



HSD1616A

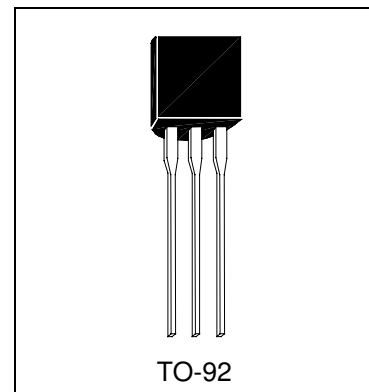
NPN EPITAXIAL PLANAR TRANSISTOR

Description

The HSD1616A is designed for audio frequency power amplifier and medium speed switching applications.

Absolute Maximum Ratings

- Maximum Temperatures
 - Storage Temperature -55 ~ +150 °C
 - Junction Temperature 150 °C Maximum
- Maximum Power Dissipation
 - Total Power Dissipation (Ta=25°C) 750 mW
- Maximum Voltages and Currents (Ta=25°C)
 - VCBO Collector to Base Voltage 120 V
 - VCEO Collector to Emitter Voltage 60 V
 - VEBO Emitter to Base Voltage 6 V
 - IC Collector Current (DC) 1 A
 - IC Collector Current *(Pulse) 2 A



Thermal Characteristic

Characteristic	Symbol	Max	Unit
Thermal Resistance, junction to ambient	Rθja	167	°C/W

Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BVCBO	120	-	-	V	IC=100uA
BVCEO	60	-	-	V	IC=1mA
BVEBO	6	-	-	V	IE=10uA
ICBO	-	-	100	nA	VCB=60V
IEBO	-	-	100	nA	VEB=6V
*VCE(sat)	-	150	300	mV	IC=1A, IB=50mA
*VBE(sat)	-	0.9	1.2	V	IC=1A, IB=50mA
VBE(on)	600	-	700	mV	VCE=2V, IC=50mA
*hFE1	135	-	600		VCE=2V, IC=100mA
*hFE2	81	-	-		VCE=2V, IC=1A
fT	100	160	-	MHz	VCE=2V, IC=100mA
Cob	-	-	19	pF	IE=0, VCB=10V, f=1MHz
ton	-	0.07	-	uS	VCE=10V, IC=100mA
ts	-	0.95	-	uS	IB1=-IB2=10mA
tf	-	0.07	-	uS	VBE(off)=-2~-3V

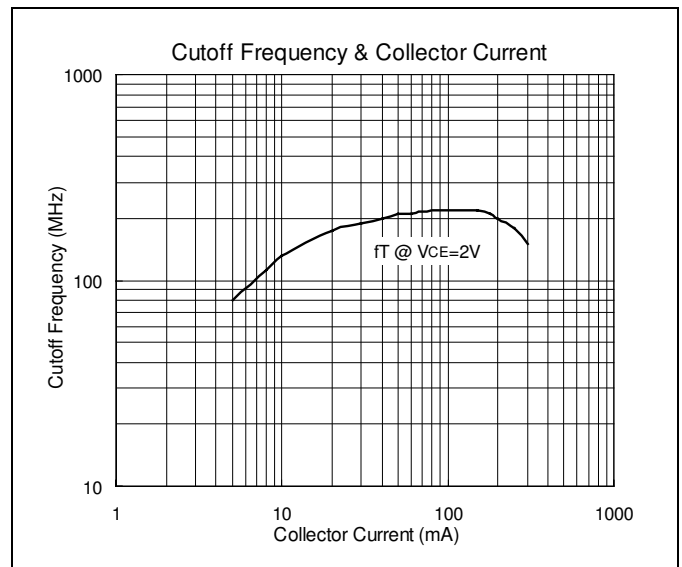
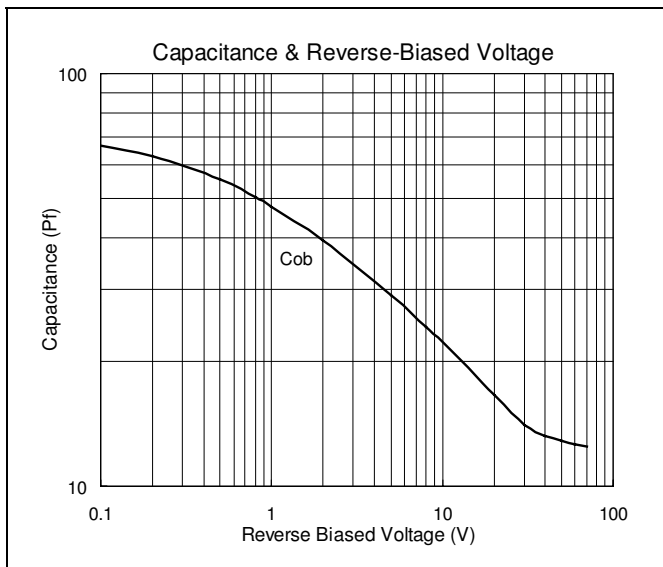
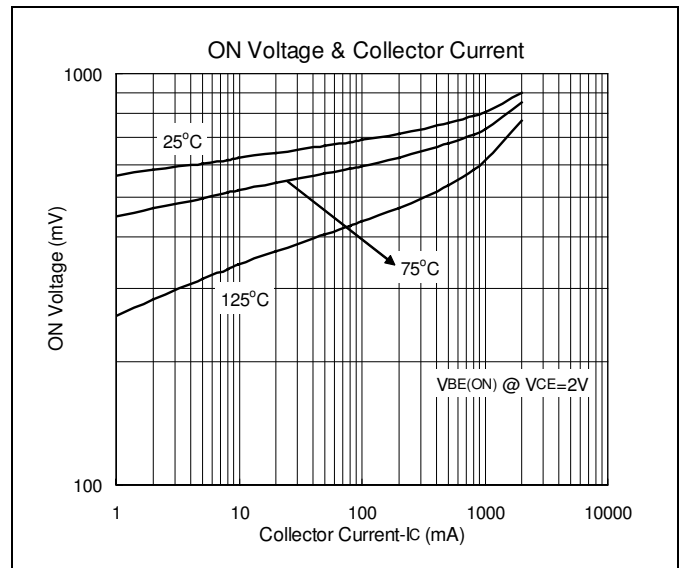
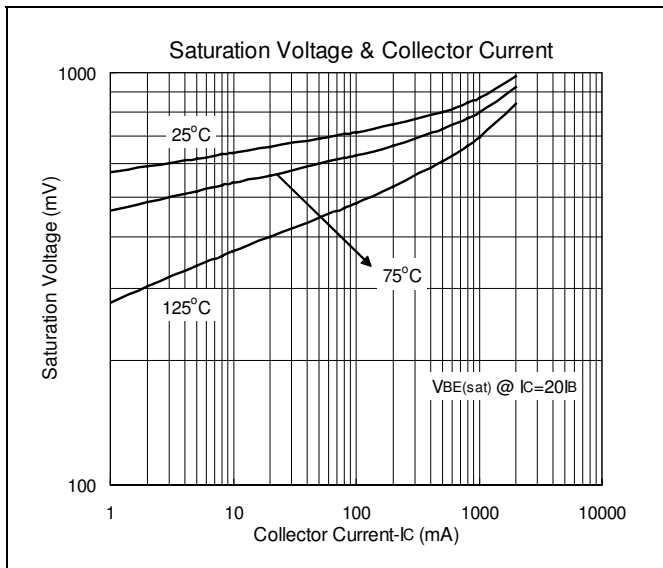
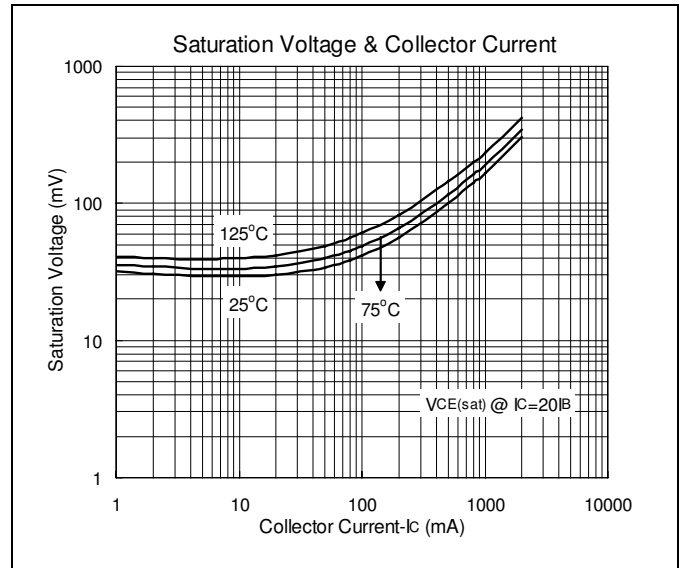
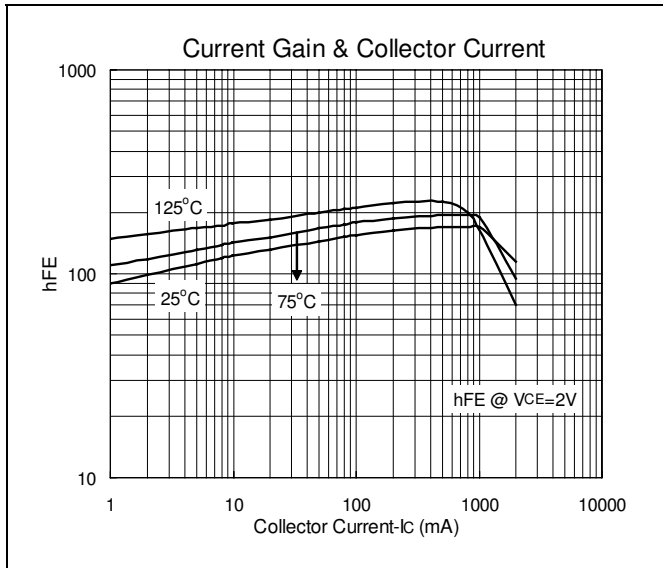
*Pulse Test: Pulse Width ≤380us, Duty Cycle≤2%

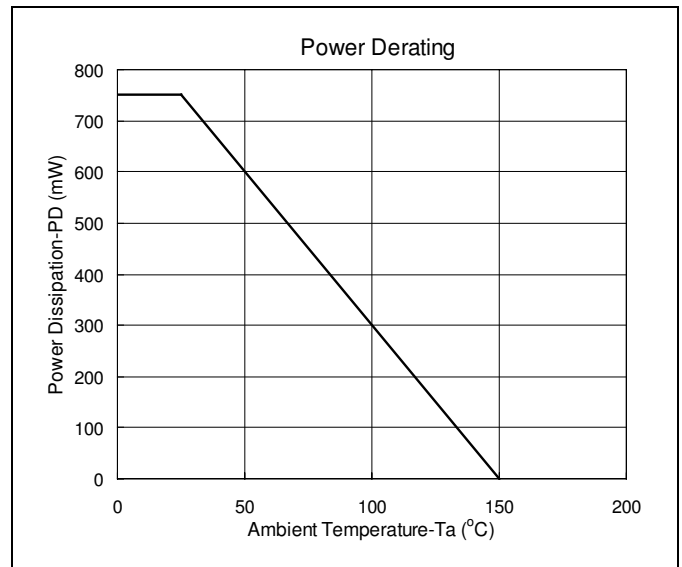
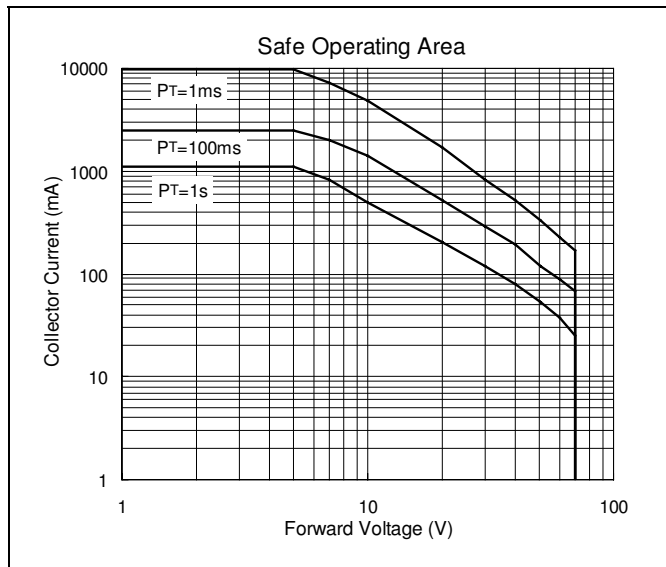
Classification of hFE1

Rank	Y	G	L
Range	135-270	200-400	300-600



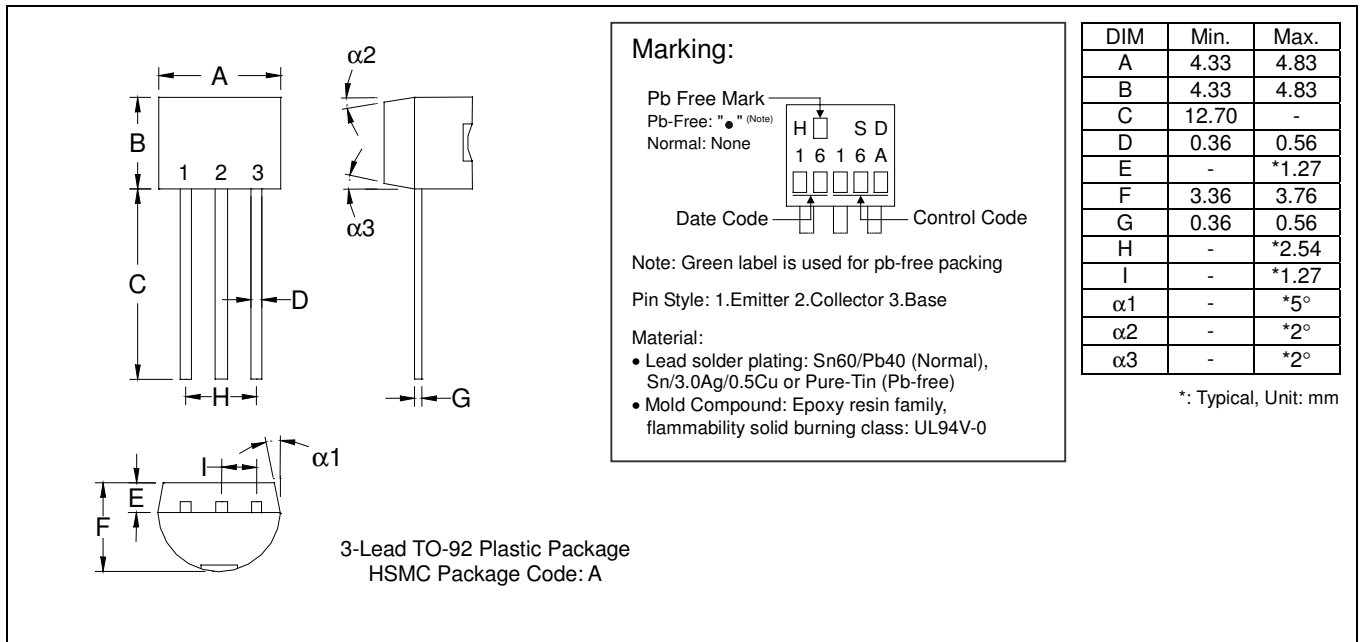
Characteristics Curve



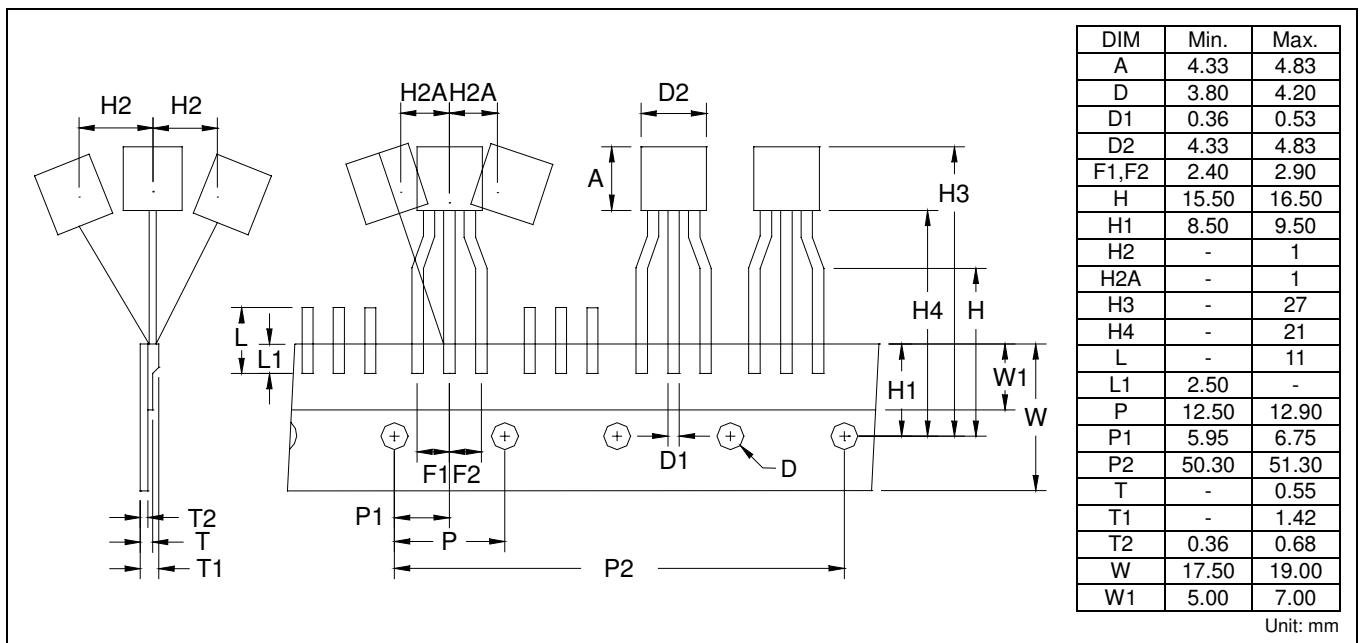




TO-92 Dimension



TO-92 Taping Dimension



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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

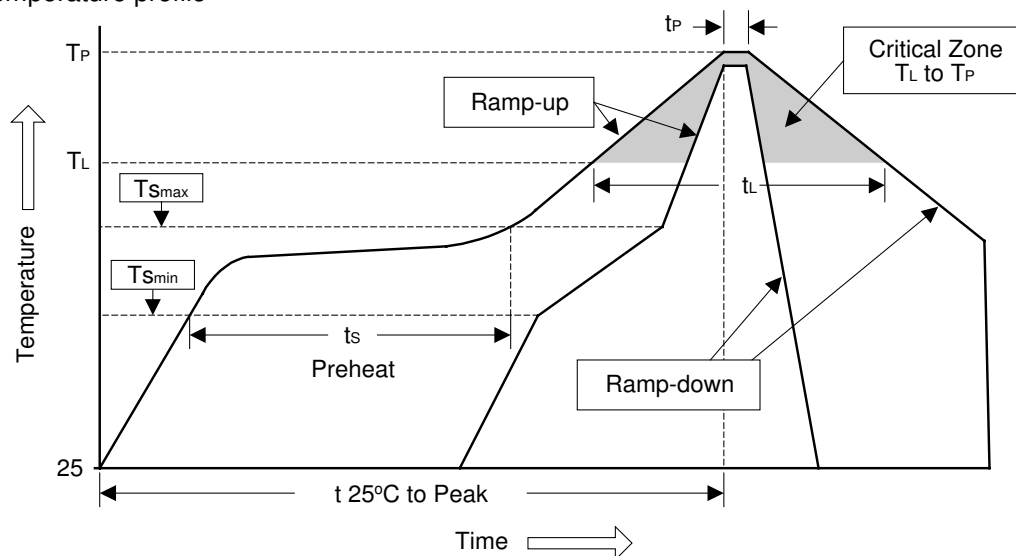


Soldering Methods for HSMC's Products

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

2. Reflow soldering of surface-mount devices

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