**Sipeed MAIX-I module Wi-Fi version**

Sipeed' s MAIX-I module Wi-Fi version is a RISC-V 64 AI Module designed to run AI at the edge.

AI is pervasive today, from consumer to enterprise applications. With the explosive growth of connected devices, combined with a demand for privacy/confidentiality, low latency and bandwidth constraints, AI models trained in the cloud increasingly need to be run at the edge.

MAIX is Sipeed' s purpose-built module designed to run AI at the edge. It delivers high performance in a small physical and power footprint, enabling the deployment of high-accuracy AI at the edge, and the competitive price make it possible embed to any IoT devices. Sipeed MAIX is quite like Edge TPU, but it acts as master controller, not an accelerator like Edge TPU, so it is more low cost and low power.

Inherit the advantage of K210's small footprint, Sipeed MAIX-I module, integrate K210, 3-channel DC-DC power, 8MBFlash, Wi-Fi chip esp8285 into Square Inch Module. All usable IO breaks out as 1.27mm(50mil) pins, and pin's voltage is selectable from 3.3V and 1.8V.

About K210: the Kendryte K210 is a system-on-chip (SoC) that integrates machine vision and machine hearing. Using TSMC’s ultra-low-power 28-nm advanced process with dual core 64-bit processors for better power efficiency, stability and reliability. The SoC strives for "zero threshold" development and to be deployable in the user’s products in the shortest possible time, giving the product artificial intelligence.

**Features**

* CPU: RISC-V Dual Core 64bit, 400Mh adjustable
* Powerful dual-core 64-bit open architecture-based processor with rich community resources
* FPU Specifications
* IEEE754-2008 compliant high-performance pipelined FPU
* Debugging Support
* High-speed UART and JTAG interface for debugging
* Neural Network Processor (KPU)
* Supports the fixed-point model that the mainstream training framework trains according to specific restriction rules
* No direct limit on the number of network layers, each layer of convolutional neural network parameters can be configured separately
* Support for 1x1 and 3x3 convolution kernels
* Support for any form of activation function
* The maximum supported neural network parameter size for real-time work is 5MiB to 5.9MiB
* The maximum supported network parameter size when working in non-real time is (flash size - software size)
* Audio Processor (APU)
* Up to 8 channels of audio input data, ie 4 stereo channels
* Simultaneous scanning pre-processing and beamforming for sound sources in up to 16 directions
* Supports one active voice stream output
* 16-bit wide internal audio signal processing
* Support for 12-bit, 16-bit, 24-bit, and 32-bit input data widths • Multi-channel direct raw signal output
* Up to 192kHz sample rate
* Built-in FFT unit supports 512-point FFT of audio data
* Uses system DMAC to store output data in system memory
* Static Random-Access Memory (SRAM)
* The SRAM is split into two parts, 6MiB of on-chip, general-purpose SRAM memory and 2MiB of on-chip AI SRAM memory, for a total of 8MiB
* Field Programmable IO Array (FPIOA/IOMUX)
* FPIOA allows users to map 255 internal functions to 48 free IOs on the chip
* Digital Video Port (DVP)
* Maximum frame size 640x480
* FFT Accelerator
* The FFT accelerator is a hardware implementation of the Fast Fourier Transform (FFT)
* Deep learning framework
* TensorFlow/Keras/Darknet
* Peripheral:
* FPIOA, UART, GPIO, SPI, I²C, I²S, WDT, TIMER, RTC etc.
* Software
* Support FreeRTOS and Standard development kit
* Support MicroPython on M1
* Machine vision based on convolutional neural network
* High performance microphone array processor
* Capability
* Object Detection, Image Classification, Face Detection and Recognition
* Obtaining size and coordinates of target in real time
* Obtaining type of detected target in real time
* Sound source orientation detection
* Sound Field Imaging, Beamforming
* Voice Wake-Up, Speech Recognition

**Applications**

* Smart Home applications like robot cleaners, smart speakers, electronic door locks, household monitoring etc.
* Medical Industry applications like Auxiliary diagnosis and treatment, medical image recognition, emergency alarm etc.
* Smart Industry applications like industrial machinery, intelligent sorting, monitoring of electrical equipment, etc.
* Education applications like educational robots, intelligent interactive platforms, educational efficiency inspection, etc.
* Agriculture applications like agricultural monitoring, pest and disease monitoring, automated control, etc.

**Key Search Terms**

Sipeed, MAIX, RISC-V, Artificial Intelligence, AIoT, Edge, Kendryte K210, Neural Network Processor, Deep Learning, Machine Vision, Voice Recognition, TensorFlow, Yolo, Training model, Keras, Darknet

**Parts Lists**

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