

# Compression Sensing Element

#OSEC — Compression Sensing Element



## Technical Data Sheet

### Product overview

Compression Sensing Elements are soft and highly precise, designed to measure the forces between the human body and objects such as shoes and wearable devices.

Purpose-built for rapid prototyping, the Compression Sensing Elements are enclosed within a fabric pouch, allowing for integration into garments such as socks, insoles or gloves through sewing. All units connect to the 10-channel SPI Sensing Board which pairs with the Android and iOS data visualization apps.



Figure 1 – Compression Sensing Element

### Features

- **Soft and lightweight for unobtrusive and comfortable measurement of compression**
- **Easy sewing or gluing integration methods into garments**
- **Highly precise measurement of deformation**

### Applications

- **Smart garments**
- **Sports and fitness**
- **Wearables**
- **VR/AR**

The data displayed in this document uses aggregated test data tested at room temperature. These values are indicative only; individual sensing element performance may vary.

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# 1. Physical Specifications

## 1.1 Technical Drawing

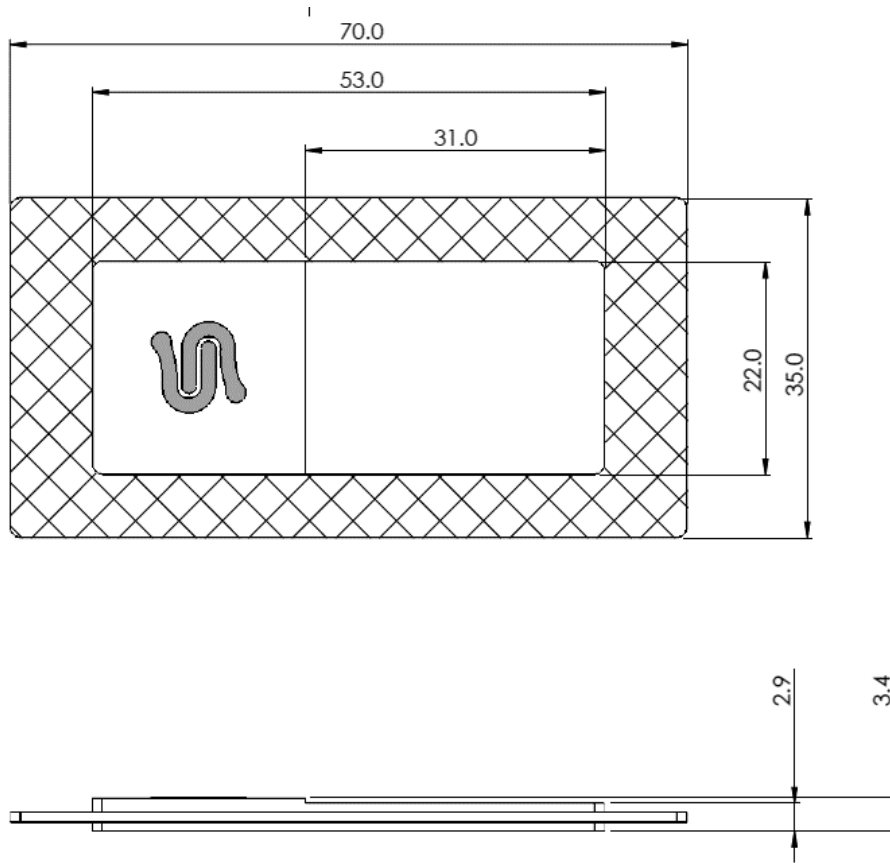


Figure 2 - Engineering drawing of a Compression Sensing Element

## 1.2 Dimensions

Zone	Thickness (mm)	Tolerance (mm)	Length (mm)	Tolerance (mm)	Width (mm)	Tolerance (mm)
Active Sensing Zone	2.90	±0.2	31.0	±1.0	22.0	±1.0
Overall Dimensions	3.40	±0.2	70.0	±2.00	35.0	±2.00
Coaxial Cable length	-	-	1000	±1.00	0.445	-

## 2. Specifications

### 2.1 Sensing Characteristics

Parameter	Typ	Units	Notes
Base Capacitance	~465	pF	At 0kg load (rest)
Max. Capacitance <sup>1</sup>	~1225	pF	At 80kg load
Max. Error <sup>2</sup>	± 8	kg	At 1000pF
Noise	± 0.23	pF	
Operating Temperature Range	10 - 30	°C	Recommended range only
Cable length	1.0	m	Coaxial cable
Connection pitch	2.54	mm	2-position FPC connector (Digi-key 609-2158-ND)

<sup>1</sup> Requires silicone buffers (durometer Shore 30A) of 9mm thickness as per Figure 2.

<sup>2</sup> Maximum error can be reduced for load values below 80kg (reducing the maximum capacitance accordingly).

### 2.2 Capacitance vs Load

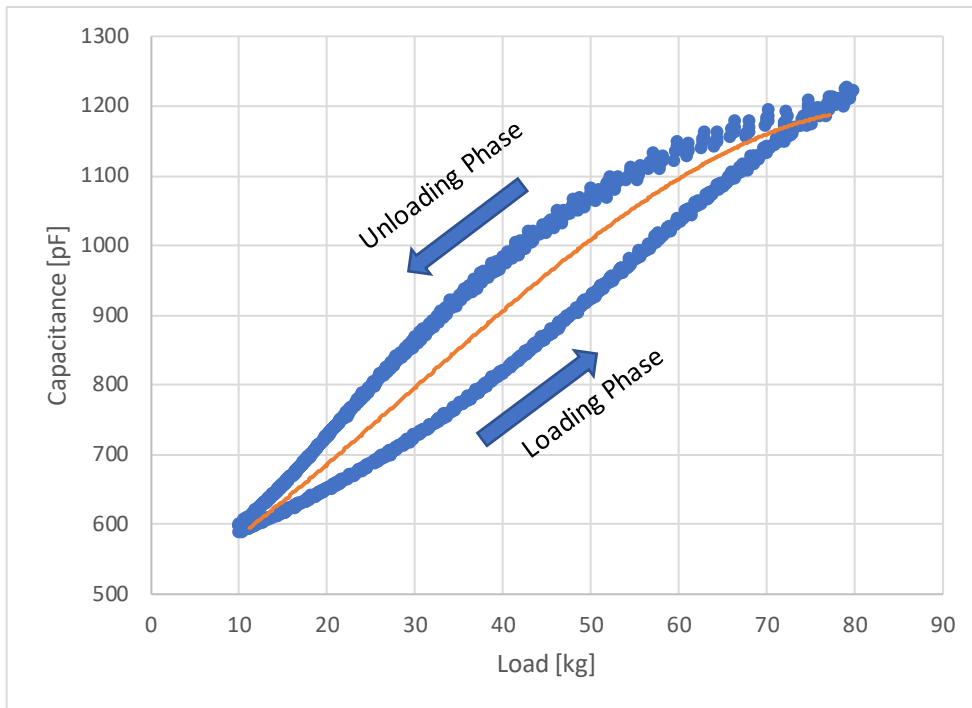


Figure 3 – Typical capacitance vs. load response of a dielectric compression sensor showing hysteresis during loading and unloading phases (here between 10kg and 80kg)

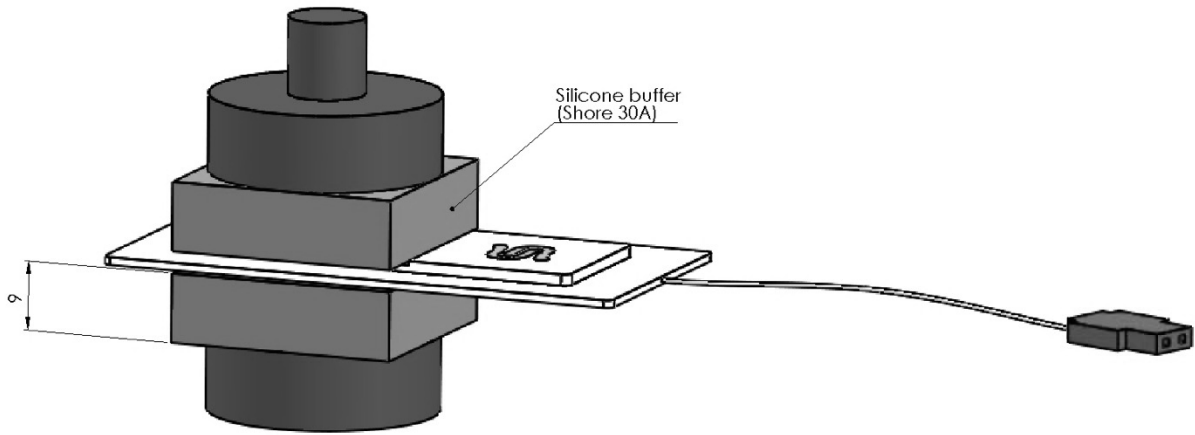


Figure 4 – Illustration of mechanical test setup for establishing capacitance vs load graph.

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