



# HM117

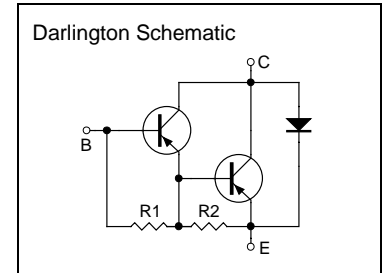
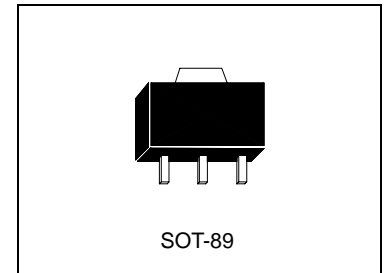
PNP EPITAXIAL PLANAR TRANSISTOR

## Description

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

## Absolute Maximum Ratings (T<sub>A</sub>=25°C)

- Maximum Temperatures
  - Storage Temperature ..... -55 ~ +150 °C
  - Junction Temperature ..... +150 °C Maximum
- Maximum Power Dissipation
  - Total Power Dissipation (T<sub>A</sub>=25°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<sub>CBO</sub> Collector to Base Voltage ..... -100 V
  - BV<sub>CEO</sub> Collector to Emitter Voltage ..... -100 V
  - BV<sub>EBO</sub> Emitter to Base Voltage ..... -5 V
  - I<sub>C</sub> Collector Current (Continue) ..... -4 A
  - I<sub>C</sub> Collector Current (Peak) ..... -6 A



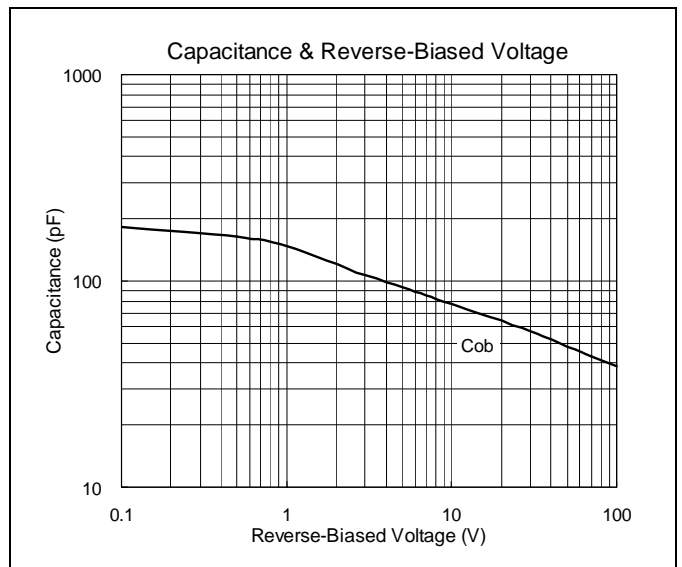
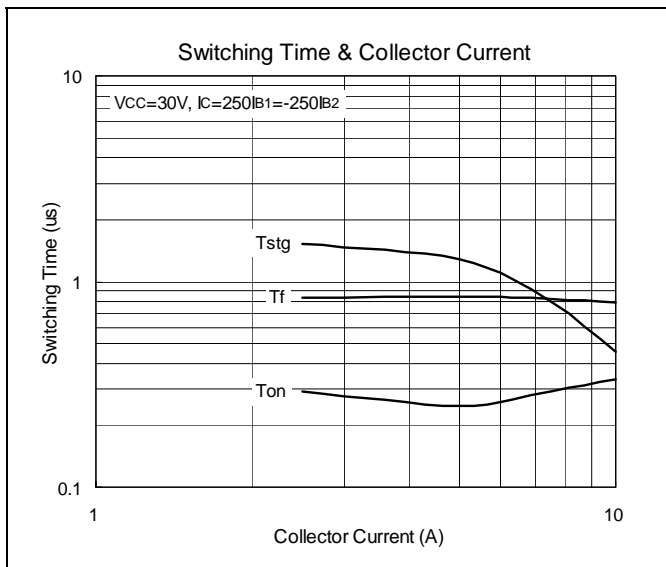
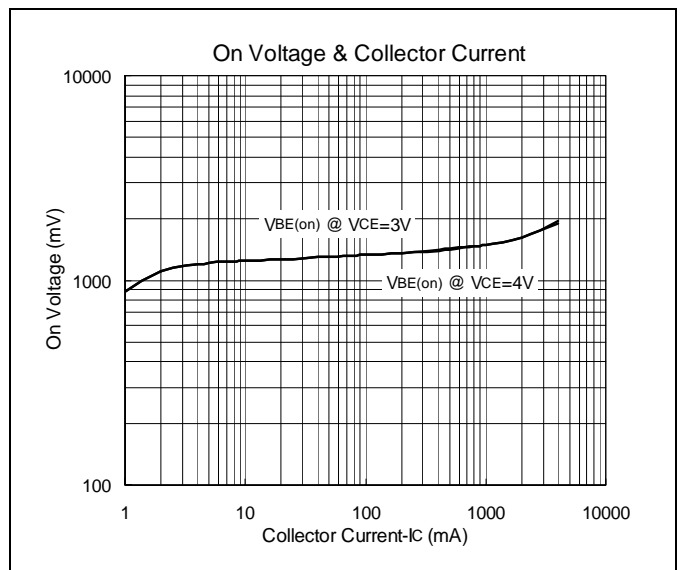
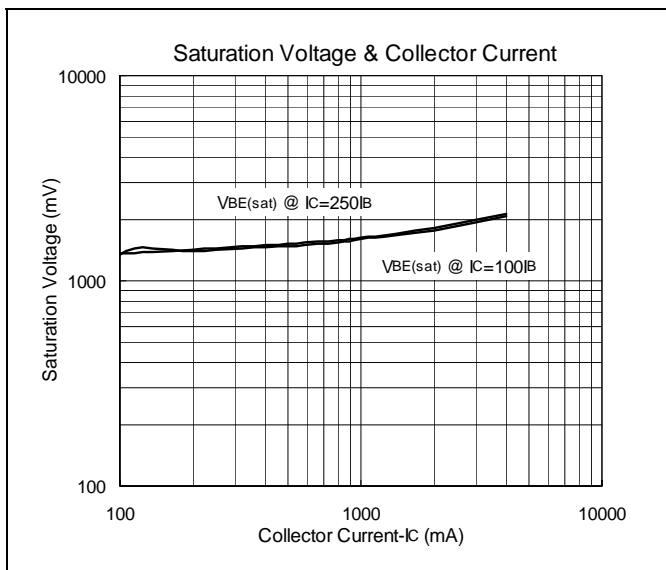
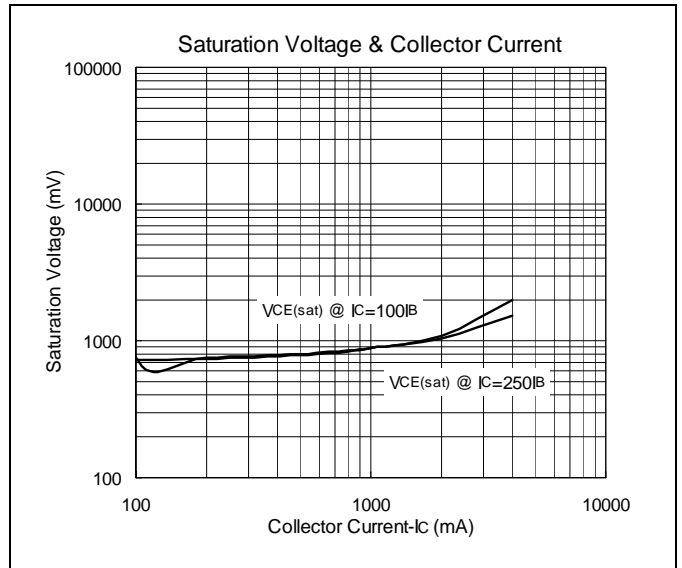
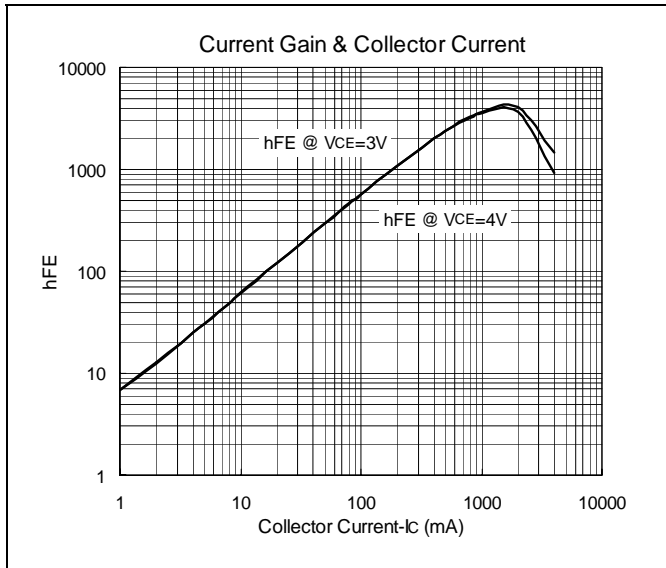
## Electrical Characteristics (T<sub>A</sub>=25°C)

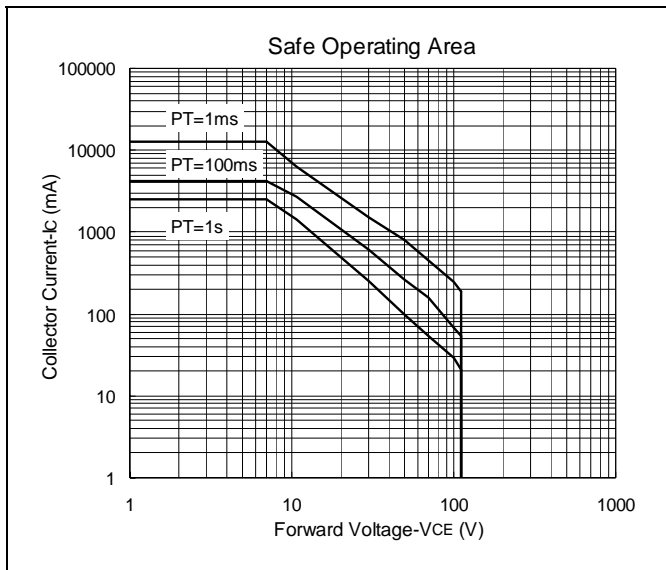
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV <sub>CBO</sub>	-100	-	-	V	I <sub>C</sub> =-1mA
BV <sub>CEO</sub>	-100	-	-	V	I <sub>C</sub> =-30mA
I <sub>CBO</sub>	-	-	-1	mA	V <sub>CB</sub> =-100V
I <sub>CEO</sub>	-	-	-2	mA	V <sub>CE</sub> =-50V
I <sub>EBO</sub>	-	-	-2	mA	V <sub>EB</sub> =-5V
*V <sub>CE(sat)</sub>	-	-	-2.5	V	I <sub>C</sub> =-2A, I <sub>B</sub> =-8mA
*V <sub>BE(on)</sub>	-	-	-2.8	V	I <sub>C</sub> =-2A, V <sub>CE</sub> =-4V
*h <sub>FE1</sub>	1	-	-	K	I <sub>C</sub> =-1A, V <sub>CE</sub> =-4V
*h <sub>FE2</sub>	500	-	-		I <sub>C</sub> =-2A, V <sub>CE</sub> =-4V
Cob	-	-	200	pF	V <sub>CB</sub> =-10V, f=0.1MHz

\*Pulse Test: Pulse Width ≤380us, Duty Cycle≤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

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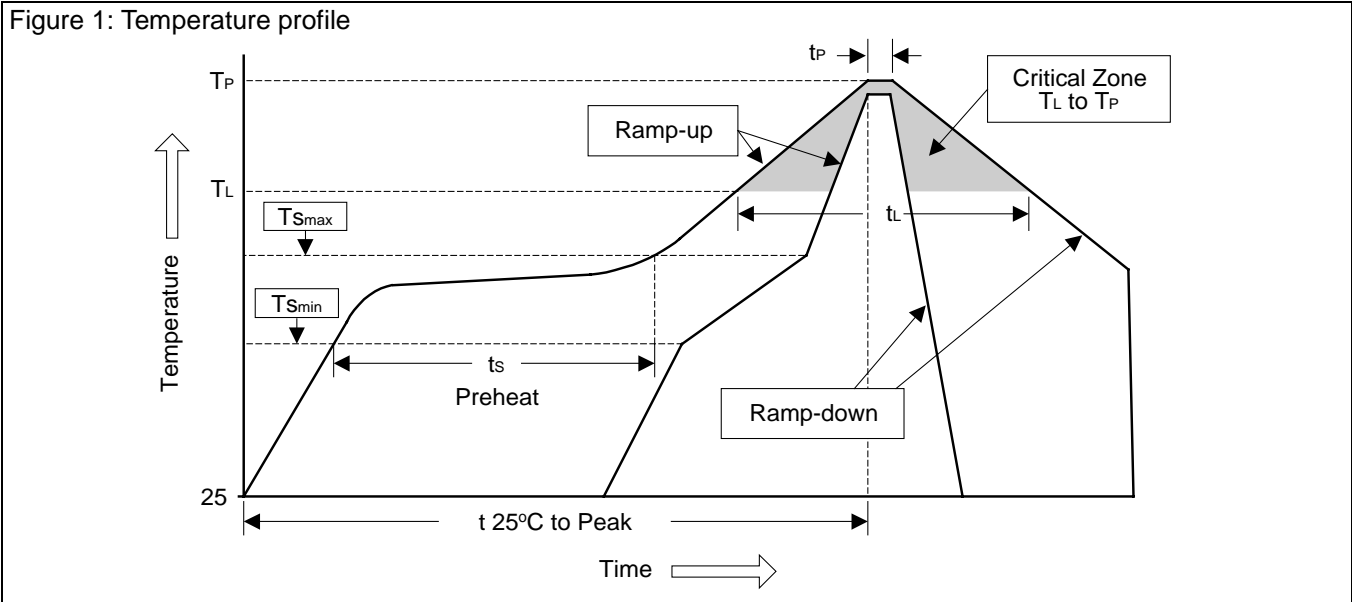
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### Soldering Methods for HSMC's Products

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