

**2SC4364**

## VHF, UHF/MIX. OSC. Low-Voltage High-Frequency Amplifier Applications

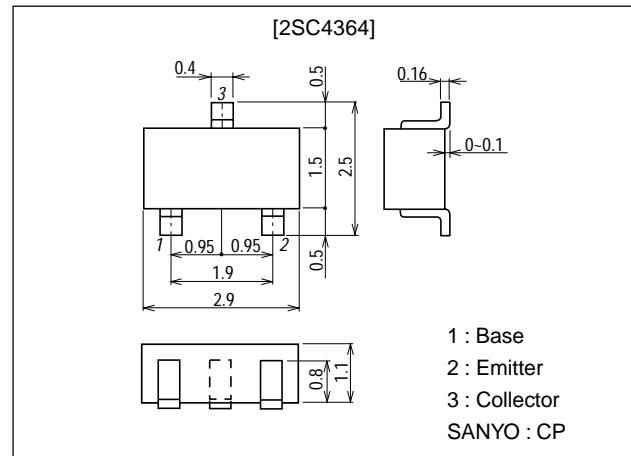
### Features

- Low-voltage operation
  - :  $f_T=3.0\text{GHz}$  typ ( $V_{CE}=3\text{V}$ )
  - :  $\text{MAG}=11\text{dB}$  typ ( $V_{CE}=3\text{V}$ ,  $I_C=3\text{mA}$ )
  - :  $\text{NF}=3.0\text{dB}$  typ ( $V_{CE}=3\text{V}$ ,  $I_C=3\text{mA}$ )

### 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	$V_{CB0}$		25	V
Collector-to-Emitter Voltage	$V_{CE0}$		15	V
Emitter-to-Base Voltage	$V_{EB0}$		3	V
Collector Current	$I_C$		30	mA
Collector Dissipation	$P_C$		250	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	$I_{CB0}$	$V_{CB}=15\text{V}$ , $I_E=0$			1.0	$\mu\text{A}$
Emitter Cutoff Current	$I_{EB0}$	$V_{EB}=2\text{V}$ , $I_C=0$			1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=3\text{V}$ , $I_C=3\text{mA}$	40*		200*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=3\text{V}$ , $I_C=3\text{mA}$		3.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB}=3\text{V}$ , $f=1\text{MHz}$		0.75	1.3	pF
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=3\text{V}$ , $f=1\text{MHz}$		0.7		pF

\* : The 2SC4364 is classified by 3mA  $h_{FE}$  as follows :

40	2	80	60	3	120	100	4	200
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(Note) Marking : OT

 $h_{FE}$  rank : 2, 3, 4

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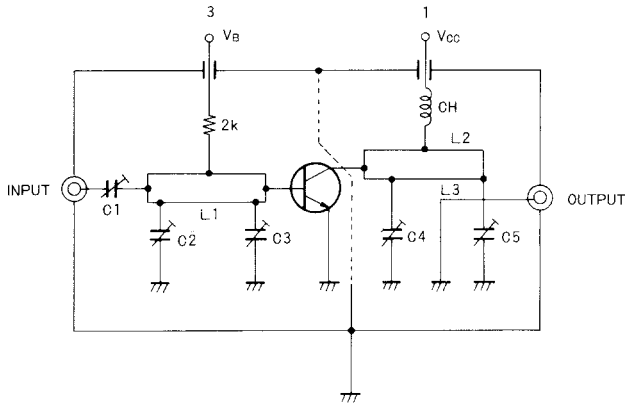
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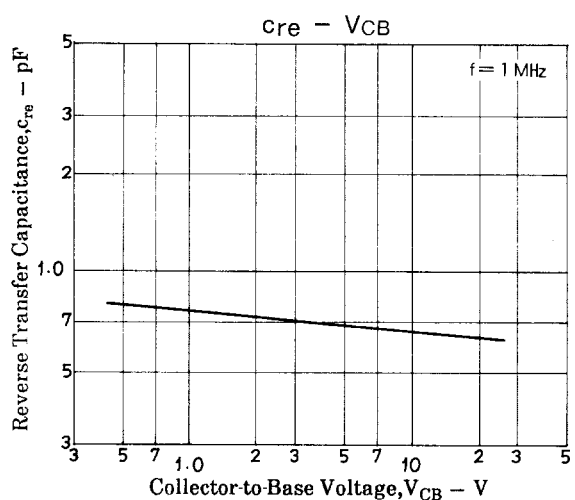
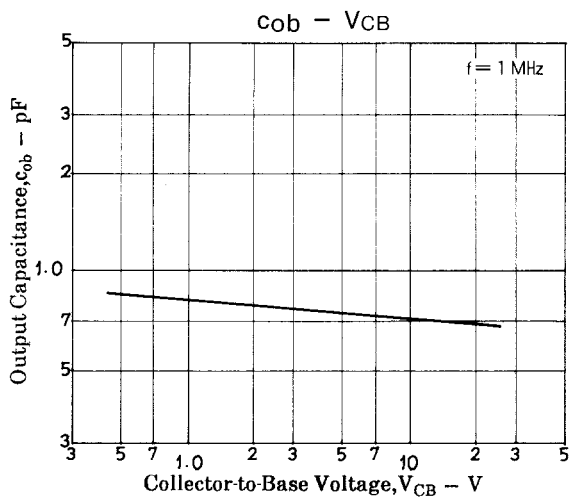
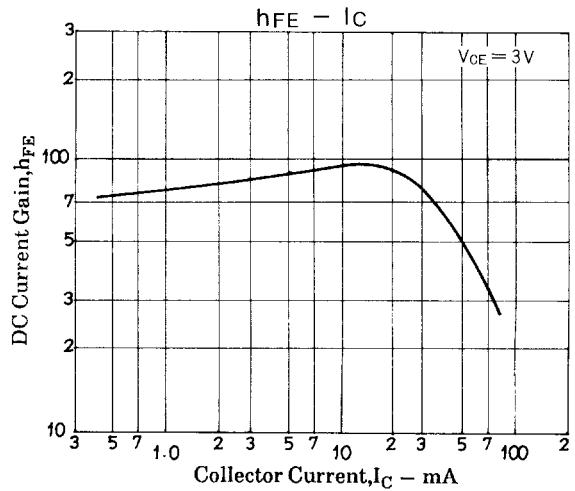
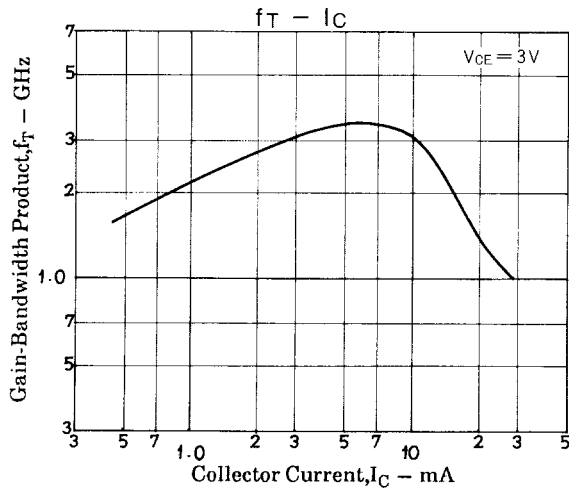
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=3V, I_C=3mA, f=0.9GHz$		7		dB
Maximum Available Power Gain	MAG	$V_{CE}=3V, I_C=3mA, f=0.9GHz$		11		dB
Noise Figure	NF	$V_{CE}=3V, I_C=3mA, f=0.9GHz$		3.0	5.0	dB

## NF Test Circuit

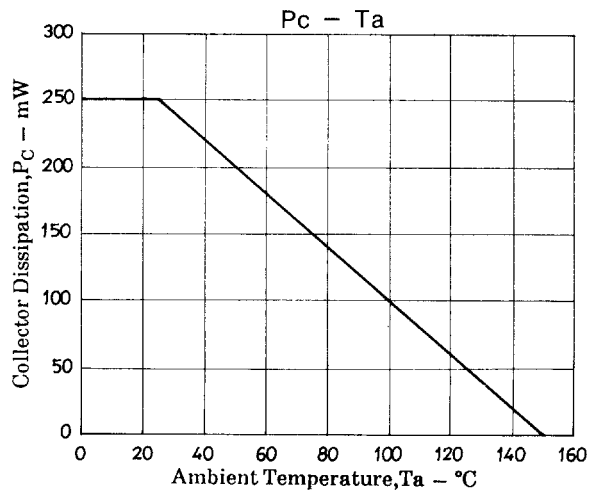
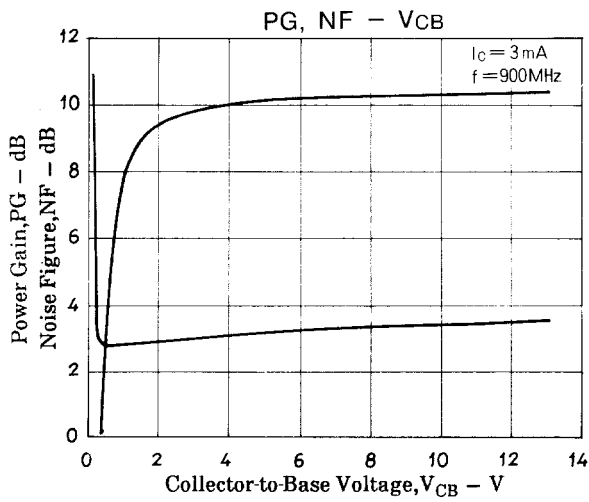
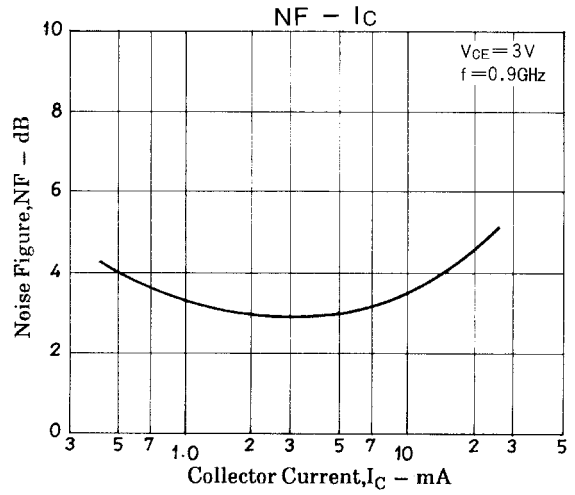
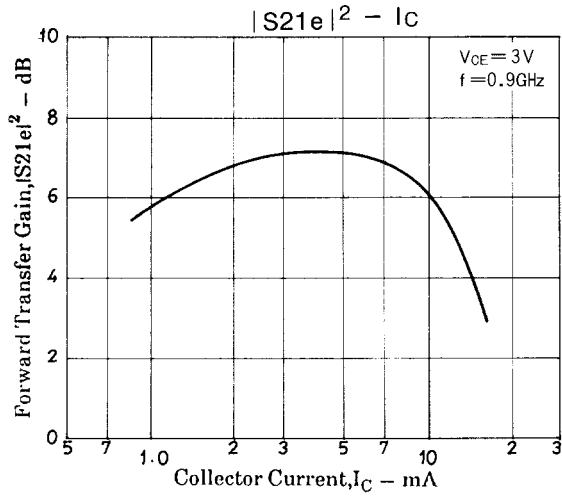


	900MHz
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W ≈ 1.5mm, l ≈ 25mm Strip line
L2	W ≈ 4mm, l ≈ 25mm Strip line
L3	0.5φ, l ≈ 40mm
CH	2t+bead core

Unit (resistance : Ω)



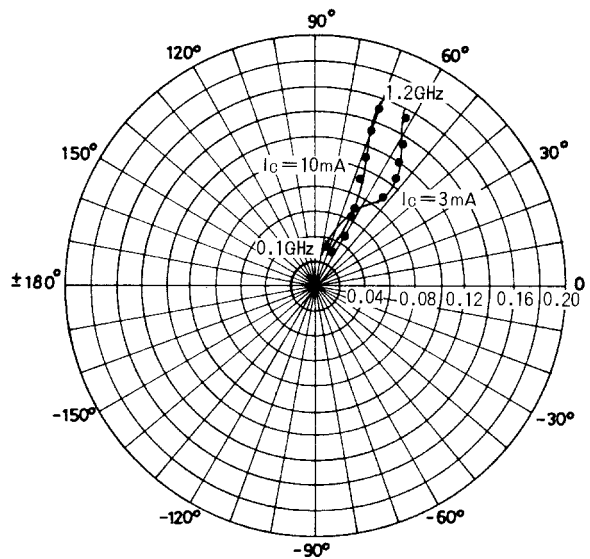
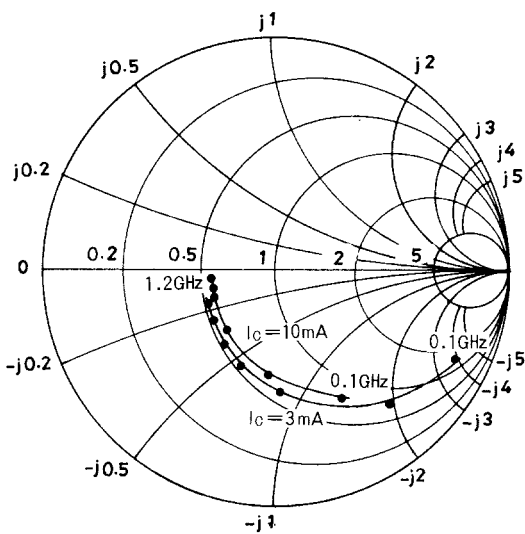
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## S parameter

S11e :  $V_{CE} = 3\text{V}$   
 $f = 100\text{MHz}, 200 \text{ to } 1200\text{MHz} (200\text{MHz step})$

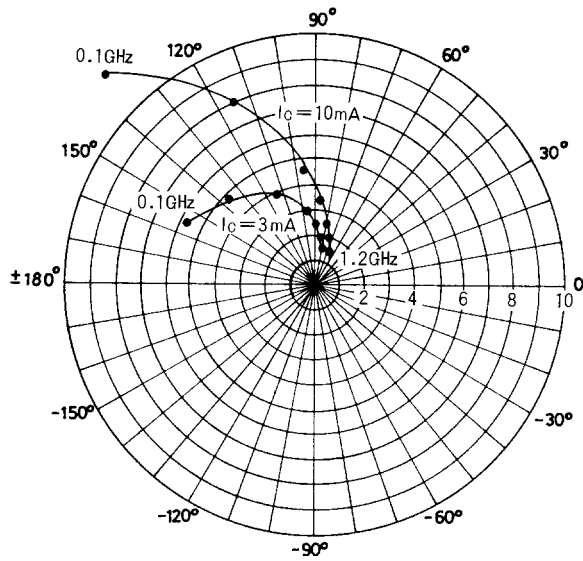
S12e :  $V_{CE} = 3\text{V}$   
 $f = 100\text{MHz}, 200 \text{ to } 1200\text{MHz} (200\text{MHz step})$



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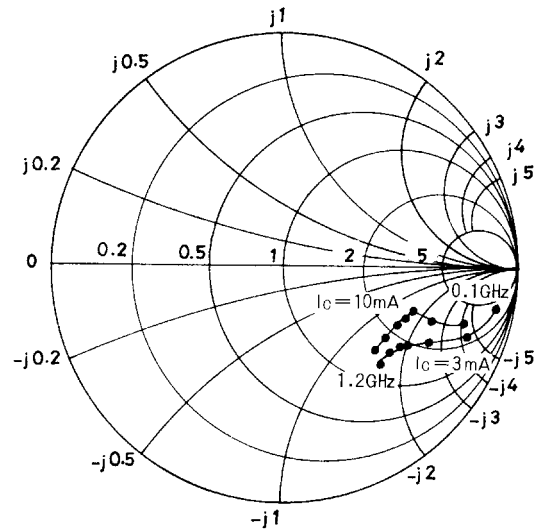
S21e :  $V_{CE}=3V$

$f=100\text{MHz}$ , 200 to 1200MHz (200MHz step)



S22e :  $V_{CE}=10V$

$f=100\text{MHz}$ , 200 to 1200MHz (200MHz step)



### S parameter (Common emitter)

$V_{CE}=3V$ ,  $I_C=3\text{mA}$ ,  $Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.874	-25.4	5.638	154.7	0.036	73.4	0.931	-12.4
200	0.758	-46.8	4.895	137.3	0.061	62.3	0.842	-19.9
400	0.555	-85.9	3.925	112.5	0.088	53.7	0.696	-26.7
600	0.437	-110.1	3.004	97.1	0.105	53.2	0.631	-30.3
800	0.377	-127.8	2.387	86.7	0.119	56.2	0.596	-32.9
900	0.361	-135.3	2.201	82.7	0.128	57.3	0.594	-34.4
1000	0.353	-141.9	2.014	79.1	0.135	56.5	0.586	-36.1
1200	0.340	-151.4	1.763	72.7	0.153	60.6	0.581	-40.1

$V_{CE}=3V$ ,  $I_C=10\text{mA}$ ,  $Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.632	-59.2	11.508	135.2	0.031	63.9	0.811	-18.4
200	0.467	-92.6	7.923	115.1	0.045	58.7	0.677	-21.8
400	0.352	-129.6	4.570	95.5	0.067	61.8	0.584	-22.7
600	0.317	-147.2	3.190	85.3	0.089	65.4	0.561	-25.8
800	0.307	-157.8	2.432	78.1	0.109	68.6	0.548	-29.2
900	0.308	-162.6	2.217	75.1	0.122	69.1	0.551	-31.2
1000	0.314	-166.9	2.023	72.2	0.133	70.1	0.547	-33.3
1200	0.318	-172.2	1.756	67.0	0.156	70.1	0.549	-38.1

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