
2SC5078

Silicon NPN Epitaxial

HITACHI

ADE-208-221
1st. Edition

Application

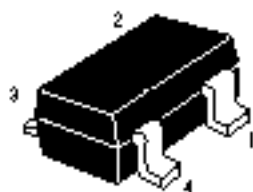
VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 12 \text{ GHz Typ}$
- High gain, low noise figure
 $PG = 17 \text{ dB Typ}$, $NF = 1.6 \text{ dB Typ}$ at $f = 900 \text{ MHz}$

Outline

MPAK-4



- 1. Collector
- 2. Emitter
- 3. Base
- 4. Emitter

2SC5078

Absolute Maximum Ratings (Ta = 25°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	20	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

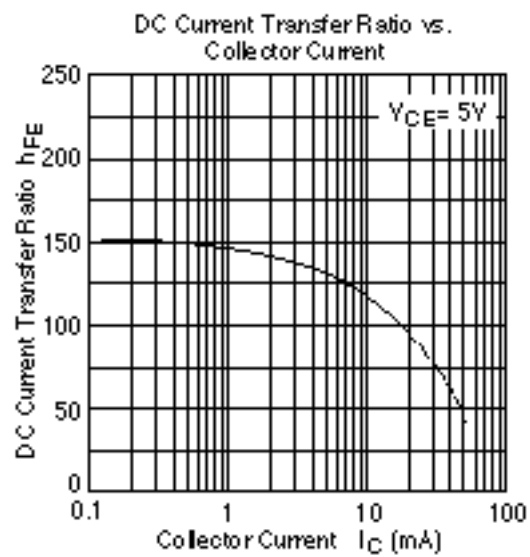
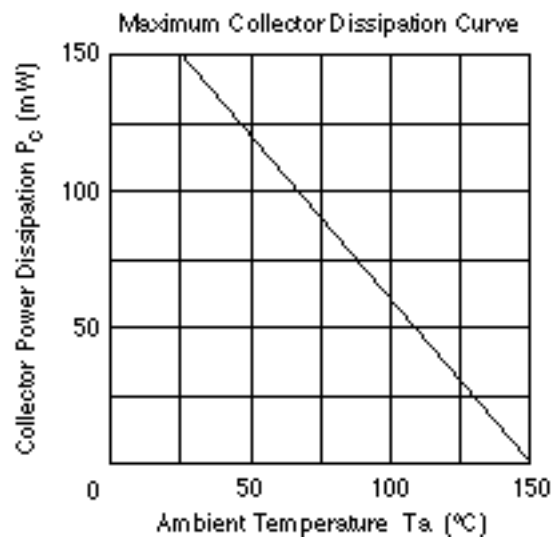
Electrical Characteristics (Ta = 25°C)

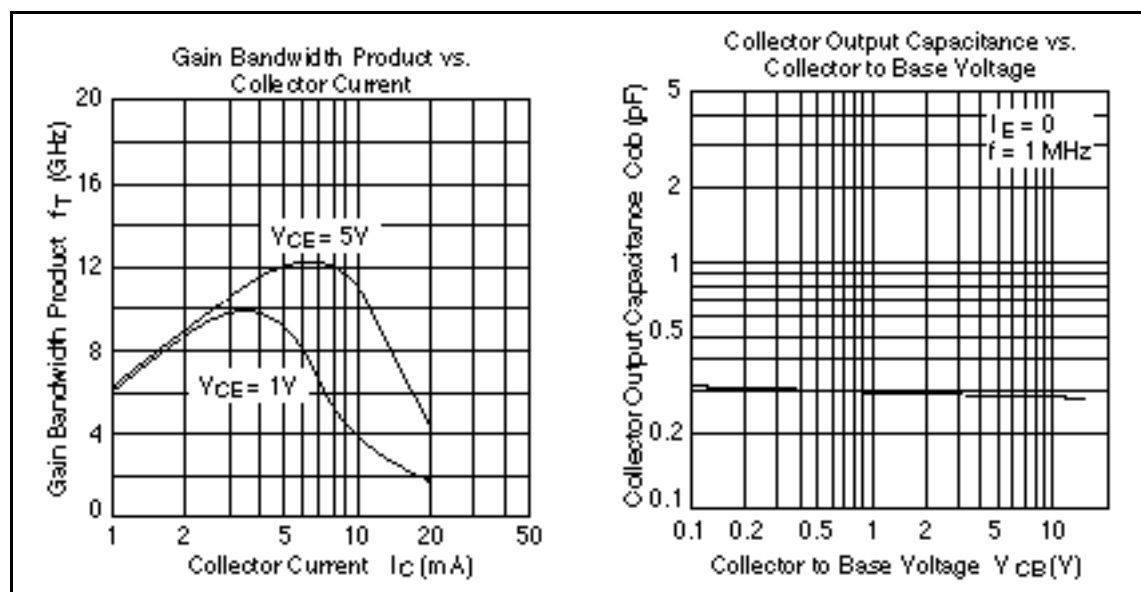
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector cutoff current	I_{CBO}	—	—	10	μA	$V_{CB} = 15\text{ V}$, $I_E = 0$
	I_{CEO}	—	—	1	mA	$V_{CE} = 8\text{ V}$, $R_{BE} =$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{EB} = 1.5\text{ V}$, $I_C = 0$
DC current transfer ratio	h_{FE}	50	120	160		$V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$
Collector output capacitance	C_{ob}	—	0.3	0.8	pF	$V_{CB} = 5\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$
Gain bandwidth product	f_T	9	12	—	GHz	$V_{CE} = 5\text{ V}$, $I_C = 5\text{ mA}$
Power gain	PG	14	17	20	dB	$V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$, $f = 900\text{ MHz}$
Noise figure	NF	—	1.6	2.5	dB	$V_{CE} = 5\text{ V}$, $I_C = 5\text{ mA}$, $f = 900\text{ MHz}$

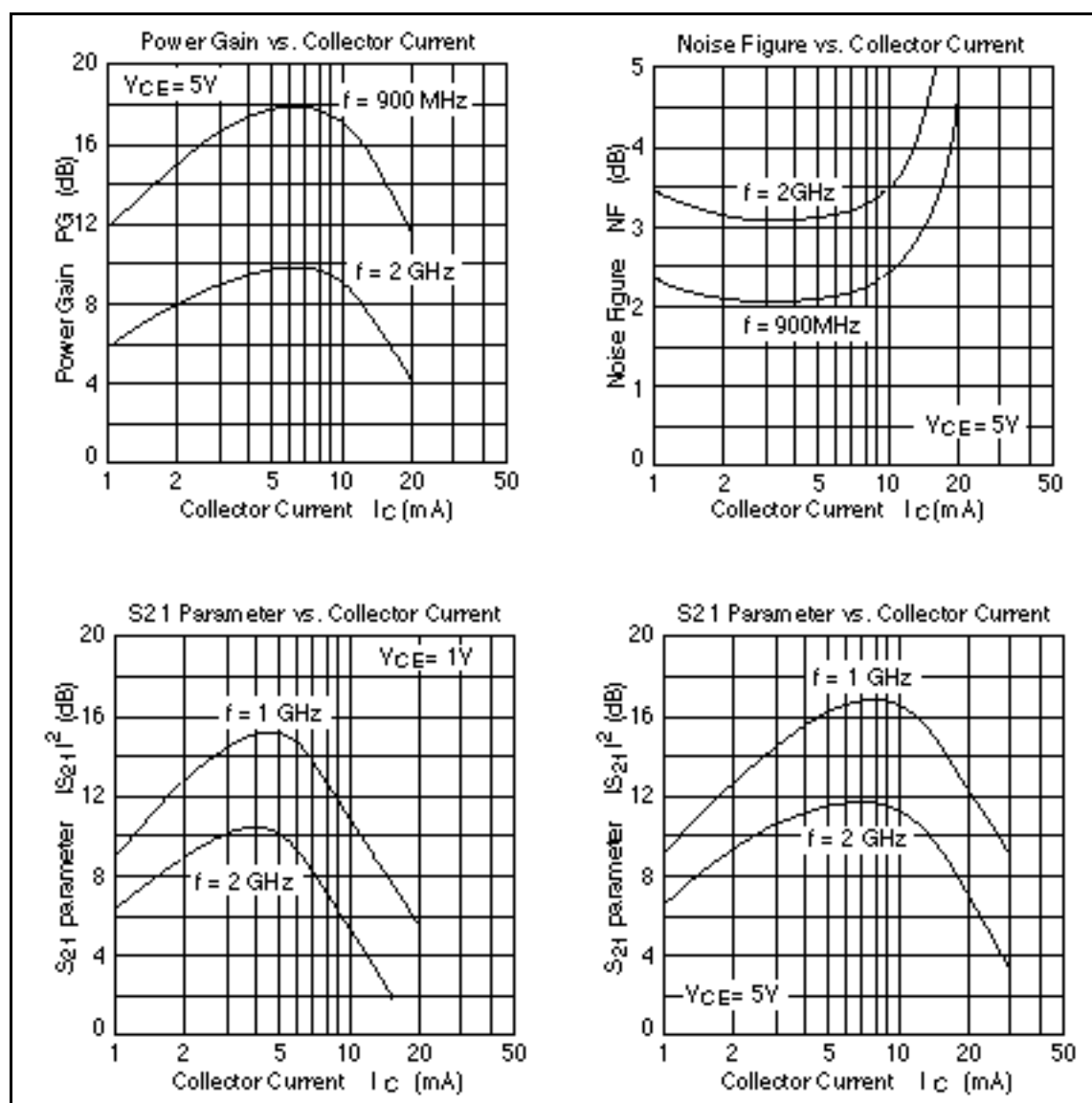
Note: Marking is "ZC-".

Attention: This device is very sensitive to electro static discharge.

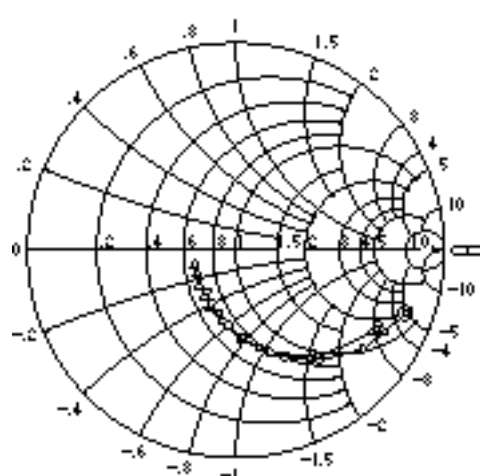
It is recommended to adopt appropriate cautions when handling this transistor.







S11 Parameter vs. Frequency

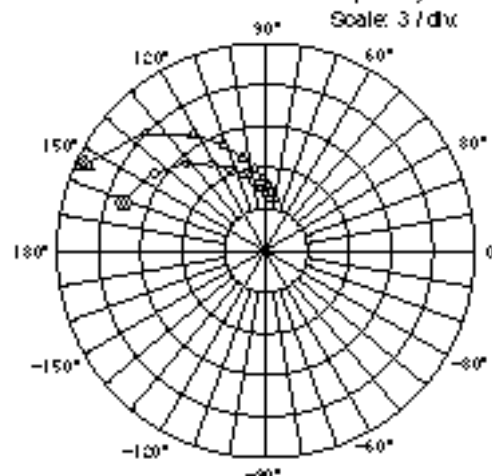


Condition: $V_{CE} = 5 \text{ V}$, $Z_0 = 50 \Omega$
200 to 2000 MHz (200 MHz step)

○ — ($I_C = 5 \text{ mA}$)
△ — ($I_C = 10 \text{ mA}$)

S21 Parameter vs. Frequency

Scale: 3 / div

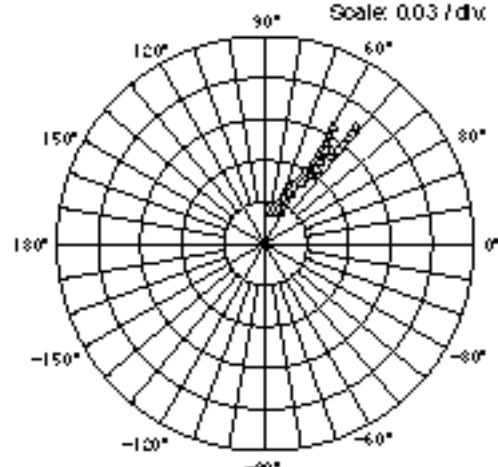


Condition: $V_{CE} = 5 \text{ V}$, $Z_0 = 50 \Omega$
200 to 2000 MHz (200 MHz step)

○ — ($I_C = 5 \text{ mA}$)
△ — ($I_C = 10 \text{ mA}$)

S12 Parameter vs. Frequency

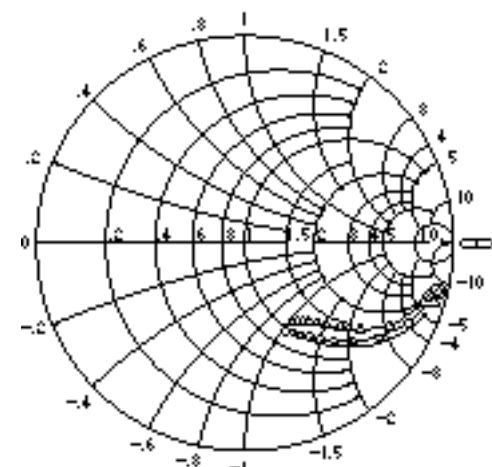
Scale: 0.03 / div



Condition: $V_{CE} = 5 \text{ V}$, $Z_0 = 50 \Omega$
200 to 2000 MHz (200 MHz step)

○ — ($I_C = 5 \text{ mA}$)
△ — ($I_C = 10 \text{ mA}$)

S22 Parameter vs. Frequency



Condition: $V_{CE} = 5 \text{ V}$, $Z_0 = 50 \Omega$
200 to 2000 MHz (200 MHz step)

○ — ($I_C = 5 \text{ mA}$)
△ — ($I_C = 10 \text{ mA}$)

When using this document, keep the following in mind:

1. This document may, wholly or partially, be subject to change without notice.
2. All rights are reserved: No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without Hitachi's permission.
3. Hitachi will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's unit according to this document.
4. Circuitry and other examples described herein are meant merely to indicate the characteristics and performance of Hitachi's semiconductor products. Hitachi assumes no responsibility for any intellectual property claims or other problems that may result from applications based on the examples described herein.
5. No license is granted by implication or otherwise under any patents or other rights of any third party or Hitachi, Ltd.
6. MEDICAL APPLICATIONS: Hitachi's products are not authorized for use in MEDICAL APPLICATIONS without the written consent of the appropriate officer of Hitachi's sales company. Such use includes, but is not limited to, use in life support systems. Buyers of Hitachi's products are requested to notify the relevant Hitachi sales offices when planning to use the products in MEDICAL APPLICATIONS.

HITACHI

Hitachi, Ltd.

Semiconductor & IC Div.

Nippon Bldg., 2-6-2, Ohite-machi, Chiyoda-ku, Tokyo 100, Japan

Tel: Tokyo (03) 3270-2111

Fax: (03) 3270-5109

For further information write to:

Hitachi America, Ltd.
Semiconductor & IC Div.
2000 Sierra Point Parkway
Brisbane, CA 94005-4835
U.S.A.
Tel: 415-589-8000
Fax: 415-589-4207

Hitachi Europe GmbH
Electronic Components Group
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 94 80-0
Fax: 089-9 29 30 00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 0628-585000
Fax: 0628-778322

Hitachi Asia Pte. Ltd.
45 Collyer Quay #20-00
Hitachi Tower
Singapore 0404
Tel: 535-2100
Fax: 535-1533

Hitachi Asia (Hong Kong) Ltd.
Unit 705, North Tower,
World Finance Centre
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306074