

<b>SANYO</b>	No.5185	<b>2SC5275</b>
		NPN Epitaxial Planar Silicon Transistor UHF to S Band Low-Noise Amp, OSC Applications

**Features**

- Low noise :  $NF=0.9\text{dB typ (}f=1\text{GHz)}$ .  
                  :  $NF=1.4\text{dB typ (}f=1.5\text{GHz)}$ .
- High gain :  $|S_{21e}|^2=10\text{dB typ (}f=1.5\text{GHz)}$ .
- High cutoff frequency :  $f_T=11\text{GHz typ}$ .
- Low-voltage, low-current operation ( $V_{CE}=1\text{V, }I_C=1\text{mA}$ ).  
  :  $f_T=7\text{GHz typ}$ .  
  :  $|S_{21e}|^2=5.5\text{dB typ (}f=1.5\text{GHz)}$ .

**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	$P_C$	200	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	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=1\text{V, }I_C=0$			10	$\mu\text{A}$
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
		$V_{CE}=1\text{V, }I_C=1\text{mA}$		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
		$V_{CE}=1\text{V, }I_C=1\text{mA, }f=1.5\text{GHz}$		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
		$V_{CE}=2\text{V, }I_C=3\text{mA, }f=1\text{GHz}$		0.9		dB

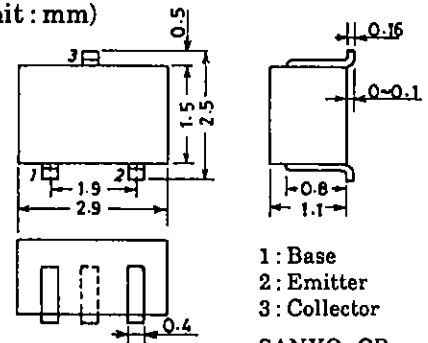
\* : The 2SC5275 is classified by 10mA  $h_{FE}$  as follows :

60	3	120	90	4	180	135	5	270
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Marking : MN  
 $h_{FE}$  ranks : 3, 4, 5

**Package Dimensions 2018B**

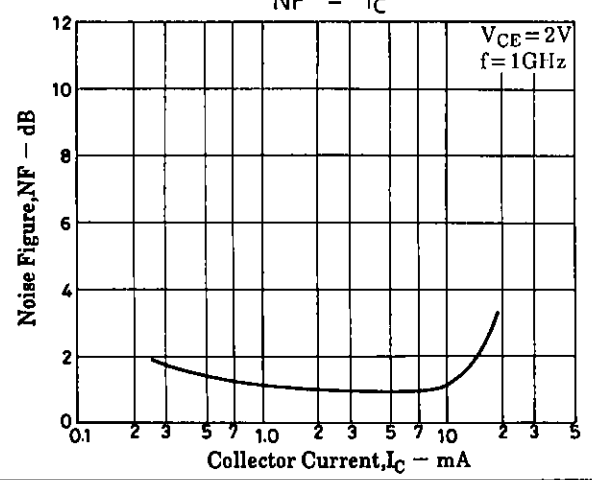
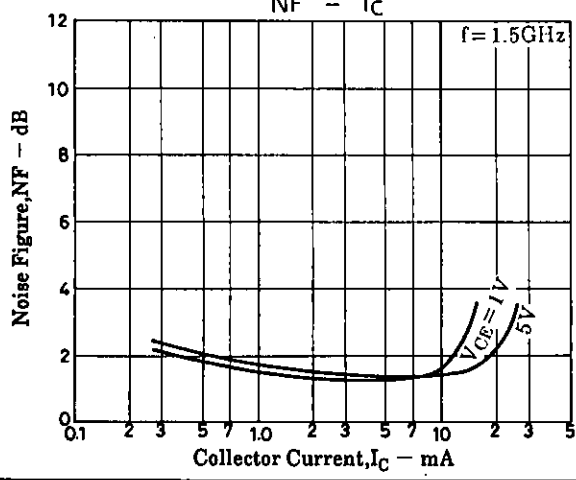
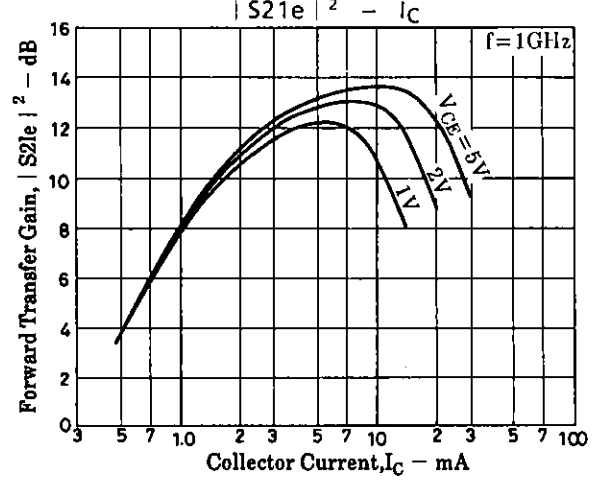
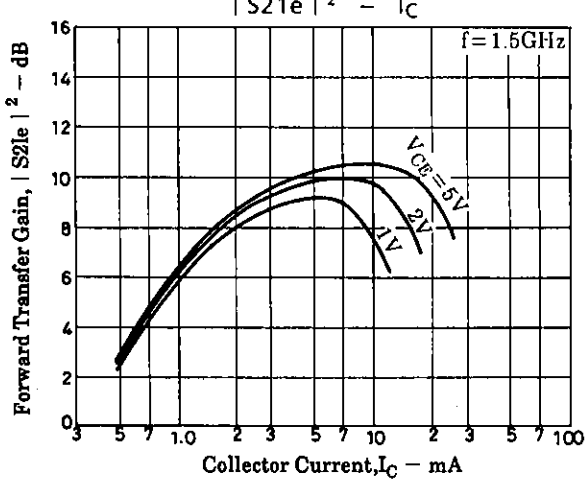
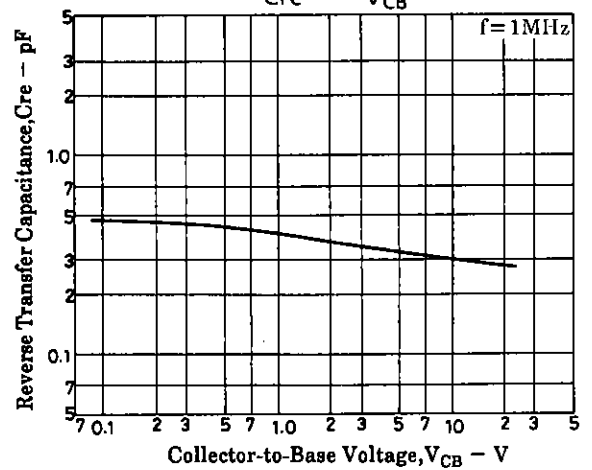
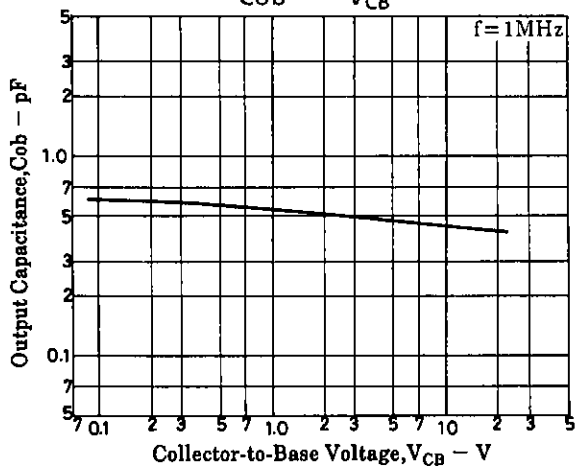
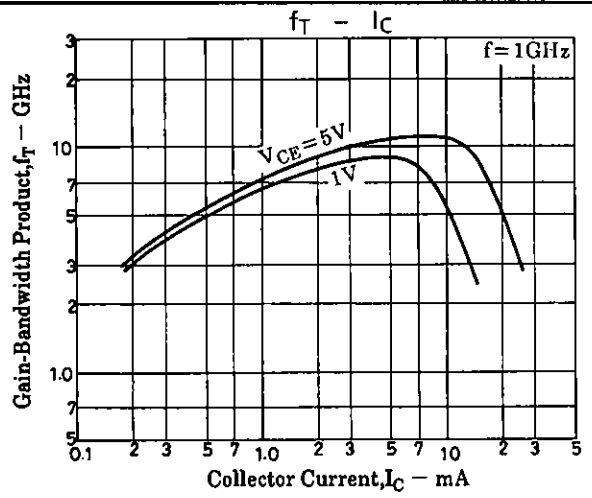
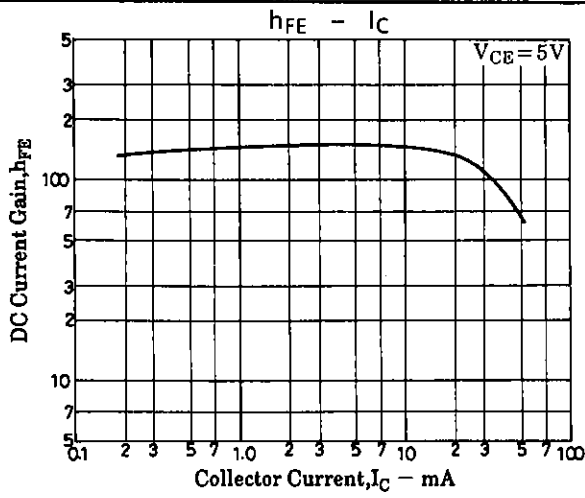
(unit : mm)

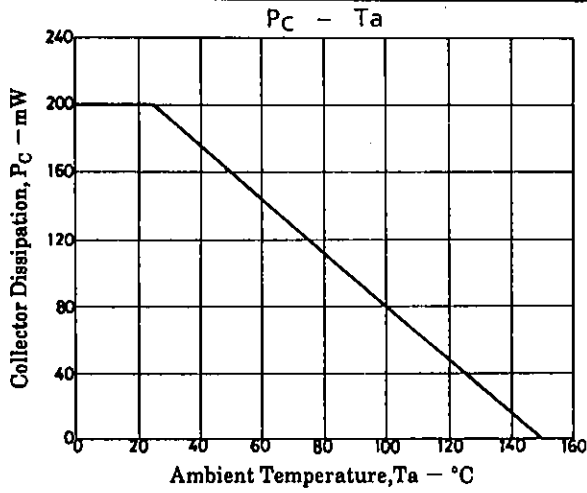


**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

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

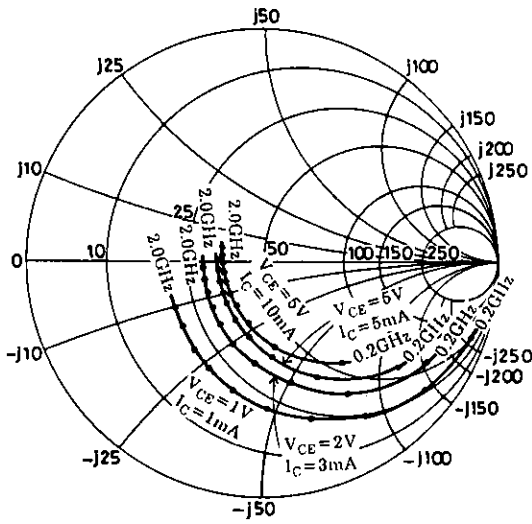
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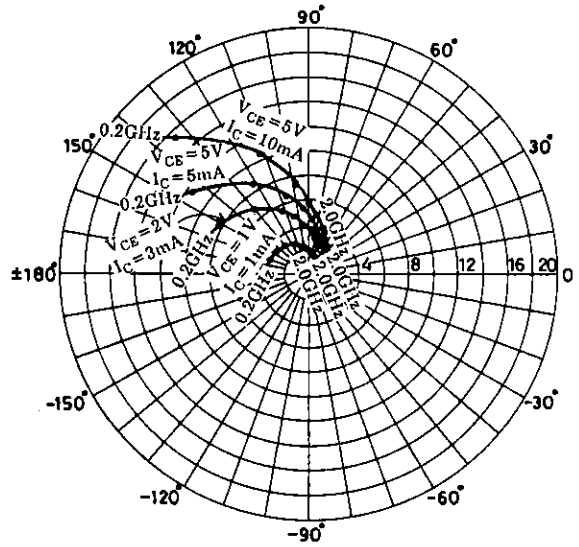


**S Parameters**

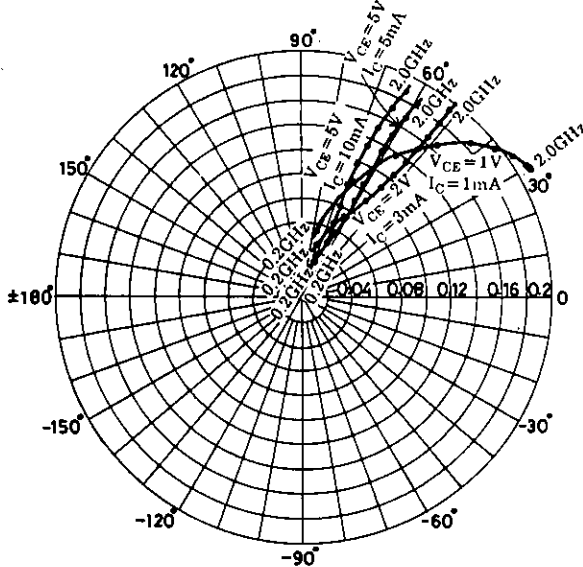
**S11e : f=200 to 2000MHz (200MHz step)**



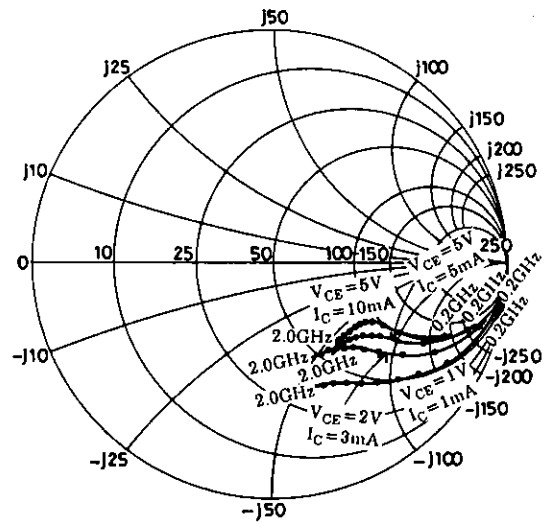
**S21e : f=200 to 2000MHz (200MHz step)**



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



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



## 2SC5275

### 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	0.725	-37.6	11.573	144.6	0.035	71.3	0.885	-18.7
400	0.540	-64.0	8.744	122.0	0.058	63.0	0.731	-27.7
600	0.400	-83.2	6.691	107.0	0.074	60.6	0.628	-31.4
800	0.320	-98.5	5.357	96.6	0.089	60.8	0.562	-33.3
1000	0.263	-112.1	4.503	88.5	0.104	61.0	0.527	-35.1
1200	0.221	-127.8	3.874	81.2	0.119	60.7	0.503	-37.5
1400	0.199	-140.4	3.409	74.6	0.135	60.7	0.487	-40.1
1600	0.180	-154.5	2.984	68.5	0.150	60.7	0.473	-43.3
1800	0.169	-169.9	2.710	63.0	0.167	59.9	0.463	-46.8
2000	0.168	176.2	2.486	58.2	0.183	59.4	0.462	-50.4

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.547	-51.4	15.617	133.5	0.031	69.6	0.799	-22.7
400	0.364	-80.4	10.257	111.4	0.049	65.8	0.628	-27.9
600	0.261	-99.7	7.389	98.8	0.065	66.3	0.548	-28.7
800	0.202	-116.9	5.761	89.9	0.081	67.4	0.501	-29.6
1000	0.177	-132.9	4.763	83.2	0.099	67.7	0.481	-31.1
1200	0.157	-150.3	4.055	76.5	0.117	67.0	0.467	-33.5
1400	0.150	-164.6	3.545	71.0	0.134	66.4	0.458	-36.3
1600	0.148	-179.2	3.111	65.6	0.151	65.7	0.448	-40.0
1800	0.154	169.8	2.814	60.5	0.170	64.3	0.441	-43.9
2000	0.162	157.5	2.565	56.0	0.187	63.4	0.440	-47.8

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.814	-31.0	8.333	151.1	0.044	72.9	0.924	-17.0
400	0.664	-56.7	6.925	129.6	0.074	61.9	0.793	-28.4
600	0.526	-75.9	5.576	113.7	0.094	56.2	0.683	-34.9
800	0.430	-92.7	4.639	101.8	0.109	54.1	0.598	-39.1
1000	0.364	-107.1	3.950	92.7	0.124	53.1	0.547	-42.1
1200	0.310	-121.7	3.449	84.3	0.138	52.3	0.510	-44.9
1400	0.274	-134.9	3.048	76.9	0.152	52.2	0.485	-48.0
1600	0.247	-148.7	2.706	70.1	0.165	52.1	0.464	-51.6
1800	0.237	-162.4	2.446	64.0	0.180	52.0	0.450	-55.2
2000	0.233	-174.5	2.250	58.7	0.193	52.0	0.444	-58.8

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.937	-19.9	3.404	161.1	0.055	77.0	0.978	-11.1
400	0.876	-38.2	3.198	144.6	0.102	65.7	0.926	-21.1
600	0.780	-56.2	2.929	128.8	0.138	56.2	0.858	-29.5
800	0.699	-72.0	2.656	115.8	0.164	48.7	0.784	-36.7
1000	0.619	-87.4	2.478	104.2	0.185	42.8	0.734	-42.1
1200	0.553	-101.1	2.224	93.8	0.196	37.8	0.677	-47.7
1400	0.498	-114.4	2.062	84.1	0.204	34.1	0.639	-52.5
1600	0.457	-125.9	1.843	75.6	0.209	31.5	0.610	-56.9
1800	0.418	-139.7	1.722	67.5	0.201	30.5	0.580	-61.4
2000	0.398	-151.1	1.592	60.9	0.210	30.3	0.567	-65.2

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