
SNC8x series professional audio processor
Shenzhen Soundec Technology
深圳市九音科技有限公司

Company Profile

Focus on acoustic research and commercialization

Shenzhen Soundec Technology Co., Ltd. (“Soundec Technology ”) is a high-tech enterprise focusing on acoustic research and commercialization. Founded in 2017, we seek to consistently deliver excellent solutions in the areas of audio.

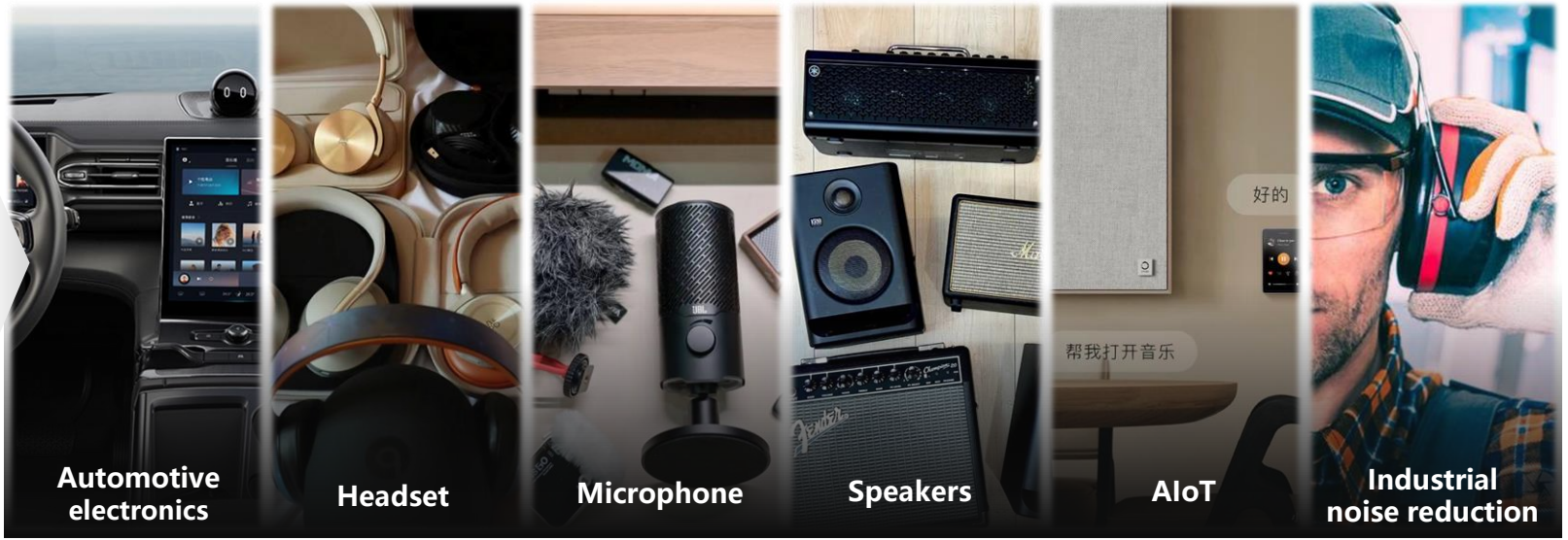
Building upon our core competence in audio processing technology, Soundec Technology provides a series of professional audio processors integrating AI algorithms, high-quality codecs, high-performance DSP, high-speed USB and power management units. Support in-depth development and turn-key solutions for algorithm + chip + application design.

Cooperation with the top semiconductor IP partners and chip manufacturers, Soundec Technology is committed to creating a serials of world-class audio processors and solutions, providing customers with reliable quality, stable supply and professional service acoustic solutions.

cadence™ DOLPHIN INTEGRATION SYNOPSYS® Silicon to Software™ tsmc

Deep into the professional audio market

Soundec Professional audio processor



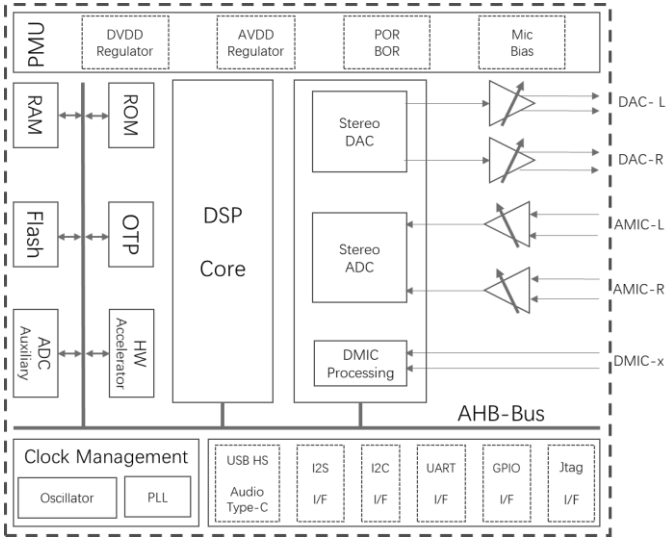
Terminals with interaction and control requirements will have audio entry, increasing the requirements for sound quality and personalized perception. Soundec series chips deeply service for the professional pre/post-processing market

Contents

- 32Bit high performance audio signal processor
- HiFi3 Architecture
- Cooperation ecosystem
- SDK Platform
- Modules BMT02/BMT03/BMT03-MicArray
- Packaging & Electrical performance
- Developer ecosystem
- Documents supporting

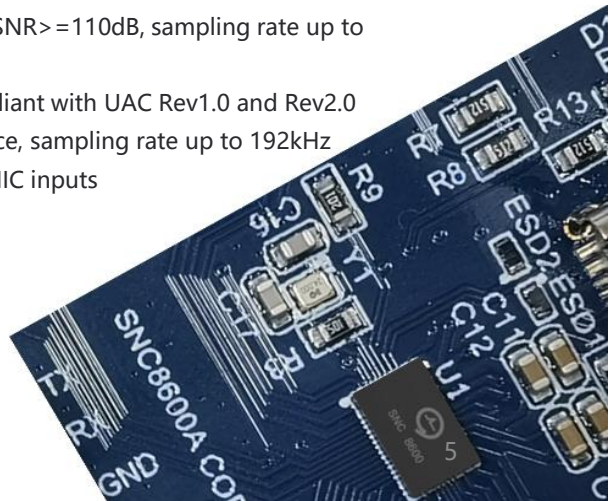
32Bit high performance audio signal processor

- SNC8x series audio signal processor, integrated AI algorithm and high quality Codec, high performance DSP, USB2.0 HS device and power management unit.
- High integration of SoC greatly reduces BOM cost and development cycle.
- Rich developer ecosystem.



Key Features

- Cadence Tensilica™ 32-bit HiFi3 DSP @200MHz
- 32-bit floating point unit, hardware acceleration
- Build-in AGC、DRC、Mixer、Wind Noise filter
- Build-in LDO and DC-DC power manager
- 24-bit high precision ADC, SNR>=106dB, sampling rate up to 192kHz
- 24-bit high precision DAC, SNR>=110dB, sampling rate up to 192kHz
- USB2.0 HS/FS device, compliant with UAC Rev1.0 and Rev2.0
- Three full duplex I²S interface, sampling rate up to 192kHz
- Up to 10 DMIC inputs/2 AMIC inputs
- 12-bit precision SAR ADC
- Full duplex UART
- Two I²C interface

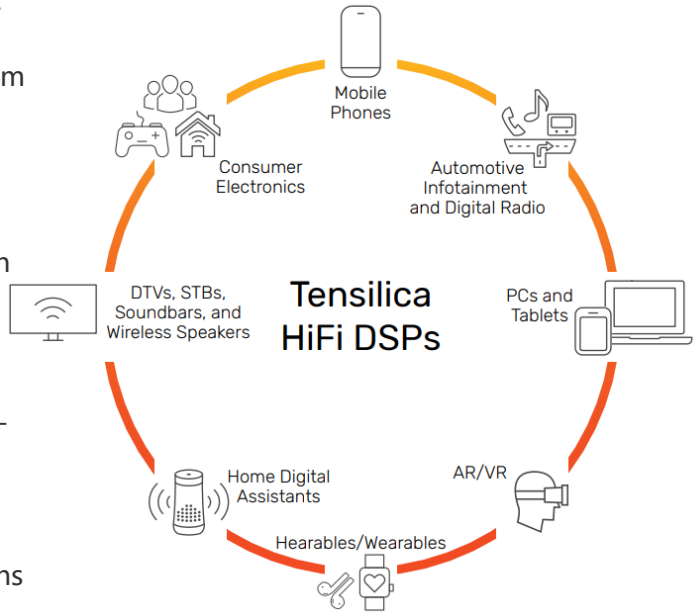


HiFi3 Architecture

- **Tensilica HiFi DSP**
  - Tensilica HiFi DSP series is the most licensed audio/sound/speech processor
  - With support for over 300 proven software packages.
  - More than 125 software partners in the Tensilica Xtensions™ partner program
  - More than 100 top-tier semiconductor companies and system OEMs have selected Tensilica HiFi DSPs for their audio, voice and speech products

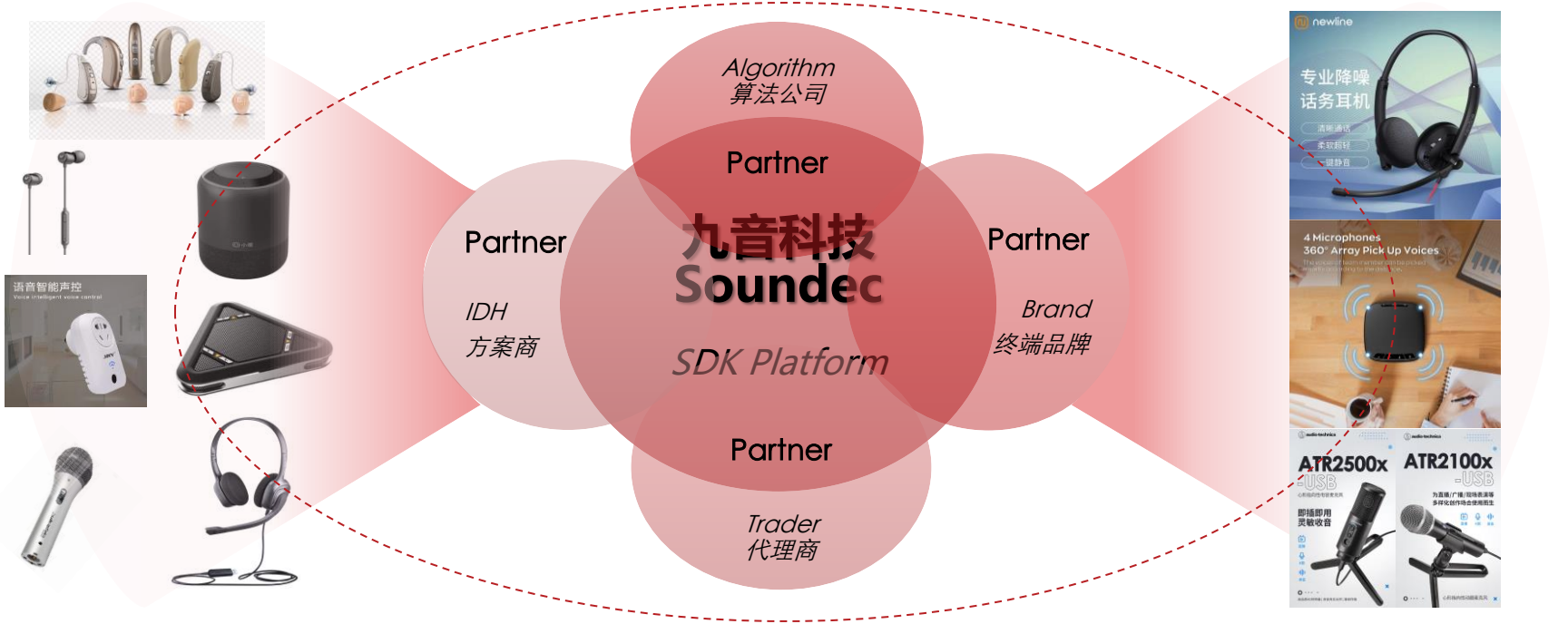
- **HiFi3 Architecture**
  - HiFi 3 is a VLIW architecture, supporting the execution of three operations in parallel.
  - Goes beyond the two MAC, four multipliers, three VLIW slots
  - Good support for 32x16-bit and 32x32-bit multiplication
  - A true 64-bit data path and native support for ITU-T/ETSI intrinsics.
  - An optional floating point unit available, providing for a 2-way SIMD, single-precision IEEE floating point MAC or ALU operation every cycle

- **HiFi3 DSP library**
  - The HiFi3 DSP has an associated generic DSP library, which contains functions for FIR filters, IIR filters, basic math functions, matrix operations, and FFTs.



Cooperation ecosystem

Rely on the SDK open platform of SNC86x series to open up the product market with excellent partners.



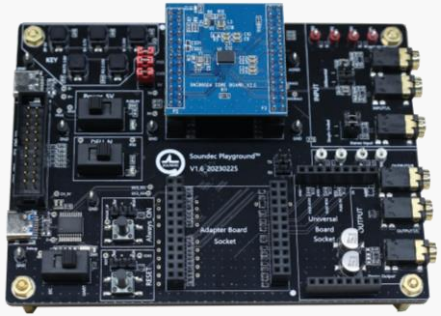
SDK Platform

Software Develop Kit

USB Connection

Connect EVA board and PC via USB cable for debugging and code upgrade

EVA Board



- *EVA board with full functions is provided for online debugging and sound settings*
- *Support lotus head, 3.5mm, USB Type-C, USB Mini interface, developers can directly connect the instrument test*
- *Through Adapter Socket, support to adapt different modules, quickly expand the application scheme.*

Topic: Main Clock frequency: SDK version:	System efficiency 220MHz SDK20_V1.0	*[Note]* *Under USB mode, Sampling accuracy is 24Bit*

Sampling Rate	Audio Path (SDK free dRAM>=217KB)					
	ADC->DAC	I2S->DAC	I2S->I2S	ADC->I2S	USB->DAC	ADC->USB
	SDK available resources					
48K@32bit	94.79%	94.75%	94.1%	94.3%	95.17%	94.36%
96K@32bit	90.59%	90.08%	89.2%	89.6%	93,35%	91.87%
192K@32bit	82.52%	81,38%	79.25%	80.21%	89,59%	85.97%

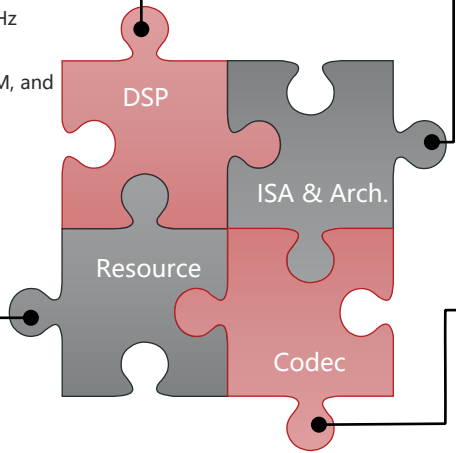
SNC8x Resources

System

- ✓ In a typical application use case, it is used for a 24MHz oscillator
- ✓ HiFi3 core as controller and audio DSP, up to 200MHz
- ✓ Single cycle MAC, vector FPU, SIMD
- ✓ 64KB ROM for system booting, 512KB zero wait RAM, and 48KB zero wait cache
- ✓ On chip 1MB NOR flash memory
- ✓ One unique power supply from 3.3V to 5.5V.
- ✓ DC-DC regulators and LDOs for all on chip supply voltages
- ✓ Build-in hardware accelerators with BQ units.

Interface

- ✓ 1* 256bits eFuse.
- ✓ 1*Uart uint.
- ✓ 2* Auxiliary ADC units.
- ✓ 16*GPIO, multiplexing with other interfaces
- ✓ Type C U SB2.0 HS device, compliant with Audio Class Specification Rev1.0 and Rev2.0
- ✓ 3*full-duplex I2S support up to 32Bit/192K sample rate
- ✓ 2*I2C controller, both support master & slaver mode



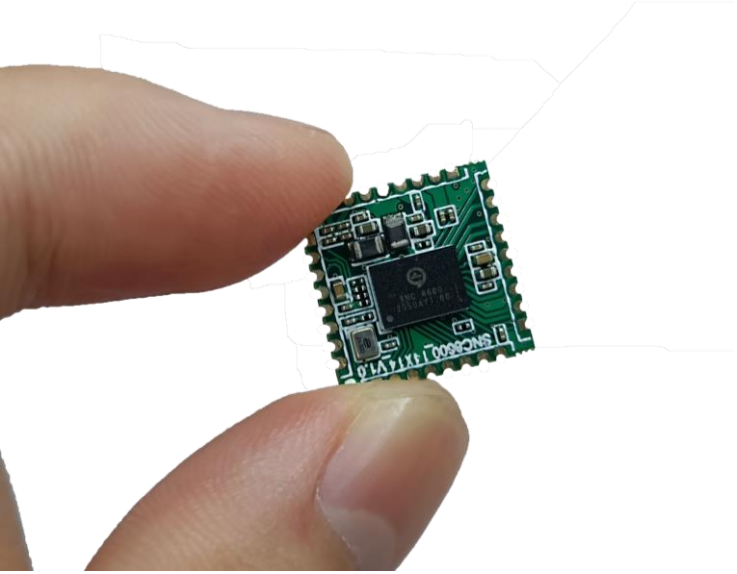
Core

- ✓ HiFi3 is a 3 VLIW slots, good support for 32x16-bit and 32x32-bit multiplication
- ✓ Support multiplication of 4 24-bit, or 4 32x16-bit, or 4 16x16-bit operands per cycle. Support 2 32x32-bit multiplies per cycle.
- ✓ Through an optional floating point unit available, providing for a 2-way SIMD, single-precision IEEE floating point MAC or ALU operation every cycle
- ✓ With the optional floating point unit, HiFi3 supports two IEEE-754 floating point MACs per cycle.

Codec

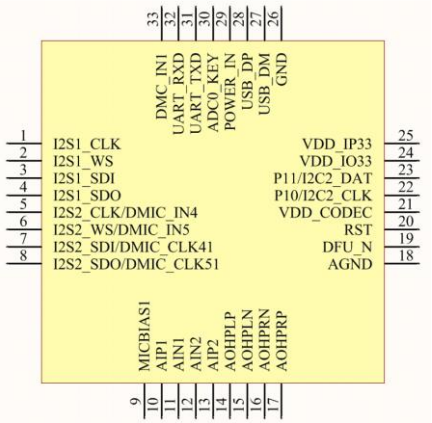
- ✓ Stereo 24bit ADC and DAC
  - ✓ DAC: SNR 100dB, THD+N: - 89dB, DR: 106dBA
  - ✓ ADC: SNR 95dB, THD+N: - 88dB, DR: 110dBA
- ✓ Sample rate：8k, 16k, 32k, 48k, 96k, 192k
- ✓ Up to 8-channel DMIC inputs
- ✓ Support local audio processer: AGC、DRC、Mixer
- ✓ Separate Gain controller for each channel：
  - ✓ Analog gain（12dB~-19dB, 1dB Step）
  - ✓ Digital gain（64dB~-64dB, 1dB Step）

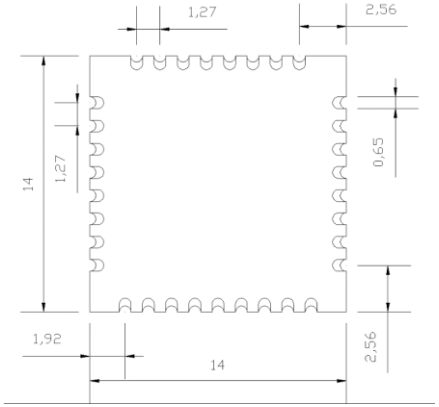
Module — BMT02



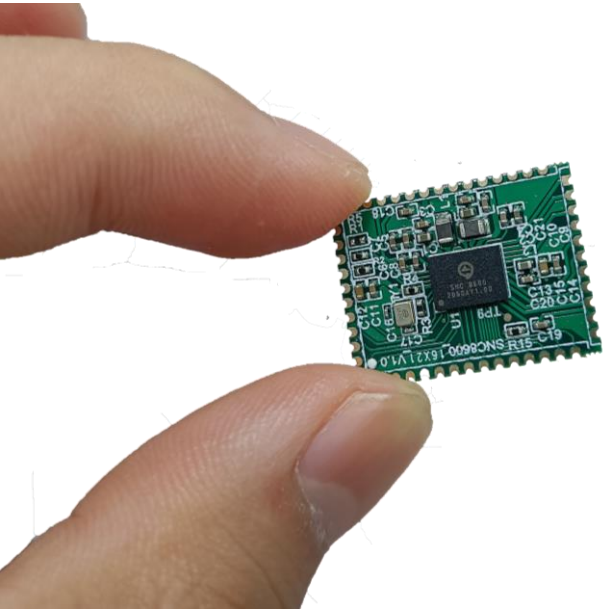
BMT02-14x14

- BMT02 is a voice front-end solution module that supports up to 4 PDM digital microphone inputs.
- It also supports 1 stereo analog differential input, 1 stereo analog differential output, 1 full duplex I2S, 1 I2C, 1 Uart, and 1 USB.
- Main application scenarios:
  - Conference box, IoT, Wireless microphone, USB microphone, etc.
- Size: 14x14 (mm).



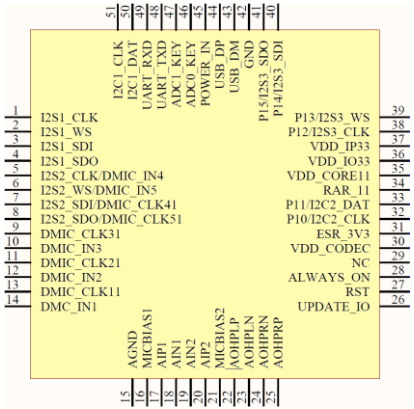


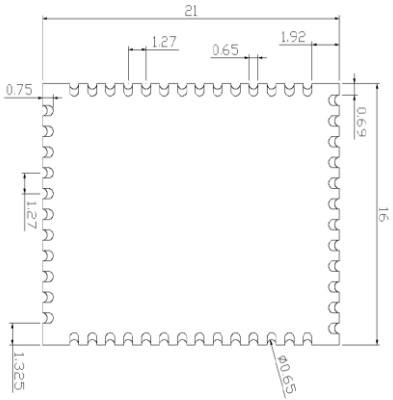
Module — BMT03



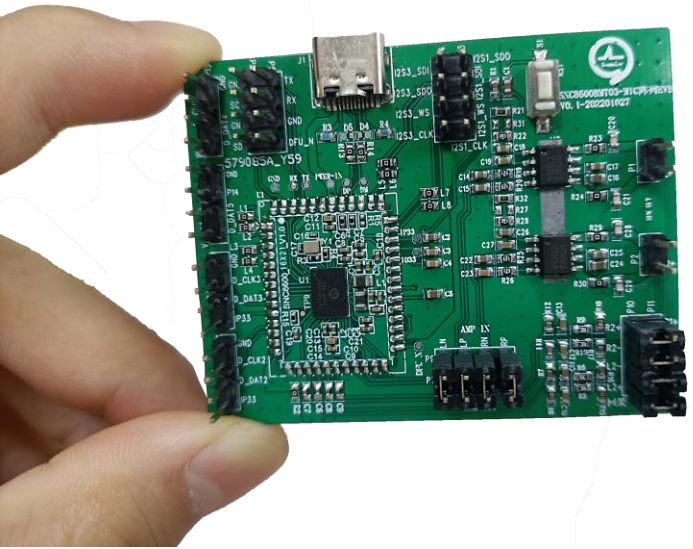
BMT03-26x21

- BMT03 is a voice front-end solution module that supports up to 6 PDM digital microphone inputs.
- It also supports 1 group of stereo analog differential input, 1 group of stereo analog differential output, 3 groups of full duplex I2S, 2 I2C, 1 Uart, and 1 USB.
- Main application scenarios:
  - Conference Box, Speakers, IoT, USB microphone, etc.
- Size: 26x21 (mm).



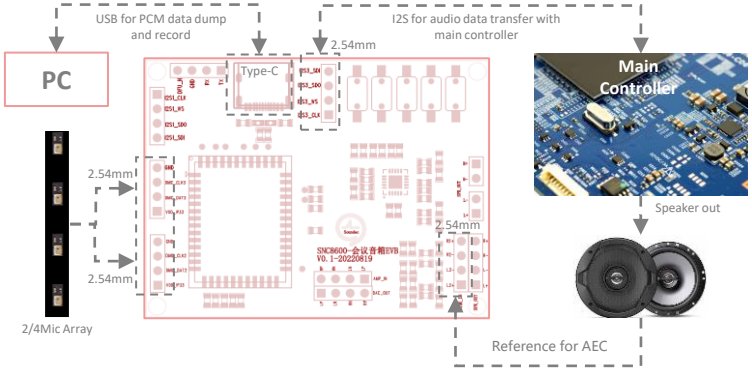


Module — BMT03 Mic Array



BMT03-MicArrayEVB

- BMT03-MicrArrayEVB is a dedicated front-end voice signal processing module that supports microphone array.
- This module supports analog input, analog output, 4 digital PDM microphone inputs, 2 sets of full-duplex I2S output, 1 USB which support UAC1.0 or UAC2.0.
- Combined with the speech algorithm, the following functions can be achieved:
  - Beamforming, Sound Source Location, Voice wake up, Voice enhancement, Echo Cancellation, Noise Reduction, etc.
- Main application scenarios:
  - Smart home, car front end, conference box, IoT, etc.

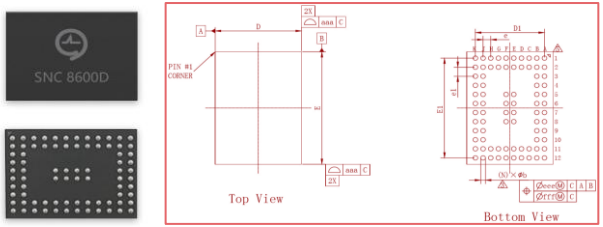


Packaging & Electrical performance

Packaging

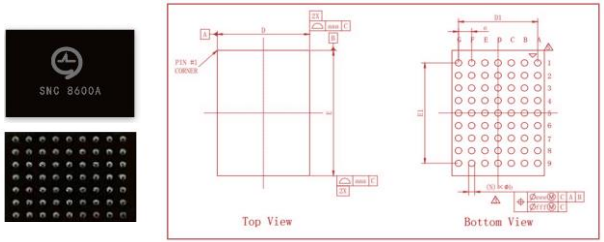
SNC8600: BGA80

E: 6.2mm; D: 4.5mm; e: 0.4mm; e1: 0.5mm



SNC8600A: BGA63

E: 3.5mm; D: 4.5mm; e: 0.5mm; e1: 0.5mm



Main electrical performance

Electrical performance	
Power consumption(5V supply, 32Ω, 48KHz)	
Powe consumption	
I2S-DAC	<=12mA
USB-DAC	<=20mA
Latency	
ADC-DAC	< 3ms
ADC-USB	< 10ms
ADC input Path(24bit,48KHz)	
SNR	106dB
Dynamic range	106dB
THD+N	-88dB
DAC output Path (32Ω 24bit,48KHz GOM/GOD=0dB)	
Output Power	30mW
SNR	101dB
Dynamic range	110dB
THD+N	-81dB
Noise level	< 5uVrms

Developer ecosystem

- Product manuals and evaluation board guidelines which support full-text search.
- Rich development manuals for quickly get started.
- Soundec Studio™ debugging tool support online parameter tuning.
- Online work order system, 8 hours response.
- For more information, please visit https://dev.soundec.com

Shenzhen Soundec Technology Co., Ltd