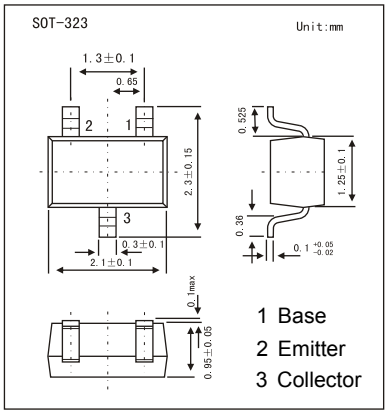
NPN Transistors

FC4227



■ Features

- High gain: | S21e |^2 typical value is 11.5dB
- Low noise: NF typical value is 1.5dB
- The gain bandwidth product: f_T typical value is 7GHz

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	20	V
Collector - Emitter Voltage	V_{CEO}	10	
Emitter - Base Voltage	V_{EBO}	1.5	
Collector Current - Continuous	I_C	65	mA
Collector Power Dissipation	P_C	150	mW
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-65 to 150	

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	I_C= 100 μA, I_E= 0	20			V
Collector- emitter breakdown voltage	V_{CEO}	I_C= 1 mA, I_B= 0	10			
Emitter - base breakdown voltage	V_{EBO}	I_E= 100 μA, I_C= 0	1.5			
Collector-base cut-off current	I_{CBO}	V_{CB}= 10 V , I_E= 0			100	nA
Emitter cut-off current	I_{EBO}	V_{EB}= 1.5V , I_C=0			100	
DC current gain	h_{FE}	V_{CE}= 3V, I_C=7mA	60	150	300	
Power gain	| S_{21e}|	V_{CE}= 3V, I_C= 7mA,f=1GHz		11.5		dB
Noise factor	NF	V_{CE}= 3V, I_C= 7mA,f=1GHz		1.5	2	
Collector output feedback capacitance	C_{re}	V_{CB}= 10V, I_E= 0mA,f=1MHz		0.65		pF
Transition frequency	f_T	V_{CE}= 3V, I_C= 7mA,f=1GHz		7		GHz

■ Classification of h_{fe}

Type	FC4227-A	FC4227-B	FC4227-C	FC4227-D	FC4227-E
Rank	60-100	90-140	130-180	170-250	250-300
Marking	R33	R34	R35		

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■ Scattering Parameters (V_{CE}=3V, I_C=7mA, Z_O=50Ω)

Test Frequency	S_{11}		S_{21}		S_{12}		S_{22}	
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
0.1	0.800	-66.638	14.882	130.7	0.030	56.249	0.890	-27.955
0.2	0.694	-91.137	11.552	124.96	0.049	60.477	0.702	-50.403
0.3	0.566	-114.06	9.815	115.06	0.068	55.227	0.551	-61.675
0.4	0.495	-133.17	8.278	108	0.078	53.784	0.469	-70.48
0.5	0.459	-150.4	6.990	101.15	0.084	53.786	0.411	-77.423
0.6	0.433	-165.33	5.964	95.673	0.093	52.516	0.372	-83.621
0.7	0.413	-179.33	5.210	89.157	0.103	54.995	0.347	-90.533
0.8	0.400	169.28	4.657	85.376	0.107	56.12	0.326	-96.514
0.9	0.393	157.03	4.200	79.433	0.113	58.255	0.310	-101.98
1	0.387	146.25	3.848	78.22	0.116	58.703	0.306	-110.33
1.1	0.383	135.34	3.350	73.324	0.133	61.525	0.297	-114.94
1.2	0.380	126.52	3.098	70.847	0.133	63.787	0.287	-121.58
1.3	0.371	117.86	2.773	65.947	0.151	66.742	0.283	-127.67
1.4	0.381	108.76	2.649	64.844	0.162	66.09	0.287	-135.48
1.5	0.369	101.67	2.369	61.992	0.175	71.374	0.280	-138.07
1.6	0.387	91.64	2.287	62.74	0.187	66.919	0.287	-147.63
1.7	0.384	85.917	1.974	59.741	0.209	70.974	0.293	-150.25
1.8	0.400	77.231	1.976	58.362	0.232	69.803	0.300	-160.33
1.9	0.390	69.48	1.788	58.193	0.236	73.023	0.282	-163.24
2	0.423	59.968	1.835	58.576	0.277	65.521	0.309	-175.14
2.1	0.429	54.47	1.666	59.972	0.290	67.129	0.323	-175.96

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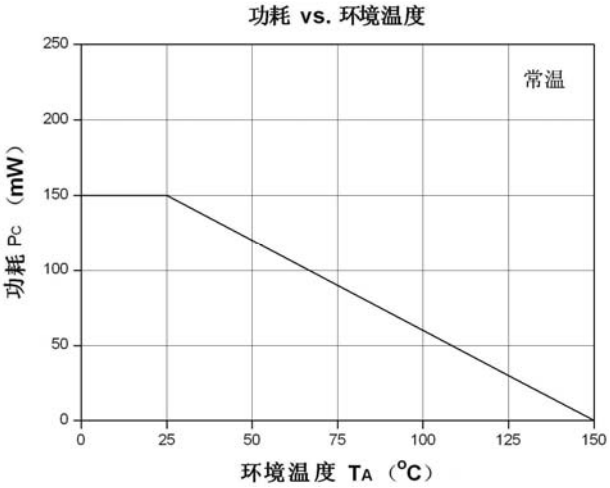
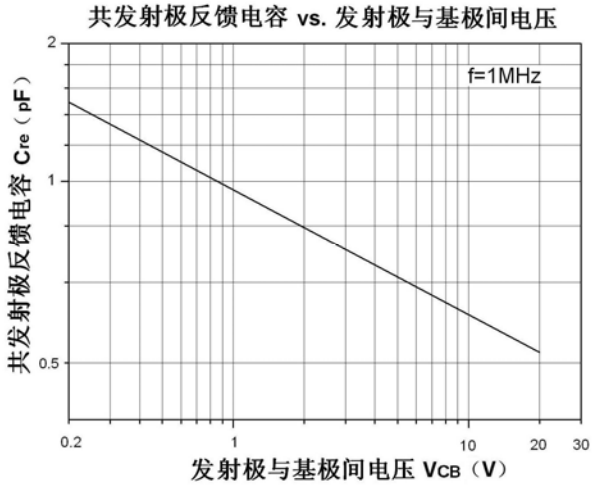
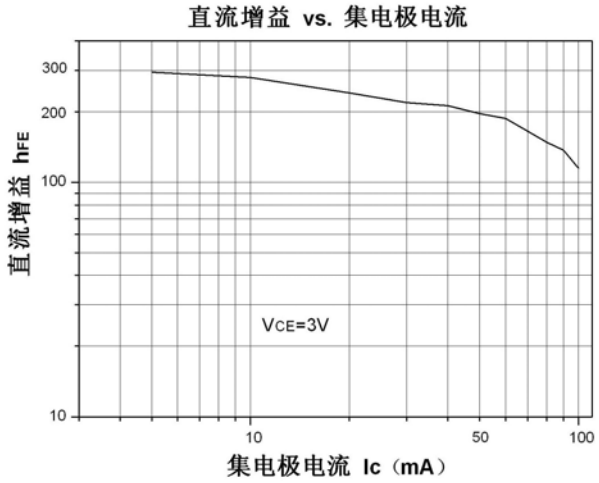
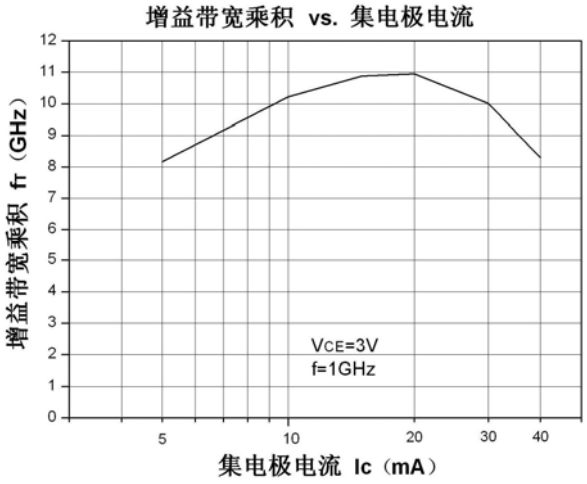
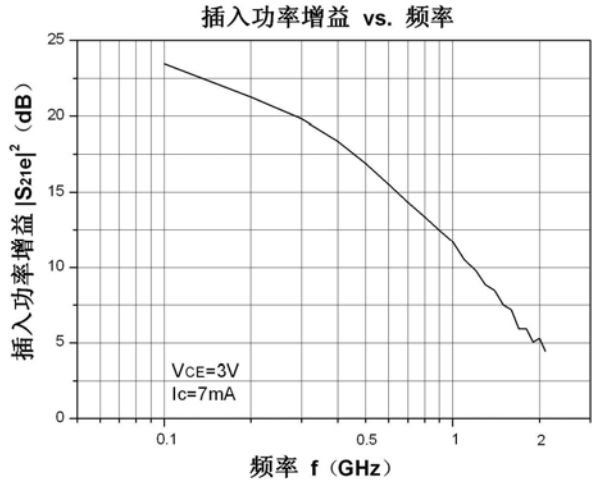
■ Typical Characterisitics

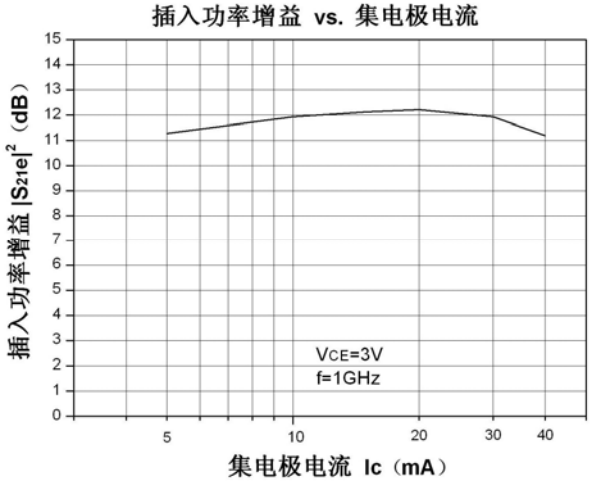












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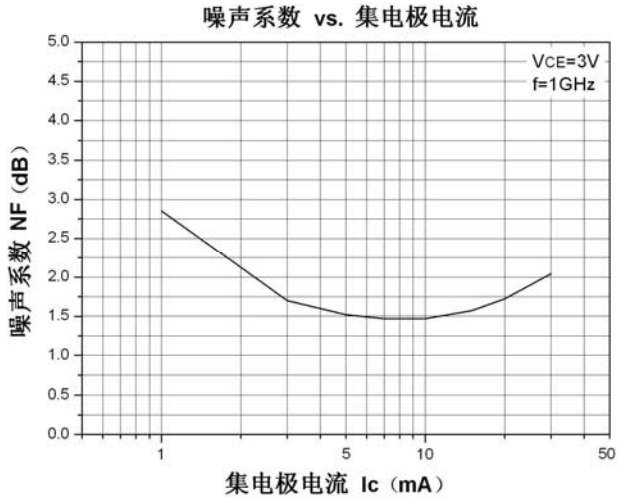
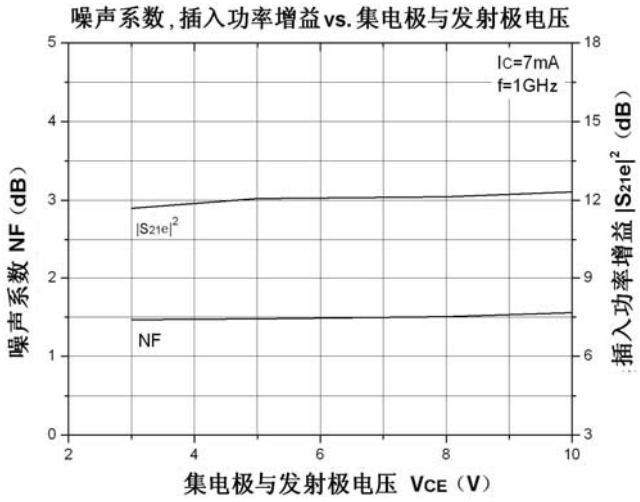
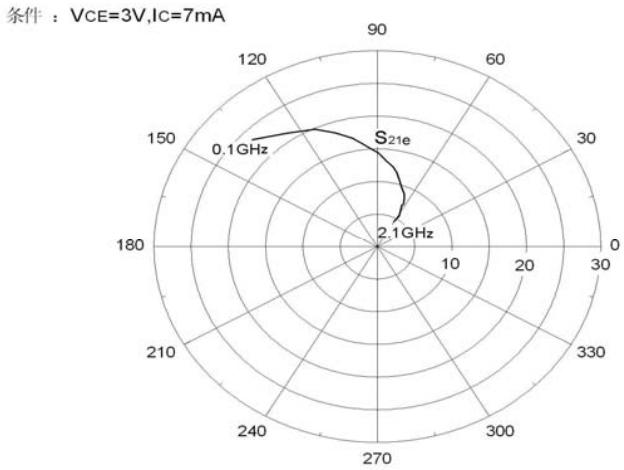
■ Typical Characterisitics





SMITH 图 (VCE=3V, IC=7mA)

S21e -FREQUENCY



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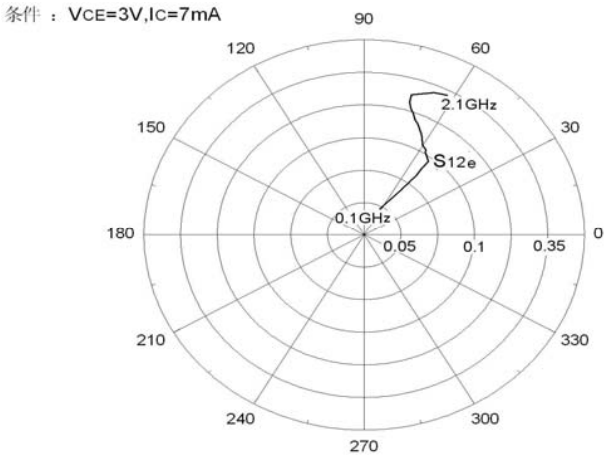

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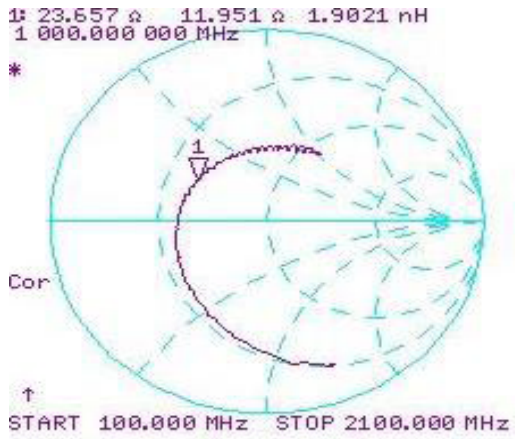
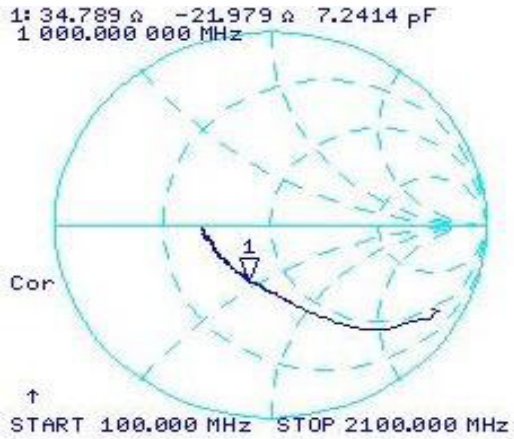
S22e -FREQUENCY