

Pressure Sensor PS-A



Pressure sensor
Built-in amplifier and compensating circuit

Features

- Built-in amplifier and temperature compensation circuit, no need for circuit design and characteristic adjustment
- High accuracy and reliability : overall accuracy $\pm 1.25\%$ FS (Standard), $\pm 2.5\%$ FS (Low-pressure type)
- Compact size, space-saving : compatible size for PS type (Standard/Economy, S and M packages)
- RoHS compliant

Typical Applications

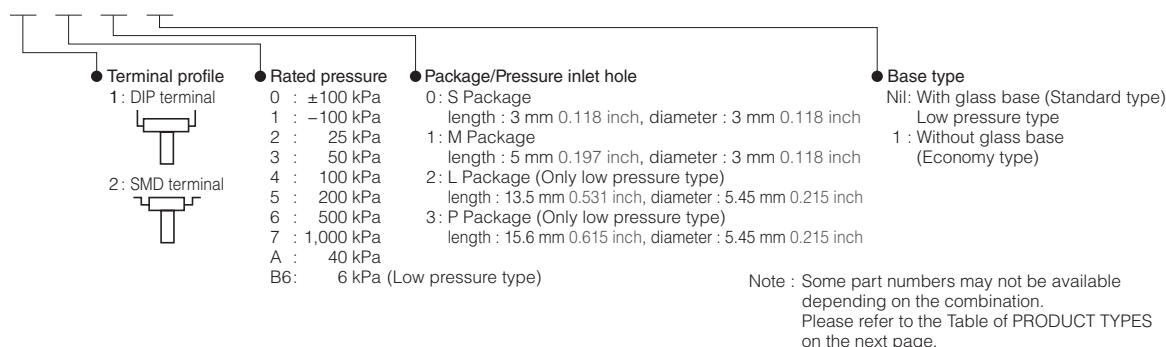
- Industrial use : pressure switches and pneumatic components, compressed air pressure measuring devices
- Medical use : blood pressure meters, oxygen generator and airbeds
- Others : pressure sensing devices for air pressure mediums

Low-pressure type

- Water level detection for domestic appliances: washing machines and dishwashers
- Air pressure control : cleanrooms and smoking rooms
- Medical applications : breathing pressure measuring devices

Ordering Information

ADP5



Product Types

Package (Pressure inlet hole length) Terminal Pressure		Part No.							
		Standard type		Standard/Economy type		Low pressure type			
		S Package (3 mm 0.118 inch)		M Package (5 mm 0.118 inch)		M Package (5 mm 0.197 inch)	L Package (13.5 mm 0.531 inch)	P Package (15.6 mm 0.614 inch)	
		DIP terminal 	SMD terminal 	DIP terminal 	SMD terminal 	DIP terminal 	DIP terminal 	DIP terminal 	
Standard type (with glass base)	±100 kPa	ADP5100	ADP5200	ADP5101	ADP5201	—	—	—	
	−100 kPa	ADP5110	ADP5210	ADP5111	ADP5211	—	—	—	
	25 kPa	ADP5120	—	ADP5121	—	—	—	—	
	50 kPa	ADP5130	—	ADP5131	—	—	—	—	
	100 kPa	ADP5140	ADP5240	ADP5141	ADP5241	—	—	—	
	200 kPa	ADP5150	ADP5250	ADP5151	ADP5251	—	—	—	
	500 kPa	ADP5160	ADP5260	ADP5161	ADP5261	—	—	—	
	1, 000 kPa	ADP5170	ADP5270	ADP5171	ADP5271	—	—	—	
Economy type (without glass base)	40 kPa	—	—	ADP51A11	—	—	—	—	
Low pressure type	6 kPa	—	—	—	—	ADP51B61	ADP51B62	ADP51B63	

Standard packing : Carton : 100 pcs.; Case : 1,000 pcs.

Rating

● Standard type

Item	Standard type (with glass base)								Remarks
Type of pressure	Gauge pressure								
Pressure medium	Air								*1
Rated pressure (kPa)	±100	−100	25	50	100	200	500	1,000	
Max. applied pressure	Twice of the rated pressure							1.5 times the rated pressure	
Ambient temperature	−10 °C to +60 °C 14 °F to +140 °F (no freezing or condensation)								
Storage temperature	−20 °C to +85 °C −4 °F to +185 °F (no freezing or condensation)								
Drive voltage	5±0.25 V.DC								
Temperature compensation range	0 °C to 50 °C 32 °F to 122 °F								
Offset voltage	2.5±0.05	0.5±0.05 V							*2, 3, 5
Rated output voltage	4.5±0.05 (+when +100kPa)	4.5±0.05 V							*2, 3, 5
Overall accuracy	±1.25 %FS								*3, 4, 5
Current consumption	Max. 10 mA								*2, 3
Output impedance	15 Ω (Typical)								*2
Source current	Max. 0.2 mA								*2, 3
Sink current	Max. 2 mA								*2, 3

Notes : *1 Please consult us for pressure media other than air.

*2 Indicates output when temperature is 25 °C 77 °F.

*3 Indicates output when drive voltage is 5 V. Although output fluctuates due to fluctuations in the drive voltage, this is not included.

*4 Overall accuracy indicates the accuracy of the offset voltage and rated output voltage at a temperature compensation range of 0 to 50 °C 32 to 122 °F.

*5 Accuracy is the value at the time of our shipping. Please set Zero-point calibration function on your products in order to safely use if the offset voltage is shifted.

● Economy type

Item	Economy type (without glass base)								Remarks
Type of pressure	Gauge pressure								
Pressure medium	Air								*1
Rated pressure (kPa)	40								
Max. applied pressure	Twice of the rated pressure								
Ambient temperature	−5 °C to +50 °C 23 °F to +122 °F (no freezing or condensation)								
Storage temperature	−20 °C to +70 °C −4 °F to +158 °F (no freezing or condensation)								
Drive voltage	3±0.15 V.DC								
Temperature compensation range	5 °C to 45 °C 41 °F to 113 °F								
Offset voltage	0.3±0.09 V								*2, 3, 5
Span voltage	2.4±0.03 V								*2, 3, 5
Offset voltage temperature characteristics	±4.0 %FS								*3, 4, 5
Sensitivity temperature characteristics	1.3 %FS								*3, 4, 5
Current consumption	Max. 3 mA								*2
Output impedance	20 Ω (Typical)								*2, 3
Source current	Max. 0.15 mA								*2, 3
Sink current	Max. 1.5 mA								*2, 3

Notes : *1 Please consult us for pressure media other than air.

*2 Indicates output when temperature is 25 °C 77 °F.

*3 Indicates output when drive voltage is 3 V. Although output fluctuates due to fluctuations in the drive voltage, this is not included.

*4 Indicates from output value at 25 °C 77 °F and the change of output at 5 and 45 °C 41 to 113 °F.

*5 Accuracy is the value at the time of our shipping. Please set Zero-point calibration function on your products in order to safely use if the offset voltage is shifted.

● Low pressure type

Item	Economy type (without glass base)	Remarks
Type of pressure	Gauge pressure	
Pressure medium	Air	*1
Rated pressure (kPa)	6	
Max. applied pressure	Twice of the rated pressure	
Ambient temperature	0 °C to +70 °C 32 °F to +158 °F (no freezing or condensation)	
Storage temperature	-30 °C to +100 °C -22 °F to +212 °F (no freezing or condensation)	
Drive voltage	5±0.25 V.DC	
Temperature compensation range	0 °C to 70 °C 32 °F to 158 °F	
Offset voltage	0.5 V (Typical)	*2
Span voltage	4.0 V (Typical)	*2
Overall accuracy	±2.5 %FS	*2, 3, 4
Current consumption	Max. 10 mA	
Output impedance	50 Ω (Typical)	
Source current	Max. 0.2 mA	
Sink current	Max. 2.0 mA	

Notes : *1 Please consult us for pressure media other than air.

*2 Indicates output when drive voltage is 5 V. Although output fluctuates due to fluctuations in the drive voltage, this is not included.

*3 Overall accuracy indicates the accuracy of the offset voltage and span voltage at temperatures between 0 to 70 °C 32 to 158 °F (FS=4V)

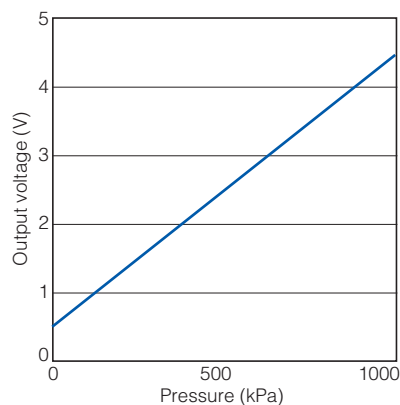
*4 The initial offset voltage error is not included in the overall accuracy.

Reference Data

● Standard type

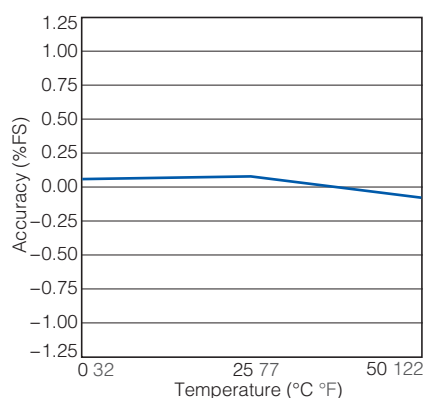
1.-(1) Output voltage

ADP5170
Drive voltage : 5 V.DC
Temperature : 25 °C 77 °F
Applied pressure : 0 to +1,000 kPa



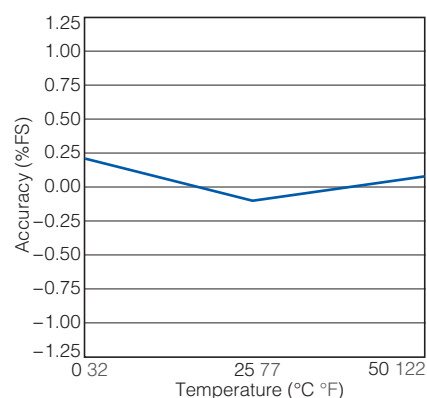
1.-(2) Overall accuracy (Offset voltage)

ADP5170
Drive voltage : 5 V.DC
Temperature : 0 to 50 °C 32 to 122 °F
Applied pressure : 0 kPa



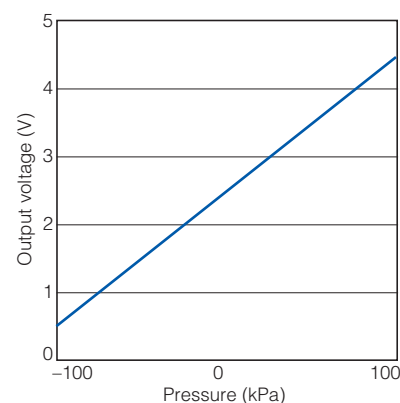
1.-(3) Overall accuracy (Rated output voltage)

ADP5170
Drive voltage : 5 V.DC
Temperature : 0 to 50 °C 32 to 122 °F
Applied pressure : +1,000 kPa



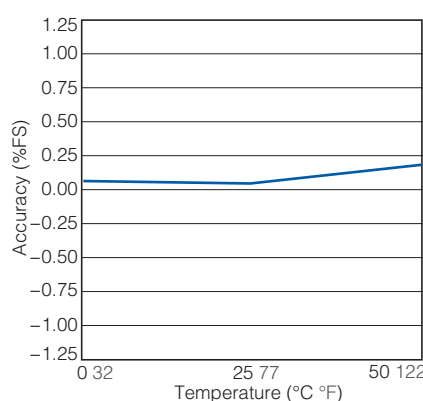
2.-(1) Output voltage

ADP5100
Drive voltage : 5 V.DC
Temperature : 25 °C 77 °F
Applied pressure : -100 to +100 kPa



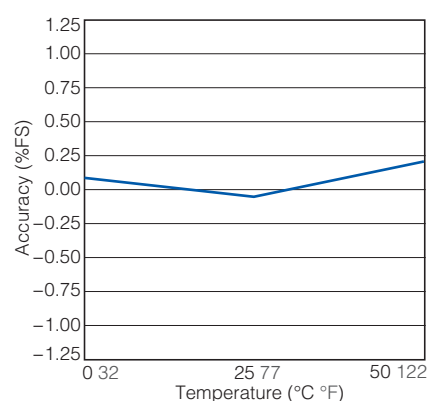
2.-(2) Overall accuracy (Offset voltage)

ADP5100
Drive voltage : 5 V.DC
Temperature : 0 to 50 °C 32 to 122 °F
Applied pressure : 0 kPa



2.-(3) Overall accuracy (Rated output voltage)

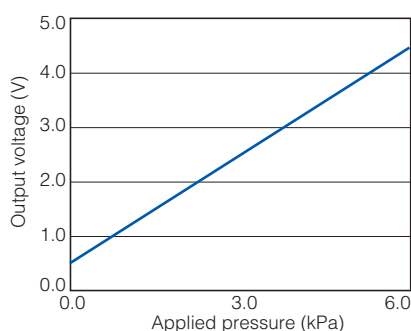
ADP5100
Drive voltage : 5 V.DC
Temperature : 0 to 50 °C 32 to 122 °F
Applied pressure : +100 kPa



● Low pressure type

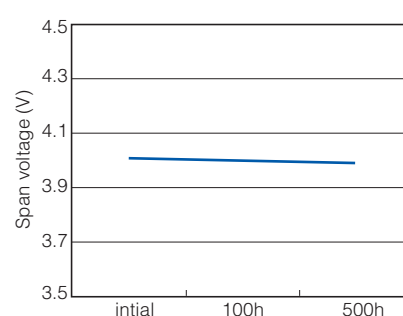
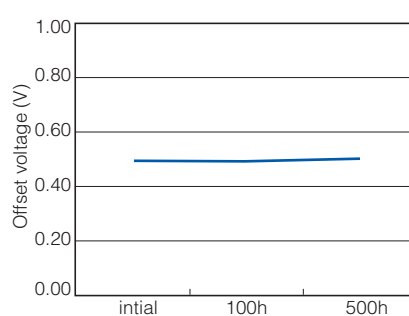
1 Output voltage

ADP51B61
Drive voltage : 5 V.DC
Temperature : 25 °C 77 °F
Applied pressure : 0 to 6 kPa



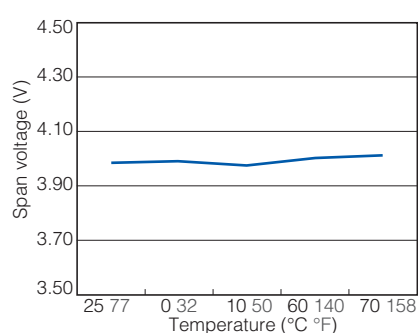
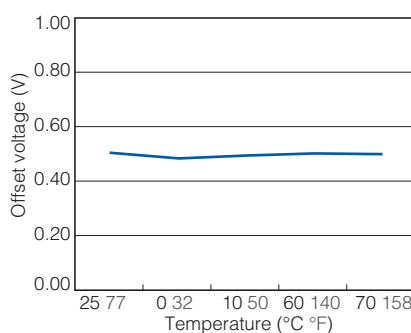
2 THB (high temperature high humidity bias test)

ADP51B61
Within 85 °C 185 °F and 85% RH
5 V applied between No.2 (Vdd) and No.3 (GND)
Applied pressure : 0 kPa



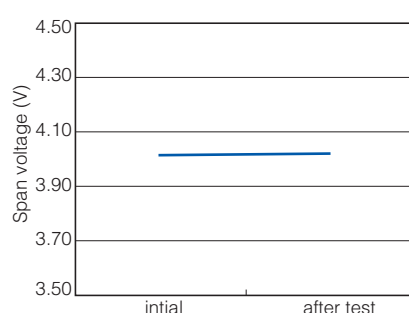
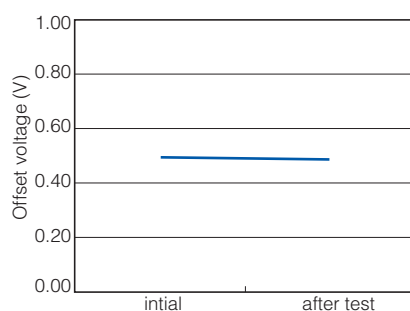
3 Ambient temperature characteristics

Ambient temperature : 25 °C 77 °F → 0 °C 32 °F → 10 °C 50 °F → 60 °C 140 °F → 70 °C 158 °F



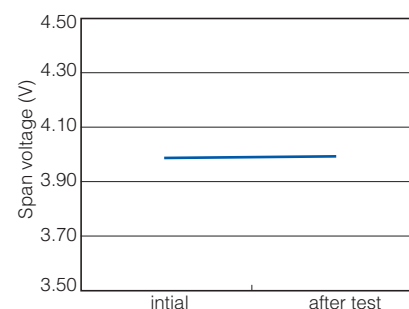
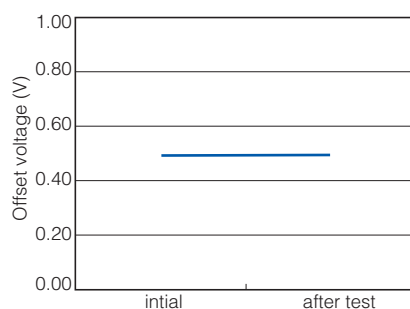
4 Shock test

ADP51B61
Shock applied : 981 m/s², 3 times in x, y and z directions
Applied pressure : 0 kPa



5 Vibration test

ADP51B61
Vibration applied : 10 to 55 Hz, amplitude : 1.5mm, x, y and z directions, 2 hrs each
Applied pressure : 0 kPa

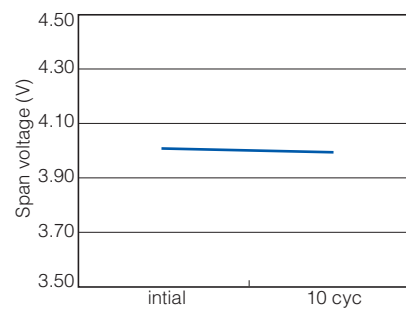
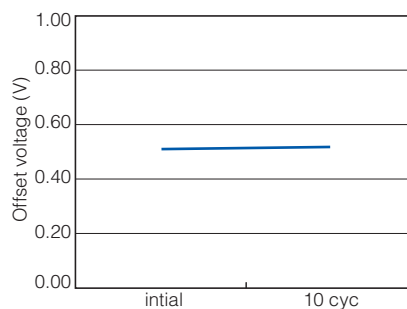
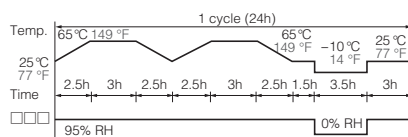


6 Temperature/humidity cycle test

ADP51B61

Exposed to 10 cycles in the temperature and humidity conditions given below.

Applied pressure : 0kPa



Evaluation Test

Classification	Tested item	Tested condition	Result
Environmental characteristics	Storage at high temperature	Temperature : Left in a 85 °C 185 °F constant temperature bath; Time : 100 hrs.	Passed
	Storage at low temperature	Temperature : Left in a -20 °C -4 °F constant temperature bath; Time : 100 hrs.	Passed
	Humidity resistance	Temperature/humidity : Left at 40 °C 104 °F, 90 % RH; Time : 100 hrs.	Passed
	Temperature cycle	Temperature : -20 °C to 85 °C -4 °F to 185 °F; 1 cycle : 30 min.; Times of cycle : 100	Passed
Endurance characteristics	High temperature/high humidity operation	Temperature/humidity : 40 °C 104 °F, 90% RH; Operation times : 10 ⁶ , rated voltage applied	Passed
Mechanical characteristics	Vibration resistance	Double amplitude : 1.5 mm 0.059 inch; Vibration : 10 to 55 Hz; Applied vibration direction : X, Y, Z 3 directions; Times : 2 hrs each	Passed
	Dropping resistance	Dropping height : 75 cm 29.528 inch; Times : 2 times	Passed
	Terminal strength	Pulling strength : 9.8 N {1 kgf}, 10 sec.; Bending strength : 4.9 N {0.5 kgf}, left and right 90 ° 1 time	Passed
Soldering Characteristics	Solderability	Temperature : 230 °C 446 °F; Time : 5 sec.	Passed
	Heat resistance (DIP)	Temperature : 260 °C 500 °F; Time : 10 sec.	Passed

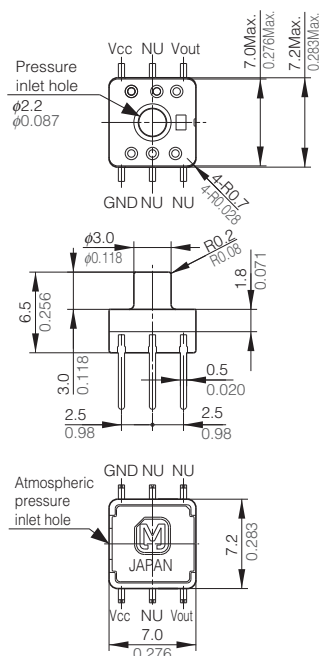
Items	Criteria
Offset voltage Rated Output Voltage	Variation amount within $\pm 2.5\%$ FS of value

Dimensions

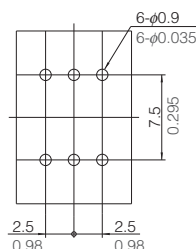
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/>

- Standard type S Package (Terminal direction : DIP terminal Pressure inlet hole length : 3 mm 0.118 inch)
ADP51□0

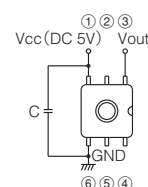
CAD Data



Recommended PC board pattern



Terminal connection diagram

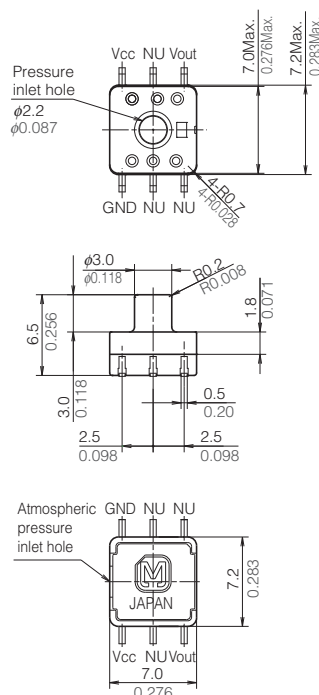


unit : mm inch
General tolerance : $\pm 0.3 \pm 0.012$

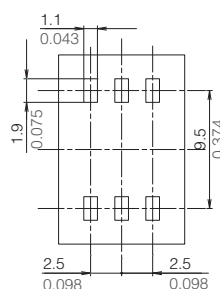
Terminal No.	Name
1	Vcc (Power supply [+])
2	NU (Not usable)
3	Vout (Output)
4	NU (Not usable)
5	NU (Not usable)
6	GND (Ground)

- Standard type S Package (Terminal direction : SMD terminal Pressure inlet hole length : 3 mm 0.118 inch)
ADP52□0

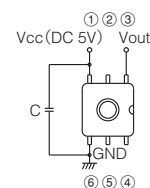
CAD Data



Recommended PC board pattern



Terminal connection diagram



unit : mm inch
General tolerance : $\pm 0.3 \pm 0.012$

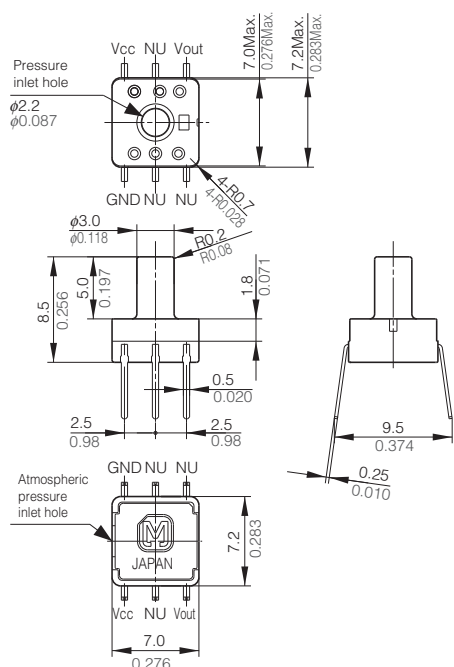
Terminal No.	Name
1	Vcc (Power supply [+])
2	NU (Not usable)
3	Vout (Output)
4	NU (Not usable)
5	NU (Not usable)
6	GND (Ground)

Dimensions

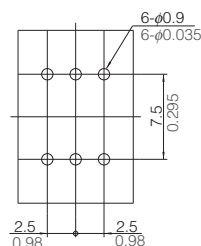
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/>

- Standard/Economy type M Package (Terminal direction : DIP terminal Pressure inlet hole length : 5 mm 0.197 inch)
ADP51□1/ADP51A11

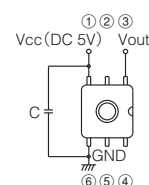
CAD Data



Recommended PC board pattern



Terminal connection diagram

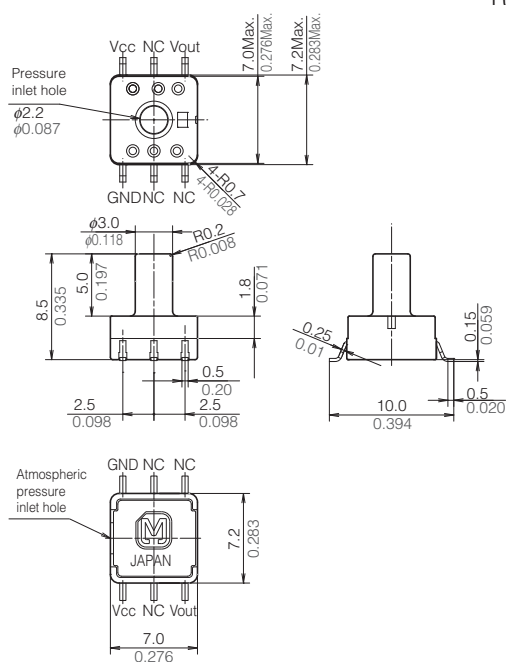


unit : mm inch
General tolerance : $\pm 0.3 \pm 0.012$

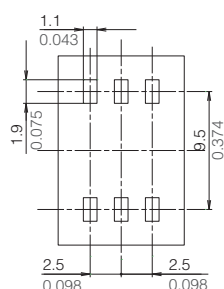
Terminal No.	Name
1	Vcc (Power supply [+])
2	NU (Not usable)
3	Vout (Output)
4	NU (Not usable)
5	NU (Not usable)
6	GND (Ground)

- Standard type M Package (Terminal direction : SMD terminal Pressure inlet hole length : 5 mm 0.197 inch)
ADP52□1

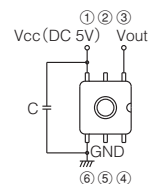
CAD Data



Recommended PC board pattern



Terminal connection diagram



unit : mm inch
General tolerance : $\pm 0.3 \pm 0.012$

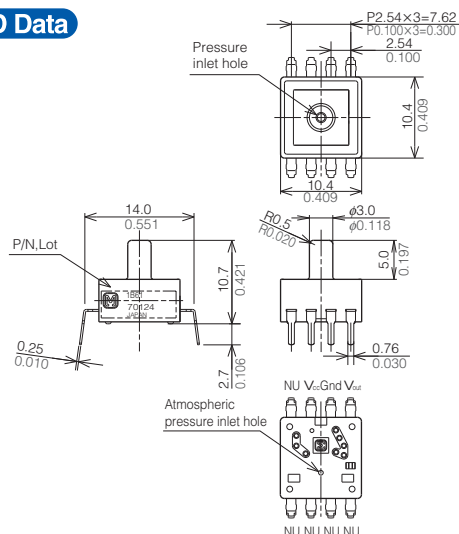
Terminal No.	Name
1	Vcc (Power supply [+])
2	NU (Not usable)
3	Vout (Output)
4	NU (Not usable)
5	NU (Not usable)
6	GND (Ground)

Dimensions

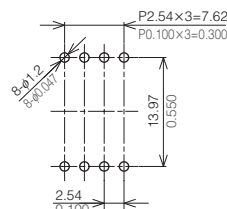
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/>

- Low pressure type M Package (Terminal direction : DIP terminal, Pressure inlet hole length : 5 mm 0.197 inch) ADP51B61

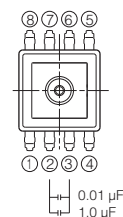
CAD Data



Recommended PC board pattern
(BOTTOM VIEW)



Terminal connection diagram



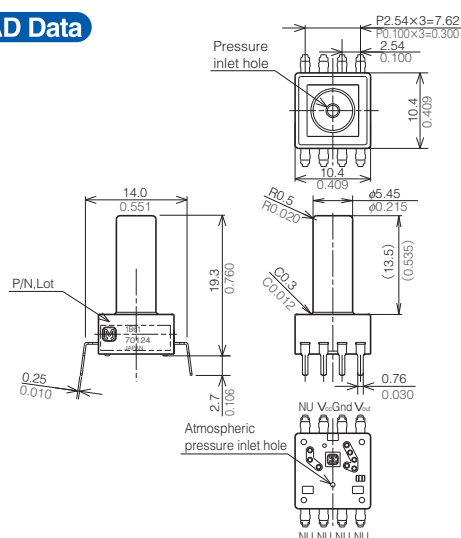
unit : mm inch
General tolerance : ± 0.3 ± 0.012

Terminal No.	Name
1	NU (Not usable)
2	Vcc (Power supply [+])
3	GND (Ground)
4	Vout (Output)

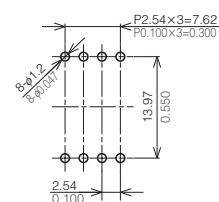
Terminal No.	Name
5	NU (Not usable)
6	NU (Not usable)
7	NU (Not usable)
8	NU (Not usable)

- Low pressure type L Package (Terminal direction : DIP terminal, Pressure inlet hole length : 13.5 mm 0.531 inch) ADP51B62

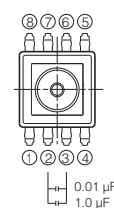
CAD Data



Recommended PC board pattern
(BOTTOM VIEW)



Terminal connection diagram



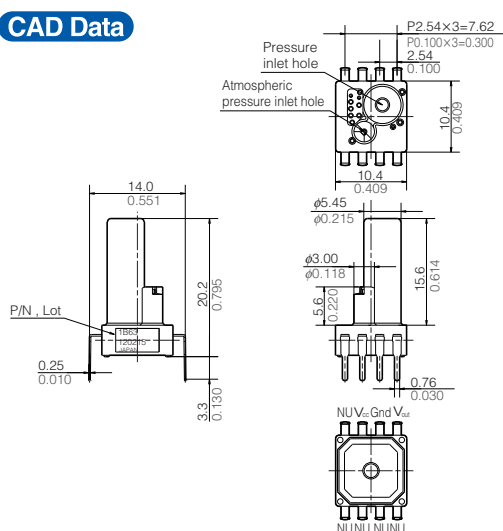
unit : mm inch
General tolerance : ± 0.3 ± 0.012

Terminal No.	Name
1	NU (Not usable)
2	Vcc (Power supply [+])
3	GND (Ground)
4	Vout (Output)

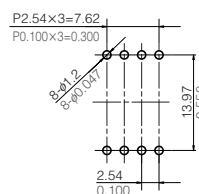
Terminal No.	Name
5	NU (Not usable)
6	NU (Not usable)
7	NU (Not usable)
8	NU (Not usable)

- Low pressure type P Package (Terminal direction : DIP terminal, Pressure inlet hole length : 15.6 mm 0.614 inch) ADP51B63

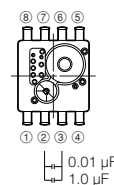
CAD Data



Recommended PC board pattern
(BOTTOM VIEW)



Terminal connection diagram



unit : mm inch
General tolerance : ± 0.3 ± 0.012

Terminal No.	Name
1	NU (Not usable)
2	Vcc (Power supply [+])
3	GND (Ground)
4	Vout (Output)

Terminal No.	Name
5	NU (Not usable)
6	NU (Not usable)
7	NU (Not usable)
8	NU (Not usable)