

SANYO	No.2971	2SC4270
		NPN Epitaxial Planar Silicon Transistor
		UHF Converter, Local Oscillator Applications

Features

- Small noise figure : NF = 3.0dB typ (f = 0.9GHz)
- High power gain : PG = 12dB typ (f = 0.9GHz)
- High cutoff frequency : $f_T = 3.0\text{GHz}$ typ

Absolute Maximum Ratings at Ta = 25°C

			unit
Collector to Base Voltage	V _{CB0}	25	V
Collector to Emitter Voltage	V _{CEO}	15	V
Emitter to Base Voltage	V _{EBO}	3	V
Collector Current	I _C	50	mA
Base Current	I _B	20	mA
Collector Dissipation	P _C	250	mW
Junction Temperature	T _j	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Electrical Characteristics at Ta = 25°C

			min	typ	max	unit
Collector Cutoff Current	I _{CBO}	V _{CB} = 20V, I _E = 0			0.1	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} = 2V, I _C = 0			10	μA
DC Current Gain	h _{FE}	V _{CE} = 10V, I _C = 5mA	40*		200*	
Gain-Bandwidth Product	f _T	V _{CE} = 10V, I _C = 10mA	1.5	3.0		GHz
Output Capacitance	c _{ob}	V _{CB} = 10V, f = 1MHz		0.7	1.0	pF
Reverse Transfer Capacitance	c _{re}	V _{CB} = 10V, f = 1MHz		0.45		pF
Power Gain	PG	V _{CE} = 10V, I _C = 10mA, f = 0.9GHz		12		dB
Noise Figure	NF	V _{CE} = 10V, I _C = 3mA, f = 0.9GHz		3.0		dB

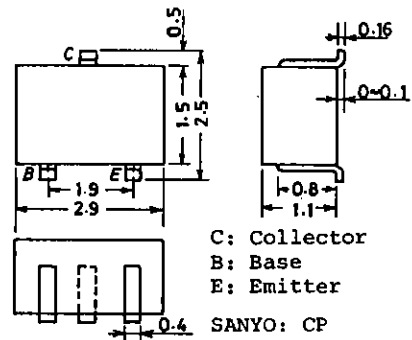
* : The 2SC4270 is classified by 5mA h_{FE} as follows:

40	2	80	60	3	120	100	4	200
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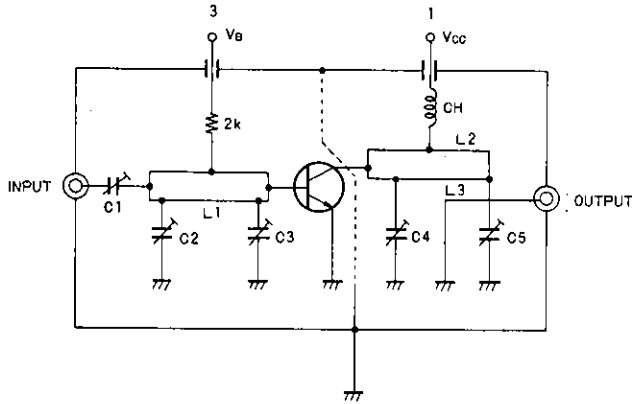
(Note) Marking : KT
h_{FE} rank : 2,3,4

Package Dimensions 2018A

(unit : mm)

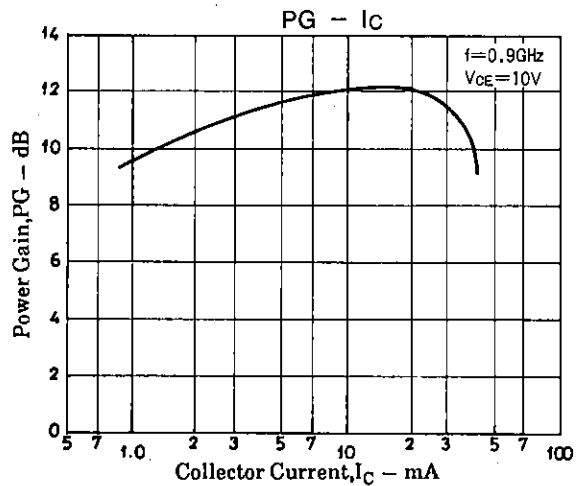
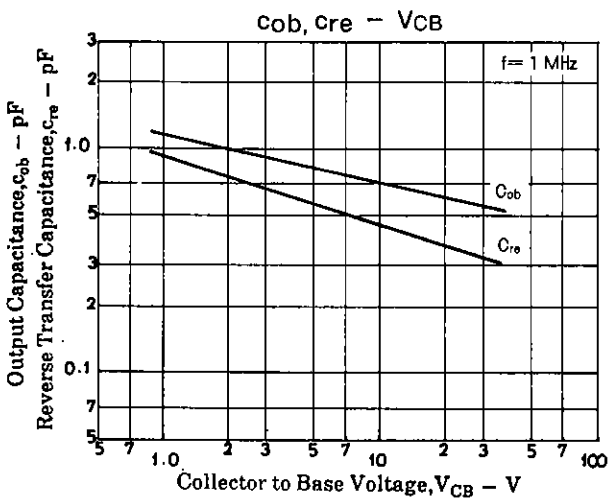
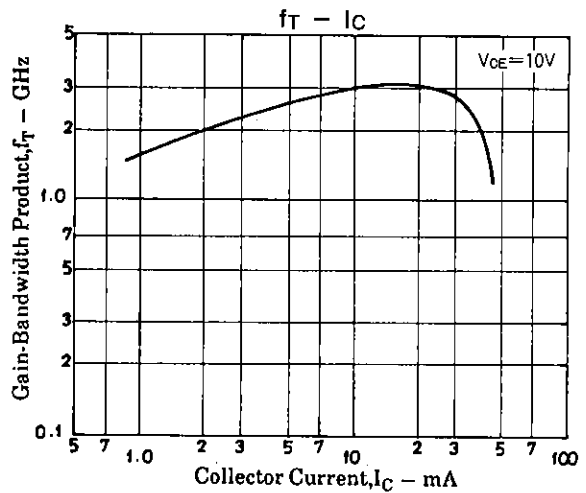
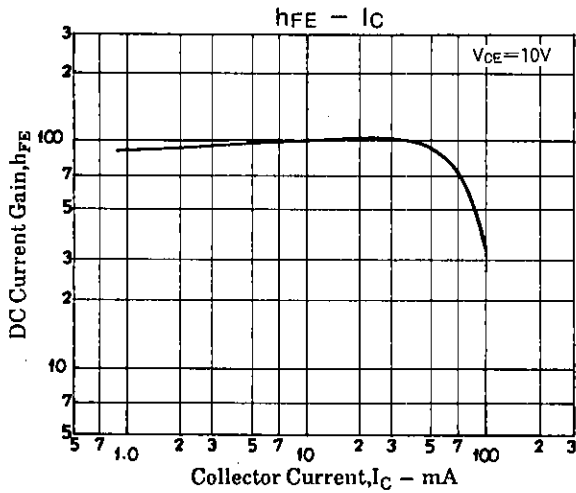


PG, NF Test Circuit

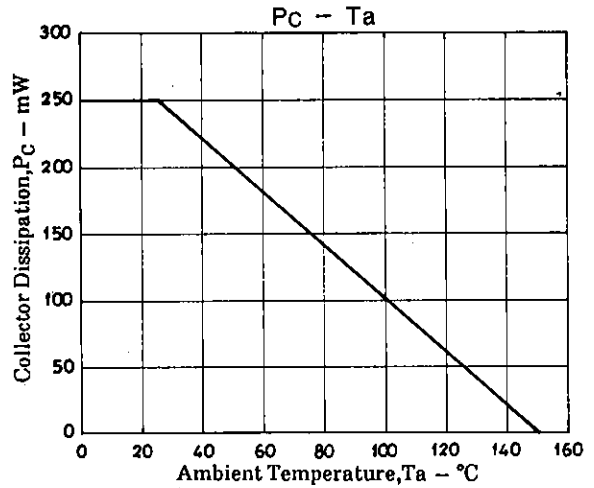
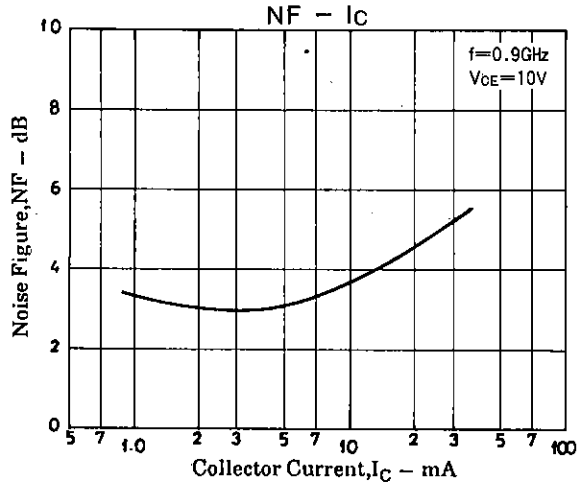


Unit (Resistance : Ω)

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



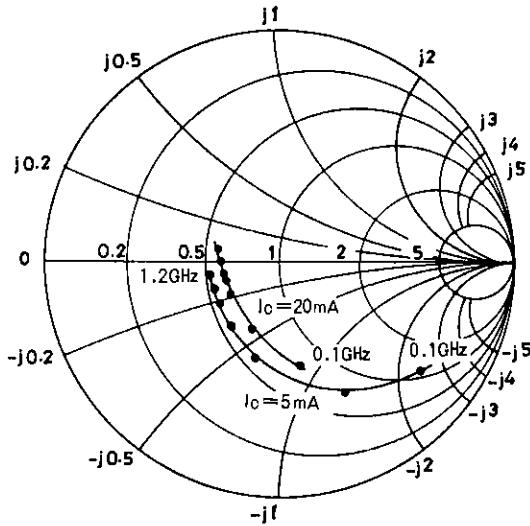
2SC4270



S parameter

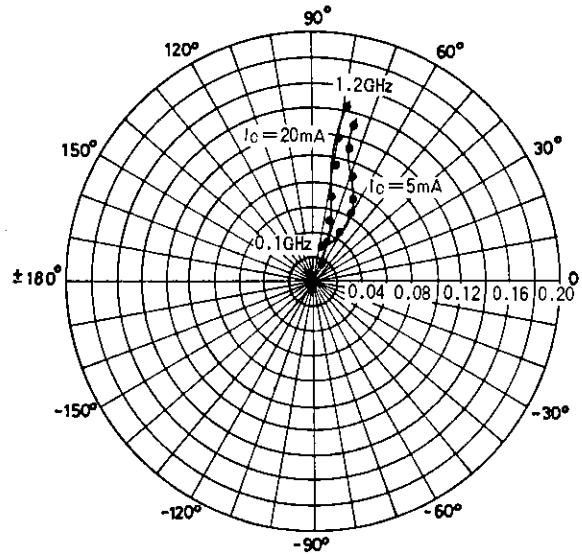
S11e : $V_{CE}=10\text{V}$

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



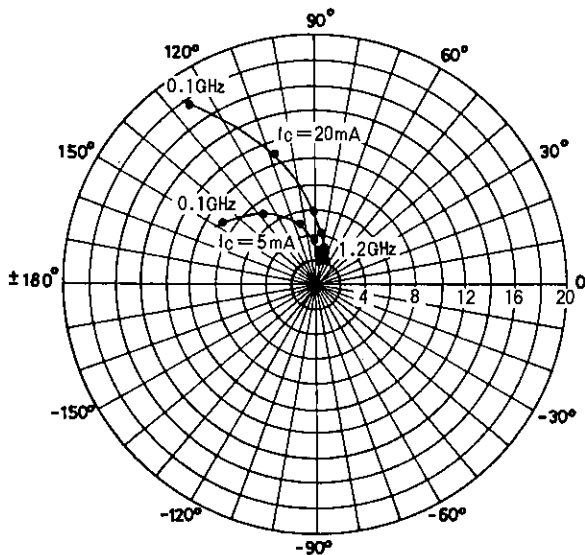
S12e : $V_{CE}=10\text{V}$

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



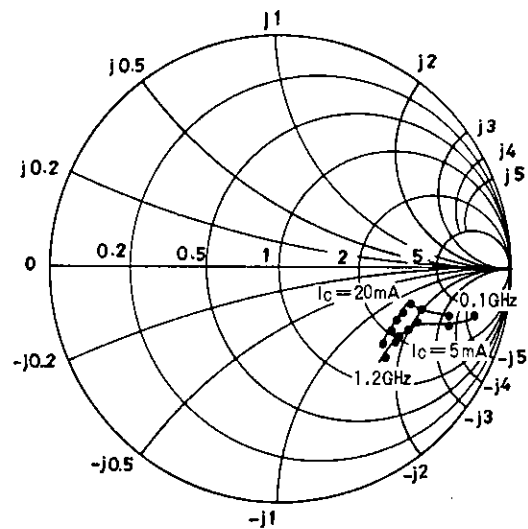
S21e : $V_{CE}=10\text{V}$

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



S22e : $V_{CE}=10\text{V}$

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



S parameter (Common emitter) $V_{CE}=10V$, $I_C=5\text{ mA}$, $Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.771	-35.1	8.763	147.2	0.027	69.3	0.890	-14.2
200	0.613	-64.7	7.004	127.6	0.043	59.8	0.780	-19.7
400	0.429	-110.7	4.882	103.1	0.061	58.1	0.660	-22.8
600	0.361	-133.5	3.471	90.5	0.075	63.1	0.625	-25.1
800	0.355	-148.4	2.693	81.6	0.091	68.1	0.612	-28.6
900	0.331	-153.7	2.450	78.9	0.100	70.5	0.609	-29.9
1000	0.328	-158.9	2.236	75.5	0.110	72.5	0.607	-31.6
1200	0.326	-167.9	1.932	69.9	0.130	74.7	0.608	-35.7

 $V_{CE}=10V$, $I_C=20\text{ mA}$, $Z_0=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.447	-78.1	17.728	125.0	0.020	66.0	0.752	-18.5
200	0.338	-113.2	10.936	107.5	0.031	66.5	0.639	-18.5
400	0.290	-146.6	5.773	91.4	0.052	72.1	0.580	-18.5
600	0.281	-159.3	3.956	83.0	0.074	75.7	0.571	-21.1
800	0.285	-168.8	2.982	76.2	0.095	77.6	0.566	-25.2
900	0.289	-171.3	2.703	74.0	0.106	78.6	0.563	-26.7
1000	0.291	-174.4	2.454	71.3	0.118	79.4	0.565	-28.6
1200	0.297	-178.1	2.116	66.5	0.140	79.0	0.569	-33.1

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