

SCA1000-N1000070

Accelerometer

FEATURES

- Silicon 3D-MEMS sensor
- Dual axis X-Y measurement
- ± 4 g range
- Over damped sensing element to control frequency response
- Advanced failure detection
- Lead-free reflow solderable lead free component

BENEFITS

- Excellent long term stability
- Highly damped sensing element
- Outstanding shock durability

APPLICATIONS

- Inclination measurement in high vibration environment
- Artificial horizon

For customized product, please contact VTI Technologies

ENVIRONMENTAL CHARACTERISTICS

Parameter	Condition	Min	Typ.	Max	Units
Operating Temperature Range		-40		125	°C
Storage Temperature Range		-55		125	°C
Shock Survival				20 000	g

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Min	Typ.	Max	Units
Supply voltage ¹		4.75	5	5.25	V
Current consumption			4.5		mA
Analog Output load	Resistive Vout to Vdd or GND	10			kΩ
	Capacitive			20	nF
SPI clock frequency				500	kHz
AD conversion time			150		μs
Data transfer time	@500 kHz clock		38		μs

PERFORMANCE CHARACTERISTICS

Parameter	Condition	SCA1000-N1000070	Units
Measuring range		± 4	g
Measuring direction	See "Measuring Directions"	X-Y	
Zero point ²	Mounting position	Vdd/2	V
Zero point error over temperature	-40...+125 °C	± 60	mg
Sensitivity ³	@ room temperature	0.55	V/g
Sensitivity error over temperature	-40...+125 °C	± 2.5	%
Typical Non-linearity ⁷	Range = -3 g...+3 g	± 80	mg
	Range = -4 g...+4 g	± 160	mg
Cross-axis sensitivity ⁴	@ room temperature	3.5	%
Frequency response -3dB point ⁵	KP, 20 dB/decade	115±55	Hz
Ratiometric error ⁶	Vdd = 4.75...5.25 V	2	%
Output noise density, typical	From DC...80 Hz	50	μg/√Hz
Digital output resolution	FS	11	Bits

VDD = 5.00V, UNLESS OTHERWISE SPECIFIED

Note 1 100 nF supply by-pass capacitor is needed.

Note 2 Zero point specified as Voffset = Vout(0 g)

Note 3 Sensitivity specified as Vsens = (Vout(+1 g) - Vout(-1 g))/2

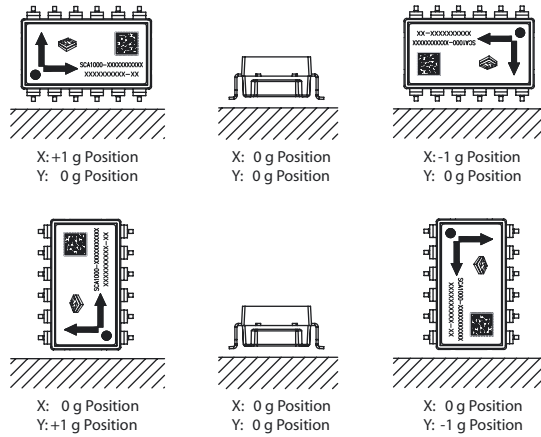
Note 4 The cross-axis sensitivity determines how much acceleration inclination, perpendicular to the measuring axis, couples to the output.

Note 5 The frequency response is determined by the sensing element's internal gas damping. The output has true DC (0Hz) response.

Note 6. The ratiometric error is specified as

$$RE = 100\% \times \left(1 - \frac{Vout(@Vx) \times \frac{5.00V}{Vx}}{Vout(@5V)} \right)$$

MEASURING DIRECTIONS

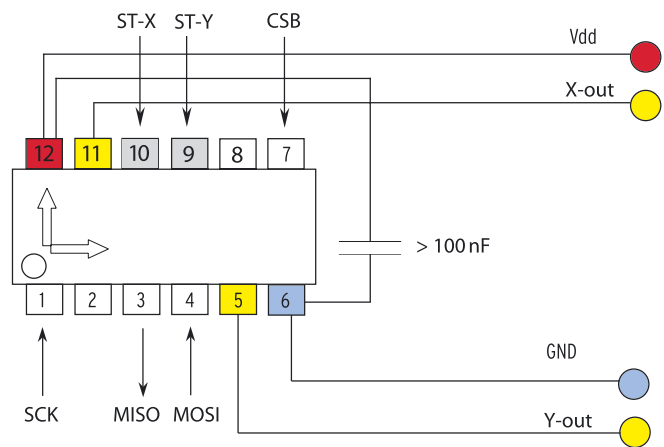


ELECTRICAL CONNECTION

Pin#	Pin Name	I/O	Connection
1	SCK	Input	Serial clock
2	NC	NC	Factory only
3	MISO	Output	Data output
4	MOSI	Input	Data input
5	Out Y	Output	Y-axis output (Ch 2)
6	CND	Power	GND
7	CSB	Input	Chip select (active low)
8	NC	NC	Factory only
9	ST_2	Input	Self test input for Channel 2
10	ST_1	Input	Self test input for Channel 1
11	OUT X	Output	X axis output (Channel 1)
12	VDD	Power	Positive supply voltage (Vdd)

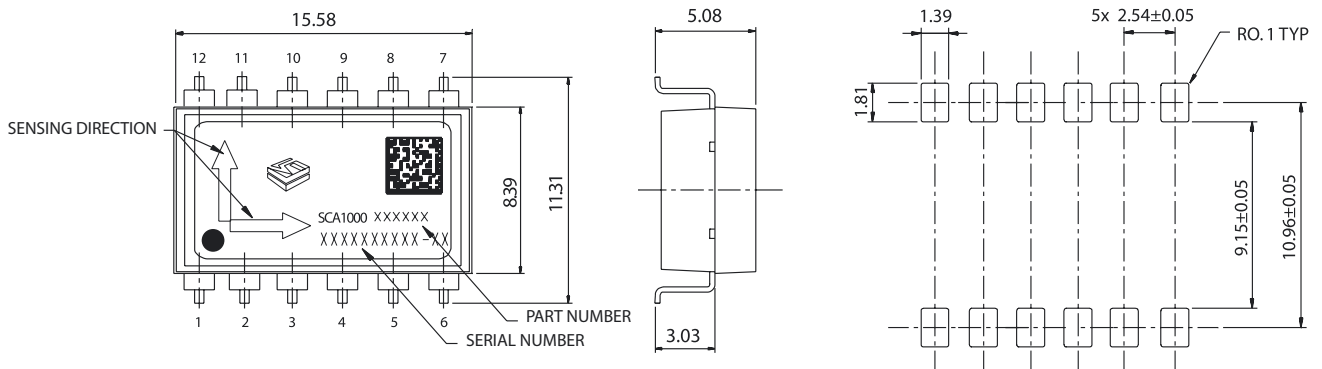
If the SPI interface is not used SCK(pin1), MISO(pin3), MOSI(pin4) and CSB (pin7) must be left floating.
 Self test can be activated applying logic "1" to ST pin (pin 9 and 10).
 If ST feature is not used pins 9 and 10 must be left floating or connected to GND.

RECOMMENDED CIRCUIT



DIMENSIONS

The accelerometer weighs < 1.2 g.
 The size of the part is approximately (w x h x l) 9 x 5 x 16 mm. Pin pitch is standard 100 mils.



PCB PAD LAYOUTS