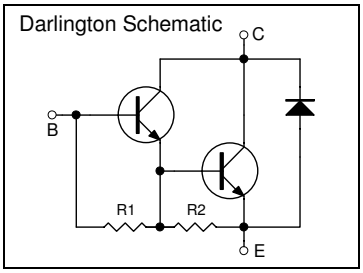
HM112

NPN EPITAXIAL PLANAR TRANSISTOR

SOT-89



Description

The HM112 is designed for use in general purpose amplifier and low-speed switching applications.

Absolute Maximum Ratings (T_A=25°C)

- Maximum Temperatures
  - Storage Temperature ..... -55 ~ +150 °C
  - Junction Temperature ..... +150 °C Maximum
  - Operating Temperature ..... +150 °C Maximum
- Maximum Power Dissipation
  - Total Power Dissipation (T_A=25°C) ..... 1.2 W
  - Total Power Dissipation (Printed circuit board 2mm thick, collector plating 1cm^2 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

Thermal Characteristic

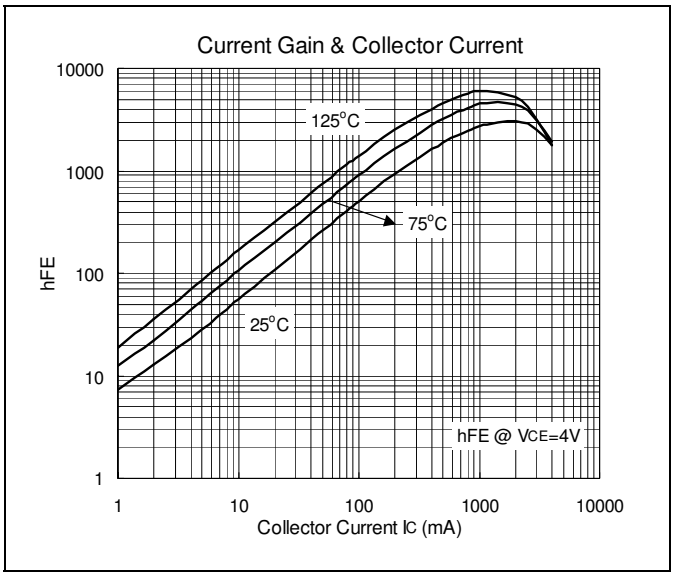
Symbol	Characteristic	Max.	Unit
$R_{\theta ja}$	Thermal Resistance, junction to ambient (T_A=25°C)	104	°C/W

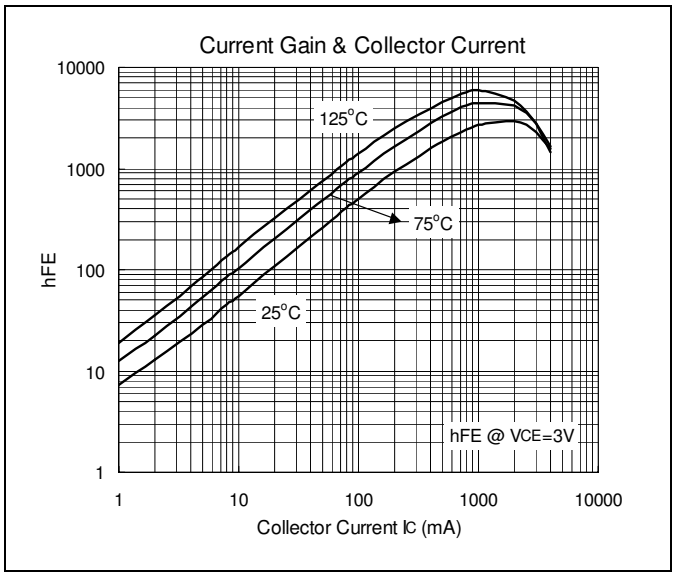
Electrical Characteristics (T_A=25°C)

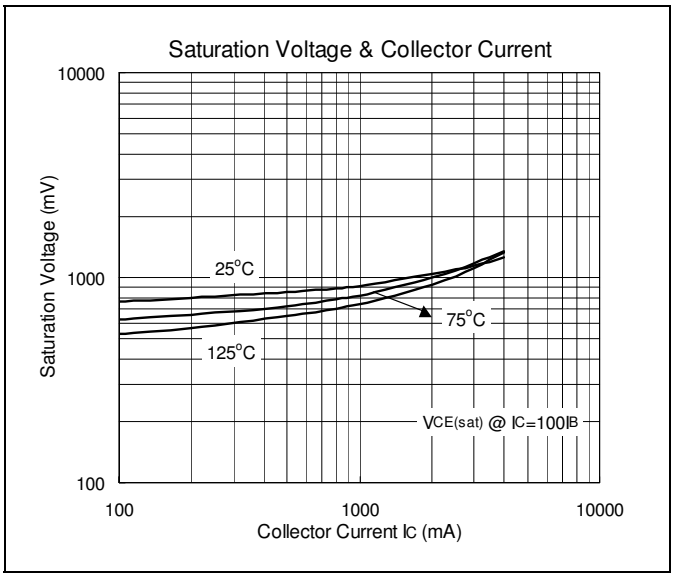
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	100	-	-	V	I_C=1mA
BV_{CEO}	100	-	-	V	I_C=30mA
I_{CBO}	-	-	1	mA	V_{CB}=100V
I_{CEO}	-	-	2	mA	V_{CE}=50V
I_{EBO}	-	-	2	mA	V_{EB}=5V
*$V_{CE(sat)}$	-	-	2.5	V	I_C=2A, I_B=8mA
*$V_{BE(on)}$	-	-	2.8	V	I_C=2A, V_{CE}=4V
*h_{FE1}	1	-	-	K	I_C=1A, V_{CE}=4V
*h_{FE2}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

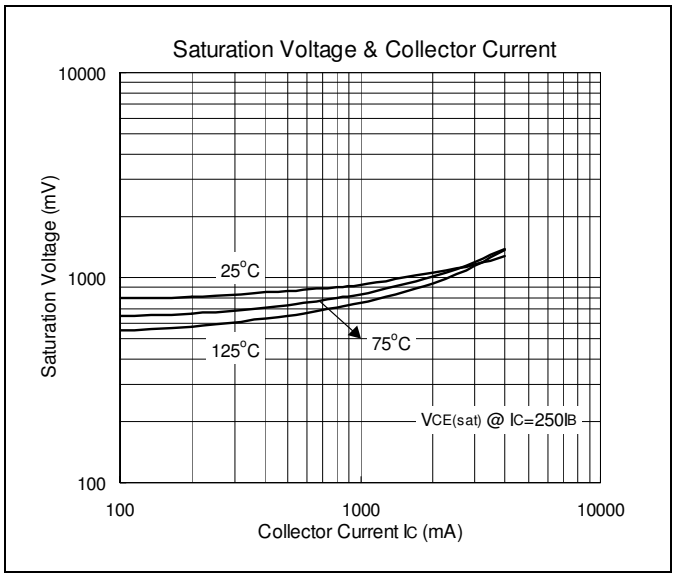
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

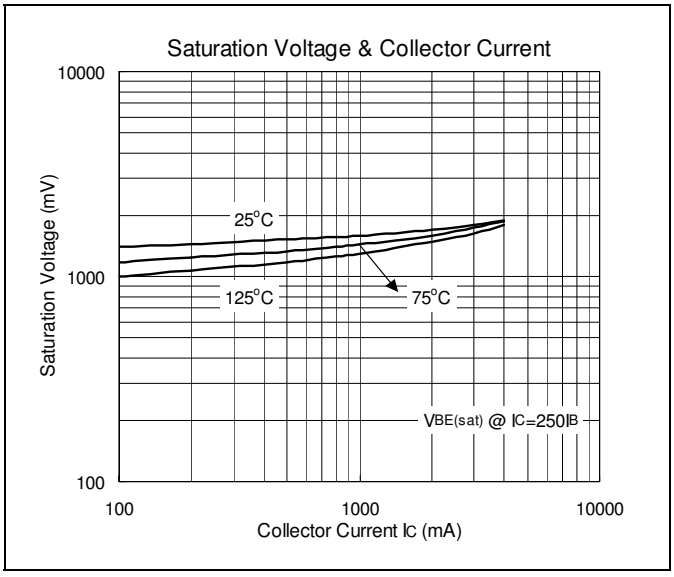
Characteristics Curve

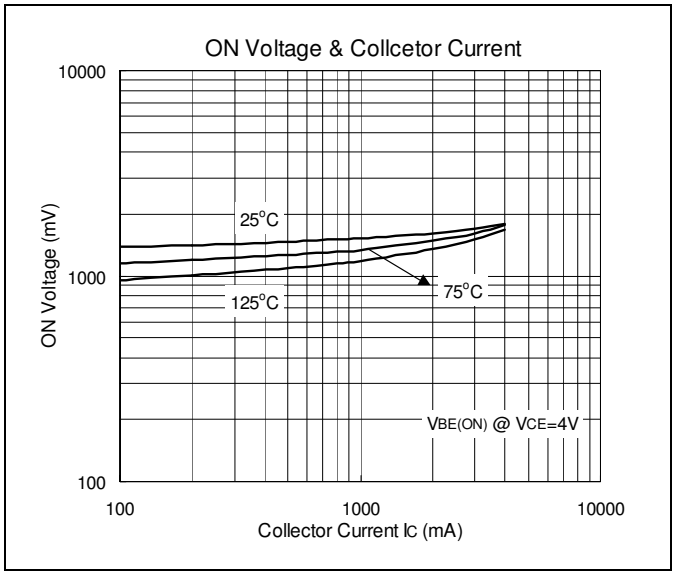


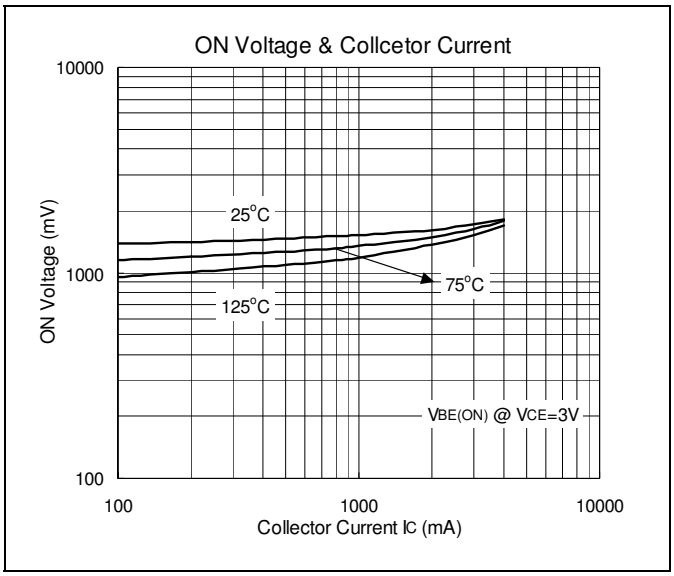


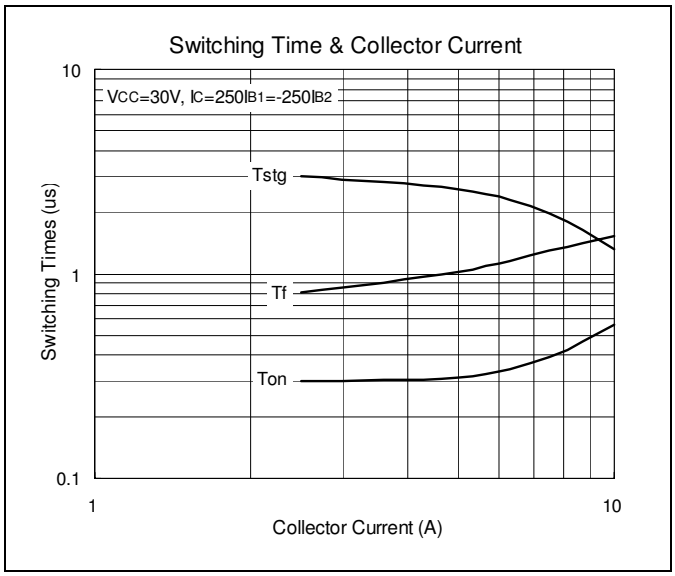


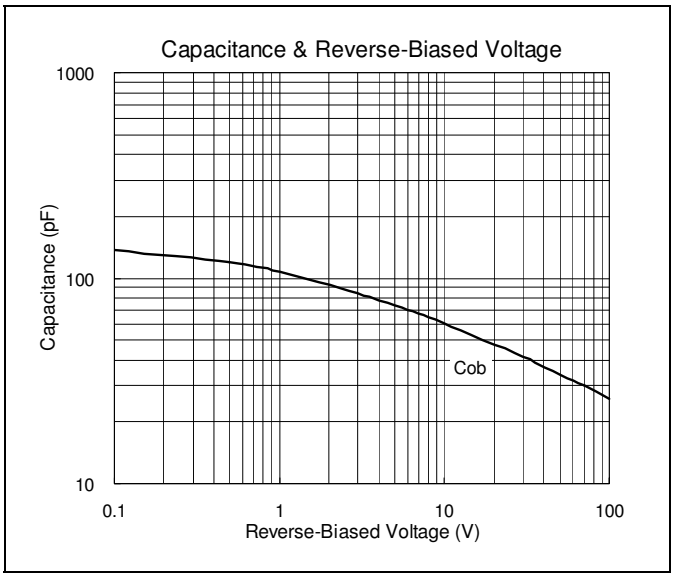


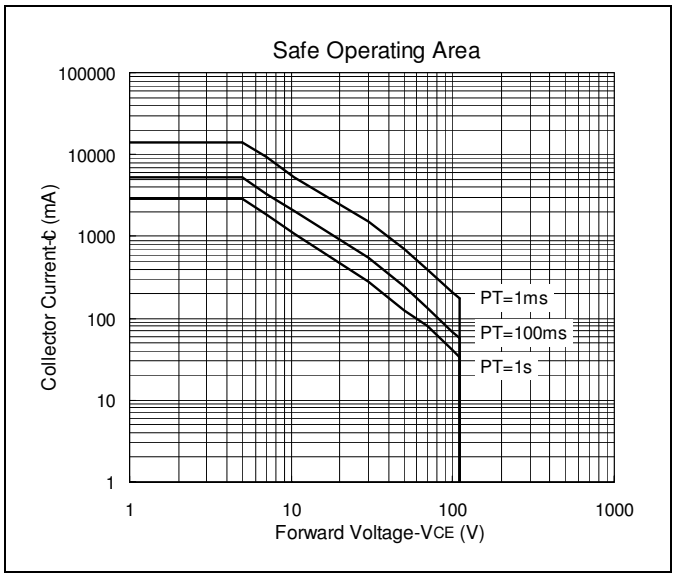




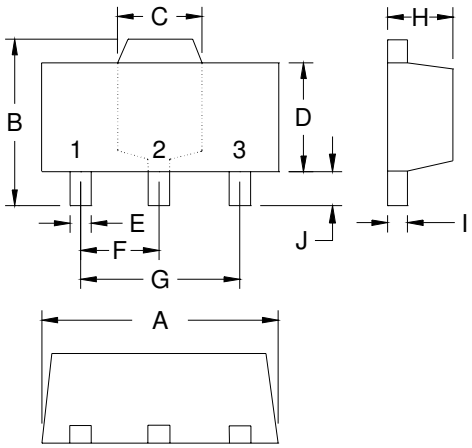

ON Voltage & Collcetor Current
10000
1000
100
ON Voltage (mV)
25°C
75°C
125°C
VBE(ON) @ VCE=3V
100
1000
10000
Collector Current IC (mA)


Switching Time & Collector Current
10
1
0.1
Switching Times (us)
VCC=30V, IC=250IB1=-250IB2
Tstg
Tf
Ton
1
10
Collector Current (A)


Capacitance & Reverse-Biased Voltage
1000
100
10
Capacitance (pF)
Cob
0.1
1
10
100
Reverse-Biased Voltage (V)

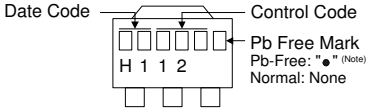

Safe Operating Area
100000
10000
1000
100
10
1
Collector Current-IC (mA)
PT=1ms
PT=100ms
PT=1s
1
10
100
1000
Forward Voltage-VCE (V)

SOT-89 Dimension



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

Marking:



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
J	0.89	1.20

*: Typical, Unit: mm

Head Office And Factory:

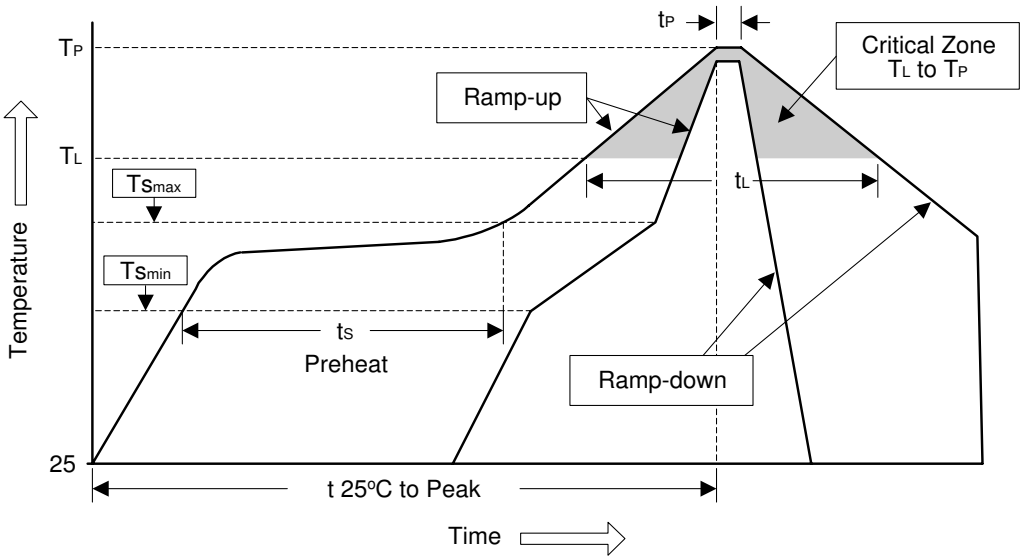
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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 (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 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	10sec ±1sec
Pb-Free devices.	260°C ±5°C	10sec ±1sec