

NPN高频低噪声晶体管

描述

2SC4901是超高频低噪声晶体管,采用平面NPN硅外延双极型工艺,具有高功率增益、低噪声特性和大动态范围的特点。采用SOT-323封装,适用于高密度表面贴片安装,主要用于VHF, UHF, CATV等高频低噪声宽带放大器。

主要特性

高增益: $|S_{21e}|^2$ 典型值为 13.5dB
 低噪声: NF 典型值为 1.6dB
 增益带宽乘积: f_T 典型值为 9GHz

@ $V_{CE}=5V, I_c=20mA, f=0.9GHz$
 @ $V_{CE}=5V, I_c=5mA, f=0.9GHz$
 @ $V_{CE}=5V, I_c=20mA, f=0.9GHz$

极限工作条件范围 (TA=25°C)

参数	符号	极值	单位
集电极基极击穿电压	V_{CBO}	15	V
集电极发射极击穿电压	V_{CEO}	9	V
发射极基极击穿电压	V_{EBO}	1.5	V
集电极电流	I_c	50	mA
功耗	P_c	100	mW
结温度	T_j	150	°C
存储温度	T_{stg}	-65 ~ +150	°C

HFE 档位

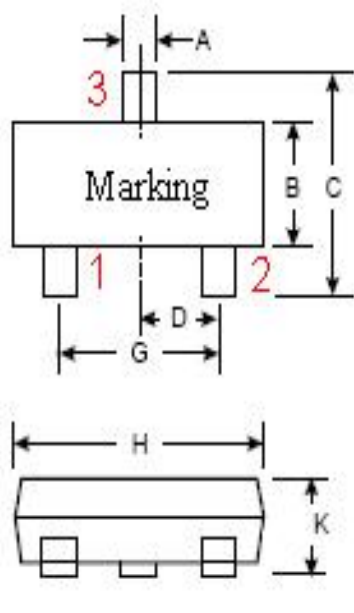
分档	B	C	D
标号	YK-		
HFE	90-140	120-180	170-250

电学特性 (TA=25°C)

参数	符号	最小	典型	最大	单位	测试条件
集电极基极击穿电压	V _{CB0}	15			V	I _c =1.0μA
集电极基极漏电流	I _{CB0}			0.1	μA	V _{CB} =10V
发射极基极漏电流	I _{EBO}			0.1	μA	V _{EB} =1V
直流增益	h _{FE}	90	150	250		V _{CE} =5V, I _c =20mA
增益带宽乘积	f _T	7	9		GHz	V _{CE} =5V, I _c =20mA, f=0.9GHz
输出反馈电容	C _{re}		0.65	1.0	pF	V _{CB} =10V, I _E =0mA, f=1MHz
插入功率增益	S _{21e} ²		13.3		dB	V _{CE} =5V, I _c =5mA, f=0.9GHz
			13.5		dB	V _{CE} =5V, I _c =20mA, f=0.9GHz
噪声因子	NF		1.6	2.5	dB	V _{CE} =5V, I _c =5mA, f=0.9GHz

封装形式
SOT-323

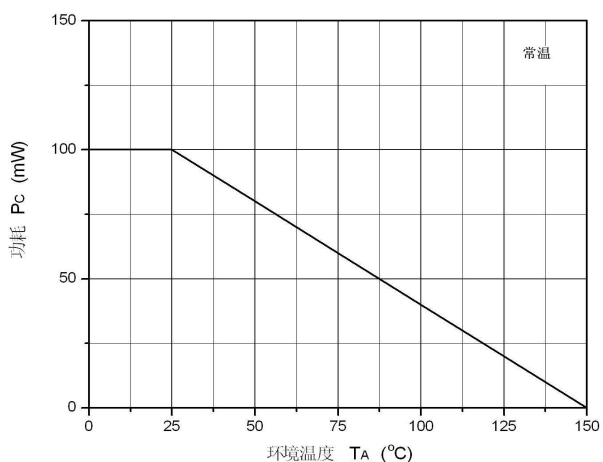
管脚定义：1：基极（Base） 2：发射极（Emitter） 3：集电极（Collector）



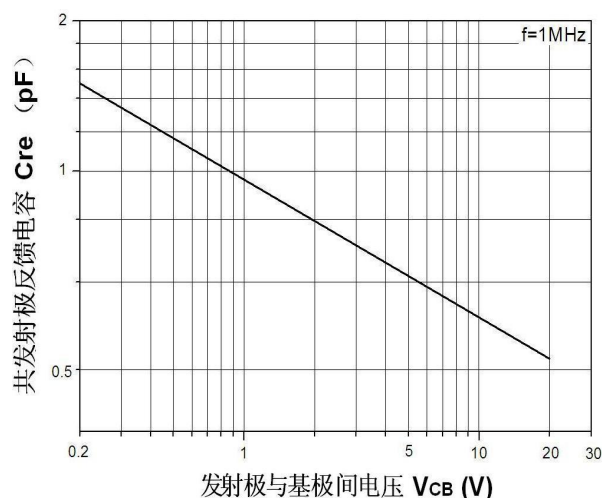
符号	最小值 (mm)	最大值 (mm)
A	0.200	0.400
B	1.150	1.350
C	2.150	2.450
D	0.650	
G	1.200	1.400
H	2.000	2.200
K	0.900	1.100
L	0.525	
M	0.080	0.150

典型特性曲线 (TA = 25°C)

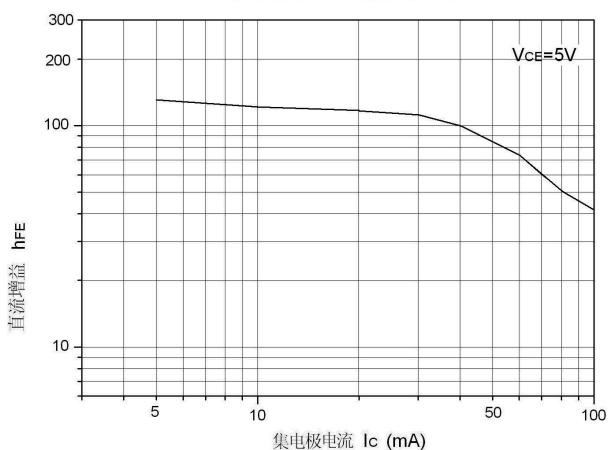
功耗 vs. 环境温度



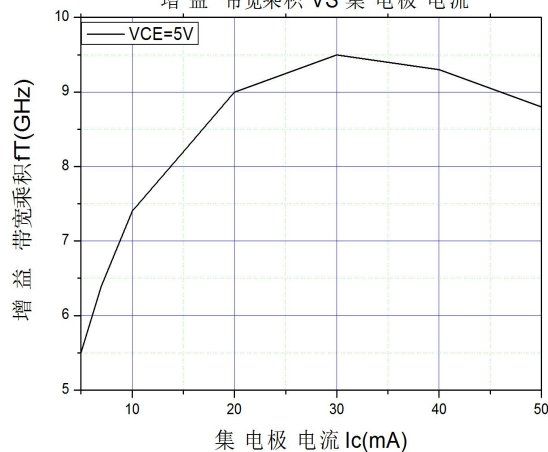
共发射极反馈电容 vs. 发射极与基极间电压



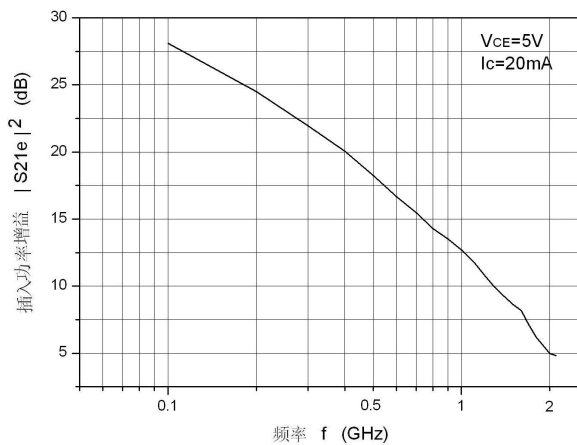
直流增益 vs. 集电极电流



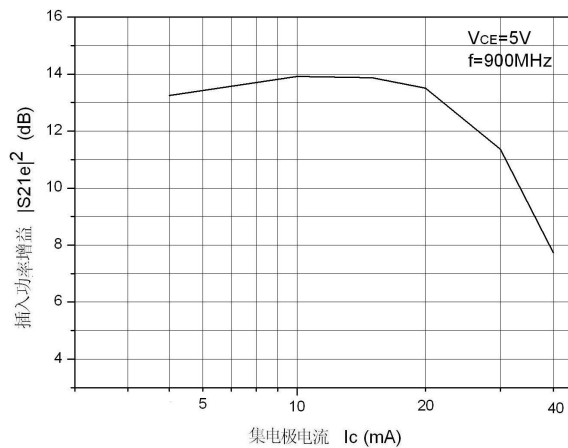
增益 带宽乘积 VS 集电极电流



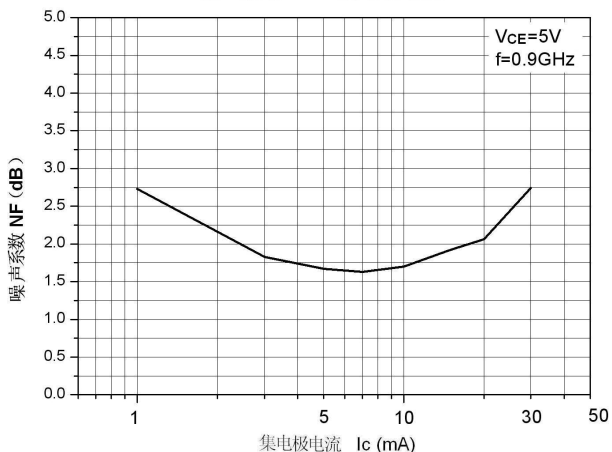
插入功率增益 vs. 频率



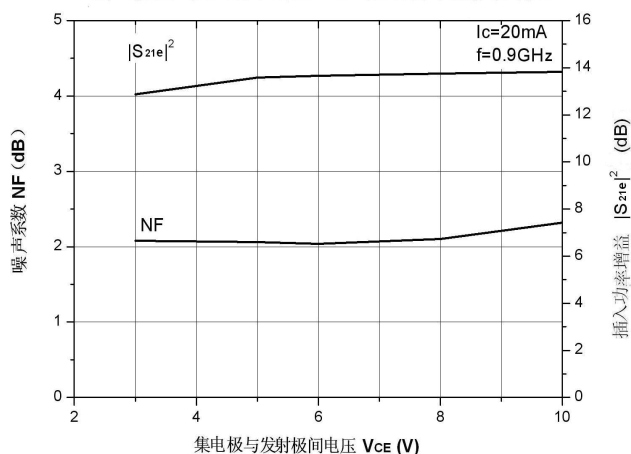
插入功率增益 vs. 集电极电流



噪声系数 vs. 集电极电流



噪声系数, 插入功率增益 vs. 集电极与发射极电压

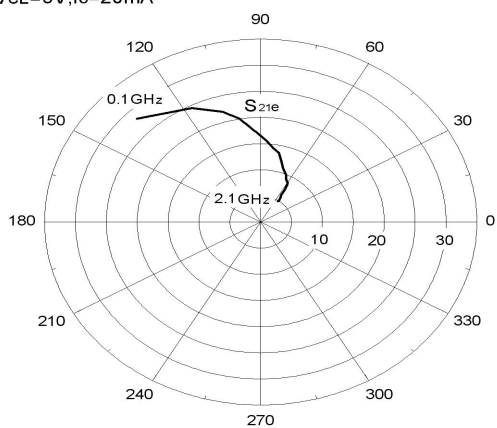


SMITH 图

测试条件: $V_{CE}=5V$, $I_c=20mA$

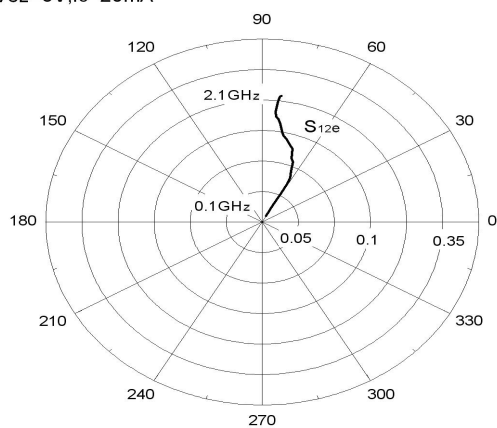
S_{21e} -FREQUENCY

条件: $V_{CE}=5V, I_c=20mA$



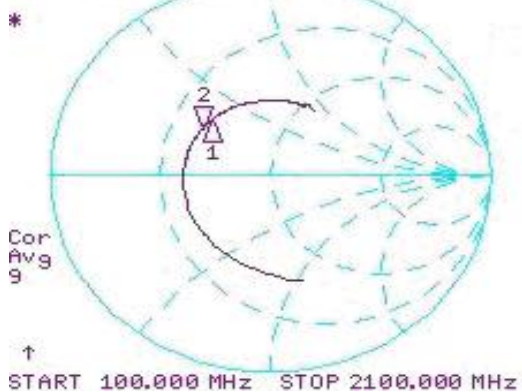
S_{12e} -FREQUENCY

条件: $V_{CE}=5V, I_c=20mA$



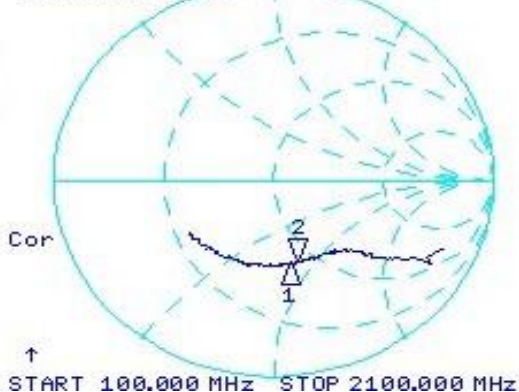
S_{11e} -FREQUENCY

2: 23.776 \angle 13.127 \angle 2.3214 nH
900.000 000 MHz



S_{22e} -FREQUENCY

2: 42.031 \angle -42.148 \angle 4.1956 pF
900.000 000 MHz



散射参数 (S-PARAMETER)

 测试条件: $V_{CE}=5V, I_c=20mA, Z_o=50\Omega$

测试频率	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.482	-79.853	25.430	135.31	0.020	63.866	0.786	-21.025
0.2	0.450	-120.84	16.776	117.16	0.026	64.66	0.614	-40.075
0.3	0.419	-146.54	12.511	106.35	0.033	67.181	0.513	-45.357
0.4	0.410	-163.95	10.054	99.859	0.040	64.4	0.467	-48.73
0.5	0.402	-178.26	8.186	95.673	0.046	66.285	0.452	-54.326
0.6	0.400	170.03	6.831	90.637	0.051	68.126	0.440	-59.156
0.7	0.395	159.69	5.944	86.449	0.061	68.343	0.434	-64.801
0.8	0.399	150.44	5.183	82.109	0.064	71.459	0.427	-70.457
0.9	0.397	142.48	4.741	77.456	0.077	73.043	0.433	-76.914
1	0.394	134.17	4.330	75.451	0.081	74.011	0.431	-81.942
1.1	0.394	126.01	3.904	73.331	0.090	78.88	0.434	-87.979
1.2	0.393	118.88	3.460	70.505	0.093	82.093	0.433	-92.392
1.3	0.395	111.24	3.131	65.779	0.100	79.846	0.439	-99.814
1.4	0.388	104.27	2.895	63.501	0.115	80.355	0.438	-105.56
1.5	0.385	98.31	2.701	59.745	0.126	84.651	0.444	-111.63
1.6	0.387	90.492	2.567	58.722	0.131	85.665	0.442	-117.48
1.7	0.389	84.07	2.263	60.445	0.144	86.137	0.443	-123.71
1.8	0.393	77.013	2.041	57.306	0.156	83.966	0.456	-129.5
1.9	0.392	71.616	1.902	55.569	0.176	83.702	0.455	-134.9
2	0.396	65.487	1.777	53.999	0.192	85.078	0.466	-140.24
2.1	0.391	57.703	1.746	54.863	0.196	83.86	0.459	-145.73