CoreS3-SE

SKU:K128-SE

Description

CoreS3-SE is a lightweight version of the third-generation CoreS3 host in the M5Stack development kit series. Its core controller uses the **ESP32-S3** solution, featuring a dual-core Xtensa LX7 processor with a main frequency of 240 MHz, and comes with **(2.4G)WiFi** functionality. It has 16MB Flash and 8MB PSRAM onboard. Programs can be downloaded via the USB Type-C interface, supporting **OTG and CDC** functions, making it convenient to connect USB devices and Flash firmware. The front is equipped with a 2.0-inch capacitive touch IPS screen, with the panel made of high-strength glass. The power section uses the AXP2101 power management chip and a 4-way power flow control circuit, with an overall low-power design. It also includes a **microSD** card slot. The onboard BM8563 RTC chip provides precise timing and sleep-timer wake-up functions. For sound output, it uses the high-fidelity 16-bit I2S amplifier chip AW88298, with a built-in **1W speaker**. For sound input, it uses the ES7210 audio decoding chip with **dual microphone input**. On the side of the device, there are independent power and reset (RST) buttons, with a built-in delay circuit. Holding the reset button for a long time will enter the program download mode. This product is suitable for **IoT development, various DIY projects, smart home control systems, and industrial automation control systems**.

Tutorial

UiFlow2

This tutorial will introduce you to how to control the CoreS3-SE device using the UiFlow2 graphical programming platform.

Arduino IDE

This tutorial introduces how to program and control the CoreS3-SE device using the Arduino IDE.

Features

- Based on ESP32-S3 development, supports WiFi @16MB Flash, 8MB PSRAM

- Speaker, dual microphones
- Capacitive touch screen
- microSD card slot
- High-strength glass material
- Supports OTG and CDC functions
- Uses AXP2101 power management, low-power design
- Development Platform
  - UiFlow2
  - Arduino IDE
  - ESP-IDF
  - PlatformIO

Includes

- 1 × CoreS3-SE

Applications

- IoT development
- Various DIY projects
- Smart home control systems
- Industrial automation control systems

Specifications

Specification	Parameters
SoC	ESP32-S3@Xtensa LX7 Wi-Fi, USB-OTG function
Flash	16MB Flash
PSRAM	8MB PSRAM
Wi-Fi	802.11 b/g/n (2.4 GHz Wi-Fi)
Touch	FT6336U@capacitive touch, touch area pixels 320 x 280
LCD Screen	2.0"@320 x 240 ILI9342C, SPI communication
Power Management Chip	AXP2101
RTC	BM8563
Speaker	1W@9028
Amplifier	16-bit I2S amplifier chip AW88298
Audio Decoding Chip	ES7210, dual microphone input
BUS Pin	G0/G1/G2/G5/G6/G7/G8/G9/G10/G11/G12/G13/G14/G17/G18/G35/G36/G37/G43/G44
Lithium Battery Charging Current	5V/198mA
Grove Output Max Current (1200mAh battery)	DC4.2V/940mA
Grove Output Max Current (USB powered)	DC 5V/680mA
Operating Temperature	0 ~ 40°C
Power Consumption	Battery powered: Standby mode: DC4.2V/104.64uA, Operating mode: DC4.2V/109.67mA USB powered: Operating mode: DC 5V/166.27mA
Product Size	54.0 x 54.0 x 15.5mm
Product Weight	38.2g
Package Size	133.0 x 93.5 x 22.5mm

Specification	Parameters
Package Weight	54.5g

Learn

Download Mode

Program Download

Before downloading the program, hold the reset button for 3S (green light on) to enter download mode

Power On/Off

Power On/Off Operation

Power On/Off Operation:

Power On: Click the left power button ①

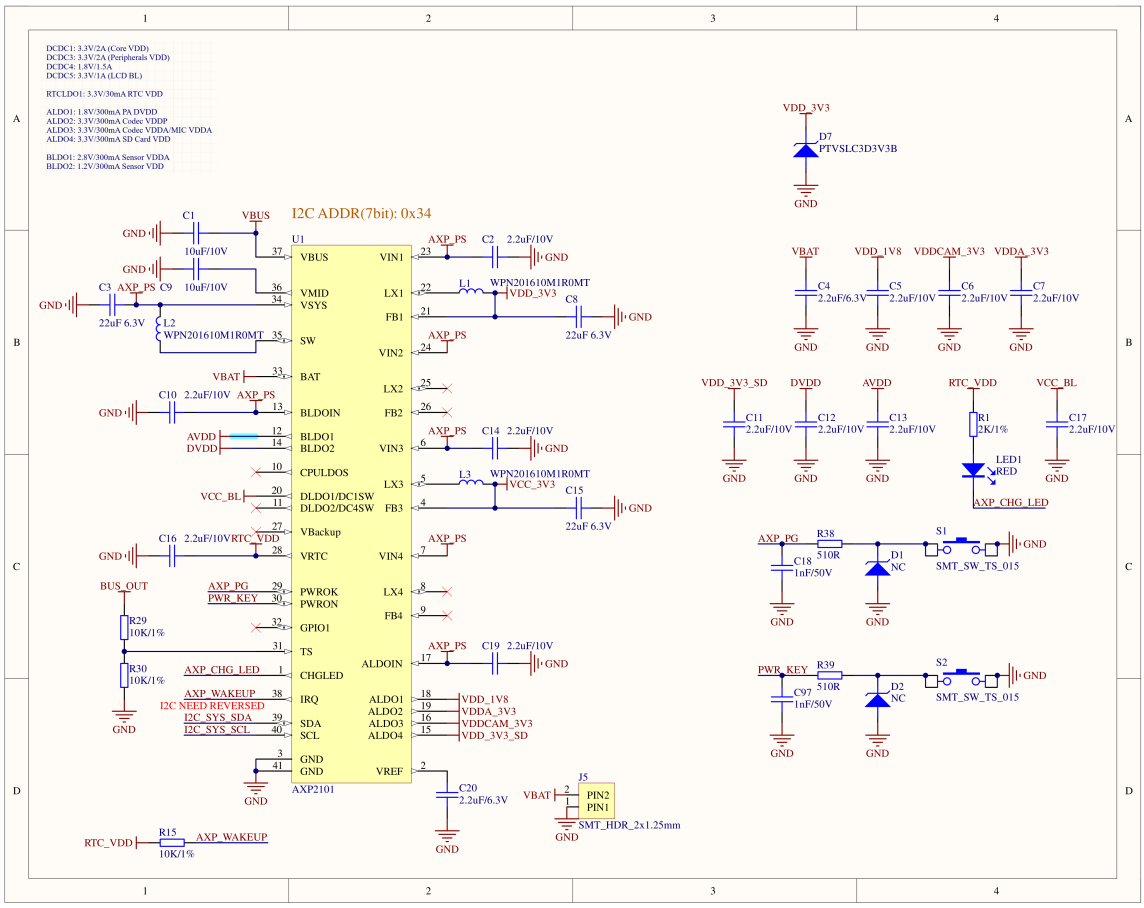
Power Off: Hold the left power button ① for 6 seconds

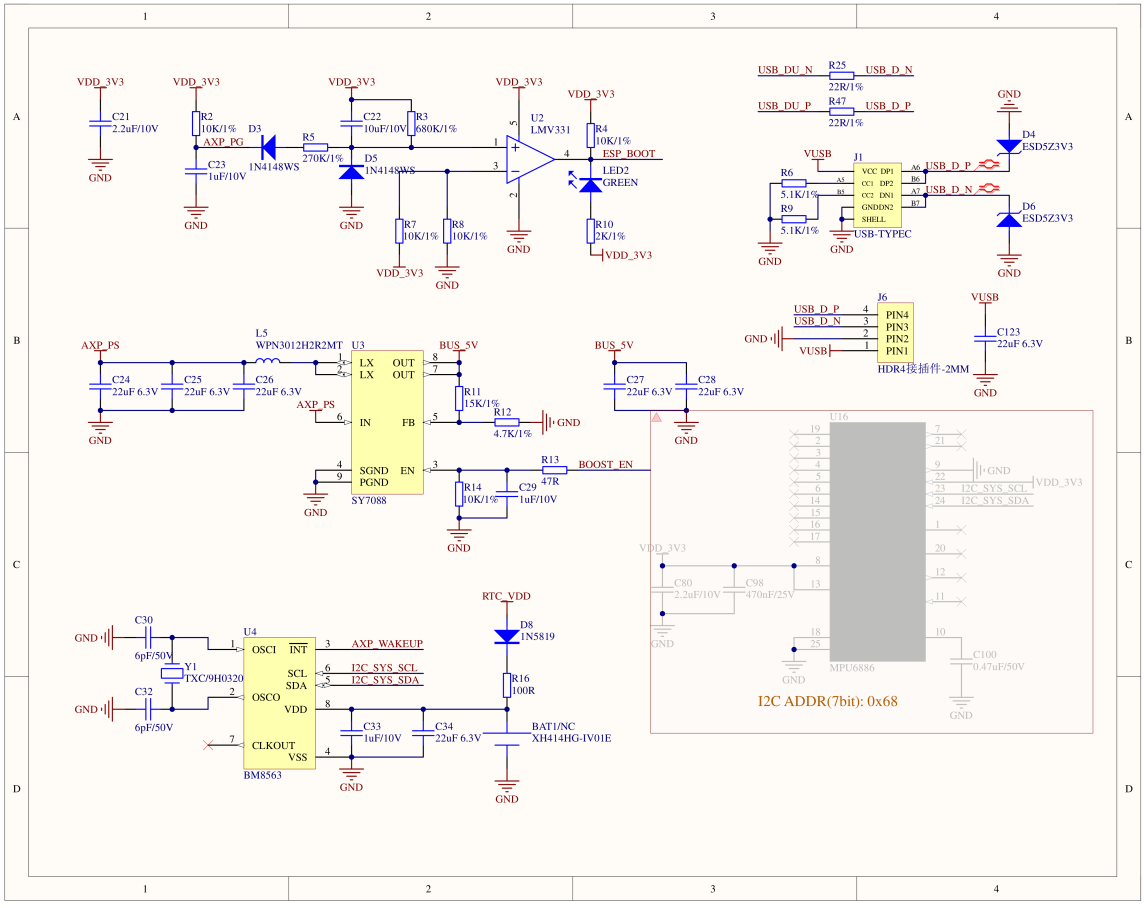
Reset: Click the bottom RST reset button ②

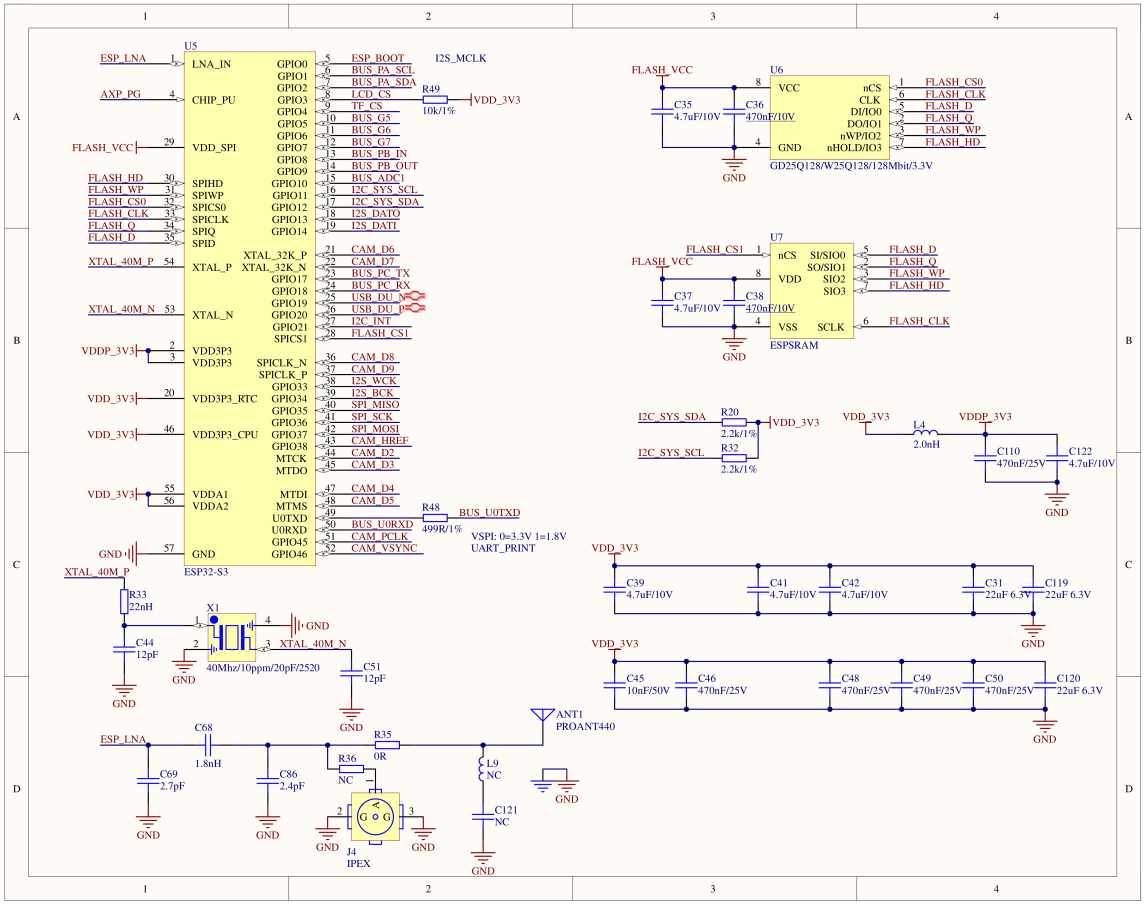
Download Mode: Hold the RST reset button ② for 3S (green light on)

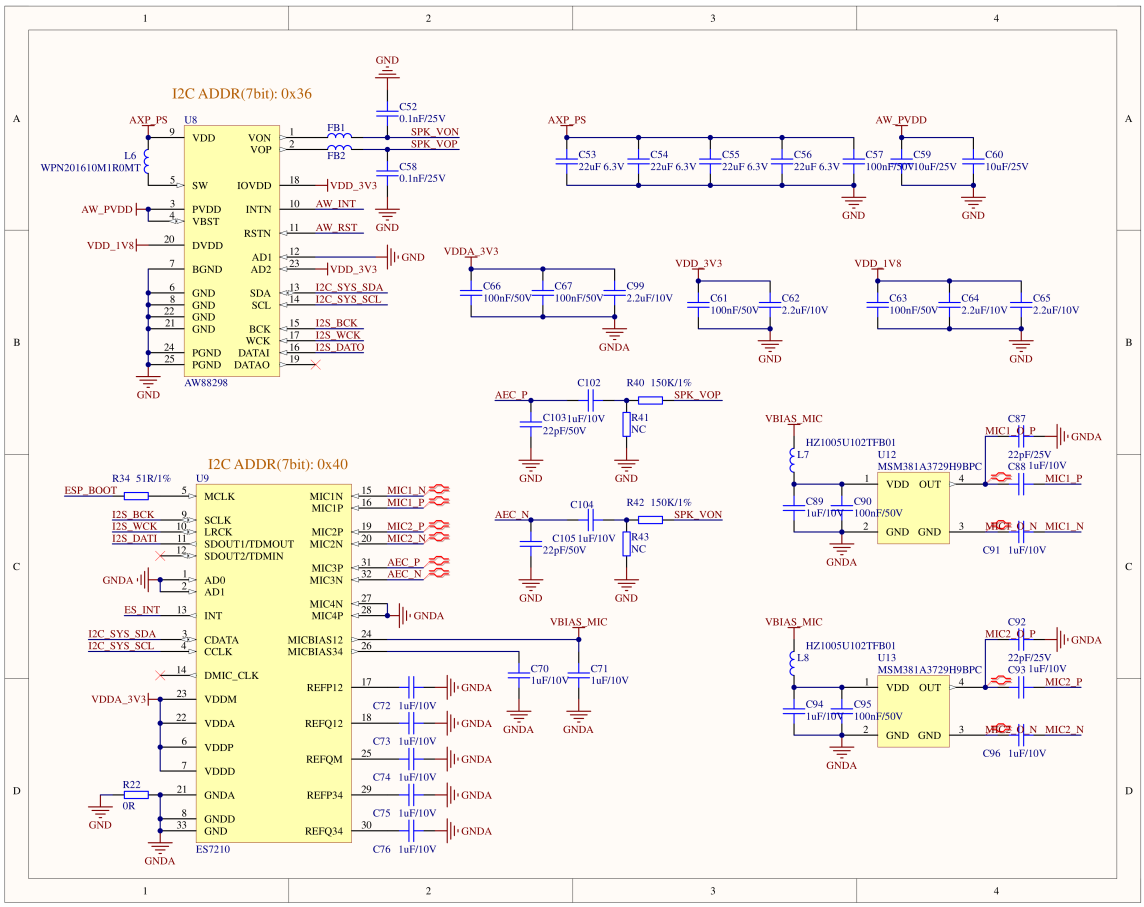
Schematics

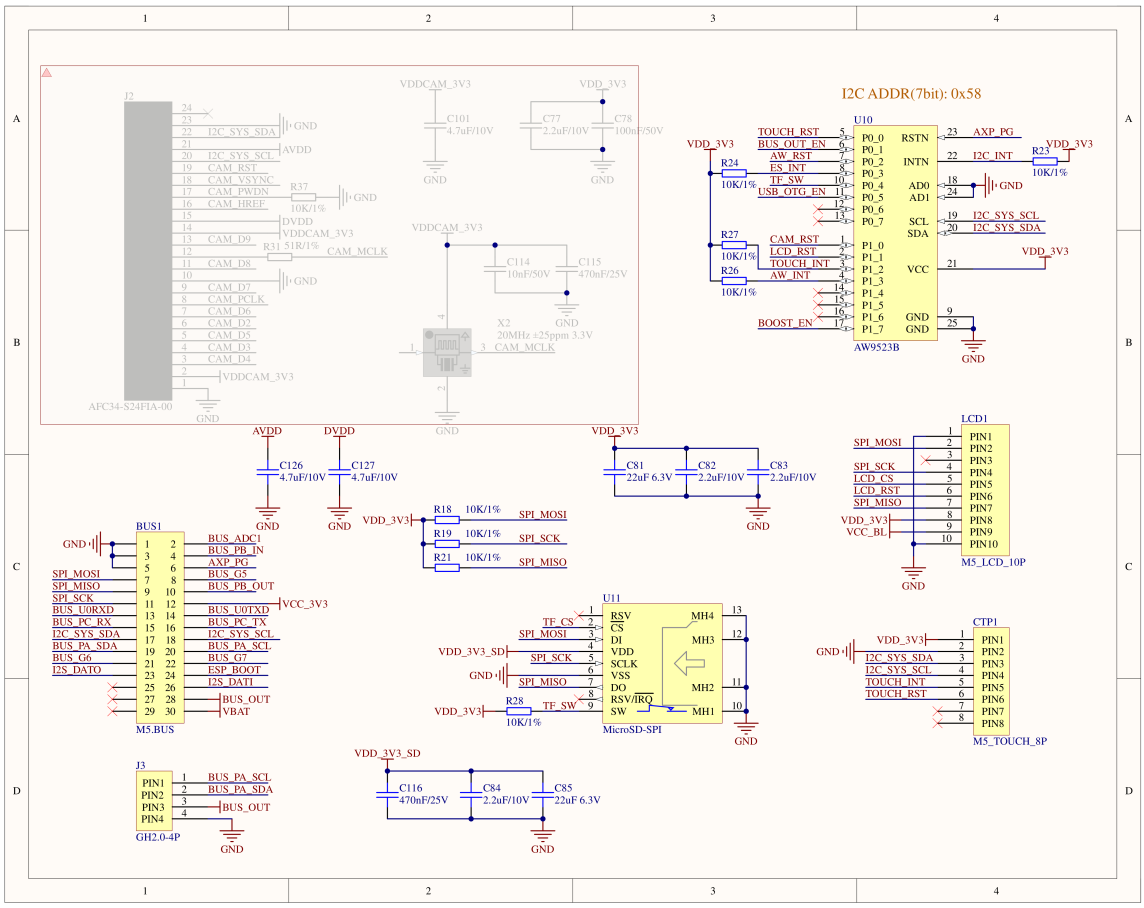
- CoreS3-SE Schematics PDF

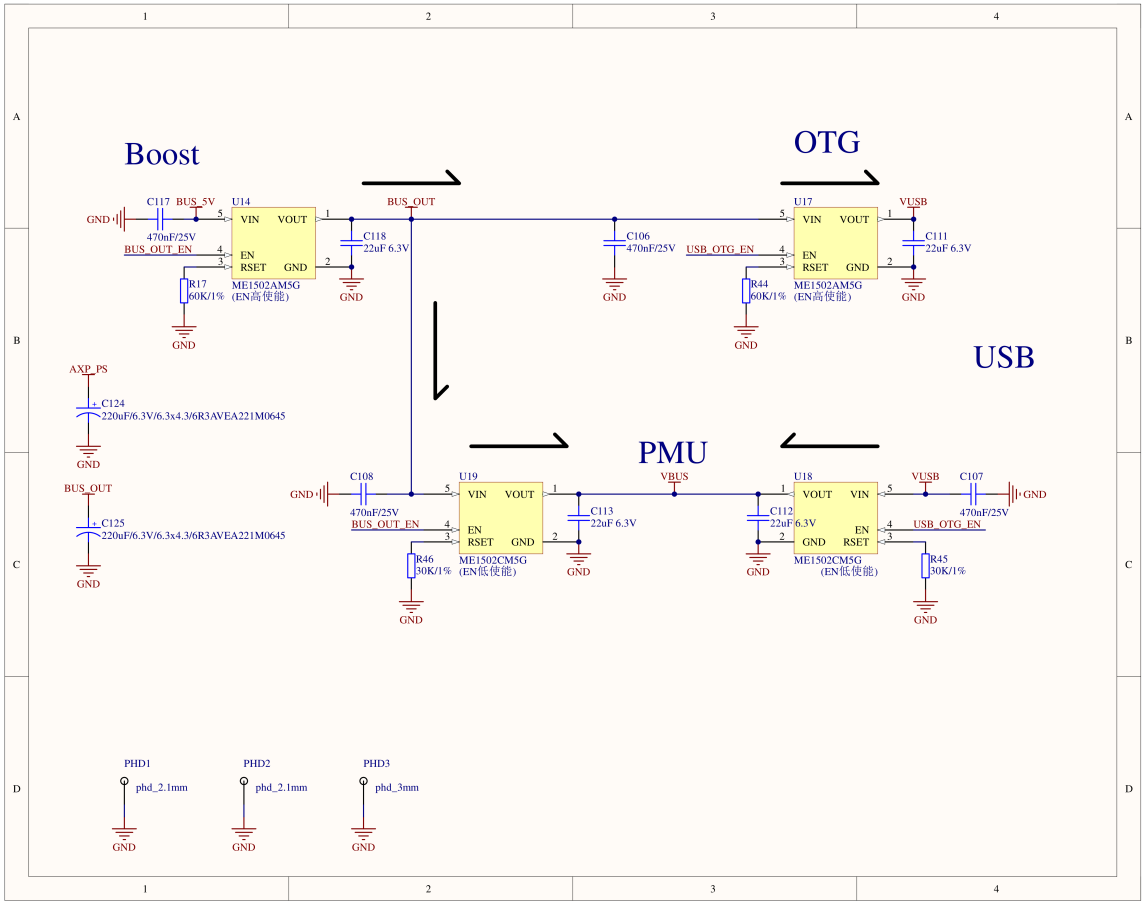

DCDC1: 3.3V/2A (Core VDD)
DCDC3: 3.3V/2A (Peripherals VDD)
DCDC4: 1.8V/1.5A
DCDC5: 3.3V/1A (LCD BL)
RTCLDO1: 3.3V/30mA RTC VDD
ALDO1: 1.8V/300mA PA DVDD
ALDO2: 3.3V/300mA Codec VDDP
ALDO3: 3.3V/300mA Codec VDDA/MIC VDDA
ALDO4: 3.3V/300mA SD Card VDD
BLDO1: 2.8V/300mA Sensor VDDA
BLDO2: 1.2V/300mA Sensor VDD
I2C ADDR(7bit): 0x34
U1
AXP2101
VBUS
VIN1
VMID
LX1
VSYS
FB1
SW
VIN2
BAT
LX2
BLDOIN
FB2
BLDO1
BLDO2
VIN3
CPULDOS
LX3
DLDO1/DC1SW
DLDO2/DC4SW
FB3
VBackup
VRTC
VIN4
PWROK
PWRON
LX4
FB4
GPIO1
TS
ALDOIN
CHGLED
IRQ
ALDO1
ALDO2
ALDO3
ALDO4
SDA
SCL
GND
VREF
I2C NEED REVERSED
J5
SMT_HDR_2x1.25mm
D7
PTVSLC3D3V3B
LED1
LED2
S1
S2
SMT_SW_TS_015
D1
D2
NC

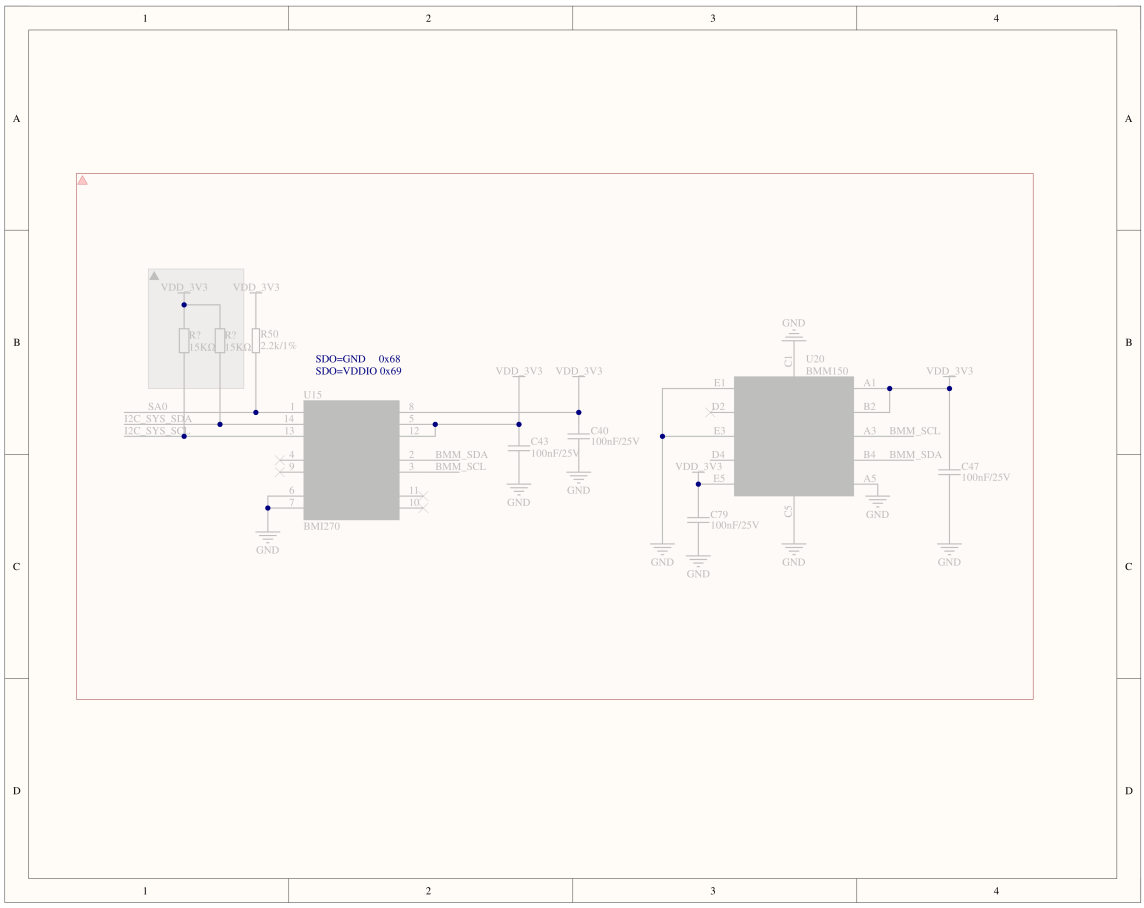

U2
LMV331
ESP_BOOT
LED2
GREEN
U3
SY7088
L5
WPN3012H2R2MT
BOOST_EN
J1
USB-TYPEC
J6
HDR4接插件-2MM
U4
BM8563
Y1
TXC/9H0320
D8
1N5819
BAT1/NC
XH414HG-IV01E
U16
MPU6886
I2C ADDR(7bit): 0x68


U5
ESP32-S3
U6
GD25Q128/W25Q128/128Mbit/3.3V
U7
ESPSRAM
ANT1
PROANT440
J4
IPEX
X1
40Mhz/10ppm/20pF/2520


I2C ADDR(7bit): 0x36
I2C ADDR(7bit): 0x40
U8
AW88298
U9
ES7210
U12
U13
MSM381A3729H9BPC
HZ1005U102TFB01


I2C ADDR(7bit): 0x58
U10
AW9523B
J2
AFC34-S24FIA-00
BUS1
M5.BUS
U11
MicroSD-SPI
LCD1
M5_LCD_10P
CTP1
M5_TOUCH_8P
J3
GH2.0-4P


Boost
OTG
USB
PMU
U14
U17
U19
U18
ME1502AM5G (EN高使能)
ME1502CM5G (EN低使能)
PHD1
PHD2
PHD3



PinMap

LCD Screen & microSD

LCD Pixels: 320x240

microSD Capacity Requirement

microSD card supports up to 16GB

ESP32-S3	GPIO37	GPIO36	GPIO3	GPIO35	GPIO4
ILI9342C	MOSI	SCK	CS	DC	
TF Card	SPI_MOSI	SPI_SCK		SPI_MISO	TF_CS

AW9523B	P1_1
ILI9342C	LCD_RST

AXP2101	DCDO1	LX1
ILI9342C	BL	PWR

CAP.TOUCH

ESP32-S3	GPIO12	GPIO11	AW9523B_P1_2	AW9523B_P0_0
FT6336U	I2C_SYS_SDA	I2C_SYS_SCL	TOUCH_INT	TOUCH_RST

ESP32-S3	GPIO12	GPIO11
FT6336U	I2C_SYS_SDA	I2C_SYS_SCL

AW9523B	P0_0	P1_2
FT6336U	TOUCH_RST	TOUCH_INT

Microphone & Amplifier

ESP32-S3	GPIO12	GPIO11	GPIO34	GPIO33	GPIO13	GPIO14	GPIO0
ES7210(0x40)	I2C_SYS_SDA	I2C_SYS_SCL	I2S_BCK	I2S_WCK	I2S_DATO		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 Indicator

AXP2101	AXP_CHG_LED
Red LED	RTC_VDD

RTC

ESP32-S3	GPIO12	GPIO11
BM8563	I2C_SYS_SDA	I2C_SYS_SCL

AXP2101	IRQ
BM8563	AXP_WAKEUP

Internal I2C Connection

ESP32-S3	GPIO12	GPIO11
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

HY2.0-4P

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	G2	G1
PORT.B	GND	5V	G9	G8
PORT.C	GND	5V	G18	G17

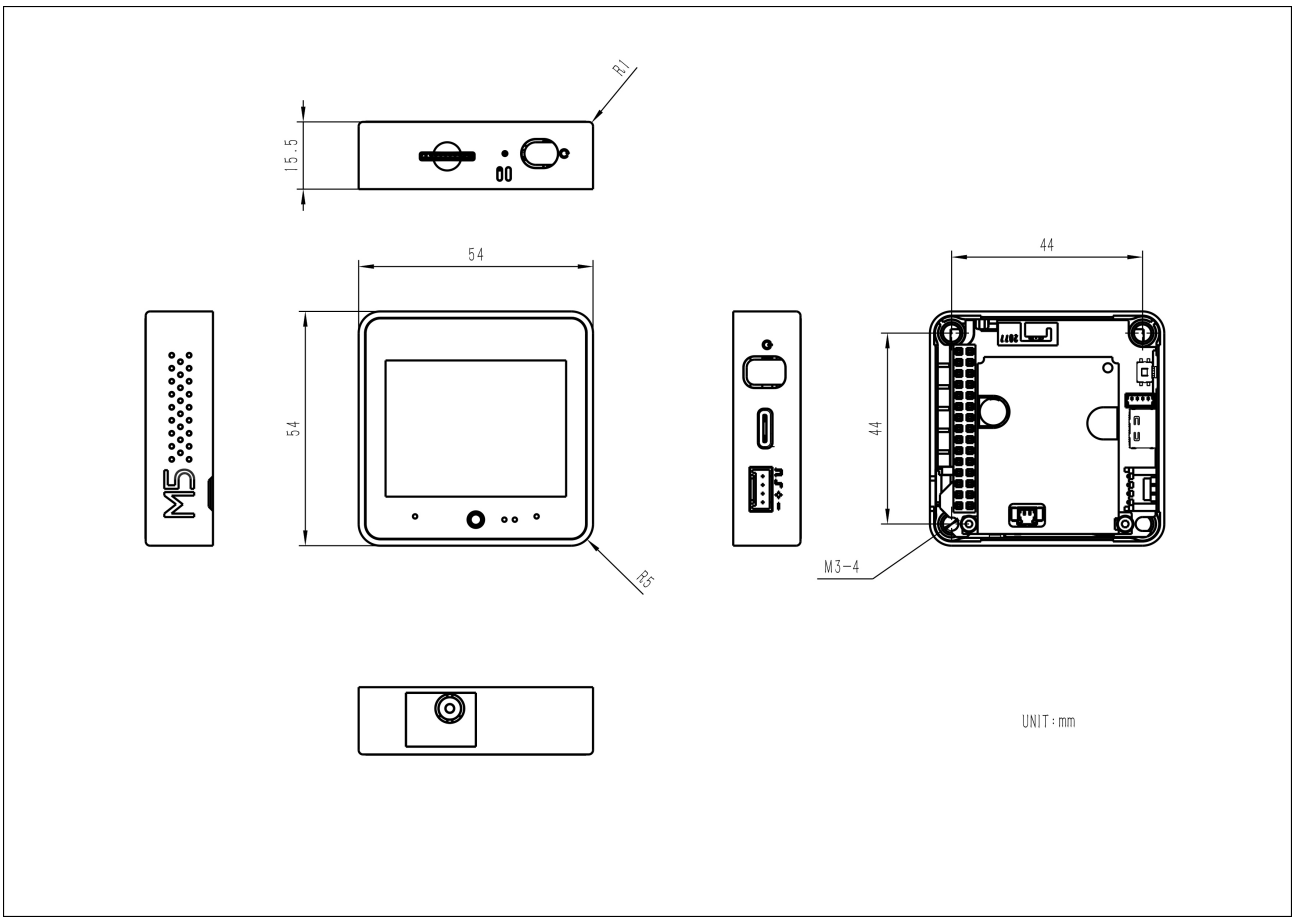
CoreS3-SE M5-Bus Diagram

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		

Core Series Host Pin Mapping Comparison

CoreMP135_Bus		M5CORES3_Bus/M5CORES3_SE_Bus		M5CORE2_Bus		M5Basic_Bus											
GND	GND	GND	GND	GND	GND	GND	GND	1	2	ADC	G35	ADC	G35	ADC	G10	GPIO	PA0
GND	GND	GND	GND	GND	GND	GND	GND	3	4	ADC	G36	ADC	G36	PB_IN	G8	PB_IN	PD3
GND	GND	GND	GND	GND	GND	GND	GND	5	6	RST_EN		RST_EN		RST_EN		AXP-PWR-OK	
PE11	SPI4MO	G37	MOSI	G23	MOSI	G23	MOSI	7	8	DAC/SPK	G25	DAC	G25	GPIO	G5	GPIO	PB13
PE13	SPI4MI	G35	MISO	G38	MISO	G19	MISO	9	10	DAC	G26	DAC	G26	PB_OUT	G9	PB_OUT	PE9
PB4	SPI4SCK	G36	SCK	G18	SCK	G18	SCK	11	12	3.3V		3.3V		3.3V		3.3V	
PH8	U2RX	G44	RXD0	G3	RXD0	G3	RXD0	13	14	TXD0	G1	TXD0	G1	TXD0	G43	U2TX	PF11
DS-USB1-N		G18	PC_RX	G13	RXD2	G16	RXD2	15	16	TXD2	G17	TXD2	G14	PC_TX	G17	DS-USB1-P	
PE8	I2C1-SDA	G12	intSDA	G21	intSDA	G21	intSDA	17	18	intSCL	G22	intSCL	G22	intSCL	G11	I2C1-SCL	PB8
PG9	I2C2-SDA	G2	PA_SDA	G32	PA_SDA	G2	GPIO	19	20	GPIO	G5	PA_SCL	G33	PA_SCL	G1	I2C2-SCL	PF2
PA6	GPIO	G6	GPIO	G27	GPIO	G12	I2S_SK	21	22	I2S_WS	G13	GPIO	G19	GPIO	G7	GPIO	PB10
PA5	GPIO	G13	I2S_DOUT	G2	I2S_DOUT	G15	I2S_DOUT	23	24	I2S_MK	G0	I2S_LRCK/PDM_CLK	G0	I2S_LRCK	G0	GPIO	PC13
NC		NC		NC		NC		25	26	I2S_DIN	G34	PDM_DAT	G34	I2S_DIN	G14	GPIO	PA1
NC		NC		NC		NC		27	28	5V		5V		5V		5V	
NC		NC		NC		NC		29	30	BAT		BAT		BAT		BAT	

Model Size



Datasheets

- esp32-s3
- ES7210
- BM8563
- AXP2101
- AW88298
- AW9523B

Softwares

Quick Start

- CoreS3-SE OpenAI Voice Assistant
- CoreS3-SE XiaoZhi Voice Assistant

Arduino

> **Note**
>
> Hardware differences exist between CoreS3-SE and CoreS3. The sections of the library involving the camera, proximity sensor, IMU, and magnetometer are not compatible with CoreS3-SE.

- CoreS3-SE Arduino Quick Start
- CoreS3-SE Arduino Driver Library

UiFlow2

- CoreS3-SE UiFlow2 Quick Start

PlatformIO

- CoreS3-SE Factory Firmware (pio)

Easyloader

Easyloader	Download Link	Remarks
CoreS3-SE Factory Firmware Easyloader	download	/

Others

I2C Communication Address

Chip	ADDRESS
AXP2101 ADDR	0x34
AW88298 ADDR	0x36
FT6336U ADDR	0x38
ES7210 ADDR	0x40
BM8563 ADDR	0x51
AW9523 ADDR	0x58

Video

- CoreS3-SE Features Introduction

K128-SE M5CoreS3 SE 视频.mp4

Version Comparison

Version Comparison

Compared to CoreS3, CoreS3-SE does not include a camera (GC0308), proximity sensor (LTR-553ALS-WA), IMU (BMI270), or magnetometer (BMM150). CoreS3-SE uses a medium gray color, different from the dark gray of CoreS3, and the glass panel touch area extends to the camera position. The DinBase base included in the CoreS3 kit is also removed.

Hardware Peripherals	CoreS3	CoreS3-SE
Camera (GC0308)	√	×
Proximity Sensor (LTR-553ALS-WA)	√	×
IMU (BMI270)	√	×
Magnetometer (BMM150)	√	×
RTC	√	√
Microphone	√	√
Speaker	√	√
PIMC (AXP2101)	√	√
16MB Flash and 8MB PSRAM	√	√
Touch	√	√