

Sonion Voice Pick Up Sensor

Introduction

The Sonion Voice Pick Up Sensor is an accelerometer optimized for picking up wearers' voice using bone conduction and/or pressure generated in a sealed ear canal.

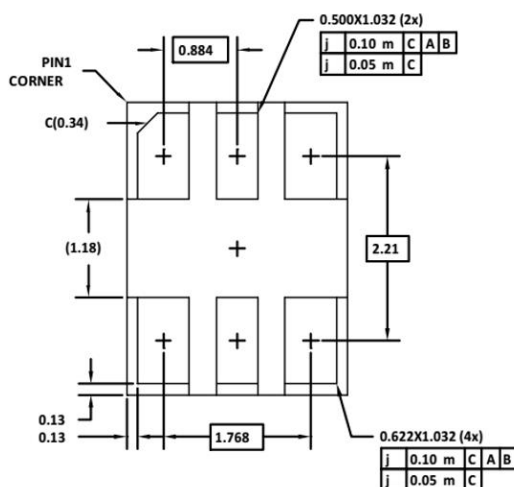
The Voice Pick Up Sensor enables communication in a noisy environment without the need of a boom microphone. Picking up the voice by bone-vibration results in a signal with high own voice to ambient sound ratio. The high audibility signal is needed for accurately controlling a voice operated Operating System, anti-occlusion purposes and creating blind spots for own voice.

The small size makes them ideal for discrete and comfortable communication devices.

Examples of applications:

- Acoustic wearable devices, also known as hearables
- Peripherals for mobile phones
- Surveillance/security communication radios
- Military communication
- Hearing aids

Connection



PIN CONFIGURATIONS AND FUNCTION DESCRIPTIONS

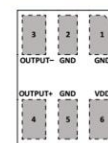


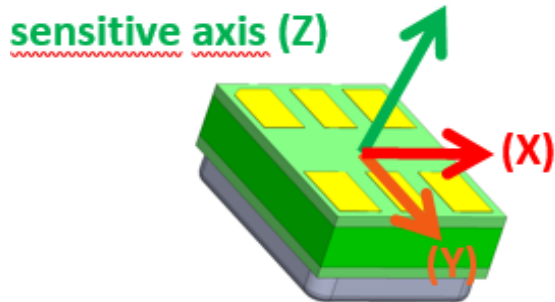
Figure 2. Pin Configuration (Top View, Terminal Side Down)

TABLE 4. PIN FUNCTION DESCRIPTIONS

PIN	NAME	FUNCTION
1	GND	Ground
2	GND	Ground
3	OUTPUT-	Analog Output Signal-
4	OUTPUT+	Analog Output Signal+
5	GND	Ground
6	VDD	Power Supply

Sensor Orientation

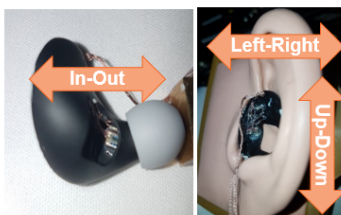
The VPU is sensitive in one direction. The following picture shows the acceleration sensitive axis (Z)



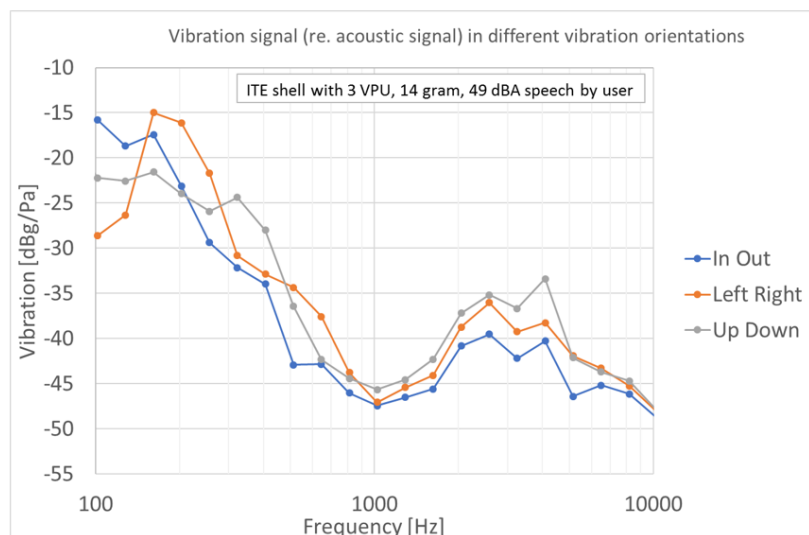
This means that the sensor should be placed in the direction with the most vibration due to the own voice.

In our experiments we conclude that the Left/Right orientation and Up/Down orientation are slightly preferred over the In/Out orientation. Although the difference are small.

3 VPU were placed in 3 orientations in an mock-up ITE shell. These plots show the individual vibration signals per orientation, when user produces speech at 49 dBA.



For this use-case, the shell vibrates most in the left-right and up-down orientations.



Mounting guidelines

For best vibration pickup:

- Place it hard-coupled (cemented) to the shell
- Use stiff dome (or mold)
- Have contact between shell and ear canal
- Orient the VPU of up-down or left-right vibrations

Further study is ongoing, we will update this application note in the coming months.

Handling notes

- For this product please follow general Sonion Handling Instructions
- After assembly in the application: the small vent channel should be closed by lacquer or glue to make sure no acoustical leakage can occur and if required be **IPX7** compliant. If this hole is sealed before the reflow process, there is a risk that the trapped air inside the sensor will expand and causes damage to the sensor.

Suggestions on glue/lacquer type :

Type	Description	Curing	Potlife	Layer thickness
Loctite 3921	UVacrylic	2-5 seconcds 100 mW/cm ² @ 365 nm	-	0.03 mm
Epotek 360	2c Epoxy	1hour@80° C	6 hours	0.03 mm
HI-VEE Lacquer 0652	Clear varnish based on acrylic resin dissolved in white spirit	1-2 hrs@ 20° C 30 mn@100° C	-	0.05 mm