

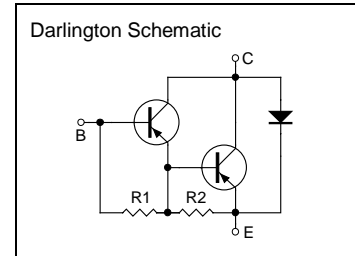
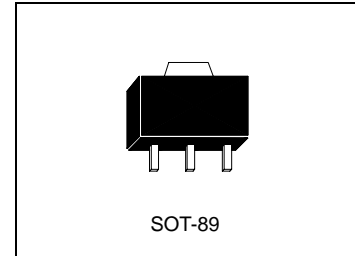


# HM117

PNP EPITAXIAL PLANAR TRANSISTOR

## Description

The HM117 is designed for use in general purpose amplifier and low-speed switching applications.



## Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ )

- Maximum Temperatures
  - Storage Temperature ..... -55 ~ +150 °C
  - Junction Temperature ..... +150 °C Maximum
- Maximum Power Dissipation
  - Total Power Dissipation ( $T_A=25^\circ\text{C}$ ) ..... 1.2 W
  - Total Power Dissipation  
(Printed circuit board 2mm thick, collector plating 1cm<sup>2</sup> square or larger) ..... 1.6 W
- Maximum Voltages and Currents
  - $BV_{CBO}$  Collector to Base Voltage ..... -100 V
  - $BV_{CEO}$  Collector to Emitter Voltage ..... -100 V
  - $BV_{EBO}$  Emitter to Base Voltage ..... -5 V
  - $I_C$  Collector Current (Continue) ..... -4 A
  - $I_C$  Collector Current (Peak) ..... -6 A

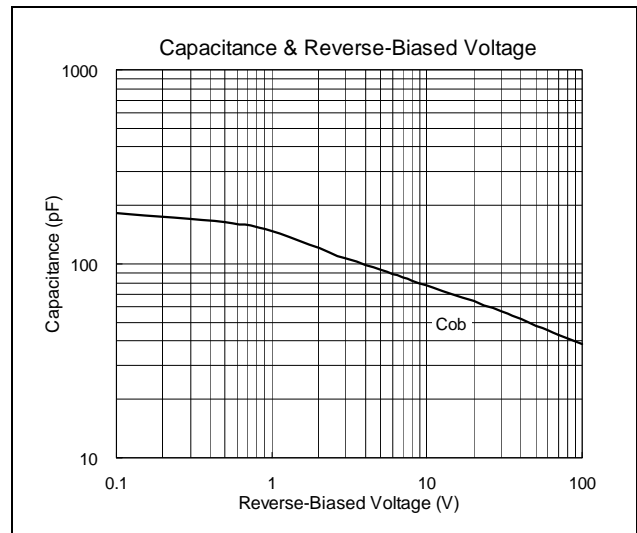
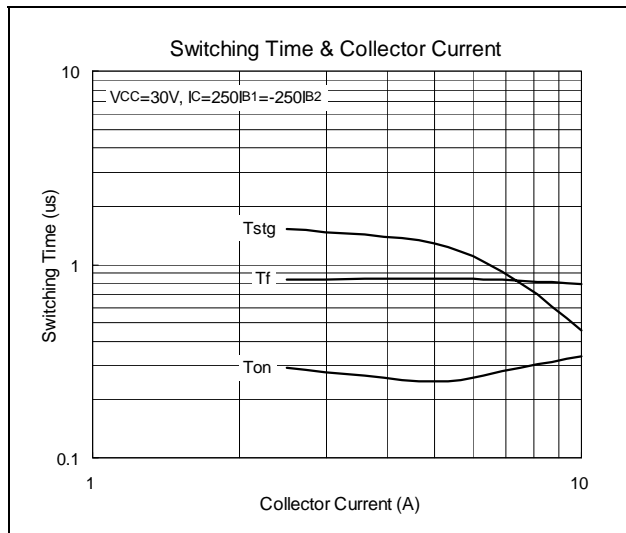
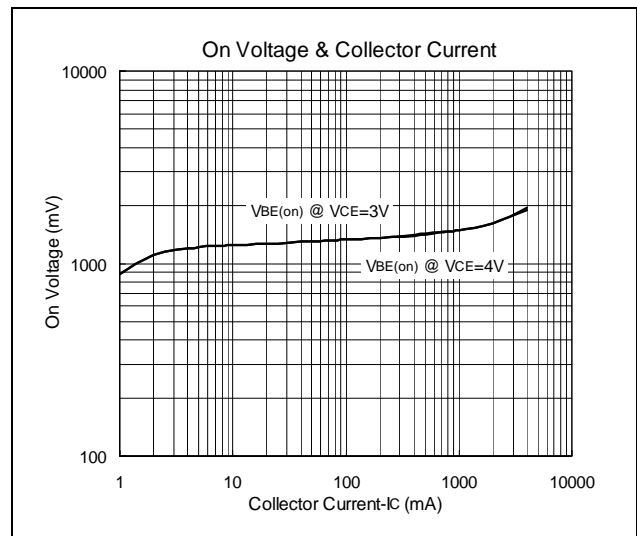
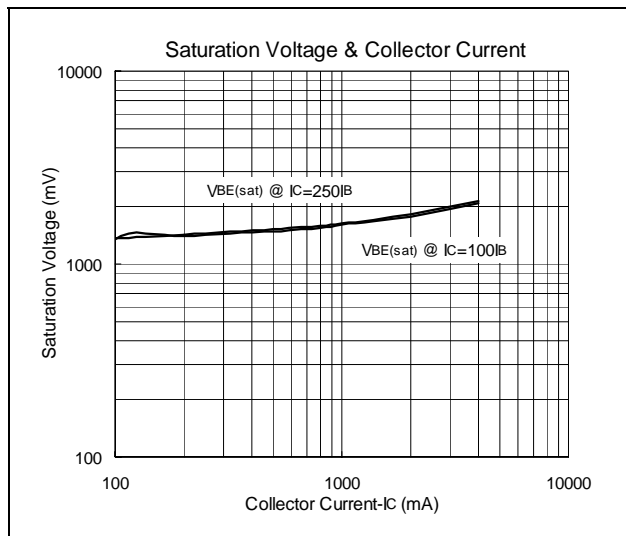
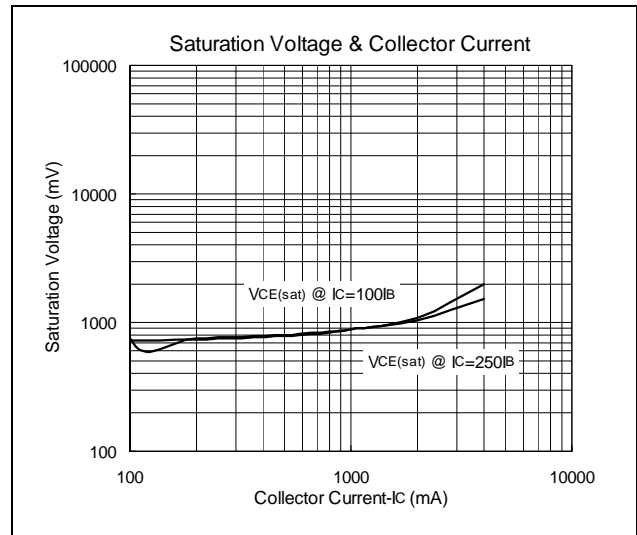
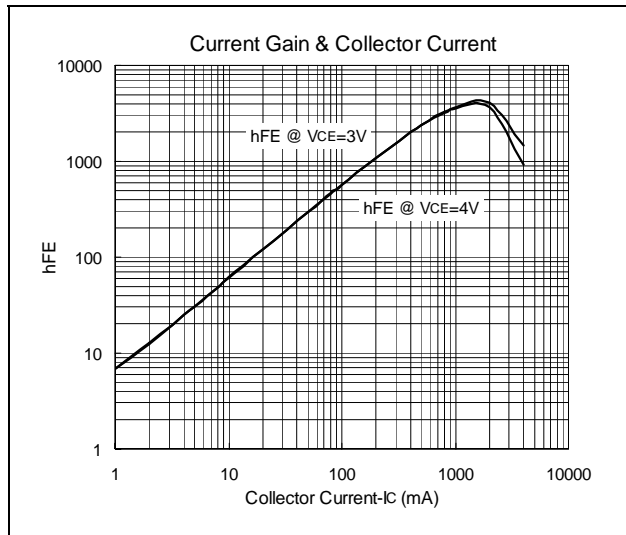
## Electrical Characteristics ( $T_A=25^\circ\text{C}$ )

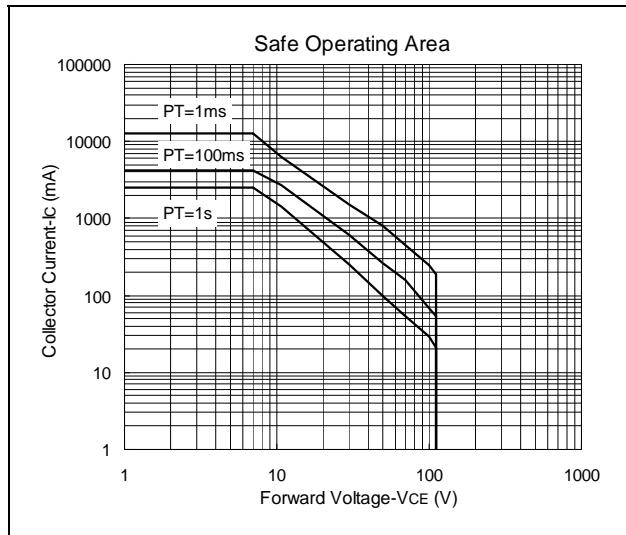
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
$BV_{CBO}$	-100	-	-	V	$I_C=-1\text{mA}$
$BV_{CEO}$	-100	-	-	V	$I_C=-30\text{mA}$
$I_{CBO}$	-	-	-1	mA	$V_{CB}=-100\text{V}$
$I_{CEO}$	-	-	-2	mA	$V_{CE}=-50\text{V}$
$I_{EBO}$	-	-	-2	mA	$V_{EB}=-5\text{V}$
* $V_{CE(sat)}$	-	-	-2.5	V	$I_C=-2\text{A}, I_B=-8\text{mA}$
* $V_{BE(on)}$	-	-	-2.8	V	$I_C=-2\text{A}, V_{CE}=-4\text{V}$
* $h_{FE1}$	1	-	-	K	$I_C=-1\text{A}, V_{CE}=-4\text{V}$
* $h_{FE2}$	500	-	-		$I_C=-2\text{A}, V_{CE}=-4\text{V}$
Cob	-	-	200	pF	$V_{CB}=-10\text{V}, f=0.1\text{MHz}$

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



### Characteristics Curve







### SOT-89 Dimension

3-Lead SOT-89 Plastic  
Surface Mounted Package  
HSMC Package Code: M

**Marking:**

Date Code      Control Code

Pb Free Mark  
Pb-Free: \* (Note)  
Normal: None

Note: Green label is used for pb-free packing

Pin Style: 1.Base 2.Collector 3.Emitter

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	4.40	4.60
B	4.05	4.25
C	1.50	1.70
D	2.40	2.60
E	0.36	0.51
F	*1.50	-
G	*3.00	-
H	1.40	1.60
I	0.35	0.41

\*: 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.

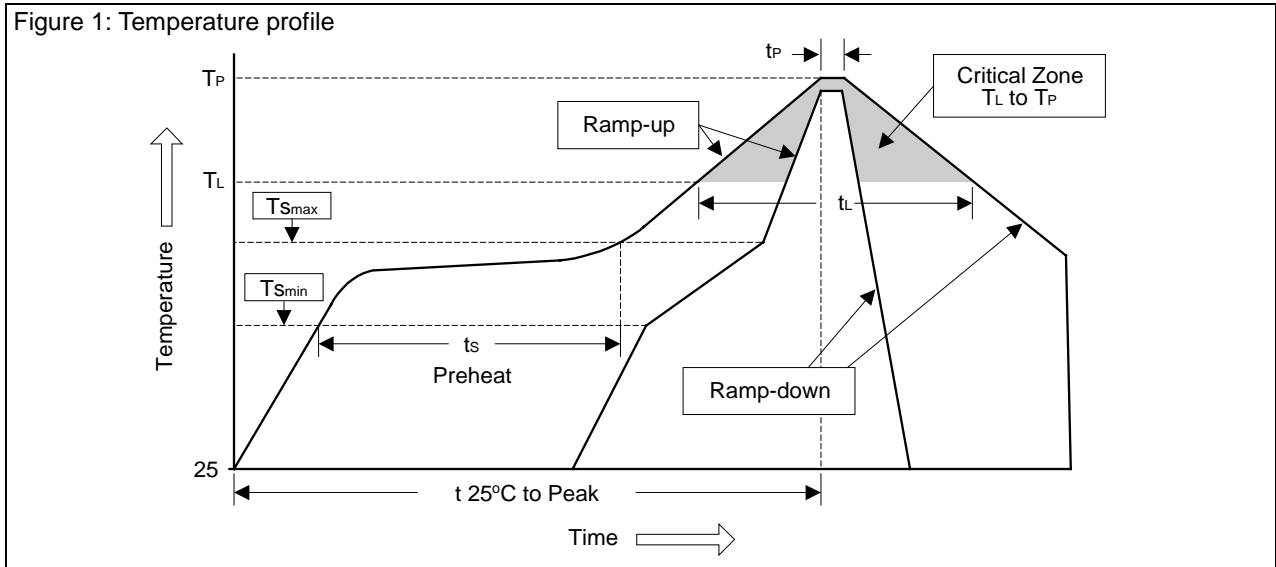
**Head Office And Factory:**

- **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



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	<math><3^\circ\text{C}/\text{sec}</math>	<math><3^\circ\text{C}/\text{sec}</math>
Preheat		
- Temperature Min ( $T_{S_{min}}$ )	100°C	150°C
- Temperature Max ( $T_{S_{max}}$ )	150°C	200°C
- Time (min to max) ( $t_s$ )	60~120 sec	60~180 sec
$T_{S_{max}}$ to $T_L$		
- Ramp-up Rate	<math><3^\circ\text{C}/\text{sec}</math>	<math><3^\circ\text{C}/\text{sec}</math>
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	<math><6^\circ\text{C}/\text{sec}</math>	<math><6^\circ\text{C}/\text{sec}</math>
Time 25°C to Peak Temperature	<math><6</math> minutes	<math><8</math> 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