

# 2SC5543

Silicon NPN Epitaxial  
VHF / UHF wide band amplifier

# HITACHI

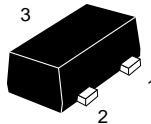
ADE-208-690 (Z)  
1st. Edition  
Nov. 1998

## 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 "YA-".

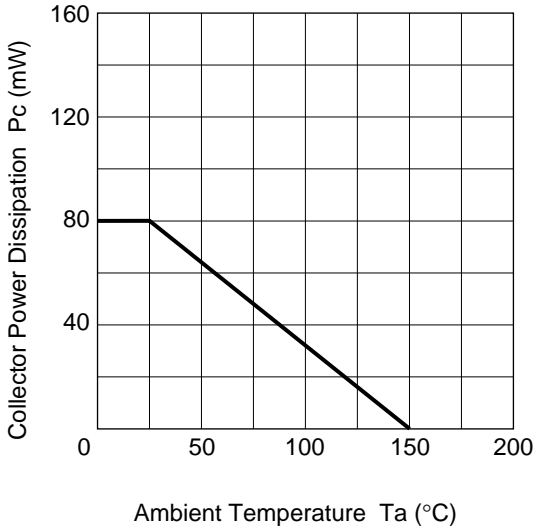
**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

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	$I_C$	20	mA
Collector power dissipation	$P_c$	80	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

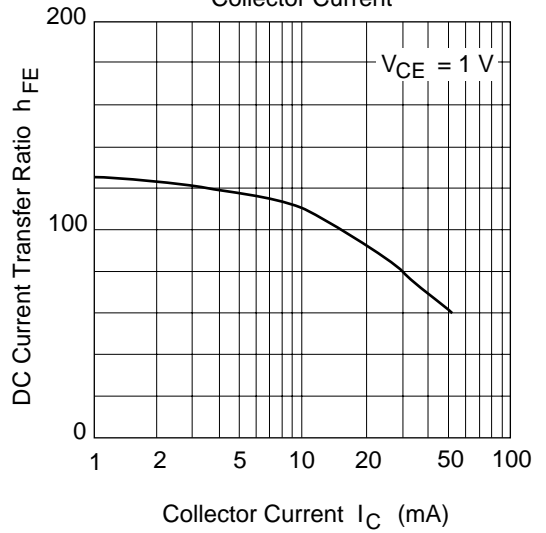
**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector cutoff current	$I_{CBO}$	—	—	10	$\mu\text{A}$	$V_{CB} = 15\text{V}, I_E = 0$
Collector cutoff current	$I_{CEO}$	—	—	1	mA	$V_{CE} = 8\text{V}, R_{BE} = \infty$
Emitter cutoff current	$I_{EBO}$	—	—	10	$\mu\text{A}$	$V_{EB} = 1.5\text{V}, I_C = 0$
DC current transfer ratio	$h_{FE}$	85	—	170	V	$V_{CE} = 1\text{V}, I_C = 5\text{mA}$
Collector output capacitance	$C_{ob}$	—	0.51	0.9	pF	$V_{CB} = 1\text{V}, I_E = 0$ $f = 1\text{MHz}$
Gain bandwidth product	$f_T$	5.5	8.5	—	GHz	$V_{CE} = 1\text{V}, I_C = 5\text{mA}$
Power gain	PG	11	13.7	—	dB	$V_{CE} = 1\text{V}, I_C = 5\text{mA}$ $f = 900\text{MHz}$
Noise figure	NF	—	1.1	2.5	dB	$V_{CE} = 1\text{V}, I_C = 5\text{mA}$ $f = 900\text{MHz}$

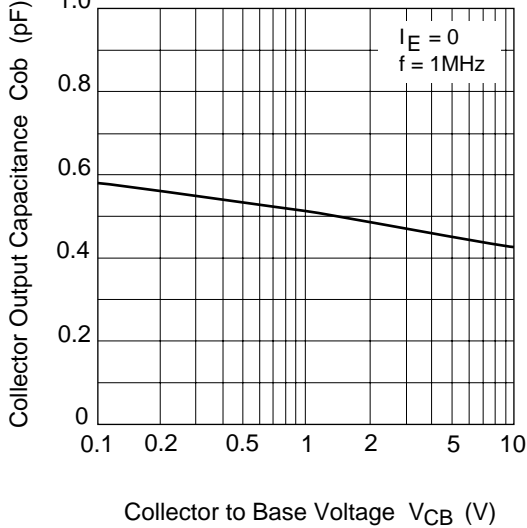
Maximum Collector Dissipation Curve



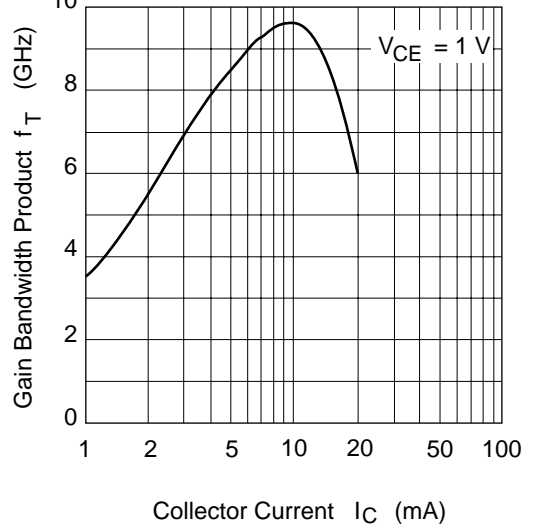
DC Current Transfer Ratio vs. Collector Current

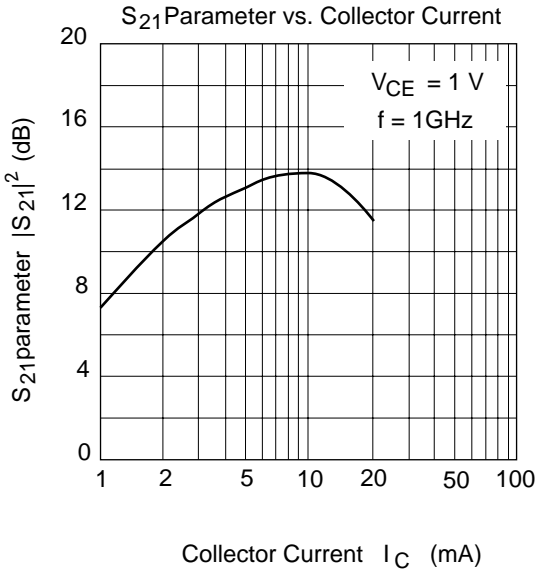
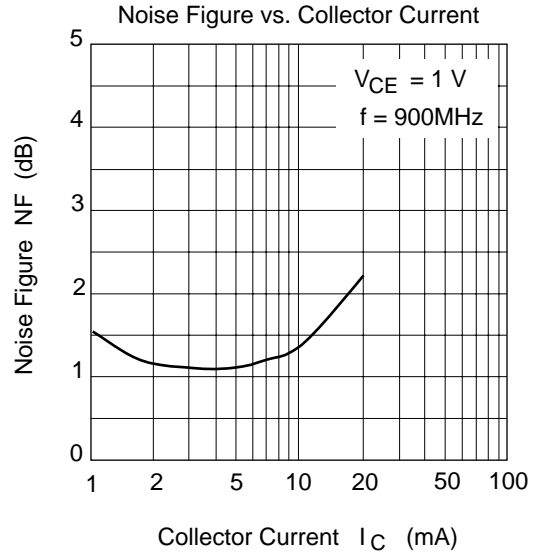
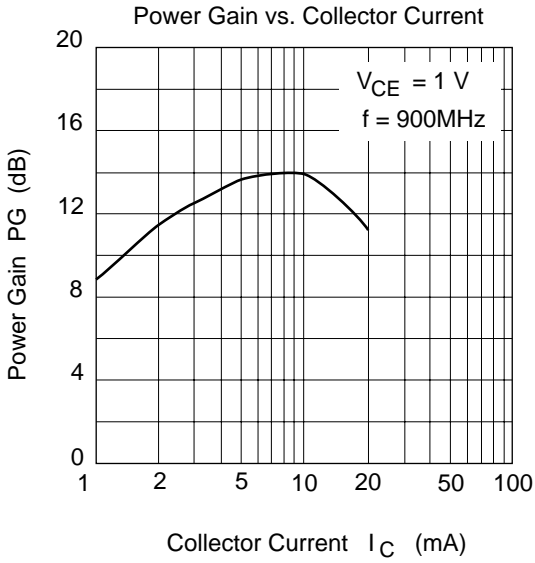


Collector Output Capacitance vs. Collector to Base Voltage

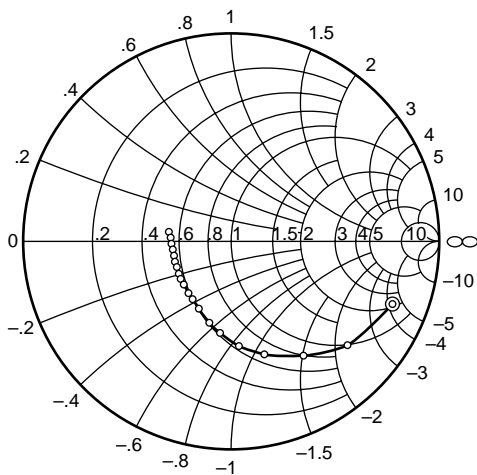


Gain Bandwidth Product vs. Collector Current





S11 Parameter vs. Frequency

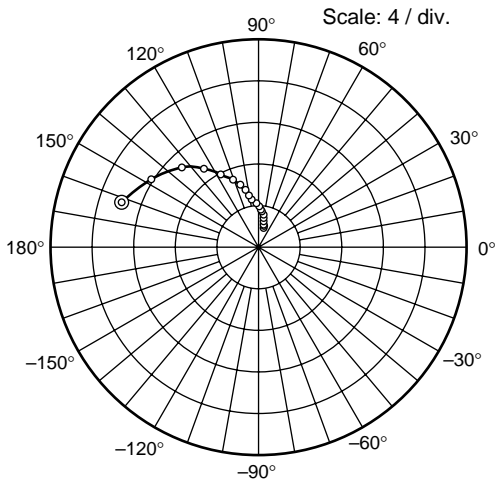


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)

⊙—○

S21 Parameter vs. Frequency

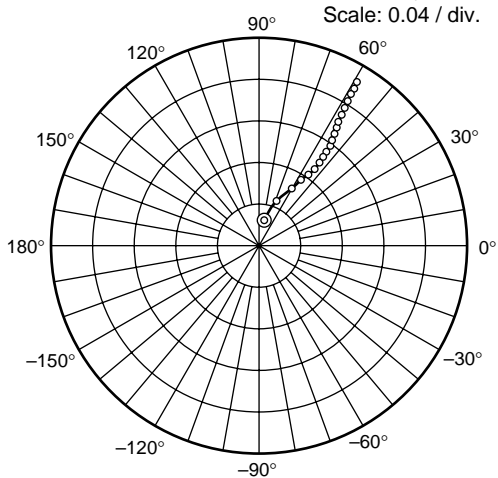


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

100 to 2000 MHz (100 MHz step)

⊙—○

S12 Parameter vs. Frequency

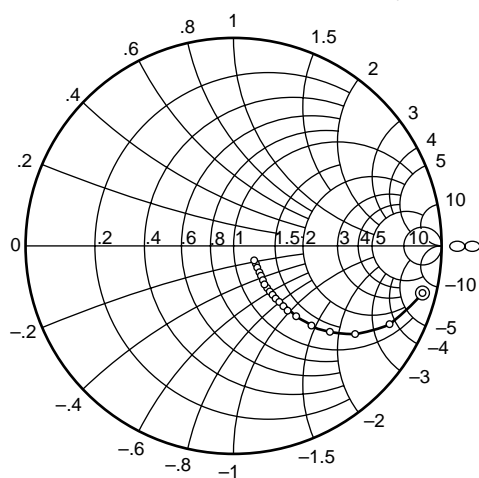


Condition :  $V_{CE} = 1\text{ V}$  ,  $I_C = 5\text{ mA}$

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)

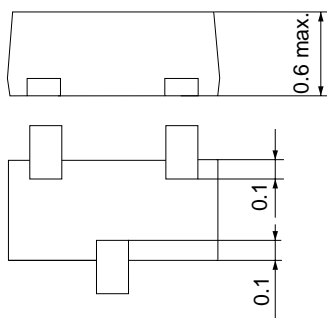
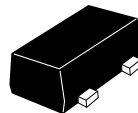
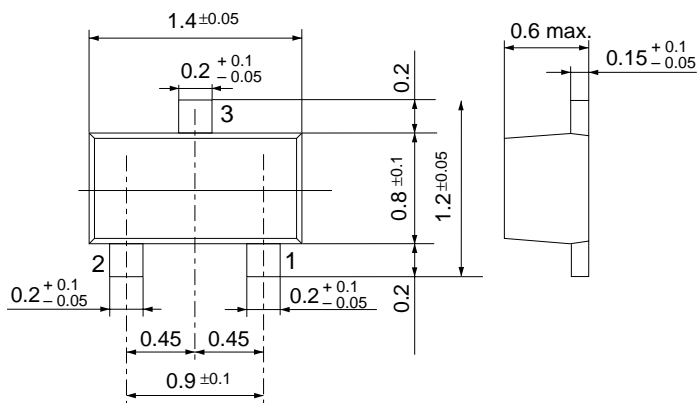
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**Sparameter** ( $V_{CE} = 1V$ ,  $I_C = 5mA$ ,  $Z_o = 50\Omega$ )

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.836	-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	—

## Cautions

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