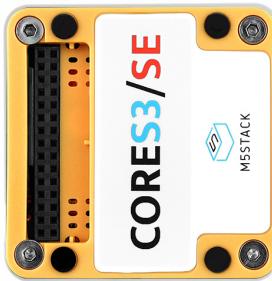


# CoreS3-SE

SKU:K128-SE





## Description

**CoreS3-SE** is the lightweight version of the third-generation CoreS3 in the M5Stack development-kit family. Powered by an ESP32-S3 SoC with dual-core Xtensa LX7 processors running at 240 MHz, it integrates 2.4 GHz Wi-Fi, 16 MB Flash and 8 MB PSRAM. Programs can be downloaded via the USB Type-C interface, which also supports OTG and CDC for easy connection to USB devices and firmware flashing. The front side features a 2.0-inch capacitive IPS touch screen protected by high-strength glass. Power management is handled by an AXP2101 PMU together with four power-flow control loops, enabling an overall low-power design. A built-in microSD card slot is provided. The on-board BM8563 RTC offers accurate timekeeping plus sleep-timed wake-up. Audio output is delivered through a high-fidelity 16-bit I2S amplifier (AW88298) driving the built-in 1 W speaker, while audio input is handled by an ES7210 codec with dual-microphone input. Independent POWER and RESET (RST) buttons are located on the side, with a dedicated delay circuit that allows entering download mode by long-pressing the RESET button. This unit is well suited for IoT development, DIY projects, smart-home control systems and industrial automation.

## Tutorial



### UiFlow2

This tutorial shows you how to control the CoreS3-SE with the graphical programming platform UiFlow2



### Arduino IDE

This tutorial explains how to program and control the CoreS3-SE using the Arduino IDE

## Features

- Based on ESP32-S3, supports Wi-Fi, with 16 MB Flash and 8 MB PSRAM
- Built-in speaker and dual microphones
- Capacitive touch screen
- microSD card slot
- High-strength glass front panel
- OTG and CDC support

- Low-power design with AXP2101 power management
- Development Platform
  - UiFlow2
  - Arduino IDE
  - ESP-IDF
  - PlatformIO

## Includes

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- 1 × CoreS3-SE
- 1 × Hex Key L-Shape 2.0mm (For M2.5 Screw)

## Applications

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

## Specifications

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Specification	Parameter
SoC	ESP32-S3 @ Xtensa LX7, Wi-Fi, USB-OTG
Flash	16 MB Flash
PSRAM	8 MB PSRAM
Wi-Fi	802.11 b/g/n (2.4 GHz Wi-Fi)
Touch	FT6336U capacitive, touch area 320 × 280 px
LCD Screen	2.0" @ 320 × 240, ILI9342C, SPI interface
PMU	AXP2101
RTC	BM8563
Speaker	1 W @ 9028
Amplifier	16-bit I2S amplifier AW88298
Audio Codec	ES7210, dual-microphone input
BUS Pins	G0/G1/G2/G5/G6/G7/G8/G9/G10/G11/G12/G13/G14/G17/G18/G35/G36/G37/G43/G44
Li-Ion Charge Current	5 V / 198 mA
Grove Max Output (Battery)	DC 4.2 V / 940 mA
Grove Max Output (USB)	DC 5 V / 680 mA
Operating Temp.	0 ~ 40 °C
Power Consumption	Battery: Stand-by DC 4.2 V @ 104.64 µA; Working DC 4.2 V @ 109.67 mA USB: Working DC 5 V @ 166.27 mA
Product Size	54.0 × 54.0 × 15.5 mm
Product Weight	37.8 g
Package Size	133.0 × 93.5 × 22.5 mm
Gross Weight	54.5 g

## Learn

### Download Mode

#### Download Mode

Before uploading the program, long-press the RESET button for 3 s (green LED lights up) to enter download mode.



## Power On/Off

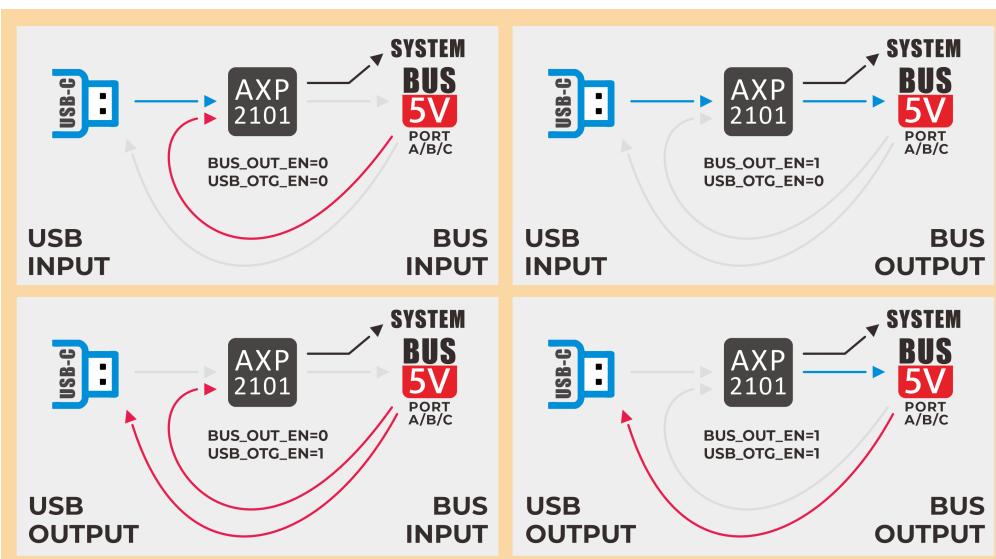
### Power On/Off

- Power on: single-click the left POWER button
- Power off: long-press the left POWER button for 6 s ①
- Reset: single-click the bottom RESET button ②



## Power Management

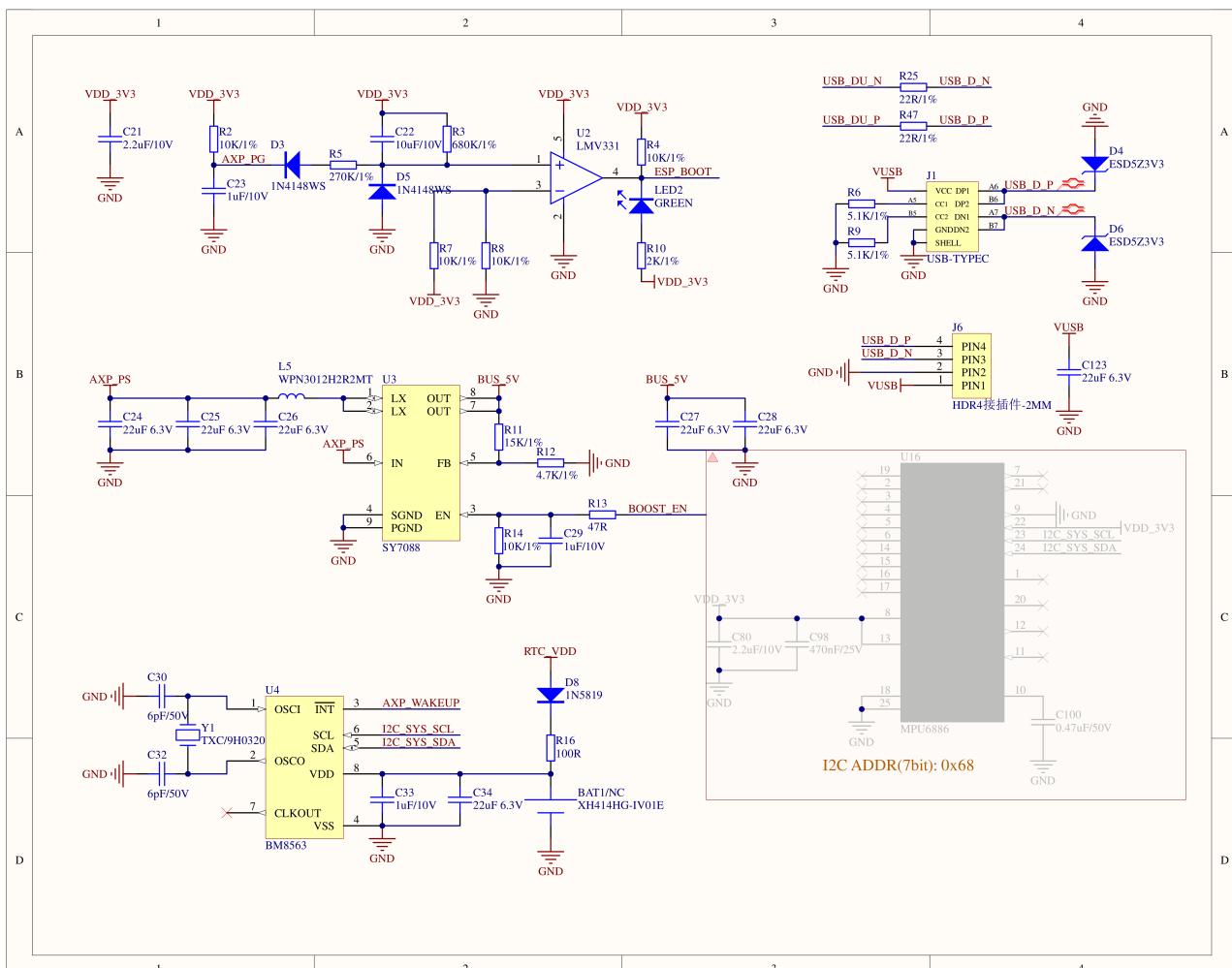
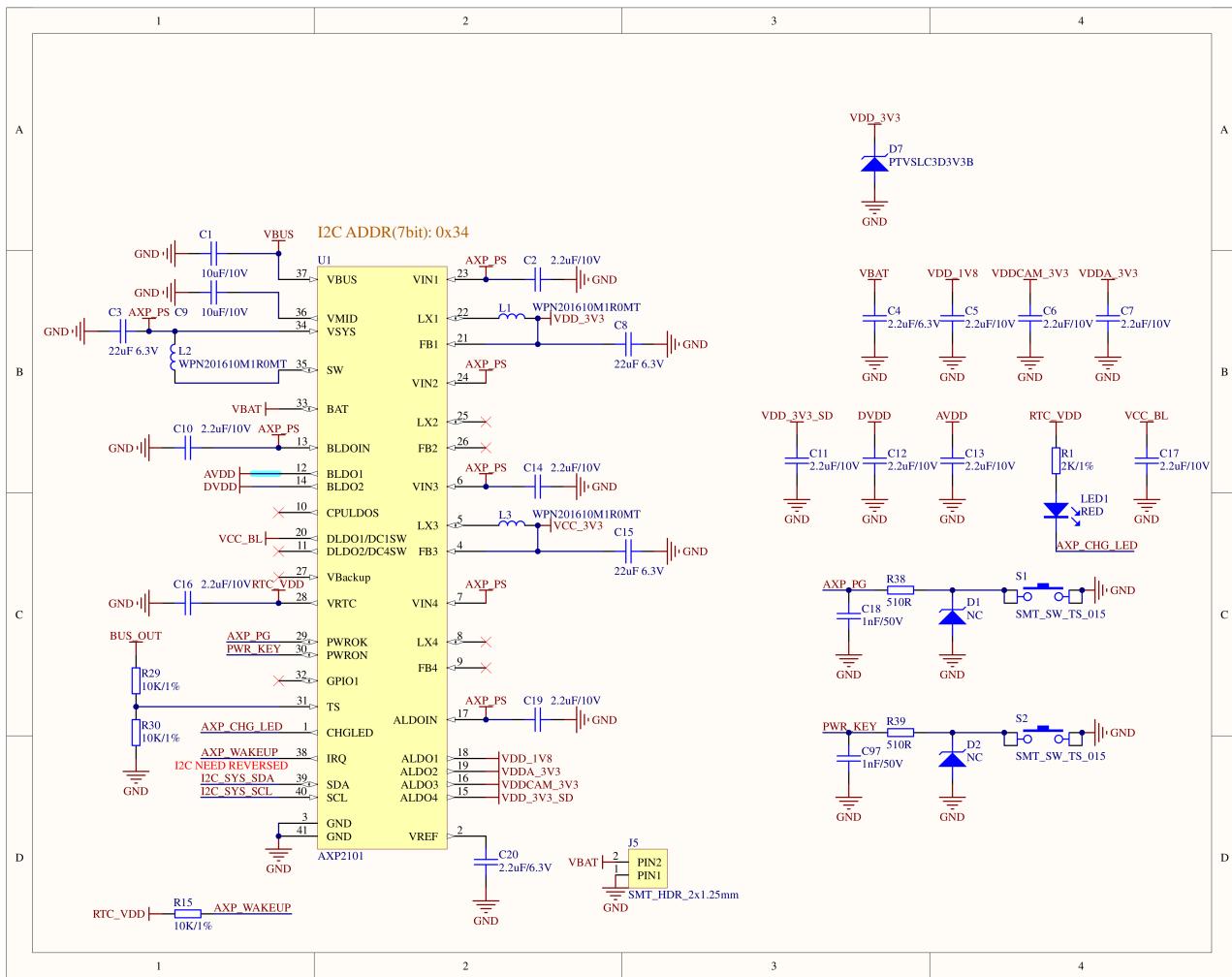
CoreS3-SE uses the AXP2101 PMU together with the AW9523B IO expander to control power input/output directions. Refer to the pin states of **BUS\_OUT\_EN** and **USB\_OTG\_EN** in the figure below and check the example code in [CoreS3 Power Manager Example](#).

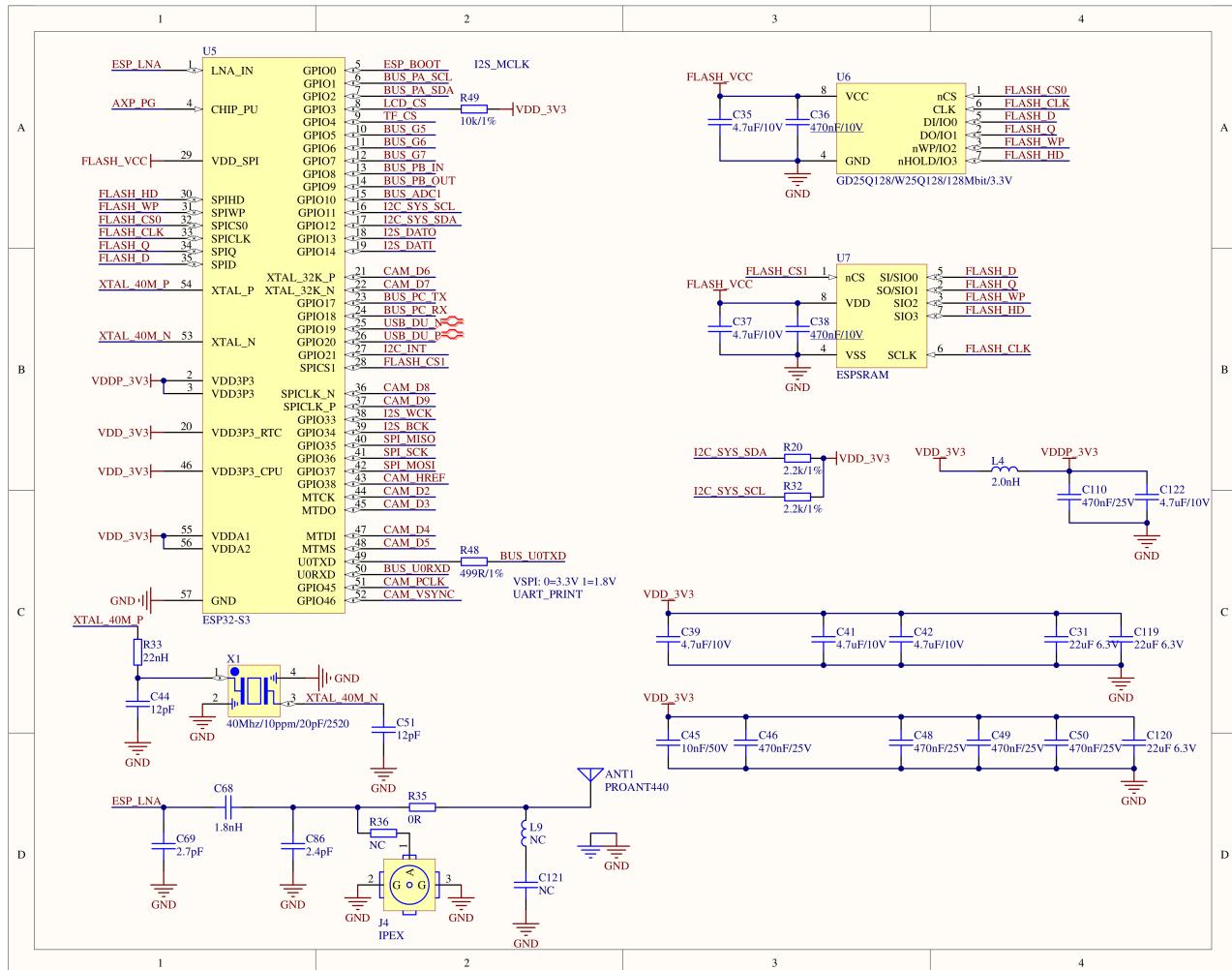


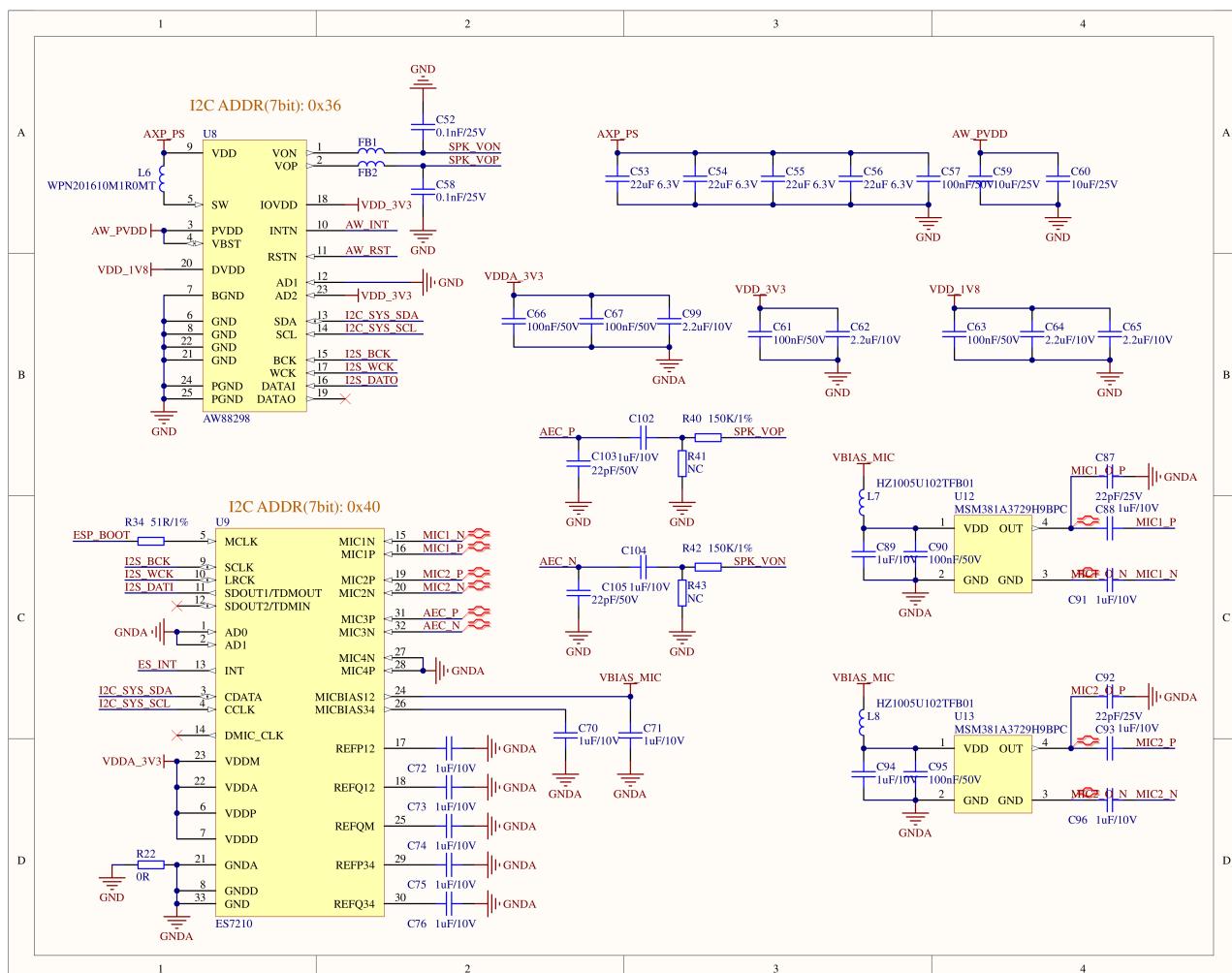
## I Schematics

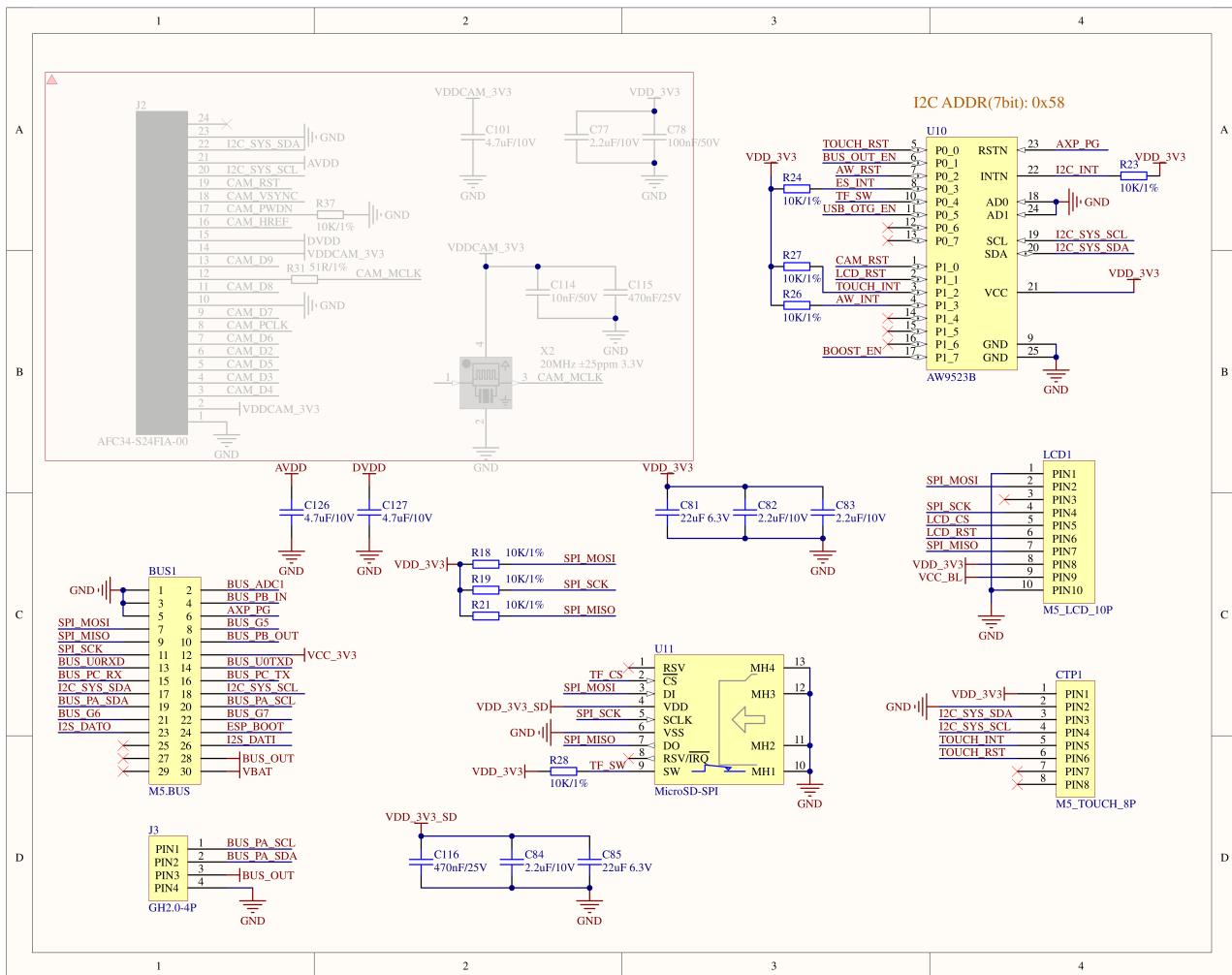
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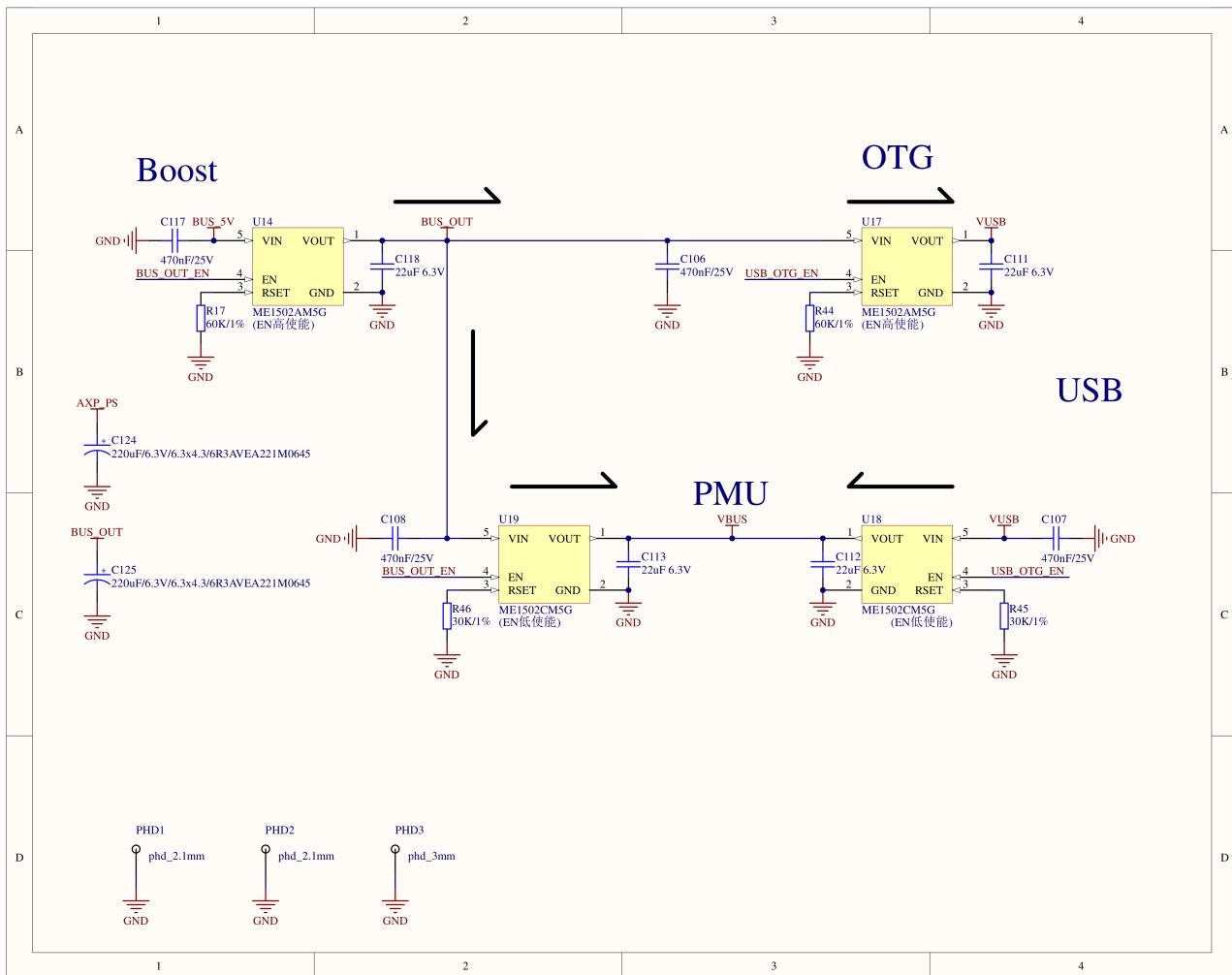
- [CoreS3-SE Schematics PDF](#)

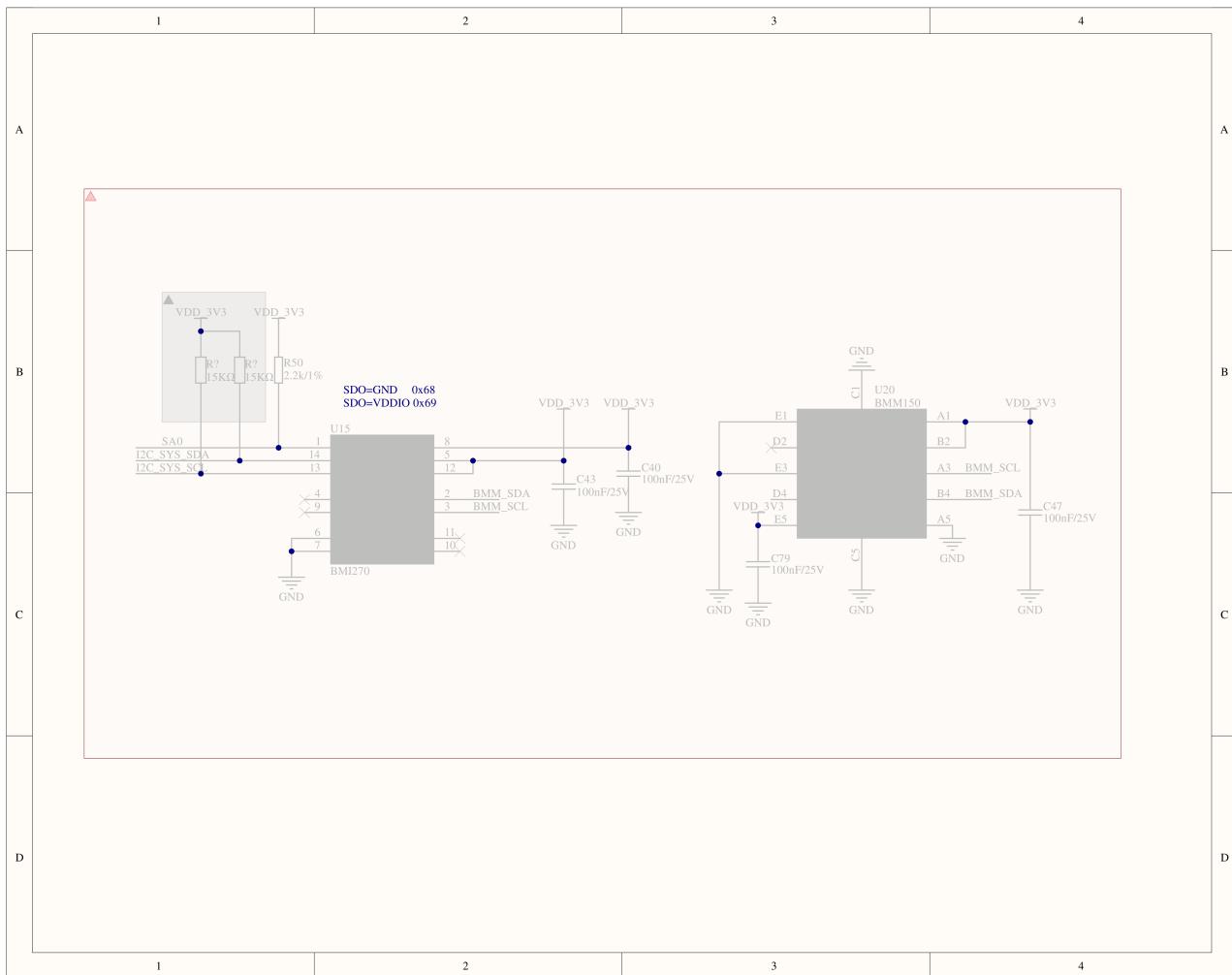












## PinMap

### LCD Screen & microSD

LCD resolution: 320 × 240

#### microSD Capacity Requirement

The microSD card supports up to 16 GB.

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

**AW9523B**

ILI9342C

**P1\_1**

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	GPIO00
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_DATI	

AW9523B	P0_2	P1_3
AW88298	AW_RST	AW_INT

## AXP Power Indicator LED

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 Bus

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 Layout

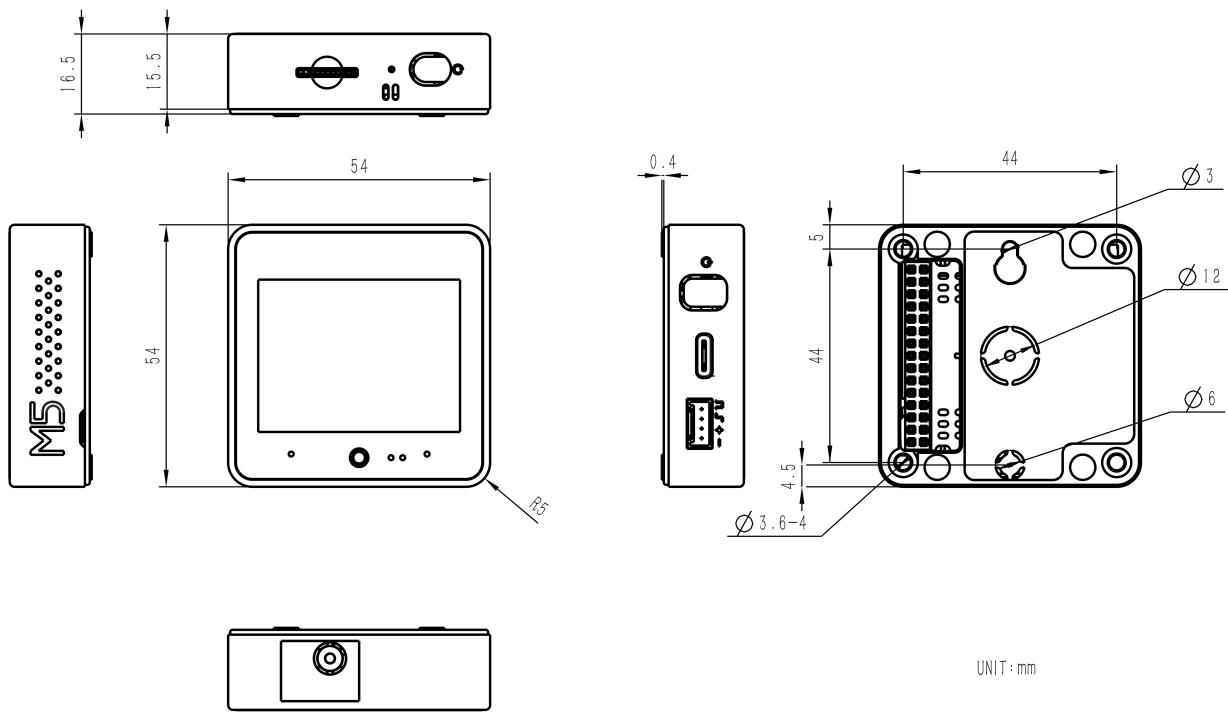
FUNC	PIN	LEFT	RIGHT	PIN	FUNC
	GND	1	2	G10	ADC
	GND	3	4	G8	PB_IN
	GND	5	6	RST	EN
MOSI	G37	7	8	G5	GPIO
MISO	G35	9	10	G9	PB_OUT
SCK	G36	11	12	3V3	
RXD0	G44	13	14	G43	TXD0
PC_RX	G18	15	16	G17	PC_TX
Int SDA	G12	17	18	G11	Int SCL
PORT.A SDA	G2	19	20	G1	PORT.A SCL
GPIO	G6	21	22	G7	GPIO
I2S_DOUT	G13	23	24	G0	I2S_LRCK
	NC	25	26	G14	I2S_DIN
	NC	27	28	5V	
	NC	29	30	BAT	

## Core Series Host Pin-Map Comparison

CoreMP135_Bus																	
M5CORES3_Bus/M5CORES3_SE_Bus																	
M5CORE2_Bus																	
M5Basic_Bus																	
GND	GND	GND	GND	GND	GND	GND	1	2	ADC	G35	ADC	G35	ADC	G10	GPIO	PA0	
GND	GND	GND	GND	GND	GND	GND	3	4	ADC	G36	ADC	G36	ADC	G8	PB_IN	PD3	
GND	GND	GND	GND	GND	GND	GND	5	6	RST_EN		RST_EN		RST_EN		AXP-PWR-OK		
PE11	SPI4MQ	G37	MOSI	G23	MOSI	G23	MOSI	7	DAC/SPK	G25	DAC	G25	DAC	G5	GPIO	PB13	
PE13	SPI4MI	G35	MISO	G38	MISO	G19	MISO	9	DAC	G26	DAC	G26	DAC	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	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	I2S_WS	G19	GPIO	G7	GPIO	PB10
PA5	GPIO	G13	I2S_DOUT	G2	I2S_DOUT	G15	I2S_DOUT	23	24	I2S_MK	G0	I2S_MK	G0	I2S_LRCK	G0	GPIO	PC13
NC		NC		NC		NC	25	26	I2S_DIN	G34	I2S_DIN	G34	PDM_DAT	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

CoreS3-SE Model Size PDF



## Datasheets

- [esp32-s3](#)
- [ES7210](#)
- [BM8563](#)
- [AXP2101](#)
- [AW88298](#)
- [AW9523B](#)

## Softwares

### Quick Start

- [CoreS3-SE OpenAI Voice Assistant](#)
- [CoreS3-SE XiaoZhi Voice Assistant](#)

### Arduino

#### Note

Due to hardware differences between CoreS3-SE and CoreS3, the sections of the library related to the camera, proximity sensor, IMU and magnetometer are not applicable to CoreS3-SE.

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

## UiFlow2

- CoreS3-SE UiFlow2 Quick Start

## PlatformIO

- CoreS3-SE Factory Firmware (PIO)

## Easyloader

Easyloader	Download	Note
CoreS3-SE Factory-Firmware Easyloader	<a href="#">download</a>	/

## Other

### I2C Addresses

Chip	ADDRESS
AXP2101	0x34
AW88298	0x36
FT6336U	0x38
ES7210	0x40
BM8563	0x51
AW9523B	0x58

## Video

- CoreS3-SE Feature Overview

[K128-SE M5CoreS3 SE 视频.mp4](#)

## Product Comparison

Compared with the CoreS3, the CoreS3-SE is not equipped with a camera (GC0308), proximity sensor (LTR-553ALS-WA), IMU (BMI270) or magnetometer (BMM150). The CoreS3-SE comes in a mid-gray color different from the black-gray of the CoreS3, and the touch area of the glass panel extends to the camera position. The DinBase dock included with the original CoreS3 kit has been removed.

Hardware Peripheral	CoreS3	CoreS3-SE
Camera (GC0308)	√	✗
Proximity Sensor (LTR-553ALS-WA)	√	✗
IMU (BMI270)	√	✗
Magnetometer (BMM150)	√	✗
RTC	√	√
Microphone	√	√
Speaker	√	√
PMIC (AXP2101)	√	√
16 MB Flash & 8 MB PSRAM	√	√
Touch	√	√