ICP-10111 Barometric Pressure Sensor

Complete Technical Specifications and Hardware Documentation

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DevLab Electronics

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1 Hardware Documentation

1.1 Overview

The ICP-10111 Barometric Pressure Sensor module is a compact embedded sensor with integrated environmental monitoring capabilities, designed for IoT applications and precise atmospheric measurements.

1.2 Features

- **ICP-10111 Pressure Sensor** (High precision)
- **BME688 Environmental Sensor** (Temperature, humidity, gas)
- **Low power consumption** modes
- **I2C/QWIIC connectivity**
- **Compact form factor** with castellated holes

2 Hardware

2.1 Technical Specifications

2.1.1 Sensor Specifications

Parameter	Value	Unit	Notes
Pressure Range	300-1250	hPa	Absolute pressure
Pressure Accuracy	ś0.4	hPa	At 25řC
Temperature Range	-40 to +85	řC	Operating range
Humidity Range	0-100	%RH	Relative humidity
Interface	I2C	-	QWIIC compatible

2.1.2 Power Specifications

Parameter	Min	Typ	Max	Unit	Conditions
Supply Voltage	3.0	3.3	5.0	V	Normal Operation
Active Current	-	1.2	2.0	mA	Continuous measurement
Sleep Current	-	0.1	0.5	ţA	Standby mode
Regulator Output	-	1.8	-	V	Internal LDO

Pinout Diagram

Figure 1: Pinout Diagram

Dimensions

Figure 2: Dimensions

2.2 Pinout

Pin Label	Function	Notes
VCC	Power Supply	3.3V or 5V
GND	Ground	Common ground for all components
SDA	I2C Data	Serial data line
SCL	I2C Clock	Serial clock line

2.3 Dimensions

2.4 Topology

Ref.	Description
IC1	ICP-10111 Barometric Pressure Sensor
IC2	BME688 Environmental Sensor
L1	Power On LED
U1	ME6206A18XG 1.8V Regulator
JP1	2.54 mm Castellated Holes
J1	QWIIC Connector (JST 1 mm pitch) for I2C

2.5 Communication Interfaces

2.5.1 I2C Interface

- **Address**: 0x63 (ICP-10111), 0x77 (BME688)
- **Speed**: Standard (100 kHz), Fast (400 kHz)
- **Features**: QWIIC compatible connector
- **Pull-up Resistors**: 4.7k integrated

2.5.2 Digital Interface Specifications

- **Logic Levels**: 3.3V CMOS compatible
- **Input High**: 2.0V minimum

Topology

Figure 3: Topology

- **Input Low**: 0.8V maximum
- **Output Drive**: 4mA typical

2.6 Physical Characteristics

2.6.1 Package Information

Parameter	Value	Unit
Package Type	Custom PCB	-
Dimensions	25.4 x 15.24 x 3.2	mm
Mounting	Castellated holes	2.54mm pitch
Weight	2.1	g

2.6.2 Environmental Specifications

Parameter	Min	Max	Unit	Conditions
Operating Temperature	-40	+85	řC	Full accuracy
Storage Temperature	-55	+125	řC	-
Humidity	0	100	%RH	Non-condensing
Pressure Range	300	1250	hPa	Absolute pressure

2.7 Software Support

2.7.1 Development Environment

- **Arduino IDE**: Full library support
- **ESP-IDF**: Native driver integration
- **PlatformIO**: Cross-platform support
- **CircuitPython**: Python library available

2.7.2 Key Libraries

- ICP-10111 pressure sensor driver
- BME688 environmental sensor library
- I2C communication protocols
- Data filtering and calibration

2.8 Applications

The ICP-10111 module is ideal for:

1. **Weather Monitoring**
    - Atmospheric pressure measurement
    - Altitude determination
    - Weather prediction systems
2. **IoT Environmental Sensing**
    - Smart building automation
    - Agricultural monitoring
    - Air quality assessment
3. **Portable Devices**
    - Fitness trackers
    - Outdoor navigation devices
    - Drone altitude control

2.9 Safety and Compliance

2.9.1 Certifications

- **RoHS**: Compliant with EU directive
- **REACH**: Compliant with EU regulation
- **CE**: Electromagnetic compatibility

2.9.2 Safety Features

- **ESD Protection**: ś2kV HBM on all pins
- **Reverse Polarity Protection**: Integrated
- **Thermal Protection**: Operating range monitoring

2.10 References

- ICP-10111 Datasheet
- BME688 Datasheet
- ME6206 Regulator Datasheet

Circuit Schematic

Figure 4: Circuit Schematic

2.11 Ordering Information

Part Number	Description	Package	MOQ
ICP10111-001	Standard Module	Individual	1
ICP10111-DEV	Development Kit	Kit Box	1
ICP10111-BULK	Bulk Order	Tray	100

2.12 Revision History

Version	Date	Changes
1.0	2025-07-18	Initial release

2.13 Schematics

For technical support and additional information, visit our website or contact our engineering team.