StretchFABRIC Sensing Element

SSD18 – StretchFABRIC Sensing Element

For sensors purchased before 20/12/2018, please refer to the OSEF StretchFABRIC Datasheet or contact us at sales@stretchsense.com

Technical Datasheet

Product overview

StretchFABRIC sensors are soft, flexible, and precise making them ideal for the measurement of soft object deformation. They connect to 10-channel SPI Sensing Boards which pair with the Android and iOS data visualization apps.

StretchFABRIC sensors come bonded onto white fabric providing an integration zone for easy sewing into garments. They connect to 10 Channel SPI boards via 2-pin female connectors.

![Figure 1: StretchFABRIC sensor](image)

Features
- Soft, flexible, and lightweight for unobtrusive and comfortable measurement of motion
- Easy sewing integration 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

1.2 Dimensions

![Diagram of StretchFABRIC Sensing Element]

<table>
<thead>
<tr>
<th>Zone</th>
<th>Length (mm)</th>
<th>Tolerance (mm)</th>
<th>Width (mm)</th>
<th>Tolerance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Sensing Zone</td>
<td>70.0</td>
<td>±1.00</td>
<td>10.0</td>
<td>±1.00</td>
</tr>
<tr>
<td>Overall Silicone Zone</td>
<td>85.0</td>
<td>±2.00</td>
<td>22.0</td>
<td>±2.00</td>
</tr>
<tr>
<td>Fabric Backing</td>
<td>127</td>
<td>±2.00</td>
<td>35.0</td>
<td>±4.00</td>
</tr>
<tr>
<td>Coaxial Cable Length</td>
<td>1000</td>
<td>±1.00</td>
<td>0.445</td>
<td>-</td>
</tr>
</tbody>
</table>

NOTES:
- DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED
- LINEAR TOLERANCE ± 1mm UNLESS OTHERWISE SPECIFIED

Figure 2: Engineering Drawing of a StretchFABRIC Sensing Element
2. Specifications

2.1 Sensing Characteristics

The data below was collected under the following testing conditions:

- The sensors were clamped on both ends
- The sensors were pre-stretched to remove any slack
- The sensors underwent uniaxial stretch up to 80% stretch

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Min</th>
<th>Typ.</th>
<th>Max</th>
<th>Units</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Capacitance</td>
<td>410</td>
<td>445</td>
<td>480</td>
<td>pF</td>
<td>Notes</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>3.98</td>
<td>5.30</td>
<td>6.30</td>
<td>pF/mm</td>
<td>Notes</td>
</tr>
<tr>
<td>Noise With Standard 10 Channel Circuit (3 Sigma)</td>
<td>0.13</td>
<td>0.16</td>
<td>0.50</td>
<td>pF</td>
<td>Notes</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>10.0</td>
<td>30.0</td>
<td>°C</td>
<td>Notes</td>
<td>Recommended range only</td>
</tr>
<tr>
<td>Connection Pitch</td>
<td>2.54</td>
<td>2.54</td>
<td>mm</td>
<td>Notes</td>
<td>Notes</td>
</tr>
</tbody>
</table>

*All values shown at 3 s.f.*

*Base capacitance includes a cable capacitance of 117 ± 3pF*
2.2 Capacitance vs Extension

Linear Fit

Figure 3: Typical StretchFABRIC Sensing Element performance based on a linear fit

Quadratic Fit

Figure 4: Typical StretchFABRIC Sensing Element performance based on a quadratic fit
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