SMART DISPLAY MODULE SPECIFICATION

ESP32 S3 Round Dev Board with display	
Model:	ESP32 S3 Round Dev Board
Version:	V1.1
Date:	2025-8-28

Customer Confirmation

Approved by	Notes

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REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	20250828	Preliminary release(integrated 1.5-inch AMOLED /1.75-inch AMOLED/1.85-inch LCD options, Added network configuration & activation function,supported LVGL UI)	
V1.1	20250917	Optimize the document structure and add visual PIN explanations	

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1. Introduction

1.1 Features

Brief Info:

1) **Button control:** One power-on button(long press 2 seconds to power on/off),one reset button.(Boot key ,for program download),one RST key(hardware reset).

2) **Power Supply:**Supports dual power modes---DC 5V(recommended 5V 1A adapter,via USB)+battery,support charge/discharge;USB priority when both connected;Integrated 5V-to-3.3V conversion circuit with power indicator(lights up when 3.3V output is normal.

3) **Extended Functions:**Integrated I2S digital microphone,I2S DAC(digital-to-analog conversion),TF (SD) card interface,6-axis IMU sensor (motion detection),capacitive touch function,USB_OTG interface (for external device expansion),and SD 3078 real-time clock module (providing precise timekeeping capabilities with low-power backup functionally). Additionally,the development board features versatile screen interfaces that are compatible with multiple display sizes,including 1.5-inch,1.75-inch,and 1.85-inch screens,ensuring flexible adaptation to various application requirement.

4) **Backup IO:** Multiple GPIO pins led out(IO3/IO8/IO43/IO44) for peripheral expansion,supporting SPI/I2C/I2S/UART interfaces.

5) **Status Indication:**RGB LED(Wi-Fi connecting:blue blinking;network success:green solid;low battery:red blinking;power off:red flash once).

System

1) **OS**: RTOS
2) **CPU**: ESP32-S3-N16R8　240MHz
   Memory:520KB SRAM,8MB PSRAM,448KB ROM
   Storage:16MB Flash
3) **Wireless Connectivity**:Support 2.4GHz Wi-Fi,BLE 5.0
4) **Interface**: USB(power supply + program download),USB_OTG,UART,QSPI(screen control),I2C(IMU/touch),I2S(audio),TF card slot
5) **Supported Peripherals**:
   GPIO,SPI,QSPI,I2C,I2S,UART,ADC,touch sensor,6-axis IMU,TF card controller,RGB LED PWM,full-speed USB 2.0,timers,watchdogs

Other

1) Operation Temperature：-20~70℃
2) Storage Temperature：-30~80℃
3) Environmental Standard:Complies with RoHS 2.0 and halogen-free requirements

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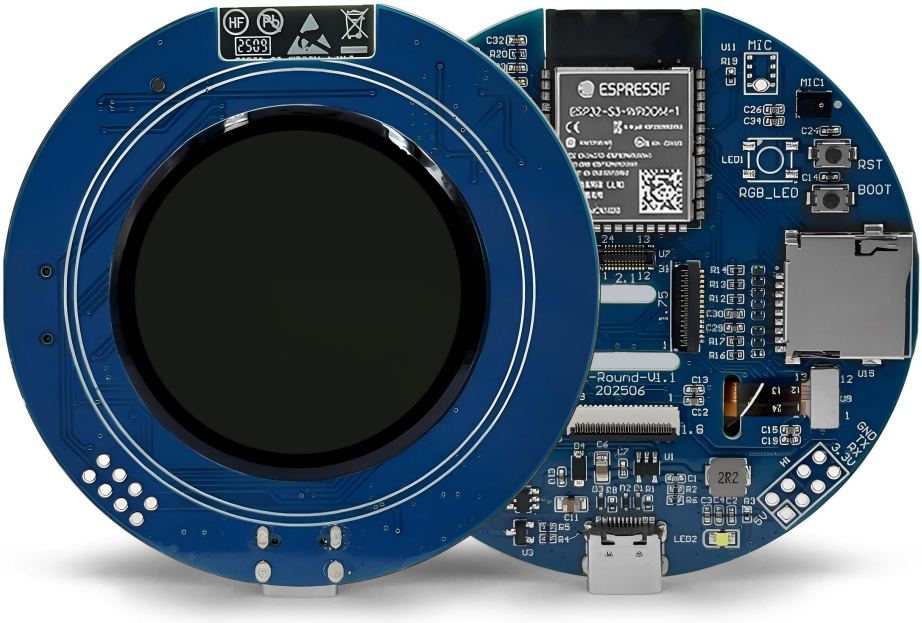
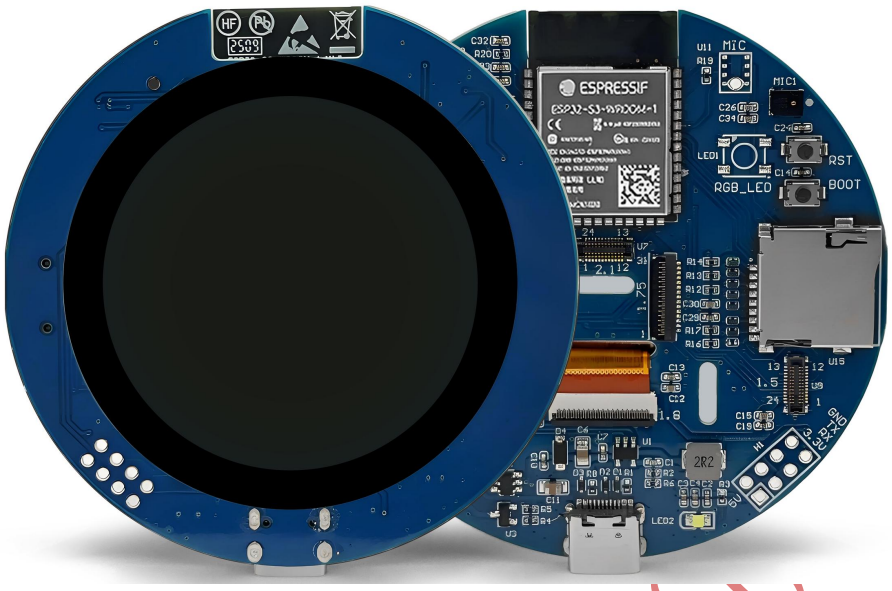
1.2 Appearance picture



1.5-inch AMOLED Combined Multifunctional Board

1.75-inch AMOLED Combined Multifunctional Board



1.85-inch TFT Combined Multifunctional Board

1.3 Basic Activation & Usage

1.**Power On/Off:**

Power On:Connect to 5V USB or install battery,long press power button for 3 seconds--screen lights up and displays hot spot name.

Power Off:Long press power button for 2 seconds,RGB LED flashes red once,screen turns off.

2.**Wi-Fi hot spot Connection:** Search for and connect to the device's hot spot (e.g., "Xiaozhi-2451") using a mobile phone/computer; no password is required by default.

3.**Network Configuration:**

If the browser does not redirect automatically,manually enter the address:http://192.168.4.1

Select a 2.4GHz Wi-Fi(5GHz is not supported) on the configuration page,enter the password,and submit..

4.**Device Activation:**

After successful network connection, visit the official website: http://xiaozhi.me to register and log in to an account.

Click "Console → Add Device" and enter the first line of numbers displayed on the screen (device ID).

5.**Verification & Usage:**

Enter the verification code (second line of numbers displayed on the screen) to complete device binding.

After binding, configure the voice role (e.g., "Wanwan Xiaohe") and select a language model (e.g., Qwen Real-Time) on the "Agent" page to start AI interaction.

Note: The above usage method is for customers who have flashed the Xiaozhi firmware. If you do not use Xiaozhi, it can be used as an ESP32S3 development board. Materials: Xiaozhi source code, Xiaozhi firmware, other sample codes

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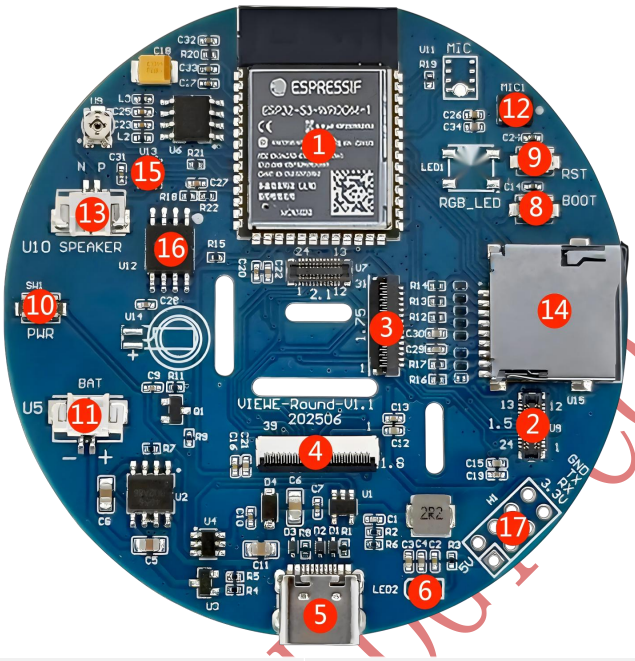
2. Product information

2.1 Hardware Description



1、ESP32-S3
16MB PSRAM, 2.4G Wi-Fi , Bluetooth 5

2、1.5-inch QSPI VIEWE display interface

3、1.75-inch QSPI VIEWE display interface

4、1.85-inch QSPI VIEWE display interface

5、Type-C interface
Can be used for power supply, program burning, and debugging

6、USER-LED
Power indicator light

8、BOOT button
Press when powering on or resetting to enter download mode

9、RST (RESET) button

10、PWR (Power) button

11、RTC socket
Connect a rechargeable RTC battery (only supports rechargeable RTC batteries)

12、SMD microphone

13、Speaker interface
MX1.25 2P connector, supports 8 Ω 2W speakers

14、TF card slot

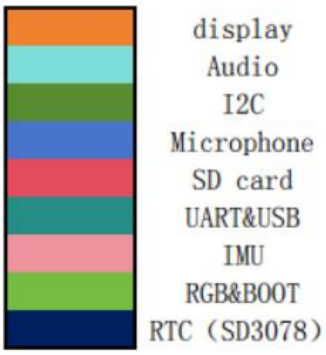
15、IMU six-axis inertial sensor

16、RTC real-time clock

17、GPIO

2.2 GPIO Summary Table

Pin	Symbol	Pin	Symbol
GPIO0	RGB&BOOT	GPIO18	I2CSCL
GPIO1	MICSCK	GPIO19	USB-
GPIO2	MICSD	GPIO20	USB+
GPIO4	DIN	GPIO21	LCD_DA2
GPIO5	BCK	GPIO38	SDCMD
GPIO6	LRCK	GPIO39	SDSCL
GPIO7	CTRL	GPIO40	SDDAT0
GPIO9	TP_INT	GPIO41	SDCD
GPIO10	TP_RST	GPIO42	MICWS
GPIO11	LCD_RST	GPIO43	U0TXD
GPIO12	LCD_CS	GPIO44	U0RXD
GPIO13	LCD_DA0	GPIO45	LCDBLK
GPIO14	LCD_DA3	GPIO46	INT
GPIO15	8658INT2	GPIO47	LCD_DA1
GPIO16	8658INT	GPIO48	LCD_CLK
GPIO17	I2CSDA		



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2.3 Display Information and Physical Map

Item	1.5-inch AMOLED	Unit	Remark
Pixel Driving element	AMOLED	-	
Screen Size	1.51	Inch	Diagonal
Resolution	466*466	Dots	-
Display Area Size	38.3052*38.3052	mm	
Interface	QSPI	-	-
Display Mode	Normal Black	-	
Driver IC (Control IC)	CO5300AF-42	-	
Touch IC	CST9217	-	
Active Area(mm)	43.2(W)*57.6(H)	mm	
Module Size (W*H*D)	44.3(W)*44.3(H)*2.405(D)	mm	
Luminance	450	cd/m^2	Type
Viewing Direction	All	O'clock	-
Display Color	16.7M	Colors	24bits
Pixel Pitch	0.0822	mm	
Pixel Per Inch	309	PPI	
Operating Temperature	-20 ~ 70	℃	
Storage Temperature	-30 ~ 80	℃	
Operating Voltage	5	V	
Power Consumption	-	-	-

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Item	1.75-inch AMOLED	Unit	Remark
Pixel Driving element	AMOLED	-	
Screen Size	1.75	Inch	Diagonal
Resolution	466*466	Dots	-
Display Area Size	Φ43.76	mm	
Interface	QSPI	-	-
Display Mode	Normal Black		
Driver IC (Control IC)	CO5300		
Touch IC	CST9217		
Module Size (W*H*D)	45.93(W)*46.35(H)*0.8(D)	mm	
Luminance	700	cd/m^2	Type
Viewing Direction	All	O'clock	-
Display Color	16.7M	Colors	24bits
Pixel Pitch	0.0822	mm	
Pixel Per Inch	309	PPI	
Operating Temperature	-20 ~ 70	℃	
Storage Temperature	-30 ~ 80	℃	
Operating Voltage	5	V	
Power Consumption	-	-	-

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Item	1.85-inch TFT	Unit	Remark
Pixel Driving element	α-Si TFT	-	-
Screen Size	1.85	Inch	Diagonal
Resolution	360RGB×360	Dots	-
Display Area Size	45.68(H)×45.68(V)	mm	-
Module Outline Dimension	48.08(H)×49.95(V)×2.12(T)	mm	-
Interface	QSPI	-	-
Display Mode	Normal Black	-	-
Driver IC (Control IC)	ST77916	-	-
Touch IC	CST816S	-	-
Module Size (W*H*D)	45.93(W)*46.35(H)*0.8(D)	mm	Type
Luminance	400	cd/m^2	Type
Viewing Direction	All	O'clock	-
Display Color	262K	Colors	24bits
Pixel Pitch	0.2	mm	-
Pixel Per Inch	127	PPI	
Operating Temperature	-20~ 70	℃	
Storage Temperature	-30 ~ 80	℃	
Operating Voltage	5	V	-
Power Consumption	-	-	-

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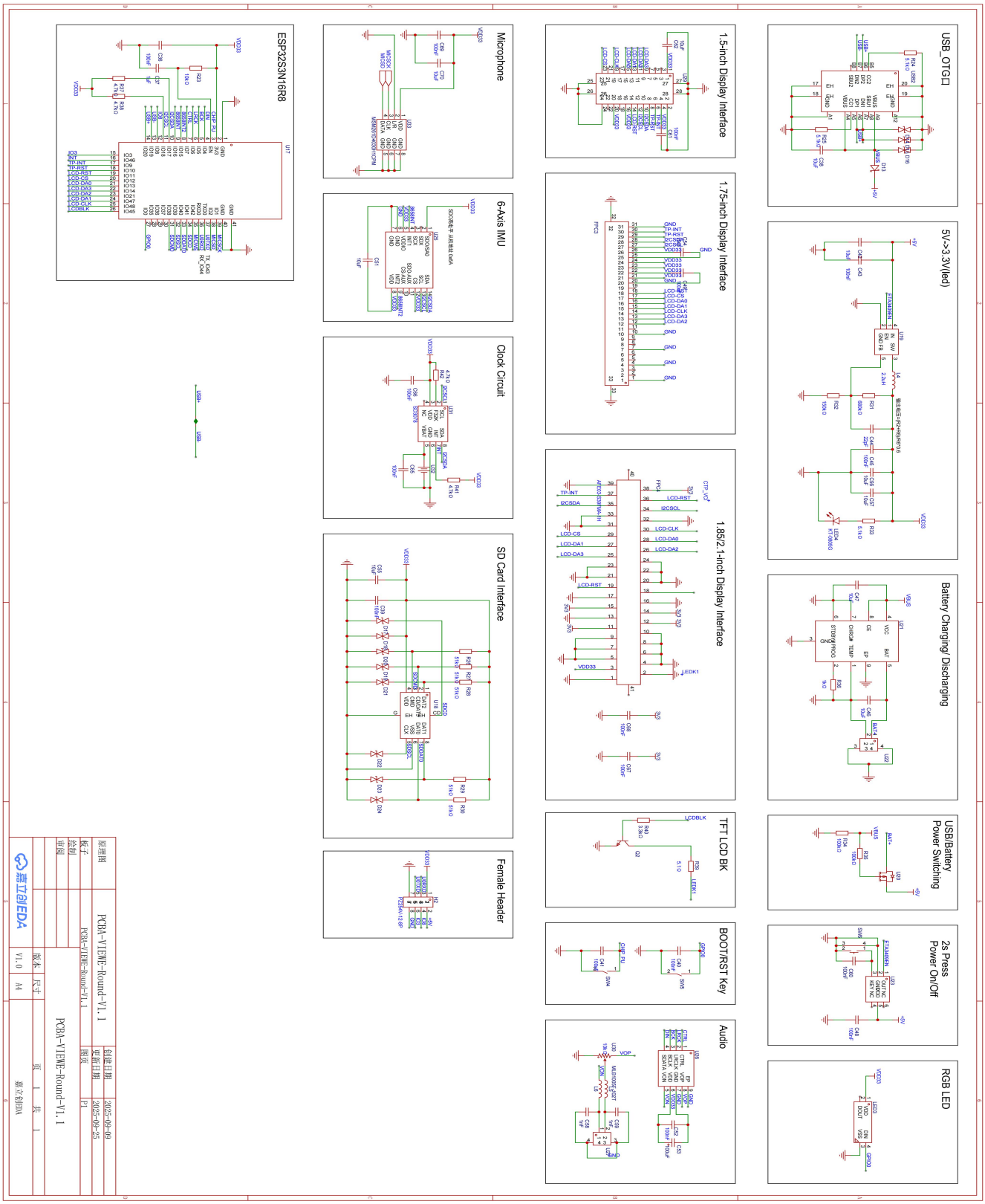
2.4 Voltage & Current

Item	Conditions	Type	Unit
Power Voltage(DC)	Main system power	5.0	V
Operation Current (1.5-inch AMOLED)	VCC= +5V,charging	1000	mA
	VCC= +5V, in non-charging	130	mA
Operation Current (1.75-inch AMOLED)	VCC= +5V,charging	1030	mA
	VCC= +5V, in non-charging	130	mA
Operation Current (1.85-inch LCD)	VCC= +5V,charging	1100	mA
	VCC= +5V, in non-charging	210	mA
Recommended power supply:5V 1A DC			

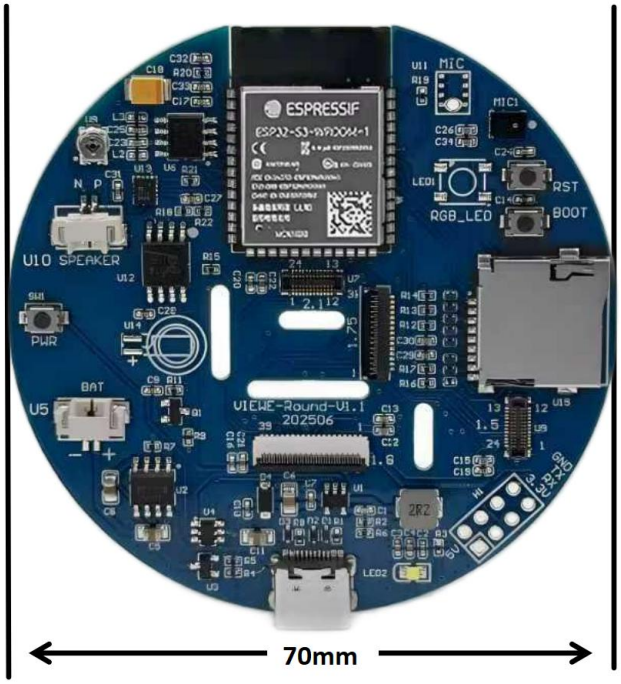
2.5 Reliability Test

Item	Conditions	Min	Type	Max	Unit
Operating Temperature	60%RH at 5V voltage	-20	25	70	℃
Storage Temperature	---	-30	25	80	℃
Operating Humidity	25℃	10%	60%	90%	RH
ESD	---	Contact: ±4KV Air: ±8KV			KV

3. Schematic


USB_OTG口
5V->3.3V(led)
Battery Charging/ Discharging
USB/Battery Power Switching
2s Press Power On/Off
RGB LED
1.5-inch Display Interface
1.75-inch Display Interface
1.85/2.1-inch Display Interface
TFT LCD BK
BOOT/RST Key
Audio
Microphone
6-Axis IMU
Clock Circuit
SD Card Interface
Female Header
ESP32S3N16R8
PCBA-VIEWE-Round-V1.1
PCBA-VIEWE-Round-V1.1
嘉立创EDA

4. dimension drawing



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4. Related materials

GitHub： VIEWESMART/ESP32-S3-Round-Dev-Board: The ESP32S3 multi-screen AI voice development board launched by VIEWE also includes an inertial sensor, a real-time clock, and a battery.

Gitee:

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