Neo10 Wideband Planar-Magnetic Transducer

The Neo10, BG's newest patent pending planar-magnetic transducer, offers excellent sound quality and is suitable for a number of applications as a high-performance wideband midrange.

Key features

- Low Mass, High Temperature Diaphragm – directly driven for high power handling, outstanding transient response and damping.
- Push-Pull Symmetrical Motor Structure – produces symmetric magnetic field for inherently low distortion and high sensitivity.
- Resistive Impedance - non-reactive load is amplifier friendly. Very low self-inductance minimizes intermodulation and phase distortion for increased accuracy and coherency.
- Patent pending diaphragm technology and plate design for extended low frequency extension, minimal distortion and increased output capability.

Background

The Neo10 is the next step in the line of BG's planar ribbon drivers. The design goals include higher sensitivity, lower distortion, a lower usable cut off frequency and higher power handling than previous offerings. This provides a solution to an important system goal – uncompromised reproduction of the human vocal range. An additional benefit of the extended bandwidth is improved integration with a dynamic woofer. Seamless integration historically has been a challenge in practice and this is much easier to accomplish at 150-250 Hz than an octave higher.

Construction Details

While the Neo10 has similar design principles as the Neo8, its construction has significant differences. Fig.2 shows the construction details. The goal of extended low frequency reproduction dictated the use of a larger magnetic gap for higher excursion. Large magnets were used to further increase magnetic flux density in the gap. The magnet system is a symmetrical "push-pull" configuration that has proven to offer low distortion and improved sensitivity. The Neo10 also uses significantly thicker metal for its plates to provide the required dimensional stability when using a physically larger magnet structure. Plate shape also becomes analogous to diaphragm shape under excursion, which facilitates extended low frequency output. Specifically tuned fabric screens have certain acoustical resistance and play an important role in stabilizing and damping of the Neo10's diaphragm. Finally, the NEO10's unique diaphragm technology provides low distortion and the ability to reproduce signals down to 150Hz, thus achieving the driver's design goals.

Application notes

1. The Neo10 shows remarkable results when used both as a single midrange device, multiples or in line arrays.
2. Frequency response largely depends on system configuration, baffle size, rear enclosure volume and physical arrangement therein. All said, there are many variables that should be considered based upon the application and system design goals.
    A. Figure 1 reflects a frequency reponse for a single Neo10 in free air without any baffle loading or enclsoure (i.e. in dipole configuration). Predictably, in a dipole configuration, increasing baffle size results in increased low frequency extension and output.
    B. Using a rear enclosure with the driver will dramatically boost the output from 300Hz to 1000Hz but results in a steeper roll-off below the cut-off point.
        i. A well damped and acoustically inert enclosure with a volume of 2 liters (or greater) is recommended depending on the required low frequency extension. The depth of the enclosure should be at least 3" (75mm). In some cases,

where a shallow enclosure is dictated by the application, the depth can be reduced to 1"(25 mm) but enclosure volume should be retained for adequate LF extension (call for more details).

ii. Fiberglass, recycled cotton or medium densty open cell polyurethane foam may be used as the damping material. Filling up to 80% of the rear cavity is recommended, while leaving at least ½" (12 mm) of free space immediately behind the driver.

3. Production tolerances will provide a +/-1.5 dB deviation from the stated response within the 300-6kHz band.
4. When used in line arrays, the combined responce has significant low frequency boost. Thus, a carefull balance of the array configuration, baffle design and acoustic loading of the rear are important parts of a succesful design.
5. The use of a high pass filter is also recommened, especially for mid to high output applications. The high pass filter settings/parameters should provide safe operation according to the specified power listing and recommendations described below.

Specifications

1	Effective frequency range (depending on application)	150 Hz-6 kHz
2	Recommended LF crossover, 2nd order min, depends on a system max SPL requirements and acoustic arrangement of the transducers: - home theater and hi-fi, (single driver) - line arrays (multiple drivers)	 250Hz-350 Hz 150 Hz -250 Hz
3	Horizontal dispersion (monopole, -6 dB beamwidth): Below 1 kHz 2 kHz 4 kHz 6 kHz 10 kHz	 180° 120° 90° 60° 40°
4	Sensitivity, 2.83V/1m, monopole in 2 L box, averaged in 300-6 kHz	92 dB
5	Nominal impedance (resistive over entire range with Rdc =6.5±0.5 Ω)	8 ohm
6	Power handling: AES Long-term (IEC268-5) Short –term (IEC268-5)	 75 W 100W 200 W
7	Weight	1 kg

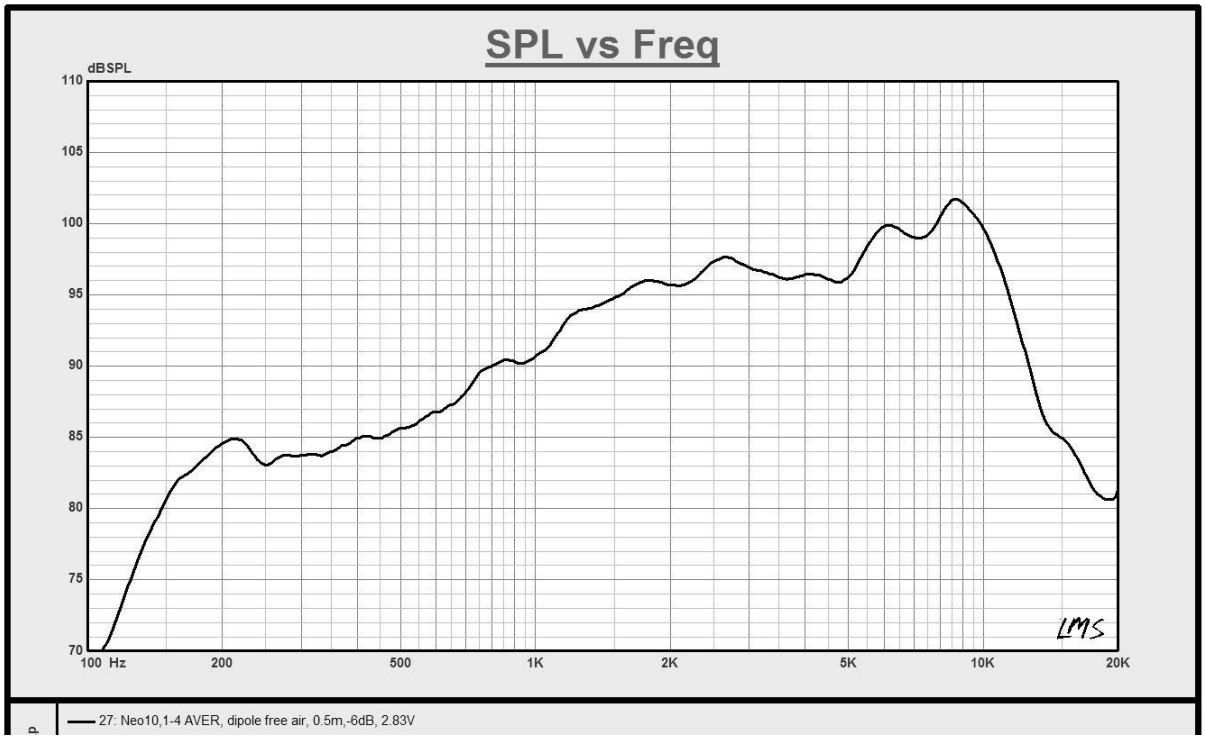

Fig. 1 Neo10 frequency response in a feee air, dipole arrangement

Fig. 2 Neo10 cut-out

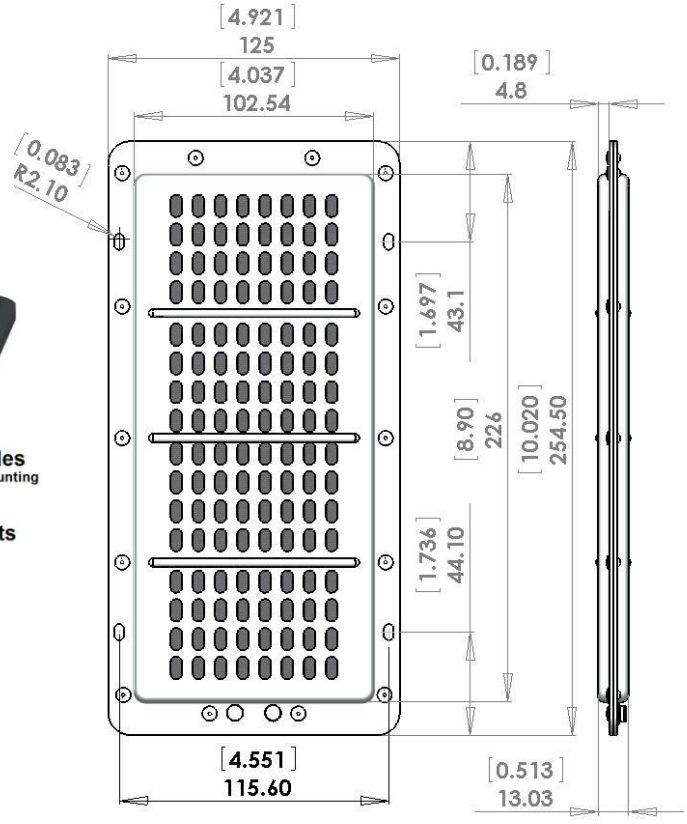

Fig. 3 Neo10 dimensions

When connecting Neo10 driver using soldering, be careful not to overheat the terminals. This can lead to diaphragm failure.