CDTech(H.K.)Electronics Limited

Product Specifications

Customer	Standard Model
Model Name	S123WU01
Description	TFT LCD Module 12.3" WUXGA 1920(RGB)x720 Dots
Date	2015/10/26
Revision	V3.0

Customer Approval	
Date	
The above signature represents that the product specifications, testing regulation, and warranty in the specifications are accepted	

Engineering			
Approved	**Date**	**Prepared**	**Date**
Sam Huang	2015.10.26	Rich Liang	2015.10.26

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CDTech(H.K.)Electronics Limited

1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2015/7/27	First Release.	Rich Liang
2.0	2015/9/14	Update Spec	Rich Liang
3.0	2015/10/26	Update the drawing	Rich Liang

2 General Specifications

Feature		Spec
Characteristics	Size	12.3 inch
	Resolution	**1920(Horizontal)*720(Vertical)**
	Interface	2 port LVDS
	Connect type	Connector
	Color Depth	16.7 M Colors
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	**0.05075(H)×RGBx0.15225(V)**
	Pixel Configuration	R.G.B. Stripe
	Display Mode	**Normally Black**
	Driver IC	TBD
	Surface Treatment	AG
	Viewing Direction	ALL
Mechanical	LCM (W x H x D) (mm)	308.1*134.86*7.3
	Active Area(mm)	292.32 x109.62
	With /Without TSP	Without
	Weight (g)	TBD
	LED Numbers	80 LEDs
	LED Life Time	50000 Hrs

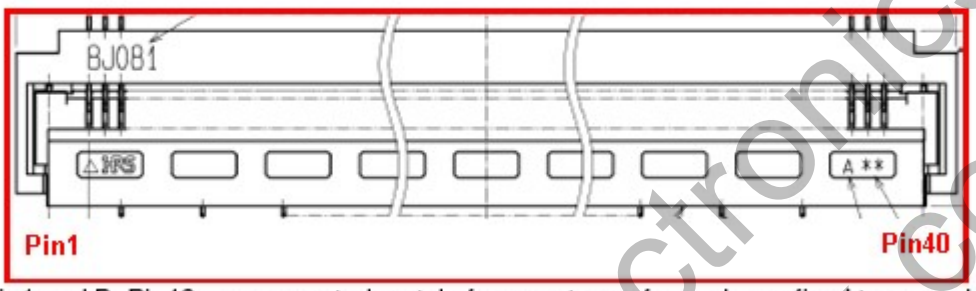
Note 1: Viewing direction is follow the data which measured by optics equipment.
Note 2: Requirements on Environmental Protection: RoHS
Note 3: LCM weight tolerance: +/- 5%

3 Input/Output Terminals

No.	Symbol	Description
1	GND	Power ground
2	GND	Power ground
3	RXOIN0-	-LVDS differential data input (Odd data)
4	RXOIN0+	+LVDS differential data input (Odd data)
5	GND	Power ground
6	RXOIN1-	-LVDS differential data input (Odd data)
7	RXOIN1+	+LVDS differential data input (Odd data)
8	GND	Power ground
9	RXOIN2-	-LVDS differential data input (Odd data)
10	RXOIN2+	+LVDS differential data input (Odd data)
11	GND	Power ground
12	RXOCLKIN-	-LVDS differential clock input (Odd clock)
13	RXOCLKIN+	+LVDS differential clock input (Odd clock)
14	GND	Power ground
15	RXOIN3-	-LVDS differential data input (Odd data)
16	RXOIN3+	-LVDS differential data input (Odd data)
17	GND	Power ground
18	RXEIN0-	-LVDS differential data input (Even data)
19	RXEIN0+	+LVDS differential data input (Even data)
20	GND	Power ground
21	RXEIN1-	-LVDS differential data input (Even data)
22	RXEIN1+	+LVDS differential data input (Even data)
23	GND	Power ground
24	RXEIN2-	-LVDS differential data input (Even data)
25	RXEIN2+	+LVDS differential data input(Even data)
26	GND	Power ground
27	RXEIN3-	-LVDS differential data input(Even data)
28	RXEIN3+	+LVDS differential data input (Even data)
29	GND	Power ground
30	STVD	Feedback signal
31	GND	Power ground
32	RESET	Global reset pin
33	GND	Power ground
34	VDD	Power input
35	VDD	Power input

36	VDD	Power input
37	VDD	Power input
38	VDD	Power input
39	GND	Power ground
40	GND	Power ground

I: Digital signal input, G: GND, P: Power input, O: Digital signal output
Connector Pin1 position:



Note: B Pin1 and B Pin42 are connected metal of connector surface, please fixed to ground.

4 Absolute Maximum Ratings

Driving TFT LCD Panel

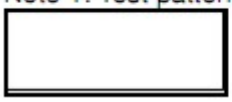
Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	V_{DD}	-0.3	4	V	
Input logic Voltage	Vi	-0.3	Vdd+0.3	V	Note 1

5 Electrical Characteristics

5.1 .1Driving TFT LCD Panel

Item	Symbol	MIN	TYP	MAX	Unit
Power voltage	V_{DD}	3	3.3	3.6	V
	IVDD	-	1.1	1.4	A
Operating Temperature	T_{OPR}	-30	85	℃	
Storage Temperature	T_{STG}	-40	95	℃	

Note 1: Test pattern is the following picture (white pattern).



5.1.2 b. Signal DC Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Differential input high threshold	R_{XVTH}	-	-	200	mV	R_{XVCM}=1.2V
Differential input low threshold	R_{XVTL}	-200	-	-	mV	R_{XVCM}=1.2V
Input voltage range (singled-end)	R_{XVIN}	0.7	-	1.6	V	
Input differential voltage	$\|V_{ID}\|$	200	-	600	mV	
Differential Input Common Mode Voltage	R_{XVCM}	1.0	1.2	1.3	V	

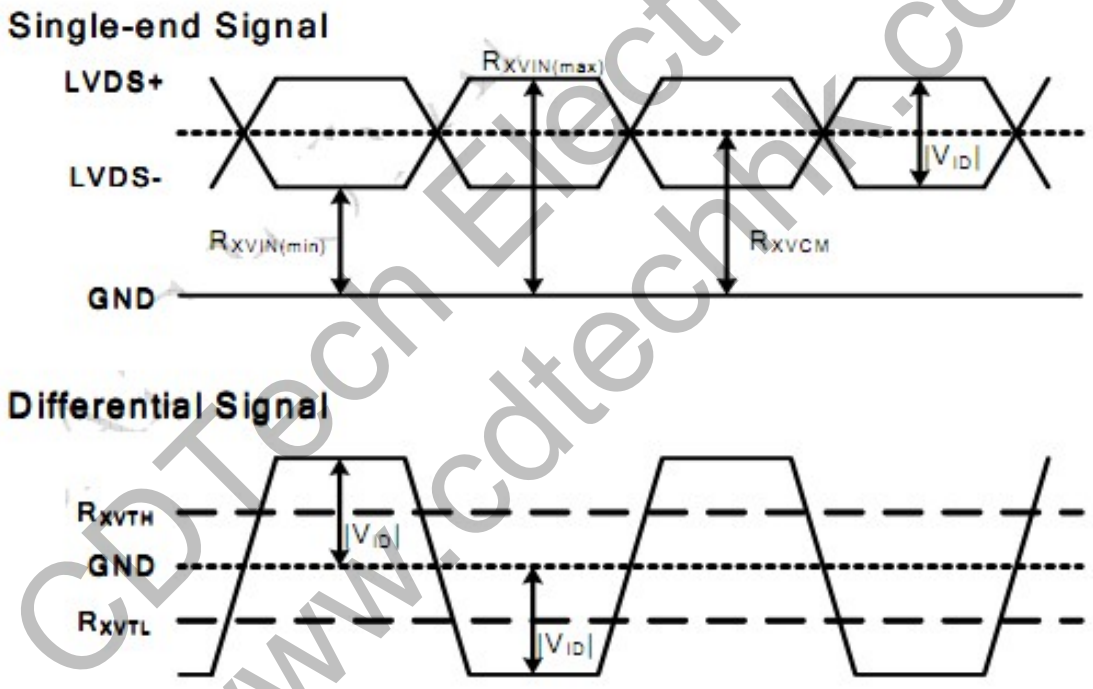


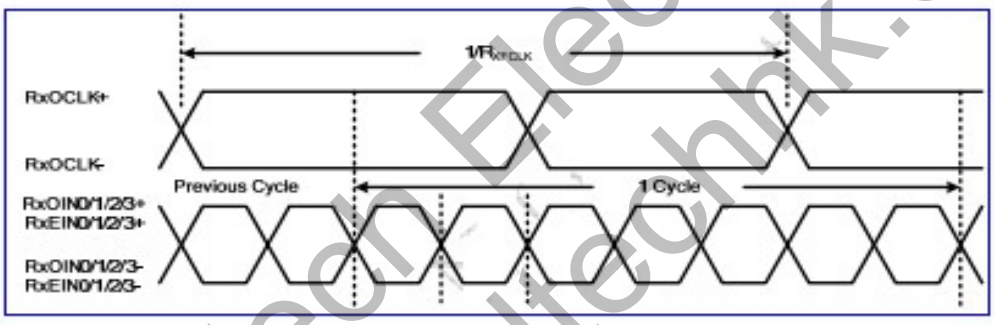
Fig. 4 LVDS DC characteristics diagram

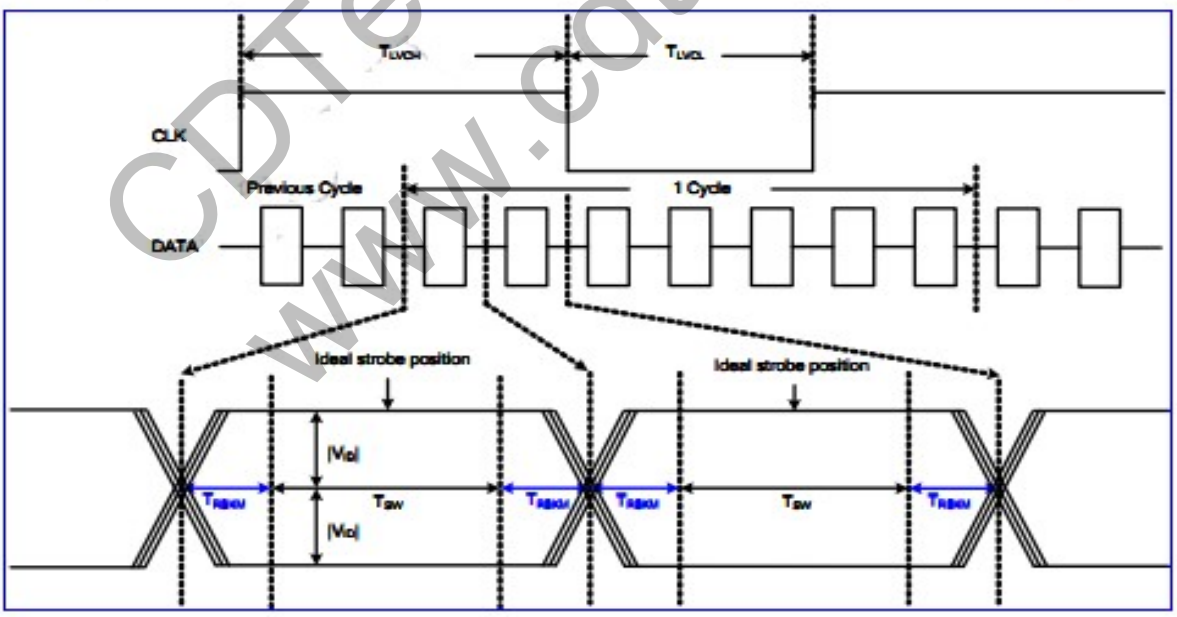
5.2 AC Electrical Characteristics

a. Differential signal AC characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock frequency	R_{XFCLK}	44.7	47.5	61	MHz	
Input data skew margin	T_{RSKM}	-	-	200	ps	|VID|=200mV RXVCM =1.2V Note1
Clock strobe width	T_{SW}	1200	-	-	ps	
Clock High Time	T_{LVCH}	-	4/(7* R_{XFCLK})	-	ns	
Clock Low Time	T_{LVCL}	-	3/(7* R_{XFCLK})	-	ns	

Note1.For the Data Skew Margin, "Input Signal Skew + Input Signal Jitter" must be smaller than TRSKM.





5.3 3. Fig. 7 Data skew margin Differential Input Data Format

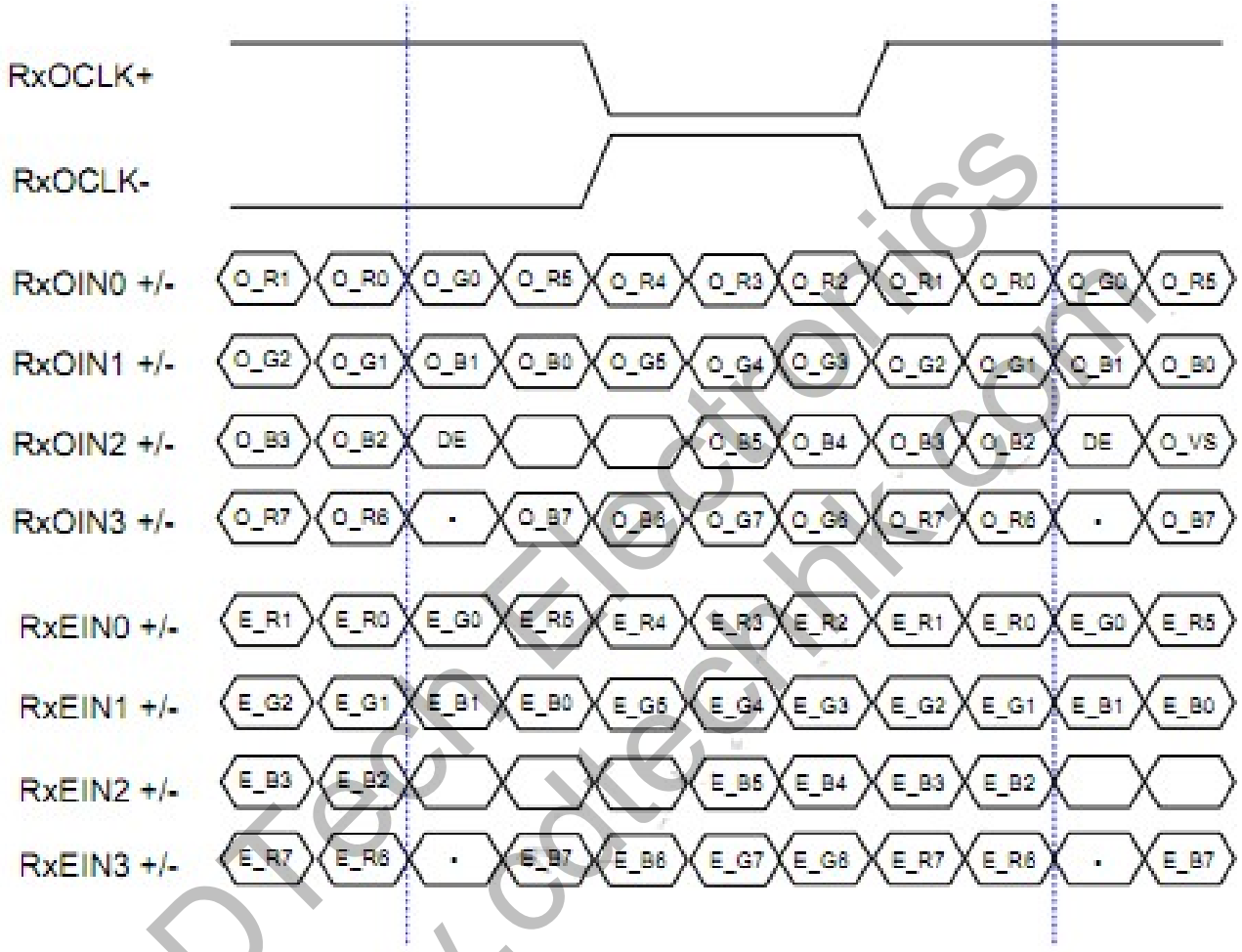


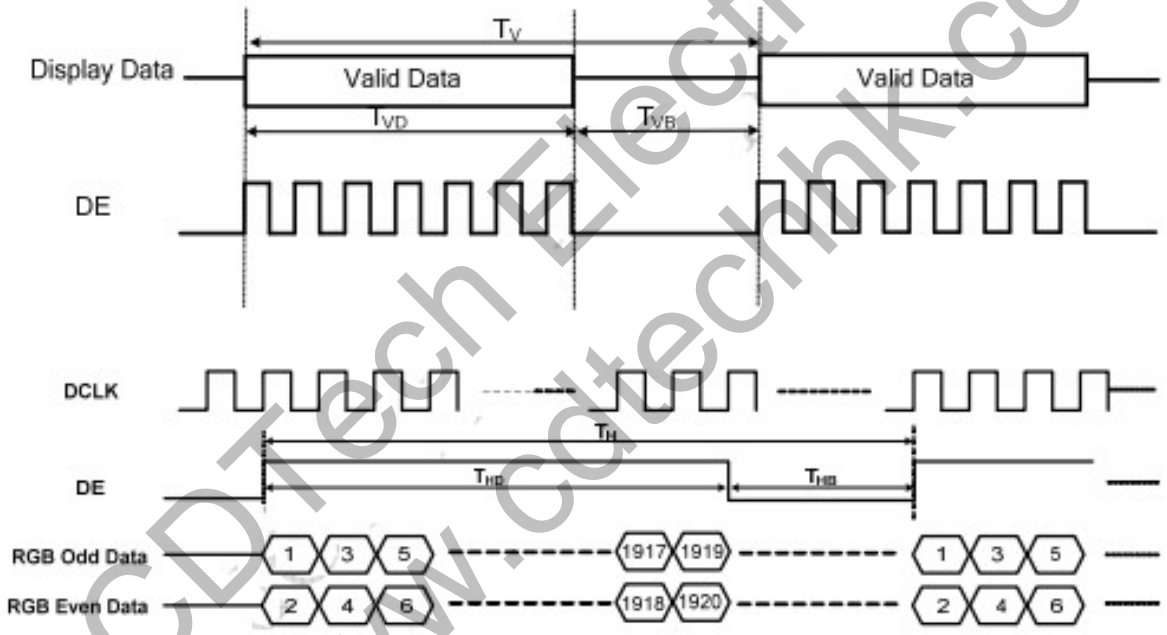
Fig.1 LVDS input data VESA format

5.4 Timing Condition

a. **DE Mode**

Item	Symbol	Min	Typ.	Max	Unit	Remark
Clock frequency	F_{DCLK}	44.7	47.5	61	MHz	
Horizontal period area	T_H	1020	1040	1200	DCLK	
Horizontal display area	T_{HD}	960	960	960	DCLK	
Horizontal blanking area	T_{HB}	60	80	240	DCLK	
Vertical period area	T_V	730	760	840	T_H	
Vertical display area	T_{VD}	720	720	720	T_H	
Vertical blanking area	T_{VB}	10	40	120	T_H	
Frame rate	F_R	55	60	65	Hz	

b. **Timing Diagram**

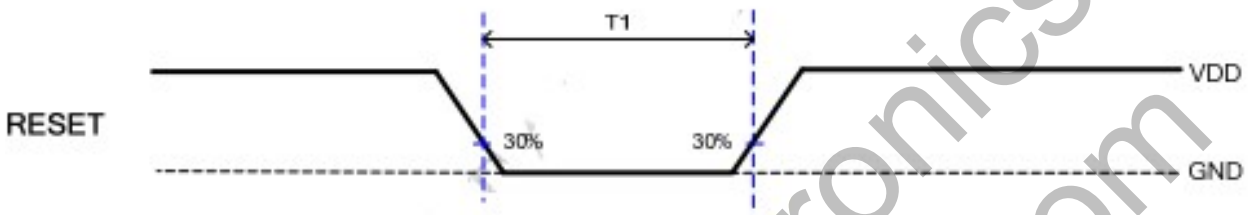


5.5 Feedback Signal Timing for Detected Function

Item	Symbol	Min	Typ	Max	Unit	Remark
STVD	V_{STVD-H}	VDD-0.3	--	VDD	V	I_{STVD-H}= 200uA
	V_{STVD-L}	GND	--	GND+0.3	V	I_{STVD-L}= -200uA
STVD frequency	F_{STVD}	55	60	65	HZ	
STVD period	T_{STVD}	15.4	16.6	18.2	ms	
STVD pulse width	T_{WSTVD}	19	21	23	us	

5.6 . RESET Function

Item	Symbol	Min	Typ	Max	Unit	Remark
RESET	T1	1	--	20	ms	



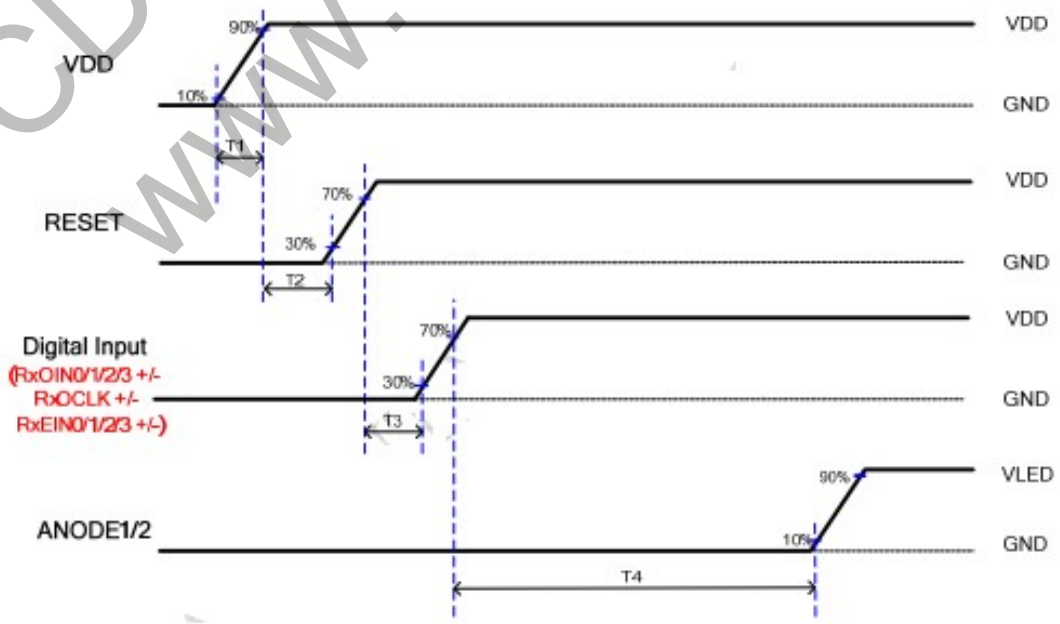
5.7 Power ON / OFF timing

The LCD adopts high voltage driver IC, so it could be permanently damaged under a wrong power on/off sequence. The suggested LCD power sequence is below:

a. Power ON sequence

Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	0.5	--	15	ms
T2	1	--	20	ms
T3	0	--	20	ms
T4	500	--	--	ms

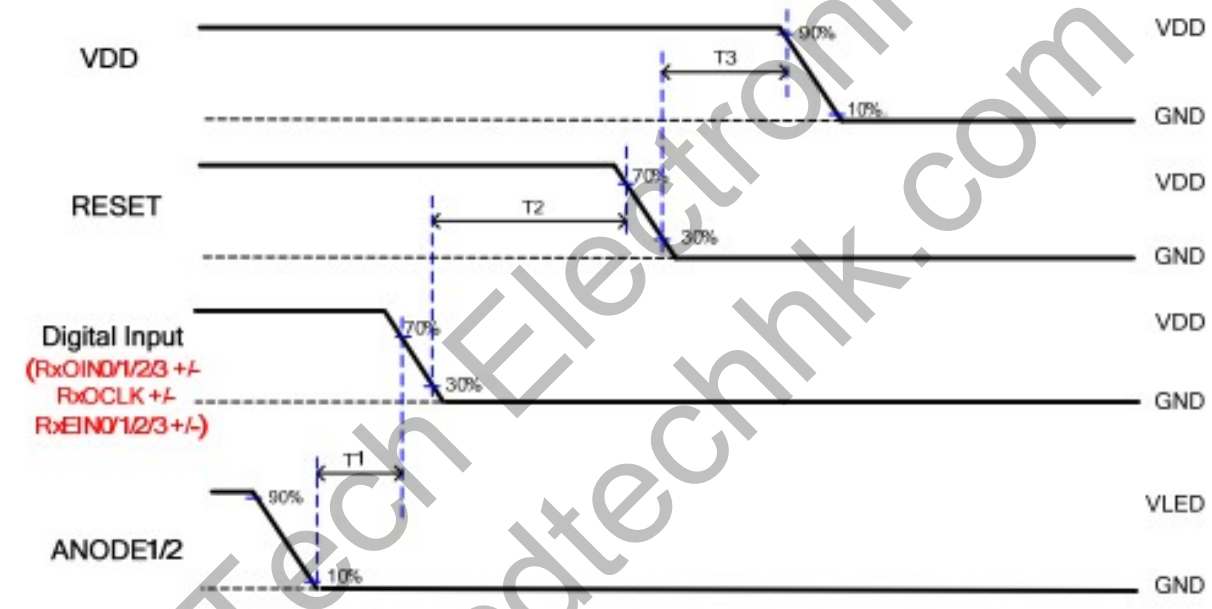
Power on sequence



b. Power OFF sequence

Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	200	--	--	ms
T2	0	--	20	ms
T3	1	--	20	ms

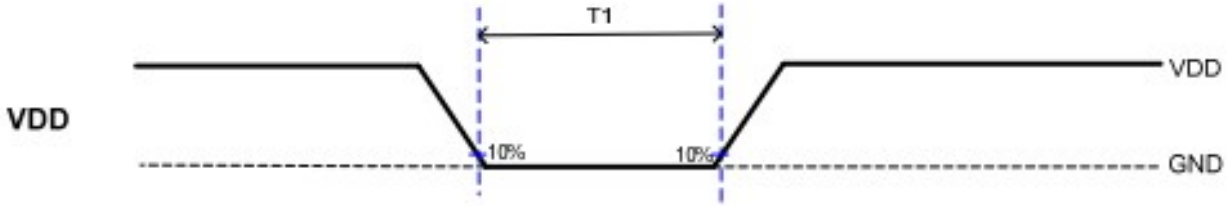
Power off sequence



c. VDD ON / OFF

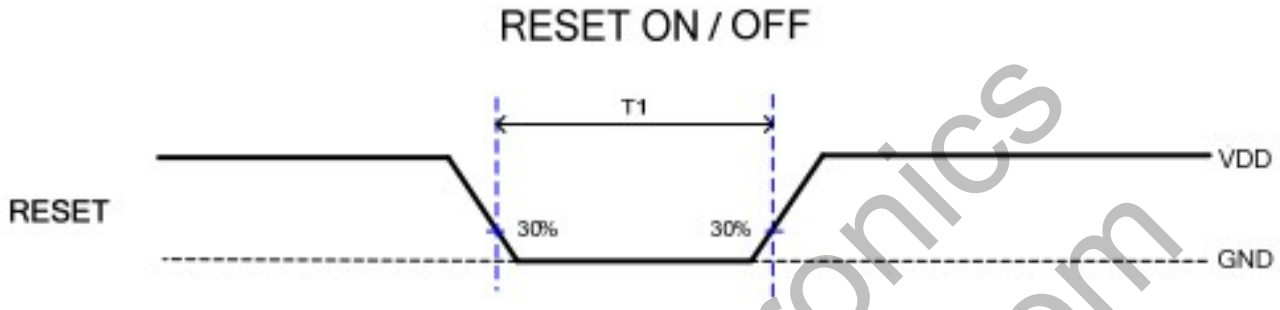
Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	1000	--	-	ms

VDD ON / OFF



d. RESET ON / OFF

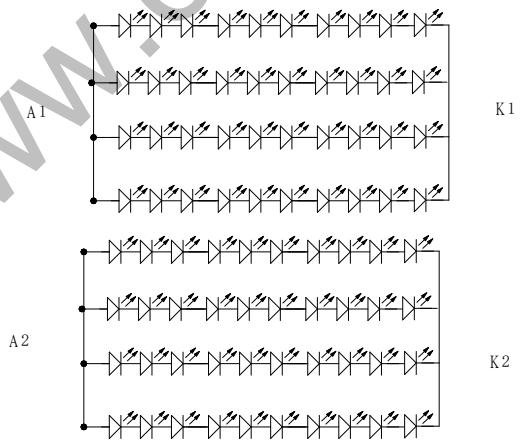
Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	1000	--	-	ms



5.8 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	480	520	mA	
Forward Voltage	V_F	-	32	33	V	
Backlight Power consumption	W_{BL}	-	15.36	17.16	W	

Note 1: Each LED : IF =60 mA, VF =3.2V.
Note 2: Optical performance should be evaluated at Ta=25℃ only.
Note 3: If LED is driven by high current, high ambient temperature & humidity condition. The life time of LED will be reduced.Operating life means brightness goes down to 50% initial brightness. Typical operating life time is estimated data.



6 Optical Characteristics

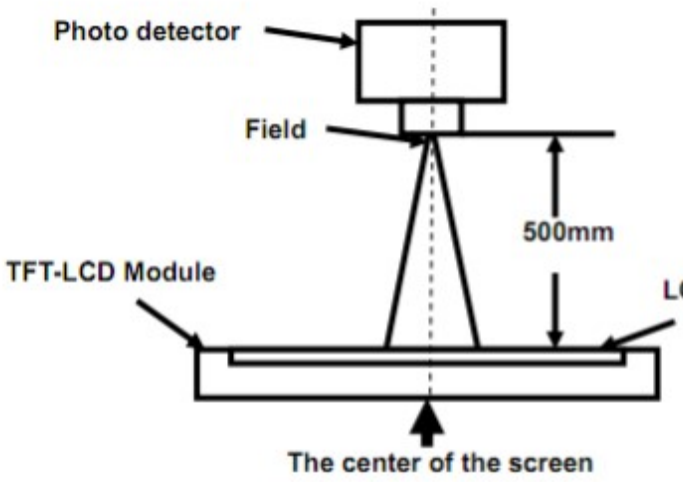
Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	70	80	-	Degree.	Note2
		θ_B		70	80	-		
		θ_L		70	80	-		
		θ_R		70	80	-		
Contrast Ratio		CR	Θ =0	800	1000	-	-	Note1, Note3
Response Time		T_{ON}	25°C	-	12		ms	Note1, Note4
		T_{OFF}		-	13			
Chromaticity	White	X_W	Backlight is on	0.248	0.288	0.328	-	Note1, Note5
		Y_W		0.287	0.327	0.367	-	
	Red	X_R		0.581	0.621	0.661	-	
		Y_R		0.298	0.338	0.378	-	
	Green	X_G		0.259	0.299	0.339	-	
		Y_G		0.581	0.621	0.661	-	
	Blue	X_B		0.108	0.148	0.188	-	
		Y_B		0.029	0.069	0.109	-	
Uniformity		U		80			%	Note1, Note6
Luminance		L		900	1000	-		Note1, Note7

Test Conditions:

1. IF= 20mA(one channel),the ambient temperature is 25℃
2. The test systems refer to Note 1 and Note 2.

Note 1:Definition of optical measurement system.

The optical characteristics should be measured in dark room. After 5 minutes operation, the optical properties are measured at the center point of the LCD screen. All input terminals LCD panel must be ground when measuring the center area of the panel.



Item	Photo detector	Field
Contrast Ratio	BM-7A	1°
Luminance		
Chromaticity		
Lum Uniformity		
Response Time	SR-3A	2°

Note 2: Definition of viewing angle range and measurement system.
viewing angle is measured at the center point of the LCD by CONOSCOPE(ergo-80).

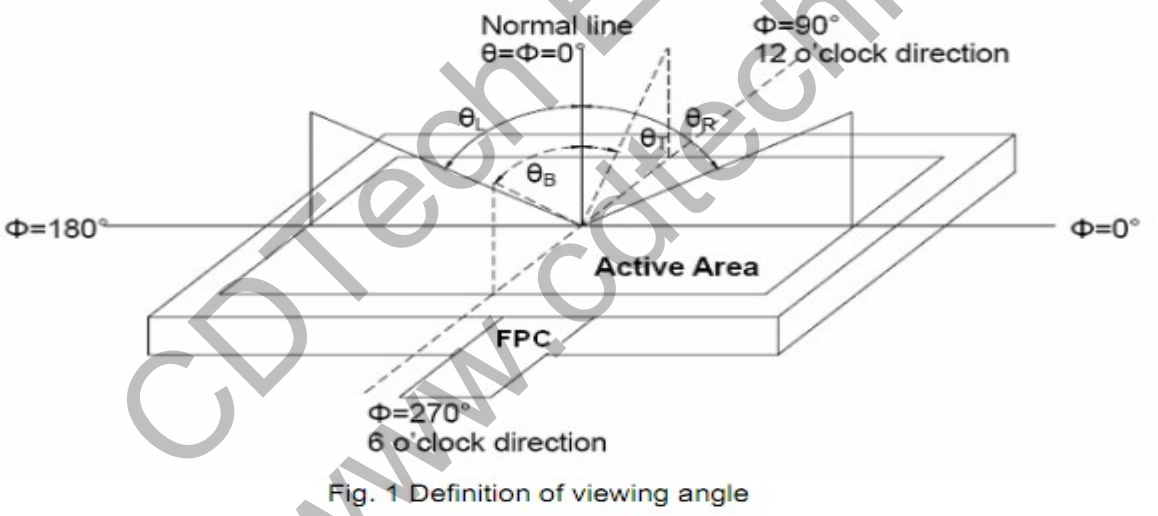


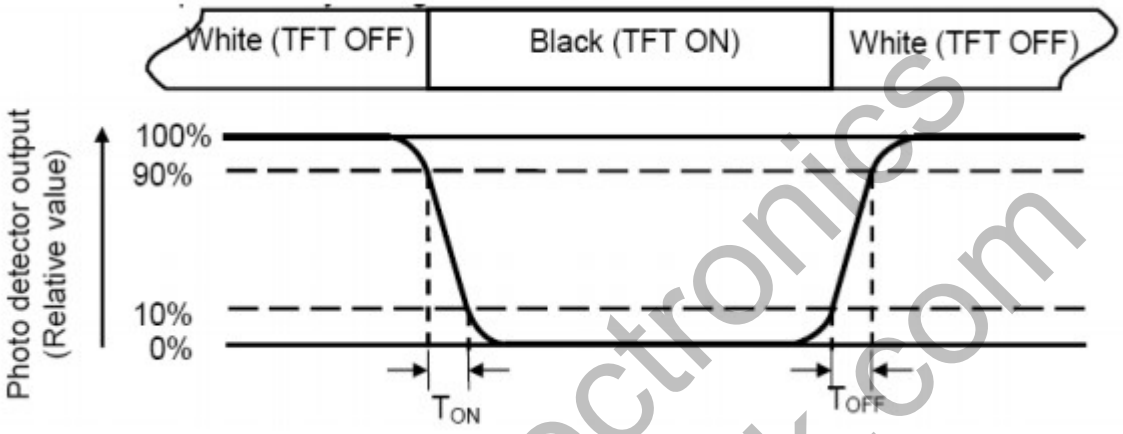
Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD is on the "White" state}}{\text{Luminance measured when LCD is on the "Black" state}}$$

"White state ":The state is that the LCD should driven by Vwhite.
"Black state": The state is that the LCD should driven by Vblack.
Vwhite: To be determined Vblack: To be determined.

Note 4: Definition of Response time
The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (TON) is the time between photo detector output intensity changed from 90% to 10%. And fall time (TOFF) is the time between photo detector output intensity changed from 10% to 90%.



Note 5: Definition of color chromaticity (CIE1931)
Color coordinates measured at center point of LCD.
Note 6: Definition of Luminance Uniformity
Active area is divided into 9 measuring areas (Refer Fig. 2). Every measuring point is placed at the center of each measuring area.
Luminance Uniformity(U) = Lmin/ Lmax x100%
L--------Active area length W----- Active area width

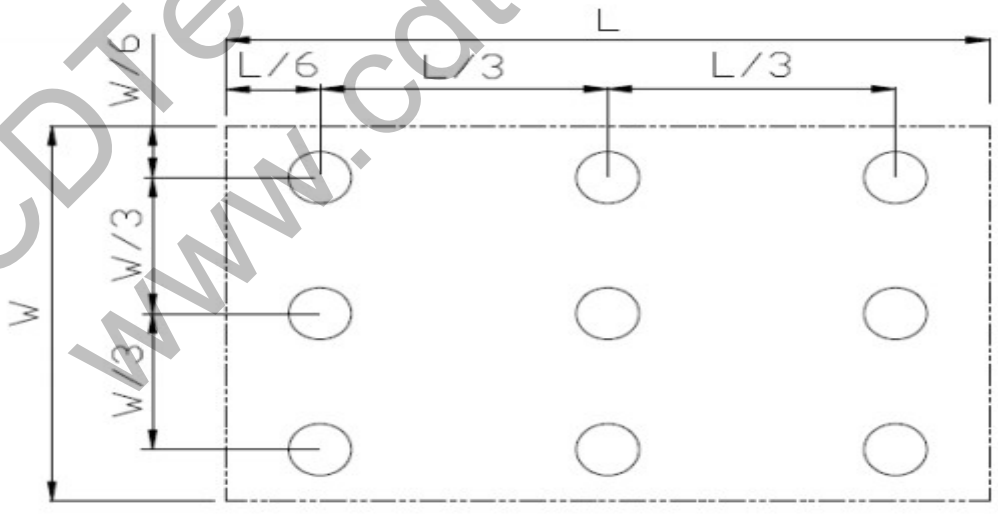


Fig. 2 Definition of uniformity

Lmax: The measured maximum luminance of all measurement position.
Lmin: The measured minimum luminance of all measurement position.
Note 7: Definition of Luminance :
Measure the luminance of white state at center point.

7 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	Ts= +85℃, 480hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	Ta= -30℃, 480hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +95℃, 480hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -40℃, 480hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-40℃ 30 min ~ +95℃ 30 min Change time: 5min, 30 Cycle	Start with cold temperature,end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Static Discharge (Opeartion)	C=150pF, R=330 Ω, 5 points/panel Air:±8KV, 5 times; Contact: ±4KV, 5 times; (Environment: 15℃ ~ 35℃, 30% ~ 60%, 86Kpa ~ 106Kpa)	IEC61000-4-2 GB/T17626.2-1998
8	Vibration (Non-operation)	Frequency range: 10~55Hz, Stroke: 1.mm Sweep: 10Hz~55Hz~10Hz 2 hours for each direction of X .Y. Z. (package condition)	IEC60068-2-6 GB/T2423.5-1995
9	Shock (Non-operation)	60G 6ms, ± X, ±Y , ± Z 3 times for each direction	IEC60068-2-27 GB/T2423.5-1995
10	Package Drop Test	Height: 80 cm, 1 corner, 3 edges, 6 surfaces	IEC60068-2-32 GB/T2423.8-1995

Note: 1. T_S is the temperature of panel's surface.
2. Ta is the ambient temperature of sample.

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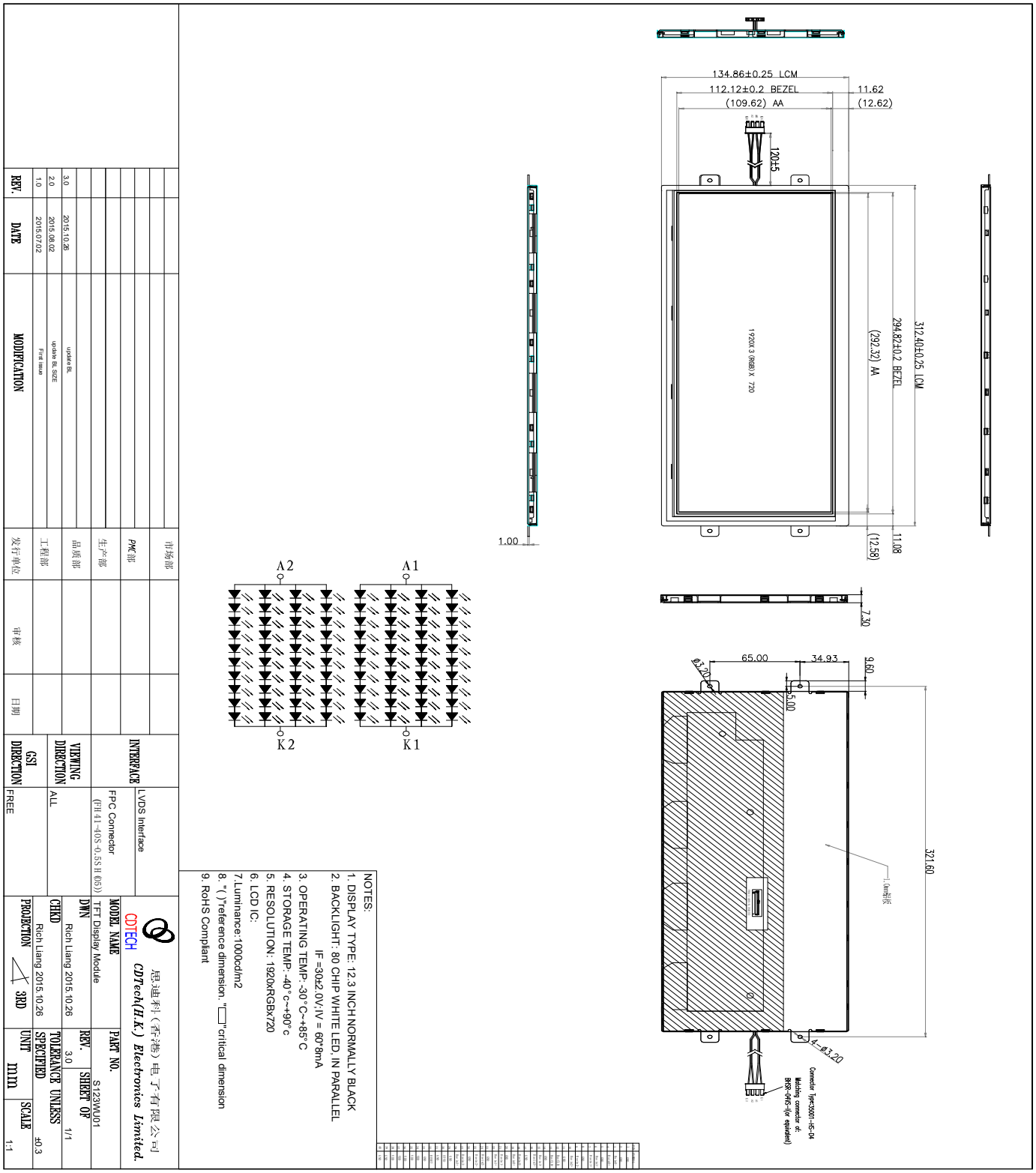
8 Mechanical Drawing



NOTES:
1. DISPLAY TYPE: 12.3 INCH NORMALLY BLACK
2. BACKLIGHT: 80 CHIP WHITE LED, IN PARALLEL
IF =30±2.0V; IV = 60*8mA
3. OPERATING TEMP: -30°C~+85°C
4. STORAGE TEMP: -40°c~+90°c
5. RESOLUTION: 1920xRGBx720
6. LCD IC:
7.Luminance:1000cd/m2
8. "( )"reference dimension. "□"critical dimension
9. RoHS Compliant

REV.	DATE	MODIFICATION	发行单位	审核	日期
3.0	2015.10.26	update BL	市场部		
2.0	2015.06.02	update BL SIZE	PMC部		
1.0	2015.07.02	First issue	生产部		
			品质部		
			工程部		

INTERFACE	LVDS Interface	MODEL NAME	PART NO.
	FPC Connector (FH41-40S-0.5SH(60))	TFT Display Module	S123WU01
VIEWING DIRECTION	ALL	DWN	REV. 3.0
GSI DIRECTION	FREE	CHKD	SHEET OF 1/1
		Rich Liang 2015.10.26	TOLERANCE UNLESS SPECIFIED ±0.3
		PROJECTION 3RD	UNIT mm SCALE 1:1

思迪科(香港)电子有限公司
CDTech(H.K.) Electronics Limited.

9 Packing

TBD

10. Precautions For Use of LCD modules

10.1 Handling Precautions

10.1.1. The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.

10.1.2. If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.

10.1.3. Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.

10.1.4. The polarizer covering the display surface of the LCD module is soft and easily scratched. Handle this polarizer carefully.

10.1.5. If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:

- Isopropyl alcohol
- Ethyl alcohol

Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:

- Water
- Ketone
- Aromatic solvents

10.1.6. Do not attempt to disassemble the LCD Module.

10.1.7. If the logic circuit power is off, do not apply the input signals.

10.1.8. To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.

10.1.8.1. Be sure to ground the body when handling the LCD Modules.

10.1.8.2. Tools required for assembly, such as soldering irons, must be properly ground.

10.1.8.3. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

10.1.8.4. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

10.2 Storage Precautions

10.2.1. When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

10.2.2. The LCD modules should be stored under the storage temperature range If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ～ 40℃ Relatively humidity: ≤80%

10.2.3. The LCD modules should be stored in the room without acid, alkali and harmful gas.

10.3 Transportation Precautions

The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.