

## RVT101HVHNWC00-B

# HB, IPS HDMI 10.1" LCD DATASHEET

Rev.1.6 2024-08-14

ITEM	CONTENTS	UNIT
LCD Type	TFT/Transmissive/Normally Black/IPS	/
Size	10.1	Inch
Viewing Direction	Free	/
Outside Dimensions (W x H x D)	257.96 x 168.60 x 19.23	mm
Active Area (W x H)	216.96 x 135.60	mm
Pixel Pitch (W x H)	0.1695 x 0.1695	mm
Resolution	1280 (RGB) x 800	/
Brightness	850	cd/m²
Color Depth	16.7 M	/
Pixel Arrangement	RGB Vertical Stripe	/
Controller of the Main Board	RTD2556QR	/
Video Interface	HDMI	/
With/Without Touch	With Projected Capacitive Touch Panel	/
CTP Driver	ILI2132A	/
Touch Panel Interface	USB-C	/
Power Supply	Power Jack (DC 7.0V - 14.0 V)	V
Bonding Technology	Optical Bonding	/
Weight	510	g

Note 1. RoHS3 compliant

Note 2. LCM weight tolerance: ± 5%.



#### **1. REVISION RECORD**

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2021-08-27	Initial Release	
1.1	2022-01-11	PCB update – Interfaces of UART and Light sensor are not available on the latest PCB version	
1.2	2022-01-27	Supplementary Instructions: On the latest PCB board which doesn't have UART and light sensor interfaces, the power supply ranges from 7.0 V-14.0V instead of 8.0V-14.0V. Accordingly, related parameters VDD, I <sub>VDD=7.0V</sub> are updated.	
1.3	2022-12-15	<ul> <li>Update 2 parameters of Backlight PWM &amp; Power - J5</li> <li>Clarify PWM frequency range: 1kHz-10kHz</li> <li>Update the power supply voltage: 7.0V-14.0V</li> <li>Monitor controller is upgraded from RTD2556T to RTD2556QR</li> </ul>	
1.4	2023-06-05	<ul> <li>100% PWM duty cycle corresponds to minimum brightness</li> <li>0% PWM duty cycle corresponds to maximum brightness</li> </ul>	
1.5	2023-08-23	<ul> <li>Update note 4 on section 10.6</li> <li>Pins 1,2 and 5,6 of accessory RVA-0106M-1.25FF-1 have misleading colors</li> </ul>	
1.6	2024-08-14	<ul> <li>Updated the electrical parameters of power supply current.</li> </ul>	



#### **2. CONTENTS**

1.	REVISION RECORD	2
2.	CONTENTS	3
3.	MODULE CLASSIFICATION INFORMATION	4
4.	ASSEMBLY GUIDE	5
4	.1 uxTouch ASSEMBLY	5
5.	MODULE DRAWING	6
6.	ABSOLUTE MAXIMUM RATINGS	7
7.	ELECTRICAL CHARACTERISTICS	7
8.	BACKLIGHT DRIVING CONDITIONS	7
9.	ELECTRO-OPTICAL CHARACTERISTICS	8
10.	INTERFACE DESCRIPTION	10
10	0.1 PCB overview	10
10	0.2 Power connector - DC	
10	0.3 HDMI connector – JP1	11
1	0.4 Touch panel connector - USB-C	11
10	0.5 External keyboard extension - J1	12
1	D.6 Backlight PWM &power - J5	12
11.	DISPLAY SPECIFICATION	12
12.	CAPACITIVE TOUCH SCREEN PANLE SPECIFICATIONS	13
1	2.1 Mechanical characteristics	13
1	2.2 Electrical characteristics	13
13.	INSPECTION	14
1	3.1 Inspection condition	14
1	3.2 Inspection standard	15
14.	RELIABILITY TEST	16
15.	LEGAL INFORMATION	17



## **3. MODULE CLASSIFICATION INFORMATION**

										В
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	101 – 10.1"
4.	MODEL SERIAL NO.	H – High Brightness, IPS
5.	RESOLUTION	V – 1280 x 800 px
6.	INTERFACE	H – HDMI
7.	FRAME	N – Without Mounting Metal Frame
8.	BACKLIGHT TYPE	W – LED White
9.	TOUCH PANEL	C – With Capacitive Touch Panel
10.	VERSION	00 – (00-99)
11	BONDING TECHNOLOGY	B – Optical bonding



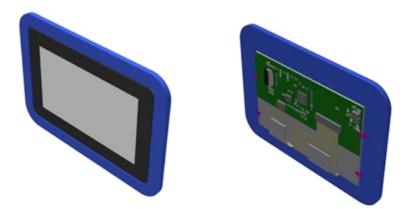
## **4. ASSEMBLY GUIDE**

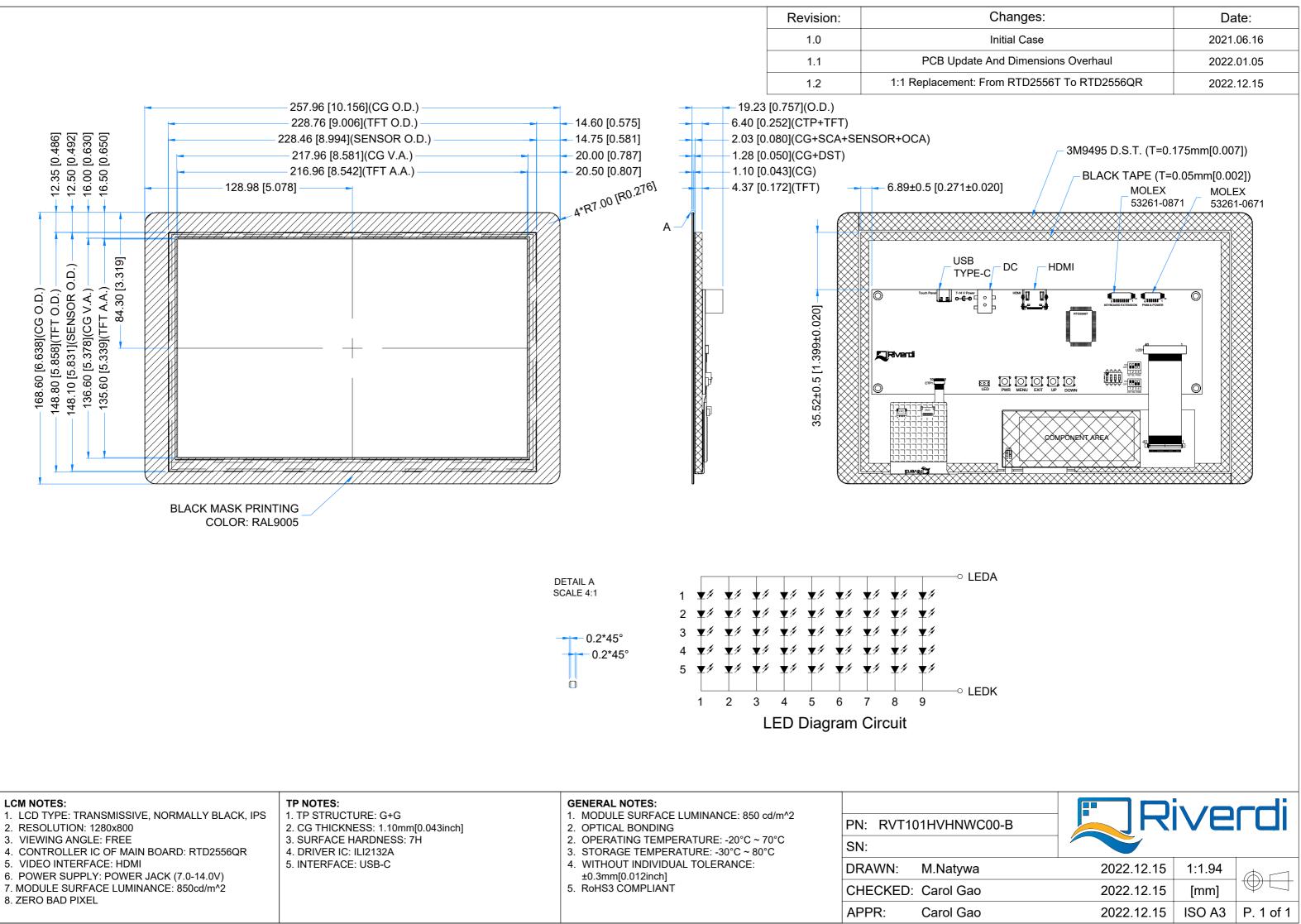
#### 4.1 uxTouch ASSEMBLY

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. Example of using the support brackets





Changes:	Date:
Initial Case	2021.06.16
e And Dimensions Overhaul	2022.01.05
From RTD2556T To RTD2556QR	2022.12.15



### **6. ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for Module	VDD	7.0	14.0	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. Exceeding maximum values may cause operation or damage to the unit.

## 7. ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Supply Voltage for Module	VDD	7.0	12.0	14.0	V	

PARAMETER	SYMBOL	BL 0%	BL 50%	BL 100%	UNIT	NOTE
Current Drawn from VDD@7.0V		273	751	1993	mA	
Current Drawn from VDD@12.0V	I <sub>VDD</sub>	184	421	685	mA	Note 1,2
Current Drawn from VDD @14.0V		168	332	555	mA	

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%.

Test condition: ambient temp is 25 °C

**Note 2.** The touch panel is powered by USB-C independently. Please refer to subchapter 12.2 for the touch panel current consumption.

## **8. BACKLIGHT DRIVING CONDITIONS**

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Backlight Power Consumption	WBL	-	5760	-	mW
Lifetime	-	-	50,000	-	

**Note.** Operating life means the period in which the LED brightness goes down to 50% of the initial brightness. Typical operating lifetime is the estimated parameter.



#### 9. ELECTRO-OPTICAL CHARACTERISTICS

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25 °C. The values specified are at an approximate distance 500mm from the LCD surface at a viewing angle of  $\Phi$  and  $\theta$  equal to 0°.

ITEM	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	RMK	NOTE
Response Time	Tr+Tf		-	25	35	ms	FIG 2.	4
Contrast Ratio	Cr	θ=O°	-	800	1000		FIG 3.	1
Luminance Uniformity	δ WHITE	ø=0° Ta=25 °C	-	75	-	%		3
Surface Luminance	Lv		-	850	-	cd/m²		2
		ø = 90°	75	85	-	deg		6
Viewing Angle	θ	ø = 270°	75	85	-	deg	FIG 4.	
Range		ø = 0°	75 85 - deg '	FIO <del>4</del> .	0			
		ø = 180°	75	85	-	deg		
	Rx		0.22	0.26	0.30	-	-	
	Ry		0.20	0.24	0.28	-		
	Gx	0-00	0.34	0.38	0.42	-		
CIE (x, y)	Gy	θ=O° ø=O°	0.50	0.54	0.58	-	FIG 3.	5
Chromaticity	Bx	<sup>g</sup> =0 Ta=25 °C	0.10	0.14	0.18	-	FIU 3.	5
	Ву	Id-25 °C	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 3.

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 at BL 100%. For more information see Figure 3.

Lv = 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 3.

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

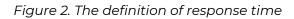
**Note 4.** Response time is the time required for the display to transition from white to black (Rise Time, Tr) and from black to white (Decay Time, Tf). For additional information see Figure 2. The test equipment is is BM-7A.

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



**Note 6**. For TFT module the contrast ratio is greater than 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 4.

**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.



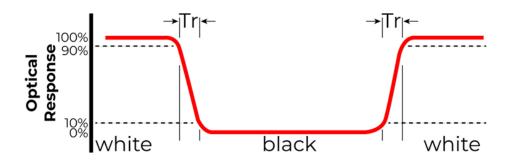
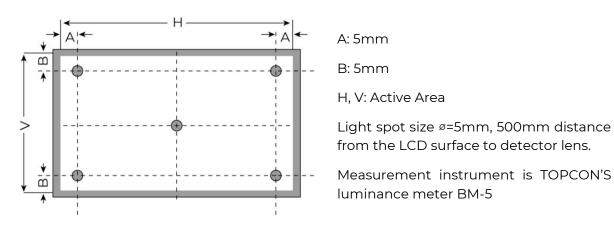
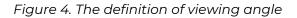
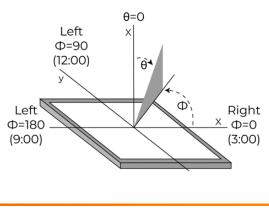


Figure 3. Measuring method for Contrast ratio, surface luminance, Luminance uniformity, CIE (x, y) chromaticity





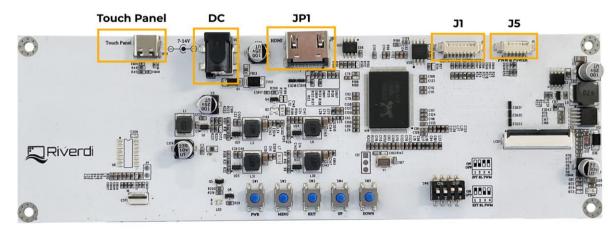




## **10. INTERFACE DESCRIPTION**

#### **10.1 PCB overview**

Picture below shows the connectors exact placement and their descriptions.



NAME	CONNECTOR	DESCRIPTION	NOTE
Touch	USB-C	Touch panel interface	
Panel	030-0	This is only for versions with touch panel.	
		DC Jack, (5.5 mm OD; 2.1mm ID)	
DC	Power Jack	This is the connector to power on the TFT module.	
		It allows DC for voltage range from 7.0V to 14.0V	
JPI	HDMI connector	This is the connector to which you can connect the HDMI	
JPI		signal source to the module.	
		Molex 53261-0871 or alternative; Horizontal, 1.25mm pitch;	
	External	8 pins.	
JI	keyboard	The connector is reserved for external keyboard.	Note 1
	connector	Performs the same functions:	
		PWR, MENU, EXIT, UP, DOWN as the push buttons on PCB.	
		Molex 53261-0671 or alternative; Horizontal, 1.25mm pitch;	
J5	Backlight PWM	6 pins.	Note 2
72	& Power	The unit realizes the function of digital dimming. This	note Z
		connector enables to control backlight PWM externally.	

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

Note 2. 4 position-DIP onboard switch SW6 is used to choose the power to backlight.

The settings are: INTERNAL BL PWM: Set 1&2 to OFF, and 3&4 to ON, EXTERNAL BL PWM: Set 1&2 to ON, and 3&4 to OFF.

#### **10.2 Power connector - DC**

PIN NO.	SYMBOL	DESCRIPTION
1	VDD	Power supply DC; 7.0V-14.0V
2	GND	GND



#### 10.3 HDMI connector – JP1

PIN NO.	SYMBOL	DESCRIPTION
1	TMDS Data 2+	TMDS differential signal 2+
2	TMDS Data2 Shield	Data2 shielding ground
3	TMDS Data 2-	TMDS differential signal 2-
4	TMDS Data 1+	TMDS differential signal 1+
5	TMDS Datal Shield	Datal shielding ground
6	TMDS Data 1-	TMDS differential signal 1-
7	TMDS Data 0+	TMDS differential signal 0+
8	TMDS Data 0 Shield	Data0 shielding ground
9	TMDS Data 0-	TMDS differential signal 0-
10	TMDS Data Clock+	TMDS differential signal Clock+
11	TMDS Data Shield	Clo6ck shielding ground
12	TMDS Data Clock-	TMDS differential signal Clock-
13	CEC	Electronic protocol CEC
14	NC	No Connection
15	SCL	I <sup>2</sup> C clock Line
16	SDA	I <sup>2</sup> C data Line
17	DDC/CEC GND	Data display channel
18	+5V	HDMI 5V
19	Hot Plug Detect	Hot plug Detect

Note 1. Matched Riverdi 4K HDMI cable accessory: 4K HDMI CABLE

#### **10.4** Touch panel connector - USB-C

SYMBOL	DESCRIPTION
USB_GND	USB_ Ground
USB_GND	USB_ Ground
V_BUS	V_Bus Power; 5V
V_BUS	V_Bus Power; 5V
CC1	Configuration channel
DPI	USB differential pair, position 1, positive
DN1	USB differential pair, position 1, negative
SBU1	Sideband use
CC2	Configuration channel
DP2	USB differential pair, position 2, positive
DN2	USB differential pair, position 2, negative
SBU2	Configuration channel
V_BUS	V_Bus Power; 5V
V_BUS	V_Bus Power; 5V
USB_GND	USB_Ground
USB_GND	USB_Ground
	USB_GND USB_GND V_BUS V_BUS CC1 DP1 DN1 SBU1 CC2 DP2 DN2 SBU2 V_BUS V_BUS USB_GND

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



#### 10.5 External keyboard extension - J1

PIN NO.	SYMBOL	DESCRIPTION
1	Down	Page down
2	Up	Page up
3	Exit	Exit
4	Menu	Menu
5	PWR	Power on/off
6	LED_EN	LED Enable; Output signal 3.3V
7	GND	Ground
8	Keyboard VDD	Keyboard VDD, Output 3.3V

Note 1. Matched Riverdi cable accessory:RVA-0108M-1.25FF

#### 10.6 Backlight PWM & power - J5

PIN NO.	SYMBOL	DESCRIPTION	NOTE
1	GND	Ground	
2	GND	Ground	
3	EN	Backlight enable, active H	
4	PWM	PWM input; 3.3V	Note 1
5	VDD	Power supply; 7.0V - 14.0V	
6	VDD	Power supply; 7.0V - 14.0V	Note 2

**Note 1.** PWM frequency range: 1kHz - 10kHz.

100% PWM duty cycle corresponds to minimum brightness 0% PWM duty cycle corresponds to maximum brightness

**Note 2.** Pin 5&6 are internally connected with power connector(DC-Jack), VDD. So, the voltage range is the same as power connector(DC-Jack)

**Note 3.** 4 position-DIP onboard switch **SW6** is used to choose the power source to backlight. The settings are:

a) INTERNAL BL PWM: Set 1&2 to OFF, and 3&4 to ON,

b) EXTERNAL BL PWM: Set 1&2 to ON, and 3&4 to OFF.

Note 4. Matched Riverdi cable accessory: RVA-0106M-1.25FF-1

**Attention!** An essential detail concerning this cable setup in your application: pins 1,2 and 5,6 have misleading colors.

#### **11. DISPLAY SPECIFICATION**

The TFT of the module applies Riverdi high brightness, IPS, 10.1" LVDS:

RVT101HVLNWC00-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 PANLE SPECIFICATIONS**

#### **12.1** Mechanical characteristics

DESCRIPTION	SPECIFICATION	REMARK
Touch Panel Size	10.1 inch	
Outline Dimension of CTP	257.96 mm x 168.60 mm	
Product Thickness	2.03mm	
Glass Thickness	1.1mm	uxTouch
CTP View Area	217.96 mm x 136.60 mm	uxiouch
Sensor Active Area	218.96mm x 137.60 mm	
Structure type	Glass + Glass	
Surface Hardness	7H	

#### **12.2 Electrical characteristics**

PARAMETER		SPECIFICATION	REMARK
Power Consumption (IDD)	Active Mode	90 mA	
Power Consumption (IDD)	Sleep Mode	10 mA	
Linearity		+/-1.5mm	uxTouch
Controller		ILI2132A	_
Resolution		1280 x 800	



## **13.INSPECTION**

Standard acceptance/rejection criteria for TFT module

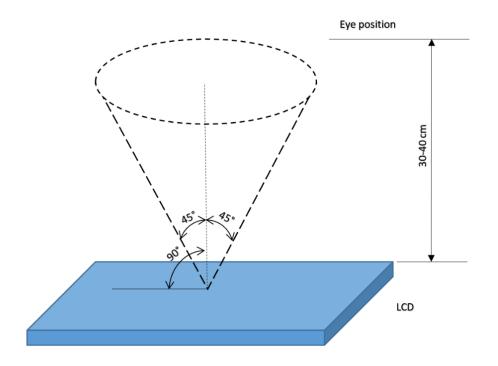
#### **13.1 Inspection condition**

Ambient conditions:

- Temperature: 25 ± 2°C
- Humidity: (60 ± 10) %RH
- Illumination: Single fluorescent lamp non-directive (300 to 700 lux)

Viewing distance: 35 ± 5cm between inspector bare eye and LCD.

Viewing Angle: U/D: 45°/45°, L/R: 45°/45°





## **13.2 Inspection standard**

The LCD TFT has zero bad pixels. Please refer the item "Bright/Dark dots".

ITEM		CRITE	RIO	Ν			
	x		Size = 10.1"				
Black spots,		Average	Average Diameter		Qualified Qty		
white spots, light leakage, Foreign Particle		D ≤ 0.2 m	D ≤ 0.2 mm		Ignored		
(round Type)	D=(x+y)/2	0.2 mm <	0.2 mm < D ≤ 0.3 mm		N≤₄	N≤4	
	Spots density: 10 mm	0.5mm <	D		Not	allowed	
	Width			Size = 10	.1"		
LCD black spots,		Lengt	h	Width		Qualified Qty	
white spots, light leakage	Length	-		W ≤ 0.0	5	Ignored	
(line Type)		L ≤ 5.	0	0.05< W ≤	0.1	N≤3	
	<b>I</b> Spots density: 10 mm	5.0 <	L	0.10< W 5.0 < L		Not allowed	
		Size :	= 10.1				
	Item		Qualified Qty				
Bright/Dark	Bright dots		0				
Dots	Dark dots		0				
	Cluster Bright Dots or Dark Dots		s 0				
	Total Bright and Dark Dots		0				
	Size ≥ 5.0"						
	Average Diameter		Qualified Qty				
	D < 0.2 mm		Ignored				
Clear spots	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						
		Size 2	≥ 5.0"				
Touch panel	Average Diameter		Qualified Qty				
spots	D < 0.25 mm		Ignored				
	0.25 mm < D < 0.5 mm		4				
	0.5 mm < D			0			
	Size ≥						
Touch panel	Length	Width		Qual		-	
white line	-	W < 0.03		Igi	nore	d	
scratch	L < 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	
2	Low Temperature Storage	-30°C/120 hours	
3	High Temperature Operating	70 °C /120 hours	Note 1
4	Low Temperature Operating	-20°C/120 hours	
5	High Temperature and High Humidity	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**. Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.



## **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.

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.



Hi, I am here to help you! If you have any additional questions, please contact our support via email: contact@riverdi.com



## **Mouser Electronics**

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Riverdi:

RVT101HVHNWC00-B