

NPN SILICON RF TRANSISTOR (WITH 2 DIFFERENT ELEMENTS)
IN A 6-PIN LEAD-LESS MINIMOLD

FEATURES

- Low voltage operation
- 2 different built-in transistors (2SC5435, 2SC5437)
 - Q1: Built-in low noise, high-gain transistor
 - NF = 1.5 dB TYP. @ $V_{CE} = 3\text{ V}$, $I_C = 3\text{ mA}$, $f = 2\text{ GHz}$
 - $f_T = 12.0\text{ GHz}$ TYP., $|S_{21e}|^2 = 8.5\text{ dB}$ TYP. @ $V_{CE} = 3\text{ V}$, $I_C = 10\text{ mA}$, $f = 2\text{ GHz}$
 - Q2: Built-in low noise transistor
 - NF = 1.5 dB TYP. @ $V_{CE} = 3\text{ V}$, $I_C = 7\text{ mA}$, $f = 2\text{ GHz}$
 - NF = 1.7 dB TYP. @ $V_{CE} = 1\text{ V}$, $I_C = 3\text{ mA}$, $f = 2\text{ GHz}$
- 6-pin lead-less minimold package

BUILT-IN TRANSISTORS

	Q1	Q2
3-pin thin-type ultra super minimold part No.	2SC5435	2SC5437

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
μ PA836TD	50 pcs (Non reel)	• 8 mm wide embossed taping
μ PA836TD-T3	10 kpcs/reel	• Pin 1 (Q1 Collector), Pin 6 (Q1 Base) face the perforation side of the tape

Remark To order evaluation samples, consult your NEC sales representative.
Unit sample quantity is 50 pcs.

Because this product uses high-frequency technology, avoid excessive static electricity, etc.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings		Unit
		Q1	Q2	
Collector to Base Voltage	V _{CBO}	9	9	V
Collector to Emitter Voltage	V _{CEO}	6	6	V
Emitter to Base Voltage	V _{EBO}	2	2	V
Collector Current	I _C	30	100	mA
Total Power Dissipation	P _{tot} ^{Note}	180 in 1 element 210 in 2 elements		mW
Junction Temperature	T _j	150		°C
Storage Temperature	T _{stg}	-65 to +150		°C

Note Mounted on 1.08 cm² × 1.0 mm (t) glass epoxy substrate

ELECTRICAL CHARACTERISTICS (T_A = +25°C)

(1) Q1

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	—	—	100	nA
Emitter Cut-off Current	I _{EBO}	V _{BE} = 1 V, I _C = 0 mA	—	—	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 3 V, I _C = 10 mA	75	—	150	—
Gain Bandwidth Product	f _T	V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz	10.0	12.0	—	GHz
Insertion Power Gain	S _{21e} ²	V _{CE} = 3 V, I _C = 10 mA, f = 2 GHz	7.0	8.5	—	dB
Noise Figure	NF	V _{CE} = 3 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	—	1.5	2.5	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 3 V, I _E = 0 mA, f = 1 MHz	—	0.4	0.7	pF

(2) Q2

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Collector Cut-off Current	I _{CBO}	V _{CB} = 5 V, I _E = 0 mA	—	—	100	nA
Emitter Cut-off Current	I _{EBO}	V _{BE} = 1 V, I _C = 0 mA	—	—	100	nA
DC Current Gain	h _{FE} ^{Note 1}	V _{CE} = 1 V, I _C = 3 mA	80	—	160	—
Gain Bandwidth Product (1)	f _T	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz	4.0	4.5	—	GHz
Gain Bandwidth Product (2)	f _T	V _{CE} = 3 V, I _C = 20 mA, f = 2 GHz	—	9.0	—	GHz
Insertion Power Gain (1)	S _{21e} ²	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz	2.5	3.5	—	dB
Insertion Power Gain (2)	S _{21e} ²	V _{CE} = 3 V, I _C = 20 mA, f = 2 GHz	—	6.5	—	dB
Noise Figure (1)	NF	V _{CE} = 1 V, I _C = 3 mA, f = 2 GHz, Z _S = Z _{opt}	—	1.7	2.5	dB
Noise Figure (2)	NF	V _{CE} = 3 V, I _C = 7 mA, f = 2 GHz, Z _S = Z _{opt}	—	1.5	—	dB
Reverse Transfer Capacitance	C _{re} ^{Note 2}	V _{CB} = 1 V, I _E = 0 mA, f = 1 MHz	—	0.75	0.85	pF

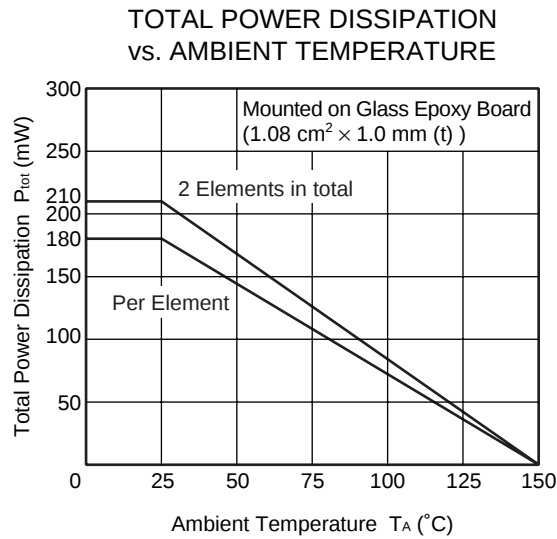
Notes 1. Pulse measurement: PW ≤ 350 μs, Duty Cycle ≤ 2%

2. Collector to base capacitance measured using capacitance meter (self-balancing bridge method) when the emitter is connected to the guard pin

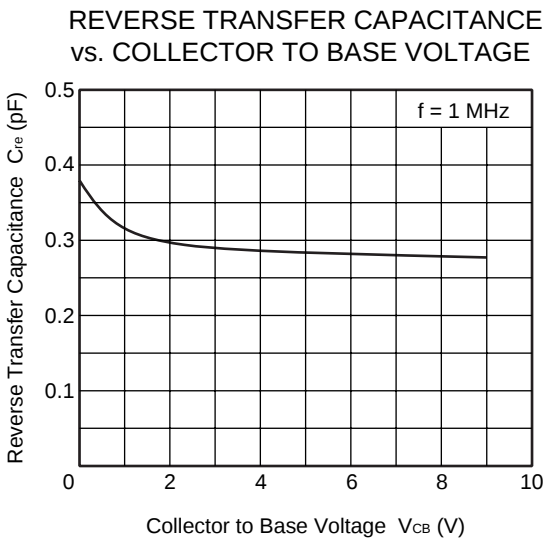
h_{FE} CLASSIFICATION

Rank	FB
Marking	nJ
h _{FE} Value of Q1	75 to 150
h _{FE} Value of Q2	80 to 160

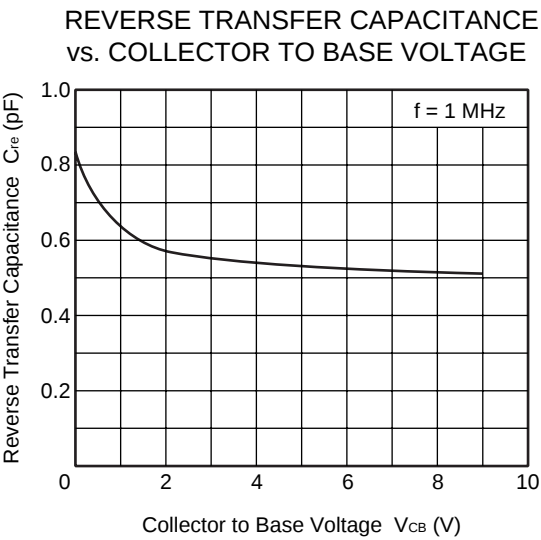
TYPICAL CHARACTERISTICS (Unless otherwise specified, $T_A = +25^{\circ}\text{C}$)



Q1

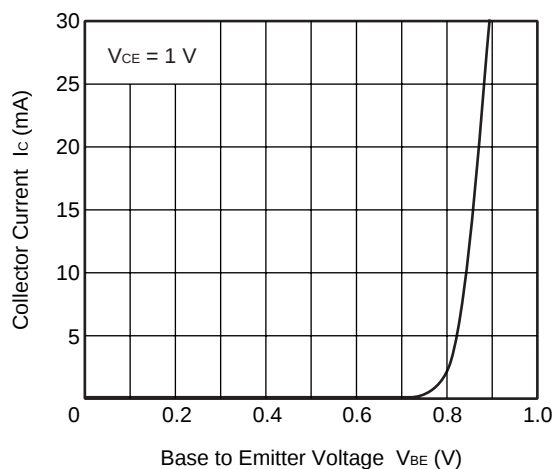


Q2



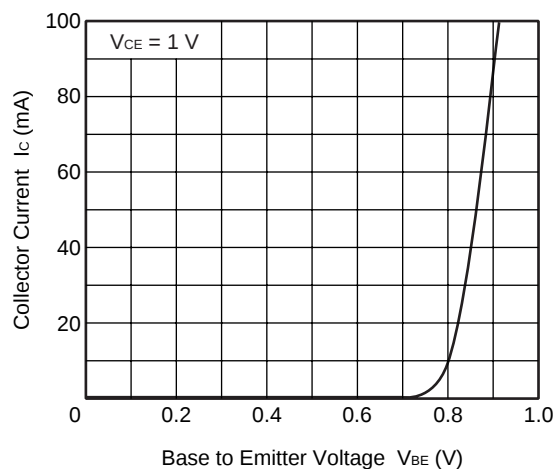
Q1

COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE

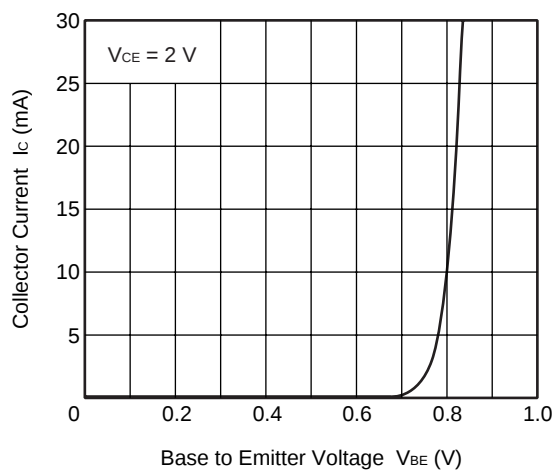


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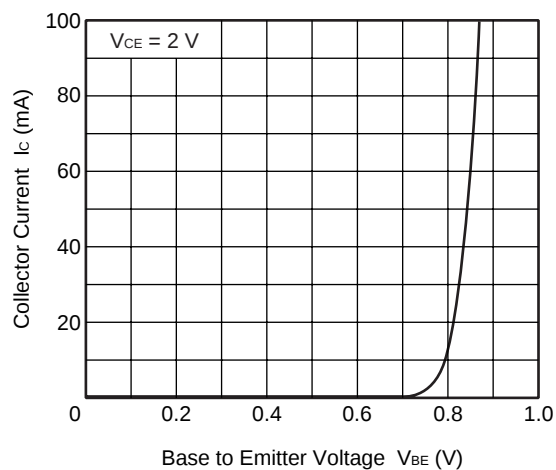
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



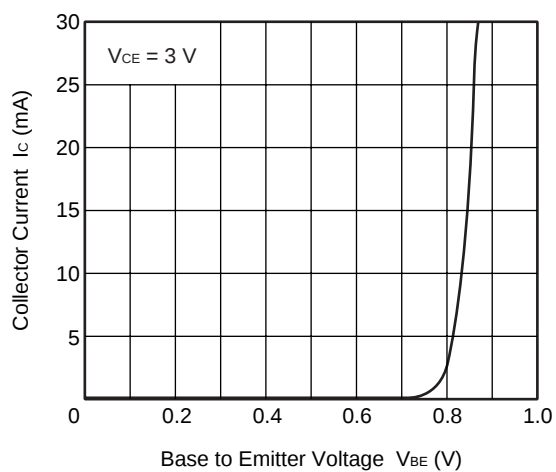
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



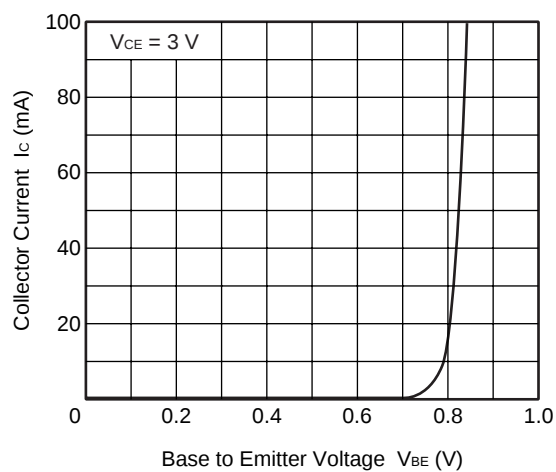
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



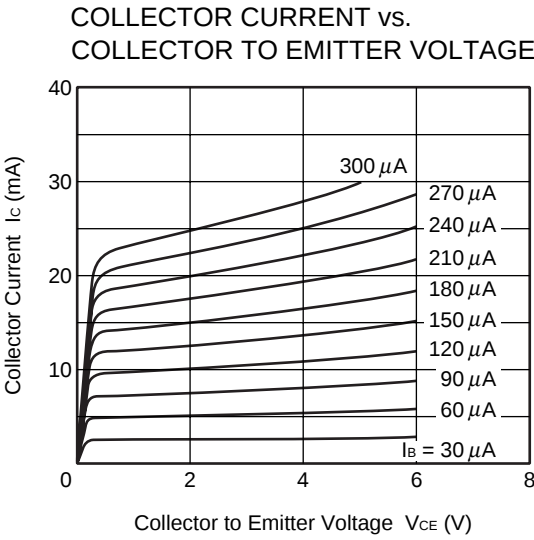
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



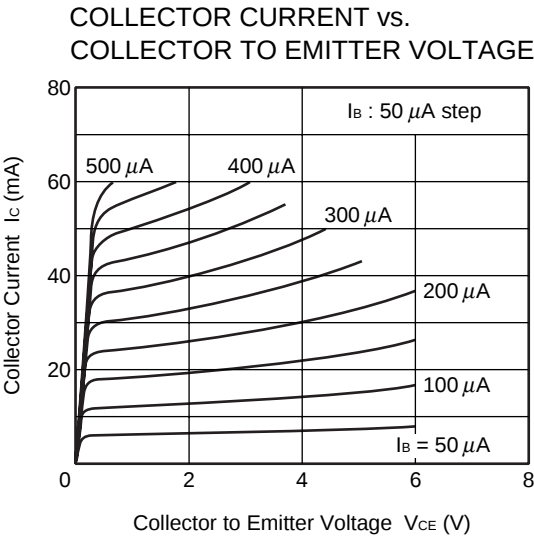
COLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGE



Q1

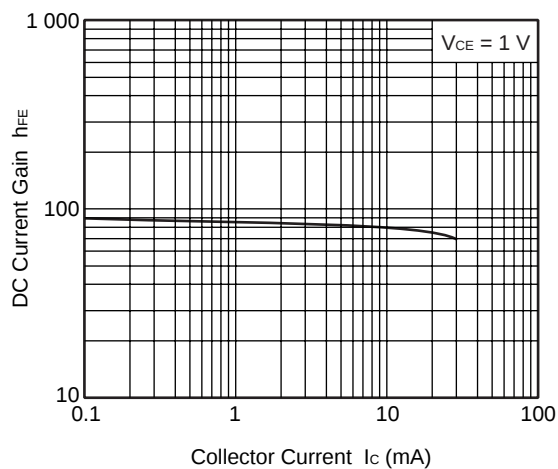


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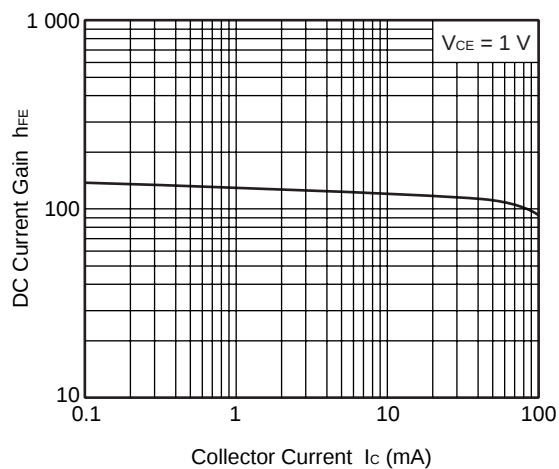
Q1

DC CURRENT GAIN vs.
COLLECTOR CURRENT

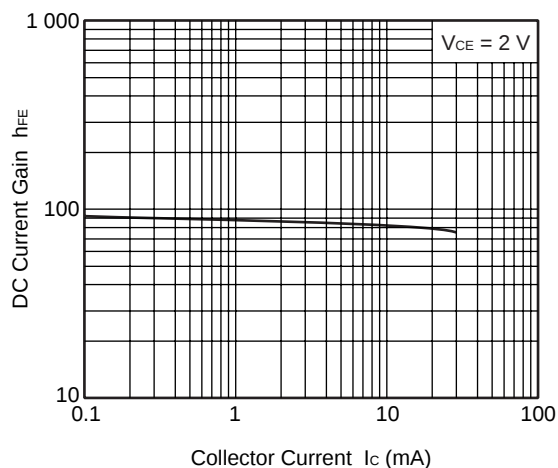


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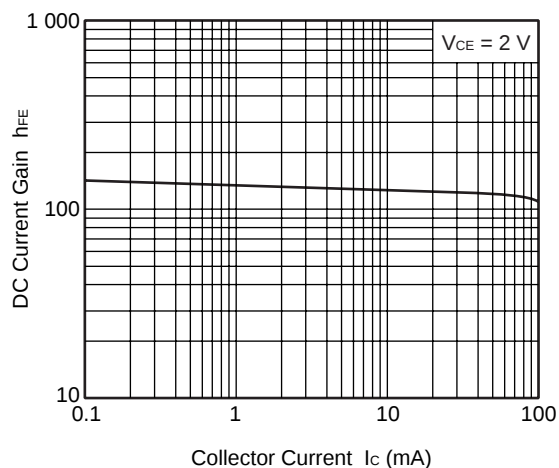
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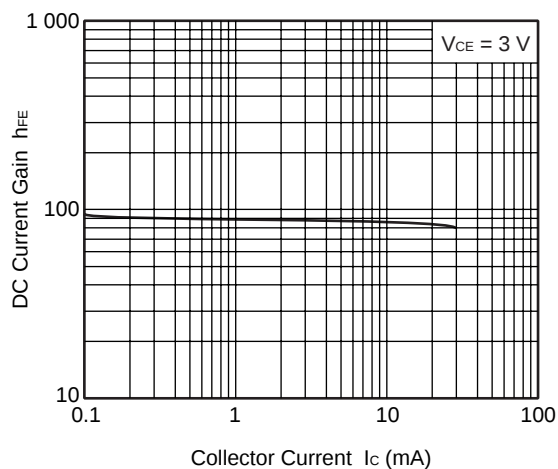
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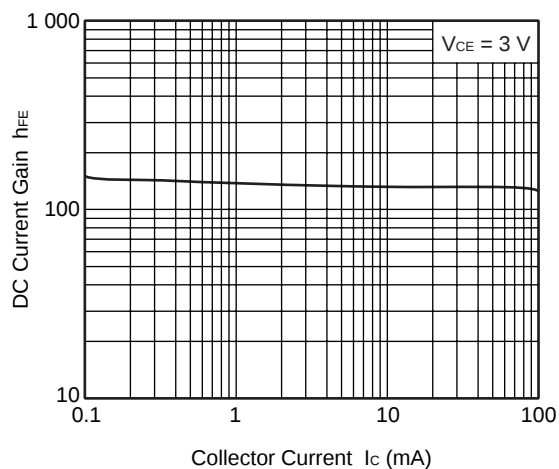
DC CURRENT GAIN vs.
COLLECTOR CURRENT



DC CURRENT GAIN vs.
COLLECTOR CURRENT

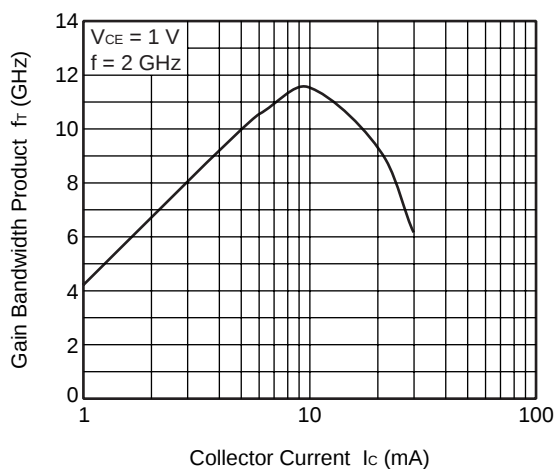


DC CURRENT GAIN vs.
COLLECTOR CURRENT



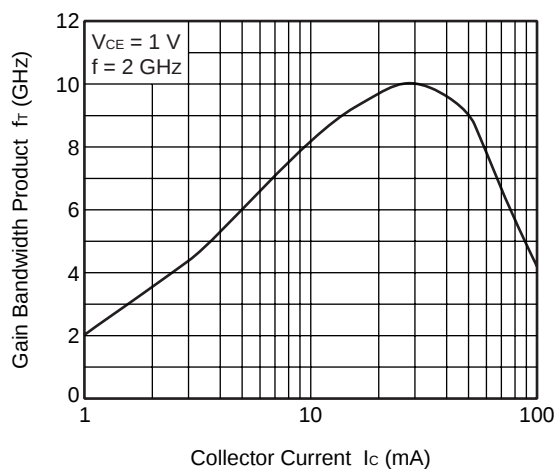
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GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT

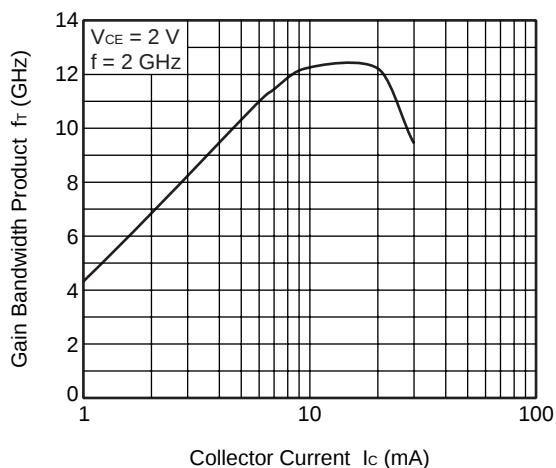


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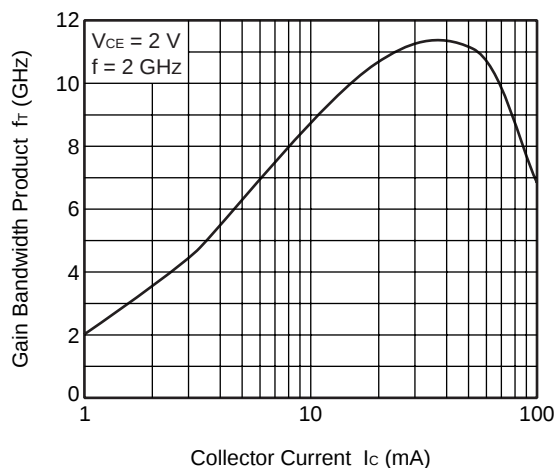
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



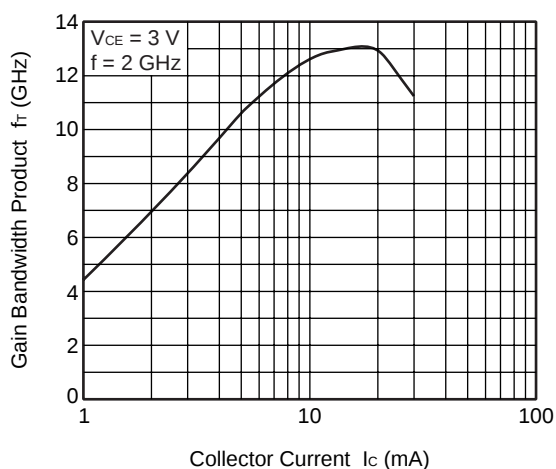
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



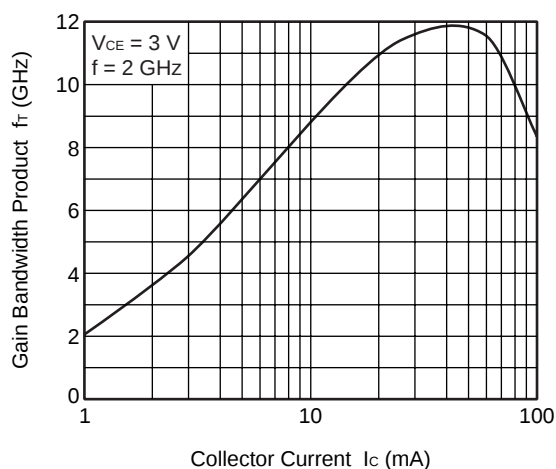
GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



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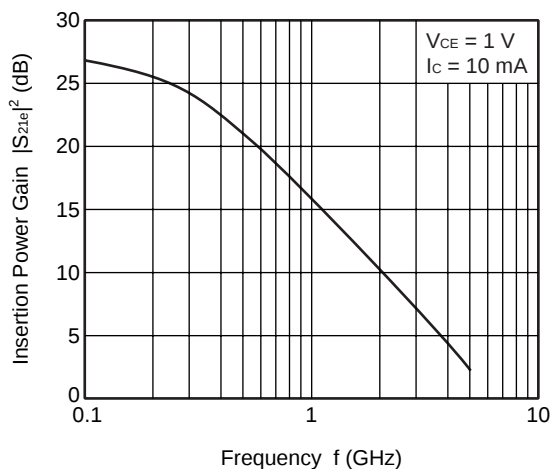


GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



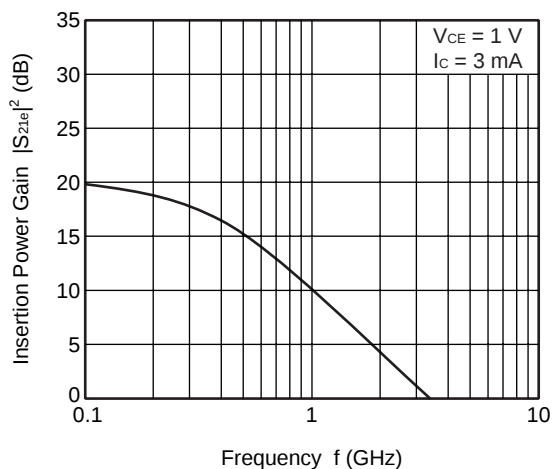
Q1

INSERTION POWER GAIN vs. FREQUENCY

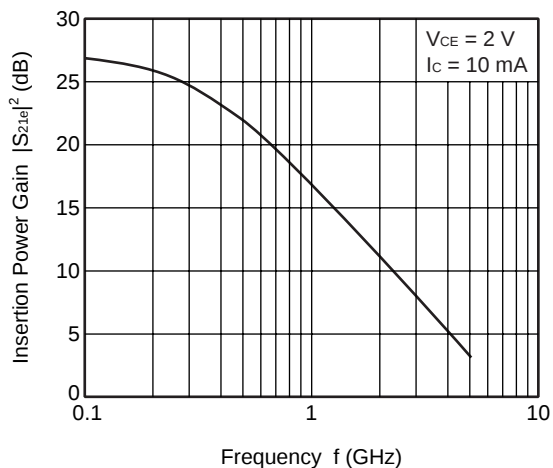


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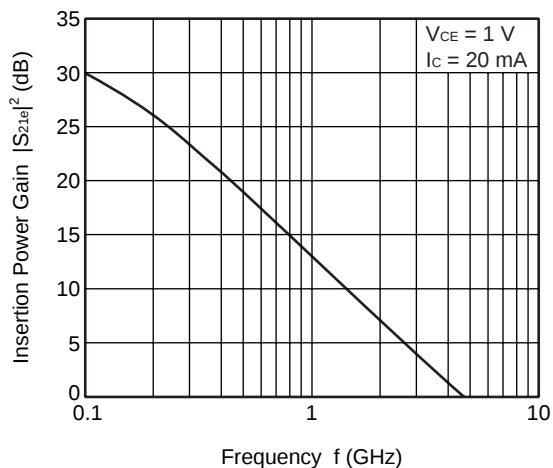
INSERTION POWER GAIN vs. FREQUENCY



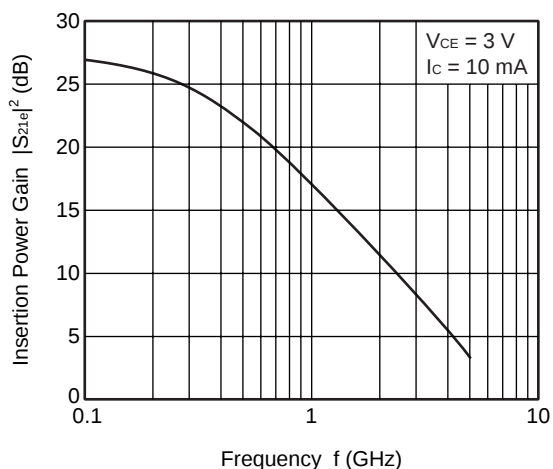
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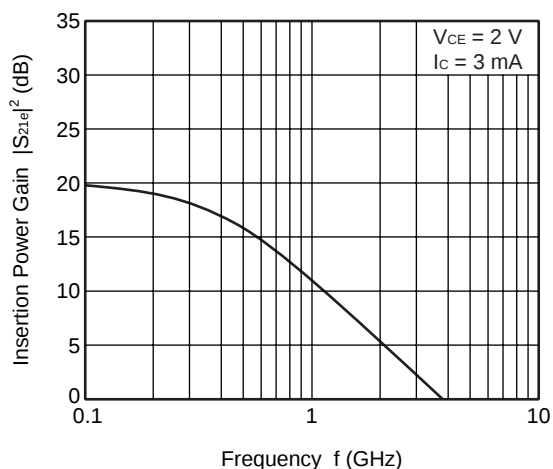
INSERTION POWER GAIN vs. FREQUENCY



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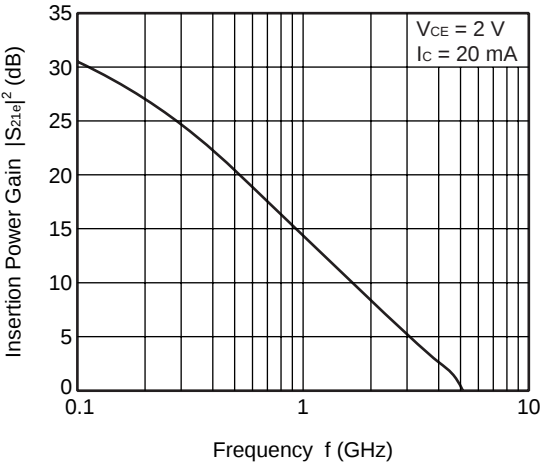


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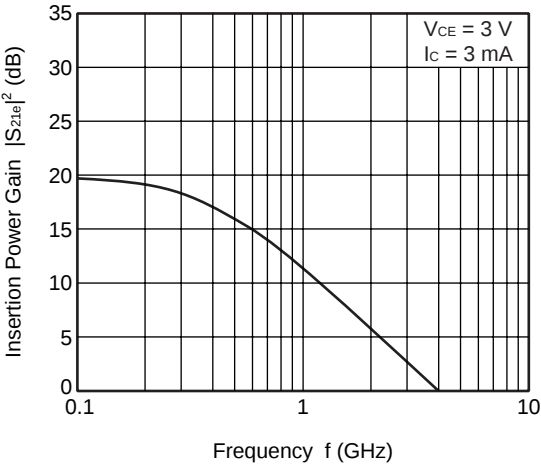


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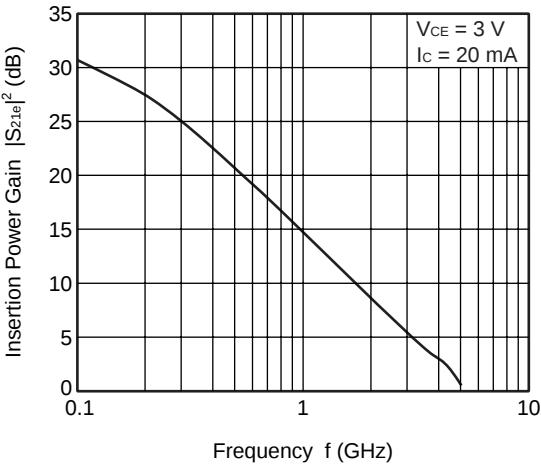
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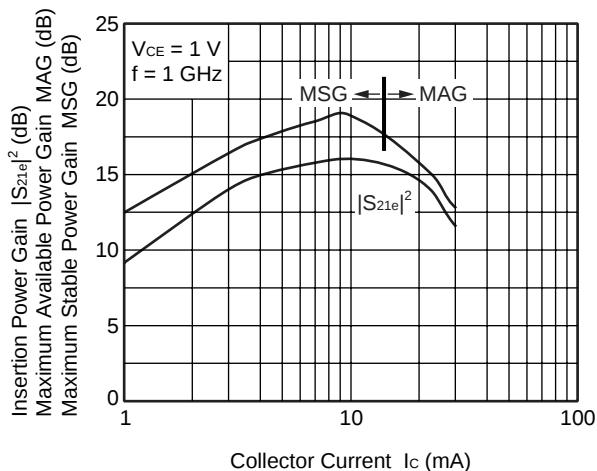


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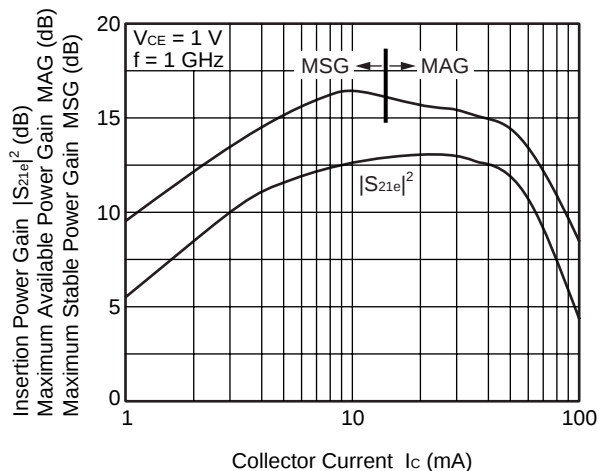
Q1

INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT

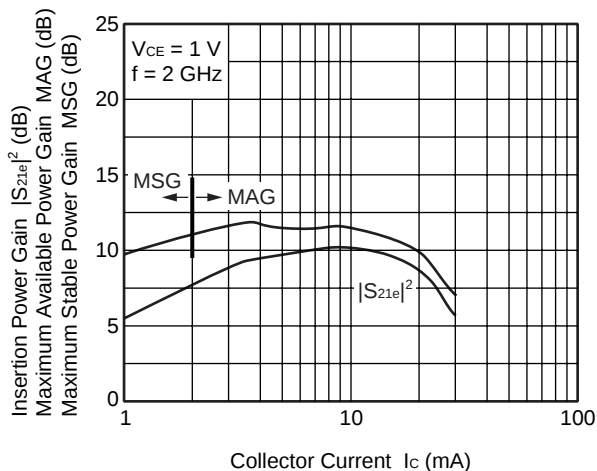


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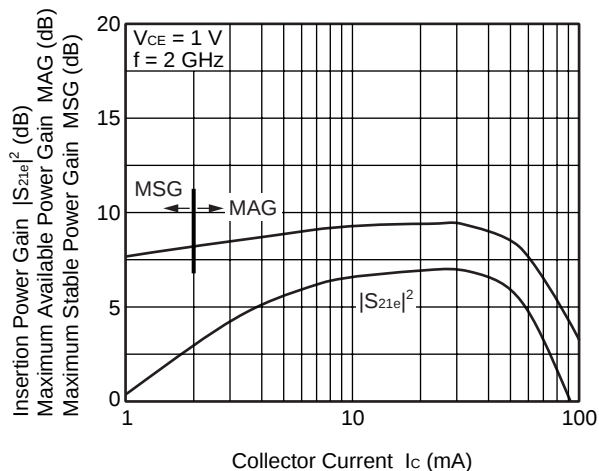
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



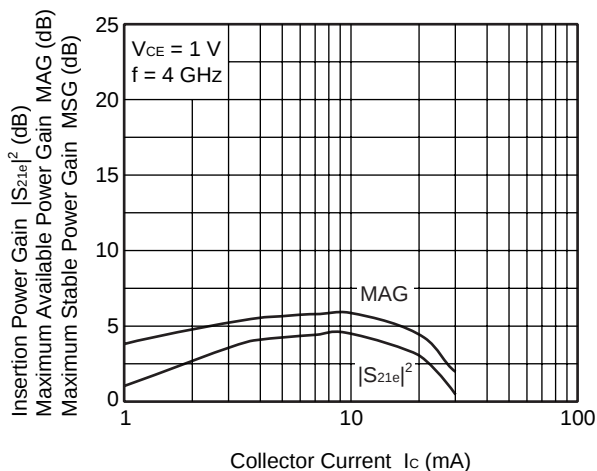
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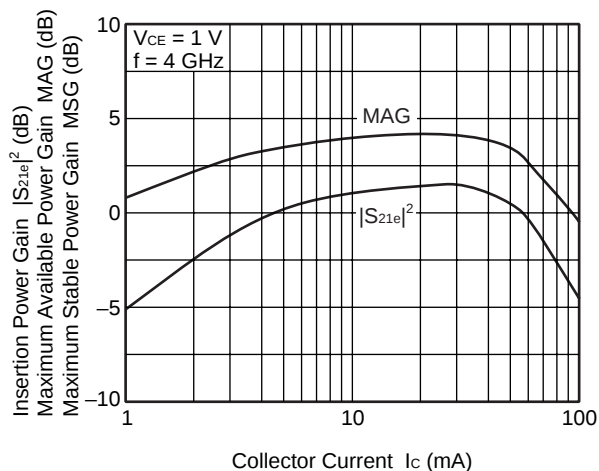
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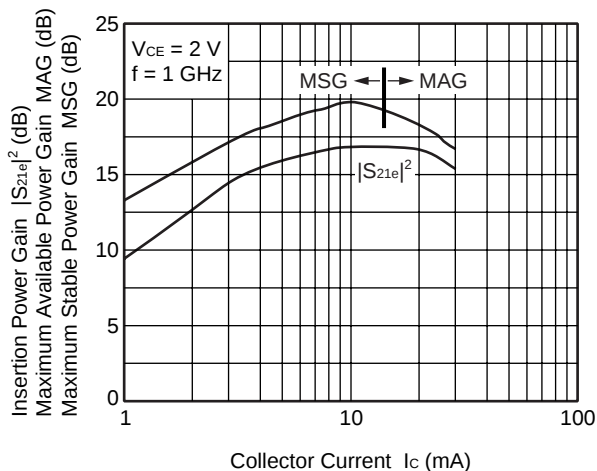


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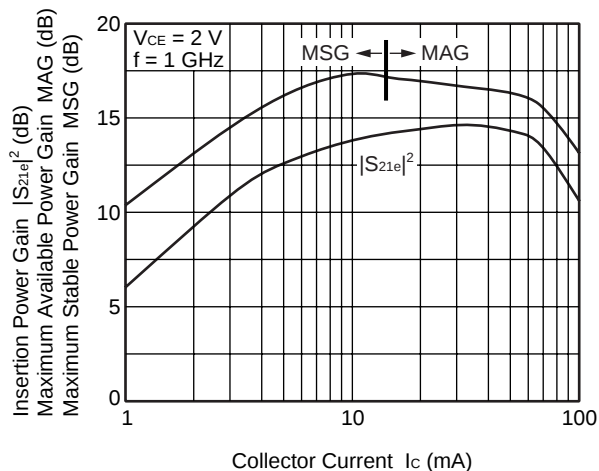
Q1

INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT

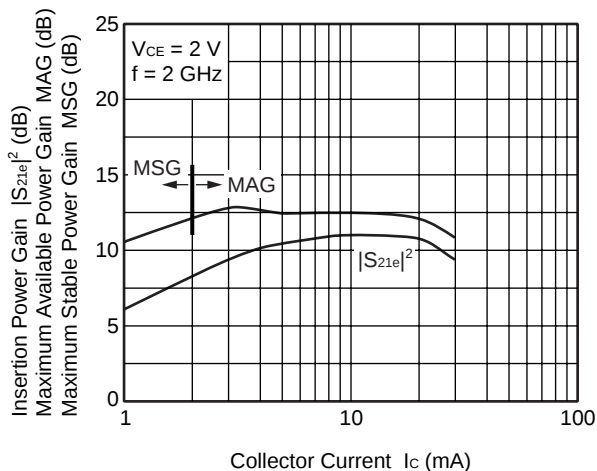


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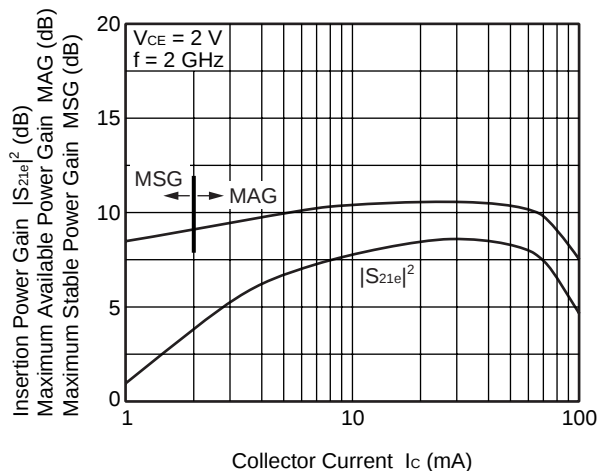
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



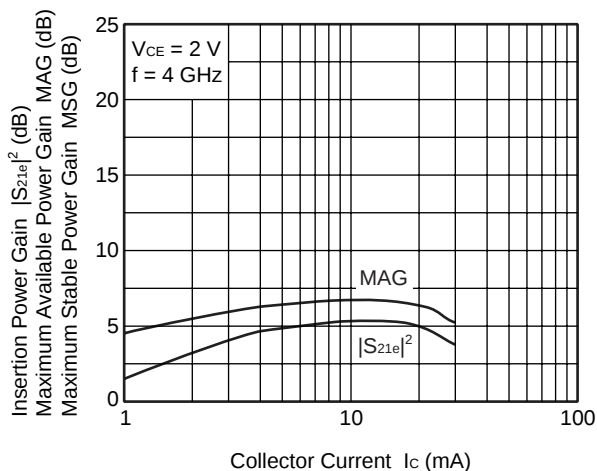
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



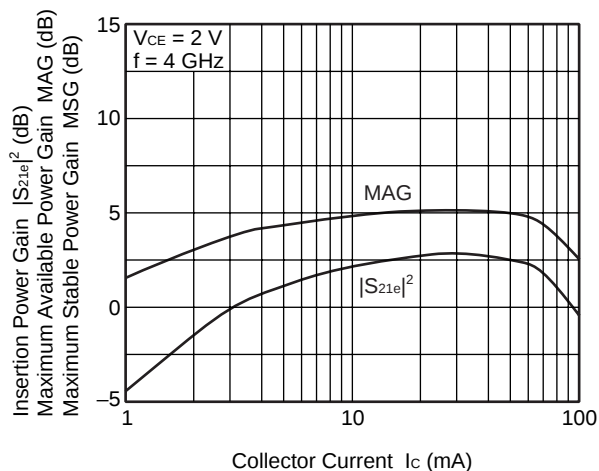
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



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vs. COLLECTOR CURRENT

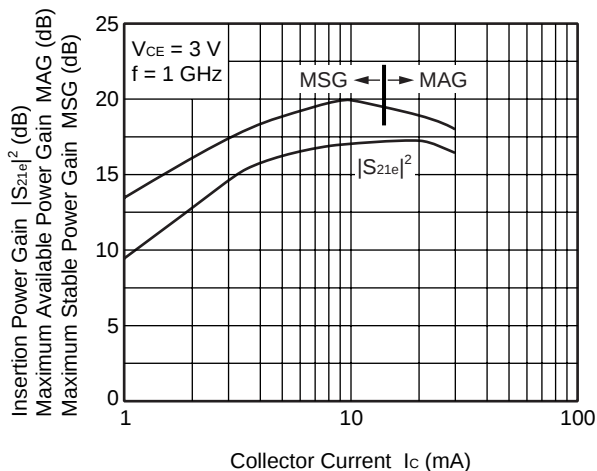


INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



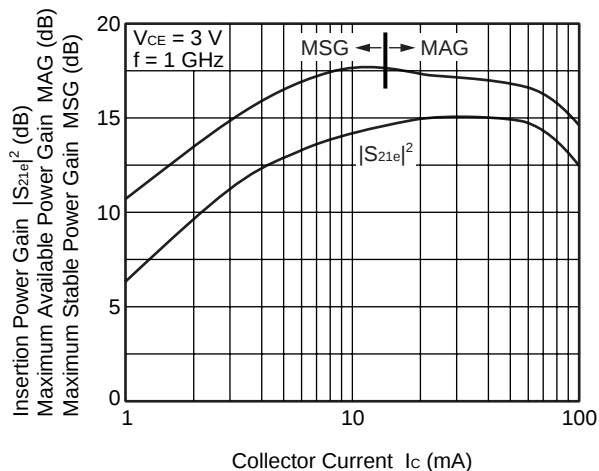
Q1

INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT

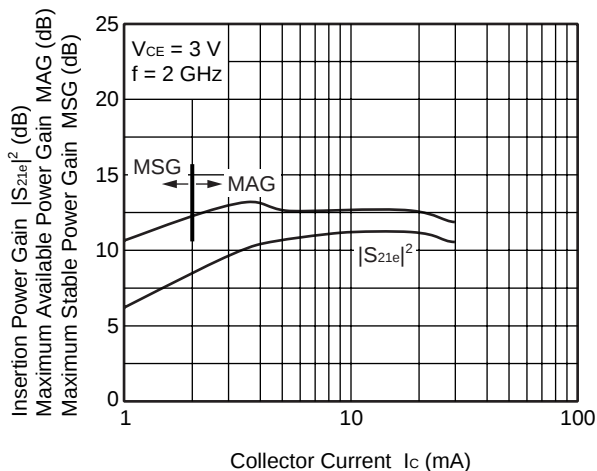


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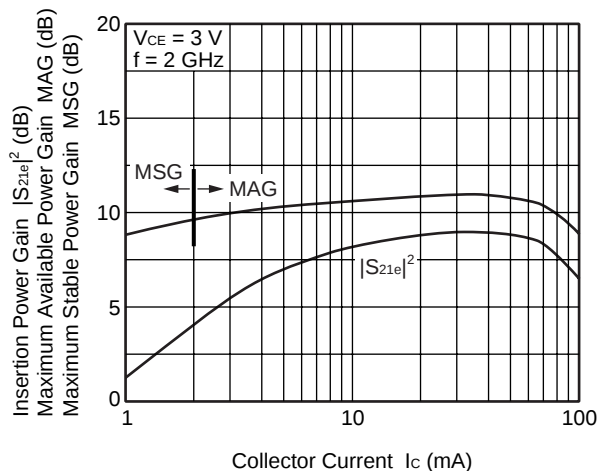
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



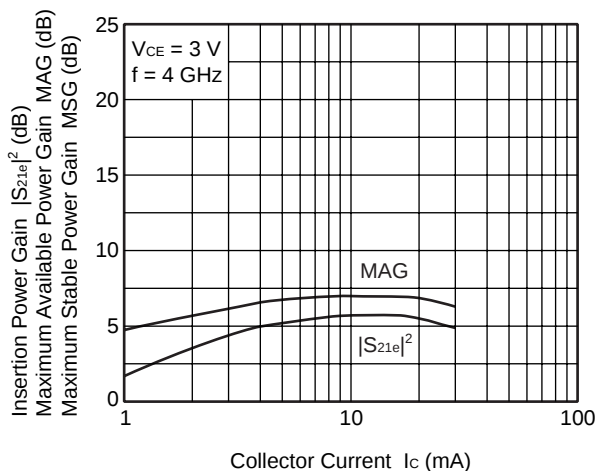
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



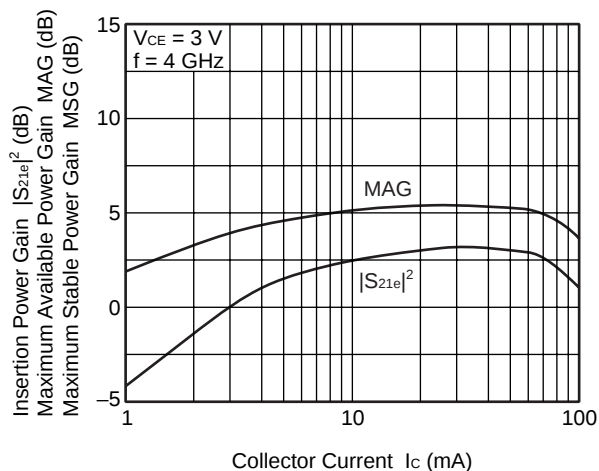
INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



INSERTION POWER GAIN, MAG, MSG
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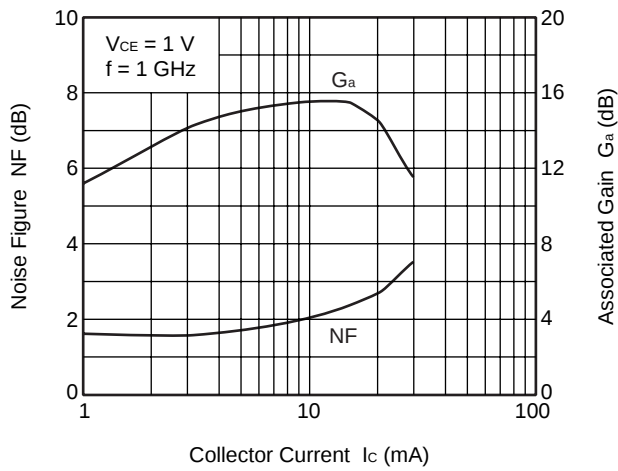


INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



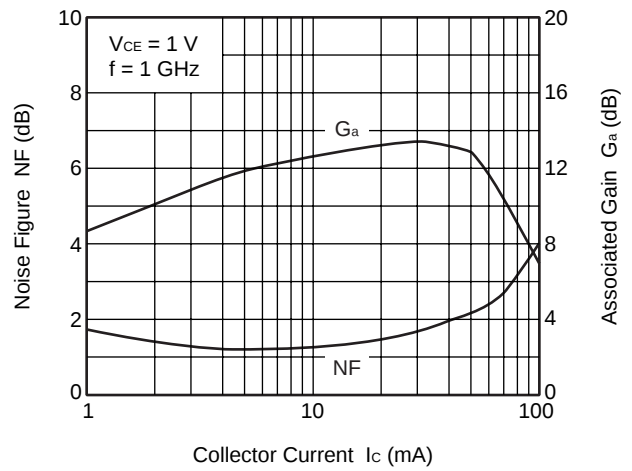
Q1

NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT

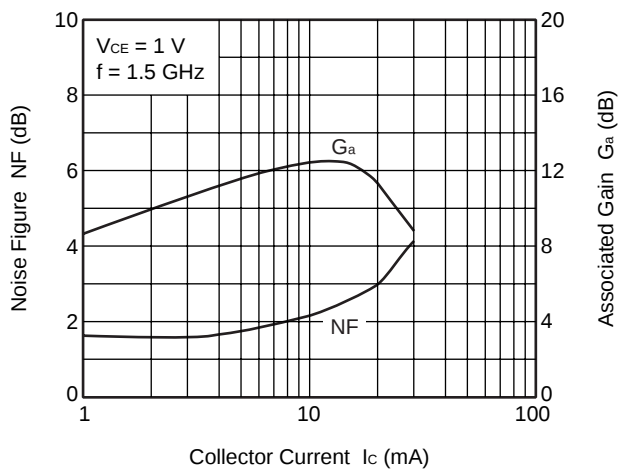


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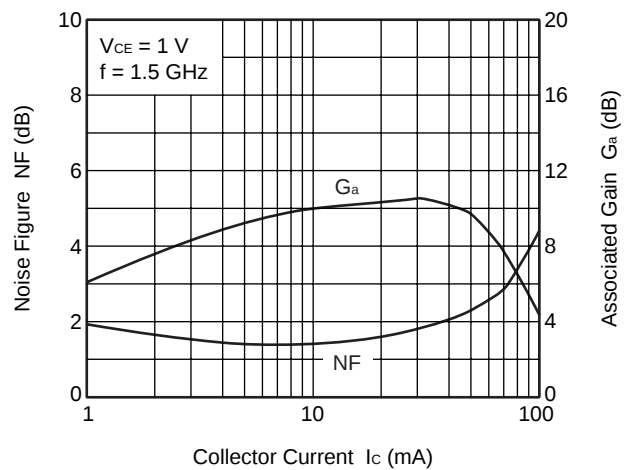
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



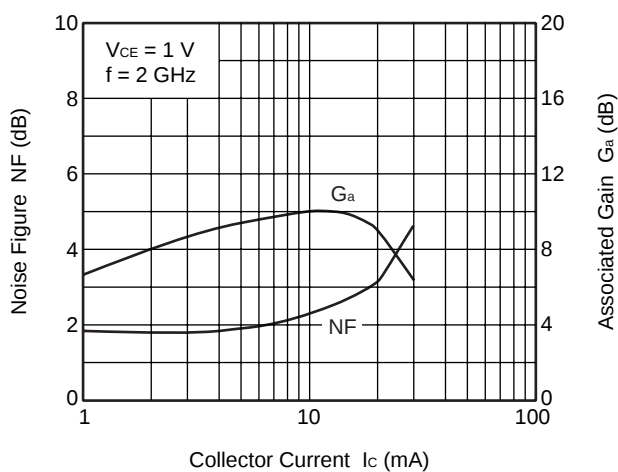
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



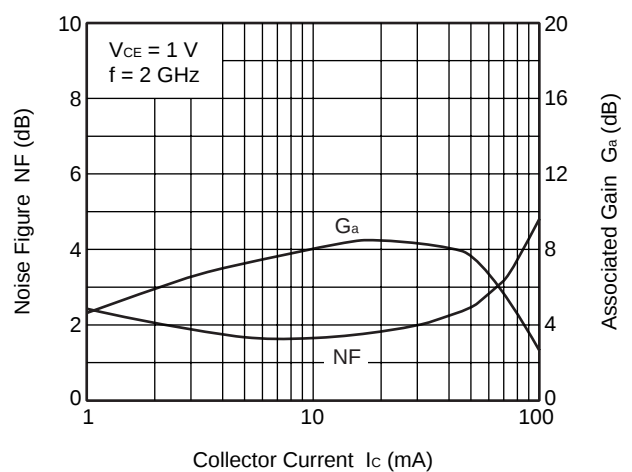
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT

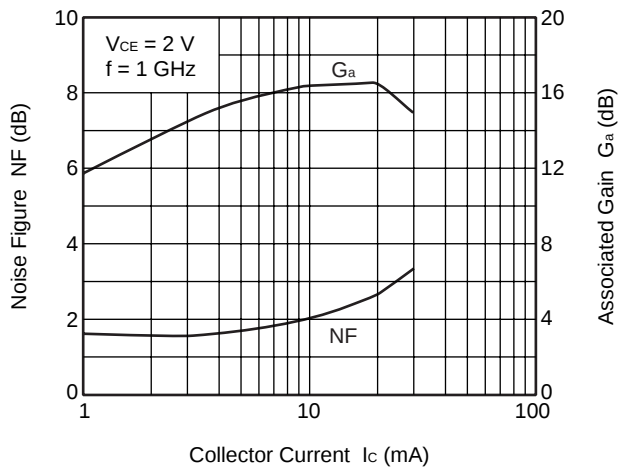


NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



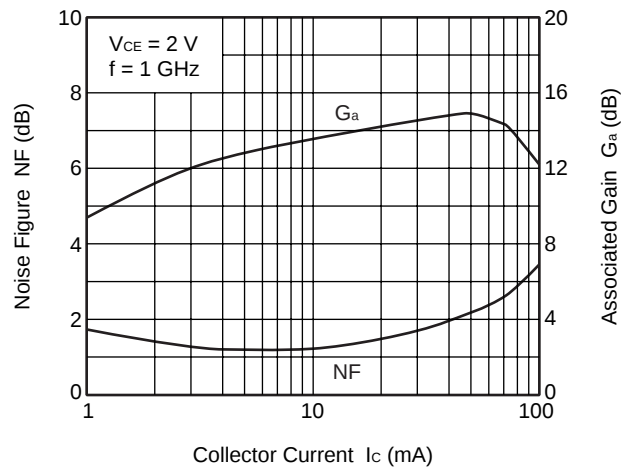
Q1

NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT

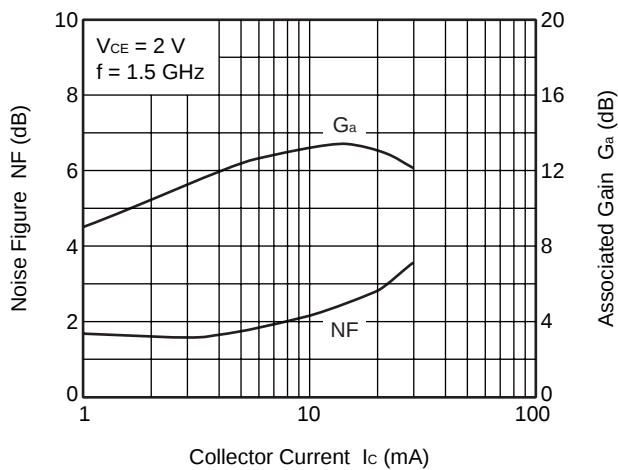


Q2

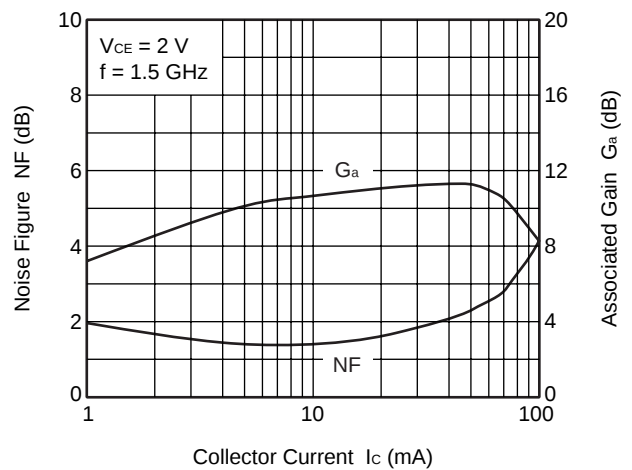
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



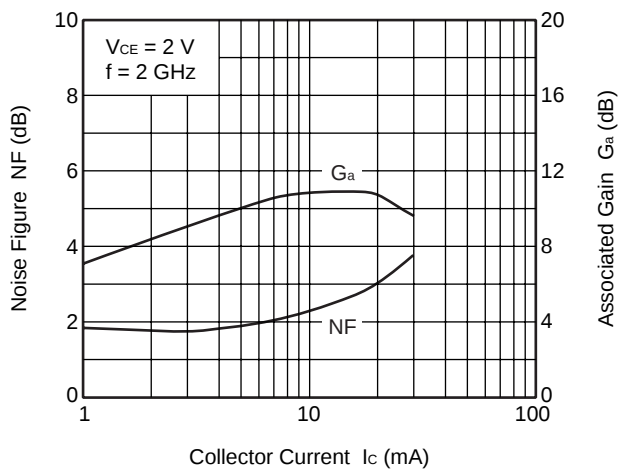
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



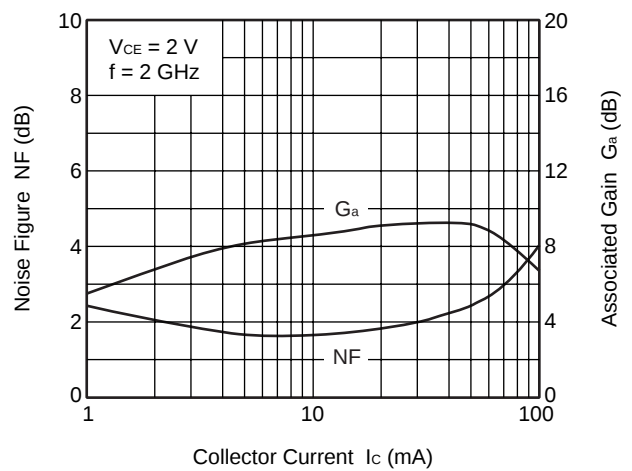
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT

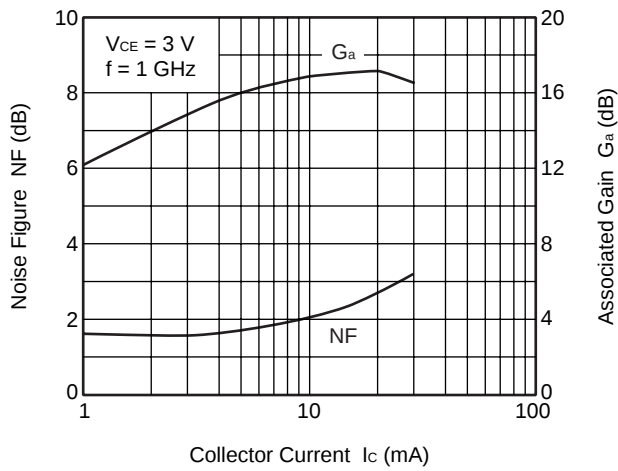


NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



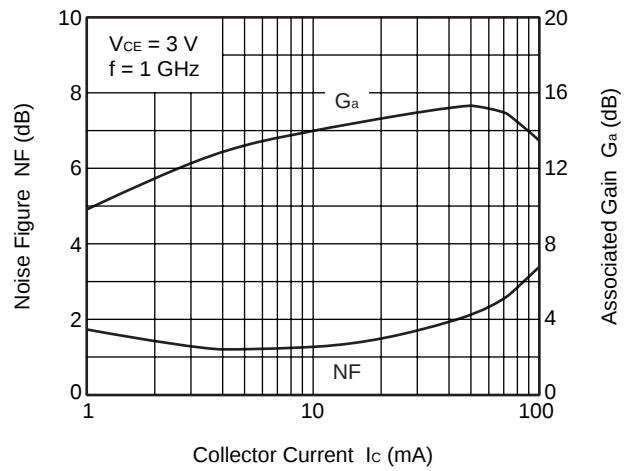
Q1

NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT

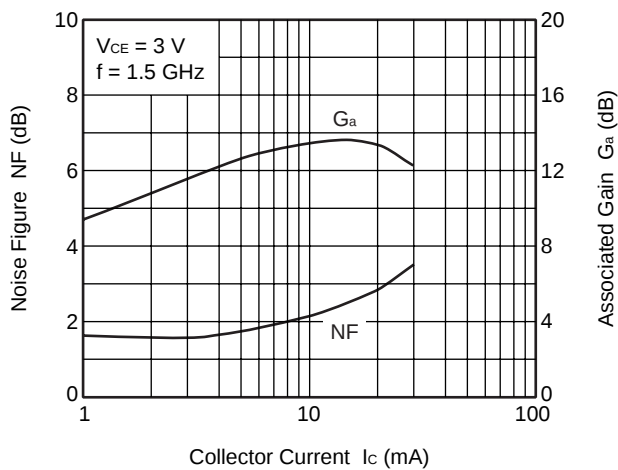


Q2

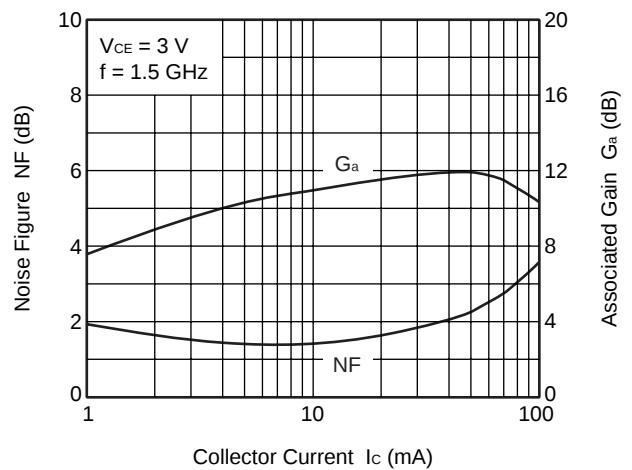
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



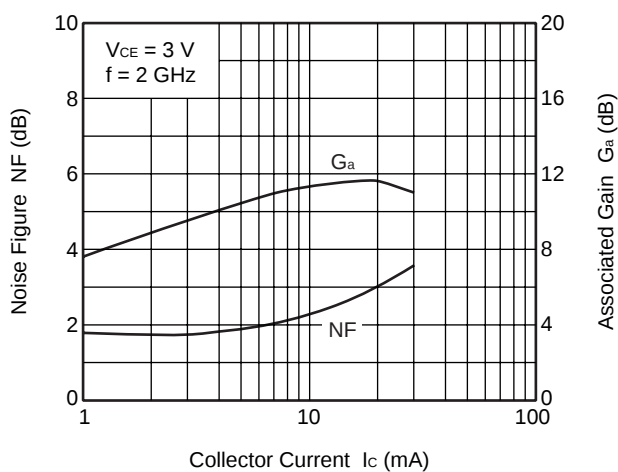
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



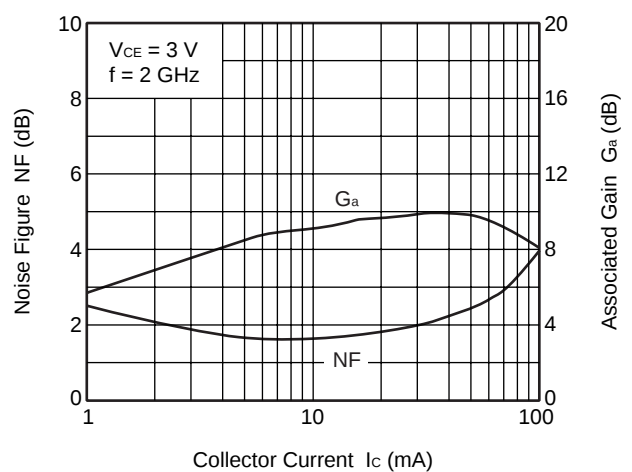
NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



NOISE FIGURE, ASSOCIATED GAIN
vs. COLLECTOR CURRENT



Remark The graphs indicate nominal characteristics.

S-PARAMETERS Q1

Note When $K \geq 1$, the MAG (Maximum Available Gain) is used. $MAG = \left| \frac{S_{21}}{S_{12}} \right| (K - \sqrt{K^2 - 1})$

When $K < 1$, the MSG (Maximum Stable Gain) is used. $MSG = \left| \frac{S_{21}}{S_{12}} \right|$

$V_{CE} = 1 \text{ V}$, $I_C = 1 \text{ mA}$, $Z_0 = 50 \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	Note MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.952	-7.1	3.547	172.9	0.020	86.6	0.992	-3.7	0.040	22.55
0.2	0.943	-14.4	3.539	167.2	0.040	80.9	0.989	-7.3	0.083	19.44
0.3	0.931	-21.5	3.494	161.1	0.060	76.6	0.971	-10.6	0.123	17.67
0.4	0.905	-28.3	3.407	154.8	0.079	72.0	0.951	-14.3	0.175	16.35
0.5	0.880	-35.8	3.352	148.4	0.096	67.8	0.929	-17.9	0.212	15.41
0.6	0.845	-43.0	3.274	142.1	0.112	63.4	0.900	-21.6	0.255	14.64
0.7	0.809	-50.3	3.172	136.6	0.127	59.1	0.870	-25.0	0.293	13.97
0.8	0.770	-57.2	3.067	130.7	0.140	55.3	0.837	-28.4	0.339	13.39
0.9	0.731	-64.5	2.965	125.0	0.152	51.5	0.807	-31.9	0.375	12.92
1.0	0.692	-71.4	2.864	119.5	0.161	48.1	0.775	-34.9	0.419	12.49
1.1	0.658	-78.5	2.756	114.6	0.169	44.8	0.746	-37.8	0.454	12.11
1.2	0.626	-85.5	2.640	110.0	0.177	42.1	0.717	-40.4	0.488	11.75
1.3	0.596	-92.3	2.536	105.5	0.182	39.4	0.693	-42.8	0.522	11.44
1.4	0.571	-98.7	2.420	101.1	0.186	36.9	0.669	-45.3	0.559	11.13
1.5	0.549	-104.8	2.325	96.9	0.190	34.8	0.648	-47.3	0.595	10.87
1.6	0.530	-110.8	2.237	93.2	0.193	32.8	0.628	-49.2	0.629	10.65
1.7	0.513	-116.9	2.141	89.7	0.195	31.1	0.609	-50.9	0.666	10.41
1.8	0.498	-122.2	2.059	86.1	0.196	29.5	0.592	-52.3	0.705	10.21
1.9	0.487	-127.6	1.976	83.4	0.197	28.2	0.577	-53.6	0.738	10.00
2.0	0.472	-132.0	1.907	80.2	0.198	27.0	0.562	-54.7	0.785	9.83
2.1	0.468	-137.5	1.844	77.5	0.198	26.1	0.552	-56.3	0.806	9.68
2.2	0.456	-141.5	1.769	74.8	0.198	25.3	0.538	-57.2	0.859	9.50
2.3	0.455	-147.0	1.721	72.3	0.199	24.5	0.533	-58.3	0.870	9.37
2.4	0.447	-150.7	1.663	69.8	0.200	23.9	0.518	-59.2	0.920	9.21
2.5	0.445	-155.3	1.611	67.5	0.200	23.5	0.512	-60.4	0.944	9.07
2.6	0.437	-158.8	1.570	65.5	0.200	22.7	0.505	-62.0	0.978	8.95
2.7	0.437	-162.3	1.517	63.2	0.200	22.3	0.499	-62.7	1.010	8.17
2.8	0.433	-166.1	1.469	61.3	0.199	22.1	0.491	-64.2	1.052	7.28
2.9	0.426	-169.4	1.409	58.1	0.200	21.3	0.472	-65.2	1.130	6.28
3.0	0.419	-173.8	1.381	55.7	0.200	21.3	0.465	-68.0	1.159	5.97
4.0	0.436	149.3	1.136	34.9	0.208	23.7	0.424	-88.2	1.339	3.89
5.0	0.503	118.2	0.905	16.8	0.232	24.5	0.397	-112.6	1.439	1.97

V_{CE} = 1 V, I_C = 3 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.853	-13.4	9.491	169.0	0.019	83.5	0.980	-7.6	0.070	26.93
0.2	0.839	-25.7	9.175	158.6	0.038	75.3	0.952	-14.8	0.151	23.88
0.3	0.791	-37.4	8.690	149.4	0.054	69.5	0.897	-21.0	0.223	22.06
0.4	0.735	-48.4	8.100	140.7	0.068	64.1	0.841	-27.0	0.288	20.74
0.5	0.673	-59.7	7.538	132.5	0.080	59.6	0.778	-32.1	0.354	19.76
0.6	0.617	-69.9	6.973	125.3	0.089	55.5	0.717	-36.6	0.421	18.95
0.7	0.565	-79.4	6.435	119.2	0.097	52.3	0.660	-40.3	0.484	18.22
0.8	0.516	-88.6	5.919	113.5	0.103	49.9	0.608	-43.7	0.548	17.58
0.9	0.475	-97.9	5.470	108.4	0.109	47.9	0.564	-46.8	0.603	17.02
1.0	0.440	-106.4	5.081	103.7	0.113	46.2	0.525	-49.7	0.660	16.52
1.1	0.417	-114.8	4.728	99.6	0.118	44.9	0.493	-52.1	0.705	16.04
1.2	0.397	-122.6	4.398	95.9	0.122	44.2	0.463	-54.3	0.752	15.59
1.3	0.384	-130.3	4.113	92.2	0.125	43.4	0.441	-56.2	0.792	15.17
1.4	0.371	-137.5	3.859	89.0	0.129	42.8	0.421	-58.2	0.831	14.77
1.5	0.364	-143.4	3.637	85.8	0.132	42.3	0.404	-59.7	0.868	14.40
1.6	0.357	-149.6	3.441	83.0	0.135	42.1	0.389	-61.0	0.903	14.07
1.7	0.355	-155.0	3.252	80.4	0.138	41.9	0.375	-62.3	0.935	13.72
1.8	0.352	-159.9	3.090	77.7	0.141	41.8	0.362	-63.2	0.967	13.40
1.9	0.352	-164.5	2.940	75.6	0.145	41.9	0.353	-64.2	0.993	13.08
2.0	0.345	-168.5	2.810	73.2	0.148	41.7	0.340	-64.8	1.030	11.73
2.1	0.355	-172.8	2.697	71.1	0.151	41.8	0.334	-66.0	1.040	11.30
2.2	0.349	-176.2	2.578	69.3	0.154	41.9	0.321	-66.3	1.079	10.52
2.3	0.360	-179.9	2.488	67.3	0.158	41.9	0.317	-67.1	1.079	10.26
2.4	0.357	-177.4	2.396	65.4	0.162	41.9	0.304	-68.2	1.106	9.72
2.5	0.362	-174.0	2.305	63.6	0.166	42.0	0.300	-69.1	1.118	9.35
2.6	0.359	-171.4	2.235	62.4	0.169	42.0	0.294	-70.9	1.136	8.97
2.7	0.367	-169.1	2.155	60.6	0.173	42.0	0.287	-70.9	1.144	8.64
2.8	0.366	-165.8	2.079	59.2	0.177	41.8	0.282	-73.1	1.167	8.23
2.9	0.359	-164.2	1.983	56.7	0.181	41.2	0.267	-74.4	1.212	7.62
3.0	0.358	-159.3	1.937	54.8	0.185	41.3	0.267	-77.6	1.215	7.39
4.0	0.403	-131.3	1.524	36.4	0.230	39.4	0.251	-102.6	1.228	5.34
5.0	0.486	-107.7	1.201	21.1	0.275	32.1	0.242	-133.9	1.232	3.50

V_{CE} = 1 V, I_C = 5 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.783	-18.8	14.076	165.6	0.018	80.3	0.964	-10.8	0.110	28.87
0.2	0.747	-34.7	13.183	152.2	0.036	72.3	0.907	-20.3	0.206	25.70
0.3	0.673	-49.8	12.003	141.1	0.049	65.6	0.823	-27.8	0.305	23.94
0.4	0.607	-62.9	10.741	131.5	0.060	61.0	0.742	-34.4	0.390	22.55
0.5	0.537	-76.1	9.603	123.1	0.068	57.1	0.663	-39.4	0.478	21.49
0.6	0.481	-87.4	8.612	116.2	0.075	54.3	0.594	-43.5	0.559	20.61
0.7	0.437	-98.0	7.754	110.7	0.081	52.7	0.535	-46.7	0.630	19.83
0.8	0.398	-108.0	6.998	105.4	0.086	51.5	0.486	-49.5	0.700	19.11
0.9	0.372	-118.1	6.348	100.9	0.091	50.6	0.444	-52.1	0.759	18.45
1.0	0.351	-127.1	5.824	96.9	0.095	50.1	0.410	-54.6	0.812	17.85
1.1	0.338	-135.6	5.367	93.4	0.100	49.8	0.383	-56.7	0.856	17.31
1.2	0.332	-143.4	4.940	90.4	0.104	49.8	0.359	-58.8	0.896	16.76
1.3	0.326	-151.0	4.598	87.4	0.109	49.7	0.342	-60.4	0.931	16.27
1.4	0.325	-156.9	4.286	84.5	0.113	49.6	0.326	-62.2	0.962	15.79
1.5	0.322	-162.3	4.028	81.7	0.117	49.5	0.313	-63.7	0.990	15.36
1.6	0.324	-167.9	3.798	79.3	0.122	49.6	0.303	-64.9	1.013	14.25
1.7	0.327	-172.4	3.582	77.0	0.126	49.6	0.291	-66.2	1.036	13.37
1.8	0.326	-176.7	3.393	74.6	0.131	49.6	0.282	-67.0	1.060	12.65
1.9	0.330	-179.2	3.224	72.8	0.135	49.6	0.275	-68.1	1.075	12.11
2.0	0.326	-176.0	3.078	70.5	0.140	49.6	0.264	-68.5	1.098	11.53
2.1	0.338	-172.5	2.946	68.7	0.144	49.6	0.260	-69.7	1.101	11.17
2.2	0.336	-170.4	2.817	67.1	0.148	49.7	0.248	-70.0	1.125	10.63
2.3	0.347	-167.5	2.713	65.3	0.153	49.5	0.245	-70.8	1.120	10.37
2.4	0.345	-165.2	2.609	63.6	0.159	49.4	0.234	-72.1	1.138	9.91
2.5	0.352	-162.6	2.509	62.1	0.163	49.3	0.231	-72.9	1.142	9.58
2.6	0.351	-160.3	2.432	60.8	0.168	49.3	0.224	-75.0	1.150	9.25
2.7	0.358	-158.5	2.340	59.2	0.173	49.0	0.219	-74.9	1.156	8.92
2.8	0.359	-155.9	2.260	57.8	0.178	48.6	0.215	-77.6	1.168	8.56
2.9	0.352	-154.4	2.158	55.6	0.183	47.8	0.202	-79.5	1.199	8.02
3.0	0.353	-150.0	2.104	53.8	0.188	47.8	0.205	-83.1	1.197	7.80
4.0	0.402	-125.3	1.631	36.5	0.239	43.3	0.203	-111.7	1.191	5.69
5.0	0.486	-104.8	1.283	22.1	0.288	33.9	0.212	-147.2	1.187	3.87

V_{CE} = 1 V, I_C = 7 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.731	-22.4	17.662	162.6	0.018	78.1	0.946	-13.2	0.161	29.87
0.2	0.666	-42.3	16.079	147.1	0.033	70.1	0.866	-24.3	0.258	26.86
0.3	0.585	-59.7	14.117	135.1	0.045	63.9	0.761	-32.4	0.375	24.99
0.4	0.515	-74.0	12.267	125.3	0.054	59.6	0.666	-38.8	0.480	23.58
0.5	0.451	-88.1	10.693	117.2	0.061	57.0	0.584	-43.3	0.575	22.45
0.6	0.402	-100.5	9.403	110.6	0.067	55.3	0.515	-46.9	0.662	21.49
0.7	0.369	-111.7	8.357	105.7	0.072	54.5	0.460	-49.5	0.733	20.63
0.8	0.341	-122.4	7.466	100.9	0.077	54.0	0.414	-52.0	0.801	19.85
0.9	0.326	-132.1	6.722	96.9	0.082	53.8	0.378	-54.2	0.857	19.14
1.0	0.313	-141.7	6.135	93.3	0.087	54.0	0.348	-56.6	0.904	18.48
1.1	0.309	-149.3	5.624	90.1	0.092	53.9	0.325	-58.5	0.941	17.86
1.2	0.309	-156.8	5.163	87.3	0.097	54.2	0.304	-60.5	0.976	17.26
1.3	0.309	-163.3	4.802	84.6	0.102	54.2	0.290	-62.1	1.003	16.41
1.4	0.311	-168.8	4.464	82.0	0.107	54.2	0.278	-63.8	1.027	15.21
1.5	0.312	-173.7	4.191	79.4	0.112	54.3	0.267	-65.3	1.047	14.41
1.6	0.316	-178.2	3.945	77.1	0.117	54.2	0.259	-66.6	1.062	13.76
1.7	0.320	178.1	3.712	75.0	0.122	54.2	0.249	-67.9	1.081	13.10
1.8	0.320	174.4	3.516	72.8	0.127	54.2	0.241	-68.7	1.098	12.52
1.9	0.327	170.6	3.333	71.1	0.132	54.1	0.236	-69.8	1.108	12.02
2.0	0.324	168.0	3.181	69.1	0.137	53.9	0.227	-70.2	1.126	11.50
2.1	0.338	165.7	3.047	67.3	0.142	53.9	0.224	-71.4	1.121	11.20
2.2	0.334	162.9	2.914	65.8	0.147	53.8	0.212	-71.5	1.141	10.69
2.3	0.348	160.7	2.803	64.2	0.153	53.6	0.210	-72.5	1.131	10.44
2.4	0.345	159.0	2.694	62.5	0.158	53.3	0.199	-73.9	1.146	9.99
2.5	0.353	156.7	2.591	61.0	0.163	53.0	0.197	-74.8	1.145	9.69
2.6	0.353	154.3	2.509	59.9	0.169	52.8	0.192	-77.4	1.152	9.36
2.7	0.359	153.2	2.414	58.3	0.174	52.4	0.186	-77.2	1.155	9.03
2.8	0.361	150.8	2.330	57.2	0.179	51.8	0.183	-80.3	1.164	8.69
2.9	0.354	149.1	2.223	55.0	0.185	50.9	0.171	-82.7	1.192	8.15
3.0	0.355	145.1	2.167	53.2	0.191	50.7	0.175	-86.6	1.187	7.94
4.0	0.404	122.9	1.674	36.3	0.244	45.0	0.183	-117.4	1.175	5.83
5.0	0.490	103.1	1.316	22.5	0.294	34.8	0.204	-154.4	1.167	4.04

V_{CE} = 1 V, I_C = 10 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.648	-29.0	21.750	159.0	0.017	76.3	0.924	-16.1	0.191	31.18
0.2	0.574	-52.1	18.960	141.4	0.030	67.2	0.810	-28.7	0.332	27.97
0.3	0.489	-71.7	15.944	128.7	0.040	62.5	0.686	-36.9	0.469	26.00
0.4	0.426	-88.0	13.412	119.2	0.048	59.7	0.584	-42.6	0.583	24.48
0.5	0.373	-103.3	11.427	111.5	0.054	58.2	0.504	-46.3	0.686	23.25
0.6	0.340	-116.3	9.904	105.5	0.060	57.8	0.440	-49.0	0.772	22.21
0.7	0.319	-127.6	8.699	101.1	0.065	57.4	0.391	-51.0	0.841	21.26
0.8	0.302	-138.3	7.716	96.8	0.071	57.6	0.351	-52.9	0.902	20.39
0.9	0.297	-147.7	6.924	93.2	0.076	57.8	0.320	-54.9	0.949	19.62
1.0	0.294	-156.2	6.289	90.0	0.081	58.1	0.294	-57.0	0.987	18.90
1.1	0.298	-163.2	5.752	87.1	0.086	58.3	0.275	-58.8	1.014	17.50
1.2	0.302	-168.7	5.272	84.8	0.092	58.6	0.258	-60.8	1.041	16.34
1.3	0.306	-175.1	4.878	82.1	0.097	58.6	0.247	-62.4	1.061	15.48
1.4	0.310	-179.3	4.535	79.7	0.103	58.6	0.238	-64.3	1.078	14.73
1.5	0.313	176.2	4.245	77.4	0.109	58.5	0.229	-65.8	1.093	14.07
1.6	0.320	172.7	4.002	75.3	0.114	58.4	0.223	-67.1	1.100	13.52
1.7	0.324	169.6	3.760	73.3	0.120	58.4	0.215	-68.4	1.115	12.92
1.8	0.327	166.6	3.562	71.2	0.125	58.1	0.209	-69.4	1.124	12.41
1.9	0.333	163.7	3.377	69.6	0.131	57.9	0.205	-70.6	1.131	11.93
2.0	0.332	161.1	3.223	67.6	0.136	57.7	0.197	-70.8	1.140	11.47
2.1	0.343	158.8	3.086	66.0	0.142	57.4	0.195	-72.2	1.136	11.14
2.2	0.340	156.9	2.947	64.5	0.147	57.1	0.184	-72.3	1.153	10.65
2.3	0.356	155.6	2.839	62.9	0.153	56.8	0.183	-73.4	1.138	10.43
2.4	0.353	153.7	2.728	61.4	0.159	56.3	0.173	-75.0	1.150	10.00
2.5	0.360	151.8	2.621	60.0	0.164	56.0	0.172	-76.1	1.150	9.69
2.6	0.360	149.9	2.540	58.9	0.170	55.6	0.166	-79.0	1.154	9.37
2.7	0.367	148.7	2.445	57.5	0.175	55.0	0.161	-79.1	1.154	9.06
2.8	0.368	146.5	2.360	56.3	0.181	54.3	0.159	-82.4	1.161	8.73
2.9	0.360	145.3	2.250	54.3	0.187	53.3	0.149	-85.4	1.186	8.20
3.0	0.361	141.2	2.191	52.6	0.193	53.0	0.154	-89.3	1.182	7.96
4.0	0.411	120.5	1.687	35.9	0.248	46.5	0.169	-122.4	1.167	5.85
5.0	0.496	101.9	1.322	22.3	0.298	35.7	0.200	-159.8	1.159	4.05

V_{CE} = 1 V, I_C = 20 mA, Z₀ = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.465	-48.9	26.851	149.0	0.016	74.9	0.815	-23.4	0.353	32.23
0.2	0.402	-84.3	20.632	128.1	0.026	63.2	0.639	-37.0	0.556	28.96
0.3	0.351	-109.5	15.878	115.8	0.033	60.8	0.504	-42.6	0.733	26.80
0.4	0.330	-127.2	12.668	107.4	0.040	61.1	0.415	-45.5	0.856	25.04
0.5	0.320	-142.0	10.429	101.3	0.045	61.7	0.354	-46.6	0.956	23.63
0.6	0.313	-152.8	8.867	96.4	0.051	62.6	0.309	-47.3	1.030	21.32
0.7	0.315	-161.6	7.698	92.8	0.057	63.4	0.276	-47.9	1.079	19.58
0.8	0.318	-169.6	6.765	89.3	0.063	63.8	0.249	-48.8	1.123	18.17
0.9	0.324	-175.5	6.024	86.4	0.069	64.1	0.230	-50.1	1.158	17.01
1.0	0.330	179.0	5.444	83.8	0.075	64.4	0.213	-52.0	1.182	16.04
1.1	0.339	174.7	4.967	81.3	0.081	64.5	0.202	-53.8	1.194	15.22
1.2	0.348	171.3	4.529	79.1	0.087	64.5	0.192	-56.2	1.211	14.38
1.3	0.356	167.3	4.195	76.9	0.093	64.5	0.186	-58.0	1.217	13.72
1.4	0.361	164.9	3.897	74.8	0.099	64.3	0.181	-60.2	1.226	13.07
1.5	0.367	161.8	3.642	72.6	0.105	64.1	0.177	-62.0	1.233	12.49
1.6	0.373	159.5	3.426	70.6	0.111	63.7	0.174	-63.6	1.237	11.96
1.7	0.376	157.3	3.218	68.8	0.117	63.4	0.171	-65.3	1.243	11.41
1.8	0.380	155.1	3.046	66.8	0.123	63.0	0.167	-66.4	1.247	10.93
1.9	0.385	153.2	2.890	65.3	0.129	62.7	0.166	-68.1	1.247	10.49
2.0	0.385	151.0	2.757	63.5	0.135	62.2	0.160	-68.5	1.255	10.06
2.1	0.398	149.9	2.640	61.9	0.141	61.7	0.161	-70.4	1.240	9.76
2.2	0.395	148.0	2.528	60.4	0.147	61.4	0.152	-70.7	1.253	9.33
2.3	0.406	147.1	2.432	59.0	0.153	60.8	0.152	-72.1	1.237	9.07
2.4	0.404	145.6	2.339	57.5	0.159	60.3	0.144	-74.4	1.246	8.68
2.5	0.410	144.5	2.250	56.2	0.165	59.7	0.145	-75.8	1.240	8.38
2.6	0.411	142.5	2.179	55.1	0.171	59.3	0.141	-79.3	1.242	8.08
2.7	0.416	141.9	2.100	53.8	0.177	58.6	0.136	-79.2	1.239	7.79
2.8	0.419	139.9	2.025	52.6	0.183	57.8	0.136	-83.7	1.244	7.47
2.9	0.408	138.8	1.931	50.7	0.189	56.7	0.127	-87.2	1.276	6.93
3.0	0.411	135.4	1.881	49.0	0.196	56.3	0.133	-91.9	1.268	6.72
4.0	0.459	116.0	1.452	32.2	0.253	48.5	0.160	-127.9	1.234	4.67
5.0	0.536	99.1	1.141	19.5	0.304	36.9	0.204	-164.6	1.216	2.94

V_{CE} = 2 V, I_C = 1 mA, Z₀ = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.965	-7.3	3.547	173.5	0.018	87.6	0.993	-3.2	0.014	22.98
0.2	0.946	-13.5	3.554	168.1	0.035	82.3	0.992	-6.3	0.066	20.12
0.3	0.930	-19.9	3.510	162.4	0.051	77.9	0.976	-9.0	0.121	18.37
0.4	0.911	-26.3	3.439	156.4	0.068	73.6	0.960	-12.3	0.166	17.06
0.5	0.887	-33.4	3.397	150.3	0.083	69.7	0.941	-15.4	0.203	16.13
0.6	0.855	-40.2	3.321	144.3	0.097	65.6	0.917	-18.7	0.244	15.35
0.7	0.821	-46.7	3.230	139.1	0.110	61.5	0.890	-21.8	0.285	14.67
0.8	0.786	-53.4	3.137	133.3	0.122	57.8	0.860	-24.8	0.330	14.10
0.9	0.746	-60.4	3.039	127.8	0.132	54.1	0.835	-27.8	0.366	13.61
1.0	0.708	-67.1	2.949	122.5	0.141	50.9	0.805	-30.7	0.406	13.19
1.1	0.672	-73.9	2.848	117.7	0.149	47.8	0.779	-33.2	0.442	12.82
1.2	0.642	-80.6	2.738	113.1	0.156	45.1	0.753	-35.5	0.475	12.45
1.3	0.611	-87.1	2.639	108.8	0.161	42.5	0.731	-37.8	0.509	12.14
1.4	0.585	-93.2	2.524	104.4	0.166	40.1	0.708	-40.0	0.546	11.83
1.5	0.562	-99.3	2.430	100.2	0.169	38.0	0.689	-41.9	0.579	11.57
1.6	0.540	-105.3	2.344	96.5	0.172	36.0	0.669	-43.7	0.615	11.35
1.7	0.523	-111.0	2.250	92.9	0.174	34.3	0.650	-45.3	0.651	11.11
1.8	0.506	-116.6	2.161	89.4	0.175	32.8	0.634	-46.6	0.691	10.91
1.9	0.493	-121.8	2.076	86.6	0.177	31.5	0.620	-47.9	0.724	10.69
2.0	0.476	-126.5	2.007	83.4	0.178	30.4	0.606	-49.0	0.770	10.52
2.1	0.468	-132.1	1.939	80.7	0.178	29.5	0.596	-50.4	0.793	10.36
2.2	0.455	-136.0	1.864	78.1	0.178	28.7	0.582	-51.1	0.849	10.19
2.3	0.452	-141.5	1.811	75.5	0.179	28.1	0.579	-52.0	0.858	10.04
2.4	0.446	-145.2	1.753	73.1	0.180	27.5	0.564	-53.0	0.902	9.89
2.5	0.442	-150.1	1.699	70.7	0.180	27.2	0.558	-54.0	0.927	9.74
2.6	0.432	-153.3	1.655	69.0	0.181	26.6	0.551	-55.4	0.963	9.62
2.7	0.432	-157.3	1.598	66.7	0.181	26.2	0.545	-56.1	0.994	9.46
2.8	0.425	-161.2	1.548	64.7	0.181	25.9	0.536	-57.5	1.039	8.12
2.9	0.419	-164.3	1.485	61.5	0.181	25.2	0.518	-58.5	1.117	7.05
3.0	0.410	-169.1	1.455	59.1	0.182	25.3	0.509	-61.0	1.150	6.68
4.0	0.421	152.7	1.199	38.3	0.193	28.8	0.466	-79.4	1.313	4.58
5.0	0.485	119.8	0.957	19.6	0.221	29.8	0.430	-101.8	1.397	2.61

V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.875	-11.4	9.429	169.8	0.018	86.2	0.984	-6.3	0.050	27.29
0.2	0.845	-23.2	9.182	160.1	0.032	77.3	0.961	-12.4	0.143	24.53
0.3	0.804	-34.0	8.752	151.4	0.046	71.7	0.914	-17.7	0.212	22.80
0.4	0.751	-44.0	8.224	143.1	0.059	66.4	0.864	-22.7	0.286	21.43
0.5	0.693	-54.3	7.717	135.3	0.070	62.2	0.811	-27.2	0.346	20.45
0.6	0.636	-63.9	7.192	128.2	0.078	58.4	0.756	-31.1	0.412	19.63
0.7	0.585	-72.7	6.672	122.2	0.086	55.1	0.704	-34.4	0.473	18.91
0.8	0.531	-81.2	6.180	116.4	0.092	52.7	0.656	-37.3	0.539	18.27
0.9	0.490	-90.1	5.735	111.2	0.097	50.6	0.616	-40.0	0.590	17.70
1.0	0.449	-98.2	5.358	106.5	0.102	49.0	0.576	-42.4	0.647	17.20
1.1	0.422	-106.3	5.003	102.4	0.106	47.8	0.545	-44.4	0.692	16.74
1.2	0.398	-114.0	4.659	98.7	0.110	46.9	0.516	-46.2	0.739	16.27
1.3	0.380	-121.6	4.379	95.1	0.114	46.1	0.495	-47.8	0.776	15.86
1.4	0.365	-128.6	4.100	91.7	0.117	45.5	0.475	-49.5	0.816	15.44
1.5	0.353	-135.1	3.879	88.5	0.120	45.1	0.457	-50.8	0.852	15.09
1.6	0.345	-141.3	3.676	85.6	0.123	44.8	0.442	-51.9	0.887	14.75
1.7	0.339	-147.0	3.478	83.0	0.126	44.6	0.428	-53.0	0.920	14.40
1.8	0.333	-152.0	3.303	80.3	0.129	44.5	0.417	-53.8	0.953	14.08
1.9	0.331	-157.7	3.144	78.2	0.132	44.5	0.407	-54.6	0.980	13.76
2.0	0.325	-161.6	3.010	75.7	0.135	44.4	0.395	-55.1	1.012	12.79
2.1	0.332	-166.5	2.886	73.7	0.138	44.5	0.388	-56.2	1.025	12.23
2.2	0.324	-169.5	2.761	71.7	0.142	44.6	0.376	-56.4	1.062	11.38
2.3	0.334	-173.8	2.663	69.8	0.145	44.7	0.373	-57.0	1.062	11.12
2.4	0.330	-176.8	2.564	67.9	0.149	44.7	0.361	-57.7	1.090	10.53
2.5	0.336	179.5	2.468	66.2	0.153	44.9	0.357	-58.5	1.098	10.18
2.6	0.332	176.4	2.394	64.8	0.156	44.9	0.349	-59.8	1.118	9.78
2.7	0.340	174.1	2.306	63.0	0.160	44.9	0.344	-59.8	1.126	9.44
2.8	0.338	170.6	2.227	61.6	0.163	44.9	0.339	-61.4	1.148	9.02
2.9	0.332	168.5	2.123	59.0	0.167	44.4	0.323	-62.4	1.194	8.38
3.0	0.329	163.7	2.071	57.1	0.171	44.4	0.321	-65.2	1.199	8.13
4.0	0.371	133.9	1.630	39.0	0.215	43.1	0.293	-86.6	1.210	6.03
5.0	0.459	109.6	1.290	23.4	0.262	35.9	0.264	-114.5	1.202	4.20

V_{CE} = 2 V, I_C = 5 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.812	-16.7	14.092	166.6	0.016	84.9	0.970	-8.9	0.058	29.48
0.2	0.760	-31.0	13.350	154.1	0.030	73.8	0.924	-17.1	0.206	26.44
0.3	0.690	-44.5	12.274	143.6	0.042	68.2	0.851	-23.4	0.299	24.62
0.4	0.623	-56.5	11.100	134.3	0.052	63.6	0.779	-29.0	0.385	23.27
0.5	0.554	-68.7	10.037	125.9	0.060	59.9	0.708	-33.3	0.468	22.23
0.6	0.494	-79.0	9.066	119.0	0.067	57.2	0.643	-36.8	0.551	21.34
0.7	0.445	-89.0	8.205	113.4	0.072	55.5	0.588	-39.5	0.618	20.54
0.8	0.401	-98.6	7.428	108.2	0.078	54.2	0.539	-41.7	0.688	19.81
0.9	0.370	-108.4	6.770	103.5	0.082	53.2	0.500	-43.8	0.744	19.16
1.0	0.342	-117.2	6.233	99.5	0.087	52.8	0.466	-45.7	0.797	18.57
1.1	0.324	-125.9	5.760	95.8	0.091	52.3	0.439	-47.3	0.842	18.03
1.2	0.316	-133.7	5.318	92.9	0.095	52.3	0.415	-48.9	0.879	17.47
1.3	0.305	-141.5	4.958	89.7	0.099	52.1	0.397	-50.1	0.914	16.99
1.4	0.299	-148.1	4.628	86.8	0.103	52.0	0.382	-51.5	0.946	16.51
1.5	0.296	-154.5	4.343	84.1	0.107	52.0	0.369	-52.6	0.974	16.06
1.6	0.296	-160.2	4.107	81.6	0.112	52.1	0.357	-53.6	0.995	15.66
1.7	0.294	-165.2	3.873	79.3	0.116	52.0	0.346	-54.5	1.020	14.38
1.8	0.295	-169.9	3.673	76.9	0.120	52.1	0.337	-55.1	1.041	13.63
1.9	0.297	-174.4	3.484	75.1	0.124	52.1	0.330	-55.9	1.059	13.00
2.0	0.291	-178.1	3.328	72.9	0.128	52.1	0.320	-56.2	1.081	12.39
2.1	0.304	177.7	3.185	71.1	0.132	52.2	0.315	-57.2	1.085	12.04
2.2	0.301	175.1	3.050	69.4	0.137	52.2	0.304	-57.1	1.106	11.50
2.3	0.314	172.1	2.938	67.7	0.141	52.2	0.302	-57.8	1.100	11.25
2.4	0.310	170.1	2.825	66.0	0.146	52.0	0.291	-58.5	1.118	10.77
2.5	0.319	167.1	2.717	64.5	0.151	52.0	0.288	-59.3	1.119	10.46
2.6	0.316	164.4	2.630	63.2	0.155	52.0	0.281	-60.7	1.132	10.08
2.7	0.324	162.5	2.533	61.7	0.160	51.7	0.277	-60.4	1.135	9.76
2.8	0.324	159.5	2.442	60.4	0.164	51.4	0.271	-62.3	1.149	9.38
2.9	0.317	158.0	2.333	58.0	0.169	50.6	0.257	-63.6	1.182	8.81
3.0	0.316	153.6	2.272	56.2	0.175	50.6	0.257	-66.7	1.181	8.57
4.0	0.366	127.8	1.762	39.2	0.225	46.8	0.239	-91.2	1.172	6.43
5.0	0.456	106.2	1.391	24.5	0.274	37.5	0.219	-123.8	1.161	4.62

V_{CE} = 2 V, I_C = 7 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.725	-19.1	17.802	163.8	0.015	80.7	0.958	-11.0	0.153	30.60
0.2	0.685	-37.4	16.382	149.5	0.029	72.5	0.890	-20.4	0.247	27.59
0.3	0.607	-53.1	14.584	138.0	0.039	66.6	0.798	-27.3	0.361	25.74
0.4	0.533	-66.2	12.825	128.3	0.048	62.2	0.712	-32.7	0.469	24.30
0.5	0.464	-79.3	11.315	120.1	0.054	59.8	0.635	-36.4	0.562	23.20
0.6	0.410	-90.2	10.021	113.5	0.060	58.2	0.569	-39.2	0.647	22.23
0.7	0.370	-101.1	8.952	108.4	0.065	56.9	0.517	-41.4	0.716	21.36
0.8	0.333	-111.3	8.035	103.5	0.070	56.7	0.472	-43.1	0.784	20.59
0.9	0.310	-121.5	7.261	99.4	0.075	56.3	0.436	-44.8	0.839	19.87
1.0	0.292	-130.5	6.641	95.7	0.079	56.3	0.405	-46.4	0.886	19.22
1.1	0.285	-139.2	6.104	92.5	0.084	56.3	0.382	-47.8	0.922	18.61
1.2	0.279	-146.9	5.613	89.7	0.089	56.3	0.362	-49.3	0.956	18.01
1.3	0.277	-154.8	5.219	86.9	0.094	56.4	0.348	-50.4	0.981	17.47
1.4	0.277	-160.9	4.862	84.2	0.098	56.4	0.335	-51.8	1.005	16.50
1.5	0.277	-166.2	4.553	81.8	0.103	56.3	0.324	-52.8	1.026	15.46
1.6	0.279	-171.3	4.297	79.4	0.108	56.5	0.315	-53.8	1.042	14.76
1.7	0.282	-175.9	4.045	77.3	0.112	56.4	0.305	-54.7	1.059	14.08
1.8	0.284	-179.7	3.836	75.1	0.117	56.4	0.298	-55.3	1.075	13.50
1.9	0.288	-176.4	3.635	73.4	0.122	56.4	0.292	-56.0	1.086	12.96
2.0	0.286	-172.6	3.469	71.3	0.127	56.2	0.283	-56.2	1.102	12.44
2.1	0.297	-169.8	3.321	69.6	0.131	56.1	0.280	-57.3	1.101	12.09
2.2	0.294	-166.9	3.171	68.0	0.136	56.1	0.270	-57.0	1.121	11.56
2.3	0.307	-164.9	3.059	66.4	0.141	55.9	0.268	-57.7	1.110	11.34
2.4	0.306	-162.7	2.941	64.8	0.146	55.7	0.257	-58.4	1.123	10.89
2.5	0.313	-160.6	2.825	63.3	0.151	55.5	0.255	-59.3	1.124	10.57
2.6	0.313	-157.8	2.737	62.1	0.156	55.3	0.248	-60.8	1.131	10.24
2.7	0.318	-156.6	2.635	60.6	0.161	54.9	0.244	-60.6	1.133	9.91
2.8	0.319	-153.8	2.536	59.4	0.166	54.4	0.239	-62.8	1.146	9.52
2.9	0.312	-152.3	2.423	57.2	0.172	53.6	0.226	-64.1	1.173	8.98
3.0	0.315	-148.1	2.362	55.5	0.177	53.5	0.227	-67.5	1.167	8.77
4.0	0.367	-124.5	1.825	39.0	0.230	48.3	0.214	-94.0	1.252	6.64
5.0	0.455	-104.3	1.438	24.9	0.280	38.3	0.202	-129.6	1.143	4.81

V_{CE} = 2 V, I_C = 10 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.670	-23.0	22.008	160.6	0.014	77.1	0.939	-13.3	0.218	31.83
0.2	0.595	-45.4	19.593	144.3	0.027	71.1	0.845	-23.9	0.311	28.68
0.3	0.510	-62.4	16.792	132.0	0.035	64.8	0.734	-30.8	0.456	26.77
0.4	0.439	-77.2	14.296	122.3	0.043	62.3	0.640	-35.7	0.566	25.25
0.5	0.380	-91.1	12.312	114.7	0.048	61.0	0.563	-38.7	0.664	24.05
0.6	0.336	-103.6	10.745	108.5	0.054	60.2	0.501	-40.8	0.747	22.98
0.7	0.306	-115.0	9.495	103.8	0.059	59.9	0.452	-42.2	0.814	22.04
0.8	0.281	-125.5	8.443	99.4	0.064	60.0	0.412	-43.5	0.877	21.18
0.9	0.269	-135.7	7.598	95.8	0.069	60.0	0.382	-44.7	0.923	20.41
1.0	0.258	-145.3	6.916	92.4	0.074	60.3	0.355	-46.2	0.962	19.69
1.1	0.259	-152.9	6.330	89.5	0.079	60.3	0.336	-47.3	0.988	19.01
1.2	0.260	-160.4	5.811	87.0	0.085	60.5	0.318	-48.7	1.015	17.61
1.3	0.262	-166.8	5.394	84.4	0.090	60.6	0.307	-49.8	1.034	16.67
1.4	0.267	-172.3	5.015	82.0	0.095	60.5	0.296	-51.2	1.051	15.86
1.5	0.269	-177.0	4.702	79.5	0.100	60.4	0.287	-52.2	1.063	15.18
1.6	0.274	-178.4	4.422	77.5	0.105	60.4	0.280	-53.2	1.075	14.57
1.7	0.277	-174.7	4.161	75.5	0.110	60.3	0.272	-54.1	1.089	13.95
1.8	0.280	-171.1	3.940	73.5	0.115	60.0	0.266	-54.8	1.098	13.43
1.9	0.287	-168.2	3.736	71.9	0.121	59.9	0.262	-55.6	1.104	12.95
2.0	0.284	-165.3	3.564	70.0	0.126	59.6	0.254	-55.7	1.115	12.46
2.1	0.296	-162.6	3.410	68.3	0.131	59.5	0.252	-56.8	1.112	12.13
2.2	0.294	-160.5	3.258	66.8	0.136	59.3	0.242	-56.5	1.125	11.63
2.3	0.308	-158.9	3.140	65.3	0.141	58.9	0.240	-57.3	1.115	11.40
2.4	0.304	-156.9	3.017	63.8	0.147	58.5	0.230	-57.9	1.127	10.96
2.5	0.314	-154.9	2.897	62.5	0.152	58.2	0.229	-59.0	1.124	10.65
2.6	0.313	-152.8	2.804	61.2	0.157	57.9	0.222	-60.7	1.130	10.32
2.7	0.321	-151.4	2.699	59.7	0.163	57.3	0.218	-60.5	1.129	10.02
2.8	0.321	-148.9	2.602	58.5	0.168	56.8	0.214	-62.7	1.139	9.65
2.9	0.315	-147.6	2.484	56.5	0.173	55.9	0.202	-64.3	1.163	9.11
3.0	0.317	-143.3	2.421	54.9	0.179	55.6	0.204	-67.9	1.157	8.90
4.0	0.367	-121.7	1.856	38.6	0.233	49.6	0.195	-96.6	1.145	6.69
5.0	0.457	-103.0	1.462	24.9	0.284	39.0	0.190	-134.7	1.134	4.89

V_{CE} = 2 V, I_C = 20 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.486	-36.9	29.425	153.6	0.013	79.1	0.883	-18.0	0.281	33.51
0.2	0.419	-65.2	23.883	133.9	0.023	68.4	0.737	-29.6	0.478	30.21
0.3	0.345	-87.4	19.002	121.4	0.029	65.7	0.608	-35.0	0.646	28.16
0.4	0.300	-104.1	15.432	112.6	0.035	64.8	0.516	-37.7	0.768	26.41
0.5	0.272	-120.6	12.867	106.0	0.041	65.2	0.451	-38.7	0.853	24.93
0.6	0.254	-133.4	11.011	100.8	0.046	65.3	0.402	-39.2	0.928	23.75
0.7	0.250	-145.0	9.606	97.0	0.052	65.7	0.365	-39.4	0.971	22.64
0.8	0.243	-155.2	8.466	93.4	0.058	66.4	0.336	-39.9	1.018	20.85
0.9	0.247	-163.0	7.570	90.3	0.063	66.5	0.314	-40.6	1.047	19.46
1.0	0.251	-170.3	6.858	87.5	0.069	66.7	0.294	-41.7	1.070	18.37
1.1	0.257	-176.3	6.251	85.0	0.074	66.7	0.281	-42.7	1.086	17.45
1.2	0.268	179.4	5.716	83.0	0.080	66.7	0.268	-44.2	1.101	16.60
1.3	0.273	174.3	5.300	80.7	0.086	66.5	0.261	-45.3	1.109	15.90
1.4	0.280	171.0	4.916	78.5	0.092	66.3	0.253	-46.8	1.117	15.22
1.5	0.284	167.4	4.605	76.4	0.097	66.1	0.248	-48.0	1.124	14.62
1.6	0.292	164.5	4.327	74.4	0.103	65.7	0.244	-49.2	1.125	14.09
1.7	0.295	161.9	4.068	72.6	0.108	65.4	0.238	-50.3	1.134	13.52
1.8	0.299	159.5	3.851	70.7	0.114	65.0	0.234	-51.0	1.138	13.03
1.9	0.307	156.5	3.650	69.2	0.119	64.6	0.231	-52.1	1.140	12.58
2.0	0.306	154.9	3.481	67.3	0.125	64.1	0.225	-52.1	1.146	12.13
2.1	0.319	152.8	3.334	65.8	0.130	63.8	0.224	-53.6	1.137	11.83
2.2	0.315	151.1	3.185	64.4	0.136	63.4	0.216	-53.2	1.149	11.35
2.3	0.329	150.6	3.067	63.0	0.142	62.9	0.216	-54.2	1.134	11.13
2.4	0.325	148.9	2.944	61.6	0.148	62.3	0.206	-55.0	1.144	10.69
2.5	0.335	147.6	2.832	60.3	0.153	61.9	0.206	-56.1	1.138	10.42
2.6	0.335	145.5	2.741	59.3	0.159	61.4	0.200	-58.1	1.141	10.09
2.7	0.340	144.9	2.639	58.0	0.164	60.7	0.197	-58.0	1.141	9.78
2.8	0.342	142.7	2.544	56.8	0.169	60.1	0.193	-60.5	1.147	9.44
2.9	0.333	141.9	2.424	54.9	0.175	58.9	0.182	-62.2	1.173	8.88
3.0	0.337	138.0	2.363	53.2	0.182	58.5	0.184	-66.3	1.165	8.69
4.0	0.387	118.4	1.811	37.2	0.237	51.5	0.179	-97.7	1.147	6.50
5.0	0.476	101.3	1.424	23.9	0.289	40.1	0.182	-138.2	1.132	4.72

V_{CE} = 3 V, I_C = 1 mA, Z_o = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.951	-6.6	3.571	173.3	0.017	87.1	0.996	-2.9	0.037	23.30
0.2	0.948	-13.1	3.558	168.3	0.033	82.6	0.993	-5.9	0.067	20.34
0.3	0.935	-19.4	3.515	162.8	0.048	78.4	0.975	-8.6	0.118	18.60
0.4	0.911	-25.8	3.442	156.8	0.064	74.1	0.962	-11.7	0.165	17.29
0.5	0.890	-32.5	3.406	150.9	0.079	70.1	0.944	-14.6	0.205	16.36
0.6	0.858	-39.1	3.337	145.0	0.092	66.2	0.920	-17.8	0.246	15.58
0.7	0.825	-45.5	3.248	139.8	0.105	62.3	0.895	-20.6	0.286	14.90
0.8	0.789	-52.2	3.160	134.1	0.116	58.6	0.867	-23.6	0.328	14.34
0.9	0.752	-59.0	3.066	128.7	0.126	55.1	0.842	-26.6	0.365	13.86
1.0	0.714	-65.4	2.974	123.4	0.135	51.8	0.815	-29.3	0.406	13.43
1.1	0.680	-72.1	2.876	118.7	0.142	48.8	0.789	-31.8	0.440	13.05
1.2	0.646	-78.7	2.769	114.2	0.149	46.2	0.765	-34.1	0.473	12.68
1.3	0.615	-85.0	2.668	109.8	0.155	43.5	0.743	-36.2	0.507	12.37
1.4	0.591	-91.5	2.557	105.4	0.159	41.2	0.719	-38.4	0.542	12.06
1.5	0.566	-97.4	2.463	101.2	0.163	39.1	0.701	-40.3	0.578	11.80
1.6	0.546	-103.3	2.378	97.6	0.165	37.2	0.682	-42.0	0.610	11.58
1.7	0.525	-109.1	2.282	94.0	0.168	35.5	0.663	-43.5	0.649	11.34
1.8	0.507	-114.2	2.195	90.5	0.169	34.0	0.647	-44.8	0.690	11.14
1.9	0.494	-119.7	2.110	87.7	0.170	32.7	0.634	-46.2	0.721	10.93
2.0	0.477	-124.1	2.041	84.4	0.172	31.5	0.618	-47.2	0.769	10.75
2.1	0.467	-129.8	1.973	81.8	0.172	30.6	0.609	-48.6	0.794	10.60
2.2	0.453	-133.9	1.895	79.1	0.172	30.0	0.596	-49.3	0.845	10.41
2.3	0.451	-139.2	1.841	76.7	0.173	29.3	0.593	-50.2	0.855	10.27
2.4	0.442	-143.2	1.782	74.2	0.174	28.8	0.578	-51.1	0.901	10.10
2.5	0.438	-148.1	1.728	71.9	0.174	28.5	0.573	-52.1	0.923	9.96
2.6	0.429	-151.4	1.679	70.0	0.175	28.0	0.565	-53.2	0.962	9.82
2.7	0.429	-155.5	1.627	67.6	0.175	27.7	0.560	-53.8	0.989	9.68
2.8	0.422	-159.5	1.573	65.8	0.175	27.5	0.551	-55.0	1.036	8.39
2.9	0.414	-162.7	1.509	62.4	0.175	26.8	0.531	-56.0	1.121	7.23
3.0	0.405	-167.3	1.480	60.1	0.176	26.9	0.523	-58.6	1.149	6.90
4.0	0.413	153.8	1.219	39.3	0.189	30.5	0.479	-76.4	1.308	4.77
5.0	0.479	120.3	0.974	20.6	0.218	31.4	0.441	-98.5	1.385	2.80

V_{CE} = 3 V, I_C = 3 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.875	-11.6	9.462	170.0	0.016	80.1	0.985	-6.1	0.134	27.70
0.2	0.851	-22.5	9.220	160.5	0.031	77.7	0.963	-11.8	0.142	24.78
0.3	0.810	-32.9	8.796	152.0	0.044	72.2	0.918	-16.7	0.212	23.02
0.4	0.758	-42.6	8.287	143.8	0.056	67.3	0.872	-21.7	0.281	21.67
0.5	0.699	-52.5	7.800	136.0	0.066	63.1	0.820	-25.7	0.348	20.70
0.6	0.641	-61.9	7.283	129.0	0.075	59.2	0.767	-29.6	0.412	19.88
0.7	0.590	-70.5	6.773	123.1	0.083	56.1	0.718	-32.7	0.471	19.14
0.8	0.538	-78.8	6.291	117.4	0.088	53.7	0.670	-35.5	0.535	18.52
0.9	0.491	-87.3	5.841	112.1	0.094	51.6	0.629	-38.1	0.591	17.95
1.0	0.453	-95.1	5.459	107.4	0.099	50.1	0.592	-40.3	0.645	17.43
1.1	0.424	-103.3	5.101	103.3	0.103	48.8	0.561	-42.3	0.688	16.97
1.2	0.398	-111.0	4.754	99.7	0.106	48.0	0.532	-44.1	0.734	16.50
1.3	0.377	-118.4	4.479	96.0	0.110	47.2	0.511	-45.5	0.774	16.10
1.4	0.362	-125.3	4.192	92.7	0.113	46.5	0.491	-47.1	0.814	15.68
1.5	0.349	-131.7	3.968	89.4	0.116	46.1	0.474	-48.4	0.849	15.32
1.6	0.341	-138.1	3.758	86.5	0.120	45.8	0.459	-49.5	0.881	14.97
1.7	0.333	-144.2	3.555	83.9	0.123	45.6	0.445	-50.5	0.916	14.62
1.8	0.327	-149.3	3.383	81.1	0.126	45.4	0.433	-51.2	0.948	14.30
1.9	0.323	-154.9	3.217	79.0	0.129	45.4	0.423	-52.0	0.975	13.98
2.0	0.317	-158.8	3.078	76.5	0.132	45.5	0.412	-52.3	1.007	13.15
2.1	0.322	-163.8	2.952	74.5	0.135	45.5	0.405	-53.4	1.020	12.54
2.2	0.315	-167.3	2.826	72.5	0.138	45.6	0.394	-53.5	1.058	11.66
2.3	0.323	-171.9	2.729	70.6	0.141	45.6	0.391	-54.2	1.056	11.41
2.4	0.321	-174.5	2.623	68.7	0.145	45.8	0.378	-54.8	1.084	10.80
2.5	0.326	-178.5	2.528	67.0	0.149	45.9	0.375	-55.5	1.091	10.47
2.6	0.323	178.3	2.453	65.7	0.152	45.9	0.367	-56.8	1.111	10.05
2.7	0.329	175.8	2.363	63.9	0.155	45.8	0.362	-56.8	1.121	9.70
2.8	0.327	172.6	2.277	62.4	0.159	45.8	0.356	-58.3	1.144	9.26
2.9	0.322	170.4	2.176	59.9	0.163	45.2	0.340	-59.2	1.187	8.64
3.0	0.318	165.6	2.124	58.0	0.167	45.4	0.338	-61.9	1.191	8.40
4.0	0.360	135.1	1.668	40.0	0.211	44.3	0.306	-82.3	1.204	6.26
5.0	0.449	110.0	1.323	24.2	0.258	37.1	0.272	-109.0	1.194	4.44

V_{CE} = 3 V, I_C = 5 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.800	-14.8	14.185	166.6	0.016	81.3	0.972	-8.5	0.138	29.61
0.2	0.762	-29.9	13.456	154.6	0.029	74.6	0.928	-16.1	0.203	26.73
0.3	0.699	-43.3	12.386	144.2	0.040	68.8	0.859	-22.2	0.293	24.91
0.4	0.632	-54.5	11.241	135.0	0.050	64.4	0.790	-27.6	0.383	23.52
0.5	0.560	-66.3	10.196	126.7	0.058	60.6	0.721	-31.6	0.469	22.47
0.6	0.500	-76.5	9.233	119.8	0.064	58.2	0.657	-35.0	0.546	21.58
0.7	0.451	-86.0	8.357	114.2	0.070	56.2	0.602	-37.4	0.617	20.77
0.8	0.404	-95.3	7.591	108.9	0.075	55.0	0.554	-39.6	0.686	20.05
0.9	0.369	-104.6	6.941	104.4	0.079	54.2	0.516	-41.6	0.742	19.41
1.0	0.339	-113.4	6.384	100.2	0.084	53.6	0.482	-43.4	0.796	18.81
1.1	0.321	-122.2	5.896	96.7	0.088	53.2	0.454	-44.8	0.840	18.27
1.2	0.309	-130.1	5.456	93.6	0.092	53.1	0.431	-46.3	0.877	17.72
1.3	0.298	-137.9	5.089	90.4	0.096	53.0	0.414	-47.5	0.909	17.22
1.4	0.292	-144.9	4.753	87.5	0.101	52.9	0.399	-48.8	0.939	16.75
1.5	0.285	-150.8	4.461	84.7	0.105	52.9	0.386	-49.8	0.968	16.29
1.6	0.284	-157.1	4.214	82.2	0.109	52.9	0.375	-50.8	0.990	15.89
1.7	0.283	-162.3	3.973	79.9	0.113	52.9	0.363	-51.6	1.014	14.73
1.8	0.282	-167.1	3.771	77.6	0.117	53.0	0.354	-52.2	1.035	13.94
1.9	0.283	-171.9	3.576	75.8	0.121	53.0	0.347	-52.9	1.054	13.29
2.0	0.280	-175.6	3.416	73.6	0.125	52.9	0.337	-53.1	1.075	12.69
2.1	0.290	-179.7	3.275	71.7	0.129	53.0	0.333	-54.1	1.077	12.34
2.2	0.289	177.4	3.131	70.0	0.133	53.0	0.322	-53.9	1.099	11.79
2.3	0.298	173.9	3.016	68.4	0.138	53.0	0.320	-54.6	1.096	11.51
2.4	0.297	171.5	2.900	66.7	0.143	52.8	0.308	-55.2	1.112	11.04
2.5	0.304	168.7	2.789	65.2	0.147	52.8	0.306	-56.0	1.114	10.72
2.6	0.302	165.9	2.700	64.0	0.152	52.7	0.299	-57.3	1.127	10.34
2.7	0.309	164.1	2.600	62.4	0.156	52.4	0.294	-57.3	1.131	10.02
2.8	0.310	161.1	2.507	61.1	0.160	52.1	0.289	-58.9	1.144	9.64
2.9	0.303	159.6	2.393	58.8	0.166	51.3	0.275	-60.0	1.175	9.06
3.0	0.304	154.7	2.335	56.9	0.171	51.3	0.274	-63.0	1.172	8.85
4.0	0.353	128.4	1.811	40.1	0.221	47.7	0.251	-85.9	1.164	6.69
5.0	0.441	106.4	1.435	25.2	0.270	38.6	0.224	-117.1	1.155	4.87

V_{CE} = 3 V, I_C = 7 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.736	-18.2	17.762	164.3	0.014	81.1	0.961	-10.3	0.147	30.92
0.2	0.696	-35.5	16.431	150.3	0.028	71.8	0.898	-19.2	0.263	27.73
0.3	0.619	-50.5	14.686	138.8	0.038	67.4	0.810	-25.7	0.360	25.92
0.4	0.544	-63.0	12.978	129.3	0.046	63.4	0.727	-31.0	0.463	24.51
0.5	0.473	-75.5	11.479	121.2	0.052	60.7	0.652	-34.6	0.556	23.40
0.6	0.418	-86.5	10.202	114.6	0.058	59.0	0.588	-37.3	0.639	22.44
0.7	0.373	-96.5	9.131	109.4	0.063	57.7	0.535	-39.3	0.711	21.58
0.8	0.334	-106.4	8.216	104.5	0.068	57.3	0.491	-41.0	0.777	20.80
0.9	0.310	-116.3	7.430	100.4	0.073	57.0	0.456	-42.5	0.830	20.08
1.0	0.288	-125.7	6.799	96.6	0.077	57.0	0.425	-44.0	0.878	19.43
1.1	0.277	-134.5	6.255	93.3	0.082	56.7	0.402	-45.2	0.915	18.83
1.2	0.271	-142.6	5.762	90.5	0.087	56.9	0.381	-46.6	0.947	18.23
1.3	0.266	-150.7	5.365	87.7	0.091	56.8	0.366	-47.6	0.973	17.69
1.4	0.265	-156.6	4.988	85.1	0.096	56.9	0.353	-48.9	0.999	17.16
1.5	0.262	-162.8	4.679	82.5	0.101	57.0	0.342	-49.9	1.020	15.80
1.6	0.266	-168.0	4.408	80.2	0.105	57.1	0.333	-50.8	1.035	15.08
1.7	0.268	-172.8	4.153	78.0	0.110	56.9	0.324	-51.6	1.054	14.36
1.8	0.270	-177.0	3.940	75.8	0.114	57.0	0.316	-52.1	1.066	13.80
1.9	0.272	178.7	3.734	74.1	0.119	56.9	0.310	-52.9	1.079	13.25
2.0	0.272	175.5	3.565	72.1	0.124	56.8	0.301	-53.0	1.094	12.73
2.1	0.282	171.9	3.415	70.4	0.128	56.7	0.298	-54.0	1.094	12.39
2.2	0.275	169.3	3.262	68.8	0.133	56.6	0.288	-53.8	1.117	11.82
2.3	0.292	166.7	3.145	67.2	0.138	56.4	0.286	-54.4	1.103	11.62
2.4	0.290	164.8	3.021	65.6	0.143	56.2	0.275	-55.0	1.117	11.16
2.5	0.298	162.1	2.906	64.1	0.148	56.1	0.273	-55.8	1.116	10.86
2.6	0.297	159.4	2.812	63.0	0.153	55.9	0.267	-57.1	1.124	10.50
2.7	0.302	158.0	2.709	61.5	0.158	55.6	0.263	-56.8	1.127	10.18
2.8	0.304	155.1	2.610	60.3	0.162	55.2	0.257	-58.7	1.139	9.80
2.9	0.298	154.0	2.490	58.1	0.168	54.2	0.244	-59.9	1.167	9.25
3.0	0.299	149.4	2.429	56.4	0.173	54.1	0.244	-63.2	1.161	9.03
4.0	0.352	125.5	1.873	39.9	0.225	49.2	0.226	-88.1	1.148	6.87
5.0	0.443	104.8	1.478	25.7	0.275	39.2	0.204	-122.3	1.138	5.04

V_{CE} = 3 V, I_C = 10 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.676	-22.3	22.003	161.3	0.014	82.7	0.944	-12.5	0.152	32.02
0.2	0.612	-42.9	19.679	145.3	0.025	71.9	0.855	-22.6	0.304	28.88
0.3	0.526	-59.1	16.963	133.1	0.034	66.5	0.749	-29.2	0.442	26.92
0.4	0.451	-73.0	14.543	123.5	0.042	63.2	0.658	-33.9	0.557	25.44
0.5	0.386	-86.6	12.577	115.7	0.047	61.7	0.583	-36.7	0.654	24.24
0.6	0.340	-98.4	10.996	109.6	0.053	60.8	0.521	-38.8	0.738	23.19
0.7	0.306	-109.1	9.727	104.9	0.058	60.4	0.473	-40.0	0.806	22.26
0.8	0.278	-119.8	8.676	100.4	0.063	60.5	0.433	-41.2	0.865	21.39
0.9	0.263	-130.2	7.819	96.7	0.068	60.4	0.402	-42.4	0.909	20.61
1.0	0.250	-139.7	7.112	93.3	0.073	60.8	0.375	-43.6	0.950	19.90
1.1	0.246	-148.1	6.522	90.4	0.078	60.8	0.356	-44.7	0.980	19.24
1.2	0.246	-155.8	5.980	87.9	0.083	61.0	0.337	-46.0	1.006	18.10
1.3	0.247	-163.1	5.562	85.3	0.088	61.0	0.326	-47.0	1.024	17.07
1.4	0.250	-168.6	5.172	82.9	0.093	61.0	0.315	-48.3	1.042	16.21
1.5	0.252	-173.7	4.838	80.5	0.098	60.8	0.306	-49.2	1.057	15.48
1.6	0.256	-178.4	4.560	78.3	0.103	60.8	0.298	-50.1	1.066	14.90
1.7	0.259	177.6	4.292	76.4	0.108	60.6	0.291	-51.0	1.078	14.28
1.8	0.264	173.8	4.069	74.3	0.113	60.4	0.284	-51.6	1.088	13.76
1.9	0.268	169.8	3.851	72.7	0.118	60.3	0.279	-52.3	1.097	13.24
2.0	0.267	167.1	3.675	70.8	0.123	60.1	0.272	-52.4	1.107	12.75
2.1	0.280	164.5	3.517	69.1	0.128	59.9	0.269	-53.4	1.103	12.44
2.2	0.277	161.9	3.364	67.6	0.133	59.7	0.260	-53.0	1.117	11.95
2.3	0.289	160.6	3.234	66.2	0.138	59.4	0.259	-53.8	1.108	11.68
2.4	0.288	158.7	3.110	64.7	0.144	59.0	0.248	-54.3	1.119	11.25
2.5	0.295	156.7	2.991	63.3	0.149	58.7	0.247	-55.2	1.117	10.94
2.6	0.296	154.1	2.893	62.1	0.154	58.5	0.240	-56.7	1.121	10.61
2.7	0.302	152.9	2.786	60.6	0.159	57.9	0.237	-56.3	1.122	10.30
2.8	0.303	150.5	2.686	59.5	0.164	57.5	0.231	-58.4	1.132	9.93
2.9	0.297	149.2	2.563	57.4	0.170	56.4	0.219	-59.7	1.156	9.39
3.0	0.299	144.6	2.496	55.7	0.176	56.1	0.220	-63.4	1.150	9.17
4.0	0.350	122.8	1.917	39.7	0.229	50.4	0.205	-90.2	1.137	6.98
5.0	0.444	103.5	1.513	25.9	0.280	39.6	0.190	-127.2	1.124	5.19

V_{CE} = 3 V, I_C = 20 mA, Z₀ = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.524	-31.2	29.776	154.7	0.013	79.3	0.896	-16.9	0.280	33.61
0.2	0.445	-59.6	24.547	135.5	0.022	69.8	0.758	-28.0	0.454	30.48
0.3	0.363	-80.1	19.730	122.9	0.029	66.8	0.631	-33.4	0.617	28.32
0.4	0.308	-95.6	16.104	113.9	0.035	65.3	0.540	-36.1	0.741	26.63
0.5	0.269	-112.0	13.477	107.4	0.040	65.7	0.475	-37.1	0.831	25.23
0.6	0.247	-124.7	11.550	102.1	0.046	65.9	0.424	-37.7	0.902	24.02
0.7	0.233	-136.9	10.103	98.2	0.051	66.0	0.387	-37.9	0.951	22.94
0.8	0.225	-147.7	8.906	94.4	0.057	66.7	0.357	-38.3	0.995	21.97
0.9	0.226	-156.8	7.971	91.4	0.062	66.8	0.334	-38.9	1.025	20.13
1.0	0.226	-164.9	7.224	88.5	0.068	67.0	0.314	-39.9	1.048	18.94
1.1	0.232	-172.0	6.593	86.0	0.073	67.0	0.300	-40.9	1.065	17.99
1.2	0.239	-176.8	6.038	84.0	0.079	67.0	0.287	-42.1	1.081	17.11
1.3	0.245	177.6	5.595	81.6	0.084	66.9	0.279	-43.1	1.090	16.40
1.4	0.253	174.0	5.198	79.5	0.090	66.6	0.271	-44.5	1.097	15.73
1.5	0.258	170.1	4.867	77.4	0.095	66.3	0.265	-45.6	1.103	15.13
1.6	0.265	166.8	4.569	75.4	0.101	65.9	0.261	-46.6	1.106	14.58
1.7	0.270	163.8	4.302	73.6	0.106	65.5	0.255	-47.6	1.112	14.03
1.8	0.273	161.0	4.071	71.7	0.112	65.3	0.250	-48.3	1.119	13.52
1.9	0.280	158.5	3.855	70.3	0.117	64.8	0.247	-49.3	1.122	13.05
2.0	0.279	156.3	3.676	68.4	0.122	64.4	0.241	-49.3	1.129	12.59
2.1	0.291	154.3	3.521	66.9	0.128	64.0	0.240	-50.6	1.120	12.29
2.2	0.289	152.4	3.365	65.5	0.134	63.6	0.232	-50.1	1.130	11.82
2.3	0.302	151.6	3.239	64.2	0.139	63.2	0.231	-51.1	1.118	11.58
2.4	0.299	150.2	3.110	62.8	0.145	62.6	0.222	-51.7	1.127	11.15
2.5	0.309	148.8	2.989	61.4	0.150	62.1	0.221	-52.7	1.123	10.86
2.6	0.308	146.5	2.894	60.4	0.156	61.7	0.215	-54.3	1.126	10.53
2.7	0.313	146.2	2.788	59.1	0.161	61.1	0.212	-53.8	1.126	10.23
2.8	0.314	143.9	2.685	58.0	0.166	60.4	0.207	-56.2	1.134	9.86
2.9	0.309	142.6	2.562	55.9	0.172	59.3	0.195	-57.7	1.156	9.34
3.0	0.311	138.8	2.494	54.4	0.178	59.0	0.197	-61.8	1.151	9.11
4.0	0.364	119.3	1.908	38.6	0.233	52.0	0.186	-91.3	1.133	6.91
5.0	0.454	101.8	1.502	25.3	0.284	40.8	0.178	-131.4	1.123	5.10

S-PARAMETERS Q2

V_{CE} = 1 V, I_C = 1 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.954	-18.3	3.604	167.3	0.045	79.3	0.983	-7.9	0.044	19.07
0.2	0.943	-34.7	3.487	155.5	0.086	69.6	0.956	-15.3	0.086	16.09
0.3	0.910	-50.4	3.289	144.5	0.121	60.6	0.903	-21.7	0.134	14.34
0.4	0.870	-64.8	3.065	134.4	0.150	52.1	0.851	-27.8	0.185	13.11
0.5	0.830	-79.3	2.841	124.7	0.172	44.7	0.794	-33.0	0.228	12.18
0.6	0.793	-92.0	2.620	116.0	0.188	38.0	0.738	-37.7	0.278	11.44
0.7	0.762	-103.5	2.409	108.9	0.200	32.4	0.689	-41.6	0.321	10.81
0.8	0.736	-113.9	2.213	101.8	0.207	27.4	0.646	-45.2	0.371	10.29
0.9	0.715	-123.4	2.036	95.4	0.211	23.0	0.611	-48.7	0.419	9.84
1.0	0.700	-131.9	1.891	89.6	0.213	19.4	0.582	-51.8	0.462	9.48
1.1	0.693	-139.7	1.756	84.4	0.213	16.0	0.559	-54.6	0.502	9.15
1.2	0.687	-146.5	1.629	79.7	0.212	13.3	0.541	-57.3	0.544	8.85
1.3	0.682	-152.9	1.526	75.1	0.210	10.7	0.528	-60.0	0.589	8.61
1.4	0.683	-158.2	1.426	71.0	0.207	8.7	0.518	-62.6	0.630	8.37
1.5	0.681	-163.0	1.345	66.8	0.203	6.8	0.510	-65.0	0.680	8.20
1.6	0.687	-167.6	1.275	63.1	0.199	5.3	0.504	-67.3	0.715	8.07
1.7	0.684	-171.8	1.202	59.8	0.194	4.2	0.499	-69.6	0.774	7.91
1.8	0.686	-175.5	1.143	56.3	0.189	3.3	0.495	-71.6	0.831	7.82
1.9	0.694	-179.0	1.089	53.5	0.184	2.6	0.493	-73.8	0.866	7.73
2.0	0.690	178.0	1.047	50.5	0.179	2.3	0.488	-75.8	0.941	7.68
2.1	0.702	174.9	1.005	48.0	0.173	2.2	0.491	-78.5	0.955	7.63
2.2	0.694	172.4	0.963	45.6	0.168	2.5	0.487	-80.7	1.058	6.11
2.3	0.707	169.6	0.931	43.6	0.163	2.8	0.494	-82.9	1.055	6.14
2.4	0.704	167.1	0.900	41.5	0.159	3.6	0.491	-85.6	1.135	5.30
2.5	0.709	164.5	0.863	39.4	0.154	4.5	0.493	-87.8	1.189	4.85
2.6	0.711	162.1	0.840	37.8	0.150	5.7	0.496	-91.0	1.235	4.57
2.7	0.715	160.3	0.808	35.8	0.146	7.1	0.498	-93.0	1.294	4.18
2.8	0.714	157.7	0.778	34.4	0.142	8.9	0.505	-95.9	1.360	3.79
2.9	0.704	155.6	0.736	32.0	0.139	10.6	0.495	-98.1	1.566	2.80
3.0	0.708	152.2	0.714	29.7	0.138	13.1	0.497	-101.5	1.611	2.56
4.0	0.736	125.6	0.557	13.2	0.168	37.1	0.543	-131.4	1.554	0.83
5.0	0.760	103.6	0.436	7.9	0.256	35.7	0.592	-160.3	1.367	-1.29

V_{CE} = 1 V, I_C = 3 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.898	-29.2	9.720	160.9	0.041	74.5	0.947	-16.7	0.060	23.70
0.2	0.838	-55.1	8.827	144.4	0.076	61.2	0.857	-31.0	0.131	20.63
0.3	0.777	-77.3	7.706	131.2	0.099	50.8	0.743	-42.0	0.199	18.89
0.4	0.725	-95.3	6.654	120.5	0.115	43.1	0.641	-51.0	0.268	17.63
0.5	0.686	-111.1	5.738	111.6	0.124	37.5	0.554	-58.0	0.331	16.64
0.6	0.655	-124.2	5.040	104.4	0.130	33.4	0.483	-64.0	0.399	15.87
0.7	0.639	-134.7	4.458	98.7	0.135	30.4	0.429	-69.0	0.459	15.20
0.8	0.624	-144.2	3.970	93.3	0.137	28.2	0.385	-73.6	0.525	14.61
0.9	0.617	-152.0	3.556	88.7	0.139	26.5	0.352	-78.0	0.586	14.08
1.0	0.612	-158.9	3.235	84.5	0.140	25.6	0.327	-82.3	0.646	13.64
1.1	0.614	-164.8	2.956	80.7	0.141	24.9	0.308	-85.9	0.697	13.22
1.2	0.616	-169.9	2.709	77.5	0.142	24.7	0.295	-89.4	0.748	12.81
1.3	0.616	-174.7	2.512	74.1	0.142	24.6	0.286	-92.3	0.799	12.46
1.4	0.620	-178.6	2.333	71.2	0.143	24.6	0.280	-95.1	0.844	12.12
1.5	0.621	177.7	2.186	68.1	0.144	24.8	0.274	-97.6	0.894	11.81
1.6	0.625	174.5	2.060	65.3	0.145	25.3	0.271	-99.7	0.932	11.53
1.7	0.626	171.4	1.935	62.7	0.146	25.6	0.268	-101.8	0.982	11.23
1.8	0.630	168.8	1.836	60.1	0.147	26.3	0.265	-103.6	1.021	10.08
1.9	0.635	165.9	1.744	58.0	0.148	26.9	0.265	-105.5	1.053	9.30
2.0	0.631	163.7	1.671	55.6	0.150	27.8	0.261	-107.3	1.100	8.55
2.1	0.644	161.2	1.603	53.5	0.151	28.7	0.263	-109.3	1.098	8.35
2.2	0.640	159.3	1.535	51.8	0.153	29.5	0.259	-111.5	1.153	7.65
2.3	0.651	157.6	1.477	50.0	0.155	30.3	0.262	-113.1	1.147	7.45
2.4	0.648	155.6	1.423	48.0	0.158	31.1	0.260	-116.0	1.184	6.95
2.5	0.654	153.8	1.367	46.3	0.161	31.8	0.262	-117.6	1.193	6.63
2.6	0.657	151.8	1.330	44.8	0.163	32.6	0.269	-120.5	1.201	6.40
2.7	0.660	150.5	1.281	43.2	0.167	33.3	0.267	-122.0	1.215	6.05
2.8	0.660	148.5	1.237	41.9	0.170	33.9	0.276	-124.7	1.234	5.70
2.9	0.647	146.9	1.174	39.5	0.174	34.0	0.272	-127.4	1.318	4.91
3.0	0.649	143.5	1.144	37.4	0.178	34.8	0.281	-129.8	1.313	4.72
4.0	0.679	121.4	0.890	18.5	0.226	36.7	0.351	-153.0	1.259	2.89
5.0	0.716	101.9	0.686	6.9	0.285	29.7	0.427	-175.2	1.221	0.97

V_{CE} = 1 V, I_C = 5 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.818	-38.5	14.773	155.4	0.040	70.7	0.907	-24.2	0.107	25.64
0.2	0.755	-71.5	12.503	136.1	0.067	55.6	0.765	-43.3	0.182	22.70
0.3	0.693	-96.3	10.248	122.5	0.083	46.3	0.622	-56.9	0.273	20.90
0.4	0.650	-114.6	8.455	112.3	0.093	40.6	0.514	-67.4	0.361	19.60
0.5	0.622	-129.6	7.095	104.6	0.099	37.2	0.431	-75.8	0.445	18.56
0.6	0.604	-141.4	6.076	98.3	0.103	35.2	0.370	-83.2	0.527	17.70
0.7	0.598	-150.6	5.304	93.6	0.106	34.0	0.325	-89.7	0.598	16.97
0.8	0.591	-158.5	4.675	89.1	0.110	33.8	0.293	-96.1	0.672	16.30
0.9	0.591	-165.1	4.165	85.4	0.113	33.5	0.270	-102.1	0.735	15.68
1.0	0.592	-170.9	3.769	81.8	0.115	33.8	0.255	-107.8	0.793	15.15
1.1	0.595	-175.7	3.435	78.6	0.118	34.1	0.245	-112.4	0.842	14.64
1.2	0.600	-179.8	3.133	75.9	0.121	34.7	0.238	-116.7	0.888	14.13
1.3	0.601	176.1	2.901	73.0	0.124	35.3	0.234	-120.1	0.931	13.68
1.4	0.606	173.0	2.690	70.5	0.128	35.8	0.232	-123.0	0.964	13.24
1.5	0.608	170.0	2.518	67.7	0.131	36.4	0.230	-125.7	1.001	12.65
1.6	0.614	167.2	2.369	65.3	0.134	37.0	0.229	-127.8	1.023	11.52
1.7	0.617	164.6	2.223	63.1	0.138	37.6	0.227	-130.0	1.055	10.64
1.8	0.617	162.1	2.107	60.8	0.142	38.2	0.226	-132.0	1.084	9.96
1.9	0.622	159.8	2.004	59.0	0.146	38.7	0.227	-133.4	1.097	9.49
2.0	0.621	157.8	1.911	56.9	0.150	39.2	0.224	-135.6	1.125	8.92
2.1	0.632	155.9	1.840	55.0	0.154	39.7	0.226	-136.8	1.112	8.74
2.2	0.627	154.2	1.756	53.4	0.158	40.2	0.222	-139.6	1.152	8.09
2.3	0.638	152.7	1.691	51.7	0.163	40.4	0.224	-140.7	1.136	7.92
2.4	0.636	150.9	1.633	49.9	0.168	40.7	0.226	-143.8	1.153	7.52
2.5	0.642	149.2	1.565	48.3	0.172	40.9	0.226	-145.0	1.157	7.18
2.6	0.642	147.2	1.521	46.8	0.177	41.2	0.233	-147.1	1.162	6.91
2.7	0.645	146.2	1.465	45.3	0.182	41.2	0.231	-148.7	1.169	6.57
2.8	0.647	144.4	1.417	44.0	0.187	41.2	0.241	-150.7	1.171	6.30
2.9	0.632	143.1	1.347	41.8	0.192	40.8	0.240	-153.8	1.232	5.56
3.0	0.634	139.7	1.313	39.9	0.198	41.0	0.250	-154.6	1.225	5.36
4.0	0.662	119.0	1.019	21.5	0.250	37.4	0.322	-170.5	1.190	3.47
5.0	0.702	100.8	0.789	9.4	0.302	28.0	0.397	171.8	1.176	1.63

V_{CE} = 1 V, I_C = 7 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.753	-47.6	18.808	151.0	0.038	67.4	0.869	-30.6	0.138	26.93
0.2	0.694	-84.7	14.984	130.0	0.060	52.4	0.692	-53.0	0.233	23.95
0.3	0.638	-109.4	11.754	116.7	0.072	44.8	0.543	-68.0	0.347	22.14
0.4	0.610	-127.4	9.457	107.4	0.080	40.6	0.439	-79.7	0.447	20.75
0.5	0.592	-141.1	7.785	100.6	0.084	39.0	0.367	-89.4	0.542	19.65
0.6	0.582	-151.5	6.614	94.9	0.089	38.4	0.317	-98.0	0.631	18.73
0.7	0.583	-159.7	5.744	90.9	0.093	38.3	0.283	-105.6	0.699	17.91
0.8	0.582	-166.7	5.048	86.8	0.097	38.9	0.261	-113.1	0.769	17.18
0.9	0.582	-172.3	4.475	83.4	0.101	39.4	0.247	-119.8	0.832	16.48
1.0	0.585	-177.4	4.035	80.4	0.105	40.2	0.239	-126.0	0.883	15.85
1.1	0.591	178.4	3.678	77.4	0.109	41.0	0.235	-130.6	0.922	15.29
1.2	0.595	175.0	3.351	75.0	0.113	41.7	0.233	-134.8	0.961	14.70
1.3	0.597	171.3	3.097	72.4	0.118	42.3	0.232	-138.0	0.996	14.20
1.4	0.603	168.5	2.876	70.1	0.123	42.9	0.233	-140.6	1.017	12.90
1.5	0.604	165.7	2.685	67.6	0.128	43.4	0.233	-143.1	1.045	11.93
1.6	0.608	163.1	2.527	65.4	0.132	43.9	0.233	-144.9	1.062	11.30
1.7	0.610	160.8	2.371	63.3	0.137	44.3	0.233	-147.0	1.085	10.60
1.8	0.612	158.9	2.246	61.1	0.142	44.6	0.232	-148.8	1.100	10.07
1.9	0.618	156.5	2.135	59.2	0.147	44.9	0.234	-150.0	1.106	9.64
2.0	0.617	154.8	2.042	57.4	0.153	45.0	0.232	-152.2	1.122	9.14
2.1	0.627	152.9	1.957	55.5	0.158	45.3	0.233	-153.2	1.113	8.89
2.2	0.624	151.1	1.870	54.0	0.163	45.5	0.230	-156.1	1.138	8.35
2.3	0.634	150.1	1.800	52.4	0.168	45.4	0.232	-157.0	1.122	8.17
2.4	0.629	148.2	1.736	50.7	0.174	45.2	0.234	-160.0	1.139	7.72
2.5	0.638	146.7	1.667	49.1	0.180	45.2	0.235	-161.0	1.133	7.46
2.6	0.638	145.1	1.620	48.0	0.185	45.1	0.242	-162.8	1.136	7.18
2.7	0.643	144.2	1.559	46.7	0.191	44.8	0.240	-164.6	1.137	6.88
2.8	0.642	142.4	1.506	45.3	0.196	44.4	0.250	-165.9	1.144	6.55
2.9	0.627	141.0	1.435	43.3	0.202	43.7	0.251	-168.7	1.190	5.87
3.0	0.628	137.9	1.397	41.4	0.208	43.7	0.260	-168.9	1.187	5.65
4.0	0.654	117.7	1.084	23.1	0.262	37.9	0.327	179.3	1.162	3.73
5.0	0.697	100.0	0.841	11.1	0.311	27.5	0.400	164.2	1.151	1.96

V_{CE} = 1 V, I_C = 10 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.695	-60.3	23.420	145.8	0.035	63.8	0.816	-38.5	0.164	28.23
0.2	0.636	-99.6	17.364	123.7	0.052	49.5	0.610	-64.0	0.302	25.22
0.3	0.599	-123.9	13.037	111.3	0.061	44.6	0.466	-80.7	0.434	23.30
0.4	0.581	-139.8	10.285	102.9	0.067	42.8	0.377	-93.7	0.549	21.83
0.5	0.573	-152.1	8.365	96.9	0.072	42.8	0.321	-104.6	0.652	20.63
0.6	0.571	-161.1	7.052	92.0	0.077	43.3	0.284	-114.4	0.738	19.61
0.7	0.574	-167.7	6.094	88.4	0.082	44.2	0.263	-122.7	0.804	18.69
0.8	0.575	-173.9	5.341	84.8	0.087	45.3	0.250	-130.4	0.866	17.86
0.9	0.578	-178.6	4.730	81.8	0.092	46.0	0.244	-136.8	0.918	17.09
1.0	0.582	176.9	4.258	79.0	0.098	46.9	0.243	-142.4	0.957	16.38
1.1	0.587	173.5	3.870	76.4	0.103	47.6	0.244	-146.5	0.987	15.73
1.2	0.593	170.2	3.526	74.1	0.109	48.4	0.246	-150.0	1.016	14.33
1.3	0.598	167.0	3.259	71.7	0.115	48.8	0.247	-152.7	1.035	13.39
1.4	0.604	164.6	3.024	69.6	0.121	49.1	0.250	-154.8	1.048	12.65
1.5	0.603	162.0	2.825	67.3	0.126	49.5	0.251	-156.9	1.070	11.89
1.6	0.609	159.9	2.655	65.2	0.132	49.6	0.252	-158.5	1.075	11.35
1.7	0.611	157.8	2.493	63.3	0.138	49.8	0.253	-160.4	1.091	10.72
1.8	0.613	155.7	2.360	61.3	0.144	49.9	0.253	-162.0	1.102	10.20
1.9	0.618	153.7	2.244	59.6	0.150	49.9	0.255	-162.8	1.102	9.80
2.0	0.614	151.9	2.142	57.9	0.156	49.8	0.254	-164.9	1.118	9.28
2.1	0.627	150.5	2.055	56.1	0.162	49.7	0.254	-165.7	1.101	9.10
2.2	0.622	148.8	1.966	54.7	0.168	49.6	0.253	-168.5	1.123	8.55
2.3	0.635	147.7	1.889	53.2	0.174	49.3	0.254	-169.5	1.103	8.40
2.4	0.630	146.2	1.820	51.5	0.180	48.8	0.257	-172.2	1.117	7.95
2.5	0.636	144.8	1.748	50.1	0.187	48.5	0.257	-173.1	1.115	7.66
2.6	0.638	142.9	1.697	48.9	0.193	48.3	0.265	-174.6	1.113	7.40
2.7	0.641	142.3	1.636	47.6	0.199	47.7	0.262	-176.4	1.113	7.11
2.8	0.642	140.5	1.578	46.3	0.204	47.1	0.272	-177.3	1.118	6.79
2.9	0.624	139.3	1.502	44.3	0.211	46.2	0.275	-179.7	1.162	6.09
3.0	0.625	136.2	1.469	42.6	0.218	45.9	0.283	-179.7	1.155	5.90
4.0	0.649	116.5	1.134	24.6	0.272	38.4	0.343	171.2	1.139	3.93
5.0	0.691	99.1	0.884	12.7	0.319	27.2	0.413	157.8	1.136	2.18

V_{CE} = 1 V, I_C = 20 mA, Z₀ = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.551	-88.1	31.618	134.6	0.028	58.8	0.689	-55.9	0.297	30.55
0.2	0.565	-128.5	20.413	113.3	0.039	49.2	0.472	-86.4	0.476	27.21
0.3	0.557	-147.6	14.491	103.1	0.045	49.5	0.365	-105.5	0.641	25.05
0.4	0.562	-159.3	11.132	96.4	0.052	50.6	0.312	-120.0	0.753	23.31
0.5	0.563	-167.7	8.930	91.8	0.058	52.6	0.284	-131.4	0.846	21.86
0.6	0.566	-174.4	7.487	87.8	0.065	54.2	0.271	-140.7	0.909	20.62
0.7	0.574	-179.2	6.444	85.0	0.072	55.5	0.266	-148.0	0.951	19.52
0.8	0.576	176.1	5.620	82.0	0.079	56.4	0.266	-154.1	0.992	18.55
0.9	0.584	172.7	4.975	79.6	0.085	56.9	0.270	-158.7	1.016	16.87
1.0	0.590	169.1	4.471	77.1	0.093	57.5	0.275	-162.6	1.035	15.69
1.1	0.594	166.4	4.064	74.8	0.100	57.9	0.279	-165.2	1.049	14.75
1.2	0.601	164.0	3.698	73.0	0.107	58.0	0.285	-167.3	1.061	13.89
1.3	0.606	161.4	3.414	70.8	0.114	58.0	0.288	-169.2	1.068	13.18
1.4	0.609	159.4	3.166	68.9	0.121	57.9	0.292	-170.5	1.075	12.51
1.5	0.612	157.0	2.955	66.8	0.128	57.7	0.295	-172.0	1.084	11.88
1.6	0.614	155.3	2.778	64.9	0.135	57.5	0.297	-173.0	1.085	11.36
1.7	0.618	153.4	2.607	63.2	0.142	57.0	0.299	-174.5	1.091	10.81
1.8	0.619	151.8	2.471	61.4	0.149	56.7	0.300	-175.8	1.095	10.33
1.9	0.623	150.0	2.347	59.9	0.156	56.2	0.301	-176.5	1.093	9.92
2.0	0.621	148.2	2.243	58.2	0.163	55.7	0.301	-178.3	1.100	9.47
2.1	0.631	146.7	2.149	56.5	0.169	55.2	0.300	-179.1	1.087	9.23
2.2	0.627	145.4	2.054	55.3	0.176	54.7	0.300	178.3	1.101	8.73
2.3	0.640	144.7	1.974	53.7	0.183	54.0	0.301	177.4	1.084	8.57
2.4	0.636	143.3	1.903	52.2	0.190	53.2	0.305	175.2	1.091	8.17
2.5	0.639	141.9	1.826	50.9	0.197	52.6	0.304	174.3	1.090	7.85
2.6	0.641	140.2	1.777	49.6	0.203	52.0	0.312	173.0	1.087	7.62
2.7	0.645	139.1	1.708	48.3	0.210	51.2	0.310	171.2	1.088	7.30
2.8	0.646	137.7	1.648	47.2	0.216	50.2	0.319	170.6	1.090	7.00
2.9	0.629	136.4	1.575	45.3	0.223	49.1	0.323	168.6	1.122	6.37
3.0	0.629	133.6	1.536	43.6	0.230	48.6	0.329	168.8	1.119	6.15
4.0	0.649	114.7	1.184	26.3	0.286	39.2	0.380	161.9	1.111	4.14
5.0	0.692	98.2	0.921	15.1	0.331	26.9	0.445	150.4	1.112	2.41

V_{CE} = 2 V, I_C = 1 mA, Z₀ = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.955	-17.0	3.558	168.4	0.035	81.7	0.986	-6.4	0.015	20.05
0.2	0.952	-31.6	3.464	157.7	0.070	71.8	0.967	-12.4	0.078	16.96
0.3	0.921	-46.2	3.314	147.7	0.099	63.3	0.924	-17.7	0.126	15.24
0.4	0.883	-59.9	3.111	138.0	0.125	55.4	0.881	-22.8	0.173	13.97
0.5	0.848	-73.8	2.913	128.7	0.145	48.3	0.832	-27.3	0.215	13.03
0.6	0.813	-86.2	2.721	120.4	0.160	41.8	0.785	-31.4	0.259	12.31
0.7	0.783	-97.4	2.518	113.3	0.171	36.2	0.741	-34.8	0.301	11.67
0.8	0.753	-107.9	2.332	106.3	0.179	31.2	0.701	-38.0	0.349	11.16
0.9	0.731	-117.5	2.159	100.0	0.184	26.7	0.668	-41.1	0.395	10.70
1.0	0.714	-126.5	2.010	94.1	0.186	23.0	0.640	-43.9	0.437	10.33
1.1	0.703	-134.4	1.875	88.9	0.187	19.7	0.616	-46.3	0.480	10.01
1.2	0.695	-141.4	1.741	84.4	0.187	17.0	0.598	-48.7	0.522	9.70
1.3	0.690	-148.0	1.635	79.8	0.185	14.5	0.585	-50.9	0.562	9.46
1.4	0.689	-153.7	1.530	75.5	0.183	12.2	0.574	-53.3	0.604	9.23
1.5	0.687	-159.0	1.443	71.4	0.180	10.5	0.565	-55.6	0.650	9.05
1.6	0.687	-163.8	1.369	67.7	0.176	9.0	0.558	-57.7	0.694	8.92
1.7	0.688	-168.1	1.293	64.2	0.172	7.9	0.551	-59.8	0.748	8.77
1.8	0.689	-172.1	1.228	60.6	0.167	7.0	0.547	-61.6	0.807	8.67
1.9	0.695	-176.0	1.168	57.9	0.162	6.4	0.542	-63.7	0.847	8.57
2.0	0.690	-179.1	1.120	55.0	0.158	6.1	0.537	-65.6	0.926	8.51
2.1	0.702	177.6	1.081	52.4	0.153	6.3	0.537	-68.1	0.937	8.50
2.2	0.693	174.8	1.035	50.2	0.148	6.6	0.533	-70.0	1.043	7.18
2.3	0.704	171.7	1.000	48.0	0.144	7.2	0.540	-72.1	1.039	7.21
2.4	0.701	169.2	0.963	46.0	0.140	8.3	0.535	-74.4	1.128	6.19
2.5	0.707	166.5	0.924	43.7	0.136	9.4	0.536	-76.5	1.176	5.77
2.6	0.707	163.9	0.900	42.3	0.132	10.9	0.539	-79.3	1.227	5.45
2.7	0.711	161.9	0.865	40.2	0.129	12.7	0.539	-81.1	1.283	5.05
2.8	0.711	159.4	0.833	38.8	0.126	14.9	0.543	-83.7	1.350	4.66
2.9	0.700	157.1	0.788	36.1	0.124	16.7	0.530	-85.9	1.568	3.59
3.0	0.702	153.5	0.766	33.8	0.123	19.5	0.531	-89.2	1.616	3.34
4.0	0.730	126.5	0.596	16.6	0.161	44.3	0.559	-118.6	1.481	1.59
5.0	0.757	104.1	0.460	9.5	0.253	41.3	0.594	-148.6	1.287	-0.61

$V_{CE} = 2\text{ V}$, $I_C = 3\text{ mA}$, $Z_o = 50\ \Omega$

Frequency (GHz)	S ₁₁			S ₂₁			S ₁₂			S ₂₂			K	MAG/MSG (dB)
	MAG.	ANG. (deg.)		MAG.	ANG. (deg.)		MAG.	ANG. (deg.)		MAG.	ANG. (deg.)			
0.1	0.890	-25.0		9.801	162.8		0.033	75.2		0.959	-13.3		0.092	24.78
0.2	0.853	-49.3		9.059	147.7		0.063	64.2		0.886	-25.1		0.127	21.55
0.3	0.793	-69.6		8.072	135.2		0.084	54.7		0.786	-34.2		0.193	19.84
0.4	0.738	-86.9		7.093	124.7		0.099	47.0		0.693	-41.7		0.262	18.56
0.5	0.692	-102.7		6.214	115.7		0.108	41.2		0.610	-47.4		0.326	17.58
0.6	0.656	-115.9		5.503	108.3		0.115	37.0		0.540	-52.1		0.392	16.81
0.7	0.636	-126.8		4.900	102.5		0.119	33.9		0.484	-55.9		0.450	16.14
0.8	0.616	-136.9		4.390	96.9		0.122	31.7		0.438	-59.3		0.515	15.56
0.9	0.606	-145.2		3.948	92.2		0.124	29.9		0.402	-62.4		0.576	15.03
1.0	0.600	-152.8		3.598	87.8		0.125	28.8		0.374	-65.5		0.633	14.58
1.1	0.599	-159.0		3.299	84.0		0.126	28.0		0.353	-68.1		0.685	14.17
1.2	0.599	-164.6		3.021	80.7		0.127	27.8		0.335	-70.7		0.738	13.75
1.3	0.600	-170.0		2.808	77.3		0.128	27.6		0.324	-73.0		0.786	13.40
1.4	0.603	-173.9		2.609	74.2		0.129	27.7		0.315	-75.3		0.831	13.05
1.5	0.603	-178.1		2.443	71.1		0.130	27.9		0.308	-77.3		0.881	12.74
1.6	0.607	178.2		2.305	68.3		0.131	28.2		0.303	-79.2		0.920	12.47
1.7	0.609	175.1		2.167	65.7		0.132	28.9		0.297	-81.0		0.966	12.16
1.8	0.610	172.1		2.053	63.0		0.133	29.5		0.293	-82.5		1.013	11.19
1.9	0.617	168.9		1.949	60.9		0.134	30.3		0.292	-84.3		1.037	10.45
2.0	0.613	166.8		1.861	58.5		0.136	31.2		0.286	-85.7		1.088	9.57
2.1	0.623	164.4		1.790	56.3		0.137	32.1		0.287	-87.7		1.090	9.33
2.2	0.620	162.1		1.709	54.5		0.139	33.0		0.281	-89.4		1.146	8.58
2.3	0.632	160.2		1.649	52.8		0.141	34.0		0.284	-90.9		1.129	8.49
2.4	0.631	158.0		1.585	51.0		0.144	34.8		0.279	-93.5		1.167	7.94
2.5	0.634	156.1		1.521	49.1		0.147	35.8		0.280	-95.0		1.185	7.56
2.6	0.637	154.0		1.478	47.6		0.150	36.6		0.283	-98.1		1.187	7.33
2.7	0.642	152.6		1.422	45.9		0.153	37.4		0.281	-99.4		1.200	6.99
2.8	0.643	150.5		1.374	44.7		0.156	38.0		0.286	-102.4		1.216	6.66
2.9	0.629	148.9		1.301	42.3		0.159	38.3		0.279	-104.8		1.306	5.81
3.0	0.631	145.6		1.266	40.1		0.164	39.2		0.286	-107.9		1.301	5.59
4.0	0.664	122.8		0.982	21.0		0.213	41.7		0.337	-134.9		1.229	3.75
5.0	0.704	102.9		0.749	8.2		0.276	34.4		0.402	-161.0		1.179	1.78

$V_{CE} = 2\text{ V}$, $I_C = 5\text{ mA}$, $Z_o = 50\ \Omega$

Frequency (GHz)	S ₁₁			S ₂₁			S ₁₂			S ₂₂			K	MAG/MSG (dB)
	MAG.	ANG. (deg.)		MAG.	ANG. (deg.)		MAG.	ANG. (deg.)		MAG.	ANG. (deg.)			
0.1	0.836	-33.6		14.979	158.2		0.033	71.3		0.927	-19.3		0.121	26.63
0.2	0.772	-63.0		13.076	140.0		0.057	59.4		0.807	-35.0		0.179	23.63
0.3	0.702	-86.7		11.024	126.7		0.071	50.4		0.675	-46.0		0.266	21.89
0.4	0.648	-104.8		9.249	116.5		0.081	44.6		0.566	-54.5		0.356	20.55
0.5	0.612	-120.5		7.852	108.3		0.088	40.8		0.480	-60.8		0.438	19.51
0.6	0.589	-132.8		6.780	102.0		0.092	38.5		0.413	-66.1		0.518	18.67
0.7	0.578	-142.7		5.956	97.0		0.096	37.2		0.362	-70.4		0.587	17.92
0.8	0.567	-151.5		5.262	92.3		0.099	36.6		0.323	-74.8		0.660	17.25
0.9	0.565	-158.7		4.699	88.3		0.102	36.2		0.293	-78.9		0.725	16.64
1.0	0.562	-165.1		4.255	84.6		0.105	36.6		0.271	-83.1		0.784	16.09
1.1	0.566	-170.4		3.883	81.4		0.107	36.8		0.255	-86.6		0.831	15.58
1.2	0.570	-175.1		3.553	78.6		0.110	37.4		0.243	-90.2		0.877	15.08
1.3	0.573	-179.5		3.288	75.7		0.113	37.9		0.234	-93.0		0.918	14.63
1.4	0.576	177.1		3.051	73.1		0.116	38.4		0.229	-95.7		0.954	14.18
1.5	0.577	173.6		2.853	70.3		0.120	39.0		0.224	-98.1		0.991	13.78
1.6	0.583	170.7		2.684	68.0		0.123	39.7		0.221	-100.1		1.016	12.64
1.7	0.587	167.7		2.520	65.6		0.126	40.3		0.217	-102.3		1.047	11.69
1.8	0.587	165.3		2.388	63.2		0.130	40.9		0.214	-103.9		1.073	11.00
1.9	0.596	162.7		2.267	61.3		0.133	41.5		0.214	-105.7		1.080	10.58
2.0	0.590	160.6		2.164	59.2		0.137	42.0		0.209	-107.4		1.116	9.91
2.1	0.601	158.6		2.077	57.2		0.141	42.6		0.210	-108.9		1.107	9.69
2.2	0.597	156.6		1.984	55.7		0.145	43.1		0.204	-111.1		1.144	9.07
2.3	0.610	155.1		1.911	53.9		0.149	43.5		0.206	-112.5		1.124	8.94
2.4	0.609	153.4		1.839	52.3		0.154	43.8		0.204	-115.6		1.142	8.48
2.5	0.614	151.5		1.767	50.6		0.159	44.1		0.204	-117.0		1.144	8.17
2.6	0.615	149.6		1.714	49.3		0.163	44.4		0.209	-120.0		1.148	7.88
2.7	0.619	148.5		1.652	47.7		0.168	44.6		0.205	-121.3		1.152	7.57
2.8	0.619	146.7		1.590	46.4		0.172	44.5		0.213	-124.2		1.164	7.20
2.9	0.606	145.0		1.513	44.2		0.177	44.1		0.209	-127.5		1.221	6.47
3.0	0.608	142.0		1.471	42.2		0.183	44.3		0.218	-129.7		1.213	6.27
4.0	0.639	120.7		1.137	23.6		0.235	41.6		0.282	-152.0		1.172	4.33
5.0	0.685	102.1		0.872	10.5		0.290	32.2		0.353	-174.3		1.147	2.45

$V_{CE} = 2\text{ V}$, $I_C = 7\text{ mA}$, $Z_o = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.759	-41.5	19.307	154.2	0.031	69.9	0.895	-24.4	0.137	27.95
0.2	0.707	-74.3	15.948	134.4	0.051	56.6	0.739	-42.8	0.226	24.92
0.3	0.638	-99.3	12.851	120.9	0.063	48.7	0.592	-54.9	0.338	23.09
0.4	0.598	-117.3	10.516	111.3	0.071	44.4	0.482	-63.9	0.437	21.72
0.5	0.572	-132.0	8.756	104.0	0.076	42.4	0.402	-70.8	0.531	20.62
0.6	0.557	-143.7	7.494	98.1	0.080	41.4	0.342	-76.8	0.618	19.71
0.7	0.553	-152.4	6.525	93.9	0.084	41.2	0.298	-82.2	0.688	18.89
0.8	0.548	-160.3	5.736	89.6	0.088	41.6	0.265	-87.5	0.759	18.14
0.9	0.547	-166.5	5.111	86.1	0.092	42.0	0.242	-92.8	0.821	17.46
1.0	0.549	-172.2	4.608	82.9	0.096	42.6	0.225	-98.0	0.872	16.82
1.1	0.554	-176.9	4.198	79.9	0.099	43.3	0.214	-102.4	0.914	16.25
1.2	0.559	179.2	3.833	77.4	0.104	44.0	0.207	-106.7	0.949	15.66
1.3	0.562	175.0	3.546	74.7	0.108	44.6	0.202	-110.0	0.982	15.16
1.4	0.566	172.1	3.290	72.3	0.113	45.1	0.200	-113.0	1.007	14.15
1.5	0.569	169.0	3.073	69.8	0.117	45.7	0.197	-115.7	1.032	13.11
1.6	0.573	166.4	2.890	67.5	0.121	46.2	0.195	-117.7	1.051	12.39
1.7	0.576	164.0	2.714	65.4	0.126	46.6	0.193	-120.1	1.071	11.71
1.8	0.578	161.6	2.568	63.3	0.130	47.0	0.191	-122.0	1.089	11.12
1.9	0.583	159.2	2.439	61.5	0.135	47.3	0.192	-123.5	1.095	10.68
2.0	0.580	157.2	2.327	59.6	0.140	47.5	0.187	-125.6	1.117	10.12
2.1	0.593	155.4	2.231	57.7	0.145	47.9	0.189	-127.0	1.102	9.92
2.2	0.590	153.5	2.135	56.3	0.150	48.0	0.184	-129.6	1.126	9.38
2.3	0.602	152.3	2.051	54.7	0.155	48.0	0.185	-130.9	1.109	9.20
2.4	0.599	150.5	1.975	52.9	0.161	48.0	0.185	-134.3	1.124	8.75
2.5	0.604	149.1	1.895	51.4	0.166	48.0	0.185	-135.4	1.125	8.43
2.6	0.605	147.3	1.841	50.2	0.171	48.1	0.190	-138.2	1.125	8.16
2.7	0.609	146.2	1.771	48.8	0.176	47.9	0.187	-139.6	1.128	7.84
2.8	0.611	144.5	1.709	47.6	0.182	47.6	0.195	-142.1	1.131	7.53
2.9	0.597	143.2	1.623	45.5	0.188	46.9	0.194	-145.6	1.180	6.81
3.0	0.597	139.9	1.582	43.6	0.194	46.9	0.204	-146.7	1.176	6.59
4.0	0.628	119.6	1.219	25.2	0.247	41.7	0.272	-164.1	1.143	4.63
5.0	0.676	101.5	0.939	12.2	0.299	31.3	0.344	176.6	1.128	2.79

$V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$, $Z_o = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.707	-49.7	24.190	149.4	0.028	67.7	0.853	-30.6	0.164	29.31
0.2	0.639	-88.0	18.849	128.3	0.045	54.4	0.660	-51.5	0.289	26.20
0.3	0.583	-112.8	14.532	115.4	0.054	48.3	0.509	-64.5	0.424	24.31
0.4	0.554	-130.1	11.613	106.6	0.061	46.0	0.405	-74.3	0.538	22.81
0.5	0.539	-143.4	9.529	100.1	0.066	45.6	0.335	-82.3	0.639	21.61
0.6	0.533	-153.7	8.091	94.8	0.071	45.8	0.284	-89.4	0.723	20.59
0.7	0.533	-161.2	6.998	91.0	0.075	46.5	0.250	-95.9	0.790	19.67
0.8	0.532	-168.2	6.142	87.3	0.080	47.5	0.225	-102.7	0.854	18.84
0.9	0.535	-173.5	5.449	84.3	0.085	48.1	0.209	-109.1	0.905	18.08
1.0	0.538	-178.5	4.909	81.4	0.090	49.0	0.200	-115.2	0.946	17.37
1.1	0.545	177.6	4.472	78.7	0.095	49.7	0.194	-120.0	0.974	16.73
1.2	0.549	173.9	4.070	76.4	0.100	50.5	0.192	-124.5	1.006	15.60
1.3	0.552	170.5	3.763	74.0	0.106	50.9	0.190	-127.8	1.026	14.52
1.4	0.560	168.0	3.490	71.8	0.111	51.2	0.191	-130.6	1.040	13.75
1.5	0.563	165.0	3.258	69.5	0.116	51.5	0.190	-133.4	1.056	13.02
1.6	0.567	162.6	3.063	67.4	0.122	51.8	0.190	-135.1	1.066	12.43
1.7	0.570	160.4	2.876	65.4	0.127	52.0	0.190	-137.6	1.080	11.81
1.8	0.574	158.3	2.725	63.4	0.133	52.0	0.189	-139.5	1.089	11.31
1.9	0.577	156.3	2.582	61.7	0.138	52.0	0.190	-140.7	1.095	10.84
2.0	0.574	154.2	2.465	59.8	0.144	51.9	0.187	-143.1	1.107	10.34
2.1	0.587	152.6	2.363	58.0	0.149	52.0	0.188	-144.0	1.094	10.12
2.2	0.583	151.0	2.260	56.7	0.155	51.9	0.184	-147.2	1.112	9.60
2.3	0.593	150.0	2.170	55.1	0.161	51.6	0.185	-148.2	1.098	9.39
2.4	0.591	148.4	2.089	53.6	0.167	51.4	0.187	-151.7	1.109	8.96
2.5	0.597	146.9	2.005	52.1	0.173	51.0	0.187	-152.6	1.105	8.67
2.6	0.600	145.1	1.947	50.9	0.179	50.9	0.193	-154.9	1.103	8.42
2.7	0.603	144.3	1.874	49.5	0.184	50.4	0.190	-156.8	1.104	8.11
2.8	0.602	142.5	1.807	48.4	0.190	49.9	0.199	-158.4	1.112	7.74
2.9	0.589	141.2	1.717	46.3	0.196	49.1	0.200	-161.8	1.150	7.07
3.0	0.590	138.1	1.675	44.5	0.203	48.7	0.210	-162.0	1.144	6.87
4.0	0.619	118.5	1.284	26.6	0.257	41.8	0.277	-174.7	1.125	4.83
5.0	0.670	100.7	0.988	13.9	0.307	30.7	0.350	168.5	1.117	3.00

$V_{CE} = 2\text{ V}$, $I_C = 20\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.574	-75.7	34.015	139.4	0.025	63.6	0.738	-44.2	0.265	31.37
0.2	0.539	-115.5	23.133	117.6	0.034	53.0	0.509	-69.0	0.454	28.34
0.3	0.512	-137.6	16.740	106.6	0.041	51.8	0.374	-83.8	0.624	26.08
0.4	0.507	-151.0	12.969	99.4	0.048	53.4	0.297	-95.6	0.740	24.34
0.5	0.509	-161.1	10.460	94.4	0.053	54.7	0.250	-105.7	0.831	22.94
0.6	0.511	-168.9	8.792	90.2	0.059	56.0	0.222	-115.0	0.895	21.70
0.7	0.518	-174.3	7.573	87.2	0.066	57.2	0.205	-123.3	0.937	20.60
0.8	0.520	-179.7	6.625	84.1	0.072	58.1	0.197	-131.0	0.975	19.61
0.9	0.527	176.5	5.857	81.6	0.079	58.7	0.194	-137.6	1.006	18.25
1.0	0.532	172.5	5.275	79.1	0.085	59.2	0.195	-143.1	1.025	16.95
1.1	0.539	169.5	4.793	76.8	0.092	59.5	0.197	-147.2	1.039	15.98
1.2	0.546	166.8	4.359	75.0	0.098	59.7	0.201	-150.5	1.052	15.08
1.3	0.552	164.0	4.032	72.7	0.105	59.7	0.204	-153.0	1.057	14.38
1.4	0.555	161.9	3.737	70.9	0.112	59.6	0.207	-154.8	1.066	13.68
1.5	0.558	159.5	3.489	68.8	0.118	59.4	0.209	-156.9	1.074	13.05
1.6	0.565	157.5	3.276	66.9	0.125	59.2	0.211	-158.2	1.071	12.56
1.7	0.567	155.7	3.074	65.2	0.131	58.8	0.213	-160.1	1.080	11.97
1.8	0.566	153.8	2.906	63.2	0.138	58.4	0.214	-161.7	1.087	11.44
1.9	0.573	152.0	2.764	61.7	0.144	58.1	0.215	-162.4	1.082	11.08
2.0	0.570	150.2	2.636	60.0	0.151	57.6	0.214	-164.6	1.091	10.59
2.1	0.581	148.8	2.524	58.3	0.157	57.2	0.214	-165.4	1.079	10.34
2.2	0.578	147.3	2.412	57.1	0.163	56.7	0.213	-168.5	1.092	9.85
2.3	0.590	146.2	2.316	55.7	0.170	56.1	0.214	-169.6	1.076	9.66
2.4	0.587	145.1	2.230	54.1	0.177	55.4	0.217	-172.4	1.083	9.26
2.5	0.592	143.6	2.140	52.7	0.183	54.8	0.217	-173.2	1.080	8.95
2.6	0.593	142.0	2.075	51.7	0.189	54.3	0.224	-174.7	1.081	8.67
2.7	0.597	141.4	1.993	50.5	0.196	53.6	0.222	-176.7	1.080	8.36
2.8	0.597	139.6	1.926	49.4	0.201	52.7	0.231	-177.6	1.086	8.02
2.9	0.583	138.5	1.836	47.4	0.208	51.6	0.235	-179.7	1.113	7.41
3.0	0.584	135.4	1.787	45.7	0.215	51.1	0.243	179.8	1.109	7.19
4.0	0.612	116.7	1.366	28.4	0.271	42.3	0.303	172.2	1.098	5.12
5.0	0.662	99.8	1.053	16.2	0.318	30.2	0.376	158.6	1.099	3.29

$V_{CE} = 3\text{ V}$, $I_C = 1\text{ mA}$, $Z_O = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.974	-16.4	3.585	168.8	0.034	80.3	0.986	-6.0	0.042	20.28
0.2	0.949	-30.4	3.517	158.3	0.066	72.3	0.969	-11.6	0.087	17.30
0.3	0.925	-45.1	3.359	148.5	0.093	64.2	0.927	-16.5	0.124	15.58
0.4	0.887	-58.6	3.159	139.0	0.117	56.3	0.889	-21.6	0.170	14.31
0.5	0.852	-72.2	2.970	129.9	0.136	49.3	0.844	-25.9	0.209	13.39
0.6	0.815	-84.5	2.776	121.7	0.151	43.0	0.798	-29.7	0.255	12.64
0.7	0.785	-95.6	2.577	114.7	0.162	37.4	0.754	-33.0	0.298	12.02
0.8	0.754	-106.2	2.393	107.7	0.170	32.4	0.716	-36.1	0.346	11.50
0.9	0.732	-115.9	2.216	101.4	0.174	28.0	0.684	-39.0	0.390	11.04
1.0	0.713	-124.7	2.067	95.5	0.177	24.3	0.656	-41.6	0.436	10.67
1.1	0.704	-132.8	1.927	90.4	0.178	20.9	0.632	-44.0	0.476	10.35
1.2	0.696	-140.2	1.794	85.7	0.178	18.2	0.614	-46.4	0.515	10.04
1.3	0.690	-146.8	1.686	81.1	0.176	15.7	0.600	-48.6	0.557	9.80
1.4	0.687	-152.4	1.577	77.0	0.174	13.6	0.588	-50.9	0.603	9.57
1.5	0.685	-157.7	1.486	72.8	0.171	11.8	0.579	-53.0	0.650	9.39
1.6	0.687	-162.8	1.411	69.1	0.168	10.4	0.572	-55.1	0.689	9.25
1.7	0.686	-167.2	1.332	65.7	0.164	9.3	0.565	-57.1	0.747	9.11
1.8	0.686	-171.1	1.266	62.2	0.160	8.5	0.560	-58.9	0.804	8.99
1.9	0.693	-175.3	1.206	59.4	0.155	7.9	0.556	-60.9	0.841	8.90
2.0	0.688	-178.3	1.157	56.3	0.151	7.8	0.551	-62.6	0.920	8.84
2.1	0.698	178.3	1.113	53.9	0.146	7.9	0.550	-65.0	0.939	8.81
2.2	0.692	175.5	1.065	51.7	0.142	8.4	0.546	-66.9	1.037	7.58
2.3	0.701	172.8	1.029	49.5	0.138	8.9	0.552	-68.9	1.043	7.45
2.4	0.699	169.9	0.994	47.4	0.135	10.1	0.547	-71.1	1.121	6.57
2.5	0.704	167.2	0.952	45.2	0.131	11.4	0.548	-73.1	1.174	6.09
2.6	0.703	164.6	0.925	43.9	0.127	13.1	0.550	-75.7	1.227	5.74
2.7	0.708	162.6	0.892	41.9	0.125	15.0	0.550	-77.4	1.278	5.38
2.8	0.708	160.0	0.858	40.5	0.122	17.3	0.552	-79.9	1.347	4.96
2.9	0.695	157.7	0.810	37.8	0.120	19.3	0.539	-81.9	1.579	3.82
3.0	0.699	154.1	0.788	35.3	0.119	22.1	0.538	-85.3	1.613	3.60
4.0	0.725	127.0	0.614	17.8	0.159	46.4	0.561	-114.4	1.462	1.84
5.0	0.751	104.2	0.473	9.8	0.251	43.0	0.591	-144.5	1.278	-0.42

V_{CE} = 3 V, I_C = 3 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.901	-23.8	9.819	163.3	0.032	77.1	0.961	-12.5	0.079	24.87
0.2	0.861	-47.1	9.129	148.7	0.059	65.2	0.894	-23.4	0.127	21.88
0.3	0.797	-67.1	8.193	136.3	0.079	55.9	0.799	-31.9	0.194	20.15
0.4	0.743	-84.0	7.230	125.9	0.094	48.4	0.710	-39.0	0.260	18.88
0.5	0.694	-99.9	6.372	116.9	0.103	42.7	0.628	-44.4	0.324	17.91
0.6	0.658	-113.1	5.651	109.5	0.110	38.3	0.559	-48.8	0.390	17.12
0.7	0.634	-124.3	5.042	103.7	0.114	35.3	0.503	-52.2	0.448	16.45
0.8	0.615	-134.1	4.528	98.1	0.117	32.9	0.457	-55.3	0.512	15.86
0.9	0.601	-142.8	4.082	93.3	0.119	31.0	0.421	-58.2	0.575	15.34
1.0	0.594	-150.5	3.722	88.9	0.121	30.0	0.392	-61.0	0.632	14.88
1.1	0.592	-157.1	3.414	85.0	0.122	29.1	0.370	-63.3	0.684	14.47
1.2	0.593	-162.9	3.131	81.7	0.123	28.9	0.352	-65.7	0.734	14.05
1.3	0.593	-168.2	2.910	78.2	0.124	28.7	0.340	-67.8	0.782	13.70
1.4	0.595	-172.5	2.703	75.2	0.125	28.7	0.331	-69.9	0.829	13.35
1.5	0.594	-176.6	2.532	72.0	0.126	29.0	0.323	-71.8	0.881	13.04
1.6	0.599	179.6	2.389	69.2	0.126	29.4	0.317	-73.6	0.918	12.77
1.7	0.600	176.4	2.245	66.7	0.127	29.9	0.311	-75.2	0.967	12.46
1.8	0.602	173.2	2.126	64.0	0.129	30.5	0.306	-76.6	1.009	11.60
1.9	0.609	170.4	2.018	61.9	0.130	31.4	0.305	-78.3	1.035	10.77
2.0	0.606	167.7	1.934	59.4	0.131	32.2	0.299	-79.6	1.081	9.94
2.1	0.619	165.2	1.854	57.3	0.133	33.2	0.300	-81.6	1.078	9.74
2.2	0.613	163.4	1.771	55.6	0.135	34.2	0.293	-83.1	1.139	8.92
2.3	0.625	161.0	1.708	53.8	0.137	35.1	0.295	-84.6	1.125	8.81
2.4	0.620	159.2	1.644	52.0	0.140	36.0	0.290	-87.0	1.166	8.23
2.5	0.627	156.9	1.577	50.2	0.143	36.9	0.291	-88.5	1.174	7.91
2.6	0.629	154.8	1.534	48.8	0.145	37.8	0.293	-91.5	1.186	7.64
2.7	0.633	153.6	1.472	47.1	0.148	38.5	0.291	-92.7	1.197	7.28
2.8	0.633	151.4	1.420	45.8	0.151	39.4	0.294	-95.6	1.218	6.90
2.9	0.619	149.8	1.346	43.3	0.155	39.5	0.286	-98.0	1.305	6.06
3.0	0.622	146.5	1.310	41.1	0.160	40.3	0.292	-101.1	1.301	5.85
4.0	0.653	123.5	1.016	21.8	0.209	43.1	0.335	-128.7	1.230	3.97
5.0	0.699	103.5	0.773	8.6	0.272	35.8	0.394	-155.9	1.166	2.06

V_{CE} = 3 V, I_C = 5 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.829	-31.2	15.030	158.7	0.030	75.0	0.933	-17.9	0.100	26.94
0.2	0.777	-60.3	13.223	141.4	0.053	60.7	0.819	-32.6	0.177	23.93
0.3	0.706	-83.0	11.213	128.2	0.068	51.8	0.692	-42.9	0.267	22.14
0.4	0.654	-101.0	9.491	117.9	0.078	46.0	0.585	-50.8	0.351	20.85
0.5	0.613	-117.1	8.087	109.6	0.085	41.9	0.499	-56.6	0.433	19.79
0.6	0.586	-129.5	7.010	103.1	0.089	39.7	0.432	-61.3	0.513	18.96
0.7	0.573	-139.8	6.149	98.1	0.093	38.3	0.380	-65.2	0.583	18.21
0.8	0.559	-148.8	5.455	93.3	0.096	37.6	0.339	-68.9	0.657	17.55
0.9	0.556	-156.3	4.883	89.3	0.099	37.2	0.308	-72.5	0.719	16.94
1.0	0.554	-162.9	4.423	85.7	0.102	37.4	0.283	-76.1	0.777	16.39
1.1	0.556	-168.4	4.041	82.3	0.104	37.7	0.266	-79.1	0.825	15.88
1.2	0.559	-173.3	3.695	79.5	0.107	38.1	0.253	-82.4	0.871	15.36
1.3	0.562	-177.8	3.419	76.6	0.110	38.6	0.243	-84.8	0.914	14.92
1.4	0.566	178.7	3.174	74.0	0.113	39.1	0.237	-87.4	0.948	14.48
1.5	0.568	175.0	2.967	71.2	0.116	39.7	0.231	-89.6	0.983	14.07
1.6	0.572	172.0	2.791	68.8	0.119	40.4	0.227	-91.5	1.011	13.05
1.7	0.574	169.2	2.623	66.5	0.123	41.0	0.223	-93.5	1.041	12.05
1.8	0.576	166.6	2.486	64.0	0.126	41.6	0.219	-95.1	1.068	11.36
1.9	0.581	163.9	2.357	62.1	0.130	42.3	0.218	-96.7	1.084	10.83
2.0	0.580	161.7	2.250	60.0	0.133	42.8	0.213	-98.2	1.111	10.24
2.1	0.591	159.7	2.162	58.1	0.137	43.5	0.214	-99.9	1.102	10.03
2.2	0.586	157.7	2.065	56.5	0.141	43.9	0.207	-101.8	1.138	9.40
2.3	0.598	156.0	1.984	54.8	0.145	44.3	0.209	-103.1	1.124	9.21
2.4	0.596	154.3	1.911	53.1	0.150	44.7	0.205	-106.1	1.142	8.77
2.5	0.602	152.5	1.833	51.5	0.154	45.0	0.206	-107.4	1.144	8.45
2.6	0.604	150.6	1.781	50.2	0.159	45.4	0.209	-110.6	1.146	8.18
2.7	0.608	149.2	1.713	48.7	0.163	45.5	0.205	-111.6	1.151	7.86
2.8	0.608	147.5	1.650	47.4	0.168	45.6	0.211	-114.8	1.163	7.48
2.9	0.596	145.9	1.570	45.2	0.173	45.2	0.205	-117.9	1.218	6.77
3.0	0.597	142.7	1.528	43.1	0.178	45.4	0.214	-120.5	1.213	6.54
4.0	0.628	121.5	1.177	24.6	0.231	42.8	0.272	-145.2	1.173	4.57
5.0	0.679	102.5	0.903	11.0	0.286	33.5	0.339	-169.1	1.135	2.76

V_{CE} = 3 V, I_C = 7 mA, Z_O = 50 Ω

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.796	-38.7	19.338	155.2	0.028	73.1	0.903	-22.7	0.090	28.41
0.2	0.709	-70.6	16.228	135.7	0.049	58.1	0.754	-39.8	0.233	25.17
0.3	0.638	-95.2	13.188	122.4	0.060	50.2	0.611	-51.1	0.338	23.39
0.4	0.594	-113.3	10.846	112.7	0.068	45.6	0.501	-59.4	0.437	22.04
0.5	0.564	-128.5	9.074	105.2	0.073	43.3	0.418	-65.7	0.530	20.93
0.6	0.547	-140.3	7.772	99.3	0.078	42.2	0.357	-70.9	0.615	20.00
0.7	0.541	-149.5	6.787	95.0	0.082	42.2	0.311	-75.5	0.685	19.18
0.8	0.535	-157.6	5.972	90.7	0.086	42.4	0.276	-80.1	0.756	18.43
0.9	0.535	-164.3	5.320	87.1	0.089	42.7	0.250	-84.6	0.814	17.75
1.0	0.536	-170.2	4.808	83.7	0.093	43.3	0.231	-89.2	0.867	17.13
1.1	0.538	-175.0	4.383	80.8	0.097	44.0	0.218	-93.1	0.909	16.55
1.2	0.544	-179.1	3.998	78.3	0.101	44.8	0.209	-97.1	0.947	15.97
1.3	0.548	176.7	3.702	75.5	0.105	45.3	0.202	-100.1	0.976	15.46
1.4	0.553	173.4	3.434	73.2	0.109	45.8	0.198	-103.1	1.003	14.61
1.5	0.555	170.4	3.209	70.7	0.114	46.4	0.195	-105.7	1.027	13.49
1.6	0.558	167.7	3.015	68.4	0.118	46.9	0.193	-107.7	1.047	12.74
1.7	0.562	165.1	2.832	66.2	0.123	47.3	0.189	-109.9	1.067	12.06
1.8	0.565	162.6	2.679	64.1	0.127	47.7	0.187	-111.8	1.084	11.47
1.9	0.571	160.5	2.546	62.4	0.132	48.0	0.187	-113.4	1.088	11.05
2.0	0.568	158.4	2.428	60.4	0.137	48.2	0.182	-115.3	1.110	10.47
2.1	0.580	156.4	2.328	58.6	0.141	48.6	0.183	-116.6	1.098	10.26
2.2	0.576	154.6	2.227	57.1	0.146	48.8	0.177	-119.2	1.124	9.69
2.3	0.588	153.2	2.137	55.4	0.151	48.8	0.178	-120.4	1.108	9.50
2.4	0.584	151.7	2.059	53.8	0.157	48.8	0.176	-123.8	1.123	9.05
2.5	0.591	149.9	1.976	52.4	0.162	48.8	0.177	-125.0	1.121	8.76
2.6	0.592	148.1	1.917	50.9	0.167	48.9	0.181	-128.3	1.124	8.46
2.7	0.595	147.1	1.846	49.5	0.172	48.6	0.177	-129.6	1.126	8.15
2.8	0.597	145.2	1.779	48.2	0.178	48.4	0.184	-132.4	1.130	7.81
2.9	0.584	143.9	1.689	46.2	0.183	47.6	0.182	-136.1	1.179	7.09
3.0	0.586	140.6	1.646	44.2	0.189	47.7	0.191	-137.7	1.172	6.90
4.0	0.616	120.2	1.264	25.9	0.242	42.8	0.256	-157.8	1.143	4.88
5.0	0.667	101.9	0.972	12.8	0.294	32.5	0.326	-178.9	1.125	3.03

V_{CE} = 3 V, I_C = 10 mA, Z_O = 50 Ω

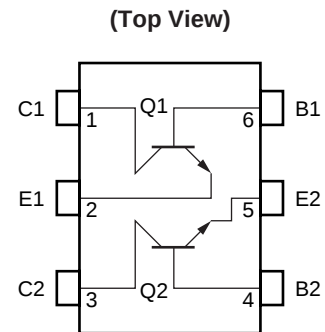
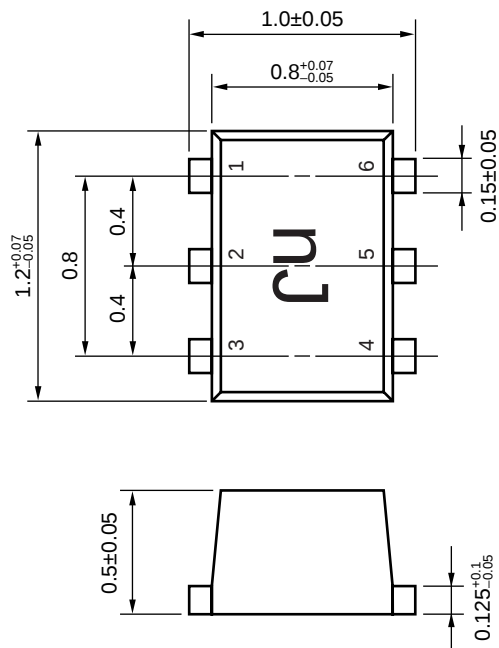
Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.711	-47.0	24.365	150.6	0.027	70.1	0.863	-28.3	0.153	29.63
0.2	0.640	-83.2	19.224	129.8	0.044	54.9	0.678	-47.8	0.299	26.44
0.3	0.579	-108.2	14.969	116.8	0.053	49.6	0.527	-60.0	0.424	24.52
0.4	0.546	-125.5	12.010	107.8	0.059	47.2	0.422	-68.7	0.535	23.08
0.5	0.529	-139.5	9.896	101.3	0.064	46.4	0.347	-75.6	0.633	21.89
0.6	0.520	-150.3	8.397	96.0	0.069	46.6	0.294	-81.8	0.718	20.86
0.7	0.518	-158.4	7.295	92.1	0.074	47.3	0.256	-87.4	0.784	19.96
0.8	0.516	-165.6	6.402	88.3	0.078	48.0	0.228	-93.3	0.848	19.13
0.9	0.520	-171.4	5.684	85.2	0.083	48.6	0.209	-99.0	0.897	18.36
1.0	0.521	-176.6	5.126	82.1	0.088	49.5	0.197	-104.9	0.941	17.66
1.1	0.528	179.2	4.669	79.5	0.093	50.2	0.189	-109.5	0.970	17.02
1.2	0.535	175.6	4.255	77.2	0.098	50.8	0.184	-114.1	0.998	16.38
1.3	0.539	171.9	3.934	74.7	0.103	51.3	0.181	-117.4	1.018	14.99
1.4	0.544	169.2	3.649	72.5	0.108	51.6	0.180	-120.4	1.034	14.14
1.5	0.546	166.3	3.407	70.2	0.114	52.0	0.179	-123.3	1.054	13.35
1.6	0.551	163.8	3.202	68.1	0.119	52.2	0.178	-125.3	1.062	12.78
1.7	0.553	161.6	3.006	66.2	0.124	52.3	0.177	-127.7	1.079	12.13
1.8	0.557	159.5	2.842	64.1	0.129	52.5	0.175	-129.7	1.087	11.62
1.9	0.562	157.2	2.698	62.5	0.135	52.5	0.176	-131.1	1.090	11.18
2.0	0.557	155.1	2.575	60.6	0.140	52.5	0.172	-133.3	1.108	10.63
2.1	0.571	153.6	2.470	58.8	0.146	52.5	0.173	-134.4	1.089	10.46
2.2	0.568	152.1	2.359	57.5	0.151	52.5	0.168	-137.5	1.109	9.92
2.3	0.581	150.8	2.268	55.9	0.157	52.2	0.170	-138.7	1.092	9.75
2.4	0.577	149.3	2.179	54.4	0.163	51.9	0.170	-142.3	1.106	9.28
2.5	0.583	147.8	2.093	52.9	0.169	51.7	0.170	-143.3	1.102	9.00
2.6	0.585	146.1	2.030	51.7	0.174	51.5	0.176	-146.1	1.101	8.72
2.7	0.587	145.0	1.953	50.3	0.180	51.0	0.172	-147.9	1.106	8.38
2.8	0.590	143.3	1.885	49.2	0.185	50.5	0.180	-150.0	1.108	8.08
2.9	0.575	142.1	1.791	47.0	0.191	49.6	0.181	-153.6	1.147	7.38
3.0	0.576	138.9	1.745	45.2	0.198	49.3	0.190	-154.3	1.143	7.16
4.0	0.608	119.1	1.336	27.4	0.252	42.8	0.257	-169.2	1.121	5.13
5.0	0.661	101.2	1.029	14.3	0.302	31.7	0.329	172.4	1.110	3.30

$V_{CE} = 3\text{ V}$, $I_C = 20\text{ mA}$, $Z_o = 50\ \Omega$

Frequency (GHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	MAG/MSG (dB)
	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		
0.1	0.563	-68.2	34.590	140.5	0.023	67.6	0.753	-41.1	0.267	31.85
0.2	0.528	-109.6	23.926	118.9	0.034	53.9	0.525	-64.0	0.458	28.50
0.3	0.501	-132.5	17.450	107.8	0.040	52.8	0.386	-77.5	0.615	26.35
0.4	0.492	-146.9	13.548	100.5	0.047	53.4	0.303	-88.0	0.730	24.63
0.5	0.489	-157.8	10.957	95.4	0.052	55.0	0.251	-97.0	0.821	23.20
0.6	0.491	-166.1	9.217	91.1	0.059	56.3	0.217	-105.5	0.885	21.97
0.7	0.495	-172.2	7.959	88.0	0.065	57.4	0.196	-113.3	0.930	20.89
0.8	0.499	-177.8	6.952	84.9	0.071	58.3	0.184	-121.1	0.969	19.91
0.9	0.507	178.1	6.156	82.3	0.077	58.9	0.178	-128.1	0.997	19.02
1.0	0.511	174.0	5.541	79.8	0.083	59.5	0.177	-134.3	1.020	17.36
1.1	0.518	170.8	5.043	77.5	0.090	59.6	0.177	-138.8	1.034	16.37
1.2	0.525	168.2	4.583	75.7	0.096	59.9	0.180	-142.7	1.048	15.45
1.3	0.530	165.1	4.236	73.4	0.103	59.8	0.182	-145.6	1.056	14.71
1.4	0.536	163.0	3.930	71.5	0.109	59.8	0.185	-147.7	1.060	14.07
1.5	0.539	160.6	3.667	69.5	0.115	59.6	0.186	-150.0	1.070	13.41
1.6	0.544	158.3	3.445	67.6	0.122	59.3	0.188	-151.4	1.070	12.90
1.7	0.547	156.4	3.231	65.8	0.128	59.1	0.190	-153.5	1.077	12.32
1.8	0.548	154.4	3.058	63.9	0.134	58.7	0.190	-155.3	1.084	11.81
1.9	0.555	152.7	2.902	62.4	0.141	58.3	0.192	-156.2	1.080	11.41
2.0	0.552	151.0	2.770	60.7	0.147	58.0	0.190	-158.5	1.087	10.94
2.1	0.564	149.5	2.648	59.2	0.154	57.5	0.190	-159.3	1.076	10.69
2.2	0.557	148.0	2.529	57.9	0.160	57.1	0.188	-162.7	1.093	10.15
2.3	0.571	147.2	2.429	56.3	0.166	56.5	0.189	-163.7	1.076	9.97
2.4	0.568	145.9	2.338	54.8	0.173	55.9	0.192	-166.8	1.083	9.57
2.5	0.574	144.3	2.245	53.5	0.179	55.2	0.192	-167.7	1.078	9.28
2.6	0.577	142.7	2.177	52.5	0.185	54.8	0.199	-169.5	1.076	9.02
2.7	0.580	142.1	2.094	51.2	0.191	54.1	0.196	-171.5	1.078	8.70
2.8	0.581	140.4	2.023	50.1	0.197	53.3	0.205	-172.6	1.081	8.38
2.9	0.566	139.3	1.923	48.1	0.203	52.1	0.208	-175.7	1.113	7.71
3.0	0.567	136.1	1.872	46.5	0.210	51.7	0.217	-175.1	1.107	7.50
4.0	0.596	117.4	1.427	29.1	0.266	43.1	0.280	176.1	1.098	5.39
5.0	0.649	100.1	1.098	16.7	0.313	30.9	0.353	161.4	1.099	3.53

PACKAGE DIMENSIONS

6-PIN LEAD-LESS MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. Collector (Q1)
2. Emitter (Q1)
3. Collector (Q2)
4. Base (Q2)
5. Emitter (Q2)
6. Base (Q1)

[MEMO]

[MEMO]

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