

# SoC Module for Beamforming



A robust, distant speech acquisition is a requirement for the use of voice control in the Smart Home, voice assistants or voice-controlled user interfaces of industrial plants and machines.

The basis of the robust, distant speech acquisition is the vicSBM developed by voice INTER connect - a SoC module for beamforming and beamsteering for use in serial products. The extremely efficient algorithms of the vicMSES library are able to process up to 16 microphone channels and can be configured for specific applications via the UART interface. vicSBM provides an output signal of outstanding audio quality and high naturalness at the I2S interface - even if the microphone signals are strongly reverberated or noisy originally.

vicSBM provides standardized interfaces for connecting customer-specific microphone arrays, an LED display for signaling the speaker's position, for transferring the cleaned speech signal to the host system and for controlling signal acquisition. The module can also be used standalone, since the ARM Cortex A7 core of the Sharc processor is available for application development.

We also provide a development kit for evaluating your solution - vicDIVA is based on Raspberry PI 3 with a circular 7-microphone array and a vicSBM.

## Product Features

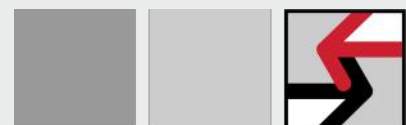
- Small, efficient OEM module for the use of beamforming in series products
- Robust distant voice acquisition
- Suppression of room influences such as reverberation and noise
- Positioning and display of the speaker
- Tracking a speaker in the room

## Applications

- Voice-controlled devices and industrial machines
- Voice control in Smart Homes
- Speech assistants
- Intercom systems in industrial environments
- Video conferencing
- Acoustic room monitoring

**vicSBM**

**Beamforming/Beamsteering for OEM products.**

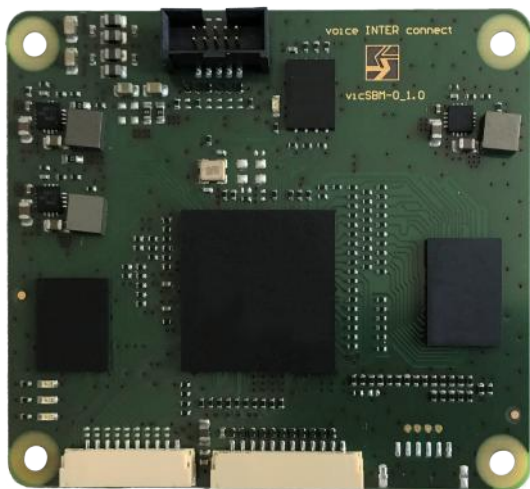


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# Technical Data

## vicSBM SoC Hardware Module

- Power Supply: 3,3 or 5 V
- Current consumption: max. 1000 mA @ 3,3 V  
max. 850 mA @ 5 V
- Operating temperature: -40°C ... 85°C
- Dimensions (LxWxH): 56,5 x 65 x 15 mm
- Form factor: double-sided SoC module
- Weight: 24 g
- Memory: 256 MByte DDR2,  
8 MByte NOR-Flash,  
256 MByte NAND-Flash

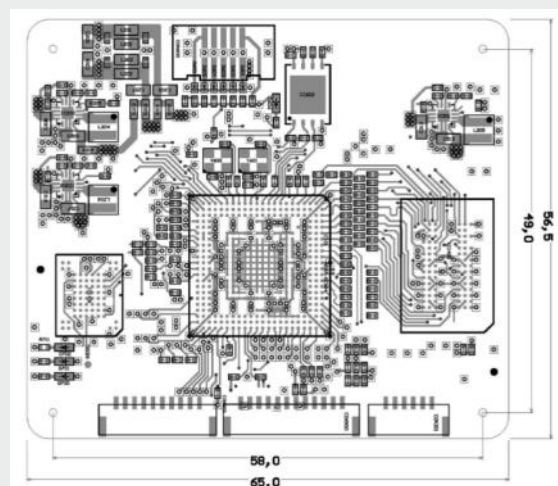


Picture 1: vicSBM - SoC module for beamforming

- Pin Assignment (Inputs / Outputs of the interfaces)
  - Host: 1 x UART  
1 x I2C  
1 x I2S (Stereo in/out)  
1 x SPI  
14 x GPIO
  - Microphone array: 1 x I2S (8 x Stereo in)
  - Aux audio: 1 x I2S (Stereo in/out)  
1 x I2C  
1 x GPIO
  - UART: 2 x UART

## Functions

- Processing of up to 16 MEMS microphones
- Beamforming
- Beamsteering
- Speaker localization and tracking
- Multichannel noise reduction
- Dereverberation
- Streaming of cleared audio signal via I2S interface
- Configuration interface via UART
  - Beamforming on/ off, proceeding
  - Performance of noise reduction
  - Output volume
- Installation location (wall, ceiling, table)



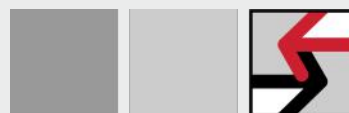
Picture 2: vicSBM dimensions and interfaces

## Demo Kit

- Circular microphone array with 7 MEMS microphones
- vicSBM
- Raspberry PI 3 with demo application:
  - Configuration of vicSBM
  - Voice control via Amazon or Google

## vicSBM SoC module for beamforming

Order number: 3890140001-01



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