

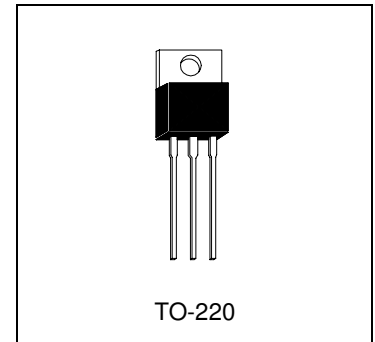


HMJE13005

NPN EPITAXIAL PLANAR TRANSISTOR

Description

- Switch Regulators
- PWM Inverters and Motor Controls
- Solenoid and Relay Drivers
- Deflection Circuits



Absolute Maximum Ratings (T_A=25°C)

- Maximum Temperatures
 - Storage Temperature -50 ~ +150 °C
 - Junction Temperature 150 °C Maximum
- Maximum Power Dissipation
 - Total Power Dissipation (T_C=25°C) 75 W
- Maximum Voltages and Currents (T_A=25°C)
 - V_{CB0} Collector to Base Voltage 700 V
 - V_{CEO} Collector to Emitter Voltage 400 V
 - V_{EBO} Emitter to Base Voltage 9 V
 - I_C Collector Current (Continuous) 4 A
 - I_B Base Current (Continuous) 2 A

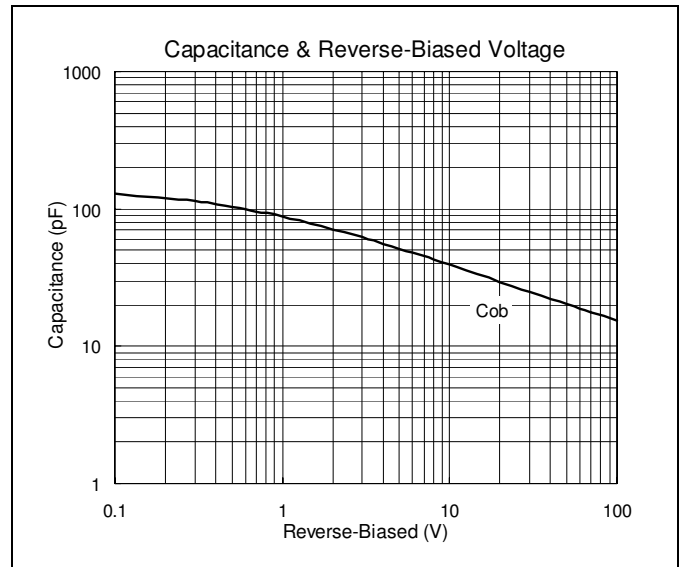
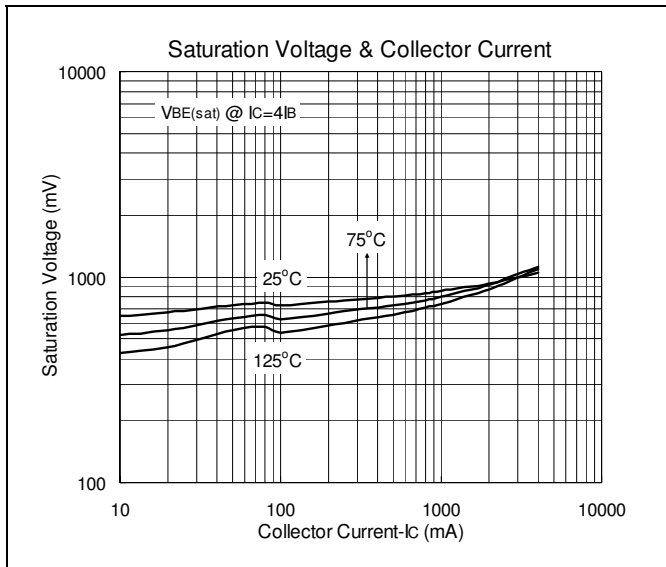
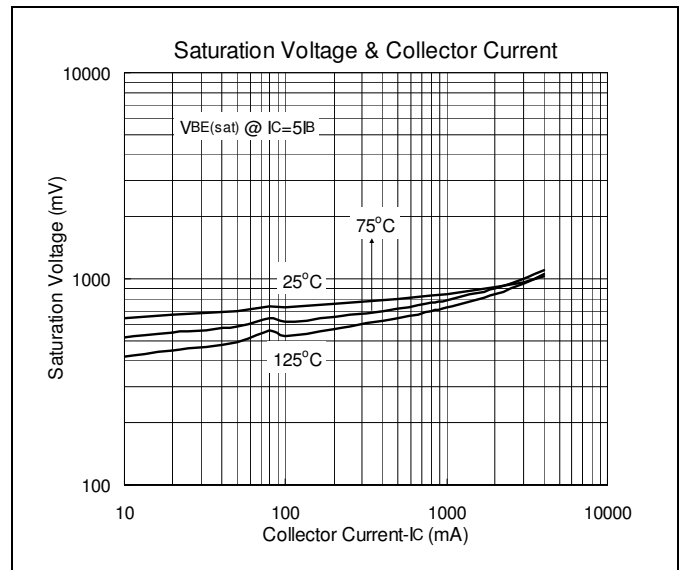
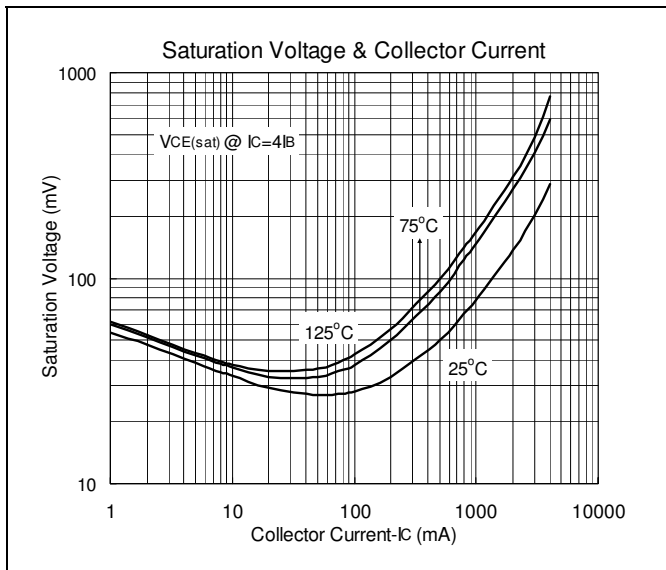
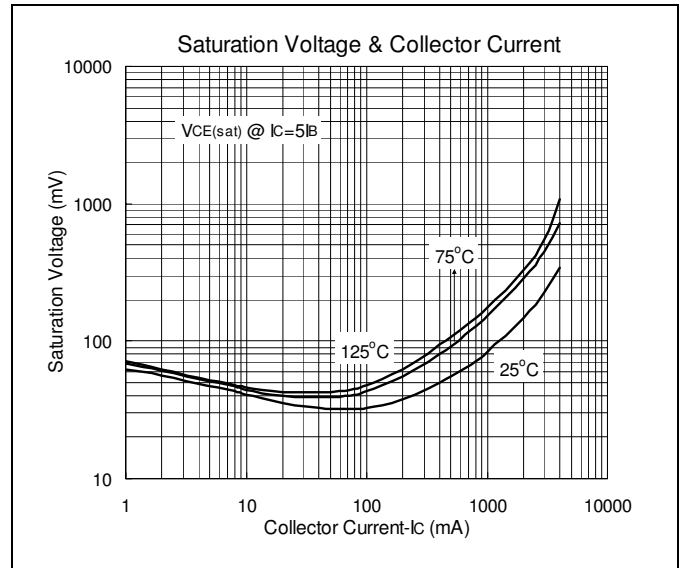
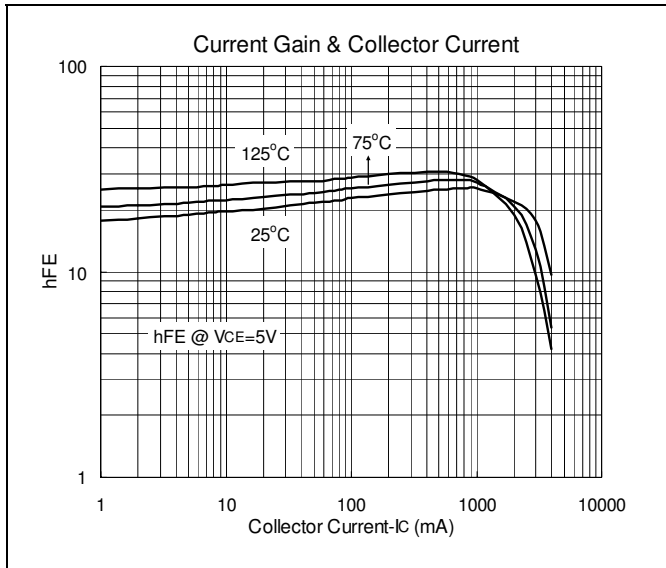
Electrical Characteristics (T_A=25°C)

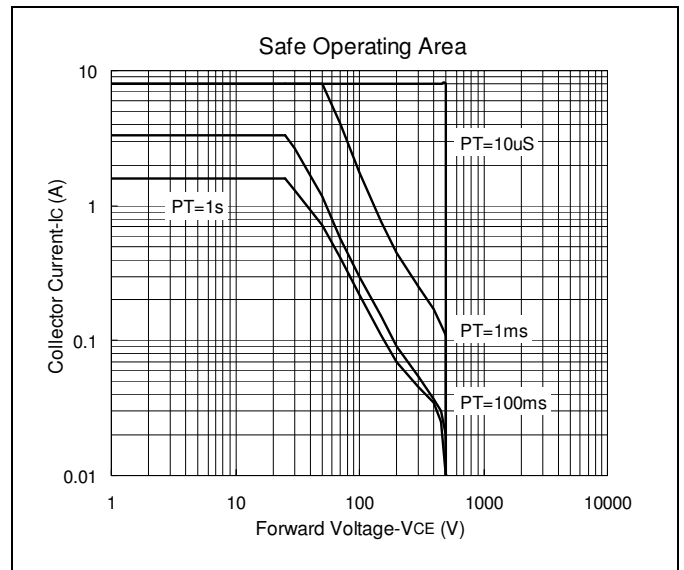
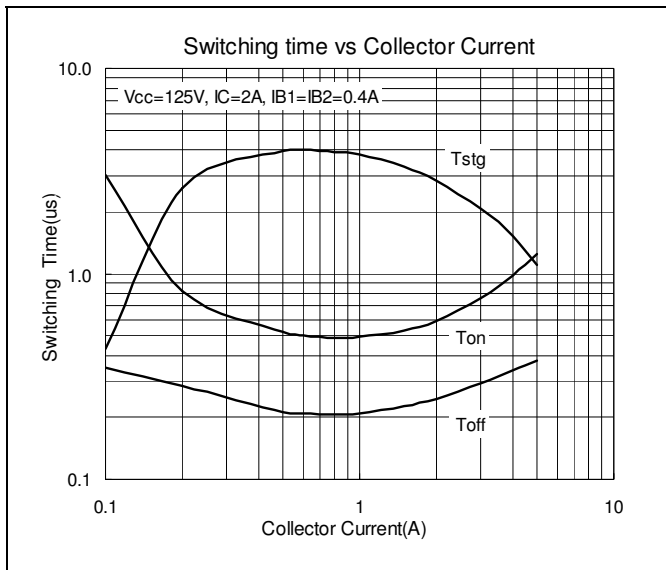
Characteristic	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Breakdown Collector-Base Voltage	BV _{CB0}	700	-	-	V	I _C =1mA
Breakdown Collector-Emitter Voltage	BV _{CEO}	400	-	-	V	I _C =10mA
Emitter Cut-off Current	I _{EBO}	-	-	1	mA	V _{EB} =9V
Collector Cut-off Current	I _{CEx}	-	-	1	mA	V _{CE} =700V, V _{BE(off)} =1.5V
Collector-Emitter Saturation Voltage	*V _{CE(sat)1}	-	-	500	mV	I _C =1A, I _B =200mA
	*V _{CE(sat)2}	-	-	0.6	V	I _C =2A, I _B =500mA
	*V _{CE(sat)3}	-	-	1	V	I _C =4A, I _B =1A
Base-Emitter Saturation Voltage	*V _{BE(sat)}	-	-	1.2	V	I _C =1A, I _B =200mA
	*V _{BE(sat)}	-	-	1.6	V	I _C =2A, I _B =500mA
DC Current Gain	*h _{FE1}	10	-	60		I _C =0.5A, V _{CE} =5V
	*h _{FE2}	10	-	60		I _C =1A, V _{CE} =5V
	*h _{FE3}	8	-	40		I _C =2A, V _{CE} =5V
Turn-On Time	T _{on}	-	0.6	0.8	uS	V _{CC} =125V, I _C =2A, I _{B1} =I _{B2} =0.4A
Storage Time	t _s	-	2.9	4	uS	V _{CC} =125V, I _C =2A, I _{B1} =I _{B2} =0.4A
Fall Time	t _f	-	0.25	0.9	uS	V _{CC} =125V, I _C =2A, I _{B1} =I _{B2} =0.4A

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



Characteristics Curve







TO-220AB Dimension

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

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.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

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Head Office And Factory:

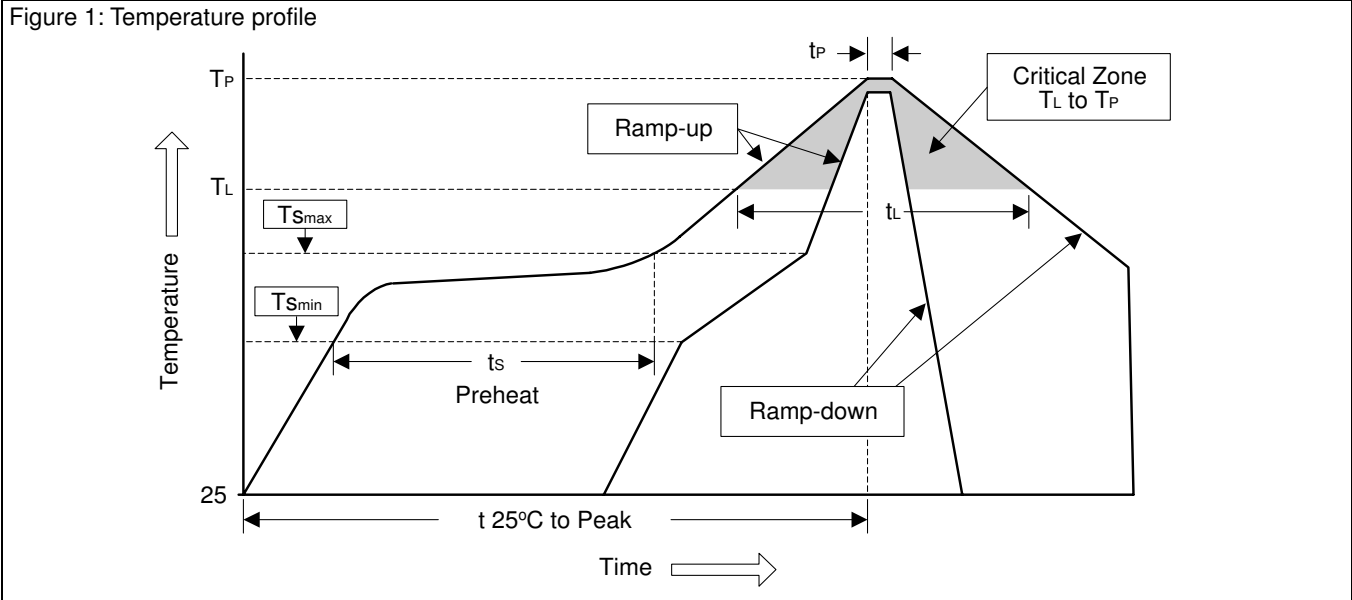
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Soldering Methods for HSMC's Products

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