TFT MODULE SPECIFICATION

RVT70HSDNWC00-B

MIPI DSI, IPS 7.0” LCD TFT display datasheet
Rev. 1.0
2025-01-30

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ITEM	CONTENTS	UNIT
LCD Type	TFT/Transmissive/Normally Black/IPS	/
Size	7.0	Inch
Viewing Direction	Free	/
Outside Dimensions (W x H x D)	179.96 x 119.00 x 13.89	mm
Active Area (W x H)	154.21 x 85.92	mm
Pixel Pitch (W x H)	0.1506 x 0.1432	mm
Resolution	1024 x 600	/
Brightness	850	cd/m^2
Color Depth	16.7 M	/
Pixel Arrangement	RGB Vertical Stripe	/
Driver IC of Board	SN65DSI83	/
Interface	MIPI DSI	/
EEPROM Memory Size	2-Kbit	/
Host Connector	ZIF 34 pins, 0.5mm pitch, down-side contact	/
With/Without Touch	With Projected Capacitive Touch Panel	/
CTP Driver	ILI2132A	/
Supply Voltage for Module	5.0	V
Bonding Technology	Optical Bonding	/
Weight	237	g

Note 1. RoHS3 compliant

Note 2. LCM weight tolerance: ± 5%.

1. REVISION RECORD

REV NO.	REV DATE	CONTENTS	REMARKS
1.0	2025-01-30	Initial release	

2. CONTENTS

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3. MODULE CLASSIFICATION INFORMATION

RV	T	70	H	S	D	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	70 – 7.0”
4.	MODEL SERIAL NO.	H – High Brightness, IPS
5.	RESOLUTION	S – 1024 x 600 px
6.	INTERFACE	D – MIPI DSI
7.	FRAME	N – Without Mounting Metal Frame
8.	BACKLIGHT TYPE	W – LED White
9.	TOUCH PANEL	C – With Capacitive Touch Panel
10.	VERSION	00 – version
11.	BONDING TECHNOLOGY	B – Optical bonding

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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.

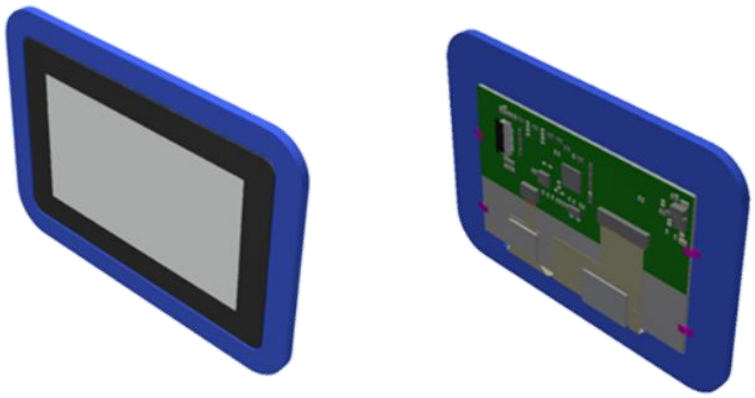
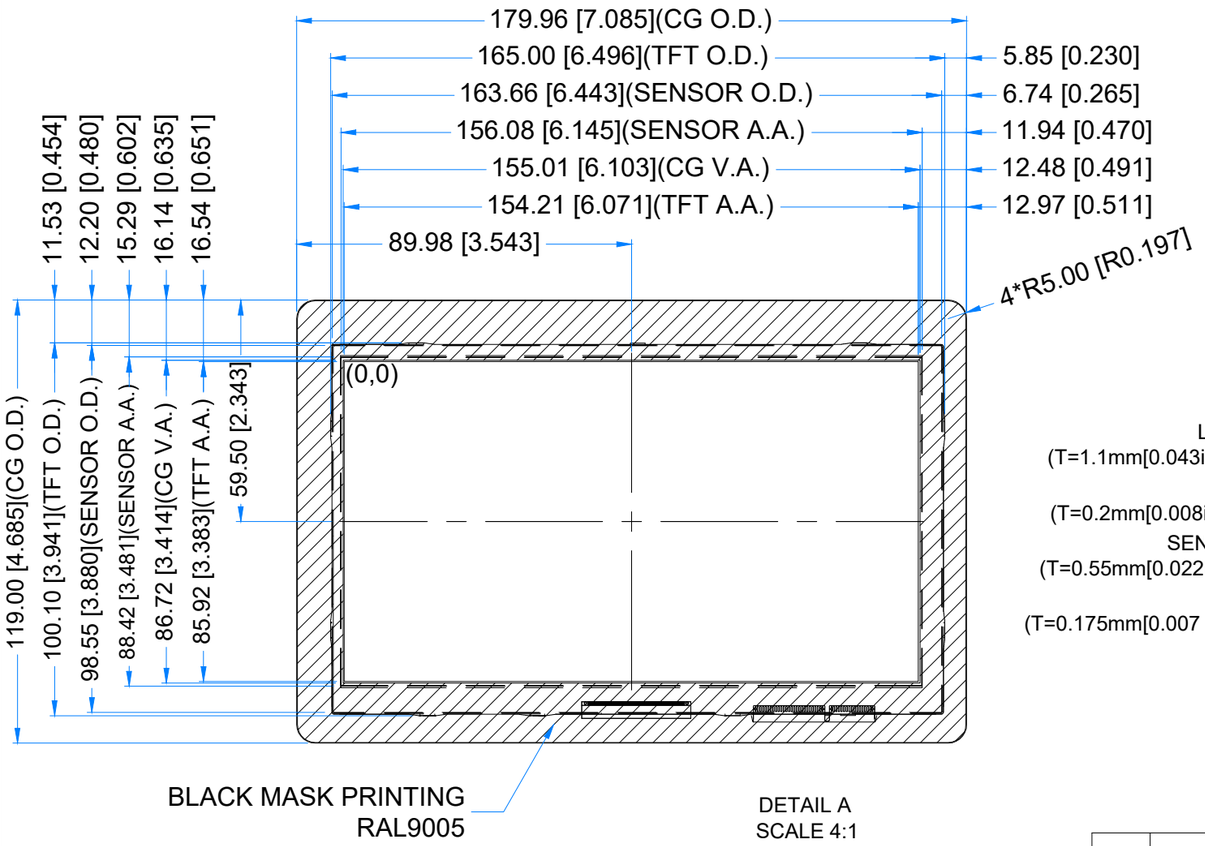
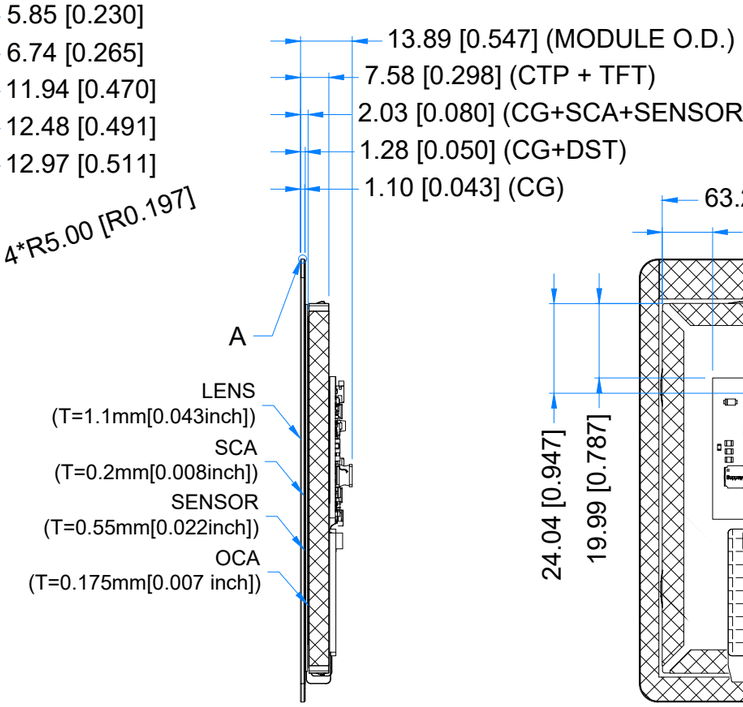
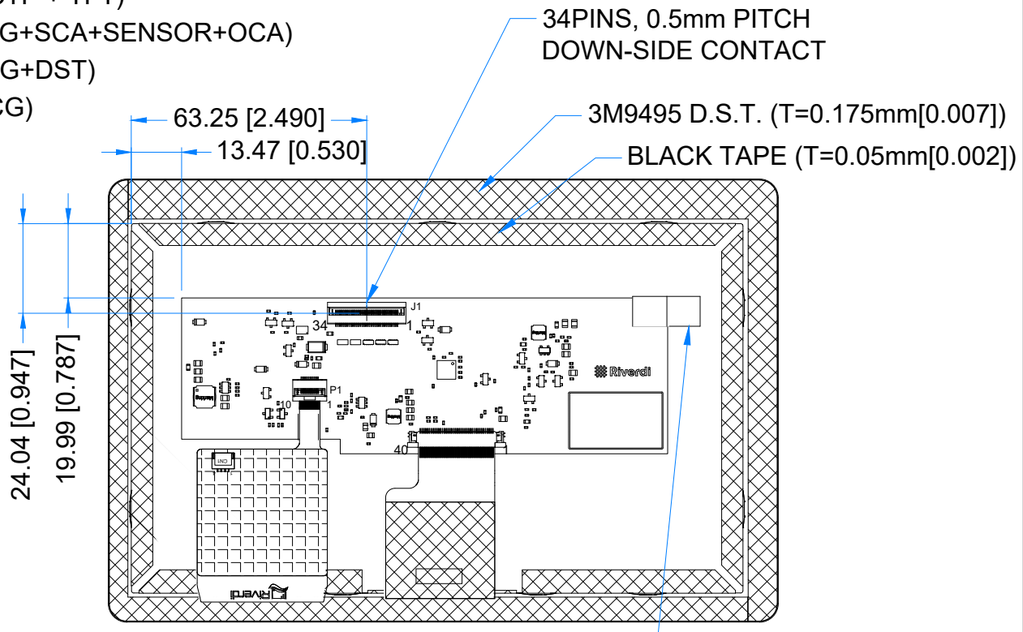


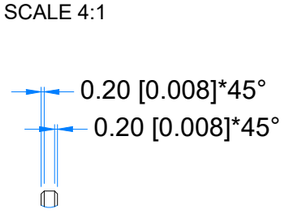
Figure 1. General view of the module

Revision:	Changes:	Date:
1.0	Initial Case	2025.01.30

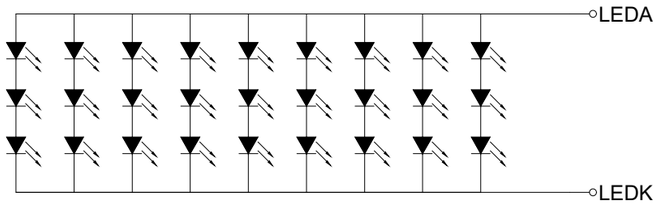








DETAIL A
SCALE 4:1



LED Diagram Circuit

TFT NOTES:
1. LCD TYPE: TRANSMISSIVE, NORMALLY BLACK, IPS
2. RESOLUTION: 1024x600
3. VIEWING ANGLE: FREE
4. DRIVING IC ON THE BOARD: SN65DSI83ZXHR
5. INTERFACE: MIPI DSI
6. OPERATION VOLTAGE: 5.0V

TP NOTES:
1. TP STRUCTURE: G+G
2. CG THICKNESS: 1.1mm[0.043inch]
3. SURFACE HARDNESS: 7H
4. DRIVER IC: ILI2132A
5. INTERFACE: I2C

GENERAL NOTES:
1. MODULE SURFACE LUMINANCE: 850 cd/m^2
2. OPTICAL BONDING
3. OPERATING TEMPERATURE: -20°C ~ 70°C
4. STORAGE TEMPERATURE: -30°C ~ 80°C
5. WITHOUT INDIVIDUAL TOLERANCE: ±0.3mm[0.012inch]
6. RoHS3 COMPLIANT

PN: RVT70HSDNWC00-B				Riverdi
SN:				
DRAWN:	M.Suchocki	2025.01.30	1:1.65	
CHECKED:	M.Wierzbowski	2025.01.30	[mm]	
APPR:			ISO A3	P. 1 of 1

6. ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for Module	V_{DD}	0	7.4	V
Reference Voltage	V_{REF}	0	4.6	V
PWM Input Voltage	V_{PWM}	-0.3	7.4	V
Operating Temperature	T_{OP}	-20	70	°C
Storage Temperature	T_{ST}	-30	80	°C
Storage Humidity (@ 25 ± 5°C)	H_{ST}	10	-	% RH
Operating Ambient Humidity (@ 25 ± 5°C)	H_{OP}	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_{DD}	-	5.0	-	V	
Reference Voltage	V_{REF}	0	-	3.6	V	Note 1
Current drawn from VREF	I_{VREF}	-	1	-	uA	V_{REF}=1.8V
Input High Voltage	V_{IH}	0.7VREF	-	-	V	
Input Low Voltage	V_{IL}	0	-	0.3VREF	V	
PWM Logic Input High Voltage	V_{PWMH}	1.2	-	VDD	V	Note 2
PWM Logic Input Low Voltage	V_{PWML}	0	-	0.4	V	Note 2
PWM Frequency	F_{PWM}	200	-	200k	Hz	Note 3

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Note 1. TYP of reference Voltage is 1.8V or 3.3V which is dependent on the SBC.

Note 2. PWM input is independent of $V_{REF.}$ Min of logic high level is 1.2V and max of logic low level is 0.4V.

Note 3. The backlight driver is DIO5661 and the recommended PWM frequency is 10kHz.

PARAMETER	SYMBOL	BL 0%	BL 58 %	BL 100%	UNIT	NOTE
Current drawn from V_{DD}@5.0V	I_{VDD}	194	450	737	mA	Note 3

Note 3.
BL 0%, current was measured with BL brightness set to 0%,
BL 58%, current was measured with BL brightness set to 58%,
BL 100%, current was measured with BL brightness set to 100%.

Test condition: ambient temperature 25°C, PCAP is in active mode. The I_{VDD} current measurement was conducted based on Dahlia Carrier board + Verdin iMX8M. Backlight levels on Verdin iMX8M can be set from 0 to 7(8 levels).

BACKLIGHT LEVEL	0%	14.5%	29%	43.5%	58%	72.5%	85.5%	100%
SOM BL SET	0	1	2	3	4	5	6	7

8. BACKLIGHT ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Lifetime	-	-	50,000	-	hours	Note 1

Note 1. Unless specified, the ambient temperature T_a = 25°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	θ=0° ø=0° Ta=25 °C	-	35	-	ms	FIG 2.	4, 7
Contrast Ratio	Cr		-	800	-	---	FIG 3.	1, 7
Surface Luminance	Lv		-	850	-	cd/m 2		2, 7
Viewing Angle Range	θ	ø = 90°	75	85	-	deg	FIG 4.	6
		ø = 270°	75	85	-	deg		
		ø = 0°	75	85	-	deg		
		ø = 180°	75	85	-	deg		
CIE (x, y) Chromaticity	Rx	θ=0° ø=0° Ta=25 °C	0.578	0.618	0.658	-	FIG 3.	5,7
	Ry		0.489	0.329	0.369	-		
	Gx		0.376	0.416	0.456	-		
	Gy		0.493	0.533	0.573	-		
	Bx		0.071	0.111	0.151	-		
	By		0.108	0.148	0.188	-		
	Wx		0.270	0.310	0.350	-		
	Wy		0.290	0.330	0.370	-		

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.

Lv = Average Surface Luminance with all white pixels (P1, P2, P3, P4, P5)

Note 3. The uniformity in surface luminance δ 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, Tr) and from black to white (Decay Time, Tf). 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.

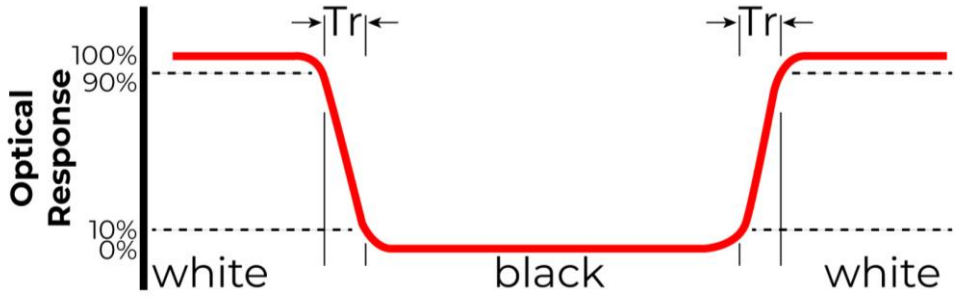
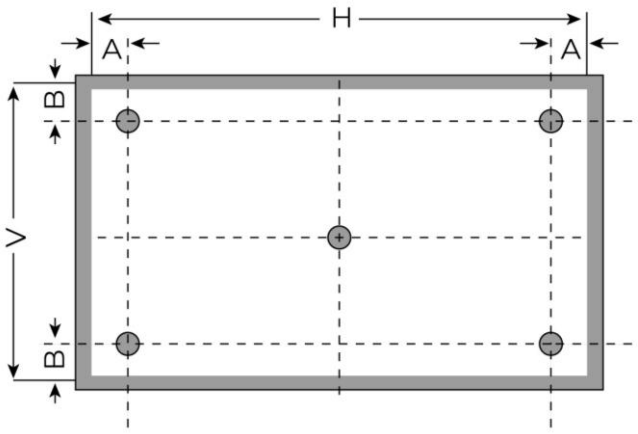


Figure 2. The definition of response time



A: 5mm

B: 5mm

H, V: Active Area

Light spot size ∅=5mm, 500mm distance from the LCD surface to detector lens.

Measurement instrument is SR-3A

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

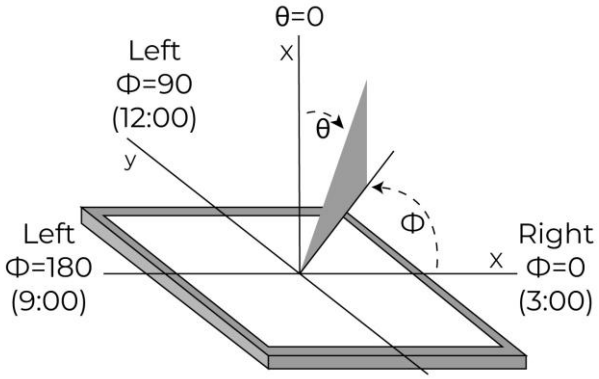


Figure 4. The definition of viewing angle

10. INTERFACES DESCRIPTION

10.1 J1 connector

PIN	SYMBOL	I/O	DESCRIPTION	NOTE
1	GND	P	Ground	
2	DSI_D0P	I/O	MIPI DSI differential data pair. (Data lane 0)	
3	DSI_D0N	I/O		
4	GND	P	Ground	
5	DSI_D1P	I	MIPI DSI differential data pair. (Data lane 1)	
6	DSI_D1N	I		
7	GND	P	Ground	
8	DSI_CLKP	I	MIPI DSI differential clock pair	
9	DSI_CLKN	I		
10	GND	P	Ground	
11	DSI_D2P	I	MIPI DSI differential data pair. (Data lane 2)	
12	DSI_D2N	I		
13	GND	P	Ground	
14	DSI_D3P	I	MIPI DSI differential data pair. (Data lane 3)	
15	DSI_D3N	I		
16	GND	P	Ground	
17	PWR_DN	I	Power down (With locally generated reset after releasing power-down) Active Low, display is off when signal is low;	Note 2
18	PWM	I	Backlight brightness control	Note 3

19	INT	O	Touch panel Interrupt signal; Open-drain output, active low	Note 2
20	I2C_SCL	I	I2C clock signal	Note 2
21	I2C_SDA	I/O	I2C data signal	
22	RESET	I	Touch panel reset, active low (touch panel is off)	
23	NC	/	No connection	
24	V_{REF}	P	Reference voltage	
25	NC	/	No connection	
26	5.0V	P	Power supply V_{DD}	
27				
28				
29				
30	GND	P	Ground	
31	NC	/	No connection	
32				
33				
34				

Note 1. Matched 34 pins, 0.5 mm pitch, 150 mm long FFC accessory: FFC0534150

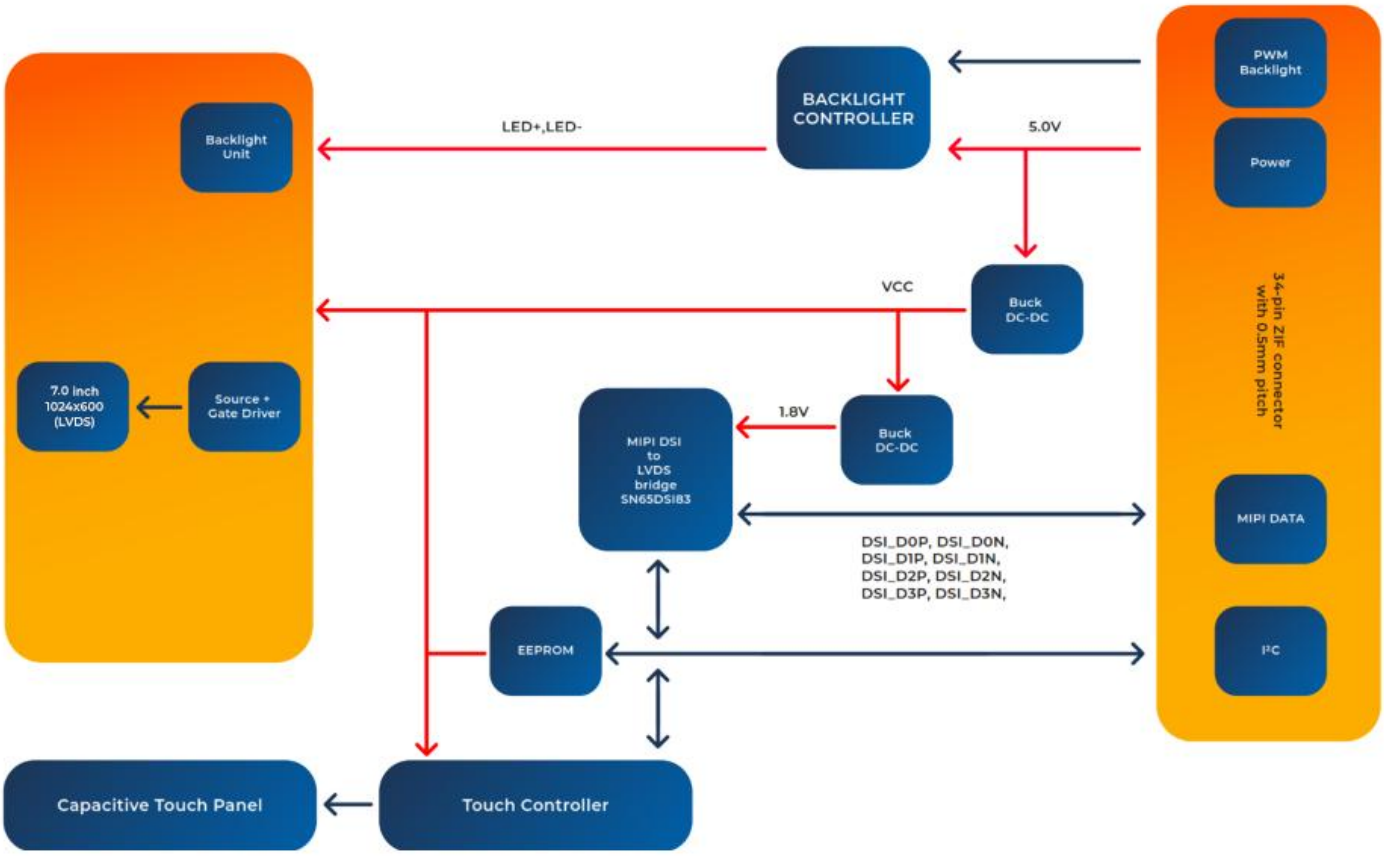
Note 2. Internally pull-up with 15K resistors to V_{REF} for pins 17, 19
Internally pull-up with 10K resistors to V_{REF} for pins 20, 21

Note 3. The backlight driver is DIO5661. PWM frequency range: 200Hz – 200KHz and the recommended PWM frequency is 10kHz.

0% PWM duty cycle corresponds to minimum brightness.

100 PWM duty cycle corresponds to maximum brightness.

11. DIAGRAM BLOCK



12. TIMING CHARACTERISTICS

The TFT of the module applies Riverdi high brightness, IPS, 7.0” TFT: RVT70HSLNWC00-B

For detailed information of the display, please refer to the datasheet of display.

PARAMETER	SYMBOL	VALUE			UNIT
		MIN.	TYP.	MAX.	
DCLK frequency (Frame rate 60Hz)	Fclk	40.8	51.2	67.2	MHz
Horizontal display area	Thd		1024		DCLK
HSYNC period time	Th	1114	1344	1400	
HSYNC blanking	Thb+Thfp	90	320	376	
Vertical display area	Tvd		600		H
VSYNC period time	Tv	610	635	800	
VSYNC blanking	Tvb+Tvfp	10	85	200	

13. CAPACITIVE TOUCH SCREEN PANEL SPECIFICATIONS

13.1 Mechanical characteristics

DESCRIPTION	SPECIFICATION	REMARK
Touch Panel Size	7.0 inch	uxTouch
Outline Dimension of CTP	179.96 mm x 119.00 mm	
Product Thickness	2.03 mm	
Glass Thickness	1.1 mm	
CTP View Area	155.01 mm x 86.72 mm	
Sensor Active Area	156.08 mm x 88.42 mm	
Surface Hardness	7H	

13.2 Electrical characteristics

DESCRIPTION	SPECIFICATION	REMARK
Linearity	+/-1.5mm	
Controller	ILI2132A	
Resolution	1024 x 600	

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14. INSPECTION

Standard acceptance/rejection criteria for TFT module

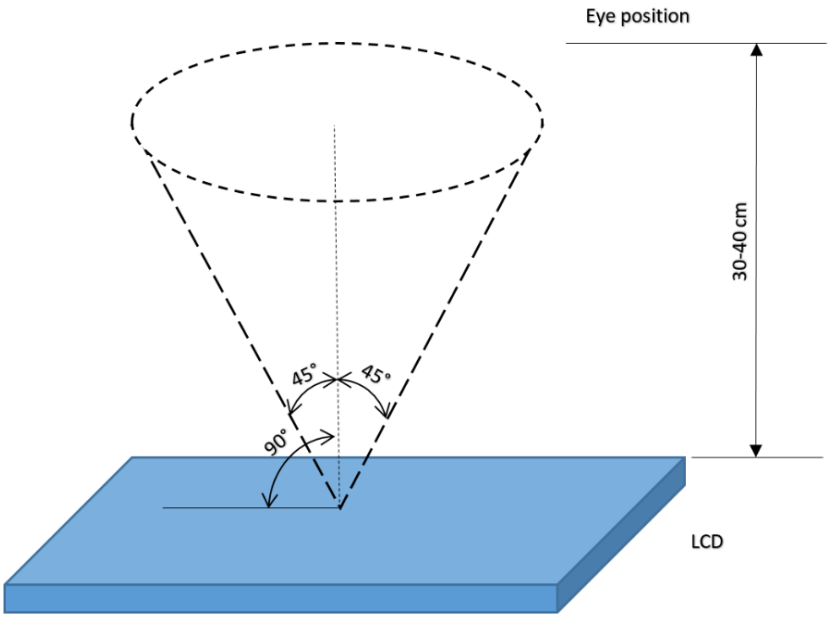
14.1 Inspection condition

Ambient conditions:

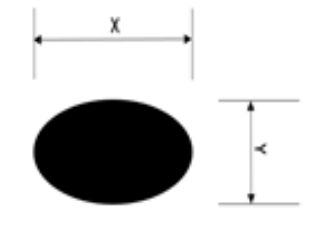
- Temperature: 25 ± 2°C
- Humidity: (60 ± 10) %RH
- Illumination: Single fluorescent lamp non-directive (300 to 700 lux)

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

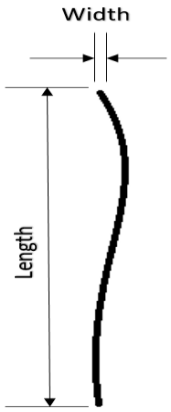
Viewing Angle: U/D: 45°/45°, L/R: 45°/45°



14.2 Inspection standard

<table>
<tr><th>ITEM</th><th colspan="4">CRITERION</th></tr>
<tr><td rowspan="5">Black spots, white spots, light leakage, Foreign Particle (round Type)</td><td colspan="4" rowspan="5">

D=(x+y)/2

Spots density: 10 mm</td><td colspan="2">Size = 7.0”</td></tr>
<tr><td>Average Diameter</td><td>Qualified Qty</td></tr>
<tr><td>D ≤ 0.2 mm</td><td>Ignored</td></tr>
<tr><td>0.2 mm < D ≤ 0.3 mm</td><td>N≤3</td></tr>
<tr><td>0.5 mm < D</td><td>Not allowed</td></tr>
<tr><td rowspan="5">LCD black spots, white spots, light leakage (line Type)</td><td colspan="4" rowspan="5">

Spots density: 10 mm</td><td colspan="3">Size = 7.0”</td></tr>
<tr><td>Length</td><td>Width</td><td>Qualified Qty</td></tr>
<tr><td>-</td><td>W ≤ 0.05</td><td>Ignored</td></tr>
<tr><td>L ≤ 5.0</td><td>0.05 < W ≤ 0.1</td><td>3</td></tr>
<tr><td>5.0 < L</td><td>0.1 < W</td><td>Not allowed</td></tr>
<tr><td rowspan="5">Bright/Dark Dots</td><td colspan="4">Size = 7.0”</td></tr>
<tr><td colspan="2">Item</td><td colspan="2">Qualified Qty</td></tr>
<tr><td colspan="2">Bright dots</td><td colspan="2">N ≤ 2</td></tr>
<tr><td colspan="2">Dark dots</td><td colspan="2">N ≤ 3</td></tr>
<tr><td colspan="2">Total Bright and Dark Dots</td><td colspan="2">N ≤ 4</td></tr>
<tr><td>Clear spots</td><td colspan="4">Size ≥ 5.0”</td></tr>
</table>

	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 ≥ 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 ≥ 5.0”	
	Length	Width	Qualified Qty
	-	W ⩽ 0.03	Ignored
	L ⩽ 5.0	0.03 < W < 0.05	2
	-	0.05 < W	0

15. 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℃, 90%RH, 120Hrs	
7	Thermal Cycling Test (No operation)	-20℃ for 30min, 70℃ for 30 min. 100 cycles. Then test at room temperature after 1 hour	Note 2
8	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)	
9	Package Drop Test	Height: 60 cm 1 corner, 3 edges, 6 surfaces	

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

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16. 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.

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contact@riverdi.com

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