

**2SC4864**

VHF to UHF Wide-Band Low-Noise Amplifier Applications

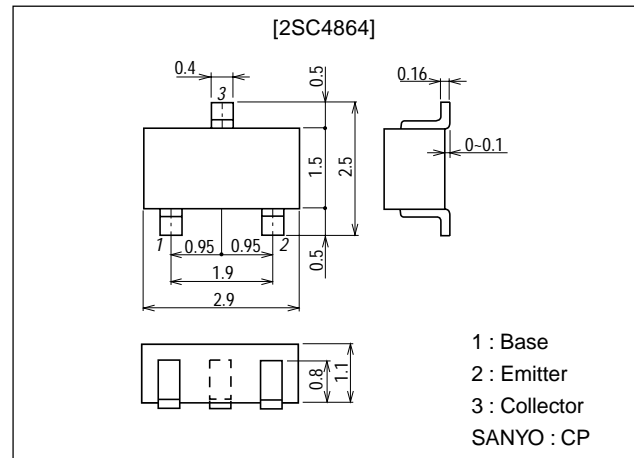
Features

- Low noise : $NF=1.1\text{dB typ (}f=1\text{GHz)}$.
- High gain : $|S_{21e}|^2=11\text{dB typ (}f=1\text{GHz)}$.
- High cutoff frequency : $f_T=7.0\text{GHz typ}$.

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}		16	V
Collector-to-Emitter Voltage	V_{CE0}		8	V
Emitter-to-Base Voltage	V_{EB0}		2	V
Collector Current	I_C		70	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_{EB0}	$V_{EB}=1\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=5\text{V}, I_C=20\text{mA}$	60*		270*	
Gain-Bandwidth Product	f_T	$V_{CE}=5\text{V}, I_C=20\text{mA}$		7.0		GHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.95	1.4	pF
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=5\text{V}, I_C=20\text{mA}, f=1\text{GHz}$	7	11		dB
Noise Figure	NF	$V_{CE}=5\text{V}, I_C=7\text{mA}, f=1\text{GHz}$		1.1	2.0	dB

* : The 2SC4864 is classified by 20mA h_{FE} as follows :

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

Marking : FN

 h_{FE} rank : 3, 4, 5

■ 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.

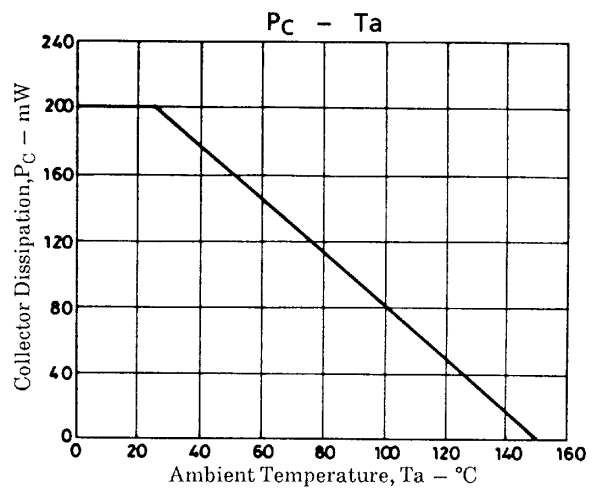
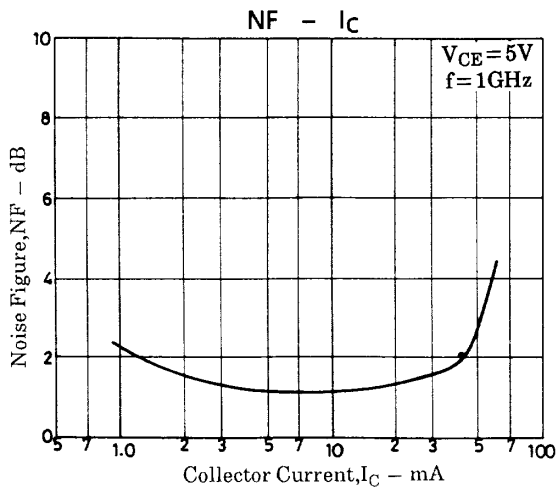
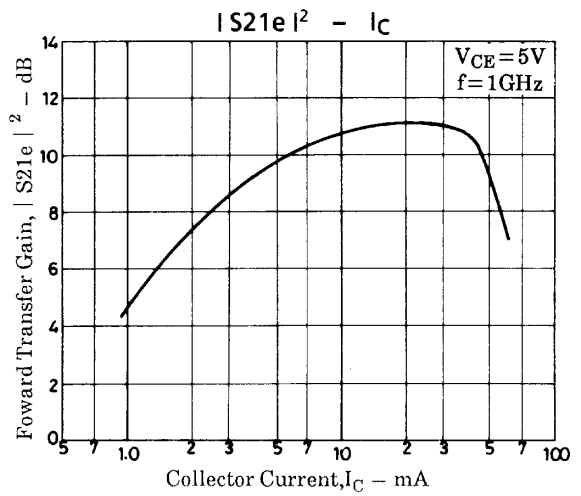
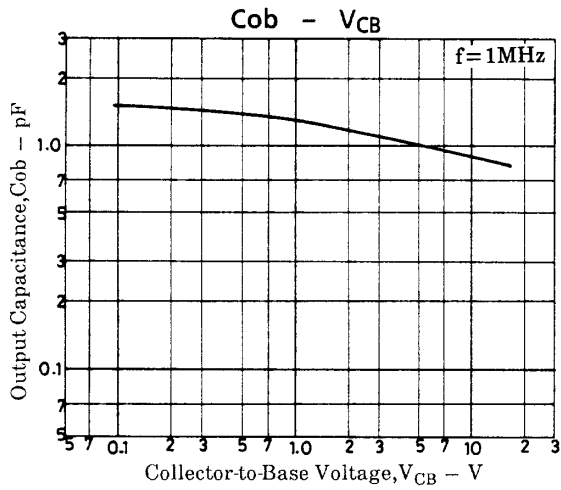
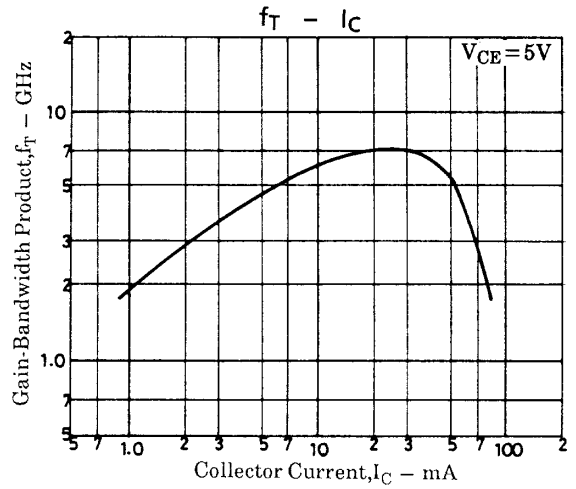
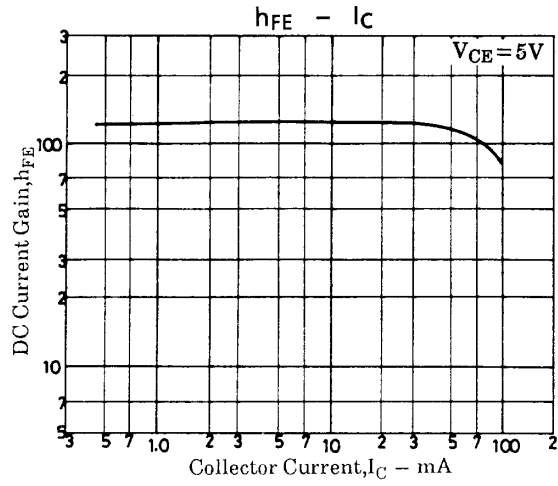
■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained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

SANYO Electric Co., Ltd. Semiconductor Business Headquarters

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

12099HA (KT)/31594HO (KOTO) AX-9524 No.4583-1/4

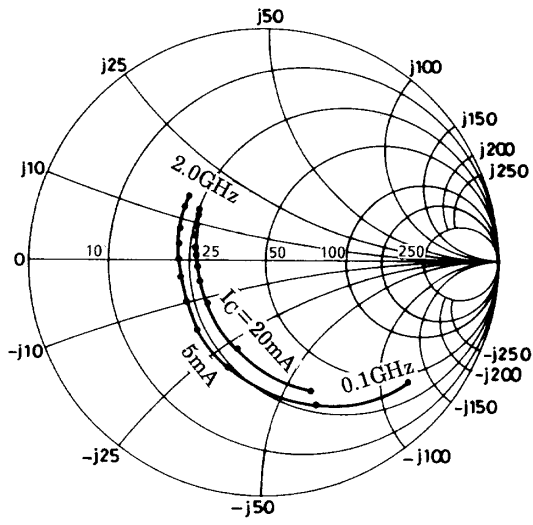
2SC4864



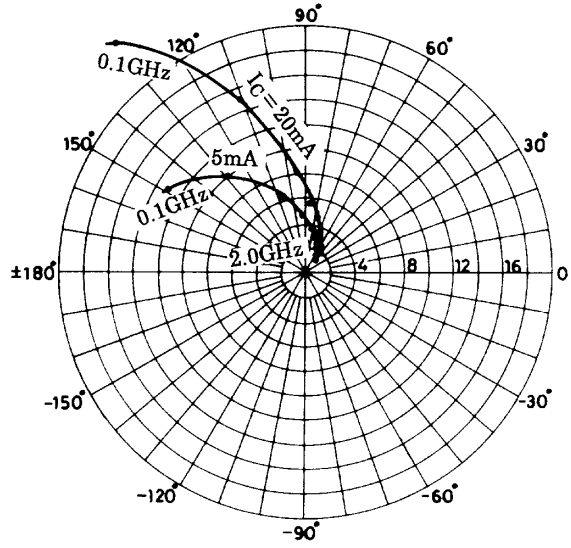
2SC4864

S parameter

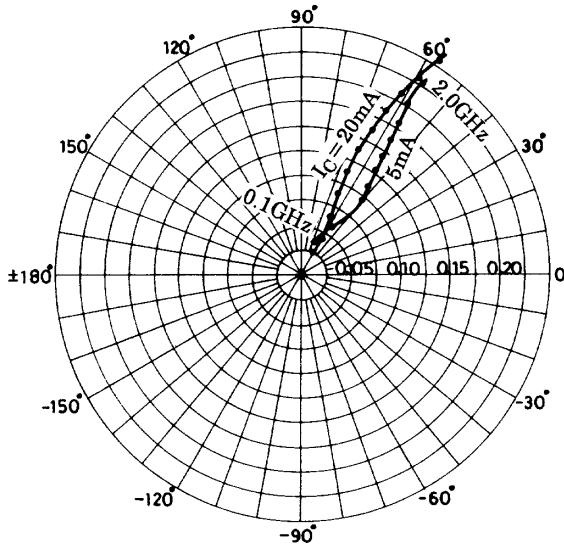
S11e : $V_{CE} = 5V$
 $f = 100MHz, 200 \text{ to } 2000MHz$ (200MHz step)



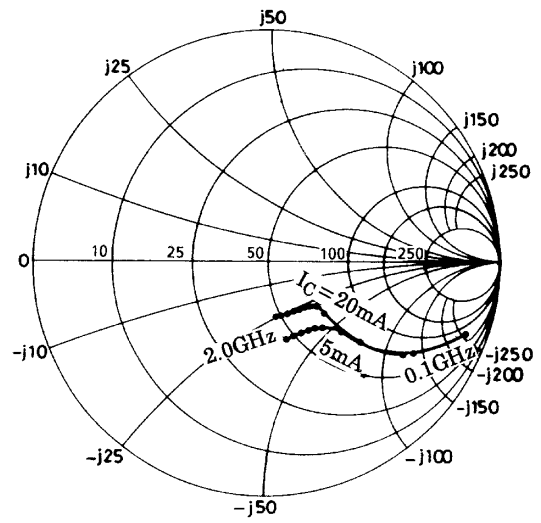
S21e : $V_{CE} = 5V$
 $f = 100MHz, 200 \text{ to } 2000MHz$ (200MHz step)



S12e : $V_{CE} = 5V$
 $f = 100MHz, 200 \text{ to } 2000MHz$ (200MHz step)



S22e : $V_{CE} = 5V$
 $f = 100MHz, 200 \text{ to } 2000MHz$ (200MHz step)



S parameter (Common emitter)

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

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.778	-40.2	13.012	149.1	0.036	68.7	0.893	-20.9
200	0.632	-70.8	10.144	128.7	0.058	57.4	0.729	-32.7
400	0.467	-110.34	6.532	106.1	0.080	50.1	0.523	-41.6
600	0.411	-136.7	4.723	93.2	0.096	50.7	0.436	-44.3
800	0.383	-154.6	3.712	83.1	0.111	52.8	0.388	-46.9
1000	0.379	-168.9	3.065	74.9	0.128	54.5	0.368	-50.3
1200	0.381	-179.0	2.624	67.4	0.146	55.7	0.354	-54.6
1400	0.383	168.7	2.302	61.2	0.163	56.6	0.346	-59.2
1600	0.395	160.2	2.051	54.7	0.182	57.3	0.342	-64.4
1800	0.412	154.1	1.858	50.0	0.202	57.6	0.339	-70.2
2000	0.423	147.1	1.729	44.9	0.227	57.4	0.337	-75.2

$V_{CE}=5V, I_C=20mA, Z_O=50\Omega$

Freq (MHz)	$ S_{11} $	$\angle S_{11}$	$ S_{21} $	$\angle S_{21}$	$ S_{12} $	$\angle S_{12}$	$ S_{22} $	$\angle S_{22}$
100	0.517	-70.9	24.026	130.6	0.027	63.8	0.702	-34.9
200	0.384	-108.5	15.011	110.9	0.041	60.5	0.478	-43.3
400	0.310	-144.9	8.261	94.4	0.064	64.0	0.329	-43.8
600	0.301	-164.7	5.701	85.1	0.087	66.0	0.285	-43.8
800	0.299	-176.9	4.392	77.6	0.112	66.5	0.263	-46.5
1000	0.307	173.7	3.586	71.1	0.137	65.6	0.255	-51.5
1200	0.318	165.5	3.035	65.2	0.162	64.2	0.248	-56.9
1400	0.329	158.0	2.650	59.6	0.185	62.7	0.244	-63.1
1600	0.339	151.5	2.345	54.1	0.207	61.1	0.243	-69.8
1800	0.361	147.3	2.126	50.3	0.230	59.6	0.240	-77.1
2000	0.369	142.4	1.977	45.6	0.256	57.7	0.238	-82.6

- 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 January, 1999. Specifications and information herein are subject to change without notice.