



# HMBT9018

NPN EPITAXIAL PLANAR TRANSISTOR

## Description

The HMBT9018 is designed for use in VHF & UHF oscillators and VHF mixer in tuner of a TV receiver.

## Features

- High frequency
- Very low capacitance

## 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 ..... 25 V  
 $V_{CEO}$  Collector to Emitter Voltage ..... 15 V  
 $V_{EBO}$  Emitter to Base Voltage ..... 3 V  
 $I_C$  Collector Current ..... 50 mA

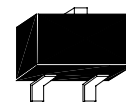
## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ )

| Symbol         | Min. | Typ. | Max. | Unit | Test Conditions                                            |
|----------------|------|------|------|------|------------------------------------------------------------|
| $BV_{CBO}$     | 25   | -    | -    | V    | $I_C=100\mu\text{A}$                                       |
| $BV_{CEO}$     | 15   | -    | -    | V    | $I_C=1\text{mA}$                                           |
| $BV_{EBO}$     | 3    | -    | -    | V    | $I_C=10\mu\text{A}$                                        |
| $I_{CBO}$      | -    | -    | 100  | nA   | $V_{CB}=20\text{V}$                                        |
| $I_{EBO}$      | -    | -    | 100  | nA   | $V_{EB}=2\text{V}$                                         |
| $*V_{CE(sat)}$ | -    | -    | 500  | mV   | $I_C=4\text{mA}$ , $I_B=0.4\text{mA}$                      |
| $V_{BE(on)}$   | -    | -    | 0.95 | V    | $V_{CE}=10\text{V}$ , $I_C=4\text{mA}$                     |
| $*h_{FE}$      | 72   | -    | 146  |      | $V_{CE}=5\text{V}$ , $I_C=2\text{mA}$                      |
| Cob            | -    | -    | 0.7  | pF   | $V_{CB}=10\text{V}$ , $f=1\text{MHz}$                      |
| $f_T$          | 650  | -    | -    | MHz  | $V_{CB}=10\text{V}$ , $I_C=4\text{mA}$ , $f=100\text{MHz}$ |

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

## Classification Of $h_{FE}$

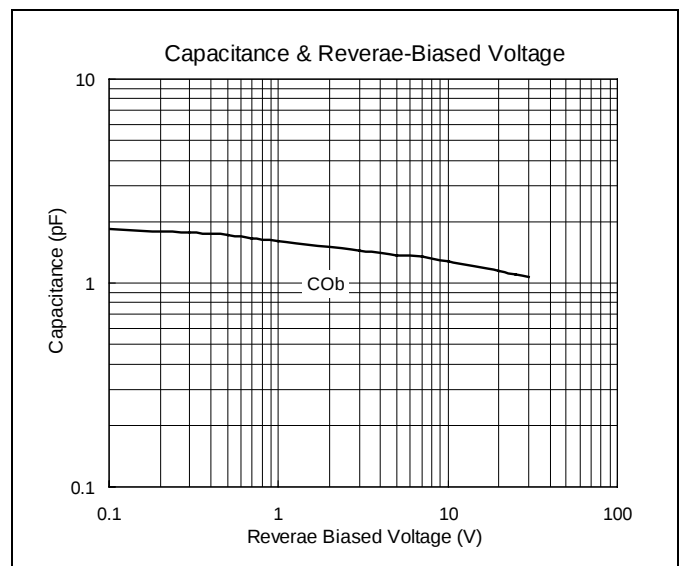
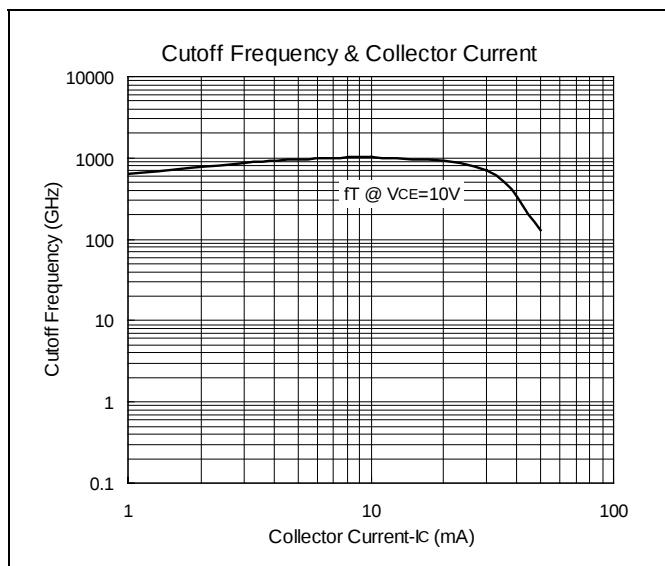
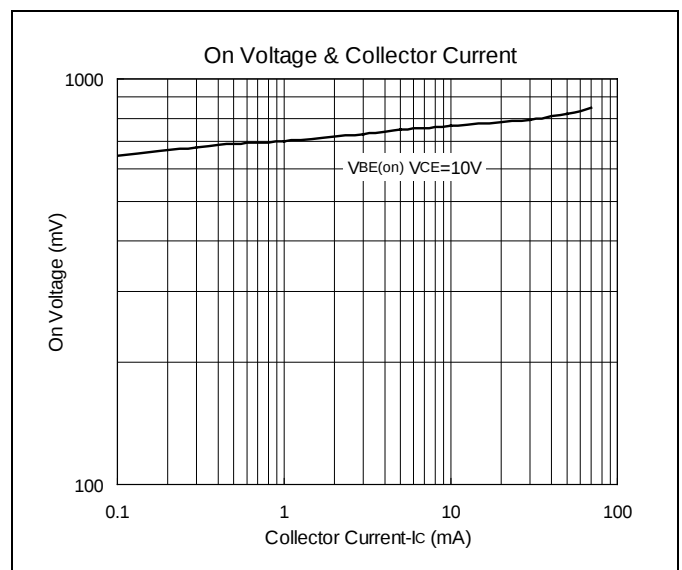
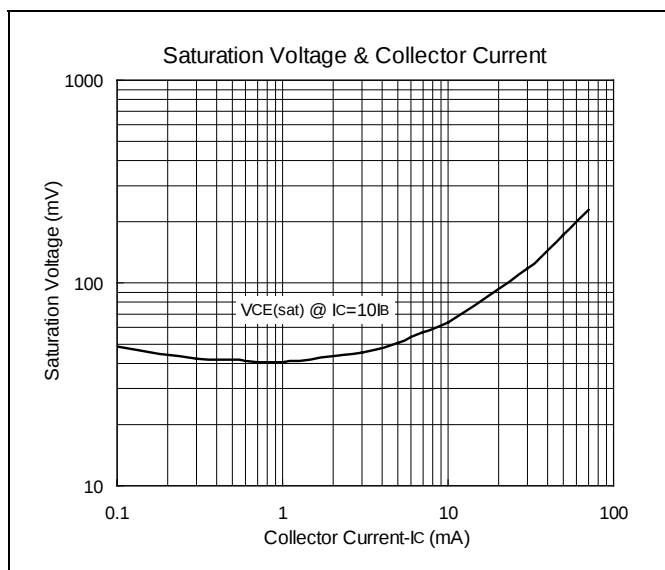
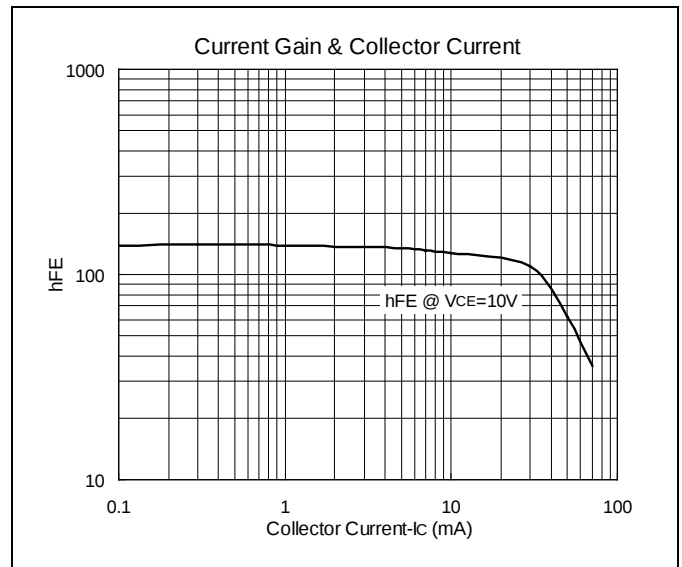
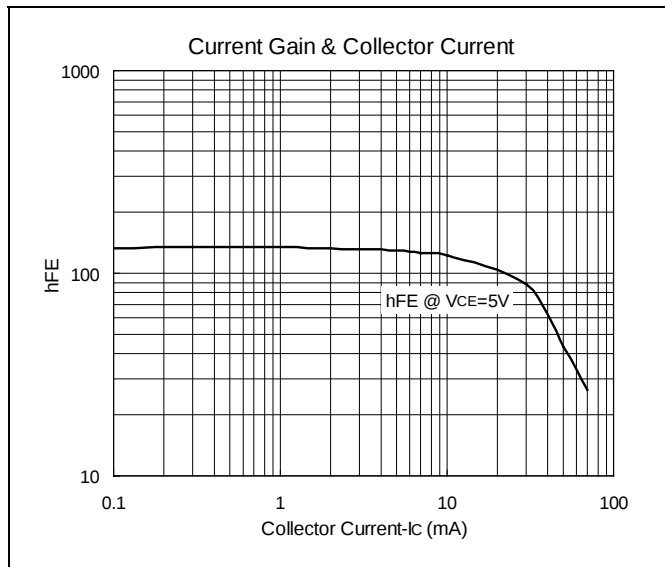
| Rank     | G      | H      |
|----------|--------|--------|
| $h_{FE}$ | 72-108 | 97-146 |



SOT-23

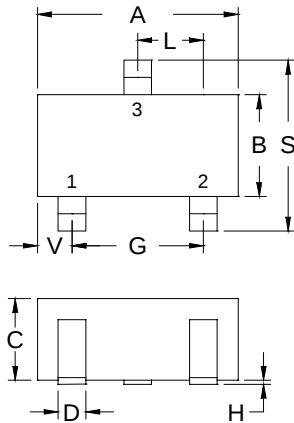


## Characteristics Curve



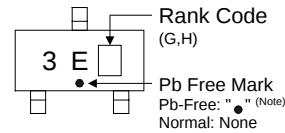


### SOT-23 Dimension



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

#### Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of HSMC.
- HSMC reserves the right to make changes to its products without notice.
- **HSMC semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- HSMC assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

#### Head Office And Factory:

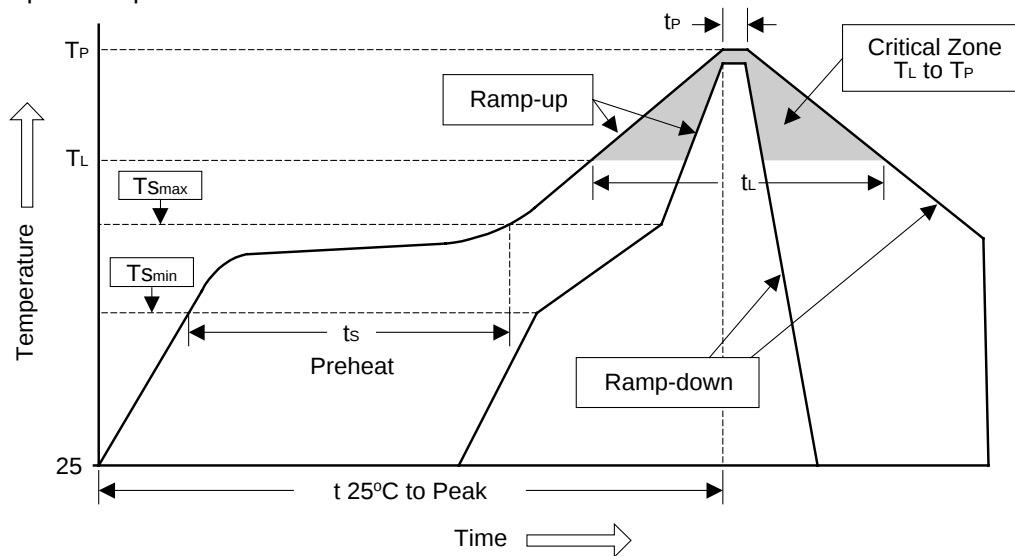
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F., No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.  
Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C  
Tel: 886-3-5983621~5 Fax: 886-3-5982931



## 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 ( $T_{smin}$ )                     | 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   |