



ASI-T-8001A6MP6/W

No	Item	Specification	Remark
1	Type	Transmissive	-
2	Display Mode	Normally Black	-
3	Pixel Element	a-Si TFT	-
4	Screen Size	8.0 Inch	-
5	TFT Interface	MIPI	-
6	Resolution	800xRGBx1280	-
7	Active Area	107.64(W) x 172.224(L) (mm)	-
8	Color Number	16.7M	-
9	Pixel Size	0.13455(W) x 0.13455(L) (mm)	-
10	Color Arrangement	RGB-stripe	-
11	Assembly Type	COG	-
12	Back Light	LED	-
13	Viewing Direction	Free	-
14	Weight	(TBD)	g
15	Module Dimension	150.0W x 208.5L x 6.25T (mm)	-
16	TP Input Mode	Single fingers detection and Touch	-
17	TP Interface	I ² C	-



RECORD OF REV

DATE	REV.	PAGE	SUMMARY

3. General specifications

3.1 General specifications

It is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses the amorphous silicon TFT as a switching device. This model is composed of a Transmissive type TFT-LCD Panel, a driver circuit and a back-light unit and a Capacitive Touch Panel.

3.2 Features

- High image quality a-Si TFT LCD module.
- 16.7M color number.
- High contrast, high brightness.
- Low power consumption.

4. Mechanical data

No	Item	Specification	Remark
1	Type	Transmissive	-
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17	TP Interface	I ² C	-

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

(a) TFT-LCD Panel Absolute Maximum Ratings

Ta=25°C

Item	Symbol	Condition	Standard Value		Unit	Remark
			Min	Max		
Power supply voltage	VDD1V8	GND=0V	-0.3	3.8	V	-
Power supply voltage	VDD3V3	GND=0V	-0.3	3.8	V	-

- If the LSI is used above these absolute maximum ratings, it may become permanently damaged. Using the LSI within the following electrical characteristics limit is strongly recommended for normal operation. If these electrical characteristic conditions are also exceeded, the LSI will malfunction and cause poor reliability.

(b) Back-Light Unit

Ta=25°C

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Current	I _{LED}	-	400	640	mA	-

(c) Touch Panel Controller IC

Ta=25°C

Item	Symbol	Min.	Max.	Unit	Remark
Supply Voltage	VDD	-0.3	3.63	V	-

- If the LSI is used above these absolute maximum ratings, it may become permanently damaged. Using the LSI within the following electrical characteristics limit is strongly recommended for normal operation. If these electrical characteristic conditions are also exceeded, the LSI will malfunction and cause poor reliability.

5.2 Environmental absolute maximum ratings

Item	Symbol	Min.	Max.	Unit	Remark
Operation temperature range	Top	-20	70	°C	Ambient
Storage temperature range	Tst	-30	80	°C	Ambient

- Corrosive gas environment is not acceptable.
- TFT-LCD color will change slightly depending on environment temperature.
This phenomenon is reversible.

6. Electrical characteristics

=25°C

6.1 TFT-LCD Module

Ta

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power supply voltage	VDD1V8	1.65	1.8	2.0	V	-
Power supply voltage	VDD3V3	3.0	3.3	3.6	V	-
Power supply current	IDD1V8	-	(15.0)	(23.0)	mA	-
Power supply current	IDD3V3	-	(27.0)	(41.0)	mA	-
High level input voltage	VIH	0.7 VDD1V8	-	VDD1V8	V	-
Low level input voltage	VIL	-0.3	-	0.3 VDD1V8	V	-

Ta = 25°C

6.2 Touch Panel Controller IC

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Digital operating voltage	VDD	2.97	3.3	3.63	V	=25°C

6.3 Back-Light Unit

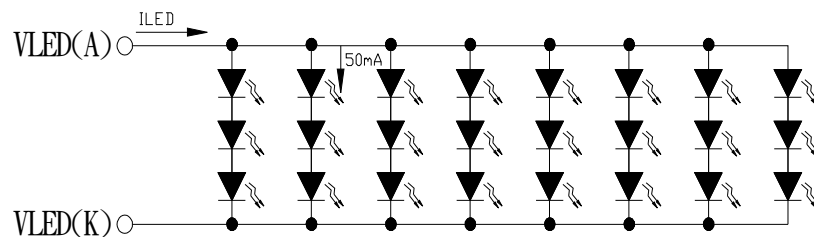
Ta

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Forward Voltage	VLED	9.0	9.6	9.9	V	NOTE(1)
Forward current	ILED	-	400	-	mA	-
Life Time	Lf	70,000	-	-	hrs	NOTE(2)

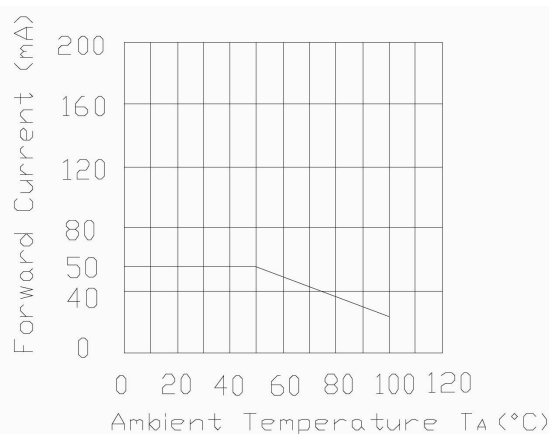
NOTE (1): The LEDs is Series and Parallel type.

NOTE(1): The “LED life time” is defined as the module brightness decreases to 50% of original brightness that the ambient temperature is 25°C and I_{LED}=400mA .The LED lifetime could be decreased if operating I_{LED} is lager than 400mA.

NOTE(2): Back-light circuit :



NOTE(3): Current reduction rate of LED backlight is according to the graph indicated below:

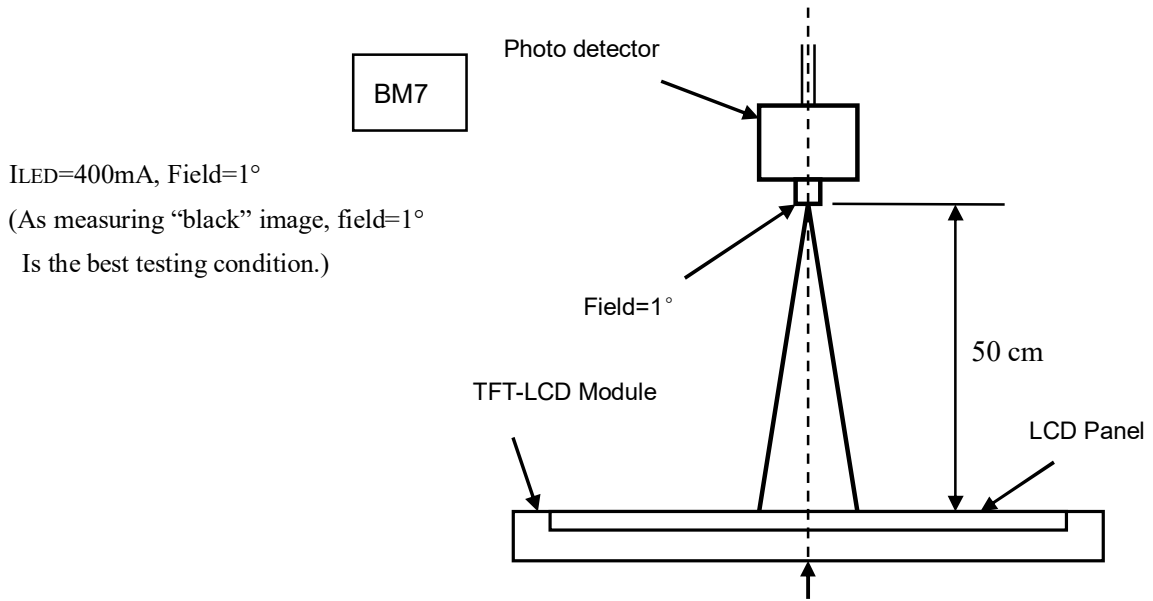


7. Optical characteristics

Ta=25°C, ILED=400mA

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Brightness	B	$\theta=0^\circ$ Normal viewing angle At the center of panel	600	650	-	cd/m ²	(1)	
Contrast Ratio	C/R		800	1000	-	-	(2)	
Response Time	Tr+Tf		-	30	35	ms	(3)	
Color chromaticity	White		Wx	(0.28)	(0.33)	(0.38)	-	-
			Wy	(0.32)	(0.37)	(0.42)		
	Red		Rx	(0.58)	(0.63)	(0.68)	-	-
			Ry	(0.29)	(0.34)	(0.39)		
	Green		Gx	(0.30)	(0.35)	(0.40)	-	-
			Gy	(0.53)	(0.58)	(0.63)		
	Blue		Bx	(0.09)	(0.14)	(0.19)	-	-
		By	(0.02)	(0.07)	(0.12)			
Viewing Angle	Top	θU	75	80	-	Deg.	(4)	
	Bottom	θD	75	80	-			
	Left	θL	75	80	-			
	Right	θR	75	80	-			
Uniformity	Un	$\theta=0^\circ$ Normal viewing angle	70	-	-	%	(5)	

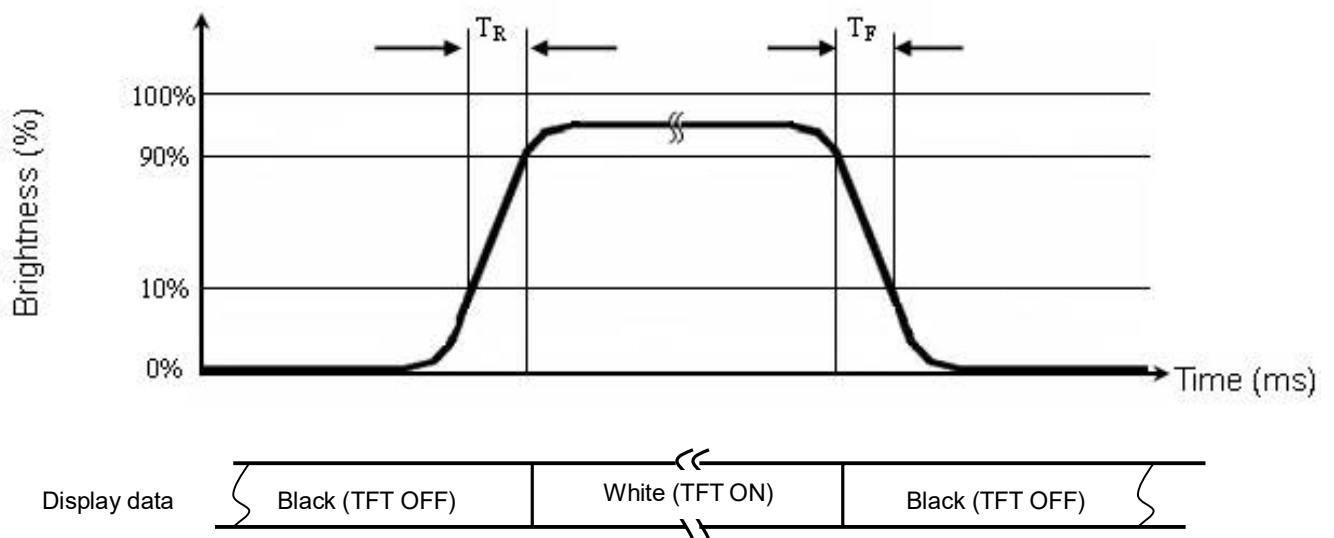
Note (1): The brightness test equipment setup



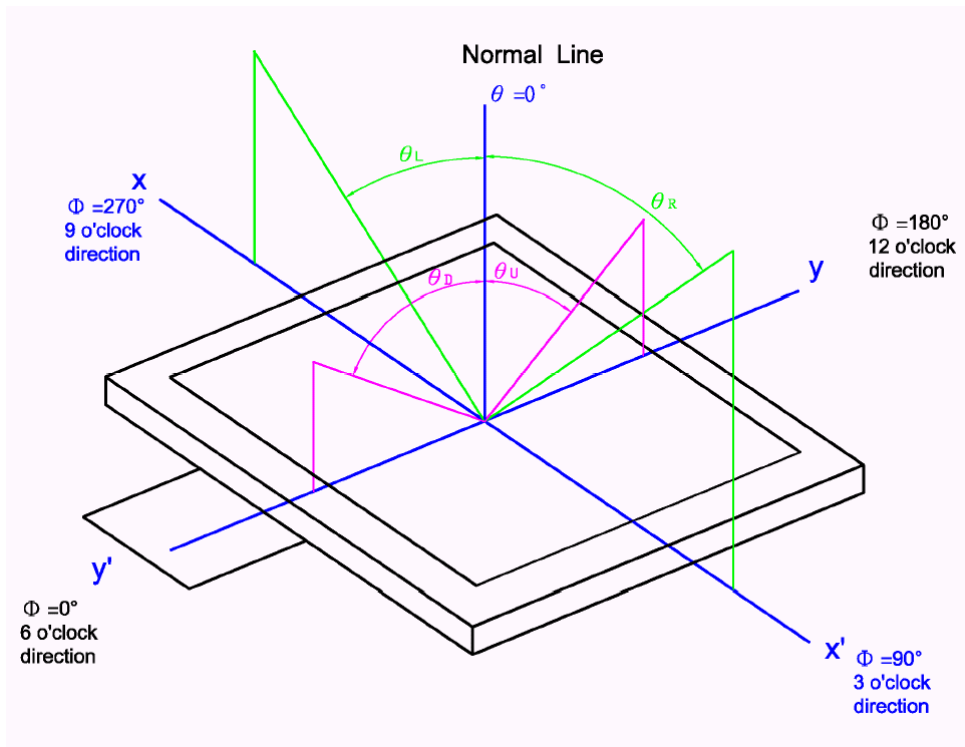
Note (2): Definition of contrast Ratio (C/R)

$$C/R = \frac{\text{Brightness When LCD is at "White" State}}{\text{Brightness When LCD is at "Black" State}}$$

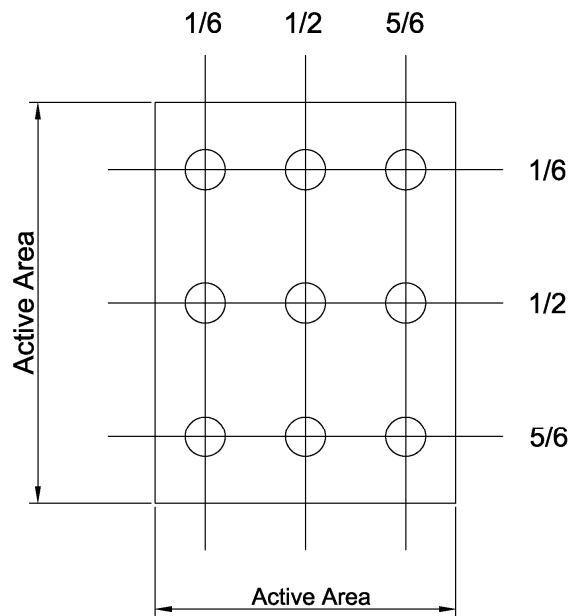
Note (3): Definition of response time



Note (4): Definition of viewing angle

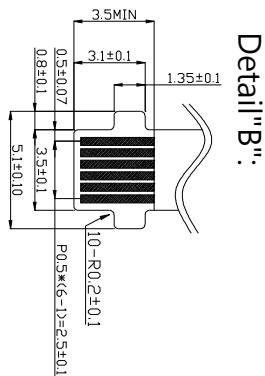
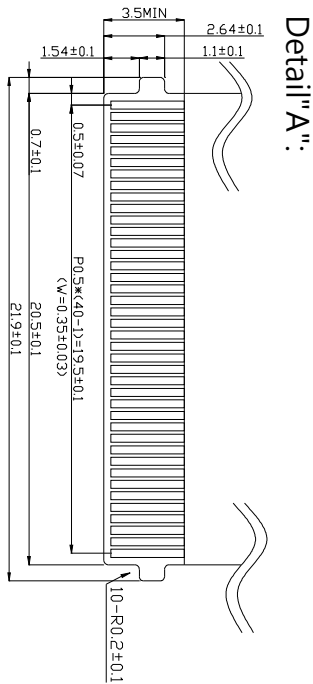


Note (5): Definition of uniformity (Un)



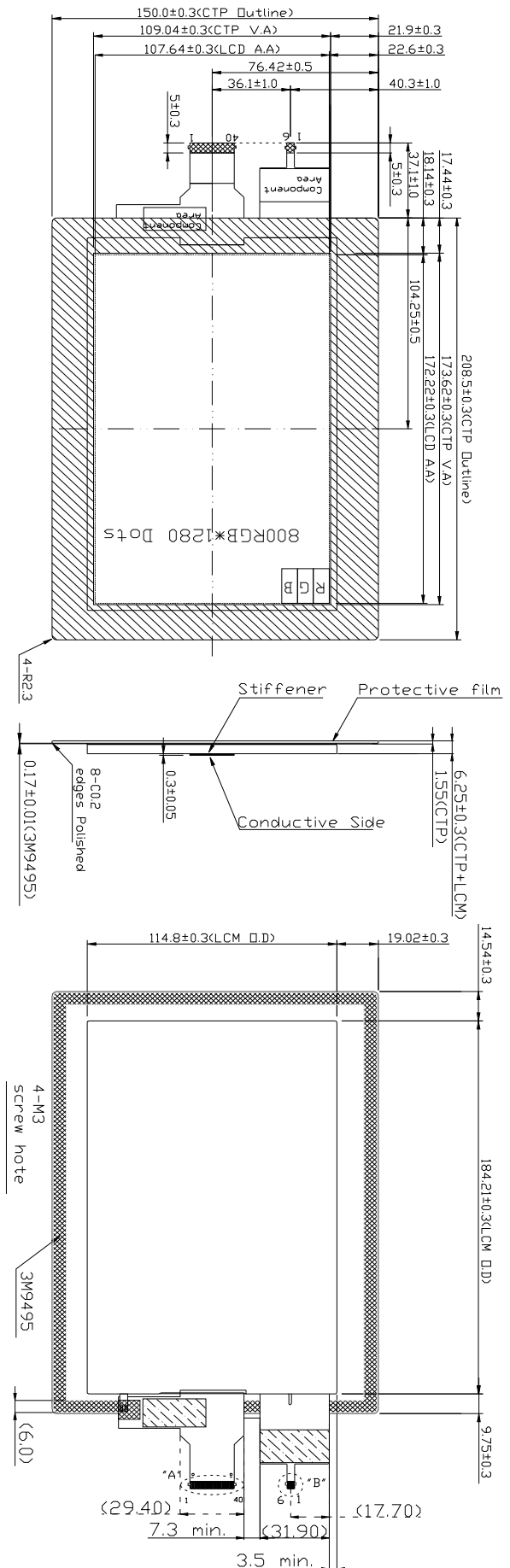
$$U_n = \frac{B_{min}}{B_{max}} \times 100\%$$

8. Outline dimension



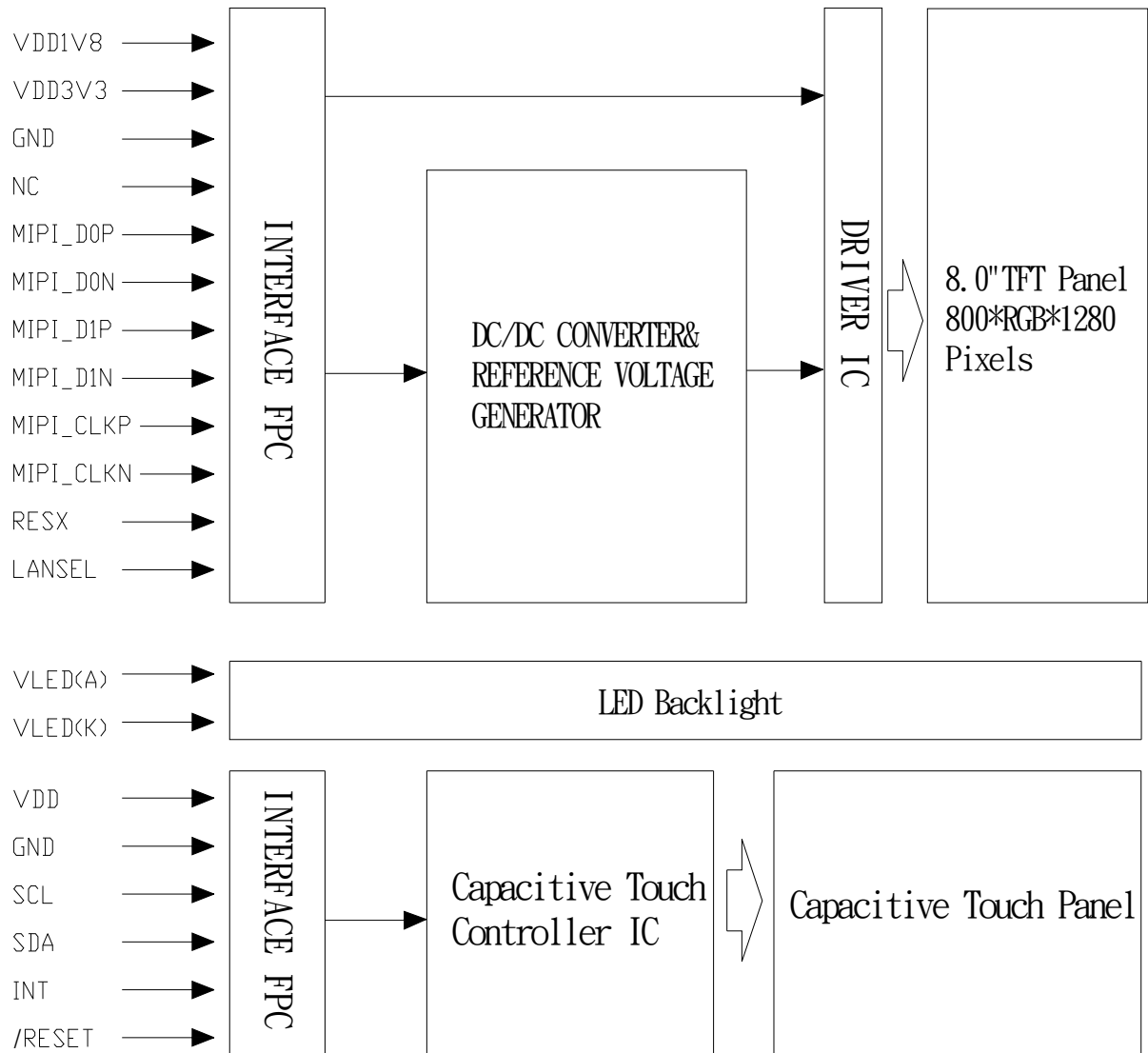
NOTE:

1. UNIT: mm
2. THE TOLERANCE UNLESS CLASSIFIED: 0.3mm
3. PROTECTIVE FILM ON COVER LENS



9. Block diagram

9.1 TFT-LCD Module (Interface System Structure)



10. Input Terminal Pin Assignment

10.1 Input Signal & Power

Pin No	Symbol	Description	Remark
1	VLED(A)	LED Anode	Power
2	VLED(A)	LED Anode	Power
3	VLED(A)	LED Anode	Power
4	NC	Not Connect	-
5	VLED(K)	LED Cathode	Power
6	VLED(K)	LED Cathode	Power
7	VLED(K)	LED Cathode	Power
8	VLED(K)	LED Cathode	Power
9	GND	Ground	Power
10	GND	Ground	Power
11	NC	Not Connect	-
12	NC	Not Connect	-
13	GND	Ground	Power
14	MIPI_D1P	MIPI-DSI data Lane1 positive	Input
15	MIPI_D1N	MIPI-DSI data Lane1 negative	Input
16	GND	Ground	Power
17	MIPI_CLKP	MIPI-DSI clock Lane positive	Input
18	MIPI_CLKN	MIPI-DSI clock Lane negative	Input
19	GND	Ground	Power
20	MIPI_D0P	MIPI-DSI data Lane0 positive	Input/output
21	MIPI_D0N	MIPI-DSI data Lane0 negative	Input/output
22	GND	Ground	Power
23	NC	Not Connect	-
24	NC	Not Connect	-
25	GND	Ground	Power
26	NC	Not Connect	-
27	RESX	Hardware global reset: Low: active reset. High: not use.	Input
28	NC	Not Connect	-

Pin No	Symbol	Description	Remark
29	VDD1V8	I/O Power supply(1.8V)	Power
30~31	VDD3V3	I/O Power supply(3.3V)	Power
32	GND	Ground	Power
33	NC	Not Connect	-
34	LANSEL	MIPI DSI Lane number selection pin: Low: MIPI DSI is 3 or 4 lane modes. High: MIPI DSI is 2 lane modes.	Input
35~40	NC	Not Connect	-

10.2 Input Signal & Power for CTP

Pin No	Symbol	Description	Remark
1	VDD	Power supply	Power
2	GND	Power Ground	Power
3	SCL	I ² C Serial clock	Input
4	SDA	I ² C Serial data	Input/output
5	INT	Interrupt output pin. (Pull low Trigger)	output
6	/RESET	System reset signal input: active low	Input

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
High level input voltage	SCL_VIH	-	0.9	-	V	-
Low level input voltage	SCL_VIL	-	0.5	-	V	-
High level input voltage	SDA_VIH	-	0.9	-	V	-
Low level input voltage	SDA_VIL	-	0.5	-	V	-
High level input voltage	INT_VIH	-	0.9	-	V	-
Low level input voltage	INT_VIL	-	0.5	-	V	-
High level input voltage	/RESET_VIH	-	1.1	-	V	-
Low level input voltage	/RESET_VIL	-	0.9	-	V	-

11. Timing characteristics

11.1 AC Characteristics

11.1.1 High Speed Mode-Clock Channel Timing

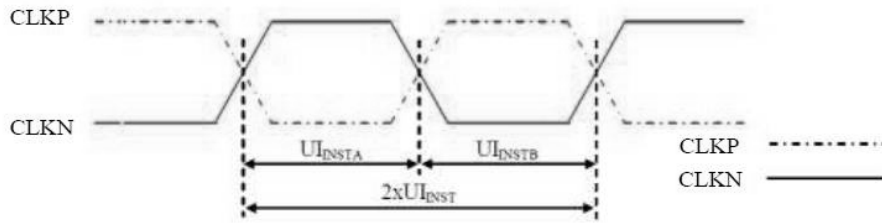


Figure 105: DSI Clock Channel Timing

Table 38: DSI Clock Channel Timing

Signal	Symbol	Parameter	Min	Max	Unit
CLKP/N	$2xUI_{INST}$	Double UI instantaneous	Note 2	25	ns
CLKP/N	UI_{INSTA}, UI_{INSTB} (Note 1)	UI instantaneous Half	Note 2	12.5	ns

Notes:

1. $UI = UI_{INSTA} = UI_{INSTB}$
2. Define the minimum value, see Table 39.

Table 39: Limited Clock Channel Speed

Data type	Two Lanes speed	Three Lanes speed	Four Lanes speed
Data Type = 00 1110 (0Eh), RGB 565, 16 UI per Pixel	566 Mbps	466 Mbps	366 Mbps
Data Type = 01 1110 (1Eh), RGB 666, 18 UI per Pixel	637 Mbps	525 Mbps	412 Mbps
Data Type = 10 1110 (2Eh), RGB 666 Loosely, 24 UI per Pixel	850 Mbps	750 Mbps	650 Mbps
Data Type = 11 1110 (3Eh), RGB 888, 24 UI per Pixel	850 Mbps	750 Mbps	650 Mbps

11.1.2 High Speed Mode-Data Clock Channel Timing

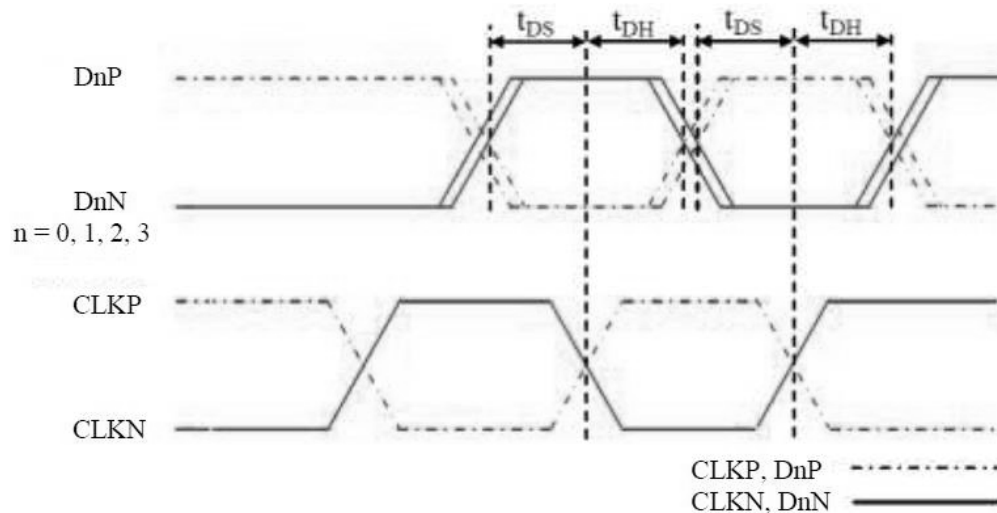


Figure 106: DSI Data to Clock Channel Timings

Table 40: DSI Data to Clock Channel Timings

Signal	Symbol	Parameter	Min	Max
DnP/N, n=0 and 1	t_{DS}	Data to Clock Setup time	0.15xUI	-
	t_{DH}	Clock to Data Hold Time	0.15xUI	-

11.1.3 High Speed Mode-Rising and Falling Timings

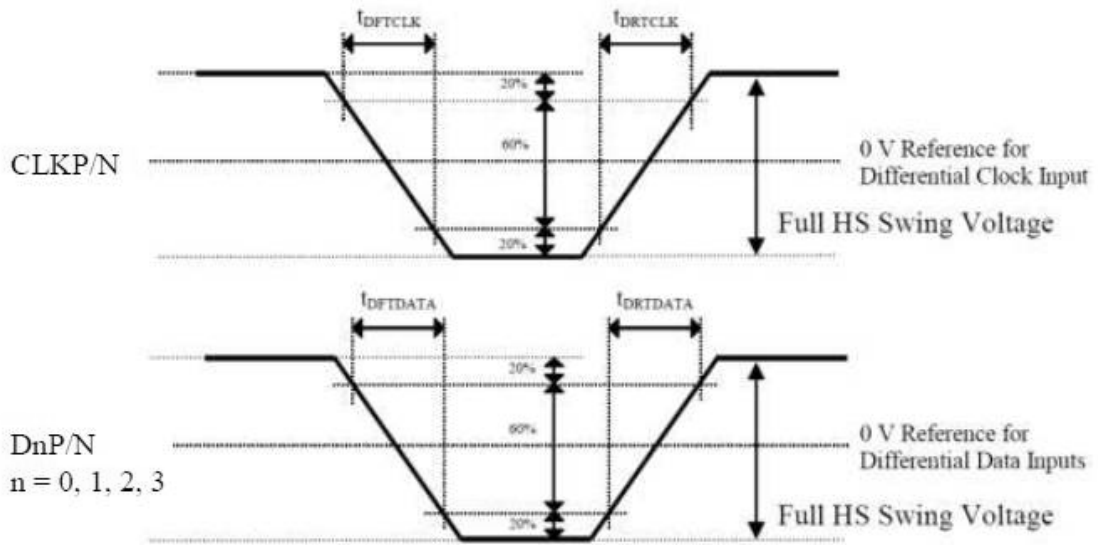


Figure 107: Rising and Falling Timings on Clock and Data Channels

Table 41: Rise and Fall Timings on Clock and Data Channels

Parameter	Symbol	Condition	Specification		
			Min	Typ	Max
Differential Rise Time for Clock	t_{DRTCLK}	CLKP/N	150 ps	-	0.3UI (Note)
Differential Rise Time for Data	$t_{DRTDATA}$	DnP/N n=0 and 1	150 ps	-	0.3UI (Note)
Differential Fall Time for Clock	t_{DFTCLK}	CLKP/N	150 ps	-	0.3UI (Note)
Differential Fall Time for Data	$t_{DFTDATA}$	DnP/N n=0 and 1	150 ps	-	0.3UI (Note)

Note: The display module has to meet timing requirements, which are defined for the transmitter (MCU) on MIPI D-Phy standard.

11.1.4 Reset Timing

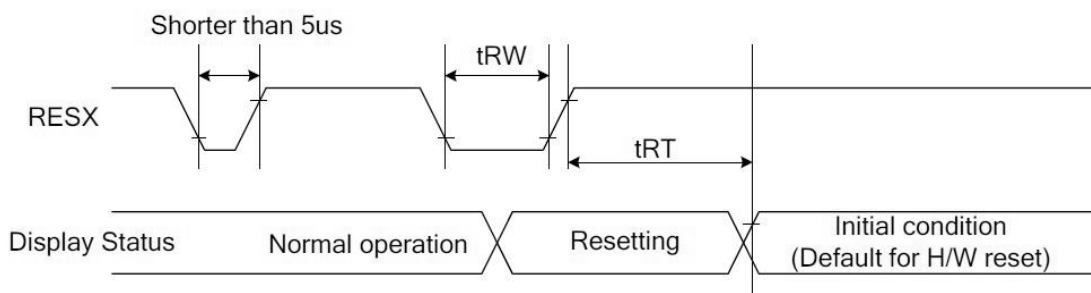
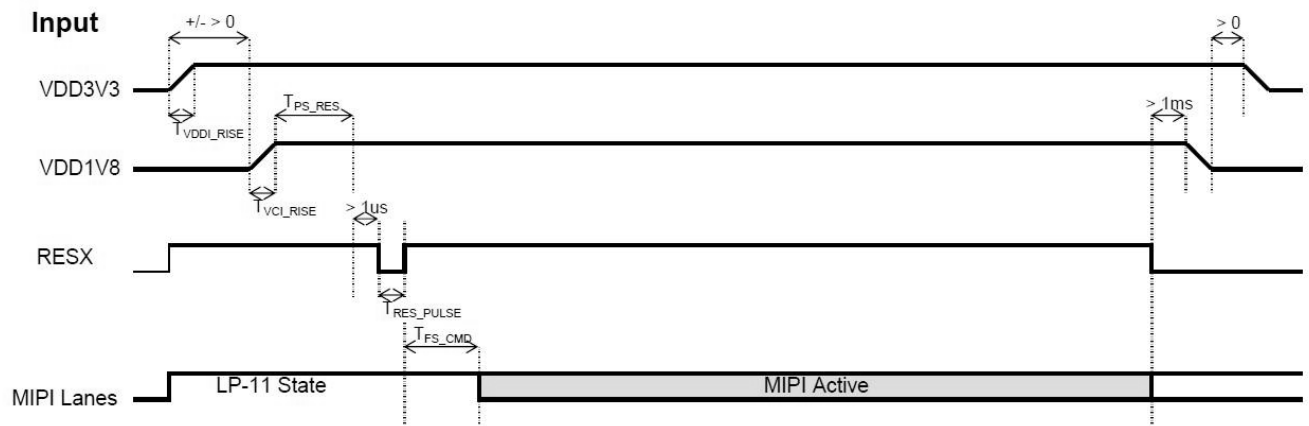


Figure 113: Reset Timing

Table 47: Reset Timing

Signal	Symbol	Parameter	Min	Max	Unit
RESX	tRW	Reset pulse duration	10		uS
	tRT	Reset cancel		5 (note 1,5) 120 (note 1,6,7)	mS

11.2 Power on/off Sequence



Symbol	Characteristics	Min.	Typ.	Max.	Units
T_{VDDI_RISE}	VDD3V3 Rise time	10	-	-	us
T_{VCI_RISE}	VDD1V8 Rise time	130	-	-	us
T_{PS_RES}	VDD3V3/VDD1V8on to RESX high	5	-	-	ms
T_{RES_PULSE}	RESX low pulse time	10	-	-	us
T_{FS_CMD}	RESX to first command	10	-	-	ms

12. Driver IC Control Algorithms

Refer to the data sheet of LCD driver IC ILI9881C or equivalent.

Refer to the data sheet of CTP driver IC ILI2131 or equivalent.

13. Reliability Test Items

No.	Test items	Conditions	Remark
1	High temperature operation	70°C , 240hours	-
2	Low temperature operation	-20°C , 240hours	-
3	High temperature storage	80°C , 240hours	-
4	Low temperature storage	-30°C , 240hours	-
5	High temperature & High humidity storage	40°C , 90% RH , 240hours	-
6	Thermal Shock storage	-20°C , 30min. ~ 70°C , 30min. , 100 Cycles	-
7	Vibration test	Sweep frequency :10~55~10 Hz, Amplitude : 0.75mm Test direction : X, Y, Z 3 axis, and duration Test time : 0.5hr for each axis	Non-operation
<p>Criterion: There should be no change which might affect the practical display function when the display quality test is conducted under normal operating condition.</p>			

14. General Precautions

Please pay attentions to the followings as using the LCD module.

14.1 Handling

- (a) Do not apply strong mechanical stress like drop, shock or any force to LCD module. It may cause improper operation, even damage.
- (b) Because the polarizer is very fragile and easy to be damaged, do not hit, press or rub the display surface with hard materials.
- (c) Do not put heavy or hard material on the display surface, and do not stack LCD modules.
- (d) If the display surface is dirty, please wipe the surface softly with cotton swab or clean cloth.
- (e) Avoid using Ketenes type materials (e.g. Acetone), Toluene, Ethyl acid or Methyl chloride to clean the display surface. It might damage the polarizer permanently. The recommended solvents are water and Isopropyl alcohol.
- (f) Wipe off water droplets or oil immediately.
- (g) Protect the LCD module from ESD. It will damage the LSI and the electronic circuit.
- (h) Do not touch the output pins directly with bare hands.
- (i) Do not disassemble the LCD module.

14.2 Storage

- (a) Do not leave the LCD modules in high temperature, especially in high humidity for a long time.
- (b) Do not expose the LCD modules to sunlight directly.
- (c) The liquid crystal is deteriorated by ultraviolet. Do not leave it in strong ultraviolet ray for a long time.
- (d) Avoid condensation of water. It may cause improper operation.
- (e) Please stack only up to the number stated on carton box for storage and transportation. Excessive weight will cause deformation and damage of carton box.

14.3 Operation

- (a) When mounting or dismounting the LCD modules, turn the power off.
- (b) Protect the LCD modules from electric shock.
- (c) The Driver IC control algorithms should always be obeyed to avoid damaging the LSI and electronic circuit.
- (d) Be careful to avoid mixing up the polarity of power supply for backlight.
- (e) Absolute maximum rating specified above has to be always kept in any case. Exceeding it may cause non-recoverable damage of electronic components or, nevertheless, burning.
- (f) When a static image is displayed for a long time, remnant image is likely to occur.
- (g) Be sure to avoid bending the FPC to an acute shape, it might break FPC.

14.4 Others

- (a) If the liquid crystal leaks from the panel, it should be kept away from the eyes or mouth.
- (b) For the fragility of polarizer, it is recommended to attach a transparent protective plate over the display surface.
- (c) It is recommended to peel off the protection film on the polarizer slowly so that the electrostatic charge can be minimized.

15. Quality and reliability

15.1 Test condition

Test should be conducted under the following conditions:

- (a) Ambient temperature: $25 \pm 5^{\circ}\text{C}$
- (b) Humidity: $55 \pm 10\% \text{ RH}$

15.2 Sampling plan

Sampling method shall be in accordance with MIL-STD-105D, inspection level II, normal inspection, and single sampling plan tables for normal tightened and reduced inspection.

15.3 Acceptable quality level

A major defect is a defect that could result in failure or materially reduce that the usability of the unit of product for its intended purpose.

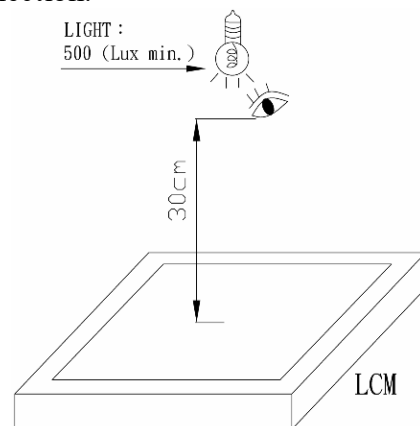
A minor defect is one that does not materially reduce the usability of the unit of product for its intended purpose or is a departure from established standards having no significant bearing on the effective use or operation of the unit.

15.4 Appearance

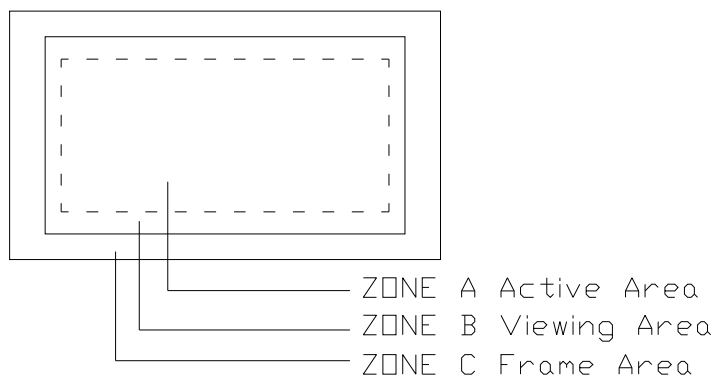
Appearance test is to be conducted by human eyes at approximately 30cm distance from LCD module under the single fluorescent light without reflection.

Condition:

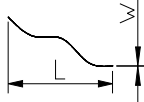
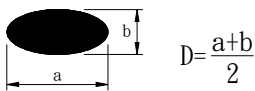
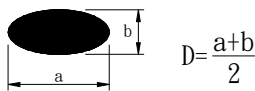
- (a) Illumination: 500 Lux min
- (b) Inspect determination: 30cm
- (c) Inspect direction: above the LCM
- (d) View angle: $\pm 30^{\circ}$



The inspection area of LCD panel shall be within the range of following limits.



15.5 Inspection quality criteria for TFT LCM

ITEM	DESCRIPTION OF DEFECTS	Zone	Acceptable level (%)																					
DIMENSION	Refer to individual acceptance specification	A,B,C	2.5																					
LINE DEFECT ON SURFACE (SCRATCHES, BLACK/WHITE LINE)	(a) $L \leq 5\text{mm}$ & $W \leq 0.05\text{mm}$, disregard (b) $L \leq 5\text{mm}$ & $0.05\text{mm} < W \leq 0.1\text{mm}$, $N \leq 3$, Distance $\geq 10\text{mm}$, ACC (c) $L > 5\text{mm}$ or $W > 0.1\text{mm}$, REJ 	A	2.5																					
SPOT DEFECT ON SURFACE (BLACK/WHITE SPOT)	Average diameter, D (a) $D \leq 0.2\text{mm}$, disregard (b) $0.2\text{mm} < D \leq 0.5\text{mm}$, $N \leq 4$, Distance $\geq 10\text{mm}$, ACC (c) $D > 0.5\text{mm}$, REJ 	A	2.5																					
PROTRUDE DOT/ DENT ON SURFACE	Average diameter D (a) $D \leq 0.3\text{mm}$, disregard (b) $0.3\text{mm} < D \leq 0.5\text{mm}$, $N \leq 4$, Distance $\geq 10\text{mm}$, ACC (c) $D > 0.5\text{mm}$, REJ 	A	2.5																					
POLARIZER EDGE	BUBBLES、DENTS、RESIDUAL GLUE、DECKLE EDGE： (a) Extended polarizer edge outside area don't care. (b) Extended inside depth $\leq 0.5\text{mm}$, ACC. (c) Extended inside depth $> 0.5\text{mm}$, refer item PROTRUDE DOT/DENTON SURFACE for judgment	A,B	2.5																					
BRIGHT/DARK POINT	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Item</th> <th>Allow number in Area A</th> </tr> </thead> <tbody> <tr> <td rowspan="4" style="text-align: center;">(a) Bright point</td> <td>Single point</td> <td style="text-align: center;">1</td> </tr> <tr> <td>Two adjacent point</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Three adjacent point</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Total point</td> <td style="text-align: center;">1</td> </tr> <tr> <td rowspan="4" style="text-align: center;">(b) Dark point</td> <td>Single point</td> <td style="text-align: center;">3</td> </tr> <tr> <td>Two adjacent point</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Three adjacent point</td> <td style="text-align: center;">0</td> </tr> <tr> <td>Total point</td> <td style="text-align: center;">3</td> </tr> </tbody> </table> <p>※ Point：A sub pixel 1R or 1G or 1B ※ The distance of bright or dark point $\geq 5\text{mm}$</p>	Item		Allow number in Area A	(a) Bright point	Single point	1	Two adjacent point	0	Three adjacent point	0	Total point	1	(b) Dark point	Single point	3	Two adjacent point	0	Three adjacent point	0	Total point	3	A	2.5
Item		Allow number in Area A																						
(a) Bright point	Single point	1																						
	Two adjacent point	0																						
	Three adjacent point	0																						
	Total point	1																						
(b) Dark point	Single point	3																						
	Two adjacent point	0																						
	Three adjacent point	0																						
	Total point	3																						
CHROMA MURA	Mura and leak are defined through transmission ND 6% filter	A	2.5																					
DISPLAY ABNORMAL	(a) Non display (b) Line defect (c) Water ripple (d) Flicker (e) Response time, contrast ratio, brightness or viewing angle abnormal	A	0.65																					

NOTE: (1) ACC: Accept (2) REJ: Reject



16. Package diagram

TBD.



17. Initialization by instructions

TBD.