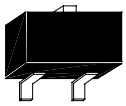
HMBT28S

NPN EPITAXIAL PLANAR TRANSISTOR



SOT-23

Description

The HMBT28S is a NPN silicon transistor, designed for use in general-purpose SPEECH SYNTHSIZER (Voice Rom) IC audio output driver stage amplifier applications.

Features

- Excellent hFE Linearity
- High DC Current Gain
- High Power Dissipation

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) ..... 225 mW
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage ..... 40 V
  V_{CEO} Collector to Emitter Voltage ..... 20 V
  V_{EBO} Emitter to Base Voltage ..... 6 V
  I_C Collector Current ..... 1.25 A
  I_B Base Current ..... 0.4 A

Electrical Characteristics (T_A=25°C)

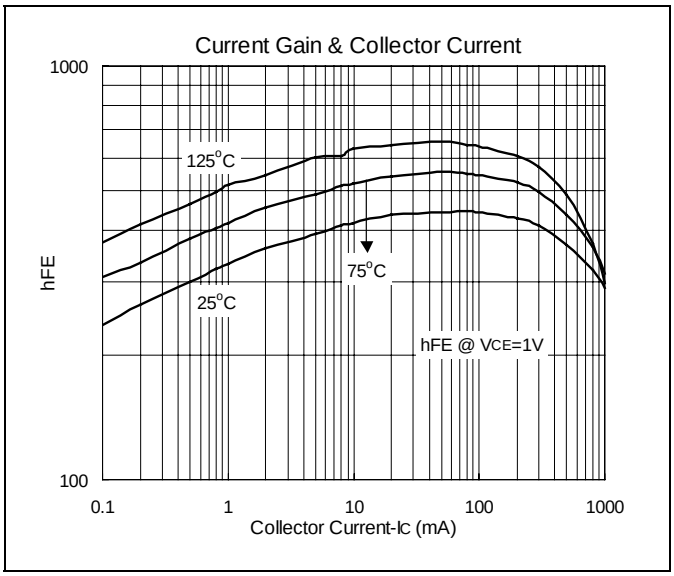
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	40	-	-	V	I_C=100uA, I_E=0
BV_{CEO}	20	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	6	-	-	V	I_E=100uA, I_C=0
I_{CBO}	-	-	100	nA	V_{CB}=35V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=6V, I_C=0
*$V_{CE(sat)}$	-	-	0.55	V	I_C=600mA, I_B=20mA
*h_{FE1}	290	-	-		V_{CE}=1V, I_C=1mA
*h_{FE2}	300	-	1000		V_{CE}=1V, I_C=0.1A
h_{FE3}	300	-	-		V_{CE}=1V, I_C=0.3A
h_{FE4}	300	-	-		V_{CE}=1V, I_C=0.5A
f_T	100	-	-	MHz	V_{CE}=10V, I_C=50mA, f=1MHz
Cob	-	9	-	pF	V_{CB}=10V, f=1MHz, I_E=0

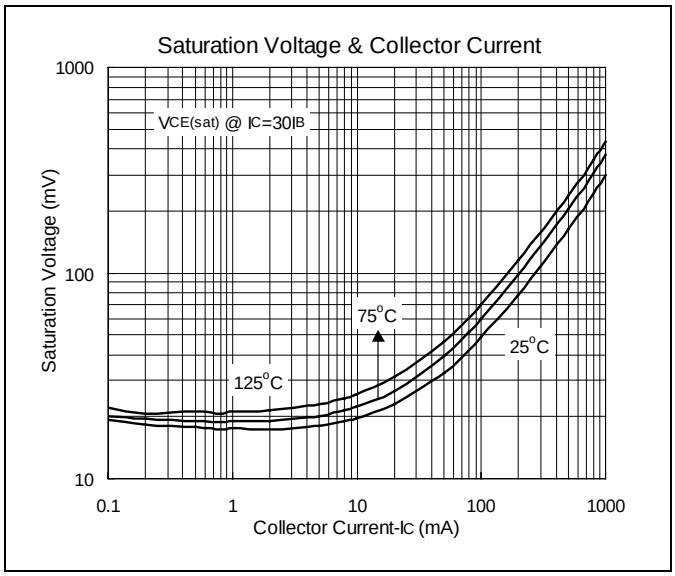
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

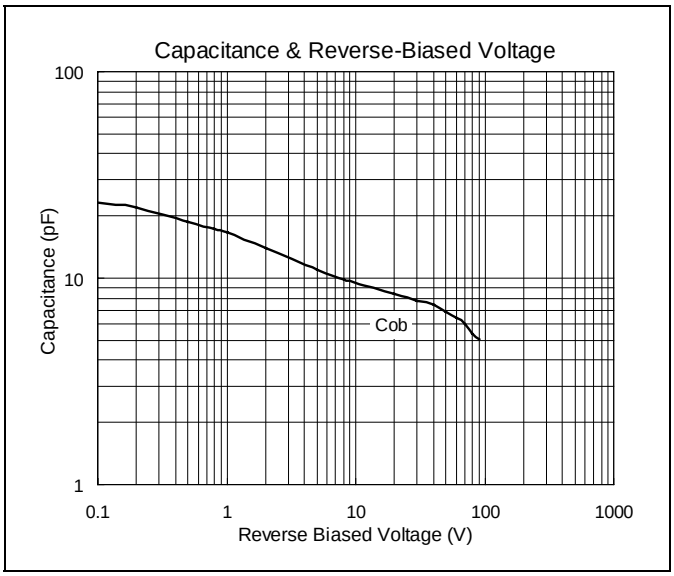
Classification of hFE2

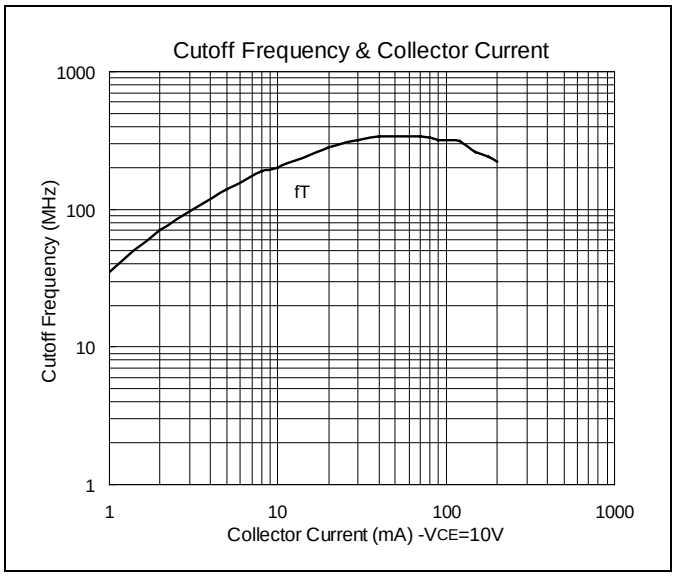
Rank (Marking Code)	B (3FB)	C (3FC)	D (3FD)
Range	300-550	500-700	650-1000

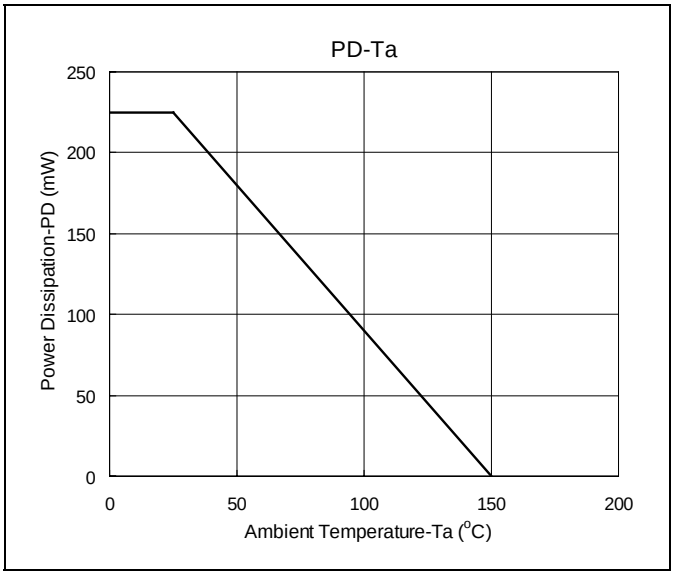
Characteristics Curve



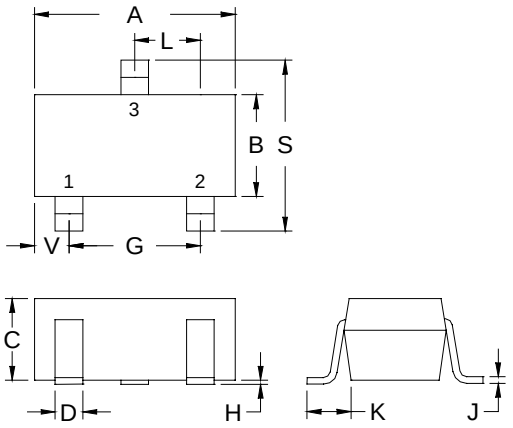






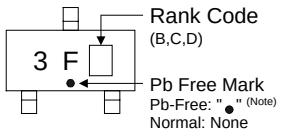


SOT-23 Dimension



3-Lead SOT-23 Plastic
Surface Mounted Package
HSMC Package Code: N

Marking:



Note: Pb-free product can distinguish by the green label or the extra description on the right side of the label.

Pin Style: 1.Base 2.Emitter 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	2.80	3.04
B	1.20	1.60
C	0.89	1.30
D	0.30	0.50
G	1.70	2.30
H	0.013	0.10
J	0.085	0.177
K	0.32	0.67
L	0.85	1.15
S	2.10	2.75
V	0.25	0.65

*: Typical, Unit: mm

Head Office And Factory:

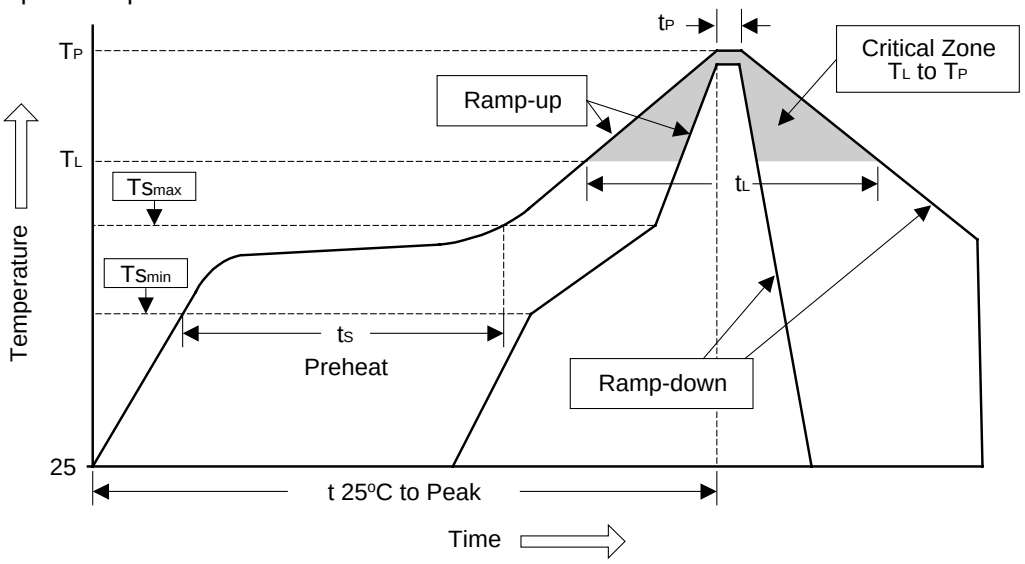
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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