2SC5554

Silicon NPN Epitaxial
VHF / UHF wide band amplifier

HITACHI

ADE-208-692 (Z)
1st. Edition
Nov. 1998

Features

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

Outline

MFPAK

1. Emitter
2. Base
3. Collector

Note: Marking is “YH-”.

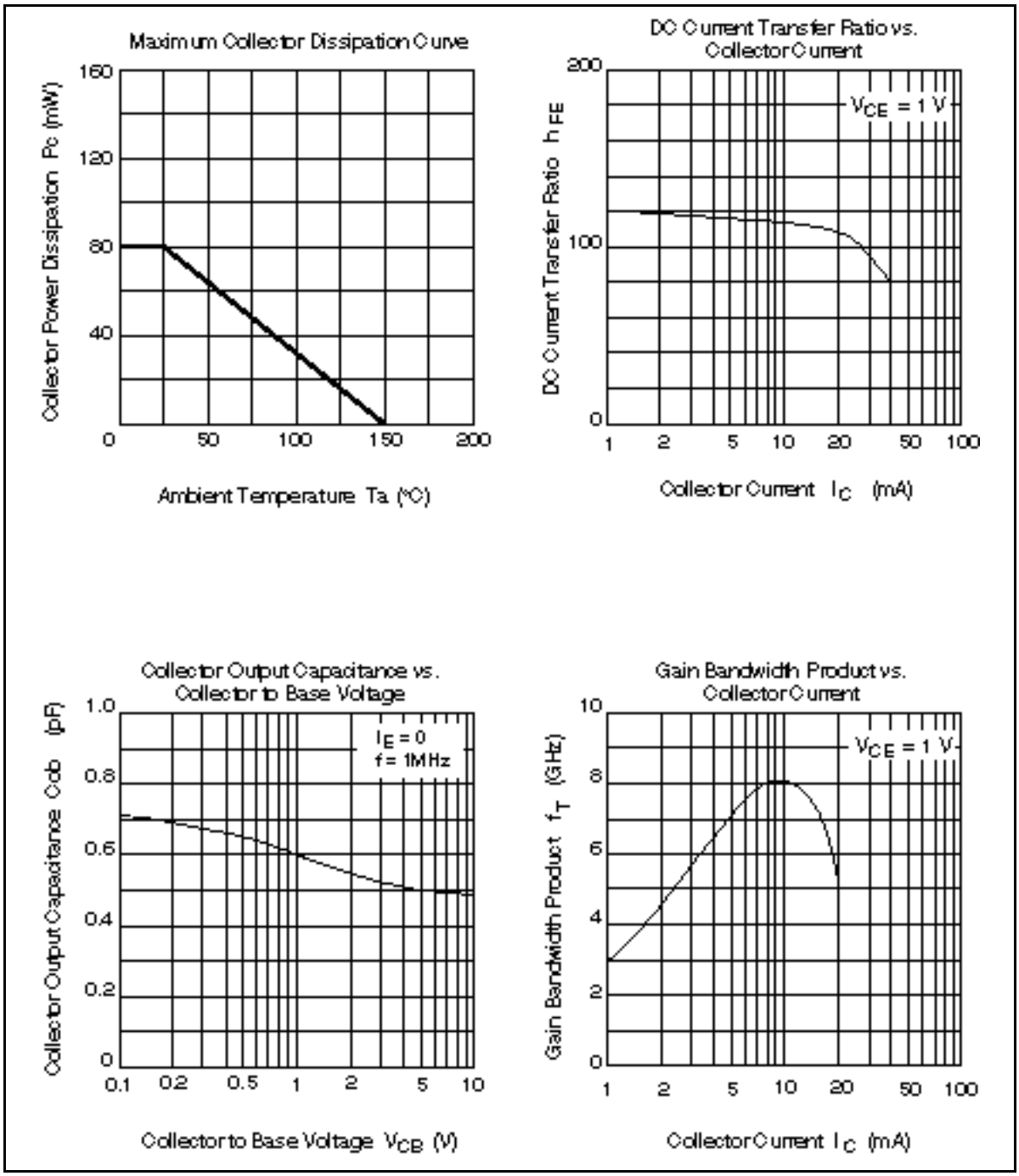
2SC5554

Absolute Maximum Ratings (Ta = 25°C)

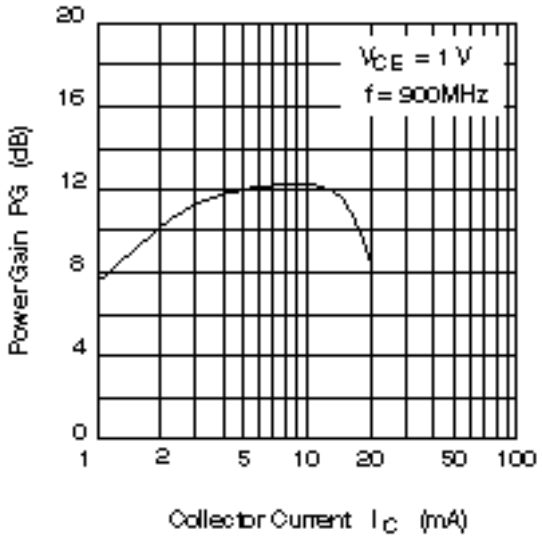
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	9	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	20	mA
Collector power dissipation	Pc	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

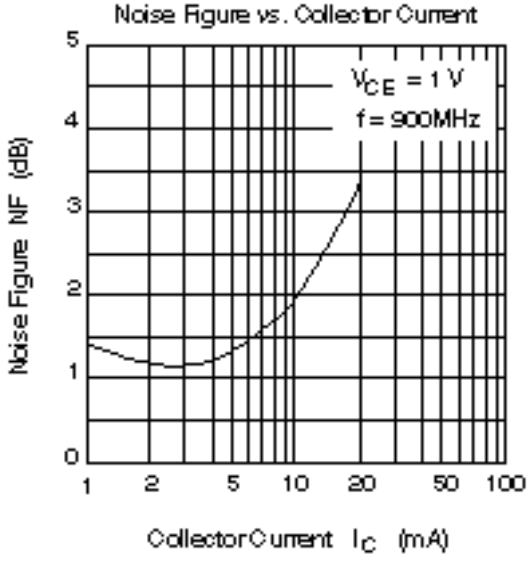
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 15V , I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	mA	V_{CE} = 9V , R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 1.5V , I_C = 0
DC current transfer ratio	h_{FE}	50	120	250	V	V_{CE} = 1V , I_C = 5mA
Collector output capacitance	Cob	—	0.6	0.9	pF	V_{CB} = 1V , I_E = 0 f = 1MHz
Gain bandwidth product	f_T	3.5	7	—	GHz	V_{CE} = 1V , I_C = 5mA
Power gain	PG	9	12	—	dB	V_{CE} = 1V, I_C = 5mA f = 900MHz
Noise figure	NF	—	1.4	3	dB	V_{CE} = 1V, I_C = 5mA f = 900MHz


Maximum Collector Dissipation Curve
Collector Power Dissipation Pc (mW)
160
120
80
40
0
50
100
150
200
Ambient Temperature Ta (°C)
DC Current Transfer Ratio vs.
Collector Current
DC Current Transfer Ratio h FE
200
100
0
VCE = 1 V
1
2
5
10
20
50
100
Collector Current IC (mA)
Collector Output Capacitance vs.
Collector to Base Voltage
Collector Output Capacitance Cob (pF)
1.0
0.8
0.6
0.4
0.2
0
IE = 0
f = 1MHz
0.1
0.2
0.5
1
2
5
10
Collector to Base Voltage VCB (V)
Gain Bandwidth Product vs.
Collector Current
Gain Bandwidth Product fT (GHz)
10
8
6
4
2
0
VCE = 1 V
1
2
5
10
20
50
100
Collector Current IC (mA)

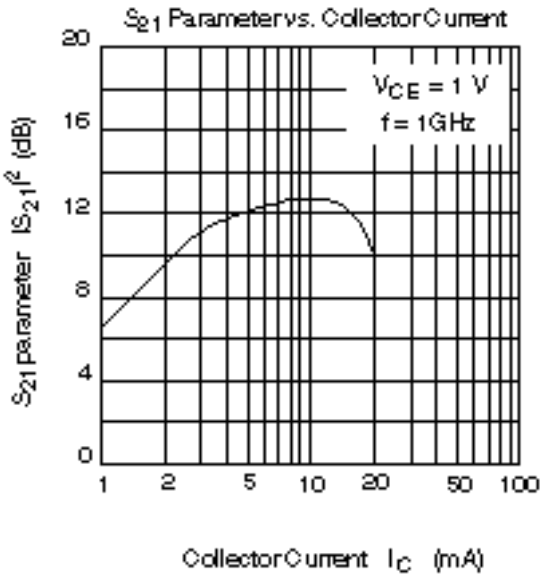
Power Gain vs. Collector Current



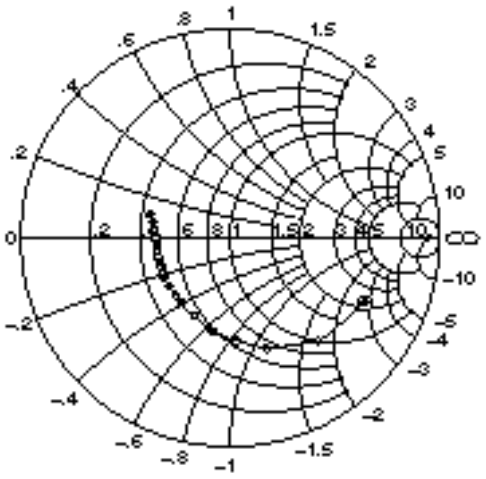
Noise Figure vs. Collector Current



S_{21} Parameter vs. Collector Current



S11 Parametervs. Frequency

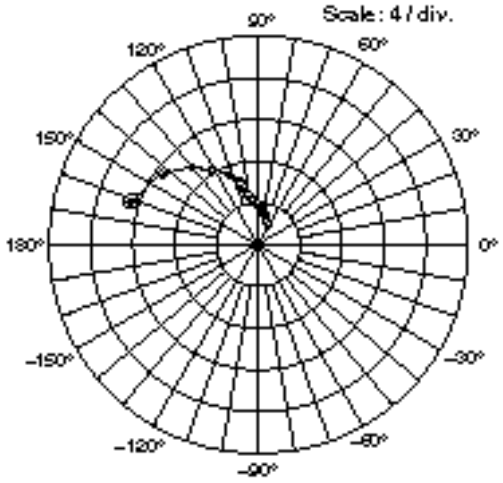


Condition : V_{CE} = 1 V , I_C = 5mA

100 to 2000 MHz (100 MHz step)

S21 Parametervs. Frequency

Scale : 4 / div.

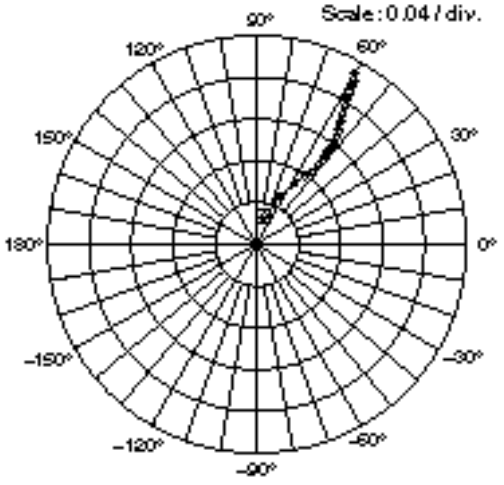


Condition : V_{CE} = 1 V , I_C = 5mA

100 to 2000 MHz (100 MHz step)

S12 Parametervs. Frequency

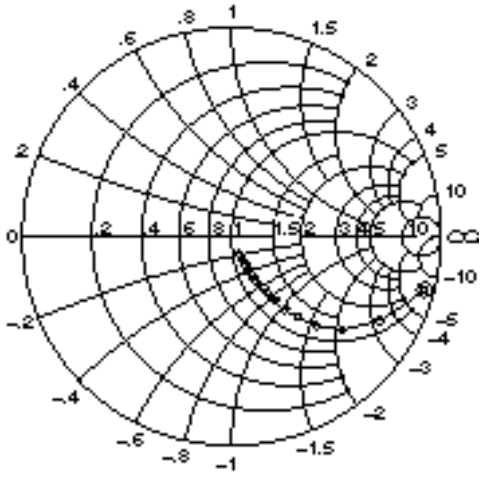
Scale : 0.04 / div.



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

100 to 2000 MHz (100 MHz step)

S22 Parametervs. Frequency



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

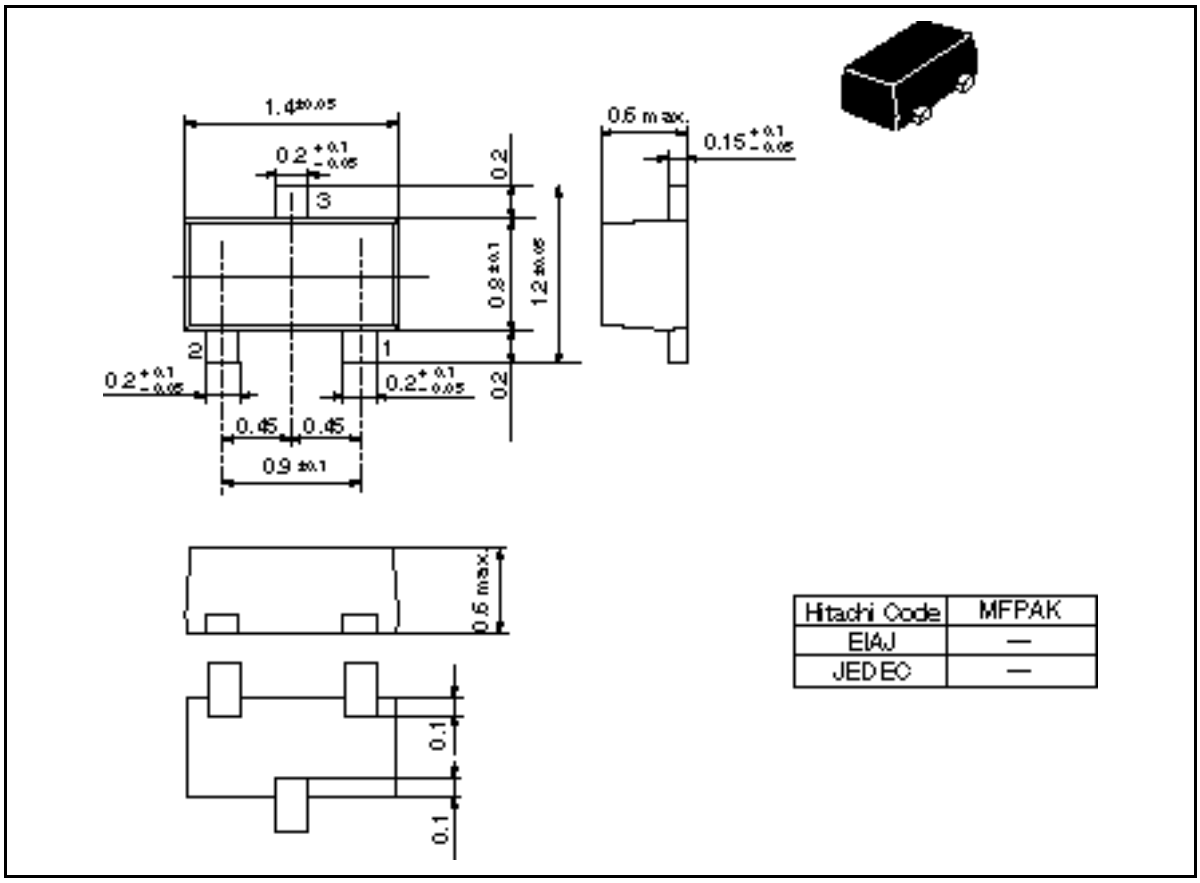
100 to 2000 MHz (100 MHz step)

Sparameter (V_{CE} = 1V, I_C = 5mA, Zo = 50Ω)

	S11		S21		S12		S22	
f (MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.715	–25.4	13.06	161.3	0.0279	76.6	0.947	–16.1
200	0.647	–50.1	11.47	144.2	0.0517	65.6	0.828	–30.2
300	0.559	–71.5	9.74	131.0	0.0681	58.4	0.697	–40.4
400	0.501	–88.2	8.28	121.3	0.0798	54.6	0.587	–47.0
500	0.453	–102.5	7.08	113.7	0.0882	52.4	0.501	–51.3
600	0.416	–114.8	6.16	108.1	0.0955	51.8	0.433	–54.3
700	0.393	–125.4	5.43	103.1	0.102	51.7	0.378	–56.2
800	0.378	–134.4	4.84	99.3	0.109	52.1	0.333	–57.3
900	0.369	–142.8	4.37	95.7	0.115	52.7	0.295	–58.0
1000	0.357	–149.5	3.99	92.5	0.122	53.5	0.266	–58.4
1100	0.361	–156.6	3.66	89.7	0.128	54.2	0.240	–58.6
1200	0.358	–162.2	3.38	87.2	0.135	55.1	0.217	–58.5
1300	0.358	–167.5	3.15	84.9	0.141	56.0	0.199	–58.0
1400	0.362	–172.5	2.96	82.7	0.148	56.9	0.180	–58.0
1500	0.362	–177.3	2.78	80.9	0.155	57.2	0.166	–57.2
1600	0.369	178.8	2.64	78.6	0.163	58.1	0.151	–56.9
1700	0.373	174.7	2.50	77.2	0.169	58.8	0.137	–56.6
1800	0.377	171.1	2.38	75.1	0.177	59.2	0.126	–56.4
1900	0.388	168.3	2.28	73.3	0.183	59.6	0.113	–56.2
2000	0.395	165.3	2.18	71.8	0.191	60.1	0.102	–55.7

Package Dimensions

Unit: mm



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

URL
North America : http://semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
Asia (Singapore) : http://www.has.hitachi.com.sg/grp3/sicd/index.htm
Asia (Taiwan) : http://www.hitachi.com.tw/E/Product/SICD_Frame.htm
Asia (HongKong) : http://www.hitachi.com.hk/eng/bo/grp3/index.htm
Japan : http://www.hitachi.co.jp/Sicd/indx.htm

For further information write to:

Hitachi Semiconductor (America) Inc.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1897
Tel: (800) 285-1601
Fax: (303) 297-0447

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

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: (1628) 585000
Fax: (1628) 778322

Hitachi Asia Pte Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: (2) 2718-3666
Fax: (2) 2718-8180

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: (2) 735 9218
Fax: (2) 730 0281
Telex: 40815 HITECHX