



DESCRIPTION

The CB523z high power, bi-amplified 3-way stage/screen loudspeaker system fills theaters with all the high impact, full-range sound encoded on today's digital soundtracks while reproducing voices clearly and naturally.

The three-way design dramatically advances cinema audio quality by improving the naturalness and intelligibility of dialog, eliminating distortion from excessive driver excursion and extending pattern control into the lower octaves.

The two component system includes a BV253z dual 15-in low frequency enclosure and an HK523z mid/high section.

The low frequency enclosure uses optimally tuned enclosure venting to increase LF response while limiting driver excursion. This method produces less distortion and minimizes driver strain while extending LF response to the lowest octaves. The enclosures dimension allows convenient placement behind the screen.

The HK523z MF/HF section features a coaxial MF/HF compression driver that incorporates a 3.5-in voice coil / 2-in exit MF section and a 1.75-in voice coil / 2-in exit HF section. This ultra-efficient, high output driver is loaded with a 90° x 45° coverage pattern constant directivity horn.

The adjustable steel bracket attaching the MF/HF section to the LF enclosure can be positioned at one of four mounting points for optimum front/rear placement. The bracket allows the MF/HF section to be aimed independently of the LF section in both the horizontal and vertical planes and can be locked once it is positioned.

Input connectors for the LF and MF sections are two-terminal barrier strips that accommodate bare wire, tinned leads or spade lugs. The MF/HF section comes complete with wires long enough to connect to the LF section, allowing the user to connect both devices in the same location. The input panels are located on the side of the LF enclosure and the bottom of the MF/HF enclosure for convenient access in cramped installation areas.

3-WAY FULL-RANGE LOUDSPEAKER SYSTEM 90° × 45°

See *NOTES TABULAR DATA* for details

CONFIGURATION

Subsystem:

	<i>Transducer</i>	<i>Loading</i>
LF	2 × 15 in cone	Vented
MF	1 × 2 in exit, 3.5 in compression mid	Horn-loaded
HF	1 × 2 in exit, 1.75 in compression driver	Horn-loaded

Operating Mode:

	<i>Amplifier Channels</i>	<i>External Signal Processing</i>
Bi-amp	LF,MF/HF	DSP w/2-way filters

PERFORMANCE

Operating Range: 40 Hz to 20 kHz

Nominal Beamwidth:

Horz 90°

Vert 45°

Axial Sensitivity (whole space SPL)

LF	102 dB	40 Hz to 400 Hz
MF/HF	110 dB	300 Hz to 20 kHz

Input Impedance (ohms):

	<i>Nominal</i>	<i>Minimum</i>
LF	4	4 @ 230 Hz
MF/HF	8	6.4 @ 3210 Hz

High Pass Filter: High Pass =>44 Hz, 12 dB/octave Butterworth

Accelerated Life Test

LF	63.3 V	1000 W @ 4 ohms
MF/HF	37 V	175 W @ 8 ohms

Calculated Axial Output Limit (Whole Space SPL):

	<i>Average</i>	<i>Peak</i>
LF	132 dB	138 dB
MF/HF	133 dB	139 dB

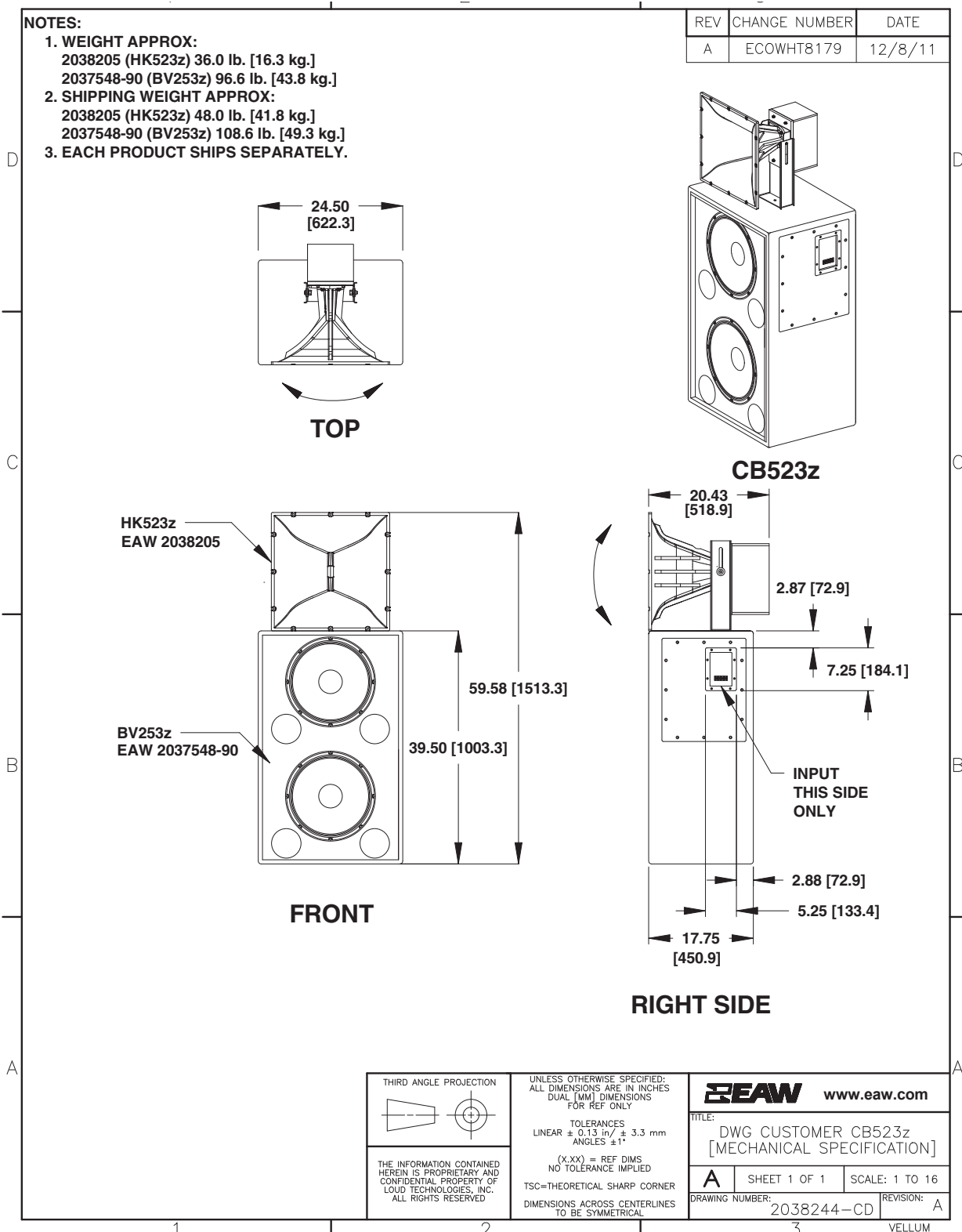
ORDERING DATA

<i>Description</i>	<i>Part Number</i>
EAW HK523z Horn Kit	2038205
EAW BV253z LF Cabinet	2037548-90

ENCLOSURE

Material Medium density hardwood plywood

Finish Wear resistant black paint



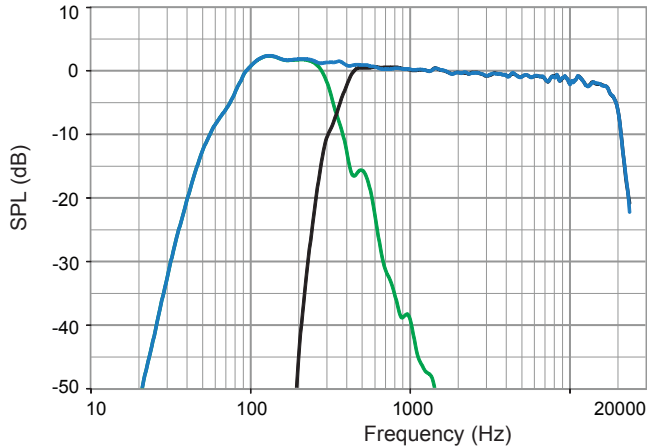
NOTE: This drawing has been reduced. Do not scale.

PERFORMANCE DATA

See *NOTES GRAPHIC DATA* for details

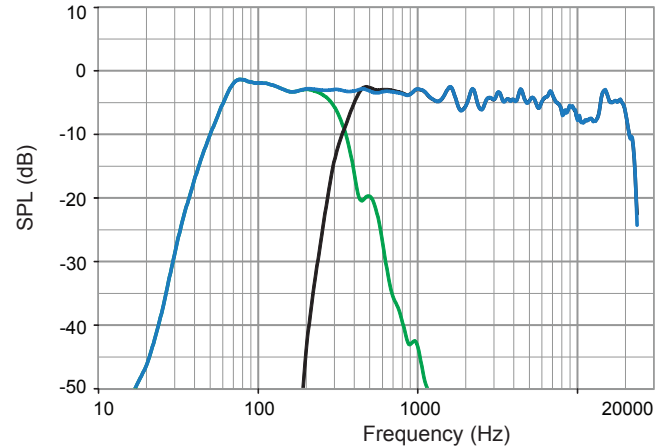
Frequency Response: Processed - Focused

LF = green, HF = black, Complete = blue



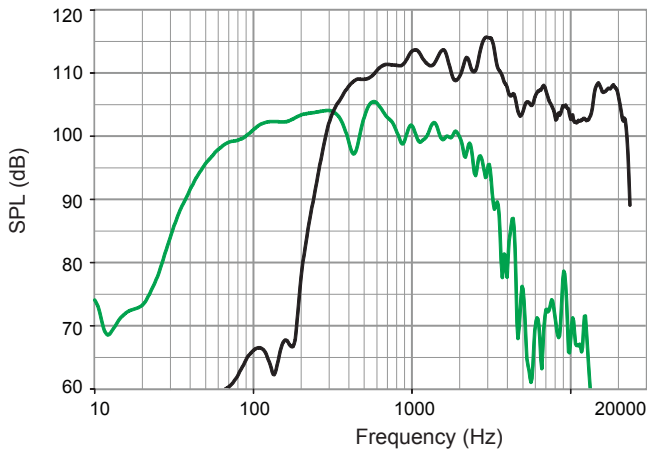
Frequency Response: Processed

LF = green, HF = black, Complete = blue



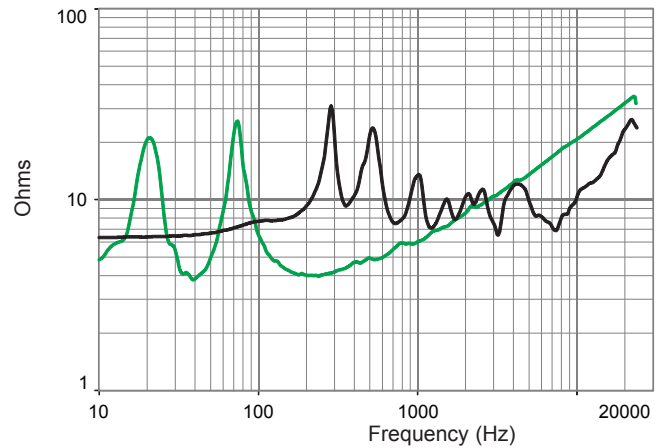
Frequency Response: Unprocessed

LF = green, MF/HF = black



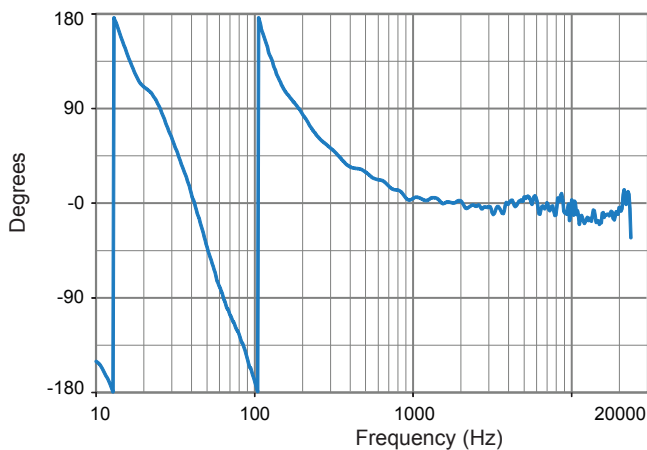
Impedance

LF = green, MF/HF = black



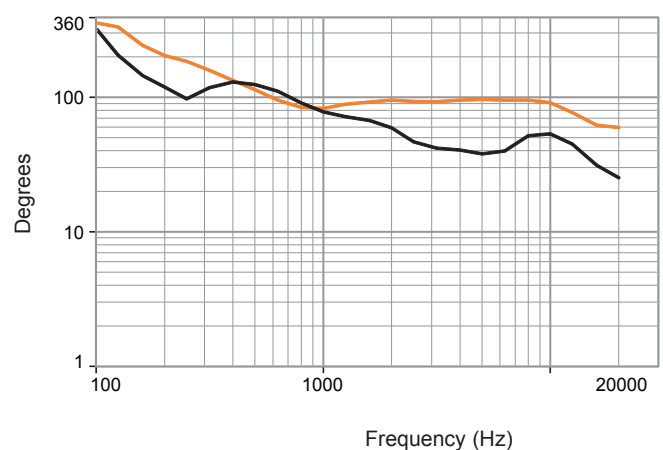
Phase Linearity

Complete = blue



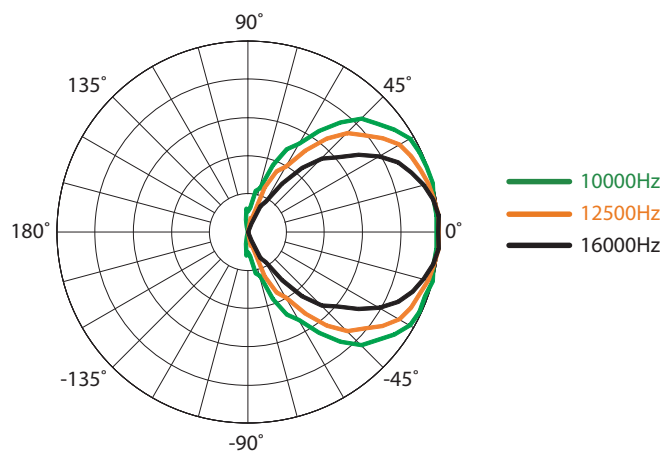
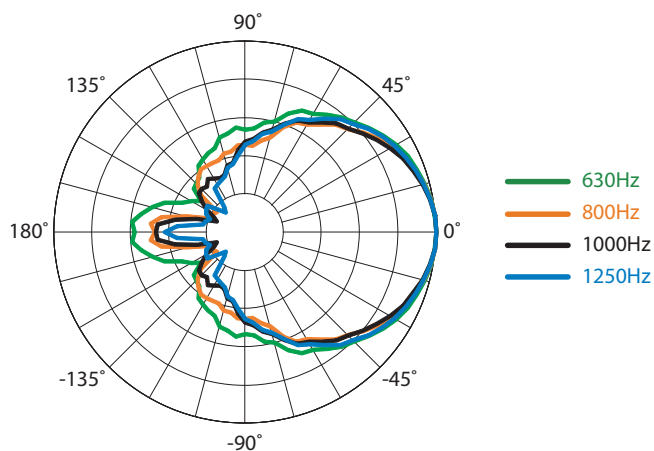
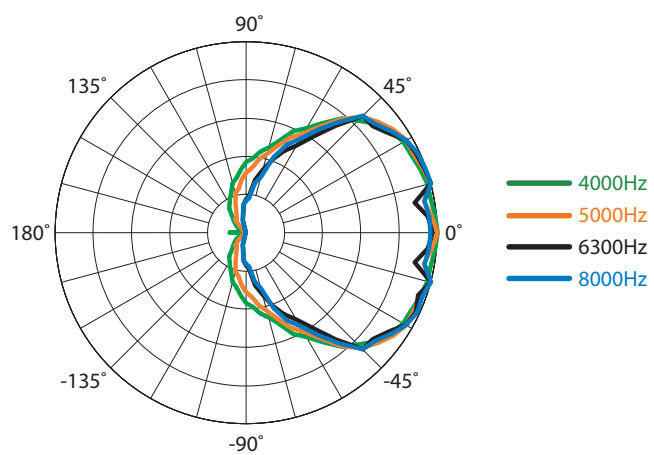
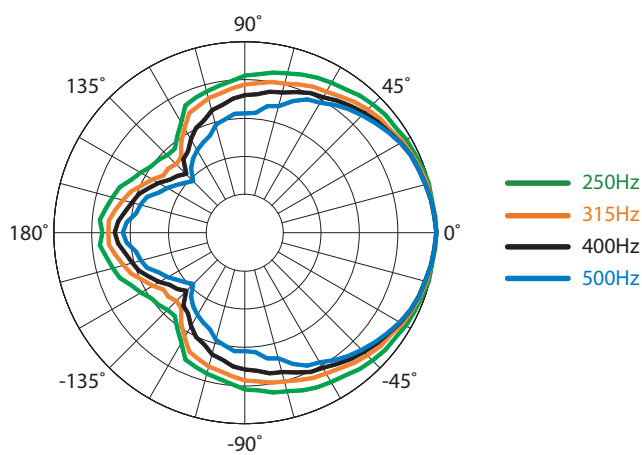
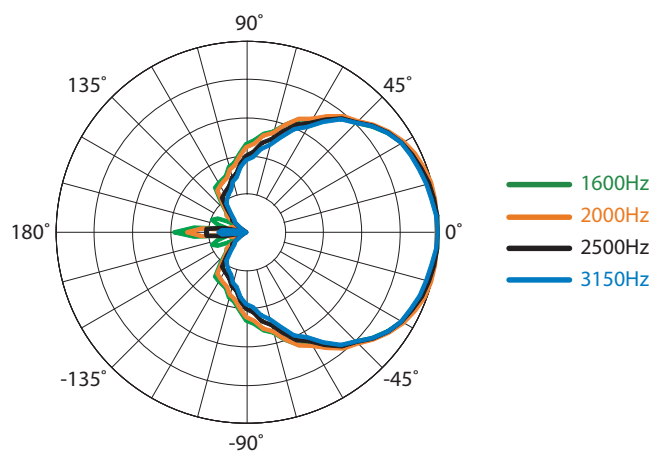
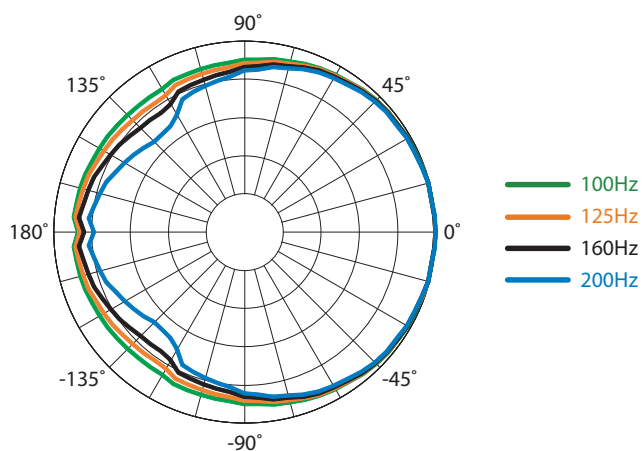
Beamwidth

Horizontal = orange Vertical = black



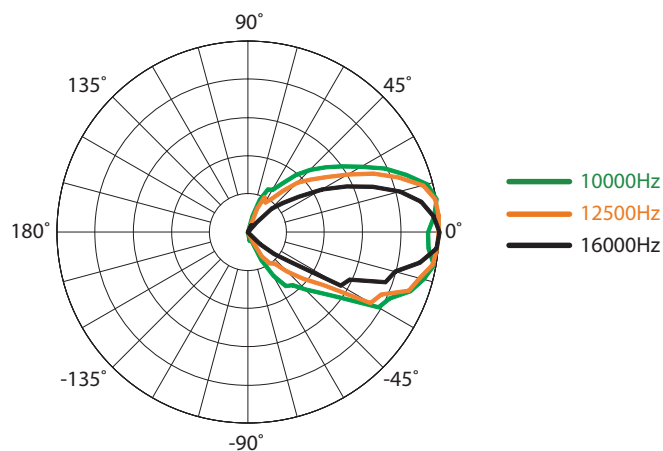
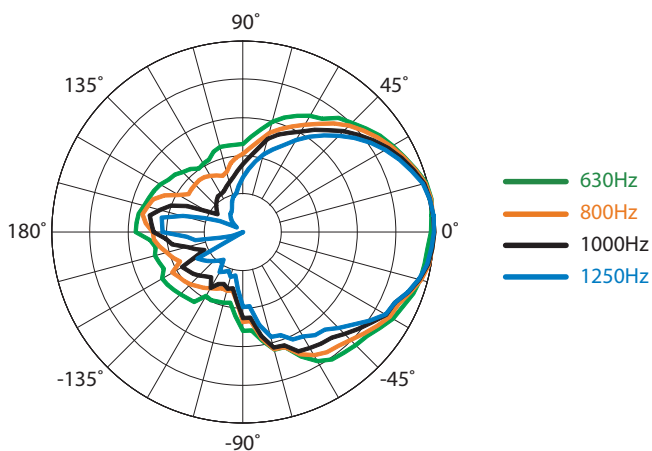
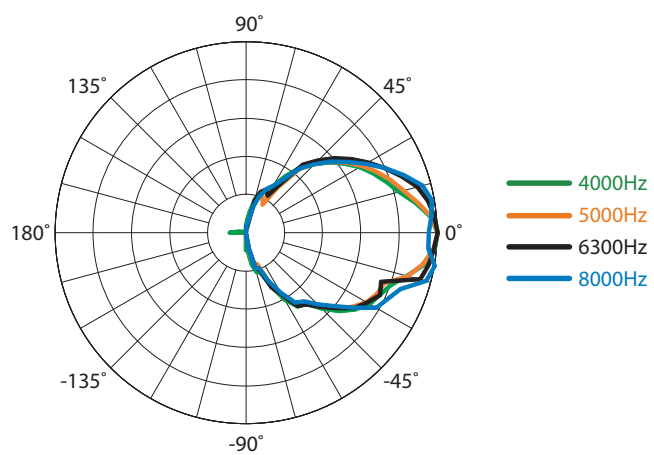
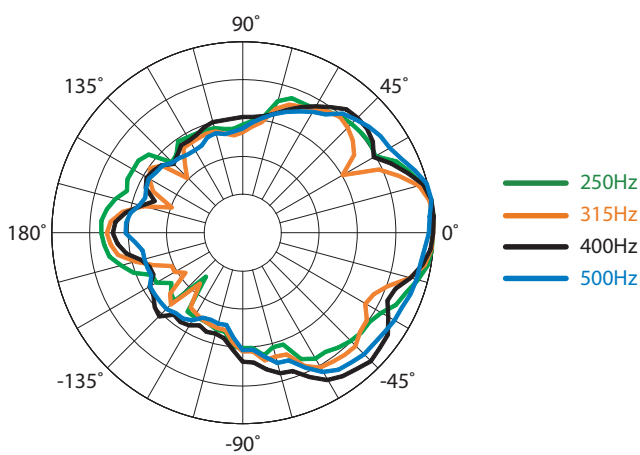
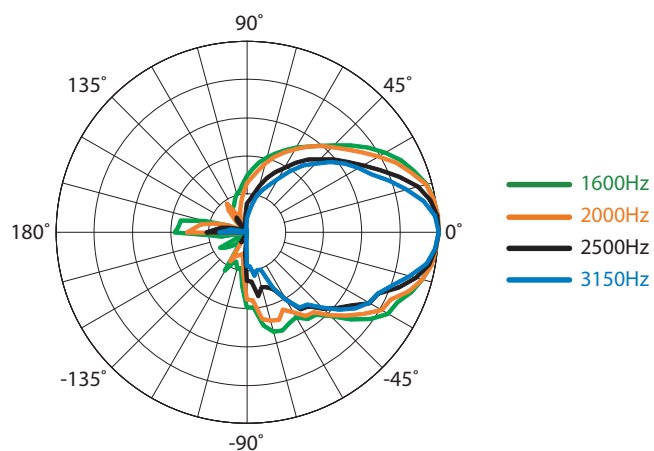
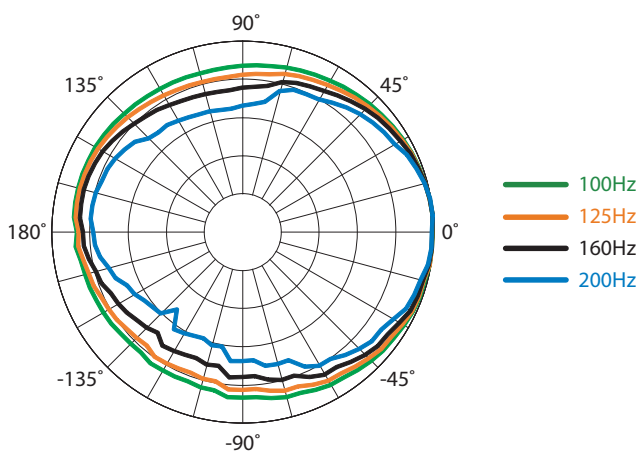
HORIZONTAL POLAR DATA

See *NOTES GRAPHIC DATA* for details

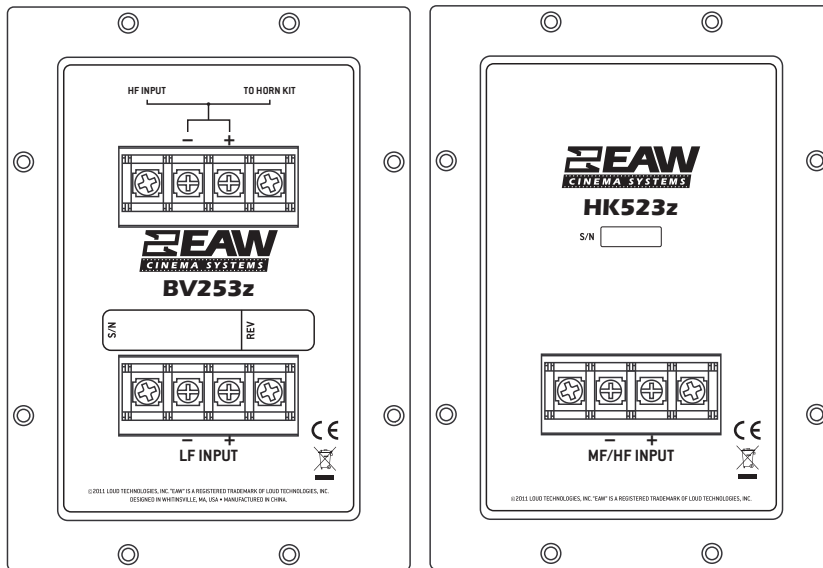


VERTICAL POLAR DATA

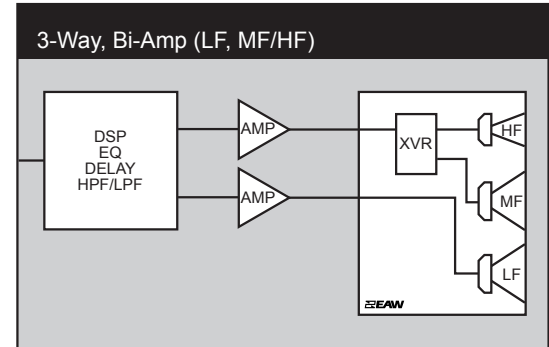
See *NOTES GRAPHIC DATA* for details



INPUT PANELS



SIGNAL DIAGRAM



LEGEND

- DSP:** EAW UX8800 Digital Signal Processor –or– Integral Digital Signal Processing for NT products.
- HPF:** High Pass Filter for crossover –or– Recommended High Pass Filter.
- LPF:** Low Pass Filter for crossover.
- LF/MF/HF:** Low Frequency / Mid Frequency / High Frequency.
- AMP:** User Supplied Power Amplifier –or– Integral Amplifier for NT products.
- XVR:** Passive LPFs, HPFs, and EQ integral to the loudspeaker.
- EAW Focusing:** Digital Signal Processor capable of implementing EAW Focusing.

NOTES

TABULAR DATA

- Measurement/Data Processing Systems:** Primary - FChart: proprietary EAW software; Secondary - Brüel & Kjær 2012.
- Microphone Systems:** Earthworks M30; Brüel & Kjær 4133
- Measurements:** Dual channel FFT; length: 32 768 samples; sample rate: 48 kHz; logarithmic sine wave sweep.
- Measurement System Qualification** (includes all uncertainties): SPL: accuracy ± 0.2 dB @ 1 kHz, precision ± 0.5 dB 20 Hz to 20 kHz, resolution 0.05 dB; Frequency: accuracy $\pm 1\%$, precision ± 0.1 Hz, resolution the larger of 1.5 Hz or 1/48 octave; Time: accuracy ± 10.4 μ s, precision ± 0.5 μ s, resolution 10.4 μ s; Angular: accuracy $\pm 1^\circ$, precision $\pm 0.5^\circ$, resolution 0.5° .
- Environment:** Measurements time-windowed and processed to eliminate room effects, approximating an anechoic environment. Data processed as anechoic or fractional space, as noted.
- Measurement Distance:** 7.46 m. Acoustic responses represent complex summation of the subsystems at 20 m. SPL is referenced to other distances using the Inverse Square Law.
- Enclosure Orientation:** For beamwidth and polar specifications, as shown in Mechanical Specification drawing.
- Volts:** Measured rms value of the test signal.
- Watts:** Per audio industry practice, "loudspeaker watts" are calculated as voltage squared divided by rated nominal impedance. Thus, these are not True Watt units of energy as defined by International Standard.
- SPL:** (Sound Pressure Level) Equivalent to the average level of a signal referenced to 0 dB SPL = 20 microPascals.
- Subsystem:** This lists the transducer(s) and their acoustic loading for each passband. Sub = Subwoofer, LF = Low Frequency, MF = Mid Frequency, HF = High Frequency.
- Operating Mode:** User selectable configurations. Between system elements, a comma (,) = separate amplifier channels; a slash (/) = single amplifier channel. DSP = Digital Signal Processor.
- IMPORTANT:** To achieve the specified performance, the listed external signal processing must be used with EAW-provided settings.
- Operating Range:** Range where the processed Frequency Response stays within -10 dB SPL of the power averaged SPL within this range; measured on the geometric axis. Narrow band dips are excepted.
- Nominal Beamwidth:** Design angle for the -6 dB SPL points, referenced to 0 dB SPL as the highest level.
- Axial Sensitivity:** Power averaged SPL over the Operating Range with an input voltage that would produce 1 W at the nominal impedance; measured with no external processing on the geometric axis, referenced to 1 m.
- Nominal Impedance:** Selected 4, 8, or 16 ohm resistance such that the minimum impedance point is no more than 20% below this resistance over the Operating Range.
- Accelerated Life Test:** Maximum test input voltage applied with an EIA-426B defined spectrum; measured with recommended signal processing and Recommended Protection Filter.
- Calculated Axial Output Limit:** Highest average and peak SPLs possible during the Accelerated Life Test. The Peak SPL represents the 2:1 (6 dB) crest factor of the Life Test signal.
- High Pass Filter:** This helps protect the loudspeaker from excessive input signal levels at frequencies below the Operating Range.

GRAPHIC DATA

- Resolution:** To remove insignificant fine details, 1/12 octave cepstral smoothing was applied to acoustic frequency responses and 1/3 octave cepstral smoothing was applied to the beamwidth and impedance data. Other graphs are plotted using raw data.
- Frequency Responses:** Variation in acoustic output level with frequency for a constant input signal. Processed: normalized to 0 dB SPL. Unprocessed inputs: 2 V (4 ohm nominal impedance), 2.83 V (8 ohm nominal impedance), or 4 V (16 ohm nominal impedance) referenced to a distance of 1 m.
- Processor Response:** The variation in output level with frequency for a constant input signal of 0.775 V = 0 dB reference.
- Beamwidth:** Average angle for each 1/3 octave frequency band where, starting from the rear of the loudspeaker, the output first reaches -6 dB SPL referenced to 0 dB SPL as the highest level. This method means the output may drop below -6 dB SPL within the beamwidth angle.
- Impedance:** Variation in impedance magnitude, in ohms, with frequency without regard to voltage/current phase. This means the impedance values may not be used to calculate True Watts (see 9 above).
- Polar Data:** Horizontal and vertical polar responses for each 1/3 octave frequency band 100 Hz to 16 kHz or Operating Range.