

# SPECIFICATIONS



## WF090WA01/02 3½" paper cone mid/woofer, 4/8 ohm

The 3½" transducers WF090WA01 (4 ohm) and WF090WA02 (8 ohm) were designed especially for high quality multimedia and lifestyle speakers, where small size is required while still obtaining sound reproduction without compromises.

### FEATURES

- Vented voice coil former for reduced distortion and compression
- Vented chassis for lower air flow speed reducing audible distortion
- Voice coil wound with Copper Clad Aluminium Wire for higher efficiency and better dynamics
- Heavy-duty black fiber glass voice coil bobbin to increase power handling and reduce mechanical losses resulting in better dynamic performance and low-level details
- Low-loss suspension (high Qm) for better reproduction of details and dynamics
- Black magnet parts for better heat transfer to increase power handling
- Progressive suspension with specially designed CONEX damper (spider) for long durability under extreme operating conditions
- Gold plated terminals to prevent oxidation for long-term reliable connection
- Delivered with foam gasket attached for hassle-free mounting and secure cabinet sealing



### NOMINAL SPECIFICATIONS

Notes	Parameter	WF090WA01		WF090WA02		Unit
		Before burn-in	After burn-in	Before burn-in	After burn-in	
	Nominal size	3½		3½		[inch.]
	Nominal impedance	4		8		[ohm]
	Recommended max. upper frequency limit	5		5		[kHz]
1, 5	Sensitivity, 2.83V/1m (average SPL in range 400 - 6,000 Hz)	86.5		84		[dB]
2	Power handling, short term, IEC 268-5, no additional filtering	30		30		[W]
2	Power handling, long term, IEC 268-5, no additional filtering	15		15		[W]
2	Power handling, continuous, IEC 268-5, no additional filtering	8		8		[W]
	Effective radiating area, Sd	36		36		[cm <sup>2</sup> ]
3, 5, 7	Resonance frequency (free air, no baffle), F <sub>s</sub>	115	109	117	110	[Hz]
	Moving mass, incl. air (free air, no baffle), M <sub>ms</sub>	3.45		3.35		[g]
3	Force factor, Bxl	2.9		3.5		[N/A]
3, 5, 7	Suspension compliance, C <sub>ms</sub>	0.55	0.62	0.55	0.62	[mm/N]
3, 5, 7	Equivalent air volume, V <sub>as</sub>	1.02	1.14	1.02	1.14	[lit.]
3, 5, 7	Mechanical resistance, R <sub>ms</sub>	0.39	0.39	0.39	0.39	[Ns/m]
3, 5, 7	Mechanical Q, Q <sub>ms</sub>	6.4	6.1	6.3	6.0	[-]
3, 5, 7	Electrical Q, Q <sub>es</sub>	0.92	0.87	1.11	1.04	[-]
3, 5, 7	Total Q, Q <sub>ts</sub>	0.81	0.76	0.94	0.89	[-]
4	Voice coil resistance, R <sub>DC</sub>	3.1		5.5		[ohm]
6	Voice coil inductance, L <sub>e</sub> (measured at 10 kHz)	0.14		0.22		[mH]
	Voice coil inside diameter	22		22		[mm]
	Voice coil winding height	8.5		8.5		[mm]
	Air gap height	3		3		[mm]
	Theoretical linear motor stroke, X <sub>max</sub>	±2.75		±2.75		[mm]
	Magnet weight (dual neodymium)	135		135		[g]
	Total unit net weight excl. packaging	0.34		0.34		[kg]
3, 6	K <sub>rm</sub>					[mohm]
3, 6	E <sub>rm</sub>					[-]
3, 6	K <sub>xm</sub>					[mH]
3, 6	E <sub>xm</sub>					[-]

Note 1 Measured in infinite baffle.

Note 2 Tested in free air (no cabinet).

Note 3 Measured using a semi-constant current source, nominal level 2 mA.

Note 4 Measured at 20 deg. C

Note 5 Measured at 25 deg. C

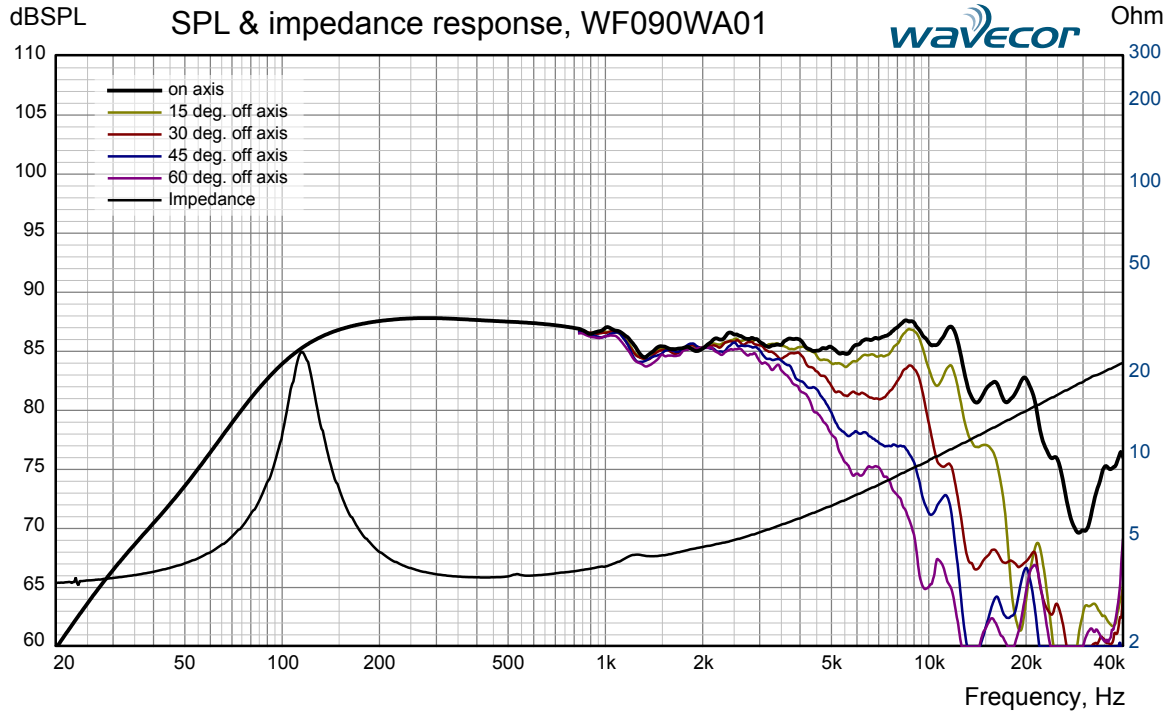
Note 6 It is generally a rough simplification to assume that loudspeaker transducer voice coils exhibit the characteristics of an inductor. Instead it is a far more accurate approach to use the more advanced model often referred to as the "Wright empirical model", also used in LEAP-4 as the TSL model ([www.linearx.com](http://www.linearx.com)), involving parameters K<sub>rm</sub>, E<sub>rm</sub>, K<sub>xm</sub>, and E<sub>xm</sub>. This more accurate transducer model is described in a technical paper [here at our web site](#).

Note 7 After burn-in specifications are measured at least 12 hours after exiting the transducer by a 20 Hz sine wave for 2 hours at level 2.83/4.0 V<sub>RMS</sub> (4/8 ohm version). Units are not burned in before shipping.

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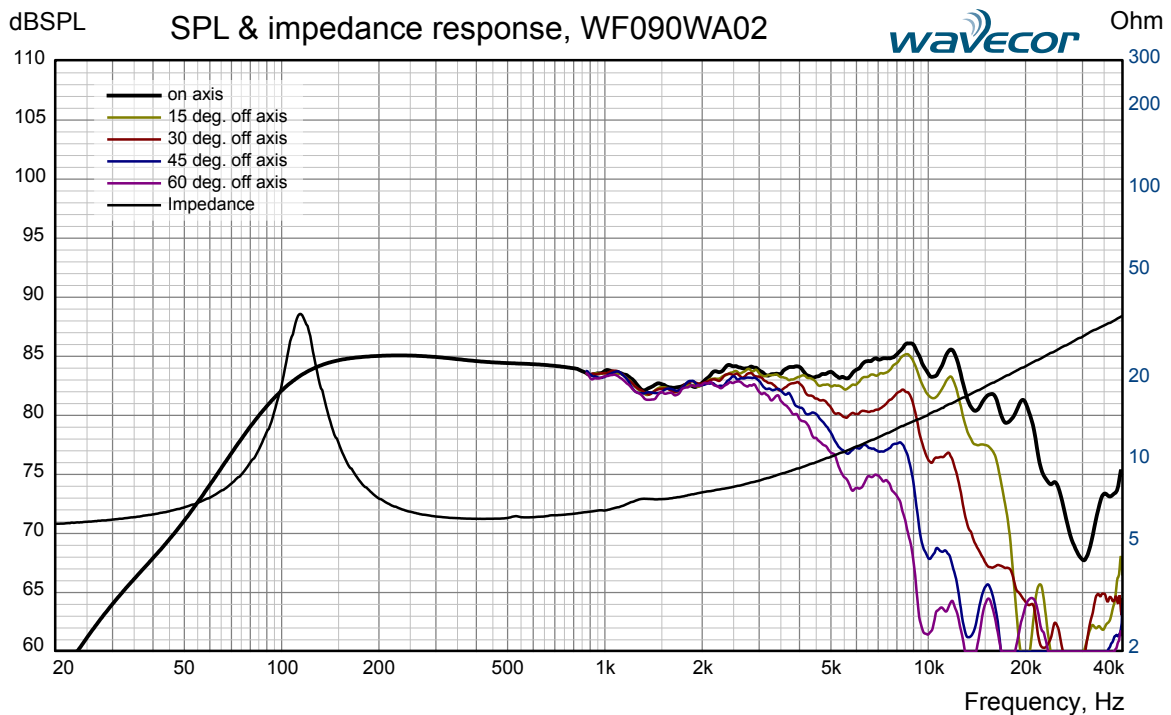


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Measuring conditions, SPL  
 Driver mounting: Flush in infinite baffle, back side open (no cabinet)  
 Microphone distance: 1.0 m  
 Input level: 2.83 VRMS  
 Smoothing: 1/6 oct.

Measuring conditions, impedance  
 Driver mounting: Free air, no baffle, back side open (no cabinet)  
 Input signal: Semi-current-drive, nominal current 2 mA  
 Smoothing: None



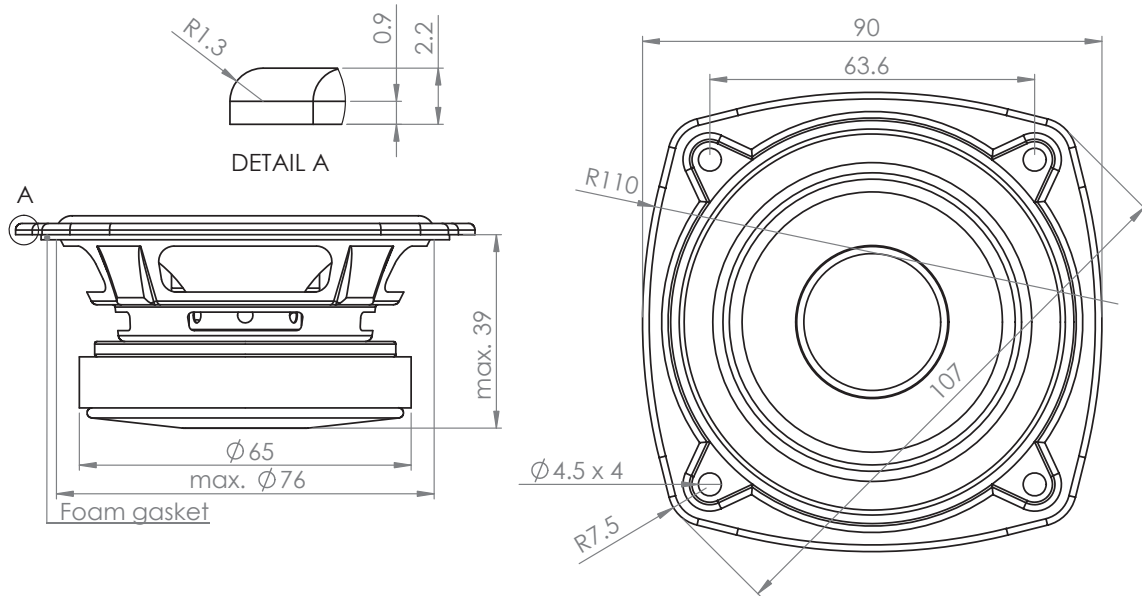
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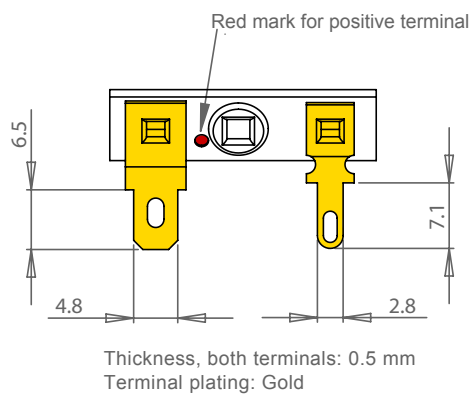


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## OUTLINE DRAWING (nominal dimensions, mm)



## CONNECTIONS (nominal dimensions, mm)



## PACKAGING AND ORDERING INFORMATION

Part no. WF090WA01-01	4 ohm version, packaged individually (one piece per box)
Part no. WF090WA01-02	4 ohm version, bulk packaging
Part no. WF090WA02-01	8 ohm version, packaged individually (one piece per box)
Part no. WF090WA02-02	8 ohm version, bulk packaging

Latest update: April 29, 2018