



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

Thank you for your interest in Hybrid Audio Technologies' Stage III wide-bandwidth, point source Legatia drivers, and specifically, the Legatia L8 Version 2 (L8V2) midrange/midbass. The Legatia L8V2 is the culmination of an inordinate amount of time and resources spent testing and refining this product to the exacting specifications of Hybrid Audio Technologies and our long heritage of quality speakers. We are certain that this product will provide class-leading performance that simply cannot be beat by competing brands if installed properly.



The Legatia L8V2 - A Brief History

The Legatia L8V2's topology is an enhanced "version 2" of the massively successful 'original' first-generation Stage III Legatia L8 transducer, which was first launched in September 2007 to an enthusiastic reception of car audio competitors, enthusiasts, and car audiophiles. In the years since its inception, the L8 midbass has been included in several International Auto Sound Challenge Association (IASCA®) national- and world-championship vehicles; the L8 was debuted initially by David Brooks in competition, and the first-generation L8 went undefeated in organized competition its first and second seasons, including the season-ending championships in 2007 and 2008. When it came time to enhance the L8, we were very cognoscente of the L8's midbass abilities, and had two general project objectives: 1) enhance the L8's ability to effectively reproduce a wider frequency spectrum for possible application as a dedicated midrange in a two-way application, and 2) to maintain, if not enhance the L8's lower-octave authority and impulse response through more displacement and lighter moving mass. The Legatia L8V2 joins Hybrid Audio Technologies' Legatia L1V2 as the second driver in the Legatia series to be enhanced with performance eclipsing the first iteration of each design. To this end, the L8V2 development began in January 2010, and the first prototypes were developed by company founder and lead designer Scott Buwalda.

By Fall 2010, a beta prototype pair of Legatia L8V2's had been refined after hundreds of hours of testing and development; these highly-evolved drivers were sent to Jim Becker and Jorge Juaristi, both multiple IASCA and USACi champions for final testing, evaluation, and debut in organized competition. After countless hours testing on the speakers under various circumstances, both as a dedicated midbass and as a midbass/midrange in two-way configuration, Juaristi and Becker gave their final approval. Production refinements were Fall of 2010, to incorporate features inclusive and proprietary to the SE line, and final production commenced November 2010. The Legatia L8V2 was



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

launched in December 2010 and is the reference 8.85-inch driver in Hybrid Audio's Stage III product category known collectively as the Legatia Series.

Legatia L8V2 Attributes

The Legatia L8V2 is a 225mm (8.85-inch) "large format" wide-bandwidth midbass/midrange driver to compliment both two-way and three-way system designs, where a point-source midrange or dedicated midbass driver is required. The following are the L8V2's design attributes:

Basket

The basket of the L8V2 is a shared design with the Stage IV Legatia L8SE for easy upgrade potential; the L8V2 and L8SE are interchangeable in mounting topology. The L8V2 differs from the first-version L8 in that the basket geometry has been enhanced in the V2 model to a slightly larger outside diameter for greater clamping surface area (from 8.5-inch on the L8 to 8.85-inch on the L8V2); the mounting holes for each driver remain nearly identical however, with a difference of only 2mm (188mm versus 186mm). Provided enough outside mounting diameter difference can be obtained, the L8V2 will fit into the first-generation L8's mounting hole.

The basket is a high-quality cast aluminum design, and contains a 225mm flange providing for the mounting of the driver via four screw holes (the use of 5mm cap head screws is ideal). The overall dimensions of the driver are very amenable for use in the car audio environment, and in locations typical of the standard "8-inch" driver, or in custom locations at the discretion of the end-user, boasting a depth of 94mm (3.7-inch). The basket features large openings behind the cone to eliminate chuffing and other aerodynamic-based noises, as well as provides adequate communication to the back of the cone for acoustic suspension and proper operation.

Motor

The motor of the L8V2 is paramount to the performance of the driver, providing for a flat and wide BL curve (as a learning note, BL is the equivalent of torque in a car; a car with a flat and constant torque curve provides much better acceleration and performance than a car with a peaky, non-constant torque curve). The BL curve is flat and extended, yielding 18mm of two-way linear excursion, resulting in the L8V2 being able to accurately track the input signal. Reduced distortion and greater dynamics are the immediate sonic benefits. The motor of the L8V2 includes a high-energy strontium magnet, with the magnetic circuit fully surrounding the outside of the voice coil.

Voice Coil

The voice coil diameter of the L8V2 is a large 35.55mm (1.4-inch), which is the proper balance between size and moving mass in super high-end mobile audio midranges/midbass. The voice coil diameter serves several key functions: elevated power handling, dissipation of heat (thereby lowering power compression), and maximizing the size of the magnet assembly for enhanced motor compliance. The voice coil is high-purity aluminum, which is superior to copper for heat dissipation, as well as significantly reduced moving mass. The result is an extremely light weight winding with good power handling and low inductance.



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

Suspension

The inverted surround is butyl rubber which is highly consistent, and does not suffer the variance of natural rubbers. This rubber surround terminates mechanical vibrations well, having a low stiffness for positive damping of resonances well above the usable range of the L8V2. The spider material was chosen for optimal performance; the spider is a 90/10 cotton/Nomex blend with single-dip low viscosity phenolic. This material provides the stiffness desired without being overly brittle or stiff, where vibrations in the spider are well damped and do not translate into the former or the cone.

Cone

Like other Legatia midrange designs, you will find no composite or metal cone materials used on the L8V2, as our approach to point-sourcing is to allow the Legatia midbass/midrange driver to effectively play into upper midrange and lower treble frequencies. The Legatia L8V2 is a cone-type driver consisting of a proprietary hybrid paper diaphragm with extremely low moving mass. Paper is widely acknowledged as the best-damping material, as it provides the near optimum balance of strength and weight. The cone has been treated with a water resistant element at the rear to accommodate door mounting, or other areas prone to *occasional* contact with liquid. The cone design offers a wide dispersion pattern to make for flexible installation and speaker location. The Legatia L8V2 has an outstanding extended frequency response; the usable frequency range of this driver exceeds six complete octaves of usable bandwidth on-axis (40 Hz - 3,800 Hz). Even off-axis, the L8V2 faithfully recreates more than five full octaves of information, for the ultimate “large-format” midrange/midbass.

Phase Plug

The L8V2 comes equipped with a phase plug pole piece extension at the center of the cone; the phase plug is aluminum and, by design, ensures enhancement of the total inductance profile, providing much of the inductance reduction benefits noted between the L8V2 and the first-generation L8. The phase plug is powder coated black, which by design does not negatively reduce eddy current, and adds thermal dissipation potential, not to mention sleek, under-stated cosmetics. The phase plug extends well down inside the pole vent, and acts as a very large and efficient heatsink for any heat that radiates into the pole.

The highest frequencies of audio emanate from the area around the center of the cone and the lower frequencies are produced by the area of the cone that is farther from the center. The phase plug pole piece extension improves the L8V2's performance and clarity by deflecting delicate midrange tones forward of the driver, while minimizing distortion and improving bandwidth.

Tinsel Leads

The tinsel leads for the L8V2 are terminated on one side of the voice coil, with a second, unused set of tinsel leads exiting the opposite side of the termination. Having two sets of tinsel leads reduces the rocking of the system under high stroke; the spider is mechanically balanced. Additionally the tinsel leads are bonded directly to the former and brought out to the terminals, which keeps tinsel lead slap to a minimum and does not compromise the structural integrity of the cone.



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

Terminals

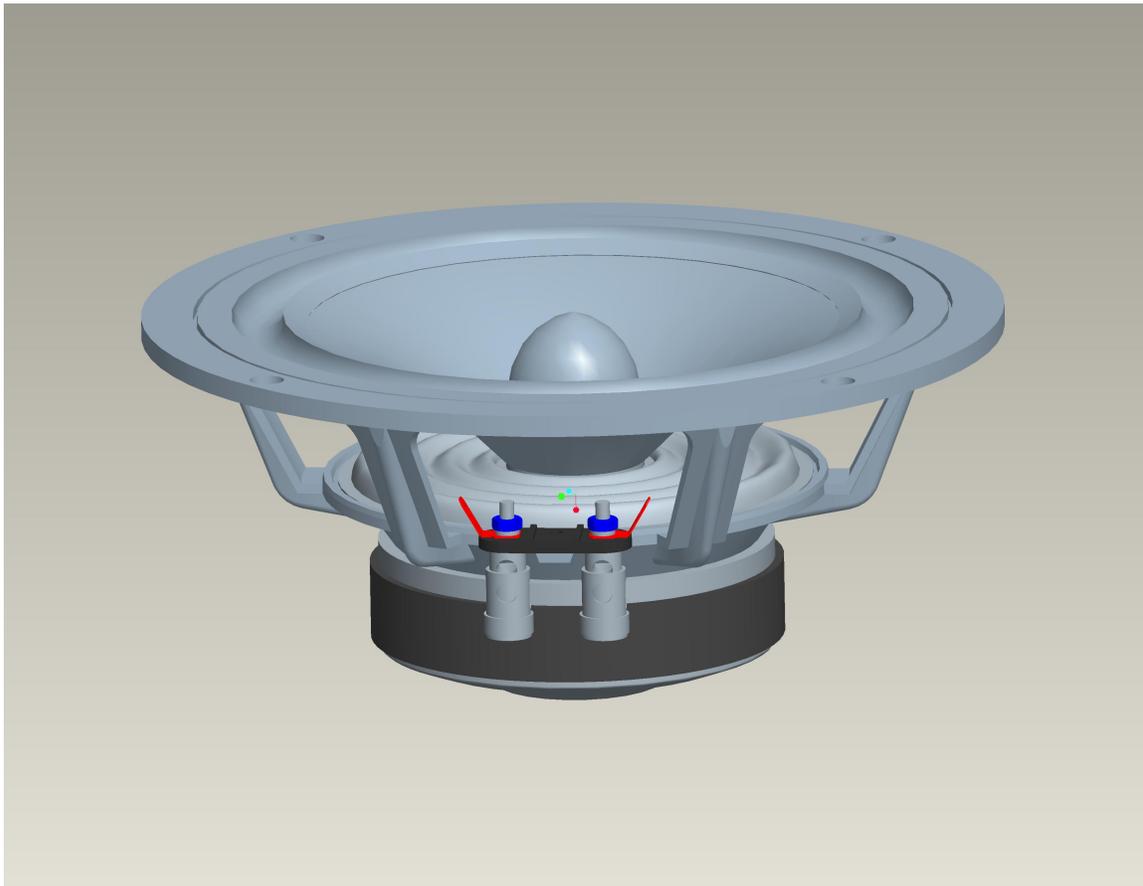
The Legatia L8V2 comes equipped with heavy-duty spring loaded brass core terminals that are nickel plated to optimize contact, and give the end user flexibility in tinned wire or binding post terminations. The terminals are designed to accept up to 12 gauge wiring.

Summary

The Legatia L8V2 is the ideal multi-purpose super high-end speaker driver. Mechanical and electrical parameters are amenable to a variety of different installations and speaker locations. This driver is intended to be used in an infinite baffle configuration; a simple, solid baffle, solidly attached to the car's chassis with available airspace at the rear of the baffle is all that is required for optimum operation. The size of the L8V2 allows it to be mounted in typical "8-inch" midbass locations within a vehicle, or in custom locations at the discretion of the end-user, as long as there is adequate airspace behind the driver to allow it to maintain proper damping and acoustic suspension.

At home in virtually any arrangement, the L8V2 is Hybrid Audio Stage III high-end large-format midrange/midbass offering, boasting exceptional performance and a design philosophy that goes hand in hand with true high-fidelity playback.

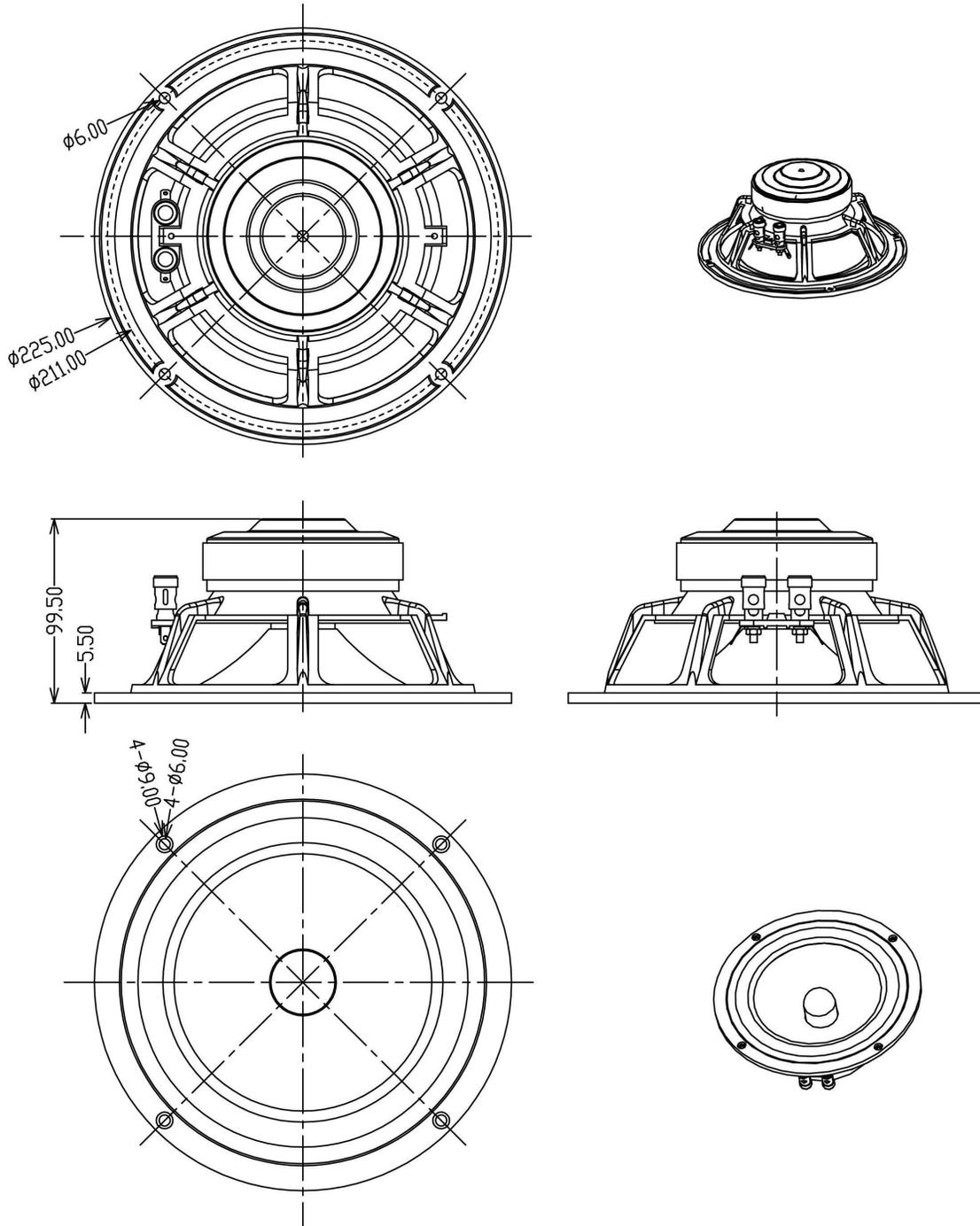
Legatia L8V2 midrange/midbass - three-dimensional design drawing





Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

Legatia L8V2 midrange/midbass - dimensioned mechanical drawing



Note: specifications are subject to change without notice
Copyright © Hybrid Audio Technologies, Inc. All Rights Reserved.



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

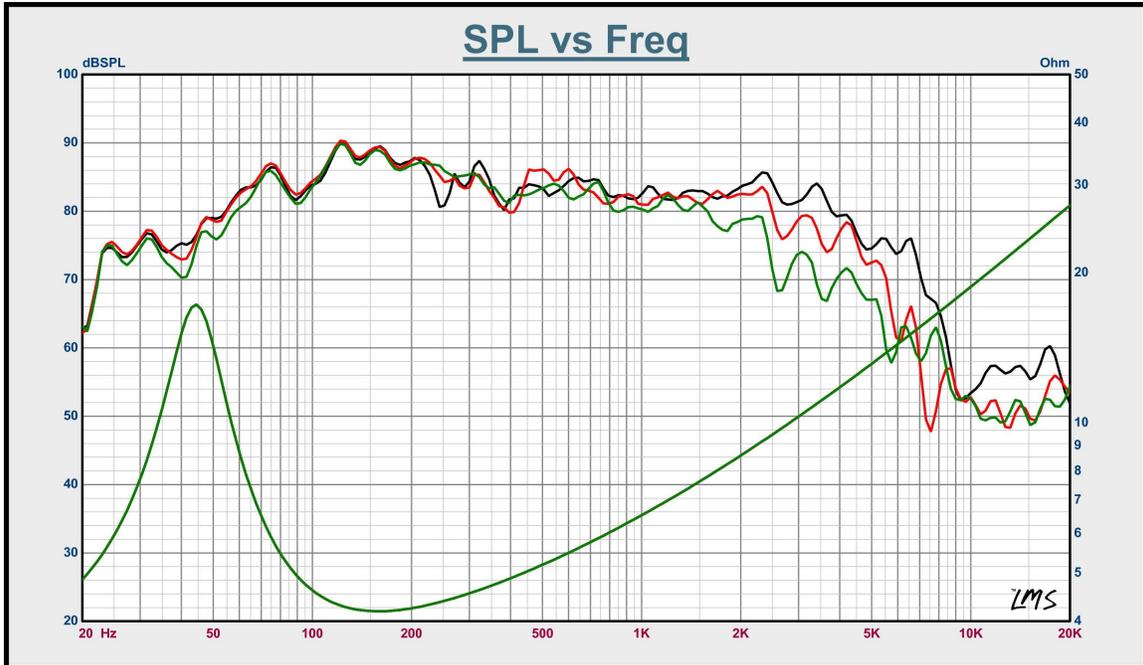
Legatia L8V2 Thiele-Small Parameters

Overall Diameter	ϕ 225 mm (8.85-inch)
Mounting Depth	94 mm
Bolt Circle Diameter	ϕ 211 mm
Mounting Hole	ϕ 186 mm
Recommended <i>Minimum</i> Crossover Frequency	40 Hz at 24 dB/octave highpass
P _{nom} Rated Power Input (No Crossover)	80 watts (AES Standard)
P _{max} Rated Power Input (No Crossover)	160 watts (AES Standard)
P _{max} (With Recommended Minimum Crossover)	215 watts
Frequency Range	40 Hz - 3,800 Hz, +/- 3 dB
Sensitivity	88.5 dB at 1 watt/1meter
Mms	30.5 g
Cms	427 μ m/N
BL	7.85 T*m
Voice Coil Diameter	35.55 mm (1.4-inch)
Impedance	4 Ω
DC Resistance	3.4 Ω
Fs	43 Hz (free air)
Qms	2.21
Qes	0.48
Qts	0.394
Xmax	9 mm (one way)
Vas	27.1 L
Sd	0.02 m ²



Product Parameters and Specifications
Model: Legatia L8V2 Wide-Bandwidth Midrange/Midbass

Legatia™ L8V2 Impedance and SPL Verses Frequency Plot
note, curve is not corrected



Black = 0-degrees, on-axis
Red = 30-degrees off-axis
Green = 60-degrees off-axis