

I2C PRESSURE SENSING ELEMENTS – DATASHEET

Monolithic & Flush Membrane, ceramic pressure sensing element

MAIN APPLICATIONS

pneumatics or
hydraulics

medical equipment

air compressors

refrigeration systems

domestic appliances

battery powered
instruments

Kolektor pressure sensing element family combines a monolithic ceramic or a flush membrane with direct on-board electronics SMD components (without PCB), allowing a very compact design for numerous applications and the OEM does not need to perform any signal conditioning. It's ideal to be easily integrated inside a housing or mounted on board a machine.

The Al_2O_3 ceramic diaphragm, inert and chemically neutral, can be in direct contact with all fluids, even very aggressive, without additional separator device. **This feature results in a very stable sensor under very harsh conditions.**

Pressure+Temperature configuration is available.

They are fully temperature compensated and pressure-calibrated using digital calibration of the on-board ASIC. **It can reach a $\pm 0.5\%$ FS accuracy error in all conditions** covering an extended pressure range.

There are four main platforms: msa18 (round monolithic ceramic), OCA18 (round flush membrane), MSQ (rectangular monolithic ceramic) and LPQ (square/rectangular flush membrane).

MSQ and LPQ platforms are intended to be fully customized based on customer specifications.

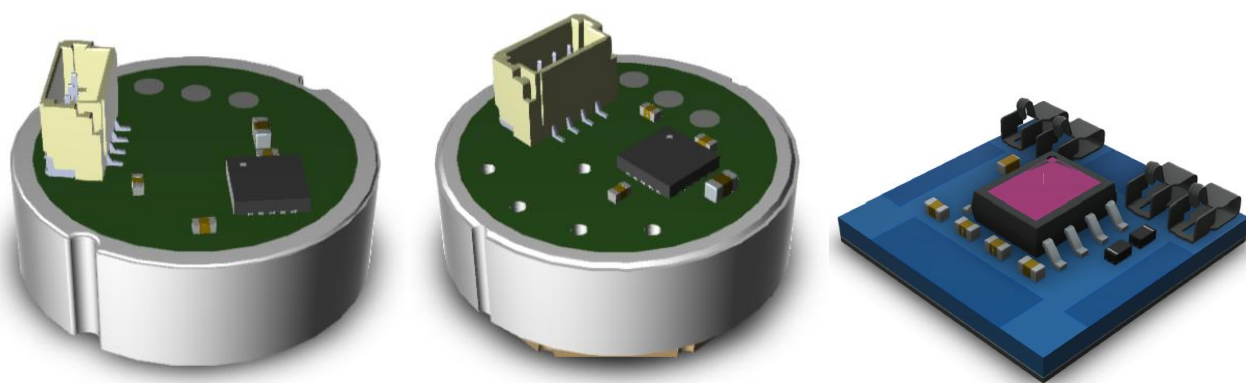


Figure 1 3D model of msa18 (left), OCA18 (center) and LPQ (right)

Technical characteristics

Parameter	Units	msa18d	OCA18D	MSQ	LPQ
Output	-	I2C			
Pressure output range	-	(5% ÷ 95%) of 15bit Customization possible			
Temperature output range	-	(10% ÷ 90%) of 15bit [-40°C ÷ 150°C] Customization possible			
Sensor type	-	Gauge	Absolute, Gauge, Sealed Gauge	Gauge	Absolute, Gauge, Sealed Gauge
Supply voltage	V	5 ± 0.5			
Supply overvoltage	V	± 18			
Supply current (max)	mA	8			
Material	-	Ceramic Al ₂ O ₃ 96%			
Weight	g	8		1	
Start-up time	ms	10			
Response time (update rate)	ms	1			
Electrical connection	-	JST connector (BM04B-SRS-TB)			
Operating temperature	°C	-25°C ÷ +85°C			
Storage temperature	°C	-25°C ÷ +85°C			
Compliant	-	RoHS, Reach. Conflict minerals free			
ESD compliance	kV	2kV			

Parameter		msa18d/OCA18D	
Nominal Pressure (bar)		2 ÷ 100	200 ÷ 1000
Accuracy (%FS)	Standard		
	25°C	0.50%	1.25%
	-25°C ÷ 85°C	1.50%	2.25%
	No thermal compensated		
	25°C	0.50%	
	-25°C ÷ 85°C	± 0.08 %FS/°C + Accuracy at 25°C	

Parameter		LPQ ¹		
Nominal Pressure (bar)		4 ÷ 6	8 ÷ 80	100 ÷ 160
Accuracy (%FS)	25°C	1.00%	0.50%	0.75%
	-25°C ÷ 85°C	1.50%	1.00%	1.25%

Parameter			ms18									
Nominal pressure	P _{op}	bar	5	10	20	30	50	80	100	200	400	600
		psi	100	150	400	450	1000	1200	1500	3000	5000	8500

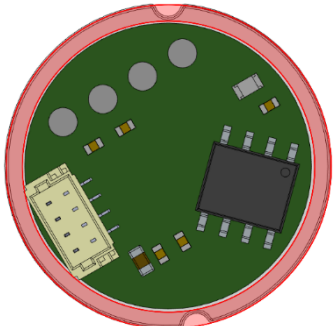
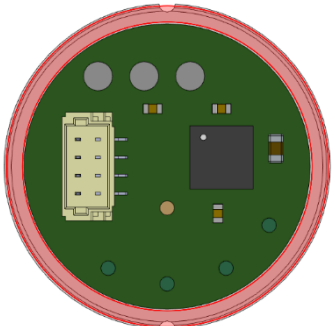
¹ after customer offset and gain assembly effect correction at room temperature. Kolektor provide instructions

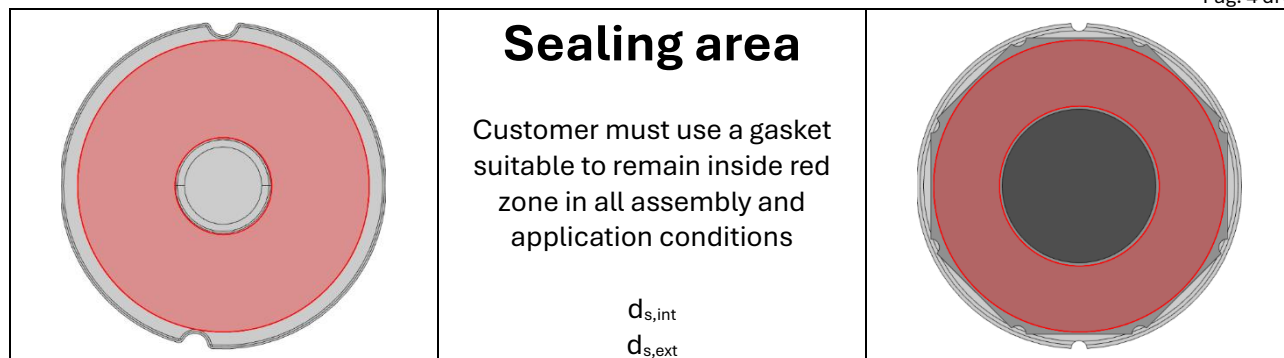
Proof pressure	P _{ov}	bar	10	20	40	60	100	160	200	300	500	700
		psi	150	290	580	870	1450	2320	2900	4350	7250	10150
Burst pressure	P _b	bar	12.5	25	50	60	125	160	200	400	600	800
		psi	1800	370	725	870	1810	2320	2900	5800	8700	11600
	d _{s,ext}	mm	<15.8									

Parameter			OC18									
Nominal pressure	P_{op}	bar	2	5	10	20	50	100	200	400	600	1000
		psi ¹	30	100	150	400	1000	1500	3000	5000	8500	15000
Proof pressure	P_{ov}	bar	4	10	15	40	100	150	350	500	750	1200
		psi	60	150	220	580	1450	2180	5080	7250	10880	17400
Burst pressure	P_b	bar	12	20	40	80	200	250	600	700	800	1500
		psi	175	290	580	1160	2900	3630	8700	10150	11600	21750

Parameter			LPQ		
Nominal pressure	P_{op}	bar	4 ÷ 6	8 ÷ 50	80 ÷ 160
		psi	50 ÷ 100	100 ÷ 700	1200 ÷ 2500
Proof pressure	P_{ov}	bar	>2xFS	>2xFS	>2xFS
Burst pressure	P_b	bar	>3xFS	>3xFS	2.5xFS

Red zones highlight areas of mechanical interfaces with customer system. OCA18 family on right column, ms18a family on left column.

	Pressing area Customer must press sensor inside red zone d_{p,int} d_{p,ext}	
	Height h = 4.45 ± 0.1	



LPQ must be customized based on customer requirements.

Parameter			LPQ		
Nominal pressure	P_{op}	bar	4 ÷ 6	8 ÷ 50	80 ÷ 160
		psi	50 ÷ 100	100 ÷ 700	1200 ÷ 2500
Thickness	t_{LPQ}	mm	1.26	1.34	1.76
	toll	mm	±0.1		
External dimension	min	mm	10.4 ÷ 14		
Pressing area	-	-	Custom		
Sealing area	-	-	Custom		

Electrical connections

All msa18 and OCA18 families are equipped with JST connector (pitch 1mm). LPQ must be customized based on customer requirements.

VCC	Power Supply
GND	Ground
SDA	I2C, Serial Data
SCL	I2C, Serial Clock

