

# **TFT Module Specification**

## **MODEL: UC-101ZIEBCBD0-S**

- < ◆ > PRELIMINARY SPECIFICATION
- <  $\diamond$  > APPROVAL SPECIFICATION

	CUSTOMER
	APPROVED BY
DATE:	

DESIGNED	CHECKED	APPROVED
RD	PM	批准
2024.07.10	2024.07.10	2024.07.10
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### **RECORD OF REVISION**

Version	Revised Date	Page	Content
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#### 1. GENERAL DESCRIPTION

### 1.1 Description

The specification is model UC-101ZIEBCBD0-S is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel, a driving circuit, a backlight system and projected capacitive touch panel. This TFT LCD has a 10.1 (16:10) inch diagonally measured active display area with WXGA (1280 horizontal by 800 vertical pixels) resolution.

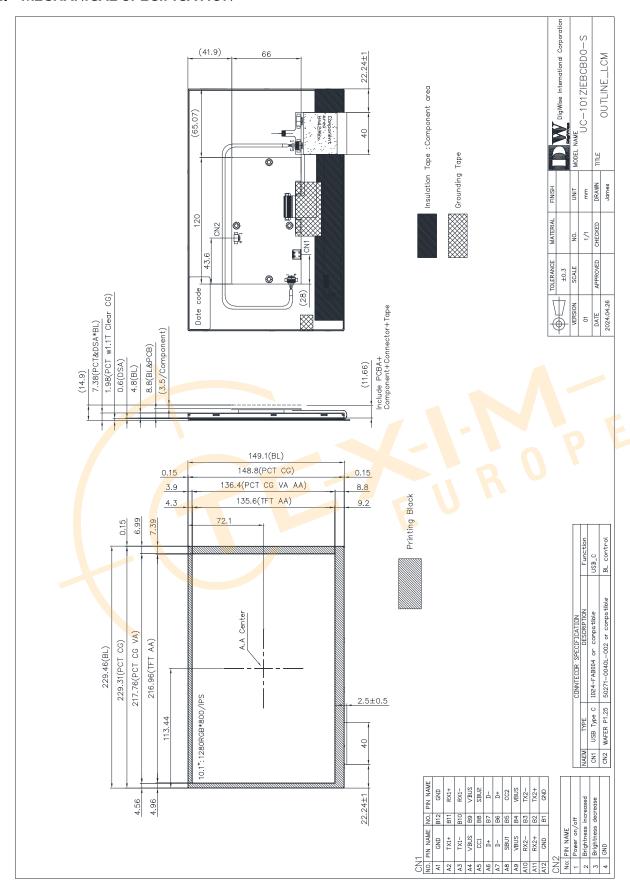
- ◆ Supports VESA DisplayPort Alt. Mode 1.0a
- DisplayPort 1.3
- Build-in OSD function.

#### 1.2 Features:

No.	ltem	Specification	Unit
1	Panel Size	10.1"	Inch
2	Number of Pixels	1280 (W) x RGB x 800 (H)	Pixels
3	Active Area	216.96 (W) × 1 <mark>35</mark> .6 (H)	mm
4	Pixel Pitch	0.1695 (W) x 0.1695 (H)	mm
5	Outline Dimension	229.46 (W) × 149.1 (H) × 14.9 (T)	mm
6	Number of Colors	16.7M	
7	Display Mode IPS / Normally Black / Transmissive		
8	Viewing Direction	Free direction	
9	Display Format	RGB vertical stripe	
10	Surface Treatment	Surface Treatment Clear (7H)	
11	Contrast Ratio	900 (Typ.)	
12	Luminance (cd/m^2)	600 (Typ.)	cd/m2
13	Interface	TYPE-C (5V/3A)	
14	Backlight	White LED	
15	Operation Temperature	0 ~ 70	°C
16	Storage Temperature	-30 ~ 80	°C
17	Weight	TBD	g



### 2. MECHANICAL SPECIFICATION





### 3. PIN DESCRIPTION

### 3.1 TYPE-C CN1(Connector Part No: 1024-FAB004 or compatible)

Pin No.	Symbol	1/0	Function	Note
A1	GND	Р	Ground	
A2	TX1+	1/0	High speed data path TX for DP Alt Mode.	
A3	TX1-	1/0	Thigh speed data path 1x for Dr Att Mode.	
A4	VBUS	Р	Cable bus power +5V only.	
A5	CC1	1/0	Type-C Port Configuration Channel	
A6	D+	1/0	USB 2.0 Interface.	
Α7	D-	1/0	OSD 2.0 litterrace.	
A8	SBU1	1/0	USB Type-C Sideband Use 1	
Α9	VBUS	Р	Cable bus power +5V only.	
A10	RX2-	1/0	High speed data path RX for DP Alt Mode.	
A11	RX2+	1/0	Thigh speed data path to the Att mode.	
A12	GND	Р	Ground	
B1	GND	Р	Ground	
B2	TX2+	1/0	High speed data path TX for DP Alt Mode.	
В3	TX2-	1/0	Thigh speed data path 1% for bil Att Mode.	
B4	VBUS	Р	Cable bus power +5V only.	
B5	CC2	1/0	Type-C Port Confi <mark>guration Channe</mark> l	
В6	D+	1/0	USB 2.0 Interface.	
В7	D-	1/0	OSD 2.0 IIIterrace.	
B8	SBU2	1/0	USB Type-C Sideband Use 2	
В9	VBUS	Р	Cable bus power +5V only.	
B10	RX1-	1/0	High speed data path RX for DP Alt Mode.	
B11	RX1+	1/0	Thigh speed data path NA 101 Dr Att Mode.	
B12	GND	Р	Ground	

### 3.2 **key Pad CN2** (50271-0040L-002 or compatible)

Pin	Symbol	1/0	Function	Note
1	Power on/off	I	Power On/Off control.	
2	Brightness increased	I	Brightness Increase.	
3	Brightness decrease	I	Brightness decrease.	
4	GND	Р	Ground	



### 4. ABSOLUTE MAXIMUM RATINGS

### 4.1 Electrical Absolute Rating

### 4.1.1 TFT LCD Module

ltom	Symbol	Va	lues	Unit	Note
ltem	Symbol	Min	Max.		
Power supply voltage	VBUS	-0.3	6	٧	

### 4.1.2 Environment Absolute Rating

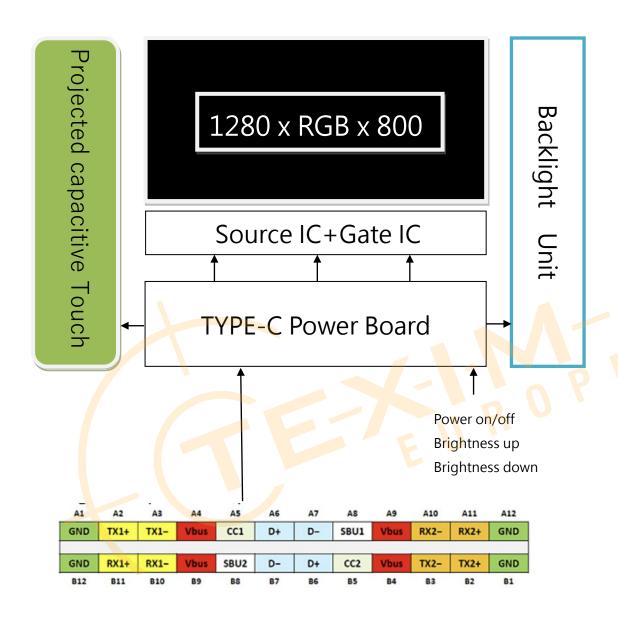
ltom	Symbol		Values	Unit	Note	
Item	Symbol	Min	Тур	Max.	Ullit	Note
Operating Temperature	Тора	0		70	°C	Ambient
Storage Temperature	Tstg	-30		80	°C	temperature





### 5. BLOCK DIAGRAM

#### 5.1 TFT LCD Module





#### 6. ELECTRICAL CHARACTERISTICS

#### 6.1 TFT LCD Module

Itom	Cumbal		Values	Unit	Note	
ltem	Symbol	Min.	Тур.	Max.	Ullit	Note
Supply Voltage	VBUS	-	5.0	5.5	٧	
required current	I <sub>BUS</sub>	-	1.09	1.15	Α	(1)
LED life time	-	-	50000	-	Hr	(2)

Note 1: condition: projected capacitive touch panel active, and under brightness 100%

Note 2: The "LED life time" is defined as the module brightness decrease to 50% original brightness that the ambient temperature is  $25^{\circ}$ C 60% RH.

#### 6.2 OSD Function

Built-in OSD function, connected to the external key pad to CN2, can control the screen switch On/Off and backlight brightness control.

The adjusted brightness level will be automatically memorized.





### 7. PROJECTED CAPACITIVE TOUCH PANEL

### 7.1 Main Feature

Item	Specification	Unit
Screen Size	10.1 inch	Diagonal
Туре	Transparent Type Projected Capacitive	
Input Mode	Human's Finger	
Finger	10	
Interface	USB	
Cover glass pencil-hardness	7H	
Response time	25	ms
Driver IC	ILI2511	



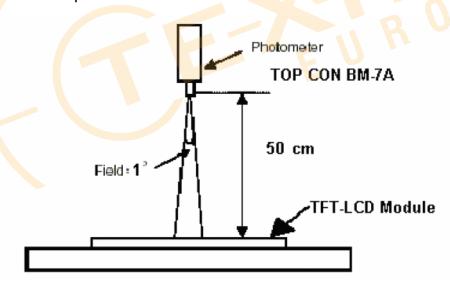


#### 8. OPTICAL CHARACTERISTICS

Item		Symbol	Condition	Min.	Тур.	Max.	Unit
Brightness				480	600		cd/m2
Unifor	mity	B-uni	Note1,	70	75	-	%
Contrast	Ratio	CR	Note 3,	400	600		
Dospons	Timo	Tr	$(\theta = 0^\circ,$ Normal		4	8	ms
Response	Response Time		Viewing		12	24	ms
Color	14/L **	Wx	Angle)	0.260	0.310	0.360	
Chromaticity	White	Wy		0.280	0.330	0.380	
	Horizontal	$\theta$ x+		80	85		
View angle	HOMEOME	$\theta$ x-	Center	80	85		
	Vertical	θ <b>Y</b> +	CR≥10	80	85		
	Vertical	<i>θ</i> <b>Y</b> -		80	85		

Note: The following optical specifications shall be measured in a darkroom or equivalent state(ambient luminance  $\leq 1$  lux, and at room temperature). The operation temperature is  $25^{\circ}C\pm2^{\circ}C$ . The measurement method is shown in Note1.

Note 1: The method of optical measurement:



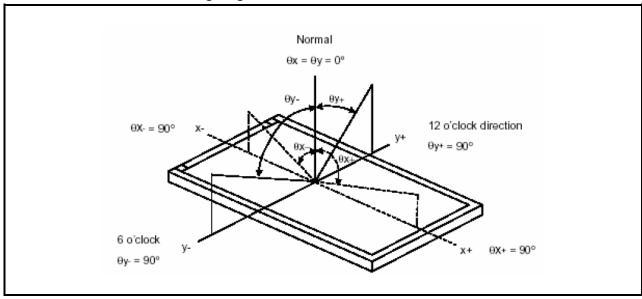
Note 2: Measured at the center area of the panel and at the viewing angle of the  $\theta x = \theta y$ =0°

Note 3: Definition of Contrast Ratio (CR):

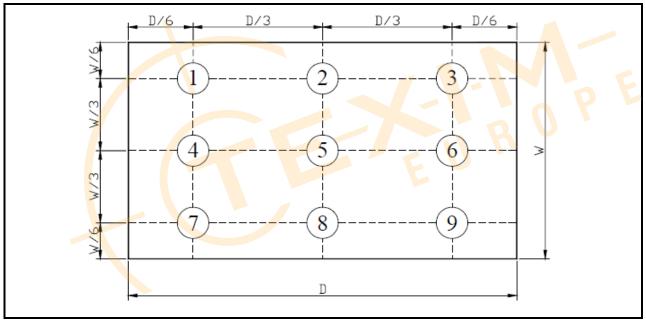
CR = Luminance with all pixels in white state ÷ Luminance with all pixels in Black state



Note 4: Definition of Viewing Angle:



Note 5: Definition of Brightness Uniformity (B-uni):

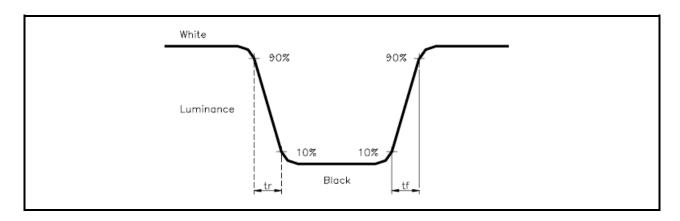


B-uni = (Minimum luminance of 9 points÷Maximum luminance of 9points)X100%



### Note 6: Definition of Response Time:

The Response Time is set initially by defining the "Rising Time (Tr)" and the "Falling Time (Tf)" respectively. Tr and Tf are defined as following figure



### Note 7: Definition of Chromaticity:

The color coordinates (Wx,Wy),(Rx,Ry),(Gx,Gy),and (Bx,By) are obtained with all pixels in the viewing field at white, red, green, and blue states, respectively.



#### 9. RELIABILITY

#### 9.1 Test Condition

**9.1.1** Temperature and Humidity(Ambient Temperature)

Temperature : 25  $\pm$  5°C

Humidity:  $65 \pm 5\%$ 

### **9.1.2** Operation

Unless specified otherwise, test will be conducted under function state.

#### **9.1.3** Container

Unless specified otherwise, vibration test will be conducted to the product itself without putting it in a container.

### **9.1.4** Test Frequency

In case of related to deterioration such as shock test. It will be conducted only once.

#### 9.2 TESTS

No.	ITEM	CONDITION CRITERION		
1	High Temperature Storage	80°C, 120 hrs		
2	Low Temperature Storage	-30°C, 120 hrs		
3	Hi <mark>g</mark> h Temper <mark>at</mark> ure Op <mark>era</mark> ting	70°C, 120 hrs		
4	Low Temperature Operating	0°C, 120 hrs		
5	High Temperature/Humidity Non-Operating	50°C, 90%RH, 120 hrs		
6	Temperature Shock Non-Operating	$-30^{\circ}\text{C} \longleftrightarrow 70^{\circ}\text{C}$ (0.5hr each), 25 cycles		
7	Vibration Test Non-Operating	Frequency:0 ~ 55 Hz Amplitude:1.5 mm Sweep Time:11min Test Period:6 Cycles for each Direction of X,Y,Z		
9	Electro-static Discharge Non-Operating	150pF,330Ω Air:± 8KV;Contact: ±4KV 10 times/point;4 points/panel face		

Note1: The test sample have recovery time for 24 hours at room temperature before the function check. In the standard conditions, there is no any touch panel function NG issue occurred.



### 9.3 JUDGMENT STANDARD

The judgment of the above test should be made as follow:

Pass: Normal display image with no obvious non-uniformity and no line defect. Partial transformation of the module parts should be ignored.

Fail: No display image, obvious non-uniformity, or line defects.





### 9.4 INCOMING INSPECTION STANDARDS

No.	Parameter		Criteria					
		Display function: No Display malfunction (Major) Contrast ratio (Black, White): Does not meet specified range in the spec. (Major) (Note:3)						
							ıht.	
		Line Defect: No obvious Vertical and Horizontal line defect in bright dark and colored. (Major) (Note:1)						
		Point Defect : Active area ≤ 5 dots (Minor) (Note:1)						
			Acceptable r	<del> </del>	•	7		
		Item	Active A		Total			
		Bright	2			+		
		Dark	4		5			
		Daik	4					
_	_ ·							
1	Operating	Name coniferencia a Visible	a there was E0/	ND files /	Minar			
		Non-uniformity: Visibl Foreign material in B				11.\	$\dashv$	
				г.		<del>*</del> L)		
		Zone	Acceptable	Class Of	<i>P</i>	\QL		
		Dimension	number	Defect	s L	evel		
		D> 0.5	0					
		0.3 < D ≤ 0.5	5	Minor	.	1.5		
		D ≤ 0.3	*	1				
		D = (Long + SI	nort) / 2 *:	Disregard				
		Foreign Material in L	ine or spiral s	shape (W≤	1/4L) (Not	e: 4)		
			Zone	cceptable	Class	AQL	1	
		I (man)		number	Of	Level		
		L (mm) W(mi	m) V>0.1		Defects			
			< W≤0.1	5	Minor	1.5		
			/≤0.03	*	IVIII IOI	1.5		
				Disregard				
		Dimension: Outline (Major)						
		Bezel appearance: ι		r)				
		Scratch on the polar						
			Zone Accepta	Clas		AQL		
		L (mm) W(mm	ble number	Of Defe	ects	Level		
		L (mm) W(mm		Mino		1.5		
		L ≤ 3 W≤0		IVIIIIO	"	1.5		
		L 2 3   VV 2 (	J.1 3					
	External Inspection	L:Length W:	Width *: D	isregard				
2	(non-operating)	Dent or bubble on the						
	' ' '	Zone	Acceptable	Ćlass	AQL	7		
			number	Of	Level			
		Dimension		Defects		4		
		D≤0.3	* 3	Minor	1.5			
		D≤0.5	<u> </u>			_		
		D = (Long + Sho	rt) / 2	* : Disre	egard			
				. 5.01	- 3			
1	I							



			Definition
Class of	Major		It is a defect that is likely to result in failure or to reduce materially the
defects	Major		usability of the product for the intended function.
defects	Minon	IAOL 1.5%	It is a defect that will not result in functioning problem with deviation
	Minor		classified.

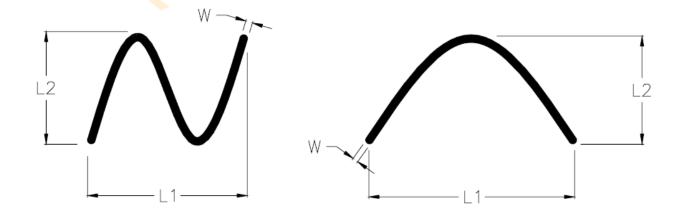
#### Note1:

- (a)Bright point defect is defined as point defect of R,G,B with area >1/2 pixel respectively (b)Dark point defect is defined as visible in full white pattern.
- (c)Definition of distribution of point defect is as follows:
  - -minimum separation between dark point defects should be larger than 5mm.
  - -minimum separation between bright point defects should be larger than 5mm.
- (d)Definition of joined bright point defect and joined dark point defect are as follows:
  - -Two or more joined bright point defects must be nil.
  - -Three joined dark point defects must be nil.
  - -Coupling of one dark and one bright point in junction is counted as one dark and bright spot with 1 pair maximum.
  - -Two Joined dark point is counted as two dark points with 2 pair maximum.

Note2: The external inspection should be conducted at the distance 30± 5cm between the eyes of inspector and the panel.

Note3: Luminance measurement for contrast ratio is at the distance 50± 5cm between the detective head and the panel with ambient luminance less than 1 lux. Contrast ratio is obtained at optimum view angle.

Note4: W-Width in mm, L-length of Max.(L1,L2) in mm.





### 9.5 Sampling Condition

Unless otherwise agree in written, the sampling inspection shall be applied to the incoming inspection of customer.

Lot size: Quantity of shipment lot per model.

Sampling type: normal inspection, single sampling

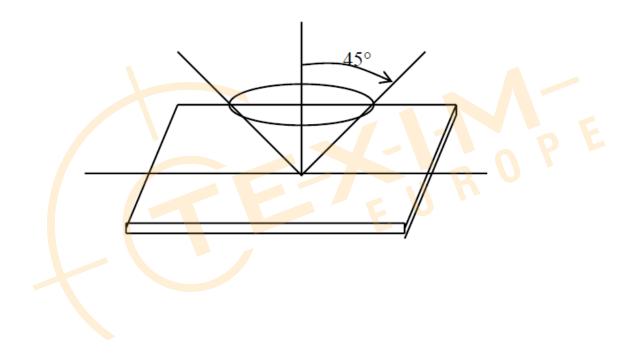
Sampling table: MIL-STD-105E Inspection level: Level II

### 9.6 Inspection conditions

The LCD shall be inspected under 40W white fluorescent light.

 $\theta \leq 45^{\circ}$  inspection under non-operating condition.

 $\theta \leq 5^{\circ}$  inspection under operating condition





#### 10. PRECAUTION RELATING PRODUCT HANDLING

#### **10.1 SAFETY**

- 10.1.1 If the LCD panel breaks, be careful not to get the liquid crystal to touch your skin.
- 10.1.2 If the liquid crystal touches your skin or clothes, please wash it off immediately by using soap and water.

#### 10.2 HANDLING

- 10.2.1 Avoid any strong mechanical shock which can break the glass.
- 10.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module, be sure to ground your body and any electrical equipment you may be using.
- 10.2.3 Do not remove the panel or frame from the module.
- 10.2.4 The polarizing plate of the display is very fragile. So, please handle it very carefully, Do not touch, push or rub the exposed polarizing with anything harder than an HB pencil lead (glass, tweezers, etc.)
- 10.2.5 Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the surface of plate.
- 10.2.6 Do not touch the display area with bare hands, this will stain the display area.
- 10.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.
- 10.2.8 To control temperature and time of soldering is 280 ± 10 °C and 3-5 sec.
- 10.2.9 To avoid liquid (include organic solvent) stained on LCM.

### 10.3 STORAGE

- 10.3.1 Store the panel or module in a dark place where the temperature is  $25^{\circ}$ C ±  $5^{\circ}$ C and the humidity is below 65% RH.
- 10.3.2 Do not place the module near organics solvents or corrosive gases.
- 10.3.3 Do not crush, shake, or jolt the module.

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

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