HITACHI

2SC4905

Silicon NPN Bipolar Transistor

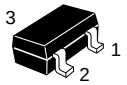
Application

VHF & UHF wide band amplifire

Features

- High gain bandwidth product
  f_T = 5.8 GHz typ
- High gain, low noise figure
  PG = 12.0 dB typ,
  NF = 1.6 dB typ at f = 900 MHz

CMPAK



1. Emitter
2. Base
3. 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}	12	V
Emitter to base voltage	V_{EBO}	2	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	100	mW
Junction temperature	T_j	150	°C
Storage temperature	Tstg	–55 to +150	°C

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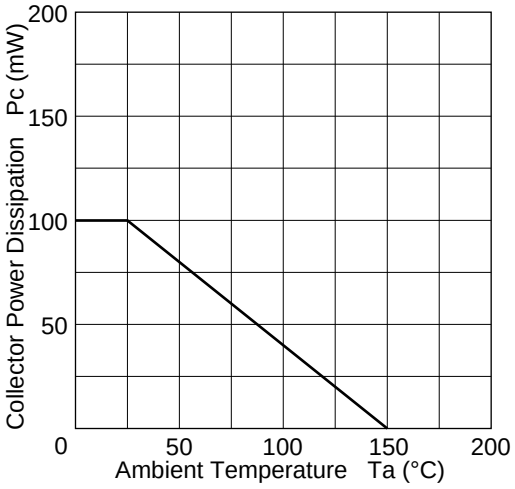
Table 2 Electrical Characteristics (Ta = 25°C)

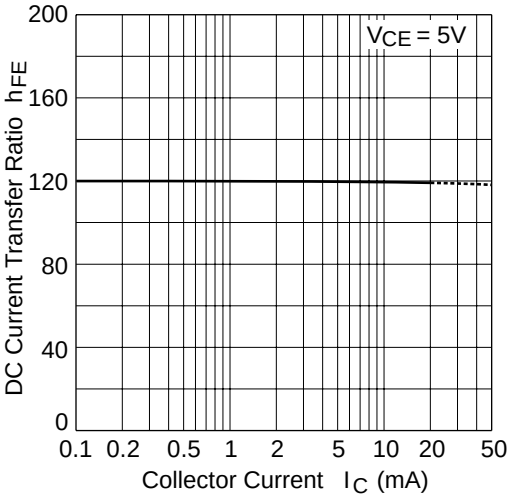
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	20	—	—	V	I_C = 10 µA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	10	µA	V_{CB} = 15 V, I_E = 0
	I_{CEO}	—	—	1	mA	V_{CE} = 12 V, R_{BE} = ∞
Emitter cutoff current	I_{EBO}	—	—	10	µA	V_{EB} = 2 V, I_C = 0
DC current transfer ratio	h_{FE}	50	120	250		V_{CE} = 5 V, I_C = 20 mA
Output capacitance	Cob	—	0.8	1.2	pF	V_{CB} = 5 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	4	5.8	—	GHz	V_{CE} = 5 V, I_C = 20 mA
Power gain	PG	9.5	12.0	—	dB	V_{CE} = 5 V, I_C = 20 mA, f = 900 MHz
Noise figure	NF	—	1.6	3.0	dB	V_{CE} = 5 V, I_C = 5 mA, f = 900 MHz

Marking for 2SC4905 is “YM–”.

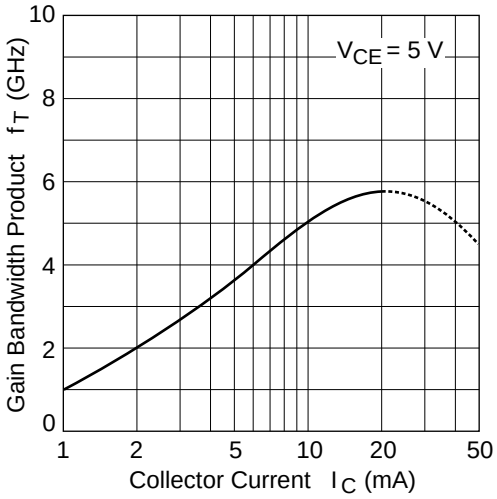
Maximum collector power dissipation curve



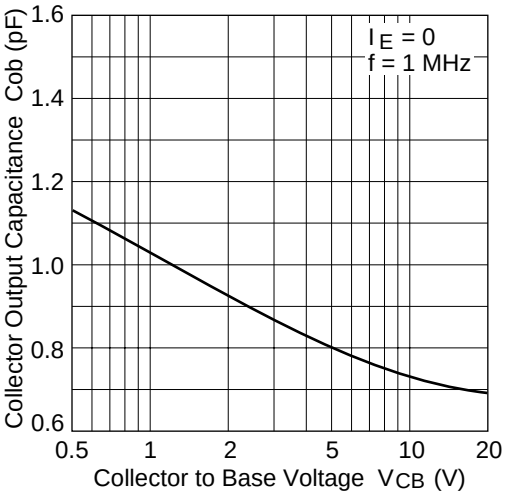
DC current transfer ratio
vs. collector current



Gain bandwidth product vs. collector current



Collector output capacitance
vs. collector to base voltage



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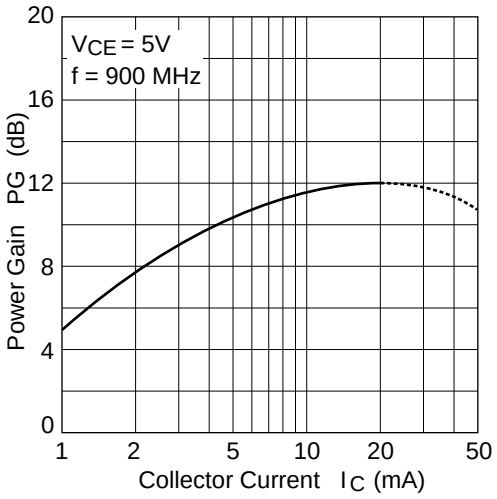
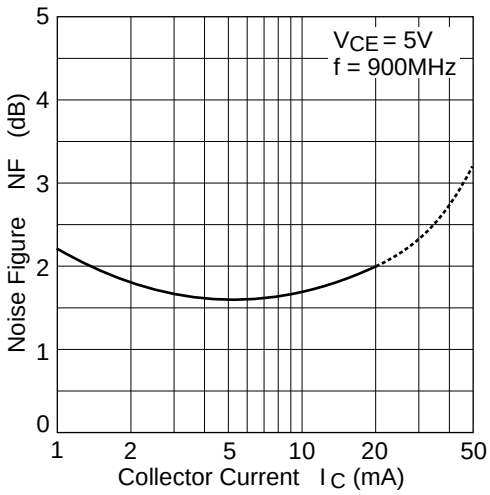
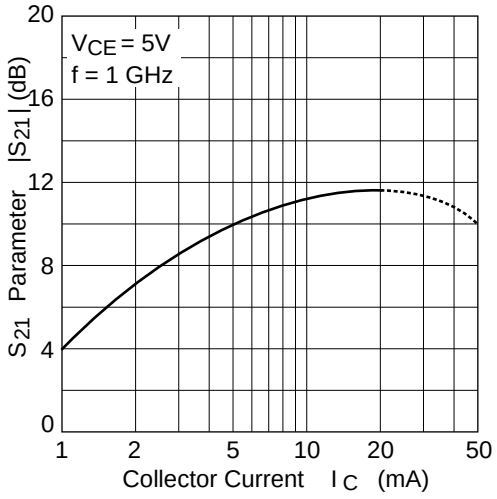
Power gain vs. collector current



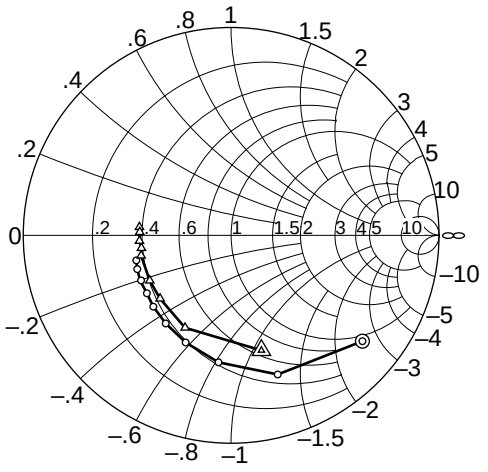
Noise figure vs. collector current



S21 parameter vs. collector current

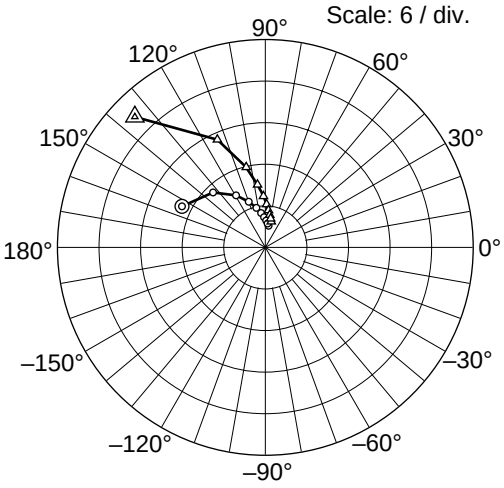


S11 parameter vs. frequency



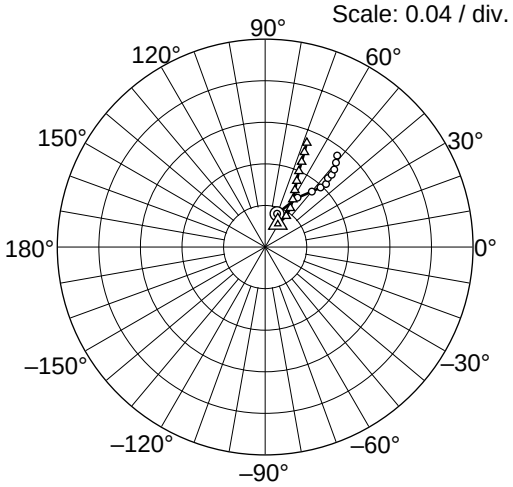
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 MHz to 1000 MHz (100 MHz step)
(I C = 5 mA)
(I C = 20 mA)

S21 parameter vs. frequency



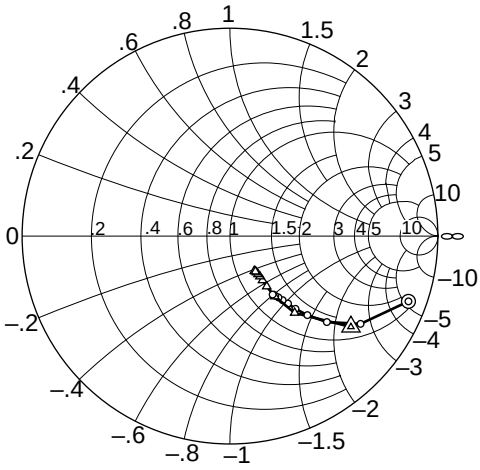
Condition: V_{CE} = 5 V , Zo = 50 Ω
100 MHz to 1000 MHz (100 MHz step)
(I C = 5 mA)
(I C = 20 mA)

S12 parameter vs. frequency



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

S22 parameter vs. frequency



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

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

	S11		S21		S12		S22	
f (MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.811	–38.9	13.42	153.8	0.0340	70.7	0.914	–20.1
200	0.706	–71.5	10.97	133.5	0.0568	56.8	0.757	–33.9
300	0.614	–95.7	8.65	119.3	0.0698	49.9	0.623	–41.6
400	0.560	–113.0	7.04	109.9	0.0783	47.1	0.532	–45.6
500	0.528	–126.6	5.87	102.7	0.0843	46.0	0.471	–48.0
600	0.508	–137.5	5.02	97.0	0.0897	46.7	0.428	–49.3
700	0.492	–145.5	4.39	92.4	0.0946	47.4	0.399	–50.6
800	0.485	–153.4	3.90	88.2	0.0999	48.3	0.376	–51.7
900	0.480	–160.2	3.50	84.5	0.106	50.0	0.360	–52.8
1000	0.472	–165.2	3.19	81.5	0.112	51.8	0.348	–53.9

Table 4 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	0.572	–75.3	26.66	135.0	0.0254	61.6	0.727	–36.9
200	0.497	–116.5	17.02	114.0	0.0361	55.7	0.483	–49.9
300	0.458	–138.3	11.90	103.4	0.0446	57.1	0.362	–53.4
400	0.448	–150.9	9.13	97.1	0.0530	59.8	0.300	–53.9
500	0.439	–160.1	7.39	92.1	0.0618	62.4	0.264	–53.7
600	0.444	–167.3	6.21	88.3	0.0705	64.4	0.242	–53.5
700	0.436	–171.9	5.37	85.2	0.0799	66.0	0.228	–53.8
800	0.442	–176.5	4.73	82.2	0.0892	66.8	0.217	–53.9
900	0.440	178.0	4.23	79.5	0.0988	67.5	0.210	–54.4
1000	0.443	174.9	3.82	77.1	0.108	68.2	0.205	–55.2