



HMBT9014

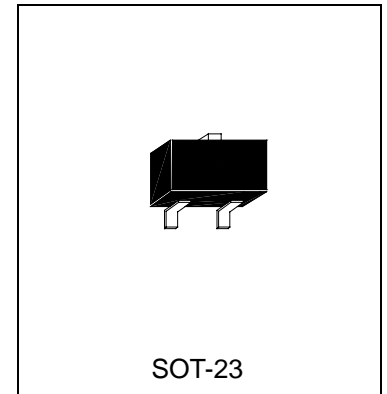
NPN EPITAXIAL PLANAR TRANSISTOR

Description

The HMBT9014 is designed for use in pre-amplifier of low level and low noise.

Features

- High Total Power Dissipation (P_D : 225mW)
- Complementary to HMBT9015
- High h_{FE} and Good Linearity



Absolute Maximum Ratings

- Maximum Temperatures
 Storage Temperature -55 ~ +150 °C
 Junction Temperature +150 °C Maximum
- Maximum Power Dissipation
 Total Power Dissipation ($T_A=25^\circ\text{C}$) 225 mW
- Maximum Voltages and Currents ($T_A=25^\circ\text{C}$)
 V_{CBO} Collector to Base Voltage 50 V
 V_{CEO} Collector to Emitter Voltage 45 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}	50	-	-	V	$I_C=100\mu\text{A}, I_E=0$
BV_{CEO}	45	-	-	V	$I_C=1\text{mA}, I_B=0$
BV_{EBO}	5	-	-	V	$I_E=100\mu\text{A}, I_C=0$
I_{CBO}	-	-	50	nA	$V_{CB}=50\text{V}, I_E=0$
I_{EBO}	-	-	50	nA	$V_{EB}=5\text{V}, I_C=0$
* $V_{CE(sat)}$	-	0.14	0.3	V	$I_C=100\text{mA}, I_B=5\text{mA}$
* $V_{BE(sat)}$	-	0.84	1	V	$I_C=100\text{mA}, I_B=5\text{mA}$
$V_{BE(on)}$	0.58	0.63	0.7	V	$V_{CE}=5\text{V}, I_C=2\text{mA}$
* h_{FE}	100	280	1000		$V_{CE}=5\text{V}, I_C=1\text{mA}$
Cob	-	2.20	3.5	pF	$V_{CB}=10\text{V}, f=1\text{MHz}, I_E=0$
f_T	150	270	-	MHz	$V_{CE}=5\text{V}, I_C=10\text{mA}$

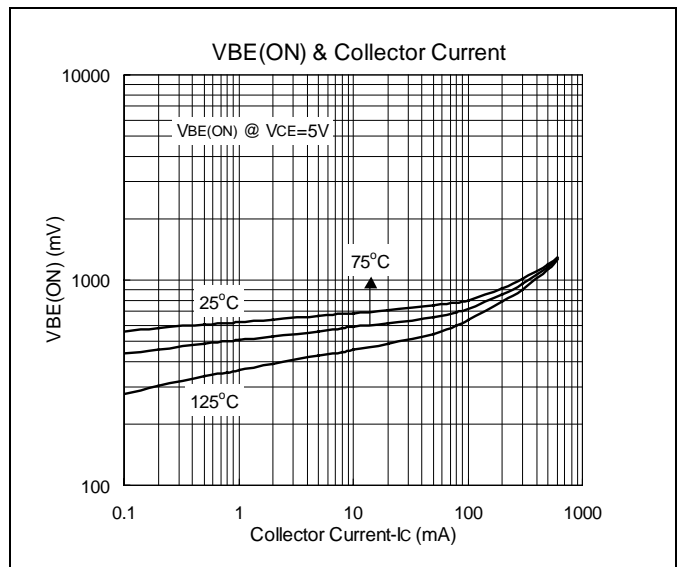
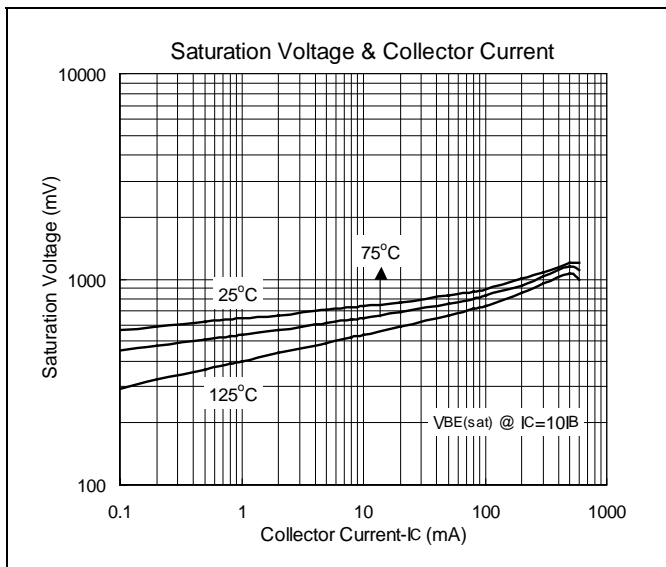
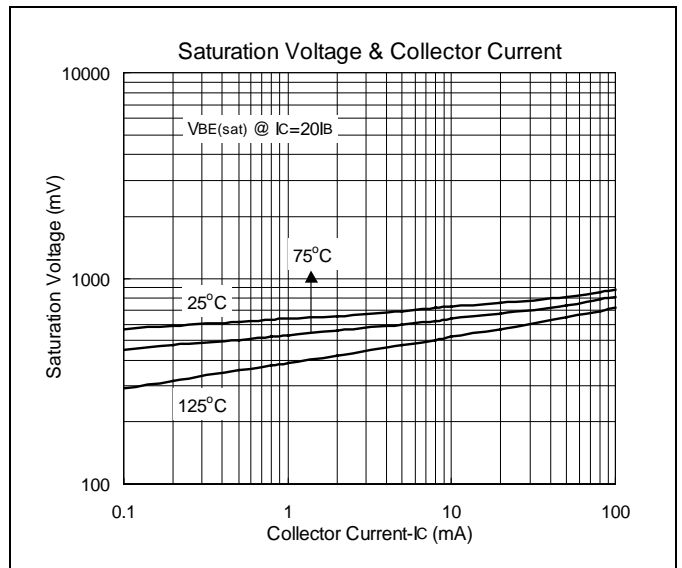
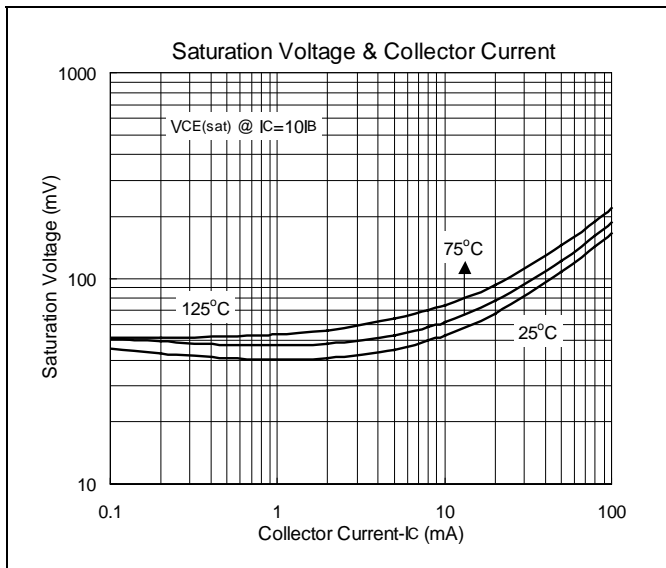
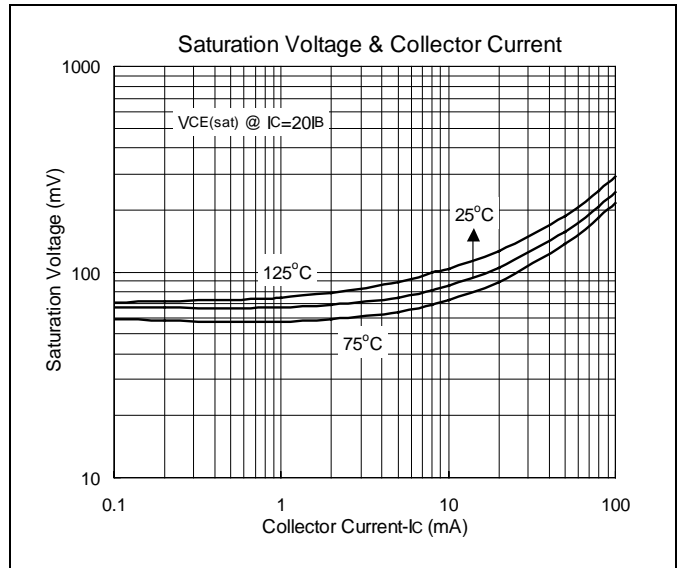
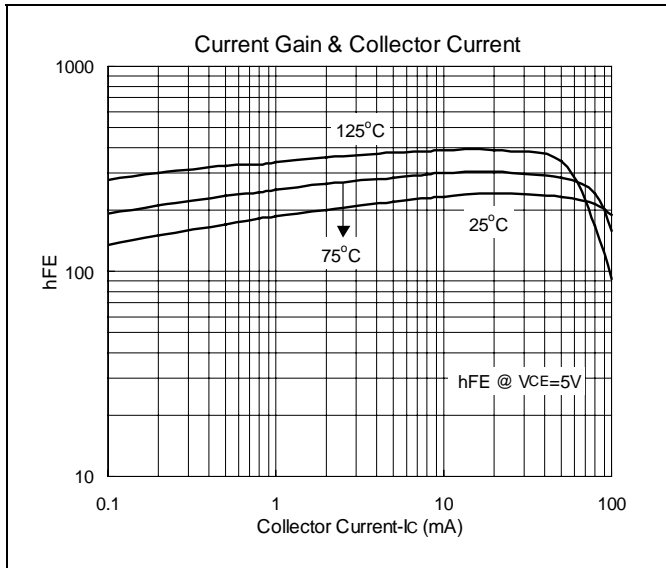
*Pulse Test: Pulse Width $\leq 380\mu\text{s}$, Duty Cycle $\leq 2\%$

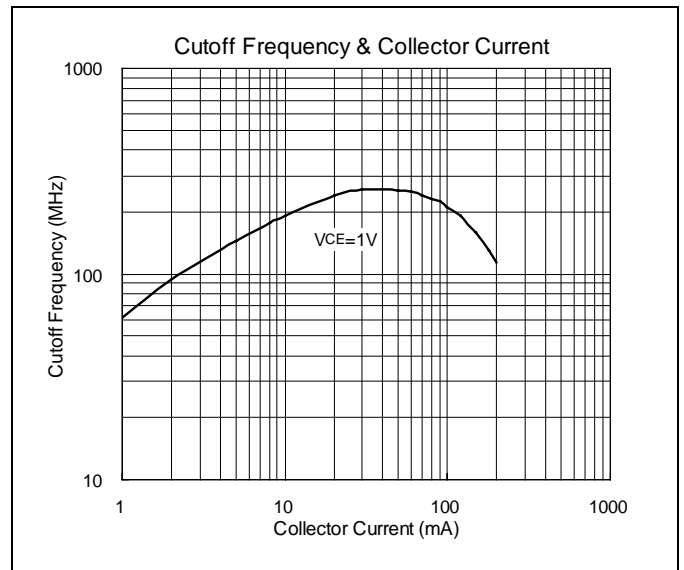
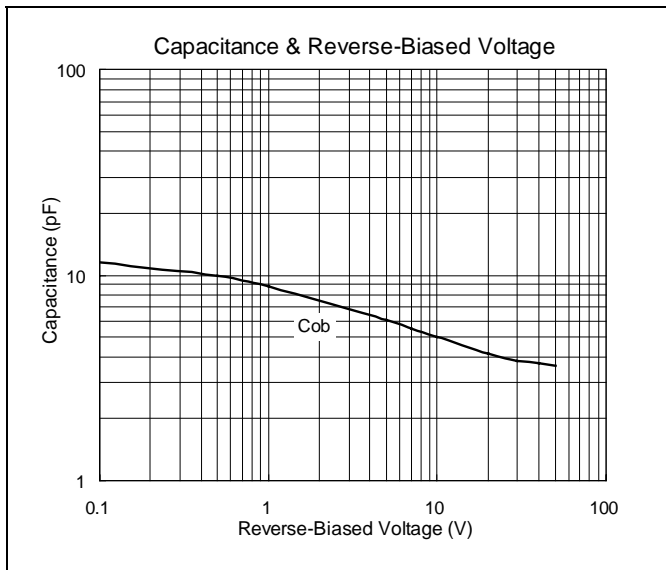
Classification on h_{FE}

Rank (Marking Code)	B (C4B)	C (C4C)	D (C4D)
Range	100-300	200-600	400-1000



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

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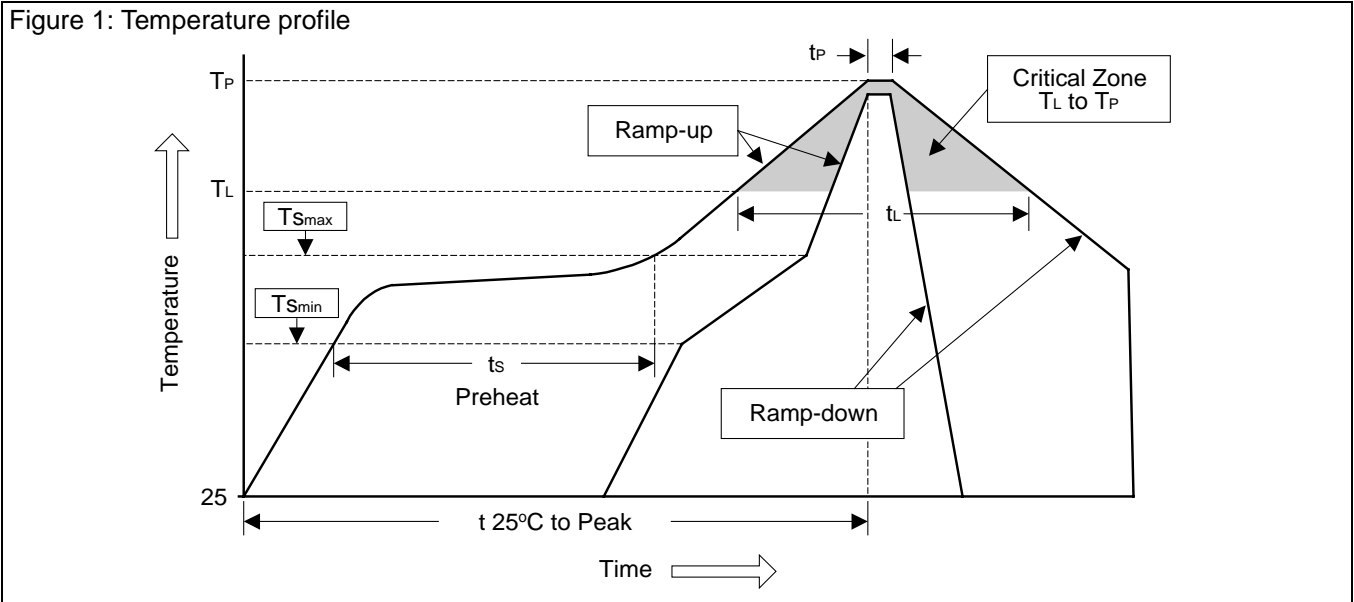
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Soldering Methods for HSMC's Products

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



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