

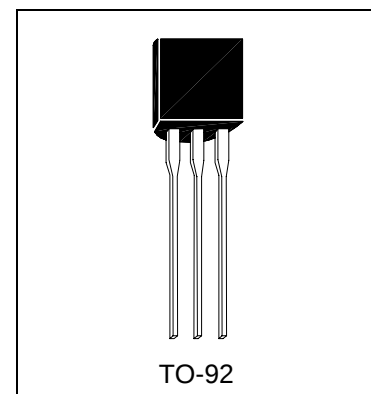


HSB1109S

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 ($T_A=25^{\circ}\text{C}$) 900 mW
- Maximum Voltages and Currents ($T_A=25^{\circ}\text{C}$)
 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 ($T_A=25^{\circ}\text{C}$)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	-160	-	-	V	$I_C=-10\mu\text{A}$, $I_E=0$
BV_{CEO}	-160	-	-	V	$I_C=-1\text{mA}$, $I_B=0$
BV_{EBO}	-5	-	-	V	$I_E=-10\mu\text{A}$, $I_C=0$
I_{CBO}	-	-	-10	μA	$V_{CB}=-140\text{V}$, $I_E=0$
$*V_{CE(sat)}$	-	-	-2	V	$I_C=-30\text{mA}$, $I_B=-3\text{mA}$
$V_{BE(on)}$	-	-	-1.5	V	$V_{CE}=-5\text{V}$, $I_C=-10\text{mA}$
$*h_{FE1}$	60	-	320		$V_{CE}=-5\text{V}$, $I_C=-10\text{mA}$
$*h_{FE2}$	30	-	-		$V_{CE}=-5\text{V}$, $I_C=-1\text{mA}$
f_T	-	140	-	MHz	$V_{CE}=-5\text{V}$, $I_C=-10\text{mA}$, $f=100\text{MHz}$
Cob	-	5.5	-	pF	$V_{CB}=-10\text{V}$, $I_E=0$, $f=1\text{MHz}$

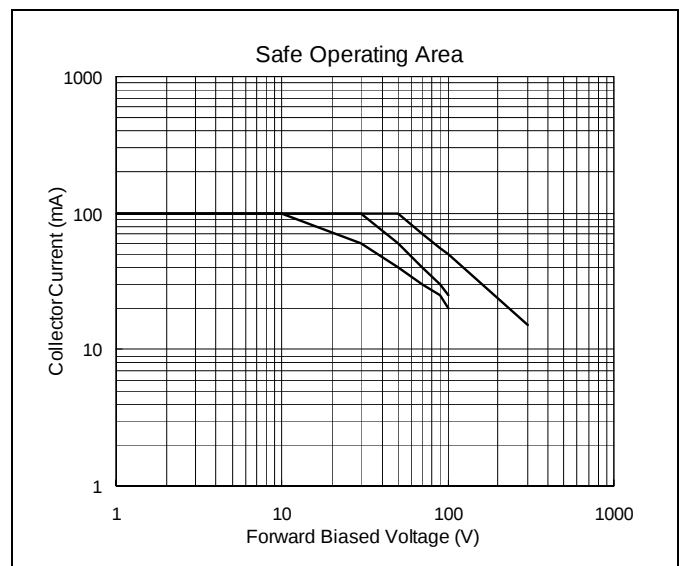
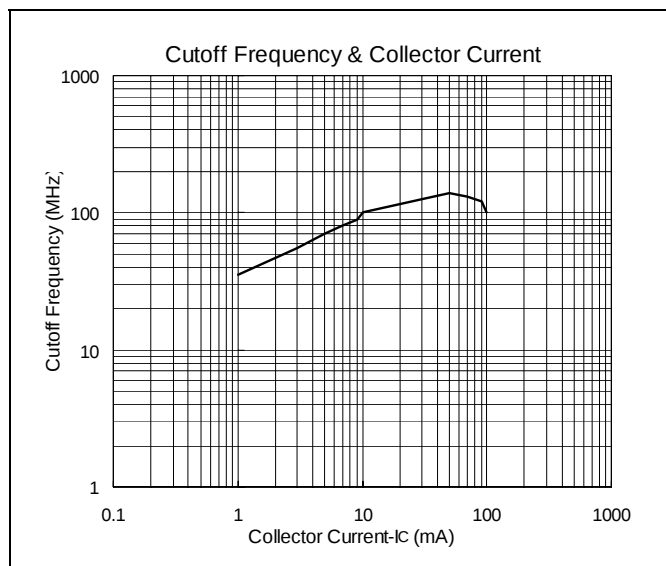
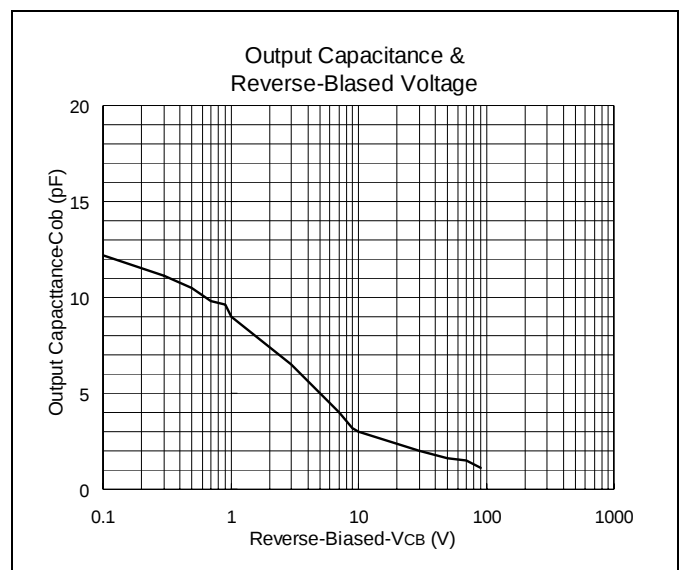
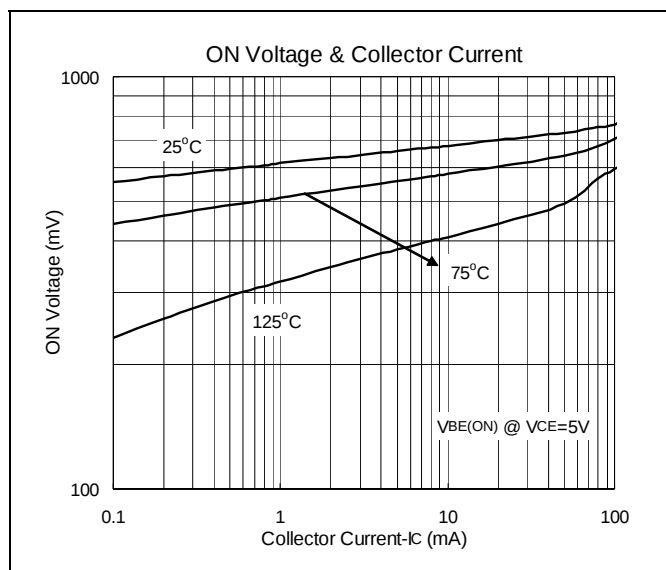
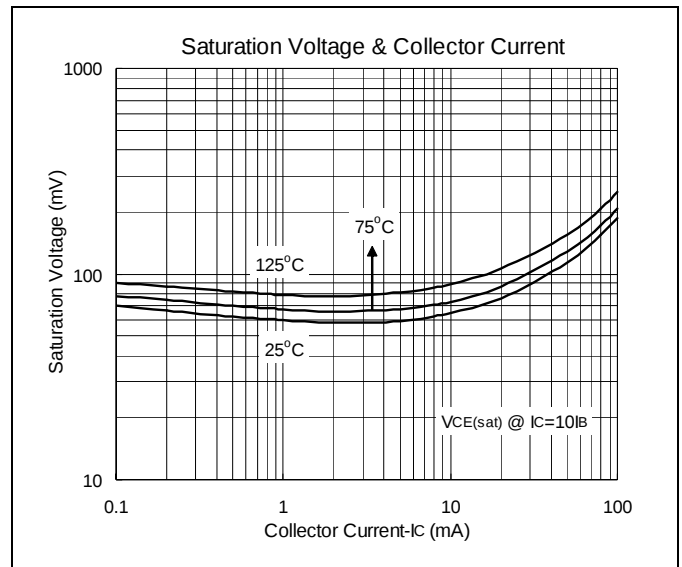
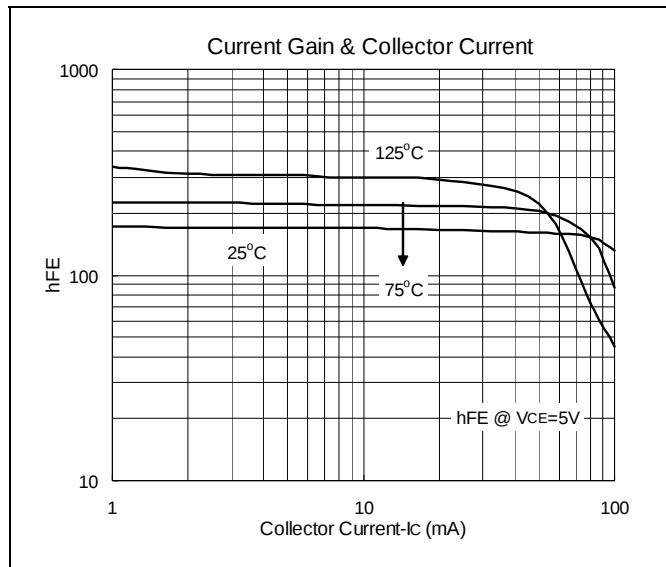
*Pulse Test: Pulse Width $\leq 380\mu\text{s}$, Duty Cycle $\leq 2\%$

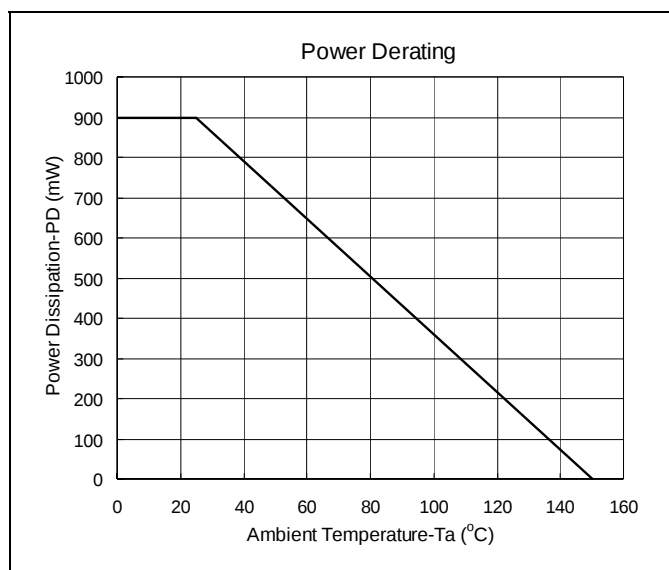
Classification Of h_{FE1}

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



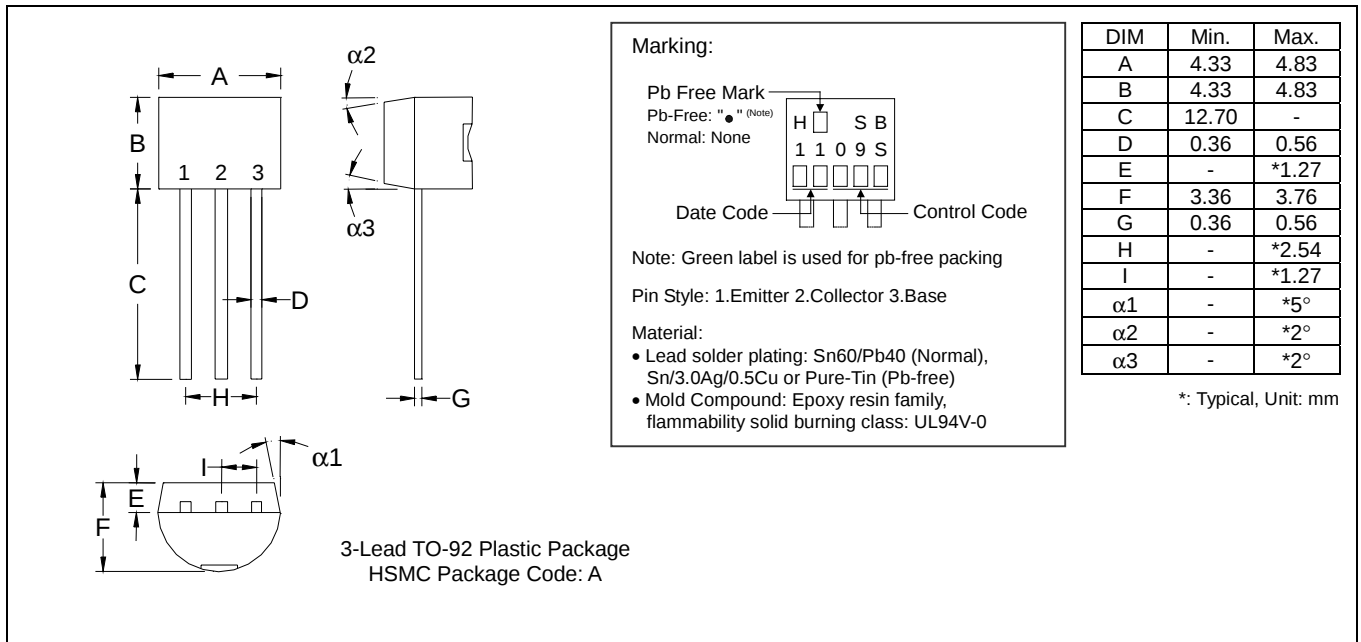
Characteristics Curve



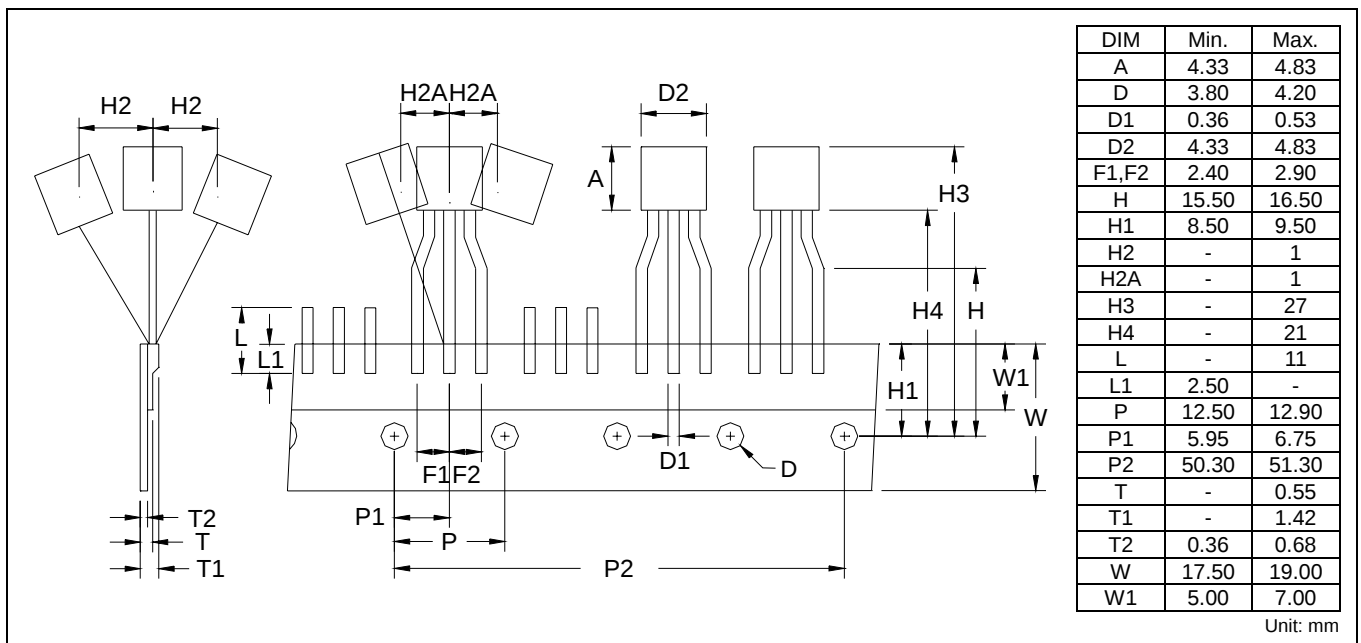




TO-92 Dimension



TO-92 Taping Dimension



Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of HSMC.
- HSMC reserves the right to make changes to its products without notice.
- **HSMC semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- HSMC assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

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

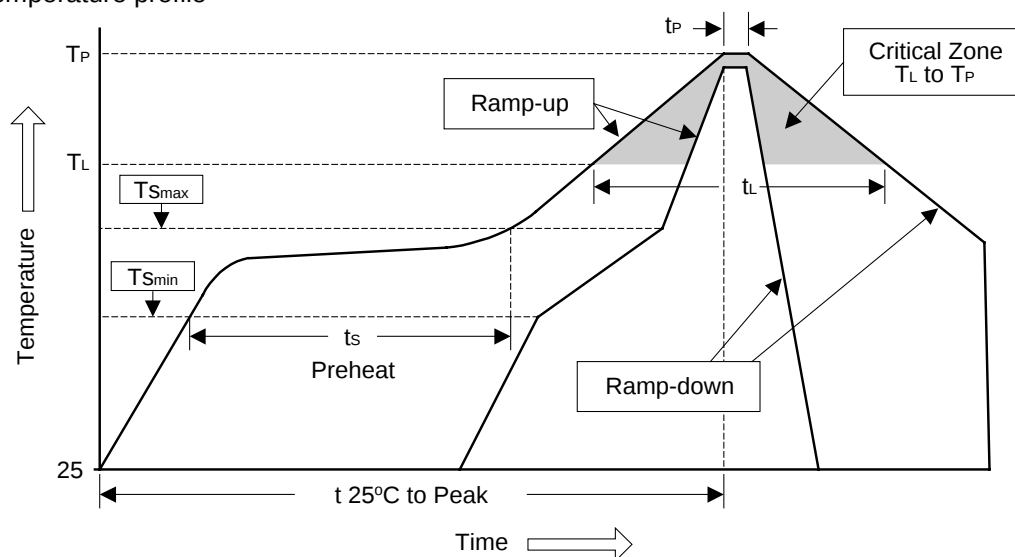


Soldering Methods for HSMC's Products

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)	$<3^{\circ}\text{C}/\text{sec}$	$<3^{\circ}\text{C}/\text{sec}$
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