

PPS34 Board-Level Digital Pressure Sensor

Compact 6-pin MEMS pressure sensor — digital SPI / I²C output



FEATURES

- Digital output — SPI / I²C
- Compact 6-pin DIP package
- MEMS piezoresistive sensor + 14-bit sigma-delta ADC ASIC
- Back-side die for harsh-media environments
- On-chip temperature measurement (0.1 °C resolution)
- Pressure range: 0–150 PSI
- ±0.5% accuracy & linearity (FS)
- Response time up to 1.5 ms
- Long-term stability ±0.25% per year

DESCRIPTION

The PPS34 is an amplified, digitally compensated pressure sensor in a compact 6-pin package. This state-of-the-art MEMS-based sensor is designed for applications where size and cost are critical but the media can be harsh.

It pairs a MEMS piezoresistive sensing element with a 14-bit sigma-delta ADC ASIC to report media pressure with a response time up to 1.5 ms. Media isolation via a stainless-steel cap enables long-term stability across a wide range of liquid media. Contact the factory for custom design availability.

APPLICATIONS

- Weather stations
- Small water pumps
- Sports watches
- Aviation
- Industrial applications

MAXIMUM ENVIRONMENTAL RATINGS

Operating Temperature	–40 to 85 °C • –40–185 °F	Proof Pressure	1.5× full scale
Storage Temperature	–40 to 125 °C • –40–257 °F	Burst Pressure	2× full scale
Supply Voltage	2.5 to 3.6 VDC	Pressure Range	0 to 150 PSI

Electrical & performance specifications

Conditions: $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Supply Voltage	Vdd	2.5	3.0	3.6	V
Operating Temperature	Ts	-40	—	85	$^{\circ}\text{C}$
Supply Current	Idd	—	—	3	mA
Total Error Band	$\pm\%\text{FS}$	-1.5	—	+1.5	$\%\text{FS}$
Accuracy	$\pm\%\text{FS}$	-0.5	—	+0.5	$\%\text{FS}$
Update Rate	—	—	1.5	—	ms
Long-term Stability	$\pm\%/yr$	-0.25	—	+0.25	$\%/yr$
ADC Resolution	—	—	14	—	bit
Temperature Resolution	—	—	0.1	—	$^{\circ}\text{C}$
Digital Output	—	—	I ² C / SPI	—	counts
Input Low Level	Vin_low	0	—	20	$\%\text{Vdd}$
Input High Level	Vin_high	80	—	100	$\%\text{Vdd}$
Output Low Level	Vo_low	—	—	0.1	$\%\text{Vdd}$
Decoupling Capacitor (Vdd-GND)	CL	—	4.7	—	μF
I ² C Pull-up Resistor	R	—	1	—	k Ω

PIN CONFIGURATION

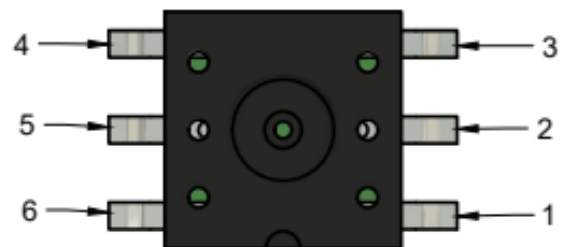
6-pin package

PIN	FUNCTION	DESCRIPTION
1	GND	Ground
2	VDD	2.5-3.6 V supply
3	SS	Mode select (see note 1)
4	SDA	I ² C data
5	SCL	I ² C clock
6	OUT	SPI output

Notes: 1) SS High after power-on selects I²C (first command must be I²C); SS Low selects SPI. 2) Fit a 4.7 μF cap between VDD and GND; I²C needs a 1 k Ω pull-up on SDA/SCL. 3) ASIC configured for low-power sink and sleep mode.

FIG. 1

Package



DIGITAL OUTPUT

SPI / I²C · 14-bit counts · addressable I²C slave 1001100.

Package, media & construction

Package

The PPS34 is housed in a 6-pin Nylon package. The Nylon cover accepts 0.120" tubing to seal to the sensor, supporting compact, low-cost OEM integration.

Media

The pressure port tolerates most media, including but not limited to air, gas, and most non-corrosive media.

Pressure port

A long cylindrical port with engineered RTV protects the sensor against water ingress.

Stability

The silicon MEMS sensing element has a SiO₂ base, is mounted to a Nylon base with RTV, and is sealed with a plastic cover. The die-attach material reduces mechanical stress for greater stability over time and temperature. Every sensor is factory stabilized.

Wetted parts

Wetted surfaces are SiO₂, Nylon, and Pyrex. Verify material compatibility for specific or aggressive media.

Sensing element

MEMS piezoresistive sensor paired with a 14-bit sigma-delta ADC ASIC. Back-side die construction suits size-, cost-, and harsh-media-sensitive applications.

0-150

Pressure range PSI

±0.5%

Accuracy FS

14-bit

ADC resolution

1.5 ms

Response time

Digital output — command & I²C format

The PPS34 reports pressure and temperature over I²C or SPI from its 14-bit sigma-delta ADC. The interface is selected by the SS pin at power-on: hold SS **High** to select I²C (the first command must then be an I²C command), or **Low** to select SPI. Measurements run in Force Mode — send command **0xAA** and the sensor wakes, converts, then returns to sleep automatically.

STATUS REGISTER [BIT 7:0]

BIT	DESCRIPTION	ATTR	DEFAULT
7	Reserved	R	0
6	ADC reference-voltage power — 1: On, 0: Off	R	0
5	Busy — 1: measurement active, 0: sleep. Auto-clears to 0 when a measurement completes.	R	0
4-0	Reserved	R	0

LEGEND

S = start · STP = stop · SLAD+W = 1001100 + write bit 1 ·
SLAD+R = 1001100 + read bit 1
A = master ACK (low) · -A = master ACK (high) · SLAK =
slave ACK (PPS34 → µC, low)

I²C COMMAND FORMAT

Write 0xAA command (Force Mode)

Master	S	SLAD+W [1001100 0]		Command [10101010]		STP
Slave			SLAK		SLAK	

▼ conversion time delay > 10 ms ▼

Read pressure data

S	SLAD+R	Status [7:0]	A	Data [23:16]	A	Data [15:8]	A	Data [7:0]	-A	STP
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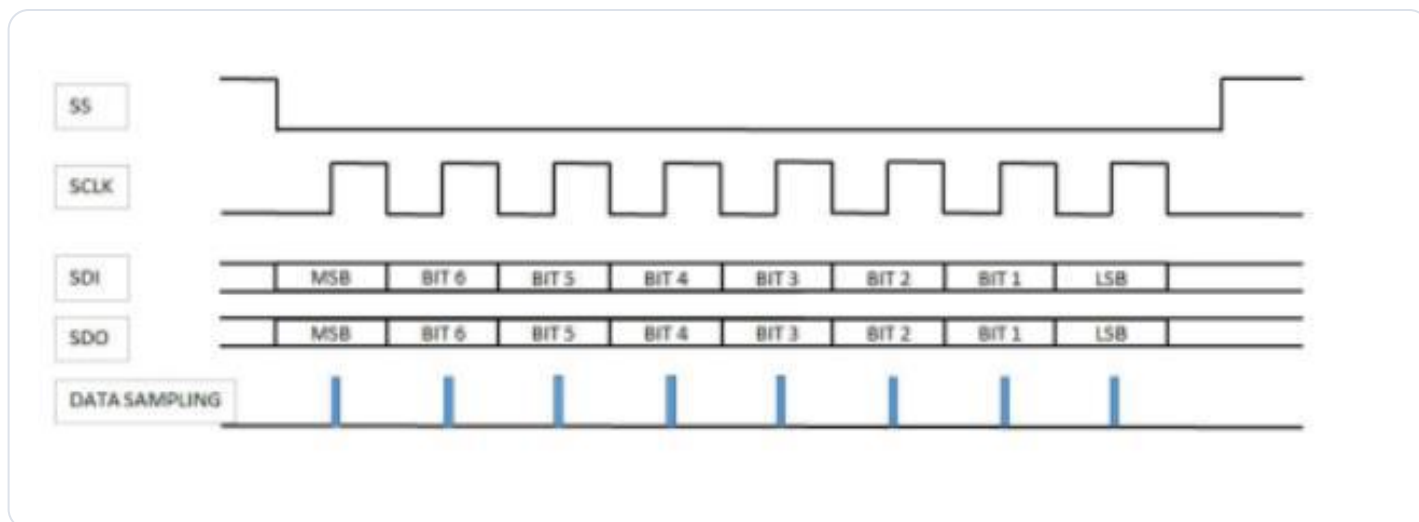
The 24-bit pressure value follows the status byte, MSB first, in three bytes. The slave acknowledges (SLAK) each address/command byte; SLAD+R = 1001100 1.

SPI parameters & format

Set the SS pin **Low** to select SPI mode; the processor then reads data over the SPI bus. As in I²C, a measurement is started with the Force-Mode command **0xAA**, and after a > 10 ms conversion delay the 24-bit pressure value is read back, MSB first. Data is sampled on the SCLK edges shown below.

FIG. 2

SPI read timing

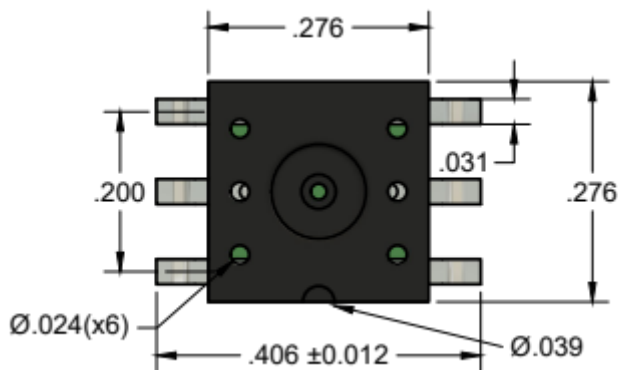


SPI COMMAND & READ-DATA FORMAT

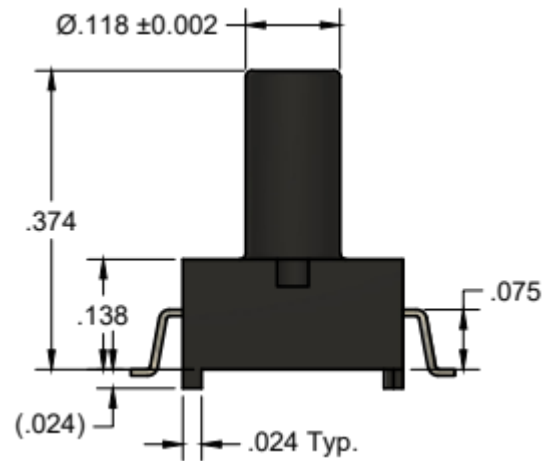
Pin	Force-mode command format			Delay	Read pressure data [bit 23:0] format			
SDI	Command [0xAA]	0x00	0x00	> 10 ms	Command [NOP - 0x00]	0x00	0x00	0x00
SDO	Status [7:0]	Data [15:8]	Data [7:0]		Status [7:0]	Pressure [23:16]	Pressure [15:8]	Pressure [7:0]

Send the Force-Mode command (0xAA) on SDI; SDO returns the status byte and two data bytes. After the > 10 ms conversion delay, clock a NOP (0x00) command to read the status byte followed by the 24-bit pressure value (MSB first).

Outline drawing — inches



TOP VIEW



SIDE VIEW

DIMENSION	INCHES	MM
Body footprint	.276 × .276	7.01 × 7.01
Overall height	.406 ±.012	10.31
Port length	.374	9.50
Port outer Ø — seals .120" tubing	.118 ±.002	3.00
Port bore Ø	.043	1.09
Lead Ø (×6)	.024	0.61
Lead thickness	.008 ±.004	0.20

NOTES

- 1) Dimensions in inches [mm]; tolerances per controlling drawing.
- 2) 6-pin Nylon package; long cylindrical port with engineered RTV against water ingress.
- 3) Surface-mount (SMD) board-level option available for OEM assembly.
- 4) Per vendor drawing PPS34_Model Rev B — consult factory for the controlling drawing.

Part-number configuration



Model	Output	Range (PSI)	Type	Port	Package
PPS34	0 = Ratiometric 1 = I ² C 2 = SPI	150 = 150 PSI Custom = contact factory	G = Gauge	1 = Single port 2 = Custom	0 = DIP 1 = SMD

EXAMPLE PART NUMBERS

PPS34-0-150G10 → Ratiometric · 150 PSI · gauge · single port · DIP

PPS34-1-150G11 → I²C · 150 PSI · gauge · single port · SMD

PPS34-2-150G10 → SPI · 150 PSI · gauge · single port · DIP

Configure your PPS34

Custom pressure ranges, packaging, and board-level (SMT) options available for OEM volumes. Talk to an engineer to spec your part.

[REQUEST A QUOTE](#)

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