2SC4901

Silicon NPN Epitaxial

HITACHI

Application

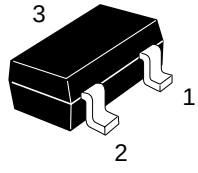
UHF / VHF wide band amplifier

Features

- High gain bandwidth product
  f_T = 9 GHz Typ
- High gain, low noise figure
  PG = 13.0 dB Typ, NF = 1.2 dB Typ at f = 900 MHz

Outline

CMPAK



1. Emitter
2. Base
3. Collector

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

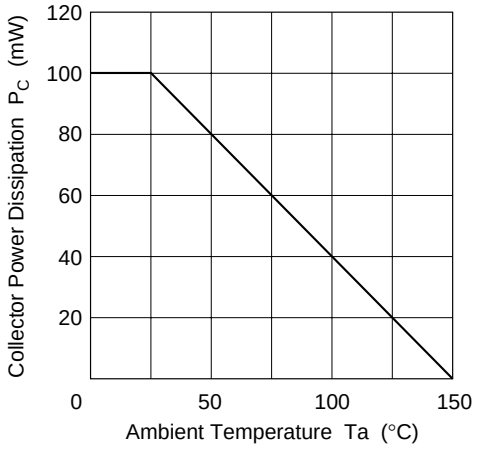
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	15	V
Collector to emitter voltage	V_{CEO}	9	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	100	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

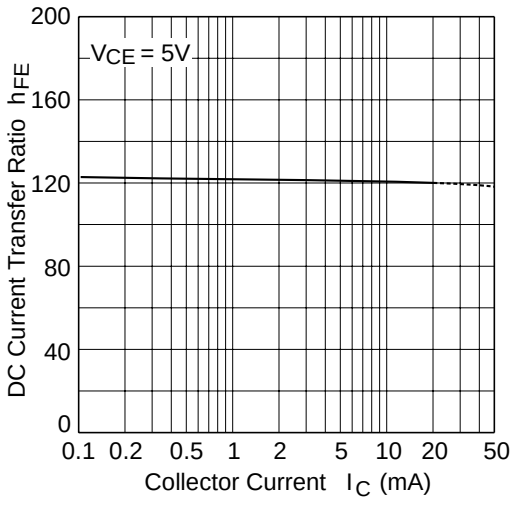
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 12 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 9 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250		V_{CE} = 5 V, I_C = 20 mA
Collector output capacitance	Cob	—	0.9	1.4	pF	V_{CB} = 5 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	6.0	9.0	—	GHz	V_{CE} = 5 V, I_C = 20 mA
Power gain	PG	10.0	13.0	—	dB	V_{CE} = 5 V, I_C = 20 mA, f = 900 MHz
Noise figure	NF	—	1.2	2.5	dB	V_{CE} = 5 V, I_C = 5 mA, f = 900 MHz

Note: Marking is “YK–”.

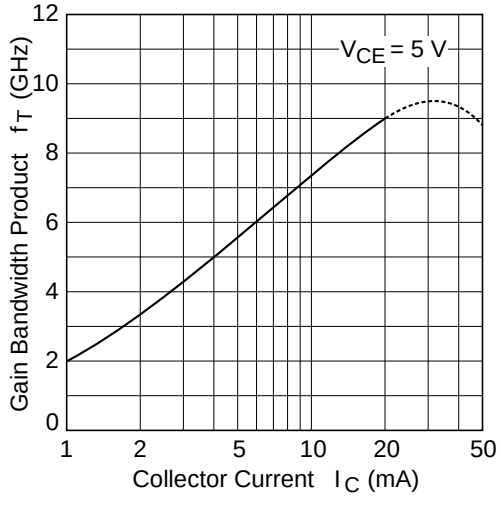
Maximum Collector Dissipation Curve



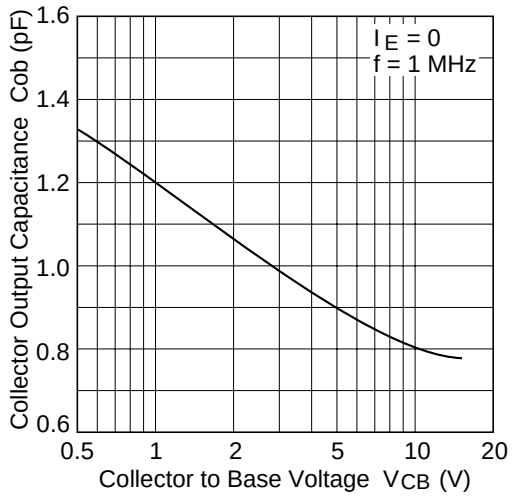
DC Current Transfer Ratio vs. Collector Current



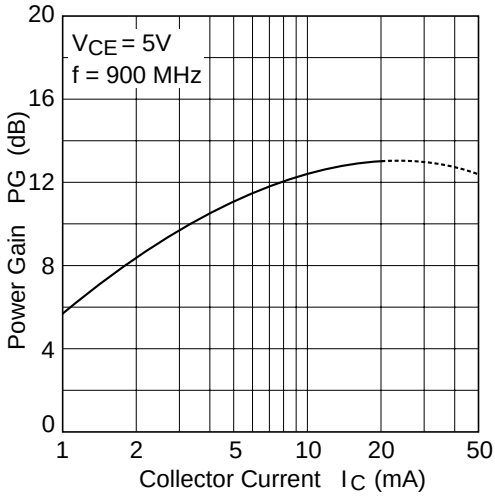
Gain Bandwidth Product vs. Collector Current



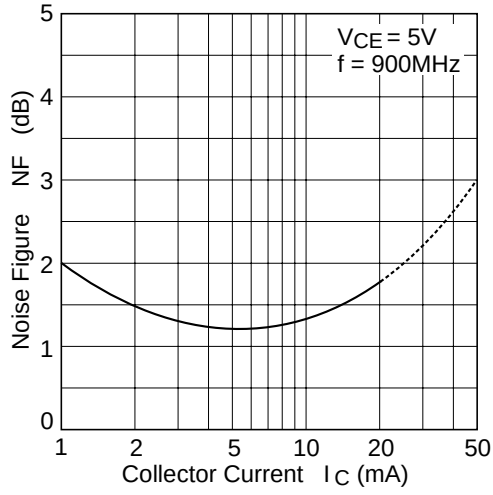
Collector Output Capacitance vs. Collector to Base Voltage



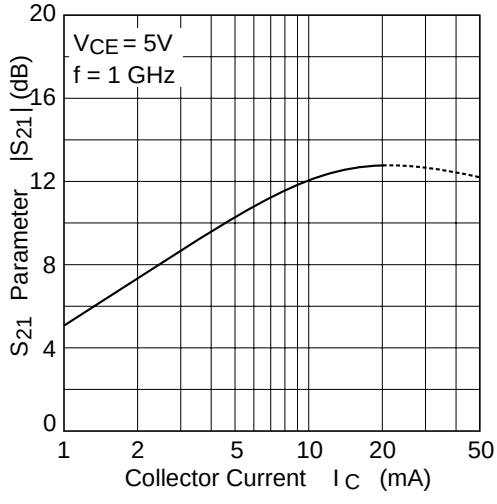
Power Gain vs. Collector Current



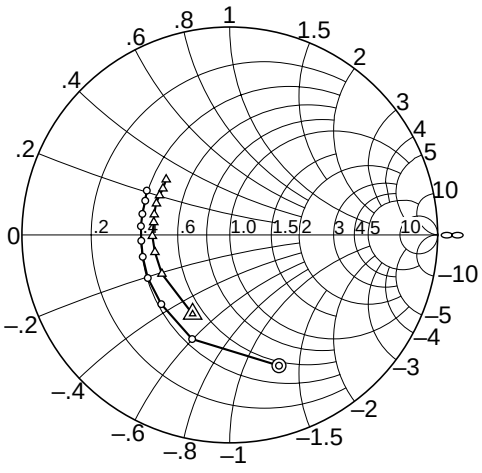
Noise Figure vs. Collector Current



S21 Parameter vs. Collector Current

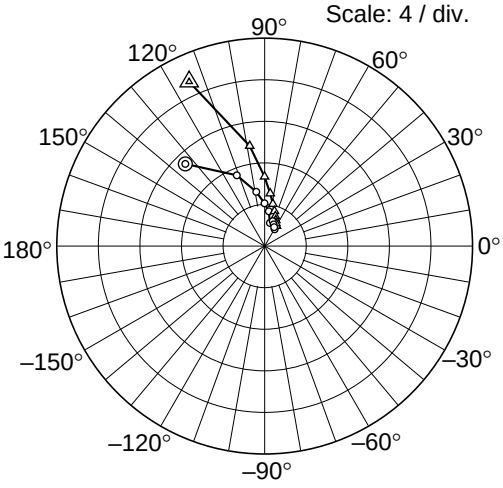


S11 Parameter vs. Frequency



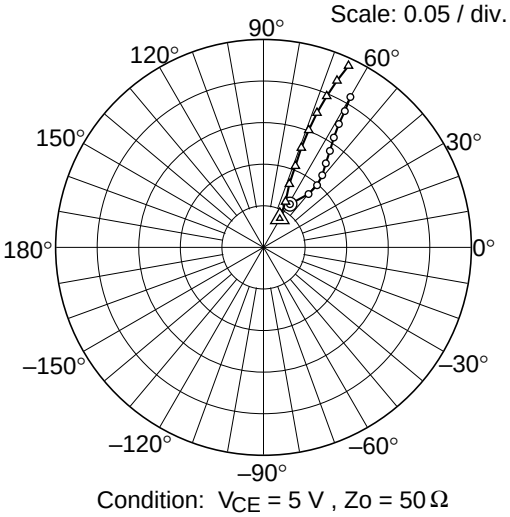
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S21 Parameter vs. Frequency



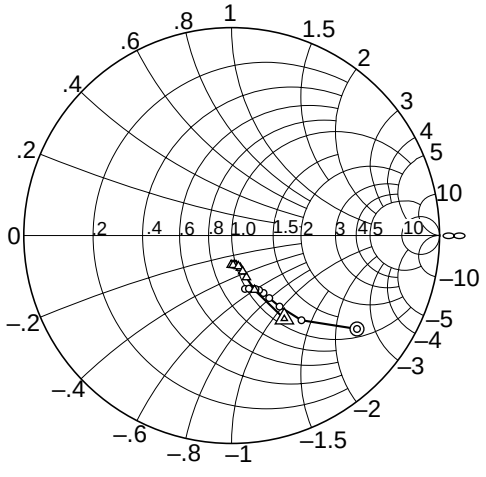
Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S12 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

S22 Parameter vs. Frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(I_C = 5 mA)
(I_C = 20 mA)

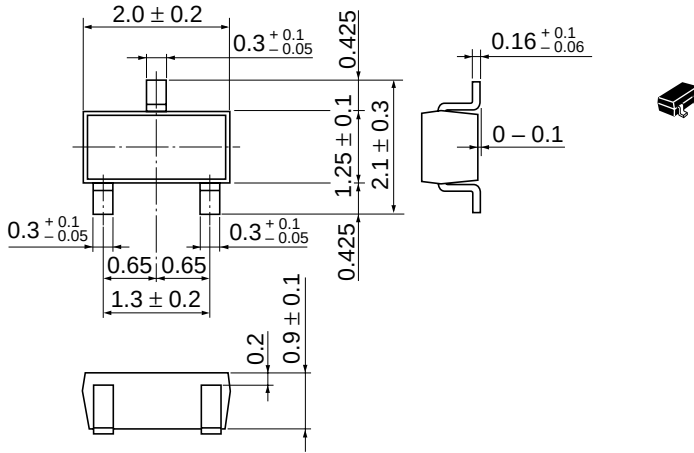
S Parameter (V_{CE} = 5 V, I_C = 5 mA, Z_O = 50 Ω, Emitter common)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.672	–69.4	10.99	134.0	0.0610	58.8	0.752	–26.7
400	0.533	–109.9	7.32	111.5	0.0841	49.9	0.528	–50.5
600	0.469	–134.7	5.28	98.8	0.0989	49.3	0.412	–56.0
800	0.446	–152.3	4.12	90.2	0.112	50.9	0.351	–59.0
1000	0.432	–165.9	3.37	83.2	0.126	53.5	0.316	–61.0
1200	0.427	–176.2	2.88	77.2	0.141	55.5	0.294	–63.3
1400	0.430	174.1	2.52	72.1	0.157	57.4	0.282	–66.0
1600	0.433	166.5	2.26	67.5	0.174	58.6	0.274	–69.1
1800	0.439	158.0	2.04	63.3	0.191	59.2	0.269	–72.0
2000	0.453	151.9	1.88	59.2	0.209	60.0	0.265	–76.0

S Parameter (V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω, Emitter common)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.421	–115.2	17.40	114.7	0.0399	50.6	0.474	–57.7
400	0.377	–150.2	9.74	98.5	0.0609	64.2	0.284	–67.2
600	0.370	–167.0	6.68	90.1	0.0822	67.8	0.213	–70.5
800	0.373	–179.1	5.09	84.0	0.105	68.6	0.180	–72.9
1000	0.371	170.6	4.13	79.0	0.128	69.2	0.161	–74.9
1200	0.377	164.9	3.49	74.3	0.151	68.9	0.151	–77.6
1400	0.384	156.9	3.04	70.3	0.174	68.3	0.146	–80.7
1600	0.388	150.7	2.71	66.8	0.197	67.3	0.143	–83.5
1800	0.392	145.3	2.45	63.3	0.219	66.2	0.142	–87.2
2000	0.406	139.0	2.25	59.5	0.241	64.9	0.141	–91.0

Unit: mm



Hitachi Code	CMPAK
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.006 g

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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
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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) 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: <886> (2) 2718-3666
Fax: <886> (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: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX