



MEMS Capacitive Accelerometers

Data sheet

SF3000L

30S.SF3000L.D.03.09

Features

Three axis output
Best in class noise level of 300ng_{rms}/√Hz
Wide dynamic range of 120dB (100Hz BW)
± 3g full scale
DC to 1000Hz frequency response
Analog servo accelerometer

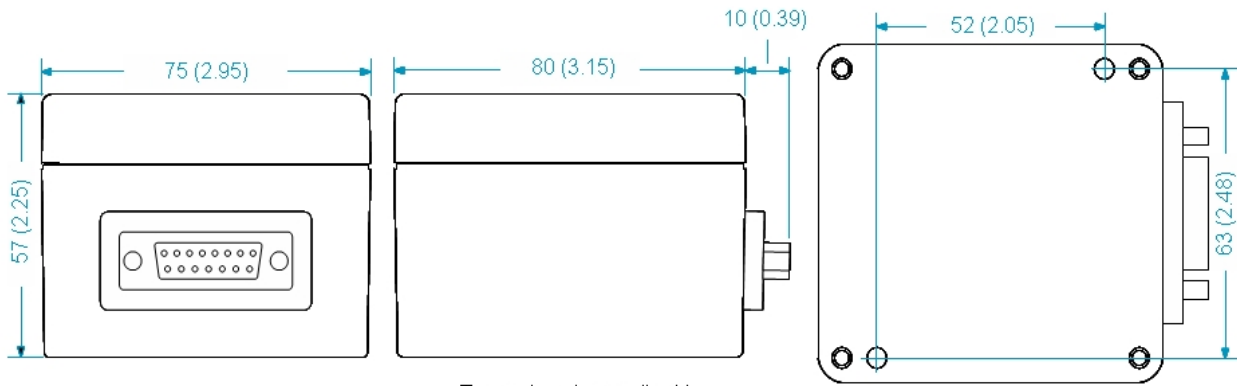
Applications

Seismic sensing
 Earthquake detection
 Geophysics
 Homeland and border security
 Structural monitoring
 Strong motion
 Railway technology

Description

The SiFlex™ accelerometer has been designed and developed by Colibrys Inc. for “strong motion” seismic sensing applications. This MEMS capacitive product is the best in class “digital geophone”, largely used for seismic and vibration sensing when extreme low noise measurement is required. Features such as wide dynamic range, excellent bandwidth, low distortion, high shock tolerance, and thermal stability make it ideal for applications such as earthquake and seismology measurements, homeland and border security or structure

monitoring. Used as a tilt sensor, it also provides a very high resolution of measurement. The SF3000L is a three axis combination of SF1500S accelerometer that operates from a bipolar power supply voltage that can range from ± 6V to ± 15V with a typical current consumption of 36mA at ± 6V. The linear full acceleration range is ± 3g with a corresponding sensitivity of 1.2V/g. The frequency response over the full scale range is DC to >1000Hz .



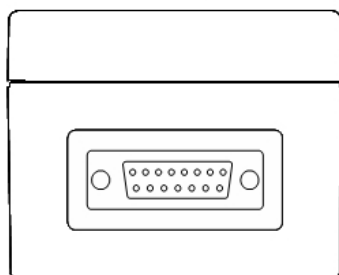
Specifications

	Units	SF3000L
Linear output range	g peak	± 3
Sensitivity	V/g	1.2
Frequency response (full signal)	Hz	DC to 1000
Dynamic range (100 Hz BW)	dB	120
Noise (10 to 1000 Hz)	ng _{rms} /√Hz	300 to 500
Cross-axis rejection	dB	> 46
Shock limit (0.5 ms ½ sine)	g peak	1000
Operating temperature range	°C	-40 to +85
Sensitivity temperature coefficient	ppm/°C (re: ±1g)	75
Offset thermal coefficient	µg/°C (re: ±1g)	± 100
DC offset (max)	mg	±200
Linearity error	% Full scale (re: ±1g)	± 0.1
Input voltage	Volts DC	± 6 to ± 15
Quiescent current	mA	< 30
Weight	Lb	1
Enclosure moisture rating	IP rating	67
Self Test	V	TTL level

Electrical connections

Both the (+) and (-) power supplies must be applied simultaneously to the input pins (within 50 ms). The power supply should have less than 100 $\mu\text{V}/\sqrt{\text{Hz}}$ noise in order to avoid the possibility of adding noise to the output of the sensor. The ASIC and on-board electronics operate on $\pm 5\text{V DC}$ provided by internal power conditioning circuitry, reducing the effects of power supply variations on sensor operation. The input power supply connections are reverse polarity protected by a diode bridge.

Should reverse polarity power be applied, the unit will self-correct and start normally. The output of the Si-Flex accelerometer is fully buffered and ready to connect to common inputs found on many analog to digital converters, oscilloscopes and digital multi-meters. The nominal output impedance for the Si-Flex accelerometers is typically 10 Ohms.



Electrical connections

P1	+Vin	Positive Power Input
P2	-Vin	Negative Power Input
P3	SNDATA* ¹	Signals for the on board EEPROM
P4	SNCLK * ¹	Signals for the on board EEPROM
P5	ATEST*	Sensor Self Test Input
P6	X-OUT	X Output
P7	Y-OUT	Y Output
P8	Z-OUT	Z Output
P9	COM Power	The common connection for the bipolar power supply
P10	COM-SNDATA	Common for SNDATA
P11	COM-SNCLK	Common for SNCLK
P12	COM-ATST	Ground Return for ATEST
P13	COM-X	AGND for X-OUT
P14	COM-Y	AGND for Y-OUT
P15	COM-Z	AGND for Z-OUT

¹Note: The datasheet for the EEPROM is available on request. A detailed SiFlex™ Product Description (30D.SFX.x.xx.xx) and further Application Notes are available on demand or on our web site. In order to provide an ideal support to our customers, our standard SF3000L products is available worldwide through

a wide network of distributors and agents or directly at Colibrys. Do not hesitate to access our web site for precise contacts or directly Colibrys in Europe or in US for more details.

*See SiFlex™ product description for more details.