Acuity Series AC3010/AC3012
5 PSI to 300 PSI (0.35 to 20 bar)
Pressure Sensor Die

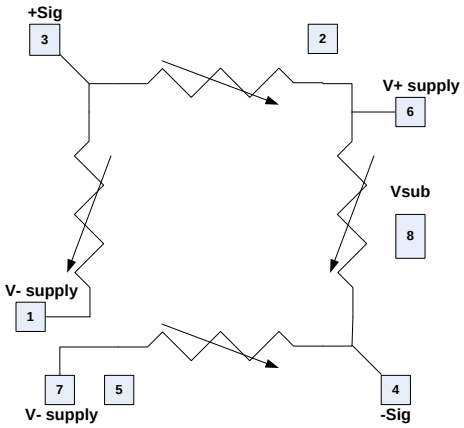
Acuity Incorporated
Fremont, California
USA 94539

The AC3010/AC3012 series pressure die is a new generation of medium-pressure die. It has been designed to replace existing pressure die with a much smaller foot-print, and improved zero-stability.

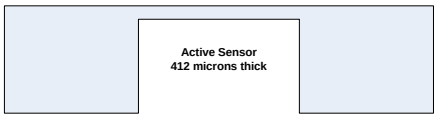
Based on the same basic process used for Acuity's industry-leading AC3030 and AC3050 series low pressure die, the AC3010 is a small (1.6 mm X1.8 mm) die that features a rectangular diaphragm to enable good output levels while maintaining good linearity. The part is available in 7 ranges (5, 15, 30, 50, 100, 150 and 300 PSI) and comes as either a gauge or absolute sensor.

The **AC3010** series has a nominal 3.6 kohm bridge while the **AC3012** has a nominal 5.0 kohm bridge. All other parameters are the same.

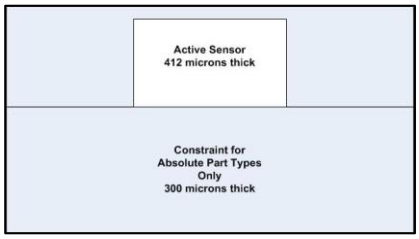
Suitable for a wide range of packages, it is particularly designed for medium pressure sensing in such applications as barometric monitoring, oil-filled sensors, flow restrictors, and a variety of industrial pressure and flow applications.



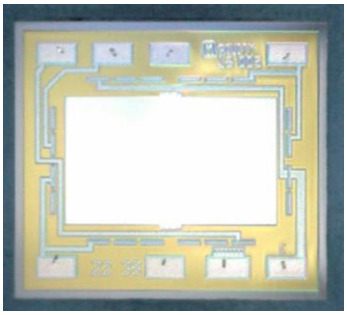
Equivalent Circuit Diagram
For maximum performance, VSub (Pad 8) should be tied to the highest voltage in the circuit.

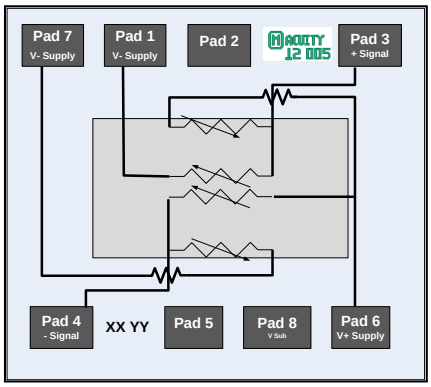


Cross-section of die for Gauge Applications



Cross-section of die for Absolute Applications





Schematic Layout of Acuity AC3010 Pressure Die

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

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Specification		Acuity Pressure Sensor - AC301X				Note
Electrical						
Resistance						
Bridge resistance	AC3010	3.1	3.6	4.1	kohms	1
	AC3012	4	5	6	kohms	1
TCR		2300	2800	3100	ppm/degree C	2
Resistance Ratiometricity		-1	0.1	1	%	3
Offset						
Offset - No Pressure		-50	0	50	mV	1
Offset Ratiometricity		-0.2	0	0.2	mV/V	3
TCO		-25	2	25	microV/V/degree C	2
Leakage						
Current Leakage - individual		0.5	4	20	nA	4
Sensitivity	**Range (PSI)**					
Span	5	51	60	70	mV	5
	15	90	110	125	mV	5
	30	98	115	130	mV	5
	50	105	126	150	mV	5
	100	135	160	180	mV	5
	150	105	125	150	mV	5
	300	85	105	125	mV	5
TCS		-2100	-1800	-1400	ppm/degree C	2
Pressure Nonlinearity		-0.1	0.02	0.1	%	6
Mechanical Pressure						
Full Scale Pressure Ranges		**5, 15, 30, 50, 100, 150, 300**			**PSI**	7
Overpressure - Burst		>15X			FS Pressure	
Overpressure - Proof		>5X			FS Pressure	
Mechanical		Min	Nominal	Max	Unit	
Stepping size	X	1.599	1.6	1.601	mm	
	Y	1.799	1.8	1.801	mm	
Unconstrained thickness – Gauge Type	Z	0.402	0.412	0.422	mm	8
Constrained thickness – Absolute Type	Z	0.682	0.712	0.742	mm	8

Ordering Information:

AC301R-XXX-T

Where **R** = 0 for 3.6k ohm nominal
= 2 for 5.0k ohm nominal

XXX = 005 for 5 PSI,
= 015 for 15 PSI,
= 030 for 30 PSI,
= 050 for 50 PSI,
= 100 for 100 PSI,
= 150 for 150 PSI and
= 300 for 300 PSI

T = A for Absolute
= G for Gauge

Note

1 Measured at 5.0 volts
2 Measured at +25 and +70 °C, normalized by reading at 25 °C
3 Measured at -2.5 and 5.0 Volts, normalized by reading at 5.0 volts
4 Measured from VSub substrate contact to any Resistor Pad at 10 V
5 Full scale output at 5 Volt drive and rated pressure;
6 1/2 TBNL (Terminal Base Nonlinearity at 0, 50%, and 100% FS) with pressure applied from the top
7 For custom pressure ranges, consult Acuity.
8 Gauge parts are unconstrained and approximately 412 microns thick. Absolute parts have a constraint and are approximately 712 microns thick.

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