DATA SHEET

NEC

NPN SILICON RF TRANSISTOR
2SC5602

NPN SILICON RF TRANSISTOR FOR LOW NOISE · HIGH-GAIN AMPLIFICATION 3-PIN ULTRA SUPER MINIMOLD

FEATURES

- High-gain transistor for buffer amplifier : $|S_{21e}|^2$ = 10.0 dB TYP. @ f = 2 GHz, V_{CE} = 1 V, I_C = 5 mA
- f_T = 25 GHz "UHS0" (Ultra High Speed Process) technology adopted
- 3-pin ultra super minimold package (t = 0.75 mm)

ORDERING INFORMATION

Part Number	Quantity	Supplying Form
2SC5602	50 pcs (Non reel)	• 8 mm wide embossed taping
2SC5602-T1	3 kpcs/reel	• Pin 3 (collector) face the perforation side of the tape

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

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

Parameter	Symbol	Ratings	Unit
Collector to Base Voltage	V_{CBO}	15	V
Collector to Emitter Voltage	V_{CEO}	6	V
Emitter to Base Voltage	V_{EBO}	2	V
Collector Current	I_C	35	mA
Total Power Dissipation	P_{tot} Note	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

Note Mounted on 1.08 $cm^2 \times$ 1.0 mm (t) glass epoxy substrate

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.

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ELECTRICAL CHARACTERISTICS (T_A = +25°C)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
DC Characteristics						
Collector Cut-off Current	I_{CBO}	V_{CB} = 5 V, I_E = 0 mA	–	–	200	nA
Emitter Cut-off Current	I_{EBO}	V_{BE} = 1 V, I_C = 0 mA	–	–	200	nA
DC Current Gain	h_{FE} Note 1	V_{CE} = 1 V, I_C = 5 mA	60	–	120	–
RF Characteristics						
Gain Bandwidth Product	f_T	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	12.0	13.5	–	GHz
Insertion Power Gain	$\|S_{21e}\|^2$	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz	8.5	10.0	–	dB
Noise Figure	NF	V_{CE} = 1 V, I_C = 5 mA, f = 2 GHz, $Z_S = Z_{opt}$	–	1.3	2.5	dB
Reverse Transfer Capacitance	C_{re} Note 2	V_{CB} = 1 V, I_E = 0 mA, f = 1 MHz	–	0.25	0.5	pF

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

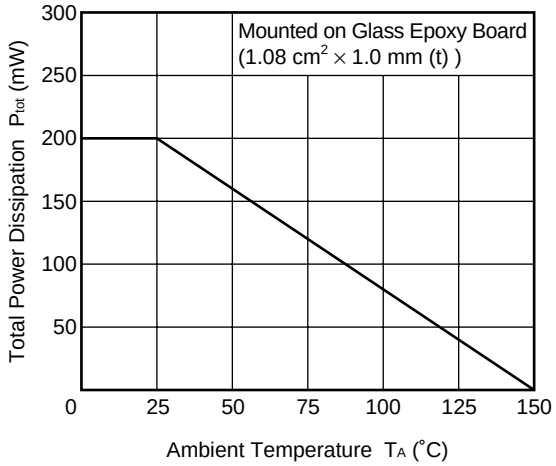
2. Collector to base capacitance measured using capacitance meter (self-balancing bridge method) when the emitter is connected to the guard pin

h_{FE} CLASSIFICATION

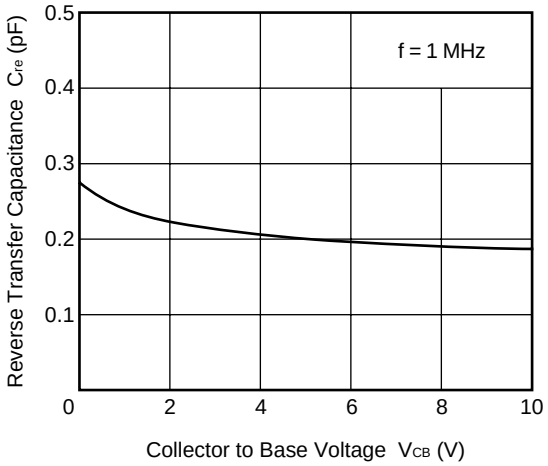
Rank	FB
Marking	TW
h_{FE} Value	60 to 120

TYPICAL CHARACTERISTICS (Unless otherwise specified, T_A = +25°C)

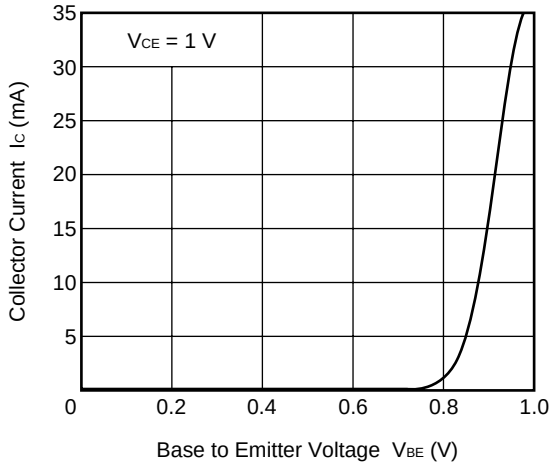
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



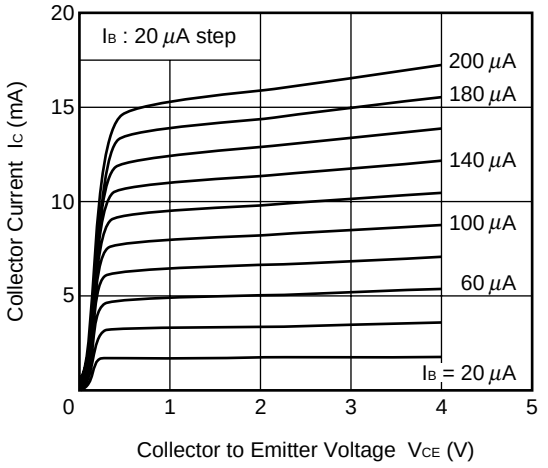
REVERSE TRANSFER CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



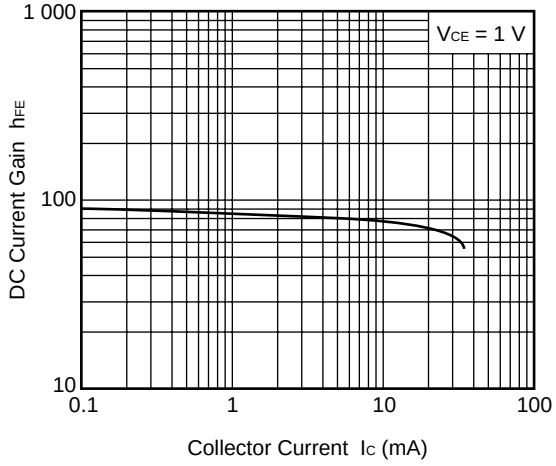
COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE



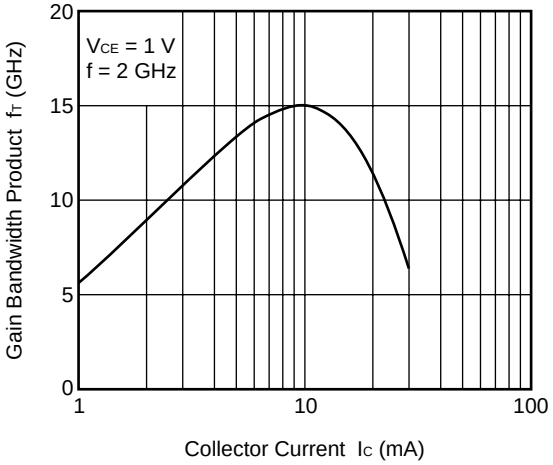
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



DC CURRENT GAIN vs. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT
vs. COLLECTOR CURRENT



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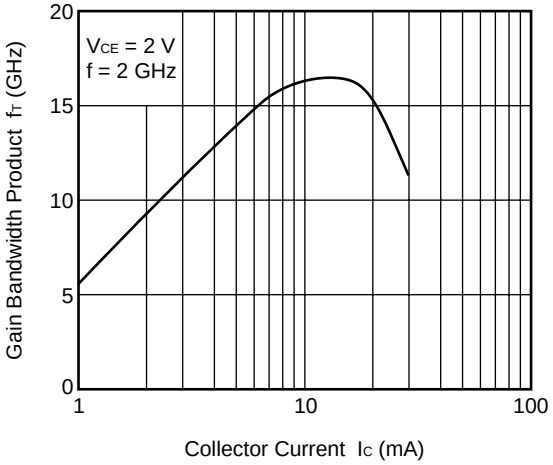

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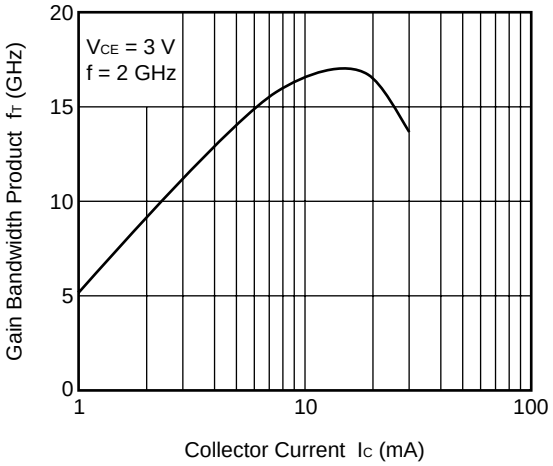
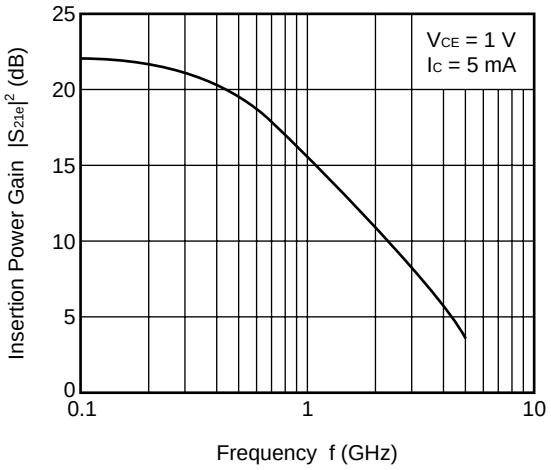


INSERTION POWER GAIN vs. FREQUENCY



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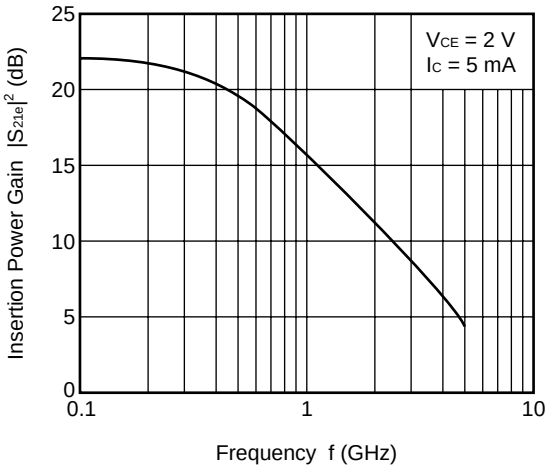

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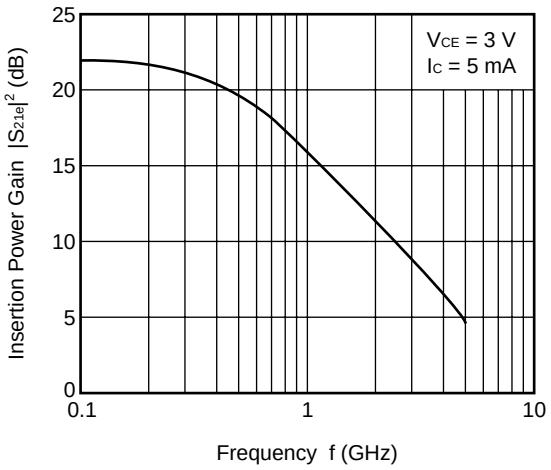
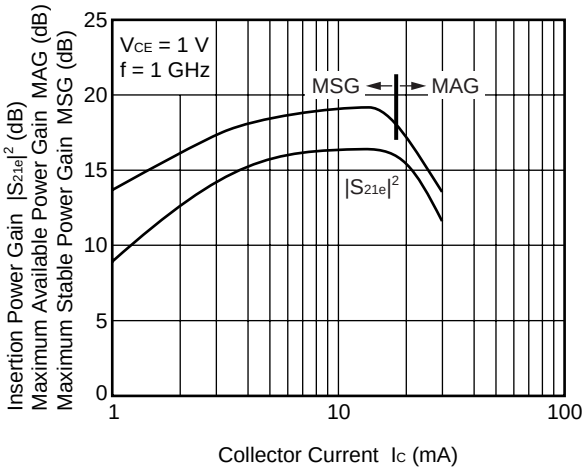


INSERTION POWER GAIN, MAG, MSG
vs. COLLECTOR CURRENT



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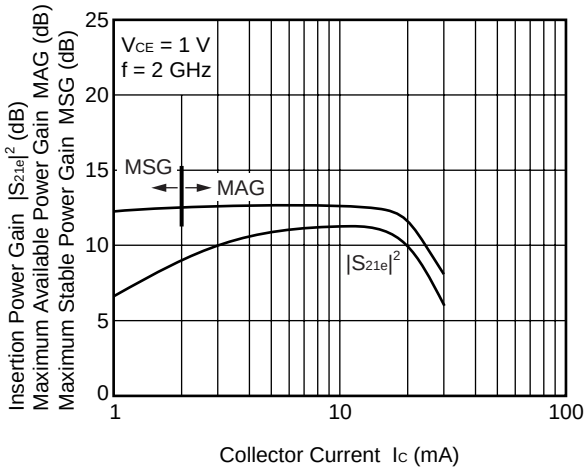

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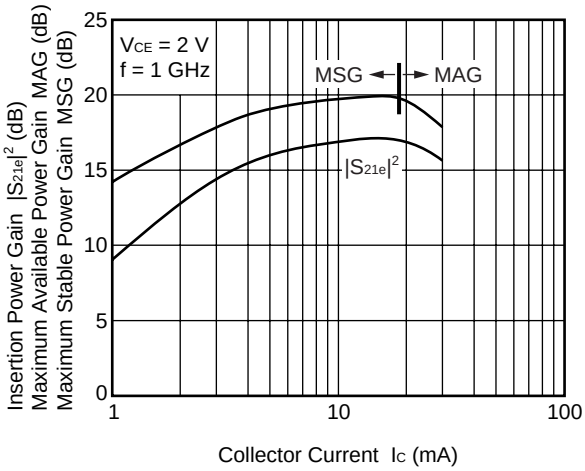

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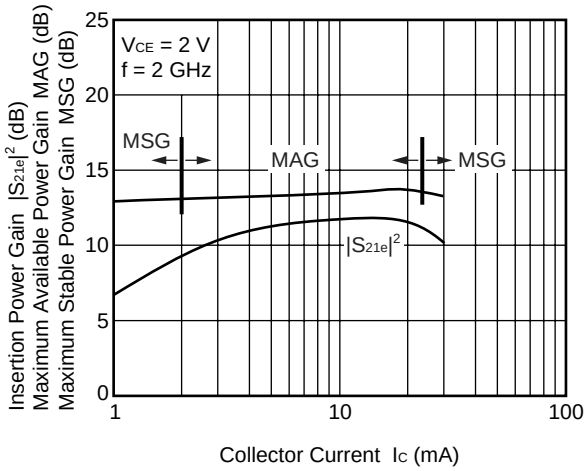

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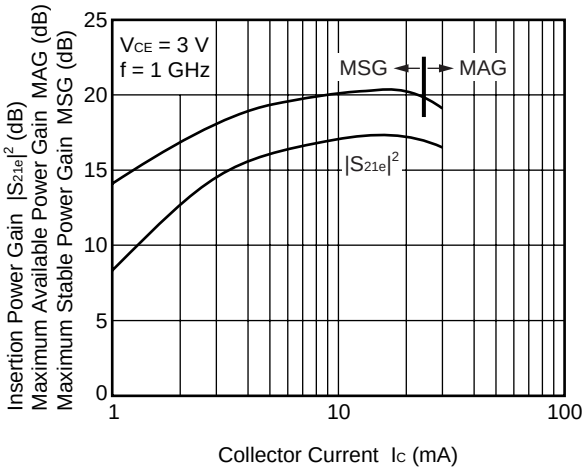

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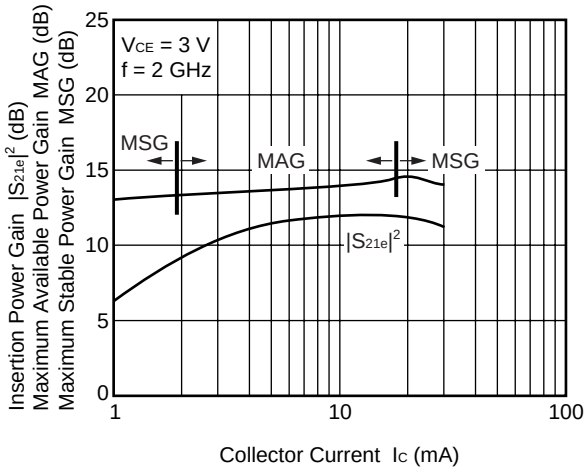
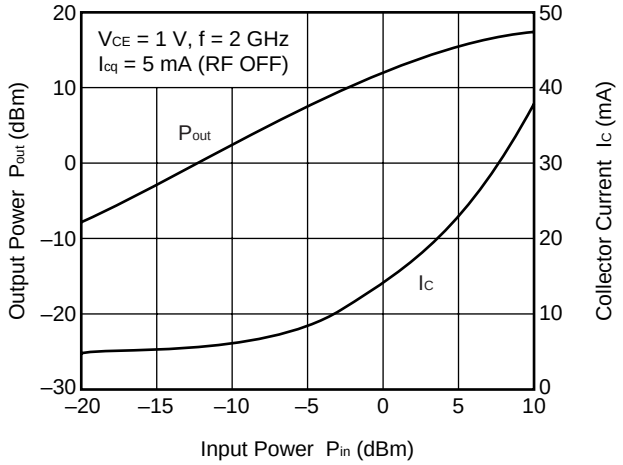
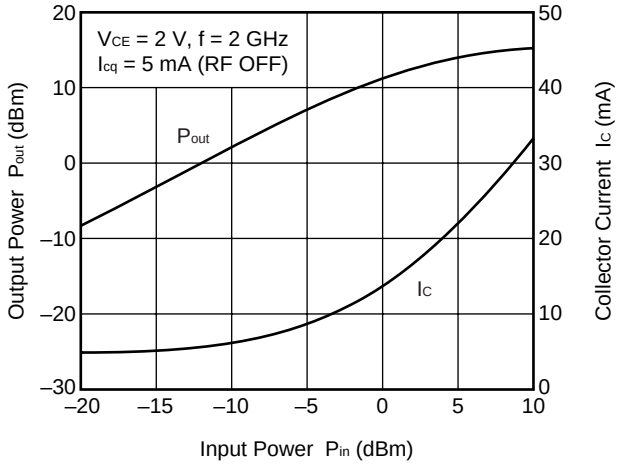


OUTPUT POWER, COLLECTOR CURRENT vs. INPUT POWER



OUTPUT POWER, COLLECTOR CURRENT vs. INPUT POWER



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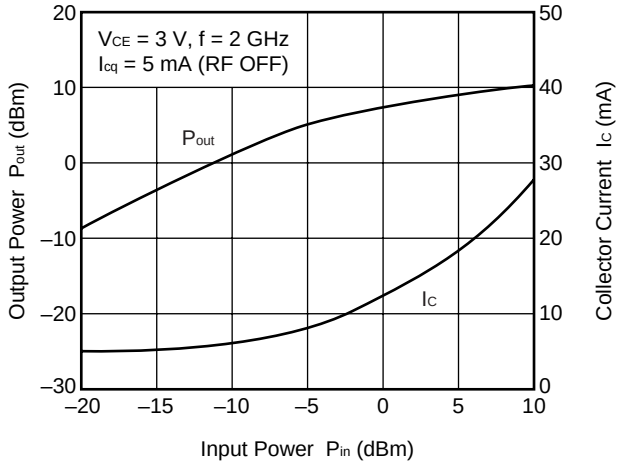
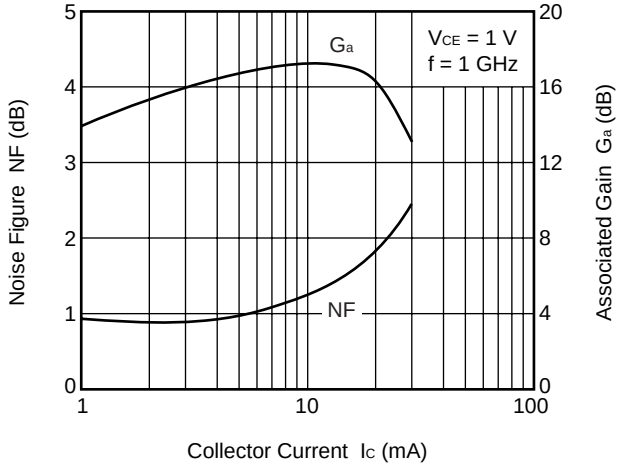


NOISE FIGURE, ASSOCIATED GAIN vs. COLLECTOR CURRENT



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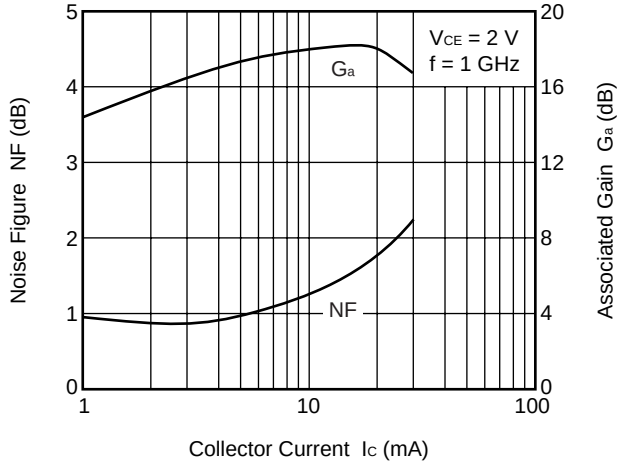

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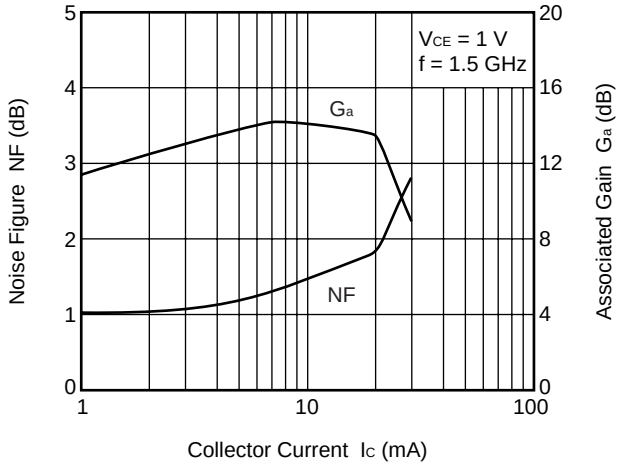

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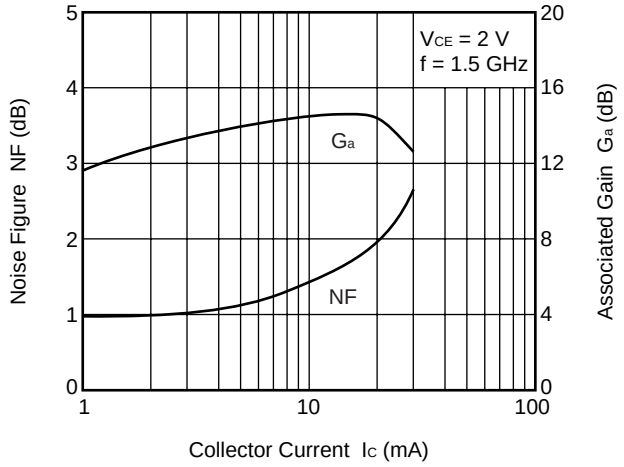

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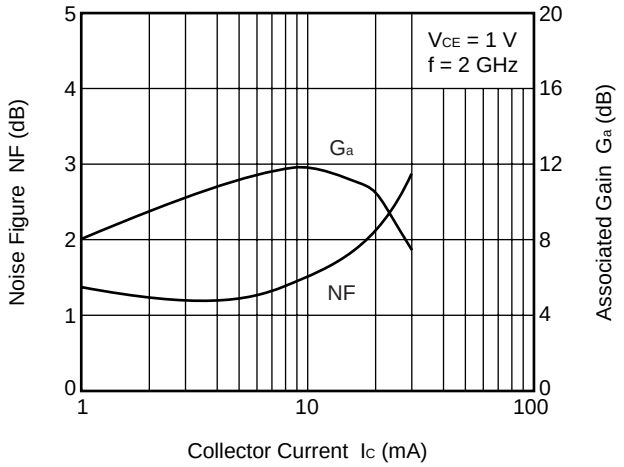

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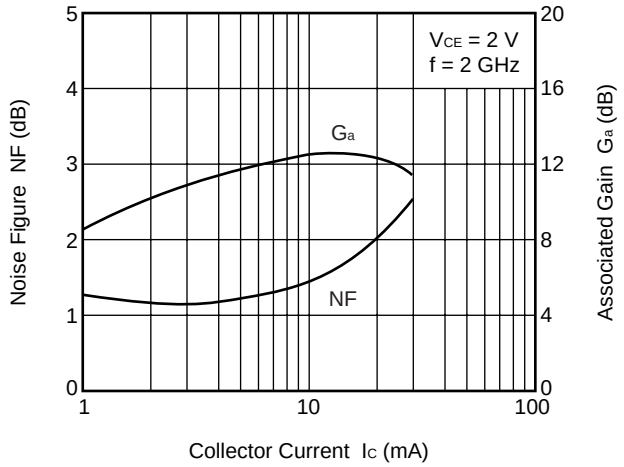

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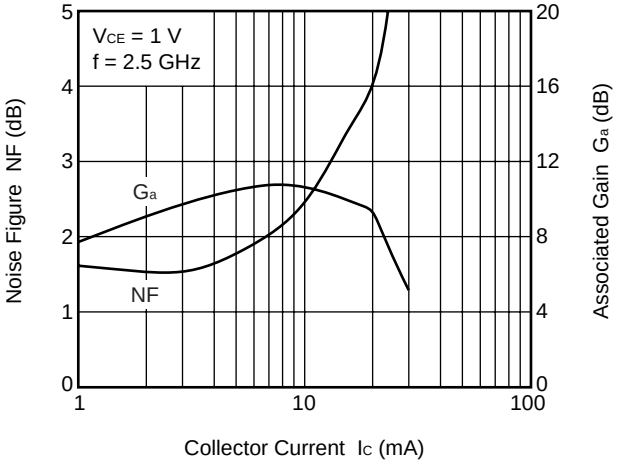

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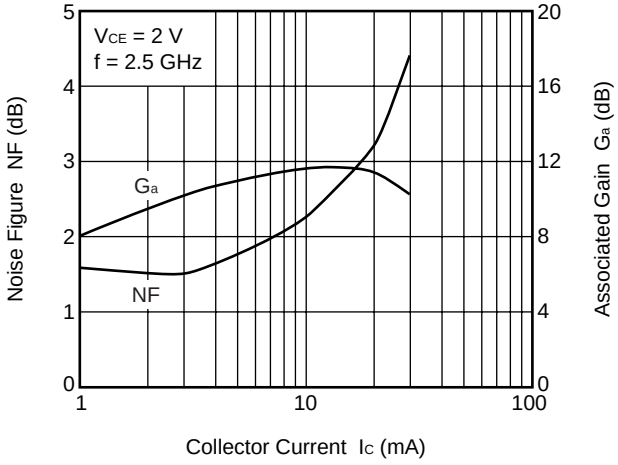


Remark The graphs indicate nominal characteristics.

S-PARAMETERS

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 V, I_C = 3 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG Note
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.868	–9.1	8.737	170.4	0.015	86.6	0.988	–6.3	0.051	27.67
0.2	0.848	–19.0	8.519	160.2	0.030	76.9	0.962	–13.8	0.171	24.53
0.3	0.812	–28.1	8.099	151.3	0.043	72.1	0.920	–20.2	0.227	22.75
0.4	0.760	–36.6	7.679	142.5	0.054	67.6	0.875	–26.4	0.291	21.50
0.5	0.707	–44.3	7.211	134.7	0.064	63.3	0.825	–31.5	0.366	20.52
0.6	0.653	–51.7	6.756	127.5	0.072	60.3	0.775	–36.2	0.428	19.71
0.7	0.603	–58.3	6.286	121.3	0.079	57.7	0.729	–40.1	0.492	19.02
0.8	0.556	–64.3	5.871	115.4	0.084	55.7	0.686	–43.9	0.555	18.43
0.9	0.513	–70.5	5.499	109.7	0.089	54.3	0.648	–47.1	0.615	17.90
1.0	0.471	–75.9	5.168	104.5	0.093	53.4	0.613	–49.9	0.676	17.44
1.1	0.435	–81.3	4.863	99.9	0.097	52.8	0.582	–52.9	0.729	16.99
1.2	0.401	–85.5	4.560	95.7	0.101	52.6	0.556	–55.1	0.788	16.54
1.3	0.371	–91.6	4.335	91.5	0.104	52.4	0.531	–57.7	0.833	16.18
1.4	0.346	–96.4	4.112	87.6	0.108	52.6	0.510	–60.1	0.876	15.80
1.5	0.323	–102.1	3.912	83.8	0.113	52.7	0.491	–62.6	0.909	15.40
1.6	0.298	–107.5	3.728	80.1	0.116	53.0	0.472	–65.0	0.952	15.06
1.7	0.282	–113.2	3.577	76.7	0.121	53.5	0.457	–67.3	0.977	14.73
1.8	0.268	–119.7	3.423	73.3	0.125	54.1	0.443	–69.6	0.997	14.36
1.9	0.253	–126.3	3.281	70.0	0.130	54.5	0.429	–72.0	1.021	13.13
2.0	0.245	–133.0	3.158	66.8	0.136	54.9	0.417	–74.5	1.031	12.58
2.1	0.237	–139.7	3.037	63.7	0.141	55.8	0.404	–77.0	1.050	11.98
2.2	0.235	–145.4	2.932	60.9	0.147	56.5	0.396	–79.6	1.052	11.61
2.3	0.236	–152.1	2.835	57.7	0.153	56.8	0.387	–82.7	1.053	11.28
2.4	0.238	–158.0	2.744	54.9	0.160	57.1	0.378	–85.5	1.052	10.95
2.5	0.241	–163.5	2.662	52.2	0.167	57.3	0.371	–89.2	1.049	10.69
2.6	0.246	–168.6	2.582	49.4	0.174	57.7	0.366	–92.3	1.040	10.48
2.7	0.254	–173.7	2.517	46.8	0.182	57.6	0.360	–96.5	1.031	10.34
2.8	0.255	–178.7	2.436	44.0	0.189	57.4	0.354	–100.1	1.033	9.99
2.9	0.262	177.5	2.371	41.4	0.198	57.0	0.349	–103.6	1.024	9.84
3.0	0.269	172.7	2.315	39.1	0.207	56.8	0.337	–108.0	1.019	9.63
4.0	0.415	138.6	1.847	13.2	0.324	47.0	0.392	–156.1	0.850	7.55
5.0	0.624	114.3	1.367	–10.5	0.411	29.8	0.536	156.2	0.776	5.22

V_{CE} = 1 V, I_C = 5 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.806	–11.1	12.681	167.4	0.015	82.3	0.978	–8.3	0.148	29.19
0.2	0.766	–24.6	12.070	155.0	0.029	75.6	0.930	–17.2	0.223	26.22
0.3	0.705	–34.9	11.129	144.5	0.040	70.4	0.867	–24.5	0.317	24.45
0.4	0.639	–44.5	10.209	134.8	0.049	66.5	0.803	–30.9	0.401	23.14
0.5	0.573	–52.5	9.296	126.5	0.058	63.1	0.738	–35.7	0.496	22.08
0.6	0.513	–60.0	8.458	119.3	0.064	61.4	0.679	–39.7	0.574	21.19
0.7	0.462	–66.6	7.697	113.4	0.070	60.2	0.628	–43.0	0.644	20.38
0.8	0.417	–72.3	7.031	107.6	0.076	59.3	0.586	–45.7	0.712	19.67
0.9	0.376	–78.1	6.489	102.6	0.081	58.7	0.549	–48.3	0.770	19.03
1.0	0.342	–83.2	6.009	97.8	0.086	58.8	0.518	–50.4	0.822	18.44
1.1	0.311	–88.2	5.592	93.6	0.091	58.8	0.492	–52.6	0.866	17.88
1.2	0.281	–92.4	5.197	90.0	0.096	59.1	0.469	–54.3	0.910	17.32
1.3	0.257	–98.4	4.899	86.3	0.101	59.1	0.451	–56.3	0.942	16.86
1.4	0.237	–103.8	4.617	82.8	0.107	59.4	0.433	–58.2	0.967	16.36
1.5	0.218	–110.1	4.360	79.4	0.113	59.4	0.420	–60.5	0.985	15.87
1.6	0.202	–116.3	4.134	76.1	0.118	59.7	0.404	–62.6	1.007	14.91
1.7	0.191	–122.8	3.948	73.1	0.124	59.9	0.392	–64.6	1.018	14.19
1.8	0.183	–130.0	3.770	70.1	0.131	59.9	0.380	–66.9	1.025	13.62
1.9	0.176	–137.8	3.601	67.1	0.138	59.8	0.369	–69.1	1.033	13.05
2.0	0.176	–145.4	3.455	64.3	0.145	59.8	0.359	–71.6	1.032	12.67
2.1	0.172	–153.8	3.315	61.6	0.151	59.9	0.348	–73.8	1.041	12.15
2.2	0.175	–158.6	3.193	59.0	0.158	59.9	0.341	–76.6	1.040	11.81
2.3	0.180	–165.5	3.083	56.2	0.166	59.6	0.333	–79.6	1.037	11.52
2.4	0.186	–171.1	2.978	53.6	0.173	59.3	0.326	–82.6	1.034	11.23
2.5	0.194	–176.4	2.892	51.1	0.181	59.0	0.319	–86.2	1.026	11.04
2.6	0.199	179.1	2.791	48.6	0.189	58.6	0.314	–89.4	1.024	10.74
2.7	0.209	174.9	2.718	46.3	0.197	58.0	0.308	–93.9	1.016	10.61
2.8	0.216	169.2	2.631	43.7	0.205	57.4	0.302	–97.6	1.016	10.31
2.9	0.225	166.8	2.556	41.3	0.213	56.5	0.296	–101.4	1.010	10.17
3.0	0.234	162.5	2.497	39.2	0.223	56.0	0.285	–106.0	1.007	9.99
4.0	0.386	134.0	1.999	15.1	0.331	44.6	0.336	–156.2	0.883	7.82
5.0	0.598	112.8	1.515	–7.8	0.408	28.4	0.483	155.7	0.816	5.70

V_{CE} = 1 V, I_C = 10 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.678	–17.3	18.895	162.6	0.013	80.1	0.947	–11.5	0.220	31.68
0.2	0.605	–33.2	17.129	146.5	0.026	74.2	0.864	–22.3	0.347	28.23
0.3	0.526	–46.2	14.881	134.2	0.036	69.4	0.768	–29.9	0.478	26.21
0.4	0.455	–56.1	12.942	124.1	0.044	67.4	0.685	–35.4	0.585	24.73
0.5	0.389	–65.1	11.313	116.0	0.050	65.7	0.613	–38.9	0.685	23.52
0.6	0.332	–72.6	9.951	109.4	0.057	65.3	0.558	–41.7	0.764	22.42
0.7	0.294	–78.7	8.839	104.0	0.063	65.5	0.514	–43.5	0.824	21.44
0.8	0.258	–84.7	7.934	99.1	0.069	65.3	0.480	–45.2	0.877	20.59
0.9	0.231	–90.9	7.209	94.8	0.075	65.5	0.451	–46.6	0.916	19.80
1.0	0.204	–96.7	6.606	90.7	0.082	65.9	0.429	–47.9	0.948	19.07
1.1	0.185	–102.8	6.081	87.1	0.089	65.8	0.410	–49.5	0.972	18.37
1.2	0.164	–107.4	5.630	83.9	0.095	65.9	0.394	–50.9	0.995	17.72
1.3	0.151	–116.0	5.274	80.7	0.102	65.9	0.381	–52.5	1.006	16.67
1.4	0.140	–122.3	4.932	77.7	0.109	65.8	0.369	–54.2	1.018	15.75
1.5	0.132	–131.4	4.636	74.7	0.116	65.4	0.360	–56.2	1.022	15.08
1.6	0.123	–139.2	4.369	71.7	0.123	65.1	0.348	–58.3	1.034	14.36
1.7	0.120	–147.6	4.173	69.1	0.131	64.9	0.339	–60.3	1.034	13.91
1.8	0.123	–157.6	3.976	66.5	0.139	64.5	0.330	–62.6	1.032	13.49
1.9	0.126	–164.9	3.787	63.9	0.147	63.9	0.321	–65.0	1.033	13.02
2.0	0.136	–172.6	3.625	61.3	0.155	63.4	0.313	–67.5	1.027	12.68
2.1	0.141	–179.4	3.478	58.8	0.162	63.1	0.303	–69.9	1.030	12.27
2.2	0.147	176.4	3.340	56.6	0.170	62.5	0.297	–72.6	1.027	11.93
2.3	0.159	171.9	3.219	53.9	0.178	61.8	0.290	–76.0	1.021	11.68
2.4	0.165	166.8	3.108	51.5	0.187	60.9	0.284	–79.0	1.018	11.39
2.5	0.179	164.2	3.013	49.2	0.195	60.2	0.277	–82.9	1.011	11.25
2.6	0.188	160.3	2.907	46.8	0.204	59.4	0.273	–86.4	1.007	11.04
2.7	0.195	158.1	2.827	44.6	0.211	58.5	0.268	–91.2	1.004	10.89
2.8	0.204	153.8	2.730	42.2	0.219	57.5	0.263	–95.5	1.005	10.54
2.9	0.213	152.5	2.649	39.9	0.228	56.4	0.256	–100.0	1.002	10.42
3.0	0.223	149.4	2.581	38.2	0.236	55.6	0.243	–105.0	1.003	10.07
4.0	0.388	127.7	2.078	15.5	0.340	42.7	0.295	–158.5	0.900	7.86
5.0	0.598	109.9	1.590	–6.2	0.410	26.9	0.446	153.4	0.843	5.89

V_{CE} = 1 V, I_C = 20 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.503	–29.1	22.647	155.5	0.014	76.6	0.870	–15.6	0.392	32.08
0.2	0.425	–55.2	18.918	135.8	0.026	69.8	0.742	–27.6	0.519	28.58
0.3	0.351	–75.1	15.301	122.9	0.034	67.1	0.630	–33.9	0.662	26.55
0.4	0.295	–90.3	12.656	113.0	0.041	67.3	0.549	–37.7	0.774	24.90
0.5	0.258	–103.6	10.689	105.6	0.048	66.8	0.490	–39.5	0.860	23.50
0.6	0.232	–116.3	9.190	99.7	0.055	67.9	0.447	–40.7	0.921	22.26
0.7	0.214	–126.4	8.050	94.9	0.062	68.4	0.416	–41.5	0.964	21.15
0.8	0.203	–135.9	7.136	90.6	0.068	68.8	0.394	–42.6	1.000	20.12
0.9	0.194	–144.7	6.435	86.6	0.076	68.8	0.375	–43.8	1.023	18.37
1.0	0.189	–153.6	5.848	82.9	0.083	69.3	0.361	–44.9	1.040	17.27
1.1	0.188	–160.7	5.367	79.5	0.090	69.3	0.349	–46.6	1.052	16.35
1.2	0.183	–168.3	4.944	76.5	0.098	69.2	0.339	–48.0	1.064	15.49
1.3	0.191	–174.5	4.627	73.4	0.105	68.9	0.331	–50.0	1.063	14.90
1.4	0.193	179.8	4.309	70.4	0.113	68.7	0.323	–51.9	1.067	14.23
1.5	0.200	174.1	4.047	67.6	0.122	68.1	0.317	–54.5	1.063	13.69
1.6	0.207	168.8	3.811	64.8	0.130	67.6	0.308	–57.0	1.064	13.14
1.7	0.215	164.8	3.617	62.2	0.138	67.1	0.302	–59.5	1.060	12.70
1.8	0.227	160.8	3.443	59.5	0.147	66.4	0.295	–62.3	1.051	12.33
1.9	0.238	156.7	3.275	56.9	0.155	65.6	0.288	–65.3	1.046	11.93
2.0	0.249	153.7	3.128	54.4	0.165	64.8	0.282	–68.3	1.038	11.60
2.1	0.261	151.0	2.995	51.8	0.173	64.3	0.274	–71.4	1.034	11.26
2.2	0.270	148.6	2.880	49.5	0.182	63.7	0.270	–74.8	1.027	11.00
2.3	0.282	146.6	2.769	46.9	0.191	62.7	0.264	–78.8	1.019	10.77
2.4	0.292	144.2	2.671	44.5	0.200	61.7	0.259	–82.5	1.013	10.57
2.5	0.306	142.4	2.586	42.0	0.209	60.7	0.254	–87.3	1.003	10.59
2.6	0.311	140.2	2.489	39.7	0.219	59.6	0.251	–91.5	1.000	10.56
2.7	0.323	138.3	2.422	37.3	0.227	58.5	0.248	–97.2	0.993	10.28
2.8	0.331	135.6	2.331	34.8	0.235	57.3	0.244	–102.3	0.996	9.96
2.9	0.340	134.9	2.258	32.5	0.244	56.1	0.241	–107.8	0.992	9.66
3.0	0.349	132.9	2.201	30.8	0.253	55.2	0.230	–113.6	0.993	9.39
4.0	0.511	115.5	1.736	8.0	0.361	40.0	0.311	–169.9	0.880	6.82
5.0	0.686	100.7	1.287	–12.2	0.423	23.6	0.475	145.8	0.836	4.84

V_{CE} = 2 V, I_C = 3 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.884	–7.7	8.695	170.7	0.013	83.9	0.993	–5.6	0.103	28.10
0.2	0.857	–17.2	8.520	161.0	0.026	78.1	0.967	–12.5	0.168	25.09
0.3	0.822	–26.3	8.120	152.5	0.038	73.7	0.930	–18.4	0.214	23.29
0.4	0.773	–34.1	7.731	144.0	0.048	69.1	0.889	–24.1	0.284	22.03
0.5	0.724	–41.2	7.293	136.4	0.057	65.3	0.846	–28.8	0.352	21.05
0.6	0.668	–48.2	6.859	129.3	0.064	62.0	0.798	–33.2	0.424	20.27
0.7	0.622	–54.6	6.428	123.1	0.071	59.9	0.754	–36.9	0.483	19.59
0.8	0.576	–59.7	5.998	117.3	0.076	57.8	0.714	–40.3	0.553	19.00
0.9	0.529	–65.6	5.642	111.8	0.080	56.5	0.676	–43.3	0.613	18.48
1.0	0.491	–70.5	5.315	106.6	0.084	55.9	0.644	–46.0	0.673	18.03
1.1	0.454	–75.2	5.008	101.8	0.088	55.2	0.614	–48.6	0.730	17.57
1.2	0.418	–79.3	4.713	97.6	0.091	55.2	0.588	–50.9	0.787	17.13
1.3	0.389	–84.6	4.485	93.5	0.094	55.3	0.565	–53.0	0.833	16.77
1.4	0.360	–89.0	4.255	89.6	0.098	55.7	0.544	–55.1	0.876	16.37
1.5	0.335	–93.9	4.057	85.9	0.102	55.9	0.527	–57.6	0.911	15.99
1.6	0.312	–99.0	3.871	82.2	0.106	56.5	0.508	–59.9	0.950	15.64
1.7	0.293	–103.5	3.720	78.8	0.110	57.2	0.494	–61.9	0.975	15.30
1.8	0.274	–109.3	3.568	75.4	0.114	58.1	0.481	–64.0	0.996	14.94
1.9	0.259	–115.7	3.423	72.1	0.119	58.8	0.467	–66.2	1.016	13.82
2.0	0.248	–121.7	3.296	68.9	0.125	59.4	0.457	–68.5	1.023	13.28
2.1	0.235	–127.8	3.178	65.8	0.130	60.5	0.444	–70.7	1.042	12.65
2.2	0.232	–132.9	3.065	63.0	0.136	61.3	0.436	–73.1	1.042	12.29
2.3	0.230	–140.3	2.968	59.9	0.142	61.8	0.427	–75.9	1.037	12.02
2.4	0.226	–146.0	2.876	57.1	0.149	62.2	0.419	–78.4	1.037	11.69
2.5	0.229	–151.7	2.797	54.3	0.156	62.5	0.412	–81.6	1.026	11.55
2.6	0.229	–156.7	2.710	51.5	0.164	63.0	0.407	–84.4	1.019	11.34
2.7	0.233	–162.0	2.645	48.9	0.172	63.0	0.403	–88.3	1.005	11.43
2.8	0.231	–167.5	2.561	46.0	0.179	62.7	0.399	–91.6	1.005	11.12
2.9	0.236	–171.2	2.484	43.4	0.188	62.2	0.393	–95.2	0.999	11.22
3.0	0.238	–176.1	2.411	41.2	0.197	62.1	0.377	–99.4	1.004	10.48
4.0	0.389	145.3	1.974	15.0	0.326	52.5	0.423	–145.6	0.802	7.82
5.0	0.614	118.2	1.467	–10.0	0.424	33.4	0.555	163.5	0.727	5.39

V_{CE} = 2 V, I_C = 5 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.818	–10.7	12.674	168.0	0.012	84.8	0.982	–7.4	0.104	30.12
0.2	0.773	–22.0	12.124	156.0	0.025	77.5	0.940	–15.4	0.217	26.86
0.3	0.717	–31.9	11.234	145.9	0.035	72.2	0.883	–22.0	0.310	25.04
0.4	0.659	–40.6	10.356	136.4	0.044	68.2	0.824	–27.9	0.398	23.71
0.5	0.594	–47.9	9.508	128.3	0.052	64.9	0.764	–32.4	0.491	22.63
0.6	0.531	–55.0	8.684	121.0	0.058	63.3	0.710	–36.1	0.570	21.77
0.7	0.482	–60.9	7.936	115.1	0.063	62.4	0.662	–39.0	0.638	20.97
0.8	0.438	–65.9	7.273	109.6	0.068	61.5	0.623	–41.7	0.704	20.26
0.9	0.395	–70.9	6.726	104.5	0.073	61.1	0.586	–43.8	0.767	19.63
1.0	0.360	–75.5	6.249	99.8	0.078	61.4	0.558	–45.6	0.816	19.04
1.1	0.328	–79.7	5.816	95.5	0.083	61.3	0.531	–47.7	0.865	18.48
1.2	0.298	–83.0	5.408	91.8	0.087	61.7	0.510	–49.2	0.909	17.92
1.3	0.272	–88.1	5.120	88.2	0.092	62.0	0.491	–51.1	0.938	17.46
1.4	0.249	–92.4	4.821	84.8	0.097	62.6	0.476	–52.8	0.962	16.95
1.5	0.230	–97.4	4.565	81.3	0.103	62.6	0.463	–54.7	0.981	16.47
1.6	0.212	–102.1	4.314	78.1	0.108	63.0	0.447	–56.7	1.004	15.60
1.7	0.196	–107.4	4.140	75.2	0.114	63.5	0.435	–58.5	1.014	14.88
1.8	0.182	–114.7	3.951	72.2	0.121	63.7	0.425	–60.5	1.019	14.31
1.9	0.172	–120.5	3.782	69.3	0.127	63.7	0.415	–62.6	1.026	13.75
2.0	0.166	–128.5	3.631	66.5	0.134	63.8	0.405	–64.7	1.025	13.36
2.1	0.159	–135.8	3.485	63.6	0.140	64.1	0.394	–66.7	1.034	12.84
2.2	0.160	–141.1	3.359	61.2	0.147	64.3	0.388	–69.1	1.028	12.56
2.3	0.160	–148.7	3.247	58.3	0.155	64.0	0.380	–71.8	1.023	12.29
2.4	0.163	–155.2	3.143	55.8	0.162	63.7	0.374	–74.4	1.017	12.08
2.5	0.168	–161.4	3.049	53.3	0.170	63.6	0.366	–77.5	1.010	11.93
2.6	0.171	–167.0	2.953	50.8	0.178	63.3	0.363	–80.3	1.002	11.94
2.7	0.176	–171.2	2.876	48.4	0.186	62.8	0.358	–84.2	0.994	11.89
2.8	0.181	–177.0	2.786	45.8	0.193	62.1	0.353	–87.7	0.993	11.58
2.9	0.184	179.7	2.697	43.3	0.202	61.3	0.346	–91.3	0.992	11.26
3.0	0.191	175.2	2.625	41.5	0.211	60.9	0.329	–95.6	0.995	10.95
4.0	0.352	141.7	2.150	17.2	0.328	50.0	0.367	–142.9	0.843	8.16
5.0	0.581	117.8	1.649	–6.8	0.418	32.4	0.497	164.9	0.771	5.96

V_{CE} = 2 V, I_C = 10 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.694	–14.2	19.002	163.5	0.012	80.6	0.961	–9.9	0.223	32.17
0.2	0.626	–29.1	17.390	148.2	0.023	76.0	0.886	–19.5	0.336	28.83
0.3	0.553	–40.5	15.284	136.4	0.032	71.4	0.801	–26.3	0.464	26.84
0.4	0.481	–49.4	13.402	126.2	0.039	69.7	0.724	–31.4	0.572	25.41
0.5	0.417	–56.5	11.792	118.2	0.045	67.7	0.655	–34.5	0.677	24.20
0.6	0.360	–62.3	10.416	111.5	0.051	67.6	0.604	–37.0	0.753	23.09
0.7	0.317	–68.1	9.288	106.1	0.057	67.6	0.560	–38.6	0.816	22.12
0.8	0.283	–71.7	8.356	101.3	0.063	67.7	0.528	–40.2	0.868	21.25
0.9	0.251	–76.5	7.623	96.9	0.068	68.0	0.501	–41.3	0.907	20.48
1.0	0.222	–80.2	6.982	92.7	0.074	68.3	0.478	–42.5	0.942	19.74
1.1	0.200	–84.4	6.444	89.2	0.080	68.5	0.461	–44.0	0.965	19.05
1.2	0.178	–87.0	5.956	86.1	0.086	68.7	0.446	–44.9	0.988	18.38
1.3	0.160	–92.8	5.592	83.0	0.092	68.8	0.433	–46.6	1.000	17.78
1.4	0.144	–98.0	5.245	79.8	0.099	68.9	0.422	–48.0	1.009	16.65
1.5	0.131	–103.6	4.932	77.0	0.106	68.7	0.414	–49.8	1.015	15.93
1.6	0.118	–109.8	4.659	74.2	0.112	68.4	0.402	–51.6	1.024	15.22
1.7	0.110	–117.3	4.435	71.5	0.119	68.4	0.394	–53.4	1.024	14.74
1.8	0.102	–125.7	4.232	68.9	0.127	68.1	0.386	–55.5	1.024	14.29
1.9	0.098	–134.9	4.042	66.3	0.135	67.7	0.378	–57.5	1.022	13.88
2.0	0.100	–146.2	3.878	63.8	0.142	67.2	0.370	–59.7	1.015	13.60
2.1	0.101	–155.8	3.718	61.3	0.149	67.1	0.360	–61.6	1.018	13.14
2.2	0.105	–159.7	3.577	59.2	0.157	66.7	0.355	–64.0	1.013	12.88
2.3	0.113	–168.5	3.453	56.4	0.166	66.0	0.349	–66.8	1.005	12.76
2.4	0.119	–174.2	3.335	54.2	0.173	65.3	0.343	–69.4	1.001	12.69
2.5	0.129	–179.6	3.233	51.9	0.182	64.7	0.336	–72.7	0.994	12.50
2.6	0.133	175.6	3.126	49.7	0.190	64.0	0.332	–75.6	0.990	12.16
2.7	0.143	171.8	3.046	47.4	0.198	63.0	0.327	–79.6	0.981	11.86
2.8	0.148	167.6	2.942	45.0	0.206	62.2	0.322	–83.3	0.982	11.55
2.9	0.158	165.2	2.851	42.7	0.215	61.1	0.314	–87.1	0.980	11.23
3.0	0.166	160.9	2.778	41.1	0.223	60.5	0.297	–91.3	0.983	10.95
4.0	0.334	135.9	2.275	18.3	0.334	48.3	0.327	–140.7	0.867	8.33
5.0	0.569	115.9	1.776	–4.6	0.417	31.3	0.453	165.6	0.801	6.29

V_{CE} = 2 V, I_C = 20 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.545	–20.3	24.280	158.6	0.010	81.2	0.928	–12.2	0.299	33.73
0.2	0.464	–38.9	21.001	140.4	0.020	75.4	0.821	–22.4	0.465	30.11
0.3	0.384	–51.7	17.425	127.7	0.028	71.3	0.719	–28.1	0.627	28.01
0.4	0.319	–62.1	14.660	117.8	0.034	71.8	0.642	–31.6	0.728	26.29
0.5	0.263	–69.1	12.529	110.3	0.041	71.7	0.582	–33.2	0.820	24.89
0.6	0.225	–77.4	10.851	104.3	0.047	71.9	0.539	–34.4	0.880	23.66
0.7	0.194	–82.6	9.547	99.4	0.053	72.4	0.507	–35.2	0.926	22.55
0.8	0.169	–88.3	8.491	95.1	0.059	72.7	0.483	–36.1	0.959	21.55
0.9	0.148	–95.4	7.678	91.2	0.065	73.0	0.464	–37.0	0.984	20.69
1.0	0.130	–101.0	6.998	87.5	0.072	73.3	0.450	–37.9	1.001	19.67
1.1	0.117	–107.7	6.428	84.3	0.079	73.4	0.437	–39.2	1.012	18.44
1.2	0.101	–113.1	5.923	81.5	0.085	73.3	0.427	–40.4	1.026	17.43
1.3	0.094	–124.2	5.553	78.5	0.092	73.2	0.419	–41.9	1.026	16.82
1.4	0.088	–131.6	5.180	75.6	0.099	73.1	0.412	–43.4	1.028	16.14
1.5	0.085	–142.7	4.877	72.9	0.107	72.7	0.406	–45.6	1.024	15.63
1.6	0.084	–152.9	4.599	70.2	0.114	72.3	0.397	–47.5	1.027	15.04
1.7	0.085	–161.0	4.372	67.8	0.122	71.9	0.392	–49.4	1.023	14.62
1.8	0.092	–170.5	4.168	65.3	0.130	71.5	0.385	–51.5	1.016	14.29
1.9	0.097	–179.3	3.969	62.9	0.138	70.9	0.379	–53.8	1.012	13.92
2.0	0.110	175.5	3.807	60.4	0.146	70.2	0.373	–56.1	1.002	13.89
2.1	0.119	170.4	3.645	58.1	0.154	70.0	0.365	–58.4	1.000	13.74
2.2	0.126	167.6	3.510	55.9	0.163	69.3	0.360	–60.9	0.993	13.34
2.3	0.138	163.2	3.380	53.2	0.171	68.5	0.354	–63.9	0.986	12.96
2.4	0.148	161.6	3.269	51.1	0.180	67.6	0.349	–66.7	0.978	12.60
2.5	0.161	158.7	3.170	48.8	0.188	66.8	0.343	–70.2	0.969	12.26
2.6	0.168	155.6	3.061	46.6	0.197	66.0	0.340	–73.3	0.964	11.91
2.7	0.178	153.9	2.979	44.4	0.206	65.0	0.335	–77.5	0.957	11.60
2.8	0.188	150.1	2.876	42.1	0.214	63.8	0.330	–81.2	0.956	11.28
2.9	0.196	149.9	2.792	39.9	0.223	62.6	0.322	–85.2	0.953	10.97
3.0	0.206	147.1	2.715	38.2	0.233	61.9	0.306	–89.4	0.956	10.67
4.0	0.381	129.2	2.217	15.6	0.348	48.3	0.340	–140.5	0.843	8.04
5.0	0.611	111.5	1.709	–7.5	0.430	30.4	0.468	165.2	0.780	5.99

V_{CE} = 3 V, I_C = 3 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.887	–7.6	8.641	170.9	0.013	86.5	0.994	–5.3	0.063	28.28
0.2	0.863	–17.0	8.464	161.4	0.025	79.9	0.970	–11.8	0.141	25.34
0.3	0.825	–25.2	8.097	153.0	0.036	73.5	0.935	–17.5	0.226	23.53
0.4	0.782	–33.1	7.718	144.7	0.045	69.8	0.896	–22.9	0.280	22.31
0.5	0.733	–39.8	7.293	137.1	0.054	65.6	0.853	–27.4	0.358	21.33
0.6	0.679	–46.6	6.864	130.1	0.061	63.0	0.809	–31.6	0.420	20.53
0.7	0.631	–52.6	6.426	123.9	0.067	60.7	0.766	–35.2	0.485	19.84
0.8	0.587	–58.0	6.036	118.2	0.071	58.9	0.728	–38.5	0.546	19.27
0.9	0.542	–63.6	5.682	112.8	0.076	57.6	0.693	–41.5	0.607	18.76
1.0	0.502	–68.0	5.366	107.5	0.079	56.9	0.660	–43.9	0.673	18.31
1.1	0.463	–72.7	5.069	102.8	0.083	56.4	0.630	–46.5	0.730	17.87
1.2	0.428	–76.7	4.762	98.6	0.086	56.5	0.606	–48.7	0.787	17.43
1.3	0.397	–81.6	4.542	94.5	0.089	56.8	0.584	–50.8	0.834	17.07
1.4	0.371	–85.9	4.304	90.6	0.093	57.1	0.563	–52.8	0.878	16.67
1.5	0.344	–90.5	4.108	86.8	0.097	57.7	0.547	–55.1	0.912	16.29
1.6	0.319	–94.8	3.926	83.1	0.100	58.5	0.528	–57.3	0.955	15.94
1.7	0.300	–99.9	3.772	79.8	0.104	59.4	0.515	–59.2	0.977	15.60
1.8	0.279	–105.2	3.619	76.3	0.108	60.3	0.501	–61.3	0.999	15.23
1.9	0.264	–110.9	3.474	73.1	0.113	61.0	0.490	–63.4	1.015	14.11
2.0	0.251	–117.1	3.346	69.9	0.119	62.0	0.479	–65.5	1.023	13.57
2.1	0.239	–122.6	3.229	66.8	0.124	63.2	0.466	–67.6	1.037	12.99
2.2	0.234	–128.0	3.116	64.0	0.130	64.2	0.459	–70.0	1.037	12.64
2.3	0.230	–134.6	3.019	60.9	0.136	64.7	0.451	–72.6	1.031	12.38
2.4	0.227	–140.2	2.931	58.0	0.143	65.1	0.444	–75.1	1.025	12.15
2.5	0.226	–145.9	2.846	55.4	0.150	65.7	0.437	–78.1	1.016	12.00
2.6	0.227	–151.4	2.763	52.5	0.159	66.2	0.432	–80.9	1.003	12.10
2.7	0.229	–156.2	2.699	49.9	0.166	66.1	0.428	–84.5	0.988	12.10
2.8	0.230	–161.5	2.616	47.2	0.175	66.0	0.423	–87.8	0.982	11.75
2.9	0.231	–165.9	2.540	44.5	0.183	65.6	0.416	–90.9	0.977	11.42
3.0	0.233	–171.7	2.475	42.3	0.194	65.5	0.402	–95.0	0.975	11.06
4.0	0.380	148.8	2.027	15.9	0.327	55.5	0.446	–140.4	0.771	7.92
5.0	0.615	120.5	1.515	–9.9	0.432	35.4	0.570	167.4	0.694	5.45

V_{CE} = 3 V, I_C = 5 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.834	–9.3	12.572	168.1	0.012	83.7	0.985	–6.9	0.133	30.31
0.2	0.783	–21.1	12.073	156.6	0.023	78.1	0.944	–14.5	0.211	27.12
0.3	0.732	–30.7	11.211	146.6	0.033	72.5	0.891	–20.8	0.307	25.27
0.4	0.670	–39.3	10.360	137.2	0.042	69.2	0.837	–26.4	0.386	23.92
0.5	0.607	–46.1	9.539	129.2	0.049	65.8	0.778	–30.7	0.486	22.93
0.6	0.547	–52.6	8.725	122.0	0.055	64.1	0.726	–34.3	0.565	22.02
0.7	0.498	–58.5	8.001	116.1	0.060	63.1	0.680	–36.9	0.633	21.24
0.8	0.453	–63.2	7.344	110.5	0.065	62.5	0.641	–39.5	0.702	20.54
0.9	0.410	–68.3	6.799	105.5	0.069	62.1	0.607	–41.7	0.761	19.93
1.0	0.373	–72.2	6.305	100.7	0.074	62.3	0.577	–43.5	0.818	19.33
1.1	0.340	–76.3	5.887	96.5	0.078	62.4	0.553	–45.4	0.863	18.77
1.2	0.309	–79.1	5.491	92.8	0.083	62.9	0.532	–46.9	0.907	18.22
1.3	0.284	–84.4	5.188	89.1	0.087	63.4	0.513	–48.5	0.936	17.75
1.4	0.260	–88.0	4.891	85.6	0.092	64.1	0.499	–50.2	0.963	17.25
1.5	0.239	–92.4	4.628	82.4	0.098	64.3	0.485	–52.0	0.982	16.76
1.6	0.218	–96.6	4.398	79.0	0.103	64.8	0.471	–53.9	1.004	15.91
1.7	0.204	–101.7	4.203	76.1	0.108	65.2	0.460	–55.6	1.012	15.22
1.8	0.190	–107.1	4.018	73.1	0.115	65.6	0.450	–57.6	1.018	14.62
1.9	0.176	–114.3	3.849	70.2	0.121	65.8	0.440	–59.5	1.023	14.10
2.0	0.168	–120.8	3.693	67.3	0.128	66.1	0.432	–61.5	1.022	13.70
2.1	0.160	–127.6	3.556	64.7	0.134	66.6	0.421	–63.4	1.027	13.23
2.2	0.158	–133.3	3.426	62.1	0.141	66.7	0.415	–65.7	1.023	12.94
2.3	0.157	–141.1	3.310	59.3	0.148	66.6	0.408	–68.3	1.016	12.71
2.4	0.157	–146.2	3.204	56.7	0.156	66.4	0.402	–70.7	1.009	12.53
2.5	0.161	–153.3	3.111	54.3	0.164	66.3	0.395	–73.7	1.000	12.73
2.6	0.164	–158.2	3.018	51.8	0.172	66.1	0.391	–76.4	0.988	12.43
2.7	0.170	–164.1	2.939	49.4	0.180	65.7	0.386	–80.2	0.980	12.13
2.8	0.173	–169.7	2.849	46.8	0.188	65.1	0.381	–83.4	0.976	11.80
2.9	0.178	–173.4	2.764	44.5	0.197	64.3	0.373	–86.6	0.972	11.47
3.0	0.185	–179.2	2.698	42.5	0.207	63.9	0.359	–90.5	0.970	11.16
4.0	0.337	145.5	2.217	18.0	0.327	53.1	0.392	–136.5	0.818	8.31
5.0	0.579	120.0	1.707	–7.0	0.425	34.5	0.514	169.9	0.740	6.04

V_{CE} = 3 V, I_C = 10 mA, Z_O = 50 Ω

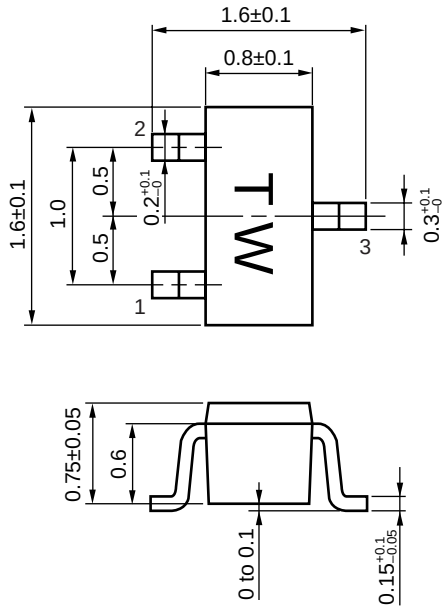
Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.705	–14.3	18.935	163.8	0.011	82.4	0.965	–9.3	0.190	32.38
0.2	0.646	–27.8	17.406	148.9	0.022	75.6	0.895	–18.3	0.336	29.05
0.3	0.569	–38.2	15.360	137.0	0.029	71.7	0.814	–24.7	0.465	27.20
0.4	0.496	–47.0	13.517	127.1	0.037	70.3	0.740	–29.5	0.567	25.68
0.5	0.433	–53.2	11.927	119.1	0.043	68.5	0.675	–32.6	0.672	24.47
0.6	0.375	–59.1	10.579	112.4	0.048	68.3	0.624	–34.8	0.750	23.39
0.7	0.332	–63.9	9.443	107.0	0.054	68.4	0.582	–36.3	0.813	22.43
0.8	0.296	–67.6	8.496	102.1	0.059	68.6	0.551	–37.9	0.864	21.55
0.9	0.262	–72.0	7.746	97.8	0.065	69.0	0.525	–39.1	0.906	20.79
1.0	0.233	–75.0	7.108	93.6	0.070	69.3	0.503	–40.1	0.940	20.04
1.1	0.211	–79.0	6.563	89.9	0.076	69.5	0.485	–41.5	0.964	19.37
1.2	0.191	–80.1	6.071	86.8	0.082	69.9	0.470	–42.5	0.989	18.70
1.3	0.171	–85.5	5.708	83.7	0.088	70.2	0.460	–44.0	0.997	18.13
1.4	0.154	–88.4	5.348	80.7	0.094	70.3	0.447	–45.4	1.010	16.93
1.5	0.138	–93.5	5.035	77.9	0.101	70.2	0.440	–47.1	1.013	16.27
1.6	0.124	–98.3	4.761	75.1	0.107	70.1	0.429	–48.9	1.023	15.55
1.7	0.115	–104.6	4.538	72.4	0.114	70.2	0.422	–50.6	1.021	15.11
1.8	0.105	–113.0	4.321	69.8	0.121	70.0	0.415	–52.4	1.018	14.69
1.9	0.095	–120.9	4.136	67.2	0.129	69.6	0.407	–54.4	1.017	14.27
2.0	0.095	–131.5	3.960	64.7	0.136	69.3	0.400	–56.4	1.011	13.99
2.1	0.092	–139.7	3.801	62.3	0.143	69.3	0.391	–58.3	1.012	13.56
2.2	0.095	–146.7	3.662	60.1	0.151	69.0	0.386	–60.7	1.006	13.39
2.3	0.100	–156.5	3.535	57.5	0.159	68.3	0.380	–63.2	0.997	13.47
2.4	0.106	–162.5	3.418	55.2	0.167	67.7	0.375	–65.7	0.991	13.12
2.5	0.115	–169.6	3.317	53.0	0.175	67.1	0.368	–68.8	0.983	12.78
2.6	0.122	–174.2	3.211	50.7	0.184	66.6	0.364	–71.5	0.975	12.42
2.7	0.130	–179.2	3.125	48.6	0.192	65.8	0.358	–75.3	0.969	12.12
2.8	0.134	175.8	3.028	46.3	0.200	65.0	0.353	–78.5	0.967	11.80
2.9	0.144	172.8	2.935	44.0	0.209	63.9	0.344	–81.8	0.963	11.48
3.0	0.154	167.5	2.871	42.2	0.219	63.2	0.330	–85.5	0.960	11.18
4.0	0.315	140.5	2.359	19.3	0.332	51.3	0.353	–132.9	0.845	8.51
5.0	0.557	118.3	1.847	–4.5	0.422	33.6	0.468	171.7	0.776	6.41

V_{CE} = 3 V, I_C = 20 mA, Z_O = 50 Ω

Frequency	S_{11}		S_{21}		S_{12}		S_{22}		K	MAG/MSG
(GHz)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)	MAG.	ANG. (deg.)		(dB)
0.1	0.559	–17.8	24.513	159.3	0.010	83.4	0.938	–11.2	0.274	33.73
0.2	0.485	–35.5	21.351	141.6	0.019	74.9	0.839	–20.9	0.462	30.46
0.3	0.403	–47.1	17.860	128.9	0.026	73.9	0.740	–26.4	0.606	28.35
0.4	0.340	–56.1	15.089	118.9	0.033	72.8	0.665	–29.8	0.715	26.62
0.5	0.285	–62.2	12.928	111.5	0.039	72.5	0.606	–31.4	0.810	25.26
0.6	0.241	–68.3	11.234	105.5	0.045	72.8	0.563	–32.6	0.871	24.02
0.7	0.210	–72.6	9.876	100.6	0.051	73.3	0.532	–33.3	0.917	22.91
0.8	0.184	–76.7	8.804	96.3	0.056	73.6	0.508	–34.2	0.952	21.94
0.9	0.159	–81.1	7.970	92.4	0.062	74.0	0.489	–35.0	0.977	21.06
1.0	0.140	–85.6	7.268	88.6	0.069	74.2	0.476	–35.9	0.994	20.25
1.1	0.123	–89.1	6.684	85.4	0.075	74.4	0.463	–37.1	1.007	18.99
1.2	0.107	–92.2	6.156	82.5	0.081	74.5	0.453	–38.2	1.020	17.92
1.3	0.096	–100.3	5.762	79.8	0.088	74.4	0.445	–39.7	1.021	17.28
1.4	0.084	–106.7	5.396	77.0	0.095	74.6	0.439	–41.2	1.022	16.65
1.5	0.076	–114.9	5.073	74.2	0.102	74.0	0.433	–43.0	1.019	16.12
1.6	0.069	–126.2	4.782	71.6	0.109	73.7	0.424	–45.0	1.023	15.50
1.7	0.068	–133.7	4.549	69.2	0.116	73.5	0.420	–46.9	1.017	15.13
1.8	0.069	–147.3	4.341	66.7	0.124	73.1	0.414	–48.8	1.009	14.87
1.9	0.072	–158.3	4.134	64.4	0.132	72.6	0.408	–50.9	1.004	14.57
2.0	0.077	–169.4	3.964	61.9	0.140	72.0	0.402	–53.0	0.996	14.51
2.1	0.085	–178.0	3.803	59.6	0.148	71.8	0.394	–55.1	0.994	14.11
2.2	0.090	178.6	3.659	57.6	0.156	71.3	0.390	–57.5	0.987	13.70
2.3	0.102	174.0	3.528	55.0	0.164	70.4	0.385	–60.3	0.979	13.32
2.4	0.111	169.9	3.411	52.8	0.173	69.7	0.380	–62.9	0.971	12.95
2.5	0.124	166.7	3.308	50.7	0.181	68.9	0.374	–66.1	0.962	12.62
2.6	0.134	163.0	3.201	48.5	0.190	68.3	0.371	–69.0	0.954	12.26
2.7	0.144	161.7	3.118	46.4	0.199	67.2	0.365	–72.9	0.946	11.95
2.8	0.154	158.0	3.021	44.1	0.208	66.3	0.359	–76.2	0.943	11.63
2.9	0.164	156.8	2.932	41.9	0.217	65.1	0.351	–79.5	0.939	11.31
3.0	0.175	153.7	2.863	40.3	0.227	64.2	0.336	–83.3	0.938	11.01
4.0	0.343	134.3	2.351	17.6	0.343	51.1	0.361	–131.9	0.829	8.36
5.0	0.588	115.1	1.830	–6.1	0.432	32.8	0.474	172.0	0.763	6.27

PACKAGE DIMENSIONS

3-PIN ULTRA SUPER MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. Emitter
2. Base
3. Collector

[MEMO]

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