LCD MODULE

SPECIFICATION

Model:	UE050WV-RB40-L070A
Version:	V1.0
Date:	2020-12-07

☑ **Preliminary Specification**

☐ **Final Specification**

Customer Confirmation

Approved by	Notes

Please return one of the copies of the specification with your signature to us within two weeks after you receive this document. If it is not returned, we will assume that you agree to the entire contents of this specification document.

VIEWE Confirmation

Prepared by	Reviewed by	Approved by

REVISION HISTORY

Revision	Date	Contents of Revision Change	Remark
V1.0	2020.12.7	Preliminary release	All

TABLE of CONTENTS

1. GENERAL INFORMATION

1.1 Features

1) Pixel Arrangement：RGB Vertical Stripe

2) Interface Mode：40PIN_RGB 24bits

3) Driver IC：ST7262-G4-1-E

4) Operation Temperature：-20~70℃

5) Storage Temperature：-30~80℃

6) Backlight Type：White LED

7) Display mode： Normally black,

8) Pixel Density：186 PPI

9) LED life time：30,000 Hours

1.2 Mechanical Specification

Item	Specification	Unit	Remark
Pixel Driving element	TFT	-	-
Screen Size	5.0 IPS	Inch	Diagonal
Resolution	800(W)*3(RGB)*480(H)	Dots	-
Interface	RGB 24bits	-	40PIN
Module Power Consumption	0.883	Watt	Typ.
Active Area	108(W)*64.80(H)	mm	-
Pixel pitch (W*H)	0.135(W)*0.135(H)	mm	-
Module Size (W*H*D)	120.70(W)*75.80(H)*2.8(D)	mm	-
Luminance	340	cd/m²	Typ.
Viewing Direction	All	O'clock	
Display Color	16.7M	Colors	24bits

2. ABSOLUTE MAXIMUM RATINGS

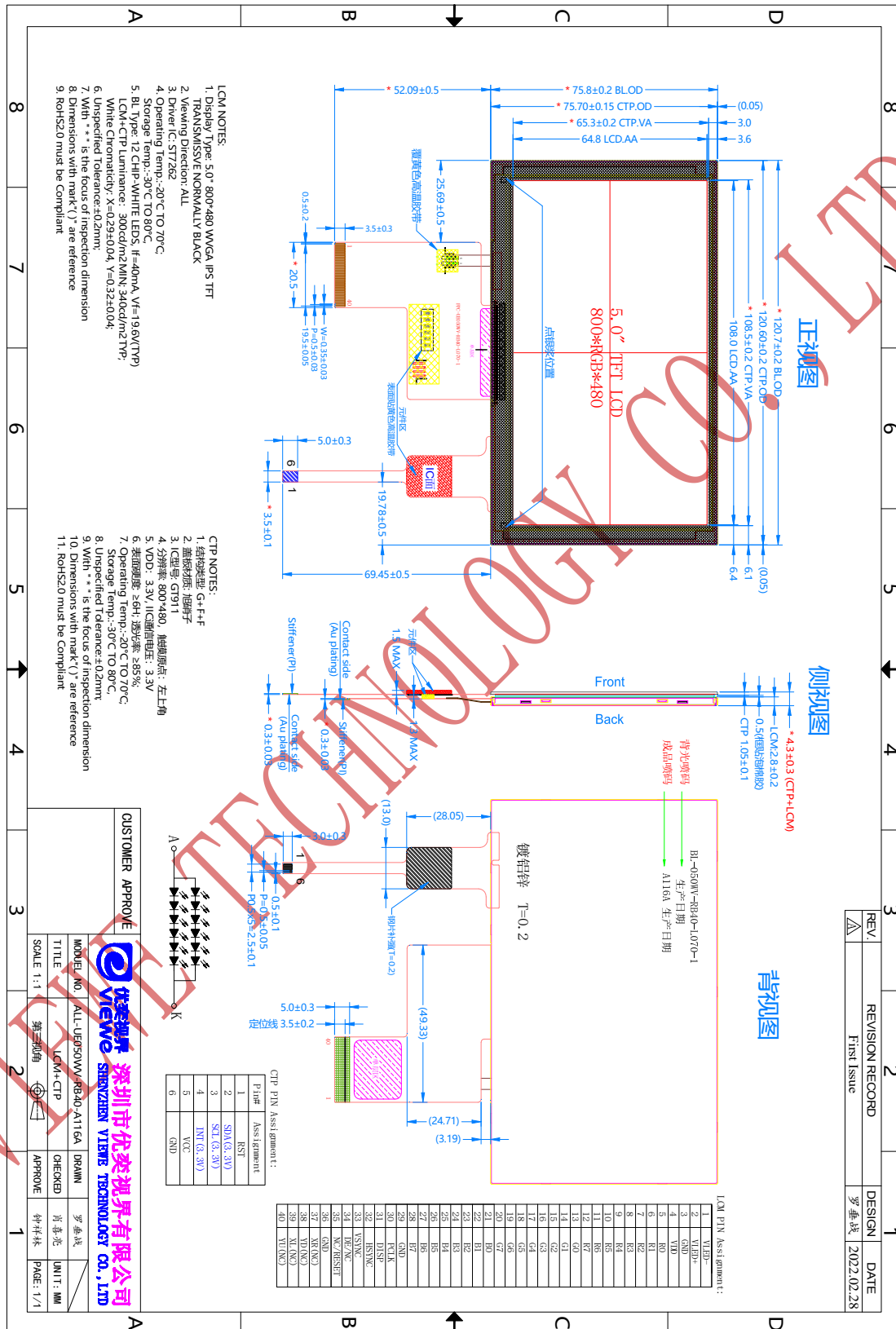| Item	Symbol	Min.	Max.	Unit	Remark
Power supply1 voltage	VDD	-0.3	4	V	Note1
LED forward current	I_F	-0.001	30	mA	For each led,Note1
LED Reverse Voltage	V_R	-	5	V	For each led,Note1
Operating temperature	T_{op}	-20	70	°C	Note1,2
Storage temperature	T_{st}	-30	80	°C	Note1,2
Humidity	H_{st}	10	90	%RH	Note1,3

(Ta=+25°C,DGND=AVSS=0V)

Note1:If the module exceeds the absolute maximum ratings, it may be damaged permanently. Also if the module operates with the absolute maximum ratings for a long time, the reliability may drop.

Note2: In case of temperature below 0℃,the response time of liquid crystal (LC) becomes slower and the color of panel darker than normal one.

Note3: Temp. ≤ 60℃ , 90% RH MAX.

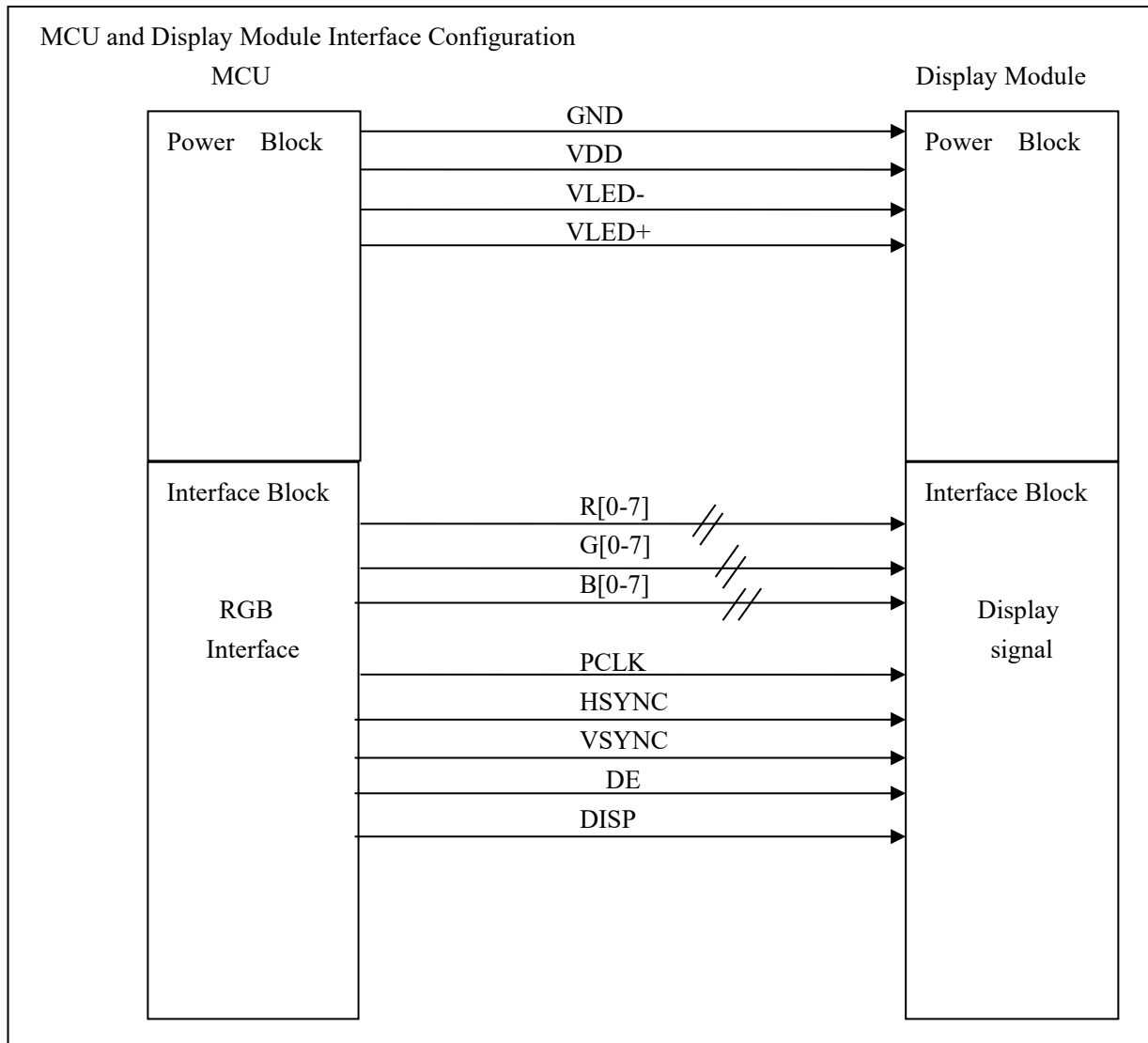Temp. ＞60℃ , Absolute humidity shall be less than 90% RH.

3. MECHANICAL DRAWING

LCM NOTES:
1. Display Type: 5.0" 800*480 WVGA IPS TFT TRANSMISSIVE NORMALLY BLACK
2. Viewing Direction: ALL
3. Driver IC: ST7262
4. Operating Temp.:-20°C TO 70°C; Storage Temp.:-30°C TO 80°C;
5. BL Type: 12 CHIP-WHITE LEDS, If=40mA,Vf=19.6V(TYP)
   LCM+CTP Luminance: 300cd/m2 MIN; 340cd/m2 TYP;
   White Chromaticity: X=0.29±0.04, Y=0.32±0.04;
6. Unspecified Tolerance:±0.2mm;
7. With " * " is the focus of inspection dimension
8. Dimensions with mark'()' are reference
9. RoHS2.0 must be Compliant

CTP NOTES:
1. 结构类型: G+F+F
2. 盖板材质: 旭硝子
3. IC型号: GT911
4. 分辨率: 800*480,
5. VDD: 3.3V, IIC通信电压: 3.3V
6. 表面硬度: ≥6H; 透过率: ≥85%;
7. Operating Temp.:-20°C TO 70°C; Storage Temp.:-30°C TO 80°C;
8. Unspecified Tolerance:±0.2mm;
9. With " * " is the focus of inspection dimension
10. Dimensions with mark'()' are reference
11. RoHS2.0 must be Compliant

5.0" TFT LCD
800*RGB*480

正视图 (Front view)
侧视图 (Side view)
背视图 (Back view)

Front
Back

BL-050WV-RB40-L070-1
A116A

CTP PIN Assignment:

Pin#	Assignment
1	RST
2	SDA(3.3V)
3	SCL(3.3V)
4	INT(3.3V)
5	VCC
6	GND

LCM PIN Assignment:

1	VLED-	21	G7
2	VLED+	22	B0
3	GND	23	B1
4	VDD	24	B2
5	R0	25	B3
6	R1	26	B4
7	R2	27	B5
8	R3	28	B6
9	R4	29	B7
10	R5	30	GND
11	R6	31	PCLK
12	R7	32	DISP
13	G0	33	HSYNC
14	G1	34	VSYNC
15	G2	35	NC/RESET
16	G3	36	DE/NC
17	G4	37	GND
18	G5	38	YD(NC)
19	G6	39	YU(NC)
20		40	XL(NC)

CUSTOMER APPROVE			
	DRAWN	CHECKED	APPROVE
	罗春成	钟祥林	肖非亮

REV.	REVISION RECORD	DESIGN	DATE
	First Issue	罗春成	2022.02.28

MODEL NO. ALL-UE050WV-RB40-A116A
TITLE LCM+CTP
SCALE 1:1 第三视角 UNIT: MM PAGE: 1/1

深圳市优恪视界有限公司
SHENZHEN VIEME TECHNOLOGY CO., LTD

4. I/O CONNECTION & BLOCK DIAGRAM

4.1 I/O Connection

Pin No.	Symbol	I/O	Description
1	VLED-	P	Power supply for backlight cathode
2	VLED+	P	Power supply for backlight anode
3	GND	P	Power Ground
4	VDD	P	Power supply to the internal logic power regulator(3.3V)
5-12	R0-R7	I	Red data input.
13-20	G0-G7	I	Green data input.
21-28	B0-B7	I	Blue data input.
29	GND	P	Power Ground
30	PCLK	I	Pixel clock input pin, Negative polarity
31	DISP	I	Standby mode. Normally pulled high.
32	HSYNC	I	Horizontal sync signal, Negative polarity
33	VSYNC	I	Vertical sync signal, Negative polarity
34	DE	I	Data input enable. Display access is enabled when DE is "H"
35	NC/RESET	-	Dummy
36	GND	P	Power Ground
37	XR(NC)	-	Dummy
38	YD(NC)	-	Dummy
39	XL(NC)	-	Dummy
40	YU(NC)	-	Dummy

I：Input；O：Output；P：Power

4.2 Block Diagram

MCU and Display Module Interface Configuration

MCU

Display Module

| Power Block | | Power Block |

GND
VDD
VLED-
VLED+

| Interface Block | | Interface Block |

RGB Interface

Display signal

R[0-7]
G[0-7]
B[0-7]

PCLK
HSYNC
VSYNC
DE
DISP

5. ELECTRICAL CHARACTERISTICS

5.1 TFT-LCD Panel Driving Section

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Power Supply1 Voltage	VDD	2.8	3.3	3.6	V	-
Power Supply Current	I_{VDD}	-	30	-	mA	Note1
Logic Input High Voltage	V_{IH}	0.7VCCIO	-	VCCIO	V	-
Logic Input Low Voltage	V_{IL}	0	-	0.3VCCIO	V	-
Panel Power Consumption	P_{VDD}	-	0.099	-	Watt	Note1
Module Power Consumption	P_{LCM}	-	0.883	-	Watt	Note1,2

(Ta=+25°C, DGND=AVSS=0V)

Note1:Measurement Conditions (Video Mode): Full Screen Red Pattern,VDD=3.3V,60Hz Refresh.

Note2: $P_{LCM}= P_{VDD}+ P_{BL}$，About P_{BL} information, inference to 5.2 Back Light Driving Section.

5.2 Back Light Driving Section

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
Forward Voltage	V_F	-	19.6	-	V	Note1
Forward Current	I_F	-	40	-	mA	Note1
Backlight Power consumption	P_{BL}	-	0.784	-	Watt	Note1
LED life time	-	30000	-	-	Hrs	Note2
LED Quantity			12		PCS	

(Ta=+25°C, DGND=AVSS=0V)

Note1: The LED driving condition is defined for each LED module (6LED Serial, 2 LED Parallel)。
   For each LED ： IF=20mA,VF=3.2V(Typ.)/3.4V(Max.),Ta=25℃。

Note2:The "LED life time" is defined as the module brightness decrease to 50% of original
   brightness at I_{LED}=20mA(Per Led). The LED life time could be decreased if operating
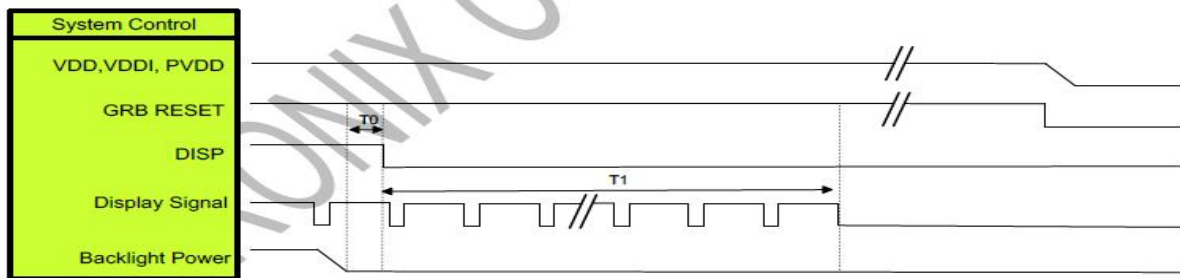 I_{LED} is larger than 20mA.
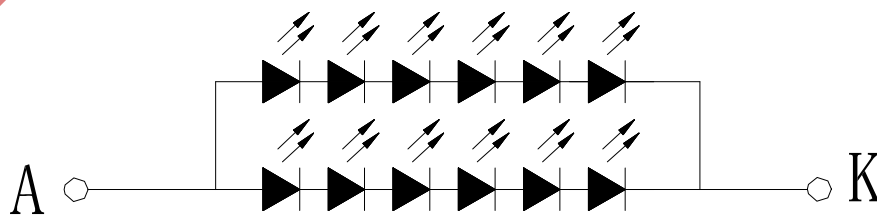
5.3 Power On/Off Sequence

5.3.1 Power on sequence
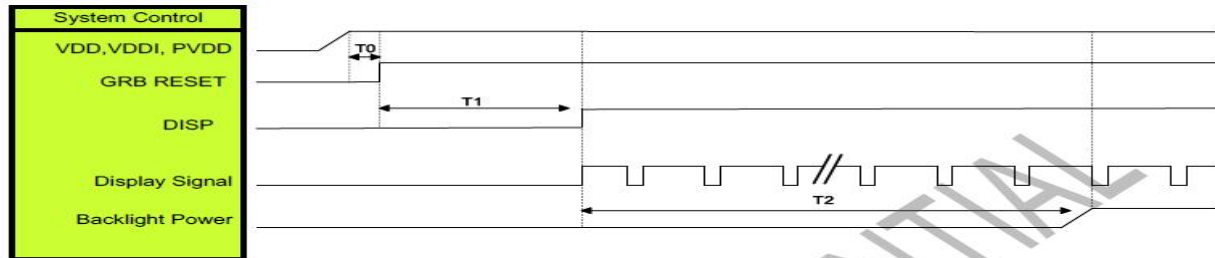
Symbol	Description	Min. Time	Unit
T0	System power stability to GRB RESET signal	0	ms
T1	GRB RESET= "High" to DISP="High"	10	ms
T2	Display Signal output to Backlight Power on	250	ms

Note: Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

5.3.2 Power off sequence

Symbol	Description	Min. Time	Unit
T0	Backlight Power off to DISP="Low"	5	ms
T1	DISP="Low" to IC internal voltage discharge complete	80	ms

Note: Display signal: DCLK; VSYNC; HSYNC; DE; DR[7:0]; DG[7:0]; DB[7:0]

5.4 Timing Characteristics

5.4.1 System Operation AC Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
VDD Power Source Slew Time	TPOR	-	-	20	ms	From 0V to 99% VDD
GRB Pulse Width	tRSTW	10	50	-	us	R=10Kohm, C=1uF
SD Output Stable Time	Tst	-	-	TBD	us	Output settled within +20mV Loading = 6.8k+28.2pF.
GD Output Rise and Fall Time	Tgst	-	-	TBD	us	Output settled (5%~95%), Loading = 4.7k+29.8pF

## 5.4.2 Parallel 24-bit RGB Input Timing Table

Parallel 24-bit RGB Interface Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	23	25	27	MHz	
HSYNC	Period Time	Th	808	816	896	DCLK	
	Display Period	Thdisp		800		DCLK	
	Back Porch	Thbp	4	8	48	DCLK	
	Front Porch	Thfp	4	8	48	DCLK	
	Pulse Width	Thw	2	4	8	DCLK	
VSYNC	Period Time	Tv	488	496	504	HSYNC	
	Display Period	Tvdisp		480		HSYNC	
	Back Porch	Tvbp	4	8	12	HSYNC	
	Front Porch	Tvfp	4	8	12	HSYNC	
	Pulse Width	Tvw	2	4	8	HSYNC	

RGB Mode Selection Table	DCLK	HSYNC	VSYNC	DE
SYNC - DE Mode	Input	Input	Input	Input
SYNC Mode	Input	Input	Input	GND
DE Mode	Input	GND	GND	Input

Note: "Input" means these signals are driven by host side

5.5 Timing Diagram
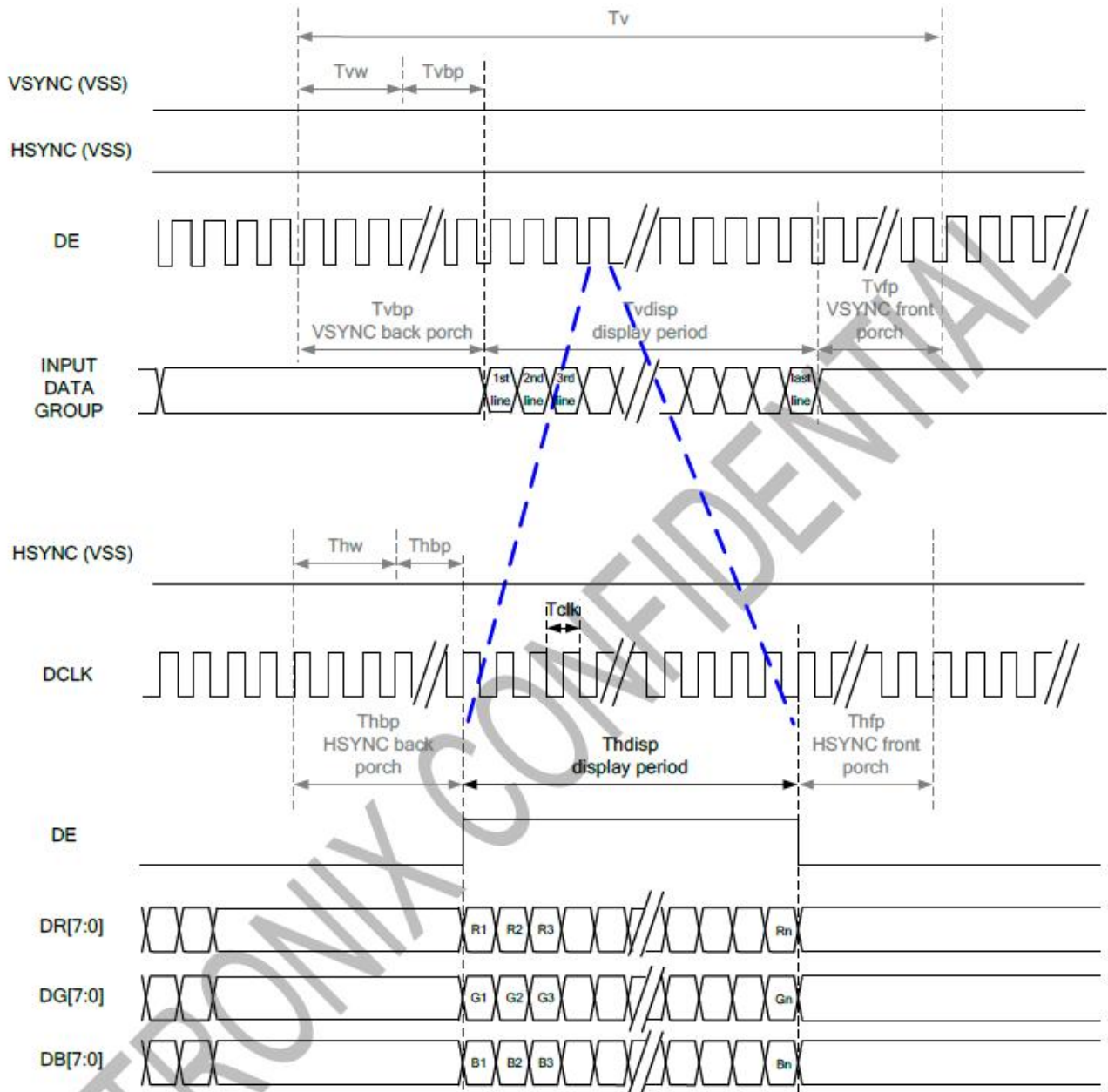
6. OPTICAL CHARACTERISTICS

| Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Contrast Ratio	C/R	θ = 0°	800	1000	-	-	Note(4)
NTSC Ratio	S	θ =0°	45	50	-	%	Note(7)
Luminance	L	θ =0°	350	400	-	cd/m2	Note(5)
Luminance uniformity	Uw	θ =0°	70	80	-	%	Note(3)
Response Time	TR+ TF	25 °C	-	30	40	ms	Note(2)
Color Coordination	WX	θ = 0° (Center) Normal viewing angle B/L On	-0.03	0.29	+0.03	NTSC (x,y)	Note(6)
	WY			0.32			
	RX			0.629			
	RY			0.326			
	GX			0.337			
	GY			0.546			
	BX			0.136			
	BY			0.143			
Viewing Angle	θ L	C/R>10	70	80	-	Degree	Note(1)
	θ R		70	80	-		
	θ U		70	80	-		
	θ D		70	80	-		

Test Conditions:
1. VDD=3.3V, IF=60mA (Backlight current), the ambient temperature is+25°C.

2. The test systems refer to Note 8.

**Note1:** Definition of Viewing Angle: The viewing angle range that the CR>10
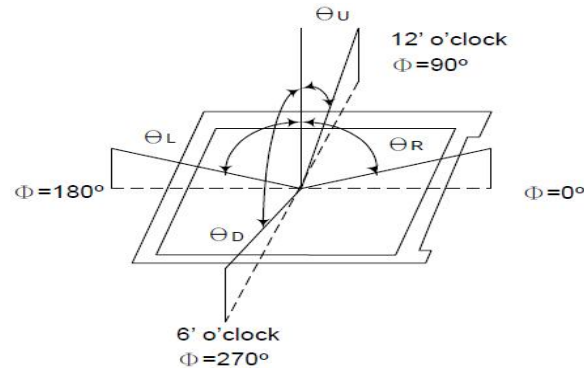
Note2: Definition of Response time: Sum of T_R and T_F
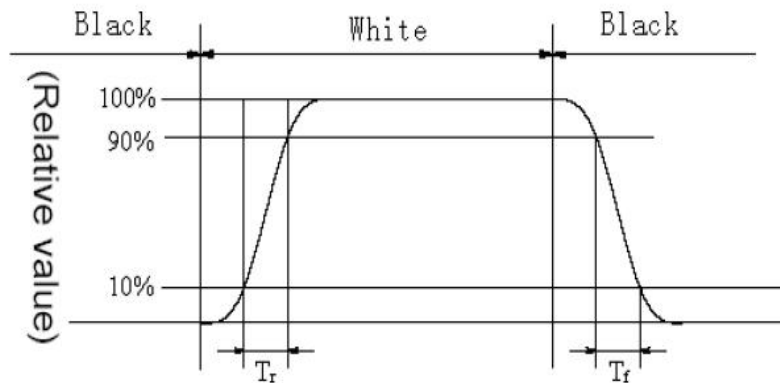
Note 3: Definition of Luminance Uniformity: Active area is divided into 9 measuring areas, every measuring point is placed at the center of each measuring area.

$$\text{Luminance Uniformity} = \frac{\text{Min Luminance of white among 9-points}}{\text{Max Luminance of white among 9-points}} \times 100\%$$
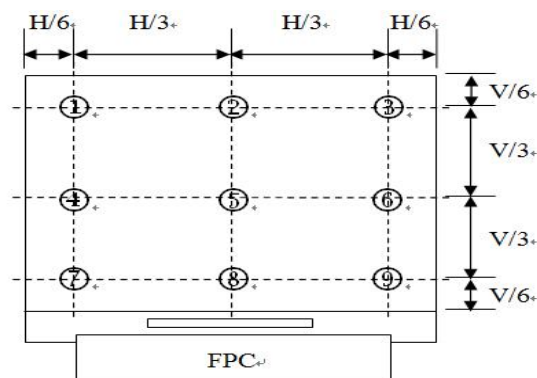
Note4: Definition of Contrast Ratio (CR): measured at the center point of panel

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

Color coordinates of white & red, green, blue measured at center point of LCD.

Note 7: Definition of NTSC ratio:

$$\text{NTSC ratio} = \frac{\text{Area of RGB triangle}}{\text{Area of NTSC triangle}}$$

1931 CIE Chromaticity Diagram
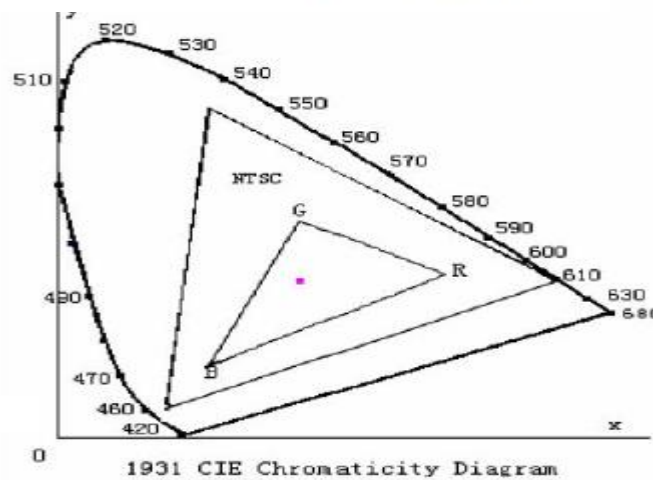
Note 8: Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen.(Response time is measured by Photo detector TOPCON BM-7, Field of view: 1°/Height: 500mm.)
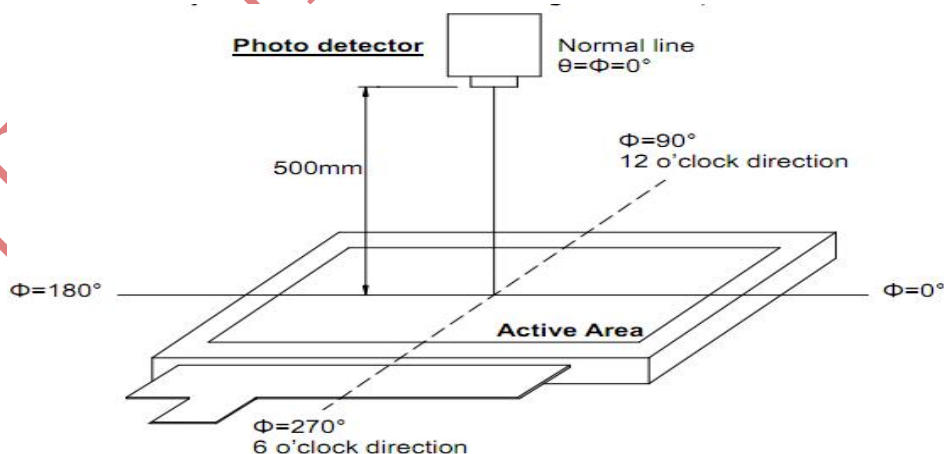
7. RELIABILITY

Item	Test Condition	Remark
High Temperature Storage	Ta =+80°C / 96Hours	Note1,2,3
Low Temperature Storage	Ta =-30°C / 96Hours	Note1,2,3
High Temperature Operating	Ta =+70°C / 96Hours	Note1,2,3
Low Temperature Operating	Ta =-20°C / 96Hours	Note1,2,3
Temperature Cycle storage Test	-40°C/30min Δ+90°C /30min for 30cycles,Transfer time less than 5min	Note2,3
Thermal humidity storage Test	60°C x 90%RH / 96Hours	Note2,3
Package Vibration Test	Frequency: 10Hz~55Hz,Amplitude:1.5mm, 1 hrs for each direction of X, Y, Z	Note2
ESD	C=150PF,R=330 Ohm Air:±8kv,5times(Center) Contact: ±4kv,5times(Center)	Note4

Inspection after Test:

Note1:Ta is the ambient temperature of samples.

Note 2: In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but doesn't guarantee all the cosmetic specification.

Note 3: Before cosmetic and function tests , the product must have enough recovery time, at least 2 hours at room temperature.

Note 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.

8. PACKAGE DRAWING

14. PACKING SPECIFICATIONS
14.1 INNER BOX SPECIFICATIONS

Tray
* LCD modules per tray

TBD

TBD
(To be updated after customer approval for new packing.)

Product

Bag

Ten (**) trays with Product
+ empty tray as cover = Eleven (**) trays

Inner carton

Stacked in an inner carton.

Inner carton

Master carton

Insert four (4) inner cartons within a master carton.
Maximum quantity per a master carton : * × * × * = ***pcs