

Touch Display Module Specification

Customer Number: 与德E300

Product Number: LMFBF05515360

Customer Name: 与德通讯技术有限公司

Customer Approve: _____

Approve Date: _____

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Remarks:

Capacitive resistive type

RoHS directive matching (based on EU Directive 2002/95/EC)

INTRODUCTION



ATTENTION!!

1. Avoid using this panel for applications that may affect people's lives, such as medical equipment, space equipment, aircraft, submarine repeater and other equipment for which extremely high reliability is required.
2. This product contains glass. Handle it with utmost care.
Dropping and strong impact applied may break this product.
3. Be sure to check the touch panel wiring before applying it voltage. If voltage is applied inadvertently and over-current flows, it could generate heat and smoke.

PROHIBITION ON HANDLING

1. At LCE Touch Panel, a thin-film of metal-oxide and a print-coated metal/Ag is used as electrodes.
Therefore, don't use T/P in an atmosphere that contains erosive gas.
2. Avoid high voltage and/or static charge.

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1. Scope

This Specification applies to Liansi P/N LMFBF05515360 Projected Capacitive touch panel for reference edition.

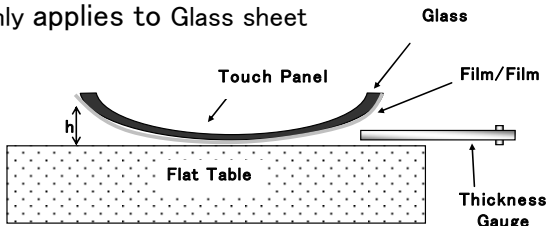
2. Shape, Structure and Dimensions

See the attached drawing.

3. General Description

Item	Contents	Unit
Active Screen Size	5.45inch	--
Active Area Dimension	61.884 (W) x 123.768 (H)	mm
LCM w/touch Size	66.68(W)×143.08(H)×2.42(T) Without FPC	mm
LCM Size	64.28(W)×130.46(H)×1.4(T)Without FPC	mm
Optimum Viewing Angle	80/80/80/80	Deg.
Number of Dots	720(RGB)×1440	Pixel
Pixel Pitch	0.0.865(H) ×RGB× 0.08595(V)	mm
LCM Driver IC	ST7703	--
TP Driver IC	HX8527-E44	--
Display Mode	Normally Black	--
Luminance, White (LCM w/TP)	360cd/m ² (min) 450cd/m ² (TYP)	cd/m ²
Interface Type	MIPI Video Mode	--
Backlight Type	LED	--
Weight	TBD	g

4. Mechanical Characteristics

4-2 Warpage	<p>$h < 0.3\text{mm}$ (No insert w/ 0.3mm thickness Gauge) * Only applies to Glass sheet</p> 
4-3 Hardness	$\geq 7H$ (As per JIS K 5600)
4-4 Ball Drop Test	<p>No Breakage w/ dropping 130g steel ball at 20cm high., 9 points. * 1 time in one point</p>

5. Electrical Characteristics

5-1 TP -Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VIN	-0.3	-	+7	V
Switch control signals output current	Output current	-	50	-	mA
Enable control voltage range	Logic Input	-0.3	-	VIN+0.3	V
Output control driver	Output voltage	-30		VIN	V

5-2 LCM -Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply voltage for I/O	VDDI	-0.3	+3.3	V
Analog operating voltage	VSP	-0.3	+6.6	V
Analog operating voltage	VSN	-6.5	+0.3	V
Operating temperature	TOP	-20	+70	°C
Storage temperature	TST	-30	+80	°C
Humidity	RH	-	90%(Max60°C)	RH

5-3 TP/DC Characteristics

(VCCD=1.65V to 3.6V, VCCA=2.7V to 3.6V)

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Input high voltage	VIH	VCCD=1.65 ~ 3.6V	0.75*VCCD	-	VCCD	V
Input low voltage	VIL	VCCA=2.7 ~ 3.6V	0	-	0.25*VCCD	V
Output low voltage (SDO)	VOL1	VCCD=1.65 ~ 3.6V IOL=1.0 mA	0	-	0.2*VCCD	V
Current consumption Deep-standby mode (VCCA/VCCD-VSS)	IST(VDD)	VCCA=3.3V, VCCD=3.3V TA=25° C	-	20	-	μA
Current consumption Active mode (VCCA/VCCD-VSS)	IACTIVE(VDD)	VCCA=3.3V, VCCD=3.3V TA=25° C	-	Note(1)	-	mA
Current consumption Idle mode (VCCA/VCCD-VSS)	IACTIVE(VDD)	VCCA=3.3V, VCCD=3.3V TA=25° C	-	Note(2)	-	mA
Minimum slew rate of VCCA and VCCD	-	-	1	-	-	V/ms
Ripple voltage of VCCD and VCCA	VR	VCCA=3.3V, VCCD=3.3V TA=25° C	-	-	100	mVp-p

Note: (1) Depend on report rate setting, the range is 7~10mA.

(2) Depend on report rate setting, the range is 0.6~0.9mA.

5-4 LCM/DC Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage for interface I/O	VDDI	1.65	1.8	3.3	V
Analog operating voltage	VSP	5.5	5.8	6	V
Analog operating voltage	VSN	-6	-5.8	-5.5	V
Input Current	Idd	11	16	21	mA
Input voltage ' H ' level	VIH	0.7* VDDI	-	VDDI	V
Input voltage ' L ' level	VIL	-0.3	-	0.3* VDDI	V

5-5 Back Light Electrical Characteristics

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT	REMARK
LED Forward Voltage	If	18	-	19.2	V	Vf=1*3.2V
LED Forward Current	Vf	-	20	-	mA	If=20 mA
Luminous Uniformity	△	80	-	-	%	-
Connection mode	-	2 Serial & 12 Parallel				-
Quantity Of LED	P	12chips				-

6.Interface

PIN No.	Symbol	Function
1	GND	Ground
2	IC_ID_1	Signal for discriminate LCM (ID)
3	IC_ID_0	Signal for discriminate LCM (ID)
4	RST	LCD Reset pin
5	GND	Ground
6	DSI_D2P	Positive MIPI differential data input. (Data lane2)
7	DSI_D2N	Negative MIPI differential data input. (Data lane2)
8	GND	Ground
9	DSI_D1P	Positive MIPI differential data input. (Data lane1)
10	DSI_D1N	Negative MIPI differential data input. (Data lane1)
11	GND	Ground
12	DSI_CP	Positive MIPI differential clock input
13	DSI_CN	Negative MIPI differential clock input
14	GND	Ground
15	DSI_D0P	Positive MIPI differential data input. (Data lane0)
16	DSI_D0N	Negative MIPI differential data input. (Data lane0)
17	GND	Ground
18	DSI_D3P	Positive MIPI differential data input. (Data lane3)
19	DSI_D3N	Negative MIPI differential data input. (Data lane3)

20	GND	Ground
21	TE	Frame head pulse signal, activated by S/Wcommand.
22	INT	Infrared interrupt
23	IOVDD	Power supply
24	NC	NC
25	LED _A	LED ANODE
26	LED _K	LED CATHODE
27	LED _K	LED CATHODE
28	VCC ₊ (5.8V)	Input voltage from step-up circuit
29	VCC ₋ (-5.8V)	Input voltage from step-up circuit
30	LED_PWM	Backlight brightness control purpses
31	GND	Ground
32	GND	Ground
33	GND	Ground
34	GND	Ground
35	SCL(1.8V)	TP PIN SCL
36	SDA(1.8V)	TP PIN SDA
37	VDD(2.8V)	TP power supply
38	INT	TP Integer PIN
39	REST	TP Reset PIN

7. Optical Characteristics

7-1 TP Only Optical Characteristics

Transparency	Typ. $\geq 86\%$ (Light source: 550nm)
Haze	$< 3\%$

7-2 Optical Characteristics

Item	Symbol	Condi on	Min	Typ	Max	Uni t	Remar k	Note
Response time	Tr+Tf	$\theta=0^\circ$ Ta=25 ℃	-	30	35	ms	FIG 1.	4
Contrast ratio	Cr		800	1300	-	-	FIG 2.	1
Luminance uniformity	δ WHITE		80	-	-	%	FIG 2.	3
Surface Luminance	LV		360	450	-	cd/ m ²	FIG 2.	2
NTSC			66%	70.8%	-	%	-	-
Viewing angle range	θ	CR>10	-	80	-	deg	FIG 3.	6
			-	80	-	deg	FIG 3.	
			-	80	-	deg	FIG 3.	
			-	80	-	deg	FIG 3.	

CIE(x,y) chromatic ity For LCM	Red	x	$\theta=0^\circ$ $T_a=25^\circ\text{C}$	-	0.642	-	FIG 2.	5
		y		-	0.340	-		
	Green	x		-	0.312	-		
		y		-	0.608	-		
	Blue	x		-	0.148	-		
		y		-	0.059	-		
	White	x		0.275	0.295	0.315		
		y		0.295	0.315	0.335		

Note 1. Contrast Ratio(CR) is defined mathematically by the following formula. Refer to the FIG 2.

Contrast Ratio = $\frac{\text{Average Surface Luminance with all white pixels (P1,P2~ P12,P13)}}{\text{Average Surface Luminance with all black pixels (P1,P2~ P12,P13)}}$

Note 2. Surface luminance is the LCD surface luminance with all pixels displaying white. Refer to the FIG 2. L_v = Average Surface Luminance with all white pixels (P1,P2~ P12,P13)

Note 3. Surface brightness uniformity, white picture, measure the brightness of 13 points, minimum brightness values divided by the maximum brightness of brightness values. Refer to the FIG 2.

$\delta \text{ WHITE} = \frac{\text{Minimum Surface Luminance with all white pixels (P1,P2~ P12,P13)}}{\text{Maximum Surface Luminance with all white pixels (P1,P2~ P12,P13)}}$

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). Refer to the FIG 1.

Note 5. CIE(x, y) chromaticity is the Center point (P5)value. Refer to the FIG 2.

Note 6. Viewing angle is the angle at which the contrast ratio is greater than a specific value.

For TFT module the contrast ratio is greater than 10. The angles are determined for the horizontal or x axis and the vertical or yaxis with respect to the z axis which is normal to the LCD surface. Refer to the FIG 3.

Note7. For Viewing angle and response time testing, the testing data is base on Autronic-Melchers's ConoScope. Series Instruments. For contrast ratio, Surface Luminance, Luminance uniformity,CIE The test data is base on BM-7 photo detector.

FIG. 1 The definition of Response Time

The response time is defined as the following figure and shall be measured by switching the input signal for "black" and "white".

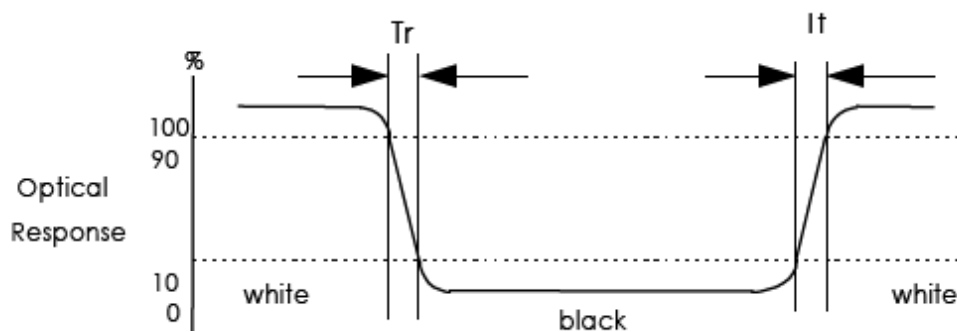
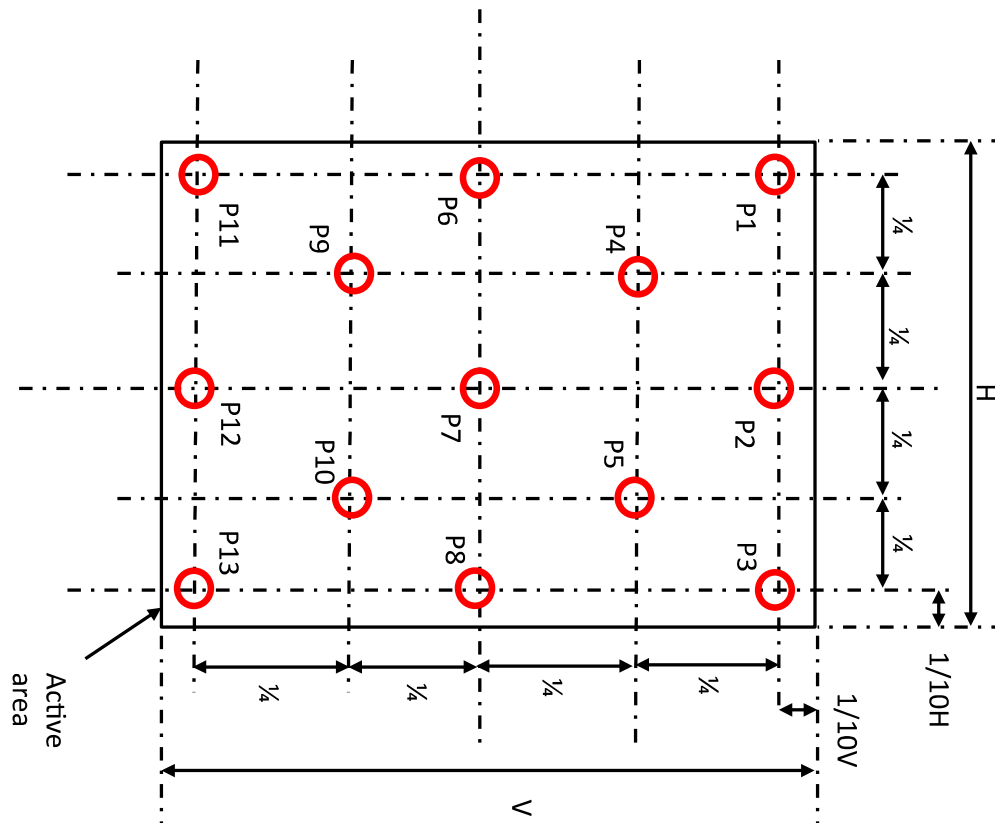


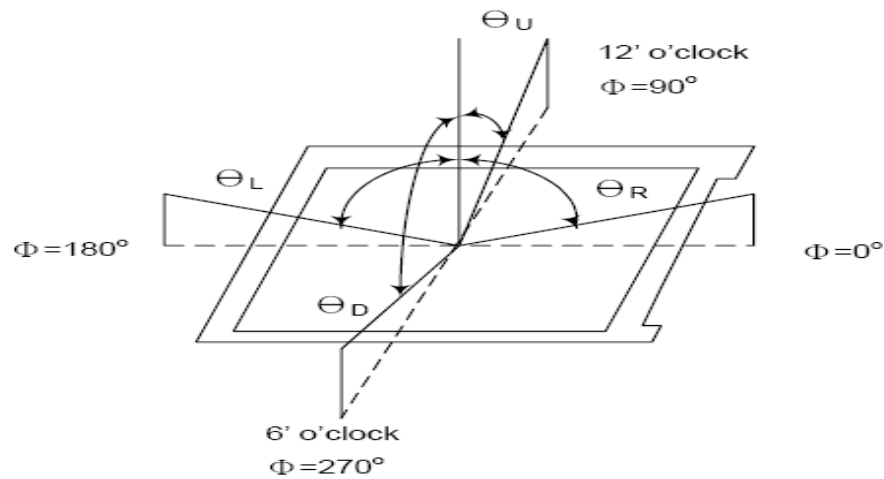
FIG. 2 Measuring method for Contrast ratio,surface luminance,Luminance uniformity, CIE (x, y) chromaticity



H,V : Active Area

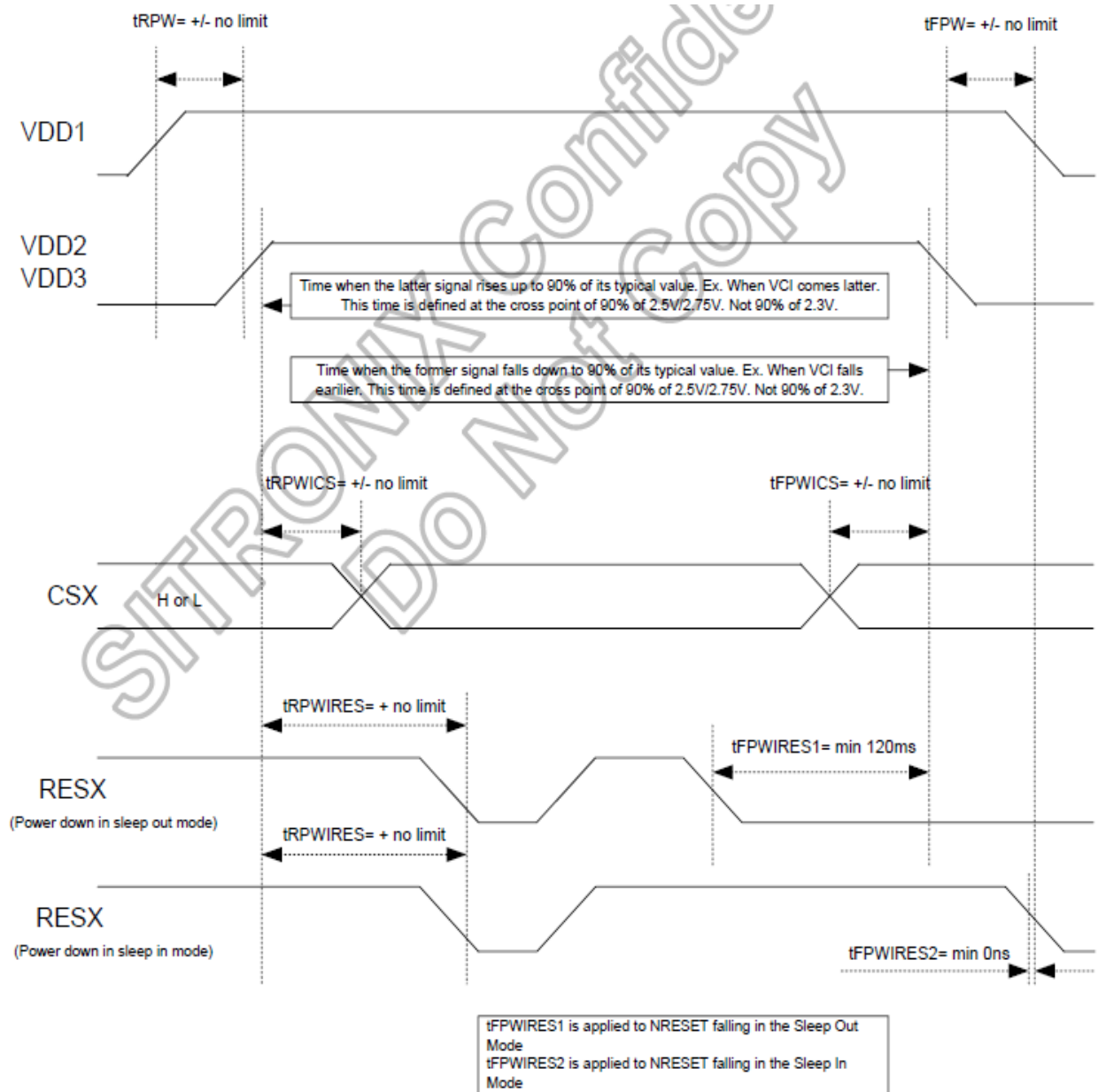
Light spot size =7mm, 500mm distance from the LCD surface to detector lens measurement instrument is luminance meter BM-7.

FIG. 3 The definition of viewing angle



8.TIMING OF POWER SUPPLY

Power ON/OFF Sequence



9. REFERENCE APPLICATION CIRCUIT

Reset Timing Characteristics

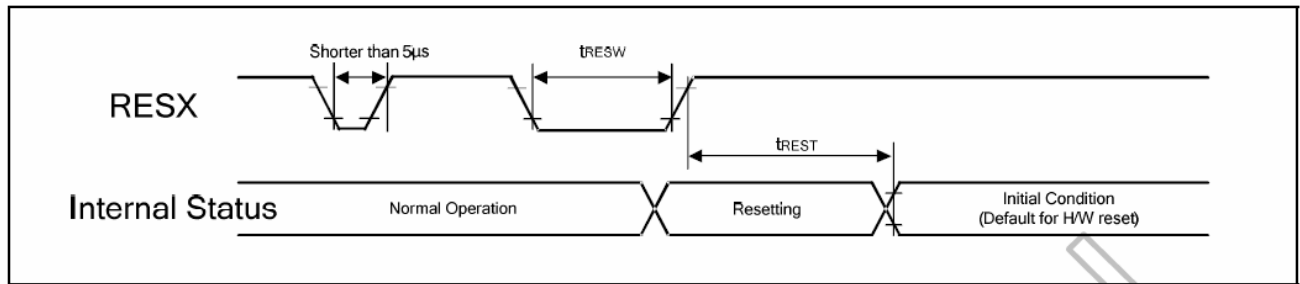


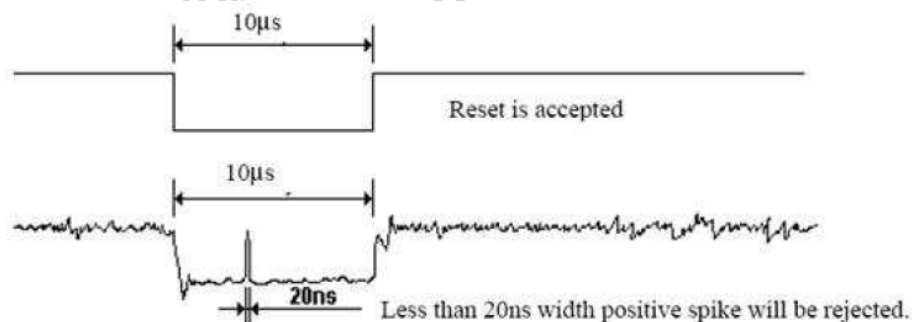
Figure 8.5: Reset input timing

Symbol	Parameter	Related pins	Min.	Typ.	Max.	Note	Unit
t_{RESW}	Reset low pulse width ⁽¹⁾	RESX	10	-	-	-	μs
t_{REST}	Reset complete time ⁽²⁾	-	5	-	-	When reset is applied during Sleep In mode	ms
		-	120	-	-	When reset is applied during Sleep Out mode	ms

Note: (1) Spike due to an electrostatic discharge on RESX line does not cause irregular system reset according to the table below.

RESX Pulse	Action
Shorter than 5 μs	Reset Rejected
Longer than 10 μs	Reset
Between 5 μs and 10 μs	Reset Start

- (2) During the resetting period, the display will be blanked (The display is entering blanking sequence, which maximum time is 120 ms, when Reset Starts in Sleep Out –mode. The display remains the blank state in Sleep In –mode) and then returns to Default condition for H/W reset.
- (3) During Reset Complete Time, ID2 value in OTP will be latched to internal register during this period. This loading is done every time when there is H/W reset complete time (t_{REST}) within 5ms after a rising edge of RESX.
- (4) Spike Rejection also applies during a valid reset pulse as shown below:



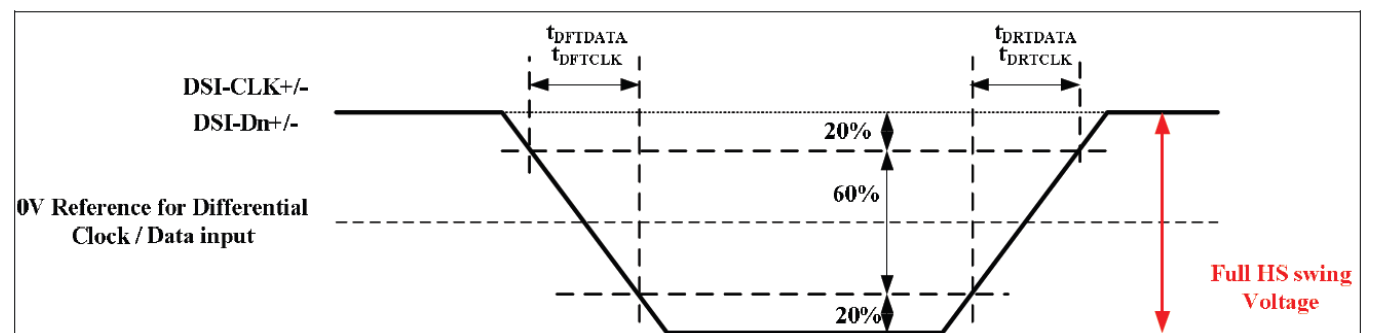
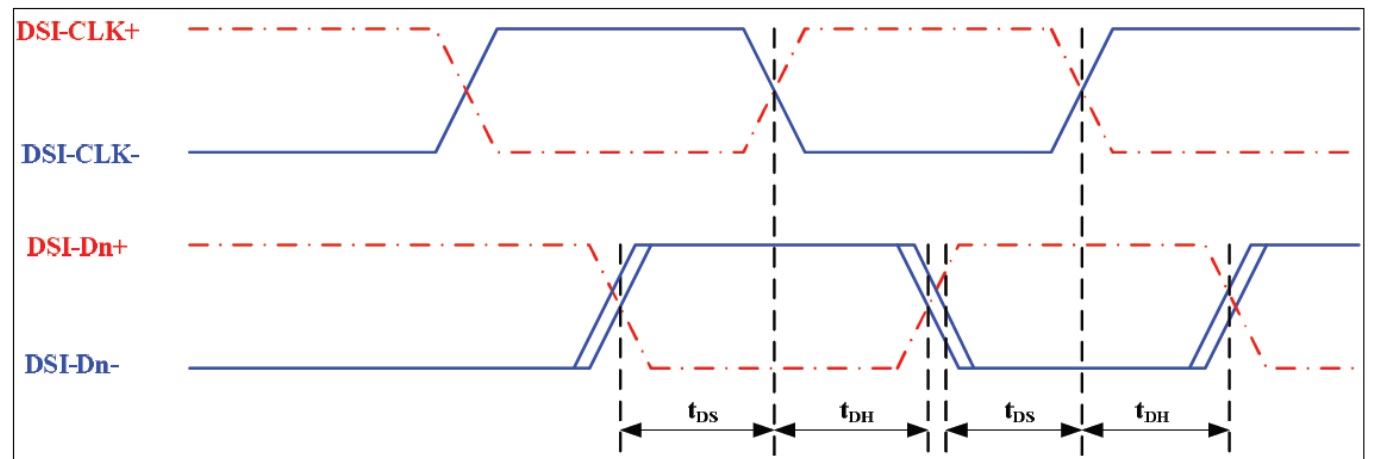
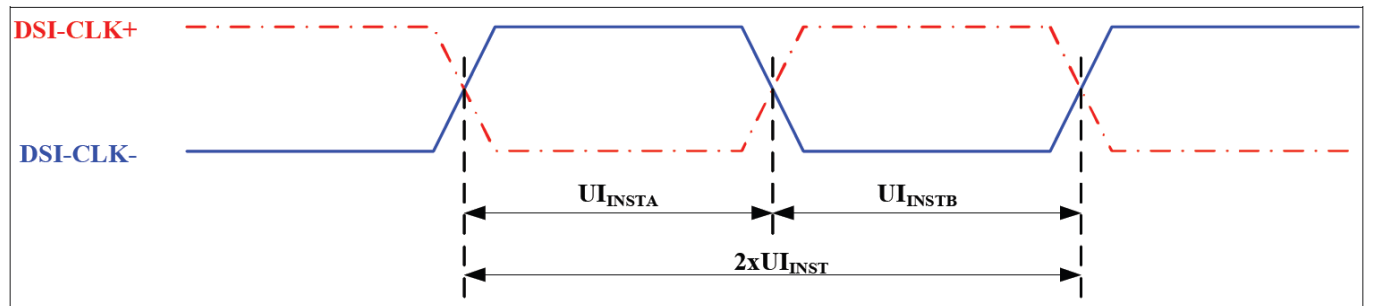
- (5) When Reset is applied during Sleep In Mode.
- (6) When Reset is applied during Sleep Out Mode.
- (7) It is necessary to wait 5msec after releasing RESX before sending commands. Also Sleep Out command cannot be sent for 120msec.

Table 8.7: Reset timing

Mipi-DSI characteristics

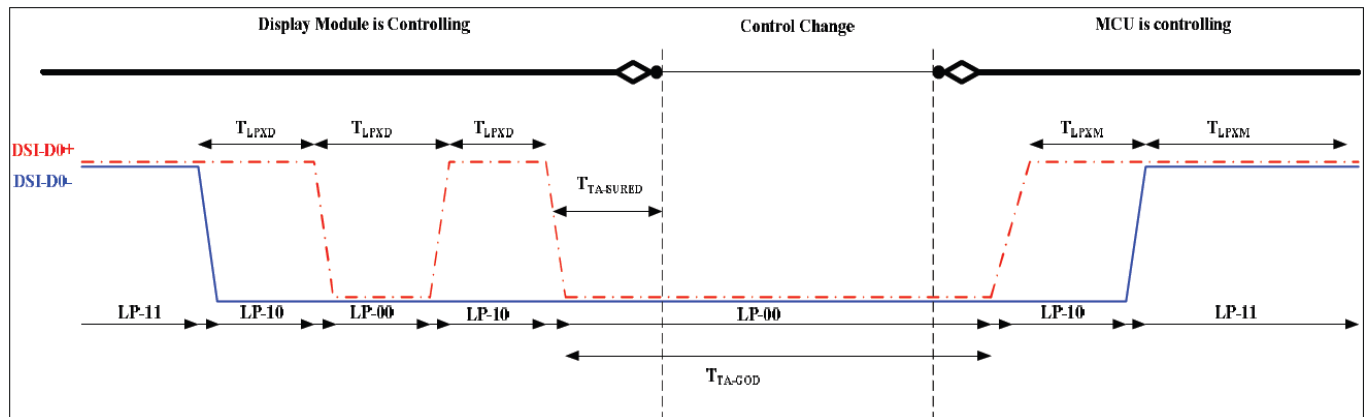
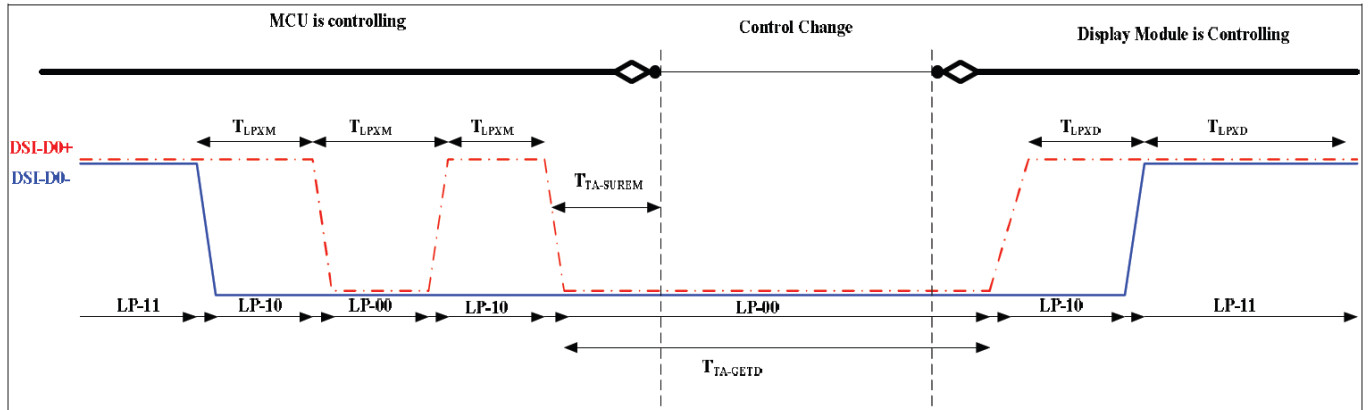
High speed mode

Parameter	Symbol	Parameter	Specification			Unit
			MIN	TYP	MAX	
High Speed mode						
DSI-CLK+/-	2xUI _{INST}	Double UI instantaneous	4	-	25	ns
DSI-CLK+/-	UI _{INSTA} , UI _{INSTB}	UI instantaneous Halfs	2	-	12.5	ns
DSI-Dn+/-	t _{DS}	Data to clock setup time	0.15	-	-	UI
DSI-Dn+/-	t _{DH}	Data to clock hold time	0.15	-	-	UI
DSI-CLK+/-	t _{DRTCLK}	Differential rise time for clock	150	-	0.3UI	ps
DSI-Dn+/-	t _{DRTDATA}	Differential rise time for data	150	-	0.3UI	ps
DSI-CLK+/-	t _{DFTCLK}	Differential fall time for clock	150	-	0.3UI	ps
DSI-Dn+/-	t _{DFTDATA}	Differential fall time for data	150	-	0.3UI	ps



Low power mode

Parameter	Symbol	Parameter	Specification			Unit
			MIN	TYP	MAX	
Low Power mode						
DSI-D0+/-	T _{LPXM}	Length of LP-00, LP-01, LP-10 or LP-11 periods MPU → Display Module	50	-	-	ns
DSI-D0+/-	T _{LPXD}	Length of LP-00, LP-01, LP-10 or LP-11 periods Display Module → MPU	58	-	-	ns
DSI-D0+/-	T _{TA-SURED}	Time-out before the MPU start driving	T _{LPXD}	-	2XT _{LPXD}	ns
DSI-D0+/-	T _{TA-GETD}	Time to drive LP-00 by display module	5XT _{LPXD}	-	-	ns
DSI-D0+/-	T _{TA-GOD}	Time to drive LP-00 after turnaround request - MPU	4XT _{LPXD}	-	-	ns
DSI-D0+/-	Ratio T _{LPX}	Ratio of T _{LPXM} / T _{LPXD} between MCU and display module	2/3	-	3/2	



10. Environmental Characteristics

Operating Temperature Range	-20~ 70°C	Humidity: Temp.40°C or below: 20% to 90%RH No dew condensation allowed. More than temp.40°C: 40°C, 90% RH humidity Max. No dew condensation allowed.
Storage Temperature Range	-30~ 80°C	

11. Reliability Test Items

No.	Test Item	Test Condition	Inspection after test
1	High Temperature Storage	70℃/120 hours	Inspection after 24hours storage at room temperature,the sample shall be free from defects: 1.Air bubble in the LCD; 2.Sealleak; 3.Non-display; 4.Glass crack; 5.the surface shall be free from damage. 6.The electrical characteristics requirements shall be satisfied.
2	Low Temperature Storage	-30℃/120 hours	
5	Temperature Cycle Storage	-30℃(0.5h) ~70℃(0.5h.)×27cycles	
6	Damp proof Test Operating	60℃×90%RH/120hours	
7	Salt spray test	35℃±2℃/ humidity >85%, PH range 6.5-7.2, 5±1% Nacl 48H spray	
8	Ball Drop Test	Dropping 120g steal ball at 20cm high,9 points. 1 time in one point	
9	ESD Test	ESD air requirement: ±12KV; ESD contact requirement: ±8KV	

Remark:

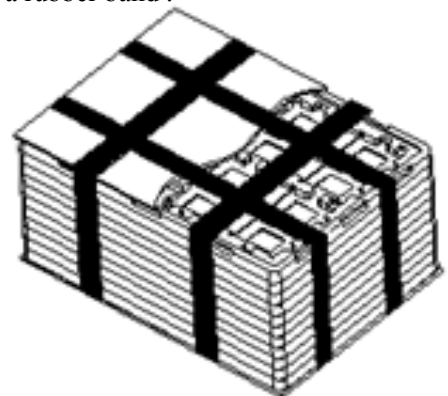
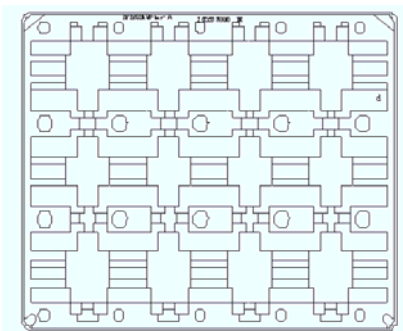
- 1.The test samples should be applied to only one test item.
- 2.Sample size for each test item is 5~10pcs.
- 3.For Damp Proof Test, Pure water(Resistance>10MΩ) should be used.
- 4.In case of malfunction defect caused by ESD damage, if it would be recovered to normal state after resetting, it would be judged as a good part.
- 5.Failure Judgment Criterion: Basic Specification, Electrical Characteristic, Mechanical Characteristic, Optical Characteristic.

12. Appearance

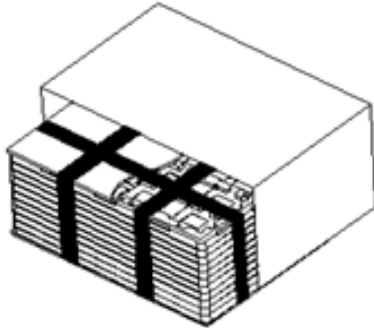
Refer to the appearance quality agreement.

13.Package Drawing

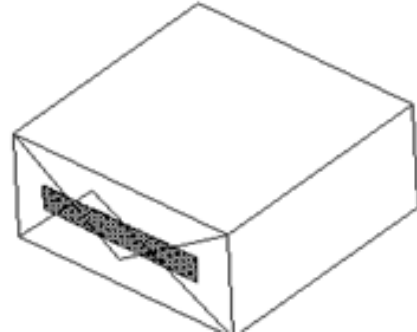
- 1、Product as shown in the direction of the plastic tray , the 1 layer of plastic tray fill with 6PCS module.
- 2、9 layer a little packed products, a total of 48 PCS products, plus the top one empty blister tray, check after fixed blister tray with a rubber band .



3、Use the vacuum bag to package the small bundle.



4、The vacuum packing sealing good, and repeat the 2~3 steps to pack four bundles.



5、The encapsulation good blister tray in a small suitcase .



6、A big box to two small box, top/bottom two pearl cotton side pearl cotton, a total of 96 PCS, cover the lid, with transparent tape seal the carton, carton label.



14. Regulation on environment

14-1. RoHS directive RoHS

This product is corresponded to RoHS directive.

“Corresponded to RoHS directive” is judged based on EU Directive 2002/95/EC.

14-2. Other

Requirement for the other restricted material needs to be cleared and it should be decided on discussion between our customer and us.

15. Operating Precautions

15-1. Chassis Mechanical Design

- Please use the module as a replaceable unit when you are designing your product. (Please do not consider the module as an permanent item.).
- Assuming input method for customers' use, design the chassis so that no chassis strain or the like has an influence on the module by the hand placed on the chassis, for example.

- c. Select insulation material when considering construction material for the chassis.
It may lead to a cause of false operation when conductive material is used as the chassis.
- d. Pay attention for not to make any stress of deformation.

15-2. Flexible Connector

- a. For flexible connector arrangement, R=1.0mm or more should be maintained so that the circuitry will not crease.
- b. Please do not bend the chip mounting area.

15-3 Handling precautions

- 15-3-1 Do not lift up the product by holding the flexible connector.
- 15-3-2 In the assembly structure, Should avoid TP thin line circuit part by touching the failure due to the partial pressure.
- 15-3-3 In the process of disassembly , Prohibit forced demolition
- 15-3-4 The display panel is made of glass and polarizer. As glass is fragile. It tends to become or chipped during handling especially on the edges. Please avoid dropping or jarring. Do not subject it to a mechanical shock by dropping it or impact.
- 15-3-5 If the display panel is damaged and the liquid crystal substance leaks out, be sure not to get any in your mouth. If the substance contacts your skin or clothes, wash it off using soap and water.
- 15-3-6 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary. Do not touch the display with bare hands. This will stain the display area and degraded insulation between terminals (some cosmetics are determined to the polarizer).
- 15-3-7 The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully. Do not touch, push or rub the exposed polarizers with anything harder than an HB pencil lead (glass, tweezers, etc.). Do not put or attach anything on the display area to avoid leaving marks on it. Condensation on the surface and contact with terminals due to cold will damage, stain or dirty the polarizer. After products are tested at low temperature they must be warmed up in a container before coming in to contact with room temperature air.
- 15-3-8 If the display surface becomes contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If it is heavily contaminated, moisten cloth with one of the following solvents
 - Isopropyl alcohol
 - Ethyl alcohol
 Do not scrub hard to avoid damaging the display surface.
- 15-3-9 Solvents other than those above-mentioned may damage the polarizer. Especially, do not use the following.(Water/Ketone/Aromatic solvents)
Wipe off saliva or water drops immediately, contact with water over a long period of time may cause deformation or color fading. Avoid contact with oil and fats.
- 15-3-10 Exercise care to minimize corrosion of the electrode. Corrosion of the electrodes is accelerated by water droplets, moisture condensation or a current flow in a high-humidity environment.
- 15-3-11 Install the LCD Module by using the mounting holes. When mounting the LCD module make sure it is free of twisting, warping and distortion. In particular, do not forcibly pull or bend the I/O cable or the backlight cable.
- 15-3-12 Do not attempt to disassemble or process the LCD module.
- 15-3-13 NC terminal should be open. Do not connect anything.

- 15-3-14 If the logic circuit power is off, do not apply the input signals.
- 15-3-15 **Electro-Static Discharge Control,** Since this module uses a CMOS LSI, the same careful attention should be paid to electrostatic discharge as for an ordinary CMOS IC. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment. Before removing LCM from its packing case or incorporating it into a set, be sure the module and your body have the same electric potential. Be sure to ground the body when handling the LCD modules. Tools required for assembling, such as soldering irons, must be properly grounded. Make certain the AC power source for the soldering iron does not leak. When using an electric screwdriver to attach LCM, the screwdriver should be of ground potentiality to minimize as much as possible any transmission of electromagnetic waves produced sparks coming from the commutator of the motor.
- To reduce the amount of static electricity generated, do not conduct assembling and other work under dry conditions. To reduce the generation of static electricity be careful that the air in the work is not too dry. A relative humidity of 50%-60% is recommended. As far as possible make the electric potential of your work clothes and that of the work bench the ground potential.
- The LCD module is coated with a film to protect the display surface. Exercise care when peeling off this protective film since static electricity may be generated.
- 15-3-16 Since LCM has been assembled and adjusted with a high degree of precision, avoid applying excessive shocks to the module or making any alterations or modifications to it. Do not alter, modify or change the shape of the tab on the metal frame. Do not make extra holes on the printed circuit board, modify its shape or change the positions of components to be attached. Do not damage or modify the pattern writing on the printed circuit board. Absolutely do not modify the zebra rubber strip (conductive rubber) or heat seal connector. Except for soldering the interface, do not make any alterations or modifications with a soldering iron. Do not drop, bend or twist the LCM.

15-4 Storage Precautions

- 15-4-1 When storing the LCD modules, the following precaution are necessary.
- 15-4-2 Store them in sealed polyethylene bag. If properly sealed, there is no need for the desiccant
- 15-4-3 Store them in a dark place. Do not expose to sunlight or fluorescent light, keep the temperature between 0~35℃, and keep the relative humidity between 40% RH and 60% RH.
- 15-4-4 The polarizer surface should not come in contact with any other objects (We advise you store them in the anti-static electricity container in which they were shipped).

15-5 Transportation Precautions

- 15-5-1 During shipment, please handle with care. The packaging bag can not be broken. Packing Carton layer height can not be over two meters .
- 15-5-2 The transportation process should pay attention to the waterproof and moisture-proof measures. Product can not be watering. Ethylene sealed bags can not be unsealed.

15-6 Others

- 15-6-1 Liquid crystals solidify under low temperature (below the storage temperature range) leading to defective orientation or the generation of air bubbles (black or white). Air bubbles may also be generated if the module is subject to a low temperature.
- 15-6-2 If the LCD modules have been operating for a long time showing the same display patterns, the display patterns may remain on the screen as ghost images and a slight contrast irregularity may also appear. A normal operating status can be regained by suspending use for some time. It should be noted that this phenomenon does not adversely affect performance reliability.

- 15-6-3 To minimize the performance degradation of the LCD modules resulting from destruction caused by static electricity etc., exercise care to avoid holding the following sections when handling the modules. Exposed area of the printed circuit board. Terminal electrode sections.
- 15-6-5 It is recommended to crush damaged or unnecessary LCDs into pieces and wash them off with solvents such as acetone and ethanol, which should later be burned.
If any liquid leaks out of a damaged glass cell and comes in contact with the hands, wash off thoroughly with soap and water.

16. Specification Revision Record

Date of Revision	Edition	Model No.	Revision	Remarks
2018.2.3	Ver01	—	Newly established	

17. Items concerning business

17-1. Warranty Period and Warranty Range

17-1-1 Warranty period

Within one year after the date of delivery, the function is OK.

Within three months after the delivery date, the outward appearance is OK.

17-1-2 Warranty range

If Touch Panel is failed and damaged due to our company's cause within the warranty period, we will repair or replace it.

As far as compensation, repair or replacement should be limited to our delivered touch panel itself. Damage induced due to delivered touch Panel failure is out of our warranty. The repair or replacement in the field are also out of our warranty.

The assurance range and time of environmental characteristics reference to reliability conditions .

The following cases are excluded from the warranty range:

- (1) Failure and damage caused by handling nonconformities, such as drop and shocks during transportation (movement) after delivery
- (2) Failure and damage caused by disasters
- (3) Repair and modification at other than our company
- (4) Failure and damage caused by handling contrary to "Touch Panel Operating Precautions" described in this Specification.

17-2. Remarks:

17-2-1 Once your company receive this specification, if no confirmation and signing back without reasonable notice within 15 days, we will consider it to be self-executing.

17-2-2 The discription above is translated from Chinese version. If you have any questions,

please kindly refer to the Chinese version. Any inconvenience,
please kindly forgive us.

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