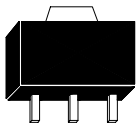
HM5401

PNP EPITAXIAL PLANAR TRANSISTOR



SOT-89

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

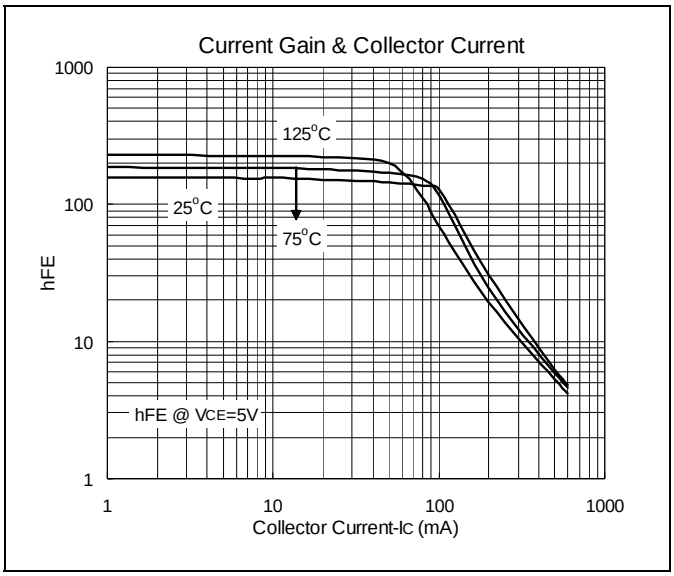
- Maximum Temperatures
  Storage Temperature ..... -55 ~ +150 °C
  Junction Temperature ..... +150 °C Maximum
- Maximum Power Dissipation
  Total Power Dissipation (T_A=25°C) ..... 1 W
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage ..... -160 V
  V_{CES} Collector to Emitter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

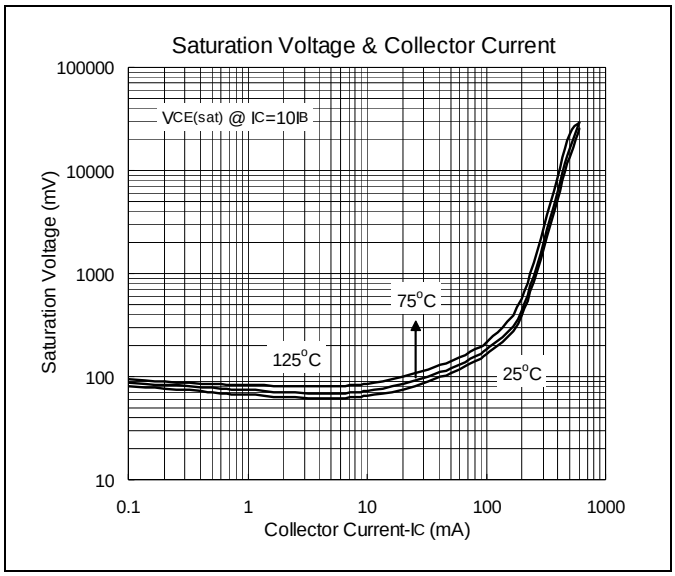
Electrical Characteristics (T_A=25°C)

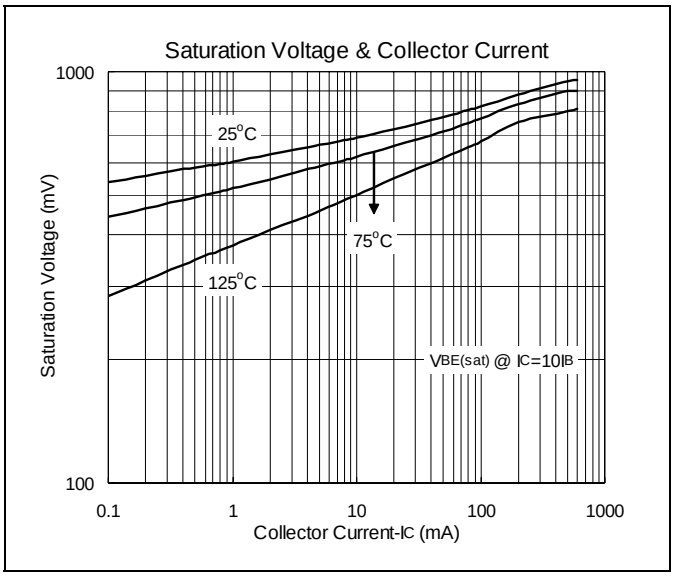
Symbol	Min.	Max.	Unit	Test Conditions
BV_{CBO}	-160	-	V	I_C=-100uA
BV_{CEO}	-150	-	V	I_C=-1mA
BV_{EBO}	-5	-	V	I_E=-10uA
I_{CBO}	-	-50	nA	V_{CB}=-120V
I_{EBO}	-	-50	nA	V_{EB}=-5V
*$V_{CE(sat)1}$	-	-0.2	V	I_C=-10mA, I_B=-1mA
*$V_{CE(sat)2}$	-	-0.5	V	I_C=-50mA, I_B=-5mA
*$V_{BE(sat)1}$	-	-1	V	I_C=-10mA, 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

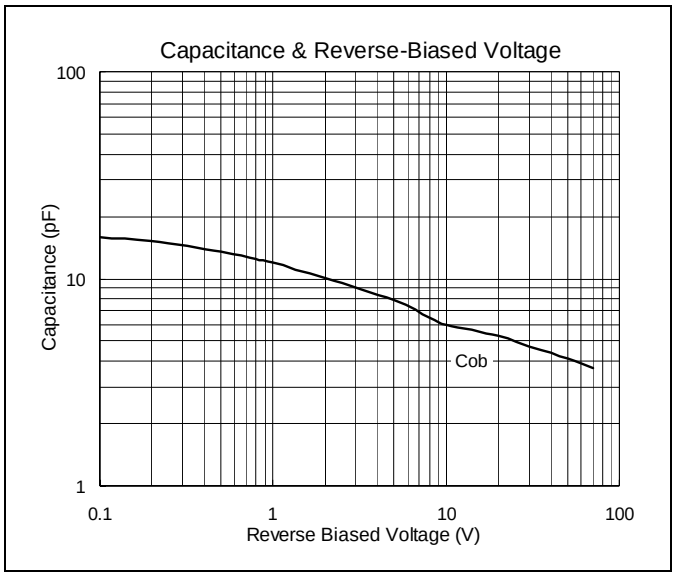
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

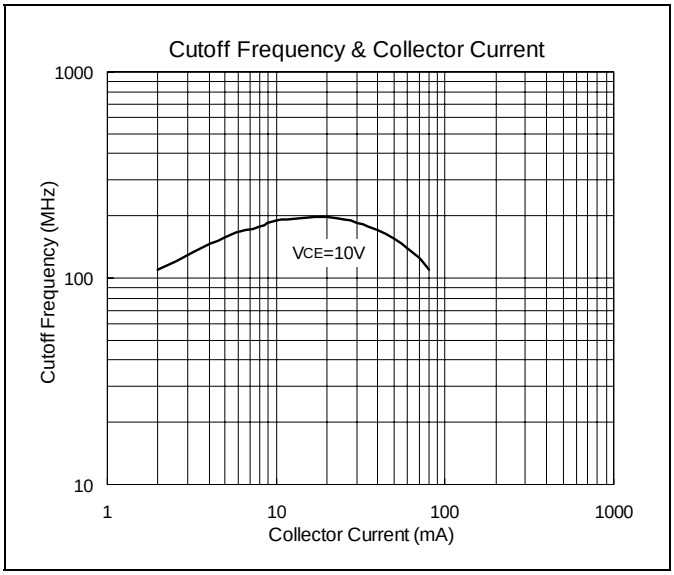
Characteristics Curve

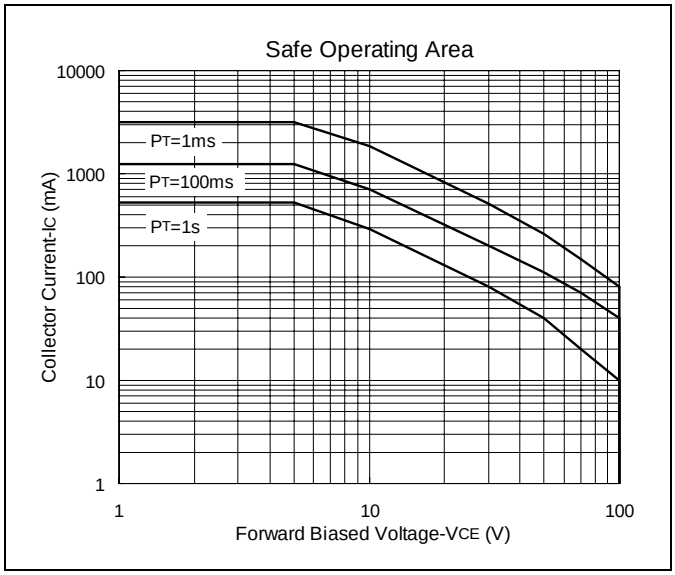


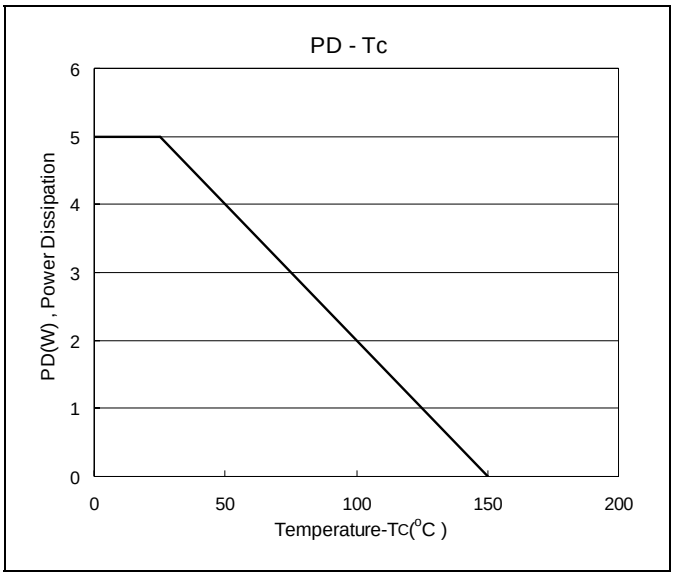


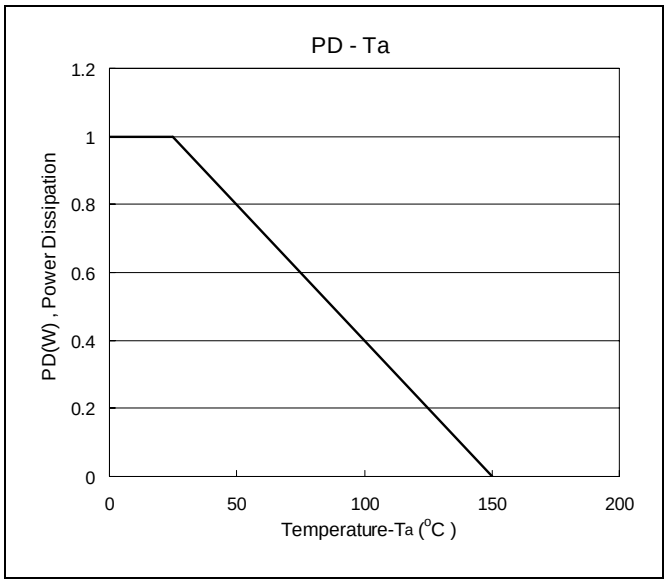




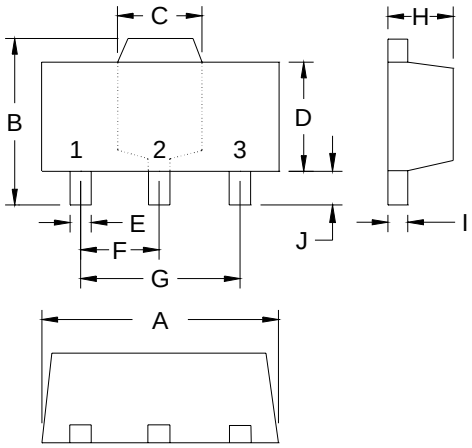





PD - Tc
PD(W) , Power Dissipation
0
1
2
3
4
5
6
0
50
100
150
200
Temperature-TC(°C)

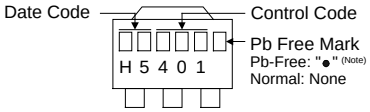

PD - Ta
PD(W) , Power Dissipation
0
0.2
0.4
0.6
0.8
1
1.2
0
50
100
150
200
Temperature-Ta (°C)

SOT-89 Dimension



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

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	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

Head Office And Factory:

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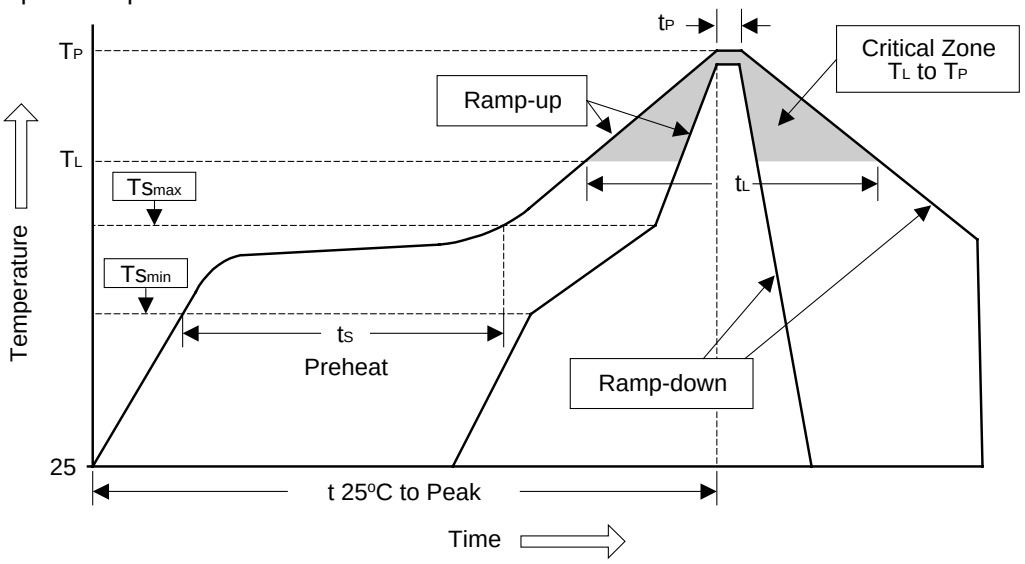
- **Factory 1:** No. 38, Kuang Fu S. Rd., Fu-Kou Hsin-Chu Industrial Park Hsin-Chu Taiwan. R.O.C
  Tel: 886-3-5983621~5 Fax: 886-3-5982931

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