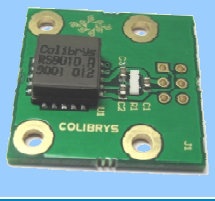
深圳市今创奇科技发展有限公司
Tel: +86-0755-82029425
88262760
Fax: +86-0755-88267240

COLIBRYS



MEMS Capacitive Accelerometers

Preliminary Data sheet

RS9010.A

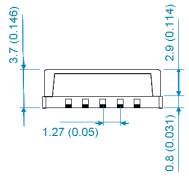
30S.RS9X10.B.08.09

Features	Applications
Tactical grade performance	**Inertial sensing**
- Bias stability down to <1.5mg for a ±10g sensor	**→ RS9010.A is dedicated to AHRS applications and**
Excellent vibration rectification coefficient	**low g IMU**
Very low intrinsic temperature sensitivity	IMU / AHRS for Mil/Aerospace
Extra small packaging (LCC20, 8.9mm x 8.9mm)	UAV
Harsh environment (shock, vibration, temperature)	Land & Sea Inertial Navigation

Description

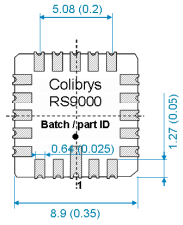
Colibrys RS9010 is the latest inertial product from the new IRIS™ family of MEMS capacitive accelerometer. This product is a major breakthrough toward advanced inertia and high stability measurements.
This generation of products comes either on a PCB board with all associated electronics components or in a LCC20 (8.9mm x 8.9mm) ceramic package.
The RS9010.A is an accelerometer based on a new MEMS element, realized with the latest Colibrys technology and designed exclusively for high bias and scale factor stability, improved vibration rectification performance and enhanced temperature behaviour. RS9000 is interfaced with an open loop electronics, specifically designed for long term stability. This integrated electronics provide an acceleration-proportional output voltage as well as a temperature-proportional output voltage for further temperature compensations.

RS9000 side View

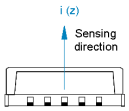


Typ. values mm (inch)

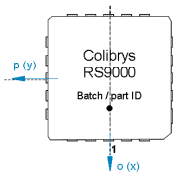
RS9000 top view



RS9000 side View



RS9000 top view



Preliminary specifications

All values are specified between -55°C (-67°F) to +95°C (203°F) and at 5.0 VDC supply voltage, unless otherwise stated

	Units	RS9010.A
Input range	g	± 10g
Packaging		PCB board or LCC20 (8.9mm x 8.9mm)
Bias @ 20ºC	mg	< 50
One year composite repeatability	µg (1σ)	< 1500
In run bias stability (48h) @ 20ºC	µg	< 350
Scale factor @ 20ºC	mV/g	< 200 ± 2
One year composite repeatability	ppm (1σ)	< 300
Input axis misalignment (Kp, Ko)	µrad	< 10'000
One year composite repeatability	µrad	< 1000
Vibration rectification @ 20ºC	µg/g^2 rms (1σ)	< 65 [50-500Hz]
	µg/g^2 rms (1σ)	< 65 [500-2000Hz]
Bandwidth@ 20ºC	Hz	500 ± 250
Noise spectral density in band @ 20ºC	µg/√Hz	140

Environmental	RS9010.A
Operating temperature range	-55°C to +95°C (-67°F to 203°F)
Reliability	Results based on MIL-HDBK-217, available on request.
Shock	Specifications are valid up to 1'000 g (0.15ms half-sine period, shocks in each direction o, p, i)
	Survivability of the product up to 4'000g (0.15ms half-sine period); no repeated shocks at this level
Recovery time	< 1ms (1000g, half-sine period 1ms, shocks in direction i)
Vibration	20 g rms, 20-2000 Hz (random noise, 30 minutes in each direction o, p, i)
LCC packaging	The product has been qualified according to MIL-STD-833-E Hermetic sealing is qualified at 5·10-8 atm·cm^3/s
ESD sensitivity	Class 2 (requirements MIL-STD-883-E, 1 Method 3015.7), HBM 2kV
Proximity effect	The sensor is sensitive to external parasitic capacitance. Proximity of large metallic mass (typ accelerometer size in mm ranges) must be avoided to insure best performances.
Note: LCC must be tightly fixed to the PCB, using the bottom of the housing as reference plan for axis alignment.	

Electrical	RS9010.A
Input voltage (VDD – VSS)	2.5 to 5.5 VDC. The standard voltage for calibration is 5.0 VDC.
Output voltage range	From 0.5 to 4.5 VDC @ 5.0 VDC input voltage (2.5 V ± 10 mV at 0 g)
Operating current consumption	< 700 µA @ 5.0 VDC
Initialization & reset current consumption	Typ. 1800 µA @ 5.0 VDC during the initialization phase (less than 35 ms at room temperature)
Reset	The sensor is Brown out protected. A reset occurs when the power supply jumps more than +0.46 V with a slope >380V/s or if the power supply drops below 2.2V. The recovery time is typ. 25 ms (max 35 ms)
Output impedance / load	Min. 50 kΩ at Vout (pin 8) and VAGND (pin 5) Max. 50 pF at Vout (pin 8) and Max. 100 µF at VAGND (pin 5)

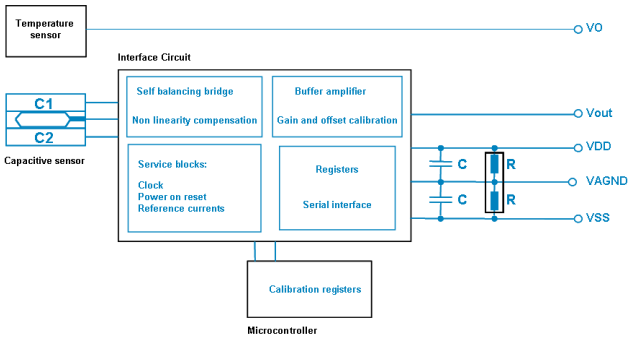
Physical	Hermetically sealed LCC, 20 pins housing	
Weight	< 0.6 grams	
Size	Typ. 8.9 x 8.9 x 3.70 mm Max. 9.2 x 9.2 x 3.98 mm	(0.35 x 0.35 x 0.146 inch) (0.354 x 0.354 x 0.157 inch)

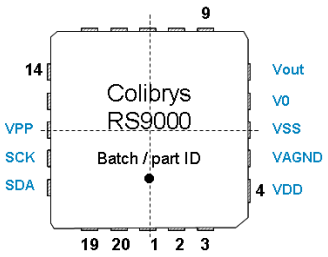
Temperature sensor:	
Output Voltage at 20°C	Typ: 1.632 V
Sensitivity	Typ: -11.77 mV/°C
Long term stability	Max -0.03°C to +0.09°C (1000h @ 150°C)
Accuracy	± 5°C (From -55°C to 125°C)

Block diagram and electrical connections

It is mandatory to implement two very high precision matched resistors [R] of 10 kΩ each outside the LCC package, as close as possible to the accelerometer between VDD and VAGND and between VSS and VAGND. This ultra-high precision resistive divider is used as internal reference voltage by the interface circuit. More precise information is available on the dedicated application note "VAGND Reference on RS9000" (30VAGND.MS9X.x.xx.xx)

It is also necessary to use decoupling capacitors [C] of 1µF each between VDD and VAGND and between VAGND and VSS, placed also as close as possible from the accelerometer. *COG* or *X7R* @ 5% capacitor types are recommended.





Pin	Description	Remarks
4	VDD	Power supply
5	VAGND	Accelerometer output reference voltage
6	VSS	Ground
7	V0	Temperature sensor output
8	Vout	Accelerometer output signal
16	VPP (Colibrys internal calibration pin)	**Must** be connected to VSS
17	SCK (Colibrys internal calibration pin)	**Must** be connected to VSS
18	SDA (Colibrys internal calibration pin)	**Must** be connected to VSS

A detailed RS9000 Product Description (30D.RS9X.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 new RS9000 products will be available worldwide through a wide network of distributors and agents or directly at Colibrys.
Do not hesitate to access our web site for precise references or contact directly Colibrys in Europe or in US for more details.

Colibrys (Switzerland) Ltd
accelero.europe@colibrys.com

Colibrys, Inc.
accelero.us@colibrys.com