Shenzhen Gelivable Optoelectronics Co.,Ltd

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APPROVAL SHEET

PRODUCT MODEL	**G07027AB01A0(GD3385A)**		
REMARKS	**TFT MODULE, 1024(RGB) * 600 PIXELS**		
APPROVED SIGNATURE BY CUSTOMER	**PROJECT**	**QUALITY**	**APPROVED**

PREPARED BY	**CHECKED BY**	**APPROVED BY**

RECORDS OF REVISION

REV.	DATE	PAGE	DESCRIPTION OF CHANGES
00	2021.05.10		First issue.

CONTENT

1. GENERAL SPECIFICATION

1.1 Description

The G07027AB01A0 is a color active matrix Thin Film Transistor (TFT) Liquid Crystal Display (LCD) that uses amorphous silicon(a-Si) TFT as a switching device. This model is composed of a single 7.0 inches transmissive type main TFT-LCD panel. The resolution of the panel is 1024RGBx600 pixels and can display up to 16.7M color.

1.2 Feature

-IPS type for main TFT-LCD panel
-Structure COG+FPC+BL
-Full, Normal (Still), Partial, Sleep mode are available

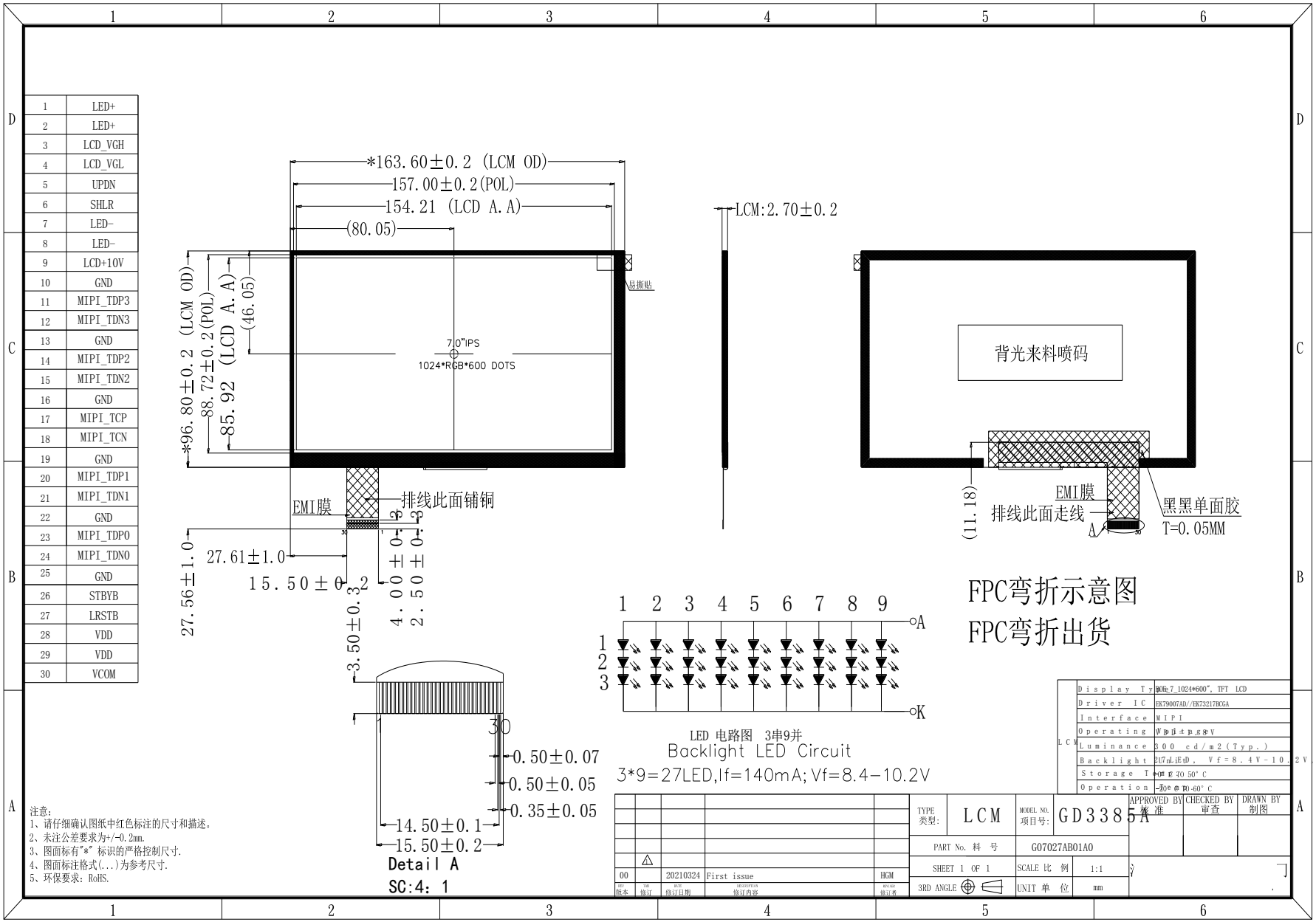
1.3 General Specification

No.	Item	Specification	Unit	Remark
1	LCD Size	7.0	inch	-
2	Panel Type	a-Si TFT active matrix	-	-
3	Resolution	1024 x (RGB) x 600	pixel	-
4	Display Mode	Normally Black,Transmissive	-	-
5	Display Number of Colors	16.7M	-	-
6	Viewing Direction	ALL	-	Note
7	Contrast Ratio	800(TYP)	-	-
8	Luminance	300(TYP)	cd/m^2	-
9	Module Size	163.60(W) x96.80(L) x 2.70(T)	mm	Note
10	Active Area	154.21(W) x 85.92(L)	mm	Note
11	Pixel Pitch	0.1506(H)×0.1432 (V)	mm	-
12	Driver IC	EK79007AD//EK73217BCGA	-	-
13	Light Source	27 LEDs White	-	-
14	Interface	MIPI	-	-
15	Operating Temperature	-0~50	℃	-
16	Storage Temperature	-20~60	℃	-

Note: Please refer to the mechanical drawing.

2. MECHANICAL DRAWING。

1	LED+
2	LED+
3	LCD_VGH
4	LCD_VGL
5	UPDN
6	SHLR
7	LED-
8	LED-
9	LCD+10V
10	GND
11	MIPI_TDP3
12	MIPI_TDN3
13	GND
14	MIPI_TDP2
15	MIPI_TDN2
16	GND
17	MIPI_TCP
18	MIPI_TCN
19	GND
20	MIPI_TDP1
21	MIPI_TDN1
22	GND
23	MIPI_TDP0
24	MIPI_TDN0
25	GND
26	STBYB
27	LRSTB
28	VDD
29	VDD
30	VCOM



注意：
1、请仔细确认图纸中红色标注的尺寸和描述。
2、未注公差要求为+/-0.2mm.
3、图面标有"*" 标识的严格控制尺寸.
4、图面标注格式(...)为参考尺寸.
5、环保要求：RoHS.

00		20210324	First issue	HGM
版本 REV.	修订 DR.	修订日期 DATE	修订内容 DESCRIPTION	修订者 REVISOR

TYPE 类型:	LCM	MODEL NO. 项目号:	GD3385A
PART No. 料 号	G07027AB01A0		
SHEET 1 OF 1		SCALE 比 例	1:1
3RD ANGLE		UNIT 单 位	mm

APPROVED BY 核 准	CHECKED BY 审查	DRAWN BY 制图

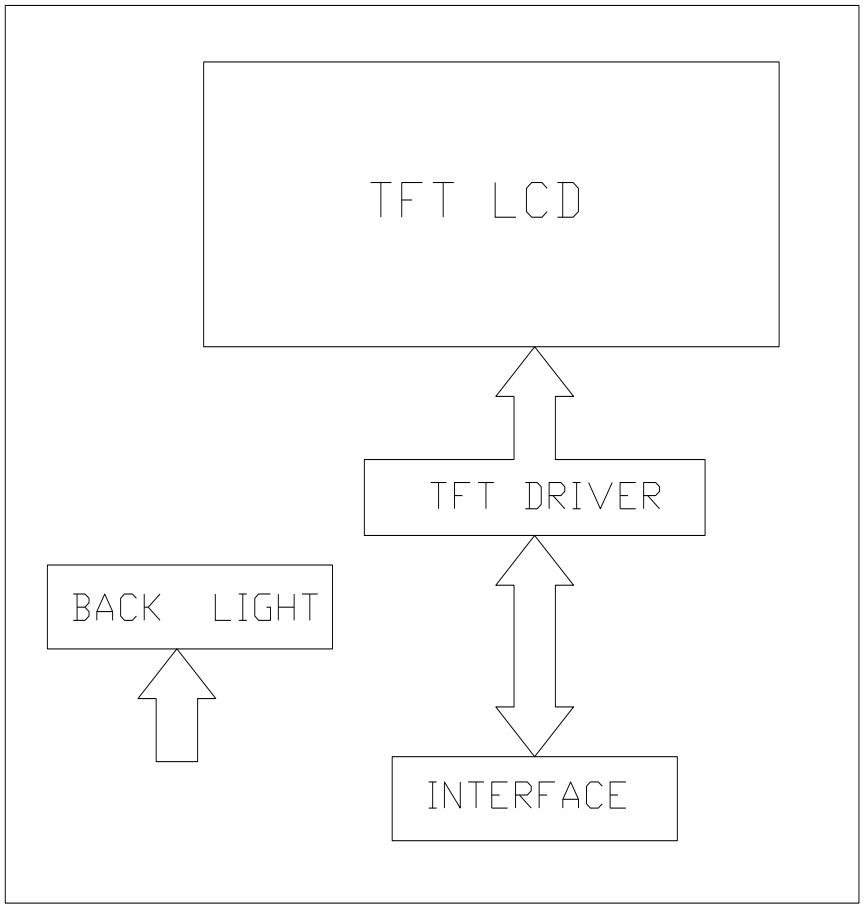
LCM	
Display Type	MODE 7_1024*600", TFT LCD
Driver IC	EK79007AD//EK73217BCGA
Interface	MIPI
Operating	[illegible]
Luminance	300 cd/m2(Typ.)
Backlight	21[illegible]LED, Vf=8.4V-10.2V
Storage T	-[illegible] TO 50° C
Operation	-20° TO 60° C

3. INTERFACE ASSIGNMENT

1	LED+	Back light LED+
2	LED+	Back light LED+
3	LCD_VGH	Gate ON Voltage
4	LCD_VGL	Gate OFF Voltage
5	UPDN	Gate up or down scan control
6	SHLR	Source right or left sequence control
7	LED-	Back light LED-
8	LED-	Back light LED-
9	LCD+10V	Power for Analog Circuit 10V
10	GND	Ground
11	MIPI_TDP3	MIPI data input
12	MIPI_TDN3	MIPI data input
13	GND	Ground
14	MIPI_TDP2	MIPI data input
15	MIPI_TDN2	MIPI data input
16	GND	Ground
17	MIPI_TCP	MIPI data input
18	MIPI_TCN	MIPI data input
19	GND	Ground
20	MIPI_TDP1	MIPI clock inpu
21	MIPI_TDN1	MIPI clock inpu
22	GND	Ground
23	MIPI_TDP0	MIPI data input
24	MIPI_TDN0	MIPI data input
25	GND	Ground
26	STBYB	Standby mode, Normally pulled high
27	LRSTB	Global reset pin(1.8V)
28	VDD	Power supply for digital circuits 1.8V
29	VDD	Power supply for digital circuits 1.8V
30	VCOM	Common voltage 3.2V

4. ELECTRICAL SPECIFICATION

4.1. Block Diagram



4.2. Tft Absolute Maximum Ratings

ITEM	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
Power Supply for Analog	VDD	Ta=25 ºC	-0.3	-	+2.0	V
Analog Supply Voltage	AVDD	Ta=25 ºC	-0.5	-	+15.0	V

Note: Permanent damage to the device may occur if maximum values are exceeded or reverse voltage is applied.

4.3. Tft Typical Operation Condition

4.3.1 TFT DC Characteristics

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Digital Power Supply voltage For Lcd	VDD	-	1.8	2.0	V	
Analog Power Supply voltage	AVDD	9.2	9.6	10.0	V	
Gate On voltage	VGH	17	18	19	V	
Gate Off voltage	VGL	-6.2	-6.8	-5.4	V	
Common voltage	VCOM	--	3.2	--	V	NOTE
Logic Input voltage	VIH	0.7VDD		VDD	V	
	VIL	GND		0.3VDD	V	
Frame Frequency	FRAME		50	60	70	Hz

Note:Please adjust Vcom to make the ficker level be minmun

Note: To prevent IC latch up or DC operation in LCD panel, the power on/off sequence should follow the driver IC specification.

4.3.2 TFT Current Consumption

Item	Symbol	Values		Unit	Remark
		type	Max.		
MIPI Interface					
Normal(Still) Mode	I_{CC1}	-	TBD	mA	Note1
Standby Mode	I_{CC1}	-	TBD	uA	Note2

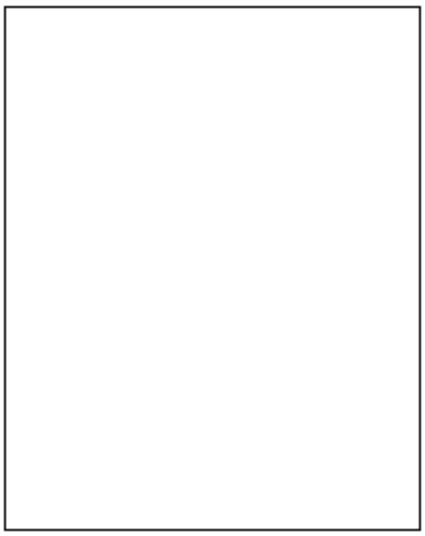
Note1: Test Condition

Typ: VCI=1.8V

Display Pattern: All Pixel White

Frame Rate=60Hz at 2-dot Inversion

Max. current check pattern:

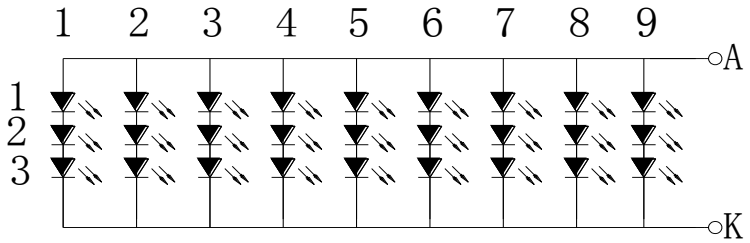


White

Note2: In the standby mode, all the internal display operations are suspended including the internal R-C oscillator.

4.4. Backlight Specification

4.4.1 Backlight Circuit



LED 电路图 3串9并

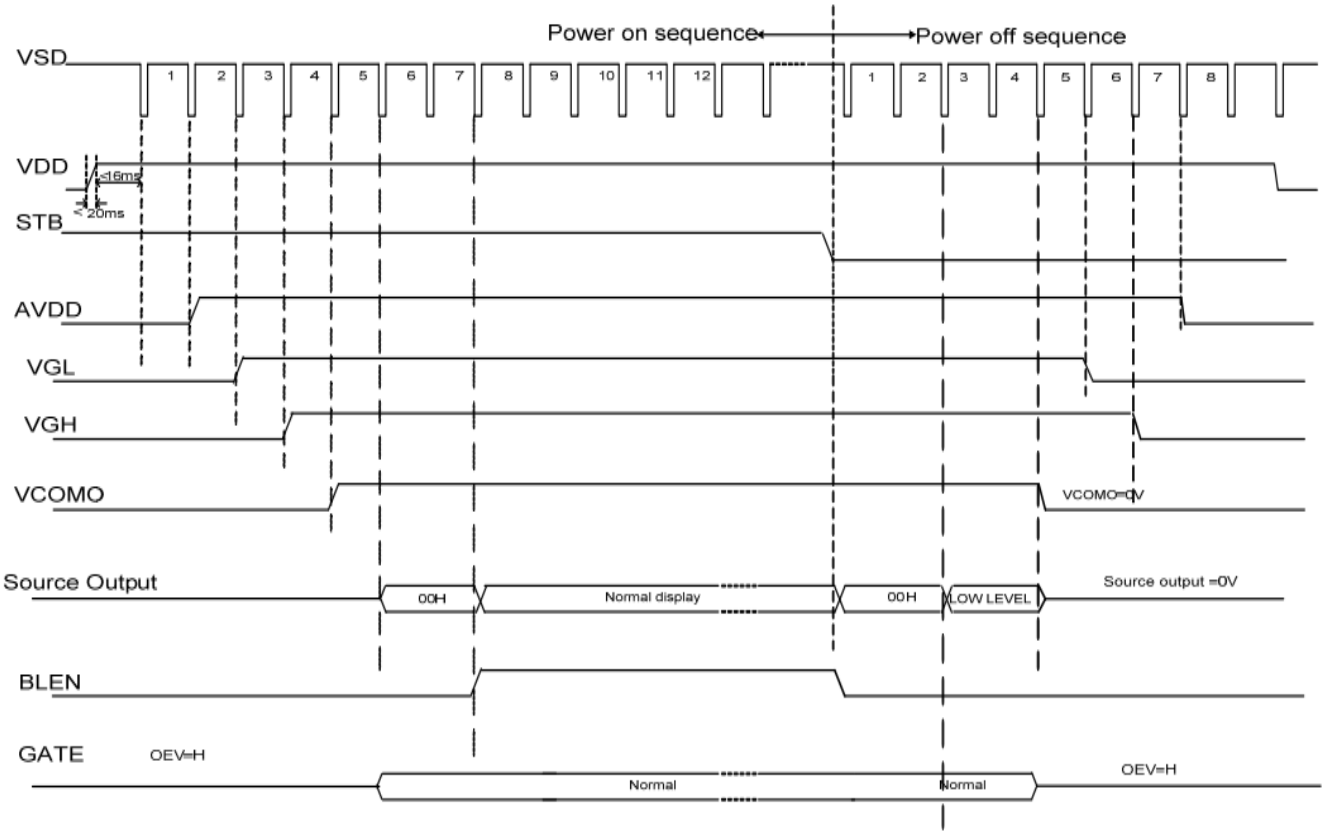
Backlight LED Circuit
3*9=27LED,If=140mA; Vf=8.4-10.2V

4.4.2 ELECTRICAL CHARACTERISTICS

(T=25℃)

PARAMETER	SYMBOL	CONDITION	STANDARD VALUE			UNIT
			MIN	TYP	MAX	
FORWARD VOLTAGE	VF	IF=140mA	8.4	9.6	10.2	V

4.5.Power、Signal Sequence:



4.6Timing Characteristics of Input Signals

DE mode

DE mode

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK frequency @Frame rate=60hz	fclk	40.8	51.2	67.2	Mhz
Horizontal display area	thd		1024		DCLK
HSYNC period time	th	1114	1344	1400	DCLK
HSYNC blanking	thb+thfp	90	320	376	DCLK
Vertical display area	tvd		600		H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

HV mode(1)

HV mode
Horizontal input timing

Parameter		Symbol	Value			Unit
Horizontal display area		thd		1024		DCLK
DCLK frequency@ Frame rate=60hz		fclk	Min.	Typ.	Max.	
			44.9	51.2	63	Mhz
1 Horizontal Line		th	1200	1344	1400	DCLK
HSYNC pulse width	Min.	thpw		1		
	Typ.			—		
	Max.			140		
HSYNC back porch		thbp	160	160	160	
HSYNC front porch		thfp	16	160	216	

HV mode(2)

Vertical input timing

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Vertical display area	tvd		600		H
VSYNC period time	tv	624	635	750	H
VSYNC pulse width	tvpw	1	—	20	H
VSYNC back porch	tvb	23	23	23	H
VSYNC front porch	tvfp	1	12	127	H

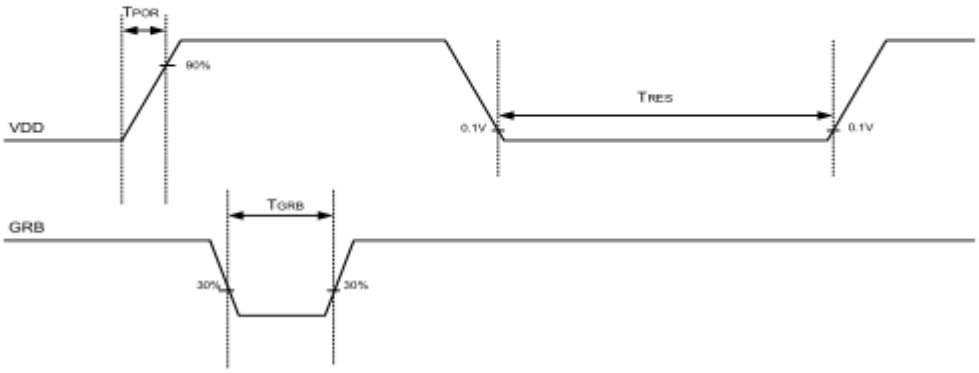
4.7 MIPI Interface DC Characteristic

(VDD=VDD_IF=1.8V,AVDD=8 to 13.5V,GND=AGND=GND_IF=0V,TA=-20℃ to 85℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
MIPI Characteristics for High Speed Receiver					
Single-ended input low voltage (DSI-CLKP/N,DSI-DnP/N)	V_{ILHS}	-40	-	-	mV
Single-ended input high voltage (DSI-CLKP/N,DSI-DnP/N)	V_{IHHS}	-	-	460	mV
Input Common-mode voltage (DSI-CLKP/N,DSI-DnP/N)	V_{CDRXDC}	70	-	330	mV
Differential input impedance	Z_{ID}		100		ohm
HS transmit differential voltage(VOD=VDP-VDN)	$\|V_{OD}\|$	140	200	250	mV
Low-level differential input voltage threshold	V_{THLCLK} $V_{THLDATA}$	-70	-	-	mV
High-level differential input voltage threshold	V_{THHCLK} $V_{THHDATA}$	-	-	-	mV
Single-ended threshold voltage for termination	V_{TERN_EN}	-	-	450	mV
Termination capacitor	C_{TERM}		-	14	pf
Input voltage common mode variation(<=450Mhz)	V_{CMRCLK} $V_{CMRDATAL}$	-50	-	50	mV
Input voltage common mode variation(>=450Mhz)	$V_{CMRCLKM}$ $V_{CMRDATAM}$		-	100	mV
MIPI Characteristics for Low Power Mode					
Pad signal voltage range	V_I	-50	-	1350	mV
Ground shift	V_{GNDSH}	-50	-	50	mV
Logic 0 input threshold	V_{IL}	0	-	550	mV
Logic 1 input threshold	V_{IH}	880	-	1350	mV
Logic 0 input voltage LPRX(CLK,ULP mode)	$V_{ILLPRXULP}$	0	-	300	mV
Input hysteresis	V_{HYST}	25	-	-	mV
Output low level	V_{OL}	-50	-	50	mV
Output high level	V_{OH}	1.1	1.2	1.3	V
Output impedance of Low Power Transmitter	Z_{OLP}	90	100	110	ohm
Logic 0 contention threshold	$V_{ILCD,MAX}$	-	-	200	mV
Logic 0 contention threshold	$V_{IHCD,MIN}$	450	-	1350	mV
Logic high level input current	I_{IH}	-	-	10	uA
Logic low level input current	I_{IL}	-10	-	-	uA
Input pulse rejection (DSI-CLKP/N,DSI-DnP/N)	SGD	-	-	300	Vps

4.8 VDD/GRB AC characteristic

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
VDD power slew rate	T_{POR}	-	-	20	ms	From 0 to 90% VDD
GRB active pulse width	T_{GRB}	1	-	-	ms	VDD=VDD_IF= 1.8V
VDD resettle time	T_{RES}	1	-	-	s	

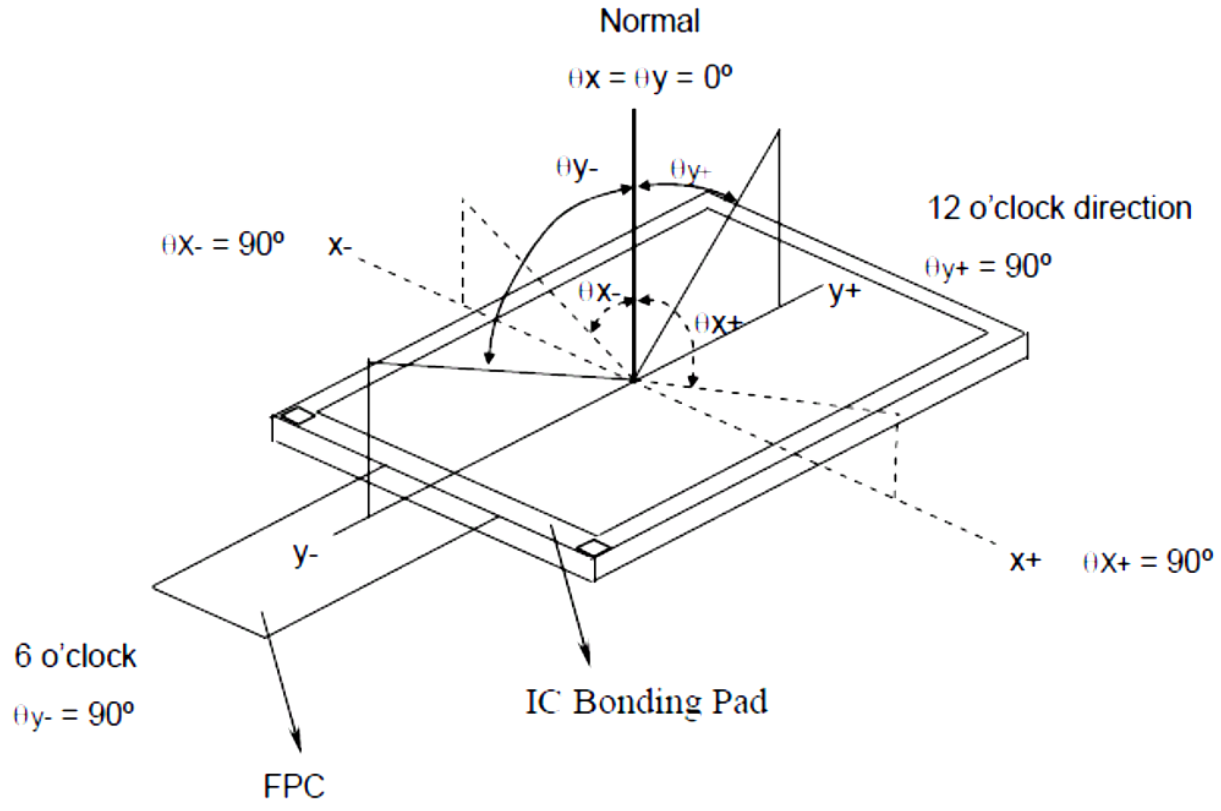


5. LCD OPTICAL CHARACTERISTICS

(T_a=+25ºC, VCI=+2.85V IOVCC=+1.8V, I_B=20mA)

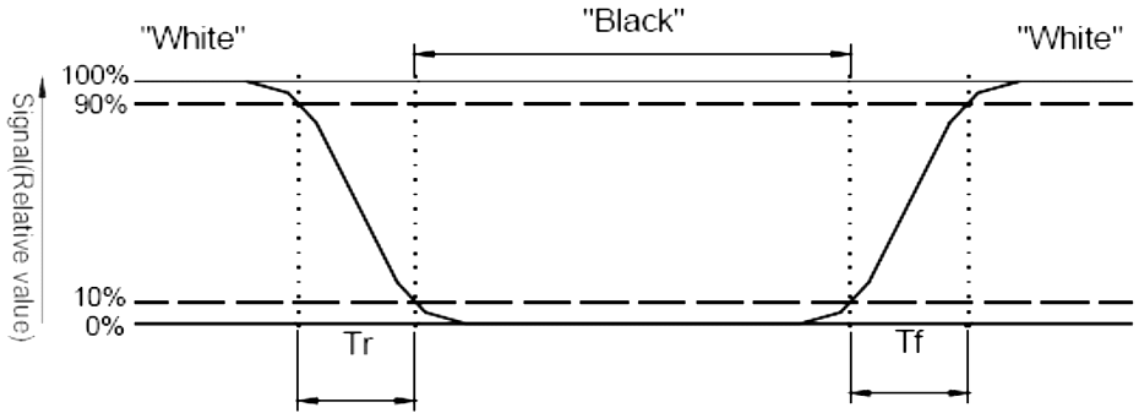
Item		Symbol	Condition	Values			Unit	Remark
				Min.	Typ.	Max.		
Viewing Angle Range	Left	θ_L	CR≧10	-	85	-	degree	Note 1
	Rig	θ_R		-	85	-		
	Top	Φ_T		-	85	-		
	Bott	Φ_B		-	85	-		
Response Time		$T_{on}+T_{off}$	Normal θ=Φ=0˚	-	25	40	ms	Note ,2
Contrast Ratio		CR	Normal θ=Φ=0˚	-	800	-	-	Note 3
Luminance		L	Normal θ=Φ=0˚	250	300	-	cd/m^2	Note 4
Color Chromaticity (CIE1931)	Whi te	X	Normal θ=Φ=0˚	+0.03	0.295	-0.03	-	Note 5
		Y			0.325			
	Red	X			TBD			
		Y			TBD			
	Gre en	X			TBD			
		Y			TBD			
	Blu e	X			TBD			
		Y			TBD			
Transmittance		Trans		-	5.0	-	%	

Note 1: Definition of viewing angle range



Note 2: Definition of response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{on}) is the time between photo detector output intensity changed from 90% to 10%, and fall time (T_{off}) is the time between photo detector output intensity changed from 10% to 90%.



Note 3: Definition of contrast ratio

Contrast ratio is calculated by the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "white" state}}{\text{Brightness on the "black" state}}$$

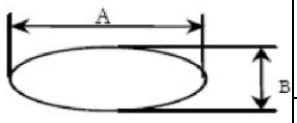
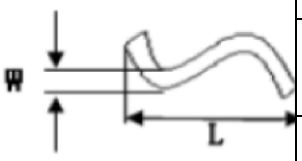
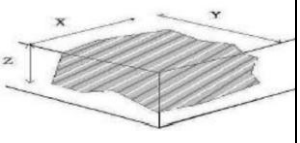
Note 4: Definition of luminance

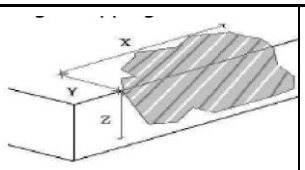
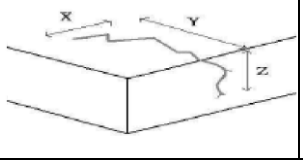
Measured at the center area of the panel when LCD panel is driven at “white” state.

Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at the center point of LCD when panel is driven at “White”, “Red”, “Green” and “Blue” state respectively.

6.THE STANDARD OF INSPECTION

Item NO.	Inspection Item	Inspection Standard		Classification of defects
1	LCD Electrical function testing	1) No display 2) Missing line 3) No backlight 4) shadow 5) black/blue display 6) Irregular operating 7) visual angle is wrong		Major
2	CTP function test	No open and No short for ALL X/Y sensors, test of accuracy/linearity/sensitivity/separation/ Jitter/anti-moisture is OK		Major
3	Outline dimension	All outline dimension beyond the drawing is not allowed		Major
4	White/Black spot (in LCD or Backlight)  D=(A+B)/2	D≤0.10mm	Ignore.	Minor
		0.10mm<D≤0.25mm	To be max 3points. (distance≥5mm)	
		D>0.25mm	Not allowed.	
5	Color/bright/dark dot	Color not allowed Bright/dark dot as same as White/Black spot		Minor
6	Dirt in CTP	as same as White/Black spot		Minor
7	Dent at CTP	as same as White/Black spot		Minor
8	Bubble	as same as White/Black spot		Minor
9	Scratch /Lines defect:  	W≤0.02mm,L≤5mm	Ignore.	Minor
		0.02mm<W≤0.05mm; L≤5.00mm	N≤3（distance≥10mm）	
		W>0.05mm，L＞5mm	Not allowed.	
10	Particle lines defect	W≤0.02mm,L≤2.5mm	Ignore.	Minor
		0.02mm<W≤0.05mm; L≤2.50mm	N≤2（distance≥10mm）	
		W>0.05mm，L＞2.5mm	Not allowed.	
11	Conner Chipping:  	Length X<1.0 mm Width Y<1.0mm Thickness Z ≤ Glass thickness (Sealant area could not be broken)		Minor
12	Edge Chipping:	Length X<1.5 mm		Minor

		Width Y<1.5 mm Thickness Z ≤ Glass thickness (Sealant area could not be broken)	
13	Crack: 	Not allowed.	Minor

Note: 1. Viewing distance: 30 +/- 2 cm

2. Inspection angle: 45 degrees in 6 o’ clock direction (all defects in viewing area should be inspected from this direction),Rotate 30° about the vertical axis.

3. Light Source: 500~700Lux +/- 20%, black background.

7.RELIABILITY TESTS

ITEM	CONDITION	CRITERION
Operating Temperature Test	High Temperature: +50 ºC, 48 hrs	No defects in display and operational functions
	Low Temperature: 0 ºC,48 hrs	
Storage Temperature Test	High Temperature: +60 ºC, 72 hrs	No defects in display and operational functions
	Low Temperature: -20 ºC, 72 hrs	
Humidity Endurance Test	60ºC, 90%RH, 96 hrs	No defects in display and operational functions
Thermal Shock Test	-20 ºC (30mins)～ +70 ºC (30mins) 10 cycles	No defects in display and operational functions
Electro Static Discharge	± 4KV, Human BodyMode,150pF/330Ω; ± 8KV,Air Mode,150pF/330Ω	No defects in display and operational functions

NOTE:

1) The samples must be free from defect before test, must be restored at room condition at least for 2 hours after reliability test before any inspection.

2) Before test the function of TP, the sample must be placed in room temperature for 24hrs after RA test.

8. PRECAUTIONS

8.1. Handling

8.1.1. Polarizer Cleaning, Petroleum ether (or N-hexane) is recommended for cleaning the front/rear polarizers and reflectors, acetone, toluene and ethanol are not allowed to avoid damaging the surface.

8.1.2. Body grounding, must wear Anti-ESD wrist strap while pick up LCDs.

8.1.3. FPC Soldering, less than 300℃/3S, solder must be grounding on grounding bench.

8.1.4. If use electric Screwdriver to do assembly, screwdriver must be grounding.

8.2. Storage

8.2.1. Keep in a sealed polyethylene bag.

8.2.2. Keep in a dark place.

8.2.3. Keep in temperature between 0ºC and 35ºC.

NOT allowed at 70ºC for more than 160 Hours, or at -20ºC for more than 48 Hrs.

8.3. Safety

If liquid crystal leak out of a damaged glass cell, DO NOT put it in your mouth or touch eyes, if the liquid crystal touch your skin or clothes, please wash it off immediately using soap and water.

9. LIMITED WARRANTY

Unless otherwise agreed between Gelivable and customer, Gelivable will replace or repair any of its LCD modules which are found to be functionally defective when inspected in accordance with Gelivalbe LCD acceptance standards (copies available upon request) for a period of one year from date of shipments. Cosmetic/visual defects over specs must be returned to Gelivable within 30 days of shipment. Confirmation of such date shall be based on freight documents. The warranty liability of Gelivable limited to repair and/or replacement on the terms set forth above. Gelivable shall not be responsible for any subsequent or consequential events.

9.1. Returning Lcm Under Warranty – Terms And Conditions

9.1.1. No warranty can be granted if the precautions stated above have been disregarded. The typical examples of violations are :

- Broken LCD glass.
- Circuit modified in any way, including addition of components.

9.1.2. Module repairs will be invoiced to the customer upon mutual agreement. Modules must be returned with sufficient description of the failures or defects. Any connectors or cable installed by the customer must be removed completely without damaging the PCB’s eyelet, conductors and terminals.