

Low Profile Force Sensor

Table 3. Environmental Specifications

Parameter	Characteristics
Shock	Qualification tested to 150 G
Vibration	Qualification tested to 0 to 2 kHz, 20 G sine
Mean Cycles To Failure (MCTF) ¹⁵	20 million at 25 ° C [77 ° F]

Notes:

1. Absolute maximum ratings are the extreme limits that the device can withstand without damage to the device.
2. The temperature range over which the product may safely be exposed without excitation or force applied. Under these conditions the product will remain in specification after excursion to any temperatures in this range. Exposure to temperatures beyond this range may cause permanent damage to the product.
3. The maximum temperature and time for which the product can be exposed to for processing of solder electrical connections.
4. The range of voltage excitation which can be supplied to the product to produce an output which is proportional to Force but due to Ratiometricity errors may not remain within the specified performance limits.
5. The temperature range over which the product will produce an output proportional to force but may not remain within the specified performance limits.
6. The output signal obtained when the zero force is applied to the sensor. Also known as "null" or "zero".
7. The algebraic difference between output signal measured at the upper and lower limits of the Operating Force Range. Also known as "full scale output" or simply "span".
8. The ratio of output signal change to the corresponding input force change. Sensitivity is determined by computing the ratio of Span to the specified Operating Force Range.
9. Force Non-Linearity (Best Fit Straight Line): The maximum deviation of product output from a straight line fitted to output measured over the operating force range. The straight line through a set of points which minimizes the sum of the square of the deviations of each of the points from the straight line.
10. The maximum difference between output readings when the same force is applied consecutively, under the same operating conditions, with force approaching from the same direction within the operating force range.
11. The maximum difference between output readings when the same force is applied consecutively, under the same operating conditions, with force approaching from opposite directions within the operating force range.
12. The maximum deviation in Offset due to changes in temperature over the Operating Temperature Range, relative to Offset measured at 25 °C.
13. The maximum deviation in Full Scale Span due to changes in temperature over the Operating Temperature Range, relative to Full Scale Span measured at 25 °C.
14. The maximum force which may safely be applied to the product for it to remain in specification once force is returned to the Operating Force Range. Exposure to higher forces may cause permanent damage to the product. Unless otherwise specified this applies to all temperature within the Operating Temperature Range.
15. MCTF is a basic measure of reliability for a non-repairable device. It is the mean number of cycles to maximum operating force over which a sensor can be expected to operate until failure. The mean value is determined statistically from a probability distribution for failures based upon test data. MCTF may vary depending on the specific application in which a sensor is utilized.

Figure 1. Sensor Pinout

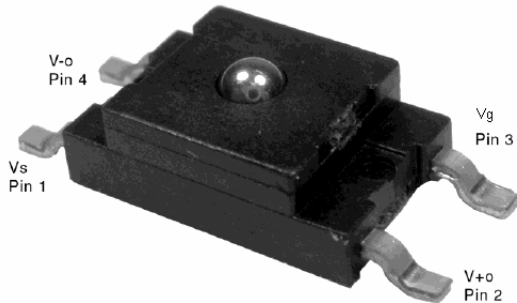
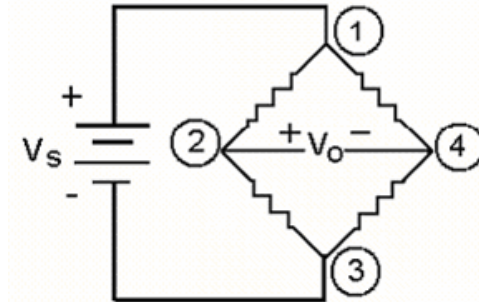


Figure 2. Excitation Schematics – Excitation 5 Vdc Typ., 6 Vdc max.



FS Series Circuit

1. Circled numbers refer to sensor terminals (pins).
Pin 1 = Supply Vs (+)
Pin 2 = Output Vo (+)
Pin 3 = Ground Vg (-)
Pin 4 = Output Vo (-)
2. The force sensor may be powered by voltage or current. Maximum supply voltage is not to exceed 6 V. Maximum supply current is not to exceed 1.2 mA. Power is applied across Pin 1 and Pin 3.
3. The sensor output should be measured as a differential voltage across Pin 2 and Pin 4 ($V_o = V_o(+) - V_o(-)$). The output is ratiometric to the supply voltage. Shifts in supply voltage will cause shifts in output. Neither Pin 2 nor Pin 4 should be tied to ground or voltage supply.

Figure 3. Mounting Dimensions (for reference only) in mm

