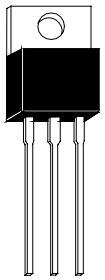
HLB124E

NPN EPITAXIAL PLANAR TRANSISTOR



TO-220

Description

The HLB124E 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 ..... -55 ~ +150 °C
  - Junction Temperature ..... +150 °C
- Maximum Power Dissipation
  - Total Power Dissipation (T_C=25°C) ..... 35 W
- Maximum Voltages and Currents (T_A=25°C)
  - 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) ..... 2 A
  - I_C Collector Current (Pulse) ..... 4 A
  - I_B Base Current (DC) ..... 1 A
  - I_B Base Current (Pulse) ..... 2 A

Electrical Characteristics (T_A=25°C)

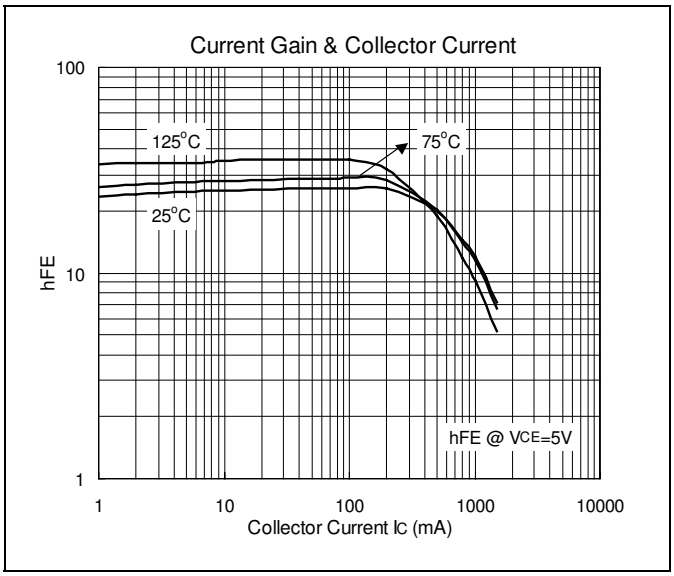
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	600	-	-	V	I_C=1mA
BV_{CEO}	400	-	-	V	I_C=10mA
BV_{EBO}	8	-	-	V	I_E=1mA
I_{CBO}	-	-	10	uA	V_{CB}=600V
I_{EBO}	-	-	10	uA	V_{EB}=9V, IC=0
*$V_{CE(sat)1}$	-	-	0.3	V	I_C=0.1A, IB=10mA
*$V_{CE(sat)2}$	-	-	0.8	V	I_C=0.3A, IB=30mA
*$V_{BE(sat)1}$	-	-	0.9	V	I_C=0.1A, IB=10mA
*$V_{BE(sat)2}$	-	-	1.2	V	I_C=0.3A, IB=30mA
*h_{FE1}	10	-	40		V_{CE}=5V, IC=0.3A
*h_{FE2}	10	-	-		V_{CE}=5V, IC=0.5A
*h_{FE3}	6	-	-		V_{CE}=5V, IC=1A
f_T	15	-	-	MHz	V_{CE}=10V, IC=0.3, f=1MHz

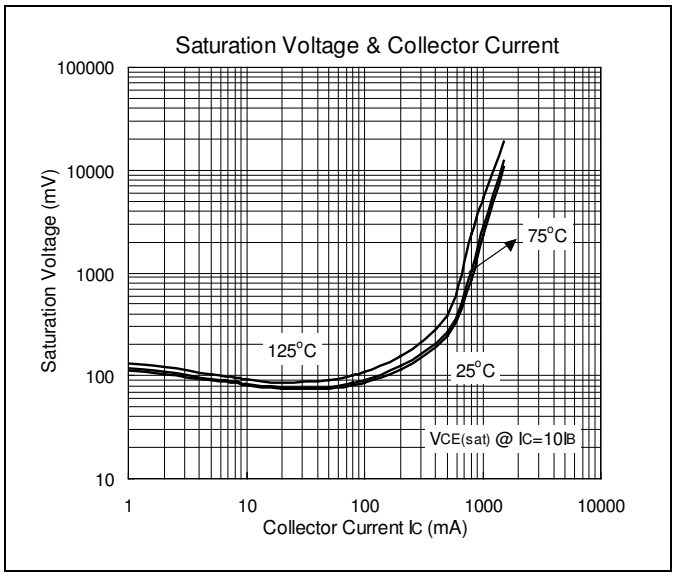
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

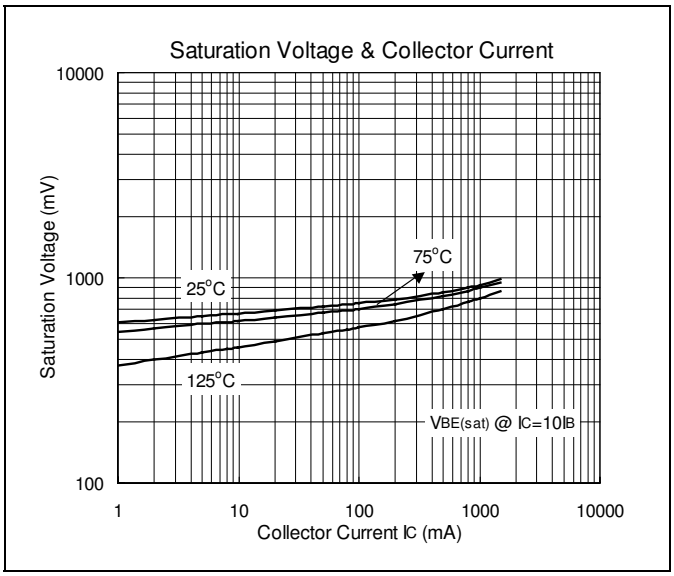
Classification of hFE1

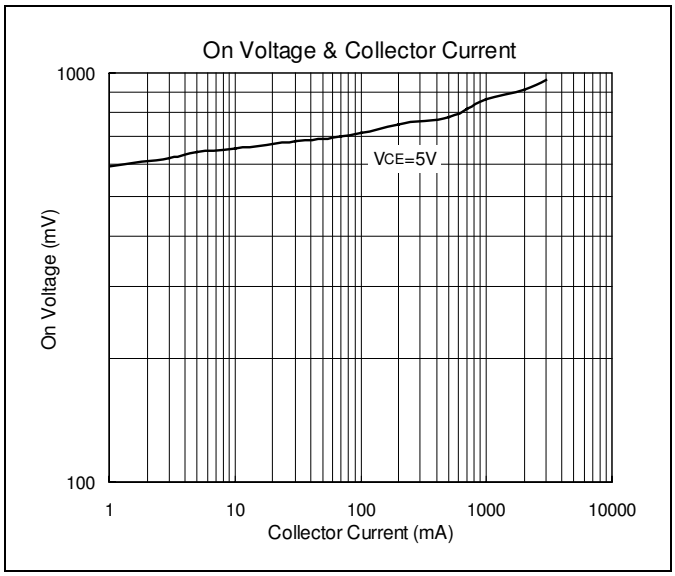
Rank	B1	B2	B3	B4	B5	B6
Range	10~17	13~22	18~27	23~32	28~37	33~40

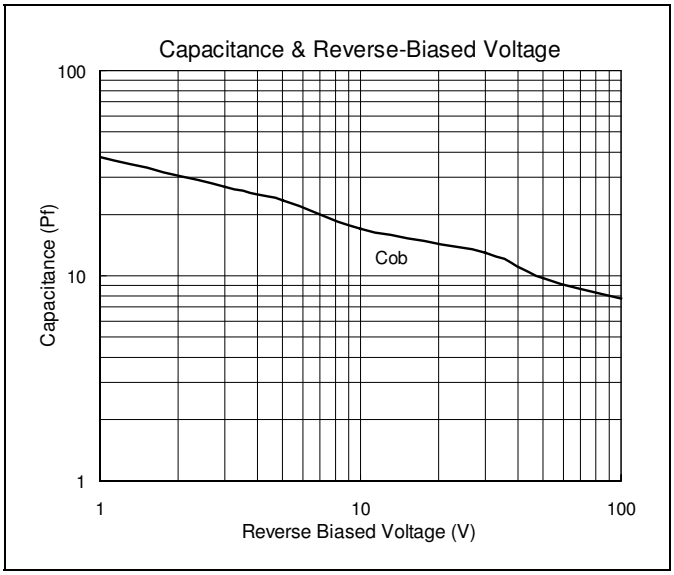
Characteristics Curve

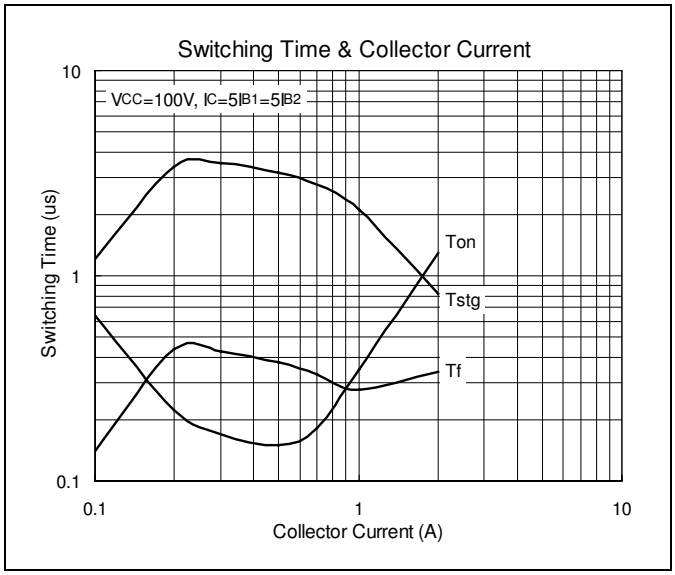


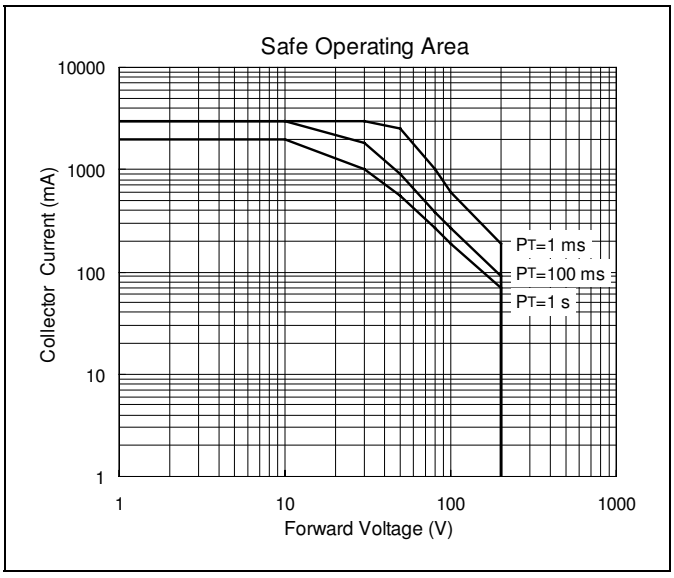




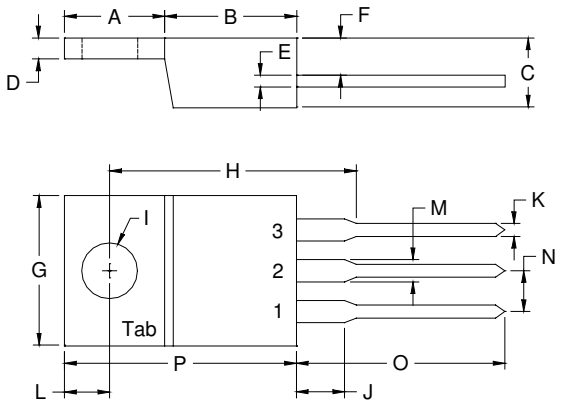






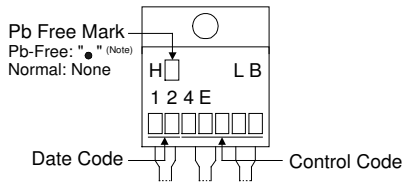

Safe Operating Area
10000
1000
100
10
1
Collector Current (mA)
1
10
100
1000
Forward Voltage (V)
PT=1 ms
PT=100 ms
PT=1 s

TO-220AB Dimension



3-Lead TO-220AB
Plastic Package
HSMC Package Code: E

Marking:



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	5.58	7.49
B	8.38	8.90
C	4.40	4.70
D	1.15	1.39
E	0.35	0.60
F	2.03	2.92
G	9.66	10.28
H	-	*16.25
I	-	*3.83
J	3.00	4.00
K	0.75	0.95
L	2.54	3.42
M	1.14	1.40
N	-	*2.54
O	12.70	14.27
P	14.48	15.87

*: Typical, Unit: mm

Head Office And Factory:

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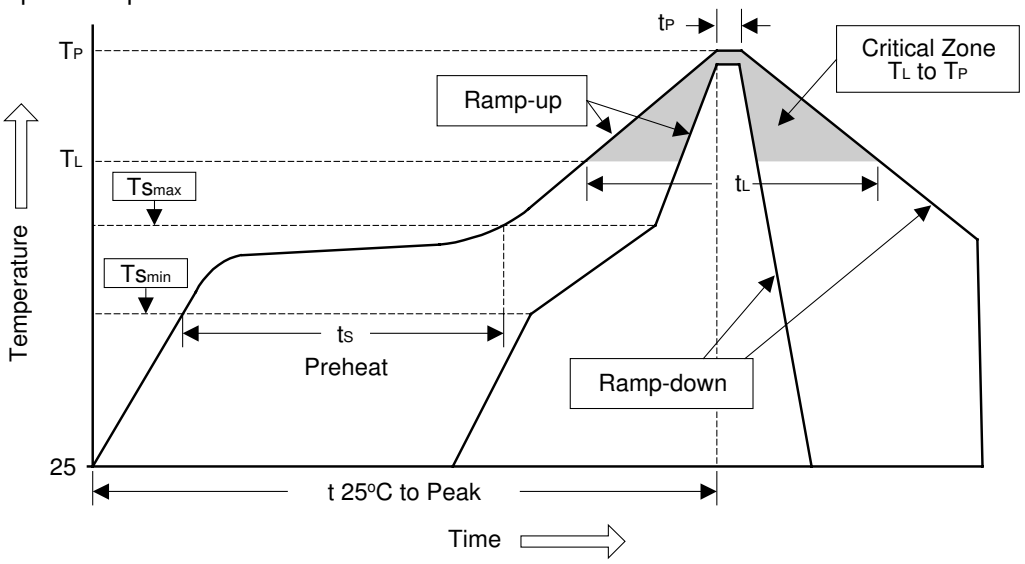
  Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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 (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	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec