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安森美半导体
Preconfigured系列

2020年11月

Public Information



overview



安森美半导体Pre-fit 与 Preconfigured 系列助听器芯片介绍



安森美半导体Pre-fit 系列助听器芯片开发流程




安森美半导体Preconfigured 系列助听器芯片开发流程

助听器结构图

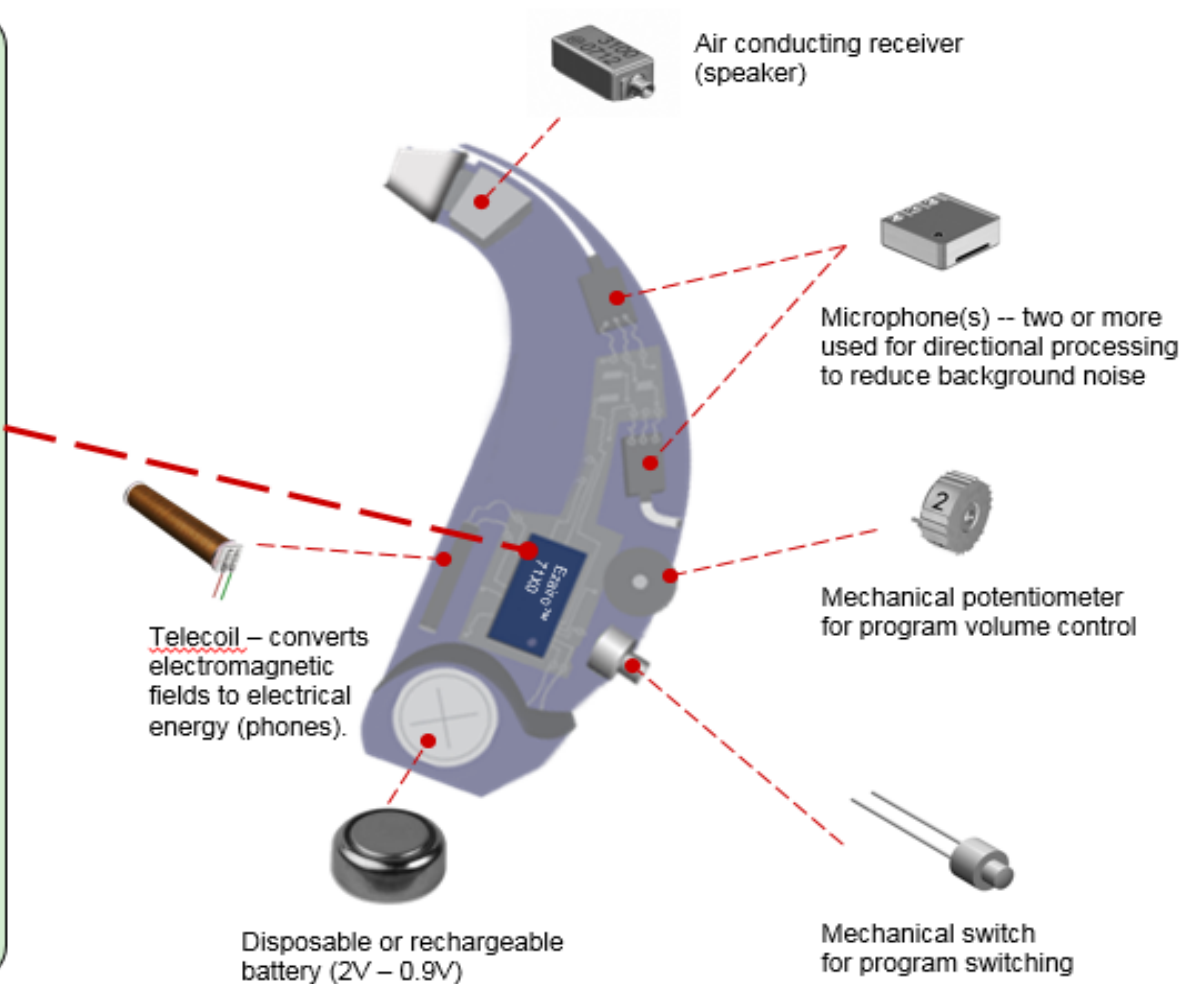

ON ON Semiconductor is the leading supplier of silicon solutions for the hearing aid market

Digital Signal Processing (DSP) system in hybrid packaging



Includes:

- DSP Chip
- Software (speech processing algorithms)
- Peripherals (eg. radio IC, EEPROM, power management IC for rechargeable batteries)



Pre-fit 与 Preconfigured 系列助听器芯片介绍

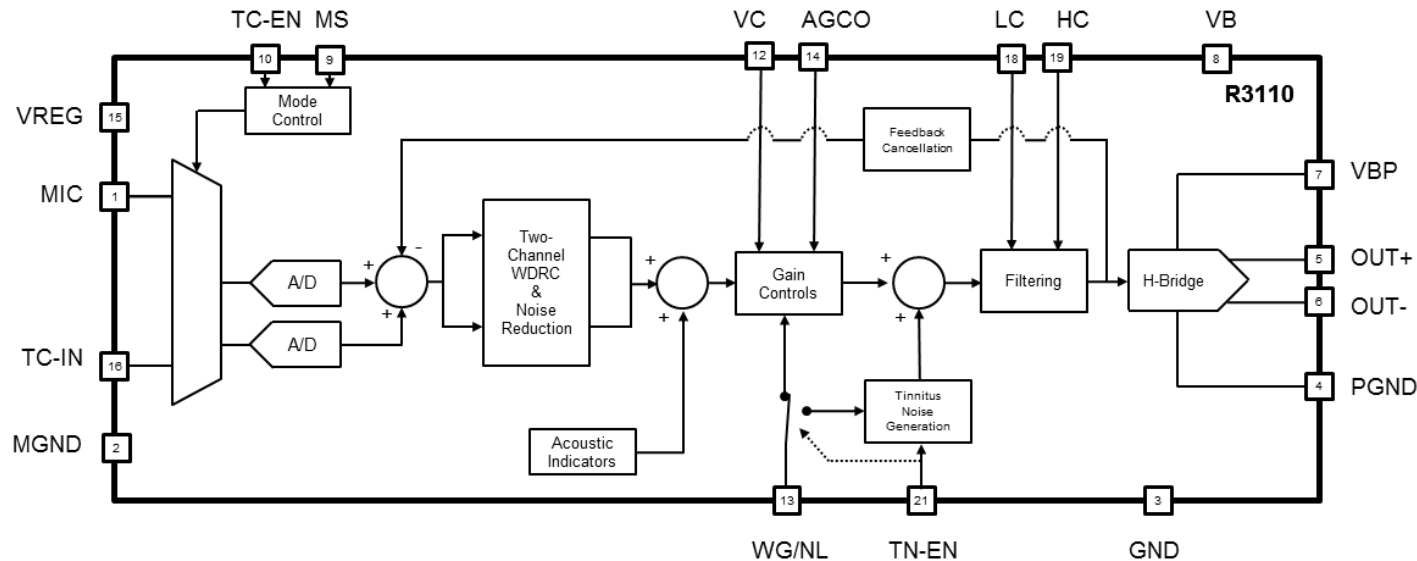
数字助听器芯片

	Rhythm				
	R3110	SB3231	SA/SB3229	R3910	R3920
Wireless					
Environmental Classification				○	○
Datalogging				○	○
Real Ear Feedback Management		○		○	○
Impulse Noise Reduction					○
Tinnitus Treatment	○	○	○	○	○
Automatic Adaptive Directionality				○	○
FrontWave™ Directional Microphone		○		○	○
Adaptive Noise Reduction	○	○		○	○
Adaptive Feedback Cancellation	○	○	○	○	○
Static Feedback Management	○	○	○	○	○
Adaptive AGC-O	○			○	○
AGC-O	○	○	○	○	○
Memories	N/A	4	4	6	6
WDR Channels	2	1, 2 or 4	1, 2 or 4	1,2,4,6 or 8	16
In-Channel Expansion	○	○	○	○	○
Graphic EQ Bands		8	8	16	16
Advanced Acoustic Indicators		○	○	○	○
Trimmer Support	○	○	○		
Digital Volume Control		○	○	○	○
High Power Compatibility		○	○	○	○
Suitable for Invisible-in-Canal (IIC)					
Software Programmable		○	○	○	○

Pre-fit R3110

优势

- 主要针对新兴的入门级市场
- Pre-Fit 听觉参数
 - 无需软件验配
 - 所有参数调整均可通过硬件实现
- 符合RoHS 要求
 - 5.08 x 3.1 x 1.0 mm
 - 200 x 122 x 39.4 mil



特色

- 2通道宽动态范围
 - 支持大部分的验配需求
- 自适应反馈消除器
 - 平稳的增加增益实现纯音与音乐反馈声的最小化
- 基于Trimmer验配
 - 支持外部4通道 trimmers 验配
- 自动 Telecoil
 - 支持telecoil 设备自动或者外部手动切换
- 自适应降噪
 - 使用32频段系统精确去除背景噪音
- 基本声学提示音

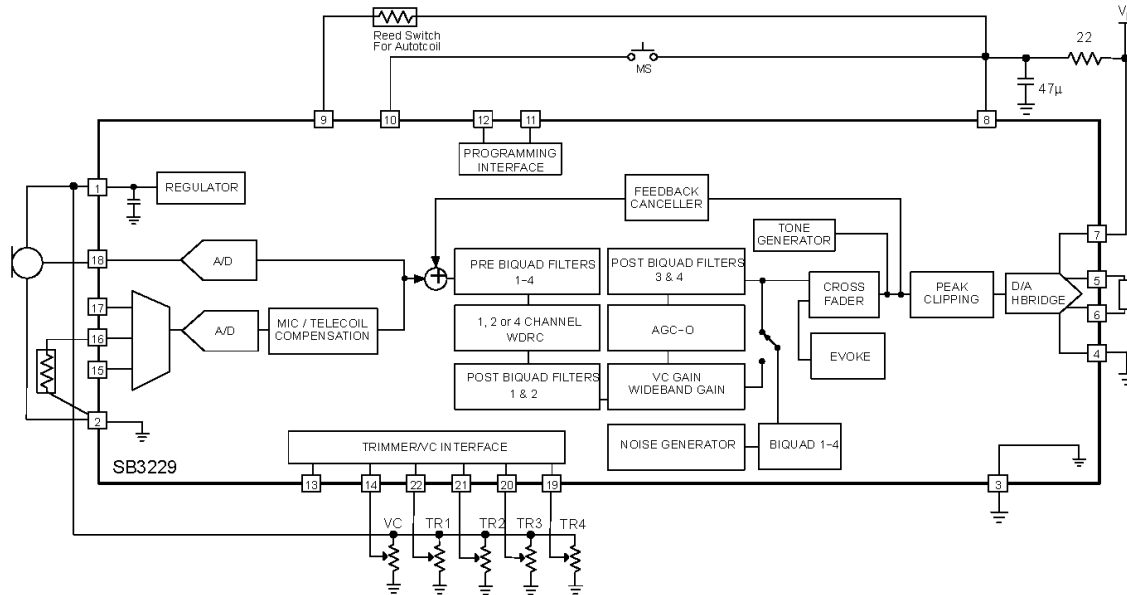
Pre-configured SA/SB3229

优势

- 主要针对中低端市场
- SA3229, OTP一次写入以降低成本, 用于生产
- SB3229, 内置256kEEPROM可多次擦写, 用于开发
- 符合RoHS 要求
 - 5.59 x 3.18 x 1.52 mm
 - 0.220 x 0.125 x 0.060 inches

特色

- 高达4通道宽动态范围, 可调整通道数
- 8通道图形化均衡器
- 4个程序档
- 自适应反馈消除器
- 基于Trimmer验配
- 适用于大功率助听器
- 自动 Telecoil
- 高级声学提示音



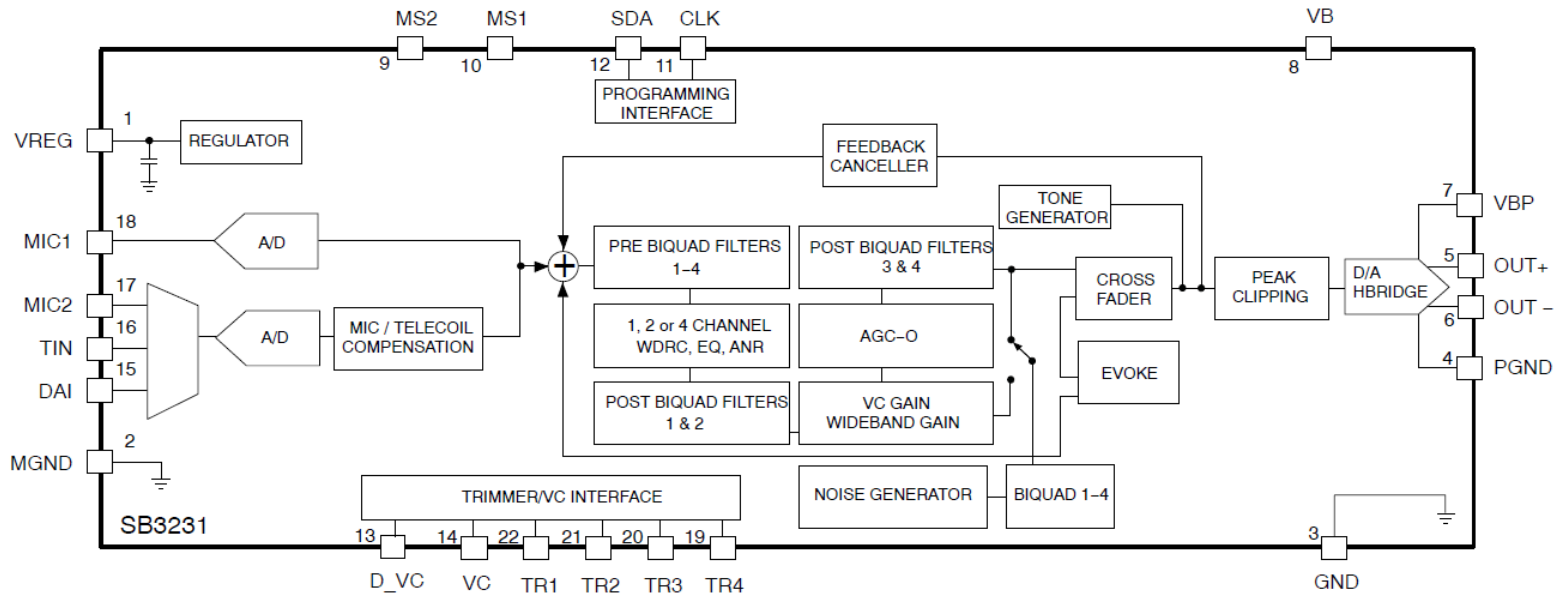
Public Information



Pre-configured SB3231

优势

- 主要针对中低端市场
- 符合RoHS 要求
 - 5.59 x 3.18 x 1.52 mm
 - 0.220 x 0.125 x 0.060 inches



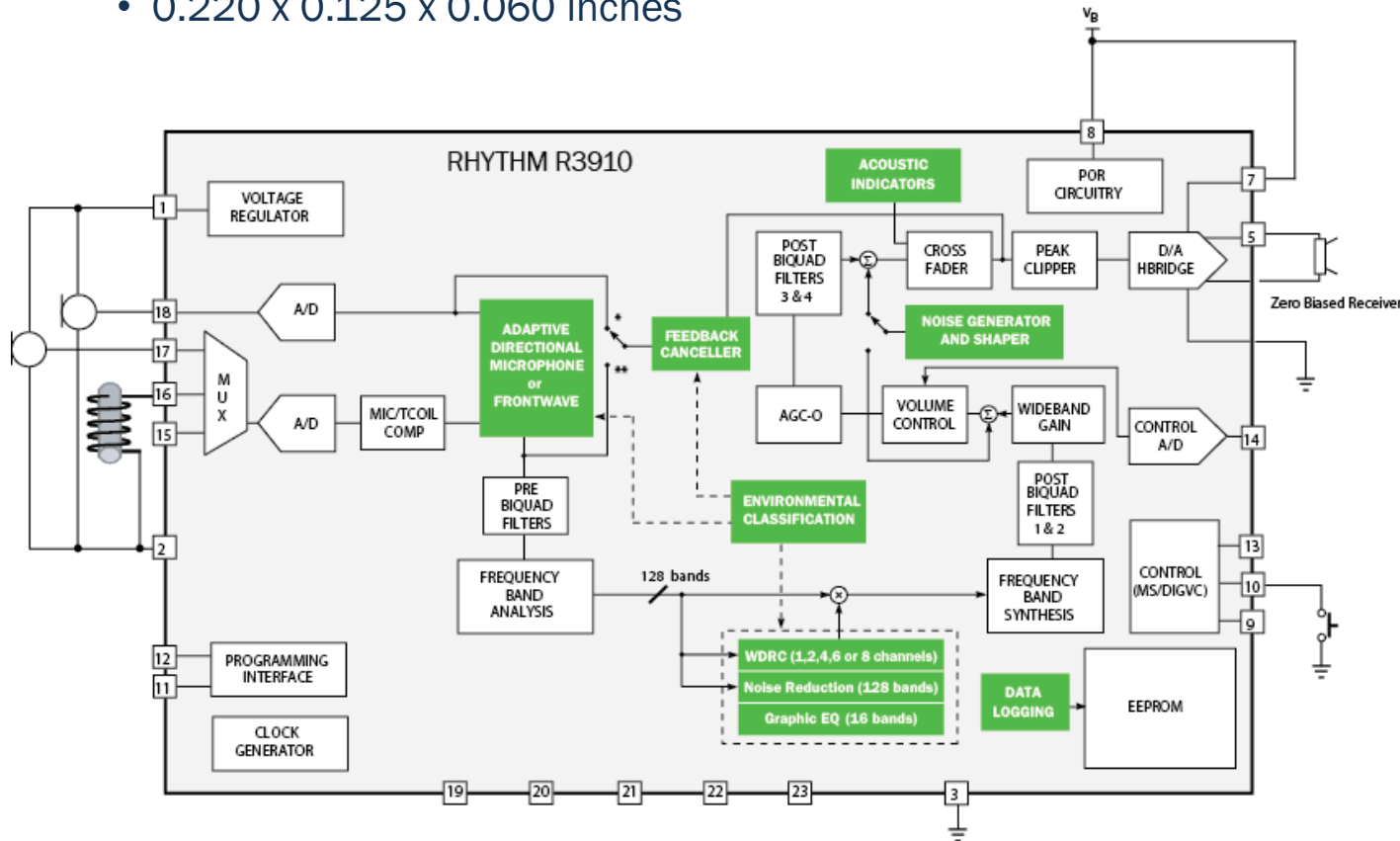
特色

- 高达4通道宽动态范围，可调整通道数
- 8通道图形化均衡器
- 4个程序档
- 自适应反馈消除器
- 基于Trimmer验配
- 适用于大功率助听器
- 自动 Telecoil
- 自适应降噪
- 高级声学提示音
- FrontWave® 方向性麦克风
- 真耳反馈管理

Pre-configured R3910

优势

- 主要针对高端市场
- 符合RoHS 要求
 - 5.59 x 3.18 x 1.52 mm
 - 0.220 x 0.125 x 0.060 inches



特色

- 高达8通道宽动态范围, 可调整通道数
- 16通道图形化均衡器
- 6个程序档
- 自适应反馈消除器适用于大功率助听器
- 自动 Telecoil
- 自适应降噪
- 高级声学提示音
- FrontWave® 方向性麦克风
- 自适应方向性
- iSceneDetect环境分类
- iLog™ 日志记录
- 真耳反馈管理

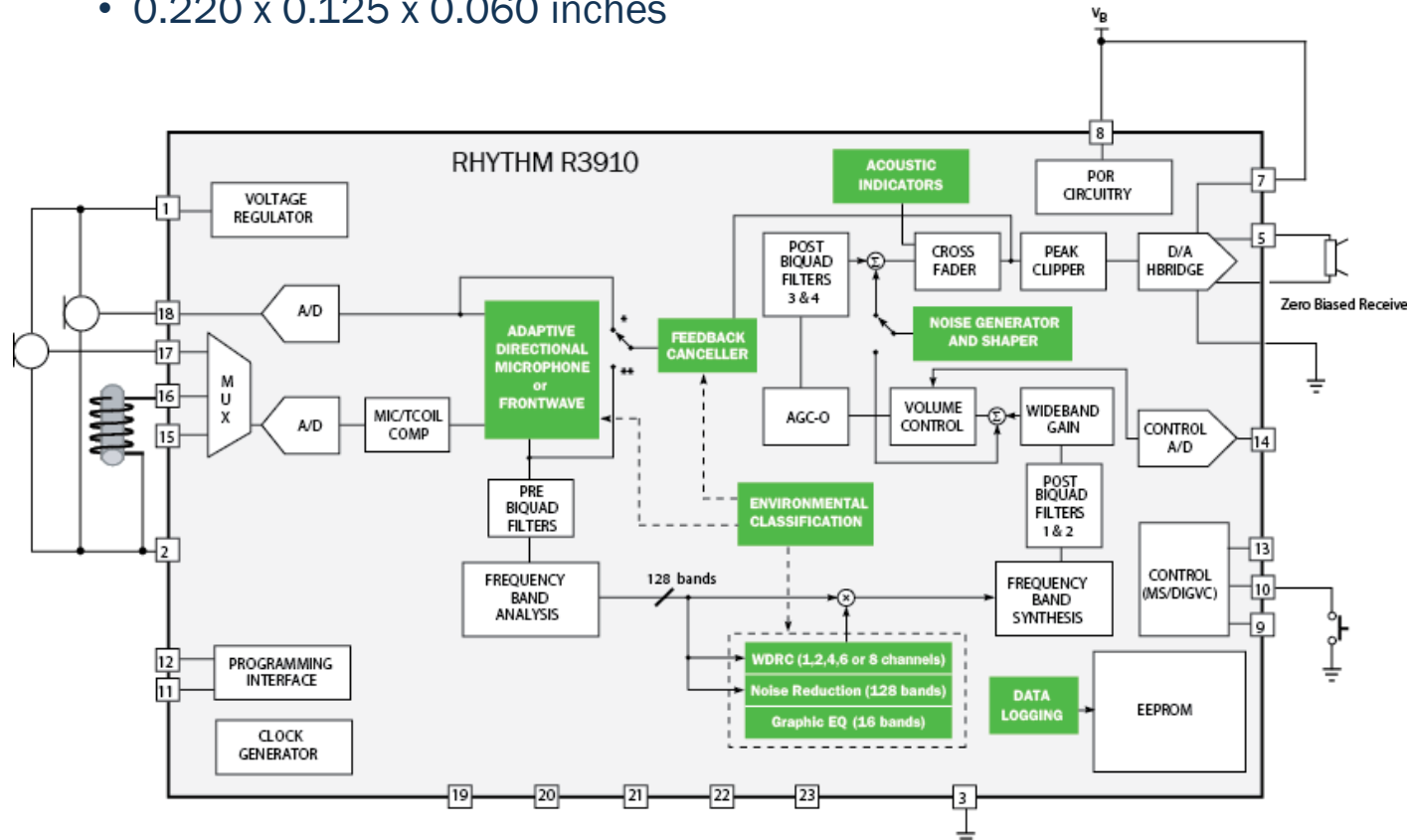
Pre-configured R3920

优势

- 主要针对高端市场，pre-configured系列中功能最全的产品
- 符合RoHS 要求
 - 5.59 x 3.18 x 1.52 mm
 - 0.220 x 0.125 x 0.060 inches

特色

- 16通道宽动态范围
- 冲击噪声抑制
- 自动receiver检测
- 16通道图形化均衡器
- 6个程序档
- 自适应反馈消除器
- 适用于大功率助听器
- 自动 Telecoil
- 基于128频段系统的自适应降噪
- 高级声学提示音
- 自适应方向性
- FrontWave® 方向性麦克风
- iSceneDetect环境分类
- iLog™ 日志记录
- 真耳反馈管理














Pre-fit 系列助听器芯片开发流程

Rhythm 3110

Pre-fit R3110开发

R3110产品属于ON的pre-fit系列，无需使用开发软件，只需根据需要改变硬件电路即可。下表中软件仅作为产品信息确认以及调试使用。

软件名称	备注
 RHYTHM R3110 MONITORING UTILITY BATCH FILES.ZIP	解压后得到如下 EXE 文件以及 BAT 脚本
 RHYTHM R3110 MONITORING UTILITY.EXE	
 R3110Mon - Test Mode and Read Settings - abs path.bat	在 PC 端对 R3110 进行产品信息确认以及调试
 R3110Monitor - DSP3 Left Test Mode.bat	
 R3110Monitor - DSP3 Right Test Mode.bat	
 R3110Monitor - HI-PRO Right Read Device.bat	
 R3110Monitor -DSP3 Left Read Device.bat	
 R3110Monitor -DSP3 Right Read Device.bat	
 R3110Monitor -HI-PRO Left Read Device.bat	
 R3110Monitor -HI-PRO Left Test Mode.bat	
 R3110Monitor -HI-PRO Right Test Mode.bat	

R3110产品开发主要参考文档 《User's Guide》 《R3110-Datasheet》

根据不同应用需求，R3110有不同的硬件连接。

本例实现一个多功能助听器设计：通过按MS按钮，在简单功能-高级功能-电感功能之间循环切换，并且带耳鸣掩蔽功能

Pre-fit R3110开发

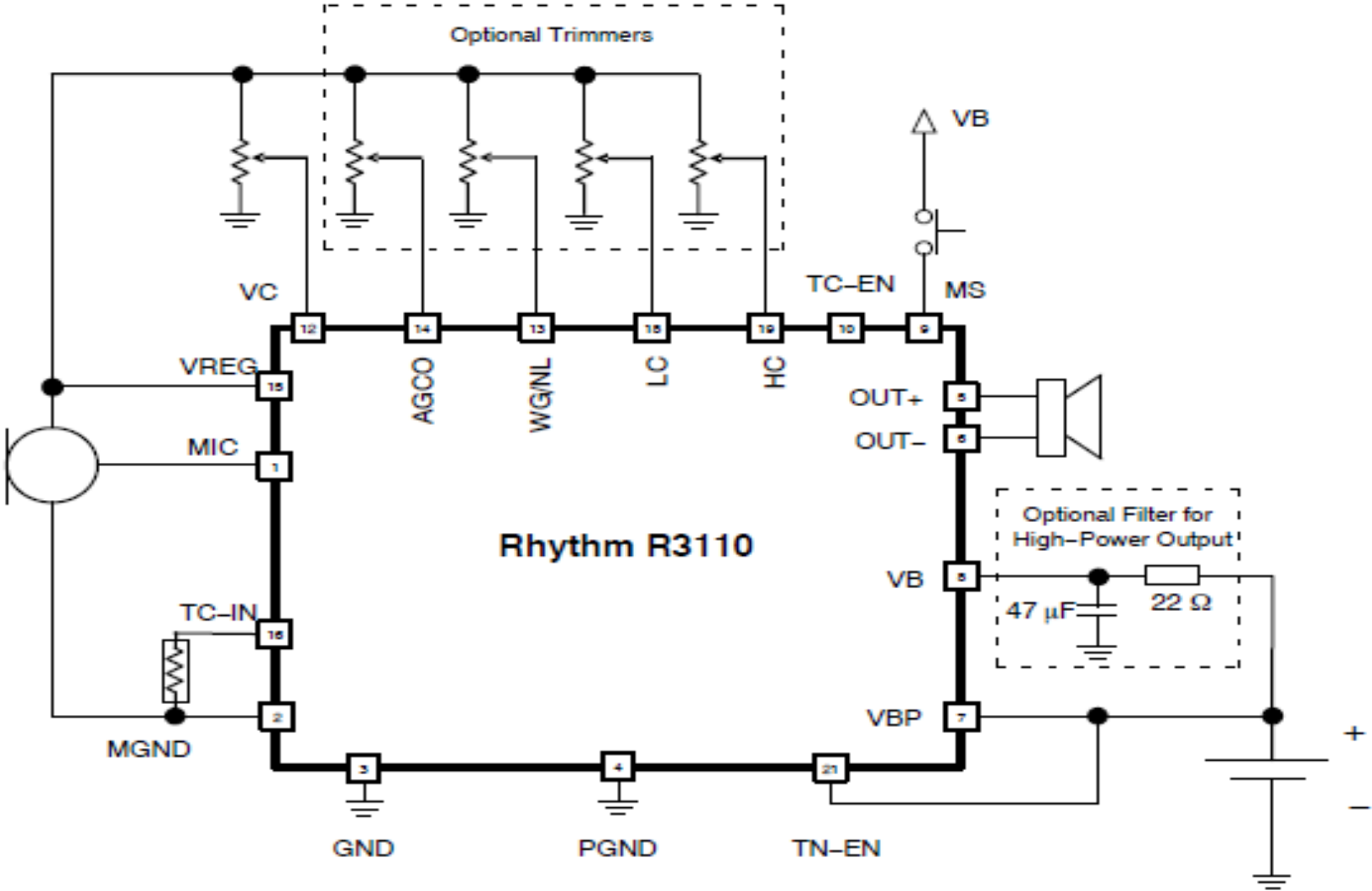


Figure 21. Advanced Hearing Aid with Push Button and Tinnitus Treatment



Preconfigured 系列助听器芯片开发流程

SA/SB3229 SB3231 R3910 R3920

开发板型号以及编程器

Part Number	Description
SU6701-E	DSP Programmer 3 Communication interface between PC and hybrid jigs
SA3400GEVB	Rhythm R3920, R3910 hybrid jig
SA3405GEVB	Rhythm SB3229/SB3230/SB3231 hybrid jig
SA3404GEVB	Rhythm SA3229
R3110GEVB	Rhythm R3110 hybrid jig



DSP Programmer



Hybrid Jig

开发平台及资源介绍

ARKonline

- 创建自定义产品库的在线设计工具
- 需导入Modeler创建的 models
- ark.onsemi.com (需要注册)

IDS

- 用于产品参数设计以及评估(声学/电子/算法的调整与评估)
- 用于产品生产制造

Cal/Config

- 用于产品生产制造与校准测试

Modeler

- 对 Microphone/receiver 建模

Filter Designer Plus

- 用于创建滤波器

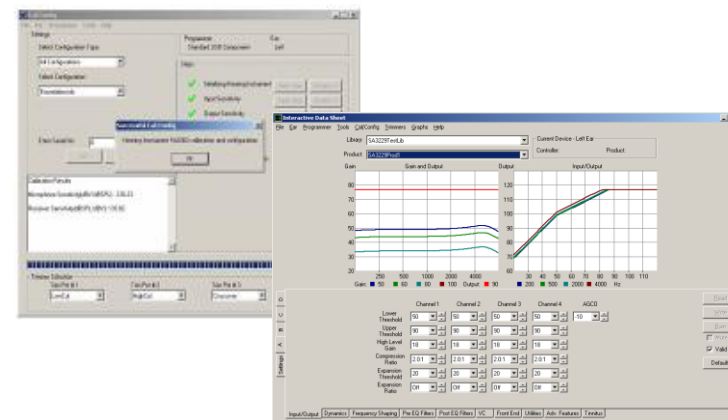
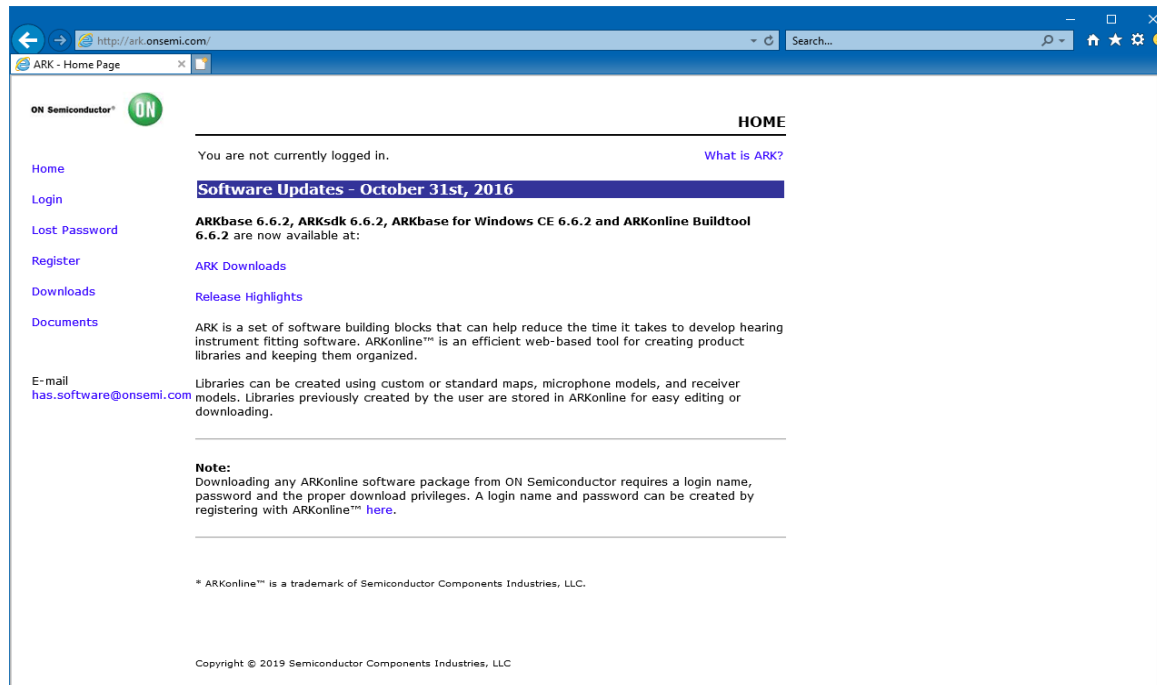
Feedback Path Measurement Tool

- 对反馈路径进行建模，以便fitting软件了解是否需要进行反馈抑制

SoundFit *

- 安森美提供的fitting示例软件
- 可导入听力图并调整产品参数 (支持autofit)

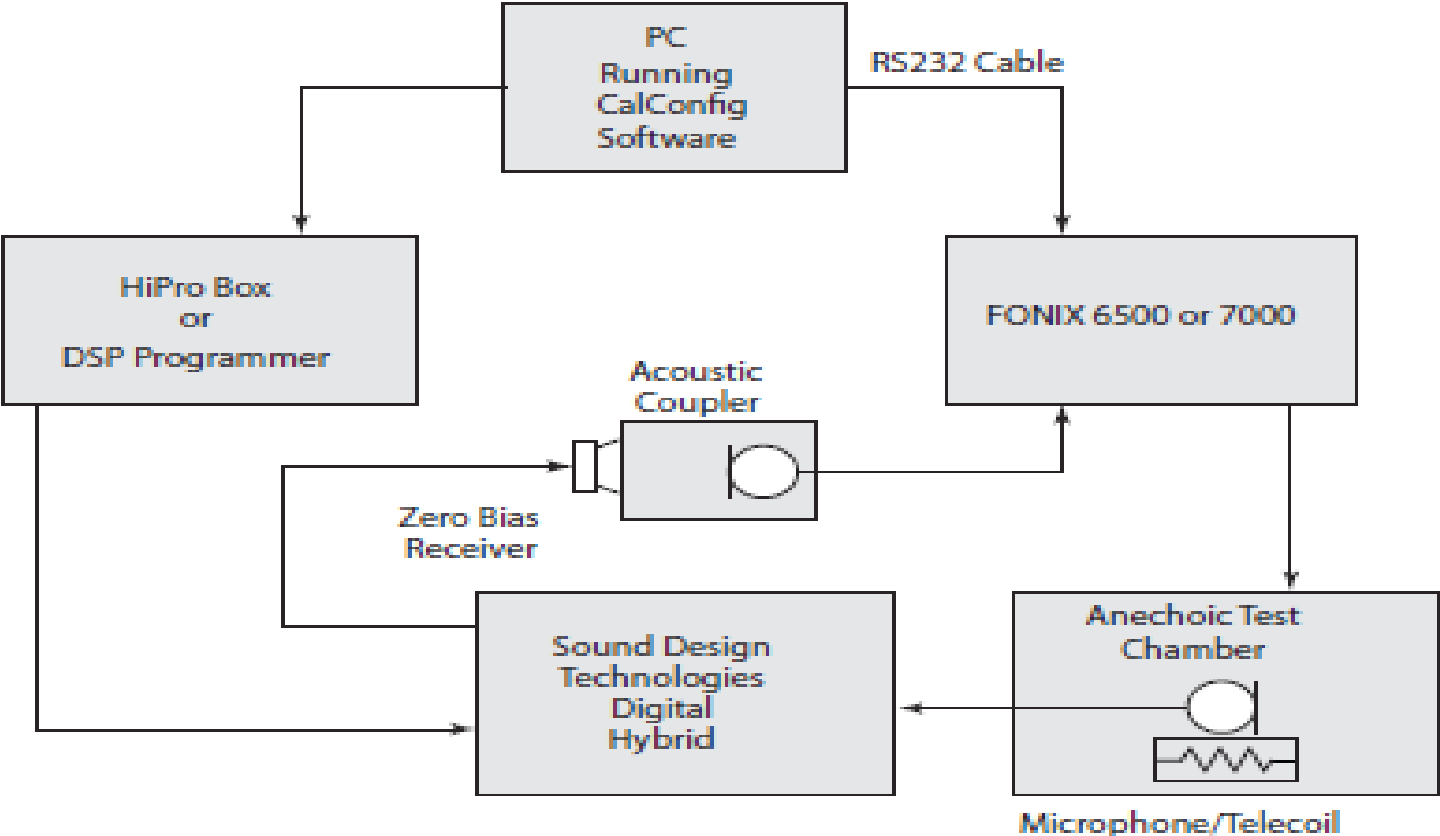
* 仅适用于SB3231, SB3229



* 不适用于Rhythm R3110



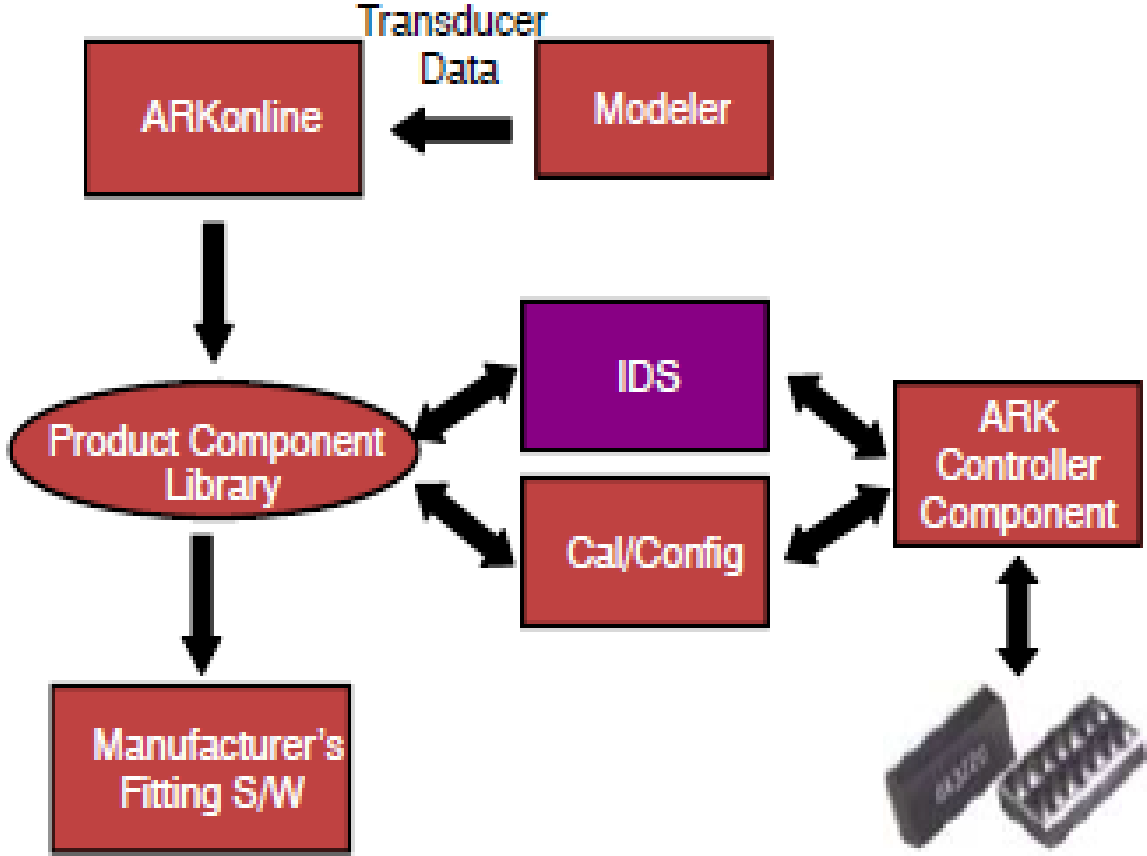
Pre-configured 硬件开发连接



测试连接图



Pre-configured 软件开发流程



开发流程图

Public Information



使用IDS测试评估芯片性能

- 测试评估芯片算法
- 检查芯片电气特性
- 使用EVB 进行芯片的性能测试评估

使用 Modeler 对microphone以及receiver建模

- 如果使用的microphone或者receiver与上一代产品一致, 可复用该文件

在ARKonline 网站上创建产品库DLL文件

- 生成的DLL 文件用于IDS 离线软件中

使用IDS软件创建各产品配置信息用于生产

在Cal/Config中使用上一步创建的配置信息

创建fitting软件或者整合调试后的DLL文件到SoundFit

Pre-configured 开发

硬件设计可参考各型号芯片的datasheet

软件设计以ARK开发套件为主，主要参考手册《ARK User's Guide.pdf》

ARK固件基于微软的COM组件，能在支持COM组件的32bit系统上运行。库文件使用C++进行开发，应用示例使用VB6开发，应用示例源代码在ARKbase与ARKsdk中。

ARK支持的编程器有：HI-PRO, Microcard, DSP3以及NOAHlink（需要客户注册HIMSA）

TABLE 1: SUPPORTED COMMUNICATION INTERFACES AND PROTOCOLS

Interface	RS232	I ² C
HI-PRO	X	X
Microcard	X	
DSP Programmer 1	X	
DSP Programmer 2	X	
DSP Programmer 3	X	X
NOAHlink	X	X

Pre-configured 开发

* 登录

<http://ark.onsemi.com/index.php> 网站

需要进行身份验证

http://ark.onsemi.com
您与此网站的连接不是私密连接

用户名

密码



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[HOME](#)

You are not currently logged in.

[What is ARK?](#)

Software Updates - October 31st, 2016

ARKbase 6.6.2, ARKsdk 6.6.2, ARKbase for Windows CE 6.6.2 and ARKonline Buildtool 6.6.2 are now available at:

[ARK Downloads](#)

[Release Highlights](#)

ARK is a set of software building blocks that can help reduce the time it takes to develop hearing instrument fitting software. ARKonline™ is an efficient web-based tool for creating product libraries and keeping them organized.

Libraries can be created using custom or standard maps, microphone models, and receiver models. Libraries previously created by the user are stored in ARKonline for easy editing or downloading.

Note:

Downloading any ARKonline software package from ON Semiconductor requires a login name, password and the proper download privileges. A login name and password can be created by registering with ARKonline™ [here](#).

* ARKonline™ is a trademark of Semiconductor Components Industries, LLC.



Pre-configured 开发

* 下载相关开发工具



- Home
- Downloads
- Documents
- Library Manager
- Private Downloads
- Preferences

You are logged in as snow

Software Updates

ARKbase 6.6.2, ARKsdk 6.6.2 are now available a

[ARK Downloads](#)

[Release Highlights](#)

ARK is a set of software h

ON Semiconductor®



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[Redacted]

DOWNLOADS

Below is a list of our most recent software packages available for download. For a more thorough description of the software package, click on the name of the software package in question.

ARKbase

ARKbase contains all ARK components and several applications for working with ON Semiconductor products

ARKbase CE

ARKbase CE contains all ARK components and several applications for working with ON Semiconductor products on Windows CE-based devices.

ARKsdk

ARKsdk is for software developers. It contains source code for most of the applications included in ARKbase.

ARKfit

ARKfit consists of source code for familiarizing software developers with ON Semiconductor's auto-fitting routines.

SOUNDFIT™

SOUNDFIT™ is ON Semiconductor's fitting software application.

Archive

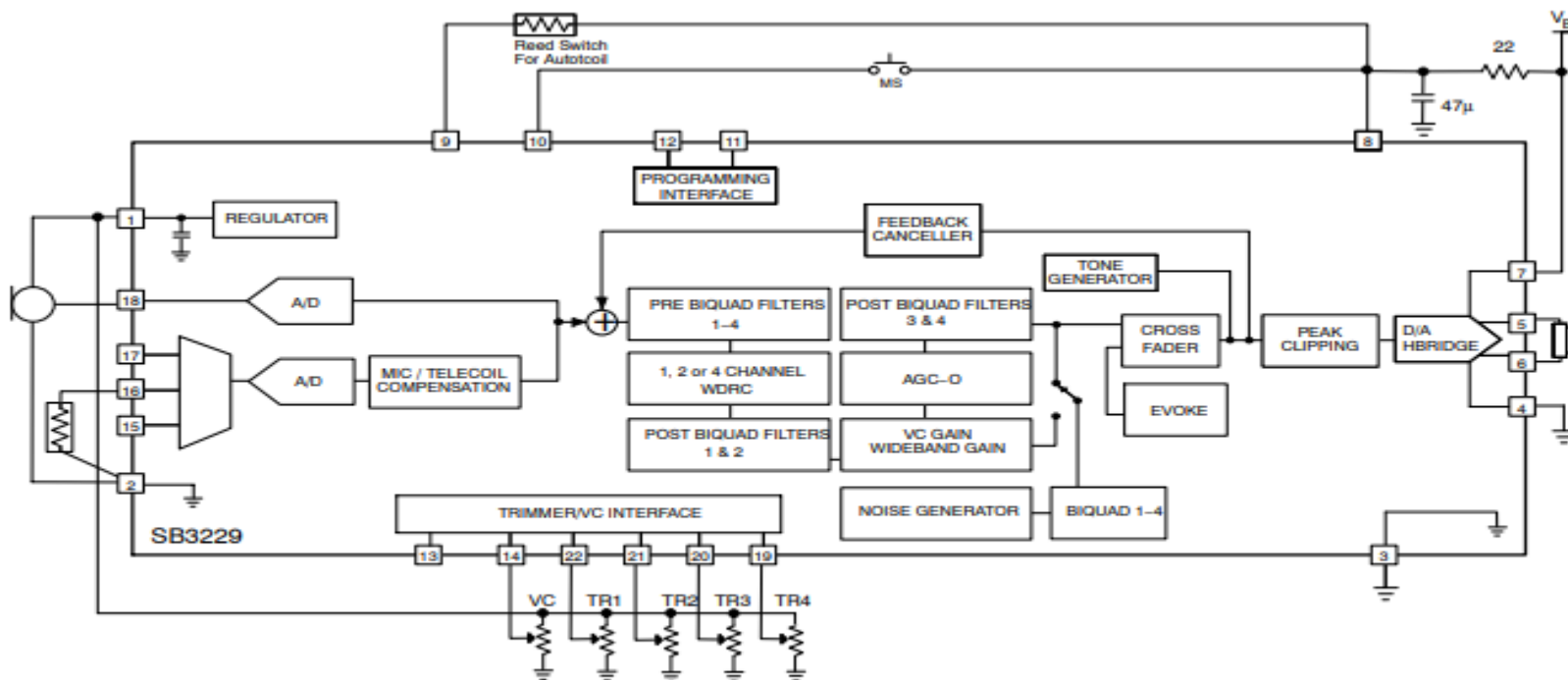
ARK downloads archive page



Pre-configured 开发

本例以SB3229为例，其他pre-configured 型号开发流程类似

硬件设计参考SB3229 datasheet， 本例使用官方EVB



Note: All resistors in ohms and all capacitors in farads, unless otherwise stated.

Figure 4. Typical Trimmer Application Circuit

Pre-configured 开发

名称	备注
ON pre-config 芯片	ON 原厂的开发板或者客户自己设计的电路
DSP3 编程器	或者其他 IDS 支持的编程器，详见编程器章节
Fonix8000	Fonix6500 或者 7000 也可以，用于测试

硬件准备

Pre-configured 开发



Fonix8000 连接

Public Information



Pre-configured 开发

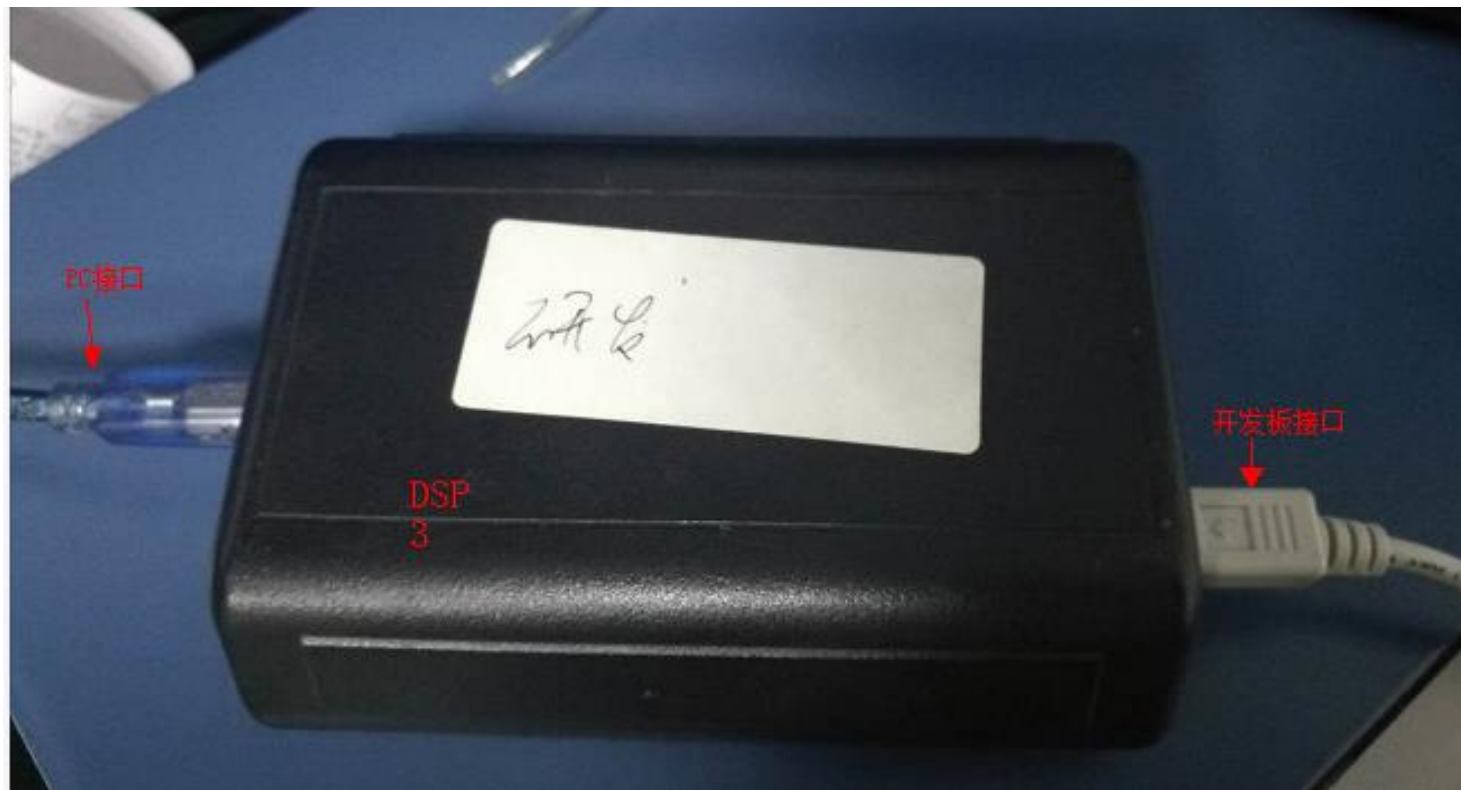


ON原厂开发板连接 (以SB3229为例)

Public Information



Pre-configured 开发



编程器连接

Public Information



Pre-configured 开发

连接 Hi-pro 与 Fonix8000 到 PC

打开电脑-设备管理器，

连接 Hi-pro 与 Fonix8000 前

Ports (COM & LPT)

Intel(R) Active Management Technology - SOL (COM3)

连接 Hi-pro 与 Fonix8000 后，建议 8000 的串口号在 5 以内，以防出现连接问题


Ports (COM & LPT)

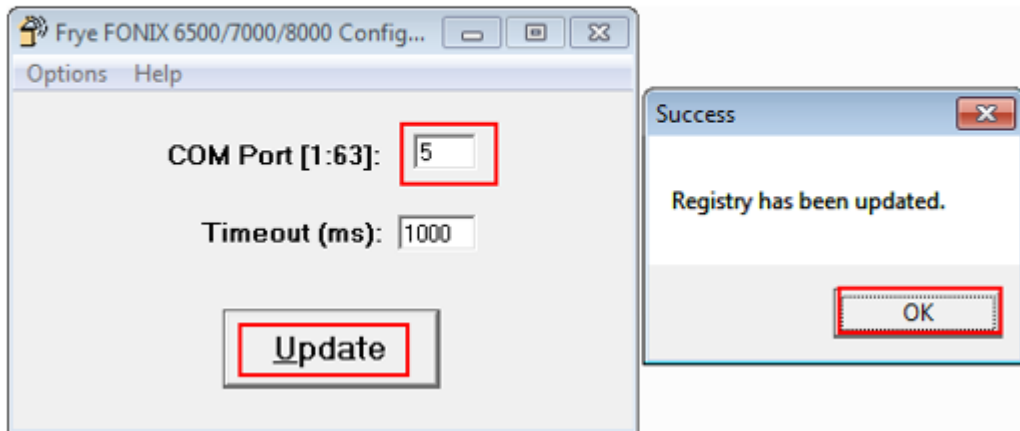
HI-PRO (COM12)

Intel(R) Active Management Technology - SOL (COM3)


USB Serial Port (COM5)

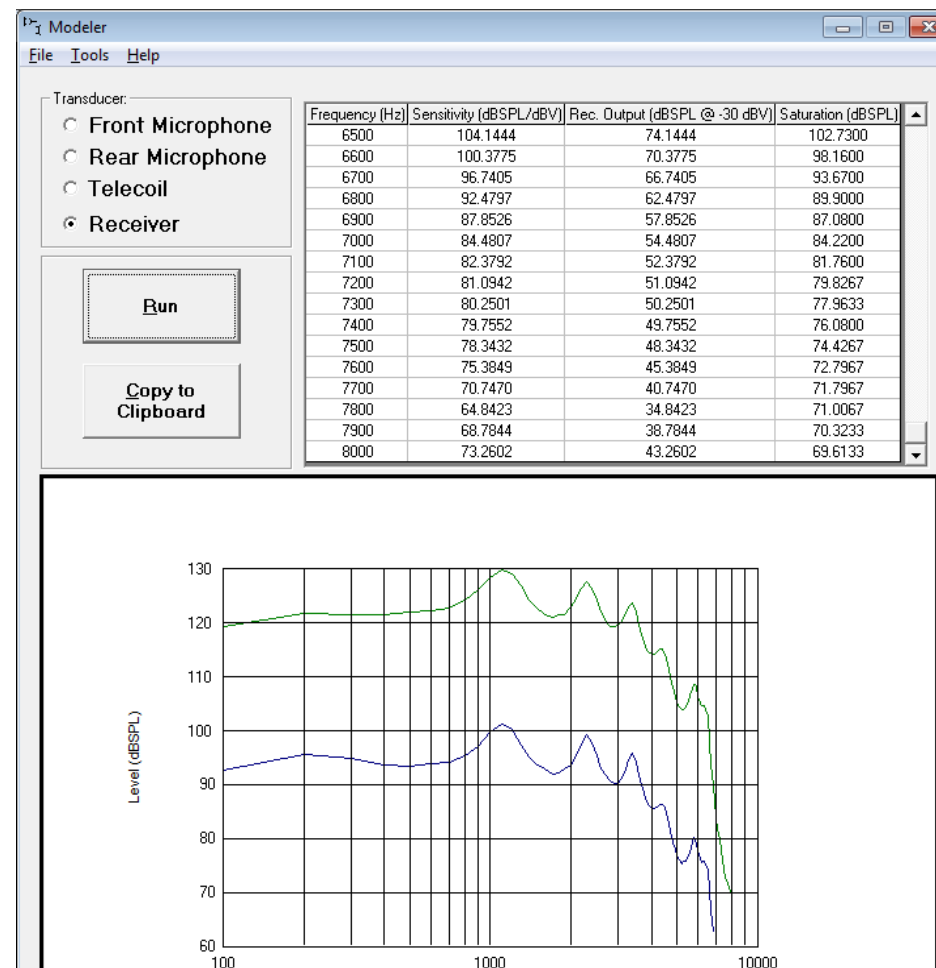
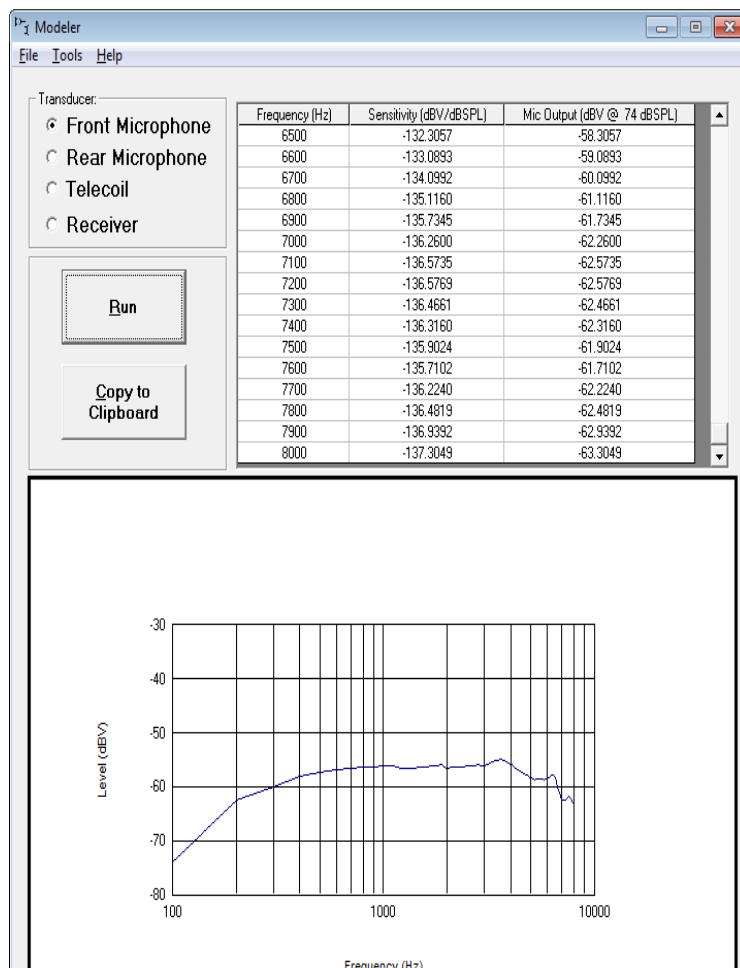
将 ON 原厂开发板放入 Fonix 测试箱内，麦克风需要放在圆圈内

打开  FryeRegTool.exe 配置 Fonix8000 串口，最好在 COM1 - COM15 内。由上图，Fonix 串口为 COM5



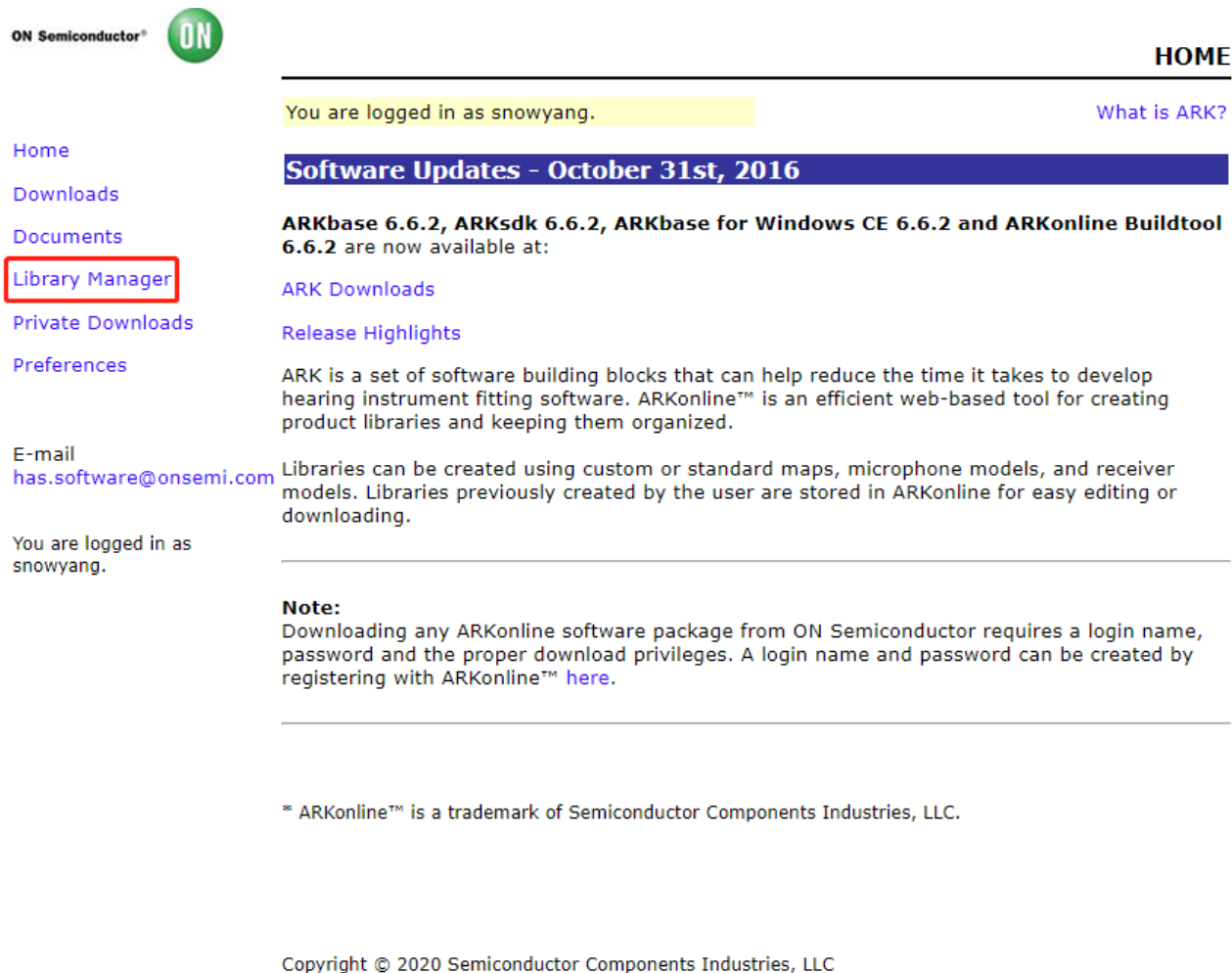
Pre-configured 开发

 **Modeler2.exe** 用于传感器的校准，生成的文件供 ARKONLINE 使用以便于在 IDS 中模拟产品特性曲线




Pre-configured 开发

- 进入产品库管理



The screenshot shows the ON Semiconductor ARKonline user interface. At the top left is the ON Semiconductor logo. The top right corner has a 'HOME' link. Below the logo is a navigation menu with links for Home, Downloads, Documents, Library Manager (highlighted with a red box), Private Downloads, and Preferences. Below the menu is the user's email address, has.software@onsemi.com, and a confirmation that the user is logged in as snowyang. The main content area features a blue header for 'Software Updates - October 31st, 2016' and a section for 'ARKbase 6.6.2, ARKsdk 6.6.2, ARKbase for Windows CE 6.6.2 and ARKonline Buildtool 6.6.2'. It includes links for 'ARK Downloads' and 'Release Highlights', and a paragraph explaining that ARK is a set of software building blocks. A 'Note' section follows, stating that downloading software requires a login and password, with a link to register. At the bottom, there is a copyright notice for 2020 Semiconductor Components Industries, LLC.

ON Semiconductor® 

HOME

You are logged in as snowyang. [What is ARK?](#)

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E-mail has.software@onsemi.com

You are logged in as snowyang.

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* ARKonline™ is a trademark of Semiconductor Components Industries, LLC.

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• 导入microphone与receiver曲线

ON Semiconductor® **ON**

MICROPHONES

Microphone Search: Go Show All

[Add New Microphone](#)

Unsaved Microphones Saved Microphones

onsemi Microphones

Title	Version	Manufacturer	App.	
EM24446_C36	1.0.0	Knowles	ITC	View
Above is being edited by: ffvntn				
test1	1.0.0	Knowles	CIC	View
Above is being edited by: ffvntn				
S6374	1.0.0	Sonion	CIC	View
Above is being edited by: ffvntn				
TM2673	1.0.0	Sonion	ITC	View Copy Edit
Above is owned by: ffvntn				
S6374_5	1.0.0	Sonion	ITC	View Copy Edit
Above is owned by: ffvntn				
TM26403	1.0.0	Sonion	ITC	View Copy Edit
Above is owned by: ffvntn				
S6374_pro	1.0.0	Sonion	CIC	View Copy Edit
Above is owned by: ffvntn				

Public Microphones

Title	Version	Manufacturer	App.	
EM-4346CX	1.0.0	Knowles	ITE	View Copy
M_9646GX	1.0.0	Sonion	ITE	View Copy

ON Semiconductor® **ON**

ADD MICROPHONE

Microphone Name: Mic 名称

Comments: Mic 描述

Version: (e.g. 1.0.0) Mic 版本

Permissions: 该文件权限设置

Allow other people in my company to view this item.

Allow other people in my company to edit this item.

Manufacturer: Mic 生产商

Knowles

Sonion

Application: 测试的样机类型

BTE

ITE

ITC

CIC

Input:

0 dB SPL 1 ubar 1 Pascal

Sensitivity Data:

Pre-configured 开发

• 建立MAP



RECEIVERS

Receiver Search:

[Add New Receiver](#)

Unsaved Receivers Saved Receivers

My Receivers

Title	Version	Manufacturer	Type	App.	
Rec_for_pre	1.0.0	Knowles	Zero-Biased	BTE	View Copy Edit Delete

onsemi Receivers

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[Library Manager](#)

[Libraries](#)

[Microphones](#)

[Receivers](#)

[Maps](#)

E-mail

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SA3229_S01 Wizard

[Previous](#)

[Next](#)

[Save](#)

[Abort](#)

System Features 系统功能设置

Sampling Frequency 系统采样率

- Set to 16 kHz
- Set to 32 kHz

Startup Program 启动程序

- Shallow reset mode.
- Deep reset mode.
- Advanced reset mode (startup with shallow reset, switch to transient reboot when low battery voltage detected).
- Enable Hybrid Authentication 芯片认证

Note:

The Sampling Frequency selection alters the recommended Feedback Canceller Delay, if the Feedback Canceller is enabled. Please ensure that this value is set correctly on the Advanced Features page.

[Previous](#)

[Next](#)

[Save](#)

[Abort](#)

[Home](#)

[Maps](#)

[Map Summary](#)

[System Features](#)

[Advanced Features](#)

[Front End](#)

[Crossover](#)

[Filters](#)

[Channel AGCs](#)

[Channel AGCs Time Constants](#)

[MPO](#)

[MPO Time Constants](#)

[Volume Control](#)

[Utilities](#)

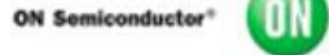
[GraphicEQ](#)

[Validation](#)

→ 可通过上一页或者下一页进行参数配置，也可通过此处选择



Pre-configured 开发



• 建立library

[Home](#)

[Library Manager](#)

[Libraries](#)

[Microphones](#)

[Receivers](#)

[Maps](#)

E-mail

has.software@onsemi.com

You are logged in as

██████████

NEW LIBRARY

Library (DLL) Name: ⓘ

Library Title: ⓘ

Comments: ⓘ

Version: ⓘ

Library ID: ⓘ

Manufacturer ID: 0 制造商ID, 自动生成

Platforms: 该 .dll 文件使用的平台, 一般为Windows, 选择Win32

Platform	Verified	Devices
<input checked="" type="checkbox"/> Win32	Yes	N/A
<input type="checkbox"/> PocketPC ARM	Yes	Casio iPAQ 3650
<input type="checkbox"/> PocketPC MIPS	No	
<input type="checkbox"/> PocketPC SH3	No	
<input type="checkbox"/> PocketPC x86em	No	
<input type="checkbox"/> H/PC Ver. 2.00 MIPS	No	
<input type="checkbox"/> H/PC Ver. 2.00 SH3	No	
<input type="checkbox"/> H/PC Pro 2.11 MIPS	No	
<input type="checkbox"/> H/PC Pro 2.11 SH3	No	
<input type="checkbox"/> Palm-size PC 2.11 MIPS	No	
<input type="checkbox"/> Palm-size PC 2.11 SH3	No	



Pre-configured 开发

- 最终导出DLL库文件供IDS软件使用

LIBRARIES

Library Search:

[Create New Library](#)

Current Buildtool Version: 6.6.2

Unsaved Libraries Saved Libraries

My Libraries

Title	DLL	Source	Status	
SB_SA3229_test_library			Pending	View Copy Edit Delete

LIBRARIES

Library Search:

[Create New Library](#)

Current Buildtool Version: 6.6.2

Unsaved Libraries Saved Libraries

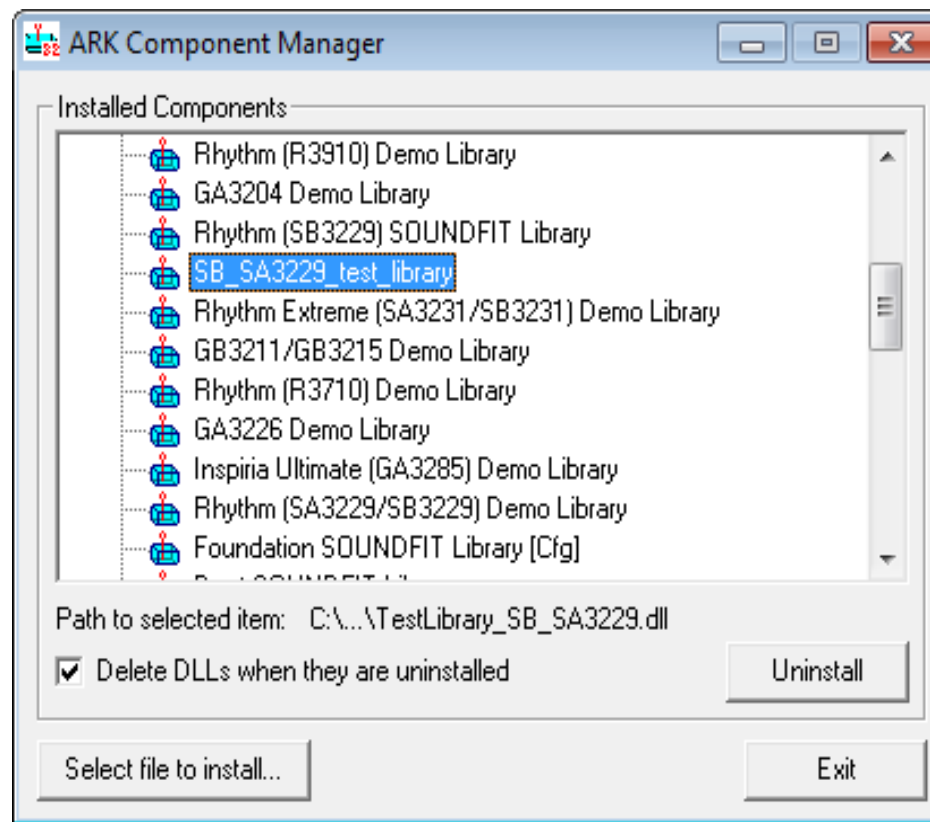
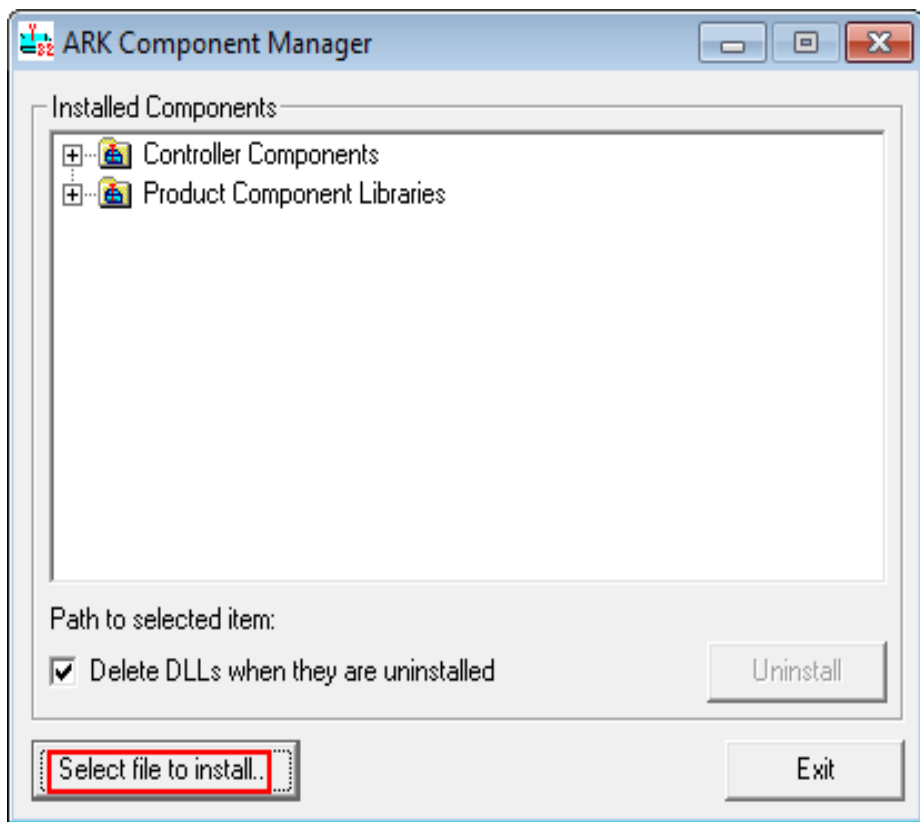
My Libraries

Title	DLL	Source	Status	
SB_SA3229_test_library	Download		Built Using v6.6.2	View Copy Edit Delete

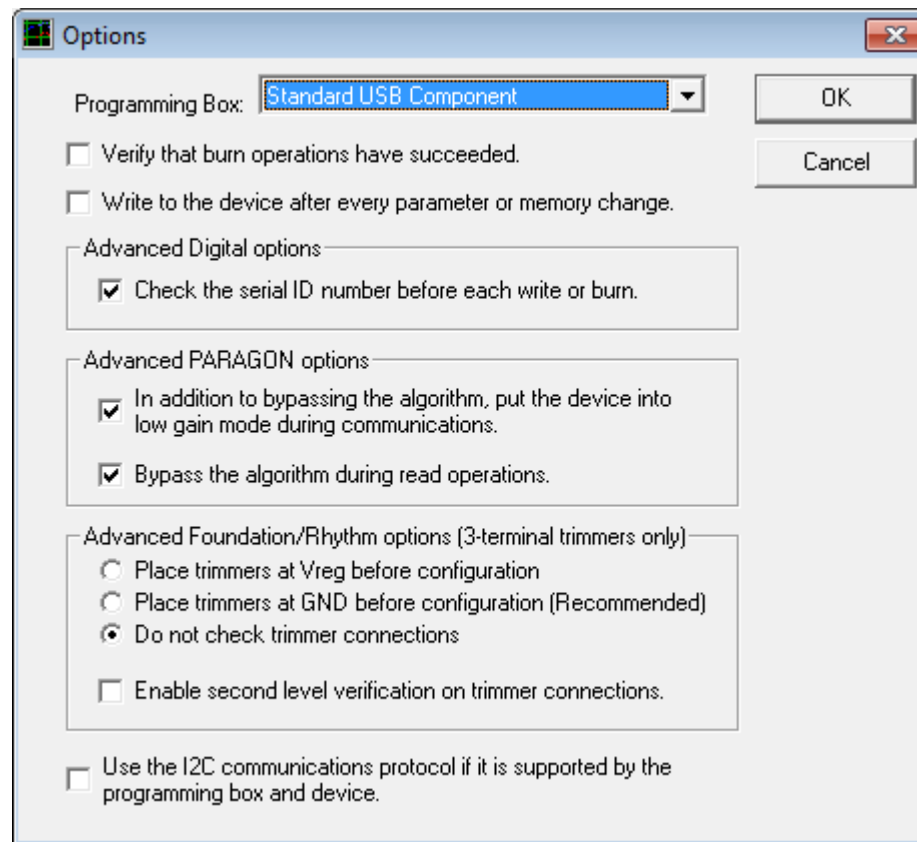
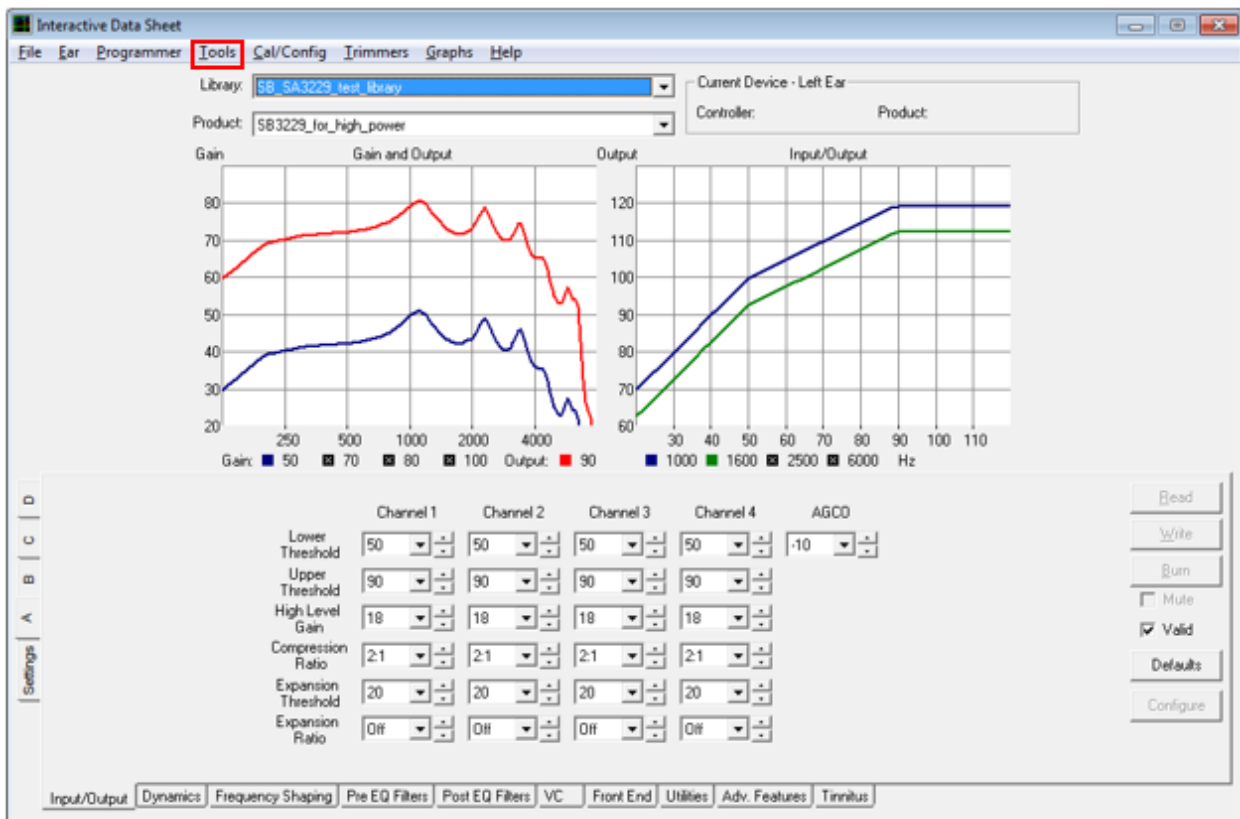
Pre-configured 开发



用于安装ARKOnline生成的库文件供IDS调用

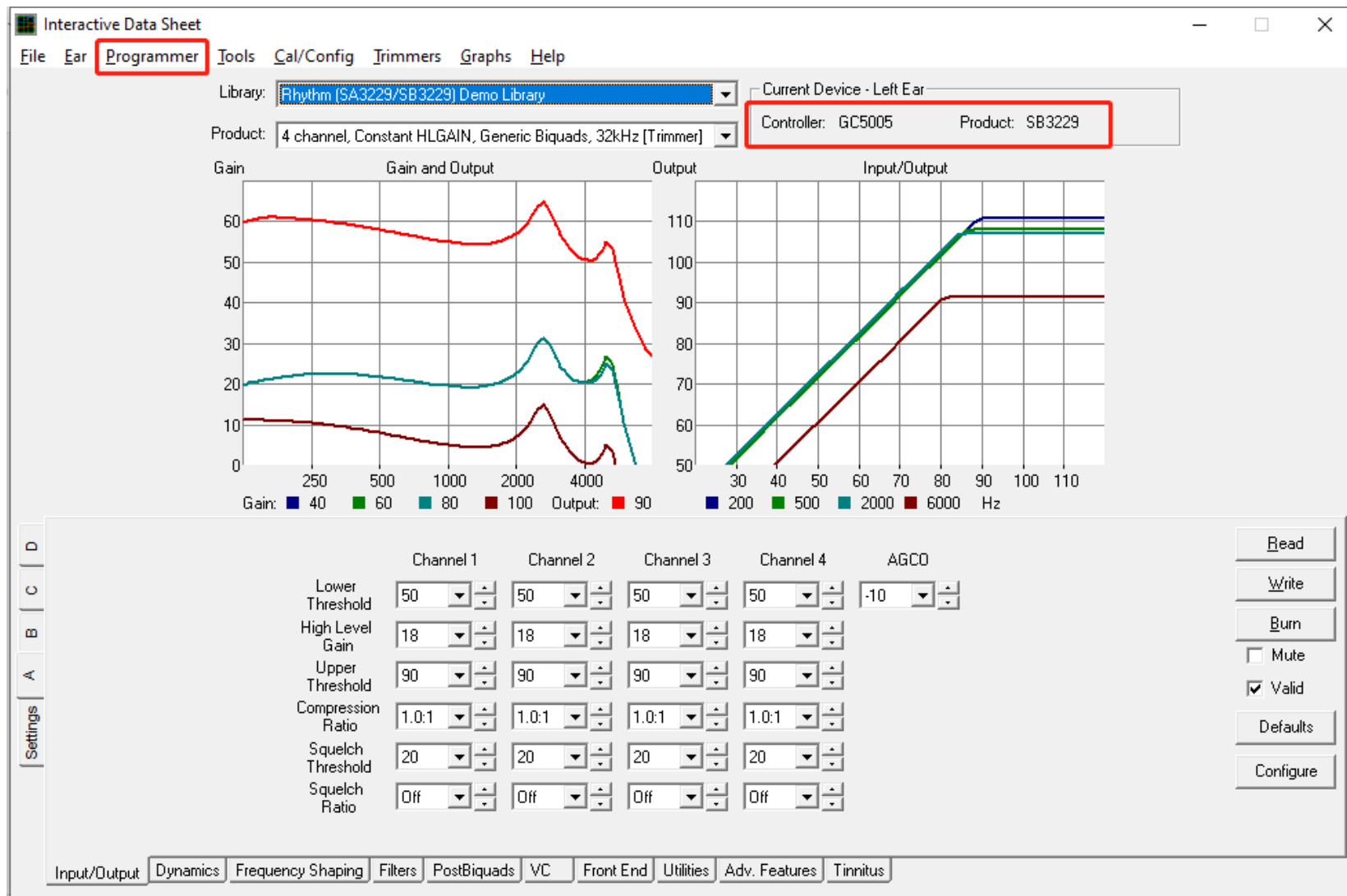


设置编程器为DSP3



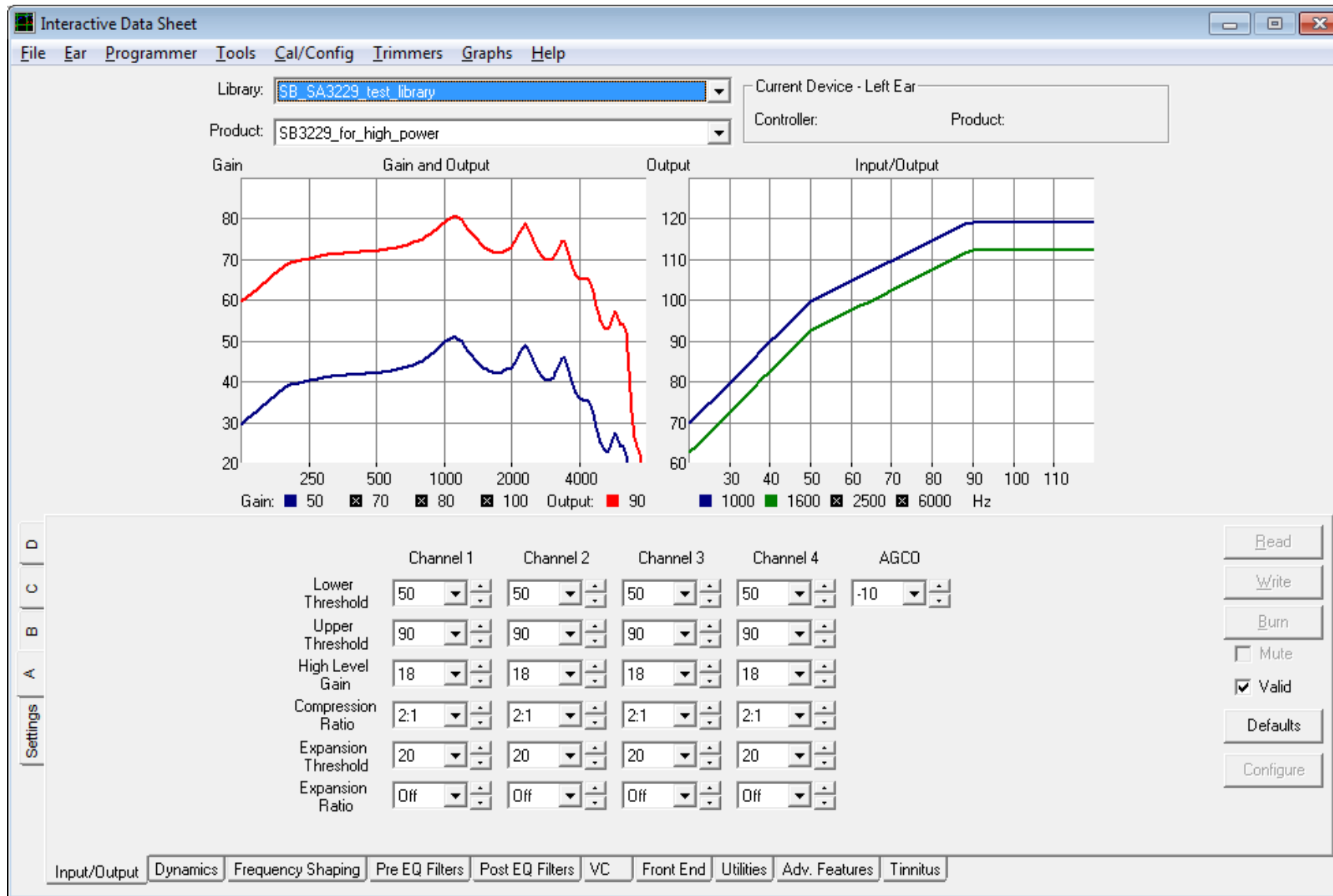
Pre-configured 开发

编程器连接开发板

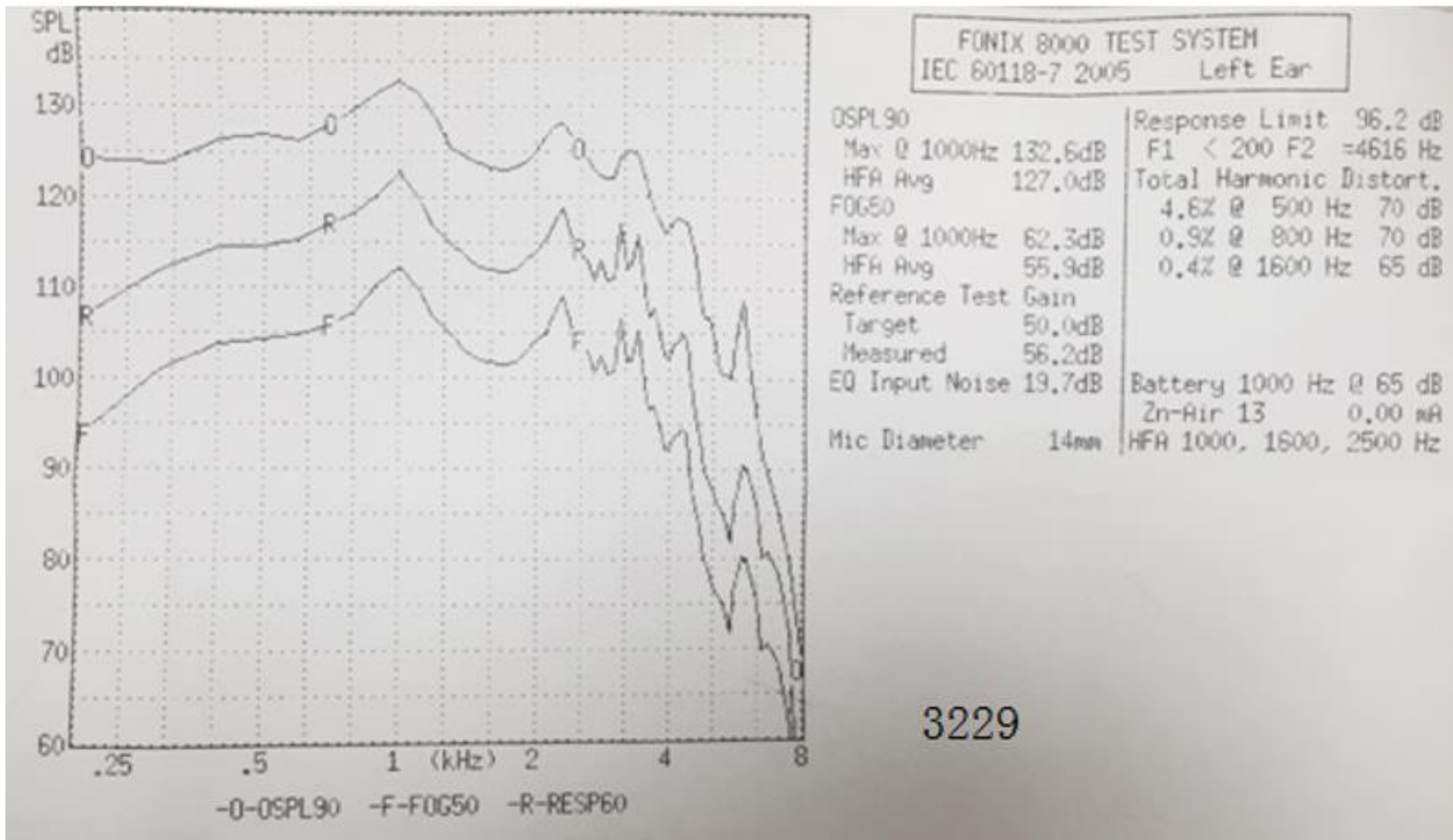


Pre-configured 开发

打开IDS进行产
品参数调整



Pre-configured 开发



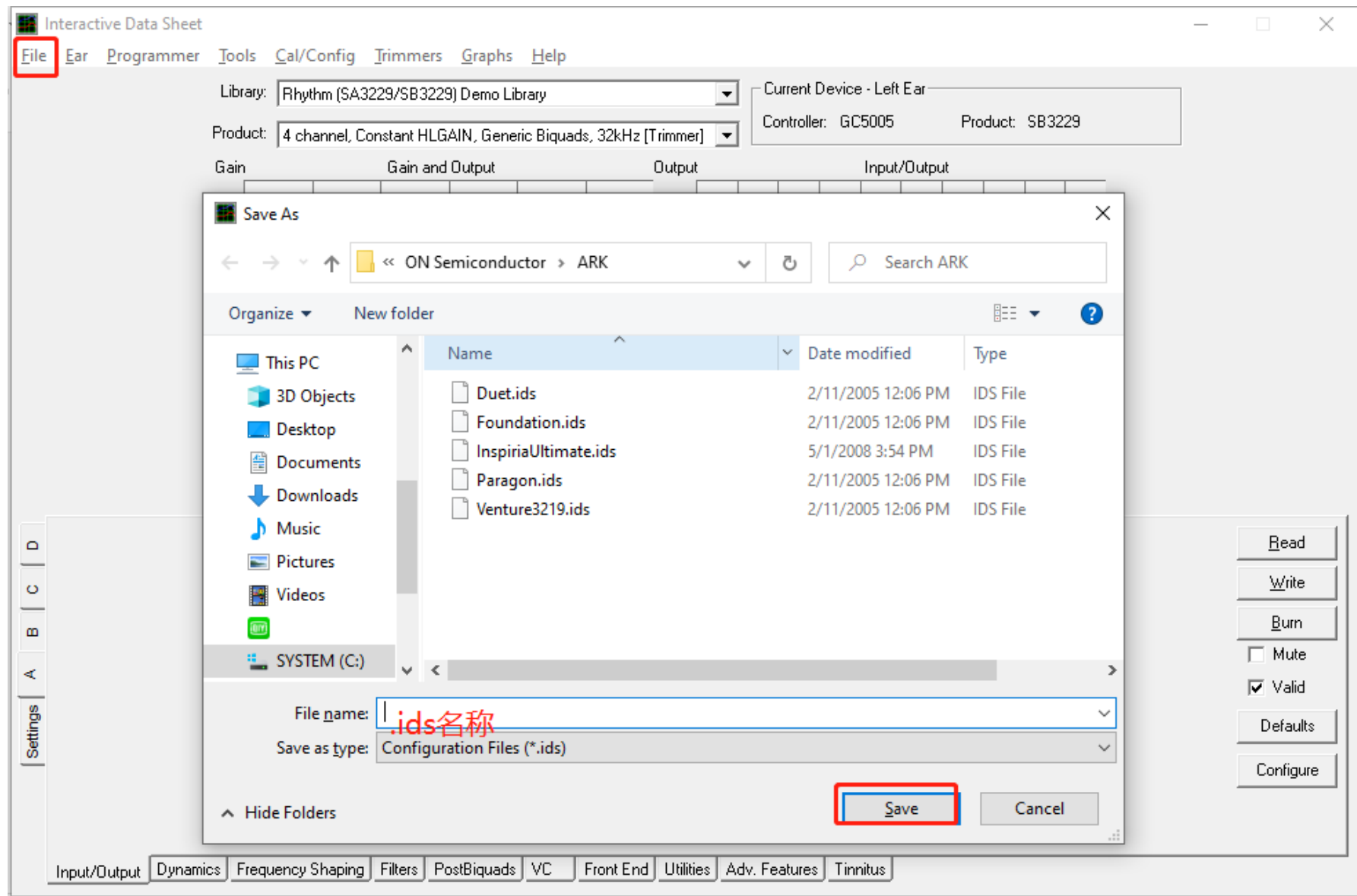
Fonix8000测试结果图

Public Information



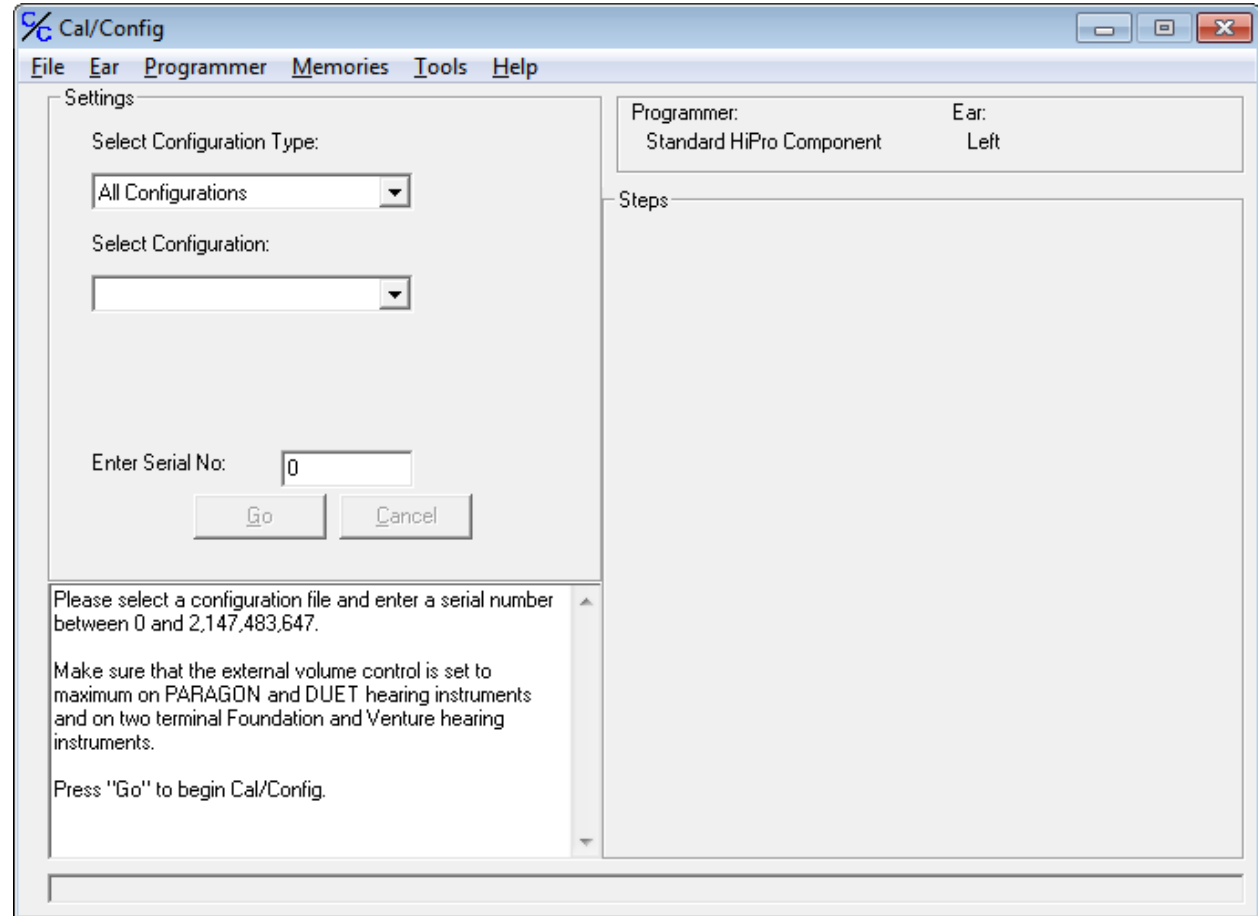
Pre-configured 开发

使用IDS进行产品参数调整并生成.ids配置文件供烧录校准软件使用



Pre-configured 开发

- * 用于芯片校准以及工厂生产
- * 在使用Cal/Config工具之前，需要先对Workstation Manager工具进行设置。
- * Cal/Config工具的配置是在IDS中设置的



Pre-configured 开发

* 开发验配软件供门店使用

* 参考sound fit 软件开发

* 与第三方合作开发

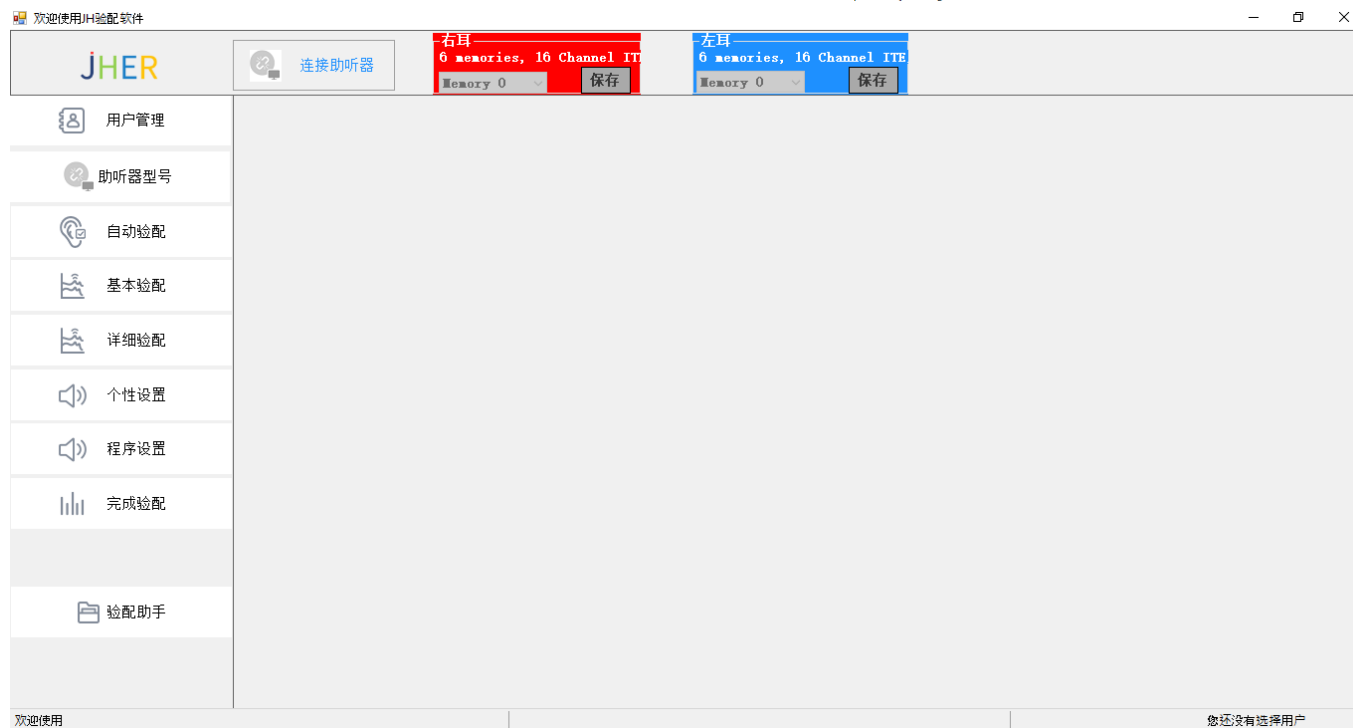
http://www.jhearing.com/jhear_files.htm



瑾颢电子验配软件列表 更新至2020-10-11

预配置DSP SB3229, R3920/3910 验配软件
下载地址
Pre Suite Ezairo 7111-V.x 系列验配软件
下载地址
Pre Suite Ezairo 7160-V.x 系列验配软件
支持有线验配和无线验配 下载地址
Pre Suite 无线助听器方案Ezairo 7160-V.x 系列验配软件
用户端软件 下载地址

联系我们: <http://www.jhearing.com>



Public Information



第三方验配软件简介

* 建立用户档案，导入听力图

姓名	性别	号码	年龄	地址	备注	最近验配时间
张大伯	男	1582100000	60	浦东		2020/6/14 12:40:52
11	男	11	222	11111	111	2020/9/14 13:53:36
222	男		111			2020/9/15 23:26:17

1.可以增删改，查询用户
2.可以导出查询结果，包括最新的听力图
3.可以导入刚刚的导出结果，方便分店之间的数据迁移

4.JH验配软件支持在完成验配后把用户资料写入到助听器设备中，这样用户拿着手中的助听器就可以去异地分店或者通过JH的app读出参数并自主验配

每次安装或卸载的时候都不会覆盖以前的用户资料

听力图输入方式:
支持鼠标双击, 手工输入和纯音听力测试

	125	250	500	750	1k	1.5k	2k	4k	6k	8k
右耳	50	50		45	40	50				

	125	250	500	750	1k	1.5k	2k	4k	6k	8k
左耳	50	40	30	20	40	30				

第三方验配软件简介

* 连接助听器

The screenshot shows the JHER software interface. At the top, there are two ear configuration panels for '右耳' (Right Ear) and '左耳' (Left Ear), each with a dropdown menu set to 'Memory 0' and a '保存' (Save) button. Below these is a '连接助听器' (Connect Hearing Aid) button. A red arrow points to this button with the text '点这里连接助听器, 读取助听器的参数'. To the right of the arrow, another red text block says '助听器连接状态, 如果有助听器连接, 按钮会红色/蓝色, 应用程序可选'. On the left side, there is a vertical menu with icons and labels: '用户管理', '助听器型号', '自动验配', '基本验配', '详细验配', '个性设置', '程序设置', '完成验配', and '验配助手'. At the bottom, there are three status bars: '状态栏1' (Status Bar 1), '状态栏2: 主要显示验配工程中详细的错误信息' (Status Bar 2: Mainly displays detailed error information in the fitting process), and '当前验配的用户' (Current fitting user) with the text '您还没有选择用户' (You have not selected a user).

第三方验配软件简介

* 根据需要进行验配

欢迎使用JH验配软件

JHER

连接助听器

右耳 4 channel, Constant HL GAIN Memory 0 保存

左耳 4 channel, Constant HL GAIN Memory 0 保存

用户管理

助听器型号

自动验配

基本验配

详细验配

个性设置

程序设置

完成验配

验配助手

频率--输出图

轻声

中声

大声

右

左

自动验配

验配公式 智能验配

大功率预设值 智能

放大策略 非线性动态

耳鸣掩蔽策略 基于听力图

提交

提交

张大伯

第三方验配软件简介

* 根据需要进行验配

欢迎使用JH验配软件

JHER

连接助听器

右耳 4 channel, Constant HLGAIN Memory 0 保存

左耳 4 channel, Constant HLGAIN Memory 0 保存

用户管理

助听器型号

自动验配

基本验配

详细验配

个性设置

程序设置

完成验配

验配助手

频率--输出图

轻声

中声

大声

右

左

基础验配, 快速达到验配效果

增益	响度	声音质量
主增益 -18 dB	轻声增益 slider1	太尖锐
AGCO -10 dB	响声增益 18 dB	太沉闷
	自己声音 -1 dB	
	言语参数 -1 dB	

增益	响度	声音质量
主增益 -18 dB	轻声增益 slider1	太尖锐
AGCO -10 dB	响声增益 18 dB	太沉闷
	自己声音 0 dB	
	言语参数 0 dB	

张大伯



第三方验配软件简介

* 调整后，点击保存

欢迎使用JH验配软件

JHER

连接助听器

右耳
4 channel, Constant HLGAIN
Memory 0 保存

左耳
4 channel, Constant HLGAIN
Memory 0 保存

姓名: 张大伯 年龄: 60 性别: 男

地址: 浦东 联系电话: 1582100000

是否首次验配: 否 验配日期: 10/26/2020 5:40:06 PM

频率: 125 250 500 1k 2k 4k 8k

dBHL

右 左

右耳
产品名: 4 channel, Constant HLGAIN, Generic Biqua
序列号:

保存右耳

保存左耳

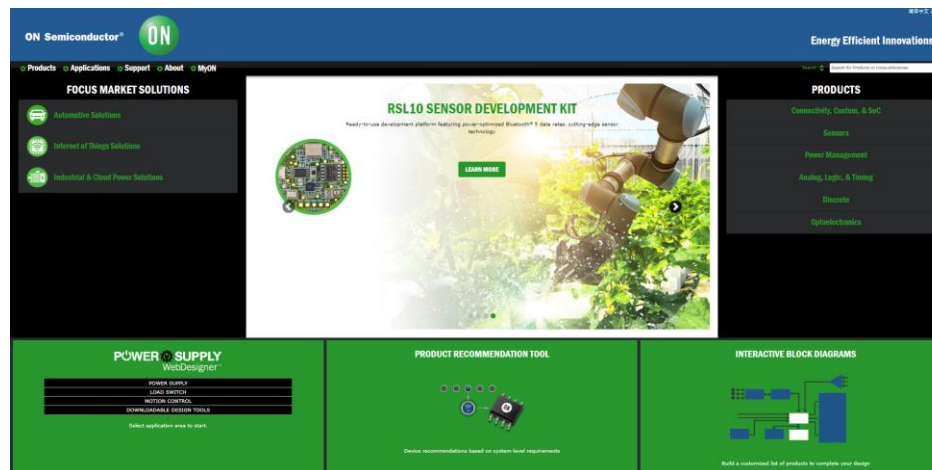
左耳
产品名: 4 channel, Constant HLGAIN, Generic
序列号:

张大伯



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谢谢

Public Information

