YOURITech
AN EUROTECH COMPANY

INDUSTRIAL STRENGTH...
Start Your Application From YOURITECH

Integration support
Obsolescence Management
PCAP
Embedded Systems
Human Machine Interface
Touch Solutions
Production
Custom designs
Installation
Software
Mechanical design
Quality Management
Open Frame Monitors
LCD Controller
Research & Development
Firmware
EMC tests
on-site service
In-house Manufacturing
Optical Bonding
Cover glass
System solutions
OEM Solutions
Custom Display

Erotech YOURITech AN EUROTECH COMPANY AOSHITE 奥视特 Your Reliable Display Panel and Smart Touch Embedded Solution Partner

For more information about comprehensive display panels and touch embedded solutions, welcome contact us at:

https://www.youritech.com
info@youritech.com

■ Preliminary Specifications

☐ Final Specifications

Title	7.02-inch LCM Product Specifications
Model Name	ET070FH01-RT
Version	P0

Customer
Approved by Date
Notice: This Specification is subject to change without notice.

Approved By	Prepared By
Cai 2025-09-15	He 2025-09-15

REVISION HISTORY

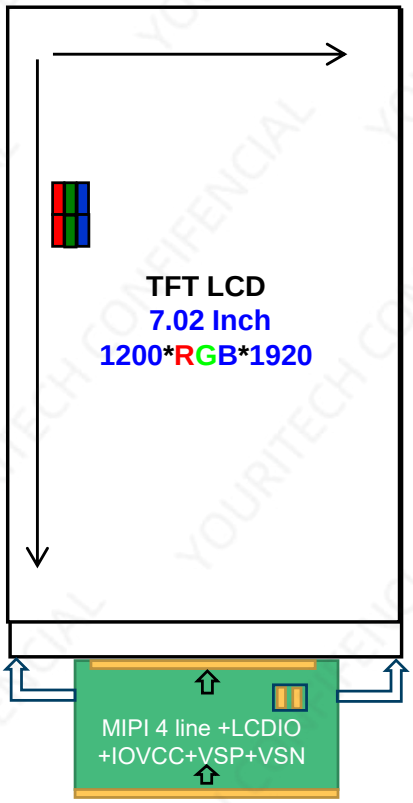
REV.	PAGE	DESCRIPTION OF CHANGES	DATE	PREPARED
P0		Initial Release	2025.09.15	H

CONTENTS

1.0 GENERAL DESCRIPTION

ET070FH01-RT is a color active matrix a-Si LCD, using a-Si (amorphous silicon) TFTs (Thin Film Transistors) as an active switching devices. The FOG has a 7.02 inch diagonally measured active area with 1200×1920 resolutions (1200 horizontal by 1920 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this FOG can display 16.7M colors.

<Figure 1. FOG>



1.2 Features

- PPI: 322
- Color Gamut: NTSC 80%(Typ.) 75%(Min.)
- RGB Interface
- Thin Border
- RoHS Compliant

1.3 Application

- Industrial Display
- Outdoor Display
- Outdoor Photography

1.4 General Specification

The followings are general specifications of the ET070FH01-RT

<Table 1. General Specifications> [Ta= 25±2℃]

Parameter	Specification	Unit	Remark
Active Area	94.5(H) ×151.2 (V)	mm	Note 1.1
Dimensional Outline	100.02(H) ×167.41(V)×2.41(T)	mm	
Border(L/R/U/D)	1.4/1.4/1.4/6.8	mm	fog
Number of Pixels	1200 (H)×1920 (V)	pixels	-
Pixel Pitch	26.25(H)×3×78.75(V)	μm	-
Pixel Arrangement	RGB Vertical Stripe	-	-
Color Gamut	75%(Min.), 80% (Typ.)		CF @C Light
Display Colors	16.7M	-	-
Display Mode	Normally Black	-	-
Viewing Direction	80/80/80/80 (Typ.) 75/75/75/75 (Min.)	Deg.	CR>=10
Weight	TBD	gram	-
IC	HX8279-D01*2 Cascade		Note 1.3

Note 1.1: H: horizontal length, V: vertical length, T：Thickness

Note 1.2: This product's compatible IC is HX8279_D01.

,Please contact IC manufacturer and vetify it when you choose any one of them.The informati on we suppose about IC just for reference.

Note 1.3: 1)The BOE reliability test is based on HX8279-D01;

2)Other ICs can only be used after the reliability test is passed.

.

2.0 ABSOLUTE MAXIMUM RATINGS

The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage values are listed in Table 2. All the measurements should be operated with driver IC and FPC mounted.

<Table 2. Absolute Maximum Ratings>

Parameter	Symbol	Min.	Max.	Unit	Remarks
Supply Voltage	IOVCC	-0.3	+2.1	V	Ta = 25 ℃ Note 1&2
	VSP	-0.3	6.6	V	
	VSN	-7.3	0.3	V	
Operating Temperature (Humidity)	T_{OP}	-20	+80	℃	
	RH	-	90	%	At 60°C
Storage Temperature (Humidity)	T_{ST}	-30	+80	℃	
	RH	-	90	%	At 60°C

Note:
1. These range above is maximum value not the actual operating temperature . Actual Operating temperature is no more than 40℃ and temperature refers to the LCM surface temperature ;
2.BOE is not responsible for product problems beyond the use conditions.

3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

<Table 3. LCD FOG Electrical Specifications >

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Power Supply Input Voltage		IOVCC	-0.3	1.8	2.1	V	Ta = 25 ℃ Note 1
		VSP	-0.3	5.5	6.6	V	
		VSN	-7.3	-5.5	0.3	V	
Current Consumption	Operating						-
	Sleep in						

Note:
1.This is the voltage range of the IC. In this range, when the voltage is too low, the brightness of LCD may decrease

3.2 LED Backlight specification

Item	Symbol	Min	Typ	Max	Unit	Note
Luminance	Lv	1350	1500	-	cd/m²	
Forward Voltage	Vf	-	24.0	25.6	V	
Forward Current	I_F	-	200	-	mA	
Backlight Power consumption	W_{BL}	-	4.8	-	W	
LED Lifetime			30000	-	Hrs	

Note 1: Each LED: IF =20mA, VF =6.0±0.3V.

Note 2: Optical performance should be evaluated at Ta=25℃ only.

4.0 INTERFACE CONNECTION.

4.1 Electrical Interface Connection

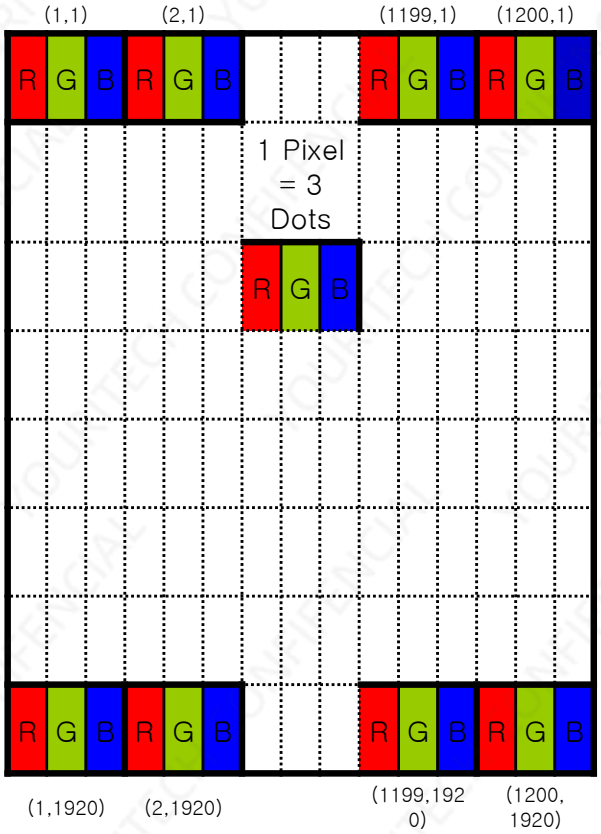
The Interface Connector assignments are listed in Table 4

< Table 4. Pin Assignments for the Interface Connector >

1	Ag_GND	41	NC	81	VSP	121	DUMMY	161	DUMMY	201	DUMMY	241	VGH	281	CLKN	321	BIST_EN
2	NULL	42	NC	82	VSP	122	DUMMY	162	DUMMY	202	DUMMY	242	VCOM	282	CLKP	322	PWRMD
3	Ag_GND	43	VCC	83	VSP	123	DUMMY	163	DUMMY	203	DUMMY	243	VCOM	283	GND	323	NC
4	Ag_GND	44	GND	84	GND	124	DUMMY	164	DUMMY	204	DUMMY	244	VCOM	284	D1N	324	LNSW0
5	GND	45	D3N	85	GND	125	DUMMY	165	DUMMY	205	DUMMY	245	SCK	285	D1P	325	LNSW1
6	GND_db	46	D3P	86	GND	126	DUMMY	166	DUMMY	206	DUMMY	246	SDAO	286	GND	326	NC
7	VGL	47	GND	87	VSN	127	DUMMY	167	DUMMY	207	DUMMY	247	RESETB	287	D0N	327	MIPI_LAN0
8	VGL	48	D2N	88	VSN	128	DUMMY	168	DUMMY	208	DUMMY	248	STBYB	288	D0P	328	MIPI_LAN1
9	Dummy	49	D2P	89	VSN	129	DUMMY	169	DUMMY	209	DUMMY	249	DIMO	289	GND	329	NC
10	VGH	50	GND	90	PN_SWAP	130	DUMMY	170	DUMMY	210	DUMMY	250	TP_SYNC	290	GND	330	NC
11	VGH	51	CLKN	91	BIST_EN	131	DUMMY	171	DUMMY	211	DUMMY	251	SDAI	291	VCC	331	TESTIN
12	VCOM	52	CLKP	92	PWRMD	132	DUMMY	172	DUMMY	212	DUMMY	252	PWMI	292	VCC	332	TESTOUT
13	VCOM	53	GND	93	NC	133	DUMMY	173	DUMMY	213	DUMMY	253	CSB	293	DRVH3	333	VCOMOUT
14	VCOM	54	D1N	94	LNSW0	134	DUMMY	174	DUMMY	214	DUMMY	254	MIPI_TYPE	294	DRVH2	334	VCOMOUT
15	SCK	55	D1P	95	LNSW1	135	DUMMY	175	DUMMY	215	DUMMY	255	VCC	295	DRVH1	335	VCOMOUT
16	SDAO	56	GND	96	NC	136	DUMMY	176	DUMMY	216	DUMMY	256	VDD	296	VSP_O	336	VPP
17	RESETB	57	D0N	97	MIPI_LAN0	137	DUMMY	177	DUMMY	217	DUMMY	257	GND	297	VSP	337	VGH_L
18	STBYB	58	D0P	98	MIPI_LAN1	138	DUMMY	178	DUMMY	218	DUMMY	258	VSP	298	GND	338	VGH_L
19	DIMO	59	GND	99	NC	139	DUMMY	179	DUMMY	219	DUMMY	259	VSP	299	VSN	339	Dummy
20	TP_SYNC	60	GND	100	NC	140	DUMMY	180	DUMMY	220	DUMMY	260	GND	300	VSN_O	340	VGL
21	SDAI	61	VCC	101	TESTIN	141	DUMMY	181	DUMMY	221	DUMMY	261	GND	301	DRVL2	341	VGL
22	PWMI	62	VCC	102	TESTOUT	142	DUMMY	182	DUMMY	222	DUMMY	262	VSN	302	DRVL1	342	GND_dr
23	CSB	63	DRVH3	103	VCOMOUT	143	DUMMY	183	DUMMY	223	DUMMY	263	VSN	303	VLPH	343	GND_dg
24	MIPI_TYPE	64	DRVH2	104	VCOMOUT	144	DUMMY	184	DUMMY	224	DUMMY	264	VCOM0	304	VLPH	344	GND
25	VCC	65	DRVH1	105	VCOMOUT	145	DUMMY	185	DUMMY	225	DUMMY	265	VCOM0	305	VDD	345	Ag_GND
26	VDD	66	VSP_O	106	VPP	146	DUMMY	186	DUMMY	226	DUMMY	266	VCOM0	306	VDD	346	Ag_GND
27	GND	67	VSP	107	VGH_L	147	DUMMY	187	DUMMY	227	DUMMY	267	VCOM_EN	307	VDD	347	NULL
28	VSP	68	GND	108	VGH_L	148	DUMMY	188	DUMMY	228	DUMMY	268	VCL	308	VCC_EN	348	Ag_GND
29	VSP	69	VSN	109	Dummy	149	DUMMY	189	DUMMY	229	DUMMY	269	VCL	309	VCC	FPC PIN based on HX8279-D01*2	
30	GND	70	VSN_O	110	VGL	150	DUMMY	190	DUMMY	230	DUMMY	270	VCL	310	GND		
31	GND	71	DRVL2	111	VGL	151	DUMMY	191	DUMMY	231	Ag_GND	271	NC	311	VSP		
32	VSN	72	DRVL1	112	GND_dr	152	DUMMY	192	DUMMY	232	NULL	272	NC	312	VSP		
33	VSN	73	VLPH	113	GND_dg	153	DUMMY	193	DUMMY	233	Ag_GND	273	VCC	313	VSP		
34	VCOM0	74	VLPH	114	GND	154	DUMMY	194	DUMMY	234	Ag_GND	274	GND	314	GND		
35	VCOM0	75	VDD	115	Ag_GND	155	DUMMY	195	DUMMY	235	GND	275	D3N	315	GND		
36	VCOM0	76	VDD	116	Ag_GND	156	DUMMY	196	DUMMY	236	GND_db	276	D3P	316	GND		
37	VCOM_EN	77	VDD	117	NULL	157	DUMMY	197	DUMMY	237	VGL	277	GND	317	VSN		
38	VCL	78	VCC_EN	118	Ag_GND	158	DUMMY	198	DUMMY	238	VGL	278	D2N	318	VSN		
39	VCL	79	VCC	119	DUMMY	159	DUMMY	199	DUMMY	239	Dummy	279	D2P	319	VSN		
40	VCL	80	GND	120	DUMMY	160	DUMMY	200	DUMMY	240	VGH	280	GND	320	PN_SWAP		

4.2 Data Input Format

<Figure 2. Pixel Format>

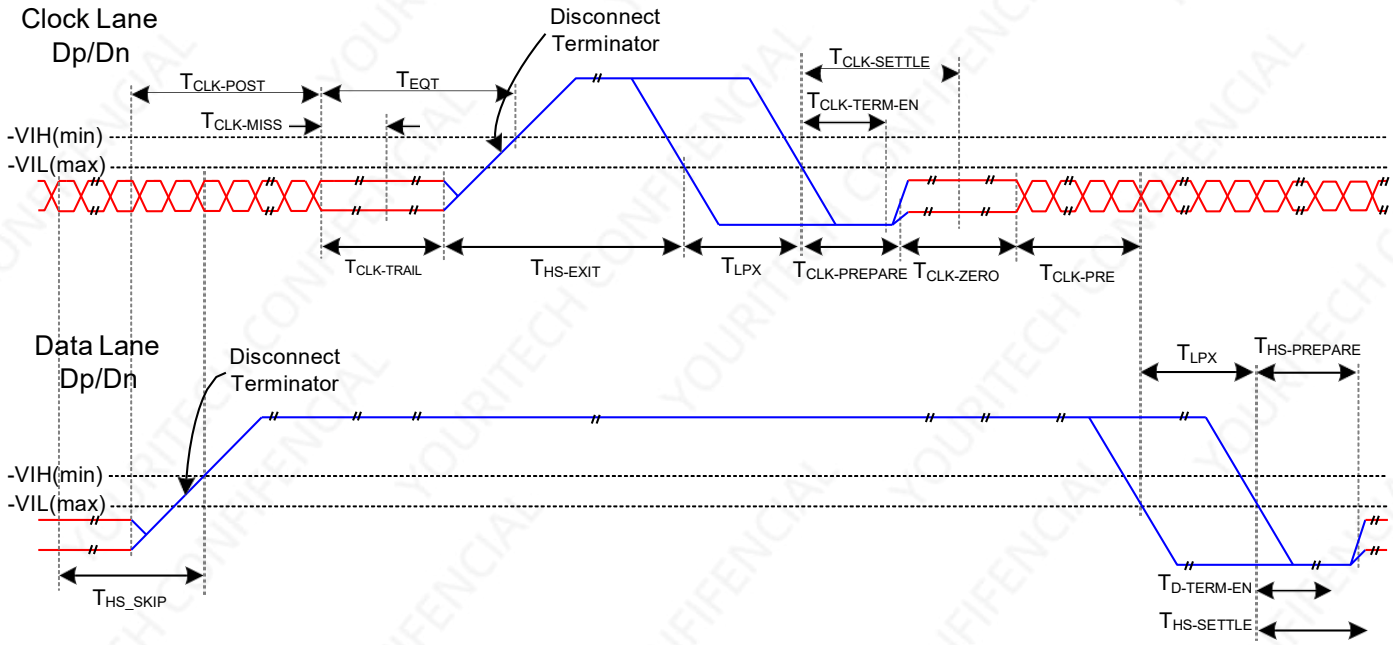


Display Position of Input Data (V-H)

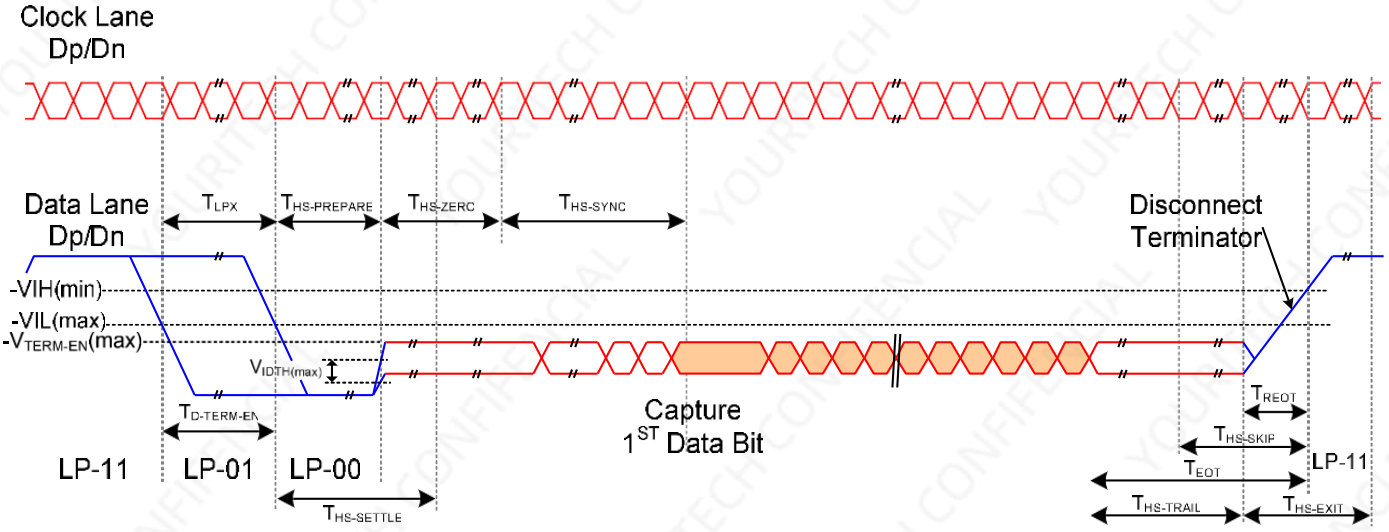
<Figure 3. Scan direction>

4.3 MIPI Interface Timing

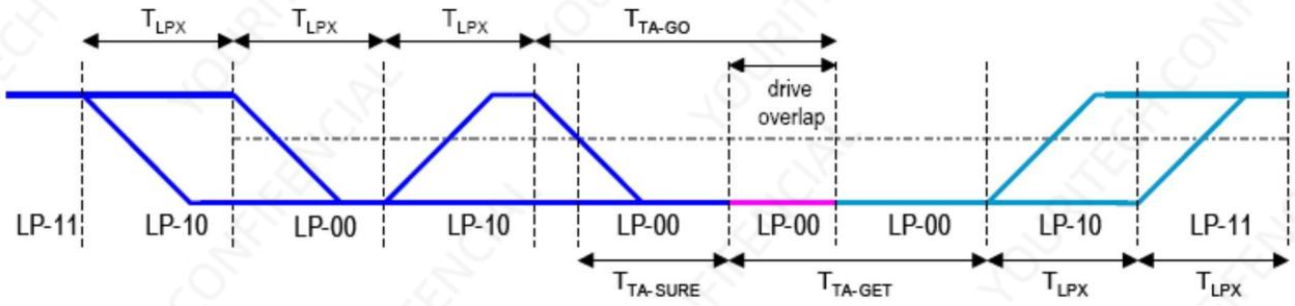
< Figure 4. Timing Chart of Signals in MIPI Interface >



Switching the clock lane between clock transmission and low-power mode



Timing of high-speed data transmission in bursts



Turnaround Procedure

4.3 MIPI Interface Timing

Parameter	Description	Spec.			Unit
		Min.	Typ.	Max.	
T_{REOT}	30%-85% rise time and fall time	-	-	35	ns
$T_{CLK-MISS}$	Timeout for receiver to detect absence of Clock transitions and disable the Clock Lane HS-RX.	-	-	60	ns
$T_{CLK-POST}$*1	Time that the transmitter continues to send HS clock after the last associated Data Lane has t ransitioned to LP Mode. Interval is defined as the period from the end of THS-TRAIL to the beginning of $T_{CLK-TRAIL}$.	60 ns + 52*UI (For DCS)	-	-	ns
$T_{CLK-PRE}$	Time that the HS clock shall be driven by the transmitter prior to any associated Data Lane beginning the transition from LP to HS mode.	8	-	-	ns
$T_{CLK-SETTLE}$	Time interval during which the HS receiver shall ignore any Clock Lane HS transitions, starting from the beginning of $T_{CLK-PRE}$.	95	-	300	ns
$T_{CLK-TERM-EN}$	Time for the Clock Lane receiver to enable the HS line termination, starting from the time point when Dn crosses $V_{IL,MAX}$.	Time for Dn to reach $V_{TERM-EN}$	-	38	ns
$T_{HS-SETTLE}$	Time interval during which the HS receiver shall ignore any Data Lane HS transitions, starting from the beginning of $T_{HSPREPARE}$.	85 ns + 6*UI		145 ns + 10*UI	ns
T_{EOT}	Time from start of $T_{HS-TRAIL}$ or $T_{CLK-TRAIL}$ period to start of LP-11 state	-	-	105ns+48*UI	-
$T_{HS-EXIT}$(1)	time to drive LP-11 after HS burst	100	-	-	ns
$T_{HS-PREPARE}$	Time to drive LP-00 to prepare for HS transmission	40ns + 4*UI	-	85ns+6*UI	ns
$T_{HS-PREPARE}$ + $T_{HS-ZERO}$	$T_{HS-PREPARE}$ + Time to drive HS-0 before the Sync sequence	145ns + 10*UI	-	-	ns
$T_{HS-SKIP}$	Time-out at RX to ignore transition period of EoT	40	-	55ns+4*UI	ns
$T_{HS-TRAIL}$	Time to drive flipped differential state after last payload data bit of a HS transmission burst	60 + 4*UI	-	-	ns
T_{LPX}	Length of any Low-Power state period	50	-	-	ns
Ratio T_{LPX}	Ratio of $T_{LPX(MASTER)}$/$T_{LPS(SLAVE)}$ between Master and Slave side	2/3	-	3/2	-
T_{TA-GET}	Time to drive LP-00 by new TX		5*T_{LPX}		ns
T_{TA-GO}	Time to drive LP-00 after Turnaround Request		4*T_{LPX}		ns
$T_{TA-SURE}$	Time-out before new TX side starts driving	T_{LPX}	-	2*T_{LPX}	ns

Note: (1) For image transmission:
$T_{CLK-POST}$ min value =164 when MIPI max frequency per lane = 0.53Gbps.
$T_{CLK-POST}$ min value =112 when MIPI max frequency per lane = 1Gbps

4.3 MIPI Interface PIN map

Pin NO.	Pin name	Description	Pin NO.	Pin name	Description
1	NC	No connection	21	MIPI_3P	MIPI Positive data signal (+)
2	IOVCC	Power supply for system ,IOVCC=1.8V	22	GND	Ground
3	IOVCC		23	NC	No connection
4	GND	Ground	24	NC	No connection
5	RST	Device reset signal	25	GND	Ground
6	NC	No connection	26	NC/TE	Tearing effect output signal for NVM(OTP),Let it open when not in use
7	GND	Ground	27	PWMO	PWM control signal for LED driver
8	MIPI_0N	MIPI Negative data signal (-)	28	NC/BIST	Enables the Test Image Generation function, if not used, connect to ground
9	MIPI_0P	MIPI Positive data signal (+)	29	NC	No connection
10	GND	Ground	30	GND	Ground
11	MIPI_1N	MIPI Negative data signal (-)	31	LED-	LED cathode
12	MIPI_1P	MIPI Positive data signal (+)	32	LED-	
13	GND	Ground	33	NC	No connection
14	MIPI_CKN	MIPI Negative clock signal (-)	34	VSN	Analog supply negative voltage
15	MIPI_CKP	MIPI Positive clock signal (+)	35	VSN	
16	GND	Ground	36	NC	No connection
17	MIPI_2N	MIPI Negative data signal (-)	37	VSP	Analog supply positive voltage
18	MIPI_2P	MIPI Positive data signal (+)	38	VSP	
19	GND	Ground	39	LED+	LED anode
20	MIPI_3N	MIPI Negative data signal (-)	40	LED+	

4.4 Porch setting

Parameter	Symbol	Min.	Typ.	Max.	Unit
Horizontal Sync. Width	hpw	10	24	-	Clock
Horizontal Sync. Back Porch	hbp	50	80	-	Clock
Horizontal Sync. Front Porch	hfp	20	60	-	Clock
Vertical Sync. Width	vs	-	2	-	Line
Vertical Sync. Back Porch	vbp	-	10	-	Line
Vertical Sync. Front Porch	vfp	-	14	-	Line

4.5 Reset Timing:

When RESETB of the reset pin equals to Low, it will be in the condition of reset. When it is in the condition of reset, it will make the device recover the initial set.

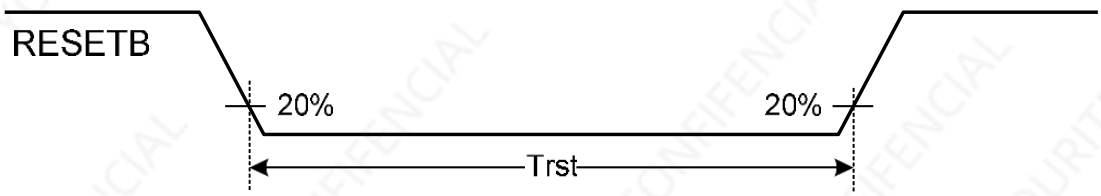
However, in order to avoid the reset noise cause reset, there is a mechanism to judge about whether the reset is needed or not.

The closed interval of low can be shown as the following.

(VDD=1.7V~2.0V, VSS=0V, T_{OPR} =-20℃~+85℃)

Parameter	Symbol	Conditions	Values			Unit
			Min.	Typ.	Max.	
Reset low pulse width	Trst	-	20	-	-	s

Reset timing



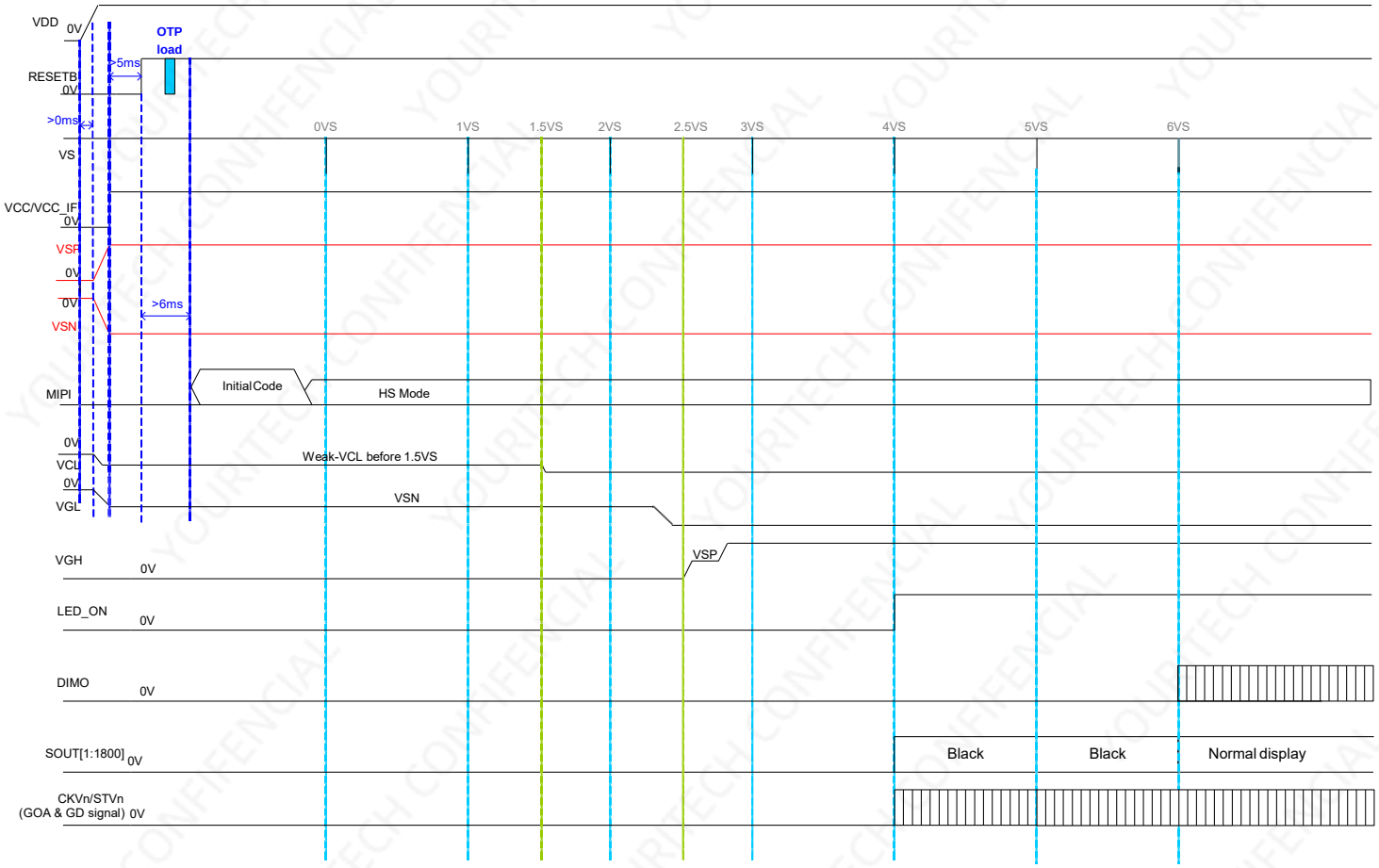
Reset timing

5.0 POWER SEQUENCE

5.1 Power ON/OFF Sequence

To prevent a latch-up or DC operation of the LCD FOG, the power on/off sequence shall be as shown in below

<Figure 5. Power on/off>

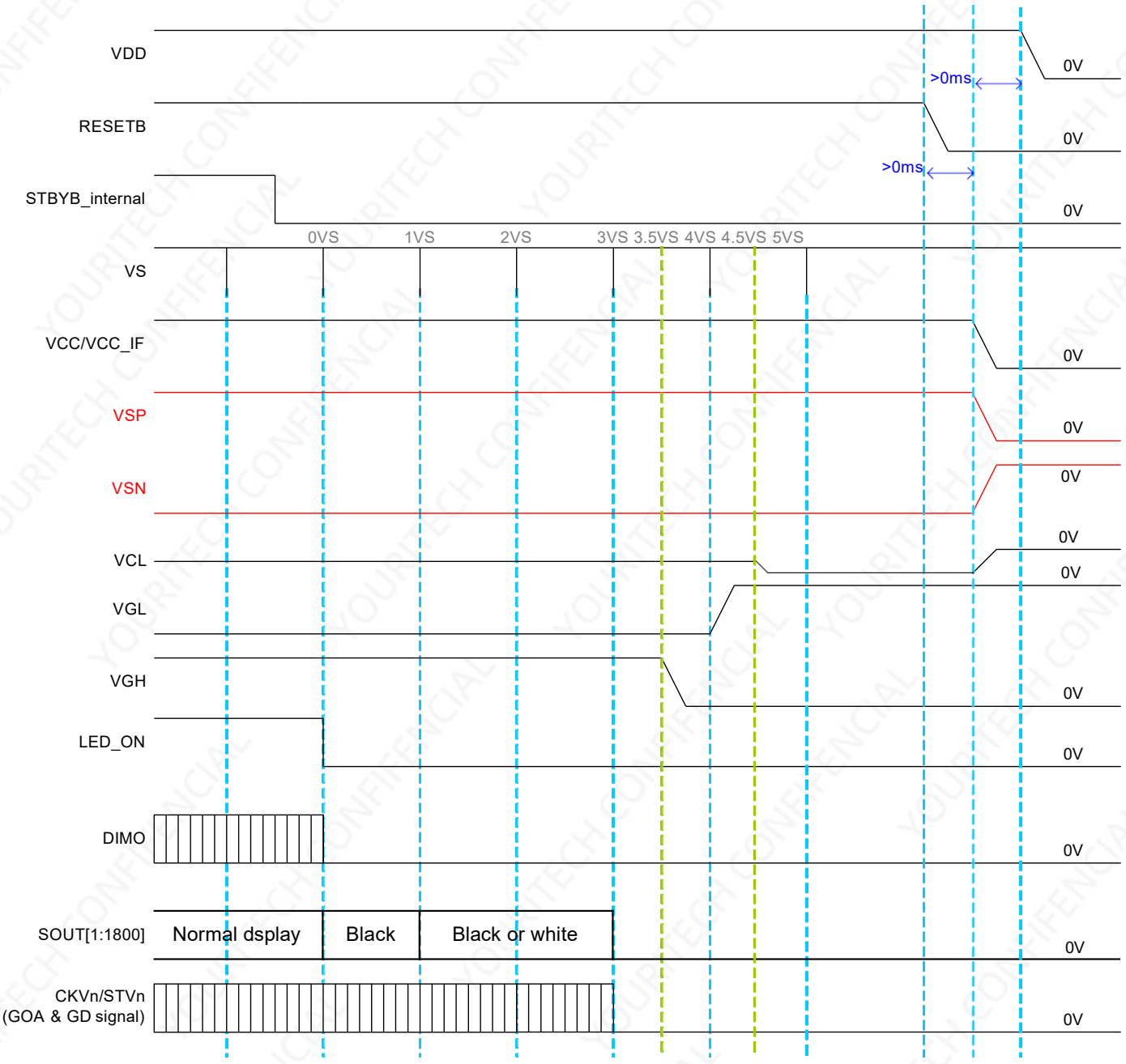


Note: (1) Finish to write the GOA MUX (page1 registers) and GOA timing setting (page3 registers) within 50ms after reset pulls to high.

Power on sequence with PWRMD=0 and repair OP disable

5.0 POWER SEQUENCE

5.1 Power ON/OFF Sequence



Power off sequence with PWRMD=0

6.0 OPTICAL SPECIFICATIONS

6.1 Overview

The test of optical specifications shall be measured in a dark room (ambient luminance <1lux and temperature=25±2℃) with the equipment of luminance meter system (Goniometer system and CS2000/CA310) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0° . We refer to Ø=0 (=θ3) as the 3 o'clock direction (the "right"), Ø=90 (=θ12) as the 12 o'clock direction ("upward"), Ø=180 (=θ9) as the 9 o'clock direction ("left") and Ø=270(=θ6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed.

The backlight should be operating for 30 minutes prior to measurement.

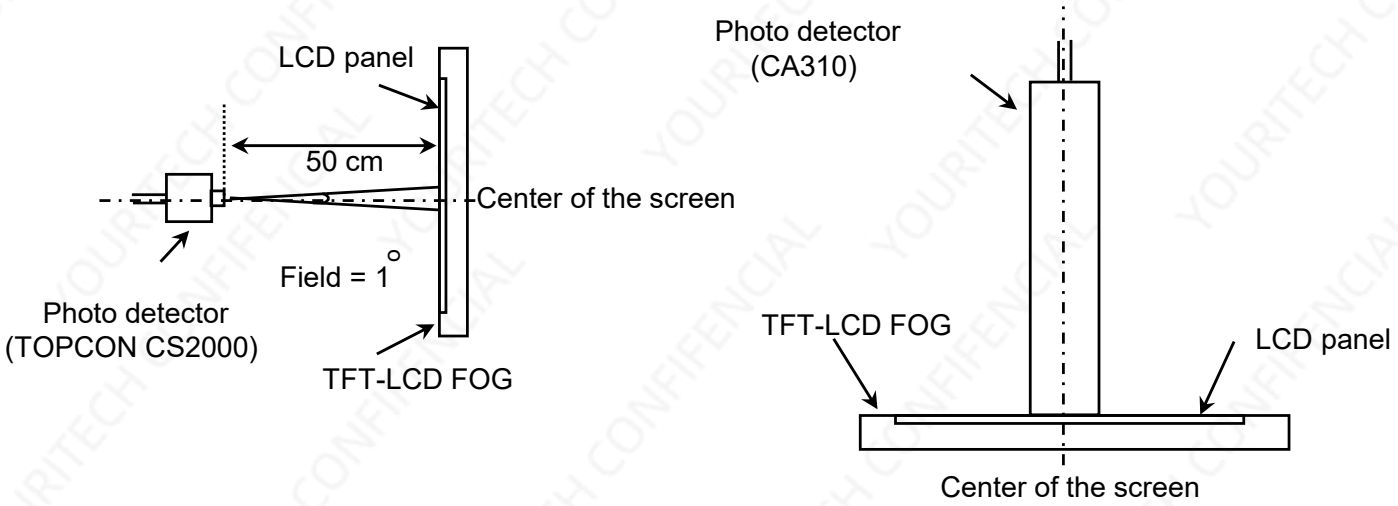
6.2 Optical Specifications

<Table 5. Optical Specifications> [Ta=25±2℃]

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle Range	Horizontal	Θ_3	CR > 10	75	80	-	Deg.	Note 6.1
		Θ_9		75	80	-	Deg.	
	Vertical	Θ_{12}		75	80	-	Deg.	
		Θ_6		75	80	-	Deg.	
Contrast Ratio		CR	Θ = 0°	1000	1200	-		
Brightness（Center）		nits		1300	1500	-		
Reproduction of color		Rx	Θ = 0°	0.653	0.673	0.693		CF @C Light Note 6.4
		Ry		0.299	0.319	0.339		
		Gx		0.208	0.228	0.248		
		Gy		0.594	0.614	0.634		
		Bx		0.120	0.140	0.160		
		By		0.086	0.106	0.126		
		Wx		0.265	0.305	0.305		
		Wy		0.327	0.367	0.407		
Uniformity(9p)			.	75	80	-	%	
Response Time		Tr+Tf	Ta= 25°C Θ = 0°	-	30	40	ms	Note 6.5

Note 6.1: Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see Figure 6).

<Figure 6. Viewing Angle Range Is Defined As Follows>



View angel range, uniformity, etc. measurement setup

Flicker, measurement setup

Note 6.2: Contrast measurements shall be made at viewing angle of Θ=0° and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

Note 6.3: Transmittance is the Value with Polarizer(APF) （Film structure is on Table 6）.

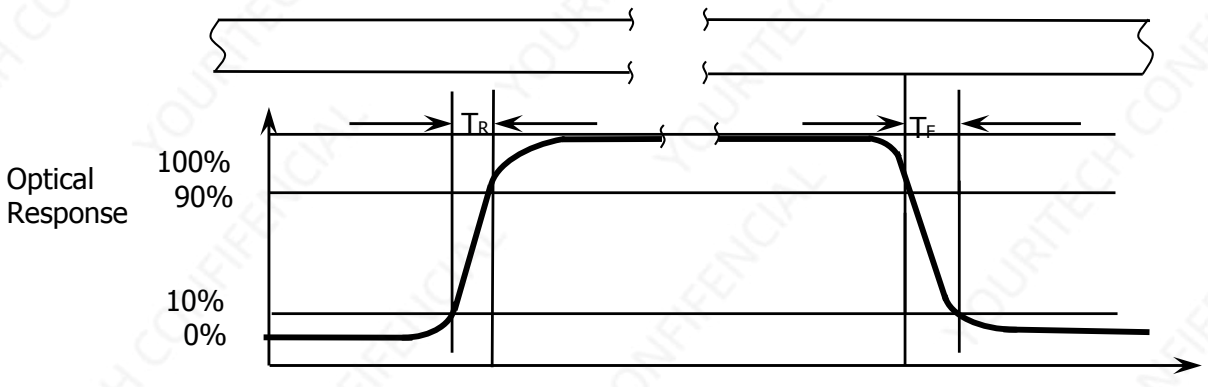
<Table 6 BLU Film structure>

遮光	Soken	SK8906B
BEF	光耀	SG43+QG42
DIF	Kimoto	38TMQ
LGP	住友	TR1801A
REF	丽光	75W28
胶铁	乐天	LB1010W
LED	AOT	3004 Silicate

Note 6.4: The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

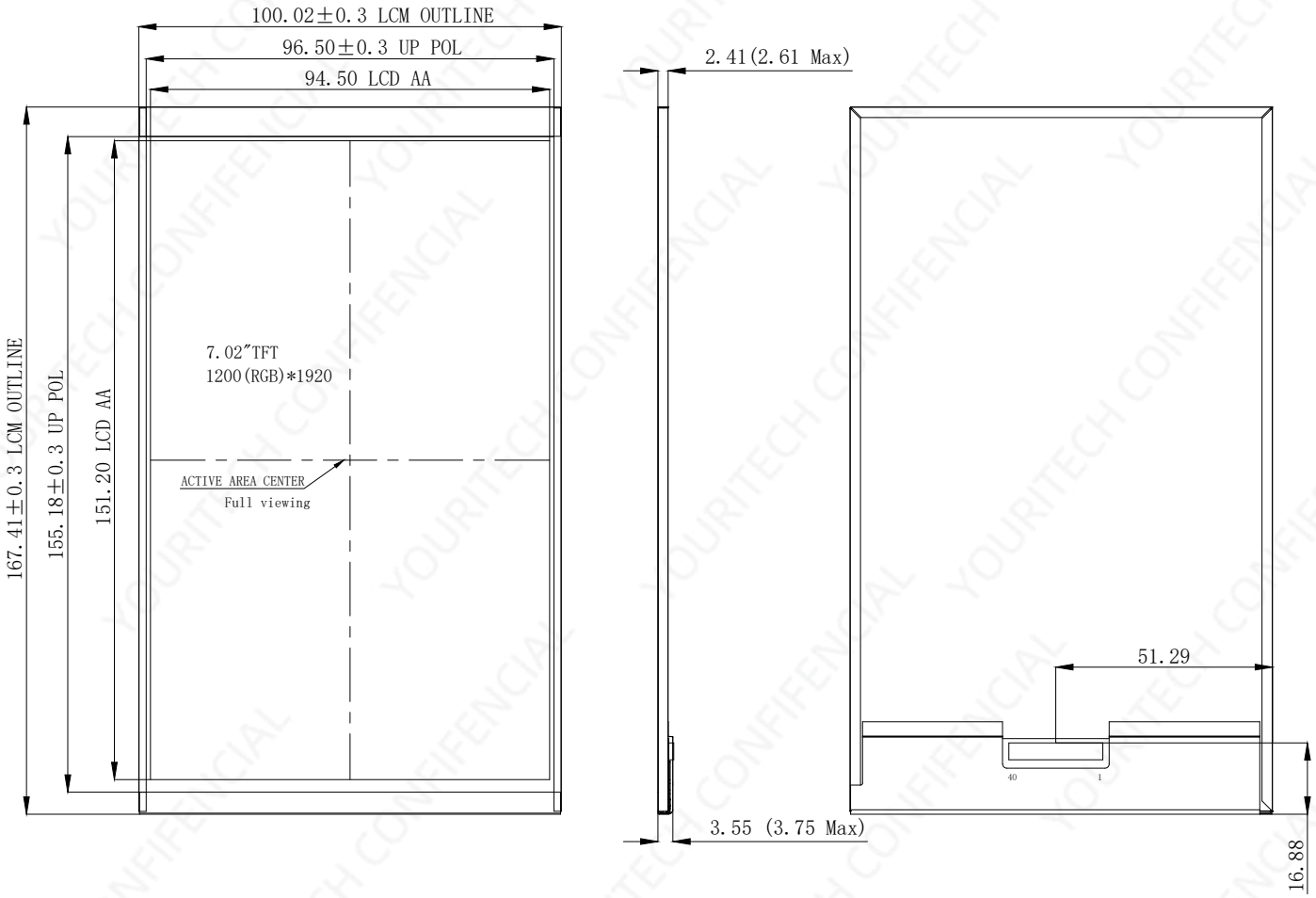
Note 6.5: The electro-optical response time measurements shall be made as Figure 7 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Tf.

<Figure 7. Response Time Testing>



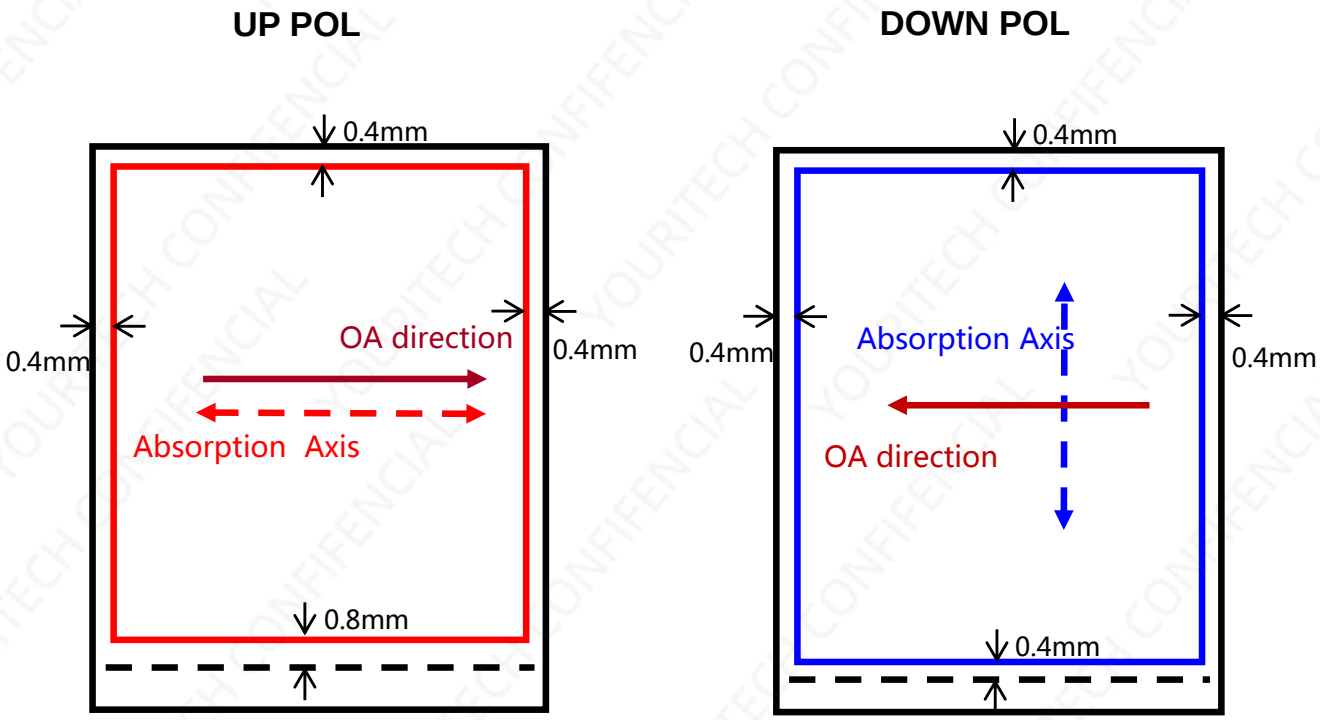
7.0 Outline Drawing

<Figure 8. Outline Drawing:Front>



8.0 LC Align Direction & Pol absorption axis

<Figure 11. Graphic Description of Pol>



Adhesive Downwards

LC Align Direction

The positive LC align direction is shown in Figure8

	CF Pol	TFT Pol	Remark
Absorption. Axis	0°	90°	BOE Proposal
Surface Treatment	HC	APF	-
Size(mm)	96.5*155.175	96.5*155.575	-
Thickness(um)	79	106	≤220

9.0 RELIABILITY

<Table 7. Reliability Test Parameters>

No	Items	Conditions	Remark
1	High Temperature Storage test(HTS)	80℃, 240hrs, Non-operational	Note 9.1
2	Low Temperature Storage test(LTS)	-30℃, 240hrs, Non-operational	
3	High Temperature Operating test(HTO)	80℃, 240hrs, operational	
4	Low Temperature Operating test(LTO)	-20℃, 240hrs, operational	
5	Thermal Humidity Operating test(THO)	60℃/90%RH, 240hrs, operational	
6	Thermal Cycle Storage test(TST)	-30~80℃, 100cycles, 1hr/cycle, Non-operational	
7	Image Sticking	5*5 Pattern, 1hr 25℃±2℃ check pattern Gray 127 in a positive view,after 5 minutes, the mura must be disappeared completely	

Note 9.1: The test result shall be evaluated after the sample has been left at room temperature and humidity for 2 hours.

The reliability test result is based on HX8279-D01 IC.

10.0 PRECAUTIONS

10.1 Handing

(1) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.
(2) You must mount a FOG using specified mounting holes (Details refer to the drawings).
(3) Please make sure to avoid external forces applied to the Source FPC and D-IC during the process of handling or assembling the MDL set. If not, It causes panel damage or malfunction.
(4) Note that LCD surfaces are very fragile and could be easily damaged. Do not touch, push or rub the exposed LCD surfaces with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment.
(5) Do not pull or fold the source D-IC which connect the source FPC and the panel. Do not pullor fold the LED wire.
(6) After removing the protective film, when the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with alcohol or purified water. Do not strong polar solvent because they cause chemical damage to the LCD surface.
(7) Wipe off saliva or water drops as soon as possible. Their long time contact with LCD surface causes deformations and color fading.
(8) Protection film for LCD surface on the FOG shall be slowly peeled off just before use so that the electrostatic charge can be minimized.
(9) Since the LCD is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass may be broken.
(10) Do not disassemble the FOG.
(11) To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.
(12) If the customer's set presses the main parts of the LCD, the LCD may show the abnormal display. But this phenomenon does not mean the malfunction of the LCD and should be pressed by the way of mutual agreement.
(13) Do not drop water or any chemicals onto the LCD’s surface.
(14) The ITO pad area needs special careful caution because it could be easily corroded. Do not contact the ITO pad area with HCFC, Soldering flux, Chlorine, Sulfur, saliva or fingerprint. To prevent the ITO corrosion, customers are recommended that the ITO area would be covered by UV or silicon.

10.2 Operating Precautions

(1) Be careful for condensation at sudden temperature change. Condensation makes damage to LCD surface or electrical contacted parts. And after fading condensation, smear or spot will occur.
(2) FOG has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference.
(3) The electrochemical reaction caused by DC voltage will lead to LCD degradation, so DC drive should be avoided.
(4) The LCD FOGs use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipment to protect against static electricity.
(5) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the FOG may be damaged.
(6) Do not connect or disconnect the cable to/ from the FOG at the "Power On" condition.
(7) When the FOG is operating, do not lose MIPI(SPI/MCU8080) , power. If any one these input is lost, the LCD panel would be damaged.
(8) Obey the supply voltage sequence. If wrong sequence is applied, the FOG would be damaged.
(9) Do not re-adjust variable resistor or switch etc.

10.3 Electrostatic Discharge Control

(1) Since a FOG is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don’t touch interface pin directly. Keep products as far away from static electricity as possible.
(2) Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

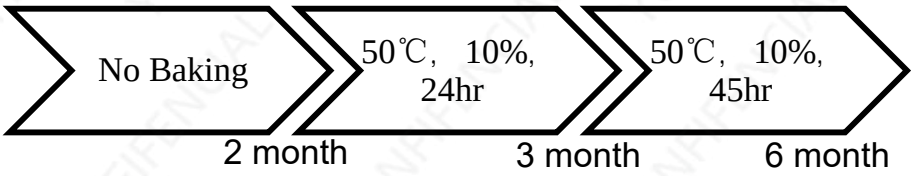
10.4 Precautions for Strong Light Exposure

Strong light exposure causes degradation of LCD surface and color filter. It is not allowed t ostore or run directly in strong light or in high temperature and humidity for a long time.

10.5 Storage Precautions

When storing FOGs as spares for a long time, the following precautions are necessary.

(1) The LCD surface should not come in contact with any other object.
It is recommended that they be stored in the container in which they were shipped.
Temperature : 5 ~ 40 ℃.
(2) Humidity : 35 ~ 75 %RH/
(3) Period : 6 months/
(4) Control of ventilation and temperature is necessary.
(5) Please make sure to protect the product from strong light exposure, water or moisture. Be careful for condensation.
(6) Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.
(7) Do not store the LCD near organic solvents or corrosive gasses.
(8) Please keep the FOGs at a circumstance shown below Fig.



10.6 Operation Condition Guide

(1) Normal operating condition
- Temperature: 0 ~ 40℃
- Operating Ambient Humidity : 10 ~ 90 %
- Display pattern: dynamic pattern (Real display)

(2) Black image or moving image is strongly recommended as a screen save.
(3) Lifetime in this spec. is guaranteed only when Commercial Display is used according to operating usages.
(4) Please contact BOE in advance when you display the same pattern for a long time.
(5) If the FOG keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen. To avoid image sticking, it is recommended to use a screen saver.
(6) Do not exceed the absolute maximum rating value. (supply voltage variation, input voltage variation, variation in part contents and environmental temperature, and so on) Otherwise the FOG may be damaged.
(7) Dew drop atmosphere should be avoided.
(8) The storage room should be equipped with a good ventilation facility, which has a temperature controlling system.
(9) When expose to drastic fluctuation of temperature (hot to cold or cold to hot) ,the LCD may be affected; Specifically, drastic temperature fluctuation from cold to hot ,produces dew on the LCD's surface which may affect the operation of the LCD surface and the LCD.

(10) Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD may turn black at temperature above its operational range. However those phenomena do not mean malfunction or out of order with the LCD. The LCD will revert to normal operation once the temperature returns to the recommended temperature range for normal operation.

10.7 Others

(1) When returning the FOG for repair or etc., Please pack the FOG not to be broken. We recommend to use the original shipping packages.

(2) In order to prevent potential problems, flicker should be adjusted by optimizing the Vcom value in customer LCM Line.

(3) (2) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, legs or clothes, it must be washed away thorough ly with soap.

(4) For the crash damaged or unnecessary LCD, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol an should be burned up later.

(5) If you should swallow the liquid crystal, first, wash your mouth thoroughly with water, then drink a lot of water and induce vomiting, and then, consult a physician.

(6) If the liquid crystal should get in your eyes, flush your eyes with running water for at least fifteen minutes.