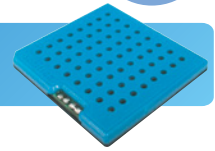


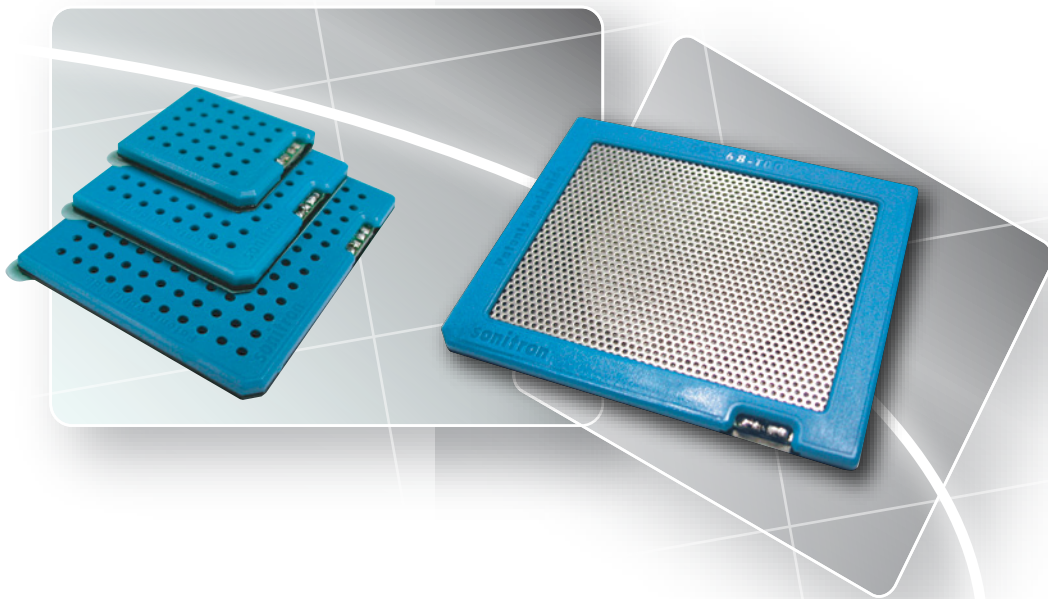
**BLUE LINE SPS SERIES** (Sonitron Polymer/metal Speakers)



**SPS-29/41/53/68-T00 Piezoceramic Audio Speaker**

- louder ✓
- broad frequency range ✓
- fast and easy mountable ✓
- flat and solid construction ✓
- dust, water-and shockproof ✓
- very small current consumption ✓

Blue Line SPS series



## INTRODUCTION

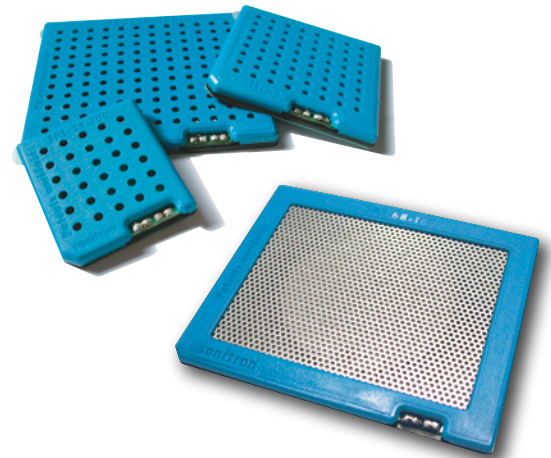
The **Blue line SPS Piezoceramic speaker series** are designed for a broad range of applications.

Equipped with a high power adhesive tape and soldering connection pads the speaker is ready for easy mounting and fast production in every application.

These series are reproducing sound signals at very low distortion (below 1%) and broad frequency range. The casing is designed to avoid sound wave reflection in the air outlet.

The power consumption and current drain are extremely low over the entire frequency response range.

Patented technology guarantees a slim line free form factor.



## ADVANTAGES & APPLICATIONS

### ADVANTAGES :

- very flat and solid construction
- dust, water- and shockproof
- resistant to temperature variations
- broad frequency range in small size
- combined use as speaker/micro
- no electro-magnetic field (EMC)
- little energy required at low frequencies
- less current consumption needed in the leads to the speaker
- 60% higher acoustic output for smaller speakers compared to electrodynamic speakers
- low weight
- low distortion
- high impedance
- can be driven directly by IC

### APPLICATIONS :

- GSM, GPS, PDA
- home equipment & domotics
- communication equipment
- talking buzzer & door bell
- computer equipment
- cars, busses and trains
- vending machines
- multimedia equipment
- industrial equipment
- portable voice recorders
- paging systems
- public address systems
- instrumentation
- cellular phone
- car audio system

## SPECIFICATIONS (Transducer)

| Model                           | SPS-29-T00                     | SPS-41-T00                     | SPS-53-T00                     | SPS-68-T00                     |
|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Frequency Range :               | 1KHz - 20 kHz                  | 450Hz - 20 kHz                 | 300Hz - 20 kHz                 | 250Hz - 20 kHz                 |
| Max SPL @ 10 cm, 60 Vpp:        | 86 dB                          | 90 dB                          | 93 dB                          | 93 dB                          |
| Distortion (%THD):              | ≤1%                            | ≤1%                            | ≤1%                            | ≤1%                            |
| Capacitance (+/- 20%):          | 480 nF                         | 880 nF                         | 960 nF                         | 1160 nF                        |
| Max. voltage PP, sine wave/RMS: | 60Vpp/21.21(V <sub>RMS</sub> ) | 60Vpp/21.21(V <sub>RMS</sub> ) | 60Vpp/21.21(V <sub>RMS</sub> ) | 60Vpp/21.21(V <sub>RMS</sub> ) |
| Weight:                         | 3.1g                           | 5.7g                           | 10.1g                          | 21 g                           |
| Operating Temperature:          | -20°C to 60°C                  | -20°C to 60°C                  | -20°C to 60°C                  | -20°C to 60°C                  |
| Storage Temperature:            | -40°C to 60°C                  | -40°C to 60°C                  | -40°C to 60°C                  | -40°C to 60°C                  |
| Case material:                  | PC                             | PC                             | PC                             | PC + RVS grid                  |

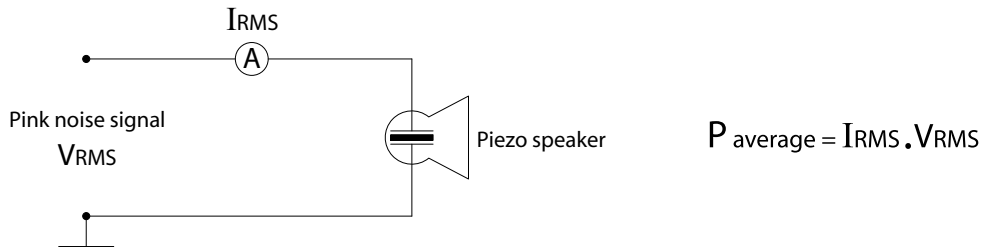
## POWER CONSUMPTION

The average power consumption of the new SPS-series can be calculated by multiplying the RMS-voltage and RMS-current.

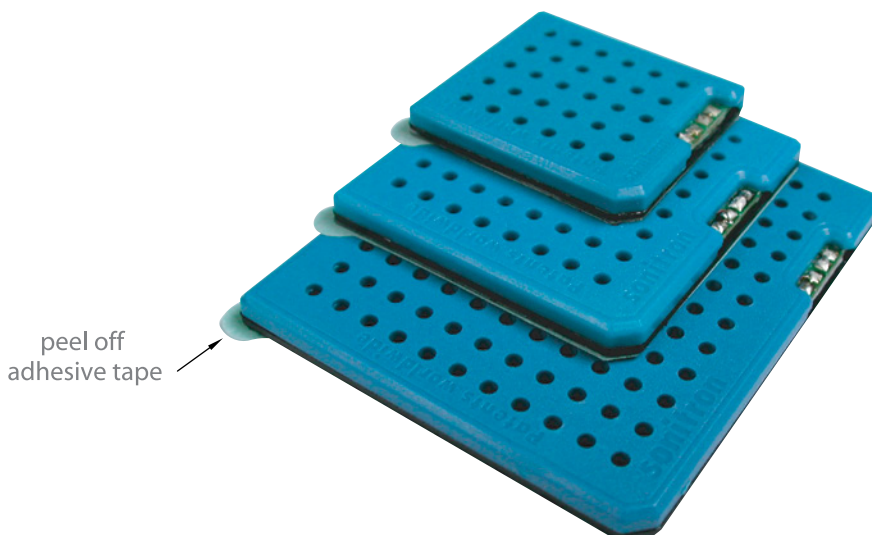
The **RMS-voltage** ( $V_{RMS}$ ) is defined by the input signal. The used signal is a standard pink noise signal with a value of  $10,6/21,21 V_{RMS}$ . This signal has the same energy as a sine wave of  $30/60V_{pp}$ .

Pink noise is an electronic signal that carries equal energy in all octaves (or similar log bundles) over the complete audio frequency range.

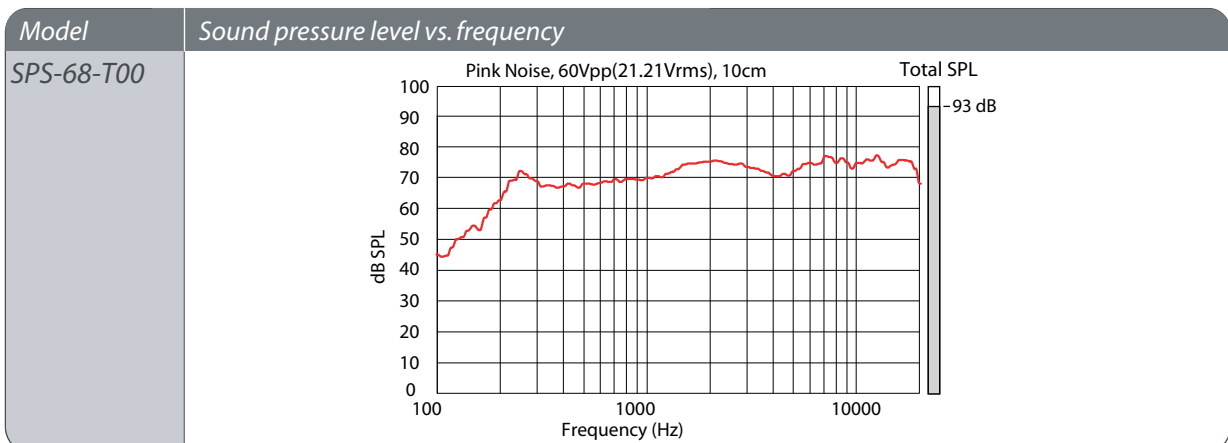
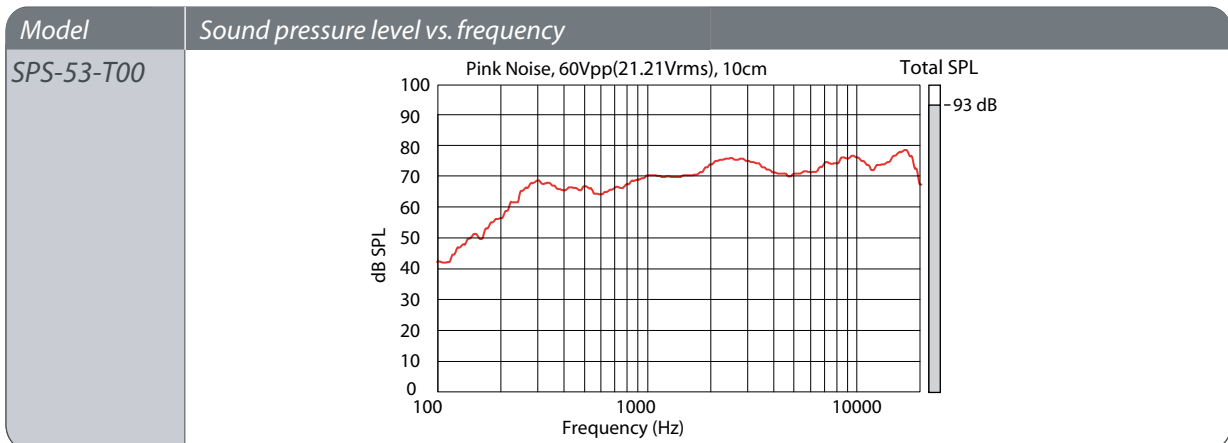
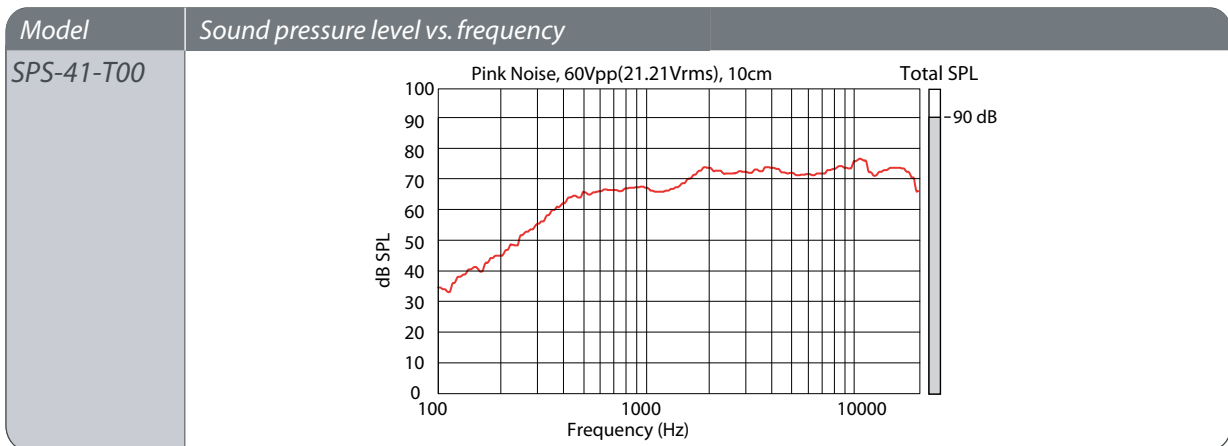
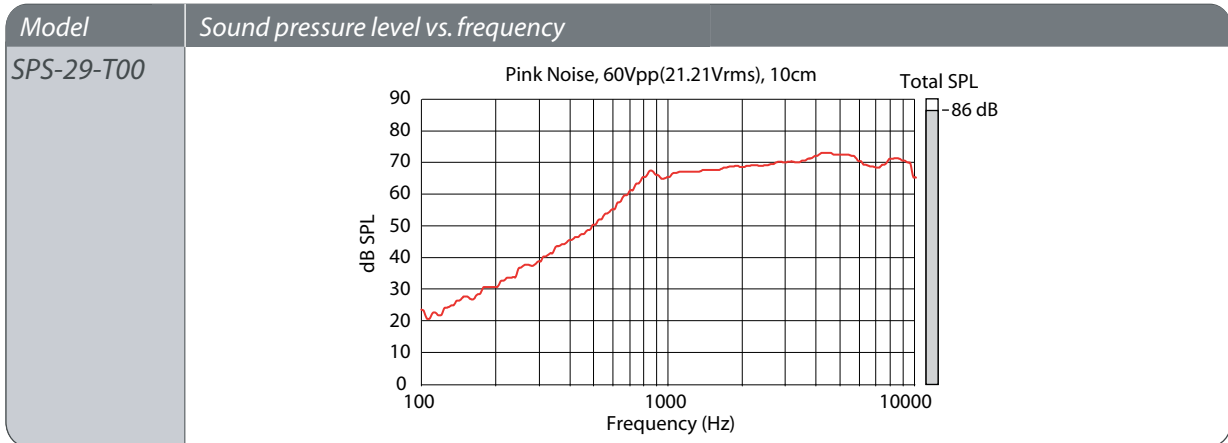
The **RMS-current** ( $I_{RMS}$ ) is measured with a true rms multimeter (Fluke 87V) in series with the speaker. A piezo speaker can mainly be seen as a capacitive load and therefore there will be no DC-current consumption. The only current consumption will be of the AC-current component.



| Model      | 10.6 $V_{RMS}$ (30 Vpp sine)<br>$I_{RMS}=mA$ | 21.21 $V_{RMS}$ (60 Vpp sine)<br>$I_{RMS}=mA$ |
|------------|--|---|
| SPS-29-T00 | 0,25Watt (= 24mA.10,6V)                      | 1,00 Watt (= 47mA.21,21V)                     |
| SPS-41-T00 | 0,48 Watt (= 45mA.10,6V)                     | 1,87 Watt (= 88mA.21,21V)                     |
| SPS-53-T00 | 0,78 Watt (= 74mA.10,6V)                     | 3,05 Watt (= 144mA.21,21V)                    |
| SPS-68-T00 | 1.38 Watt (= 130mA.10,6V)                    | 5.51 Watt (= 260mA.21,21V)                    |

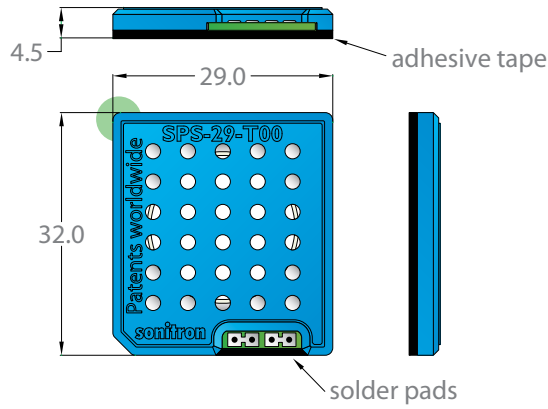


## FREQUENCY RESPONSE

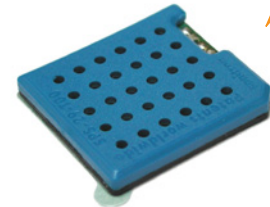


## DIMENSIONS

SPS-29-T00

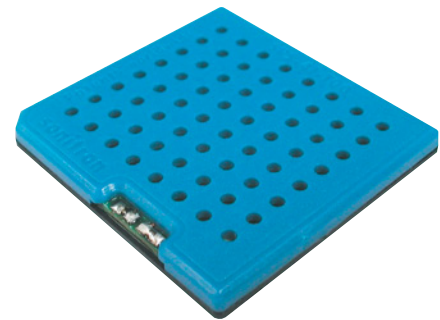
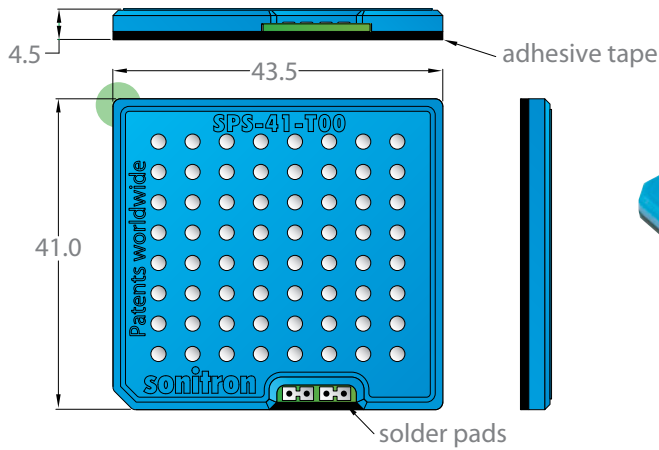


A Blue speaker backside for easy production handling



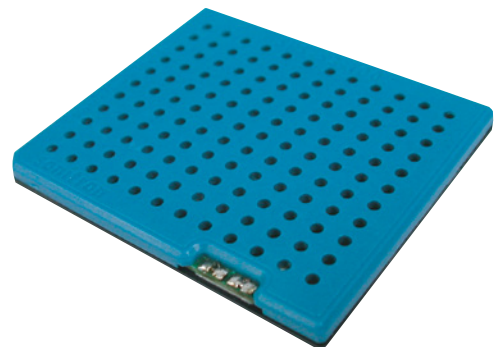
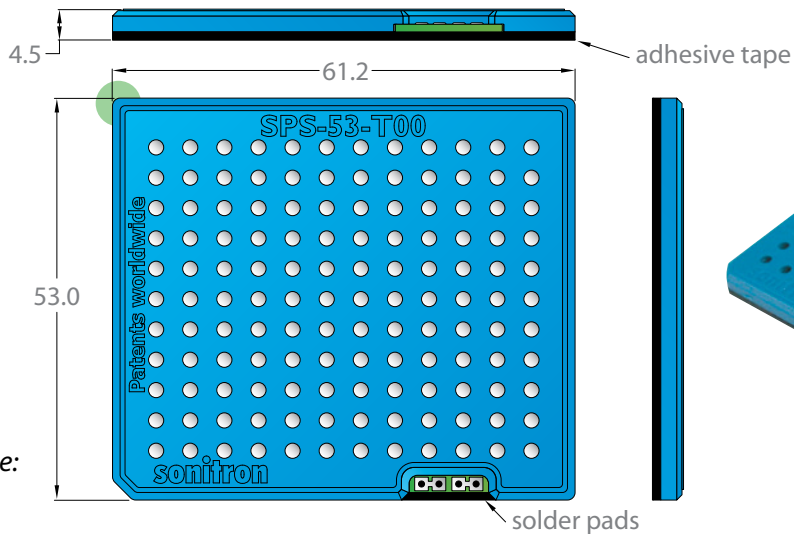
Scale:  
1:1

SPS-41-T00



Scale:  
1:1

SPS-53-T00

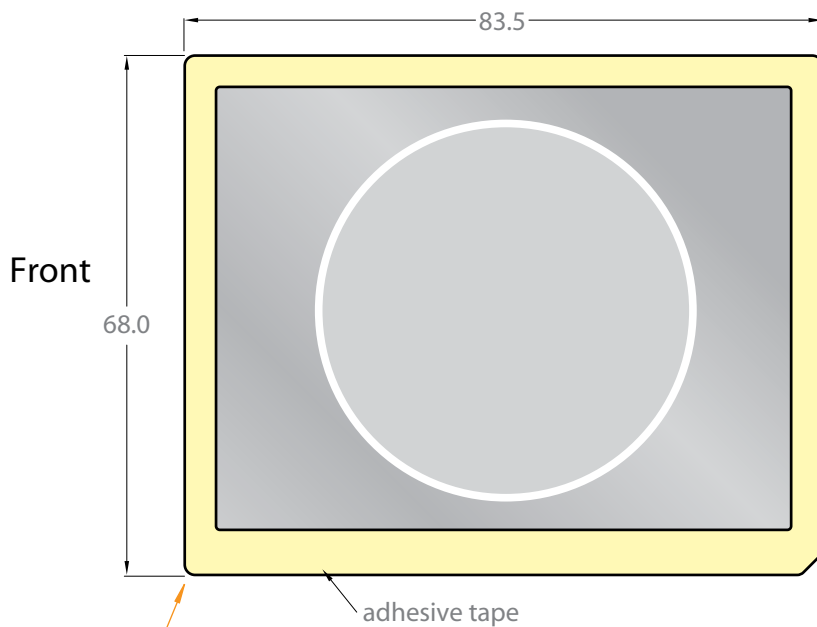
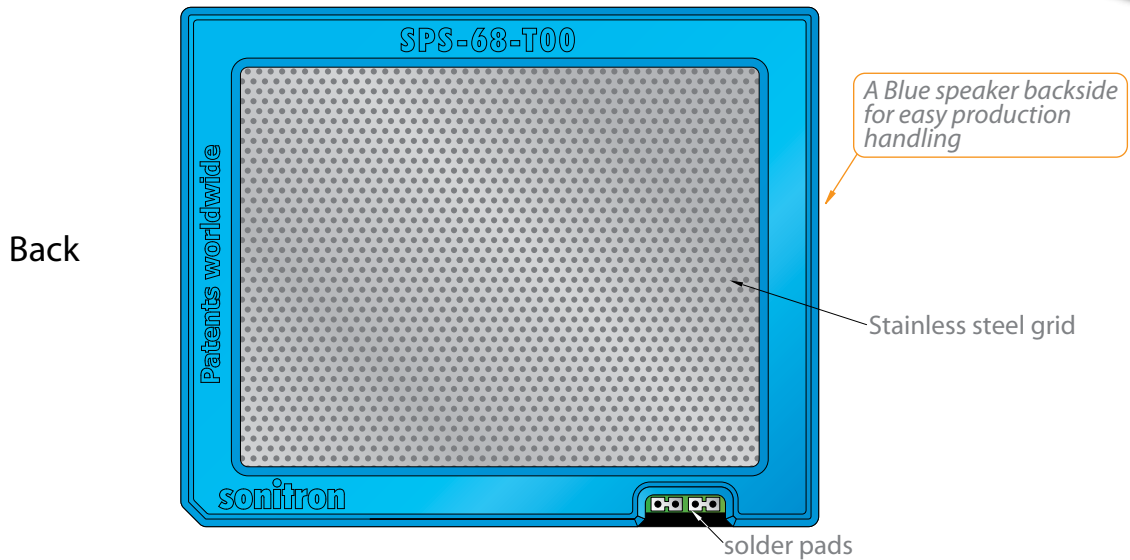
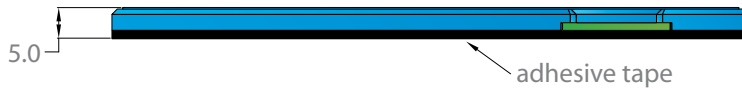


Scale:  
1:1

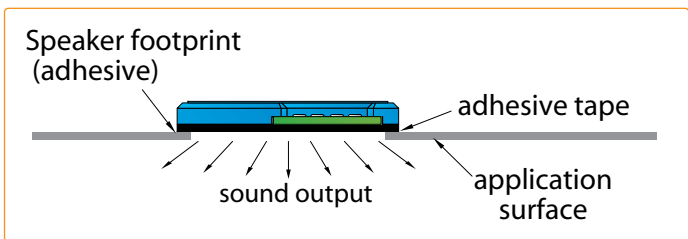
# DIMENSIONS

SPS-68-T00

Scale:  
1:1

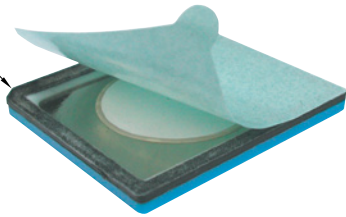


Inclusive adhesive tape for easy mounting into the application

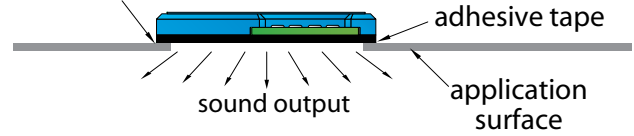


# MOUNTING GUIDELINES

peel-off adhesive tape



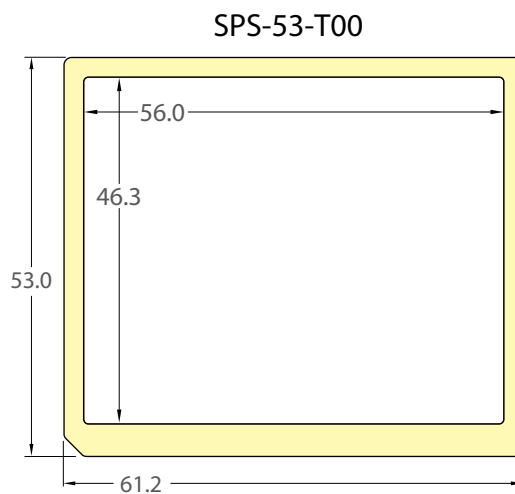
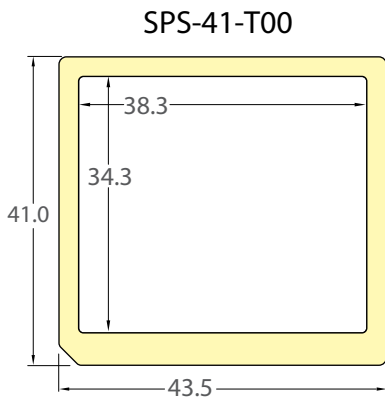
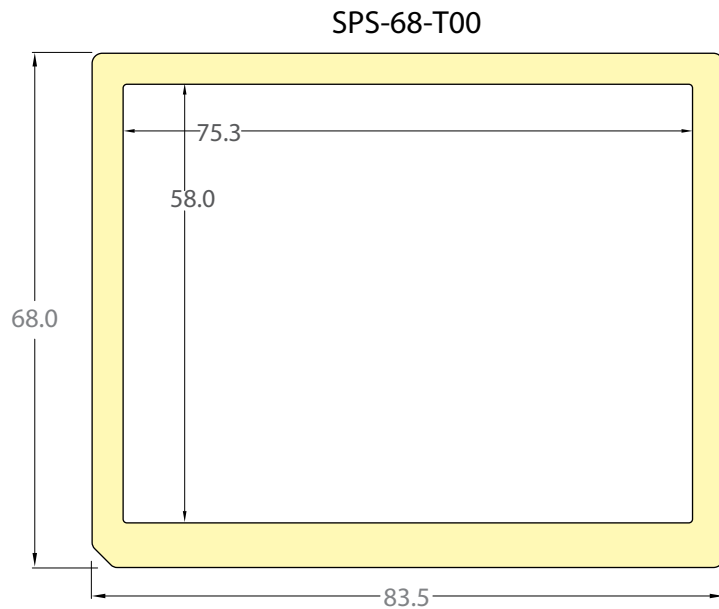
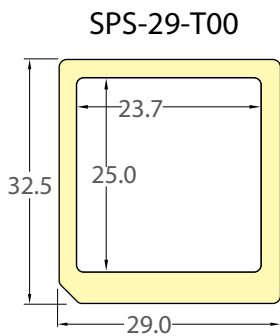
Speaker footprint (adhesive)



on request the speaker can be delivered without adhesive tape

**Important:** speaker grill cloth fabric, foam or other filters can be placed in front of the speaker to specifically "design" the desired sound output.

## Speaker (adhesive) footprint

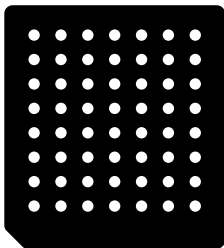


## PRODUCT OPTIONS

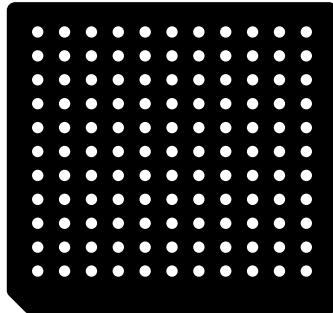
### Option FI (Front Installed) & FS (Front Seperate)

Optional a front panel is available, it is also equipped with adhesive tape for fast assembly to the application. It can be ordered pre-installed (already attached to the speaker) or as a separate part. (Be aware the speaker thickness increases with 1.5 mm.)

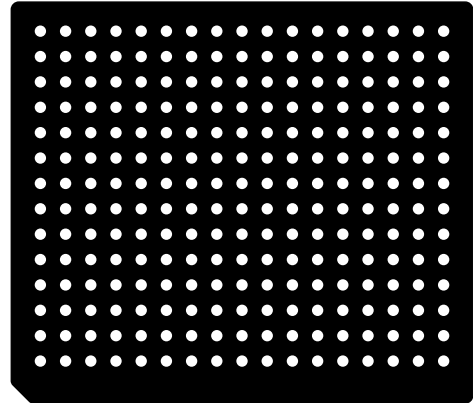
FI & FS option available for the following items:



SPS-29-T00  
FRONT PANEL

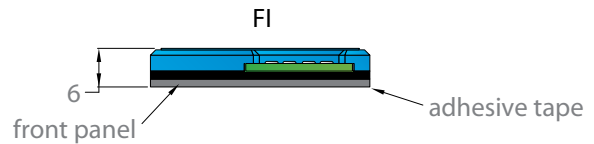
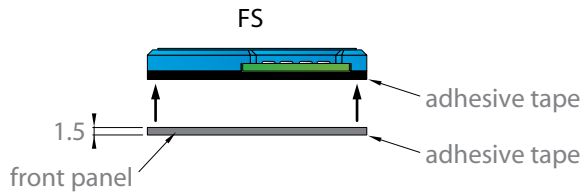


SPS-41-T00  
FRONT PANEL



SPS-53-T00  
FRONT PANEL

Construction example:



To order the speaker with pre-installed front panel add FI to the speaker codification (example: SPS-29-T00-**FI**)

To order the speaker with separate front panel add FS to the speaker codification (example: SPS-29-T00-**FS**)





## PRODUCT CODIFICATION

|                                      |      |            |         |                 |                |
|--------------------------------------|------|------------|---------|-----------------|----------------|
| SPS -                                | 29 - | T          | 00 -    | F I -           | F S            |
| ↓                                    | 41   | ↓          | ↓       | ↓               | ↓              |
| 53                                   | ↓    | ↓          | ↓       | ↓               | ↓              |
| 68*                                  | Size | Transducer | Version | Front Installed | Front Separate |
| Sonitron<br>Polymer/metal<br>Speaker |      |            |         |                 |                |

\*The SPS-68-T00 is always delivered without front. (standard with adhesive tape)

## LIST OF AVAILABLE PRODUCT TYPES

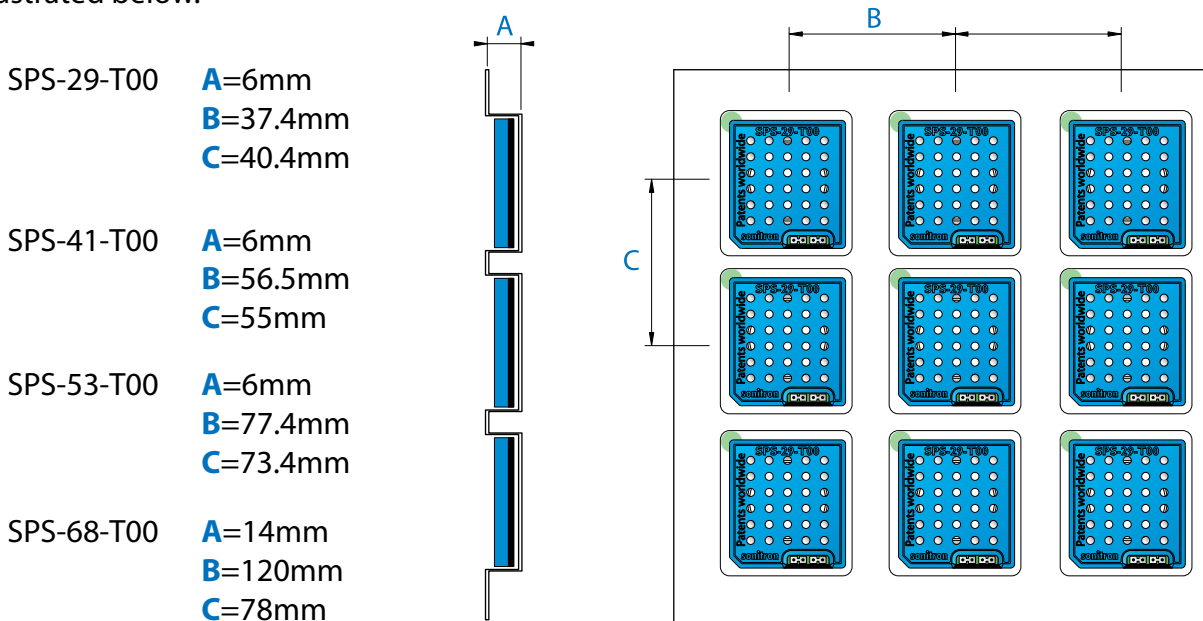
| Standard   | Optional      | Optional      |
|------------|---------------|---------------|
| SPS-29-T00 | SPS-29-T00-FI | SPS-29-T00-FS |
| SPS-41-T00 | SPS-41-T00-FI | SPS-41-T00-FS |
| SPS-53-T00 | SPS-53-T00-FI | SPS-53-T00-FS |
| SPS-68-T00 | Not available | Not available |

## PACKAGING

The SPS-29-T00/41-T00/53-T00/68-T00 are packed in trays (245 L x 245 W) and sold in boxes with dimensions of 250 L x 250 W x 125 H.

| Model    | SPS-29-T00 | SPS-41-T00 | SPS-53-T00 | SPS-68-T00 |
|----------|------------|------------|------------|------------|
| per tray | 30         | 16         | 9          | 6          |

Dimensions of the tray and position of the SPS-speakers SPS-29-T00/41-T00 and 53-T00 are illustrated below.



## RECOMMENDED PIEZO AUDIO AMPLIFIERS

### Integrated Circuits

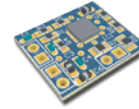
**Maxim**  
MAX9788

**National semiconductor**  
LM4960

**Texas Instruments**  
TPA2100P1

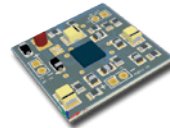
### Sonitron production models

20Vpp amplifier



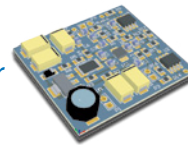
**PAA-MAX-9788-01**

24Vpp amplifier



**PAA-LM4960SQ-02**

60Vpp amplifier



**PAA-StepUpBTL-01**

For more information about PAA-amplifiers, go to "PAA application documents" on our website.

## AVAILABLE DEMO-UNIT AND SAMPLE-KIT



### DU6597 & DU65SB

The demonstration unit DU6597 or DU65SB is the ideal way to have a first introduction to piezoceramic audio speaker technology.

### PAA Sample kit

The PAA Sample kit gives you the freedom to do experiments with a piezoceramic audio speaker SPS-6555-03 and four different piezo audio amplifiers. The SPS-6555-03 piezo speaker is built-in a small case for optimum sound quality.

PAA amplifiers:

- PAA-LT3469-01
- PAA-MAX9788-01
- PAA-LM4960SQ-02
- PAA-StepUpBTL-01

