NXP Accelerates Hearables Innovation

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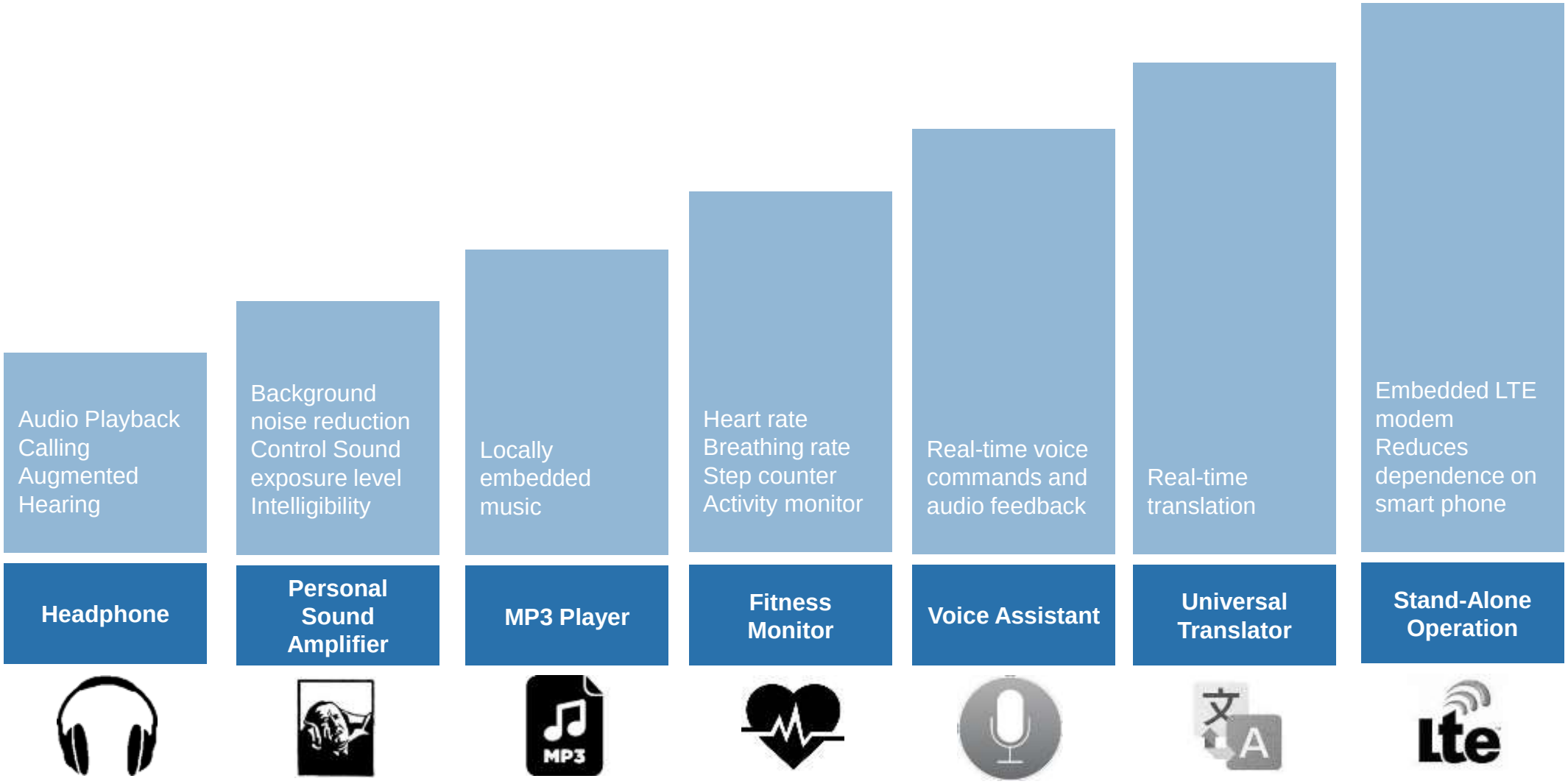
NXP | CONNECTS

Agenda

- NFMI
- BLE Audio

NFMI

Hearables Mature as a Separate Product Segment



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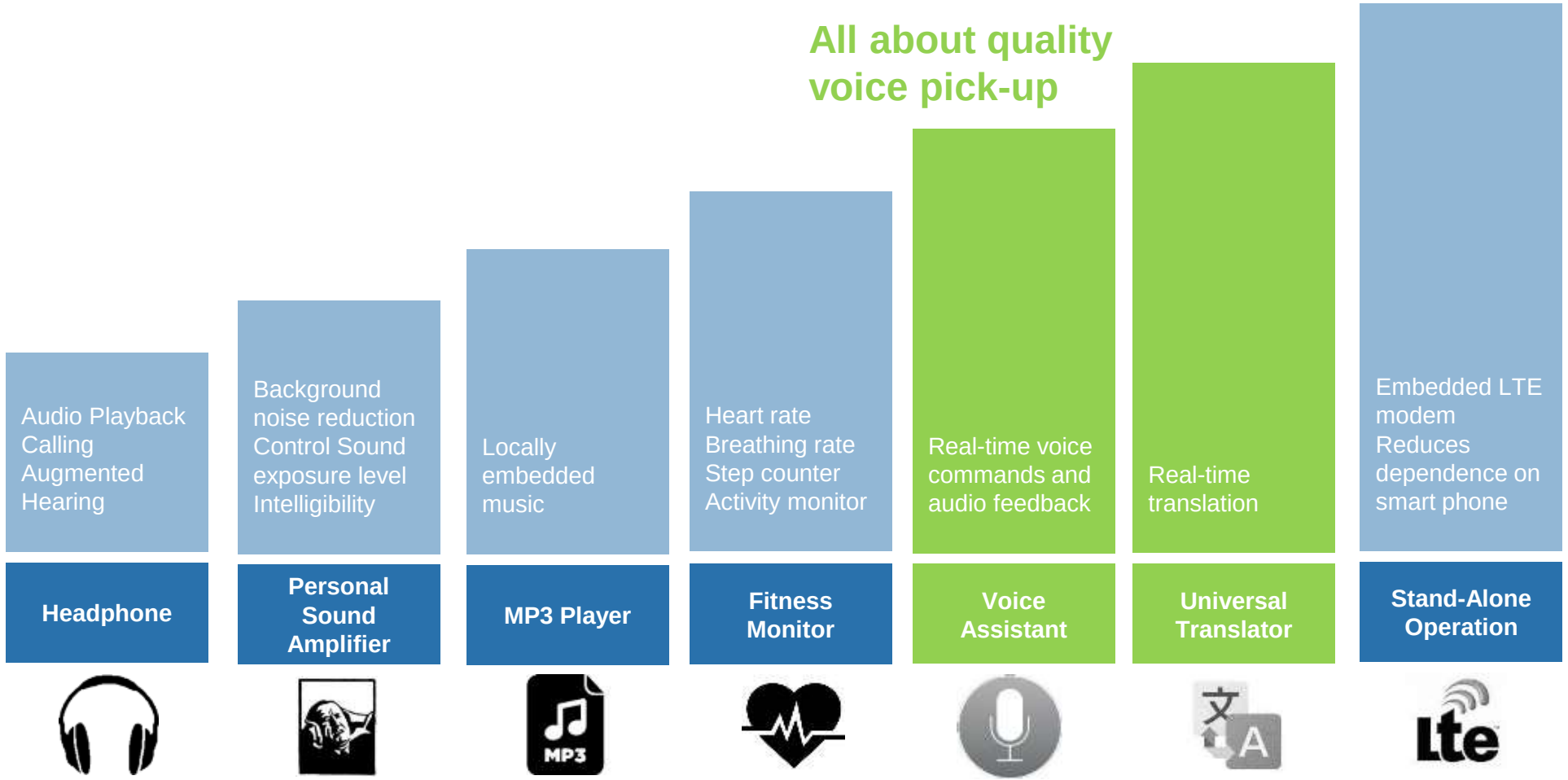


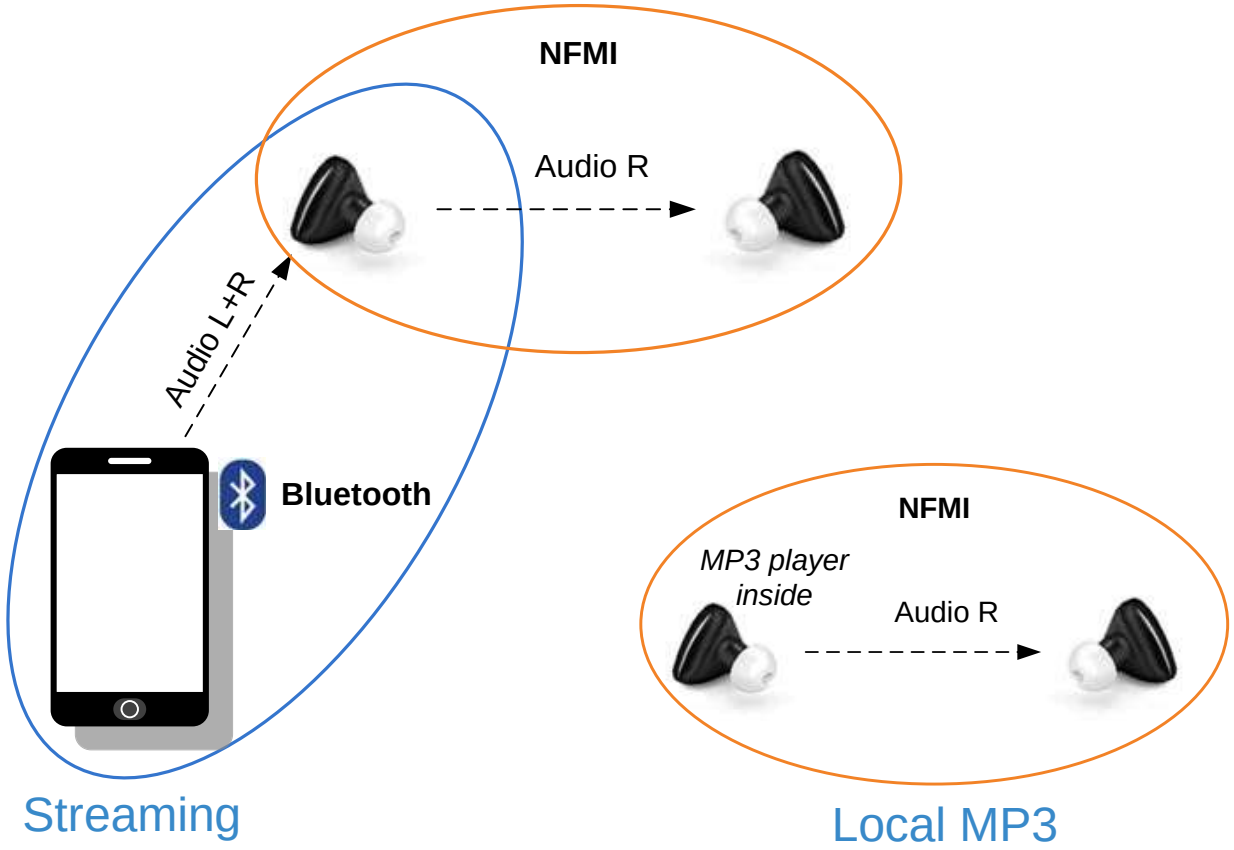
NFMI Enables Robust Audio Playback

Key benefits NFMI:

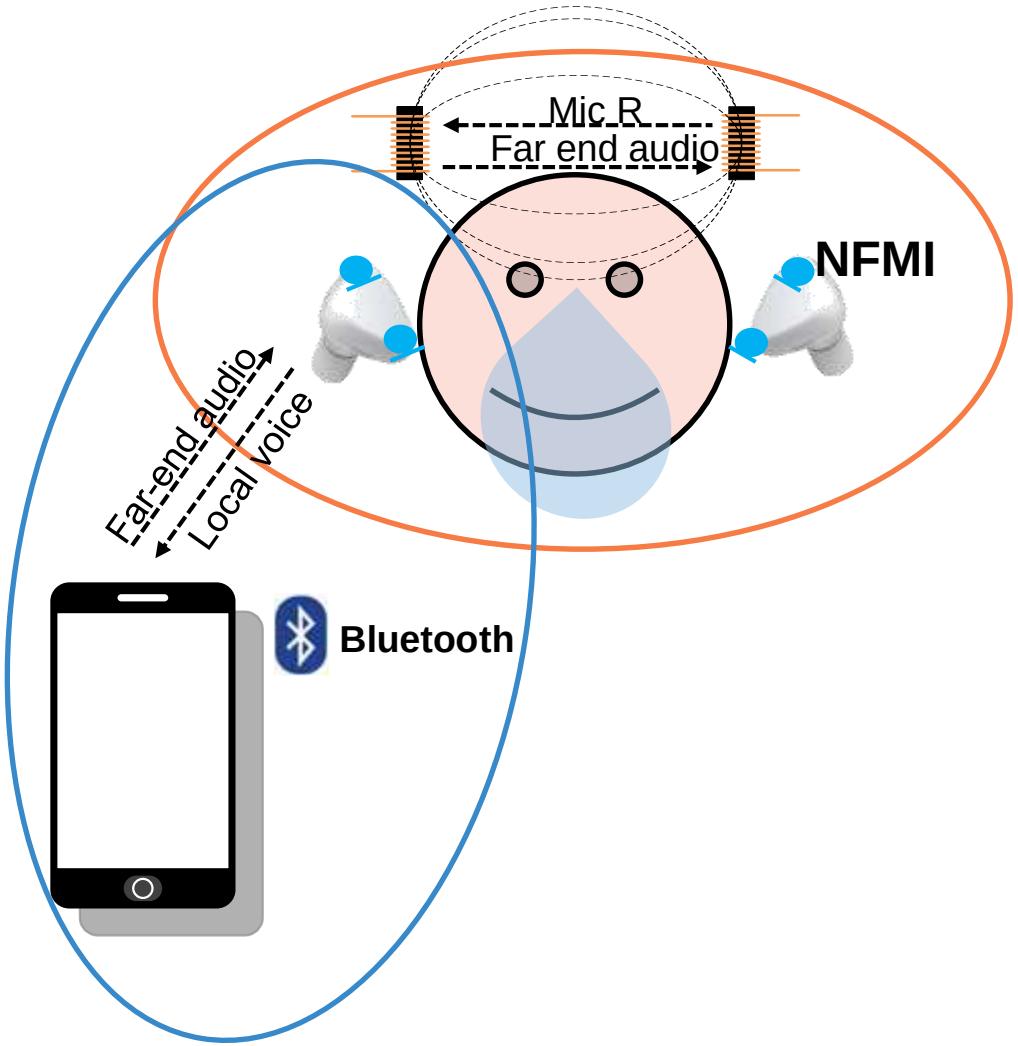
- Not affected by 2.4GHz interferers
- Reliable ear-to-ear communication
- Ultra-low body absorption
- Ultra-low power

NFMI for audio playback enables:

- Perfect stereo image
- Lip-synchronized video
- Dual mono calling
- MP3 playback during swimming



NFMI is Key Enabler of 2+2-mic Voice Pick-up



Voice assistant, voice commands, translation and calling all require:

- Robust ear-to-ear audio streaming
- Ultra-low power ear-to-ear communications.
- Ultra-low latency ear-to-ear communications with low jitter.

NXP NFMI:

- Zero audio dropouts
- Power consumption: 3.5 mW
- Latency: 6.5 ms with <30us jitter
  - BT Classic TWS: >100ms

NFMI Enables Robust Ear-to-ear for Hearables

Jabra GN

Elite Sport

Elite Active 65t

Elite 65t

B&O PLAY

Beoplay E8

NUHEARA

Iqbuds

Iqbuds

BRAGI

Headphone

Dash PRO

YEVO

Yevo 1

EARIN

M-2

Optoma

Be Free8

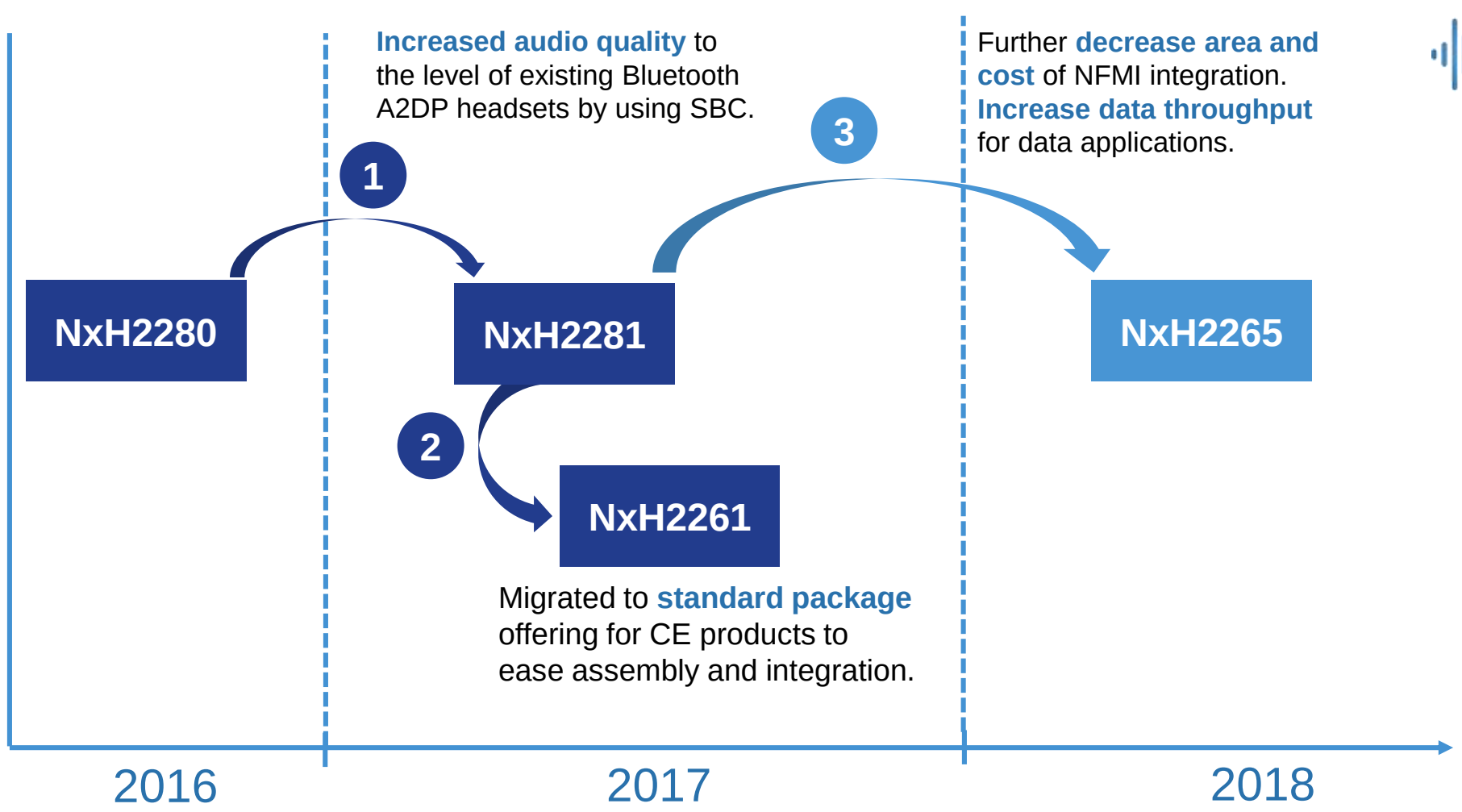
mymanu

CLIK

SONY

Xperia Ear Duo

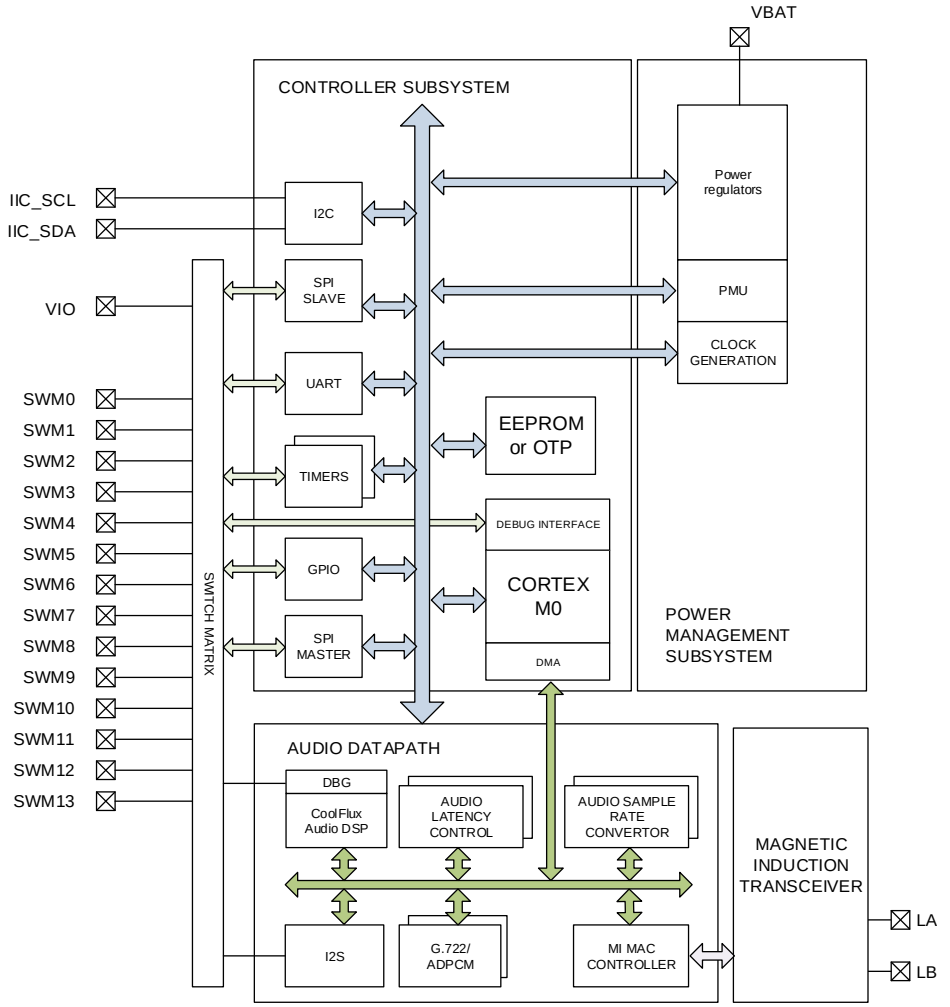
MiGLO for Hearables Product Roadmap



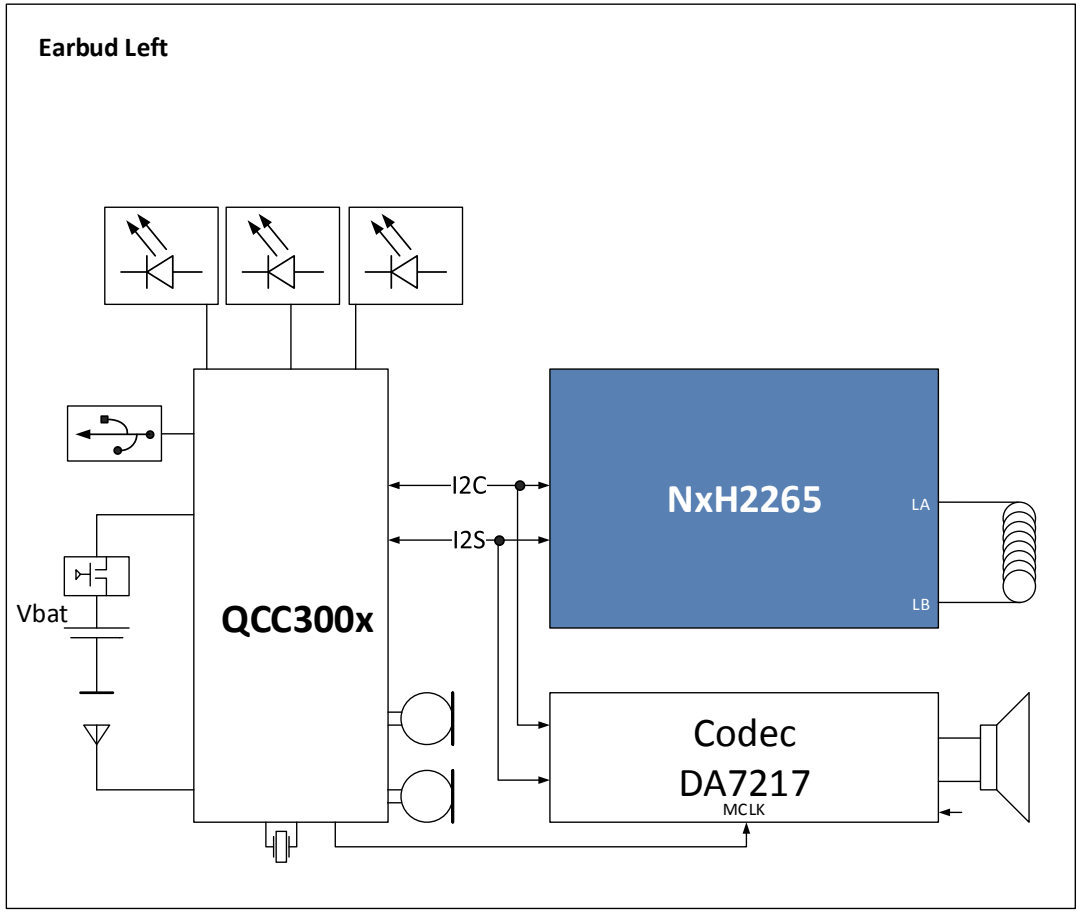
NxH22XX Features

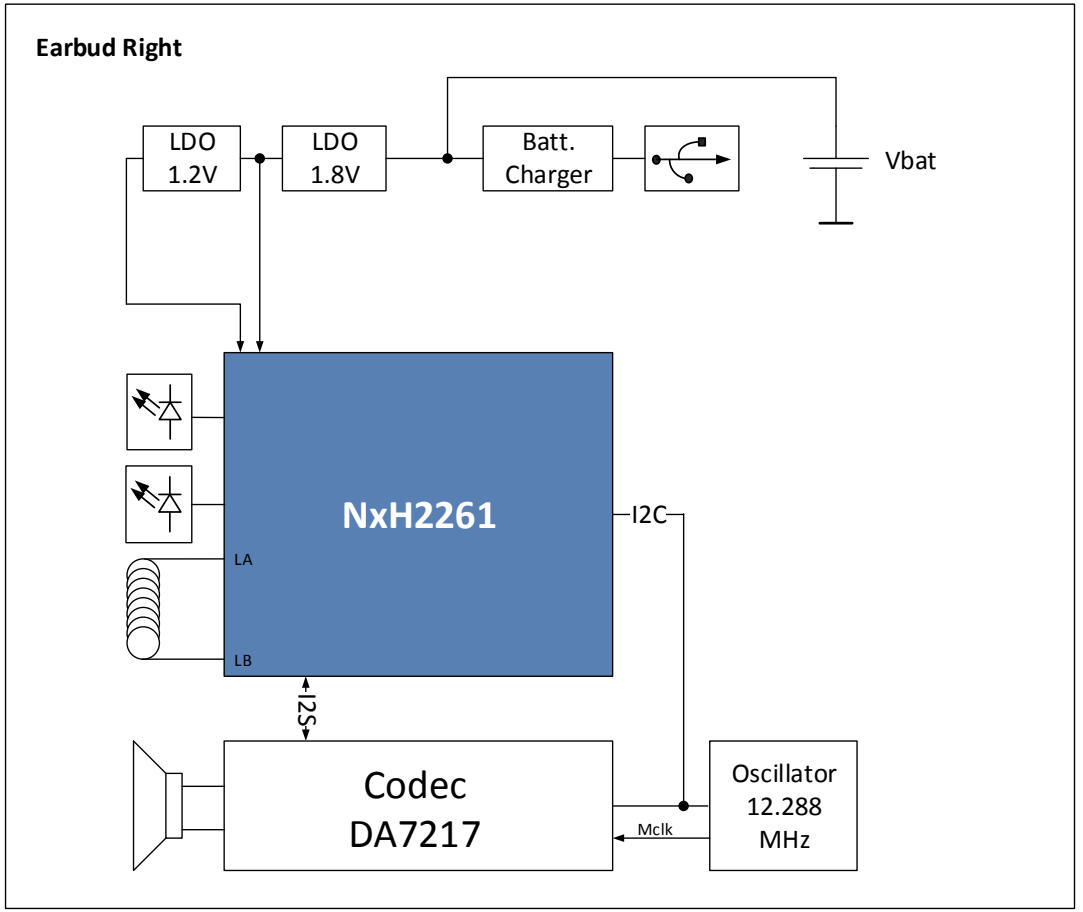
Single-chip solution for wireless audio and data streaming

- 2nd Generation NFMI radio
  - 596kbps PHY throughput
  - Automatic antenna tuning
- Customer-programmable ARM Cortex-M0 processor
  - Allows application customization
- Flexible embedded network protocol stack
  - Up to 2 audio Tx, 2 audio Rx
  - Multiple data streams in parallel
- Embedded NVM
  - Stand-alone devices: 512kbit EEPROM
  - Companion devices: OTP
- Embedded power management for all on-chip functionality
- Low power, high quality, low-latency audio processing
  - CoolFlux DSP
  - HW audio accelerators

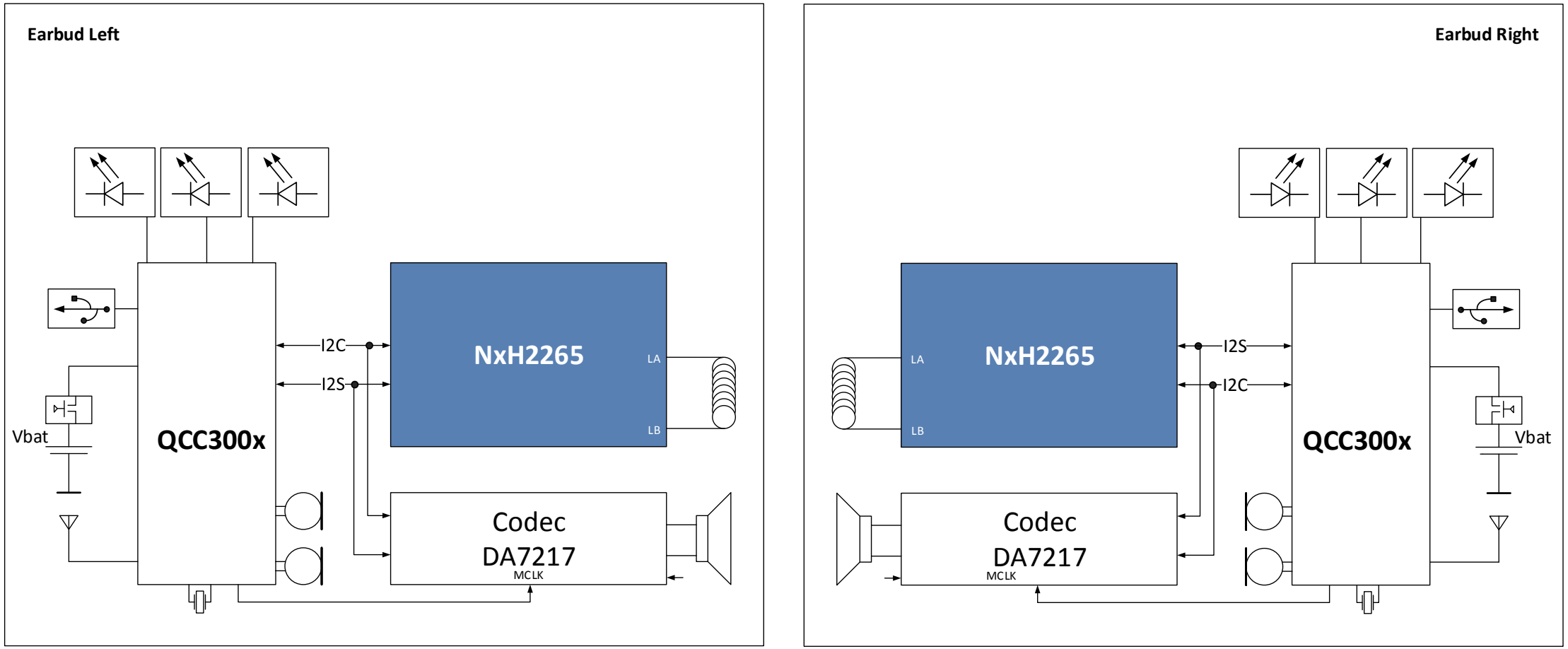


NFMI Reference Design – Asymmetric





NFMI Reference Design – Symmetric



NFMI Product Comparison

Parameter	NxH2261 Released	NxH2265 Q3 18
Audio quality	SBC	SBC
Power [mW] **unidirectional streaming*	3.6 mW	3.4mW
Net data throughput [kbps]	220	350
Non-volatile memory [kbit]	512	0
External components	5 capacitors	1 capacitor
	1 antenna	1 antenna
Package	WLCSP	WLCSP
Pitch [um]	400	400
Back side coating	Yes	Yes
Size [mm^2]	10.4	7.8

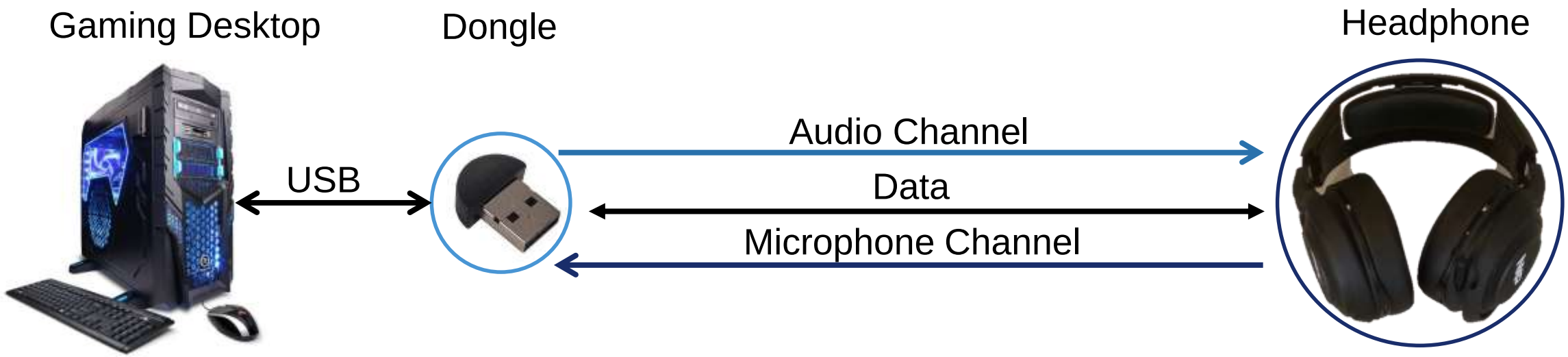
NxH2265 planning	Date
Customer Engineering Samples (CES)	Available
Customer Qualified Samples (CQS)	Available
Release for mass production (MP)	28/09/18

BLE Audio

NxH3670 Value Proposition

Applications	Wireless gaming / communication headsets: small form factor communication and consumer gaming headsets with long battery life
Power efficient	Lowest active energy consumption in the market Average power consumption of <8.5mW for 48kHz audio
Highly integrated	Low external component count enabling miniaturized devices
HiFi Audio	Optimized architecture with DSP and hardware support for robust, high quality audio streaming at low latency
Flexible	Bluetooth Low Energy 5.0 certified. Proprietary low latency audio streaming support

NxH3670 Wireless Headset Use Case



Data channel

- HCI interface
- ~4kbps

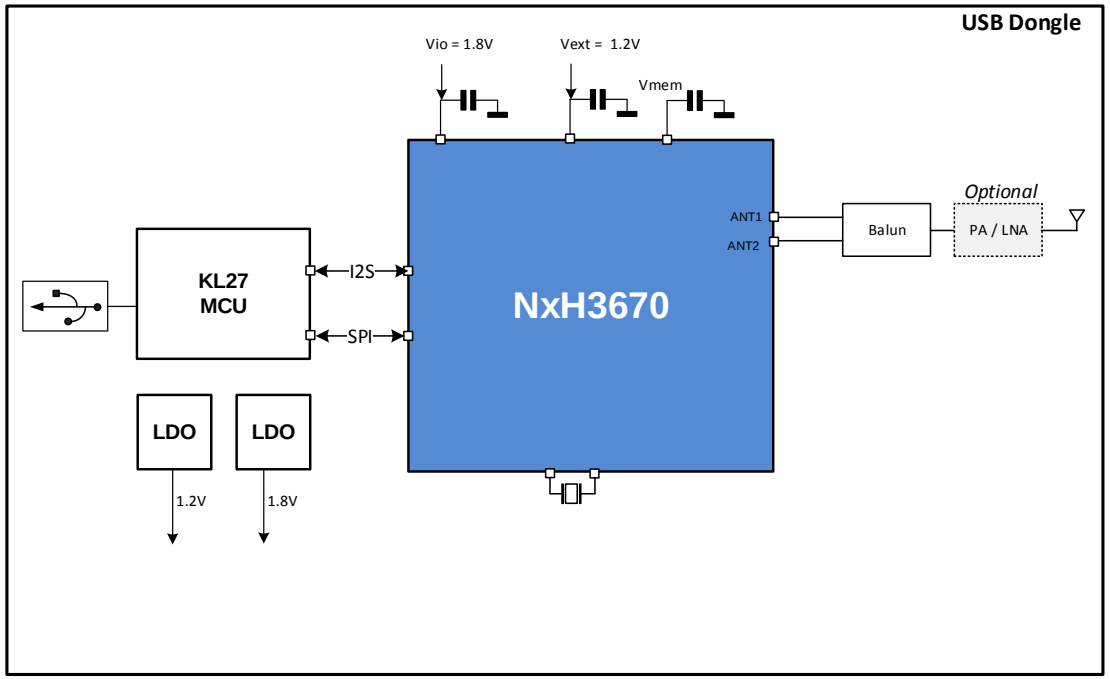
Forward audio channel

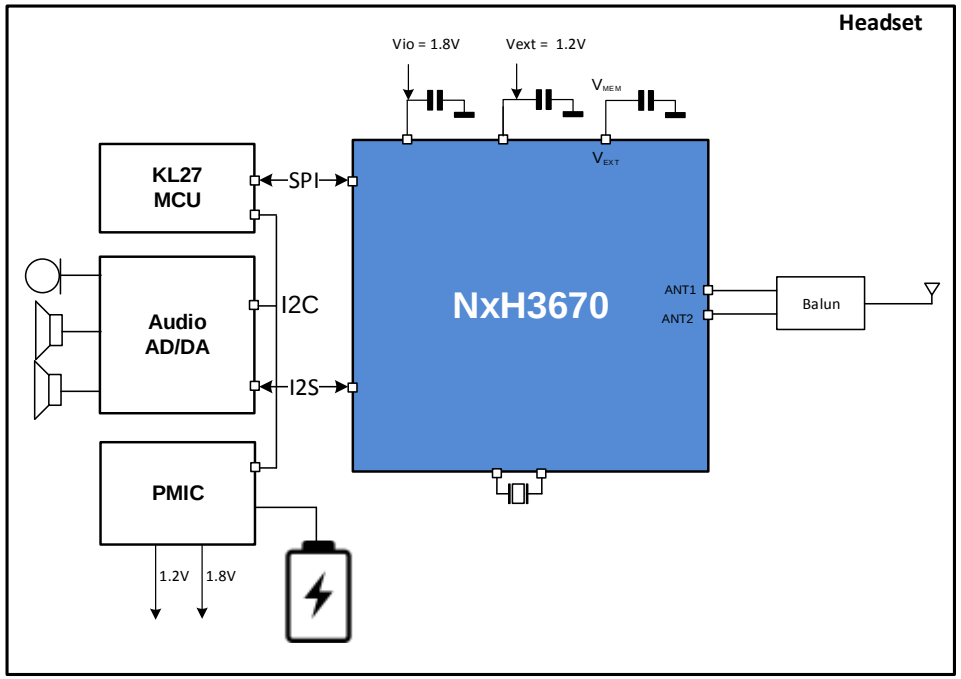
- Stereo audio
- SBC HQ audio codec
- 48kHz, 16 bit
- Latency < 20ms

Microphone channel

- Mono audio
- G.722 audio codec
- 16kHz, 16 bit

NxH3670 Reference Design – Gaming Headset





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FOR A SMARTER WORLD

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