TITLE : HV101WX1-1E2

Preliminary Product Specification

HYDIS Technologies

REVISION HISTORY

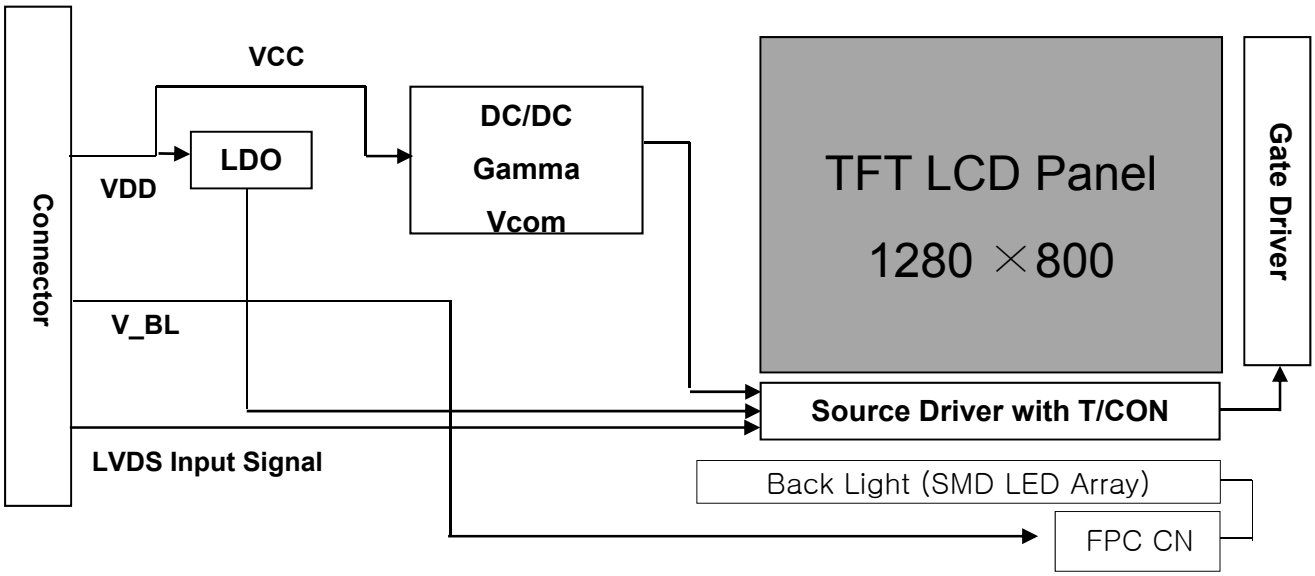
REV.	ECN NO.	DESCRIPTION OF CHANGES	DATE	PREPARED
0	-	▪ Initial Release	2012. 2. 8	H.S. LEE
A	-	▪ Wx (0.313) Wy (0.329) → Wx (TBD) Wy (TBD)	2012. 2. 20	H.S.LEE

Contents

1.0 GENERAL DESCRIPTION

1.1 Introduction

HV101WX1-1E2 is a color active matrix TFT LCD module using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This module has a 10.1 inch diagonally measured active area with WXGA resolutions (1280 horizontal by 800 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical Stripe and this module can display 16,777,216 colors. The TFT-LCD panel used for this module is a low reflection and higher color type.



1.2 Features

- Thin and Light Weight
- 3.3 V Logic Power Supply
- 1 Channel LVDS Interface
- SMD LED (40EA) Array (Bottom Side/Horizontal Direction)
- 16,777,216 Colors (With dither & HFRC)
- Data Enable Signal Mode
- Green Product (RoHS)

1.3 General Specifications

Parameter	Specification	Unit	Remarks
Active area	216.96(H) ×135.60(V)	mm	
Number of pixels	1280(H) ×800(V)	pixels	
Pixel pitch	0.1695(H) ×0.1695(V)	mm	
Pixel arrangement	RGB Vertical Stripe		
Display colors	16,777,216	colors	
Display mode	Normally Black		
Outline dimension	228.21±0.3(H) ×148.86±0.3(V) ×2.39±0.3(D)	mm	Note 1
Weight	130(Typ.) 140(Max)	g	
Back-light	SMD LED (40EA) Array		
Surface treatment	AG22%		

Note 1 : At LED side (PCB Side: 4.55Max)

2.0 ABSOLUTE MAXIMUM RATINGS

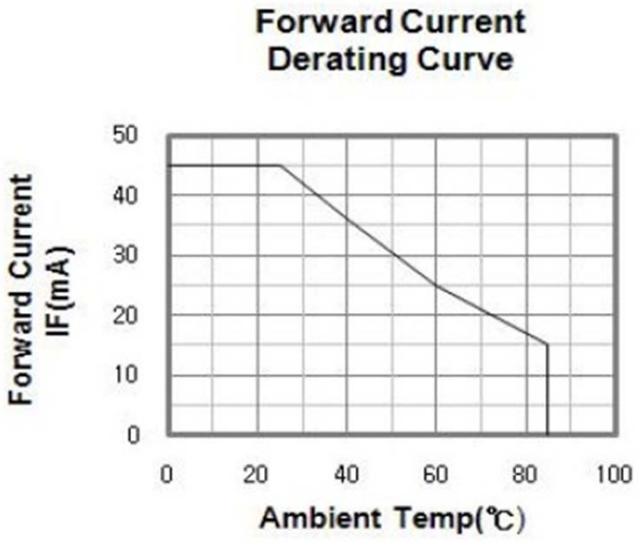
The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit.

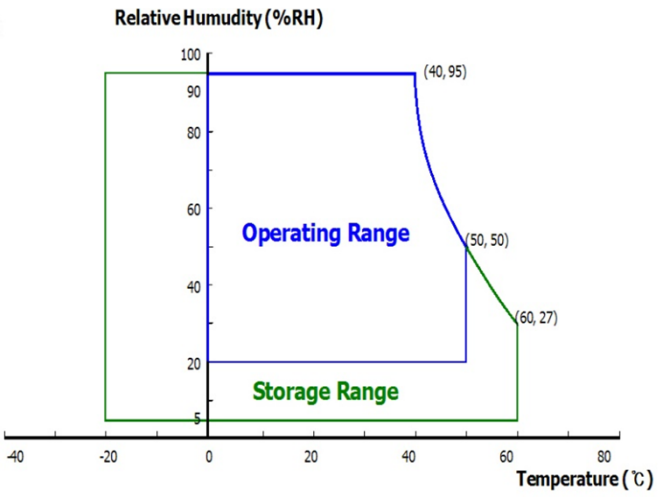
Ta=25+/-2°C

Parameter	Symbol	Min.	Max.	Unit	Remarks
Logic Power Supply Voltage	V_{DD}	-0.3	4.0	V	
Logic Power Supply Voltage	V_{IN}	-0.3	V_{DD}+0.3	V	
Back-light Power Supply Voltage	HV_{DD}	-0.3	40	V	
Back-light LED Current	I_{LED}	-	30	mA	Note 1
Back-light LED Reverse Voltage	V_R		5	V	
Operating Temperature	T_{OP}	0	+50	℃	Note 1, Note 2
Storage Temperature	T_{SP}	-20	+60	℃	

Note 1. Ambient temperature vs allowable forward current are shown in the figure below.

Note 2. Temperature and relative humidity range are shown in the figure below.
95% RH Max. (40℃ ≥ Ta)
Maximum wet - bulb temperature at 39℃ or less. (> 40℃) No condensation.





3.0 ELECTRICAL SPECIFICATIONS

3.1 Electrical Specifications

Parameter		Min.	Typ.	Max.	Unit	Remarks
Logic Power Supply Voltage	V_{DD}	3.0	3.3	3.6	V	Note 1
Logic Power Supply Current	I_{DD}	-	-	283	mA	Note 1
Back-light Power Consumption	P_{BL}	-	-	2.44	W	Note 2, 3
High Level Differential Input Signal Voltage	V_{IH}	-	-	+100	mV	
Low Level Differential Input Signal Voltage	V_{IL}	-100	-	-	mV	
Back-light LED Voltage / Back-light LED Total Voltage	V_{LED} /V_{BL}	-	-	3.0 / 30	V	Note 4
Back-light LED Current / Back-light LED Total Current	I_{LED} /I_{BL}	-	-	20.3 / 81.2	mA	Note 4
Life Time		12,000	-	-	Hrs	Note 6
Power Consumption	P_D	-	-	0.85	W	Note 1
	P_{LED}	-	-	2.44	W	Note 4
	P_{total}	-	-	3.14	W	Note 1, 4

Notes : 1. The supply voltage is measured and specified at the interface connector of LCM.
The current draw and power consumption specified is for 3.3V at 25℃.
a) Typ : Window XP pattern, b) Max : White.

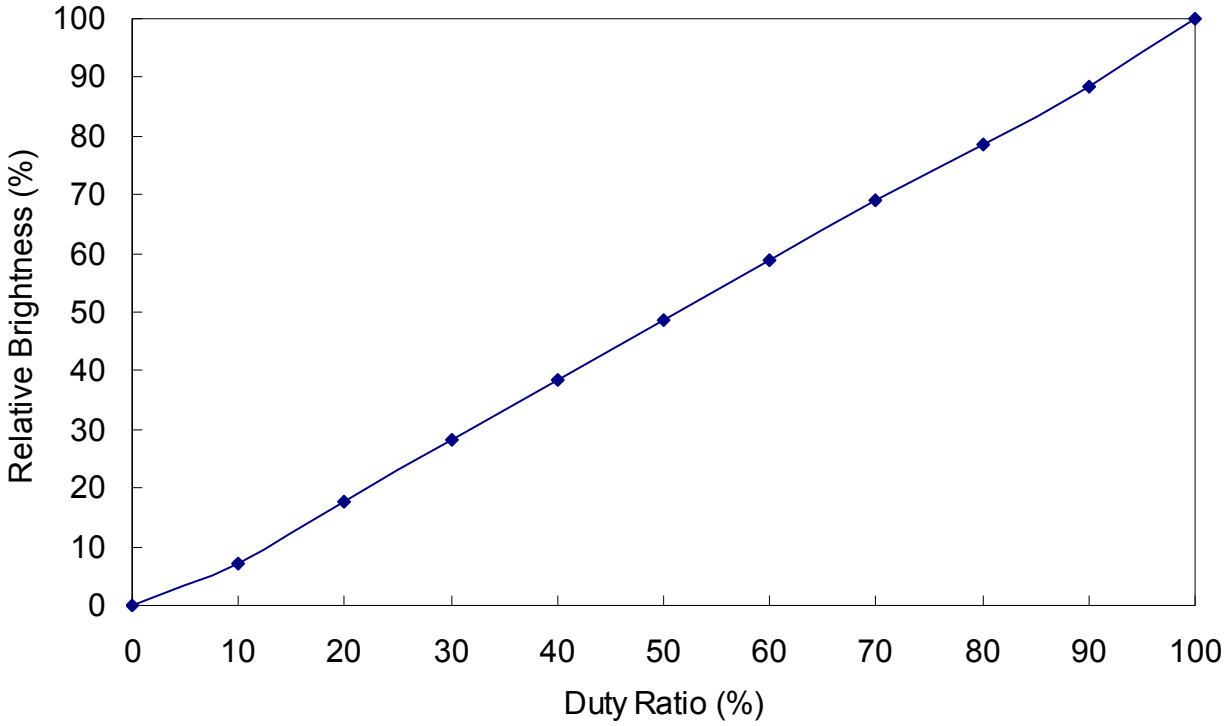
2. The power supply voltage and current is measured and specified at the interface connector of LCM without LED Driver.

3. Reference value, which is measured without LED Driver.

4. Calculated value for reference (V_{LED} × I_{LED} × # of LEDs (40EA)).

5. End of Life shall be determined by the time when any of the following is satisfied under continuous lighting at 25℃ and ILED = 20mA.
-. Intensity drops to 50% of the Initial Value (Luminance Spec.)
-. Based on LED

3.2 PWM Duty Ratio vs Brightness



Notes :
In case of duty ratio 0%, LED can't illuminate itself so this state is LED off.
In case of duty ratio 100%, LED the brightness of LED is maximum and this state is LED off.

4.0 OPTICAL SPECIFICATIONS

4.1 Overview

The test of optical specifications shall be measured in a dark room (ambient luminance ≤ 1 lux and temperature = 25±2℃) with the equipment of Luminance meter system (Goniometer system and TOPCON BM-5A) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of θ and Φ equal to 0°. We refer to $\theta_{Ø=0}$ (=θ3) as the 3 o'clock direction (the "right"), $\theta_{Ø=90}$ (= θ12) as the 12 o'clock direction ("upward"), $\theta_{Ø=180}$ (= θ9) as the 9 o'clock direction ("left") and $\theta_{Ø=270}$(= θ6) as the 6 o'clock direction ("bottom"). While scanning θ and/or Ø, the center of the measuring spot on the Display surface shall stay fixed. The backlight should be operating for 30 minutes prior to measurement. V_{DD} shall be 3.3+/- 0.3V at 25°C. Optimum viewing angle direction is 6 o'clock.

4.2 Optical Specifications

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	Remarks
Viewing Angle Range	Horizontal	Θ_3	CR > 10	80	85	-	Deg.	Note 1
		Θ_9		80	85	-	Deg.	
	Vertical	Θ_{12}		80	85	-	Deg.	
		Θ_6		80	85	-	Deg.	
Luminance Contrast Ratio		CR	Θ = 0°	500	800			Note 2
Luminance of White	Center	Y_w		-	400	-	cd/m²	
White Luminance Uniformity	5 Points	ΔY5		80	-	-	%	Note 3
	13 Points	ΔY13		60	-	-		
Color Chromaticity	White	W_x			TBD			Note 4
		W_y			TBD			
	Red	R_x			TBD			
		R_y			TBD			
	Green	G_x			TBD			
		G_y			TBD			
	Blue	B_x			TBD			
		B_y			TBD			
Color Reproduction					50		%	
Response Time		Total ($T_r + T_d$)	Ta= 25° C Θ = 0°	-	30	-	ms	Note 5
Cross Talk		CT	Θ = 0°	-	-	2.0	%	Note 6

Note : 1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface (see FIGURE 1 shown in page 11).

2. Contrast measurements shall be made at viewing angle of Θ= 0° and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See FIGURE 1 shown in page 11)
Luminance Contrast Ratio (CR) is defined mathematically.

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

3. The White luminance uniformity on LCD surface is then expressed.
(See FIGURE 2~3 shown in page 12)

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

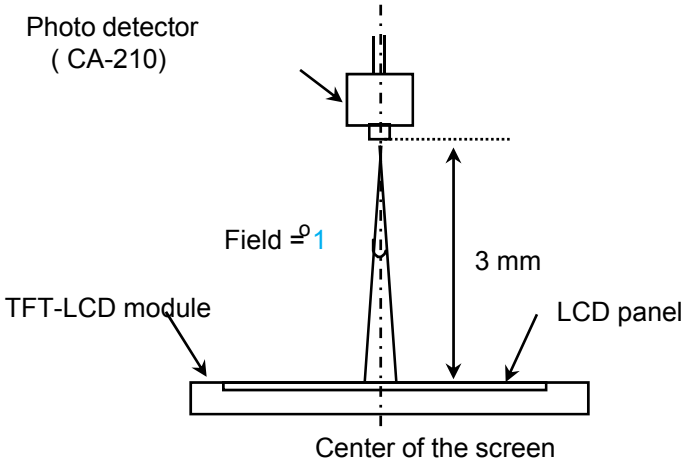
4. The color chromaticity coordinates specified in Table 4 shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.

5. The electro-optical response time measurements shall be made as FIGURE 4 shown in page 13 by switching the "data" input signal OFF and ON. The times needed for the luminance to change from 10% to 90% is Tr, and 90% to 10% is Td. (See FIGURE 4 shown in page 13)

6. Cross-Talk of one area of the LCD surface by another shall be measured by comparing the luminance (YA) of a 25mm diameter area, with all display pixels set to a gray level, to the luminance (YB) of that same area when any adjacent area is driven dark. (See FIGURE 5 shown in page 13)

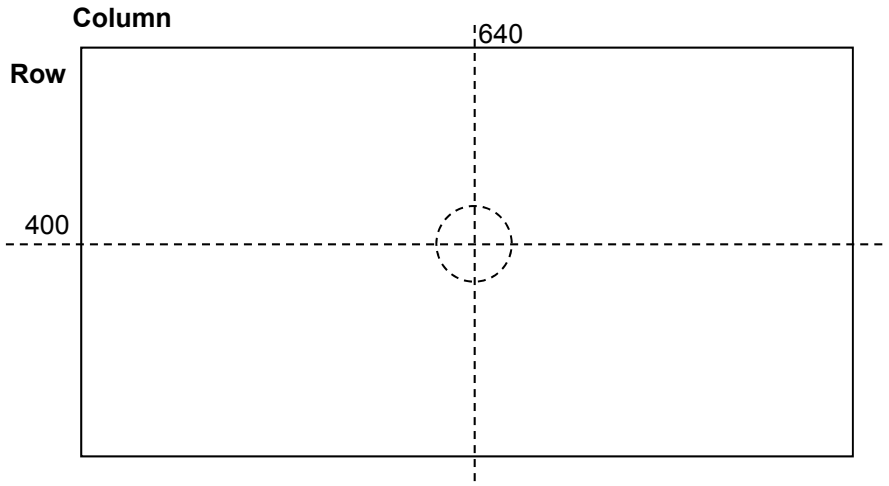
4.3 Optical Measurements

Figure 1. Measurement Set Up



Optical characteristics measurement setup

Figure 2. White Luminance Measurement Locations (Center 1point)



Note.
Luminance of white is defined as luminance values of center 1 point across the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in Figure 2.

Figure 3. Uniformity Measurement Locations (9 points)

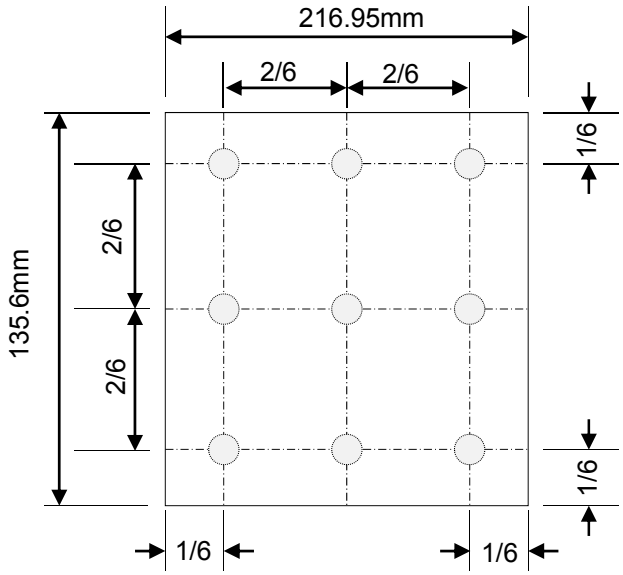


Figure 4. Response Time Testing

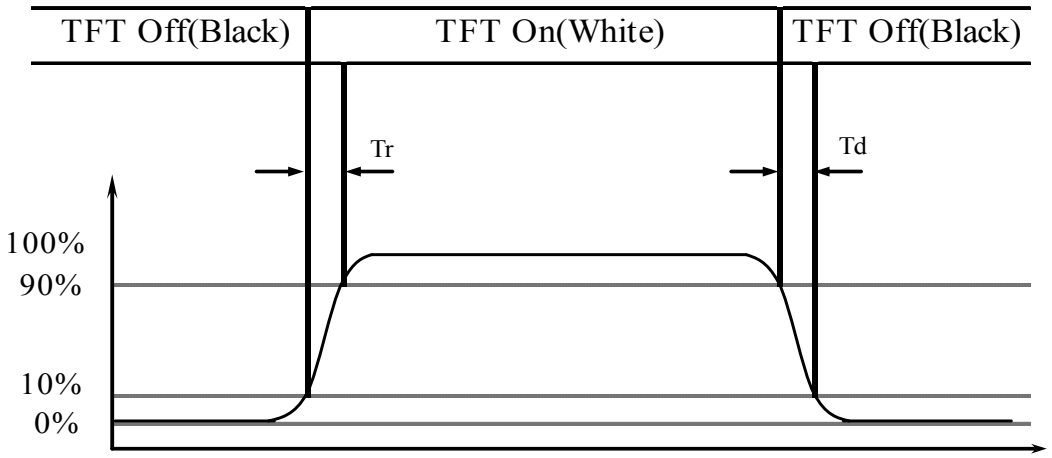
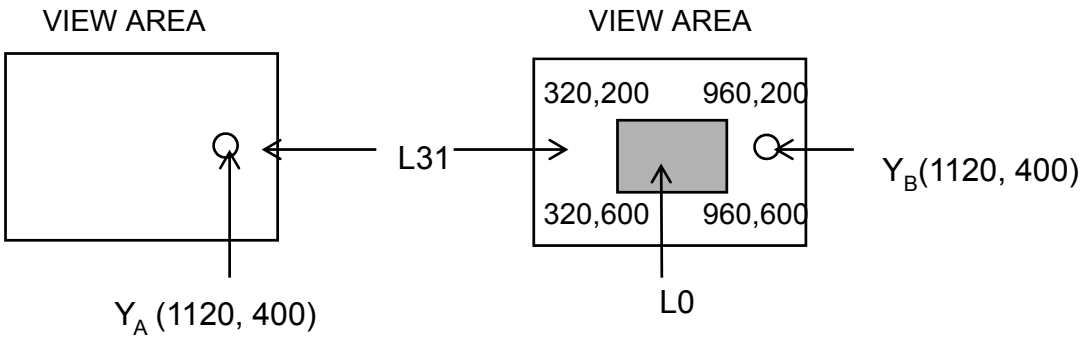


Figure 5. Cross Modulation Test Description



$$\text{Cross-Talk (\%)} = \left| \frac{Y_B - Y_A}{Y_B} \right| \times 100$$

Where:

Y_A = Initial luminance of measured area (cd/m^2)

Y_B = Subsequent luminance of measured area (cd/m^2)

The location measured will be exactly the same in both patterns

5.0 INTERFACE CONNECTIONS

5.1 Electrical Interface Connection

CN1 Interface Connector (FF12-45A-R12BN-D3_45P, Manufactured by DDK)

Pin No.	Symbol	Function	Pin No.	Symbol	Function
1	GND	Ground	24	LVDS_RX_1N	-LVDS input (G1-G5,B0-B1)
2	LCD select	LCD select	25	LVDS_RX_1P	+LVDS input(G1-G5,B0-B1)
3	NC	Non connection	26	GND	Ground
4	VDD	V_BAT (3.3V)	27	LVDS_RX_0N	-LVDS input(R0-R5, G0)
5	VDD	V_BAT (3.3V)	28	LVDS_RX_0P	+LVDS input(R0-R5, G0)
6	VDD	V_BAT (3.3V)	29	GND	Ground
7	VDD	V_BAT (3.3V)	30	GND	Ground
8	VDD	V_BAT (3.3V)	31	NC	Non connection
9	NC	Non connection	32	LED_K1	LED Cathode 1
10	NC	Non connection	33	LED_K2	LED Cathode 2
11	NC	Non connection	34	LED_K3	LED Cathode 3
12	GND	Ground	35	LED_K4	LED Cathode 4
13	GND	Ground	36	NC	Non connection
14	GND	Ground	37	NC	Non connection
15	LVDS_RX_3N	-LVDS input(R6,7/G6,7/B6,7)	38	NC	Non connection
16	LVDS_RX_3P	+LVDS input(R6,7/G6,7/B6,7)	39	LED_VOUT	LED Power supply (18V)
17	GND	Ground	40	LED_VOUT	LED Power supply (18V)
18	LVDS_CLK_N	-LVDS clock	41	LED_VOUT	LED Power supply (18V)
19	LVDS_CLK_P	+LVDS clock	42	LED_VOUT	LED Power supply (18V)
20	GND	Ground	43	LED_VOUT	LED Power supply (18V)
21	LVDS_RX_2N	-LVDS input(B2-B5,HS,VS,DE)	44	NC	Non connection
22	LVDS_RX_2P	+LVDS input(B2-B5,HS,VS,DE)	45	NC	Ground (BIST)
23	GND	Ground			

※ Note1) In order to operate BIST mode, PIN45 should be applied 3.3V (BIST high signal) after 1 frame normal operation (LVDS Power High).
(BIST is used at LCM maker.)

5.2 LVDS Interface

LVDS Transmitter : THC63LVDM83A

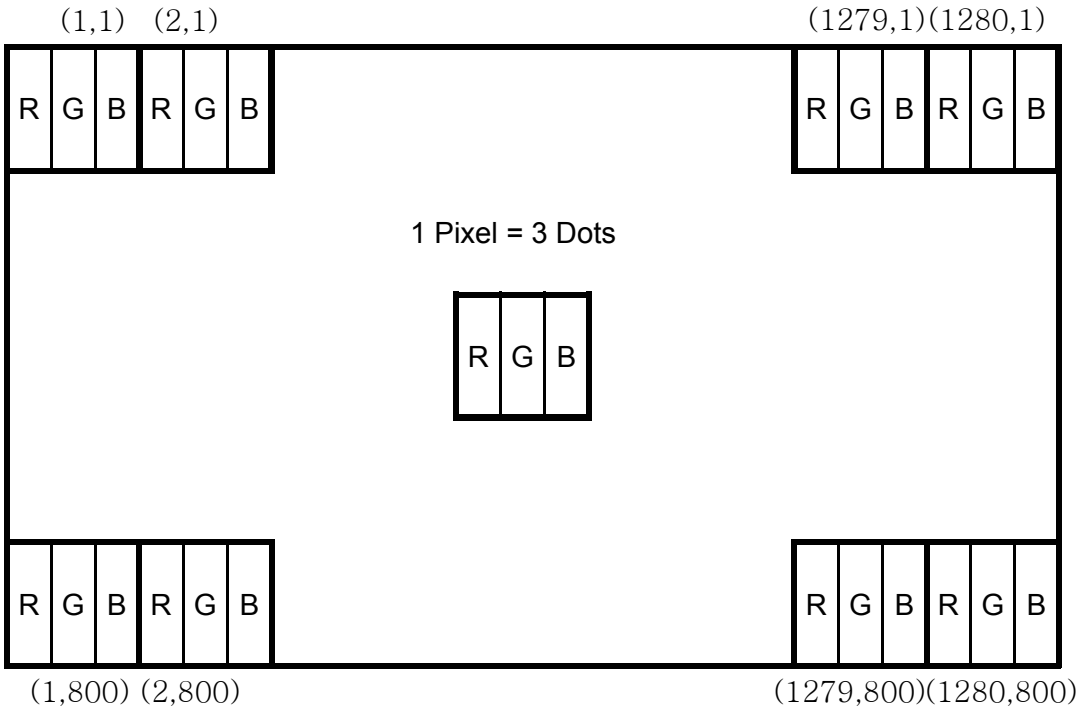
Input Signal	Transmitter		Interface		HD1S040HA1	Remark
	Pin No.	Pin No.	System (Tx)	TFT-LCD (Rx)	Pin No.	
R0	51					
R1	52					
R2	54	48	OUT0-	IN0-	8	
R3	55					
R4	56	47	OUT0+	IN0+	9	
R5	3					
G0	4					
G1	6					
G2	7					
G3	11	46	OUT1-	IN1-	11	
G4	12					
G5	14	45	OUT1+	IN1+	12	
B0	15					
B1	19					
B2	20					
B3	22					
B4	23	42	OUT2-	IN2-	14	
B5	24					
HSYNC	27	41	OUT2+	IN2+	15	
VSYNC	28					
DE	30					
MCLK	31	40	CLKOUT-	CLKIN-	17	
		39	CLKOUT+	CLKIN+	18	
R6	50					
R7	2					
G6	8	38	OUT3-	IN3-	20	
G7	10					
B6	16	37	OUT3+	IN3+	21	
B7	18					
RSVD	25					

5.3 Back-light Interface

CN2 LED FPC Connector (20397-008E, Manufactured by I-PEX)

Pin No.	Symbol	Function	Remark
1	Anode	LED Anode Power Supply	3V X 10EA = 30V
2	Anode	LED Anode Power Supply	
3	Anode	LED Anode Power Supply	
4	NC	Non connection	
5	Cathode1	LED Cathode Power Supply	LED Cathode Power Supply
6	Cathode2	LED Cathode Power Supply	
7	Cathode3	LED Cathode Power Supply	
8	Cathode4	LED Cathode Power Supply	

5.4 Data Input Format



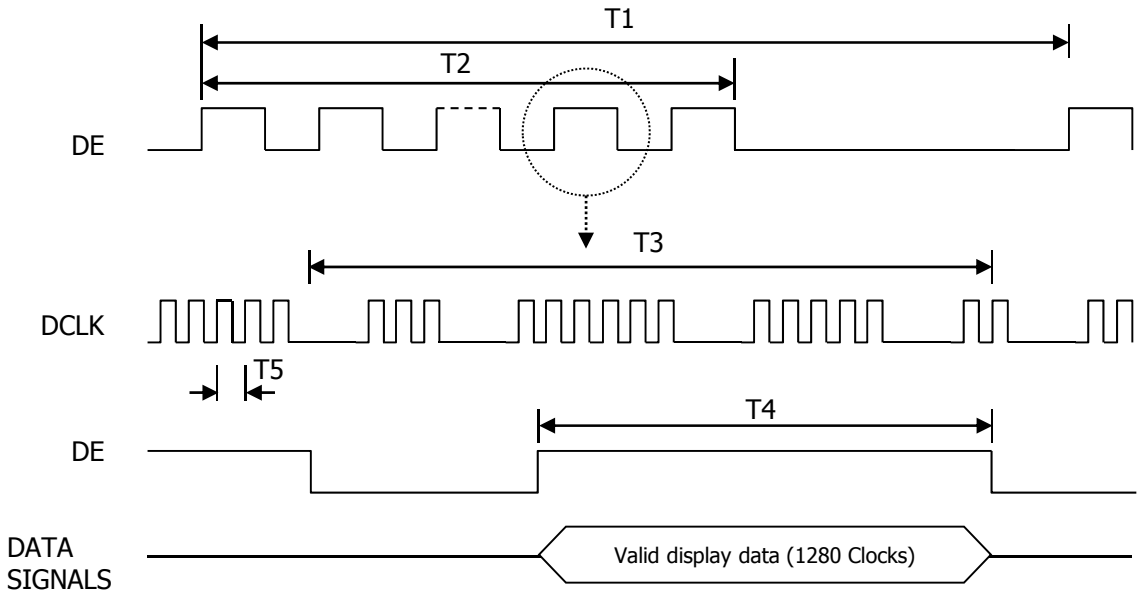
6.0. SIGNAL TIMING SPECIFICATIONS

6.1 The 10.1" WXGA LCM is operated by the only DE (Data enable) mode (LVDS Transmitter Input)

Item	Symbol	Min.	Typ.	Max.	Unit
Frame Period	T1	-	823	-	Lines
Vertical Display Period	T2	-	800	-	Lines
One line Scanning Period	T3	-	1440	-	Clocks
Horizontal Display Period	T4	-	1280	-	Clocks
Clock Frequency	1/T5	-	71.1	-	MHz

7.0 SIGNAL TIMING WAVEFORMS

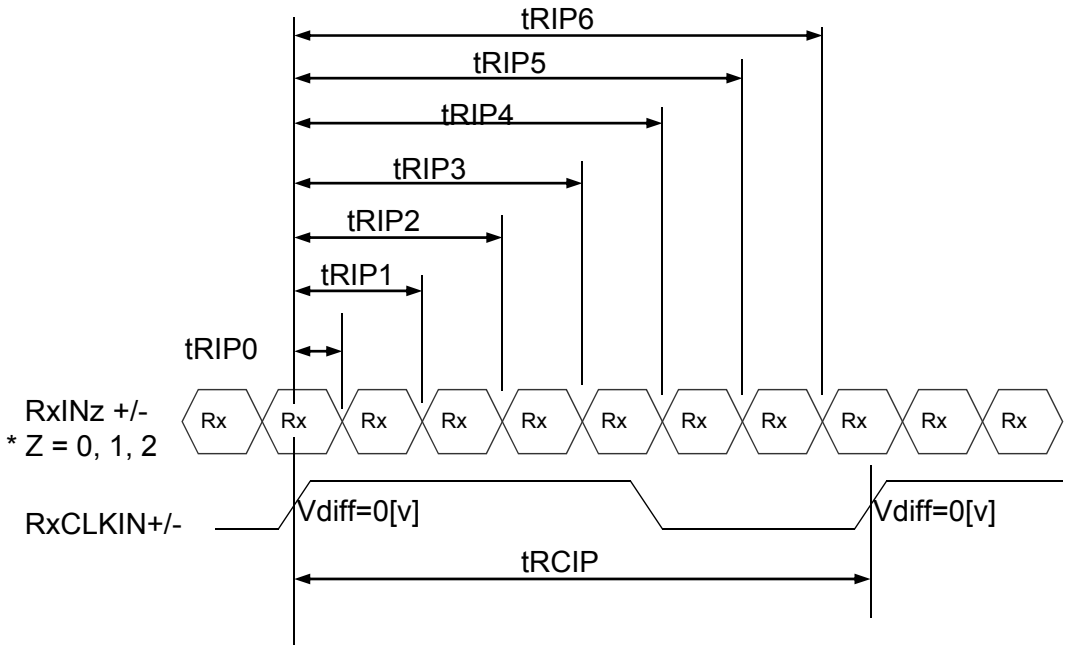
7.1 Timing Waveforms of Interface Signal



7.2 LVDS Rx Interface Timing Parameter

The specification of the LVDS Rx interface timing parameter

Item	Symbol	Min.	Typ.	Max.	Unit	Remarks
CLKIN Period	tRCIP	-	14.06	-	nsec	
Input Data 0	tRIP0	-0.4	0.0	+0.4	nsec	
Input Data 1	tRIP1	tRICP/7-0.4	tRICP/7	tRICP/7+0.4	nsec	
Input Data 2	tRIP2	2 ×tRICP/7-0.4	2 ×tRICP/7	2 ×tRICP/7+0.4	nsec	
Input Data 3	tRIP3	3 ×tRICP/7-0.4	3 ×tRICP/7	3 ×tRICP/7+0.4	nsec	
Input Data 4	tRIP4	4 ×tRICP/7-0.4	4 ×tRICP/7	4 ×tRICP/7+0.4	nsec	
Input Data 5	tRIP5	5 ×tRICP/7-0.4	5 ×tRICP/7	5 ×tRICP/7+0.4	nsec	
Input Data 6	tRIP6	6 ×tRICP/7-0.4	6 ×tRICP/7	6 ×tRICP/7+0.4	nsec	



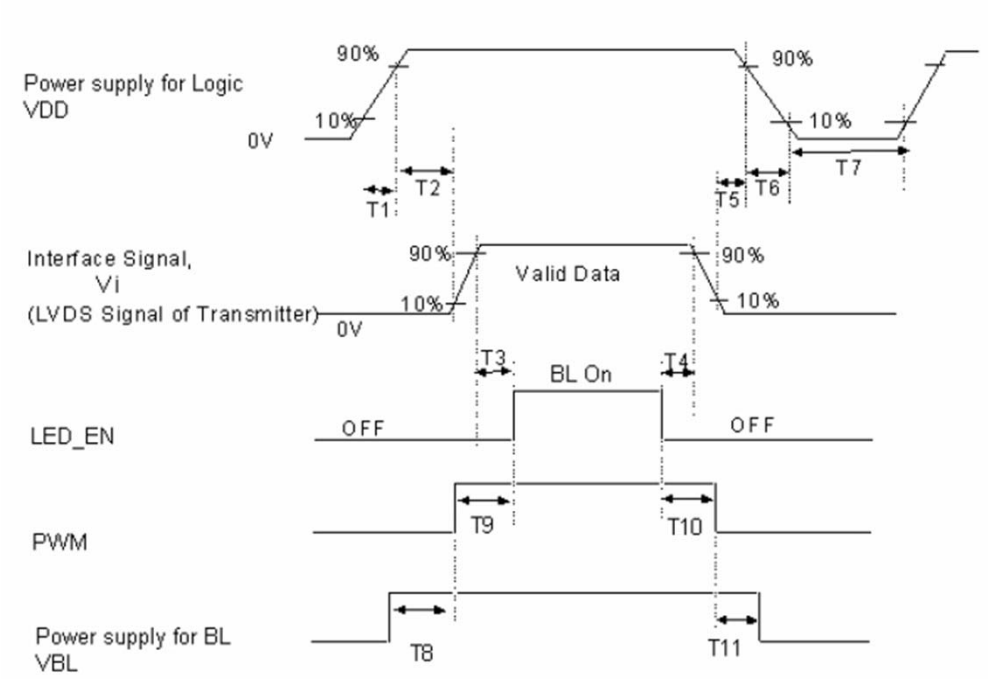
8.0 INPUT SIGNALS, BASIC DISPLAY COLORS & GRAY SCALE OF COLORS

Each color is displayed in sixty-four gray scales from a 8 bit data signal input. A total of 16,777,216 colors are derived from the resultant 24 bit data.

Colors & Gray Scale		Data signal																									
		Red data								Green data								Blue data							
		R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Light Blue	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Purple	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gray Scale of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	↓								↓								↓							
	▽	↓								↓								↓							
	Brighter	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	▽	↓								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray Scale of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	↓								↓								↓							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	▽	0	0	0	0	0	0	0	0	↓								0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Gray Scale of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Darker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	△	↓								↓								↓							
	▽	↓								↓								↓							
	Brighter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1
	▽	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	↓							
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
Gray Scale of White & Black	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	△	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	Darker	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	△	↓								↓								↓							
	▽	↓								↓								↓							
	Brighter	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1
	▽	↓								↓								↓							
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

9.0 SEQUENCE

To prevent a latch-up or DC operation of the LCD module, the power on/off sequence shall be as shown in below



ITEMS	Unit	Min.	Typ.	Max.
T1	ms	0.5	-	10
T2	ms	0	-	50
T3	ms	200	-	-
T4	ms	0	-	-
T5	ms	0	-	-
T6	ms	0	-	10
T7	ms	150	-	-
T8 (Only Internal controller)	ms	0	-	-
T9 (Only Internal controller)	ms	0	-	-
T10 (Only Internal controller)	ms	0	-	-
T11 (Only Internal controller)	ms	0	-	-

Notes : 1. When the power supply VDD is 0V, Keep the level of input signals on the low or keep high impedance.
2. Do not keep the interface signal high impedance when power is on.
3. Back Light must be turn on after power for logic and interface signal are valid.
4. VDD and VBL circuit should be independent.

10.0 MECHANICAL CHARACTERISTICS

10.1 Dimensional Requirements

Figure 6 & 7 (located in 11.0) shows mechanical outlines for the model

Parameter	Specification	Unit
Active Area	216.96(H) X 135.60(V)	mm
Number of pixels	1280(H) X 800(V) (1 pixel = R + G + B dots)	
Pixel pitch	0.1695(H) X 0.1695(V)	
Pixel arrangement	RGB Vertical stripe	
Display colors	16,777,216	
Display mode	Normally Black	
Outline dimension	228.21±0.3(H) ×148.86±0.3(V) ×2.39±0.3(D)	mm
Weight	130(Typ.)	g
Back-light	SMD LED (40EA) Array	

10.2 Polarizer

The surface of the LCD has an AG22% polarizer.

10.3 Light Leakage

There shall not be visible light from the back-lighting system around the edges of the screen as seen from a distance 50cm from the screen with an overhead light level of 150lux. The manufacture shall furnish limit samples of the panel showing the light leakage acceptable.

11.0 Mechanical Drawing

Figure 6. TFT-LCD Module Outline Dimension (Front View)

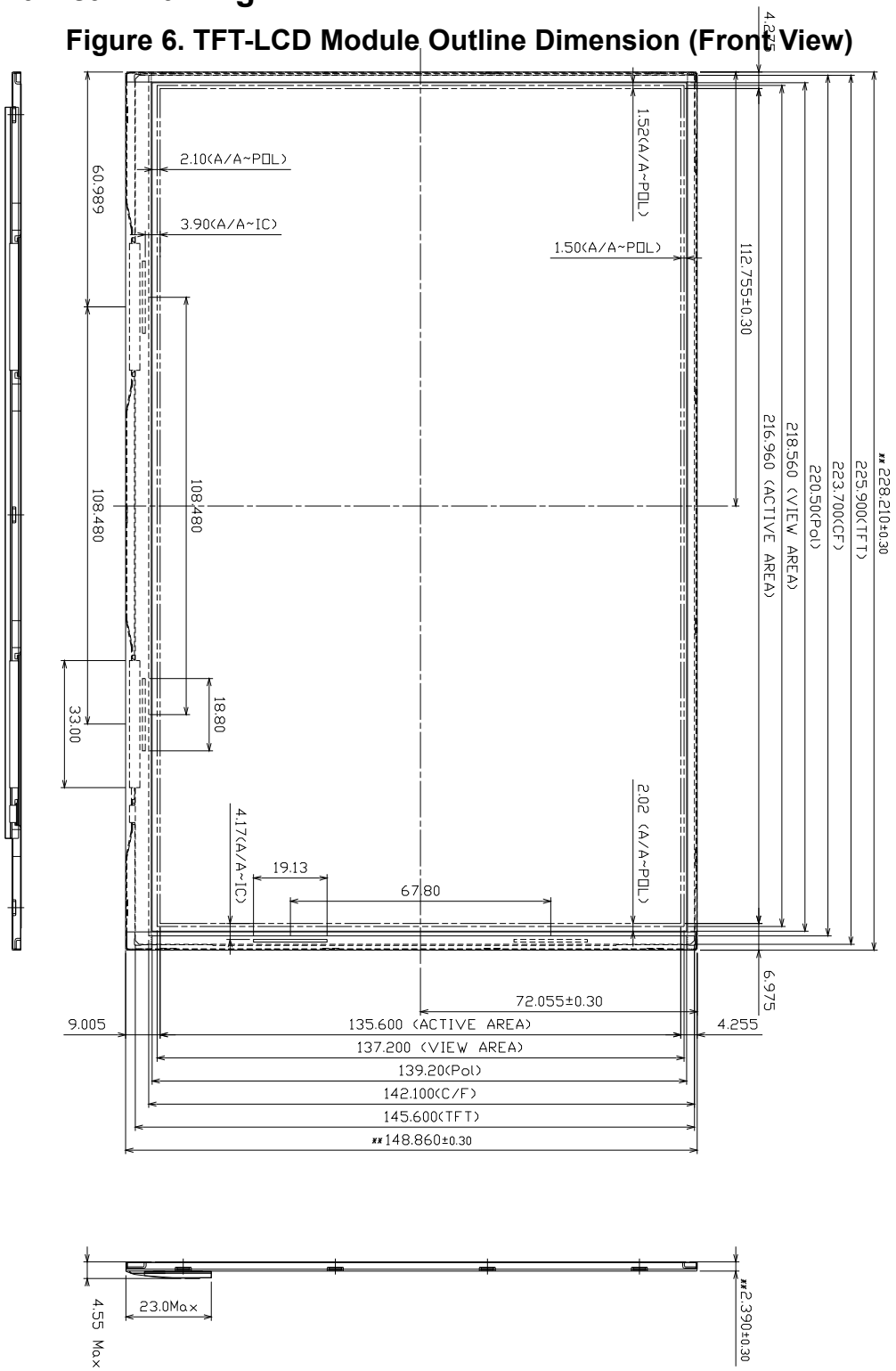
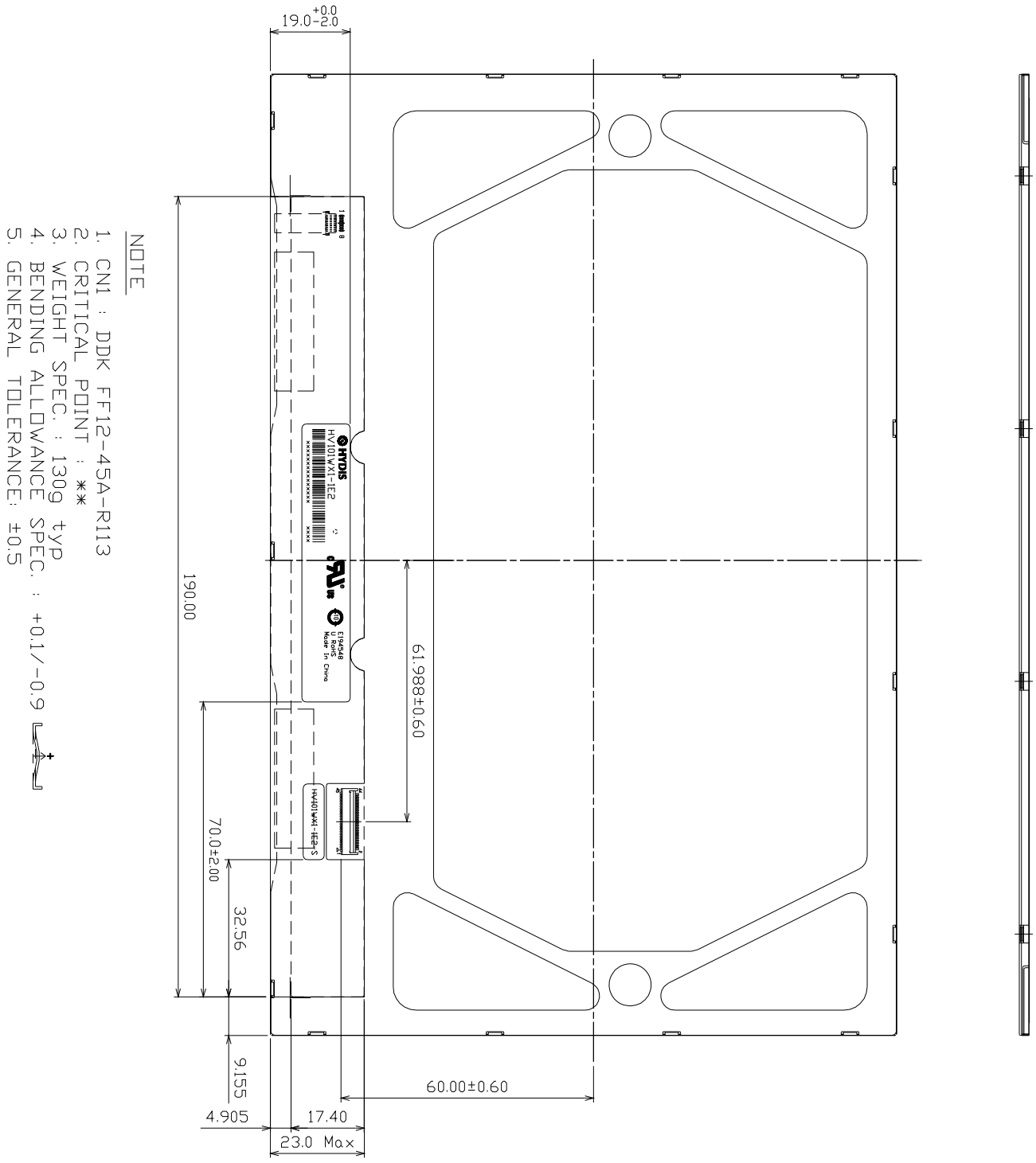


Figure 7. TFT-LCD Module Outline Dimensions (Rear view)



12.0 RELIABILITY TEST

The Reliability test items and its conditions are shown in below.

No	Test Item	Conditions
1	High temperature storage test	Ta = 60 °C, 240 hrs
2	Low temperature storage test	Ta = -20 °C, 240 hrs
3	High temperature operation test	Ta = 50 °C, 240 hrs
4	High temperature & high humidity operation test	Ta = 50 ℃, 80%RH, 240hrs
5	Low temperature operation test	Ta = 0 °C, 240 hrs
6	Thermal shock	Ta = -20 °C ↔ 60 °C (30 min), 100 cycle
7	Vibration test (non-operating)	Frequency : 10~500Hz Gravity/AMP : 1.5G Period : X,Y,Z 30min
8	Shock test (non-operating)	Gravity : 220G Pulse width : 2ms, half sine wave ±X, ±Y, ±Z Once for each direction
9	Electro-static discharge test (non-operating)	Air : 150pF, 330ohm, 15KV Contact : 150pF, 330ohm, 8KV

13.0 HANDLING & CAUTIONS

13.1 Cautions when taking out the module

- Pick the pouch only, when taking out module from a shipping package.

13.2 Cautions for handling the module

- As the electrostatic discharges may break the LCD module, handle the LCD module with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.
- As the LCD panel and back - light element are made from fragile glass (epoxy) material, impulse and pressure to the LCD module should be avoided.
- As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.
- Do not pull the interface connector in or out while the LCD module is operating.
- Put the module display side down on a flat horizontal plane.
- Handle connectors and cables with care.

13.3 Cautions for the operation

- When the module is operating, do not lose MCLK, DE signals. If any one of these signals were lost, the LCD panel would be damaged.
- Obey the supply voltage sequence. If wrong sequence is applied, the module would be damaged.

13.4 Cautions for the atmosphere

- Dew drop atmosphere should be avoided.
- Do not store and/or operate the LCD module in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.

13.5 Cautions for the module characteristics

- Do not apply fixed pattern data signal to the LCD module at product aging.
- Applying fixed pattern for a long time may cause image sticking.

13.6 Cautions for the digitizer assembly

- When assembling FPC connector, do not flip connector past 90° due to possible damage to connector.
- When positioning digitizer underneath driver IC, do not lift driver IC past 90° due to possible damage to drive IC pattern.
- Please be warned that during assembly of digitizer, the opening or closing of FPC will result in possible electrostatic discharge damage to the LED

13.7 Other cautions

- Do not re-adjust variable resistor or switch etc.
- When returning the module for repair or etc., Please pack the module not to be broken. We recommend to use the original shipping packages.

14.0 LABELS

14.1 Product Label

TBD

14.2 Box Packing Label

TBD

14.3 Pallet Packing Label

TBD

15.0 PACKING INFORMATION

15.1 Box Packing

TBD

15.2 Pallet Packing

TBD