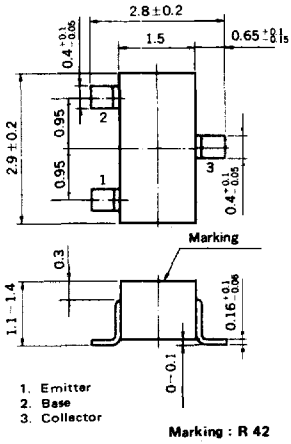
SILICON TRANSISTOR
2SC3585

MICROWAVE LOW NOISE AMPLIFIER
NPN SILICON EPITAXIAL TRANSISOR

PACKAGE DIMENSIONS
in millimeters



Marking : R 42

DESCRIPTION

2SC3585 is an NPN epitaxial silicon transistor designed for use in low-noise and small signal amplifiers from VHF band to UHF band. 2SC3585 features excellent power gain with very low-noise figures. 2SC3585 employs direct nitride passivated base surface process (DNP process) which is an NEC proprietary new fabrication technique which provides excellent noise figures at high current values. This allows excellent associated gain and very wide dynamic range.

FEATURES

- NF 1.8 dB TYP. @ f = 2.0 GHz
- G_a 9 dB TYP. @ f = 2.0 GHz

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Base Voltage	V_{CBO}	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	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

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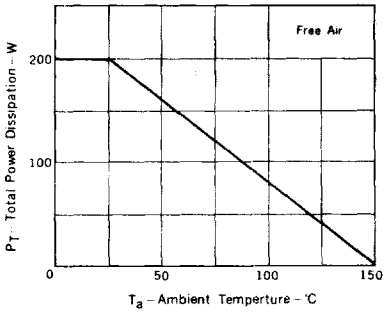
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

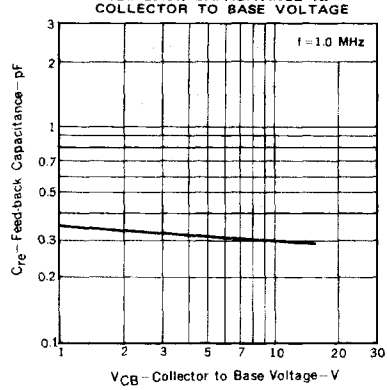
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			1.0	μA	V_{CB} = 10 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			1.0	μA	V_{EB} = 1 V, I_C = 0
DC Current Gain	h_{FE}	50	100	250		V_{CE} = 6 V, I_C = 10 mA
Gain Bandwidth Product	f_T		10		GHz	V_{CE} = 6 V, I_C = 10 mA
Feed-Back Capacitance	C_{re}		0.3	0.8	pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz
Insertion Power Gain	$\|S_{21e}\|^2$	6.0	8.0		dB	V_{CE} = 6 V, I_C = 10 mA, f = 2.0 GHz
Maximum Available Gain	MAG		10		dB	V_{CE} = 6 V, I_C = 10 mA, f = 2.0 GHz
Noise Figure	NF		1.8	3.0	dB	V_{CE} = 6 V, I_C = 5 mA, f = 2.0 GHz

TYPICAL CHARACTERISTICS (T_a = 25 °C)

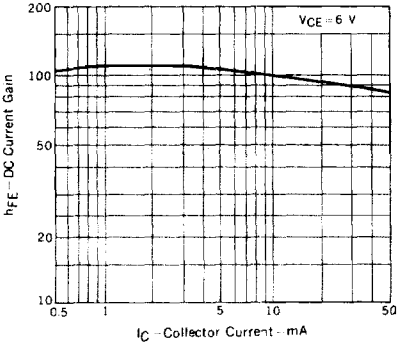
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



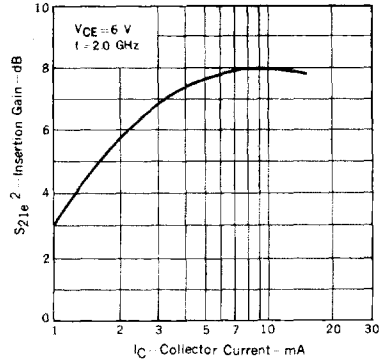
FEED-BACK CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



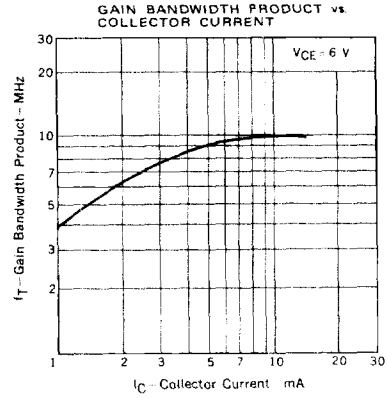
DC CURRENT GAIN vs. COLLECTOR CURRENT



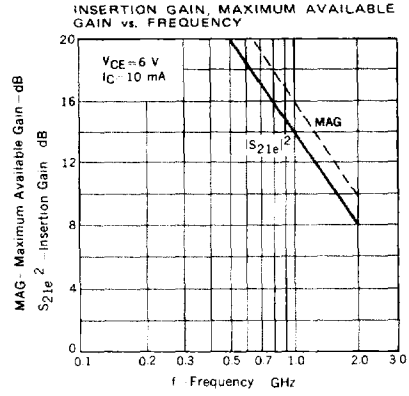
INSERTION GAIN vs. COLLECTOR CURRENT

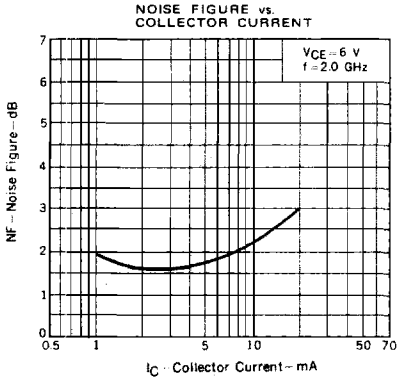


GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



INSERTION GAIN, MAXIMUM AVAILABLE GAIN vs. FREQUENCY





S-PARAMETER

V_{CE} = 6.0 V, I_C = 3.0 mA, Z_O = 50 Ω

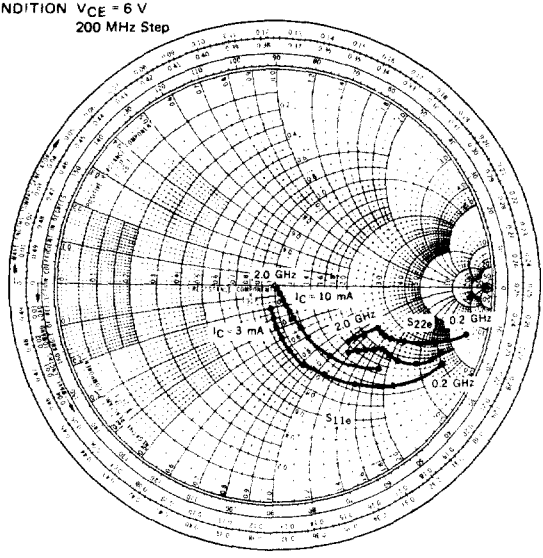
f(MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
200	0.858	−23.1	8.499	153.3	0.030	46.5	0.905	−13.5
400	0.724	−40.6	6.923	131.6	0.060	58.7	0.826	−21.2
600	0.580	−51.1	5.951	118.4	0.080	60.3	0.749	−27.0
800	0.457	−58.9	4.615	104.9	0.099	60.2	0.666	−28.6
1000	0.362	−65.6	4.134	98.0	0.106	61.2	0.614	−30.1
1200	0.304	−73.1	3.412	88.9	0.129	61.1	0.574	−30.0
1400	0.232	−82.2	3.180	82.0	0.148	60.1	0.542	−31.7
1600	0.179	−84.9	2.763	75.7	0.154	59.5	0.514	−35.2
1800	0.147	−88.2	2.726	70.5	0.188	58.7	0.483	−40.1
2000	0.108	−104.1	2.378	64.9	0.197	56.8	0.455	−42.6

V_{CE} = 6.0 V, I_C = 10.0 mA, Z_O = 50 Ω

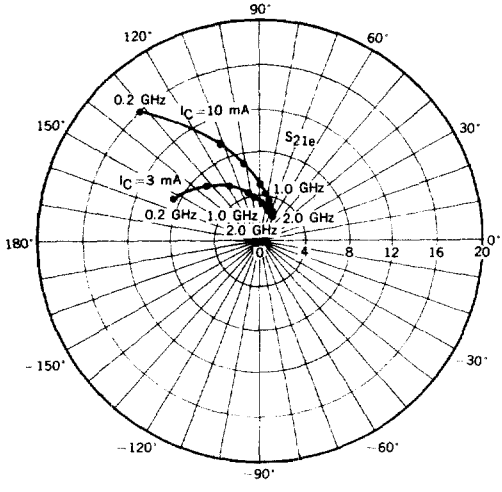
f(MHz)	$\|S_{11}\|$	$\angle S_{11}$	$\|S_{21}\|$	$\angle S_{21}$	$\|S_{12}\|$	$\angle S_{12}$	$\|S_{22}\|$	$\angle S_{22}$
200	0.613	−37.0	16.141	133.9	0.021	52.5	0.781	−19.4
400	0.406	−53.6	10.096	111.5	0.053	70.6	0.651	−22.4
600	0.285	−56.0	7.640	101.4	0.064	73.0	0.590	−24.0
800	0.214	−57.6	5.564	90.7	0.089	71.7	0.548	−22.8
1000	0.156	−58.1	4.787	86.0	0.095	70.6	0.526	−23.3
1200	0.130	−54.2	3.876	79.3	0.119	70.3	0.506	−22.1
1400	0.105	−56.5	3.573	74.0	0.141	68.3	0.489	−24.8
1600	0.065	−55.0	3.058	69.4	0.158	68.9	0.470	−27.9
1800	0.042	−48.9	2.997	65.3	0.178	66.5	0.439	−31.4
2000	0.018	−65.6	2.590	60.7	0.202	66.2	0.426	−36.5

S-PARAMETER

S_{11e}, S_{22e} – FREQUENCY CONDITION V_{CE} = 6 V
200 MHz Step



S_{21e} – FREQUENCY CONDITION V_{CE} = 6 V



S_{12e} – FREQUENCY CONDITION V_{CE} = 6 V