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Cover glass

System solutions

OEM Solutions

Custom Display

Production Custom designs Installation

Mechanical design



Product Specification

Customer: _____

Model Name: _____ ET035HV01-HT _____

Date: _____ 2023.09.23 _____

Version: _____ A0 _____

☒ 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

Version	Revise Date	Content	Editor
A0	2023/09/23	First Release.	



2 General Specifications

Feature		Spec
Characteristics	LCD Size	3.5inch
	Display Format	320 (RGB) × 240
	Interface	24-bit RGB
	Color Depth	16.7M
	Technology type	a-Si
	Display Spec.	0.073 x 0.219
	Display Mode	Normally BLACK
	Driver IC	ST7272A-G4-1-E
	Surface Treatment	Haze 20%
	Viewing Direction	ALL
	Gray Viewing Direction	FREE
Mechanical	LCM+CTP (W x H x D) (mm)	84.4*71.5*5.13
	Active Area(mm)	70.08 x 52.56
	With /Without TSP	With TSP
	Weight (g)	TBD
	LED Numbers	6 LEDs

Note 1: Viewing direction is following the data which measured by optics equipment.

Note 2: Requirements on Environmental Protection: RoHS

Note 3: LCM+CTP weight tolerance: +/- 5%



3 Input/Output Terminals

No.	Symbol	Description
1,2	VBL-	Backlight LED Cathode
3,4	VBL+	Backlight LED Anode.
5	YU	Touch panel up side
6	XR	Touch panel right side
7	NC	NC
8	RESET	Reset Signal pin ("Low" is enable)
9	SPENB	Chip select
10	SPCK	Serial Clock.
11	SPDA	Serial Data
12-19	B0~B7	Data bus
20-27	G0~G7	Data bus
28-35	R0~R7	Data bus
36	HSYNC	Line Synchronous Signal
37	VSYNC	Frame Synchronous Signal
38	DOTCLK	Dot-clock signal and oscillator source
39-40	NC	NC
41-42	VDD	Power supply for logic operation
43	YD	Touch panel bottom side
44	XL	Touch panel left side
45-47	NC	
48	IF2	Control the input data format/floating
49	IF1	Control the input data format
50	IF0	Control the input data format
51	NC	NC
52	DEN	Display enable signal
53-54	GND	System Ground



4 Absolute Maximum Ratings

Item	Symbol	MIN	MAX	Unit	Remark
Supply Voltage	V_{DD}	-0.3	5.0	V	
Input Signal Voltage	V_{in}	-0.3	$V_{DD}+0.3$	V	
Logic Output Voltage	V_{OUT}	-0.3	$V_{DD}+0.3$	V	
Operating Temperature	T_{OPR}	-20	70	°C	
Storage Temperature	T_{STG}	-30	80	°C	

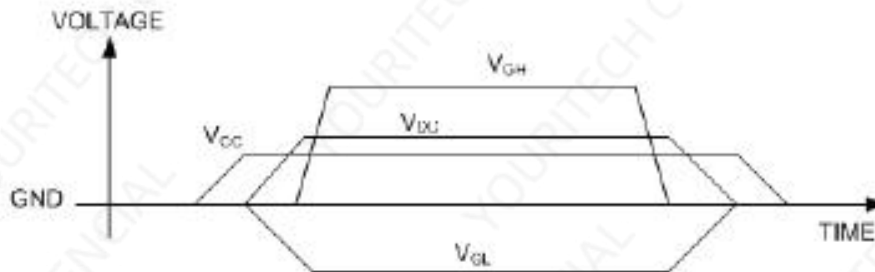
5 Electrical Characteristics

5.1 Operating conditions:

Parameter	Symbol	MIN	TYP	MAX	Unit	Remark
Power Voltage	V_{CC}	3.0	3.3	3.6	V	
Digital Operation Current	I_{CC}		8.6		mA	
Gate On Power	V_{COMH}	2.5	13.9	4.5	V	
Gate Off Power	V_{GH}	-	-13.6	15	V	
Vcom High Voltage	V_{comH}	-	3.9	-	V	Note1
Vcom low Voltage	V_{comL}	-	-1.2	-	V	Note1
Vcom level max	V_{comA}	-	-	6	V	

Note1. V_{comH} & V_{comL} : Adjust the color with gamma data. V_{p-p} should be higher then 4V.(Option 5V)

Note: Please power on following the sequence V_{CC} V_{DD}



5.2 Driving Backlight

Item	Symbol	MIN	TYP	MAX	Unit	Remark
LED current	I_F	-	40	-	mA	Note 1 Note 2,3
Power Consumption					mW	
LED Voltage	V_F	16.8	18	19.2	V	
LED Life Time	W_{BL}	-	25000	-	Hr	

Note 1 : There are 2 Groups LED

Note 2 : $T_a = 25^{\circ}\text{C}$

Note 3 : Brightness to be decreased to 50% of the initial value





Digital Parallal RGB interface

Signal	Item	Symbol	Min	Typ	Max	Unit
Dclk	Frequency	Tosc	-	156	-	ns
	High Time	Tch	-	78	-	ns
	Low Time	Tcl	-	78	-	ns
Data	Setup Time	Tsu	12	-	-	ns
	Hold Time	Thd	12	-	-	ns
Hsync	Period	TH	-	408	-	Tosc
	Pulse Width	THS	5	30	-	Tosc
	Back-Porch	Thb		38		Tosc
	Display Period	TEP	-	320	-	Tosc
	Hsync-den time	THE	36	68	88	Tsoc
	Front-Porch	Thf	-	20	-	Tosc
Vsync	Period	Tv	-	262	-	TH
	Pulse Width	Tvs	1	3	5	TH
	Back-Porch	Tvb	-	15	-	TH
	Display Period	Tvd	-	240	-	TH
	Front-Porch	Tvf	2	4	-	TH

Note: 1. $Thp + Thb = 68$, the user is make up by yourself.
 2. $Tv = Tvs + Tvb + Tvd + Tvf$, the user is make up by yourself.
 3. When SYNC mode is used, 1st data start from 68th Dclk after Hsync falling



Digital Serial RGB interface

Signal	Item	Symbol	Min	Typ	Max	Unit
Dclk	Frequency	Tosc	-	52	-	ns
	High Time	Tch	-	78	-	ns
	Low Time	Tcl	-	78	-	ns
Data	Setup Time	Tsu	12	-	-	ns
	Hold Time	Thd	12	-	-	ns
Hsync	Period	TH	-	1224	-	Tosc
	Pulse Width	THS	5	90	-	Tosc
	Back-Porch	Thb		114		Tosc
	Display Period	TEP	-	960	-	Tosc
	Hsync-den time	THE	108	204	264	
	Front-Porch	Thf	-	60	-	Tosc
Vsync	Period	Tv	-	262	-	TH
	Pulse Width	Tvs	1	3	5	TH
	Back-Porch	Tvb	-	15	-	TH
	Display Period	Tvd	-	240	-	TH
	Front-Porch	Tvf	2	4	-	TH

Note: 1. $T_{hp} + T_{hb} = 204$, the user is make up by yourself.
 2. $T_v = T_{vs} + T_{vb} + T_{vd} + T_{vf}$, the user is make up by yourself.
 3. When SYNC mode is used, 1st data start from 204th Dclk after Hsync falling



CCIR601/656 Interface

Signal	Item	Symbol	Min	Typ	Max	Unit
Dclk	Frequency	Tosc	-	37	-	ns
	High Time	Tch	-	78	-	ns
	Low Time	Tcl	-	78	-	ns
Data	Setup Time	Tsu	12	-	-	ns
	Hold Time	Thd	12	-	-	ns

6.2 Waveform

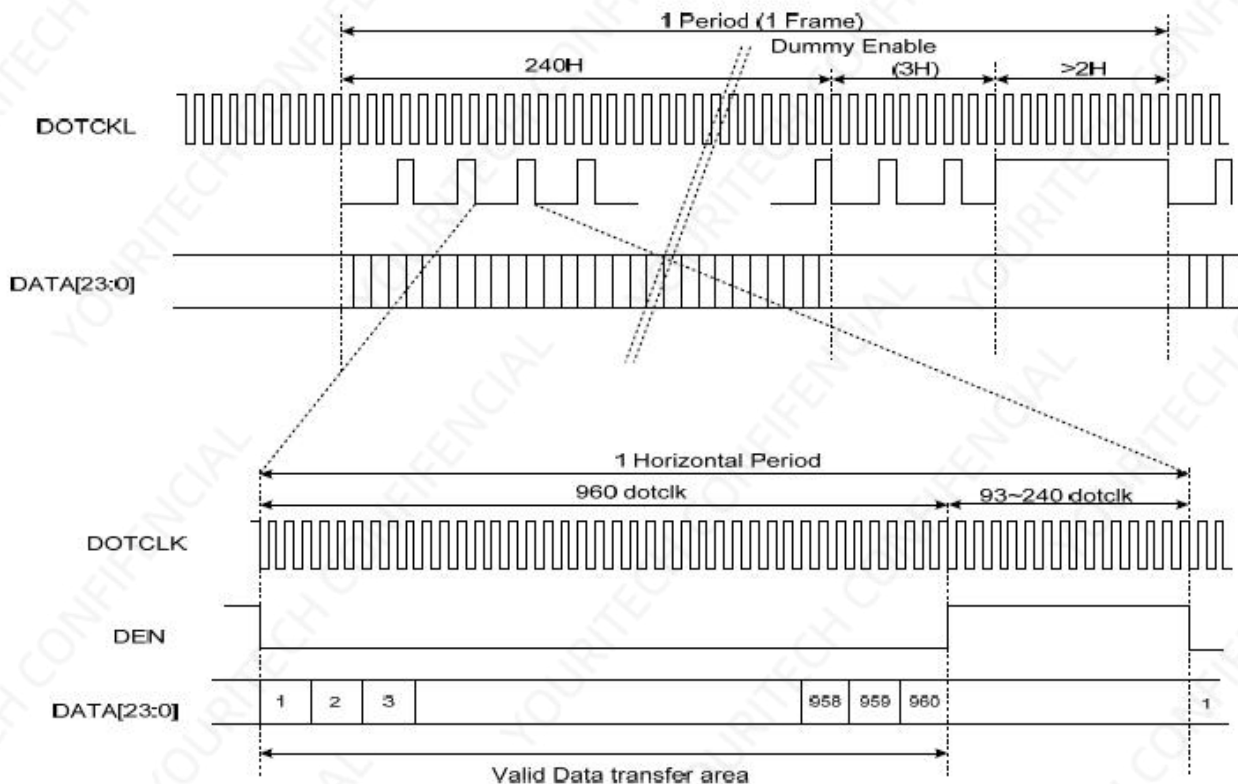


Figure 3 Data Transaction Timing in Serial RGB (8 bit) Interface (DE Mode)



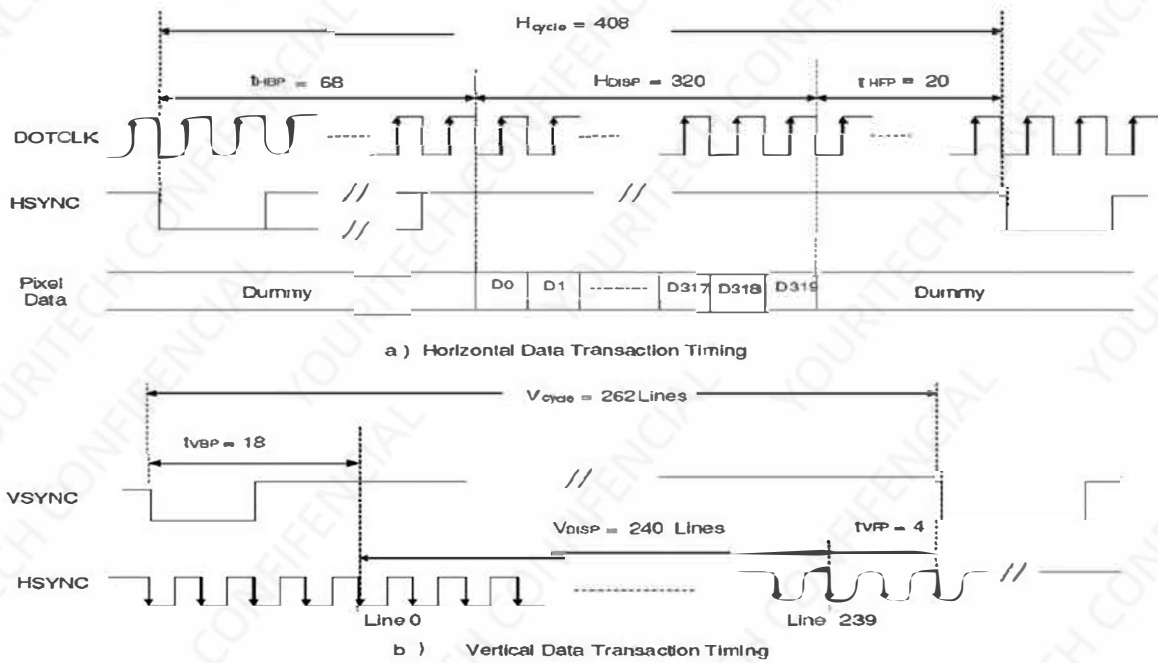


Figure 3 Data Transaction Timing in Parallel RGB (24 bit) Interface (SYNC Mode)



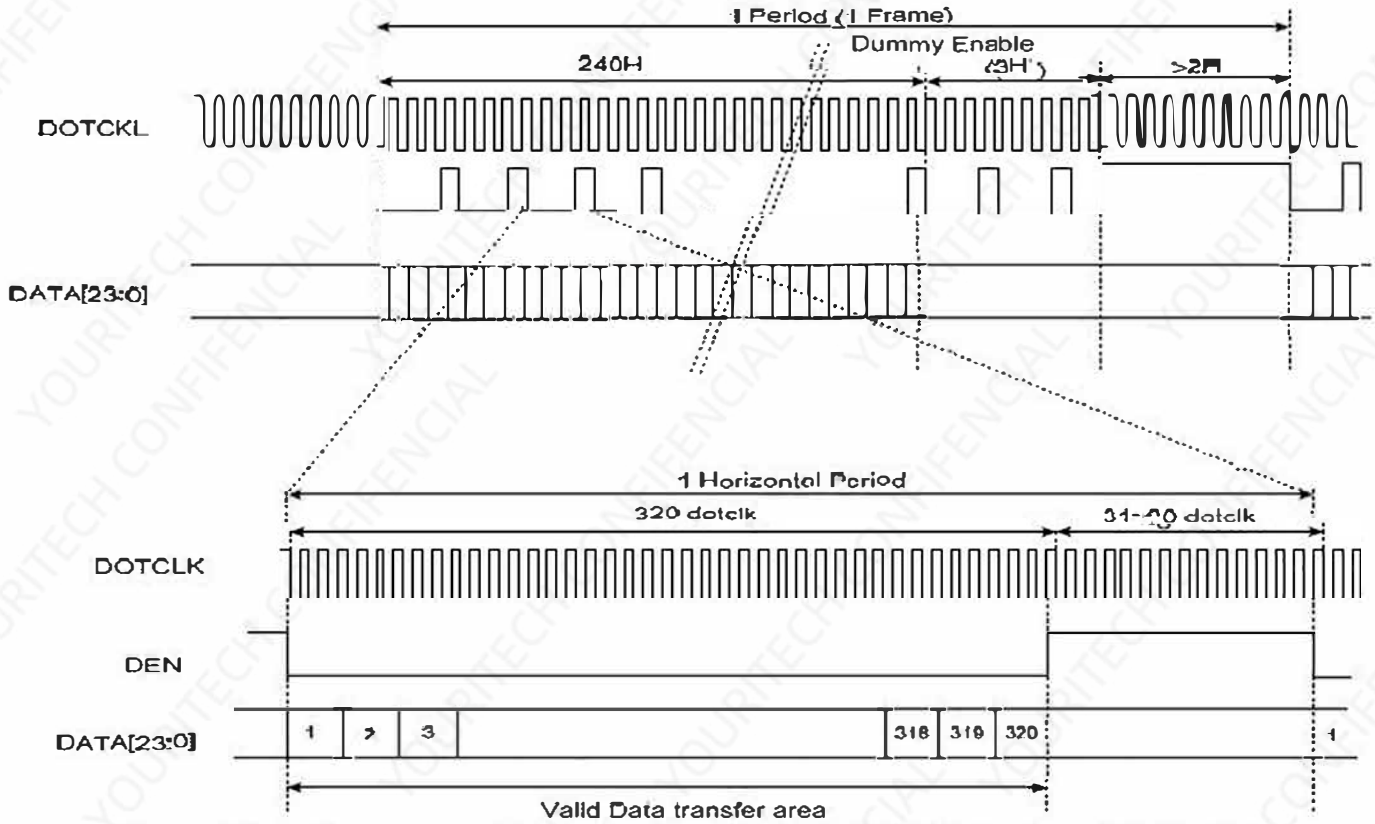


Figure 4 Data Transaction Timing in Parallel RGB (24 bit) Interface (DE Mode)



6.3 Clock and Sync waveforms

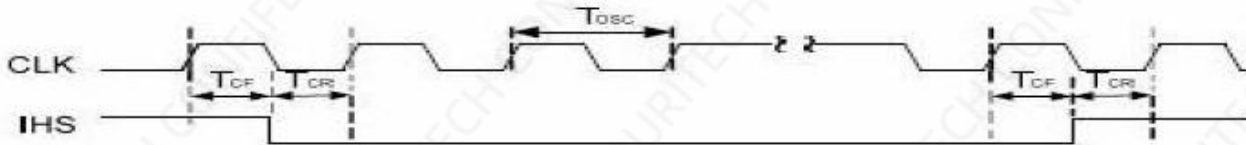


Figure 6 CLK and IHS timing waveform

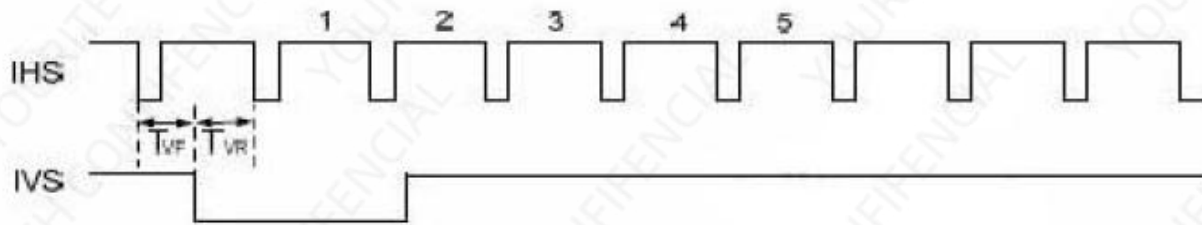
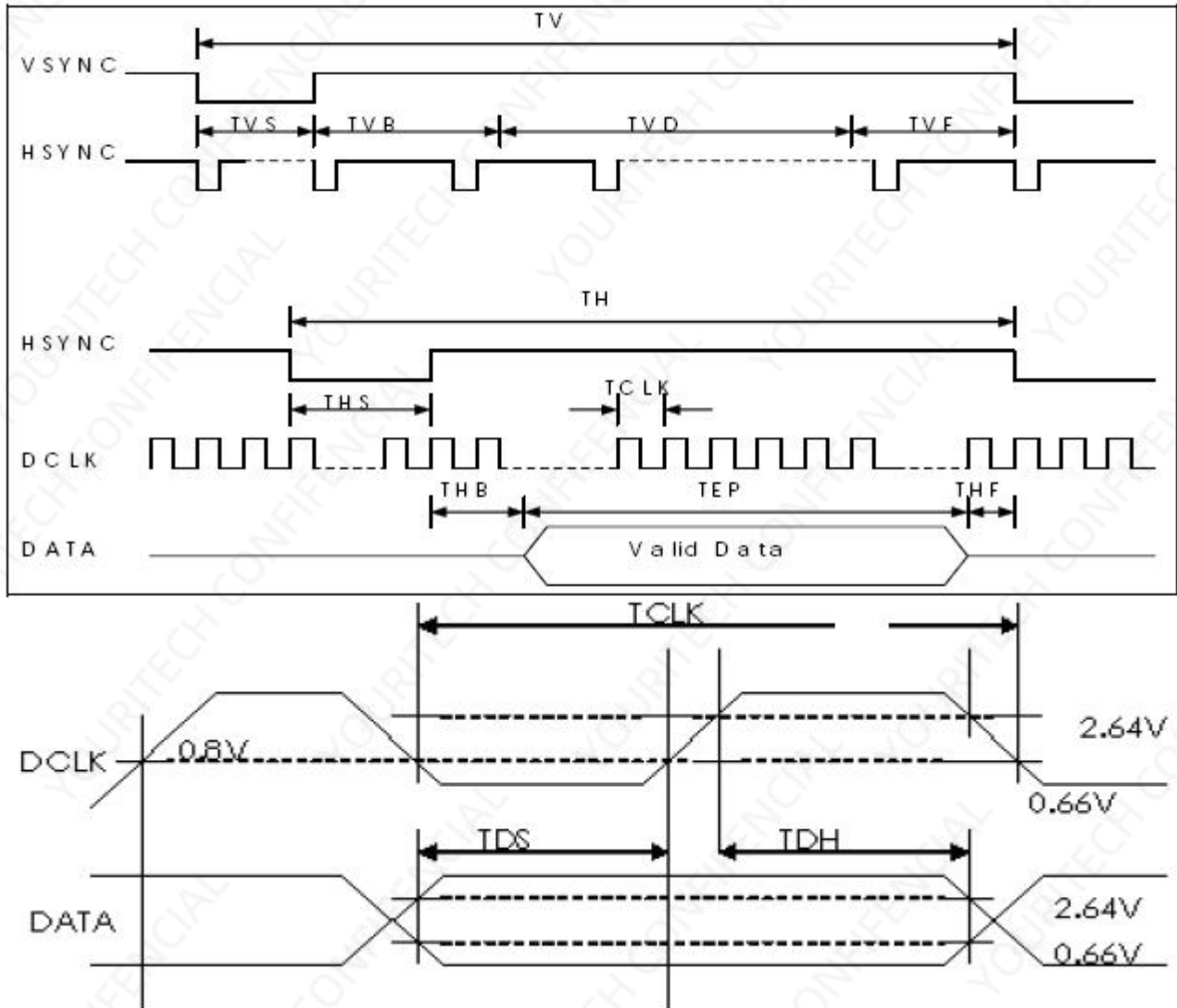


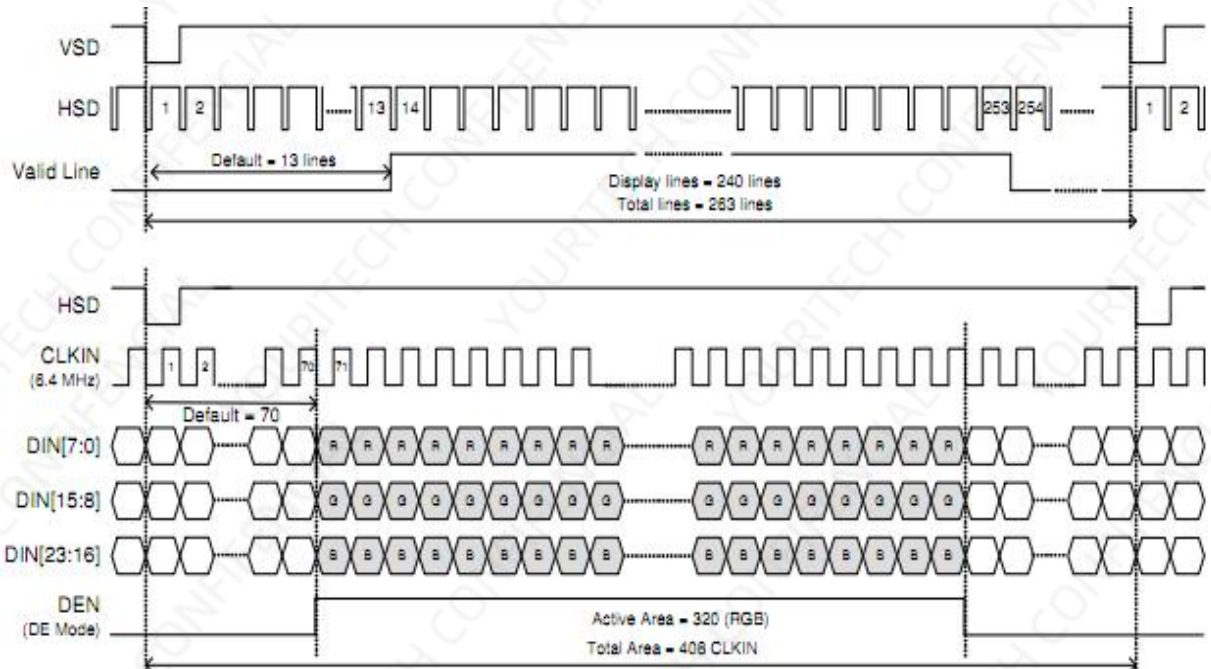
Figure 7 IHS and IVS timing waveforms



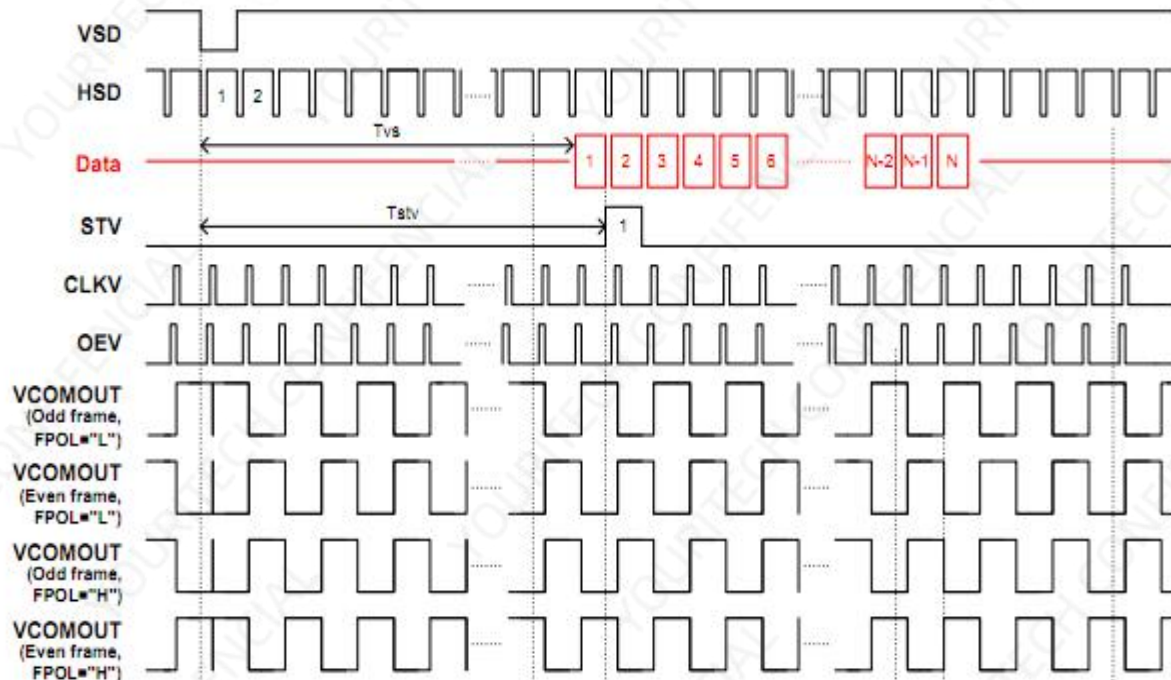


6.4 Input Data Timing (24 bit RGB mode for 960 x 240 @ SEL[3:0] = 1100b)

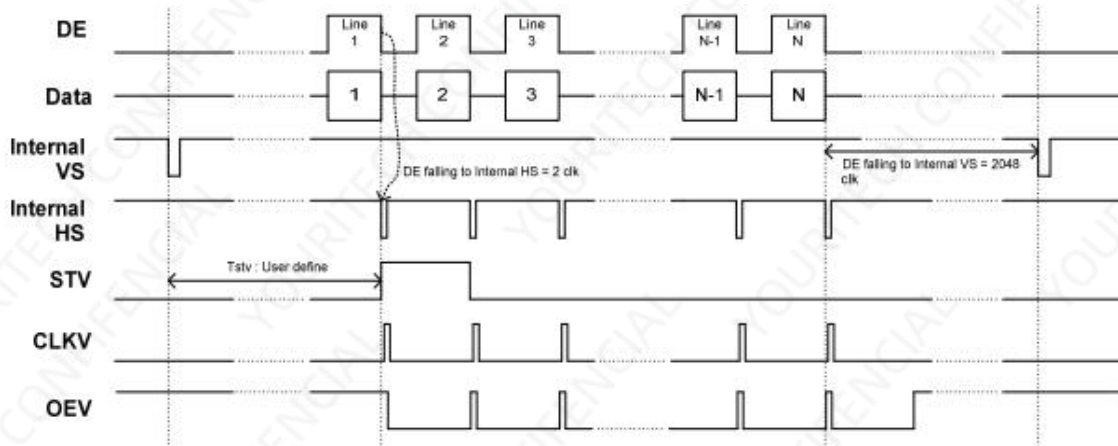




6.5 Vertical Timing Diagram (HV Mode)

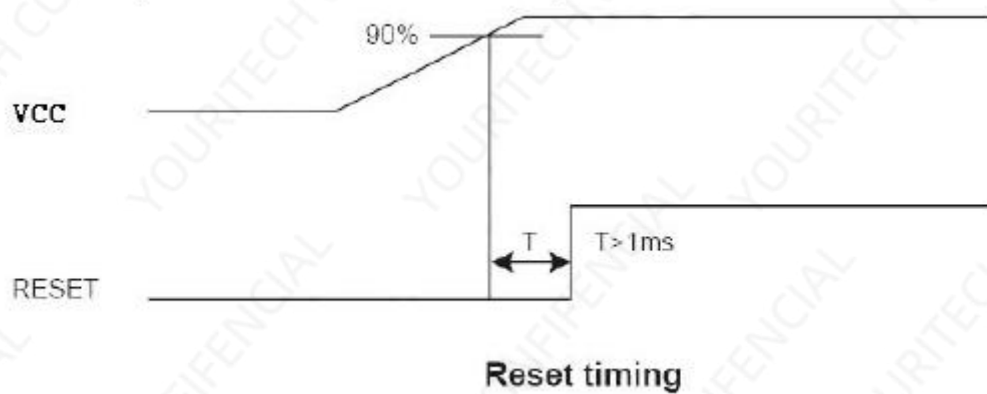


6.6 Vertical Timing Diagram (DE Mode)



6.7 Reset Timing Chart

The RESET input must be held at least 1ms after power is stable



7 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	$\Theta =0$	900	1200	-	-	Note1 Note3
Response Time		T _{ON}	25°C	-	30	40	ms	Note1 Note4
		T _{OFF}		-	30	40		
Chromaticity	White	X _W	Backlight is on	0.282	0.322	0.352	-	Note1 Note5
		Y _W		0.309	0.339	0.369	-	
	Red	X _R		0.609	0.639	0.669	-	
		Y _R		0.314	0.344	0.374	-	
	Green	X _G		0.264	0.294	0.324	-	
		Y _G		0.557	0.587	0.617	-	
	Blue	X _B		0.102	0.132	0.162	-	
		Y _B		0.106	0.136	0.166	-	
Uniformity		U		80	-	-	%	Note1 Note6
Colour Temperature				-	-	-	K	
NTSC				55	60	-	%	Note5
LCM+CTP Luminance		L		800	960	-		Note1 Note7

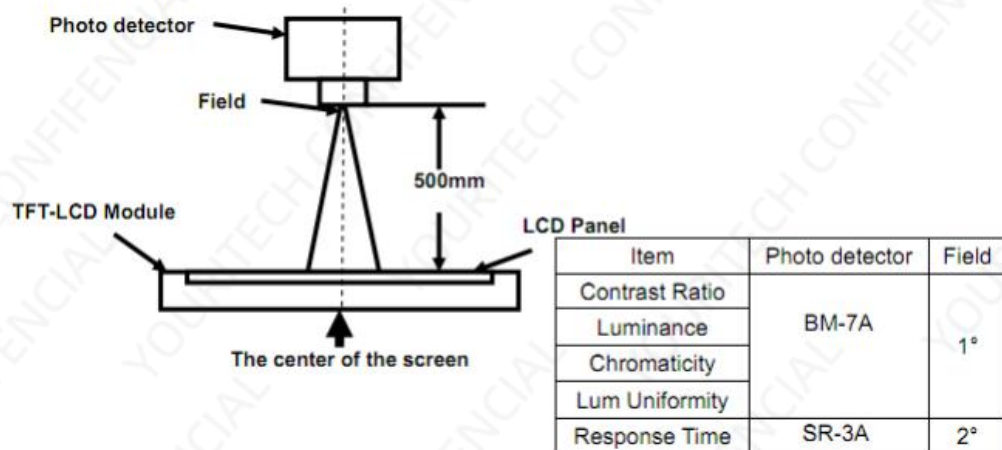
Test Conditions:

1. IF= 20mA(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.





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).

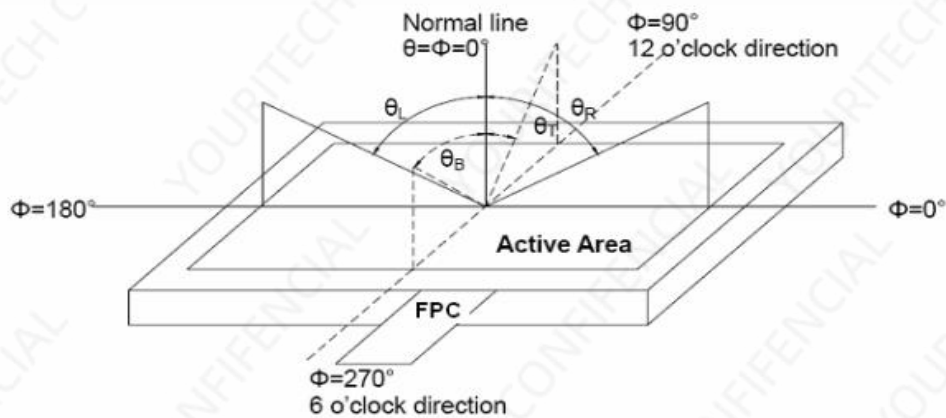


Fig. 1 Definition of viewing angle

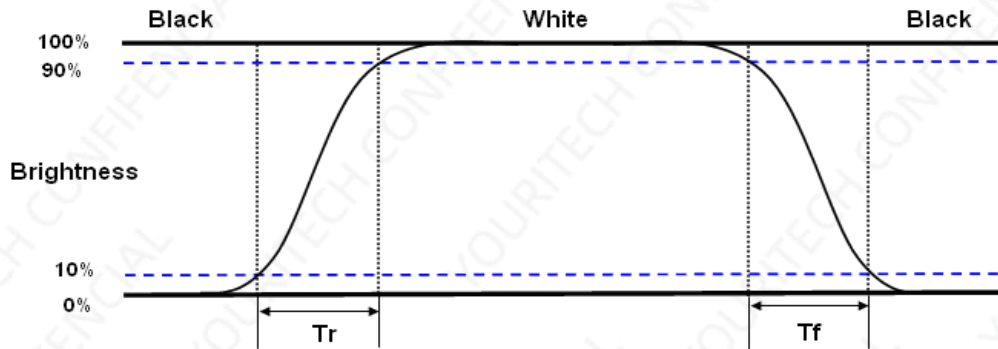
Note 3: Definition of contrast ratio

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

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) = $L_{min} / L_{max} \times 100\%$

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

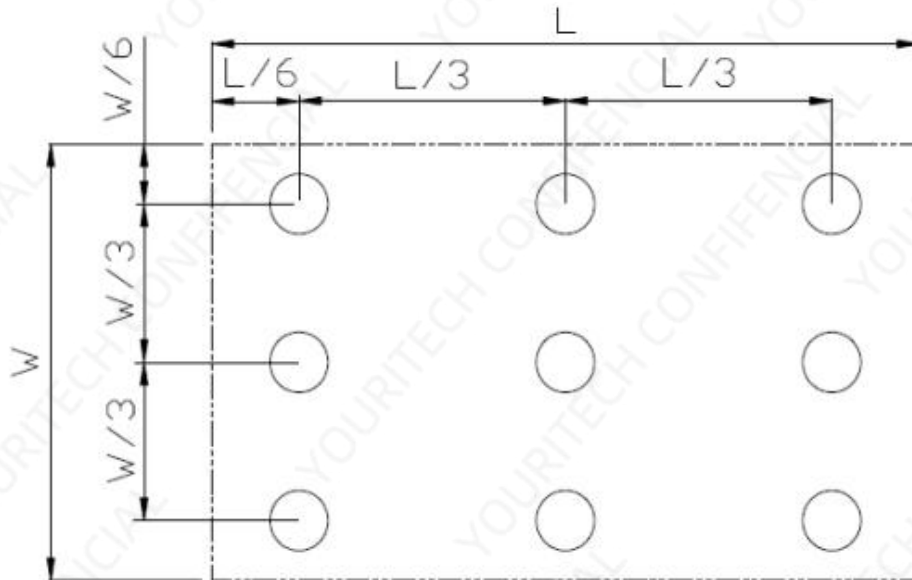


Fig. 2 Definition of uniformity

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.

8 Environmental / Reliability Tests

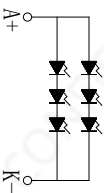
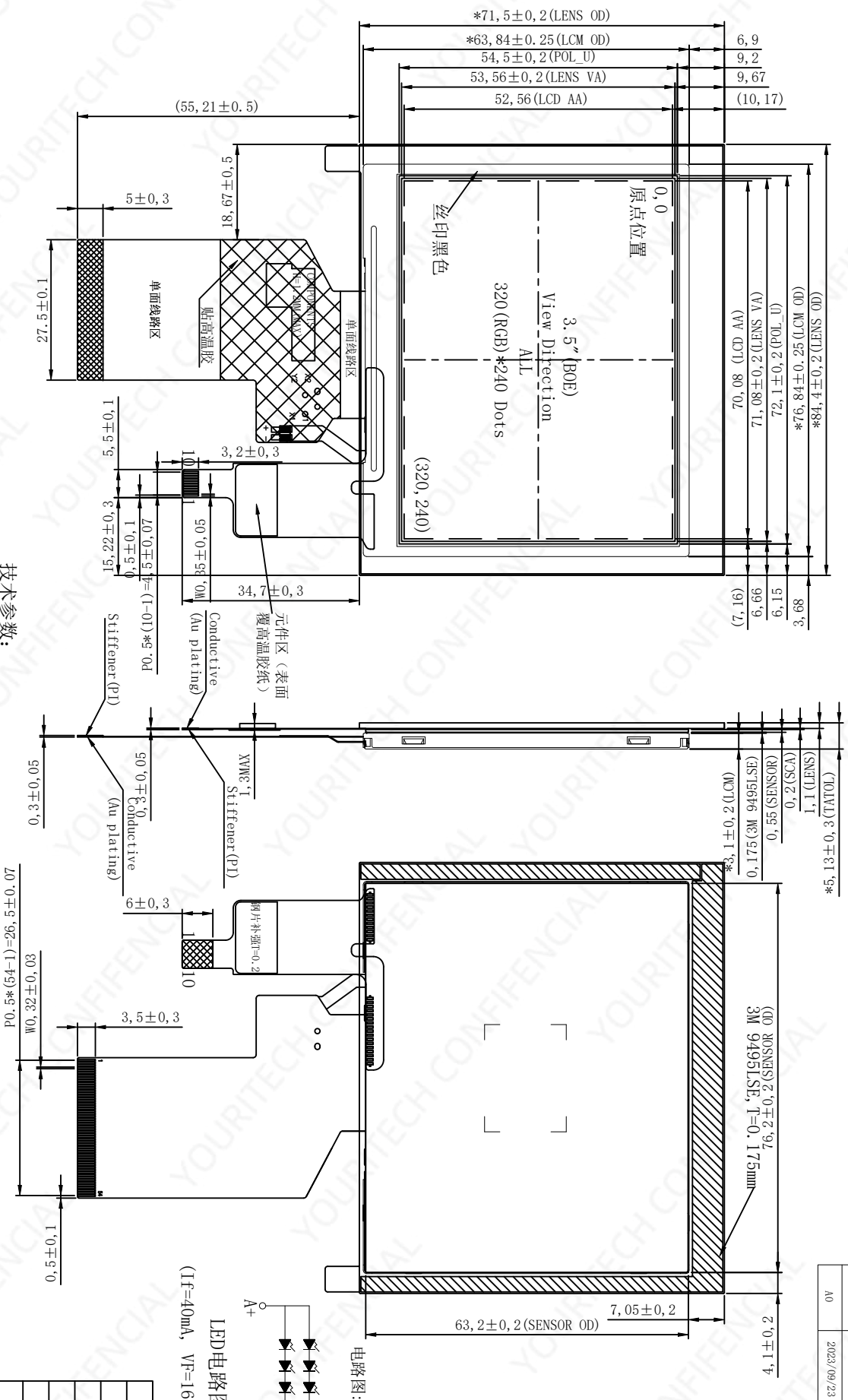
No	Test Item	Condition	Remarks
1	High Temperature Operation	Ts= +70℃, 96hrs	Note 1 IEC60068-2-2, GB2423. 2-89
2	Low Temperature Operation	Ta= -20℃, 96hrs	Note 2 IEC60068-2-1 GB2423.1-89
3	High Temperature Storage	Ta= +80℃, 96hrs	IEC60068-2-2 GB2423. 2-89
4	Low Temperature Storage	Ta= -30℃, 96hrs	IEC60068-2-1 GB/T2423.1-89
5	High Temperature & Humidity Storage	Ta= +60℃, 90% RH max, 96 hours	IEC60068-2-3 GB/T2423.3-2006
6	Thermal Shock (Non-operation)	-30℃ 30 min ~ +80℃ 30 min Change time: 5min, 20 Cycle	Start with cold temperature, end with high temperature IEC60068-2-14, GB2423.22-87
7	Electro Discharge (Operation) Static	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: 1mm 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: 60 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.

9 Mechanical Drawing





LED电路图

(I_F=40mA, V_F=16.8~19.2V)

1	VDD	38	DOUT1A
2	NC	39	NC
3	GND	40	NC
4	INT	41	VDD
5	SCLK	42	VDD
6	SDATA	43	XL
7	URAT	44	YD
8	WAKE	45	NC
9	GND	46	NC
10	GND	47	NC
		48	IF1
		49	IF2
		50	IF0
		51	NC
		52	DN
		53	GND
		54	GND

YOUR TECH TECHNOLOGY

YOURI TECH TECHNOLOGY			
RGB Interface		PART NO.	
INTERFACE		E1035HV01-HT	
PFC Connector		REV. A0	
VIEWING DIRECTION		SHEET OF 1/1	
ALL		TOLERANCE UNLESS SPECIFIED	
Gray Scale DIRECTION		UNIT	
FREE		MM	
FREE		SCALE 1:1	
PROJECTION		3RD ANGLE	
3RD ANGLE			

- NOTES:

1. DISPLAY TYPE:3.5 INCH TFT /BLACK
2. BACKLIGHT: 6 CHIP WHITE LED, IN PARALLEL
3. OPERATING TEMP: $-20^{\circ}\text{C}^{\sim}+70^{\circ}\text{C}$
4. STORAGE TEMP: $-30^{\circ}\text{C}^{\sim}+80^{\circ}\text{C}$
5. RESOLUTION: 320*RGB*240
6. Luminous intensity(9 Avg):Module:800cd/m²(MIN.) , 960cd/m²(TYP.)
7. Uniformity: 80%(Min)
8. LCD IC:ST7272A-G4-1-E
9. " ()"reference dimension. "*"critical dimension
10. RoHS Compliant

- ### 技术参数:

1. IC型号:CT911
2. 工作电压: 2. 8V~3. 3 V;
I2C通讯电压2. 8V~3. 3 V
3. 透光率: $\geq 80\%$
4. 表面硬度: 6H
5. 工作环境: $-10^{\circ}\text{C}^{\sim}+60^{\circ}\text{C}$, $\leq 90\%$ RH
6. 储存环境: $-20^{\circ}\text{C}^{\sim}+70^{\circ}\text{C}$, $\leq 90\%$ RH
7. 未注尺寸公差按 $\pm 0. 2\text{mm}$
8. 符合RoHS环保要求。
- 9.主板上SCA, SDA请加上拉电阻
主板上INT请不要加上拉电阻和电容
驱动里请勿下发CFG固件

1 0.Packing

TBD

11. Precautions for Use of LCD modules

11.1 Handling Precautions

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

11.1.2. 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.

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

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

11.1.5. 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 ; Ketene ; Aromatic solvents

11.1.6. Do not attempt to disassemble the LCD Module.

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

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

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

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

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

11.1.8.4. 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.

11.2 Storage Precautions

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

11.2.2. 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%

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

11.3 Transportation Precautions

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

