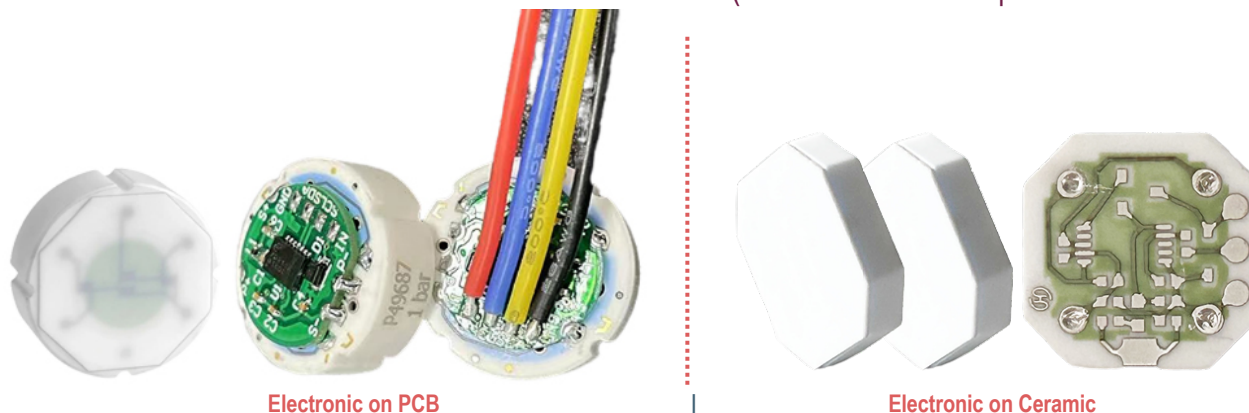


ESS502I/V/IIC Flush Diaphragm Ceramic Pressure Sensor Module (Electronic on PCB | Electronic on Ceramic)



- Range: 0~5bar~70bar~100bar
- Diaphragm Material: Ceramic Al₂O₃ 96%
- Integrated accuracy: 0.5%
- Output: 0.5-4.5Vdc | 4-20mA | I2C
- Flush Diaphragm Ceramic
- Electronic on PCB | Ceramic

Description

Based on ESS502 **flush diaphragm ceramic sensing cell**, ESS502 I/V/IIC pressure sensors module is integrated electronic on pcb or on ceramic, which amplify the output from mv to analogy signal such as 0.5-4.5Vdc or 4-20mA and I2C.

Because of the Al₂O₃ ceramic excellent chemical resistance (aggressive gases, most of solvents and acids, etc.), no additional protection is normally required.

Key Features & Benefits

- Pressure range 0~5bar...100bar
- Excellent resistance to corrosion and abrasion
- Absolute measurement available
- Thermally compensated
- Extended customization
- Flush Diaphragm

• Application

- Cooling equipment & A/C system
- Automotive and vehicle
- Industrial process control
- HVAC system
- Refrigeration equipment
- Air conditioning unit

Technical Characteristics [for sensor module]

Parameter	Unit	Description			
Sensor type	-	Absolute (A), Gauge (R) or Sealed gauge (S)			
Technology	-	Piezoresistive			
Diaphragm material	-	Ceramic Al ₂ O ₃ 96% (standard), 99.6% or sapphire (Sapphire is underway)			
Weight	g	≤ 8 (ceramic cell only) ; ≤ 30 (module)			
Response time	ms	≤ 1 (@90%/FS)			
Output signal		0-5V	I2C	0.5-4.5V	4-20mA
Supply voltage	VDC	2...36	2.7-5.5	3.0-5.5	11-36
Current cons.	mA	≤ 3 @ 10V	2.5(TYP)	2.5(TYP)	-
Impedance	Ω	11k ± 30%	>10k	>10k	≤50 (U-11)

Offset		mv/v	- 0.2 ± 0.1 (Other nominal values available on request)										
Operating temperature		°C	① -40...+85 °C (-40 °F...+185 °F) ; ② -40...+135 °C (-40 °F...+275 °F) ;										
Storage temperature		°C	① -40...+125 °C (-40 °F...+257 °F) ; ② -40...+140 °C (-40 °F...+284 °F) ;										
Nominal pressure FSO	bar	0.5*	1*	2*	5	10	20	50	100	200	400*	600	800
	psi	7	14	29	73	145	290	725	1450	2900	5800	8700	11600
Overload pressure	bar	1	2	4	10	15	35	100	150	350	500	750	1000
	psi	14	29	58	145	217	507	1450	2175	5075	7250	10875	14500
Burst pressure	bar	2	3	6	15	25	65	120	200	500	650	950	1250
	psi	29	43	87	217	362	942	1740	2900	7250	9425	13775	18125
Vacuum capability	bar	-0.1	-0.5	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	psi	-1.4	-7	-14	-14	-14	-14	-14	-14	-14	-14	-14	-14
Type	-	R	A/R/S	A/R/S	A/R/S	A/R/S	A/R/S	A/R/S	S	S	S	S	S
Total thickness	mm				6.30	6.30	6.35	6.55	6.78	6.95			
	in	0.242	0.2432	0.245	0.248	0.250	0.258	0.263	0.263	0.278	0.288	0.297	0.317
Sensitivity	mv/v	1.4-	2.0-3.6	2.3-3.5	2.3-4.0	3.1-5.5	2.4-4.0	4.0-6.0	3.0-4.8	2.5-3.9	3.1-4.8	3.1-4.8	2.0-3.5
Accuracy	%/fs	0.4/0.	0.3/0.9	0.3/0.6	0.2/0.4	0.2/0.5	0.2/0.5	0.2/0.5	0.2/0.5	0.4/0.9	0.5/1.0	0.5/1.0	0.5/1.0
Thermal offset shift(typ./max.)	%/fs/k	± 0.005 / ± 0.040			25 °C...85 °C				(77 °F...185 °F)				
Thermal span shift	%/fs/k	≤ ± 0.010			0 °C...70 °C				(32 °F...158 °F)				
		≤ ± 0.012			-25 °C...0 °C / 70 °C...85 °C				(-13 °F...32 °F / 158 °F...185 °F)				
		≤ ± 0.014			-40 °C...-25 °C / 85 °C...135 °C				(-40 °F...-13 °F / 185 °F...275 °F)				
Reliability tests	-	1000 hours @85 °C (185 °F) & 85 %RH						500 thermal shocks -40°C...+150 °C (-40 °F... +302 °F)					
		1000 hours burn-in @150 °C (302 °F)						10 million 0 bar to Pnom pressure cycles					

Tests performed at 25 °C in Eastsensor housings, unless otherwise specified. Different housings may affect performances.

1. Psi values for reference only.

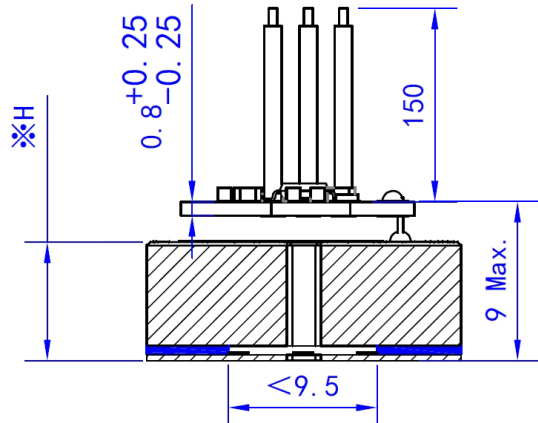
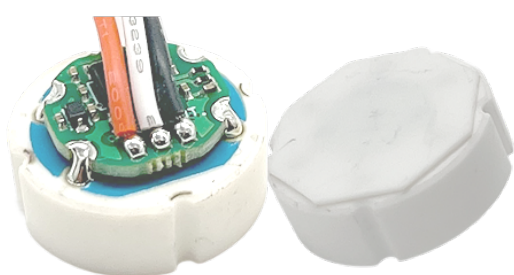
2. The sensitivity of each production batch is constant, within the indicated range and with minimal dispersion.

3. Accuracy = $\sqrt{\text{NonLinearity}^2 + \text{Hysteresis}^2 + \text{NonRepeatability}^2}$, terminal based.

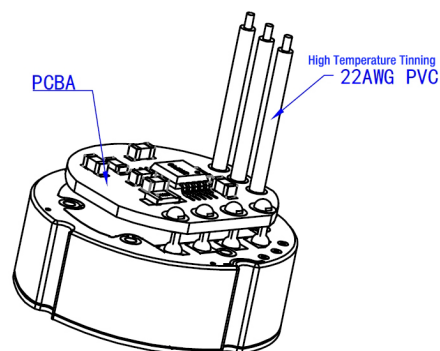
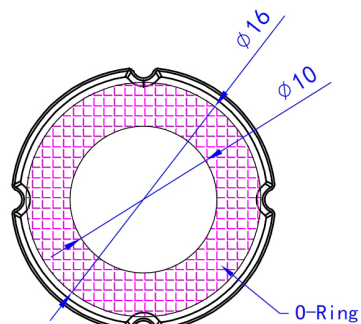
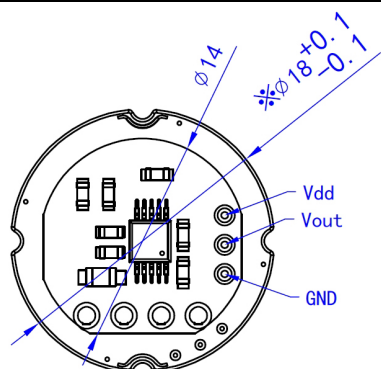
4. All technical characteristics will remain within indicated ranges performing the above-mentioned reliability tests.

5. Please consult manufacturer when pressure range with "*".

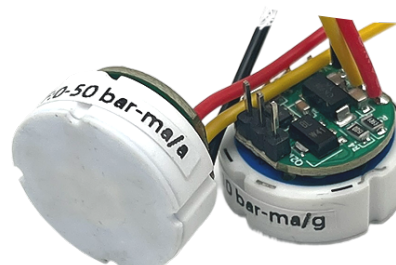
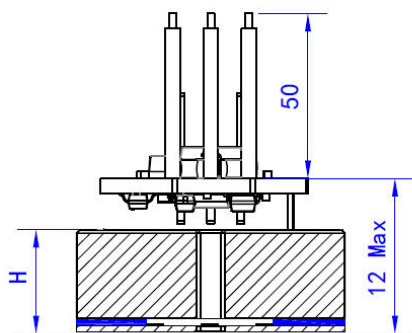
Drawing

【 FLUSH DIAPHRAGM】ESS502-I/V/IIC Ceramic Piezo-resistive Pressure Sensor Module I Electronic on PCB		Output: 4-20mA Power Supply: 11-36V Output: 0.5-4.5V Power Supply: 5V Output: I2C Power Supply: 2.7-5.5V	
Available Rane: 0-5 bar 0-10 bar 0-16 bar 0-20 bar 0-25 bar 0-35 bar 0-50 bar 0-70 bar 0-100 bar 0-200 bar			
【0.5-4.5V】Side View Schematics ~		Range: 0bar~200bar,	
			
		1	2
		Power supply	Output
		"+"	Voltage
			3
			Power supply
			"-"

【0.5-4.5V】 Top View | Schematics

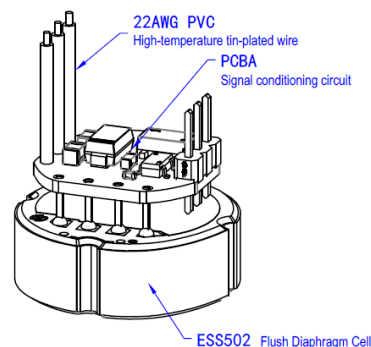
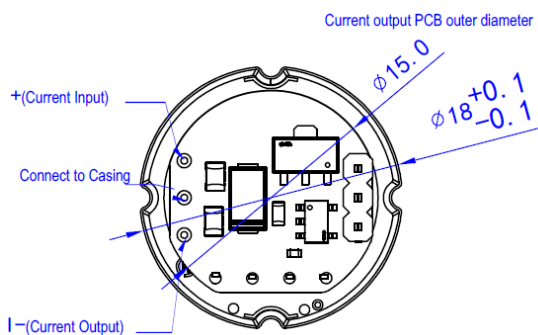


【4-20mA】 Side View | Schematics ~

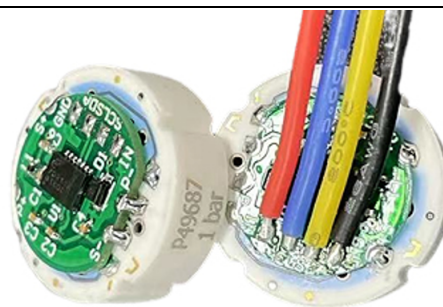
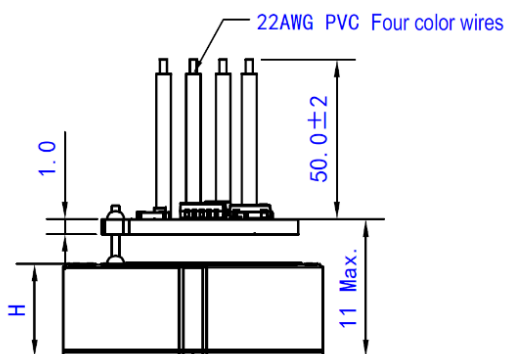


1	2	3
Power supply	Output	Power supply
"+"	Voltage	"-"

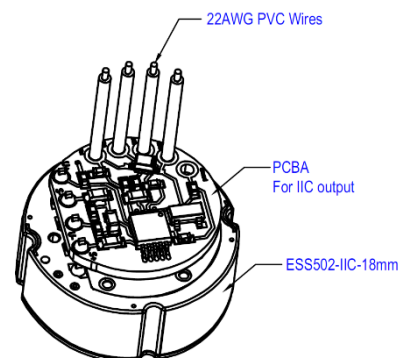
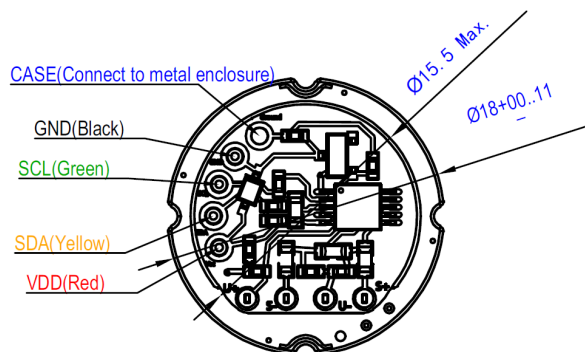
【4-20mA】 Top View | Schematics



【IIC Output】 Side View | Schematics



【IIC Output】 Top View | Schematics



【 FLUSH DIAPHRAGM】 ESS502-IV/IIC

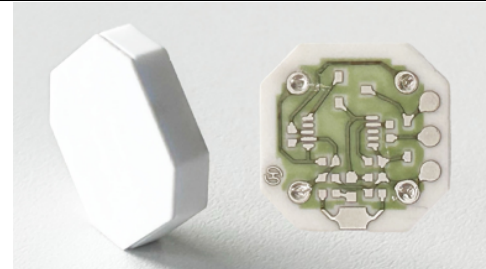
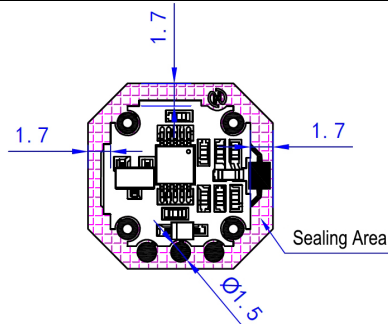
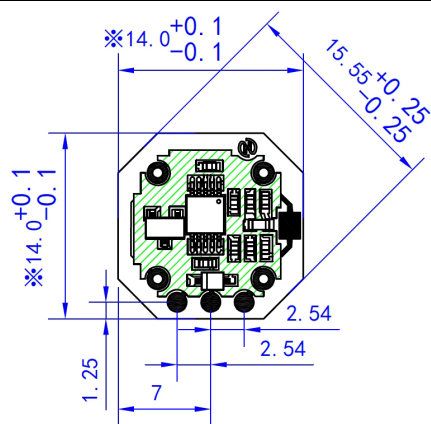
Ceramic Piezo-resistive Pressure Sensor Module | Electronic on Ceramic

Available Range: 0-5 bar | 0-10 bar | 0-16 bar | 0-20 bar | 0-25 bar | 0-35 bar | 0-50 bar | 0-70 bar | 0-100 bar

Top View (without supporter) | Schematics

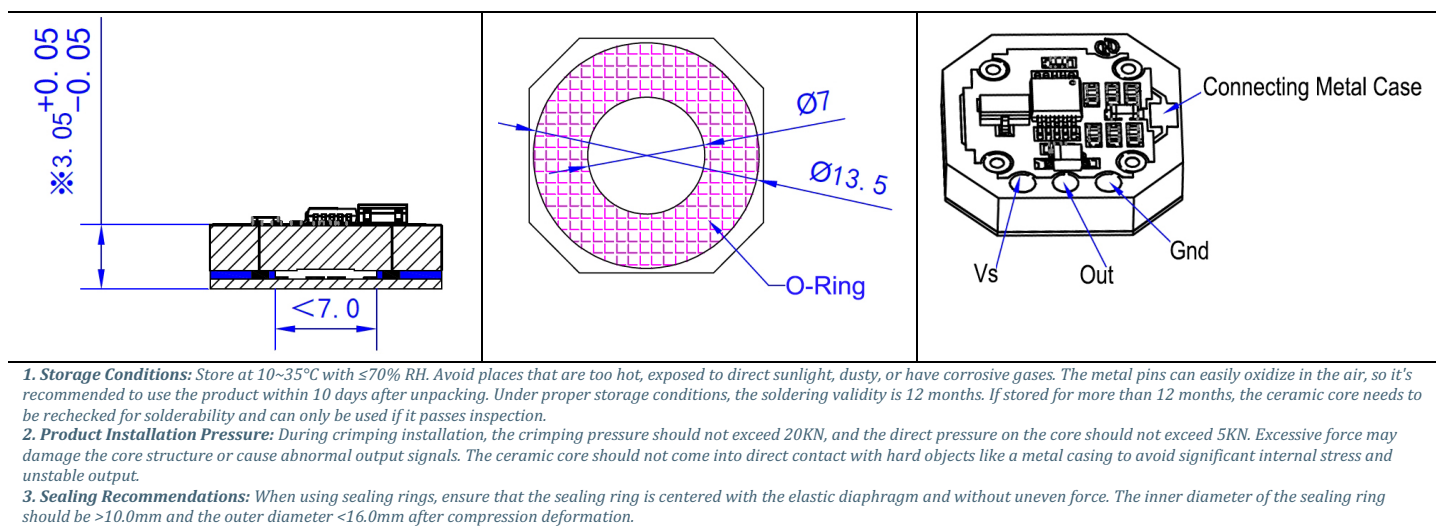
Output: 4-20mA Power Supply: 11-36V
Output: 0.5-4.5V Power Supply: 5V
Output: I2C Power Supply: 2.7-5.5V
Output: SENT/SPI (Customized)

Range: 0bar~70bar,



Output Signal	0.5-4.5V
Vs	Voltage Supply
Out	Voltage Output
GND	Ground

Side View (without supporter) | Schematics



Ordering Procedure

ESS5	Ceramic Piezoresistive Pressure Sensor			
	Code	Model		
	01	Pressure Sensor Cell, Monolithic 18*6.35mm		
	01 Thin	Pressure Sensor Cell, Monolithic 18*3.35mm		
	01-I	Pressure Sensor Module, Monolithic (with pcb) 4-20mA; Electronics on PCB		
	01-V	Pressure Sensor Module, Monolithic (with pcb) 0.5-4.5V; Electronics on PCB		
	01-IIC	Pressure Sensor Module, Monolithic (with pcb) I2C Output; Electronics on PCB		
	02 (18)	Pressure Sensor Cell, Flush diaphragm 18*6.35mm		
	02 (18)Thin	Pressure Sensor Cell, Flush diaphragm 18*3.35mm		
	02 (12)	Pressure Sensor Cell, Flush diaphragm 12*12*3mm		
	02 (14)	Pressure Sensor Cell, Flush diaphragm 14*14*3mm		
	02 (21)	Pressure Sensor Cell, Flush diaphragm 21*4.35mm		
	02-I	Pressure Sensor Module, Flush diaphragm (with pcb) 4-20mA; Electronics on PCB		
	02-IOC	Pressure Sensor Module, Flush diaphragm (with pcb) 4-20mA; Electronics on Ceramic		
	02-V	Pressure Sensor Module, Flush diaphragm (with pcb) 0.5-4.5V; Electronics on PCB		
	02-VOC	Pressure Sensor Module, Flush diaphragm (with pcb) 0.5-4.5V; Electronics on Ceramic		
	02-IIC	Pressure Sensor Module, Flush diaphragm (with pcb) I2C Output; Electronics on PCB		
	02-IICOC	Pressure Sensor Module, Flush diaphragm (with pcb) I2C Output; Electronics on Ceramic		
	03	Pressure Sensor Cell (with temperature sensor mounted), Monolithic 18*6.35mm		
	03 Thin	Pressure Sensor Cell (with temperature sensor mounted), Monolithic 18*3.35mm		
		Code	Span	Code
		R01	0...0.5 bar [0...7psi]	R07
		R02	0...1 bar [0...14psi]	R08
		R03	0...2 bar [0...29psi]	R09
		R04	0...5 bar [0...72psi]	R10
		R05	0...10 bar [0...145psi]	R11
		R06	0...20 bar [0...290psi]	R12
		Code	Pressure Type	
		R	Gauge	
		A	Absolute	
		S	Sealed Gauge	
			Code	
			M	Monolithic

				F	Flush Diaphragm			
					Code	Sensitivity adjustment		
					0	Without		
					9	On request		
					Code	Output		
					0	0.5-4.5Vdc		
					9	4-20mA		
					10	IIC		
					Code	Termination type		
					02	Pre-tinned pads		
					03	Silicone single wires 80 mm-100 mm		
					07	Customization Type		
						Code	Accuracy	
						1	0.5%	
						2	1.0%	
						9	Others on request	
ESS5	02-I	R06	R	F	0	9	03	1

Note: ① Extremely attention must be paid to sensor installation process to avoid any miss conduction that affect the sensor performance, ② please protect the diaphragm and the compensated board carefully to prevent any damage. ③ Please contact us if your requested working temperature lower than -20 °C