

# GW7233

## Smart Ultrasonic Sensor SoC

### Description

The GW7233 is a device that combines an integrated microcontroller and an analog front end to provide ultrasonic range detection using a minimal number of components. Its pulse-width modulation (PWM) outputs allow for programmable bursts to be sent to a single ultrasonic transducer. With the support of compatible transducers, this device allows for distance measurement and can be utilized for presence detection without any external components.

By utilizing internal components such as a programmable gain amplifier (PGA), a 12-bit analog-to-digital converter (ADC), digital filters, an envelope detector, and a peak detector, the desired measurement range and resolution can be achieved. Additionally, the device includes an internal temperature sensor and ADC for reading operating temperature information.

The device includes a 32 KB embedded Flash memory for storing application-specific programs and data, while a 4 KB SRAM is available for storing data required for signal processing purposes.

The GW7233 offers various communication interfaces, including UART, I<sup>2</sup>C, SPI and I/O communication making it convenient to connect with a host device.

### Features

- High Precision PWM Generator
  - Programmable Burst Generation
  - Period/Duty/Delay/Polarity Adjustable
- Ultrasonic Transducer Driver
  - Direct Voltage Driver
  - Up to 300 kHz Frequency
  - Damping Resistance Control
  - Programmable Sinking Current
- Analog Front End Integrated, Stand-alone Ultrasonic Sensor Solution
  - Analog Circuits for Ultrasonic Sensor Rx
    - Filters with Bandwidth Control
    - Programable Gain Amplifier
    - 1.6 MSPS 12-bit SAR ADC
  - Digital Signal Processing
    - Digital Filtering

- Signal Processing including Envelope Detection
- Programmable Receiver Sensitivity
- 32MHz Internal Oscillator
- 8bit CPU with Various Peripherals
  - 4 KB SRAM / 32 KB Flash Memory
  - WDT / TIMER
  - I<sup>2</sup>C / UART / SPI / GPIO
- Fast Calibration Data and Program Update via Communication interface

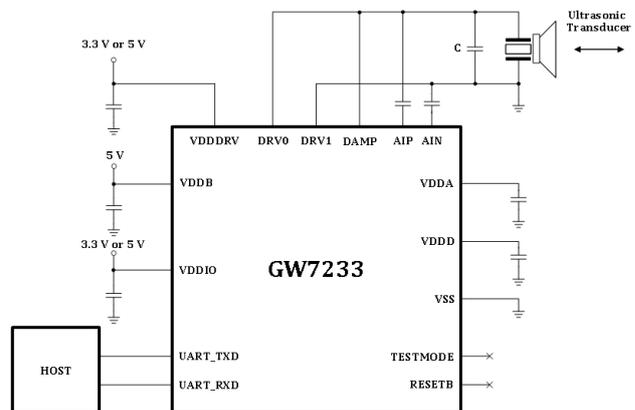
### Physical Characteristics

- Operating Voltages
  - 5 V External Supply Voltage
  - 3.3 V ~ 5 V for I/O
  - 3.3 V for Analog Core, 1.5 V for Digital Core
- Operating Temperature: -40°C to 105°C

### Typical Applications

- Ultrasonic Sensor Systems
- Distance Measurement/Presence Detection
- Robotics

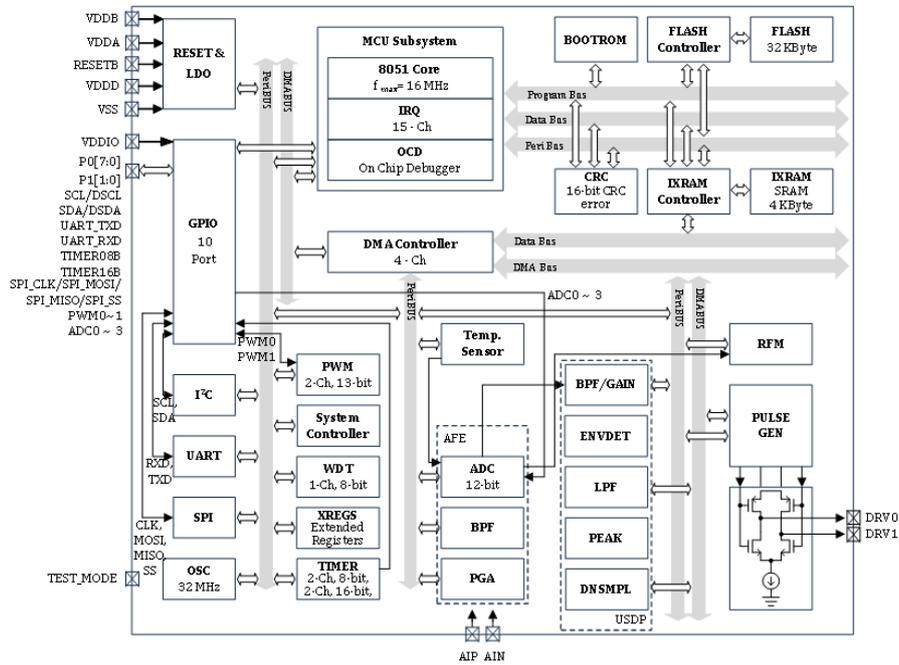
### Basic Application Diagram



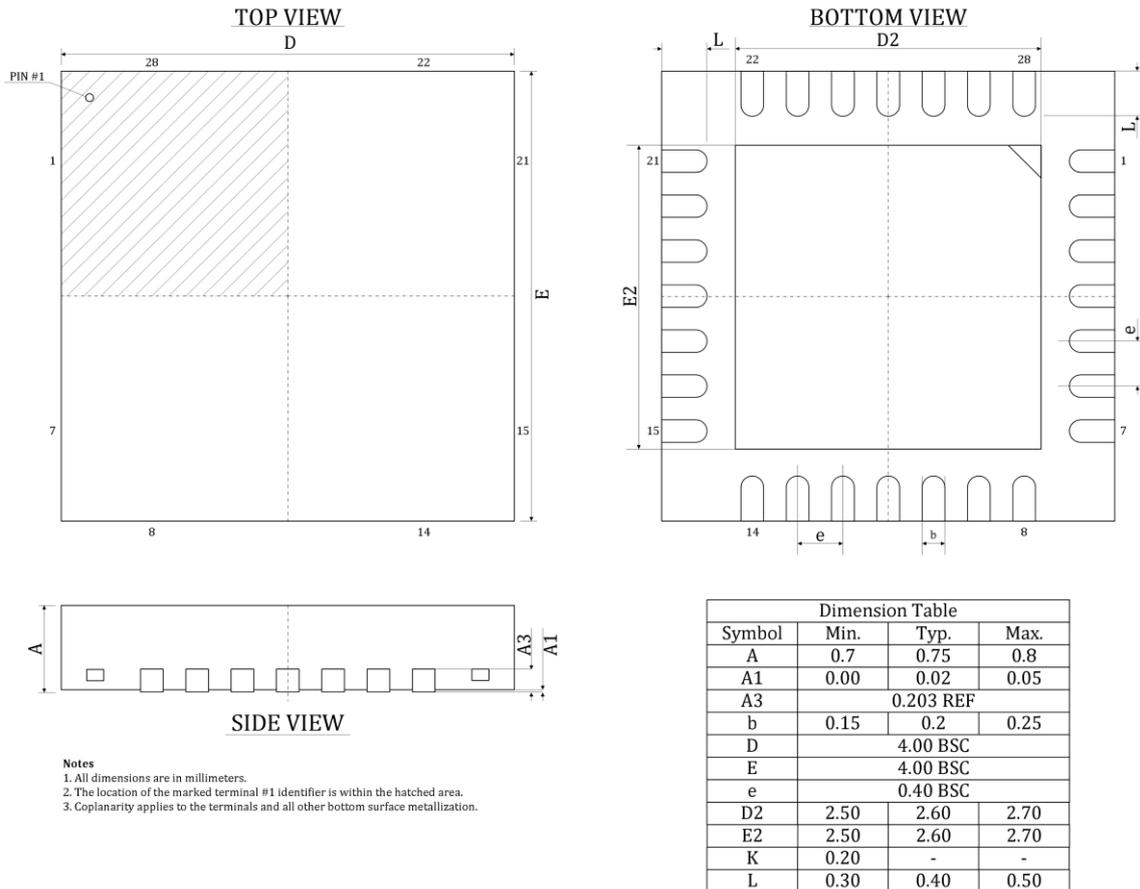
### Ordering Information

| Device name | Package                     | Remark            |
|-------------|-----------------------------|-------------------|
| GW7233IRUYT | 4.0mm x 4.0mm, 0.4 mm pitch | QFN28, Industrial |

## Block Diagram



## Package Information



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