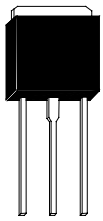
HI112

NPN EPITAXIAL PLANAR TRANSISTOR



TO-251

Description

The HI112 is designed for use in general purpose amplifier and low-speed switching applications.

Absolute Maximum Ratings (T_A=25°C)

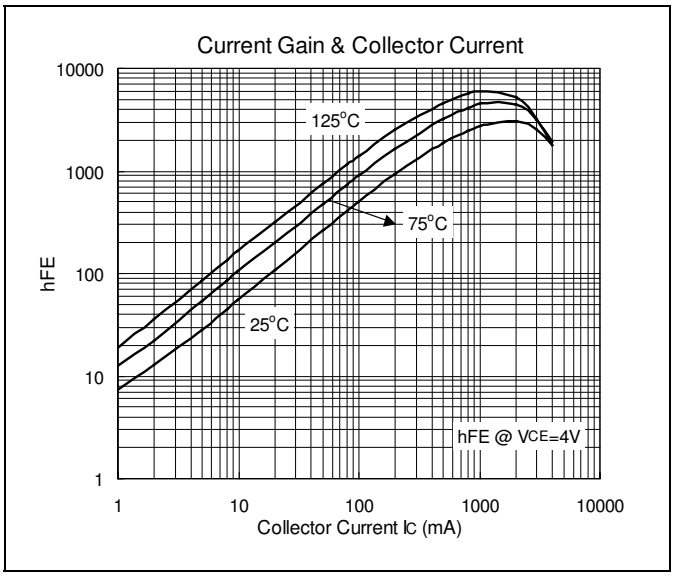
- Maximum Temperatures
  Storage Temperature ..... -55 ~ +150 °C
  Junction Temperature ..... 150 °C Maximum
- Maximum Power Dissipation
  Total Power Dissipation (T_C=25°C) ..... 25 W
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage ..... 100 V
  V_{CEO} Collector to Emitter Voltage ..... 100 V
  V_{EBO} Emitter to Base Voltage ..... 5 V
  I_C Collector Current ..... 4 A

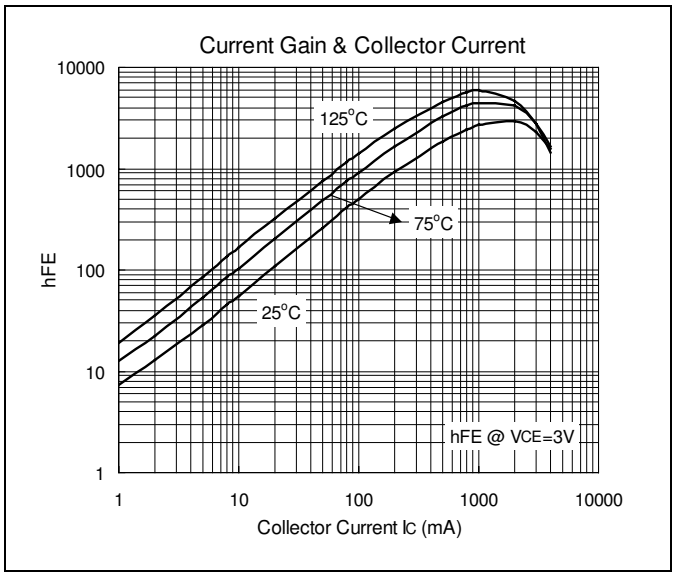
Electrical Characteristics (T_A=25°C)

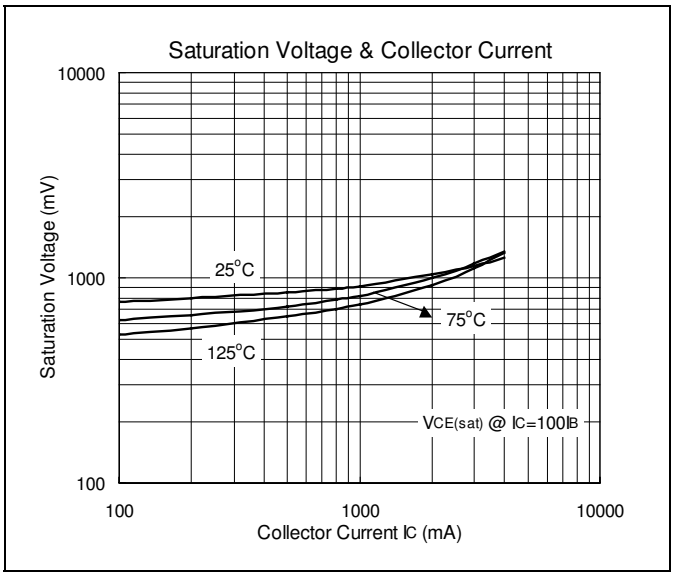
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	100	-	-	V	I_C=1mA
BV_{CEO}	100	-	-	V	I_C=30mA
I_{CBO}	-	-	10	uA	V_{CB}=80V
I_{CEO}	-	-	20	uA	V_{CE}=50V
I_{EBO}	-	-	2	mA	V_{EB}=5V
*$V_{CE(sat)1}$	-	-	2	V	I_C=2A, I_B=8mA
*$V_{CE(sat)2}$	-	-	3	V	I_C=4A, I_B=40mA
*$V_{BE(on)}$	-	-	2.8	V	I_C=2A, V_{CE}=4V
*$V_{BE(sat)}$	-	-	4	V	I_C=4A, I_B=80mA
*h_{FE1}	500	-	-		I_C=0.5A, V_{CE}=3V
*h_{FE2}	1	-	12	K	I_C=2A, V_{CE}=3V
*h_{FE3}	200	-	-		I_C=4A, V_{CE}=3V
Cob	-	-	100	pF	V_{CB}=10V

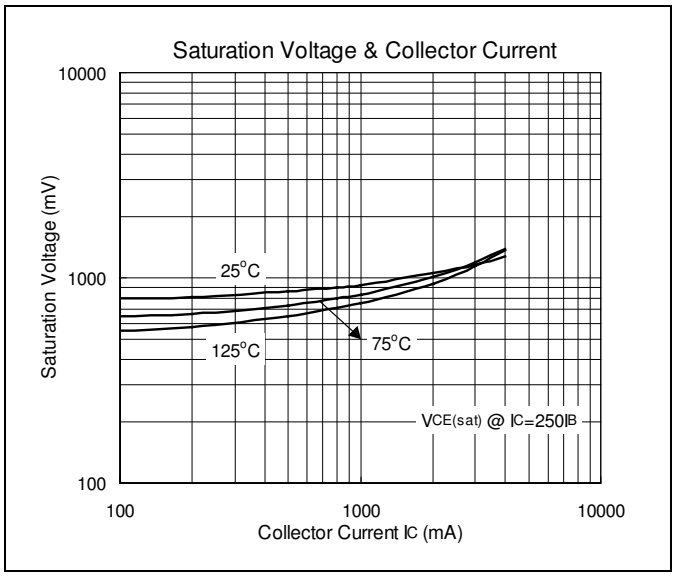
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

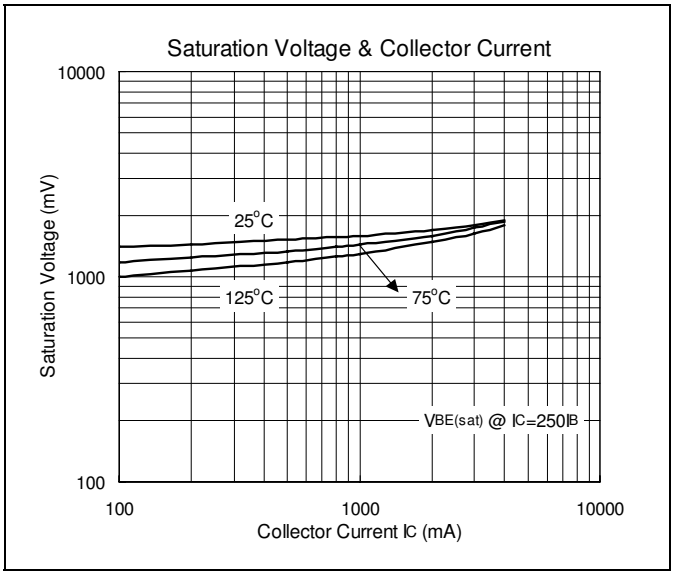
Characteristics Curve

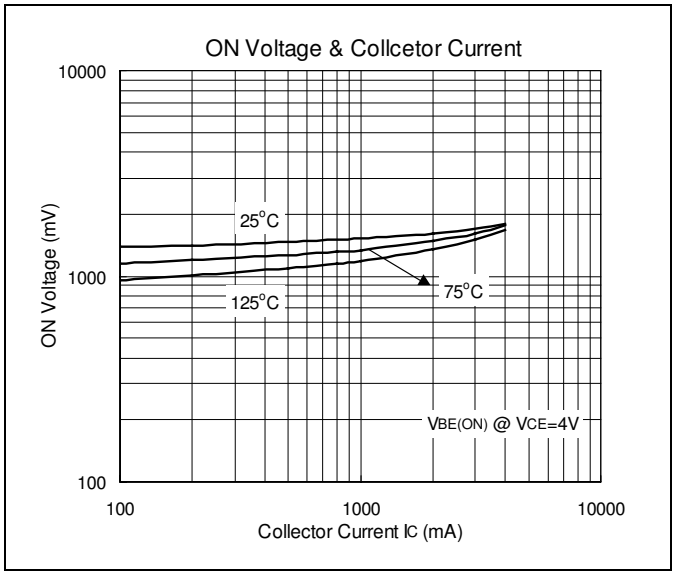


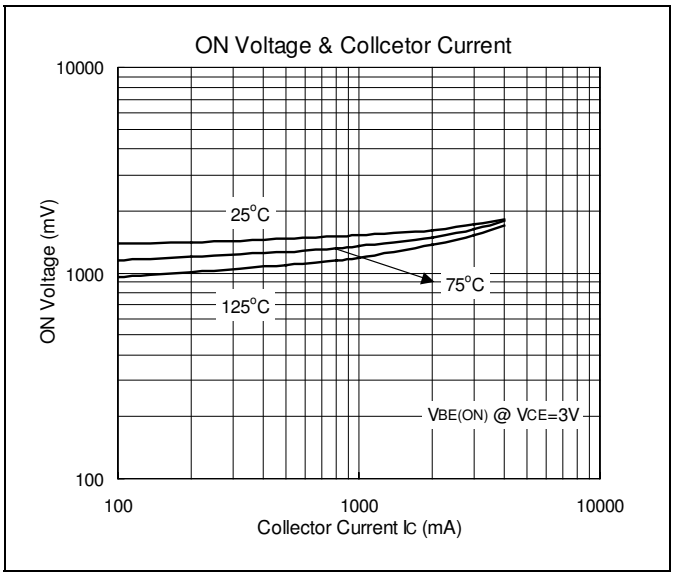


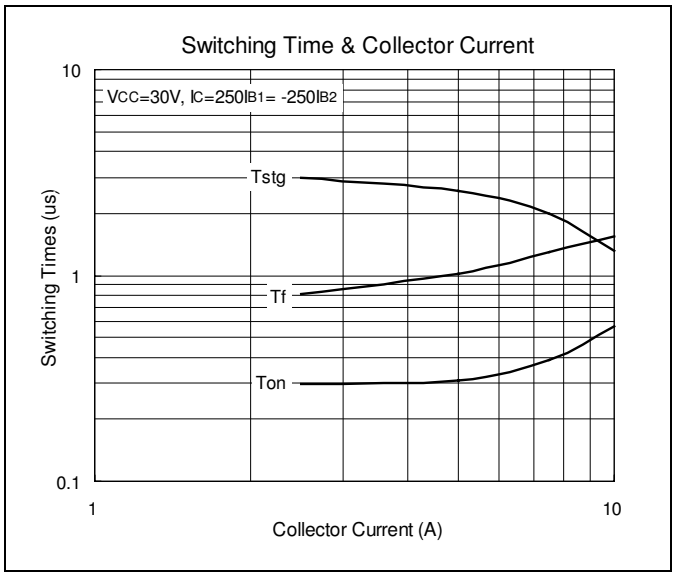


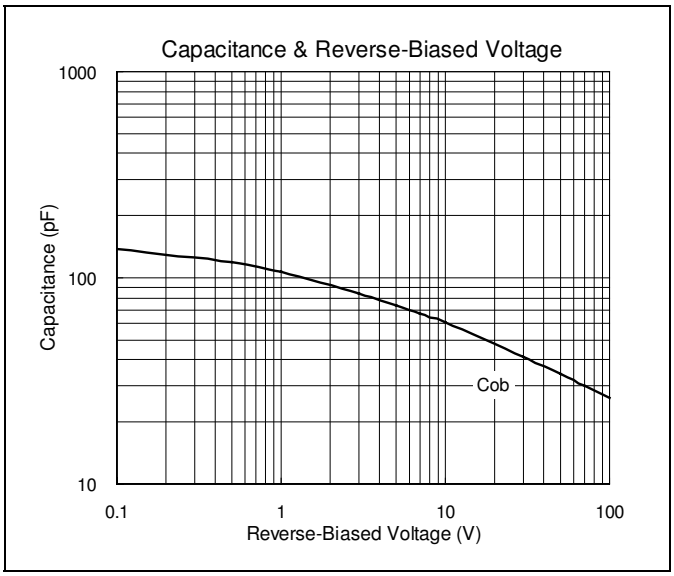


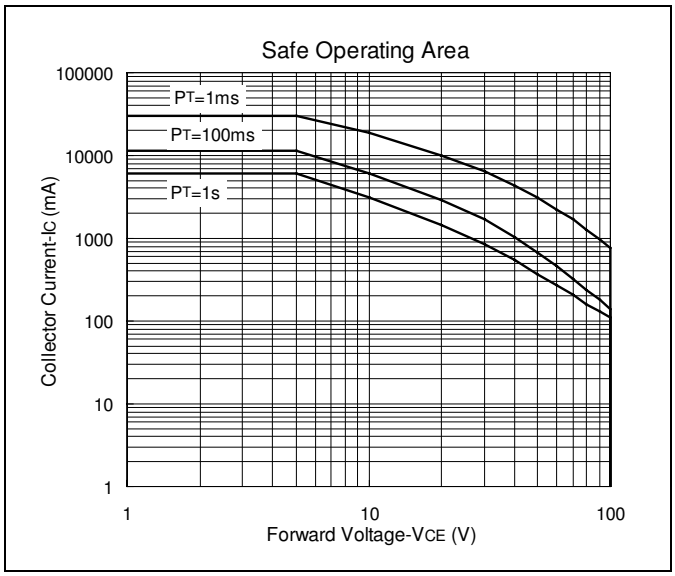




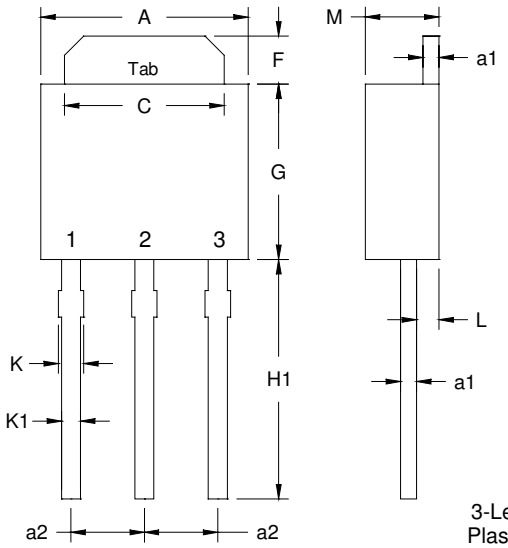

ON Voltage & Collcetor Current
10000
1000
100
ON Voltage (mV)
25°C
75°C
125°C
VBE(ON) @ VCE=3V
100
1000
10000
Collector Current IC (mA)


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

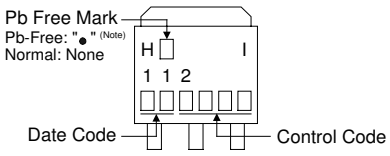

Capacitance & Reverse-Biased Voltage
1000
100
10
Capacitance (pF)
Cob
0.1
1
10
100
Reverse-Biased Voltage (V)


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

TO-251 Dimension



Marking:



Note: Green label is used for pb-free packing

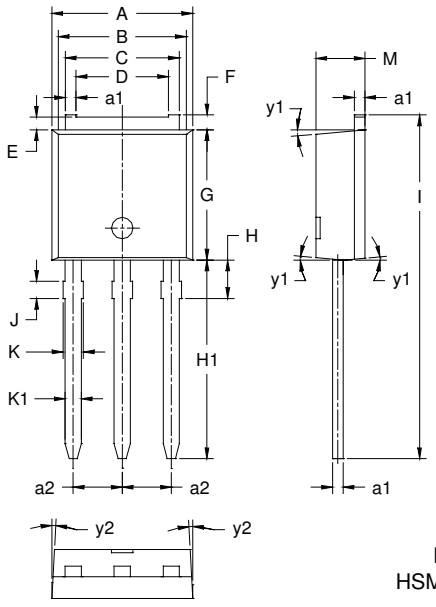
Pin Style: 1.Base 2/Tab.Collector 3.Emitter

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

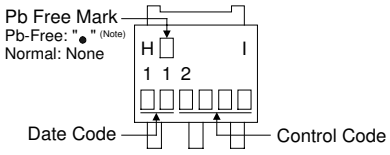
DIM	Min.	Max.
A	6.35	6.80
C	4.80	5.50
F	1.30	1.70
G	5.40	6.25
H1	6.75	8.00
K	0.50	0.90
K1	0.40	0.90
L	0.90	1.50
M	2.20	2.40
a1	0.40	0.65
a2	-	*2.30

*: Typical, Unit: mm

3-Lead TO-251
Plastic Package
HSMC Package Code: I



Marking:



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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	6.40	6.80
B	-	6.00
C	5.04	5.64
D	-	*4.34
E	0.40	0.80
F	0.50	0.90
G	5.90	6.30
H	-	*1.80
H1	-	*9.30
I	-	*16.10
J	-	*0.80
K	-	0.96
K1	-	*0.76
M	2.20	2.40
a1	0.40	0.60
a2	2.10	2.50
y1	-	5°
y2	-	3°

*: Typical, Unit: mm

3-Lead TO-251
Plastic Package
HSMC Package Code: I

Head Office And Factory:

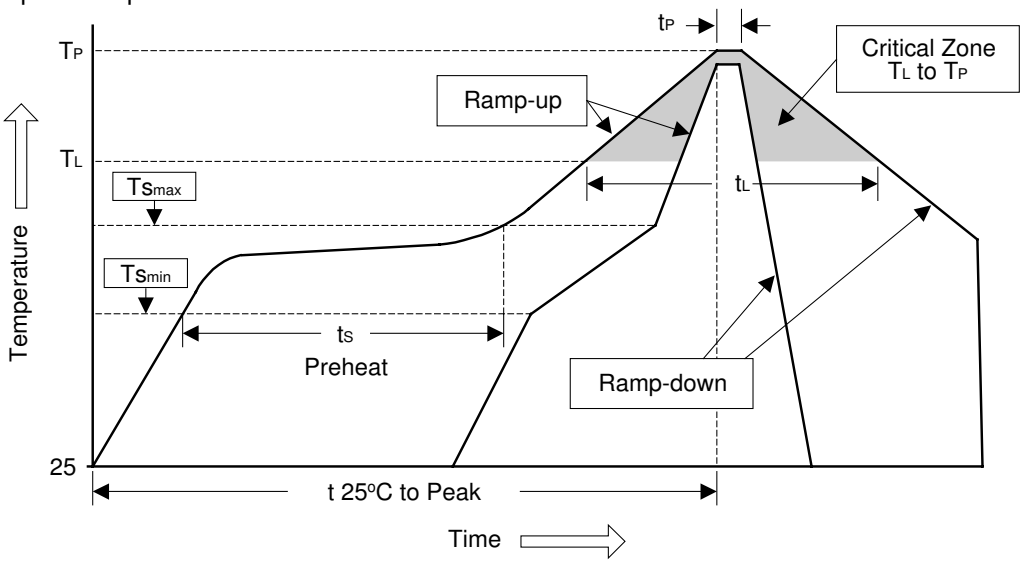
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec