MS4525

- **PCB Mounted Pressure Transducers**
- **Amplified Ratiometric Analog Output**
- **Differential, Gage, Absolute, Compound and Vacuum**
- **Temperature Compensated**
- **3.3 or 5.0 Vdc Supply Voltage**

DESCRIPTION

The MS4525 is a small, ceramic based, PCB mounted pressure transducer from Measurement Specialties. The transducer is built using Measurement Specialties' proprietary UltraStable™ process and the latest CMOS sensor conditioning circuitry to create a low cost, high performance transducer designed to meet the strictest requirements from OEM customers.

The MS4525 is fully calibrated and temperature compensated with a total error band (TEB) of less than 1.0% over the compensated range. The sensor operates from single supply of either 3.3 or 5.0Vdc and requires a single external component for proper operation.

The rugged ceramic transducer is available in side port, top port, and manifold mount and can measure absolute, gauge, differential, vacuum or compound pressure from 1 to 150psi. The 1/8" barbed pressure ports mate securely with 3/32" ID tubing.

FEATURES

- PSI Pressure Ranges
- PCB Mountable
- High Level Analog Output
- Barbed Pressure Ports

APPLICATIONS

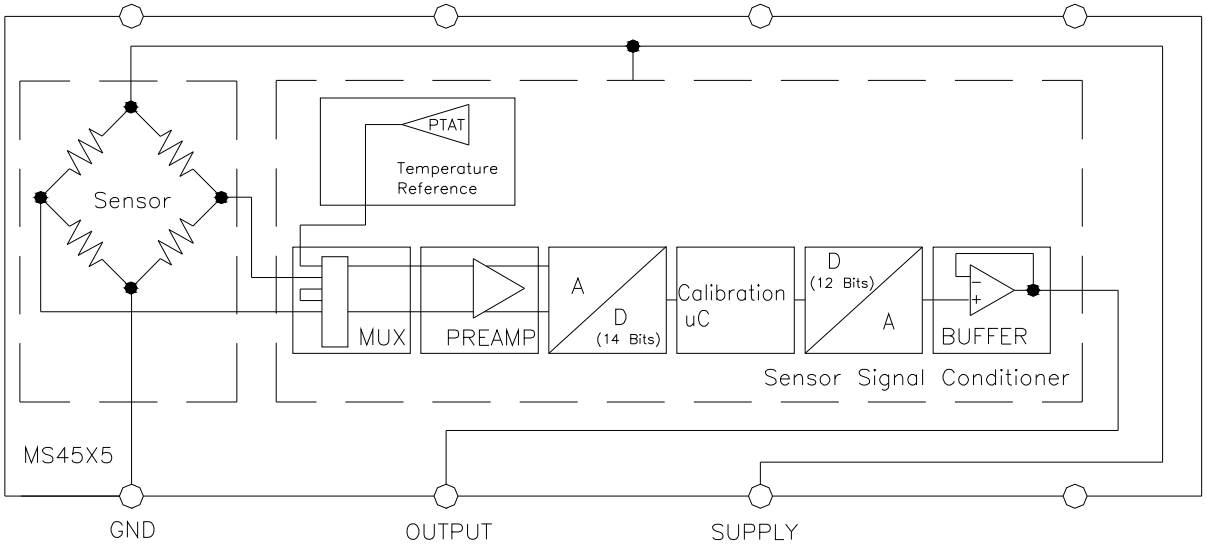
- Factory Automation, Vacuum Switch
- Altitude and Airspeed Measurements
- Medical Instruments
- Leak Detection

STANDARD RANGES (PSI)

Pressure	Absolute	Gauge	Differential	Compound	Vacuum
1		DS, SS, TP, MM	DS, SS, TP		
2		DS, SS, TP, MM	DS, SS, TP		
5		DS, SS, TP, MM	DS, SS, TP		
15	SS, TP	DS, SS, TP, MM	DS, MM	SS, TP	SS, TP, DS
30	SS, TP	DS, SS, TP, MM	DS, MM	SS, TP	
50	SS, TP	DS, SS, TP, MM	DS, MM	SS, TP	
100	SS, TP	DS, SS, TP, MM	DS, MM	SS, TP	
150	SS, TP	DS, SS, TP, MM	DS, MM	SS, TP	

See Package Configurations: DS= Dual Side Port, SS= Single Side Port, TP= Top Port, MM= Manifold Mount
Pin Style "L" is only available SS and MM port types

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Conditions	Min	Max	Unit	Notes
Supply Voltage	T_A = 25 °C	2.7	5.5	V	
Output Current	T_A = 25°C		3	mA	
Load Resistance (R_L)	T_A = 25°C	10		kΩ	
Storage Temperature		-40	+125	°C	
Humidity	T_A = 25°C		95	%RH	Non Condensing
Overpressure	T_A = 25 °C, both Ports	Not to Exceed 300		psi	
Burst Pressure	T_A = 25 °C, Port 1			psi	See Table 1
ESD	HBM	-4	+4	kV	EN 61000-4-2
Solder Temperature	250°C, 5 sec max.				

TABLE 1- BURST PRESSURE BY RANGE AND PACKAGE STYLE

Range	DS	TP, SS, MM	Unit
001	20	20	psi
002	20	20	psi
005	15	20	psi
015	45	90	psi
030	90	200	psi
050	150	300	psi
100	300	300	psi
150	300	300	psi

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions
Mechanical Shock	Mil Spec 202F, Method 213B, Condition C, 3 Drops
Mechanical Vibration	Mil Spec 202F, Method 214A, Condition 1E, 1Hr Each Axis
Thermal Shock	100 Cycles over Storage Temperature, 30 minute dwell
Life	1 Million FS Cycles
MTTF	>10Yrs, 70 ºC, 10 Million Pressure Cycles, 120%FS Pressure

PERFORMANCE SPECIFICATIONS

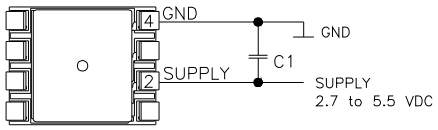
Supply Voltage[1]: 5.0V or 3.3 Vdc
Reference Temperature: 25°C (unless otherwise specified)

PARAMETERS	MIN	TYP	MAX	UNITS	NOTES
Accuracy	-0.25		0.25	%Span	2
Total Error Band (TEB)	-1.0		1.0	%Span	3,5
Supply Current		3		mA	5
Compensated Temperature	-10		+85	ºC	4
Operating Temperature	-25		+105	ºC	
Response Time		1		mS	5
Weight		3		grams	
Media	Non-Corrosive Dry Gases Compatible with Ceramic, Silicon, Pyrex, PPS, RTV, Gold, Aluminum and Epoxy. See “Wetted Material by Port Designation” chart below.				

Notes

1. Proper operation requires an external capacitor placed as shown in Connection Diagram. Output is ratiometric to supply voltage variations of less than 10%.
2. The maximum deviation from a best fit straight line (BFSL) fitted to the output measured over the pressure range at 25°C. Includes all errors due to pressure non linearity, hysteresis, and non repeatability.
3. Total error band includes all accuracy errors, thermal errors over the compensated temperature range, and span and offset calibration tolerances. For ideal sensor output with respect to input pressure, reference Pressure Transfer Function charts below. TEB values are valid only at the calibrated supply voltage.
4. For errors beyond the compensated temperature range, see Extended Temperature Multiplier chart below.
5. This product can be configured for custom OEM requirements, contact factory for lower power consumption or higher accuracy.

CONNECTION DIAGRAM



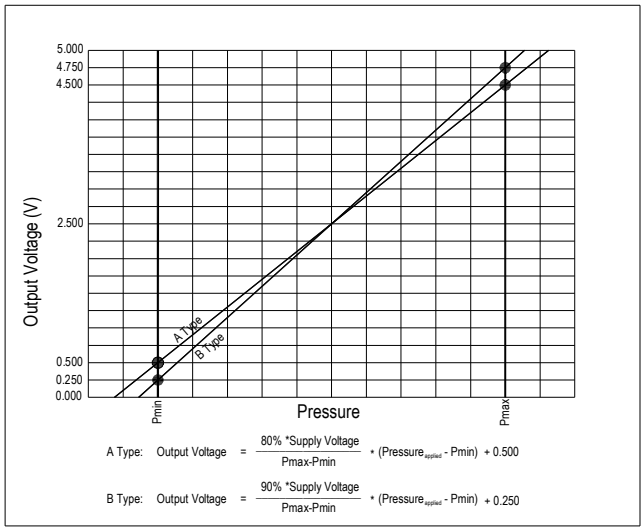
Notes

1. Place 100nF capacitor between Supply and GND to within 2 cm of sensor.

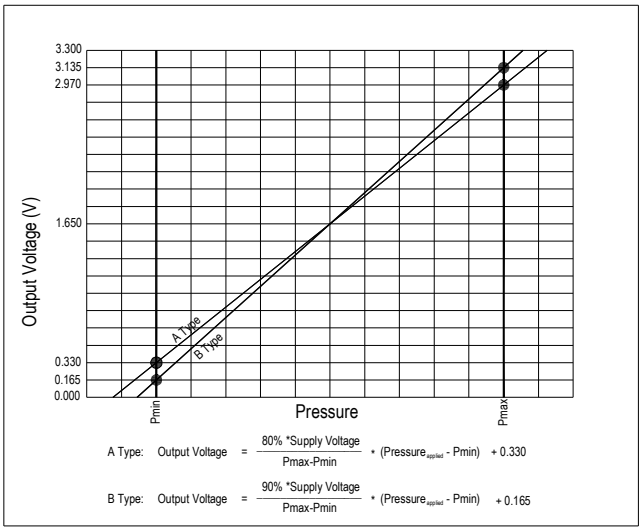
PRESSURE AND TEMPERATURE TRANSFER FUNCTION

Gage, Differential and Compound Pressure Types

Pressure Transfer Functions, Supply=5V



Pressure Transfer Functions, Supply=3.3V



Sensor Output at Significant Percentages (Supply=5.000V)

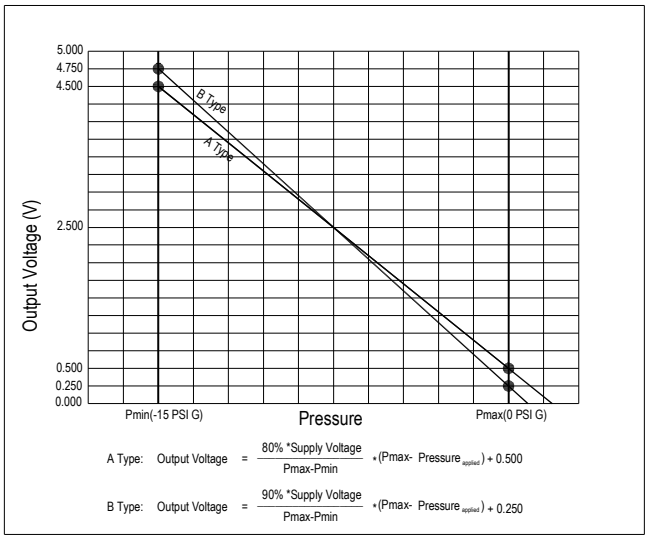
% Output	Output Type A (PSI)	Output Type B (PSI)	Voltage(V)
0	Pmin-(Pmax-Pmin)*10/80	Pmin-(Pmax-Pmin)*5/90	0.000
5		Pmin	0.250
10	Pmin		0.500
50			2.500
90	Pmax		4.500
95		Pmax	4.750
100	Pmax+(Pmax-Pmin)*10/80	Pmax+(Pmax-Pmin)*5/90	5.000

Sensor Output at Significant Percentages (Supply=3.300V)

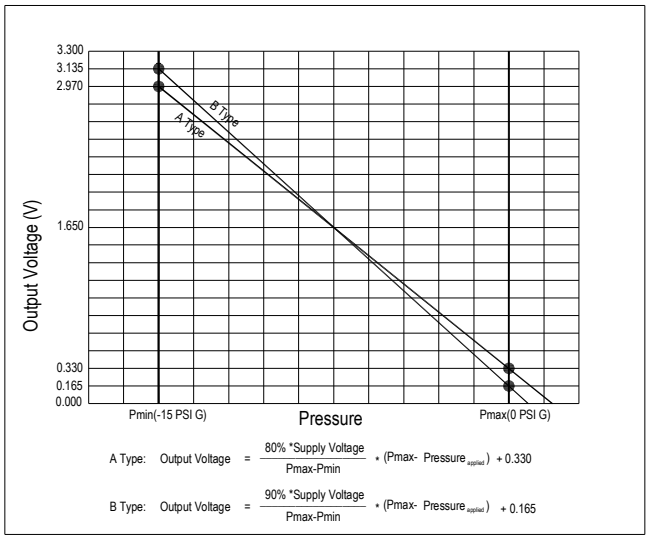
% Output	Output Type A (PSI)	Output Type B (PSI)	Voltage(V)
0	Pmin-(Pmax-Pmin)*10/80	Pmin-(Pmax-Pmin)*5/90	0.000
5		Pmin	0.165
10	Pmin		0.330
50			1.650
90	Pmax		2.970
95		Pmax	3.135
100	Pmax+(Pmax-Pmin)*10/80	Pmax+(Pmax-Pmin)*5/90	3.300

Vacuum Pressure Type

Vacuum Series Transfer Functions, Supply=5V



Vacuum Series Transfer Functions, Supply=3.3V



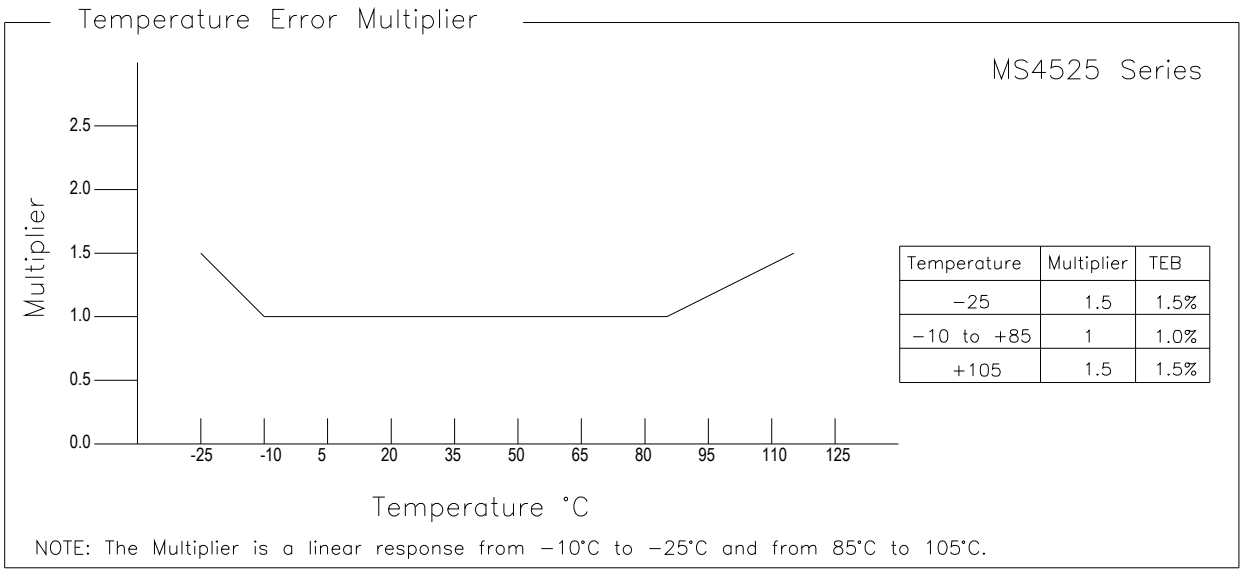
Sensor Output at Significant Percentages (Supply=5.000V)

% Output	Output Type A (PSI G)	Output Type B (PSI G)	Voltage(V)
0	1.6875	0.833	0.000
5		0	0.250
10	0		0.500
50			2.500
90	−15		4.500
95	-	−15	4.750
100	-	-	5.000

Sensor Output at Significant Percentages (Supply=3.300V)

% Output	Output Type A (PSI G)	Output Type B (PSI G)	Voltage(V)
0	1.6875	0.833	0.000
5		0	0.165
10	0		0.330
50			1.650
90	−15		2.970
95	-	−15	3.135
100	-	-	3.300

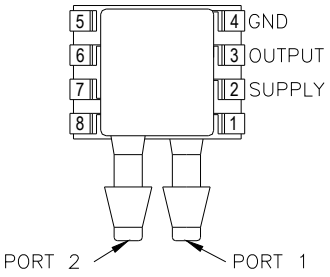
EXTENDED TEMPERATURE MULTIPLIER CHART



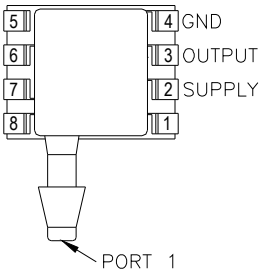
Temperature	Multiplier	TEB
−25	1.5	1.5%
−10 to +85	1	1.0%
+105	1.5	1.5%

NOTE: The Multiplier is a linear response from −10°C to −25°C and from 85°C to 105°C.

PACKAGE, PINOUT & PRESSURE TYPE CONFIGURATION



MS4525−DSvoxxxyP



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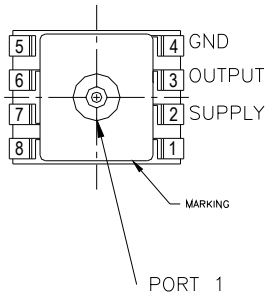

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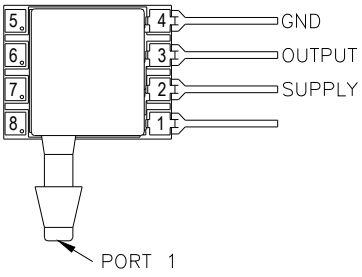
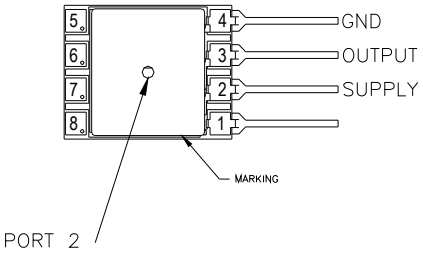
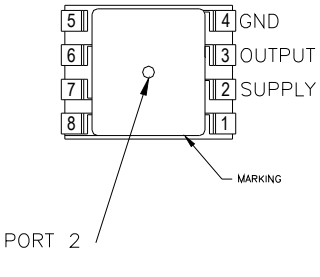


MS4525−SSvoxxxyL



MS4525−MMvoxxxyL



MS4525−MMvoxxxyP

Pin Name	Pin	Function
SUPPLY	2	Positive Supply Voltage
OUTPUT	3	Analog Output
GND	4	Ground
	1, 5-8	No Connection

Pressure Type	Pmin	Pmax	Description
Absolute	0psiA	+Prange	Output is proportional to the difference between 0psiA (Pmin) and pressure applied to Port 1.
Differential/ Bidirectional	-Prange	+Prange	Output is proportional to the difference between Port 1 and Port 2. Output swings positive when Port 1> Port 2. Output is 50% of supply voltage when Port 1=Port 2.
Gauge	0psiG	+Prange	Output is proportional to the difference between 0psiG (Pmin) and Port 1. Output swings positive when Port 1> Port 2.
Vacuum	-15psiG	+0psiG	Output is inversely proportional to the difference between -15psiG pressure (Pmin) and pressure applied to Port 1.
Compound	-15psiG	+Prange	Output is proportional to the difference between -15psiG pressure (Pmin) and pressure applied to Port 1.

Prange is equal to the maximum full scale pressure specified in the ordering information.

WETTED MATERIAL BY PORT DESIGNATION

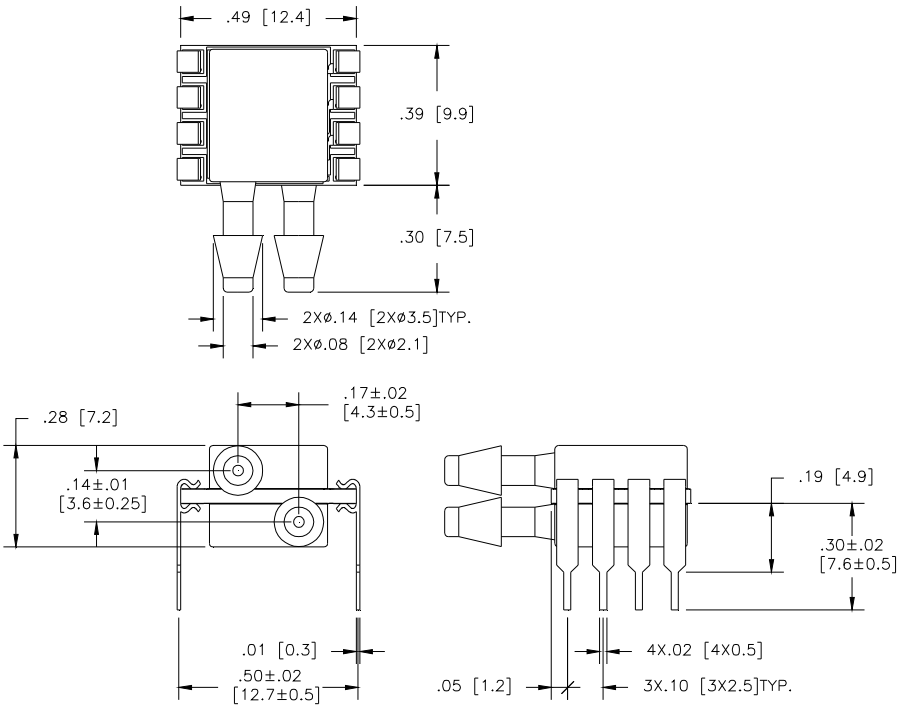
		Material							
Style	Port	PPS	Ceramic	Silicon	Pyrex	RTV	Gold	Aluminum	Epoxy
DS, MM	Port 1	X	X	X	X	X			X
	Port 2	X	X	X	X	X	X	X	X
SS, TP	Port 1	X	X	X	X	X	X	X	X

"X" Indicates Wetted Material

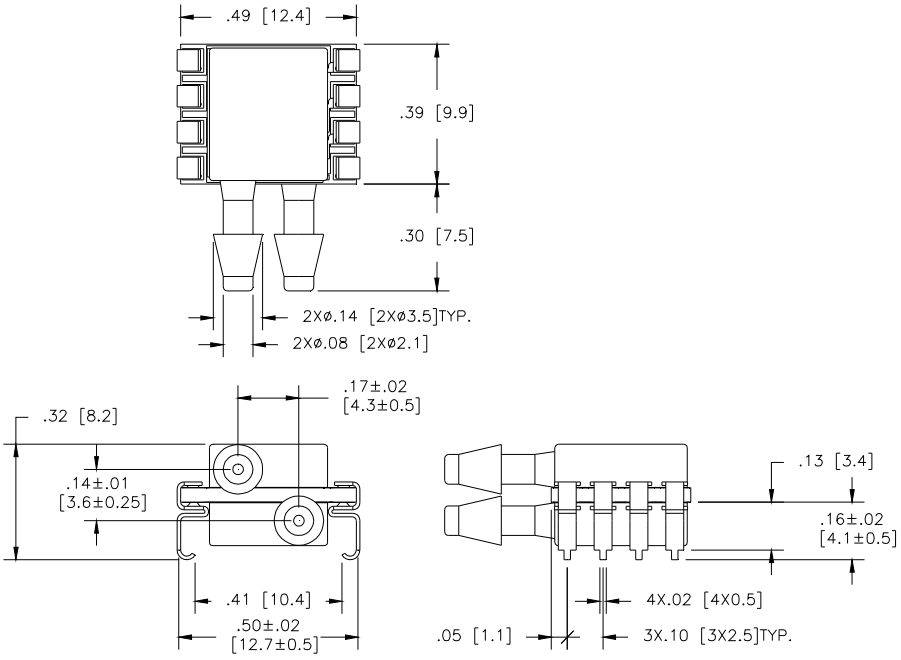
DIMENSIONS

DIMENSIONS ARE IN INCHES [mm]

Model MS4525–DSvoxxxyP

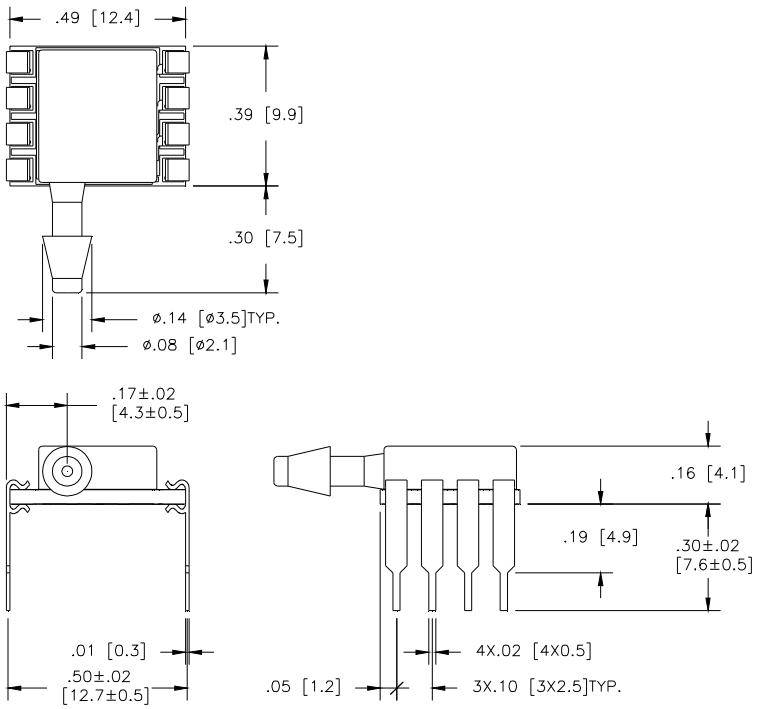


Model MS4525–DSvoxxxyS

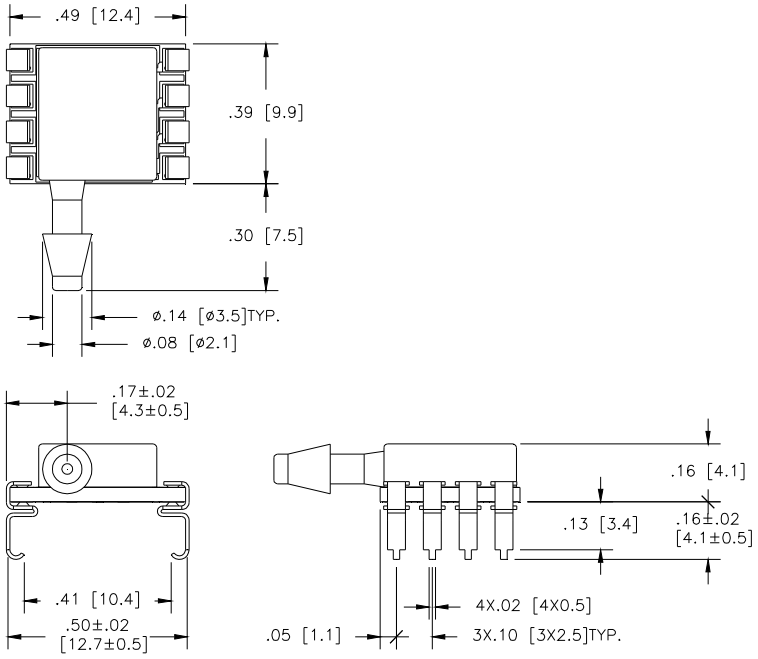


DIMENSIONS ARE IN INCHES [mm]

Model MS4525-SSvoxxxyP

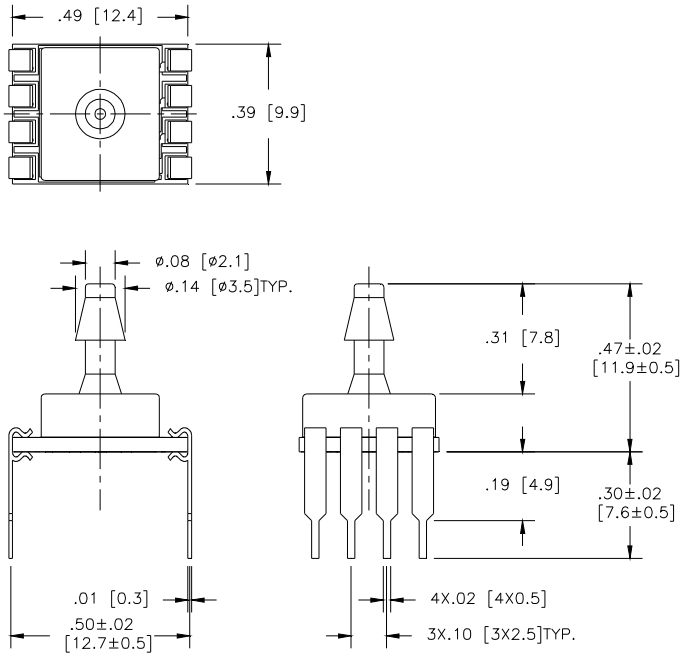


Model MS4525-SSvoxxxyS



DIMENSIONS ARE IN INCHES [mm]

Model MS4525-TPvoxxxyP



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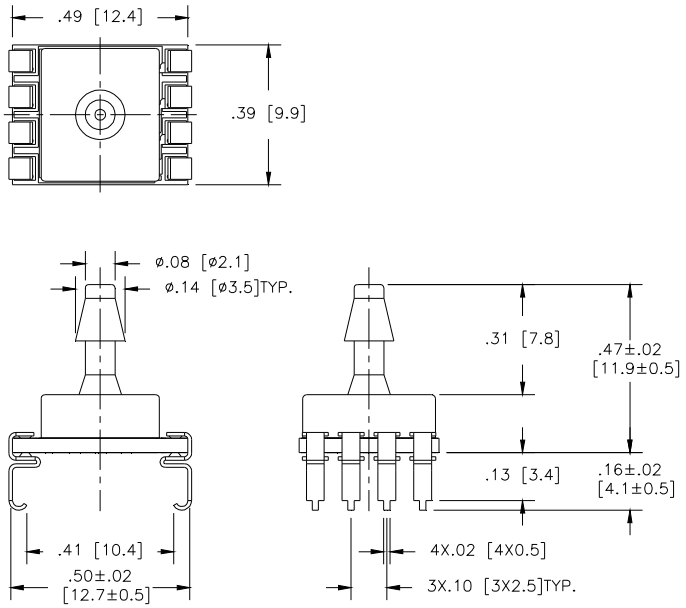
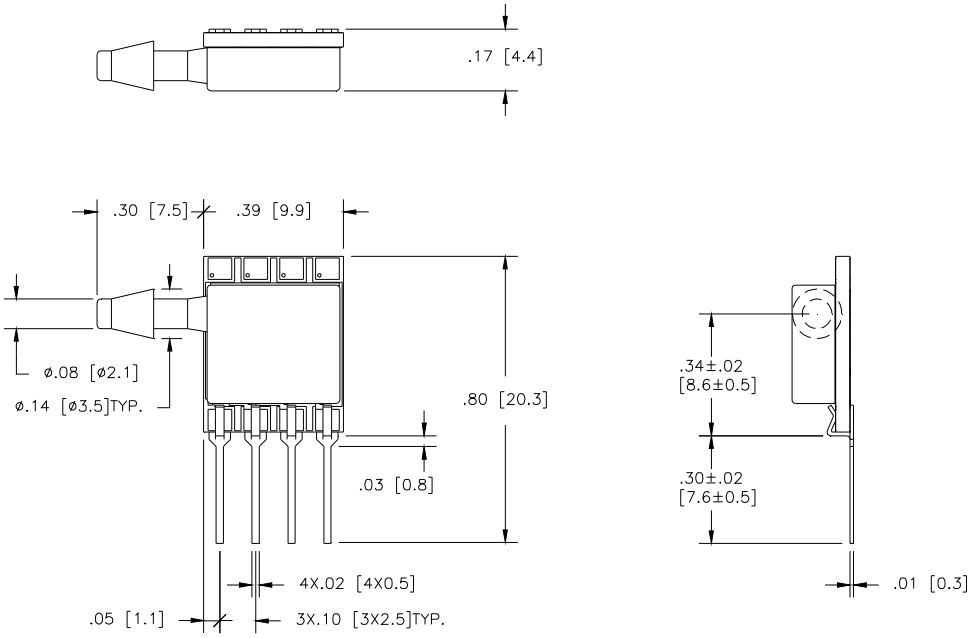
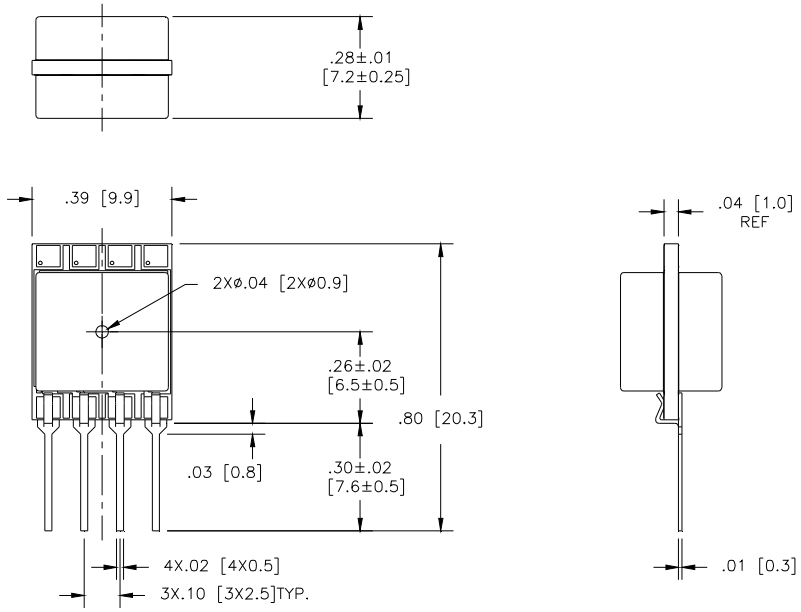


DIMENSIONS ARE IN INCHES [mm]

Model MS4525-SSvoxxxyL

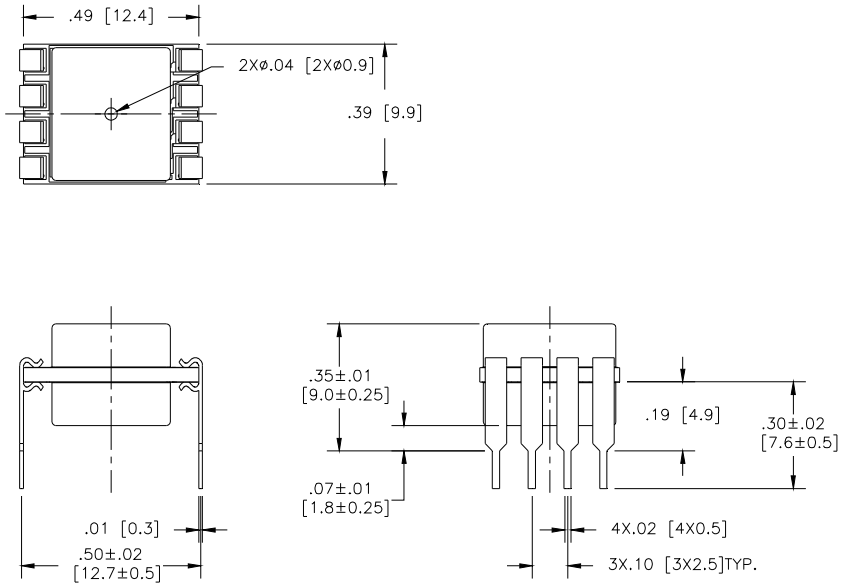


Model MS4525-MMvoxxxyL

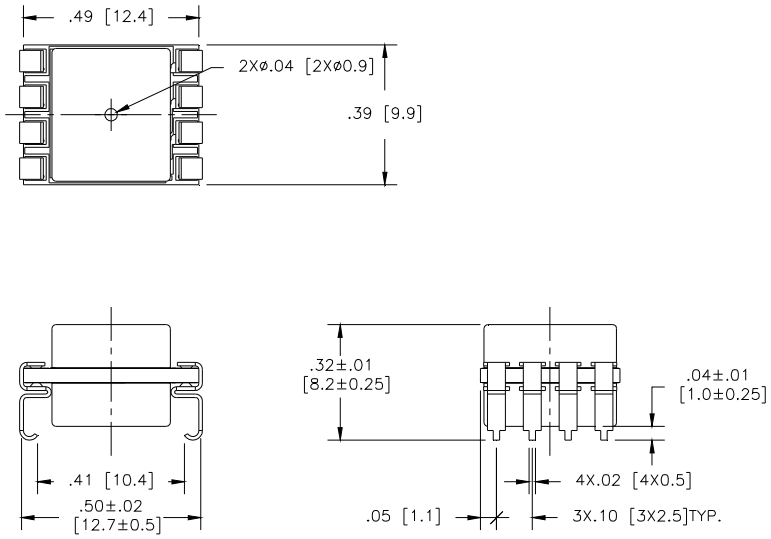


DIMENSIONS ARE IN INCHES [mm]

Model MS4525-MMvoxxxyP



Model MS4525-MMvoxxxyS

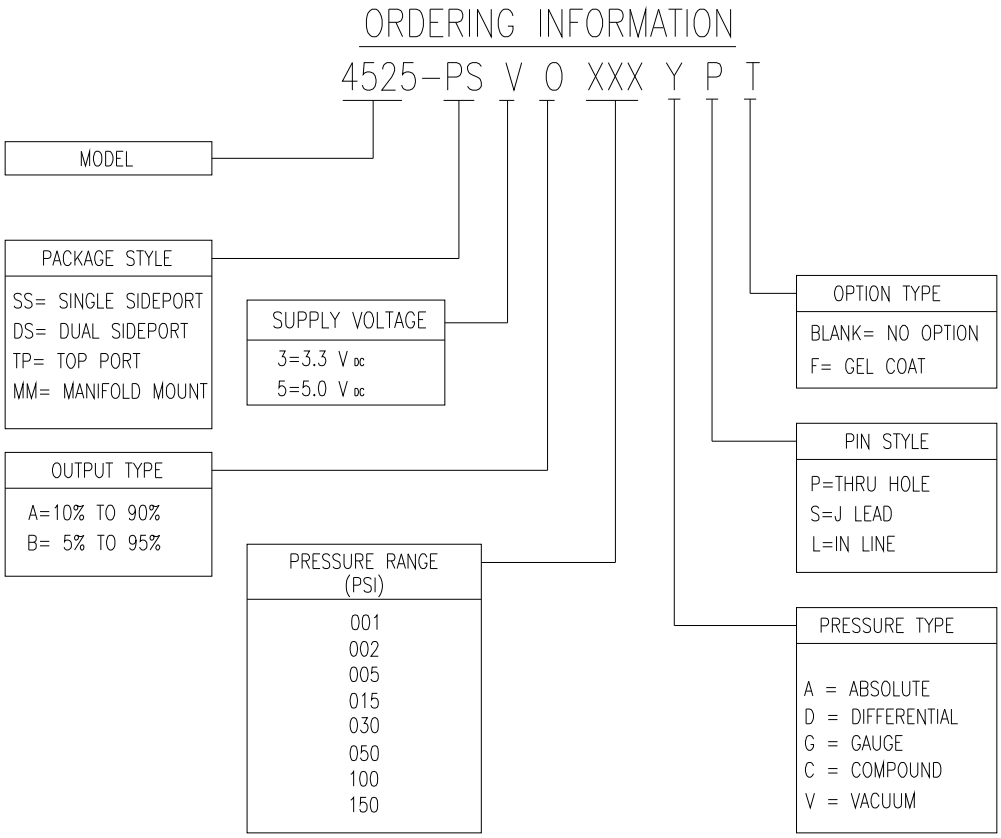


AVAILABLE OPTIONS

Gel Coat (-F Option)

The MS45x5 is designed for non ionic and clean dry air applications. Select this option for added protection in high humidity or slightly corrosive environments with the application of a silicone gel elastomer to sensor and ASIC. For questions concerning media compatibility, contact the factory.

ORDERING INFORMATION



MS4525

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