



HM5401

PNP EPITAXIAL PLANAR TRANSISTOR

Description

The HM5401 is designed for general purpose applications requiring high breakdown voltages.

Features

- High current-emitter breakdown voltage. $V_{CEO}=150V(@I_C=1mA)$
- Complements to NPN type HM5551

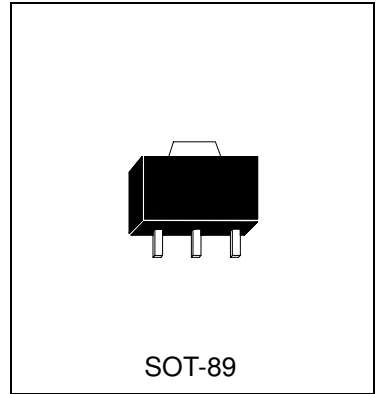
Absolute Maximum Ratings

- Maximum Temperatures
Storage Temperature -55 ~ +150 °C
Junction Temperature +150 °C Maximum
- Maximum Power Dissipation
Total Power Dissipation ($T_A=25^\circ C$) 1 W
- Maximum Voltages and Currents ($T_A=25^\circ C$)
 V_{CBO} Collector to Base Voltage -160 V
 V_{CES} Collector to Emitter Voltage -150 V
 V_{EBO} Emitter to Base Voltage -5 V
 I_C Collector Current -600 mA

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

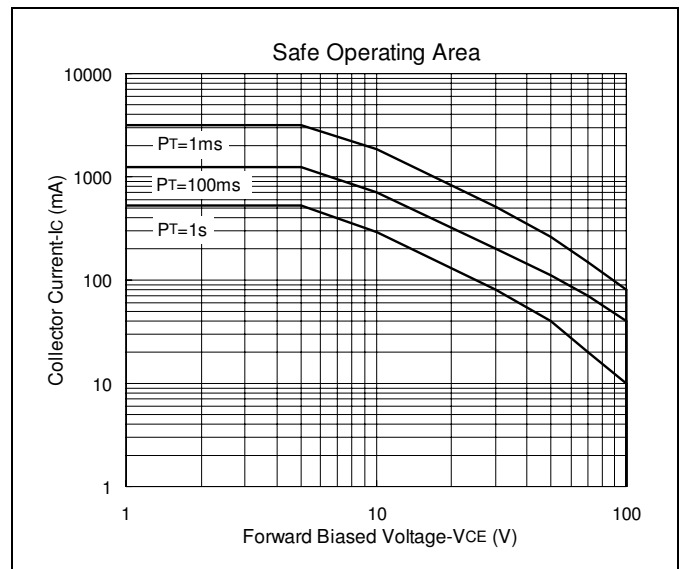
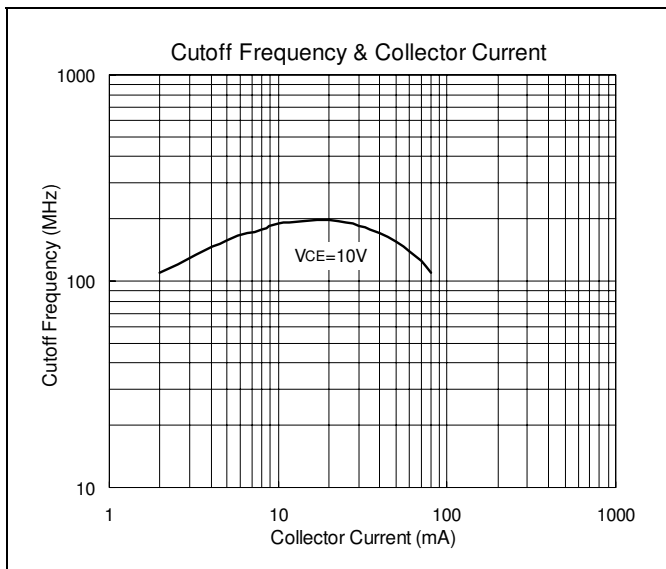
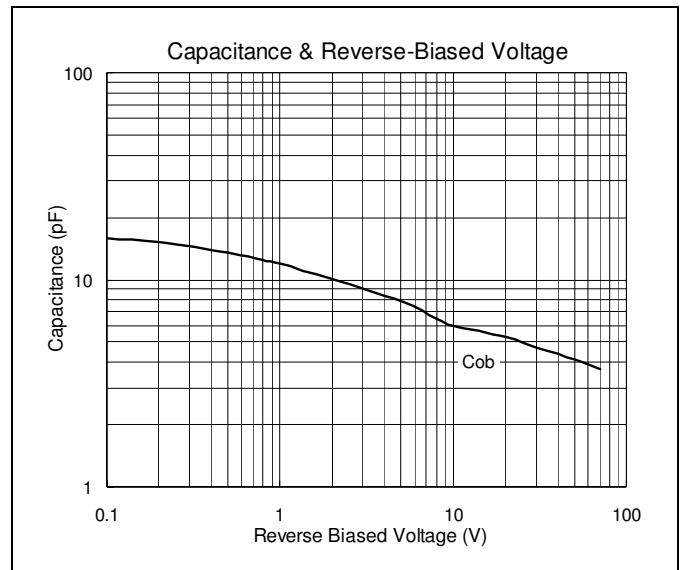
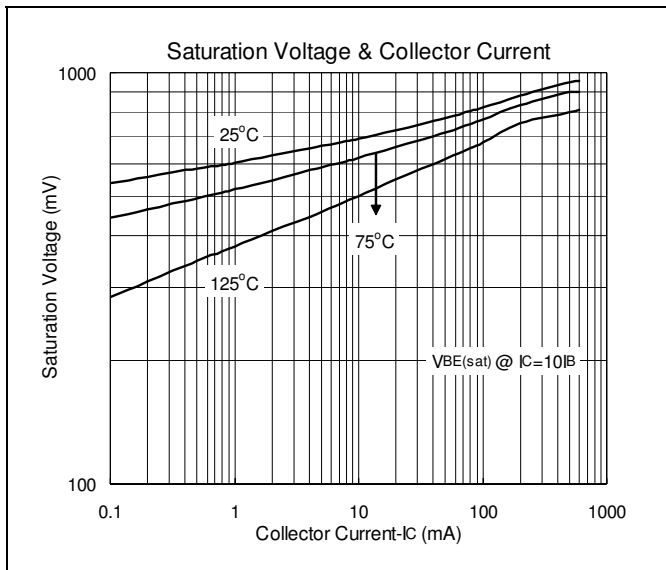
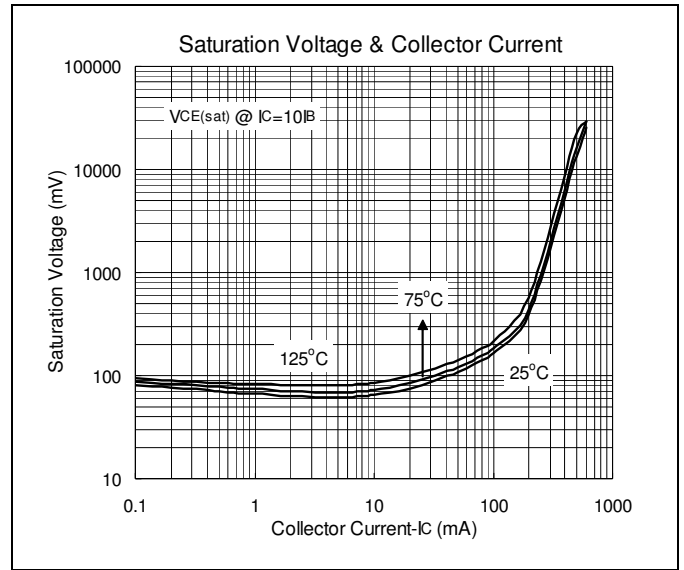
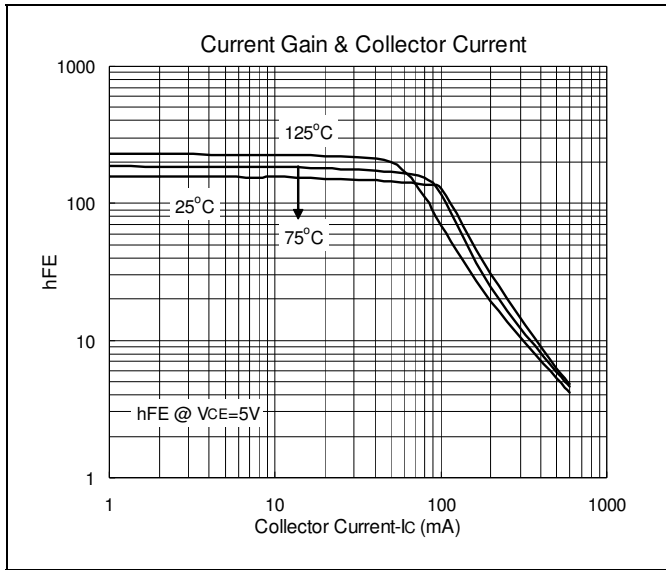
Symbol	Min.	Max.	Unit	Test Conditions
BV_{CBO}	-160	-	V	$I_C=-100\mu A$
BV_{CEO}	-150	-	V	$I_C=-1mA$
BV_{EBO}	-5	-	V	$I_E=-10\mu A$
I_{CBO}	-	-50	nA	$V_{CB}=-120V$
I_{EBO}	-	-50	nA	$V_{EB}=-5V$
* $V_{CE(sat)1}$	-	-0.2	V	$I_C=-10mA, I_B=-1mA$
* $V_{CE(sat)2}$	-	-0.5	V	$I_C=-50mA, I_B=-5mA$
* $V_{BE(sat)1}$	-	-1	V	$I_C=-10mA, I_B=-1mA$
* $V_{BE(sat)2}$	-	-1	V	$I_C=-50mA, I_B=-5mA$
* h_{FE1}	50	-		$V_{CE}=-5V, I_C=-1mA$
* h_{FE2}	60	240		$V_{CE}=-5V, I_C=-10mA$
* h_{FE3}	50	-		$V_{CE}=-5V, I_C=-50mA$
f_T	100	-	MHz	$V_{CE}=-10V, I_C=-10mA, f=100MHz$
Cob	-	6	pF	$V_{CB}=-10V, f=1MHz$

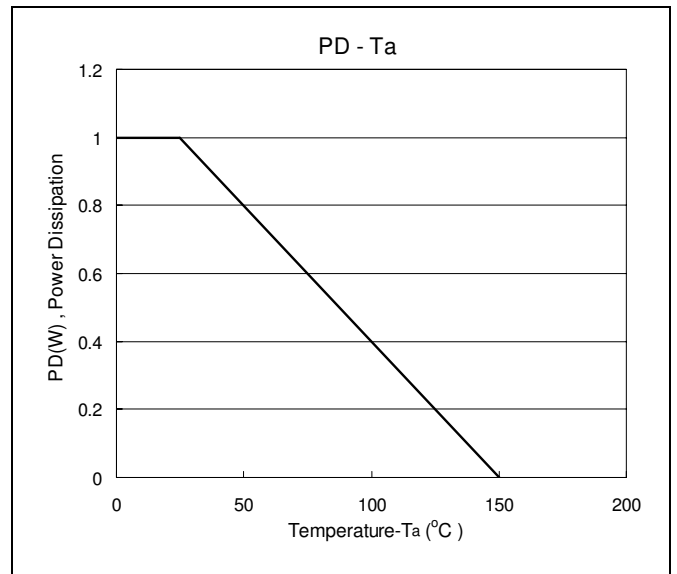
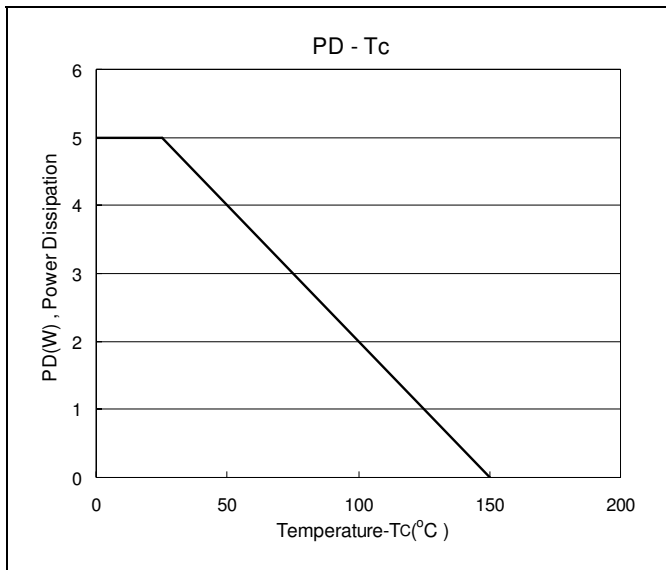
*Pulse Test: Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$





Characteristics Curve







SOT-89 Dimension

3-Lead SOT-89 Plastic
Surface Mounted Package
HSMC Package Code: M

Marking:

Date Code Control Code

Pb Free Mark
Pb-Free: "●" (Note)
Normal: None

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	4.40	4.60
B	4.05	4.25
C	1.50	1.70
D	2.40	2.60
E	0.36	0.51
F	*1.50	-
G	*3.00	-
H	1.40	1.60
I	0.35	0.41

*: Typical, Unit: mm

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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



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) (ts)	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