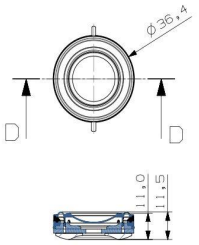
soundmatters

Twoofer^{TM} 25mm Parts Number SMM25-125-4-17k
Date: 2015-09-01
Rev.: 03

Product Description, Mechanical Drawing

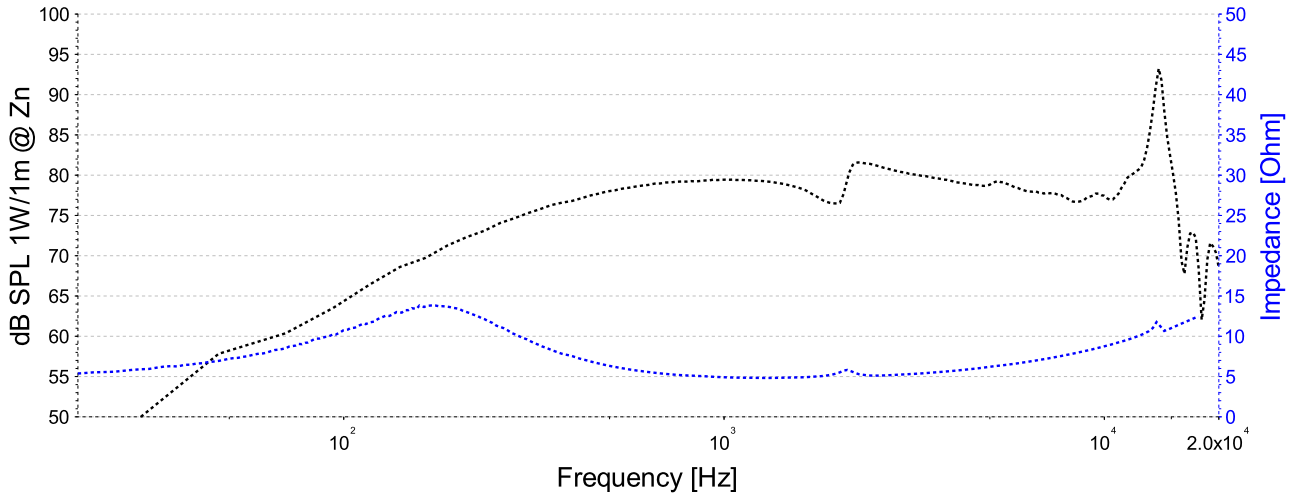
The Twoofer^{TM} 25mm is an efficient full bandwidth transducer with the ability to reproduce both high (tweeter) and low (woofer) frequencies from a small diameter (diaphragm diameter=25mm) speaker. The diaphragm of the speaker can communicate through central motor opening to passive radiator, embedded in enclosure to extend loudspeaker system bass performance. Typical applications: pocket-size portable devices, flat panel loudspeaker arrays.



Specifications [1]

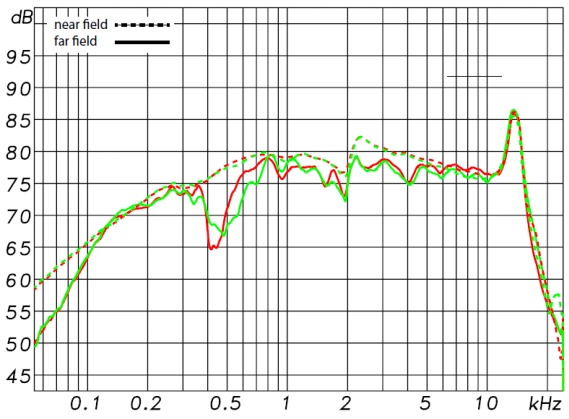
Nominal Impedance, Z_n	[Ohm]	6.0	Resonance Frequency , f_s	[Hz]	180
Minimum Impedance, Z_{min}	[Ohm]	4.8	DC Resistance, Re	[Ohm]	4.5
Long-term maximum power [2], P	[W]	4.0	Inductance , Le	[mH]	0.09
Nominal Sensitivity [3], L_{nom}	[dB]	80.5	Moving Mass, M_{ms}	[g]	1.1
Frequency Range (dB SPL -10dB) [4]	[Hz]	160 – 16000	Suspension Stiffness, K_{ms}	[N/mm]	1.1
Frequency Range (dB SPL +/-3dB) [5]	[Hz]	400 – 13000	Force Factor, Bl	[N/A]	3.5
Maximum Linear Excursion [6] , X_{max10}	[mm]	0.6	Motor Efficiency Factor, $(Bl)^2/R_e$	[N^2/W]	2.7
Maximum Excursion [7] , X_{mech}	[mm]	1.8	Mechanical Q factor, Q_{ms}	[-]	0.86
Transducer Height, h	[mm]	11.5	Electrical Q factor, Q_{es}	[-]	0.42
Transducer Diameter, d	[mm]	36.4	Total Q factor, Q_{ts}	[-]	0.28
Transducer Mass, m	[g]	36	Effective Volume, V_{as}	[l]	0.06
Ferrofluid	[-]	*Yes*	Effective Piston Area, S_D	[cm^2]	6.6

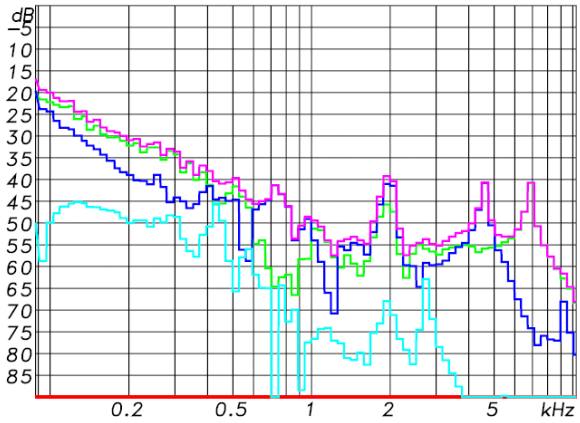
On-Axis Frequency Response [8], Impedance



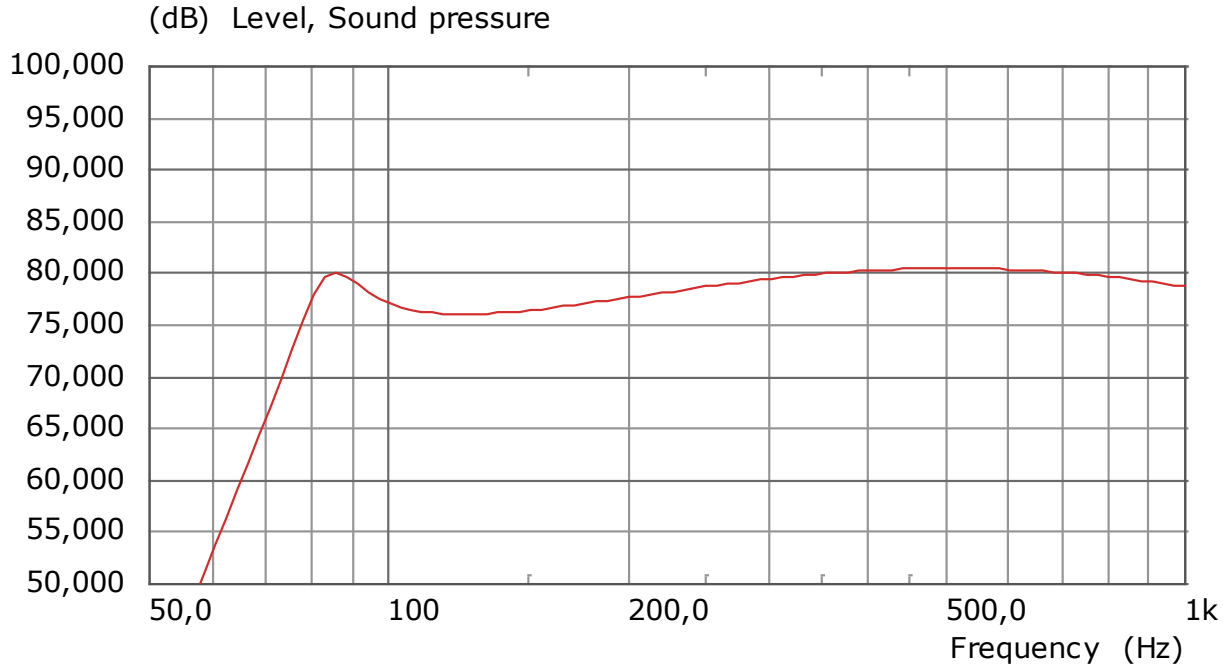
[1] Due to continuing product improvement, the features and the design are subject to change without notice.
[2] IEC 60268-5:2003 + A1:2007, pink noise $f \geq fs$, power calculated on nominal impedance, loudspeaker operated in free air.
[3] SPL at 1m for 1W @ Z_n based on TS-Parameters
[4] $f(SPL_{nom} - 10dB)$
[5] $f(SPL_{nom} + / - 3dB)$
[6] IEC 62458:2010, harmonic and intermodulation distortion < 10%
[7] IEC 62458:2010, maximum mechanical voice coil displacement
[8] Half-space frequency response is based on transducer vibration data

On-Axis Frequency Response [9], THD [10]





On-Axis System Frequency Response [11]



[9] IEC 60268-5:2003 + A1:2007, measurement shows SPL of two different Twoofer^{TM} 25mm transducers in far- and near field - single transducer mounted in standard baffle; SPL dip at 450Hz far-field measurement (1W/1m) is caused by diffraction of standard baffle (compare with near field measurement at 1W/10cm); nominal sensitivity in far-field $L_{nom} \approx 77.5$dB/1W/1m; SPL peak at f≈14kHz is caused by cone break-up.

[10] THD measurement in near field 1W/10cm, total harmonic distortion - violet, second harmonics - green, third harmonics - blue, fifth harmonics - cyan.

[11] BEM infinite baffle simulation; system comprises one Twoofer^{TM} 25mm dB SPL 1W/1m @ Zn + one passive radiator; passive radiator data: $S_P = 3 * S_D, M_{mp} = 9g, K_{mp} = 0.9N/mm$; box volume: $V_{box} = 0.35l$