

**2SC4861**

## UHF Converter, Local Oscillator Applications

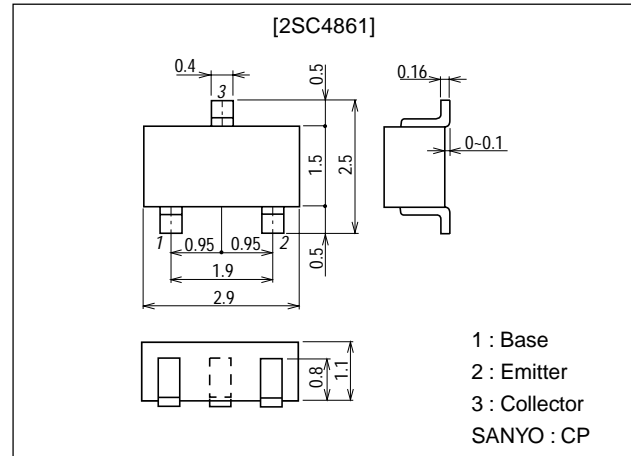
### Features

- High cutoff frequency :  $f_T=6.5\text{GHz}$  typ.
- High gain :  $|S_{21e}|^2=11.5\text{dB}$  typ ( $f=1\text{GHz}$ ).
- Small Cob :  $NF=0.65\text{pF}$  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	$V_{CB0}$		20	V
Collector-to-Emitter Voltage	$V_{CE0}$		10	V
Emitter-to-Base Voltage	$V_{EB0}$		2	V
Collector Current	$I_C$		30	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	$h_{FE}$	$V_{CE}=5\text{V}, I_C=5\text{mA}$	60*		270*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=5\text{V}, I_C=5\text{mA}$		6.5		GHz
Output Capacitance	Cob	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.65	1.1	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$	8	11.5		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=5\text{mA}, f=1\text{GHz}$		2.2	4.0	dB

\* : The 2SC4861 is classified by 5mA  $h_{FE}$  as follows :

60	3	120	90	4	180	135	5	270
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Marking : EN

 $h_{FE}$  rank : 3, 4, 5

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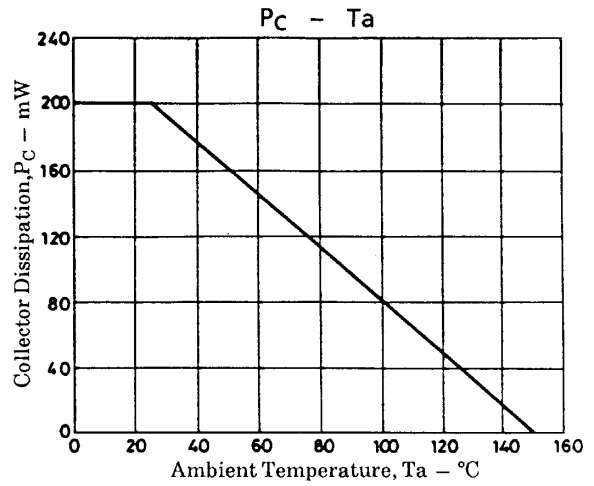
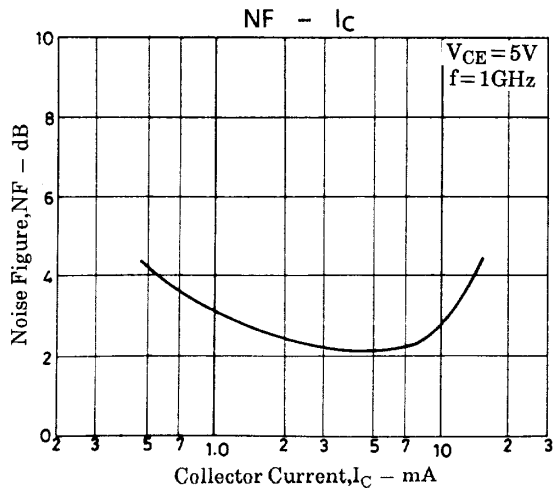
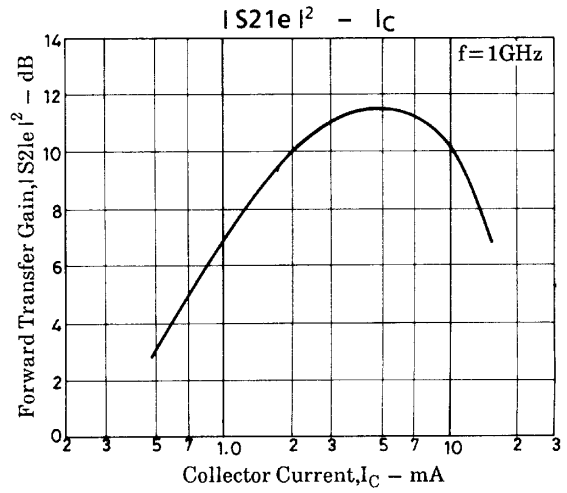
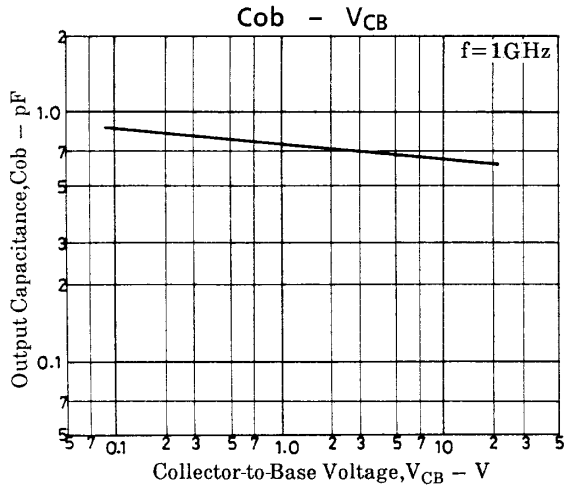
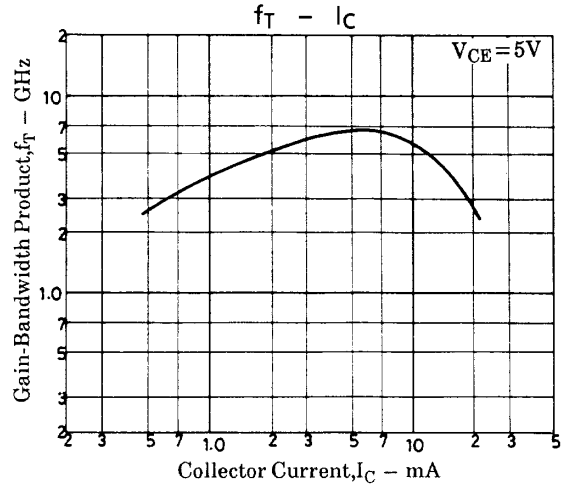
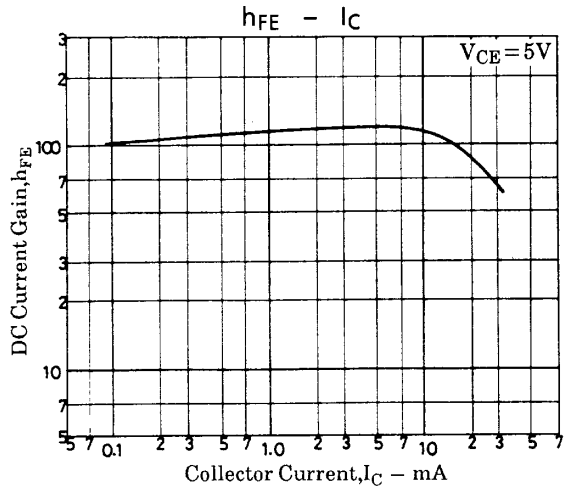
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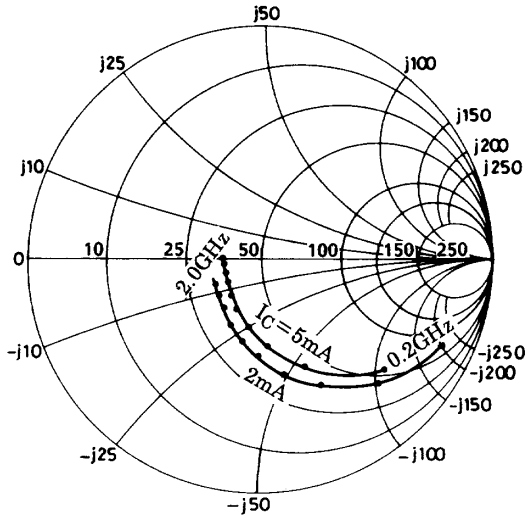
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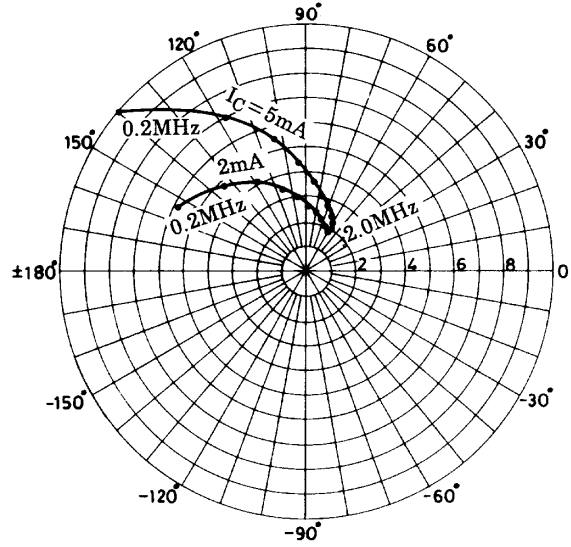
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## S parameter

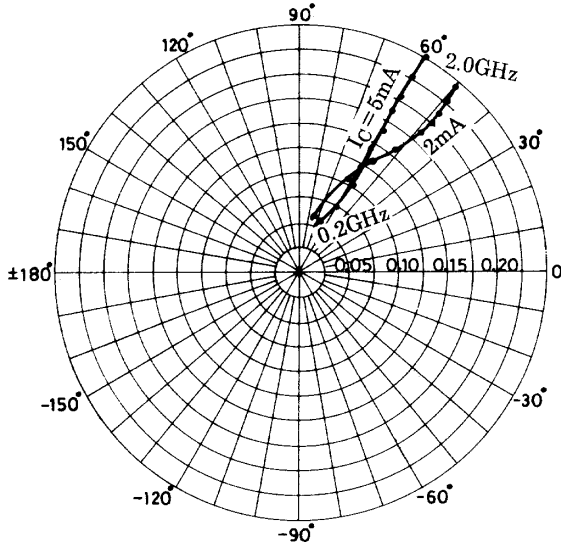
S11e:  $V_{CE}=5V$   
 $f=200$  to  $2000MHz$  (200MHz step)



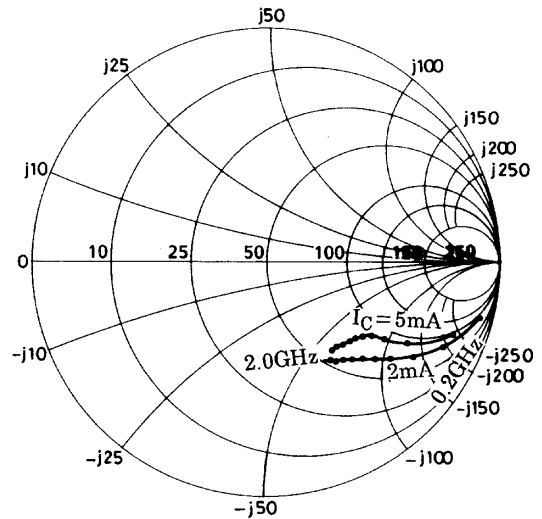
S21e:  $V_{CE}=5V$   
 $f=200$  to  $2000MHz$  (200MHz step)



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



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



**S parameter (Common emitter)**

$V_{CE}=5V, I_C=2mA, Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.868	-25.9	5.790	153.2	0.048	73.9	0.944	-14.5
400	0.737	-46.6	4.868	133.9	0.084	62.5	0.839	-25.6
600	0.604	-64.1	4.170	118.7	0.107	55.8	0.747	-32.6
800	0.503	-78.5	3.570	106.4	0.125	52.0	0.672	-37.6
1000	0.420	-91.5	3.117	96.2	0.138	49.9	0.622	-41.5
1200	0.367	-103.8	2.731	87.6	0.151	48.8	0.583	-44.9
1400	0.312	-115.4	2.457	79.9	0.161	48.6	0.553	-48.0
1600	0.272	-128.6	2.232	72.5	0.170	48.9	0.534	-51.1
1800	0.254	-140.6	2.042	67.0	0.182	49.4	0.516	-54.5
2000	0.232	-150.6	1.906	61.5	0.196	50.2	0.511	-57.2

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.714	-41.8	10.073	140.4	0.042	68.2	0.858	-20.7
400	0.508	-67.9	7.241	118.0	0.066	60.2	0.693	-29.6
600	0.378	-86.7	5.499	104.1	0.084	58.5	0.603	-32.7
800	0.294	-101.5	4.414	93.7	0.100	58.9	0.550	-34.8
1000	0.245	-116.0	3.675	85.5	0.116	59.3	0.522	-37.5
1200	0.211	-130.0	3.167	78.3	0.132	59.6	0.503	-40.3
1400	0.185	-145.8	2.783	72.2	0.148	59.8	0.488	-43.2
1600	0.173	-158.5	2.481	66.2	0.164	59.8	0.479	-46.7
1800	0.180	-172.1	2.252	61.8	0.181	59.8	0.472	-50.3
2000	0.174	178.9	2.098	57.1	0.201	59.4	0.468	-53.3

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