harman consumer group

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

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Section View

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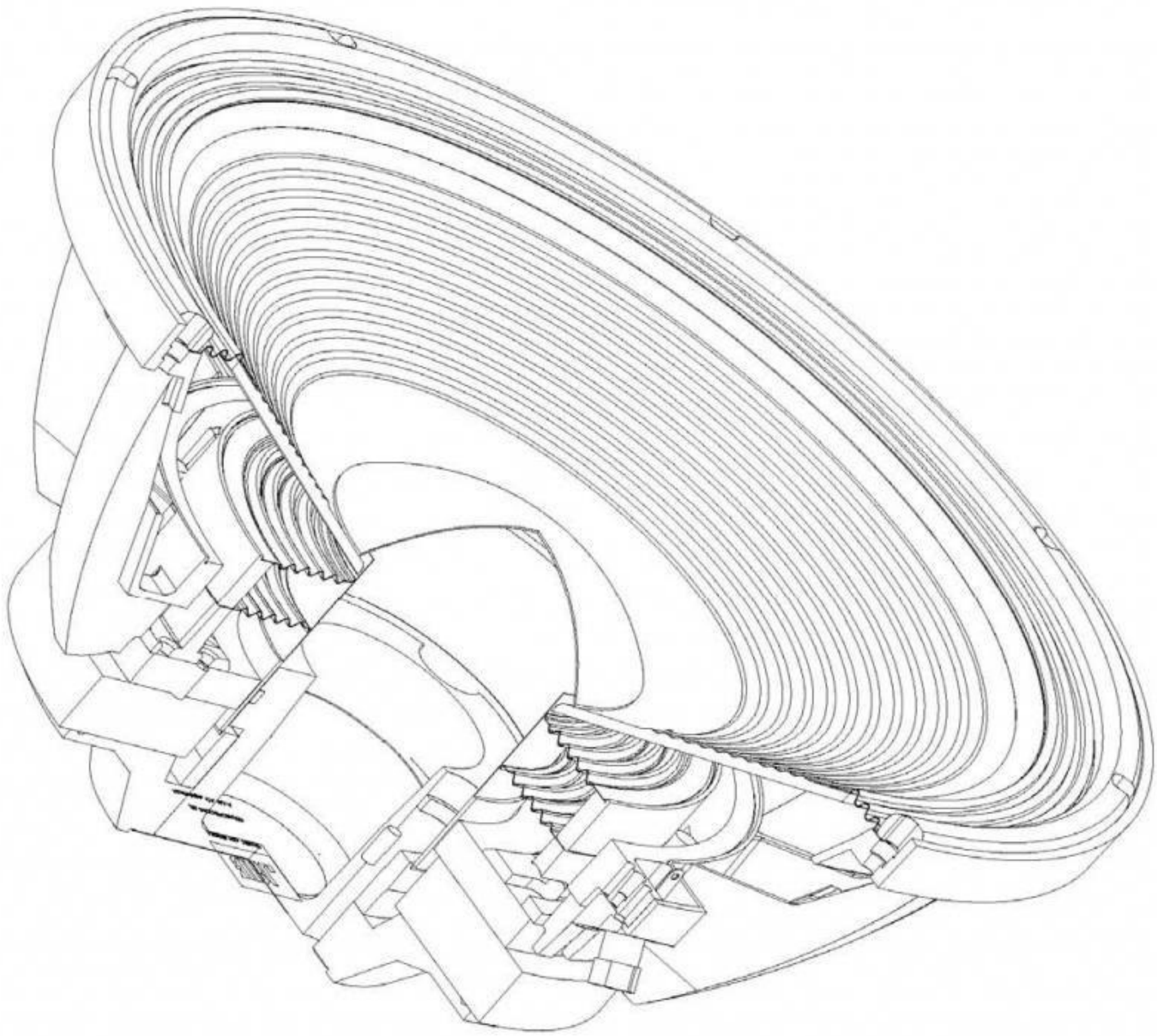

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Document Revision History

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

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Transducer Mechanical Characteristics

Model #	1501FE	Part #	443974-001

Assembly

Mounting Diameter:	13.75"	Mounting Depth:	6.65"
Flange Diameter:	15.25"	Flange Depth:	0.75"
Mounting Detail:	8x # 10-32 screw on 14.560 B.C.	Overall Depth:	7.45"
Other:			

Frame

Type:	Heavy wall Cast Aluminum	Material:	380 Aluminum Alloy
Color:	Gray- Cardinal PowderCoat LS#5368	Finish:	Textured
Other:			

Diaphragm

Type:	3-layer Sandwich cone	Material:	Paper skins with Injection Foam core
Color:	Black	Finish:	Ribbed cone surface - smooth back
Other:	DKN paper pulp for Front and back side skins with Polyurethane injection foam core (about 2 mm thk.)		

Surround

Type:	3 roll accordian edge	Material:	Polyester/Cotton blend (50/50%)
Color:	Black	Finish:	Moyen SP706 edge treat damping
Other:			

Spider

Type:	5 roll accordian - Flat	Material:	Nomex
Weave:	NX9046	Color:	Yellow
Other:	Dual "inverted" spider configuration seperated by 0.80" aluminum spacer ring		

Front Gasket

Material:	Nitrile Butylene (NBR) - 70 ShoreA	Color:	Black

Rear Gasket

Material:	n/a	Color:	n/a

Voice Coil

I.D.:	3.903"	Max. O.D.:	4.025"
Wire Type:	Aluminum Edge Wound	Wire Size:	.051" wide x 0.0077" thick
Wire Turns:	150	Wire D.C.R.:	5.4 Ohms
Winding Width:	1.20"	Winding layers:	1
Former:	10 mil thk. High Temperature Fiberglass	Wrapper:	10 mil thk Nomex 410
Other:	0.0004" Adhesive and Bond TOTAL build thickness on bare wire		

Magnet

Material:	Ceramic 8 - TDK FB4N or Equiv.	Thickness:	0.866"
O.D.:	8.66"	I.D.:	4.33"
Other:			

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Transducer Mechanical Characteristics (Motor)

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Top Plate

Material:	1010 Low Carbon Steel (< 0.18%)	Thickness:	0.50"
O.D.:	7.75"	I.D.:	4.064" with 3 vent notches
Other:	Clear Zinc plating finish		

Pole Piece

O.D.:	3.879"	Copper Cap:	Copper ring crimped into pole groove
Vent:	3 venturies starting on 3.879 inch OD extending to rear of pole.		
Other:	Low Carbon Cast steel, 1010. Black Plating finish		

Back Plate

Material:	Forged Low Carbon Steel,, 1010	Thickness:	Various - Tappered thin at magnet OD
O.D.:	8.25"	I.D.:	n/a
Other:	Black Powder Coat finish		

Bucking Magnet

Material:	n/a	Thickness:	n/a
O.D.:	n/a	I.D.:	n/a
Other:	n/a		

Shielding Can

Material:	n/a	Thickness:	n/a
Other:	n/a		

Misc

Terminal Size / Type:	5-way Binding Post - Screw type	Polarity:	E. I. A.
SFG Configuration:	Yes		
Flux Stabilizing Ring:	0.90" Aluminum ring height at base of pole		
Tinsel Lead Type:	RoHS compliant CAD free Twisted lead # ATA7Y18H2KA42W-115B		
Tinsel Lead Attach.:	Soldered to Terminal and cone/vc Eyelet		
Other:	VGC - Vented Gap Cooling		

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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^2		

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 Referance Standard

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

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Transducer Test Specifications

production testing quantities per HCG QA AQL

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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
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Notes:

Engineering Standard Measured Parameters	Date	Rev #	Document Number
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MLSSA SPD 4WI #010227-3479-3488 for Harman Consumer Group
QC Limits
Measured Parameters

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	µM/Newton
15	Bl	24.69	Tesla-M
16	SPLref(Sd)	97.0	dBI8 ohms]
17	Rub-index	0.00	

Method: Mass-loaded (200.000 grams) Area (Sd): 897.27 sq cm
DCR mode: Fixed (6.01 - 0.59 ohms) QC file: CLOSED

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

MLSSA: Parameters

150IFE PV TEMP STND #2

Engineering Standard Frequency Response	Date	Rev #	Document Number
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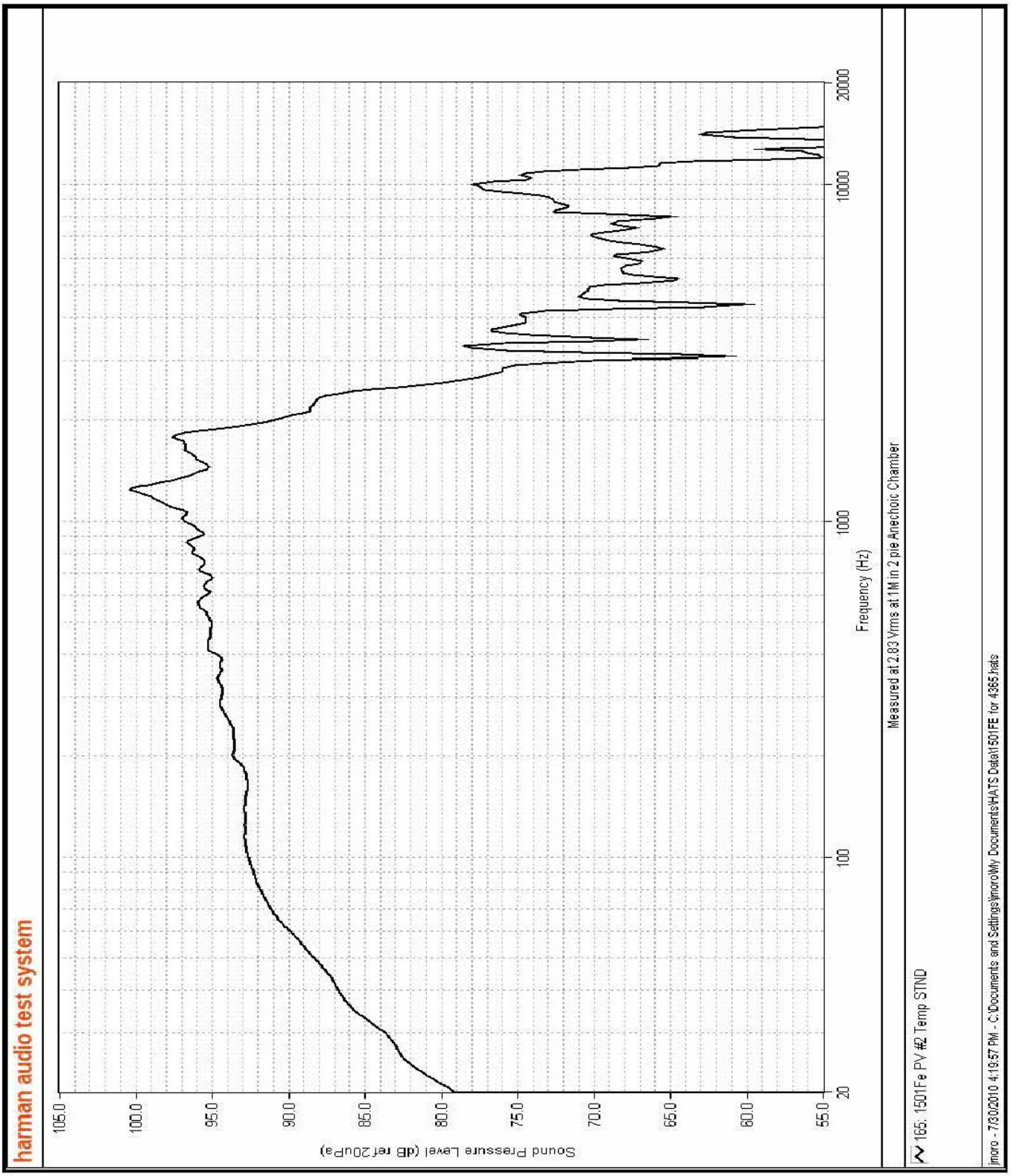

Engineering Standard Distortion (Low Level)	Date	Rev #	Document Number
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Engineering Standard Distortion (High Level)	Date	Rev #	Document Number
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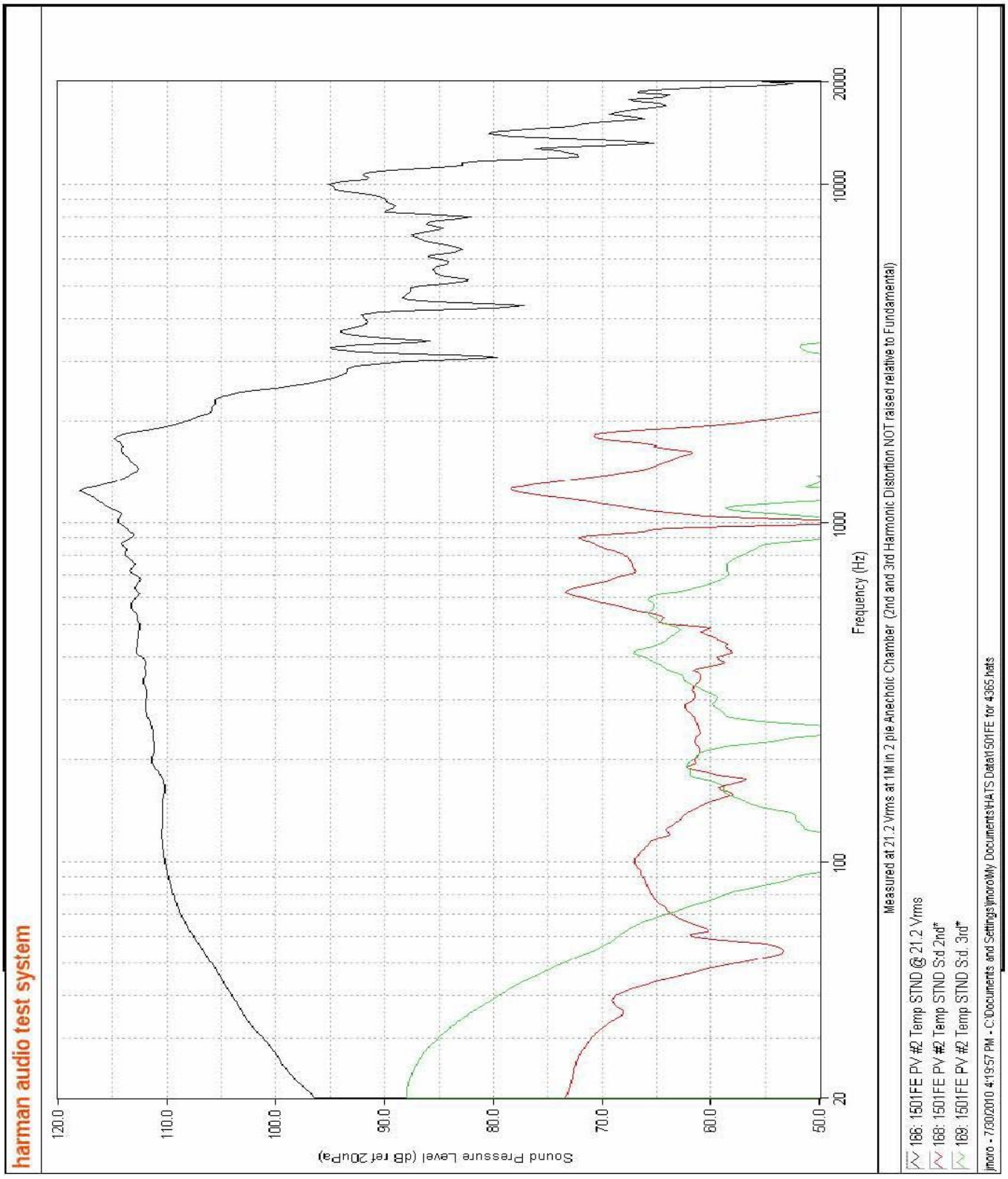

Engineering Standard Impedance	Date	Rev #	Document Number
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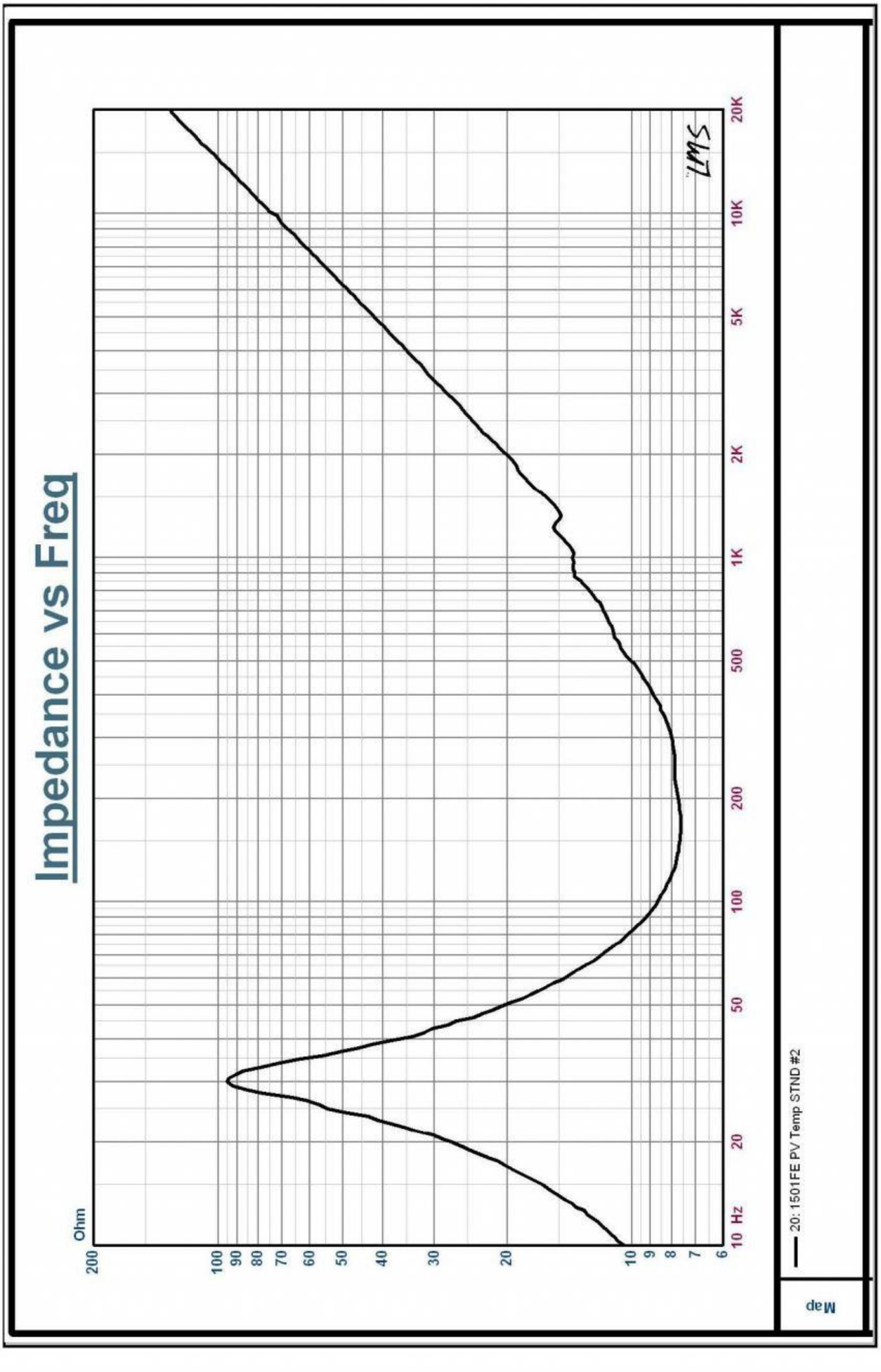

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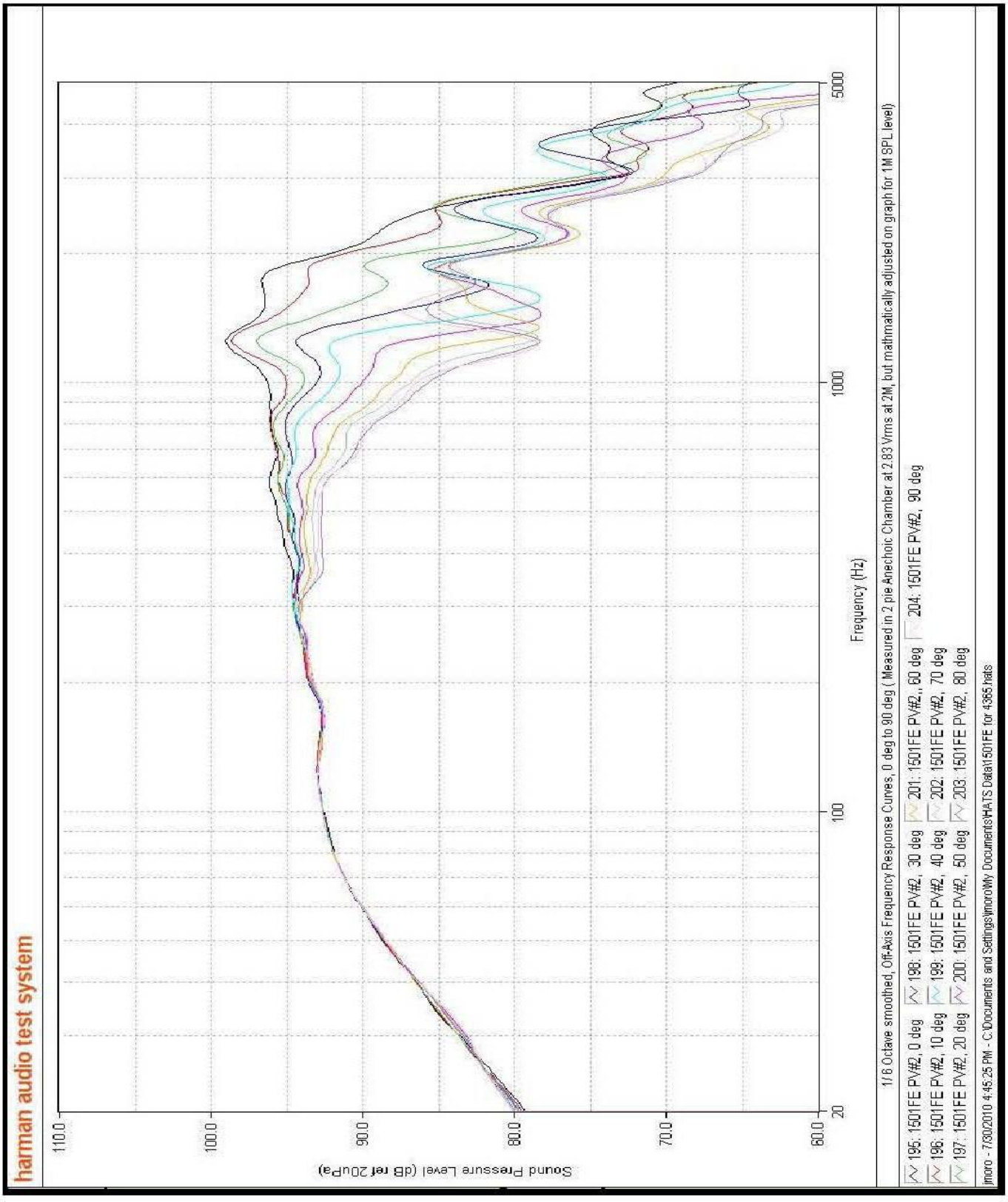

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