AUK Semiconductor

THN4301 Series

SiGe NPN Transistor

☐ Application

LNA and wide band amplifier up to GHz range

☐ Features

o Low Noise Figure

NF = 1.5dB at f = 2 GHz, V_{CE} = 3 V, I_C = 5 mA

NF = 1.7dB at f = 2 GHz, V_{CE} = 1 V, I_C = 3 mA

o High Gain

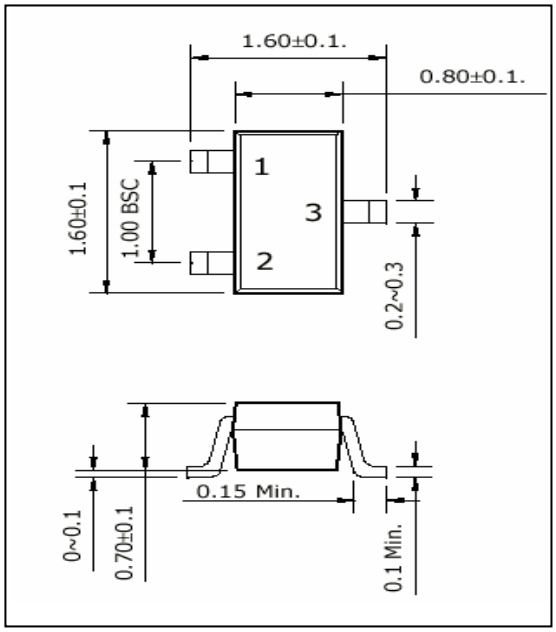
MAG = 12.3 dB at f = 2 GHz, V_{CE} = 3 V, I_C = 25 mA

MAG = 12.0 dB at f = 2 GHz, V_{CE} = 1 V, I_C = 5 mA

o High Transition Frequency

f_T = 15 GHz at f = 2 GHz, V_{CE} = 3 V, I_C = 25 mA

SOT−523 Unit in mm



Pin Configuration

Pin No	Symbol	Description
1	B	Base
2	E	Emitter
3	C	Collector

☐ h_{FE} Classification

Marking	AH1	AH2
h_{FE}	125 to 300	80 to 160

☐ Available Package

Unit : mm

Product	Package	Dimension
THN4301U	SOT-323	2.0 x 1.25, 1.0t
THN4301Z	SOT-343	2.0 x 1.25, 1.0t
THN4301E	SOT-523	1.6 x 0.8, 0.8t

☐ Absolute Maximum Ratings

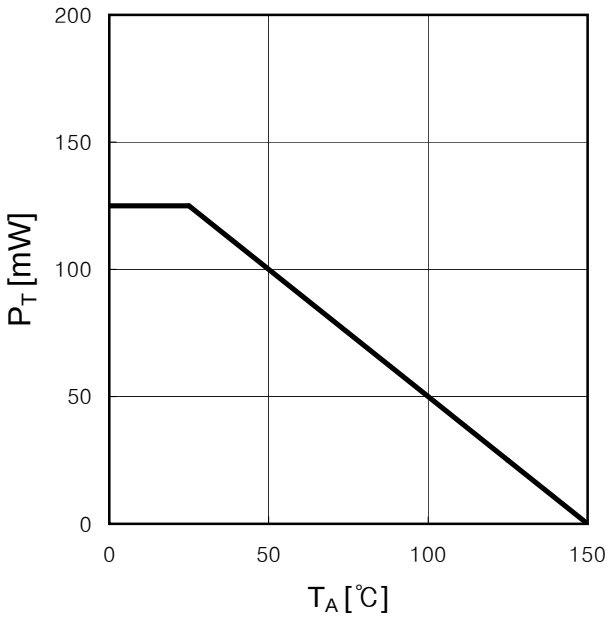
Symbol	Parameter	Ratings	Unit
V_{CBO}	Collector to Base Breakdown Voltage	15	V
V_{CEO}	Collector to Emitter Breakdown Voltage	6	V
V_{EBO}	Emitter to Base Breakdown Voltage	2.5	V
I_C	Collector Current (DC)	65	mA
P_T	Total Power Dissipation	150	mW
T_{STG}	Storage Temperature	-65 ~ 150	℃
T_J	Operating Junction Temperature	150	℃

☐ Electrical Characteristics (T_A = 25 ℃)

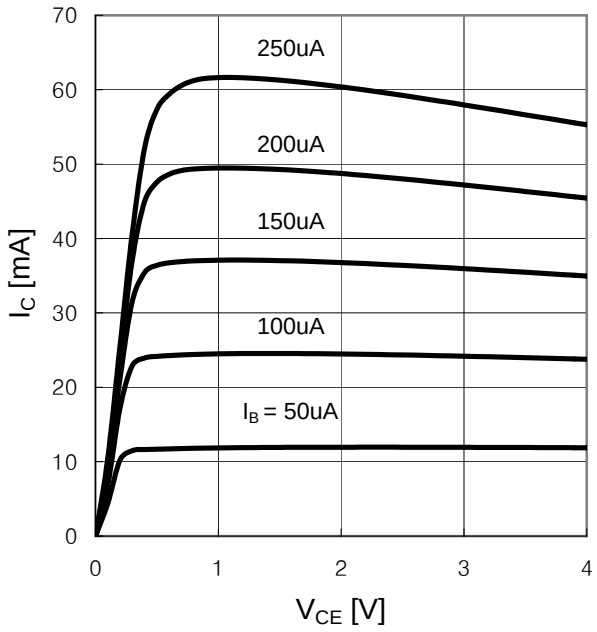
Symbol	Parameter	Test Condition	Value			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	V_{CB} = 10 V, I_E = 0 mA	-	-	0.5	uA
I_{CEO}		V_{CE} = 6 V, I_B = 0 mA	-	-	5.0	uA
I_{EBO}	Emitter Cut-off Current	V_{EB} = 1 V, I_C = 0 mA	-	-	0.5	uA
h_{FE}	DC Current Gain	V_{CE} = 3 V, I_C = 15 mA	80	200	300	
f_T	Transition Frequency	V_{CE} = 3 V, I_C = 20 mA	-	14	-	GHz
C_{CB}	Collector to Base Capacitance	V_{CB} = 10 V, f = 1 MHz	-	0.63	-	pF
$\|S_{21}\|^2$	Insertion Power Gain	V_{CE} = 3 V, I_C = 15 mA, f = 2 GHz	6.0	8.0	-	dB
		V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz	5.0	7.0	-	
MAG	Maximum Available Gain	V_{CE} = 3 V, I_C = 15 mA, f = 2 GHz	10.2	12.2	-	dB
		V_{CE} = 1 V, I_C = 10 mA, f = 2 GHz	9.5	11.5	-	
NFmin	Minimum Noise Figure	V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz	-	1.5	-	dB
		V_{CE} = 1 V, I_C = 3 mA, f = 2 GHz	-	1.7	-	
rn	Noise Resistance	V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz	-	0.04	-	Ω
		V_{CE} = 1 V, I_C = 3 mA, f = 2 GHz	-	0.05	-	
G_A	Associated Gain	V_{CE} = 3 V, I_C = 5 mA, f = 2 GHz	-	9.5	-	dB
		V_{CE} = 1 V, I_C = 3 mA, f = 2 GHz	-	8.0	-	

Total Power Dissipation, P_T vs. T_A

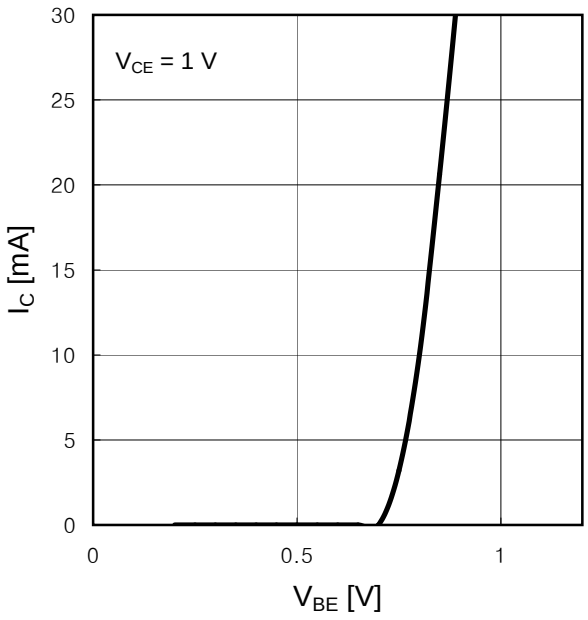
(T_A = 25 ℃)



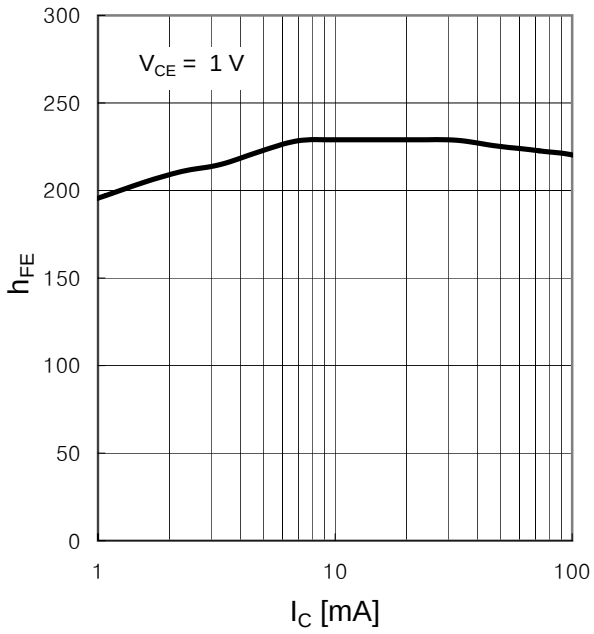
I_C vs. V_{CE}



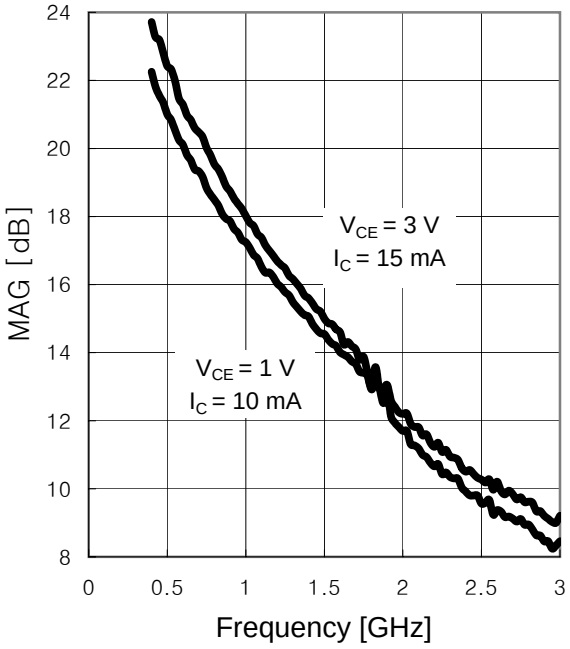
I_C vs. V_{BE}



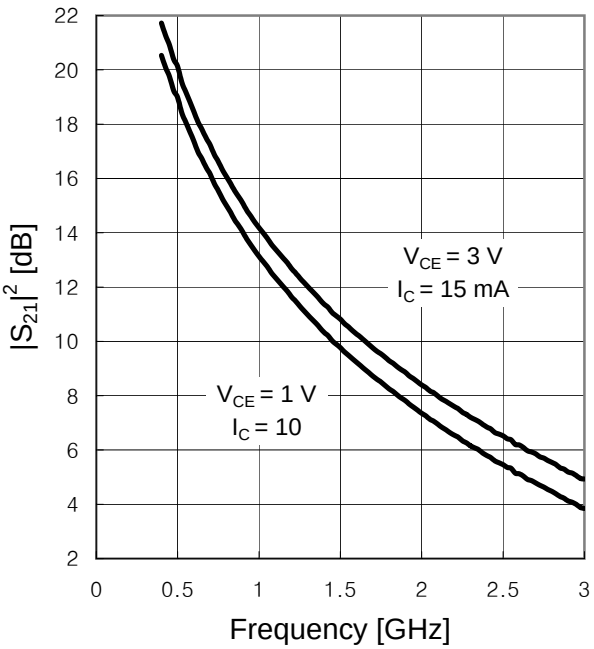
h_{FE} vs. I_C



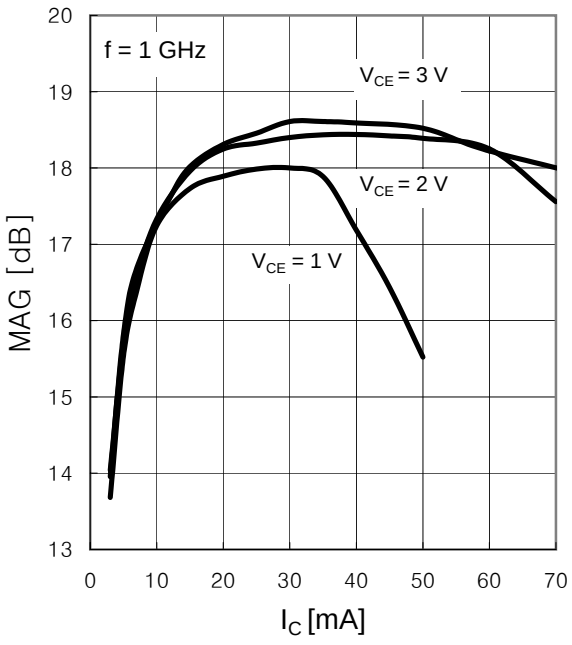
Maximun Available Gain, MAG vs. Frequency



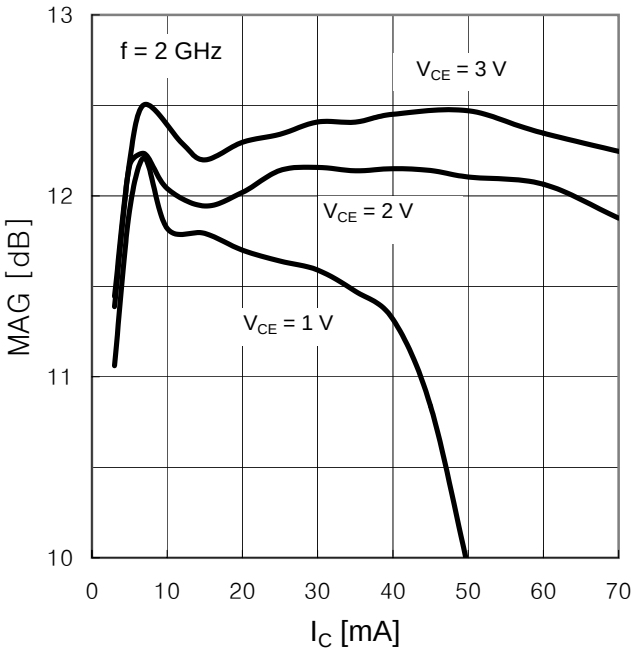
Insertion Power Gain, $|S_{21}|^2$ vs. Frequency



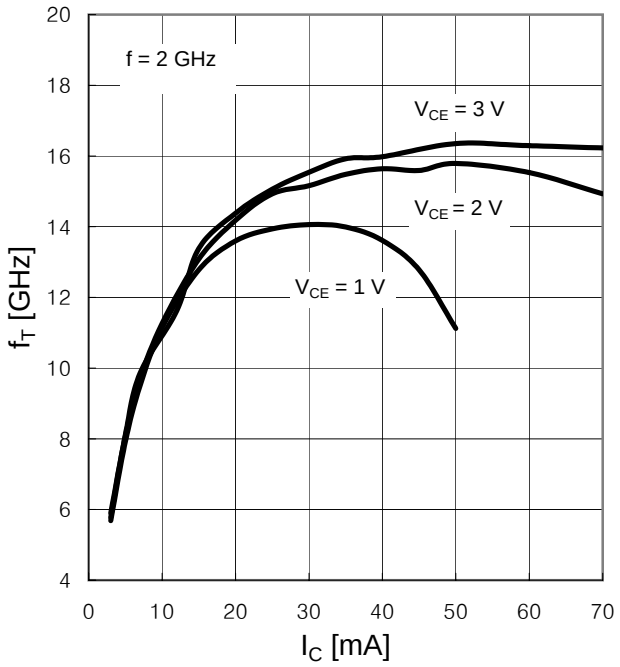
Maximun Available Gain, MAG vs. I_C



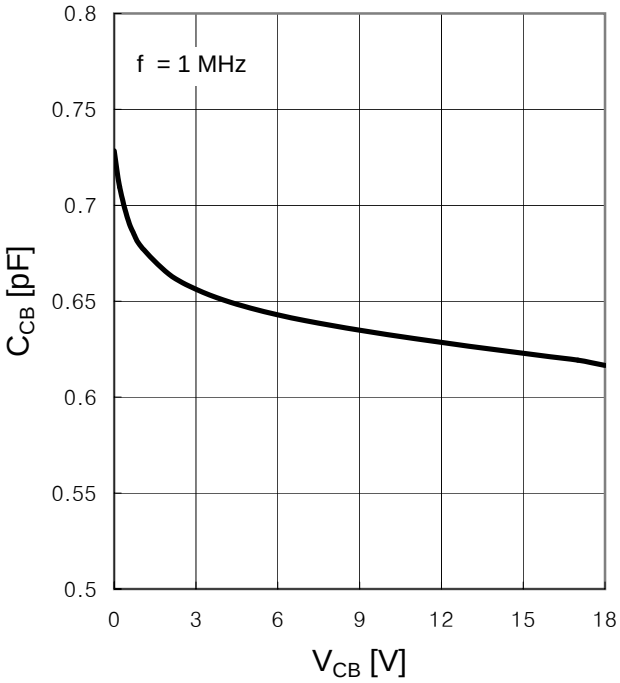
Maximun Available Gain, MAG vs. I_C



Transition Frequency : f_T vs. I_C

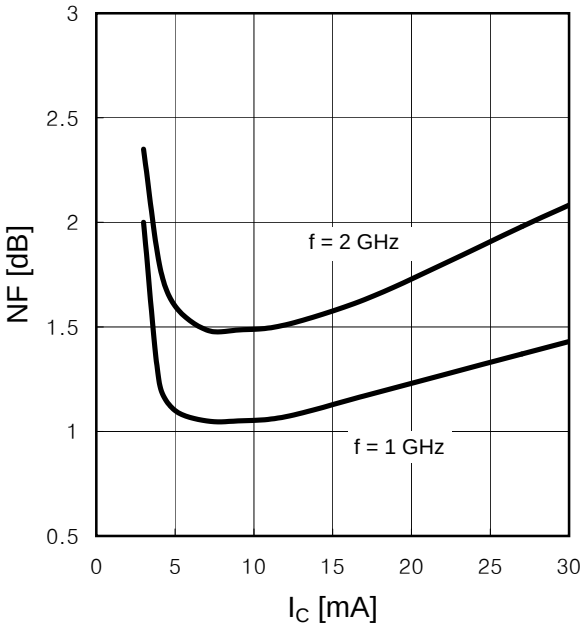


C_{CB} vs. V_{CB}



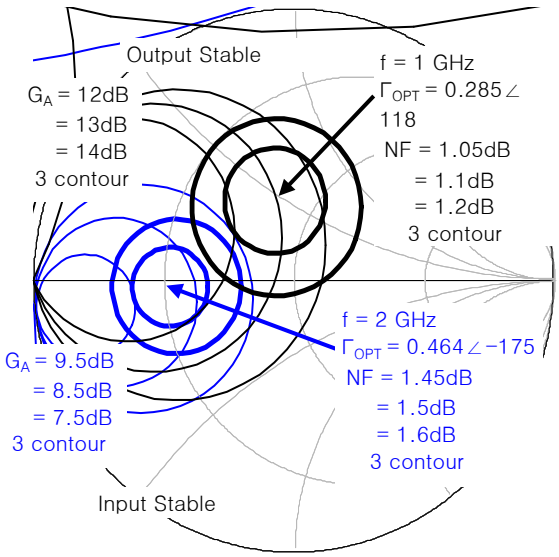
NF vs. I_C

V_{CE} = 3 V, I_C = parameter, Z_S = Z_{Sopt}

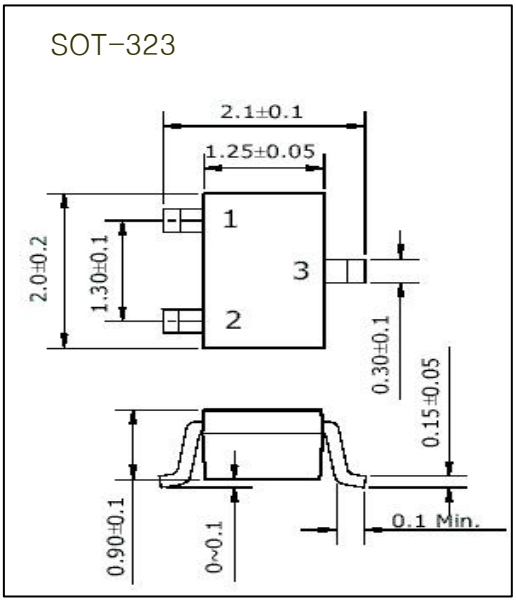


Noise Figure Contours & Constant Gain

f = 1 GHz, 2 GHz, V_{CE} = 3 V, I_C = 5 mA



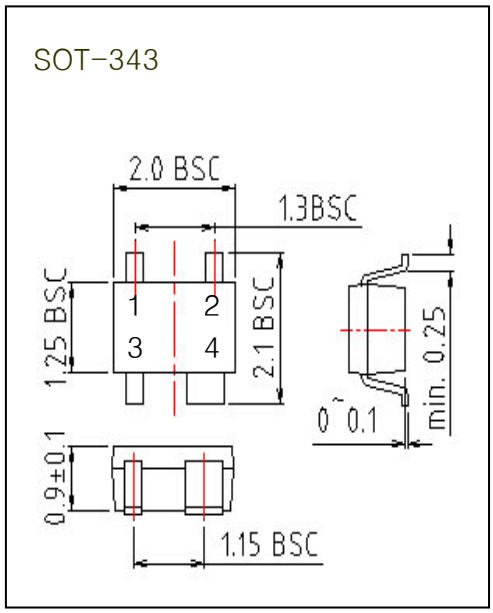
☐ **Dimensions of THN4301U in mm**



Pin Configuration

Pin No	Symbol	Description
1	B	Base
2	E	Emitter
3	C	Collector

☐ **Dimensions of THN4301Z in mm**



Pin Configuration

Pin No	Symbol	Description
1	B	Base
2, 3	E	Emitter
4	C	Collector

☐ Common Emitter S-Parameter Data

V_{CE} = 3 V, I_C = 3 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.731 / -92.959	6.616 / 117.864	0.110 / 37.555	0.675 / -65.460
600.0MHz	0.670 / -115.966	4.994 / 102.668	0.125 / 27.222	0.578 / -82.620
800.0MHz	0.637 / -131.586	3.942 / 91.562	0.130 / 22.803	0.517 / -94.702
1.000GHz	0.619 / -142.942	3.235 / 82.769	0.130 / 18.912	0.495 / -104.434
1.200GHz	0.609 / -151.388	2.745 / 75.387	0.129 / 17.257	0.489 / -111.309
1.400GHz	0.602 / -158.475	2.369 / 68.688	0.127 / 17.364	0.492 / -118.097
1.600GHz	0.605 / -164.510	2.090 / 62.735	0.124 / 17.979	0.498 / -123.634
1.800GHz	0.608 / -170.448	1.868 / 57.173	0.123 / 19.581	0.514 / -128.303
2.000GHz	0.612 / -175.427	1.680 / 51.951	0.122 / 21.937	0.527 / -133.501
2.200GHz	0.614 / 179.374	1.528 / 47.216	0.122 / 24.444	0.544 / -138.178
2.400GHz	0.618 / 174.627	1.396 / 42.661	0.124 / 28.030	0.562 / -142.236
2.600GHz	0.628 / 170.139	1.287 / 38.296	0.127 / 30.905	0.583 / -146.021
2.800GHz	0.636 / 164.493	1.188 / 33.974	0.132 / 32.676	0.601 / -147.993
3.000GHz	0.639 / 160.366	1.097 / 30.518	0.135 / 35.924	0.627 / -151.825

V_{CE} = 3 V, I_C = 5 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.671 / -111.121	8.693 / 111.010	0.089 / 34.336	0.569 / -82.159
600.0MHz	0.636 / -133.078	6.290 / 97.718	0.100 / 28.090	0.481 / -100.500
800.0MHz	0.614 / -146.308	4.874 / 88.367	0.103 / 26.455	0.436 / -112.284
1.000GHz	0.605 / -155.970	3.959 / 80.869	0.104 / 26.702	0.421 / -121.300
1.200GHz	0.598 / -163.031	3.344 / 74.558	0.107 / 27.692	0.420 / -126.942
1.400GHz	0.592 / -169.282	2.879 / 68.774	0.111 / 29.785	0.428 / -132.413
1.600GHz	0.597 / -174.619	2.534 / 63.481	0.114 / 31.087	0.435 / -136.753
1.800GHz	0.598 / -179.600	2.263 / 58.556	0.117 / 33.679	0.450 / -140.211
2.000GHz	0.604 / 175.821	2.038 / 53.923	0.123 / 35.545	0.464 / -144.314
2.200GHz	0.603 / 171.213	1.856 / 49.550	0.128 / 37.276	0.482 / -147.864
2.400GHz	0.608 / 166.888	1.698 / 45.381	0.134 / 38.777	0.501 / -150.791
2.600GHz	0.617 / 162.874	1.567 / 41.300	0.142 / 39.996	0.520 / -154.062
2.800GHz	0.621 / 157.528	1.451 / 37.217	0.150 / 40.911	0.539 / -154.607
3.000GHz	0.624 / 153.732	1.345 / 33.997	0.158 / 42.001	0.567 / -158.120

V_{CE} = 3 V, I_C = 7 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.641 / -124.673	10.034 / 106.290	0.072 / 34.475	0.505 / -96.354
600.0MHz	0.619 / -143.882	7.099 / 94.537	0.083 / 32.193	0.438 / -114.570
800.0MHz	0.608 / -155.392	5.449 / 86.327	0.087 / 32.316	0.402 / -125.849
1.000GHz	0.601 / -164.015	4.405 / 79.662	0.094 / 33.924	0.395 / -134.295
1.200GHz	0.599 / -170.295	3.714 / 74.008	0.099 / 35.265	0.397 / -138.592
1.400GHz	0.591 / -175.821	3.194 / 68.800	0.104 / 38.636	0.403 / -143.053
1.600GHz	0.596 / 179.234	2.814 / 63.938	0.109 / 39.509	0.411 / -146.683
1.800GHz	0.597 / 174.740	2.511 / 59.415	0.119 / 41.549	0.423 / -149.379
2.000GHz	0.603 / 170.661	2.265 / 55.081	0.127 / 42.134	0.437 / -152.779
2.200GHz	0.602 / 166.498	2.061 / 50.994	0.133 / 43.785	0.455 / -155.451
2.400GHz	0.606 / 162.353	1.889 / 47.116	0.143 / 44.554	0.471 / -157.876
2.600GHz	0.615 / 158.455	1.745 / 43.208	0.151 / 44.583	0.491 / -160.193
2.800GHz	0.619 / 153.425	1.617 / 39.264	0.161 / 45.528	0.508 / -160.217
3.000GHz	0.619 / 149.827	1.503 / 36.101	0.169 / 44.441	0.533 / -163.213

V_{CE} = 3 V, I_C = 10 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.627 / -136.653	11.152 / 102.214	0.063 / 36.269	0.463 / -110.894
600.0MHz	0.612 / -153.208	7.758 / 91.917	0.071 / 37.208	0.412 / -128.044
800.0MHz	0.607 / -163.247	5.917 / 84.671	0.077 / 38.099	0.386 / -138.501
1.000GHz	0.603 / -170.315	4.774 / 78.729	0.083 / 41.240	0.386 / -145.682
1.200GHz	0.600 / -176.069	4.018 / 73.608	0.092 / 42.757	0.387 / -149.252
1.400GHz	0.595 / 178.939	3.455 / 68.824	0.102 / 45.548	0.395 / -152.946
1.600GHz	0.599 / 174.612	3.041 / 64.328	0.111 / 47.273	0.401 / -155.740
1.800GHz	0.600 / 170.217	2.717 / 60.148	0.122 / 47.874	0.412 / -157.790
2.000GHz	0.605 / 166.502	2.452 / 56.109	0.129 / 48.776	0.426 / -160.481
2.200GHz	0.604 / 162.398	2.233 / 52.230	0.140 / 48.646	0.442 / -162.642
2.400GHz	0.607 / 158.615	2.047 / 48.494	0.150 / 48.910	0.458 / -164.362
2.600GHz	0.614 / 154.890	1.894 / 44.813	0.162 / 47.999	0.474 / -166.342
2.800GHz	0.616 / 149.916	1.757 / 41.019	0.172 / 47.147	0.488 / -165.745
3.000GHz	0.616 / 146.463	1.636 / 38.062	0.179 / 46.972	0.515 / -168.315

V_{CE} = 3 V, I_C = 15 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.614 / -149.054	12.194 / 98.203	0.052 / 39.699	0.429 / -126.721
600.0MHz	0.614 / -162.216	8.375 / 89.412	0.062 / 44.319	0.403 / -142.154
800.0MHz	0.612 / -170.437	6.361 / 83.111	0.071 / 47.235	0.389 / -150.820
1.000GHz	0.607 / -176.526	5.118 / 77.840	0.081 / 51.636	0.394 / -157.031
1.200GHz	0.607 / 178.539	4.306 / 73.260	0.092 / 51.702	0.392 / -159.591
1.400GHz	0.601 / 174.230	3.703 / 68.866	0.102 / 53.270	0.400 / -162.422
1.600GHz	0.606 / 170.153	3.259 / 64.734	0.113 / 53.254	0.405 / -164.681
1.800GHz	0.605 / 166.208	2.912 / 60.846	0.124 / 53.763	0.413 / -166.176
2.000GHz	0.610 / 162.608	2.629 / 57.075	0.136 / 53.035	0.425 / -168.437
2.200GHz	0.609 / 158.650	2.398 / 53.496	0.147 / 52.808	0.437 / -169.932
2.400GHz	0.610 / 154.980	2.200 / 49.961	0.158 / 52.131	0.453 / -171.250
2.600GHz	0.618 / 151.545	2.038 / 46.456	0.170 / 51.066	0.467 / -172.573
2.800GHz	0.619 / 146.672	1.893 / 42.806	0.179 / 50.228	0.478 / -171.683
3.000GHz	0.621 / 143.285	1.764 / 39.991	0.191 / 49.073	0.502 / -173.934

V_{CE} = 3 V, I_C = 20 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.615 / -155.360	12.718 / 96.041	0.048 / 47.927	0.426 / -136.010
600.0MHz	0.614 / -167.203	8.686 / 88.112	0.056 / 48.766	0.406 / -149.304
800.0MHz	0.615 / -174.045	6.584 / 82.320	0.068 / 53.676	0.394 / -157.356
1.000GHz	0.611 / -179.831	5.294 / 77.375	0.078 / 56.443	0.401 / -162.577
1.200GHz	0.609 / 175.868	4.453 / 73.045	0.092 / 56.180	0.397 / -164.649
1.400GHz	0.605 / 171.565	3.829 / 68.901	0.105 / 57.479	0.407 / -167.349
1.600GHz	0.609 / 167.893	3.371 / 64.960	0.115 / 56.737	0.410 / -169.222
1.800GHz	0.611 / 164.020	3.013 / 61.239	0.128 / 56.288	0.416 / -170.483
2.000GHz	0.614 / 160.677	2.723 / 57.612	0.140 / 55.621	0.427 / -172.560
2.200GHz	0.611 / 156.801	2.483 / 54.099	0.151 / 54.496	0.442 / -173.820
2.400GHz	0.615 / 153.249	2.277 / 50.725	0.164 / 54.137	0.453 / -174.967
2.600GHz	0.620 / 149.908	2.111 / 47.306	0.175 / 52.661	0.468 / -176.258
2.800GHz	0.624 / 145.065	1.962 / 43.795	0.185 / 51.468	0.474 / -175.122
3.000GHz	0.622 / 141.694	1.829 / 41.070	0.193 / 49.906	0.500 / -177.047

V_{CE} = 3 V, I_C = 25 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.612 / -160.550	13.073 / 94.509	0.041 / 46.411	0.420 / -142.415
600.0MHz	0.617 / -170.431	8.903 / 87.149	0.055 / 52.110	0.409 / -154.510
800.0MHz	0.619 / -176.703	6.738 / 81.738	0.064 / 59.176	0.401 / -161.664
1.000GHz	0.615 / 178.037	5.415 / 77.059	0.077 / 59.429	0.407 / -166.565
1.200GHz	0.614 / 173.857	4.555 / 72.908	0.091 / 58.295	0.406 / -168.231
1.400GHz	0.610 / 169.956	3.917 / 68.915	0.104 / 59.550	0.413 / -170.526
1.600GHz	0.613 / 166.300	3.447 / 65.127	0.117 / 58.815	0.417 / -172.502
1.800GHz	0.614 / 162.586	3.083 / 61.516	0.130 / 58.432	0.421 / -173.377
2.000GHz	0.617 / 159.259	2.785 / 57.966	0.142 / 57.109	0.432 / -175.316
2.200GHz	0.616 / 155.387	2.540 / 54.607	0.154 / 56.112	0.446 / -176.660
2.400GHz	0.617 / 151.909	2.333 / 51.306	0.166 / 54.924	0.456 / -177.600
2.600GHz	0.624 / 148.460	2.164 / 47.991	0.178 / 53.689	0.471 / -178.851
2.800GHz	0.625 / 143.775	2.012 / 44.522	0.188 / 51.681	0.476 / -177.516
3.000GHz	0.623 / 140.511	1.875 / 41.767	0.199 / 50.369	0.499 / -179.237

V_{CE} = 3 V, I_C = 30 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.612 / -163.748	13.291 / 93.492	0.037 / 54.770	0.421 / -146.970
600.0MHz	0.619 / -172.952	9.030 / 86.525	0.053 / 57.871	0.416 / -158.036
800.0MHz	0.621 / -178.499	6.834 / 81.338	0.065 / 59.579	0.408 / -164.469
1.000GHz	0.618 / 176.670	5.488 / 76.820	0.077 / 61.427	0.417 / -169.123
1.200GHz	0.617 / 172.560	4.617 / 72.814	0.092 / 62.187	0.412 / -170.650
1.400GHz	0.613 / 168.730	3.968 / 68.941	0.105 / 61.969	0.420 / -172.912
1.600GHz	0.617 / 165.207	3.493 / 65.220	0.118 / 60.288	0.421 / -174.410
1.800GHz	0.617 / 161.488	3.125 / 61.661	0.132 / 59.493	0.427 / -175.615
2.000GHz	0.620 / 158.162	2.825 / 58.194	0.145 / 58.258	0.435 / -177.224
2.200GHz	0.618 / 154.538	2.577 / 54.861	0.156 / 57.367	0.448 / -178.335
2.400GHz	0.619 / 151.020	2.366 / 51.629	0.168 / 55.698	0.459 / -179.251
2.600GHz	0.626 / 147.563	2.193 / 48.322	0.180 / 53.791	0.473 / 179.658
2.800GHz	0.627 / 142.786	2.039 / 44.990	0.192 / 52.803	0.476 / -179.019
3.000GHz	0.626 / 139.727	1.904 / 42.311	0.201 / 51.333	0.500 / 179.077

V_{CE} = 3 V, I_C = 35 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.618 / -166.081	13.406 / 92.885	0.040 / 51.958	0.421 / -149.612
600.0MHz	0.619 / -174.505	9.101 / 86.158	0.053 / 57.655	0.417 / -160.038
800.0MHz	0.623 / -179.745	6.884 / 81.099	0.065 / 61.270	0.409 / -166.393
1.000GHz	0.620 / 175.644	5.525 / 76.683	0.079 / 62.464	0.420 / -170.667
1.200GHz	0.618 / 171.614	4.649 / 72.782	0.091 / 62.611	0.417 / -172.220
1.400GHz	0.614 / 167.978	3.998 / 68.942	0.105 / 62.411	0.422 / -174.379
1.600GHz	0.618 / 164.466	3.520 / 65.259	0.121 / 61.085	0.424 / -175.613
1.800GHz	0.619 / 160.849	3.149 / 61.764	0.132 / 60.307	0.430 / -176.613
2.000GHz	0.622 / 157.662	2.845 / 58.349	0.146 / 59.136	0.440 / -178.134
2.200GHz	0.621 / 154.114	2.596 / 55.055	0.158 / 57.772	0.452 / -179.350
2.400GHz	0.622 / 150.610	2.383 / 51.837	0.170 / 56.376	0.463 / 179.704
2.600GHz	0.628 / 147.157	2.213 / 48.561	0.181 / 54.809	0.474 / 178.457
2.800GHz	0.630 / 142.359	2.055 / 45.243	0.195 / 52.699	0.478 / -179.991
3.000GHz	0.628 / 139.332	1.919 / 42.591	0.203 / 51.381	0.503 / 178.334

V_{CE} = 3 V, I_C = 40 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.619 / -168.494	13.512 / 92.197	0.036 / 58.251	0.425 / -152.509
600.0MHz	0.627 / -175.674	9.163 / 85.731	0.051 / 61.317	0.420 / -162.241
800.0MHz	0.626 / 179.081	6.930 / 80.827	0.065 / 63.058	0.415 / -168.139
1.000GHz	0.624 / 174.671	5.564 / 76.514	0.077 / 64.154	0.423 / -172.124
1.200GHz	0.623 / 170.653	4.679 / 72.686	0.092 / 64.538	0.418 / -173.500
1.400GHz	0.618 / 167.234	4.025 / 68.906	0.107 / 64.444	0.428 / -175.485
1.600GHz	0.621 / 163.717	3.545 / 65.307	0.119 / 61.903	0.428 / -176.930
1.800GHz	0.622 / 160.311	3.170 / 61.829	0.134 / 61.236	0.433 / -177.805
2.000GHz	0.626 / 156.976	2.865 / 58.443	0.146 / 59.166	0.441 / -179.379
2.200GHz	0.622 / 153.385	2.613 / 55.208	0.159 / 58.677	0.454 / 179.432
2.400GHz	0.623 / 149.976	2.401 / 52.024	0.170 / 56.518	0.464 / 178.665
2.600GHz	0.630 / 146.514	2.229 / 48.804	0.183 / 54.879	0.474 / 177.496
2.800GHz	0.629 / 141.798	2.071 / 45.412	0.196 / 53.285	0.478 / 179.181
3.000GHz	0.629 / 138.503	1.935 / 42.890	0.205 / 51.947	0.502 / 177.423

V_{CE} = 3 V, I_C = 50 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.752 / -176.714	9.492 / 88.676	0.037 / 51.704	0.574 / -168.865
600.0MHz	0.758 / 178.340	6.415 / 83.284	0.050 / 60.617	0.575 / -174.503
800.0MHz	0.758 / 174.641	4.853 / 79.000	0.065 / 63.951	0.570 / -178.358
1.000GHz	0.754 / 170.752	3.899 / 75.016	0.078 / 63.220	0.579 / 178.586
1.200GHz	0.753 / 167.405	3.291 / 71.446	0.095 / 63.975	0.573 / 177.553
1.400GHz	0.746 / 164.156	2.840 / 67.875	0.107 / 62.725	0.576 / 175.800
1.600GHz	0.749 / 160.946	2.507 / 64.407	0.121 / 61.933	0.576 / 174.285
1.800GHz	0.746 / 157.681	2.250 / 61.141	0.135 / 60.769	0.574 / 173.496
2.000GHz	0.748 / 154.740	2.042 / 57.877	0.149 / 58.839	0.579 / 171.915
2.200GHz	0.743 / 151.271	1.870 / 54.792	0.161 / 56.875	0.587 / 170.814
2.400GHz	0.743 / 148.015	1.725 / 51.753	0.173 / 55.453	0.591 / 169.916
2.600GHz	0.747 / 145.051	1.608 / 48.608	0.184 / 53.635	0.598 / 168.645
2.800GHz	0.746 / 140.704	1.500 / 45.312	0.196 / 51.975	0.593 / 169.361
3.000GHz	0.741 / 137.951	1.409 / 42.960	0.205 / 50.388	0.612 / 168.022

V_{CE} = 3 V, I_C = 60 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.752 / -177.640	9.550 / 88.400	0.032 / 62.176	0.579 / -170.140
600.0MHz	0.762 / 177.645	6.452 / 83.159	0.051 / 63.688	0.584 / -175.457
800.0MHz	0.762 / 173.909	4.879 / 79.015	0.065 / 65.106	0.579 / -179.417
1.000GHz	0.758 / 170.463	3.920 / 75.123	0.078 / 67.036	0.588 / 177.972
1.200GHz	0.756 / 166.860	3.310 / 71.633	0.095 / 65.114	0.581 / 176.744
1.400GHz	0.748 / 163.748	2.854 / 68.091	0.108 / 63.613	0.585 / 175.121
1.600GHz	0.751 / 160.548	2.523 / 64.670	0.122 / 62.609	0.582 / 173.577
1.800GHz	0.750 / 157.183	2.264 / 61.445	0.137 / 60.424	0.582 / 172.691
2.000GHz	0.750 / 154.354	2.054 / 58.259	0.148 / 59.776	0.588 / 171.154
2.200GHz	0.745 / 150.926	1.882 / 55.166	0.162 / 57.577	0.593 / 170.086
2.400GHz	0.743 / 147.795	1.737 / 52.198	0.176 / 56.166	0.598 / 169.023
2.600GHz	0.748 / 144.747	1.619 / 49.057	0.187 / 54.548	0.604 / 167.880
2.800GHz	0.748 / 140.331	1.510 / 45.879	0.199 / 52.613	0.599 / 168.593
3.000GHz	0.741 / 137.782	1.419 / 43.464	0.206 / 50.441	0.618 / 167.222

V_{CE} = 2 V, I_C = 3 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.723 / -94.620	6.724 / 117.134	0.111 / 37.983	0.664 / -67.173
600.0MHz	0.667 / -117.918	5.051 / 102.022	0.122 / 27.393	0.566 / -84.573
800.0MHz	0.637 / -133.143	3.978 / 91.034	0.128 / 22.897	0.508 / -96.607
1.000GHz	0.617 / -144.531	3.264 / 82.372	0.129 / 19.805	0.486 / -106.324
1.200GHz	0.610 / -152.813	2.763 / 75.095	0.129 / 17.898	0.481 / -113.078
1.400GHz	0.604 / -159.592	2.386 / 68.476	0.126 / 18.415	0.485 / -119.446
1.600GHz	0.605 / -165.880	2.104 / 62.514	0.124 / 18.990	0.491 / -125.317
1.800GHz	0.606 / -171.404	1.877 / 56.976	0.124 / 20.013	0.505 / -129.809
2.000GHz	0.612 / -176.431	1.689 / 51.869	0.121 / 22.567	0.519 / -135.021
2.200GHz	0.613 / 178.488	1.537 / 47.133	0.124 / 25.809	0.538 / -139.522
2.400GHz	0.620 / 173.628	1.403 / 42.646	0.125 / 27.815	0.555 / -143.384
2.600GHz	0.629 / 169.420	1.290 / 38.237	0.129 / 31.170	0.574 / -147.468
2.800GHz	0.637 / 163.784	1.194 / 34.047	0.133 / 33.715	0.595 / -148.845
3.000GHz	0.638 / 159.530	1.105 / 30.572	0.137 / 35.911	0.621 / -152.880

V_{CE} = 2 V, I_C = 5 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.674 / -112.477	8.645 / 110.634	0.092 / 35.053	0.564 / -83.708
600.0MHz	0.633 / -133.632	6.246 / 97.414	0.099 / 28.555	0.479 / -101.599
800.0MHz	0.617 / -147.091	4.832 / 88.080	0.102 / 26.372	0.432 / -113.723
1.000GHz	0.606 / -156.427	3.925 / 80.669	0.105 / 27.122	0.420 / -123.172
1.200GHz	0.602 / -163.727	3.314 / 74.384	0.107 / 28.113	0.418 / -127.795
1.400GHz	0.595 / -169.803	2.855 / 68.588	0.111 / 28.937	0.426 / -133.338
1.600GHz	0.598 / -175.255	2.512 / 63.302	0.114 / 31.038	0.433 / -137.928
1.800GHz	0.600 / 179.968	2.241 / 58.326	0.118 / 33.246	0.447 / -141.516
2.000GHz	0.605 / 175.402	2.020 / 53.736	0.123 / 35.244	0.463 / -145.268
2.200GHz	0.604 / 170.917	1.839 / 49.431	0.128 / 37.328	0.481 / -148.651
2.400GHz	0.610 / 166.526	1.683 / 45.257	0.135 / 38.625	0.499 / -151.558
2.600GHz	0.618 / 162.674	1.553 / 41.207	0.142 / 39.457	0.520 / -154.549
2.800GHz	0.624 / 157.223	1.435 / 37.000	0.150 / 41.643	0.537 / -155.532
3.000GHz	0.624 / 153.454	1.333 / 33.841	0.156 / 41.814	0.566 / -158.651

V_{CE} = 2 V, I_C = 7 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.644 / -124.157	9.845 / 106.344	0.075 / 34.947	0.509 / -96.391
600.0MHz	0.622 / -143.614	6.967 / 94.518	0.083 / 30.917	0.436 / -114.805
800.0MHz	0.611 / -155.529	5.347 / 86.215	0.089 / 32.661	0.404 / -126.187
1.000GHz	0.606 / -164.050	4.323 / 79.493	0.095 / 32.732	0.399 / -134.930
1.200GHz	0.600 / -170.285	3.645 / 73.829	0.100 / 34.528	0.398 / -139.178
1.400GHz	0.596 / -175.876	3.134 / 68.497	0.105 / 37.509	0.404 / -143.622
1.600GHz	0.599 / 179.404	2.758 / 63.657	0.111 / 38.257	0.411 / -147.266
1.800GHz	0.601 / 174.851	2.462 / 59.061	0.117 / 40.609	0.424 / -149.713
2.000GHz	0.605 / 170.721	2.218 / 54.745	0.127 / 42.273	0.439 / -153.454
2.200GHz	0.605 / 166.418	2.021 / 50.606	0.134 / 43.467	0.457 / -156.128
2.400GHz	0.609 / 162.323	1.850 / 46.758	0.143 / 43.852	0.474 / -158.222
2.600GHz	0.619 / 158.569	1.709 / 42.811	0.151 / 43.526	0.494 / -160.863
2.800GHz	0.620 / 153.458	1.584 / 38.952	0.160 / 44.369	0.508 / -160.851
3.000GHz	0.620 / 149.920	1.471 / 35.723	0.168 / 44.822	0.536 / -163.638

V_{CE} = 2 V, I_C = 10 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.630 / -136.397	10.947 / 102.251	0.066 / 39.528	0.464 / -110.838
600.0MHz	0.619 / -153.201	7.614 / 91.878	0.072 / 36.649	0.414 / -128.415
800.0MHz	0.610 / -163.295	5.810 / 84.578	0.079 / 37.784	0.390 / -138.943
1.000GHz	0.606 / -170.487	4.687 / 78.561	0.087 / 39.466	0.390 / -146.321
1.200GHz	0.604 / -176.113	3.943 / 73.454	0.095 / 43.163	0.389 / -149.551
1.400GHz	0.599 / 179.034	3.390 / 68.579	0.102 / 45.677	0.398 / -153.582
1.600GHz	0.604 / 174.497	2.984 / 64.138	0.112 / 46.387	0.402 / -156.261
1.800GHz	0.604 / 170.279	2.667 / 59.889	0.121 / 47.371	0.414 / -158.219
2.000GHz	0.607 / 166.556	2.405 / 55.853	0.130 / 47.280	0.426 / -160.876
2.200GHz	0.607 / 162.499	2.192 / 51.972	0.140 / 47.823	0.443 / -163.005
2.400GHz	0.609 / 158.528	2.008 / 48.286	0.150 / 48.013	0.459 / -164.820
2.600GHz	0.618 / 155.115	1.858 / 44.537	0.162 / 47.956	0.475 / -166.784
2.800GHz	0.621 / 149.973	1.723 / 40.838	0.171 / 47.593	0.490 / -166.111
3.000GHz	0.619 / 146.481	1.605 / 37.755	0.178 / 46.748	0.516 / -168.717

V_{CE} = 2 V, I_C = 15 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.614 / -148.873	11.984 / 98.180	0.053 / 40.570	0.436 / -127.378
600.0MHz	0.616 / -162.309	8.226 / 89.316	0.060 / 42.651	0.407 / -142.315
800.0MHz	0.616 / -170.317	6.246 / 82.980	0.071 / 47.418	0.390 / -151.153
1.000GHz	0.612 / -176.678	5.024 / 77.705	0.080 / 49.678	0.395 / -157.914
1.200GHz	0.610 / 178.486	4.227 / 73.067	0.091 / 51.758	0.394 / -160.116
1.400GHz	0.604 / 174.106	3.635 / 68.747	0.103 / 51.798	0.402 / -162.843
1.600GHz	0.609 / 170.060	3.200 / 64.554	0.114 / 53.521	0.406 / -165.320
1.800GHz	0.610 / 166.096	2.859 / 60.675	0.125 / 52.801	0.415 / -166.670
2.000GHz	0.613 / 162.497	2.582 / 56.783	0.136 / 53.050	0.425 / -168.887
2.200GHz	0.613 / 158.687	2.352 / 53.257	0.148 / 52.346	0.440 / -170.534
2.400GHz	0.615 / 155.046	2.158 / 49.783	0.158 / 51.808	0.455 / -171.688
2.600GHz	0.619 / 151.472	2.002 / 46.249	0.171 / 50.551	0.468 / -173.187
2.800GHz	0.623 / 146.494	1.858 / 42.655	0.180 / 49.416	0.479 / -172.304
3.000GHz	0.622 / 143.325	1.731 / 39.776	0.189 / 48.847	0.505 / -174.155

V_{CE} = 2 V, I_C = 20 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.617 / -155.915	12.510 / 95.908	0.050 / 49.065	0.425 / -136.840
600.0MHz	0.620 / -167.394	8.544 / 87.943	0.057 / 49.865	0.407 / -150.087
800.0MHz	0.620 / -174.301	6.470 / 82.166	0.068 / 53.310	0.397 / -158.150
1.000GHz	0.616 / -179.668	5.201 / 77.219	0.078 / 56.443	0.405 / -163.209
1.200GHz	0.613 / 175.599	4.376 / 72.917	0.092 / 56.051	0.401 / -165.453
1.400GHz	0.612 / 171.514	3.762 / 68.751	0.103 / 56.575	0.409 / -167.974
1.600GHz	0.615 / 167.661	3.312 / 64.847	0.115 / 56.342	0.414 / -169.882
1.800GHz	0.615 / 163.923	2.962 / 61.077	0.128 / 56.195	0.419 / -171.131
2.000GHz	0.618 / 160.588	2.676 / 57.433	0.140 / 56.248	0.430 / -172.984
2.200GHz	0.616 / 156.691	2.439 / 53.975	0.151 / 54.920	0.444 / -174.457
2.400GHz	0.617 / 153.071	2.240 / 50.611	0.163 / 53.126	0.456 / -175.603
2.600GHz	0.627 / 149.643	2.077 / 47.285	0.176 / 52.586	0.470 / -176.991
2.800GHz	0.626 / 144.943	1.928 / 43.659	0.186 / 51.360	0.477 / -175.620
3.000GHz	0.625 / 141.382	1.799 / 40.928	0.196 / 49.800	0.501 / -177.343

V_{CE} = 2 V, I_C = 25 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.623 / -161.403	12.865 / 94.220	0.044 / 48.376	0.423 / -144.397
600.0MHz	0.622 / -170.971	8.755 / 86.931	0.053 / 53.105	0.414 / -155.744
800.0MHz	0.624 / -177.083	6.626 / 81.512	0.065 / 59.196	0.406 / -162.793
1.000GHz	0.621 / 177.642	5.320 / 76.874	0.078 / 58.721	0.414 / -167.742
1.200GHz	0.620 / 173.465	4.477 / 72.779	0.091 / 59.558	0.410 / -169.196
1.400GHz	0.616 / 169.631	3.851 / 68.819	0.105 / 59.774	0.417 / -171.788
1.600GHz	0.620 / 165.949	3.388 / 64.972	0.118 / 59.613	0.421 / -173.404
1.800GHz	0.619 / 162.221	3.031 / 61.362	0.131 / 58.361	0.426 / -174.385
2.000GHz	0.624 / 159.000	2.739 / 57.859	0.144 / 57.589	0.437 / -176.069
2.200GHz	0.620 / 155.145	2.500 / 54.505	0.155 / 56.140	0.451 / -177.365
2.400GHz	0.622 / 151.620	2.294 / 51.192	0.167 / 55.254	0.461 / -178.326
2.600GHz	0.627 / 148.186	2.129 / 47.874	0.178 / 53.949	0.472 / -179.596
2.800GHz	0.630 / 143.584	1.979 / 44.469	0.191 / 52.118	0.480 / -178.267
3.000GHz	0.628 / 140.263	1.845 / 41.745	0.199 / 50.478	0.502 / -179.899

V_{CE} = 2 V, I_C = 30 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.621 / -163.303	13.027 / 93.369	0.043 / 56.310	0.428 / -147.446
600.0MHz	0.625 / -172.842	8.847 / 86.405	0.053 / 56.659	0.417 / -158.699
800.0MHz	0.626 / -178.763	6.694 / 81.247	0.065 / 60.243	0.410 / -164.881
1.000GHz	0.623 / 176.332	5.376 / 76.729	0.076 / 59.998	0.417 / -169.544
1.200GHz	0.624 / 172.394	4.523 / 72.698	0.092 / 62.210	0.416 / -171.147
1.400GHz	0.620 / 168.699	3.887 / 68.780	0.105 / 61.251	0.422 / -173.214
1.600GHz	0.623 / 165.120	3.424 / 65.033	0.118 / 60.734	0.425 / -175.058
1.800GHz	0.623 / 161.302	3.061 / 61.536	0.131 / 59.257	0.429 / -176.025
2.000GHz	0.624 / 158.189	2.768 / 58.036	0.144 / 57.944	0.439 / -177.705
2.200GHz	0.624 / 154.443	2.526 / 54.716	0.158 / 56.907	0.451 / -178.930
2.400GHz	0.625 / 150.868	2.320 / 51.457	0.170 / 55.481	0.461 / -179.960
2.600GHz	0.630 / 147.772	2.151 / 48.202	0.181 / 53.907	0.475 / 179.163
2.800GHz	0.632 / 142.849	2.000 / 44.758	0.194 / 52.955	0.479 / -179.540
3.000GHz	0.631 / 139.832	1.866 / 42.113	0.201 / 51.223	0.503 / 178.860

V_{CE} = 2 V, I_C = 35 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.623 / -166.387	13.146 / 92.606	0.039 / 51.377	0.425 / -150.929
600.0MHz	0.626 / -174.431	8.916 / 85.949	0.051 / 59.838	0.423 / -160.865
800.0MHz	0.629 / -179.964	6.741 / 80.933	0.064 / 61.462	0.415 / -167.229
1.000GHz	0.628 / 175.454	5.414 / 76.525	0.078 / 61.928	0.422 / -171.284
1.200GHz	0.625 / 171.514	4.556 / 72.586	0.092 / 62.910	0.420 / -172.548
1.400GHz	0.623 / 167.826	3.917 / 68.768	0.107 / 61.876	0.425 / -174.895
1.600GHz	0.625 / 164.238	3.450 / 65.087	0.120 / 61.331	0.428 / -176.294
1.800GHz	0.625 / 160.662	3.085 / 61.612	0.132 / 60.155	0.433 / -177.310
2.000GHz	0.628 / 157.501	2.787 / 58.165	0.146 / 59.227	0.443 / -179.111
2.200GHz	0.627 / 153.885	2.545 / 54.911	0.157 / 57.867	0.455 / 179.904
2.400GHz	0.628 / 150.318	2.337 / 51.690	0.171 / 56.188	0.465 / 178.995
2.600GHz	0.635 / 147.128	2.169 / 48.469	0.182 / 55.139	0.476 / 177.904
2.800GHz	0.635 / 142.355	2.016 / 45.074	0.195 / 52.553	0.481 / 179.426
3.000GHz	0.632 / 139.005	1.884 / 42.372	0.203 / 51.569	0.504 / 177.885

V_{CE} = 2 V, I_C = 40 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.626 / -168.604	13.215 / 91.897	0.039 / 58.313	0.430 / -154.164
600.0MHz	0.633 / -176.030	8.955 / 85.497	0.051 / 59.654	0.424 / -163.587
800.0MHz	0.632 / 178.888	6.769 / 80.634	0.065 / 62.992	0.419 / -169.120
1.000GHz	0.630 / 174.458	5.431 / 76.296	0.079 / 66.338	0.429 / -173.004
1.200GHz	0.631 / 170.469	4.571 / 72.443	0.093 / 64.340	0.422 / -174.286
1.400GHz	0.625 / 167.107	3.930 / 68.690	0.105 / 63.617	0.429 / -176.162
1.600GHz	0.628 / 163.513	3.462 / 65.093	0.121 / 62.593	0.431 / -177.705
1.800GHz	0.630 / 160.205	3.097 / 61.649	0.134 / 61.185	0.435 / -178.850
2.000GHz	0.634 / 156.961	2.797 / 58.208	0.146 / 60.119	0.446 / 179.708
2.200GHz	0.630 / 153.249	2.554 / 54.996	0.160 / 57.978	0.457 / 178.913
2.400GHz	0.631 / 149.733	2.348 / 51.813	0.173 / 56.415	0.466 / 177.892
2.600GHz	0.636 / 146.499	2.178 / 48.602	0.184 / 54.432	0.478 / 176.884
2.800GHz	0.638 / 141.834	2.026 / 45.176	0.195 / 53.955	0.481 / 178.438
3.000GHz	0.635 / 138.499	1.891 / 42.612	0.206 / 52.002	0.505 / 176.655

V_{CE} = 2 V, I_C = 50 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.629 / -170.710	13.226 / 91.073	0.038 / 61.484	0.431 / -157.513
600.0MHz	0.636 / -177.747	8.947 / 84.991	0.050 / 64.125	0.428 / -165.552
800.0MHz	0.641 / 177.609	6.761 / 80.264	0.065 / 66.186	0.422 / -170.882
1.000GHz	0.637 / 173.368	5.427 / 76.064	0.078 / 65.292	0.432 / -174.764
1.200GHz	0.637 / 169.648	4.566 / 72.259	0.095 / 65.860	0.430 / -175.713
1.400GHz	0.630 / 166.057	3.926 / 68.563	0.107 / 64.968	0.435 / -177.522
1.600GHz	0.635 / 162.682	3.456 / 64.985	0.123 / 63.286	0.437 / -179.086
1.800GHz	0.635 / 159.449	3.095 / 61.600	0.135 / 62.415	0.440 / -179.859
2.000GHz	0.637 / 156.258	2.799 / 58.218	0.148 / 60.809	0.449 / 178.742
2.200GHz	0.634 / 152.506	2.555 / 54.984	0.161 / 58.834	0.460 / 177.777
2.400GHz	0.636 / 149.244	2.346 / 51.866	0.173 / 57.033	0.470 / 176.736
2.600GHz	0.643 / 145.885	2.178 / 48.654	0.185 / 55.456	0.481 / 175.853
2.800GHz	0.643 / 141.265	2.027 / 45.342	0.198 / 53.729	0.485 / 177.420
3.000GHz	0.641 / 138.105	1.892 / 42.782	0.207 / 52.224	0.509 / 175.863

V_{CE} = 2 V, I_C = 60 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.638 / -172.641	13.082 / 90.359	0.037 / 66.574	0.431 / -159.861
600.0MHz	0.645 / -179.132	8.844 / 84.472	0.050 / 67.497	0.431 / -167.609
800.0MHz	0.646 / 176.468	6.681 / 79.894	0.065 / 68.432	0.427 / -172.516
1.000GHz	0.644 / 172.469	5.364 / 75.734	0.079 / 66.258	0.437 / -175.811
1.200GHz	0.644 / 168.938	4.512 / 71.993	0.095 / 67.753	0.431 / -176.890
1.400GHz	0.638 / 165.557	3.881 / 68.330	0.108 / 66.664	0.439 / -178.499
1.600GHz	0.641 / 162.152	3.420 / 64.777	0.120 / 64.529	0.440 / -179.811
1.800GHz	0.643 / 158.816	3.059 / 61.394	0.137 / 63.532	0.444 / 179.293
2.000GHz	0.644 / 155.690	2.766 / 58.023	0.149 / 60.766	0.452 / 177.884
2.200GHz	0.643 / 152.093	2.524 / 54.824	0.162 / 59.728	0.463 / 177.034
2.400GHz	0.644 / 148.767	2.321 / 51.681	0.175 / 57.725	0.472 / 176.110
2.600GHz	0.651 / 145.468	2.152 / 48.510	0.188 / 56.413	0.484 / 175.277
2.800GHz	0.649 / 140.967	2.003 / 45.174	0.200 / 54.092	0.485 / 176.640
3.000GHz	0.647 / 137.737	1.872 / 42.625	0.209 / 52.163	0.509 / 175.322

V_{CE} = 1 V, I_C = 3 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.725 / -95.243	6.438 / 116.961	0.113 / 36.507	0.667 / -67.556
600.0MHz	0.670 / -118.286	4.836 / 101.777	0.131 / 27.220	0.565 / -85.613
800.0MHz	0.637 / -133.432	3.811 / 90.659	0.132 / 20.758	0.511 / -97.530
1.000GHz	0.623 / -144.386	3.120 / 81.847	0.134 / 18.100	0.487 / -107.498
1.200GHz	0.613 / -152.891	2.648 / 74.528	0.133 / 16.998	0.484 / -114.299
1.400GHz	0.606 / -159.766	2.284 / 67.788	0.130 / 16.384	0.489 / -120.939
1.600GHz	0.609 / -166.021	2.014 / 61.735	0.129 / 17.070	0.496 / -126.669
1.800GHz	0.612 / -171.677	1.797 / 56.187	0.127 / 18.061	0.512 / -131.276
2.000GHz	0.617 / -176.440	1.618 / 50.960	0.127 / 20.224	0.525 / -136.370
2.200GHz	0.617 / 178.476	1.472 / 46.171	0.124 / 22.399	0.545 / -140.738
2.400GHz	0.624 / 173.683	1.344 / 41.662	0.126 / 25.564	0.564 / -144.626
2.600GHz	0.634 / 169.286	1.238 / 37.309	0.129 / 28.497	0.584 / -148.364
2.800GHz	0.641 / 163.463	1.143 / 33.054	0.133 / 31.424	0.603 / -150.159
3.000GHz	0.643 / 159.487	1.056 / 29.689	0.139 / 34.364	0.630 / -154.041

V_{CE} = 1 V, I_C = 5 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.673 / -113.644	8.370 / 110.171	0.094 / 33.650	0.562 / -85.655
600.0MHz	0.638 / -134.727	6.041 / 96.955	0.102 / 28.895	0.478 / -104.081
800.0MHz	0.621 / -147.970	4.672 / 87.628	0.105 / 26.269	0.435 / -115.973
1.000GHz	0.611 / -157.399	3.792 / 80.182	0.106 / 26.751	0.423 / -125.226
1.200GHz	0.605 / -164.699	3.205 / 73.868	0.112 / 26.991	0.421 / -130.551
1.400GHz	0.600 / -170.600	2.759 / 68.080	0.113 / 28.270	0.429 / -135.988
1.600GHz	0.604 / -175.824	2.430 / 62.755	0.117 / 30.732	0.438 / -140.383
1.800GHz	0.606 / 179.264	2.169 / 57.824	0.122 / 32.299	0.451 / -143.536
2.000GHz	0.611 / 175.031	1.954 / 53.155	0.126 / 33.895	0.467 / -147.685
2.200GHz	0.611 / 170.301	1.777 / 48.793	0.131 / 35.708	0.487 / -150.811
2.400GHz	0.615 / 166.069	1.627 / 44.622	0.136 / 36.907	0.504 / -153.654
2.600GHz	0.624 / 162.113	1.502 / 40.558	0.143 / 38.644	0.525 / -156.706
2.800GHz	0.626 / 156.758	1.391 / 36.386	0.152 / 38.982	0.543 / -157.171
3.000GHz	0.629 / 153.009	1.289 / 33.253	0.157 / 40.465	0.569 / -160.457

V_{CE} = 1 V, I_C = 7 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.651 / -125.982	9.539 / 105.760	0.080 / 35.890	0.505 / -99.302
600.0MHz	0.629 / -144.991	6.737 / 94.023	0.088 / 32.094	0.442 / -117.727
800.0MHz	0.617 / -156.518	5.168 / 85.798	0.091 / 31.691	0.408 / -128.763
1.000GHz	0.612 / -164.856	4.177 / 79.108	0.096 / 33.767	0.403 / -137.388
1.200GHz	0.608 / -171.080	3.522 / 73.471	0.101 / 34.665	0.404 / -141.536
1.400GHz	0.602 / -176.534	3.030 / 68.144	0.107 / 37.178	0.412 / -146.135
1.600GHz	0.607 / 178.557	2.669 / 63.290	0.113 / 38.285	0.419 / -149.635
1.800GHz	0.608 / 174.112	2.383 / 58.722	0.121 / 40.497	0.432 / -152.367
2.000GHz	0.612 / 170.126	2.150 / 54.346	0.129 / 41.233	0.446 / -155.617
2.200GHz	0.612 / 165.849	1.956 / 50.252	0.137 / 42.351	0.464 / -158.220
2.400GHz	0.616 / 161.763	1.792 / 46.300	0.145 / 42.986	0.483 / -160.371
2.600GHz	0.622 / 158.204	1.656 / 42.430	0.154 / 43.592	0.501 / -162.762
2.800GHz	0.628 / 152.746	1.536 / 38.529	0.163 / 43.693	0.515 / -162.706
3.000GHz	0.627 / 149.196	1.427 / 35.420	0.170 / 44.146	0.541 / -165.588

V_{CE} = 1 V, I_C = 10 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.634 / -139.250	10.633 / 101.413	0.063 / 34.214	0.456 / -115.308
600.0MHz	0.625 / -155.065	7.386 / 91.235	0.072 / 38.083	0.418 / -132.113
800.0MHz	0.620 / -164.568	5.626 / 84.039	0.080 / 38.552	0.397 / -142.719
1.000GHz	0.614 / -171.768	4.533 / 78.138	0.085 / 41.260	0.398 / -149.464
1.200GHz	0.614 / -177.456	3.819 / 73.053	0.095 / 43.810	0.398 / -153.153
1.400GHz	0.606 / 177.774	3.286 / 68.234	0.103 / 44.790	0.407 / -156.803
1.600GHz	0.613 / 173.592	2.892 / 63.753	0.115 / 44.793	0.414 / -159.456
1.800GHz	0.614 / 169.185	2.584 / 59.552	0.123 / 46.852	0.423 / -161.504
2.000GHz	0.616 / 165.695	2.332 / 55.485	0.133 / 47.181	0.436 / -164.005
2.200GHz	0.616 / 161.603	2.125 / 51.668	0.142 / 47.381	0.453 / -165.922
2.400GHz	0.619 / 157.764	1.949 / 47.951	0.153 / 47.619	0.469 / -167.562
2.600GHz	0.625 / 154.099	1.803 / 44.225	0.162 / 47.151	0.484 / -169.423
2.800GHz	0.628 / 149.084	1.674 / 40.457	0.173 / 46.819	0.498 / -168.789
3.000GHz	0.629 / 145.839	1.557 / 37.456	0.182 / 45.788	0.523 / -170.967

V_{CE} = 1 V, I_C = 15 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.628 / -151.796	11.537 / 97.314	0.055 / 41.116	0.438 / -131.700
600.0MHz	0.627 / -164.063	7.912 / 88.688	0.062 / 43.969	0.416 / -146.106
800.0MHz	0.627 / -171.833	6.003 / 82.480	0.071 / 46.789	0.405 / -154.972
1.000GHz	0.624 / -177.835	4.829 / 77.230	0.081 / 49.751	0.410 / -160.905
1.200GHz	0.623 / 177.315	4.065 / 72.643	0.095 / 51.494	0.410 / -163.201
1.400GHz	0.617 / 173.090	3.496 / 68.314	0.104 / 53.082	0.415 / -165.916
1.600GHz	0.623 / 169.063	3.077 / 64.155	0.117 / 52.763	0.421 / -168.437
1.800GHz	0.623 / 165.159	2.751 / 60.274	0.127 / 52.948	0.428 / -169.515
2.000GHz	0.626 / 161.695	2.485 / 56.489	0.140 / 52.617	0.440 / -171.810
2.200GHz	0.625 / 157.765	2.265 / 52.886	0.151 / 51.953	0.455 / -173.307
2.400GHz	0.627 / 154.164	2.079 / 49.396	0.162 / 51.464	0.467 / -174.480
2.600GHz	0.633 / 150.849	1.927 / 45.890	0.171 / 50.770	0.483 / -176.031
2.800GHz	0.635 / 145.930	1.791 / 42.289	0.183 / 49.684	0.492 / -174.922
3.000GHz	0.635 / 142.544	1.670 / 39.526	0.192 / 48.352	0.515 / -176.713

V_{CE} = 1 V, I_C = 20 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.634 / -158.662	11.951 / 94.946	0.050 / 45.355	0.437 / -142.586
600.0MHz	0.634 / -169.220	8.148 / 87.225	0.057 / 50.072	0.424 / -154.334
800.0MHz	0.634 / -175.888	6.173 / 81.589	0.067 / 54.418	0.414 / -161.720
1.000GHz	0.630 / 178.745	4.961 / 76.728	0.081 / 55.182	0.421 / -166.787
1.200GHz	0.631 / 174.363	4.174 / 72.412	0.093 / 56.599	0.422 / -168.899
1.400GHz	0.628 / 170.421	3.589 / 68.261	0.105 / 57.046	0.428 / -171.240
1.600GHz	0.632 / 166.590	3.160 / 64.354	0.118 / 56.809	0.432 / -173.149
1.800GHz	0.631 / 162.974	2.827 / 60.602	0.131 / 56.608	0.438 / -174.389
2.000GHz	0.632 / 159.544	2.555 / 56.980	0.143 / 55.255	0.447 / -176.326
2.200GHz	0.632 / 155.676	2.331 / 53.549	0.155 / 54.448	0.460 / -177.478
2.400GHz	0.632 / 152.229	2.140 / 50.168	0.165 / 53.266	0.473 / -178.490
2.600GHz	0.639 / 148.881	1.985 / 46.765	0.177 / 52.488	0.486 / -179.795
2.800GHz	0.639 / 144.115	1.848 / 43.257	0.189 / 50.546	0.492 / -178.609
3.000GHz	0.639 / 140.619	1.723 / 40.530	0.198 / 49.646	0.514 / 179.932

V_{CE} = 1 V, I_C = 25 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.640 / -162.552	12.097 / 93.675	0.046 / 50.005	0.437 / -146.995
600.0MHz	0.639 / -171.919	8.221 / 86.452	0.055 / 53.336	0.428 / -158.380
800.0MHz	0.641 / -178.121	6.220 / 81.096	0.067 / 55.745	0.421 / -164.993
1.000GHz	0.637 / 177.112	4.998 / 76.428	0.079 / 58.423	0.429 / -169.775
1.200GHz	0.636 / 172.927	4.204 / 72.297	0.092 / 58.082	0.428 / -171.546
1.400GHz	0.632 / 169.098	3.616 / 68.316	0.107 / 59.553	0.434 / -173.572
1.600GHz	0.637 / 165.297	3.183 / 64.483	0.120 / 58.563	0.436 / -175.424
1.800GHz	0.636 / 161.719	2.849 / 60.861	0.133 / 57.572	0.441 / -176.431
2.000GHz	0.639 / 158.351	2.576 / 57.331	0.146 / 56.623	0.452 / -178.282
2.200GHz	0.637 / 154.646	2.351 / 53.950	0.158 / 55.639	0.463 / -179.652
2.400GHz	0.638 / 151.151	2.159 / 50.591	0.169 / 54.450	0.474 / 179.496
2.600GHz	0.643 / 147.861	2.004 / 47.309	0.181 / 52.741	0.484 / 178.431
2.800GHz	0.645 / 143.007	1.864 / 43.894	0.194 / 51.304	0.491 / 179.704
3.000GHz	0.644 / 139.910	1.740 / 41.199	0.202 / 50.182	0.515 / 178.082

V_{CE} = 1 V, I_C = 30 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.638 / -166.745	12.103 / 92.423	0.038 / 48.393	0.439 / -152.726
600.0MHz	0.649 / -174.655	8.209 / 85.654	0.054 / 57.127	0.435 / -162.690
800.0MHz	0.648 / -179.889	6.208 / 80.544	0.068 / 60.339	0.431 / -168.508
1.000GHz	0.648 / 175.364	4.986 / 76.030	0.080 / 60.280	0.441 / -172.238
1.200GHz	0.644 / 171.335	4.198 / 72.056	0.093 / 61.776	0.436 / -173.870
1.400GHz	0.642 / 167.677	3.608 / 68.190	0.106 / 60.557	0.441 / -176.173
1.600GHz	0.644 / 164.058	3.179 / 64.436	0.120 / 60.843	0.445 / -177.823
1.800GHz	0.644 / 160.531	2.844 / 60.901	0.132 / 59.349	0.449 / -178.784
2.000GHz	0.647 / 157.359	2.571 / 57.384	0.147 / 57.937	0.458 / 179.536
2.200GHz	0.644 / 153.628	2.348 / 54.072	0.160 / 56.726	0.470 / 178.255
2.400GHz	0.646 / 150.185	2.158 / 50.877	0.173 / 55.049	0.478 / 177.526
2.600GHz	0.650 / 146.731	2.003 / 47.579	0.182 / 53.437	0.490 / 176.457
2.800GHz	0.652 / 142.200	1.864 / 44.168	0.195 / 51.962	0.494 / 178.037
3.000GHz	0.651 / 139.048	1.742 / 41.576	0.206 / 50.198	0.517 / 176.410

V_{CE} = 1 V, I_C = 35 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.768 / -175.200	8.330 / 88.754	0.042 / 49.772	0.586 / -168.617
600.0MHz	0.773 / 179.242	5.637 / 83.102	0.054 / 56.875	0.590 / -174.446
800.0MHz	0.773 / 175.133	4.265 / 78.640	0.067 / 57.633	0.585 / -178.452
1.000GHz	0.768 / 171.331	3.431 / 74.527	0.078 / 61.026	0.592 / 179.010
1.200GHz	0.768 / 167.808	2.897 / 70.801	0.093 / 62.003	0.586 / 177.647
1.400GHz	0.761 / 164.606	2.501 / 67.090	0.108 / 60.241	0.592 / 175.842
1.600GHz	0.764 / 161.275	2.210 / 63.509	0.123 / 59.319	0.591 / 174.184
1.800GHz	0.763 / 158.012	1.987 / 60.206	0.137 / 57.752	0.589 / 173.315
2.000GHz	0.763 / 155.010	1.807 / 56.836	0.149 / 56.869	0.592 / 171.698
2.200GHz	0.758 / 151.596	1.658 / 53.689	0.162 / 55.422	0.601 / 170.656
2.400GHz	0.757 / 148.367	1.530 / 50.601	0.173 / 54.026	0.605 / 169.697
2.600GHz	0.761 / 145.384	1.428 / 47.419	0.184 / 52.277	0.612 / 168.532
2.800GHz	0.757 / 140.914	1.336 / 44.106	0.196 / 50.603	0.609 / 169.140
3.000GHz	0.754 / 138.230	1.254 / 41.669	0.207 / 48.643	0.625 / 167.744

V_{CE} = 1 V, I_C = 40 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.660 / -170.766	11.646 / 90.826	0.037 / 55.711	0.452 / -159.273
600.0MHz	0.666 / -177.631	7.886 / 84.539	0.051 / 61.124	0.451 / -167.149
800.0MHz	0.668 / 177.584	5.960 / 79.725	0.066 / 62.218	0.447 / -172.414
1.000GHz	0.666 / 173.325	4.788 / 75.389	0.079 / 64.346	0.455 / -175.899
1.200GHz	0.664 / 169.641	4.030 / 71.539	0.094 / 63.589	0.450 / -177.068
1.400GHz	0.660 / 166.020	3.468 / 67.669	0.109 / 62.677	0.458 / -179.117
1.600GHz	0.662 / 162.671	3.055 / 64.035	0.122 / 61.333	0.460 / 179.350
1.800GHz	0.664 / 159.266	2.735 / 60.536	0.138 / 60.946	0.462 / 178.442
2.000GHz	0.665 / 155.957	2.474 / 57.114	0.151 / 58.967	0.471 / 177.004
2.200GHz	0.662 / 152.539	2.259 / 53.795	0.163 / 57.498	0.482 / 175.766
2.400GHz	0.662 / 149.043	2.079 / 50.668	0.176 / 56.085	0.491 / 175.036
2.600GHz	0.667 / 145.789	1.934 / 47.407	0.187 / 54.527	0.501 / 174.352
2.800GHz	0.666 / 140.926	1.799 / 44.047	0.202 / 52.143	0.503 / 175.578
3.000GHz	0.667 / 138.149	1.682 / 41.414	0.208 / 51.435	0.527 / 173.983

V_{CE} = 1 V, I_C = 50 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.785 / -178.231	7.950 / 87.788	0.039 / 58.548	0.622 / -172.976
600.0MHz	0.791 / 177.186	5.377 / 82.604	0.054 / 60.343	0.628 / -177.849
800.0MHz	0.791 / 173.592	4.069 / 78.492	0.068 / 65.116	0.622 / 178.868
1.000GHz	0.783 / 169.880	3.275 / 74.551	0.082 / 64.261	0.631 / 176.413
1.200GHz	0.783 / 166.524	2.768 / 71.030	0.098 / 63.983	0.624 / 175.054
1.400GHz	0.776 / 163.423	2.392 / 67.500	0.112 / 62.711	0.626 / 173.295
1.600GHz	0.779 / 160.152	2.120 / 64.085	0.124 / 61.273	0.624 / 171.698
1.800GHz	0.778 / 156.862	1.907 / 60.824	0.140 / 59.700	0.623 / 170.733
2.000GHz	0.778 / 154.011	1.735 / 57.587	0.153 / 58.150	0.626 / 169.157
2.200GHz	0.772 / 150.492	1.594 / 54.535	0.165 / 56.962	0.631 / 167.963
2.400GHz	0.770 / 147.407	1.474 / 51.558	0.178 / 55.260	0.634 / 167.058
2.600GHz	0.775 / 144.370	1.378 / 48.442	0.190 / 53.453	0.638 / 165.833
2.800GHz	0.772 / 139.923	1.289 / 45.288	0.203 / 51.533	0.634 / 166.391
3.000GHz	0.768 / 137.390	1.215 / 42.989	0.212 / 49.654	0.651 / 165.045

V_{CE} = 1 V, I_C = 60 mA

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.805 / -179.531	7.139 / 87.156	0.035 / 58.095	0.654 / -175.464
600.0MHz	0.811 / 175.976	4.827 / 82.168	0.052 / 65.977	0.657 / -179.489
800.0MHz	0.810 / 172.652	3.656 / 78.212	0.068 / 66.431	0.652 / 177.241
1.000GHz	0.802 / 169.092	2.950 / 74.337	0.084 / 65.501	0.659 / 174.950
1.200GHz	0.804 / 165.897	2.495 / 70.839	0.098 / 65.941	0.653 / 173.573
1.400GHz	0.796 / 162.694	2.161 / 67.431	0.115 / 64.680	0.656 / 171.720
1.600GHz	0.797 / 159.485	1.917 / 63.999	0.126 / 62.228	0.652 / 170.151
1.800GHz	0.794 / 156.154	1.730 / 60.834	0.142 / 60.351	0.652 / 168.992
2.000GHz	0.796 / 153.415	1.575 / 57.623	0.157 / 59.159	0.653 / 167.500
2.200GHz	0.790 / 150.011	1.452 / 54.614	0.169 / 57.213	0.658 / 166.356
2.400GHz	0.788 / 146.760	1.345 / 51.728	0.183 / 55.166	0.661 / 165.338
2.600GHz	0.791 / 143.678	1.260 / 48.607	0.195 / 53.376	0.665 / 164.016
2.800GHz	0.788 / 139.584	1.184 / 45.539	0.208 / 51.298	0.657 / 164.569
3.000GHz	0.783 / 136.836	1.118 / 43.147	0.215 / 49.781	0.672 / 163.210