



# HMBTA44

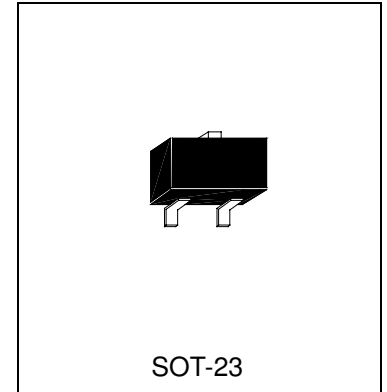
NPN EPITAXIAL PLANAR TRANSISTOR

## Description

The HMBTA44 is designed for application requires high voltage.

## Features

- High voltage:  $V_{CEO}=400V(\text{min})$  at  $I_C=1mA$
- High current:  $I_C=300mA$  at  $25^\circ C$
- Complementary with HMBTA94



## Absolute Maximum Ratings

- Maximum Temperatures  
Storage Temperature .....  $-55 \sim +150^\circ C$   
Junction Temperature .....  $+150^\circ C$  Maximum
- Maximum Power Dissipation  
Total Power Dissipation ( $T_A=25^\circ C$ ) ..... 350 mW
- Maximum Voltages and Currents ( $T_A=25^\circ C$ )  
 $V_{CBO}$  Collector to Base Voltage ..... 450 V  
 $V_{CEO}$  Collector to Emitter Voltage ..... 400 V  
 $V_{EBO}$  Emitter to Base Voltage ..... 6 V  
 $I_C$  Collector Current ..... 300 mA

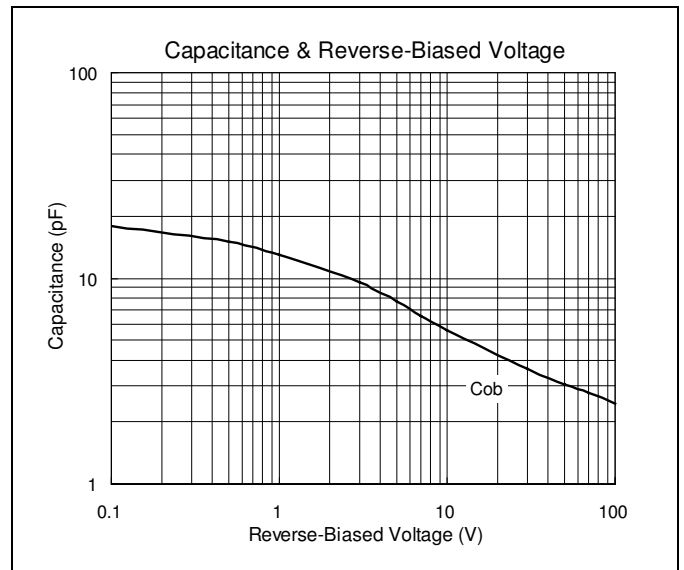
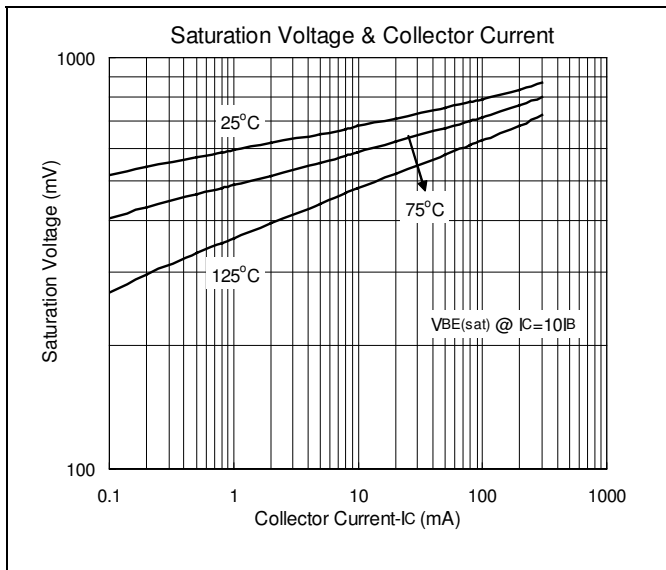
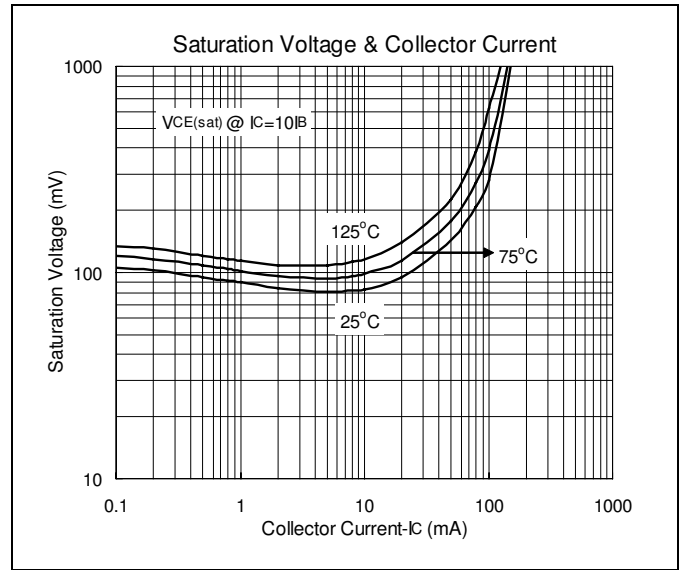
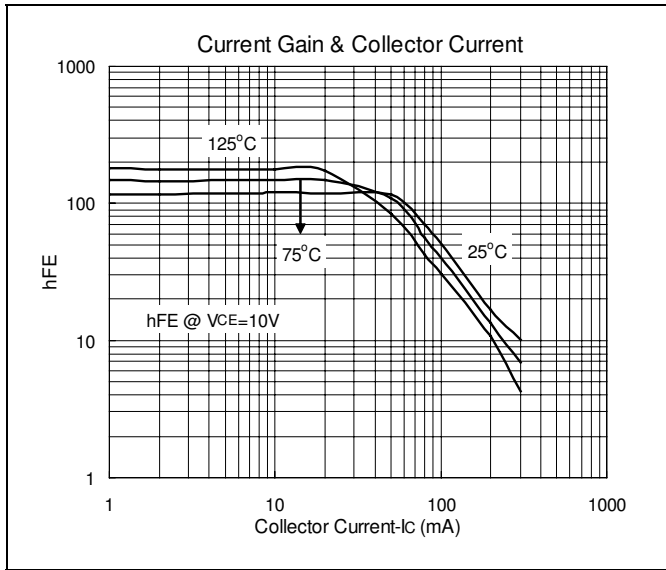
## Electrical Characteristics ( $T_A=25^\circ C$ )

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
$BV_{CBO}$	450	-	-	V	$I_C=100\mu A$
$BV_{CEO}$	400	-	-	V	$I_C=1mA$
$BV_{EBO}$	6	-	-	V	$I_E=10\mu A$
$I_{CBO}$	-	-	100	nA	$V_{CB}=400V$
$I_{EBO}$	-	-	100	nA	$V_{EB}=4V$
$I_{CES}$	-	-	500	nA	$V_{CE}=400V$
* $V_{CE(sat)1}$	-	-	400	mV	$I_C=1mA, I_B=0.1mA$
* $V_{CE(sat)2}$	-	-	500	mV	$I_C=10mA, I_B=1mA$
* $V_{CE(sat)3}$	-	-	750	mV	$I_C=50mA, I_B=5mA$
* $V_{BE(sat)}$	-	-	750	mV	$I_C=10mA, I_B=1mA$
* $h_{FE1}$	40	-	-		$V_{CE}=10V, I_C=1mA$
* $h_{FE2}$	50	-	300		$V_{CE}=10V, I_C=10mA$
* $h_{FE3}$	45	-	-		$V_{CE}=10V, I_C=50mA$
* $h_{FE4}$	40	-	-		$V_{CE}=10V, I_C=100mA$
Cob	-	4	6	pF	$V_{CB}=20V, f=1MHz$

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



### Characteristics Curve





### SOT-23 Dimension

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

**Marking:**

Pb Free Mark  
Pb-Free: "●" (Note)  
Normal: None

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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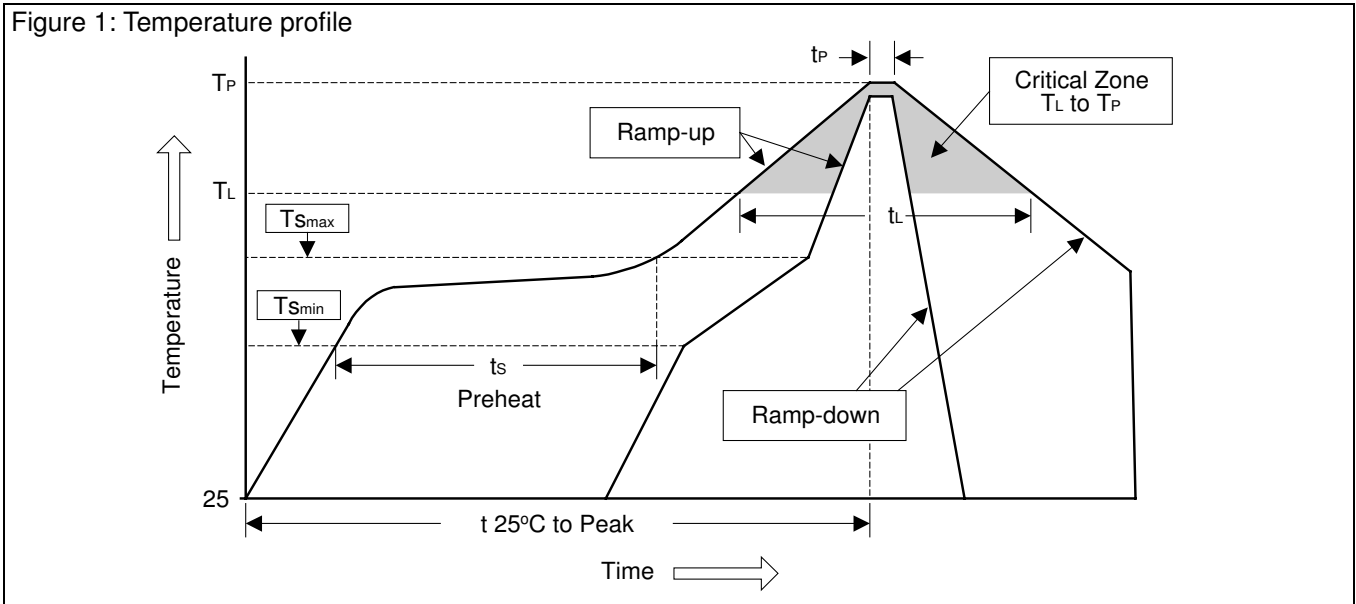
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### Soldering Methods for HSMC's Products

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°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