



HMBT2222A

NPN EPITAXIAL PLANAR TRANSISTOR

Description

The HMBT2222A is designed for general purpose amplifier and high-speed switching, medium-power switching applications.



SOT-23

Features

- High frequency current gain
- High Speed Switching

Absolute Maximum Ratings

- Maximum Temperatures
Storage Temperature..... -55 ~ +150 °C
Junction Temperature..... +150 °C
- 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..... 75 V
 V_{CEO} Collector to Emitter Voltage 40 V
 V_{EBO} Emitter to Base Voltage..... 6 V
 I_C Collector Current..... 600 mA

Thermal Characteristic

Symbol	Characteristic	Max.	Unit
$R_{\theta ja}$	Thermal Resistance, junction to ambient ($T_A=25^{\circ}\text{C}$)	556	$^{\circ}\text{C}/\text{W}$

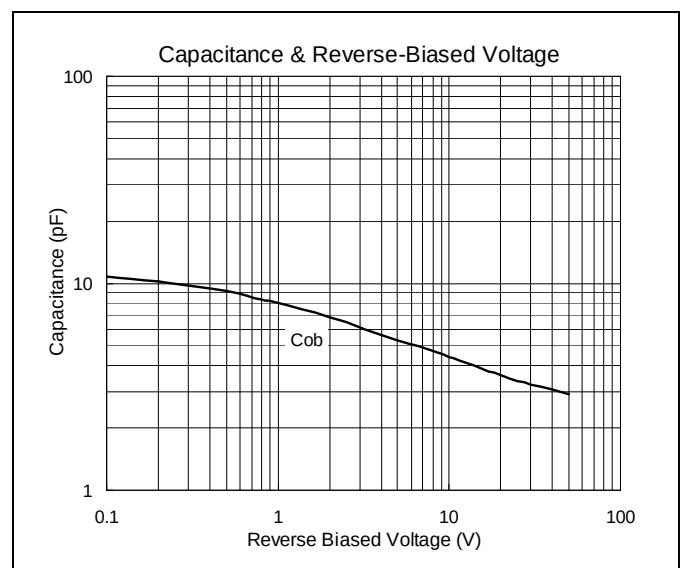
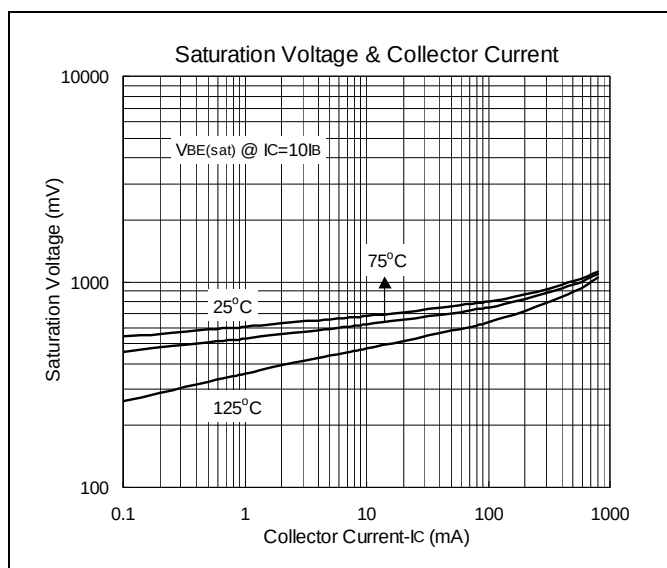
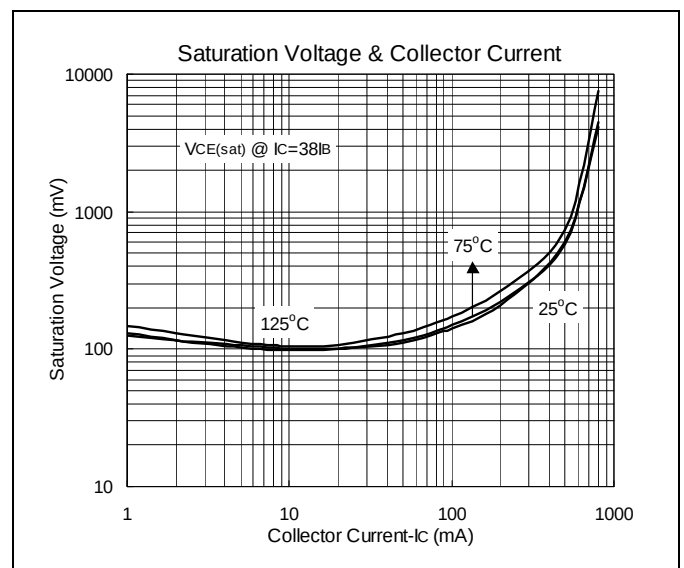
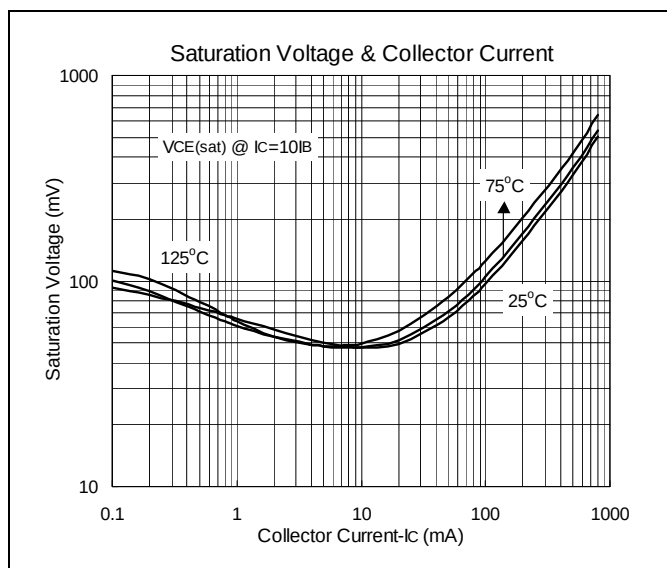
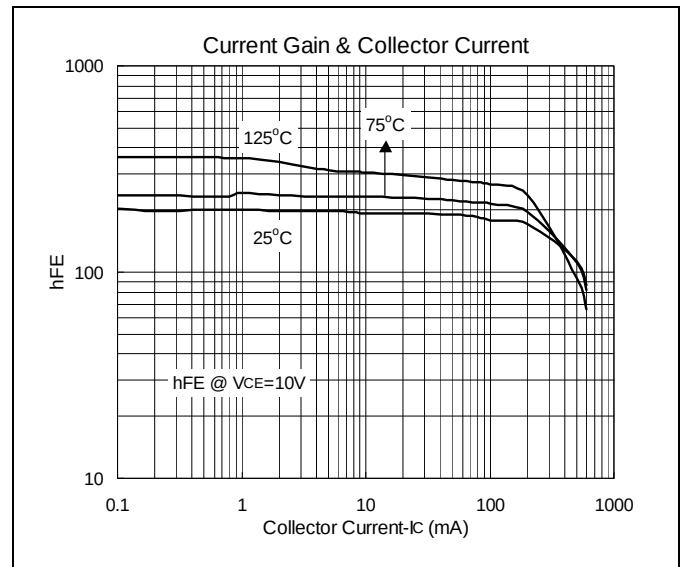
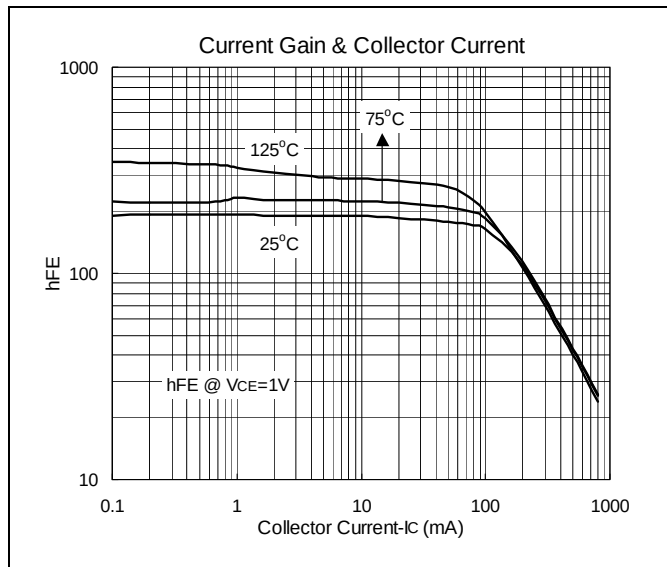
Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	75	-	-	V	$I_C=10\mu\text{A}$
BV_{CEO}	40	-	-	V	$I_C=10\text{mA}$
BV_{EBO}	6	-	-	V	$I_C=10\mu\text{A}$
I_{CBO}	-	-	10	nA	$V_{CB}=60\text{V}$
I_{CEX}	-	-	10	nA	$V_{CE}=60\text{V}$, $V_{EB(OFF)}=3\text{V}$
I_{EBO}	-	-	10	nA	$V_{EB}=3\text{V}$
$*V_{CE(sat)1}$	-	-	500	mV	$I_C=380\text{mA}$, $I_B=10\text{mA}$
$*V_{CE(sat)2}$	-	-	1.0	V	$I_C=500\text{mA}$, $I_B=50\text{mA}$
$*V_{BE(sat)1}$	0.6	-	1.2	V	$I_C=150\text{mA}$, $I_B=15\text{mA}$
$*V_{BE(sat)2}$	-	-	2.0	V	$I_C=500\text{mA}$, $I_B=50\text{mA}$
$*h_{FE1}$	35	-	-		$V_{CE}=10\text{V}$, $I_C=100\mu\text{A}$
$*h_{FE2}$	50	-	-		$V_{CE}=10\text{V}$, $I_C=1\text{mA}$
$*h_{FE3}$	75	-	-		$V_{CE}=10\text{V}$, $I_C=10\text{mA}$
$*h_{FE4}$	100	-	300		$V_{CE}=10\text{V}$, $I_C=150\text{mA}$
$*h_{FE5}$	40	-	-		$V_{CE}=10\text{V}$, $I_C=500\text{mA}$
f_T	300	-	-	MHz	$V_{CB}=20\text{V}$, $I_C=20\text{mA}$, $f=100\text{MHz}$

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

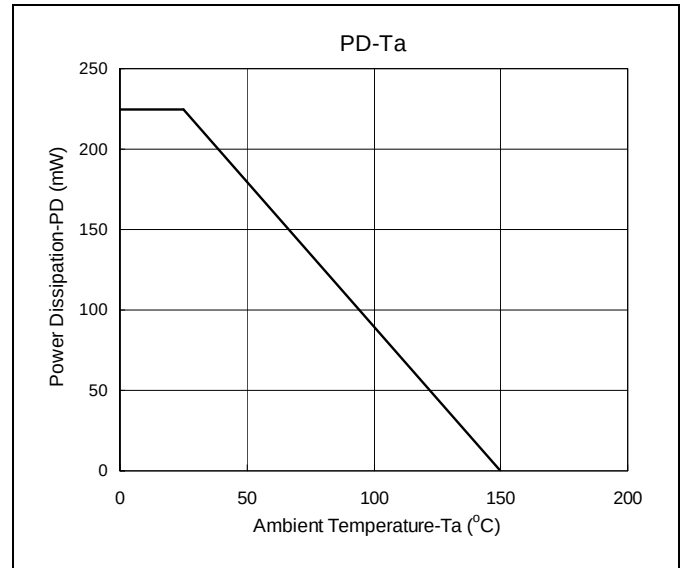
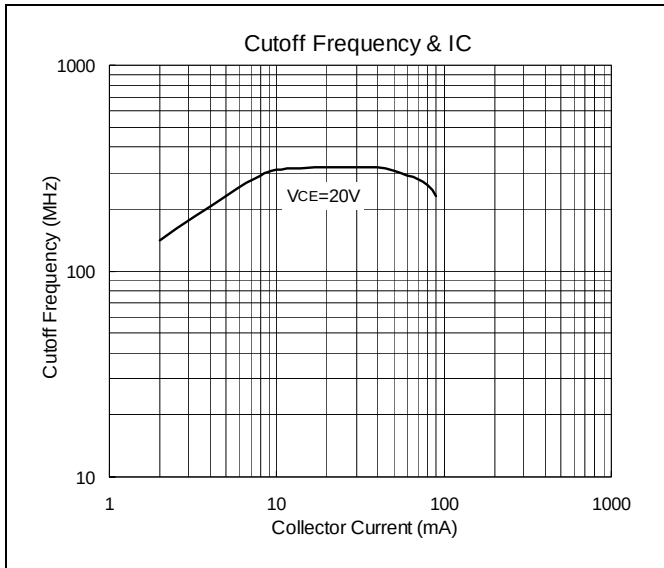


Characteristics Curve



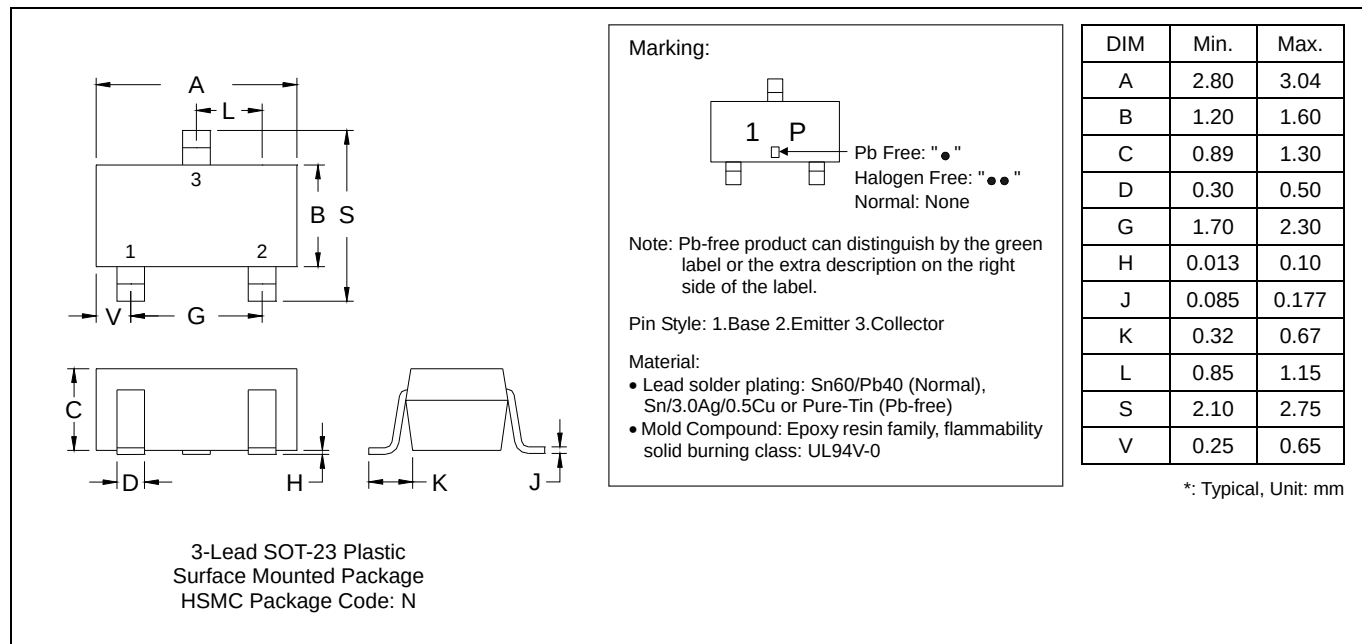


Characteristics Curve





SOT-23 Dimension



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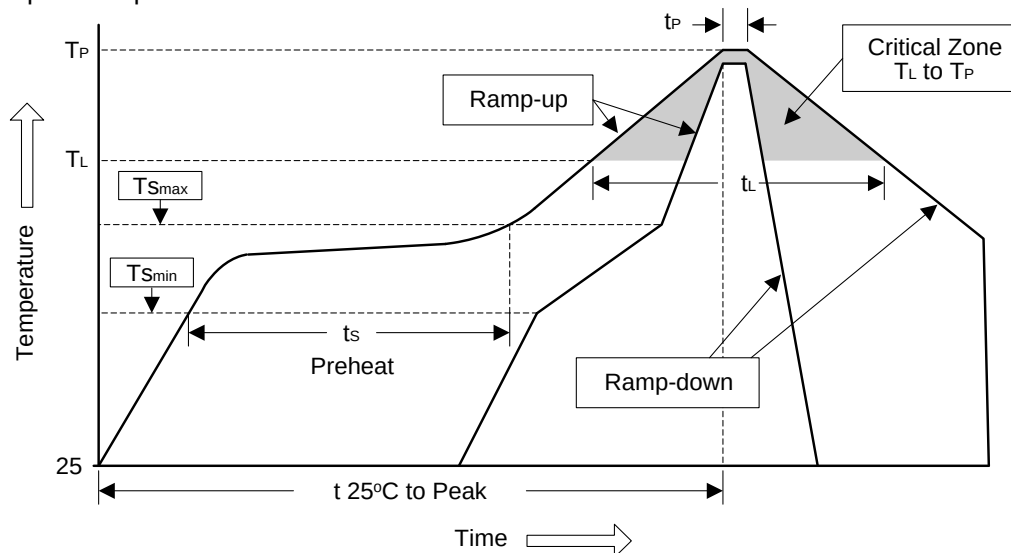
- **Head Office**(HSMC CORP.): 3F., No.72, Sec.2, Nanjing E. Rd., Taipei, Taiwan, R.O.C.
Tel: +886-2-2521-2056, Fax: +886-2-2521-0452
- **Shanghai Office**(AVANTICS): No.399, Cai Lum Rd. Zhangjiang Technology Industrial Park Pudong, Shanghai 201210, China
Tel: +86-21- 6163-7118, Fax: +86-21-6163-7006



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