

GW2120

Artificial Intelligence System on Chip

Description

The GW2120 is an artificial intelligence system on a chip (AI-SoC), with 32-bit RISC core, AI Inference Accelerator, and peripherals. The GW2120 integrates ARM® Cortex-M4F and 128 16-bit floating point (FP16) Multiply-Accumulate (MAC) logic which can operate up to 180 MHz, and vector processing manipulator for efficient neural network operations. Two high speed Quad Serial Peripheral Interface (QSPI) for serial NAND or NOR flash memory which enables access of large number of neural network coefficients in efficient way. 2,048 KB shared SRAM exists between the AI Inference Accelerator and the RISC core.

The GW2120 support digital interfaces for various sensors like SPI/I²C/I²S/UART/PWM/PDM. A 12-bit SAR ADC allows analog sensor signal input and Digital DAC allows analog audio output.

Two internal oscillators, Phase Lock Loop (PLL) circuit, and two LDOs minimize required external components for system implementation.

Features

- ARM® Cortex M4F 32-bit RISC Core
 - 256 KB program memory
 - 512 KB data memory
- AI Inference Accelerator
 - 128 16-bit floating point MAC
 - 2,048 KB SRAM shared with RISC Core
 - Vector processing acceleration
 - Convolution
 - Data Alignment
 - Add, Multiply, Sum, Square Sum
 - ReLu, Leaky ReLu, tanh
- Two 133 MHz QSPI for NAND or NOR flash access
- Digital Sensor Interface
 - 2x SPI

- 4x I²C
- 8x UART
- 12 channel PWM
- 12 channel Pulse Density Modulator (PDM) for microphone input
- Inter-IC Sound (I²S) for digital audio input/output
- Digital DAC for direct analog audio output
- 8 channels 12-bit SAR ADC for analog input
- Two LDOs for 1.2 V supply
- Internal 8 MHz Oscillator, 32 kHz Real Time Clock Oscillator or Crystal Clock 12 ~ 48 MHz
- Phase Lock Loop (PLL) with Spread Spectrum

Physical Characteristics

- Operating voltages
 - External supply voltage: 3.3 V
 - Analog/Digital Core: 1.2 V
- Operating temperature: -40°C to 85°C

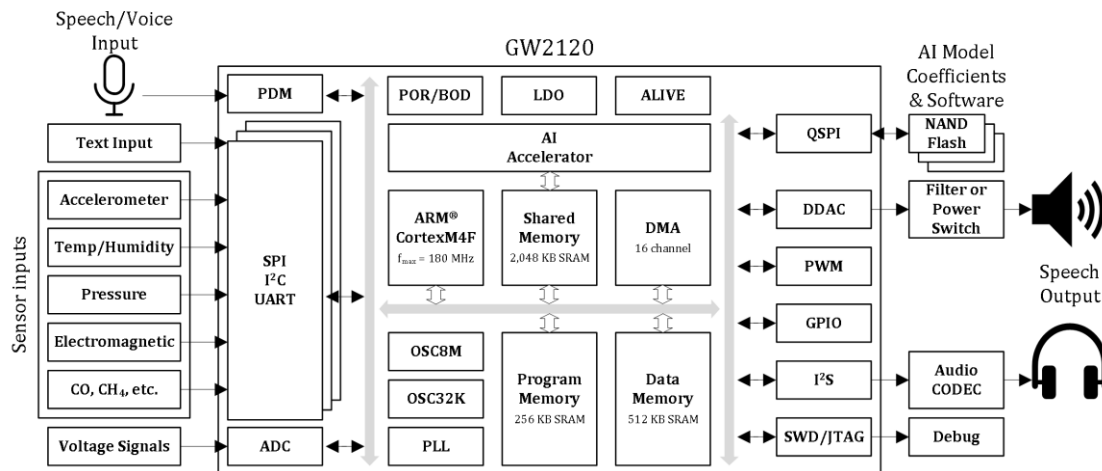
Typical Applications

- Text-to-Speech, Speech-to-Text,
- Keyword Spotting
- Sensor Data Processing
- Smart home automation
- Voice-controlled IoT devices
- Healthcare, medical, and industrial devices
- Environmental monitoring
- Retail, hospitality, and education
- Automotive and accessibility solutions
- Robotics and automation

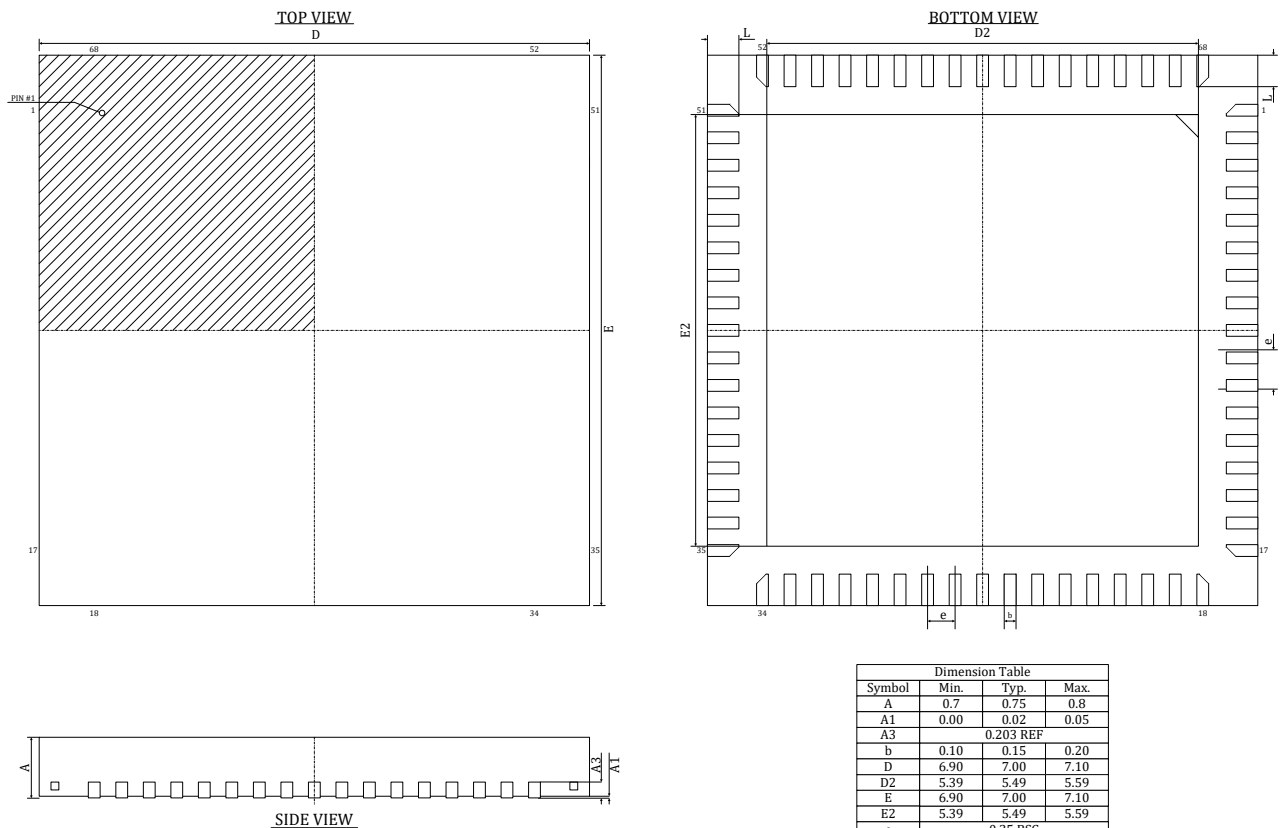
Ordering Information

Device name	Package	Remark
GW2120INKHT	7.0 mm x 7.0 mm 0.35 mm pitch	QFN68 Industrial

Basic Application Diagram



Package Information



Notes
1. All dimensions are in millimeters.
2. The location of the marked terminal #1 identifier is within the hatched area.
3. Coplanarity applies to the terminals and all other bottom surface metallization.

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