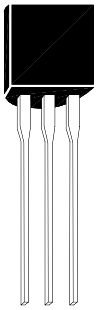
HI-SINCERITY
MICROELECTRONICS CORP.

H2N5089

NPN EPITAXIAL PLANAR TRANSISTOR


TO-92

Description

Amplifier Transistor.

Absolute Maximum Ratings

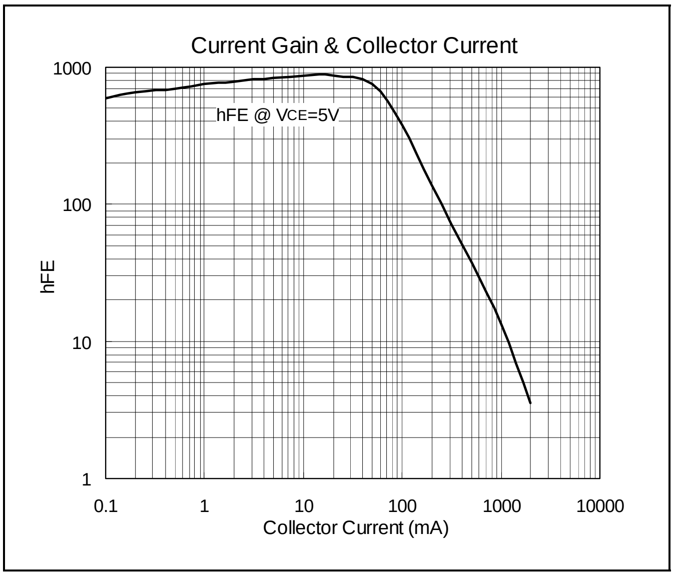
- Maximum Temperatures
  Storage Temperature .... -55 ~ +150 °C
  Junction Temperature .... +150 °C Maximum
- Maximum Power Dissipation
  Total Power Dissipation (T_A=25°C) .... 350 mW
- Maximum Voltages and Currents (T_A=25°C)
  V_{CBO} Collector to Base Voltage .... 30 V
  V_{CEO} Collector to Emitter Voltage .... 25 V
  V_{EBO} Emitter to Base Voltage .... 4.5 V
  I_C Collector Current .... 50 mA

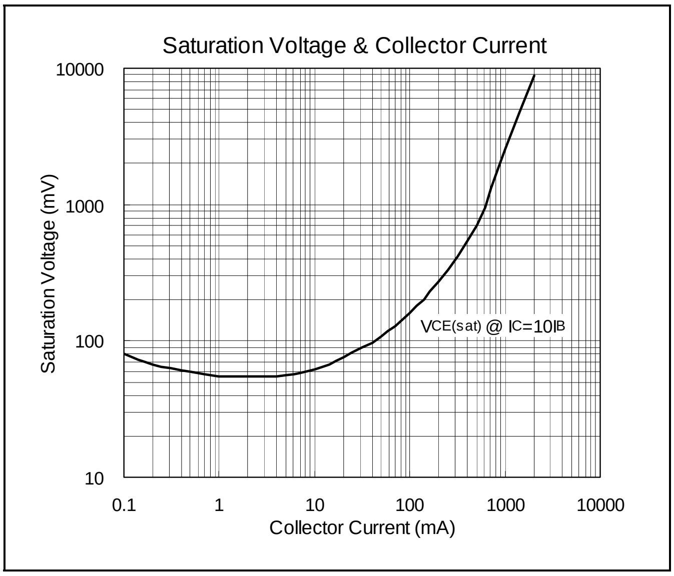
Electrical Characteristics (T_A=25°C)

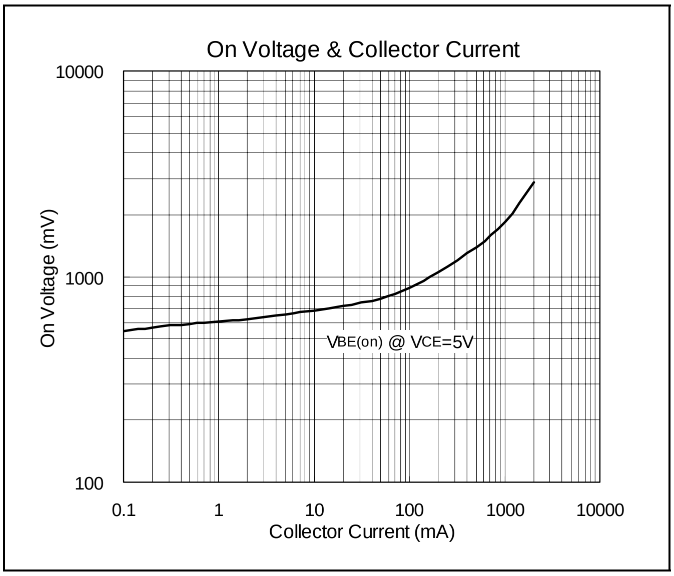
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	30	-	-	V	I_C=100uA, I_E=0
BV_{CEO}	25	-	-	V	I_C=1mA, I_B=0
BV_{EBO}	4.5	-	-	V	I_E=10uA, I_C=0
I_{CBO}	-	-	50	nA	V_{CB}=15V, I_E=0
I_{EBO}	-	-	100	nA	V_{EB}=4.5V, I_C=0
*$V_{CE(sat)}$	-	-	0.5	V	I_C=10mA, I_B=1mA
$V_{BE(on)}$	-	-	0.8	V	I_C=10mA, I_B=5V
*h_{FE1}	400	-	1200		V_{CE}=5V, I_C=0.1mA
*h_{FE2}	450	-	-		V_{CE}=5V, I_C=1mA
*h_{FE3}	400	-	-		V_{CE}=5V, I_C=10mA
f_T	50	-	-	MHz	V_{CE}=5V, I_C=0.5mA, f=20MHz
Cob	-	-	4.0	pF	V_{CB}=5V, f=1MHz, I_E=0

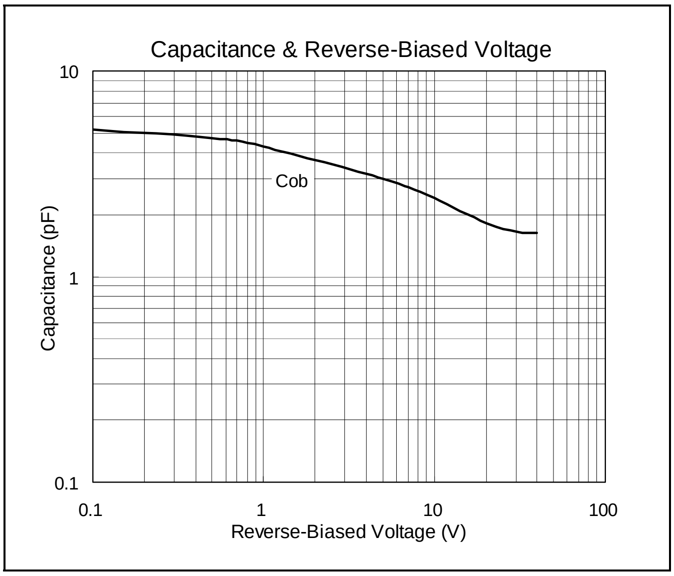
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

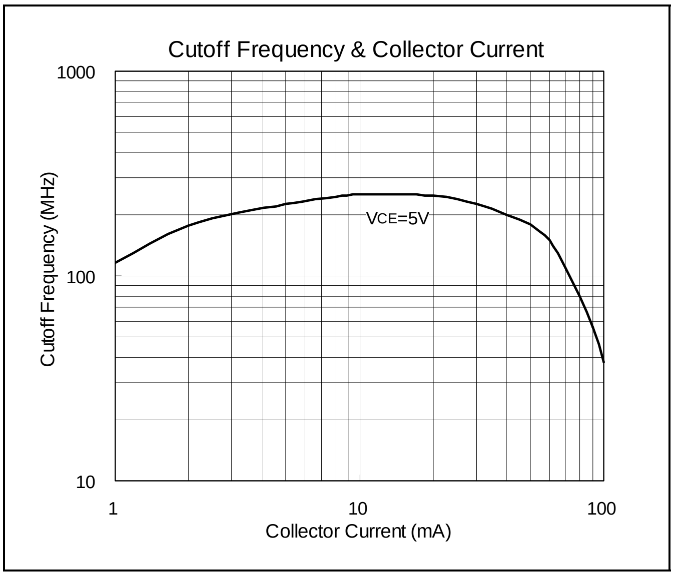
Characteristics Curve

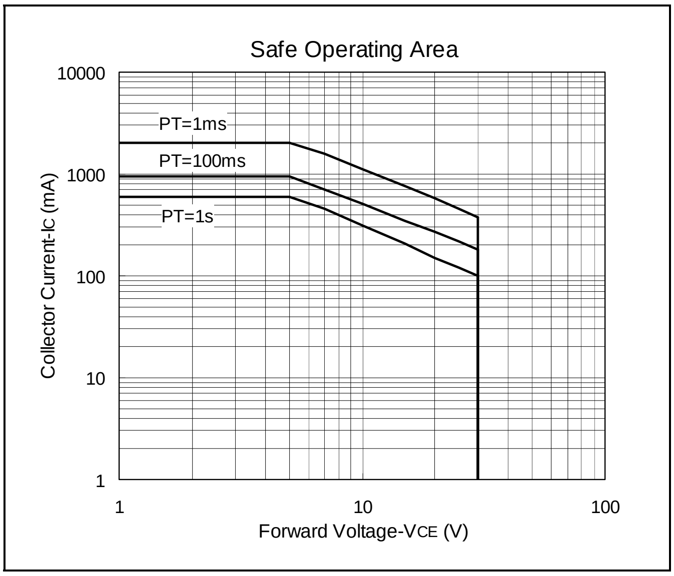

Current Gain & Collector Current


Saturation Voltage & Collector Current

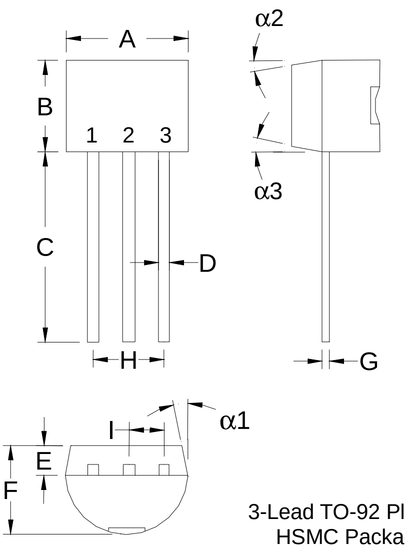

On Voltage & Collector Current


Capacitance & Reverse-Biased Voltage


Cutoff Frequency & Collector Current

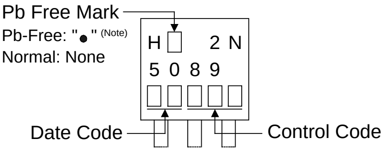

Safe Operating Area

TO-92 Dimension



3-Lead TO-92 Plastic Package
HSMC Package Code: A

Marking:



Note: Green label is used for pb-free packing

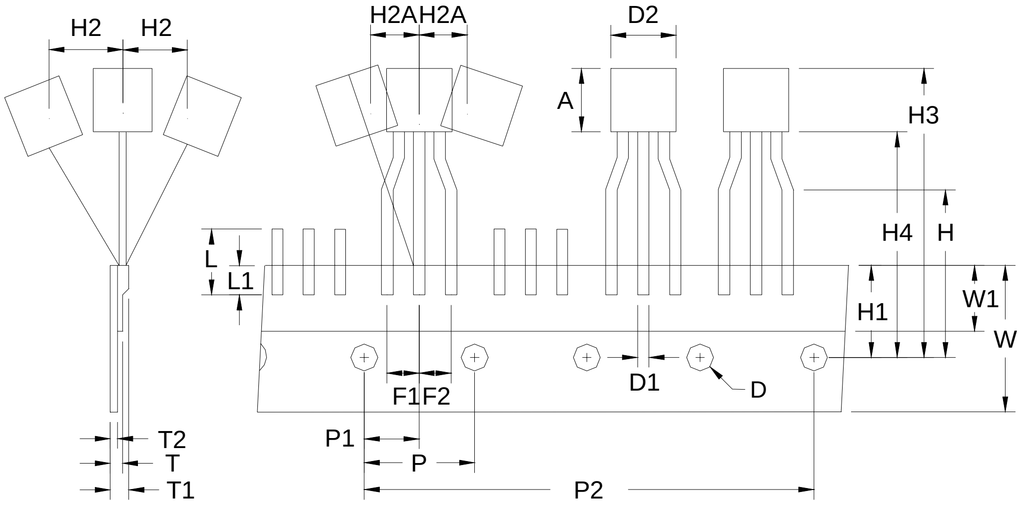
Pin Style: 1.Emitter 2.Base 3.Collector

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	4.33	4.83
B	4.33	4.83
C	12.70	-
D	0.36	0.56
E	-	*1.27
F	3.36	3.76
G	0.36	0.56
H	-	*2.54
I	-	*1.27
α1	-	*5°
α2	-	*2°
α3	-	*2°

*: Typical, Unit: mm

TO-92 Taping Dimension



DIM	Min.	Max.
A	4.33	4.83
D	3.80	4.20
D1	0.36	0.53
D2	4.33	4.83
F1,F2	2.40	2.90
H	15.50	16.50
H1	8.50	9.50
H2	-	1
H2A	-	1
H3	-	27
H4	-	21
L	-	11
L1	2.50	-
P	12.50	12.90
P1	5.95	6.75
P2	50.30	51.30
T	-	0.55
T1	-	1.42
T2	0.36	0.68
W	17.50	19.00
W1	5.00	7.00

Unit: mm

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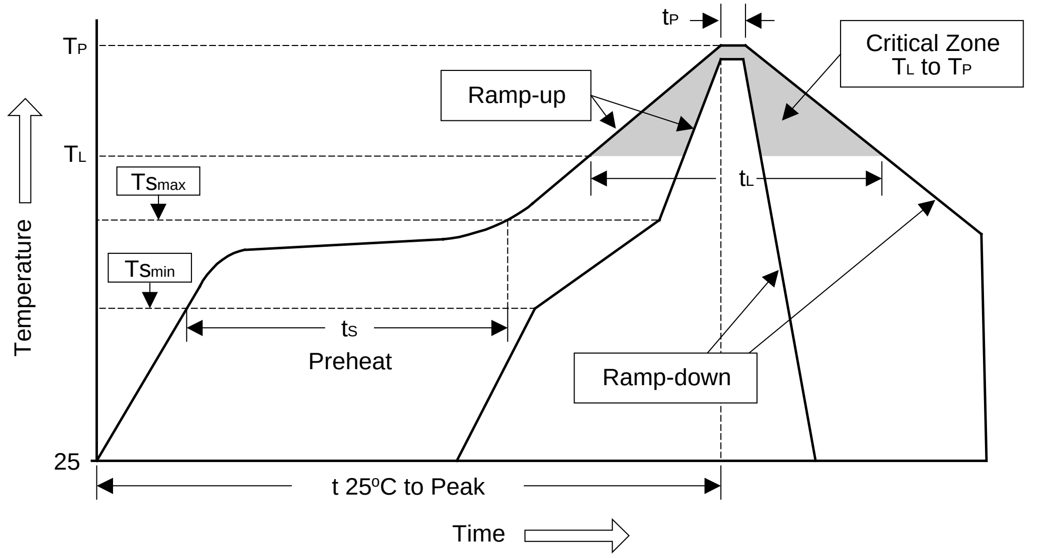
Soldering Methods for HSMC's Products

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

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