LCD MODULE

SPECIFICATION

Model:	UE055FH-AN33-A034A
Version:	V1.0
Date:	2020.01.06

☐ **Preliminary Specification** 样品规格书

☑ **Final Specification** 量产规格书

Customer Confirmation 客户确认

Approved by	Notes

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VIEWE Confirmation 优奕确认

Prepared by	Reviewed by	Approved by

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REVISION HISTORY

Revision 版本号	Date 日期	Contents of Revision Change 修改内容	Remark 备注
V1.0	2020.01.06	Preliminary release	

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1. GENERAL INFORMATION

1.1 Features

1) Pixel Arrangement：RGB Vertical Stripe
2) Interface Mode： MIPI
3) Driver IC：ILI7807D
4) Operation Temperature：-20~70℃
5) Storage Temperature：-30~80℃
6) Backlight Type：White LED
7) Display mode：Normally Black,
8) Pixel Density：400 PPI
9) LED life time：30,000 Hours

1.2 Mechanical Specification

Item 项目	Specification 规格	Unit 单位	Remark 备注
Pixel Driving element	IPS TFT	-	-
Screen Size	5.5	Inch	Diagonal
Resolution	1080(W)*3(RGB)*1920(H)	Dots	-
Interface	MIPI	-	4lane
Module Power Consumption	0.9	Watt	Typ.
Active Area	68.04(W)*120.96(H)	mm	-
Pixel pitch (W*H)	0.063(W)*0.063(H)	mm	-
CTP_Module Size (W*H*D)	75.40(W)*144.88(H)*2.91(D)	mm	-
Luminance	350	cd/m^2	Typ.
Viewing Direction	All	O'clock	-
Display Color	16.7M	Colors	24bits

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2. ABSOLUTE MAXIMUM RATINGS

Item 项目	Symbol 符号	Min. 最小值	Max. 最大值	Unit 单位	Remark 备注
Power supply1 voltage	IOVCC	-0.3	3.6	V	Note1
Power supply2 voltage	VDD	-0.3	3.6	V	Note1
Power supply3voltage	TP_VDD	-0.3	3.6	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	℃	Note1,2
Storage temperature	T_{st}	-30	80	℃	Note1,2
Humidity	H_{st}	10	90	%RH	Note1,3

(Ta=+25°C,GND=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 .

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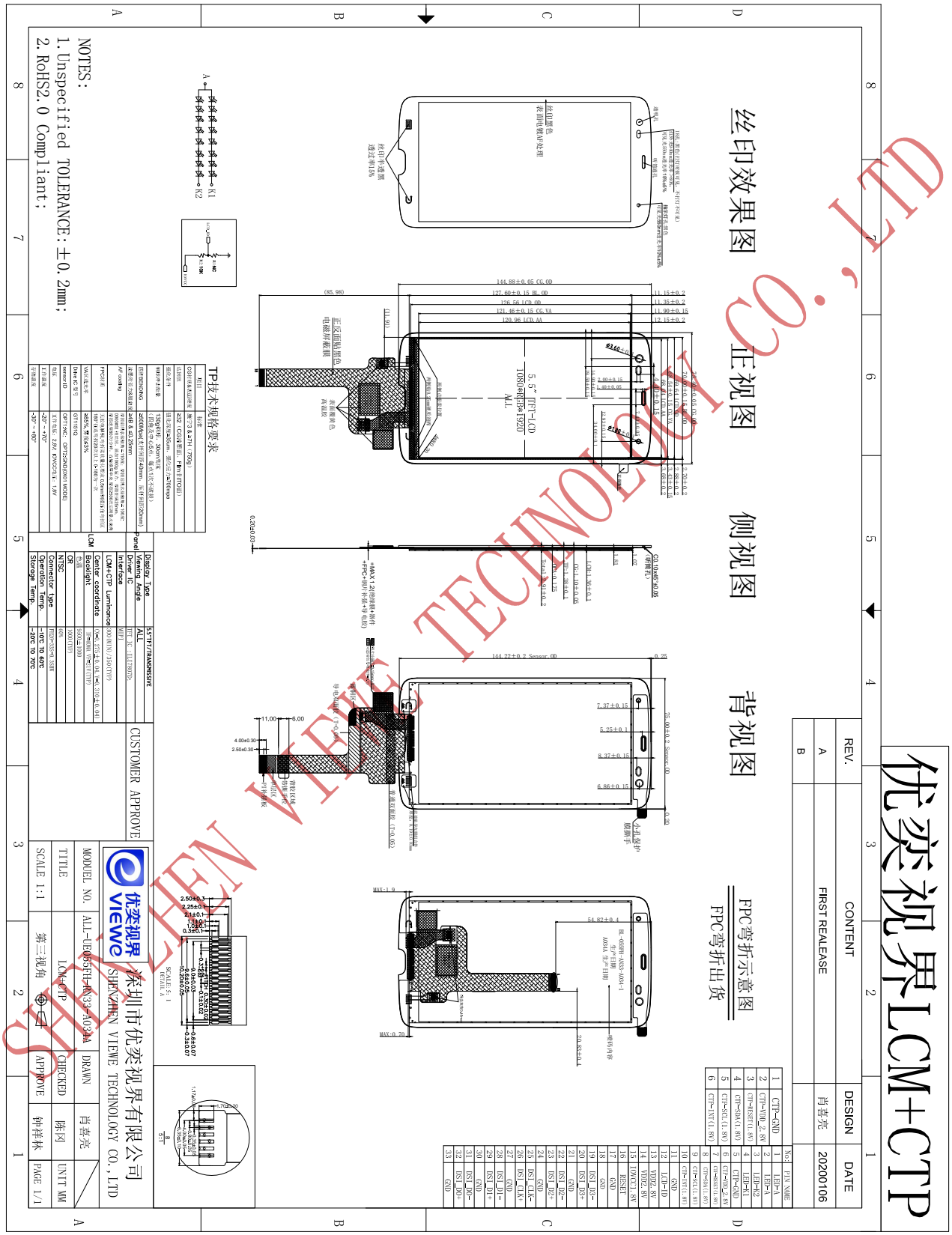
3. MECHANICAL DRAWING



4. I/O CONNECTION & BLOCK DIAGRAM

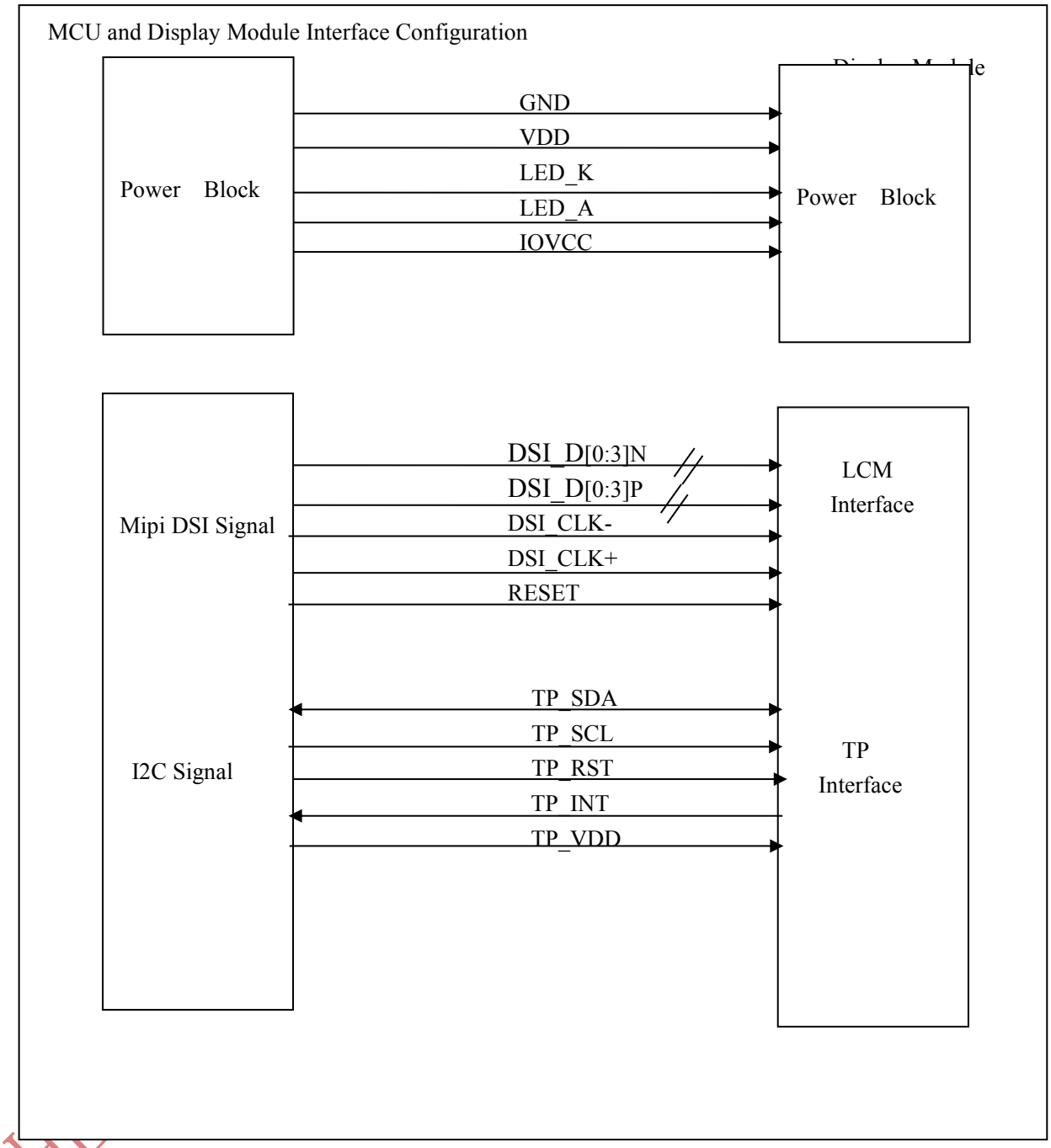
4.1 I/O Connection

Pin No.	Symbol	I/O	Description
1-2	LED_A	P	Power supply for backlight anode
3-4	LED_K2-K1	P	Power supply for backlight cathode
5	CTP_GND	P	Power Ground
6	**TP_VDD**	P	TP_VDD(2.8V) Power Supply for TP
7	**TP_RST**	I	The signal will reset the TP, Signal is active low
8	**TP_SDA**	I/O	I2C data signals for TP
9	**TP_SCL**	I	I2C clock signals for TP
10	**TP_INT**	O	Interrupt signals for TP
11	GND	P	Power Ground
12	**LCD_ID**	O	ID Select.
13-14	VDD	I	Power supply for digital circuits (2.8V)
15	IOVCC	I	Power supply for digital circuits and IO pads(1.8V)
16	RESET	I	Chip reset signal, active is low
17-18	GND	P	Power Ground
19	DSI_D3-	I	MIPI-DSI data lane
20	DSI_D3+	I	MIPI-DSI data lane
21	GND	P	Power Ground
22	DSI_D2-	I	MIPI-DSI data lane
23	DSI_D2+	I	MIPI-DSI data lane
24	GND	P	Power Ground
25	DSI_CLK-	I	MIPI-DSI clock lane
26	DSI_CLK+	I	MIPI-DSI clock lane
27	GND	P	Power Ground
28	DSI_D1-	I	MIPI-DSI data lane
29	DSI_D1+	I	MIPI-DSI data lane
30	GND	P	Power Ground
31	DSI_D0-	I/O	MIPI-DSI data lane
32	DSI_D0+	I/O	MIPI-DSI data lane
33	GND	P	Power Ground

TP PIN .	Symbol	I/O	Description
1	**TP_GND**	P	Ground.
2	**TP_VDD**	P	TP_VDD(2.8V) Power Supply for TP
3	**TP_RST**	I	The signal will reset the TP, Signal is active low
4	**TP_SDA**	I/O	I2C data signals for TP
5	**TP_SCL**	I	I2C clock signals for TP
6	**TP_INT**	O	Interrupt signals for TP

I：Input；O：Output；P：Power

4.2 Block Diagram



5. ELECTRICAL CHARACTERISTICS

5.1 TFT-LCD Panel Driving Section

Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Power Supply1 Voltage	IOVCC	1.7	1.8	3.6	V	-
Power Supply2 Voltage	VDD	2.8	3.3	3.6	V	-
Power Supply3 Voltage	TP_VDD	2.8	3.3	3.6	V	-
Power Supply Current	I_{IOVCC}	-	30	-	mA	Note1
Logic Input High Voltage	V_{IH}	0.7IOVCC	-	IOVCC	V	-
Logic Input Low Voltage	V_{IL}	0	-	0.3IOVCC	V	-
Panel Power Consumption	P_{IOVCC}	-	0.099	-	Watt	Note1
Module Power Consumption	P_{LCM}	-	0.19	-	Watt	Note1,2

(Ta=+25°C,GND=0V)

Note1:Measurement Conditions (Video Mode): Full Screen Red Pattern,IOVCC=1.8V,60Hz Refresh.

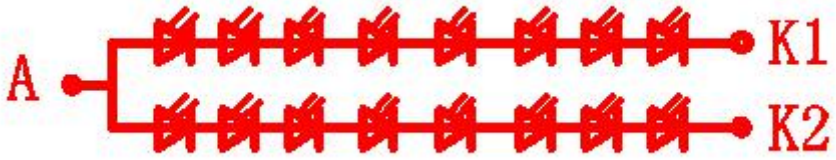
Note2: P_{LCM}= P_{IOVCC}+ P_{BL}， About P_{BL} information, inference to 5.2 Back Light Driving Section.

5.2 Back Light Driving Section

Item 项目	Symbol 符号	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Forward Voltage	V_F	-	21	-	V	Note1
Forward Current	I_F	-	40	-	mA	Note1
Backlight Power consumption	P_{BL}	-	0.8	-	Watt	Note1
LED life time	-	30000	-	-	Hours	Note2
LED Quantity			16		PCS	

Note1: The LED driving condition is defined for each LED module (8 LED Serial, 2 LED Parallel)。
For each LED ： I_F=20mA,V_F=3.2V(Typ.),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.



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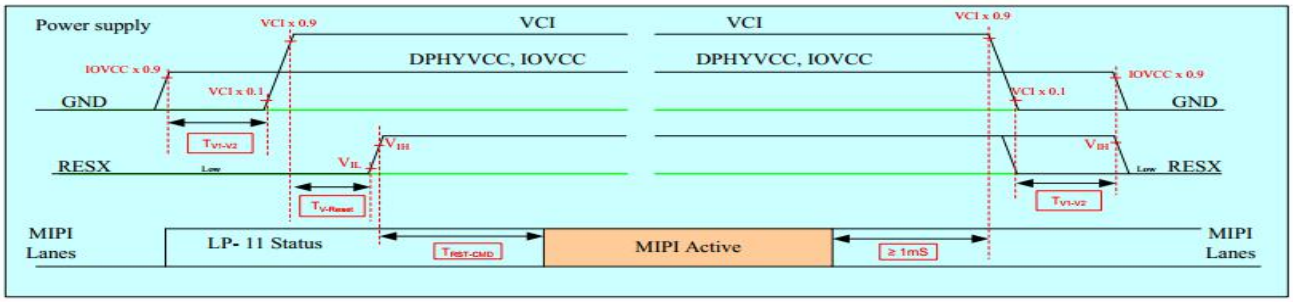
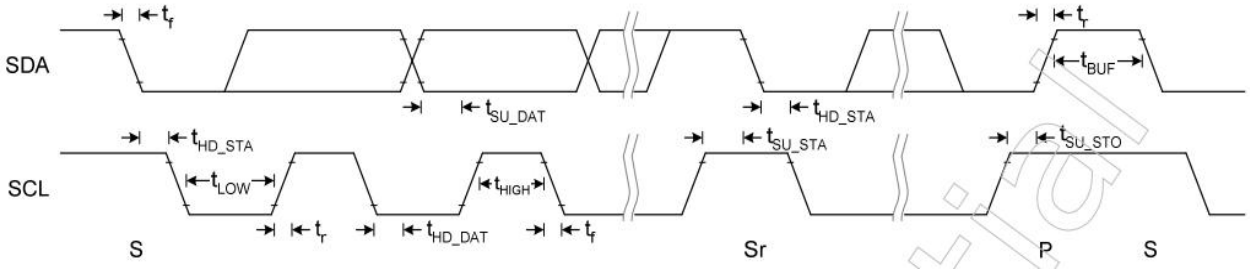
5.3Power On/Off Sequence



	Characteristics	Min.	Typ.	Max.	Units
T_{V1-V2}	Delay time between two external power	2	5	-	ms
$T_{V-Reset}$	Delay time between external power and Reset	4	10	-	ms
T_{rise}	External power rise time	0.2	-	20	ms
$T_{RST-CMD}$	Reset to first command	10	-	-	ms

5.4 Timing Characteristics

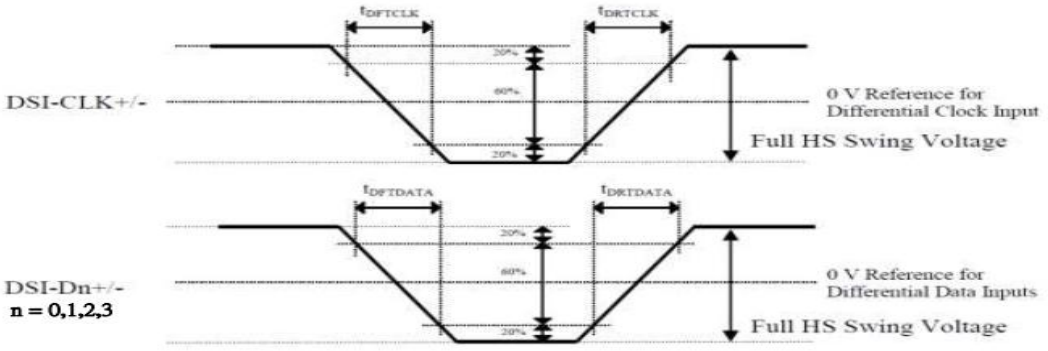
5.4.0 I2C interface timings



Parameter	Symbol	Min.	Max.	Unit
SCL low period	t_{lo}	1.3	-	us
SCL high period	t_{hi}	0.6	-	us
SCL setup time for START condition	t_{st1}	0.6	-	us
SCL setup time for STOP condition	t_{st3}	0.6	-	us
SCL hold time for START condition	t_{hd1}	0.6	-	us
SDA setup time	t_{st2}	0.1	-	us
SDA hold time	t_{hd2}	0	-	us

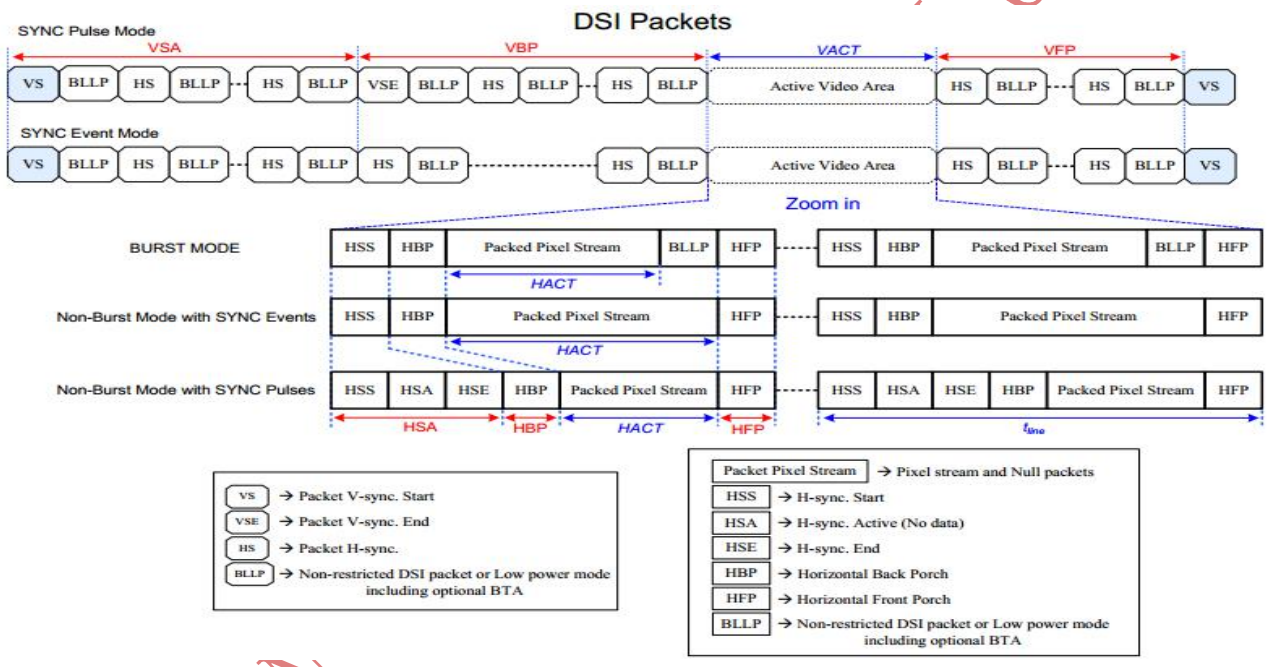
Note：2.8V 通讯接口，400Kbps 通讯速度，上拉电阻 2K

Parameter	Symbol	Condition	Specification		
			Min	Typ	Max
Differential Rise Time for Clock	t_{DRTCLK}	DSI-CLK+/-	150 ps	-	0.3UI (Note)
Differential Rise Time for Data	$t_{DRTDATA}$	DSI-Dn+/- n=0,1,2,3	150 ps	-	0.3UI (Note)
Differential Fall Time for Clock	t_{DFTCLK}	DSI-CLK+/-	150 ps	-	0.3UI (Note)
Differential Fall Time for Data	$t_{DFTDATA}$	DSI-Dn+/- n=0,1,2,3	150 ps	-	0.3UI (Note)



5.5 Timing Diagram

5.5.1 Horizontal and Vertical Timings



5.5.3 Timing Parameters

Parameter	Symbol	Value			Unit
		Min.	Typ.	MAX.	
Bit rate per lane	BR_{PHY}	80	-	1000	Mbps
Active pixel per line	HACT	-	1080	-	Pixels
Horizontal back porch	t_{HBP}	-	70	-	DCLK
Horizontal sync active	t_{HSA}	-	20	-	DCLK
Horizontal front porch	t_{HFP}	-	90	-	DCLK
Active pixel per frame	VACT	-	1920	-	H
Vertical back porch	t_{VBP}	-	4	-	H
Vertical sync active	t_{VSA}	-	4	-	H
Vertical front porch	t_{VFP}	-	4	-	H

6. OPTICAL CHARACTERISTICS

Parameter 参数	Symbol 符号	Condition 条件	Min. 最小值	Typ. 典型值	Max. 最大值	Unit 单位	Remark 备注
Contrast Ratio	C/R	θ = 0°	700	1000	-	-	Note(4)
NTSC Ratio	S	θ =0°	60	70	-	%	Note(7)
Luminance	L	θ =0°	-	350	-	cd/m2	Note(5)
Luminance uniformity	U_W	θ =0°	-	80	-	%	Note(3)
Response Time	T_R+ T_F	25 °C	-	35	45	ms	Note(2)
Color Coordination	W_X	θ = 0° (Center) Normal viewing angle B/L On	-0.03	0.275	+0.03	NTSC (x,y)	Note(6)
	W_Y			0.310			
	R_X			TBD			
	R_Y			TBD			
	G_X			TBD			
	G_y			TBD			
	B_X			TBD			
	B_Y			TBD			
Viewing Angle	θ L	C/R>10	-	80	-	Degree	Note(1)
	θ R		-	80	-		
	θ U		-	80	-		
	θ D		-	80	-		

Test Conditions:

1. IOVCC=1.8V, I_F=40mA (Backlight current), the ambient temperature is+25℃.
2. The test systems refer to Note 8.

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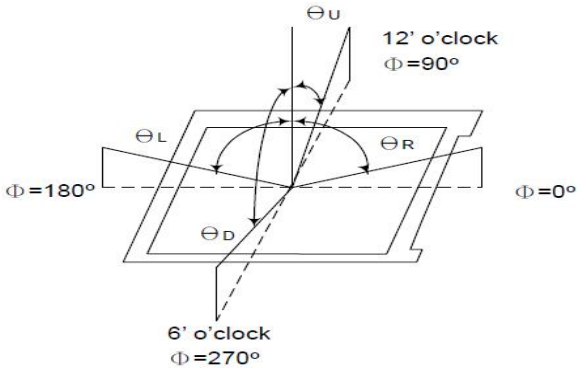
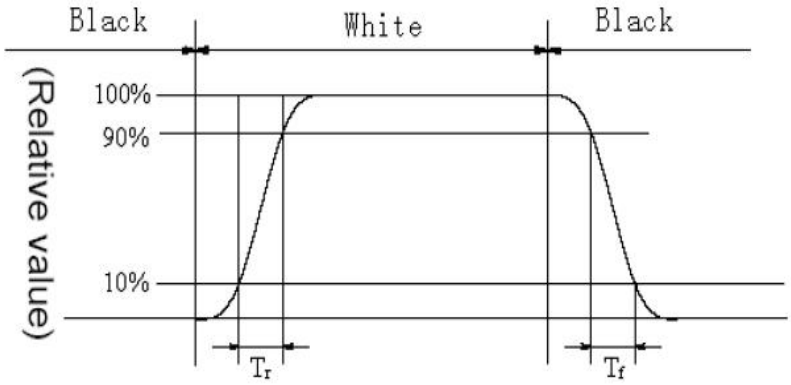
Note1: Definition of Viewing Angle: The viewing angle range that the CR>10

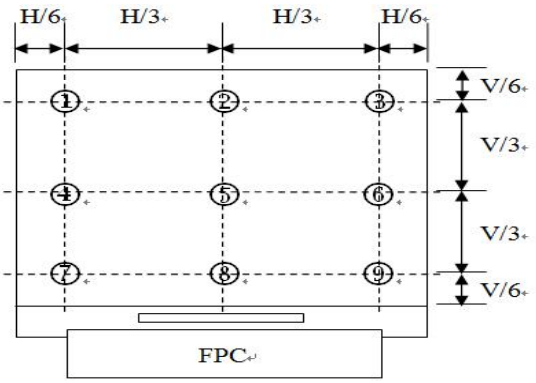


Note2: Definition of Response time: Sum of T_R and T_F



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

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

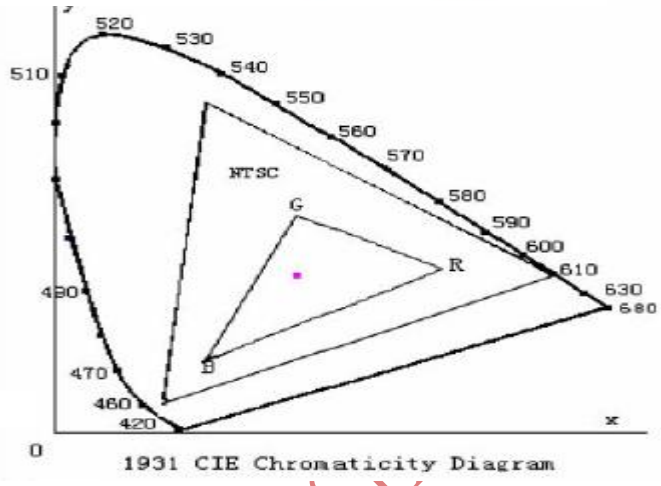
Note 5: Definition of Luminance: Center Luminance of white is defined as luminance values of 1point average across the LCD surface.

Note 6: Definition of Color Chromaticity (CIE 1931)

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

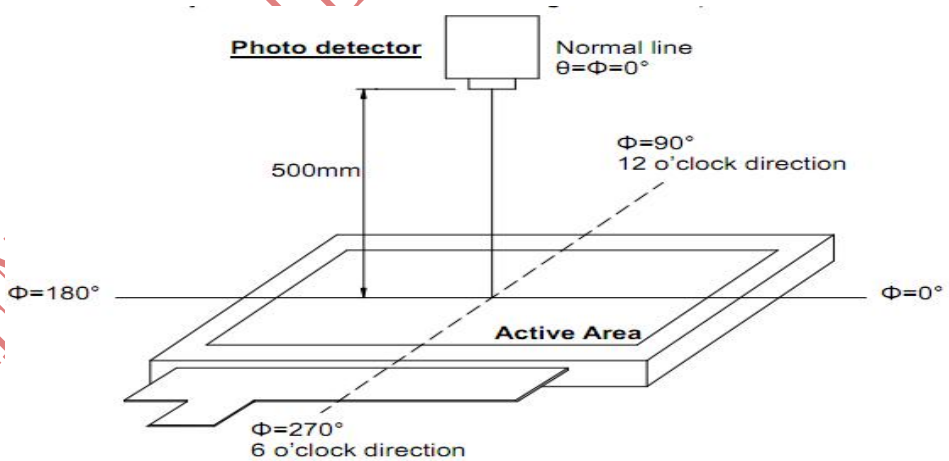
Note 7: Definition of NTSC ratio:

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



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 项目	Test Condition 测试条件	Remark 备注
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	-30°C/30min ⇆+80°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

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.

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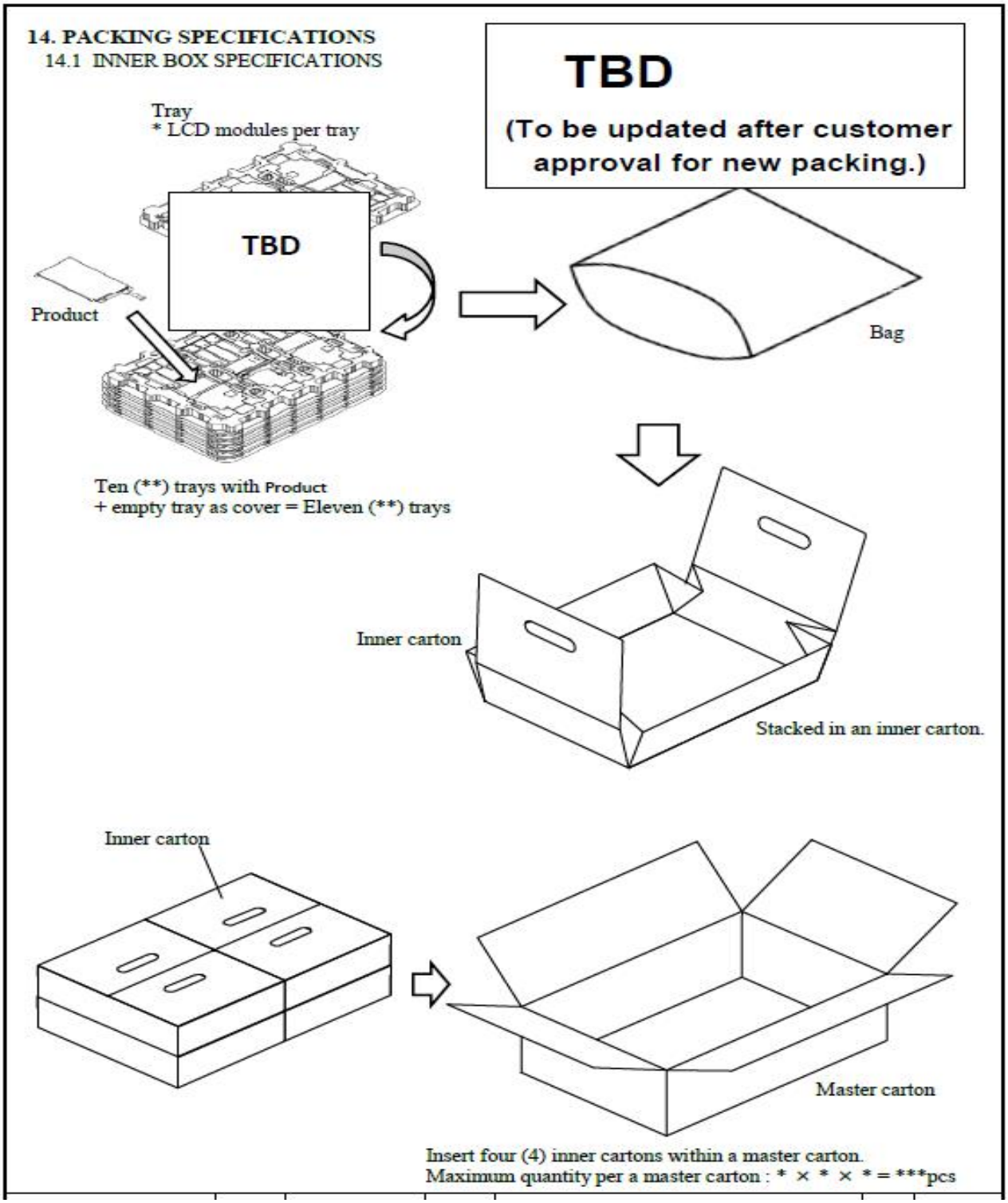
8. PACKAGE DRAWING