

# FSR Series

## Force Sensing Resistor



The Ohmite FSR series exhibits the unique characteristic of dynamic resistance related to the amount of applied force. In general, the more force applied to the surface of the sensor, the lower the resistance. The resistance change is inversely proportional to the applied force. Typical force-sensing resistors are characterized for Human-Machine Interface (HMI) or Machine-Machine Interface (MMI) applications with a sensing range from circa 20g to 5Kg. Specific device characteristics will depend on the size, shape and materials used in construction. Force-sensing resistors are intended for applications where a delta in applied force is to be detected. They are not intended for high accuracy or specific weight measurement applications.



### SERIES SPECIFICATIONS

| Series | Active area      | Thickness (inc. 0.05mm adhesive) | Sensor overall width | Sensor overall length | Tail length | Tail width |
|--------|------------------|----------------------------------|----------------------|-----------------------|-------------|------------|
| FSR01  | 39.70 x 39.70mm  | 0.375mm                          | 43.69 x 43.69mm      | 83.09mm               | 39.40mm     | 7.62mm     |
| FSR02  | 604.60 x 10.20mm | 0.375mm                          | 15.20mm              | 622.30mm              | 12.70mm     | 7.60mm     |
| FSR03  | ø25.42mm         | 0.425mm                          | 30.50mm              | 69.00mm               | 38.00mm     | 7.62mm     |
| FSR04  | ø5.60mm          | 0.325mm                          | 7.62mm               | 15.80mm               | 9.00mm      | 6.35mm     |
| FSR05  | ø5.60mm          | 0.325mm                          | 7.62mm               | 38.10mm               | 30.00mm     | 6.35mm     |
| FSR06  | ø14.70mm         | 0.375mm                          | 18.00mm              | 25.00mm               | 9.00mm      | 7.62mm     |
| FSR07  | ø14.70mm         | 0.375mm                          | 18.00mm              | 56.34mm               | 38.00mm     | 7.62mm     |

### CHARACTERISTICS

| Characteristic                    | Description  | FSR01             | FSR02 | FSR03 | FSR04 | FSR05 | FSR06 | FSR07 |
|-----------------------------------|--|-------------------|-------|-------|-------|-------|-------|-------|
| <b>Actuation force</b>            | Force to reach 10MΩ, Average of 100 samples  | < 20g             | < 20g | < 10g | <20g  | <30g  | <15g  | <15g  |
| <b>Force range</b>                | linear region of log/log, Higher forces can be achieved with custom sensor and actuation methods | All: Up to 5kg    |       |       |       |       |       |       |
| <b>Long term drift</b>            | 1kg for 48hrs, Per log time  | < 2%              | < 1%  | < 1%  | < 2%  | < 2%  | 1%    | 1%    |
| <b>Single part repeatability</b>  | 100 actuations of 1kg, 1 standard deviation/mean   | All: 2%           |       |       |       |       |       |       |
| <b>Part to part repeatability</b> | 100 sensors same batch, 1 standard deviation/mean  | All: ±4%          |       |       |       |       |       |       |
| <b>Low temp. storage</b>          | -20°C for 250hrs, Avg. change in res. of 5 sensors   | 8%                | 7%    | 7%    | 8%    | 8%    | 7%    | 7%    |
| <b>High temp. storage</b>         | +85°C for 250hrs, Avg. change in res. of 5 sensors   | 4%                | 3%    | 3%    | 4%    | 4%    | 3%    | 3%    |
| <b>High humidity storage</b>      | +85°C/85%RH for 250hrs, Avg. change in res. of 5 sensors   | 8%                | 12%   | 8%    | 8%    | 8%    | 12%   | 12%   |
| <b>Lifecycle durability</b>       | (10M) 1kg force at 3Hz, Avg. change in res. of 4 sensors   | 17%               | 12%   | 3%    | 7%    | 7%    | 3%    | 3%    |
| <b>Hysteresis</b>                 | 100 actuations of 1kg, Avg. change in res. of 100 samples  | All: 5%           |       |       |       |       |       |       |
| <b>Operational temp. range</b>    | 100 cycles at 0.5kg  | All: -20 to +85°C |       |       |       |       |       |       |

Note: All values typical, and quoted at 10N applied force unless otherwise stated. Force dependant on actuation interface, mechanics, touch location, and measurement electronics.

|                      | FSR01-03 | FSR04   | FSR05   | FSR06   | FSR07   |
|----------------------|----------|---------|---------|---------|---------|
| <b>Mode</b>          | Shunt    | Shunt   | Shunt   | Shunt   | Shunt   |
| <b>Trace pitch</b>   | 0.25mm   | 0.50mm  | 0.50mm  | 0.50mm  | 0.50mm  |
| <b>Spacer height</b> | 0.125mm  | 0.125mm | 0.125mm | 0.125mm | 0.125mm |
| <b>Trace width</b>   | 0.25mm   | 0.25mm  | 0.25mm  | 0.25mm  | 0.25mm  |

# FSR Series

## Force Sensing Resistor

### DIMENSIONS



### ORDERING INFORMATION

#### Terminal type

- A = Bare tail
- B = Solder tab
- C = Connector housing (female, equivalent to Nicomatic 14106-12 and OF02)
- D, E... = Assigned sequentially for custom designs

**FSR03CXE** RoHS Compliant

|   |  |  |
|---|--|--|
| <p><b>Series FSR</b><br/>Force sensing resistor</p> | <p><b>Format</b><br/>01 = Std. square<br/>02 = Std. strip<br/>03 = Std. round<br/>04, 05... = Assigned sequentially for custom designs</p> | <p><b>Modifier</b><br/>for custom designs (optional)</p> |
|---|--|--|

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