

**2SC4869**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

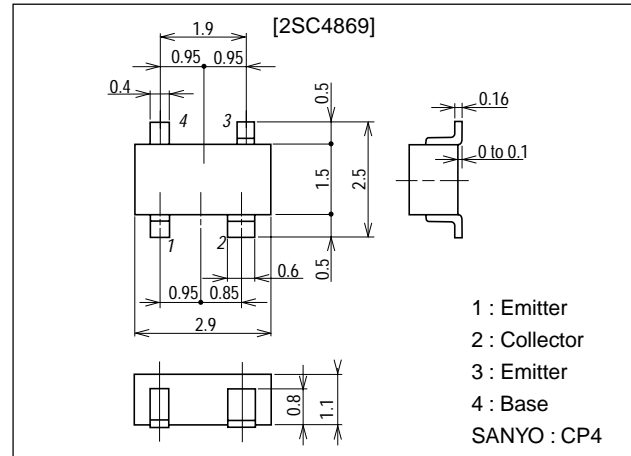
Features

- Low noise : $NF=1.2\text{dB typ (}f=1\text{GHz)}$.
- High gain : $|S_{21e}|^2=15\text{dB typ (}f=1\text{GHz)}$.
- High cutoff frequency : $f_T=9.0\text{GHz typ}$.

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}		1.5	V
Collector Current	I_C		50	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}	$V_{CE}=5\text{V}, I_C=15\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE}=5\text{V}, I_C=15\text{mA}$		9.0		GHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.6	1.1	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=5\text{V}, I_C=15\text{mA}, f=1\text{GHz}$	12	15		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$		1.2	2.5	dB

* : The 2SC4869 is classified by 15mA h_{FE} as follows :

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

h_{FE} rank : 3, 4, 5

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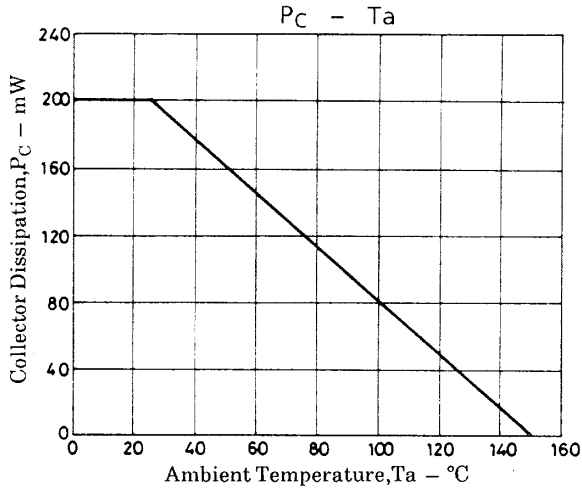
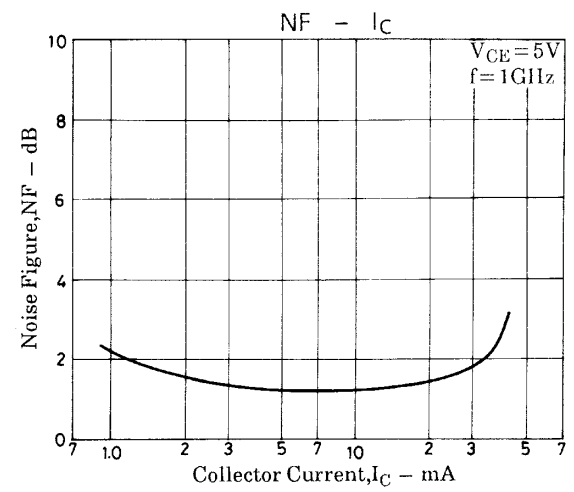
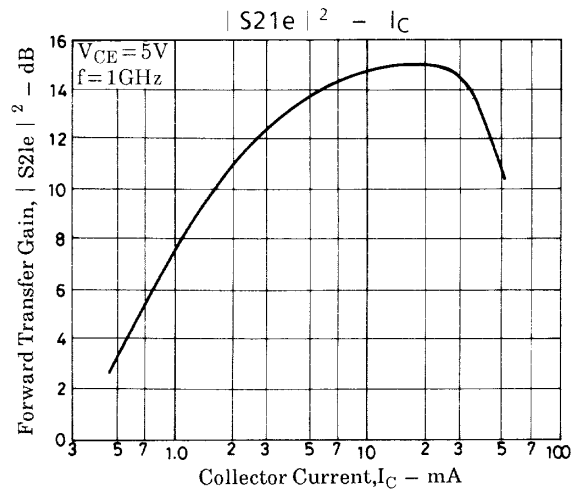
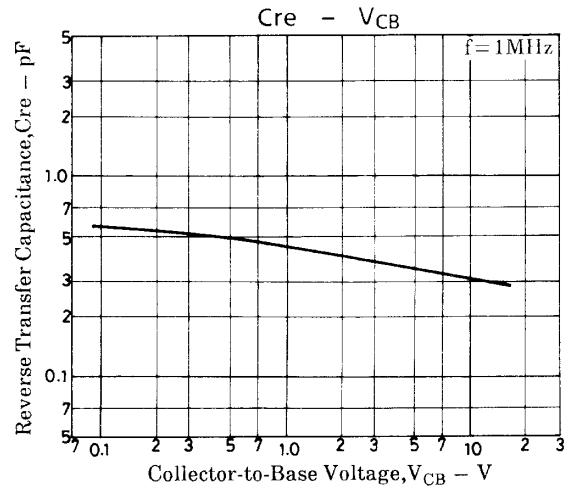
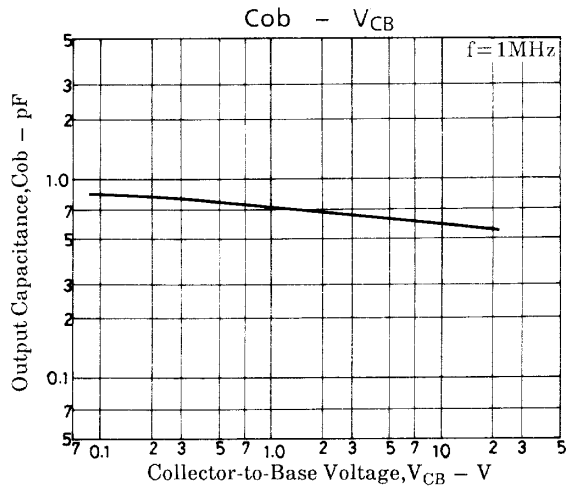
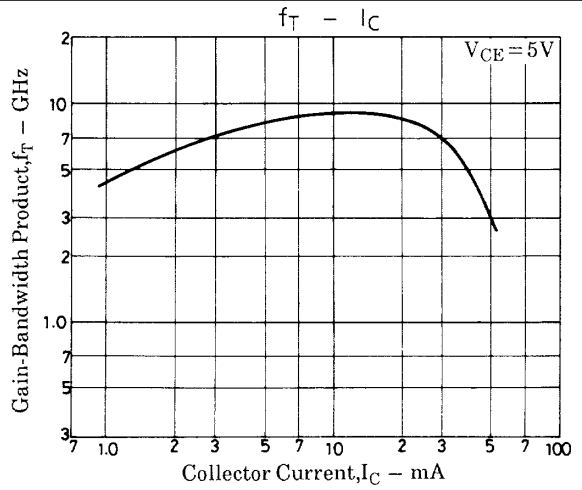
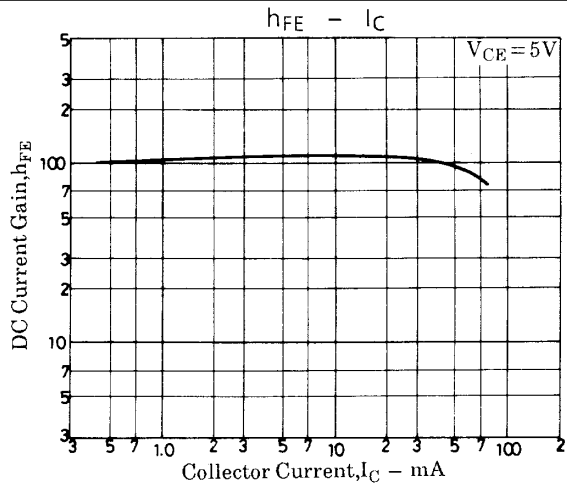
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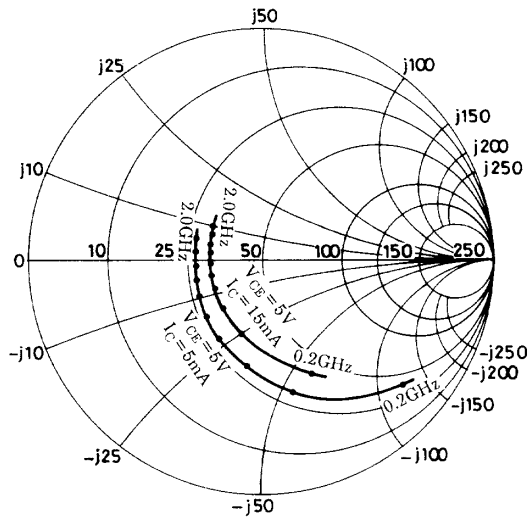
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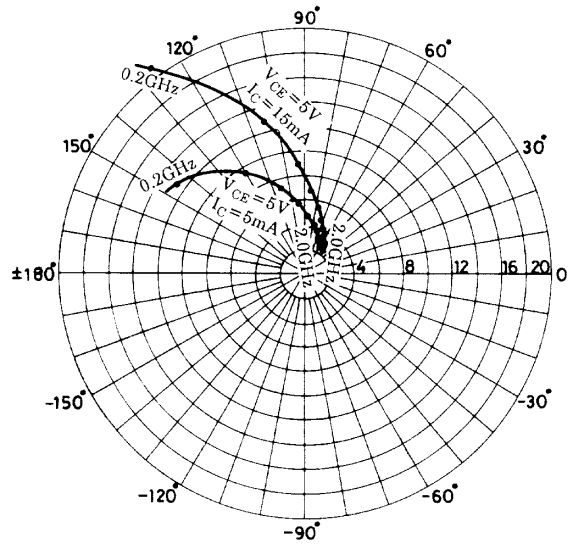


S parameter

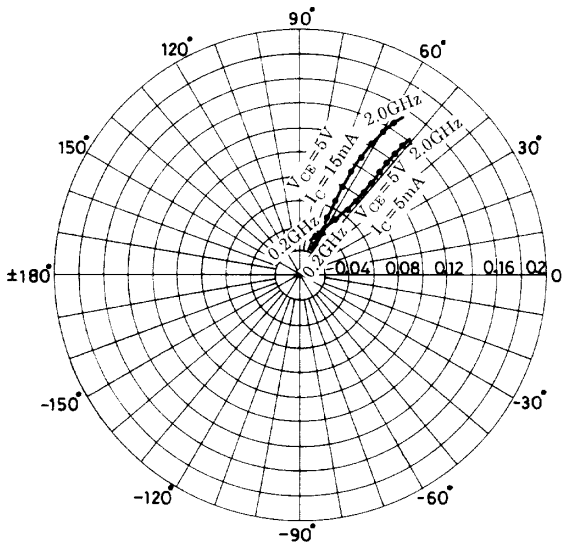
f = 200 to 2000MHz (200MHz step)



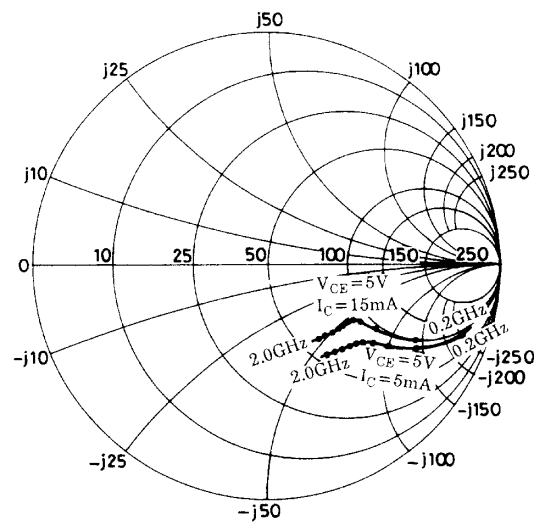
f = 200 to 2000MHz (200MHz step)



f = 200 to 2000MHz (200MHz step)



f = 200 to 2000MHz (200MHz 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} $	$\angle S_{22}$
200	0.782	-43.7	12.681	144.2	0.034	68.1	0.883	-19.9
400	0.591	-76.4	9.601	120.2	0.054	56.7	0.727	-29.9
600	0.467	-100.3	7.329	105.2	0.066	52.9	0.624	-34.5
800	0.393	-119.8	5.828	94.1	0.076	51.8	0.564	-37.4
1000	0.346	-135.3	4.831	85.6	0.090	51.8	0.532	-40.1
1200	0.322	-150.3	4.109	78.1	0.095	52.2	0.513	-42.5
1400	0.304	-163.6	3.585	71.7	0.106	52.2	0.499	-45.4
1600	0.299	-175.3	3.715	65.2	0.116	52.2	0.487	-49.0
1800	0.296	173.4	2.873	59.8	0.126	52.0	0.477	-52.7
2000	0.301	162.9	2.618	54.1	0.135	51.5	0.472	-57.0

 $V_{CE}=5V, I_C=15mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.525	-69.3	20.888	126.3	0.027	64.4	0.710	-28.0
400	0.347	-106.8	12.787	104.6	0.040	62.3	0.540	-32.0
600	0.281	-131.5	8.978	93.2	0.053	63.6	0.472	-32.8
800	0.251	-150.6	6.897	85.1	0.067	64.2	0.442	-34.3
1000	0.240	-164.7	5.584	78.6	0.080	64.0	0.428	-37.1
1200	0.235	-177.5	4.715	72.6	0.094	63.8	0.421	-39.6
1400	0.237	172.0	4.090	67.2	0.108	62.7	0.414	-42.9
1600	0.242	163.7	3.615	62.0	0.122	61.4	0.406	-47.1
1800	0.251	154.1	3.240	57.2	0.135	59.9	0.400	-51.3
2000	0.264	145.5	2.943	52.3	0.147	58.0	0.398	-56.0

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