Acuity Series AC3070

Ultra-low Pressure Sensor Die

Acuity Incorporated
Fremont, California
USA 94539

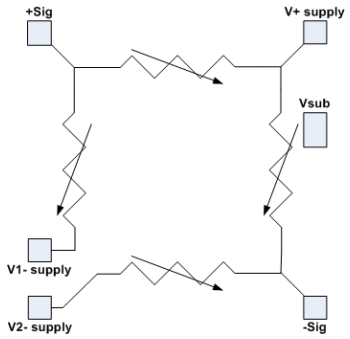
2 mbar, 0.8 inches H_2O, 200 pA

The AC3070series of very low-pressure die is an extension of the AC3050 low pressure series, but with 4X more sensitivity.

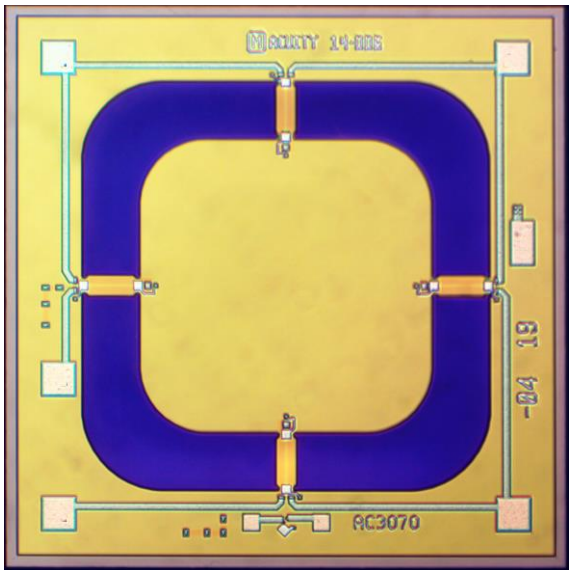
The AC3070 is based on the same structure and sensing element of the AC3055 but optimized for improved performance in the 2-mbar full-scale range. With 5-volt excitation, the sensor provides about 20 mV at full-scale pressure. The increased sensitivity is achieved with a larger diaphragm size and a larger die. The die is 2.4 mm on a side and is 0.40 mm thick.

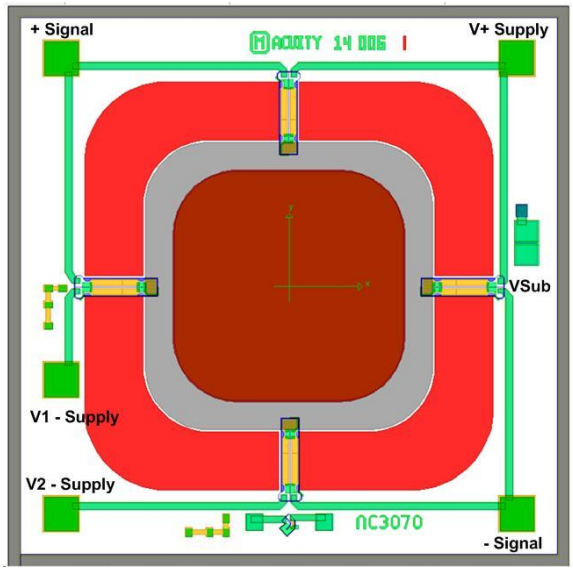
The Acuity design and process achieve very stable zero offsets. This allows the pressure range to be extended with further amplification to realize even lower full-scale pressure ranges with good performance.

Suitable for a wide range of packages, it is particularly designed for low-pressure differential sensing where the die may be used in an uncompensated package or in a passively compensated design where no correction can be made for linearity errors. The AC3070 finds uses in such applications as HVAC, and air-flow applications.



Equivalent Circuit Diagram





Pin-out of Acuity AC3070
Ultra-Low-Pressure Die

+ Sig increases and **–Sig** decreases when pressure is applied to the top of the die.

Acuity recommends tying Vsub to V+ Supply in most applications.

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2 mbar

Preliminary Specifications		Ultra Low Pressure Sensor - AC3070				Note
Mechanical		Min	Nominal	Max	Unit	
Stepping size	X	2.399	2.4	2.401	mm	
	Y	2.399	2.4	2.401	mm	
Unconstrained wafer thickness	Z	0.401	0.406	0.411	mm	
Electrical						
Resistance						
Bridge resistance		3.25	3.6	4.25	kohms	1
TCR		2300	2800	3100	ppm/degree C	2
Offset						
Offset - No Pressure		-120	0	25	mV	1
Offset Ratiometricity		-0.2	0	0.2	mV/V	3
TCO		-30	5	30	microV/V/degree C	2
Position Sensitivity		0	0.076	0.2	mv/g	4
Leakage						
Current Leakage		0.1	2.1	20	nA	5
Sensitivity						
Sensitivity		**12**	**18**	**26**	**mV**	6
TCS		-2100	-1800	-1400	ppm/degree C	2
Pressure Nonlinearity		-0.5	0.08	0.5	% FS at 2.5 mbar	7
Mechanical Pressure						
Overpressure - Burst		>100			mbar	9

Note

1 Measured at 5.0 volts
2 Measured at +25 and +75 °C, normalized by reading at 25 °C
3 Measured at -2.5 and 5.0 Volts, normalized by reading at 5.0 volts
4 One Half the Delta Offset between the sensor facing up and the senor facing down.
5 Measured from VSub substrate contact to any Resistor Pad at 10 V; Acuity recommends tying Vsub to the V+ Supply in normal use.
6 Full scale output at 5 Volt drive
7 1/2 TBNL (Terminal Base Nonlinearity at 0, 50%, and 100% FS) with topside pressure
8 For custom pressure ranges, consult Acuity.
9 Burst Pressure – Pressure over which sensor may have catastrophic failure

Ordering Information:
AC3070-XXX
where XXX = 2P0 for 2 mbar