

PRODUCT SPECIFICATION **FOR LCD MODULE**

Revision: 1.0

Model No: LSC031I02-MP-V1

Module Type: COG+FPC+B/L+LENS

APPROVED SIGNATURE

- ☒ Approved Product Specification only
- ☐ Approved Product Specification and Samples

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1. General Description

LSC031102-MP-V1 is a transmissive type a-Si TFT-LCD (amorphous silicon thin film transistor liquid crystal display) module, which is composed of a TFT-LCD panel, a driver circuit and a backlight unit. The panel size is 3.1 inch and the resolution is 480(RGB)*800, the panel can display up to 16.7 M colors.

2. Physical Features

Display Mode	TFT-LCD Module
	Active matrix TFT, Transmissive type
Display Format	Graphic 480(RGB)×800 Dot-matrix
Input Data	MIPI input
Viewing Direction (Grayscale Inversion)	Free (IPS)
Drive	ST7102

3. Mechanical Specification

Item	Specification	Unit
LCM+LENSModule size (H×V×D)	58.12 ×85.0×4.0	mm
LCM Module size (H×V×D)	43.48 ×74.72 ×2.32	mm
Number of dots	480RGB) ×800	pixel
Active area (H×V)	40.32×67.20	mm



5. Absolute Maximum Ratings

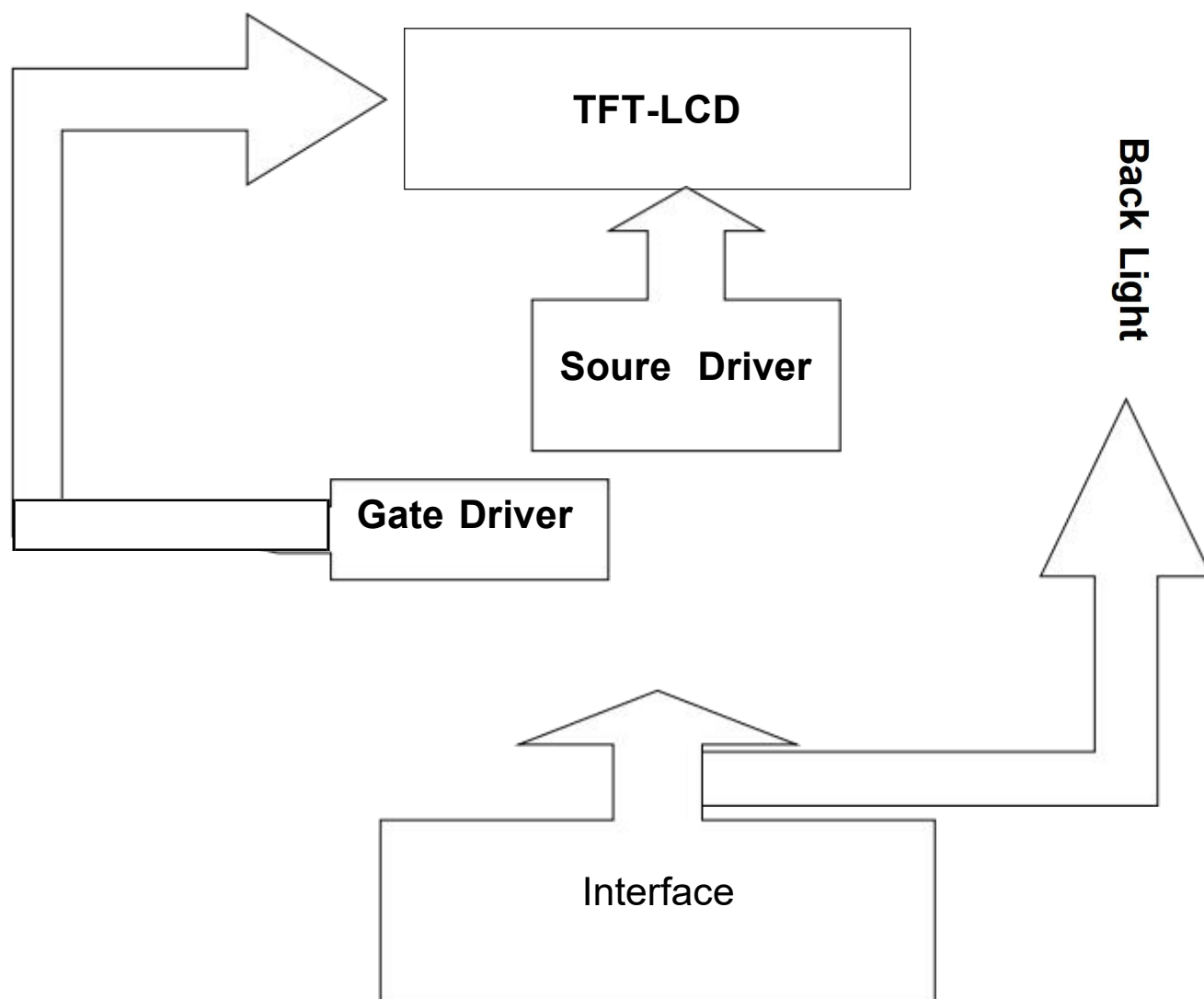
Item	Symbol	Min	Max	Unit	Remark
Supply voltage	VCI	-0.3	3.3	V	
Operating temperature	TOPR	-20	70	°C	
Storage temperature	TSTR	-30	80	°C	

6. Electrical Characteristics

Item		Symbol	Rating			Unit	Remark
			Min	Typ	Max		
Supply voltage		VCI	---	2.8	3.3	V	
Input Voltage	L level	VIL	VSS	---	0.3*IOVCC	V	
	H level	VIH	0.7*IOVCC	---	IOVCC	V	

7. Module Function Description

7- 1. Block Diagram Of LCM



7-2. Pin Description

PIN NO.	Symbol	I/O	Description
1	GND	P	Ground
2	NC		
3	NC		
4	GND	P	Ground
5	D1P	I	MIPI-DSI data lane 1 negative-end input pin
6	D1N	I	MIPI-DSI data lane 1 negative-end input pin
7	GND	P	Ground
8	CLKP	I	MIPI-DSI clock lane negative-end input pin
9	CLKN	I	MIPI-DSI clock lane negative-end input pin
10	GND	P	Ground
11	D0P	I/O	MIPI-DSI data lane 0 negative-end input/output pin
12	D0N	I/O	MIPI-DSI data lane 0 negative-end input/output pin
13	GND	P	Ground
14	NC		
15	NC		
16	GND	P	Ground
17	TE/NC	O	Tearing effect output pin to synchronies MCU to frame writing, activated by S/W command.
18	RESX	I	Global reset signal. Low active
19	NC		
20	VCI 3.3V	P	power supply
21	VCI 3.3V	P	power supply
22	CTP_INT 3.3V	I	Touch screen interrupt
23	CTP_SDA 3.3V	I	I2C interface data pin
24	CTP_SCL 3.3V	I	I2C interface clock pin
25	CTP_RSET 3.3V	I	external reset for TP
26	LEDK	P	Power for LED backlight cathode
27	LEDK	P	Power for LED backlight cathode

28	NC		
29	LED A	P	Power for LED backlight anode
30	LED A	P	Power for LED backlight anode

7-3 Timing Characteristics

7.3.1 MIPI Timing



Figure 77 High Speed Mode – Clock Channel Timing

Signal	Symbol	Parameter	Specification			Unit	Description
			MIN	TYP	MAX		
DSI-CLK+/-	$2xUI_{INST}$	Double UI instantaneous	TBD	-	TBD	ns	
DSI-CLK+/-	UI_{INSTA}, UI_{INSTB}	UI instantaneous half	TBD	-	TBD	ns	
fDSI-CLK+/-	F_{DSICLK}	DSI-CLK+/- frequency	TBD	-	TBD	MHz	
DSI-Dn+/-	T_{DS}	Data to clock setup time	TBD	-	-	UI	
DSI-Dn+/-	T_{DH}	Data to clock hold time	TBD	-	-	UI	

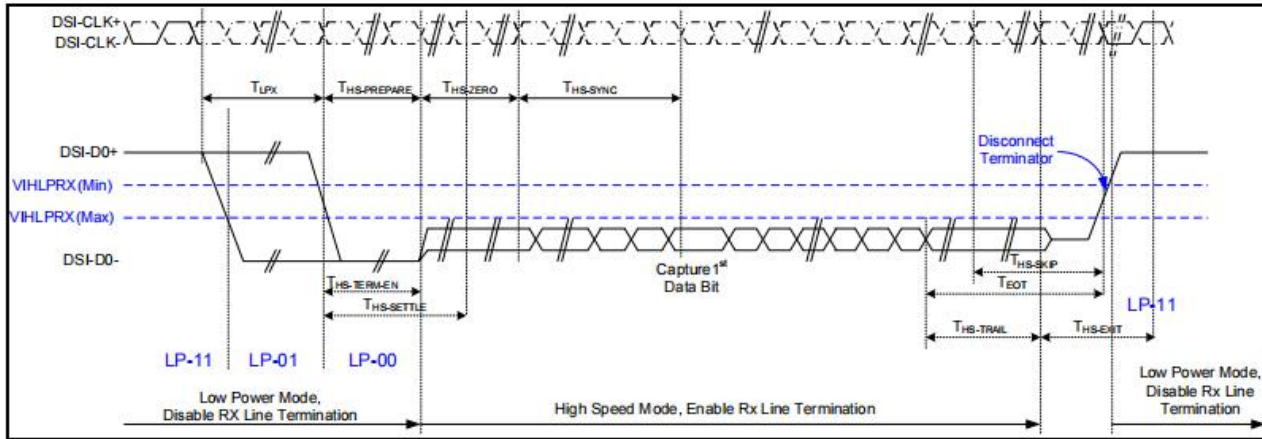


Figure 78 High-Speed Data Transmission

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Time to drive LP-00 to prepare for HS transmission	$T_{HS-PREPARE}$	TBD	-	TBD	ns
Time from start of $t_{HS-TRAIL}$ or $t_{CLK-TRAIL}$ period to start of LP-11 state	T_{EOT}	-	-	TBD	ns
Time to enable data receiver line termination measured from when D_n crosses V_{ILMAX}	$T_{HS-TERM-EN}$	-	-	TBD	ns
Time to drive flipped differential state after last payload data bit of a HS transmission	$T_{HS-TRAIL}$	TBD	-	-	ns
Time-out at RX to ignore transition period of EoT	$T_{HS-SKIP}$	TBD	-	TBD	ns
Time to drive LP-11 after HS burst	$T_{HS-EXIT}$	TBD	-	-	ns
Length of any Low-Power state period	T_{LPX}	TBD	-	-	ns
Sync sequence period	$T_{HS-SYNC}$	-	TBD	-	ns
Minimum lead HS-0 drive period before the Sync sequence	$T_{HS-ZERO}$	TBD	-	-	ns
Time interval during which the HS receiver should ignore any Clock Lane HS transitions, starting from the beginning of $T_{CLK-PREPAR}$	$T_{CLK-SETTLE}$	TBD	-	TBD	ns
Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{HS-PREPAR}$. The HS receiver shall ignore any Data Lane transitions before the minimum value, and the HS receiver shall respond to any Data Lane transitions after the maximum value.	$T_{HS-SETTLE}$	TBD	-	TBD	ns

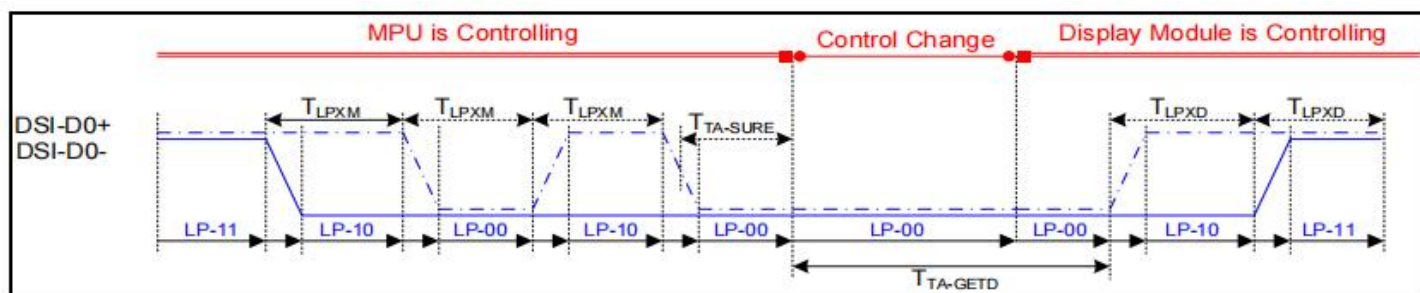


Figure 80 Bus Turn-around Procedure

Parameter	Symbol	Specification			Unit
		MIN	TYP	MAX	
Length of any Low-Power state period : Master side	T_{LPX}	TBD	-	TBD	ns
Length of any Low-Power state period : Slave side	T_{LPX}	TBD	-	TBD	ns
Ratio of T_{LPX} (MASTER)/ T_{LPX} (SLAVE) between Master and Slave side	Ratio T_{LPX}	TBD	-	TBD	
Time-out before new TX side start driving	$T_{TA-SURE}$	TBD	-	TBD	ns
Time to drive LP-00 by new TX	T_{TA-GET}	-	TBD	-	ns
Time to drive LP-00 after Turnaround Request	T_{TA-GO}	-	TBD	-	ns

8. Electro-Optical Characteristics

Item		Symbol	Condition	Min	Typ	Max	Unit	Remark
Response time		Tr+ Tf	$\theta=0_{\circ}$ $\phi=0_{\circ}$	---	35	40	ms	Note2
Contrast ratio		Cr		---	1100	---	---	Note3
Transmittance (with POL)		T		2.5	3.2	---	%	C light
Viewing angle range (CR≥10)		θ	$\phi=90_{\circ}$	---	80	---	deg	Note4
			$\phi=270_{\circ}$	---	80	---	deg	
			$\phi=0_{\circ}$	---	80	---	deg	
			$\phi=180_{\circ}$	---	80	---	deg	
NTSC		---	---	---	61	---	%	
CIE(x,y) chromaticity	Red	x	$\theta=0_{\circ}$ $\phi=0_{\circ}$	0.609	0.629	0.649	---	Note5 CF glass (C light)
		y		0.316	0.336	0.356		
	Green	x		0.277	0.297	0.317		
		y		0.577	0.597	0.617		
	Blue	x		0.119	0.139	0.159		
		y		0.121	0.141	0.161		
	White	x		0.283	0.303	0.323		
		y		0.317	0.337	0.357		

Note1. Measuring Condition

1) Measuring surrounding: dark room

2) Ambient temperature: Ta=25°C

3) 15min. warm-up time

Note2. Response time is the time required for the display to transition from Black to White (Rise Time, Tr) and from White to Black (Decay Time, Tf). The measurement instrument is DMS-803. For more information, please refer to FIG 1 and FIG 2.

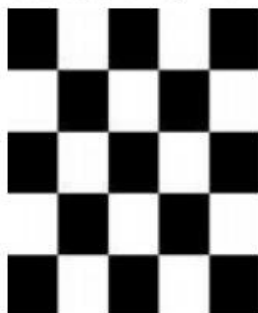
Note3. Contrast Ratio (CR) is defined mathematically as below. Measured at the center point of panel by DMS-803, please refer to FIG 1

Contrast Ratio = $\frac{\text{Surface Luminance with all white pixels}}{\text{Surface Luminance with all black pixels}}$

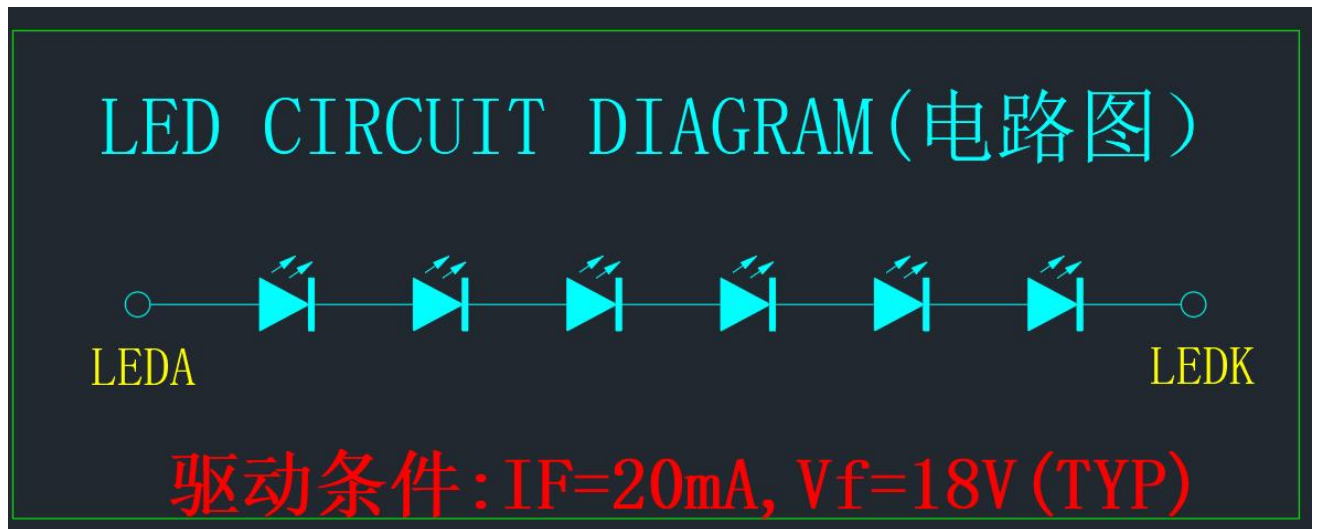
Note4. Viewing angle is the angle at which the contrast ratio is greater than 10(CR $\geq$ 10:1). The measurement instrument is DMS-803. For more information, please refer to FIG 1 and FIG 3

Note5. CIE (x, y) chromaticity for CF only, measured with Olympus MHL-450 under C light.

Note6. Measurement equipment: Fast imaging photometer: Techno Team LMK5 or equivalent. Distance: Location of test phone and horizontal distance selected so that device detection fulfill defined measurement area requirement. Set 5*5 Checkerboard image to the display for 1 hour and change the pattern to Gray 127, recorded time, The Image sticking disappears within 5 minutes after its appearance.



Backlight circuit



9. Inspection Standards

1. AQL(Acceptable Quality Level)

AQL of major and minor defect

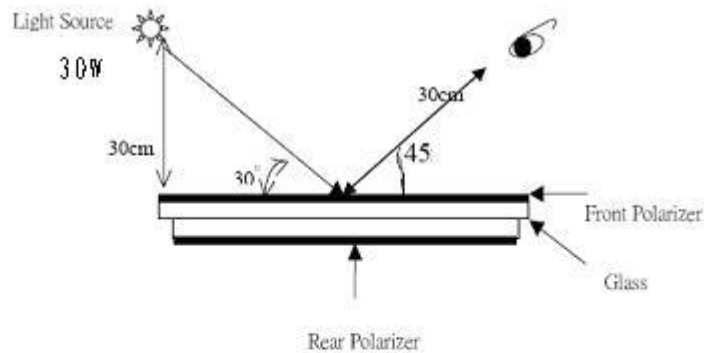
According to GB/T 2828-2003 ; , normal inspection, Class II

MAJOR DEFECT	MINOR DEFECT
0.65	1.5

2. Basic conditions for inspection

The LCM face to us, in normal environment, About an angle of incidence 30, a distance of 30cm with normal eye, with an angle of 45 degree to check the products without uncovering the film!

(As shown below)

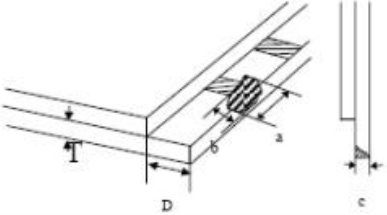
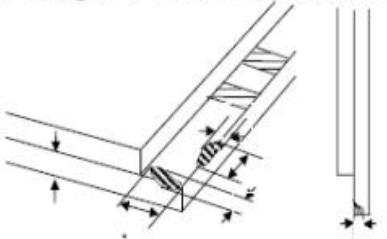


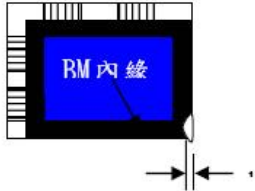
3. Inspection item and criteria

3.1 Visual inspection criterion in immobility

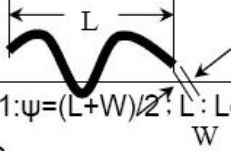
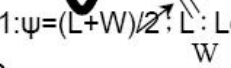
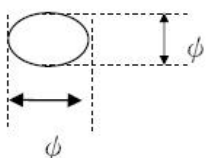
3.1.1 Glass defect

No	Defect item	Criteria	Remark
1	Dimension Unconformity (Major defect)	By Engineering Drawing	

No	Defect item	Criteria	Remark
2	Cracks (Major defect)	1.Linear cracks on panel 【Reject】 2. Nonlinear crack contrast by limited sample	
3	Glass extrude the conductive area (minor defect)	a: disregards and no influence assemblage 1) $b \leq 1/3$ Pin width(non bonding area) 【Accept】 2) bonding area $\leq 0.5\text{mm}$ 【Accept】	a:Length, b:Width
4	Pin-side , conductive area damaged (minor defect)	(a c : disregards) $b \leq 1/3$ of effective length for bonding electrode 【Accept】	a:Length, b:Width, c: Thickness 
5	Pin-side , non-conductive area damaged (minor defect)	1) Damage area don't touch the ITO (Inclueling contraposition mark,except scribing mark) 【Accept】 2) $c < T$ $b \leq BM 1/3$ of width 【Accept】 3) $c = T$ b not touch the seal glue 【Accept】 4) a disregards	a:Length, b:Width, c: Thickness 

No	Defect item	Criteria	Remark
6	Non-pin-side damage (minor defect)	$c < T$	c : Thickness b : width of damage 
		1) b exceeds 1/3 BM	
		$c = T$	
		b not touch the seal glue	
		【Reject】	
		【Reject】	

3.1.2 LCD appearance defect (View area)

No	Defect item	Criteria		Remark
1	Fiber 、glass cratch 、polarizer scratch/folded (minor defect)	Specification	Allowable	note1: L : Length , W : Width note2: disregard if out of AA 
		$0.05\text{mm} < W \leq 0.1\text{mm}$; $L \leq 3.0\text{mm}$	1	
		$W > 0.1\text{mm}$; $L > 3.0\text{mm}$	0	
2	Polarizer bubble 、 concave and convex (minor defect)	$\psi \leq 0.2\text{mm}$	disregard	note 1: $\psi = (L+W)/2$; L : Length , W : Width note2: disregard if out of AA 
		$0.2\text{mm} < \psi \leq 0.3\text{mm}$	2	
		$0.3\text{mm} < \psi \leq 0.5\text{mm}$	1	
		$0.5\text{mm} < \psi$	0	
3	Black dots 、dirty dots 、 impurities 、eyewinker (Major defect)	$\psi \leq 0.15\text{mm}$	disregard	note2: disregard if out of AA 
		$0.15\text{mm} < \psi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \psi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \psi$	0	
4	Polarizer prick (Major defect)	$\psi \leq 0.1\text{mm}$	disregard	note1: $\psi = (L+W)/2$; L = Length , W = Width note2: the distance between two dots $> 5\text{mm}$
		$0.1\text{mm} < \psi \leq 0.25\text{mm}$	3	
		$\psi > 0.25\text{mm}$	0	

3.1.3 .FPC

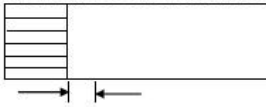
No	Defect item	Criteria		Remark
1	Copper screen peel (Major defect)	Copper screen peel 【 Reject】		
2	No release tape or peel (Major defect)	No release tape or peel 【 Reject】		
3	Dirty dot and impurity of FPC for customer using side (minor defect)	Specification	Allowable	note1: Cannot have stride ITO impurities
		$\psi \leq 0.25\text{mm}$	2	
		$\psi > 0.25$	0	

3.1.4 Black tape & Mara tape

1	FPC or H/S black tape shift (minor defect)	1.shift spec: 1)glue to the polarize 【 Reject】 2) IC bare 【 Reject】 2. left-and-right spec: 1) exceed of FPC edge or H-S edge 【 Reject】 2)IC bare 【 Reject】	
2	No black tape (Major defect)	No black tape 【 Reject】	
3	Tape position mistake (minor defect)	Not by engineering drawing 【 Reject】	
4	Mara tape defect (minor defect)	Peel before pulling the protecting film. 【 Reject】	

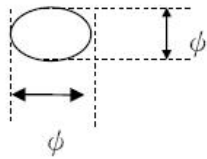
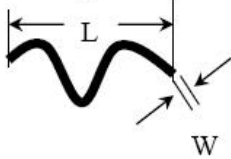
3.1.5 Silicon and Tuffy glue

No	Defect item	Criteria	Remark
1	Quantity of silicon (minor defect)	Uncover the ITO and circuit area. 【 Reject】	note: compared by engineering drawing.

No	Defect item	Criteria	Remark
2	Tuffy glue (minor defect)	1. Uncover the reveal copper area 【 Reject】 2. Cover layer 0.3mm(Min) ~ 3.0mm(Max) 【 accept】	note:if customer has special requirement , refer to the technical document. 
3	Depth of glue covering (minor defect)	Depth of glue covering overtop front Polarizer 【 Reject】	Except of the special requirement °

3.2 Electrical criteria

No	Defect item	Criteria	Remark
1	No display (Major defect)	No display 【 Reject】	
2	Missing line (Major defect)	Missing line 【 Reject】	
3	Seg-com light and dark (Major defect)	Seg-com light and dark 【 Reject】	ND filter 2% test
4	No display in immobility (Major defect)	No display in immobility 【 Reject】	
5	Flicker of Pattern (Major defect)	Flicker of Pattern 【 Reject】	
6	Mura (Major defect)	ND filter 2% test	
7	Over current (Major defect)	Over current 【 Reject】	
8	Voltage out of specification (Major defect)	Voltage out of specification 【 Reject】	
9	Pattern blur ,error code (Major defect)	Pattern blur ,error code 【 Reject】	
10	Dark light, Flicker (Major defect)	Dark light, Flicker 【 Reject】	

No	Defect item	Criteria	Remark	
11	Black/White dots 、 Dirty dots 、 eyewinker (Major defect)	Specification	Allowable	Note1: disregard if out of AA 
		$\psi \leq 0.15\text{mm}$	disregard	
		$0.15\text{mm} < \psi \leq 0.25\text{mm}$	2	
		$0.25\text{mm} < \psi \leq 0.3\text{mm}$	1	
		$0.3\text{mm} < \psi$	0	
12	Fiber 、 glass cratch 、 polarizer scratch/folded (minor defect)	$W \leq 0.03\text{mm}$	disregard	note1: L : Length 、 W : Width note2: disregard if out of AA 
		$0.03\text{mm} < W \leq 0.05\text{mm} ;$ $L \leq 3.0\text{mm}$	2	
		$0.05\text{mm} < W \leq 0.1\text{mm} ;$ $L \leq 3.0\text{mm}$	1	
		$W > 0.1\text{mm} ; L > 3.0\text{mm}$	0	

10.Records Of Version

Version	Revise Date	Page	Content
00	2026-8-26	all	New released