# 2. Specifications

## 2.1 Electrical Specifications

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Units | Comments |
|---|---|---|---|---|---|---|---|
| Supply Voltage | $V_{DD}$ | | 2.7 | 3.3 | 5.5 | V | |
| Power-up/down level | $V_{POR}$ | | 2.3 | 2.5 | 2.7 | V | |
| Supply current | $I_{DD}$ | Measuring | | 3.8 | 5.5 | mA | |
| | | Idle state | | | 1.1 | mA | |
| | | Sleep mode | | | 1 | uA | |
| IRQn driving strength | | | | | 4 | mA | |

## 2.2 Timing Specifications

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Units | Comments |
|---|---|---|---|---|---|---|---|
| Power-up time | $t_{PU}$ | | | | 25 | ms | Time to sensor ready |
| Soft reset time | $t_{SR}$ | | | | 20 | ms | Time between soft reset command and sensor ready |
| $I^2C$ SCL frequency | $f_{I2C}$ | | | 400 | 1000 | kHz | |
| Update rate differential pressure value | | Continuous mode | 1800 | 2000 | 2200 | Hz | |
| Update rate temperature value | | Continuous mode | 112.5 | | | Hz | Temperature value is updated at least every 16 pressure values |
| Measurement time | | Triggered mode | 40 | 45 | 50 | ms | |

## 2.3 Mechanical Specifications

| Parameter | Symbol | Condition | Min. | Typ. | Max. | Units | Comments |
|---|---|---|---|---|---|---|---|
| Allowable overpressure[1] | $P_{max}$ | | | 1 | | bar | |
| Rated burst pressure | $P_{burst}$ | | 3 | | | bar | |
| Weight | W | | | | 0.2 | g | |

## 2.4 Materials

| Parameter | |
|---|---|
| Wetted materials | Glass (silicon nitride, silicon oxide), LCP, green epoxy-based mold compound, epoxy-based resins |
| REACH, RoHS | REACH and RoHS compliant |

## 2.5 Absolute Maximum Ratings

| Parameter | Rating | Units |
|---|---|---|
| Supply Voltage $V_{DD}$ | -0.3 to 5.5 | V |
| Max Voltage on pins SDA, SCL, IRQn | -0.3 to $V_{DD}$+0.3 | V |
| Input current on any pin | ±70 | mA |
| Operating temperature range[2] | -40 to +85 | °C |
| Storage temperature range[3] | -40 to +85 | °C |
| Max. humidity for long term exposure | 40°C dew point | |
| ESD HBM (human body model) | 2 | kV |

[1] Allowable overpressure during operation. Refer to the SDP selection guide for pressure dependency of the measured signal. Fast absolute pressure changes on both ports can result in dynamic effects on the sensor signal. For higher overpressures or continuous high overpressures contact Sensirion.
[2] For Air and $N_2$. Long term exposure to high temperatures and (high concentrations of) $O_2$ can reduce the product lifetime
[3] For long term storage in Tape and Reel refer to the SDP3x handling instructions

# 3. Pin Assignment

The SDP3x consists of a QFN package with a plastic cap covering the top and providing the pneumatic connections to the sensor. Table 1 shows the pin assignments of the SDP3x-Digital sensor.

| Pin no. | Name | Description |
|---|---|---|
| 1 | GND | Connect to ground |
| 2 | GND | Connect to ground |
| 3 | GND | Connect to ground |
| 4 | IRQn | Interrupt output. Active low. Keep floating when not used. |
| 5 | SCL | Serial Clock ($I^2C$ Interface) |
| 6 | GND | Connect to ground |
| 7 | VDD | VDD Supply |
| 8 | SDA | Bidirectional Serial Data ($I^2C$ Interface) |
| 9 | ADDR | $I^2C$ Address selection input. |
| 10 | GND | Connect to ground |
| 11 | GND | Connect to ground |
| 12-16 | - | Reserved. Do not connect |

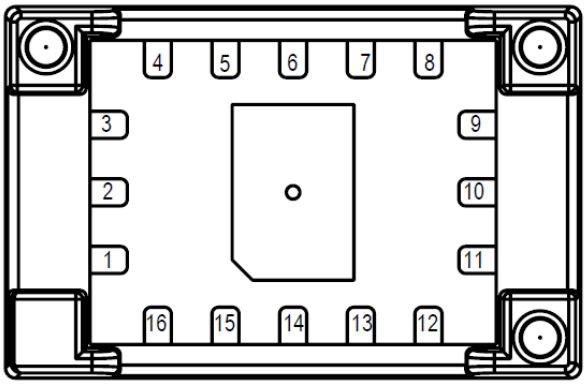


***Table 1:*** *SDP3x-Digital pin assignment (bottom view).*

## 3.1 Power Pins (VDD, GND)

The power supply pins must be decoupled with a 100 nF capacitor that shall be placed as close to the sensor as possible.

## 3.2 Serial Clock and Serial Data (SCL, SDA)

The SCL and SDA are bidirectional pins of the $I^2C$ slave interface. The SCL is the Serial Clock pin and the SDA is the Serial Data pin. For more details about the $I^2C$ interface refer to section 5.

## 3.3 ADDR Pin

The SDP3x-Digital supports different $I^2C$ addresses. With the ADDR pin an address can be selected. Connecting the ADDR pin to GND selects the default address. Other $I^2C$ addresses can be selected with a resistor connected to GND. The maximum tolerance for the resistor is ±5%. Do not connect the ADDR pin to VDD.

| $I^2C$ Address (Hex) | Condition |
|---|---|
| 0x21 | ADDR connected to GND |
| 0x22 | ADDR connected with 1.2kOhm to GND |
| 0x23 | ADDR connected with 2.7kOhm to GND |

## 3.4 IRQn Pin

The IRQn pin indicates whether new measurement results are available. The signal is active low, meaning that when the signal is high there is no new measurement data available. The IRQn will automatically clear to high when a differential pressure value is read out. The IRQn pin will also be set to low after every soft reset or Power on Reset, until a measurement command is sent.
When the IRQn signal is not used, the pin should stay unconnected and must not be connected to GND or VDD.

## 3.5 Die Pad (Center Pad)

The die pad or center pad is visible from below and located in the center of the package. It is internally connected to GND and therefore there are no electrical constraints on connecting or not connecting the die pad to GND. For mechanical stability it is recommended to solder the center pad to the PCB.
The hole in the middle of the die pad must stay open during and after soldering.