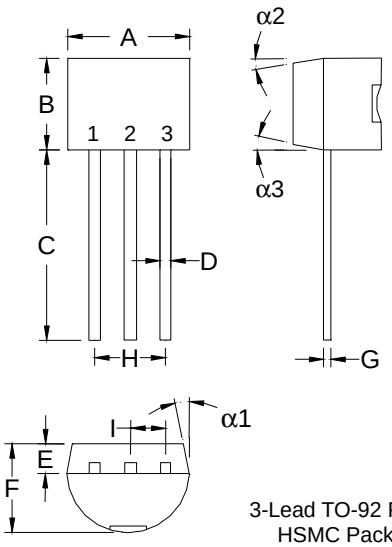






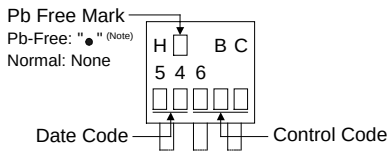


TO-92 Dimension



3-Lead TO-92 Plastic Package
HSMC Package Code: A

Marking:



Note: Green label is used for pb-free packing

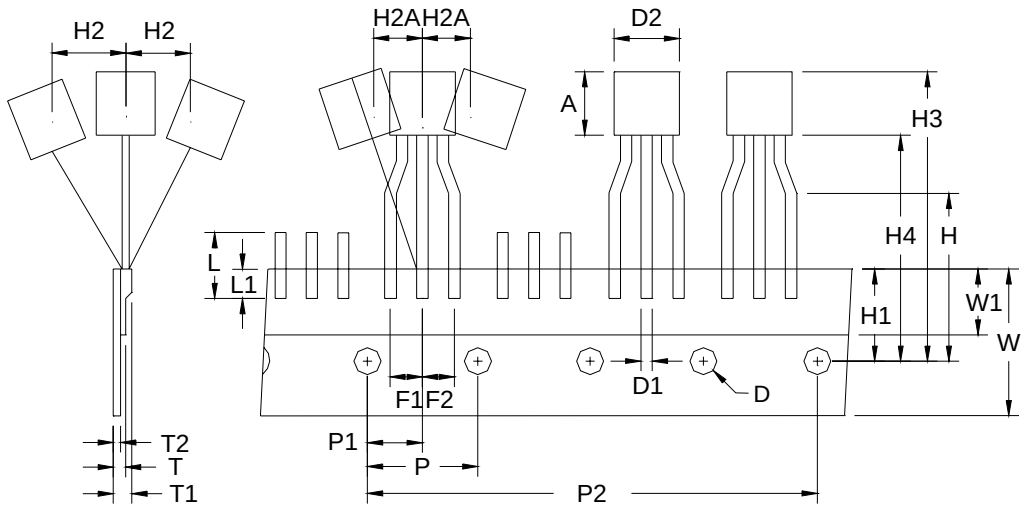
Pin Style: 1.Collector 2.Base 3.Emitter

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	4.33	4.83
B	4.33	4.83
C	12.70	-
D	0.36	0.56
E	-	*1.27
F	3.36	3.76
G	0.36	0.56
H	-	*2.54
I	-	*1.27
α1	-	*5°
α2	-	*2°
α3	-	*2°

*: Typical, Unit: mm

TO-92 Taping Dimension



DIM	Min.	Max.
A	4.33	4.83
D	3.80	4.20
D1	0.36	0.53
D2	4.33	4.83
F1,F2	2.40	2.90
H	15.50	16.50
H1	8.50	9.50
H2	-	1
H2A	-	1
H3	-	27
H4	-	21
L	-	11
L1	2.50	-
P	12.50	12.90
P1	5.95	6.75
P2	50.30	51.30
T	-	0.55
T1	-	1.42
T2	0.36	0.68
W	17.50	19.00
W1	5.00	7.00

Unit: mm

Head Office And Factory:

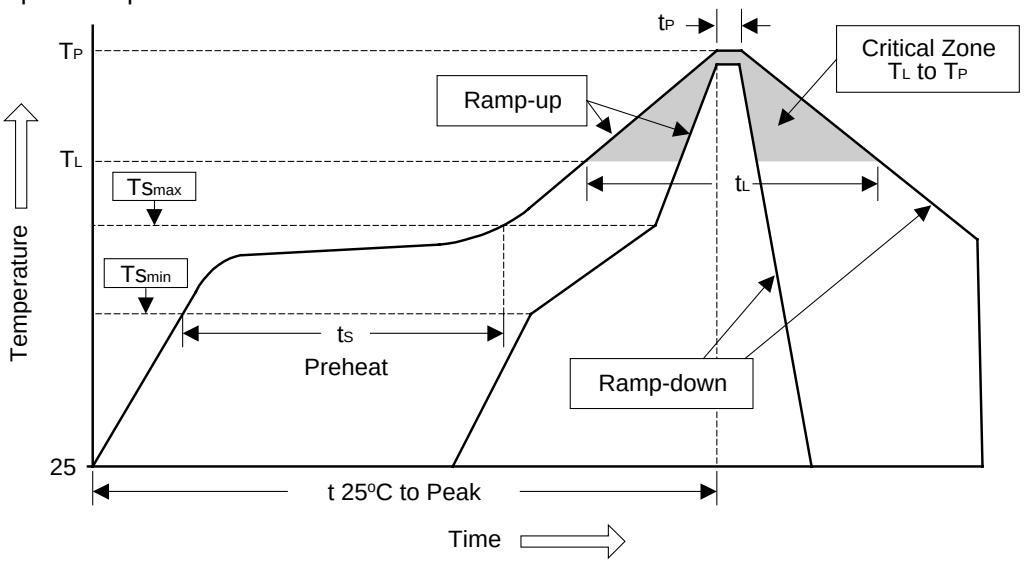
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec