Digital Output
Semiconductor Pressure Sensor

AT7 Series

Description

The AT7 pressure sensor series is composed of a silicon piezoresistive pressure sensing chip and a signal conditioning integrated circuit. The low-level signal from the sensing chip is amplified, temperature compensated, calibrated and finally converted to digital data that is proportional with the applied pressure. The AT7 series measures gauge pressure.

AT7

Features

· Miniature 4 mm x 4 mm SMT package
· Digital output
· High accuracy ±1.5 %FS
· Supply voltage 3.0, 3.3 & 5.0 Vdc
· Low supply current Max 3.5 mA
· Operating temperature -40 to 125℃
· Wide compensated temperature 0 to 85℃
· Customization available

Applications

· Battery-operated Devices
· Medical Devices
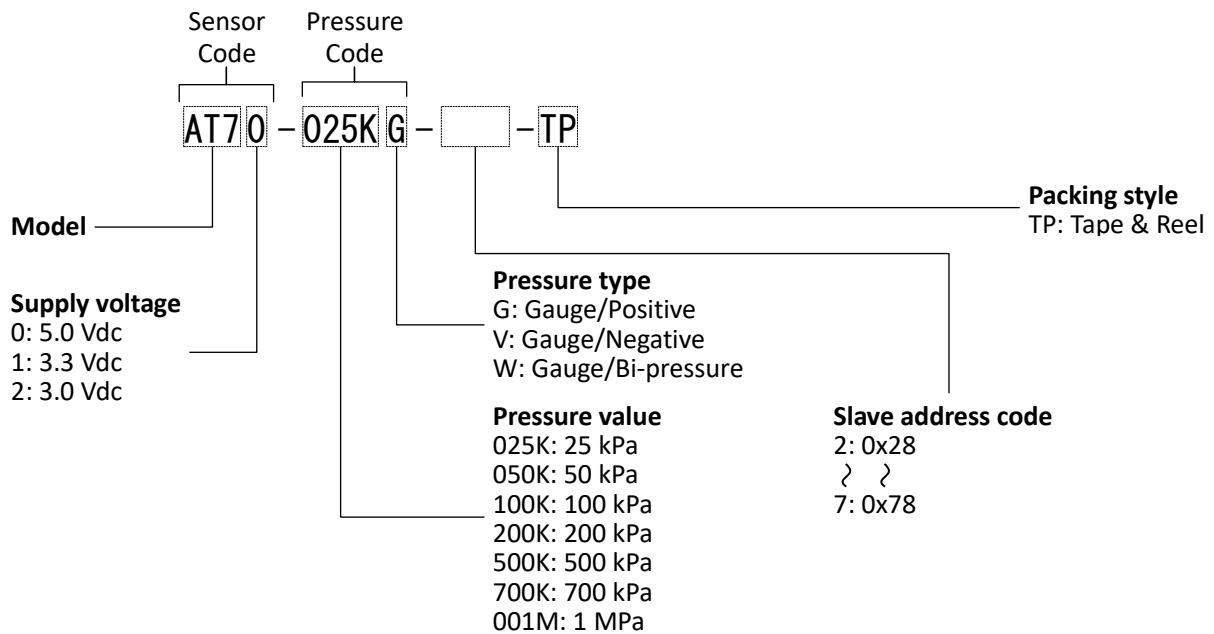· Industrial Pneumatic Devices
· Consumer Devices

✓ RoHS Compliant

Device Lineup

Model	Pressure Type	Supply Voltage	Accuracy	Pressure Range
				-100 (-15) / -50 (-7) / 0 / 25 (3) / 50 (7) / 100 (15) / 200 (30) / 500 (70) / 700 (100) / 1000 kPa (150) psi
AT7	Gauge	5.0 Vdc / 3.3 Vdc / 3.0 Vdc	±1.5 %FS	025KG / 050KG / 100KG / 200KG / 500KG / 700KG / 001MG / 050KV / 100KV / 100KW

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Device Name Code

Sensor Code

Pressure Code

AT7 0 – 025K G – ☐ –TP

Model

Supply voltage
0: 5.0 Vdc
1: 3.3 Vdc
2: 3.0 Vdc

Pressure type
G: Gauge/Positive
V: Gauge/Negative
W: Gauge/Bi-pressure

Pressure value
025K: 25 kPa
050K: 50 kPa
100K: 100 kPa
200K: 200 kPa
500K: 500 kPa
700K: 700 kPa
001M: 1 MPa

Slave address code
2: 0x28
⋛ ⋛
7: 0x78

Packing style
TP: Tape & Reel

Block Diagram

5.0, 3.3 or 3.0 Vdc

0.1 μF

R_{pu}
$\geqq 1$ kΩ

Pin 3 VDD

Temp. Sensor

Reg.

MUX

Pin 2 SCL

ADC DSP COM I/F

Pre-Amp

Sensor Bridge

EEPROM OSC POR

Pin 1 SDA

Pin 4 VSS

Output Characteristics

Pressure Code: 050KV, 100KV

Output

Dfs

SD

Error

Doff

Min. Popt

Max. Popt

Input Pressure

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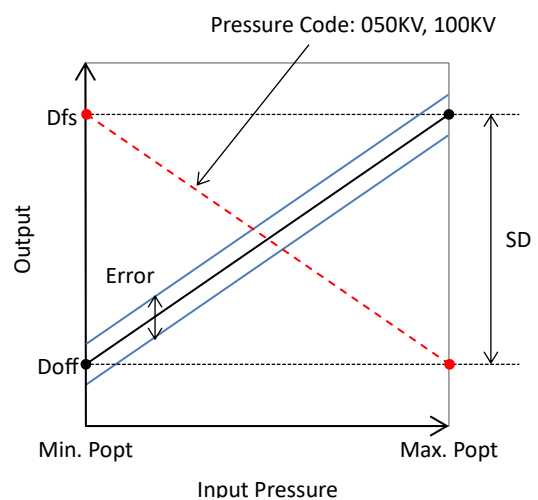
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Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply Voltage	VDD_{max}	-0.3 to +6	Vdc
Voltage at Digital I/O Pins	V_{diomax}	-0.3 to VDD + 0.3	Vdc
Load Pressure	P_{max+}	See Pressure Range Table	
Operating Temperature	T_{opt}	-40 to +125	℃
Storage Temperature	T_{stg}	-40 to +125	℃

General Specifications

Item	Symbol	Sensor Code AT70	Sensor Code AT71	Sensor Code AT72	Unit
Supply Voltage	VDD	5.0±0.25	3.3±0.165	3.0±0.15	Vdc
Type of Pressure	-	Gauge pressure			
Pressure Media	-	Non-corrosive gases			
Compensated Temperature	-	0 to +85			℃
Operating Humidity	H_{opt}	30 to 85 (non-condensing)			%RH
Storage Humidity	H_{stg}	30 to 85 (non-condensing)			%RH

Pressure Range

Item	Symbol		025KG	050KG	100KG	200KG	500KG	700KG	001MG	050KV	100KV	100KW	Unit
Absolute Maximum Load Pressure	P_{max+}		+50	+100	+200	+400	+1000	+1400	+1500	+100	+200	+200	kPa
Measurement Pressure	P_{opt}	Min.	0	0	0	0	0	0	0	-50	-100	-100	
		Max.	+25	+50	+100	+200	+500	+700	+1000	0	0	+100	

Electrical Characteristics

Ambient temperature Ta = 25℃

Item	Condition	Symbol	Rating Min.	Rating Typ.	Rating Max.	Unit
Offset Pressure Data	Min. P_{opt}, 050KV & 100KV: Max. P_{opt}	Doff	2393	3277	4161	Count
Full Scale Pressure Data	Max. P_{opt}, 050KV & 100KV: Min. P_{opt}	Dfs	61375	62259	63143	Count
Span Pressure Data	Min. to Max. P_{opt}	SD	-	58982	-	Count
Accuracy	0 to 85℃	Error	-1.5	-	+1.5	%FS
Supply Current		Ic	-	-	3.5	mAdc
Response Time	for reference	tr	-	1	-	msec.

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Communication Interface & Protocol

Item	Content
Interface	I²C™
Slave Address	7 bit , 0x28 to 0x78
Measurement Packet	
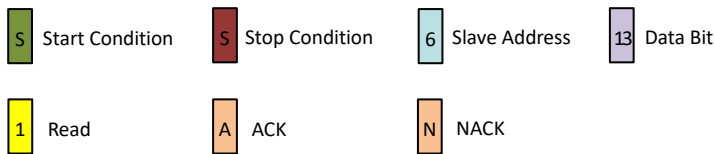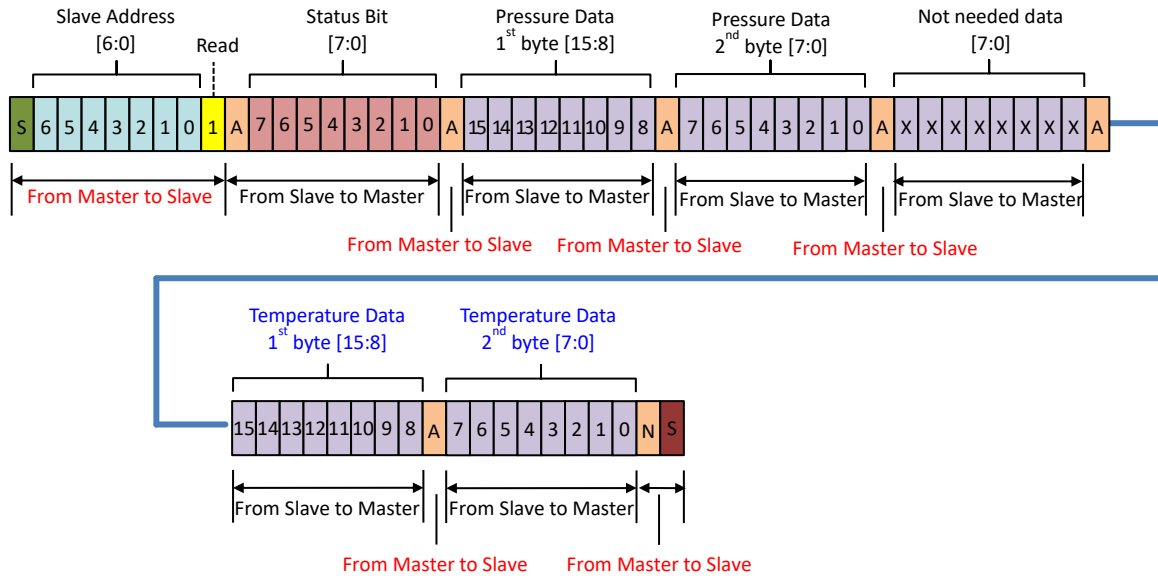
- Sensor pressure output is 16bit which are 1st byte [15…8] and 2nd byte [7…0].
- It is needed to take 3rd byte data in order to take the following temperature data, but 3rd byte data should be thrown away.
- Temperature output is 16bit.

I²C™ is a trademark of NXP Semiconductors.

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Package Dimensions

unit: mm

Footprint for PCB
(Reference)

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