RGB 4.3"

This datasheet gives detailed information about the Riverdi 4.3" TFT displays with an RGB interface. The displays come in different versions: with **capacitive, resistive, or no touchscreen**, with a decorative **cover glass**, as well as with our without a **metal mounting frame**.

ORDER NOW
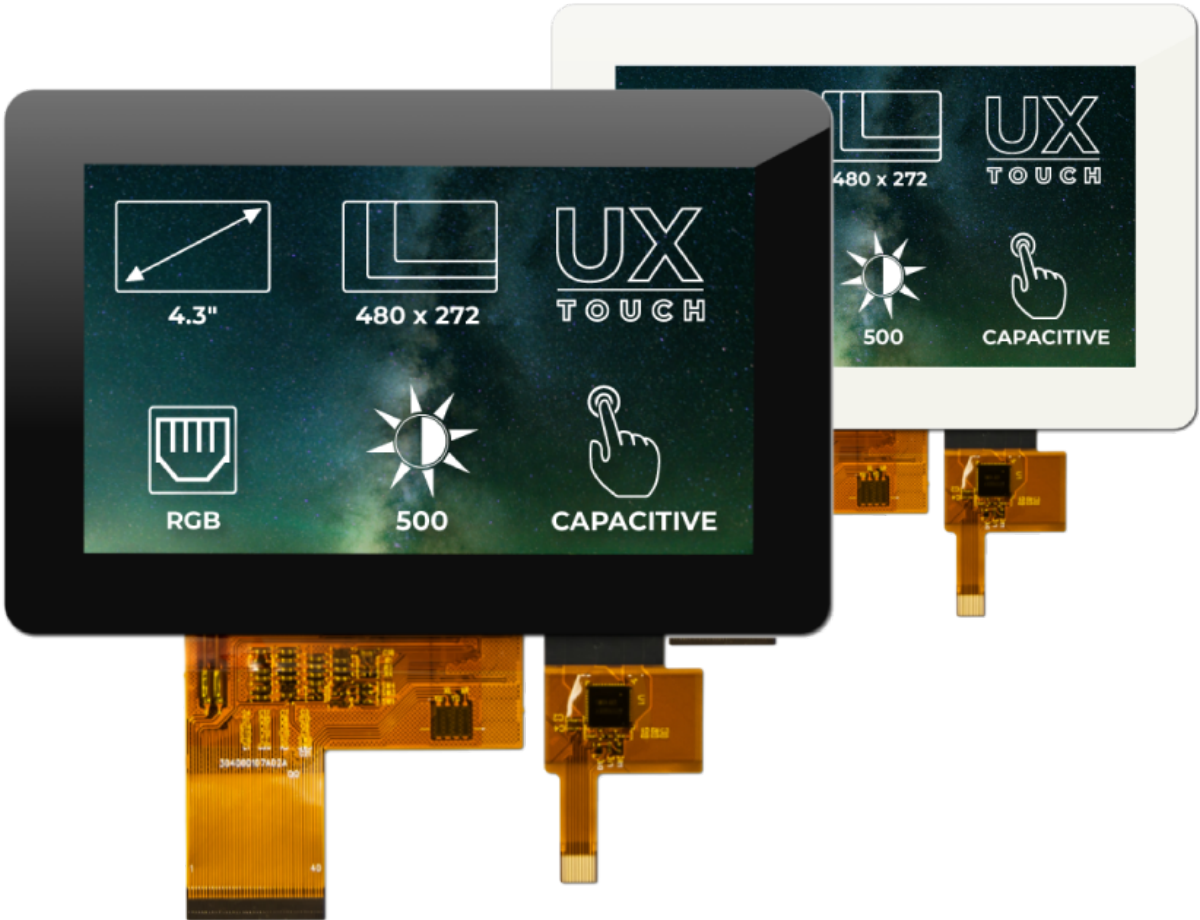
Rev.1.0
2019-06-07

ITEM	CONTENTS	UNIT

LCD Type		TFT/Transmissive/Normally white	/
Size		4.3	Inch
Viewing Direction		12:00 (without image inversion)	O' Clock
Gray Scale Inversion Direction		6:00	O' Clock
Number of Dots		480 x (RGB) × 272	/
Driver IC		HX8257A	/
Interface Type		24bit RGB	/
Brightness	no touch module	550	cd/m2
	CTP module	500	
	RTP module	440	
Color Depth		16.7M	/
Pixel Arrangement		RGB Vertical Stripe	/
Surface Treatment		Anti-glare / Clear (for CTP)	/
Input Voltage		3.3	V

Note 1: RoHS, REACH SVHC compliant

Note 2: LCM weight tolerance: ± 5%.

Revision Record

REV NO.	REVDATE	CONTENTS	REMARKS
1.0	2019-06-07	Initial Release	

Table of Content

1. Module classification information

RV	T	4.3	x	x	T	x	W	x	0x
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.

1.	BRAND	RV – Riverdi
2.	PRODUCT TYPE	T – TFT Standard
3.	DISPLAY SIZE	43 – 4.3"
4.	MODEL SERIAL NO.	x (A-Z) U – UxTouch
5.	RESOLUTION	480272 – 480×272 px L – 480×272 px
6.	INTERFACE	T– LCD TFT
7.	FRAME	N – No Frame F – Mounting Frame
8.	BACKLIGHT TYPE	W – LED White
9.	TOUCH PANEL	N – No Touch Panel R – Resistive Touch Panel C – Capacitive Touch Panel
10.	VERSION	0x (00-99)

2. Assembly guide – integration

Three options of rear side adhesive tape are available: double side adhesive tape 0.2 mm with 3M 467MP glue, foam double side adhesive tape 0.5 mm with DST 3M 9495LE glue or without any tape.

There are also two versions of glass color: black and white.

Rear side adhesive tape options:

Double side adhesive tape with DST 3M 9495LE glue (total thickness 0.2mm)	Foam double side adhesive tape with 3M 9495LE glue (total thickness 0.5mm)	Without tape

Cover glass color options:

BLACK	WHITE

Product options:

PART NUMBER	DESCRIPTION
RVT43ULTNWC00	RGB, CTP uxTouch, black cover glass, 0.2mm DST
RVT43ULTNWC01	RGB, CTP uxTouch, black cover glass, 0.5 mm DST
RVT43ULTNWC02	RGB, CTP uxTouch, black cover glass, no DST
RVT43ULTNWC03	RGB, CTP uxTouch, white cover glass, 0.2mm DST
RVT43ULTNWC04	RGB, CTP uxTouch, white cover glass, 0.5 mm DST
RVT43ULTNWC05	RGB, CTP uxTouch, white cover glass, no DST

2.1. UxTouch assembly

UxTouch are LCD TFT displays with specially designed projected capacitive touch panels. UxTouch display can be mounted without any holed in the housing. Our standard UxTouch displays include double-sided adhesive tape (DST) to stick TFT easily to the housing. Basic series include 4.3", 5.0" and 7.0" display sizes.

UxTouch models with double-side adhesive tape (PN with endings 00, 01, 03, 04) can be mounted by connecting the glass to the housing. Riverdi recommends to use support brackets assembled to display's back. An additional support will stiffen the whole structure and minimize the influence of external factors such as vibration. Figure 1 and Figure 2 below show examples of using support elements.

Figure 1. Example of using support brackets

UxTouch models with double-side adhesive tape (PN with endings 00, 01, 03, 04) can be mounted by connecting the glass to the housing.
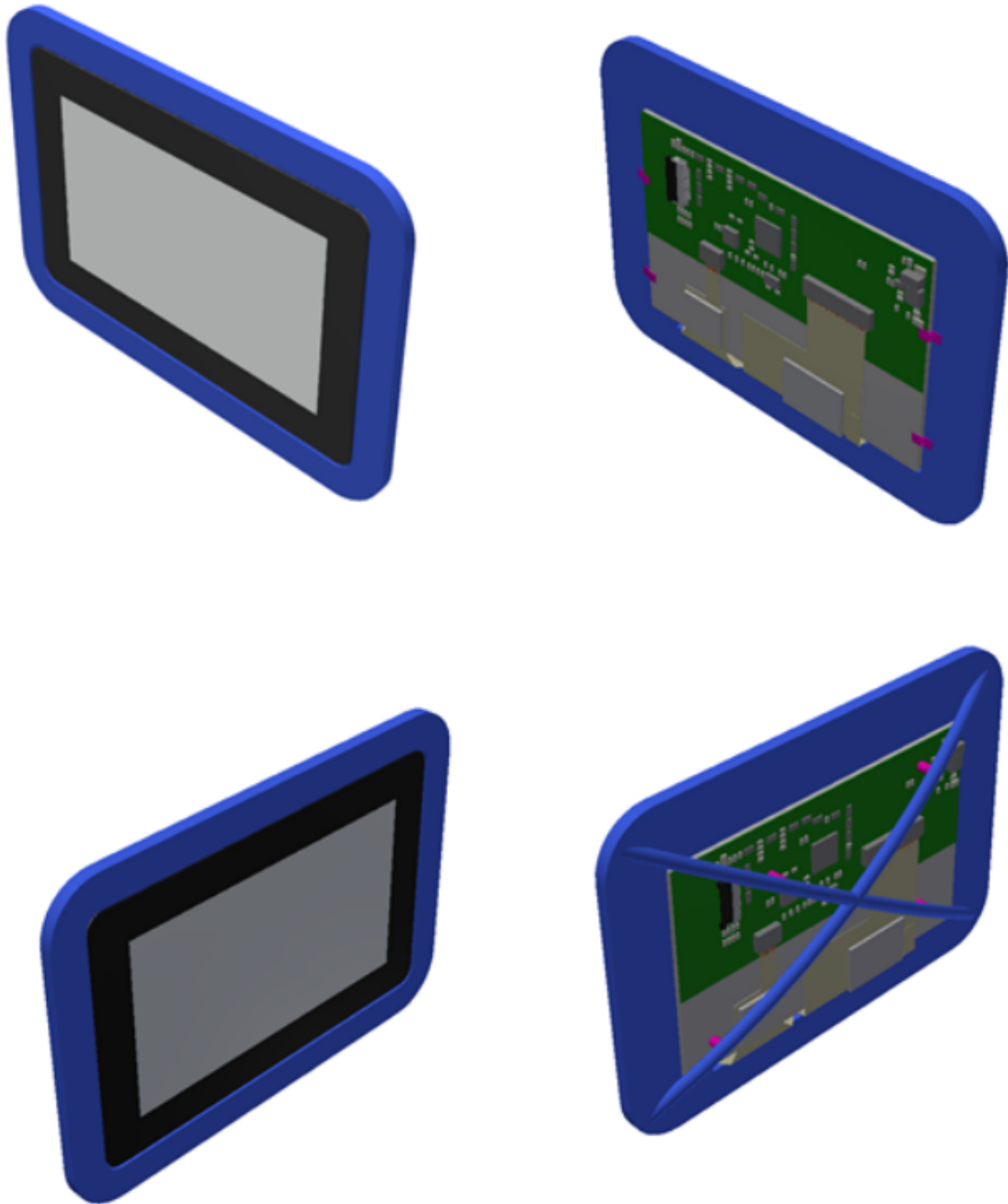
2.2. Mounting frame

For dimensions 3.5", 4.3", 5.0" and 7.0" the product with mounting frame version is available. Thanks to the four catches attached to the side, frame provides strong assembly to the surface by mounting element (like the screw, see Figure 3). The frames are specially designed to fit Riverdi products perfectly. The diameter of the mounting hole is 3.5mm.

Figure 2. Mounting frame

3. Drawings

Drawing 1 — RVT4.3A480272TNWN00

TFT PINOUT

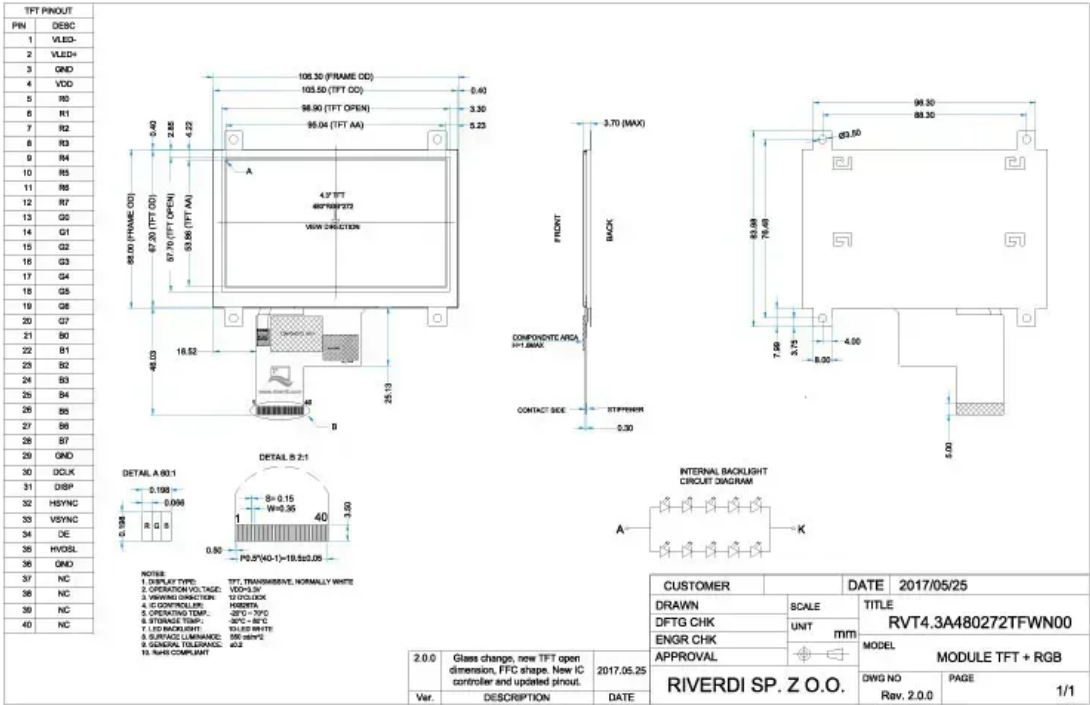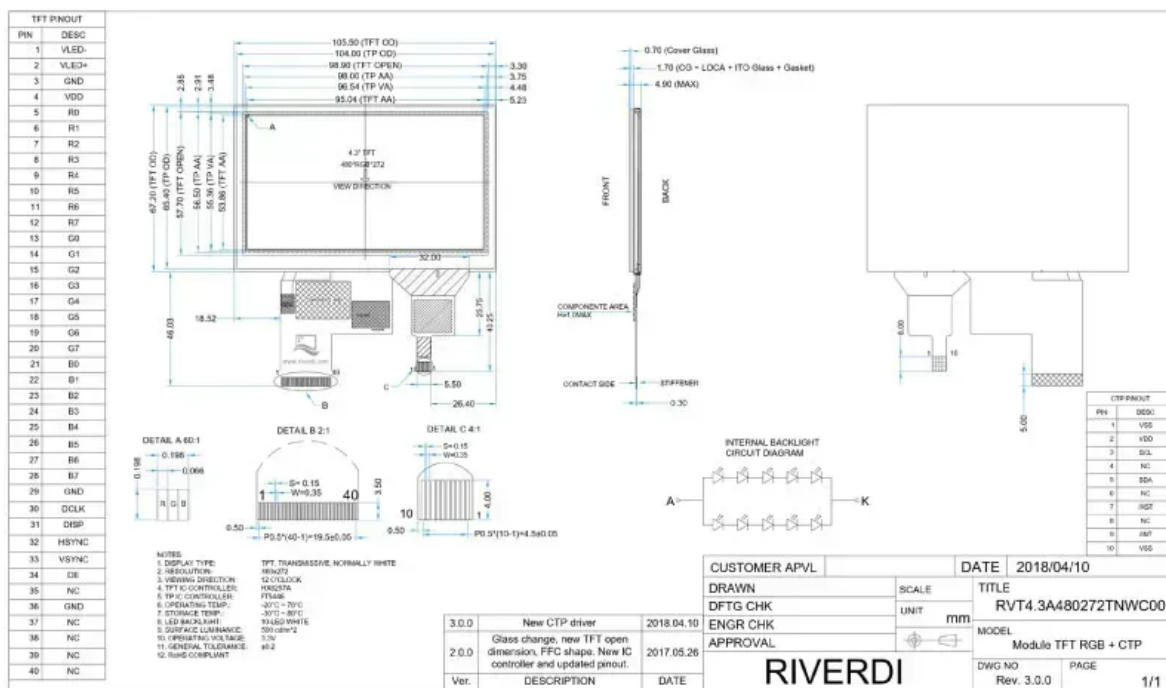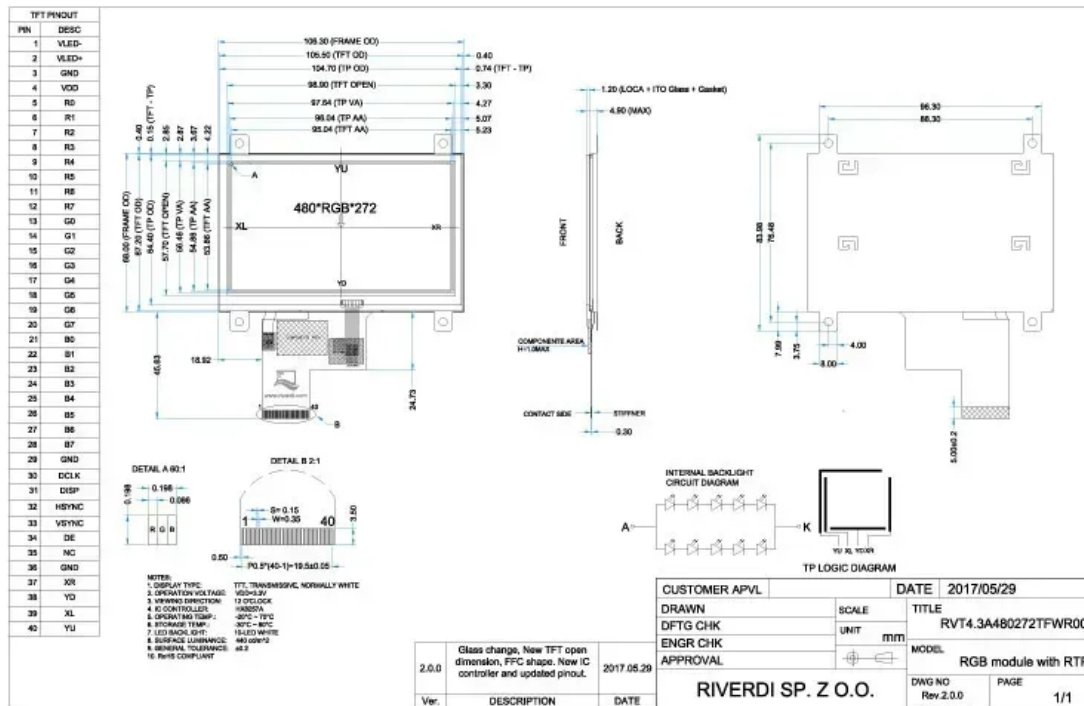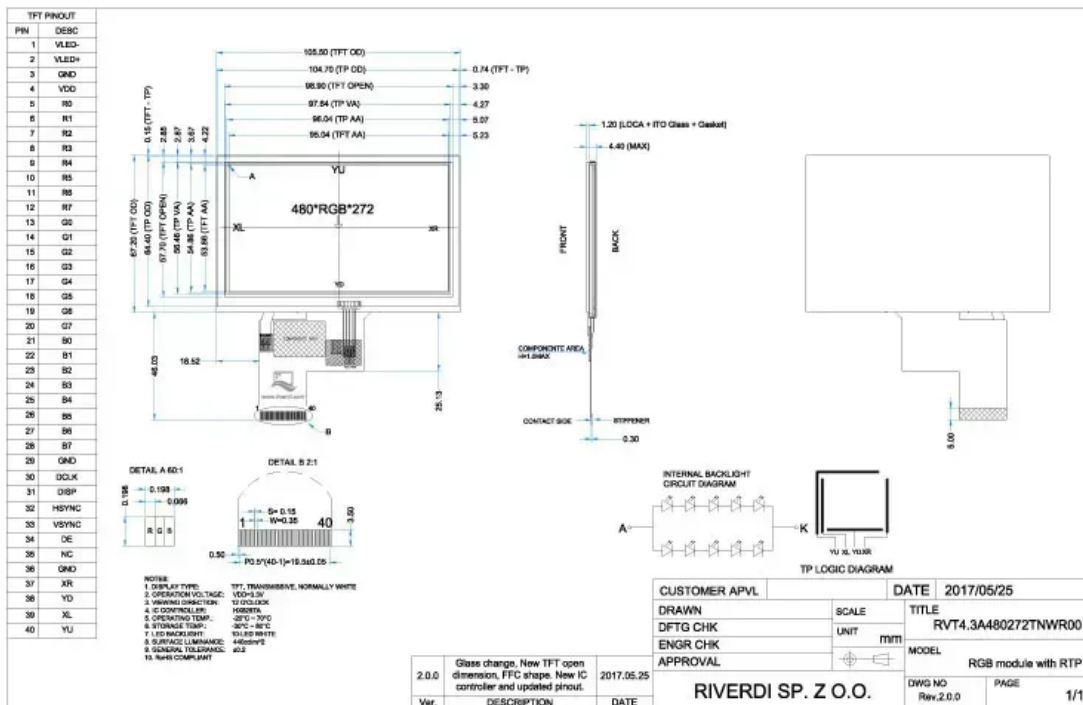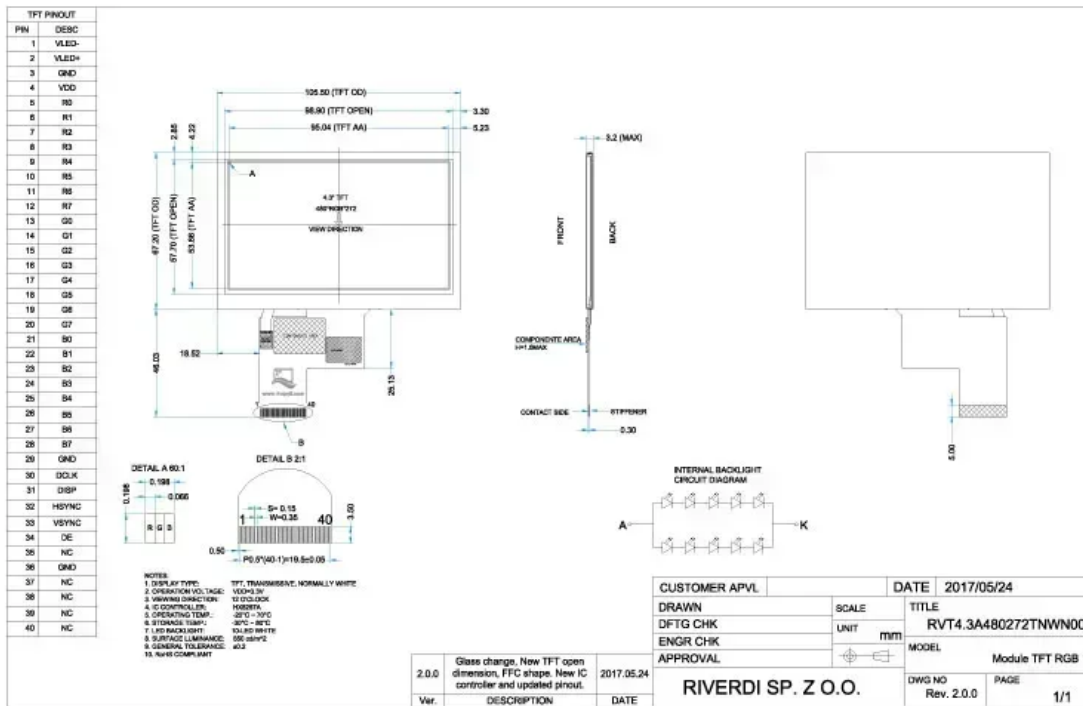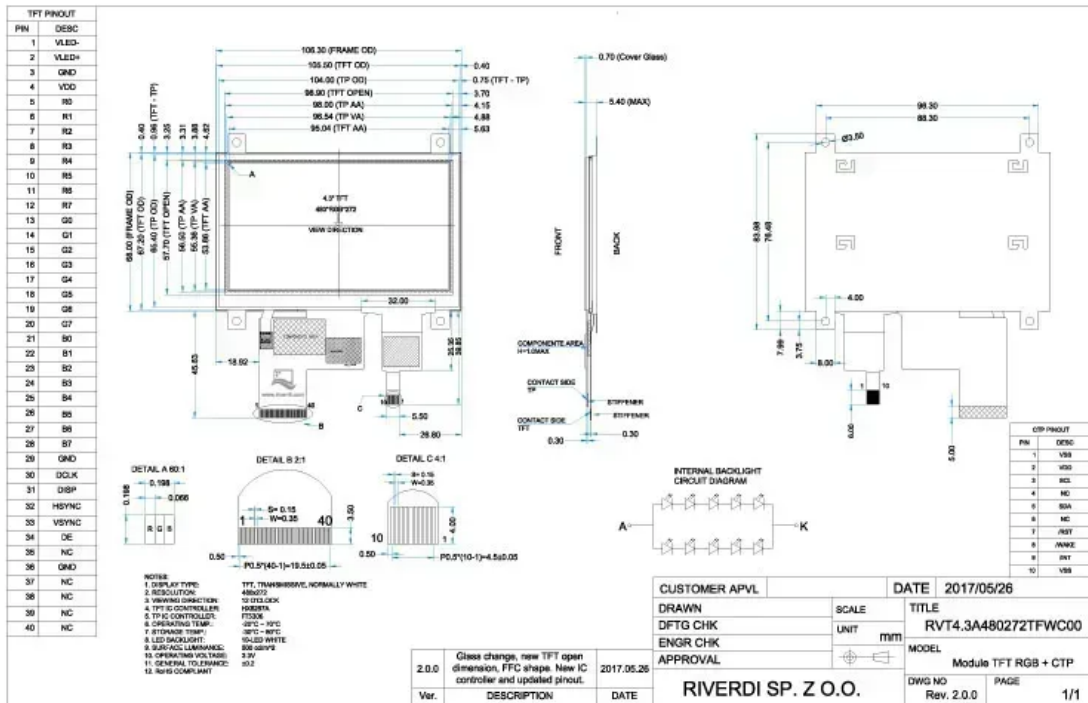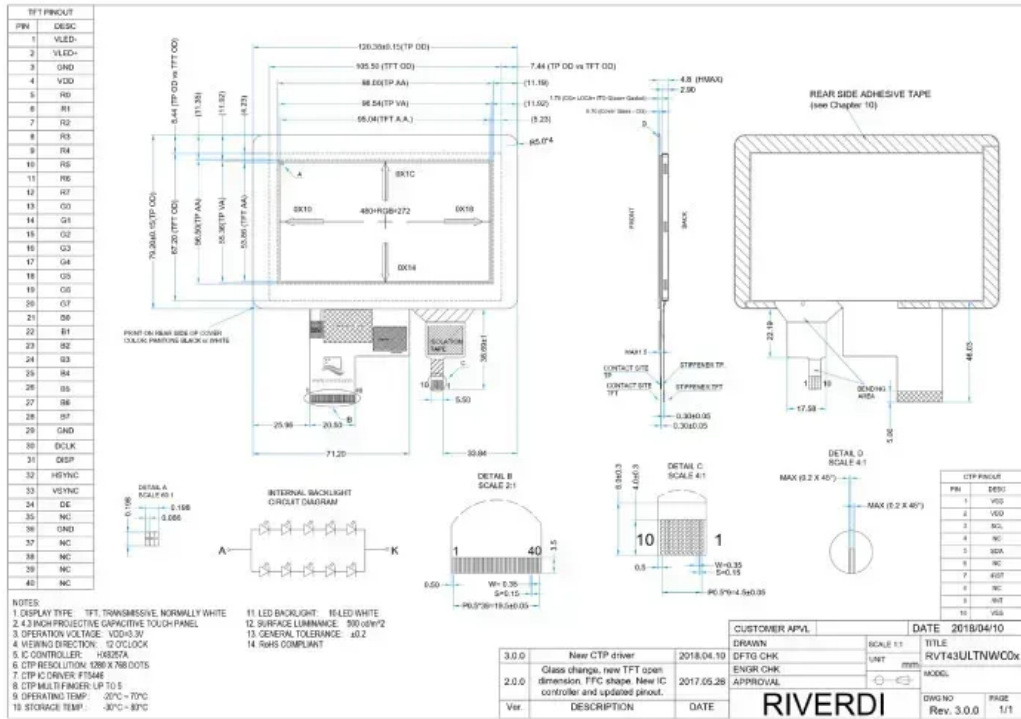| PIN	DESC
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

Dimensions: 105.50 (TFT OD), 98.90 (TFT OPEN), 95.04 (TFT AA), 3.30, 5.23, 2.86, 4.33, 47.20 (TFT OD), 57.70 (TFT OPEN), 53.86 (TFT AA), 46.03, 18.52, 25.13

4.3" TFT
480*RGB*272
VIEW DIRECTION

A

DETAIL A 60:1 0.198 0.066 R G B

DETAIL B 2:1 S= 0.15 W=0.35 1 ... 40 3.50 0.50 P0.5*(40-1)=19.5±0.05

FRONT / BACK 3.2 (MAX)
COMPONENTS AREA H=1.0MAX
CONTACT SIDE STIFFENER 0.30
5.00

INTERNAL BACKLIGHT CIRCUIT DIAGRAM A ---- K

NOTES:
1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY WHITE
2. OPERATION VOLTAGE: VDD=3.3V
3. VIEWING DIRECTION: 12 O'CLOCK
4. IC CONTROLLER: HX8257A
5. OPERATING TEMP.: -20°C ~ 70°C
6. STORAGE TEMP.: -30°C ~ 80°C
7. LED BACKLIGHT: 53 LED WHITE
8. SURFACE LUMINANCE: 550 cd/m^2
9. GENERAL TOLERANCE: ±0.2
10. RoHS COMPLIANT

CUSTOMER APVL			DATE	2017/05/24
DRAWN		SCALE	TITLE	RVT4.3A480272TNWN00
DFTG CHK		UNIT mm		
ENGR CHK			MODEL	Module TFT RGB
APPROVAL				

| 2.0.0 | Glass change, New TFT open dimension, FFC shape. New IC controller and updated pinout. | 2017.05.24 | RIVERDI SP. Z O.O. | DWG NO Rev. 2.0.0 | PAGE 1/1 |
| Ver. | DESCRIPTION | DATE | | | |

Drawing 2 — RVT4.3A480272TNWR00

TFT PINOUT

PIN	DESC
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	XR
38	YD
39	XL
40	YU

Dimensions: 105.50 (TFT OD), 104.70 (TP OD), 98.90 (TFT OPEN), 97.64 (TP VA), 96.04 (TP AA), 95.04 (TFT AA), 0.74 (TFT - TP), 3.30, 4.27, 5.07, 5.23, 0.15 (TFT - TP), 2.86, 2.87, 3.87, 4.33, 67.20 (TFT OD), 64.40 (TP OD), 57.70 (TFT OPEN), 58.46 (TP VA), 54.86 (TP AA), 53.86 (TFT AA), 46.03, 18.52, 25.13

YU
480*RGB*272
XL XR
YD

DETAIL A 60:1 0.198 0.066 R G B

DETAIL B 2:1 S= 0.15 W=0.35 1 ... 40 3.50 0.50 P0.5*(40-1)=19.5±0.05

FRONT / BACK 1.20 (LOCA + ITO Glass + Gasket) 4.40 (MAX)
COMPONENTS AREA H=1.0MAX
CONTACT SIDE STIFFENER 0.30
5.00

INTERNAL BACKLIGHT CIRCUIT DIAGRAM A ---- K
TP LOGIC DIAGRAM YU XL YD XR

NOTES:
1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY WHITE
2. OPERATION VOLTAGE: VDD=3.3V
3. VIEWING DIRECTION: 12 O'CLOCK
4. IC CONTROLLER: HX8257A
5. OPERATING TEMP.: -20°C ~ 70°C
6. STORAGE TEMP.: -30°C ~ 80°C
7. LED BACKLIGHT: 53 LED WHITE
8. SURFACE LUMINANCE: 440 cd/m^2
9. GENERAL TOLERANCE: ±0.2
10. RoHS COMPLIANT

CUSTOMER APVL			DATE	2017/05/25
DRAWN		SCALE	TITLE	RVT4.3A480272TNWR00
DFTG CHK		UNIT mm		
ENGR CHK			MODEL	RGB module with RTP
APPROVAL				

| 2.0.0 | Glass change, New TFT open dimension, FFC shape. New IC controller and updated pinout. | 2017.05.25 | RIVERDI SP. Z O.O. | DWG NO Rev.2.0.0 | PAGE 1/1 |
| Ver. | DESCRIPTION | DATE | | | |

TFT PINOUT

PIN	DESC
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

CTP PINOUT

PIN	DESC
1	VDD
2	VDD
3	SCL
4	NC
5	SDA
6	NC
7	/RST
8	/WAKE
9	INT
10	VSS

NOTES:
1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY WHITE
2. 4.3 INCH PROJECTIVE CAPACITIVE TOUCH PANEL
3. OPERATION VOLTAGE: VDD=3.3V
4. VIEWING DIRECTION: 12 O'CLOCK
5. IC CONTROLLER: HX8257A
6. CTP RESOLUTION: 1280 X 768 DOTS
7. CTP IC DRIVER: FT5446
8. CTP MULTI FINGER: UP TO 5
9. OPERATING TEMP: -20°C ~ 70°C
10. STORAGE TEMP: -30°C ~ 80°C
11. LED BACKLIGHT: 10-LED WHITE
12. SURFACE LUMINANCE: 500 cd/m²
13. GENERAL TOLERANCE: ±0.2
14. RoHS COMPLIANT

REAR SIDE ADHESIVE TAPE (see Chapter 10)

DETAIL A SCALE 60:1

DETAIL B SCALE 2:1

DETAIL C SCALE 4:1

DETAIL D SCALE 4:1

INTERNAL BACKLIGHT CIRCUIT DIAGRAM

A — K

480×RGB×272

CUSTOMER APVL			DATE	2018/04/10
	DRAWN		SCALE 1:1	TITLE
3.0.0	New CTP driver	2018.04.10	DFTG CHK	UNIT mm
	Glass change, new TFT open dimension, FFC shape, New IC controller and updated pinout.		ENGR CHK	RVT43ULTNWC0x
2.0.0		2017.05.26	APPROVAL	MODEL
Ver.	DESCRIPTION	DATE		DWG NO
			RIVERDI	Rev. 3.0.0 PAGE 1/1

TFT PINOUT

PIN	DESC
1	VLED-
2	VLED+
3	GND
4	VDD
5	R0
6	R1
7	R2
8	R3
9	R4
10	R5
11	R6
12	R7
13	G0
14	G1
15	G2
16	G3
17	G4
18	G5
19	G6
20	G7
21	B0
22	B1
23	B2
24	B3
25	B4
26	B5
27	B6
28	B7
29	GND
30	DCLK
31	DISP
32	HSYNC
33	VSYNC
34	DE
35	NC
36	GND
37	NC
38	NC
39	NC
40	NC

CTP PINOUT

PIN	DESC
1	VSS
2	VSS
3	SCL
4	NC
5	SDA
6	NC
7	/RST
8	/WAKE
9	INT
10	VSS

4.3" TFT
480×RGB×272
VIEW DIRECTION

NOTES:
1. DISPLAY TYPE: TFT, TRANSMISSIVE, NORMALLY WHITE
2. RESOLUTION: 480×272
3. VIEWING DIRECTION: 12 O'CLOCK
4. TFT IC CONTROLLER: HX8257A
5. TP IC CONTROLLER: FT5306
6. OPERATING TEMP: -20°C ~ 70°C
7. STORAGE TEMP: -30°C ~ 80°C
8. LED BACKLIGHT: 10-LED WHITE
9. SURFACE LUMINANCE: 500 cd/m²
10. OPERATING VOLTAGE: 3.3V
11. GENERAL TOLERANCE: ±0.2
12. RoHS COMPLIANT

DETAIL A 60:1

DETAIL B 2:1

DETAIL C 4:1

INTERNAL BACKLIGHT CIRCUIT DIAGRAM

A — K

CUSTOMER APVL			DATE	2017/05/26
	DRAWN		SCALE	TITLE
	DFTG CHK		UNIT mm	RVT4.3A480272TFWC00
	ENGR CHK			MODEL
2.0.0	Glass change, new TFT open dimension, new IC controller and updated pinout.	2017.05.26	APPROVAL	Module TFT RGB + CTP
Ver.	DESCRIPTION	DATE	**RIVERDI SP. Z O.O.**	DWG NO Rev. 2.0.0 PAGE 1/1

4. Absolute maximum ratings

PARAMETER	SYMBOL	MIN	MAX	UNIT
Supply Voltage for LCD Logic	VDD	-0.3	4.5	V
Supply Voltage for CTP Logic	VDD-VSS	-0.3	3.6	V
Input Voltage for Logic	VIN	VSS-0.5	VDD	V
Operating Temperature	TOP	-20	70	°C
Storage Temperature	TST	-30	80	°C
Humidity	RH	–	90% (Max 60°C)	RH
LED forward current (each LED)	IF	–	25	mA

5. Electrical characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	NOTES
Supply Voltage For Module	VDD	3.0	3.3	3.6	V	
Input Current	IDD	–	19.5	–	mA	VDD=3.3V
Input Voltage 'H' level	Vih	0.7VDD	–	VDD	V	
Input Voltage 'L' level	Vil	VSS	–	0.3VDD	V	
Voltage for LED backlight	Vl	15	16	17	V	
Current for LED backlight	IL	–	40	–	mA	
LED Life Time	–	30000	50000	–	Hrs	Note1

Note 1: The LED life time is defined as the module brightness decrease to 50% original brightness at Ta=25°C.

6. Electro-optical characteristics

ITEM		SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	REMARK	NOTE
Response Time		Tr+Tf		–	20	30	ms	Figure 4	4
Contrast Ratio		Cr	θ=0° ∅=0° Ta=25	320	400	–	—	Figure 5	1
Luminance Uniformity		δ WHITE		80	–	–	%	Figure 5	3
Surface Luminance	TFT	Lv		440	550	–	cd/m2	Figure 5	2
	TFT+CTP			400	500	–			
	TFT+RTP			350	440	–			
Viewing Angle Range		θ	∅ = 90°	35	50	–	deg	Figure 6	6
			∅ = 270°	55	70	–	deg	Figure 6	

				Ø = 0°	55	70	–	deg	Figure 6
				Ø = 180°	55	70	–	deg	Figure 6
CIE (x, y) Chromaticity	Red	x			0.570	0.620	0.670		
		y			0.294	0.344	0.394		
	Green	x	θ=0° Ø=0° Ta=25		0.256	0.306	0.356	Figure 6	5
		y			0.513	0.563	0.613		
	Blue	x			0.083	0.133	0.183		
		y			0.099	0.149	0.199		
	White	x			0.250	0.300	0.350		
		y			0.280	0.330	0.380		

Note 1. Contrast Ratio(CR) is defined mathematically as below, for more information see Figure 3 .

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

Note 2. Surface luminance is the LCD surface from the surface with all pixels displaying white. For more information, see Figure 3 .

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

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 maximum luminance of 5 points luminance by minimum 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 FIG 1. The test equipment is Autronic-Melchers's ConoScope series.

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. Viewing angle is the angle at which the contrast ratio is greater than 2. 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 the LCD surface. For more information see Figure 4.

Note 7. For viewing angle and response time testing, the testing data is based on Autronic-Melchers's ConoScope series. Instruments for Contrast Ratio, Surface Luminance, Luminance Uniformity, CIE the test data is based on TOPCON's BM-5 photo detector.

Note 8. For TFT module, Gray scale reverse occurs in the direction of panel viewing angle.

Figure 3. The definition of response time
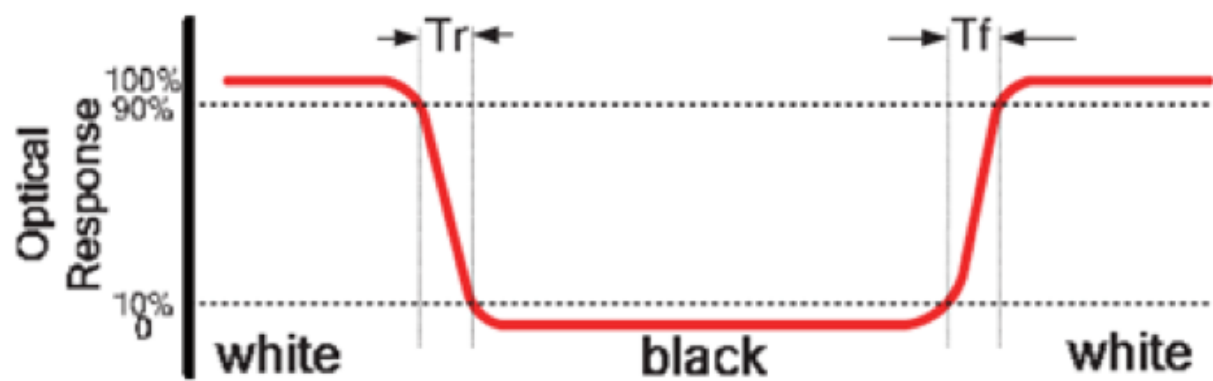
Figure 3. Measuring method for Contrast ratio, surface luminance, Luminance uniformity, CIE (x, y) chromaticity

A : 5 mm
B : 5 mm
H,V : Active Area
Light spot size Ø=5mm, 500mm distance from the LCD surface to detector lens
measurement instrument is TOPCON's luminance meter BM-5
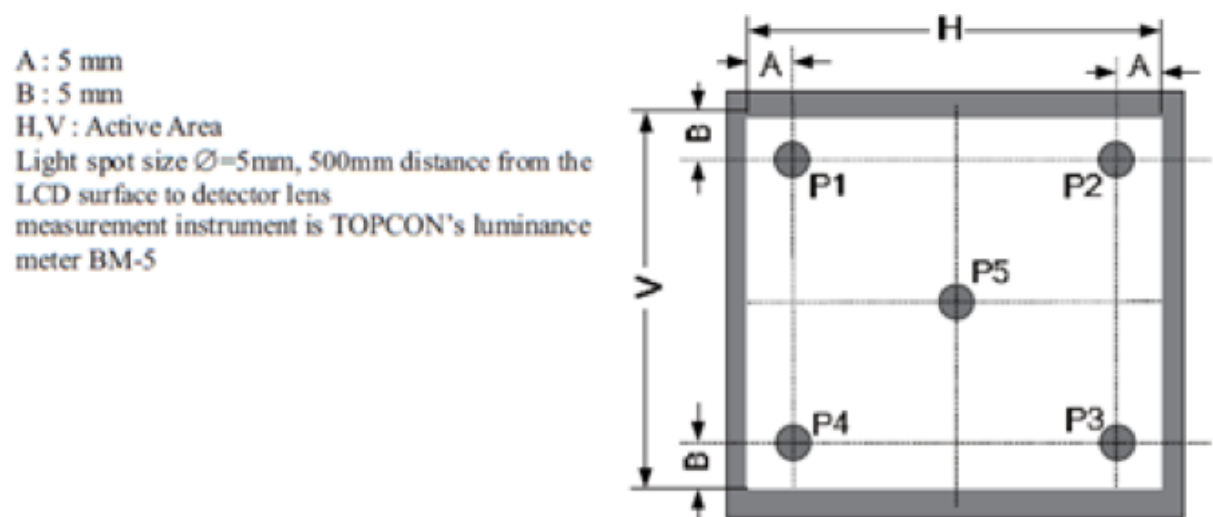
Figure 4.The definition of viewing angle
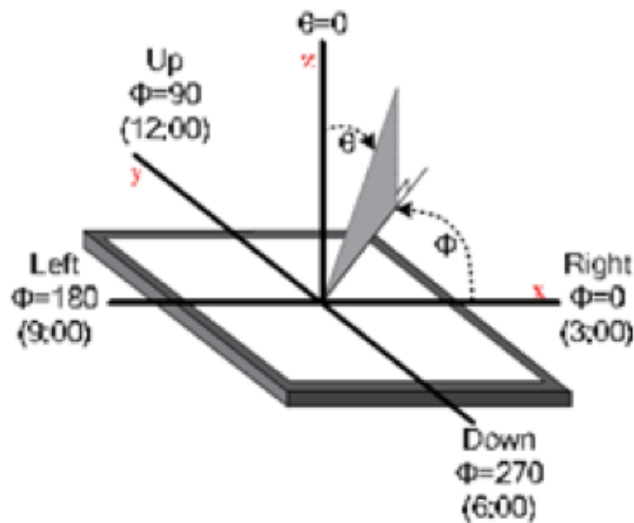
7. Interface description

PIN NO.	SYMBOL	DESCRIPTION	NOTE
1	VLED-	Cathode Of LED Backlight	
2	VLED+	Anode Of LED Backlight	
3	GND	Power Ground	
4	VDD	Power Voltage	
5-12	R0-R7	Red Data (R0-LSB, R7-MSB)	
13-20	G0-G7	Green Data (G0-LSB, G7-MSB)	
21-28	B0-B7	Blue Data (B0-LSB, B7-MSB)	
29	GND	Power Ground	
30	DCLK	Pixel Clock	
31	DISP	Display On/Off	
32	HSYNC	Horizontal Sync Signal	
33	VSYNC	Vertical Sync Signal	
34	DE	Data Enable	
35	NC	No Connect	
36	GND	Power Ground	
37	NC	No Connect	
38	NC	No Connect	
39	NC	No Connect	
40	NC	No Connect	

Note 1: Displays marked with „rev.2.0" printing, have the ability to select the operating mode: HV mode or DE mode.

HVDSL="H": Set under HV mode, VSD and HSD signal have to provide by system.

HVDSL="L": Set under DE mode, DE signal have to provide by system.

By default: Internal pulled weak low.

7.1. Interface CTP

PIN NO.	SYMBOL	DESCRIPTION	REMARK
1	Vss	Power Ground	
2	Vdd	Power For CTP	
3	SCL	I2C SCL	
4	NC	–	
5	SDA	I2C SDA	
6	NC	–	
7	/RST	Reset pin	
8	NC	–	
9	/INT	Interrupt signal from CTP	
10	VSS	Power Ground	

8. Timing characteristics

8.1. LCD Clock and data input time diagram

Figure 5. Clock and data input time diagram
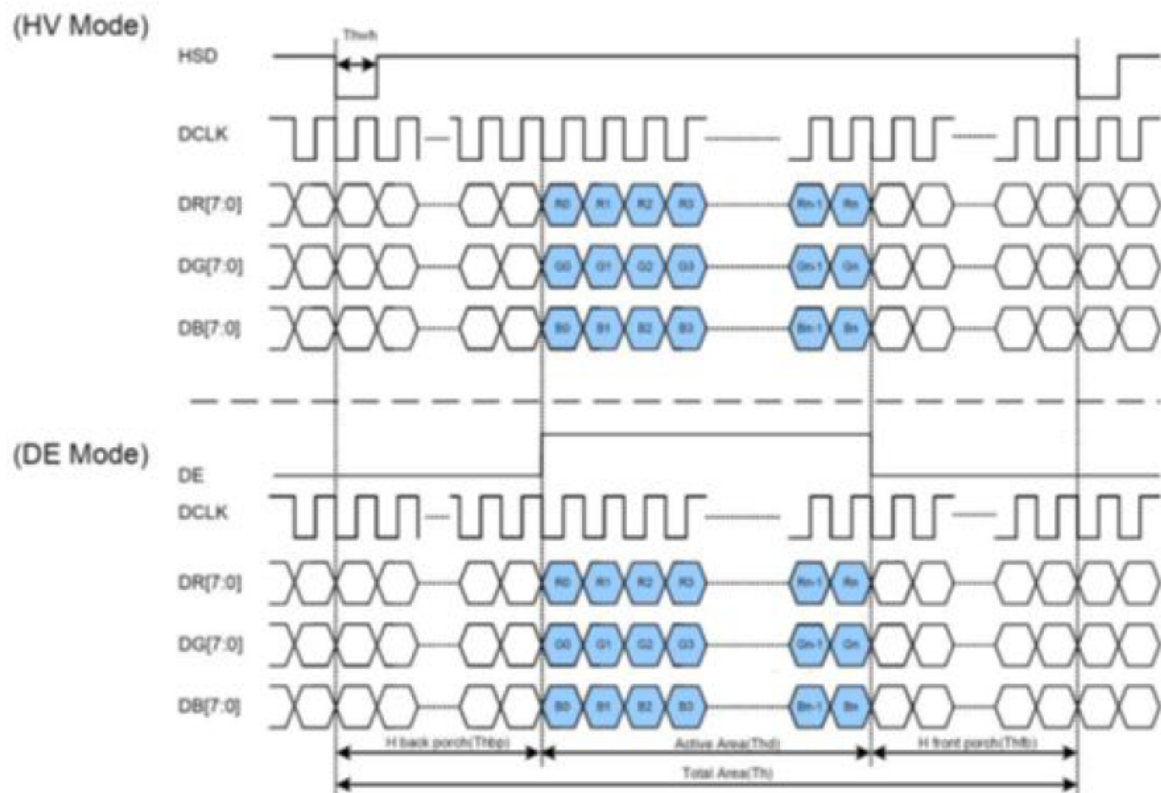
8.2. Parallel RGB input timing table for LCD

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
DCLK Frequency	Fclk	5	9	12	MHz
VSD Period Time	Tv	277	288	400	H
VSD Display Area	Tvd	272			H
VSD Back Porch	Tvb	3	8	31	H
VSD Front Porch	Tvfp	2	8	97	H
HSD Period Time	Th	520	525	800	DCLK
HSD Display Area	Thd	480			DCLK
HSD Back Porch	Thbp	36	40	255	DCLK
HSD Front Porch	Thfp	4	5	65	DCLK

8.3. CTP interface timing characteristics

PARAMETER	MIN	MAX	UNIT
SCL Frequency	0	400	kHz
Bus Free Time Between a STOP and START Condition	4.7	/	µs
Hold Time (repeated) START Condition	4.0	/	µs
Data Setup Time	250	/	ns
Setup Time for Repeated START Condition	4.7	/	µs
Setup Time for STOP Condition	4.0	/	µs

8.4. I2C Read/Write Interface description

Figure 6. Write N bytes to I2C slave
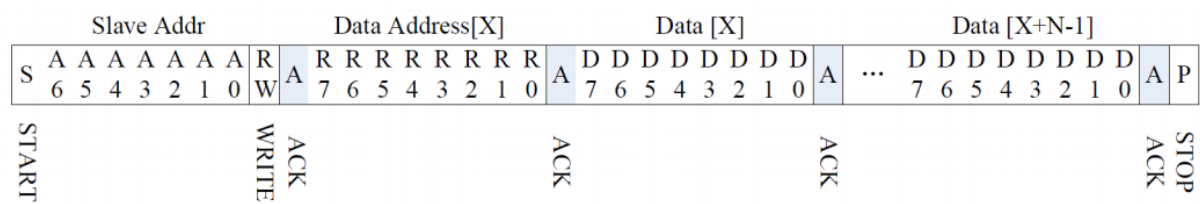
Figure 7. Set Data Address

Slave Addr | **Data Address[X]**

| S | A6 A5 A4 A3 A2 A1 A0 | R/W | A | R7 R6 R5 R4 R3 R2 R1 R0 | A | P |

START — WRITE — ACK — ACK — STOP
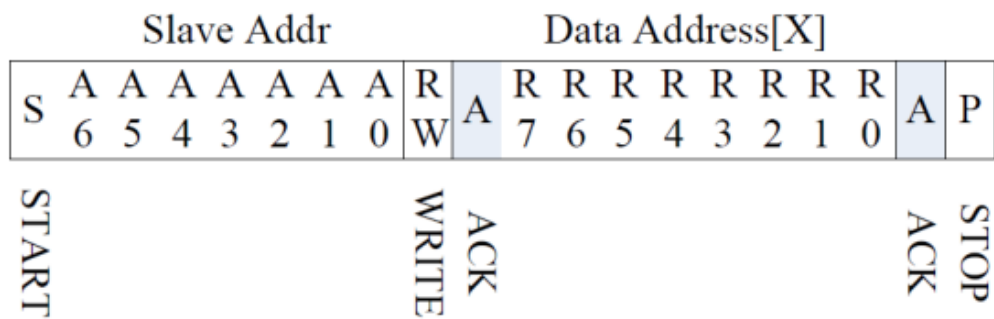
Figure 8. Read X bytes from I2C Slave

Slave Addr | **Data [N]** | **Data [X+N-1]**

| S | A6 A5 A4 A3 A2 A1 A0 | R/W | A | D7 D6 D5 D4 D3 D2 D1 D0 | A | ... | D7 D6 D5 D4 D3 D2 D1 D0 | A | P |

START — Read ACK — ACK — ACK — STOP ACK
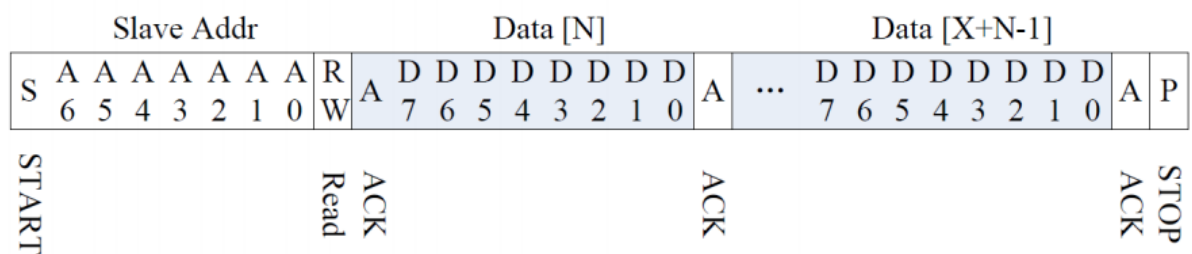
8.5. Communication of the I2C interface with Host

Figure 9. Communication of the I2C interface with Host
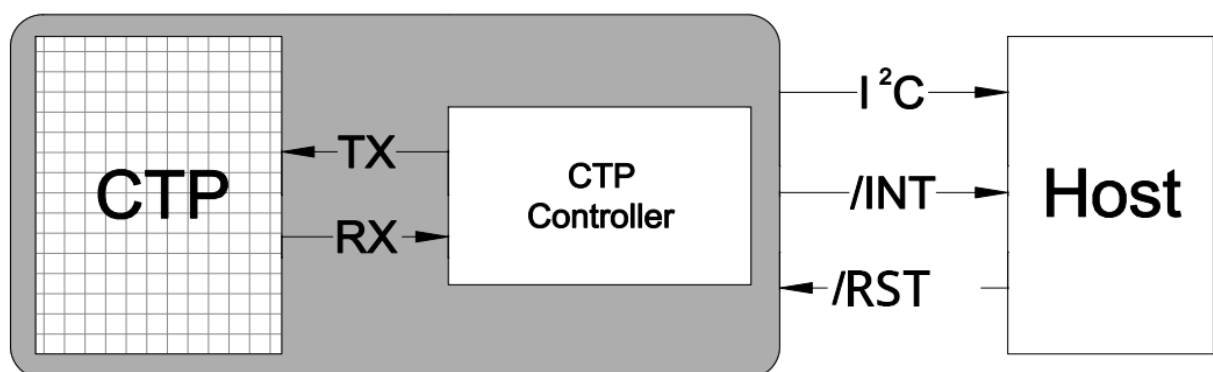
8.6. Touch data read protocol

ADDRESS	NAME	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0	HOST

			ACCESS
00h	DEVIDE_MODE	Device Mode[2:0]	RW
01h	GEST_ID	Gesture ID[7:0]	R
02h	TD_STATUS	Number of touch points[3:0]	R
03h	TOUCH1_XH	1st Event Flag ‖ 1st Touch X Position[11:8]	R
04h	TOUCH1_XL	1st Touch X Position[7:0]	R
05h	TOUCH1_YH	1st Touch ID[3:0] ‖ 1st Touch X Position[11:8]	R
06h	TOUCH1_YL	1st Touch Y Position[7:0]	R
07h			R
08h			R
09h	TOUCH2_XH	2nd Event Flag ‖ 2nd Touch X Position[11:8]	R
0Ah	TOUCH2_XL	2nd Touch X Position[7:0]	R
0Bh	TOUCH2_YH	2nd Touch ID[3:0] ‖ 2nd Touch X Position[11:8]	R
0Ch	TOUCH2_YL	2nd Touch Y Position[7:0]	R
0Dh			R
0Eh			R
0Fh	TOUCH3_XH	3rd Event Flag ‖ 3rd Touch X Position[11:8]	R
10h	TOUCH3_XL	3rd Touch X Position[7:0]	R
11h	TOUCH3_YH	3rd Touch ID[3:0] ‖ 3rd Touch X Position[11:8]	R
12h	TOUCH3_YL	3rd Touch Y Position[7:0]	R
13h			R
14h			R
15h	TOUCH4_XH	4th Event Flag ‖ 4th Touch X Position[11:8]	R
16h	TOUCH4_XL	4th Touch X Position[7:0]	R
17h	TOUCH4_YH	4th Touch ID[3:0] ‖ 4th Touch X Position[11:8]	R
18h	TOUCH4_YL	4th Touch Y Position[7:0]	R
19h			R
1Ah			R
1Bh	TOUCH5_XH	5th Event Flag ‖ 5th Touch X Position[11:8]	R
1Ch	TOUCH5_XL	5th Touch X Position[7:0]	R
1Dh	TOUCH5_YH	5th Touch ID[3:0] ‖ 5th Touch X Position[11:8]	R
1Eh	TOUCH5_YL	5th Touch Y Position[7:0]	R

8.7 Data description

DEVICE_MODE

This register is the device mode register, configure it to determine the current mode of the chip.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
00h	6:4	Device Mode [2:0]	000b Work Mode 100b Factory Mode – Read Raw Data

GEST_ID

This register describes the gesture of a valid touch.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
01h	7:0	Gesture ID [7:0]	Gesture ID 0x10 Move Up 0x14 Move Down 0x18 Move Right 0x48 Zoom In 0x49 Zoom Out 0x00 No Gesture

TD_STATUS

This register is the Touch Data status register.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
02h	3:0	Number of Touch Points [2:0]	How Many Points Detected 1-5 is Valid
	7:4		

TOUCHn_XH(n:1-10)

This register describes MSB of the X coordinate of the nth touch point and the corresponding event flag.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
03h ~ 39h	7:6	Event Flag	00b: Put Down 01b: Put Up 10b: Contact 11b: Reserved
	5:4		Reserved
	3:0	Touch X Position [11:8]	MSB of Touch X Position in Pixels

TOUCHn_XL(n:1-10)

This register describes LSB of the X coordinate of the nth touch point.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
04h	7:0	Touch X Position [7:0]	LSB of the Touch X Position in Pixels

~			
3Ah			

TOUCHn_YH(n:1-10)

This register describes MSB of the Y coordinate of the nth touch point and corresponding touch ID.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
05h ~ 3Bh	7:4	Touch ID[3:0]	Touch ID of Touch Point
	3:0	Touch X Position [11:8]	MSB of Touch Y Position in Pixels

TOUCHn_YL(n:1-10)

This register describes LSB of the Y coordinate of the nth touch point.

ADRESS	BIT ADRESS	REGISTER NAME	DESCRIPTION
05h ~ 3Bh	7:0	Touch X Position [7:0]	LSB of the Touch Y Position in Pixels

8.8 interrupt trigger mode

Figure 10. Interrupt trigger mode timing
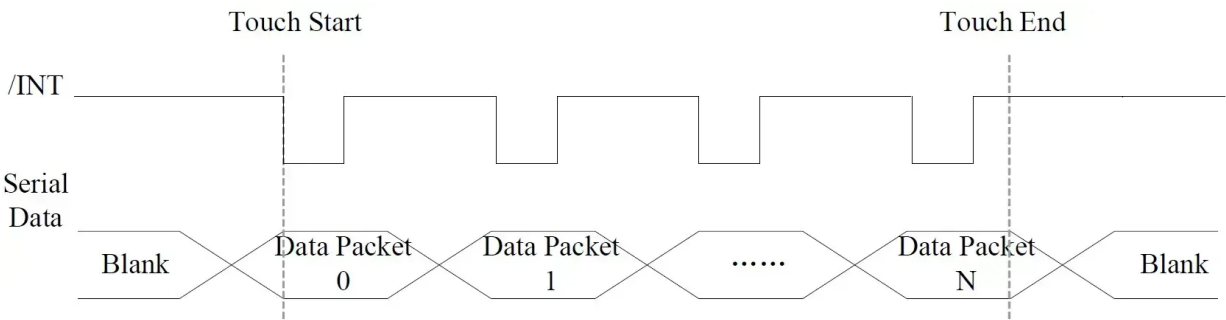
9. Touch screen panel specification

9.1. Electrical characteristics

9.1.1. Capacitive touch panel

DESCRIPTION		SPECIFICATION
Operating Voltage		DC 2.8~3.3V
Power Consumption (IDD)	Active Mode	10~18mA
	Sleep Mode	30~50µA
Interface		I2C
Linearity		<1.5%
Controller		FT5446
I2C address		0x38 (7-bit address)
Resolution		1280*768

9.1.2. Resistive touch panel

ITEM	VALUE			UNIT	REMARK
	Min.	Typ.	Max.		
Linearity	-3.0	–	3.0	%	Analog X and Y directions
Terminal Resistance	400	–	1050	Ω	X
	100	–	450	Ω	Y
Insulation Resistance	–	–	–	MΩ	DC 25V
Voltage	–	–	10	V	DC
Chattering	–	–	10	ms	100kΩ pull-up
Transparency	80	–	–	%	JIS K7105

Note: Avoid operating with hard or sharp material such as a ball point pen or a mechanical pencil except a polyacetal pen (tip R0.8mm or less) or a finger

9.2. Mechanical characteristic

9.2.1. Capacitive touch panel

DESCRIPTION	INL SPECIFICATION	REMARK
Touch Panel Size	4.3 inch	
Outline Dimension (OD)	103.1mm x 65.4mm	Cover Lens Outline
Outline Dimension (OD) – UxTouch	120.38mm x 79.20mm	Cover Lens Outline
Product Thickness	1.7mm	
Glass Thickness	0.7mm	
Ink View Area	97.0mm x 55.5mm	
Sensor Active Area	97.4mm x 56.4mm	
Input Method	5 Finger	
Activation Force	Touch	
Surface Hardness	≥7H	

9.2.2. Resistive touch panel

ITEM	VALUE			UNIT	REMARK
	Min.	Typ.	Max.		
Activation Force	30	–	–	gf	Note 1
Durability – Surface Scratching	Write 100,000	–	–	characters	Note 2
Durability-Surface Pitting	1,000,000	–	–	touches	Note 3
Surface Hardness	3	–	–	H	JIS K5400

Note 1: Force test condition, Input DC 5V on X direction, Drop off Polyacetal Stylus (R0.8), until output voltage stabilize, then get the R8.0mm Silicon rubber and do finger Activation force test. Next step, 9 points.
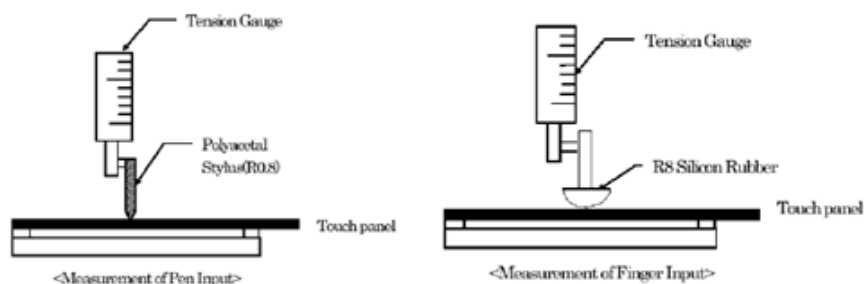
Note 2: Measurement surface area conditions, Scratch 100,000 times straight line on the film with a stylus change every 20,000 times with Force: 250gf, Speed: 60mm/sec by R0.8 polaceteal stylus.

Note 3: Pitting test, Pit 1, 000, 000 times on the film with R0.8 silicon rubber with Force: 250gf and Speed: 2 times/sec.

10. Inspection

Standard acceptance/rejection criteria for TFT module.

10.1. Inspection condition

Ambient conditions:

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

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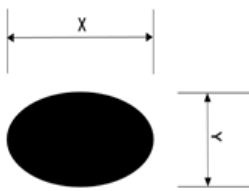
35±5cm between inspector bare eye and LCD.

Viewing Angle:

U/D: 45°/45°, L/R 45°/45°
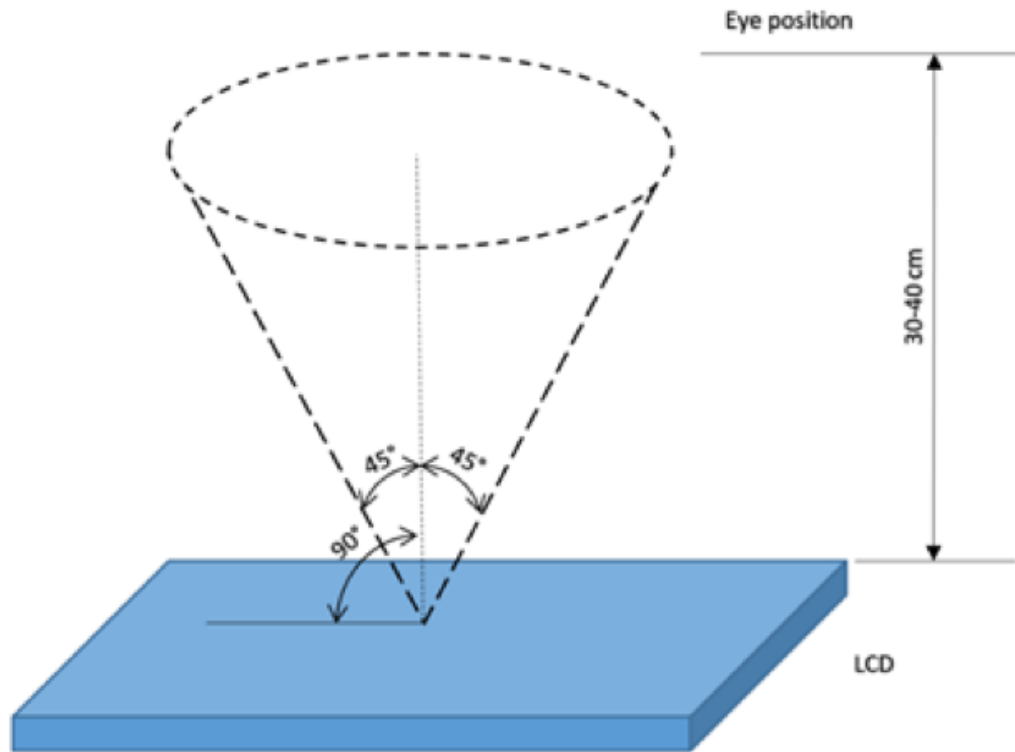
10.2 Inspection standard

Item	Criterion		
Black spots, white spots, light leakage, Foreign Particle (round Type)	$$D = \frac{(x + y)}{2}$$		

Size < 5"

Average Diameter	Qualified Qty
D < 0.2 mm	Ignored
0.2 mm < D < 0.3 mm	3
0.3 mm < D < 0.5 mm	2
0.5 mm < D	0

Size >= 5"

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

LCD black spots, white spots, light leakage (line Type)		Size < 5"		
		Length	Width	Qualified Qty
		–	W< 0.02	Ignored
		L < 3.0	0.02 < W <0.05	2
		L < 2.5	0.05 < W <0.08	
		–	0.08 < W	0
		Size >= 5"		
		Length	Width	Qualified Qty
		–	W< 0.02	Ignored
		L < 3.0	0.02 < W <0.05	4
		L < 2.5	0.05 < W <0.08	
		–	0.08 < W	0
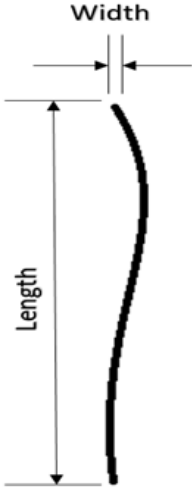
Item	Criterion

Clear spots

Size < 5"	
Average Diameter	Qualified Qty
D < 0.2 mm	Ignored
0.2 mm < D < 0.3 mm	3
0.3 mm < D < 0.5 mm	2
0.5 mm < D	0

Size >= 5"	
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

Polarizer bubbles

Size < 5"	
Average Diameter	Qualified Qty
D < 0.2 mm	Ignored
0.2 mm < D < 0.5 mm	3
0.5 mm < D < 1 mm	2
1 mm < D	0
Total Q'ty	3

Size >= 5"	
Average Diameter	Qualified Qty

D<0.25 mm	Ignored
0.25 mm < D < 0.5 mm	3
0.5 mm < D	0

Electrical Dot Defect

Size < 5"	
item	Qualified Qty
Black do defect	4
Bright dot defect	2
Total Dot	5

Size >= 5"	
item	Qualified Qty
Black do defect	5
Bright dot defect	2
Total Dot	5

Item	Criterion

Touch panel spot

Size < 5"	
Average Diameter	Qualified Qty
D < 0.2 mm	Ignored
0.2 mm < D < 0.4 mm	5
0.4 mm < D < 0.5 mm	2
0.5 mm < D	0

Size >= 5"	
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"		
Length	Width	Qualified Qty
–	W< 0.02	Ignored
L < 3.0	0.02 < W <0.05	2
L < 2.5	0.05 < W <0.08	
–	0.08 < W	0

Size >= 5"		
Length	Width	Qualified Qty
–	W< 0.03	Ignored
L < 5.0	0.03 < W <0.05	2
–	0.05 < W	0

11. Reliability test

NO.	TEST ITEM	TEST CONDITION
1	High Temperature Storage	80±2°C/240hours
2	Low Temperature Storage	-30±2°C/240hours
3	High Temperature Operating	70±2°C/240hours
4	Low Temperature Operating	-20±2°C/240hours
5	Temperature Cycle	-30±2°C~25~80±2°C × 20 cycles (30min.) (5min.)　(30min.)
6	Damp Proof Test	60°C ±5°C × 90%RH/240hours
7	Vibration Test	Frequency 10Hz~55Hz Amplitude of vibration : 1.5mm Sweep: 10Hz~55Hz~10Hz X, Y, Z 2 hours for each direction.
8	Package Drop Test	Height:60 cm 1 corner,3 edges,6 surfaces
9	ESD Test	Air: ±4KV 150pF/330Ω 5 times Contact: ±2KV 150pF/330Ω 5 time