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SMART DISPLAY SPECIFICATION



WINSTAR Display Co.,Ltd.
華凌光電股份有限公司



Winstar Display Co., LTD

華凌光電股份有限公司

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SPECIFICATION

CUSTOMER : _____

MODEL NO. : WL0F00039000FGFAASA00

APPROVED BY: (FOR CUSTOMER USE ONLY)	
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SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
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VERSION	DATE	REVISED PAGE NO.	SUMMARY
B	2025/0801	P6. P9.	Revise summary Revise Operating Temperature

TFT Display Inspection Specification: <https://www.winstar.com.tw/technology/download.html>

Precaution in use of TFT module: <https://www.winstar.com.tw/technology/download/declaration.html>
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RECORDS OF REVISION			DOC. FIRST ISSUE
VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2025/05/07		First issue
A	2025/05/28	P9.	Revise Storage Temperature
B	2025/0801	P6. P9.	Revise summary Revise Operating Temperature



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1. Smart Display Classification Information

W	L	0F	000390	00F	G	F	AA	S	A	00
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 OJ: TFT	
④	Display size: (diagonal) / Display format: (resolution)	Character STN:	e.g., 8x1: 000801 16x2: 001602 24x4: 002404		
		Graphic STN:	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			
⑪	Model code:	00 ~ ZZ			

2. Summary

3.9 Inch Smart Display Feature

1. Input voltage dynamic range 5V to 48V, typical voltage 5V.
2. Self-testing after booting function.
3. UART communication interface.
4. Supports Proprietary UART protocol, default baud rate at 115200Kbps.
5. Built in flash memory 16MB, store the font and Object Dictionary Data.
6. Support capacitive touch panel (CTP).
7. Build in buzzer and can be controlled by Master Device.
8. Demo set HOST can be used on multiple platforms, such as Computer (with USB to UART Dongle), MCU, Raspberry Pi.
9. GPIO PIN support

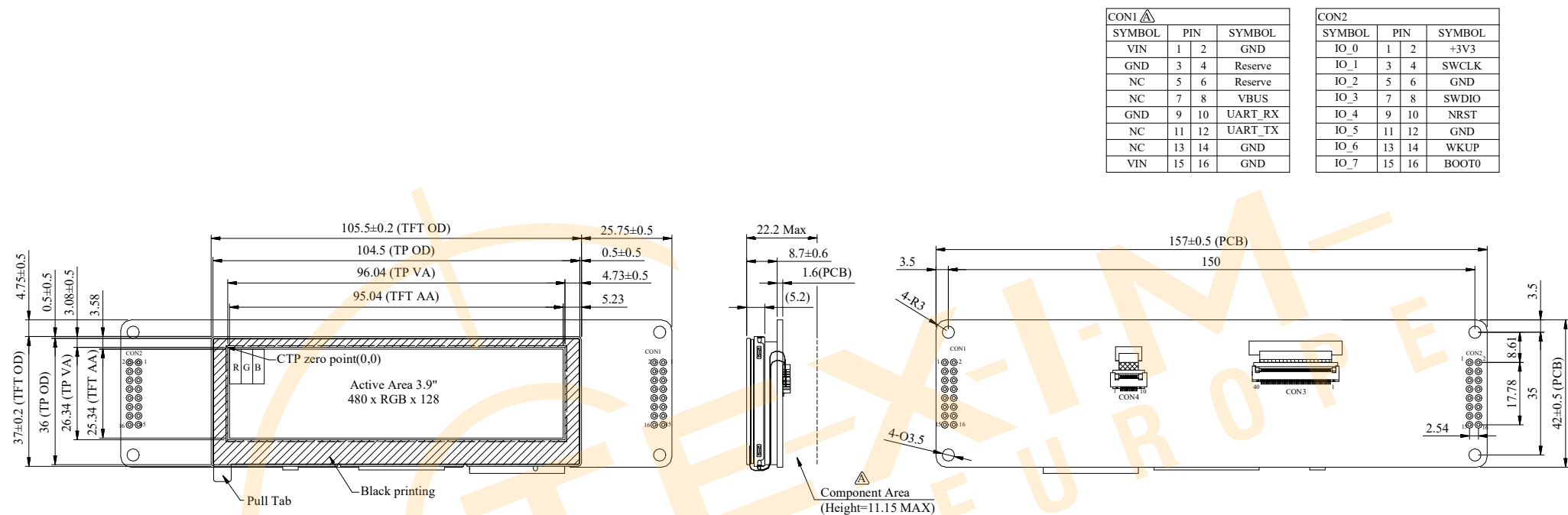


3 Product information

General information

Item	Standard Value	Unit
Operating voltage	5V~ 48V dynamic	Vdc
Communication Interface	UART	-
MCU	STM32F750	N/A
Flash Memory	16	MB
LCD display size	3.9	inch
Dot Matrix	480x128 x RGB (TFT)	dot
Module dimension	157.0(W) x 42.0(H) x 16	mm
Active area	95.04 x 25.34	mm
Pixel pitch	0.198 x 0.198	mm
Brightness	Min: 700; Typ: 800	cd/m ²
LCD type	TFT, Normally Black, Transmissive	
Viewing Angle	85/85/85/85	
Aspect Ratio	Bar Type	
With /Without TP	With CTP	
Surface	Glare	

4. Contour Drawing



The non-specified tolerance of dimension is $\pm 0.3\text{mm}$.

5. Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	TOP	-30	—	+80	°C
Storage Temperature	TST	-40	—	+90	°C

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above
1. Temp. $\leq 60^{\circ}\text{C}$, 90% RH MAX. Temp. $> 60^{\circ}\text{C}$, Absolute humidity shall be less than 90% RH at 60°C

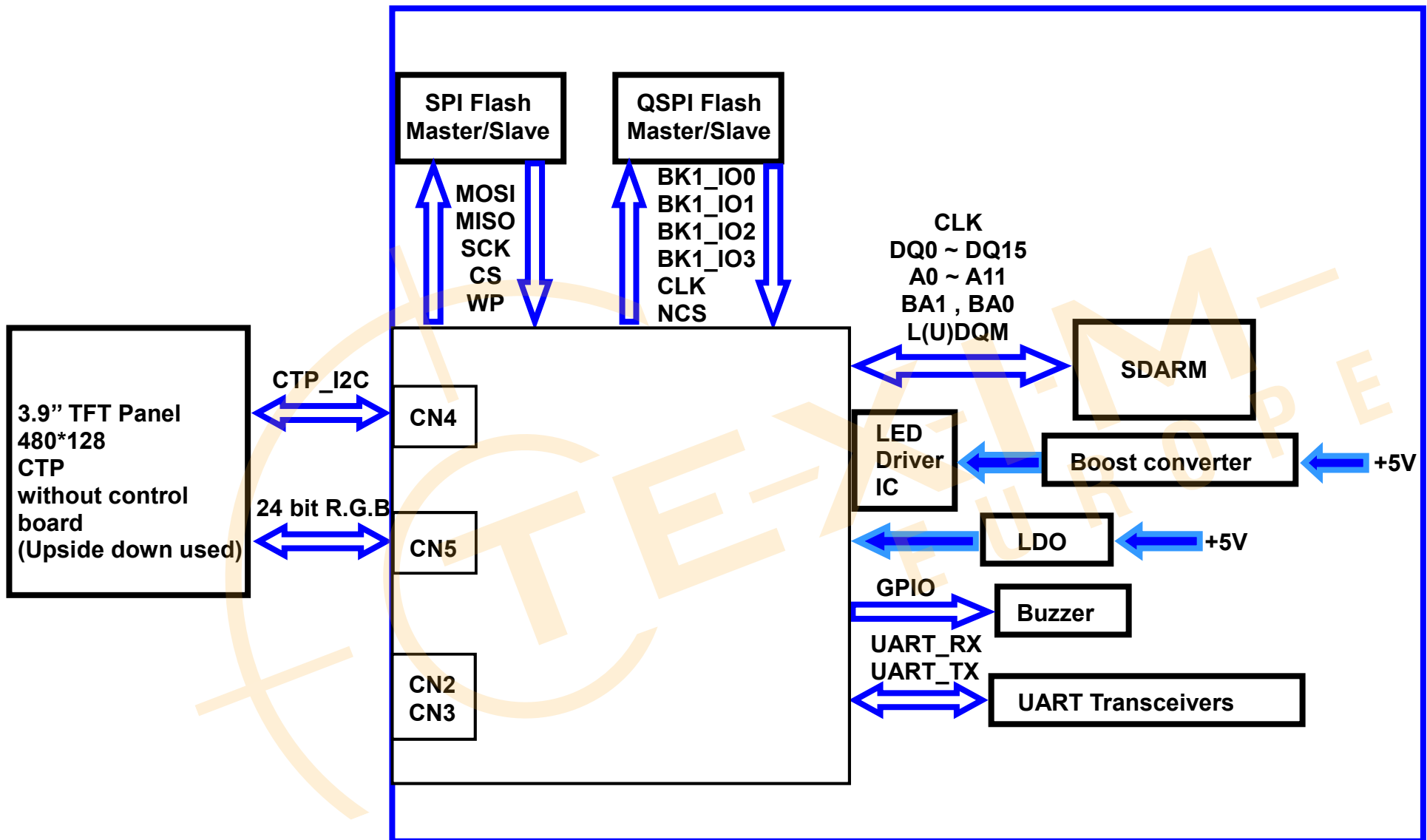
6. Electrical Characteristics

Item	Symbol	Min	Typ	Max	Unit	Remark
Supply Voltage For Analog	VCC	5	5	48	V	
Interface Operation Voltage	ICC	420	460	50	mA	

7. BOM

Item	Description	Remark
LCM	WF39FSWASDNG0#	
PCBA	SV10003R900FA00N0102	

8. Block diagram



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9.Interface

CN1 definition:

Pin	Symbol	Function	Remark
1	VIN	Power +5V~48V	Input
2	GND	Power supply GND input	GND
3	GND	Power supply GND input	GND
4	Reserve	Differential signal D-	I/O
5	Reserve	-	-
6	Reserve	Differential signal D+	I/O
7	Reserve	-	-
8	VBUS	5V output for UART interface	Output
9	GND	Power supply GND input	GND
10	UART_RX	UART RX interface	I/O
11	Reserve	Power supply GND input	GND
12	UART_TX	UART TX interface	I/O
13	Reserve	-	-
14	GND	UART5_TX	I/O
15	VIN	-	-
16	Reserve	UART5_RX	I/O

I/O allow below 3.3V input. If exceeding 3.3V may cause MCU damage.

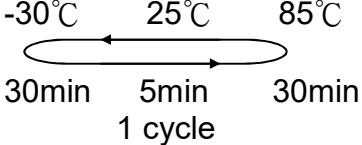
CN2 definition:

Pin	Symbol	Function	Remark
1	IO_0	UART6_TX	I/O
2	+3V3	Power supply 3V3 input	Input
3	IO_1	UART6_RX	I/O
4	SWCLK	CLK pin for JTAG interface	Input
5	IO_2	-	-
6	GND	Power supply GND input	GND
7	IO_3	-	-
8	SWDIO	Data pin for JTAG interface	I/O
9	IO_4	-	-
10	NRST	Reset pin for JTAG interface	Input
11	IO_5	-	-
12	GND	Wire trace Output for JTAG interface	I/O
13	IO_6	Power supply GND input	GND
14	WKUP	Power supply GND input	GND
15	IO_7	Power supply 5V output	Output
16	BOOT0	Buzz	Output

I/O allow below 3.3V input. If exceeding 3.3V may cause MCU damage.

10. Reliability

Content of Reliability Test (Wide temperature, -30°C~85°C)

Environmental Test			
Test Item	Content of Test	Test Condition	Note
High Temperature storage	Endurance test applying the high storage temperature for a long time.	90°C 200hrs	2
Low Temperature storage	Endurance test applying the low storage temperature for a long time.	-40°C 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.	85°C 200hrs	—
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30°C 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 40°C,90%RH max	60°C,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation 	-30°C/85°C 10 cycles	—
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=±4KV(contact), ±4KV(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.

11. Product inspection check list

Check samples by meter V_{IN} , I_{system}

Item	No 1	No 2	No 3	Note
V_{IN} (V)	5	5	5	
I_{system} (mA)	353	350	358	

Check sample Reliability Test

Item	Result	Note
Thermal shock		-30°C/80°C 10 cycles
High Temperature Operation		80°C 200hrs
Low Temperature Operation		-30°C 200hrs
Static electricity test		VS=±4KV(contact), ±4KV(air), RS=330Ω CS=150pF 10 times
Vibration test		Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes

- Prepare sets for testing

Disclaimer

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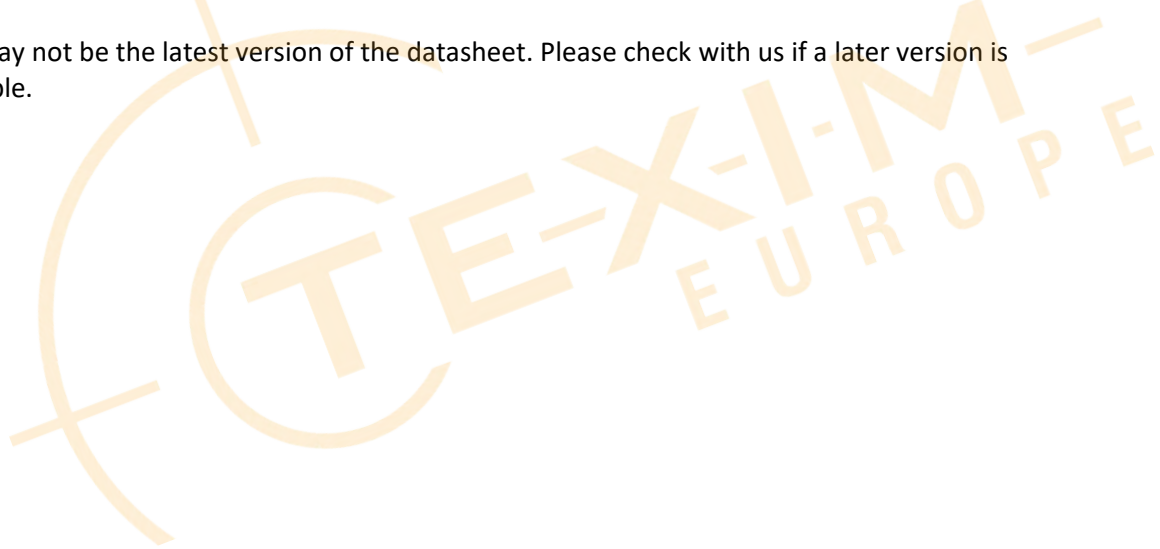
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Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time.

All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts.

Please contact us if you have any questions about the contents of the datasheet.

This may not be the latest version of the datasheet. Please check with us if a later version is available.





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