

**2SC4865**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

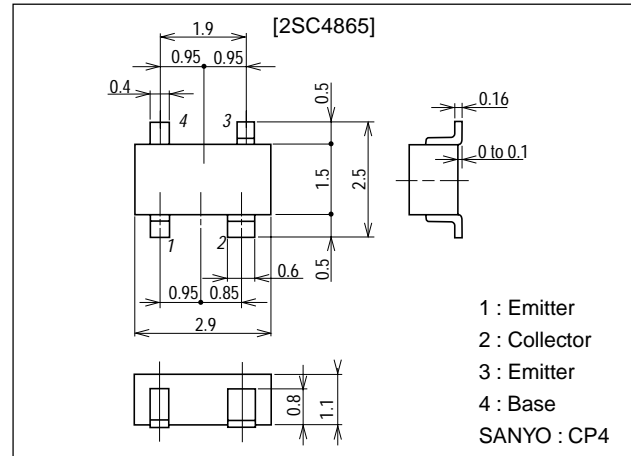
Features

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

Package Dimensions

unit:mm

2110A



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		16	V
Collector-to-Emitter Voltage	V_{CE0}		8	V
Emitter-to-Base Voltage	V_{EB0}		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 $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CB0}	$V_{CB}=10\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EB0}	$V_{EB}=1\text{V}, I_C=0$			10	μA
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 is 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

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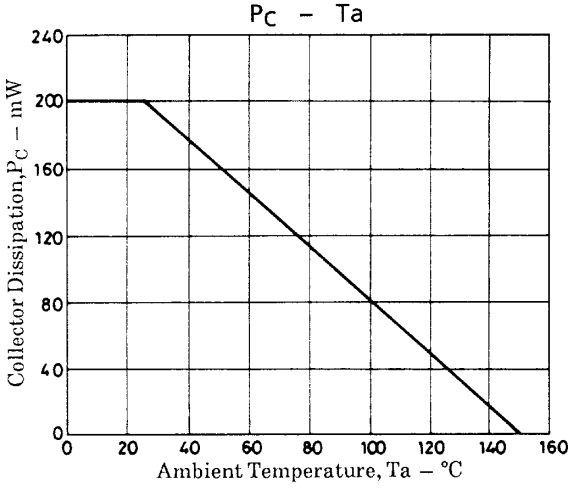
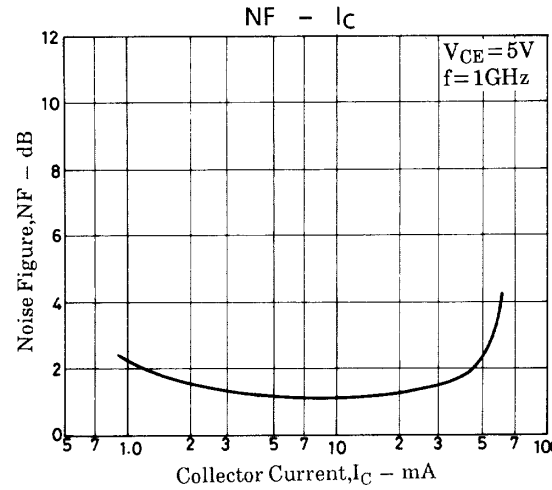
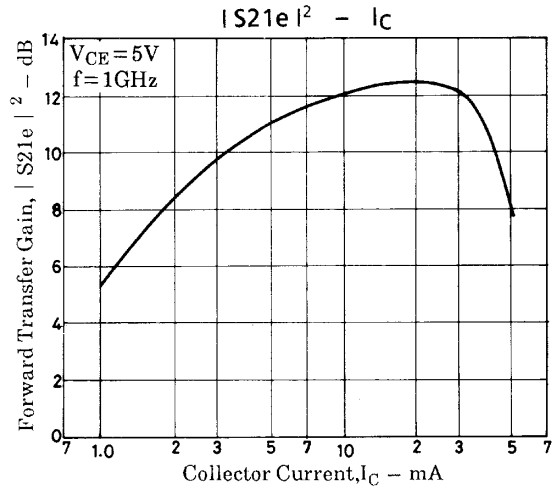
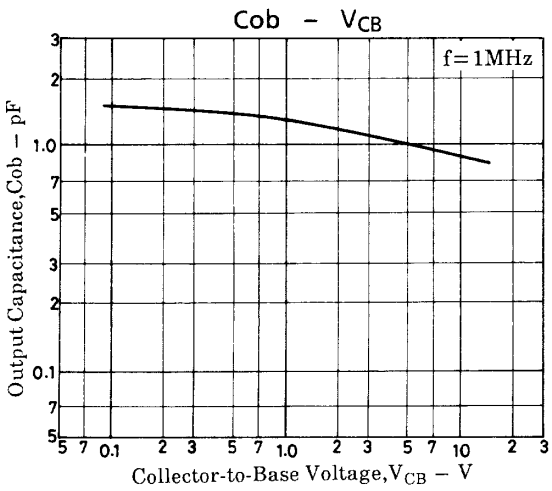
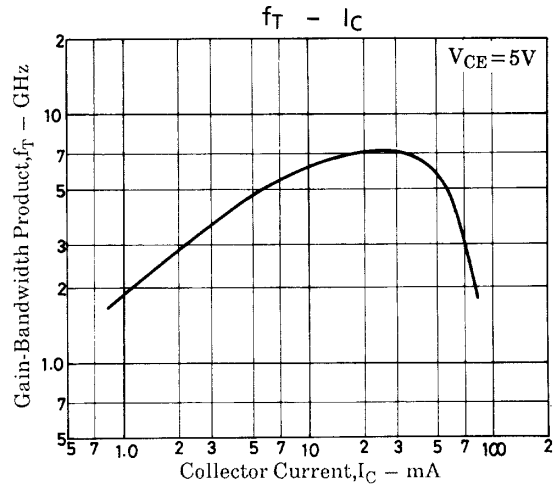
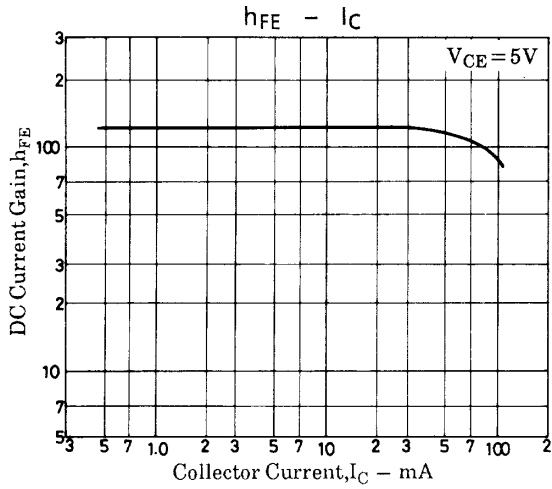
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SANYO Electric Co., Ltd. Semiconductor Business Headquarters

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

12099HA (KT)/90794MT (KOTO) AX-9525 No.4760-1/4

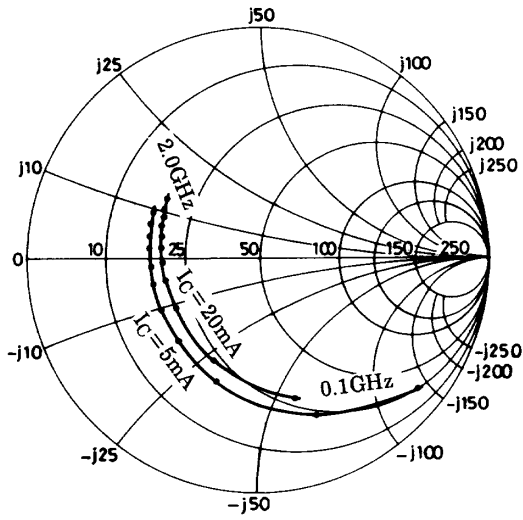
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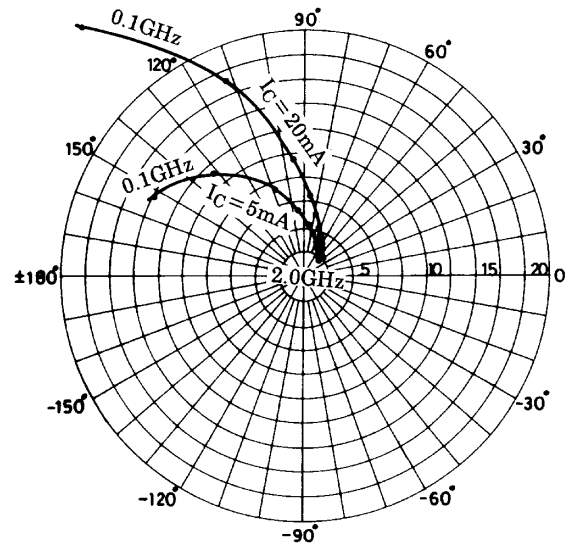
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S parameter

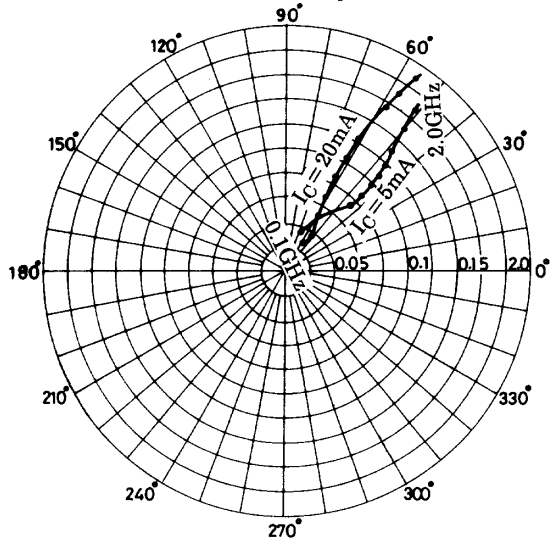
S11e: $V_{CE} = 5V$
 $f = 100, 200$ to $2000MHz$ (200 step)



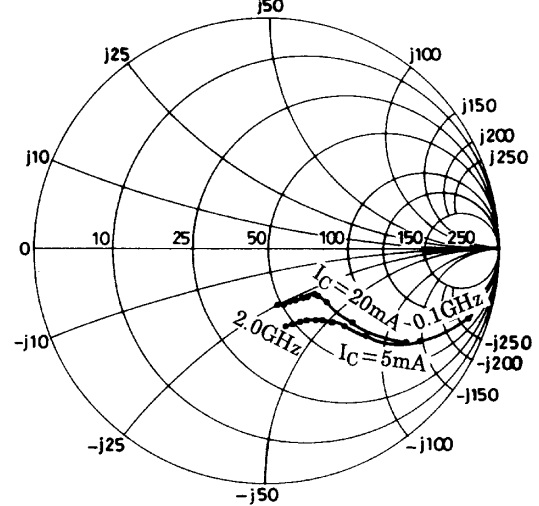
S21e: $V_{CE} = 5V$
 $f = 100, 200$ to $2000MHz$ (200 step)



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



S22e: $V_{CE} = 5V$
 $f = 100, 200$ to $2000MHz$ (200 step)



S parameter (Common emitter)

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

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

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

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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