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MODEL NO : ET043WV06-TT

MODEL VERSION: 01

SPEC VERSION : 1.0

ISSUED DATE: 2021-02-01

□Preliminary Specification

■Final Product Specification

Customer :

Approved by	Notes

Youri Confirmation

Prepared by	Reviewed by	Approved by
John	Johnny	Wang

1. Introduction

1.1 Scope of application

LCD specification: Dots 480xRGBx272
As to basic specification of the driver IC, refer to the IC (ILITEK:ST7283) specification and data book.
All material & processing of the LCD module should be Lead Free.

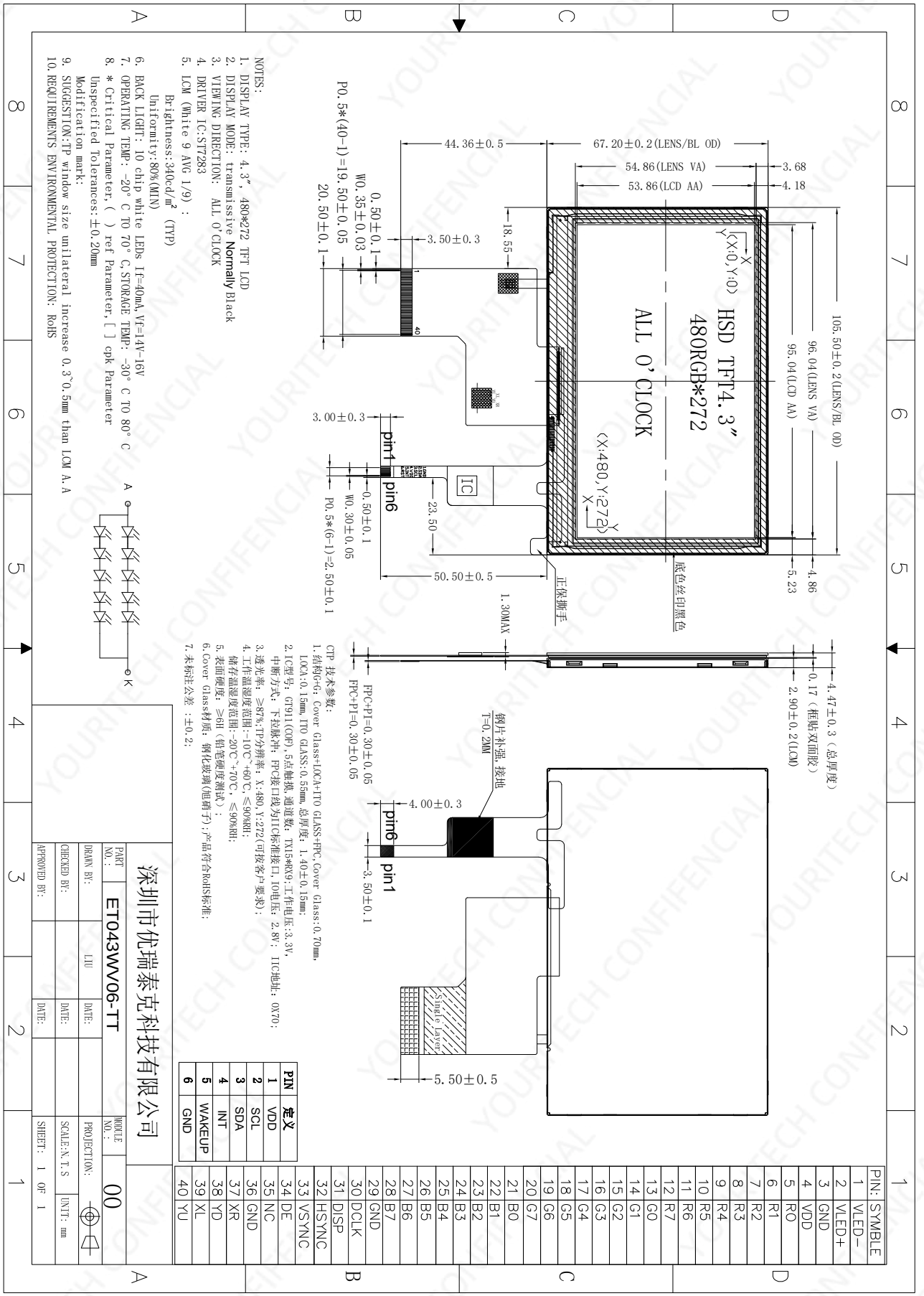
1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL+FPC+CTP;
ALL O'CLOCK Type LCD
480 dot-segment and 272dot-common outputs;
16.7M Color can be selected by software;
White LED back light;
24bit RGB Interface

1.3 Applications:

2. LCM General specification

ITEM	Sandard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	480*3RGB(H)X272(V)	Dots
Pixel arrangement	RGB Vertical Stripe	--
Pixel Pitch (W*H)	0.198 (H) x 0.198 (V)	mm
Active area	95.04(H) x 53.86(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	ST7283	--
TFT interface	24bit RGB Interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	105.50(W) ×67.10(H) ×2.90(T)	mm
LCM+CTP Size(W*H*T)	105.50(W) ×67.20(H) ×4.47(T)	mm
Touch structure	G+G	--
Touch Driver IC	GT911	--
Touch Interface	I2C	--



NOTES:

1. DISPLAY TYPE: 4.3", 480*272 TFT LCD
2. DISPLAY MODE: transmissive Normally Black
3. VIEWING DIRECTION: ALL 0' CLOCK
4. DRIVER IC:ST7283
5. LCM (White 9 AVG 1/9) :
   Brightness:340cd/m^2 (TYP)
   Uniformity:80%(MIN)
6. BACK LIGHT: 10 chip white LEDs If=40mA, Vf=14V-16V
7. OPERATING TEMP: -20° C TO 70° C, STORAGE TEMP: -30° C TO 80° C
8. * Critical Parameter, ( ) ref Parameter, [ ] cpk Parameter
   Unspecified Tolerances: ±0.20mm
   Modification mark:
9. SUGGESTION:TP window size unilateral increase 0.3~0.5mm than LCM A.A
10. REQUIREMENTS ENVIRONMENTAL PROTECTION: RoHS

CTP 技术参数:
1.结构G+G; Cover Glass+LOCA+ITO GLASS+FPC, Cover Glass:0.70mm, LOCA:0.15mm, ITO GLASS:0.55mm, 总厚度: 1.40±0.15mm;
2.IC型号: GT911(COF),5点触摸,通道数: TX15*RX9;工作电压:3.3V, 中断方式: 下拉脉冲; FPC接口线为IIC标准接口,IO电压: 2.8V; IIC地址: 0X70;
3.透光率: ≥87%;TP分辨率: X:480,Y:272(可按客户要求);
4.工作温湿度范围:-10℃~+60℃,≤90%RH;
储存温湿度范围:-20℃~+70℃,≤90%RH;
5.表面硬度: ≥6H（铅笔硬度测试）;
6.Cover Glass材质: 钢化玻璃(旭硝子);产品符合RoHS标准;
7.未标注公差 :±0.2;

PIN	定义
1	VDD
2	SCL
3	SDA
4	INT
5	WAKEUP
6	GND

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

深圳市优瑞泰克科技有限公司

PART NO.:	ET043WV06-TT	MODULE NO.:	00
DRAWN BY:	LIU DATE:	PROJECTION:	
CHECKED BY:	DATE:	SCALE:N.T.S	UNIT: mm
APPROVED BY:	DATE:	SHEET: 1 OF 1	

3.Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T_{OPR}	-20	+70	°C
LCM Storage Temperature	T_{STG}	-30	+80	°C
TP Operating Temperature & Humidity(20% ~ 90%RH)	T_{OPR}	-20	+70	°C
TP SStorage Temperature & Humidity(20% ~ 90%RH)	T_{STG}	-30	+80	°C
Humidity	RH	--	90	%

4.Electrical Characteristics

4.1 TFT DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for I/O	VDDIO	3.0	3.3	3.6	V
Supply Voltage for(DC/DC)	VDD	3.0	3.3	3.6	V
Supply Voltage for(DC/DC)	AVDD	--	--	--	V
Supply Voltage for(DC/DC)	AVEE	--	--	--	V

4.2 Back-Light Unit Characeristics

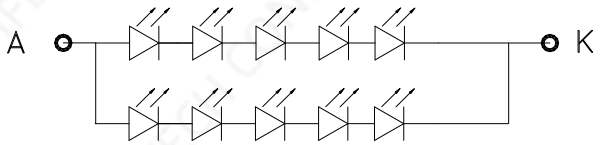
The back-light system is an edge-lighting type with 10 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V_F	14	--	16	V	--
Forward current	I_F	--	40	--	mA	--
Luminance(With LCD+CTP)	Lv	--	340	--	cd/m^2	--
LED life time	N/A	--	30,000	--	Hr	Note 1

Note:

(1) The “LED life time” is defined as the module brightness decrease to 50% of original brightness at I_L=20mA/LED. The LED life time could be decreased if operating I_L is larger than 25mA/LED.

Backlight circuit diagram shown in below:



5. Module Function Description

LCM:

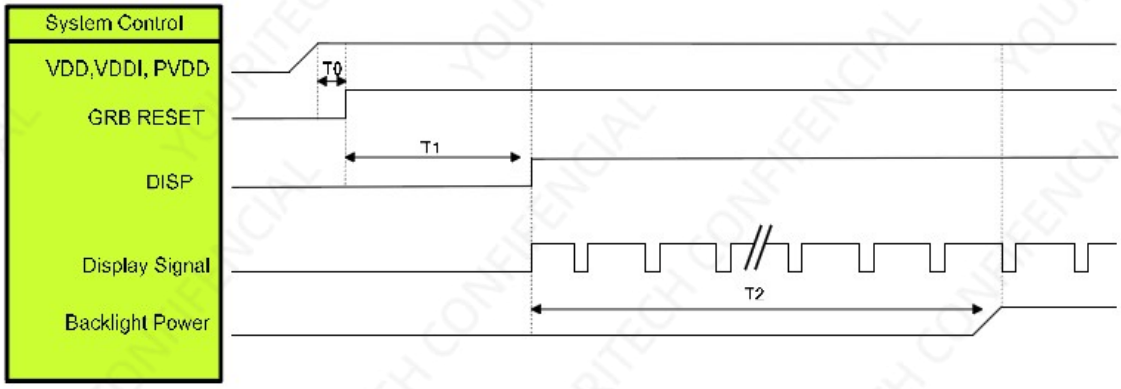
Pin No.	Symbol	Functional	Notes
1	LEDK	Power supply for backlight cathode input terminal.	
2	LEDA	Power supply for backlight anode input terminal.	
3	GND	Power Ground	
4	VDD	POWER SUPPLY（3.0V-3.6V）	
5~12	R0~R7	Parallel data Input. For TTL 18-bit parallel RGB image data input. For 18bit RGB interface, connect two LSB bits of all the R/G/B data buses to GND.	
13~20	G0~G7		
21~28	B0~B7		
29	GND	Power Ground	
30	DCLK	Pixel clock signal in RGB I/F	
31	DISP	NC	
32	HSYNC	Horizontal sync. Signal in RGB I/F	
33	VSYNC	Vertical sync. Signal in RGB I/F	
34	DE	Data enable signal in RGB I/F mode 1	
35	NC	NC	
36	GND	Power Ground	
37	XR	Touch panel pin XR	
38	YD	Touch panel pin YD	
39	XL	Touch panel pin XL	
40	YU	Touch panel pin YU	

TP:

Pin No.	Symbol	Functional	Notes
1	GND	TP Power Ground	
2	SCL-2.8V	TP SCL PIN	
3	SDA-2.8V	TP SDA PIN	
4	INT-2.8V	TP INT PIN	
5	RST-2.8V	TPReset signal	
6	VCC-3.3V	TP POWER SUPPLY（3.3V）	

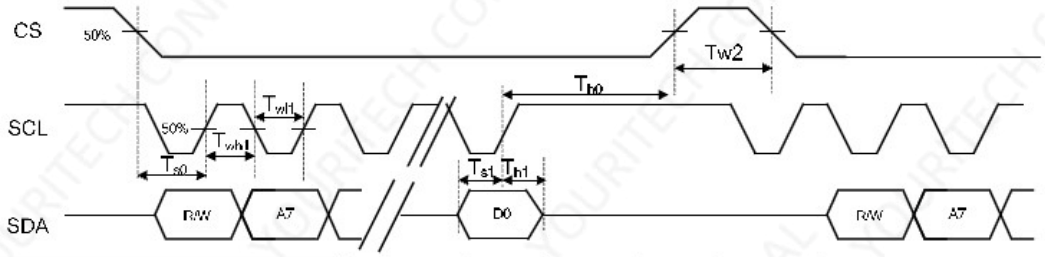
6. Timing Characteristics

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

System Bus Timing for 3-Wire SPI Interface



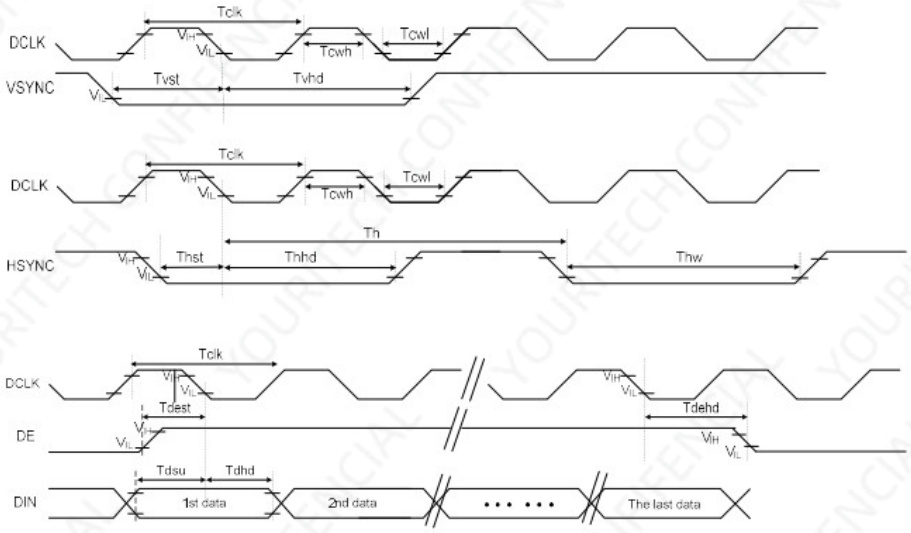
Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CS Input Setup Time	Ts0	50	-	-	ns	
Serial Data Input Setup Time	Ts1	50	-	-	ns	
CS Input Hold Time	Th0	50	-	-	ns	
Serial Data Input Hold Time	Th1	50	-	-	ns	
SCL Write Pulse High Width	Twh1	50	-	-	ns	
SCL Write Pulse Low Width	Twl1	50	-	-	ns	
SCL Read Pulse High Width	Trh1	300	-	-	ns	
SCL Read Pulse Low Width	Trl1	300	-	-	ns	
CS Pulse High Width	Tw2	400	-	-	ns	

18/ 24-bit Bus RGB Interface Timing Characteristics of IC

Parallel 18/24-bit RGB Input Timing (PVDD=VDD=VDDI= 3.3V, AGND= 0V, TA=25°C)

480RGB X 272 Resolution Timing Table							
Item		Symbol	Min.	Typ.	Max.	Unit	Remark
DCLK Frequency		Fclk	8	9	12	MHz	
DCLK Period		Tclk	83	111	125	ns	
HSYNC	Period Time	Th	485	531	598	DCLK	
	Display Period	Thdisp		480		DCLK	
	Back Porch	Thbp	3	43	43	DCLK	By H_BLANKING setting
	Front Porch	Thfp	2	8	75	DCLK	
	Pulse Width	Thw	2	4	43	DCLK	
VSYNC	Period Time	Tv	276	292	321	HSYNC	
	Display Period	Tvdisp		272		HSYNC	
	Back Porch	Tvbp	2	12	12	HSYNC	By V_BLANKING setting
	Front Porch	Tvfp	2	8	37	HSYNC	
	Pulse Width	Tvw	2	4	12	HSYNC	

Note: It is necessary to keep Tvbp =12 and Thbp =43 in sync mode. DE mode is unnecessary to keep it.



Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	Tcw	40	50	60	%	
HSYNC Width	Thw	2	-	-	DCLK	
HSYNC Period	Th	55	60	65	us	
VSYNC Setup Time	Tvst	12	-	-	ns	
VSYNC Hold Time	Tvhd	12	-	-	ns	
HSYNC Setup Time	Thst	12	-	-	ns	
HSYNC Hold Time	Thhd	12	-	-	ns	
Data Setup Time	Tdsu	12	-	-	ns	
Data Hold Time	Tdhd	12	-	-	ns	
DE Setup Time	Tdest	12	-	-	ns	
DE Hold Time	Tdehd	12	-	-	ns	

7.Optical Characteristics

Optical Specification

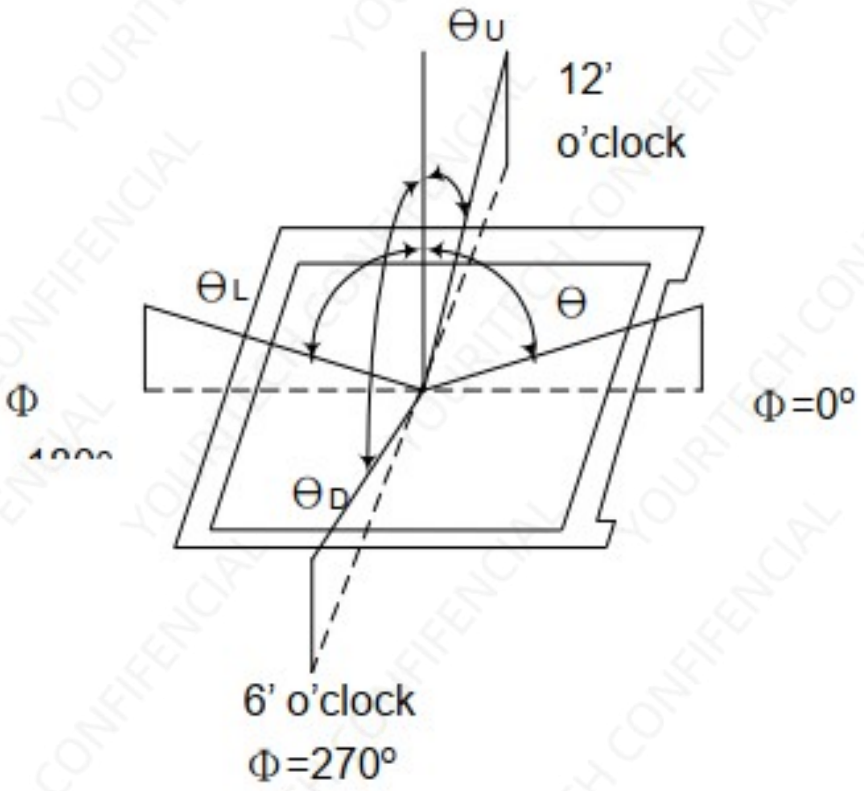
Item		Symbol	Condition	Min.	Typ.	Max.	Unit	Note
Transmittance (with Polarizer)		T (%)	Θ=0 Normal viewing angle	–	(6.6)	–	%	Measuring with normal polarizer , Reference Only Base on Vop=5.1V
Transmittance (without Polarizer)		T (%)		–	(23.45)	–	%	
Contrast Ratio		CR		640	800	–	–	(1)(2)
Response Time		$T_{R+}T_F$		–	30	40	msec	(1)(3)
Color Gamut	(%)			45	50	–	%	C-light
Color Chromaticity (CIE1931)	White	W_x		–	(0.320)	–	–	(1)(4) CF glass C-light
		W_y		–	(0.345)	–		
	Red	R_x		–	(0.629)	–	–	
		R_Y		–	(0.326)	–		
	Green	G_x		–	(0.337)	–	–	
		G_Y		–	(0.546)	–		
	Blue	B_x		–	(0.136)	–	–	
		B_Y		–	(0.143)	–		
Viewing Angle	Hor.	Θ_L	CR>10	70	80	–	–	(1)(4) Measuring with normal polarizer , Reference Only
		Θ_R		70	80	–		
	Ver.	Θ_U		70	80	–		
		Θ_D		70	80	–		
Optima View Direction		Free						(5)

■ Measuring surrounding : dark room
■ Ambient temperature : 25±2Oc
■ 15min. warm-up time.

Measuring Equipment

■FPM520 of Westar Display technologies, INC., which utilized SR-3 for Chromaticity and BM-5A for other optical characteristics.

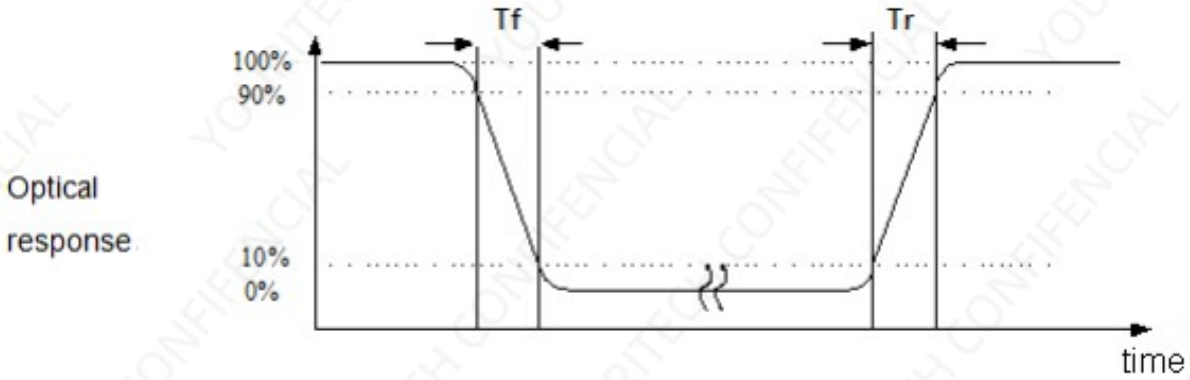
Note (1) Definition of Viewing Angle:



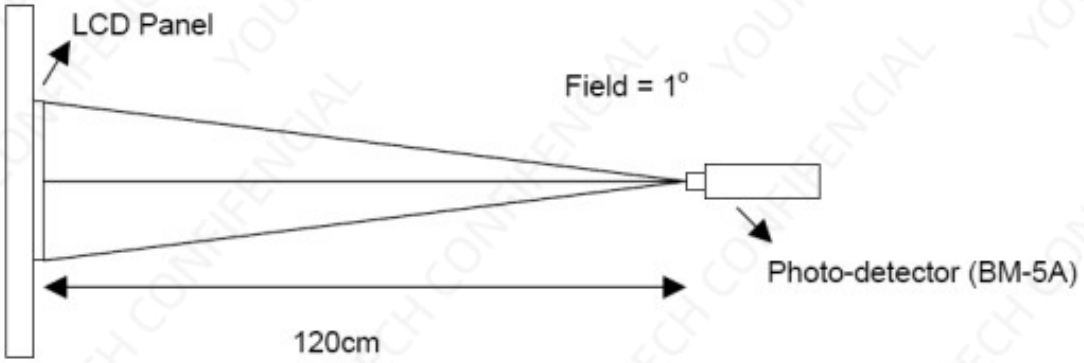
Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

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

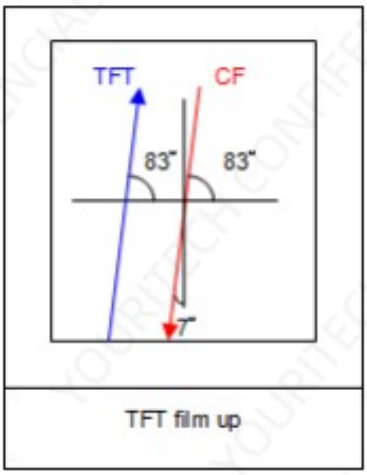
Note (3) Definition of Response Time : Sum of T_R and T_F



Note (4) Definition of optical measurement setup



Note (5) Rubbing Direction (The different Rubbing Direction will cause the different optima view direction.)



8. Reliability Test Item

No.	Test Item	Test Condition	Notes
1	High Temp. Storage	+80°C / 96H	1. Functional test isOK. Missing Segment,short, unclear segment non-display,display abnormally and liquid crystal leakare un-allowed. 2. No low temperature bubbles,end seal loose andfall, frame rainbow.
2	Low Temp. Storage	-30°C / 96H	
3	High Tempe. Operating	+80°C / 96H	
4	Low Tempe. Operating	-30°C / 96H	
5	High Temperature /Humidity storage	50°C x 90%RH /96H	
6	Thermal and cold shock	Static state，-20℃（30min）~70℃（30min），50 cycles	

9. Packing Method----TBD

- END -