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. : WL0F00035000XGFAASA01

APPROVED BY: (FOR CUSTOMER USE ONLY)	

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY
		Leo Liu	Debby Hsu

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2025/07/25		First issue

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**
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1. Smart Display Classification Information

W	L	0F	000350	00X	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 P: RS422 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 ~ Z		
⑪	Model code:	00 ~ ZZ		

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2. Summary

3.5 Inch Smart Display Feature

1. Input voltage dynamic range 5V to 28V, typical voltage 12V.
2. Self-testing after booting function.
3. UART communication interface.
4. Supports Proprietary UART protocol, default baud rate at 115200Kbps.
5. Built in 16MB external flash memory to 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 (with PiCAN2).
9. GPIO PIN support
10. Polarity diode protection in power root.

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3. Product information

General information

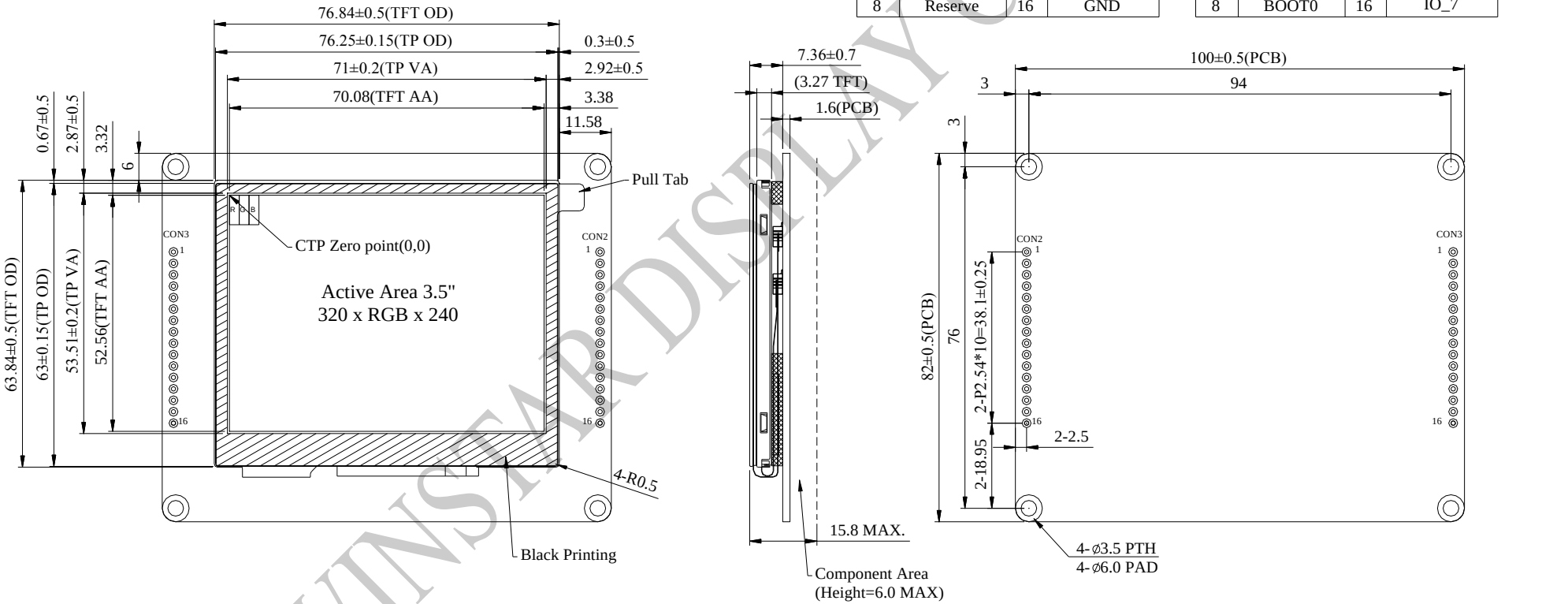
Item	Standard Value	Unit
Operating voltage	5 ~ 28	Vdc
Communication Interface	UART	--
MCU	STM32F750	N/A
Flash ROM	16	MB
SDRAM	8	MB
LCD display size	3.5	inch
Dot Matrix	320× 3(RGB) × 240	dot
Module dimension	100(W) x 82(H) x 13.2(D)	mm
Active area	70.08(W) x 52.56(H)	mm
Pixel pitch	0.219 x 0.219	mm
Brightness	Min: 800	cd/m^2
LCD type	TFT, Normally Black, Transmissive	
View Direction	80/80/80/80	
Aspect Ratio	4:3	
With /Without TP	With CTP	
Surface	Glare	

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4. Contour Drawing

CON2			
PIN	SYMBOL	PIN	SYMBOL
1	VIN	9	VBUS
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	Remark
Operating Temperature	TOP	-30	—	+80	℃	
Storage Temperature	TST	-30	—	+80	℃	

Note: Device is subject to be damaged permanently if stresses beyond those absolute maximum ratings listed above
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	Remark
Supply Voltage	VIN	5	12	28	V	
Supply Current	ICC	-	175	-	mA	
I/O pin Voltage	--	--	--	3.3	V	Note 1

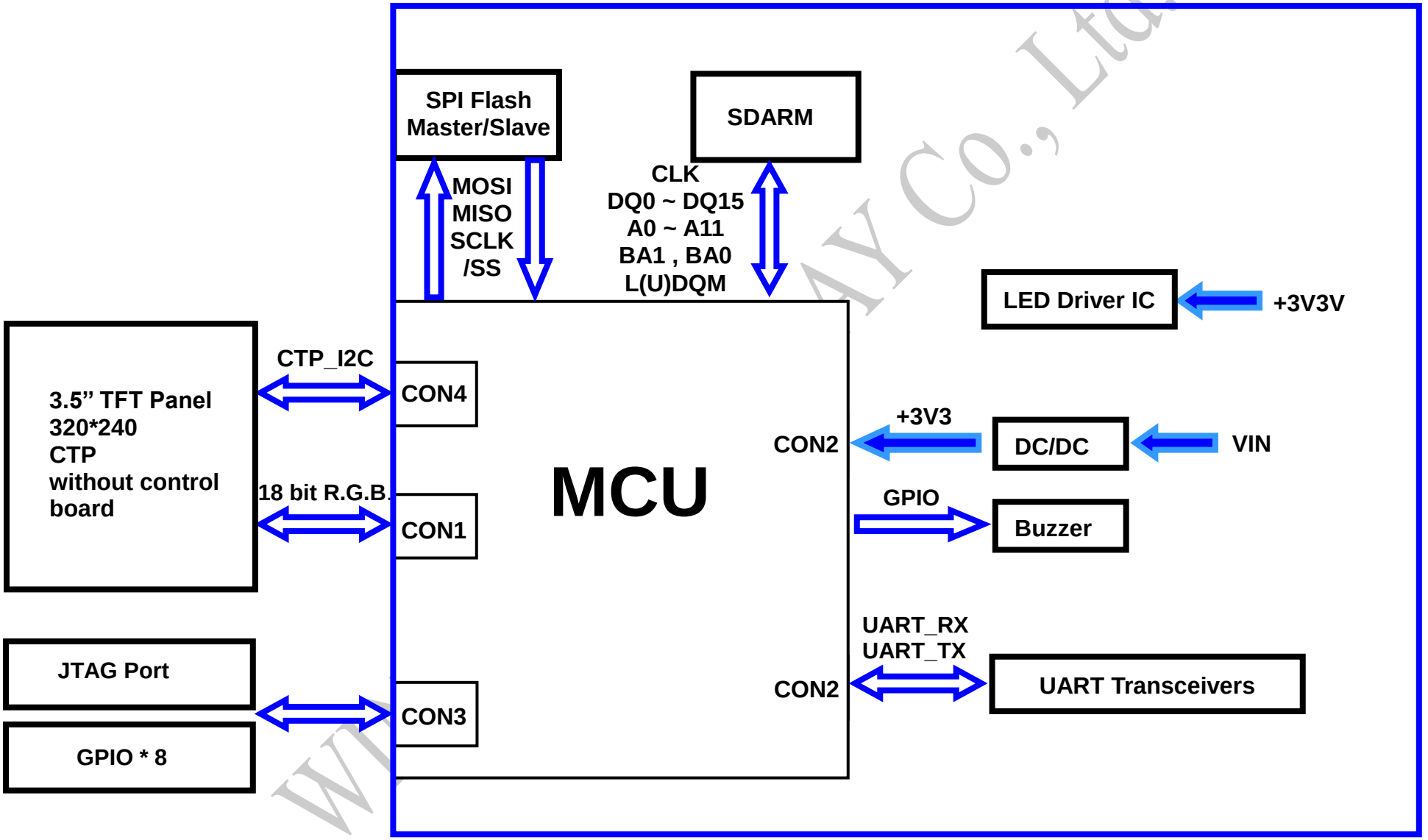
Note1: I/O allow below 3.3V input, If exceeding 3.3V may cause MCU damage.

7. BOM

Item	Description	Remark
LCM	WF35XSWACDNG0#	
PCBA	SV10003R500XA00N0106	

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8. Block diagram



WL0F00035000XGFAASA01

9. Interface

CON2 definition:

Pin	Symbol	Function	Remark
1	VIN	Power +5V~28V	Input
2	GND	Power GND	--
3~9	Reserve	-	--
10	UART_RX	UART RX interface	I/O
11	UART_TX	UART TX interface	I/O
12	GND	Power GND	Input
13~16	Reserve	-	--

CON3 definition:

Pin	Symbol	Function	Remark
1	+3V3	3.3V power for JTAG interface	Output
2	SWCLK	CLK pin for JTAG interface	Input
3	GND	GND for JTAG interface	--
4	SWDIO	Data pin for JTAG interface	I/O
5	NRST	Reset pin for JTAG interface	Input
6	GND	Power GND	--
7	WKUP	WKup,ADC,Timer,Event,I/O	Input
8	BOOT0	Lo: Internal flash boot (Default) Hi: External flash boot	Input
9	IO_0	ADC,DAC,Timer,Event,I/O @3.3V	I/O
10	IO_1	ADC,Timer,Event,I/O @3.3V	I/O
11	IO_2	ADC,Timer,Event,I/O @3.3V	I/O
12	IO_3	RST,Timer,Event,I/O @3.3V	I/O
13	IO_4	RST,Timer,Event,I/O @3.3V	I/O
14	IO_5	ADC,Timer,Event,I/O @3.3V	I/O
15	IO_6	RST,Timer,Event,I/O @3.3V	I/O
16	IO_7	RST,ADC,Event,I/O @3.3V	I/O

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

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10. Reliability

Content of Reliability Test

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℃ 200hrs	___
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-30℃ 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,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	___
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=±2kV~±6kV(contact),±2kV~±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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11. Product inspection check list

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

Item	No 1	No 2	No 3	Note
V_{IN} (V)	12	12	12	
I_{System} (mA)	173	171	170	

Check sample Reliability Test

Item	Result	Note
Thermal shock	PASS	-30℃/80℃ 20 cycles
High Temperature Operation	PASS	80℃ 200hrs
Low Temperature Operation	PASS	-30℃ 200hrs
High Temperature/ Humidity Operation	PASS	60℃,90%RH 96hrs
Static electricity test	PASS	VS=±2KV~±6KV(contact),±2KV~±8KV (air), RS=330Ω CS=150pF 10 times
Vibration test	PASS	Total fixed amplitude : 1.5mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes

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