

# GW6210

## Sensor Signal Conditioning SoC for Particulate Matter Measurement

### Description

The GW6210 simplifies particulate matter detection by integrating an MCU and an analog front end, reducing the component count.

An automatic power control unit efficiently manages external sensing components. The integrated analog front end includes a Transimpedance Amplifier (TIA), two Programmable Gain Amplifiers (PGAs) with low-pass filters, and a 12-bit ADC.

These components process the sensor's input by amplifying, filtering, and converting it into a digital format, ready for proprietary digital signal processing algorithms.

Two embedded Low Dropout Regulators (LDOs) provide essential power, while an internal temperature sensor, in coordination with the ADC, monitors operating temperature.

The GW6210 features 32KB of embedded Flash memory for program and data storage, and 2KB of SRAM for critical processing data.

Multiple communication interfaces, such as UART and SPI/I2C options, ensure seamless host device connectivity.

### Features

- PM1.0, PM2.5 and PM10 support.
- PC0.3, PC0.5, PC1.0, PC2.5, PC4, PC7 and PC10
- System clock frequency: 16MHz
- Analog Front End featuring a 12-bit 50kSPS ADC
- Embedded temperature sensor
- Integrated 8-bit MCU
- Integrated DSP
- Internal Oscillators: 16MHz, 32KHz for sleep mode
- 32KB Flash memory for application programs
- 2KB SRAM
- 2 UART, 2 I2C, SPI and 4 PWM interfaces
- Support for LIN interface through UART functionality
- Support for laser diodes and infrared sensors

- Low power operation modes: Run, Idle, Sleep and Deep-Sleep

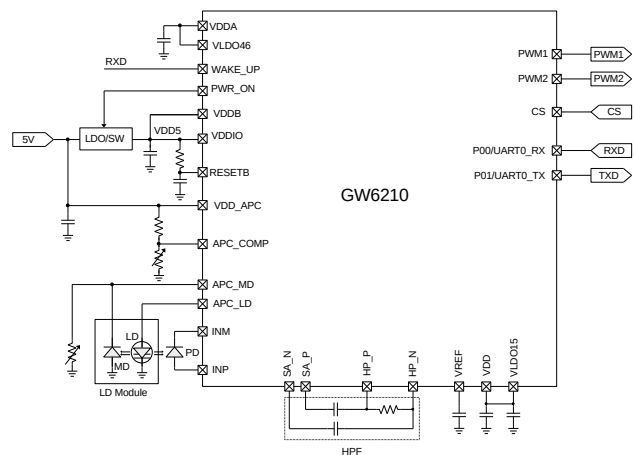
### Physical Characteristics

- Operating voltages
  - External supply voltage: 5V
  - I/O supply voltage: 5V
  - Analog core voltage: 4.6V
  - Digital core voltage: 1.5V
- Operating temperature: -40°C to 85°C
- Available in 6x6 0.4mm pitch 48-QFN package and 5x5 0.35mm pitch 48-QFN package

### Typical Applications

- PM detection
- Dust sensor
- HVAC and climate control

### Basic Application Diagram



### Ordering Information

Device name	Package	Remark
GW6210_Q48C6	48QFN, 6x6, 0.4 mm pitch	QFN48, Commercial
GW6210_Q48I6	48QFN, 6x6, 0.4 mm pitch	QFN48, Industrial
GW6210_Q48C5*	48QFN, 5x5, 0.35 mm pitch	QFN48, Commercial
GW6210_Q48I5*	48QFN, 5x5, 0.35 mm pitch	QFN48, Industrial

\*5x5 0.35mm pitch package information will be available soon.

## Block Diagram

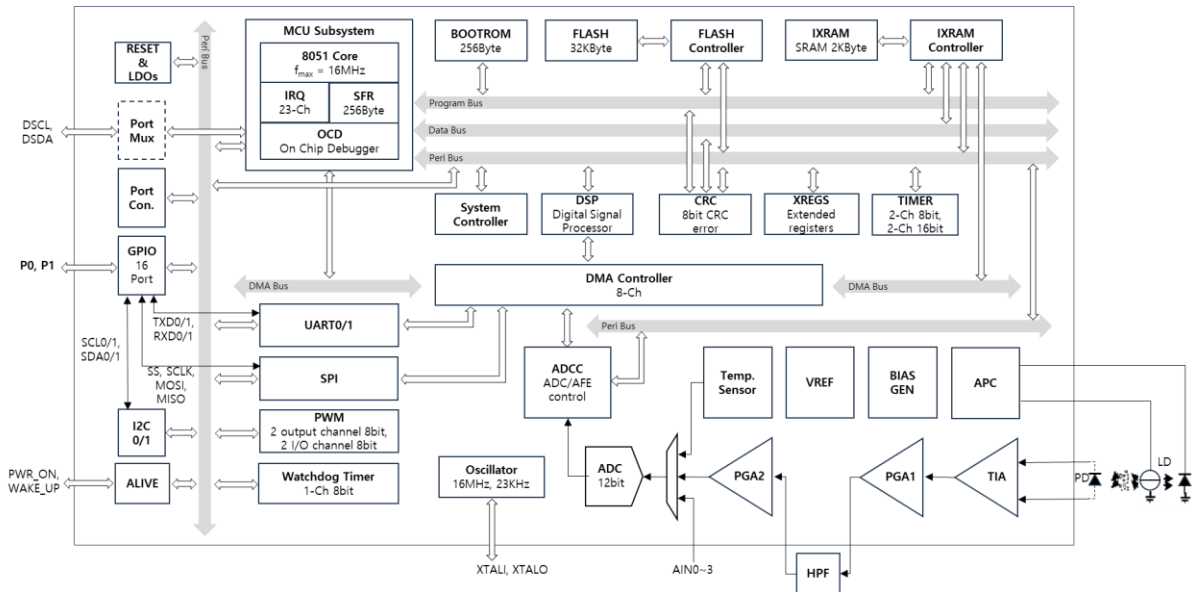
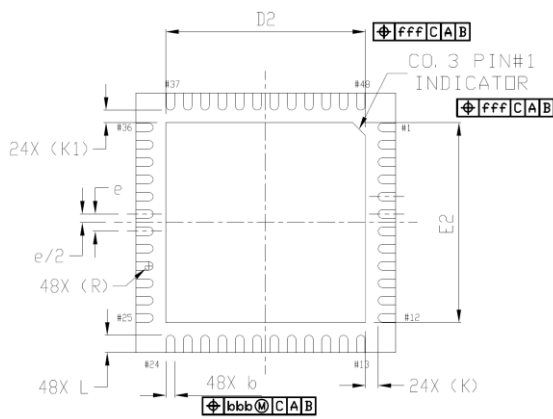
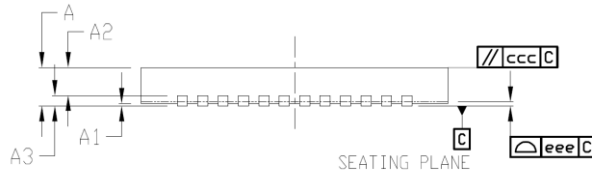


Figure 1 Functional Block Diagram

## Package Information (6x6, 0.4mm pitch)



	SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS	A	0.70	0.75	0.80
STAND OFF	A1	0	0.02	0.05
MOLD THICKNESS	A2	---	0.55	---
L/F THICKNESS	A3	0.203 REF		
LEAD WIDTH	b	0.15	0.20	0.25
BODY SIZE	X	5.90	6.00	6.10
	Y	E	5.90	6.00
LEAD PITCH	e	0.40 BSC		
EXPOSED PAD SIZE	X	4.52	4.62	4.72
	Y	E2	4.52	4.62
LEAD LENGTH	L	0.35	0.40	0.45
LEAD TIP TO EXPOSED PAD EDGE	K	0.29 REF		
	K1	0.29 REF		
LEAD TIP ROUND SIZE	R	b MIN/2	---	---
PACKAGE EDGE TOLERANCE	aaa	0.10		
MOLD FLATNESS	ccc	0.10		
COPLANARITY	eee	0.08		
LEAD OFFSET	bbb	0.07		
EXPOSED PAD OFFSET	fff	0.10		



\*5x5 0.35mm pitch package information will be available soon.

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