



H2N4401

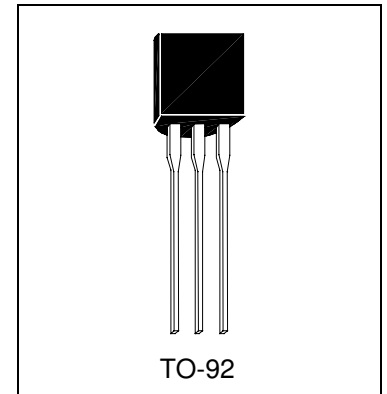
NPN EPITAXIAL PLANAR TRANSISTOR

Description

The H2N4401 is designed for general purpose switching and amplifier applications.

Features

- Complementary to H2N4403
- High Power Dissipation: 625 mW at 25°C
- High DC Current Gain: 100-300 at 150mA
- High Breakdown Voltage: 40 V Min.



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 60 V
 - V_{CEO} Collector to Emitter Voltage..... 40 V
 - V_{EBO} Emitter to Base Voltage 5 V
 - I_C Collector Current 600 mA

Electrical Characteristics (T_A=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV _{CBO}	60	-	-	V	I _C =100uA, I _E =0
BV _{CEO}	40	-	-	V	I _C =1mA, I _B =0
BV _{EBO}	5	-	-	V	I _E =10uA, I _C =0
I _{CEX}	-	-	100	nA	V _{CE} =35V, V _{BE} =0.4V
*V _{CE(sat)1}	-	-	400	mV	I _C =150mA, I _B =15mA
*V _{CE(sat)2}	-	-	750	mV	I _C =500mA, I _B =50mA
*V _{BE(sat)1}	750	-	950	mV	I _C =150mA, I _B =15mA
*V _{BE(sat)2}	-	-	1.2	V	I _C =500mA, I _B =50mA
*h _{FE1}	20	-	-		V _{CE} =1V, I _C =0.1mA
*h _{FE2}	40	-	-		V _{CE} =1V, I _C =1mA
*h _{FE3}	80	-	-		V _{CE} =1V, I _C =10mA
*h _{FE4}	100	-	300		V _{CE} =1V, I _C =150mA
*h _{FE5}	40	-	-		V _{CE} =2V, I _C =500mA
f _T	250	-	-	MHz	V _{CE} =10V, I _C =20mA, f=100MHz
Cob	-	-	6.5	pF	V _{CB} =5V, I _E =0, f=1MHz

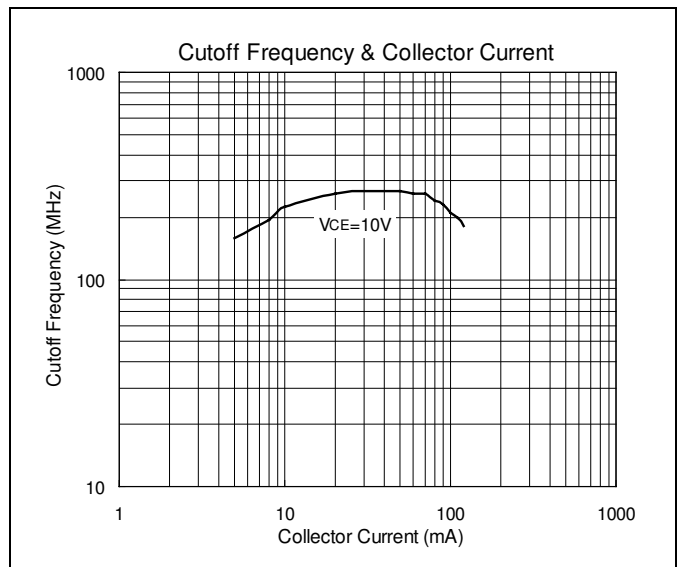
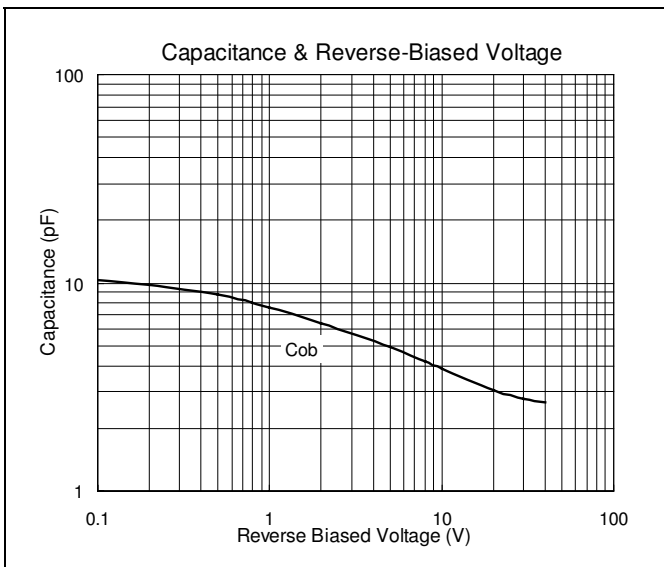
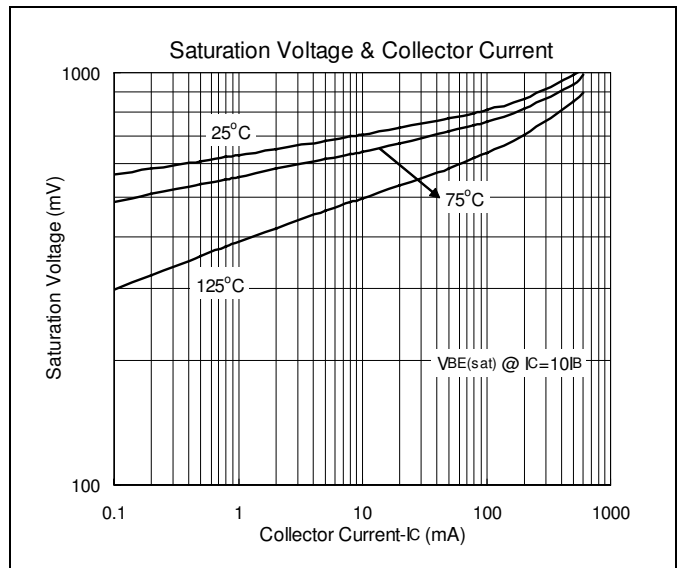
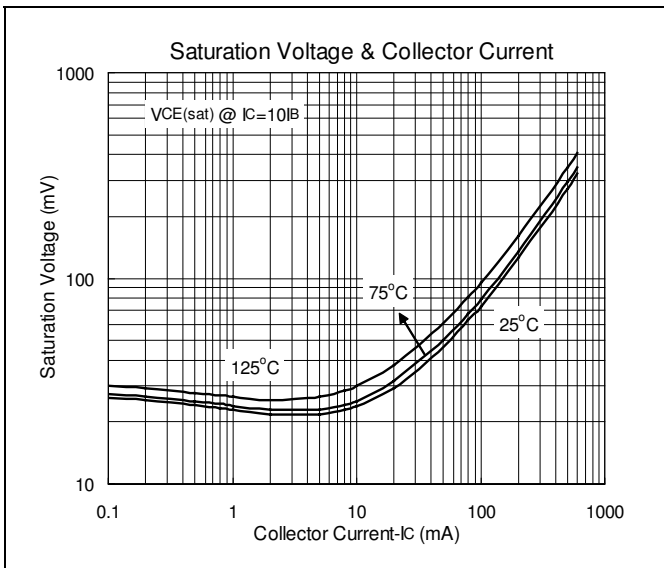
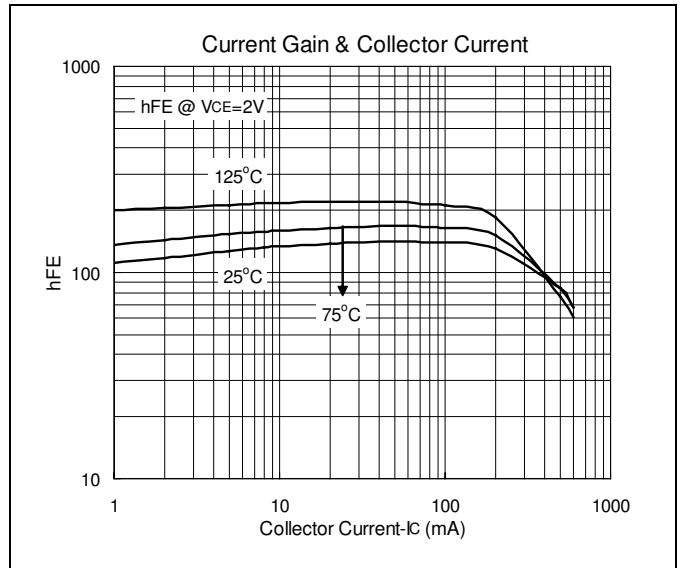
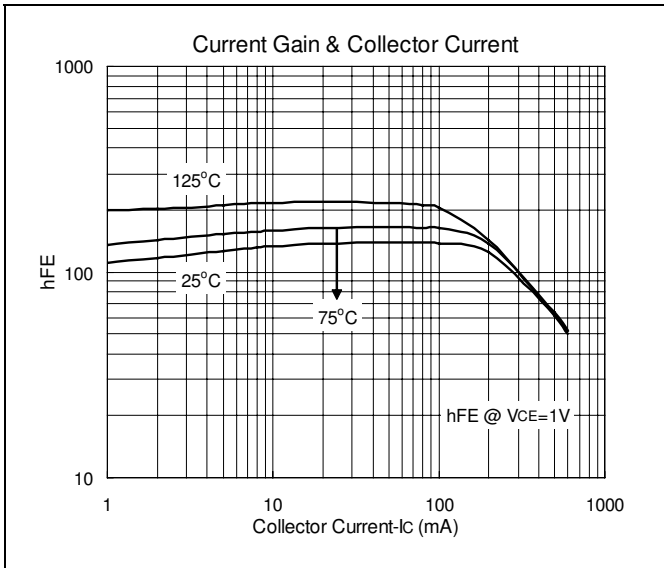
*Pulse Test: Pulse Width ≤380us, Duty Cycle ≤2%

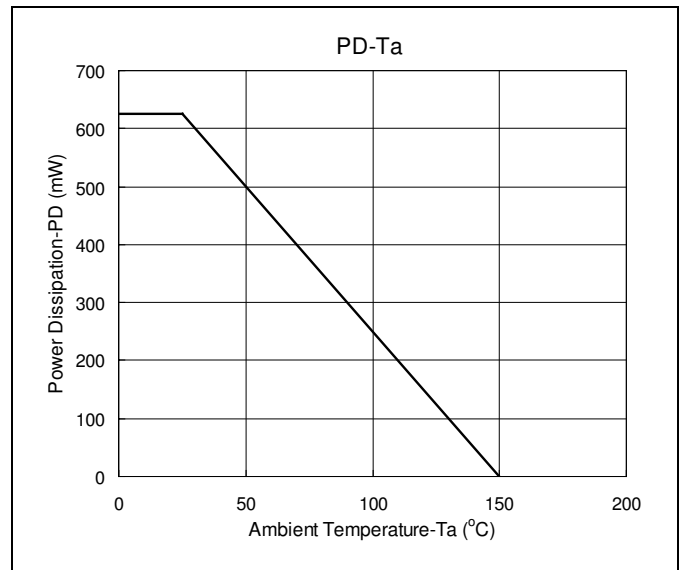
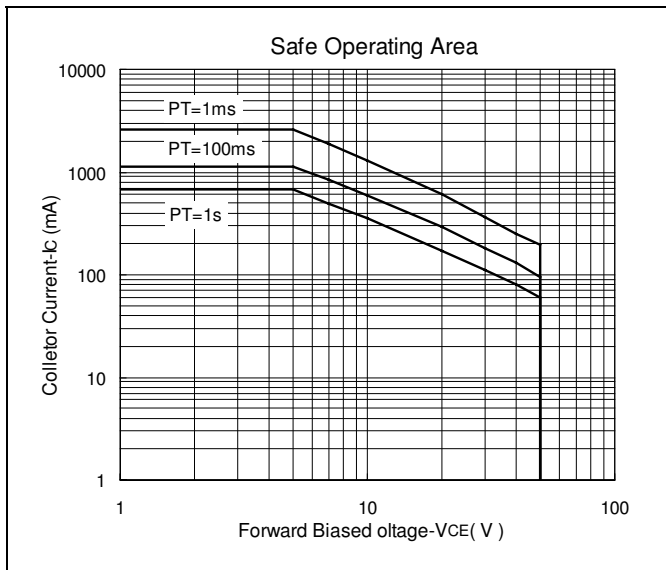
Classification of hFE4

Rank	A	B
Range	100-210	190-300



Characteristics Curve







TO-92 Dimension

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

Marking:

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

Date Code Control Code

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
$\alpha 1$	-	*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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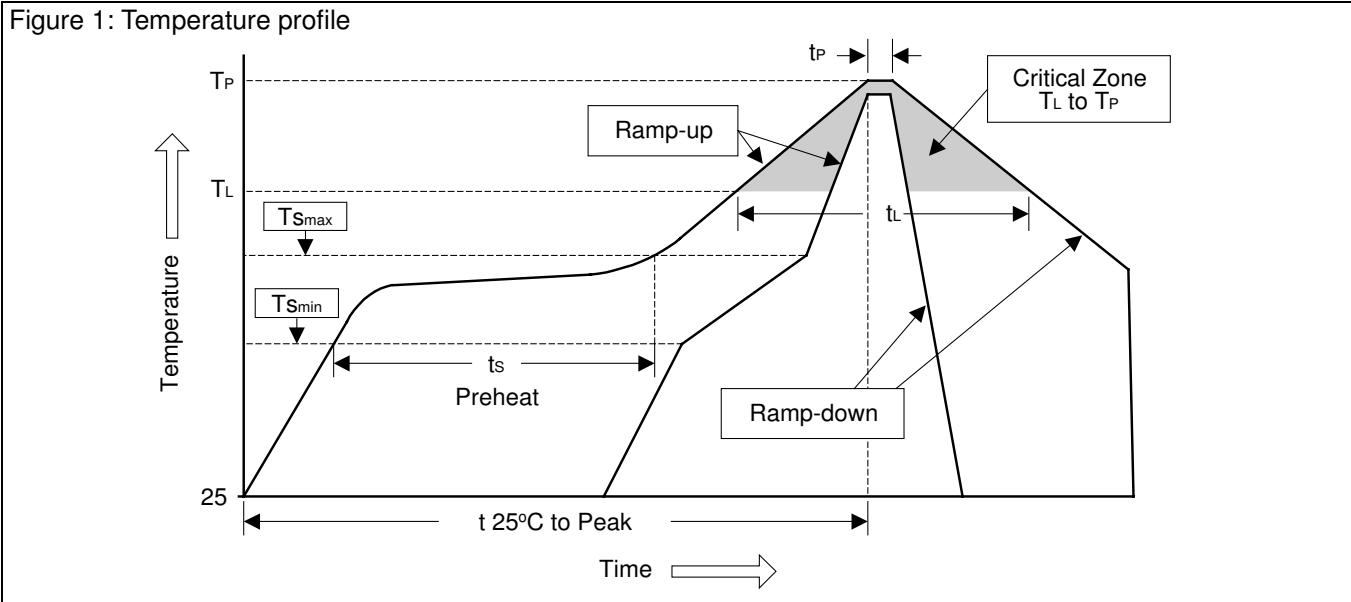
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Soldering Methods for HSMC's Products

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) (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