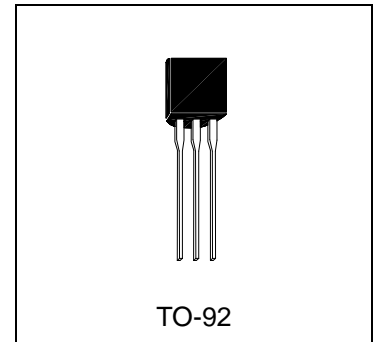




HLB123SA

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

- 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 (T_C=25°C)
 - V_{CBO} 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 Continuous 1.2 A
 - I_B Base Current Continuous 0.3A

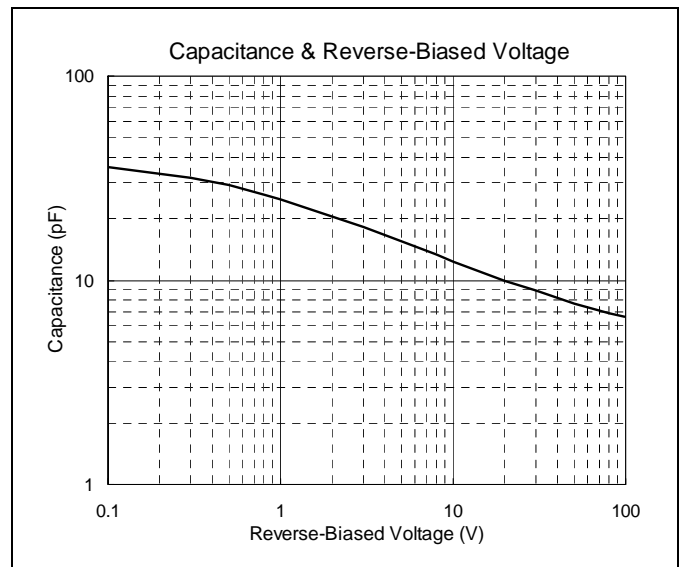
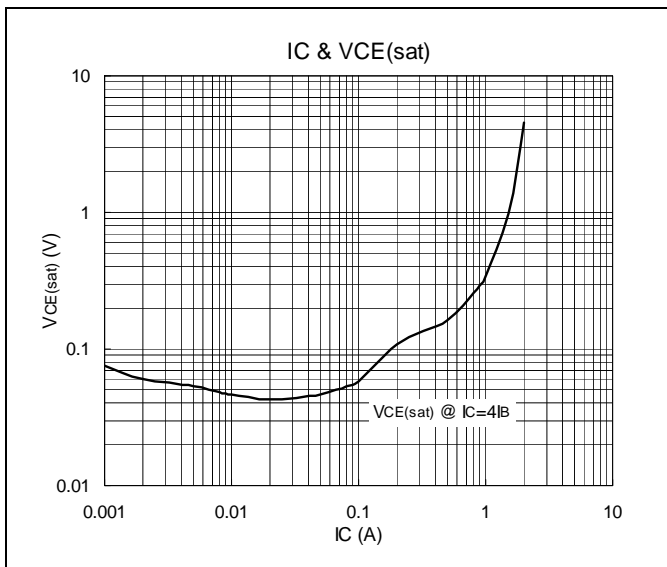
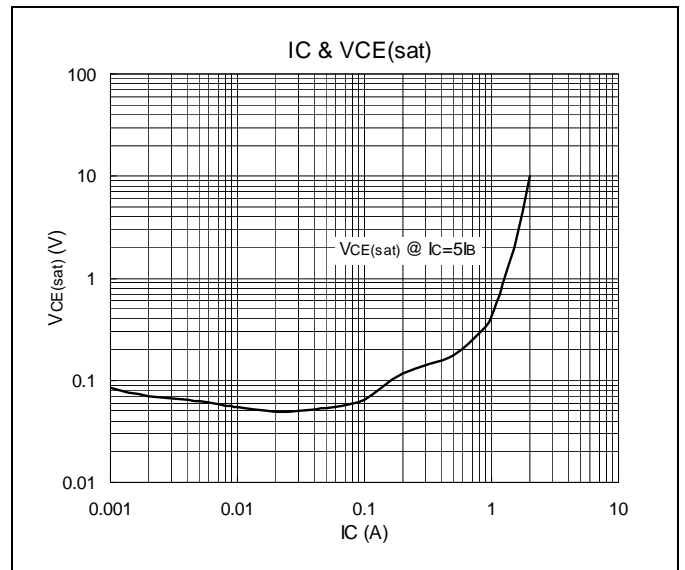
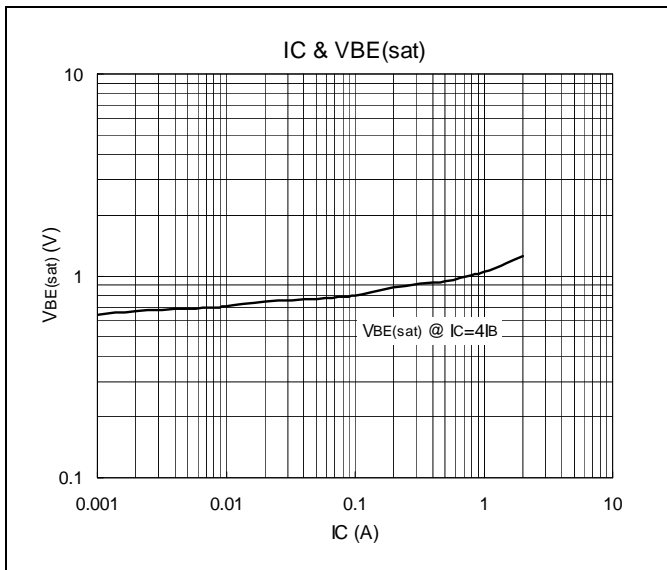
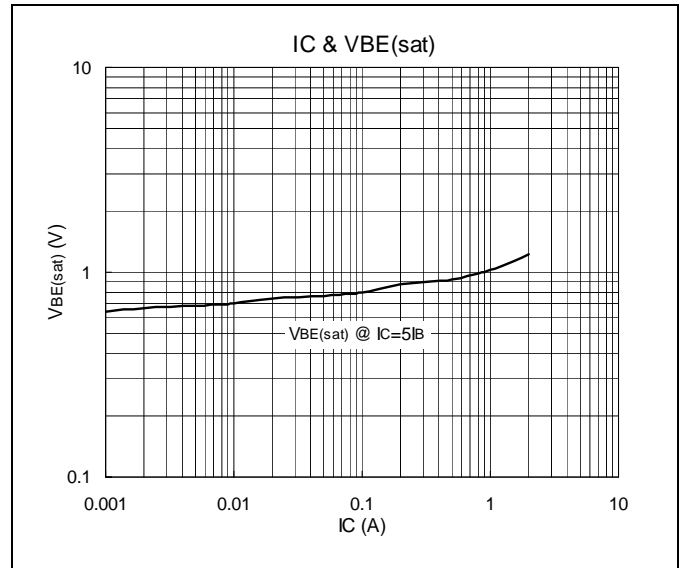
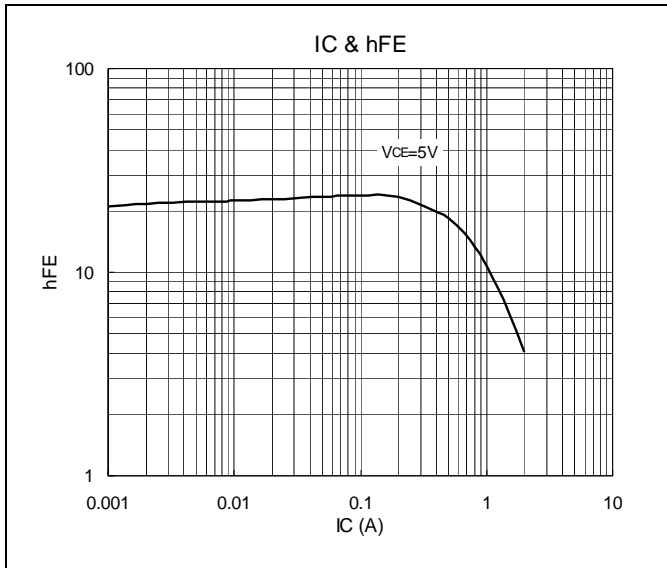
Electrical Characteristics (T_C=25°C)

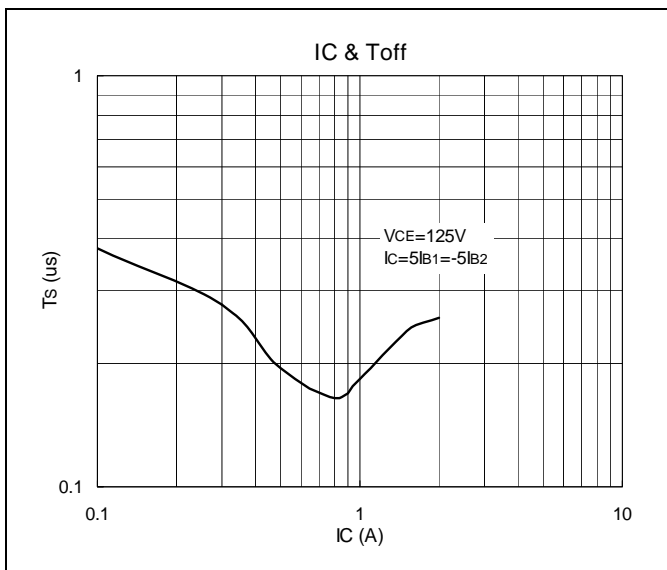
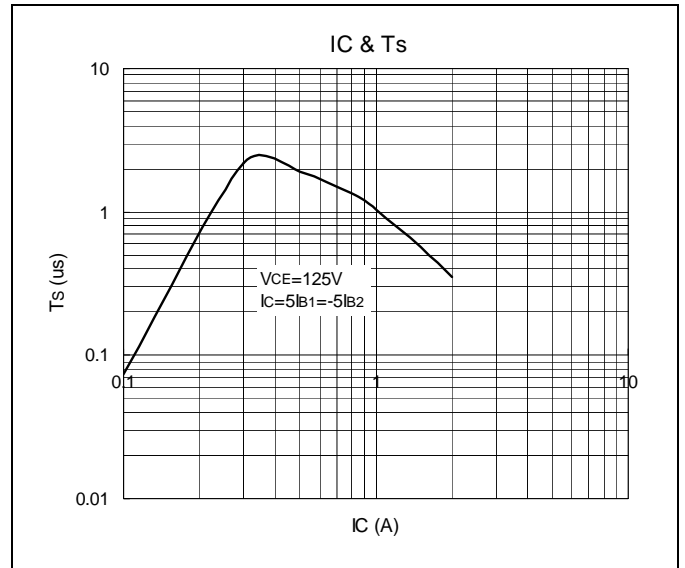
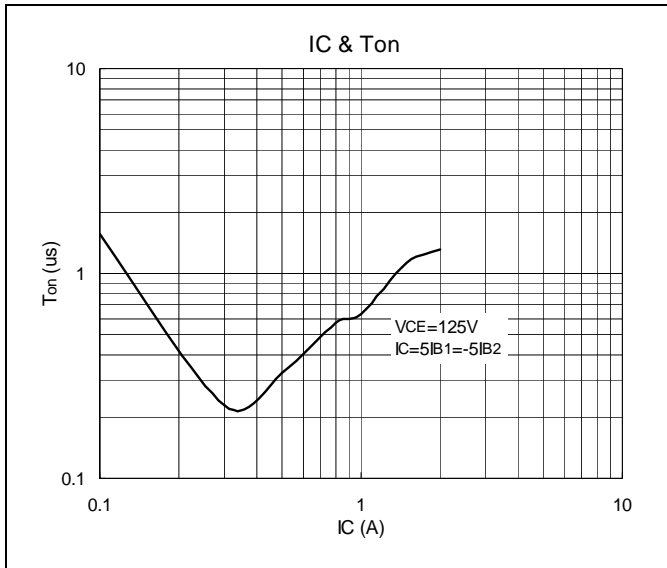
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	700	-	-	V	I _B =1mA
BV _{CEO}	400	-	-	V	I _C =10mA
I _{EBO}	-	-	1	mA	V _{EB} =9V
I _{CEX}	-	-	1	mA	V _{CE} =700V, V _{BE(off)} =1.5V
*V _{CE(sat)1}	-	-	500	mV	I _C =0.5A, I _B =0.1A
*V _{CE(sat)2}	-	-	1	V	I _C =1A, I _B =0.25A
*V _{CE(sat)3}	-	-	3	V	I _C =1.5A, I _B =0.5A
*V _{BE(sat)}	-	-	1	V	I _C =0.5A, I _B =0.1A
*V _{BE(sat)}	-	-	1.2	V	I _C =1A, I _B =0.25A
*h _{FE1}	8	-	40		I _C =0.3A, V _{CE} =5V
*h _{FE2}	5	-	25		I _C =1A, V _{CE} =5V

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



Characteristics Curve







TO-92 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.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
$\alpha 1$	-	*5°
$\alpha 2$	-	*2°
$\alpha 3$	-	*2°

*: Typical, Unit: mm

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

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

Important Notice:

- All rights are reserved. Reproduction in whole or in part is prohibited without the prior written approval of HSMC.
- HSMC reserves the right to make changes to its products without notice.
- **HSMC semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.**
- HSMC assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.

Head Office And Factory:

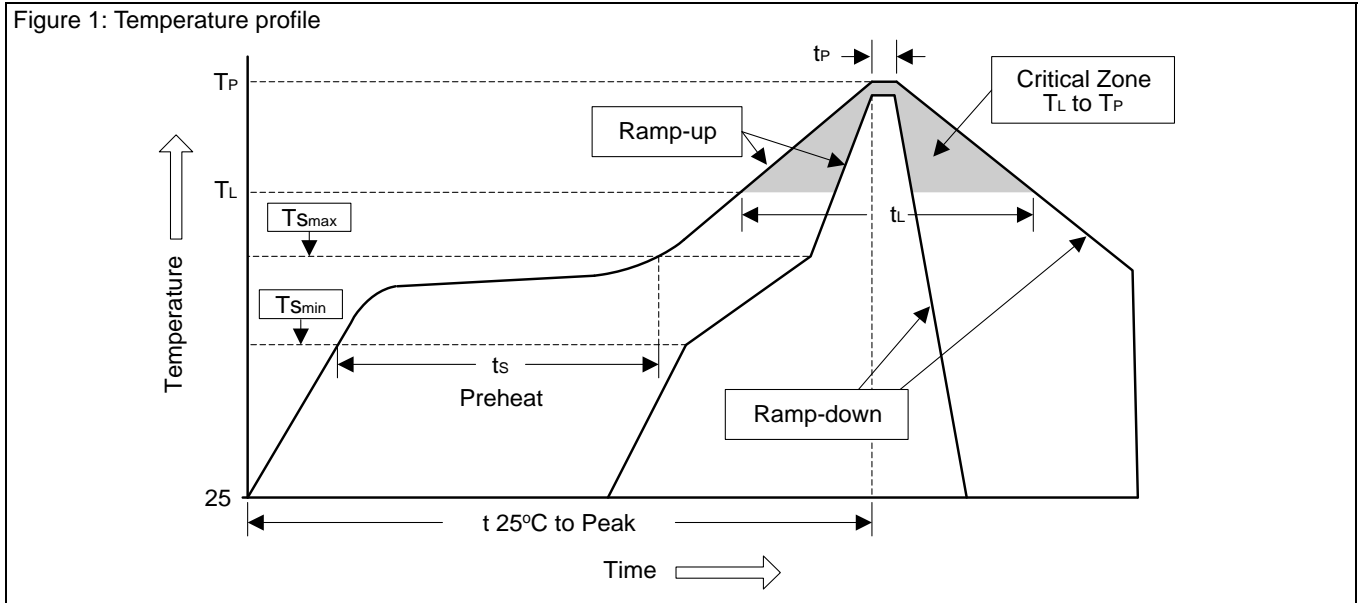
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
 Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
 Tel: 886-3-5983621~5 Fax: 886-3-5982931



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 (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