HITACHI

2SC4807

Silicon NPN Bipolar Transistor

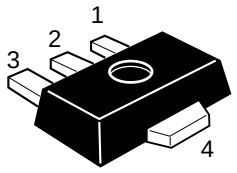
Application

VHF & UHF wide band amplifier

Features

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

UPAK



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

Table 1 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*	800	mW
Junction temperature	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

* Value on the alumina ceramics board (12.5 x 2.0 x 0.7 mm)

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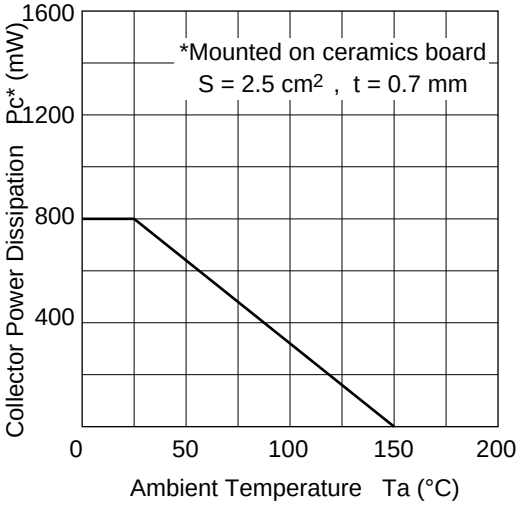
Table 2 Electrical Characteristics (Ta = 25°C)

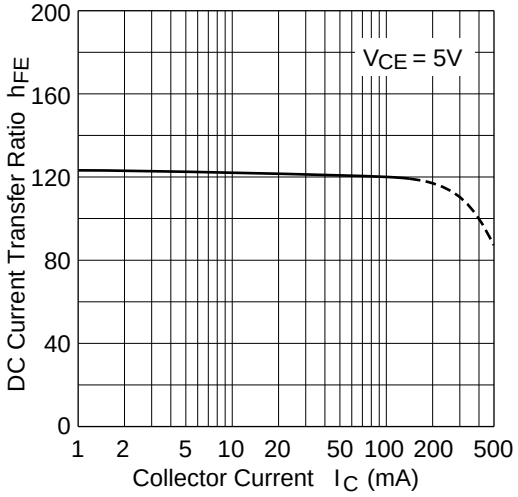
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	20	30	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	1	µA	V_{CB} = 15 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 15 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 2 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250	—	V_{CE} = 5 V, I_C = 100 mA
Output capacitance	Cob	—	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

Marking for 2SC4807 is “ER–”.

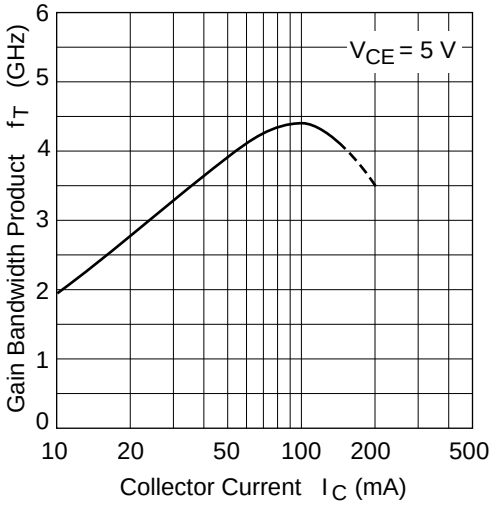
Maximum collector power dissipation curve



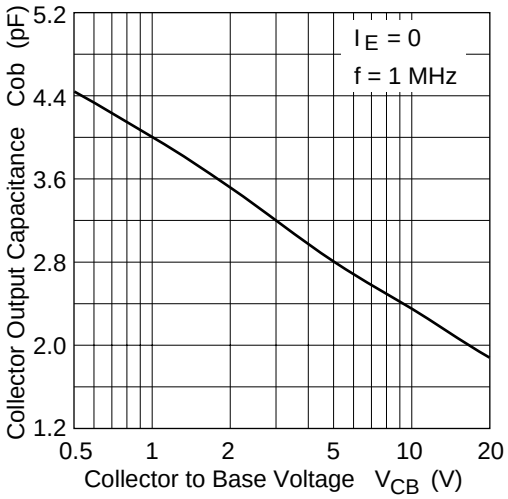
DC current transfer ratio
vs. collector current



Gain bandwidth product vs. collector current



Collector output capacitance
vs. collector to base voltage



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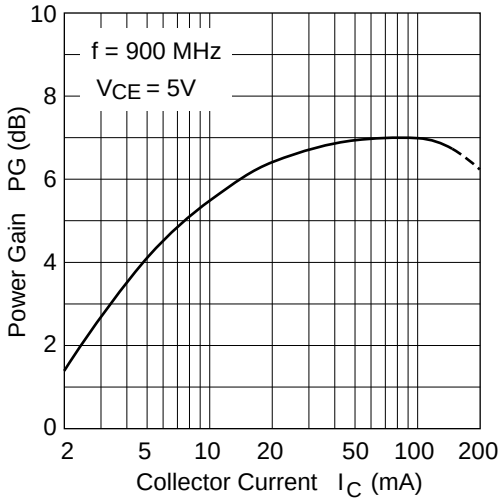
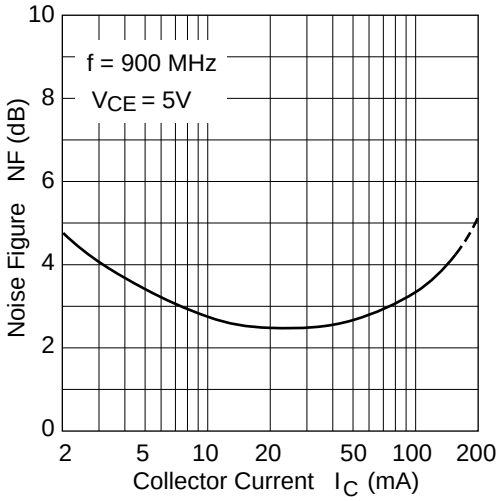
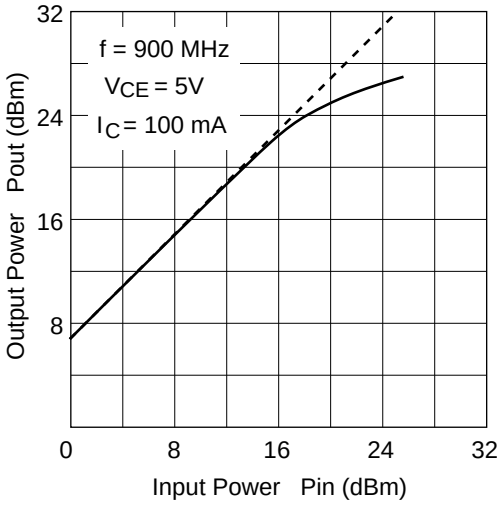
Power gain vs. collector current



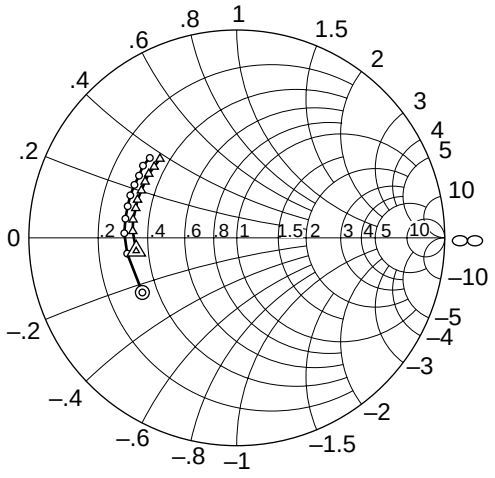
Noise figure vs. collector current



Output power vs. input power

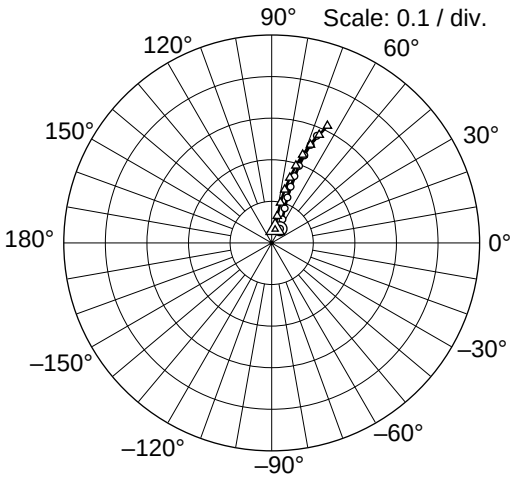


S11 parameter vs. frequency



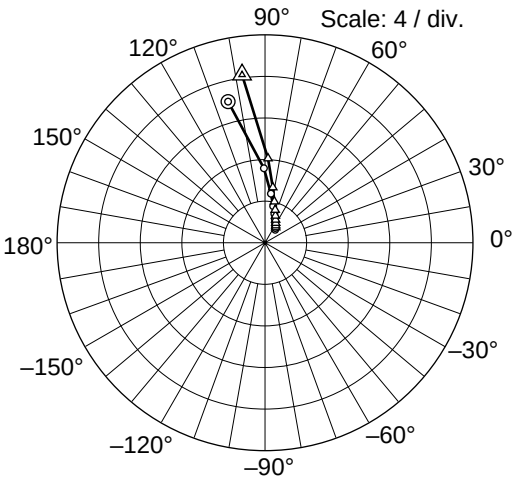
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 20 mA)
(I_C = 100 mA)

S12 parameter vs. frequency



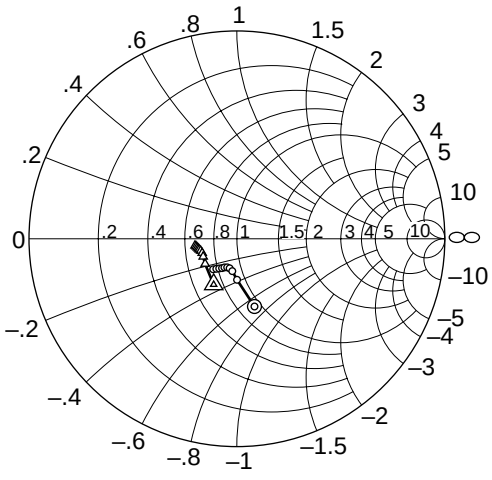
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 20 mA)
(I_C = 100 mA)

S21 parameter vs. frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 20 mA)
(I_C = 100 mA)

S22 parameter vs. frequency



Condition: V_{CE} = 5 V , Zo = 50 Ω
100 to 1000 MHz (100 MHz step)
(I_C = 20 mA)
(I_C = 100 mA)

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Table 3 S Parameter (V_{CE} = 5 V, I_C = 20 mA, Z_O = 50 Ω, Emitter common)

	S11		S21		S12		S22	
f (MHz)	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

Table 4 S Parameter (V_{CE} = 5 V, I_C = 100 mA, Z_O = 50 Ω, Emitter common)

	S11		S21		S12		S22	
f (MHz)	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