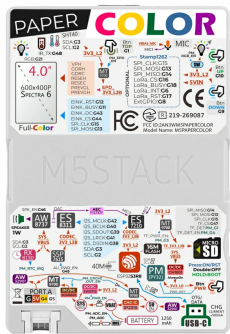
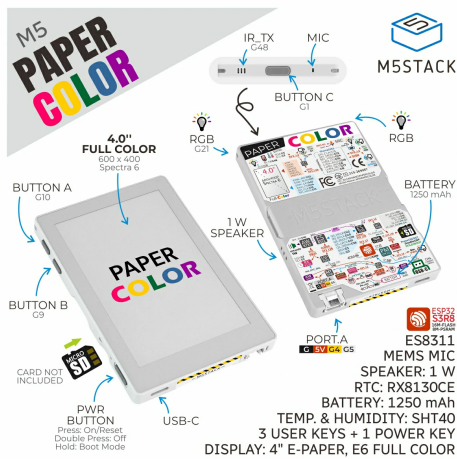


PaperColor

SKU:C151

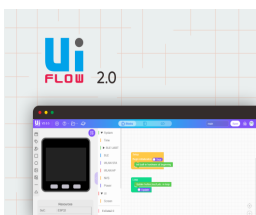




Description

PaperColor is a development board featuring a 4-inch E Ink Spectra 6 full-color e-paper display with a resolution of 400x600, offering both low power consumption and high visibility. It is built around an integrated ESP32-S3R8 core with 16MB Flash and 8MB PSRAM, and supports 2.4 GHz Wi-Fi wireless communication. The board incorporates a complete human-machine interaction system, including three programmable buttons, an audio system based on the ES8311 audio codec, a MEMS microphone with AEC echo cancellation, and a speaker driven by an AW8737A amplifier — enabling high-quality voice capture and audio playback. In terms of expanded functionality, the board integrates an SHT40 temperature and humidity sensor, RX8130CE real-time clock, microSD card slot, infrared emitter, two RGB LEDs, and an HY2.0-4P expansion interface. Combined with the M5PM1 multi-stage power management system and a 1250mAh battery, it enables long-lasting, low-power operation. Suitable for IoT and embedded applications such as electronic signage, voice interaction terminals, environmental monitoring instruments, and art display installations.

Tutorial



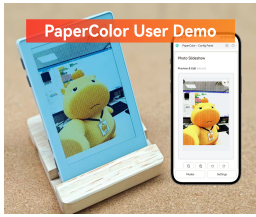
UiFlow2

This tutorial introduces how to control the PaperColor device using the UiFlow2 graphical programming platform.



Arduino IDE

This tutorial introduces how to program and control the PaperColor device using Arduino IDE.



Factory Firmware Usage Guide

This tutorial covers the factory firmware usage guide for PaperColor, including configuration page overview, and setup instructions for both Local Mode and Ezdata Mode.

Features

- ESP32-S3R8 Core:
 - 16MB Flash + 8MB PSRAM
 - 2.4 GHz Wi-Fi
- 4-inch E Ink Spectra 6 Full-Color E-Paper Display
- Built-in 1250mAh Battery
- microSD Card Slot
- Audio Interaction:
 - ES8311 Audio Codec
 - 1W Speaker + MEMS Microphone
- Human-Machine Interaction:
 - 3x User Buttons + 1x Power Button
 - Infrared Emitter
 - 2x RGB LED
- Onboard SHT40 Temperature & Humidity Sensor
- RX8130CE Real-Time Clock

Includes

- 1 x PaperColor

Applications

- Smart Digital Photo Frame
- Data Display Panel
- Electronic Signage

Specifications

Specification	Parameter
SoC	ESP32-S3R8 @Dual-core Xtensa LX7, up to 240MHz
Flash	16MB
PSRAM	8MB
Wi-Fi	2.4 GHz Wi-Fi
Display	4" E-Paper (E6 Full-Color) ED2208-DOA (EL040EF1), Resolution 400x600
Input Power	USB Type-C DC 5V
Battery Capacity	1250mAh
Audio Codec	ES8311
Microphone	MEMS Microphone, ES7210 Audio ADC, Integrated AEC Circuit
Speaker	1W @ 8Ω 2520 Speaker, AW8737A Audio Amplifier
Temp/Humidity	SHT40
Expandable Storage	microSD
RTC	RX8130CE
User Buttons	3x User Buttons + 1x Power Button (ON/OFF/RESET/BOOT)
Power Consumption	Standby: 92.53uA
	Full Load: 211.97mA
Product Size	70.8 x 103.9 x 8.5mm
Product Weight	73.3g
Package Size	120.0 x 80.0 x 23.0mm
Gross Weight	93.4g

Learn

Power On/Off

- Power On / Restart: Press the power button once
- Power Off: Press the power button twice in quick succession



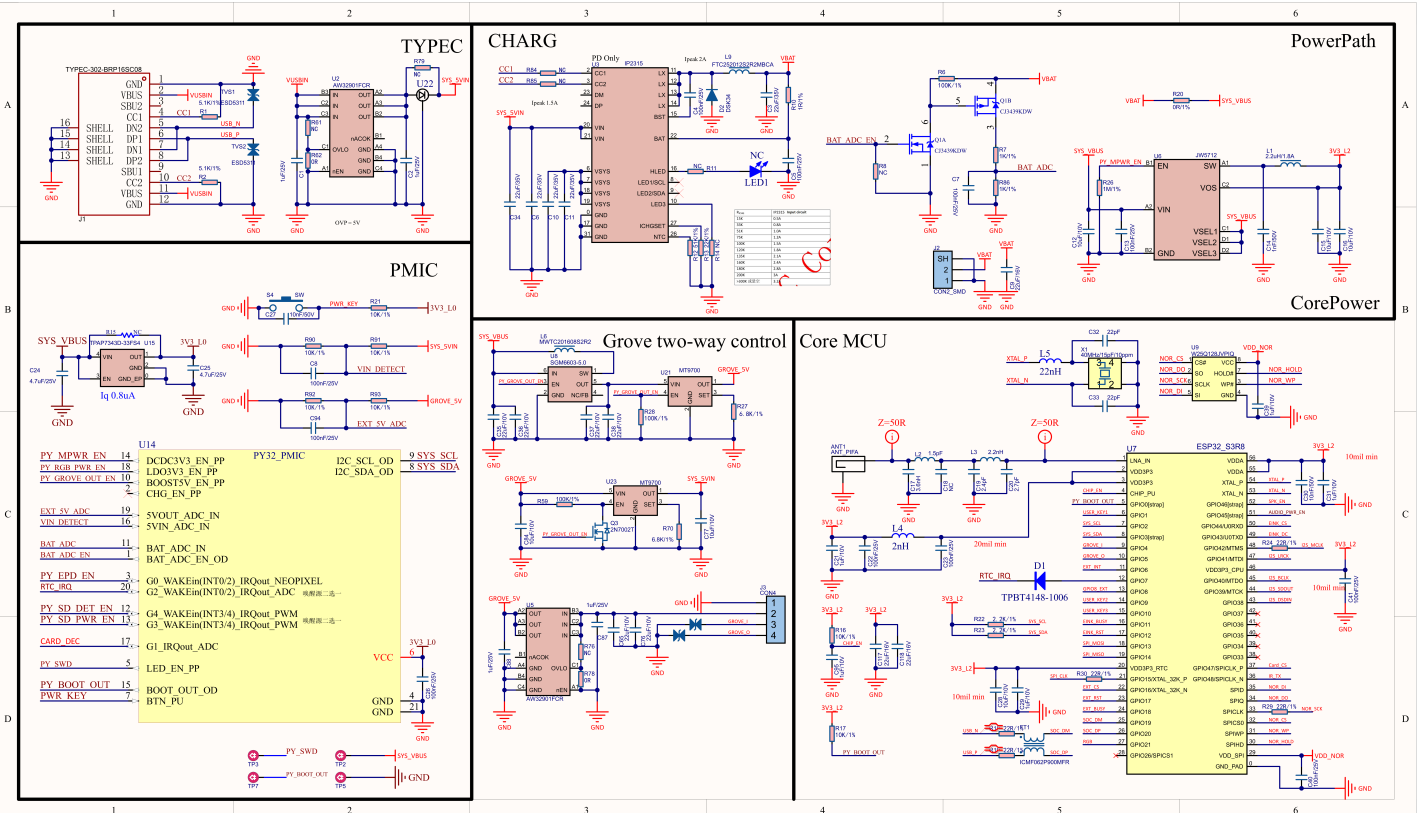
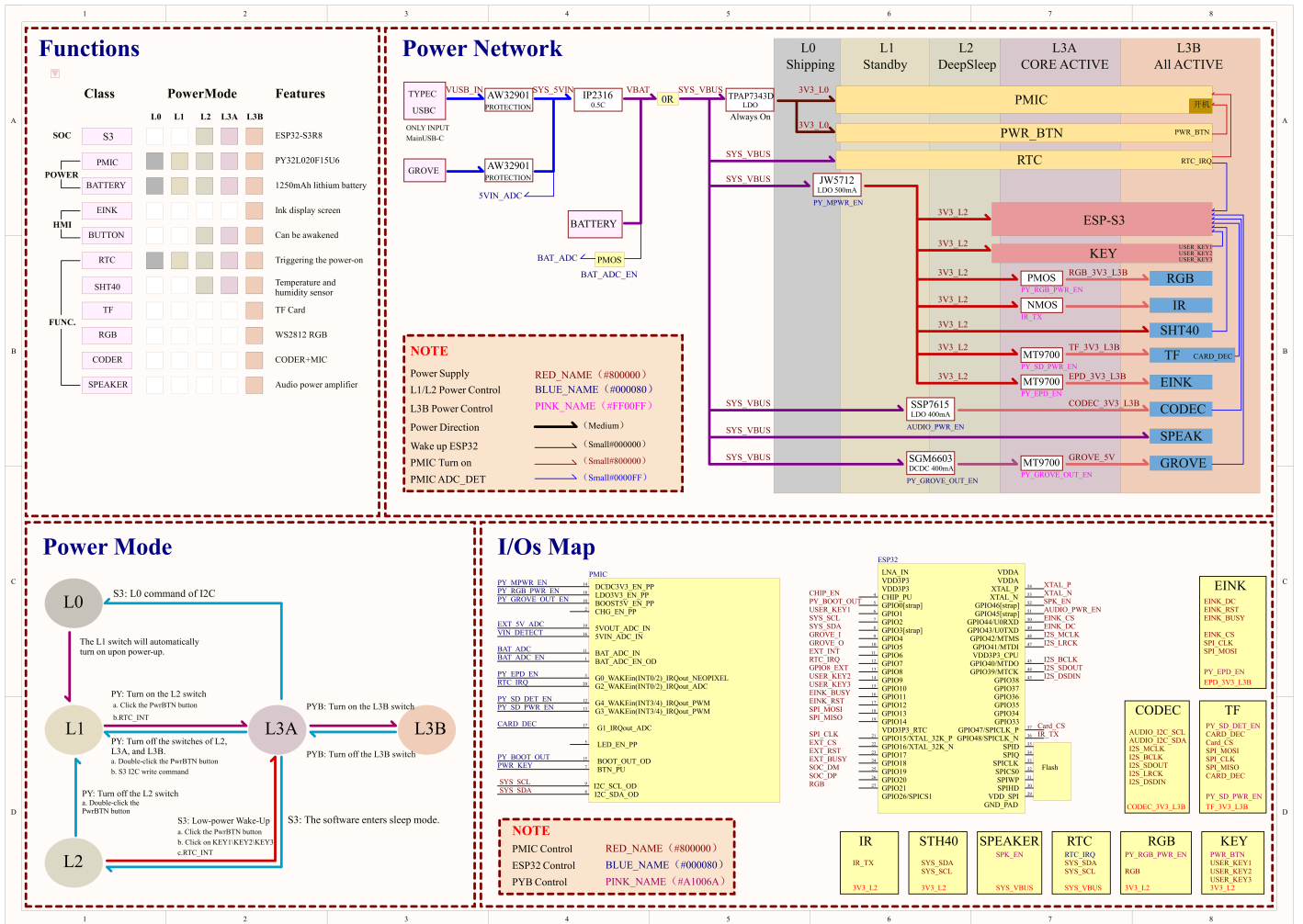
| Download Mode

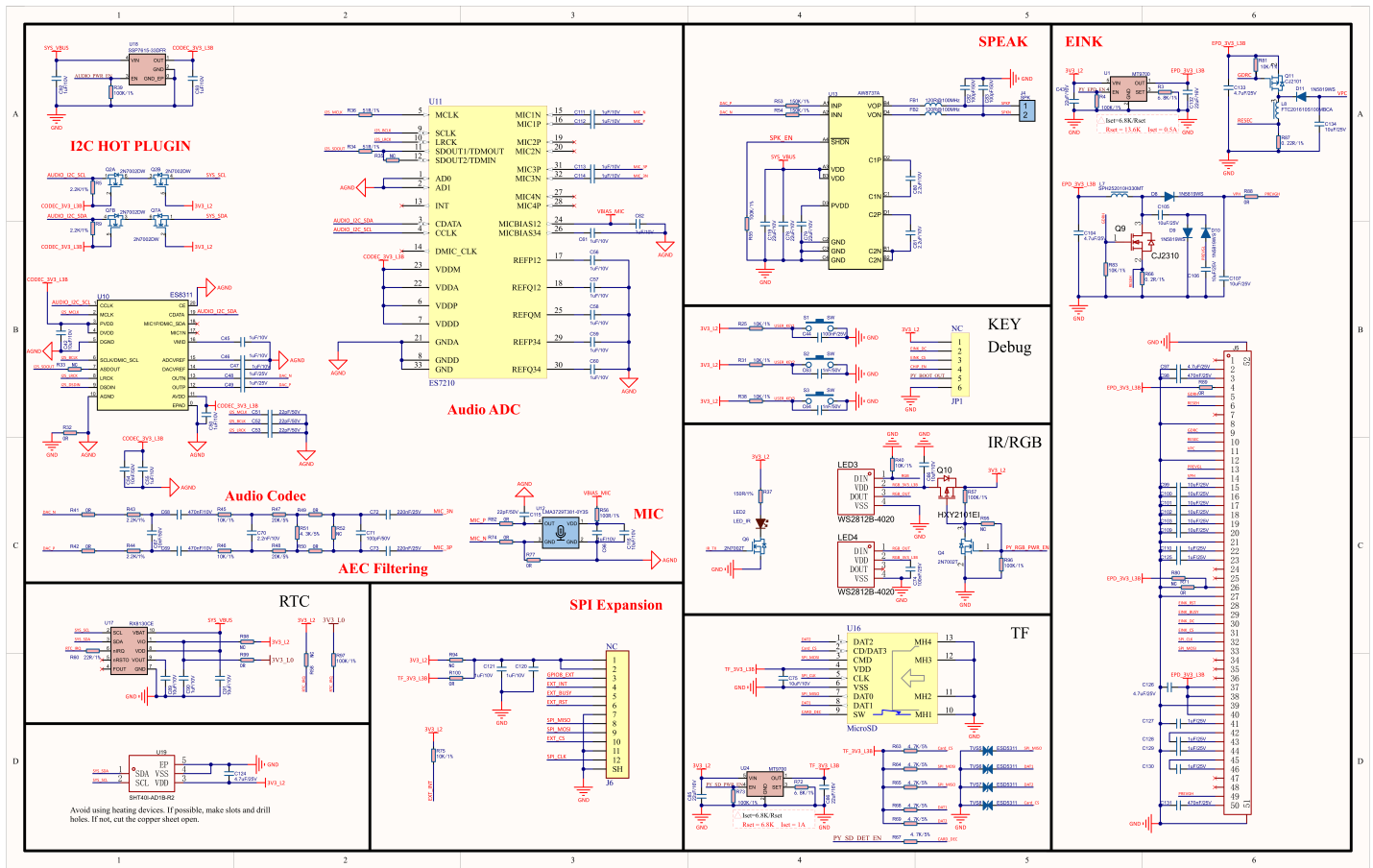
To flash firmware, connect the device to a computer via a USB Type-C cable, then press and hold the side reset button to enter download mode and wait for the flashing process to complete.



| Schematics

- [PaperColor Schematics PDF](#)





PinMap

E-Paper

ESP32S3R8	G15	G13	G44	G43	G11	G12
EL040EF1	SPI_CLK	SPI_MOSI	EINK_CS	EINK_DC	EINK_BUSY	EINK_RST

M5PM1	PYG0
EL040EF1	PY_EP_D_EN

KEY

ESP32S3R8	G1	G9	G10
KEY	USER_KEY1 (Button C)	USER_KEY2 (Button B)	USER_KEY3 (Button A)

IR

ESP32S3R8	G48
IR	IR_TX

RGB

ESP32S3R8	G21
RGB LED	RGB

Audio

ESP32S3R8	G2	G3
ES8311 (0x18)	AUDIO_I2C_SCL	AUDIO_I2C_SDA
ES7210 (0x40)	AUDIO_I2C_SCL	AUDIO_I2C_SDA

ESP32S3R8	G42	G41	G40	G39	G38
ES8311	I2S_MCLK	I2S_LRCK	I2S_BCLK		I2S_DSDIN
ES7210	I2S_MCLK	I2S_LRCK	I2S_BCLK	I2S_SDOUT	

ESP32S3R8	G45
ES8311 & ES7210 Power (CODEC_3V3_L3B)	AUDIO_PWR_EN

ESP32S3R8	G46
AW8737A	SPK_EN

- G46(SPK_EN): Speaker amplifier enable
- G45(AUDIO_PWR_EN): Power supply for audio codec chips and microphone

RTC

ESP32S3R8	G7	G3	G2
RX8130CE (0x32)	RTC_IRQ	SYS_SDA	SYS_SCL

SHT40

ESP32S3R8	G3	G2
SHT40 (0x44)	SYS_SDA	SYS_SCL

microSD

ESP32S3R8	G47	G15	G13	G14
microSD	CS	SPI_CLK	SPI_MOSI	SPI_MISO

HY2.0-4P

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	G4	G5

M5PM1

ESP32S3R8	G3	G2
M5PM1 (0x6e)	SYS_SDA	SYS_SCL

M5PM1	DCDC3V3_EN_PP	LDO3V3_EN_PP	BOOST5V_EN_PP
3V3_L2	PY_MPWR_EN		
RGB LED		PY_RGB_PWR_EN	
Grove			PY_GROVE_OUT_EN

- DCDC3V3_EN_PP(PY_MPWR_EN): 3V3_L2 power layer switch
- LDO3V3_EN_PP(RTCPY_RGB_PWR_EN_IRQ): RGB LED power supply switch
- BOOST5V_EN_PP(PY_GROVE_OUT_EN): Grove expansion interface power direction control

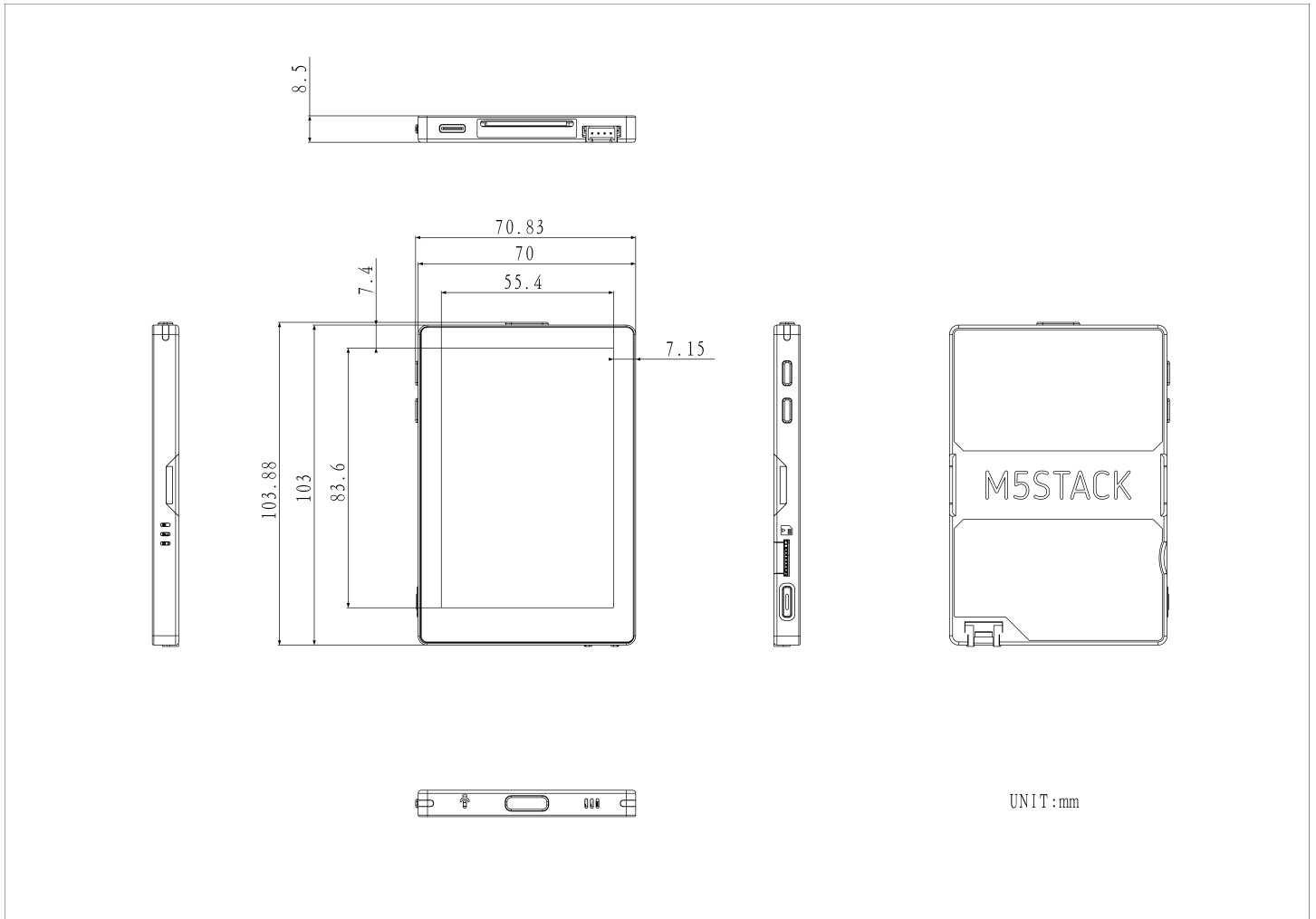
M5PM1	PYG0	PYG2	PYG4	PYG3	PYG1
E-Paper	PY_EPД_EN				
RTC		RTC_IRQ			
microSD			PY_SD_DET_EN	PY_SD_PWR_EN	CARD_DEC

- PYG0(PY_EPД_EN): Enable e-paper display power supply

- PYG2(RTC_IRQ): RTC interrupt signal
- PYG3(PY_SD_PWR_EN): microSD module power supply
- PYG4(PY_SD_DET_EN): microSD detection enable, pull-up enabled
- PYG1(CARD_DEC): microSD card insertion detection

Model Size

- [PaperColor Model Size PDF](#)



Datasheets

- [ESP32S3](#)
- [ES8311](#)
- [RX8130CE](#)

Softwares

Arduino

- [PaperColor Arduino Quick Start](#)
- [PaperColor M5PM1 Power Management](#)
- [M5PM1 Arduino Library](#)

- [PaperColor Arduino M5Unified Driver Library](#)
- [PaperColor Arduino M5GFX Driver Library](#)

UiFlow2

- [PaperColor UiFlow2 Quick Start](#)

Protocol

- [M5PM1 Power Management IC](#)

ESP-IDF

- [PaperColor Factory Firmware Source Code](#)

PlatformIO

```
[env:m5stack-papercolor]
platform = espressif32 @ 6.12.0
board = esp32s3box
framework = arduino
board_build.partitions = default_16MB.csv
board_upload.flash_size = 16MB
board_upload.maximum_size = 16777216
board_build.arduino.memory_type = qio_opi
monitor_speed = 115200
build_flags =
    -DESP32S3
    -DBOARD_HAS_PSRAM
    -DCORE_DEBUG_LEVEL=5
    -DARDUINO_USB_CDC_ON_BOOT=1
    -DARDUINO_USB_MODE=1

lib_deps =
    M5Unified = https://github.com/m5stack/M5Unified
    M5GFX = https://github.com/m5stack/M5GFX
    M5PM1 = https://github.com/m5stack/M5PM1
```

Easyloader

Easyloader	Download	Note
PaperColor Factory Firmware Easyloader	download	/

Other

- [PaperColor Restore Factory Firmware Tutorial](#)
- [PaperColor Factory Firmware Usage Guide](#)

Video

- PaperColor Product Introduction and Feature Demonstration

[C151-PaperColor-video-EN.mp4](#)