

2SC5975

Silicon NPN Epitaxial High Frequency Low Noise Amplifier / Oscillator

REJ03G0381-0100Z

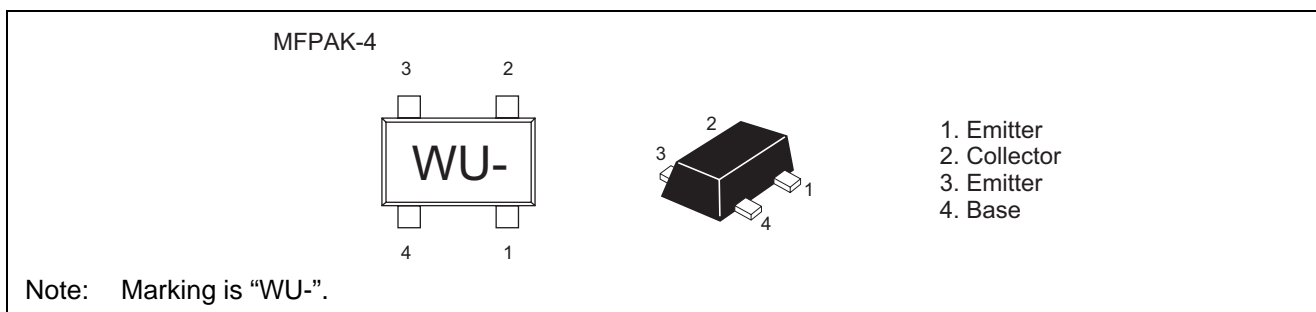
Rev.1.00

Jul.06.2004

Features

- High gain bandwidth product
 $f_T = 20 \text{ GHz typ.}$
- High power gain and low noise figure;
 $PG = 17.5 \text{ dB typ.}$, $NF = 1.15 \text{ dB typ.}$ at $f = 1.8 \text{ GHz}$

Outline



Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	12	V
Collector to emitter voltage	V_{CEO}	4	V
Emitter to base voltage	V_{EBO}	1.5	V
Collector current	I_C	35	mA
Collector power dissipation	P_C^{*1}	200	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

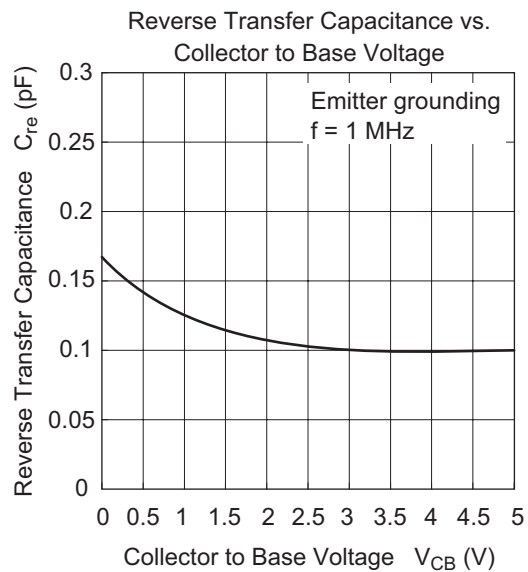
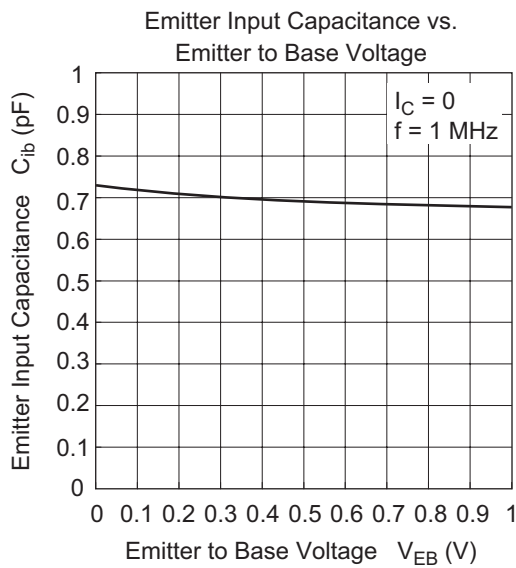
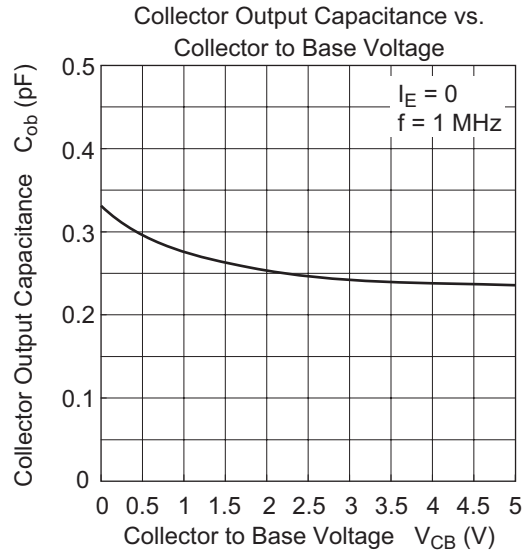
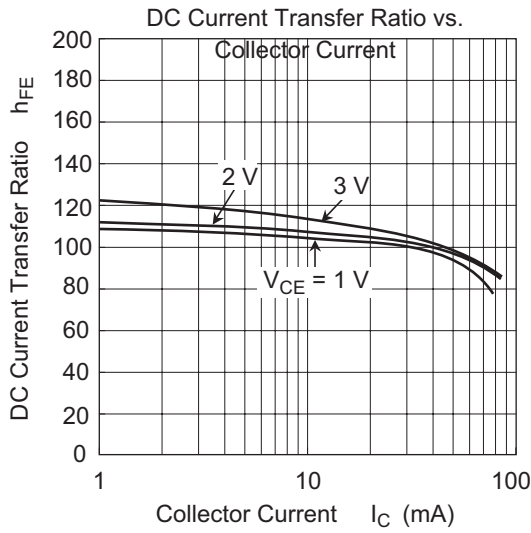
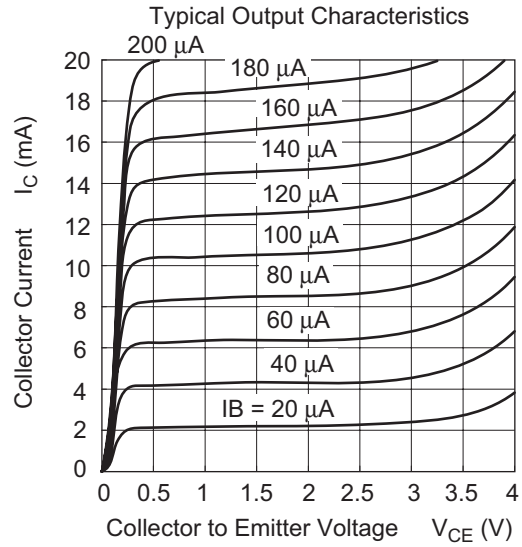
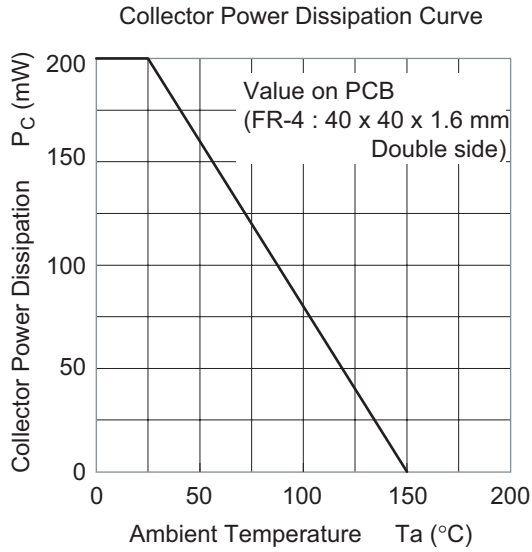
Note: 1. Value on PCB (FR-4 : 40 x 40 x 1.6mm Double side)

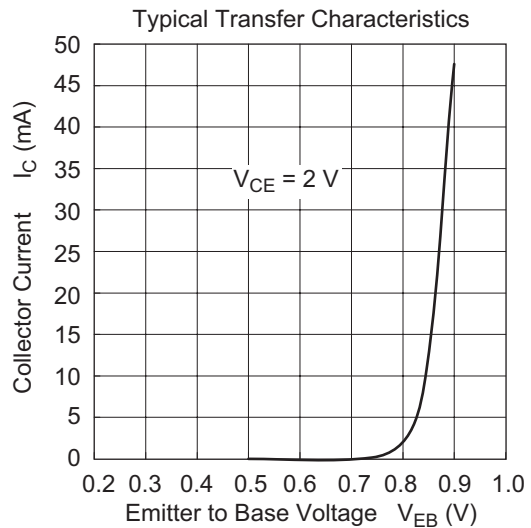
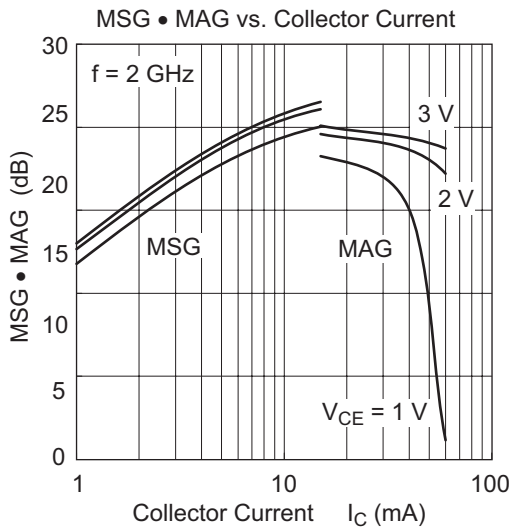
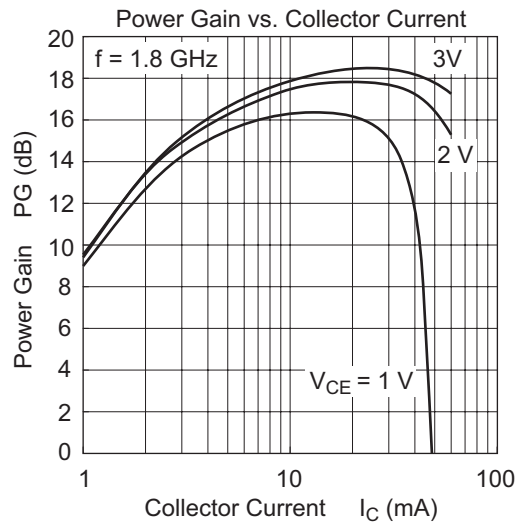
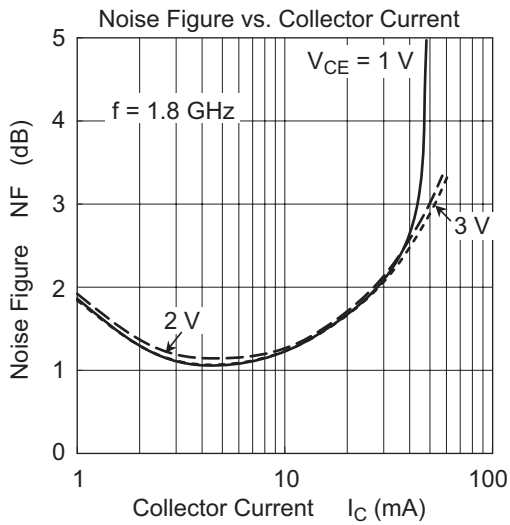
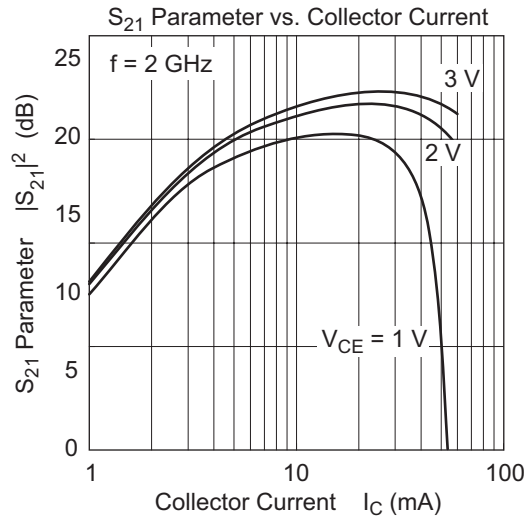
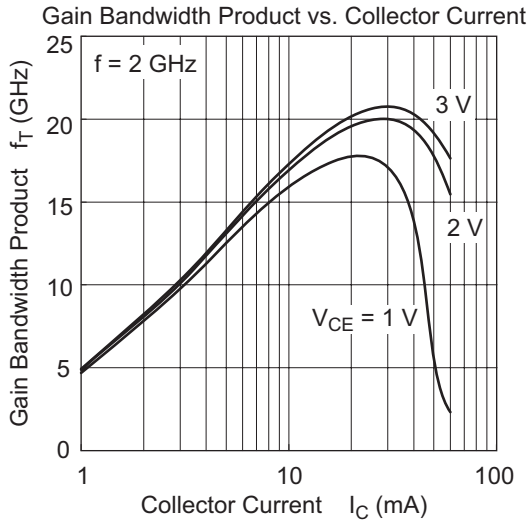
Electrical Characteristics

(Ta = 25°C)

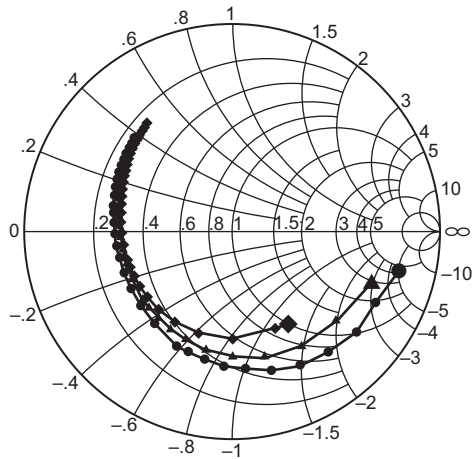
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{CB} = 12\text{ V}, I_E = 0$
Collector cutoff current	I_{CEO}	—	—	1	μA	$V_{CE} = 4\text{ V}, R_{BE} = \infty$
Emitter cutoff current	I_{EEO}	—	—	10	μA	$V_{EB} = 1.5\text{ V}, I_C = 0$
DC current transfer ratio	h_{FE}	70	110	150	—	$V_{CE} = 2\text{ V}, I_C = 20\text{ mA}$
Collector output capacitance	C_{ob}	—	0.3	0.6	pF	$V_{CB} = 2\text{ V}, I_E = 0, f = 1\text{ MHz}$
Gain bandwidth product	f_T	17	20	—	GHz	$V_{CE} = 2\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$
Power gain	PG	13	17.5	—	dB	$V_{CE} = 2\text{ V}, I_C = 30\text{ mA}, f = 1.8\text{ GHz}$
Noise figure	NF	—	1.15	1.7	dB	$V_{CE} = 2\text{ V}, I_C = 5\text{ mA}, f = 1.8\text{ GHz}$

Main Characteristics

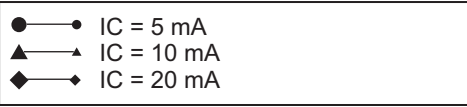




S11 Parameter vs. Frequency

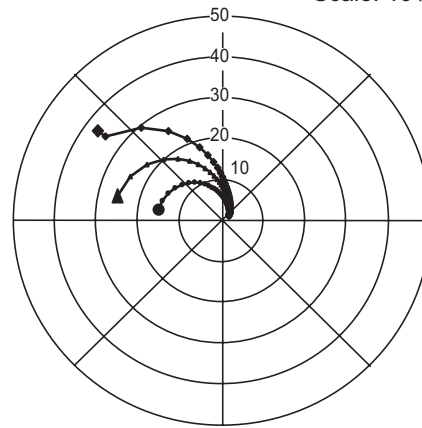


Condition: VCE = 1 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)

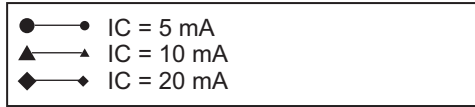


S21 Parameter vs. Frequency

Scale: 10 / div.

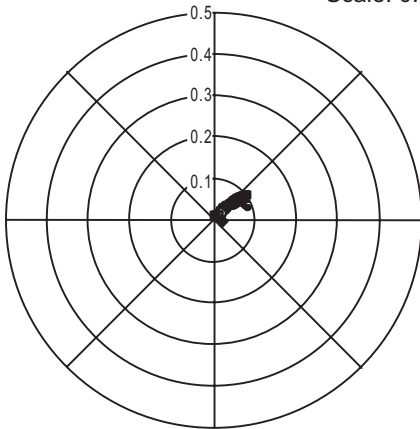


Condition: VCE = 1 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)

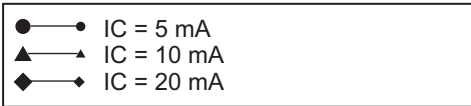


S12 Parameter vs. Frequency

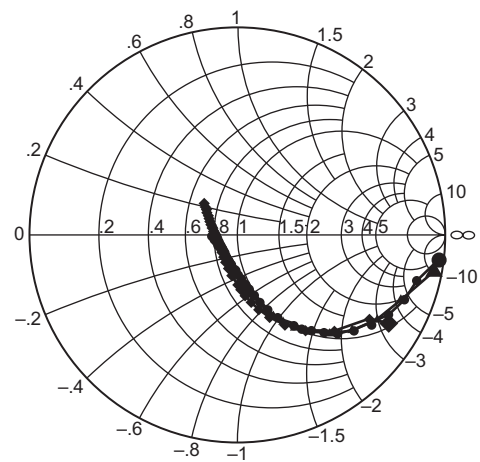
Scale: 0.1 / div.



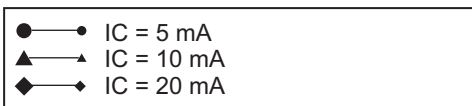
Condition: VCE = 1 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)



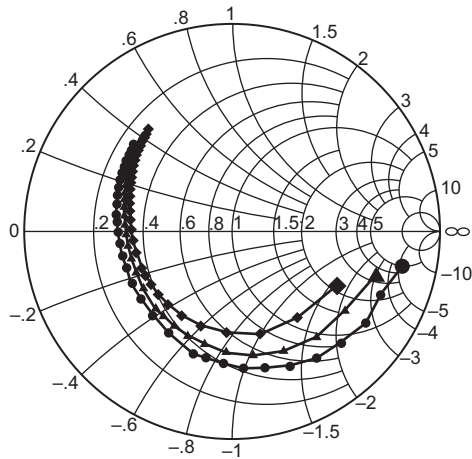
S22 Parameter vs. Frequency



Condition: VCE = 1 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)



S₁₁ Parameter vs. Frequency

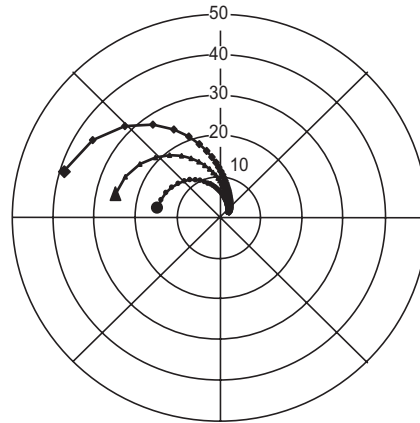


Condition: VCE = 2 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S₂₁ Parameter vs. Frequency

Scale: 10 / div.

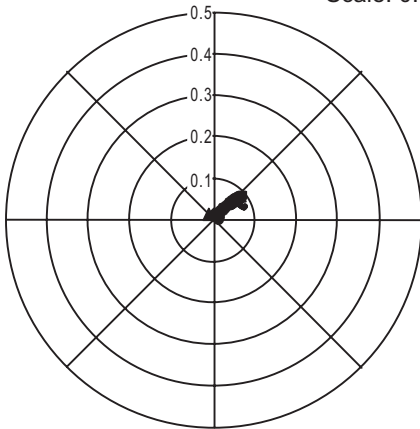


Condition: VCE = 2 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S₁₂ Parameter vs. Frequency

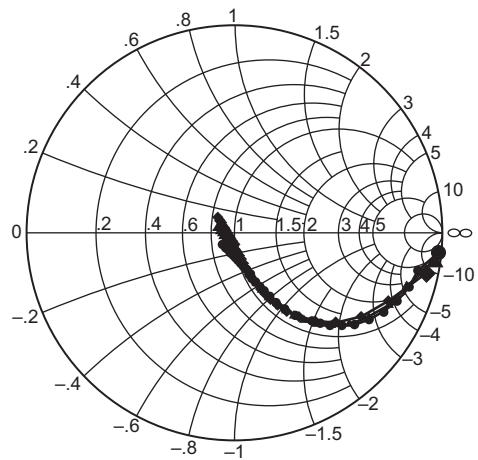
Scale: 0.1 / div.



Condition: VCE = 2 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

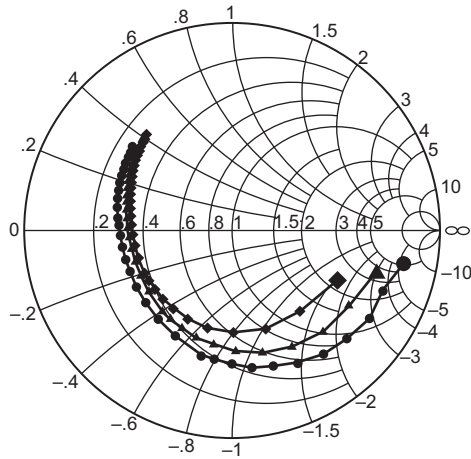
S₂₂ Parameter vs. Frequency



Condition: VCE = 2 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S11 Parameter vs. Frequency

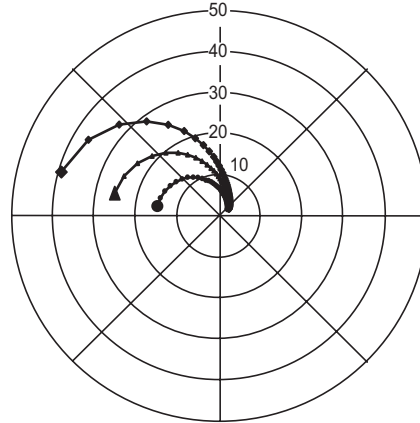


Condition: VCE = 3 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S21 Parameter vs. Frequency

Scale: 10 / div.

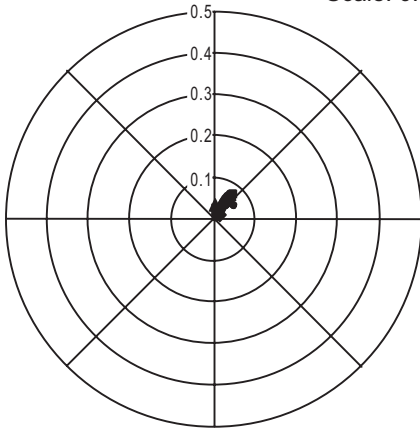


Condition: VCE = 3 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S12 Parameter vs. Frequency

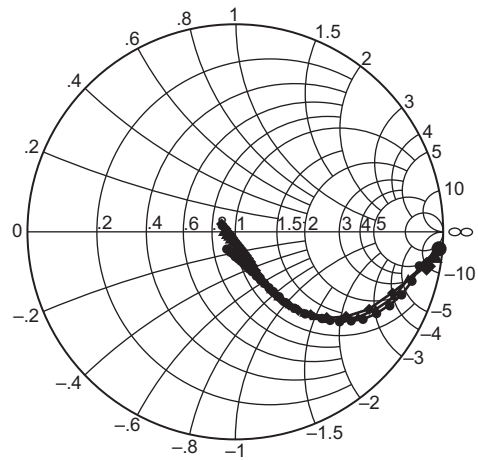
Scale: 0.1 / div.



Condition: VCE = 3 V , Zo = 50 Ω
 100 to 5100 MHz (100 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S22 Parameter vs. Frequency



Condition: VCE = 3 V , Zo = 50 Ω
 100 to 1000 MHz (100 MHz step)
 1000 to 5100 MHz (200 MHz step)

- IC = 5 mA
- ▲ IC = 10 mA
- ◆ IC = 20 mA

S parameter

 $(V_{CE} = 1 \text{ V}, I_C = 5 \text{ mA}, Z_o = 50 \Omega)$

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.828	-13.3	15.36	170.8	0.0098	84.3	0.979	-7.0
200	0.830	-26.4	14.97	161.7	0.0201	78.4	0.960	-14.4
300	0.831	-39.1	14.41	153.0	0.0300	72.8	0.929	-21.3
400	0.801	-51.5	13.65	145.1	0.0381	66.9	0.887	-28.0
500	0.778	-63.1	12.83	137.8	0.0461	61.5	0.839	-34.0
600	0.750	-74.3	12.03	131.0	0.0524	56.2	0.784	-39.6
700	0.716	-84.5	11.27	125.2	0.0576	51.7	0.731	-44.8
800	0.703	-93.5	10.40	119.7	0.0624	47.9	0.678	-48.6
900	0.680	-102.2	9.68	114.9	0.0661	43.8	0.629	-52.5
1000	0.665	-110.1	8.94	110.4	0.0692	40.9	0.583	-55.2
1100	0.662	-115.8	8.27	106.6	0.0726	38.0	0.546	-57.7
1200	0.636	-123.9	7.88	103.1	0.0733	36.0	0.503	-61.2
1300	0.626	-130.0	7.39	99.8	0.0746	33.7	0.468	-63.6
1400	0.617	-135.7	6.95	96.7	0.0760	32.2	0.437	-65.8
1500	0.612	-140.8	6.54	94.0	0.0773	30.8	0.410	-67.5
1600	0.606	-145.8	6.19	91.3	0.0781	29.3	0.385	-69.5
1700	0.603	-150.5	5.87	88.7	0.0784	28.6	0.360	-71.2
1800	0.600	-155.3	5.60	86.2	0.0791	27.0	0.334	-73.5
1900	0.600	-159.0	5.30	83.8	0.0794	26.5	0.316	-74.1
2000	0.598	-162.6	5.06	82.0	0.0804	25.5	0.301	-76.3
2100	0.599	-166.8	4.84	79.5	0.0796	24.9	0.278	-77.5
2200	0.600	-169.2	4.60	78.1	0.0819	24.1	0.272	-79.1
2300	0.604	-172.8	4.43	75.6	0.0815	23.7	0.251	-80.5
2400	0.606	-175.7	4.25	73.7	0.0820	23.4	0.237	-82.1
2500	0.609	-178.8	4.10	71.7	0.0819	22.9	0.221	-84.5
2600	0.611	178.8	3.93	70.2	0.0830	22.7	0.213	-86.1
2700	0.615	175.8	3.80	68.2	0.0821	21.9	0.199	-88.9
2800	0.618	173.8	3.66	66.7	0.0836	22.0	0.192	-90.8
2900	0.623	171.0	3.54	64.5	0.0828	22.0	0.177	-92.7
3000	0.627	168.8	3.41	62.6	0.0834	21.4	0.165	-95.0
3100	0.631	167.8	3.25	61.5	0.0849	20.1	0.172	-94.0
3200	0.634	164.9	3.19	59.7	0.0845	21.2	0.155	-99.7
3300	0.639	163.0	3.08	58.1	0.0845	20.8	0.147	-102.7
3400	0.643	161.1	2.99	56.4	0.0854	20.5	0.140	-106.2
3500	0.648	159.1	2.90	54.9	0.0853	20.6	0.133	-109.8
3600	0.652	157.4	2.81	53.3	0.0853	20.5	0.127	-113.8
3700	0.656	155.6	2.73	51.7	0.0847	20.2	0.122	-118.2
3800	0.659	154.0	2.65	50.2	0.0854	20.2	0.118	-122.0
3900	0.664	152.4	2.58	48.7	0.0855	19.9	0.113	-127.3
4000	0.666	150.7	2.50	47.1	0.0857	20.0	0.111	-131.6
4100	0.670	149.2	2.43	45.7	0.0857	20.0	0.108	-136.9
4200	0.672	147.8	2.36	44.3	0.0857	20.2	0.108	-141.3
4300	0.675	146.4	2.30	42.9	0.0858	20.2	0.106	-145.7
4400	0.679	145.1	2.24	41.5	0.0862	20.5	0.108	-151.1
4500	0.683	143.8	2.19	40.0	0.0866	20.4	0.111	-156.5
4600	0.685	142.2	2.13	38.6	0.0857	20.2	0.112	-162.2
4700	0.688	141.0	2.07	37.3	0.0863	20.7	0.113	-166.4
4800	0.689	139.9	2.02	36.1	0.0866	21.1	0.115	-169.2
4900	0.693	138.8	1.97	34.8	0.0881	21.4	0.122	-173.3
5000	0.699	137.5	1.93	33.3	0.0892	20.7	0.128	-177.7
5100	0.704	136.3	1.88	31.9	0.0888	20.0	0.134	178.4

S parameter

(V_{CE} = 1 V, I_C = 10 mA, Z_O = 50 Ω)

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.718	-20.9	25.67	166.7	0.0099	80.8	0.957	-10.7
200	0.711	-40.8	24.35	154.2	0.0186	73.0	0.912	-21.8
300	0.698	-58.9	22.48	142.9	0.0266	65.9	0.850	-31.4
400	0.673	-75.5	20.32	133.3	0.0327	59.6	0.775	-39.9
500	0.652	-89.8	18.23	125.1	0.0377	54.8	0.702	-47.1
600	0.632	-102.4	16.34	118.1	0.0416	50.4	0.631	-53.2
700	0.611	-113.2	14.67	112.5	0.0441	46.9	0.568	-58.5
800	0.603	-122.1	13.22	107.5	0.0466	44.5	0.512	-62.5
900	0.592	-130.3	11.99	103.3	0.049	41.8	0.463	-66.3
1000	0.588	-137.3	10.90	99.5	0.0509	40.8	0.419	-69.2
1100	0.584	-142.5	9.99	96.3	0.0528	39.5	0.385	-71.6
1200	0.577	-149.2	9.28	93.4	0.0538	38.7	0.350	-75.2
1300	0.575	-154.2	8.61	90.7	0.0544	37.3	0.320	-77.7
1400	0.574	-158.8	8.02	88.2	0.0562	37.3	0.295	-80.1
1500	0.573	-162.8	7.51	86.0	0.0571	37.0	0.273	-82.0
1600	0.574	-166.8	7.05	83.8	0.0583	36.5	0.253	-84.4
1700	0.575	-170.3	6.65	81.7	0.0591	36.8	0.233	-86.8
1800	0.578	-173.9	6.29	79.6	0.0607	36.3	0.215	-89.4
1900	0.580	-176.8	5.96	77.7	0.0612	36.6	0.200	-90.9
2000	0.582	-179.6	5.66	76.1	0.0625	35.9	0.188	-93.6
2100	0.586	-177.4	5.38	74.1	0.0632	36.2	0.172	-96.0
2200	0.588	-175.3	5.14	72.6	0.0647	35.8	0.165	-98.3
2300	0.593	-172.6	4.92	70.8	0.0662	36.0	0.151	-101.3
2400	0.597	-170.4	4.71	69.1	0.0671	35.9	0.141	-104.6
2500	0.601	-168.1	4.52	67.5	0.0694	36.1	0.131	-108.8
2600	0.605	-166.2	4.34	66.0	0.0693	35.8	0.125	-112.3
2700	0.610	-164.0	4.18	64.3	0.0697	35.2	0.119	-117.6
2800	0.614	-162.3	4.03	62.9	0.0717	36.2	0.114	-120.8
2900	0.619	-160.3	3.88	61.2	0.0724	35.7	0.106	-126.5
3000	0.623	-158.7	3.74	59.5	0.074	35.7	0.100	-131.3
3100	0.626	-157.5	3.60	58.4	0.0753	35.0	0.100	-131.7
3200	0.632	-155.4	3.50	56.9	0.0761	35.3	0.097	-141.0
3300	0.636	-154.0	3.38	55.4	0.0772	35.3	0.095	-146.6
3400	0.641	-152.4	3.27	53.9	0.0778	35.0	0.095	-152.7
3500	0.647	-150.9	3.17	52.6	0.0791	35.1	0.096	-158.9
3600	0.651	-149.4	3.08	51.1	0.0801	34.8	0.097	-164.4
3700	0.655	-148.0	2.98	49.7	0.0807	34.7	0.099	-169.8
3800	0.659	-146.7	2.90	48.4	0.0818	34.2	0.102	-174.2
3900	0.664	-145.4	2.81	47.0	0.0829	33.9	0.106	-179.8
4000	0.666	-143.9	2.73	45.6	0.0838	33.7	0.110	-176.7
4100	0.670	-142.7	2.65	44.2	0.0841	34.0	0.113	-171.9
4200	0.673	-141.6	2.57	43.0	0.0851	34.1	0.118	-169.0
4300	0.675	-140.3	2.51	41.7	0.0861	33.9	0.122	-166.1
4400	0.679	-139.3	2.44	40.4	0.0873	33.9	0.129	-163.2
4500	0.684	-138.1	2.38	39.1	0.0879	33.4	0.136	-160.7
4600	0.687	-136.8	2.31	37.8	0.088	33.2	0.142	-157.3
4700	0.689	-135.8	2.25	36.6	0.0897	33.4	0.146	-154.8
4800	0.691	-134.8	2.20	35.5	0.0906	33.6	0.151	-153.2
4900	0.695	-133.9	2.14	34.2	0.0923	33.2	0.159	-152.0
5000	0.701	-132.9	2.10	32.9	0.0939	32.2	0.168	-150.3
5100	0.706	-131.7	2.04	31.6	0.0934	31.8	0.176	-148.1

S parameter

(V_{CE} = 1 V, I_C = 20 mA, Z_o = 50 Ω)

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.561	-61.2	36.78	143.8	0.0137	64.0	0.863	-32.6
200	0.557	-66.3	34.53	143.9	0.0167	66.8	0.815	-32.5
300	0.562	-89.9	29.67	130.6	0.0222	59.4	0.711	-44.6
400	0.561	-108.3	25.17	120.5	0.0261	54.8	0.611	-54.4
500	0.561	-122.2	21.47	112.7	0.0291	51.2	0.530	-62.0
600	0.560	-133.2	18.51	106.6	0.0314	49.2	0.460	-68.4
700	0.559	-142.1	16.15	101.8	0.0332	47.9	0.404	-73.7
800	0.561	-149.0	14.30	97.8	0.0352	47.7	0.357	-78.0
900	0.561	-155.3	12.78	94.4	0.0368	46.4	0.318	-82.3
1000	0.563	-160.4	11.53	91.3	0.0389	46.8	0.284	-85.9
1100	0.564	-164.5	10.53	88.8	0.0406	46.7	0.259	-88.9
1200	0.567	-169.0	9.64	86.5	0.0424	46.8	0.233	-93.3
1300	0.569	-172.6	8.90	84.3	0.0437	46.3	0.212	-97.1
1400	0.571	-176.0	8.26	82.2	0.0458	47.5	0.195	-100.6
1500	0.574	-178.9	7.71	80.4	0.0472	47.6	0.179	-104.1
1600	0.577	178.2	7.22	78.5	0.0491	47.0	0.166	-108.0
1700	0.581	175.6	6.78	76.7	0.0507	48.1	0.153	-112.5
1800	0.585	173.0	6.39	75.0	0.0525	47.5	0.142	-117.1
1900	0.589	170.8	6.06	73.3	0.0543	48.0	0.133	-120.9
2000	0.591	168.6	5.75	71.8	0.056	47.5	0.126	-125.4
2100	0.596	166.5	5.45	70.2	0.0577	47.4	0.118	-130.9
2200	0.598	164.7	5.22	68.8	0.0597	47.3	0.114	-134.8
2300	0.605	162.8	4.98	67.2	0.0608	47.3	0.110	-140.9
2400	0.609	161.1	4.76	65.7	0.0629	47.5	0.106	-146.4
2500	0.614	159.4	4.56	64.2	0.0656	47.0	0.105	-152.8
2600	0.618	157.8	4.38	62.8	0.0662	46.6	0.105	-157.7
2700	0.623	156.1	4.20	61.4	0.0673	46.0	0.107	-163.5
2800	0.627	154.7	4.06	60.0	0.0697	46.7	0.108	-167.6
2900	0.633	153.1	3.90	58.5	0.0714	46.0	0.110	-173.2
3000	0.636	151.8	3.76	57.1	0.0728	45.6	0.112	-177.9
3100	0.639	150.7	3.65	55.9	0.0745	45.4	0.112	-179.6
3200	0.645	149.1	3.51	54.5	0.0759	45.3	0.119	174.6
3300	0.649	148.0	3.39	53.2	0.0775	45.0	0.123	171.0
3400	0.655	146.6	3.29	51.8	0.079	44.0	0.128	167.4
3500	0.660	145.4	3.18	50.5	0.0805	44.1	0.134	163.9
3600	0.663	144.1	3.09	49.1	0.0817	43.8	0.139	161.2
3700	0.668	143.0	2.99	47.8	0.083	43.2	0.145	158.1
3800	0.672	141.9	2.90	46.6	0.0848	43.0	0.151	155.9
3900	0.677	140.6	2.82	45.3	0.0855	42.5	0.157	153.3
4000	0.679	139.4	2.73	43.9	0.0871	42.0	0.162	151.3
4100	0.683	138.3	2.66	42.7	0.0876	42.1	0.168	149.2
4200	0.685	137.3	2.58	41.5	0.0889	42.0	0.174	147.7
4300	0.688	136.3	2.51	40.3	0.0906	41.5	0.179	145.8
4400	0.692	135.4	2.44	39.1	0.0919	41.1	0.187	144.7
4500	0.696	134.3	2.38	37.8	0.0931	40.6	0.195	143.2
4600	0.700	133.1	2.31	36.6	0.0939	40.4	0.203	141.2
4700	0.702	132.3	2.25	35.5	0.0954	40.4	0.206	139.9
4800	0.703	131.4	2.19	34.5	0.0969	39.8	0.212	138.8
4900	0.707	130.6	2.14	33.3	0.0987	39.4	0.219	138.3
5000	0.713	129.7	2.09	32.0	0.1003	38.3	0.228	137.4
5100	0.717	128.6	2.04	30.7	0.1001	37.6	0.237	135.9

S parameter

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

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.835	-11.7	15.31	171.6	0.0077	85.2	0.985	-5.6
200	0.838	-23.3	14.98	163.4	0.0158	80.3	0.970	-11.7
300	0.841	-34.6	14.51	155.4	0.0237	75.7	0.948	-17.3
400	0.813	-45.8	13.88	148.1	0.0309	70.7	0.915	-22.9
500	0.792	-56.4	13.17	141.2	0.0382	66.3	0.877	-28.1
600	0.764	-66.9	12.48	134.6	0.0441	61.0	0.831	-33.0
700	0.730	-76.6	11.83	128.9	0.0489	56.7	0.784	-37.6
800	0.715	-85.3	10.99	123.4	0.0534	52.8	0.736	-40.9
900	0.689	-93.8	10.31	118.7	0.0569	48.5	0.691	-44.3
1000	0.672	-101.7	9.56	114.2	0.0603	45.5	0.647	-46.7
1100	0.669	-107.6	8.86	110.2	0.0637	42.4	0.610	-48.8
1200	0.636	-115.7	8.51	106.6	0.0650	40.5	0.567	-51.8
1300	0.623	-121.9	8.01	103.2	0.0661	37.7	0.533	-53.9
1400	0.612	-127.9	7.56	100.1	0.0681	36.4	0.501	-55.5
1500	0.603	-133.2	7.13	97.3	0.0688	34.5	0.473	-56.8
1600	0.596	-138.4	6.76	94.6	0.0696	32.9	0.448	-58.3
1700	0.590	-143.3	6.43	91.9	0.0704	32.1	0.422	-59.5
1800	0.585	-148.4	6.15	89.3	0.0709	30.8	0.396	-61.0
1900	0.585	-152.4	5.82	86.9	0.0713	29.7	0.378	-61.2
2000	0.580	-156.2	5.57	85.2	0.0724	28.8	0.362	-62.8
2100	0.580	-160.8	5.33	82.5	0.0720	28.3	0.339	-63.2
2200	0.580	-163.3	5.07	81.2	0.0739	27.5	0.332	-64.6
2300	0.583	-167.2	4.88	78.6	0.0734	27.1	0.310	-65.0
2400	0.584	-170.3	4.69	76.7	0.0738	26.6	0.296	-65.9
2500	0.586	-173.7	4.54	74.7	0.0742	26.3	0.278	-67.2
2600	0.588	-176.2	4.35	73.2	0.0747	25.6	0.270	-68.0
2700	0.591	-179.5	4.21	71.1	0.0741	25.5	0.255	-69.4
2800	0.594	178.4	4.05	69.7	0.0755	25.3	0.246	-70.7
2900	0.598	175.4	3.92	67.5	0.0754	25.5	0.232	-71.0
3000	0.604	173.0	3.79	65.5	0.0754	24.8	0.218	-71.7
3100	0.608	171.9	3.59	64.5	0.0769	23.6	0.225	-72.1
3200	0.610	168.8	3.54	62.7	0.0762	24.4	0.206	-74.6
3300	0.614	166.8	3.43	61.1	0.0763	24.0	0.196	-75.8
3400	0.619	164.7	3.32	59.4	0.0769	24.0	0.186	-77.7
3500	0.624	162.6	3.22	57.8	0.0771	24.2	0.178	-79.5
3600	0.628	160.8	3.13	56.2	0.0774	23.7	0.169	-81.3
3700	0.631	158.9	3.04	54.7	0.0771	24.0	0.160	-83.4
3800	0.635	157.2	2.95	53.2	0.0777	23.7	0.153	-85.5
3900	0.640	155.4	2.87	51.6	0.0778	23.3	0.145	-88.0
4000	0.643	153.6	2.79	50.1	0.0779	23.5	0.138	-90.6
4100	0.647	152.1	2.71	48.7	0.0775	23.7	0.131	-93.4
4200	0.649	150.6	2.64	47.3	0.0776	23.8	0.125	-96.8
4300	0.652	149.1	2.57	45.9	0.0778	24.1	0.120	-99.2
4400	0.656	147.8	2.51	44.5	0.0785	24.4	0.115	-103.8
4500	0.661	146.4	2.44	43.0	0.0784	24.0	0.111	-108.3
4600	0.663	144.7	2.38	41.6	0.0783	24.0	0.105	-113.3
4700	0.665	143.4	2.32	40.3	0.0790	24.5	0.100	-117.2
4800	0.667	142.3	2.26	39.1	0.0788	25.1	0.098	-120.8
4900	0.671	141.3	2.21	37.7	0.0804	24.9	0.099	-126.6
5000	0.677	139.9	2.17	36.2	0.0813	24.7	0.098	-133.8
5100	0.682	138.6	2.11	34.8	0.0810	24.0	0.098	-140.8

S parameter

(V_{CE} = 2 V, I_C = 10 mA, Z_o = 50 Ω)

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.723	-17.9	26.12	168.0	0.0071	82.8	0.968	-8.4
200	0.717	-35.3	25.04	156.6	0.0146	76.8	0.935	-17.4
300	0.705	-51.6	23.44	146.2	0.0213	70.0	0.886	-25.2
400	0.678	-66.8	21.53	137.0	0.0267	64.7	0.824	-32.4
500	0.655	-80.4	19.59	128.9	0.0310	59.5	0.761	-38.6
600	0.630	-92.8	17.77	121.9	0.0352	55.3	0.695	-43.9
700	0.605	-103.7	16.13	116.1	0.0379	52.0	0.635	-48.4
800	0.593	-112.9	14.61	111.0	0.0404	49.5	0.579	-51.7
900	0.578	-121.4	13.32	106.6	0.0424	46.1	0.530	-54.7
1000	0.569	-128.9	12.15	102.6	0.0450	45.1	0.485	-56.8
1100	0.565	-134.6	11.15	99.3	0.0469	43.6	0.449	-58.7
1200	0.553	-141.6	10.40	96.3	0.0478	42.5	0.412	-61.0
1300	0.548	-147.1	9.67	93.6	0.0487	41.1	0.381	-62.6
1400	0.545	-152.1	9.03	91.0	0.0498	41.2	0.353	-63.9
1500	0.544	-156.5	8.45	88.7	0.0512	40.7	0.330	-64.9
1600	0.543	-160.8	7.95	86.5	0.0520	40.0	0.309	-66.1
1700	0.543	-164.7	7.51	84.3	0.0528	40.4	0.287	-67.0
1800	0.544	-168.6	7.12	82.2	0.0543	39.7	0.267	-68.2
1900	0.546	-171.8	6.74	80.3	0.0551	40.0	0.252	-68.4
2000	0.547	-174.9	6.41	78.7	0.0563	39.2	0.238	-69.7
2100	0.550	-178.2	6.10	76.7	0.0569	39.5	0.221	-69.9
2200	0.553	-179.6	5.82	75.3	0.0590	39.0	0.212	-71.2
2300	0.558	-176.7	5.58	73.4	0.0592	39.1	0.197	-71.8
2400	0.561	-174.3	5.34	71.7	0.0605	39.4	0.185	-72.8
2500	0.565	-171.9	5.14	70.1	0.0622	39.3	0.172	-74.1
2600	0.569	-169.8	4.93	68.6	0.0627	39.6	0.164	-75.5
2700	0.574	-167.4	4.75	67.0	0.0633	38.9	0.153	-77.2
2800	0.578	-165.6	4.58	65.6	0.0648	39.3	0.145	-78.8
2900	0.583	-163.5	4.42	63.8	0.0658	39.0	0.134	-79.9
3000	0.587	-161.7	4.26	62.2	0.0669	39.2	0.124	-81.1
3100	0.592	-160.5	4.09	61.1	0.0682	38.7	0.124	-82.3
3200	0.597	-158.3	3.98	59.6	0.0692	38.9	0.112	-86.2
3300	0.601	-156.8	3.85	58.1	0.0699	38.5	0.104	-88.4
3400	0.607	-155.1	3.73	56.7	0.0714	38.4	0.096	-92.0
3500	0.612	-153.5	3.62	55.3	0.0723	38.3	0.089	-95.9
3600	0.616	-152.0	3.51	53.9	0.0733	38.4	0.082	-99.7
3700	0.621	-150.5	3.41	52.5	0.0739	38.6	0.076	-105.1
3800	0.625	-149.1	3.31	51.1	0.0747	37.9	0.072	-109.9
3900	0.631	-147.7	3.21	49.7	0.0758	37.7	0.066	-116.8
4000	0.633	-146.2	3.12	48.3	0.0766	37.8	0.064	-122.7
4100	0.637	-144.9	3.03	47.0	0.0767	37.5	0.061	-131.1
4200	0.640	-143.7	2.95	45.8	0.0780	37.9	0.059	-138.2
4300	0.643	-142.5	2.87	44.5	0.0788	37.7	0.058	-145.2
4400	0.648	-141.4	2.80	43.3	0.0801	37.8	0.061	-153.5
4500	0.653	-140.2	2.73	41.9	0.0807	37.4	0.063	-161.8
4600	0.656	-138.8	2.66	40.6	0.0811	37.4	0.065	-170.7
4700	0.659	-137.7	2.59	39.5	0.0821	37.4	0.067	-175.6
4800	0.659	-136.8	2.52	38.4	0.0833	37.4	0.071	-179.9
4900	0.664	-135.9	2.47	37.1	0.0852	37.3	0.078	175.9
5000	0.671	-134.8	2.41	35.8	0.0865	36.5	0.086	171.4
5100	0.676	-133.7	2.35	34.4	0.0865	35.4	0.094	166.1

S parameter

(V_{CE} = 2 V, I_C = 20 mA, Z_o = 50Ω)

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.566	-28.1	39.50	163.4	0.0067	79.3	0.938	-12.0
200	0.560	-53.7	36.24	148.5	0.0129	71.9	0.872	-24.1
300	0.554	-75.5	32.12	135.9	0.0176	65.6	0.788	-33.8
400	0.543	-93.7	27.97	125.8	0.0213	60.1	0.701	-41.8
500	0.536	-108.4	24.30	117.6	0.0243	57.5	0.622	-48.0
600	0.528	-120.5	21.21	111.1	0.0271	54.9	0.551	-52.9
700	0.523	-130.5	18.68	106.0	0.0286	53.0	0.492	-56.9
800	0.520	-138.5	16.60	101.6	0.0308	52.5	0.439	-59.7
900	0.518	-145.6	14.90	98.0	0.0327	50.2	0.395	-62.2
1000	0.519	-151.6	13.46	94.7	0.0345	51.0	0.357	-64.0
1100	0.519	-156.4	12.28	92.0	0.0361	50.8	0.326	-65.7
1200	0.519	-161.6	11.30	89.6	0.0379	50.6	0.297	-67.5
1300	0.520	-165.8	10.45	87.3	0.0391	50.2	0.272	-68.8
1400	0.522	-169.6	9.71	85.2	0.0408	50.7	0.250	-70.0
1500	0.524	-173.0	9.06	83.3	0.0423	50.9	0.230	-70.8
1600	0.527	-176.3	8.49	81.4	0.0435	50.2	0.214	-72.0
1700	0.529	-179.3	8.00	79.6	0.0454	51.2	0.196	-73.0
1800	0.533	-177.8	7.55	77.9	0.0470	50.5	0.182	-74.2
1900	0.536	-175.3	7.15	76.2	0.0486	51.3	0.169	-74.7
2000	0.540	-172.9	6.78	74.7	0.0502	50.6	0.157	-75.7
2100	0.544	-170.6	6.45	73.1	0.0519	50.8	0.144	-76.5
2200	0.548	-168.6	6.16	71.6	0.0537	50.3	0.136	-78.1
2300	0.553	-166.5	5.88	70.1	0.0550	50.3	0.124	-79.1
2400	0.558	-164.7	5.63	68.7	0.0565	50.2	0.115	-81.0
2500	0.562	-162.8	5.41	67.2	0.0584	49.9	0.105	-83.0
2600	0.567	-161.1	5.19	65.8	0.0595	50.0	0.097	-85.7
2700	0.572	-159.3	4.99	64.4	0.0604	49.2	0.089	-89.0
2800	0.577	-157.7	4.81	63.0	0.0628	49.6	0.083	-91.8
2900	0.582	-156.1	4.63	61.6	0.0642	49.4	0.074	-95.4
3000	0.586	-154.7	4.47	60.1	0.0653	49.0	0.067	-99.3
3100	0.590	-153.4	4.32	59.0	0.0672	48.3	0.065	-101.9
3200	0.596	-151.8	4.18	57.6	0.0687	48.3	0.058	-109.8
3300	0.601	-150.6	4.04	56.3	0.0700	47.9	0.053	-117.6
3400	0.606	-149.3	3.92	54.9	0.0715	48.0	0.049	-125.8
3500	0.612	-147.9	3.80	53.7	0.0728	47.6	0.048	-136.2
3600	0.617	-146.6	3.68	52.3	0.0741	47.0	0.046	-146.1
3700	0.621	-145.3	3.57	51.0	0.0752	46.8	0.047	-157.0
3800	0.626	-144.2	3.47	49.8	0.0767	46.5	0.049	-165.4
3900	0.631	-142.9	3.37	48.4	0.0778	45.9	0.051	-175.2
4000	0.634	-141.7	3.27	47.2	0.0794	45.7	0.055	178.3
4100	0.638	-140.6	3.18	46.0	0.0801	45.5	0.060	170.9
4200	0.642	-139.5	3.09	44.8	0.0810	45.5	0.065	166.7
4300	0.644	-138.4	3.01	43.5	0.0826	45.1	0.069	162.1
4400	0.648	-137.5	2.93	42.4	0.0842	44.8	0.077	159.3
4500	0.654	-136.5	2.86	41.1	0.0846	44.4	0.085	155.8
4600	0.657	-135.1	2.77	39.9	0.0852	44.1	0.091	151.3
4700	0.659	-134.3	2.70	38.8	0.0867	44.2	0.096	149.0
4800	0.661	-133.5	2.64	37.8	0.0879	43.9	0.100	147.5
4900	0.666	-132.7	2.58	36.6	0.0902	43.1	0.109	147.2
5000	0.673	-131.7	2.52	35.3	0.0914	42.0	0.119	145.3
5100	0.678	-130.6	2.46	34.0	0.0913	41.4	0.128	142.7

S parameter

 $(V_{CE} = 3 \text{ V}, I_C = 5 \text{ mA}, Z_o = 50 \Omega)$

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.839	-11.0	15.26	171.9	0.0073	81.8	0.982	-5.1
200	0.843	-22.0	14.95	164.0	0.0143	79.8	0.970	-10.6
300	0.847	-32.8	14.51	156.4	0.0215	75.6	0.950	-15.7
400	0.819	-43.5	13.93	149.3	0.0284	71.6	0.922	-20.9
500	0.799	-53.7	13.29	142.6	0.0345	67.0	0.888	-25.7
600	0.771	-63.8	12.64	136.2	0.0406	62.7	0.846	-30.2
700	0.737	-73.2	12.04	130.5	0.0452	58.4	0.803	-34.6
800	0.722	-81.8	11.22	125.1	0.0497	54.5	0.758	-37.7
900	0.695	-90.1	10.55	120.3	0.0528	50.1	0.715	-40.9
1000	0.676	-97.9	9.81	115.8	0.0565	47.1	0.673	-43.2
1100	0.673	-103.8	9.11	111.8	0.0600	44.1	0.636	-45.2
1200	0.638	-112.0	8.78	108.2	0.0614	42.2	0.594	-48.0
1300	0.623	-118.3	8.28	104.7	0.0626	39.4	0.560	-49.8
1400	0.611	-124.3	7.82	101.6	0.0641	37.8	0.529	-51.3
1500	0.601	-129.7	7.39	98.7	0.0654	36.4	0.502	-52.5
1600	0.592	-135.0	7.01	96.0	0.0662	34.8	0.476	-53.8
1700	0.586	-140.0	6.67	93.4	0.0668	33.5	0.451	-54.9
1800	0.580	-145.2	6.39	90.7	0.0672	32.0	0.425	-56.2
1900	0.578	-149.3	6.05	88.2	0.0679	31.7	0.407	-56.3
2000	0.573	-153.2	5.79	86.5	0.0689	30.6	0.391	-57.8
2100	0.572	-158.0	5.55	83.9	0.0687	29.9	0.368	-57.9
2200	0.572	-160.5	5.28	82.6	0.0707	29.0	0.360	-59.2
2300	0.573	-164.5	5.09	80.0	0.0700	28.2	0.339	-59.3
2400	0.575	-167.8	4.89	78.0	0.0703	28.1	0.325	-60.1
2500	0.576	-171.2	4.73	76.0	0.0708	27.6	0.308	-60.9
2600	0.578	-173.8	4.53	74.5	0.0712	27.2	0.299	-61.9
2700	0.580	-177.3	4.39	72.4	0.0703	26.5	0.284	-62.7
2800	0.584	-179.4	4.23	71.0	0.0717	26.6	0.276	-63.8
2900	0.588	177.5	4.09	68.8	0.0714	26.7	0.260	-63.8
3000	0.592	175.0	3.96	66.8	0.0715	26.5	0.248	-64.2
3100	0.597	173.9	3.74	65.8	0.0734	24.8	0.254	-64.9
3200	0.599	170.7	3.70	64.0	0.0730	25.9	0.234	-66.5
3300	0.603	168.6	3.58	62.4	0.0727	26.1	0.224	-67.7
3400	0.607	166.4	3.47	60.7	0.0734	25.7	0.215	-68.8
3500	0.612	164.4	3.37	59.2	0.0734	25.7	0.206	-70.2
3600	0.616	162.5	3.27	57.6	0.0734	25.5	0.197	-71.5
3700	0.620	160.5	3.18	56.0	0.0733	25.4	0.187	-72.9
3800	0.624	158.8	3.09	54.5	0.0736	25.4	0.180	-74.6
3900	0.629	156.9	3.00	53.0	0.0741	25.1	0.171	-75.9
4000	0.631	155.1	2.92	51.4	0.0745	25.3	0.164	-78.1
4100	0.635	153.5	2.84	49.9	0.0740	25.4	0.155	-79.9
4200	0.638	151.9	2.76	48.6	0.0742	25.6	0.149	-82.4
4300	0.641	150.4	2.69	47.2	0.0748	26.0	0.143	-84.3
4400	0.644	149.1	2.63	45.8	0.0756	26.1	0.136	-87.5
4500	0.650	147.6	2.56	44.3	0.0753	26.1	0.130	-90.7
4600	0.653	146.0	2.49	42.9	0.0750	26.1	0.122	-94.2
4700	0.655	144.6	2.43	41.6	0.0753	26.7	0.116	-96.8
4800	0.656	143.5	2.37	40.4	0.0752	27.2	0.113	-99.7
4900	0.660	142.3	2.32	39.0	0.0770	27.2	0.110	-104.8
5000	0.667	141.0	2.28	37.5	0.0781	26.7	0.106	-110.6
5100	0.672	139.7	2.22	36.1	0.0773	26.1	0.102	-116.5

S parameter

 $(V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}, Z_o = 50 \Omega)$

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.725	-16.7	26.01	168.5	0.0066	79.2	0.962	-7.5
200	0.720	-33.0	25.02	157.7	0.0131	74.8	0.934	-15.5
300	0.708	-48.4	23.57	147.7	0.0192	70.1	0.892	-22.6
400	0.682	-63.0	21.80	138.7	0.0242	65.6	0.838	-29.2
500	0.657	-76.2	19.97	130.8	0.0288	61.7	0.780	-34.9
600	0.631	-88.4	18.23	123.8	0.0328	56.9	0.718	-39.9
700	0.604	-99.2	16.63	118.0	0.0351	54.0	0.662	-44.2
800	0.590	-108.4	15.11	112.7	0.0378	51.1	0.608	-47.2
900	0.573	-117.0	13.83	108.3	0.0402	48.1	0.559	-50.0
1000	0.563	-124.6	12.64	104.3	0.0424	46.2	0.516	-51.8
1100	0.558	-130.5	11.60	100.9	0.0439	44.9	0.478	-53.6
1200	0.544	-137.8	10.86	97.8	0.0453	44.6	0.442	-55.5
1300	0.538	-143.4	10.10	95.0	0.0460	43.3	0.411	-56.8
1400	0.534	-148.6	9.44	92.4	0.0474	42.8	0.384	-57.8
1500	0.531	-153.3	8.84	90.0	0.0485	42.2	0.359	-58.6
1600	0.529	-157.7	8.32	87.8	0.0497	41.4	0.338	-59.5
1700	0.529	-161.7	7.87	85.6	0.0503	41.6	0.317	-60.0
1800	0.530	-165.8	7.46	83.5	0.0518	40.9	0.297	-60.8
1900	0.531	-169.2	7.06	81.5	0.0525	41.4	0.282	-60.8
2000	0.532	-172.4	6.72	79.9	0.0537	40.5	0.268	-61.7
2100	0.535	-175.8	6.41	77.9	0.0546	40.9	0.251	-61.5
2200	0.537	-178.1	6.10	76.5	0.0560	40.4	0.242	-62.5
2300	0.541	-178.9	5.85	74.6	0.0568	41.0	0.226	-62.5
2400	0.546	-176.4	5.61	73.0	0.0576	40.6	0.215	-63.1
2500	0.549	-173.8	5.40	71.3	0.0594	40.7	0.202	-64.0
2600	0.553	-171.7	5.18	69.8	0.0596	40.5	0.194	-64.6
2700	0.558	-169.2	4.99	68.2	0.0605	40.4	0.182	-65.7
2800	0.562	-167.4	4.81	66.8	0.0623	40.7	0.175	-66.6
2900	0.567	-165.1	4.65	65.1	0.0627	40.7	0.163	-66.9
3000	0.571	-163.3	4.48	63.4	0.0640	40.3	0.154	-67.0
3100	0.576	-162.0	4.30	62.3	0.0653	39.7	0.153	-68.2
3200	0.581	-159.7	4.19	60.8	0.0657	40.6	0.140	-70.1
3300	0.586	-158.2	4.06	59.4	0.0673	40.3	0.131	-71.4
3400	0.591	-156.5	3.93	57.9	0.0682	39.8	0.123	-73.2
3500	0.596	-154.8	3.81	56.5	0.0686	40.4	0.114	-75.1
3600	0.601	-153.3	3.70	55.1	0.0698	40.0	0.107	-77.3
3700	0.605	-151.7	3.59	53.7	0.0706	39.9	0.098	-79.3
3800	0.610	-150.3	3.49	52.4	0.0715	39.4	0.092	-82.2
3900	0.615	-148.8	3.39	51.0	0.0723	39.3	0.084	-85.2
4000	0.618	-147.3	3.29	49.6	0.0734	39.2	0.078	-89.2
4100	0.622	-146.0	3.20	48.3	0.0739	39.1	0.071	-92.7
4200	0.626	-144.8	3.11	47.1	0.0749	39.7	0.066	-97.6
4300	0.629	-143.5	3.03	45.7	0.0754	39.4	0.061	-102.2
4400	0.633	-142.4	2.96	44.5	0.0769	39.5	0.058	-110.0
4500	0.639	-141.2	2.88	43.1	0.0778	39.2	0.055	-119.2
4600	0.642	-139.8	2.81	41.8	0.0777	39.1	0.050	-129.0
4700	0.645	-138.7	2.73	40.7	0.0790	39.1	0.048	-136.4
4800	0.646	-137.7	2.67	39.6	0.0796	39.4	0.049	-143.6
4900	0.650	-136.8	2.61	38.3	0.0818	38.9	0.053	-152.3
5000	0.657	-135.7	2.55	37.0	0.0830	38.0	0.057	-162.0
5100	0.663	-134.6	2.49	35.6	0.0830	37.3	0.062	-172.1

S parameter

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

f(MHz)	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100	0.561	-25.7	39.57	164.2	0.0062	77.3	0.933	-10.4
200	0.555	-49.7	36.60	150.0	0.0114	72.4	0.878	-21.2
300	0.547	-70.6	32.78	137.9	0.0160	66.7	0.804	-30.0
400	0.534	-88.5	28.83	127.8	0.0196	62.0	0.724	-37.3
500	0.524	-103.2	25.24	119.6	0.0227	58.7	0.651	-43.0
600	0.515	-115.6	22.17	113.0	0.0251	56.3	0.582	-47.5
700	0.508	-126.0	19.59	107.7	0.0268	55.1	0.523	-51.1
800	0.504	-134.3	17.46	103.3	0.0288	54.2	0.472	-53.5
900	0.500	-141.8	15.71	99.5	0.0303	52.0	0.428	-55.6
1000	0.500	-148.0	14.21	96.2	0.0327	52.7	0.389	-57.0
1100	0.500	-153.1	12.95	93.4	0.0340	51.6	0.358	-58.4
1200	0.498	-158.6	11.95	90.9	0.0360	52.4	0.328	-59.3
1300	0.500	-163.0	11.06	88.6	0.0368	51.6	0.303	-60.3
1400	0.501	-167.1	10.28	86.4	0.0386	52.0	0.281	-60.9
1500	0.503	-170.7	9.59	84.5	0.0401	52.0	0.261	-61.2
1600	0.506	-174.1	9.00	82.6	0.0415	51.9	0.244	-61.7
1700	0.508	-177.2	8.48	80.8	0.0430	52.6	0.227	-61.9
1800	0.511	179.8	8.00	79.0	0.0450	52.2	0.212	-62.4
1900	0.515	177.1	7.58	77.4	0.0463	52.5	0.199	-62.1
2000	0.519	174.7	7.20	75.9	0.0474	52.0	0.188	-62.7
2100	0.523	172.2	6.85	74.2	0.0491	52.1	0.176	-62.4
2200	0.526	170.2	6.53	72.8	0.0511	51.8	0.167	-63.2
2300	0.532	168.0	6.25	71.3	0.0524	51.6	0.155	-63.1
2400	0.537	166.0	5.98	69.8	0.0540	51.8	0.146	-63.6
2500	0.541	164.1	5.75	68.4	0.0560	51.7	0.135	-64.3
2600	0.546	162.3	5.52	67.0	0.0571	51.1	0.127	-65.1
2700	0.551	160.4	5.31	65.6	0.0573	50.9	0.119	-66.2
2800	0.556	158.9	5.12	64.2	0.0598	51.5	0.111	-67.4
2900	0.561	157.2	4.93	62.8	0.0611	51.1	0.102	-68.1
3000	0.565	155.7	4.76	61.4	0.0631	50.5	0.094	-68.8
3100	0.570	154.5	4.59	60.2	0.0643	50.0	0.090	-70.6
3200	0.576	152.9	4.45	58.9	0.0652	49.8	0.081	-72.7
3300	0.581	151.6	4.31	57.5	0.0664	49.6	0.074	-74.7
3400	0.586	150.2	4.17	56.2	0.0680	49.4	0.065	-78.3
3500	0.592	148.8	4.05	54.9	0.0695	49.4	0.058	-81.8
3600	0.597	147.6	3.93	53.6	0.0709	48.8	0.051	-86.9
3700	0.602	146.3	3.81	52.3	0.0721	48.8	0.045	-92.9
3800	0.606	145.0	3.70	51.0	0.0730	48.3	0.040	-99.3
3900	0.612	143.8	3.59	49.7	0.0741	47.7	0.033	-110.1
4000	0.615	142.5	3.49	48.4	0.0753	47.2	0.031	-121.2
4100	0.619	141.4	3.39	47.2	0.0762	46.9	0.028	-137.0
4200	0.622	140.2	3.29	46.0	0.0780	47.2	0.029	-151.8
4300	0.625	139.2	3.21	44.8	0.0790	47.0	0.029	-162.8
4400	0.629	138.3	3.13	43.7	0.0810	46.8	0.035	-175.0
4500	0.636	137.2	3.05	42.3	0.0814	46.4	0.041	174.5
4600	0.639	135.9	2.97	41.1	0.0819	45.9	0.046	165.2
4700	0.642	135.0	2.89	40.1	0.0834	45.9	0.050	160.1
4800	0.643	134.1	2.82	39.1	0.0844	46.0	0.054	156.5
4900	0.648	133.4	2.76	37.8	0.0868	45.2	0.063	155.2
5000	0.655	132.5	2.70	36.6	0.0880	44.1	0.072	153.1
5100	0.661	131.4	2.63	35.3	0.0883	43.4	0.081	148.8

Package Dimensions

MFPAK-4

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
—	—	0.0016	Cu Alloy

Symbol	Dimension in Millimeters		
	Min.	Nom.	Max.
A	0.5	—	0.55
A ₁	0	—	0.01
A ₂	0.5	—	0.54
b	0.15	0.22	0.3
b ₁	—	0.2	—
c	0.1	0.13	0.15
c ₁	—	0.11	—
D	1.35	1.4	1.45
E	0.7	0.8	0.9
[e]	—	0.45	—
H _E	1.15	1.2	1.25
L	0.1	0.2	0.3
L _P	0.15	—	0.45
x	—	—	0.05
b ₂	—	—	0.35
[e] ₁	—	0.75	—
l ₁	—	—	0.5

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Part Name	Quantity	Shipping Container
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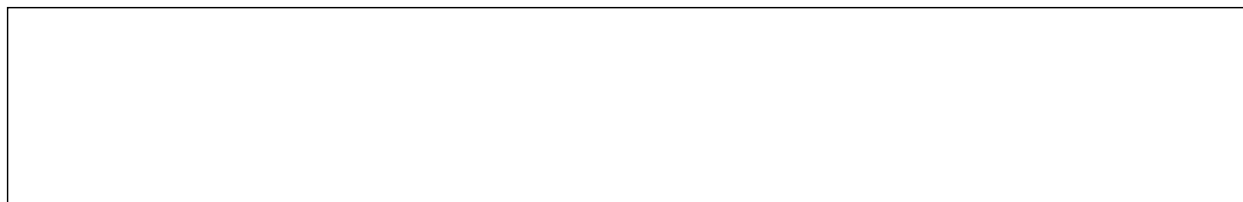
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