

SensorsX

SX-PFYADS0102 Series

Piezoelectric-Piezoresistive Composite Sensor

Flexible Force-Sensing Touch Strip (Piezoresistive / Piezoelectric Composite)



≤5 VDC Operating Voltage	<1 ms Response Time	100 gf (0.22 lbf) Response Point
<0.5 mm (0.020 in) Thickness	≥ 1,000,000 cycles Actuation Life	-20 to 60 °C (-4 to 140 °F) Operating Temperature

Flexible Touch Sensing | Force / Press-Button Actuation | Non-Conductive Panel Integration

■ PRODUCT OVERVIEW

The SX-PFYADS0102 is a thin, flexible piezoelectric-piezoresistive composite sensor designed for force and press-actuation sensing. The sensing element combines a mixed-carbon-paste piezoresistive layer with a piezoelectric film and silver-paste conductive traces, protected by a 0.075 mm (0.003 in) PET outer layer. As applied force increases, the sensor resistance decreases; a resistance below 1 MΩ defines the nominal response point of 100 gf (0.22 lbf). The sensor uses a four-conductor cable with an overall shield and is designed for laminated installation on rigid, non-conductive surfaces such as PC, ABS, glass, and wood.



■ KEY FEATURES

◆ 0.075 mm (0.003 in) PET outer protective layer	◆ Composite sensing structure: piezoresistive carbon-paste layer + piezoelectric film with silver-paste conductive traces
◆ Fast response time: <1 ms; rebound time ≤6 ms	◆ High actuation life: ≥ 1,000,000 cycles
◆ Lead wire withstands 80 roller-bend cycles without electrical discontinuity.	◆ PET-sealed laminated construction

■ TYPICAL APPLICATIONS

- Pressure / force sensing on rigid non-conductive surfaces
- Press-button sensing applications
- Flexible force-sensing interfaces

■ PERFORMANCE SPECIFICATIONS

Mechanical	
Rebound Time	≤6 ms
Lead-Wire Bend Endurance	80 roller-bend cycles without electrical discontinuity
Other Performance	

Actuation Life	≥ 1,000,000 cycles
Unit-to-Unit Consistency	±15% (same model, same production batch; batch-to-batch variation may be larger)
Sensor Thickness	<0.5 mm (<0.020 in)

Typical Force-Resistance Characteristics

Model	Parameter	100 gf (0.22 lbf)	200 gf (0.44 lbf)
SX-PFYADS0102	Resistance (kΩ)	<15	<10

※ Reference data measured under specific test conditions; for reference only. Actual performance should be verified after installation in the target application. Sensor should be mounted on a rigid, flat surface; if both the support and pressing surfaces are rigid, add a round soft pad (diameter slightly smaller than the sensing area, area >60% of the sensing area) centered on the sensing zone to avoid a weak/unstable pressure response.

ELECTRICAL SPECIFICATIONS

Operating Voltage	≤5 VDC
Operating Current	≤20 mA
Initial Resistance (no load)	≥10 MΩ
Response Point	100 gf (0.22 lbf) — see note below
Response Time	<1 ms
Static Capacitance	5.7 nF

※ Response Point is defined as follows: as applied pressure increases from zero, the sensor is considered to have “responded” when its resistance drops below 1 MΩ; the corresponding pressure value is the Response Point.

ENVIRONMENTAL SPECIFICATIONS

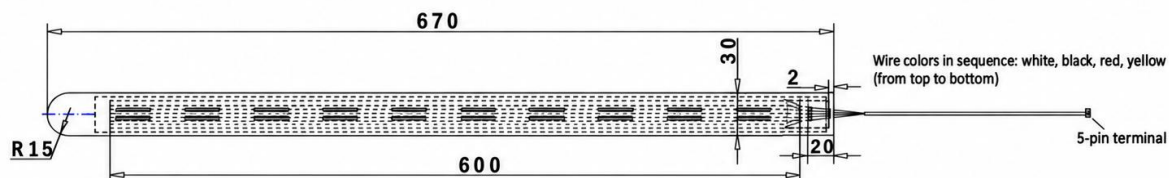
Operating Temperature	−20 to 60 °C (−4 to 140 °F)
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MECHANICAL DIMENSIONS

Layer Structure & Materials

Outer Protective Layer	0.075 mm (0.003 in) PET
Piezoresistive Material	Mixed carbon paste
Piezoelectric Material	Piezoelectric film
Conductive Material	Silver paste
Adhesive Backing	Double-sided adhesive tape
Lead-Out Cable	4-conductor power cable + overall shield, 5-pin terminal
Lead Wire Colors	White / Black / Red / Yellow (in sequence)

SX-PFYADS0102 — Engineering Drawing (Exploded View & Key Dimensions)



Dimensional Data

Overall Length	670 mm (26.38 in)
Sensing Strip Length	600 mm (23.62 in)
Overall Width	30 mm (1.18 in)
Connector End Width	20 mm (0.79 in)
End Radius	R15 mm (R0.59 in)
Composite Sensor Element	600 x 20 mm (23.62 x 0.79 in)
PET Sealing Film	670 x 30 x 0.2 mm (26.38 x 1.18 x 0.008 in)

Double-Sided Adhesive Layer	640 x 20 mm (25.20 x 0.79 in)
Nickel Foil Strip / Shielding Cloth	20 x 30 x 2 mm (0.79 x 1.18 x 0.08 in)

■ INSTALLATION & HANDLING NOTES

1. Mount the sensor only on non-conductive surfaces. Recommended substrate materials include PC, ABS, glass, bamboo, and wood.
2. Mounting surface should be clean and flat.
3. Bond the sensor firmly and uniformly to the target surface, avoiding wrinkles and trapped air bubbles.
4. During transport and storage, avoid sustained bending or creasing of the film, as permanent deformation may alter the initial resistance.
5. If soldering lead wires, soldering temperature should not exceed 300 °C (572 °F), with contact time not exceeding 1 second, to avoid melting or deforming the film substrate.