
2SC4807

Silicon NPN Epitaxial

HITACHI

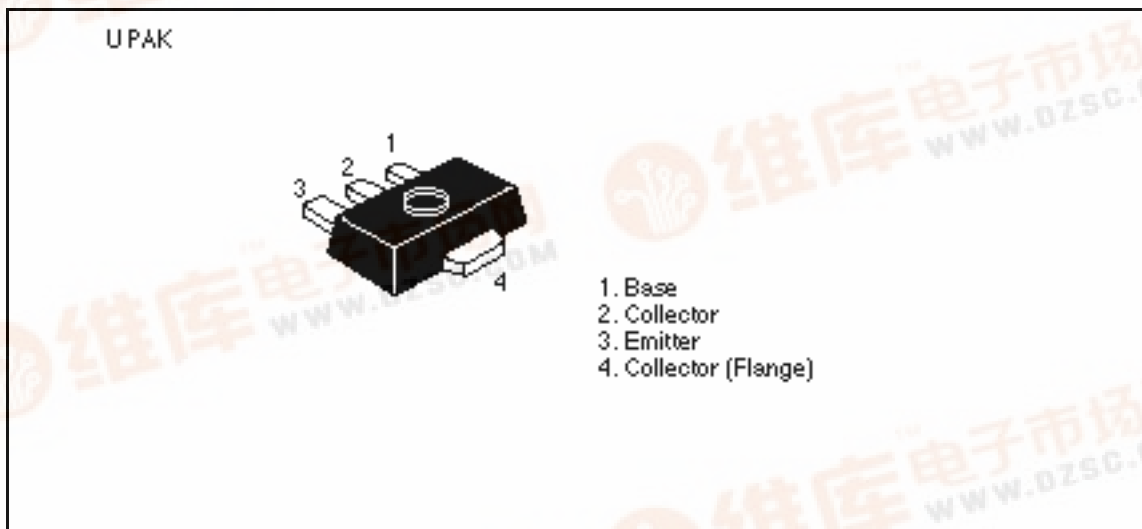
Application

VHF / UHF wide band amplifier

Features

- High gain bandwidth product
 $f_T = 4.4 \text{ GHz Typ}$
- High output power
1 dB Power compression point $P_{cp} = 24 \text{ dBm Typ}$ at $V_{CE} = 5V, I_C = 100 \text{ mA}, f = 900 \text{ MHz}$

Outline



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Absolute Maximum Ratings (Ta = 25°C)

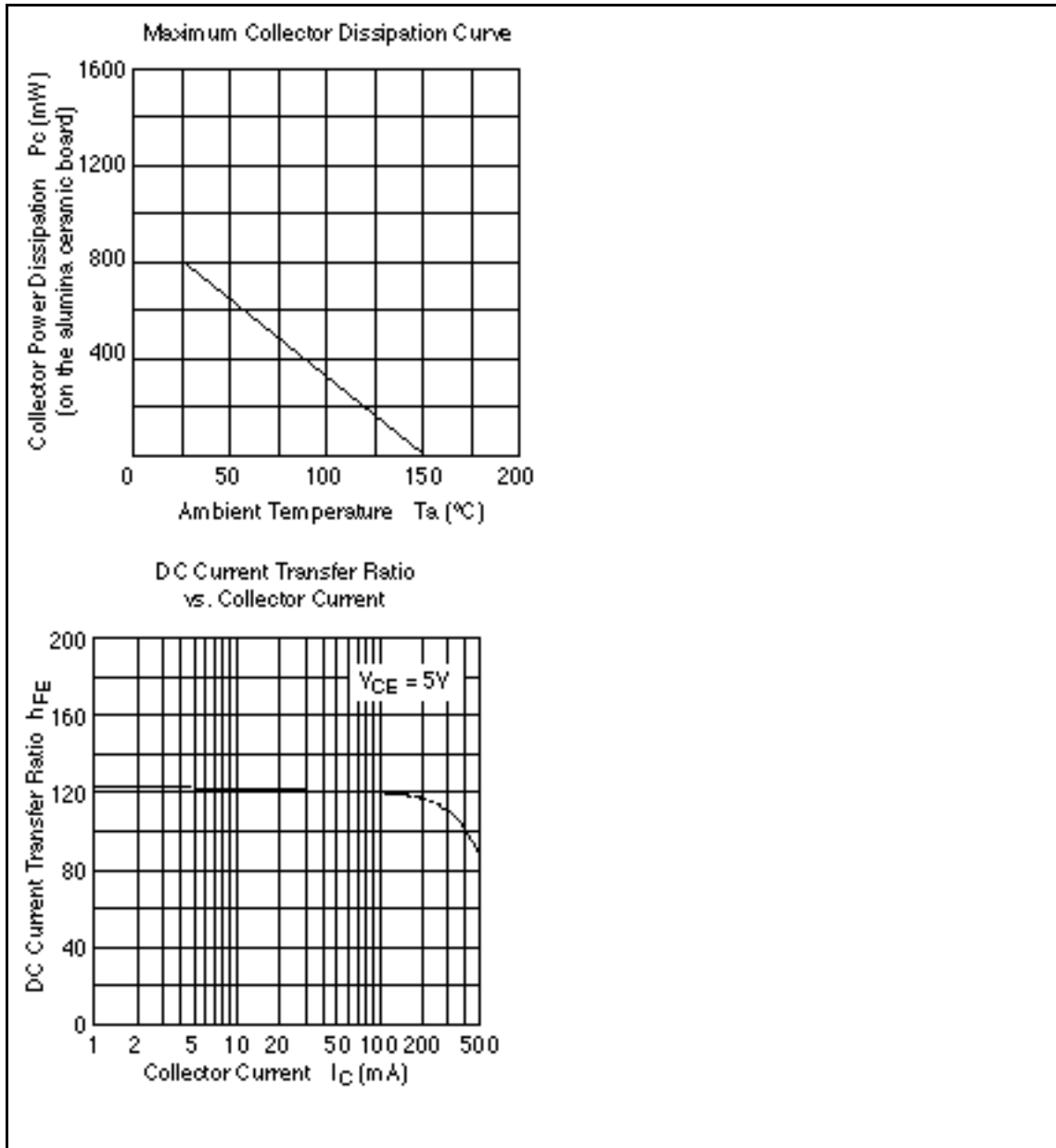
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	20	V
Collector to emitter voltage	V_{CEO}	15	V
Emitter to base voltage	V_{EBO}	2	V
Collector current	I_C	200	mA
Collector power dissipation	P_C^{*1}	800	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Note: 1. Value on the alumina ceramics board (12.5 x 20 x 0.7 mm)

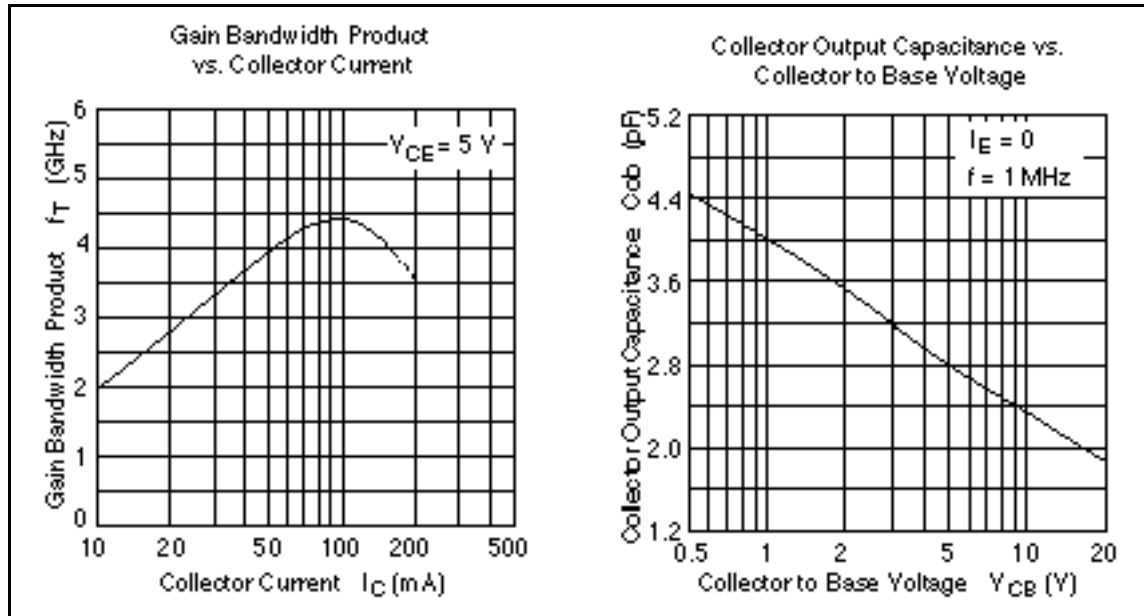
Electrical Characteristics (Ta = 25°C)

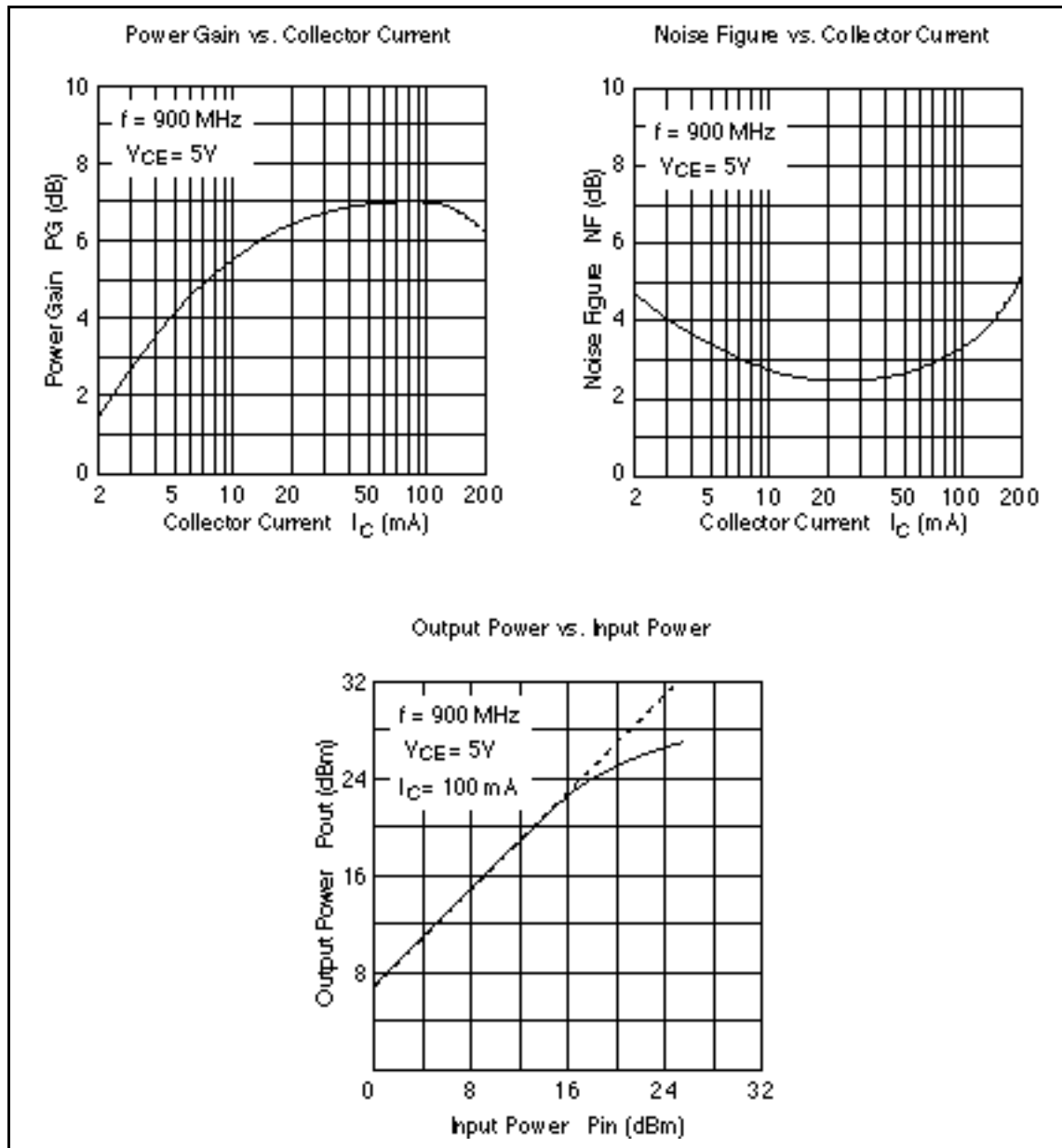
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	20	30	—	V	$I_C = 10 \mu A, I_E = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{CB} = 15 V, I_E = 0$
	I_{CEO}	—	—	1	mA	$V_{CE} = 15 V, R_{BE} =$
Emitter cutoff current	I_{EBO}	—	—	10	μA	$V_{EB} = 2 V, I_C = 0$
DC current transfer ratio	h_{FE}	50	120	250		$V_{CE} = 5 V, I_C = 100 mA$
Collector output capacitance	C_{ob}	—	2.8	4.0	pF	$V_{CB} = 5 V, I_E = 0, f = 1 MHz$
Gain bandwidth product	f_T	3.0	4.4	—	GHz	$V_{CE} = 5 V, I_C = 100 mA$
Power gain	PG	5.0	7.0	—	dB	$V_{CE} = 5 V, I_C = 100 mA,$ $f = 900 MHz$
Noise figure	NF	—	2.5	4.0	dB	$V_{CE} = 5 V, I_C = 20 mA,$ $f = 900 MHz$

Note: Marking is "ER".



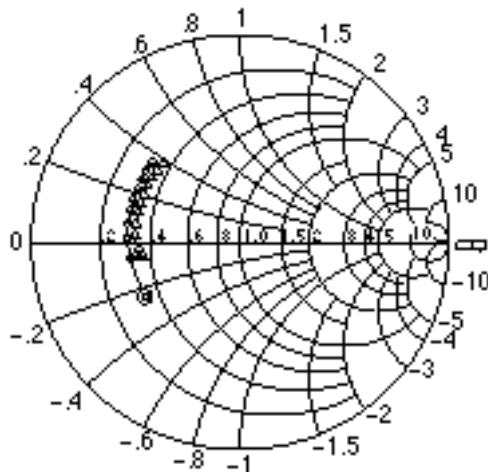
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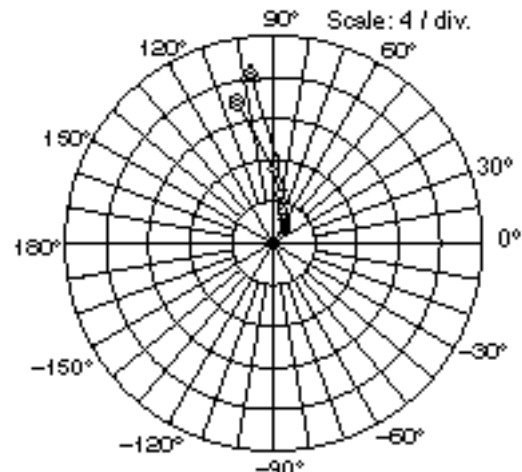
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S11 Parameter vs. Frequency



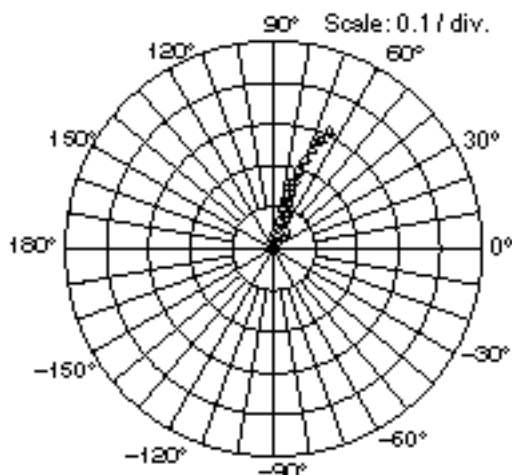
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 100 to 1000 MHz (100 MHz step)
 ○ — ○ ($I_C = 20\text{ mA}$)
 △ — △ ($I_C = 100\text{ mA}$)

S21 Parameter vs. Frequency



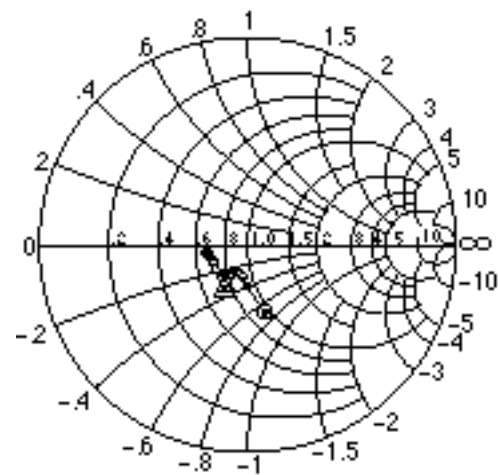
Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 100 to 1000 MHz (100 MHz step)
 ○ — ○ ($I_C = 20\text{ mA}$)
 △ — △ ($I_C = 100\text{ mA}$)

S12 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 100 to 1000 MHz (100 MHz step)
 ○ — ○ ($I_C = 20\text{ mA}$)
 △ — △ ($I_C = 100\text{ mA}$)

S22 Parameter vs. Frequency



Condition: $V_{CE} = 5\text{ V}$, $Z_o = 50\ \Omega$
 100 to 1000 MHz (100 MHz step)
 ○ — ○ ($I_C = 20\text{ mA}$)
 △ — △ ($I_C = 100\text{ mA}$)

S Parameter ($V_{CE} = 5 \text{ V}$, $I_C = 20 \text{ mA}$, $Z_O = 50 \text{ } \Omega$, Emitter Common)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.525	-150.0	14.03	104.7	0.039	58.4	0.336	-75.5
200	0.533	-171.9	7.16	90.9	0.063	65.7	0.197	-89.9
300	0.542	177.6	4.75	83.2	0.089	69.6	0.157	-98.3
400	0.544	170.2	3.60	77.5	0.116	71.0	0.146	-104.0
500	0.547	163.8	2.91	72.1	0.143	71.5	0.145	-109.0
600	0.552	158.2	2.46	67.4	0.170	71.3	0.150	-113.7
700	0.555	152.6	2.14	63.3	0.197	70.5	0.158	-117.1
800	0.558	147.5	1.90	59.3	0.225	69.6	0.166	-121.0
900	0.570	142.4	1.72	55.2	0.254	68.4	0.175	-124.6
1000	0.569	137.4	1.58	51.9	0.280	67.2	0.186	-128.1

S Parameter ($V_{CE} = 5 \text{ V}$, $I_C = 100 \text{ mA}$, $Z_O = 50 \text{ } \Omega$, Emitter Common)

Freq. (MHz)	S11		S21		S12		S22	
	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
100	0.488	-172.8	16.32	97.8	0.034	76.2	0.248	-116.9
200	0.502	176.3	8.08	88.0	0.066	78.6	0.195	-141.9
300	0.507	170.0	5.34	82.0	0.099	77.8	0.184	-152.2
400	0.507	163.6	4.03	77.2	0.132	76.4	0.181	-157.9
500	0.514	159.0	3.27	72.8	0.163	74.5	0.184	-161.8
600	0.513	153.6	2.75	68.8	0.195	72.7	0.189	-164.0
700	0.518	148.5	2.40	65.1	0.225	70.7	0.192	-165.8
800	0.524	144.0	2.13	61.3	0.254	68.5	0.196	-167.6
900	0.525	139.3	1.93	57.8	0.284	66.3	0.200	-169.4
1000	0.531	134.2	1.77	54.6	0.312	64.6	0.205	-170.8

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