audiopixels®

Breaking the Barriers of Sound

Market Overview May 2015

ASX: AKP; OTCQX: ADPXY

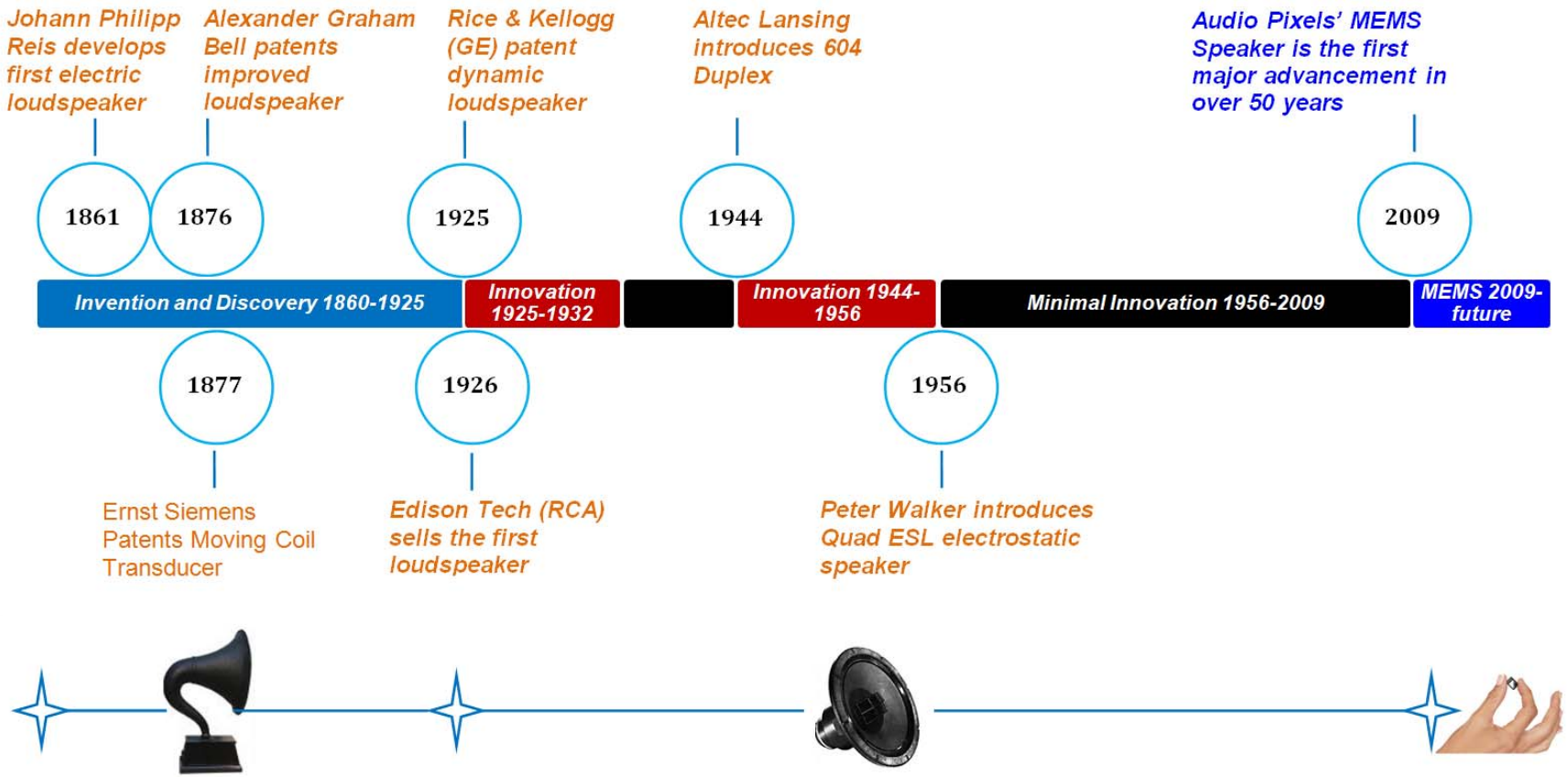
audiopixels®

Breaking the Barriers of Sound

Loudspeakers are Rooted in Century Old Technology

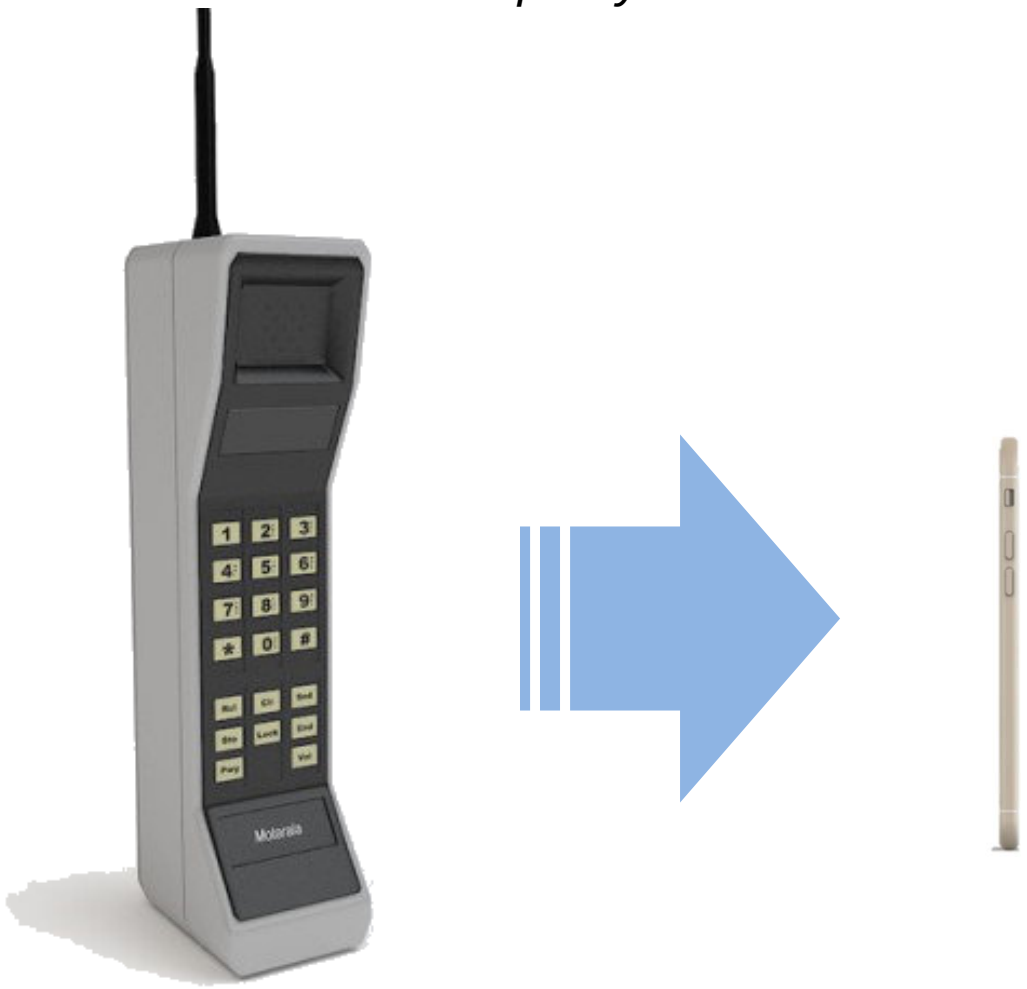
"While the industry at large has been able to digitize, shrink and enhance all other device electronics, the last remaining barrier is the speaker, which remains large, heavy, bulky, and very analog."

Voice Coil Magazine 2015



As electronic devices have grown thinner, smaller, and more mobile, speaker technology has not kept pace.

Modern devices no longer have the space and power to provide quality audio

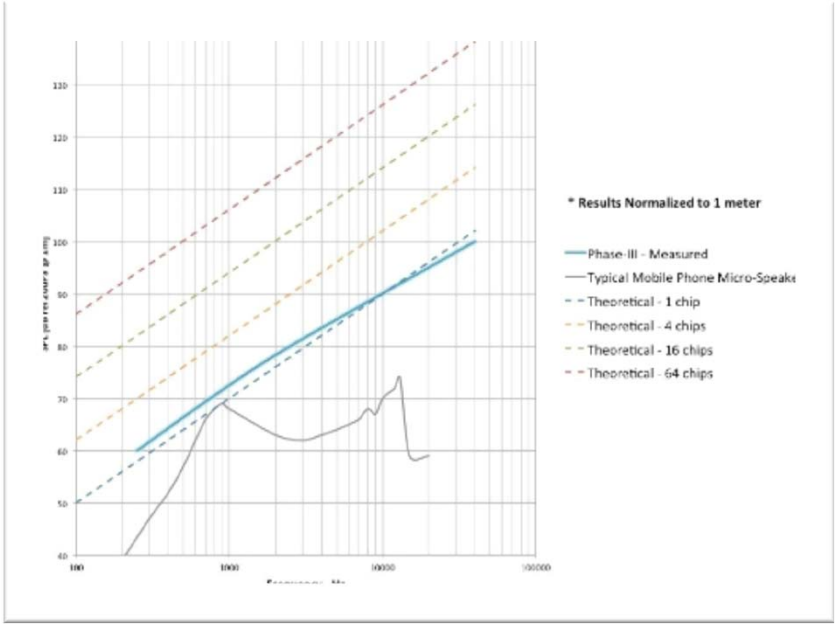


Audio Pixels brings both higher quality sound and a thinner footprint to the electronics market.

Analog speakers require compromise as sound quality shrinks along with speaker size.

Secondary speakers or other creative options are currently the only solutions for poor quality audio.

Audio Pixels' has demonstrated improved sound reproduction in multiple tests.



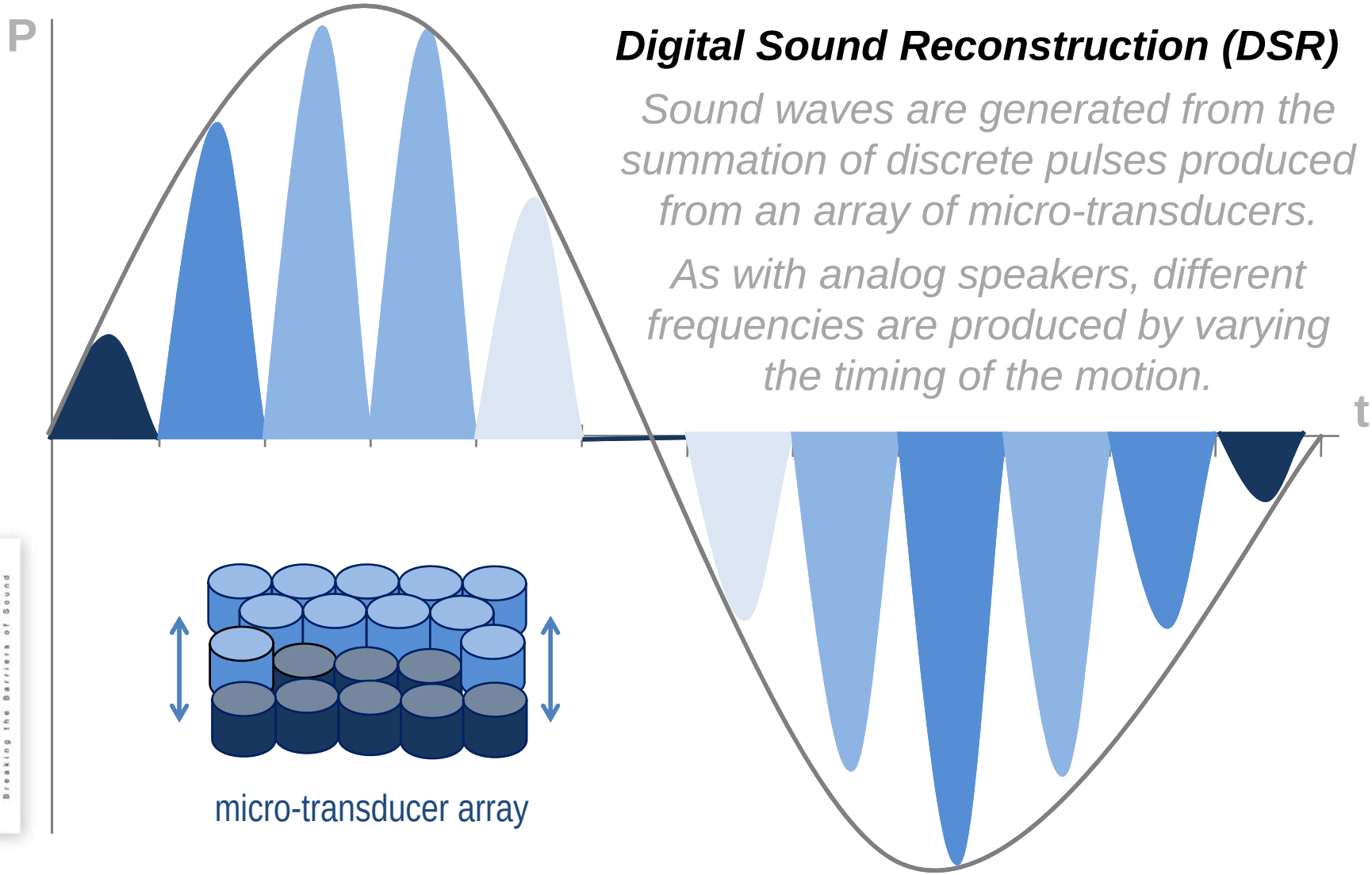
Phase III testing verified significantly better sound quality. (03/2015)

What is an Audio Pixels Speaker?

A revolutionary new way to reproduce sound, with patents in the fields of micro-electro-mechanical structures (MEMS), pressure generation, acoustic wave generation, control, signal processing, and packaging.

	Conventional Speaker	Audio Pixels Speaker
	Electromechanical Assembly	Semiconductor Chip
Magnet	Required	Not required
Voice Coil	Required	Not required
Cone	Required	Not required
Number of Components	4-15	1
Drive Circuitry	External	Integrated
Digital to Analog Conversion	Required	Not required
Enclosure or Chamber	**Required**	**Not Required**
Surface Mount Compatible	No	Yes

How does it work?



Digital Sound Reconstruction (DSR)

Sound waves are generated from the summation of discrete pulses produced from an array of micro-transducers.

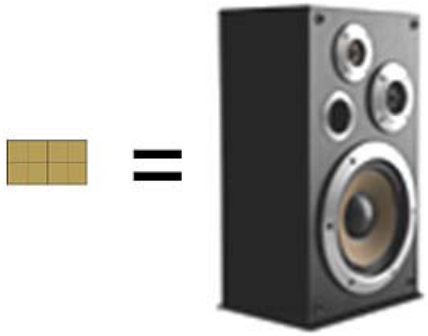
As with analog speakers, different frequencies are produced by varying the timing of the motion.

DSR is different than any other speaker technology

Unlike analog speakers …

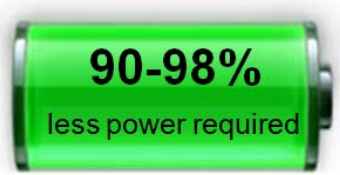
- the Audio Pixels micro-transducers do NOT require a large dynamic range. This allows the array to be constructed from identical elements all finely tuned to a particular frequency.

- the chips can be used either as a standalone micro-speaker or cascaded in any multiples of the same chip to replicate the desired function of the speaker.



- there is no need for a DAC, amplifier, or enclosure; meaning fewer parts and a much smaller footprint.

Not just smaller, but better: The chips have higher energy efficiency, lower harmonic distortion, faster transient response, and improved flatness; with a two-octave (frequency) gain.



Audio Pixels Sets New Standards In Sound Quality

What you hear today

Audio Pixels has achieved sound pressure levels (SPL) within the low frequency spectrum that were previously believed by experts to be unattainable within a micro form factor; measuring 80dB (decibels) at 250Hz for a standalone chip.

Audio Pixels delivers a 150% wider frequency range than current phone speaker technology

Truly disruptive for every device that uses loudspeakers

Form factors will change dramatically

This -

- can become this

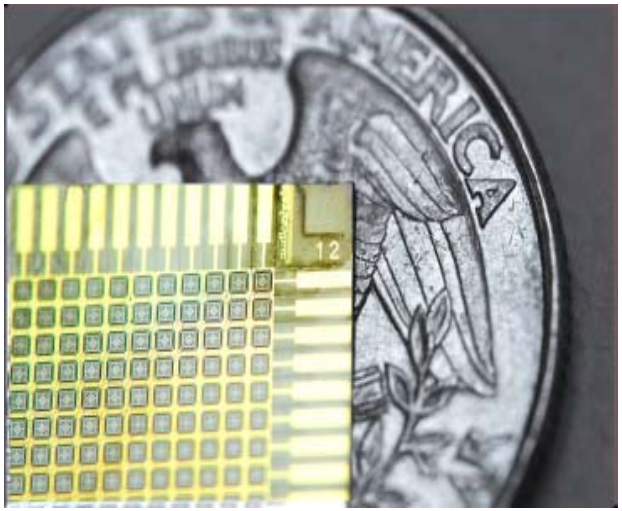
Every product with speakers will undergo design changes

What was external -

- can become embedded

Value Analysis

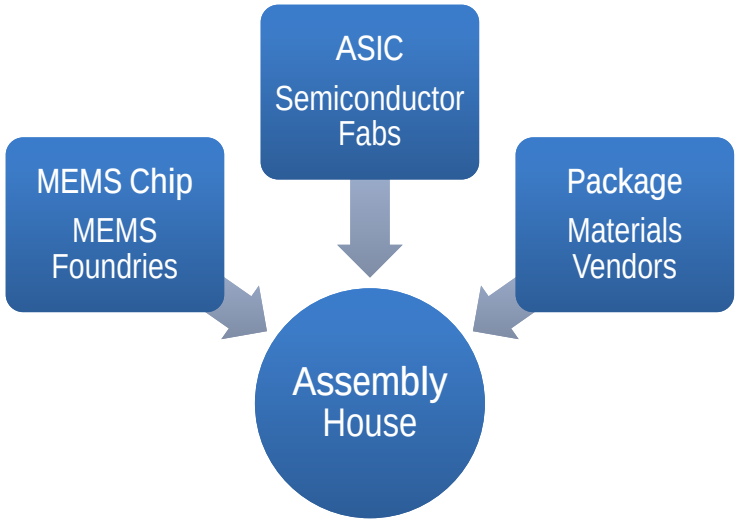
Audio Pixels delivers a superior sound experience in every known device category

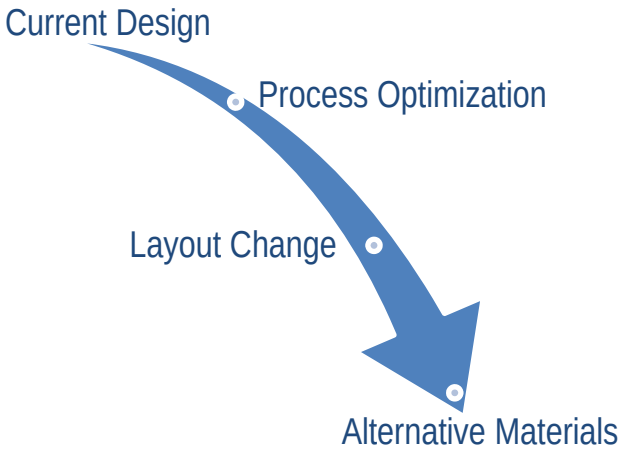


	Handheld	IOT / Wearable	Tablets & Laptops	Display	Smart Phones	Television
Primary Strength	High quality audio within device size constraints (“thinness”)					
Secondary Strengths	Reduced power consumption			Enabling far smaller footprint	Reduced power consumption	Reduced vibration
	Reliability and ease of assembly					

Fabless Semiconductor Manufacturer

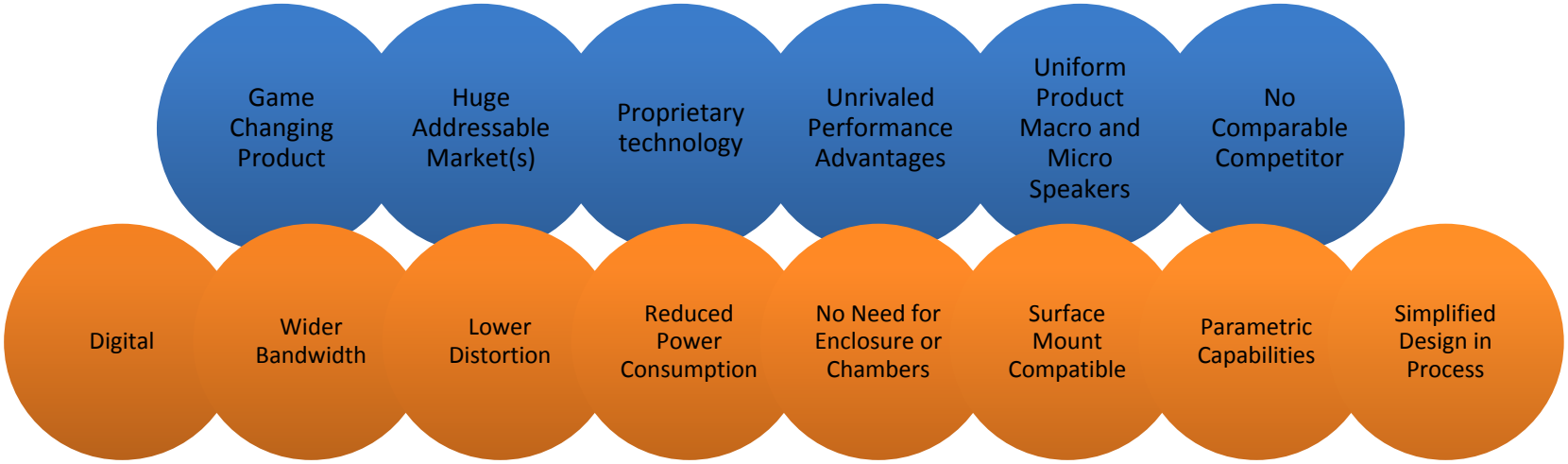
While the technology is novel, the manufacturing process is not.





Audio Pixels is currently working with some of the industry's leading suppliers to develop its manufacturing capabilities.

Winning Combinations




Addressable Market
the last 75 years have shown...pretty much
EVERYONE

Primary Market Segmentation

Except for the lowest price point segment of the market, Audio Pixels has the potential to target every device that uses speakers.

Embedded

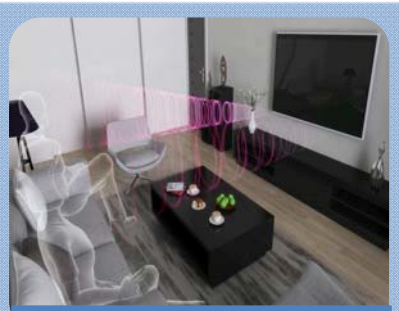
- Smartphone
- Tablet/Phablet
- Laptop
- Computer
- Television
- Display
- IOT
- Wearables
- Others…

Consumer

- Docking Station
- Portable
- Multimedia
- Paired
- Woofers
- Surround Sound
- In-wall
- Outdoor
- Others…

Specific

- Automotive
- Airline
- Train
- Others…

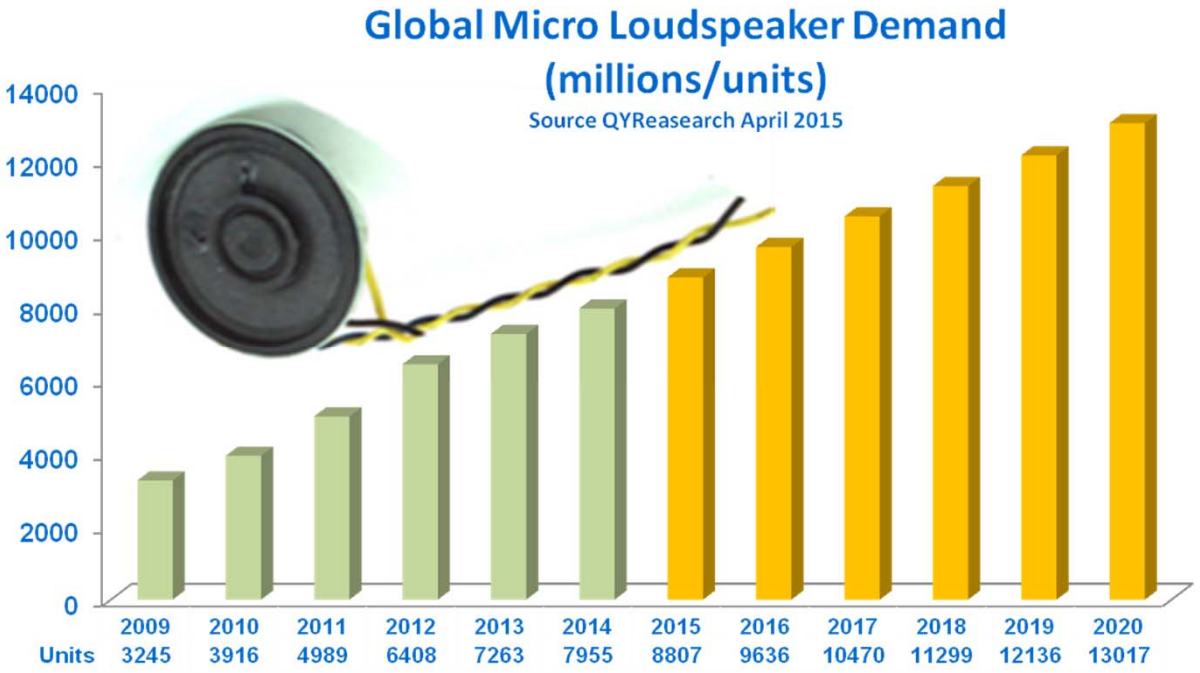


Customized

- Parametric Applications
- Sensors
- Ultrasonic
- Medical
- Security
- Others…

Segment Breakdown

Global Demand for micro-speakers is expected to exceed 8 billion units in 2015, growing to over 13 billion by 2020.



Embedded

- Smartphone
- Tablet/Phablet
- Laptop
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- IOT
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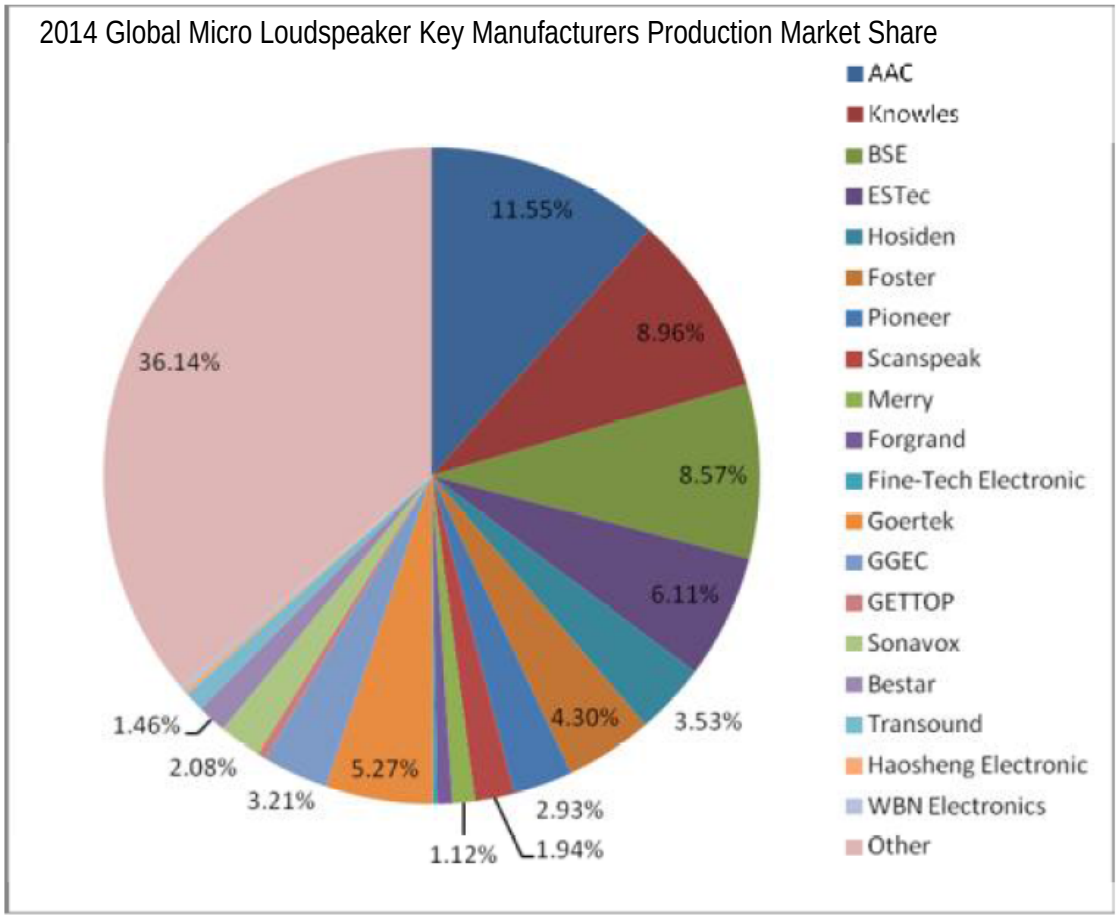
- Others…

Segment Breakdown – Micro Loudspeaker

The market is highly competitive, with a diverse, international cast of manufacturers targeting dozens of product categories.



Source: QYResearch Loudspeaker Research Center; Apr 2015

Embedded

- Smartphone
- Tablet/Phablet
- Laptop
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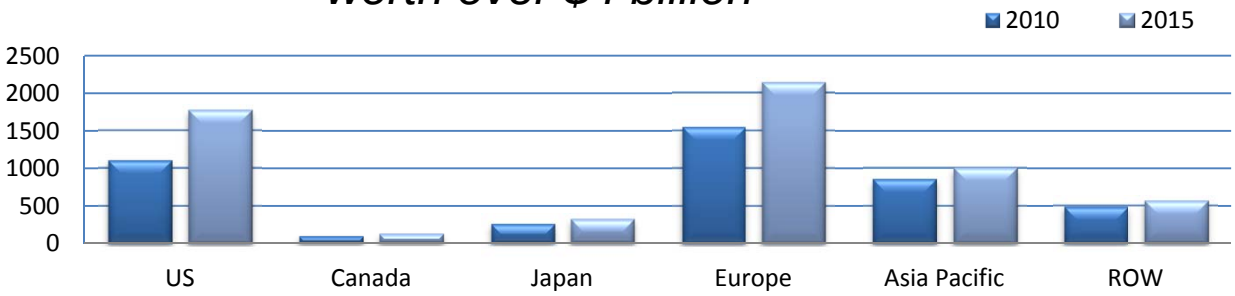
- Television
- Display
- IOT
- Wearables
- Others…

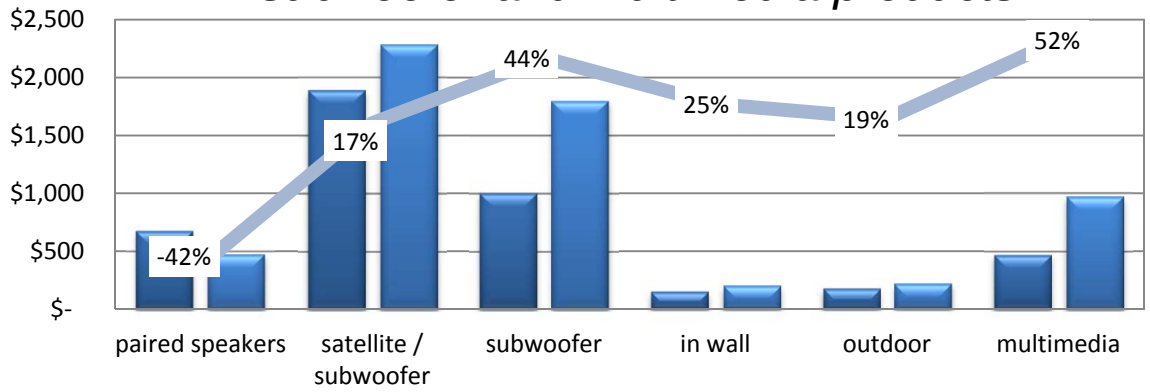
Home Market – Standalone Speakers and Systems

(not including soundbars)

The home loudspeaker market is currently worth over $4 billion



Home loudspeaker growth is led by demand for subwoofer and multimedia products



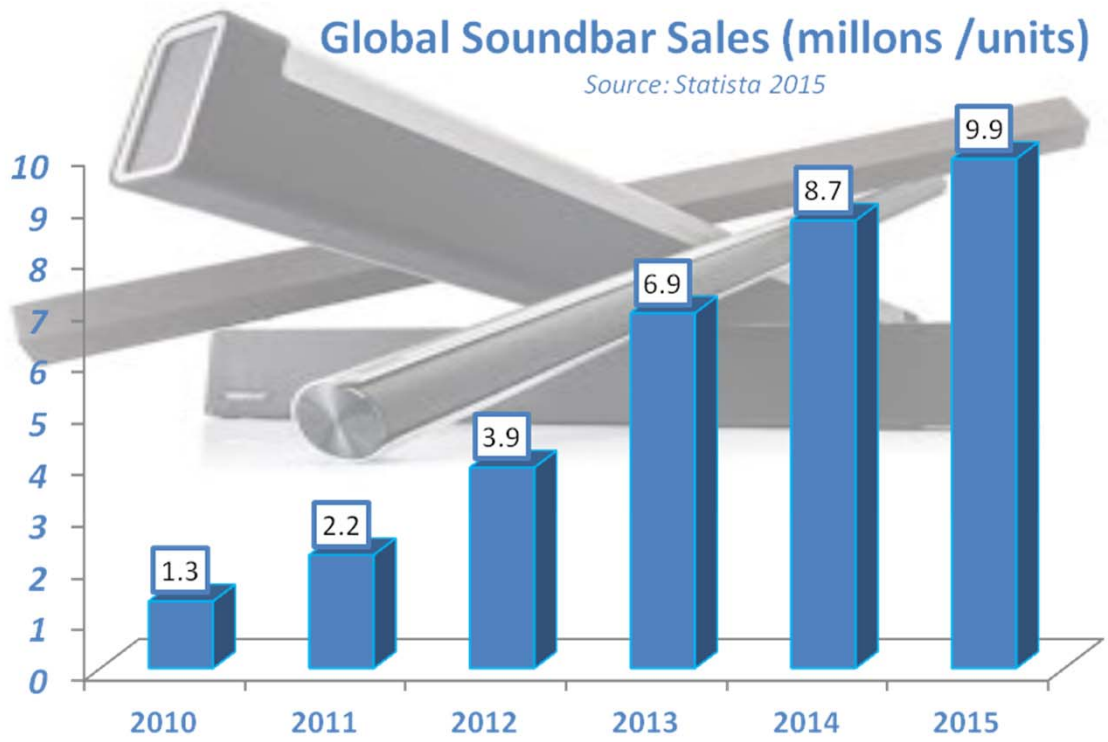
Source: Global Industry Analysts

Consumer

- Docking Station
- Portable
- Multimedia
- Paired
- Woofers
- Surround Sound
- In-wall
- Outdoor
- Others…

Home Market –Standalone Speakers and Systems

Global soundbar sales will reach 9.9 million units in 2015



Consumer

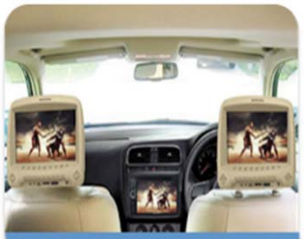
- Docking Station
- Portable
- Multimedia
- Paired
- Woofers
- Surround Sound
- In-wall
- Outdoor
- Others…

Growth is expected in every home market category. The Bluetooth (Portable) speakers market will reach $7 billion by 2019.

Source Infiniti Research Limited – Nov. 2014

Automotive (Aviation) Audio / Infotainment Market

At $3.4 billion, automotive represents an important future market for Audio Pixels. Premium Audio, featuring systems with a dozen or more speakers, has strong OEM penetration in Europe (17%), North America (12%), and Asia (9%).



Specific

- Automotive
- Airline
- Train
- Others…

	2010	2011	2012E
HARMAN	2738	3406	3802
Continetal	1829	1863	1913
PIONEER	2895	3303	3972
ALPINE	2294	2567	2785
CLARION	2032	2363	2405
PANASONIC	3238	3331	4080
FUJITSU-TEN	2482	2358	2302
JVC-KENWOOD	1232	1358	1426
Hyundai Mobis	1189	1306	1488
Delphi	1206	1202	1226
Visteon	462	508	522
Denso	1493	1595	1860
Aisin AW	862	974	1149
Mitsubishi Electric	1822	2008	2309

RIC<Global and China Automotive Audio and Navigation Industry Report, 2011-2012>

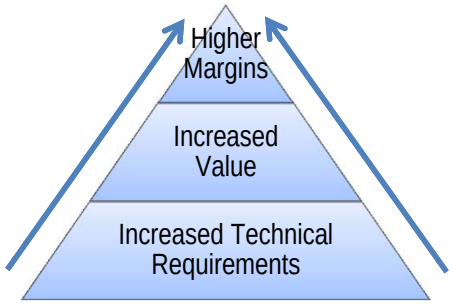
The Audio Pixels Solution is uniquely suited to the automotive market due to:

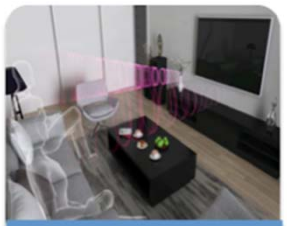
- Size & weight advantages
- Sound quality
- Speaker positioning
- Directionality
- Power consumption
- Noise cancelation
- Wiring
- and other aesthetic and technical form factors.

Source: Extrapolation from accumulated Public Domain Research

Customized “Niche” Applications

Audio Pixels is frequently approached to apply its technology to industry specific applications, thus expanding market opportunities beyond conventional loudspeaker functions.





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- Ultrasonic
- Medical
- Others…

Sensors

Ultrasound is already in use for touchless gesture recognition input. Audio Pixels’ chips have the added advantage of also offering audible sound in the same “sensor.”

The total gesture recognition and touchless sensing market is expected to reach $22.04 billion by 2020 with a double digit CAGR.

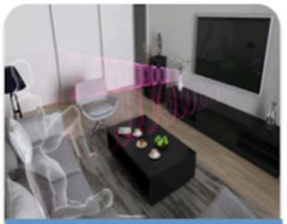
source: marketsandmarkets Apr. 2014

Customized “Niche” Applications

Parametric Speaker

Fundamentally, Audio Pixels produces Sound-from-Ultrasound allowing the speaker to project a narrow beam of sound that can be heard only along the path of the beam (directional speaker).

This effect, which is not possible using conventional loudspeakers, enables countless applications to become a new reality.



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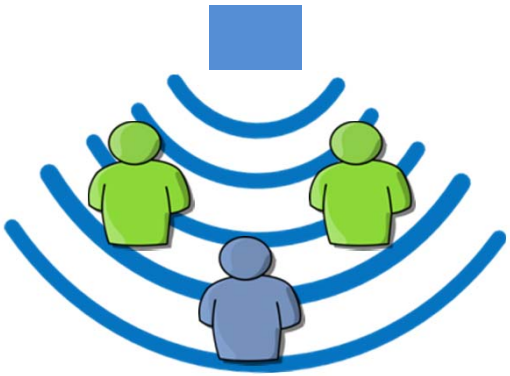
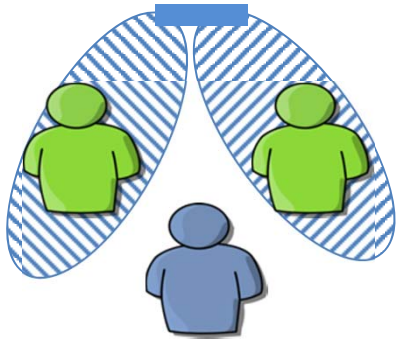


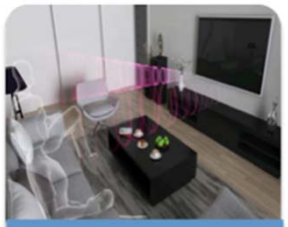
conventional loudspeakers



parametric loudspeakers

Customized “Niche” Applications

Parametric Speaker



Customized

- Parametric Applications
- Sensors
- Ultrasonic
- Medical
- Others…

Television – projecting sound at different volumes, settings and even different languages

Automotive – Separation between driver navigation and communication to rear seat entertainment

Advertisement – projecting sound directly at the consumer

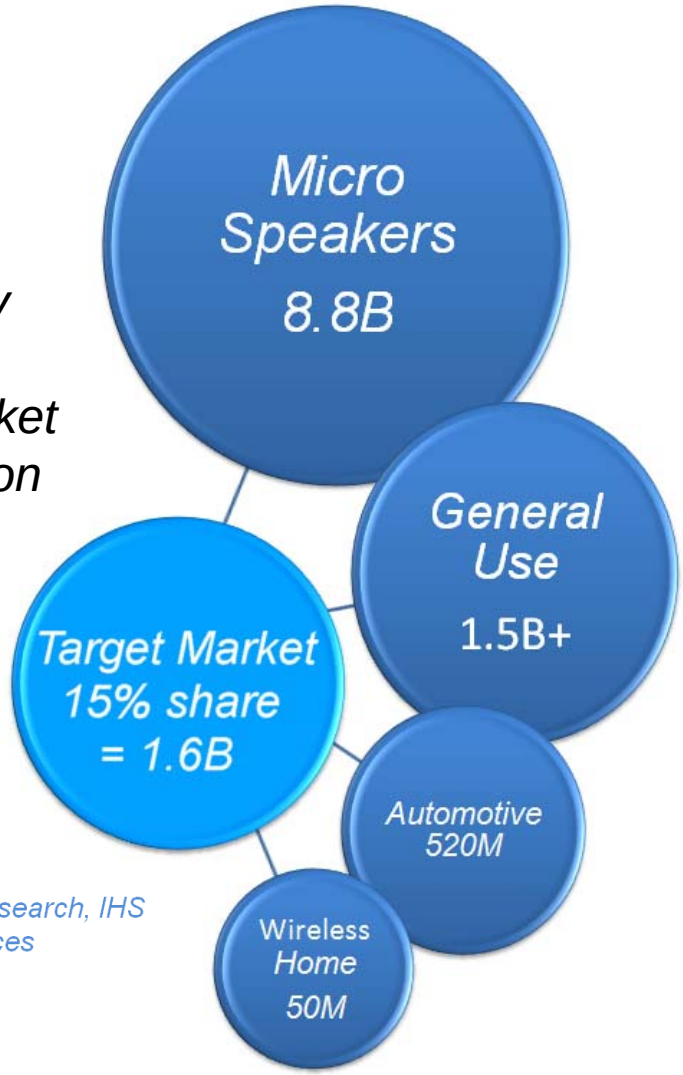
Public Safety and Museums - Transmitting warning and informational messages in airports, train stations, escalators entrances, and any other place where a message should be directed and heard only in a designated target area

Bank Teller, Automated Teller Machines, Passport control etc… - any other application where confidential information should not be overheard

Commercial Advertising - billboard messaging to get the attention of the listener without distracting staff or other customers

Audio Pixels will target applications where size and high quality sound are both important.

Based on industry estimates, Audio Pixels' target market will reach 1.6 billion speakers in 2016.



Gartner, QYResearch, IHS and other sources

Development Timeline

***Phase III** -- integrate, test and optimize all components*
Completed March 2015

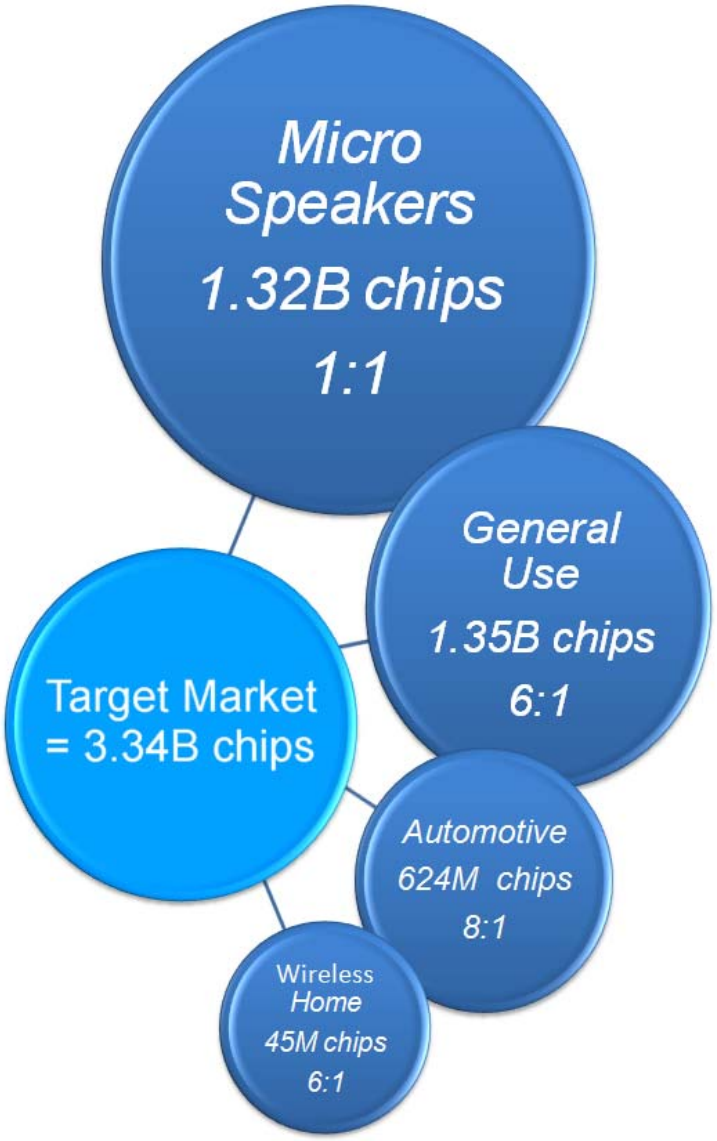
***Phase IV** – Mass manufacturing phase, pre-production planning*
In progress

Begin shipping sample product to leaders in consumer electronics
In conjunction with Phase IV

Target unit totals are much higher when measured in chips per speaker.

With the exception of micro-speaker applications, which generally have a 1:1 speaker to audio chip ratio, most digital versions of analog speakers will use between 2 and 64 chips.

Audio Pixels' target speaker market will require more than 3 billion audio chips



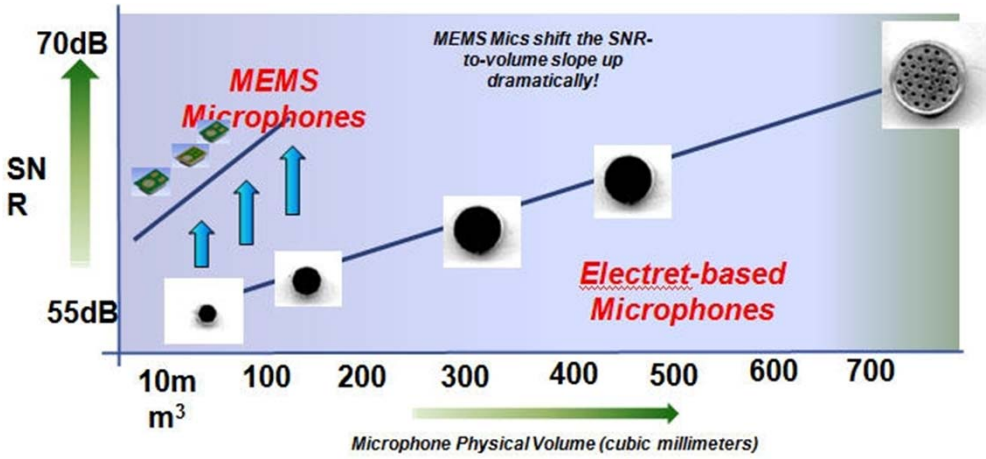
Investment Thesis– The Analogous Story of MEMS Microphones

MEMS Microphones

- Electret Condenser Microphone (ECM) invented at Bell Laboratories in the 1960s.
- Fundamentally unchanged. But ECM's dominated the market for roughly 50 years
- MEMS Microphones were introduced sometime in the late 90's

Advantages of MEMS over ECM:

- Reduced Noise
- Size
- Surface mount compatible



Significant Cost Disadvantage - Average microphone price per unit at the point of introduction of MEMS microphone –

ECM microphones cost less than $0.10 per unit compared to >$2.00 for a comparable MEMS microphone

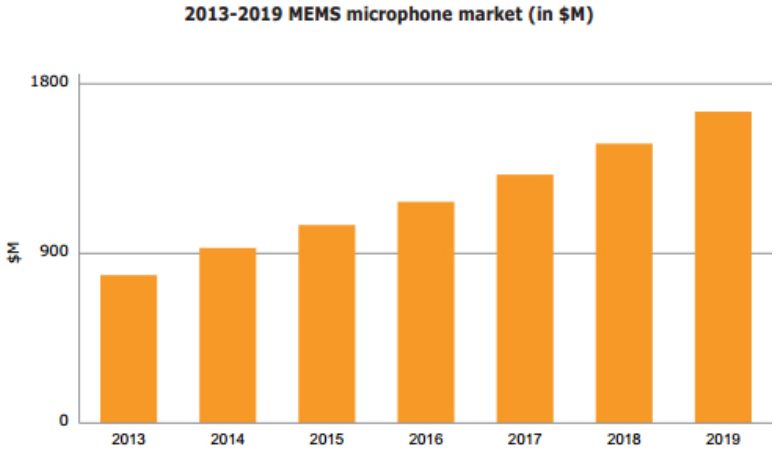
Investment Thesis – Analogous Study

Despite the cost disadvantage, MEMS microphone production accelerated

Over the past decade more than a dozen manufacturers began producing MEMS microphones, driving improvements in performance, size and cost. Nonetheless MEMS microphones remain >10x the price of ECMs.

How has the market responded?

- In 2013 MEMS microphone shipments overtook analog microphones
- MEMS microphone sales are expected to reach 5.4 billion units by 2017



And the trend continues

- Sales of MEMS microphones are expected to grow from $1.0 billion (USD) in 2014 to $1.4B in 2017
- Growth of the MEMS microphone market is exceeding forecasts as more microphones and more applications are added to devices.

Source: HIS technology Apr. 2014

Investment Thesis – Market Cap Insight

No Crossover

Micro

Macro

Micro Speaker	
	Market Cap
AAC	66.8B (HKD)
Knowles	1.7B (USD)
Hosiden	49B (Yen)
Foster	74.8B (Yen)
Merry	18.2B (TWD)
Goertek	52.2B (CNY)

Manufacturers of micro-speakers tend to be public, with greater capital requirements to support large quantity OEM demands.

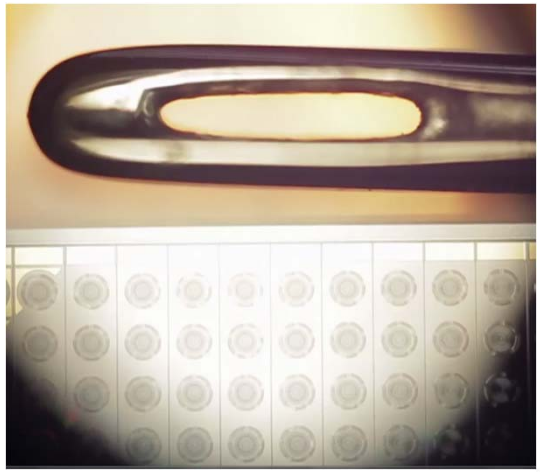
Home Speaker		
	MCAP	Annual Revenue
Harman International	9.4B (USD)	
Polk Audio, Inc.	Private	$50-100M
Boston Acoustics, Inc.	Private	$50-100M
Bose Corporation	Private	$2.9B
Cambridge SoundWorks, Inc.	Private	<$50M
Klipsch Group, Inc.	Private	$150M
Altec Lansing LLC	Acquired by Plantronics $166M	
Martin Logan, Ltd.	Private	<$25M
Bowers & Wilkins	Private	NA

Manufacturers of Home Speakers typically remain private, due to market dynamics of very high margins, relatively limited quantities, and end-user direct sales.

Success Factor

Given the digital nature, enhanced sound reproduction, improved power consumption, ease of assembly and design-in, and smaller more compatible package …there is little reason any company would continue to use conventional speaker technology.

Audio Pixels' Thesis



Key Takeaways

1. Proprietary Game Changing Technology
2. No Direct Competition on the Horizon
3. Final Phase of Productization
4. Immense, Diverse and Stable Market Opportunities

Breaking the Barriers of Sound