

NPN Planer RF TRANSISTOR

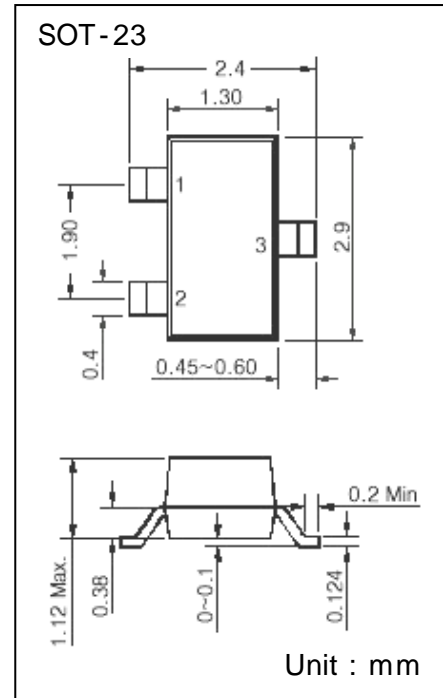
DESCRIPTION

The THN6501S is a low Noise figure and good associated gain performance at UHF, VHF and Microwave frequencies

It is suitable for a high density surface mount since transistor has been SOT23 package

FEATURES

- o Low Noise Figure
N.F = 1.0dB TYP. @ f=1GHz, V_{CE}=3V, I_c=7mA
- o High Gain
MAG = 14dB TYP. @ f=1GHz, V_{CE}=3V, I_c=7mA
- o High Transition Frequency
f_T = 5GHz TYP. @ f=1GHz, V_{CE}=3V, I_c=7mA



PIN CONFIGURATION

| PIN NO | SYMBOL | DESCRIPTION |
|--------|--------|-------------|
| 1 | B | Base |
| 2 | E | Emitter |
| 3 | C | Collector |

MARKING : AB1

MAXIMUM RATINGS

| SYMBOL | PARAMETER | CONDITION | VALUE | Unit |
|------------------|--------------------------------|---------------------|-----------|------|
| V _{CB0} | Collector-Base Voltage | Open Emitter | 25 | V |
| V _{CEO} | Collector-Emitter Voltage | Open Base | 12 | V |
| V _{EBO} | Emitter-Base Voltage | Open Collector | 2.5 | V |
| I _c | Collector Current (DC) | | 100 | mA |
| P _T | Total Power Dissipation | T _s = 60 | 150 | mW |
| T _{STG} | Storage Temperature | | -65 ~ 150 | |
| T _J | Operating Junction Temperature | | 150 | |

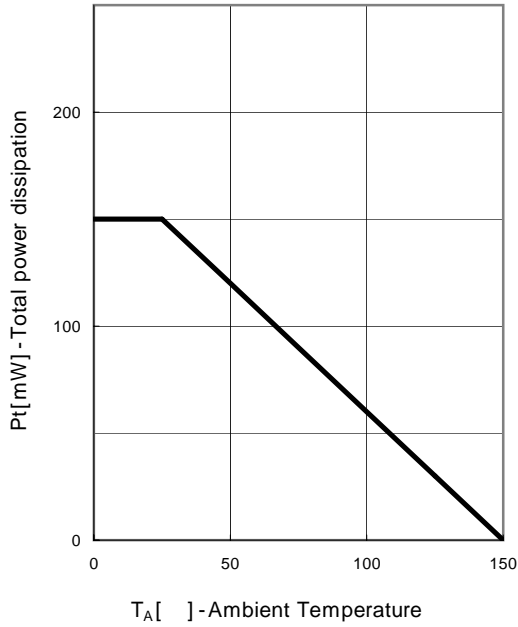
Electrical Characteristics ($T_A = 25$)

| SYMBOL | PARAMETER | CONDITION | VALUE | | | Unit |
|------------------|----------------------------|---|-------|------|-----|------|
| | | | min | typ | max | |
| V _{CBO} | Collector-Base Voltage | I _{CE} = 100uA, I _E = 0 | 20 | 25 | | V |
| V _{CEO} | Collector-Emitter Voltage | I _{CE} = 100uA, I _B = 0 | 12 | 13 | | V |
| I _{CBO} | Collector-Cut-off current | V _{CB} = 10V, I _E = 0 | | | 100 | n A |
| I _{EBO} | Emitter-Cut-off current | V _{EB} = 1V, I _C = 0 | | | 100 | n A |
| h _{fe} | D.C Current Gain | V _{CE} = 3V, I _C = 7mA | 130 | | 300 | |
| f _T | Transition Frequency | V _{CE} = 3V, I _C = 7mA | | 5 | | GHz |
| C _{CB} | Collector-Base Capacitance | V _{CB} = 10V, f = 1MHz | | 0.90 | | pF |

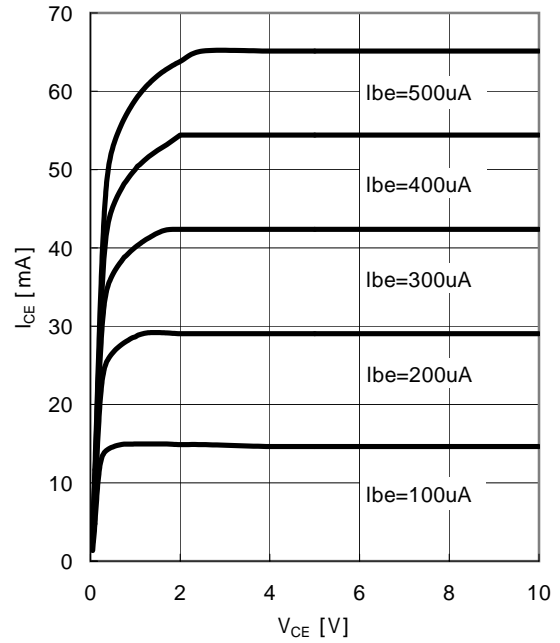
Performance Characteristics

| SYMBOL | PARAMETER | CONDITION | VALUE | | | Unit |
|---------------------------------|------------------------|---|-------|-------|-----|------|
| | | | min | typ | max | |
| [S ₂₁] ² | Insertion Power Gain | V _{CE} =3V, I _C =7mA, f=1GHz | | 9.5 | | dB |
| | | V _{CE} =3V, I _C =15mA, f=1GHz | | 11 | | |
| MSG | Maximum Stable Gain | V _{CE} =3V, I _C =7mA, f=1GHz | | 14 | | dB |
| MAG | Maximum Available Gain | V _{CE} =3V, I _C =15mA, f=1GHz | | 14.5 | | |
| NF _{min} | Minimum Noise Figure | V _{CE} =3V, I _C =7mA, f=1GHz | | 1.0 | | dB |
| r _n | Noise Resistance | V _{CE} =3V, I _C =7mA, f=1GHz | | 0.056 | | |
| G _A | Associated Gain | V _{CE} =3V, I _C =7mA, f=1GHz | | 12 | | dB |
| | | V _{CE} =3V, I _C =15mA, f=1GHz | | 12.5 | | |
| OIP ₃ | Output 3rd Intercept | V _{CE} =6V, I _C =15mA, f=1GHz | | 27 | | dBm |

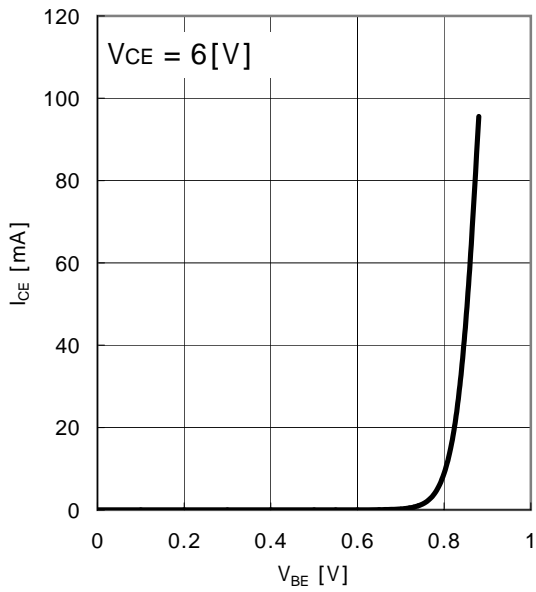
Total power dissipation $P_t = f(T_A)$
 ($T_A = 25$)



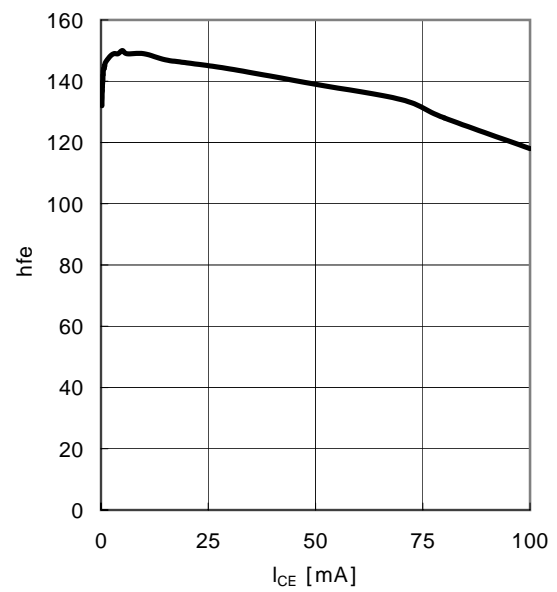
Icc vs. VCE



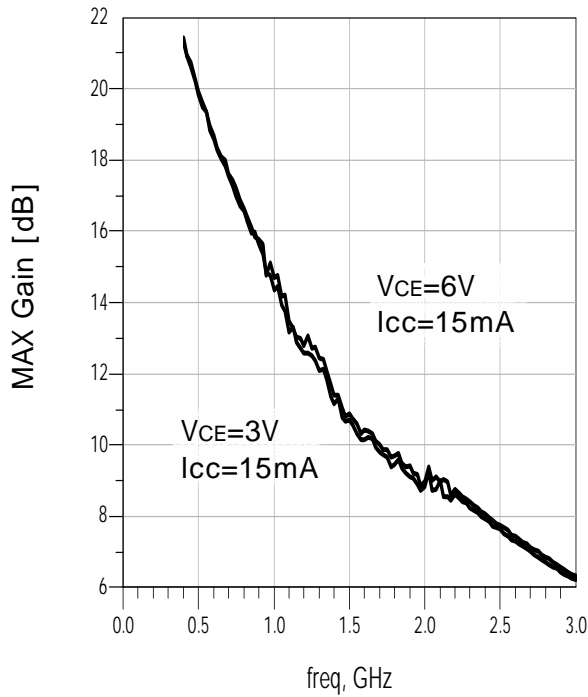
Icc vs. VBE



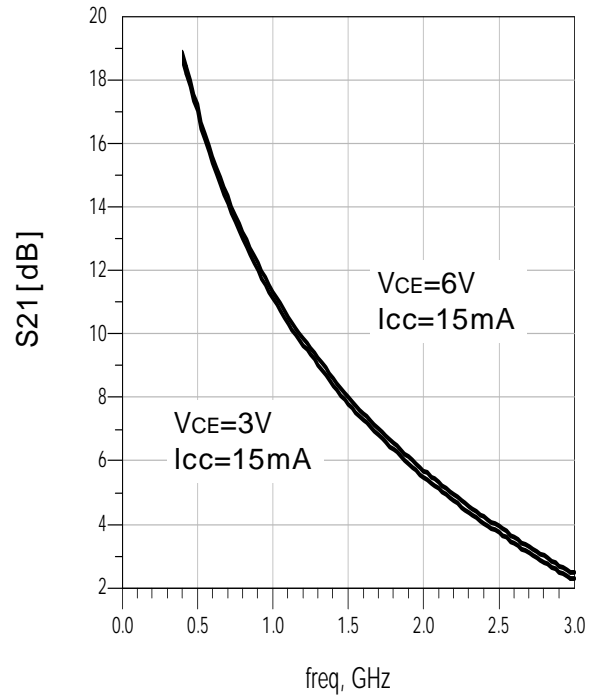
hfe vs. Icc



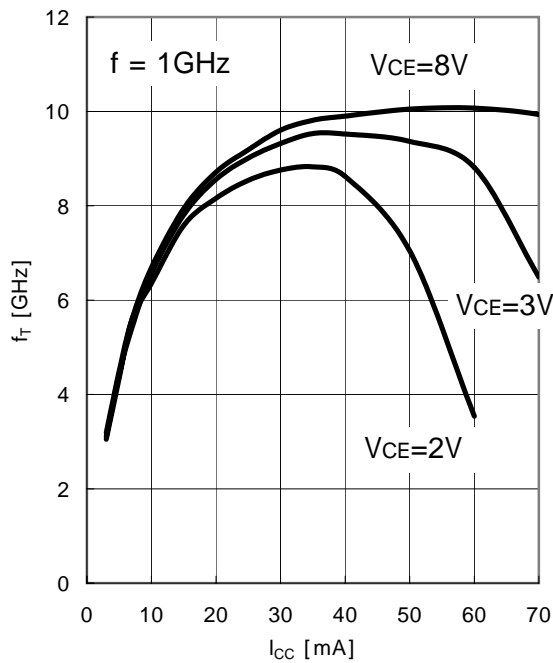
Power Gain : MSG, MAG vs. Frequency



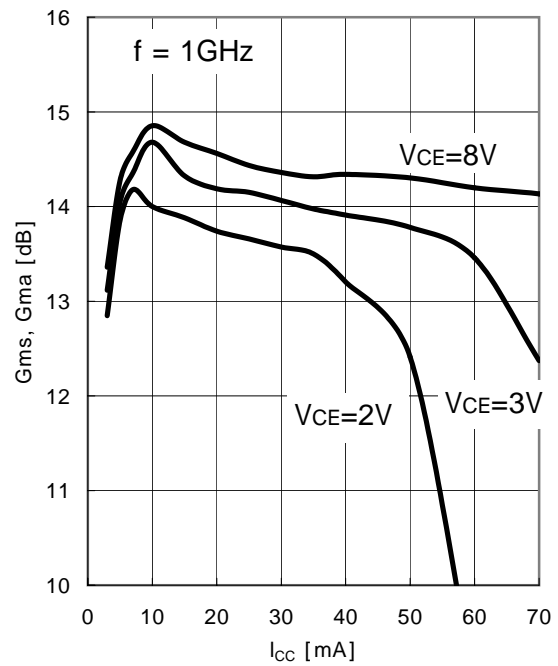
Power Gain : S₂₁ vs. Frequency



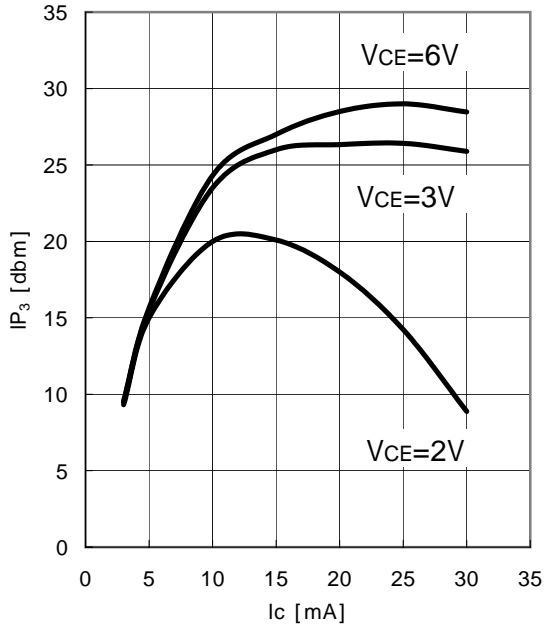
Transition Frequency : f_T vs. I_{CC}



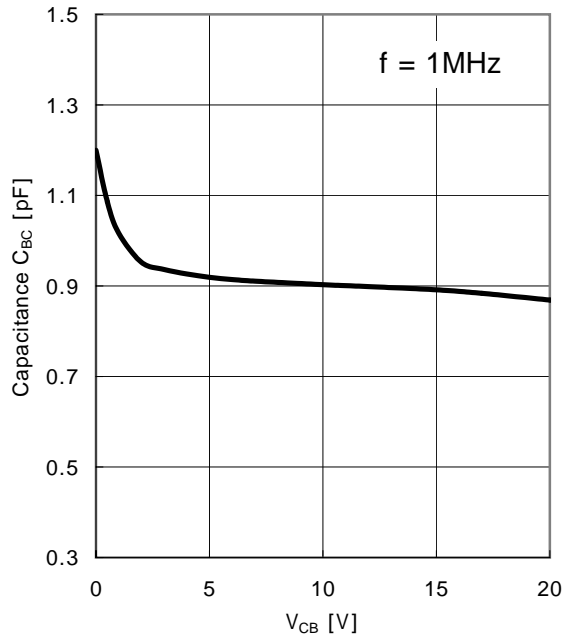
Power Gain : MSG, MAG vs. I_{CC}



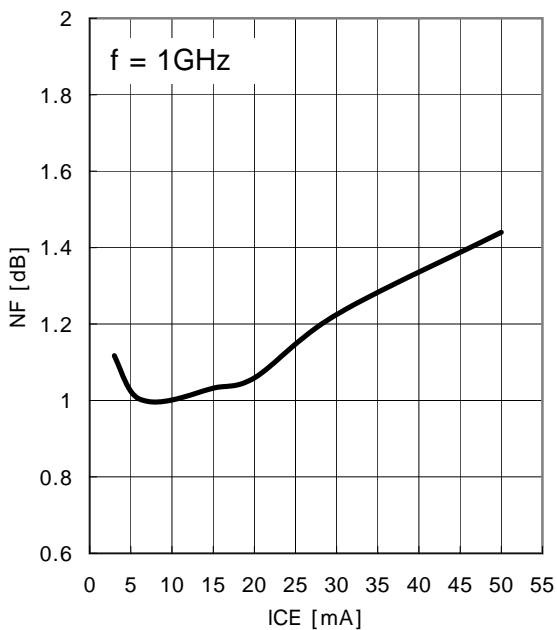
Intermodulation Intercept Point $IP_3=f(I_c)$
 ($Z_S = Z_L = 50 \Omega$)



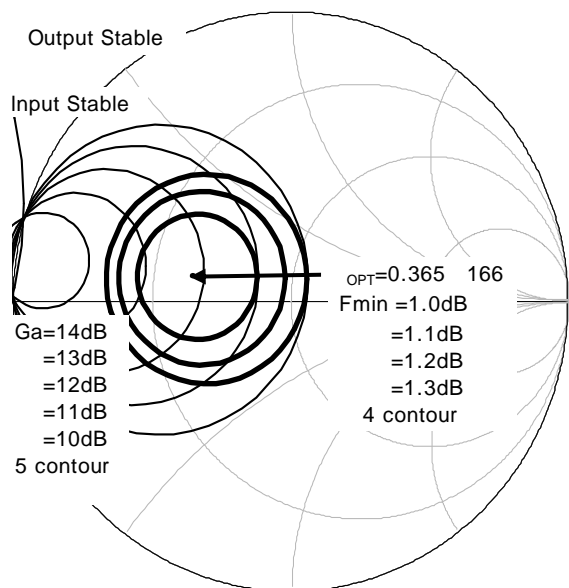
CCB vs. V_{CB}



Fmin vs. I_{cc}
 $V_{CE} = 3V, I_{cc} = \text{parameter}, Z_s = Z_{opt}$



Noise Figure Contours & Constant Gain
 $f = 1\text{ GHz}, V_{CE} = 3V, I_{cc} = 7\text{ mA}$



Common Emitter S-Parameter Data
 $V_{CE} = 3V, I_{CC} = 3mA$

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|-----------------|----------------|------------------|
| 400.0MHz | 0.673 / -114.987 | 5.277 / 104.719 | 0.112 / 33.127 | 0.560 / -65.480 |
| 600.0MHz | 0.638 / -138.494 | 3.824 / 89.089 | 0.119 / 25.394 | 0.468 / -78.630 |
| 800.0MHz | 0.621 / -154.045 | 2.986 / 77.167 | 0.120 / 26.074 | 0.423 / -87.931 |
| 1.000GHz | 0.615 / -166.340 | 2.427 / 67.147 | 0.118 / 26.587 | 0.408 / -97.480 |
| 1.200GHz | 0.615 / -175.451 | 2.047 / 59.066 | 0.120 / 31.134 | 0.414 / -103.003 |
| 1.400GHz | 0.619 / 175.679 | 1.775 / 50.763 | 0.122 / 35.241 | 0.433 / -112.054 |
| 1.600GHz | 0.630 / 168.154 | 1.560 / 43.978 | 0.128 / 40.651 | 0.445 / -118.347 |
| 1.800GHz | 0.639 / 160.586 | 1.396 / 37.461 | 0.142 / 46.239 | 0.466 / -124.215 |
| 2.000GHz | 0.652 / 154.371 | 1.251 / 31.728 | 0.158 / 49.759 | 0.489 / -130.749 |
| 2.200GHz | 0.664 / 147.663 | 1.140 / 26.350 | 0.178 / 51.706 | 0.510 / -137.368 |
| 2.400GHz | 0.676 / 141.686 | 1.037 / 21.885 | 0.203 / 52.773 | 0.532 / -143.298 |
| 2.600GHz | 0.688 / 135.962 | 0.957 / 17.238 | 0.228 / 52.137 | 0.555 / -149.898 |
| 2.800GHz | 0.698 / 129.276 | 0.880 / 13.492 | 0.252 / 50.962 | 0.574 / -153.669 |
| 3.000GHz | 0.702 / 124.245 | 0.820 / 10.887 | 0.277 / 49.033 | 0.600 / -159.899 |

 $V_{CE} = 3V, I_{CC} = 5mA$

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.608 / -130.316 | 6.583 / 99.461 | 0.094 / 36.800 | 0.446 / -80.512 |
| 600.0MHz | 0.589 / -151.091 | 4.645 / 86.103 | 0.099 / 33.445 | 0.365 / -93.557 |
| 800.0MHz | 0.582 / -164.528 | 3.580 / 75.923 | 0.106 / 36.687 | 0.332 / -103.207 |
| 1.000GHz | 0.578 / -174.963 | 2.897 / 67.151 | 0.114 / 38.646 | 0.325 / -112.034 |
| 1.200GHz | 0.578 / 177.112 | 2.442 / 60.112 | 0.122 / 43.075 | 0.333 / -116.490 |
| 1.400GHz | 0.584 / 169.074 | 2.115 / 52.573 | 0.134 / 45.587 | 0.349 / -124.461 |
| 1.600GHz | 0.594 / 162.489 | 1.865 / 46.391 | 0.148 / 47.775 | 0.364 / -129.522 |
| 1.800GHz | 0.602 / 155.726 | 1.671 / 40.360 | 0.164 / 49.604 | 0.385 / -133.966 |
| 2.000GHz | 0.614 / 150.194 | 1.507 / 34.891 | 0.183 / 50.330 | 0.406 / -139.189 |
| 2.200GHz | 0.626 / 144.092 | 1.377 / 29.587 | 0.202 / 50.406 | 0.428 / -144.627 |
| 2.400GHz | 0.634 / 138.748 | 1.261 / 25.062 | 0.223 / 50.031 | 0.450 / -149.506 |
| 2.600GHz | 0.648 / 133.536 | 1.167 / 20.159 | 0.245 / 48.954 | 0.470 / -155.244 |
| 2.800GHz | 0.658 / 127.399 | 1.078 / 15.966 | 0.266 / 47.557 | 0.493 / -157.981 |
| 3.000GHz | 0.665 / 122.691 | 1.010 / 12.739 | 0.286 / 45.704 | 0.520 / -163.520 |

 $V_{CE} = 3V, I_{CC} = 7mA$

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.579 / -139.964 | 7.314 / 96.405 | 0.081 / 39.745 | 0.384 / -90.569 |
| 600.0MHz | 0.567 / -158.423 | 5.094 / 84.431 | 0.090 / 41.369 | 0.321 / -105.358 |
| 800.0MHz | 0.567 / -170.703 | 3.906 / 75.177 | 0.102 / 43.417 | 0.293 / -115.141 |
| 1.000GHz | 0.565 / 179.907 | 3.151 / 67.152 | 0.116 / 46.183 | 0.290 / -123.636 |
| 1.200GHz | 0.565 / 172.650 | 2.655 / 60.642 | 0.130 / 49.891 | 0.298 / -126.601 |
| 1.400GHz | 0.569 / 165.231 | 2.301 / 53.577 | 0.142 / 49.301 | 0.317 / -133.894 |
| 1.600GHz | 0.580 / 159.074 | 2.030 / 47.800 | 0.158 / 50.743 | 0.331 / -138.204 |
| 1.800GHz | 0.584 / 152.724 | 1.821 / 41.942 | 0.177 / 51.161 | 0.350 / -141.540 |
| 2.000GHz | 0.597 / 147.584 | 1.644 / 36.720 | 0.195 / 51.307 | 0.370 / -146.278 |
| 2.200GHz | 0.607 / 141.648 | 1.507 / 31.553 | 0.215 / 50.069 | 0.391 / -150.815 |
| 2.400GHz | 0.615 / 136.817 | 1.383 / 27.089 | 0.234 / 49.414 | 0.411 / -155.139 |
| 2.600GHz | 0.628 / 131.947 | 1.283 / 22.205 | 0.254 / 47.818 | 0.433 / -160.268 |
| 2.800GHz | 0.636 / 125.846 | 1.190 / 17.979 | 0.276 / 46.223 | 0.451 / -162.008 |
| 3.000GHz | 0.646 / 121.257 | 1.115 / 14.701 | 0.295 / 44.058 | 0.479 / -167.273 |

 $V_{CE} = 3V, I_{CC} = 10mA$

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.559 / -150.284 | 7.994 / 93.404 | 0.071 / 45.822 | 0.334 / -104.332 |
| 600.0MHz | 0.551 / -165.545 | 5.514 / 82.777 | 0.085 / 49.303 | 0.289 / -118.976 |
| 800.0MHz | 0.555 / -176.363 | 4.209 / 74.465 | 0.099 / 50.859 | 0.269 / -128.646 |
| 1.000GHz | 0.553 / 174.985 | 3.390 / 67.109 | 0.115 / 52.217 | 0.274 / -136.958 |
| 1.200GHz | 0.553 / 168.103 | 2.860 / 61.143 | 0.134 / 53.710 | 0.278 / -138.235 |
| 1.400GHz | 0.558 / 161.453 | 2.473 / 54.469 | 0.149 / 53.956 | 0.299 / -144.689 |
| 1.600GHz | 0.567 / 155.842 | 2.182 / 49.075 | 0.167 / 53.921 | 0.311 / -148.121 |
| 1.800GHz | 0.573 / 149.722 | 1.960 / 43.523 | 0.189 / 52.578 | 0.328 / -150.913 |
| 2.000GHz | 0.582 / 144.861 | 1.773 / 38.571 | 0.207 / 51.705 | 0.345 / -154.610 |
| 2.200GHz | 0.592 / 139.262 | 1.628 / 33.571 | 0.227 / 50.213 | 0.363 / -158.450 |
| 2.400GHz | 0.599 / 134.650 | 1.496 / 29.170 | 0.247 / 48.748 | 0.383 / -161.982 |
| 2.600GHz | 0.612 / 130.030 | 1.392 / 24.451 | 0.267 / 46.630 | 0.403 / -166.713 |
| 2.800GHz | 0.621 / 124.231 | 1.296 / 20.198 | 0.286 / 44.712 | 0.418 / -167.610 |
| 3.000GHz | 0.625 / 119.776 | 1.218 / 16.730 | 0.304 / 42.767 | 0.448 / -172.042 |

VCE = 3V, Icc = 15mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.540 / -158.963 | 8.574 / 90.734 | 0.064 / 55.060 | 0.300 / -119.381 |
| 600.0MHZ | 0.544 / -172.674 | 5.867 / 81.377 | 0.081 / 54.967 | 0.274 / -133.475 |
| 800.0MHZ | 0.546 / 178.235 | 4.468 / 73.838 | 0.099 / 56.613 | 0.262 / -141.916 |
| 1.000GHZ | 0.547 / 170.986 | 3.593 / 67.078 | 0.119 / 58.135 | 0.270 / -149.034 |
| 1.200GHZ | 0.547 / 164.387 | 3.027 / 61.586 | 0.140 / 57.400 | 0.273 / -150.233 |
| 1.400GHZ | 0.551 / 158.009 | 2.619 / 55.284 | 0.158 / 56.598 | 0.294 / -155.420 |
| 1.600GHZ | 0.559 / 152.608 | 2.313 / 50.205 | 0.178 / 55.707 | 0.305 / -158.183 |
| 1.800GHZ | 0.565 / 146.962 | 2.077 / 44.929 | 0.199 / 54.371 | 0.319 / -159.827 |
| 2.000GHZ | 0.573 / 142.338 | 1.882 / 40.195 | 0.218 / 52.324 | 0.334 / -162.935 |
| 2.200GHZ | 0.583 / 136.807 | 1.730 / 35.338 | 0.238 / 50.297 | 0.350 / -166.552 |
| 2.400GHZ | 0.588 / 132.488 | 1.591 / 31.149 | 0.257 / 48.489 | 0.367 / -169.225 |
| 2.600GHZ | 0.600 / 128.107 | 1.484 / 26.464 | 0.277 / 46.629 | 0.385 / -173.166 |
| 2.800GHZ | 0.608 / 122.458 | 1.382 / 22.346 | 0.295 / 44.066 | 0.399 / -173.696 |
| 3.000GHZ | 0.612 / 118.335 | 1.300 / 18.986 | 0.311 / 41.615 | 0.426 / -177.576 |

VCE = 3V, Icc = 20mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.532 / -165.104 | 8.858 / 89.330 | 0.060 / 53.668 | 0.290 / -129.289 |
| 600.0MHZ | 0.540 / -176.304 | 6.043 / 80.623 | 0.080 / 58.315 | 0.270 / -141.338 |
| 800.0MHZ | 0.546 / 175.345 | 4.596 / 73.486 | 0.100 / 59.980 | 0.262 / -149.166 |
| 1.000GHZ | 0.546 / 168.421 | 3.692 / 67.033 | 0.122 / 60.727 | 0.272 / -155.829 |
| 1.200GHZ | 0.544 / 162.092 | 3.113 / 61.784 | 0.142 / 59.994 | 0.275 / -156.455 |
| 1.400GHZ | 0.550 / 156.193 | 2.692 / 55.669 | 0.164 / 58.074 | 0.297 / -161.267 |
| 1.600GHZ | 0.557 / 150.786 | 2.379 / 50.791 | 0.184 / 56.403 | 0.306 / -163.324 |
| 1.800GHZ | 0.562 / 145.410 | 2.137 / 45.618 | 0.205 / 54.571 | 0.317 / -164.924 |
| 2.000GHZ | 0.569 / 140.811 | 1.935 / 41.043 | 0.225 / 52.417 | 0.333 / -167.967 |
| 2.200GHZ | 0.578 / 135.541 | 1.780 / 36.314 | 0.244 / 50.549 | 0.349 / -170.988 |
| 2.400GHZ | 0.583 / 131.207 | 1.639 / 32.191 | 0.263 / 48.213 | 0.365 / -173.386 |
| 2.600GHZ | 0.596 / 126.945 | 1.529 / 27.580 | 0.282 / 46.163 | 0.381 / -177.205 |
| 2.800GHZ | 0.601 / 121.328 | 1.424 / 23.532 | 0.301 / 43.260 | 0.393 / -177.295 |
| 3.000GHZ | 0.607 / 117.381 | 1.346 / 20.210 | 0.317 / 41.371 | 0.417 / 178.980 |

VCE = 3V, Icc = 25mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.534 / -168.349 | 9.021 / 88.378 | 0.059 / 58.130 | 0.281 / -134.569 |
| 600.0MHZ | 0.540 / -178.806 | 6.139 / 80.084 | 0.080 / 62.152 | 0.270 / -146.356 |
| 800.0MHZ | 0.546 / 173.426 | 4.668 / 73.230 | 0.101 / 62.385 | 0.267 / -154.230 |
| 1.000GHZ | 0.547 / 166.638 | 3.747 / 66.958 | 0.124 / 61.879 | 0.278 / -159.845 |
| 1.200GHZ | 0.544 / 160.837 | 3.159 / 61.866 | 0.142 / 61.722 | 0.281 / -160.166 |
| 1.400GHZ | 0.552 / 154.991 | 2.731 / 55.885 | 0.165 / 59.236 | 0.300 / -164.576 |
| 1.600GHZ | 0.557 / 149.601 | 2.411 / 51.093 | 0.187 / 57.209 | 0.309 / -166.975 |
| 1.800GHZ | 0.562 / 144.302 | 2.169 / 46.048 | 0.208 / 54.608 | 0.319 / -168.126 |
| 2.000GHZ | 0.569 / 139.862 | 1.964 / 41.564 | 0.228 / 52.885 | 0.333 / -171.034 |
| 2.200GHZ | 0.578 / 134.475 | 1.806 / 36.904 | 0.248 / 50.668 | 0.349 / -173.956 |
| 2.400GHZ | 0.580 / 130.327 | 1.666 / 32.817 | 0.268 / 48.069 | 0.364 / -176.556 |
| 2.600GHZ | 0.593 / 126.210 | 1.554 / 28.336 | 0.286 / 45.831 | 0.379 / -179.984 |
| 2.800GHZ | 0.600 / 120.526 | 1.449 / 24.236 | 0.304 / 43.053 | 0.391 / -179.754 |
| 3.000GHZ | 0.605 / 116.647 | 1.367 / 20.863 | 0.320 / 40.942 | 0.415 / 176.698 |

VCE = 3V, Icc = 30mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.534 / -171.192 | 9.106 / 87.689 | 0.057 / 58.092 | 0.282 / -138.863 |
| 600.0MHZ | 0.543 / 179.433 | 6.194 / 79.703 | 0.080 / 65.483 | 0.273 / -149.966 |
| 800.0MHZ | 0.547 / 172.121 | 4.705 / 73.044 | 0.101 / 63.859 | 0.270 / -157.574 |
| 1.000GHZ | 0.548 / 165.659 | 3.778 / 66.946 | 0.124 / 63.324 | 0.283 / -162.976 |
| 1.200GHZ | 0.547 / 159.876 | 3.184 / 61.927 | 0.147 / 61.767 | 0.282 / -162.806 |
| 1.400GHZ | 0.552 / 153.895 | 2.752 / 55.998 | 0.168 / 60.126 | 0.304 / -167.226 |
| 1.600GHZ | 0.560 / 148.681 | 2.430 / 51.291 | 0.190 / 57.511 | 0.313 / -169.388 |
| 1.800GHZ | 0.563 / 143.398 | 2.187 / 46.324 | 0.211 / 55.292 | 0.322 / -170.532 |
| 2.000GHZ | 0.570 / 139.000 | 1.980 / 41.863 | 0.232 / 53.291 | 0.334 / -173.204 |
| 2.200GHZ | 0.577 / 133.957 | 1.822 / 37.234 | 0.251 / 50.615 | 0.349 / -176.093 |
| 2.400GHZ | 0.582 / 129.724 | 1.679 / 33.202 | 0.271 / 48.178 | 0.365 / -178.416 |
| 2.600GHZ | 0.593 / 125.399 | 1.568 / 28.771 | 0.290 / 45.538 | 0.381 / 178.068 |
| 2.800GHZ | 0.598 / 120.214 | 1.464 / 24.712 | 0.307 / 43.185 | 0.387 / 178.388 |
| 3.000GHZ | 0.603 / 116.192 | 1.382 / 21.431 | 0.324 / 40.765 | 0.413 / 174.669 |

VCE = 6V, Icc = 3mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|-----------------|----------------|------------------|
| 400.0MHZ | 0.669 / -113.864 | 5.375 / 105.421 | 0.110 / 33.904 | 0.572 / -64.502 |
| 600.0MHZ | 0.637 / -137.206 | 3.906 / 89.730 | 0.117 / 27.067 | 0.472 / -77.496 |
| 800.0MHZ | 0.620 / -153.113 | 3.047 / 77.780 | 0.118 / 25.129 | 0.426 / -87.134 |
| 1.000GHZ | 0.612 / -165.474 | 2.481 / 67.747 | 0.116 / 27.928 | 0.410 / -96.528 |
| 1.200GHZ | 0.610 / -174.678 | 2.093 / 59.749 | 0.117 / 30.860 | 0.416 / -101.862 |
| 1.400GHZ | 0.617 / 176.326 | 1.813 / 51.422 | 0.120 / 36.467 | 0.434 / -110.820 |
| 1.600GHZ | 0.627 / 168.879 | 1.594 / 44.674 | 0.127 / 41.550 | 0.444 / -117.538 |
| 1.800GHZ | 0.636 / 161.304 | 1.422 / 38.113 | 0.141 / 46.336 | 0.469 / -123.324 |
| 2.000GHZ | 0.647 / 155.074 | 1.280 / 32.380 | 0.157 / 50.238 | 0.490 / -129.888 |
| 2.200GHZ | 0.661 / 148.139 | 1.163 / 26.991 | 0.178 / 52.213 | 0.510 / -136.451 |
| 2.400GHZ | 0.670 / 142.359 | 1.061 / 22.475 | 0.201 / 53.090 | 0.532 / -142.223 |
| 2.600GHZ | 0.686 / 136.714 | 0.976 / 17.892 | 0.225 / 52.635 | 0.554 / -148.883 |
| 2.800GHZ | 0.693 / 129.877 | 0.900 / 14.026 | 0.251 / 51.461 | 0.573 / -152.724 |
| 3.000GHZ | 0.701 / 124.794 | 0.837 / 11.272 | 0.276 / 49.957 | 0.600 / -159.195 |

VCE = 6V, Icc = 5mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|-----------------|----------------|------------------|
| 400.0MHZ | 0.610 / -128.523 | 6.697 / 100.169 | 0.090 / 37.915 | 0.456 / -78.368 |
| 600.0MHZ | 0.586 / -149.449 | 4.730 / 86.766 | 0.101 / 34.340 | 0.374 / -92.107 |
| 800.0MHZ | 0.579 / -163.096 | 3.649 / 76.526 | 0.105 / 37.057 | 0.337 / -101.437 |
| 1.000GHZ | 0.572 / -173.659 | 2.955 / 67.761 | 0.113 / 38.620 | 0.329 / -110.603 |
| 1.200GHZ | 0.574 / 178.240 | 2.493 / 60.687 | 0.122 / 43.770 | 0.336 / -114.708 |
| 1.400GHZ | 0.578 / 170.019 | 2.158 / 53.157 | 0.130 / 45.312 | 0.352 / -123.008 |
| 1.600GHZ | 0.590 / 163.412 | 1.901 / 47.009 | 0.146 / 48.282 | 0.365 / -128.356 |
| 1.800GHZ | 0.596 / 156.548 | 1.703 / 40.934 | 0.163 / 50.141 | 0.386 / -132.449 |
| 2.000GHZ | 0.609 / 151.192 | 1.534 / 35.506 | 0.179 / 50.772 | 0.407 / -138.164 |
| 2.200GHZ | 0.619 / 144.732 | 1.403 / 30.143 | 0.200 / 50.656 | 0.429 / -143.386 |
| 2.400GHZ | 0.630 / 139.494 | 1.284 / 25.574 | 0.222 / 50.835 | 0.448 / -148.383 |
| 2.600GHZ | 0.643 / 134.192 | 1.190 / 20.877 | 0.243 / 49.308 | 0.470 / -154.335 |
| 2.800GHZ | 0.653 / 127.859 | 1.099 / 16.501 | 0.265 / 48.444 | 0.492 / -156.909 |
| 3.000GHZ | 0.659 / 123.165 | 1.027 / 13.189 | 0.284 / 46.518 | 0.520 / -162.622 |

VCE = 6V, Icc = 7mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.571 / -138.645 | 7.482 / 96.972 | 0.079 / 40.664 | 0.390 / -89.776 |
| 600.0MHZ | 0.562 / -157.293 | 5.221 / 84.981 | 0.090 / 40.413 | 0.324 / -103.388 |
| 800.0MHZ | 0.560 / -169.504 | 4.002 / 75.710 | 0.100 / 44.171 | 0.295 / -113.105 |
| 1.000GHZ | 0.555 / -179.040 | 3.233 / 67.694 | 0.114 / 45.677 | 0.291 / -122.019 |
| 1.200GHZ | 0.555 / 173.382 | 2.725 / 61.247 | 0.127 / 49.279 | 0.299 / -124.940 |
| 1.400GHZ | 0.562 / 165.835 | 2.359 / 54.189 | 0.141 / 50.185 | 0.316 / -132.431 |
| 1.600GHZ | 0.571 / 159.619 | 2.080 / 48.374 | 0.158 / 50.892 | 0.329 / -136.960 |
| 1.800GHZ | 0.579 / 153.412 | 1.866 / 42.541 | 0.175 / 51.382 | 0.349 / -140.439 |
| 2.000GHZ | 0.589 / 148.294 | 1.684 / 37.382 | 0.194 / 51.615 | 0.367 / -145.082 |
| 2.200GHZ | 0.599 / 142.293 | 1.544 / 32.206 | 0.213 / 50.477 | 0.389 / -149.856 |
| 2.400GHZ | 0.609 / 137.374 | 1.417 / 27.750 | 0.235 / 49.517 | 0.409 / -154.206 |
| 2.600GHZ | 0.623 / 132.430 | 1.315 / 22.831 | 0.254 / 48.263 | 0.430 / -159.232 |
| 2.800GHZ | 0.630 / 126.499 | 1.219 / 18.598 | 0.275 / 46.534 | 0.451 / -161.144 |
| 3.000GHZ | 0.637 / 122.063 | 1.143 / 15.205 | 0.294 / 44.654 | 0.477 / -166.265 |

VCE = 6V, Icc = 10mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.549 / -148.029 | 8.173 / 94.111 | 0.070 / 46.377 | 0.339 / -101.255 |
| 600.0MHZ | 0.543 / -164.309 | 5.643 / 83.372 | 0.085 / 49.057 | 0.292 / -116.265 |
| 800.0MHZ | 0.545 / -175.279 | 4.310 / 75.015 | 0.100 / 49.263 | 0.268 / -126.260 |
| 1.000GHZ | 0.544 / 176.061 | 3.473 / 67.599 | 0.113 / 52.067 | 0.274 / -134.586 |
| 1.200GHZ | 0.543 / 169.153 | 2.926 / 61.652 | 0.132 / 53.970 | 0.276 / -136.227 |
| 1.400GHZ | 0.550 / 162.231 | 2.534 / 55.010 | 0.150 / 53.672 | 0.295 / -142.703 |
| 1.600GHZ | 0.559 / 156.249 | 2.234 / 49.602 | 0.168 / 53.653 | 0.311 / -146.638 |
| 1.800GHZ | 0.564 / 150.515 | 2.007 / 44.057 | 0.187 / 53.231 | 0.325 / -149.200 |
| 2.000GHZ | 0.573 / 145.599 | 1.814 / 39.094 | 0.207 / 51.512 | 0.342 / -153.305 |
| 2.200GHZ | 0.583 / 139.815 | 1.667 / 34.141 | 0.225 / 50.358 | 0.361 / -157.074 |
| 2.400GHZ | 0.592 / 135.344 | 1.531 / 29.717 | 0.245 / 48.761 | 0.382 / -160.636 |
| 2.600GHZ | 0.605 / 130.542 | 1.426 / 25.010 | 0.264 / 47.073 | 0.401 / -165.433 |
| 2.800GHZ | 0.612 / 124.667 | 1.324 / 20.738 | 0.284 / 44.915 | 0.417 / -166.225 |
| 3.000GHZ | 0.620 / 120.391 | 1.244 / 17.249 | 0.302 / 43.155 | 0.444 / -170.851 |

VCE = 6V, Icc = 15mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.530 / -157.455 | 8.769 / 91.541 | 0.063 / 51.620 | 0.301 / -115.430 |
| 600.0MHZ | 0.533 / -171.007 | 6.007 / 81.996 | 0.081 / 54.713 | 0.273 / -129.376 |
| 800.0MHZ | 0.537 / 179.535 | 4.577 / 74.383 | 0.099 / 56.708 | 0.260 / -138.416 |
| 1.000GHZ | 0.537 / 171.657 | 3.681 / 67.614 | 0.118 / 57.156 | 0.268 / -146.507 |
| 1.200GHZ | 0.537 / 165.308 | 3.104 / 62.115 | 0.139 / 58.093 | 0.269 / -147.659 |
| 1.400GHZ | 0.541 / 158.899 | 2.685 / 55.759 | 0.157 / 56.450 | 0.289 / -152.628 |
| 1.600GHZ | 0.550 / 153.281 | 2.369 / 50.703 | 0.177 / 55.431 | 0.301 / -155.942 |
| 1.800GHZ | 0.554 / 147.722 | 2.127 / 45.368 | 0.197 / 53.837 | 0.315 / -157.800 |
| 2.000GHZ | 0.562 / 143.099 | 1.926 / 40.643 | 0.216 / 52.449 | 0.330 / -161.194 |
| 2.200GHZ | 0.572 / 137.551 | 1.770 / 35.816 | 0.235 / 50.638 | 0.347 / -164.670 |
| 2.400GHZ | 0.579 / 133.058 | 1.630 / 31.614 | 0.255 / 48.661 | 0.364 / -167.764 |
| 2.600GHZ | 0.593 / 128.842 | 1.517 / 26.944 | 0.274 / 46.613 | 0.382 / -171.492 |
| 2.800GHZ | 0.598 / 123.168 | 1.414 / 22.715 | 0.293 / 44.496 | 0.396 / -172.058 |
| 3.000GHZ | 0.606 / 118.668 | 1.331 / 19.314 | 0.309 / 41.811 | 0.421 / -176.030 |

VCE = 6V, Icc = 20mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.524 / -163.017 | 9.068 / 90.151 | 0.061 / 55.605 | 0.288 / -124.907 |
| 600.0MHZ | 0.530 / -174.767 | 6.197 / 81.230 | 0.080 / 58.158 | 0.269 / -137.517 |
| 800.0MHZ | 0.533 / 176.794 | 4.717 / 74.027 | 0.099 / 60.899 | 0.259 / -145.871 |
| 1.000GHZ | 0.533 / 169.254 | 3.789 / 67.541 | 0.119 / 60.106 | 0.270 / -153.470 |
| 1.200GHZ | 0.533 / 163.305 | 3.195 / 62.254 | 0.142 / 59.632 | 0.271 / -153.276 |
| 1.400GHZ | 0.541 / 156.919 | 2.763 / 56.165 | 0.164 / 58.359 | 0.291 / -158.706 |
| 1.600GHZ | 0.546 / 151.537 | 2.438 / 51.230 | 0.182 / 56.393 | 0.301 / -160.937 |
| 1.800GHZ | 0.550 / 146.164 | 2.191 / 46.080 | 0.204 / 54.588 | 0.313 / -162.696 |
| 2.000GHZ | 0.559 / 141.549 | 1.983 / 41.486 | 0.223 / 52.646 | 0.328 / -165.811 |
| 2.200GHZ | 0.568 / 136.179 | 1.823 / 36.777 | 0.243 / 50.484 | 0.344 / -168.891 |
| 2.400GHZ | 0.573 / 131.897 | 1.680 / 32.608 | 0.262 / 48.406 | 0.360 / -171.771 |
| 2.600GHZ | 0.585 / 127.673 | 1.567 / 28.008 | 0.279 / 46.036 | 0.378 / -175.544 |
| 2.800GHZ | 0.590 / 121.842 | 1.461 / 23.905 | 0.298 / 44.087 | 0.389 / -175.584 |
| 3.000GHZ | 0.597 / 117.984 | 1.375 / 20.494 | 0.315 / 41.687 | 0.413 / -179.506 |

VCE = 6V, Icc = 25mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.521 / -166.236 | 9.269 / 89.185 | 0.060 / 59.246 | 0.286 / -129.940 |
| 600.0MHZ | 0.526 / -177.490 | 6.317 / 80.724 | 0.078 / 61.322 | 0.268 / -142.516 |
| 800.0MHZ | 0.532 / 174.709 | 4.803 / 73.791 | 0.099 / 62.435 | 0.261 / -150.799 |
| 1.000GHZ | 0.532 / 167.702 | 3.857 / 67.519 | 0.120 / 61.683 | 0.272 / -150.036 |
| 1.200GHZ | 0.532 / 161.677 | 3.249 / 62.369 | 0.142 / 60.704 | 0.271 / -157.654 |
| 1.400GHZ | 0.537 / 155.808 | 2.810 / 56.370 | 0.163 / 59.381 | 0.293 / -162.193 |
| 1.600GHZ | 0.546 / 150.449 | 2.481 / 51.600 | 0.184 / 57.123 | 0.301 / -164.357 |
| 1.800GHZ | 0.548 / 144.983 | 2.231 / 46.534 | 0.206 / 55.048 | 0.314 / -165.924 |
| 2.000GHZ | 0.557 / 140.559 | 2.020 / 41.993 | 0.226 / 52.733 | 0.326 / -168.695 |
| 2.200GHZ | 0.565 / 135.284 | 1.857 / 37.346 | 0.244 / 50.652 | 0.343 / -171.739 |
| 2.400GHZ | 0.570 / 130.975 | 1.711 / 33.229 | 0.264 / 48.411 | 0.360 / -174.174 |
| 2.600GHZ | 0.583 / 126.800 | 1.595 / 28.764 | 0.285 / 46.279 | 0.375 / -177.914 |
| 2.800GHZ | 0.589 / 121.429 | 1.489 / 24.630 | 0.303 / 43.628 | 0.384 / -177.681 |
| 3.000GHZ | 0.594 / 117.227 | 1.404 / 21.306 | 0.316 / 41.389 | 0.409 / 178.251 |

VCE = 6V, Icc = 30mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.520 / -168.626 | 9.389 / 88.510 | 0.058 / 63.696 | 0.281 / -134.488 |
| 600.0MHZ | 0.524 / -178.959 | 6.393 / 80.357 | 0.081 / 64.520 | 0.268 / -145.684 |
| 800.0MHZ | 0.532 / 173.180 | 4.856 / 73.588 | 0.101 / 62.984 | 0.263 / -153.952 |
| 1.000GHZ | 0.533 / 166.655 | 3.899 / 67.473 | 0.124 / 61.947 | 0.274 / -159.903 |
| 1.200GHZ | 0.533 / 160.717 | 3.287 / 62.454 | 0.145 / 61.965 | 0.274 / -160.167 |
| 1.400GHZ | 0.536 / 154.681 | 2.842 / 56.579 | 0.165 / 59.448 | 0.295 / -164.485 |
| 1.600GHZ | 0.544 / 149.741 | 2.507 / 51.854 | 0.187 / 57.609 | 0.305 / -166.543 |
| 1.800GHZ | 0.549 / 144.174 | 2.255 / 46.829 | 0.206 / 55.254 | 0.314 / -168.110 |
| 2.000GHZ | 0.554 / 139.892 | 2.042 / 42.328 | 0.228 / 53.103 | 0.327 / -171.022 |
| 2.200GHZ | 0.564 / 134.619 | 1.878 / 37.739 | 0.249 / 50.604 | 0.343 / -173.739 |
| 2.400GHZ | 0.569 / 130.332 | 1.730 / 33.716 | 0.266 / 48.433 | 0.359 / -176.172 |
| 2.600GHZ | 0.580 / 126.219 | 1.615 / 29.229 | 0.285 / 45.952 | 0.375 / -179.349 |
| 2.800GHZ | 0.586 / 120.651 | 1.506 / 25.162 | 0.304 / 43.597 | 0.382 / -179.513 |
| 3.000GHZ | 0.590 / 116.626 | 1.421 / 21.817 | 0.321 / 40.941 | 0.409 / 176.699 |

VCE = 6V, Icc = 35mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.514 / -170.908 | 9.452 / 88.097 | 0.056 / 63.409 | 0.275 / -137.063 |
| 600.0MHz | 0.528 / 179.828 | 6.433 / 80.115 | 0.079 / 65.041 | 0.266 / -148.457 |
| 800.0MHz | 0.531 / 172.391 | 4.886 / 73.487 | 0.102 / 65.466 | 0.264 / -156.103 |
| 1.000GHz | 0.534 / 165.755 | 3.924 / 67.417 | 0.123 / 62.764 | 0.276 / -161.738 |
| 1.200GHz | 0.531 / 159.988 | 3.305 / 62.463 | 0.145 / 62.791 | 0.277 / -161.985 |
| 1.400GHz | 0.539 / 154.175 | 2.859 / 56.587 | 0.167 / 60.433 | 0.297 / -165.832 |
| 1.600GHz | 0.545 / 149.091 | 2.523 / 51.893 | 0.188 / 57.602 | 0.307 / -167.937 |
| 1.800GHz | 0.549 / 143.583 | 2.267 / 46.973 | 0.210 / 55.519 | 0.315 / -169.584 |
| 2.000GHz | 0.556 / 139.239 | 2.053 / 42.538 | 0.230 / 53.267 | 0.329 / -172.297 |
| 2.200GHz | 0.564 / 134.095 | 1.890 / 37.950 | 0.250 / 50.676 | 0.343 / -174.871 |
| 2.400GHz | 0.568 / 130.130 | 1.741 / 33.943 | 0.269 / 48.320 | 0.357 / -177.311 |
| 2.600GHz | 0.580 / 125.794 | 1.625 / 29.506 | 0.288 / 45.779 | 0.374 / 179.334 |
| 2.800GHz | 0.585 / 120.468 | 1.517 / 25.453 | 0.307 / 43.601 | 0.384 / 179.303 |
| 3.000GHz | 0.590 / 116.244 | 1.432 / 22.090 | 0.322 / 40.912 | 0.407 / 175.872 |

VCE = 6V, Icc = 40mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.516 / -171.755 | 9.506 / 87.713 | 0.057 / 65.818 | 0.277 / -138.769 |
| 600.0MHz | 0.528 / 178.321 | 6.454 / 79.894 | 0.081 / 65.657 | 0.269 / -150.032 |
| 800.0MHz | 0.534 / 171.426 | 4.906 / 73.340 | 0.102 / 65.886 | 0.266 / -157.427 |
| 1.000GHz | 0.536 / 165.258 | 3.937 / 67.362 | 0.124 / 63.397 | 0.276 / -162.829 |
| 1.200GHz | 0.535 / 159.337 | 3.317 / 62.447 | 0.144 / 63.389 | 0.279 / -163.088 |
| 1.400GHz | 0.537 / 153.791 | 2.869 / 56.641 | 0.166 / 60.734 | 0.297 / -167.344 |
| 1.600GHz | 0.545 / 148.686 | 2.530 / 51.979 | 0.189 / 58.457 | 0.307 / -169.182 |
| 1.800GHz | 0.548 / 143.451 | 2.277 / 47.054 | 0.210 / 56.143 | 0.315 / -170.395 |
| 2.000GHz | 0.557 / 138.845 | 2.061 / 42.613 | 0.231 / 53.738 | 0.329 / -173.052 |
| 2.200GHz | 0.564 / 133.791 | 1.896 / 38.083 | 0.252 / 50.930 | 0.343 / -175.978 |
| 2.400GHz | 0.569 / 129.630 | 1.748 / 34.106 | 0.271 / 48.169 | 0.357 / -177.855 |
| 2.600GHz | 0.580 / 125.326 | 1.633 / 29.670 | 0.289 / 46.202 | 0.374 / 178.274 |
| 2.800GHz | 0.586 / 119.890 | 1.522 / 25.651 | 0.308 / 43.502 | 0.383 / 178.832 |
| 3.000GHz | 0.588 / 116.020 | 1.436 / 22.259 | 0.323 / 40.781 | 0.405 / 175.138 |

VCE = 6V, Icc = 50mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.521 / -174.271 | 9.519 / 87.216 | 0.056 / 67.248 | 0.278 / -141.934 |
| 600.0MHz | 0.530 / 176.963 | 6.469 / 79.574 | 0.079 / 67.031 | 0.267 / -151.912 |
| 800.0MHz | 0.536 / 170.198 | 4.912 / 73.115 | 0.101 / 67.631 | 0.267 / -159.091 |
| 1.000GHz | 0.537 / 164.175 | 3.941 / 67.217 | 0.126 / 65.531 | 0.280 / -164.570 |
| 1.200GHz | 0.534 / 158.607 | 3.324 / 62.353 | 0.149 / 63.861 | 0.277 / -164.343 |
| 1.400GHz | 0.542 / 152.830 | 2.871 / 56.587 | 0.169 / 60.791 | 0.297 / -168.321 |
| 1.600GHz | 0.548 / 147.875 | 2.537 / 51.988 | 0.190 / 58.830 | 0.307 / -170.599 |
| 1.800GHz | 0.551 / 142.552 | 2.280 / 47.080 | 0.212 / 56.280 | 0.317 / -171.373 |
| 2.000GHz | 0.558 / 138.383 | 2.064 / 42.696 | 0.233 / 53.495 | 0.330 / -174.208 |
| 2.200GHz | 0.566 / 133.169 | 1.899 / 38.143 | 0.253 / 51.483 | 0.345 / -176.790 |
| 2.400GHz | 0.571 / 129.045 | 1.750 / 34.234 | 0.273 / 48.775 | 0.358 / -179.166 |
| 2.600GHz | 0.583 / 124.909 | 1.636 / 29.828 | 0.291 / 45.814 | 0.374 / 177.445 |
| 2.800GHz | 0.589 / 119.446 | 1.525 / 25.678 | 0.309 / 43.296 | 0.380 / 177.813 |
| 3.000GHz | 0.591 / 115.497 | 1.439 / 22.462 | 0.324 / 40.754 | 0.404 / 174.177 |

VCE = 6V, Icc = 60mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.524 / -176.222 | 9.478 / 86.828 | 0.053 / 67.939 | 0.269 / -143.725 |
| 600.0MHz | 0.533 / 175.899 | 6.438 / 79.294 | 0.079 / 67.520 | 0.265 / -153.382 |
| 800.0MHz | 0.540 / 169.398 | 4.887 / 72.898 | 0.101 / 67.404 | 0.265 / -160.181 |
| 1.000GHz | 0.542 / 163.449 | 3.923 / 67.011 | 0.126 / 65.962 | 0.278 / -165.224 |
| 1.200GHz | 0.541 / 157.848 | 3.305 / 62.142 | 0.148 / 64.105 | 0.280 / -165.010 |
| 1.400GHz | 0.545 / 152.478 | 2.859 / 56.400 | 0.169 / 61.647 | 0.297 / -169.067 |
| 1.600GHz | 0.552 / 147.409 | 2.524 / 51.831 | 0.192 / 59.143 | 0.307 / -170.984 |
| 1.800GHz | 0.556 / 142.065 | 2.267 / 46.905 | 0.212 / 56.683 | 0.317 / -171.968 |
| 2.000GHz | 0.563 / 137.944 | 2.054 / 42.563 | 0.233 / 53.930 | 0.330 / -174.456 |
| 2.200GHz | 0.568 / 132.821 | 1.890 / 38.034 | 0.254 / 51.297 | 0.344 / -177.253 |
| 2.400GHz | 0.574 / 128.669 | 1.742 / 34.060 | 0.274 / 48.865 | 0.359 / -179.371 |
| 2.600GHz | 0.585 / 124.515 | 1.625 / 29.663 | 0.293 / 46.057 | 0.373 / 177.238 |
| 2.800GHz | 0.591 / 119.256 | 1.520 / 25.633 | 0.310 / 43.206 | 0.380 / 177.727 |
| 3.000GHz | 0.596 / 115.072 | 1.433 / 22.301 | 0.327 / 41.015 | 0.405 / 173.975 |

VCE = 8V, Icc = 3mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|-----------------|----------------|------------------|
| 400.0MHz | 0.678 / -113.165 | 5.406 / 105.617 | 0.109 / 35.377 | 0.569 / -64.137 |
| 600.0MHz | 0.636 / -136.802 | 3.932 / 89.927 | 0.118 / 27.881 | 0.475 / -77.341 |
| 800.0MHz | 0.617 / -152.645 | 3.071 / 78.009 | 0.117 / 25.741 | 0.430 / -86.672 |
| 1.000GHz | 0.608 / -164.972 | 2.500 / 67.897 | 0.115 / 26.824 | 0.414 / -95.944 |
| 1.200GHz | 0.610 / -174.267 | 2.109 / 59.917 | 0.116 / 30.945 | 0.418 / -101.518 |
| 1.400GHz | 0.613 / 176.761 | 1.828 / 51.598 | 0.119 / 36.084 | 0.433 / -110.444 |
| 1.600GHz | 0.625 / 169.082 | 1.606 / 44.880 | 0.128 / 41.512 | 0.446 / -117.126 |
| 1.800GHz | 0.633 / 161.646 | 1.434 / 38.344 | 0.139 / 47.158 | 0.469 / -122.951 |
| 2.000GHz | 0.646 / 155.306 | 1.287 / 32.633 | 0.157 / 50.545 | 0.490 / -129.496 |
| 2.200GHz | 0.659 / 148.396 | 1.172 / 27.238 | 0.177 / 52.534 | 0.511 / -135.970 |
| 2.400GHz | 0.669 / 142.536 | 1.068 / 22.750 | 0.202 / 53.419 | 0.531 / -141.780 |
| 2.600GHz | 0.684 / 136.830 | 0.984 / 18.170 | 0.227 / 52.239 | 0.554 / -148.527 |
| 2.800GHz | 0.693 / 130.013 | 0.904 / 14.294 | 0.251 / 51.474 | 0.572 / -152.346 |
| 3.000GHz | 0.699 / 124.932 | 0.841 / 11.443 | 0.274 / 49.953 | 0.601 / -158.670 |

VCE = 8V, Icc = 5mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|-----------------|----------------|------------------|
| 400.0MHz | 0.609 / -127.513 | 6.713 / 100.511 | 0.091 / 33.725 | 0.460 / -77.743 |
| 600.0MHz | 0.586 / -148.380 | 4.750 / 86.986 | 0.098 / 34.845 | 0.380 / -90.707 |
| 800.0MHz | 0.577 / -162.498 | 3.663 / 76.707 | 0.105 / 35.990 | 0.341 / -100.344 |
| 1.000GHz | 0.573 / -173.195 | 2.965 / 67.905 | 0.111 / 39.286 | 0.330 / -109.442 |
| 1.200GHz | 0.572 / 178.416 | 2.502 / 60.866 | 0.119 / 42.533 | 0.337 / -113.634 |
| 1.400GHz | 0.577 / 170.392 | 2.167 / 53.270 | 0.133 / 45.112 | 0.354 / -121.828 |
| 1.600GHz | 0.589 / 163.767 | 1.909 / 47.162 | 0.147 / 48.341 | 0.367 / -127.218 |
| 1.800GHz | 0.596 / 156.952 | 1.710 / 41.072 | 0.162 / 49.324 | 0.388 / -131.668 |
| 2.000GHz | 0.608 / 151.431 | 1.540 / 35.576 | 0.179 / 51.030 | 0.410 / -137.251 |
| 2.200GHz | 0.618 / 145.063 | 1.409 / 30.258 | 0.198 / 51.127 | 0.429 / -142.684 |
| 2.400GHz | 0.628 / 139.792 | 1.289 / 25.751 | 0.222 / 50.871 | 0.453 / -147.732 |
| 2.600GHz | 0.642 / 134.602 | 1.193 / 20.825 | 0.242 / 49.801 | 0.473 / -153.537 |
| 2.800GHz | 0.652 / 128.236 | 1.101 / 16.591 | 0.263 / 48.532 | 0.494 / -156.316 |
| 3.000GHz | 0.660 / 123.495 | 1.028 / 13.342 | 0.285 / 46.643 | 0.523 / -162.027 |

VCE = 8V, Icc = 7mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.576 / -137.412 | 7.500 / 97.333 | 0.081 / 41.229 | 0.394 / -88.115 |
| 600.0MHz | 0.560 / -155.937 | 5.238 / 85.211 | 0.089 / 41.349 | 0.329 / -101.848 |
| 800.0MHz | 0.557 / -168.710 | 4.020 / 75.920 | 0.102 / 43.769 | 0.299 / -112.117 |
| 1.000GHz | 0.552 / -178.648 | 3.244 / 67.832 | 0.113 / 46.913 | 0.294 / -121.269 |
| 1.200GHz | 0.554 / 174.067 | 2.732 / 61.388 | 0.125 / 49.389 | 0.300 / -124.020 |
| 1.400GHz | 0.561 / 166.588 | 2.367 / 54.296 | 0.141 / 49.803 | 0.317 / -131.400 |
| 1.600GHz | 0.568 / 160.187 | 2.088 / 48.525 | 0.156 / 50.901 | 0.331 / -135.920 |
| 1.800GHz | 0.576 / 153.840 | 1.873 / 42.684 | 0.174 / 51.763 | 0.351 / -139.639 |
| 2.000GHz | 0.587 / 148.649 | 1.691 / 37.469 | 0.193 / 51.094 | 0.370 / -144.174 |
| 2.200GHz | 0.598 / 142.662 | 1.548 / 32.271 | 0.211 / 50.696 | 0.390 / -149.101 |
| 2.400GHz | 0.606 / 137.718 | 1.422 / 27.834 | 0.234 / 49.801 | 0.410 / -153.224 |
| 2.600GHz | 0.621 / 132.660 | 1.319 / 22.973 | 0.253 / 48.166 | 0.432 / -158.583 |
| 2.800GHz | 0.628 / 126.733 | 1.222 / 18.630 | 0.274 / 46.644 | 0.451 / -160.518 |
| 3.000GHz | 0.639 / 122.165 | 1.145 / 15.198 | 0.292 / 44.875 | 0.479 / -165.528 |

VCE = 8V, Icc = 10mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.547 / -146.727 | 8.168 / 94.608 | 0.070 / 42.679 | 0.341 / -99.451 |
| 600.0MHz | 0.541 / -163.335 | 5.646 / 83.715 | 0.082 / 46.648 | 0.295 / -114.175 |
| 800.0MHz | 0.543 / -174.340 | 4.312 / 75.247 | 0.099 / 48.767 | 0.270 / -124.248 |
| 1.000GHz | 0.541 / 176.854 | 3.479 / 67.802 | 0.114 / 52.449 | 0.275 / -132.579 |
| 1.200GHz | 0.542 / 170.028 | 2.930 / 61.795 | 0.131 / 53.611 | 0.278 / -134.583 |
| 1.400GHz | 0.548 / 162.944 | 2.536 / 55.092 | 0.148 / 53.452 | 0.298 / -140.986 |
| 1.600GHz | 0.556 / 157.077 | 2.238 / 49.675 | 0.167 / 53.242 | 0.310 / -144.980 |
| 1.800GHz | 0.561 / 151.062 | 2.008 / 44.095 | 0.185 / 52.829 | 0.326 / -147.611 |
| 2.000GHz | 0.573 / 146.071 | 1.815 / 39.113 | 0.203 / 52.028 | 0.345 / -151.795 |
| 2.200GHz | 0.583 / 140.298 | 1.668 / 34.124 | 0.223 / 50.591 | 0.363 / -155.912 |
| 2.400GHz | 0.590 / 135.701 | 1.530 / 29.754 | 0.243 / 49.176 | 0.383 / -159.572 |
| 2.600GHz | 0.603 / 130.974 | 1.426 / 24.966 | 0.262 / 47.442 | 0.401 / -164.219 |
| 2.800GHz | 0.611 / 125.061 | 1.325 / 20.630 | 0.282 / 45.401 | 0.419 / -165.379 |
| 3.000GHz | 0.618 / 120.809 | 1.243 / 17.173 | 0.300 / 43.327 | 0.447 / -170.079 |

VCE = 8V, Icc = 15mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.528 / -156.058 | 8.803 / 91.856 | 0.062 / 50.663 | 0.307 / -114.015 |
| 600.0MHz | 0.530 / -170.388 | 6.037 / 82.220 | 0.080 / 54.954 | 0.272 / -127.889 |
| 800.0MHz | 0.533 / -179.918 | 4.599 / 74.580 | 0.099 / 55.837 | 0.258 / -137.233 |
| 1.000GHz | 0.533 / 172.411 | 3.701 / 67.731 | 0.117 / 57.749 | 0.263 / -145.078 |
| 1.200GHz | 0.534 / 165.834 | 3.118 / 62.218 | 0.134 / 57.512 | 0.267 / -146.129 |
| 1.400GHz | 0.537 / 159.524 | 2.698 / 55.888 | 0.155 / 56.105 | 0.289 / -151.740 |
| 1.600GHz | 0.546 / 153.706 | 2.380 / 50.797 | 0.178 / 55.450 | 0.301 / -154.625 |
| 1.800GHz | 0.551 / 147.932 | 2.139 / 45.472 | 0.194 / 54.599 | 0.313 / -156.465 |
| 2.000GHz | 0.560 / 143.318 | 1.935 / 40.759 | 0.214 / 52.438 | 0.329 / -160.163 |
| 2.200GHz | 0.570 / 137.818 | 1.778 / 35.874 | 0.234 / 50.631 | 0.346 / -163.651 |
| 2.400GHz | 0.577 / 133.465 | 1.636 / 31.649 | 0.253 / 48.940 | 0.365 / -166.584 |
| 2.600GHz | 0.588 / 128.922 | 1.525 / 26.971 | 0.272 / 46.370 | 0.381 / -170.577 |
| 2.800GHz | 0.596 / 123.288 | 1.418 / 22.768 | 0.293 / 44.220 | 0.396 / -171.048 |
| 3.000GHz | 0.603 / 119.193 | 1.337 / 19.338 | 0.308 / 42.273 | 0.423 / -175.421 |

VCE = 8V, Icc = 20mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.523 / -161.730 | 9.114 / 90.424 | 0.059 / 54.927 | 0.287 / -122.732 |
| 600.0MHz | 0.525 / -174.322 | 6.229 / 81.477 | 0.080 / 57.803 | 0.266 / -135.838 |
| 800.0MHz | 0.529 / 177.217 | 4.742 / 74.196 | 0.100 / 60.615 | 0.257 / -144.488 |
| 1.000GHz | 0.530 / 169.815 | 3.811 / 67.701 | 0.120 / 59.805 | 0.265 / -151.663 |
| 1.200GHz | 0.529 / 163.581 | 3.212 / 62.353 | 0.140 / 59.696 | 0.268 / -152.126 |
| 1.400GHz | 0.535 / 157.365 | 2.778 / 56.277 | 0.160 / 57.936 | 0.290 / -157.620 |
| 1.600GHz | 0.543 / 152.124 | 2.451 / 51.342 | 0.180 / 56.466 | 0.299 / -160.200 |
| 1.800GHz | 0.549 / 146.368 | 2.202 / 46.170 | 0.201 / 54.397 | 0.311 / -161.662 |
| 2.000GHz | 0.556 / 141.805 | 1.993 / 41.573 | 0.220 / 52.771 | 0.325 / -164.512 |
| 2.200GHz | 0.566 / 136.513 | 1.833 / 36.831 | 0.239 / 50.801 | 0.343 / -167.839 |
| 2.400GHz | 0.570 / 132.164 | 1.687 / 32.684 | 0.259 / 48.449 | 0.359 / -170.602 |
| 2.600GHz | 0.582 / 127.941 | 1.573 / 28.071 | 0.279 / 46.114 | 0.376 / -174.480 |
| 2.800GHz | 0.589 / 122.361 | 1.466 / 23.981 | 0.296 / 43.881 | 0.387 / -174.524 |
| 3.000GHz | 0.596 / 118.120 | 1.382 / 20.555 | 0.314 / 41.562 | 0.413 / -178.682 |

VCE = 8V, Icc = 25mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.518 / -165.450 | 9.297 / 89.546 | 0.062 / 56.986 | 0.280 / -127.678 |
| 600.0MHz | 0.523 / -176.457 | 6.340 / 80.977 | 0.080 / 60.191 | 0.264 / -140.607 |
| 800.0MHz | 0.527 / 175.061 | 4.823 / 73.979 | 0.101 / 60.997 | 0.258 / -149.050 |
| 1.000GHz | 0.529 / 168.481 | 3.873 / 67.618 | 0.121 / 61.447 | 0.267 / -155.742 |
| 1.200GHz | 0.528 / 162.301 | 3.264 / 62.463 | 0.142 / 61.051 | 0.273 / -156.031 |
| 1.400GHz | 0.532 / 156.032 | 2.823 / 56.474 | 0.163 / 58.899 | 0.291 / -160.798 |
| 1.600GHz | 0.542 / 150.806 | 2.490 / 51.621 | 0.185 / 57.159 | 0.299 / -162.975 |
| 1.800GHz | 0.545 / 145.245 | 2.239 / 46.599 | 0.204 / 55.309 | 0.313 / -164.541 |
| 2.000GHz | 0.554 / 140.922 | 2.028 / 42.023 | 0.223 / 53.097 | 0.325 / -167.476 |
| 2.200GHz | 0.563 / 135.528 | 1.864 / 37.383 | 0.245 / 50.869 | 0.341 / -170.420 |
| 2.400GHz | 0.568 / 131.317 | 1.716 / 33.270 | 0.263 / 48.762 | 0.358 / -173.020 |
| 2.600GHz | 0.581 / 127.044 | 1.602 / 28.699 | 0.282 / 46.440 | 0.373 / -176.664 |
| 2.800GHz | 0.586 / 121.583 | 1.493 / 24.560 | 0.300 / 43.552 | 0.383 / -176.783 |
| 3.000GHz | 0.590 / 117.381 | 1.406 / 21.250 | 0.318 / 41.643 | 0.408 / 179.430 |

VCE = 8V, Icc = 30mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHz | 0.511 / -167.915 | 9.412 / 88.921 | 0.056 / 60.387 | 0.278 / -131.496 |
| 600.0MHz | 0.520 / -178.357 | 6.411 / 80.611 | 0.078 / 62.336 | 0.266 / -143.804 |
| 800.0MHz | 0.528 / 173.840 | 4.875 / 73.782 | 0.101 / 61.911 | 0.259 / -151.852 |
| 1.000GHz | 0.527 / 167.112 | 3.916 / 67.627 | 0.121 / 62.714 | 0.271 / -158.031 |
| 1.200GHz | 0.530 / 161.271 | 3.298 / 62.523 | 0.143 / 61.981 | 0.272 / -158.098 |
| 1.400GHz | 0.533 / 155.358 | 2.852 / 56.613 | 0.165 / 59.530 | 0.292 / -163.124 |
| 1.600GHz | 0.541 / 150.001 | 2.518 / 51.831 | 0.187 / 57.142 | 0.301 / -165.320 |
| 1.800GHz | 0.545 / 144.478 | 2.260 / 46.814 | 0.206 / 55.569 | 0.313 / -166.694 |
| 2.000GHz | 0.552 / 140.159 | 2.048 / 42.287 | 0.226 / 53.474 | 0.326 / -169.193 |
| 2.200GHz | 0.561 / 134.902 | 1.885 / 37.717 | 0.247 / 51.038 | 0.341 / -172.432 |
| 2.400GHz | 0.566 / 130.728 | 1.734 / 33.668 | 0.265 / 48.736 | 0.357 / -174.862 |
| 2.600GHz | 0.578 / 126.579 | 1.620 / 29.181 | 0.284 / 46.173 | 0.371 / -178.547 |
| 2.800GHz | 0.584 / 120.977 | 1.509 / 25.102 | 0.302 / 43.576 | 0.382 / -178.447 |
| 3.000GHz | 0.591 / 116.813 | 1.425 / 21.685 | 0.318 / 41.756 | 0.407 / 177.873 |

VCE = 8V, Icc = 35mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.512 / -169.735 | 9.480 / 88.465 | 0.054 / 61.465 | 0.275 / -134.229 |
| 600.0MHZ | 0.520 / -179.620 | 6.455 / 80.344 | 0.079 / 63.701 | 0.264 / -145.779 |
| 800.0MHZ | 0.529 / 172.928 | 4.905 / 73.627 | 0.101 / 64.437 | 0.261 / -153.776 |
| 1.000GHZ | 0.529 / 166.368 | 3.937 / 67.542 | 0.122 / 63.668 | 0.272 / -160.086 |
| 1.200GHZ | 0.530 / 160.446 | 3.317 / 62.547 | 0.145 / 62.788 | 0.273 / -159.805 |
| 1.400GHZ | 0.534 / 154.493 | 2.869 / 56.644 | 0.165 / 59.938 | 0.293 / -164.242 |
| 1.600GHZ | 0.540 / 149.520 | 2.530 / 51.918 | 0.186 / 58.669 | 0.302 / -166.537 |
| 1.800GHZ | 0.545 / 144.020 | 2.277 / 46.960 | 0.209 / 55.899 | 0.312 / -167.960 |
| 2.000GHZ | 0.553 / 139.715 | 2.061 / 42.488 | 0.228 / 53.505 | 0.325 / -170.400 |
| 2.200GHZ | 0.561 / 134.576 | 1.894 / 37.899 | 0.248 / 50.837 | 0.341 / -173.416 |
| 2.400GHZ | 0.566 / 130.201 | 1.745 / 33.891 | 0.269 / 48.878 | 0.356 / -175.951 |
| 2.600GHZ | 0.577 / 125.875 | 1.629 / 29.421 | 0.288 / 46.224 | 0.371 / -179.320 |
| 2.800GHZ | 0.583 / 120.628 | 1.520 / 25.306 | 0.306 / 43.517 | 0.381 / -179.330 |
| 3.000GHZ | 0.590 / 116.491 | 1.433 / 22.050 | 0.321 / 41.222 | 0.406 / 176.728 |

VCE = 8V, Icc = 40mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.514 / -170.855 | 9.514 / 88.138 | 0.058 / 65.043 | 0.274 / -136.767 |
| 600.0MHZ | 0.520 / 179.284 | 6.477 / 80.149 | 0.078 / 65.848 | 0.263 / -147.710 |
| 800.0MHZ | 0.528 / 171.852 | 4.919 / 73.518 | 0.101 / 65.641 | 0.260 / -155.191 |
| 1.000GHZ | 0.530 / 165.712 | 3.950 / 67.484 | 0.123 / 63.402 | 0.274 / -161.178 |
| 1.200GHZ | 0.529 / 159.782 | 3.328 / 62.491 | 0.146 / 62.592 | 0.275 / -160.957 |
| 1.400GHZ | 0.535 / 154.018 | 2.875 / 56.668 | 0.166 / 60.419 | 0.294 / -165.529 |
| 1.600GHZ | 0.541 / 148.774 | 2.540 / 51.979 | 0.188 / 57.877 | 0.303 / -167.334 |
| 1.800GHZ | 0.546 / 143.521 | 2.283 / 47.041 | 0.209 / 55.736 | 0.311 / -169.052 |
| 2.000GHZ | 0.553 / 139.223 | 2.066 / 42.602 | 0.229 / 53.575 | 0.326 / -171.403 |
| 2.200GHZ | 0.561 / 134.019 | 1.902 / 38.022 | 0.249 / 50.929 | 0.340 / -174.281 |
| 2.400GHZ | 0.566 / 129.904 | 1.752 / 34.027 | 0.270 / 48.628 | 0.355 / -176.624 |
| 2.600GHZ | 0.577 / 125.593 | 1.635 / 29.461 | 0.285 / 45.921 | 0.371 / 179.943 |
| 2.800GHZ | 0.583 / 120.184 | 1.524 / 25.473 | 0.306 / 43.357 | 0.380 / -179.586 |
| 3.000GHZ | 0.588 / 116.193 | 1.438 / 22.156 | 0.322 / 40.976 | 0.405 / 176.470 |

VCE = 8V, Icc = 50mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.515 / -173.408 | 9.538 / 87.668 | 0.056 / 67.374 | 0.274 / -139.119 |
| 600.0MHZ | 0.526 / 177.687 | 6.486 / 79.852 | 0.079 / 66.591 | 0.262 / -148.776 |
| 800.0MHZ | 0.532 / 170.844 | 4.925 / 73.331 | 0.102 / 66.631 | 0.260 / -156.445 |
| 1.000GHZ | 0.533 / 164.835 | 3.952 / 67.346 | 0.124 / 64.574 | 0.273 / -162.492 |
| 1.200GHZ | 0.532 / 158.909 | 3.330 / 62.395 | 0.146 / 63.304 | 0.275 / -162.031 |
| 1.400GHZ | 0.537 / 153.466 | 2.880 / 56.570 | 0.168 / 61.087 | 0.293 / -166.723 |
| 1.600GHZ | 0.545 / 148.325 | 2.541 / 51.935 | 0.189 / 58.683 | 0.302 / -168.405 |
| 1.800GHZ | 0.548 / 142.808 | 2.285 / 47.014 | 0.211 / 56.151 | 0.314 / -169.704 |
| 2.000GHZ | 0.556 / 138.522 | 2.070 / 42.590 | 0.232 / 53.963 | 0.326 / -172.310 |
| 2.200GHZ | 0.564 / 133.481 | 1.903 / 38.027 | 0.252 / 51.305 | 0.340 / -175.079 |
| 2.400GHZ | 0.568 / 129.396 | 1.752 / 34.038 | 0.271 / 48.817 | 0.355 / -177.331 |
| 2.600GHZ | 0.580 / 125.244 | 1.636 / 29.600 | 0.290 / 46.456 | 0.371 / 179.136 |
| 2.800GHZ | 0.585 / 119.748 | 1.527 / 25.482 | 0.307 / 43.500 | 0.380 / 179.281 |
| 3.000GHZ | 0.588 / 115.719 | 1.443 / 22.185 | 0.325 / 41.122 | 0.404 / 175.772 |

VCE = 8V, Icc = 60mA

| freq | S(1,1) | S(2,1) | S(1,2) | S(2,2) |
|----------|------------------|----------------|----------------|------------------|
| 400.0MHZ | 0.519 / -174.776 | 9.501 / 87.355 | 0.054 / 67.934 | 0.270 / -139.289 |
| 600.0MHZ | 0.527 / 176.547 | 6.457 / 79.621 | 0.076 / 68.450 | 0.262 / -149.799 |
| 800.0MHZ | 0.535 / 169.898 | 4.905 / 73.121 | 0.102 / 66.004 | 0.260 / -157.488 |
| 1.000GHZ | 0.537 / 164.107 | 3.936 / 67.120 | 0.124 / 65.886 | 0.272 / -163.009 |
| 1.200GHZ | 0.535 / 158.470 | 3.317 / 62.269 | 0.146 / 64.622 | 0.272 / -162.520 |
| 1.400GHZ | 0.540 / 152.781 | 2.867 / 56.426 | 0.168 / 61.681 | 0.293 / -166.766 |
| 1.600GHZ | 0.548 / 147.767 | 2.530 / 51.758 | 0.189 / 58.892 | 0.302 / -168.683 |
| 1.800GHZ | 0.552 / 142.451 | 2.273 / 46.832 | 0.211 / 56.510 | 0.312 / -170.090 |
| 2.000GHZ | 0.559 / 138.153 | 2.059 / 42.403 | 0.232 / 53.957 | 0.326 / -172.492 |
| 2.200GHZ | 0.566 / 133.066 | 1.895 / 37.869 | 0.252 / 51.144 | 0.339 / -175.273 |
| 2.400GHZ | 0.571 / 128.921 | 1.745 / 33.896 | 0.273 / 49.194 | 0.355 / -177.726 |
| 2.600GHZ | 0.581 / 124.782 | 1.631 / 29.431 | 0.290 / 46.260 | 0.370 / 178.856 |
| 2.800GHZ | 0.587 / 119.158 | 1.522 / 25.399 | 0.309 / 43.610 | 0.378 / 179.082 |
| 3.000GHZ | 0.593 / 115.303 | 1.435 / 21.965 | 0.325 / 40.916 | 0.401 / 175.647 |