

NPN EPITAXIAL SILICON TRANSISTOR
FOR MICROWAVE LOW-NOISE AMPLIFICATION

The 2SC3587 is an NPN epitaxial transistor designed for low-noise amplification at 0.5 to 6.0 GHz. This transistor has low-noise and high-gain characteristics in a wide collector current region, and has a wide dynamic range.

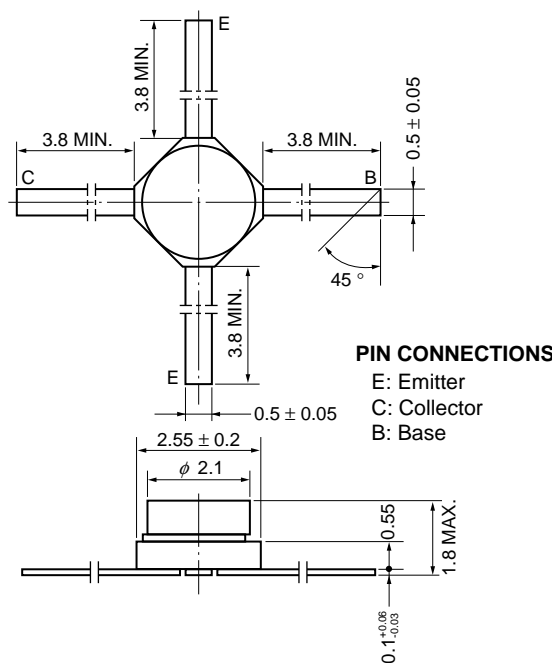
FEATURES

- Low noise : NF = 1.7 dB TYP. @ f = 2 GHz
NF = 2.6 dB TYP. @ f = 4 GHz
- High power gain : GA = 12.5 dB TYP. @ f = 2 GHz
GA = 8.0 dB TYP. @ f = 4 GHz

ABSOLUTE MAXIMUM RATINGS (TA = 25 °C)

PARAMETER	SYMBOL	RATING	UNIT
Collector to Base Voltage	V _{CB0}	20	V
Collector to Emitter Voltage	V _{CEO}	10	V
Emitter to Base Voltage	V _{EBO}	1.5	V
Collector Current	I _c	35	mA
Total Power Dissipation	P _T (T _C = 25 °C)	580	mW
Junction Temperature	T _j	200	°C
Storage Temperature	T _{stg}	-65 to +150	°C

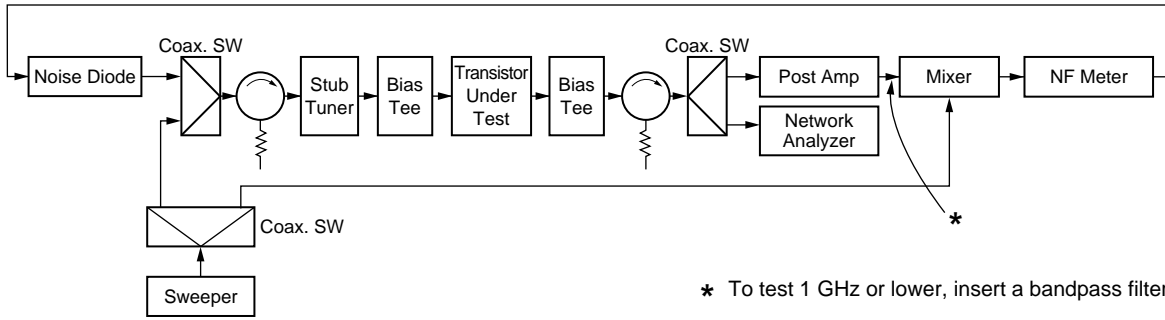
PACKAGE DIMENSIONS (in mm)



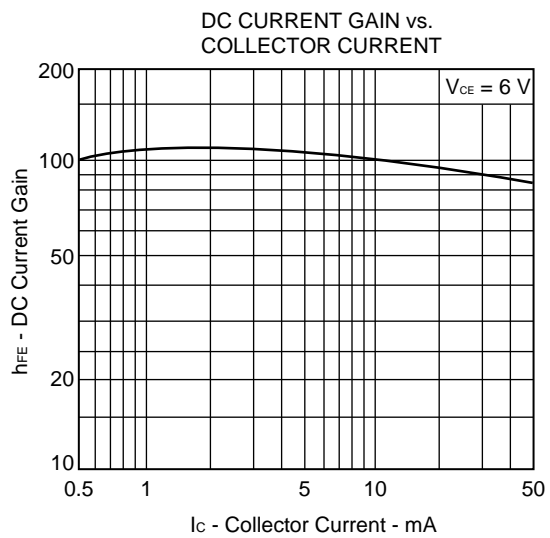
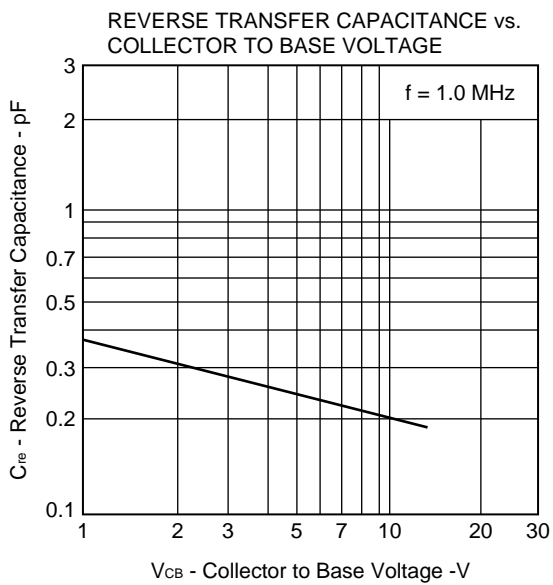
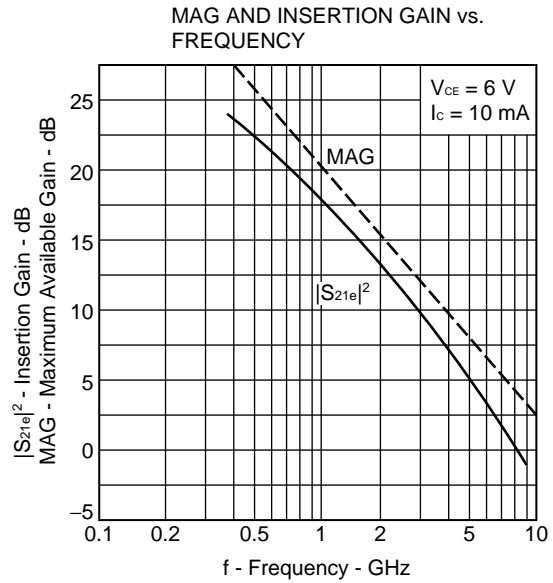
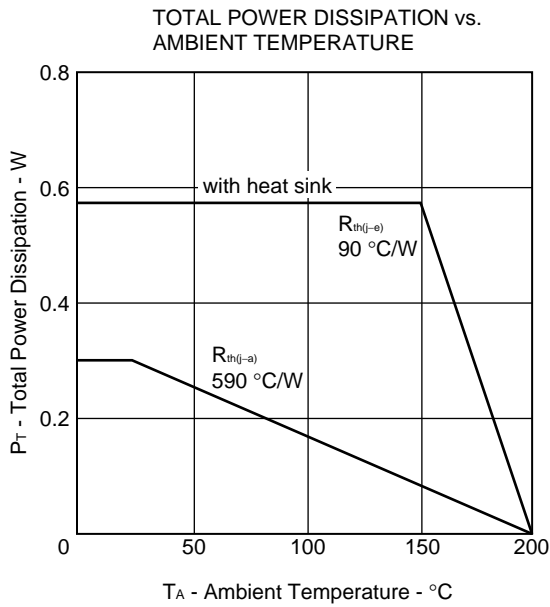
ELECTRICAL CHARACTERISTICS (TA = 25 °C)

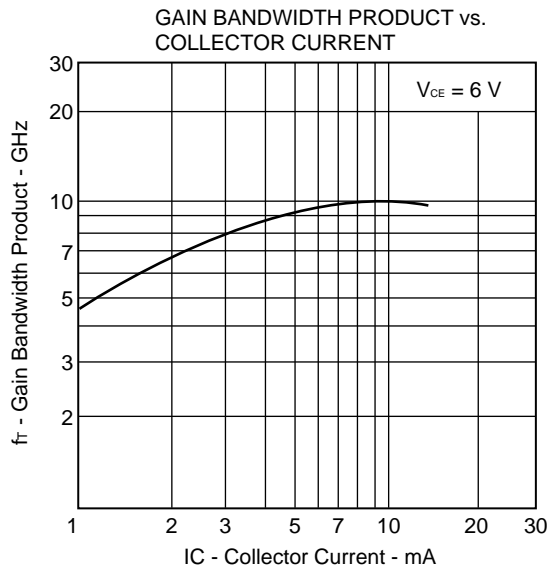
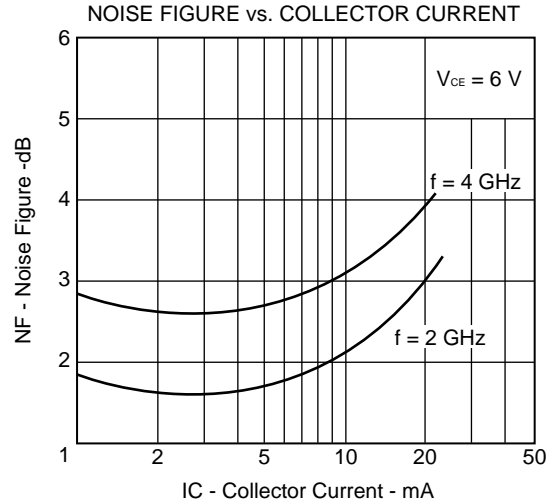
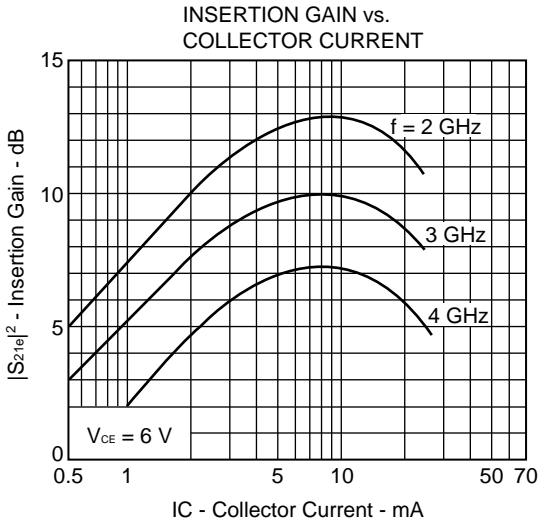
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I _{cBO}	V _{CB} = 10 V			1.0	μA
Emitter Cut-off Current	I _{EBO}	V _{EB} = 1 V			1.0	μA
DC Current Gain	h _{FE}	V _{CE} = 6 V, I _c = 10 mA Pulse	50	100	250	
Gain Bandwidth Product	f _T	V _{CE} = 6 V, I _c = 10 mA		10.0		GHz
Reverse Transfer Capacitance	C _{re}	V _{CB} = 10 V, f = 1 MHz		0.2	0.7	pF
Noise Figure	NF ^{Note}	V _{CE} = 6 V, I _c = 5 mA	f = 2 GHz	1.7	2.4	dB
			f = 4 GHz	2.6		dB
Insertion Gain	S _{21e} ²	V _{CE} = 6 V, I _c = 10 mA	f = 2 GHz	10.5	12.5	dB
			f = 4 GHz	7.5		dB
Maximum Available Gain	MAG	V _{CE} = 6 V, I _c = 10 mA, f = 4 GHz		10		dB
Power Gain	G _A	V _{CE} = 6 V, I _c = 5 mA	f = 2 GHz	12.5		dB
			f = 4 GHz	8.0		dB

Note Test block diagram



TYPICAL CHARACTERISTICS (T_A = 25 °C)





S PARAMETER

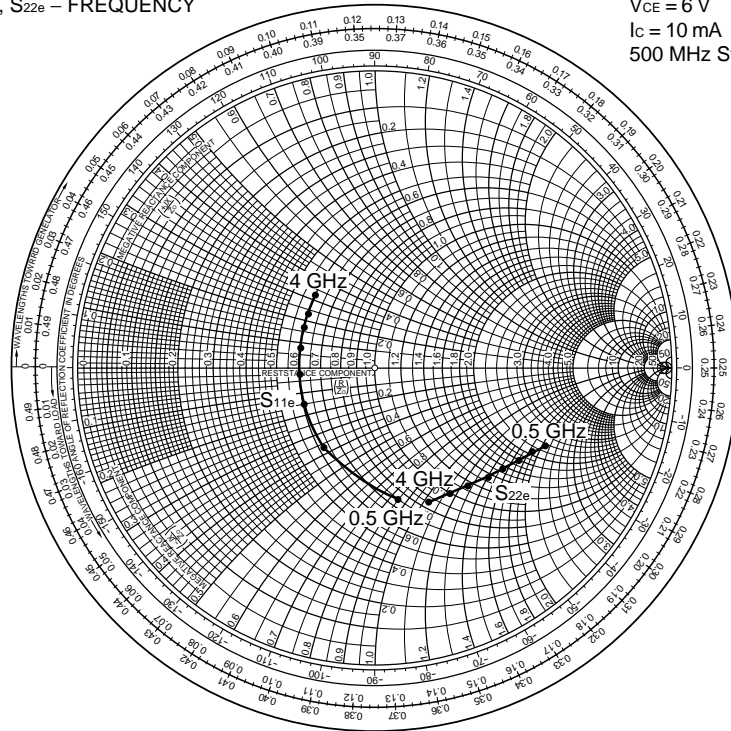
$V_{CE} = 6\text{ V}$, $I_C = 10\text{ mA}$, $Z_O = 50\ \Omega$

f (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
500	.466	-82.1	13.209	120.8	.0288	50.9	.634	-25.0
1000	.322	-123.8	8.371	95.7	.0424	54.2	.610	-29.4
1500	.271	-153.7	5.672	78.7	.0561	54.5	.579	-33.5
2000	.256	-176.6	4.304	66.9	.0697	54.1	.549	-38.7
2500	.262	167.3	3.456	58.6	.0848	51.9	.531	-46.2
3000	.270	152.0	3.095	46.1	.0955	48.0	.507	-52.8
3500	.294	142.0	2.595	35.0	.106	43.2	.498	-61.0
4000	.327	129.7	2.231	27.6	.127	35.2	.500	-68.4

S PARAMETER

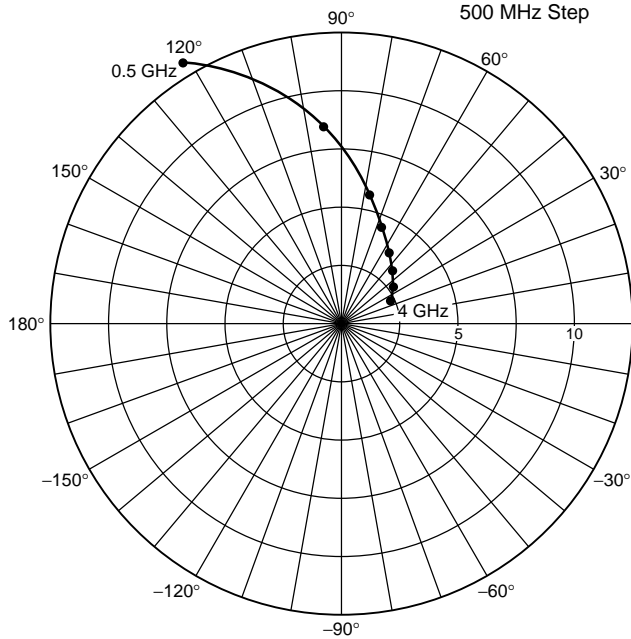
S_{11e}, S_{22e} – FREQUENCY

V_{CE} = 6 V
I_C = 10 mA
500 MHz Step



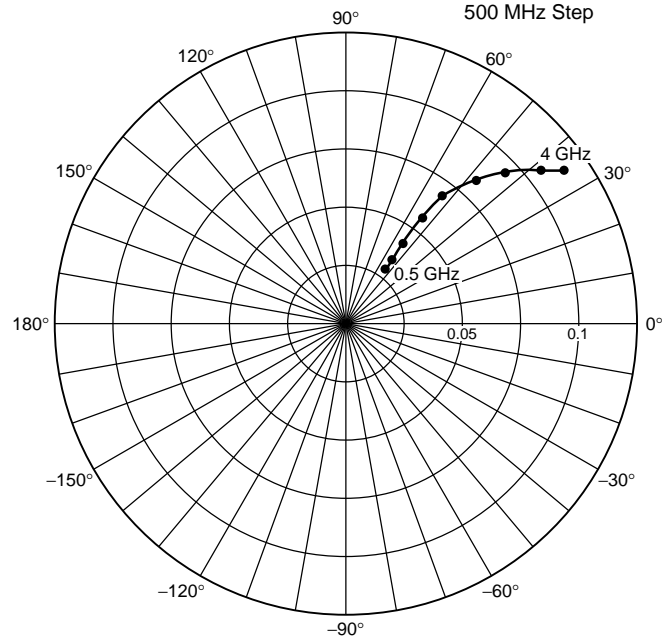
S₂₁ – FREQUENCY

V_{CE} = 6 V
I_C = 10 mA
500 MHz Step



S₁₂ – FREQUENCY

V_{CE} = 6 V
I_C = 10 mA
500 MHz Step



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Anti-radioactive design is not implemented in this product.