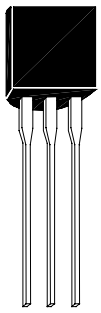
HA8050

NPN EPITAXIAL PLANAR TRANSISTOR



TO-92

Description

The HA8050 is designed for use in 2W output amplifier of portable radios in class B push-pull operation.

Features

- High total power dissipation (P_T: 2W, T_C=25°C)
- High collector current (I_C: 1.5A)
- Complementary to HA8550

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)..... 1 W
  Total Power Dissipation (T_C=25°C)..... 2 W
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage..... 40 V
  V_{CEO} Collector to Emitter Voltage..... 25 V
  V_{EBO} Emitter to Base Voltage..... 6 V
  I_C Collector Current..... 1.5 A
  I_B Base Current..... 500 mA

Electrical Characteristics (T_A=25°C)

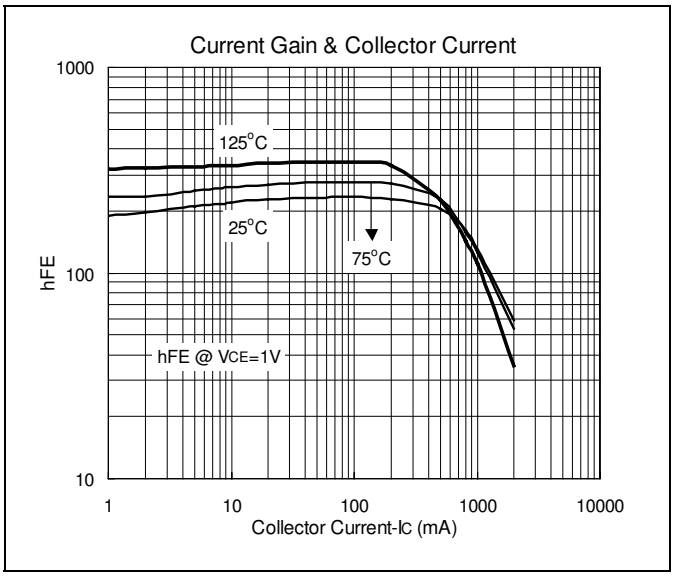
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	40	-	-	V	I_C=100uA
BV_{CEO}	25	-	-	V	I_C=2mA
BV_{EBO}	6	-	-	V	I_E=100uA
I_{CBO}	-	-	100	nA	V_{CB}=35V
I_{EBO}	-	-	100	nA	V_{EB}=6V
*$V_{CE(sat)}$	-	-	0.5	V	I_C=0.8A, I_B=80mA
*$V_{BE(sat)}$	-	-	1.2	V	I_C=0.8A, I_B=80mA
$V_{BE(on)}$	-	-	1	V	V_{CE}=1V, I_C=10mA
*h_{FE1}	45	-	-		V_{CE}=1V, I_C=5mA
*h_{FE2}	85	-	500		V_{CE}=1V, I_C=100mA
*h_{FE3}	40	-	-		V_{CE}=1V, I_C=800mA
f_T	100	-	-	MHz	V_{CE}=10V, I_C=50mA

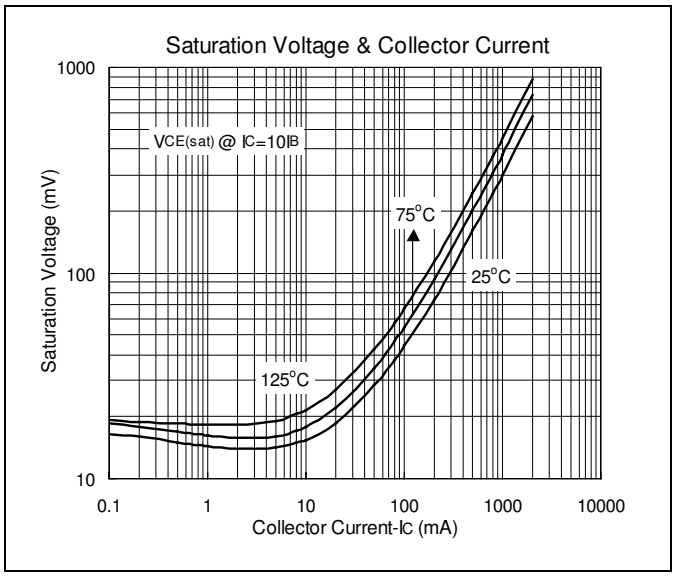
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

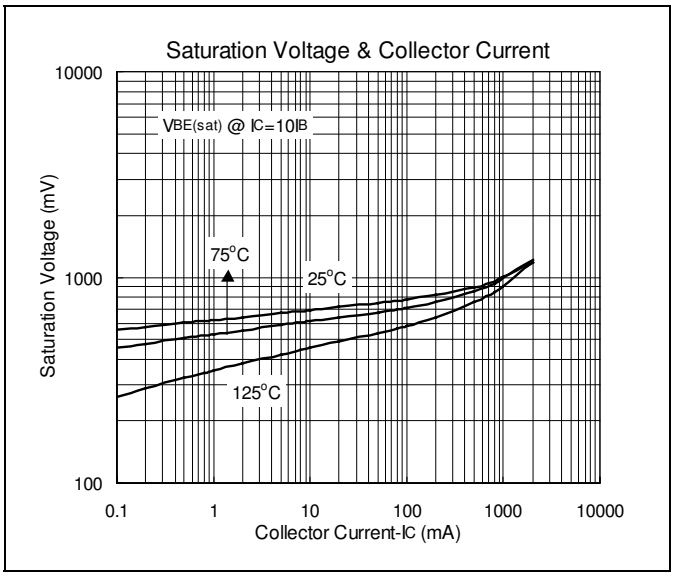
Classification on h_{FE2}

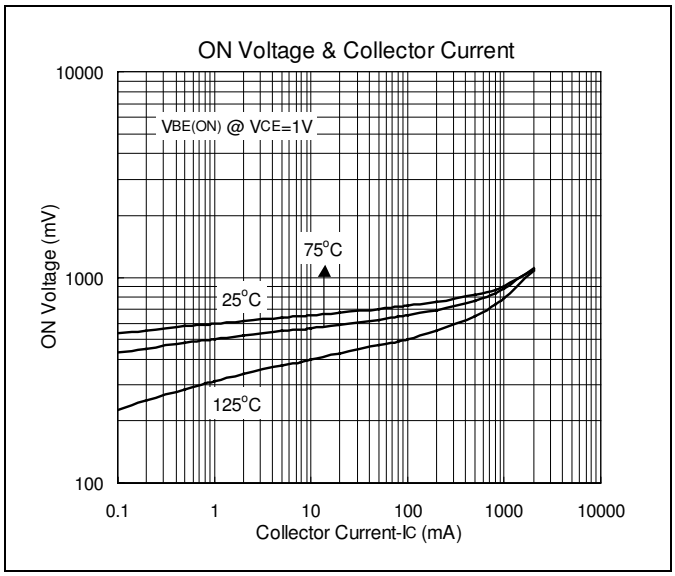
Rank	B	C	D	E
Range	85-160	120-200	160-300	250-500

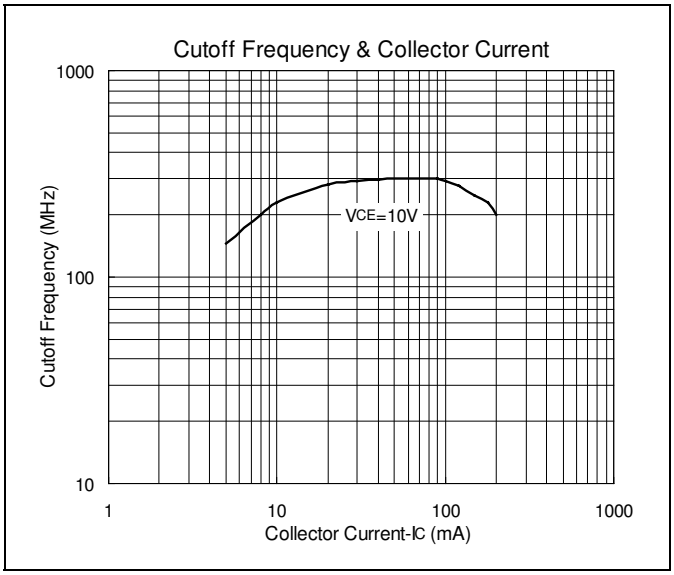
Characteristics Curve

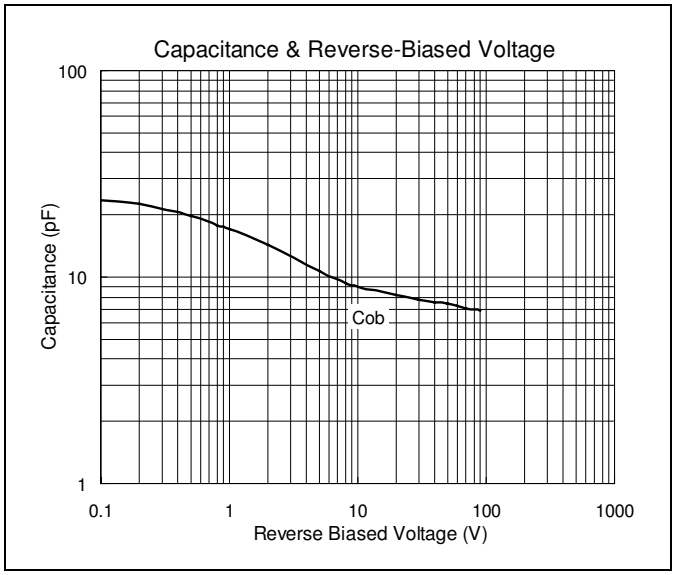


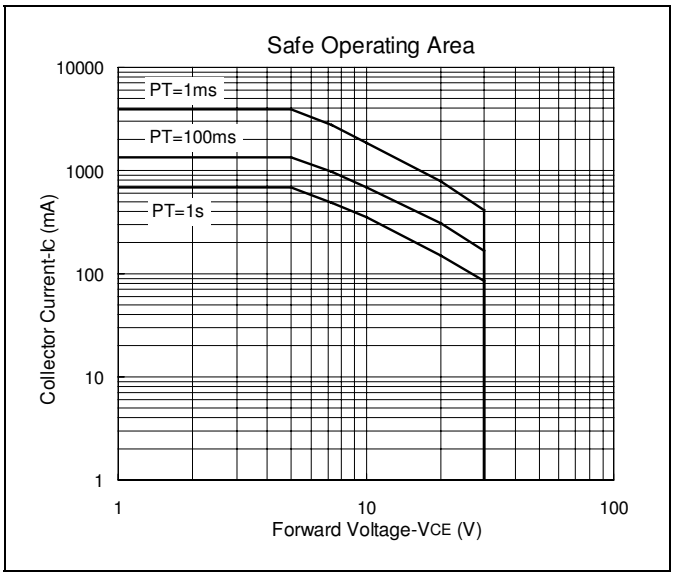


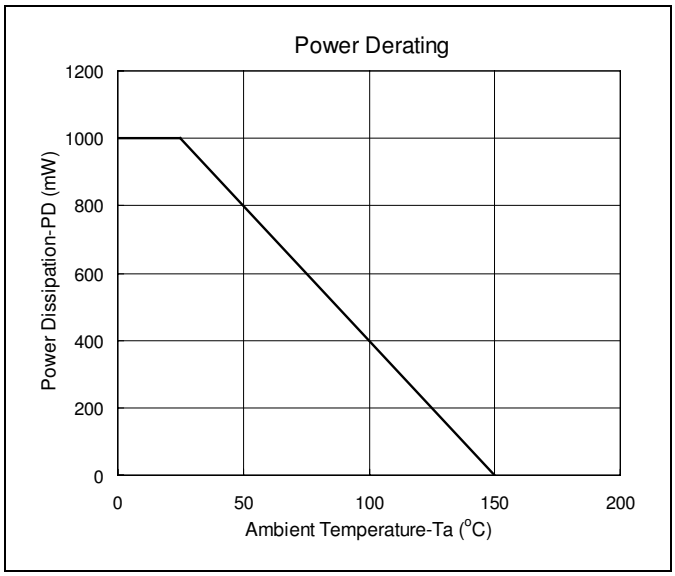




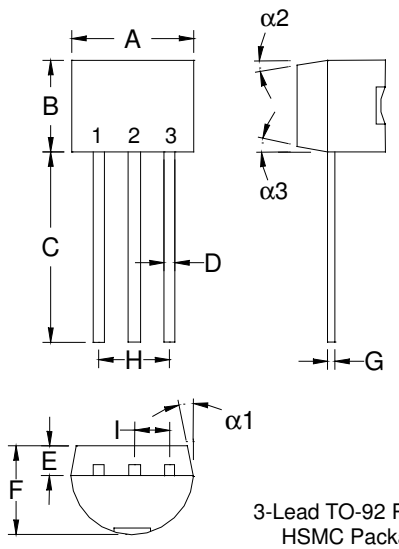





Safe Operating Area
10000
1000
100
10
1
PT=1ms
PT=100ms
PT=1s
Collector Current-Ic (mA)
1
10
100
Forward Voltage-VCE (V)

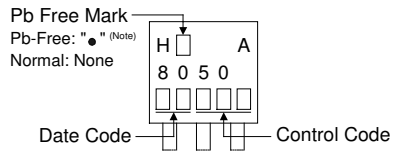

Power Derating
1200
1000
800
600
400
200
0
Power Dissipation-PD (mW)
0
50
100
150
200
Ambient Temperature-Ta (°C)

TO-92 Dimension



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

Marking:



Note: Green label is used for pb-free packing

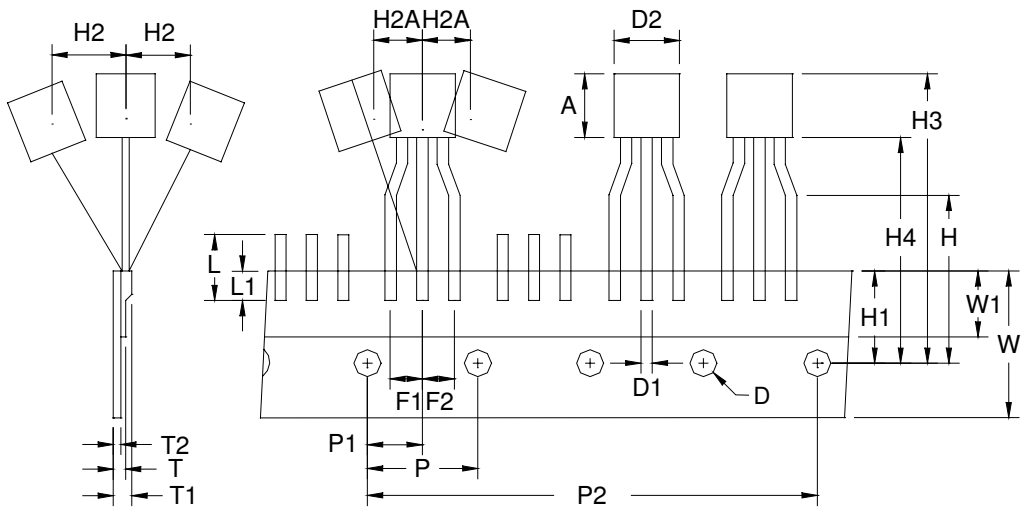
Pin Style: 1.Emitter 2.Base 3.Collector

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:

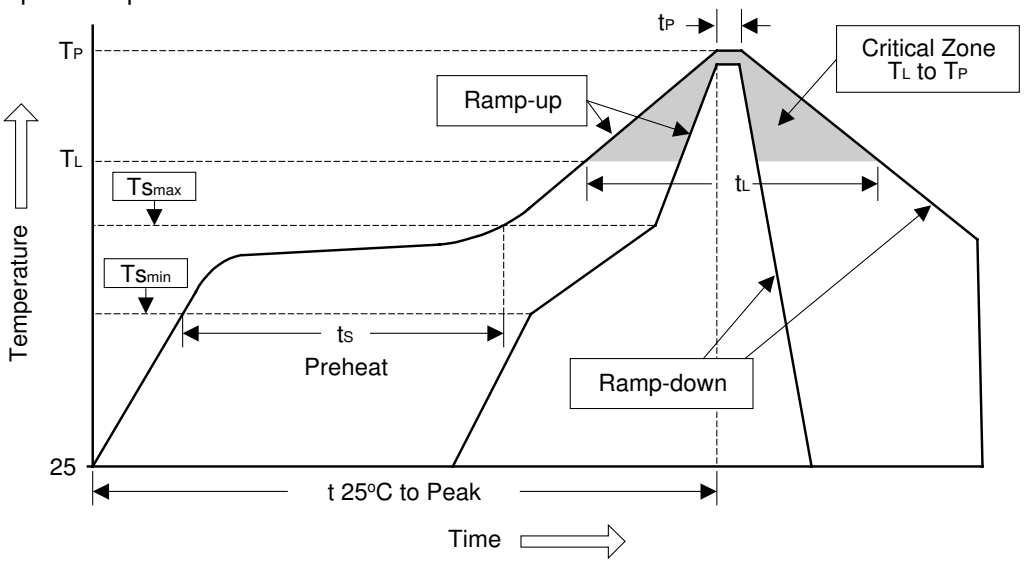
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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