華凌光電股份有限公司
WINSTAR WINSTAR Display Co., Ltd.

SMART DISPLAY SPECIFICATION



Think good, Do good, Be good !

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SPECIFICATION

CUSTOMER	WINSTAR
MODEL NO.	WL0F00043000WGFAASA01
CURRENT VERSION	0
RELEASE DATE	2026/01/09

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
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APPROVED BY: **(FOR CUSTOMER USE ONLY)**	

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RECORDS OF REVISION

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2026/01/09		First issue
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1. Smart Display Classification Information

W	L	0F	000430	00W	G	F	AA	S	A	01
1	2	3	4	5	6	7	8	9	10	11

1	W: WINSTAR products			
2	Type: L:Standard K:Customization			
3	Display Type:	Standard:	0H: Character STN 0X: Graphic STN (TAB/COF) 0F: TFT EH: Character OLED EX: OLED (TAB/COF)	0G: Graphic STN 0P: Graphic STN (COG) EG: Graphic OLED EP: OLED (COG)
		Customization:	DH: Character DN: Graphic ED: OLED	DG: Graphic STN 0J: TFT
4	Display size: (diagonal) / Display format: (resolution)	Character STN: Graphic STN:	e.g., 8x1: 000801 16x2: 001602 24x4: 002404 e.g., 128x64: 012864 320x240: 320240	
		TFT Size (inch):	000096-0.96” / 000350-3.5” / 000430-4.3” / 000570-5.7” 000700-7.0” / 000800-8.0” / 001020-10.2” / 001210-12.1” (The last two digits are two digits after the decimal point)	
		OLED:	e.g., 128x64: 012864 Customization: 0001XX	
5	Serial No:	0A1 ~ 0ZZ	Customization STN: 000	
6	Touch Panel Type:	N: Without TP T: RTP G: CTP		
7	Model Interface:	A: CAN B: Bluetooth C:Controller Specified D: RS485 E: RS232 F: USART	G: Logic I/O H: HDMI R: Memory Specified N: Ethernet J: Analog I/O K: USB	L: WIFI M: Zigbee X: Combined Y: Proprietary interface
8	Interface Serial No.:	AA ~ ZZ		
9	Control Category:	S: Smart Display E: Entry N: Non-specified		
10	Special Code:	A → Generic B → Industrial C →Automotive D →Medical K → With Housing		
11	Model code:	00 ~ ZZ		

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2. Summary

4.3-inch Smart Display (UART series) Features

1. **High-brightness Smart Display** with LED backlight (min. 650 / typ. 800 cd/m²), LED lifetime ≥ 50,000 hours).
2. **Capacitive Touch Panel (CTP)** for HMI interaction.
3. **Input supply voltage** 5-28 VDC (typ. 12 VDC).
4. **Integrated UART communication interface** (3.3V / 5V TTL levels).
5. **Proprietary UART protocol** (8-N-1), default baud rate at 115200 kbps, configurable to 38400 kbps, 19200 kbps, or 9600 kbps via GUI Builder. Full frame format and command definitions are provided in the *Smart Display UART User Guide*.
6. **On-board 16MB external flash memory** for storing fonts and images.
7. **On-board single-tone buzzer** for simple alarms.
8. **Development Support options:**
   - **GUI Builder:** Rapid UI creation using Winstar GUI Builder; the host controls UI behavior via UART commands and receives events (e.g., touch). Supported host platforms include PC, general-purpose MCUs, and Raspberry.
   - **STMicroelectronics's Software Ecosystem:** Supplied with **Initial Code Project** compatible with STM32CubeMX, STM32CubeIDE, STM32Cube Programmer and TouchGFX Designer, enabling rapid application development; hardware schematic is available under NDA to assist developers with system integration and secondary development.
9. **GPIO:** Provides 8-channels of bidirectional GPIO with 3.3V TTL logic levels. GPIO behavior can be configured via **GUI Builder** or fully controlled through the **Initial Code Project**.

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3. Product Information

General information

Item	Standard Value	Unit
Operating Voltage	5-28	VDC
Communication Interface	UART TTL 3.3V/5V	—
Protocol	Proprietary UART	—
MCU	STM32F750	—
Flash Memory	16	MB
LCD Display Size	4.3	inch
Dot Matrix	480 × (RGB) × 272	dot
Module Dimension	119.3(W) × 67.2(H) × 13(D)	mm
Active Area	95.04(W) × 53.856 (H)	mm
Dot Pitch	0.198(H) × 0.198(V)	mm
Brightness	Min: 650; Typ: 800	cd/m^2
LCD Type	TFT, Normally Black, Transmissive	
View Direction	80/80/80/80	
Aspect Ratio	16:9	
With / Without TP	With CTP	
Surface	Glare	

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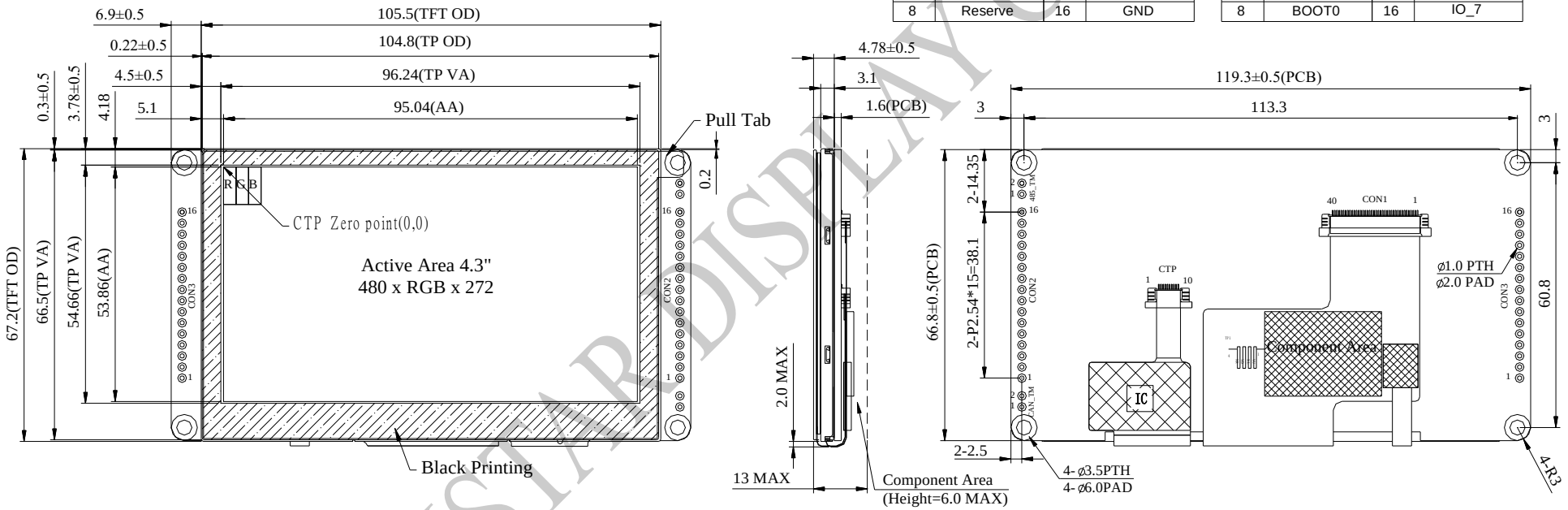
4. Contour Drawing

CON2

PIN	SYMBOL	PIN	SYMBOL
1	VIN	9	Reserve
2	GND	10	UART_RX
3	Reserve	11	UART_TX
4	Reserve	12	GND
5	GND	13	VIN
6	GND	14	Reserve
7	Reserve	15	Reserve
8	Reserve	16	GND

CON3

PIN	SYMBOL	PIN	SYMBOL
1	+3V3	9	IO_0
2	SWCLK	10	IO_1
3	GND	11	IO_2
4	SWDIO	12	IO_3
5	NRST	13	IO_4
6	GND	14	IO_5
7	WKUP	15	IO_6
8	BOOT0	16	IO_7



The non-specified tolerance of dimension is ±0.3mm.

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5. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-30	—	+80	℃
Storage Temperature	TST	-30	—	+80	℃
Supply Voltage	VIN	—	—	30	V

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above.

1. Temp. ≦60℃, 90% RH MAX. Temp.＞60℃, Absolute humidity shall be less than 90% RH at 60℃

6. Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	VCC	5	12	28	V	—
Supply Current	ICC	—	220	—	mA	—
I/O Pin Voltage	—	—	—	3.3	V	Note 1

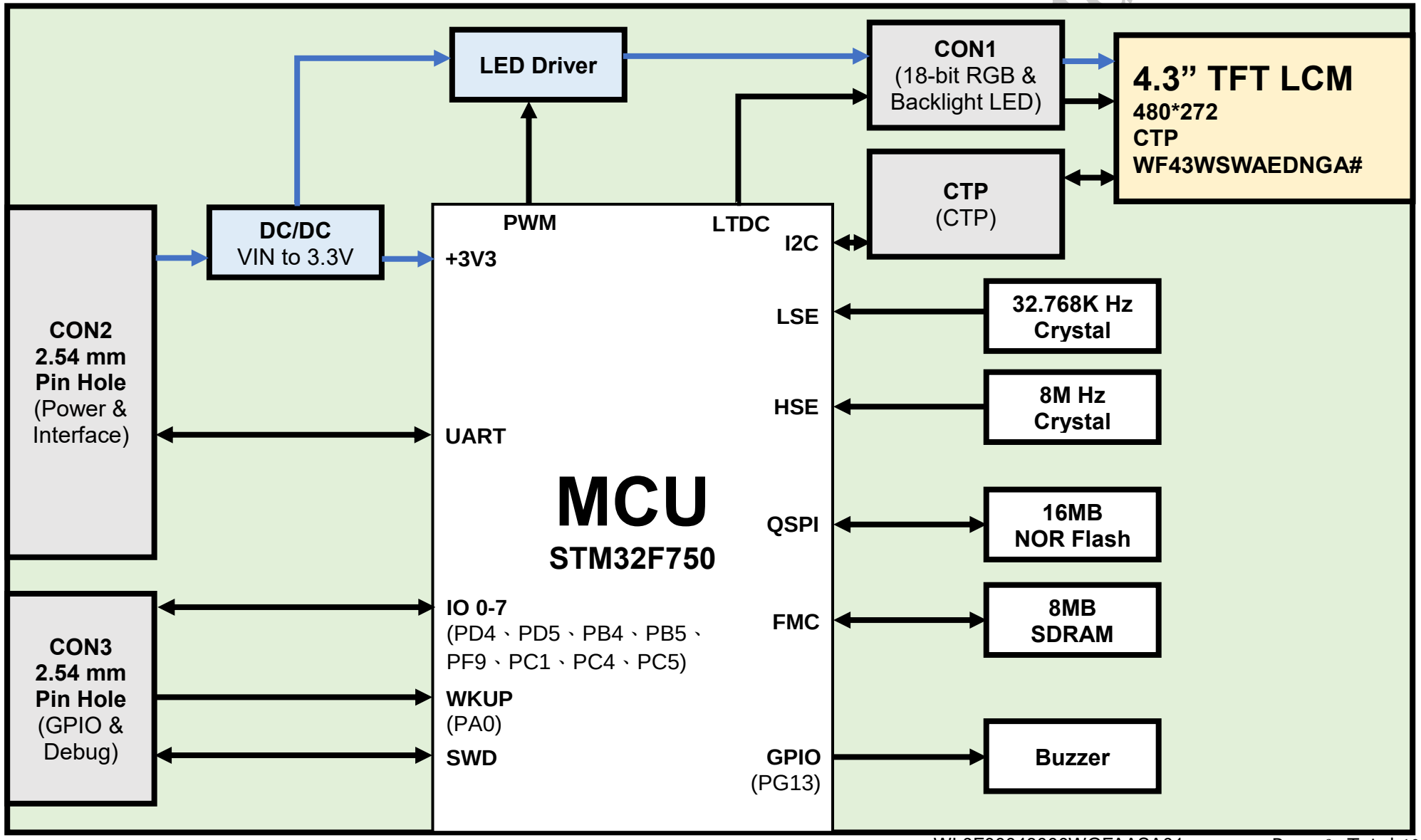
Note 1: Analog / ADC inputs range from 0 to 3.3V, exceed 3.3V may cause MCU damage. FT (5V tolerant) in digital mode; not 5V tolerant in analog mode.

7. BOM

Item	Description	Remark
LCM	WF43WSWAEDNGA#	
PCBA	SV10004R300WB00N0108	

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8. Block Diagram



9. Interface

CON2 Definition:

Pin	Symbol	Function	Remark
16	Reserve	–	–
15	Reserve	–	–
14	Reserve	–	–
13	VIN	Power supply input; 5V ~ 28V	Power
12	GND	Ground	Power
11	UART_TX	USART1_TX	I/O
10	UART_RX	USART1_RX	I/O
9	Reserve	–	–
8	Reserve	–	–
7	Reserve	–	–
6	Reserve	–	–
5	Reserve	–	–
4	Reserve	–	–
3	Reserve	–	–
2	Reserve	–	–
1	Reserve	–	–

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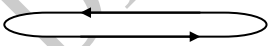
CON3 definition:

Pin	Symbol	Function	Remark
16	IO_7 (PC5)	GPIO, EVENTOUT, ADC12_IN15, SPDIFRX_IN3	I/O
15	IO_6 (PC4)	GPIO, EVENTOUT, ADC12_IN14, SPDIFRX_IN2	I/O
14	IO_5 (PC1)	GPIO, EVENTOUT, ADC123_IN11, WKUP3, RTC_TAMP3	I/O
13	IO_4 (PF9)	GPIO, EVENTOUT, TIM14_CH1, ADC3_IN7	I/O
12	IO_3 (PB5)	GPIO, EVENTOUT, TIM3_CH2	I/O
11	IO_2 (PB4)	GPIO, EVENTOUT, TIM3_CH1	I/O
10	IO_1 (PD5)	GPIO, EVENTOUT	I/O
9	IO_0 (PD4)	GPIO, EVENTOUT	I/O
8	BOOT0	L: Internal flash boot (Default) H: External flash boot	Input
7	WKUP (PA0)	GPIO, EVENTOUT, WKUP1 ADC123_IN0, TIM2_CH1, TIM5_CH1	Input
6	GND	Ground	Output
5	NRST	Reset	Input
4	SWDIO	Serial wire debug data input/output	I/O
3	GND	Ground	Power
2	SWCLK	Serial wire clock	Input
1	+3V3	Power input	Power

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10. Reliability

Content of Reliability Test (Wide temperature, -30℃~80℃)

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-30℃ 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	80℃ 240hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 240hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 40 ℃,90%RH max	60℃,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation -30℃ 25℃ 80℃  30min 5min 30min 1 cycle	-30℃/80℃ 10 cycles	—
Static electricity test	Endurance test applying the electric stress to the terminal.	VS= ±2V~±6KV (contact), ±2V~±8KV (air) RS=330Ω CS=150pF 10 times	—

Note1: No dew condensation to be observed.
Note2: The function test shall be conducted after 4 hours storage at the normal Temperature and humidity after remove from the test chamber.
Note3: The packing have to including into the vibration testing.

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TFT Display Inspection Specification: https://www.winstar.com.tw/technology/download.html
Precaution in use of TFT module:
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