

## Legatia™ L4

The incredible new midrange solution from Hybrid Audio is the Legatia™ L4, an approximate four and a half inch cone midrange driver that boasts an even more impressive frequency response than its little brother, the Legatia™ L3. While the Legatia™ L3 offers several distinct benefits for certain installations, such as a-pillar, dashboard, or small/shallow kick panels, the larger cone area and extended phase plug pole piece of the L4 is an even better wide-bandwidth midrange option for those with room to accommodate the larger midrange in the Legatia™ family.

The Legatia™ L4 has an outstanding extended frequency response; the usable frequency range of this driver exceeds seven full octaves (yes, seven octaves!). With proper filtering, installation strategy, and tuning, this driver will effectively reproduce music tones from as low as 100 Hz to as high as 17,000 Hz. It is the ultimate point-source midrange driver. In certain installations and for certain listeners, a tweeter may be optional because the L4 plays to 17,000 Hz on axis with ease. Not only that, but paired with our L8 midbass/subwoofer, a clever installer might be able to get away with just a four-speaker front stage installation, with no dedicated subwoofers! A true two-way system! The L4 opens up a world of possibilities for point-source, phase, and tonally perfect front-stage installations.



Photo 1: L4 midrange.

## Legatia™ L4 in more detail

Like the Legatia™ L3, the Legatia™ L4 is a very unique driver that satisfies a need in the high-end car audio community for a small diameter, super wide-bandwidth midrange driver for the ultimate in point-source midrange applications. With proper filtering, installation, and tuning, this driver will effectively reproduce music tones from 100 Hz (24 dB/octave) to 17,000 Hz. It is the ultimate point-source midrange driver; there is no comparison to L4. In certain applications and installations, as noted above, this driver can be used as both the midrange and treble driver, and can only be made better with the addition of a transient midwoofer or subwoofer, such as the Legatia™ L6 or L8 for the ultimate true two-way front stage system.

The Legatia™ L4 is a 118mm (4.65-inch) cone-type wide-bandwidth midrange; the cone is an untreated pressed paper with extremely low moving mass. The cone design offers a wide dispersion pattern to make for flexible installation and speaker location. What makes the L4

different than the L3 is the addition of a phase plug pole piece extension at the center of the cone. 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. Due to the shape of a conventional loudspeaker cone, the higher frequency sound waves tend to collide at a focal point, causing phase distortion. The phase plug pole piece extension improves the L4's performance and clarity by deflecting delicate midrange and treble tones forward of the driver, while minimizing distortion and improving the driver's ability to reproduce a wider bandwidth; this is the reason why the L4 has an extremely wide bandwidth into the upper treble frequencies.

You will find no composite or metal cone materials used on the L4, as our approach to point-sourcing is to allow the midrange or midbass driver to effectively play into treble frequencies. The paper cone is critical to tame unwanted cone modes, resonances, and the classic "cone breakup" associated with all composite and most polypropylene cones, but still be rigid enough for upper midbass attack. The "point source" design ensures stable stereo imaging across the fundamental frequencies which define image placement and definition. Rounding out the face of the driver is an inverted high-loss rubber surround that, in concert with the spider, provides the compliance needed for this 118mm midrange to play middle and upper midbass frequencies. You'll also know a higher-end Hybrid Audio midrange and midbass design by its inverted surround; this design feature allows for the use of a smaller height grille, and more flexibility in mounting options.

The motor of the design is conventional dynamic and very complimentary, utilizing a 1-inch voice coil, ferrite magnet, and a unique T-yoke to improve the speaker's power handling. The basket is a high-quality cast aluminum design, and contains a 118mm wide flange providing for the mounting of the driver via four screw holes (the use of 3 - 4mm screws is ideal). The overall dimensions of the driver are very amenable for use in the car audio environment, boasting a depth of just 54mm, just 8mm more than the L3, for the ultimate in mounting flexibility. The terminations are standard spade terminals which have been gold plated to optimize contact, and give the end user flexibility in low-temperature soldered options and crimp terminations.

Mechanical and electrical parameters are amenable to a variety of different installations and speaker locations. The high Qts and low Mms of the driver will allow it to be used in a purely infinite baffle configuration. Hybrid Audio and select Team Hybrids competitors have also had great success using this driver in a dipole configuration, a.k.a. completely "free-air", in larger vented enclosures, arrays, and in folded horns and transmission lines. It is important to note that sealed enclosures are not required; in fact, the L4 works optimally in areas where a large volume of area is available, such as in kick panel, floor boards, or foot wells, underneath dashboards, etc. You do not have to build enclosures for these speakers to perform as intended; a simple baffle attached to the car's chassis with available airspace at the rear of the baffle is all that is required; this driver quickly solves the universal installation quandary of having to build enclosures for car stereo speakers. Finally, the size of the unit allows it to be mounted in typical locations within a vehicle, including kick panels, floor boards, and in some cases a-pillars and dash pods, as long as there is adequate airspace behind the driver to allow it to maintain proper damping and acoustic suspension.

The Legatia™ L4 might be slightly larger than the famed L3, but its performance makes up for the larger footprint area. If you can fit the larger L4 midrange, it is well worth your time to utilize this driver. In our unabashed opinion, it is the best 4-inch car audio midrange on the market today. Our years of developing and refining drivers to win world championships can now be yours for your own vehicle!

 **HYBRID AUDIO  
TECHNOLOGIES**  
Product Parameters and Specifications  
Model: Legatia L4 Midrange

**Legatia™ L4 Thiele-Small Parameters**

Overall diameter:	118mm (4.65-inch)
Mounting depth:	54mm
Bolt Circle Diameter:	109.5mm
Mounting hole:	94.5mm
P <sub>nom</sub> (without crossover)	30W (AES Standard)
P <sub>max</sub> (without crossover):	60W
P <sub>max</sub> (with recommended crossover):	200W
Frequency range:	90Hz - 17,000 Hz
Sensitivity:	89dB (2.83V/1m)
Mms:	4.22g
Cms:	706.4 um/N
BL:	3.74 T*m
Voice coil diameter:	25.5mm (1-inch)
Impedance:	4 Ohm
DC Resistance:	3.4 Ohm
Fs:	90Hz (free air)
Qms:	2.61
Qes:	0.61
Qts:	0.50
Xmax:	2.5mm (one way)
Vas:	2.54L
Sd:	5000mm <sup>2</sup>

### Legatia™ L4 Impedance and SPL Verses Frequency Plots

