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Cover glass

System solutions

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Custom Display

PCAP

Mechanical design

Production Custom designs Installation



MODEL NO : ET043WV02-T

MODEL VERSION: 01

SPEC VERSION : 1.0

ISSUED DATE: 2020-12-15

☐ 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 (Sitronix:ST7283) specification and data book.

All material & processing of the LCD module should be Lead Free.

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC1+BL;

ALL O'CLOCK Type LCD

480 dot-segment and 272dot-common outputs;

16.7M Color can be selected by software;

White LED back light;

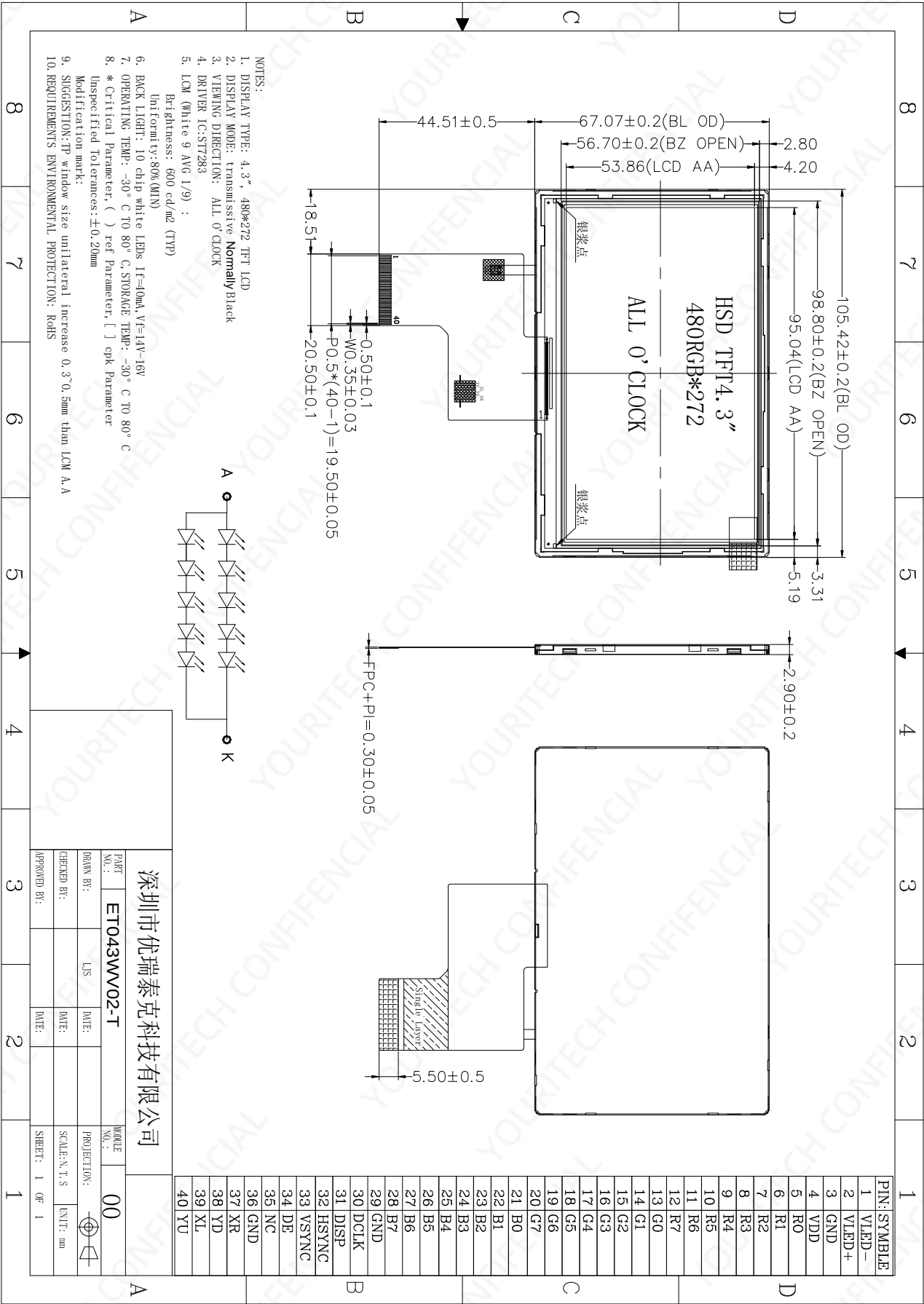
3SPI+24bit RGB Interface

Scanning mode: forward scanning

1.3 Applications:

2. LCM General specification

ITEM	Standard 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	3SPI+24bit RGB Interface	--
Module Size(W*H*T)	105.42(W) ×67.07(H) ×2.90(T)	mm
Approx. Weight	TBD	g
Touch structure	--	--
Touch Driver IC	--	--
Touch Interface	--	--



3. Absolute Maximum Rating

Characteristics	Symbol	Min.	Max.	Unit
LCM Operating Temperature	T _{OPR}	-30	+80	°C
LCM Storage Temperature	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	--	--	--	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 Characteristics

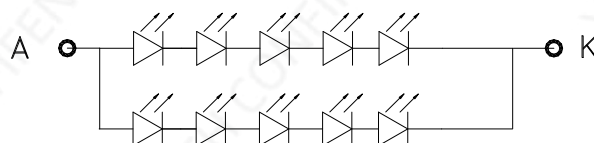
The back-light system is an edge-lighting type with 10 white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V _F	14	--	15	V	--
Forward current	I _F	--	40	--	mA	--
Luminance(With LCD)	L _v	--	600	--	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:



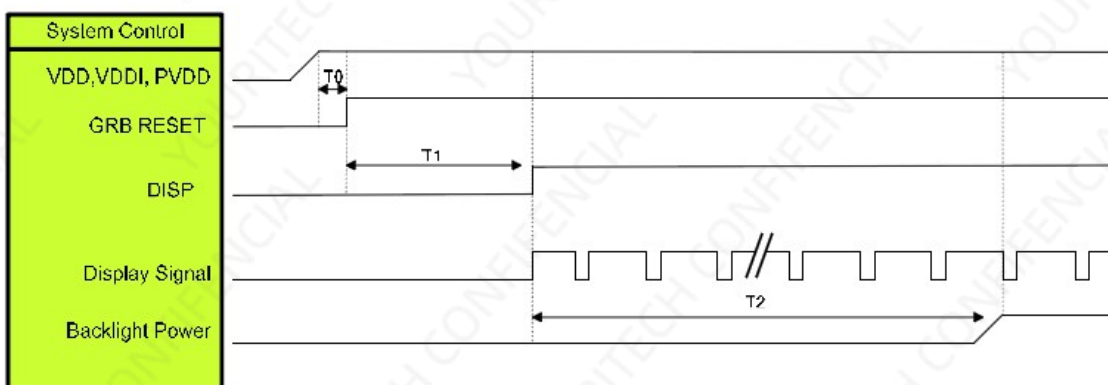
5. Module Function Description

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/NC	
38	YD	Touch panel pin YD/NC	
39	XL	Touch panel pin XL/NC	
40	YU	Touch panel pin YU/NC	

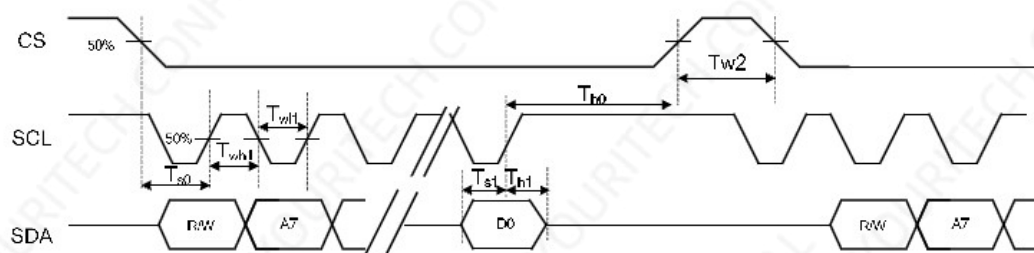
6. Timing Characteristics

Power On Sequence



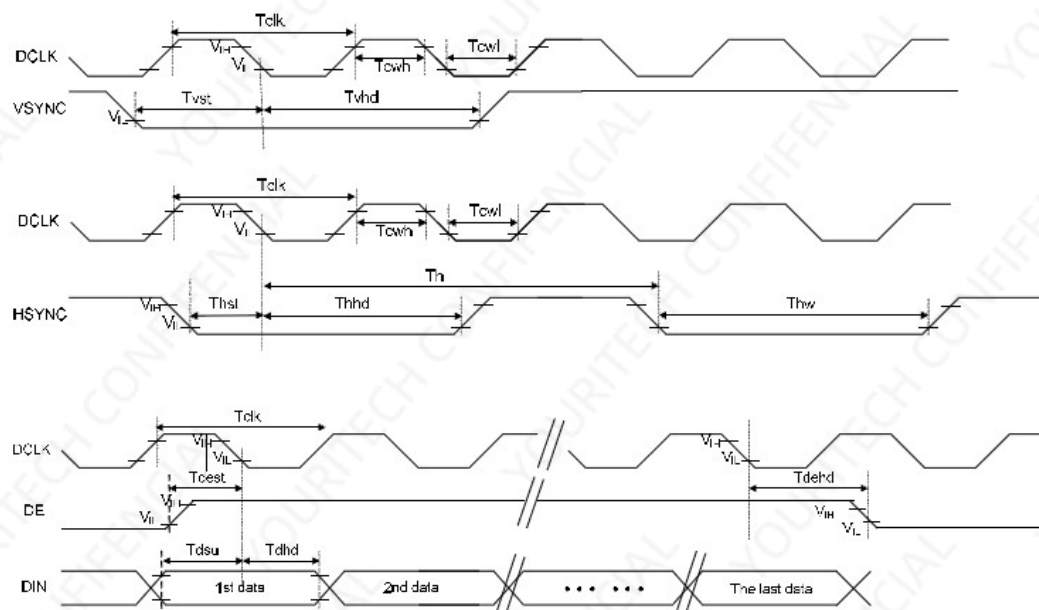
Symbol	Description	Min. Time	Unit
T0	System power stability to GRB RESET signal	0	ms
T1	GRB RESET= "High" to DISP="High"	10	ms
T2	Display Signal output to Backlight Power on	250	ms

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	

System Bus Timing for RGB Interface



Item	Symbol	Min.	Typ.	Max.	Unit	Conditions
CLK Pulse Duty	T_{cw}	40	50	60	%	
HSYNC Width	T_{hw}	2	-	-	DCLK	
HSYNC Period	T_h	55	60	65	us	
VSYNC Setup Time	T_{vst}	12	-	-	ns	
VSYNC Hold Time	T_{vhd}	12	-	-	ns	
HSYNC Setup Time	T_{hst}	12	-	-	ns	
HSYNC Hold Time	T_{hhd}	12	-	-	ns	
Data Setup Time	T_{dsu}	12	-	-	ns	
Data Hold Time	T_{dhhd}	12	-	-	ns	
DE Setup Time	T_{dest}	12	-	-	ns	
DE Hold Time	T_{dehd}	12	-	-	ns	

7. Optical Characteristics

Optical Specification

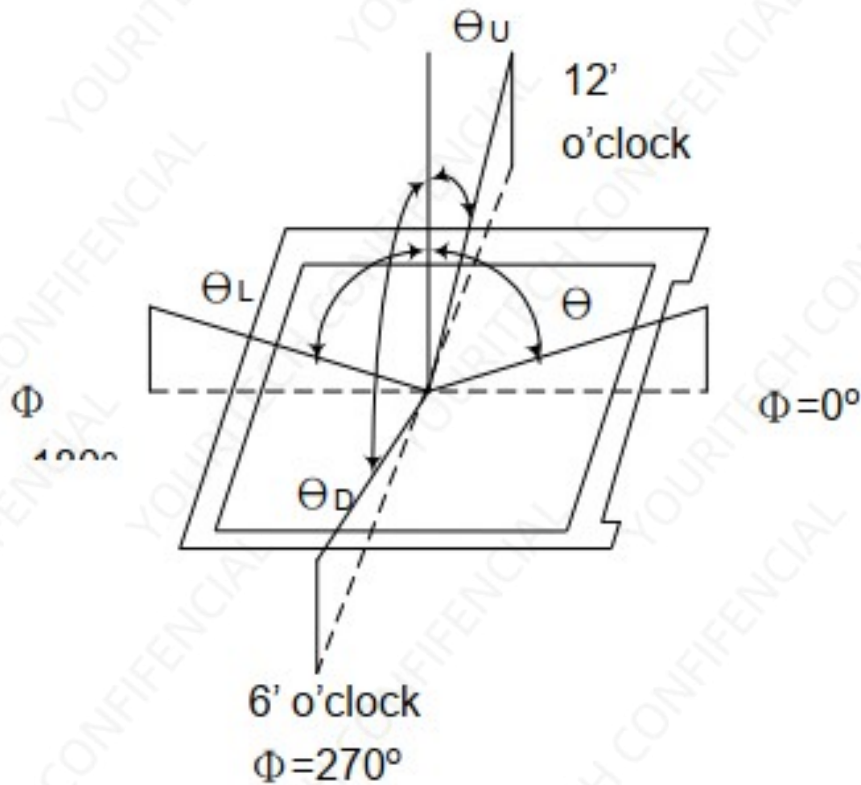
Item	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
Transmittance (with Polarizer)	T (%)	Θ=0 Normal viewing angle	—	(6.6)	—	%	Measuring with normal polarizer , Reference Only Base on Vop=5.1V	
Transmittance (without Polarizer)	T (%)		—	(23.45)	—	%		
Contrast Ratio	CR		640	800	—	—	(1)(2)	
Response Time	T _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 : $25\pm 2^\circ\text{C}$
- 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.

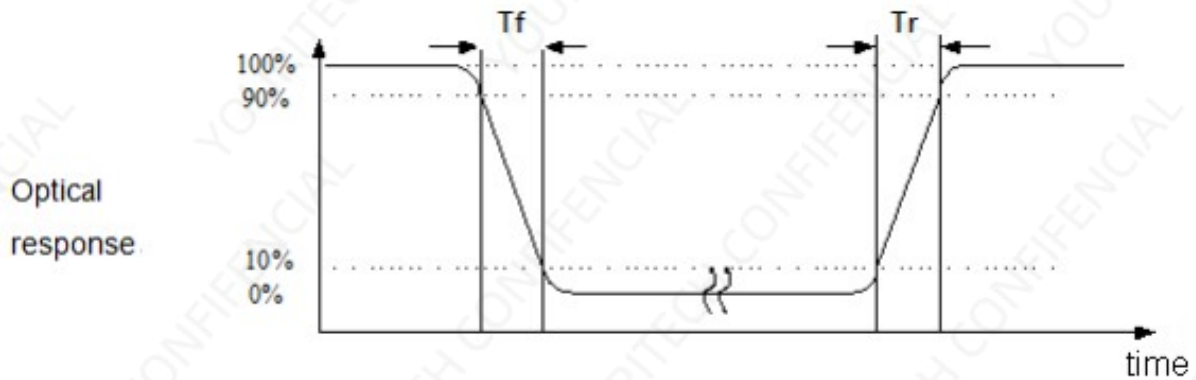
Note (1) Definition of Viewing Angle:



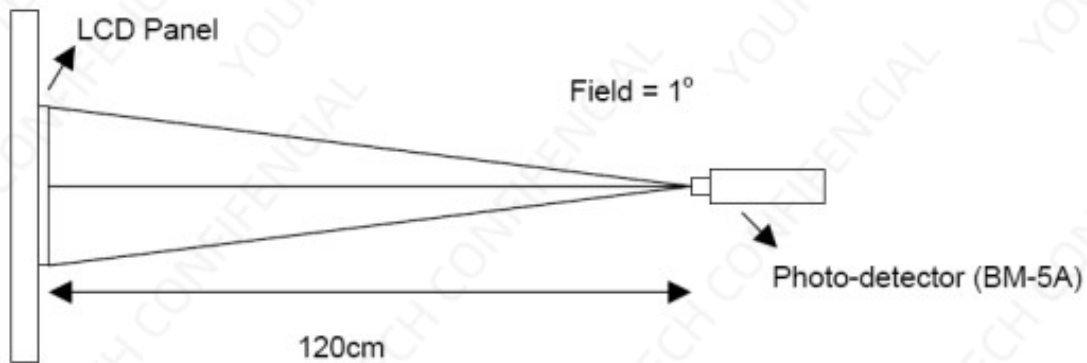
Note (2) Definition of Contrast Ratio (CR) :
measured at the center point of panel

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

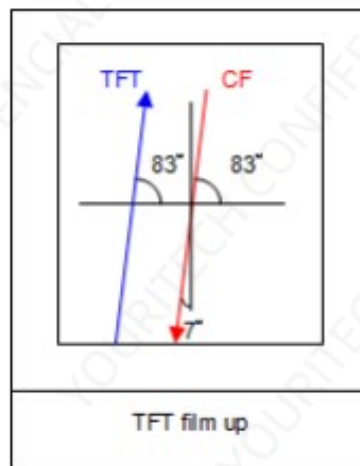
Note (3) Definition of Response Time : Sum of T_R and T_F



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 is OK. Missing Segment, short, unclear segment non-display, display abnormally and liquid crystal leakage un-allowed. 2. No low temperature bubbles, end seal loose and fall, frame rainbow.
2	Low Temp. Storage	-30°C / 96H	
3	High Temp. Operating	+80°C / 96H	
4	Low Temp. Operating	-30°C / 96H	
5	High Temperature / Humidity storage	50°C x 90%RH / 96H	
6	Thermal and cold shock	Static state, -20°C (30min) ~70°C (30min), 50 cycles	

9. Packing Method----TBD

- END -