SMART DISPLAY MODULE SPECIFICATION

1.85 Inch AI Smart Display with Touch	
Model:	EMO-Dot
Version:	V1.0
Date:	2025-09-5

Customer Confirmation

Approved by	Notes

REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	20250905	Preliminary release	

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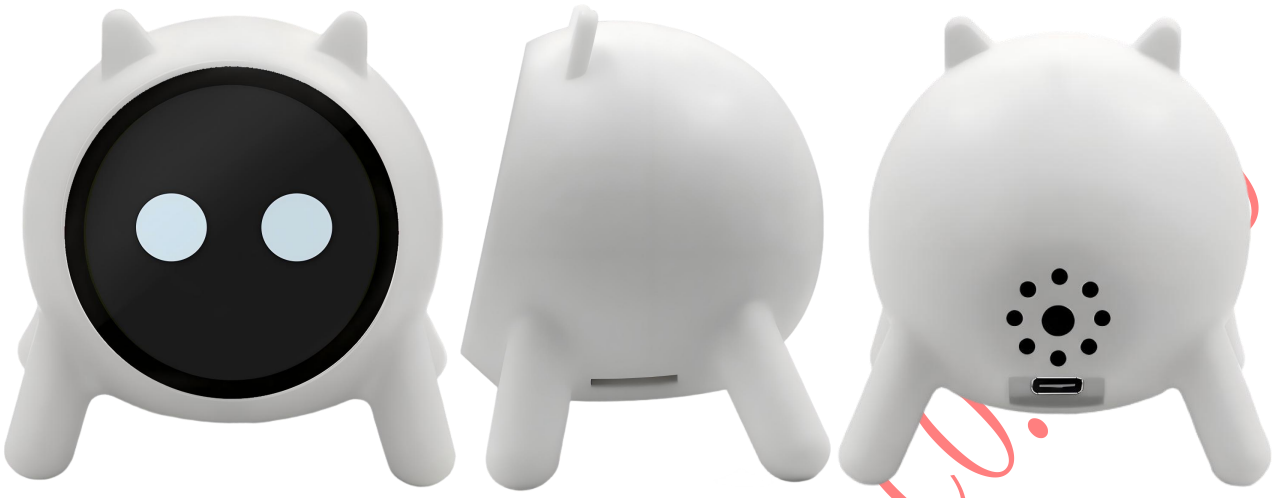
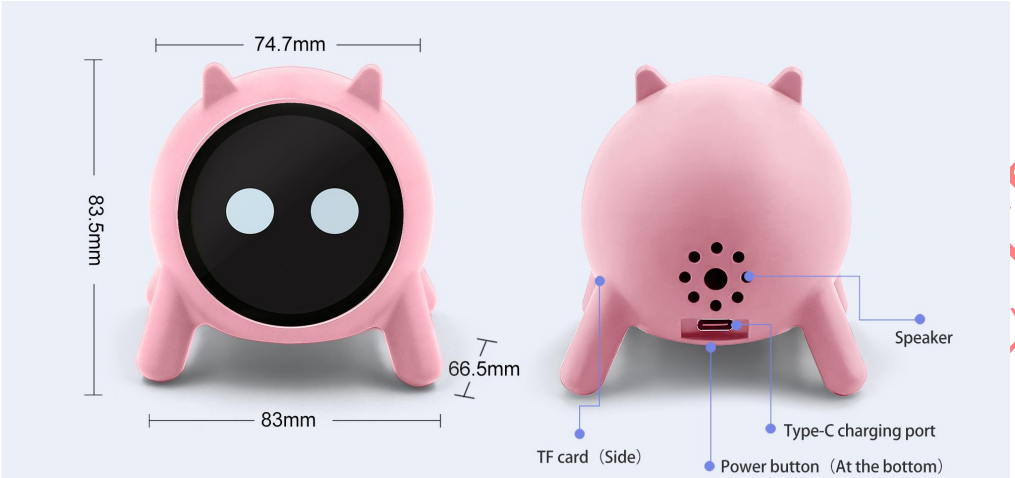
1. Product Overview



- ✧ **Main Control Chip**: ESP32-S3-N16R8 (dual-core MCU, integrated with Wi-Fi and Bluetooth BLE5.0, 240MHz main frequency, 520KB SRAM, 8MB PSRAM, 448KB ROM, 16MB Flash).
- ✧ **Color:**white\pink\blue\red
- ✧ **Display Screen:** 360 x 360 resolution, capacitive touch.
- ✧ **Module Functions:** Includes LCD display, backlight control, touchscreen control, I2S digital microphone, I2S digital-to-analog conversion, Power monitoring ,TF card interface, and wireless power supply circuit（Bottom magnetic base for wireless charging and UART communication）.
- ✧ **Development Environment:** Supports secondary development via Arduino IDE, ESP IDE, MicroPython, PlatformIO, etc., and UI development with LVGL.
- ✧ **Supports burning Xiaozhi firmware.Provide Xiaozhi source code**

2. Product information



Model	SFG-EM0-Dot-1.8	Color	White, red, light blue, pink
Screen size	1.85″ IPS R28mm	Chip	ESP32-S3
Resolution	360*360	Charging port	Support Type-C charging
Battery	1500mA	Memory	Support TF card
Product size	83mm * 66.5mm *83.5mm	Development	Secondary development
Microphone	Dual microphones		

2.1 Brie Information

1) Interaction Method: Touch
2) Shell Color: 3D printing white\pink\blue\red
3) Power: DC 5V, 1A
4) Operation Temperature：-20~60℃;Storage Temperature：-30~70℃
5) **Schematic get link**: schematic

System

1) OS: RTOS
2) CPU: ESP32-S3 240Mhz
3) RAM: 8MB
4) Flash: 16MB
5) Interface: UART/USB
6) Support 2.4GHz Wi-Fi、BLE 5、BLE Mesh

For more information on ESP32-S3-R8, please refer to the following link:datasheet_en.pdf(English) or datasheet_cn.pdf(Chinese)

Display

1) Model：UE018HV-RB39-A002
2) Display Size(Diagonal)：1.85
3) Resolution：360RGB x 360
4) Display Mode：IPS
5) Display Colors：262K
6) Interface：QSPI
7) Driver IC：77916
8) Luminance on surface：400
9) For more information：display datasheet and IC datasheet

Touch

10) Model：CST816S
11) Communication Mode：I2C
12) For more information：datasheet(English) or datasheet(Chinese)

PA

1) Model：NS4150B
2) For more information：datasheet

CODEC

1) Model：ES8311，ES7210
2) For more information：ES8311 datasheet, ES7210 datasheet

MIC

1) Model：ZTS6216
2) For more information：datasheet

IMU

1) Model：QMI8658A
2) For more information：datasheet

3. PIN Definition

Pin NO.	FUNCTION	Pin NO.	FUNCTION
GPIO0	BOOT	GPIO17	DVP_D3
GPIO1	IO1_I2C_SCL	GPIO18	DVP_D1
GPIO2	IO2_I2C_SDA	GPIO19	USB_DN
GPIO3	SD_DAT0	GPIO20	USB_DP
GPIO4	GPIO4	GPIO21	LCD_D0
GPIO5	GPIO5	GPIO38	I2S_DI
GPIO6	BATTERY_LEVEL	GPIO39	LCD_CS
GPIO7	GPIO7	GPIO40	TP_INT
GPIO8	I2S_MCK	GPIO41	LCD_SCK
GPIO9	SD_CLK	GPIO42	LCD_BL
GPIO10	SD_CMD	GPIO43	TXD0
GPIO11	I2S_MCK	GPIO44	RXD0
GPIO12	I2S_DO	GPIO45	LCD_D3
GPIO13	I2S_WS	GPIO46	PA_EN
GPIO14	I2S_BCK	GPIO47	LCD_D2
GPIO15	DVP_D4	GPIO48	LCD_D1
GPIO16	DVP_D0		

Boot　I2C　SD

I2S　USB　LCD

UART0　PA_EN　GPIO

DVP_CAM　BATTERY_LEVEL　TP_INT

4. Display Information

Features	Details	Unit
Display Size(Diagonal)	1.85	inch
LCD type	α-Si TFT	-
Display Mode	IPS / Transmissive / Normally Black	-
Resolution	360RGB x 360	-
Active Area	45.68(H)×45.68(V)	mm
Module Outline	48.08(H) ×49.95(V)×2.12(T)	mm
Display Colors	262K	-
Interface	QSPI	-
Driver IC	77916	-
TP Viewing Area	46.08(H)×46.08(V)	mm
TP Outline(assembly)	55(H) ×55(V)×0.7(T)	mm
Luminance on surface	400	cd/m²
View Direction	All	Best image
Contrast ratio	1200:1	
Color gamut	70%	
PPI	200	-
Window effect	No one black	-
Cover plate surface effect	No AF/AG	-
Operating Temperature	-20～70	ºC
Storage Temperature	-30～80	ºC
Weight	TBD	g
connector	OK-F302-39115	

5. Voltage & Current

Item	Conditions	Min	Typ	Max	Unit
Power Voltage	DC	-	5.0	-	V
Operation	VCC= +5V, Maximum backlight current	-	240	-	mA
Recommended power supply:5V 1A DC					

6. Detailed Information

GitHub: VIEWESMART/ESP32S3-EMO-Dot
Technical support: smartrd1@viewedisplay.com