



HI-SINCERITY

MICROELECTRONICS CORP.

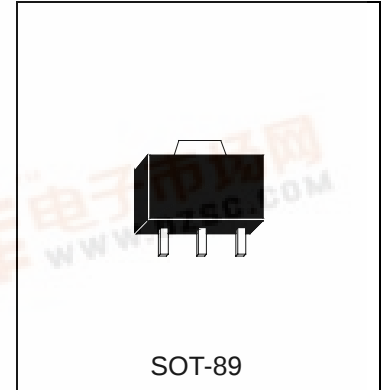
Spec. No. : HM200205
Issued Date : 1995.12.18
Revised Date : 2004.09.16
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HM669A

NPN EPITAXIAL PLANAR TRANSISTOR

Description

Low frequency power amplifier complementary pair with HM649A



SOT-89

Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

- Maximum Temperatures
 - Storage Temperature $-55 \sim +150^{\circ}\text{C}$
 - Junction Temperature $+150^{\circ}\text{C}$ Maximum
- Maximum Power Dissipation
 - Total Power Dissipation ($T_A=25^{\circ}\text{C}$) 1 W
 - Total Power Dissipation ($T_C=25^{\circ}\text{C}$) 10 W
- Maximum Voltages and Currents
 - BV_{CBO} Collector to Base Voltage 180 V
 - BV_{CEO} Collector to Emitter Voltage 160 V
 - BV_{EBO} Emitter to Base Voltage 5 V
 - I_C Collector Current (DC) 1.5 A
 - I_C Collector Current (Pulse) 3 A

Thermal Characteristic

Symbol	Characteristic	Max.	Unit
$R_{\theta ja}$	Thermal Resistance, junction to ambient ($T_A=25^{\circ}\text{C}$)	125	$^{\circ}\text{C/W}$
$R_{\theta jc}$	Thermal Resistance, junction to case ($T_C=25^{\circ}\text{C}$)	12.5	$^{\circ}\text{C/W}$

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	180	-	-	V	$I_C=1\text{mA}$, $I_E=0$
BV_{CEO}	160	-	-	V	$I_C=10\text{mA}$, $I_B=0$
BV_{EBO}	5	-	-	V	$I_E=1\text{mA}$, $I_C=0$
I_{CBO}	-	-	10	μA	$V_{CB}=160\text{V}$, $I_E=0$
$*V_{CE(sat)}$	-	-	1	V	$I_C=500\text{mA}$, $I_B=50\text{mA}$
$V_{BE(on)}$	-	-	1.5	V	$I_C=150\text{mA}$, $V_{CE}=5\text{V}$
$*h_{FE1}$	100	-	320		$I_C=150\text{mA}$, $V_{CE}=5\text{V}$
$*h_{FE2}$	30	-	-		$I_C=500\text{mA}$, $V_{CE}=5\text{V}$
f_T	-	140	-	MHz	$I_C=150\text{mA}$, $V_{CE}=5\text{V}$

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

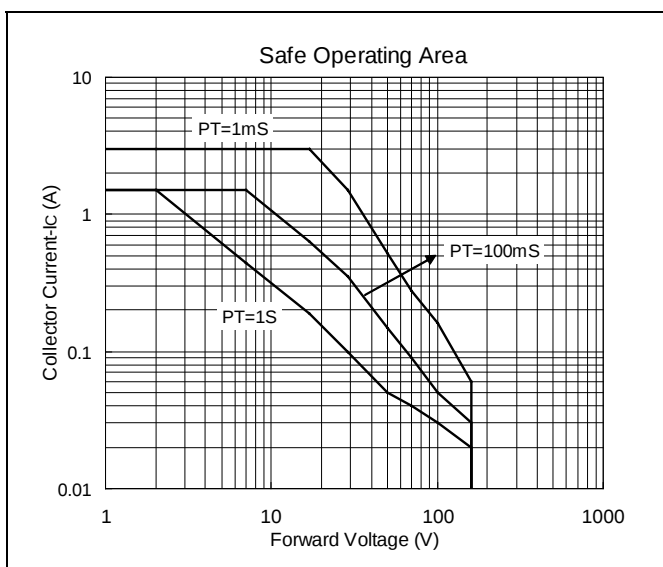
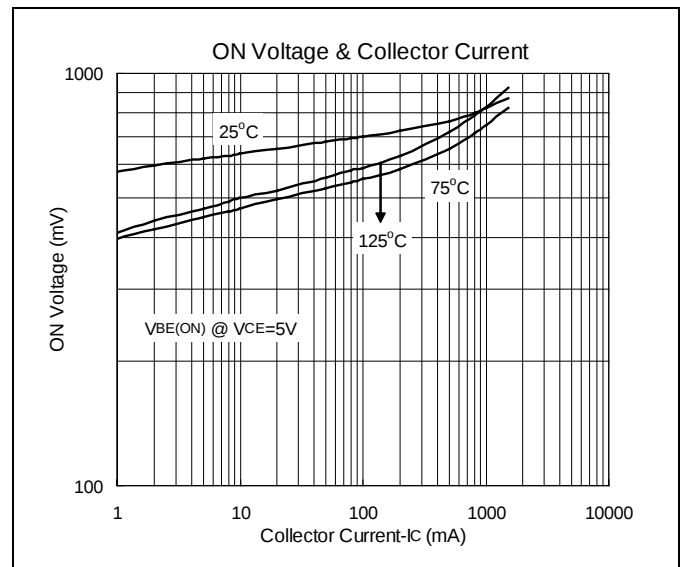
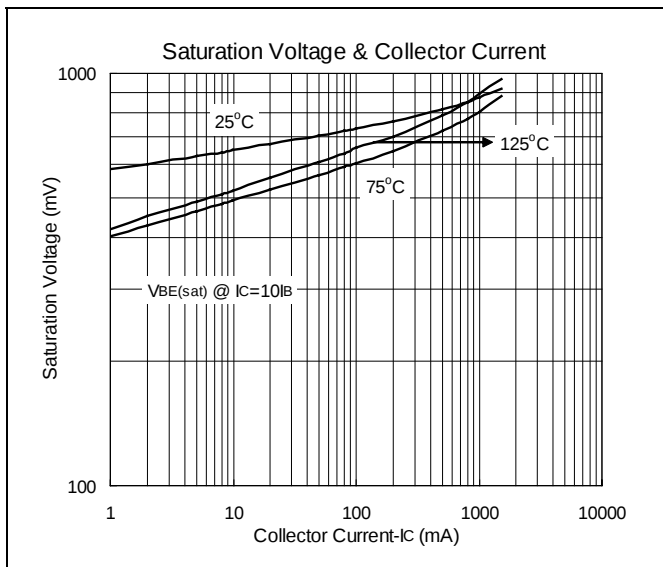
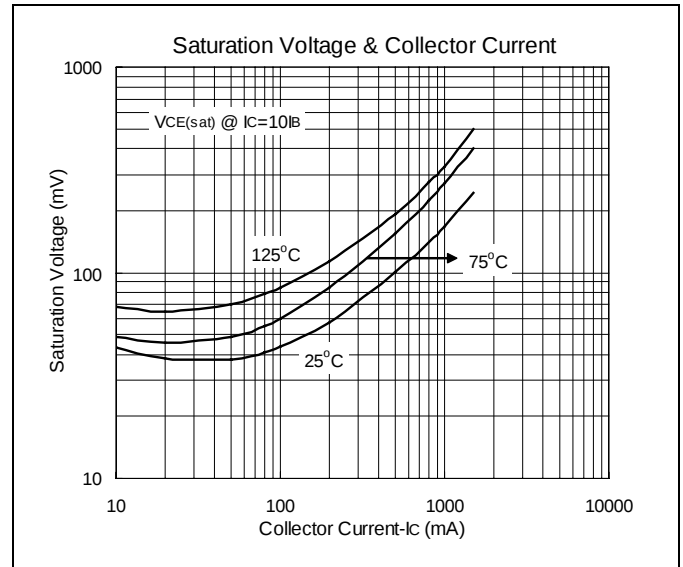
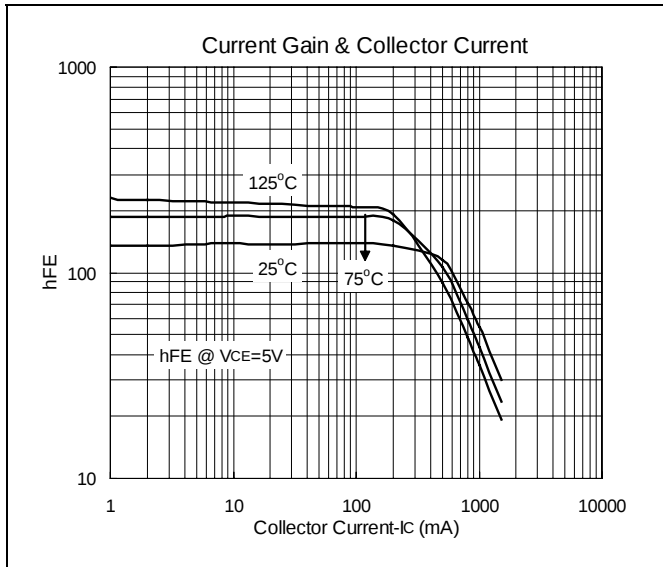
Classification Of h_{FE1}

Rank	C	D
Range	100-200	180-320





Characteristics Curve



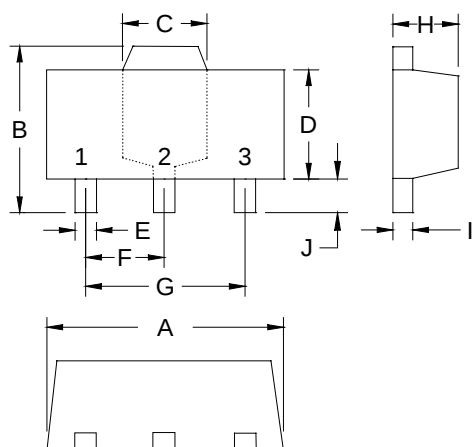


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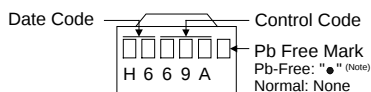
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SOT-89 Dimension



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

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Head Office And Factory:

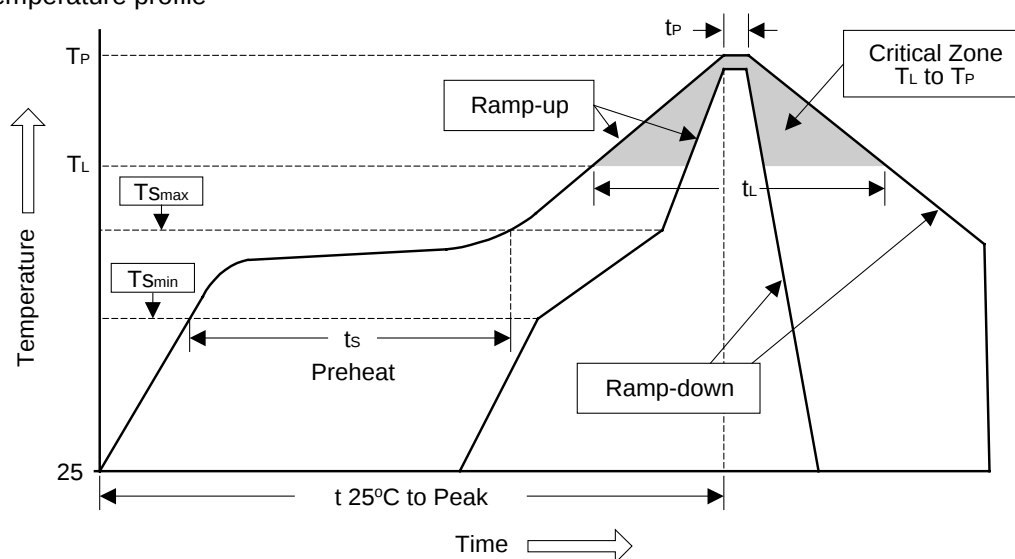
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Soldering Methods for HSMC's Products

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