

<b>SANYO</b>	No.4760	<b>2SC4865</b>
		NPN Epitaxial Planar Silicon Transistor VHF to UHF Wide-Band Low-Noise Amp Applications

**Features**

- Lownoise :  $NF = 1.1\text{dB typ (}f = 1\text{GHz)}$ .
- High gain :  $|S_{21e}|^2 = 12.5\text{dB typ (}f = 1\text{GHz)}$ .
- High cutoff frequency :  $f_T = 7.0\text{GHz typ}$ .

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

			unit
Collector-to-Base Voltage	$V_{CB0}$	16	V
Collector-to-Emitter Voltage	$V_{CEO}$	8	V
Emitter-to-Base Voltage	$V_{EBO}$	2	V
Collector Current	$I_C$	70	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	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$	60*		270*	
Gain-Bandwidth Product	$f_T$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}$		7.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1\text{MHz}$		0.95	1.4	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE} = 5\text{V}, I_C = 20\text{mA}, f = 1\text{GHz}$	8.5	12.5		dB
Noise Figure	NF	$V_{CE} = 5\text{V}, I_C = 7\text{mA}, f = 1\text{GHz}$		1.1	2.0	dB

\* : The 2SC4865 are classified by 20mA  $h_{FE}$  as follows:

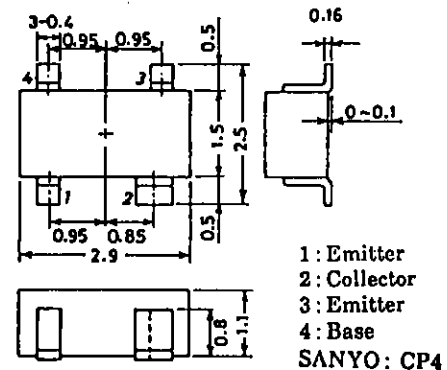
60	3	120	90	4	180	135	5	270
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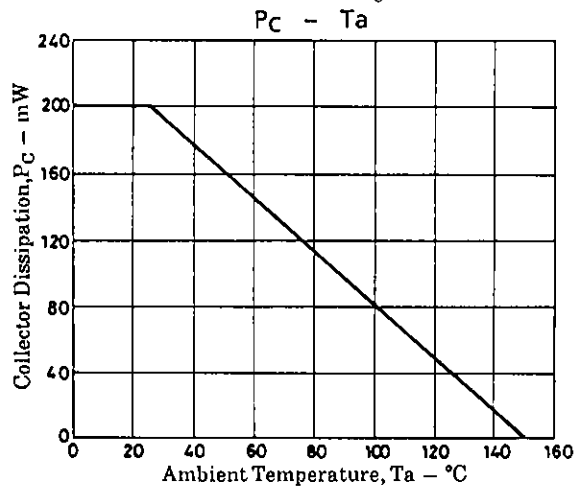
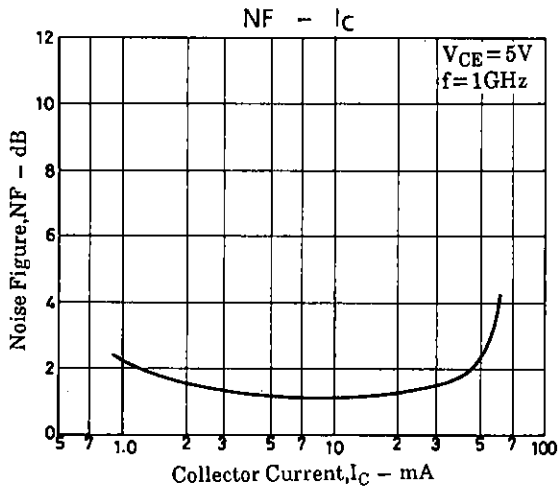
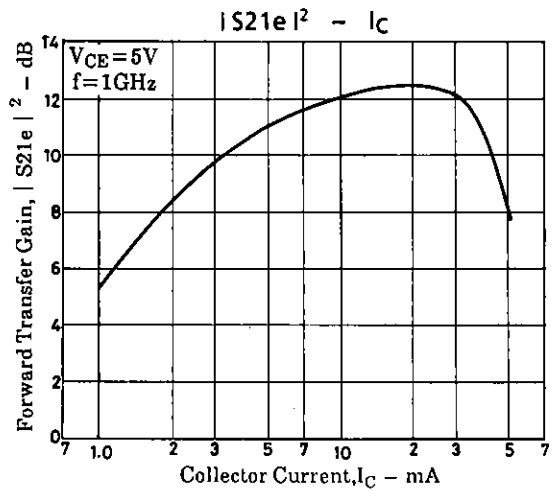
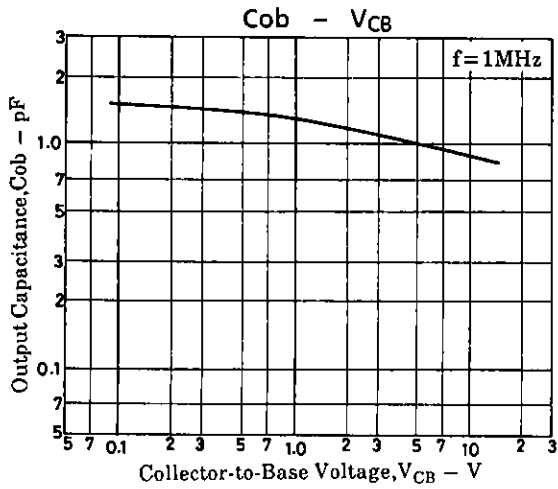
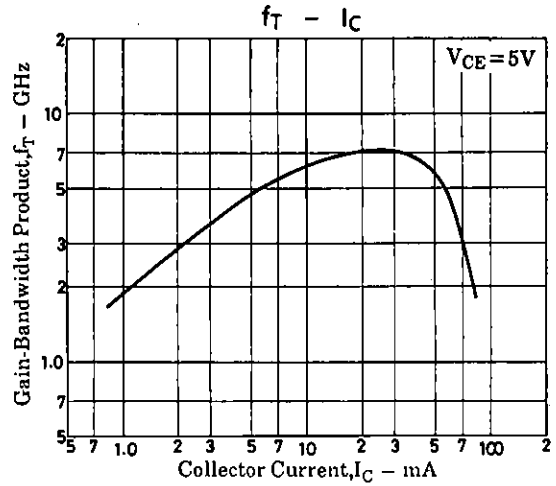
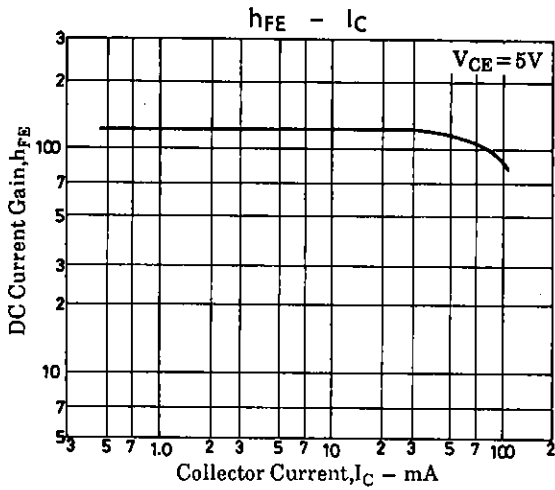
Marking : FN

$h_{FE}$  rank : 3,4,5

**Package Dimensions 2110A**

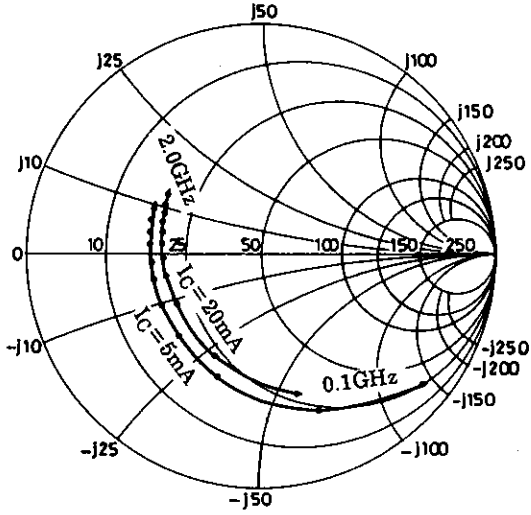
(unit : mm)



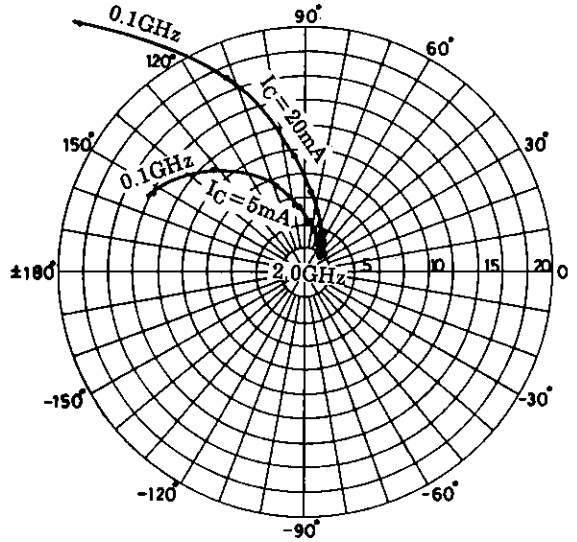


S Parameters

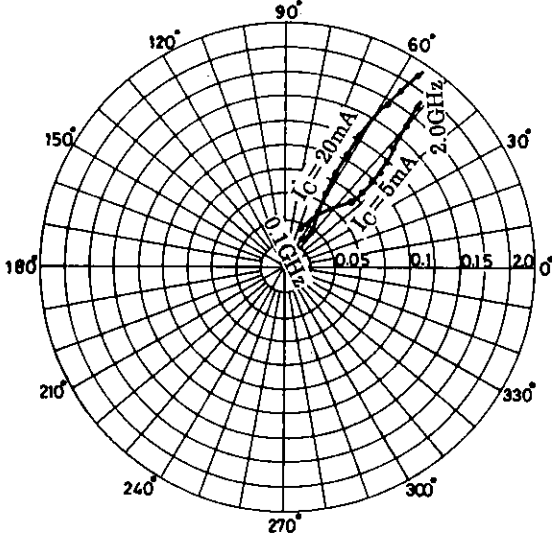
S11e:  $V_{CE} = 5V$   
 $f = 100, 200 \sim 2000MHz$  (200 step)



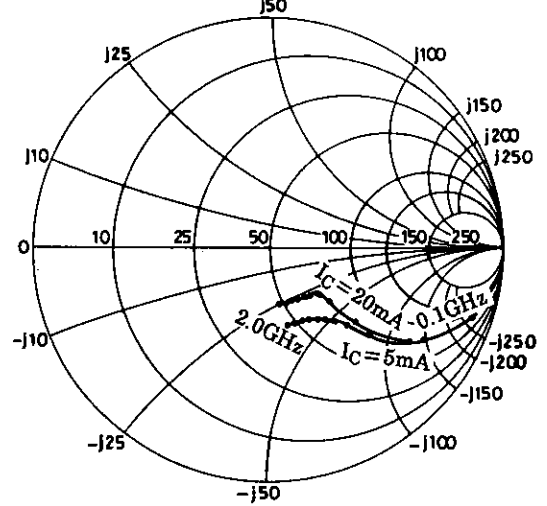
S21e:  $V_{CE} = 5V$   
 $f = 100, 200 \sim 2000MHz$  (200 step)



S12e:  $V_{CE} = 5V$   
 $f = 100, 200 \sim 2000MHz$  (200 step)



S22e:  $V_{CE} = 5V$   
 $f = 100, 200 \sim 2000MHz$  (200 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} $	$\angle S_{22}$
100	0.860	-40.0	13.912	152.74	0.034	67.2	0.904	-19.7
200	0.705	-71.2	11.185	132.28	0.054	54.3	0.748	-32.0
400	0.551	-110.99	7.426	109.5	0.074	45.9	0.555	-42.8
600	0.494	-135.61	5.385	95.9	0.086	44.0	0.461	-47.2
800	0.484	-152.6	4.241	86.1	0.097	44.9	0.413	-50.1
1000	0.473	-166.0	3.505	77.7	0.107	45.5	0.385	-54.0
1200	0.478	-176.2	2.993	70.2	0.118	46.7	0.368	-57.2
1400	0.484	175.5	2.617	63.4	0.129	47.8	0.353	-62.5
1600	0.484	168.9	2.329	57.4	0.140	49.3	0.347	-66.8
1800	0.498	163.3	2.102	52.6	0.151	50.0	0.339	-72.2
2000	0.504	156.9	1.946	47.3	0.167	50.8	0.340	-77.5

 $V_{CE}=5V, I_C=20mA, Z_0=50\Omega$ 

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.607	-77.0	27.348	132.4	0.025	58.0	0.706	-35.5
200	0.478	-115.9	17.148	112.3	0.035	53.4	0.478	-43.5
400	0.422	-150.2	9.497	95.7	0.051	57.9	0.337	-44.6
600	0.417	-166.7	6.515	86.3	0.068	61.0	0.296	-45.3
800	0.423	-176.9	4.996	79.2	0.086	62.4	0.280	-47.3
1000	0.429	174.1	4.072	72.4	0.104	61.7	0.270	-52.3
1200	0.435	167.7	3.456	66.2	0.121	61.1	0.263	-56.5
1400	0.449	162.2	3.001	60.7	0.139	59.7	0.254	-63.1
1600	0.455	157.5	2.672	55.6	0.155	58.6	0.251	-68.2
1800	0.465	153.4	2.388	51.4	0.170	57.4	0.246	-74.9
2000	0.477	148.2	2.208	46.8	0.188	56.0	0.248	-81.2

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