GW2110

Synthetic Signal Processing SoC with TTS for On-Device AI Applications

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 CH_4 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

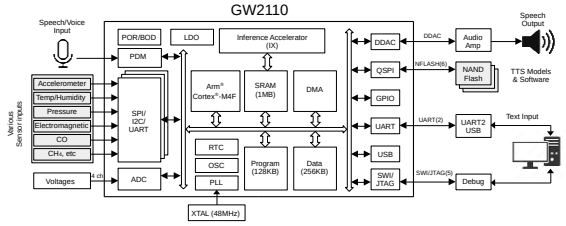
Physical Characteristics

- 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

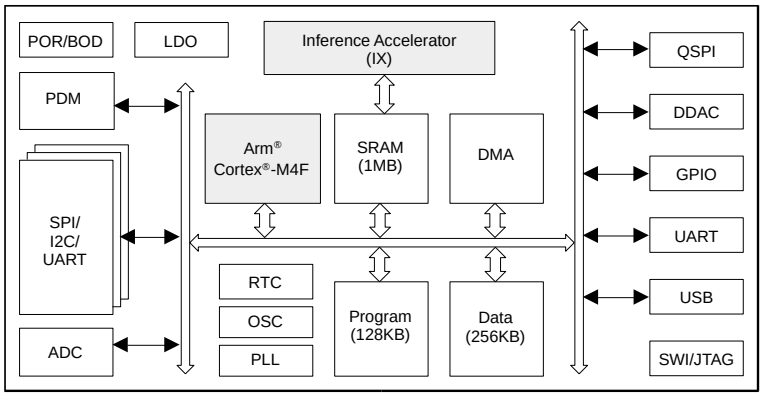
Typical Applications

- 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

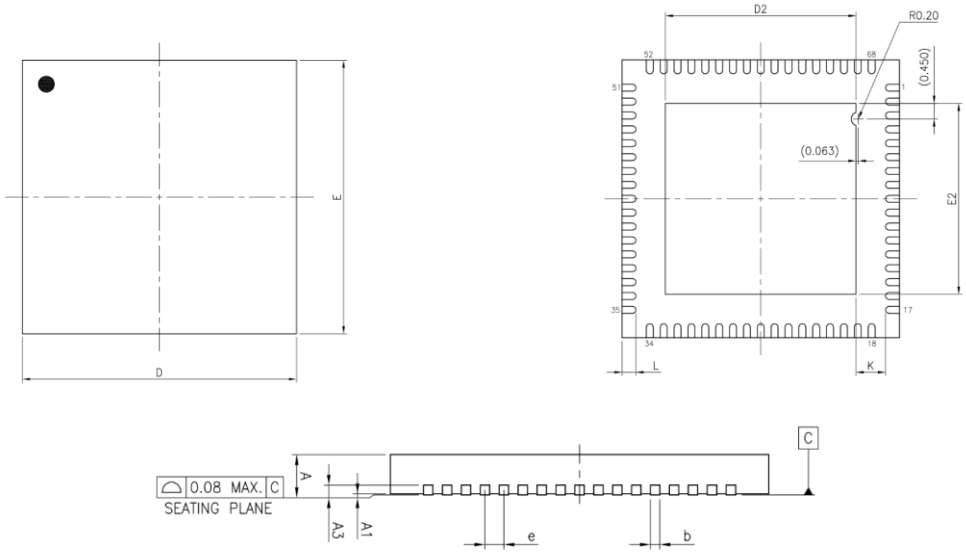
Basic Application Diagram



Block Diagram



Package Information



	PACKAGE TYPE					
JEDEC OUTLINE	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.	Pure Tin	PPF	
236X23* MIL	5.45	5.50	5.55	5.45	5.50	5.55	V	X	N/A

Ordering Information

Device name	Package	Remark
GW2110_Q68C	68QFN, 8x8, 0.4mm pitch	QFN68, Commercial
GW2110_Q68I	68QFN, 8x8, 0.4mm pitch	QFN68, Industrial

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