

**2SC4365**

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

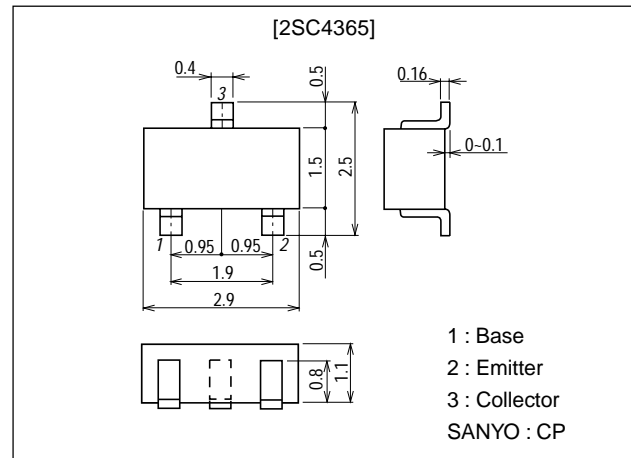
### Features

- Low-voltage operation
  - :  $f_T=3.0\text{GHz}$  typ ( $V_{CE}=3\text{V}$ )
  - :  $\text{MAG}=12\text{dB}$  typ ( $V_{CE}=3\text{V}$ ,  $I_C=10\text{mA}$ )
  - :  $\text{NF}=1.5\text{dB}$  typ ( $V_{CE}=3\text{V}$ ,  $I_C=5\text{mA}$ )

### 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	$I_C$		50	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	$I_{EB0}$	$V_{EB}=1\text{V}$ , $I_C=0$			1.0	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=3\text{V}$ , $I_C=10\text{mA}$	40*		200*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=3\text{V}$ , $I_C=10\text{mA}$		3.0		GHz
Output Capacitance	$C_{ob}$	$V_{CB}=3\text{V}$ , $f=1\text{MHz}$		0.9	1.5	pF
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=3\text{V}$ , $f=1\text{MHz}$		0.85		pF

\* : The 2SC4365 is classified by 10mA  $h_{FE}$  as follows :

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

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

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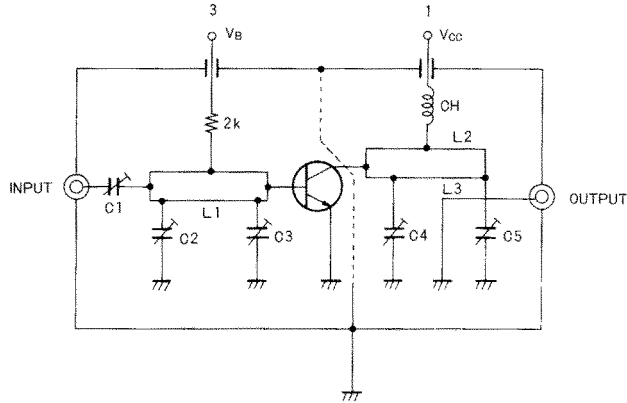
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# 2SC4365

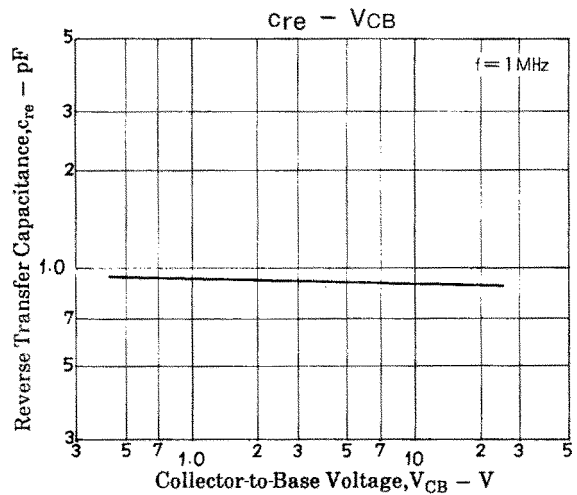
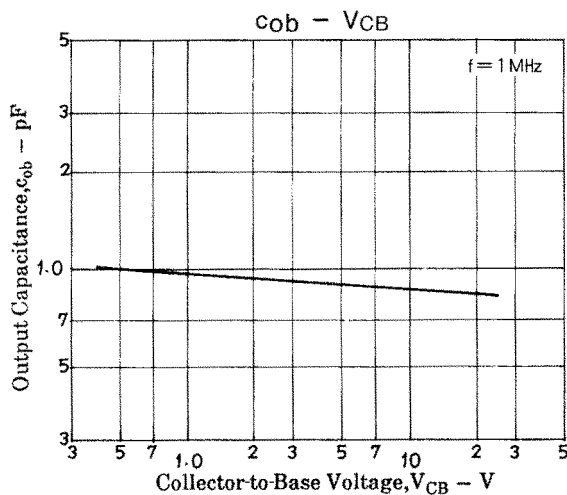
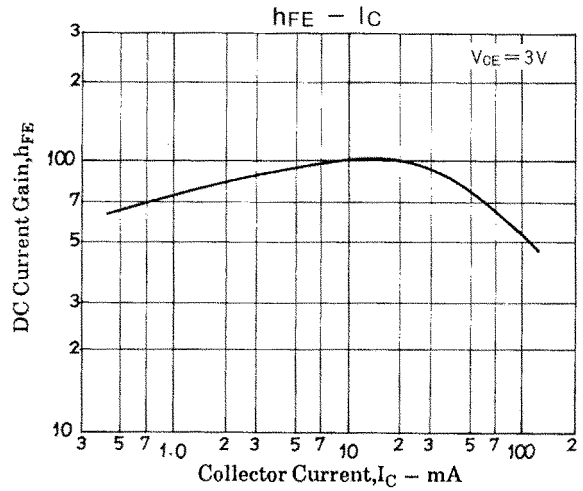
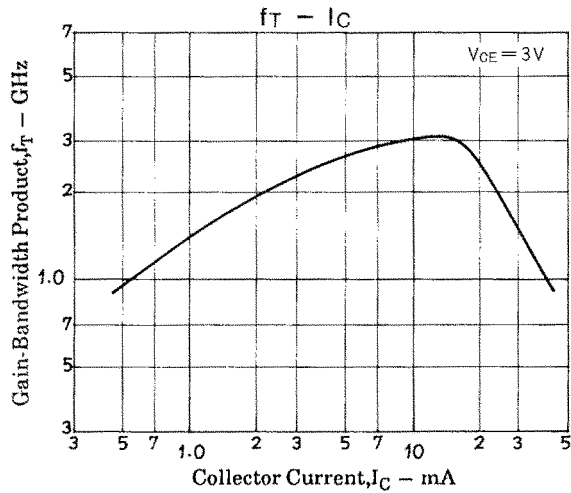
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=3V, I_C=10mA, f=0.9GHz$		7		dB
Maximum Available Power Gain	MAG	$V_{CE}=3V, I_C=10mA, f=0.9GHz$		12		dB
Noise Figure	NF	$V_{CE}=3V, I_C=5mA, f=0.9GHz$		1.5	3.0	dB

## NF Test Circuit

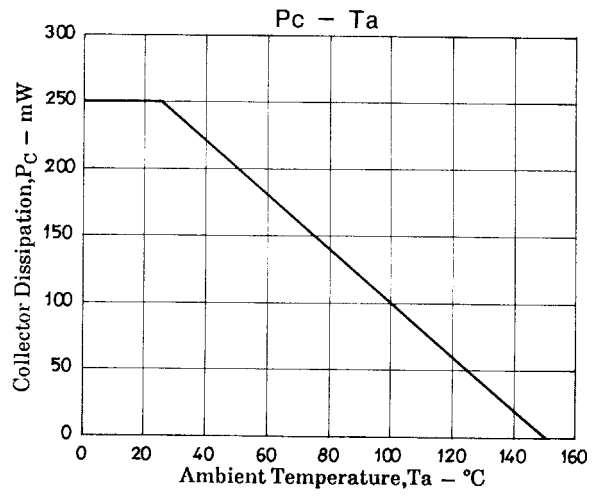
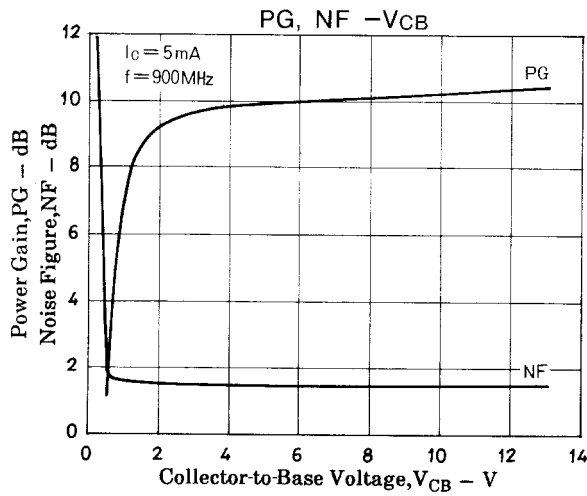
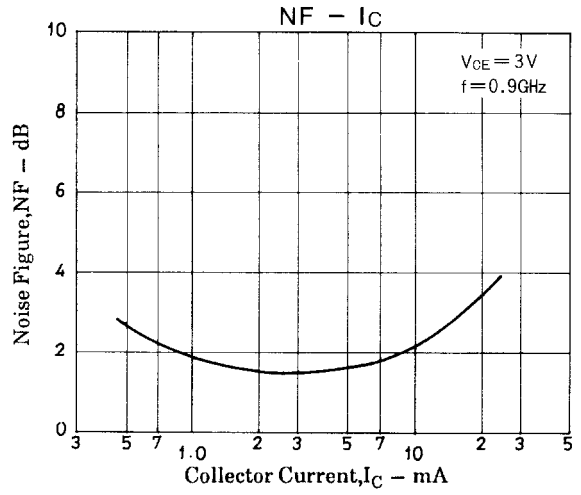
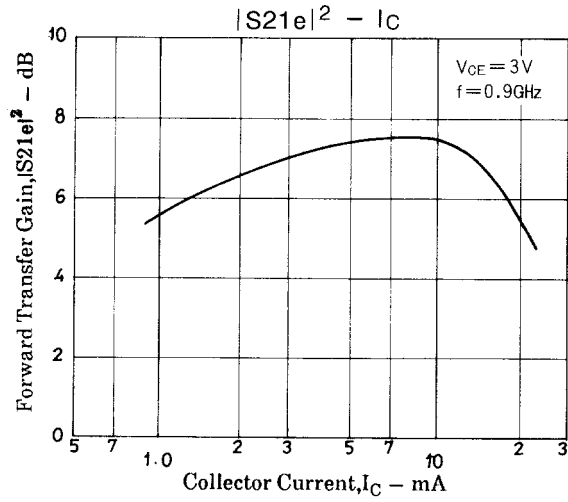


	900MHz
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W ≈ 1.5mm, l ≈ 25mm Strip line
L2	W ≈ 4mm, l ≈ 25mm Strip line
L3	0.5φ, l ≈ 40mm
CH	2t+bead core

Unit (resistance : Ω)

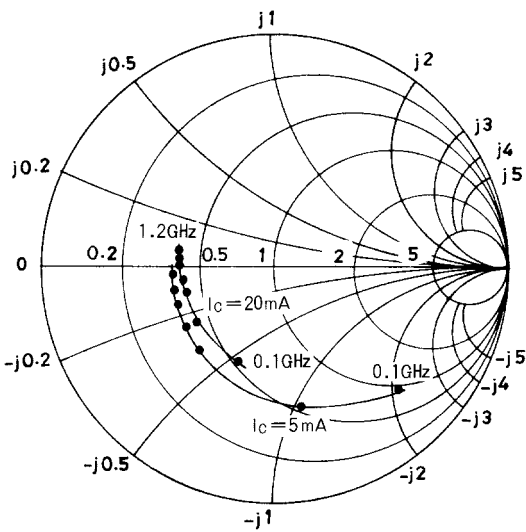


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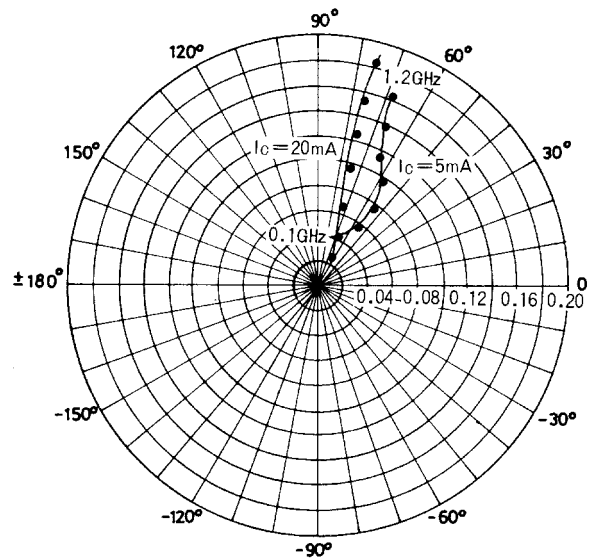


## S parameter

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



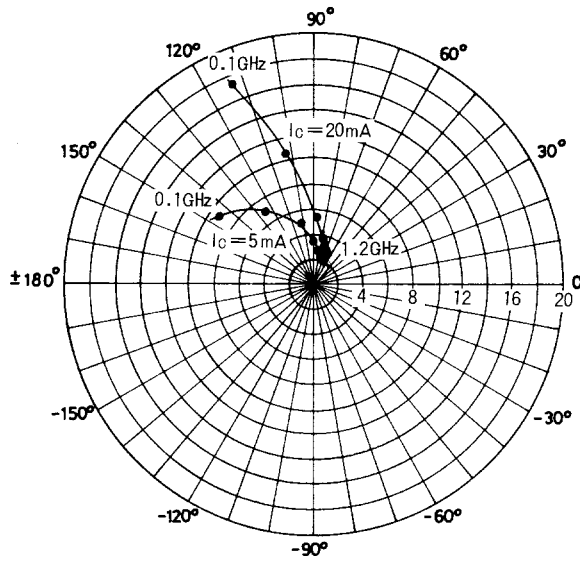
S12e :  $V_{CE} = 3\text{V}$   
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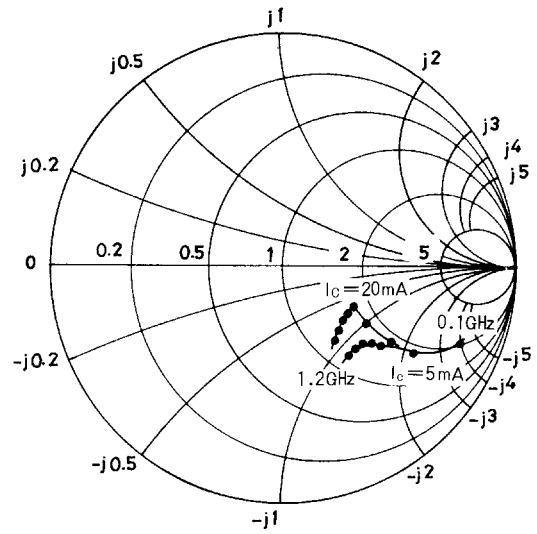
S21e :  $V_{CE} = 3\text{ V}$

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



S22e :  $V_{CE} = 3\text{ V}$

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



### S parameter (Common emitter)

$V_{CE} = 3\text{ V}$ ,  $I_C = 5\text{ mA}$ ,  $Z_0 = 50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.738	-45.7	9.352	143.7	0.040	65.0	0.827	-22.5
200	0.606	-80.3	7.183	123.9	0.059	54.4	0.664	-31.3
400	0.485	-129.6	4.814	99.4	0.079	53.5	0.506	-35.3
600	0.449	-149.5	3.426	87.4	0.097	58.1	0.463	-38.1
800	0.437	-161.2	2.626	78.8	0.115	63.5	0.444	-41.4
900	0.437	-165.9	2.392	75.6	0.127	65.2	0.446	-43.3
1000	0.444	-170.2	2.180	72.3	0.138	67.3	0.444	-45.4
1200	0.448	-175.7	1.891	66.8	0.163	69.0	0.451	-50.4

$V_{CE} = 3\text{ V}$ ,  $I_C = 20\text{ mA}$ ,  $Z_0 = 50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.446	-112.7	17.471	118.5	0.026	61.5	0.581	-32.6
200	0.421	-143.4	10.341	102.4	0.040	65.0	0.437	-32.2
400	0.414	-164.8	5.545	88.2	0.067	71.7	0.370	-30.5
600	0.412	-173.5	3.742	79.9	0.096	74.1	0.361	-34.4
800	0.412	-178.4	2.822	73.4	0.123	75.8	0.359	-39.1
900	0.418	-179.1	2.566	70.9	0.139	75.6	0.365	-41.5
1000	0.428	-176.8	2.326	68.1	0.153	76.0	0.366	-44.2
1200	0.435	-174.0	2.013	63.2	0.182	74.9	0.398	-50.2

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