seeed studio
The IoT Hardware Enabler

MAIX Go KIT FOR RISC-V AI+IoT

SiPEED

Full-Featured | Deep Learning | Machine Vision | Out-of-the-Box

Sipeed MAIX GO Suit (MAIX GO + 2.8 inch LCD + ov2640 with M12 lens)

SKU 110991191

Sipeed MAix Go have on board JTAG&UART based on STM32F103C8, I2S Mic, Speaker, RGB LED, Mic array connector, thumbwheel, TF card Slot and lithium battery manager chip with power path management function, all pins out, with standard M12 lens DVP camera.

PRODUCT DETAILS

Sipeed MAix: 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, we called it AIoT. 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. As you see, Sipeed MAIX is quite like Google edge TPU, but it act as master controller, not an accelerator like edge TPU, so it is more low cost and low power than AP+edge TPU solution.

MAix's Advantage and Usage Scenarios:
- MAIX is not only hardware, but also provide an end-to-end, hardware + software infrastructure for facilitating the deployment of customers' AI-based solutions.
- Thanks to its performance, small footprint, low power, and low cost, MAIX enables the broad deployment of high-quality AI at the edge.
- MAIX isn't just a hardware solution, it combines custom hardware, open software, and state-of-the-art AI algorithms to provide high-quality, easy to deploy AI solutions for the edge.
- MAIX can be used for a growing number of industrial use-cases such as predictive maintenance, anomaly detection, machine vision, robotics, voice recognition, and many more. It can be used in manufacturing, on-premise, healthcare, retail, smart spaces, transportation, etc.
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MAix's CPU
- In hardware, MAIX have powerful KPU K210 inside, it offers many excited features:
- 1st competitive RISC-V chip, also 1st competitive AI chip, newly release in Sep. 2018
- 28nm process, dual-core RISC-V 64bit IMAFDC, on-chip huge 8MB high-speed SRAM (not for XMR :D), 400MHz frequency (able to 800MHz)
- KPU (Neural Network Processor) inside, 64 KPU which is 576bit width, support convolution kernels, any form of activation function. It offers 0.25TOPS@0.3W,400MHz, when overclock to 800MHz, it offers 0.5TOPS. It means you can do object recognition 60fps@VGA
- APU (Audio Processor) inside, support 8mics, up to 192KHz sample rate, hardcore FFT unit inside, easy to make a Mic Array (MAIX offer it too)
- Flexible FPIOA (Field Programmable IO Array), you can map 255 functions to all 48 GPIOs on the chip
- DVP camera and MCU LCD interface, you can connect an DVP camera, run your algorithm, and display on LCD
- Many other accelerators and peripherals: AES Accelerator, SHA256 Accelerator, FFT Accelerator (not APU's one), OTP, UART, WDT, IIC, SPI, I2S, TIMER, RTC, PWM, etc.

MAix's Module

Inherit the advantage of K210's small footprint, Sipeed MAIX-I module, or called M1, integrate K210, 3-channel DC-DC power, 8MB/16MB/128MB Flash (M1w module add wifi chip esp8285 on it) 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.
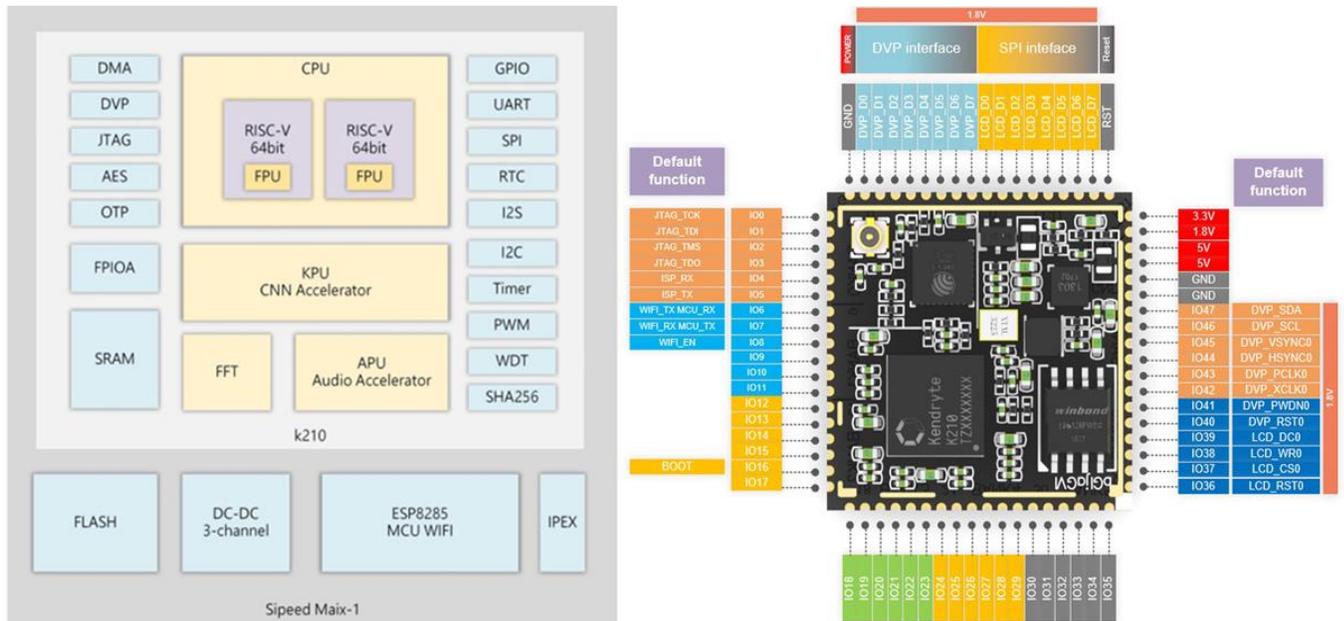
Sipeed MAix Go development kit

MAix Go is bigger and better than M1 Dock.

- It is 88x60mm, all pins out, with standard M12 lens DVP camera, and the Camera can be fliped from front to rear!
- It have on board JTAG&UART based on STM32F103C8, so you can debug M1 without extra Jlink.
- It have lithium battery manager chip with power path management function, you can use the board with lithium battery and usb power without conflict~
- It have I2S Mic, Speaker, RGB LED, Mic array connector, thumbwheel, TF card Slot and so on.
- This suit include 2.8 inch LCD too, and have an simple case for it.
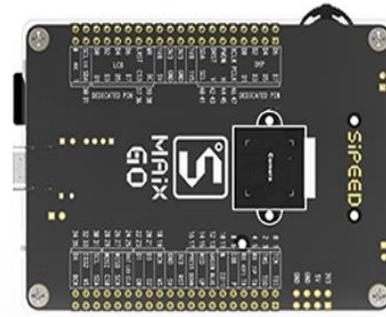
MAix's SoftWare

MAIX support original standalone SDK and FreeRTOS SDK base on C/C++.
And it is also compatible with micropython which has many basic libraries for developing such as FPIOA, GPIO, TIMER, PWM, Flash, OV2640, LCD, etc. Besides, it can support zmodem protocol, SPIFFS library for wireless communication. you can use python or vi to edit the code to the board.

MAix's Deep learning

MAIX support fixed-point model that the mainstream training framework trains, according to specific restriction rules, and have model compiler to compile models to its own model format.
It support tiny-yolo, mobilenet-v1, and, TensorFlow Lite! Many TensorFlow Lite model can be compiled and run on MAIX! And We will soon release model shop, you can trade your model on it.

SOFTWARE FEATURES	
FreeRtos & Standard SDK	Support FreeRtos and Standrad development kit.
MicroPython Support	Support MicroPython on M1
Machine vision	Machine vision based on convolutional neural network
Speech Recognition	High performance microphone array processor

ELECTRICAL SPEC

Supply voltage of external power supply	4.8V ~ 5.2V
Supply current of external power supply	>600mA
Temperature rise	<30K
Range of working temperature	-30℃ ~ 85℃

RF

MCU : ESP8285	Tensilica L106 32-bit MCU
Wireless Standard	802.11 b/g/n
Frequency Range	2400Mhz - 2483.5Mhz
TX Power(Conduction test)	802.11.b : +15dBm 802.11.g : +10dBm(54Mbps) 802.11.n : +10dBm (65Mbps)
Antenna Connector	IPEX 3.0x3.0mm
Wi-Fi mode	Station/SoftAP/SoftAP+Station

Part List

Sipeed MAIX GO dev. board	1
ACRYLIC Case	2
2.8inch touch LCD	1
OV2640 with M12 4mm lens	1
WiFi Antenna	1
Type-C USB cable	1
Li-ion Battery	1
Screw&Stud	6

ECCN/HTS

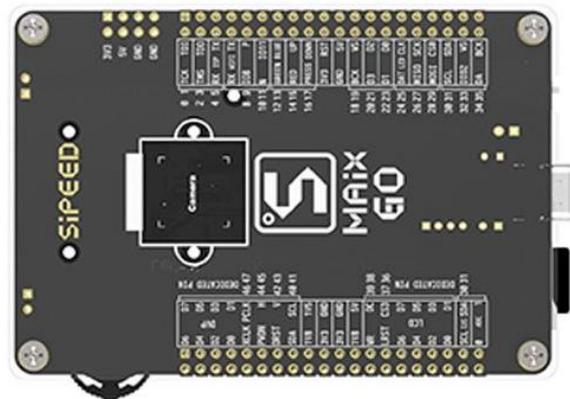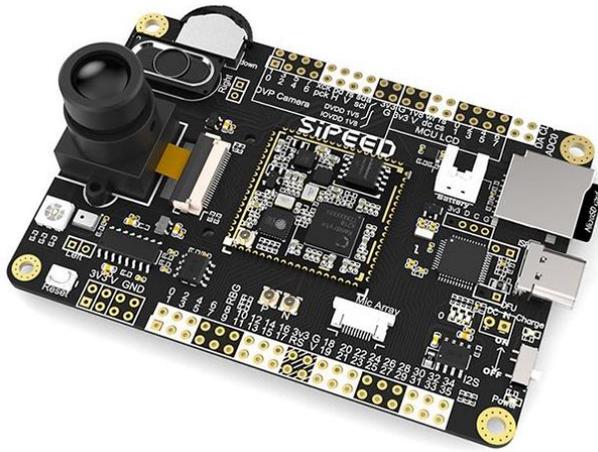|	
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USHSCODE	8473301180
UPC	

LEARN AND DOCUMENTS

Documentations

- **Wiki-maixpy**
- **Resource Download**
- **Assembly Guide**
- **BBS**
- **MaixPy Introduction**
- **Getting Started**
- **MaixPy Release**
- **MaixPy Model**
- **MAIX_SDK_ToolChain**
- **MAIX_Tools**
- **Libraries - Maix**
- **Libraries - Machine vision**
- **MicroPython Introduction**
- **Difference between MicroPython & CPython**
- **Chip_Datasheet**
- **Telegram group**
- **FAE support email: support@sipeed.com**
- **Kendryte K210 FreeRTOS SDK V0.5.0**
- **Kendryte K210 Standalone SDK V0.5.2**
- **Kendryte K210 datasheet English ver.V0.1.5**
- **Kendryte Standalone SDK Programming Guide-EN-V0.3.0**
- **Kendryte FreeRTOS SDK Programming Guide-EN-V0.1.0**
- **Kendryte OpenOCD for win32 V0.1.3**
- **Kendryte OpenOCD for Ubuntu x86_64 V0.1.3**
- **RISC-V 64bit toolchain for Kendryte K210_win32 V8.2.0**
- **RISC-V 64bit toolchain for Kendryte K210_ubuntu_amd64 V8.2.0**
- **K-Flash V0.3.0**
- **Kendryte K210 Model Download Guide V0.1.0**
- **Kendryte K210 Face Detection Demo V0.1.0**
- **kendryte-Github**
- **Cmake installation**
- **Windows CPP Build tools**

https://www.seeedstudio.com/Sipeed-MAix-GO-Suit-for-RISC-V-AI-IoT-p-2874.html/9-16-20