



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

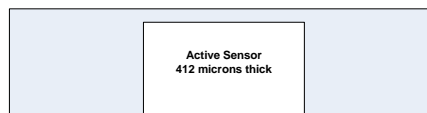
**Acuity Incorporated**  
Fremont, California  
USA 94539

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.

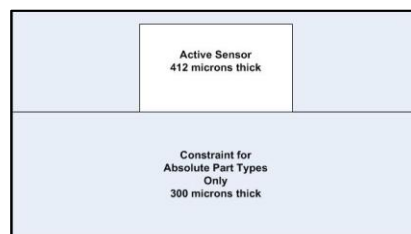
Based on the same basic process used for Acuity's industry-leading AC3030 and AC3050 series low pressure die, the AC3010 is a small (1.6 mm X1.8 mm) die that features a rectangular diaphragm to enable good output levels while maintaining good linearity. The part is available in 7 ranges (5, 15, 30, 50,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

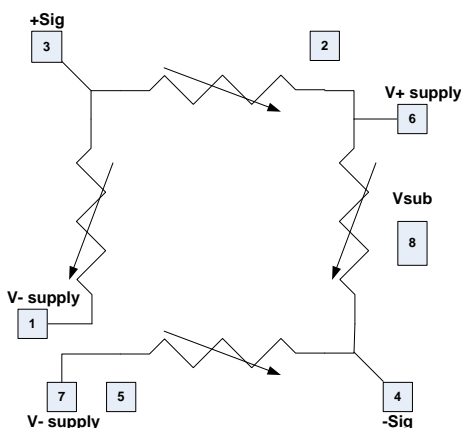
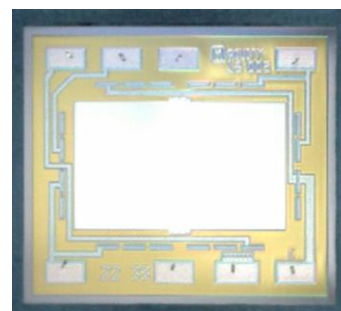
Suitable for a wide range of packages, it is particularly designed for medium pressure sensing in such applications as barometric monitoring, oil-filled sensors, flow restrictors, and a variety of industrial pressure and flow applications.



**Cross-section of die for Gauge Applications**

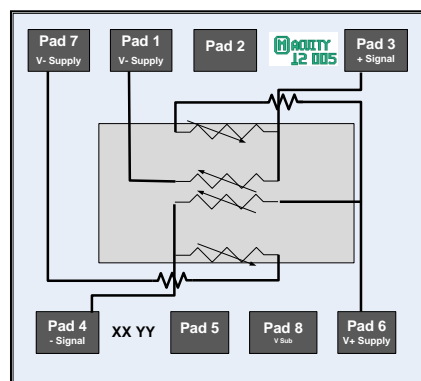


**Cross-section of die for Absolute Applications**



**Equivalent Circuit Diagram**

*For maximum performance, Vsub (Pad 8) should be tied to the highest voltage in the circuit.*



**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
<b>Electrical</b>						
<b>Resistance</b>						
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
<b>Offset</b>						
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
<b>Leakage</b>						
Current Leakage - individual		0.5	4	20	nA	4
<b>Sensitivity</b>						
	<b>Range (PSI)</b>					
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
<b>Mechanical Pressure</b>						
<b>Full Scale Pressure Ranges</b>		<b>5, 15, 30, 50, 100, 150, 300</b>			<b>PSI</b>	<b>7</b>
Overpressure - Burst		>15X			FS Pressure	
Overpressure - Proof		>5X			FS Pressure	
<b>Mechanical</b>						
		<b>Min</b>	<b>Nominal</b>	<b>Max</b>	<b>Unit</b>	
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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