



## 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)

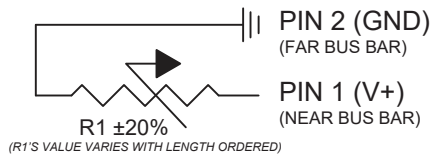
## Mechanical Specifications

- 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

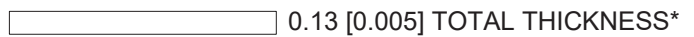
## Electrical Specifications

- 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

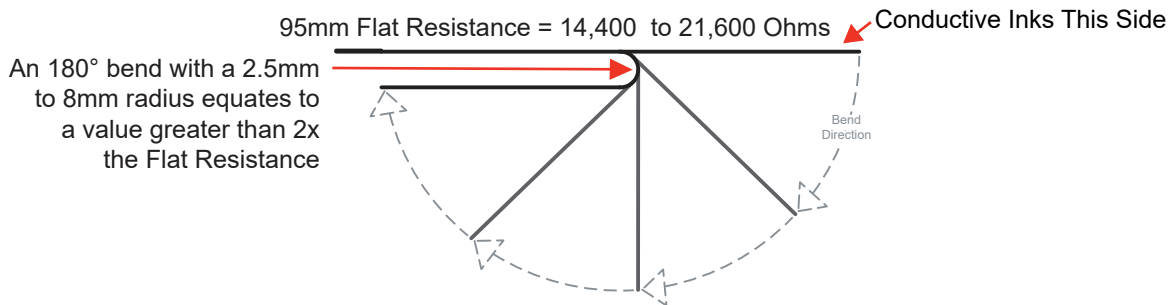


## Material Cross-section

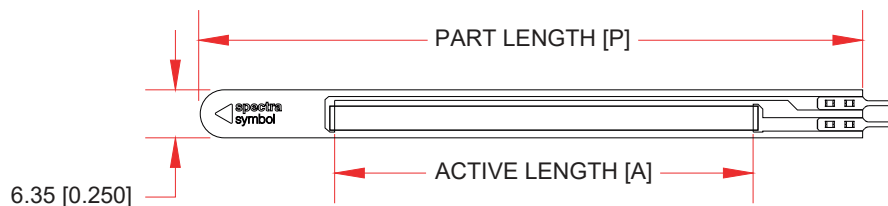


\* sensor only - pins and connector will be thicker and the thickness is dependent on the type of pin/connector selected

## How It Works

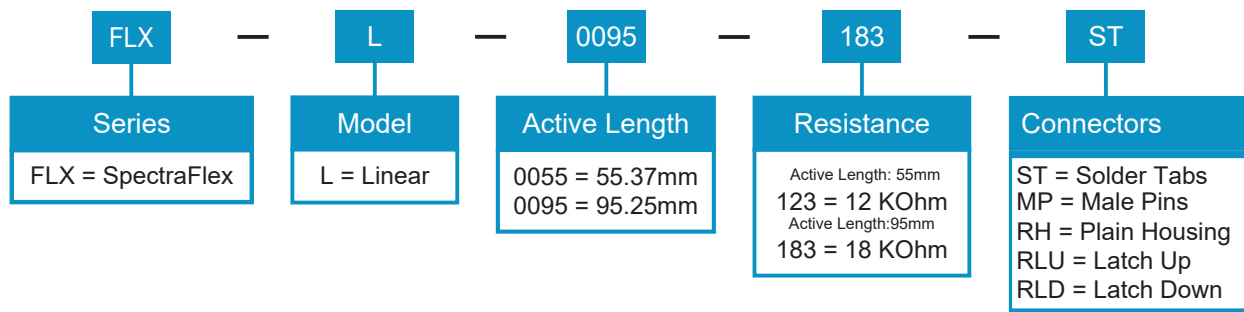


## Dimensional Diagram - Stocked Sizes



A	55.37mm 2.165"	95.25mm 3.750"
P	87.63mm 3.450"	127.51mm 5.020"
$\Omega_{FLAT}$	12,000	18,000

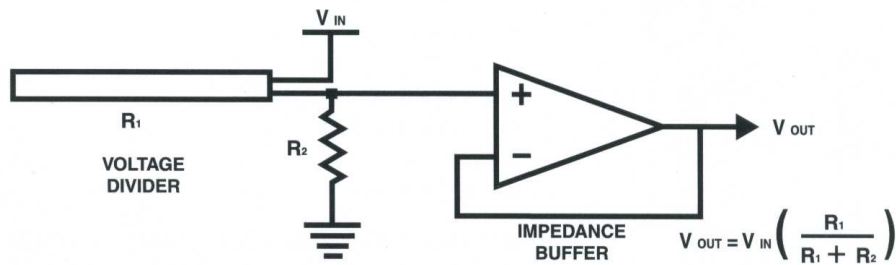
## How to Order - Stock SpectraFlex Sensors



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

SPECIFICATION	FS	FLX
<b>Substrate:</b> the base material of the sensor	Polyimide	
<b>Finished Overall Thickness:</b>	0.43mm [0.017"]	0.13mm [0.005"]
<b>Flat Resistance (Ohms):</b>	10,000 ±30%	95mm = 18,000 ±20% 55mm = 12,000 ±20%
<b>Resistance Change Multiplier:</b> <i>defined as a function of bend radius (8mm) and angular deflection (180°)</i>	>2x	95mm = >2x 55mm = >4x
<b>Repeatability:</b> <i>under controlled conditions</i>	Never characterized.	±2%
<b>Bidirectional:</b> <i>defined as measurable and repeatable output when bent in either direction</i>	No, should only be bent in the direction shown in the "How it Works" section.	
<b>Operating Temperature:</b>	-35°C to +80°C	-35°C to +80°C <i>(currently testing up to 150°C)</i>
<b>Power Rating:</b> 5VDC, +25°C	0.5 Watt continuous, 1 Watt Peak	
<b>Customizable:</b>	Yes, will require extra NRE and Tooling charges.	

**BASIC FLEX SENSOR CIRCUIT:**

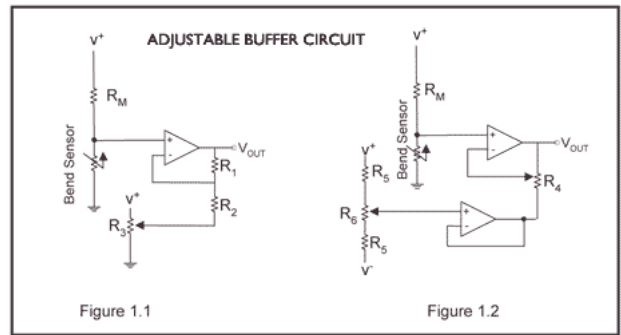


Following are notes from the ITP Flex Sensor Workshop

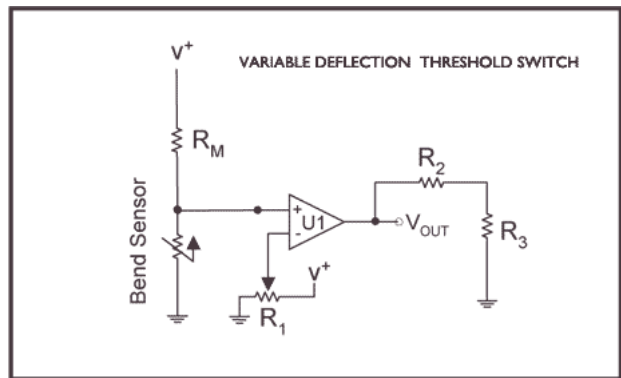
"The impedance buffer in the Basic Flex Sensor Circuit (above) is a single-sided operational amplifier, used with these sensors because the low bias current of the op-amp reduces error due to impedance of the flex sensor as voltage divider. Suggested op-amps are the LM358 or LM324."

"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."

