Engineering Test and Performance Specification

Division: JBL

Project: Performance Series

Model Number: LE14H-3

Part Number: 336321-001

Description: 14 inch, Medium Power subwoofer of medium excursion capabilities

Where Used: PS1400 (BE,BK,etc)

Approved Supplier: Nexus Manufacturing

Design Engineer: Jerry Moro

Approval Sample number: EPR approval Revision E

Approved Production Line Reference Standard (chosen from Pilot run): QA # 16, 8 and ENG # 7 **Data Code:** ######

Revision: **X1** #######

Engineering Test and Performance Specification

Purpose:

To define and establish a reference for the JBL Engineering approved performance characteristics of the stated model. To define the type of testing, and minimum conditions for testing, of production units of the stated model. To insure that the JBL design and performance intent is met. The performance data contained in this document is taken from the JBL Engineering Reference Standard unit that is held in the Harman Northridge facility.

This document is a JBL Engineering specification only and does not attempt to establish AQL or Visual acceptance levels or other criteria that are set forth and enforced by the Customer Purchasing, Incoming Inspection, and Quality Assurance groups.

Contents:

1) Physical and Mechanical Specifications

2) Engineering Test Specification (ETS)
   Defines minimum testing for production units and response variation tolerance

3) Performance Specification
   T/S Parameters
   Frequency Response
   Harmonic Distortion
   Impedance

Physical and Mechanical Characteristics

Model #	LE14H-3	**NMG Part #**	336321-001
Description:	14 inch medium power subwoofer		

Frame Type:	"Squircle" Cast Aluminum	**Frame Finish:**	Black Wrinkle Powder ct.
Outer Dia.	13.88 inches (12.75 across flats)	**Mounting Depth:**	4.77 inches
Mounting Dia:	12.45 inches	**Overall Height:**	5.29 inches

Trim Ring:	**Type:**	Integral with surround	**Color:**	n/a
Surround:	**Type:**	NBR Rubber 1/2 roll	**Color:**	Black
Cone:	**Type:**	Aquaplas paper pulp	**Color:**	Black
Dome:	**Type:**	Compressed paper	**Color:**	Black

Front Gasket:	**Type:**	None	**Color:**	n/a
Rear Gasket:	**Type:**	None	**Color:**	n/a
Tinsel Lead	**Type:**	Copper twisted pigtails	**Attachment:**	Soldered to eyelets
Terminal:	**Type:**	Dual push buttons	**Lug Size:**	n/a
	Polarity:	JBL STND - positive to RED post moves cone in towards magnet		

Voice Coil:	**Diameter:**	4 inch	**Wire:**	High temp,Copper Ribbon SV-R .17x.600mm
	Layers:	1	**Former:**	High temp, 0.005 thk, Fiberglass
	Turns:	106	**Wrapper:**	High temp NEC paper
	Winding Length :	0.780 inch		

Top Plate:	**Thickness:**	0.280 inch				
Primary Magnet:	**Type:**	Ceramic	**OD:**	8.25 inches	**Thickness:**	0.75inch
Bucking Magnet:	**Type:**	n/a	**OD:**	n/a	**Thickness:**	n/a
Shield Can:	**Yes or No**	n/a	**OD:**	n/a	**Thickness:**	n/a

Notes:

Revision : **X1**

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Model		Document Number	Rev
LE14H-3	**Engineering Test Specification**		**X2**

1. Model Description: 14 inch subwoofer

Model Part # 336321-001 (Part # listed is S/M level for systems and M/I level for transducers) — Design Engineer: Jerry Moro

Shipping Weight: — Packaging Test Method:

2. Dynamic Test: (100% test) — Input Voltage (@ lowest sweep range): 10.0 Vrms

Sweep Range: 20-2000 — Sweep Duration: 4 seconds

3. Power Test-Production Audit of 6 pcs @ each run: (Must EPR Qualify at 100 hours@same spec)

Input Signal: Pink Noise — Filter: 50-500hz

Crest Factor: 6 dB — Duration (hours): 2 hrs — Input Voltage: 36.0 Vrms

4. Impedance: (Ref only) — D.C. Resistance: 6.0 ohms

Rated Impedance: 8.0 ohms — Min.Impedance: — Motional Impedance:

Thiele-Small; See: — Impedance Curve; See:

5. Polarity: (Automatically checked 100% during Canetics test.): JBL STANDARD

EIA = + volt. to + term. gives forward cone movement; phase detector green; JBL = + volt. to + term. gives reverse movement, phase detector red.

For System only (this section not applicable to transducers alone):

	Description:	Polarity:
Driver 1:		
Driver 2:		
Driver 3:		

6. Frequency Response Test: (100% test)

Mic Position (inches): X: Y: Z: X=vert., Y=Horiz, Z = Dist from baffle. 0,0,0 = lower left corner facing spkr front

Crossover Frequencies (System Ref):

Canetics File Name — Test Voltage

Stimulus File — Gate Length — Pregate Length

Number of Stacks — Mic Distance — Max Noise

	Frequency		Bins Per	Rolloff	Tolerance	
Channel 1	Start	Stop	Octave	dB/Octave	Upper	Lower
Group 1	60 Hz	254 Hz	6	36	1.0 dB	1.0 dB
Group 2	269 Hz	508 Hz	3	36	1.0 dB	0.8 dB
Group 3	538 Hz	718 Hz	6	36	1.5 dB	1.0 dB
Group 4	767 Hz	1016 Hz	6	36	2.0 dB	1.0 dB
Group 5	1076 Hz	2032 Hz	6	36	2.5 dB	2.0 dB
Group 6						
Group 7						
Group 8						

Note: Group ranges listed per QF1004, rev B. Frequencies shown are effective ranges of group(s).

7. Other:

Signatures

Marketing:_____ Date_____ Proc. Eng:_____ Date:_____

Mfg Engr.:_____ Date_____ Dev. Engr.:_____ Date:_____

QA Lab:_____ Date_____

Revision History

Rev	Release Action	Date	Rev Initials
X	Preliminary release for MSB	5/24/2000	JM
X2	change to JBL STND polarity	9/5/2000	JM

T/S Parameters

Model # LE14H-3 **NMG Part #** 336321-001
Description: 14 inch medium power subwoofer

Fundamental Resonant Frequency:	**Fs**	22hz	+/-	10%
Transducer Direct Current Resistance:	**DCR**	5.9ohms	+/-	10%
Total Driver Q at Fs, Considering all driver Resistance:	**Qts**	0.25		
Moving Mass:	**Mms**	137	+/-	5%
Motor Strength:	**Bl**	20.8	+/-	5%
Voltage Sensitivity(2.83V@1 meter)	**SPL**	91dB	+/-	1.0 dB

Magnetic Flux information: (For Engineering Reference ONLY)

Total Flux lines intercepted by Coil Windings [Maxwell turns]:	390,549
Conversion to Flux Density [Tesla]:	0.627
Flux lines throughout Gap thickness [Maxwell turns]:	268,320
Conversion to Flux Density [Tesla]:	1.2

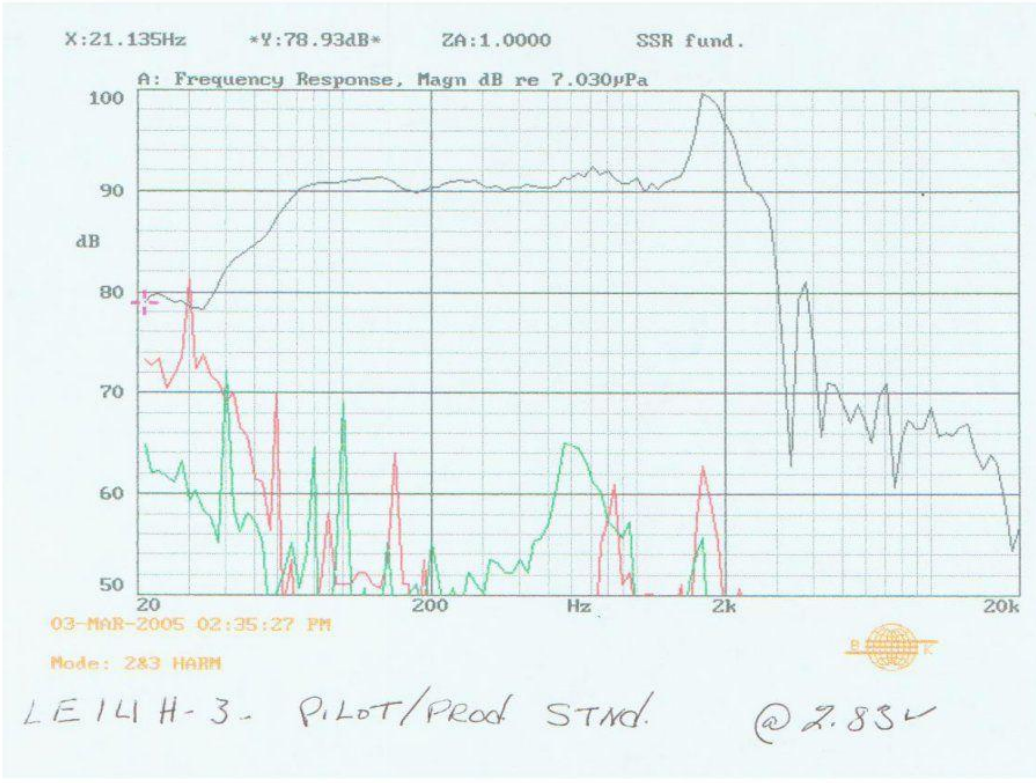
Method; MLSSA added MASS

Notes;

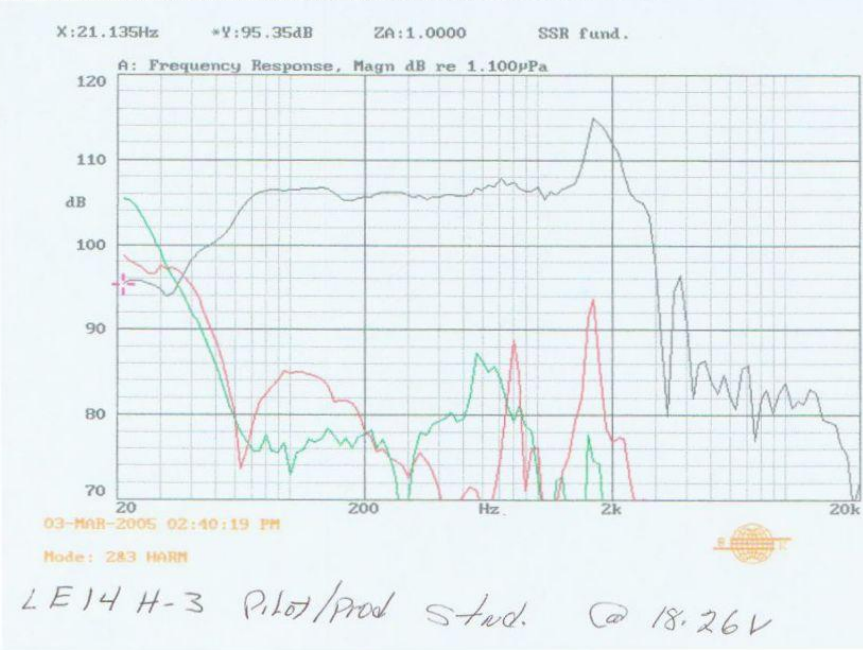
Revision: **X1** 7/30/2001

Insert frequency response, 2.83Vrms @ 1Meter

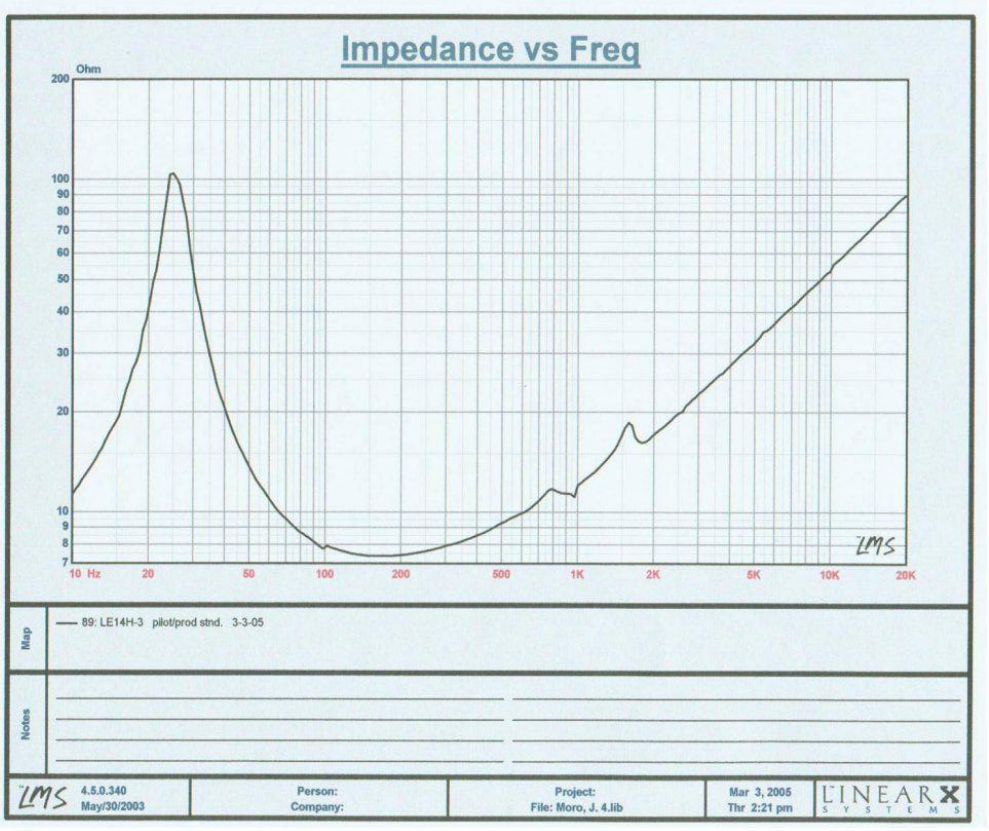
Insert 2nd and 3rd Harmonic distortion raised 20dB relative to Fundamental



Insert 2nd and 3rd Harmonic distortion raised 20dB relative to Fundamental



Insert LMS impedance curve



MLSSA SPO 4WI #010227-3479-3488 for Harman Consumer Group

Line	Parameter	Measured Parameters Value	Units	QC Limits
1	RMSE-free	0.94	Ohms	
2	Fs	26.82	Hz	
3	Re	5.94	Ohms	
4	Res	113.52	Ohms	
5	Qms	6.05		
6	Qes	0.32		
7	Qts	0.30		
8	L1	1.05	mH	
9	L2	1.66	mH	
10	R2	3.37	Ohms	
11	RMSE-load	0.73	Ohms	
12	Vas(Sd)	146.05	liters	
13	Mms	147.80	grams	
14	Cms	238	µM/Newton	
15	Bl	21.61	Tesla-M	
16	SPLref(Sd)	89.6	dB[4 ohms]	
17	Rub-index	0.00		

Method: Mass-loaded (160.000 grams) Area (Sd): 660.52 sq cm
DCR mode: Fixed (6.45 - 0.51 ohms) QC file: CLOSED

Analysis successful. Shift in Fs = -29.7% (-20% to -50% is recommended).

LE14H-3 pilot/prod. stnd. 3-3-05 MLSSA: Parameters

MLSSA PARAMETERS