

**2SC4868**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

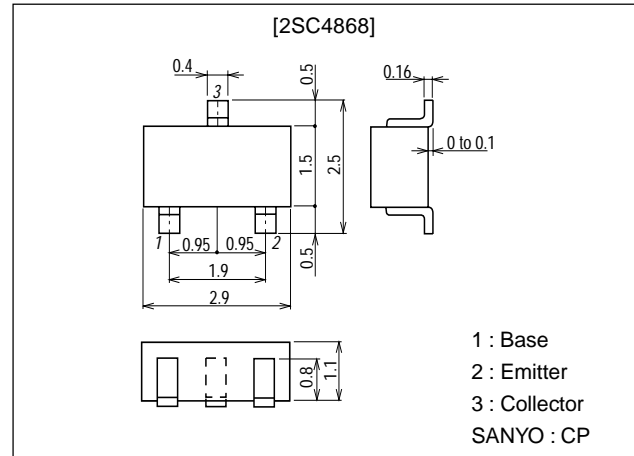
Features

- Low noise : $NF=1.2\text{dB typ (}f=1\text{GHz)}$.
- High gain : $|S_{21e}|^2=13\text{dB typ (}f=1\text{GHz)}$.
- 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	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$	$V_{CE}=5\text{V}, I_C=15\text{mA}, f=1\text{GHz}$	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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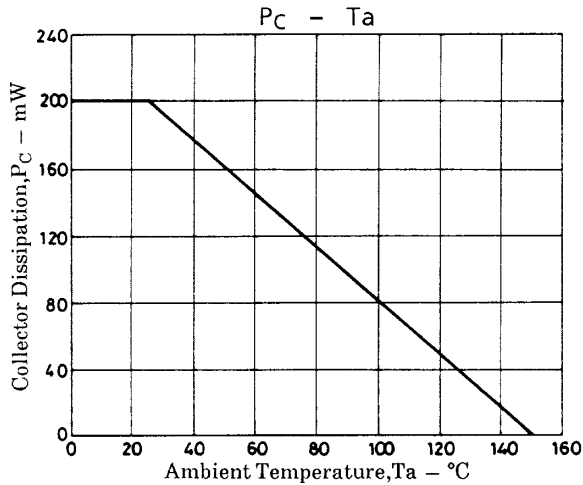
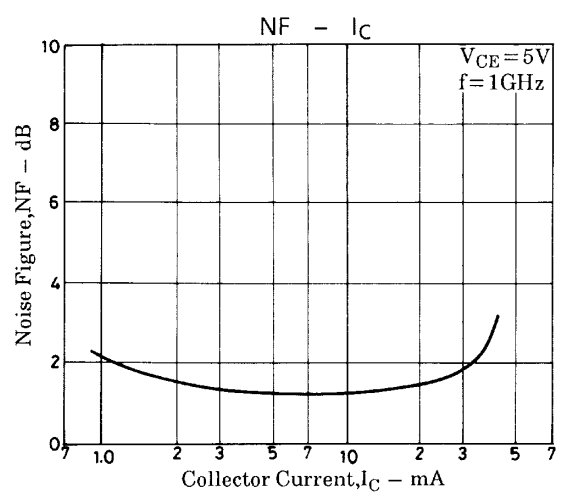
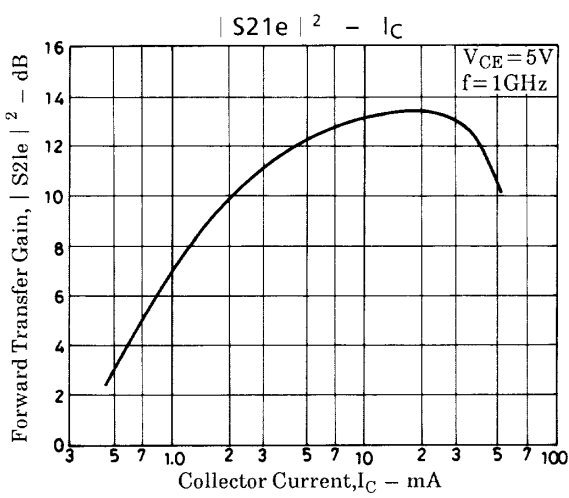
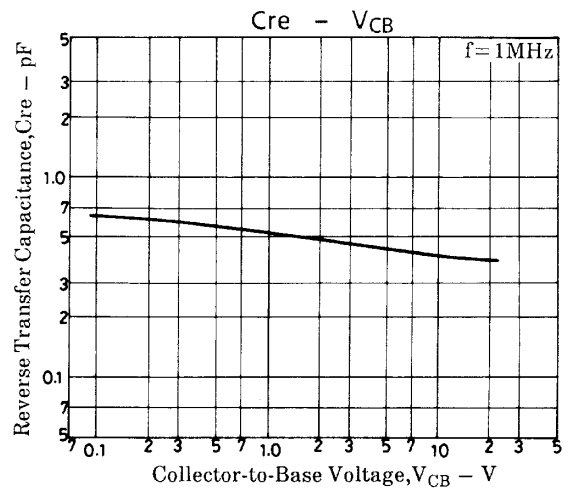
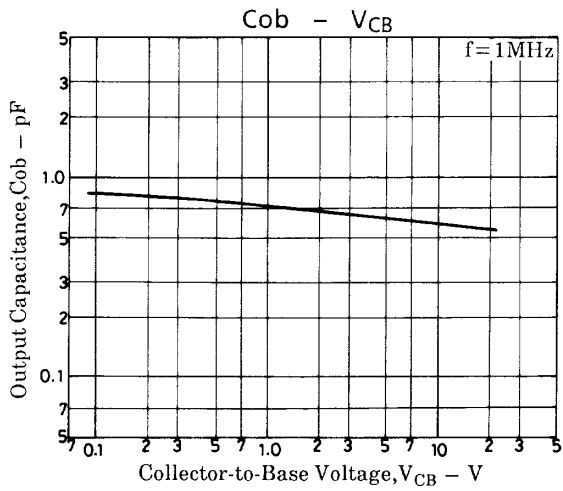
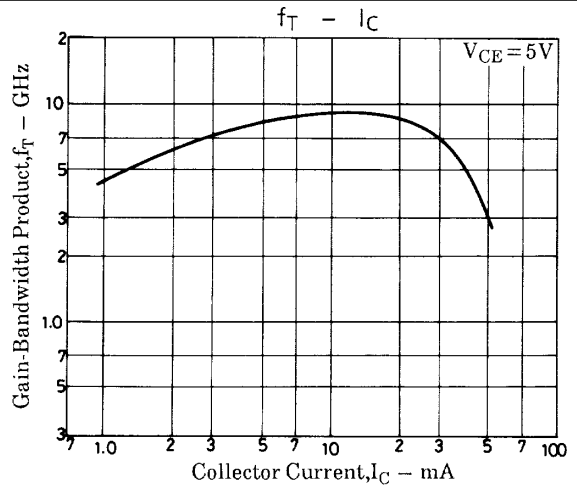
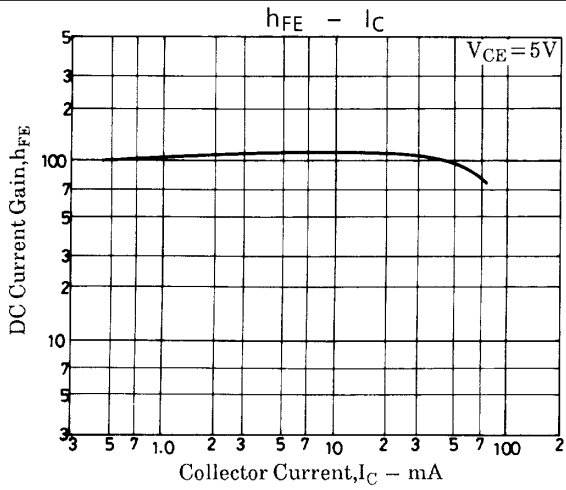
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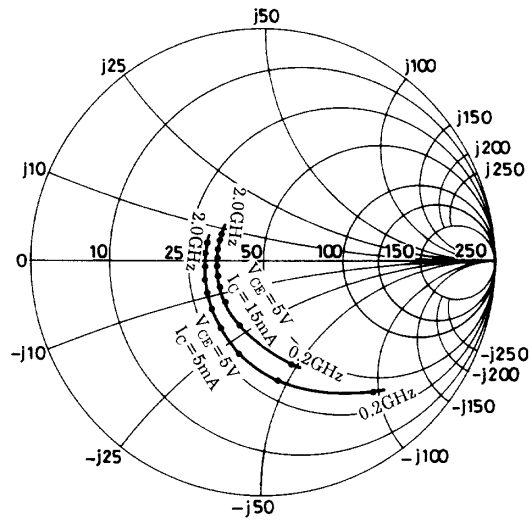
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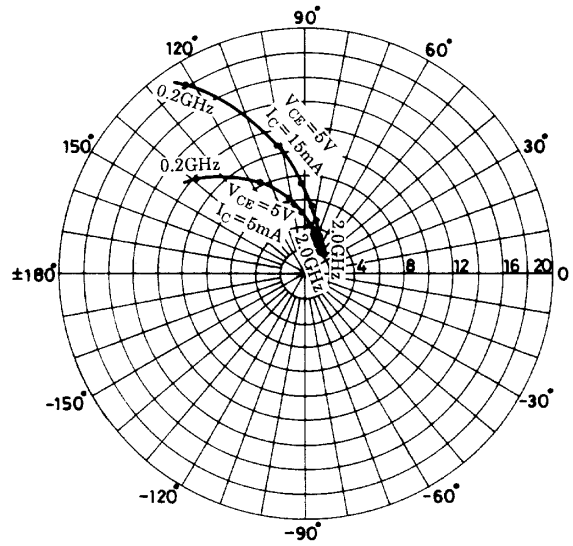


S parameter

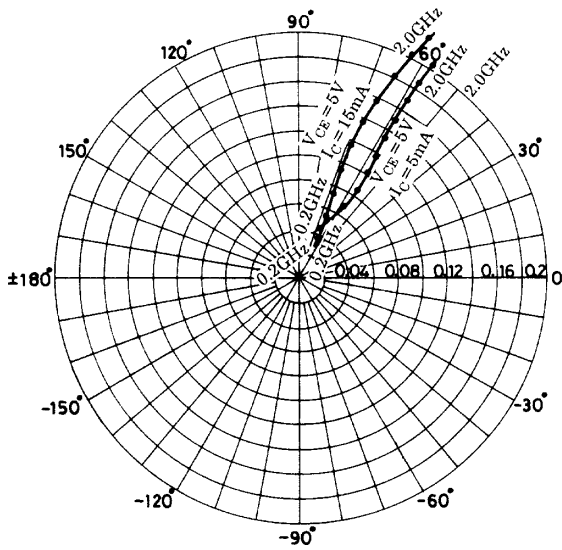
f = 200 to 2000MHz (200MHz step)



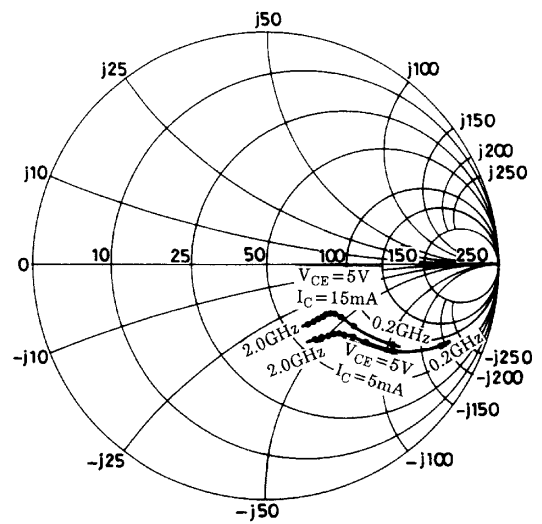
f = 200 to 2000MHz (200MHz step)



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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