Thiele/Small Low Frequency Driver Parameters and Definitions

NOTE: The Parameters marked with an (*) asterisk are the minimum set required for a complete low frequency system design.

SMALL SIGNAL

PARAMETER	DESCRIPTION	UNITS
*f_S	Resonance frequency of driver in free-air	hertz
*Q_{ts}	Total of driver at "fs" including driver loss mechanism	dimensionless
*Eff	Reference efficiency h_o (half-space acoustic load)	%
*V_{as}	Volume of air having same acoustic compliance as driver suspension	cubic feet
Q_{es}	Q of driver as "f_S"considering electromagnetic damping only	dimensionless
Q_{ms}	Q of driver at "f_S"considering mechanical loss mechanism only (non-electromagnetic)	dimensionless
L_e	Voice coil inductance	mH

LARGE SIGNAL

PARAMETER	DESCRIPTION	UNITS
*P_e(Max)	Thermally-limited maximum electrical input power	watts
X_{max}	Peak linear displacement of driver diaphragm (0 to peak)	inches
S_D	Effective projected surface area of driver diaphragm	square inches
*V_D	Peak displacement volume of driver diaphragm (0 to peak)	cubic inches
*R_E	dc resistance of driver voice coil	ohms

MISC. DATA

PARAMETER	DESCRIPTION	UNITS
Dia	Piston diameter	inches
Bl	Bl Product	N/A (Newtons/ampere)
M_{ms}	Effective moving mass	grams
flux	Flux density	tesla

Thiele/Small Parameters of JBL Drivers

MODEL	fs	Qts	Qms	Qes	Vas	Eff	Pe	Xmax	VD	Re	Le	SD	Dia	Bl	Mms	flux
112A	40	.21	4.0	.22	1.2	.90	60	.11	3	5.8	0.3	28.3	6.0	12.0	22	0.95
116A	28	.46	5.0	.51	2.6	.30	50	.19	5	5.2	0.6	28.3	6.0	6.7	25	0.85
122A	17	.23	7.0	0.24	12.0	.67	50	.27	22	5.7	1.5	81.7	10.2	16.0	100	1.08
123A	25	.49	8.5	.52	8.3	.68	50	.31	23	4.4	0.6	75.4	9.8	8.9	85	1.00
124A	16	.14	6.0	.14	14.1	1.1	100	.20	16	6.3	1.4	81.7	10.2	21.0	100	1.20
125A	25	.43	7.5	.46	8.3	.77	50	.19	14	5.2	0.7	75.4	9.8	7.5	32	0.85
127A	25	.43	7.5	.46	8.3	.77	50	.19	14	5.2	0.7	75.4	9.8	7.5	32	0.85
127H	25	.43	7.5	.46	8.4	.77	50	.19	9	6.6	0.7	49.0	7.9	7.5	33	1.07
128H	20	.24	7.0	.25	9.9	.86	100	.31	25	5.7	0.6	81.7	10.2	16.0	90	1.07
130A	37	.18	4.0	.19	10.5	7.7	100	.08	11	5.7	0.8	138.9	13.3	22.5	70	1.10
136A	16	.21	5.5	.22	26.0	1.4	100	.20	27	6.3	1.4	136.8	13.2	21.0	151	1.20
2105H	200	.53	3.0	.65	.035	1.2	25	.06	1	6.1	0.3	9.6	3.5	6.6	3.5	1.35
2108	40	.17	4.5	.18	1.3	1.2	75	.06	2	5.8	0.5	28.3	6.0	13.0	20	1.02
2110	60	.31	3.5	.34	1.2	2.1	25	.10	3	6.0	0.3	33.2	6.5	6.8	11	0.85
2115A	55	.48	4.0	.54	1.2	1.0	30	.22	6	5.5	0.3	28.3	6.0	6.8	11	0.85
2118H	85	.35	2.4	.40	0.5	2.1	100	.12	4	5.5	0.6	33.2	6.5	11.0	17	1.05
2118J	85	.35	2.4	.40	0.5	2.1	100	.12	4	10.3	0.9	33.2	6.5	15.0	17	1.05
2120	65	.36	4.0	.40	1.6	3.0	75	.06	3	6.0	0.4	49.0	7.9	10.3	17	1.02
2121	35	.19	5.5	.20	3.9	2.7	75	.06	3	6.8	0.9	49.0	7.9	12.7	25	1.00
2121H	35	.16	5.5	.17	3.9	2.7	75	.06	3	6.0	0.8	49.0	7.9	13.7	26	1.02
2122H	40	.23	1.9	.26	2.3	2.4	100	.12	6	5.8	0.6	50.3	8.0	13.2	28	1.02
2123H	85	.32	2.5	.37	0.7	3.5	250	.10	5	4.2	0.4	49.0	7.9	13.0	25	1.07
2123J	85	.32	2.5	.37	0.7	3.5	250	.10	5	8.7	0.8	49.0	7.9	18.7	25	1.07
2125	45	.45	4.5	.50	4.8	2.5	50	.10	8	6.0	0.5	81.7	10.2	12.4	45	1.00
2130	50	.20	4.0	.21	4.3	6.9	100	.06	5	6.3	0.6	81.7	10.2	18.0	35	1.20
2135	40	.25	4.0	.27	10.5	6.7	125	.06	8	6.3	0.6	138.6	13.2	18.0	60	1.20
2142H	72	.75	4.2	.92	1.6	1.82	100	.25	20	5.2	0.85	81.7	10.2			
2145A	30	.51	12.0	.53	5.5	.76	50	.14	10	5.0	0.4	67.9	9.3	9.4	50	1.00
2150	55	.64	5.0	.73	3.5	2.2	50	.10	12	5.5	1.0	116.9	12.2	22.3	105	1.20
2152H	85	.39	3.3	.44	1.3	5.1	150	0.1	8	4.5	0.5	81.7	10.2			
2155H	53	.47	4.47	.53	5.8	4.4	150	0.1	14	4.2	0.48	138.9	13.3			
2202A	50	.17	3.5	.18	3.1	5.5	100	.12	10	5.5	1.0	81.7	10.2	22.0	50	1.20
2202H	50	.16	3.5	.18	3.1	6.0	150	.14	11	5.5	1.1	81.7	10.2	22.5	50	1.20
2202J	50	.16	4.3	.18	3.1	6.0	150	.14	11	11.0	1.8	81.7	10.2	27.8	50	1.20
2203A	16	.14	6.0	.14	14.1	1.1	100	.20	16	6.3	1.4	81.7	10.2	21.0	100	1.20
2203H	16	.14	6.0	.14	14.1	1.1	100	.20	16	6.3	1.4	81.7	10.2	21.0	100	1.20
2204H	45	.35	1.7	.44	3.1	1.8	350	.27	22	6.2	0.7	83.3	10.3	15.0	57	1.20
2204J	45	.35	1.7	.44	3.1	1.8	350	.27	22	12.4	1.6	83.3	10.3	25.5	57	1.20
2205A	30	.21	5.0	.22	10.5	3.5	150	.10	14	5.5	1.3	138.9	13.3	22.3	105	1.20
2205H	30	.21	5.0	.22	10.5	3.5	150	.10	14	5.5	1.3	138.9	13.3	22.3	105	1.20
2206H	52	.32	4.45	.34	2.2	2.5	600	.30	25	5.3	1.5	84.9	10.4	18.1	65	
2213	25	.49	8.5	.52	8.3	.68	50	.31	23	4.4	0.6	75.4	9.8	8.9	85	1.00
2213H	25	.49	8.5	.52	8.3	.68	75	.31	23	4.4	0.6	75.4	9.8	8.9	85	1.00
2214H	23	.24	10.5	.25	7.9	1.1	200	.26	21	5.6	1.3	81.7	10.2	16.0	90	1.07
2215H	20	.21	5.5	.22	26.0	2.6	100	.16	22	5.7	1.0	138.9	13.3	22.0	97	0.90
2215A	20	.21	5.5	.22	26.0	2.6	100	.16	22	8.8	2.2	136.8	13.2	22.0	97	0.90
2220A	37	.18	4.0	.19	10.5	7.7	100	.08	11	5.7	0.8	138.9	13.3	22.5	70	1.10
2220H	37	.17	5.0	.18	10.5	8.7	200	.12	17	5.7	1.0	138.9	13.3	22.5	70	1.15
2220J	37	.17	5.0	.18	10.5	8.7	200	.12	17	13.2	2.0	138.9	13.3	34.0	70	1.15
2225H	40	.28	2.5	.31	6.0	3.5	200	.20	28	6.3	1.1	138.9	13.3	23.0	105	1.20
MODEL	fs	Qts	Qms	Qes	Vas	Eff	Pe	Xmax	VD	Re	Le	SD	Dia	Bl	Mms	flux

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MODEL	fs	Qts	Qms	Qes	Vas	Eff	Pe	Xmax	VD	Re	Le	SD	Dia	Bl	Mms	flux
2225J	40	.28	2.5	.31	6.0	3.5	200	.20	28	12.9	2.2	138.9	13.3	34.0	105	1.20
2226G	40	.31	5.0	.33	6.2	3.3	600	.30	41	2.5	0.92	136.8	13.2	13.5	98	
2226H	40	.31	5.0	.33	6.2	3.3	600	.30	41	5.0	1.75	136.8	13.2	19.2	98	
2226J	40	.31	5.0	.33	6.2	3.3	600	.30	41	10.0	3.5	136.8	13.2	27.1	98	
2231A	16	.21	5.5	.22	26.0	1.4	100	.20	27	6.3	1.4	136.8	13.2	21.0	151	1.20
2231H	16	.21	5.5	.22	26.0	1.4	100	.20	27	6.3	1.4	136.8	13.2	21.0	151	1.20
2234H	23	.22	2.0	.25	16.2	2.1	150	.33	46	6.0	1.2	138.9	13.3	20.5	105	1.20
2235H	20	.25	2.5	.28	16.2	1.3	150	.33	46	6.0	1.2	138.9	13.3	20.5	155	1.20
2240G	30	.25	2.5	.25	17.0	5.0	300	.22	44	2.5	0.7	201.1	16.0	17.1	164	1.22
2240H	30	.23	2.2	.25	17.0	5.0	300	.22	44	6.0	1.4	201.1	16.0	25.0	164	1.22
2241G	35	.40	5.7	.43	11.0	2.9	600	.30	57	2.5	0.86	191.1	15.6	13.6	145	
2241H	35	.40	5.7	.43	11.0	2.9	600	.30	57	5.0	1.75	191.1	15.6	19.2	145	
2245H	20	.27	2.2	.27	29.0	2.1	300	.38	76	5.8	1.4	201.1	16.0	21.0	185	1.22
D123	45	.45	4.5	.50	4.8	2.5	50	.10	8	6.0	0.5	81.7	10.2	12.4	45	1.00
D130	40	.25	4.0	.27	10.5	6.7	75	.03	4	6.3	0.6	139	13.3	18.0	60	1.20
D131	50	.18	8.5	.18	4.5	8.4	75	.03	2	6.3	0.5	81.7	10.2	18.0	35	1.20
D208	60	.31	3.5	.34	1.2	2.1	25	.10	3	6.0	0.3	33.2	6.5	6.8	11	0.85
E110	65	.36	4.0	.40	1.6	3.0	75	.10	5	6.0	0.4	49.0	7.9	12.1	21	1.03
E120	60	.17	1.8	.19	2.8	8.6	150	.12	10	6.3	0.4	81.7	10.2	21.7	36	1.35
E130	40	.19	1.8	.21	10.5	8.6	150	.10	14	6.3	0.4	138.9	13.3	21.1	60	1.35
E140	32	.17	5.0	.19	10.5	4.9	200	.14	19	5.5	1.1	138.9	13.3	24.1	94	1.35
E145	35	.25	6.0	.26	9.7	4.3	150	.28	39	5.7	1.6	138.9	13.3	16.1	55	0.97
E155-4	30	.20	2.2	.22	15.0	4.9	300	.20	35	2.5	0.7	176.7	15.0	17.1	125	1.22
E155-8	30	.20	2.2	.22	15.0	4.9	300	.20	35	6.0	1.4	176.7	15.0	25.0	125	1.22
G125-8	65	.32	5.5	.34	2.5	5.5	200	.10	8	5.2	0.5	81.7	10.2	13.7	37	0.98
G135-8	45	.36	5.5	.38	8.3	5.5	200	.10	14	5.2	0.5	138.9	13.3	13.7	60	0.98
G135-A	45	.48	6.6	.51	7.7	3.8	200	.24	33	6.0	0.75	138.9	13.3	15.8	60	0.98
K110	65	.36	4.0	.40	1.6	3.0	75	.06	3	6.0	0.4	49.0	7.9	10.3	17	1.02
K120	50	.20	4.0	.21	4.3	6.9	100	.06	5	6.3	0.6	81.7	10.2	18.0	35	1.20
K130	40	.25	4.0	.27	10.5	6.7	125	.03	4	6.3	0.6	138.9	13.3	18.0	60	1.20
K140	30	.21	5.0	.22	10.5	3.5	150	.20	28	5.5	1.3	138.9	13.3	22.3	105	1.20
K145	35	.29	6.0	.30	8.6	3.4	150	.20	25	8.8	2.2	122.7	12.5	21.7	75	0.90
K151	30	.27	6.0	.28	12.9	3.4	150	.10	17	6.0	2.0	165.1	14.5	22.0	125	1.20
LE5-10	250	1.0	3.0	1.6	.026	.69	25	.06	1	6.0	.05	9.6	3.5	4.3	3	1.30
LE8T	45	.49	4.0	.55	1.2	0.5	25	.18	5	5.5	0.3	28.3	6.0	6.2	16	0.85
LE8TH	45	.56	4.0	.65	1.2	0.5	25	.22	6	5.5	0.3	28.3	6.0	6.2	16	0.85
LE10A	30	.41	6.0	.44	3.6	0.6	75	.24	12	4.4	0.6	49.0	7.9	8.1	35	1.02
LE10H	33	.37	6.9	.39	2.7	0.7	75	.24	12	4.8	0.6	49.0	7.9	9.7	40	1.02
LE111A	25	.17	6.0	.18	3.6	0.87	75	.24	12	5.7	1.5	49.0	7.9	16.0	50	1.08
LE12C	30	.51	12.0	.53	5.5	0.76	50	.14	10	5.0	0.4	67.9	9.3	9.4	50	1.00
LE14A	28	.32	6.5	.34	5.2	0.95	100	.20	20	6.3	1.4	102.1	11.4	21.5	140	1.20
LE14H	26	.27	2.3	.30	5.2	0.89	150	.33	34	5.9	1.3	102.1	11.4	22.0	139	1.25
LE15A	20	.21	5.5	.22	26.0	2.6	100	.16	22	8.8	2.2	136.8	13.2	22.0	97	0.90
MI-10	75	.33	1.8	.41	1.3	3.5	150	.12	6	5.6	0.6	52.8	8.2			
MI-12	65	.46	2.2	.58	2.7	3.5	150	.12	10	5.6	0.6	84.9	10.4			
MI-15	55	.62	2.8	.79	6.0	3.5	150	.12	17	5.6	0.6	138.9	13.3			
MI-15A	40	.42	4.0	.47	9.6	3.5	150	.14	19	5.6	0.9	138.9	13.3			
M121-8	60	.245	4.0	.25	2.5	6.0	300	.18	15	5.2	0.63	81.7	10.2	17.5	39	
M151-8	45	.25	4.8	.27	7.0	6.5	300	.20	27	4.8	0.72	136.8	13.2	18.8	70	
MODEL	fs	Qts	Qms	Qes	Vas	Eff	Pe	Xmax	VD	Re	Le	SD	Dia	Bl	Mms	flux