

SPL-X4 WOOFER SPECIFICATION SHEET

EMPHASER

SPL-X4 WOOFER KEY FEATURES

- Proprietary Die-Cast Aluminum Basket
- 315 oz. Triple Stacked Ceramic Sr-Fe Magnet
- Nomex™ Composite Cone with Stitched Surround
- Broad High Excursion Polyether Surround
- Laminated Nomex™ Quadruple Spider
- 3 ½" Laminated BASV Voice-Coil Former
- Structurally Reinforced VC Former Neck
- 4-Layer Wound 2 x 2 Ohms CCAW Double Voice Coil
- Faraday Copper Ring on Center Pole
- Perimeter Vented Basket Design
- CNC Machined Front Pole Plate & T-Yoke
- Undercut & Extended Center Pole
- Laterally Cross Vented Center Pole
- Insulated Tinsel Lead Wires
- Oversized Screw Terminals

CAST ALUMINUM BASKET

EMPHASER's proprietary cast aluminum basket line is overbuilt to offer a truly solid and anti-resonant platform for the ultra-heavy 315 oz. Strontium-Ferrite magnet motor assembly. A deep draw basket design enables huge cone travel to both sides, due to increased distance between lower spider platform and basket bottom.

TRIPLE STACKED CERAMIC SR-FE MAGNET

Triple stacked Strontium-Ferrite magnets with a total weight of 315 oz. form the drive motor of the SPL-X4 woofer models. The magnet system uses the highest coercive force ceramic magnet material available today, standing out with its strong BL product.

NOMEX™ COMPOSITE CONE WITH STITCHED SURROUND

The SPL-X4 woofers deploy Nomex™ composite cones of extra thickness, offering highest stiffness and low weight, for extremely low cone flex at high SPL levels. To improve field reliability, the surround is stitched to the cone, preventing unnecessary strain on the joint that holds the surround to the cone.

HIGH EXCURSION POLYETHER SURROUND

Polyether foam is used as surround material, to allow proper centering of the cone throughout the large excursion capabilities of the SPL-X4 woofers. Polyether was chosen for its low weight and lower sensitivity to temperature changes, i.e. hardening of material at temperatures below 5°C.

NOMEX™ QUADRUPLE SPIDER

The SPL-X4 woofer models deploy mirrored Nomex™ quadruple spiders with huge diameters for large cone excursion. The quadruple spider design keeps the voice coil in perfect alignment up to highest cone excursions, while the progressive deflection characteristics protect the surround from failure when the cone is driven to its mech. max. Nomex™ material stands out with its unparalleled durability against mechanical failure, aging or any other degradation based on physical strain.

4-LAYER WOUND CCAW VOICE COIL

A 4-layer wound copper clad aluminum double voice coil with extended winding height provides the necessary thermal power handling for high SPL output, but keeps the moving mass low for increased effi-

ciency. The coil body is treated with a heat conductive black epoxy resin, to evenly spread the thermal load over the full voice coil and former height.

3½" COMPOUND BASV VOICE COIL FORMER

The voice coil former is made of laminated black anodized aluminum, with additional mechanical reinforcement of the neck area above the coil windings. Black anodized aluminum conducts heat very well, pulling the heat away from the coil.

FARADAY COPPER RING ON CENTER POLE

The copper ring added to the center pole acts as Faraday inductance break, stabilizing the magnetic field and effectively counteracting the rising voice-coil impedance rising to higher frequencies, while also lowering total harmonic distortion.

PERIMETER VENTED BASKET DESIGN

The vented cavity under the double-spider suspension features large windows to sustain best air exchange around the voice coil. The fully open basket structure also counteracts compression effects of air trapped under the lower spider. The increased air flow significantly improves electrical / thermal power handling and reduces thermal stress on parts held together by adhesives. Less airflow noise during full power operation is another side benefit of the perimeter vented basket design.

TECHNICAL SPECIFICATIONS

	E12SPL-X4	E15SPL-X4
Usable Frequency Response*	20 – 100 Hz	20 – 100 Hz
Continuous Power Handling*	2500 W RMS*	2500 W RMS*
Peak Power Handling*	5 kW*	5 kW*
Nominal Impedance	2 x 2 Ohms	2 x 2 Ohms
Voice Coil Diameter	3 ½"/88.6 mm	3 ½"/88.6 mm
Voice Coil Winding Height	54 mm	54 mm
Front Pole Plate Height	19 mm	19 mm
Total Weight of Sr-Fe Magnet	315 oz./8930 g	315 oz./8930 g

*Exact performance data depending upon actual enclosure!

THIELE – SMALL PARAMETERS

Free-Air Resonance	(Fs)	35.8 Hz	23.4 Hz
DC Resistance	(Re)	2x1.85 Ohms	2x1.85 Ohms
Electrical Damping	(Qes)	0.63	0.60
Mechanical Damping	(Qms)	5.63	4.31
Total Damping	(Qts)	0.57	0.53
Equivalent Vol. of Compliance	(Vas)	23.8 l	97.5 l
Moving Mass incl. Air Load	(Mms)	304.5 g	487 g
Electrically Limited Cone Excursion	(Xmax)	17.5mm (one way)	17.5mm (one way)
Effective Cone Surface	(Sd)	510 cm ²	855 cm ²
Volume Displacement of Cone	(Vd)	1785cm ³	2993 cm ³
Voice Coil Inductance @ 1kHz	(Le)	2.36 mH (series)	2.40 mH (series)
Efficiency (2.00V)	(RefSPL)	84.2 dB/1W/1m	85.0dB/1W/1m

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MOUNTING DIMENSIONS

	E12SPL-X4	E15SPL-X4
Mounting Cutout Diameter	284 mm	358 mm
Rear Mounting Clearance (Mounting Depth)	216 mm	249 mm

ENCLOSURE SUGGESTIONS

EMPHASER Laboratories recommend to use the SPL-X4 woofers in combination with sealed, vented and bandpass enclosures. To obtain the best possible performance of this woofer in your car audio system, make sure to follow the stated basic enclosure suggestions listed below. If the provided enclosure suggestions listed are not applicable to your system, contact your authorized EMPHASER dealer to ask for further assistance.

SEALED ENCLOSURE

	E12SPL-X4	E15SPL-X4
Net Volume:	45 l	75 l

PORTED ENCLOSURE I (SPL)

Net Volume:	60 l	95 l
Inner Diameter of Port:	2 x 10 cm	4 x 10 cm
Length of Port:	25 cm each	27 cm each

PORTED ENCLOSURE II (LOW BASS)

Net Volume:	65 l	115 l
Inner Diameter of Port:	1 x 10 cm	2 x 10 cm
Length of Port:	28 cm	30 cm each

BANDPASS ENCLOSURE

Net Volume Ported Chamber:	32 l	55 l
Net Volume Sealed Chamber:	27 l	45 l
Inside Diameter of Ports:	2 x 10 cm	3 x 10 cm
Length of Port:	22 to 27 cm each	18 to 25 cm each

ENCLOSURE CONSTRUCTION / CABINET DAMPING / BREAK-IN INFO

→ Always use at least 25mm or thicker MDF or birch plywood to build the enclosure. Make sure all joints are well sealed, since a woofer can only reach optimum performance when mounted to an airtight cabinet!

→ The enclosures should be damped according to their function principle: The sealed enclosure must be filled with polyfill (bonded acrylic fiber). The inner walls of the ported enclosure should be lined out with egg crate PU-foam. The sealed chamber of the bandpass enclosure has to be lined with PU-foam, while the ported chamber remains free of any damping material.

→ Loudspeakers using spiders made of Nomex™ need extra time to break-in! Out of the box, the suspension system of any SPL-X4 woofer is extremely stiff. To achieve optimum low bass response, this EMPHASER woofer model will need approximately two weeks of daily playing at medium playback levels. After that period of time, the suspension system has reached its equilibrium and will remain stable for the entire life-span of this product. The broken-in driver will play audibly smoother and exhibit a stronger bass performance, as well as greater bass extension!

WARRANTY

EMPHASER Inc. Wyoming, Michigan U.S.A. warrants this SPL-X4 woofer to be free of defects in materials and workmanship for **two years** from the original date of purchase at retail, contingent upon installation being performed or approved by an authorized EMPHASER dealer. EMPHASER Inc. will at its own discretion repair or replace any mechanically defective SPL-X4 woofer at no charge, during the warranty period. This warranty is limited to the **original purchaser**.

Should your EMPHASER woofer require warranty service, please return it to the retailer from whom it was purchased.

Please do not send any product to EMPHASER Inc., Wyoming, Michigan U.S.A. Should you have difficulty in finding an authorized EMPHASER dealer or service center, details are available from the national distributor in the country of purchase.

Abuse of this loudspeaker is **not covered under warranty**.

The warranty **does NOT cover**:

- Woofers that have been used to participate in SPL contests
- Any freight damage
- Woofers damaged due to amplifier clipping or distortion
- Exposure to water, oil, solvents or excessive heat
- Repair attempts by unauthorized individuals
- Install damage (screwdriver holes)