



# 深圳市勋瑞光电科技有限公司

Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

## PRDDUCT SPECIFCATION

Model: H080BWX31I4505

CUSTOMER		
Approved 核 准	Checked 审 核	Prepared 确 认

Approved 核 准	Checked 审 核	Prepared 制 作







## 1.0 General Description

### 1.1 Introduction

H080BWX31I4505 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. This model is composed of a TFT LCD panel and a driving circuit. This TFT LCD has a 8.0 inch diagonally measured active display area with (800 horizontal by 1280 vertical pixels) resolution.

### 1.2. Features

8 inch configuration  
ROHS design

### 1.3. General information

Item	Specification	Unit
Outline Dimension	114.6 (H) x 184.1(V) x 2.55 (D)	mm
Display area	107.64 (H) x 172.224(V)	mm
Number of Pixel	800 RGB (H) x 1280(V)	pixels
Pixel pitch	44.85um (H) x 134.55um (V)	um
Pixel arrangement	RGB Vertical stripe	
Display mode	Normally Black	
Color Filter Array	RGB vertical stripes	
Backlight	White LED	
Weight	TBD	g
Driver IC	JD9365	



## 2.0 Absolute Maximum Ratings

### 2.1 Environment Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Operating Temperature	Topa	-20	60	°C	
Storage Temperature	Tstg	-20	70	°C	

### 2.2 Back-light Unit:

PARAMETER	Sym.	Min.	Typ.	Max.	Unit	Test Condition	Note
LED Current	IF	—	140	—	mA	—	—
LED Voltage	VF	8.7	9.6	10.2	V	—	—
Life Time		—	20000	—	Hr.	$I \leq 140\text{mA}$	—
Color	White						

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.

(2)  $T_a = 25 \pm 2^\circ\text{C}$

(3) Test condition: LED Current 140mA



### 3.0 Optical Characteristics

#### 3.1 Optical specification

Item	Symbol	Condition	Values			Unit	Remark
			Min.	Typ.	Max.		
Viewing angle (CR≥ 10)	$\theta_L$	$\Phi=180^\circ$ (9 o'clock)	-	80	-	degree	Note 1
	$\theta_R$	$\Phi=0^\circ$ (3 o'clock)	-	80	-		
	$\theta_T$	$\Phi=90^\circ$ (12 o'clock)	-	80	-		
	$\theta_B$	$\Phi=270^\circ$ (6 o'clock)	-	80	-		
Response time	$T_{ON}$	Normal $\theta=\Phi=0^\circ$	-	10	20	msec	Note 3
	$T_{OFF}$		-	15	30	msec	Note 3
Contrast ratio	CR			900	1200	-	Note 4
Color chromaticity	$W_x$		0.26	0.31	0.36	-	Note 2 Note 5
	$W_y$		0.28	0.33	0.38	-	Note 6
Luminance	L		400	480	-	cd/m <sup>2</sup>	Note 6
Luminance uniformity	$Y_U$		70	75	-	%	Note 7

#### 3.2 Measuring Condition

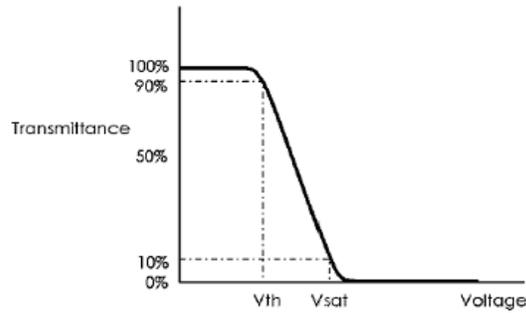
- Measuring surrounding : dark room
- Ambient temperature :  $25\pm 2^\circ\text{C}$
- 30min. warm-up time.

#### 3.3 Measuring Equipment

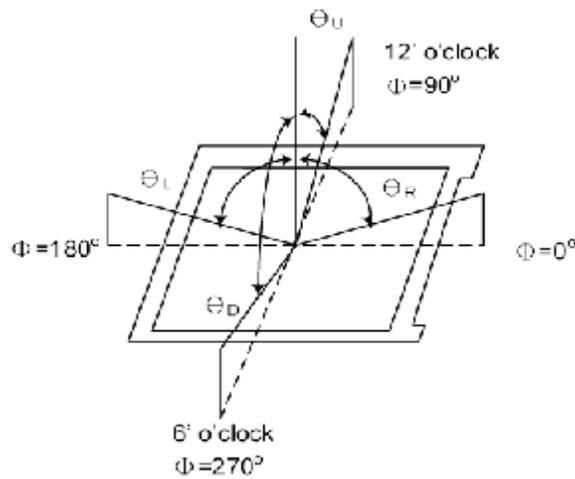
- TOPCON BM-7
- Measuring spot size : field  $2^\circ$



**Note (1)** Definition of Vsat and Vth (at 20°C)



**Note (2)** Definition of Viewing Angle :

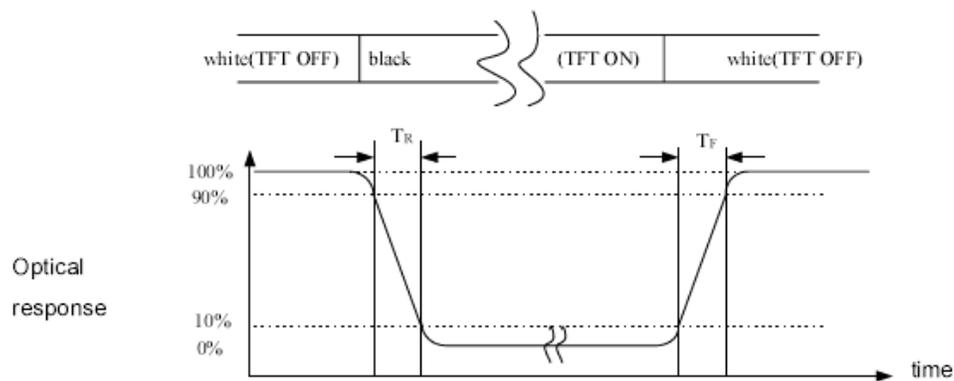


**Note (3)** Definition of Contrast Ratio(CR) :

measured at the center point of panel

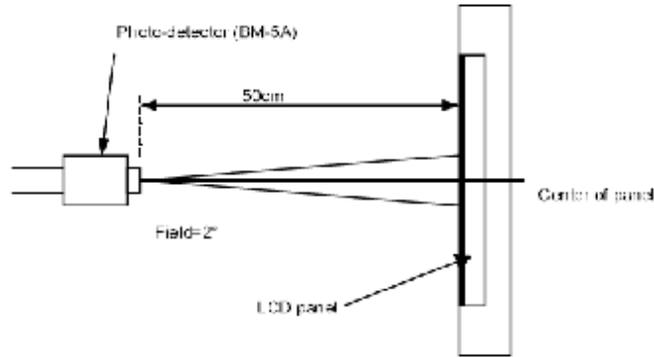
$$CR = \frac{\text{Luminance with all pixels white}}{\text{Luminance with all pixels black}}$$

**Note (4)** Definition of Response Time : Sum of TR and TF

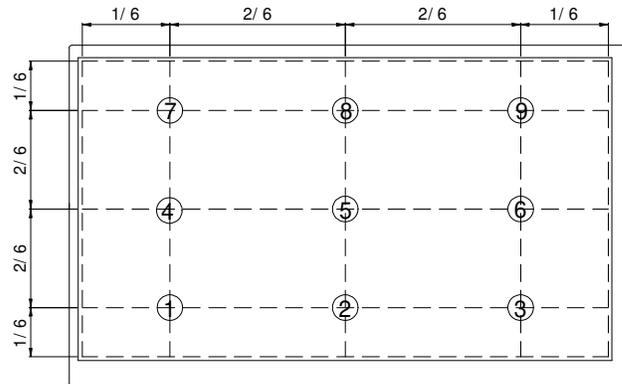




**Note (5)** Definition of optical measurement setup



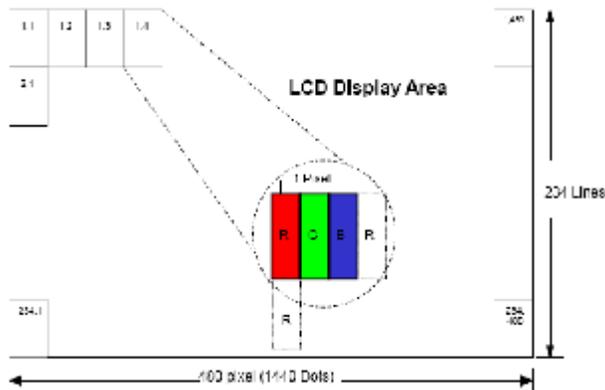
**Note (6)** Definition of brightness uniformity



**Note (7)** Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.)

**4.0 Block Diagram**

**4.1 TFT-LCD Module**





## 5.0 Interface Pin Connection

PIN NO	SYMBOL	DESCRIPTION
1	LEDA	Power for LED backlight(Anode)
2	LEDA	Power for LED backlight(Anode)
3	LEDA	Power for LED backlight(Anode)
4	NC	No connect
5	LEDK	Power for LED backlight(Cathode)
6	LEDK	Power for LED backlight(Cathode)
7	LEDK	Power for LED backlight(Cathode)
8	LEDK	Power for LED backlight(Cathode)
9	GND	Ground
10	GND	Ground
11	MIPI_D2+	HSSI_D2_Pare differential small amplitude signals
12	MIPI_D2-	HSSI_D2_Nare differential small amplitude signals
13	GND	Ground
14	MIPI_D1+	HSSI_D1_Pare differential small amplitude signals
15	MIPI_D1-	HSSI_D1_Nare differential small amplitude signals
16	GND	Ground
17	MIPI_CLK+	HSSI_CLK_Pare differential small amplitude signals
18	MIPI_CLK-	HSSI_CLK_Nare differential small amplitude signals
19	GND	Ground
20	MIPI_D0+	HSSI_D0_Pare differential small amplitude signals
21	MIPI_D0-	HSSI_D0_Nare differential small amplitude signals
22	GND	Ground
23	MIPI_D3+	HSSI_D3_Pare differential small amplitude signals
24	MIPI_D3-	HSSI_D3_Nare differential small amplitude signals
25	GND	Ground
26	NC	
27	RESET	Reset signal
28	NC	
29	VDD1V8	I/O power supply
30	VDD3V3	Power supply 3.0-3.6V
31	VDD3V3	Power supply 3.0-3.6V



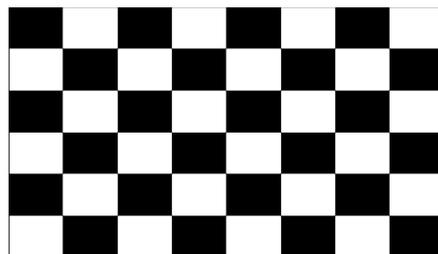
## 6. Electrical Characteristics

### 6.1 TFT LCD Module

< Table 3. LCD Module Electrical specifications > [Ta = 25 ± 2 °C]

Parameter		Symbol	Values			Unit	Notes
			Min.	Typ.	Max.		
Power Supply Voltage		VDD	1.7	1.8	1.9	V	
		VSP	5.2	5.5	5.8	V	
		VSN	-5.8	-5.5	-5.2	V	
Power Supply Current		IDD	-	20	25	mA	Note 1
		ISP	-	20	35	mA	
		ISN	-	10	25	mA	
Power Consumption		PLCD	-	0.2	0.375	W	
CMOS Interface	Input Voltage	VIH	0.7VDD	-	VDD	V	
		VIL	0	-	0.3VDD	V	
	Output Voltage	VOH	0.8VDD	-	VDD	V	
		VOL	0	-	0.2VDD	V	

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.  
The current draw and power consumption specified is for Frame rate  $f_v$   
and Clock frequency = 201MHz. Test Pattern of power supply current  
a) Typ : Mosaic 8 x 6 Pattern(L0/L255)





## 6.2 MIPI Interface Characteristic

### 6.2.1 Data Format

#### Packed Pixel Stream, 24-bit Format, Long Packet

Packed Pixel Stream 24-Bit Format shown in Figure 7.16 is a Long packet. It is used to transmit image data formatted as 24-bit pixels to a Video Mode display module. The packet consists of the DI byte, a two-byte WC, an ECC byte, a payload of length WC bytes and a two-byte Checksum. The pixel format is red (8 bits), green (8 bits) and blue (8 bits), in that order. Each color component occupies one byte in the pixel stream; no components are split across byte boundaries. Within a color component, the LSB is sent first, the MSB last. With this format, pixel boundaries align with byte boundaries every three bytes. The total line width (displayed plus non-displayed pixels) should be a multiple of three bytes.

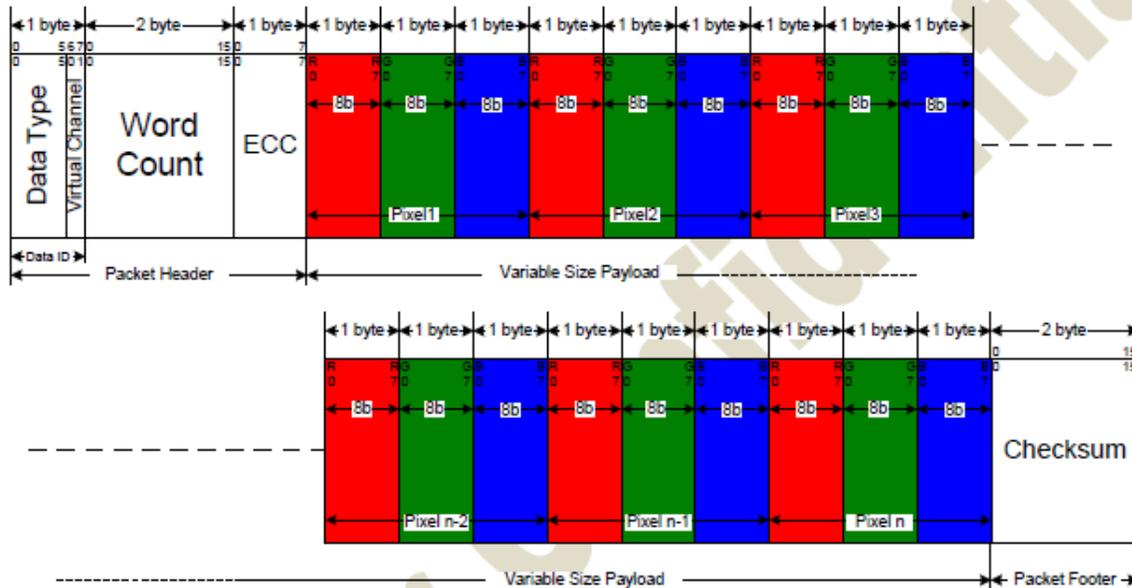


Figure 7.16: 24-bit per Pixel – RGB Color Format, Long Packet

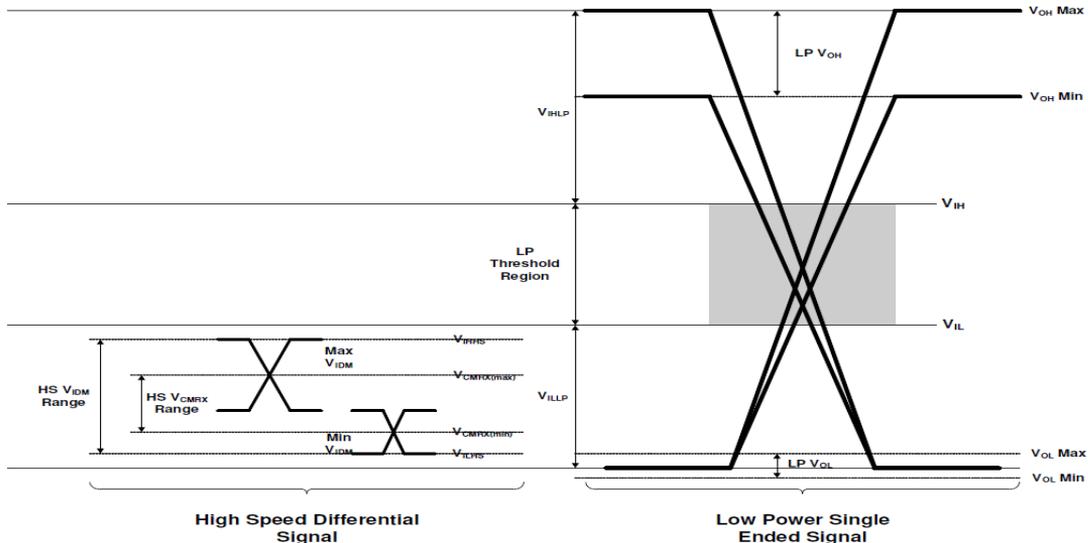
< MIPI Tx Data Configuration >



## 6.2.2 DC Specification

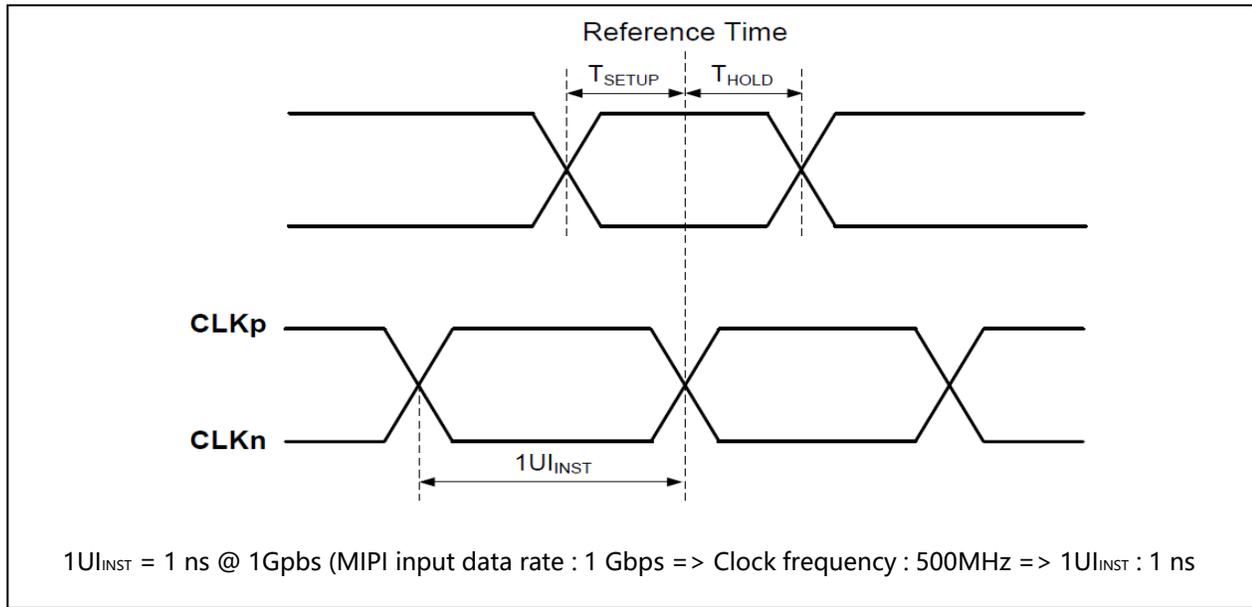
< Table6. DC Specification >

Parameter	Symbol	Min	Typ	Max	Unit	Condition
MIPI digital operation current	$I_{VCCIF}$	14	15	16	mA	
MIPI digital stand-by current	$I_{VCCIFST}$	-	200	-	uA	
<b>MIPI Characteristics for High Speed Receiver</b>						
Single-ended input low voltage	$V_{ILHS}$	-40	-	-	mV	
Single-ended input high voltage	$V_{IHHS}$	-	-	460	mV	
Common-mode voltage	$V_{CMRXDC}$	70	-	330	mV	
Differential input impedance	$Z_{ID}$	80	100	125	$\Omega$	
HS transmit differential voltage ( $V_{OD} = V_{DP} - V_{DN}$ )	$ V_{OD} $	120	200	250	mV	
<b>MIPI Characteristics for Low Power Receiver</b>						
Pad signal voltage range	$V_I$	-50	-	1300	mV	
Ground shift	$V_{GNDSH}$	-50	-	50	mV	
Output low level	$V_{OL}$	-50	-	50	mV	
Output high level	$V_{OH}$	1.1	1.2	1.3	V	





### 6.2.3 AC Specification



< Timing Diagram of MIPI Transmitter >

< Table7. AC Specification >

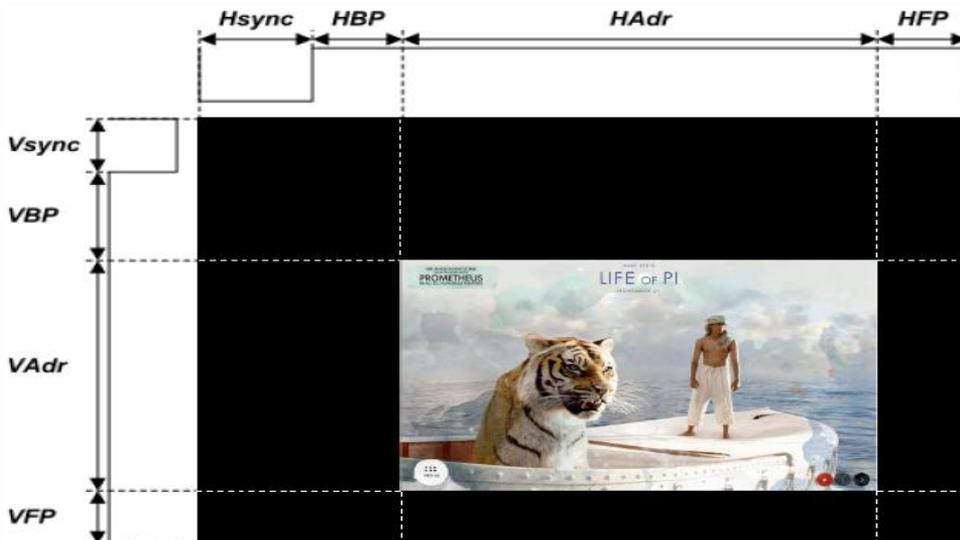
Description	Symbol	Condition	Min	Typ	Max	Unit
Data to Clock Setup Time	$T_{SETUP}$	-	0.15	-	-	$UI_{INST}$
Clock to Data Hold Time	$T_{HOLD}$	-	0.15	-	-	$UI_{INST}$



### 6.3 Interface timing Parameter

< Table8. Timing Parameter >

Item		Symbol	min	typ	max	UNIT	
LCD	Frame Rate	-	-	60	-	Hz	
	Pixels Rate	-	-	67.8	-	MHz	
Timing	DCLK	Frequency	fCLK	-	201	MHz	
		Period	Tclk	-	4.975	ns	
	Horizontal	Horizontal total time	tHP	-	872	-	t <sub>CLK</sub>
		Horizontal Active time	tHadr	800		-	t <sub>CLK</sub>
		Horizontal Pulse Width	tHsync	-	20	-	t <sub>CLK</sub>
		Horizontal Back Porch	tHBP	-	20	-	t <sub>CLK</sub>
		Horizontal Front Porch	tHFP	-	32	-	t <sub>CLK</sub>
	Vertical	Vertical total time	tvp	-	1296	-	t <sub>H</sub>
		Vertical Active time	tVadr	1280		-	t <sub>H</sub>
		Vertical Pulse Width	tVsync	-	4	-	t <sub>H</sub>
Vertical Back Porch		tVBP	-	4	-	t <sub>H</sub>	
Vertical Front Porch		tVFP	-	8	-	t <sub>H</sub>	
Bit Rate		TX SPD (Mbps)	-	402	-	Mbps	
Lane			-	4	-	Lane	





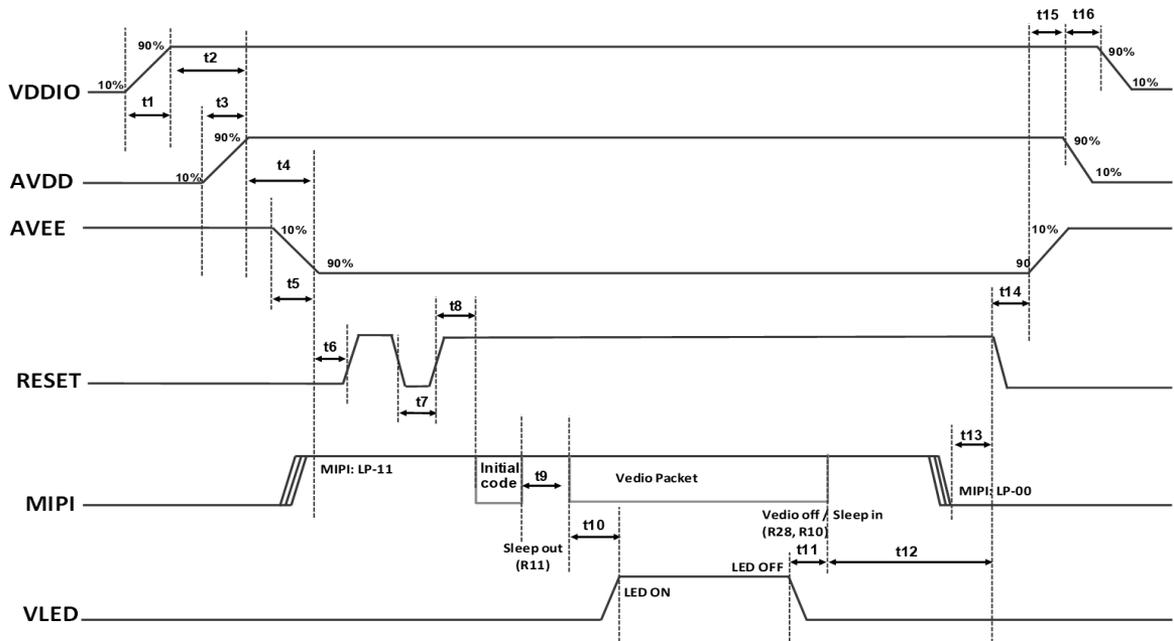
## 6.4 Input Color Data Mapping

< Table9. Input Signal and Display Color Table >

Color & Gray Scale		Input Data Signal																							
		Red Data								Green Data						Blue Data									
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	↑								↑						↑									
	▽	↓								↓						↓									
	Brighter	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	▽	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	
	△	↑								↑						↑									
	▽	↓								↓						↓									
	Brighter	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
Gray Scale of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	△	↑								↑						↑									
	▽	↓								↓						↓									
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
Gray Scale of White	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	△	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
	Darker	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	
	△	↑								↑						↑									
	▽	↓								↓						↓									
	Brighter	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1
	▽	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1



## 6.5 Power Sequence

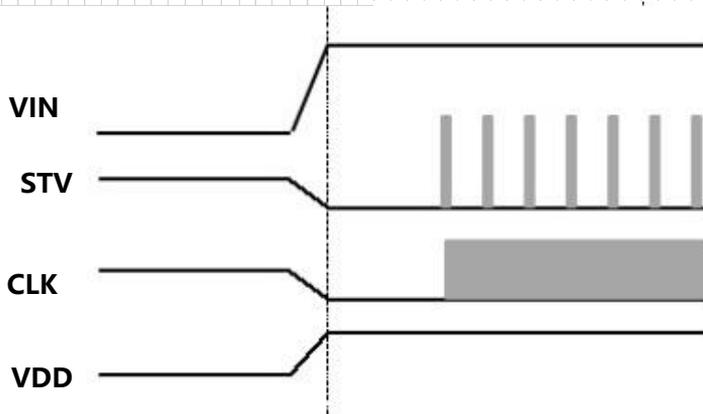
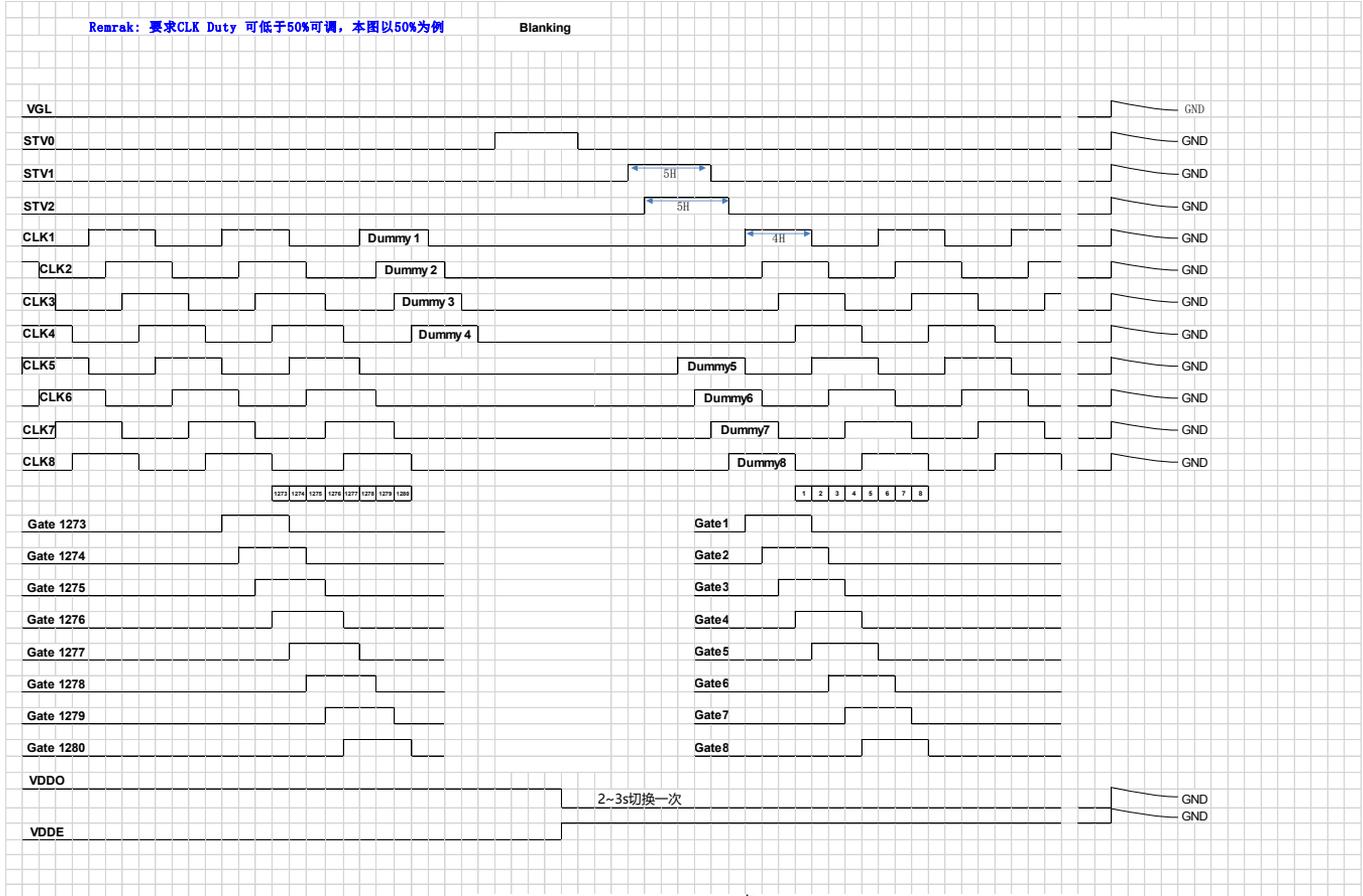


< Table10. Sequence Table >

Item	Time	Unit	Remark
t1	$0.2 < t1 < 20$	ms	
t2	$t2 \geq 5$	ms	
t3	$0.2 < t3 < 20$	ms	
t4	$t4 \geq 0$	ms	
t5	$0.2 < t5 < 20$	ms	
t6	$t6 \geq 5$	ms	
t7	$t7 > 10$	us	
t8	$t8 \geq 5$	ms	OTP Reload time
t9	$t9 \geq 120$	ms	
t10	$t10 \geq 100$	ms	Back light power on
t11	$t11 \geq 50$	ms	Back light power off
t12	$t12 \geq 120$	ms	Scan Black
t13	$0 \leq T13 \leq T12 - 120\text{ms}$	ms	
t14	$t14 \geq 0$	ms	
t15	$t15 \geq 0$	ms	
t16	$t16 \geq 0$	ms	



## 6.6 GOA Timing (单向扫描)



上电: VDD较STV1提前1H上电



## 6.7 GOA Timing

< Table11. Parameter Table >

Item	Setting	Adjustable Range	Remark	
VGH(V)	18	Tolerance $\pm 3$	VGH-VGL $\leq$ 30V	
VGL(V)	-12	Tolerance $\pm 3$		
STV/CLK (V)	H Level	18	Tolerance $\pm 3$	H short to VGH
	L Level	-12	Tolerance $\pm 3$	L short to VGL
Dummy CLK	Front Porch	4	CLK5~CLK8	
	Back Porch	4	CLK1~CLK4(Stop before STV)	
Driver	Bilateral cross	Unilateral/Bilateral cross/Bilateral		
STV	H Level	4H	50.12us	Overlap 1H
	Num	4ea	-	
CLK	Duty Cycle	45%	Tolerance $\pm 1\%$	
	Num	8ea	-	
GOE(pixel CLK)	238 pixel CLK=3.5us	0~1/2Htotal pixel CLK		From G(n-1) CLK fall to Dn start
Scan direction	Forward	Forward : STVL $\rightarrow$ STVR,CLKL $\rightarrow$ CLKR $\rightarrow$ CLKBL $\rightarrow$ CLKBR		VDS=VGH,VSD=VGL
		Backward : STVR $\rightarrow$ STVL,CLKBR $\rightarrow$ CLKBL $\rightarrow$ CLKR $\rightarrow$ CLKL		VDS=VGL,VSD=VGH



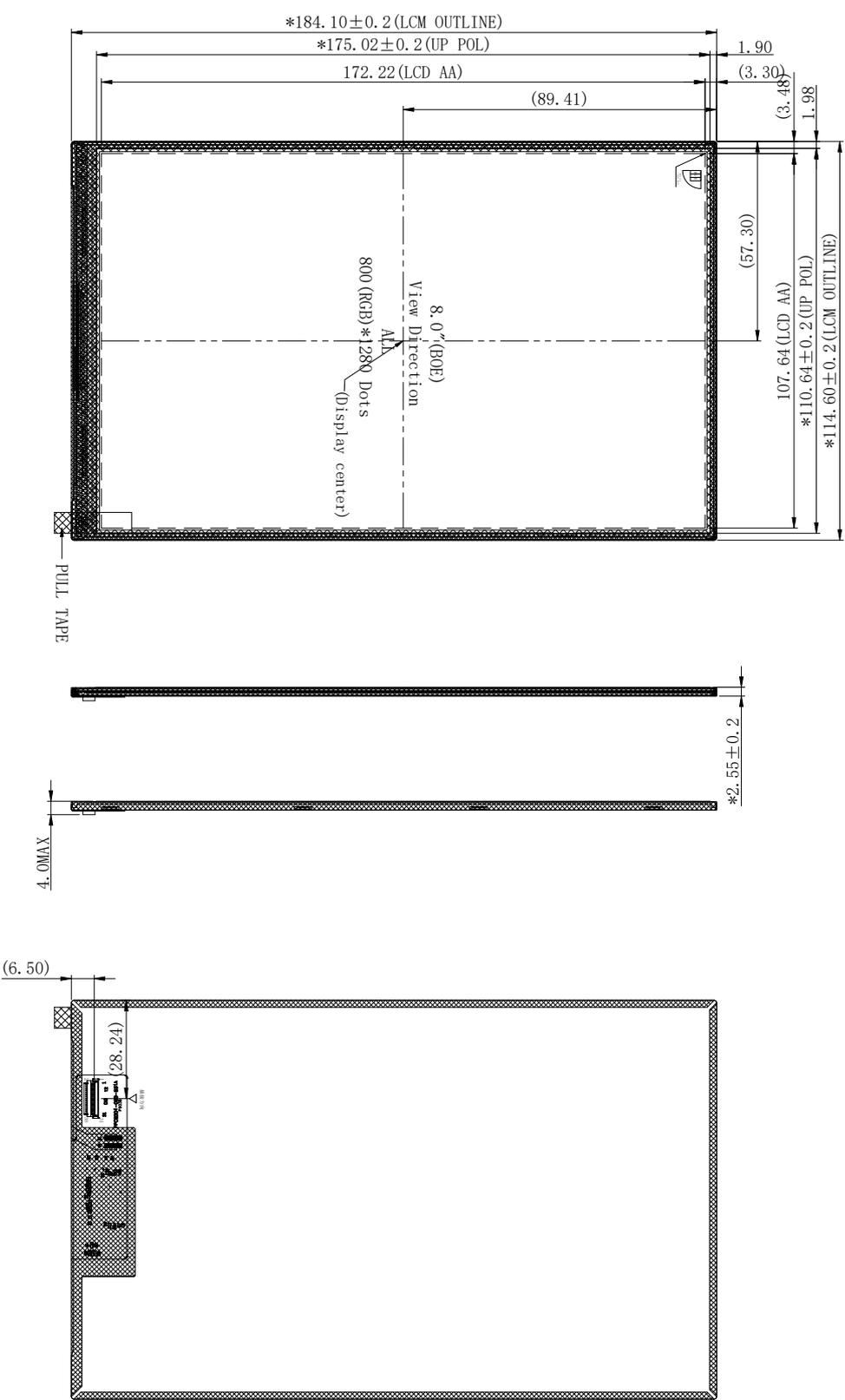
## 7.0 Reliability test items

NO	Item	Conditions	Remark
1	High Temperature Storage	Ta=+70℃,24hrs	
2	Low Temperature Storage	Ta=-20℃,24hrs	
3	High Temperature Operation	Ta=+60℃,24hrs	
4	Low Temperature Operation	Ta=-20℃,24hrs	
5	High Temperature and High Humidity (operation)	Ta=+40℃,90%RH,24hrs	
6	Thermal Cycling Test (non operation)	-20℃(0.5hr)→+70℃(0.5hr),200cycles	
7	Electrostatic Discharge	150pf/330Ω/±8KV air & contact test 200pf/0Ω/±4KV contact test	

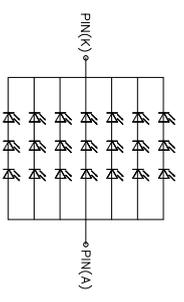
Note: All tests above are practiced at module type.

There is no display function NG issue occurred, All the cosmetic specification is judged before the reliability stress.

REV.	DATE	MODIFICATION
A0	2023/06/28	First Issue



- NOTES:
1. DISPLAY TYPE: 8.0 INCH TFT /BLACK
  2. BACKLIGHT: 21 CHIP WHITE LED, IN PARALLEL
  3. OPERATING TEMP: -20° C~+60° C
  4. STORAGE TEMP: -20° C~+70° C
  5. RESOLUTION: 800RGBx1280
  6. LCD IC: JD9365
  7. Luminous intensity (9 AVG): Module: 400cd/m<sup>2</sup> (MIN.), 480cd/m<sup>2</sup> (TYP.)
  8. Uniformity: 70% (Min)
  9. " ( ) "reference dimension. " \* "critical dimension
  10. RoHS Compliant



IF: 1.40MA VF: 8.7V~10.2V

INTERFACE	MIPi Interface	MODEL NAME	PART NO.
	PPC Connector		
VIEWING DIRECTION	ALL	DMN	REV. SHEET OF
Gray Scale DIRECTION	FREE	CHKD	1/1
PROJECTION	3RD ANGLE	TOLERANCE UNLESS SPECIFIED	±0.3
		UNIT	MM
		SCALE	1:1



LCM: PIN de fine

PIN	SYMBOL
1	LEDA
2	LEDA
3	LEDA
4	NC
5	LEBK
6	LEBK
7	LEBK
8	LEBK
9	GND
10	GND
11	MIPi D2+
12	MIPi D2-
13	GND
14	MIPi D1+
15	MIPi D1-
16	GND
17	MIPi CLK+
18	MIPi CLK-
19	GND
20	MIPi DO+
21	MIPi DO-
22	GND
23	MIPi D3+
24	MIPi D3-
25	GND
26	NC
27	RESET
28	NC
29	VDD1V8
30	VDD3V3
31	VDD3V3