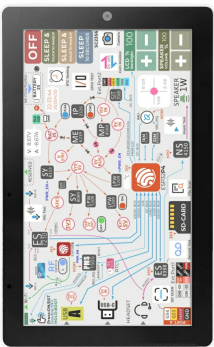
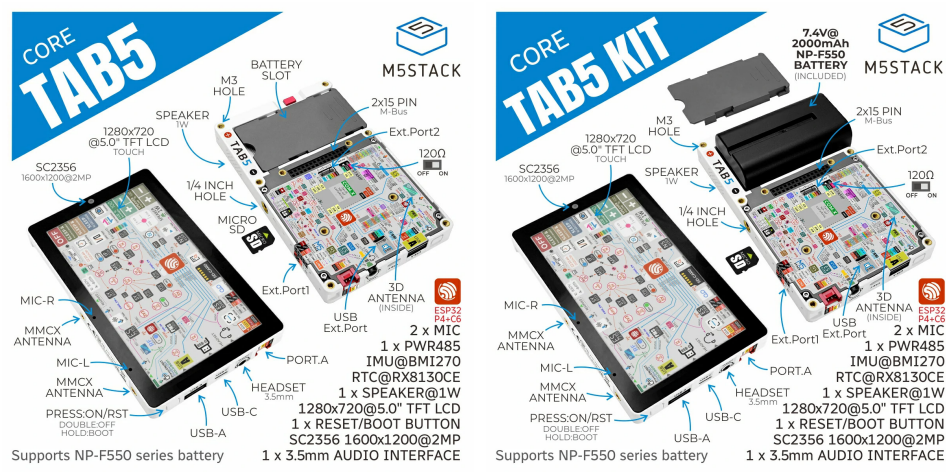


Tab5

SKU:C145/K145





Description

Tab5 is a highly expandable, portable smart-IoT terminal development device for developers, integrating a dual-core architecture and rich hardware resources. The main controller adopts the **ESP32-P4** SoC based on the RISC-V architecture, with 16MB Flash and 32MB PSRAM. The wireless module uses the ESP32-C6-MINI-1U, supporting Wi-Fi 6. Its antenna system can freely switch between the built-in 3D antenna and an external MMCX antenna interface, flexibly adapting to various deployment environments to ensure data throughput and low-latency control.

In terms of visual and interactive experience, the Tab5 is equipped with a 5" 1280×720 IPS touchscreen featuring an MIPI-DSI interface, delivering a smooth and responsive touch interaction. It also comes with an SC2356 2MP **camera** (1600×1200) that uses an MIPI-CSI interface, enabling HD video recording, image processing, and edge AI applications such as facial recognition and object tracking.

Peripheral interfaces include **USB Type-A** (Host) and **USB Type-C** (USB 2.0 OTG) for mouse, keyboard and other devices. Industrial users can leverage **RS-485** (SIT3088 + switchable 120Ω terminator). HY2.0-4P, M5-Bus, GPIO_EXT headers, a **microSD** slot, and reserved STAMP pads (for Cat-M, NB-IoT, LoRaWAN, etc.) enable versatile sensor and communication expansion. Reset/Boot buttons provide quick reset and download-mode entry.

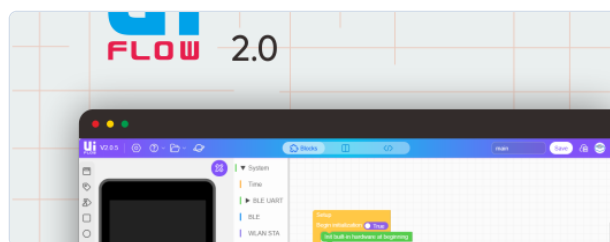
Audio features consist of an ES8388 **codec** plus an ES7210 AEC front-end, a **dual-mic** array, 3.5mm headphone jack and speaker, supporting Hi-Fi recording/playback and accurate voice recognition. A BMI270 **6-axis sensor** (accelerometer + gyroscope, interrupt wake-up) can wake the MCU in motion-tracking scenarios, boosting response efficiency in low-power mode.

For time and power, Tab5 integrates an RX8130CE **RTC** (timed interrupt wake-up). The base accepts a removable NP-F550 battery and features MP4560 buck-boost, IP2326 charge management, and INA226 real-time **monitoring** for stable standalone operation.

A 1/4"-20 tripod nut on the side allows direct mounting to a tripod or bracket.

Applications include smart-home control, remote monitoring, industrial automation, IoT prototyping and education, offering a full-featured, easily expandable high-performance platform.

Tutorial & Quick Start



UiFlow2

This tutorial shows how to control Tab5 with the UiFlow2 graphical platform.



Arduino IDE

This tutorial explains how to program Tab5 with the Arduino IDE.

Features

- ESP32-P4 dual-core MCU
- ESP32-C6 wireless module
- 2.4GHz Wi-Fi 6
- Built-in 3D antenna & MMCX external antenna port
- 5-inch IPS TFT display, resolution 1280×720 (720P)
- SC2356 2MP camera
- USB Type-A Host + USB Type-C OTG
- RS485 industrial interface
- HY2.0-4P & M5-Bus expansion
- microSD card slot
- Stamp expansion pads
- ES8388 audio codec
- ES7210 AEC dual microphones
- 1W speaker + 3.5mm headphone jack
- BMI270 6-axis sensor
- RX8130CE real-time clock
- Reset/Boot & Power keys
- Removable NP-F550 battery
- Standard 1/4"-20 tripod-mount nut
- Development Platform
 - UiFlow2
 - Arduino IDE

- ESP-IDF
- PlatformIO

Includes

Product Note

The Tab5 Kit is a complete set with a removable NP-F550 battery, whereas the standard Tab5 has no battery and requires an external power source or a separately purchased battery.

Tab5 (SKU:C145)

- 1 x Tab5
- 1 x 1.25-6P Single-ended Terminal Cable

Tab5 Kit (SKU:K145)

- 1 x Tab5 Kit
- 1 x 1.25-6P Single-ended Terminal Cable
- 1 x NP-F550 2000mAh Removable Battery

Applications

- Smart-home control
- Remote monitoring systems
- IoT device development
- Industrial automation

Specifications

Specification	Parameter
Main Controller SoC	ESP32-P4NRW32@RISC-V 32-bit Dual-core 360MHz + LP Single-core 40MHz
Wireless Module SoC	ESP32-C6-MINI-1U
Flash	16MB
PSRAM	32MB Octal
Wi-Fi	2.4 GHz Wi-Fi 6, Thread, Zigbee
Antenna	Built-in 3D antenna & 2 x MMCX external antenna ports
Display	Uses a 5-inch IPS TFT display with a resolution of 1280×720 (720P), equipped with an integrated display and touch driver IC: ST7123 / ST7121
Camera	SC2356 @ 2MP (1600×1200), via MIPI-CSI interface
Audio Chip	ES8388 codec, ES7210 AEC front end
Microphone	Dual microphone system (AEC echo cancellation)
Speaker	1W@8Ω NS4150B

Specification	Parameter
Headphone Jack	3.5mm
USB Ports	USB Type-A (Host), USB Type-C (USB 2.0 OTG)
RS485 Port	SIT3088 (120Ω switchable terminal resistor) Power supply range: 6 ~ 24V
Expansion Interface	1 × HY2.0-4P, 1 × M5-Bus, GPIO_EXT expansion bus
Storage Expansion	microSD card slot
Extensible Stamp Interface	Stamp pads (support Cat.M / NB-IoT / LoRaWAN and other modules)
Motion Sensor	BMI270 six-axis (accelerometer + gyroscope, support interrupt wake-up)
RTC	RTC Chip: RX8130CE (supports timed interrupt wake-up), RTC supercapacitor specification: 70000μF/3.3V, size Φ4.8×1.4mm
Reset/Boot Button	1x Button, for power on/off and entering download mode
Charging Management	IP2326 charging management chip
Real-time Power Monitoring	INA226 (bus current / voltage monitoring)
Battery	NP-F550 removable lithium battery, 7.4V@2000mAh (14.8 Wh)
Battery Life	Under standard usage environment (screen brightness 50%, Wi-Fi always on, background tasks running), Tab5 built-in battery discharges from full (8.23 V) to shutdown threshold (6.0 V), lasting about 6 hours.
Operating Temperature	0 ~ 40°C
Product Size	Tab5: 128.0 x 80.0 x 12.0mm Tab5 Kit: 128.0 x 80.0 x 26.7mm
Product Weight	Tab5: 118.4g Tab5 Kit: 217.3g Battery: 98.9g
Package Size	Tab5: 148.0 x 103.0 x 21.0mm Tab5 Kit: 191.0 x 103.0 x 25.0mm
Gross Weight	Tab5: 161.5g Tab5 Kit: 280.5g

Learn

Tab5 Power Supply

Tab5 Power Supply Notes

Before disconnecting the power or replacing the battery, please perform a shutdown first. If the power is disconnected directly, wait 5 seconds before powering on again; otherwise, the IMU sensor may fail to initialize properly due to abnormal voltage.

Tab5 Charging

Tab5 Charging Notes

- 1.Tab5 can only be charged after the device is powered on and initialized. Charging is not possible when the device is off.
 - 2.When the battery is over-discharged and its voltage drops below 6V, it enters protection mode. Before recharging, remove the battery, reset the device, reinstall it, and then charge via the device' s USB Type-C port.
- During the initial charging phase, since the battery is still in protection mode, the charging chip trickle-charges with a small current. This state lasts several minutes, depending on the battery voltage level. Once the voltage rises above 6V, the chip automatically switches to normal charging mode.

Power On/Off

Power On/Off

When the device is powered by a USB data cable or battery, press the power button once to power on while it is off. While it is on, double-press the power button to shut it down.



Download Mode

Download Mode

With the USB data cable connected or the battery supplying power, press and hold the reset button (about 2 seconds) until the internal green LED starts flashing rapidly. Release the button and the device will enter download mode, waiting for firmware flashing.



Battery Installation Notes

Battery Installation

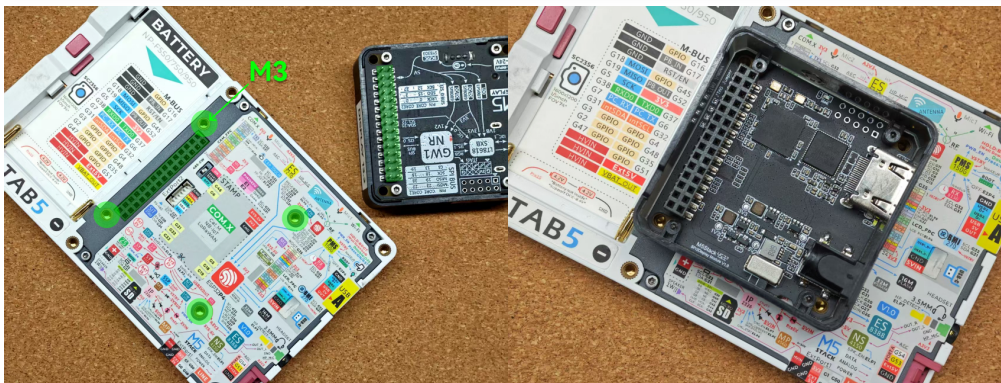
With the device powered off, press and hold the red locking button on the side of the main board. Align the metal spring contacts on the back of the battery module with the “BATTERY” slot on the main board, then slide it downward along the rail until the battery module fits flush with the main board. Release the red button to complete installation and start powering the device.



M5-Bus Expansion

M5-Bus Expansion

As shown below, the back of the Tab5 integrates an M5-Bus connector, which can be used to expand Module series products.



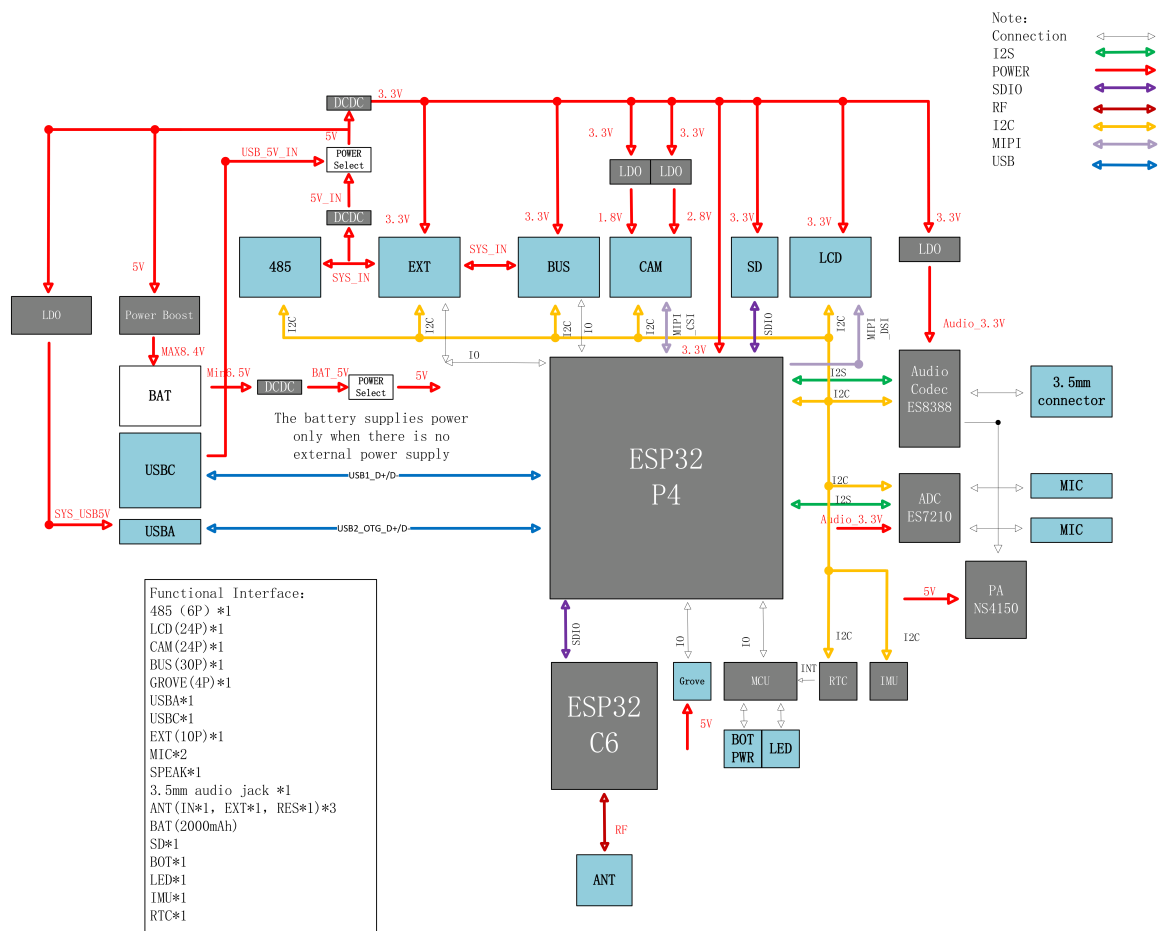
IMU Triaxial Direction Schematic Diagram

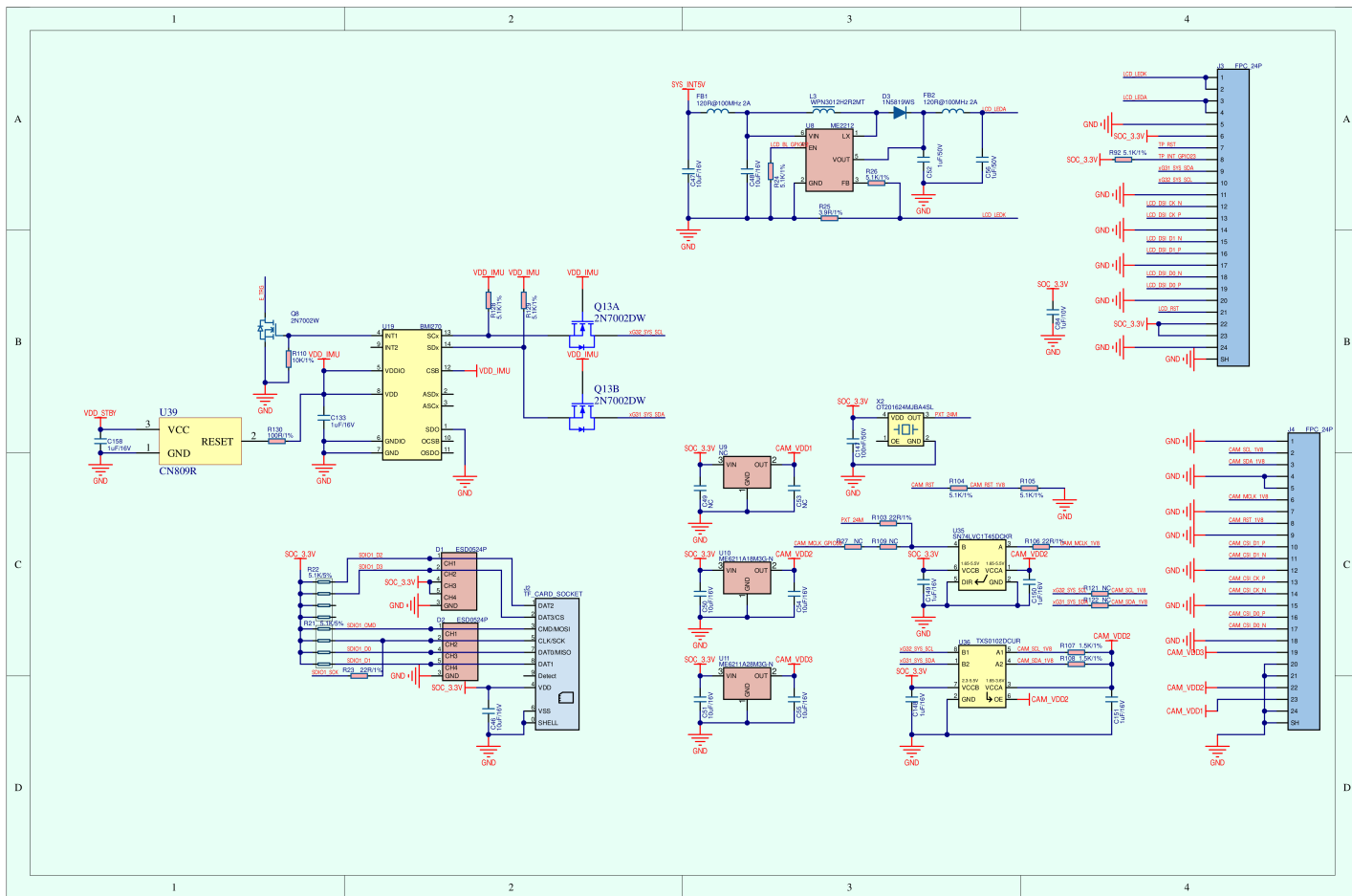
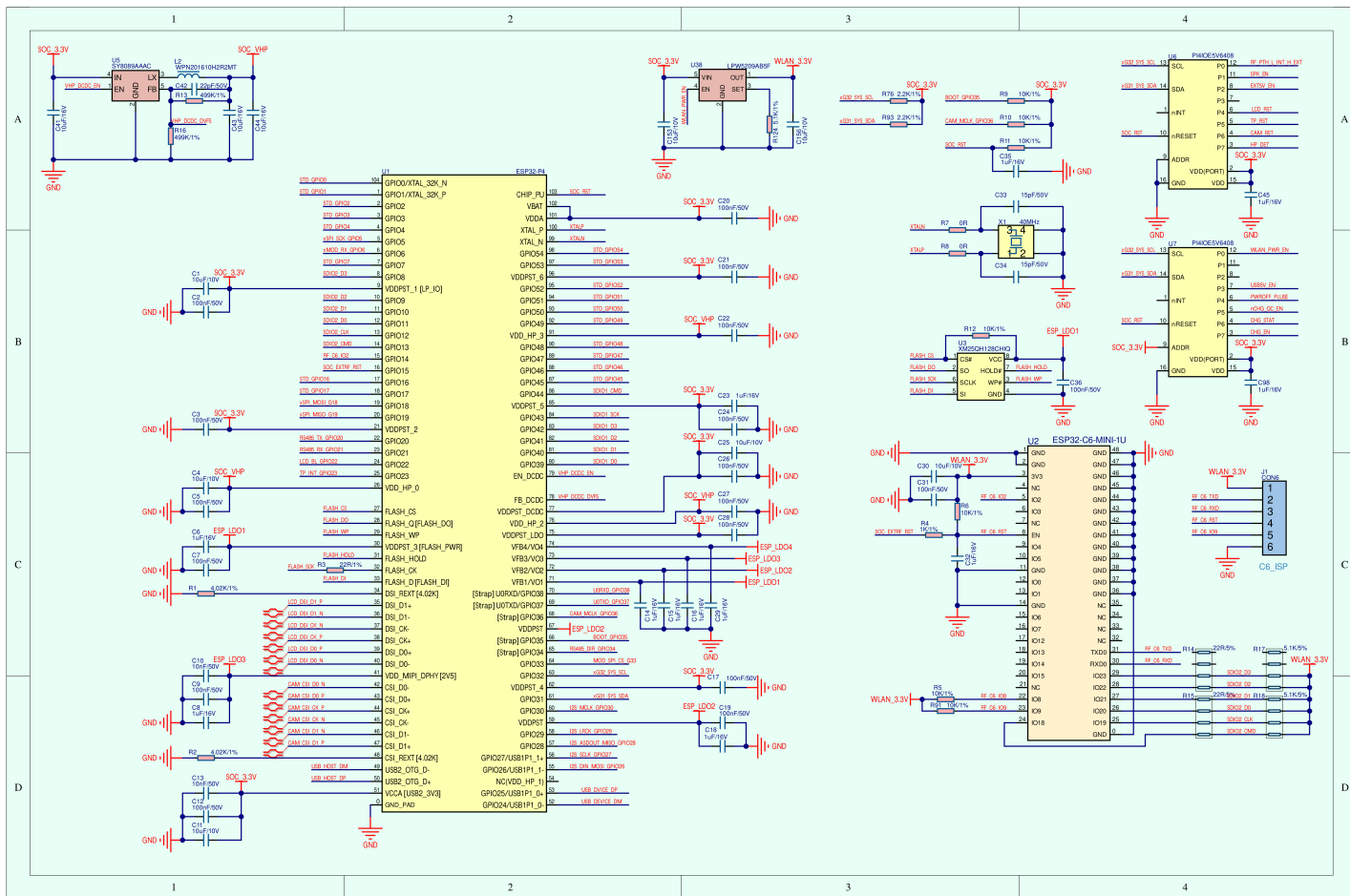


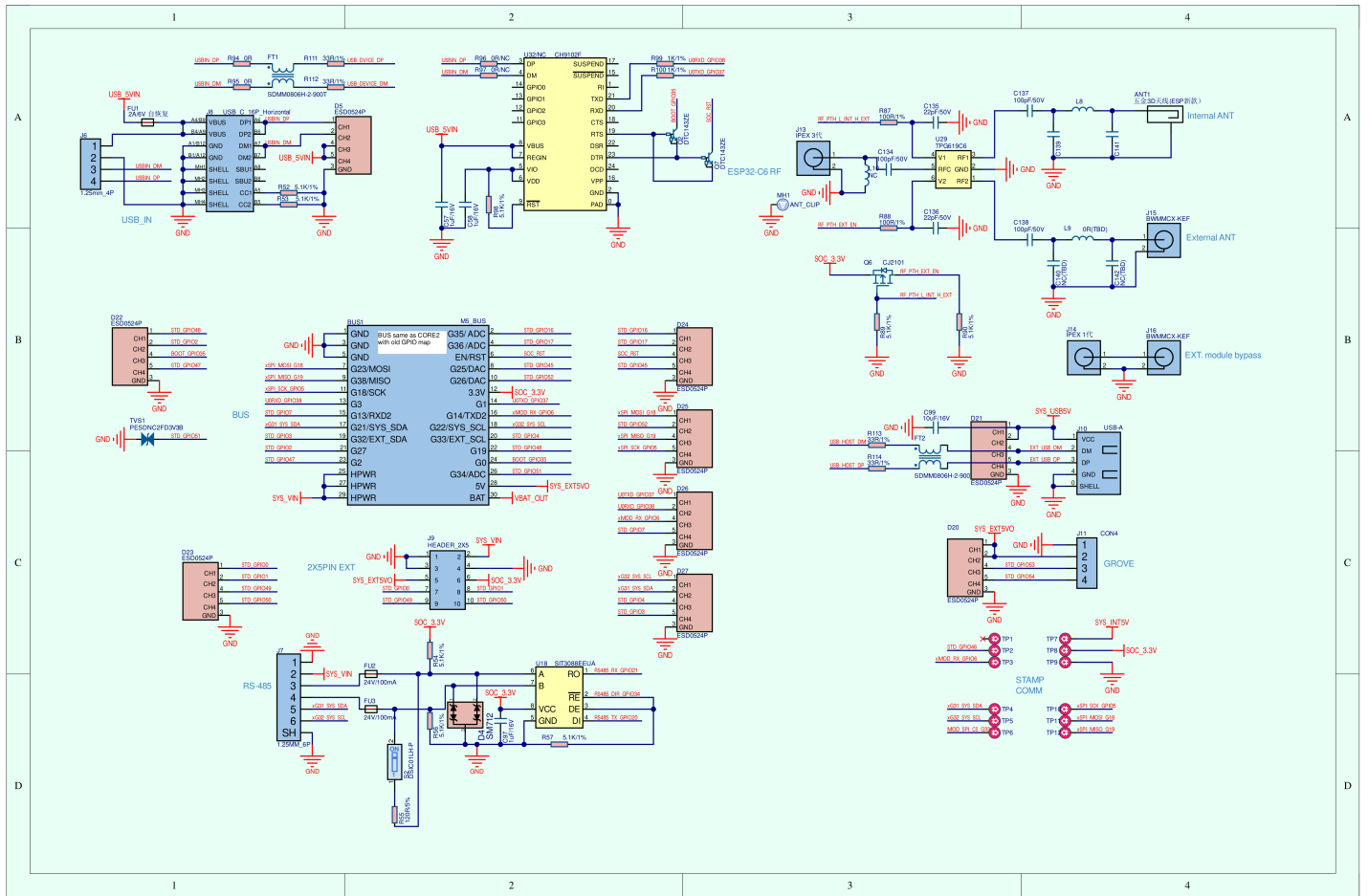
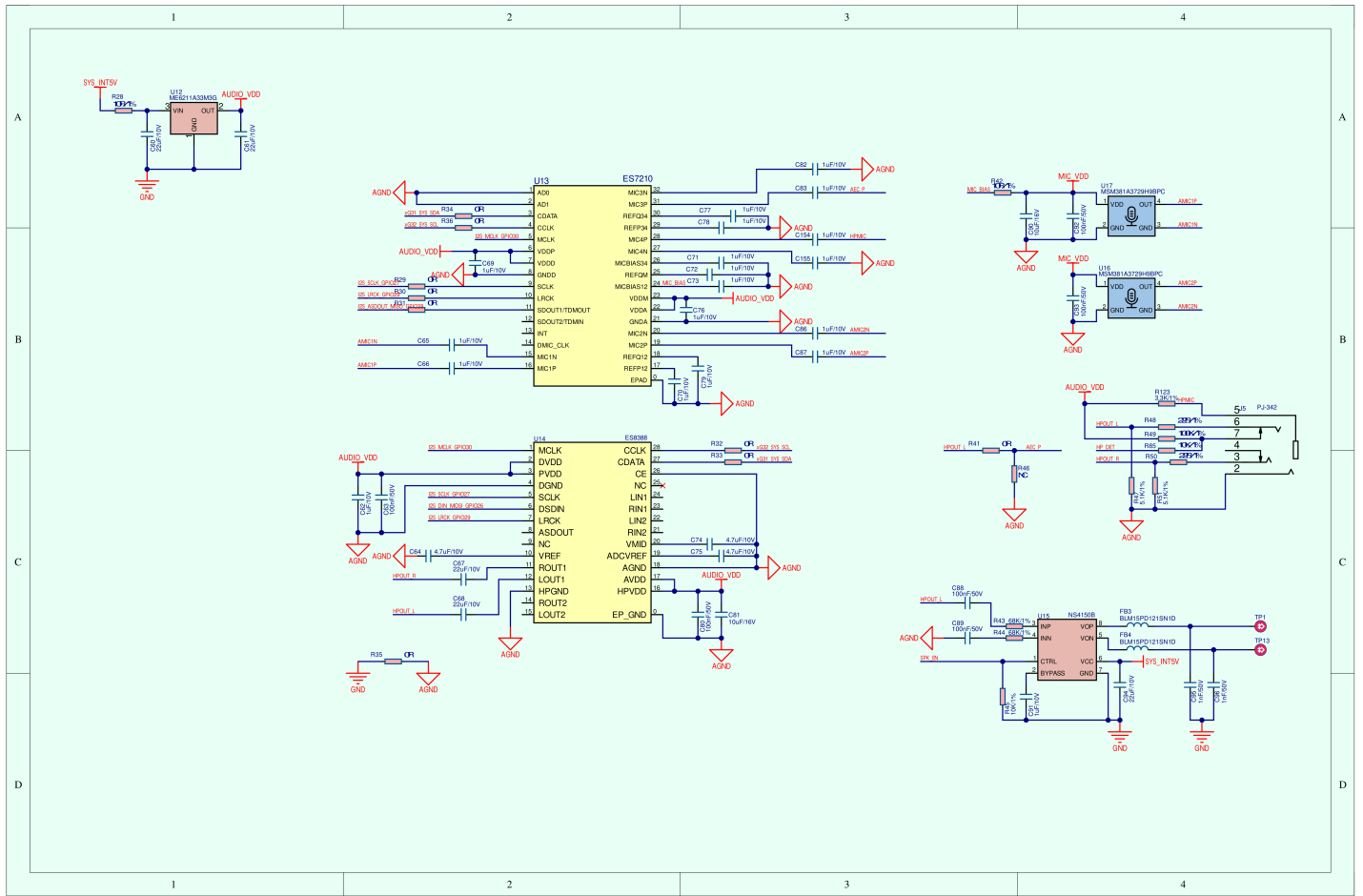
IMU ORIENTATION OF AXES

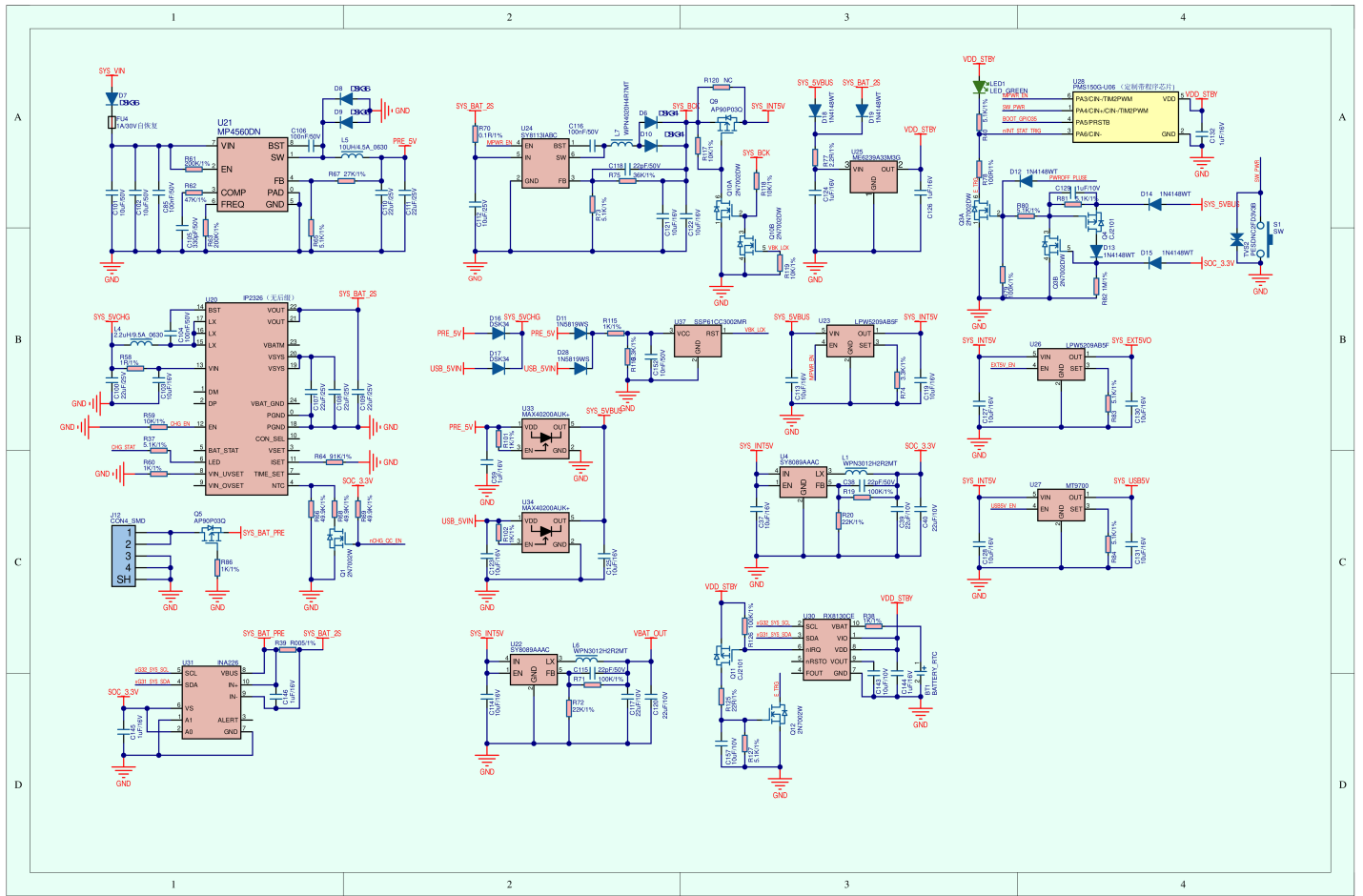
Schematics

- [Tab5 Overall Design Block Diagram](#)
- [Tab5 Schematics PDF](#)









PinMap

CAM

ESP32-P4	CAM					
G32	CAM_SCL					
G31	CAM_SDA					
G36	CAM_MCLK					
CSI_DATAP1 (Dedicated)	CAM_D1P					
CSI_DATAN1 (Dedicated)	CAM_D1N					
CSI_CLKP (Dedicated)	CAM_CSI_CKP					
CSI_CLKN (Dedicated)	CAM_CSI_CKN					
CSI_DATAP0 (Dedicated)	CSI_DOP					
CSI_DATAN0 (Dedicated)	CSI_DON					

ES8388

ESP32-P4	G30	G27	G26	G29	G32	G31
ES8388 (0x10)	MCLK	SCLK	DSDIN	LRCK	SCL	SDA

ES7210

ESP32-P4	G30	G27	G28	G29	G32	G31
ES7210 (0x40)	MCLK	SCLK	ASDOUT	LRCK	SCL	SDA

LCD

ESP32-P4	ILI9881C / ST7123 / ST7121
G22	LEDA
DSI_CLKN (Dedicated)	DSI_CK_N
DSI_CLKP (Dedicated)	DSI_CK_P
DSI_DATAN1 (Dedicated)	DSI_D1_N
DSI_DATAP1 (Dedicated)	DSI_D1_P
DSI_DATAN0 (Dedicated)	DSI_D0_N
DSI_DATAP0 (Dedicated)	DSI_D0_P

Touch

ESP32-P4	G31	G32	G23
GT911 (0x14) / ST7123 (0x55) / ST7121 (0x55)	SDA	SCL	TP_INT

BMI270 & RTC(RX8130CE) & INA226

ESP32-P4	G32	G31
BMI270 (0x68)	SCL	SDA
RX8130CE (0x32)	SCL	SDA
INA226 (0x41)	SCL	SDA

◦ Interrupt Wakeup (PMS150G-U06)

PMS150G-U06	PA6/CIN-
BMI270 (0x68)	INT(E_TRG)
RX8130CE	INT(E_TRG)

ESP32-C6

ESP32-P4	G11	G10	G9	G8	G13	G12	G15	G14
ESP32-C6	SDIO2_D0	SDIO2_D1	SDIO2_D2	SDIO2_D3	SDIO2_CMD	SDIO2_CK	RESET	IO2

microSD

ESP32-P4	G39	G40	G41	G42	G43	G44
microSD SPI Mode	MISO			CS	SCK	MOSI
microSD SDIO Mode	DAT0	DAT1	DAT2	DAT3	CLK	CMD

RS485

ESP32-P4	G21	G20	G34
SIT3088	RX	TX	DIR

HY2.0-4P

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	G53	G54

PI4IOE5V6408

ESP32-P4	G32	G31	CHIP_PU
PI4IOE5V6408-1 (0x43)	SCL	SDA	RST
PI4IOE5V6408-2 (0x44)	SCL	SDA	RST

PI4IOE5V6408-1 (0x43)	E1.P0	E1.P1	E1.P2	E1.P4	E1.P5	E1.P6	E1.P7
RF_PTH_L_INT_H_EXT	RF_INT_EXT_SWITCH						
NS4150B		SPK_EN					
EXT_5V_BUS			EXT5V_EN				
LCD				LCD_RST			
TP					TP_RST		
CAM						CAM_RST	
HEADPHONE							HP_DET

- RF_PTH_L_INT_H_EXT: Used to switch between the internal Wi-Fi antenna and the external SMA antenna. Low level selects the internal antenna, while high level selects the external antenna.
- EXT_5V_BUS: Provides 5V power to the Tab5 rear M5-Bus, the side 2.54-10P expansion port, and the HY2.0-4P interface. The power output can be controlled via EXT5V_EN.

PI4IOE5V6408-2 (0x44)	E2.P0	E2.P3	E2.P4	E2.P5	E2.P6	E2.P7
ESP32-C6	WLAN_PWR_EN					
USB-A		USB5V_EN				
DEVICE PWR			PWROFF_PLUSE			
IP2326 (CHARGE IC)				nCHG_QC_EN	CHG_STAT_LED	CHG_EN

- WLAN_PWR_EN: Enables power supply for the internal ESP32-C6 (Wi-Fi SoC).

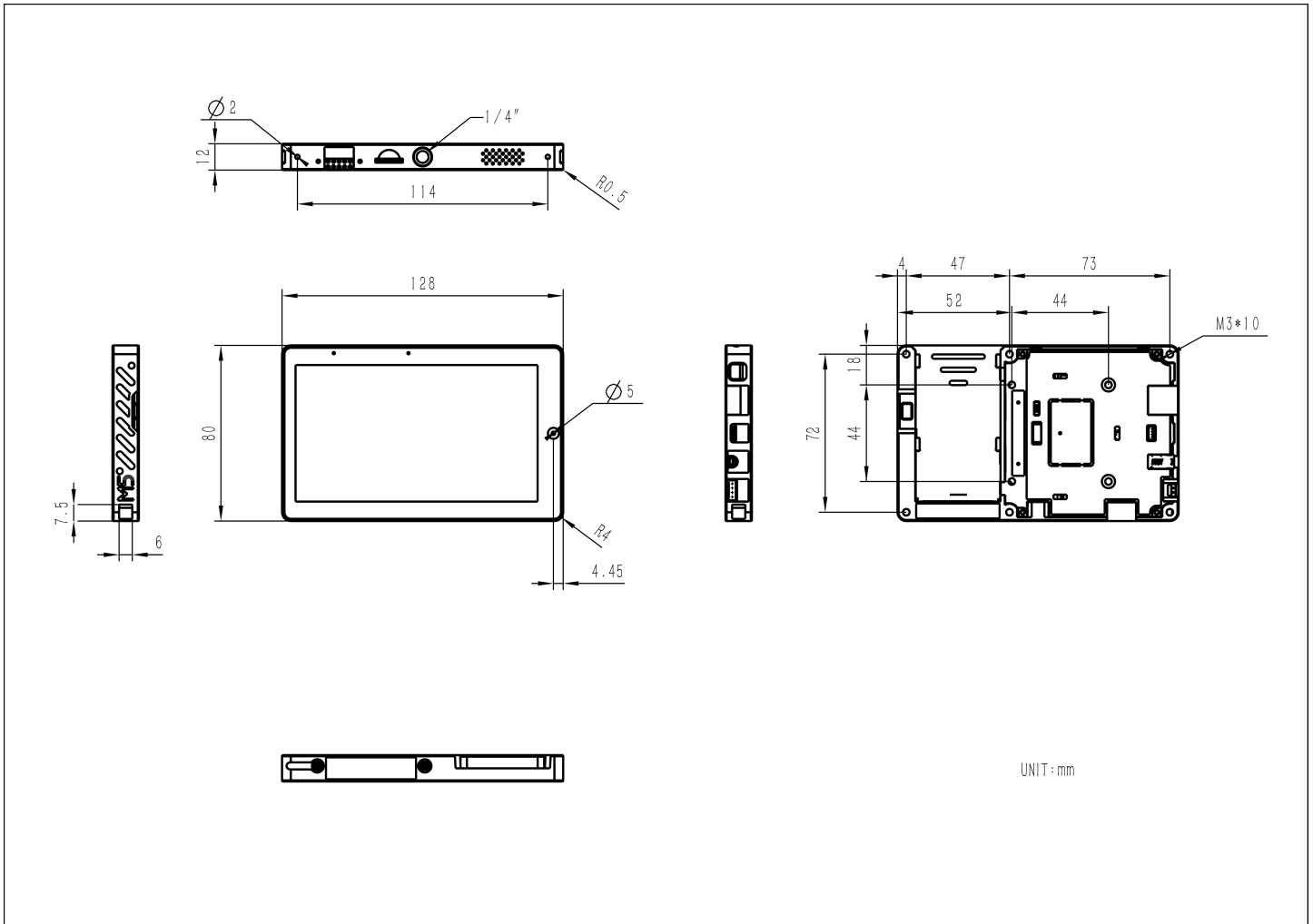
M5-Bus

FUNC	PIN	LEFT	RIGHT	PIN	FUNC
	GND	1	2	G16	GPIO
	GND	3	4	G17	PB_IN
	GND	5	6	RST	EN
MOSI	G18	7	8	G45	GPIO
MISO	G19	9	10	G52	PB_OUT
SCK	G5	11	12	3V3	
RXD0	G38	13	14	G37	TXD0
PC_RX	G7	15	16	G6	PC_TX
Int SDA	G31	17	18	G32	Int SCL
GPIO	G3	19	20	G4	GPIO
GPIO	G2	21	22	G48	GPIO
GPIO	G47	23	24	G35	GPIO
	HVIN	25	26	G51	GPIO
	HVIN	27	28	5V	
	HVIN	29	30	BAT	

Tab5 Board PinMap Overview



Model Size



Structure

- [Tab5 Structure Files](#)

Datasheets

- [ESP32-P4](#)
- [BMI270](#)
- [ESP32-C6](#)
- [NS4150B](#)
- [ES7210](#)
- [ES8388](#)
- [INA226](#)
- [IP2326](#)
- [NP-F550 Battery Report](#)
- [ST7123 Model Touch IC Interface Protocol Document](#)
- [ST7123 Model Screen Manual](#)
- [RX8130CE Datasheet](#)
- [RX8130CE Register Manual](#)

Softwares

Arduino

- [Tab5 Arduino Quick Start](#)
- [Tab5 Arduino M5Unified Library](#)
- [Tab5 Arduino M5GFX Library](#)

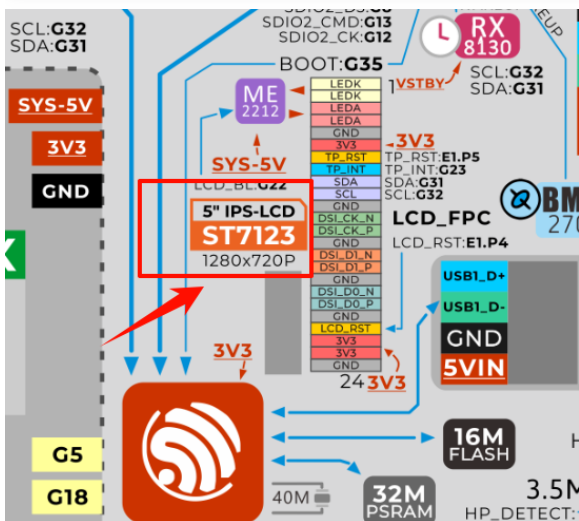
Tab5 Screen Reset

When the Tab5 (screen driver IC: ST7123 / ST7121) performs a screen reset, the PI4IO G4 (LCD_RST) pin must be configured as push-pull or open-drain while it is driven low, and switched to input pull-up while it is driven high; otherwise, the stability of I2C bus communication will be affected. Use M5Unified >= 0.2.23 and M5GFX >= 0.2.30, which optimize the screen reset handling during initialization.

Screen Driver Change

Starting from October 14, 2025, the Tab5' s original independent display driver ILI9881C and touch driver GT911 will be replaced by the integrated display-touch driver ST7123. Some early firmware builds may not run properly. The latest versions of M5Unified and M5GFX have already been adapted for compatibility with this new screen driver, and older programs can be recompiled using the latest M5Unified and M5GFX to achieve proper compatibility.

By checking the sticker on the back of the Tab5 product, you can confirm the driver model of the device.



UiFlow2

- [Tab5 UiFlow2 Quick Start](#)

PlatformIO

```
[env:esp32p4_pioarduino]
platform = https://github.com/pioarduino/platform-espessif32.git#54.03.21
upload_speed = 1500000
monitor_speed = 115200
build_type = debug
framework = arduino
board = esp32-p4-evboard
board_build.mcu = esp32p4
board_build.flash_mode = qio
build_flags =
    -DBOARD_HAS_PSRAM
    -DCORE_DEBUG_LEVEL=5
    -DARDUINO_USB_CDC_ON_BOOT=1
    -DARDUINO_USB_MODE=1
```

```
lib_deps =
  https://github.com/M5Stack/M5Unified.git
  https://github.com/M5Stack/M5GFX.git
```

ESP-IDF

- [Tab5 Factory Firmware Source Code](#)
- [Tab5 Factory Firmware Build Guide](#)
- [Tab5 ESP-IDF BSP](#)

Easyloader

Easyloader	Download	Note
Tab5 User Demo	download	/

Others

- [Tab5 Restore Factory Firmware Tutorial](#)
- [Tab5 Internal Wi-Fi Module Restore Factory Firmware](#)

Video

Version Change

Release Date	Product Changes
2026.4.28	Screen driver IC model changed from ST7123 to ST7121
2025.10.14	Tab5 screen driver solution optimized: the original independent ILI9881C display driver and GT911 touch driver were changed to an ST7123 integrated display-touch driver.
2025.5.9	Initial product release