

**2SC4863**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

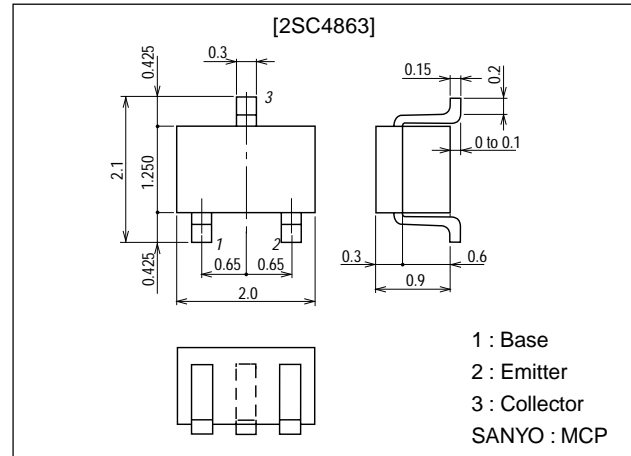
Features

- Low noise : $NF=1.1\text{dB typ (f=1GHz)}$.
- High gain : $|S_{21e}|^2=11\text{dB typ (f=1GHz)}$.
- High cutoff frequency : $f_T=7.0\text{GHz typ}$.

Package Dimensions

unit:mm

2059B



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		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		150	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_{CBO}	$V_{CB}=10\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1\text{V}, I_C=0$			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$	$V_{CE}=5\text{V}, I_C=20\text{mA}, f=1\text{GHz}$	7	11		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=7\text{mA}, f=1\text{GHz}$		1.1	2.0	dB

* : The 2SC4863 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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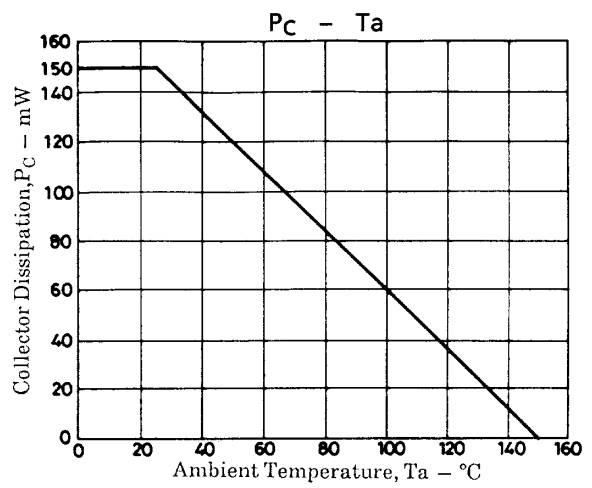
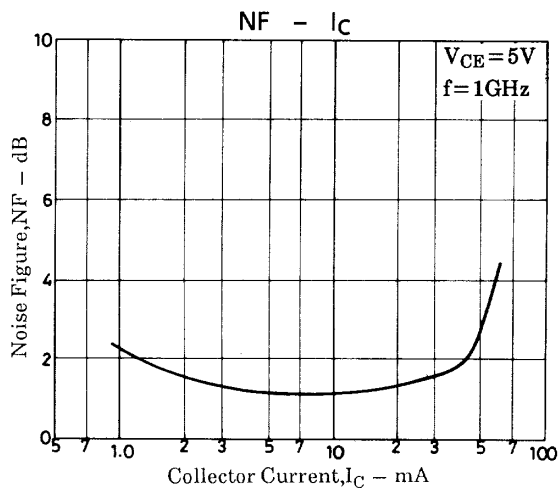
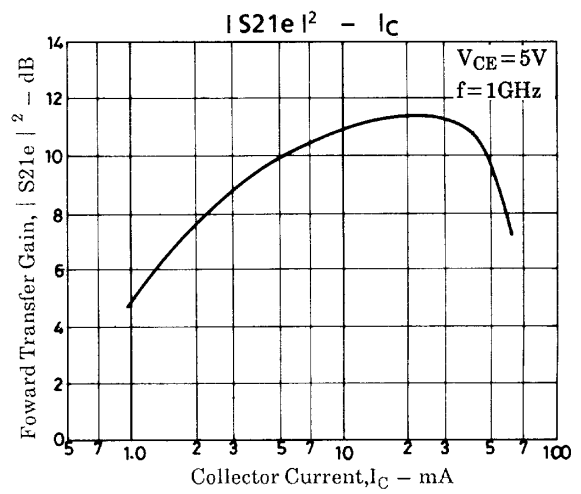
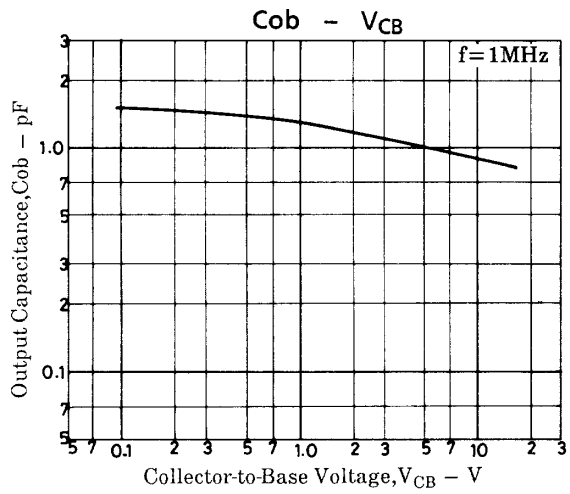
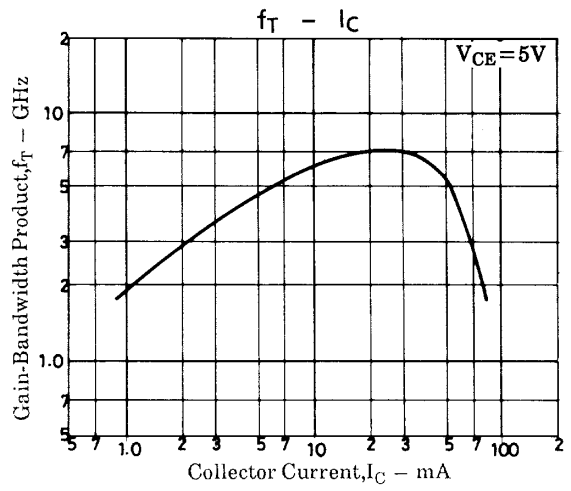
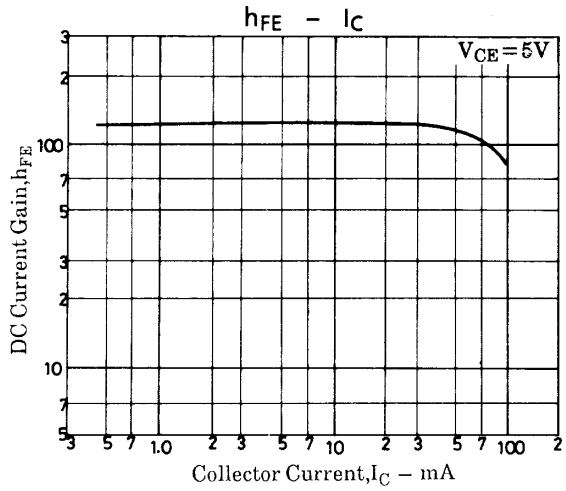
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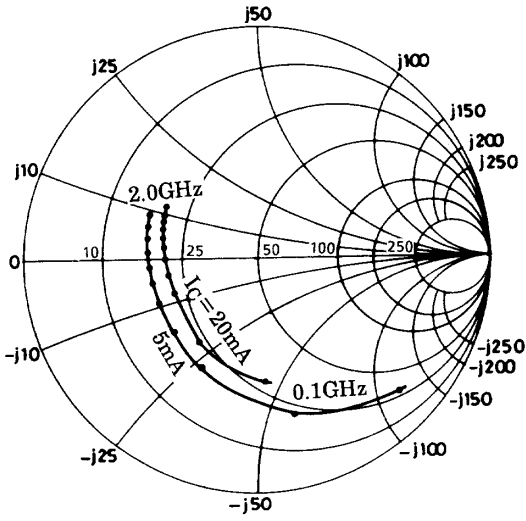
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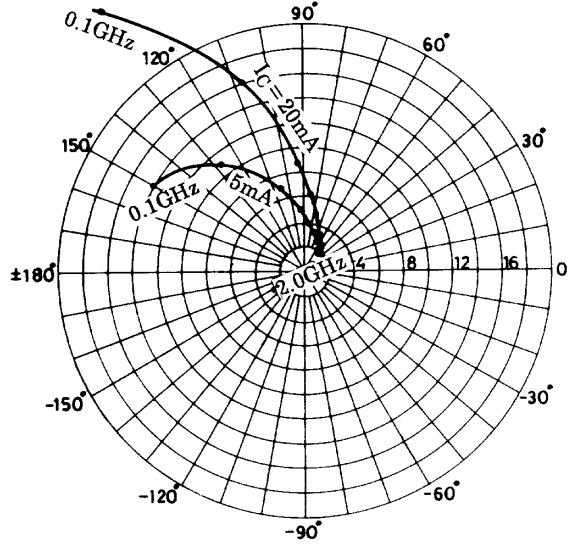


S parameter

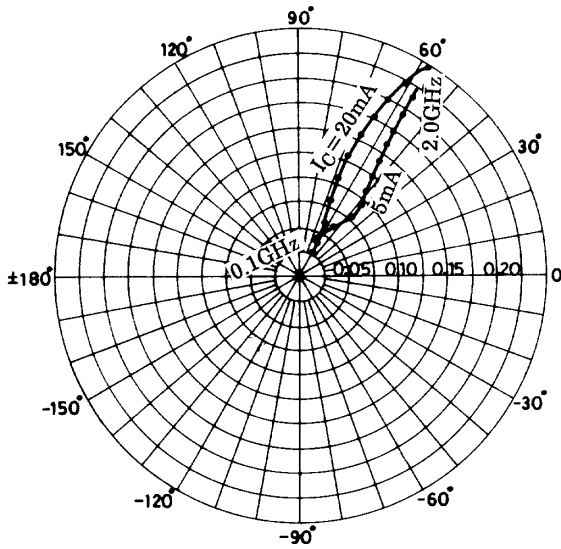
S11e : $V_{CE}=5V$
 $f=100MHz, 200 \text{ to } 2000MHz (200MHz \text{ step})$



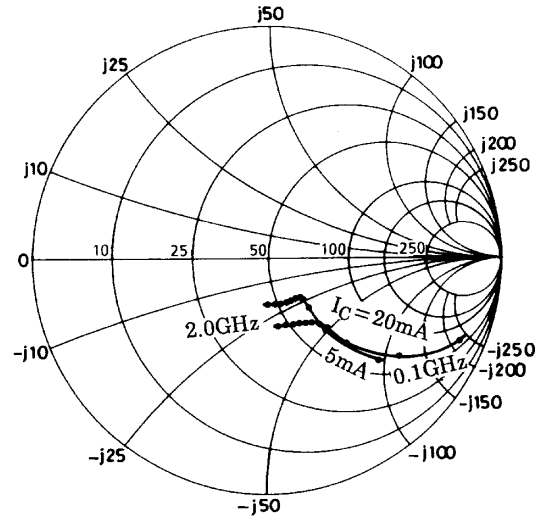
S21e : $V_{CE}=5V$
 $f=100MHz, 200 \text{ to } 2000MHz (200MHz \text{ step})$



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



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



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	0.810	-43.8	13.998	149.9	0.039	66.6	0.877	-23.4
200	0.669	-77.9	10.882	128.5	0.060	53.7	0.687	-37.0
400	0.521	-118.3	6.872	106.2	0.081	47.6	0.488	-46.9
600	0.478	-140.5	4.929	93.4	0.095	48.3	0.397	-50.5
800	0.470	-156.3	3.857	84.2	0.109	51.1	0.355	-52.7
1000	0.470	-168.2	3.194	75.7	0.125	53.0	0.331	-56.3
1200	0.473	-177.3	2.712	68.9	0.141	54.7	0.317	-59.9
1400	0.479	174.7	2.378	62.3	0.159	55.7	0.306	-65.3
1600	0.480	169.0	2.122	56.7	0.175	56.8	0.302	-69.9
1800	0.486	164.6	1.918	51.9	0.194	57.1	0.296	-76.0
2000	0.500	158.3	1.773	46.7	0.214	57.3	0.294	-82.0

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.519	-87.6	26.951	127.9	0.026	59.9	0.629	-42.6
200	0.433	-126.9	16.215	108.5	0.038	58.2	0.395	-51.2
400	0.397	-158.1	8.736	93.4	0.059	64.2	0.264	-50.4
600	0.394	-169.7	5.958	85.0	0.082	66.9	0.228	-50.2
800	0.404	-178.8	4.568	78.1	0.106	68.0	0.217	-51.7
1000	0.412	173.9	3.713	71.9	0.131	67.3	0.211	-56.8
1200	0.422	168.6	3.151	66.4	0.156	65.9	0.207	-61.9
1400	0.430	163.3	2.764	60.6	0.179	64.3	0.203	-69.1
1600	0.435	160.0	2.437	56.2	0.200	62.8	0.201	-75.3
1800	0.442	157.3	2.202	51.9	0.222	60.9	0.199	-83.5
2000	0.460	151.9	2.025	47.3	0.245	59.4	0.199	-90.7

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