



描述

FC4228 是国芯佳品半导体有限公司生产的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。由于采用了超小型的 SOT-323 封装，特别适用于高密度表面贴片安装，主要用于 VHF, UHF 低噪声放大器。

主要特性

高增益: $|S_{21e}|^2$ 典型值为 5.5dB

低噪声: NF 典型值为 2dB

增益带宽乘积: f_T 典型值为 8GHz

@ $V_{CE}=3V$, $I_c=5mA$, $f=2GHz$

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订购信息

产品号	标准包装
FC4228	3K/盘

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}	20	V
集电极发射极击穿电压	V_{CEO}	10	V
发射极基极击穿电压	V_{EBO}	1.5	V
集电极电流	I_c	35	mA
功耗	P_c	150	mW
结温度	T_j	150	°C
存储温度	T_{stg}	-65 ~ +150	°C

HFE 档位

分档	A	B	C	D
标号	R43	R44	R45	
HFE	60-100	90-130	120-180	170-250

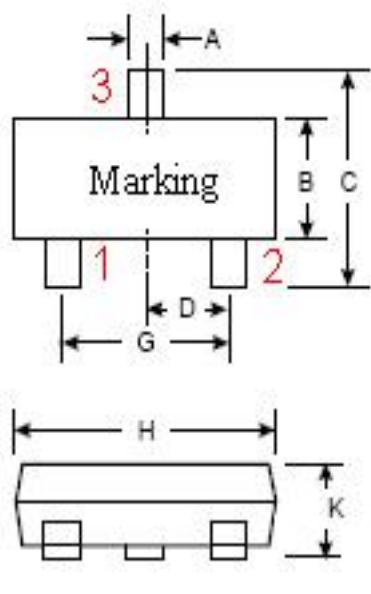
电学特性 (TA=25°C)

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}	20			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 _{EB0}			0.1	μA	V _{EB} =1V
直流增益	h _{FE}	60	150	250		V _{CE} =3V, I _c =5mA
特征频率	f _T		8	8.5	GHz	V _{CE} =3V, I _c =5mA, f=2GHz
输出反馈电容	C _{re}		0.65	1.0	pF	V _{CB} =10V, I _E =0mA, f=1MHz
功率增益	S _{21e} ²		5.5		dB	V _{CE} =3V, I _c =5mA, f=2GHz
噪声系数	NF		2.0		dB	V _{CE} =3V, I _c =5mA, f=2GHz

封装形式

SOT-323

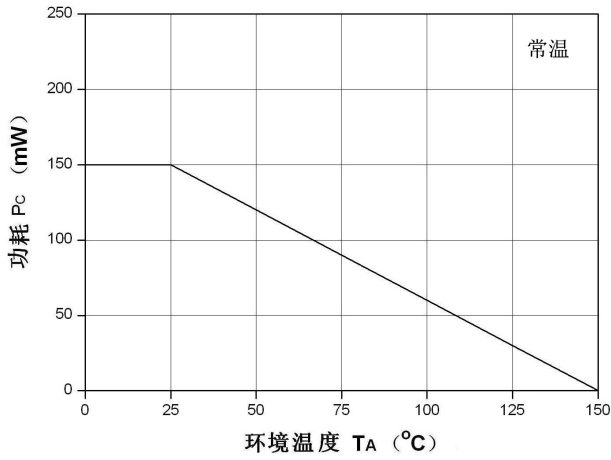
管脚定义：1：基极（Base） 2：发射极（Emitter） 3：集电极（Collector）



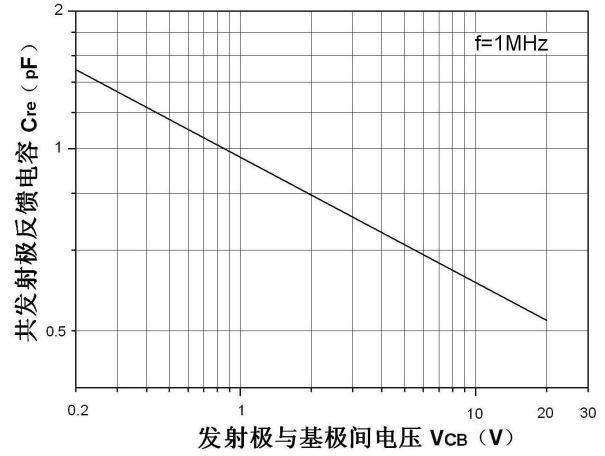
符号	最小值 (mm)	最大值 (mm)
A	0.200	0.400
B	1.150	1.350
C	2.150	2.450
D	0.650	
G	1.200	1.400
H	2.000	2.200
K	0.900	1.100
L	0.525	
M	0.080	0.150

典型特性曲线 (TA = 25°C)

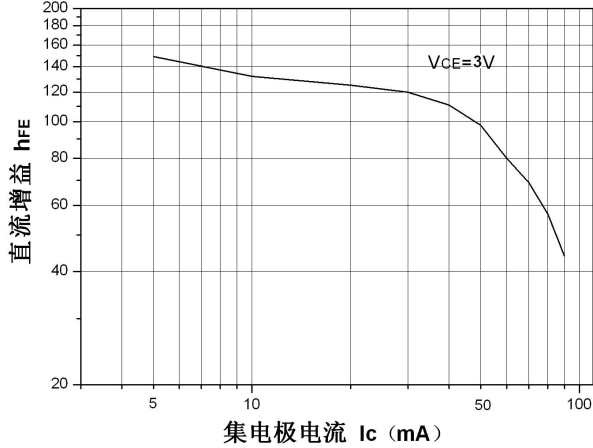
功耗 vs. 环境温度



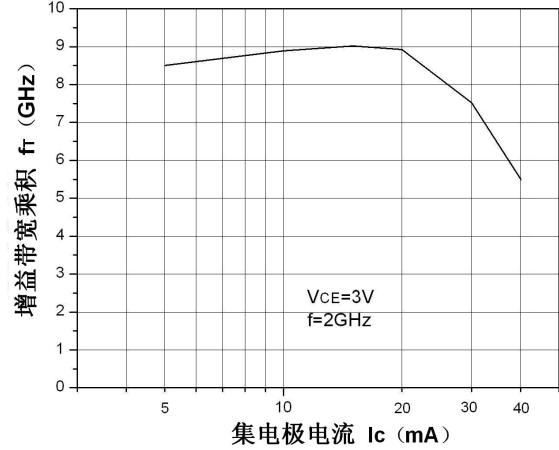
共发射极反馈电容 vs. 发射极与基极间电压



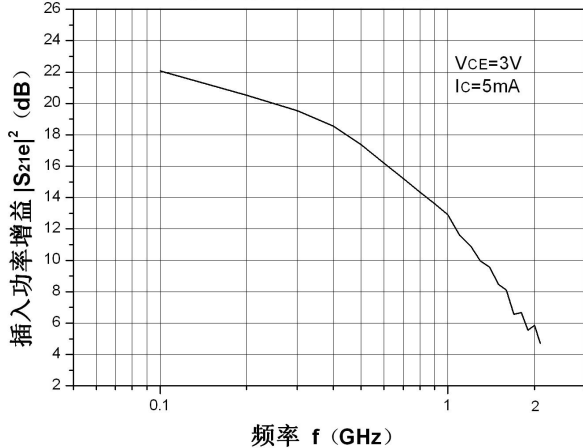
直流增益 vs. 集电极电流



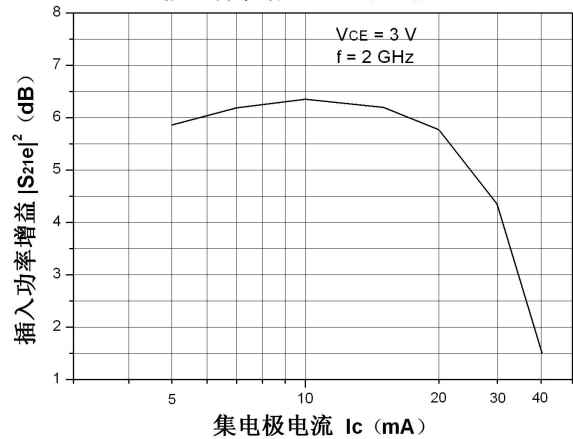
增益带宽乘积 vs. 集电极电流



插入功率增益 vs. 频率

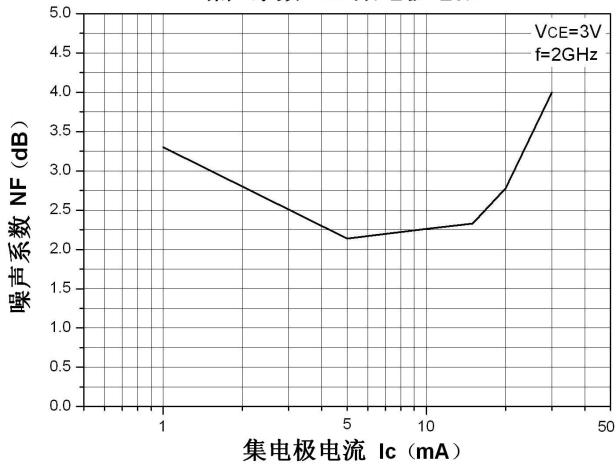


插入功率增益 vs. 集电极电流

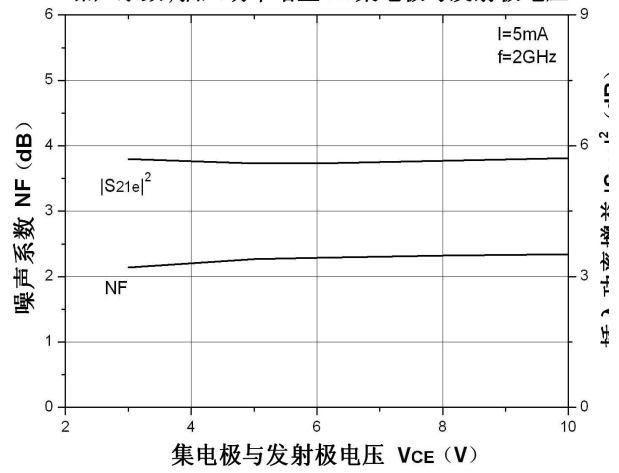




噪声系数 vs. 集电极电流



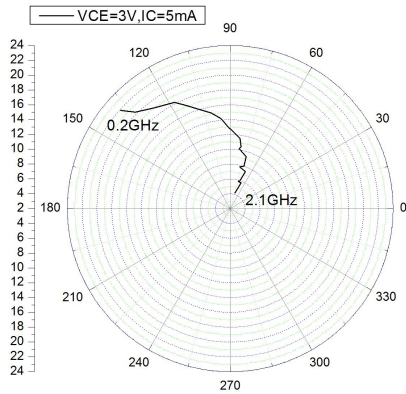
噪声系数, 插入功率增益 vs. 集电极与发射极电压



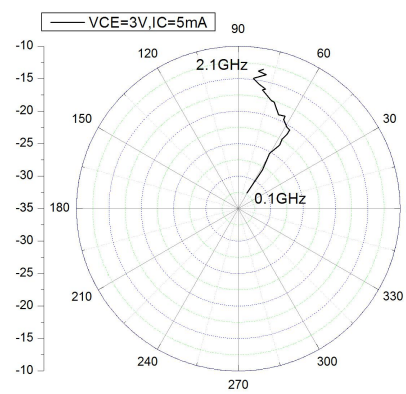
SMITH 图

测试条件: $V_{CE}=3V$, $I_c=5mA$

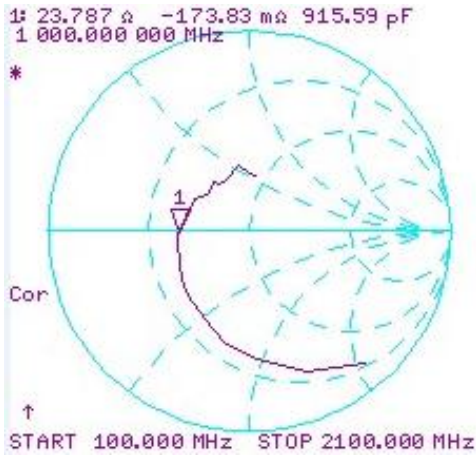
S_{21e} -FREQUENCY



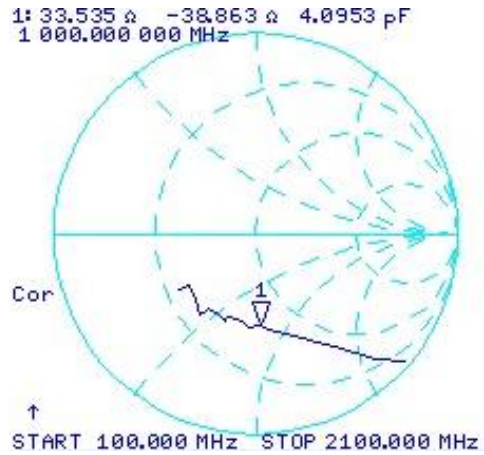
S_{12e} -FREQUENCY



S_{11e} -FREQUENCY



S_{22e} -FREQUENCY





散射参数 (S-PARAMETER)

测试条件: $V_{CE}=3V, I_c=5mA, Z_o=50\Omega$

测试频率	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	-1.2921	-49.62	21.878	138.22	-32.239	61.197	-0.3764	-41.12
0.2	-2.4389	-67.625	20.252	134.55	-27.984	57.913	-1.2808	-45.678
0.3	-3.8791	-87.825	18.997	126.93	-25.237	60.423	-2.8838	-53.558
0.4	-5.0346	-102.96	18.215	117.74	-23.31	56.97	-3.8077	-58.251
0.5	-6.2174	-116.69	17.106	112.92	-22.311	57.805	-4.5748	-63.439
0.6	-7.1738	-132.97	15.776	105.78	-21.434	56.784	-5.2887	-69.467
0.7	-7.6193	-144.89	15.173	101.41	-20.532	56.709	-5.7274	-74.257
0.8	-8.4356	-155.81	14.194	95.707	-20.38	59.229	-6.0117	-78.411
0.9	-8.8687	-169.89	12.862	90.856	-19.6	62.916	-6.4301	-83.305
1	-8.9966	-179.64	12.746	89.922	-19.047	63.127	-6.7384	-88.178
1.1	-9.7634	171.45	11.565	82.193	-19.24	66.691	-6.7591	-94.157
1.2	-10.168	160.1	10.468	80.045	-18.017	70.525	-6.8706	-96.887
1.3	-9.9703	150.28	10.148	81.455	-17.696	71.289	-7.2018	-103.02
1.4	-10.78	143.04	9.3313	73.04	-17.62	72.834	-7.2232	-108.76
1.5	-11.065	135.55	8.0293	72.258	-16.325	78.455	-6.8264	-109.78
1.6	-10.477	125.6	7.761	77.4	-16.101	77.04	-7.1797	-114.81
1.7	-11.128	121.01	7.3872	67.657	-15.666	80.143	-7.1988	-122.24
1.8	-11.332	116.36	5.9943	70.811	-14.796	83.454	-6.1665	-124.46
1.9	-9.5706	99.257	5.8526	73.645	-13.934	78.122	-6.9915	-131.26
2	-10.349	91.553	5.7879	67.327	-13.583	81.598	-7.5823	-141.88
2.1	-11.377	83.224	4.1896	73.7	-13.188	79.696	-6.3739	-143.23