



HLB123I

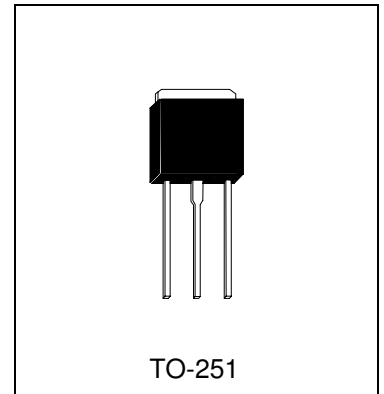
NPN EPITAXIAL PLANAR TRANSISTOR

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

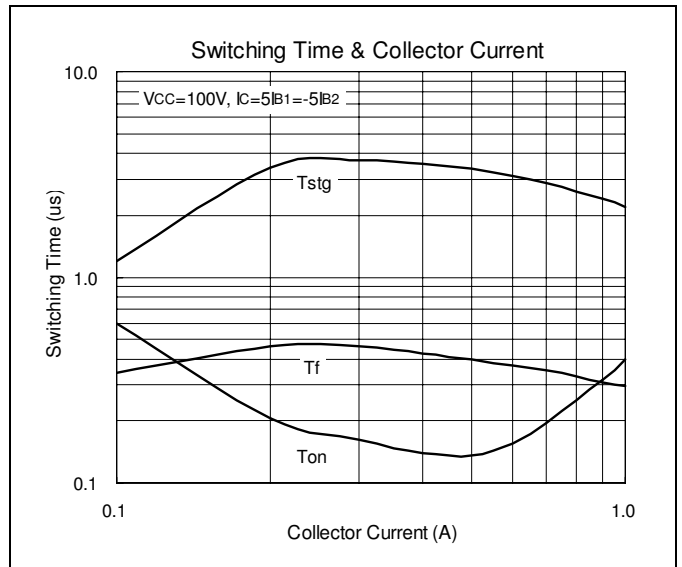
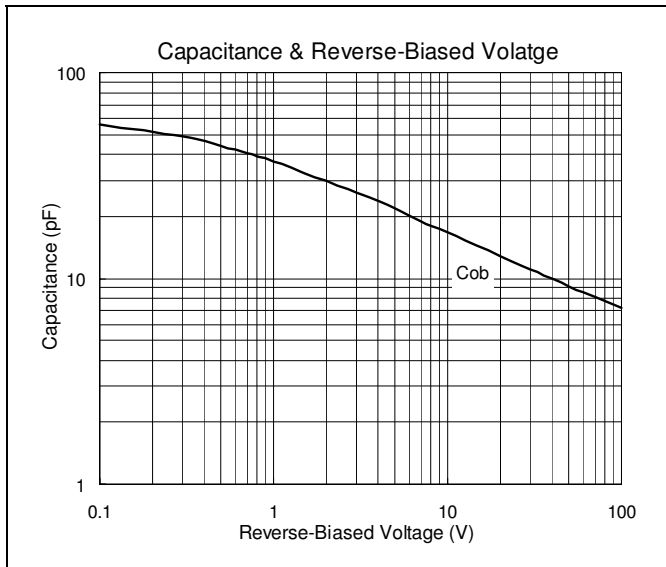
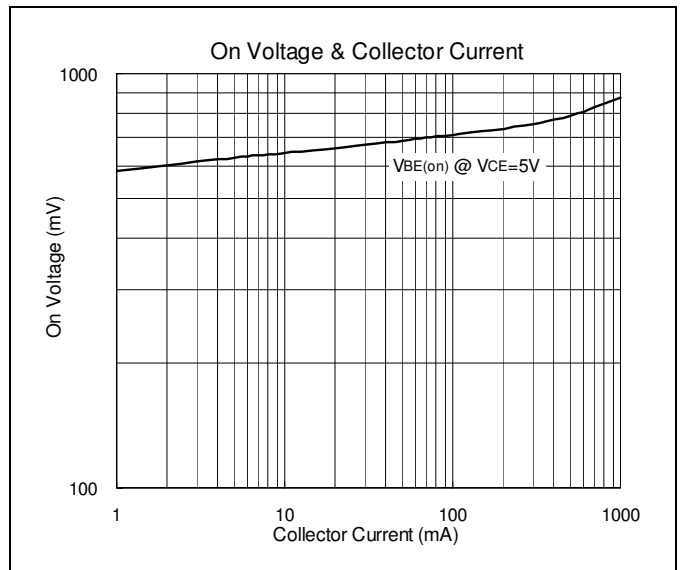
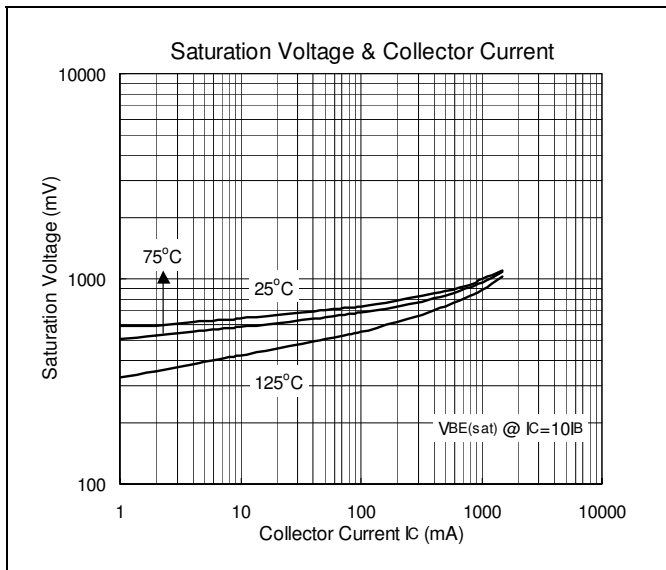
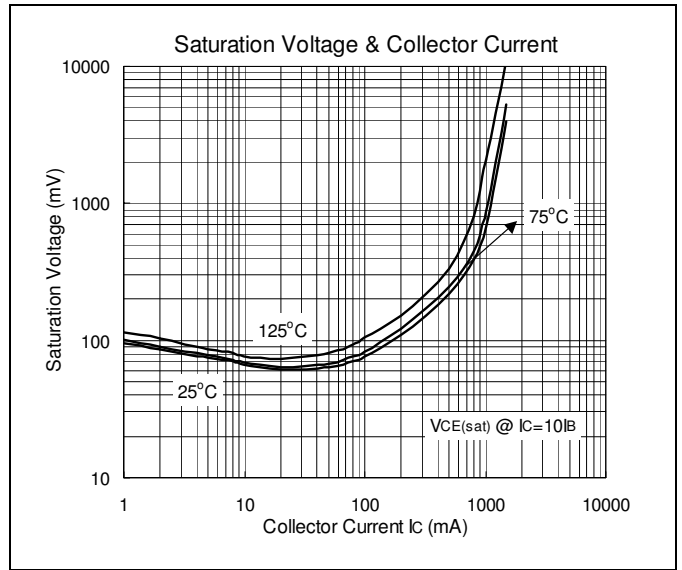
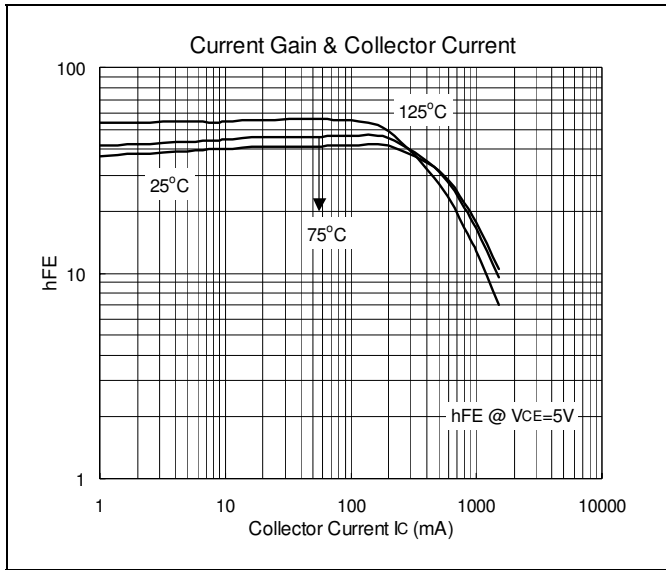
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

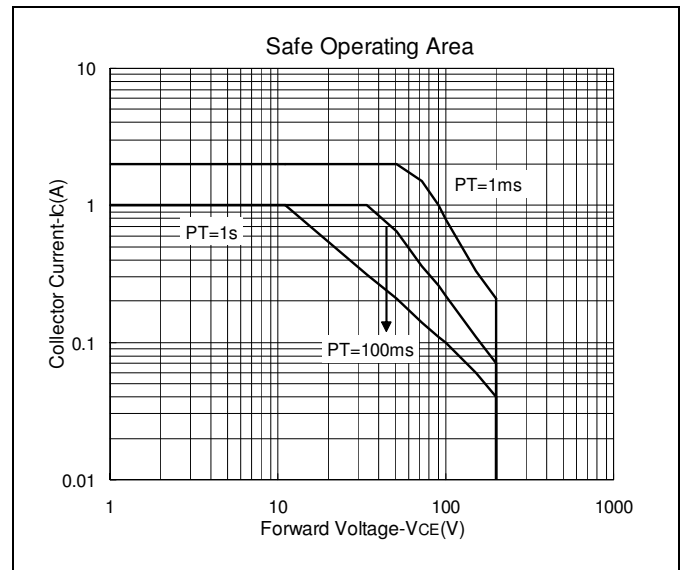
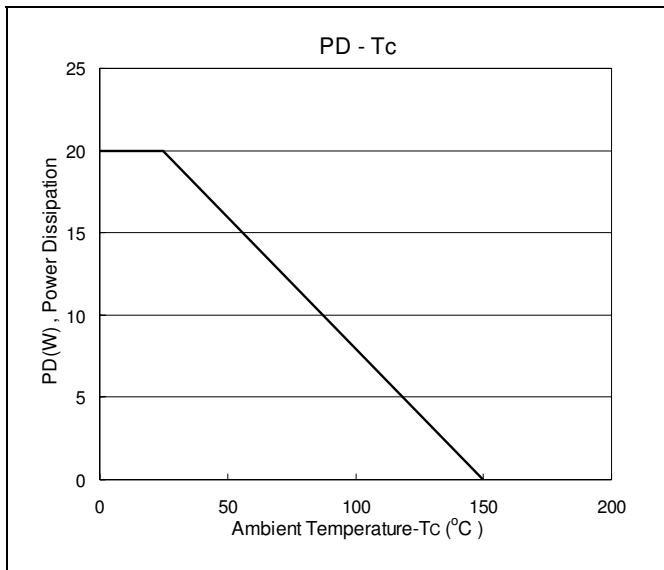
Classification Of hFE1

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







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

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

Date Code Control Code

Note: Green label is used for pb-free packing
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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

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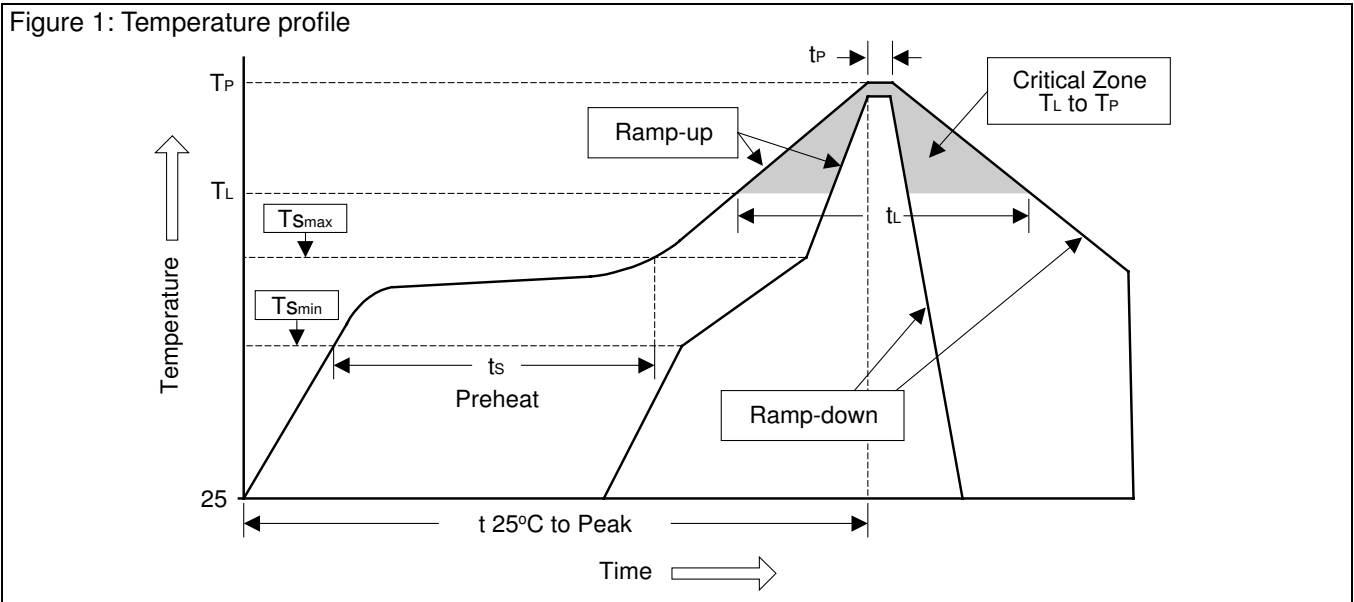
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Soldering Methods for HSMC's Products

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