BEFORE adding output stabilizing circuit:

Device is unstable for frequencies
in the band 2.0GHz-2.1GHz.

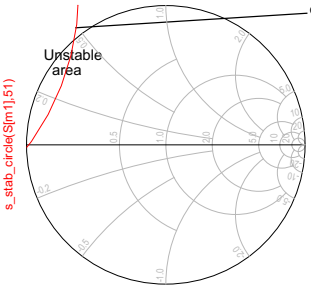
freq	Mu	K	B1
1.900 GHz	0.879	0.740	0.629
1.910 GHz	0.881	0.744	0.630
1.920 GHz	0.883	0.748	0.631
1.930 GHz	0.886	0.753	0.632
1.940 GHz	0.888	0.757	0.634
1.950 GHz	0.890	0.761	0.635
1.960 GHz	0.892	0.765	0.636
1.970 GHz	0.895	0.770	0.637
1.980 GHz	0.897	0.774	0.639
1.990 GHz	0.899	0.778	0.640
2.000 GHz	0.902	0.783	0.641
2.010 GHz	0.903	0.785	0.642
2.020 GHz	0.904	0.788	0.643
2.030 GHz	0.906	0.790	0.644
2.040 GHz	0.907	0.793	0.645
2.050 GHz	0.908	0.795	0.647
2.060 GHz	0.910	0.798	0.648
2.070 GHz	0.911	0.801	0.649
2.080 GHz	0.912	0.803	0.650
2.090 GHz	0.913	0.806	0.651
2.100 GHz	0.915	0.808	0.652
2.110 GHz	0.916	0.811	0.653
2.120 GHz	0.917	0.814	0.654
2.130 GHz	0.919	0.816	0.655
2.140 GHz	0.920	0.819	0.656
2.150 GHz	0.922	0.822	0.657
2.160 GHz	0.923	0.825	0.658
2.170 GHz	0.924	0.827	0.659
2.180 GHz	0.926	0.830	0.660
2.190 GHz	0.927	0.833	0.661
2.200 GHz	0.928	0.836	0.662

Mu and K factors
show device is unstable
in the band 2.0GHz-2.1GHz.

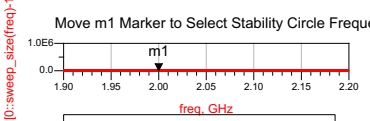
unconditionally stable if:
Mu > 1 and B1 > 0
or
K > 1

Source Stability Circle at Frequency of m1 Marker

The source stability circle shows all values
of source impedance for |S22|=1.



Move m1 Marker to Select Stability Circle Frequency

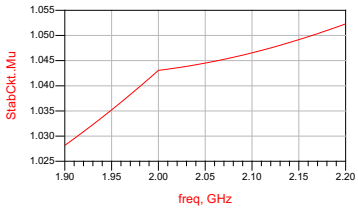


m1
indep(m1)=2.000 G
vs([0::sweep_size(freq)-1],freq)=10.00

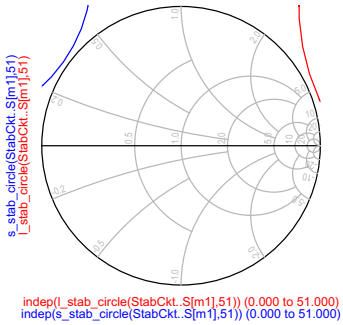
At 2GHz, |S22|<1, so 50 Ohms is a stable source
impedance, therefore this area is the stable area.
This can also be seen by using the "s_stab_region" function:

s_stab_region(S[m1])
Outside

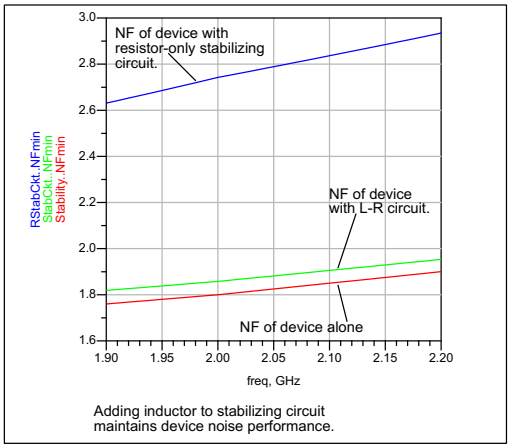
AFTER adding output stabilizing circuit:



Device with stabilizing circuit on output
is unconditionally stable at all frequencies.



Load and source stability circles now fall
outside Smith Chart. All passive source and
load terminations will produce stable circuit.



Adding inductor to stabilizing circuit
maintains device noise performance.

Results at m1 marker frequency:

Stability..Mu[m1]	StabCkt..Mu[m1]
0.902	1.043

MU > 1 - circuit now
stable at the price of...

Stability..NFmin[m1]	StabCkt..NFmin[m1]	...in[m1] - NFmin[m1]
1.800	1.858	0.058

XXX dB higher NF

dB(Stability..S(2,1)[m1])	dB(StabCkt..S(2,1)[m1])	...B(StabCkt..S(2,1)[m1])
8.787	8.574	0.213

and XXX dB drop in gain.

Sopt at 1GHz, used in Matching.dsn

mag(StabCkt..Sopt[9])	phase(StabCkt..Sopt[9])
0.445	98.137

freq	RStabCkt..Sopt	Stability..Sopt	StabCkt..Sopt
1.900 GHz	0.500 / 100.525	0.450 / 93.000	0.454 / 93.746
1.910 GHz	0.499 / 100.970	0.449 / 93.500	0.453 / 94.233
1.920 GHz	0.498 / 101.416	0.448 / 94.000	0.452 / 94.720
1.930 GHz	0.497 / 101.861	0.447 / 94.500	0.451 / 95.208
1.940 GHz	0.496 / 102.308	0.446 / 95.000	0.450 / 95.695
1.950 GHz	0.495 / 102.754	0.445 / 95.500	0.449 / 96.183
1.960 GHz	0.494 / 103.201	0.444 / 96.000	0.448 / 96.671
1.970 GHz	0.493 / 103.648	0.443 / 96.500	0.447 / 97.160
1.980 GHz	0.492 / 104.096	0.442 / 97.000	0.446 / 97.648
1.990 GHz	0.491 / 104.543	0.441 / 97.500	0.445 / 98.137
2.000 GHz	0.490 / 104.992	0.440 / 98.000	0.444 / 98.626
2.010 GHz	0.489 / 105.323	0.440 / 98.410	0.443 / 99.023
2.020 GHz	0.489 / 105.655	0.440 / 98.820	0.443 / 99.421
2.030 GHz	0.489 / 105.986	0.439 / 99.230	0.443 / 99.818
2.040 GHz	0.488 / 106.318	0.439 / 99.640	0.443 / 100.216
2.050 GHz	0.488 / 106.650	0.439 / 100.050	0.442 / 100.614
2.060 GHz	0.488 / 106.983	0.439 / 100.460	0.442 / 101.012
2.070 GHz	0.487 / 107.315	0.439 / 100.870	0.442 / 101.410
2.080 GHz	0.487 / 107.648	0.438 / 101.280	0.442 / 101.808
2.090 GHz	0.487 / 107.981	0.438 / 101.690	0.441 / 102.207
2.100 GHz	0.486 / 108.314	0.438 / 102.100	0.441 / 102.606
2.110 GHz	0.486 / 108.647	0.438 / 102.510	0.441 / 103.005
2.120 GHz	0.486 / 108.981	0.438 / 102.920	0.441 / 103.404
2.130 GHz	0.485 / 109.315	0.437 / 103.330	0.441 / 103.804
2.140 GHz	0.485 / 109.649	0.437 / 103.740	0.440 / 104.204
2.150 GHz	0.485 / 109.983	0.437 / 104.150	0.440 / 104.603
2.160 GHz	0.484 / 110.317	0.437 / 104.560	0.440 / 105.003
2.170 GHz	0.484 / 110.652	0.437 / 104.970	0.440 / 105.404
2.180 GHz	0.484 / 110.986	0.436 / 105.380	0.439 / 105.804
2.190 GHz	0.483 / 111.322	0.436 / 105.790	0.439 / 106.204
2.200 GHz	0.483 / 111.657	0.436 / 106.200	0.439 / 106.605