

# 2SC5543

Silicon NPN Epitaxial  
VHF / UHF wide band amplifier

# HITACHI

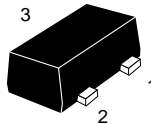
ADE-208-690 (Z)  
1st. Edition  
Nov. 1998

## 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 "YA-".

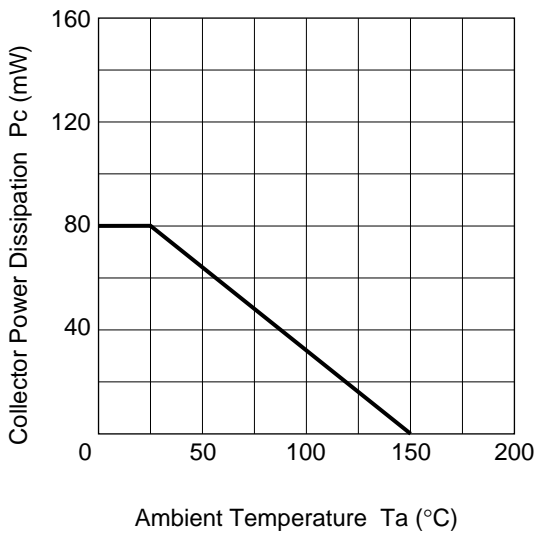
Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V <sub>CBO</sub>	15	V
Collector to emitter voltage	V <sub>CEO</sub>	8	V
Emitter to base voltage	V <sub>EBO</sub>	1.5	V
Collector current	I <sub>C</sub>	20	mA
Collector power dissipation	Pc	80	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	−55 to +150	°C

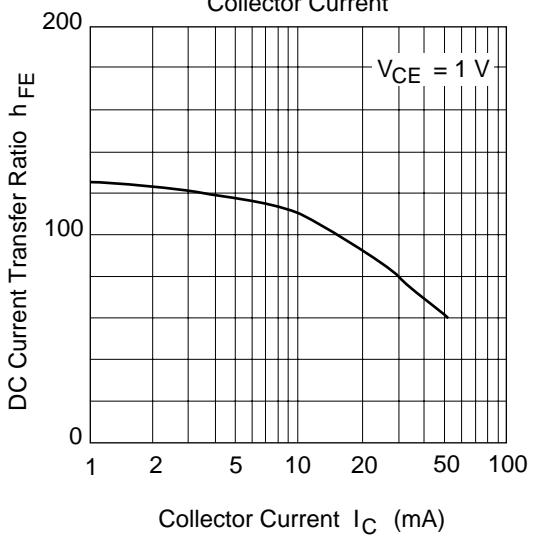
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector cutoff current	I <sub>CBO</sub>	—	—	10	μA	V <sub>CB</sub> = 15V , I <sub>E</sub> = 0
Collector cutoff current	I <sub>CEO</sub>	—	—	1	mA	V <sub>CE</sub> = 8V , R <sub>BE</sub> = ∞
Emitter cutoff current	I <sub>EBO</sub>	—	—	10	μA	V <sub>EB</sub> = 1.5V , I <sub>C</sub> = 0
DC current transfer ratio	h <sub>FE</sub>	85	—	170	V	V <sub>CE</sub> = 1V , I <sub>C</sub> = 5mA
Collector output capacitance	Cob	—	0.51	0.9	pF	V <sub>CB</sub> = 1V , I <sub>E</sub> = 0 f = 1MHz
Gain bandwidth product	f <sub>T</sub>	5.5	8.5	—	GHz	V <sub>CE</sub> = 1V , I <sub>C</sub> = 5mA
Power gain	PG	11	13.7	—	dB	V <sub>CE</sub> = 1V , I <sub>C</sub> = 5mA f = 900MHz
Noise figure	NF	—	1.1	2.5	dB	V <sub>CE</sub> = 1V , I <sub>C</sub> = 5mA f = 900MHz

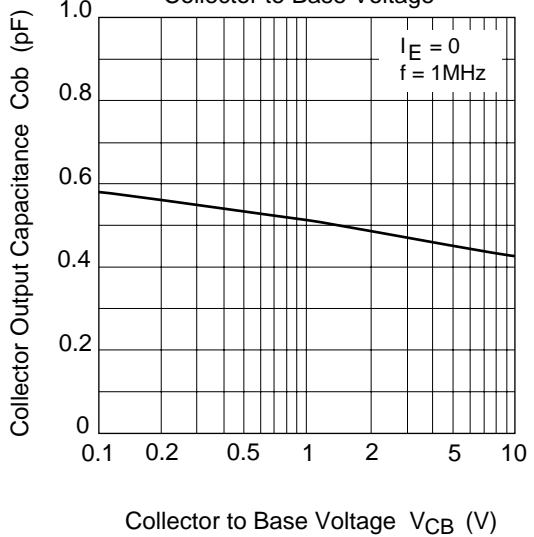
Maximum Collector Dissipation Curve



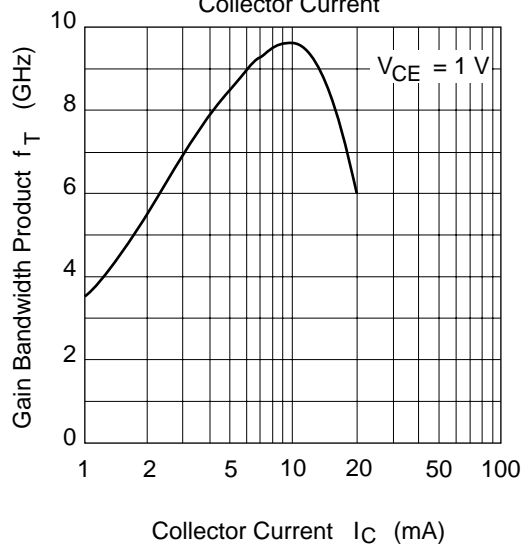
DC Current Transfer Ratio vs. Collector Current

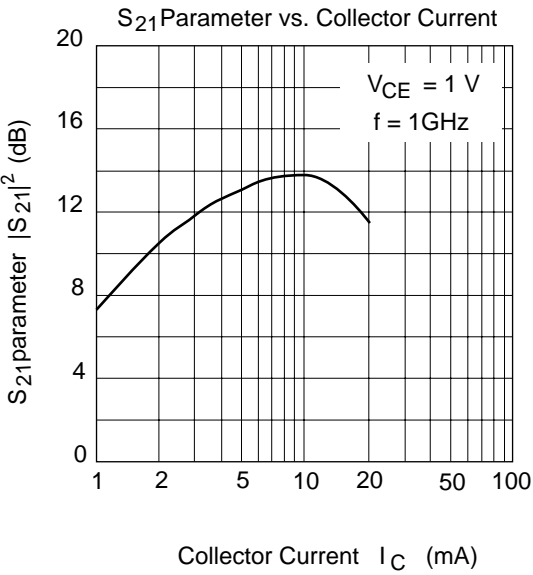
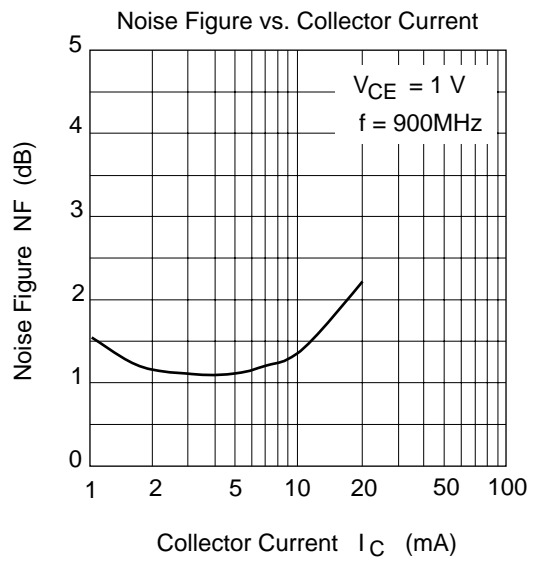
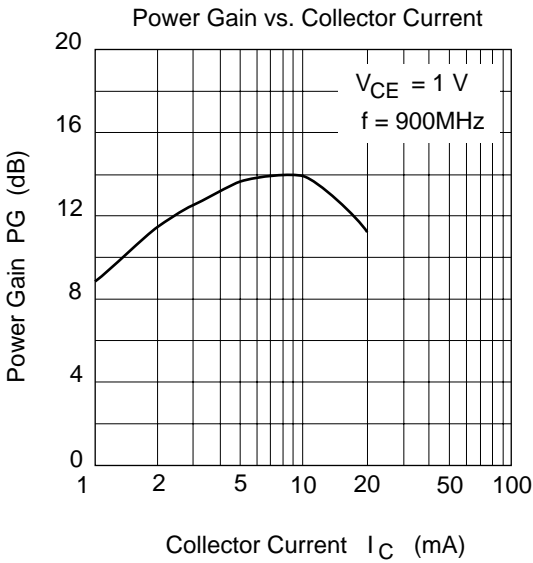


Collector Output Capacitance vs. Collector to Base Voltage

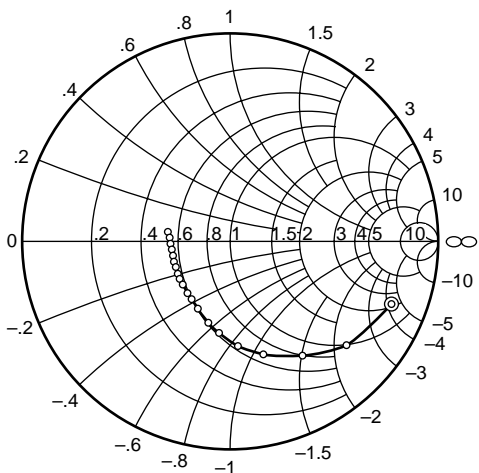


Gain Bandwidth Product vs. Collector Current





S11 Parameter vs. Frequency

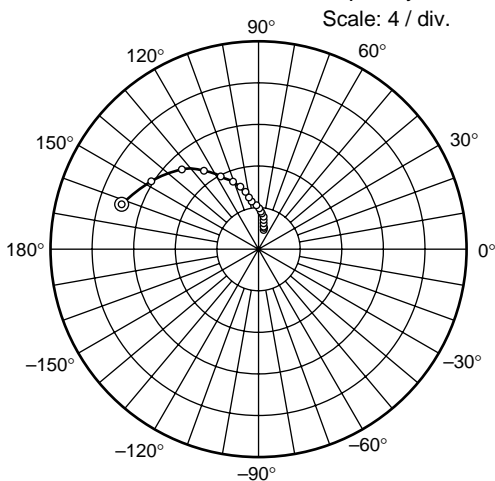


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)



S21 Parameter vs. Frequency

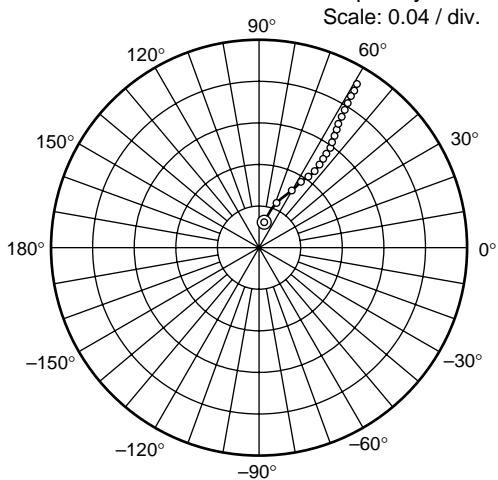


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)



S12 Parameter vs. Frequency

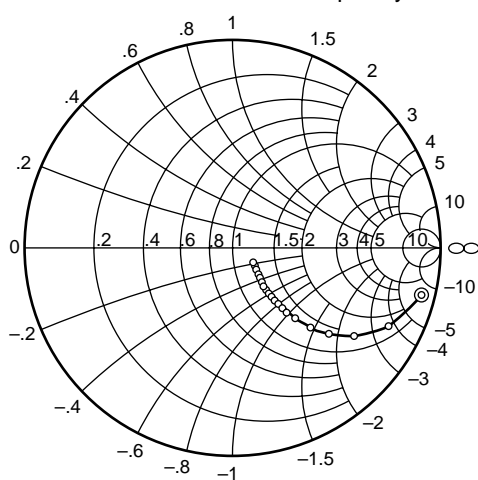


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

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)

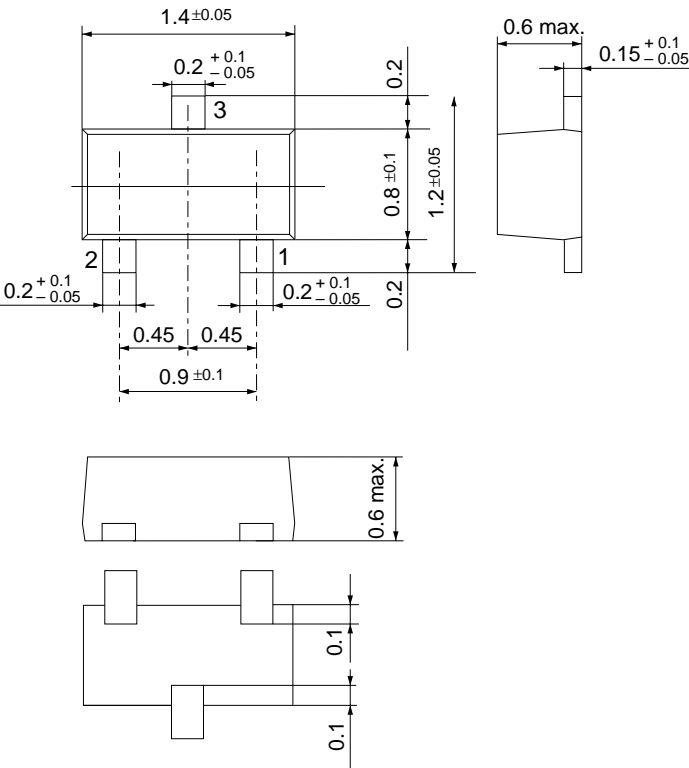


Sparameter (V<sub>CE</sub> = 1V, I<sub>C</sub> = 5mA, Z<sub>o</sub> = 50Ω)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.836	−20.7	13.66	162.9	0.0249	77.4	0.948	−14.2
200	0.757	−41.1	12.22	146.9	0.0472	68.0	0.846	−26.9
300	0.649	−58.5	10.57	134.1	0.0637	60.8	0.727	−36.2
400	0.564	−73.2	9.14	124.5	0.0750	56.9	0.623	−42.5
500	0.496	−85.2	7.90	116.8	0.0840	54.2	0.538	−46.2
600	0.436	−97.1	6.91	111.2	0.0916	53.4	0.469	−48.8
700	0.396	−106.2	6.12	105.9	0.0985	53.0	0.413	−50.4
800	0.364	−114.9	5.49	102.0	0.105	53.2	0.368	−51.1
900	0.338	−123.9	4.96	98.3	0.111	53.6	0.327	−51.1
1000	0.316	−130.6	4.52	95.3	0.118	54.1	0.297	−51.2
1100	0.305	−140.0	4.16	92.3	0.124	54.7	0.270	−50.7
1200	0.296	−146.5	3.86	89.8	0.130	55.3	0.246	−49.7
1300	0.293	−153.0	3.59	87.5	0.137	56.1	0.229	−48.7
1400	0.286	−159.5	3.36	85.4	0.143	56.6	0.209	−47.9
1500	0.287	−166.0	3.17	83.2	0.150	57.2	0.195	−46.3
1600	0.285	−170.7	3.00	81.4	0.157	57.7	0.180	−45.0
1700	0.289	−175.8	2.83	79.8	0.164	58.2	0.167	−43.8
1800	0.294	178.7	2.71	77.9	0.171	58.8	0.154	−42.4
1900	0.302	175.4	2.59	75.9	0.178	59.0	0.144	−40.2
2000	0.308	171.1	2.47	74.5	0.185	59.2	0.133	−38.6

Package Dimensions

Unit: mm



Hitachi Code	MFPK
EIAJ	—
JEDEC	—

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