

晶汉达 • JHD[®] SHENZHEN JING HAN DA ELECTRONICS CO., LTD.

TO: GENERAL

DATE: 2008-8-5

Approval

JHD TFT_LCD

MODEL NO.: JHD827TFT430-F00

MODIFY HISTORY:

NOTE: Any modification of spec will not be notified to user.

Approved by: WANG AN XI

Revision History

Date	Rev. No.	Page	summary
2008-8-5	Ver1.0		Ver1.0 was issued

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1. SUMMARY

This technical specification applies to 4.3" color TFT-LCD panel. The 4.3" color TFT-LCD panel is designed for GPS, camcorder, digital camera, portable DVD, digital album, PMP application and other electronic products which require high quality flat panel displays. This module follows RoHS.

2. FEATURES

High resolution: 391,680 Dots (480RGB×272). JHD827TFT430-F00 is a transmissive type Color active matrix liquid crystal display (LCD) which uses amorphous thin film Transistor (TFT) as switching devices. This product is composed of a TFT-LCD panel, Driver ICs, (touch panel), FPC and a high bright backlight unit. So it can be show high quality static picture and moving picture.

3. GENERAL SPECIFICATIONS

Item		Specification	Unit
Substrate thickness	t	0.5	mm
Panel outline dimension		102.04(H)X63.006(V)X1.0(D)	mm
Active screen size		4.3" diagonal	
Resolution		480RGBX272	pixel
Pixel driving element		a-Si TFT	-
Pixel size		198X198	Um
View direction(Gray inversion)		12 o'clock	-
Driver IC		Source:HX8227-A01(2ea) Gate:HX8655-A(1ea)	-
Pre-tilt angle		3~5	degree
Cell gap		4.7±0.3	Um
Assembly precision		±5	Um
Operation temperature range		-20~+70	℃
Storage temperature range		-30~+80	℃

4.ABSOLUTE MAXIMUM RATINGS (Unit: V)

Parameter	Symbol	Rating		Unit
Logic power supply	DVDD	-0.3	to 6.0	V
Driver power supply	AVDD	-0.3	to 6.0	V
Logic input voltage	V_{I1}	-0.3	to DVDD +0.3	V
Driver input voltage	V_{I2}	-0.3	to AVDD +0.3	V
Logic output voltage	V_{O1}	-0.3	to DVDD +0.3	V
Driver output voltage	V_{O2}	-0.3	to AVDD +0.3	V
Operation ambient temperature	T_A	-30	to 85	V
Storage temperature	T_{STG}	-40	to 125	°C

5. Recommended operating conditions ($T_A=25^{\circ}\text{C}$, DVSS=AVSS=0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Logic power supply	DVDD	2.25	2.5	3.6	V
Driver power supply	AVDD	4.8	5.0	5.2	V
Input high voltage	V_{IH}	$0.7 \times \text{DVDD}$	-	DVDD	V
Input low voltage	V_{IL}	0	-	$0.3 \times \text{DVDD}$	V
Driver output voltage	V_O	0.2	-	AVDD-0.2	V
Gamma voltage	V_N	0.2	-	AVDD-0.2	V
Clock frequency	f_{CLK}^{*1}	-	9	15^{*1}	MHz

Item	Symbol	Specification			Unit
		Min.	Typ	Max.	
TFT gate on voltage	VGH	-	+15	-	V
TFT gate off voltage	VGL	-	-10	-	V
TFT common electrode voltage	VcomH	2	-	4.3	V
	VcomL	-3.5	-	0	

Note: (1) Vcom must be adjusted to optimize display quality: cross talk, contrast ratio and etc.

(2) VGH is TFT gate operating voltage

(3) VGL is TFT gate operating voltage

The storage capacitance structure of this product is Cst(Storage on Common).

The low voltage level of VGL signal must be fluctuated with same phase as Vcom, in case of Storage on Gate structure.

(4) Environmental condition: $25 \pm 5^{\circ}\text{C}$

VGH - VGL = 33V (max.)

VGH - VSS = 10 ~ 30V

6.1 Timing Requirement 1

(480RGBx272, $T_A=25^{\circ}\text{C}$, DVDD=2.25V to 3.6V, DVSS= 0V)

PARAMETER	Symbol	Min.	Typ.	Max.	Unit
Clock cycle	$1/t_C^{*1}$	-	9	15	MHz
Hsync cycle	$1/f_H$	-	17.14	-	KHz
Vsync cycle	$1/f_V$	-	59.94	-	Hz
Horizontal Signal					
Horizontal cycle	th^{*2}	-	525	-	CLK
Horizontal display period	thd	-	480	-	CLK
Horizontal front porch	thf	2	-	-	CLK
Horizontal pulse width	thp	2	41	-	CLK
Horizontal back porch	thb	2	2	-	CLK
Vertical Signal					
Vertical cycle	tv	-	286	-	H
Vertical display period	tvd	-	272	-	H
Vertical front porch	tvf	1	2	-	H
Vertical pulse width	tvp	1	10	-	H
Vertical back porch	tvb	1	2	-	H

Note:

1. Parallel interface. Clock frequency and horizontal signal parameters are tripled in serial interface.
The Maximum clock frequency of serial interface is 33MHz
2. $thd=480\text{CLK}$, $thf=2\text{CLK}$, $thp=41\text{CLK}$, $thb=2\text{CLK}$, $thf + fhp + ftb > 44$

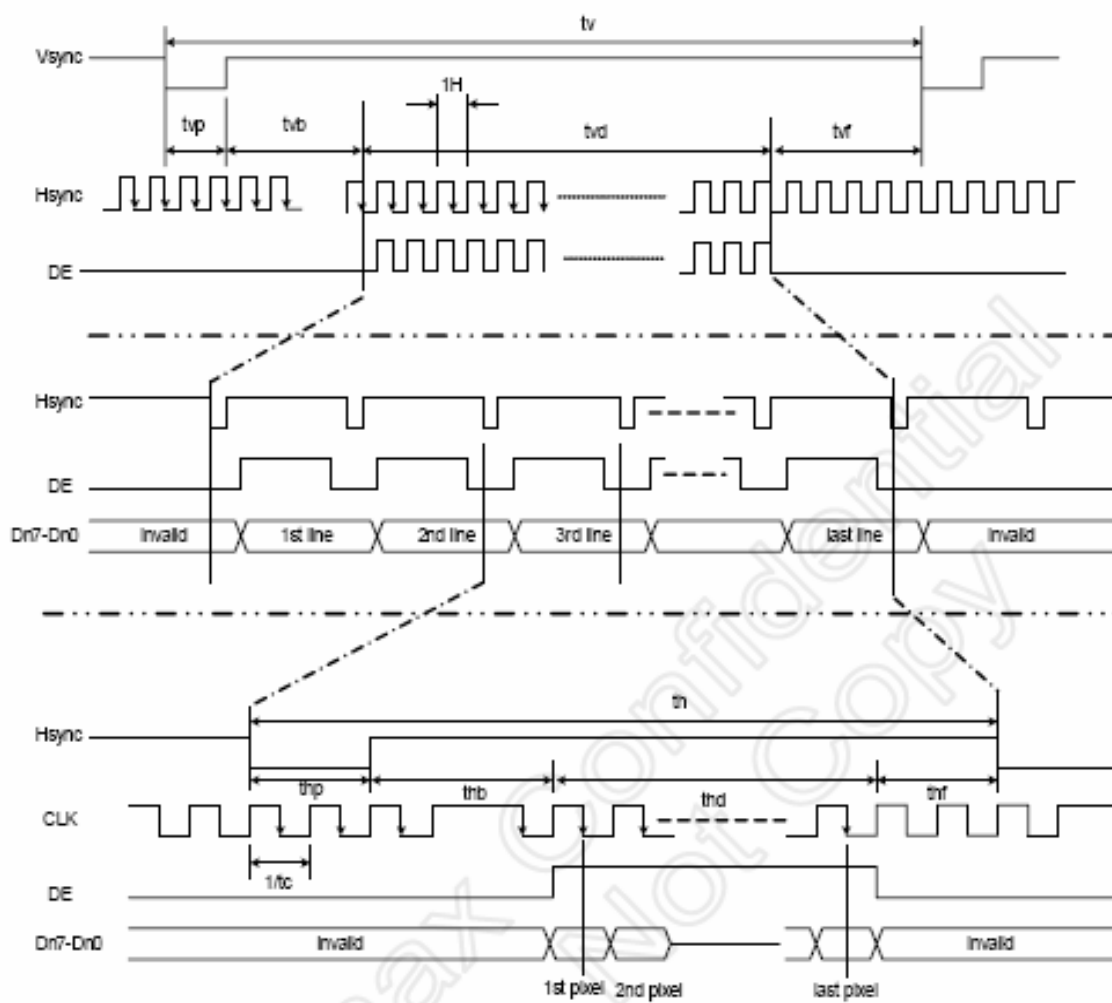


Figure 8. 1 Input timing

6.2 Timing Requirement 2

($T_A=25^{\circ}\text{C}$, $\text{DVDD}=2.25\text{V}$ to 3.6V , $\text{DVSS}=0\text{V}$, $t_r=t_f=2\text{ns}$)

PARAMETER	Symbol	Min.	Typ.	Max.	Unit
DISP setup time	t_{diss}	10	-	-	ns
DISP hold time	t_{dish}	10	-	-	ns
Clock period	$\text{PW}_{\text{CLK}}^{*1}$	66.7	-	-	ns
Clock pulse high period	PWH^{*1}	26.7	-	-	ns
Clock pulse low period	PWL^{*1}	26.7	-	-	ns
Hsync setup time	t_{hs}	10	-	-	ns
Hsync hold time	t_{hh}	10	-	-	ns
Data setup time	t_{ds}	10	-	-	ns
Data hold time	t_{dh}	10	-	-	ns
DE setup time	t_{des}	10	-	-	ns
DE hold time	t_{deh}	10	-	-	ns
Vsync setup time	t_{vhs}	10	-	-	ns
Vsync hold time	t_{vhh}	10	-	-	ns

Note:

- For parallel interface, maximum clock frequency is 15MHz.
- t_r , t_f is defined 10% to 90% of signal amplitude.

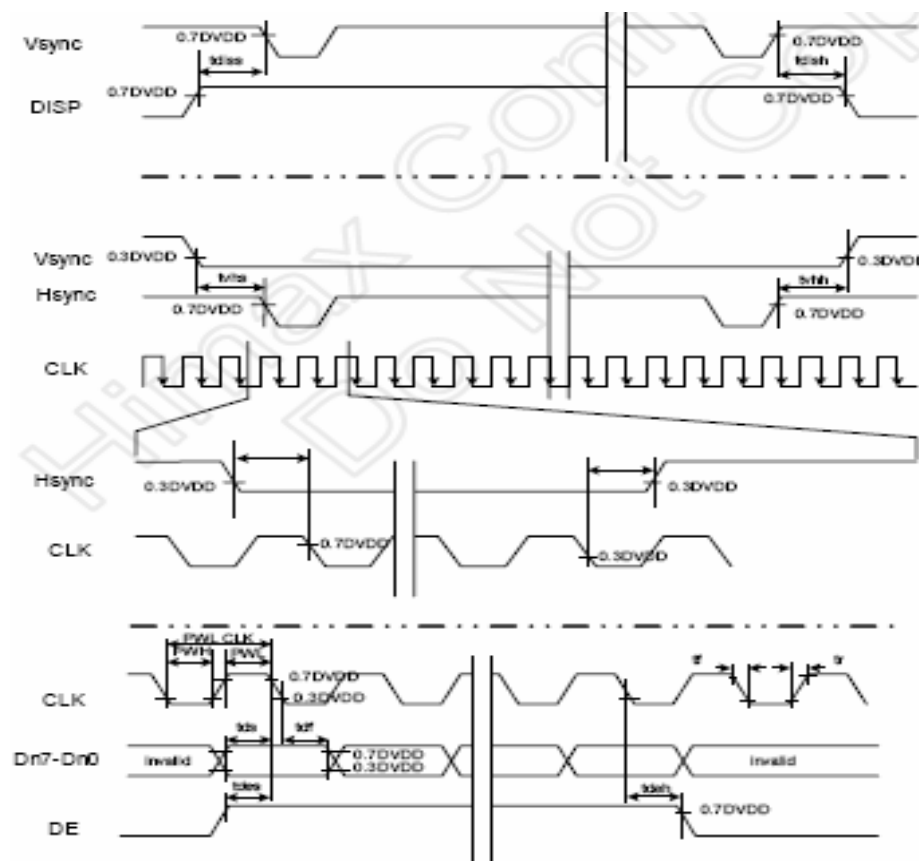
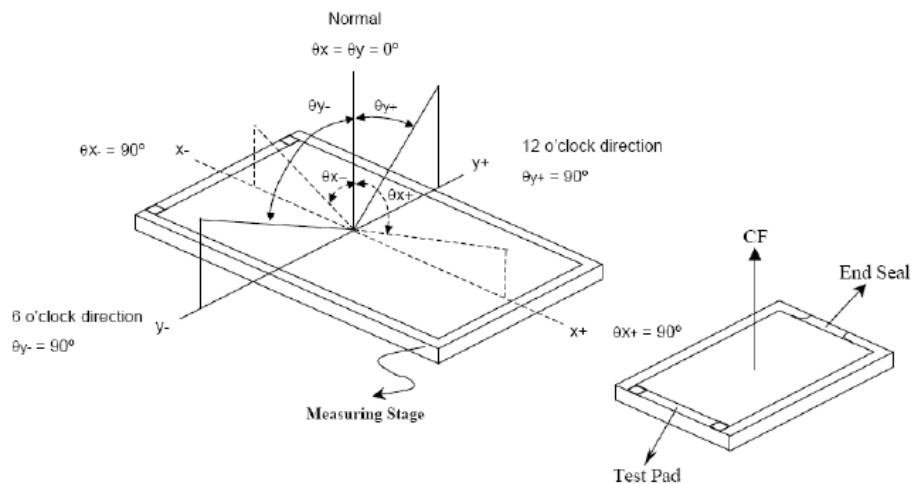


Figure 8. 2 Input setup timing

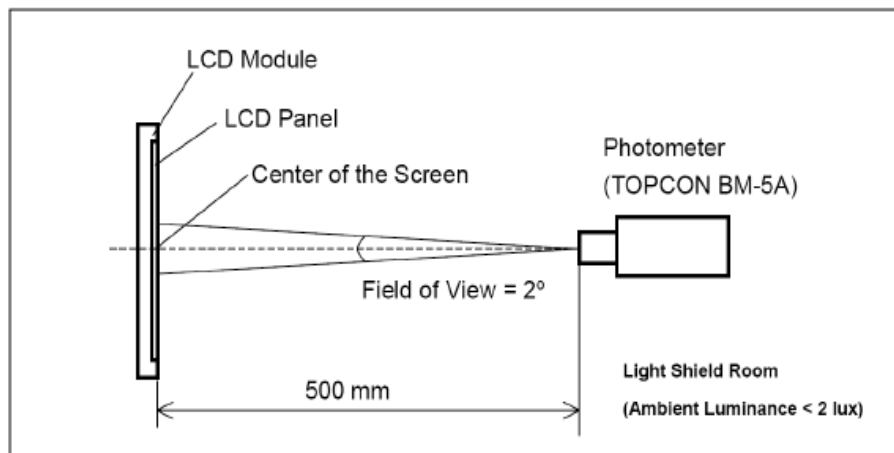
*Note(3) Definition of Viewing Angle



*** The above "Viewing Angle" is the measuring position with Largest Contrast Ratio; not for good image quality. View Direction for good image quality is 12 O'clock. Module maker can increase the "Viewing Angle" by applying Wide View Film.

*Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 20 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 20 minutes in a windless room.



7. TOUCH PANEL

8. INTERFACE

Pin No.	Symbol	I/O	Function	Remark
1	VLED-	P	Power for LED	
2	VLED+	P	Power for LED	
3	GND	P	Power ground	
4	V _{DD}	P	Power supply	
5	R0	I	Red data (LSB)	
6	R1	I	Red data	
7	R2	I	Red data	
8	R3	I	Red data	
9	R4	I	Red data	
10	R5	I	Red data	
11	R6	I	Red data	
12	R7	I	Red data (MSB)	
13	G0	I	Green data (LSB)	
14	G1	I	Green data	
15	G2	I	Green data	
16	G3	I	Green data	
17	G4	I	Green data	
18	G5	I	Green data	
19	G6	I	Green data	
20	G7	I	Green data (MSB)	

21	B0	I	Blue data (LSB)	
22	B1	I	Blue data	
23	B2	I	Blue data	
24	B3	I	Blue data	
25	B4	I	Blue data	
26	B5	I	Blue data	
27	B6	I	Blue data	
28	B7	I	Blue data (MSB)	
29	GND	P	Power ground	
30	PCLK	P	Pixel clock	
31	DISP	I	Display on/off	
32	HSYNC	I	Horizontal Sync Signal	
33	VSYNC	I	Vertical Sync Signal	
34	DE	I	Data Enable	
35	AVDD	P	Power supply (+5V)	
36	GND	P	Power ground	
37	X1	I/O	Right side of touch panel	
38	Y1	I/O	Bottom side of touch panel	
39	X2	I/O	Left side of touch panel	
40	Y2	I/O	Up side of touch panel	

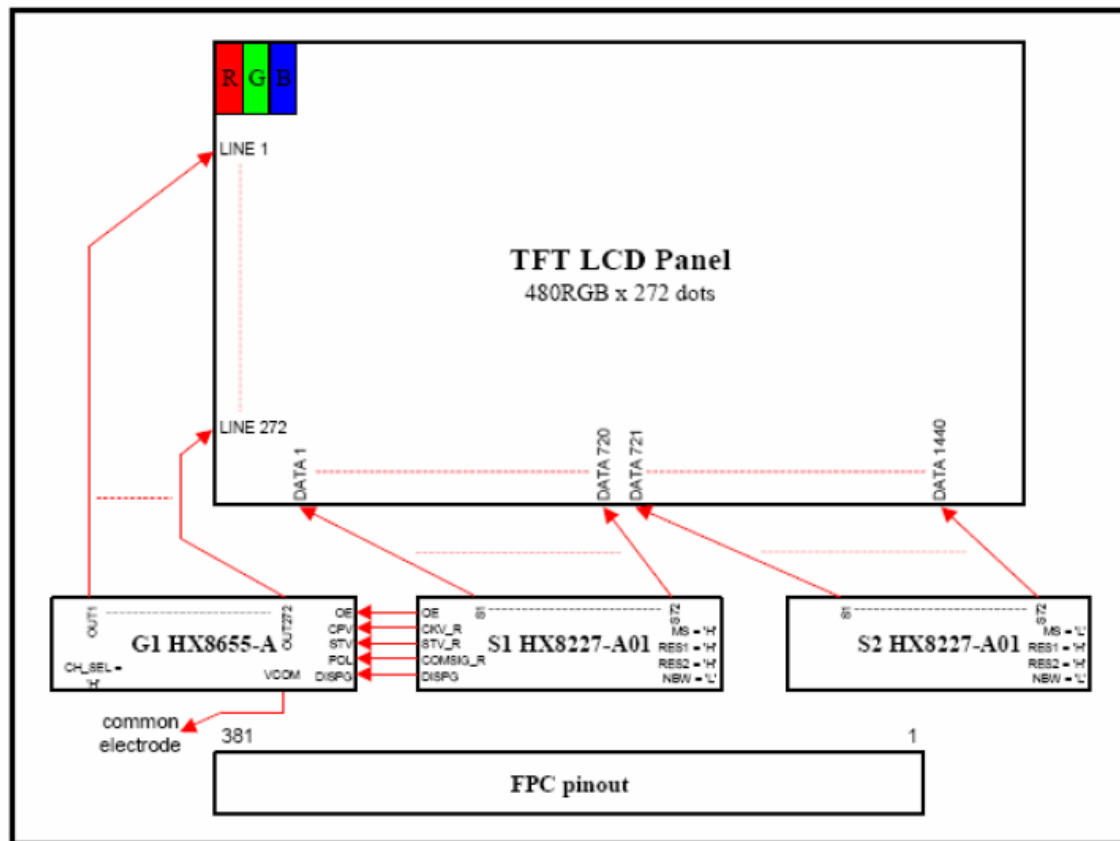
9. QUALITY ASSURANCE

No.	Test Item	Test Condition	Check Time
1	High temp storage	T= 80°C	240 hrs
2	Low temp storage	T= -30°C	240 hrs
3	High temp operation	T= 70°C	240 hrs
4	Low temp operation	T= -20°C	240 hrs
5	High temp & High humidity	T=60°C H=90%	240 hrs

Reliability Test Criteria:

Display function should be no change under normal operating condition.

10. layout



11. Optical specifications(light source: C light,using CMO TN LC+Polarizer,reference only)

Item		Symbol	Conditions	Specifications			Unit	Note
				Min.	Typ.	Max.		
Transmittance		T%	Viewing normal angle $\theta_x = \theta_y = 0^\circ$		7.5		%	All left side data are based on CMO's following condition -T6 NTSC: 50% LC:5091 Light : C light (Machine:BM5A) Normal Polarizer Without DBEF Simulation Data Reference Only
Contrast Ratio		CR		150	250		—	
Response Time		T_R			15	20	ms	
		T_F			35	50	ms	
Chromaticity	Red	X_R		0.595	0.615	0.645		
		Y_R		0.314	0.344	0.374		
	Green	X_G		0.277	0.307	0.337		
		Y_G		0.532	0.562	0.592		
	Blue	X_B		0.103	0.133	0.163		
		Y_B		0.120	0.150	0.180		
	White	$X_{W'}$	0.279	0.309	0.339			
		$Y_{W'}$	0.320	0.350	0.380			
Viewing Angle	Hor.	θ_{x+}		45		deg.		
		θ_x		45				
	Ver.	θ_{y+}		15				
		θ_y		35				

*Note (1) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

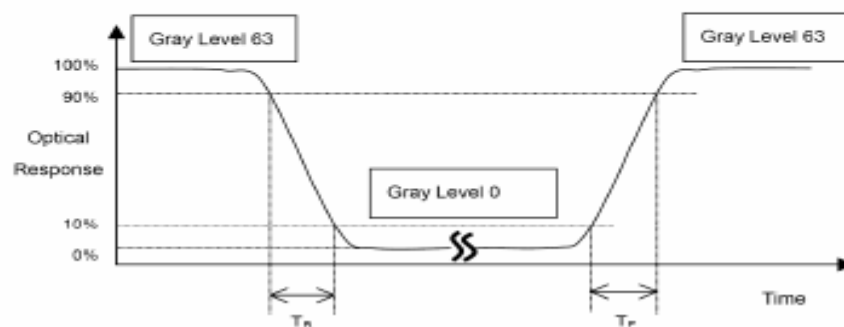
L_{63} : Luminance of gray level 63

L_0 : Luminance of gray level 0

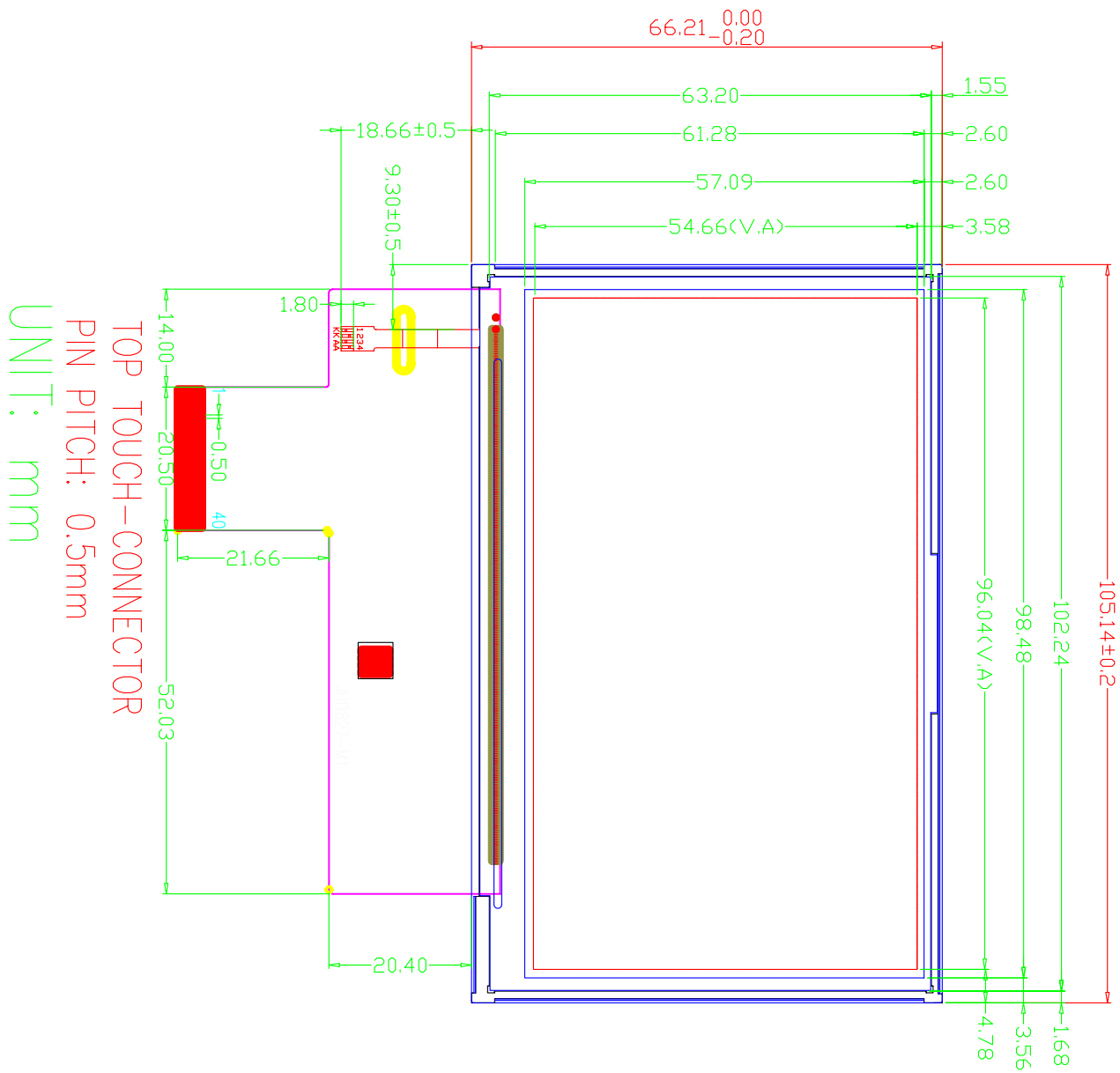
$$CR = CR(10)$$

$CR(X)$ is corresponding to the Contrast Ratio of the point X at Figure in Note (5).

*Note (2) Definition of Response Time (T_R , T_F):



12. DIMENSION



TOP TOUCH-CONNECTOR
PIN PITCH: 0.5mm