FlexiForce™ Standard Model ESS102

Actual size of sensor

The ESS102 is a standard force sensor ideal for conditions with high temperature and humidity. This sensor is made from Tekscan's Enhanced Stability Series (ESS) pressure sensitive ink. This allows better performance in a wider range of operating and storage conditions. The ESS102 can be used with our test & measurement, prototyping, and embedding electronics, including the FlexiForce Sensor Characterization Kit, FlexiForce Prototyping Kit, FlexiForce Quickstart Board, and the ELF™ System*. You can also use your own electronics or multimeter.

Benefits

- **Thin and Flexible**
  Easily integrates into tight spaces for non-intrusive force measurement between mating surfaces.
- **Operates in temperatures up to 85°C (approximately 185°F) and with a relative humidity up to 95%**
- **Easy to use, ideal for prototyping and integrating**
- **Available off-the-shelf**

Physical Properties

Thickness	0.203 mm (0.008 in.)
Length	38.1 mm (1.5 in.)**
Width	7.6 mm (0.30 in.)
Sensing Area	3.8 mm (0.15 in.) diameter
Connector	2-pin Male Square Pin
Substrate	Polyester
Pin Spacing	2.54 mm (0.1 in.)

* Sensor will require an adapter/extender to connect to the ELF System. Contact your Tekscan representative for assistance.
** Length does not include pins. Please add approximately 6 mm (0.25 in.) for pin length for a total length of approximately 32 mm (1.25 in)

	Typical Performance	Evaluation Conditions
Linearity (Error)	< ±8.6% of full scale	Line drawn from 0 to 50% load
Repeatability	< ±2.5%	Conditioned sensor, 80% of full force applied
Hysteresis	< 5.5% of full scale	Conditioned sensor, 80% of full force applied
Drift	< 3.8% per logarithmic time scale	Constant load of 111 N (25 lb)
Response Time	< 5µsec	Impact load, output recorded on oscilloscope
Operating Temperature	-40°C - 85°C (-40°F - 185°F)	Convection and conduction heat sources
Durability	≥ 3 million actuations	Perpendicular load, room temperature, 22 N (5 lb)
Temperature Sensitivity	0.36%/°C (± 0.2%/°F)	Conductive heating

All data above was collected utilizing an Op Amp Circuit (shown on the next page).
If your application cannot allow an Op Amp Circuit, visit www.tekscan.com/flexiforce-integration-guides, or contact a FlexiForce Applications Engineer.

ROHS COMPLIANT

Typical Performance

Standard Force Ranges
as Tested with Inverting Op-Amp Circuit

4.4 N (0 - 1 lb) †

† This sensor can measure up to 44 N (10 lb). The force range can be extended by reducing the drive voltage, VT, or the resistance value of the feedback resistor, RF. Conversely, the sensitivity can be increased for measurement of lower forces by increasing VT or RF.

Sensor output is a function of many variables, including interface materials. Calibration is recommended. See FlexiForce Best Practices for details. The graph below is an illustration of how a sensor can be used to measure varying force ranges by changing the feedback resistor (**Figure 1** below should not be used as a calibration chart).

Test Conditions: Input Voltage- 0.45V; Load Applied - 1lb; Measured Current- 79uA

Recommended Circuit

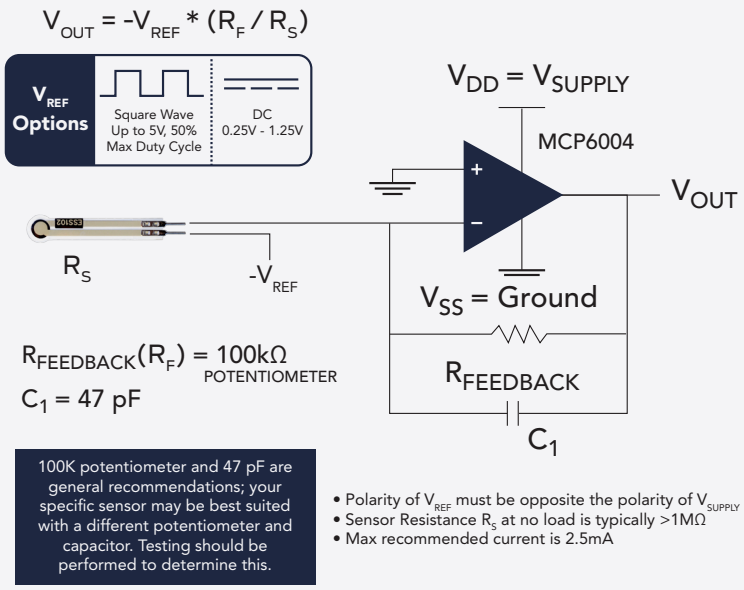
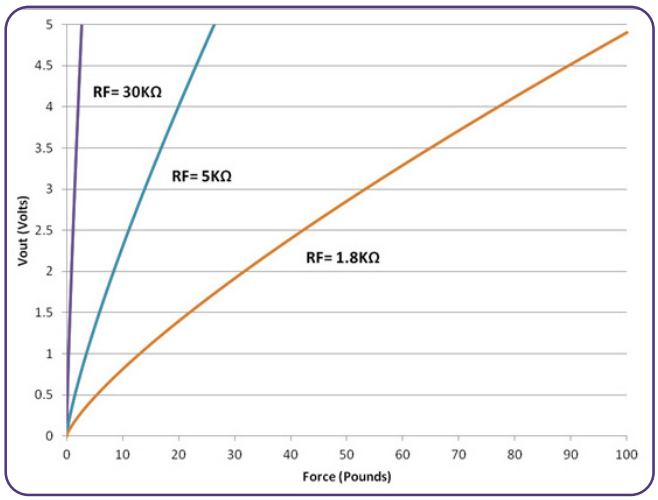


Figure 1



617.464.4500 1.800.248.3669 info@tekscan.com tekscan.com

Sensor Datasheet
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