Specification
For
Approval

■Preliminary specification
□ Final specification

Title	10.25 1920*720 ADS TFT-LCD (Module)

Buyer	
Model	

Supplier	Cheng Du BOE Optoelectronics Technology CO., LTD
Model	AV103Z7M-N10

TITLE/SIGNATURE	DATE
_____	_____
_____	_____
_____	_____
_____	_____

Please return one copy confirmation with signature and your comments

ITEM	SIGNATURE/DATE
Approved	_____
Reviewed	_____
Reviewed	_____
Prepared	_____

BOE CHENG DU
Optoelectronics Technology CO., LTD

CONTENT LIST

Record of Revisions				
Revision	Date	Page	Description	Released by
Pre.0	2019.1.29		Initial Released	Jiao Fang

1.0 GENERAL DESCRIPTION

1.1 Introduction

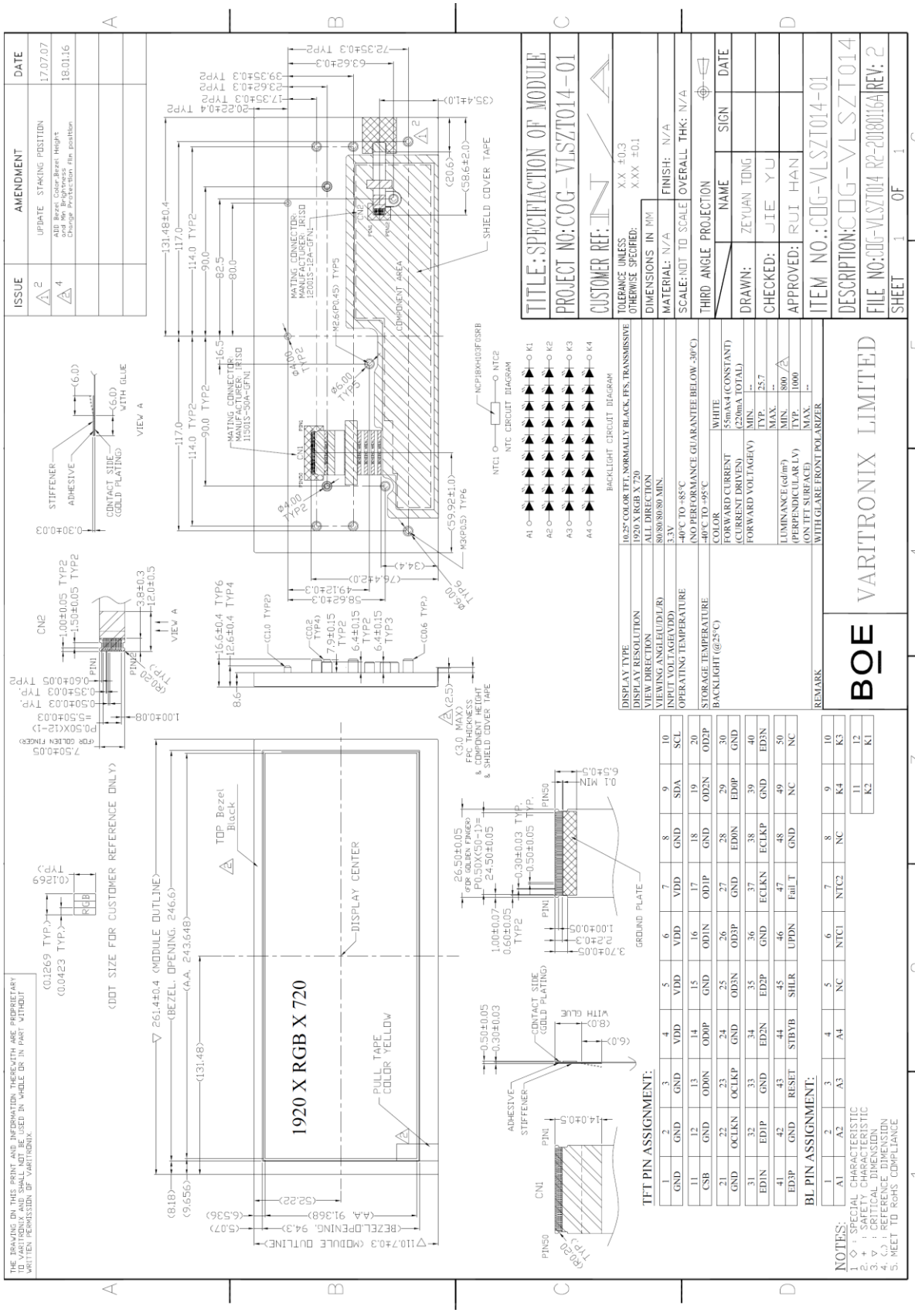
AV103Z7M-N10 is a color active matrix TFT-LCD Panel using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This model is composed of a TFT-LCD Panel, a driving circuit and a back light system. It is a transmissive type display operating in the normal white. This TFT-LCD has a 10.25 inch diagonally measured active area with WVGA resolutions (1920 horizontal by 720 vertical pixel array). Each pixel is divided into Red, Green, Blue dots which are arranged in vertical stripe and this panel can display 16.7M colors.

1.2 Features

- 10.25" (diagonal), 8:3, landscape, normally black, ADS, transmissive, amorphous silicon TFT LCD module
- Display Resolution: 1920 x RGB x 720
- Wide viewing angle (U/D/L/R): 85/85/85/85
- Display up to 16.7M colours
- 24-bit dual port LVDS interface (with T-CON)
- HC front polarizer
- White LED backlight
- NTC Thermistor included
- RoHS Compliance

1.3 General Specifications (H: horizontal length, V: vertical length)

Parameters		Specifications	Unit
Outline dimensions	Width x Height	261.4(W) x 110.7(H) x 8.6(T)	mm
Color TFT 1920 x RGB x 720	Bezel opening	246.6 (W) x 94.3 (H)	mm
	Active area	243.648(W) x 91.368(H)	mm
	Display format	1920 x RGB x 720	dots
	Color configuration	RGB Vertical stripes	-
	Dot pitch	(0.0423*3) (W) x 0.1269 (H)	mm
Backlight		LED	-
Weight		Approx.:~360g	g


TITLE: SPECIFIACTION OF MODULE
PROJECT NO: COG-VLSZT014-01
CUSTOMER REF:
DESCRIPTION: COG-VLSZT014
FILE NO: COG-VLSZT014 R2-20180116
REV: 2
ITEM NO.: COG-VLSZT014-01
VARITRONIX LIMITED
1920 X RGB X 720
TFT PIN ASSIGNMENT:
BL PIN ASSIGNMENT:
NOTES:

2.0 ELECTRICAL SPECIFICATION

2.1 The product or its functions may subject to permanent damage if it's stressed beyond those absolute maximum ratings listed below. Exposure to absolute maximum rating conditions for extended periods may affect display module reliability.

Table 3: Absolute Maximum Ratings & Environmental Conditions

Item	Symbol	Min.	Max.	Unit
Digital supply voltage	VDD	-0.3	+3.96	V
Digital I/O input signals	V_{IO}	-0.3	VDD+0.3	V
Single LED forward current	I_F	-	150	mA
Total LED forward current	I_F (Total)	-	600	mA
Relative Humidity (at 60°C, Note 3)	RH		90	%
Operating Temperature (Note 2)	Topr	-40	+85	°C
Storage Temperature(Note 2)	Tstg	-40	+95	°C

Note 1: GND=VSS=0V.

Note 2: After the reliability test, the product only guarantee function normally without any fatal defect (non-display, line defect, abormal display etc).

Note 3: No condensation allowed under any condition.

[Caution]

Do not display fixed pattern for prolonged hours because it may develop image sticking on the display.

2.2 TFT LCD Module DC Characteristics-Typical Electrical Characteristics

At Ta = 25 °C, VDD=3.3V, GND=0V

Table 4

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage f	VDD	3.0	3.3	3.6	V
Power supply current for DCDC	IVDDA (Note 2)	-	240	450	mA
Power supply current for Logic	IDD (Note 2)	-	40	60	mA
Driver input high signal voltage	V_{IH}	0.7*VCC	-	VCC	V
Driver input low signal voltage	V_{IL}	GND		0.3*VCC	
LED Life Time (50%)	(Note 3)	30000	-	-	hrs

Note 1: There is tolerance in optimum LCD driving voltage during production and it will be within the specified range.

Note 2: All white pattern.

Note 3: The "LED Life Time" is defined as the time period when the brightness decrease to 50% of the initial value under continuous lighting at 25ºC (dry condition) with the recommended driving current

Table 5:LVDS DC Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Differential input high Threshold voltage	V_{th}	-	-	+0.1	V
Differential input low threshold voltage	V_{tl}	-0.1	-	0	V
Differential input common Mode voltage	VCM	1	1.2	1.7-| V_{ID} |/2	V
LVDS input voltage	V_{INLV}	0.7		1.7	V
Differential input voltage	| Vid |	0.1		0.6	V
Differential input leakage Current	Ilvleak	-10	-	+10	uA

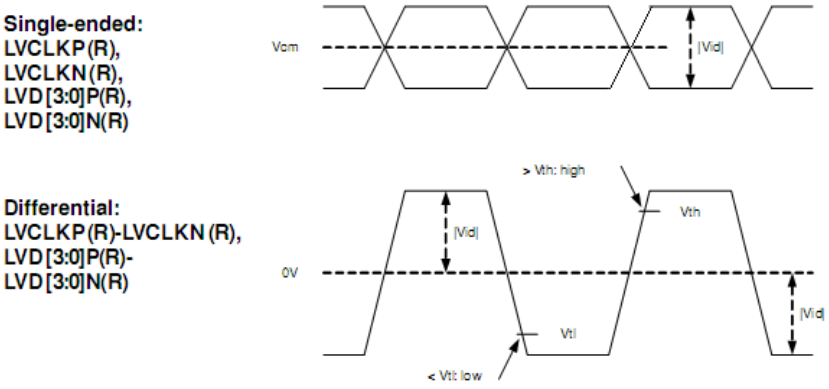


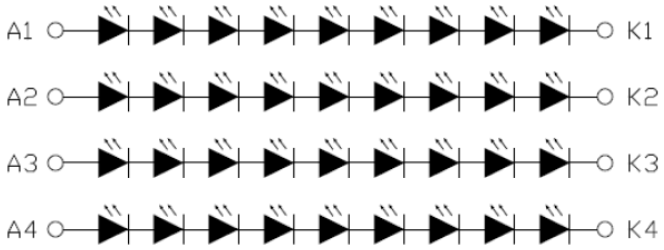
Figure 3

2.3 Backlight Driving Conditions

Table 6 **(Ta = 25℃)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Supply voltage of LED backlight	V_{LED}	Backlight current = 220 mA Number of LED dies = 36 pcs	23.6	25.8	29.7	V	Note 1
Supply current of LED backlight	$I_{LED1/4}$	Per LED string	-	55	60	mA	Note 2
Total Supply current of LED backlight	$I_{LEDTotal}$	$I_{LED1} + \ldots + I_{LED4}$	-	220	240	mA	Note 2
Backlight Power Consumption	P_{LED}	-	-	5.7	7.1	W	Note 3

Note 1: Backlight Circuit Diagram, the minimum meet the threshold voltage



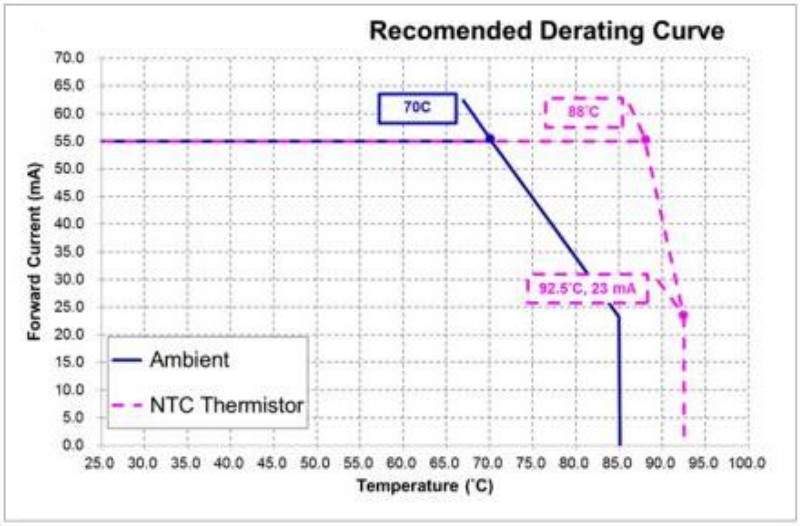
BACKLIGHT CIRCUIT DIAGRAM

Note 2: The LED driving condition is defined for each LED and applied to this module only.
Total input current = 55 x 4= 220 mA

Note 3: Backlight power consumption is calculated by I_{LED} (Total) x V_{LED}

Note 4：Backlight driving current best at 220mA（for total）/55mA (Per LED string)or below , and Should not significantly exceed 220mA (for total)/ 55mA (Per LED string)at all temperature ; Otherwise, overheating may happen and may damage the backlight.

Backlight Driving Derating Curve

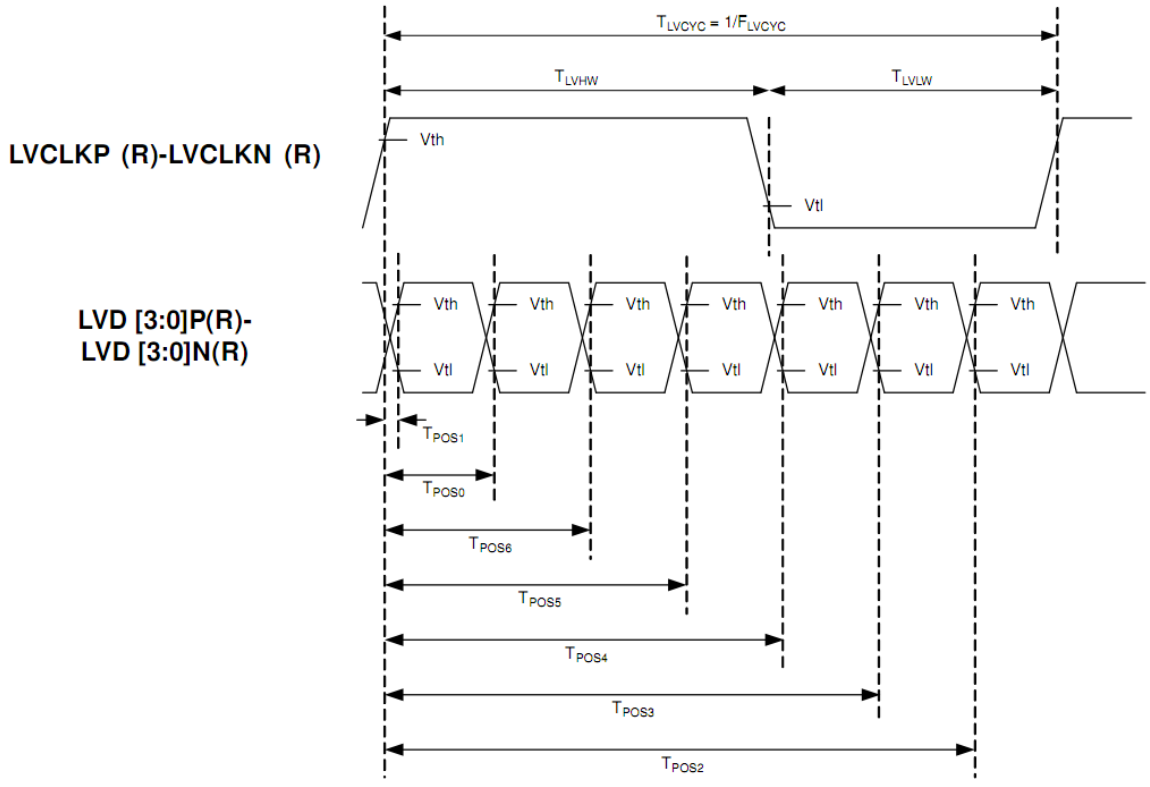


2.5 Power ON/OFF Sequence

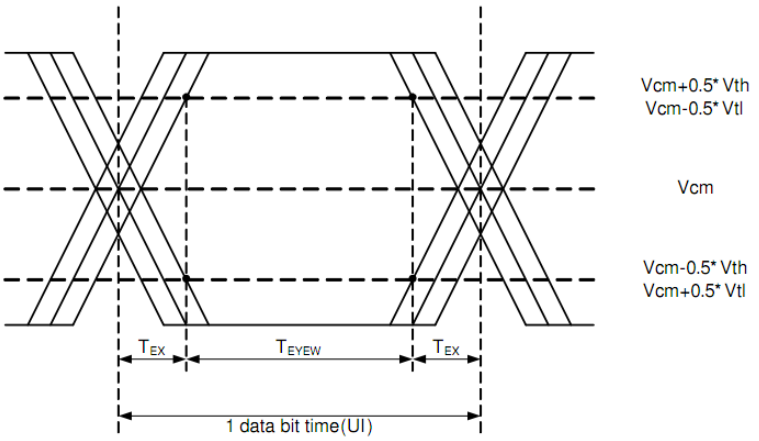
1.1.1 LVDS AC electrical characteristics

Table 7: AC Characteristic of LVDS

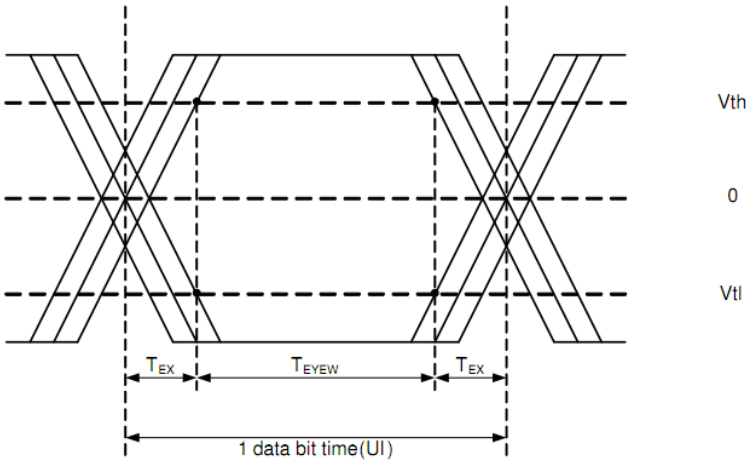
Parameter	Symbol	Min.	Typ.	Max.	Unit
Clock frequency	F_{LVCYC}	20	-	85	MHz
Clock period	T_{LVCYC}	11.76			ns
1 data bit time	UI		1/7		T_{LVCYC}
Clock high time	TLVCH		4		UI
Clock low time	TLVCL		3		UI
Position 1	T_{POS1}	-0.2	0	0.2	UI
Position 0	T_{POS0}	0.8	1	1.2	UI
Position 6	T_{POS6}	1.8	2	2.2	UI
Position 5	T_{POS5}	2.8	3	3.2	UI
Position 4	T_{POS4}	3.8	4	4.2	UI
Position 3	T_{POS3}	4.8	5	5.2	UI
Position 2	T_{POS2}	5.8	6	6.2	UI
Input eye width	T_{EYEW}	0.6	-	-	UI
Input eye border	T_{EX}	-	-	0.2	UI
LVDS wake up time	T_{ENLVDS}	-	-	150	us

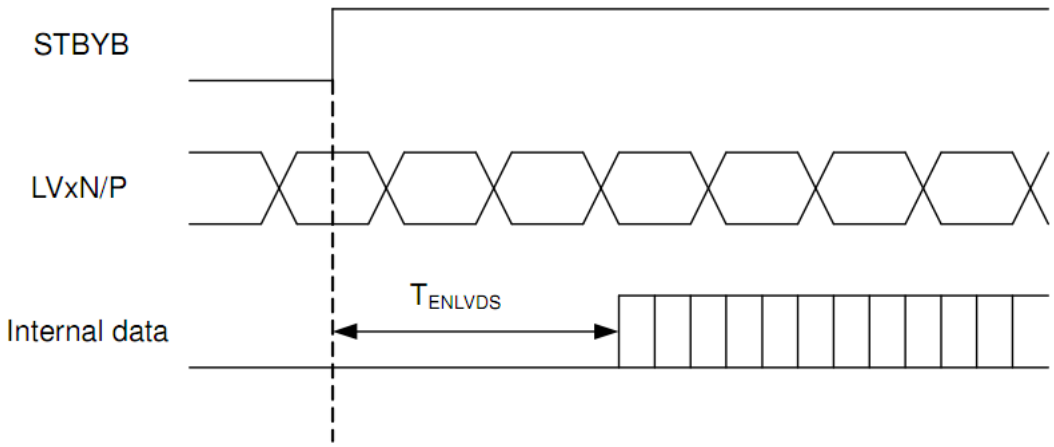


Single-ended:
LVD[3:0]P,
LVD[3:0]N



Differential:
LVD[3:0]P-LVD[3:0]N





1.1.1 LVDS Input Format

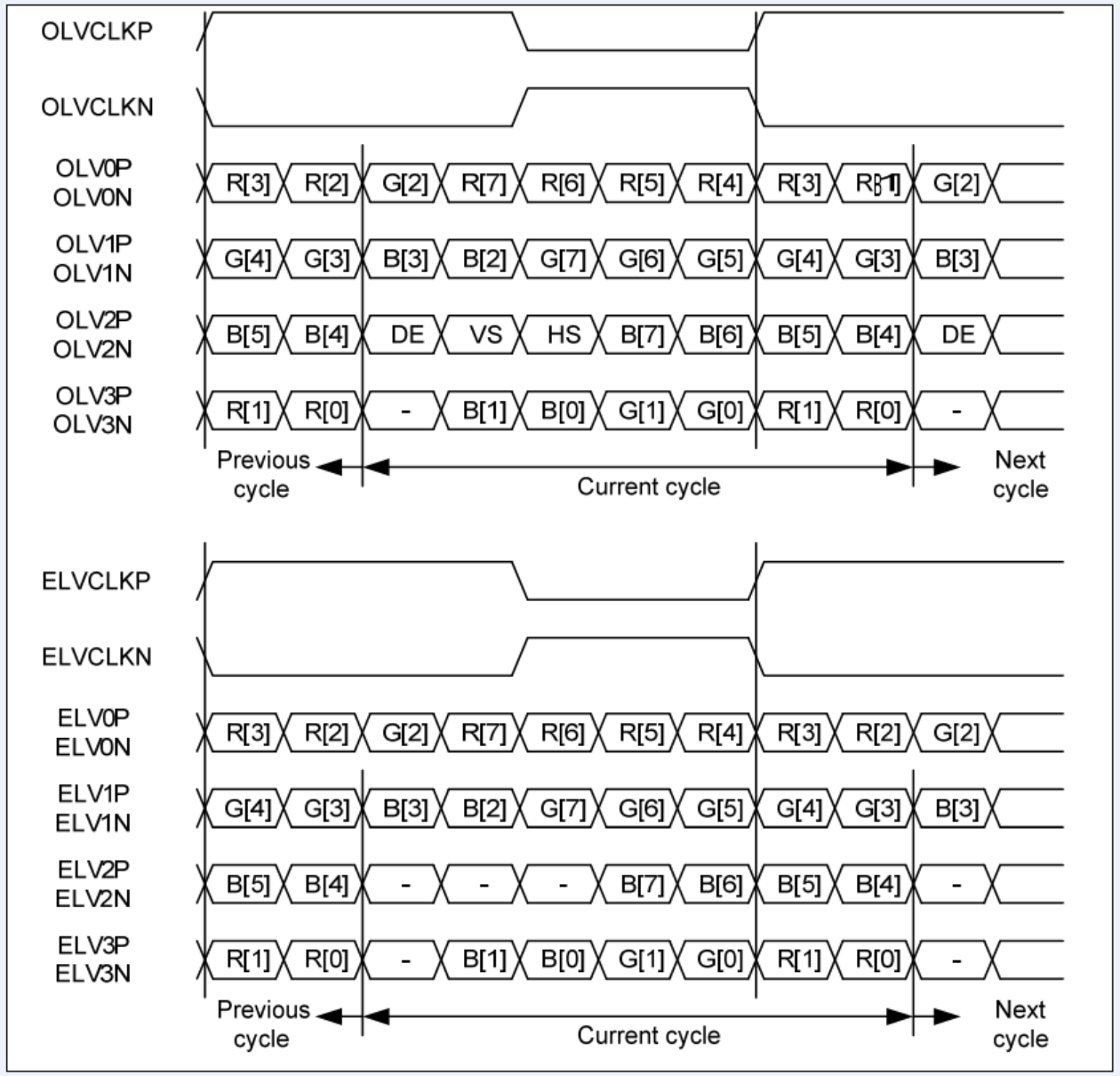


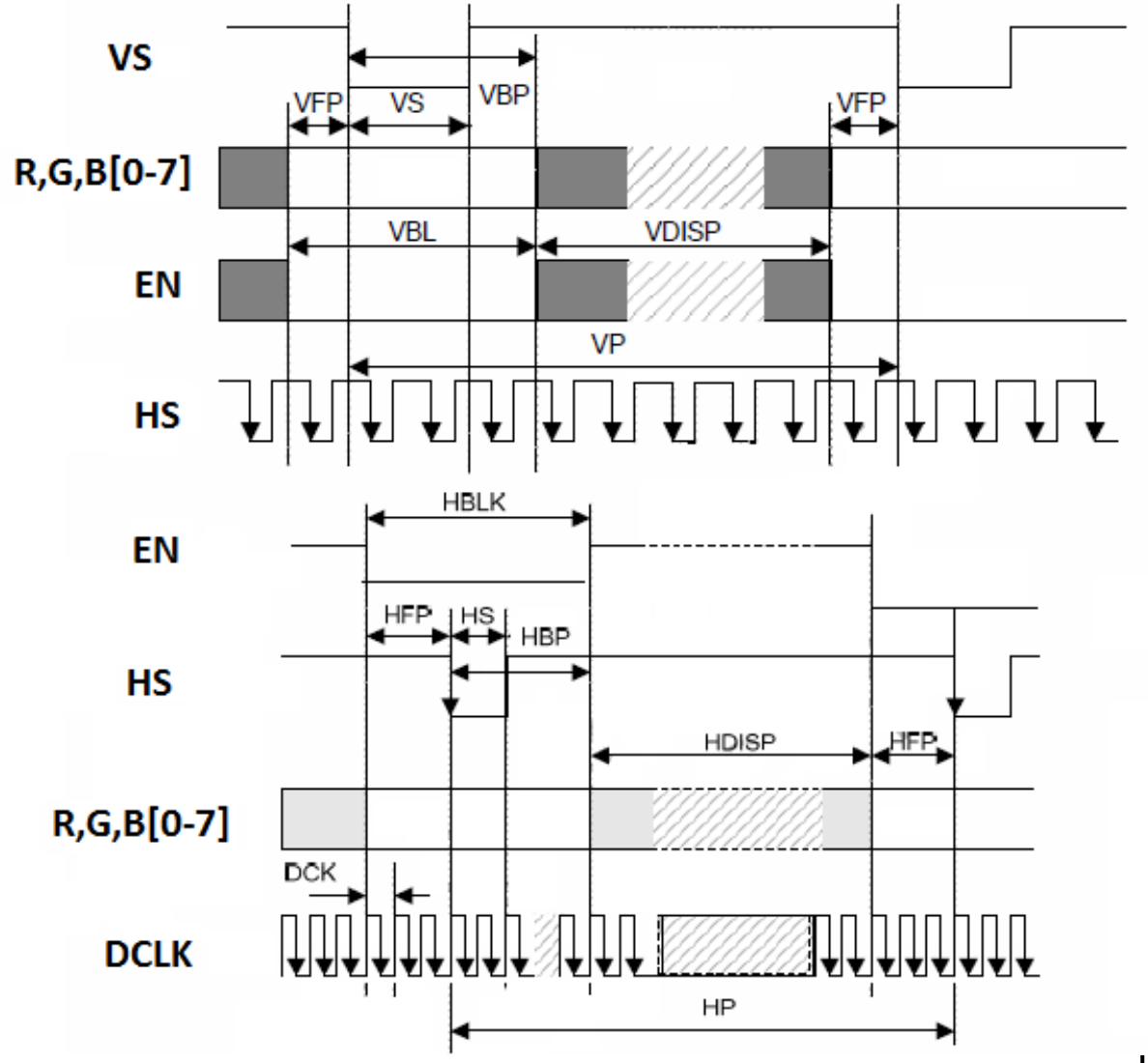
Figure 4: 2-port LVDS signals, JEIDA format, 8-bit mode

Notes: Using DE mode for Sync signal.

1.1.2 Video Signal Timing

Table 8: Video signal timing

Symbol	Parameter	Related Pins	Min.	Typ.	Max.	Unit
VP	Vertical Total	VSYNC	727	733	740	Line
VS	VSYNC Low Pulse Width	VSYNC	1	3	20	Line
VBP	Vertical Back Porch	VSYNC	2	5	255	Line
VFP	Vertical Front Porch	VSYNC	5	8	260	Line
VDISP	Vertical Active Area	VSYNC, HSYNC	-	720	-	Line
HP	Horizontal Total	HSYNC	989	1002	1152	
HS	HSYNC Low Pulse Width	HSYNC	10	12	255	DCK
HBP	Horizontal Back Porch	HSYNC	5	16	255	DCK
HFP	Horizontal Front Porch	HSYNC	24	26	260	DCK
HDISP	Horizontal Active Area	HSYNC	-	960	-	DCK
F_{frame}	Frame Frequency	CLK	-	60	-	Hz
f_{CLK}	CLK frequency	CLK	43.1	44.1	51.1	MHz



1.1.3 SPI interface (3 wires)

SPI interface is used to read and write the setting registers of the TFT module and read commands to control the TFT module. Refer to Appendix is for details of the registers setting.

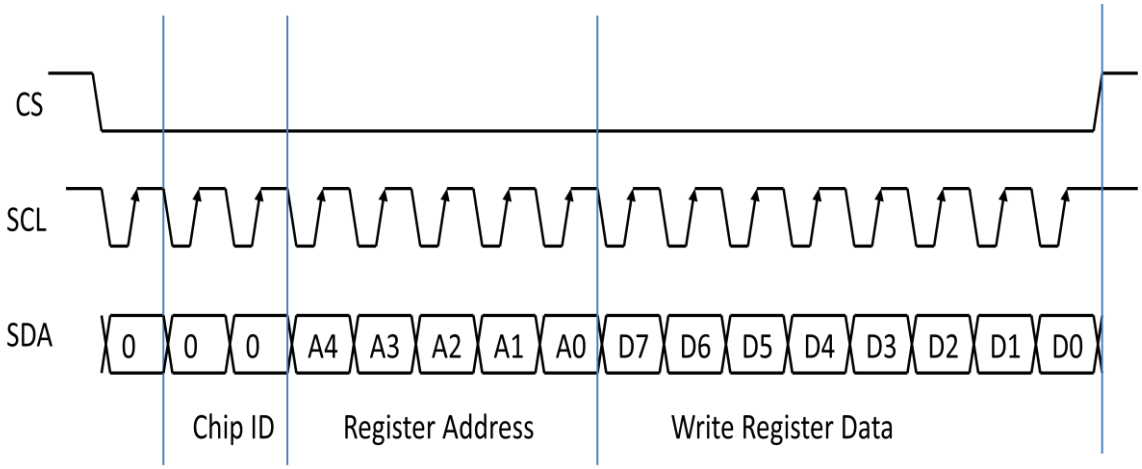


Figure 5: SPI write data format

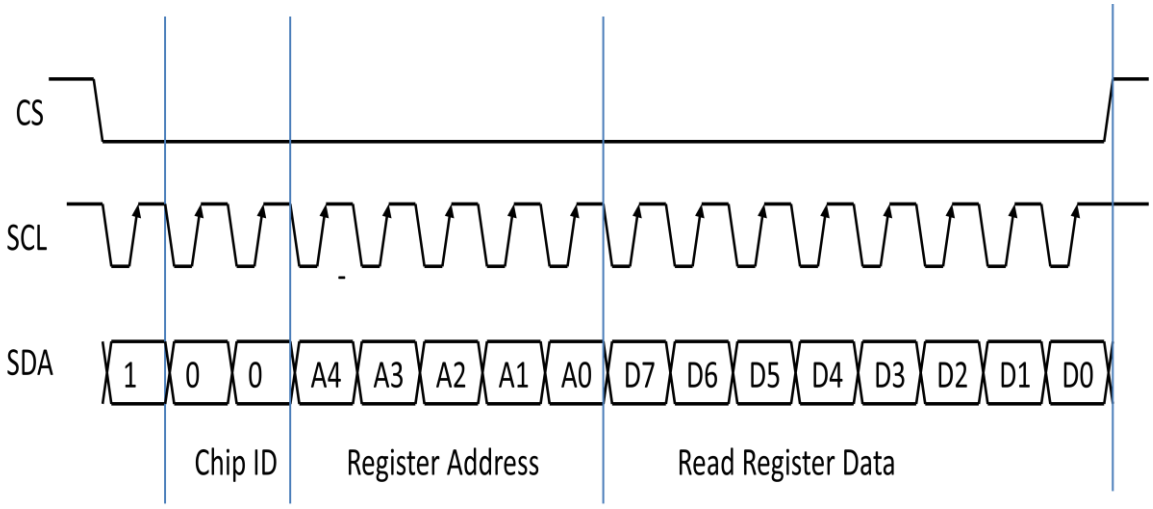


Figure 6: SPI read data format

1.1.4 SPI interface timing chart

Table 9: AC Characteristic of SPI Interface

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Setup Time	t_{S0}	CS to SCL	60	-	-	ns
	t_{S1}	SDA to SCL	60	-	-	
Hold Time	t_{H0}	CS to SCL	60	-	-	ns
	t_{H1}	SDA to SCL	60	-	-	
Pulse Width	t_{W1L}	SCL Negative cycle	75	-	-	ns
	t_{W1H}	SCL Positive cycle	75	--	--	
	t_{W2}	CS	1			us
Clock duty		SCL	40	50	60	%

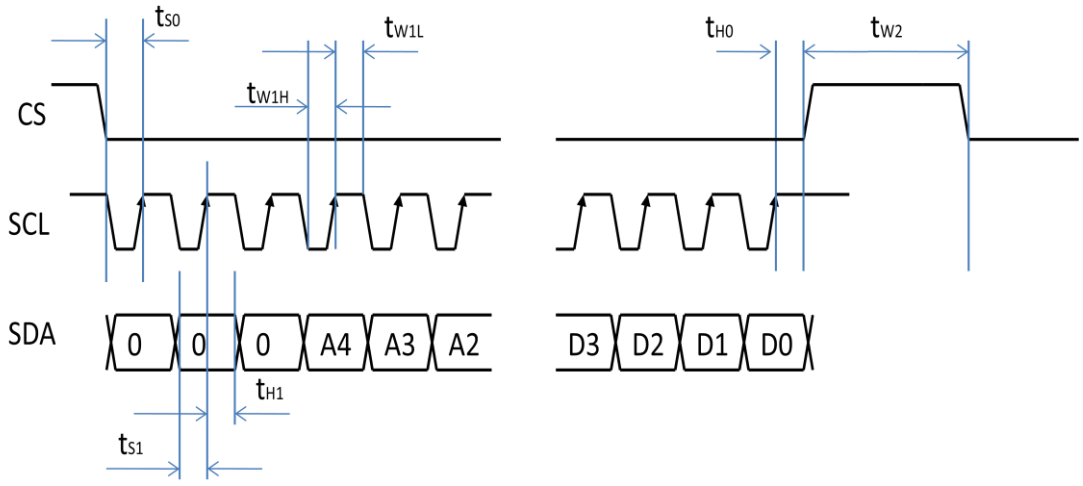
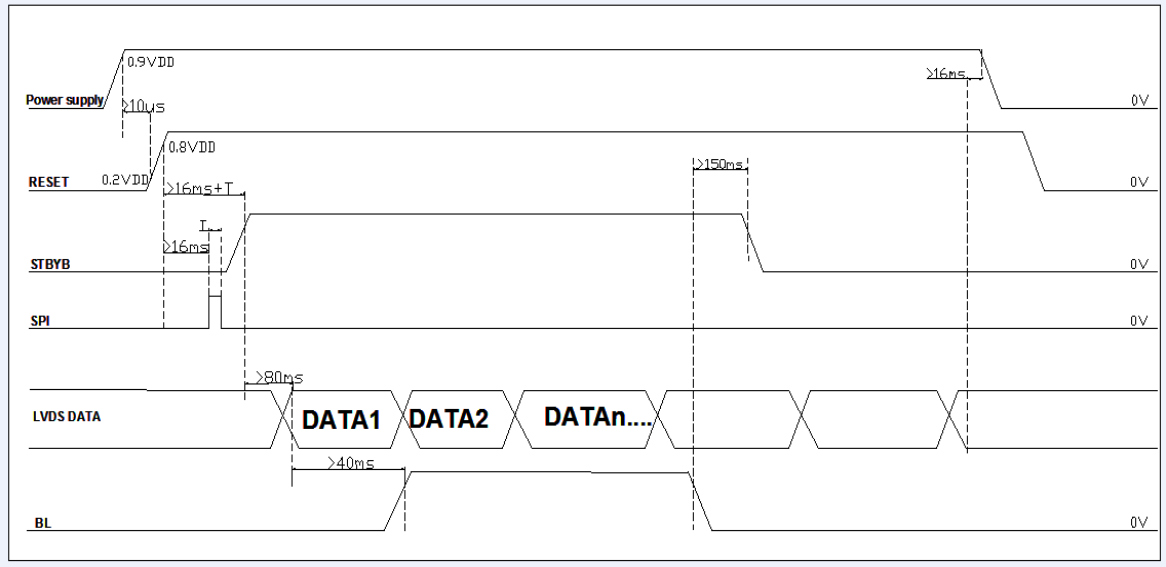


Figure 7: SPI timing

1.2 Power On/Off Sequence



1.3 Thermistors Resistance

NCP18XH103F0SRB

TEMP. (deg. C)	R-low (k ohm)	R-center (k ohm)	R-high (k ohm)
-40	188.0202	195.6520	203.5731
-35	142.7877	148.1710	153.7418
-30	109.5221	113.3471	117.2940
-25	84.8227	87.5588	90.3741
-20	66.2694	68.2367	70.2554
-15	52.2283	53.6496	55.1040
-10	41.4765	42.5062	43.5570
-5	33.1462	33.8922	34.6515
0	26.6780	27.2186	27.7675
5	21.6294	22.0211	22.4175

10	17.6430	17.9255	18.2107
15	14.4712	14.6735	14.8772
20	11.9371	12.0805	12.2244
25	9.9000	10.0000	10.1000
30	8.2162	8.3145	8.4132
35	6.8534	6.9479	7.0430
40	5.7443	5.8336	5.9238
45	4.8333	4.9169	5.0015
50	4.0833	4.1609	4.2395
55	3.4634	3.5350	3.6076
60	2.9486	3.0143	3.0812
65	2.5259	2.5861	2.6476
70	2.1724	2.2275	2.2839
75	1.8741	1.9245	1.9761
80	1.6225	1.6685	1.7157
85	1.4101	1.4521	1.4952

2. Optical Characteristics

Conditions unless specified otherwise:

- Ta = 25 ℃
- Supply voltage = 3.3 volts
- Elapsed time from switch on is greater than 30 minutes
- RGB, white and black test patterns only
- Factory settings

- Brightness = 100% unless specified
- Measurements are conducted at ambient temperature and perpendicular unless specified

Table 10

Items		Symbol	Condition		Min.	Typ.	Max.	Unit	Note
Response Time		T_R+T_F	Ta = 25℃	Viewing normal angle θ=ϕ=0°	-	30	40	ms	(Note 1)
Viewing Angle (Centre)	12’/ 6’	θ2, θ1	Ta=25℃	CR≥10	80	88	-	deg.	(Note 2)
	9’, 3’	ϕ2, ϕ1		CR≥10	80	88	-		
Contrast Ratio		CR	Ta=25℃	Viewing normal angle θ=ϕ=0°	800	1000	-	-	(Note 3)
Chromaticity	White	x_W	Ta=25℃		0.26	0.30	0.34	-	(Note 4)
		y_W			0.30	0.34	0.38	-	
	Red	x_R			0.62	0.66	0.70	-	
		y_R			0.28	0.32	0.36	-	
	Green	x_G			0.25	0.29	0.33	-	
		y_G			0.61	0.65	0.69	-	
	Blue	x_B			0.11	0.15	0.19	-	
		y_B			0.05	0.09	0.13	-	
Brightness		L			800	1000	-	cd/m2	
Luminance Uniformity		ΔY9	Ta=25℃	9 Points	75	80		%	(Note 5)
NTSC Ratio		-	Ta=25℃	-	70	75			%

Note 1: The electro-optical response time measurements shall be made as Figure 8 by switching the “data” input signal OFF and ON. The times needed for the luminance to change from 10% to 90% s T_r, and 90% to 10% is T_f.

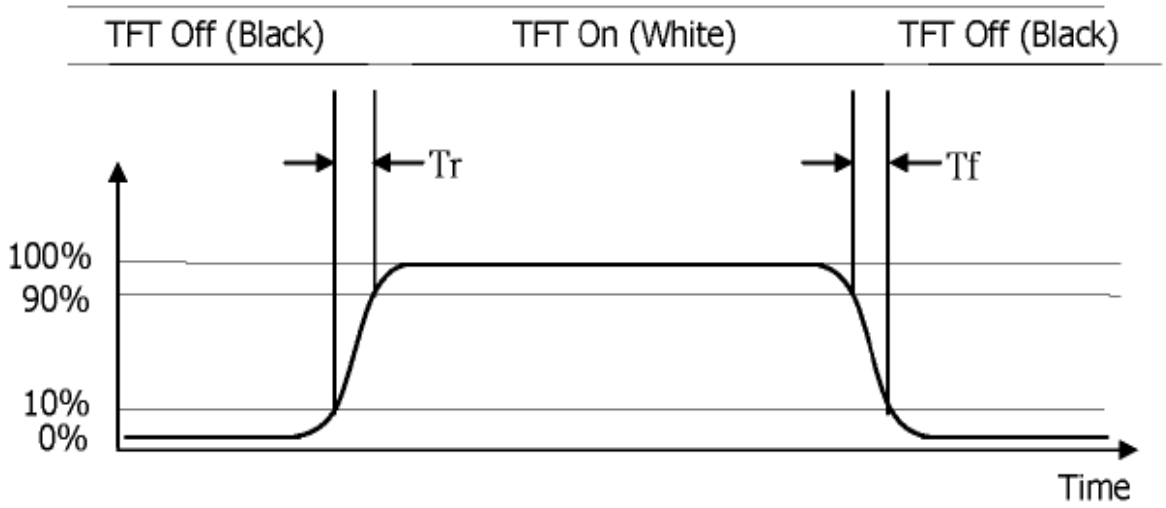


Figure 8: Response Time Testing

Note 2: The definitions of viewing angle.

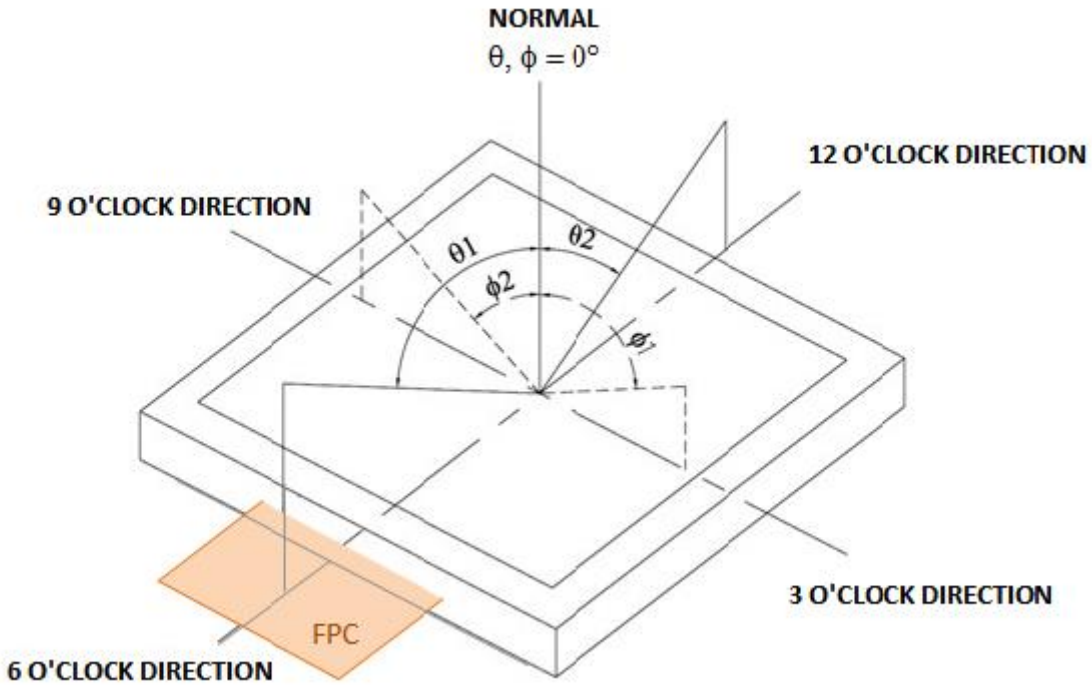


Figure 9

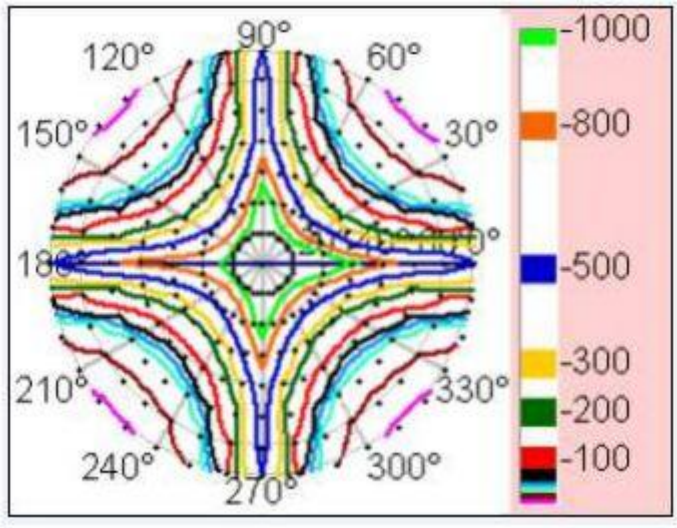


Figure 10：ISO-Contrast Plot（for reference）（Ta=25）

Note 3: Contrast measurements shall be made at viewing angle of θ=0° and at the center of the LCD surface by using DMS. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See Figure 9)

Luminace Contrast Ratio (CR) is defined mathematically.

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

Note 4: The color chromaticity coordinates specified in Table 10 shall be updated from later actual spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

Note 5: The White luminance uniformity on LCD surface is measured per VESA standard over 9 points and is then expressed as

$$\text{Uniformity } \Delta Y = \frac{\text{Minimum Luminance of 9 points}}{\text{Maximum Luminance of 9 points}} \times 100\ (\%)$$

3. Reliability Tests / Environmental

3.1 Reliability Test Conditions

Table 11: List of Reliability Tests

Test		Symbol	Condition	Sample Qty.	Remark
1	High Temperature Storage	HST	+95℃ / 500 hrs	4pcs	
2	Low Temperature Storage	LST	-40℃ / 500 hrs	4pcs	
3	High Temperature Operating (Note)	HOT	+85℃ / 500 hrs	4pcs	
4	Low Temperature Operating	LOT	-40℃ / 500 hrs	4pcs	
5	Accelerated Humidity Test Operating	AHTO	+60℃ / 90% RH / 500 hrs	4pcs	
6	Temperature Shock Test	TST	-30℃ <> +80℃, 30min/5min/30min,100cycles Non-Operating	4pcs	
7	UV exposure resistance	UV	1KW Xenon / 100 hrs Power off.	2pcs	
8	Mechanical Shock	-	3 directions: X,Y,Z axes Repeats:6 Peak acc.:100 G Pulse duration: 6 ms (half sine wave) Non-Operating	2pcs	Note 2
9	Mechanical Vibration	-	3 directions: X,Y,Z axes Sweep time: 1Oct/ min for 10 cycles Frequency: 10 -> 150->10 Hz per cycle 10-58 Hz: constant amplitude 0.75mm peak. 58-150Hz: constant acceleration 10g peak Sinusoidal , Non-Operating	1box	Note 2
10	Image sticking	–	60℃/1hrs	4pcs	Note 3

Note 1: After the reliability test, the product only guarantee function normally without any fatal defect (non-display, line defect, abormal display etc).

Note 2: For module internal structure robustness test purpose only. Customer application CID

design should take care of overall mounting robustness with display module.

Note 3: Power on the LCD 1 hour @60℃ at tessellated picture(5*5 Chess pattern), then switch to 127 gray picture, Invisible after 5 minutes

3.2 Electrostatic Discharge (ESD)

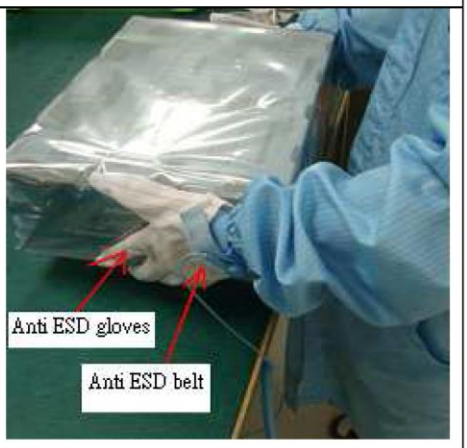
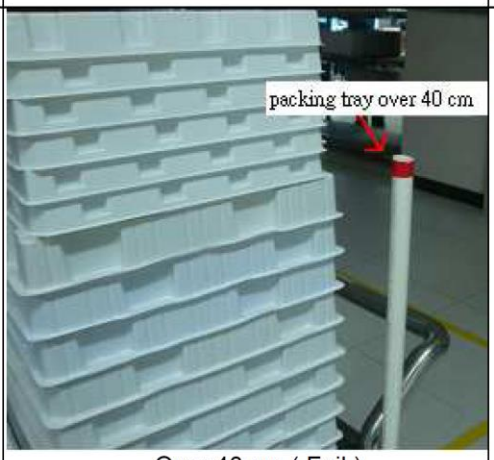
Table 12: ESD Test Conditions

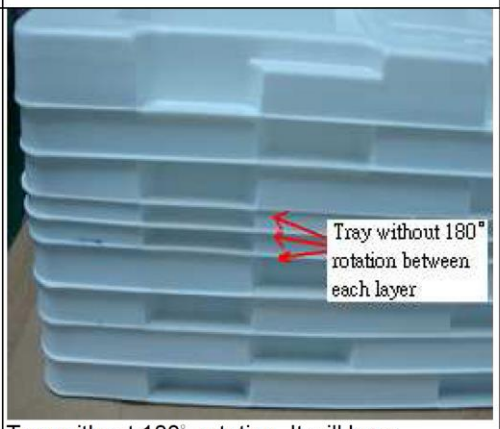
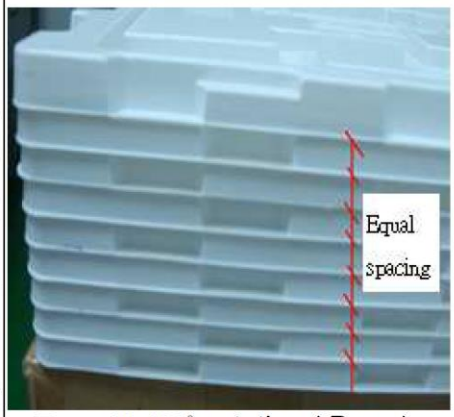
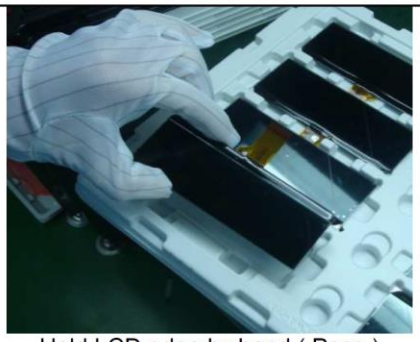
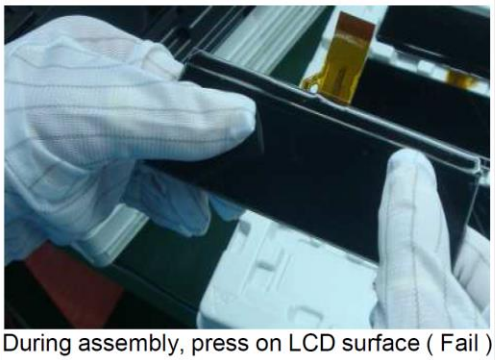
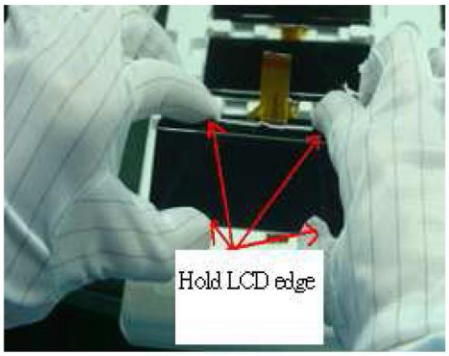
Test	Condition	Method	Sample Qty.	Remark
Human body model	R = 330Ω, C = 150pF, • Air discharge: ± 15 KV to display surface • Contact discharge: ± 8 KV to metal frame	IEC61000-4-2	2pcs	Not operating
Machine model	R = 0Ω, C = 200pF, ±200V to I/O pins	MIL-STD-883, method 3015	2pcs	Not operating

Note 1: The TFT-LCD panel and IC on module are sensitive to electrostatic discharge; please make sure equipments and operators are properly ground before and during handling

Note 2: As different customer application have different interfacing designs and assembly processes, the display module has no ESD protection circuitry. Customer is required to take special care on ESD level control in the assembly and test processes.

4. Packing removal and handling requirement

Requirement	Wrong	Correct
Get one package each times & hold the package by both hands with proper ESD shielding	 Hold the modules by one hand and without proper ESD shielding (Fail)	 Hold the modules by both hands (Pass)
Prohibit to stack inner package over 3 layers	 Over 3 layers (Fail)	 Not exceed 3 layers (Pass)
Total packing tray height must within 40 cm	 Over 40 cm (Fail)	 Lower than 40 cm (Pass)

Requirement	Wrong	Correct
Packing tray must rotate 180° in each layer when stack together	 Tray without 180° rotation, It will have pressure on the module (Fail)	 Tray with 180° rotation (Pass)
Prohibit to touch LCD surface by fingers	 Hold LCD and touch its surface (Fail)	 Hold LCD edge by hand (Pass)
During assembly, prohibit to press on LCD surface by fingers, Must hold the LCD edges by both hands	 During assembly, press on LCD surface (Fail)	 During assembly, use both hands to hold LCD edge only (Pass)

Remark: For all ISTN display, it is extremely sensitive to external pressure, beside above handling requirement, special care to avoid pressure application on LCD surface is necessary.

5. Definitions

Data sheet status	

Objective Specification	This data sheet contains target or goal specifications for product development.
Preliminary Specification	This data sheet contains preliminary data; supplementary data may be published later.
Product Specification	This data sheet contains final product specification.

Limiting values

Limiting values given are in accordance with the Absolute Maximum Rating. Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operating of the device at these or any other conditions above those given in the Characteristics sections of the specification is not implied. Expose to limiting values for extended periods may affect device reliability.

Device is functional within the limiting conditions doesn't imply the same performance over the covered conditions, customer is required to decide the best range for the final applications.

6. Life Support Applications

These products are not designed for use in life saving appliances, devices or systems where malfunctioning of these products can reasonably be expected to result in personal injury. Customers using or selling these products for use in such applications do so at their own risk and agree full non liability of Varitronix Limited for any damages or losses resulting from such improper use or sale.

10.0 HANDDLING & CAUTIONS

10.1 Mounting Method

● The panel of the LCM consists of two thin glasses with polarizer which easily get damaged. So extreme care should be taken when handling the LCM.

● Excessive stress or pressure on the glass of the LCM should be avoided. Care must be taken to insure that no torsional or compressive forces are applied to the LCM unit when it is mounted.

● If the customer's set presses the main parts of the LCM, the LCM may show the abnormal display. But this phenomenon does not mean the malfunction of the LCM and should be pressed by the way of mutual agreement.

● To determine the optimum mounting angle, refer to the viewing angle range in the specification for each model.

● Mount a LCM with the specified mounting parts.

10.2 Caution of LCM Handling and Cleaning

● Since the LCM is made of glass, do not apply strong mechanical impact or static load onto it. Handling with care since shock, vibration, and careless handling may seriously affect the product. If it falls from a high place or receives a strong shock, the glass maybe broken.

● The polarizer on the surface of panel are made from organic substances. Be very careful for chemicals not to touch the polarizer or it leads the polarizer to be deteriorated.

● If the use of a chemical is unavoidable, use soft cloth with solvent recommended below to clean the LCM's surface with wipe lightly.

-IPA (Isopropyl Alcohol), Ethyl Alcohol, Tri-chloro, tri-florothane.

● Do not wipe the LCM's surface with dry or hard materials that will damage the polarizer and others. Do not use the following solvent—Water, acetone, Aromatics.

● It is recommended that the LCM be handled with soft gloves during assembly, etc.
The polarizer on the LCM's surface are vulnerable to scratch and thus to be damaged by shape particles.

● Do not drop water or any chemicals onto the LCM's surface.

● A protective film is supplied on the LCM and should be left in place until the LCM is required for operation.

● The ITO pad area needs special careful caution because it could be easily corroded. Do not contact the ITO pad area with HCFC, Soldering flux, Chlorine, Sulfur, saliva or fingerprint. To prevent from the ITO corrosion, customers are recommended that the ITO area would be covered by UV or silicon.

● Please handle FPC with care.

10.3 Caution Against Static Charge

● The LCM use C-MOS LSI drivers, so customers are recommended that any unused input terminal would be connected to Vdd or Vss, do not input any signals before power is turn on, and ground you body, work/assembly area, assembly equipments to protect against static electricity.

● Remove the protective film slowly, keeping the removing direction approximate 30-degree not vertical from panel surface, if possible, under ESD control device like ion blower, and the humidity of working room should be kept over 50%RH to reduce the risk of static charge.

● Avoid the use work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity-treated fibers.

● In handling the LCM, wear non-charged material gloves. And the conducting wrist to the earth and the conducting shoes to the earth are necessary.

10.4 Caution For Operation

● It is indispensable to drive the LCM within the specified voltage limit since the higher voltage than the limit causes LCM's life shorter. An electro-chemical reaction due to DC causes undesirable deterioration of the LCM so that the use of DC drive should avoid.

● Do not connect or disconnect the LCM to or from the system when power is on.

● Never use the LCM under abnormal conditions of high temperature and high humidity.

● When expose to drastic fluctuation of temperature(hot to cold or cold to hot), the LCM may be affected; specifically, drastic temperature fluctuation from cold to hot, produces dew on the LCM's surface which may affect the operation of the polarizer on the LCM.

● Response time will be extremely delay at lower temperature than the operating temperature range and on the other hand LCM may turn black at temperature above its operational range. However those phenomenon do not mean malfunction or out of order with the LCM. The LCM will revert to normal operation once the temperature returns to the recommended temperature range for normal operation.

● Do not display the fixed pattern for a long time because it may develop image sticking due to the LCM structure. If the screen is displayed with fixed pattern, use a screen saver.

● Do not disassemble and/or re-assemble LCM module

10.5 Packaging

● Modules use LCM element, and must be treated as such.

-Avoid intense shock and falls from a height.

-To prevent modules from degradation, do not operate or store them exposed directly to sunshine or high temperature/humidity for long periods.

10.6 Storage

- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit. Relative humidity of the environment should therefore be kept below 60%RH.
- Original protective film should be used on LCM's surface (polarizer). Adhesive type protective film should be avoided, because it may change color and/or properties of the polarizer.
- Do not store the LCM near organic solvents or corrosive gasses.
- Keep the LCM safe from vibration, shock and pressure.
- Black or white air-bubbles may be produced if the LCM is stored for long time in the lower temperature or mechanical shocks are applied onto the LCM.
- In the case of storing for a long period of time for the purpose or replacement use, the following ways are recommended.

-Store in a polyethylene bag with sealed so as not to enter fresh air outside in it.
-Store in a dark place where neither exposure to direct sunlight nor light is.
-Keep temperature in the specified storage temperature range.
-Store with no touch on polarizer surface by the anything else. If possible, store the LCM in the packaging situation when it was delivered.

10.7 Safety

- For the crash damaged or unnecessary LCM, it is recommended to wash off liquid crystal by either of solvents such as acetone and ethanol an should be burned up later.
- In the case of LCM is broken, watch out whether liquid crystal leaks out or not. If your hands touch the liquid crystal, wash your hands cleanly with water and soap as soon as possible.
- If you should swallow the liquid crystal, first, wash your mouth thoroughly with water, then drink a lot of water and induce vomiting, and then, consult a physician.
- If the liquid crystal get in your eyes, flush your eyes with running water for at least fifteen minutes.
- If the liquid crystal touches your skin or clothes, remove it and wash the affected part of your skin or clothes with soap and running water.

11.0 Applicable Scope

- This product specification only applies to the products manufactured and sold by our company.
- Any specification, quality etc. about other parts mentioned in this product spec are no concern of our company.