



The Promise of Next-Generation Bluetooth® LE Audio Connectivity

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The new Bluetooth specification has grown into “*one of the largest development efforts in the Bluetooth SIG’s history.*”

Nick Hunn

Wireless Evangelist

7 January 2020

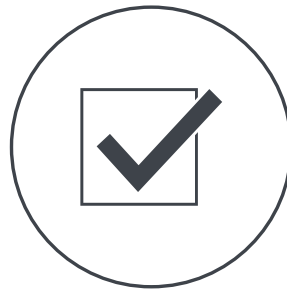
Bluetooth SIG, Inc.



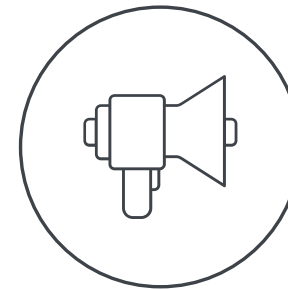
- Global trade association established in 1998
- Oversees Bluetooth® technology and brand
- Over 36,000 member companies in 150 countries



Specification



Qualification



Promotion

Bluetooth® Technology Usage and Applications



Audio Streaming

Headphones
Speakers
Infotainment

1.3
BILLION
annual device
shipments



Data Transfer

Sports & Fitness
Health & Wellness
Peripherals & Accessories

941
MILLION
annual device
shipments



Location Services

Asset Tracking
Navigation & Wayfinding
Access Control

167
MILLION
annual device
shipments

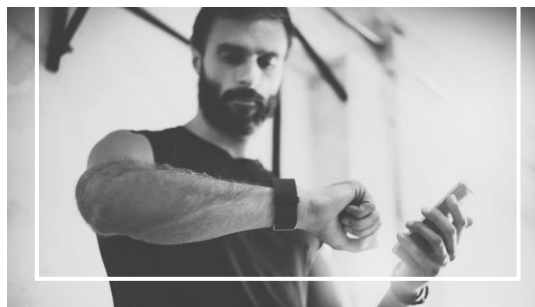


Device Networks

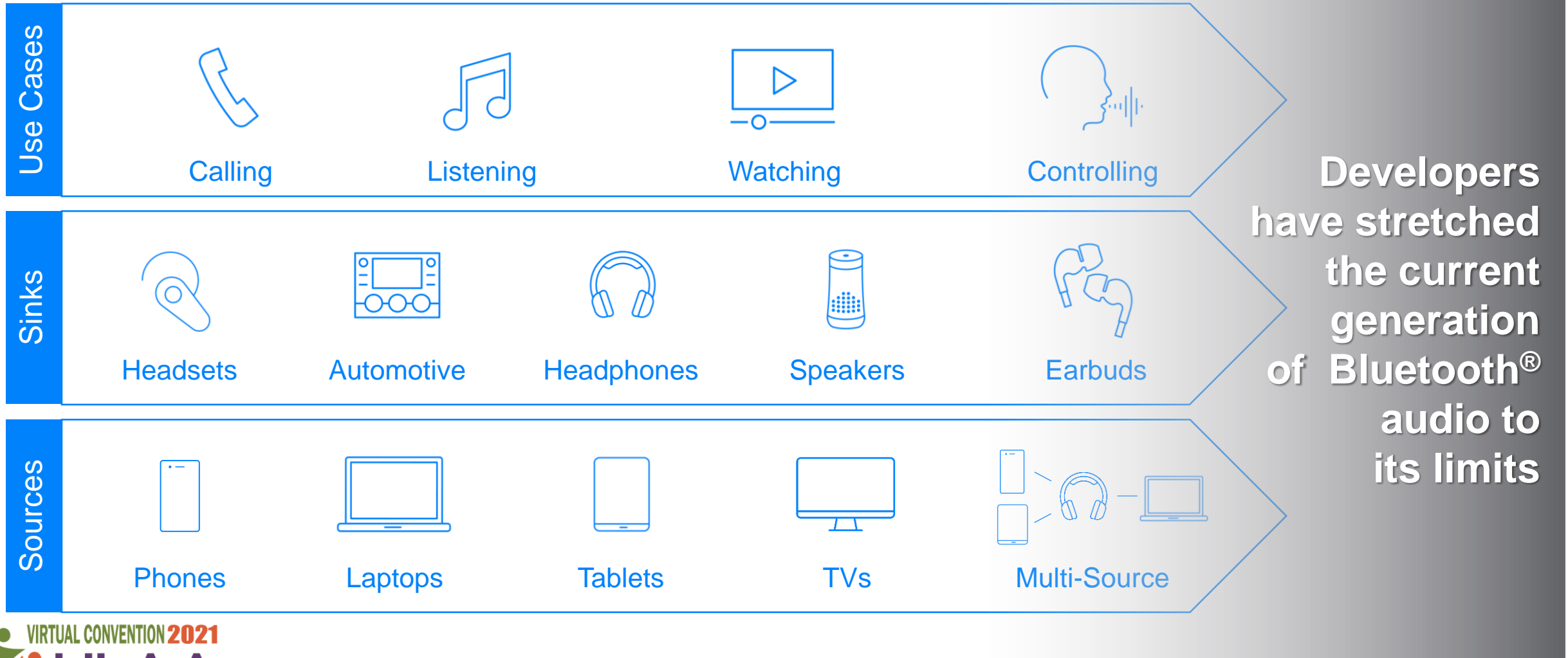
Control
Automation
Monitoring

270
MILLION
annual device
shipments

2021



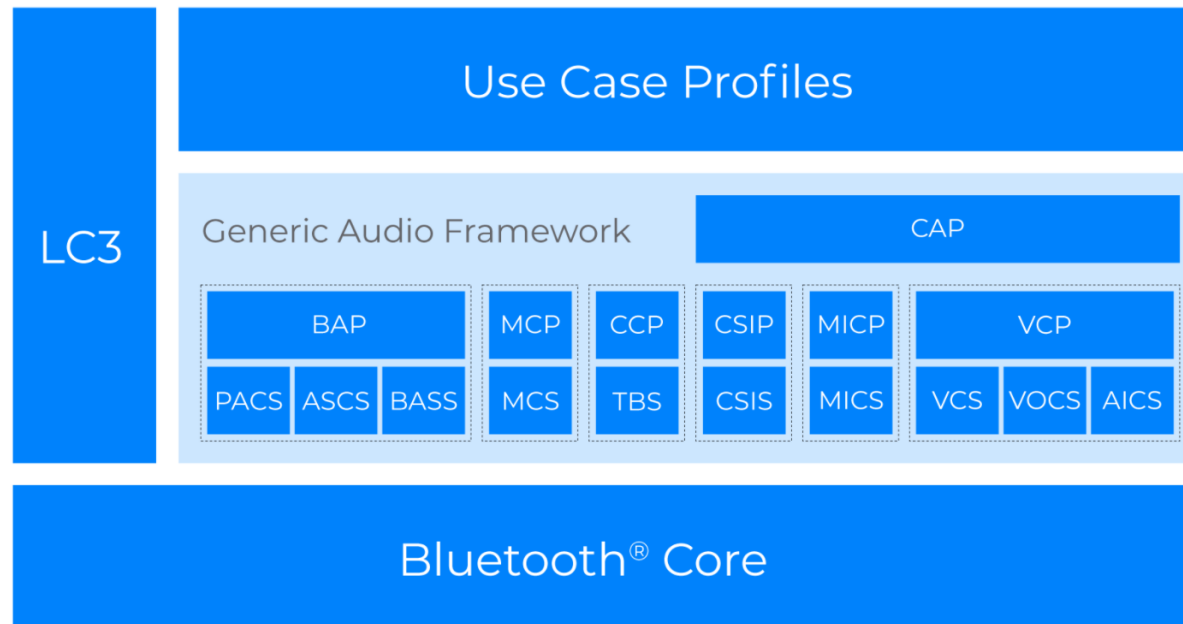
20 years of audio streaming



LE Audio

The next generation
of Bluetooth[®] audio

LE Audio Specifications



Bluetooth Audio

Classic Audio
Audio on Bluetooth® Classic

LE Audio
Audio on Bluetooth® LE

Enabling the next 20 years of audio streaming

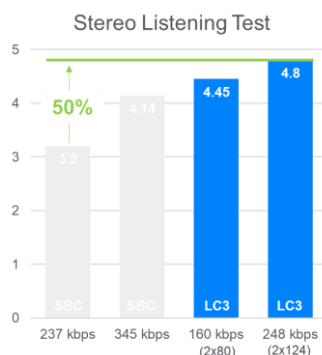
LE Audio | The next generation of Bluetooth® audio

Standardized Hearing Aids



Better Performance
More Flexibility
Global Interoperability

New Modern Codec



Lower Power
Higher Quality
Better Performance

Multi-Stream Support



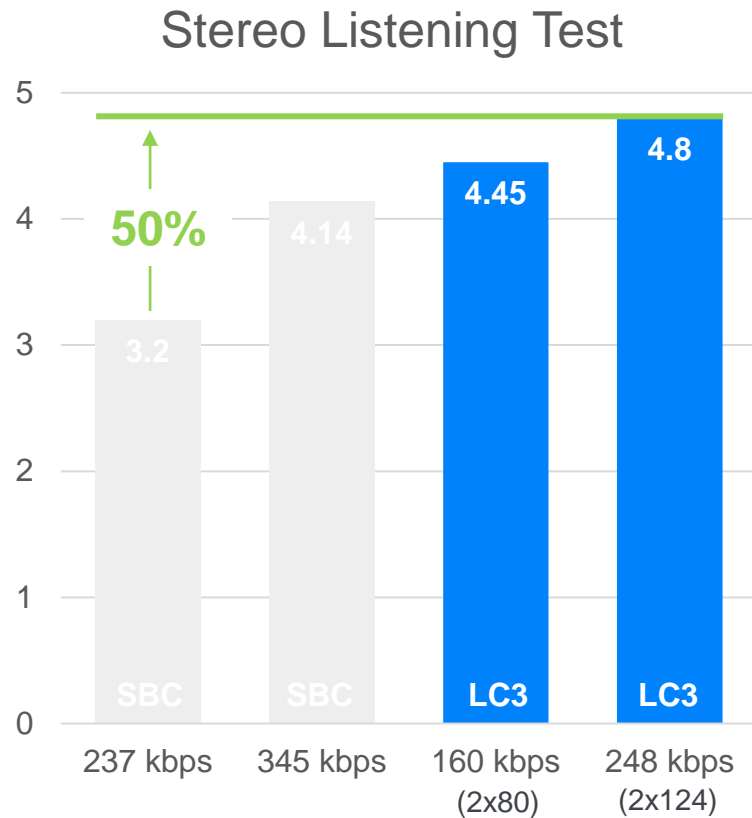
Truly Wireless Stereo (TWS)
Binaural Hearing Aids
Seamless Voice Control

Broadcast Audio



Next Generation
Assistive Listening
(and more)

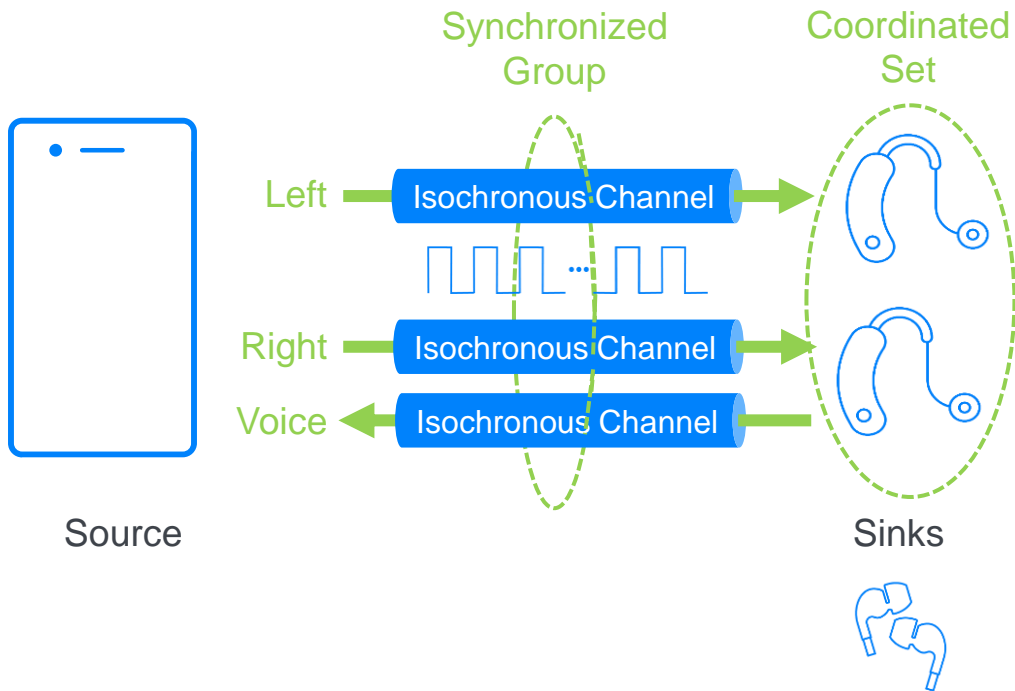
LC3 (Low Complexity Communications Codec)



Higher quality at lower power

- Flexible audio codec
 - Sample rates: 8, 16, 24, 32, 44.1, 48 kHz
 - Bit rates: 16-320 kbps
 - Frame rates: 7.5, 10 ms
- Mandatory for all LE Audio products
- End user benefits
 - Higher quality audio
 - More robust audio
 - Longer battery life (or smaller products)

Multi-Stream Audio



Standardization for binaural hearing aids

- Multiple audio streams between devices
 - Synchronized groups (e.g. $<25 \mu\text{s}$ for L/R)
 - Coordinated sets of sink devices
 - Separation of voice control and audio
- End user benefits
 - Consistent stereo imaging
 - More seamless voice control
 - Enhanced multi-source experience

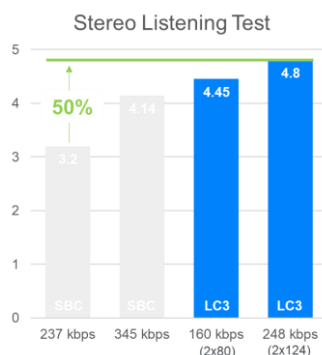
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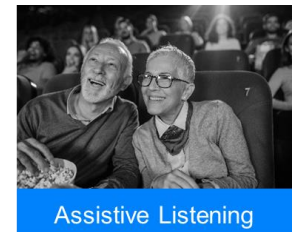
What is Audio Sharing?

Audio Sharing is a new, global consumer service using Bluetooth® technology to deliver audio accessibility for those with hearing loss and new, enhanced audio experiences for everyone.

Personal Audio Sharing



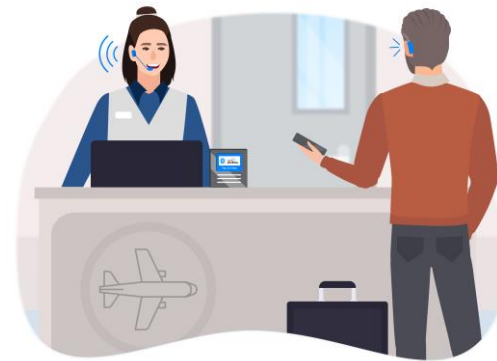
Location Audio Sharing



Example: International Airport



Bluetooth® Audio Sharing available here



Conversations at the counter



Public TV watching



Public address and gate announcements

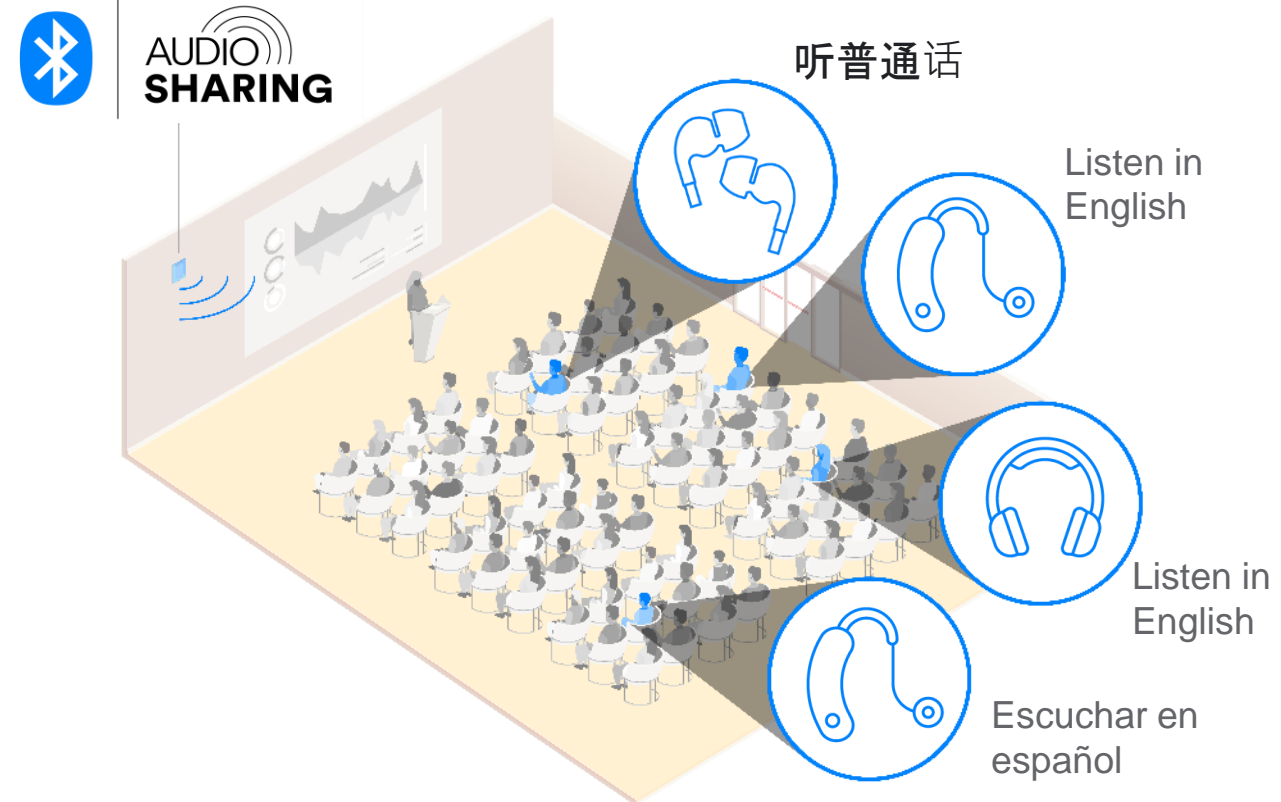


Shared listening and watching

Example: Conference Center/Theater

Assistive listening for all

- Unlimited end points
- Improved user experience (higher quality, multi-channel, multi-language, etc.)
- Hearing assistance and consumer use cases
- Overcome resistance to increase market acceptance
 - Simple deployment – expands accessibility
 - Enhanced listening – increases value
 - Work along side current Loop deployments
 - Comply with regulatory requirements



Audio Sharing Vision

Improving the quality of life for people with hearing loss

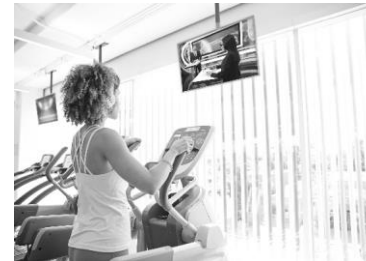
Delivering an enhanced audio experience for everyone



Airports



Waiting Rooms



Gymnasiums



Sports Bars



Conferences



Cinemas



Listening



Watching

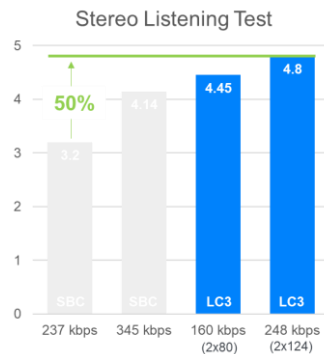
LE Audio: Coming in early 2022

Standardized Hearing Aids



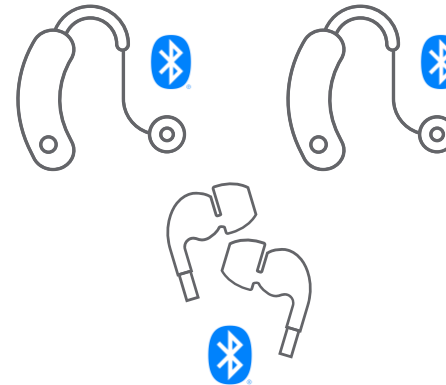
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Questions

Thank you!