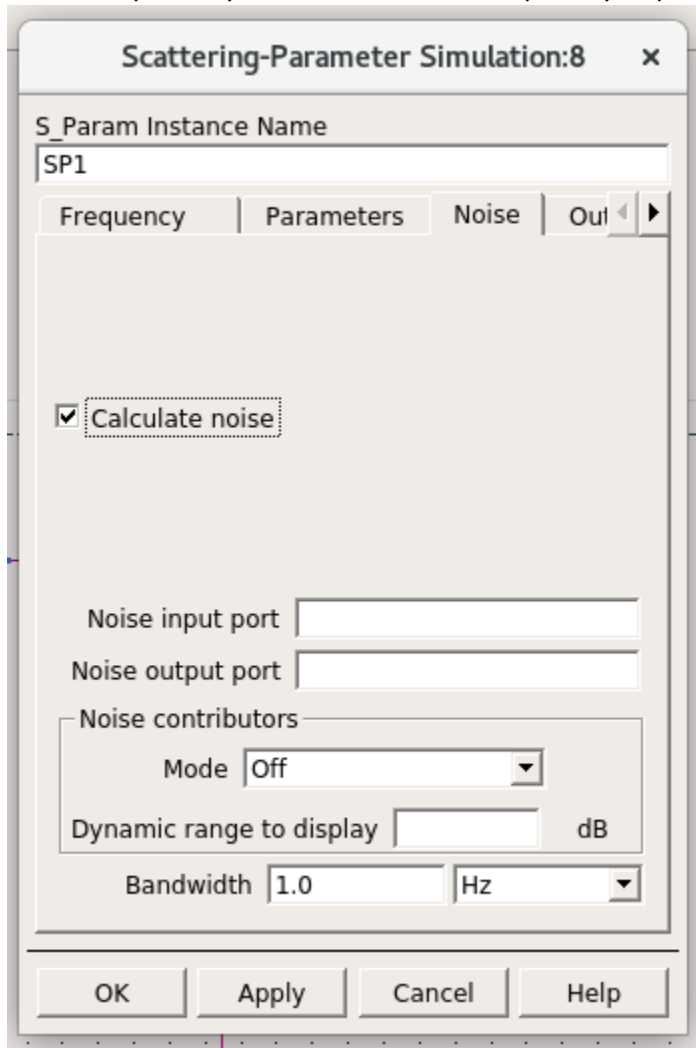
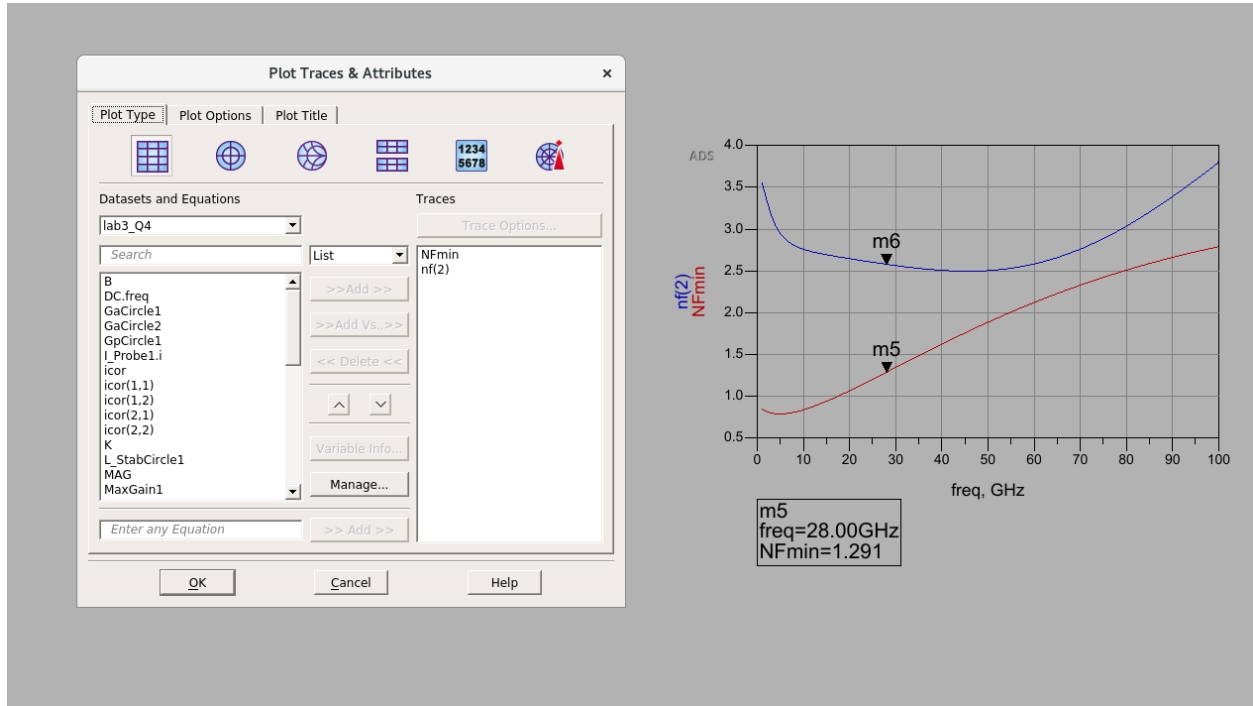


Noise Simulation in ADS

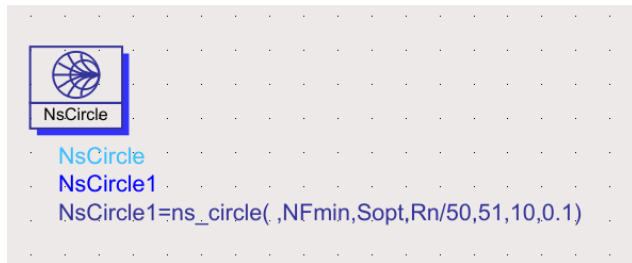
1. Enable “Calculate noise” in S-parameter controller. When you have only 2 ports you don’t have to specify input and output ports.



2.If your input port in the schematic has “NUM=1” and output port has “NUM=2”, nf(2) plots the noise figure as shown below. NFmin plots the minimum possible noise figure.nf(1) would treat port 1 as output giving incorrect values



3.The noise circles controller has to be added to generate noise circles.



Syntax

`y = ns_circle(nf2, NFmin, Sopt, rn, numOfPts, numCircles, NFStep)`

Arguments

Name	Description	Range	Type	Default	Required
nf2	specified noise figure	$(-\infty, \infty)$	real	+	no
NFmin	minimum noise figure	$[0, \infty)$	integer or real		yes
Sopt	optimum mismatch	$[0, \infty)$	complex		yes
rn	equivalent normalized noise resistance of a 2-port network †	$[0, \infty)$	complex		yes
numOfPts	desired number of points per circle	$[1, \infty)$	integer	51	no
numCircles	number of desired circles. This is used if nf2 is not specified.	$[0, \infty)$	integer		no
NFStep	nf step size. This is used if nf2 is not specified.	$[0, \infty)$	integer or real	1.0	no

† If nf2 is NULL or not specified the default is $\max(\text{NFmin}) + \{0, 1, 2, 3\}$. ‡ $rn = Rn/zRef$ where Rn is the equivalent noise resistance and $zRef$ is the reference impedance.

If nf2 is not specified, and numCircles is given, then numCircles nf2 circles are drawn at NFStep above $\max(\text{NFmin})$.

The equation in the figure above plots 10 circles with increments of 0.1 dB noise figure. AS shown below. The center of the circles is the optimum noise match required to get NFmin, and the remaining the circles are are at increments of 0.1 dB noise figure. While simulating noise circles choose only the design frequency in your sweep if not you will get circles at each frequency.(similar to gain circles)

