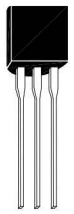
HLB123SA

NPN EPITAXIAL PLANAR TRANSISTOR



TO-92

Description

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

Absolute Maximum Ratings

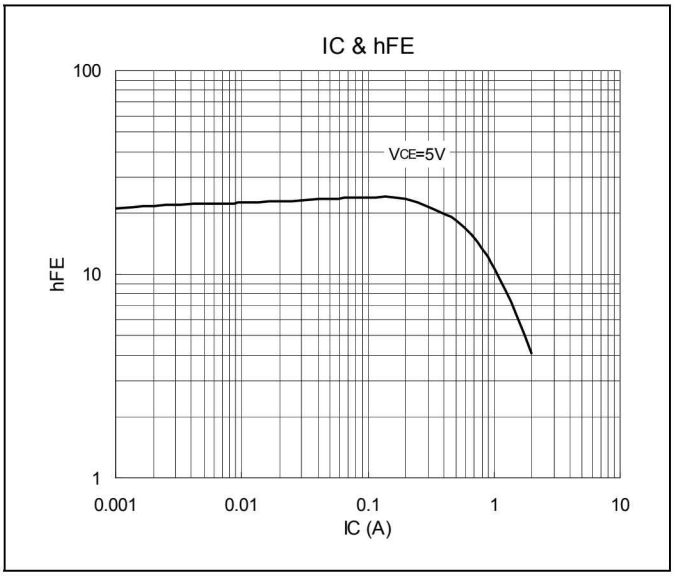
Parameter	Symbol	Maximun rating	Unit
Collector-Base Voltage	VCBO	700	V
Collector-Emitter Voltage	VCEO	400	V
Emitter-Base Voltage	VEBO	9	V
Collector Current(DC)	IC	1.2	A
Base Current	IB	0.3	A
Total Power Dissipation (T_A=25°C)	Ptot	1.0	W
Total Power Dissipation (Tc=25°C)	Ptot	10	W
Thermal Resistance Junctionto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

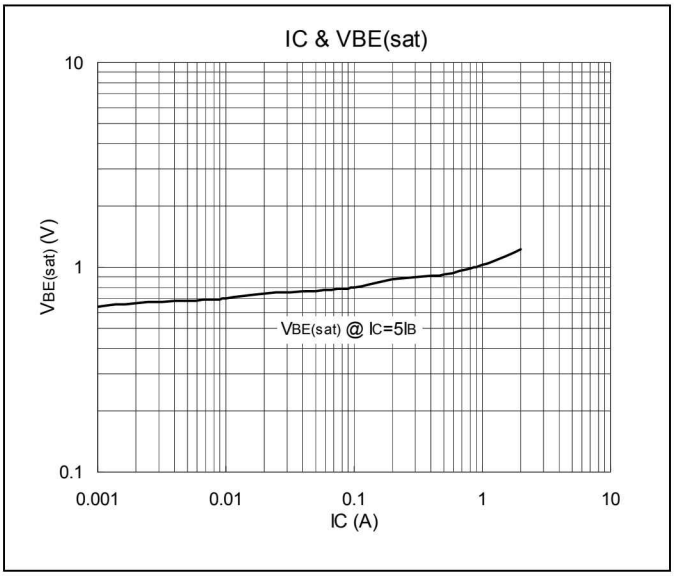
Electrical Characteristics (T_C=25°C)

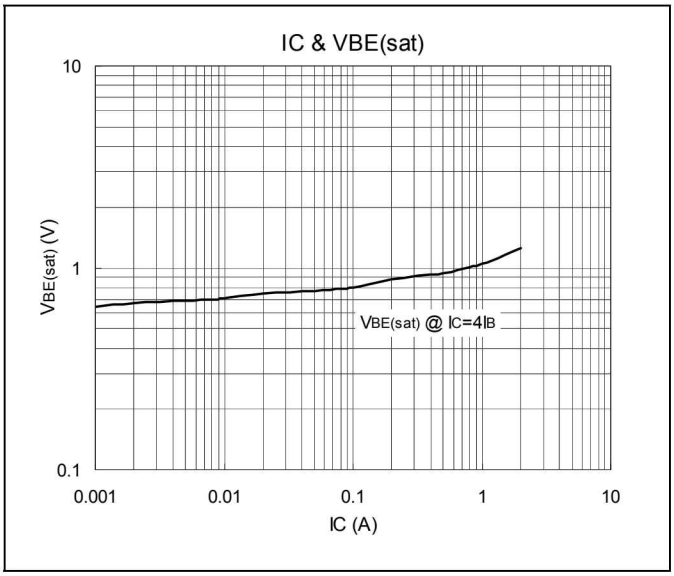
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Collector-Base Voltage	BVCBO	IC=1.0mA, IE=0	700			V
Collector-Emitter Breakdown Voltage	BVCEO	IC=10mA, IB=0	400			V
Emitter-Base Voltage	VEBO	IE=1mA, IC=0	9			V
Collector Cutoff Current	ICBO	VCB=700V, IE=0			1	mA
Emitter Cutoff Current	IEBO	VEB=9V, IC=0			1	mA
Collector Cut-off Current (VBE = -1.5V)	ICEV	VCE=700V, $V_{BE(off)}$=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

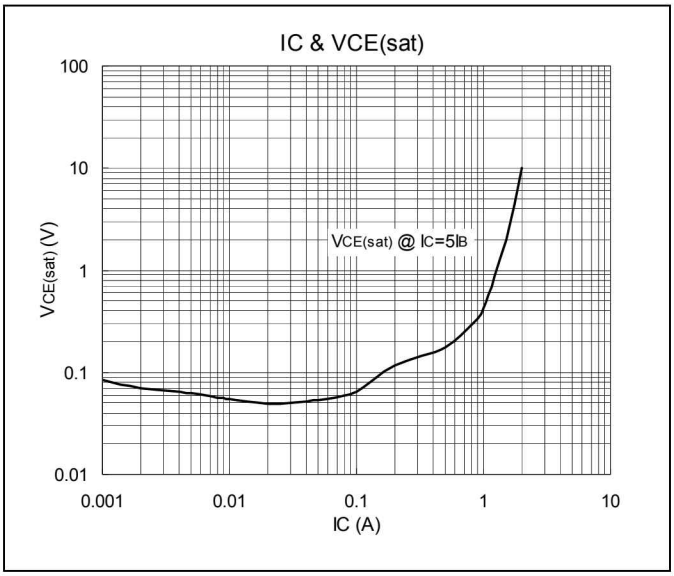
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

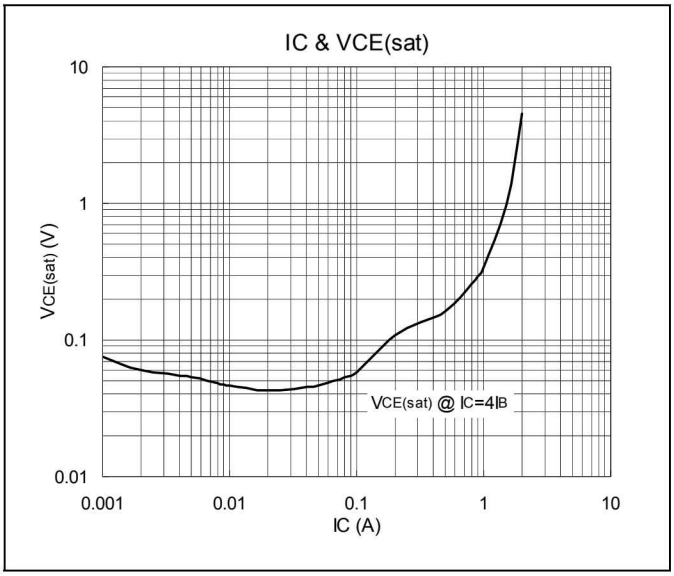
Characteristics Curve

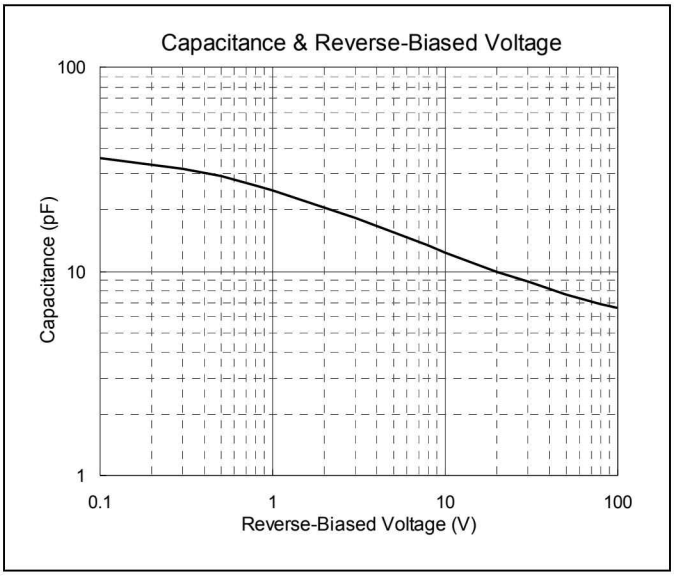


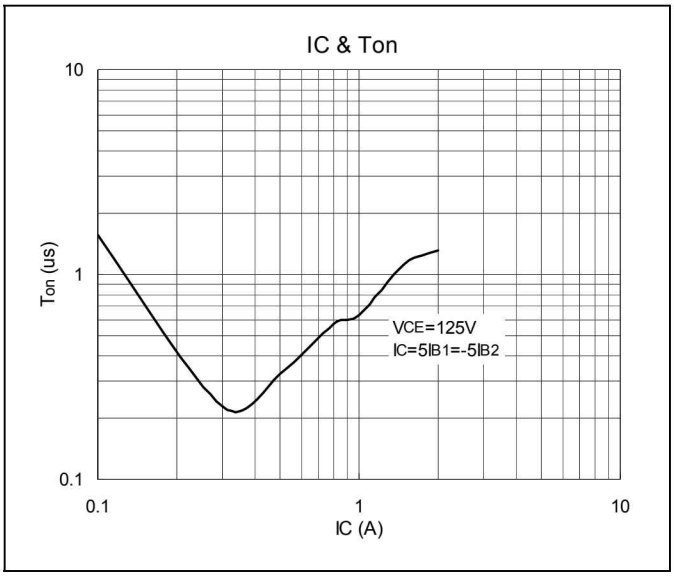


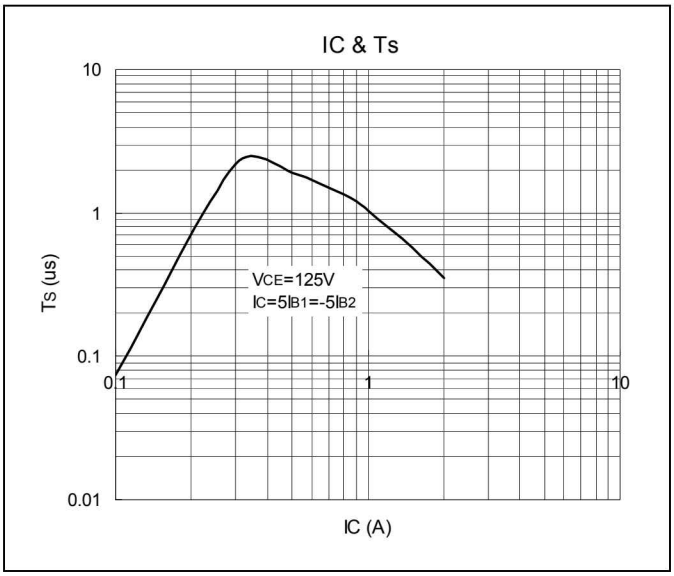


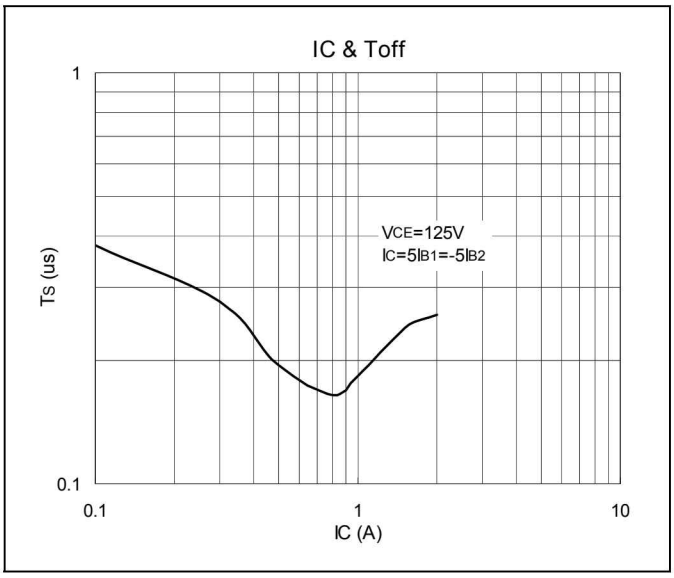




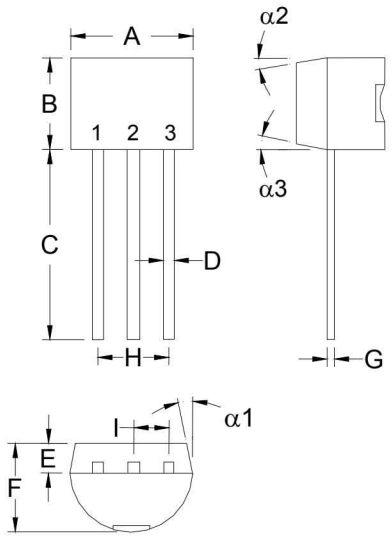



IC & Ton
10
1
0.1
Ton (us)
0.1
1
10
IC (A)
VCE=125V
IC=5IB1=-5IB2


IC & Ts
10
1
0.1
0.01
Ts (us)
0.1
1
10
IC (A)
VCE=125V
IC=5IB1=-5IB2

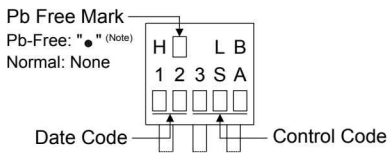

IC & Toff
1
0.1
Ts (us)
0.1
1
10
IC (A)
VCE=125V
IC=5IB1=-5IB2

TO-92 Dimension

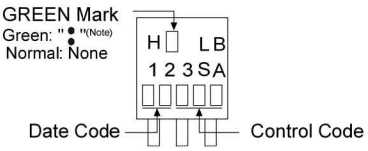


3-Lead TO-92 Plastic Package
HSMC Package Code: A

Marking:



Note: Green label is used for pb-free packing



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

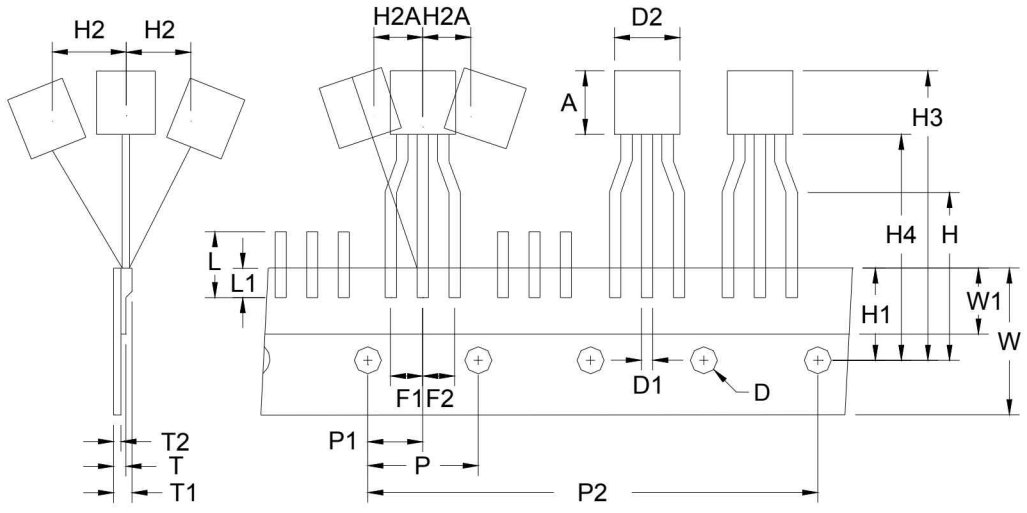
Pin Style: 1.Emitter 2.Collector 3.Base

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

Head Office And Factory:

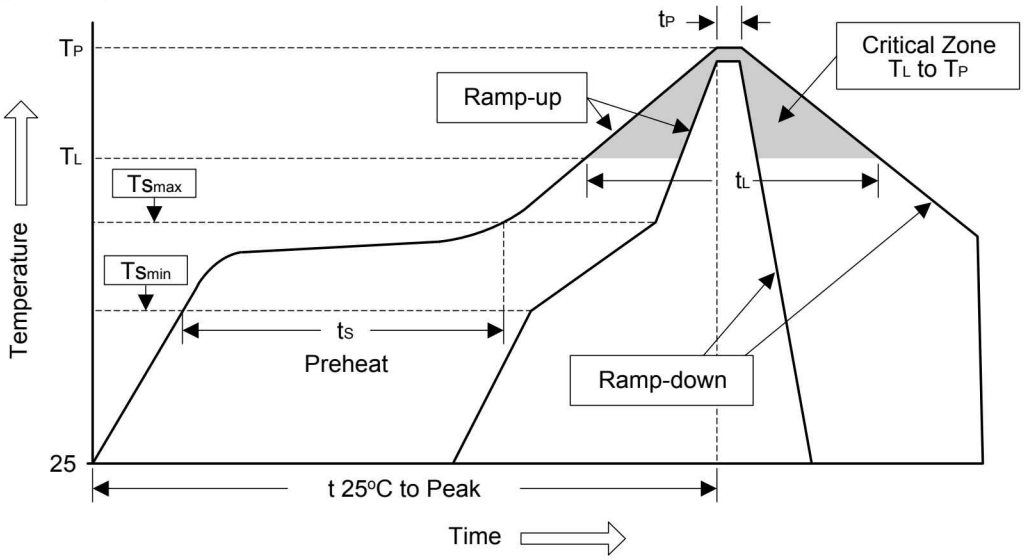
- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F.,No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454

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