

MIXER_F

Where To Find This Example

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Or in Version 13 or higher you can open the project directly from this page using this button. Make sure to select the **Enable Guided Help** before clicking this button.

Open Install Example

Design Notes

WJ SME 1400B 10 One Tone Diagram:

This example demonstrates the VSS file based mixer MIXER_F. The gain conversion (GCONV) of the mixer is set to -7.5dB. The oscillator frequency (fLO) is set to 2000MHz and its power (PLO) is 10dBm. The input tone (fInp) is set to 1950MHz and its power (PIn) is -10dBm.

MIXER_F is dependent on an external spur table. The data file "WJ SME 1400B 10" is derived from the datasheet for the WJ SME 1400B-10 mixer. The first row of the data file is designated as a comment by the exclamation mark and is used to number the columns.

The first column/first row value, 0, is ignored since it does not correspond to any harmonic or intermodulation product.

Each row represents the input harmonics, each column represents the LO harmonics, with the top row and left column representing the first harmonic. For example, the value 33 in column 2, row 1 (the first row is 0 since there is no input contribution to the LO harmonics) of the data file designates a 33dBc spur at $2*f_{LO} - 1*f_{Inp}$ (2050MHz) and $2*f_{LO} + 1*f_{Inp}$ (5950MHz).

Values in the table greater than or equal to 100 indicate no spur is to be generated. The actual limit is determined by the SUPPLIM parameter. The expected spurs for the above settings are:

LO (n)	RF (m)	MHz	dBc	dBm
1	-1	50	0	-17.5
2	-2	100	56	-73.5
3	-3	150	68	-85.5*
-1	2	1900	55	-72.5
0	1	1950	27	-44.5
1	0	2000	34	-51.5
2	-1	2050	33	-50.5
3	-2	2100	55	-72.5
4	-3	2150	73	-90.5
-1	3	3850	69	-86.5
0	2	3900	63	-80.5
1	1	3950	0	-17.5
2	0	4000	44	-61.5
3	-1	4050	12	-29.5
4	-2	4100	59	-76.5
5	-3	4150	47	-64.5
1	2	5900	55	-72.5
2	1	5950	33	-50.5
3	0	6000	46	-63.5
4	-1	6050	35	-52.5
5	-2	6100	59	-76.5
0	4	7800	77	-94.5
1	3	7850	69	-86.5*
2	2	7900	56	-73.5
3	1	7950	12	-29.5
4	0	8000	57	-74.5
5	-1	8050	28	-45.5

The mixer LOHTYP parameter is set to "dBc LO" according to the WJ SME 1400B specs. With PLO=10dBm, the LO harmonics should be:

MHz dBm

1xLO 2000 -24

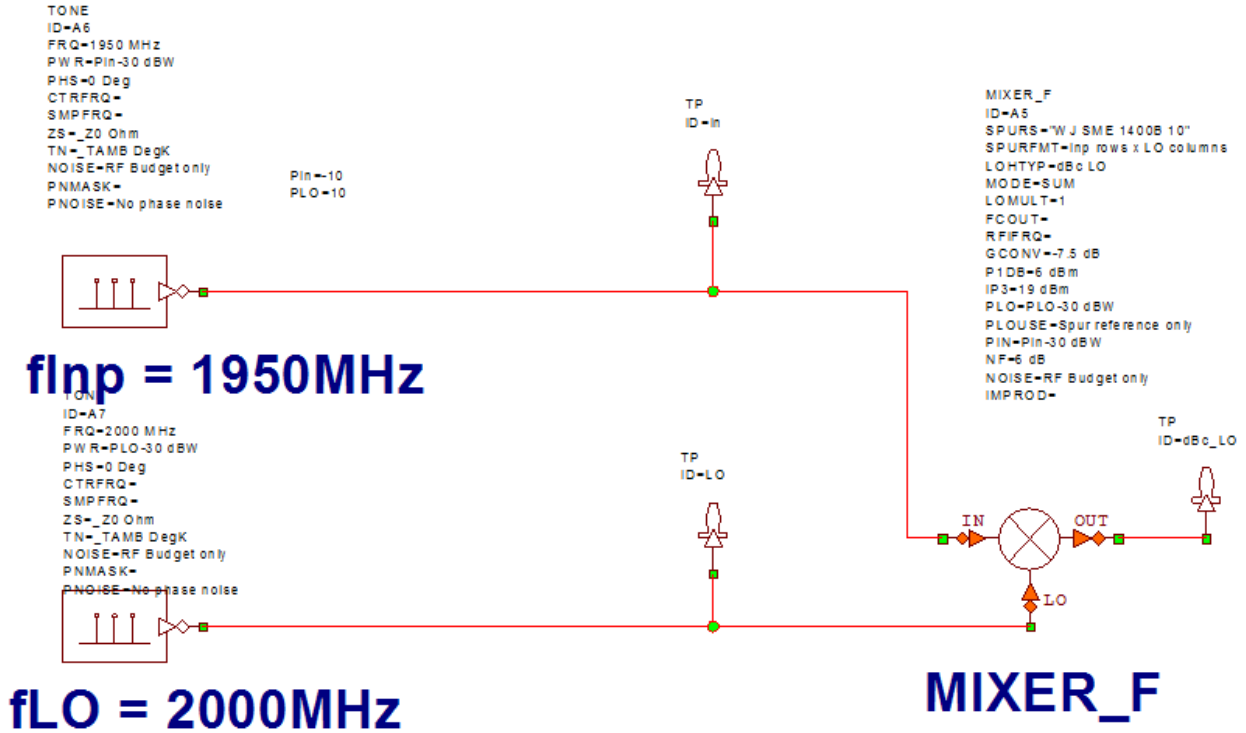
2xLO 4000 -34

3xLO 6000 -36

4xLO 8000 -47

The results shown in the graph "WJ SME 1400B Spectrum" graph agree with the values in the above table. For example, the 7900MHz tone in the graph is at -73.5dBm, which agrees with the value in the table. An RFI spectral measurement is also plotted.

System Diagram - WJ SME 1400B 10 One Tone



Graph - WJ SME 1400B 10 Spectrum

+ DB(PWR_SPEC(TP.In,50,4,50,5,-1,0,-1,0,1,0,0,0,0)) (dBm) + DB(PWR_SPEC(TP.dBc_LO,25,4,25,5,-1,0,-1,0,1,0,0,0,0)) (dBm)
+ DB(PWR_SPEC(TP.LO,50,4,50,5,-1,0,-1,0,1,0,0,0,0)) (dBm) ◇ DB(|RFI_PWR_SPEC(TP.dBc_LO,TP.In,1,0,0,0,0)) (dBm)

WJ SME 1400B 10 Spectrum

