New Features

Compared to the Original Flex Sensor, SpectraFlex:
- has Better Repeatability!
- has Less Signal Drift!
- is More Flexible!
- and has an even Lower Profile!
(see comparison table for more details)

Mechanical Specifications
- Life Cycle: >2 million cycles with a bend angle of 180° over an 8mm (0.315") radius
- Recommended Bend Radius: 2.5mm to 8mm
- Thickness: 0.13mm (0.005")
- Temperature Range: -35°C to +80°C

Electrical Specifications
- Flat Resistance: Varies with length, see Dimensional Diagram below
- Bend Resistance: greater than or equal to 2 times the flat resistance at 180° on an 8mm (0.315") radius (see "How it Works" below), the 55mm version can achieve greater than or equal to 4 times the flat resistance.
- Power Rating (depending on size, varies with length and temperature): 1 Watt max. @ 25°C, 0.5 Watt recommended

Electrical Schematic

Material Cross-section
0.13 [0.005] TOTAL THICKNESS*

* sensor only - pins and connector will be thicker and the thickness is dependent on the type of pin/connector selected

How It Works
An 180° bend with a 2.5mm to 8mm radius equates to a value greater than 2x the Flat Resistance

Dimensional Diagram - Stocked Sizes

<table>
<thead>
<tr>
<th>Stocked Size (mm)</th>
<th>Part Length (P)</th>
<th>Active Length (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.37</td>
<td>2.165&quot;</td>
<td>95.25mm</td>
</tr>
<tr>
<td>95.25</td>
<td>3.750&quot;</td>
<td>127.51mm</td>
</tr>
</tbody>
</table>

Conductive Inks This Side

Ω

FLAT

12,000

18,000
## How to Order - Stock SpectraFlex Sensors

<table>
<thead>
<tr>
<th>FLX</th>
<th>L</th>
<th>0095</th>
<th>183</th>
<th>ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>Model</td>
<td>Active Length</td>
<td>Resistance</td>
<td>Connectors</td>
</tr>
<tr>
<td>FLX = SpectraFlex</td>
<td>L = Linear</td>
<td>0055 = 55.37mm</td>
<td>0095 = 95.25mm</td>
<td>ST = Solder Tabs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MP = Male Pins</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RH = Plain Housing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RLU = Latch Up</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RLD = Latch Down</td>
</tr>
</tbody>
</table>

### Comparison Chart - Original Flex Sensor [FS] vs SpectraFlex [FLX]

<table>
<thead>
<tr>
<th>SPECIFICATION</th>
<th>FS</th>
<th>FLX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substrate</strong>: the base material of the sensor</td>
<td>Polyimide</td>
<td></td>
</tr>
<tr>
<td><strong>Finished Overall Thickness</strong>:</td>
<td>0.43mm [0.017”]</td>
<td>0.13mm [0.005”]</td>
</tr>
<tr>
<td><strong>Flat Resistance (Ohms)</strong></td>
<td>10,000 ±30%</td>
<td>95mm = 18,000 ±20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>55mm = 12,000 ±20%</td>
</tr>
<tr>
<td><strong>Resistance Change Multiplier</strong>: \textit{defined as a function of bend radius (8mm) and angular deflection (180°)}</td>
<td>&gt;2x</td>
<td>95mm = &gt;2x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>55mm = &gt;4x</td>
</tr>
<tr>
<td><strong>Repeatability</strong>: \textit{under controlled conditions}</td>
<td>Never characterized.</td>
<td>±2%</td>
</tr>
<tr>
<td><strong>Bidirectional</strong>: \textit{defined as measurable and repeatable output when bent in either direction}</td>
<td>No, should only be bent in the direction shown in the “How it Works” section.</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temperature</strong>:</td>
<td>-35°C to +80°C</td>
<td>-35°C to +80°C</td>
</tr>
<tr>
<td><strong>Power Rating</strong>: 5VDC, +25°C</td>
<td></td>
<td>0.5 Watt continuous, 1 Watt Peak</td>
</tr>
<tr>
<td><strong>Customizable</strong>:</td>
<td>Yes, will require extra NRE and Tooling charges.</td>
<td></td>
</tr>
</tbody>
</table>
"The impedance buffer in the Basic Flex Sensor Circuit (above) is a single-sided operational amplifier, used with these sensors because the low bias current of the op-amp reduces error due to impedance of the flex sensor as voltage divider. Suggested op-amps are the LM358 or LM324."

"You can also test your flex sensor using the simplest circuit, and skip the op-amp."

"Adjustable Buffer - a potentiometer can be added to the circuit to adjust the sensitivity range."

"Variable Deflection Threshold Switch - an op-amp is used and outputs either high or low depending on the voltage of the inverting input. In this way, you can use the flex sensor as a switch without going through a microcontroller."

"Resistance to Voltage Converter - use the sensor as the input of a resistance to voltage converter using a dual-sided supply op-amp. A negative reference voltage will give a positive output. Should be used in situations when you want to output at a low degree of bending."