

GW2110

Synthetic Signal Processing SoC with TTS & KWS for On-Device AI

Description

The GW2110 is a state-of-the-art Edge AI chip designed to facilitate the development of advanced signal processing-related On-Device AI systems. This chip is a high-performance Synthetic Signal Processing SoC (System-on-Chip) specifically designed to enable real-time processing and data analysis.

Equipped with an on-chip Inference Accelerator (IX) based on cutting-edge CNN architecture and hardware activation functions optimized for efficient speech processing, this device can provide real-time Text-to-Speech (TTS) and Keyword Spotting (KWS) capabilities without relying on a cloud server.

Featuring multiple interfaces, including analog voltage input channels, the GW2110 seamlessly integrates with a variety of sensors. From gas sensors for detecting CO and CH₄ to pressure, temperature, and humidity sensors, it empowers intelligent and user-friendly environmental monitoring. Utilizing its internal Edge AI engine and speech processing, the GW2110 offers comprehensive environmental insights and data analysis, including sensor fusion capabilities.

Features

- Real-time TTS and KWS processing without a cloud server
- Multilingual TTS and KWS support
- Embedded ARM® Cortex®-M4F (180MHz)
- On-chip inference accelerator (IX)
 - Utilizes CNN architecture with hardware activation functions (tanh and ReLU)
 - 128 MACs/cycle @FP16 (46.08GFLOPS @FP16)
- DRAM-Free Architecture
- Internal memory
 - 128KB Program Memory
 - 256KB Data Memory
 - 1MB Shared Memory with IX

- Versatile interfaces
 - UART/I2C/SPI
 - Audio output: DDAC
 - Digital mic input: PDM
 - 4-channel 12-bit SAR ADC
 - USB2.0 Full Speed
- Dual QSPI interfaces for external SPI NAND and SPI NOR Flash memory
- Lower Power Consumption
- Power management with sleep, stop, and standby modes
 - Wake-up options: RTC, GPIO, PDM
- Integrated power management components: LDO, POR, BOD

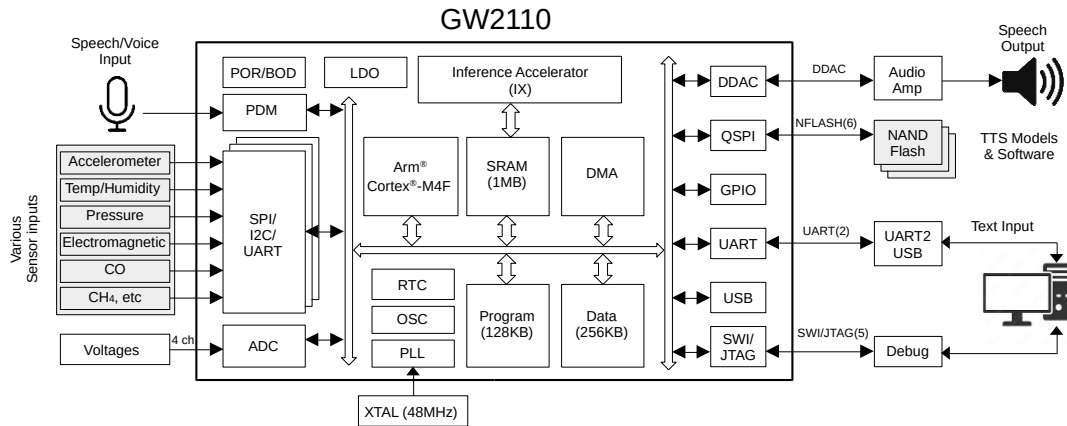
Physical Characteristics

- Operating voltages
 - External supply voltage: 3.3V
 - I/O supply voltage: 3.3V
 - Analog core voltage: 1.2V
 - Digital core voltage: 1.2V
- Operating temperature: -40°C ~ 85°C
- Available in 8x8 0.4mm pitch 68-QFN package

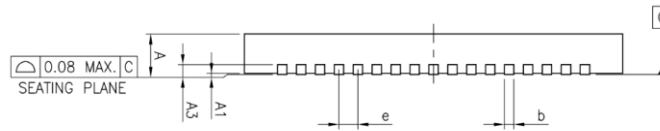
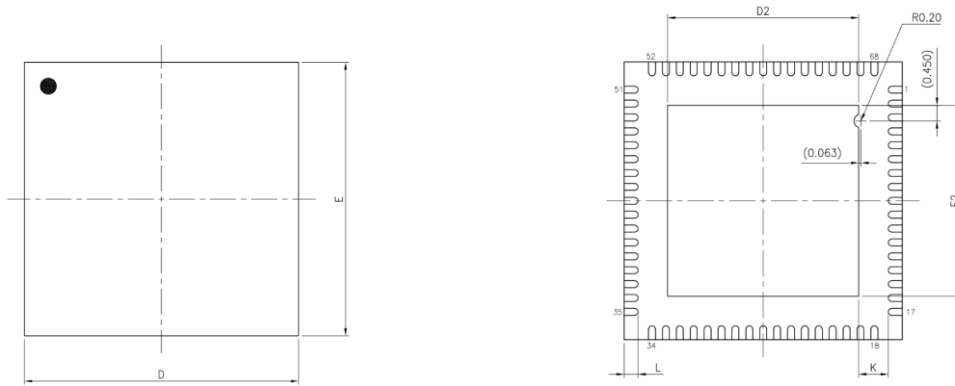
Typical Applications

- 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

Block Diagram



Package Information



| JEDEC OUTLINE | PACKAGE TYPE | | | | | |
|---------------|--------------|------|------|------------|------|------|
| | MO-220 | | | MO-220 | | |
| PKG CODE | WQFN(x868) | | | VQFN(y868) | | |
| SYMBOLS | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. |
| A | 0.70 | 0.75 | 0.80 | 0.80 | 0.85 | 0.90 |
| A1 | 0.00 | 0.02 | 0.05 | 0.00 | 0.02 | 0.05 |
| A3 | 0.203 REF. | | | 0.203 REF. | | |
| b | 0.15 | 0.20 | 0.25 | 0.15 | 0.20 | 0.25 |
| D | 7.90 | 8.00 | 8.10 | 7.90 | 8.00 | 8.10 |
| E | 7.90 | 8.00 | 8.10 | 7.90 | 8.00 | 8.10 |
| e | 0.40 BSC | | | 0.40 BSC | | |
| L | 0.35 | 0.40 | 0.45 | 0.35 | 0.40 | 0.45 |
| K | 0.20 | — | — | 0.20 | — | — |

| PAD SIZE | D2 | | | E2 | | | LEAD FINISH | JEDEC CODE | |
|------------|------|------|------|------|------|------|-------------|------------|-----|
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. | | | |
| 236x23 MIL | 5.45 | 5.50 | 5.55 | 5.45 | 5.50 | 5.55 | Pure Tin | PPF | N/A |

Ordering Information

| Device name | Package | Remark |
|-------------|--------------------------|-------------------|
| GW2110INKET | 8.0mmx8.0mm, 0.4mm pitch | QFN68, Industrial |

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