



HSC3953S

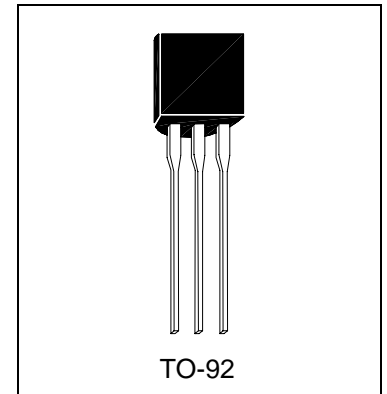
NPN EPITAXIAL PLANAR TRANSISTOR

Description

High-definition CRT display video output, wide-band amplifier applications.

Features

- High f_T : 500MHz
- High breakdown voltage: $V_{CEO}=120V$ min
- Small reverse transfer capacitance



Absolute Maximum Ratings

- Maximum Temperatures
 - Storage Temperature -55 ~ +150 °C
 - Junction Temperature 150 °C Maximum
- Maximum Power Dissipation
 - Total Power Dissipation ($T_A=25^{\circ}C$) 900 mW
- Maximum Voltages and Currents ($T_A=25^{\circ}C$)
 - V_{CBO} Collector to Base Voltage 120 V
 - V_{CEO} Collector to Emitter Voltage 120 V
 - V_{EBO} Emitter to Base Voltage 3 V
 - I_C Collector Current 200 mA
 - I_{CP} Peak Collector Current 400 mA

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
BV_{CBO}	120	-	-	V	$I_C=10\mu A, I_E=0$
BV_{CEO}	120	-	-	V	$I_C=1mA, I_B=0$
BV_{EBO}	3	-	-	V	$I_E=100\mu A, I_C=0$
I_{CBO}	-	-	0.1	μA	$V_{CB}=80V, I_E=0$
I_{EBO}	-	-	0.1	μA	$V_{EB}=2V, I_C=0$
$*V_{CE(sat)}$	-	-	1	V	$I_C=30mA, I_B=3mA$
$*V_{BE(sat)}$	-	-	1	V	$I_C=30mA, I_B=3mA$
$*h_{FE1}$	60	160	320		$V_{CE}=10V, I_C=10mA$
$*h_{FE2}$	40	-	-		$V_{CE}=10V, I_C=100mA$
f_T	-	400	-	MHz	$V_{CE}=10V, I_C=50mA,$
Cob	-	2.1	-	pF	$I_E=0, V_{CB}=30V, f=1MHz$

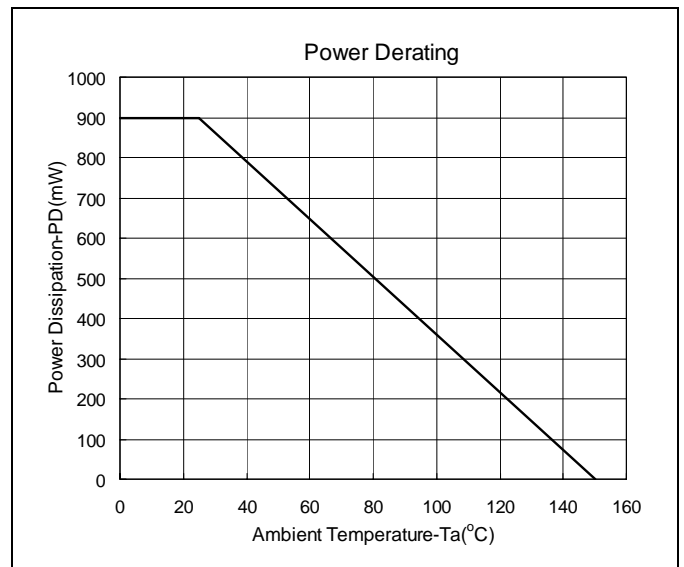
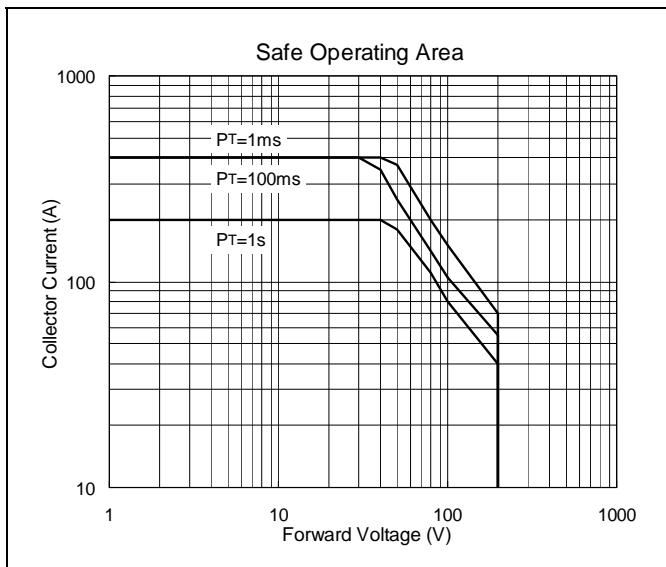
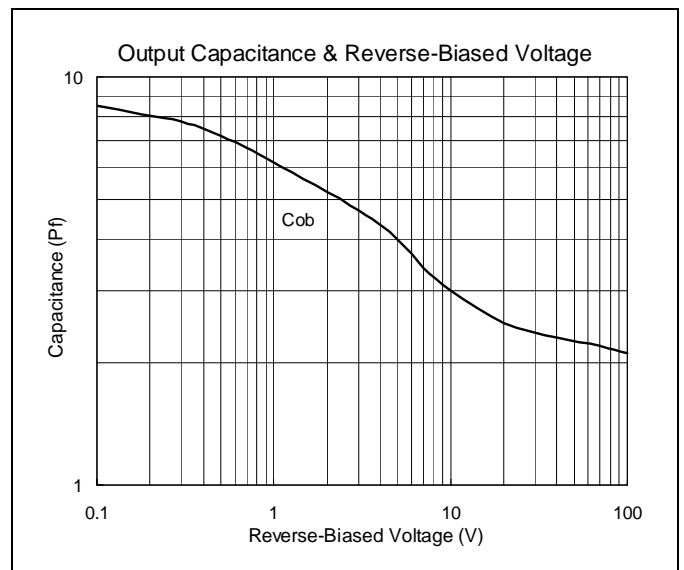
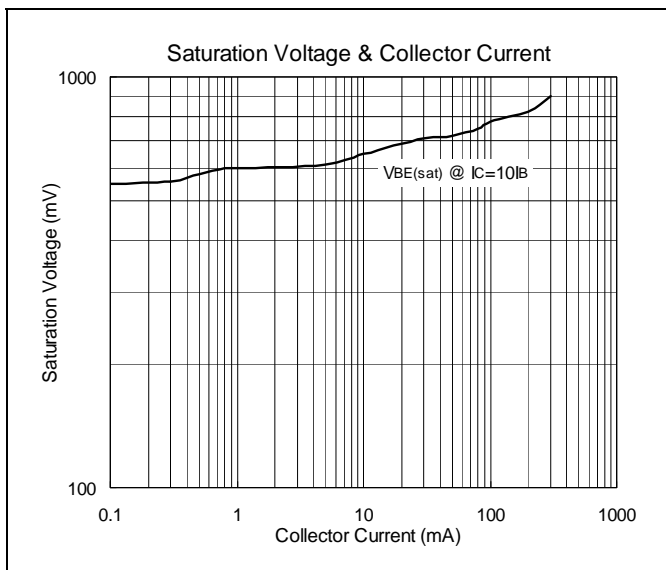
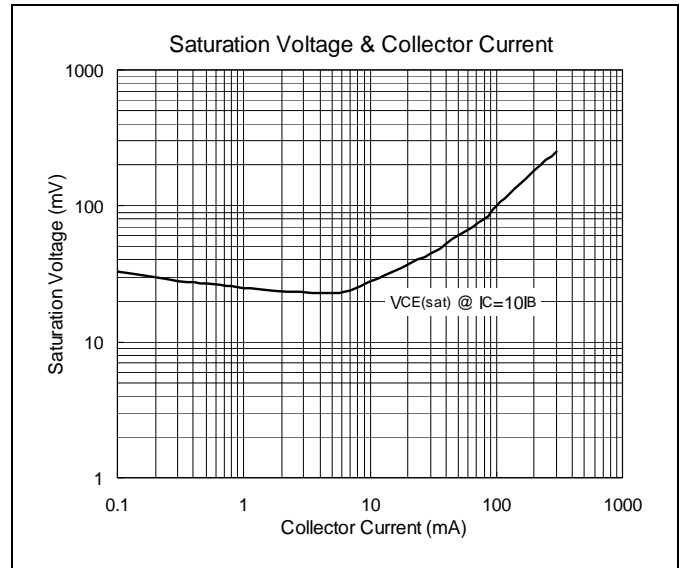
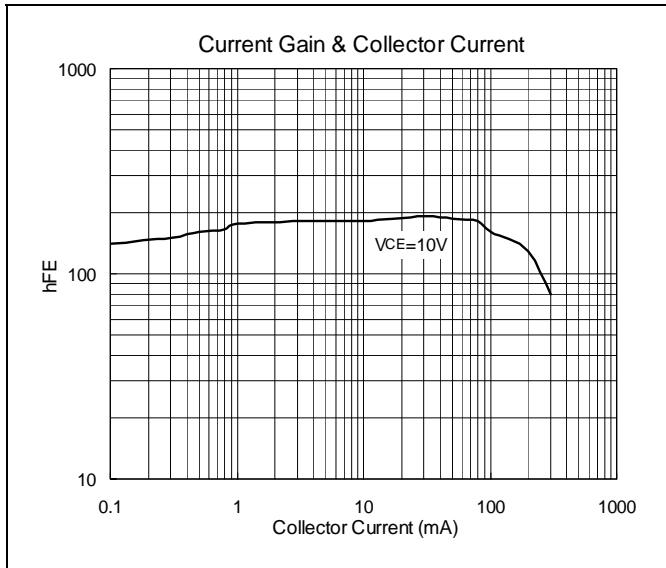
*Pulse Test: Pulse Width $\leq 380\mu s$, Duty Cycle $\leq 2\%$

Classification of h_{FE1}

Rank	D	E	F
Range	60-120	100-200	160-320



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	S	C
3	9	5
3	9	5

Date Code Control Code

Note: Green label is used for pb-free packing

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

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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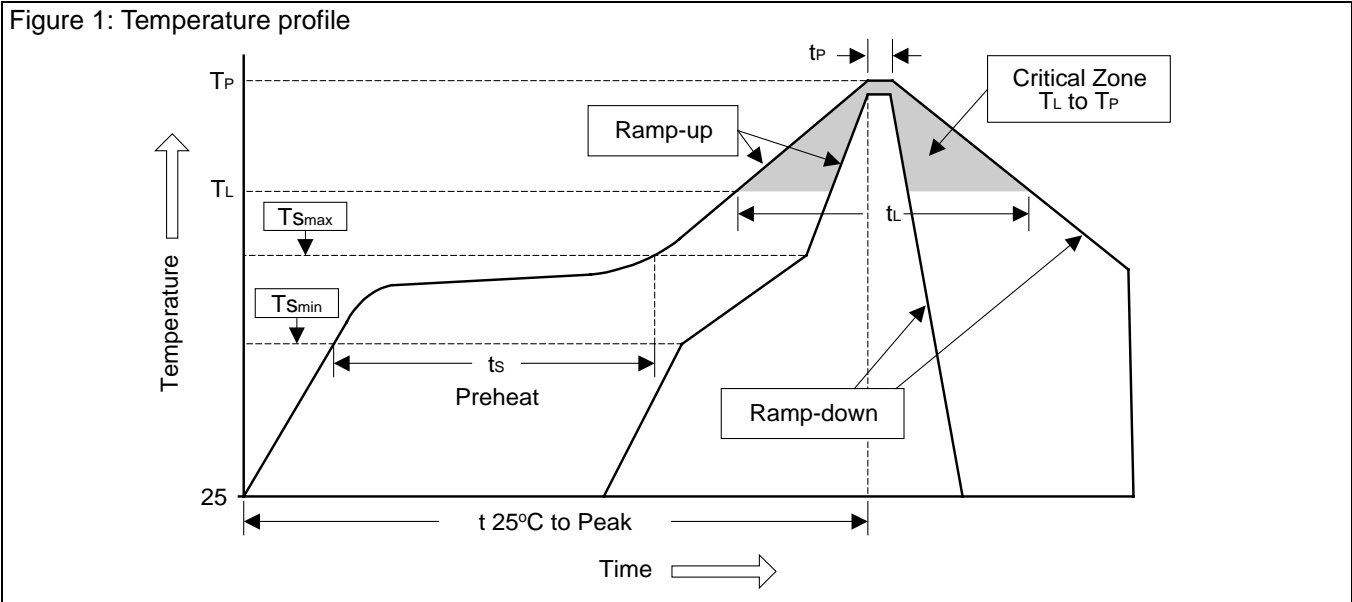
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Soldering Methods for HSMC's Products

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) (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