



深圳市勋瑞光电科技有限公司

Xunrui Shenzhen Optoelectronics Technology Co., Ltd.

Product Specification

Customer: _____

Model Name: H101IFH40I3516-CT19

Date: _____

Version: _____

☒ **Preliminary Specification**

☐ **Final Specification**

For Customer's Acceptance

Approved by	Comment

Approved by	Reviewed by	Prepared by



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1. Record of Revision

Rev	Issued Date	Description	Editor
1.0	2017/11/14	First Release.	



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2 General Specifications

Feature		Spec
Characteristics	Size	10.1 inch
	Resolution	1280(horizontal)*800(Vertical)
	Interface	LVDS
	Connect type	Connector
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec. Pixel pitch (mm)	0.0565*0.1695
	Pixel Configuration	R.G.B.-Stripe
	Display Mode	Normally Black
	Driver IC	TBD
	Surface Treatment	HC
	Viewing Direction	Full View
	Gray scale Direction	free
Mechanical	CTP+LCM (W x H x D) (mm)	229.30*150.90*4.95
	Active Area(mm)	216.96x 135.6
	With /Without TSP	With TSP
	Weight (g)	-
	LED Numbers	39LEDs

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	VCOM	Common Voltage
2	VDD	Power Voltage for digital circuit
3	VDD	Power Voltage for digital circuit
4	NC	No connection
5	NC	No connection
6	NC	No connection
7	GND	Ground
8	RXIN0-	-LVDS differential data input
9	RXIN0+	+LVDS differential data input
10	GND	Ground
11	RXIN1-	-LVDS differential data input
12	RXIN1+	+LVDS differential data input
13	GND	Ground
14	RXIN2-	-LVDS differential data input
15	RXIN2+	+LVDS differential data input
16	GND	Ground
17	RXCLKIN-	-LVDS differential clock input
18	RXCLKIN+	+LVDS differential clock input
19	GND	Ground



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20	RXIN3-	-LVDS differential data input
21	RXIN3+	-LVDS differential data input
22	GND	Ground
23	NC	No connection
24	NC	No connection
25	GND	Ground
26	NC	No connection
27	NC	No connection
28	NC	No connection
29	AVDD	Power for Analog Circuit
30	GND	Ground
31	LED-	LED Cathode
32	LED-	LED Cathode
33	NC	No connection
34	NC	No connection
35	VGL	Gate oFF Voltage
36	NC	No connection
37	NC	No connection
38	VGH	Gate ON Voltage
39	LED+	LED Anode
40	LED+	LED Anode



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4 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Digital Supply Voltage	V _{DD}	-0.3	3.9	V	
TFT Gate on Voltage	V _{GH}	-0.3	42	V	
TFT Gate off Voltage	V _{GL}	-19	0.3	V	
Analog power Supply Voltage	AVDD	-0.3	14	V	
Operating Temperature	T _{OPR}	-20	70	°C	
Storage Temperature	T _{STG}	-30	80	°C	

5 Electrical Characteristics

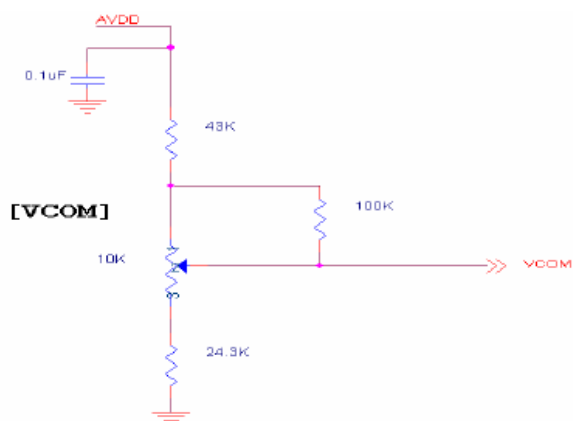
5.1 Typical Operation Conditions

Item	Symbol	MIN	Typ	MAX	Unit	Remark
Digital Supply Voltage	V _{DD}	2.3	2.5	3.6	V	
TFT Gate on Voltage	V _{GH}	21.7	22	22.3	V	
TFT Gate off Voltage	V _{GL}	-7.3	-7	-6.7	V	
Analog power Supply Voltage	AVDD	8	8.2	8.4	V	
TFT Common electrode Voltage	V _{COM}	2.7	3.0	3.3	V	

Note 1: Be sure to apply V_{DD} and V_{GL} to the LCD first, and then apply V_{GH}.

Note 2: V_{DD} setting should match the signals output voltage (refer to Note 3) of customer's system board.

Note 4: Typical V_{COM} is only a reference value, it must be optimized according to each LCM. Be sure to use VR.





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5.1.1 Current Consumption

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Current for Driver	I_{GH}	300	705	1000	μA	$V_{GH} = 22V$
	I_{GL}	300	705	1000	μA	$V_{GL} = -7V$
	I_{VDD}	50	95	120	mA	$V_{DD} = 2.5V$
	I_{AVDD}	8	45	70	mA	$AV_{DD} = 8.2V$

5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
Forward Current	I_F	-	260	-	mA	
Forward Voltage	V_F	-	9.6		V	
Reverse current	I_R		50		μA	
Power dissipation	P_d				mW	
Peak forward current	I_{FP}		100		mA	
Peak forward current	V_R		5		V	
Backlight Power consumption	W_{BL}	25000	-	-	W	

Note 1: Each LED : $I_F = 20\text{ mA}$, $V_F = 3.3V$.

Note 2: Optical performance should be evaluated at $T_a = 25^\circ C$ 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.



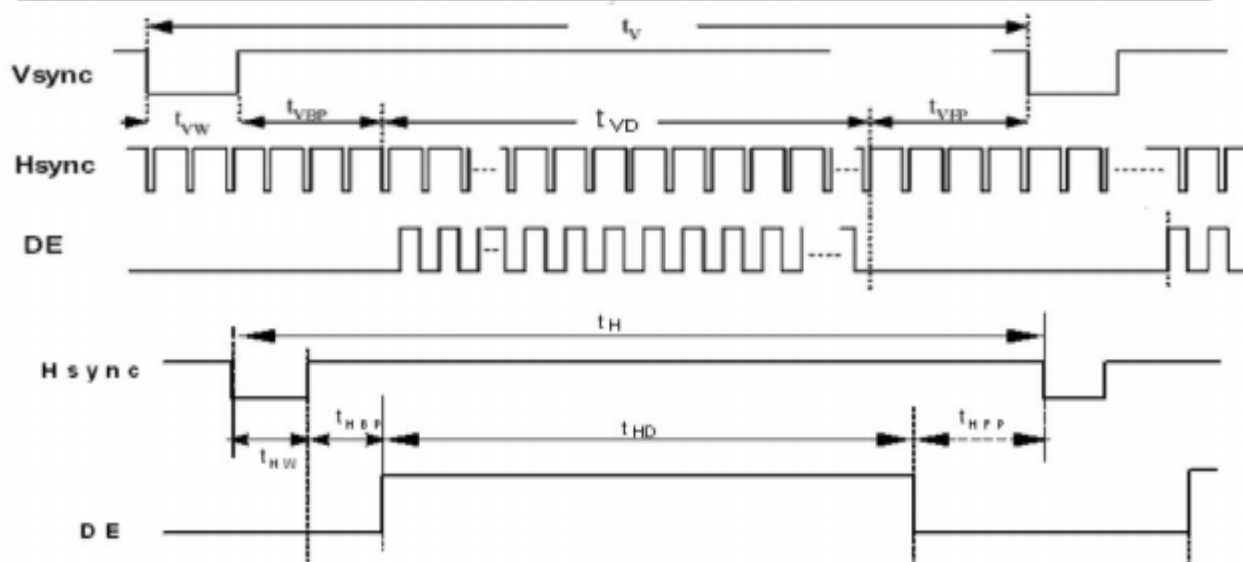
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6.TIMING CHARACTERISTICS OF INPUT SIGNAL

6.1 Input Signal Timing

Item	Symbol	Values				Conditions
		Min.	Typ.	Max.	Unit	
Frame rate	Fr	-	60.0	-	Hz	
Clock frequency	1/Tc	68.9	71.1	73.4	MHz	
Hor. display period	t _{HD}	1280			Tc	
HS period	t _H	1410	1440	1470	Tc	
HS width + back porch + front porch	t _{HW} +t _{HBP} +t _{HFP}	60	160	190	Tc	
Vertical display period	t _{VD}	800			TH	
VS period	t _V	815	823	833	TH	
VS width + back porch + front porch	t _{VW} +t _{VBP} +t _{VFP}	15	23	33	TH	





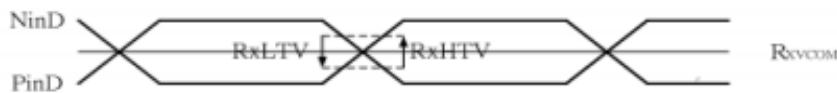
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6.2 LVDS Input Characteristics

Item	Symbol	Values				Conditions
		Min.	Typ.	Max.	Unit	
LVDS differential signal high threshold voltage	RxHTV	-	-	100.0	mV	RxVCOM=1.2V
LVDS differential signal low threshold voltage	RxLTV	-100.0	-	-	mV	
LVDS differential signal common voltage	RxVCOM	0.7	-	1.6	V	
LVDS differential signal voltage	VD	0.1	-	0.6	V	

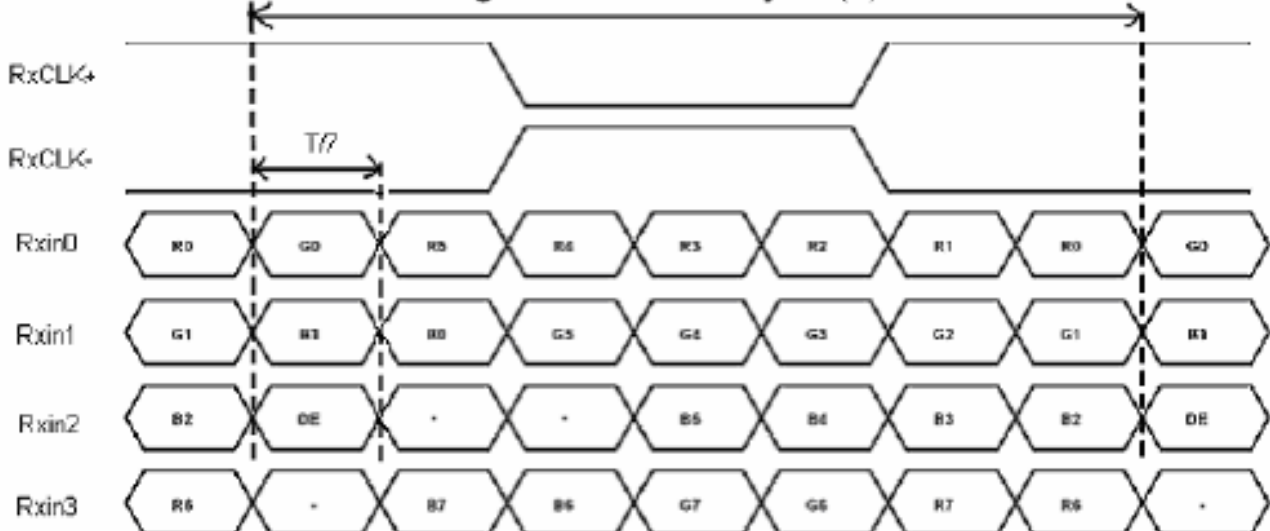
Signal Ended



Differential Signal



Signal for 1 DCLK Cycle (T)



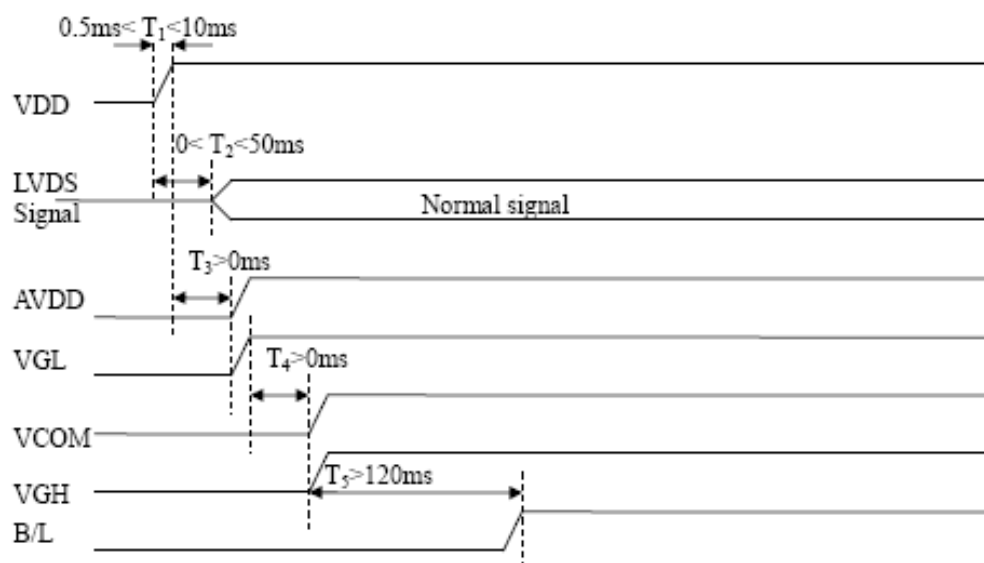


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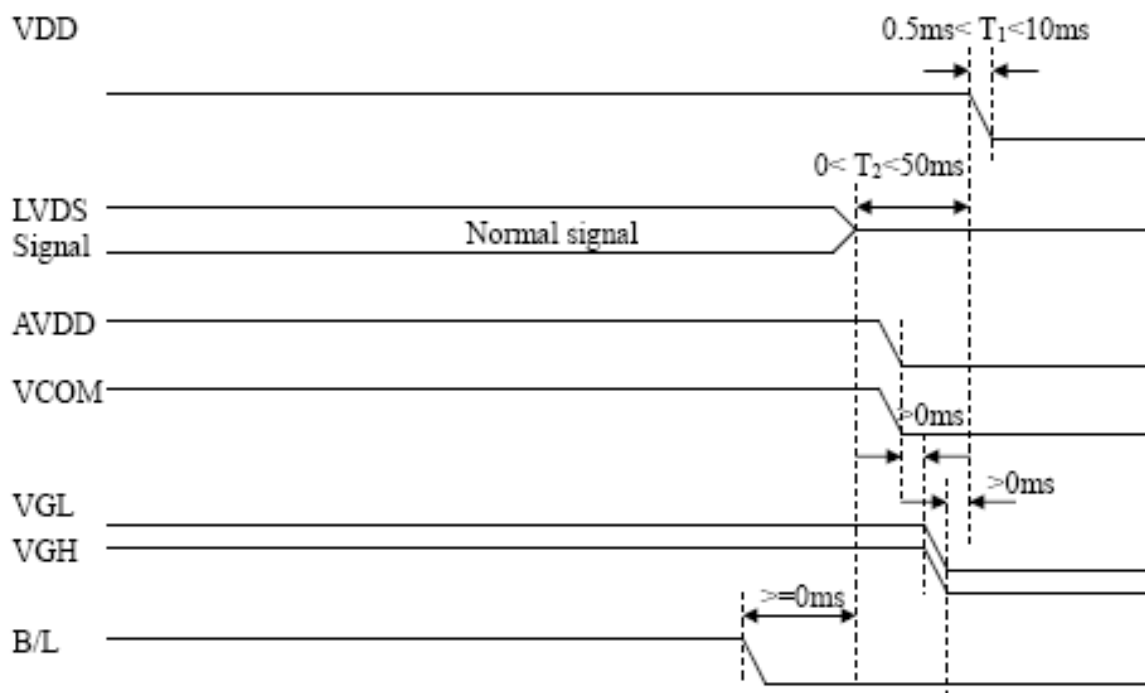
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6.3 Power sequence

a. Power on:



b. Power off:





6 Optical Characteristics

Items		Symbol	Condition	Min.	Typ.	Max.	Unit	Remark
Viewing angles		θ_T	Center CR≥10	70	85	-	Degree.	Note2
		θ_B		70	85	-		
		θ_L		70	85	-		
		θ_R		70	85	-		
Contrast Ratio		CR	$\Theta =0$	-	600	-	-	Note1, Note3
Response Time		T _{ON}	25° C	-	10	20	ms	Note1, Note4
		T _{OFF}		-	25	40		
Chromaticity	White	X _W	Backlight is on	0.262	0.302	0.342	-	Note1, Note5
		Y _W		0.298	0.338	0.378	-	
	Red	X _R		0.566	0.606	0.646	-	
		Y _R		0.285	0.325	0.365	-	
	Green	X _G		0.263	0.303	0.343	-	
		Y _G		0.527	0.567	0.607	-	
	Blue	X _B		0.107	0.147	0.187	-	
		Y _B		0.121	0.161	0.201	-	
Uniformity		U		75	80	-	%	Note1, Note6
NTSC					50		%	Note5
Luminance		L		250	290			Note1, Note7

Test Conditions:

1. IF= 260mA(one channel),the ambient temperature is 25° C
2. The test systems refer to Note 1 and Note 2.

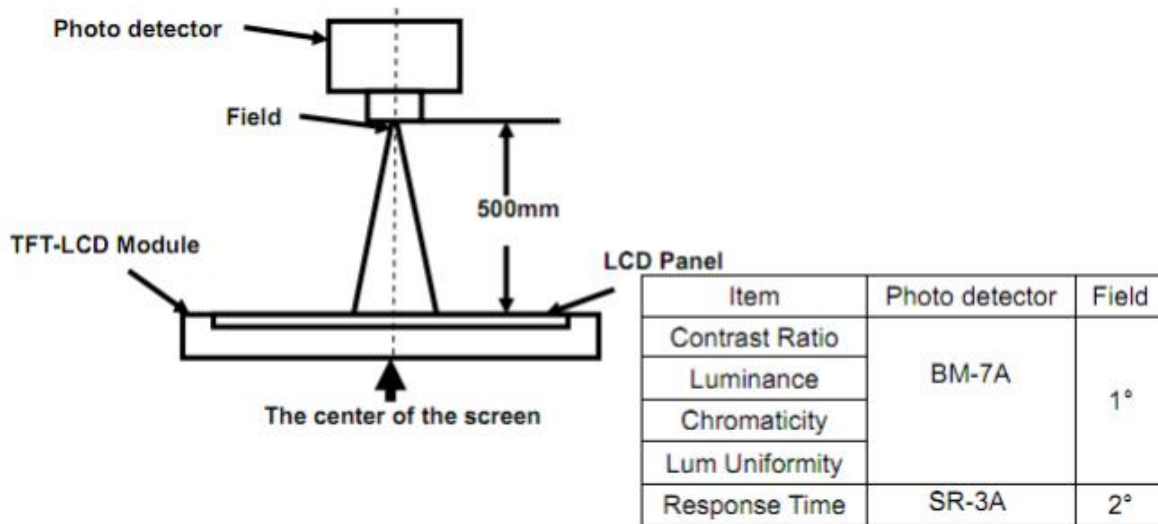
Note 1:Definition of optical measurement system.

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.



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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).

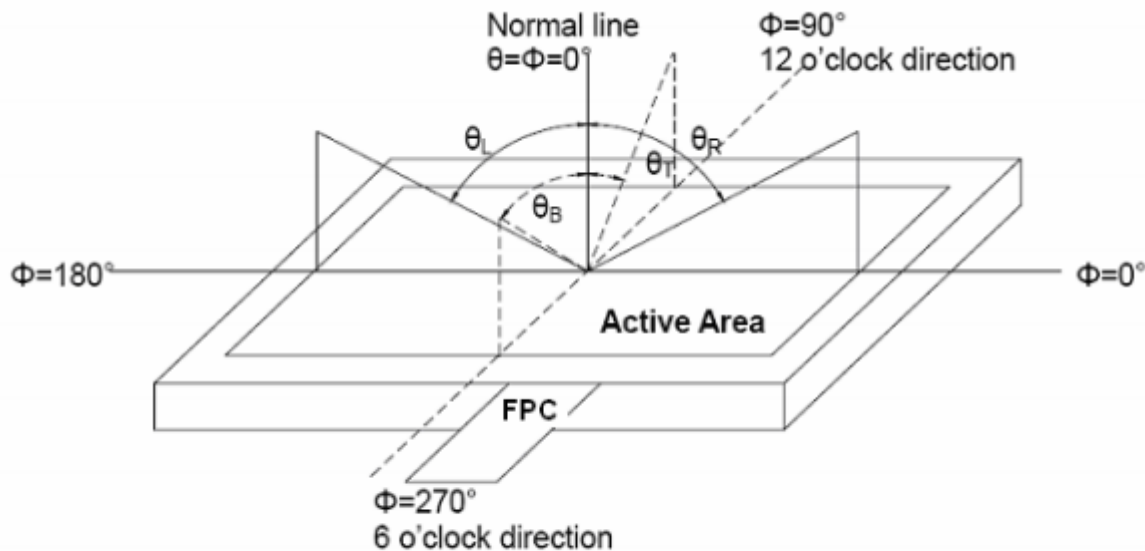


Fig. 1 Definition of viewing angle

Note 3: Definition of contrast ratio

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

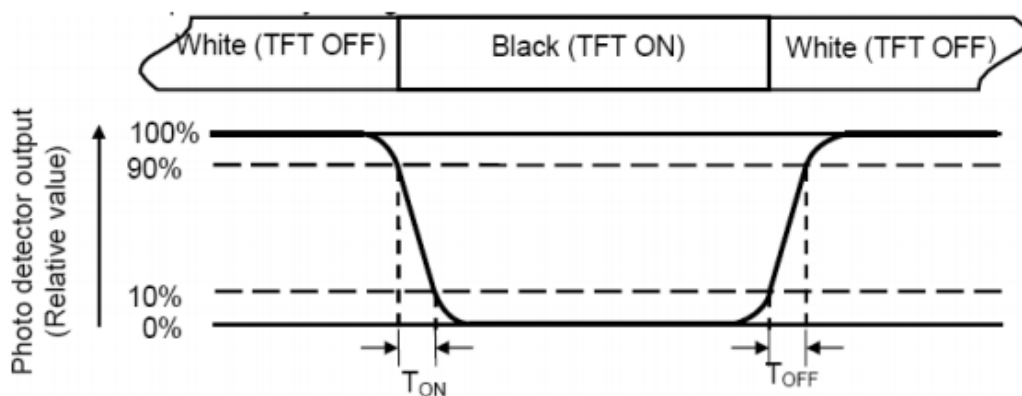


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Note 4: Definition of Response time

The response time is defined as the LCD optical switching time interval between “White” state and “Black” state. Rise time (T_{ON}) is the time between photo detector output intensity changed from 10% to 90%. And fall time (T_{OFF}) is the time between photo detector output intensity changed from 90% to 10%.



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.

$$\text{Luminance Uniformity}(U) = L_{\min} / L_{\max} \times 100\%$$

L-----Active area length W----- Active area width

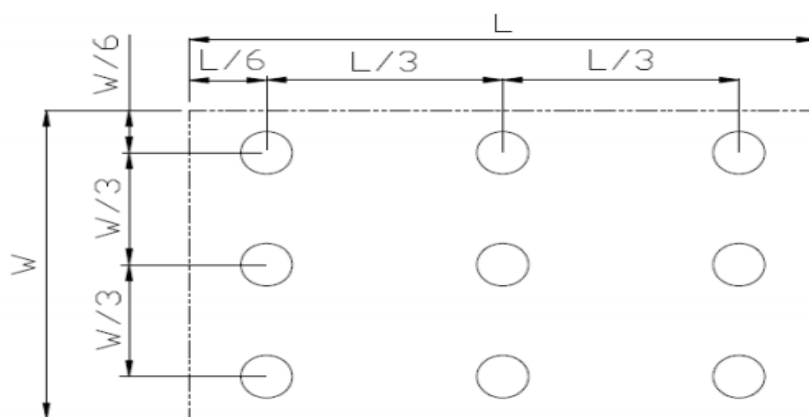


Fig. 2 Definition of uniformity

$L_{\max}$: The measured maximum luminance of all measurement position.

$L_{\min}$: The measured minimum luminance of all measurement position.

Note 7: Definition of Luminance :

Measure the luminance of white state at center point.



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7 Environmental / Reliability Tests

No	Test Item	Condition	Remarks
1	High Temperature Opeartion	$T_s = +70^{\circ}\text{C}$, 240hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Opeartion	$T_a = -20^{\circ}\text{C}$, 240hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	$T_a = +80^{\circ}\text{C}$, 240hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	$T_a = -30^{\circ}\text{C}$, 240hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	$T_a = +60^{\circ}\text{C}$, 90% RH max, 160 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30°C 30 min $\sim$ $+80^{\circ}\text{C}$ 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)	$C=150\text{pF}$, $R=330\ \Omega$, 5 points/panel Air: $\pm 8\text{KV}$, 5 times; Contact: $\pm 4\text{KV}$, 5 times; (Environment: $15^{\circ}\text{C} \sim 35^{\circ}\text{C}$, 30% $\sim$ 60%, 86Kpa $\sim$ 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, $\pm X$, $\pm Y$, $\pm Z$ 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. T_a is the ambient temperature of sample.

8 Mechanical Drawing

A0	2022/08/03	First issue	

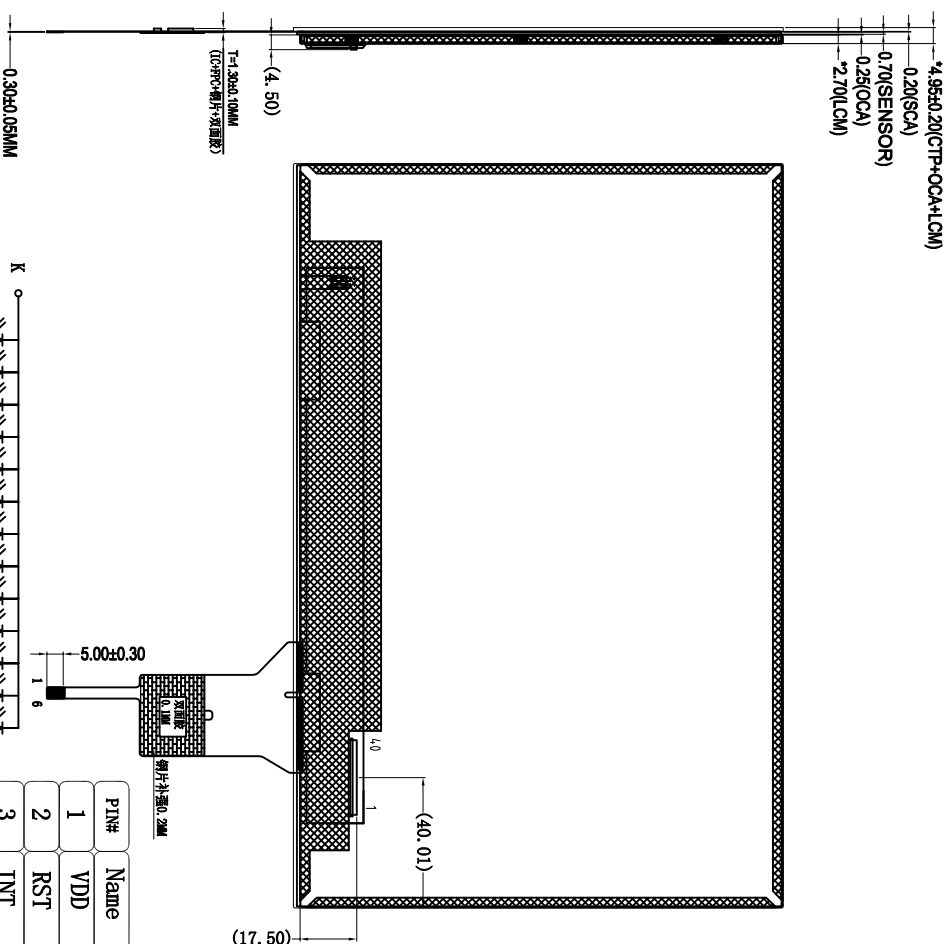
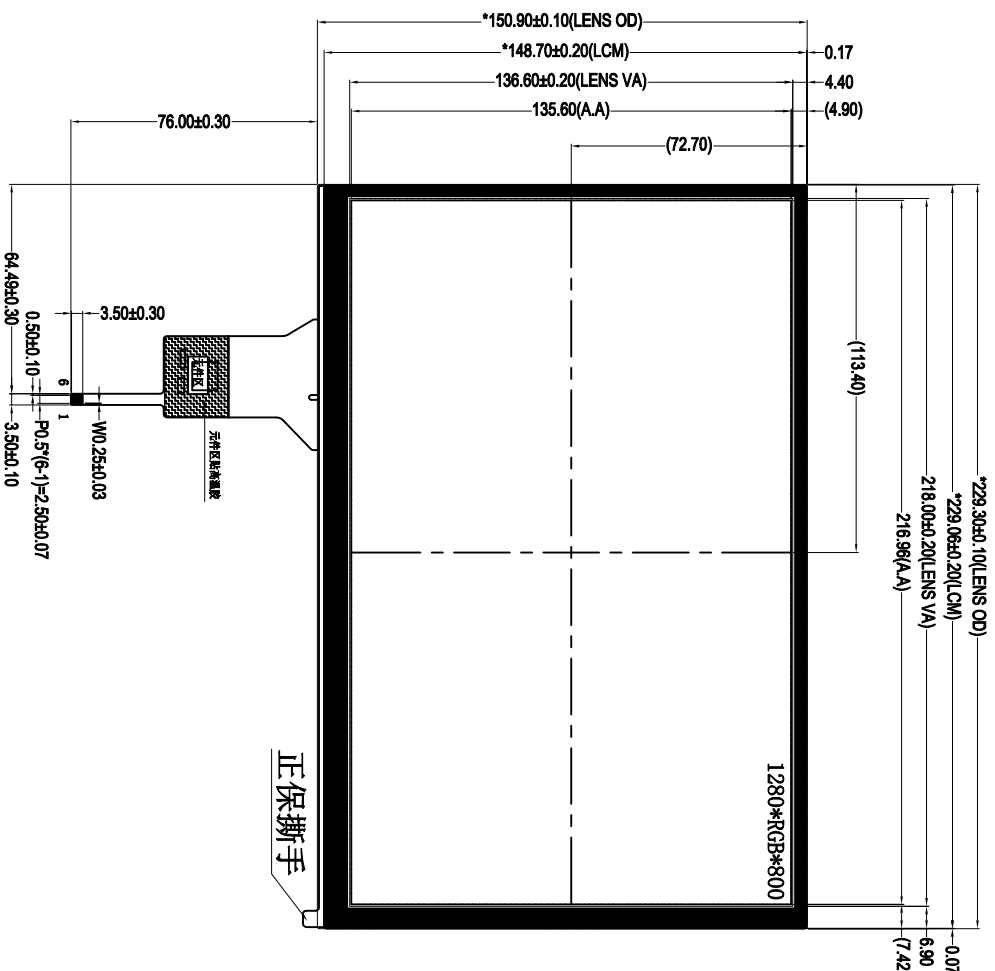


Figure 1: Pin assignment diagram of the chip. The diagram shows a top-down view of the chip with pins numbered 1 to 40. Pins 1-6 are on the left, 7-12 on the top, 13-18 on the right, and 19-40 on the bottom. A detailed view of the bottom pins (19-26) shows a 0.1mm pitch and a 5.00±0.30mm width. A note indicates '焊片外宽0.28mm' (solder pad outer width 0.28mm). A coordinate system (17.50, 40.01) is shown at the bottom right corner.

PIN	ASSIGN
1	VDD
2	VDD
3	VDD
4	NC
5	NC
6	NC
7	GND
8	EXTIO-
9	EXTIO+
10	GND
11	EXTIN-
12	EXTIN+
13	GND
14	EXTIN-
15	EXTIN+
16	GND
17	IOCLK
18	IOCLK
19	GND
20	EXTIN-
21	EXTIN+
22	GND
23	NC
24	NC
25	GND
26	NC
27	NC
28	NC
29	AVDD
30	GND
31	LD-
32	LD-
33	NC
34	NC
35	VCL
36	NC
37	NC
38	VCL
39	LD+
40	LD+

- LCM NOTES:
1. DISPLAY TYPE:10.1 INCH TFT /Black
 2. BACKLIGHT: 39 CHIP WHITE LED, IN PARALLEL
 3. OPERATING TEMP: -20° C~+70° C
 4. STORAGE TEMP: -30° c~+80° c
 5. RESOLUTION: 1280xRGBx800
 6. Luminous instensity(9 AVG):Module:250cd/m2 (MIN.), 290cd/m2 (TYP.)
 7. Uniformity:75% (Min)
 8. " () "reference dimension. * "critical dimension
 9. RoHS Compliant

- 技术要求:
- 1、结构为:G+G IC: GT928 通道数:TX32 RX20
 - 2、盖板材质:物理半钢化, $T=1.1\text{mm}$ 表面硬度: 6H
 - 3、成品可视区透光率: $\geq 85\%$
 - 4、要求肉眼看不到蚀刻纹
 - 5、TP翘曲度 $\leq 0.3\text{mm}$
 - 6、未标注公差为 $\pm 0.2\text{mm}$, 未注倒边 $CO.15 \pm 0.05\text{mm}$
 - 7、操作环境: -10°C ~ 60°C , 20% ~ $90\%\text{RH}$
 - 8、所有材料符合ROHS标准

INTERFACE	LVDs Interface	 深圳市恒光电子技术有限公司 Shenzhen Hengguang Electronics Technology Co., Ltd.	MODEL NAME	PART NO.	REV.	SHEET OF	TOLERANCE UNLESS SPECIFIED	UNIT	SCALE
	PFC Connector								
VIEWING DIRECTION	ALL		TFT Display Module	H1011FH4013516-CT1		1/1			±0.
Gray Scale DIRECTION			CHMD						
FREE DIRECTION			PROJECTION						
			3RD ANGLE						



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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.