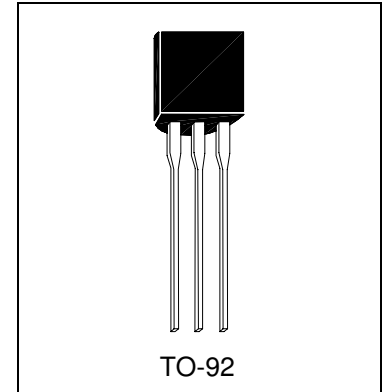




HPH2369

NPN EPITAXIAL PLANAR TRANSISTOR



TO-92

Description

The HPH2369 is designed for general purpose switching and amplifier applications.

Features

- Low Collector Saturation Voltage
- High speed switching 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) 625 mW
- Maximum Voltages and Currents (T_A=25°C)
V_{CBO} Collector to Base Voltage 40 V
V_{CES} Collector to Emitter Voltage 40 V
V_{CEO} Collector to Emitter Voltage 15 V
V_{EBO} Emitter to Base Voltage 4.5 V
I_C Collector Current 500 mA

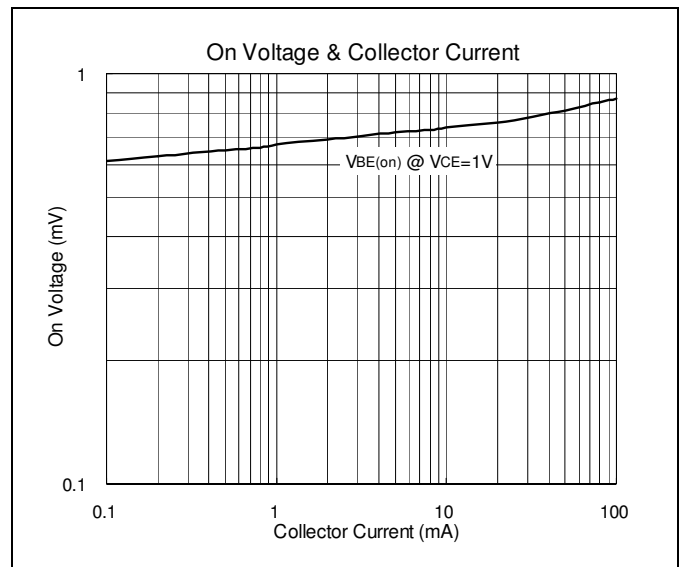
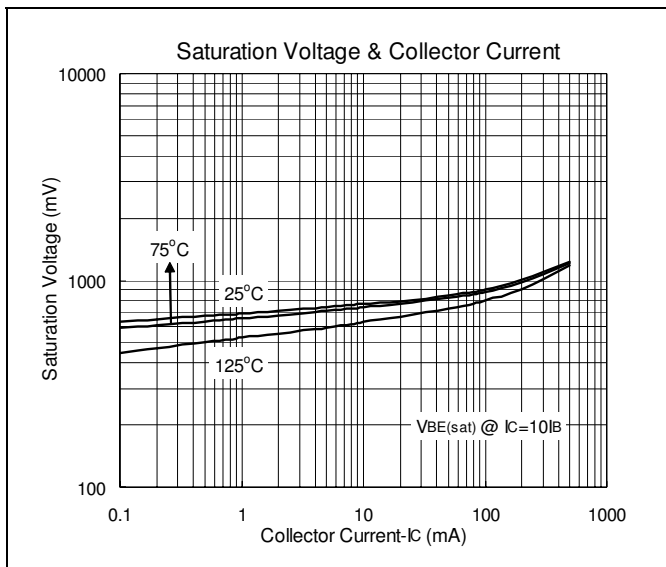
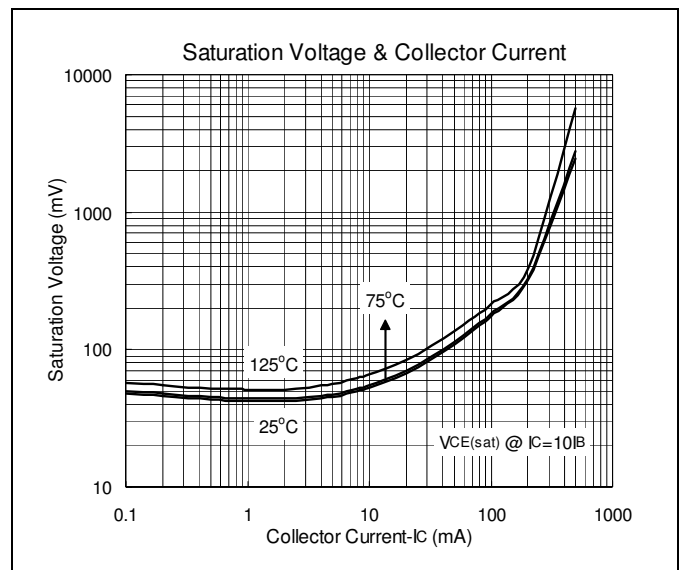
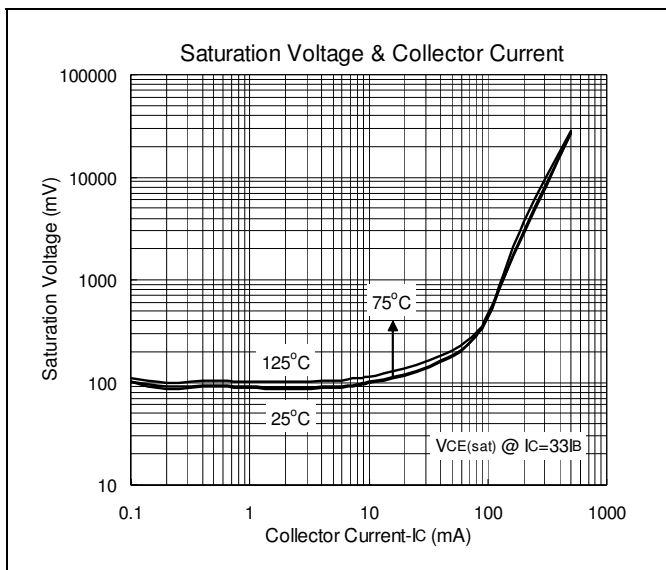
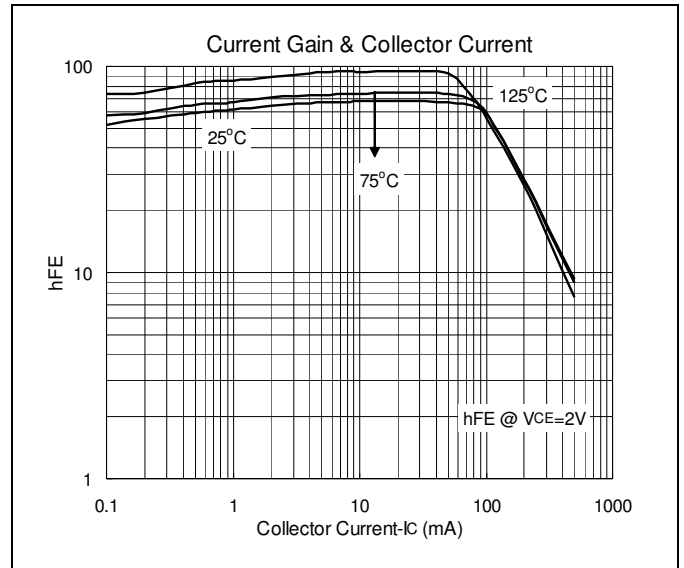
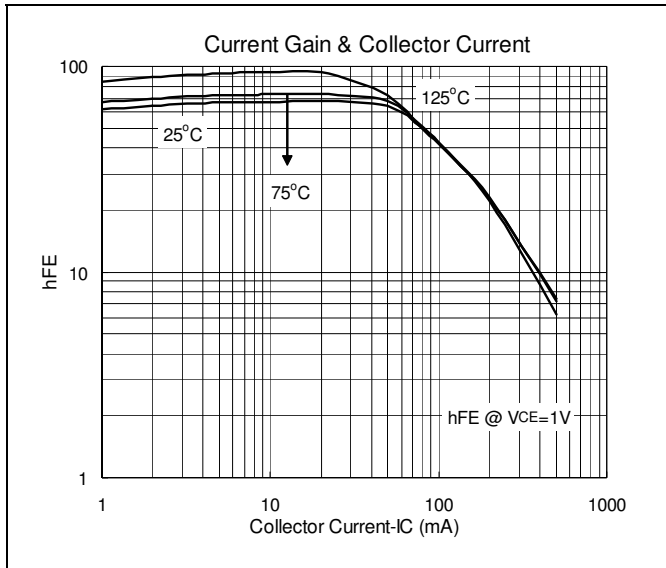
Electrical Characteristics (T_A=25°C)

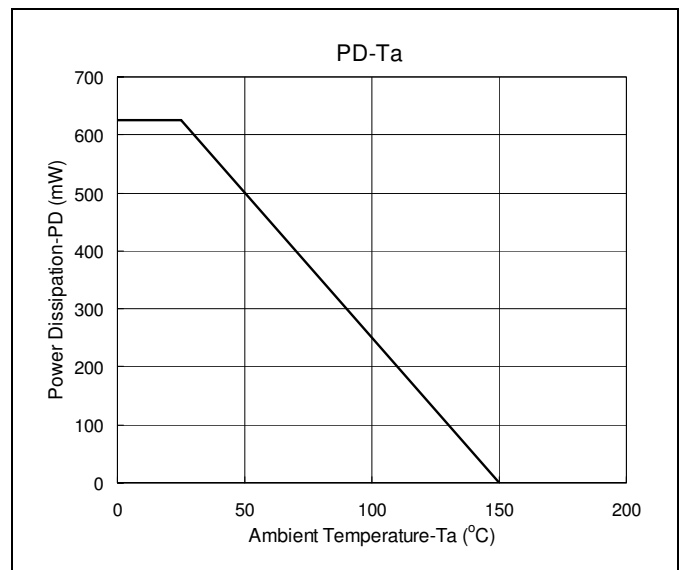
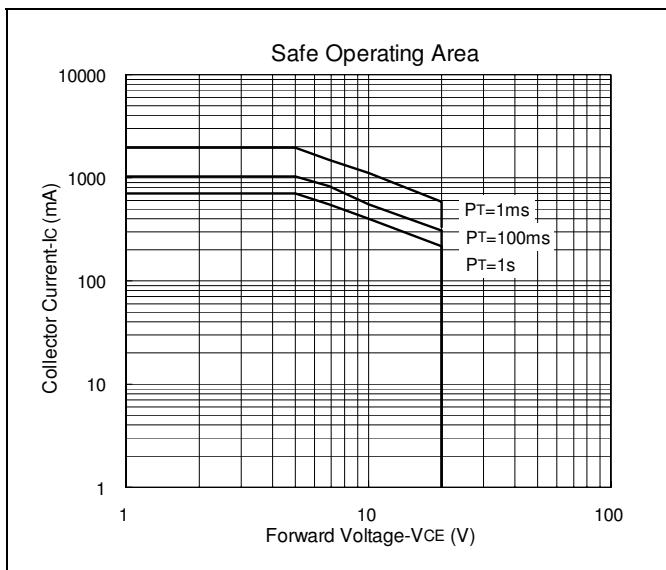
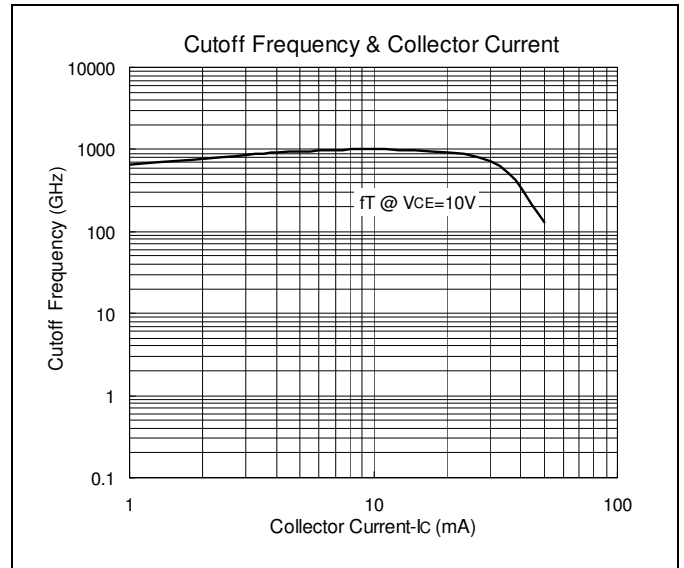
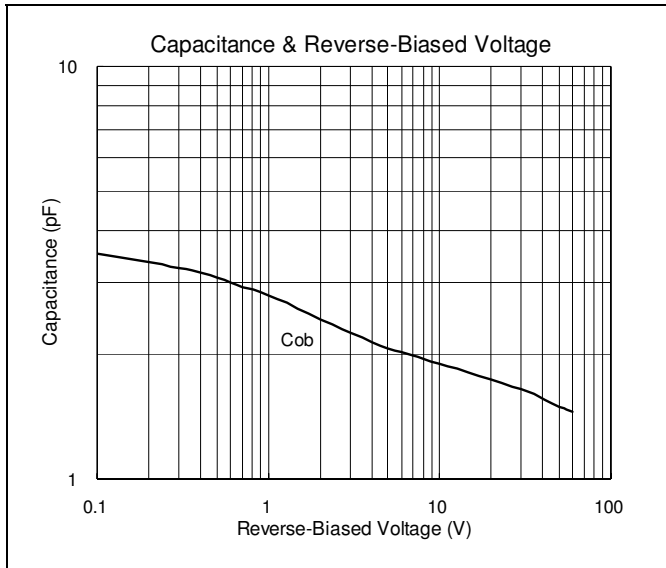
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	40	-	-	V	I _C =100uA, I _E =0
BV _{CEO}	15	-	-	V	I _C =10mA, I _B =0
BV _{CES}	40	-	-	V	I _C =10uA, V _{BE} =0
BV _{EBO}	4.5	-	-	V	I _E =10uA, I _C =0
I _{CBO}	-	-	400	nA	V _{CB} =20V, I _E =0
I _{CES}	-	-	300	nA	V _{CE} =25V, V _{BE} =0
I _{EBO}	-	-	100	nA	V _{EB} =2V, I _C =0
*V _{CE(sat)1}	-	-	250	mV	I _C =10mA, I _B =1mA
*V _{CE(sat)2}	-	-	300	mV	I _C =10mA, I _B =0.3mA
*V _{CE(sat)3}	-	-	600	mV	I _C =100mA, I _B =10mA
*V _{BE(sat)1}	700	-	850	mV	I _C =10mA, I _B =1mA
*V _{BE(sat)2}	-	-	1.5	V	I _C =100mA, I _B =1mA
*h _{FE1}	40	80	120		I _C =10mA, V _{CE} =1V
*h _{FE2}	20	-	-		I _C =100mA, V _{CE} =2V
f _T	500	-	-	MHz	I _C =10mA, V _{CE} =10V, f=100MHz
Cob	-	-	4	pF	V _{CB} =5V, f=1MHz, I _E =0

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



Characteristics Curve







TO-92 Dimension

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

Marking:

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

H	PH
2	3 6 9

Date Code Control Code

Note: Green label is used for pb-free packing
 Pin Style: 1. Collector 2. Base 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	4.33	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
$\alpha 1$	-	*5°
$\alpha 2$	-	*2°
$\alpha 3$	-	*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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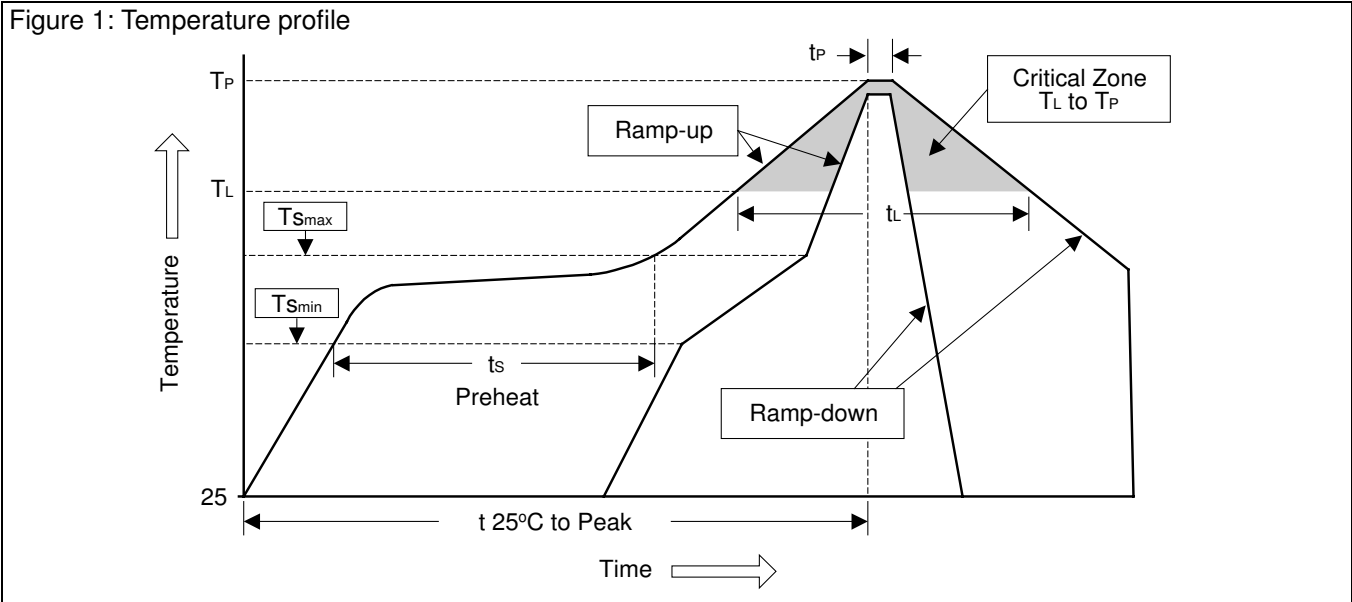
Head Office And Factory:

- **Head Office** (Hi-Sincerity Microelectronics Corp.): 10F., No. 61, Sec. 2, Chung-Shan N. Rd. Taipei Taiwan R.O.C.
 Tel: 886-2-25212056 Fax: 886-2-25632712, 25368454
- **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



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