SCA320 Series

Accelerometer Chip

FEATURES

- Available ranges ±1.5g, ±3g, ±12g
- 8-Pin surface mount plastic DIP package suitable for pick and place machines
- Enhanced failure detection
- Digitally activated electrostatic self test
- Calibration memory parity check
- Continuous connection failure detection
- Controlled frequency response in the sensing element
- Bi-directional acceleration measurement
- Re-flow solder, process compatible
- Single +5V supply; ratiometric voltage output in the range 4.75 ... 5.25V
- Measuring direction perpendicular to the assembly plane

BENEFITS

- Excellent overload and shock durability
- Stability over temperature and time
- No additional components required

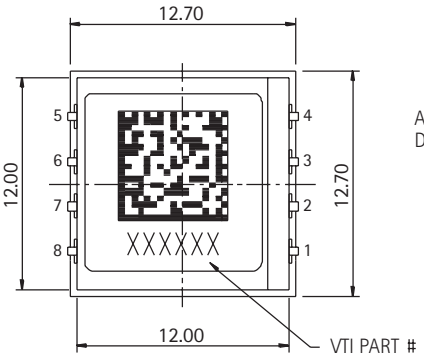
APPLICATIONS

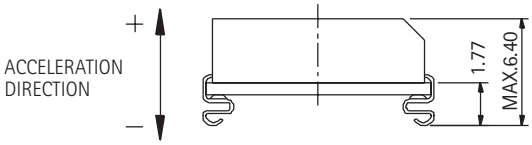
- Acceleration measurement
- Inclination measurement
- Vibration measurement
- Motion measurement

For customised products please contact VTI HAMLIN

DIMENSIONS

The accelerometer weighs under 1.5g. The size of the part is approximately (w x h x l) 12,7 x 6,4 x 12,7 mm. Pin pitch is standard 100 mils.



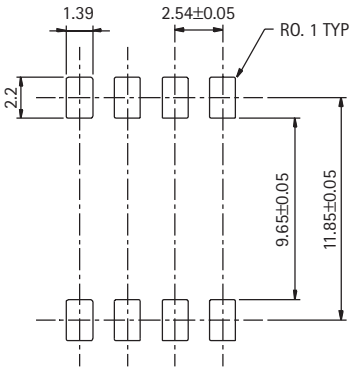


CONNECTION

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)
7 Analog output voltage (Vout)
8 Supply voltage (Vdd)

Acceleration in the positive direction of the arrow perpendicular to the mounting plane will increase the output voltage.

PCB PAD LAYOUTS



PRODUCT CODE KEY

PART NUMBER X X X 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
J=400mV/g

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

VTI Hamlin Oy, P.O. Box 27, FIN-01621 Vantaa, Finland
Phone +358 9 879 181, Fax +358 9 8791 8791, www.vti.fi/vtihome.htm

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	SCA320-C28H1G	SCA320-CC5V1G	SCA320-CDCV1G	Units
Measuring range [1]	Nominal	±1.5	±3	±12	g
Mounting plane [2]		Vertical	Horizontal	Horizontal	
Zero Point [2]		Vdd/2	Vdd/2	Vdd/2	V
Sensitivity [3]	@ room temperature	1.2	0.75	0.15	V/g
Zero Point error [4]	@ room temperature	±50[4a]	±75[4b]	±450[4b]	mg
	-20...85°C	±80[4a]	±130[4b]	±700[4b]	mg
	-40...125°C	±120[4a]	±195[4b]	±1000[4b]	mg
Sensitivity error [4,5]	@ room temperature	±2	±2	±3	%
	-20...85°C	±3	±3	±4	%
	-40...125°C	±4	±4	±5	%
Typical non-linearity [6]	Over measuring range	±20	±60	±200	mg
Cross-axis sensitivity [7]		4	4	5	%
Frequency response	-3dB point [8]	50±30	115±55	400±150	Hz
Ratiometric error [9]	Vdd = 4.75...5.25V	±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. The measuring direction is perpendicular to the mounting plane; zero point is defined with no acceleration and the device mounted in the prescribed mounting plane; for a vertical mounting plane the zero point is defined with pins 1 and 8 low.

Note 3. Sensitivity specified as [Vout (+1g) - Vout(-1g)] / 2 [V/g].

Note 4. Room temperature and –20 ... +85°C values are only typical.

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

Note 4b. Zero point error specified as (Vout (+1g) - Vdd/2) / Vsens [g] (room temp. error included); Vsens = Nominal sensitivity.

Note 5. Sensitivity error specified as {{[Vout (+1g) -Vout (-1g)] / 2} -Vsens} / Vsens x 100% [%]; Vsens = Nominal sensitivity.

Note 6. Relative to the straight line between ±1g.

Note 7. 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 8. The output has true DC (0Hz) response.

Note 9. Supply voltage noise also couples to the output, due to the ratiometric (output proportional to supply voltage) nature of the accelerometer.

The ratiometric error is specified as:

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

VTI HAMLIN

VTI Hamlin Oy, P.O. Box 27, FIN-01621 Vantaa, Finland
Phone +358 9 879 181, Fax +358 9 8791 8791, www.vti.fi/vtihome.htm