Data Sheet

SCA610-CAHH1G 1-AXIS ANALOG INCLINOMETER

Features

- Single +5 V supply; ratiometric voltage output in the range 4.75…5.25 V
- ±0.5g (±30°) Range
- 8-pin plastic surface mount package with gull wing legs, mountable with pick and place machine
- Enhanced failure detection
- Calibration memory parity check
- Continuous connection failure detection
- Bi-directional acceleration measurement
- Controlled frequency response in the sensing element
- RoHS compliant suitable for lead free soldering process and SMD mounting
- Proven capacitive 3D-MEMS technology

Applications

SCA6X0-series is targeted to automotive applications. Typical applications include:

- Acceleration measurement
- Inclination measurement
- Motion measurement
- Vibration measurement

General Description

SCA610-CAHH1G is a one axis accelerometer component based on proven VTI capacitive 3D-MEMS technology. It has exceptional reliability, unprecedented accuracy and excellent stability over temperature and time.

SCA6X0-series is designed, manufactured for high stability and reliability and tested against tough quality requirements of automotive applications. The accelerometer has outstanding overload and shock durability. There is no need for additional components.

SCA610-CAHH1G is a part of VTI analog accelerometer family and fully compatible with other SCA610 and SCA620 -series accelerometers.

Absolute maximum ratings

Parameter	Value	Units
Supply voltage	-0.3 to 7.0	V
Voltage to input/output pins	-0.3 to Vdd+0.3	V
Temperature range	-50 to +125	°C
Mechanical shock	20000	g

Performance Characteristics

Vdd=5 V and ambient temperature unless otherwise specified.

Parameter	Condition	Min	Typ	Max	Units
Supply voltage Vdd		4.75		5.25	V
Current consumption	Vdd=5V;No load		2	4	mA
Measurement range	Measurement Direction Horizontal	-0.5		+0.5	g
Operating temperature		-40		125	°C
Offset	Output at 0g position		Vdd/2		V
Sensitivity A)	V_{dd}=5V		4		V/g
Offset error	-40…+125 °C (max)	-50		+50	mg
Sensitivity error	-40…+125 °C (max)	-4		+4	%
	-25…+85 °C	-2.5		+2.5	%
Non-Linearity			±10		mg
Cross axis sensitivity			5		%
Amplitude response B)	-3dB frequency	8		28	Hz
Output noise	Noise density		30		$\mu g/\sqrt{Hz}$
	DC…4kHz			5	mV_{rms}
Ratiometric error C)	Vdd=4.75…5.25 V			2	%
Resistive output load		20			kΩ
Capacitive load				20	nF

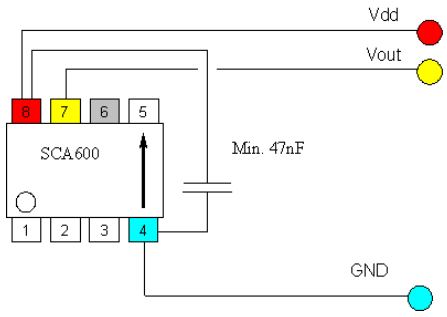
A) Sensitivity specified as [Vout(+0.5g)-Vout(-0.5g)] [V/g]

B) Output has true DC response

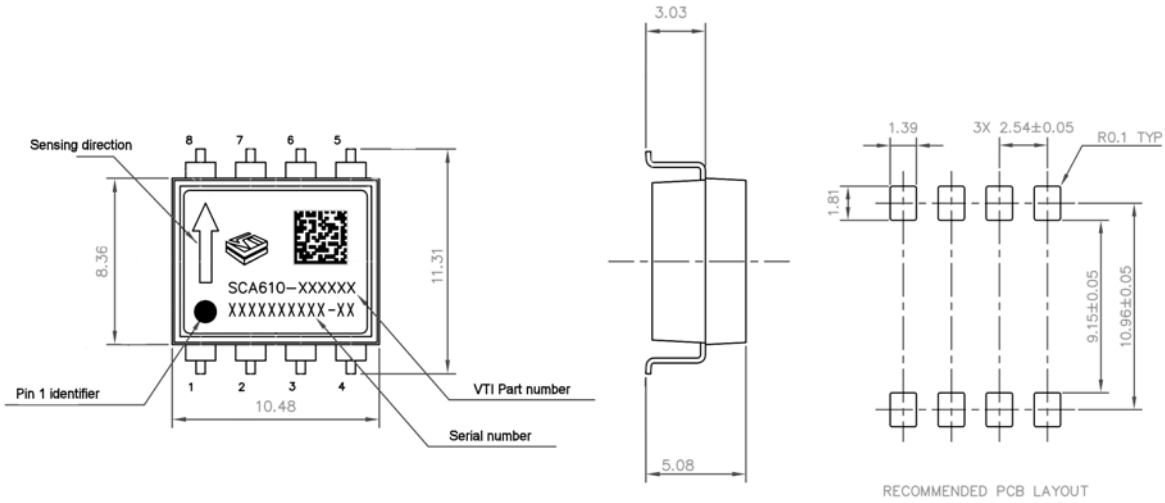
C) Ratiometric error is specified as: $$RE = 100\% \times \left(1 - \frac{Vout(@Vs) \times \frac{5.00V}{Vs}}{Vout(@5V)}\right)$$

Electrical connections

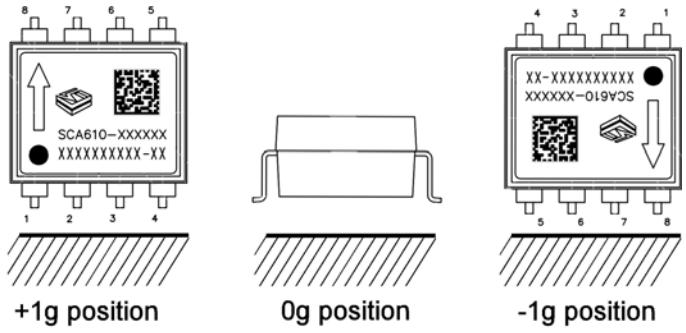
PIN #	Pin Name	Connection
1		Open or capacitively connected to GND
2		Open or capacitively connected to GND
3		Open or capacitively connected to GND
4	GND	Negative supply voltage(VSS)
5		Open or capacitively connected to GND
6	ST	Self-test control
7	VOUT	Sensor analog output
8	VDD	Positive supply voltage (VDD)



Dimensions



Measuring directions



Voltage to angle conversion

To convert acceleration to inclination angle use equation:

$$Angle_{inclination} = \arcsin\left(\frac{V_{out} - Offset}{Sensitivity}\right),$$

Where:
V_{out} = analog output [V]
Offset = 2.5 V, output at 0° inclination position
Sensitivity = sensitivity of device [V/g]