

Application

LNA and wide band amplifier up to GHz range

FEATURES

o Low Noise Figure

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

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

o High Gain

MAG = 12.5 dB at f = 2 GHz, $V_{CE} = 3\text{ V}$, $I_C = 30\text{ mA}$

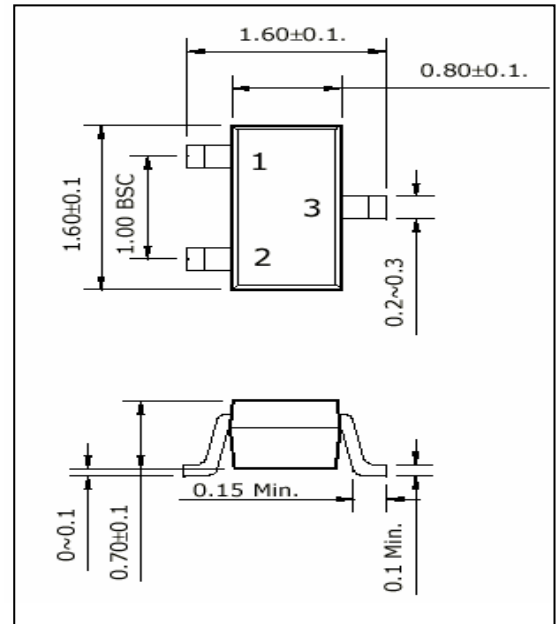
MAG = 9.5 dB at f = 2 GHz, $V_{CE} = 1\text{ V}$, $I_C = 7\text{ mA}$

o High Transition Frequency

$f_T = 11\text{ GHz}$ at f = 2 GHz, $V_{CE} = 3\text{ V}$, $I_C = 50\text{ mA}$

SOT-523

Unit in mm



Pin Configuration

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

h_{FE} Classification

Marking	AK1	AK2
h_{FE}	125 to 300	80 to 160

Available Package

Unit : mm

Product	Package	Dimension
THN4501U	SOT-323	2.0 x 1.25, 1.0t
THN4501Z	SOT-343	2.0 x 1.25, 1.0t
THN4501E	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)	100	mA
P_T	Total Power Dissipation	150	mW
T_{STG}	Storage Temperature	-65 ~ 150	°C
T_J	Operating Junction Temperature	150	°C

THN4501 Series

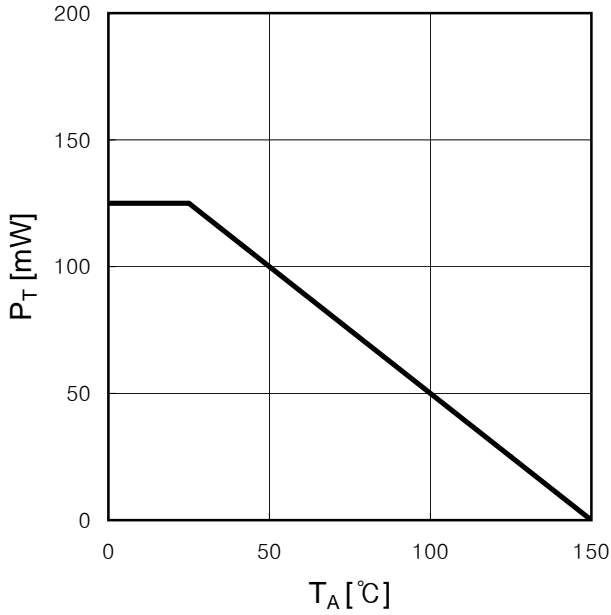
□ Electrical Characteristics ($T_A = 25\text{ }^\circ\text{C}$)

Symbol	Parameter	Test Condition	Value			Unit
			Min.	Typ.	Max.	
I_{CBO}	Collector Cut-off Current	$V_{CB} = 10\text{ V}, I_E = 0\text{ mA}$	-	-	0.5	μA
I_{CEO}		$V_{CE} = 6\text{ V}, I_B = 0\text{ mA}$	-	-	5.0	μA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 1\text{ V}, I_C = 0\text{ mA}$	-	-	0.5	μA
h_{FE}	DC Current Gain	$V_{CE} = 3\text{ V}, I_C = 15\text{ mA}$	80	200	300	
f_T	Transition Frequency	$V_{CE} = 3\text{ V}, I_C = 20\text{ mA}$	-	10.4	-	GHz
C_{CB}	Collector to Base Capacitance	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	-	1.1	-	pF
$ S_{21} ^2$	Insertion Power Gain	$V_{CE} = 3\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$	4.5	5.5	-	dB
		$V_{CE} = 1\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$	3.0	5.0	-	
MAG	Maximum Available Gain	$V_{CE} = 3\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$	8.5	10.5	-	dB
		$V_{CE} = 1\text{ V}, I_C = 30\text{ mA}, f = 2\text{ GHz}$	8.0	10.0	-	
NFmin	Minimum Noise Figure	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	1.5	-	dB
		$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	1.7	-	
rn	Noise Resistance	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	0.04	-	Ω
		$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	0.05	-	
G_A	Associated Gain	$V_{CE} = 3\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	9.5	-	dB
		$V_{CE} = 1\text{ V}, I_C = 5\text{ mA}, f = 2\text{ GHz}$	-	8.0	-	

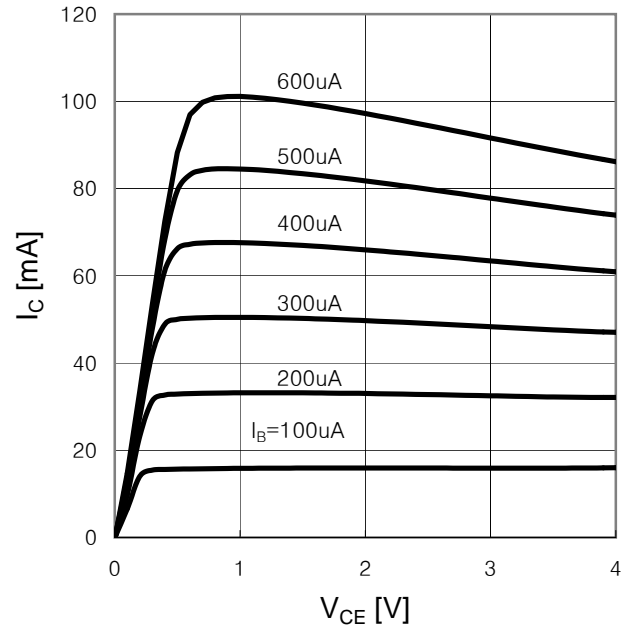
THN4501 Series

Total Power Dissipation, P_T vs. T_A

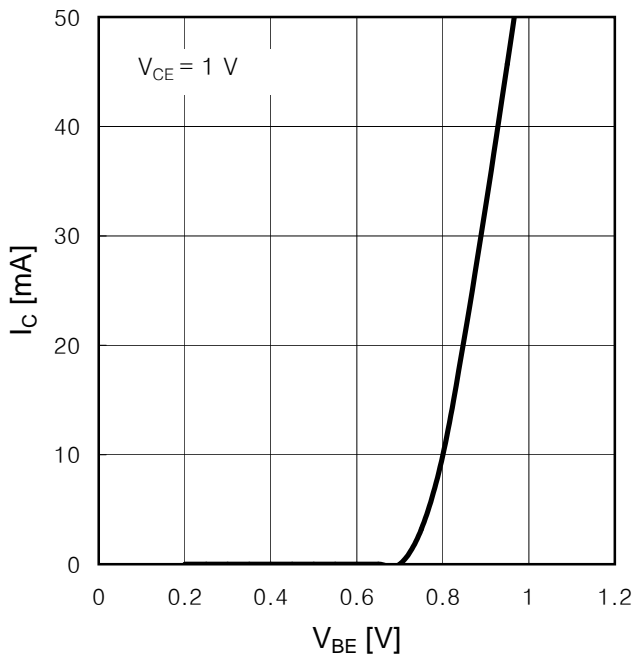
($T_A = 25\text{ }^\circ\text{C}$)



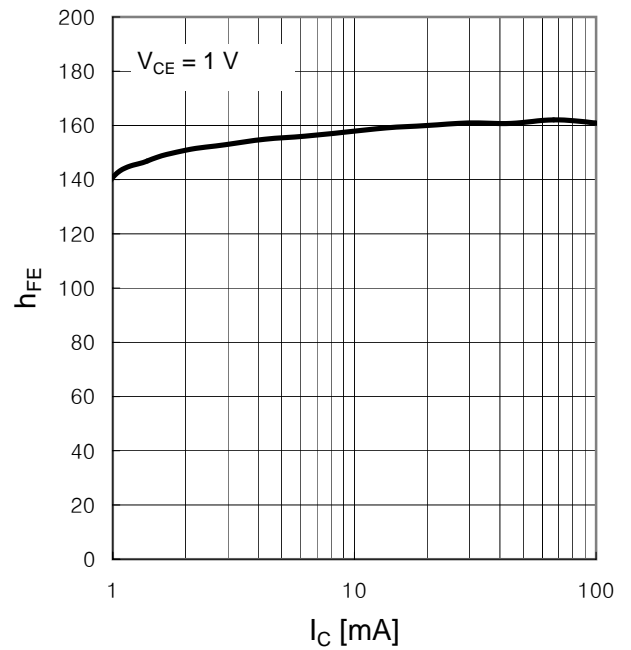
I_C vs. V_{CE}



I_C vs. V_{BE}

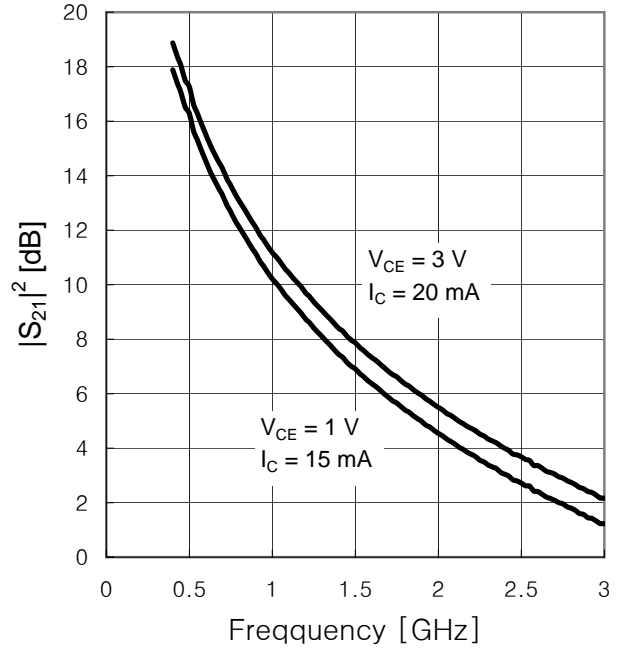
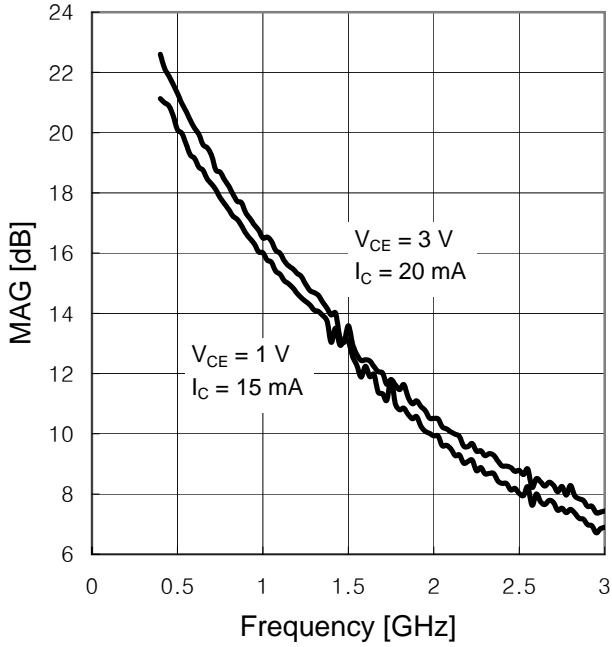


h_{FE} vs. I_C

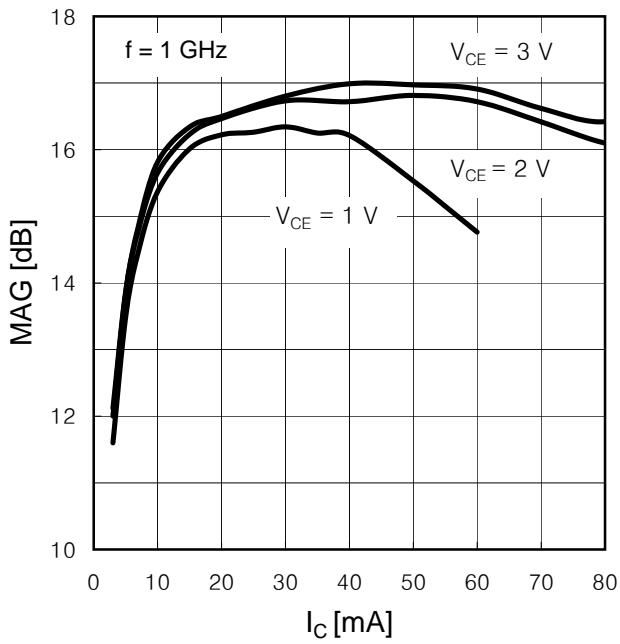


THN4501 Series

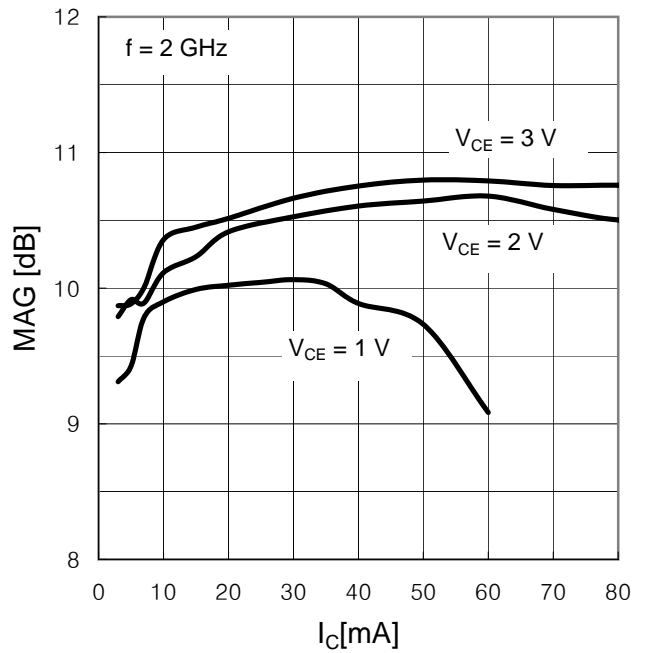
Maximun Available Gain, MAG vs. Frequency Insertion Power Gain, $|S_{21}|^2$ vs. Frequency



Maximun Available Gain, MAG vs. I_C

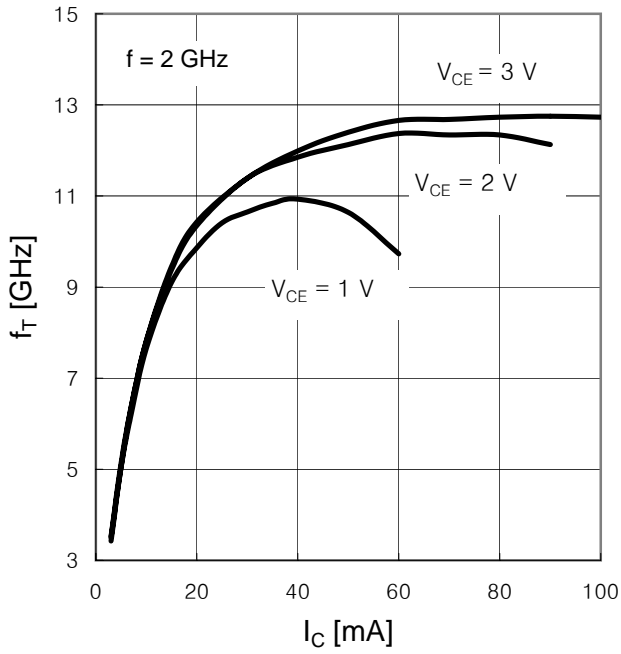


Maximun Available Gain, MAG vs. I_C

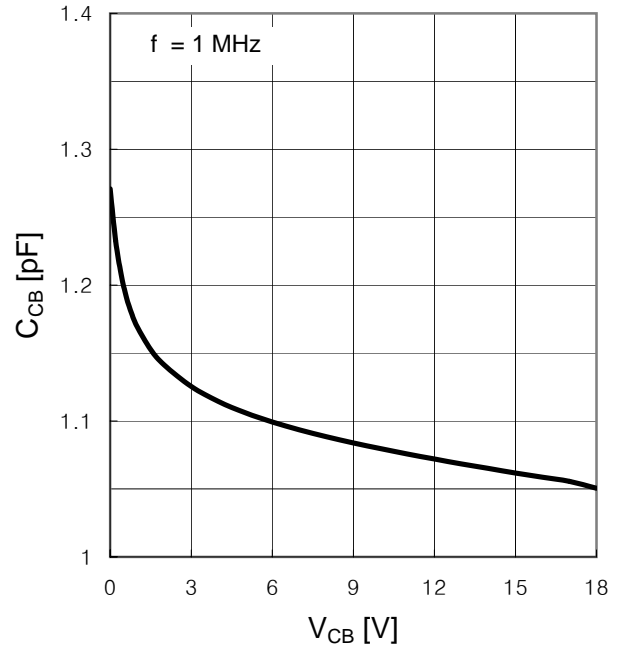


THN4501 Series

Transition Frequency : f_T vs. I_C

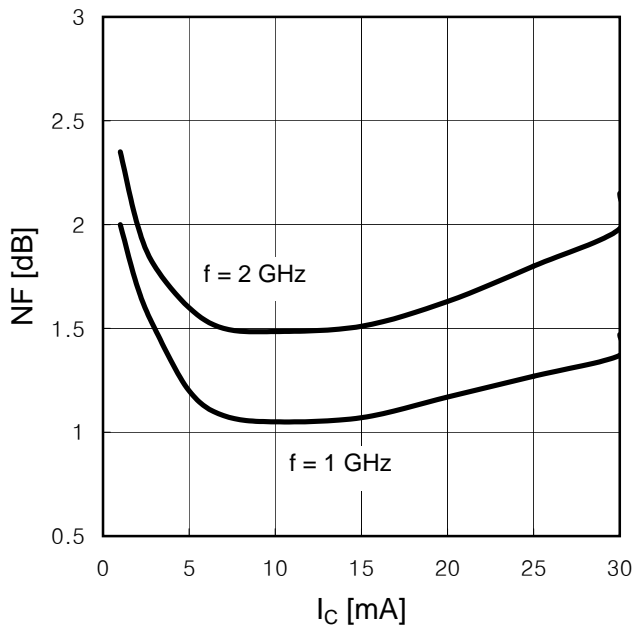


C_{CB} vs. V_{CB}



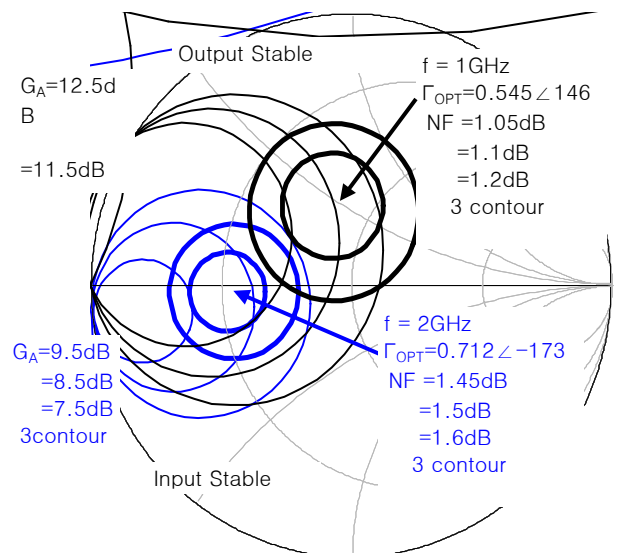
NF vs. I_C

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



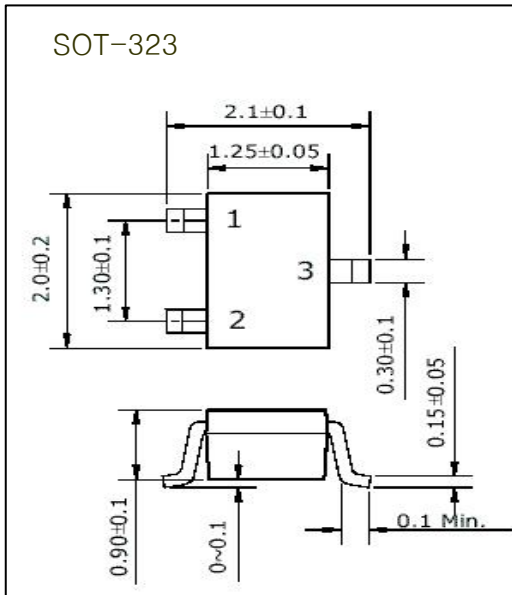
Noise Figure Contours & Constant Gain

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



THN4501 Series

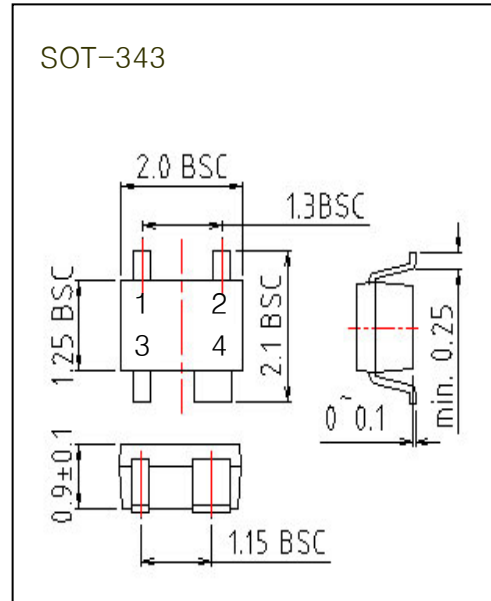
□ Dimensions of THN4501U in mm



Pin Configuration

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

□ Dimensions of THN4501Z in mm



Pin Configuration

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

THN4501 Series

□ Common Emitter S-Parameter Data

$$V_{CE} = 3 \text{ V}, I_C = 3 \text{ mA}$$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.755 / -122.616	4.780 / 103.918	0.127 / 24.905	0.543 / -79.697
600.0MHz	0.737 / -141.937	3.405 / 89.636	0.138 / 15.115	0.479 / -95.178
800.0MHz	0.729 / -153.413	2.607 / 79.158	0.136 / 10.312	0.460 / -105.017
1.000GHz	0.724 / -161.703	2.102 / 70.477	0.129 / 8.372	0.463 / -113.711
1.200GHz	0.727 / -167.991	1.765 / 63.034	0.126 / 5.736	0.482 / -119.119
1.400GHz	0.728 / -173.221	1.506 / 56.323	0.119 / 6.015	0.507 / -124.944
1.600GHz	0.738 / -178.117	1.315 / 50.152	0.111 / 7.682	0.527 / -130.019
1.800GHz	0.743 / 177.175	1.164 / 44.713	0.106 / 11.834	0.555 / -134.366
2.000GHz	0.752 / 173.136	1.039 / 39.692	0.104 / 15.743	0.578 / -138.982
2.200GHz	0.756 / 168.687	0.936 / 35.182	0.102 / 21.383	0.606 / -143.215
2.400GHz	0.763 / 164.508	0.848 / 31.112	0.104 / 26.393	0.629 / -147.032
2.600GHz	0.774 / 160.532	0.774 / 27.377	0.108 / 31.712	0.654 / -151.010
2.800GHz	0.780 / 155.374	0.711 / 23.720	0.115 / 36.072	0.674 / -152.900
3.000GHz	0.780 / 151.856	0.653 / 21.198	0.123 / 40.276	0.700 / -156.891

$$V_{CE} = 3 \text{ V}, I_C = 5 \text{ mA}$$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.730 / -136.643	6.059 / 100.019	0.102 / 25.000	0.470 / -101.253
600.0MHz	0.727 / -152.865	4.223 / 87.995	0.107 / 18.974	0.426 / -116.862
800.0MHz	0.725 / -162.363	3.216 / 79.276	0.106 / 16.959	0.409 / -125.788
1.000GHz	0.719 / -169.523	2.589 / 71.929	0.106 / 16.617	0.419 / -133.117
1.200GHz	0.721 / -174.844	2.173 / 65.593	0.106 / 17.807	0.433 / -136.200
1.400GHz	0.720 / -179.466	1.861 / 59.686	0.104 / 19.837	0.455 / -140.212
1.600GHz	0.726 / 176.107	1.631 / 54.255	0.108 / 22.777	0.473 / -143.763
1.800GHz	0.730 / 172.055	1.450 / 49.227	0.107 / 26.450	0.496 / -146.383
2.000GHz	0.738 / 168.394	1.301 / 44.631	0.110 / 29.754	0.518 / -149.606
2.200GHz	0.739 / 164.309	1.177 / 40.215	0.115 / 33.126	0.543 / -152.535
2.400GHz	0.745 / 160.518	1.073 / 36.253	0.120 / 36.386	0.566 / -155.334
2.600GHz	0.755 / 156.874	0.987 / 32.326	0.127 / 38.702	0.589 / -158.383
2.800GHz	0.761 / 151.987	0.908 / 28.563	0.136 / 40.463	0.607 / -159.214
3.000GHz	0.760 / 148.847	0.841 / 25.882	0.144 / 42.819	0.634 / -162.455

$$V_{CE} = 3 \text{ V}, I_C = 7 \text{ mA}$$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.730 / -136.643	6.059 / 100.019	0.102 / 25.000	0.470 / -101.253
600.0MHz	0.727 / -152.865	4.223 / 87.995	0.107 / 18.974	0.426 / -116.862
800.0MHz	0.725 / -162.363	3.216 / 79.276	0.106 / 16.959	0.409 / -125.788
1.000GHz	0.719 / -169.523	2.589 / 71.929	0.106 / 16.617	0.419 / -133.117
1.200GHz	0.721 / -174.844	2.173 / 65.593	0.106 / 17.807	0.433 / -136.200
1.400GHz	0.720 / -179.466	1.861 / 59.686	0.104 / 19.837	0.455 / -140.212
1.600GHz	0.726 / 176.107	1.631 / 54.255	0.108 / 22.777	0.473 / -143.763
1.800GHz	0.730 / 172.055	1.450 / 49.227	0.107 / 26.450	0.496 / -146.383
2.000GHz	0.738 / 168.394	1.301 / 44.631	0.110 / 29.754	0.518 / -149.606
2.200GHz	0.739 / 164.309	1.177 / 40.215	0.115 / 33.126	0.543 / -152.535
2.400GHz	0.745 / 160.518	1.073 / 36.253	0.120 / 36.386	0.566 / -155.334
2.600GHz	0.755 / 156.874	0.987 / 32.326	0.127 / 38.702	0.589 / -158.383
2.800GHz	0.761 / 151.987	0.908 / 28.563	0.136 / 40.463	0.607 / -159.214
3.000GHz	0.760 / 148.847	0.841 / 25.882	0.144 / 42.819	0.634 / -162.455

$$V_{CE} = 3 \text{ V}, I_C = 10 \text{ mA}$$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.724 / -154.876	7.677 / 94.827	0.070 / 26.972	0.452 / -133.943
600.0MHz	0.730 / -166.342	5.253 / 85.794	0.076 / 28.562	0.441 / -147.040
800.0MHz	0.730 / -173.303	3.978 / 79.153	0.079 / 31.577	0.431 / -153.920
1.000GHz	0.725 / -178.864	3.200 / 73.361	0.084 / 34.736	0.441 / -158.931
1.200GHz	0.724 / 176.770	2.692 / 68.288	0.091 / 36.591	0.448 / -160.389
1.400GHz	0.721 / 172.967	2.314 / 63.455	0.100 / 39.762	0.459 / -163.045
1.600GHz	0.727 / 169.085	2.036 / 58.877	0.109 / 41.645	0.468 / -164.786
1.800GHz	0.727 / 165.381	1.819 / 54.567	0.116 / 43.200	0.481 / -165.632
2.000GHz	0.732 / 162.291	1.642 / 50.481	0.126 / 44.164	0.494 / -167.621
2.200GHz	0.730 / 158.590	1.495 / 46.614	0.133 / 45.348	0.512 / -169.106
2.400GHz	0.732 / 155.071	1.372 / 42.970	0.144 / 45.467	0.527 / -170.472
2.600GHz	0.741 / 151.781	1.269 / 39.210	0.152 / 45.821	0.544 / -172.087
2.800GHz	0.743 / 147.240	1.176 / 35.456	0.162 / 45.741	0.555 / -171.765
3.000GHz	0.742 / 144.433	1.096 / 32.706	0.170 / 45.450	0.580 / -173.948

THN4501 Series

$V_{CE} = 3\text{ V}$, $I_C = 15\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.731 / -162.875	8.390 / 92.505	0.055 / 35.336	0.483 / -148.564
600.0MHz	0.737 / -172.134	5.703 / 84.847	0.063 / 36.887	0.478 / -158.569
800.0MHz	0.737 / -177.944	4.320 / 79.066	0.072 / 40.953	0.471 / -164.641
1.000GHz	0.733 / 177.131	3.467 / 73.948	0.081 / 44.666	0.482 / -168.569
1.200GHz	0.734 / 173.297	2.923 / 69.450	0.090 / 48.363	0.481 / -169.838
1.400GHz	0.726 / 169.529	2.518 / 65.061	0.100 / 49.303	0.489 / -171.846
1.600GHz	0.732 / 166.145	2.218 / 60.902	0.111 / 49.902	0.494 / -173.542
1.800GHz	0.731 / 162.578	1.985 / 56.988	0.122 / 49.678	0.502 / -174.365
2.000GHz	0.733 / 159.332	1.797 / 53.240	0.133 / 49.819	0.511 / -175.903
2.200GHz	0.730 / 155.833	1.640 / 49.599	0.142 / 50.128	0.524 / -177.194
2.400GHz	0.733 / 152.472	1.507 / 46.099	0.154 / 49.810	0.534 / -178.151
2.600GHz	0.737 / 149.351	1.401 / 42.516	0.164 / 48.788	0.547 / -179.629
2.800GHz	0.740 / 144.893	1.300 / 38.954	0.177 / 47.187	0.552 / -178.427
3.000GHz	0.737 / 142.173	1.216 / 36.162	0.184 / 47.166	0.574 / 179.579

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.735 / -167.567	8.782 / 91.198	0.048 / 37.238	0.511 / -156.343
600.0MHz	0.743 / -175.528	5.962 / 84.289	0.058 / 42.927	0.505 / -164.806
800.0MHz	0.744 / 179.440	4.508 / 79.059	0.068 / 47.836	0.500 / -169.991
1.000GHz	0.737 / 174.881	3.624 / 74.309	0.081 / 52.156	0.511 / -173.419
1.200GHz	0.737 / 171.228	3.056 / 70.130	0.090 / 52.819	0.506 / -174.610
1.400GHz	0.733 / 167.793	2.630 / 66.042	0.102 / 53.470	0.515 / -176.443
1.600GHz	0.735 / 164.414	2.322 / 62.116	0.114 / 54.022	0.516 / -177.965
1.800GHz	0.735 / 160.899	2.079 / 58.365	0.127 / 53.327	0.520 / -178.951
2.000GHz	0.737 / 157.770	1.884 / 54.759	0.137 / 53.064	0.528 / 179.470
2.200GHz	0.733 / 154.277	1.723 / 51.292	0.148 / 52.648	0.539 / 178.578
2.400GHz	0.734 / 151.133	1.584 / 47.988	0.159 / 51.488	0.547 / 177.548
2.600GHz	0.739 / 147.813	1.472 / 44.558	0.171 / 50.715	0.558 / 176.398
2.800GHz	0.741 / 143.416	1.371 / 41.091	0.183 / 48.867	0.559 / 177.103
3.000GHz	0.737 / 140.755	1.284 / 38.436	0.192 / 48.736	0.582 / 175.564

$V_{CE} = 3\text{ V}$, $I_C = 30\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.735 / -167.567	8.782 / 91.198	0.048 / 37.238	0.511 / -156.343
600.0MHz	0.743 / -175.528	5.962 / 84.289	0.058 / 42.927	0.505 / -164.806
800.0MHz	0.744 / 179.440	4.508 / 79.059	0.068 / 47.836	0.500 / -169.991
1.000GHz	0.737 / 174.881	3.624 / 74.309	0.081 / 52.156	0.511 / -173.419
1.200GHz	0.737 / 171.228	3.056 / 70.130	0.090 / 52.819	0.506 / -174.610
1.400GHz	0.733 / 167.793	2.630 / 66.042	0.102 / 53.470	0.515 / -176.443
1.600GHz	0.735 / 164.414	2.322 / 62.116	0.114 / 54.022	0.516 / -177.965
1.800GHz	0.735 / 160.899	2.079 / 58.365	0.127 / 53.327	0.520 / -178.951
2.000GHz	0.737 / 157.770	1.884 / 54.759	0.137 / 53.064	0.528 / 179.470
2.200GHz	0.733 / 154.277	1.723 / 51.292	0.148 / 52.648	0.539 / 178.578
2.400GHz	0.734 / 151.133	1.584 / 47.988	0.159 / 51.488	0.547 / 177.548
2.600GHz	0.739 / 147.813	1.472 / 44.558	0.171 / 50.715	0.558 / 176.398
2.800GHz	0.741 / 143.416	1.371 / 41.091	0.183 / 48.867	0.559 / 177.103
3.000GHz	0.737 / 140.755	1.284 / 38.436	0.192 / 48.736	0.582 / 175.564

$V_{CE} = 3\text{ V}$, $I_C = 40\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.752 / -174.988	9.369 / 89.170	0.040 / 49.139	0.558 / -166.658
600.0MHz	0.752 / 179.623	6.338 / 83.467	0.051 / 58.122	0.560 / -172.571
800.0MHz	0.754 / 175.551	4.794 / 79.024	0.064 / 60.775	0.555 / -176.961
1.000GHz	0.749 / 171.663	3.852 / 74.879	0.077 / 60.244	0.565 / -179.851
1.200GHz	0.748 / 168.102	3.249 / 71.173	0.093 / 62.210	0.557 / 179.020
1.400GHz	0.742 / 164.890	2.802 / 67.527	0.106 / 60.376	0.563 / 177.203
1.600GHz	0.745 / 161.690	2.474 / 63.934	0.121 / 60.238	0.562 / 175.787
1.800GHz	0.743 / 158.356	2.219 / 60.580	0.133 / 58.937	0.562 / 174.753
2.000GHz	0.745 / 155.356	2.014 / 57.264	0.146 / 57.364	0.566 / 173.367
2.200GHz	0.740 / 151.915	1.844 / 54.095	0.157 / 55.943	0.575 / 172.210
2.400GHz	0.740 / 148.703	1.699 / 50.975	0.170 / 54.726	0.580 / 171.326
2.600GHz	0.745 / 145.615	1.583 / 47.782	0.184 / 52.712	0.586 / 170.052
2.800GHz	0.743 / 141.203	1.477 / 44.468	0.194 / 51.270	0.585 / 170.953
3.000GHz	0.739 / 138.563	1.384 / 42.047	0.203 / 49.551	0.603 / 169.504

THN4501 Series

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

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

$V_{CE} = 3\text{ V}$, $I_C = 60\text{ mA}$

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

$V_{CE} = 3\text{ V}$, $I_C = 70\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.759 / -178.474	9.582 / 88.108	0.039 / 64.983	0.593 / -171.393
600.0MHz	0.762 / 176.729	6.475 / 83.059	0.050 / 65.759	0.592 / -176.467
800.0MHz	0.765 / 173.508	4.893 / 78.980	0.064 / 67.390	0.588 / -179.982
1.000GHz	0.758 / 169.959	3.933 / 75.155	0.080 / 68.705	0.597 / 177.341
1.200GHz	0.757 / 166.463	3.320 / 71.728	0.095 / 66.395	0.591 / 176.187
1.400GHz	0.751 / 163.389	2.863 / 68.260	0.109 / 64.734	0.592 / 174.473
1.600GHz	0.752 / 160.220	2.531 / 64.908	0.122 / 63.846	0.591 / 172.920
1.800GHz	0.751 / 156.874	2.271 / 61.686	0.137 / 61.792	0.591 / 171.935
2.000GHz	0.751 / 154.056	2.064 / 58.539	0.151 / 59.739	0.593 / 170.454
2.200GHz	0.747 / 150.562	1.890 / 55.512	0.163 / 58.104	0.600 / 169.331
2.400GHz	0.746 / 147.421	1.745 / 52.543	0.175 / 56.258	0.603 / 168.433
2.600GHz	0.748 / 144.313	1.627 / 49.466	0.187 / 54.304	0.609 / 167.094
2.800GHz	0.748 / 139.976	1.519 / 46.283	0.202 / 52.884	0.604 / 167.899
3.000GHz	0.746 / 137.293	1.427 / 43.940	0.209 / 50.794	0.621 / 166.484

$V_{CE} = 3\text{ V}$, $I_C = 80\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.757 / -179.129	9.583 / 87.971	0.033 / 62.338	0.595 / -172.321
600.0MHz	0.764 / 176.464	6.473 / 82.988	0.049 / 67.069	0.596 / -176.958
800.0MHz	0.766 / 173.051	4.894 / 78.982	0.065 / 68.883	0.593 / 179.513
1.000GHz	0.759 / 169.440	3.932 / 75.180	0.080 / 67.869	0.601 / 176.797
1.200GHz	0.759 / 166.232	3.321 / 71.783	0.095 / 66.283	0.594 / 175.824
1.400GHz	0.753 / 163.095	2.863 / 68.361	0.109 / 66.153	0.598 / 174.028
1.600GHz	0.755 / 159.984	2.530 / 64.977	0.125 / 64.028	0.596 / 172.445
1.800GHz	0.751 / 156.723	2.272 / 61.812	0.137 / 61.810	0.596 / 171.502
2.000GHz	0.754 / 153.777	2.063 / 58.650	0.152 / 60.447	0.597 / 169.966
2.200GHz	0.749 / 150.379	1.892 / 55.652	0.164 / 58.534	0.604 / 168.859
2.400GHz	0.747 / 147.289	1.746 / 52.739	0.176 / 56.881	0.608 / 168.001
2.600GHz	0.751 / 144.219	1.627 / 49.690	0.189 / 54.944	0.613 / 166.718
2.800GHz	0.750 / 139.909	1.519 / 46.540	0.201 / 53.086	0.609 / 167.368
3.000GHz	0.746 / 137.141	1.427 / 44.179	0.211 / 51.485	0.626 / 165.997

THN4501 Series

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.752 / -123.605	4.767 / 103.515	0.130 / 25.472	0.541 / -81.462
600.0MHz	0.736 / -142.672	3.389 / 89.348	0.138 / 15.126	0.478 / -96.600
800.0MHz	0.730 / -153.904	2.595 / 78.943	0.135 / 9.703	0.453 / -106.787
1.000GHz	0.726 / -162.086	2.092 / 70.294	0.132 / 7.632	0.462 / -115.219
1.200GHz	0.729 / -168.403	1.756 / 62.893	0.125 / 5.457	0.480 / -120.462
1.400GHz	0.729 / -173.723	1.498 / 56.177	0.119 / 6.721	0.504 / -126.146
1.600GHz	0.737 / -178.423	1.309 / 50.148	0.113 / 8.708	0.527 / -131.245
1.800GHz	0.744 / 176.986	1.158 / 44.657	0.108 / 10.749	0.552 / -135.039
2.000GHz	0.753 / 172.748	1.034 / 39.544	0.105 / 15.530	0.577 / -139.893
2.200GHz	0.757 / 168.407	0.932 / 35.042	0.104 / 20.752	0.604 / -143.985
2.400GHz	0.763 / 164.304	0.843 / 31.056	0.105 / 26.159	0.628 / -147.728
2.600GHz	0.775 / 160.390	0.773 / 27.221	0.108 / 31.074	0.651 / -151.731
2.800GHz	0.781 / 155.253	0.707 / 23.559	0.115 / 36.052	0.670 / -153.377
3.000GHz	0.783 / 151.777	0.651 / 21.267	0.124 / 40.144	0.700 / -157.391

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.733 / -138.015	6.063 / 99.521	0.103 / 23.354	0.466 / -103.812
600.0MHz	0.730 / -153.922	4.220 / 87.736	0.104 / 19.121	0.425 / -119.248
800.0MHz	0.724 / -163.224	3.215 / 79.095	0.106 / 16.535	0.410 / -128.514
1.000GHz	0.721 / -170.026	2.585 / 71.805	0.106 / 16.712	0.419 / -134.956
1.200GHz	0.722 / -175.497	2.171 / 65.554	0.106 / 19.357	0.432 / -138.472
1.400GHz	0.721 / 179.905	1.859 / 59.736	0.106 / 20.874	0.454 / -142.209
1.600GHz	0.727 / 175.660	1.631 / 54.342	0.108 / 23.092	0.470 / -145.556
1.800GHz	0.732 / 171.477	1.449 / 49.381	0.109 / 26.293	0.494 / -147.937
2.000GHz	0.739 / 167.929	1.301 / 44.690	0.112 / 29.648	0.516 / -151.112
2.200GHz	0.739 / 163.833	1.180 / 40.461	0.116 / 33.231	0.539 / -154.046
2.400GHz	0.745 / 160.160	1.074 / 36.438	0.122 / 36.528	0.563 / -156.610
2.600GHz	0.754 / 156.633	0.990 / 32.567	0.129 / 38.309	0.586 / -159.561
2.800GHz	0.761 / 151.742	0.912 / 28.716	0.139 / 40.432	0.604 / -160.237
3.000GHz	0.760 / 148.626	0.843 / 26.044	0.145 / 42.007	0.632 / -163.418

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.727 / -146.678	6.818 / 97.078	0.089 / 23.012	0.450 / -119.392
600.0MHz	0.728 / -160.467	4.702 / 86.714	0.090 / 22.249	0.425 / -134.007
800.0MHz	0.727 / -168.447	3.570 / 79.094	0.092 / 22.710	0.408 / -142.030
1.000GHz	0.721 / -174.756	2.870 / 72.574	0.095 / 25.293	0.423 / -147.933
1.200GHz	0.723 / -179.502	2.413 / 66.947	0.098 / 27.977	0.430 / -150.229
1.400GHz	0.720 / 176.177	2.072 / 61.596	0.101 / 30.520	0.449 / -153.108
1.600GHz	0.728 / 172.248	1.820 / 56.604	0.107 / 32.622	0.462 / -155.383
1.800GHz	0.728 / 168.485	1.621 / 51.968	0.111 / 35.065	0.480 / -157.031
2.000GHz	0.734 / 165.026	1.463 / 47.582	0.118 / 38.058	0.498 / -159.408
2.200GHz	0.734 / 161.192	1.327 / 43.500	0.126 / 39.220	0.518 / -161.614
2.400GHz	0.738 / 157.580	1.214 / 39.655	0.134 / 41.516	0.538 / -163.418
2.600GHz	0.745 / 154.203	1.120 / 35.859	0.141 / 42.433	0.559 / -165.646
2.800GHz	0.751 / 149.562	1.037 / 32.048	0.152 / 42.595	0.574 / -165.843
3.000GHz	0.750 / 146.514	0.960 / 29.144	0.157 / 43.399	0.601 / -168.340

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.727 / -155.607	7.577 / 94.609	0.070 / 25.924	0.459 / -135.221
600.0MHz	0.732 / -166.766	5.180 / 85.659	0.075 / 27.826	0.444 / -148.018
800.0MHz	0.733 / -173.650	3.925 / 79.003	0.082 / 31.666	0.437 / -155.259
1.000GHz	0.727 / -179.168	3.154 / 73.272	0.086 / 35.865	0.447 / -159.785
1.200GHz	0.729 / 176.580	2.655 / 68.208	0.093 / 37.658	0.452 / -161.373
1.400GHz	0.724 / 172.626	2.284 / 63.417	0.100 / 39.354	0.463 / -163.604
1.600GHz	0.730 / 168.879	2.012 / 58.850	0.110 / 41.722	0.472 / -165.609
1.800GHz	0.729 / 165.179	1.797 / 54.563	0.118 / 43.102	0.484 / -166.502
2.000GHz	0.732 / 161.994	1.622 / 50.468	0.126 / 44.120	0.498 / -168.481
2.200GHz	0.731 / 158.248	1.479 / 46.621	0.135 / 45.265	0.515 / -169.891
2.400GHz	0.734 / 154.903	1.357 / 42.961	0.144 / 45.538	0.529 / -171.344
2.600GHz	0.742 / 151.622	1.254 / 39.272	0.154 / 45.588	0.546 / -172.994
2.800GHz	0.745 / 147.145	1.164 / 35.615	0.164 / 45.277	0.556 / -172.433
3.000GHz	0.742 / 144.251	1.085 / 32.694	0.172 / 44.894	0.581 / -174.661

THN4501 Series

$V_{CE} = 2\text{ V}$, $I_C = 15\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.733 / -163.362	8.237 / 92.388	0.058 / 33.039	0.486 / -149.287
600.0MHz	0.737 / -172.355	5.605 / 84.769	0.061 / 36.273	0.480 / -159.496
800.0MHz	0.741 / -178.107	4.242 / 79.002	0.071 / 41.736	0.475 / -165.059
1.000GHz	0.736 / 177.181	3.409 / 73.867	0.081 / 44.492	0.486 / -168.973
1.200GHz	0.736 / 173.169	2.873 / 69.345	0.091 / 46.580	0.487 / -170.528
1.400GHz	0.731 / 169.464	2.473 / 65.011	0.103 / 48.008	0.495 / -172.429
1.600GHz	0.734 / 165.905	2.181 / 60.812	0.112 / 49.318	0.498 / -173.890
1.800GHz	0.734 / 162.451	1.951 / 56.822	0.124 / 49.986	0.505 / -174.790
2.000GHz	0.735 / 159.266	1.767 / 53.104	0.133 / 50.302	0.516 / -176.435
2.200GHz	0.732 / 155.742	1.613 / 49.475	0.143 / 49.786	0.527 / -177.604
2.400GHz	0.734 / 152.396	1.484 / 46.052	0.155 / 49.473	0.539 / -178.550
2.600GHz	0.741 / 149.461	1.378 / 42.474	0.165 / 48.683	0.550 / -179.962
2.800GHz	0.742 / 144.838	1.283 / 38.893	0.175 / 47.558	0.556 / -179.157
3.000GHz	0.739 / 142.025	1.197 / 36.254	0.185 / 46.914	0.578 / 179.147

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.738 / -168.162	8.649 / 90.987	0.045 / 36.713	0.515 / -157.253
600.0MHz	0.746 / -175.793	5.865 / 84.151	0.059 / 43.498	0.514 / -165.502
800.0MHz	0.747 / 179.268	4.437 / 78.955	0.066 / 48.216	0.508 / -170.771
1.000GHz	0.742 / 174.681	3.565 / 74.235	0.080 / 51.104	0.520 / -174.163
1.200GHz	0.743 / 171.048	3.010 / 70.107	0.091 / 53.766	0.515 / -175.424
1.400GHz	0.736 / 167.507	2.589 / 66.018	0.102 / 53.307	0.520 / -177.287
1.600GHz	0.739 / 163.984	2.286 / 62.118	0.115 / 53.027	0.524 / -178.765
1.800GHz	0.738 / 160.727	2.048 / 58.410	0.128 / 53.669	0.528 / -179.725
2.000GHz	0.740 / 157.695	1.855 / 54.784	0.139 / 53.346	0.534 / 178.824
2.200GHz	0.737 / 154.089	1.697 / 51.357	0.149 / 52.576	0.545 / 177.799
2.400GHz	0.735 / 150.876	1.561 / 48.044	0.162 / 51.619	0.553 / 176.896
2.600GHz	0.741 / 147.847	1.454 / 44.643	0.174 / 50.868	0.562 / 175.569
2.800GHz	0.743 / 143.544	1.353 / 41.112	0.183 / 48.741	0.564 / 176.682
3.000GHz	0.740 / 140.772	1.266 / 38.488	0.190 / 48.264	0.585 / 174.907

$V_{CE} = 2\text{ V}$, $I_C = 30\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.747 / -173.040	9.018 / 89.646	0.044 / 42.328	0.549 / -164.356
600.0MHz	0.752 / -179.100	6.108 / 83.615	0.052 / 54.220	0.548 / -170.836
800.0MHz	0.754 / 176.505	4.616 / 78.949	0.065 / 54.944	0.544 / -175.540
1.000GHz	0.750 / 172.597	3.709 / 74.633	0.079 / 58.249	0.553 / -178.433
1.200GHz	0.749 / 169.099	3.131 / 70.769	0.091 / 59.527	0.549 / -179.684
1.400GHz	0.742 / 165.643	2.700 / 67.005	0.105 / 58.394	0.553 / 178.605
1.600GHz	0.746 / 162.276	2.385 / 63.356	0.119 / 58.217	0.554 / 177.125
1.800GHz	0.744 / 158.993	2.138 / 59.884	0.132 / 57.420	0.554 / 176.168
2.000GHz	0.746 / 155.921	1.939 / 56.474	0.144 / 56.370	0.560 / 174.593
2.200GHz	0.742 / 152.556	1.774 / 53.192	0.155 / 55.053	0.568 / 173.583
2.400GHz	0.741 / 149.346	1.636 / 50.046	0.167 / 54.083	0.575 / 172.633
2.600GHz	0.747 / 146.400	1.523 / 46.775	0.180 / 52.580	0.583 / 171.341
2.800GHz	0.744 / 141.926	1.421 / 43.422	0.191 / 51.062	0.580 / 172.249
3.000GHz	0.742 / 139.186	1.335 / 40.861	0.200 / 49.169	0.600 / 170.912

$V_{CE} = 2\text{ V}$, $I_C = 40\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.750 / -175.165	9.182 / 88.970	0.038 / 51.302	0.571 / -167.662
600.0MHz	0.759 / 179.192	6.207 / 83.337	0.052 / 56.671	0.570 / -173.396
800.0MHz	0.758 / 175.159	4.696 / 78.940	0.065 / 60.264	0.564 / -177.595
1.000GHz	0.756 / 171.528	3.773 / 74.812	0.077 / 62.781	0.574 / 179.662
1.200GHz	0.753 / 167.911	3.186 / 71.148	0.094 / 62.295	0.567 / 178.664
1.400GHz	0.749 / 164.786	2.748 / 67.535	0.106 / 61.620	0.572 / 176.726
1.600GHz	0.749 / 161.384	2.427 / 63.972	0.121 / 59.991	0.570 / 175.129
1.800GHz	0.748 / 158.117	2.176 / 60.628	0.134 / 59.268	0.572 / 174.219
2.000GHz	0.749 / 155.180	1.975 / 57.288	0.147 / 57.770	0.575 / 172.663
2.200GHz	0.745 / 151.765	1.810 / 54.168	0.159 / 56.346	0.583 / 171.695
2.400GHz	0.744 / 148.507	1.670 / 51.077	0.171 / 54.475	0.587 / 170.643
2.600GHz	0.749 / 145.430	1.556 / 47.934	0.184 / 53.335	0.592 / 169.270
2.800GHz	0.749 / 141.212	1.452 / 44.585	0.197 / 51.230	0.591 / 170.181
3.000GHz	0.743 / 138.363	1.362 / 42.153	0.204 / 50.014	0.609 / 168.723

THN4501 Series

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.757 / -177.055	9.256 / 88.546	0.037 / 55.243	0.578 / -169.682
600.0MHz	0.762 / 178.117	6.255 / 83.160	0.052 / 62.330	0.584 / -175.043
800.0MHz	0.764 / 174.492	4.731 / 78.901	0.066 / 65.282	0.580 / -178.899
1.000GHz	0.758 / 170.736	3.804 / 74.941	0.079 / 63.463	0.586 / 178.356
1.200GHz	0.758 / 167.260	3.211 / 71.398	0.094 / 63.710	0.581 / 177.070
1.400GHz	0.751 / 163.978	2.770 / 67.872	0.109 / 62.924	0.583 / 175.365
1.600GHz	0.753 / 160.893	2.447 / 64.344	0.122 / 61.560	0.582 / 173.899
1.800GHz	0.751 / 157.583	2.197 / 61.085	0.136 / 60.849	0.583 / 172.902
2.000GHz	0.753 / 154.540	1.994 / 57.870	0.149 / 58.551	0.587 / 171.475
2.200GHz	0.749 / 151.213	1.828 / 54.760	0.160 / 57.212	0.593 / 170.455
2.400GHz	0.747 / 148.037	1.687 / 51.771	0.173 / 55.838	0.597 / 169.492
2.600GHz	0.751 / 144.940	1.572 / 48.649	0.187 / 53.836	0.603 / 168.172
2.800GHz	0.750 / 140.651	1.469 / 45.352	0.197 / 52.003	0.600 / 168.796
3.000GHz	0.745 / 137.969	1.378 / 42.948	0.207 / 49.724	0.617 / 167.582

$V_{CE} = 2\text{ V}$, $I_C = 60\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.762 / -178.133	9.283 / 88.161	0.037 / 57.433	0.593 / -171.481
600.0MHz	0.766 / 177.236	6.271 / 83.028	0.050 / 61.858	0.594 / -176.363
800.0MHz	0.769 / 173.722	4.742 / 78.917	0.064 / 65.981	0.589 / -179.967
1.000GHz	0.764 / 170.080	3.812 / 75.001	0.081 / 65.866	0.599 / 177.255
1.200GHz	0.762 / 166.795	3.219 / 71.551	0.095 / 65.677	0.592 / 176.239
1.400GHz	0.754 / 163.583	2.779 / 68.077	0.108 / 64.379	0.594 / 174.480
1.600GHz	0.758 / 160.260	2.455 / 64.667	0.123 / 62.650	0.593 / 173.178
1.800GHz	0.754 / 157.147	2.204 / 61.440	0.138 / 61.199	0.592 / 171.924
2.000GHz	0.756 / 154.078	2.002 / 58.242	0.153 / 59.654	0.597 / 170.600
2.200GHz	0.751 / 150.888	1.834 / 55.184	0.162 / 57.844	0.603 / 169.578
2.400GHz	0.748 / 147.600	1.694 / 52.190	0.177 / 56.095	0.607 / 168.433
2.600GHz	0.753 / 144.610	1.579 / 49.126	0.187 / 54.073	0.611 / 167.307
2.800GHz	0.752 / 140.238	1.477 / 45.926	0.200 / 52.039	0.606 / 167.826
3.000GHz	0.748 / 137.431	1.385 / 43.561	0.210 / 50.712	0.626 / 166.520

$V_{CE} = 2\text{ V}$, $I_C = 70\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.765 / -178.798	9.266 / 87.946	0.035 / 60.695	0.597 / -172.367
600.0MHz	0.771 / 176.681	6.261 / 82.931	0.050 / 63.661	0.600 / -177.043
800.0MHz	0.771 / 173.163	4.733 / 78.880	0.062 / 65.273	0.598 / 179.394
1.000GHz	0.765 / 169.743	3.805 / 75.035	0.080 / 66.954	0.604 / 176.917
1.200GHz	0.764 / 166.402	3.213 / 71.612	0.097 / 66.360	0.598 / 175.758
1.400GHz	0.758 / 163.277	2.773 / 68.173	0.110 / 64.988	0.601 / 174.166
1.600GHz	0.760 / 160.120	2.451 / 64.794	0.122 / 63.248	0.599 / 172.389
1.800GHz	0.756 / 156.820	2.201 / 61.580	0.139 / 62.014	0.599 / 171.502
2.000GHz	0.757 / 153.942	2.000 / 58.447	0.151 / 59.822	0.602 / 169.984
2.200GHz	0.754 / 150.407	1.833 / 55.455	0.164 / 58.355	0.609 / 168.939
2.400GHz	0.752 / 147.316	1.693 / 52.471	0.176 / 56.713	0.612 / 167.900
2.600GHz	0.757 / 144.395	1.578 / 49.420	0.187 / 54.448	0.616 / 166.732
2.800GHz	0.756 / 140.066	1.476 / 46.237	0.199 / 52.645	0.610 / 167.408
3.000GHz	0.750 / 137.333	1.384 / 43.825	0.211 / 50.639	0.630 / 166.098

$V_{CE} = 2\text{ V}$, $I_C = 80\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.767 / -179.608	9.188 / 87.713	0.034 / 69.207	0.607 / -173.443
600.0MHz	0.774 / 176.188	6.207 / 82.796	0.051 / 67.301	0.608 / -177.770
800.0MHz	0.774 / 172.810	4.693 / 78.840	0.065 / 67.727	0.604 / 178.622
1.000GHz	0.769 / 169.441	3.773 / 75.015	0.079 / 68.419	0.613 / 176.371
1.200GHz	0.769 / 166.133	3.187 / 71.663	0.097 / 67.392	0.607 / 175.167
1.400GHz	0.762 / 163.012	2.752 / 68.235	0.109 / 65.337	0.608 / 173.306
1.600GHz	0.764 / 159.823	2.432 / 64.890	0.124 / 63.983	0.607 / 171.975
1.800GHz	0.762 / 156.599	2.185 / 61.704	0.138 / 62.510	0.606 / 171.016
2.000GHz	0.761 / 153.662	1.985 / 58.592	0.154 / 60.734	0.609 / 169.383
2.200GHz	0.757 / 150.290	1.820 / 55.639	0.165 / 58.845	0.615 / 168.303
2.400GHz	0.755 / 147.097	1.682 / 52.639	0.179 / 56.652	0.618 / 167.222
2.600GHz	0.758 / 144.068	1.570 / 49.614	0.190 / 54.156	0.621 / 165.982
2.800GHz	0.759 / 139.756	1.466 / 46.448	0.203 / 52.287	0.615 / 166.660
3.000GHz	0.755 / 137.184	1.377 / 44.164	0.211 / 50.862	0.634 / 165.380

THN4501 Series

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

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.750 / -124.142	4.566 / 102.985	0.141 / 21.980	0.537 / -82.813
600.0MHz	0.737 / -142.976	3.240 / 88.748	0.144 / 14.242	0.474 / -98.403
800.0MHz	0.730 / -154.250	2.485 / 78.253	0.141 / 9.079	0.452 / -108.434
1.000GHz	0.725 / -162.526	1.997 / 69.564	0.138 / 6.365	0.461 / -116.979
1.200GHz	0.730 / -168.589	1.679 / 62.121	0.129 / 4.447	0.482 / -121.995
1.400GHz	0.729 / -173.788	1.435 / 55.355	0.124 / 4.582	0.506 / -127.601
1.600GHz	0.741 / -178.541	1.253 / 49.277	0.117 / 6.250	0.529 / -132.517
1.800GHz	0.745 / 176.771	1.109 / 43.764	0.112 / 9.290	0.555 / -136.664
2.000GHz	0.755 / 172.788	0.989 / 38.637	0.107 / 13.494	0.581 / -141.277
2.200GHz	0.758 / 168.366	0.893 / 34.142	0.105 / 18.585	0.606 / -145.157
2.400GHz	0.765 / 164.220	0.809 / 30.202	0.107 / 24.463	0.632 / -148.880
2.600GHz	0.778 / 160.183	0.740 / 26.321	0.109 / 30.047	0.656 / -152.577
2.800GHz	0.783 / 155.178	0.678 / 22.934	0.116 / 33.274	0.675 / -154.619
3.000GHz	0.786 / 151.603	0.625 / 20.483	0.121 / 36.966	0.702 / -158.530

$V_{CE} = 1\text{ V}$, $I_C = 5\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.734 / -139.169	5.814 / 98.928	0.107 / 20.802	0.467 / -106.279
600.0MHz	0.729 / -154.761	4.044 / 87.208	0.108 / 17.266	0.427 / -121.806
800.0MHz	0.725 / -163.872	3.079 / 78.623	0.110 / 16.201	0.414 / -130.911
1.000GHz	0.722 / -170.737	2.475 / 71.358	0.111 / 16.056	0.425 / -137.583
1.200GHz	0.726 / -176.014	2.081 / 65.032	0.109 / 17.207	0.440 / -140.688
1.400GHz	0.723 / 179.478	1.784 / 59.240	0.108 / 20.853	0.459 / -144.289
1.600GHz	0.731 / 175.400	1.564 / 53.834	0.109 / 21.301	0.477 / -147.404
1.800GHz	0.735 / 171.198	1.391 / 48.913	0.111 / 25.916	0.500 / -149.694
2.000GHz	0.741 / 167.603	1.250 / 44.167	0.113 / 28.913	0.521 / -153.088
2.200GHz	0.741 / 163.589	1.133 / 39.912	0.117 / 31.901	0.545 / -155.741
2.400GHz	0.747 / 159.917	1.033 / 35.964	0.123 / 34.471	0.566 / -158.010
2.600GHz	0.756 / 156.431	0.953 / 32.037	0.128 / 37.577	0.588 / -160.899
2.800GHz	0.763 / 151.643	0.877 / 28.348	0.137 / 38.954	0.607 / -161.675
3.000GHz	0.762 / 148.379	0.812 / 25.819	0.144 / 40.866	0.635 / -164.638

$V_{CE} = 1\text{ V}$, $I_C = 7\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.728 / -147.830	6.534 / 96.556	0.087 / 25.782	0.456 / -121.908
600.0MHz	0.729 / -161.135	4.497 / 86.259	0.092 / 20.870	0.429 / -136.581
800.0MHz	0.731 / -169.108	3.416 / 78.644	0.095 / 22.168	0.419 / -144.803
1.000GHz	0.727 / -175.244	2.745 / 72.161	0.098 / 23.553	0.431 / -150.353
1.200GHz	0.728 / -179.995	2.310 / 66.541	0.099 / 26.815	0.441 / -152.479
1.400GHz	0.724 / 175.807	1.982 / 61.217	0.105 / 28.585	0.457 / -155.218
1.600GHz	0.730 / 171.858	1.744 / 56.210	0.108 / 32.590	0.470 / -157.448
1.800GHz	0.732 / 168.035	1.555 / 51.588	0.113 / 34.298	0.488 / -159.015
2.000GHz	0.738 / 164.613	1.401 / 47.224	0.121 / 36.338	0.505 / -161.296
2.200GHz	0.737 / 160.750	1.275 / 43.115	0.127 / 38.720	0.526 / -163.359
2.400GHz	0.740 / 157.202	1.166 / 39.289	0.134 / 40.627	0.545 / -165.129
2.600GHz	0.750 / 153.852	1.077 / 35.541	0.141 / 40.935	0.564 / -167.212
2.800GHz	0.754 / 149.240	0.996 / 31.708	0.151 / 41.669	0.580 / -167.290
3.000GHz	0.753 / 146.270	0.926 / 29.007	0.160 / 42.196	0.605 / -169.757

$V_{CE} = 1\text{ V}$, $I_C = 10\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.735 / -156.935	7.250 / 94.009	0.072 / 26.515	0.466 / -138.563
600.0MHz	0.738 / -167.802	4.952 / 85.221	0.076 / 28.530	0.456 / -151.098
800.0MHz	0.738 / -174.555	3.754 / 78.688	0.081 / 29.907	0.451 / -157.706
1.000GHz	0.737 / -179.642	3.019 / 72.953	0.088 / 35.625	0.462 / -161.957
1.200GHz	0.733 / 175.835	2.542 / 67.973	0.096 / 36.951	0.466 / -163.705
1.400GHz	0.729 / 172.114	2.186 / 63.157	0.102 / 39.822	0.476 / -166.020
1.600GHz	0.736 / 168.281	1.928 / 58.612	0.112 / 41.787	0.485 / -167.766
1.800GHz	0.735 / 164.733	1.721 / 54.374	0.120 / 42.742	0.496 / -168.776
2.000GHz	0.740 / 161.457	1.558 / 50.279	0.127 / 43.737	0.508 / -170.472
2.200GHz	0.738 / 157.949	1.419 / 46.455	0.137 / 44.146	0.526 / -172.012
2.400GHz	0.739 / 154.456	1.304 / 42.828	0.147 / 44.945	0.540 / -173.254
2.600GHz	0.747 / 151.311	1.207 / 39.051	0.157 / 45.669	0.554 / -174.870
2.800GHz	0.748 / 146.781	1.122 / 35.483	0.166 / 44.754	0.564 / -174.381
3.000GHz	0.747 / 143.946	1.046 / 32.735	0.174 / 44.246	0.588 / -176.528

THN4501 Series

$V_{CE} = 1\text{ V}$, $I_C = 15\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.743 / -164.623	7.841 / 91.816	0.060 / 31.370	0.506 / -152.487
600.0MHz	0.747 / -173.339	5.327 / 84.335	0.065 / 36.615	0.501 / -162.075
800.0MHz	0.749 / -178.975	4.033 / 78.702	0.072 / 41.795	0.495 / -167.510
1.000GHz	0.745 / 176.388	3.242 / 73.631	0.081 / 45.022	0.506 / -170.858
1.200GHz	0.743 / 172.546	2.735 / 69.174	0.093 / 47.905	0.505 / -172.418
1.400GHz	0.737 / 168.904	2.355 / 64.875	0.101 / 48.854	0.512 / -174.435
1.600GHz	0.743 / 165.284	2.080 / 60.736	0.115 / 49.216	0.515 / -175.987
1.800GHz	0.742 / 161.877	1.862 / 56.844	0.125 / 49.613	0.522 / -177.117
2.000GHz	0.743 / 158.757	1.686 / 53.036	0.137 / 50.002	0.530 / -178.580
2.200GHz	0.741 / 155.260	1.543 / 49.499	0.147 / 49.248	0.542 / -179.703
2.400GHz	0.743 / 151.942	1.419 / 46.037	0.158 / 49.363	0.553 / 179.387
2.600GHz	0.747 / 148.749	1.319 / 42.548	0.168 / 47.863	0.563 / 178.123
2.800GHz	0.749 / 144.378	1.229 / 38.968	0.179 / 47.417	0.568 / 178.620
3.000GHz	0.745 / 141.492	1.152 / 36.318	0.188 / 46.349	0.589 / 177.191

$V_{CE} = 1\text{ V}$, $I_C = 20\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.747 / -168.579	8.112 / 90.686	0.049 / 34.143	0.528 / -158.748
600.0MHz	0.755 / -176.383	5.500 / 83.894	0.060 / 41.698	0.531 / -166.963
800.0MHz	0.756 / 178.883	4.161 / 78.685	0.068 / 47.211	0.524 / -171.731
1.000GHz	0.751 / 174.458	3.345 / 73.967	0.080 / 49.918	0.533 / -175.190
1.200GHz	0.751 / 170.692	2.823 / 69.792	0.092 / 51.473	0.530 / -176.404
1.400GHz	0.745 / 167.112	2.435 / 65.746	0.105 / 53.123	0.538 / -178.218
1.600GHz	0.748 / 163.708	2.149 / 61.789	0.116 / 52.531	0.539 / -179.870
1.800GHz	0.745 / 160.499	1.928 / 58.130	0.129 / 52.464	0.542 / 179.174
2.000GHz	0.748 / 157.358	1.749 / 54.469	0.141 / 52.467	0.549 / 177.462
2.200GHz	0.746 / 153.867	1.600 / 51.064	0.152 / 51.739	0.559 / 176.480
2.400GHz	0.745 / 150.641	1.475 / 47.780	0.163 / 51.116	0.566 / 175.649
2.600GHz	0.750 / 147.543	1.373 / 44.350	0.174 / 49.995	0.576 / 174.307
2.800GHz	0.749 / 143.167	1.280 / 40.966	0.185 / 48.116	0.576 / 175.204
3.000GHz	0.746 / 140.400	1.199 / 38.272	0.193 / 47.241	0.599 / 173.663

$V_{CE} = 1\text{ V}$, $I_C = 25\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.754 / -171.725	8.268 / 89.844	0.043 / 39.924	0.550 / -163.238
600.0MHz	0.762 / -178.317	5.600 / 83.552	0.056 / 50.322	0.553 / -170.250
800.0MHz	0.762 / 177.169	4.237 / 78.692	0.068 / 53.959	0.548 / -174.718
1.000GHz	0.756 / 172.973	3.408 / 74.264	0.081 / 54.232	0.558 / -178.022
1.200GHz	0.758 / 169.434	2.877 / 70.291	0.094 / 56.421	0.553 / -179.323
1.400GHz	0.751 / 166.102	2.481 / 66.356	0.105 / 56.374	0.558 / 178.982
1.600GHz	0.753 / 162.654	2.192 / 62.600	0.118 / 55.981	0.559 / 177.354
1.800GHz	0.751 / 159.420	1.967 / 59.013	0.133 / 55.400	0.561 / 176.502
2.000GHz	0.753 / 156.307	1.786 / 55.532	0.143 / 54.456	0.566 / 175.099
2.200GHz	0.749 / 152.783	1.636 / 52.258	0.155 / 53.361	0.574 / 173.876
2.400GHz	0.748 / 149.646	1.509 / 49.026	0.168 / 52.272	0.580 / 173.015
2.600GHz	0.754 / 146.552	1.406 / 45.614	0.180 / 50.942	0.588 / 171.824
2.800GHz	0.755 / 142.132	1.311 / 42.300	0.191 / 49.562	0.587 / 172.403
3.000GHz	0.749 / 139.403	1.233 / 39.704	0.198 / 47.841	0.607 / 171.018

$V_{CE} = 1\text{ V}$, $I_C = 30\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.758 / -173.720	8.334 / 89.282	0.042 / 43.486	0.567 / -165.941
600.0MHz	0.769 / -179.632	5.640 / 83.331	0.054 / 52.513	0.568 / -172.531
800.0MHz	0.768 / 176.163	4.269 / 78.674	0.069 / 55.760	0.565 / -176.684
1.000GHz	0.762 / 172.115	3.431 / 74.421	0.080 / 57.418	0.575 / -179.747
1.200GHz	0.763 / 168.636	2.897 / 70.541	0.096 / 59.002	0.571 / 179.044
1.400GHz	0.755 / 165.194	2.500 / 66.793	0.107 / 58.639	0.575 / 177.289
1.600GHz	0.757 / 161.889	2.210 / 63.122	0.120 / 57.990	0.573 / 175.681
1.800GHz	0.756 / 158.580	1.985 / 59.608	0.134 / 57.593	0.574 / 174.831
2.000GHz	0.759 / 155.655	1.803 / 56.250	0.146 / 55.763	0.578 / 173.217
2.200GHz	0.753 / 152.172	1.653 / 53.013	0.159 / 54.241	0.588 / 172.244
2.400GHz	0.752 / 148.993	1.525 / 49.898	0.170 / 53.223	0.593 / 171.264
2.600GHz	0.758 / 145.882	1.424 / 46.583	0.182 / 51.382	0.600 / 169.975
2.800GHz	0.756 / 141.470	1.327 / 43.256	0.194 / 50.035	0.598 / 170.780
3.000GHz	0.751 / 138.716	1.249 / 40.791	0.204 / 48.768	0.616 / 169.300

THN4501 Series

$V_{CE} = 1\text{ V}$, $I_C = 35\text{ mA}$

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

$V_{CE} = 1\text{ V}$, $I_C = 40\text{ mA}$

freq	S(1,1)	S(2,1)	S(1,2)	S(2,2)
400.0MHz	0.772 / -176.530	8.273 / 88.400	0.042 / 51.118	0.601 / -170.198
600.0MHz	0.778 / 178.500	5.597 / 82.939	0.053 / 57.479	0.601 / -175.580
800.0MHz	0.777 / 174.422	4.232 / 78.615	0.066 / 60.053	0.596 / -179.364
1.000GHz	0.773 / 170.780	3.405 / 74.562	0.081 / 62.016	0.607 / 177.901
1.200GHz	0.772 / 167.342	2.878 / 70.936	0.095 / 61.116	0.598 / 176.506
1.400GHz	0.766 / 164.156	2.488 / 67.331	0.109 / 61.782	0.604 / 175.024
1.600GHz	0.769 / 160.957	2.200 / 63.768	0.122 / 59.826	0.601 / 173.394
1.800GHz	0.766 / 157.583	1.976 / 60.476	0.137 / 58.684	0.602 / 172.308
2.000GHz	0.767 / 154.559	1.796 / 57.214	0.149 / 58.009	0.604 / 170.759
2.200GHz	0.762 / 151.225	1.649 / 54.050	0.162 / 55.964	0.611 / 169.693
2.400GHz	0.761 / 148.101	1.523 / 50.996	0.176 / 54.374	0.614 / 168.596
2.600GHz	0.765 / 144.917	1.423 / 47.894	0.187 / 53.103	0.619 / 167.431
2.800GHz	0.765 / 140.683	1.330 / 44.649	0.200 / 51.196	0.616 / 168.008
3.000GHz	0.761 / 138.063	1.250 / 42.259	0.208 / 49.596	0.632 / 166.827

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

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

$V_{CE} = 1\text{ V}$, $I_C = 60\text{ mA}$

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