



## TFT MODULE SPECIFICATION

### **RVT121HVUNWC00-B**

HB, IPS, USB C 12.1" LCD TFT display datasheet

Rev. 1.1

2025-11-14

---

**Riverdi Sp. z o.o.**

Nowy Swiat 36  
80-299 Gdansk, Poland  
VAT ID: PL5842767153  
Registration number (KRS): 0000923967

**+48 587 703 116**

Office hours: 9:00 to 17:30 CET (Mon-Fri)

**[contact@riverdi.com](mailto:contact@riverdi.com)**

**[riverdi.com](https://riverdi.com)**

ITEM	CONTENTS	UNIT
LCD Type	TFT/Transmissive/Normally Black/IPS	/
Size	12.1	Inch
Viewing Direction	Free	/
Outside Dimensions (W x H x D)	312.12 x 204.20 x 14.52	mm
Active Area (W x H)	261.12 x 163.20	mm
Pixel Pitch (W x H)	0.1695 x 0.1695	mm
Resolution	1280 (RGB) x 800	/
Brightness	850	cd/m <sup>2</sup>
Color Depth	16.7 M	/
Pixel Arrangement	RGB Vertical Stripe	/
Controller of the main board	LT7911D	/
Interface	USB-C	/
With/Without Touch	With Projected Capacitive Touch Panel	/
CTP Driver	ILI2511	/
Touch Panel Interface	USB-C	/
Power Supply	USB-C (5.0V)	V
Weight	914	g

**Note 1.** RoHS3 compliant

**Note 2.** LCM weight tolerance: ± 5%.

## 1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2025-05-23	Initial release	
1.1	2025-11-14	PCBA position changed	

## 2. CONTENTS

1.	REVISION RECORD .....	3
2.	CONTENTS .....	4
3.	MODULE CLASSIFICATION INFORMATION .....	5
4.	ASSEMBLY .....	6
4.1	uxTouch Assembly .....	6
5.	MODULE DRAWING .....	7
6.	ABSOLUTE MAXIMUM RATINGS .....	8
7.	ELECTRICAL CHARACTERISTICS .....	8
8.	BACKLIGHT ELECTRICAL CHARACTERISTICS .....	9
9.	ELECTRO-OPTICAL CHARACTERISTICS .....	10
10.	INTERFACES DESCRIPTION .....	13
10.1	PCB overview .....	13
10.2	USB interface (P9, P10) .....	14
10.3	Video/Touch panel interface - USB-C .....	14
10.4	External keyboard - P6 .....	15
10.5	Backlight PWM & Power - P5 .....	15
10.6	Speaker - P4 .....	16
10.7	I2C - P11, P12 .....	16
11.	DISPLAY SPECIFICATION .....	16
12.	CaPACITIVE TOUCH SCREEN PANEL SPECIFICATIONS .....	17
12.1	Mechanical characteristics .....	17
12.2	Electrical characteristics .....	17
13.	INSPECTION .....	18
13.1	Inspection condition .....	18
13.2	Inspection standard .....	19
14.	RELIABILITY TEST .....	21
15.	LEGAL INFORMATION .....	22
16.	CONTACT .....	23

### 3. MODULE CLASSIFICATION INFORMATION

RV	T	121	H	V	U	N	W	C	00	B
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.

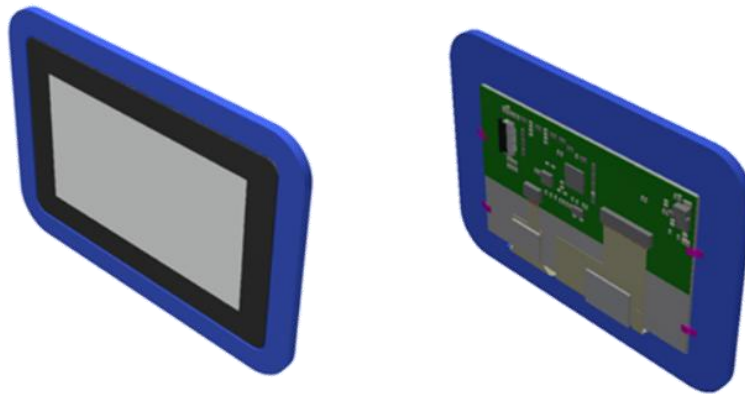
NO.	PARAMETER	SYMBOL
1.	BRAND	RV – Riverdi
2.	PRODUCT TYPE	T – TFT Standard
3.	DISPLAY SIZE	121 – 12.1”
4.	MODEL SERIAL NO.	H – High Brightness, IPS
5.	RESOLUTION	V – 1280 x 800 px
6.	INTERFACE	U – USB C
7.	FRAME	N – Without Mounting Metal Frame
8.	BACKLIGHT TYPE	W – LED White
9.	TOUCH PANEL	C – uxTouch
10.	VERSION	00 – version
11.	BOONDING TECHNOLOGY	B – Optical bonding

## 4. ASSEMBLY

### 4.1 uxTouch Assembly

uxTouch are LCD TFT displays with specially designed projected capacitive touch panels. uxTouch display can be mounted without any additional holes in the housing. Our standard uxTouch displays include double-sided adhesive tape (DST) to stick TFT easily to the housing.

uxTouch models with double-side adhesive tape can be mounted by fastening the glass to the housing.



*Figure 1. General view of the module*



## 6. ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for Module	V <sub>DD</sub>	-0.5	5.5	V
Operating Temperature	T <sub>OP</sub>	-20	70	°C
Storage Temperature	T <sub>ST</sub>	-30	80	°C
Storage Humidity (@ 25 ± 5°C)	H <sub>ST</sub>	10	-	% RH
Operating Ambient Humidity (@ 25 ± 5°C)	H <sub>OP</sub>	10	-	% RH

**Note.** The above are maximum values. If exceeded, they may cause permanent damage to the unit.

## 7. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Supply Voltage for Module	V <sub>DD</sub>	4.7	5.0	5.3	V	

PARAMETER	SYMBOL	BL 0%	BL 50 %	BL 100%	UNIT	NOTE
Current drawn from V <sub>DD</sub> @5.0V	I <sub>VDD</sub>	460	1675	2670	mA	Note 3

**Note 1.**

BL 0%, current was measured with BL brightness set to 0%,  
 BL 50%, current was measured with BL brightness set to 50%,  
 BL 100%, current was measured with BL brightness set to 100%.

Values of current may vary due to type of used cable.



## 8. BACKLIGHT ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Backlight Power Consumption	WBL	-	5,76	-	W	
Lifetime	-	-	50,000	-	hours	Note 1

**Note 1.** Unless specified, the ambient temperature  $T_a = 25^{\circ}\text{C}$

**Note 2.** The recommended operating conditions refer to a range in which operation of this product is guaranteed. The operation cannot be guaranteed if the absolute maximum values exceed.

**Note 3.** If LED is driven by high current, high ambient temperature and humidity condition, the lifetime of LED will be reduced. Operating life means brightness goes down to 50% initial brightness. Typical operating lifetime is estimated data.

## 9. ELECTRO-OPTICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	RMK	NOTE
Response Time	Tr+Tf	$\theta=0^\circ$ $\phi=0^\circ$ Ta=25 °C	-	25	35	ms	FIG 1.	4, 7
Contrast Ratio	Cr		-	800	1000	---	FIG 2.	1, 7
Surface Luminance	Lv		-	850	-	cd/m <sup>2</sup>		2, 7
Viewing Angle Range	$\theta$	$\phi = 90^\circ$	75	85	-	deg	FIG 3.	6
		$\phi = 270^\circ$	75	85	-	deg		
		$\phi = 0^\circ$	75	85	-	deg		
		$\phi = 180^\circ$	75	85	-	deg		
CIE (x, y) Chromaticity	Rx	$\theta=0^\circ$ $\phi=0^\circ$ Ta=25 °C	0.22	0.26	0.30	-	FIG 2.	5,7
	Ry		0.20	0.24	0.28	-		
	Gx		0.34	0.38	0.42	-		
	Gy		0.50	0.54	0.58	-		
	Bx		0.10	0.14	0.18	-		
	By		0.09	0.13	0.17	-		
	Wx		0.28	0.32	0.36	-		
	Wy		0.29	0.33	0.37	-		

**Note 1.** Contrast Ratio (CR) is defined mathematically as below, for more information see Figure 2.

$$\text{Contrast Ratio} = \frac{\text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Average Surface Luminance with all black pixels (P1, P2, P3, P4, P5)}}$$

**Note 2.** Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information see Figure 2.

$$L_v = \text{Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}$$

**Note 3.** The uniformity in surface luminance  $\delta$  WHITE is determined by measuring luminance at each test position 1 through 5, and then dividing the minimum luminance of 5 points luminance by maximum luminance of 5 points luminance. For more information see Figure 2.

$$\delta \text{ WHITE} = \frac{\text{Minimum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}{\text{Maximum Surface Luminance with all white pixels (P1, P2, P3, P4, P5)}}$$

**Note 4.** Response time is the time required for the display to transition from white to black (Rise Time,  $T_r$ ) and from black to white (Decay Time,  $T_f$ ). For additional information see Figure 1. The test equipment is BM-7A.

**Note 5.** CIE (x, y) chromaticity, the x, y value is determined by measuring luminance at each test position 1 through 5, and then make average value.

**Note 6.** For TFT module, viewing angle is the angle at which the contrast ratio is greater 10. The angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to LCD surface. For more information see Figure 3.

**Note 7.** Viewing angle is measured at the center point of the LCD by CONOSCOPE (ergo-80). For response time testing, the testing data is based on BM-7A. Instruments for Contrast Ratio, Surface Luminance, Luminance Uniformity, Chromaticity the test data is based on SR-3A.

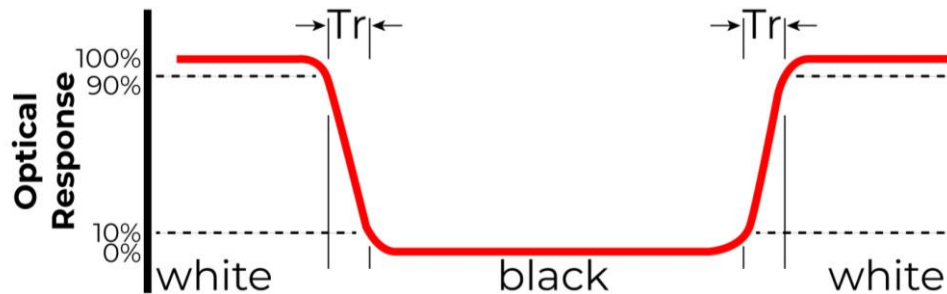


Figure 2. The definition of response time

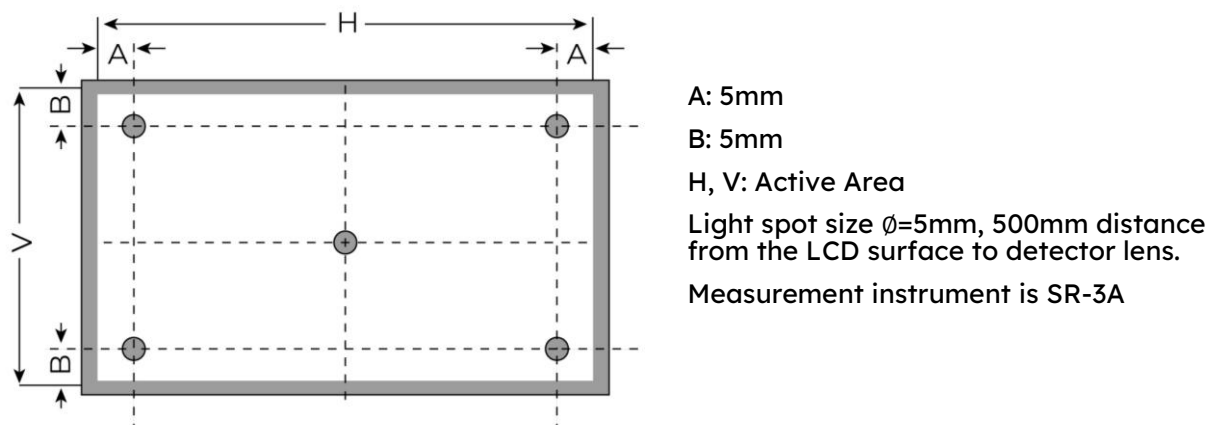


Figure 3. Measuring method for Contrast ratio, surface luminance, Luminance uniformity, CIE (x, y) chromaticity

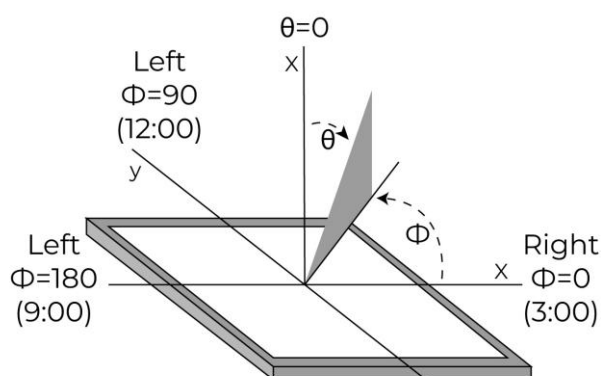
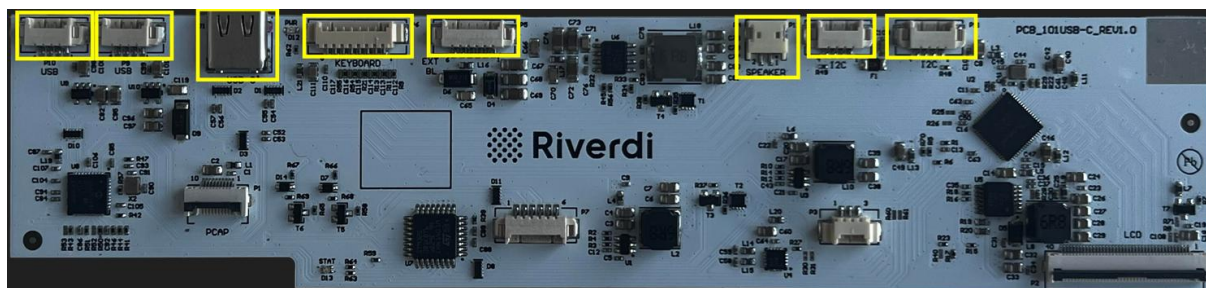


Figure 4. The definition of viewing angle

## 10. INTERFACES DESCRIPTION

### 10.1 PCB overview



NAME	CONNECTOR	DESCRIPTION	NOTE
<b>P9, P10</b>	USB	USB molex	
<b>VIDEO/ TOUCH PANEL</b>	USB-C	Video interface/Touch panel interface	
<b>P6</b>	External keyboard connector	Molex 53261-0871 or alternative; Horizontal, 1.25mm pitch; 8 pins. The connector is reserved for external keyboard.	
<b>P5</b>	Backlight PWM & Power	Molex 53261-0671 or alternative; Horizontal, 1.25mm pitch; 6 pins.  The unit realizes the function of digital dimming. This connector enables to control backlight PWM externally.  Alternative power supply.	
<b>P4</b>	Speaker	Speaker molex	
<b>P11, P12</b>	I2C	I2C molex	

Note 1. External keyboards are optional, not included in the standard kit.

## 10.2 USB interface (P9, P10)

PIN	SYMBOL	DESCRIPTION
<b>1</b>	VBUS	Power supply, 5.0V
<b>2</b>	USB_N	USB_D-
<b>3</b>	USB_P	USB_D+
<b>4</b>	GND	Ground

## 10.3 Video/Touch panel interface – USB-C

PIN	SYMBOL	DESCRIPTION
<b>A4/B4</b>	VBUSA/VBUSB	Power supply, 5.0V
<b>A9/B9</b>	VBUSA/VBUSB	Power supply, 5.0V
<b>A2/B2</b>	SSTXP1/SSTXP2	Super speed differential pair transmit positive
<b>A3/B3</b>	SSTXN1/SSTXN2	Super speed differential pair transmit negative
<b>A5/B5</b>	CC1/CC2	Configuration channel
<b>A6/B6</b>	DP1/DP2	Differential pair positive
<b>A7/B7</b>	DN1/DN2	Differential pair negative
<b>A8/B8</b>	SBU1/SBU2	Sideband use
<b>A10/B10</b>	SSRXN2/SSRXN1	Super speed differential pair receive positive
<b>A11/B11</b>	SSRXP2/SSRXP1	Super speed differential pair receive positive
<b>A1/B1</b>	GND	Ground
<b>A12/B12</b>	GND	Ground

**Note 1.** All the signals in Touch panel connector are in accordance with USB-C standard.

**Note 2.** Matched Riverdi cable accessory: USB-A 2.0 TO USB-C CABLE

## 10.4 External keyboard – P6

PIN	SYMBOL	DESCRIPTION
1	INP1	Brightness level rise
2	INP2	Brightness level decrease
3	INP3	Switch Input 3 – reserved, not used
4	INP4	Switch Input 4 – reserved, not used
5	INP5	Switch Input 5 – reserved, not used
6	INP6	Switch Input 6 – reserved, not used
7	GND	Ground
8	VCC	Power supply, 3.3V

**Note.** External keyboard is by default to change backlight brightness level.

## 10.5 Backlight PWM & Power – P5

PIN	SYMBOL	DESCRIPTION	NOTE
1	GND	Ground	
2	GND	Ground	
3	EXT_DIMM	External dimming	Note 1, 3
4	EXT_EN	External dimming enable	Note 3
5	VIN2	Power supply, 6-36V	Note 2
6	VIN2	Power supply, 6-36V	Note 2

**Note 1.** PWM frequency range: 1kHz - 5kHz.

100% PWM duty cycle corresponds to maximum brightness

0% PWM duty cycle corresponds to minimum brightness

**Note 2.** Matched Riverdi cable accessory: RVA-0106M-1.25FF-1.

**Note 3.** Notice

$V_L < 1.2V$  = active low

$V_H > 2.4V \dots 36V$  = active high

Socket used for external power supply.

## 10.6 Speaker – P4

PIN	SYMBOL	DESCRIPTION	NOTE
1	OUTP	Speaker coil „+” terminal	
2	OUTN	Speaker coil „-” terminal	

**Note.** Max available power for connected speaker 3W (4Ω).

## 10.7 I2C – P11, P12

PIN	SYMBOL	DESCRIPTION	NOTE
1	VBUS	Power supply, 5.0V	
2	SCL	Serial clock	
3	SDA	Serial data	
4	GND	Ground	

**Note.** I2C pins are not connected (not available)

## 11. DISPLAY SPECIFICATION

The TFT of the module applies Riverdi high brightness, IPS, 12.1” LVDS: RVT121HVLNWC00-B

The supported resolution of the display in this module is 1280\*800.

For detailed information, please refer to datasheet of display.



## 12. CAPACITIVE TOUCH SCREEN PANEL SPECIFICATIONS

### 12.1 Mechanical characteristics

DESCRIPTION	SPECIFICATION	REMARK
<b>Touch Panel Size</b>	12.1 inch	αTouch
<b>Outline Dimension of CTP</b>	275.56 mm x 178.46 mm	
<b>Product Thickness</b>	2.95 mm	
<b>Glass Thickness</b>	1.8 mm	
<b>CTP View Area</b>	261.92 mm x 164.00 mm	
<b>Sensor Active Area</b>	261.12 mm x 163.20 mm	
<b>Surface Hardness</b>	6H	

### 12.2 Electrical characteristics

DESCRIPTION	SPECIFICATION	REMARK
<b>Linearity</b>	+/-1.5mm	
<b>Controller</b>	ILI2511	
<b>Resolution</b>	1280 x 800	

## 13. INSPECTION

Standard acceptance/rejection criteria for TFT module

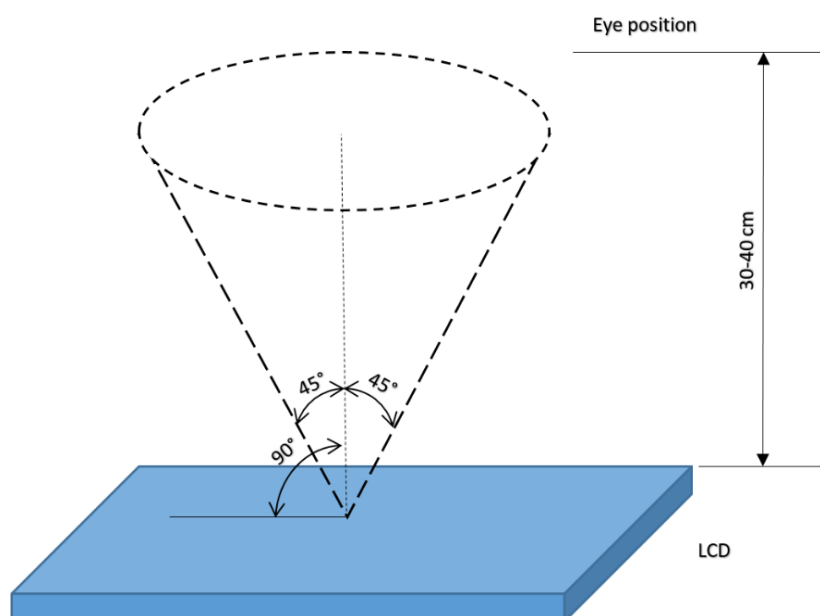
### 13.1 Inspection condition

Ambient conditions:

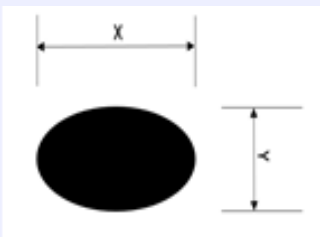
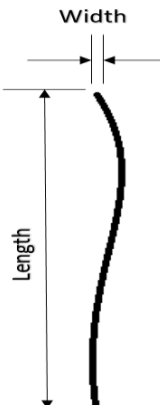
- Temperature:  $25 \pm 2^{\circ}\text{C}$
- Humidity:  $(60 \pm 10) \% \text{RH}$
- Illumination: Single fluorescent lamp non-directive (300 to 700 lux)

Viewing distance:  $35 \pm 5\text{cm}$  between inspector bare eye and LCD.

Viewing Angle: U/D:  $45^{\circ}/45^{\circ}$ , L/R:  $45^{\circ}/45^{\circ}$



## 13.2 Inspection standard

ITEM	CRITERION		
Black spots, white spots, light leakage, Foreign Particle (round Type)	 $D=(x+y)/2$ Spots density: 10 mm	Size = 12.1"	
		Average Diameter	Qualified Qty
		$D \leq 0.2 \text{ mm}$	Ignored
		$0.2 \text{ mm} < D \leq 0.3 \text{ mm}$	$N \leq 4$
		$0.5 \text{ mm} < D$	Not allowed
LCD black spots, white spots, light leakage (line Type)	 Spots density: 10 mm	Size = 12.1"	
		Length	Width Qualified Qty
		-	$W \leq 0.05$ Ignored
		$L \leq 5.0$	$0.05 < W \leq 0.1$ $N \leq 3$
		$5.0 < L$	$0.10 < W$ $5.0 < L$ Not allowed
Bright/Dark Dots	Size = 12.1"		
	Item	Qualified Qty	
	Bright dots	0	
	Dark dots	0	
	Cluster bright dots or dark dots	0	
	Total bright and dark dots	0	

Clear spots	Size $\geq 5.0''$		
	Average Diameter		Qualified Qty
	D < 0.2 mm		Ignored
	0.2 mm < D < 0.3 mm		4
	0.3 mm < D < 0.5 mm		2
	0.5 mm < D		0
	Spots density: 10 mm		
Touch panel spots	Size $\geq 5.0''$		
	Average Diameter		Qualified Qty
	D < 0.25 mm		Ignored
	0.25 mm < D < 0.5 mm		4
	0.5 mm < D		0
Touch panel white line scratch	Size $\geq 5.0''$		
	Length	Width	Qualified Qty
	-	$W \leq 0.03$	Ignored
	$L \leq 5.0$	$0.03 < W < 0.05$	2
	-	$0.05 < W$	0

## 14. RELIABILITY TEST

NO.	TEST ITEM	TEST CONDITION	NOTE
1	High Temperature Storage	80°C/120 hours	Note 1
2	Low Temperature Storage	-30°C/120 hours	
3	High Temperature Operating	70°C/120 hours	
4	Low Temperature Operating	-20°C/120 hours	
5	High Temperature and High Humidity	40°C, 90%RH, 120Hrs	
6	Thermal Cycling Test (No operation)	-20°C for 30min, 70°C for 30 min. 100 cycles. Then test at room temperature after 1 hour	Note 2
7	Vibration Test	Frequency: 10 ÷ 55 Hz. Stroke: 1.5 mm. Sweep: 10Hz ÷ 55Hz ÷ 10 Hz. 2 hours for each direction of X, Y, Z (Total 6 hours)	

**Note 1.** Sample quantity for each test item is 5 ÷ 10 pcs.

**Note 2.** The device is kept at room temperature for 2 hours prior to starting the test

## 15. LEGAL INFORMATION

CE marking is usually obligatory only for a complete end product. Riverdi display modules are semi-finished goods which are used as inputs to become part of the finished products.

Therefore, Riverdi display modules are not CE marked.

This is not a standalone product. It was designed as an electronic component. It needs integration with a whole system to be fully functional.

Riverdi grants the guarantee for the proper operation of the goods for a period of 12 months from the date of possession of the goods. If in a consequence of this guaranteed execution the customer has received the defects-free item as replacement for the defective item, the effectiveness period of this guarantee shall start anew from the moment the customer receives the defects-free item.

Information about device is the property of Riverdi and may be the subject of patents pending or granted. It is not allowed to copy or disclosed this document without prior written permission.

Riverdi endeavors to ensure that all contained information in this document is correct but does not accept liability for any error or omission. Riverdi products are in developing process and published information may be not up to date. Riverdi reserves the right to update and makes changes to Specifications or written material without prior notice at any time. It is important to check the current position with Riverdi.

Images and graphics used in this document are only for illustrative the purpose. All images and graphics are possible to be displayed on the range products of Riverdi, however the quality may vary. Riverdi is no liable to the buyer or to any third party for any indirect, incidental, special, consequential, punitive, or exemplary damages (including without limitation lost profits, lost savings, or loss of business opportunity) relating to any product, service provided or to be provided by Riverdi, or the use or inability to use the same, even if Riverdi has been advised of the possibility of such damages.

Riverdi products are not fault tolerant nor designed, manufactured or intended for use or resale as on line control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines or weapons systems in which the failure of the product could lead directly to death, personal injury or severe physical or environmental damage ('High-Risk Activities'). Riverdi and its suppliers specifically disclaim any expressed or implied warranty of fitness for High-Risk Activities. Using Riverdi products and devices in 'High-Risk Activities' and in any other application is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Riverdi from all damages, claims or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Riverdi intellectual property rights.

## 16. CONTACT

### Your Success is Our Priority

Stuck on a technical challenge? Need expert guidance?  
Our dedicated support team is just a message away.

Contact us at

[\*\*contact@riverdi.com\*\*](mailto:contact@riverdi.com)

We're here to ensure your project's success, every step of the way!