LAMPIRAN

1. Perhitungan Linieritas Sensor MPX5050GP antara Tegangan ke Tekanan

a. Diketahui : 200 mmHg

Vs = 5 V

P = Pressure (kPa)

Ditanya : Volt ?

Jawaban :

1 kPa = 7,50062 mmHg

1 mmHg = 0,133 kPa

200 mmHg = kPa

$$\frac{200\ mmHg}{7{,}50062} = 26{,}66667\ kPa$$

Vout = Vs (0,018 * P + 0,04)

Vout = 5 (0,018 * 26,66667 + 0,04)

Vout = 5 (0,52006)

Vout = 2,6003 Volt

b. Diketahui : Vout = 2,6003 volt

Ditanya : P ?

Jawaban :

Vout = Vs (0,018 * P + 0,04)

P = $\frac{(Vout/5-0{,}04)}{0{,}018}$

P = $\frac{(2{,}6003/5-0{,}04)}{0{,}018}$

P = $\frac{(0{,}48006)}{0{,}018}$

P = 26,67 kPa

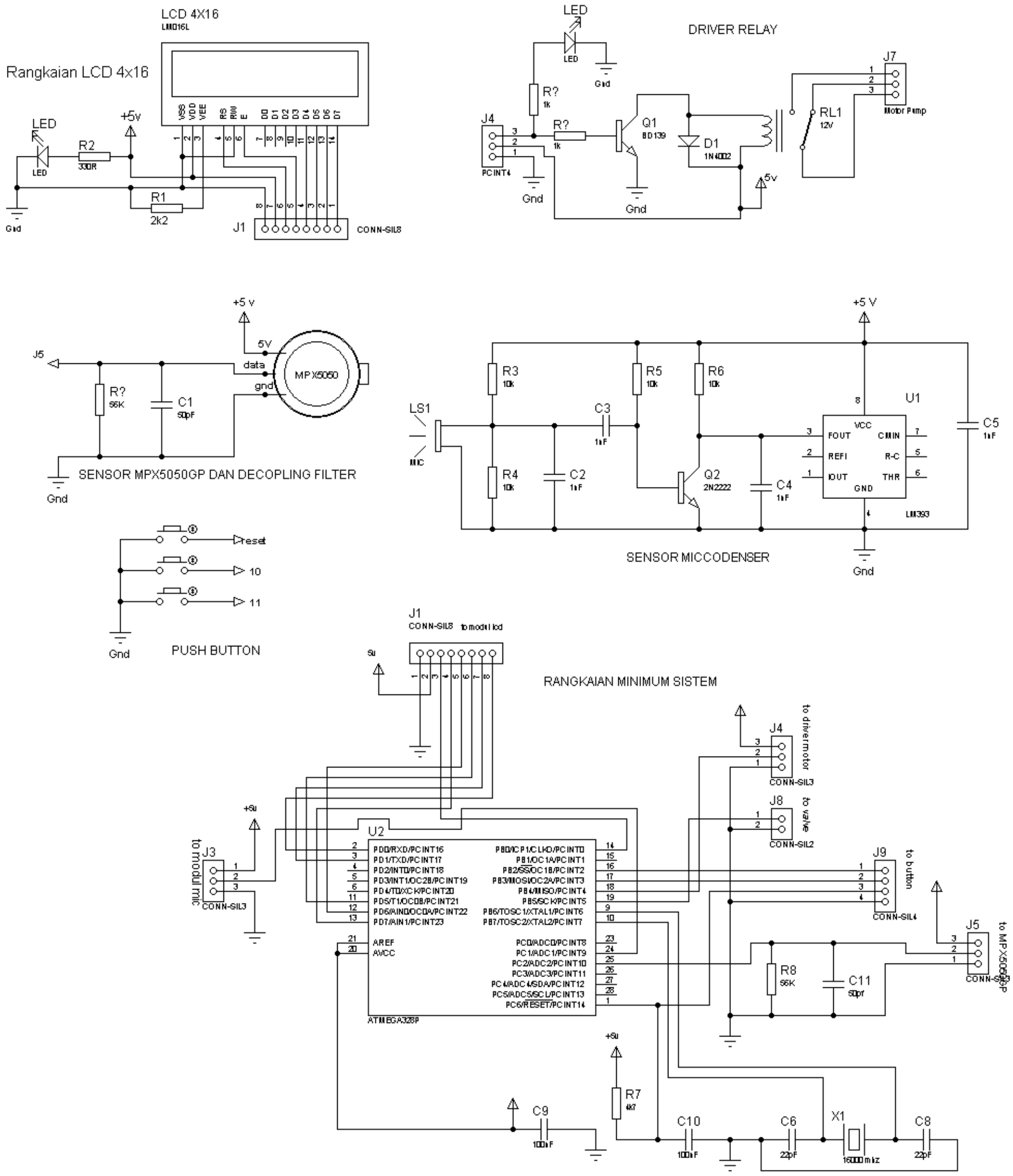
Untuk merubah kPa menjadi mmHg :

mmHg = 26,67 * 7,50062

mmHg = 200,04 mmHg

2. Pengambilan Data Menggunakan FLUKE DPM4-H

3. Gambar Rangkaian Keseluruhan



4. Program Keseluruhan Arduino

```
#define sensorMPX  A2 //deklarasi sensorMPx pada kaki A2
Arduino
#define sensorresp  A1//deklarasi sensorresp pada kaki A1
Arduino
int tanda,counter=0,timeout,counterresp; //deklarasi variable
untuk pengukuran respirasi
void loop()
{
 resp(); //memanggil fungsi resp
 if(second()==20||second()==40||second()==0){display();}
//jika detik bernilai 20,40,0 maka memanggil fungsi display
  if(digitalRead(start)==LOW){delay(100);tekanan();}
// jika tombol start ditekan maka memanggil fungsi tekanan
}
void tekanan()
{
  lcd.clear(); //menghapus karakter di lcd
  while(1){
int dataadc1 ; //deklarasi variabel dataadc1 pada tipe data int
  long sum = 0; // deklarasi variabel sum pada tipa data long
  int i;               // deklarasi variabel i pada tipe data
int

  for (i = 0; i < 30; i++)
  {
    sum += analogRead(sensorMPX);
  }
//mengulang mengambil data  pada sensorMPX selama 30 kali dan
dijumlahkan
  dataadc1  = sum / 30;
//hasil penjumlahan selama 30 kali,dibagi 30 untuk mendapatkan
nilai rata rata
  float tegangan=(((dataadc1*5)/1024.0)-0.02); //mengubah nilai
adc ke tegangan
  float kpa=(tegangan/5-0.04)/0.018; //nilai tegangan dirubah
menjadi nilai kpa
  float mmhg=kpa*7.5; //nilai kpa diubah menjadi mmhg

  darah1=mmhg;
  selisih=darah2-darah1;
  darah2=darah1;
//mencari nilai selisih saat tekanan turun dengan konstan

  lcd.setCursor(0,0);
  lcd.print("PRES:");
  lcd.print(mmhg);
//menampilkan tekanan pada cuff
  if(selisih<-0.4 && tandas==1 &&
mmhg<150){sistol=darah1;rumus();break;}
```

```
//jika selisih lebih kecil dari -0.4 dan tandas bernilai 1 dan
mmhg kurang dari 150,maka mendapatkan nilai sistol dari
darah1,kemudian memanggil fungsi rumus
  if(mmhg>200) //jika tekanan lebih dari 200
  {
    tandas=1; //tandas diberi nilai 1
    digitalWrite(motor, LOW); //motor berhenti
    digitalWrite(valve, HIGH); //valve tertutup
  }
   if(mmhg<60)
  {digitalWrite(motor, HIGH);  //motor bekerja
    digitalWrite(valve, HIGH);  //valve tertutup}
  delay(100); //jeda 100ms
}}
void rumus(){
  MAP=(sistol-15.192)/1.1597; //rumus mendapatkan MAP
  distol=(1.0337*MAP)-18.909;    //rumus mendapatkan distol
  lcd.clear(); //menghapus karakter di lcd
  lcd.setCursor(0,3);
  lcd.print("Nibp:");
  lcd.print(sistol,0);
//menampilkan nilai sistol
  lcd.print("/");
  lcd.print(distol,0);
//menampilkan nilai distol
  lcd.setCursor(12,3);
  lcd.print(MAP,0);
//menampilkan nilai MAP
  tandas=0;  //tandas diberi nilai 0
    digitalWrite(motor, LOW);    //motor berhenti
    digitalWrite(valve, LOW);      //valve terbuka
}
void resp(){
  int dataadc ; //deklarasi variabel dataadc pada tipe data int
  long sum = 0; // deklarasi variabel sum pada tipa data long
  int i;              // deklarasi variabel i pada tipe data
int

  for (i = 0; i < 30; i++)
  {
    sum += analogRead(sensorresp);
  }

//mengulang mengambil data  pada sensorrep selama 30 kali dan
dijumlahkan

  dataadc  = sum / 30;

//hasil penjumlahan selama 30 kali,dibagi 30 untuk mendapatkan
nilai rata rata
```

```
if(dataadc <800 && tanda==1) //jika hasil adc dibawah 800 dan
tanda bernilai 1 maka
  {digitalWrite(buzz,HIGH); // buzzer aktif
    counter++; //variable counter mulai mencacah
    tanda=0; //tanda diberi nilai 0
    timeout=0;  //timeout diberi nilai 0}
  if( dataadc > 800  ) // jika hasil adc diatas 800
  {digitalWrite(buzz,LOW) ); // buzzer mati
    timeou++; //variable timeout mulai mencacah}
  if(timeout>10){tanda=1;} //jika timeout lebih dari 10 maka
tanda diberi nilai 1
  if(timeout<10){tanda=0;} //jika timeout kurang dari 10 maka
tanda diberi nilai 0
  counterresp=(counter*3); //hasil counterresp adalah hasil
dara counter kali 3}
void display()
{
    lcd.clear();//menghapus karakter lcd

   lcd.setCursor(0,2);
    lcd.print("RESP:");
    lcd.print(counterresp);
  //menampilkan nilai respirasi
    lcd.setCursor(0,3);
    lcd.print("Nibp:");
    lcd.print(sistol,0);
    lcd.print("/");
    lcd.print(distol,0);
  //menampilkan nilai sistol dan distol

    delay(1000);//jeda 1000 ms
    counter1=0;//memberi nilai awal
}
```

Order this document by MPX5050/D

senseon™

MPX5050 SERIES

Integrated Silicon Pressure Sensor On-Chip Signal Conditioned, Temperature Compensated and Calibrated

**OPERATING OVERVIEW
INTEGRATED
PRESSURE SENSOR
0 to 50 kPa (0 to 7.25 psi)
0.2 to 4.7 Volts Output**

The MPX5050 series piezoresistive transducer is a state–of–the–art monolithic silicon pressure sensor designed for a wide range of applications, but particularly those employing a microcontroller or microprocessor with A/D inputs. This patented, single element transducer combines advanced micromachining techniques, thin–film metallization, and bipolar processing to provide an accurate, high level analog output signal that is proportional to the applied pressure.

Features

- 2.5% Maximum Error over 0° to 85°C
- Ideally suited for Microprocessor or Microcontroller–Based Systems
- Temperature Compensated Over – 40° to +125°C
- Patented Silicon Shear Stress Strain Gauge
- Durable Epoxy Unibody Element
- Easy–to–Use Chip Carrier Option

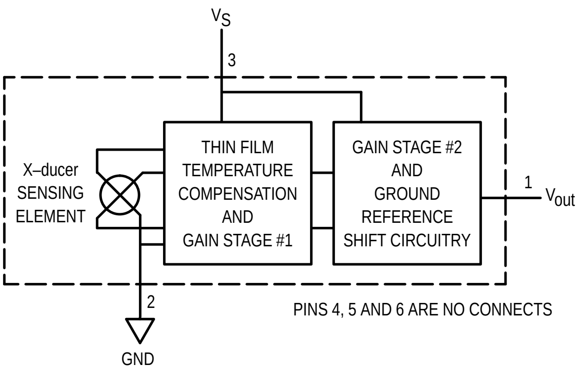
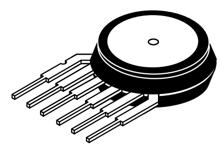
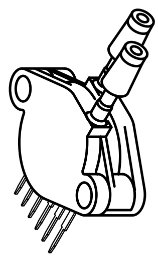


Figure 1. Fully Integrated Pressure Sensor Schematic



**BASIC CHIP CARRIER
ELEMENT
CASE 867–08, STYLE 1**



**DIFFERENTIAL PORT OPTION
CASE 867C–05, STYLE 1**

NOTE: Pin 1 is the notched pin.

PIN NUMBER			
1	V_{out}	4	N/C
2	Grd	5	N/C
3	V_S	6	N/C

NOTE: Pins 4, 5, and 6 are internal device connections. Do not connect to external circuitry or ground.

MAXIMUM RATINGS(1)

Parametrics	Symbol	Value	Unit
Overpressure(2) (P1 > P2)	P_{max}	200	kPa
Burst Pressure(2) (P1 > P2)	P_{burst}	700	kPa
Storage Temperature	T_{stg}	–40° to +125°	°C
Operating Temperature	T_A	–40° to +125°	°C

1. T_C = 25°C unless otherwise noted.
2. Exposure beyond the specified limits may cause permanent damage or degradation to the device.

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REV 3

OPERATING CHARACTERISTICS (V_S = 5.0 Vdc, T_A = 25°C unless otherwise noted, P1 > P2)

Characteristic		Symbol	Min	Typ	Max	Unit
Pressure Range(1)		P_{OP}	0	—	50	kPa
Supply Voltage(2)		V_S	4.75	5.0	5.25	Vdc
Supply Current		I_o	—	7.0	10.0	mAdc
Minimum Pressure Offset(3) @ V_S = 5.0 Volts	(0 to 85°C)	V_{off}	0.088	0.20	0.313	Vdc
Full Scale Output(4) @ V_S = 5.0 Volts	(0 to 85°C)	V_{FSO}	4.587	4.70	4.813	Vdc
Full Scale Span(5) @ V_S = 5.0 Volts	(0 to 85°C)	V_{FSS}	—	4.50	—	Vdc
Accuracy(6)		—	—	—	±2.5	$\%V_{FSS}$
Sensitivity		V/P	—	90	—	mV/kPa
Response Time(7)		t_R	—	1.0	—	mS
Output Source Current at Full Scale Output		I_o+	—	0.1	—	mAdc
Warm–Up Time(8)		—	—	20	—	mSec
Offset Stability(9)		—	—	±0.5	—	$\%V_{FSS}$

Decoupling circuit shown in Figure 4 required to meet electrical specifications.

MECHANICAL CHARACTERISTICS

Characteristic	Symbol	Min	Typ	Max	Unit
Weight, Basic Element (Case 867)	—	—	4.0	—	Grams
Common Mode Line Pressure(10)	—	—	—	690	kPa

NOTES:

1. 1.0kPa (kiloPascal) equals 0.145 psi.
2. Device is ratiometric within this specified excitation range.
3. Offset (V_{off}) is defined as the output voltage at the minimum rated pressure.
4. Full Scale Output (V_{FSO}) is defined as the output voltage at the maximum or full rated pressure.
5. Full Scale Span (V_{FSS}) is defined as the algebraic difference between the output voltage at full rated pressure and the output voltage at the minimum rated pressure.
6. Accuracy (error budget) consists of the following:
   - Linearity: Output deviation from a straight line relationship with pressure over the specified pressure range.
   - Temperature Hysteresis: Output deviation at any temperature within the operating temperature range, after the temperature is cycled to and from the minimum or maximum operating temperature points, with zero differential pressure applied.
   - Pressure Hysteresis: Output deviation at any pressure within the specified range, when this pressure is cycled to and from minimum or maximum rated pressure at 25°C.
   - TcSpan: Output deviation over the temperature range of 0° to 85°C, relative to 25°C.
   - TcOffset: Output deviation with minimum pressure applied, over the temperature range of 0° to 85°C, relative to 25°C.
   - Variation from Nominal: The variation from nominal values, for Offset or Full Scale Span, as a percent of V_{FSS} at 25°C.
7. Response Time is defined as the time for the incremental change in the output to go from 10% to 90% of its final value when subjected to a specified step change in pressure.
8. Warm–up is defined as the time required for the product to meet the specified output voltage after the Pressure has been stabilized.
9. Offset stability is the product's output deviation when subjected to 1000 hours of Pulsed Pressure, Temperature Cycling with Bias Test.
10. Common mode pressures beyond what is specified may result in leakage at the case–to–lead interface.

Figure 3 illustrates the Differential/Gauge Sensing Chip in the basic chip carrier (Case 867). A fluorosilicone gel isolates the die surface and wire bonds from the environment, while allowing the pressure signal to be transmitted to the sensor diaphragm.

The MPX5050 series pressure sensor operating characteristics, and internal reliability and qualification tests are based on use of dry air as the pressure media. Media, other than dry air, may have adverse effects on sensor performance and long–term reliability. Contact the factory for information regarding media compatibility in your application.

Figure 4 shows a typical decoupling circuit for interfacing the integrated sensor to the A/D input of a microprocessor. Proper decoupling of the power supply is recommended.

Figure 2 shows the sensor output signal relative to pressure input. Typical, minimum, and maximum output curves are shown for operation over a temperature range of 0° to 85°C using the decoupling circuit below. (The output will saturate outside of the specified pressure range.)

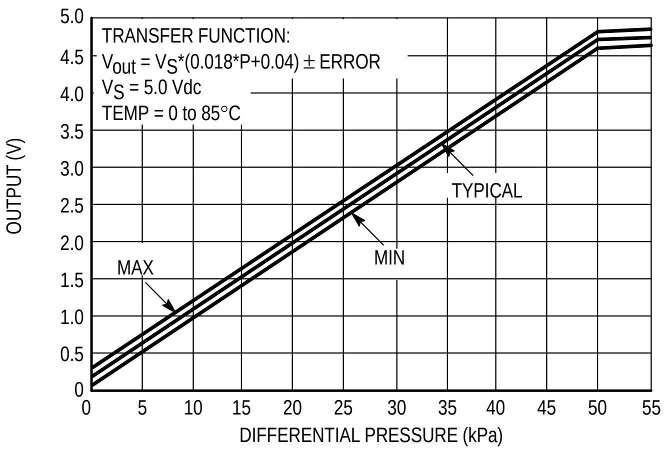


Figure 2. Output versus Pressure Differential

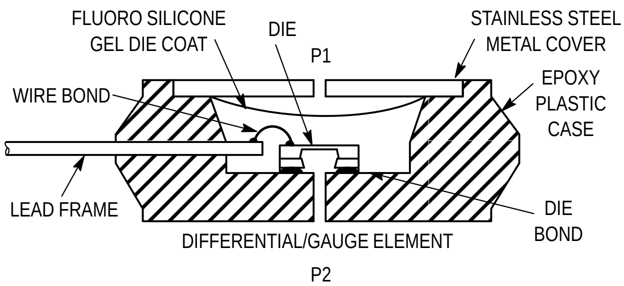


Figure 3. Cross–Sectional Diagram (Not to Scale)

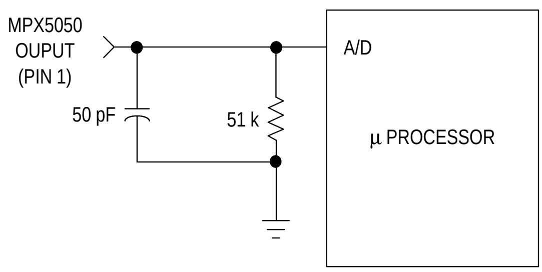


Figure 4. Typical Decoupling Filter for Sensor to Microprocessor Interface

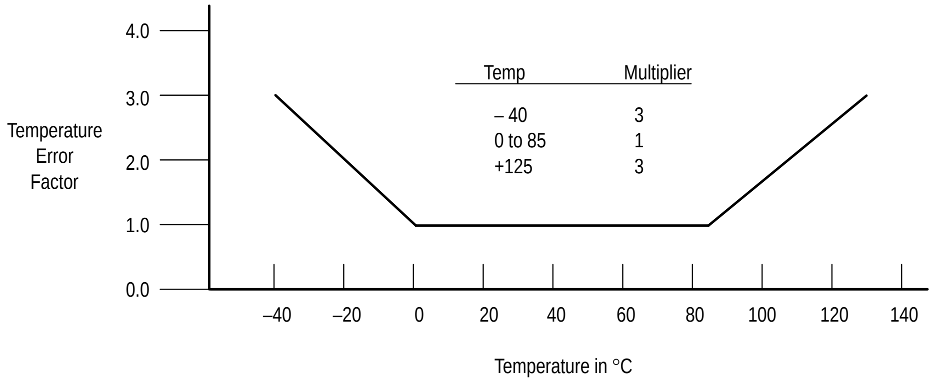
MPX5050 SERIES

Transfer Function

Nominal Transfer Value: $V_{out} = V_S$ (P x 0.018 + 0.04)
+/– (Pressure Error x Temp. Factor x 0.018 x V_S)
V_S = 5.0 V ± 0.25 Vdc

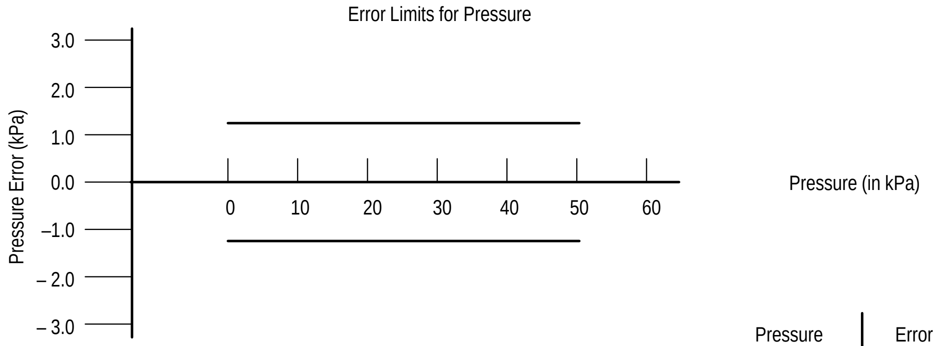
Temperature Error Band

MPX5050D Series



NOTE: The Temperature Multiplier is a linear response from 0° to –40°C and from 85° to 125°C.

Pressure Error Band



Pressure	Error (Max)
0 to 50 kPa	± 1.25 kPa

PRESSURE (P1) / VACUUM (P2) SIDE IDENTIFICATION TABLE

Motorola designates the two sides of the pressure sensor as the Pressure (P1) side and the Vacuum (P2) side. The Pressure (P1) side is the side containing fluorosilicone gel which protects the die from harsh media. The Motorola MPX pressure sensor is designed to operate with positive differential pressure applied, P1 > P2.

The Pressure (P1) side may be identified by using the table below:

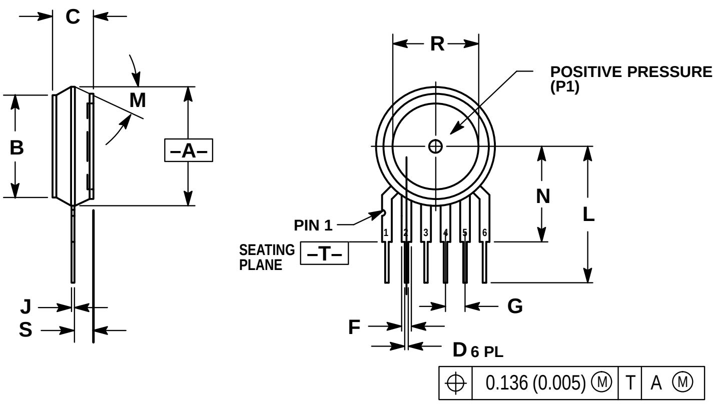
Part Number	Case Type	Pressure (P1) Side Identifier
MPX5050D	867–08	Stainless Steel Cap
MPX5050DP	867C–05	Side with Part Marking
MPX5050GP	867B–04	Side with Port Attached
MPX5050GVP	867D–04	Stainless Steel Cap
MPX5050GS	867E–03	Side with Port Attached
MPX5050GVS	867A–04	Stainless Steel Cap
MPX5050GSX	867F–03	Side with Port Attached
MPX5050GVSX	867G–03	Stainless Steel Cap

ORDERING INFORMATION

The MPX5050 pressure sensor is available in differential and gauge configurations. Devices are available in the basic element package or with pressure port fittings that provide printed circuit board mounting ease and barbed hose pressure connections.

Device Type	Options	Case Type	MPX Series	
			Order Number	Device Marking
Basic Element	Differential	867–08	MPX5050D	MPX5050D
Ported Elements	Differential Dual Ports	867C–05	MPX5050DP	MPX5050DP
	Gauge	867B–04	MPX5050GP	MPX5050GP
	Gauge Vacuum Port	867D–04	MPX5050GVP	MPX5050GVP
	Gauge, Axial	867E–03	MPX5050GS	MPX5050D
	Gauge Vacuum Axial	867A–04	MPX5050GVS	MPX5050D
	Gauge, Axial PC Mount	867F–03	MPX5050GSX	MPX5050D
	Gauge Vacuum Axial PC Mount	867G–03	MPX5050GVSX	MPX5050D

PACKAGE DIMENSIONS



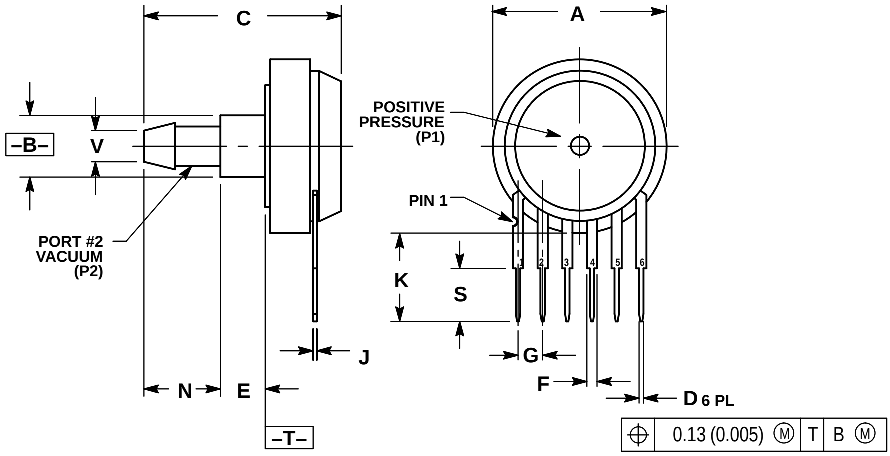
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION –A– IS INCLUSIVE OF THE MOLD STOP RING. MOLD STOP RING NOT TO EXCEED 16.00 (0.630).

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.595	0.630	15.11	16.00
B	0.514	0.534	13.06	13.56
C	0.200	0.220	5.08	5.59
D	0.027	0.033	0.68	0.84
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.40
L	0.695	0.725	17.65	18.42
M	30° NOM		30° NOM	
N	0.475	0.495	12.07	12.57
R	0.430	0.450	10.92	11.43
S	0.090	0.105	2.29	2.66

STYLE 1:
PIN 1. VOUT
2. GROUND
3. VCC
4. V1
5. V2
6. VEX

CASE 867–08
ISSUE N

BASIC ELEMENT (D)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

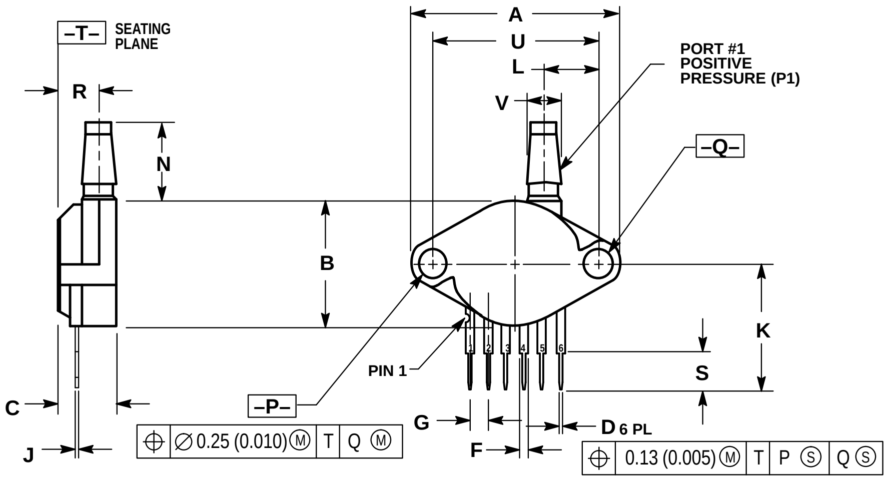
	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.690	0.720	17.53	18.28
B	0.245	0.255	6.22	6.48
C	0.780	0.820	19.81	20.82
D	0.027	0.033	0.69	0.84
E	0.178	0.186	4.52	4.72
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.345	0.375	8.76	9.53
N	0.300	0.310	7.62	7.87
S	0.220	0.240	5.59	6.10
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. VOUT
2. GROUND
3. VCC
4. V1
5. V2
6. VEX

CASE 867A–04
ISSUE E

VACUUM SIDE PORTED (GVS)

PACKAGE DIMENSIONS–CONTINUED



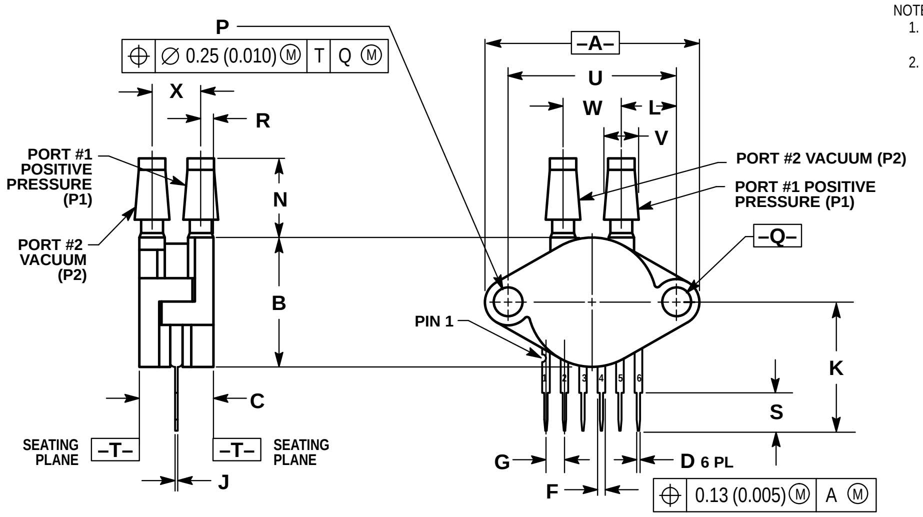
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.145	1.175	29.08	29.85
B	0.685	0.715	17.40	18.16
C	0.305	0.325	7.75	8.26
D	0.027	0.033	0.68	0.84
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.695	0.725	17.65	18.42
L	0.290	0.300	7.37	7.62
N	0.420	0.440	10.67	11.18
P	0.153	0.159	3.89	4.04
Q	0.153	0.159	3.89	4.04
R	0.230	0.250	5.84	6.35
S	0.220	0.240	5.59	6.10
U	0.910 BSC		23.11 BSC	
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867B–04
ISSUE E

PRESSURE SIDE PORTED (GP)



NOTES:
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2. CONTROLLING DIMENSION: INCH.

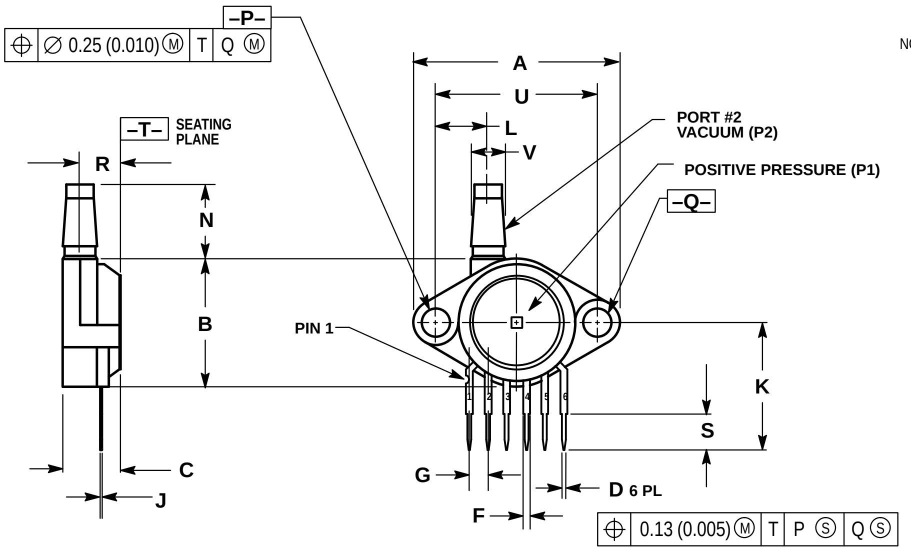
DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.145	1.175	29.08	29.85
B	0.685	0.715	17.40	18.16
C	0.405	0.435	10.29	11.05
D	0.027	0.033	0.68	0.84
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.695	0.725	17.65	18.42
L	0.290	0.300	7.37	7.62
N	0.420	0.440	10.67	11.18
P	0.153	0.159	3.89	4.04
Q	0.153	0.159	3.89	4.04
R	0.063	0.083	1.60	2.11
S	0.220	0.240	5.59	6.10
U	0.910 BSC		23.11 BSC	
V	0.182	0.194	4.62	4.93
W	0.310	0.330	7.87	8.38
X	0.248	0.278	6.30	7.06

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867C–05
ISSUE F

PRESSURE AND VACUUM SIDES PORTED (DP)

PACKAGE DIMENSIONS–CONTINUED



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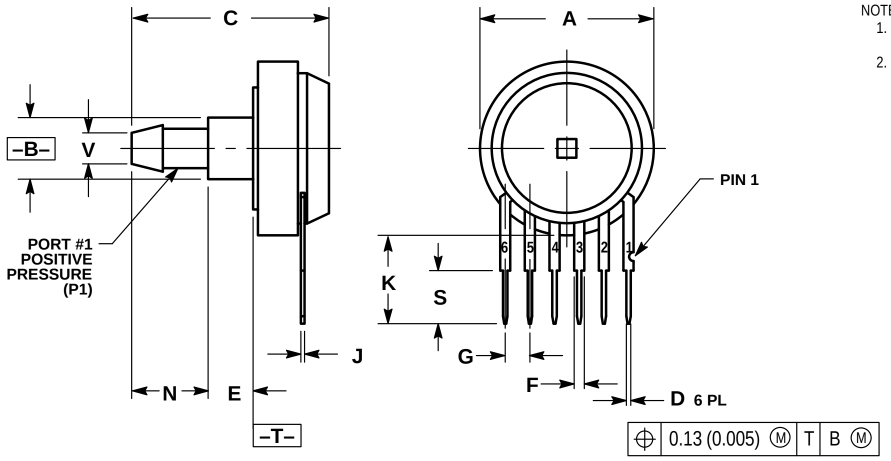
D	0.027	0.033	0.68	0.84
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.695	0.725	17.65	18.42
L	0.290	0.300	7.37	7.62
N	0.420	0.440	10.67	11.18
P	0.153	0.159	3.89	4.04
Q	0.153	0.159	3.89	4.04
R	0.230	0.250	5.84	6.35
S	0.220	0.240	5.59	6.10
U	0.910 BSC		23.11 BSC	
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867D–04
ISSUE F

VACUUM SIDE PORTED (GVP)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

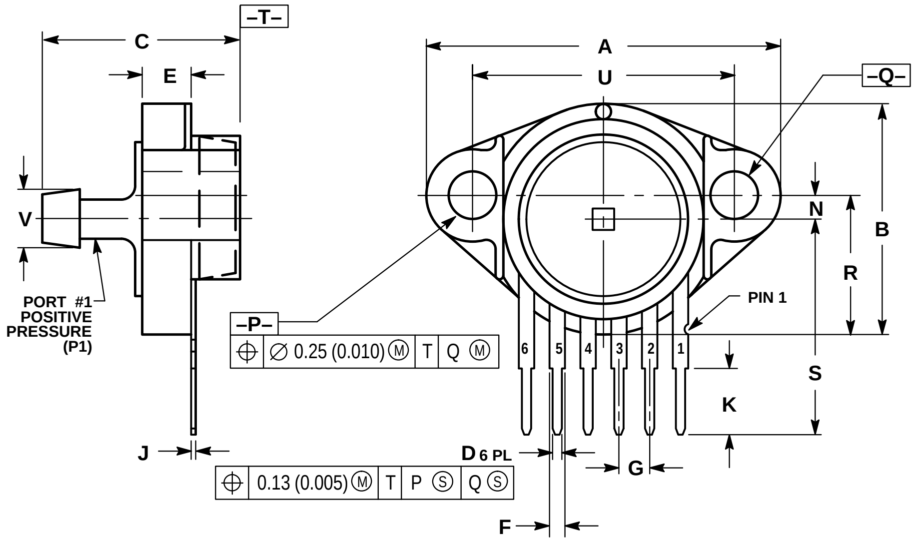
DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.690	0.720	17.53	18.28
B	0.245	0.255	6.22	6.48
C	0.780	0.820	19.81	20.82
D	0.027	0.033	0.69	0.84
E	0.178	0.186	4.52	4.72
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.345	0.375	8.76	9.53
N	0.300	0.310	7.62	7.87
S	0.220	0.240	5.59	6.10
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867E–03
ISSUE D

PRESSURE SIDE PORTED (AS, GS)

PACKAGE DIMENSIONS–CONTINUED



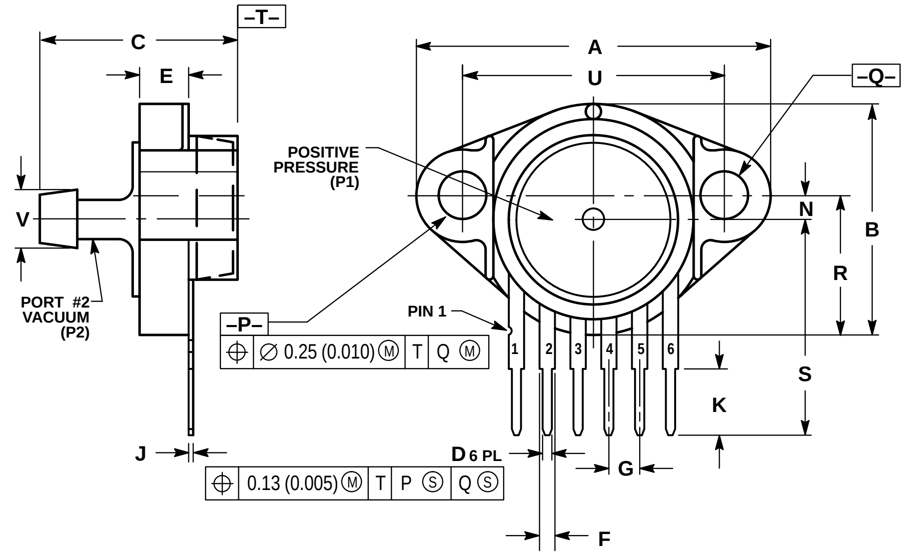
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.080	1.120	27.43	28.45
B	0.740	0.760	18.80	19.30
C	0.630	0.650	16.00	16.51
D	0.027	0.033	0.68	0.84
E	0.160	0.180	4.06	4.57
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.220	0.240	5.59	6.10
N	0.070	0.080	1.78	2.03
P	0.150	0.160	3.81	4.06
Q	0.150	0.160	3.81	4.06
R	0.440	0.460	11.18	11.68
S	0.695	0.725	17.65	18.42
U	0.840	0.860	21.34	21.84
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867F–03
ISSUE D

PRESSURE SIDE PORTED (GSX)



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	1.080	1.120	27.43	28.45
B	0.740	0.760	18.80	19.30
C	0.630	0.650	16.00	16.51
D	0.027	0.033	0.68	0.84
E	0.160	0.180	4.06	4.57
F	0.048	0.064	1.22	1.63
G	0.100 BSC		2.54 BSC	
J	0.014	0.016	0.36	0.41
K	0.220	0.240	5.59	6.10
N	0.070	0.080	1.78	2.03
P	0.150	0.160	3.81	4.06
Q	0.150	0.160	3.81	4.06
R	0.440	0.460	11.18	11.68
S	0.695	0.725	17.65	18.42
U	0.840	0.860	21.34	21.84
V	0.182	0.194	4.62	4.93

STYLE 1:
PIN 1. V_{OUT}
2. GROUND
3. V_{CC}
4. V1
5. V2
6. V_{EX}

CASE 867G–03
ISSUE D

VACUUM SIDE PORTED (GVSX)

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MOTOROLA

Sound Detection Sensor

The sound sensor module provides an easy way to detect sound and is generally used for detecting sound intensity. This module can be used for security, switch, and monitoring applications. Its accuracy can be easily adjusted for the convenience of usage.

It uses a microphone which supplies the input to an amplifier, peak detector and buffer. When the sensor detects a sound, it processes an output signal voltage which is sent to a microcontroller then performs necessary processing.

Sound detection sensor module for arduino detects whether sound has exceeded a threshold value. Sound is detected via microphone and fed into an LM393 op amp. The sound level set point is adjusted via an on board potentiometer. When the sound level exceeds the set point, an LED on the module is illuminated and the output is set low.

Specifications of sound detection sensor module:

- Working voltage: DC 3.3-5V
- Adjustable Sensitivity
- Dimensions: 32 x 17 mm
- Signal output indication
- Single channel signal output
- With the retaining bolt hole, convenient installation
- Outputs low level and the signal light when there is sound
- Output in the form of digital switching outputs (0 and 1 high and low)

Schematic Diagram