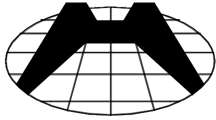
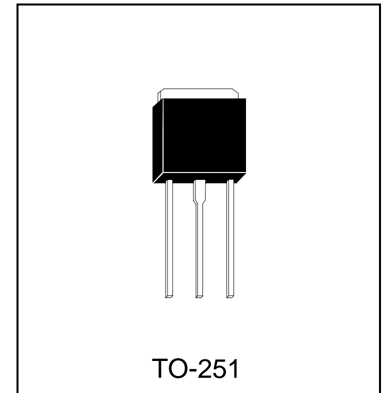


HI-SINCERITY
MICROELECTRONICS CORP.

Spec. No. : HI200202
Issued Date : 2002.06.01
Revised Date : 2006.02.20

HLB123I

NPN EPITAXIAL PLANAR TRANSISTOR


TO-251

Description

The HLB123I is designed for high voltage. High speed switching inductive circuits and amplifier applications.

Features

- High Speed Switching
- Low Saturation Voltage
- High Reliability

Absolute Maximum Ratings (T_A=25°C)

- Maximum Temperatures
  - Storage Temperature .... -50 ~ +150 °C
  - Junction Temperature .... +150 °C Maximum
- Maximum Power Dissipation
  - Total Power Dissipation (T_C=25°C) .... 20 W
- Maximum Voltages and Currents
  - BV_{CBO} Collector to Base Voltage .... 600 V
  - BV_{CEO} Collector to Emitter Voltage .... 400 V
  - BV_{EBO} Emitter to Base Voltage .... 8 V
  - I_C Collector Current (DC) .... 1 A
  - I_C Collector Current (Pulse) .... 2 A

Electrical Characteristics (T_A=25°C)

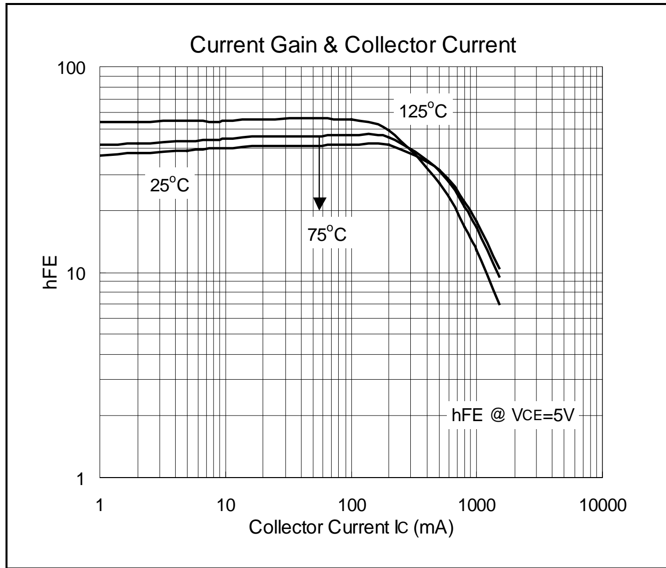
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	600	-	-	V	I_C=1mA, I_E=0
BV_{CEO}	400	-	-	V	I_C=10mA, I_B=0
BV_{EBO}	8	-	-	V	I_E=1mA, I_C=0
I_{CBO}	-	-	10	uA	V_{CB}=600V, I_E=0
I_{EBO}	-	-	10	uA	V_{BE}=9V, I_C=0
*$V_{CE(sat)1}$	-	-	0.8	V	I_C=0.1A, I_B=10mA
*$V_{CE(sat)2}$	-	-	0.9	V	I_C=0.3A, I_B=30mA
*$V_{BE(sat)1}$	-	-	1.2	V	I_C=0.1A, I_B=10mA
*$V_{BE(sat)2}$	-	-	1.8	V	I_C=0.3A, I_B=30Ma
*h_{FE1}	10	-	50		I_C=0.3A, V_{CE}=5V
*h_{FE2}	10	-	-		I_C=0.5A, V_{CE}=5V
*h_{FE3}	6	-	-		I_C=1A, V_{CE}=5V
T_{on}	-	0.4	1.1	uS	V_{CC}=100V, I_C=1A, I_{B1}=I_{B2}=0.2A
T_{stg}	-	2.4	4	uS	V_{CC}=100V, I_C=1A, I_{B1}=I_{B2}=0.2A
T_{off}	-	0.3	0.7	uS	V_{CC}=100V, I_C=1A, I_{B1}=I_{B2}=0.2A

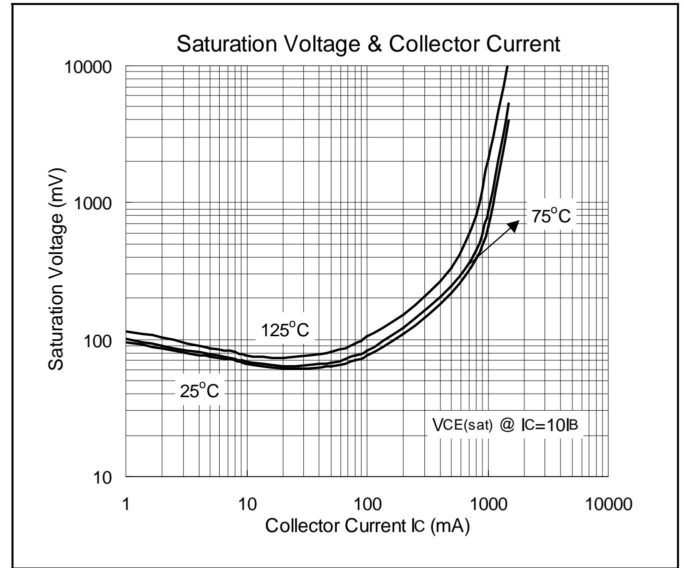
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

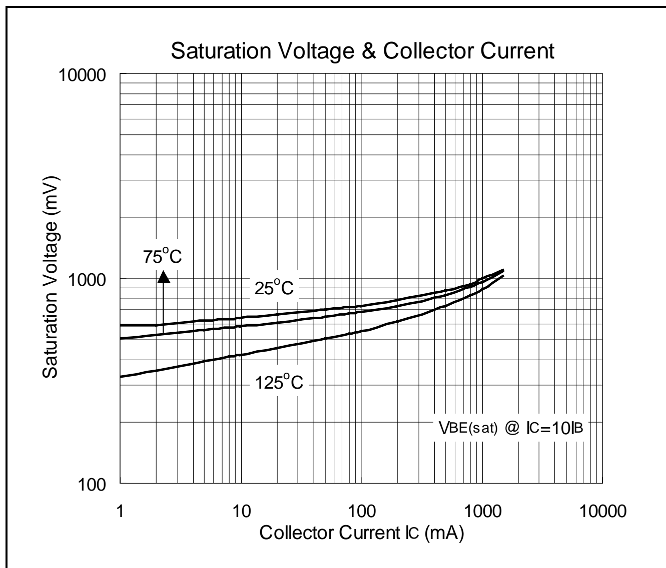
Classification Of hFE1

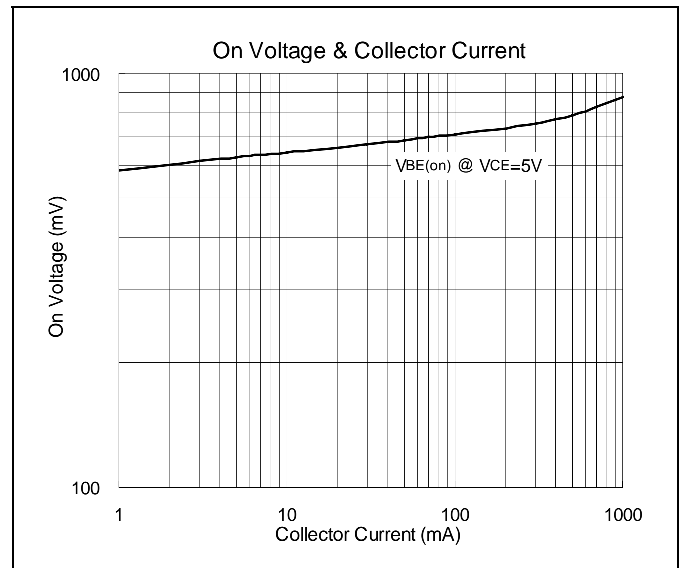
Rank	B1	B2	B3	B4	B5	B6	B7	B8
Range	10-17	13-22	18-27	23-32	28-37	33-42	38-47	43-50

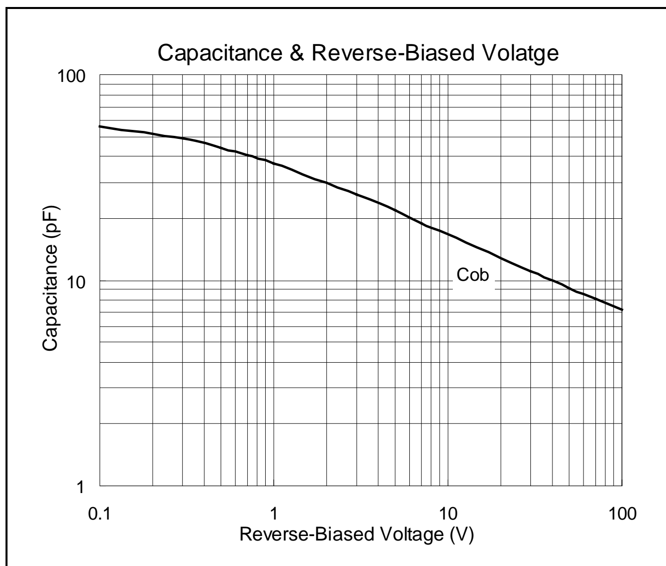
Characteristics Curve

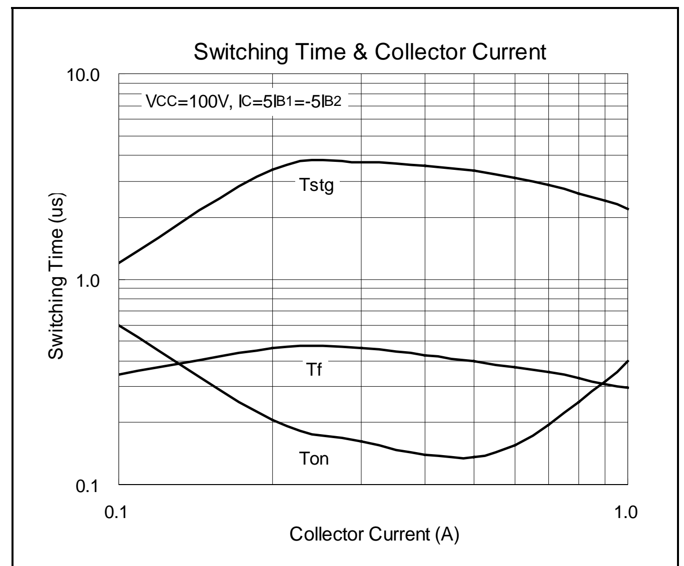


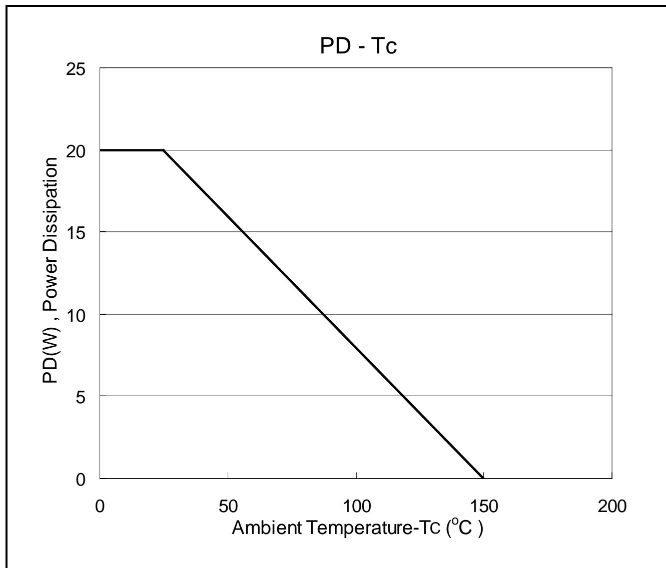


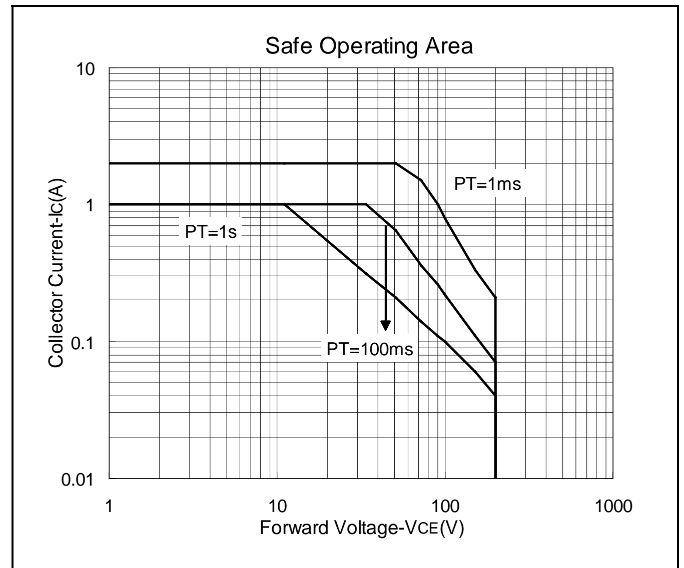









PD - Tc
PD(W) , Power Dissipation
Ambient Temperature-Tc (°C)
0
5
10
15
20
25
0
50
100
150
200


Safe Operating Area
Collector Current-Ic(A)
Forward Voltage-VCE(V)
PT=1ms
PT=1s
PT=100ms
10
1
0.1
0.01
1
10
100
1000

TO-251 Dimension

Marking:

Pb Free Mark
Pb-Free: "●" (Note)
Normal: None

Date Code
Control Code

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:

Pb Free Mark
Pb-Free: "●" (Note)
Normal: None

Date Code
Control Code

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	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

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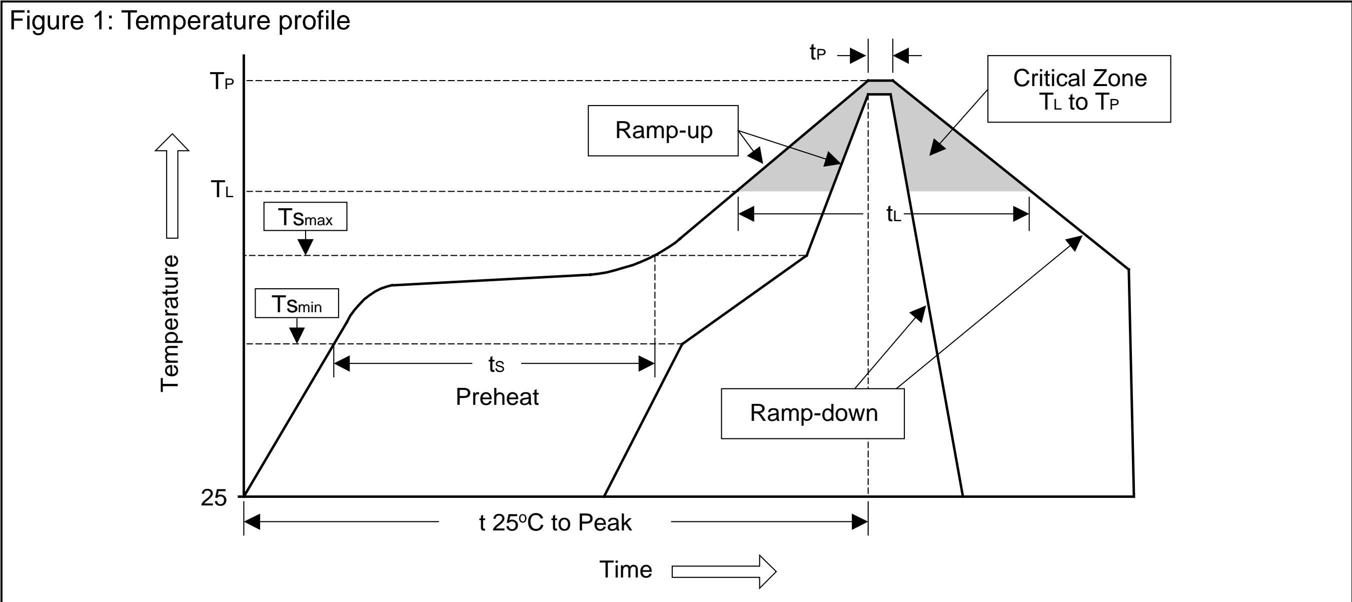
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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