

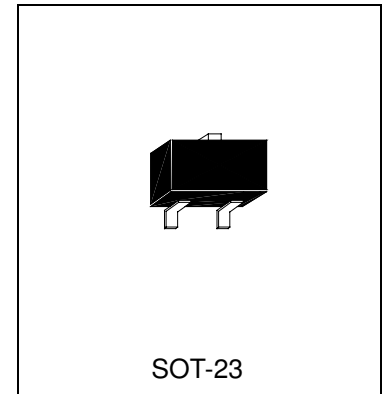


# HMBT1015

PNP EPITAXIAL PLANAR TRANSISTOR

## Description

The HMBT1015 is designed for use in driver stage of AF amplifier and general purpose amplification.



## Absolute Maximum Ratings

- Maximum Temperatures  
Storage Temperature..... -55 ~ +150 °C  
Junction Temperature..... 150 °C Maximum
- Maximum Power Dissipation  
Total Power Dissipation (T<sub>A</sub>=25°C)..... 225 mW
- Maximum Voltages and Currents (T<sub>A</sub>=25°C)  
V<sub>CBO</sub> Collector to Base Voltage ..... -50 V  
V<sub>CEO</sub> Collector to Emitter Voltage..... -50 V  
V<sub>EBO</sub> Emitter to Base Voltage ..... -5 V  
I<sub>C</sub> Collector Current ..... -150 mA

## Electrical Characteristics (T<sub>A</sub>=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	-50	-	-	V	I <sub>C</sub> =-100uA
BV <sub>CEO</sub>	-50	-	-	V	I <sub>C</sub> =-1mA
BV <sub>EBO</sub>	-5	-	-	V	I <sub>E</sub> =-10uA
I <sub>CBO</sub>	-	-	-100	nA	V <sub>CB</sub> =-50V
I <sub>EBO</sub>	-	-	-100	nA	V <sub>EB</sub> =-5V
*V <sub>CE(sat)</sub>	-	-	-300	mV	I <sub>C</sub> =-100mA, I <sub>B</sub> =-10mA
*V <sub>BE(sat)</sub>	-	-	-1.1	V	I <sub>C</sub> =-100mA, I <sub>B</sub> =-10mA
*h <sub>FE1</sub>	120	-	700		V <sub>CE</sub> =-6V, I <sub>C</sub> =-2mA
*h <sub>FE2</sub>	25	-	-		V <sub>CE</sub> =-6V, I <sub>C</sub> =-150mA
f <sub>T</sub>	80	-	-	MHz	V <sub>CE</sub> =-10V, I <sub>C</sub> =-1mA, f=100MHz
Cob	-	-	7	pF	V <sub>CB</sub> =-10V, f=1MHz, I <sub>E</sub> =0

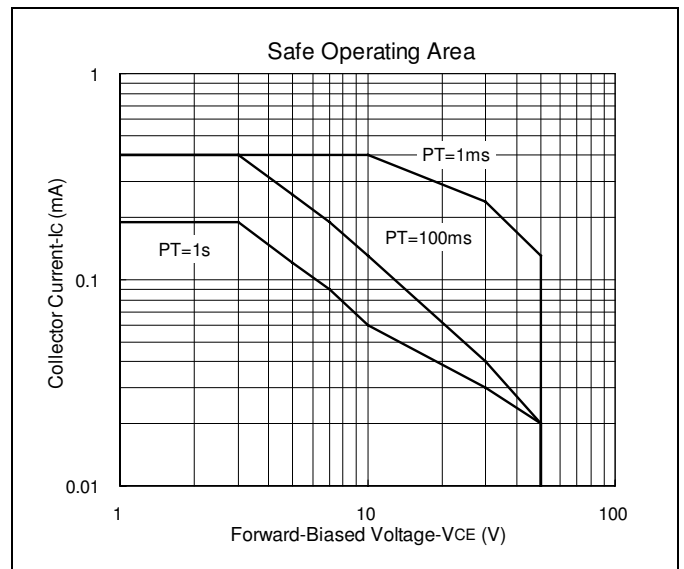
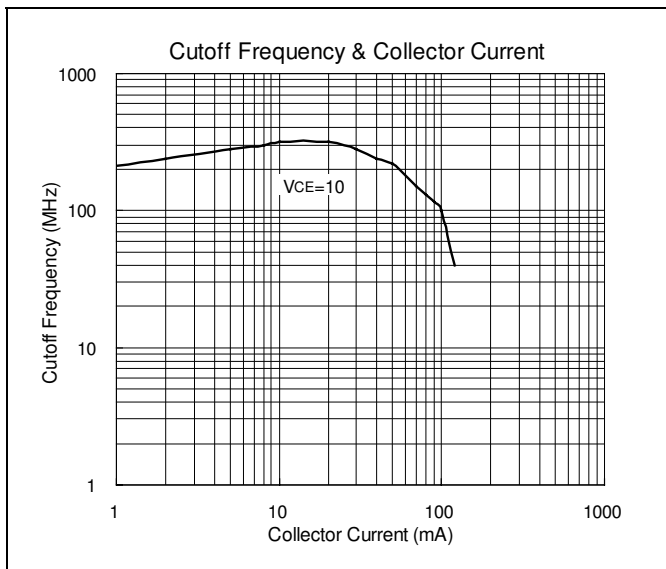
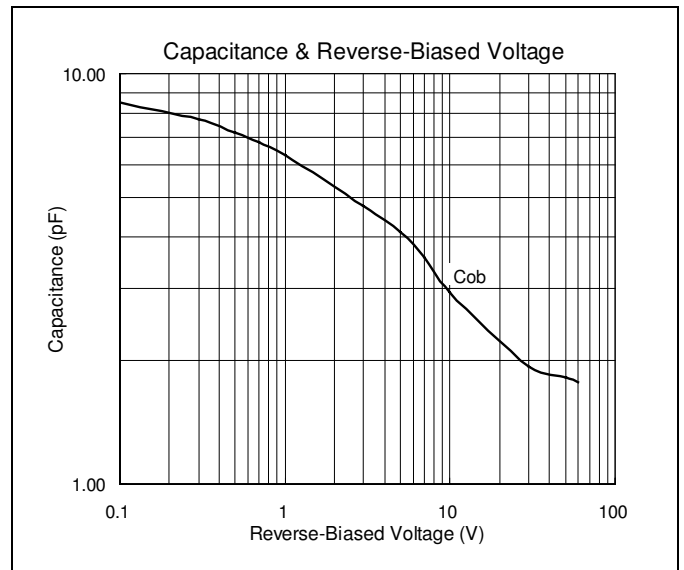
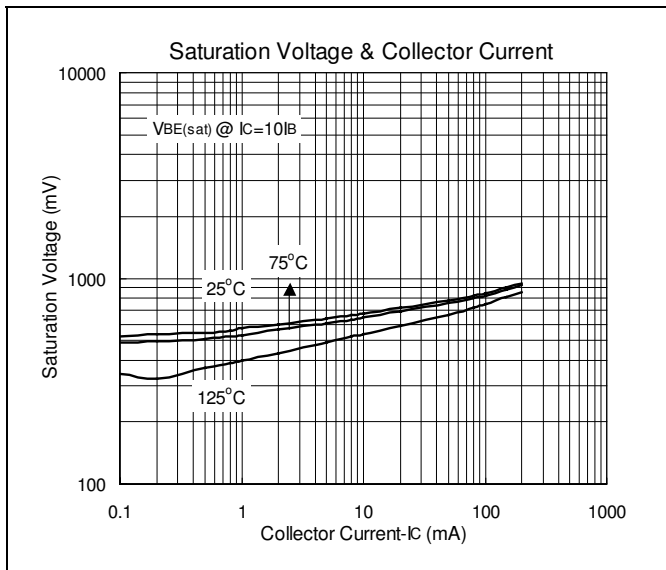
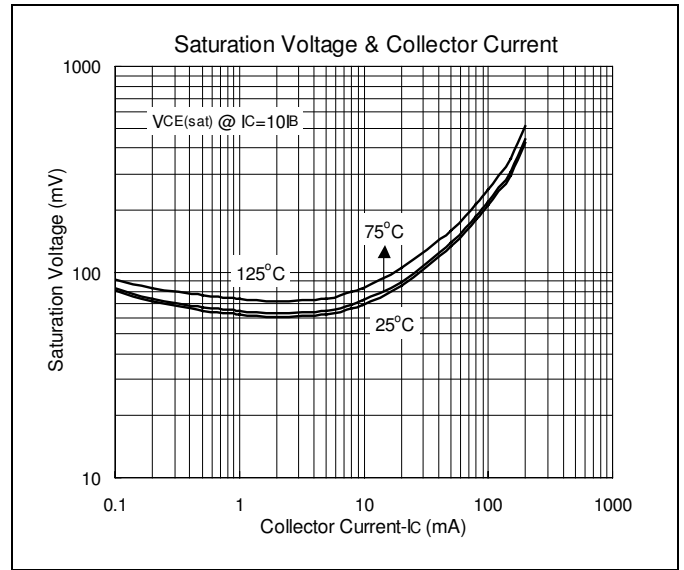
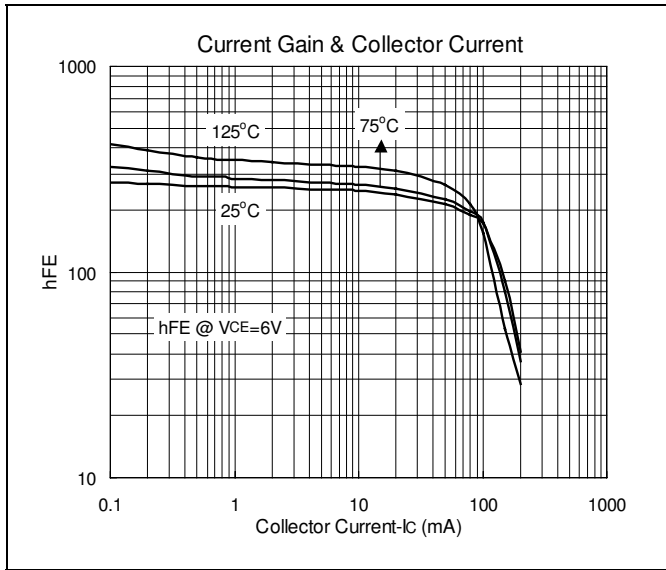
\*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

## Classification Of hFE1

Rank	A4Y	A4G	A4B
Range	120-240	200-400	350-700



### 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

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**Head Office And Factory:**

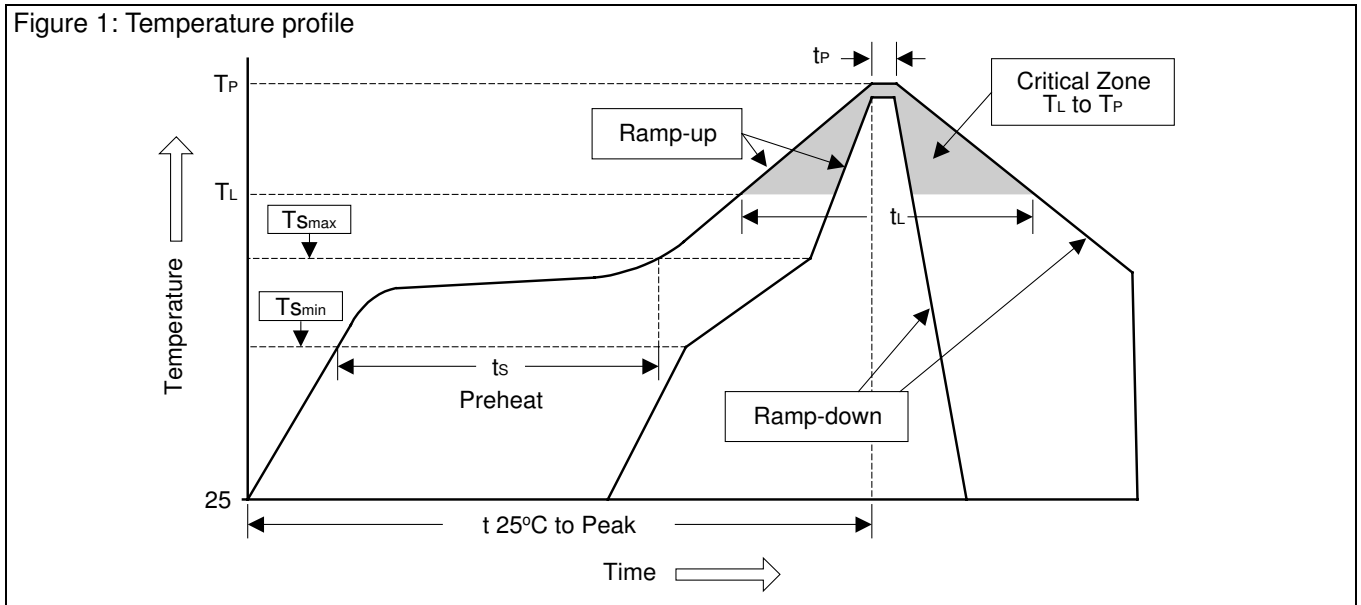
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### Soldering Methods for HSMC's Products

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 ( $T_{smin}$ )	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°C/sec	<3°C/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°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