

INDUSTRIAL STRENGTH... Start Your Application From YOURITECH

Integration support

Obsolescence Management

PCAP

Embedded Systems

Human Machine Interface

Touch Solutions

Software

Quality Management

Open Frame Monitors

LCD Controller

Research & Development

Firmware

EMC tests

on-site service

Optical Bonding

In-house Manufacturing

Cover glass

System solutions

OEM Solutions

Custom Display

Production Custom designs Installation

Mechanical design



 优 瑞 泰 克	深圳市优瑞泰克科技有限公司 SHENZHEN YOURITECH TECHNOLOGY CO.,LTD Product Specification	ET116FH02-T 2025-01-04 PAGE 1 OF 13
--	---	--

Project No. 项目编号	ET116FH02-T
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	Standard LCD Module TFT: 1920*RGBx1080Dots 11.6”TFT LCD

客户确认Customer Approval	
项目负责人Project Manager	
品质主管Director of Quality	
采购工程师Purchasing Engineer	

PREPARED BY	CHECKED BY	APPROVED BY

1. Introduction

1.1 Scope of application

This specification applies to the LCD module that is supplied by YOURITECH Technology CO., LTD.

LCD specification: Dots 1920xRGBx1080.

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

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL;

ALL O'CLOCK Type LCD

1920dot-segment and1080 dot-common outputs;

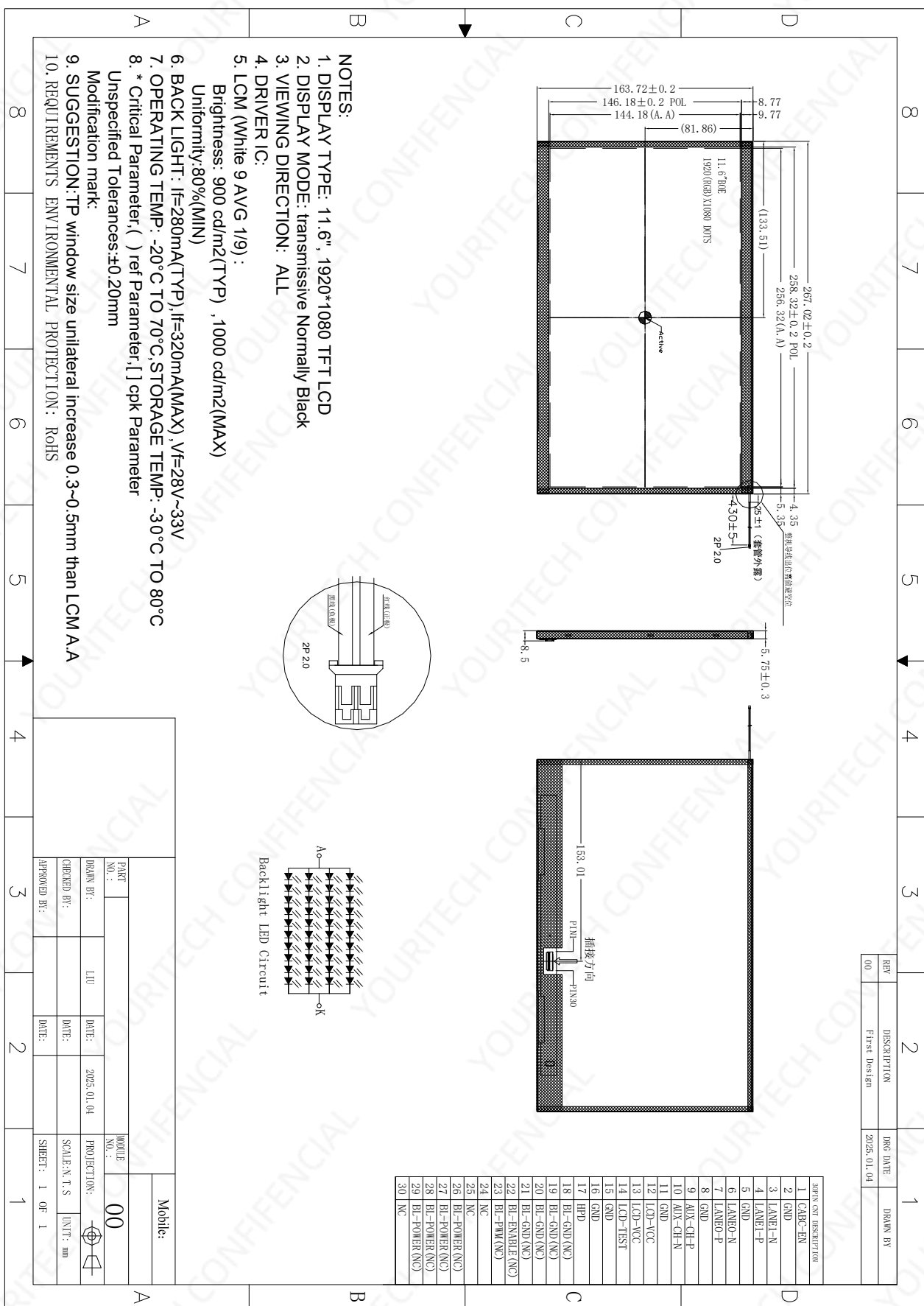
16.7M Color can be selected by software;

White LED back light;

2lane EDP interface

2. LCM General specification

ITEM	Standard value	Unit
LCD Type	Normally Black	--
Drive element	TFT active matrix	--
Number of pixels	1920*3RGB(H)X1080(V)	Dots
Pixel arrangement	RGB vertical stripe	--
Pixel Pitch (W*H)	0.1335 (H) × 0.1335 (V)	mm
Active area	256.32(H) x 144.18(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	TBD	--
TFT interface	2lane EDP interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	267.02(W)x163.72(H) x 5.75(T)	mm
Touch structure	--	--
Touch Driver IC	--	--
Touch Interface	--	--



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
Humidity	RH	-	90	%

4.Electrical Characteristics

4.1 TFT-LCD panel driving

Parameter		Min.	Typ.	Max.	Unit	Remarks
LCD Power Supply Voltage	V _{DD}	3.0	3.3	3.6	V	
Operating Temperature	T _{op}	-20		70	°C	
Storage Temperature	T _{st}	-30		80	°C	
Power supply voltage for LED Driver	V _{LED}	5	12	21	V	
Maximum LED Current Setting	ICH_MAX	6	~	25	mA	LED 100% setting
Minimum LED Current Setting	ICH_Min	0.1	~	~	mA	Setting by Dimming
Output Voltage	VLED	~	~	37	V	
EN Control Level	Backlight on	1.2		5.0	V	
	Backlight off	0		0.6	V	
PWM Control Level	PWM High Level	1.2		5.0	V	
	PWM Low Level	0		0.6	V	
PWM Control Frequency	F _{PWM}	200	-	20,000	Hz	
Duty Ratio	-	1	-	100	%	

4.2 Back-Light Unit Characteristics

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

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V_F	28	--	33	V	-
Forward current	I_F	--	320	--	mA	$V_{BL}=12.0V$ (TYP)
Luminance(With LCD)	L_v	--	900	1000	cd/m ²	-
LED life time	N/A	--	30000	--	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 Description:

Pin No.	Symbol	Functional	Notes
1	CABC-EN	CABC-EN	
2	GND	Power Ground	
3	LANE1-N	eDP RX channel 1 negative	
4	LANE1-P	eDP RX channel 1 positive	
5	GND	Power Ground	
6	LANE0-N	eDP RX channel 0 negative	
7	LANE0-P	eDP RX channel 0 positive	
8	GND	Power Ground	
9	AUX-CH-P	eDP AUX CH positive	
10	AUX-CH-N	eDP AUX CH negative	
11	GND	Power Ground	
12	LCD-VCC	Power Supply For LCD.	
13	LCD-VCC	Power Supply For LCD.	
14	LCD-TEST	Panel self test enable	
15	GND	Power Ground	
16	GND	Power Ground	
17	HPD	Hot plug detect output	
18	BL-GND (NC)	No Connection.	
19	BL-GND (NC)	No Connection.	
20	BL-GND (NC)	No Connection.	
21	BL-GND (NC)	No Connection.	
22	BL-ENABLE (NC)	No Connection.	
23	BL-PWM (NC)	No Connection.	
24	NC	No Connection.	
25	NC	No Connection.	
26	BL-POWER (NC)	No Connection.	
27	BL-POWER (NC)	No Connection.	
28	BL-POWER (NC)	No Connection.	
29	BL-POWER (NC)	No Connection.	
30	NC	No Connection.	

6. Timing Characteristics

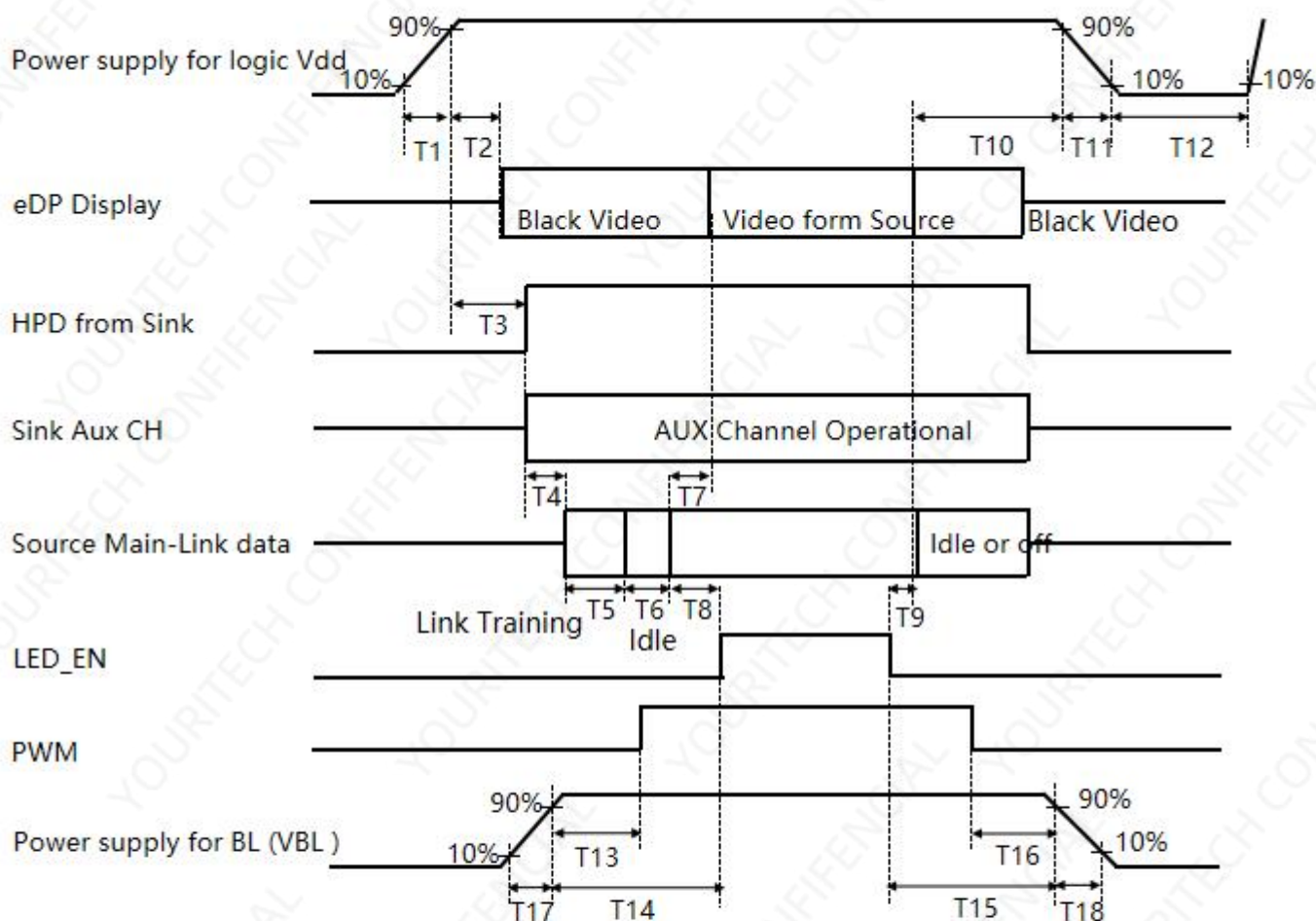
SIGNAL TIMING SPECIFICATION

The QV116FHB-N81 is operated by the DE only.

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
DCLK Frequency	fclk	-	477	-	MHz
Horizontal display area	thd	1920			pixel
HSYNC period time	th	-	2142	-	pixel
HSYNC blanking	thb+ thfp	-	222	-	pixel
Vertical display area	Tvd	1080			H
Frequency	fV	48	60	65	Hz
VSYNC period time	Tv	-	1100	-	H
VSYNC blanking	Tvb+ Tvfp	-	20	-	H

POWER SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



- $0.5\text{ms} \leq T1 \leq 10\text{ms}$
- $0\text{ms} \leq T2 \leq 200\text{ms}$
- $0\text{ms} \leq T3 \leq 200\text{ms}$
- $0\text{ms} \leq T13$
- $0\text{ms} \leq T14$
- $0\text{ms} \leq T17$
- $80\text{ms} \leq T8$
- $0\text{ms} \leq T7 \leq 50\text{ms}$
- $0\text{ms} \leq T10 \leq 500\text{ms}$
- $0.5\text{ms} \leq T11 \leq 10\text{ms}$
- $500\text{ms} \leq T12$
- $0\text{ms} \leq T15$
- $0\text{ms} \leq T16$
- $0\text{ms} \leq T18$

Notes:

1. When the power supply VDD is 0V, keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on. Back Light must be turn on after power for logic and interface signal are valid.

7.Optical Characteristics

Overview

The test of view angle range shall be measured in a dark room (ambient luminance $\leq 1\text{lux}$ and temperature = $25\pm 2^\circ\text{C}$) with the equipment of Luminance meter system (Goniometer system and TOPCON CS2000/CA310) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and ϕ equal to 0° . We refer to $\theta=0$ ($=\theta_3$) as the 3 o'clock direction (the "right"), $\theta=90$ ($=\theta_{12}$) as the 12 o'clock direction ("upward"), $\theta=180$ ($=\theta_9$) as the 9 o'clock direction ("left") and $\theta=270$ ($=\theta_6$) as the 6 o'clock direction ("bottom"). While scanning θ and/or ϕ , the center of the measuring spot on the Display surface shall stay fixed. The luminance, color and uniformity (etc) should be tested by CS2000/CA310. VDD shall be $3.3 \pm 0.3\text{V}$ at 25°C . Optimum viewing angle direction is 6 'clock

<Table 5. Optical Specifications>

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	-	85	-	Deg.	Note 1
		Θ_9		-	85	-	Deg.	
	Vertical	Θ_{12}		-	85	-	Deg.	
		Θ_6		-	85	-	Deg.	
Luminance Contrast ratio		CR	$\Theta = 0^\circ$	800	1000	-		Note 2
Response Time		T _{RT}	Ta= 25° C $\Theta = 0^\circ$	-	30	35	ms	Note 6
Cross Talk		CT	$\Theta = 0^\circ$	-	-	2.0	%	Note 7

Notes : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing angles are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1).

2. Contrast measurements shall be made at viewing angle of $\Theta = 0$ and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (see FIGURE 1) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. The electro-optical response time measurements shall be made as FIGURE 3 by switching the "data" input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r , and 90% to 10% is T_d .
4. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance (YA) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance (YB) of that same area when any adjacent area is driven dark. (See FIGURE 4).

Optical measurements

Figure 1. Measurement Set Up

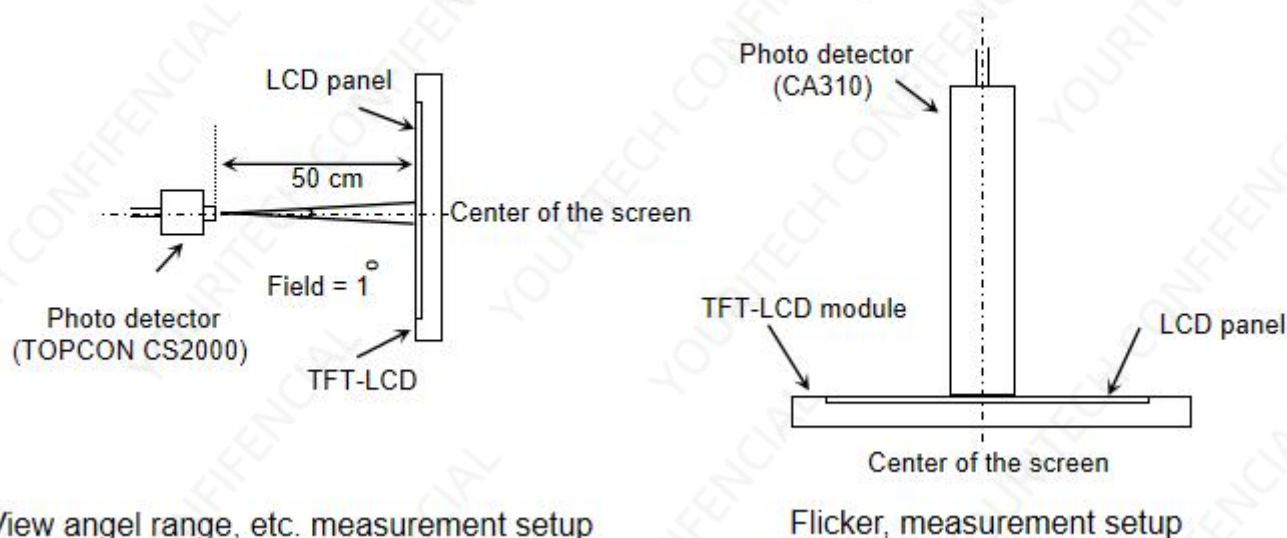
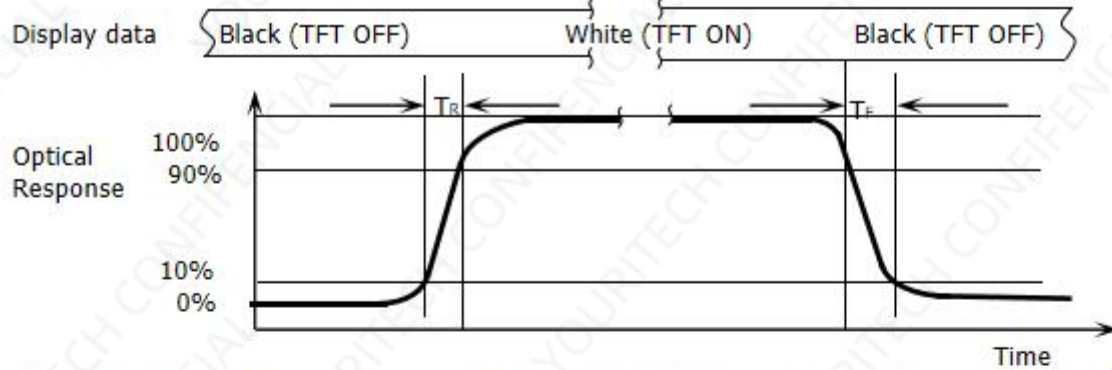
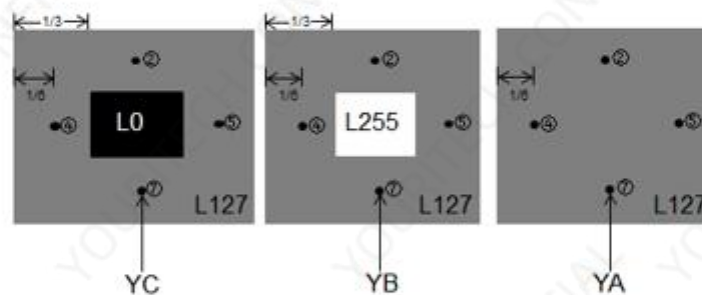


Figure 2. Response Time Testing



The electro-optical response time measurements shall be made as shown in FIGURE 3 by switching the “data” input signal ON and OFF. The times needed for the luminance to change from 10% to 90% is T_r and 90% to 10% is T_d .

Figure 3. Cross Modulation Test Description



$$\text{White Bar Cross-Talk(\%)} = \left| \frac{YB - YA}{YA} \right| \times 100$$

$$\text{Black Bar Cross-Talk(\%)} = \left| \frac{YC - YA}{YA} \right| \times 100$$

Where:

YA = Initial luminance of measured area (cd/m²)

YB = Subsequent luminance of measured area (cd/m²) @White Bar

YC = Subsequent luminance of measured area (cd/m²) @Black Bar

The location measured will be exactly the same in both patterns

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	+70°C / 96H	
4	Low Temp. Operating	-20°C / 96H	
5	High Temperature / Humidity storage	60°C x 90%RH / 96H	
6	Thermal and cold shock	Static state, -20°C (30min) ~70°C (30min), 10 cycles	ESD
7	Air	±8KV, 150pF(330) 1sec, 100 points, 1 times/ point	
8	Contact	±4KV, 150pF(330) 1sec, 100 points, 1 times/ point	

9. Packing Method----TBD

- END -