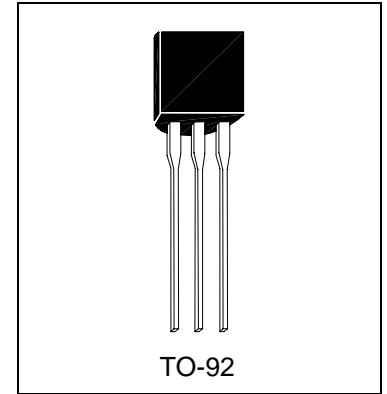




HSB1109S

PNP EPITAXIAL PLANAR TRANSISTOR



Description

The HSB1109S is designed for low frequency and high voltage amplifier applications complementary pair with HSD1609S.

Absolute Maximum Ratings

- Maximum Temperatures
 Storage Temperature -50 ~ +150 °C
 Junction Temperature +150 °C Maximum
- Maximum Power Dissipation
 Total Power Dissipation (T_A=25°C) 900 mW
- Maximum Voltages and Currents (T_A=25°C)
 V_{CBO} Collector to Base Voltage -160 V
 V_{CEO} Collector to Emitter Voltage -160 V
 V_{EBO} Emitter to Base Voltage -5 V
 I_C Collector Current -100 mA

Electrical Characteristics (T_A=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	-160	-	-	V	I _C =-10uA, I _E =0
BV _{CEO}	-160	-	-	V	I _C =-1mA, I _B =0
BV _{EBO}	-5	-	-	V	I _E =-10uA, I _C =0
I _{CBO}	-	-	-10	uA	V _{CB} =-140V, I _E =0
*V _{CE(sat)}	-	-	-2	V	I _C =-30mA, I _B =-3mA
V _{BE(on)}	-	-	-1.5	V	V _{CE} =-5V, I _C =-10mA
*h _{FE1}	60	-	320		V _{CE} =-5V, I _C =-10mA
*h _{FE2}	30	-	-		V _{CE} =-5V, I _C =-1mA
f _T	-	140	-	MHz	V _{CE} =-5V, I _C =-10mA, f=100MHz
Cob	-	5.5	-	pF	V _{CB} =-10V, I _E =0, f=1MHz

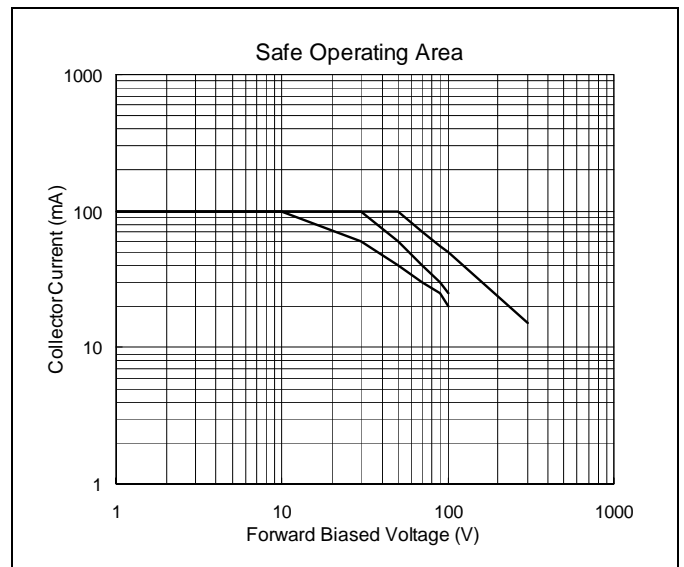
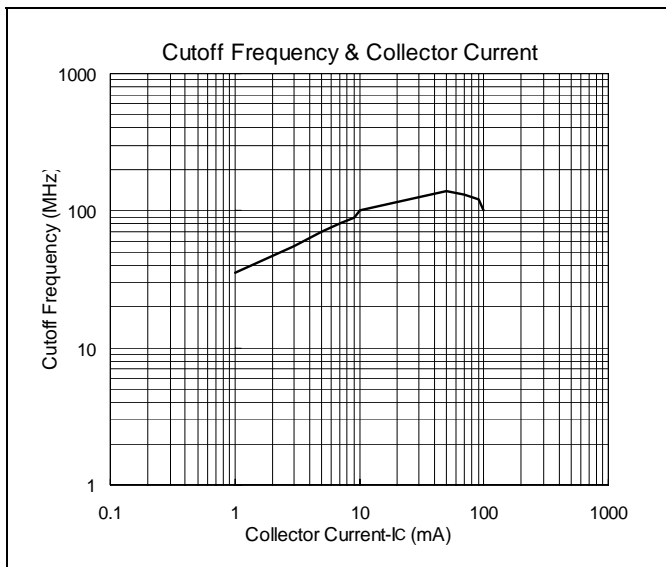
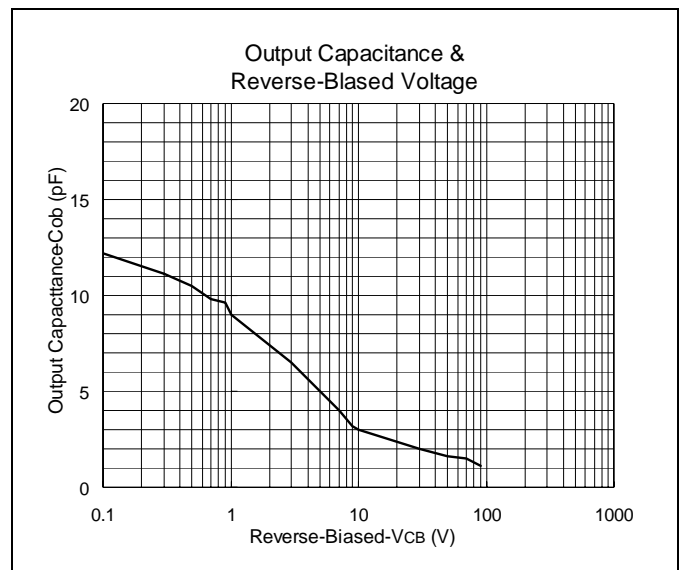
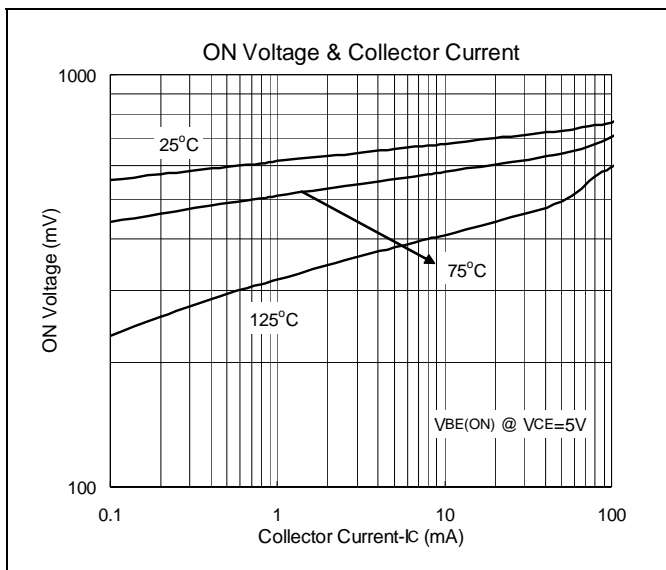
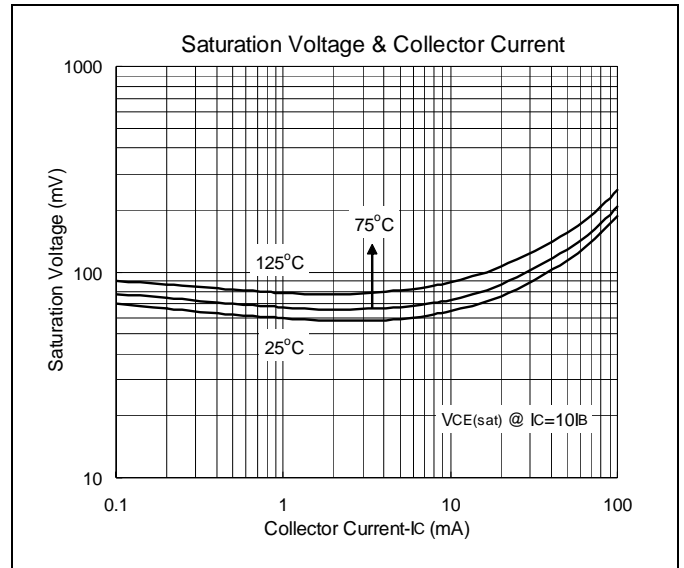
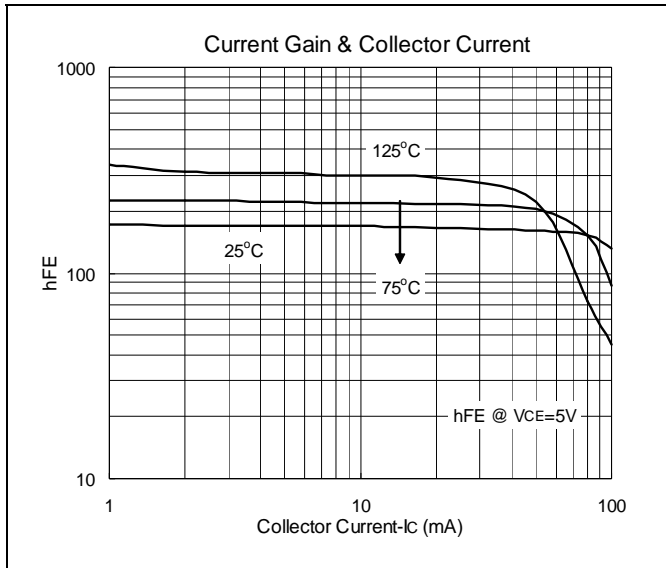
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

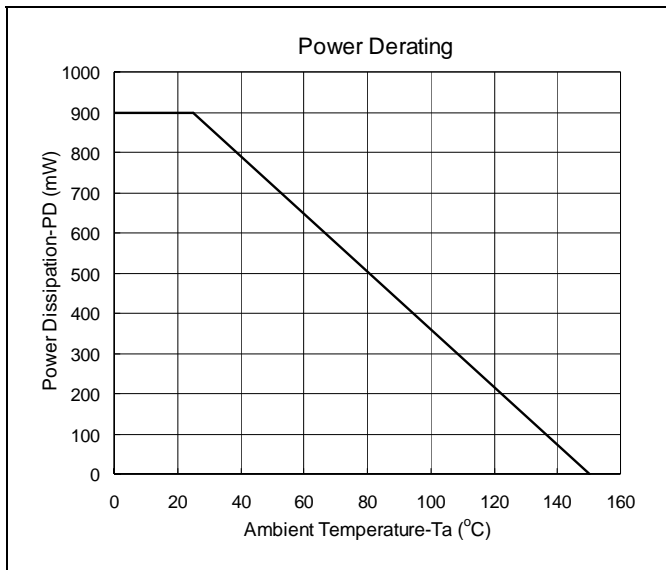
Classification Of h_{FE1}

Rank	B	C	D
Range	60-120	100-200	160-320



Characteristics Curve







TO-92 Dimension

Marking:

Pb Free Mark
 Pb-Free: "●" (Note)
 Normal: None

H	S B
1 1 0 9 S	

Date Code Control Code

Note: Green label is used for pb-free packing

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

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
$\alpha 1$	-	*5°
$\alpha 2$	-	*2°
$\alpha 3$	-	*2°

*: Typical, Unit: mm

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

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

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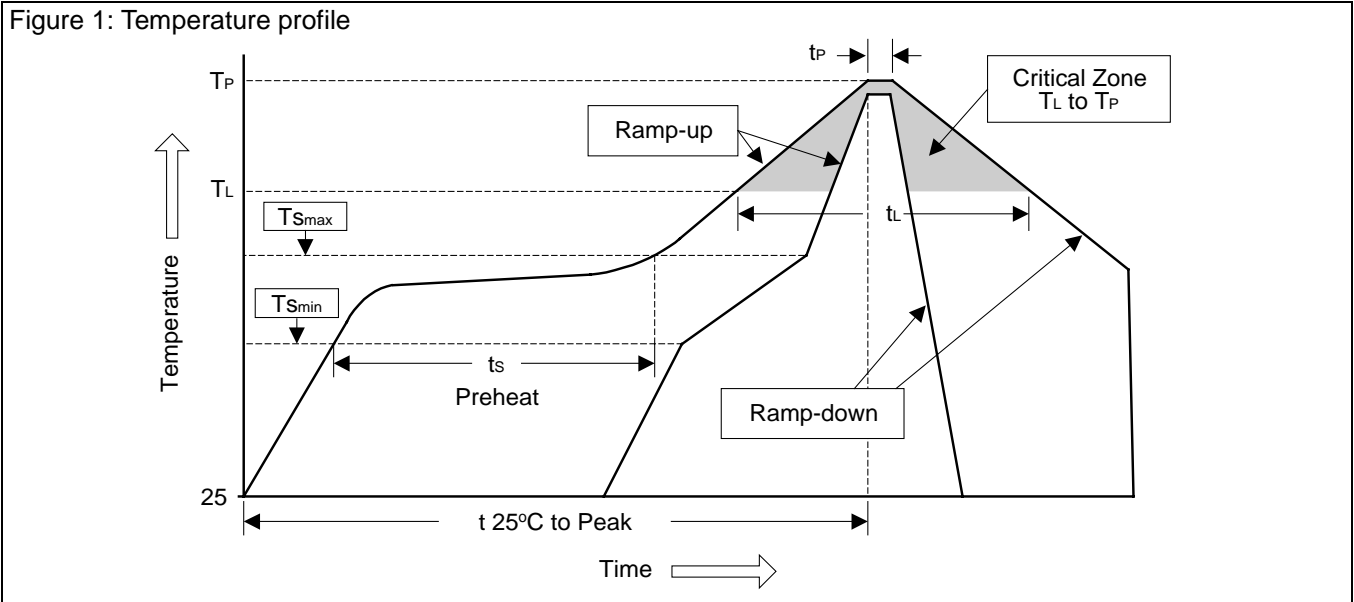
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- Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
 Tel: 886-3-5983621~5 Fax: 886-3-5982931



Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	$<3^{\circ}\text{C}/\text{sec}$	$<3^{\circ}\text{C}/\text{sec}$
Preheat		
- Temperature Min (T_{Smin})	100°C	150°C
- Temperature Max (T_{Smax})	150°C	200°C
- Time (min to max) (t_s)	60~120 sec	60~180 sec
T_{Smax} to T_L		
- Ramp-up Rate	$<3^{\circ}\text{C}/\text{sec}$	$<3^{\circ}\text{C}/\text{sec}$
Time maintained above:		
- Temperature (T_L)	183°C	217°C
- Time (t_L)	60~150 sec	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	$<6^{\circ}\text{C}/\text{sec}$	$<6^{\circ}\text{C}/\text{sec}$
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