

**2SC4868**

## VHF to UHF Wide-Band Low-Noise Amplifier Applications

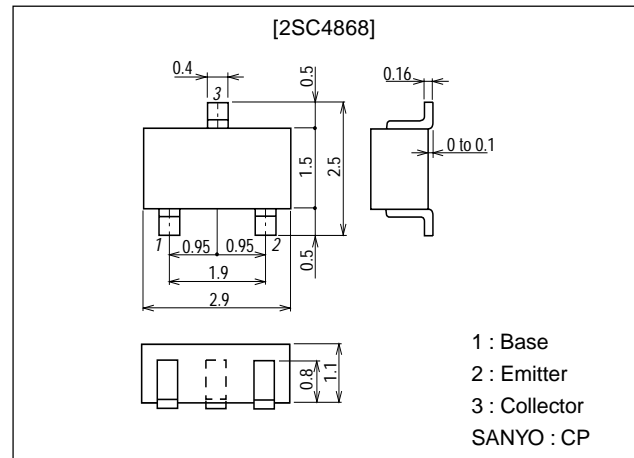
### Features

- Low noise : NF=1.2dB typ (f=1GHz).
- High gain :  $|S_{21e}|^2=13\text{dB}$  typ (f=1GHz).
- High cutoff frequency :  $f_T=9.0\text{GHz}$  typ.

### Package Dimensions

unit:mm

2018B



### 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	$\mu\text{A}$
Emitter Cutoff Current	$I_{EB0}$	$V_{EB}=1\text{V}, I_C=0$			10	$\mu\text{A}$
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$	$V_{CE}=5\text{V}, I_C=15\text{mA}, f=1\text{GHz}$	10	13		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$		1.2	2.5	dB

\* : The 2SC4868 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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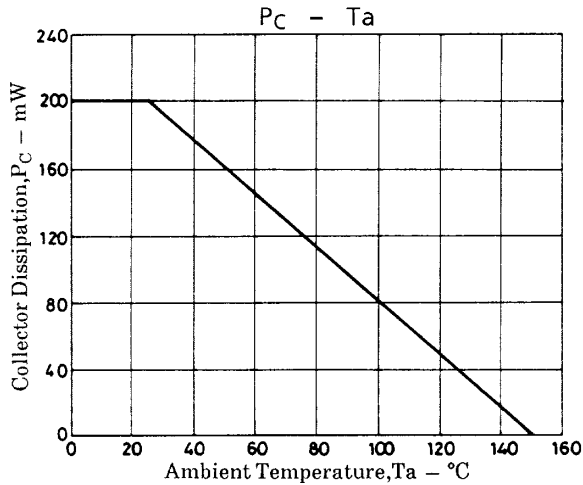
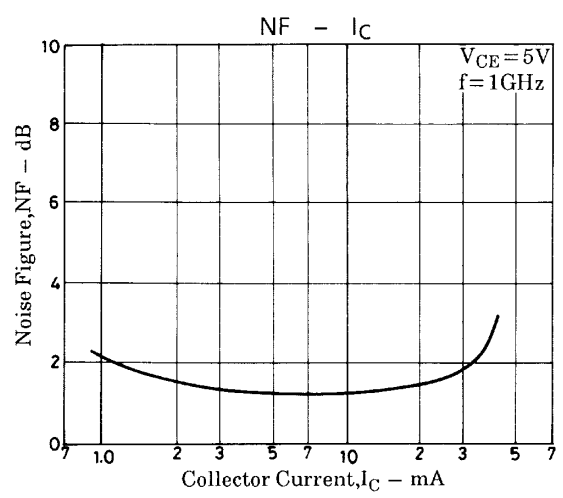
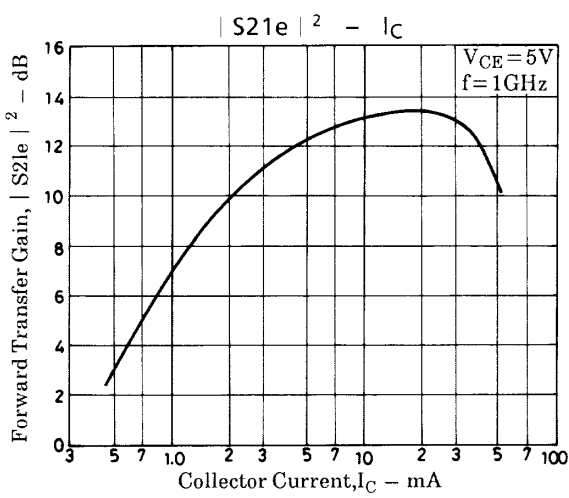
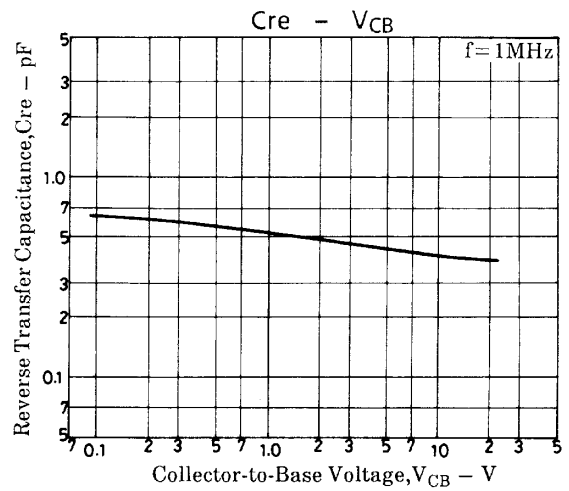
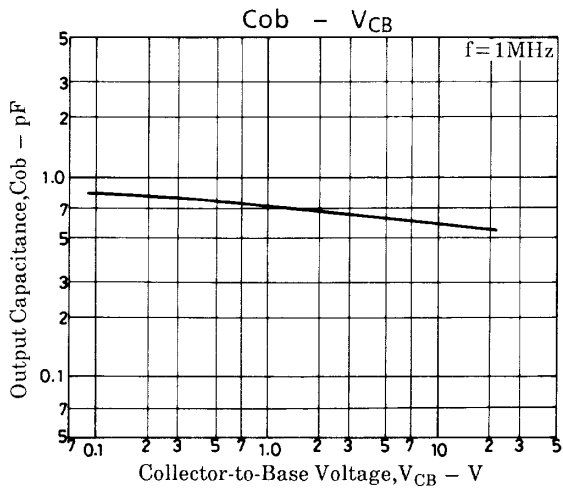
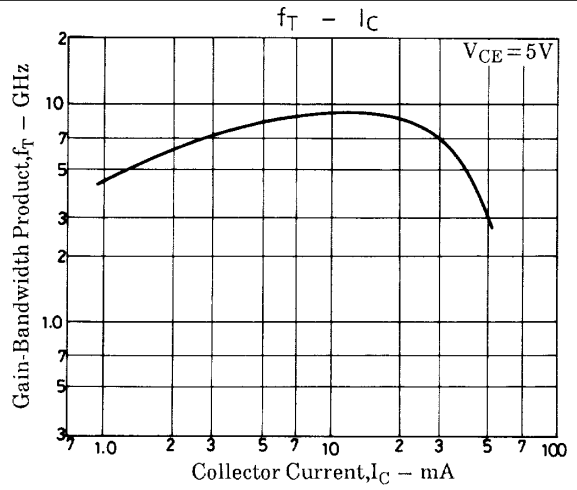
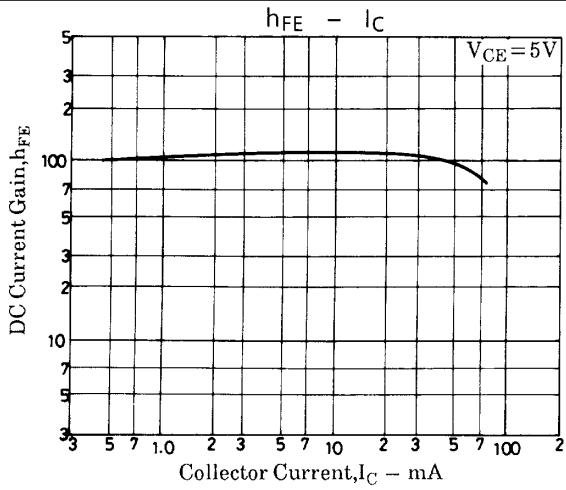
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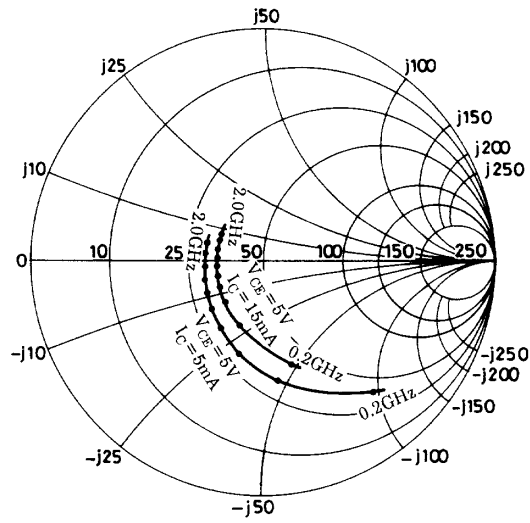
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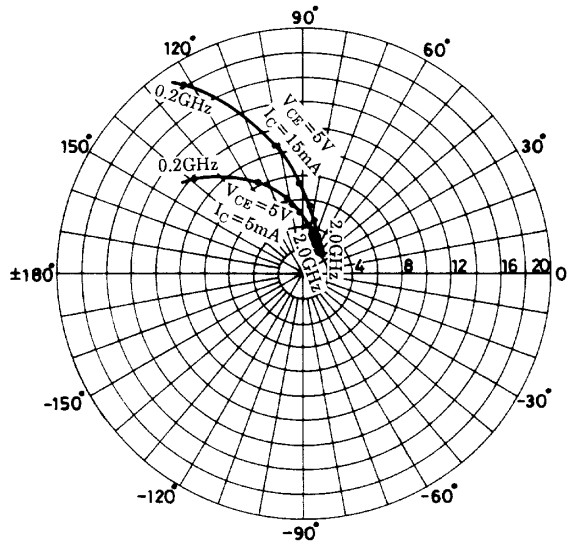


S parameter

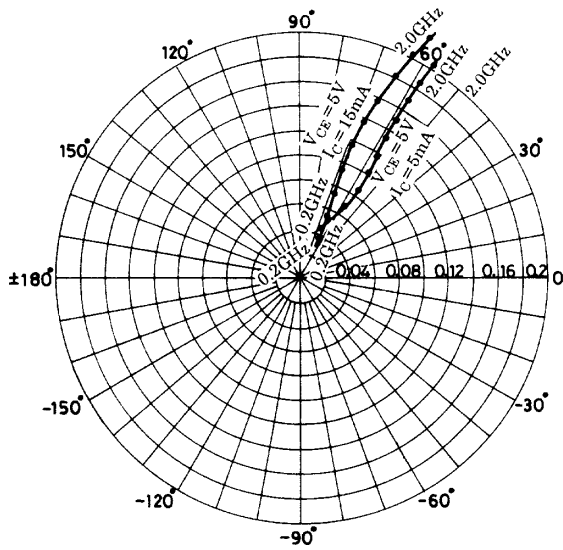
f = 200 to 2000MHz (200MHz step)



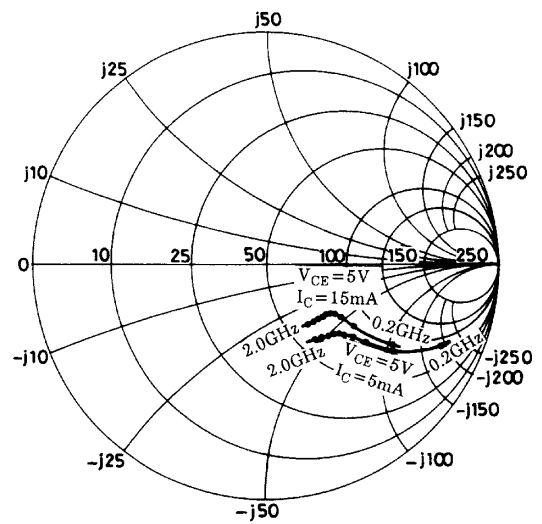
f = 200 to 2000MHz (200MHz step)



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	0.726	-49.0	11.900	139.5	0.045	66.5	0.832	-25.0
400	0.522	-81.9	8.438	115.9	0.070	58.2	0.648	-35.5
600	0.411	-104.5	6.284	101.5	0.086	56.5	0.538	-39.5
800	0.342	-122.0	4.977	91.5	0.102	57.1	0.473	-41.7
1000	0.304	-136.2	4.094	83.7	0.118	57.8	0.448	-44.0
1200	0.278	-150.8	3.498	76.8	0.134	58.8	0.427	-46.0
1400	0.263	-162.9	3.057	70.7	0.151	58.9	0.413	-48.4
1600	0.254	-174.7	2.732	65.3	0.170	58.8	0.400	-51.7
1800	0.252	172.2	2.473	60.2	0.187	58.5	0.391	-55.0
2000	0.253	162.6	2.289	55.4	0.206	58.1	0.387	-58.5

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.454	-74.7	18.146	122.0	0.035	65.4	0.635	-33.9
400	0.295	-110.8	10.672	101.9	0.055	66.1	0.459	-37.3
600	0.243	-132.5	7.405	91.5	0.075	67.8	0.391	-37.1
800	0.219	-149.0	5.706	84.0	0.095	68.5	0.363	-38.0
1000	0.205	-161.4	4.636	78.0	0.117	68.4	0.347	-39.9
1200	0.200	-174.2	3.913	72.4	0.138	67.6	0.340	-42.4
1400	0.200	175.6	3.407	67.7	0.159	66.3	0.334	-45.3
1600	0.202	165.1	3.032	62.9	0.181	64.8	0.327	-49.3
1800	0.209	154.6	2.734	58.5	0.202	63.4	0.322	-53.1
2000	0.215	146.0	2.517	54.3	0.223	61.6	0.319	-57.3

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