



HLB120S

NPN Triple Diffused Planar Type High Voltage Transistors

Description

The HLB120S is a medium power transistor designed for use in switching applications.

Features

- High Breakdown Voltage
- Low Collector Saturation Voltage
- Fast Switching Speed

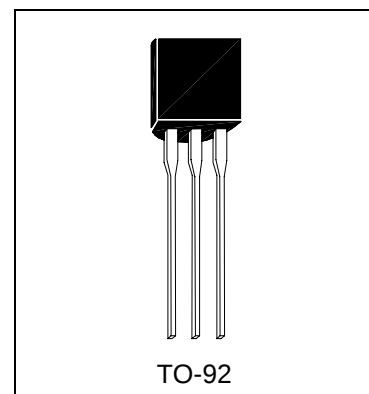
Absolute Maximum Ratings

- Maximum Temperatures
Storage Temperature -55 ~ +150 °C
Junction Temperature +150 °C Maximum
- Maximum Power Dissipation
Total Power Dissipation ($T_A=25^{\circ}\text{C}$) 625 mW
Total Power Dissipation ($T_C=25^{\circ}\text{C}$) 7 W
- Maximum Voltages and Currents ($T_A=25^{\circ}\text{C}$)
 V_{CBO} Collector to Base Voltage 500 V
 V_{CEO} Collector to Emitter Voltage 400 V
 V_{EBO} Emitter to Base Voltage 6 V
 I_C Collector Current (DC) 100 mA
 I_C Collector Current (Pulse)..... 200 mA
 I_B Base Current (DC)..... 20 mA
 I_B Base Current (Pulse)..... 40 mA

Electrical Characteristics ($T_A=25^{\circ}\text{C}$)

Symbol	Min.	Typ.	Max	Unit	Test Conditions
BV_{CBO}	500	-	-	V	$I_C=100\mu\text{A}$, $I_E=0$
BV_{CEO}	400	-	-	V	$I_C=10\text{mA}$, $I_B=0$
BV_{EBO}	6	-	-	V	$I_E=10\mu\text{A}$, $I_C=0$
I_{CBO}	-	-	10	μA	$V_{CB}=450\text{V}$
I_{CEO}	-	-	10	μA	$V_{CE}=400\text{V}$, $I_B=0$
I_{EBO}	-	-	10	μA	$V_{EB}=6\text{V}$, $I_C=0$
$*V_{CE(sat)1}$	-	-	400	mV	$I_C=50\text{mA}$, $I_B=10\text{mA}$
$*V_{CE(sat)2}$	-	-	750	mV	$I_C=100\text{mA}$, $I_B=20\text{mA}$
$*V_{BE(sat)}$	-	-	1	V	$I_C=50\text{mA}$, $I_B=10\text{mA}$
$*h_{FE1}$	8	-	-		$V_{CE}=10\text{V}$, $I_C=10\text{mA}$
$*h_{FE2}$	10	-	36		$V_{CE}=10\text{V}$, $I_C=50\text{mA}$

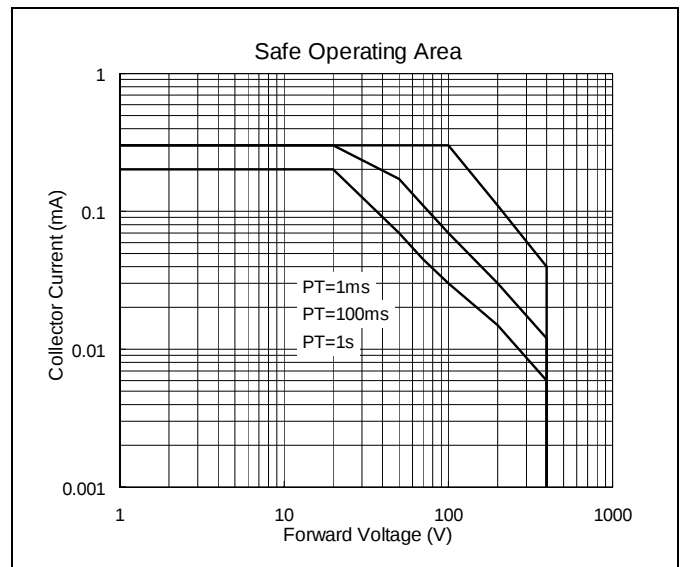
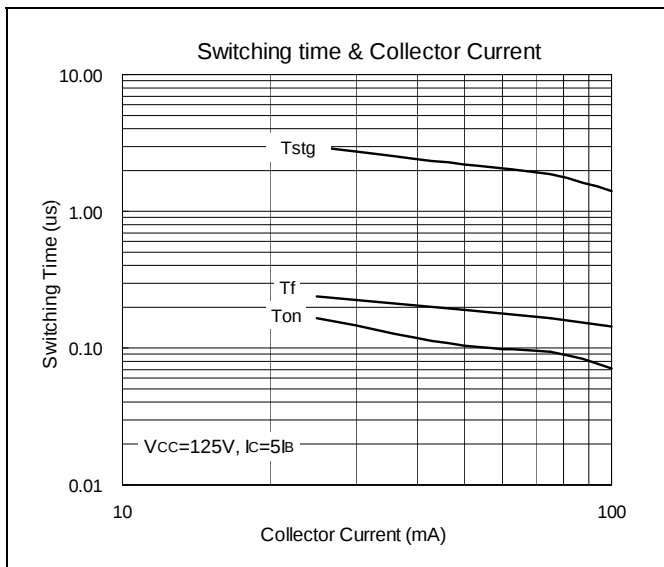
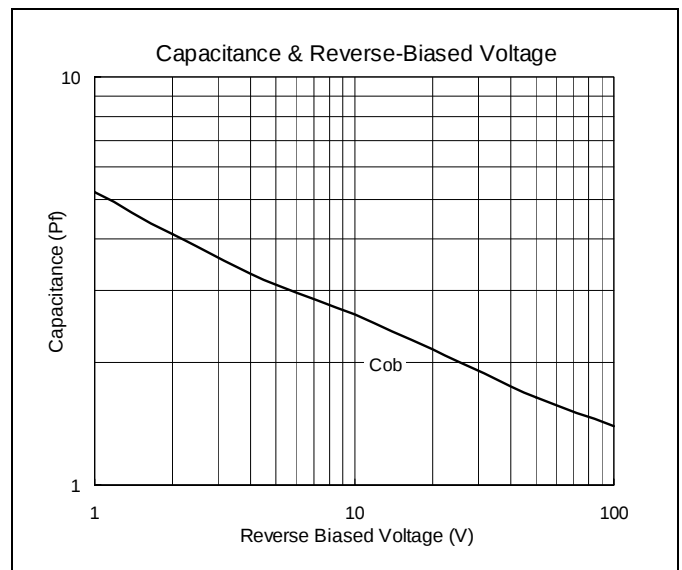
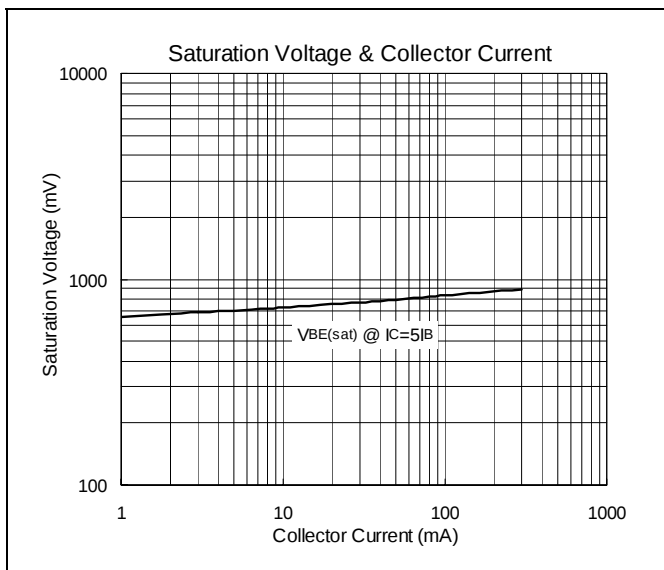
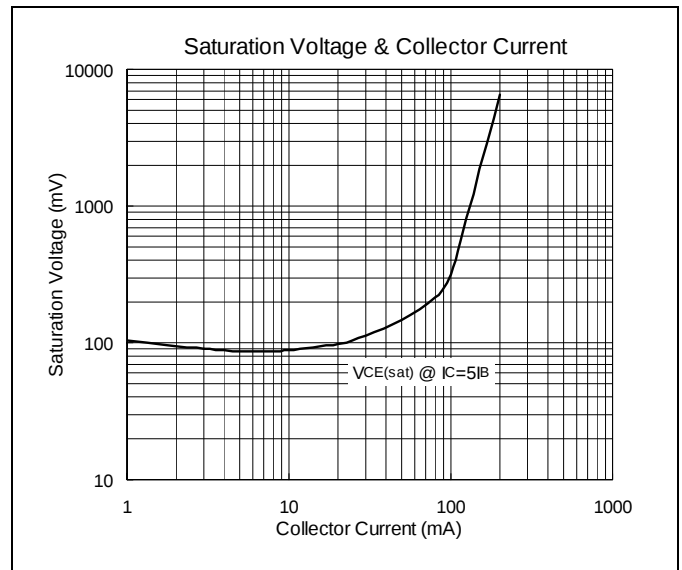
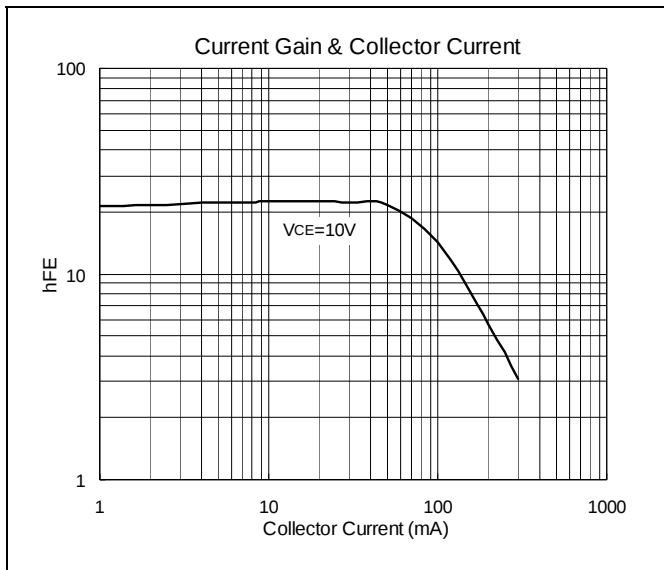
*Pulse Test: Pulse Width $\leq 380\mu\text{s}$, Duty Cycle $\leq 2\%$



TO-92

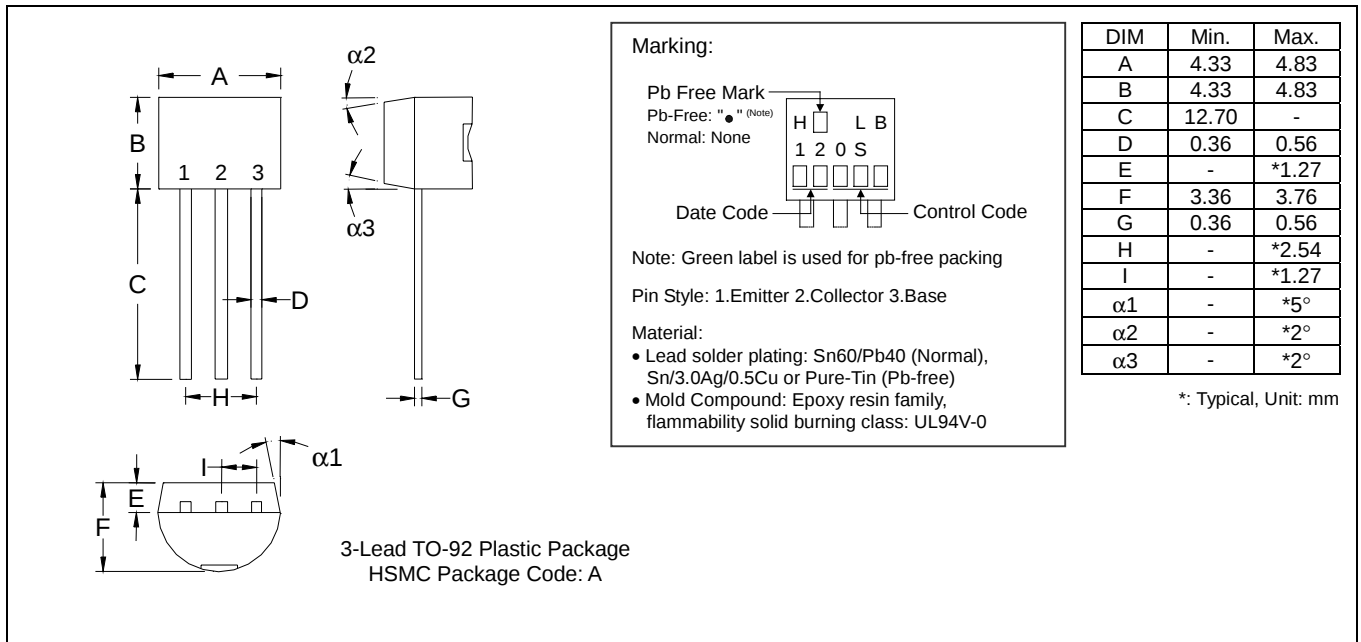


Characteristics Curve

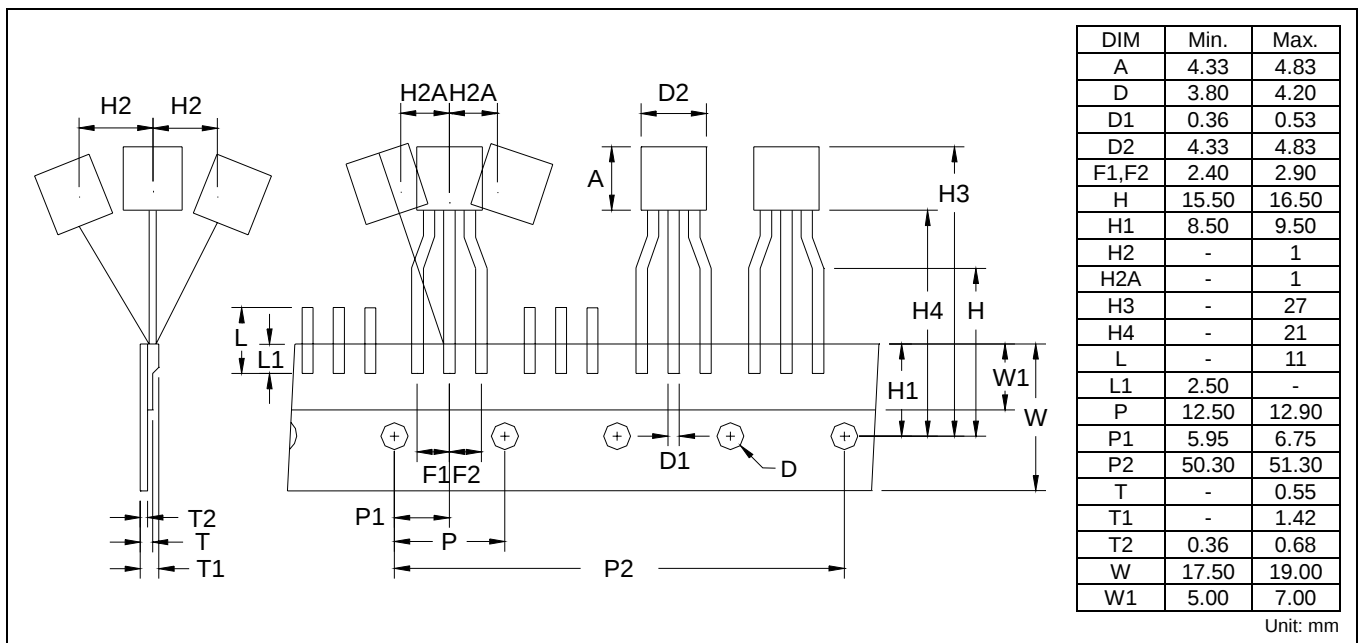




TO-92 Dimension



TO-92 Taping Dimension



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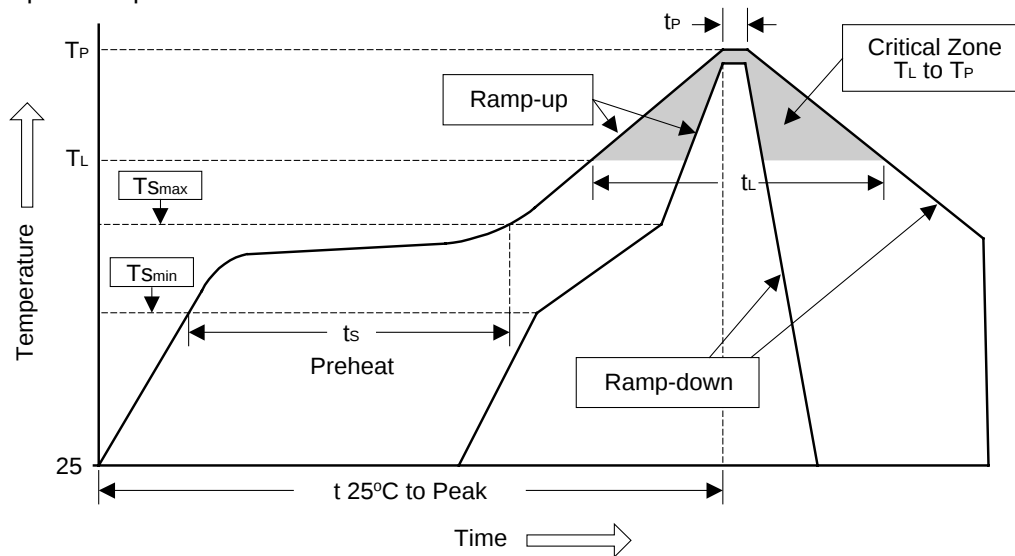
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Soldering Methods for HSMC's Products

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

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