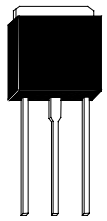
HI13003

NPN EPITAXIAL PLANAR TRANSISTOR



TO-251

Description

These devices are designed for high-voltage, high-speed power switching inductive circuits where fall time is critical. They are particularly suited for 115 and 220V switchmode applications such as Switching Regulators, Inverters, Motor Controls, Solenoid/Relay drivers and Deflection circuits.

Absolute Maximum Ratings (T_A=25°C)

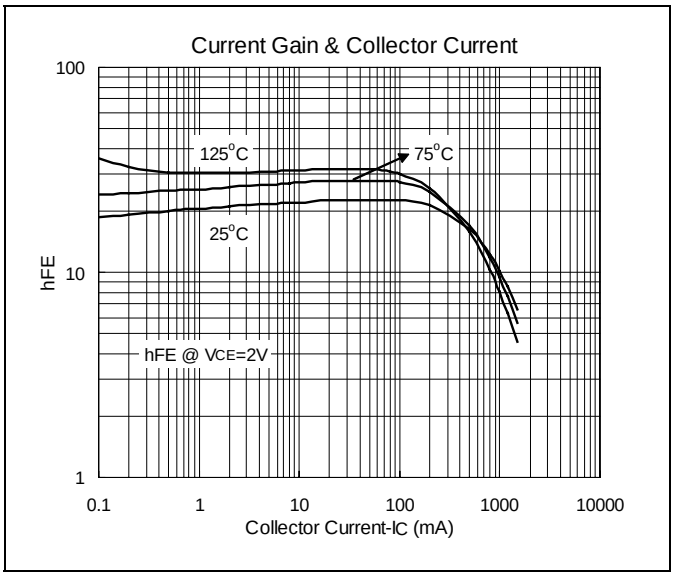
- Maximum Temperatures
  - Storage Temperature ..... -55 ~ +150 °C
  - Junction Temperature ..... 150 °C Maximum
- Maximum Power Dissipation
  - Total Power Dissipation (T_C=25°C) ..... 40 W
  - Total Power Dissipation (T_A=25°C) ..... 1.3 W
- Maximum Voltages and Currents (Ta=25°C)
  - BV_{CEV} Collector to Emitter Voltage ..... 700 V
  - V_{CEO} Collector to Emitter Voltage ..... 400 V
  - V_{EBO} Emitter to Base Voltage ..... 9 V
  - I_C Collector Current ..... 1.5 A

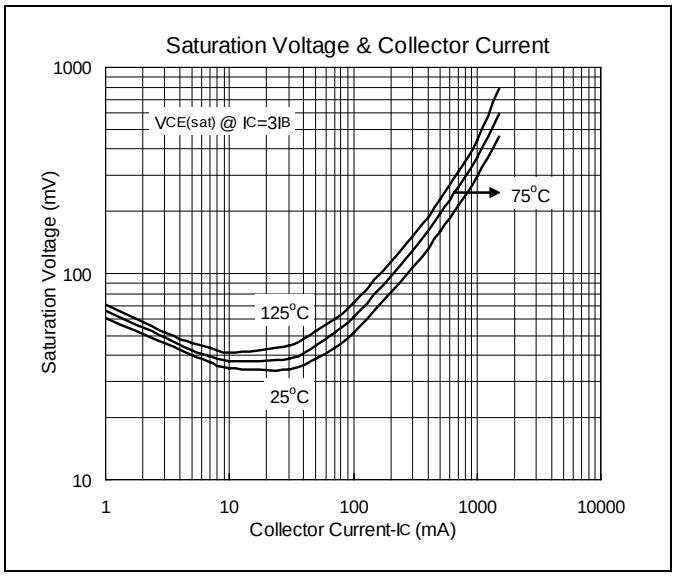
Electrical Characteristics (T_A=25°C)

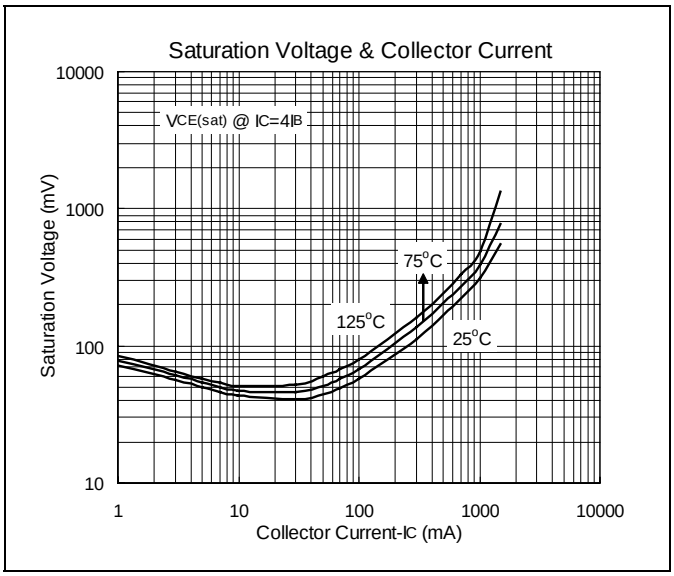
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CEO}	400	-	-	V	I_C=10mA
BV_{CEV}	700	-	-	V	I_C=1mA, $V_{BE(OFF)}$=1.5V
I_{EBO}	-	-	1	mA	V_{EB}=9V
I_{CEV}	-	-	1	mA	V_{CE}=700V, $V_{BE(OFF)}$=1.5V
*$V_{CE(sat)1}$	-	-	0.5	V	I_C=0.5A, I_B=0.1A
*$V_{CE(sat)2}$	-	-	1	V	I_C=1A, I_B=0.25A
*$V_{CE(sat)3}$	-	-	3	V	I_C=1.5A, I_B=0.5A
*$V_{BE(sat)1}$	-	-	1	V	I_C=0.5A, I_B=0.1A
*$V_{BE(sat)2}$	-	-	1.2	V	I_C=1A, I_B=0.25A
*h_{FE1}	8	-	40		I_C=0.5A, V_{CE}=2V
*h_{FE2}	5	-	25		V_{CE}=2V, I_C=1A
Cob	-	21	-	pF	V_{CB}=10V, I_E=0, f=1MHz

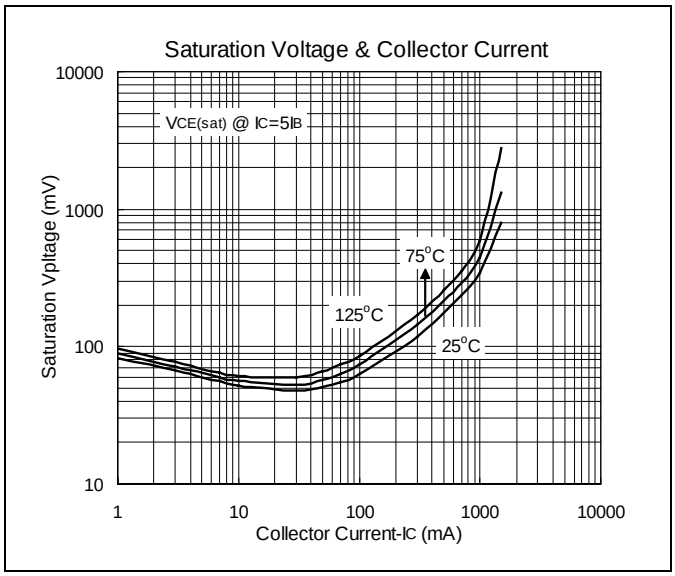
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

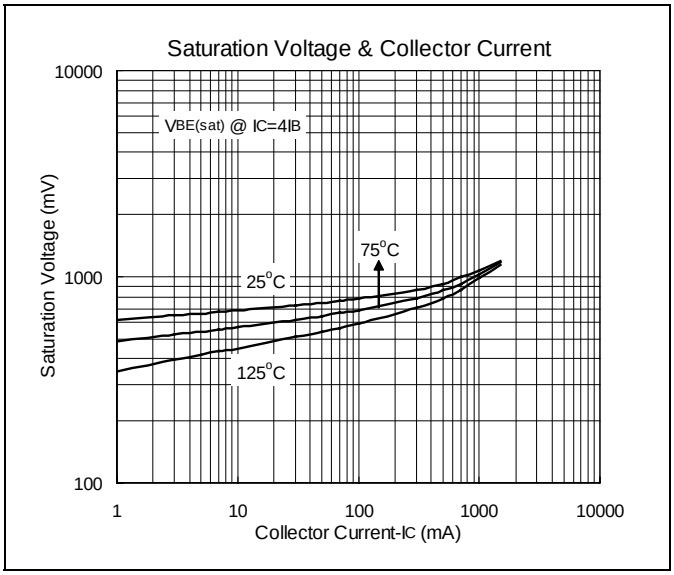
Characteristics Curve

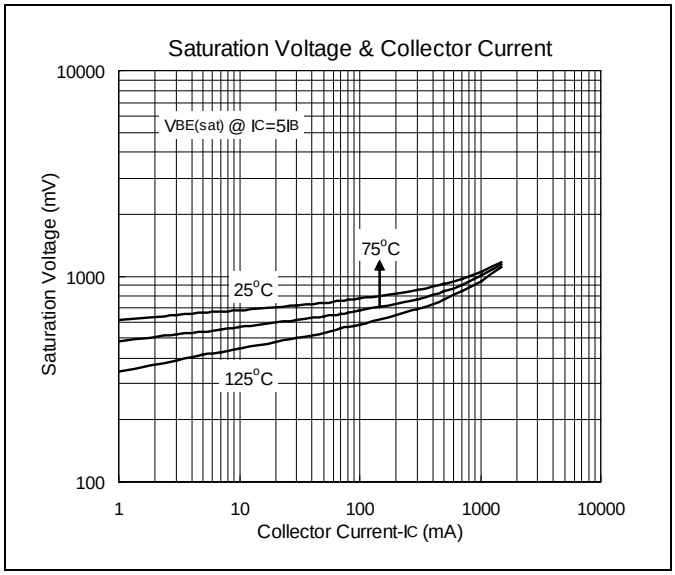




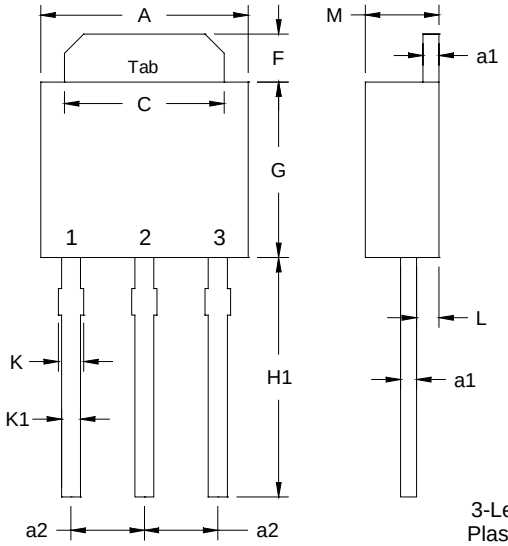




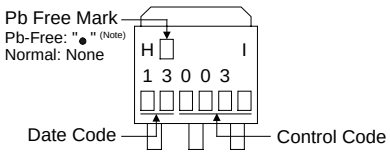




TO-251 Dimension



Marking:



Note: Green label is used for pb-free packing

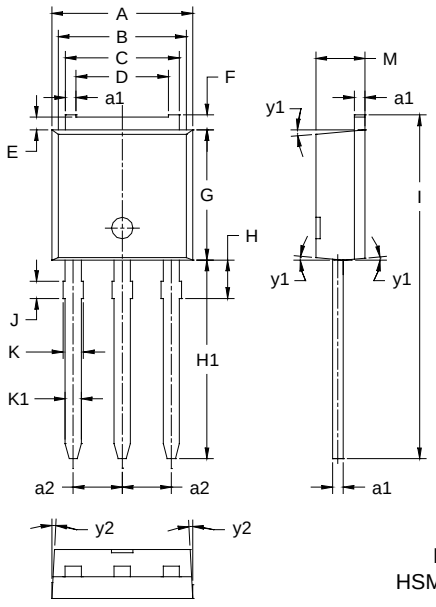
Pin Style: 1.Base 2/Tab.Collector 3.Emitter

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



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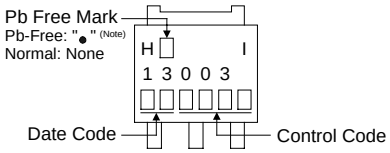

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Pin Style: 1.Base 2.Collector 3.Emitter

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	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:

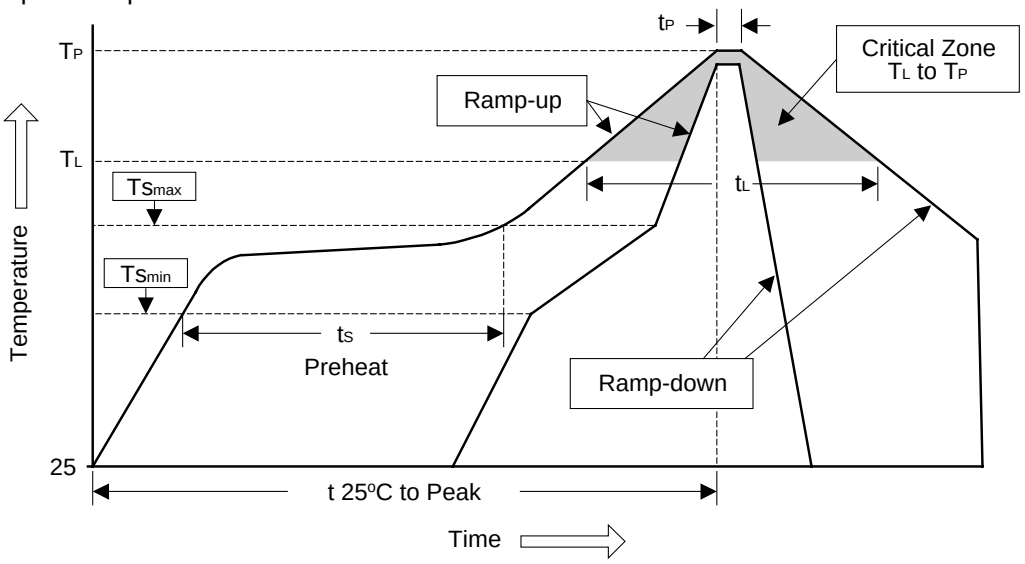
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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	10sec ±1sec
Pb-Free devices.	260°C ±5°C	10sec ±1sec