
2SC5544

Silicon NPN Epitaxial
VHF / UHF wide band amplifier

HITACHI

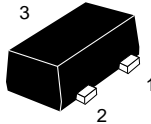
ADE-208-691 (Z)
1st. Edition
Oct. 1998

Features

- Super compact package;
($1.4 \times 0.8 \times 0.59\text{mm}$)
- Capable low voltage operation ;
($V_{CE} = 1\text{V}$)

Outline

MFPAK



1. Emitter
2. Base
3. Collector

Note: Marking is "YZ-".

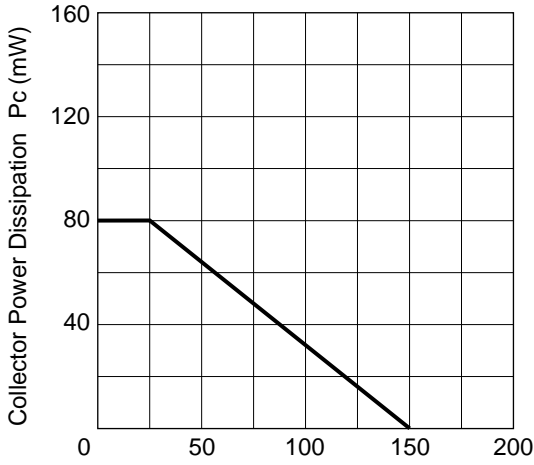
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	8	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_{C}	50	mA
Collector power dissipation	P_{C}	80	mW
Junction temperature	T_{j}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

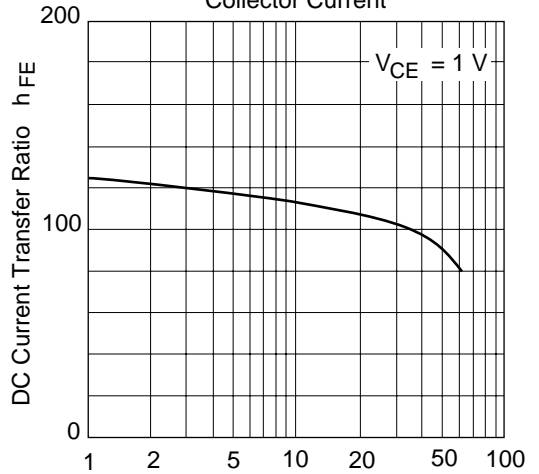
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	15	—	—	V	$I_{\text{C}} = 10\mu\text{A}$, $I_{\text{E}} = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{\text{CB}} = 12\text{V}$, $I_{\text{E}} = 0$
Collector cutoff current	I_{CEO}	—	—	1	mA	$V_{\text{CE}} = 8\text{V}$, $R_{\text{BE}} = \infty$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{\text{EB}} = 1.5\text{V}$, $I_{\text{C}} = 0$
DC current transfer ratio	h_{FE}	85	—	170	V	$V_{\text{CE}} = 1\text{V}$, $I_{\text{C}} = 5\text{mA}$
Collector output capacitance	C_{ob}	—	0.88	1.4	pF	$V_{\text{CB}} = 1\text{V}$, $I_{\text{E}} = 0$ $f = 1\text{MHz}$
Gain bandwidth product	f_{T}	3	6	—	GHz	$V_{\text{CE}} = 1\text{V}$, $I_{\text{C}} = 5\text{mA}$
Power gain	PG	8	11.6	—	dB	$V_{\text{CE}} = 1\text{V}$, $I_{\text{C}} = 5\text{mA}$ $f = 900\text{MHz}$
Noise figure	NF	—	1.0	2.0	dB	$V_{\text{CE}} = 1\text{V}$, $I_{\text{C}} = 5\text{mA}$ $f = 900\text{MHz}$

Maximum Collector Dissipation Curve



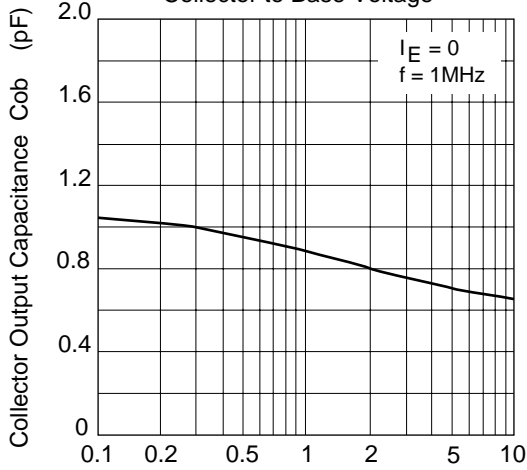
Ambient Temperature Ta (°C)

DC Current Transfer Ratio vs. Collector Current



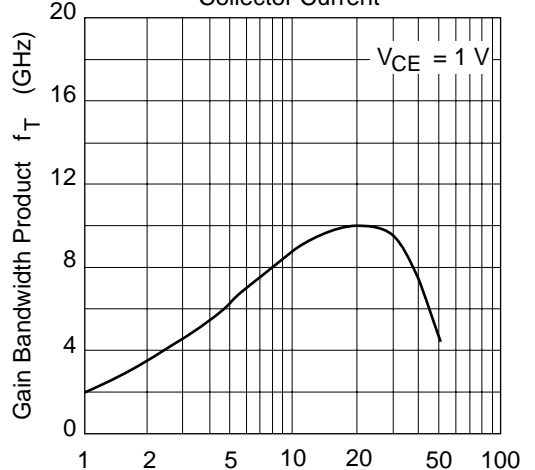
Collector Current IC (mA)

Collector Output Capacitance vs. Collector to Base Voltage

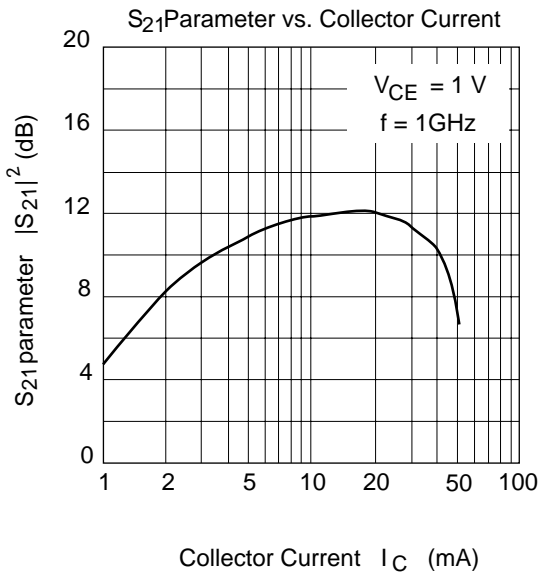
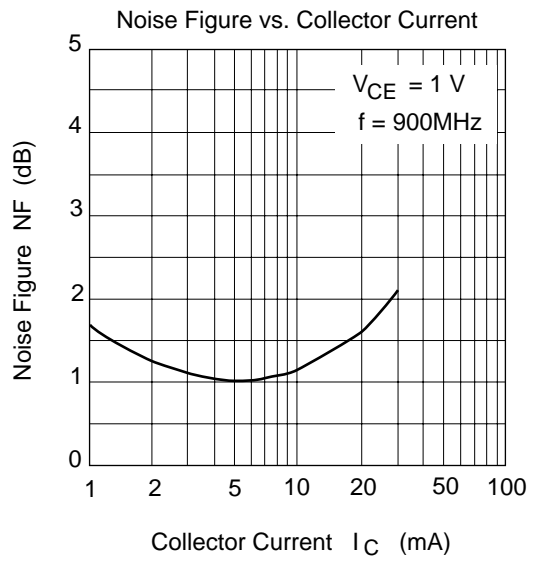
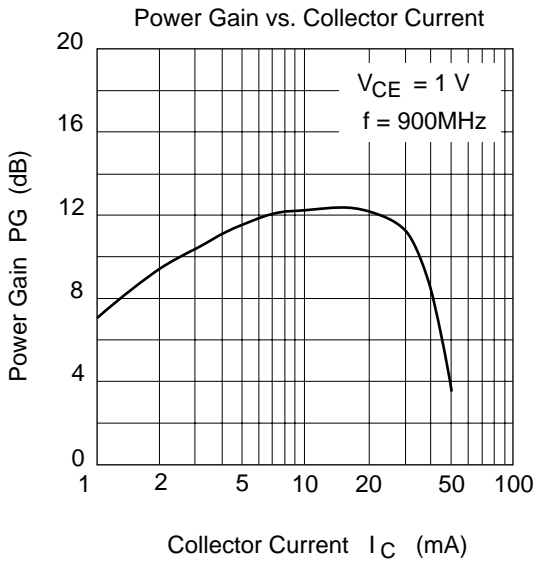


Collector to Base Voltage VCB (V)

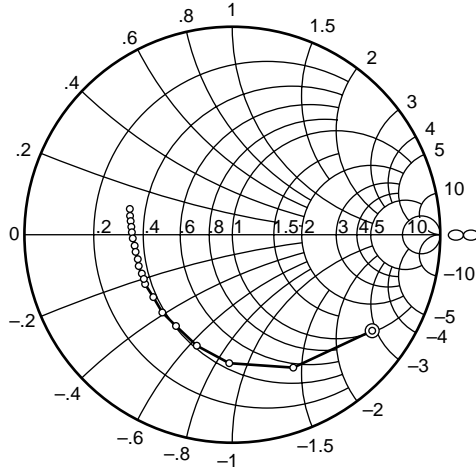
Gain Bandwidth Product vs. Collector Current



Collector Current IC (mA)



S11 Parameter vs. Frequency

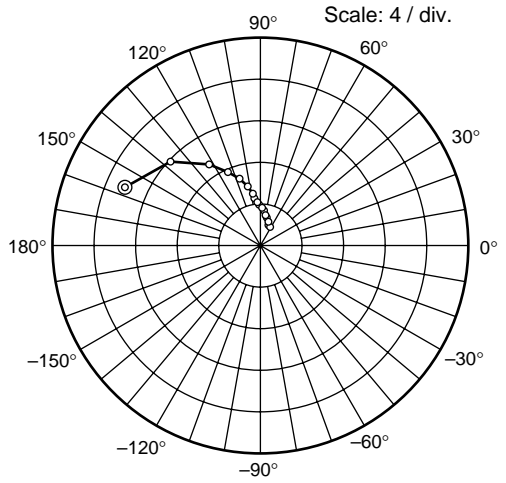


Condition : $V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)



S21 Parameter vs. Frequency

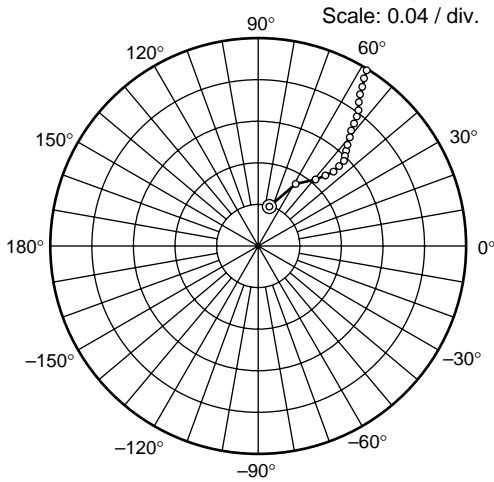


Condition : $V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)



S12 Parameter vs. Frequency

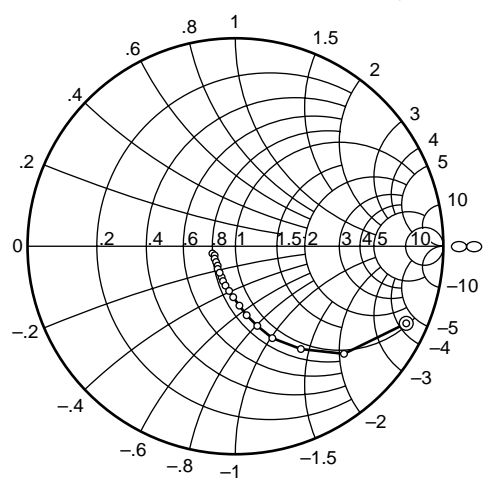


Condition : $V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)



S22 Parameter vs. Frequency



Condition : $V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)

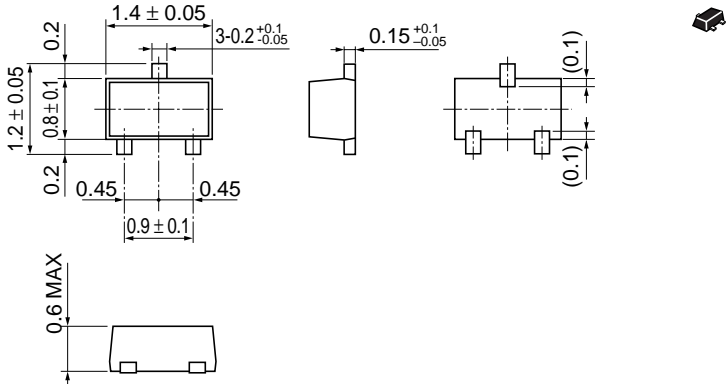


Sparameter ($V_{CE} = 1V$, $I_C = 5mA$, $Z_o = 50\Omega$)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.806	-34.7	14.09	156.3	0.0395	71.3	0.905	-24.2
200	0.706	-66.0	11.64	136.7	0.0691	57.5	0.739	-44.3
300	0.617	-90.3	9.35	122.8	0.0860	49.4	0.586	-58.1
400	0.562	-108.0	7.66	113.8	0.0965	45.8	0.474	-67.6
500	0.527	-121.9	6.40	106.7	0.104	44.3	0.392	-74.9
600	0.500	-133.0	5.47	101.7	0.110	43.9	0.331	-81.1
700	0.487	-142.3	4.78	97.0	0.115	44.5	0.284	-86.2
800	0.480	-149.3	4.24	93.7	0.121	45.4	0.247	-91.2
900	0.481	-155.4	3.81	90.5	0.127	46.3	0.217	-96.2
1000	0.472	-161.4	3.46	87.8	0.132	47.7	0.193	-100.8
1100	0.473	-166.6	3.18	85.1	0.138	48.9	0.174	-106.2
1200	0.475	-170.5	2.94	82.8	0.144	50.3	0.157	-111.2
1300	0.478	-174.4	2.73	80.6	0.150	51.7	0.145	-115.7
1400	0.482	-178.1	2.56	78.6	0.157	52.8	0.135	-122.6
1500	0.488	178.4	2.41	76.6	0.163	53.7	0.125	-128.1
1600	0.494	175.9	2.28	74.9	0.171	55.0	0.119	-134.2
1700	0.503	172.5	2.16	73.2	0.177	55.9	0.116	-140.3
1800	0.509	169.9	2.06	71.4	0.185	56.9	0.114	-147.1
1900	0.515	167.7	1.97	69.8	0.191	57.5	0.114	-153.3
2000	0.520	165.8	1.89	68.4	0.199	58.3	0.115	-159.4

Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	MFPAK
JEDEC	—
EIAJ	—
Mass (reference value)	0.0016 g

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
5. This product is not designed to be radiation resistant.
6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
 Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
 Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL NorthAmerica : <http://semiconductor.hitachi.com/>
 Europe : <http://www.hitachi-eu.com/hel/ecg>
 Asia : <http://sicapac.hitachi-asia.com>
 Japan : <http://www.hitachi.co.jp/Sicd/indx.htm>

For further information write to:

Hitachi Semiconductor
 (America) Inc.
 179 East Tasman Drive,
 San Jose, CA 95134
 Tel: <1> (408) 433-1990
 Fax: <1> (408) 433-0223

Hitachi Europe GmbH
 Electronic Components Group
 Dornacher Straße 3
 D-85622 Feldkirchen, Munich
 Germany
 Tel: <49> (89) 9 9180-0
 Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
 Electronic Components Group.
 Whitebrook Park
 Lower Cookham Road
 Maidenhead
 Berkshire SL6 8YA, United Kingdom
 Tel: <44> (1628) 585000
 Fax: <44> (1628) 585160

Hitachi Asia Ltd.
 Hitachi Tower
 16 Collyer Quay #20-00,
 Singapore 049318
 Tel : <65>-538-6533/538-8577
 Fax : <65>-538-6933/538-3877
 URL : <http://www.hitachi.com.sg>

Hitachi Asia Ltd.
 (Taipei Branch Office)
 4/F, No. 167, Tun Hwa North Road,
 Hung-Kuo Building,
 Taipei (105), Taiwan
 Tel : <886>-(2)-2718-3666
 Fax : <886>-(2)-2718-8180
 Telex : 23222 HAS-TP
 URL : <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.
 Group III (Electronic Components)
 7/F., North Tower,
 World Finance Centre,
 Harbour City, Canton Road
 Tsim Sha Tsui, Kowloon,
 Hong Kong
 Tel : <852>-(2)-735-9218
 Fax : <852>-(2)-730-0281
 URL : <http://www.hitachi.com.hk>

Copyright © Hitachi, Ltd., 2000. All rights reserved. Printed in Japan.
 Colophon 2.0