Realtek BT Audio Roadmap

Q2'2022

Bluetooth Audio Roadmap

Superior — RTL8773C
BT5.2 Audio SoC

Ultra low power ★ Available Now

- BT 5.2 (BT legacy + BLE)
- Cortex-M4 120MHz + HiFi Mini 200MHz (support ext. DSP)
- MCU+DSP SDK
- Tx Power 10dBm
- USB Audio(HS)/Charger
- 2xMic Algorithm - AEC/NN-NR (RCV NN)
- Low-power hybrid ANC (Programmable Arithmetic Logic Unit)
- Ultra-low audio latency (20ms)
- Good RF sensitivity -95dBm(Typ.)
- A2DP power consumption (<5.5mA)
- Small Package 4.5x6 BGA 117
- MP: 2020/Q2

## LE Audio — RTL8773E
BT5.3 Audio SoC

LE Audio/ANC ★ Coming soon

- BT 5.3 (BT legacy + BLE , LE Audio)
- Support 32K Voice
- Real-M300 (ARM Cortex-M55 compatible) 100MHz
- MCU SDK
- HiFi Mini 200MHz (support ext. DSP)
- Tx Power 10dBm
- USB Audio(HS)/Charger
- 2xMic Algorithm — AEC/NN-NR(RCV NN)
- Low-power hybrid ANC(PALU)
- Ultra-low latency mode supported (20ms)
- Class D Audio Amplifier
- Good RF sensitivity -95dBm(Typ.)
- A2DP power consumption (<5mA)
- LE Audio (<4.5mA)
- Small Package 4.5x6.5 QFN-46
- MP: 2022/Q1

Premium — RTL8773D
BT5.3 Audio SoC
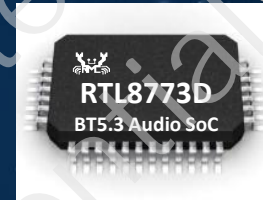
LE Audio/AI ★ Coming soon

- Bluetooth 5.3(BT legacy + BLE , LE Audio)
- Cortex-M4 160MHz
- HiFi Mini 320MHz + HiFi 4 320MHz (with NN lib)
- 2.56GOPS for NN application
- Embedded 4.3MB RAM + MCM 8MB pSRAM
- Low-power adaptive hybrid ANC(PALU v2.0)
- Ultra-low latency mode supported (20ms)
- MCU + DSP SDK
- 192kHz USB Audio
- Class D Audio Amplifier
- RF (Rx)-96dBm, (Tx) 10dBm, EDR2M
- A2DP power consumption (<4mA, with 0.1mW audio output power)
- LE Audio (BIS ,<3.0mA, 0.1mW)
- Small Package 4.9x6.0 FCCSP
- ES: 2022/Q1

Valued — RTL8753G
BT5.3 Audio SoC
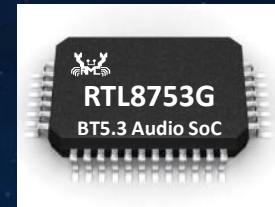
Low power ★ Coming soon

- BT 5.3 (BT legacy + BLE)
- Real-M300 (ARM Cortex-M55 compatible) 80MHz
- MCU SDK
- HiFi Mini 160MHz
- Tx Power 10dBm
- 2xMic Algorithm - ENC (RCV 5.0)
- Support Multi-link
- Support Gaming mode
- Class D Audio Amplifier
- Good RF sensitivity -95dBm(Typ.)
- A2DP power consumption (<5.5mA)
- Small Package 4x6 QFN-40
- CS: 2022/Q2

LE Audio Platform (Time to Market)

High Performance ANC
- 32 biquad filters
- HW for Anti-wind noise/de-howling

SDK(for Audio TX dongle & RX headset)
- SDK & Configuration tool
- Not rely on smartphone

Easy Mass Production
- FW same as 8753/73B
- CIS/BIS easy configuration

P2P Compatible
- Package P2P with 8753/73
- Reusable eRWS PCBA schematic

RTL8773E

LE Audio
- BT5.3 – QDID:174072
- LC3 Codec
- 32K Voice
- CIS/BIS

Low Power Consumption
- System level (0.1mW)
- eRWS < 5mA
- LE Audio <4mA
- Hybrid ANC add <1mA

AI ENC
- DNN 2-MIC NR
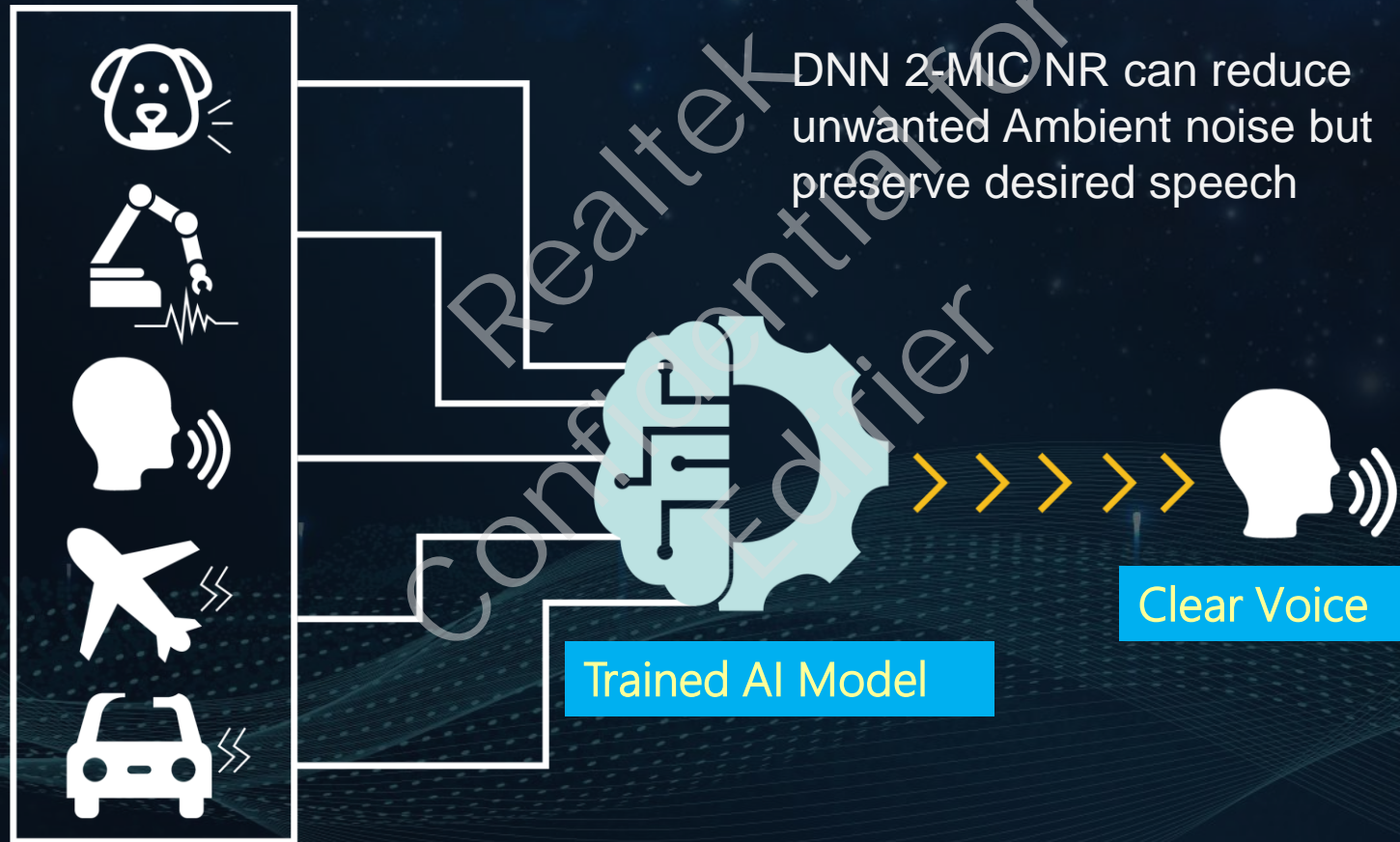- 3-MIC NR
(2MIC + VPU(voice pickup unit) or FB MIC)

1ˢᵗ vendor support Multi-link

- 1ˢᵗ BT chip vendor support multi-link in TWS field
    - Supported in all Realtek eRWS platform
- Seamless role-switch between 2 phones
- Released on Apr'21

Smartphone IOP test list		
iOS	Model	iOS version
	iphone8Plus	iOS13.4
	iphoneX	iOS 11.2.1
	iphoneXR	iOS 12.3.1
	iphoneSE	iOS 14.6
	iphone11	iOS 13.3.1
	iphone11Pro	iOS 14.6 Beta2
	2020ipad air	iOS 14.2
	iphone12	iOS 14.1
	iphone12 mini	iOS 15 beta
Android	Model	Version
	sony xperia1(Android9)	Android9
	samsung galaxy note10	Android 10
	samsung galaxy s20	Android 10
	samsung galaxy s21	Android 11
	google pixel 4a	Android 11
	google pixel 4XL	Android 10
	Redmi K30 Pro	Android 10
	redmi note 8T	Android 9
	LG ThinQ V40	Android8.1.0
	Huawei mate20x	Android10
	Huawei mate 30Pro	Android10
	Mi 9T Pro	Android9
	vivo nex	Android 9
	oppo a9 2020	Android 10
	one plus 6t	Android 9
Laptop	Model	Version
	lenovo ThinkPad X270	Win10

DNN 2-MIC NR (RCV NN 1.0)

DNN 2-MIC NR can reduce unwanted Ambient noise but preserve desired speech

Trained AI Model

Clear Voice

DNN 2-MIC NR for ENC (RCV NN 1.0)

- ENC (Environment noise cancellation for phone call)

3Quest (TS 103 106)	RCV NN 1.0 2-mic	RCV 5.0 2-mic
SMOS	3.664	3.248
NMOS	3.746	3.737
GMOS	3.361	3.043

3Quest (TS 103 106) Measured at PAL-Lab Taiwan	MOS	RCV NN 1.0 2-mic	RCV 5.0 2-mic
Pub	SMOS	3.376	3.102
	NMOS	3.096	3.044
	GMOS	2.861	2.64
Road	SMOS	2.875	2.456
	NMOS	3.703	3.51
	GMOS	2.761	2.403
XRoad	SMOS	3.797	3.23
	NMOS	3.981	4.127
	GMOS	3.552	3.177
Train	SMOS	3.597	2.992
	NMOS	4.074	4.135
	GMOS	3.439	3.02
Car	SMOS	3.969	3.237
	NMOS	3.984	3.708
	GMOS	3.697	3.012
Café Counter	SMOS	3.726	3.552
	NMOS	3.553	3.622
	GMOS	3.322	3.213
Mensa	SMOS	3.825	3.509
	NMOS	3.821	3.869
	GMOS	3.509	3.282
Call Center	SMOS	4.143	3.904
	NMOS	3.758	3.883
	GMOS	3.749	3.599
Average	SMOS	3.664	3.248
	NMOS	3.746	3.737
	GMOS	3.361	3.043

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SDK & Configuration supported

Entry-Level TWS Solution

RTL8753GFE

Phone APP
- Support SDK for IOS
- Support SDK for Android

Cap Touch
- Integrated cap touch function in BT chip

P2P Compatible
- Package P2P with 8753B
- Reusable eRWS PCBA schematic

BT5.3
- QDID:174072
- Cost effective

Low Power Consumption
- System level (0.1mW)
- eRWS ~ 5.5mA

Multi-link
- Support multi-link in TWS field
- Seamless role-switch between 2 phones

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TWS Selection Table

	RTL8753GFE	RTL8753EFE	RTL8753EFE-VS	RTL8773EFE
Bluetooth version	BT 5.3	BT 5.3	BT 5.3	BT 5.3
MCU	Real-M300 80MHz	Real-M300 100MHz	Real-M300 100MHz	Real-M300 100MHz
DSP	Hifi-Mini 160MHz	Hifi-Mini 200MHz	Hifi-Mini 200MHz	Hifi-Mini 200MHz
MCU SDK	Yes	Yes	Yes	Yes
Flash Size	2MB	2MB	4MB	4MB
RCV 5.0(Dual-MIC)	Yes	No	No	No
RCV NN(Dual-MIC)	No	Yes	Yes	Yes
3D sound effect	No	No	Yes	Yes
Spatial Audio	No	No	Yes	Yes
Hybrid ANC	No	No	No	Yes
Cap touch	Yes	Yes	Yes	Yes
Gaming Mode	Yes	Yes	Yes	Yes
Multi-link	Yes	Yes	Yes	Yes
GFPS/XiaoAI/XiaoWei	No	No	Yes	Yes
RHE	No	No	No	Yes
Android/IOS APP	Yes	Yes	Yes	Yes
User EQ storage	6 sets	6 sets	10 sets	10 sets
A2DP with eRWS	<5.5mA	<5mA	<5mA	<5mA
Package	QFN40，4x6	QFN40，4x6	QFN40，4x6	QFN46，4.5x6.5
Status	CS in Q2	MP	MP	MP
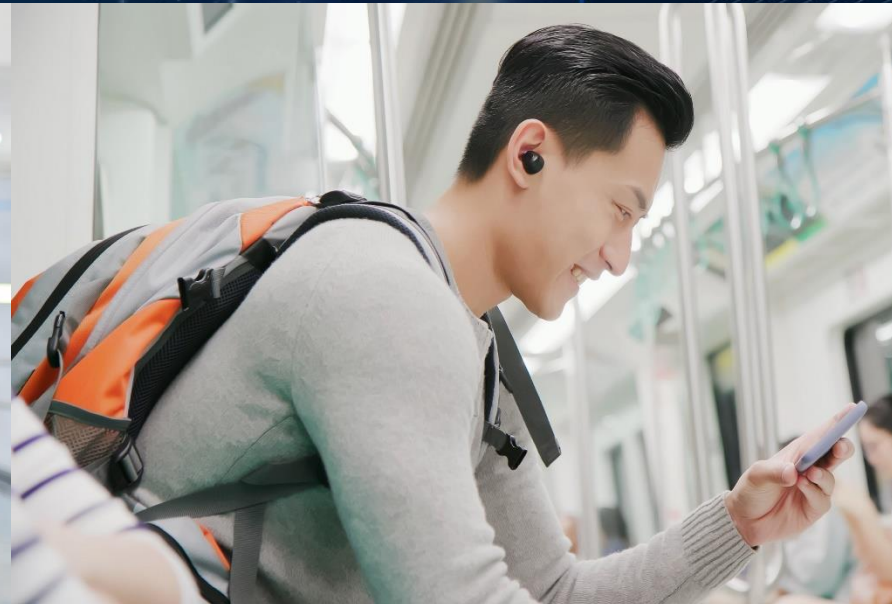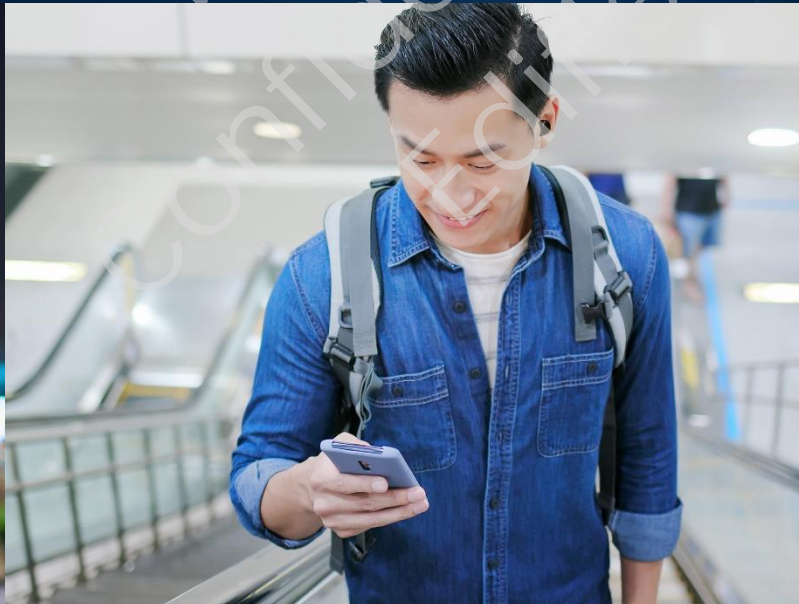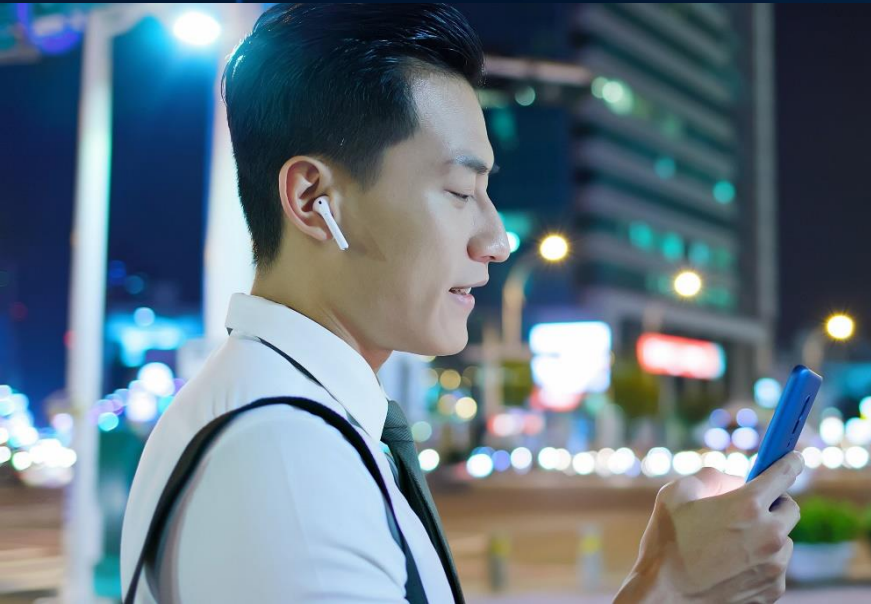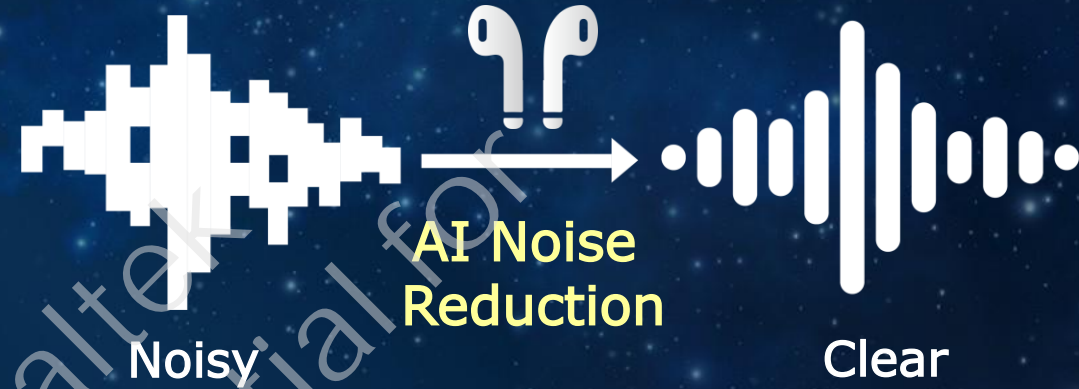
WW 1ˢᵗ BT AI Platform

RTL8773D

Bigger RAM for AI
- 4.3MB Embedded SRAM
- Optional MCM 8MB pSRAM

Adaptive ANC
- Automatically adapt ANC performance for different ear fits
- Open-type/In-Ear Hybrid ANC

Easy Mass Production
- FW same as 8753/73B
- CIS/BIS easy configuration

Small Package
All In One 4.9x6 WL-BGA 184

LE Audio
- BT5.3 – QDID:174072
- LC3 Codec
- 32K Voice
- CIS/BIS

Powerful AI Platform
- 2.56GOPS
- AI NN calculation supported

30% Power Reduction
- A2DP <4mA
- LE Audio
  - BIS < 3mA

Bluetooth Classic Audio Portfolio

Sample release

2021 NOV

Overhead ANC Solution

SDK
RTL8773CF/CO
RTL8773CFE

<7mA, 32 biquads AI NR

SDK
RTL8773EFE

<6mA, 32biquads AI NR

HB ANC TWS Solution

RTL8773BFE

<7.5mA, 9 biquads
2-MIC NR

SDK
RTL8773CF/CO
RTL8773CFE

<7mA, 32 biquads AI NR

SDK
RTL8773EFE

<6.2mA, 32biquads AI NR

FF ANC TWS Solution

RTL8773BFR-VF

<9mA, 9 biquads
2-MIC NR

SDK
RTL8773EFE-VF

<6mA, 32biquads AI NR

TWS Solution

RTL8753BFE

<6mA, 2-MIC NR

SDK
RTL8753EFE

<5mA, AI NR

★ **Coming soon**

New Entry-Level
RTL8753GFE

<5.5mA

Test Condition:
@3.8V, w/ 0.1 mW loading

Y21.Dec NN NR release

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Bluetooth LE Audio Portfolio

	2021 NOV	EVB Available for Developing	2022 Q1
Sharing Audio Solution	SDK RTL8763EFL BIS<3.3mA		SDK RTL8763DO BIS <3mA
HB ANC TWS Solution		SDK RTL8773EFL <5mA, 32biquads AI NR	SDK RTL8773DO <4mA, AI NR Adaptive ANC
Dongle Solution	SDK RTL8763EAU BIS/CIS Supported		SDK RTL8763DO BIS/CIS Supported
TWS/STEREO Solution	SDK RTL8763EFL <4mA, AI NR		SDK RTL8763DO <3.3mA, AI NR

Test Condition:
@3.8V, w/ 0.1 mW loading

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Gaming Headset Solutions

BT Gaming Headset Solutions

Realtek BT dongle and headset paired support

- Low latency mode, Lowest < 20ms
- RTP(Realtek Talk Profile,16K/32K 16bits)
- 3D sound effect in headset
- Multi-link

A2DP

RTP

Generic BT

BT Gaming Portfolio (Over Head)

RTL8763EAU LE Audio SDK + 🎧 **RTL8773E LE Audio SDK**

- End2End latency < 20ms
- **LE Audio**
- RTP(Realtek talk Profile,32K/16bits)
- Multi-link
- ENC RCV5.0 Dual MIC
- **Game/Chat sound volume balance**
- **Hybrid ANC support**
- **3D Sound effect**
- **Android/IOS/Windows APP**

2022 Q2

RTL8763EAU LE Audio SDK + 🎧 **RTL8773C SDK**

- End2End latency < 20ms
- RTP(Realtek talk Profile,16K/16bits)**(32K Q2`Y22)**
- Multi-link
- ENC RCV5.0 Dual MIC
- **Game/Chat sound volume balance**
- **Hybrid ANC support**
- **USB Audio support**
- **3D Sound effect**
- **Android/IOS/Windows APP**

2022 Q1

RTL8753BAU ROM + 🎧 **RTL8763B ROM**

- End2End latency < 20ms
- RTP(Realtek talk Profile,16K/16bits)
- Multi-link
- ENC RCV4.0 support

2021 Q4

BT Gaming Portfolio (TWS)

RTL8763EAU
LE Audio
SDK

+ 🎧

RTL8773E
LE Audio
SDK

- End2End latency < 30ms
- **LE Audio**
- CIS for voice(**32K/16bits**)
- **Dongle support IIS interface**
- **Hybrid ANC support**
- **Android/IOS/Windows APP**

2022
Q2

RTL8753BAU
ROM

+ 🎧

RTL8753B
ROM

- End2End latency < 50ms
- RTP(Realtek talk Profile,16K/16bits)
- ENC RCV4.0 support
- **3D sound effect(RTL8753BFE-VQ only)**

2021
Q4

# Teams Product & Certification

Advantages for Qualifying Teams Certifications

- Interoperability with Teams Client Software

- License to use the logo for product marketing and packaging

- Listed on Microsoft Teams Qualified Products Marketplace web page

- Recommendation by Microsoft in Microsoft Teams deployment

Solutions on Teams and UC Products

- Challenges on Teams Requirements
  - ➤ Latencies for recording and playback paths need to meet Teams audio requirements to ensure smooth and natural conversation
  - ➤ Pass ACQUA tests to provide natural and clear conversation in both quiet and office noise environment
- Solution for Teams and UC Products
  - ➤ Experienced for Teams and UC products
  - ➤ Provide SDK for fast product implementation for Teams program partners
  - ➤ Provide tested and proven high quality Unified Communications products for other corporate customers
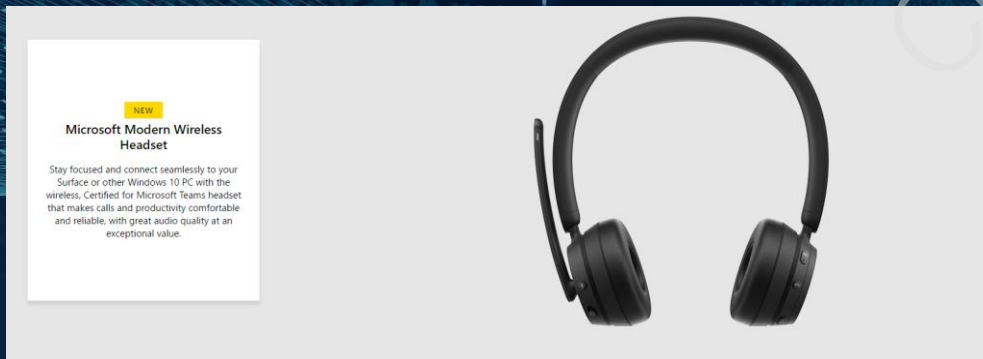
Dongle: RTL8753BAU

Headset: RTL8763COM

Microsoft Teams Certified Product Portfolios

Product Categories	Stereo Headset	TWS	Open Office Stereo Headset	Speakerphone (1 chip solution)	Dongle
Highlights	Certified for Teams in 2021	With Realtek Clear Voice (RCV) 5.0 (noise reduction algorithm)	With third party noise reduction algorithm	Embedded HiFi-4 DSP for noise reduction and echo cancellation processing	Teams ASP SDK for certified Teams partners
SDK	Yes	Yes	Yes	Yes	Yes
Super Wideband# (LE Audio Only)	32KHz	32KHz	32KHz	32KHz	32KHz
LE Audio/Legacy	8773EFL	8773EFL	8773DO	Yes	Yes
Legacy Only	8773CO	8773CO	8773CO	8773DO	8763EAU
Status	Available now	Available now	Available now	2022 Q2	2022 Q2
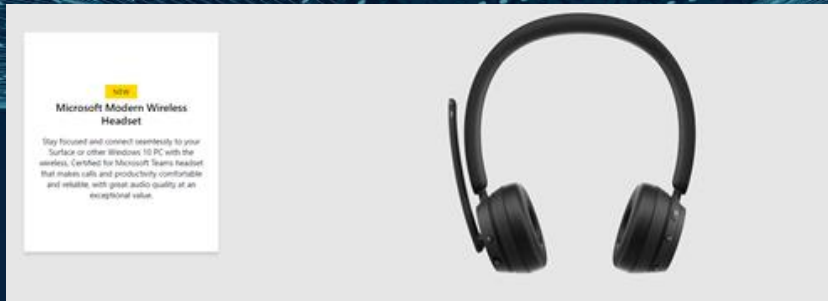
Thank You!

Realtek is committed to providing its customers with the best possible connectivity and multimedia solutions