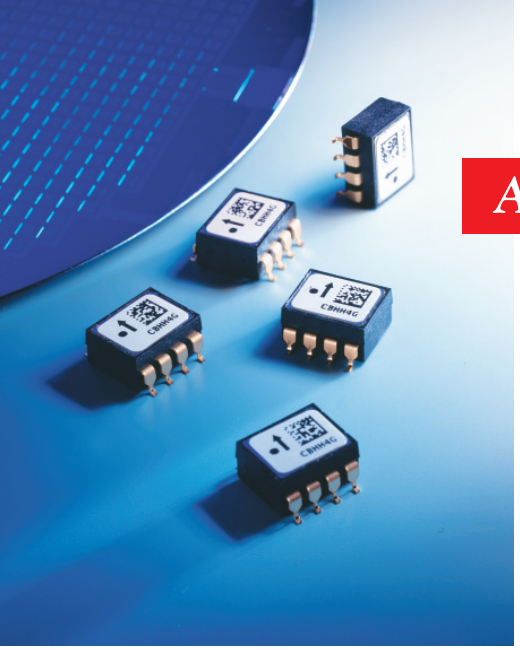


SCA610 Series

Accelerometer Chip

FEATURES

- Available ranges ±0.5g, ±1g, ±1.5g, ±1.7g
- 8-pin plastic surface mount DIP package mountable with pick and place machines
- Enhanced failure detection
- Digitally activated electrostatic self test (not for inclinometers)
- Calibration memory parity check
- Continuous connection failure detection
- Bi-directional acceleration measurement
- Controlled frequency response in the sensing element
- Re-flow solder, process compatible
- Single +5V supply; ratiometric voltage output in the range 4.75 ... 5.25V

BENEFITS

- Exceptional reliability, unprecedented accuracy and excellent stability over temperature and time
- Outstanding overload and shock durability
- No additional components required

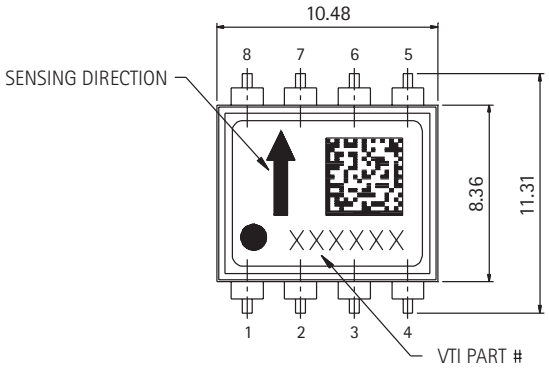
APPLICATIONS

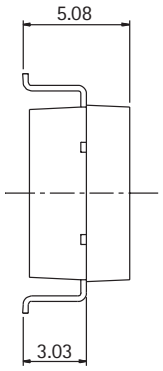
- Acceleration measurement
- Inclination measurement
- Motion measurement
- Vibration measurement

For customised products please contact VTI HAMLIN

DIMENSIONS

The accelerometer weighs under 1g. The size of the part is approximately (w x h x l) 9 x 5 x 11 mm. Pin pitch is standard 100 mils.



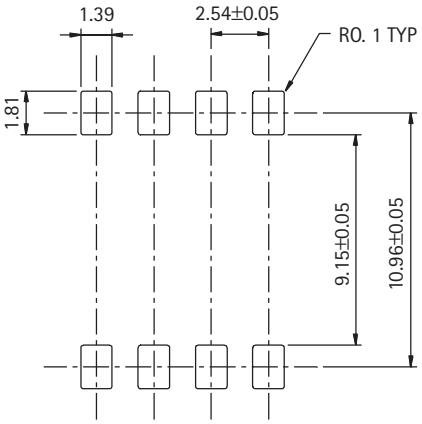


CONNECTION

1, 2, 3, 5 Open or capacitively connected to GND for EMC
(2 (C1) may be used for frequency setting in a different mode)
4 Ground (GND)
6 Self test triggering (ST) (not for inclinometers)
7 Analog output voltage (Vout)
8 Supply voltage (Vdd)

Acceleration in the direction of the arrow will increase the output voltage.

PCB PAD LAYOUTS



PRODUCT CODE KEY

PART NUMBER X X X

ASIC TYPE
C=HML294

SENSING ELEMENT
1= Small 1g; G001BA (XC)
2= Small 1g; 50Hz; G001BB
3= Small 3g; G003BA (XE)
B= Inclinometer 0.5g; G001BC (XB)
C=Small 3g; G003BC; 115Hz
D=Small 12g, G012XX (XX)

SENSITIVITY
1=2000 mV/g
2=1500 mV/g
3=1333 mV/g
4=1000 mV/g
5=750 mV/g
8=1200mV/g
C=150mV/g
D=1575mV/g
E=1666mV/g
F=1471.5mV/g
G=1875mV/g
H= 4000 mV/g
J=400mV/g

X X X

MECHANICAL FEATURE
G= SMD Pins

FREQUENCY RESPONSE
1= 400Hz
2= 1kHz
3= Wide Band
4= External Capacitor

OFFSET
H= Output @ 0g = 2.500V
V= Output @ +1g = 2.500V

Standard versions in bold

VTI HAMLIN

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ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Units
Acceleration (powered or non-powered)	20000	g
Supply voltage	-0.3 to +7.0	V
Voltage at input / output pins	-0.3 to Vdd + 0.3	V
Temperature range	-55 to +125	°C

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Min.	Typ	Max.	Units
Supply voltage Vdd		4.75		5.25	V
Current consumption	Vdd = 5V; No load		2.0	4.0	mA
Operating temperature		- 40		+ 125	°C
Resistive output load	Vout to Vdd or Vss	20			kOhm
Capacitive load	Vout to Vdd or Vss			20	nF
Output noise [9]	DC...4kHz		1	5	mVrms

VDD = 5.00V, UNLESS OTHERWISE SPECIFIED

PERFORMANCE CHARACTERISTICS

Parameter	Condition/ Comment	SCA610-CBHH1G [11]	SCA610-CB1H1G [11]	SCA610-C23H1G	SCA610-C28H1G	Units
Measuring range [1]	Nominal	±0.5	±1	±1.5	±1.7	g
Mounting plane [2]	Measuring Direction	Horizontal	Horizontal	Horizontal	Horizontal	
Zero point (nom.) [3]	Mounting position	Vdd/2	Vdd/2	Vdd/2	Vdd/2	V
Sensitivity	@ room temperature	4 [5b]	2 [5a]	1.333 [5a]	1.2 [5a]	V/g
Zero point error	-40...125°C	±60 [4]	±60 [4]	±125 [4]	±125 [4]	mg
Sensitivity error	-40...125°C	±4 [6b]	±4 [6a]	±4 [6a]	±4 [6a]	%
Typical non-linearity [6]	Over measuring range	±10 [7b, c]	±20 [7a, c]	±30 [7a]	±40 [7a]	mg
Cross-axis sensitivity [8]		5	5	5	5	%
Frequency response	-3dB point [9]	6±4	6±4	50±30	50±30	Hz
Ratiometric error [10]	Vdd = 4.75...5.25V	2	2	2	2	%

VDD = 5.00V, UNLESS OTHERWISE SPECIFIED

Note 1. The measuring range is limited by sensitivity, offset and supply voltage rails of the device.

Note 2. Measuring direction parallel to mounting plane.

Note 3. Vertical versions in +1g position, i.e. arrow up; horizontal versions pins down (+0g).

Note 4. Zero point error specified as (Vout (+0g) - Vdd/2) / Vsens [g] (room temp. error included); Vsens = Nominal sensitivity.

Note 5a. Sensitivity specified as [Vout (+1g) - Vout(-1g)] / 2 [V/g].

Note 5b. Sensitivity specified as [Vout (+0.5g) - Vout(-0.5g)][V/g].

Note 6a. Sensitivity error specified as {[Vout (+1g) -Vout (-1g)] / 2 -Vsens} / Vsens x 100% [%] (room temp. error included); Vsens = Nominal sensitivity.

Note 6b. Sensitivity error specified as {[Vout (+0.5g) -Vout (-0.5g)] -Vsens} / Vsens x 100% [%] (room temp. error included); Vsens = Nominal sensitivity.

Note 7a. Relative to straight line between ±1g.

Note 7b. Relative to straight line between ±0.5g.

Note 7c. In inclinometer applications a correction based on the angular error resulting in cross-axis sensitivity around the inclination angle reduces non-linearity.

Note 8. The cross-axis sensitivity determines how much acceleration, perpendicular to the measuring axis, couples to the output. The total cross-axis sensitivity is the geometric sum of the sensitivities of the two axes, which are perpendicular to the measuring axis.

Note 9. The output has true DC (0Hz) response.

Note 10. Supply voltage noise also couples to the output, due to the ratiometric (output proportional to supply voltage) nature of the accelerometer.

Note 11. Self test not recommended

The ratiometric error is specified as:

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

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