



JHEAR OTC hearing aid Platform introduction

May. 2024

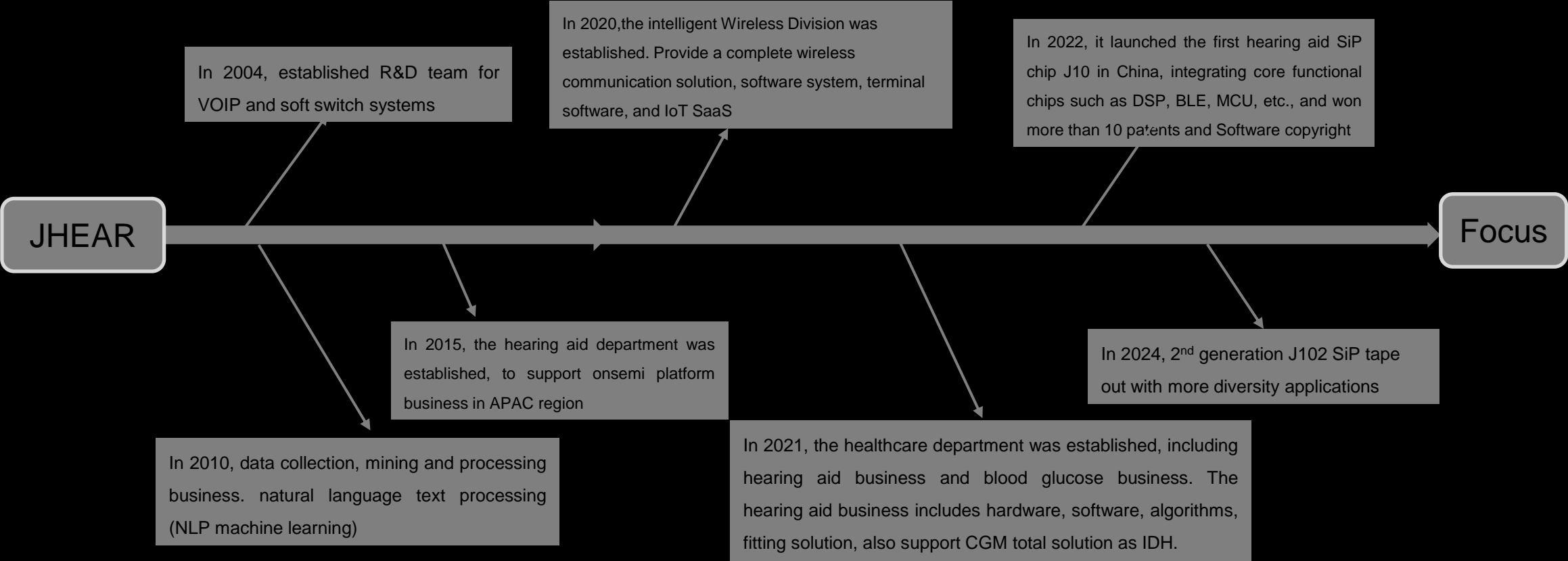
<http://en.jhearing.com>

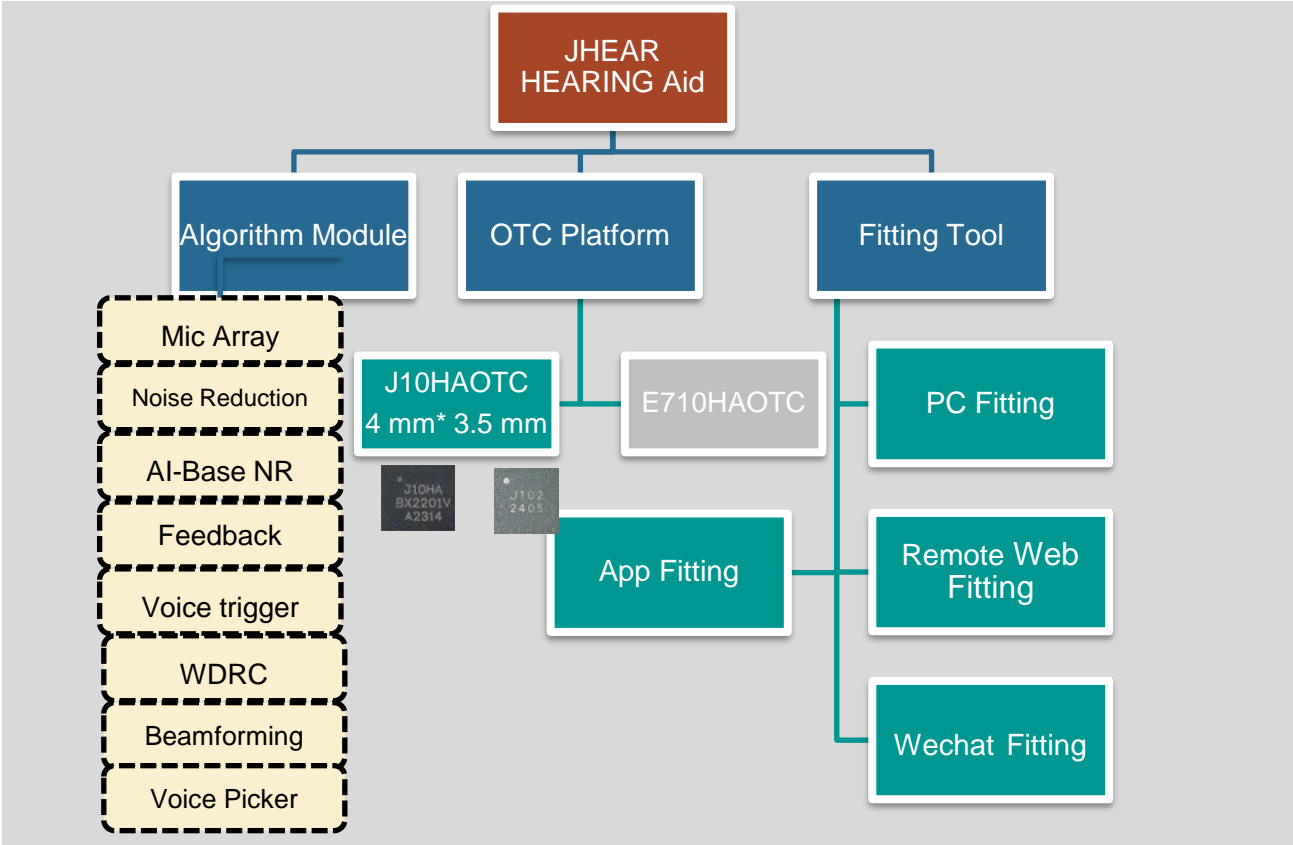
tech@jhearing.com

Agenda

- JHAR one page introduction
- J10 platform introduction
- J10 Platform overview
- J10 OTC Hearing Aid Scenarios
- J10 Platform Performance picture (OTC)
- J10 design support resource
- J10 Hearing Aid Accessories
- J10 platform eco-system build for ramping up market
- J10 hearing aid platform advantages
- J10 platform Success stories

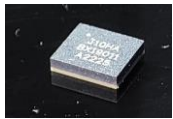
JHEAR corporate evolution





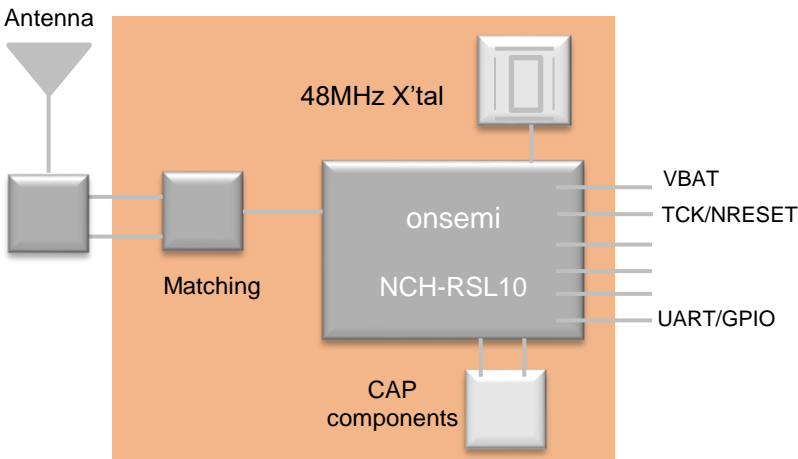
- ☒ Hardware
- ☒ software
- ☒ algorithm
- ☒ Fitting tool
- ☒ System design

JHEAR J10 Smallest BLUETOOTH® 5.2 Wireless SiP

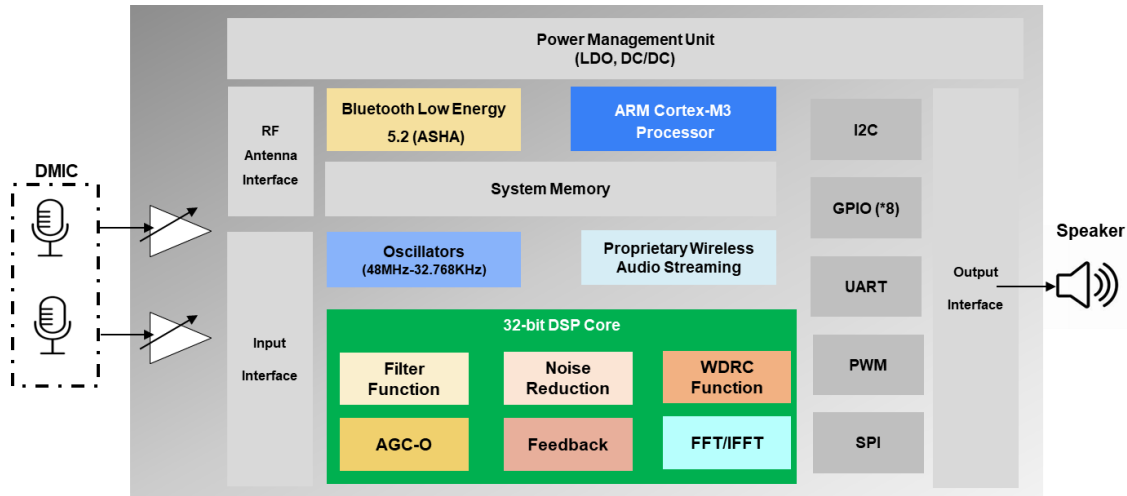


JHEARING ELECTORICS J10 BLUETOOTH® 5.2 Wireless Module is ultra-small, designed for connected portable devices in industrial and medical applications. This module offers ultra-low power consumption, integrated dual core- MCU core and DSP core for user applications. The J10 wireless module provides a **4mm x 3.5mm x 0.75mm LGA package**, 48MHz Arm® Cortex® M3, 50ohm match to external antenna, and various I/O interfaces such as UART, QSPI, SPI, GPIO, ADC, DAC, PWM, and I2C. The Wireless Module has an operating temperature range -40°C to +85°C and an input supply range of **1.2V to 3.6V**.

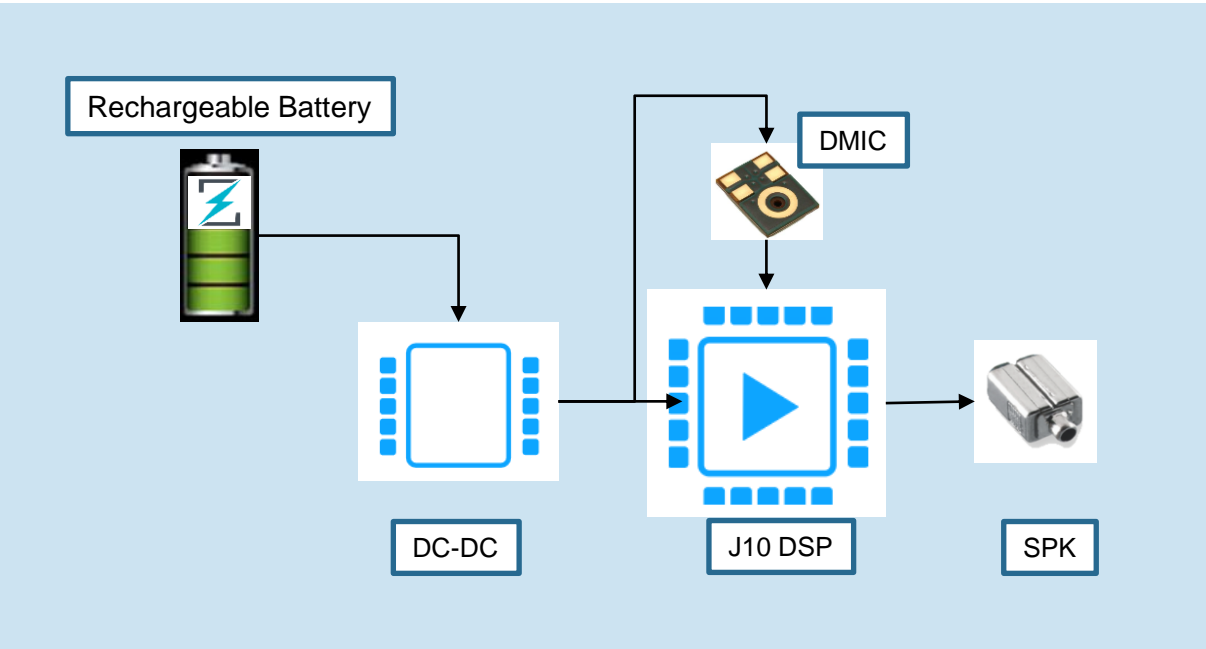
J102 SiP module offer 4mm*4mm*0.75mm LGA package with more GPIOs



Hearing Aid Applications



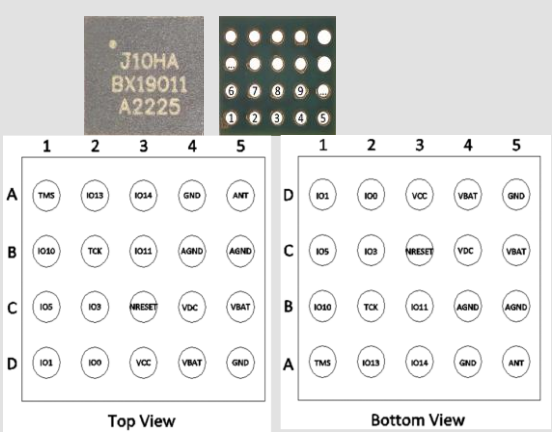
<https://en.jhearing.com/>



JHEAR J10 SiP & J102 SiP Package

J10 SiP

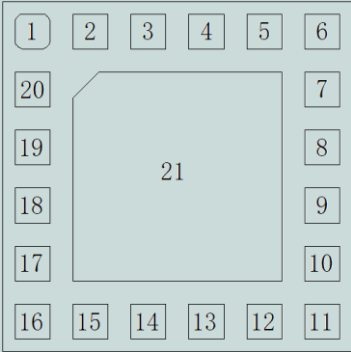
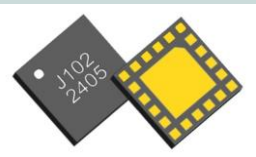
- 4mm*3.5mm*0.75mm
- 20 pins
- MP status



Pin#	Pin Def	Pin Name	Pin Function	Pin Description
1	A1	TMS	I/O	Test Mode Select
2	A2	IO13	I/O	I/O
3	A3	IO14	I/O	I/O
4	A4	GND	GND	GND
5	A5	ANT	RF	RF signal input/output (Antenna)
6	B1	IO10	I/O	I/O
7	B2	TCK	I/O	External clock input
8	B3	IO11	I/O	I/O
9	B4	AGND	AGND	AGND
10	B5	AGND	AGND	AGND
11	C1	IO5	I/O	I/O
12	C2	IO3	I/O	I/O
13	C3	NRESET	I/O	Reset
14	C4	VDC	VDC	DC-DC output voltage to external LC filter
15	C5	VBAT	Power Source	Power Source
16	D1	IO1	I/O	I/O
17	D2	IO0	I/O	I/O
18	D3	VCC	VCC	DC-DC filtered output
19	D4	VBAT	VBAT	VBAT
20	D5	GND	GND	GND

J102 SiP

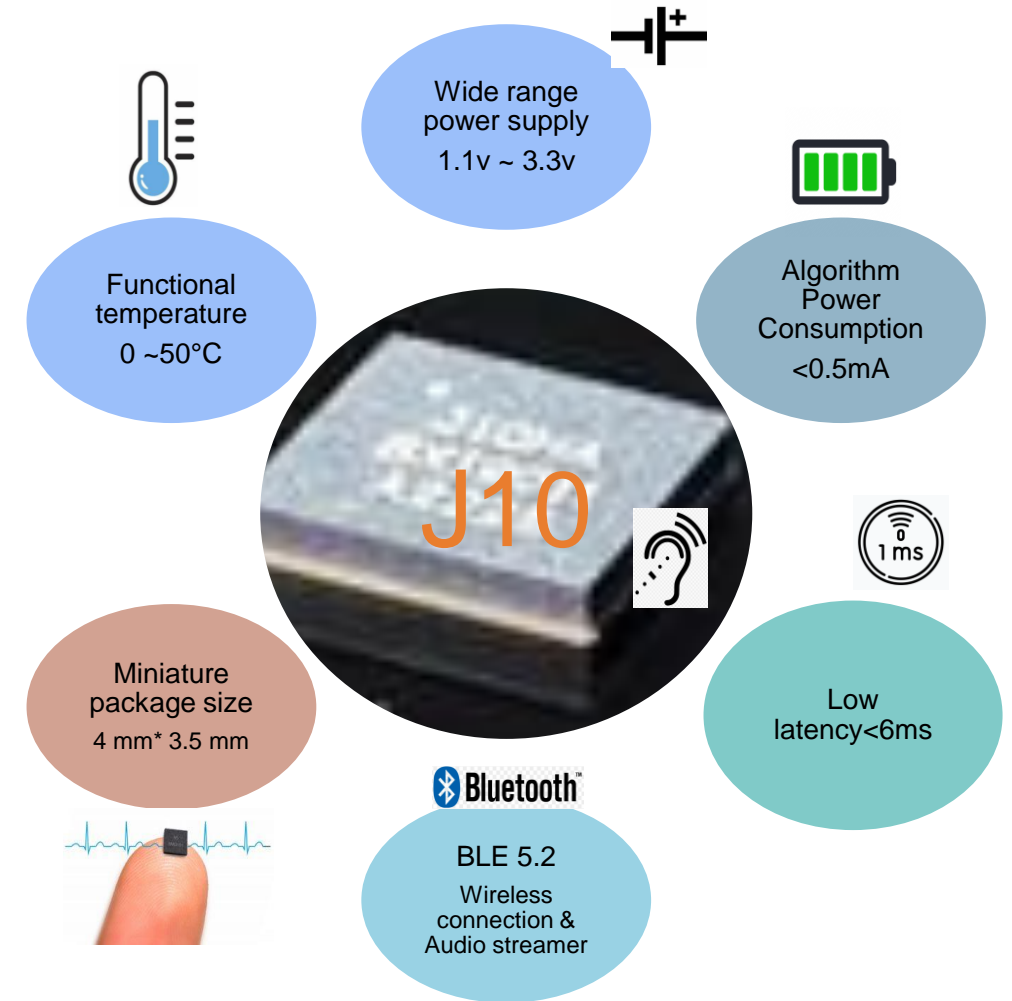
- 4mm*4mm*0.75mm
- 20 pins
- MP: 2024. July



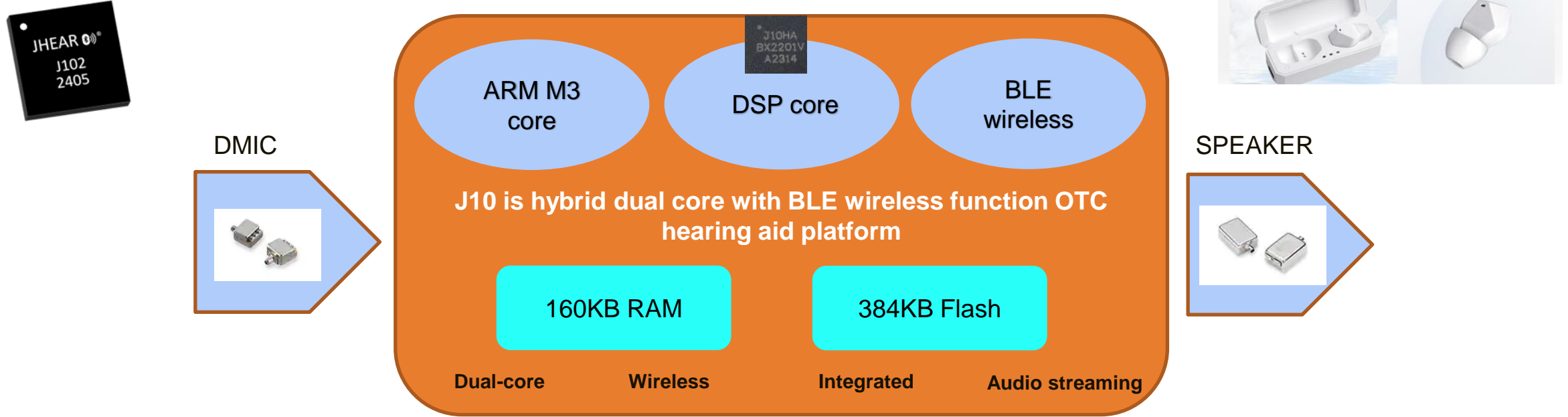
Pad #	Pad Name	Description	I/O	A/D
1	RF	RF signal input/output (Antenna)	I/O	
2	IO11	Digital input output 9	I/O	
3	IO9	Digital input output 10	I/O	
4	VCC	DC-DC filtered output		P
5	AGND	Analog ground		P
6	NRESET	Reset pin	I	
7	IO0	Digital input output / ADC 0	I/O	A/D
8	IO1	Digital input output / ADC 1	I/O	A/D
9	IO2	Digital input output / ADC 2	I/O	A/D
10	IO4	Digital input output 4	I/O	D
11	IO3	Digital input output / ADC 3	I/O	A/D
12	VBAT	Battery input voltage		P
13	IO10	Digital input output 10	I/O	D
14, 21	GND	Digital ground		P
15	IO12	Digital input output 12	I/O	D
16	IO13	Digital input output / CM3-JTAG Test Reset	I/O	D
17	TMS	CM3-JTAG Test Mode State	I/O	D
18	TCK	CM3-JTAG Test Clock	I/O	D
19	IO14	Digital input output / CM3-JTAG Test Data In	I/O	D
20	IO15	Digital input output / CM3-JTAG Test Data Out	I/O	D

JHEAR J10/J102 Platform Introduction

Features	Comment
1-2-3 Buttons	Flexible choice for volume up/down
additional touch sensor interface	Customized touch function for volume, mode etc., better waterproof
50-0hm antenna port	Save PCB size and design cycle time
Support Multi customized Mode	In door, meeting, outdoor, Restaurant mode, music mode, ASHA mode
TV streamer Mode	Property protocol with ultra low power consumption, broadcasting, enable group flexibly
8-WDRC	8 channel WDRC
AI-base Noise reduction	AI NR model, will full operate at next generation platform
Feedback Algorithm	Support in pulse noise compression
ASHA function	Embedded ASHA function
Wireless fitting (App, Website)	reference code for App design, web remote fitting through https://yp.jhearing.com/webj10_2022.php
Rechargeable battery	Mature design reference, charging indicator
Pure Tone test	Open interface for self test
audio prompt function	Support custom multi-languages



J10/J102 Platform hearing aid features



Basic Algorithm

- Customized 8-ch WDRC
- 16-Ch EQ
- Ultra low power audio streaming
- Starry AI Noise reduction
- AFC Feedback Control
- Howling Detect
- Pure-Tone Audiometry(PTA)

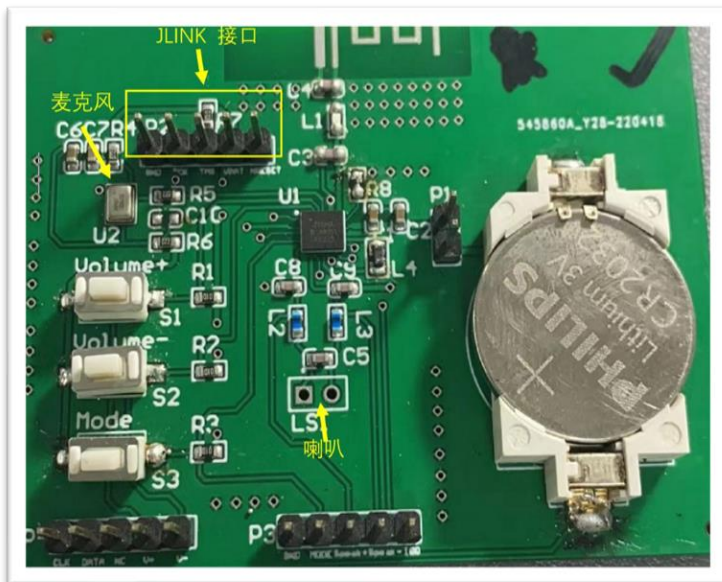
Functions & Features

- TX SRC Sample Rate Convert: 16kHz
- 1->X style Audio broadcasting
- Marked Group for group education etc.
- Max latency<6 ms
- TV streamer support 15 meters
- Rechargeable battery
- Remote Mic

Solution support

- OTC hearing aid "turn-key" solution
- Open-source Mobile App
- PC Fitting source code sharing
- TV streamer(3.5mm, AUX, SPDIF)
- MFi support(special approval)
- ASHA function support
- Custom logo, name, audio prompt

J10 DEMO 评估步骤



- ❑ Insert the battery and connect P1 jumper
 - ❑ 4 different models can be configured by website fitting tools
 - ❑ Website for fitting
- (https://yp.jhearing.com/webj10_2022.php)

J10 Hearing Aid ,you can fitting on the web page


Support On following OS:

- Windows 10+ ,Edge Browser /Chrome Browser
- Linux ,Mac ,see [implentation status](#)
- Android Chrome
- Iphone/Ipad : Please install "Bluefy – Web BLE Browser" first

You could select different mode to fine tune, total 4 mode support

issues about web ble,please check implentation status

Read J10 HA exit parameters or save the fine-tuning Paras to J10 HA

All BLE Devices  Scan J10 Hearing Aid

Click here to search
your J10 hearing aid
and connected

Reset Mode Config Test Change Volume

Reset to default
Parameters

Current Mode: Mode A

Read Mode Config Save Mode Config Reset Mode Config Test Change Volume

General EQ WDR Calibration and Others Ble Upgrade

Name	Value	
# Volume	-6 dB	This parameter only applicable for version after 2023-06-25
# Power on delay	0 Seconds	After x seconds ,the DMIC will turn on to work
# Enabled Modules	None	
# Hardware Revision	J10	J10/J11 , Our firmware consider J10 as default hardware , You need reboot your hearing aid to make effect, for Custom PCBA, we will deliver customized firmware for you
# BLE Display Name	0	Only letter and digits allowed , maximum length is 10 bytes , You need reboot your hearing aid to make effect

J10– 无线OTC助听器 无线验配工具

无线网页验配：

https://yp.jhearing.com/webj10_2022.php

提供源代码供验配软件定制需求

Current Mode: Mode A Read Mode Config Save Mode Config

General

EQ

WDRC

Calibration and Others

	Name	Band 0	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7
#	Cross over Frequency 频率		317Hz	502Hz	797Hz	1264Hz	2005Hz	3181Hz	5044Hz
#	Expansion Rate 放大系数	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
#	Expansion Knee point 放大区拐点	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB
#	Linear Gain 线性增益	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB
#	Compress Knee 压缩拐点	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB
#	Compress Ratio 压缩系数	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
#	Limit Knee 限制区拐点	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB



J10/J102 OTC Hearing Aid Scenarios

Support the coexistence of hearing aid features and ASHA function

- ❖ Volume control
- ❖ Mode switch
- ❖ EQ modification
- ❖ Pure Tone Test



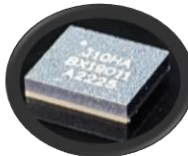
Mobile Wireless Fitting



- ❖ WDRC
- ❖ NR
- ❖ Signal Chain Calibration
- ❖ Volume
- ❖ Mode
- ❖ AGC-O

PC Wireless Fitting

J10 hearing aids



❖ TV-Box



- ❖ ASHA
- ❖ MFi



- ❖ TV-Box
- ❖ Remote Mic

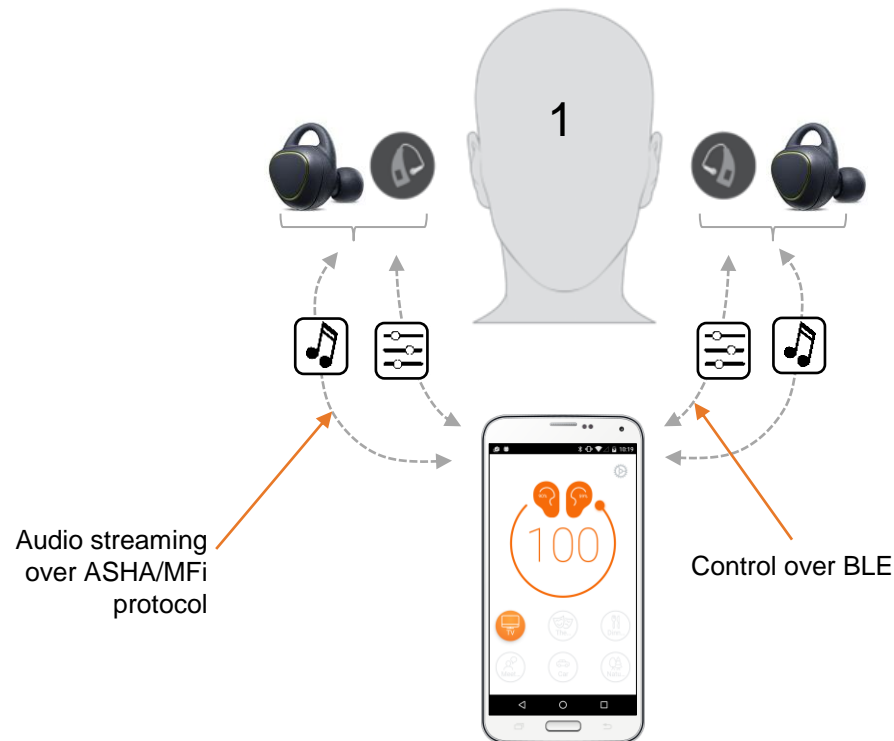


J10/J102 bases hearing aid use cases



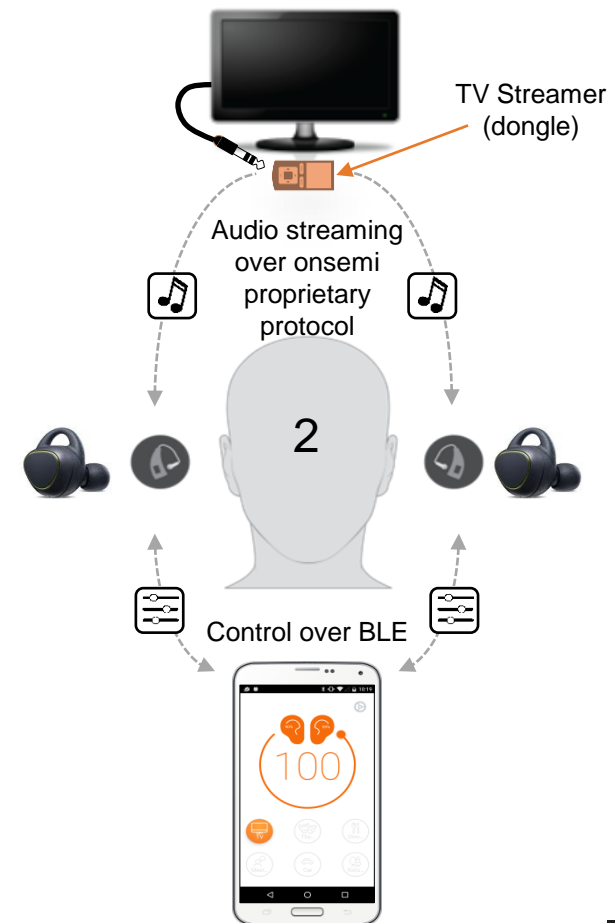
Direct connectivity with a Smartphone (no dongle)

- Streaming music and speech to earbuds/HA
- Controlling the earbuds/HA (volume up/down, equalizer etc..)



Connectivity with accessories i.e. TV set (via a dongle)

- The earbuds/HA receive audio stream from TV
- The Smartphone controls the earbuds/HA

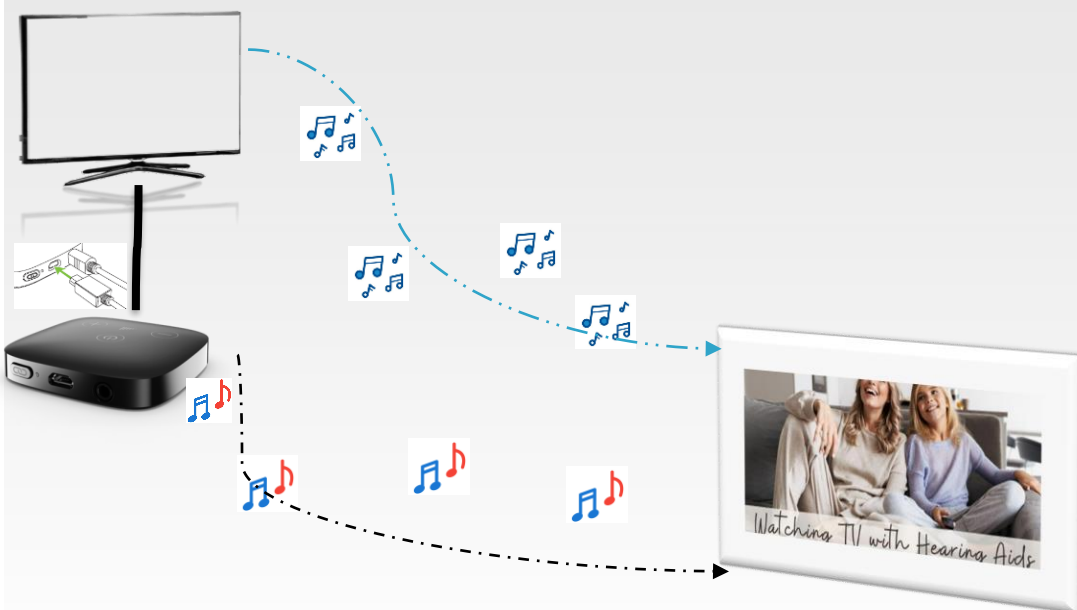


J10/J102 Platform for Audio

TV Steamer

With TV Steamer, you can

- watch TV, listen to music. we support audio broadcasting, one host for many slave device
- Support Group isolate group broadcasting
- Support all families TV enjoying together



ASHA/MFi

Support most of Android phone, the system >10.0.0 version

- ASHA is audio streaming for Android smart phone
- This is for single direction audio receive



TV Streamer 配件参考设计

- **TV streamer 将“准备好生产”，并可通过方案合作伙伴获得**

- 瑞士公司Arendi与中国公司JHEAR均有类似产品专利
- Arendi 或JHEAR提供全制造服务
- 单价取决于数量，直接与Arendi,JHEAR 协商

- **TV streamer 可视乎需要定制**

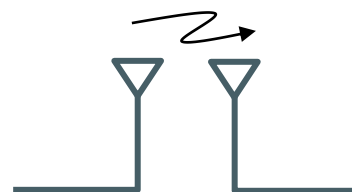
- 设计、特性和外形可修改
- 修改将由Arendi, JHEAR 进行，直接与他们讨论细节

- **产品特性**

- 该设备支持音频3.5mm 音频、光纤音频两种音频输入方式
- 支持Type C供电模式
- 通过循环音量按键可以调整音频输出大小
- 关机键支持关断音频输出信号
- 配套安森美高端Ezairo 7160, 中低端J10/J11平台的无线助听设备
- 该设备支持广播式音频传输，同时支持分组广播
- 实验室测试，音频传输距离约15m~20m
- 体积小，便携式携带方便



具性价比的
streamer 设计

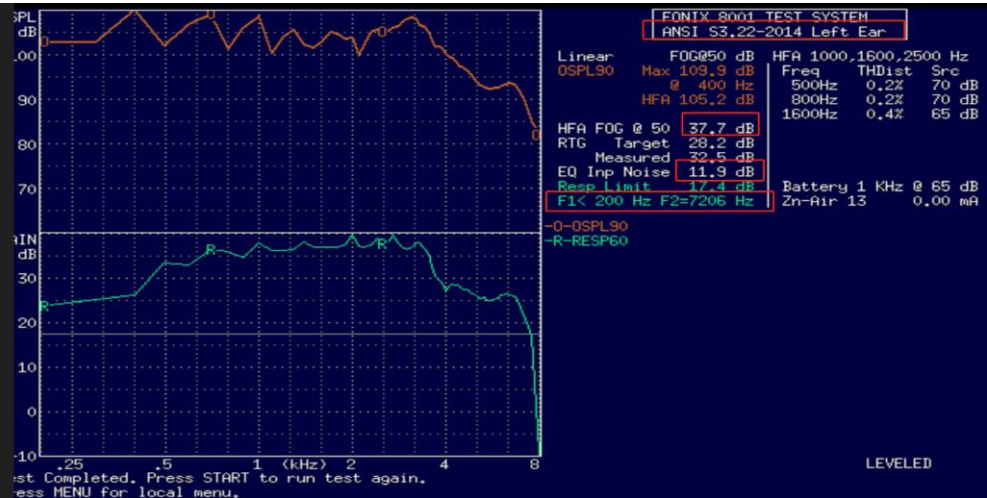


基于Ezairo 7160 SL /J10HAOTC 的助听器

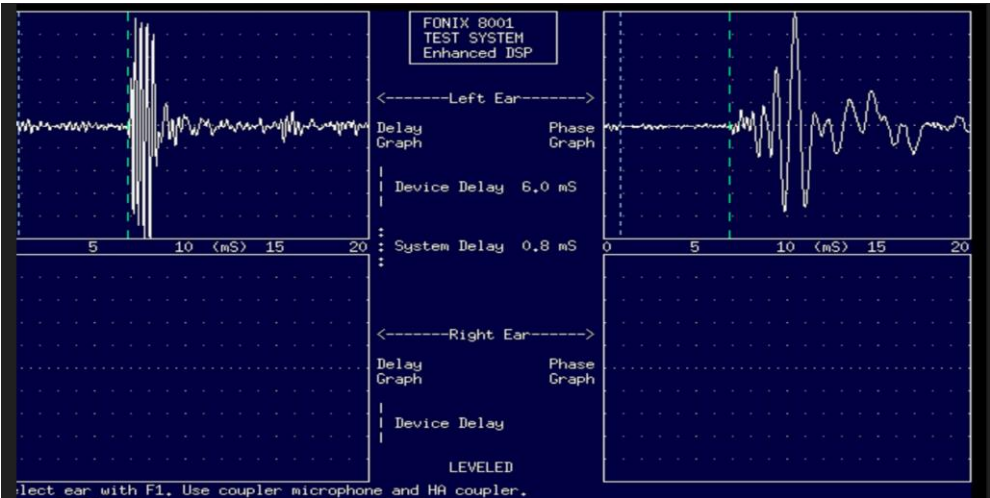


J10 Platform Performance picture (OTC)

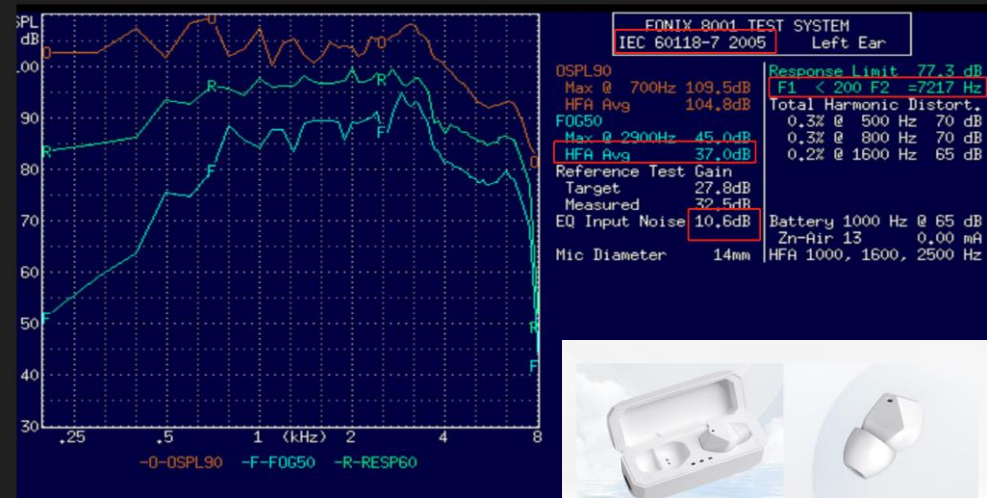
ANSI specification to support OTC hearing aid benchmark



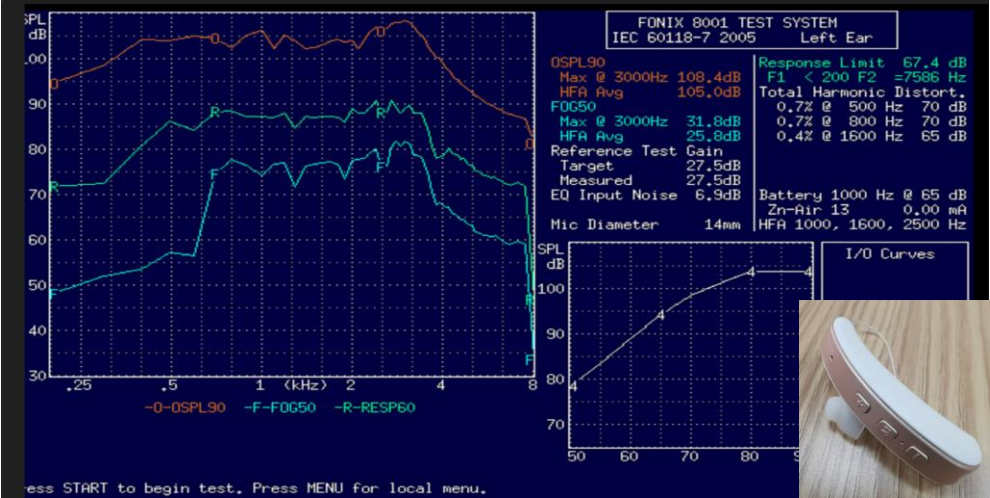
Delay=6ms



RIC hearing aid



ITE hearing aid




J10 OTC hearing aid design resource

<https://en.jhearing.com/docs/>

J10 Document

- J10 Description
- Datasheet
- BLE protocol and client code
- J10 Schema pdf
- J10 Functions
- J10 Web fitting
- Downloads

 https://yp.jhearing.com/webj10_2022.php

J10 Hearing Aid ,you can fitting on the web page

Current Mode: Mode A Read Mode Config Save Mode Config Reset Mode Config Test Change Volume

General EQ WDRC Calibration and Others

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#	Cross over Frequency 频率		317Hz	502Hz	797Hz	1264Hz	2005Hz	3181Hz	5044Hz
#	Expansion Rate 放大系数	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
#	Expansion Knee point 放大区拐点	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB	30 dB
#	Linear Gain 线性增益	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB	20 dB
#	Compress Knee 压缩拐点	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB	55 dB
#	Compress Ratio 压缩系数	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
#	Limit Knee 限制区拐点	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB	90 dB

J10 Hearing Aid Accessories

USB dongle



TV Streamer



TV Streamer



Remote Mic



3.5mm

SPDIF

HDMI IN

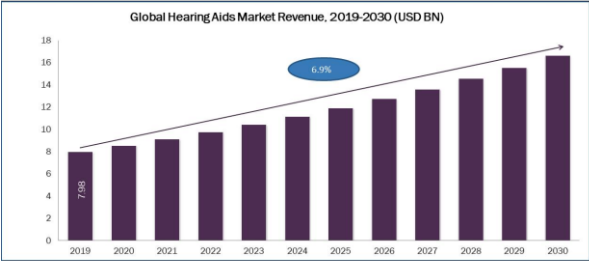
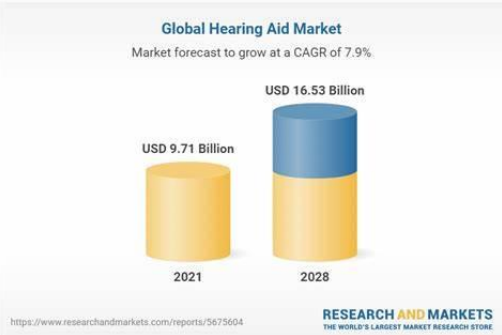
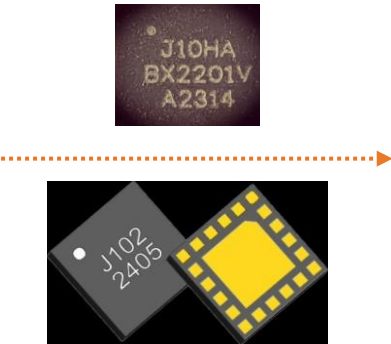
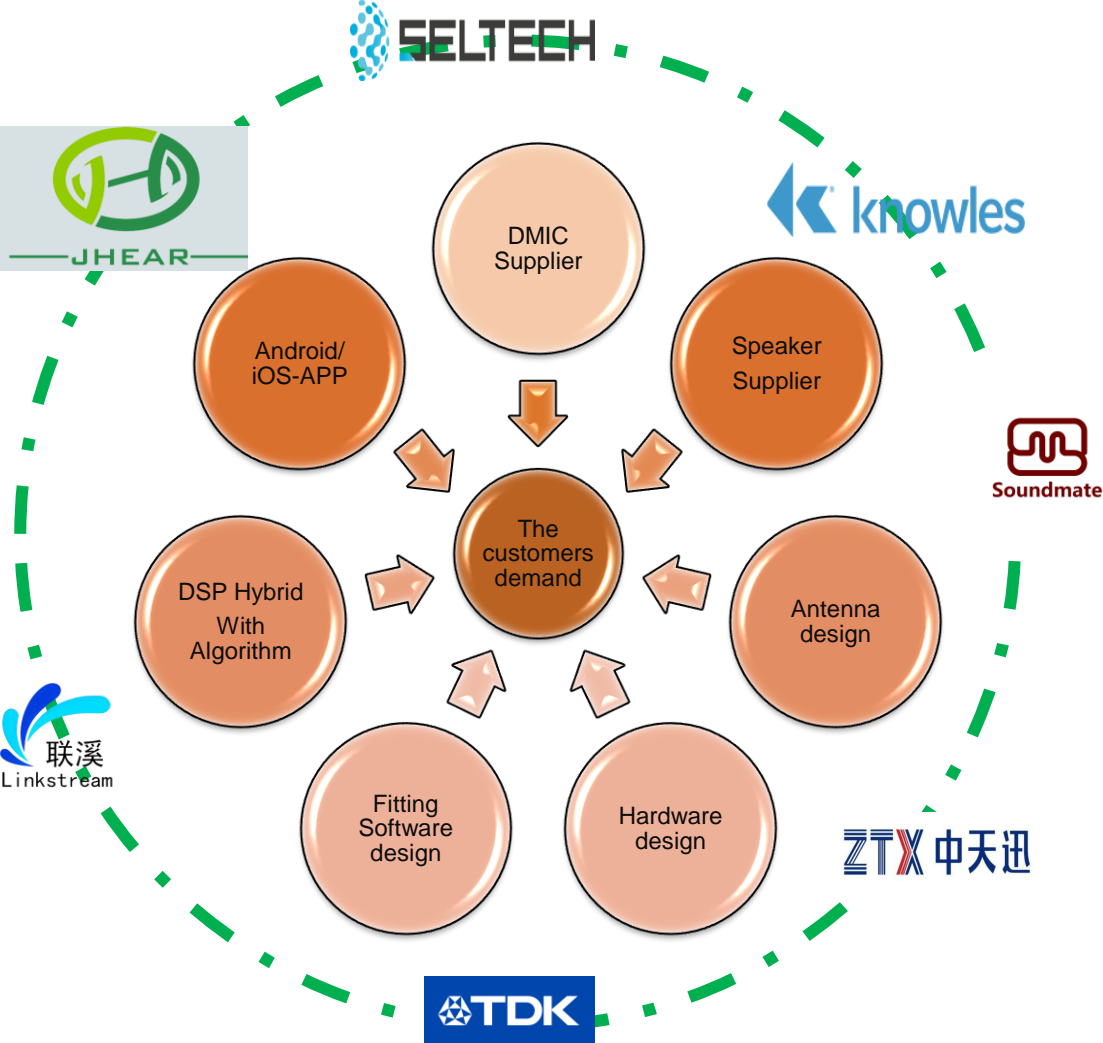
HDMI OUT



Support Ezairo 7160 hearing aid

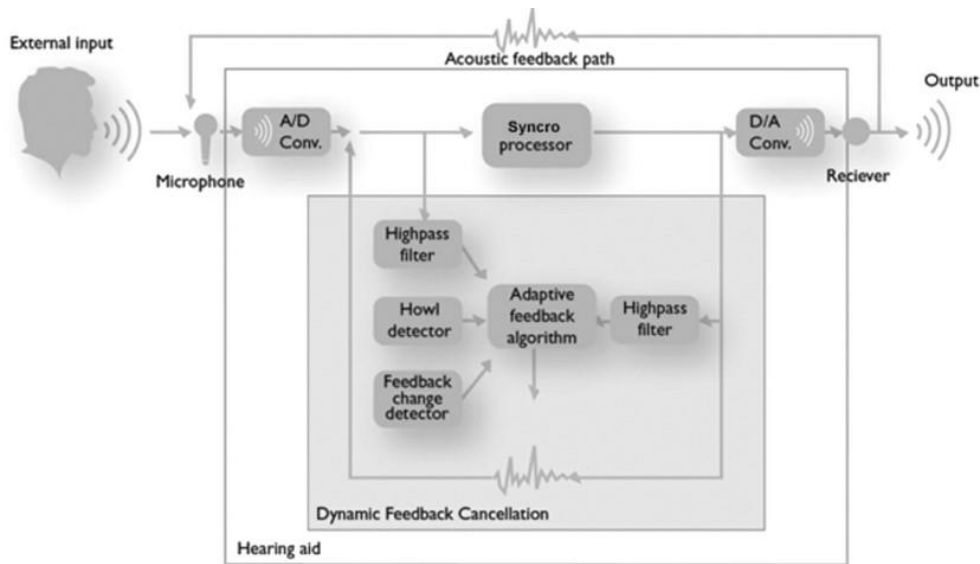
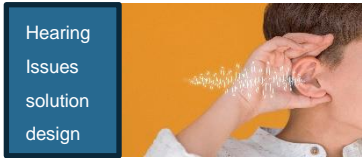
J10/J102 Hybrid SoC platform eco-system build for ramping up market

JHEAR could help support your HA supply chain to help your product best BOM and efficient design cycle



<https://marketresearch.biz/report/hearing-aids-market/>

J10HAOTC/J102系列 算法迭代更新



TX SRC Sample Rate Convert 输入信号的重采样, 32k->16k

AFC Feedback Control 声反馈处理, 线性部分对回波进行处理, 非线性部分交给AI

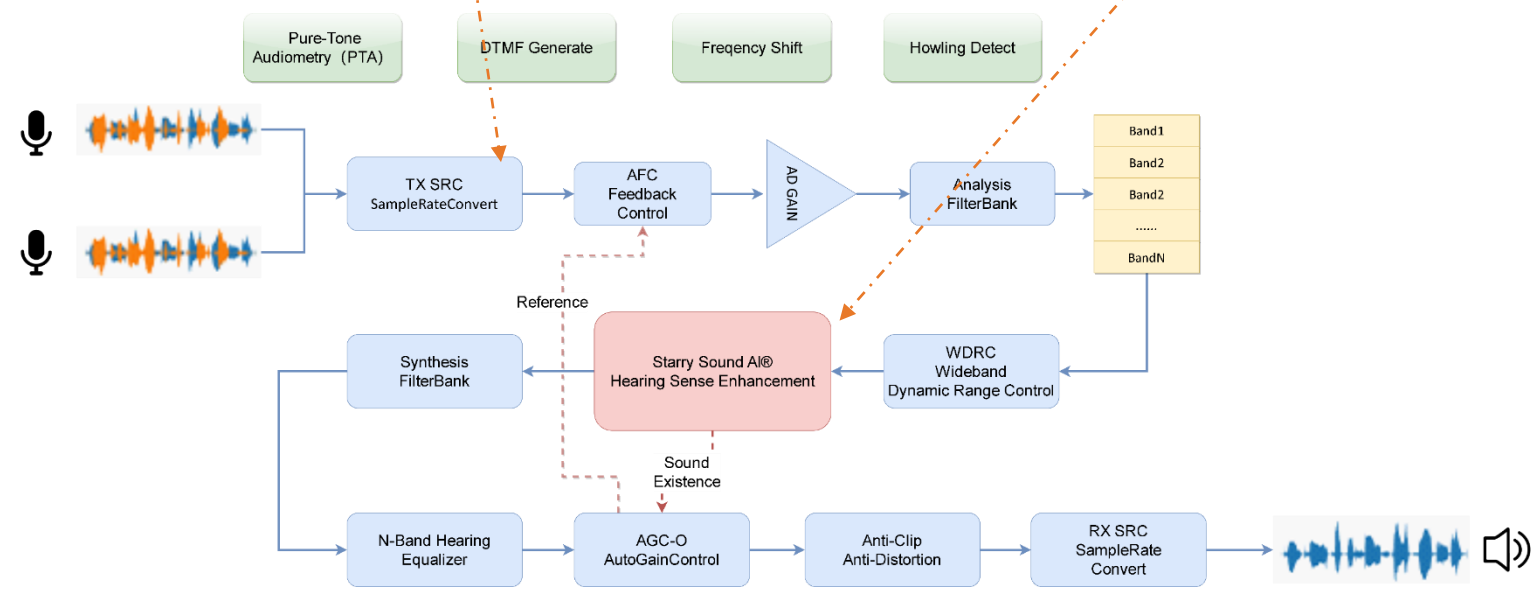
Analysis Filterbank 子带分析滤波器组, 将信号分解成N个Band

- Starry AI对比传统算法, 在处理非稳噪声、非线性问题都有极大优势, 在冲击Impulse, 风噪Wind Noise, 啸叫Nolinear部分的处理上比较明显。
- Starry AI对音乐场景同样能保持极高的还原保真度
- Starry AI生成声音存在 (Sound Existence) 标志, 取代传统VAD标志
- Starry AI声信号前端处理算法, 不仅针对语音, 对听感Hearing Sense整体提升。

Howling Detect 啸叫检测, 检测到啸叫通过改变助听器频响尽快降低影响。

Synthesis Filterbank 子带合成, 将信号还原成时域信号。

Frequency Shift 频移算法, <5Hz的频移防止自激振荡



J10的算法多样深入，定制灵活



J10 platform Success stories



HEARNU PRIME
RECHARGEABLE HEARING AID

CONTROLS

Mode Change

Volume Up

Volume Down



More coming soon...



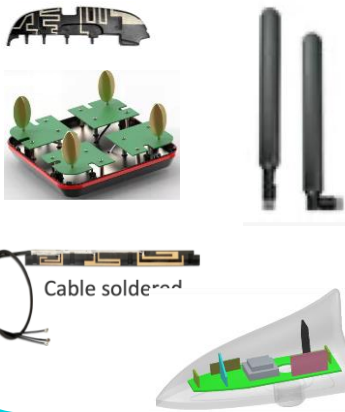
JHEAR support whole supply Chain



Antenna

Antenna category

- LDS/PDS/LAP antennas
- Mobile phone/laptop/panel antenna
- TWS earphone/Hearing Aid antenna
- Internet of Things/Smart "Water and Electricity" Three Antennas
- NFC/RFID antennas
- V2X/UWB/GNSS antennas for new energy vehicles



R&D Capability Resource

3D Chamber



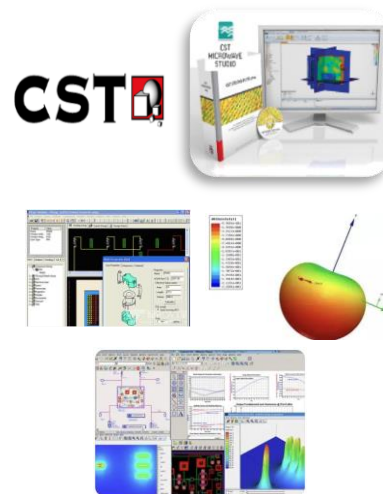
Shenzhen 8 Set: ETS & SATIMO
Chambers
TW 1 set: ETS
Shanghai 1set: ETS & Satimo
XiAn 1 set: ETS
Fuzhou 2 Set: ETS & Satimo

Test equipment



Cellular protocol testing :BT, DVB-H,
DVB-T and GPS, LTE SISO
Positive test:
2G,3G,4G,5G,WiFi/6E,BT,GPS
NFC (Micropross / EMVCo)

RF simulation Tool



CST MICROWAVE STUDIO
HFSS 2 Sets
ADS Circuit
Maxwell

Mechanical modeling software



PRO/E 5.0
Catia
Creo 8.0
CAD 2019

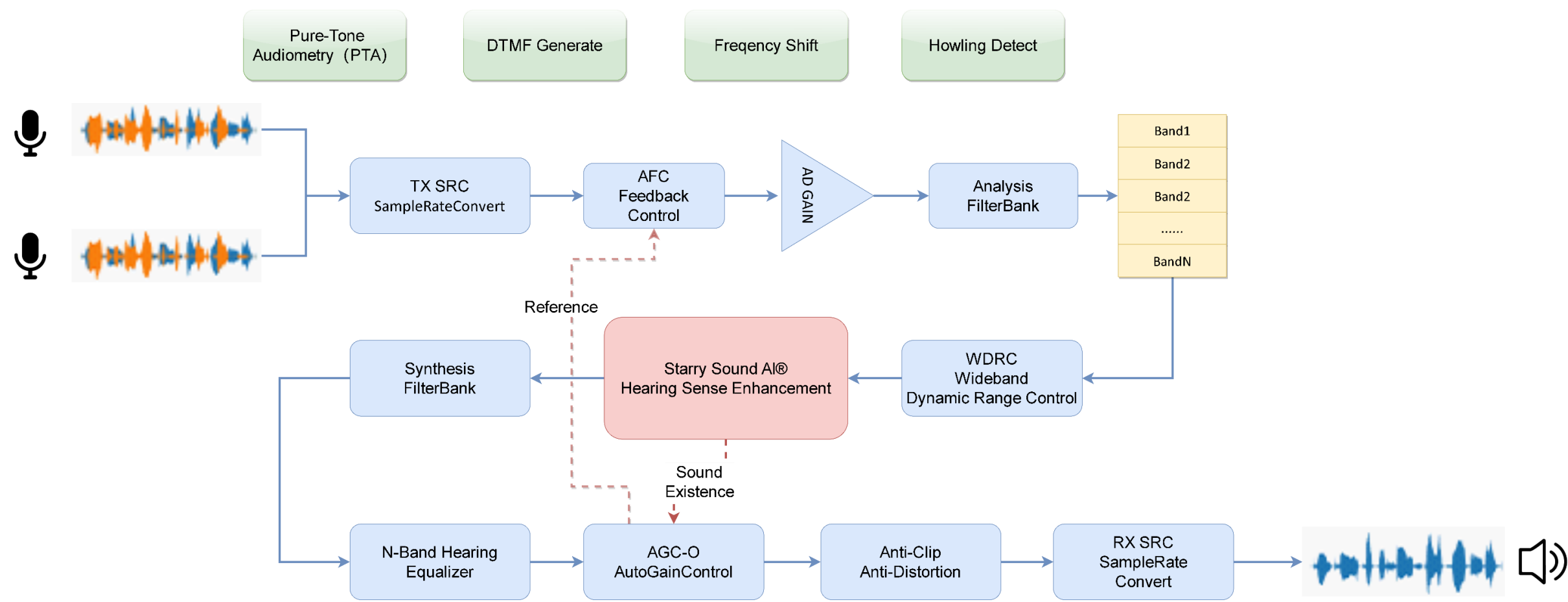


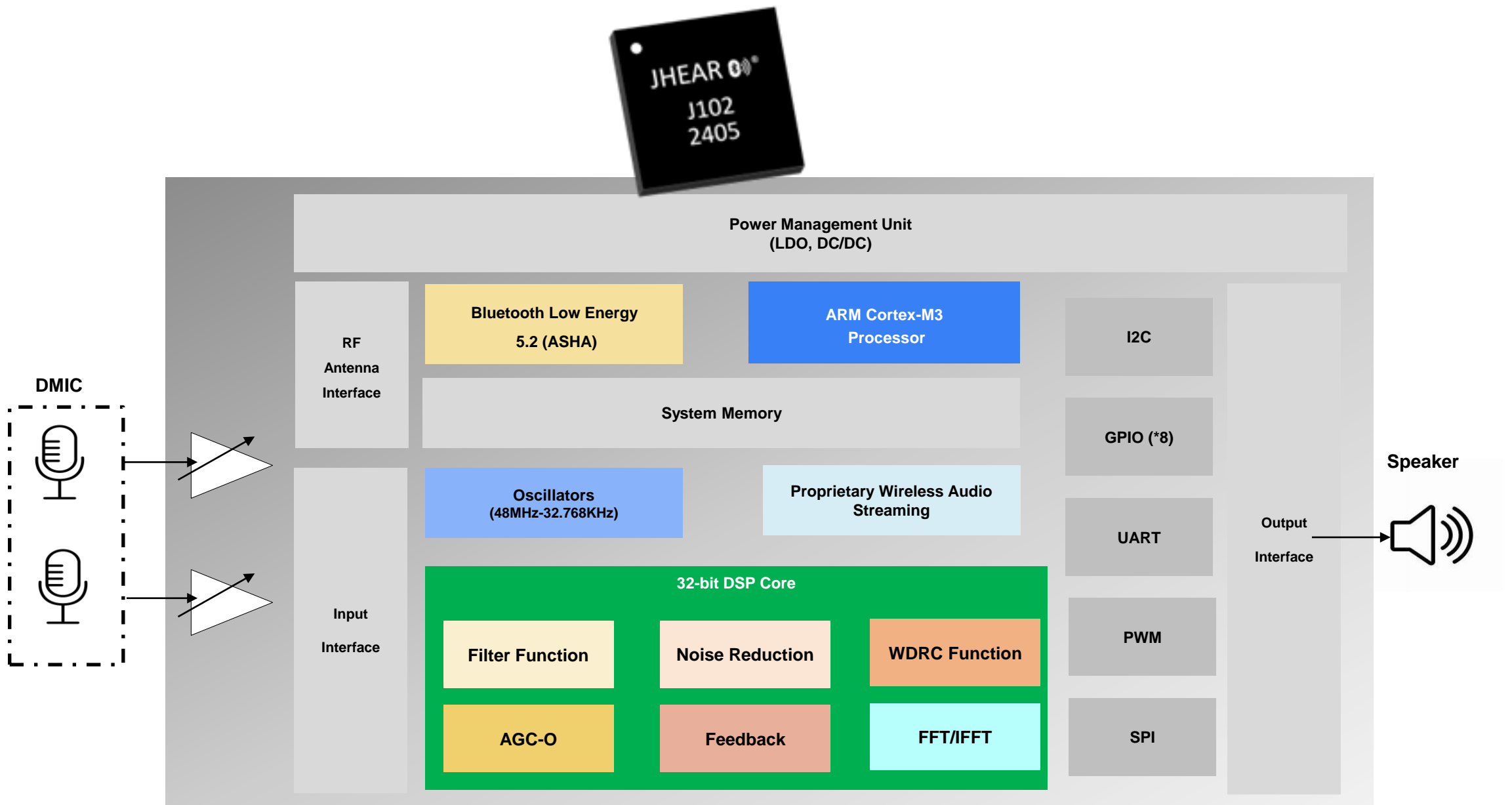
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J10 Algorithms flow





专业助听器平台总结

		Pre Suite	Open Platform	Open Platform
High-Mid platform (中高端平台)	Wireless	Ezairo 7160		
	Non-Wireless	Ezairo E7111	Ezario8300 Ezairo 7100	Ezario8310
Low-Mid Platform (中低端平台) (OTC)	Wireless	J10----J20		
	Non-Wireless	J300	Ezairo 5900/5920 Belasigna 300	
Note:	<div><div>1. Belasigna 300 平台可以配置经典蓝牙功能的方案</div><div>2. 具备硬件、软件、手机APP、蓝牙天线等助听器生态资源共享</div><div>3. Ezairo平台SiP功能+算法，延申不同平台需求</div></div>			