YOURITech
AN EUROTECH COMPANY

INDUSTRIAL STRENGTH...
Start Your Application From YOURITECH

Integration support
Obsolescence Management
PCAP
Embedded Systems
Human Machine Interface
Touch Solutions
Production
Custom designs
Installation
Software
Mechanical design
Quality Management
Open Frame Monitors
LCD Controller
Research & Development
Firmware
EMC tests
on-site service
In-house Manufacturing
Optical Bonding
Cover glass
System solutions
OEM Solutions
Custom Display

Erotech YOURITech AN EUROTECH COMPANY AOSHITE 奥视特 Your Reliable Display Panel and Smart Touch Embedded Solution Partner

For more information about comprehensive display panels and touch embedded solutions, welcome contact us at:

https://www.youritech.com
info@youritech.com

Project No. 项目编号	ET045FH10-T
Customer 客户名称	
Module No. 客户型号	
Product type 产品内容	**Standard LCD Module** **TFT：1920*RGBx1080Dots** **4.45”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

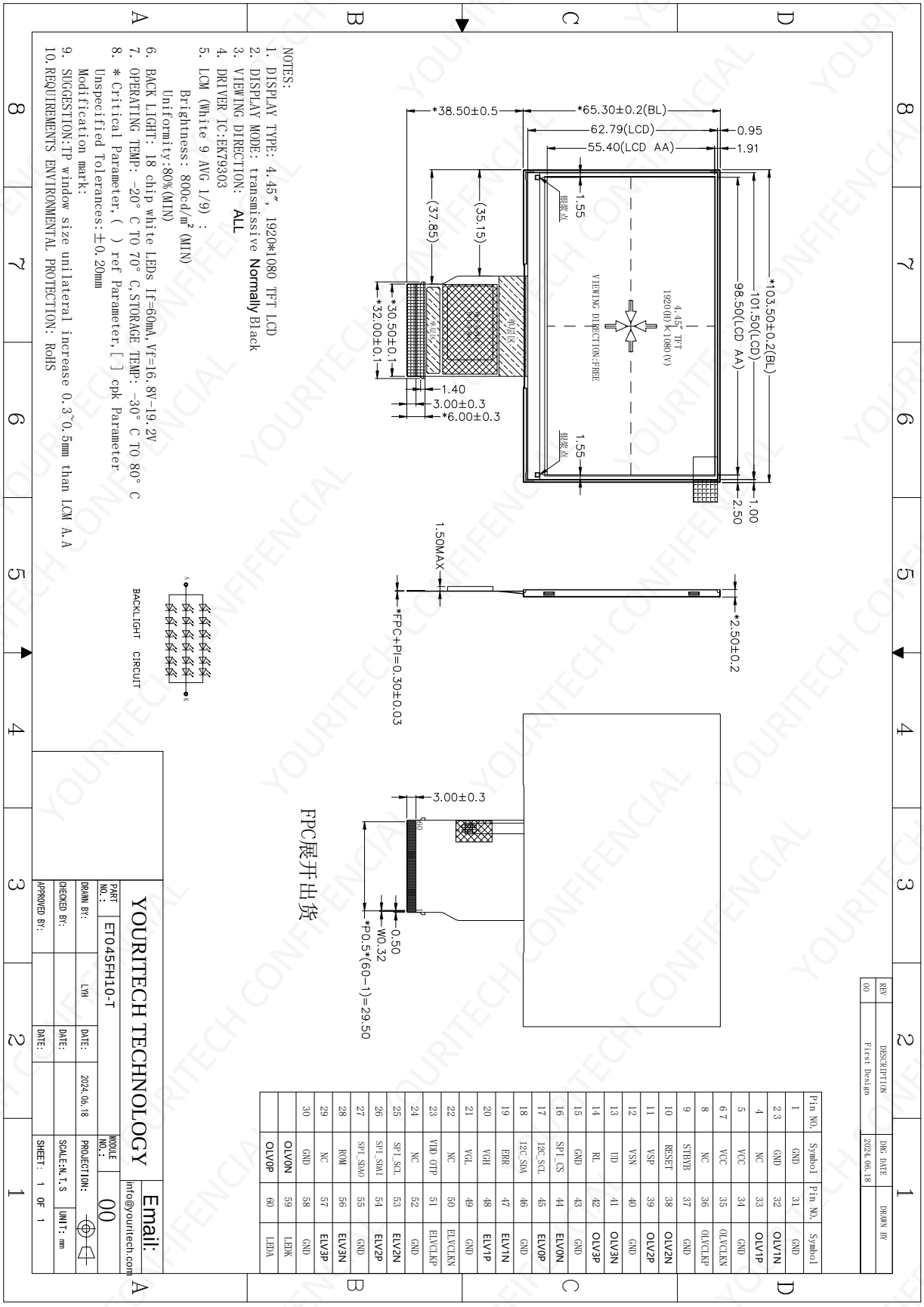
This specification applies to the LCD module that is supplied by YOURITECH TECHNOLOGY
LCD specification: Dots 1920xRGBx1080
As to basic specification of the driver IC, refer to the IC (EK79303) specification and data book.
All material & processing of the LCD module should be Lead Free.

1.2 TFT features:

Structure: TFT PANNEL+IC +FPC+BL;
ALL Viewing Type LCD
1920 dot-segment and 1080 dot-common outputs;
16.7M Color can be selected by software;
White LED back light;
Double 8-bit LVDS interface

2. LCM General specification

ITEM	Sandard 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)	0.0513(H) X 0.0513(V)	mm
Active area	98.50(H) x55.40(V)	mm
Viewing direction	ALL O'CLOCK	--
TFT Driver IC	EK79303	--
TFT interface	Double 8-bit LVDS interface	--
Approx. Weight	TBD	g
LCM Size(W*H*T)	103.50(W) ×65.30(H) ×2.50(T)	mm
Touch structure	--	--
Touch Driver IC	--	--
Touch Interface	--	--



Pin NO.	Symbol	Pin NO.	Symbol
1	GND	31	GND
2 3	GND	32	OLV1N
4	NC	33	OLV1P
5	VCC	34	GND
6 7	VCC	35	OLVCLKN
8	NC	36	OLVCLKP
9	STBYB	37	GND
10	RESET	38	OLV2N
11	VSP	39	OLV2P
12	VSN	40	GND
13	UD	41	OLV3N
14	RL	42	OLV3P
15	GND	43	GND
16	SPI_CS	44	ELVON
17	I2C_SCL	45	ELVOP
18	I2C_SDA	46	GND
19	ERR	47	ELV1N
20	VGH	48	ELV1P
21	VGL	49	GND
22	NC	50	ELVCLKN
23	VDD_OTP	51	ELVCLKP
24	NC	52	GND
25	SPI_SCL	53	ELV2N
26	SPI_SDAI	54	ELV2P
27	SPI_SDAO	55	GND
28	ROM	56	ELV3N
29	NC	57	ELV3P
30	GND	58	GND
	OLVON	59	LEDK
	OLVOP	60	LEDA

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 DC Characteristics

Characteristics	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage for(DC/DC)	VDD	3.0	3.3	3.3	V
Analog voltage	VSP	4.8	5.8	6	V
Analog voltage	VSN	-6	-5.8	-4.8	V

4.2 Back-Light Unit Characeristics

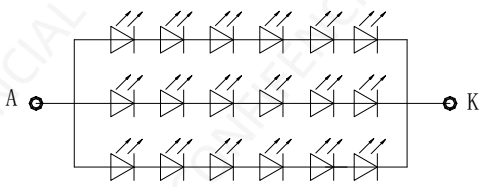
The back-light system is an edge-lighting type with 18white LEDs. The characteristics of the back-light are shown in the following tables.

Characteristics	Symbol	Min.	Type	Max.	Unit	Notes
Forward Voltage	V_F	16.8	--	19.2	V	--
Forward current	I_F	--	60	--	mA	--
Luminance(With LCD)	Lv	--	800	--	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:



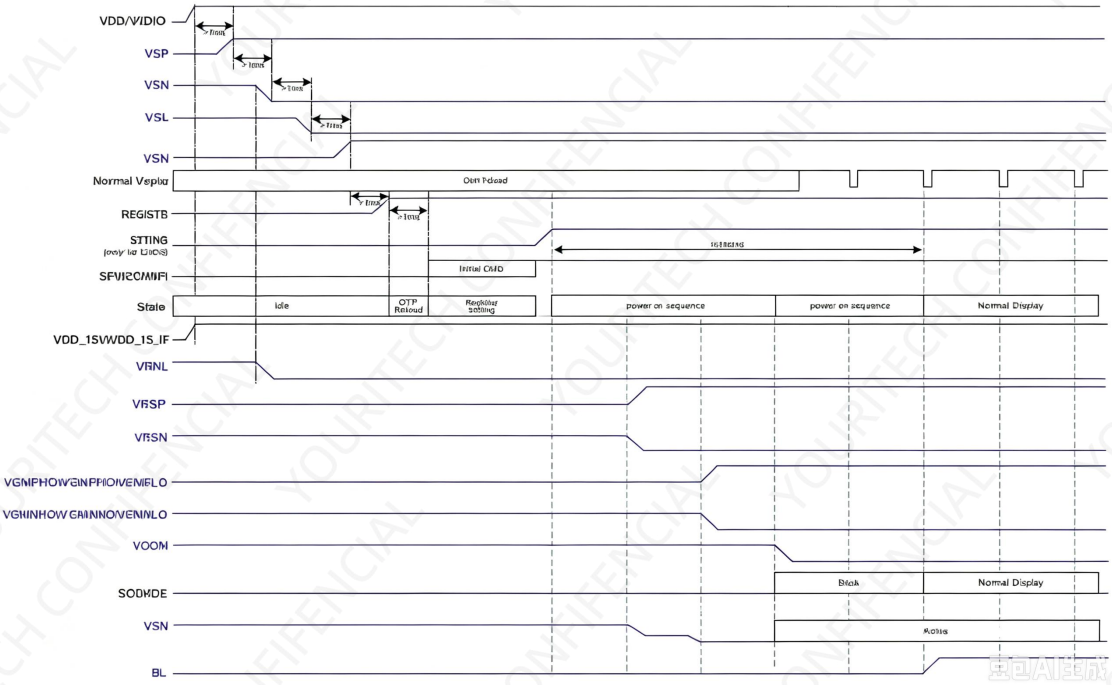
5. Module Function Description

Pin No.	Symbol	LCM Functional	Notes
1	GND	Power Ground	
2	GND	Power Ground	
3	NC	No Connection.	
4	VCC3.3V	Power Supply For LCD.	
5	VCC3.3V	Power Supply For LCD.	
6	NC	No Connection.	
7	STBYB	Standby mode, Normally pulled high. STBYB = “1”, Normal operation STBYB = “0”, Enter standby mode for power saving.	
8	RESET3.3V	Reset Signal input pin.	
9	VSP	External input voltage(5.8V)	
10	VSN	External input voltage(-5.8V)	
11	U/D	Gate Up or Down scan control.Normally pull low.	
12	R/L	Source Right or Left sequence control.Normally pull high.	
13	GND	Power Ground	
14	SPI-CS	Chip selection signal(SPI).	
15	I2C-SCL	Serial clock signal(I2C).	
16	I2C-SDA	Serial data input/output pin(I2C).	
17	ERR	Output pin for error detection. "Hi-z" : no error detected (internal pull-high) Leave this pin open.	
18	VGH	No Connection.	
19	VGL	No Connection.	
20	NC	No Connection.	
21	VDD-OTP	Power supply for OTP circuit	
22	NC	No Connection.	
23	SP-SCL	Serial clock signal(SPI).	
24	SP-SDAI	Serial data input/output pin(SPI).	
25	SP-SDAO	Serial data output pin(SPI).	
26	ROM	MTP reload per 30 frames: ‘H’: Enable auto-reload MTP ‘L’: Disable auto-reload MTP External pull high.	
27	NC	No Connection.	
28	GND	Power Ground	
29	OLV0N	Negative LVDS differential data0 inputs	
30	OLV0P	Positive LVDS differential data0 inputs	
31	GND	Power Ground	
32	OLV1N	Negative LVDS differential data1 inputs	
33	OLV1P	Positive LVDS differential data1 inputs	
34	GND	Power Ground	
35	OLVCLKN	Negative LVDS differential clock inputs	
36	OLVCLKP	Positive LVDS differential clock inputs	
37	GND	Power Ground	

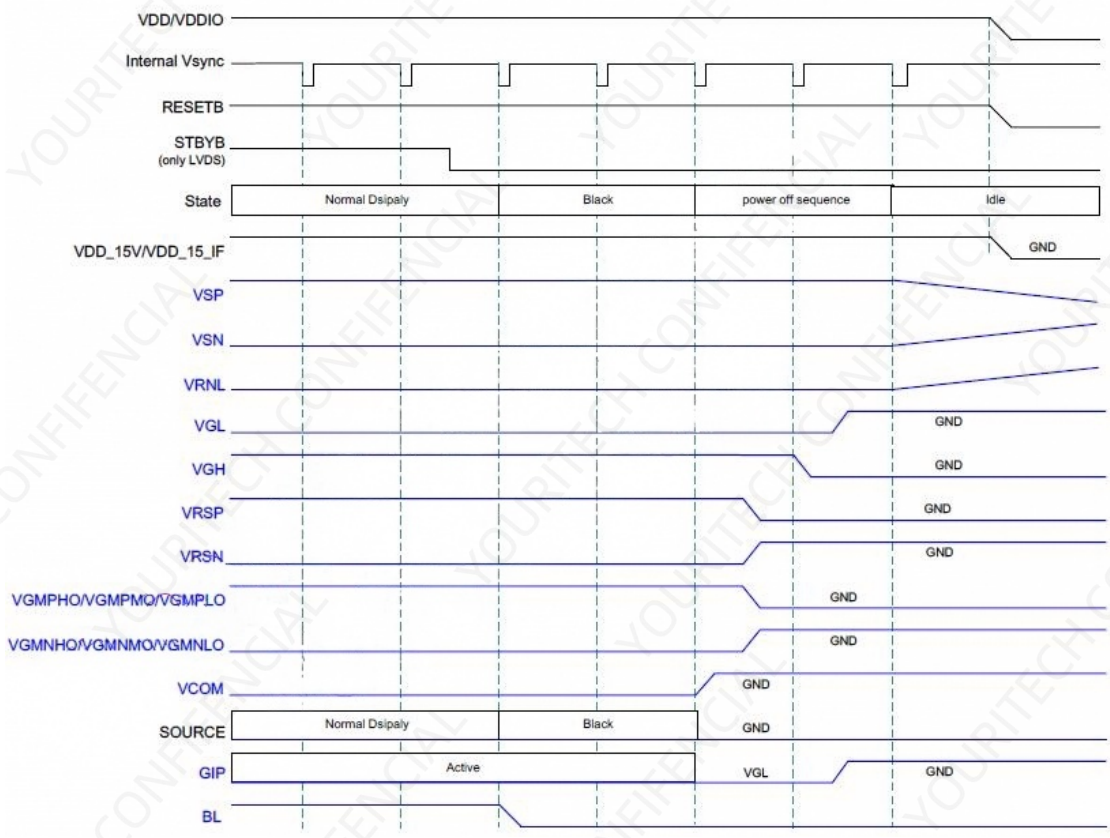
38	OLV2N	Negative LVDS differential data2 inputs	
39	OLV2P	Positive LVDS differential data2 inputs	
40	GND	Power Ground	
41	OLV3N	Negative LVDS differential data3 inputs	
42	OLV3P	Positive LVDS differential data3 inputs	
43	GND	Power Ground	
44	ELV0N	Negative LVDS differential data0 inputs	
45	ELV0P	Positive LVDS differential data0 inputs	
46	GND	Power Ground	
47	ELV1N	Negative LVDS differential data1 inputs	
48	ELV1P	Positive LVDS differential data1 inputs	
49	GND	Power Ground	
50	ELVCLKN	Negative LVDS differential clock inputs	
51	ELVCLKP	Positive LVDS differential clock inputs	
52	GND	Power Ground	
53	ELV2N	Negative LVDS differential data2 inputs	
54	ELV2P	Positive LVDS differential data2 inputs	
55	GND	Power Ground	
56	ELV3N	Negative LVDS differential data3 inputs	
57	ELV3P	Positive LVDS differential data3 inputs	
58	GND	Power Ground	
59	LEDK	Power supply for backlight cathode input terminal.	
60	LEDA	Power Supply For LED Backlight Anode Input.	

6. Timing Characteristics

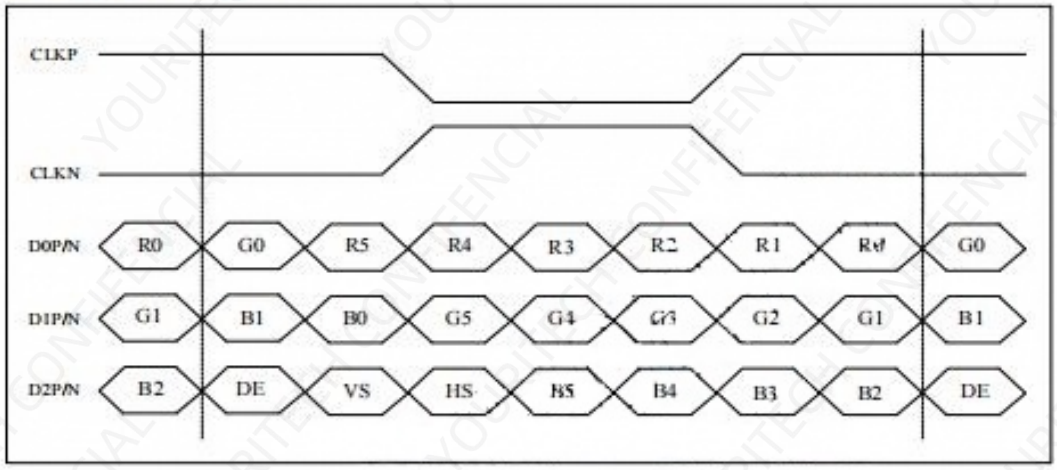
Power on sequence:



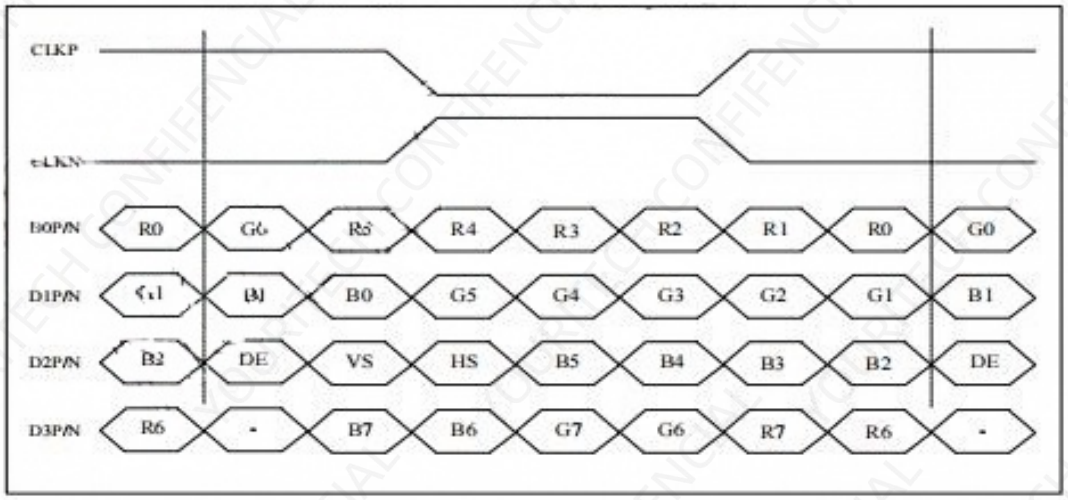
Power off sequence:



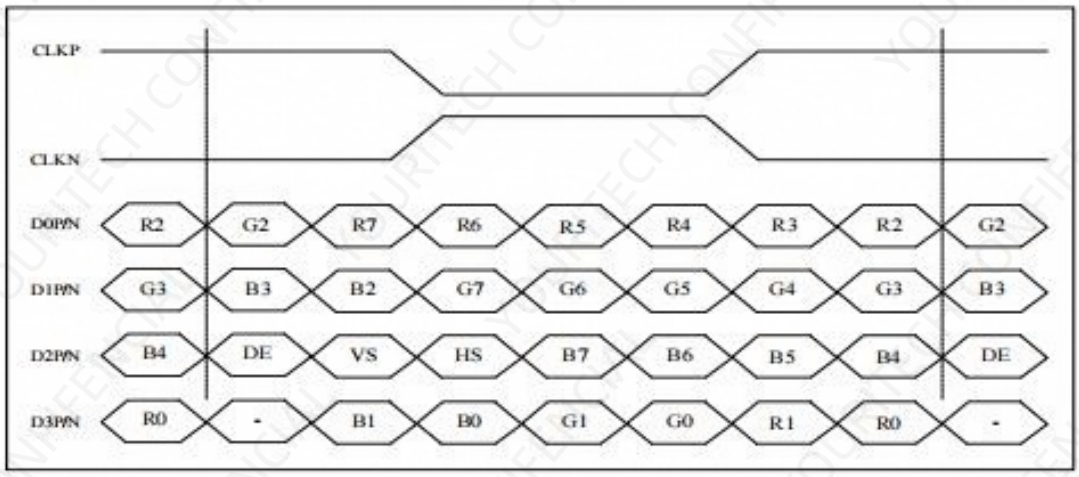
LVDS data input format



6-bit RGB LVDS input timing



8-bit RGB LVDS VESA input timing



8-bit RGB LVDS JEIDA input timing

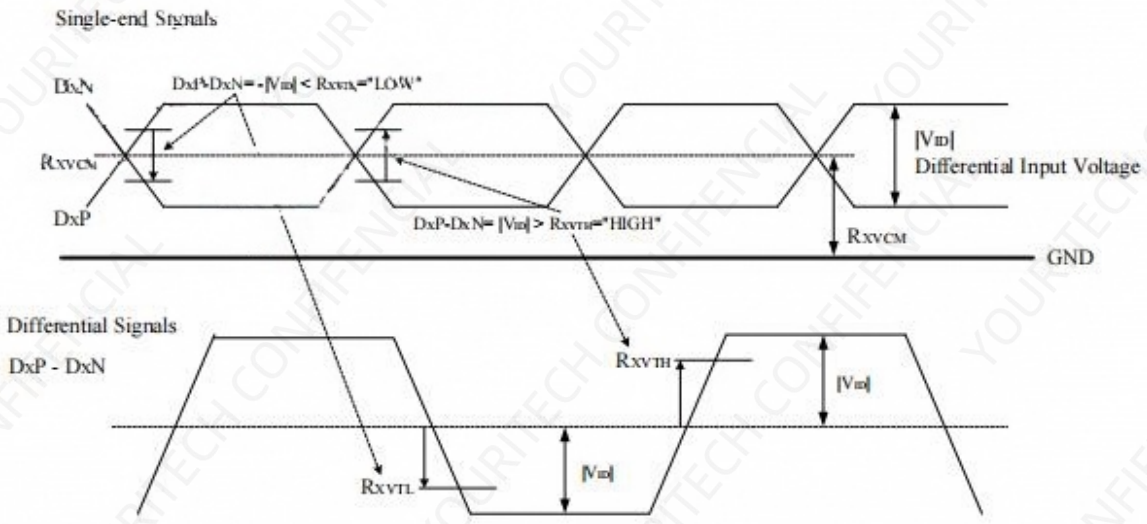
LVDS DC electrical characteristicLVDS

DC electrical characteristics

(Test condition: VDD=3.0V~3.6V, VSS=0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Differential input high threshold voltage	R_{XVTH}			+37	mV	
Differential input low threshold voltage	R_{XVTL}	-37			mV	
Input voltage range (singled-end)	R_{XVIN}	400	-	1400	mV	
Differential input common mode voltage	R_{XVCM}	600	1200	1400	mV	1. R_{XVCM}+|V_{ID}|<=1400mV. 2. R_{XVCM}-|V_{ID}|>=400mV.
Differential input voltage	|V_{ID}|	200	400	600	mV	
Differential input impedance	Z_{ID}	85	100	115	ohm	1. R_{XVCM} = 1.2V condition.
		105	120	135	ohm	1. R_{XVCM} = 0.9V condition.
Differential input leakage current	I_{LCLVDS}	-10	-	+10	uA	

Note: When R_{XVCM}=0.9V, user can use external resistance in parallel to fit 100 ohm application.



LVDS AC electrical characteristic

Parameter	Symbol	Spec.			Unit	Condition
		Min.	Typ.	Max.		
Clock frequency	R_{xFCLK}	20	-	76	MHz	Refer to input timing table for each display resolution
Input data skew margin	T_{RSKM}	-0.2	-	0.2	UI	|VID| = 200mV RxVCM = 1.2V 1UI=1/(RxFCLKx7)
Clock high time	T_{LVCH}	-	3.5/(7* R_{xFCLK})	-	ns	
Clock low time	T_{LVCL}	-	3.5/(7* R_{xFCLK})	-	ns	
PLL wake-up time	T_{enPLL}	-	-	150	us	

Table : LVDS mode AC electrical characteristics

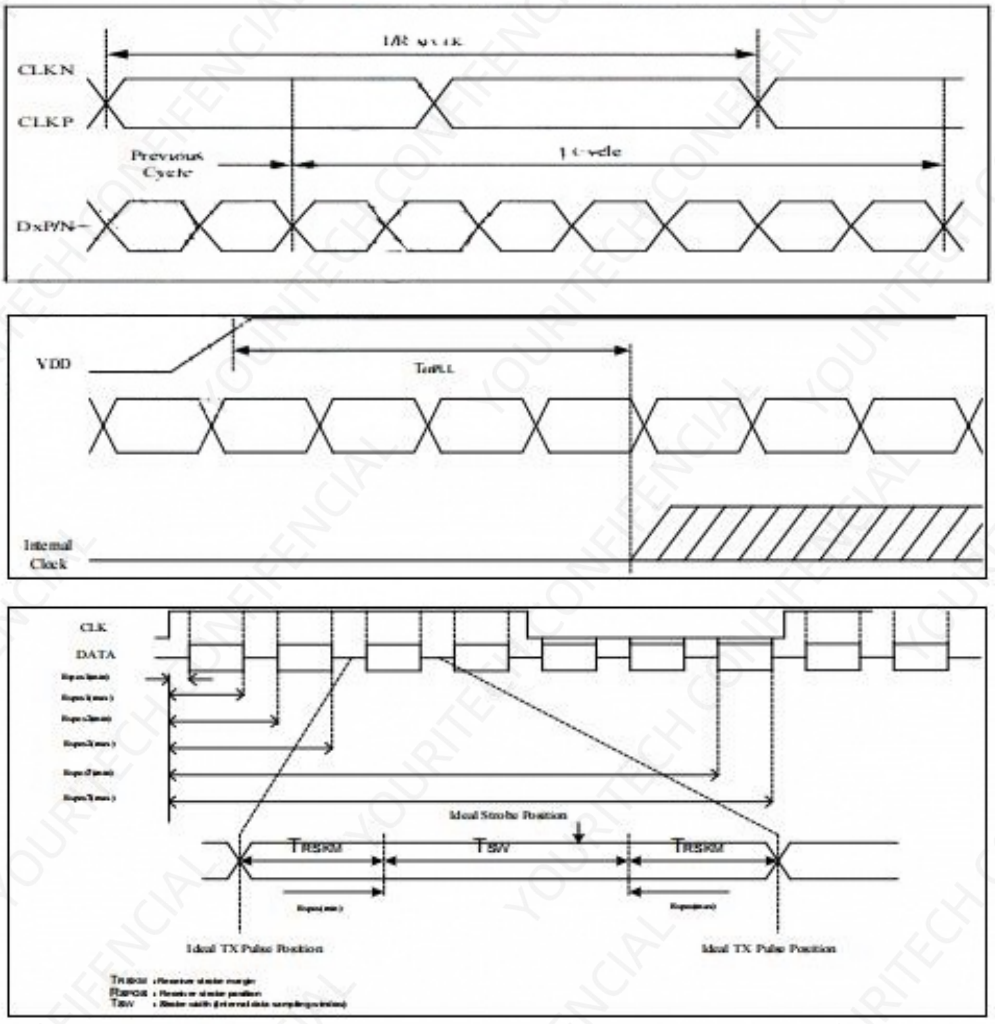


Figure : LVDS figure

7. Optical Characteristics

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing Angle range	Horizontal	Θ_3	CR > 10	70	80	-	Deg.	
		Θ_9		70	80	-	Deg.	
	Vertical	Θ_{12}		70	80	-	Deg.	
		Θ_6		70	80	-	Deg.	
Luminance Contrast ratio		CR	Θ = 0°	1000	1500	-	-	
FOG Transmittance		Tr		6.4	7.5	-	%	高透POL不带APF&Haze 19000K 投影COB光源
Red Chromaticity		x	CIE 1931	0.587	0.617	0.647	-	Bare CF Glass @C-Light
Red Chromaticity		y		0.291	0.321	0.351	-	
Green Chromaticity		x		0.290	0.320	0.350	-	
Green Chromaticity		y		0.491	0.521	0.551	-	
Blue Chromaticity		x		0.113	0.143	0.173	-	
Blue Chromaticity		y		0.089	0.119	0.149	-	
White Chromaticity		x		0.277	0.307	0.337	-	
White Chromaticity		y		0.292	0.322	0.352	-	
Color Gamut (C light)			NTSC		70	-	%	
Response Time (Rising + Falling)		T_{RT}	Ta= 25° C Θ = 0°	-	-	45	ms	Tr+Tf, @60°C

Note :

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 4).

2. Contrast measurements shall be made at viewing angle of Θ= 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. Transmittance is the Value with High Transmission Polarizer.

4. The color chromaticity coordinates specified in Table 5 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5. 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 Tr, and 90% to 10% is Tf.

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	+70°C / 96H	
4	Low Tempe. Operating	-20°C / 96H	
5	High Temperature /Humidity storage	60°C x 90%RH /96H	
6	Thermal and cold shock	Static state，-20℃（30min）~70℃（30min），10 cycles	

9. Packing Method----TBD

- END -