

# harman consumer group

Engineering Design  
Specification

Date

8/4/2010

Rev #

A

Document Number

443877

**JBL 4365**



**JBL 4365**

**System Physical Specifications**

*may be superceded by information on the drawings*

**Description:**

3-way 15" Compression Driver Studio Monitor

**Specification:**

Material	MDF
Panel Thickness	1"
Ext. Dimensions	40.25" H x 23.5" W x 17" D, Including feet and spikes
Weight	
Net Internal Vol	4.2 cubic feet
Sub Enclosure	None
Bracing	Perimeter bracing
Feet	Stainless Steel spikes (blunt and pointed)
Finish	Man made Walnut veneer with satin top coat
Grille	Plastic grille frame covered with Monitor Blue stretch cloth
Grille Cup	rubber cup (6)
Port	Flared 3" diameter ports (2)
Damping Material	1" fiberglass
Terminals	2 pair 5-way binding posts with jumper straps
Terminal Cup	1/2" MDF board, internal mounting
Front Controls	HF and UHF level trim controls, 5 position
Badging	JBL Inameplate/control label
Product ID Label	Polycarbonite label on input plate
Mounting Features	None
RoHS	All material specified in this EDS shall comply with European Directive 2002 / 95 / EC

**JBL 4365**

**Acoustical and Electrical Specifications**

**System:**

*Sensitivity:* 93 dB, 2.83 V @ 1m

*Nominal Impedance:* 8 Ω

*Minimum Impedance:* 7.7 Ohms @ 100 Hz, 8 Ohms @ 900 Hz, 3.7 Ohms @ 8 kHz

*Power Dissipation* 20 V IEC Shaped Noise, 50 w

*Bandwidth (-6 dB):* 32 Hz - 40 kHz (Anechoic), 28 Hz - 40 kHz (2 Pi)

*f3 (-3 dB):* 38 Hz - 40 kHz (Anechoic), 32 Hz - 40 kHz (2 Pi)

*Distortion Criteria*

*System Polarity:* E.I.A.

**Network:**

*Voltage Drive:* See Attachment

*Schematic:* See Attachment

<http://www.audioheritage.org/bulletin/showthread.php?29370-New-JBL-43xx-Studio-Monitor/page2>

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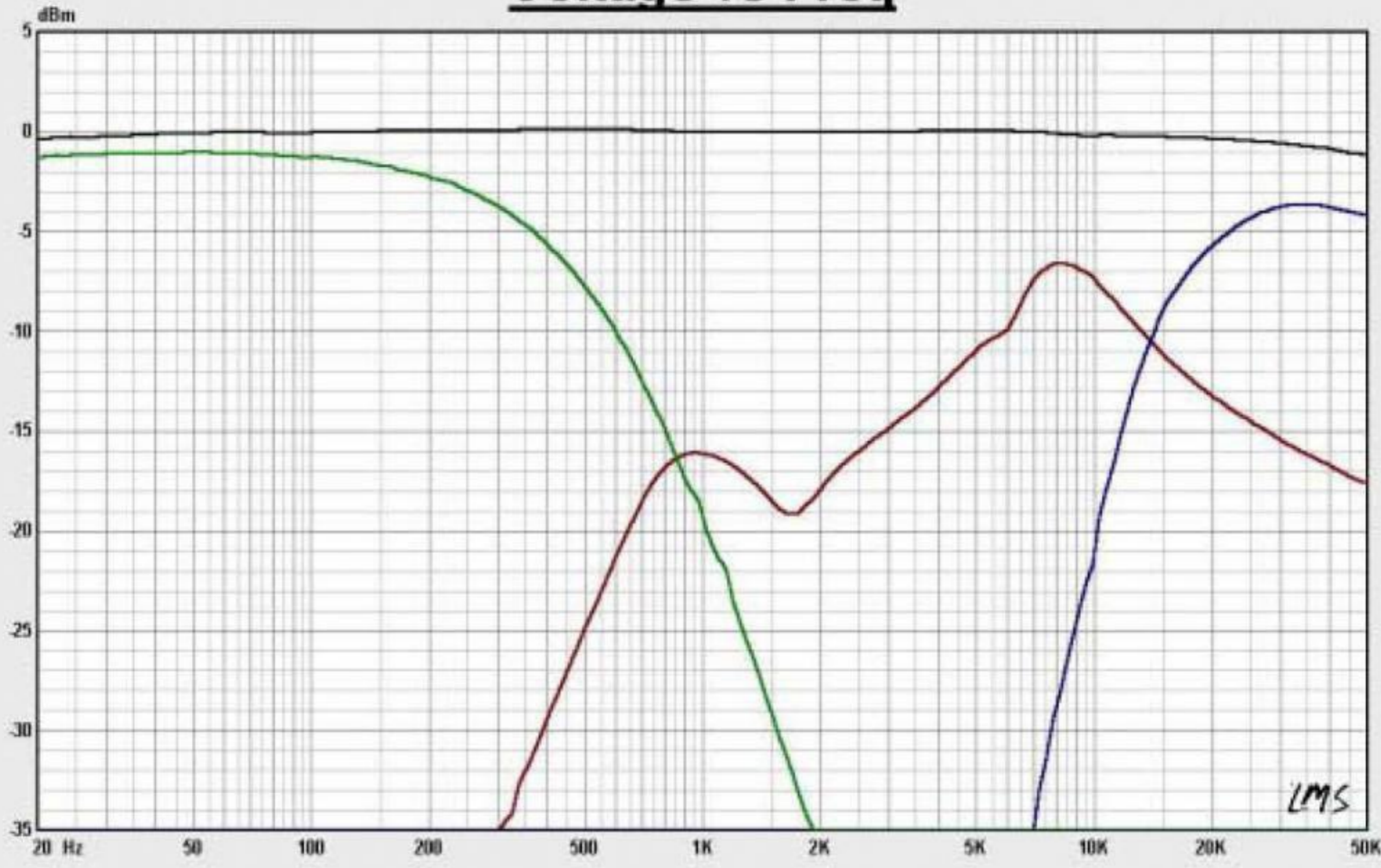
The S9900 uses the D45BE while 4365 uses the D45TI (roughly half the cost).  
 The S9900 uses the 1500AL-1 while 4365 uses a "cloth surround version of the 1500FE" (roughly half the cost).  
 This new monitor has more bottom end than the S9900 as measured at JBL. The cloth surround worked out very well.

S9900  
 3.4 cu ft  
 F6 50 Hz Anechoic, 34 Hz 2Pi  
 F3 60 Hz Anechoic, 50 Hz 2 Pi

4365  
 4.2 cu ft  
 F6 32 Hz Anechoic 28 Hz 2Pi  
 F3 38 Hz Anechoic 32 Hz 2 Pi

JBL 4365

# Voltage vs Freq

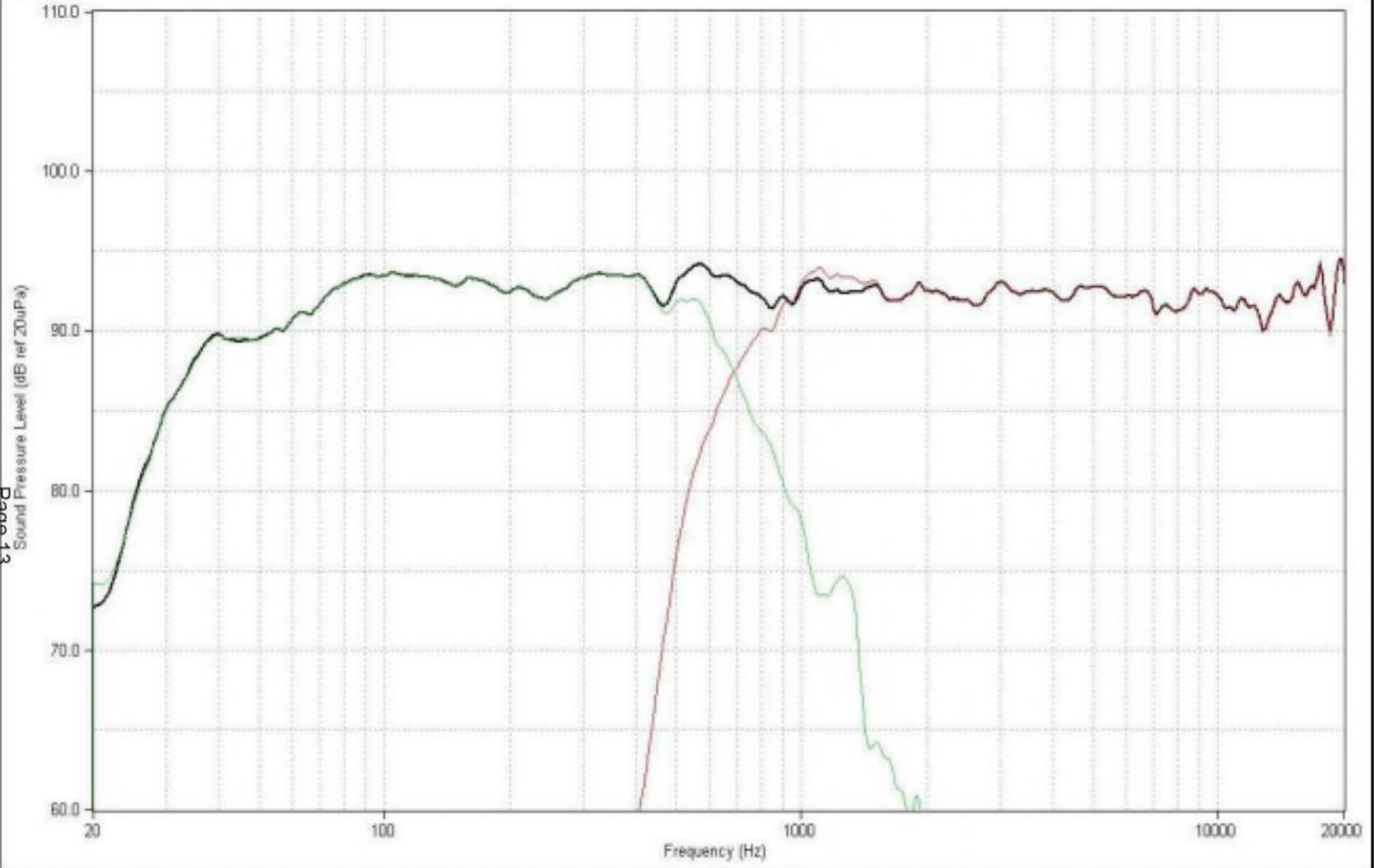


LMS

- 3: Ref
- 11: HF, 8 Ohm Load
- 12: UHF, 8 Ohm Load
- 21: LF, 8 Ohm Load

Map

harman audio test system



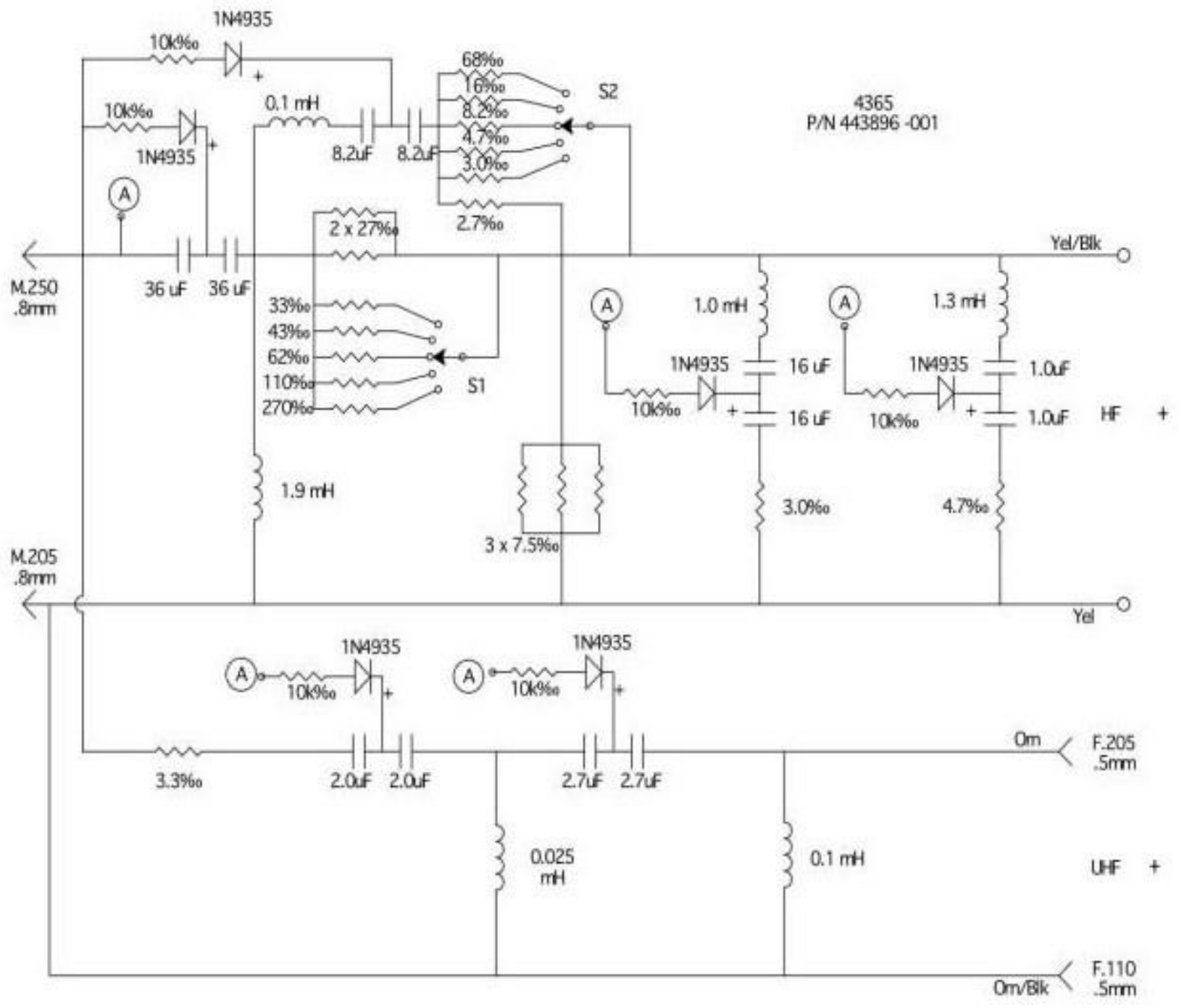
36: 4365 Controls @ 0  
34: 4365 LF  
35: 4365 HF

JBL 4365

Engineering Standard	Date	Rev #	Document Number
Frequency Response	8/4/2010	A	443877

JBL 4365

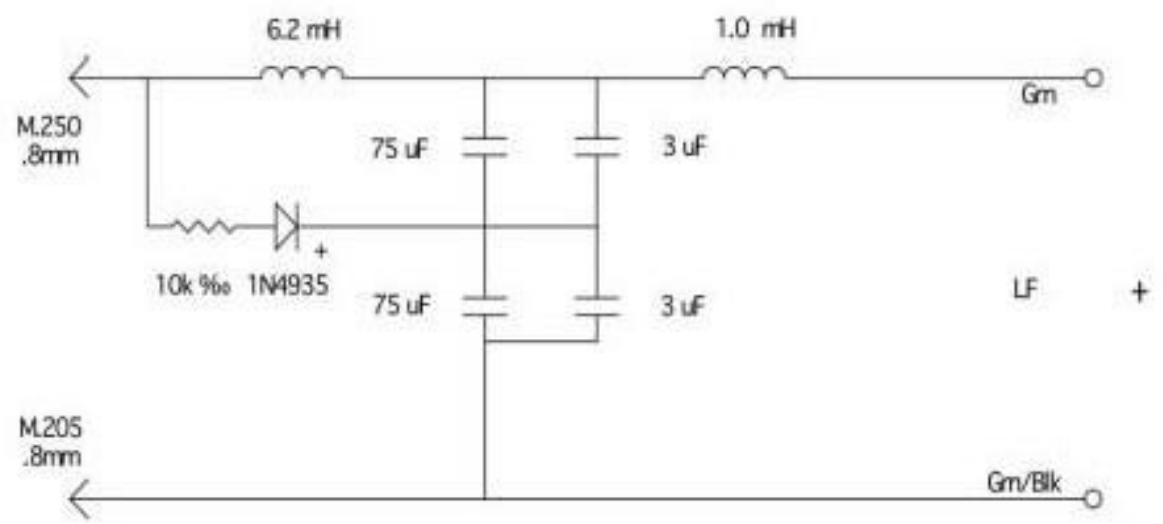
4365  
P/N 443896 -001



**JBL 4365**

2/26/10  
Rev. 2  
G.T.

4365  
P/N 443896 -002



M.250  
.8mm

M.205  
.8mm

# harman consumer group

Engineering Design  
Specification

Date

7/30/2010

Rev #

X1

Document Number

9990010

**15 inch low distortion woofer with special 3-layer cone**

Model Number: 1501FE

Part Number: 443974-001

Division: Harman Japan

Where Used: JBL 4365

Approved Supplier(s): HAdM (Mexico)

Design Engineer: JMoro

Assembled View:





**15 inch low distortion woofer with special 3-layer cone**

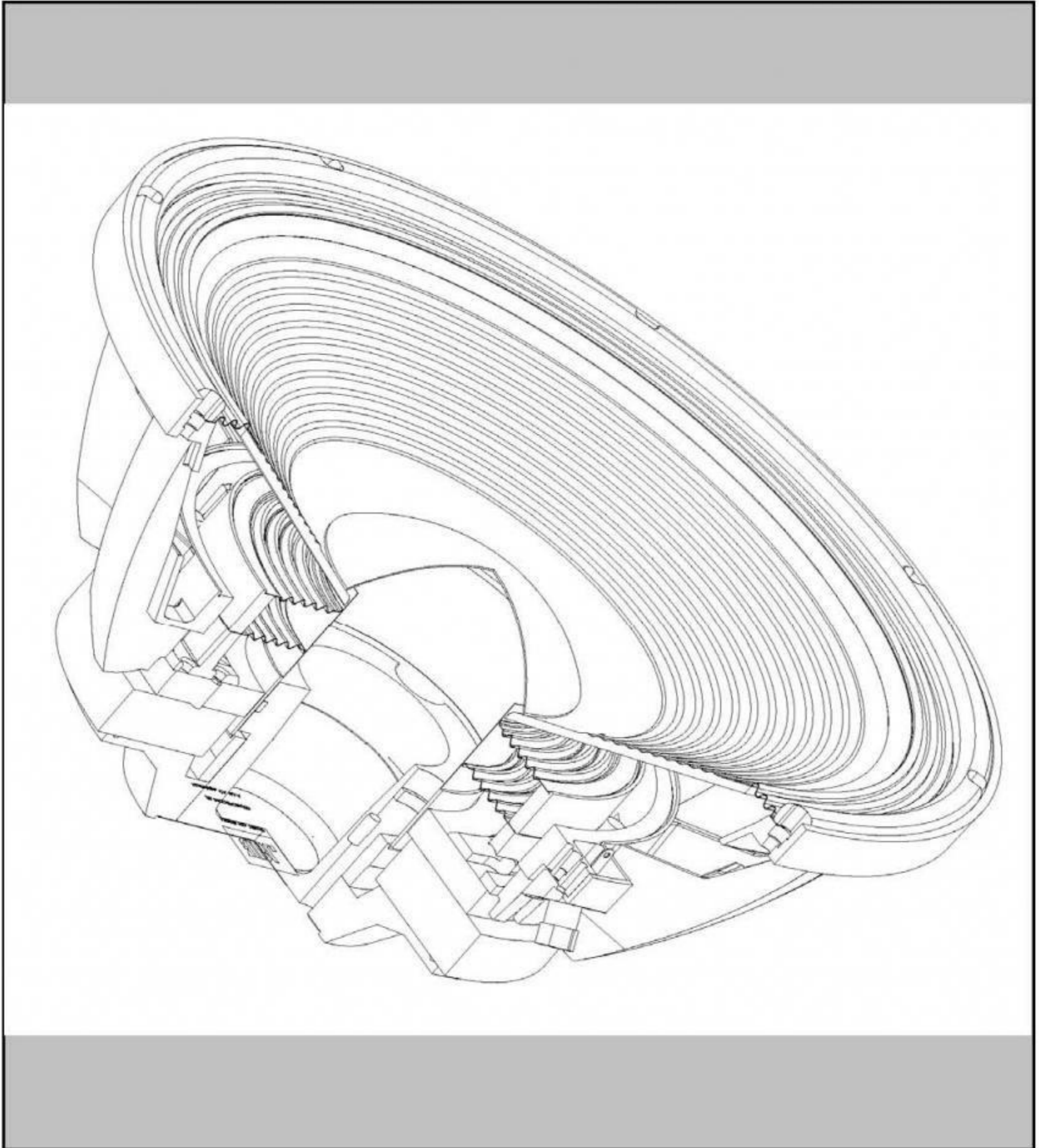
*Section View*

Model #

1501FE

Part #

443974-001



Engineering Design Specification	Date	Rev #	Document Number
	7/30/2010	X1	9990010

**15 inch low distortion woofer with special 3-layer cone**

**Document Revision History**

Rev #	Date	Description of Change	ECO#	Approval	
				M.E.	T.E.
X1	7/30/2010			n/a	JM

**15 inch low distortion woofer with special 3-layer cone**

**Transducer Mechanical Characteristics**

Model #  Part #

**Assembly**

Mounting Diameter:  Mounting Depth:   
 Flange Diameter:  Flange Depth:   
 Mounting Detail:  Overall Depth:   
 Other:

**Frame**

Type:  Material:   
 Color:  Finish:   
 Other:

**Diaphragm**

Type:  Material:   
 Color:  Finish:   
 Other:

**Surround**

Type:  Material:   
 Color:  Finish:   
 Other:

**Spider**

Type:  Material:   
 Weave:  Color:   
 Other:

**Front Gasket**

Material:  Color:

**Rear 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:

**15 inch low distortion woofer with special 3-layer cone**

**Transducer Mechanical Characteristics (Motor)**

Model #  Part #

**Top Plate**

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

**Pole Piece**

O.D.:  Copper Cap:   
 Vent:   
 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**

Terminal Size / Type:  Polarity:   
 SFG Configuration:   
 Flux Stabilizing Ring:   
 Tinsel Lead Type:   
 Tinsel Lead Attach.:   
 Other:

**Notes:**

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**15 inch low distortion woofer with special 3-layer cone**

Model # 1501FE

Part # 443974-001

**Transducer Electro-Mechanical Parameters**

Fundamental Resonant Frequency (Hz):	Fs	29.5	+/-	10%
Transducer Direct Current Resistance (Ohms):	DCR	5.4	+/-	3%
Total Driver Q at Fs, Considering all driver Resistance:	Qts	0.25	+/-	5%
Moving Mass (g):	Mms	150	+/-	5%
Motor Strength (T*m):	Bl	24.69	+/-	5%
Voltage Sensitivity(2.83V@1 meter)	SPL	93dB	+/-	1dB
Radiation Area	Sd	897.27cm <sup>2</sup>		

**Method**

Software:	MLSSA
Mass Loading:	200 Grams
Misc.:	

**Magnetic Flux Information (For Engineering Reference Only)**

Total flux lines intercepted by coil windings [Maxwell Turns]:	532,290
Conversion to flux density [Tesla]:	0.552
Flux lines throughout gap thickness [Maxwell Turns]:	330,000 throughout 0.5" top plate
Conversion to flux density [Tesla]:	0.818

**Notes**

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

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

**15 inch low distortion woofer with special 3-layer cone**

**Transducer Test Specifications**

production testing quantities per HCG QA AQL

Model # **1501FE**

Part # **443974-001**

**Polarity Test**

Polarity: **EIA standard (+ voltage at Pos terminal = Cone Out)**

**Dynamic Test**

Sine Sweep Voltage: **17 vrms**

Frequency Range: **20 Hz - 500 Hz**

Sweep Duration: **6 seconds**

**Power Test**

Signal: **Pink Noise, 30-300Hz, 40 Vrms, 6dB Crest Factor**

Duration: **8 + 92 hour (Qualification), 2 hrs (Production Audit)**

**Impedance**

DC Resistance: **5.4 Ohms**

Min. Impedance @ Frequency: **7.5 Ohms at 150 Hz**

**Frequency Response**

Freq. Response:

Window	Averaging	Slope
60 - 403 Hz +/- 1.0 dB	1/6 Octave	36 dB / Octave
403 - 905 Hz +/- 1.0 dB	1/3 Octave	36 dB / Octave
905 - 2K Hz +/- 2.0 dB	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
	1/3 Octave	36 dB / Octave
	1/3 Octave	36 dB / Octave

**Notes:**

Engineering Standard  
Measured Parameters

Date

7/30/2010

Rev #

X1

Document Number

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15 inch low distortion woofer with special 3-layer cone

Model #

1501FE

Part #

443974-001

MLSSA SPD 4WI #010227-3479-3488 for Harman Consumer Group  
Measured Parameters QC Limits

Line	Parameter	Value	Units
1	RMSE-free	0.82	Ohms
2	Fs	29.52	Hz
3	Re	5.42	Ohms
4	Res	92.65	Ohms
5	Qms	4.25	
6	Qes	0.25	
7	Qts	0.24	
8	L1	1.26	mH
9	L2	2.39	mH
10	R2	4.48	Ohms
11	RMSE-load	0.79	Ohms
12	Vas(Sd)	217.67	liters
13	Mms	150.98	grams
14	Cms	192	$\mu$ M/Newton
15	B1	24.69	Tesla-M
16	SPLref(Sd)	97.0	dB[8 ohms]
17	Rub-index	0.00	

Method: Mass-loaded (200.000 grams)  
DCR mode: Fixed (6.01 - 0.59 ohms)

Area (Sd): 897.27 sq cm  
QC file: CLOSED

Analysis successful. Shift in Fs = -35.1% (-20% to -50% is recommended).

1501FE PV TEMP STND #2

MLSSA: Parameters

Engineering Standard  
Frequency Response

Date  
7/30/2010

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X1

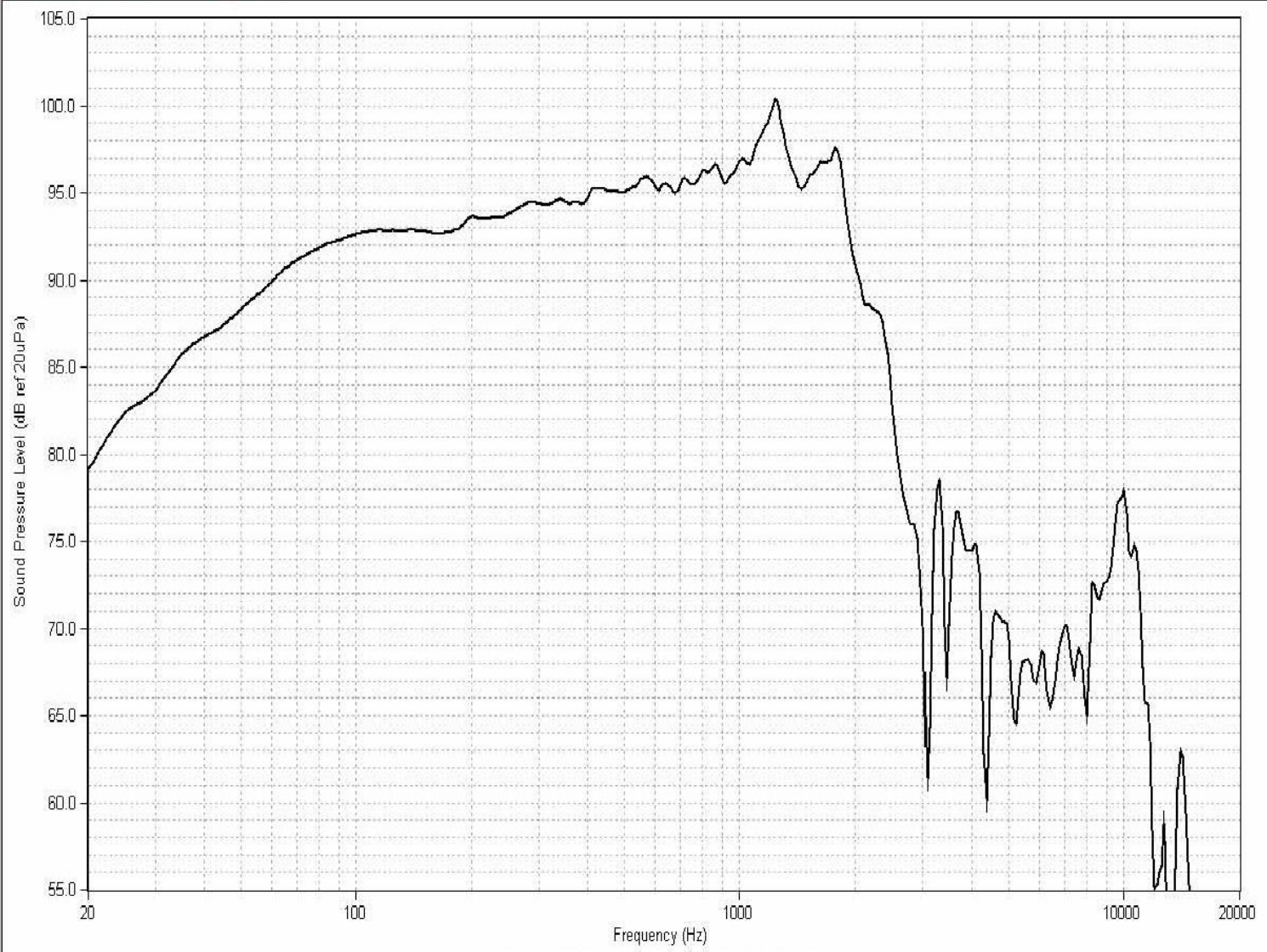
Document Number  
9990010

**15 inch low distortion woofer with special 3-layer cone**

Model # 1501FE

Part # 443974-001

harman audio test system



Measured at 2.83 Vrms at 1M in 2 pie Anechoic Chamber

165: 1501Fe PV #2 Temp STND



Engineering Standard  
Distortion (Low Level)

Date  
7/30/2010

Rev #  
X1

Document Number  
9990010

***15 inch low distortion woofer with special 3-layer cone***

Model #

1501FE

Part #

443974-001



**Notes:**

A large yellow rectangular area, likely a placeholder for notes or additional information.

Engineering Standard  
Distortion (High Level)

Date

7/30/2010

Rev #

X1

Document Number

9990010

**15 inch low distortion woofer with special 3-layer cone**

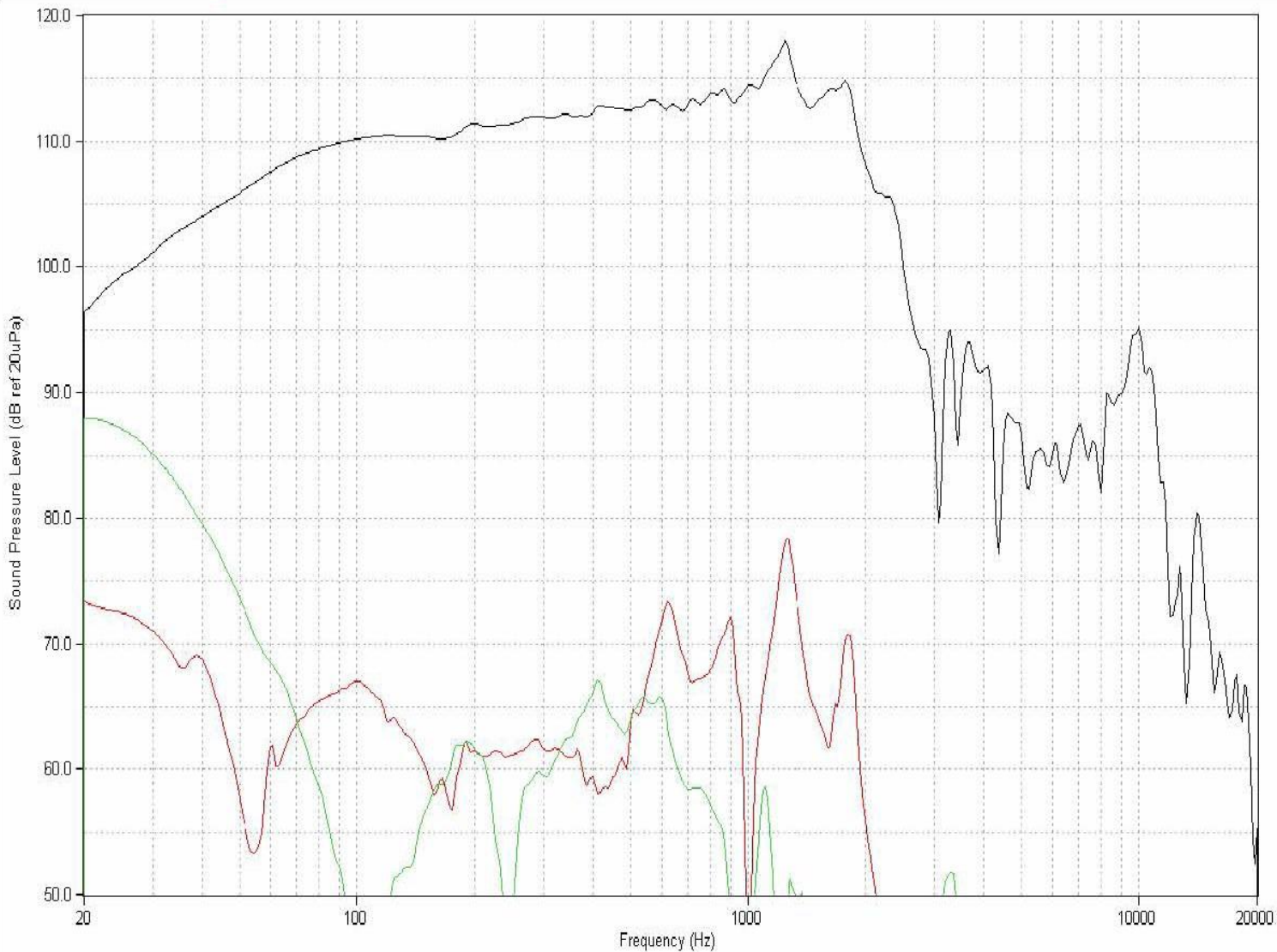
Model #

1501FE

Part #

443974-001

harman audio test system



Measured at 21.2 Vrms at 1M in 2 pie Anechoic Chamber (2nd and 3rd Harmonic Distortion NOT raised relative to Fundamental)

- 166: 1501FE PV #2 Temp STND @ 21.2 Vrms
- 168: 1501FE PV #2 Temp STND S:d 2nd\*
- 169: 1501FE PV #2 Temp STND S:d 3rd\*

jmoro - 7/30/2010 4:19:57 PM - C:\Documents and Settings\jmoro\My Documents\HATS Data\1501FE for 4365 hats

Engineering Standard  
Impedance

Date  
7/30/2010

Rev #  
X1

Document Number  
9990010

**15 inch low distortion woofer with special 3-layer cone**

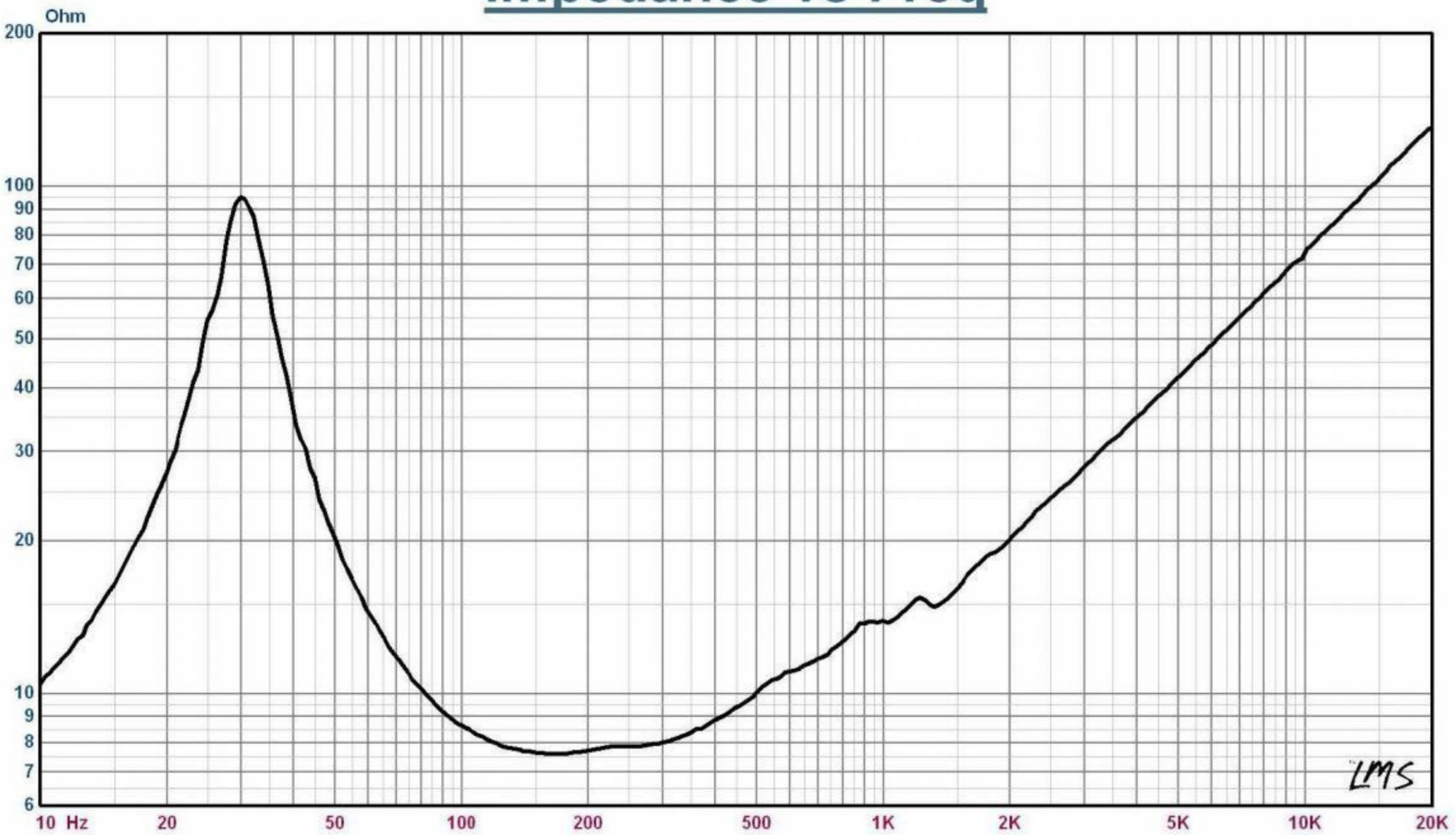
Model #

1501FE

Part #

443974-001

## Impedance vs Freq



— 20: 1501FE PV Temp STND #2

Map

**15 inch low distortion woofer with special 3-layer cone**

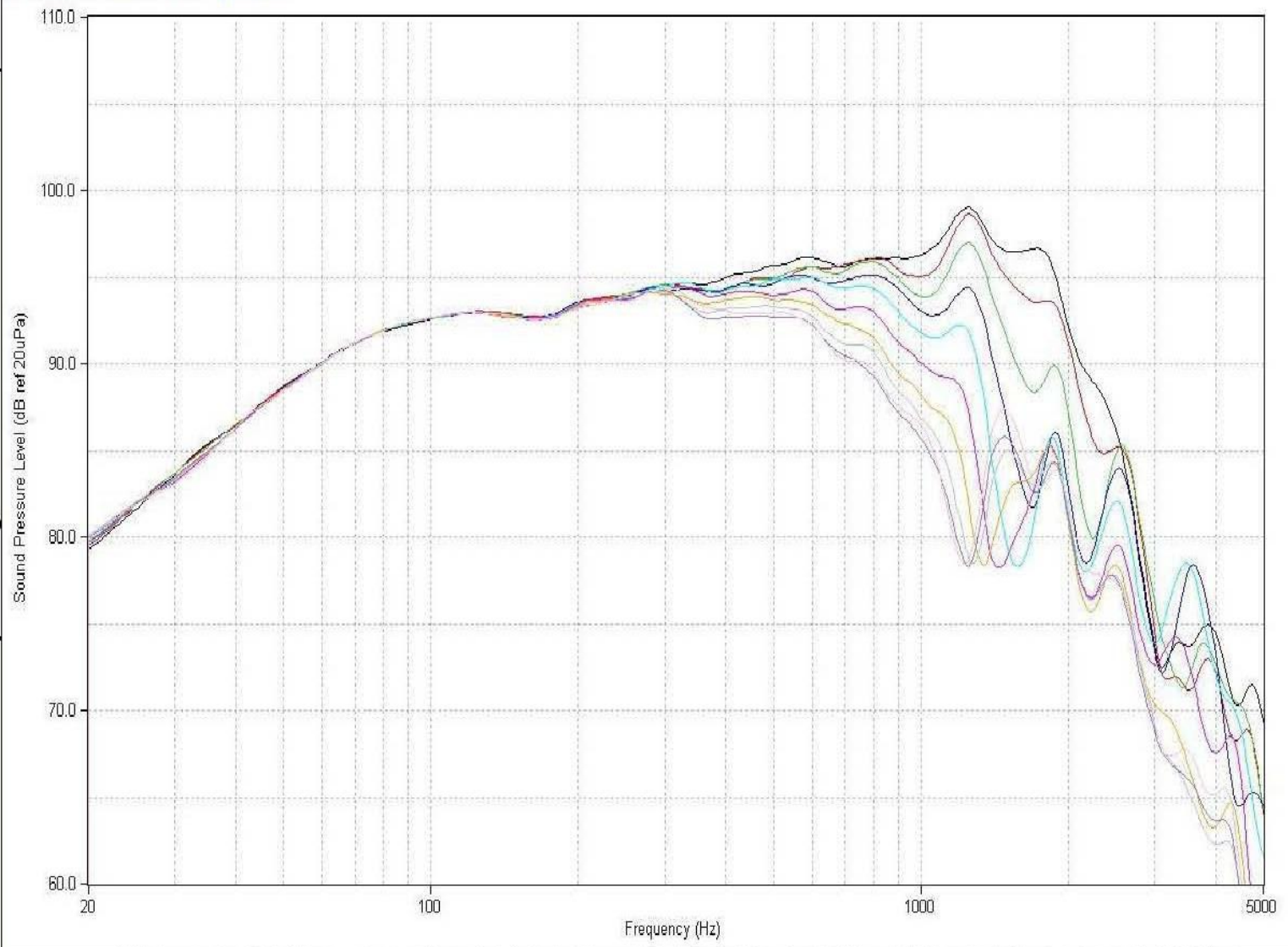
Model #

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harman audio test system



1/6 Octave smoothed, Off-Axis Frequency Response Curves, 0 deg to 90 deg ( Measured in 2 pie Anechoic Chamber at 2.83 Vrms at 2M, but mathematically adjusted on graph for 1M SPL level)

- 195: 1501FE PV#2, 0 deg    198: 1501FE PV#2, 30 deg    201: 1501FE PV#2,, 60 deg    204: 1501FE PV#2, 90 deg
- 196: 1501FE PV#2, 10 deg    199: 1501FE PV#2, 40 deg    202: 1501FE PV#2, 70 deg
- 197: 1501FE PV#2, 20 deg    200: 1501FE PV#2, 50 deg    203: 1501FE PV#2, 80 deg

**15 inch low distortion woofer with special 3-layer cone**

Model # 1501FE

Part # 443974-001

