LX1790 and LX1792
Class-D Audio Amplifier ICs

Description

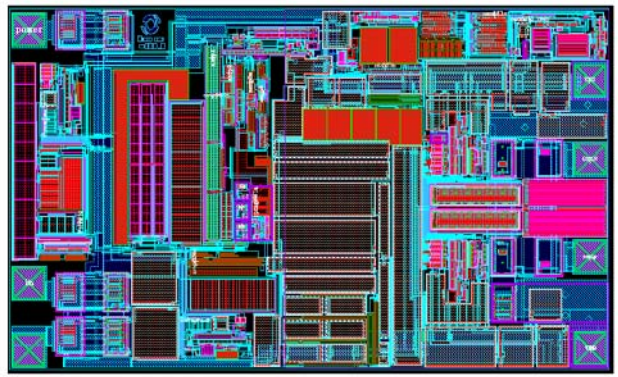
- The LX1790 and LX1792 are high performance Class-D integrated circuits (IC's) targeted for high efficiency audio requirements such as battery powered products, portable systems, or space constrained applications. Systems benefiting from Class-D technology include hearing aids, hearing assist products, wireless headsets or any application where ultra-low power consumption is critical.
- The LX1790 and LX1792 offer dramatically improved performance including: lowest supply voltage, highest output power, superior SNR, low noise floor, and reduced THD.
- The LX1790 has 3 fixed gain settings whereas the LX1792 allows higher gain setting via external resistors. Both IC's operate at a supply voltage range of 0.9-1.5V. These amplifiers offer high fidelity performance and are designed to operate over 100Hz to 10kHz audio band. Distortion is typically less than 0.3% driving 200 Ohms.
- The IC's are available as bare die or in a space saving 8 pad MLPM (3x3mm) package.
- Evaluation boards LXE1790 or LXE1792 are available to quickly evaluate the LX1790 or LX1792 IC's.

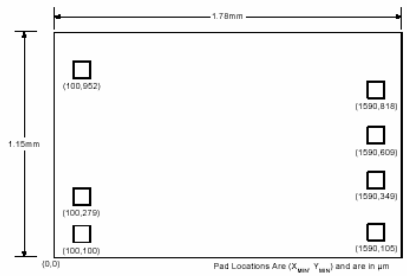
Key Features

- **Ultra low voltage and power**
  - Supply voltage 0.9-1.5 Volt.
  - Typical “no load” (standby) quiescent current, 100-130uA
- **Gain setting**
  - LX1790: Selectable fixed settings: 14, 20 or 26 dB.
  - LX1792: Set by external resistors, up to approx 38dB
- **Low noise, high PSRR, low distortion**
  - LX1790, LX1792: Input noise typically <10uVrms at 20dB gain
  - LX1792: Typically 5uVrms @ gain=32dB.
  - PSRR typically 45 dB.
- **Switch impedance setting**
  - Selectable fixed settings: 15, 30, 45 Ohm.

Bare Die

- **Part numbers:**
  - LX1790CDB, LX1792CDB
- **See data sheet for details**
- **For use in hybrids or applications with size constraints**
- **Available in wire bondable or flip-chip format**
- **Contact information:**
  - Samples: order on line www.microsemi.com
  - Technical: Jonas Weiland jweiland@microsemi.com
  - Sales: Lance Robertson lrobertson@microsemi.com



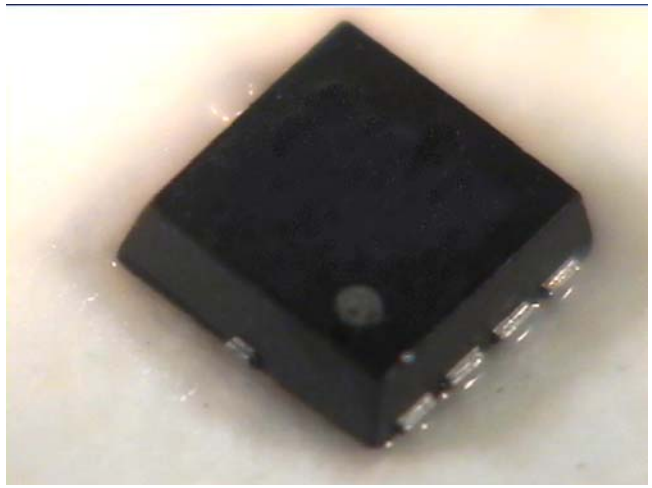


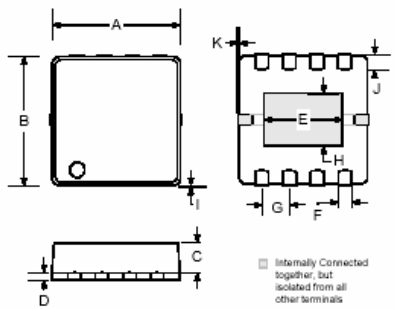
Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
X		1.15		0.045
Y		1.78		0.070
Z	0.190	0.216	0.0075	0.0085

Note:
1. Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.

Packaged Parts

- Part numbers:
  - LX1790CLM, LX1792CLM
- See data sheet for details
- MLPM, 8 pad, 3x3mm
- For surface mounting onto printed circuit board
- Eliminates problems with handling bare die
- Contact information:
  - Samples: order on line www.microsemi.com
  - Technical: Jonas Weiland jweiland@microsemi.com
  - Sales: Lance Robertson lrobertson@microsemi.com



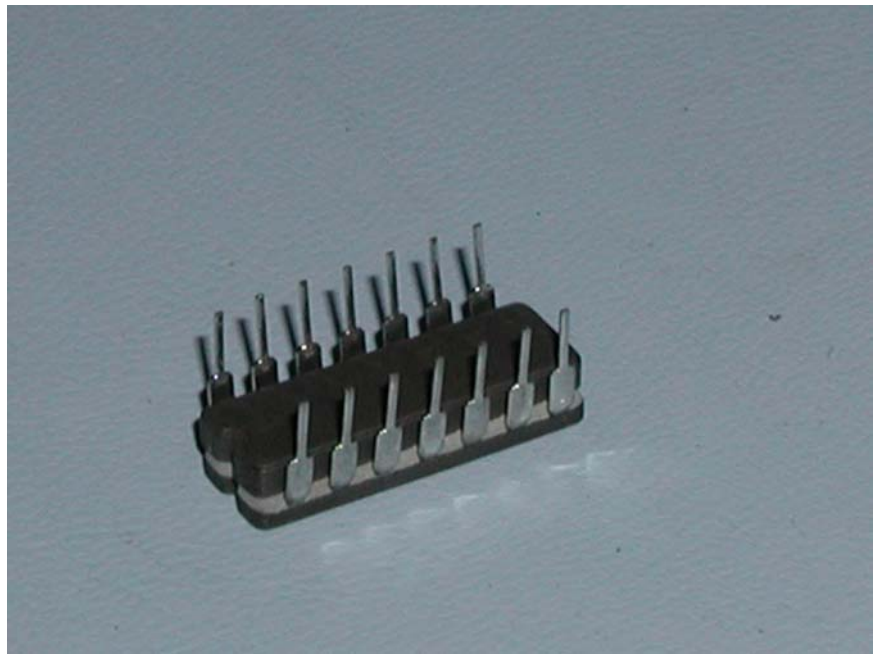


Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.90	3.10	0.114	0.122
B	2.90	3.10	0.114	0.122
C	0.65	0.75	0.025	0.029
D	0.15	0.25	0.005	0.009
E	1.841 BSC		0.075 BSC	
F	0.27	0.43	0.010	0.016
G	0.65 BSC		0.025 BSC	
H	1.22 BSC		0.048 BSC	
I	0	0.10	0	0.003
J	0.21	0.37	0.008	0.014
K	0	0.10	0	0.003

Note:
1. Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.

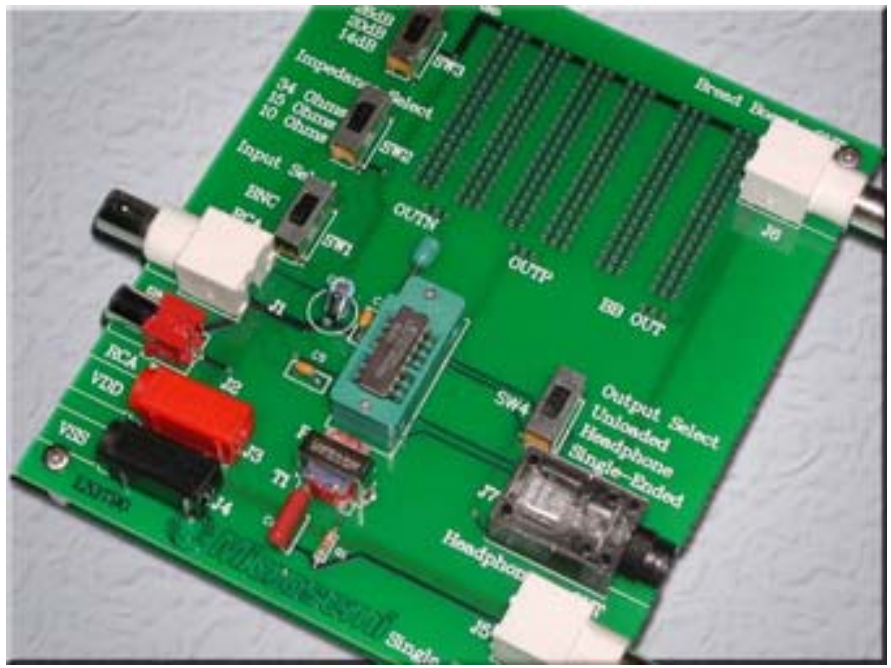
Evaluation Samples

- **Part numbers**
  - LX1790CJ, LX1792CJ
- **For functional evaluation**
- **Not for production use**
- **14 pin DIP**
- **Use with evaluation boards LXE1790 or LXE1792**
- **Contact information:**
  - Samples: order on line www.microsemi.com
  - Technical: Jonas Weiland jweiland@microsemi.com



Evaluation Boards

- Part numbers:
  - LX1790EVAL, LX1792EVAL
- For evaluation of 14 pin DIP samples
- Evaluation Board User Guides on line
- **Contact information:**
  - Samples: order on line www.microsemi.com
  - Technical: Jonas Weiland jweiland@microsemi.com



Evaluation Board Users Guide

- **LX1790USER and LX1792USER**
- **Available on line**
  www.microsemi.com
  – Technical: Jonas Weiland
  jweiland@microsemi.com

Distortion vs. Input Voltage

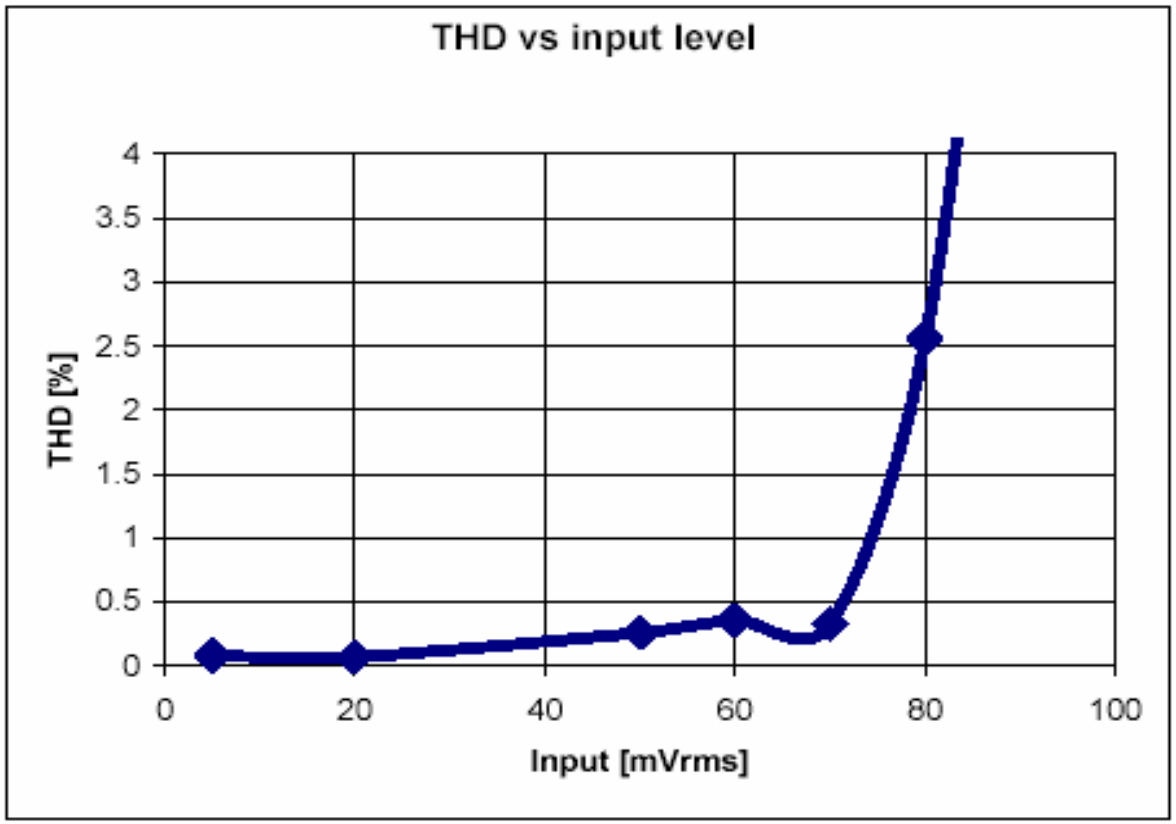


Figure 1 – THD vs. Input Level FIN = 1kHz, Gain = 20dB (Note: clip level at 90mVrms)

Impedance vs. Supply Voltage

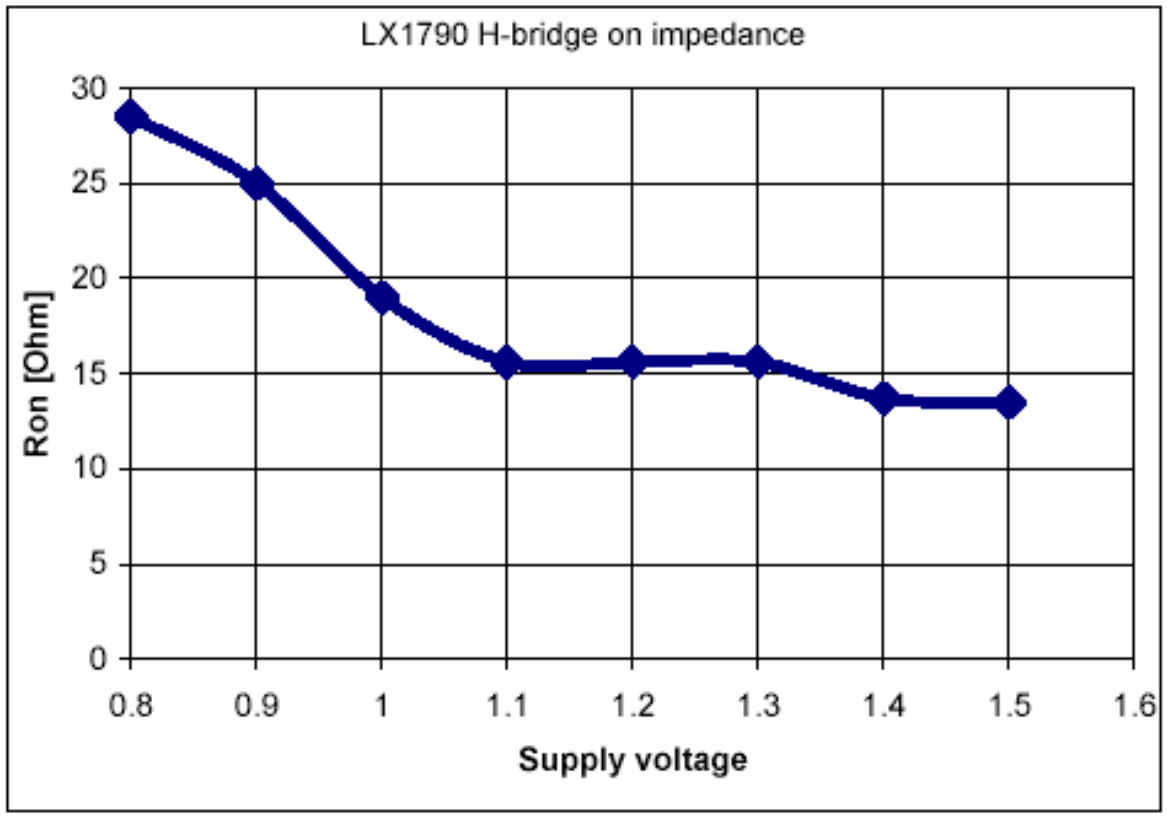
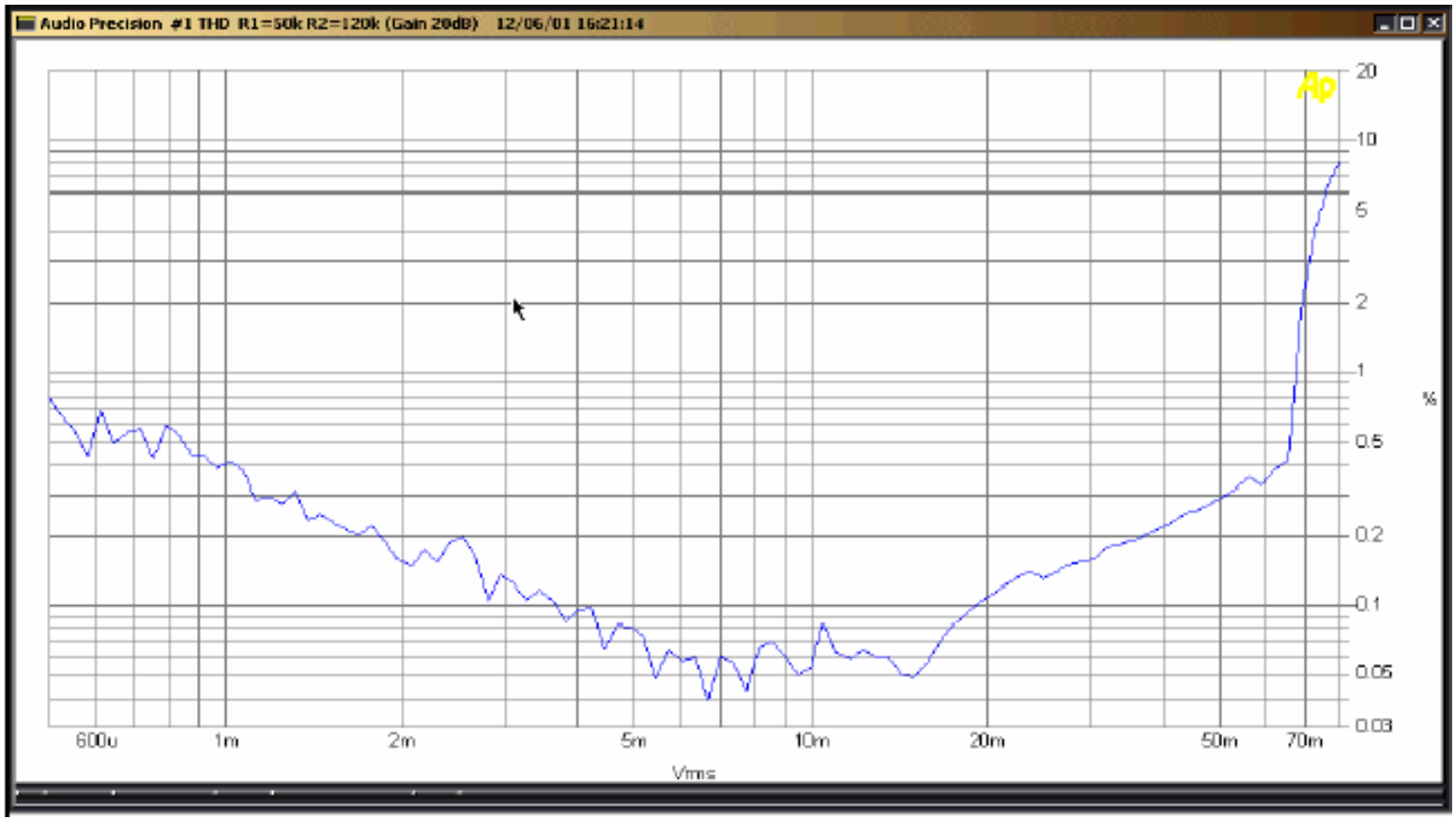
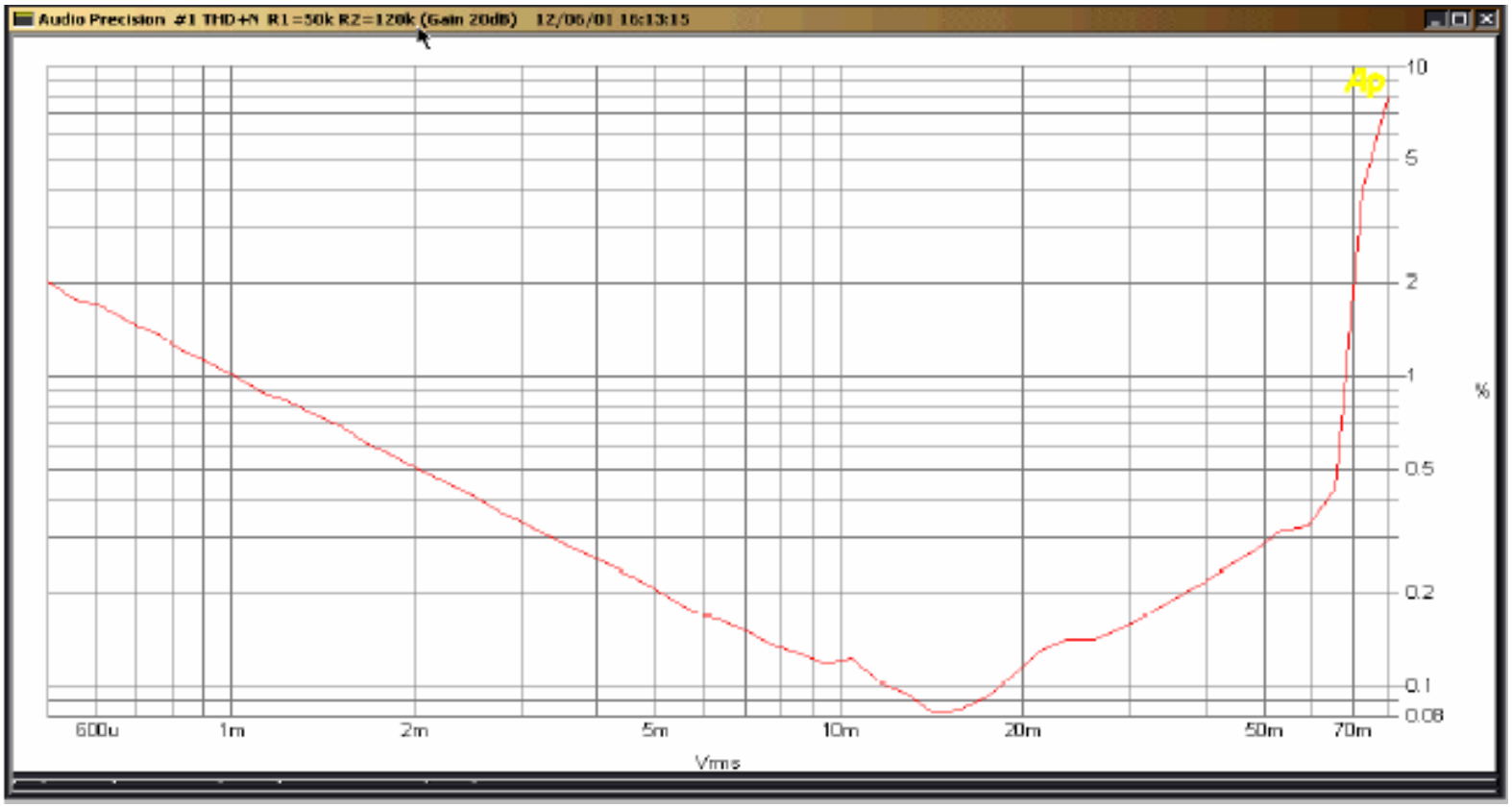


Figure 2 – H-Bridge Impedance vs. Supply Voltage (Lowest Impedance Setting)

THD, Total Harmonic Distortion



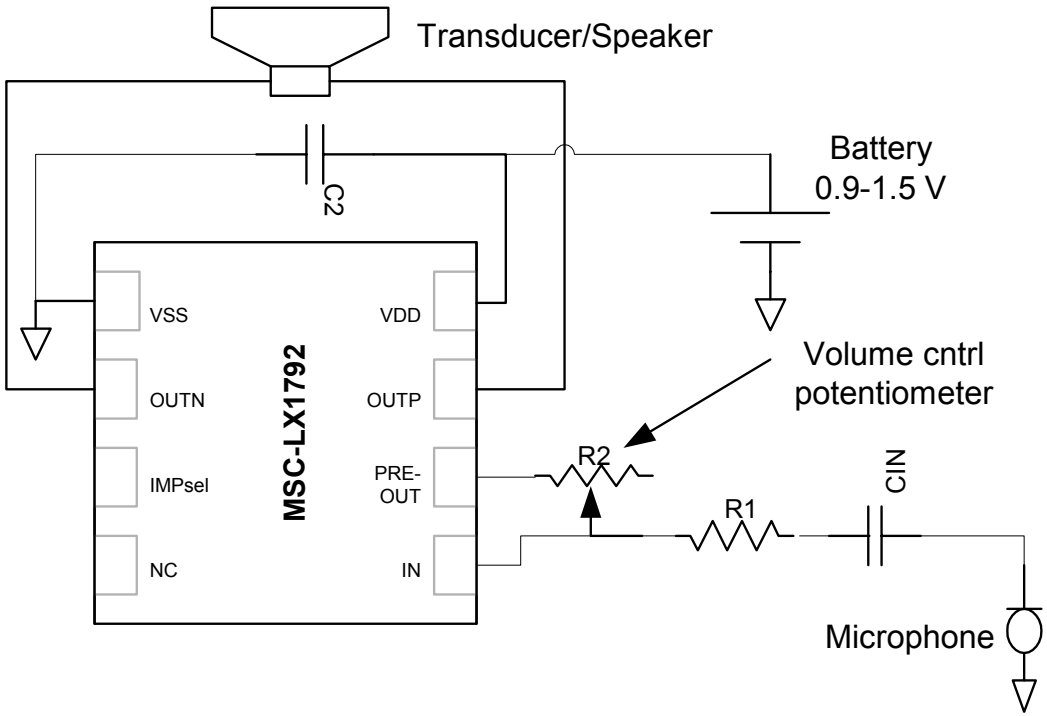
THD+N, Total Harmonic Distortion+Noise



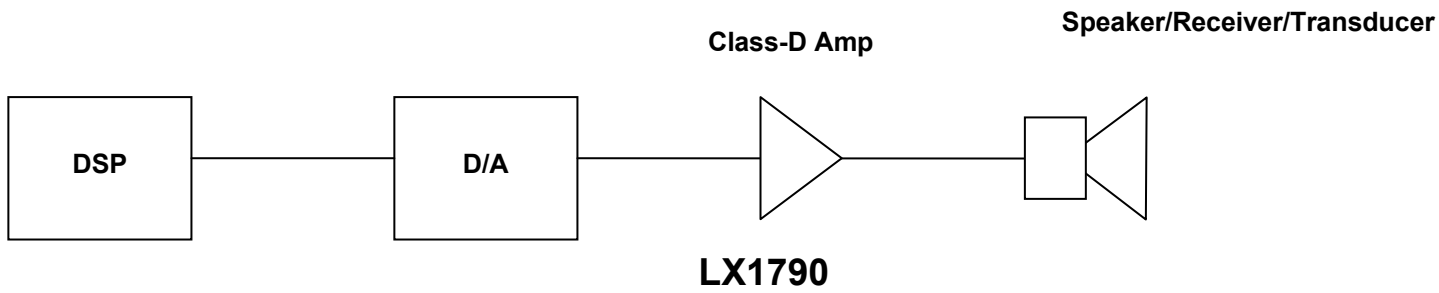
Typical Applications

- **LX1790/LX1792:**
  - For driving speakers/transducers with impedance > 32 Ohms
- **LX1790**
  - Fixed gain applications
  - Minimum number of external components
  - Example application: amplified hearing aid receivers/transducers
- **LX1792**
  - Flexibility to set gain, suitable for use with external volume control potentiometers
  - Higher gain applications (up to ~36-38dB)
  - Example application: assistive listening devices

LX1792, Typical Hearing Assist Device



LX1790, Typical DSP Hearing Aid



Product Availability

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  - Samples: order on line www.microsemi.com
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- **LX1790**
  - LX1790CDB bare die: samples and production die available now
  - LX1790CLM packaged parts: starting April 2002
  - LX1790CJ evaluation samples: available now
- **LX1792**
  - LX1792CDB bare die: samples available now
  - LX1792CLM packaged parts: starting April 2002
  - LX1792CJ evaluation samples: available now
- **LX1790EVAL and LX1792EVAL**
  - Evaluation boards available now