

CoreS3-Lite

SKU:K128-Lite





Description

CoreS3-Lite is a programmable IoT controller packed with rich peripherals. Powered by an ESP32-S3 at its core, it features a 240 MHz Xtenso® 32-bit LX7 dual-core processor with 16 MB Flash and 8 MB PSRAM on board. On the front, a 2.0" capacitive touch IPS display is integrated, along with a 0.3 MP GC0308 camera and an LTR-553ALS-WA proximity/ambient-light sensor, enabling basic face-detection and recognition applications. The built-in BMI270 6-axis IMU plus BMM150 3-axis magnetometer provide additional interaction possibilities. With the AXP2101 power-management IC and BM8563 RTC, the device supports real-time power monitoring and low-power timed wake-up. For audio interaction, it offers a high-fidelity 16-bit I2S amplifier AW88298 paired with a 1 W speaker, and a full-duplex audio solution based on the ES7210 codec with dual-microphone input. A microSD card slot is included for development and data storage. The unit contains a 200 mAh LiPo battery and adopts a magnetic back cover for easy mounting and fixation. Typical scenarios include smart-home control, desktop robot companions, and more.

Tutorial



UiFlow2

This tutorial shows how to control the CoreS3-Lite with the UiFlow2 graphical-programming platform.



Arduino IDE

This tutorial shows how to program and control the CoreS3-Lite with the Arduino IDE.

Features

- Based on the ESP32-S3
 - 240 MHz Xtensa® 32-bit LX7 dual-core
 - 2.4 GHz Wi-Fi
 - 16 MB Flash + 8 MB PSRAM
- 2.0" capacitive-touch IPS display
- 0.3 MP camera (GC0308)
- Integrated digital ambient-light & proximity sensor: LTR-553ALS-WA
- 6-axis IMU (BMI270) + 3-axis magnetometer (BMM150)
- AXP2101 power management
- BM8563 RTC with low-power timed wake-up
- AW88298 16-bit I2S amplifier + 1 W speaker
- ES7210 codec + dual-microphone array
- microSD card slot
- USB-OTG support
- Magnetic back cover

Includes

- 1 × CoreS3-Lite
- 1 × Hex Key L-Shape 2.5 mm (For M3 Screw)

Applications

- DIY project development
- Smart-home systems
- Desktop voice assistant
- Educational interactive robots
- Industrial equipment status monitor

Specifications

Specification	Parameter
SoC	ESP32-S3@32-bit Xtensa LX7 Dual-core, 240MHz
USB	USB OTG, USB Serial/JTAG
Flash	16MB
PSRAM	8MB
Wi-Fi	2.4 GHz Wi-Fi
Display Driver	2.0" @ 320 x 240 ILI9342C
Touch Driver	FT6336U
Camera	GC0308 @ 0.3MP
Proximity Sensor	LTR-553ALS-WA
Power Management IC	AXP2101
6-Axis IMU	BMI270
3-Axis Magnetometer	BMM150
RTC	BM8563
Speaker	16-bit I2S amplifier chip AW88298 @ 1W
Audio Codec Chip	ES7210, dual microphone input
Product Size	54.0 x 54.0 x 16.5mm
Product Weight	54.0g
Package Size	133.0 x 93.5 x 22.5mm
Gross Weight	71.5g

Learn

BMM150 Magnetic Interference

Products containing magnets may interfere with the BMM150 magnetic-field sensor, resulting in abnormal readings. When used with M5 controllers that contain magnets, remove the magnets and avoid placing the BMM150 near strong magnetic fields.

Download Mode

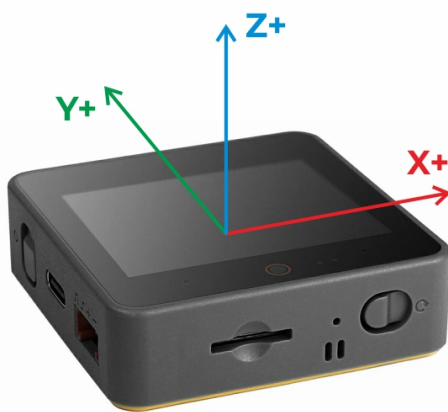
Before flashing, press and hold the reset button for 3 s (green LED on) to enter download mode.



| Power On/Off

- Power on: click the left-side power button once
- Power off: press and hold the left-side power button for 6 s
- Reset: click the bottom RST button once

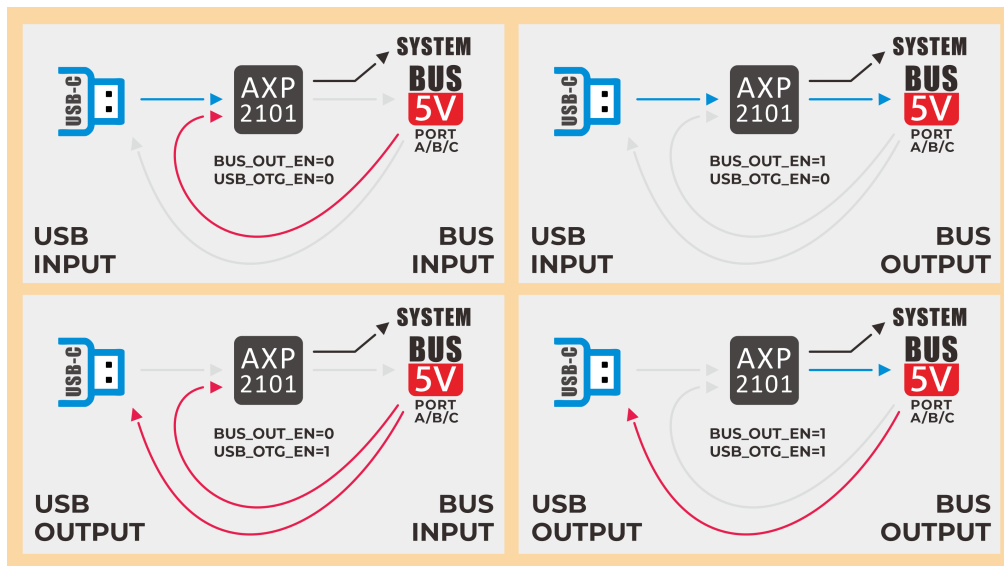
| IMU Triaxial Direction Schematic Diagram



IMU ORIENTATION OF AXES

| Power Management

CoreS3-Lite uses the AXP2101 PMU together with the AW9523B IO expander to control power input/output directions. Refer to the pin states of **BUS_OUT_EN** and **USB_OTG_EN** in the figure below and check the example code in [CoreS3 Power Manager Example](#).

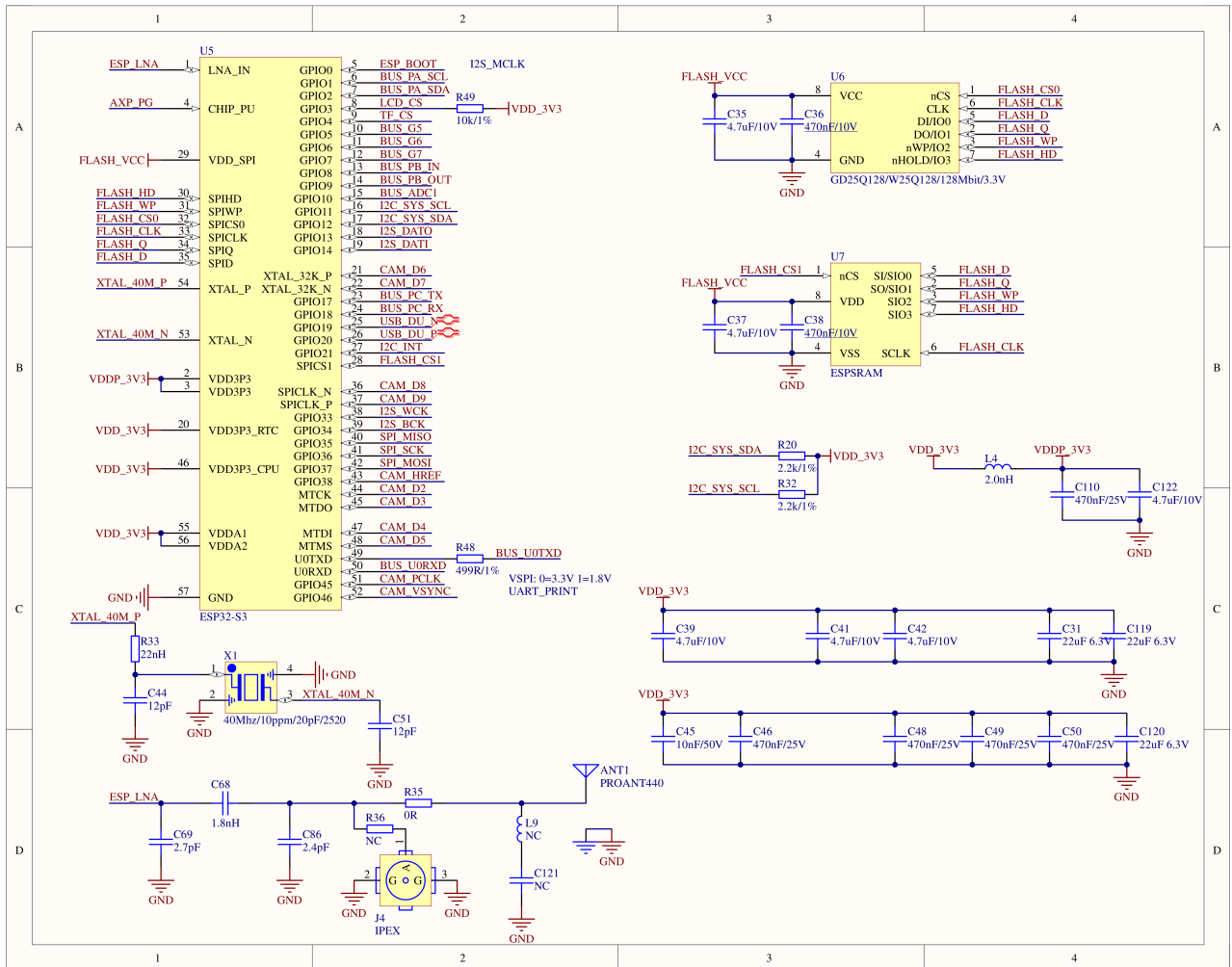


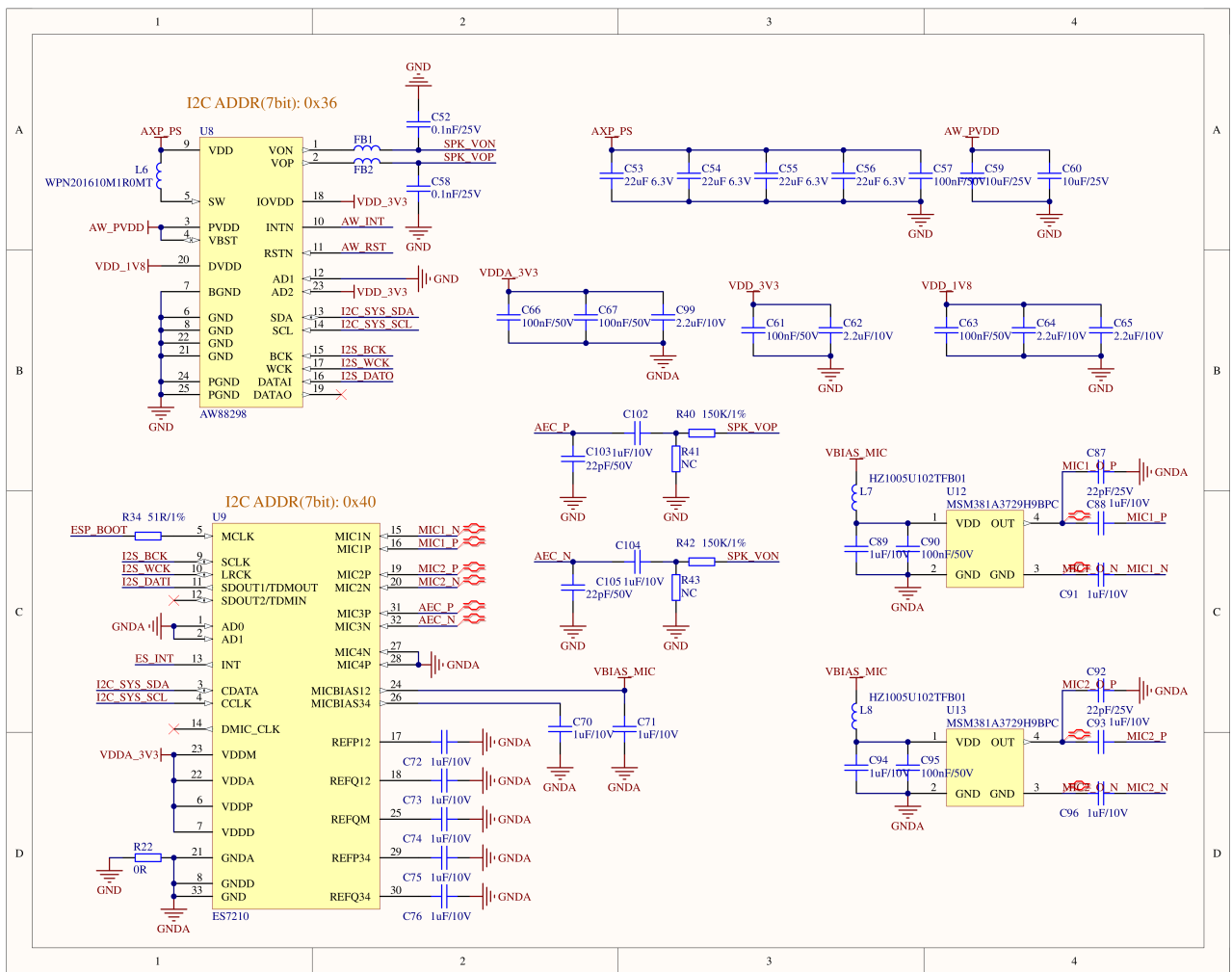
Certifications

- CE / MIC / FCC / SAR

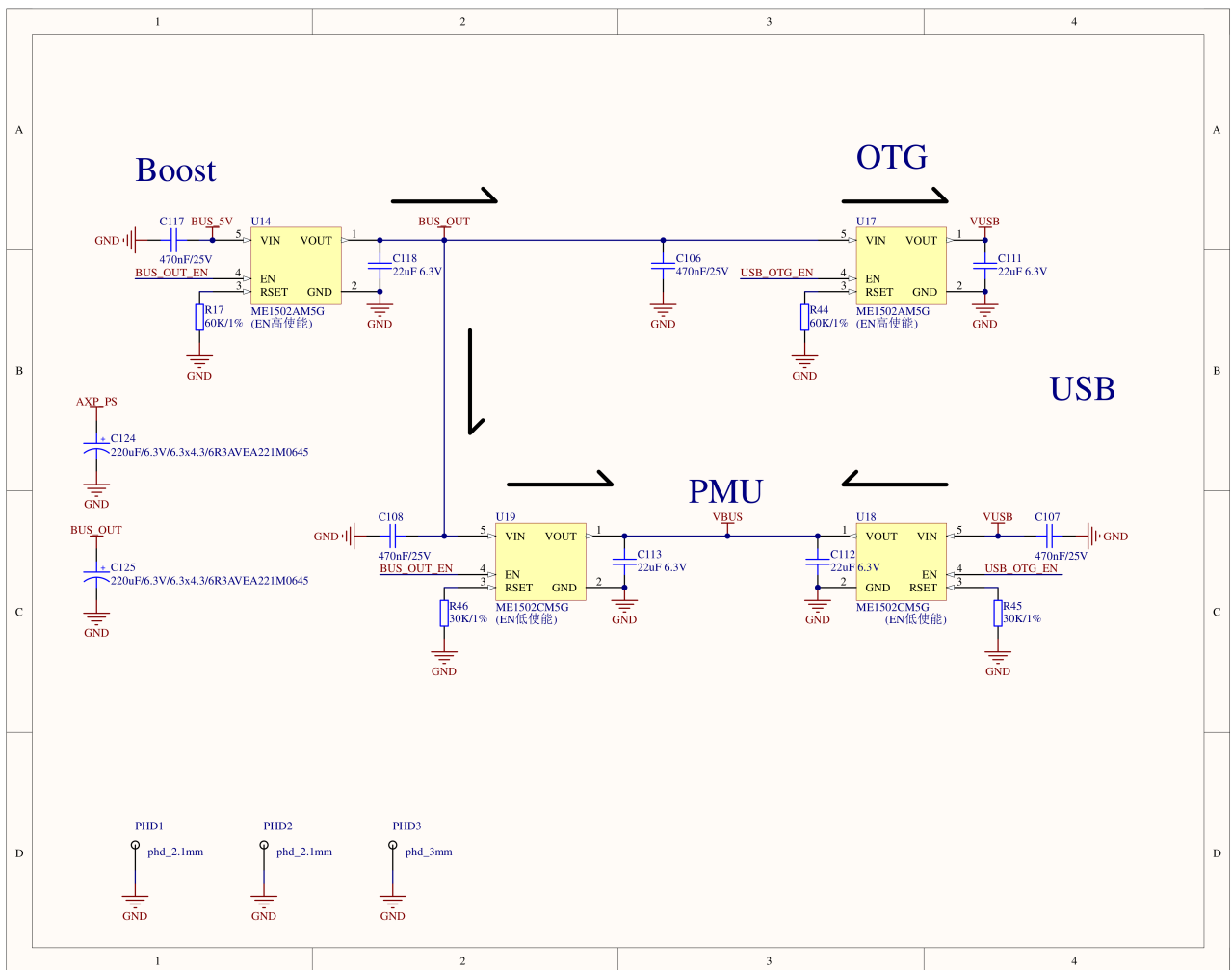
Schematics

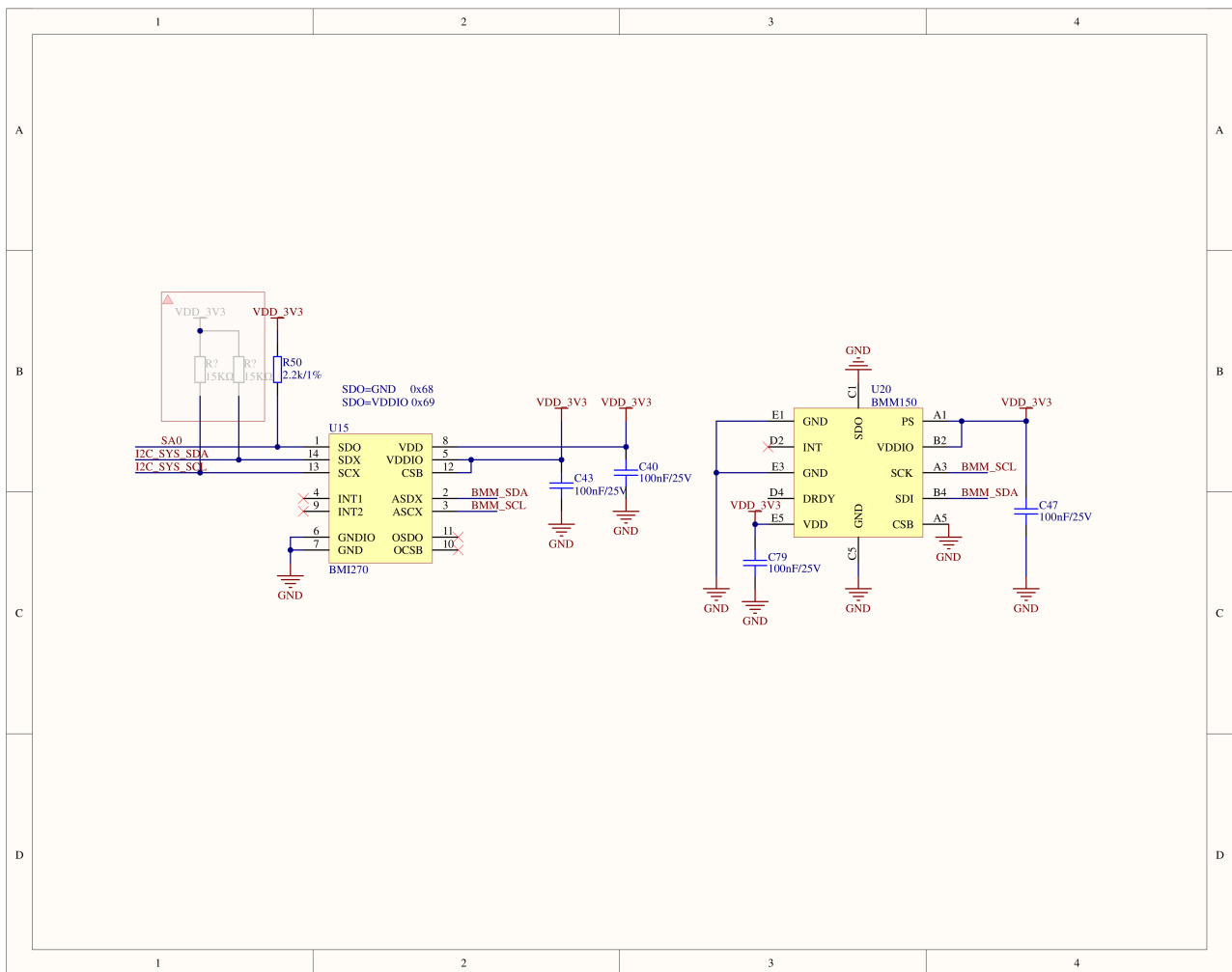
- [CoreS3-Lite Schematics PDF](#)











PinMap

LCD

LCD resolution: 320 × 240

ESP32-S3	G37	G36	G3	G35
ILI9342C	MOSI	SCK	CS	DC

AW9523B	P1_1
ILI9342C	RST

AXP2101	DLDO	LX1
ILI9342C	BL	PWR

microSD

ESP32-S3	G35	G37	G36	G4
microSD	MISO	MOSI	SCK	CS

Camera & Proximity Sensor LTR-553ALS-WA

ESP32-S3	G12	G11	G45	G46	G38
GC0308	I2C_SYS_SDA	I2C_SYS_SCL	CAM_PCLK	CAM_VSYNC	CAM_HREF
LTR-553ALS-WA	I2C_SYS_SDA	I2C_SYS_SCL			

AW9523B	P1_0
GC0308	CAM_RST

GC0308

接口	Camera Pin	ESP32-S3
SCCB Clock	SIOC	G11
SCCB Data	SIOD	G12
System Clock	XCLK	-1
Vertical Sync	VSYNC	G46
Horizontal Reference	HREF	G38
Pixel Clock	PCLK	G45
Pixel Data Bit 0	D0	G39
Pixel Data Bit 1	D1	G40
Pixel Data Bit 2	D2	G41
Pixel Data Bit 3	D3	G42
Pixel Data Bit 4	D4	G15
Pixel Data Bit 5	D5	G16
Pixel Data Bit 6	D6	G48
Pixel Data Bit 7	D7	G47
Camera Reset	RESET	-1
Camera Power Down	PWDN	-1

CAP.TOUCH (I2C Addr: 0x38)

ESP32-S3	G12	G11
FT6336U	I2C_SYS_SDA	I2C_SYS_SCL

AW9523B	P0_0	P1_2
FT6336U	TOUCH_RST	TOUCH_INT

Microphone & Amplifier

ESP32-S3	G12	G11	G34	G33	G13	G14	G0
ES7210 (0x40)	I2C_SYS_SDA	I2C_SYS_SCL	I2S_BCK	I2S_WCK	I2S_DAT0		I2S_MCLK
AW88298(0x36)	I2C_SYS_SDA	I2C_SYS_SCL	I2S_BCK	I2S_WCK		I2S_DAT1	

AW9523B	P0_2	P1_3
AW88298	AW_RST	AW_INT

AXP Power LED

AXP2101	AXP_CHG_LED
Red LED	RTC_VDD

RTC

ESP32-S3	G12	G11
BM8563	I2C_SYS_SDA	I2C_SYS_SCL

AXP2101	IRQ
BM8563	AXP_WAKEUP

IMU (3-axis Gyro + 3-axis Accel + 3-axis Magnetometer)

ESP32-S3	G12	G11
BMI270	I2C_SYS_SDA	I2C_SYS_SCL

Internal I2C Bus

ESP32-S3	G12	G11
BMI270	I2C_SYS_SDA	I2C_SYS_SCL
AXP2101	I2C_SYS_SDA	I2C_SYS_SCL
BM8563	I2C_SYS_SDA	I2C_SYS_SCL
ES7210	I2C_SYS_SDA	I2C_SYS_SCL
AW88298	I2C_SYS_SDA	I2C_SYS_SCL

BMM150

BMI270	BMI270_AS Dx	BMI270_ASCx
BMM150	BMM_SDA	BMM_SCL

BMM150 Mounted on BMI270

Connected via BMI270’ s Sensor Hub auxiliary I2C interface, enabling unified 9-axis sensor data acquisition.

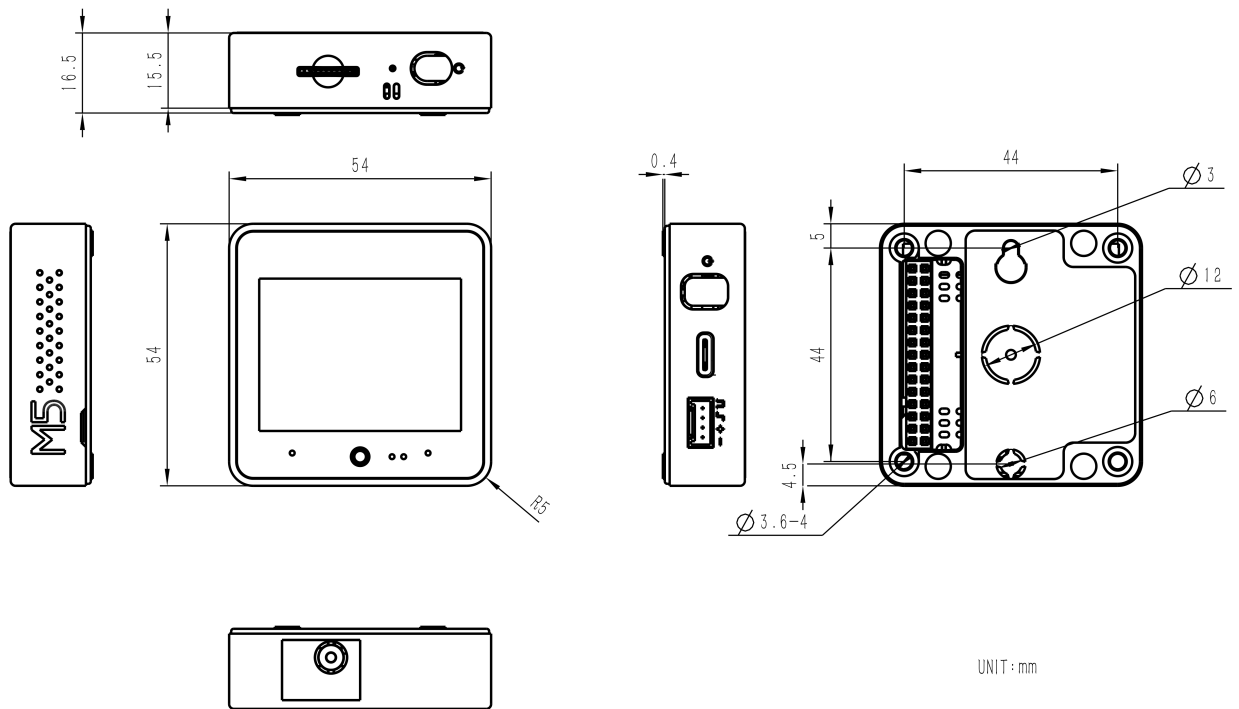
HY2.0-4P

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	G2	G1

M5-BUS

GND	ADC	G10
GND	PB.IN	G8
GND	RST/EN	
G37	MOSI	GPIO G5
G35	MISO	PB.OUT G9
G36	SCK	3.3V
G44	RXD0	TXD0 G43
G18	PC_RX	PC_TX G17
G12	intSDA	intSCL G11
G2	PA.SDA	PA.SCL G1
G6	GPIO	GPIO G7
G13	I2S.DOUT	I2S.LRCK G0
NC	I2S.DIN	G14
NC	5V	
NC	BAT	

Model Size



Structure

- [CoreS3-Lite Structure Files](#)

Datasheets

- [ESP32-S3](#)
- [LTR-553ALS-WA](#)
- [GC0308](#)
- [ES7210](#)
- [BMM150](#)
- [BMI270](#)
- [BM8563](#)
- [AXP2101](#)
- [AW88298](#)
- [AW9523B](#)

Softwares

Arduino

- [CoreS3-Lite Arduino Quick Start](#)

- [CoreS3-Lite Arduino Library](#)
- [CoreS3-Lite Arduino M5Unified Library](#)
- [CoreS3-Lite Arduino M5GFX Library](#)

UiFlow2

- [CoreS3-Lite UiFlow2 Quick Start](#)
- [CoreS3-Lite UiFlow2 Developer Manual](#)

PlatformIO

- [CoreS3-Lite Factory Firmware](#)

```
[env:m5stack-cores3]
platform = espressif32@6.7.0
board = esp32-s3-devkitc-1
framework = arduino
upload_speed = 1500000
monitor_speed = 115200
build_flags =
    -DESP32S3
    -DBOARD_HAS_PSRAM
    -mfix-esp32-psram-cache-issue
    -DCORE_DEBUG_LEVEL=5
    -DARDUINO_USB_CDC_ON_BOOT=1
    -DARDUINO_USB_MODE=1
lib_deps =
    M5Unified=https://github.com/m5stack/M5Unified
```

ESP-IDF

- [Espressif's Board Support Packages - CoreS3](#)
- [CoreS3 ESP-IDF BSP Guide](#)

Easyloader

Easyloader	Download	Note
CoreS3-Lite Factory Firmware Easyloader	download	/

Other

- [CoreS3 OpenAI Voice Assistant](#)
- [CoreS3 XiaoZhi Voice Assistant](#)
- [CoreS3 Home Assistant Voice Assistant](#)
- [CoreS3 Factory Firmware Restore Guide](#)

I2C Address Map

Chip	ADDRESS
GC0308	0x21
LTR553	0x23
AXP2101	0x34
AW88298	0x36
FT6336	0x38
ES7210	0x40
BM8563	0x51
AW9523	0x58
BMI270	0x69
BMM150	0x10

Video

- CoreS3-Lite Product Introduction

[K128-Lite-CoreS3-Lite_video.mp4](#)

Product Comparison

Hardware Peripheral



CoreS3-Lite

CoreS3

CoreS3-SE

Camera (GC0308)	✓	✓	✗
Proximity Sensor (LTR-553ALS-WA)	✓	✓	✗
IMU (BMI270)	✓	✓	✗
Compass (BMM150)	✓	✓	✗
RTC	✓	✓	✓
Microphone	✓	✓	✓
Speaker	✓	✓	✓
PMIC (AXP2101)	✓	✓	✓
16 MB Flash & 8 MB PSRAM	✓	✓	✓
Touch	✓	✓	✓
Back Cover	Cover For CoreS3	Base DIN	✗
Battery Capacity	200 mAh	500 mAh	✗