

## 2SC4902

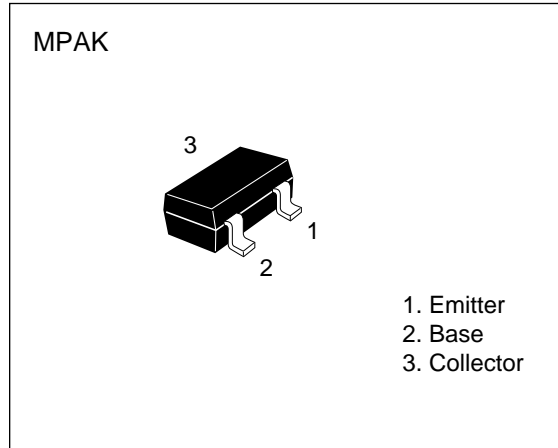
### Silicon NPN Bipolar Transistor

#### Application

VHF & UHF wide band amplifier

#### Features

- High gain bandwidth product  
 $f_T = 6 \text{ GHz typ}$
- High gain, low noise figure  
 $PG = 12.0 \text{ dB typ,}$   
 $NF = 1.6 \text{ dB typ at } f = 900 \text{ MHz}$



**Table 1 Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

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	$I_C$	30	mA
Collector power dissipation	$P_C$	150	mW
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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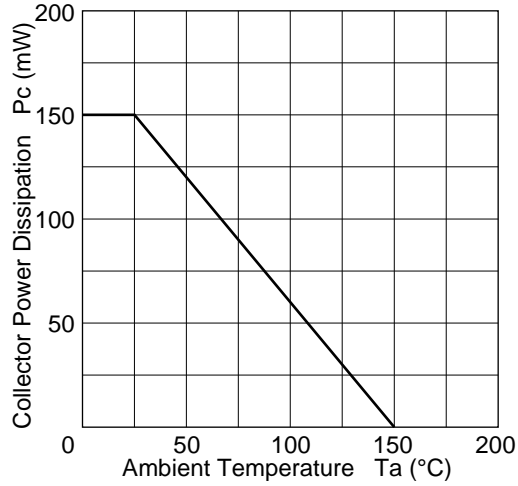
**Table 2 Electrical Characteristics** (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector cutoff current	$I_{CBO}$	—	—	10	$\mu\text{A}$	$V_{CB} = 20 \text{ V}$ , $I_E = 0$
	$I_{CEO}$	—	—	1	mA	$V_{CE} = 12 \text{ V}$ , $R_{BE} = \infty$
Emitter cutoff current	$I_{EBO}$	—	—	10	$\mu\text{A}$	$V_{EB} = 2 \text{ V}$ , $I_C = 0$
DC current transfer ratio	$h_{FE}$	50	120	250		$V_{CE} = 5 \text{ V}$ , $I_C = 10 \text{ mA}$
Output capacitance	$C_{ob}$	—	0.6	1.0	pF	$V_{CB} = 5 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$
Gain bandwidth product	$f_T$	4.0	6.0	—	GHz	$V_{CE} = 5 \text{ V}$ , $I_C = 10 \text{ mA}$
Power gain	PG	9.5	12.0	—	dB	$V_{CE} = 5 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 900 \text{ MHz}$
Noise figure	NF	—	1.6	3.0	dB	$V_{CE} = 5 \text{ V}$ , $I_C = 5 \text{ mA}$ , $f = 900 \text{ MHz}$

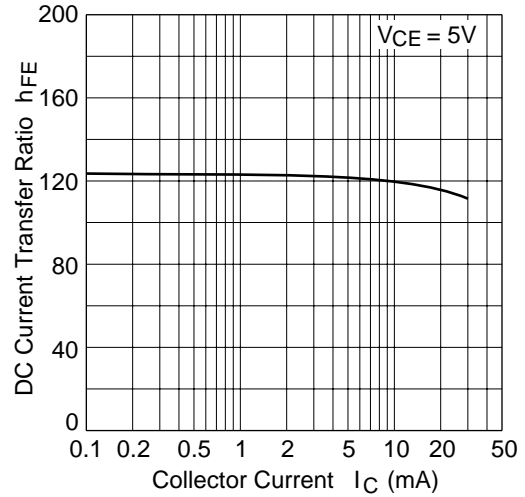
Marking for 2SC4902 is "YL-".

Attention: This is electrostatic sensitive device.

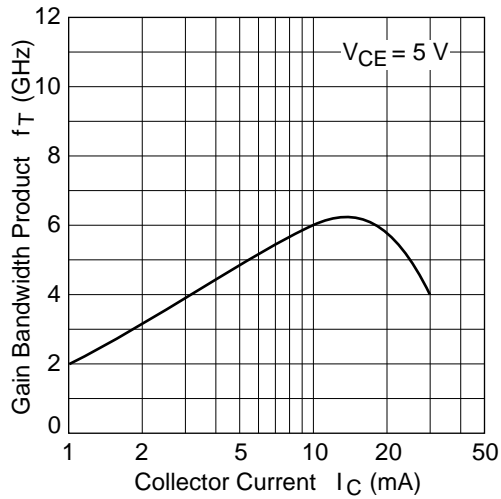
Maximum collector power dissipation curve



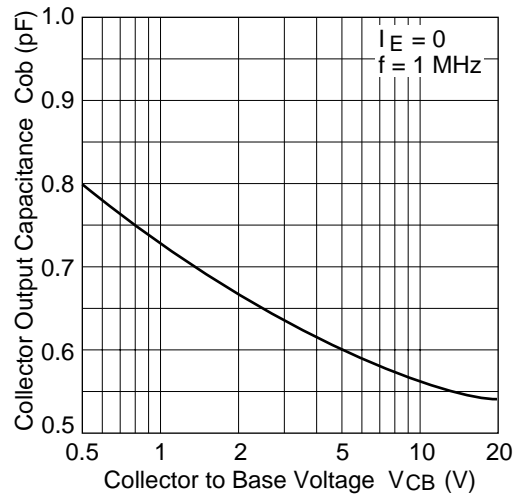
DC current transfer ratio vs. collector current



Gain bandwidth product vs. collector current

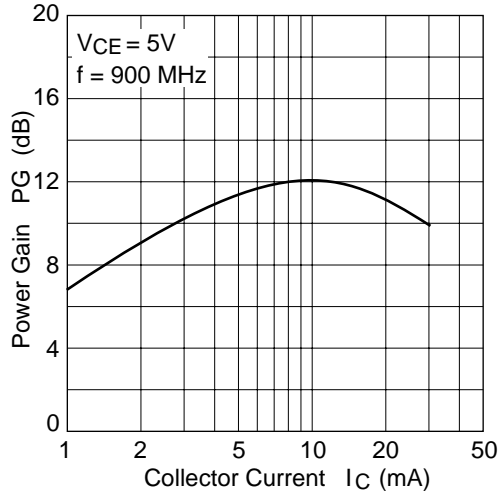


Collector output capacitance vs. collector to base voltage

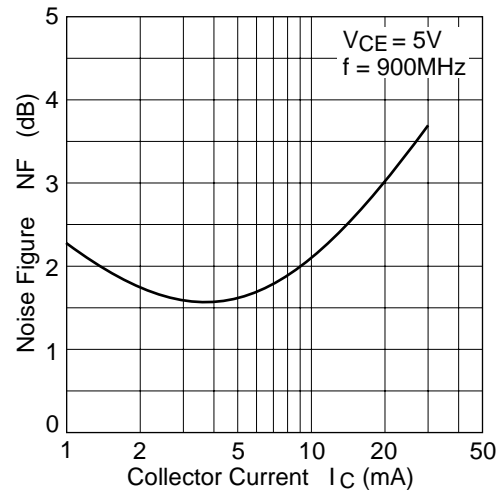


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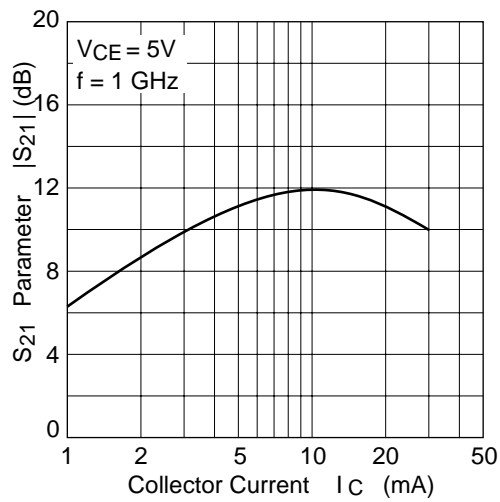
Power gain vs. collector current



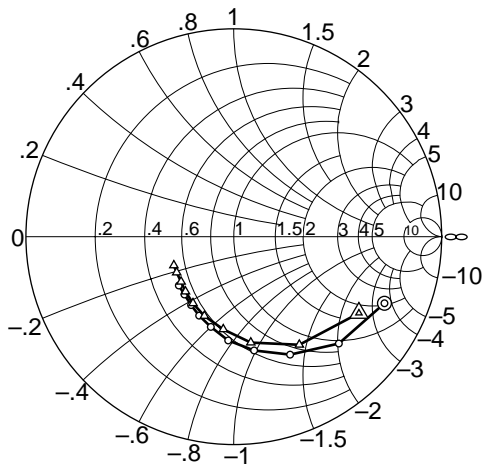
Noise figure vs. collector current



S21 parameter vs. collector current

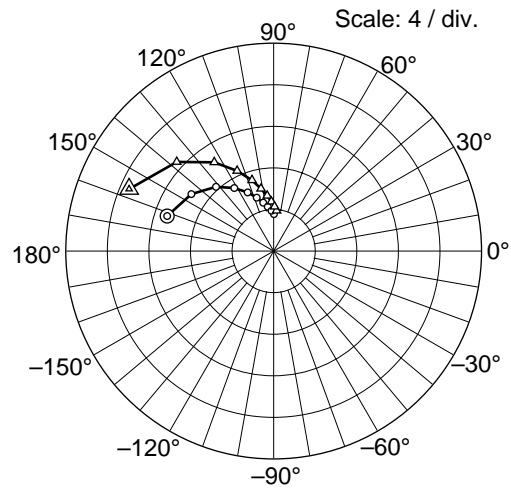


S11 parameter vs. frequency



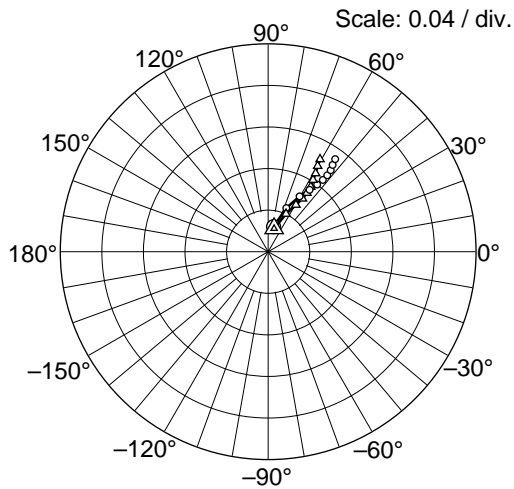
Condition:  $V_{CE} = 5 \text{ V}$ ,  $Z_o = 50 \Omega$   
 100 to 1000 (100 MHz step)  
 ○ (  $I_C = 5 \text{ mA}$  )  
 △ (  $I_C = 10 \text{ mA}$  )

S21 parameter vs. frequency



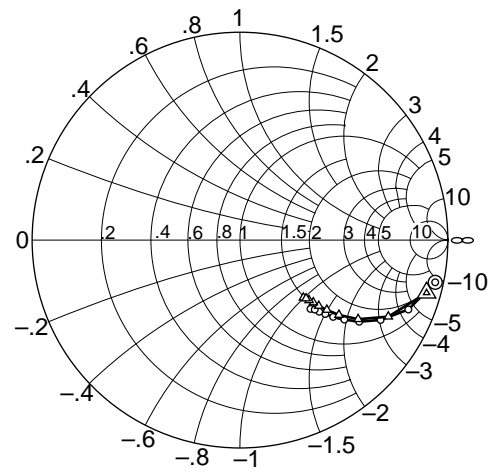
Condition:  $V_{CE} = 5 \text{ V}$ ,  $Z_o = 50 \Omega$   
 100 to 1000 (100 MHz step)  
 ○ (  $I_C = 5 \text{ mA}$  )  
 △ (  $I_C = 10 \text{ mA}$  )

S12 parameter vs. frequency



Condition:  $V_{CE} = 5 \text{ V}$ ,  $Z_o = 50 \Omega$   
 100 to 1000 (100 MHz step)  
 ○ (  $I_C = 5 \text{ mA}$  )  
 △ (  $I_C = 10 \text{ mA}$  )

S22 parameter vs. frequency



Condition:  $V_{CE} = 5 \text{ V}$ ,  $Z_o = 50 \Omega$   
 100 to 1000 (100 MHz step)  
 ○ (  $I_C = 5 \text{ mA}$  )  
 △ (  $I_C = 10 \text{ mA}$  )

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**Table 3 S Parameter** ( $V_{CE} = 5\text{ V}$ ,  $I_C = 5\text{ mA}$ ,  $Z_O = 50\ \Omega$ , Emitter common)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.792	-23.8	10.79	161.8	0.0247	77.8	0.961	-12.2
200	0.721	-45.5	9.63	145.3	0.0455	67.4	0.876	-22.4
300	0.629	-64.5	8.31	131.9	0.0613	60.4	0.778	-29.6
400	0.556	-79.9	7.15	122.0	0.0717	56.2	0.695	-34.4
500	0.500	-93.1	6.18	113.9	0.0800	53.9	0.631	-37.3
600	0.448	-104.3	5.39	107.6	0.0869	52.7	0.581	-39.5
700	0.415	-113.7	4.77	102.2	0.0930	52.3	0.543	-40.9
800	0.388	-122.0	4.30	97.6	0.0989	52.5	0.514	-42.1
900	0.366	-130.5	3.89	93.1	0.104	53.4	0.491	-42.9
1000	0.354	-138.4	3.56	89.6	0.110	54.1	0.474	-44.3

**Table 4 S Parameter** ( $V_{CE} = 5\text{ V}$ ,  $I_C = 10\text{ mA}$ ,  $Z_O = 50\ \Omega$ , Emitter common)

f (MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.706	-31.5	15.14	156.8	0.0230	75.7	0.933	-15.8
200	0.608	-58.8	12.67	137.4	0.0403	64.5	0.803	-27.3
300	0.516	-80.9	10.28	123.8	0.0525	59.2	0.684	-33.8
400	0.449	-96.5	8.48	114.5	0.0609	57.0	0.597	-37.1
500	0.407	-110.4	7.13	107.0	0.0678	56.5	0.536	-38.8
600	0.376	-121.5	6.13	101.5	0.0747	56.5	0.494	-39.9
700	0.352	-131.4	5.36	96.7	0.0815	57.9	0.463	-40.4
800	0.334	-139.5	4.77	92.7	0.0882	58.7	0.441	-41.1
900	0.325	-147.9	4.28	88.9	0.0953	59.9	0.424	-41.5
1000	0.320	-154.4	3.90	85.9	0.102	60.6	0.412	-42.3