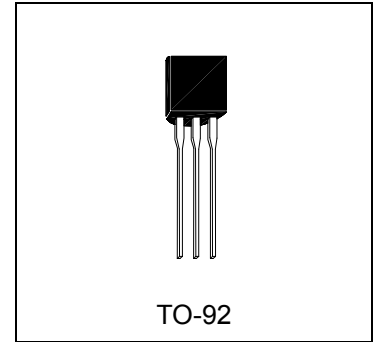




# HLB123SA

NPN EPITAXIAL PLANAR TRANSISTOR



## Description

- High Voltage, High Speed Power Switch
- Switch Regulators
- PWM Inverters and Motor Controls
- Solenoid and Relay Drivers
- Deflection Circuits

## Absolute Maximum Ratings

Parameter	Symbol	Maximun rating	Unit
Collector-Base Voltage	VCBO	700	V
Collector-Emitter Voltage	VCEO	400	V
Emitter-Base Voltage	VEBO	9	V
Collector Current(DC)	IC	1.2	A
Base Current	IB	0.3	A
Total Power Dissipation (TA=25°C)	Ptot	1.0	W
Total Power Dissipation (Tc=25°C)	Ptot	10	W
Thermal Resistance Junctionto Case	RθJC	88.2	°C/W
Junction Temperature	TJ	150	°C
Storage Temperature	TSTG	-55~150	°C

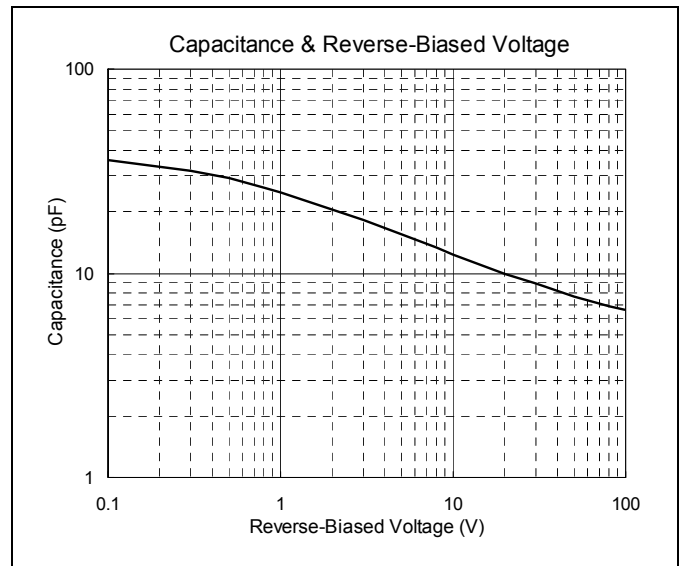
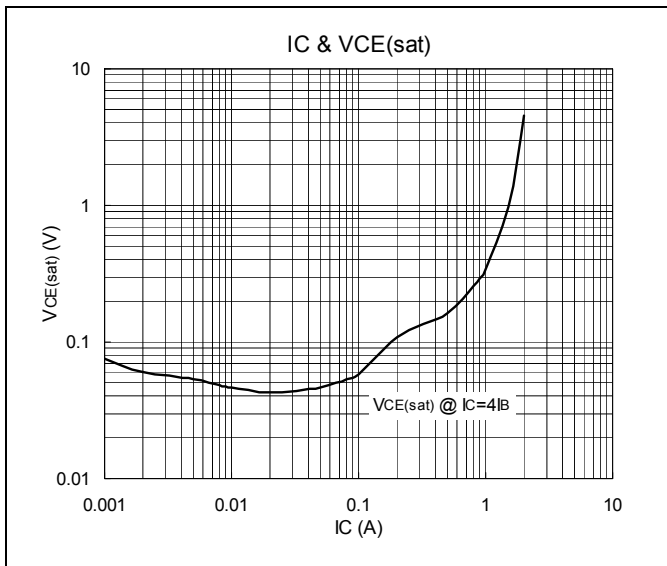
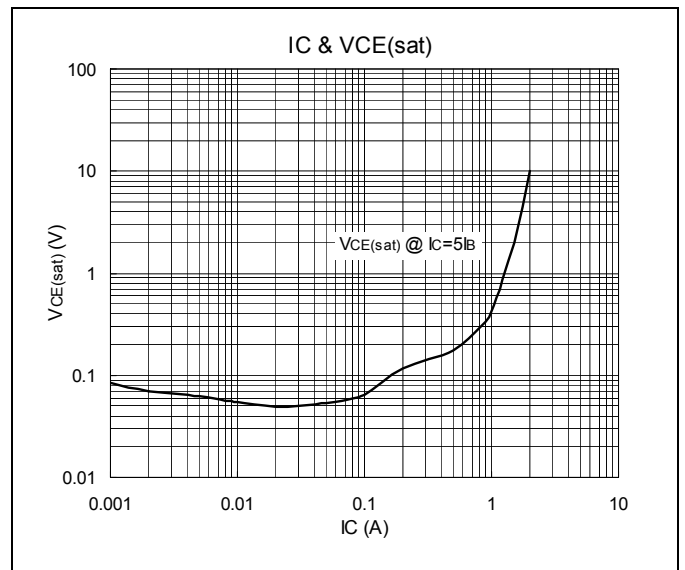
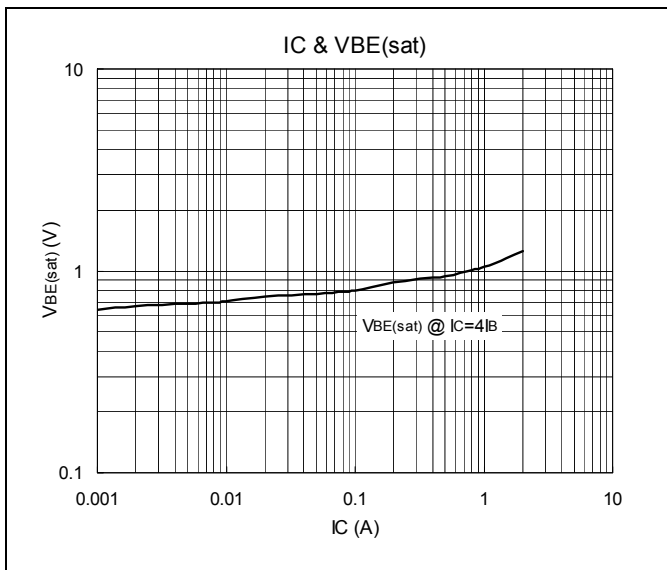
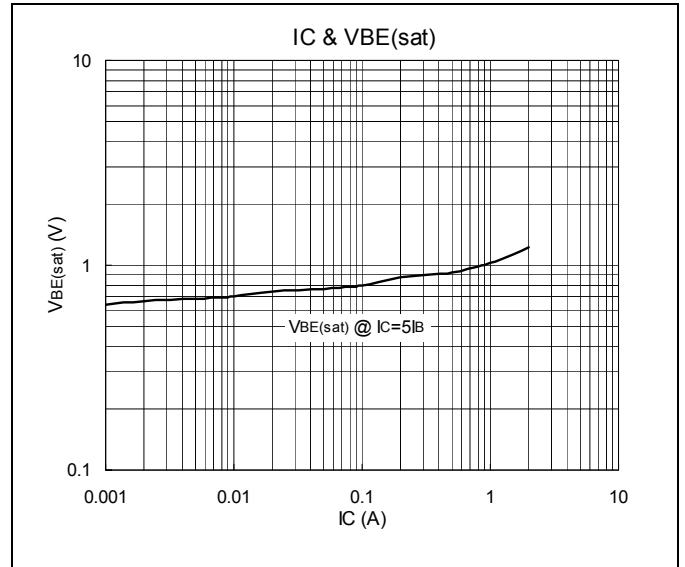
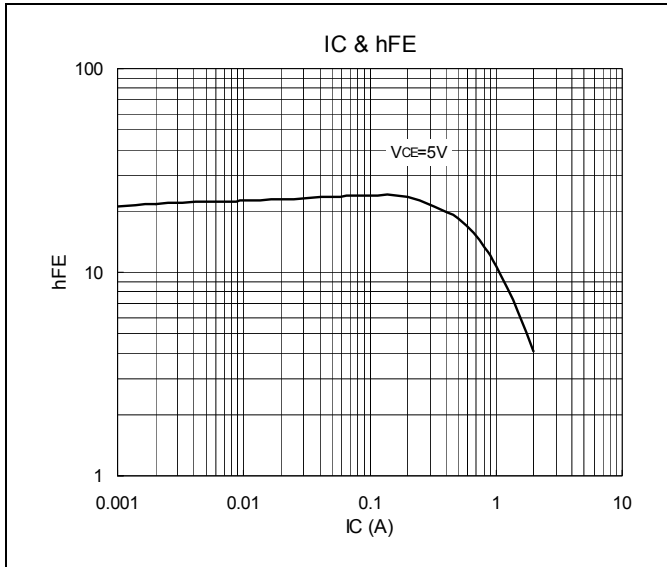
## Electrical Characteristics (Tc=25°C)

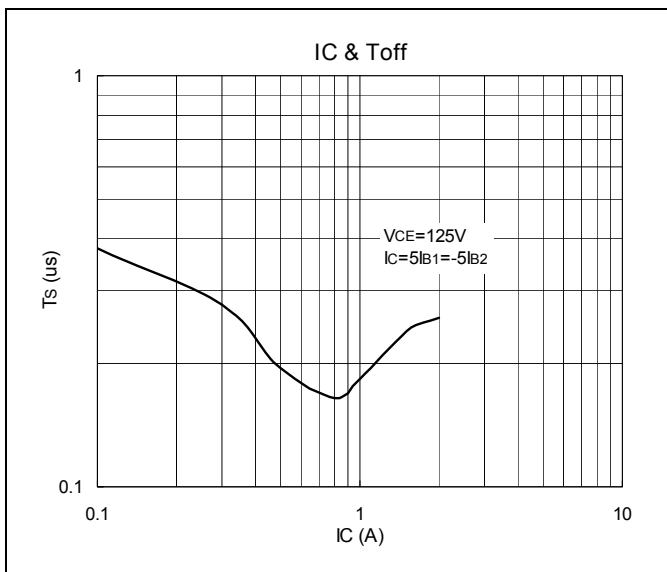
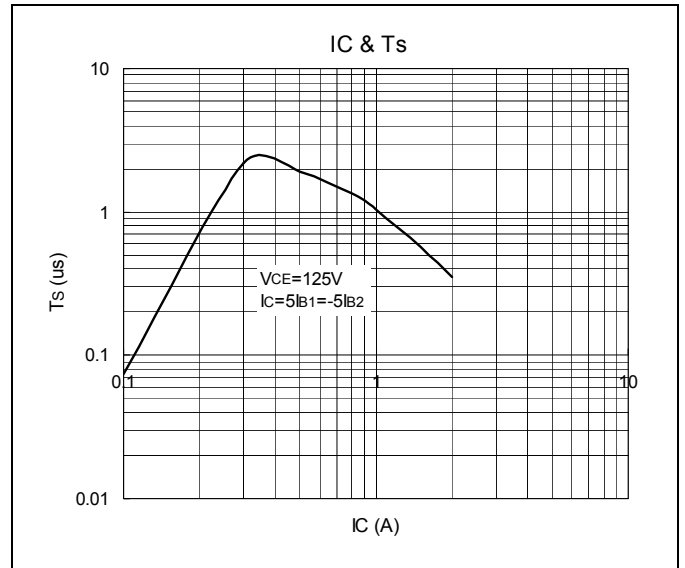
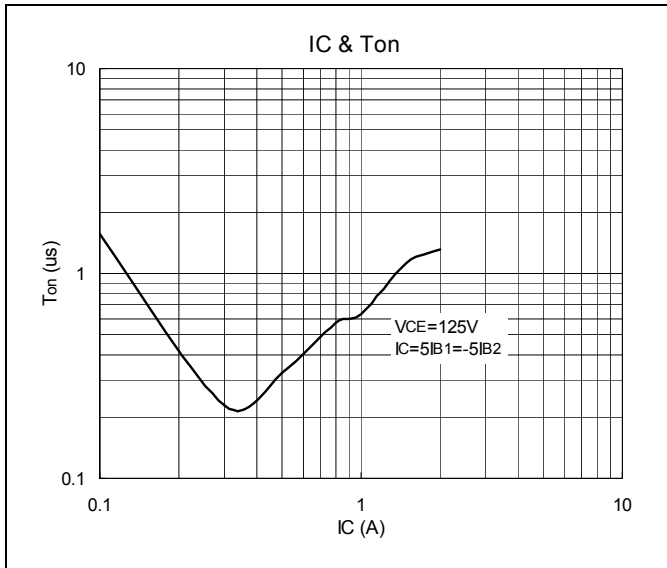
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	BVCBO	IC=1.0mA, IE=0	700			V
Collector-Emitter Breakdown Voltage	BVCEO	IC=10mA, IB=0	400			V
Emitter-Base Voltage	VEBO	IE=1mA, IC=0	9			V
Collector Cutoff Current	ICBO	VCB=700V, IE=0			1	mA
Emitter Cutoff Current	IEBO	VEB=9V, IC=0			1	mA
Collector Cut-off Current (VBE = -1.5V)	ICEV	VCE=700V, VBE(off)=1.5V			1	mA
DC Current Gain	hFE1	VCE=5V, IC=300mA	15		40	-
	*hFE2	VCE=5V, IC=1.0A	5		30	-
Collector-Emitter Saturation Voltage	VCE(SAT)1	IC=0.5A, IB=0.1A			0.5	V
	VCE(SAT)2	IC=1.0A, IB=0.25A			1	V
	VCE(SAT)3	IC=1.5A, IB=0.5A			3	V
Base-Emitter Saturation Voltage	VBE(SAT)1	IC=0.5A, IB=0.1A			1	V
	VBE(SAT)2	IC=1.0A, IB=0.25A			1.2	V

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



### Characteristics Curve







### TO-92 Dimension

3-Lead TO-92 Plastic Package  
HSMC Package Code: A

**Marking:**

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

Date Code      Control Code

Note: Green label is used for pb-free packing

GREEN Mark  
 Green: "●" (Note)  
 Normal: None

Date Code      Control Code

Note: Green label is used for pb-free packing +GP

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

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	4.33	4.83
B	4.33	4.83
C	12.70	-
D	0.36	0.56
E	-	*1.27
F	3.36	3.76
G	0.36	0.56
H	-	*2.54
I	-	*1.27
α1	-	*5°
α2	-	*2°
α3	-	*2°

\*: Typical, Unit: mm

### TO-92 Taping Dimension

DIM	Min.	Max.
A	4.33	4.83
D	3.80	4.20
D1	0.36	0.53
D2	4.33	4.83
F1,F2	2.40	2.90
H	15.50	16.50
H1	8.50	9.50
H2	-	1
H2A	-	1
H3	-	27
H4	-	21
L	-	11
L1	2.50	-
P	12.50	12.90
P1	5.95	6.75
P2	50.30	51.30
T	-	0.55
T1	-	1.42
T2	0.36	0.68
W	17.50	19.00
W1	5.00	7.00

Unit: mm

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- HSMC assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

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# HI-SINCERITY

## MICROELECTRONICS CORP.

Spec. No. : HA200601  
Issued Date : 2006.12.01  
Revised Date : 2009.07.02  
Page No. : 5/6

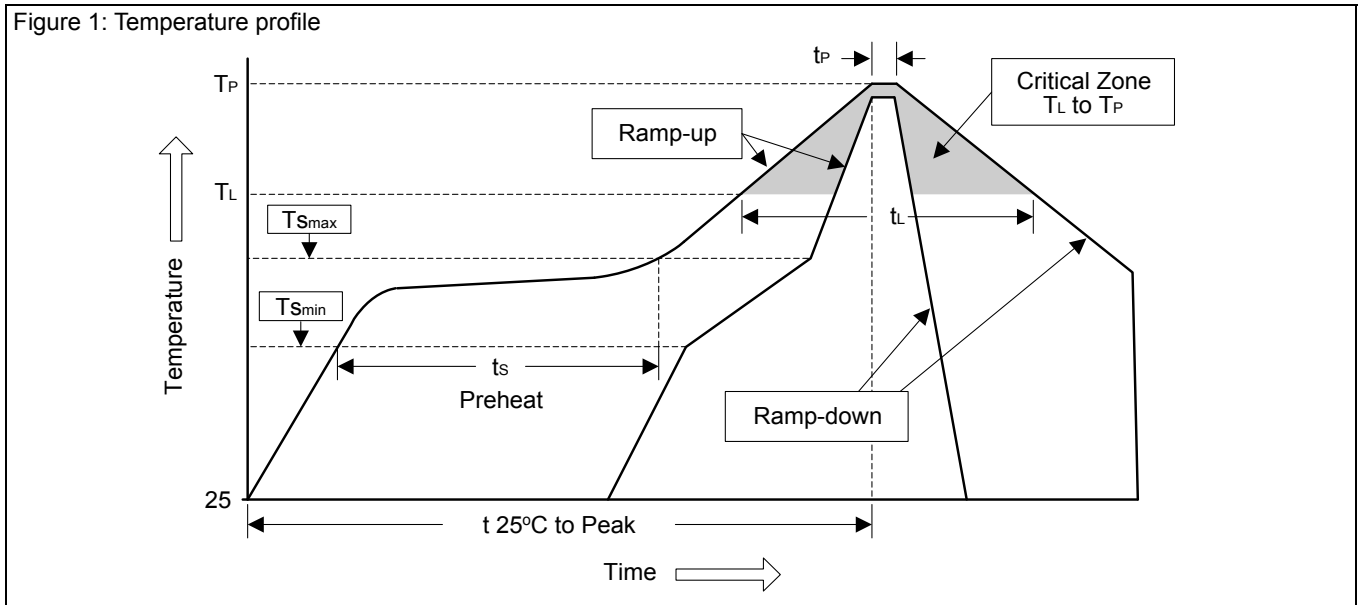
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### Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices

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 ( $T_{smin}$ )	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	10sec ±1sec
Pb-Free devices.	260°C ±5°C	10sec ±1sec