

SANYO	No.5184A	2SC5245
		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 : | S21e | ²=10dB typ (f=1.5GHz).
- High cutoff frequency : f_T=11GHz typ.
- Low-voltage, low-current operation (V_{CE}=1V, I_C=1mA).
 : f_T=7GHz typ.
 : | S21e | ²=5.5dB typ (f=1.5GHz).

Absolute Maximum Ratings at Ta = 25°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	150	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Electrical Characteristics at Ta = 25°C

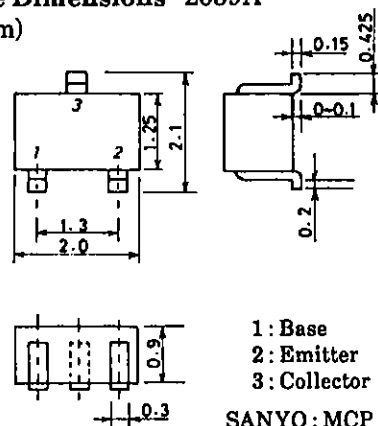
			min	typ	max	unit
Collector Cutoff Current	I _{CBO}	V _{CB} =10V, I _E =0			1.0	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} =1V, I _C =0			10	μA
DC Current Gain	h _{FE}	V _{CE} =5V, I _C =10mA	60※		270※	
Gain-Bandwidth Product	f _T (1)	V _{CE} =5V, I _C =10mA	8	11		GHz
		V _{CE} =1V, I _C =1mA		7		GHz
Output Capacitance	C _{ob}	V _{CB} =10V, f=1MHz		0.45	0.7	pF
Reverse Transfer Capacitance	C _{re}	V _{CB} =10V, f=1MHz		0.30		pF
Forward Transfer Gain	S21e ² (1)	V _{CE} =5V, I _C =10mA, f=1.5GHz	8	10		dB
		V _{CE} =1V, I _C =1mA, f=1.5GHz		5.5		dB
Noise Figure	NF(1)	V _{CE} =5V, I _C =5mA, f=1.5GHz		1.4	3.0	dB
		V _{CE} =2V, I _C =3mA, f=1GHz		0.9		dB

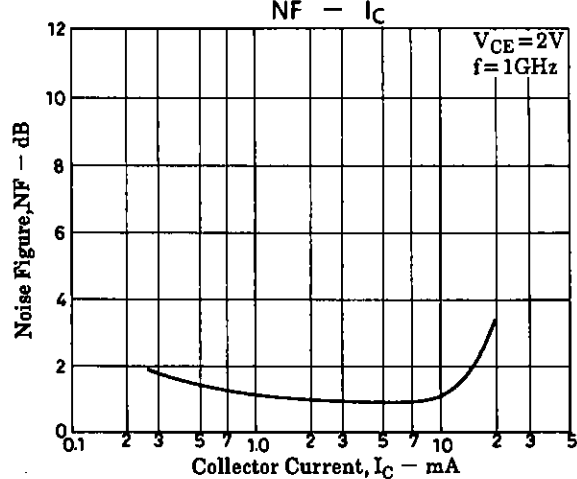
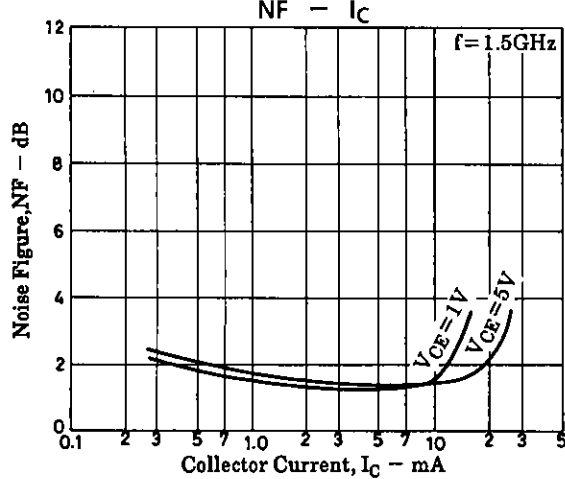
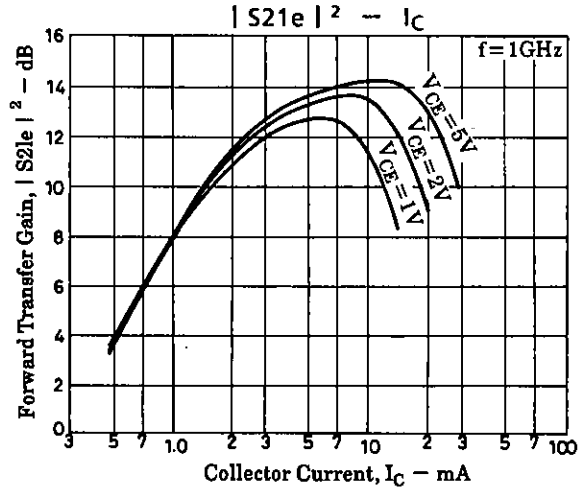
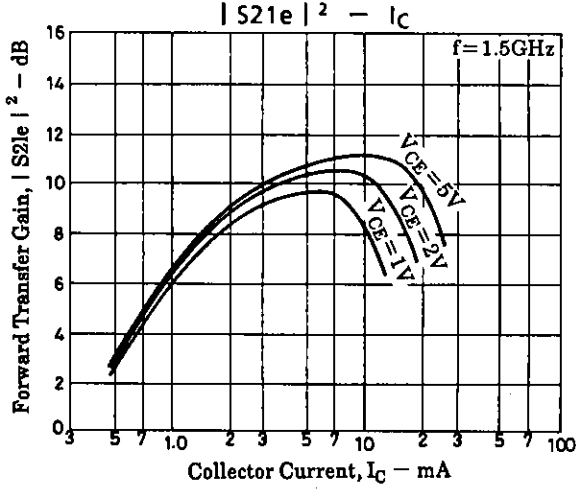
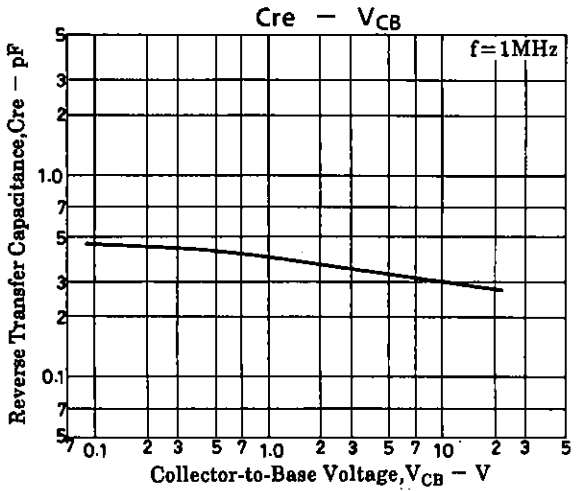
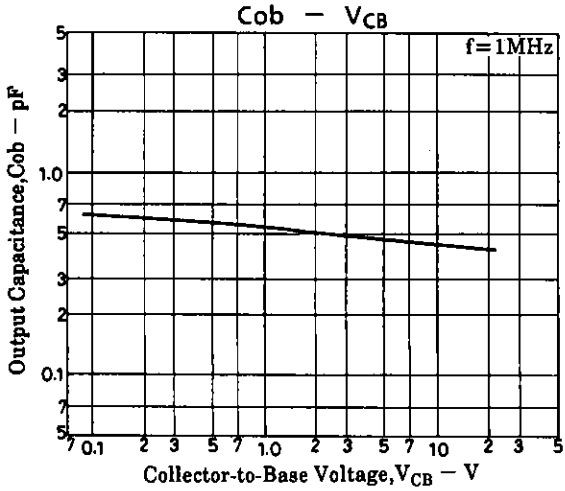
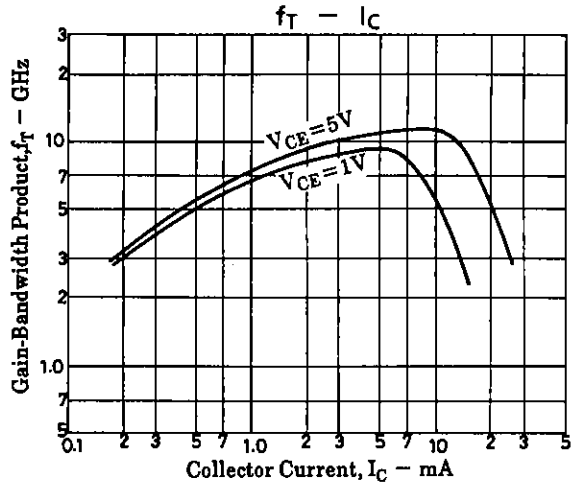
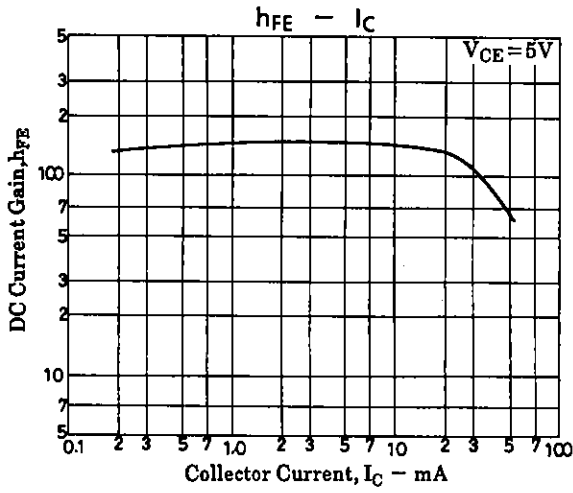
※ : The 2SC5245 is classified by 10mA h_{FE} as follows.

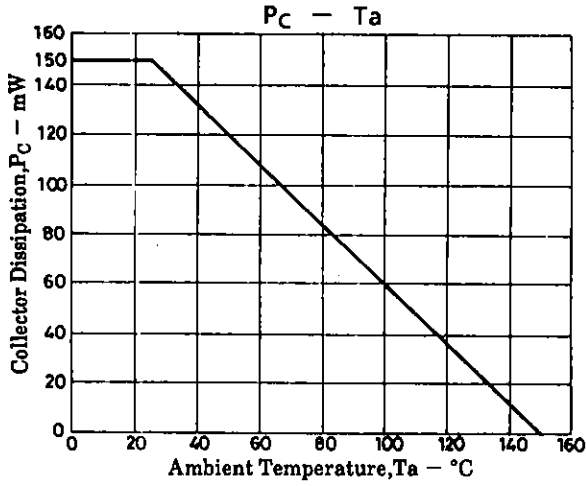
60	3	120	90	4	180	135	5	270
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Marking : MN
h_{FE} ranks : 3, 4, 5

Package Dimensions 2059A
(unit : mm)

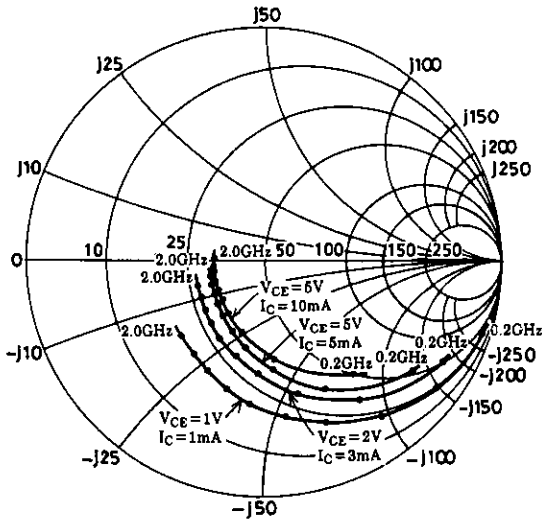




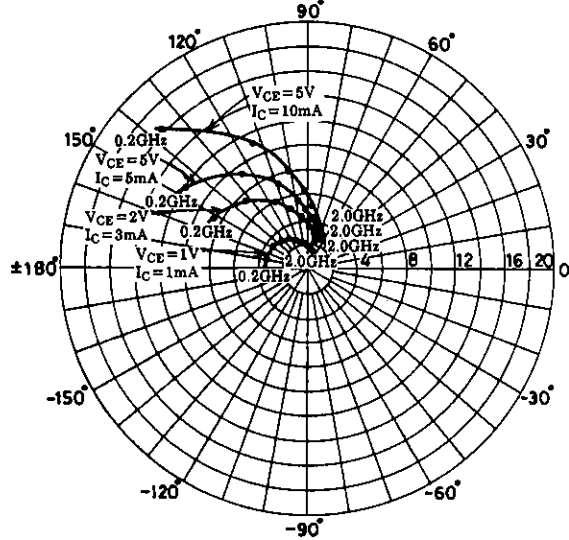


S Parameters

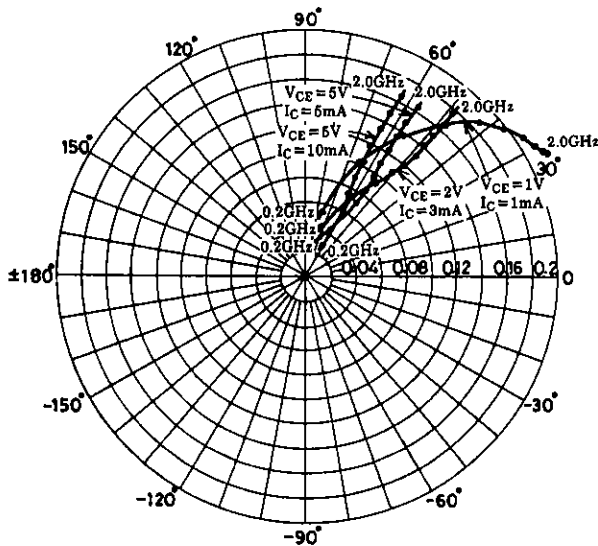
S11e : $f = 200$ to 2000 MHz (200 MHz step)



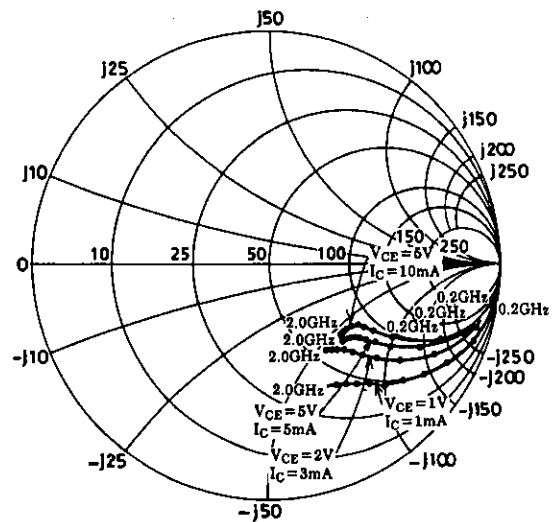
S21e : $f = 200$ to 2000 MHz (200 MHz step)



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



S22e : $f = 200$ to 2000 MHz (200 MHz 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	0.763	-37.5	11.926	146.9	0.036	70.7	0.892	-19.1
400	0.590	-65.4	9.202	124.3	0.058	60.9	0.740	-29.1
600	0.456	-85.5	7.173	109.4	0.073	57.4	0.631	-33.7
800	0.374	-102.0	5.743	98.7	0.086	56.7	0.566	-35.8
1000	0.323	-115.0	4.785	90.5	0.098	56.7	0.528	-37.2
1200	0.288	-127.5	4.105	83.6	0.110	57.2	0.505	-38.4
1400	0.264	-137.7	3.599	77.5	0.123	57.7	0.488	-39.6
1600	0.248	-147.4	3.213	71.3	0.136	57.6	0.476	-41.2
1800	0.239	-156.9	2.905	66.4	0.150	57.6	0.466	-43.3
2000	0.235	-165.7	2.651	61.3	0.165	57.2	0.462	-45.4

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.605	-52.6	16.354	136.2	0.031	67.5	0.804	-23.9
400	0.417	-84.6	11.011	113.3	0.048	62.4	0.622	-30.5
600	0.319	-106.3	8.026	100.5	0.062	62.2	0.533	-32.0
800	0.266	-124.6	6.250	91.3	0.076	63.4	0.491	-32.4
1000	0.238	-136.5	5.115	84.7	0.090	64.3	0.469	-33.2
1200	0.225	-148.9	4.336	78.8	0.104	64.4	0.458	-34.6
1400	0.215	-158.3	3.813	73.4	0.119	64.5	0.449	-35.8
1600	0.213	-167.3	3.365	68.1	0.135	63.8	0.443	-37.7
1800	0.212	-175.6	3.030	63.5	0.150	63.1	0.436	-39.6
2000	0.216	-177.5	2.754	58.9	0.166	62.5	0.438	-41.9

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.842	-30.7	8.491	153.0	0.044	72.5	0.931	-17.1
400	0.704	-56.3	7.161	131.9	0.075	60.9	0.808	-28.8
600	0.579	-76.1	5.879	116.3	0.095	54.1	0.696	-36.2
800	0.480	-93.1	4.882	104.2	0.109	51.0	0.615	-40.6
1000	0.417	-106.3	4.154	95.0	0.121	49.3	0.564	-43.5
1200	0.376	-119.6	3.597	87.1	0.132	48.7	0.526	-45.8
1400	0.343	-130.2	3.212	80.2	0.143	48.6	0.496	-47.5
1600	0.319	-140.5	2.875	73.4	0.154	48.7	0.475	-49.6
1800	0.303	-150.0	2.604	67.7	0.166	48.6	0.461	-51.6
2000	0.298	-160.0	2.383	62.1	0.179	48.9	0.451	-52.9

2SC5245

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

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	-18.9	3.296	162.5	0.054	77.2	0.980	-11.0
400	0.884	-37.3	3.206	145.9	0.102	65.9	0.934	-20.5
600	0.810	-53.6	2.942	131.2	0.139	56.3	0.870	-29.0
800	0.728	-69.4	2.711	117.8	0.166	48.6	0.811	-35.5
1000	0.667	-82.5	2.449	107.0	0.187	42.5	0.763	-40.9
1200	0.605	-95.8	2.252	96.9	0.199	37.3	0.715	-45.7
1400	0.561	-106.1	2.061	88.1	0.207	33.5	0.673	-49.4
1600	0.518	-117.2	1.909	79.5	0.212	30.6	0.638	-53.4
1800	0.492	-127.5	1.766	72.2	0.215	28.6	0.611	-56.5
2000	0.465	-137.9	1.658	65.2	0.217	27.6	0.592	-59.9

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