

harman consumer group

Engineering Design
Specification

Date

1/6/2009

Rev #

A

Document Number

364061

K2S9900



Engineering Design Specification

Date

1/6/2009

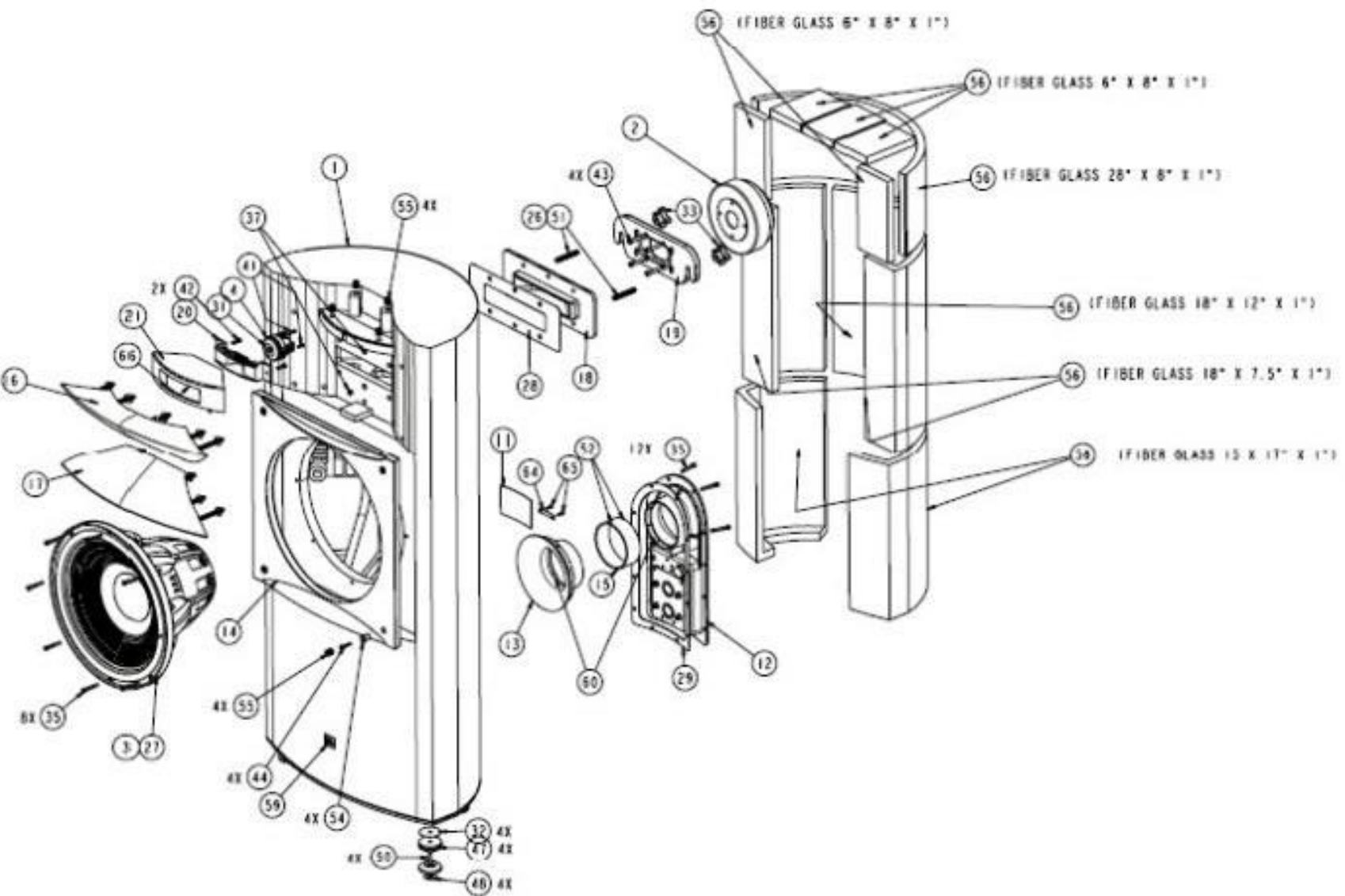
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K2S9900



Engineering Design
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K2S9900

Document Revision History

Rev #	Date	Description of Change	ECO#	Approval	
				M.E.	S.E.
X1	10/7/2008			FM	GT
X2	#####	Added Drawings		FM	GT
A	1/6/2009	Release to production	37443	F.M.	G.T.37443

K2S9900**System Physical Specifications***may be superseded by information on the drawings***Description:**

3 Way 15" Loudspeaker System

Specification:

Material	MDF using Hornflex technology
Panel Thickness	1"
Ext. Dimensions	47 1/4" H x 22" W x 13 3/4" D. Plus 1" H for foot assembly
Weight	160 Pounds
Net Internal Vol	3.4 Cu. Ft.
Sub Enclosure	None
Bracing	3/4" MDF, vertical and horizontal, interlocking
Feet	Stainless steel Base with blunt and sharp spikes and coasters
Finish	Engineered Walnut grain veneer with Satin mahogany finish
Grille	Fiberglass reinforced ABS frame with Gray cloth (from SB600 and DD66000)
Grille Cup	4 rubber cups with metal mounting housings
Port	4" cardboard tube with port flares. 36 Hz tuning
Damping Material	1" fiberglass
Terminals	5-way gold plated binding posts with wire shorting straps
Terminal Cup	Cast aluminum input cup/port assembly
Front Controls	None; HF Level, Presence and Bi-Amp controls mounted on the input/port cup
Badging	Oudensha JBL logo on the front of the enclosure
Product ID Label	Oudensha name plate and separate serial number strip mounted on the rear
Mounting Features	N/A
RoHS	All material specified in this EDS shall comply with European Directive 2002 / 95 / EC

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System Physical Specifications (continued)

may be superceded by information on the drawings

Driver(s)	Qty	Size	Supplier	Model /Part #	Specification
Low Frequency Transducer:	1	15"	JBL Pro	1500A1-1	
Mid Frequency Transducer:					
High Frequency Transducer:	1	4"	JBL Pro	476Mg	
UHF Transducer:	1	1"	JBL Pro	0458e-1	

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Acoustical and Electrical Specifications

System:

Sensitivity: 93 dB fro 2.83 v @ 1 m

Nominal Impedance: 8 Ω

Minimum Impedance: 5.5 Ohm @ 95 Hz

Power Dissipation: 200 W

Bandwidth (-6 dB): 50 Hz Anechoic, 34 Hz 2Pi

f3 (-3 dB): 60 Hz Anechoic, 50 Hz 2 Pi

Distortion Criteria

System Polarity: E. I. A.

Network:

Voltage Drive: See Attachment

Schematic: See Attachment

K2S9900**System Test Specifications**

production testing quantiles per HCG QA AQL

System:

Reliability Test: HCG Reliability Test Plan for Passive Loudspeaker System (Latest Revision)

Visual Criteria: HCG QA Visual Inspection Criteria (Latest Revision) Level:

Dynamic Test: Sine Sweep Voltage:
 Frequency Range:
 Sweep Duration:

Power Test: Input Signal:
 Duration:
 Control Settings:

Polarity Test: Microphone Position: Control Position:

Frequency Response	Window	Averaging	Slope
	+/- 1.5 dB, 50 Hz - 6 kHz	1/3 Octave	36 dB / Octave
	+/- 1.5 dB, 6 kHz - 6 kHz - 12 kHz	1 Octave	36 dB / Octave
	+/- 2.0 dB, 12 kHz - 20 kHz	1 Octave	36 dB / Octave

Network:

Voltage Drive:	Window	Averaging	Slope
LF <input type="text" value="8"/> Ω	+/- 0.5 dB, 20 Hz - 200 Hz	1/3 Octave	36 dB / Octave
	+/- 0.7 dB, 200 Hz - 800 Hz	1/3 Octave	36 dB / Octave
	+/- 1.5 dB, 800 Hz - 1600 Hz	1/3 Octave	36 dB / Octave

MF <input type="text" value=""/> Ω		1/3 Octave	36 dB / Octave
		1/6 Octave	36 dB / Octave
		1/6 Octave	36 dB / Octave
		1/6 Octave	36 dB / Octave
		1/3 Octave	36 dB / Octave

HF <input type="text" value="8"/> Ω	+/- 1.2 dB, 300 Hz - 700 Hz	1/6 Octave	36 dB / Octave
	+/- 0.7 dB, 700 Hz - 20 kHz	1/6 Octave	36 dB / Octave
		1/6 Octave	36 dB / Octave
		1/6 Octave	36 dB / Octave
		1/3 Octave	36 dB / Octave

UHF <input type="text" value="8"/> Ω	+/- 1.5 dB, 10 kHz - 20 kHz	1/3 Octave	36 dB / Octave
	+/- 1.0 dB, 20 kHz - 50 kHz	1/3 Octave	36 dB / Octave

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System Package Specifications

may be superceded by information on the drawings

Accessories:

Owners Manual	Leather bound binder
Warranty Card	N/A
Wire	N/A
Hardware	4 spikes, 4 coasters, 9 v Battery

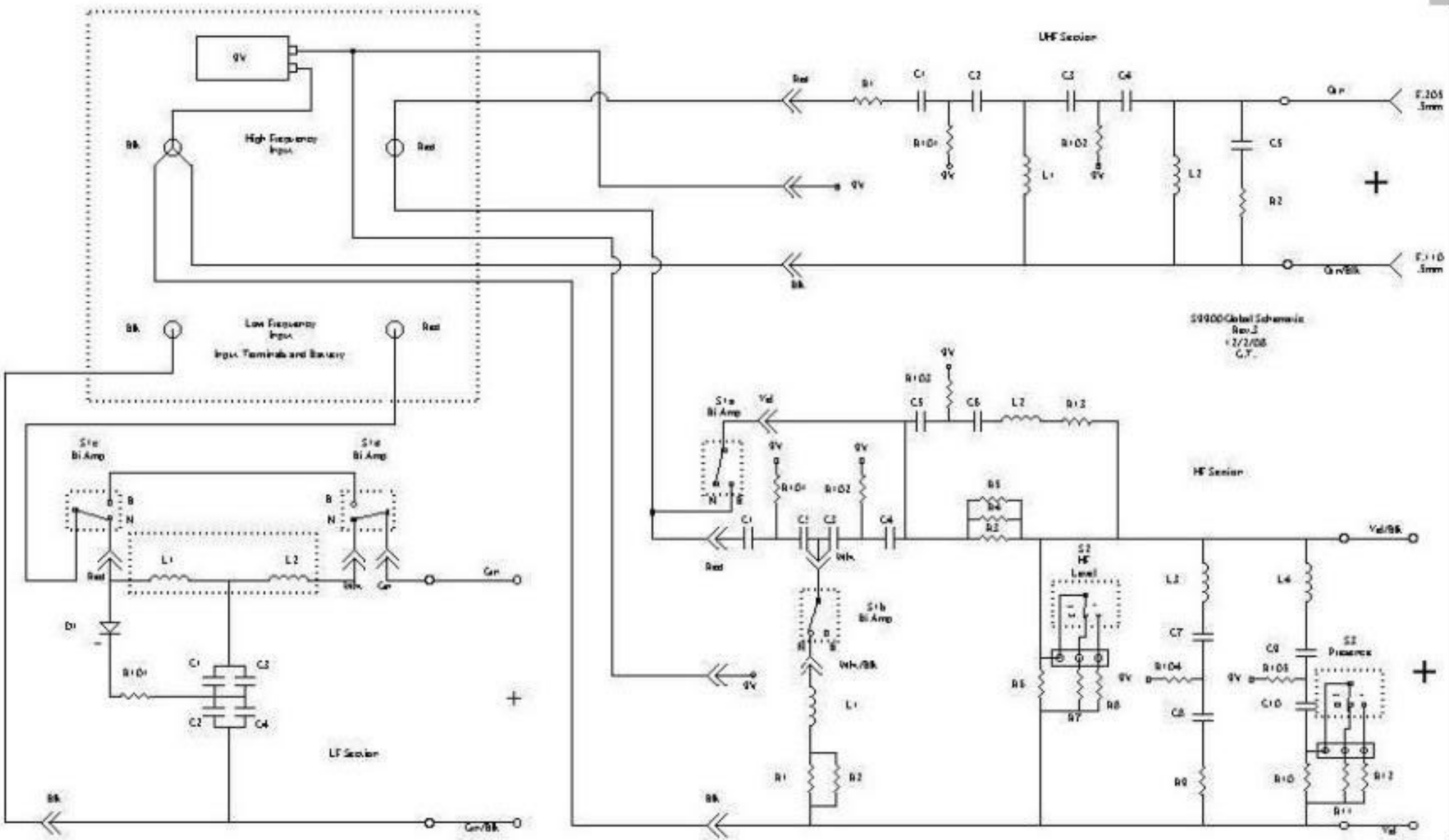
Other	
Other	

Packaging:

Material	375 pound corrugated
Thickness	
Colors	
Finish	
Endpad Material	Etha foam
Master Carton	

Other	
Other	

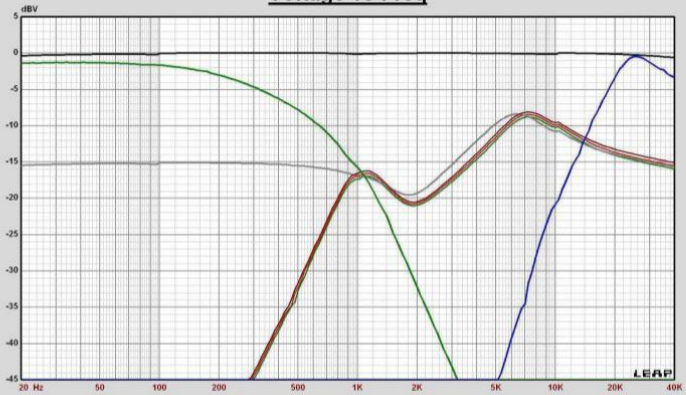
K2S9900



Engineering Standard Network	Date	Rev #	Document Number
		1/6/2009	A
K2S9900			
LF Parts L1 - 6.2 mH \pm 5%, AirCore, DCR < 0.5 L2 - 1.0 mH \pm 5%, AirCore, DCR < 0.3 C1, C2 - 43 uF \pm 5%, 100 V NPE, DF < 4% C3, C4 - 4.7 uF \pm 5%, 250 V Solen D1 - 1N4935 R101 - 10k Ω \pm 10%, 1/4 W, Metalor Carbon Film Red Input - M.250 board mount (.8mm) Blk Input - M.205 board mount (.8mm) Grn - M.250 board mount (.8mm) Wht - M.205 board mount (.8mm) Green Speaker Wire - 12 Ga OFC 28", Strip and Tin 10 mm Grn/Blk Speaker Wire - 12 Ga OFC 28", Strip and Tin 10 mm Circuit Board - Double sided foil, 1 Oz Copper, Glass Epoxy		UHF Parts L1 - 0.025 mH \pm 5%, AirCore, DCR < 0.15 Ω L2 - 0.1 mH \pm 5%, AirCore, DCR < 0.25 Ω C1, C2 - 2.0 uF \pm 5%, 250V Solen C3, C4 - 2.7 uF \pm 5%, 250V Solen C5 - 0.56 uF \pm 5%, 100V Polypropylene R1 - 0.47 Ω \pm 5%, 1 W MetalOxide Film R2 - 5.1 Ω \pm 5%, 0.5 W MetalOxide Film R101, R102 - 2.2 M Ω \pm 10%, 1/4 W, Metalor Carbon Film Red Input - M.205 board mount (.8mm) Blk Input - M.110 board mount (.5mm) Grn Speaker Wire - 16 Ga OFC - 24" terminated with F.205 Grn/Blk Speaker Wire - 16 Ga OFC - 24" terminated with F.110 9 V - (+) Battery connection, M.110 board mount (.5mm) Circuit Board - Double sided foil, 1 Oz Copper, Glass Epoxy	
HF Parts			
L1 - 1.5 mH \pm 5%, AirCore, DCR 0.65 Ω \pm 10%, Wire Gauge = 1 mm L2 - 0.27 mH \pm 5%, AirCore, DCR < 0.3 Ω L3 - 0.65 mH \pm 5%, AirCore, DCR 0.69 Ω \pm 10%, Wire Gauge = 0.7 mm L4 - 0.65 mH \pm 5%, AirCore, DCR 0.69 Ω \pm 10%, Wire Gauge = 0.7 mm C1, C2 - 24 uF \pm 5%, 250 V Solen C3, C4 - 20 uF \pm 5%, 250 V Solen C5, C6 - 3.9 uF \pm 5%, 250 V Solen C7, C8 - 22 uF \pm 5%, 250 V Solen C9, C10 - 16 uF \pm 5%, 250 V Solen R1, R2 - 3.6 Ω \pm 5%, 5 W MetalOxide Film R3, R4, R5 - 47 Ω \pm 5%, 5 W MetalOxide Film R6 - 6.2 Ω \pm 5%, 5 W MetalOxide Film R7 - 56 Ω \pm 5%, 5 W MetalOxide Film R8 - 27 Ω \pm 5%, 5 W MetalOxide Film R9 - 3.9 Ω \pm 5%, 5 W MetalOxide Film R10 - 9.1 Ω \pm 5%, 5 W MetalOxide Film R11 - 100 Ω \pm 5%, 5 W MetalOxide Film R12 - 39 Ω \pm 5%, 5 W MetalOxide Film R13 - 6.2 Ω \pm 5%, 5 W MetalOxide Film R101, R102, R103, R104, R105 - 2.2 M Ω \pm 10%, 1/4 W, Metalor Carbon Film Red - M.205 board mount (.8mm) Blk - M.110 board mount (.5mm) Yel - M.250 board mount (.8mm) Wht - M.250 board mount (.8mm) Wht/Blk - M.205 board mount (.8mm) 9 V - M.110 board mount (.5mm) Yel Speaker Wire - 16 Ga OFC, 18" Strip and Tin 10 mm Yel/Blk Speaker Wire - 16 Ga OFC, 18" Strip and Tin 10 mm HF Level Switch wires - 20 Ga, 24" from Input Circuitboard to 3 pin female Connector 3 pin male circuitboard mount connector attached to PCB Presence Switch wires - 20 Ga, 24" from Input Circuitboard to 3 pin female Connector 3 pin male circuitboard mount connector attached to PCB Circuit Board - Double sided foil, 1 Oz Copper, Glass Epoxy			

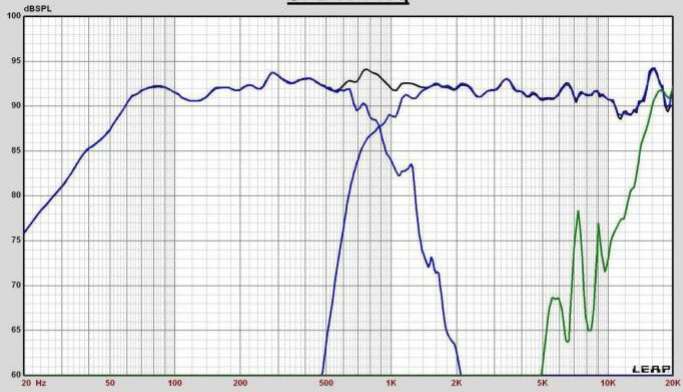
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Voltage vs Freq



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SPL vs Freq

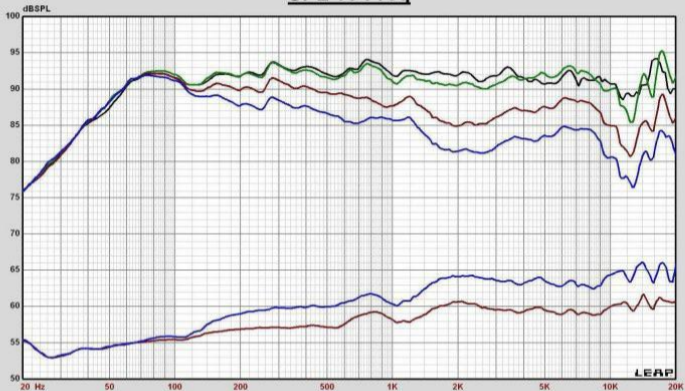


Map

- 53: System, 2.83 V
- 54: LF
- 55: HF
- 56: UHF

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SPL vs Freq

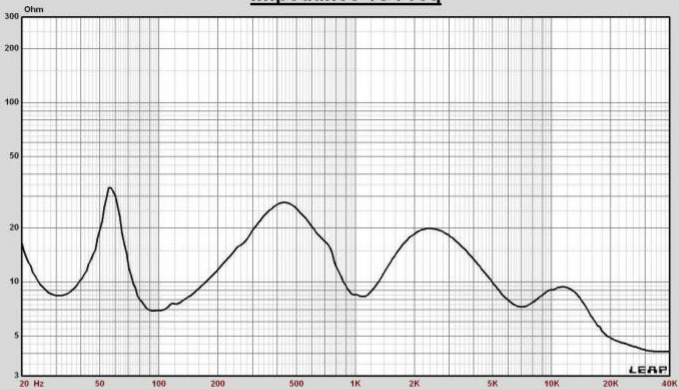


Date

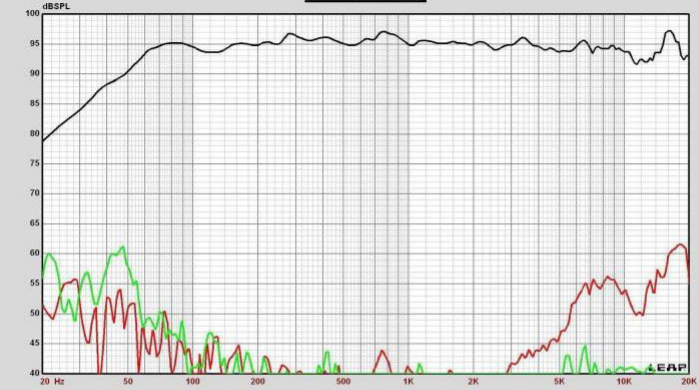
— 53: System, 2.83 V
— 71: Window
— 72: First Reflections
— 73: Total Sound Power
— 74: First Reflections DI
— 75: Total Sound Power DI

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Impedance vs Freq



SPL vs Freq



Map
— 50: On Axis, 96 dB
— 51: 2nd Harmonic
— 52: 3rd Harmonic

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442793

4 inch Magnesium Compression Driver with 1.5 inch exit

Model Number: **476Mg**

Part Number: **440944-001**

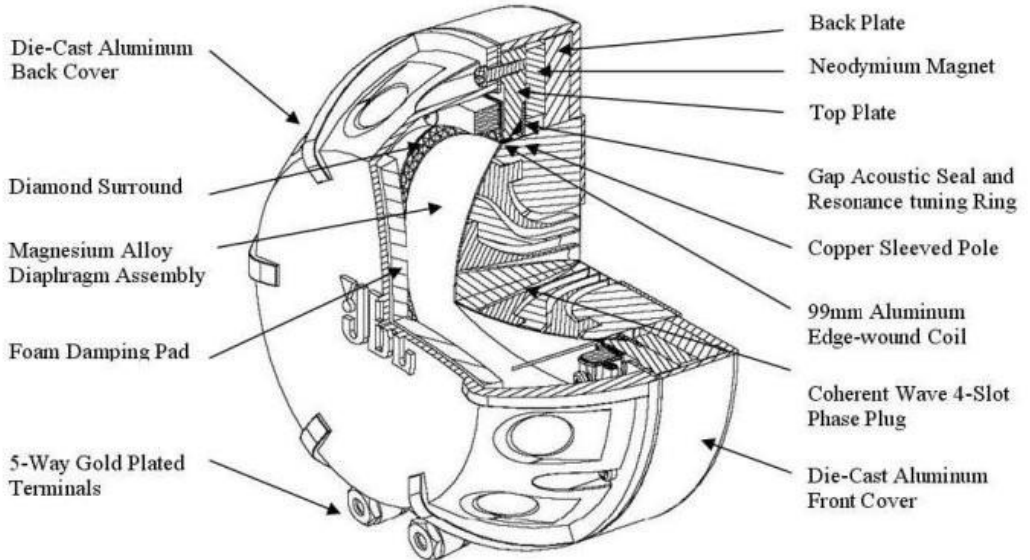
Division: **JBL**

Where Used: **JBL K2 S9900**

Approved Supplier(s) **JBL Pro Manufacturing**

Design Engineer: **Jerry Moro**

Assembled View:



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4 inch Magnesium Compression Driver with 1.5 inch exit

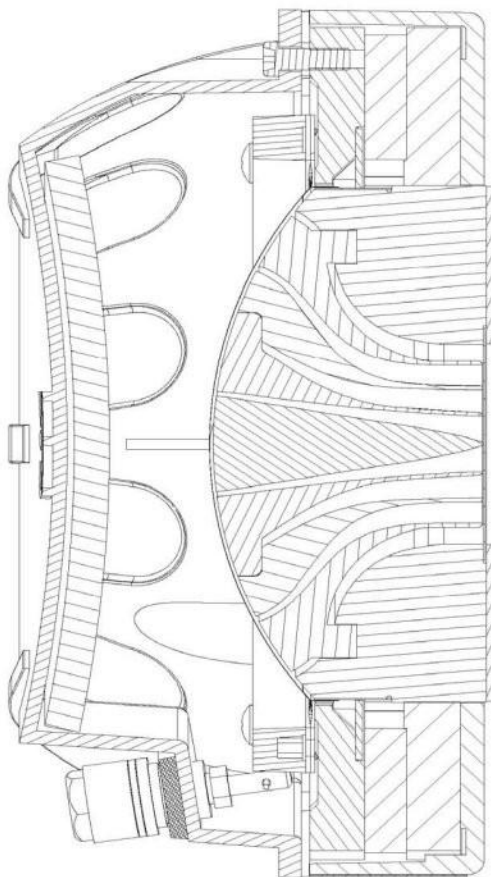
Section View

Model #

476Mg

Part #

440944-001



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Date
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4 inch Magnesium Compression Driver with 1.5 inch exit

Document Revision History

Rev #	Date	Description of Change	ECO#	Approval			
				M.E.	J.M.	J.N.	T.E.
X1	2/27/2009			JM	JM	JN	JM
A	2/27/2009	Release to production	37458	JM			JM

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Date
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4 inch Magnesium Compression Driver with 1.5 inch exit

Transducer Mechanical Characteristics

Model # Part #

Assembly

Overall Height: Overall Diameter:

Mounting Detail:

Other:

Throat

O.D.: Length:

I.D. (Entrance): I.D. (Exit):

Mounting Feature(s):

Other:

Dome

Material: Thickness:

Shape: O.D.:

Other:

Surround

Material: Type:

Other:

Rear Cover

Material: Features:

Color / Finish:

Other:

Mounting Gasket

Material: Color:

Cover Gasket

Material: Color:

Voice Coil

I.D.: Max. O.D.:

Wire Type: Wire Size:

Wire Turns: Wire D.C.R.:

Winding Width: Winding layers:

Former: Wrapper:

Other:

Magnet

Material: Thickness:

O.D.: I.D.:

Other:

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4 inch Magnesium Compression Driver with 1.5 inch exit

Transducer Mechanical Characteristics (Motor)

Model # Part #

Top Plate

Material: Thickness:
 O.D.: I.D.:
 Other:

Pole Piece

O.D.: Copper Cap:
 Other:

Back Plate

Material: Thickness:
 O.D.: I.D.:
 Other:

Bucking Magnet

Material: Thickness:
 O.D.: I.D.:
 Other:

Shielding Can

Material: Thickness:
 Other:

Misc

Magnetic Fluid: Polarity:
 Tinsel Lead Type:
 Tinsel Lead Attach.:
 Terminal Size / Type:
 Other:

Notes:

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4 inch Magnesium Compression Driver with 1.5 inch exit

Model #

476Mg

Part #

440944-001

Transducer Electro-Mechanical Parameters

Fundamental Resonant Frequency (Hz):	Fs	800	+/-	10%
Transducer Direct Current Resistance (Ohms):	DCR	8	+/-	3%
Total Driver Q at Fs, Considering all driver Resistance:	Qts	***	+/-	5%
Moving Mass (g):	Mms	3.7	+/-	5%
Motor Strength (T*m):	Bl	16.95	+/-	5%
Voltage Sensivity(2.83V@1 meter)	SPL	110 dB	+/-	1dB
Radiation Area	Sd	78.54 cm ²		

Method

Software: ****

Mass Loading: ****

Misc.: BL determined by gap flux measurement with search coil

Magnetic Flux Information (For Engineering Reference Only)

Total flux lines intercepted by coil windings [Maxwell Turns]: 176,509

Conversion to flux density [Tesla]: 1.78

Flux lines throughout gap thickness [Maxwell Turns]: 176,509

Conversion to flux density [Tesla]: 1.78

Notes

Parameters provided are nominal values which are closest to the Engineering Reference Standard

Voltage Sensivity takes precedence over possible T/S combinations that would produce SPL

SPL value of 110dB is with 476Mg compression driver mounted on 4338 reference horn measured on axis in a 4 pie chamber (SPL value taken at 2 KHz).

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4 inch Magnesium Compression Driver with 1.5 inch exit

Transducer Test Specifications

production testing quantities per HCG QA AQL

Model #

476Mg

Part #

440944-001

Polarity Test

Polarity: JBL Standard

Dynamic Test

Sine Sweep Voltage: 1.2 Vrms

Frequency Range: 100 Hz to 1,000 Hz

Sweep Duration: 4 sec

Power Test

Signal: 600Hz- 6KHz Pink Noise, 6dB CrF, 12.0 Vrms

Duration: 8 + 92 hours

Impedance

DC Resistance: 8 Ohms

Min. Impedance @ Frequency: 11

Frequency Response

Freq. Response:

Window	Averaging	Slope
508Hz - 640Hz +1.0dB / - 1.3dB	1/3 Octave	36 dB / Octave
640Hz - 3,225Hz +/- 0.8dB	1/3 Octave	36 dB / Octave
3,225Hz - 5,120Hz +/- 1.0dB	1/3 Octave	36 dB / Octave
5,120Hz - 10,240Hz +/- 2.0dB	1/3 Octave	36 dB / Octave
10,240Hz - 20,000Hz +/-3.0dB	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave

Notes:

Test Voltage 2.0 Vrms, Stimulus file: 1/24 OCT

Engineering Standard
Frequency Response

Date

2/27/2009

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4 inch Magnesium Compression Driver with 1.5 inch exit

Model #

Part #

SPL vs Freq



Map — 9: Import: 476Mg Freq Resp .677v.csv

Notes

Measured on 2 inch Plane Wave Tube, using 1.5 to 2 inch Adaptor
Measured at 0.57 Vrms

LMS

4.6.0.364
Mar/16/2007

Person:
Company:

Project:
File: 476Mg.lib

Jan 26, 2009
Mon 12:08 pm

LINEAR X
S Y S T E M S

Engineering Standard
Distortion (Low Level)

Date

2/27/2009

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4 Inch Magnesium Compression Driver with 1.5 Inch exit

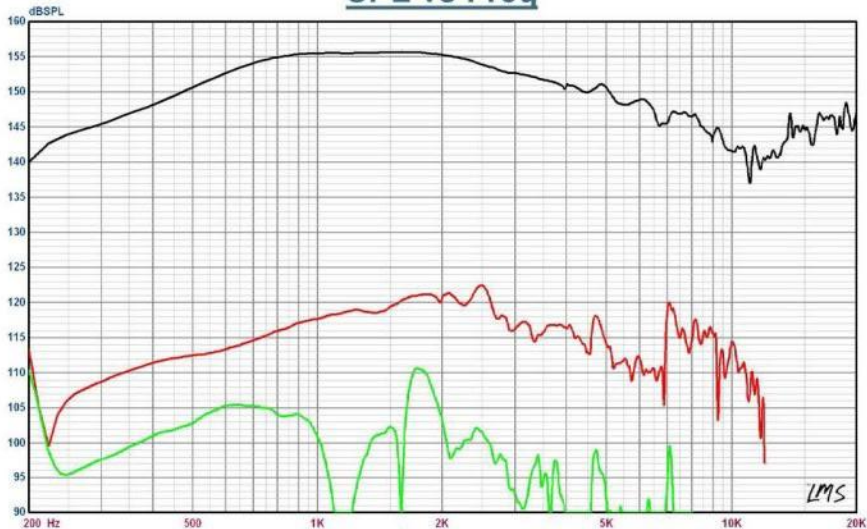
Model #

476Mg

Part #

440944-001

SPL vs Freq



Map
 — 2: Inport: 476Mg Dist Fund.csv
 — 3: Inport: 476Mg Dist_2H.csv
 — 4: Inport: 476Mg Dist_3H.csv

Notes

Measured on 2 Inch Plane Wave Tube, using 1.5 to 2 inch Adaptor

BLACK = Fundamental

Measured at 7.5 Vrms

RED = 2nd Harmonic

Harmonic Distortion shown is NOT RAISED relative to Fundamental

GREEN = 3rd Harmonic

LMS

4.6.0.364
Mar/16/2007

Person:
Company:

Project:
File: 476Mg.lib

Jan 26, 2009
Mon 12:02 pm

LINEAR
S Y S T E M S

Engineering Standard
Distortion (High Level)

Date
2/27/2009

Rev #
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Document Number
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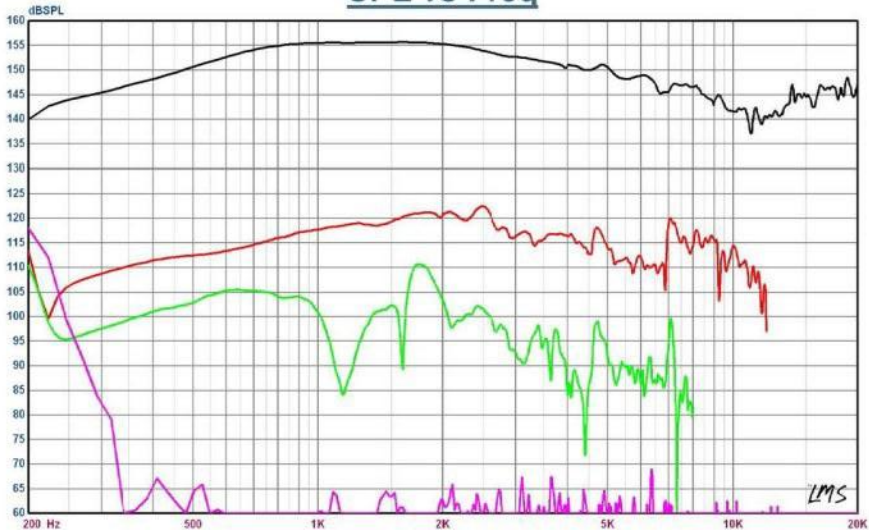
4 Inch Magnesium Compression Driver with 1.5 Inch exit

Model # 476Mg

Part #

440944-001

SPL vs Freq



- Map
- 2: Imp: 476Mg Dist Fund.csv
 - 3: Imp: 476Mg Dist_2H.csv
 - 4: Imp: 476Mg Dist_3H.csv
 - 5: Imp: 476Mg Dist_0.5H.csv

Notes

Measured on 2 inch Plane Wave Tube, using 1.5 to 2 inch Adaptor
 Measured at 7.5 Vrms
 Harmonic Distortion shown is **NOT RAISED** relative to Fundamental

BLACK = Fundamental
 RED = 2nd Harmonic
 GREEN = 3rd Harmonic
 PURPLE = 1/2 (sub) Harmonic

LMS

4.6.0.364
Mar16/2007

Person:
Company:

Project:
File: 476Mg.lib

Jan 26, 2009
Mon 12:06 pm

LINEAR X
S Y S T E M S