

**2SC5275**

UHF to S Band Low-Noise Amplifier, OSC Applications

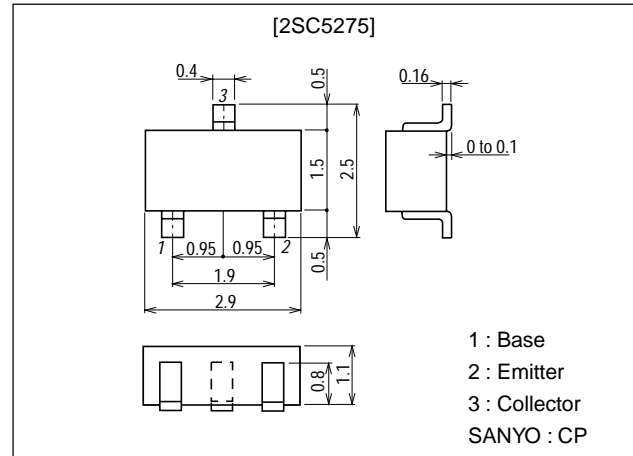
Features

- Low noise : $NF=0.9\text{dB}$ typ ($f=1\text{GHz}$).
: $NF=1.4\text{dB}$ typ ($f=1.5\text{GHz}$).
- High gain : $|S_{21e}|^2=10\text{dB}$ typ ($f=1.5\text{GHz}$).
- High cutoff frequency : $f_T=11\text{GHz}$ typ.
- Low-voltage, low-current operation
($V_{CE}=1\text{V}$, $I_C=1\text{mA}$)
: $f_T=7\text{GHz}$ type.
: $|S_{21e}|^2=5.5\text{dB}$ typ ($f=1.5\text{GHz}$).

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_{EBO}		1.5	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	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=1\text{V}$, $I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_{T1}	$V_{CE}=5\text{V}$, $I_C=10\text{mA}$	8	11		GHz
	f_{T2}	$V_{CE}=1\text{V}$, $I_C=1\text{mA}$		7		GHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}$, $f=1\text{MHz}$		0.45	0.7	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB}=10\text{V}$, $f=1\text{MHz}$		0.30		pF

* : The 2SC5275 is classified by 10mA h_{FE} as follows :

60	3	120	90	4	180	135	5	270
----	---	-----	----	---	-----	-----	---	-----

Marking : MN

 h_{FE} rank : 3, 4, 5

Continued on next page.

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

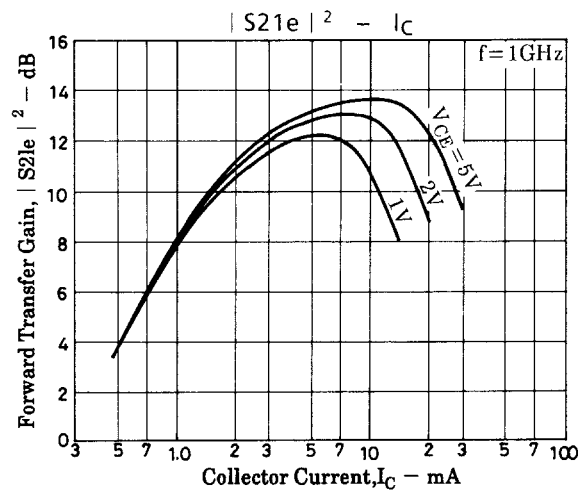
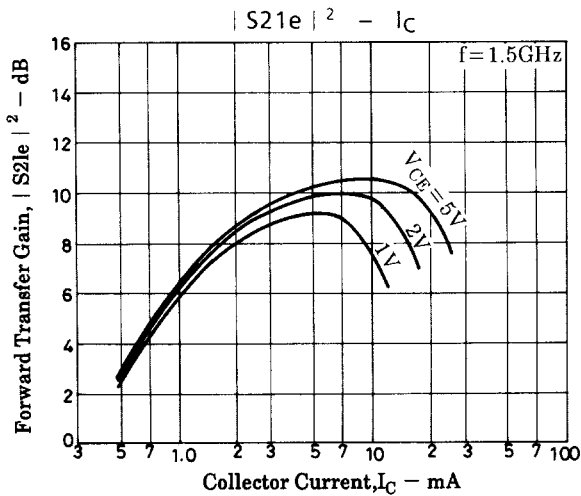
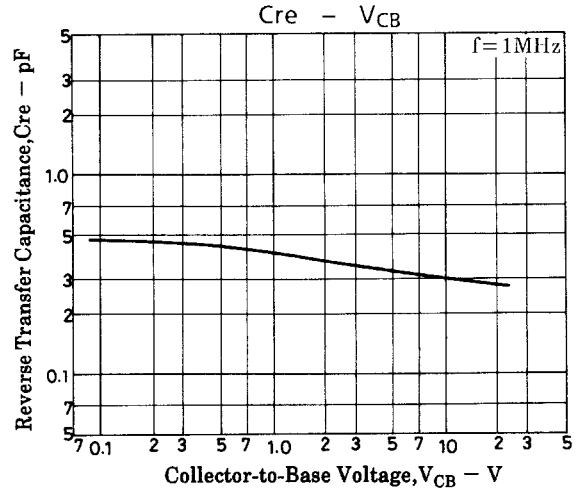
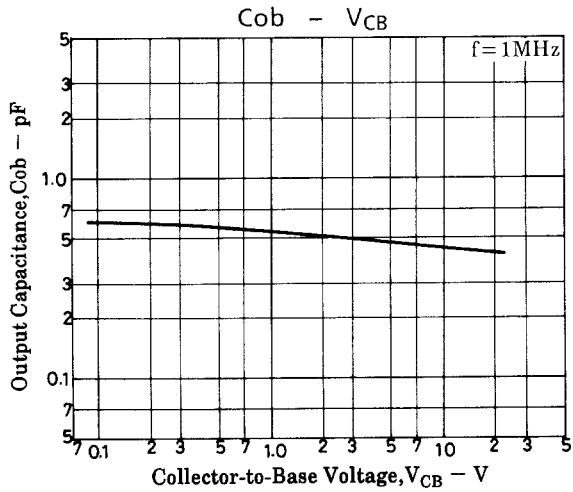
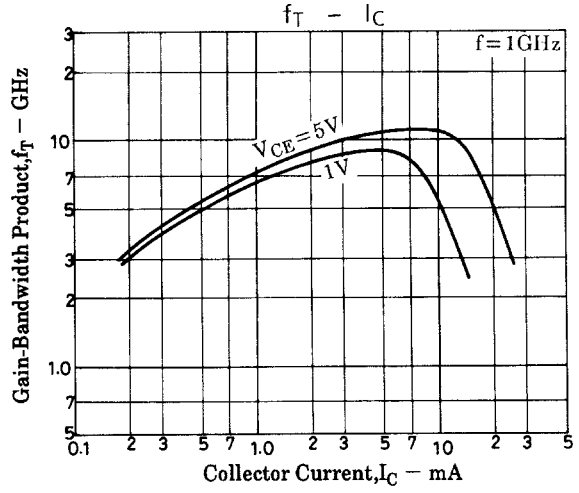
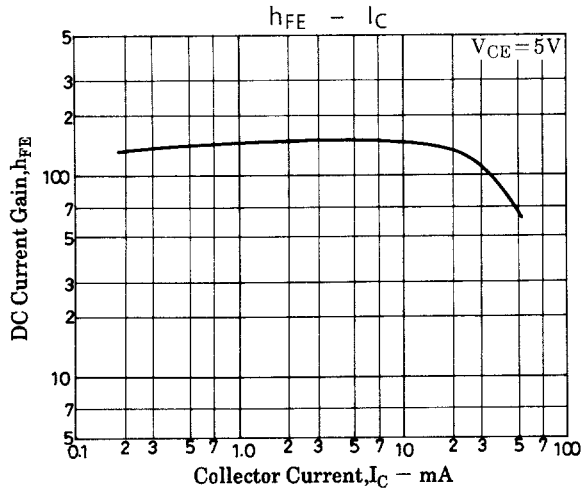
SANYO Electric Co., Ltd. Semiconductor Business Headquarters

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

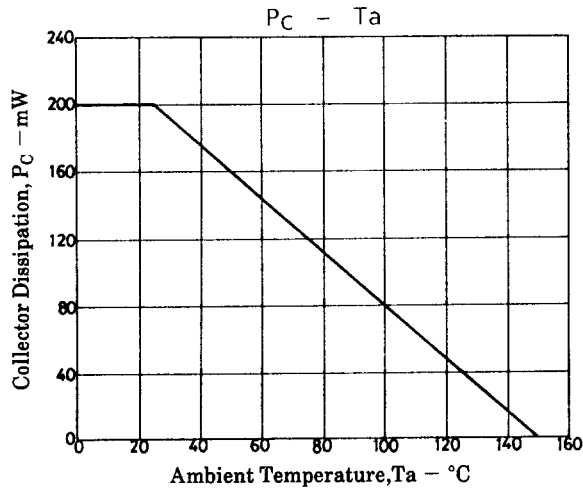
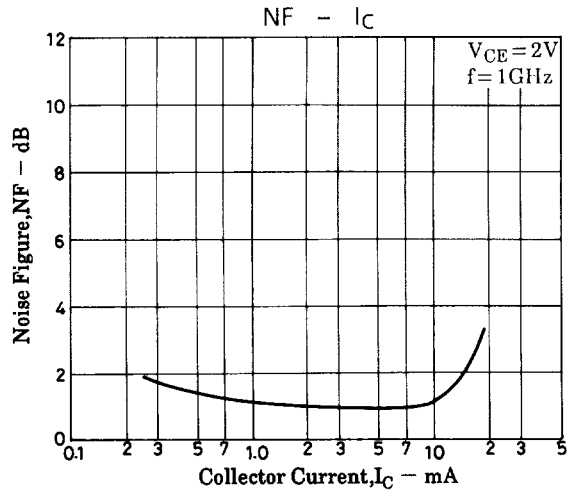
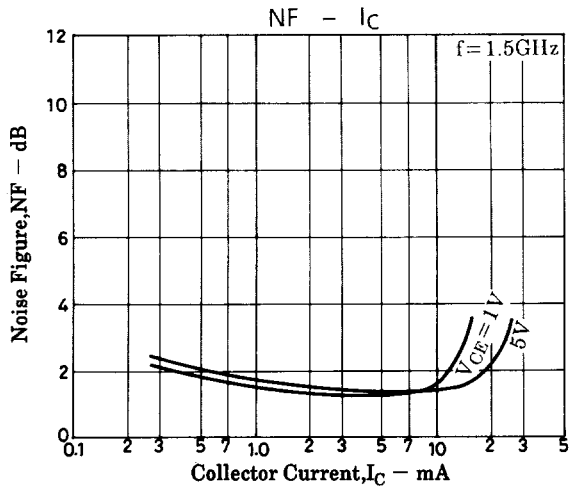
2SC5275

Continued from preceding page.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2 - 1$	$V_{CE}=5V, I_C=10mA, f=1.5GHz$	8	10		dB
	$ S_{21e} ^2 - 2$	$V_{CE}=1V, I_C=1mA, f=1.5GHz$		5.5		dB
Noise Figure	NF1	$V_{CE}=5V, I_C=5mA, f=1.5GHz$		1.4	3.0	dB
	NF2	$V_{CE}=2V, I_C=3mA, f=1GHz$		0.9		dB

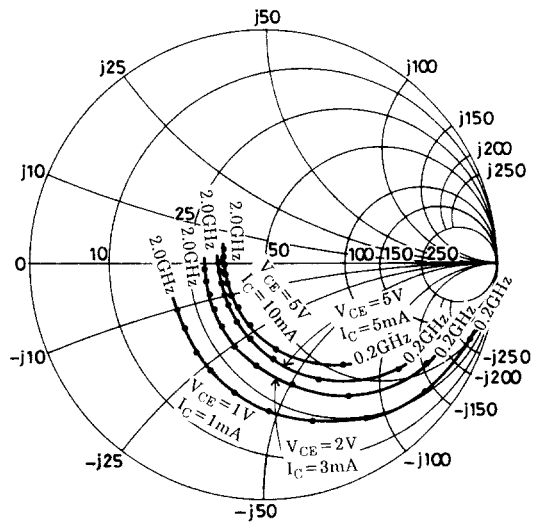


2SC5275

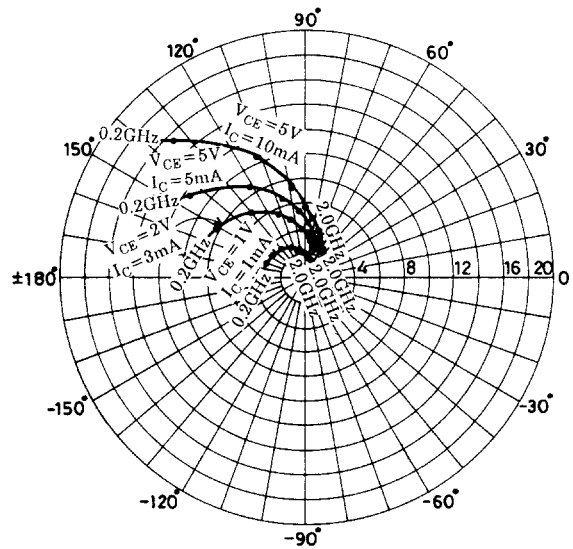


S Parameters

S11e : $f = 200$ to 2000MHz (200MHz step)

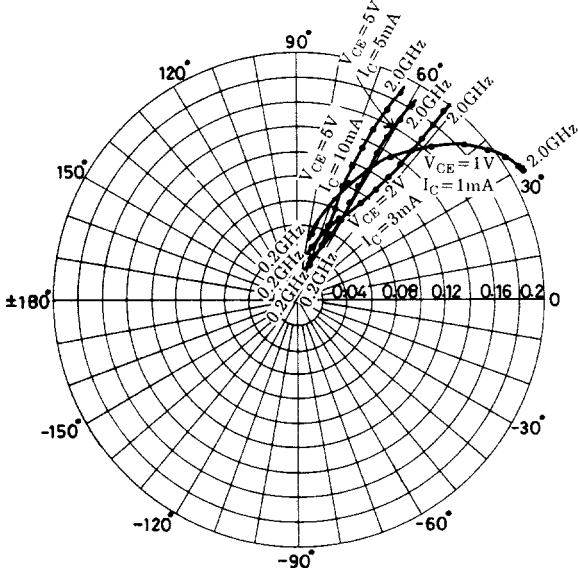


S21e : $f = 200$ to 2000MHz (200MHz step)

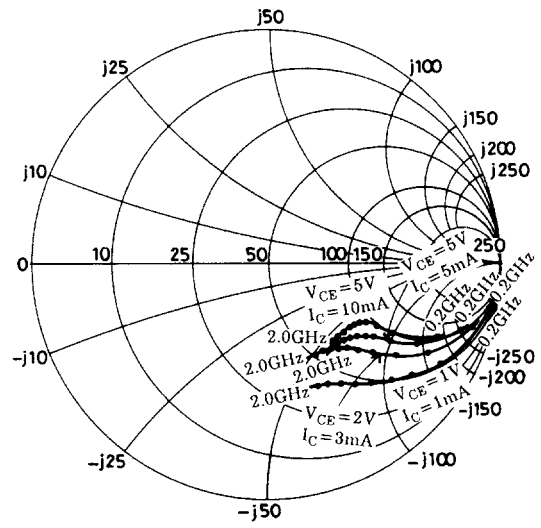


2SC5275

S12e : f= 200 to 2000MHz (200MHz step)



S22e : f= 200 to 2000MHz (200MHz step)



S parameters (Common emitter)

V_{CE}=5V, I_C=5mA, Z_O=50Ω

Freq (MHz)	S ₁₁	∠S ₁₁	S ₂₁	∠S ₂₁	S ₁₂	∠S ₁₂	S ₂₂	∠S ₂₂
200	0.725	-37.6	11.573	144.6	0.035	71.3	0.885	-18.7
400	0.540	-64.0	8.744	122.0	0.058	63.0	0.731	-27.7
600	0.400	-83.2	6.691	107.0	0.074	60.6	0.628	-31.4
800	0.320	-98.5	5.357	96.6	0.089	60.8	0.562	-33.3
1000	0.263	-112.1	4.503	88.5	0.104	61.0	0.527	-35.1
1200	0.221	-127.8	3.874	81.2	0.119	60.7	0.503	-37.5
1400	0.199	-140.4	3.409	74.6	0.135	60.7	0.487	-40.1
1600	0.180	-154.5	2.984	68.5	0.150	60.7	0.473	-43.3
1800	0.169	-169.9	2.710	63.0	0.167	59.9	0.463	-46.8
2000	0.168	176.2	2.486	58.2	0.183	59.4	0.462	-50.4

V_{CE}=5V, I_C=10mA, Z_O=50Ω

Freq (MHz)	S ₁₁	∠S ₁₁	S ₂₁	∠S ₂₁	S ₁₂	∠S ₁₂	S ₂₂	∠S ₂₂
200	0.547	-51.4	15.617	133.5	0.031	69.6	0.799	-22.7
400	0.364	-80.4	10.257	111.4	0.049	65.8	0.628	-27.9
600	0.261	-99.7	7.389	98.8	0.065	66.3	0.548	-28.7
800	0.202	-116.9	5.761	89.9	0.081	67.4	0.501	-29.6
1000	0.177	-132.9	4.763	83.2	0.099	67.7	0.481	-31.1
1200	0.157	-150.3	4.055	76.5	0.117	67.0	0.467	-33.5
1400	0.150	-164.6	3.545	71.0	0.134	66.4	0.458	-36.3
1600	0.148	-179.2	3.111	65.6	0.151	65.7	0.448	-40.0
1800	0.154	169.8	2.814	60.5	0.170	64.3	0.441	-43.9
2000	0.162	157.5	2.565	56.0	0.187	63.4	0.440	-47.8

2SC5275

$V_{CE}=2V, I_C=3mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.814	-31.0	8.333	151.1	0.044	72.9	0.924	-17.0
400	0.664	-56.7	6.925	129.6	0.074	61.9	0.793	-28.4
600	0.526	-75.9	5.576	113.7	0.094	56.2	0.683	-34.9
800	0.430	-92.7	4.639	101.8	0.109	54.1	0.598	-39.1
1000	0.364	-107.1	3.950	92.7	0.124	53.1	0.547	-42.1
1200	0.310	-121.7	3.449	84.3	0.138	52.3	0.510	-44.9
1400	0.274	-134.9	3.048	76.9	0.152	52.2	0.485	-48.0
1600	0.247	-148.7	2.706	70.1	0.165	52.1	0.464	-51.6
1800	0.237	-162.4	2.446	64.0	0.180	52.0	0.450	-55.2
2000	0.233	-174.5	2.250	58.7	0.193	52.0	0.444	-58.8

$V_{CE}=1V, I_C=1mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
200	0.937	-19.9	3.404	161.1	0.055	77.0	0.978	-11.1
400	0.876	-38.2	3.198	144.6	0.102	65.7	0.926	-21.1
600	0.780	-56.2	2.929	128.8	0.138	56.2	0.858	-29.5
800	0.699	-72.0	2.656	115.8	0.164	48.7	0.784	-36.7
1000	0.619	-87.4	2.478	104.2	0.185	42.8	0.734	-42.1
1200	0.553	-101.1	2.224	93.8	0.196	37.8	0.677	-47.7
1400	0.498	-114.4	2.062	84.1	0.204	34.1	0.639	-52.5
1600	0.457	-125.9	1.843	75.6	0.209	31.5	0.610	-56.9
1800	0.418	-139.7	1.722	67.5	0.201	30.5	0.580	-61.4
2000	0.398	-151.1	1.592	60.9	0.210	30.3	0.567	-65.2

- Specifications of any and all SANYO products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- SANYO Electric Co., Ltd. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all SANYO products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of SANYO Electric Co., Ltd.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO product that you intend to use.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

This catalog provides information as of February, 1999. Specifications and information herein are subject to change without notice.