

SANYO	No.5187	2SC5277
		NPN Epitaxial Planar Silicon Transistor UHF to S Band Low-Noise Amp, OSC Applications

Features

- Low noise : NF=0.9dB typ (f=1GHz).
: NF=1.4dB typ (f=1.5GHz).
- High gain : $|S_{21e}|^2 = 10\text{dB typ (f=1.5GHz)}$.
- High cutoff frequency : $f_T = 11\text{GHz typ}$.
- Low-voltage, low-current operation ($V_{CE} = 1\text{V}, I_C = 1\text{mA}$).
: $f_T = 7\text{GHz typ}$.
: $|S_{21e}|^2 = 5.5\text{dB typ (f=1.5GHz)}$.
- Very small-sized package permitting 2SC5277-applied sets to be made small and slim.

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

			unit
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	30	mA
Collector Dissipation	P_C	100	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

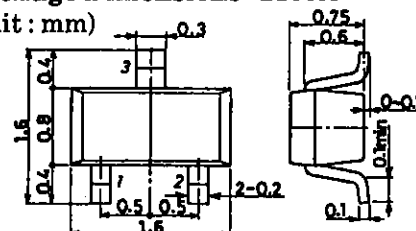
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB} = 10\text{V}, I_E = 0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 1\text{V}, I_C = 0$			10	μA
DC Current Gain	h_{FE}	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	60*		270*	
Gain-Bandwidth Product	$f_T(1)$	$V_{CE} = 5\text{V}, I_C = 10\text{mA}$	8	11		GHz
	$f_T(2)$	$V_{CE} = 1\text{V}, I_C = 1\text{mA}$		7		GHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.45	0.7	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.30		pF
Forward Transfer Gain	$ S_{21e} ^{2(1)}$	$V_{CE} = 5\text{V}, I_C = 10\text{mA}, f = 1.5\text{GHz}$	8	10		dB
	$ S_{21e} ^{2(2)}$	$V_{CE} = 1\text{V}, I_C = 1\text{mA}, f = 1.5\text{GHz}$		5.5		dB
Noise Figure	NF(1)	$V_{CE} = 5\text{V}, I_C = 5\text{mA}, f = 1.5\text{GHz}$		1.4	3.0	dB
	NF(2)	$V_{CE} = 2\text{V}, I_C = 3\text{mA}, f = 1\text{GHz}$		0.9		dB

* : The 2SC5277 is classified by 10mA h_{FE} as follows :

Marking	D1	D2	D3
h_{FE}	60 to 120	90 to 180	135 to 270

Package Dimensions 2106A

(unit : mm)

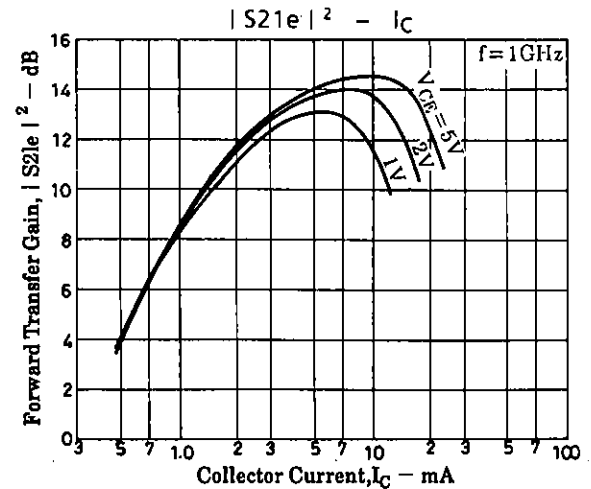
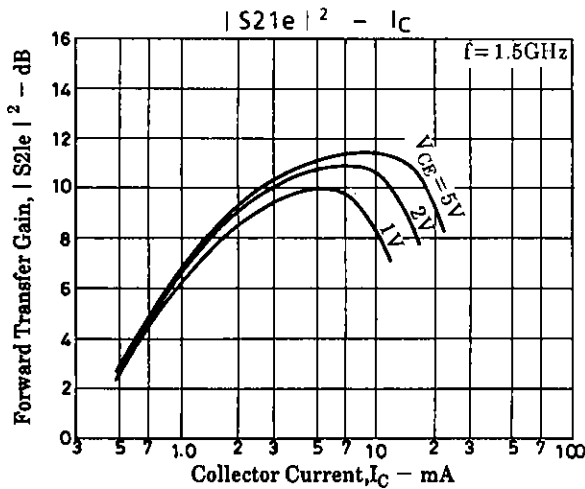
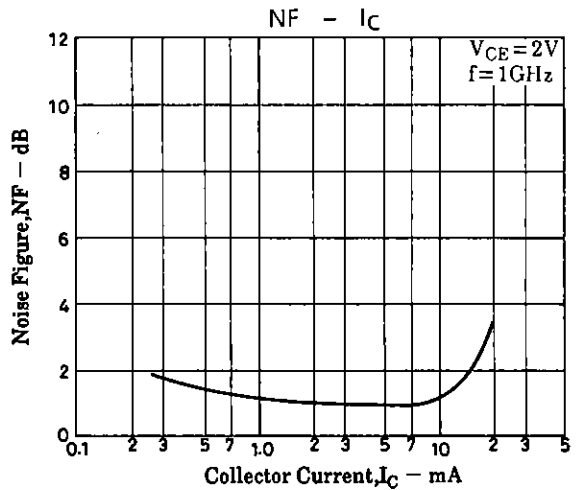
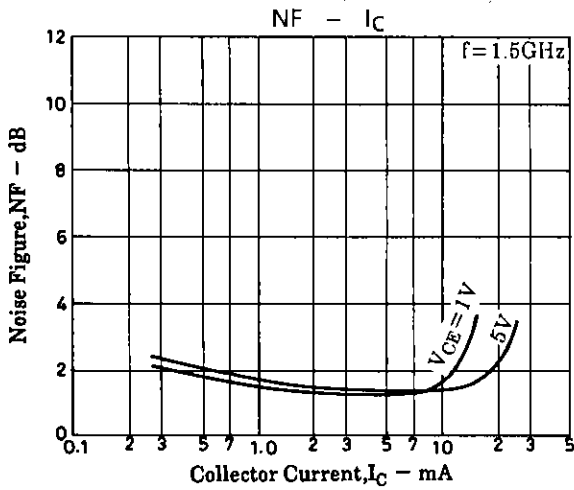
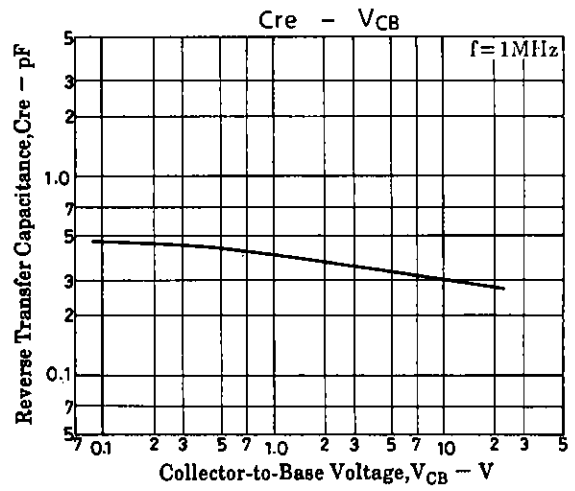
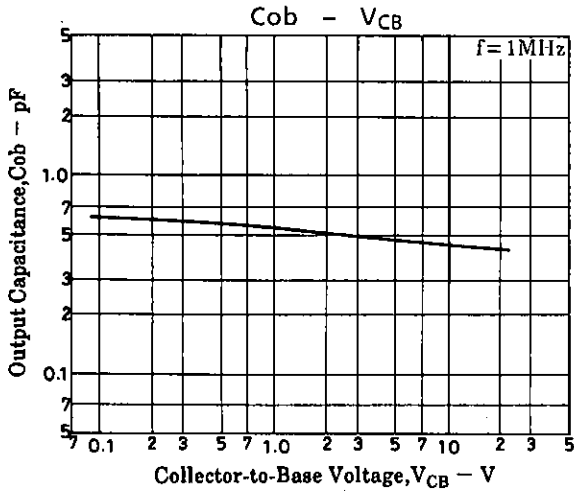
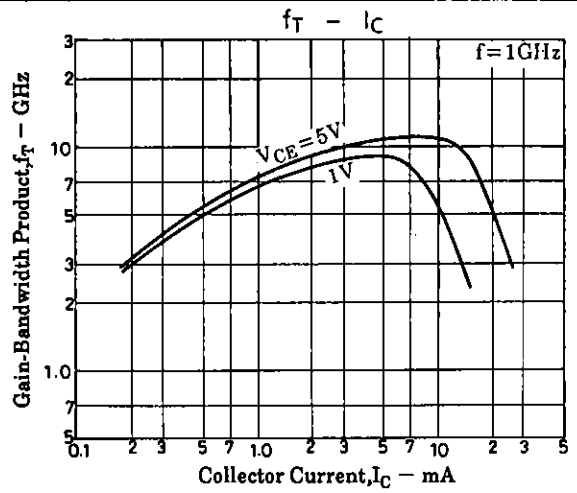
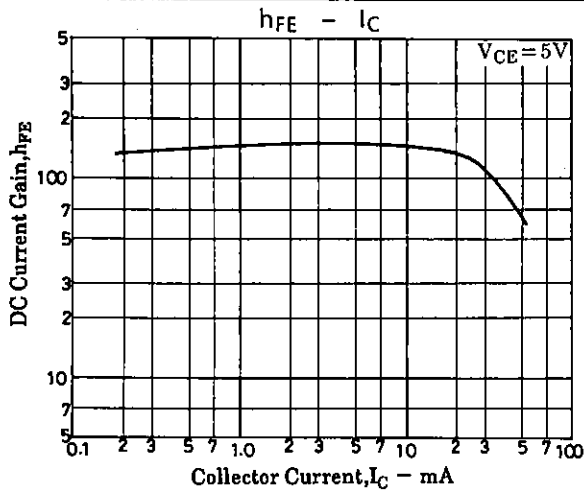


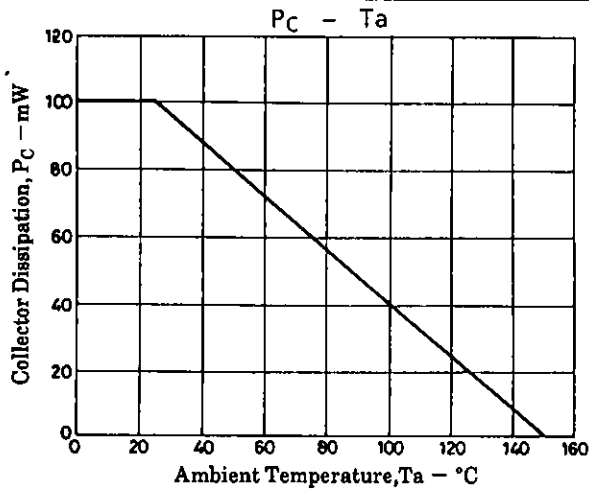
1: Base
2: Emitter
3: Collector

SANYO: SMCP

SANYO Electric Co., Ltd. Semiconductor Business Headquarters

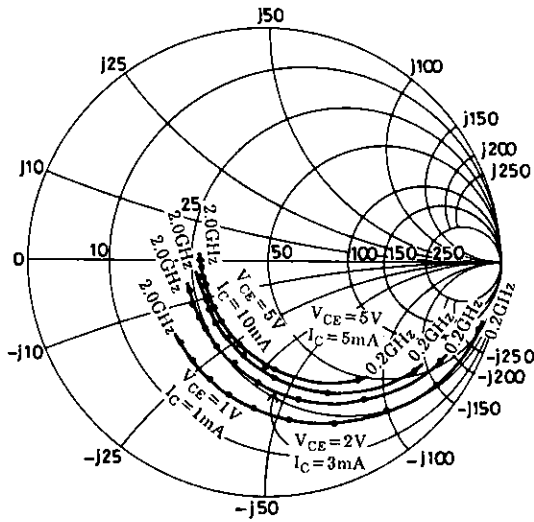
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN



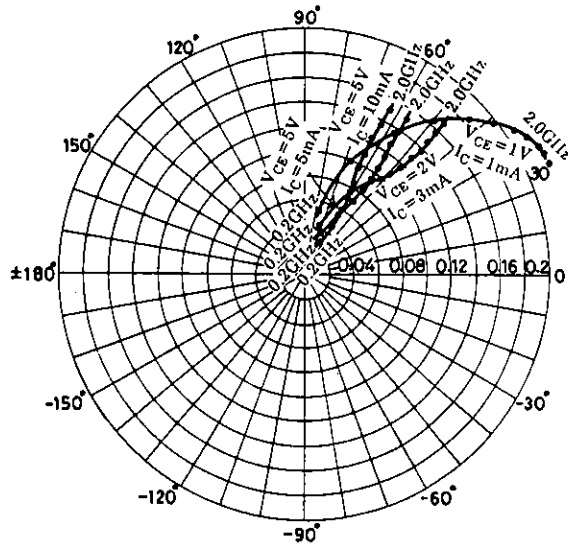


S Parameters

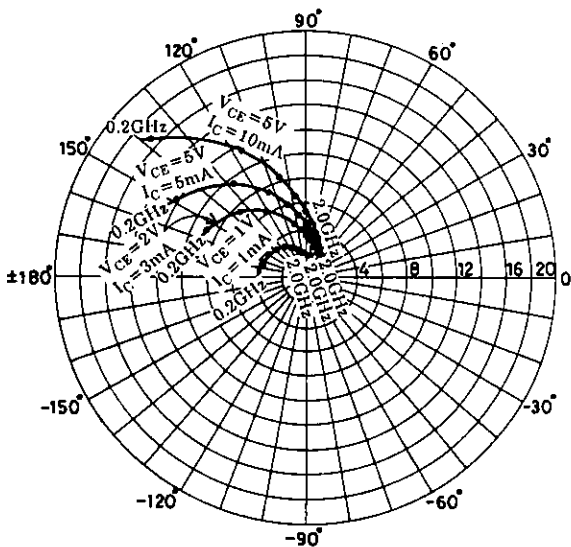
S11e : f= 200 to 2000MHz (200MHz step)



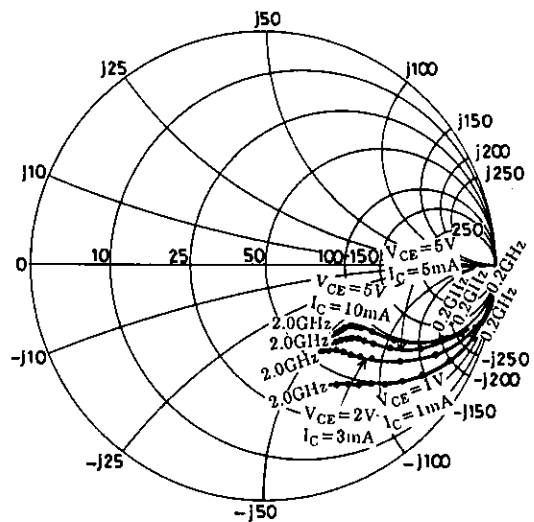
S21e : f= 200 to 2000MHz (200MHz step)



S12e : f= 200 to 2000MHz (200MHz step)



S22e : f= 200 to 2000MHz (200MHz step)



S Parameters (Common emitter) $V_{CE}=5V, I_C=5mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.782	-37.1	12.043	148.4	0.038	69.7	0.889	-19.5
400	0.623	-65.4	9.431	126.6	0.057	60.8	0.758	-28.3
600	0.502	-85.6	7.415	112.2	0.072	56.5	0.646	-33.3
800	0.420	-102.4	6.000	101.5	0.083	55.2	0.577	-35.9
1000	0.369	-114.7	5.025	93.6	0.094	55.1	0.538	-37.6
1200	0.339	-127.2	4.323	86.7	0.105	55.6	0.513	-38.7
1400	0.311	-137.2	3.785	80.6	0.115	55.6	0.490	-39.7
1600	0.296	-144.9	3.391	75.3	0.127	56.7	0.480	-41.3
1800	0.285	-156.5	3.018	70.1	0.139	56.4	0.466	-43.5
2000	0.277	-164.2	2.767	65.7	0.150	56.7	0.460	-45.5

 $V_{CE}=5V, I_C=10mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.641	-52.7	16.527	137.8	0.031	67.4	0.820	-22.9
400	0.468	-85.4	11.299	115.7	0.048	60.5	0.643	-30.2
600	0.377	-106.6	8.303	103.1	0.060	60.0	0.549	-32.2
800	0.321	-124.1	6.502	94.0	0.072	60.9	0.499	-33.2
1000	0.293	-136.1	5.342	87.4	0.084	61.9	0.477	-33.9
1200	0.280	-146.7	4.546	81.4	0.097	62.7	0.462	-35.0
1400	0.266	-156.6	3.947	76.4	0.108	63.0	0.449	-36.2
1600	0.263	-163.2	3.527	71.4	0.123	63.7	0.444	-37.8
1800	0.263	-173.5	3.121	67.0	0.136	62.8	0.435	-39.9
2000	0.264	-179.8	2.864	62.8	0.150	62.4	0.434	-42.4

 $V_{CE}=2V, I_C=3mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.851	-30.4	8.644	154.1	0.042	73.0	0.937	-16.4
400	0.724	-55.7	7.310	133.8	0.073	61.3	0.820	-27.9
600	0.612	-76.1	6.083	118.6	0.093	54.2	0.709	-35.7
800	0.521	-93.0	5.085	106.9	0.107	50.4	0.628	-40.4
1000	0.461	-106.1	4.343	98.1	0.118	48.3	0.572	-43.7
1200	0.423	-118.6	3.806	90.0	0.128	47.5	0.536	-45.8
1400	0.382	-129.4	3.349	83.3	0.137	46.9	0.506	-47.3
1600	0.366	-138.0	3.036	77.5	0.147	47.4	0.485	-49.5
1800	0.341	-148.8	2.685	71.7	0.157	47.2	0.463	-51.9
2000	0.333	-157.7	2.479	66.7	0.167	47.6	0.453	-54.1

2SC5277

$V_{CE}=1V, I_C=1mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.945	-18.7	3.431	162.9	0.053	78.1	0.982	-10.3
400	0.892	-36.9	3.263	147.1	0.099	66.9	0.939	-19.7
600	0.826	-52.9	3.004	133.2	0.136	57.5	0.879	-27.7
800	0.754	-67.9	2.765	120.4	0.164	49.7	0.815	-34.8
1000	0.691	-81.1	2.539	109.9	0.184	43.4	0.758	-40.0
1200	0.639	-94.3	2.366	99.8	0.199	38.4	0.727	-44.3
1400	0.589	-104.9	2.143	91.2	0.207	34.1	0.683	-47.8
1600	0.558	-114.1	1.969	83.6	0.213	31.7	0.653	-51.4
1800	0.522	-124.4	1.797	76.2	0.218	28.7	0.621	-54.9
2000	0.490	-134.9	1.701	69.7	0.219	27.0	0.601	-58.1

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