

Speaker design program in Excel. There are more comments on the Documentation sheet.
Note that there are 2 columns for 2 designs, so you can do comparisons.
User inputs are in yellow. Edit other cells only with extreme caution
This pukey color highlights things that you should look at. Everything else, shown in normal background color, is stuff that the program is calculating for itself

Step 1. Enter the Thiele-Small parameters for the drivers that you are considering. Make sure

Thiele-Small Parameters	Design 1	Design 2	Units	SI Units 1	SI Units 2	Units
Name of design	3015LF-8	18		3015LF-8	18	
Fs	44	19.5	Hz	44	19.5	Hz
Re	5.5	4.4	Ohms	5.5	4.4	Ohms
Qes	0.48	0.62		0.48	0.62	
Qms	8.97	3.82		8.97	3.82	
Vas	150.9	212	liters	0.1509	0.212	m^3
Sd	881.1	1219	cm^2	0.08811	0.1219	m^2
Xmax	9.6	22	mm	0.0096	0.022	m
Le	0.93	2.22	mH	0.00093	0.00222	H
Nominal driver impedance	8	4	Ohms	8	4	Ohms
Driver "RMS" rated power	500	1000	W			

Step 2. Enter the major parameters of your box design. Note that the port tuning frequency is

Number of drivers	1	1		1	1	
Box volume	130	115	liters	0.13	0.115	m^3
Port tuning frequency	46	20	Hz	46	20	Hz
Input power for sensitivity graph	1	1	W	1	1	W
Input power for excursion graph	500	1000	W	500	1000	W
Additional series resistance	0.1	0.1	Ohms	0.1	0.1	Ohms

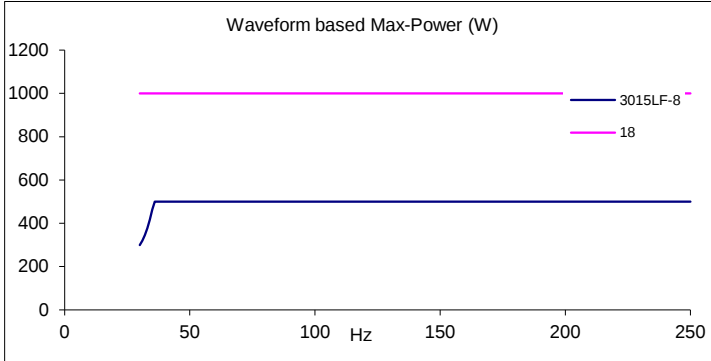
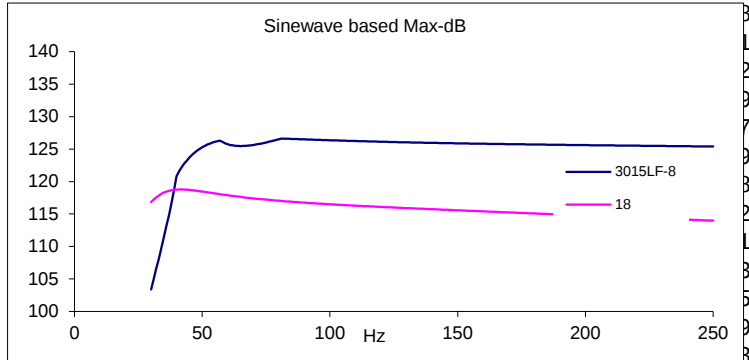
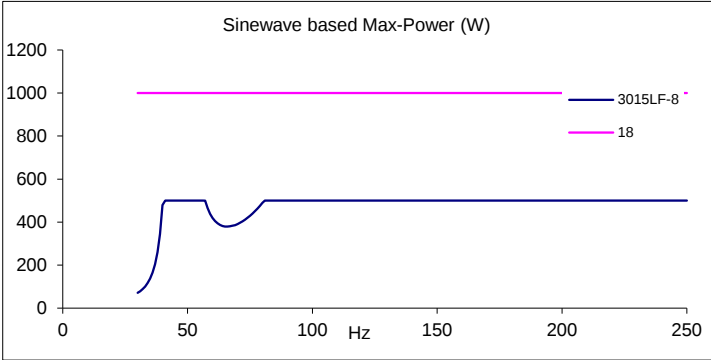
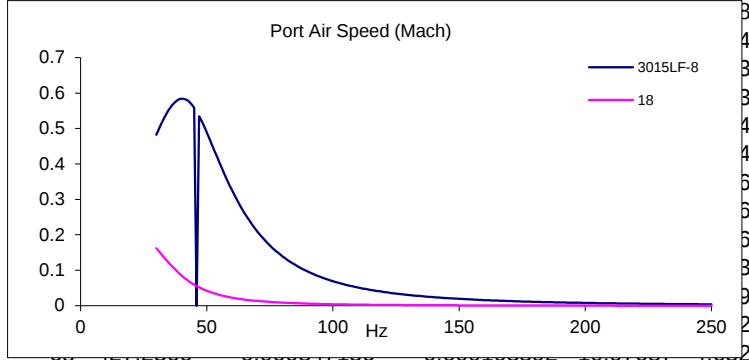
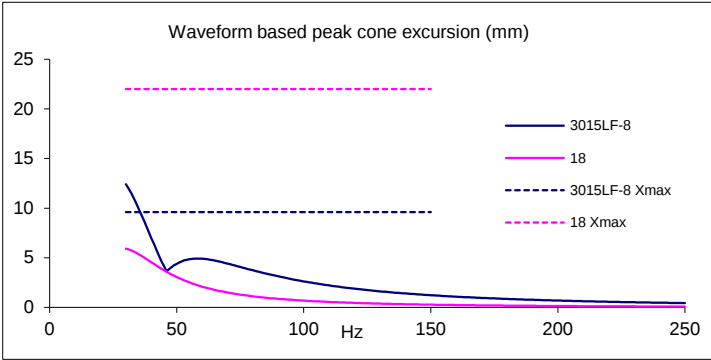
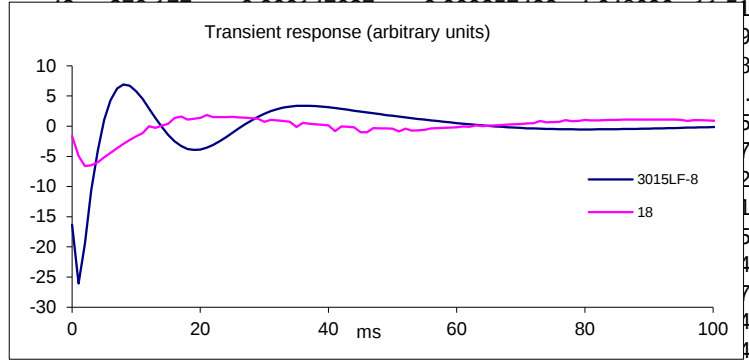
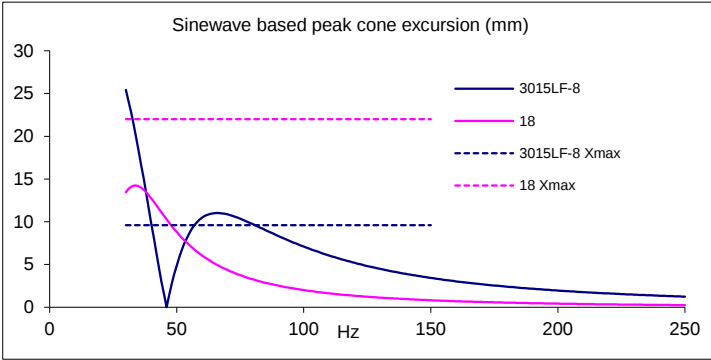
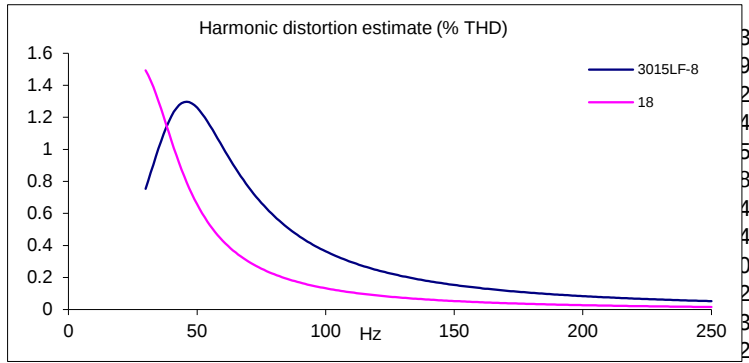
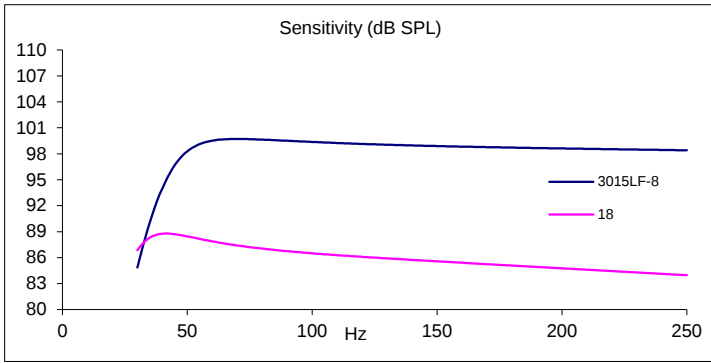
Some computed analysis of the system			
Computed approx. sensitivity	97.6	85.3	dB at 10 kHz w/o inductance
Max sensitivity	99.8	88.8	dB
Max sens. W/o inductance	99.8	86.8	dB
Height of hump	2.2	1.4	dB
Peak frequency	70.0	41.0	Hz
3 dB frequency	45.0	0.0	Hz
10 dB frequency	34.0	0.0	Hz

Step 3. Design your port.

Port type (0=Round 1=Rect.)	1	1	Rect.	Rect.
Number of ports	2	2		
Port end correction (see below)	0.614	0.732	0.614	0.732
Circular port calculations				
Port diameter	7.5	7.5 cm	0.075	0.075 m
Diameter in inches	2.952756	2.952756 in		
Port area			0.004418	0.004418 m^2
Rectangular port calculations				
Port width	9.5	9.5 cm	0.095	0.095 m
Port height	4	4 cm	0.04	0.04 m
Port width in inches	3.740157	3.740157 in		
Port height in inches	1.574803	1.574803 in		
Port area			0.0038	0.0038 m^2
Dimension for end correction			0.04	0.04 m^2
Total port area			0.0076	0.0076 m^2
Table of port end corrections				
Two flanged ends	0.85			
One flanged, one free (typical)	0.732			
Both ends free	0.614			

Results up to this point: The computed length of the port.					
Length of port	5.955052	47.37009	cm	0.059551	0.473701 m
Length of port in inches	2.344509	18.64964	in		

freq ang freq x rms 1 x rms 2 x mm 1 x mm 2
30 188.4956 0.000804153 0.000300739 25.42572 13.44745



82	515.2212	0.000298422	6.91068E-05	9.435501	3.090085
83	521.5044	0.000294039	6.73142E-05	9.296925	3.009927
84	527.7876	0.000289651	6.55883E-05	9.158172	2.932754
85	534.0708	0.000285268	6.39259E-05	9.019597	2.858419
86	540.3539	0.0002809	6.23239E-05	8.881508	2.786789
87	546.6371	0.000276557	6.07796E-05	8.744172	2.717735
88	552.9203	0.000272244	5.92901E-05	8.607818	2.651135
89	559.2035	0.000267969	5.78531E-05	8.472644	2.586877
90	565.4867	0.000263736	5.6466E-05	8.338817	2.524853
91	571.7699	0.000259551	5.51265E-05	8.206481	2.464961
92	578.053	0.000255416	5.38327E-05	8.075756	2.407106
93	584.3362	0.000251336	5.25823E-05	7.946741	2.351197
94	590.6194	0.000247312	5.13735E-05	7.819519	2.297147
95	596.9026	0.000243347	5.02046E-05	7.694158	2.244878