T-51513D104JU-FW-A-AC-V406D

TFT-LCD with LED Backlighting & transflective upgrade

Rev. 4
2010-03-26

Contents

1. Revision History

Date	Rev.	Author	Description	Page
26-Mar-10	4	wc1	Initial Release	

2. General Specifications

The T-51513D104JU-FW-A-AC-V406D is a 10.4" color TFT-LCD (Thin Film Transistor Liquid Crystal Display) module composed of an LCD panel, driver ICs, control circuits, a LED backlight unit and a transflective upgrade. By applying 6-bit digital data, 640×480, 262,144-color images are displayed on a 10.4" diagonal screen. Input power is 3.3/5.0VDC for the LCD. Digital type data and control signals are transmitted via a CMOS interface having a (typical) 25MHz clock frequency. T-51513D104JU-FW-A-AC-V406D features white LED backlighting. The power supply for the backlight unit is not integrated into this module.

Specifications are summarized in the following table:

Item	Specification
Display Area (mm)	211.2 × 158.4 (10.39-inch diagonal)
Number of Dots	640 × 3 (H) × 480 (V)
Pixel Pitch(mm)	0.33 (H) × 0.33 (V)
Color Pixel Arrangement	RGB vertical stripe
Display Mode	Normally white TN
Number of Colors	262,144
Brightness (cd/m²)	1600
Wide Viewing Angle Technology	Optical Compensation Film
	-65~65°(H) -45~65°(V)
Surface Treatment	Anti-glare and hard-coating 3H, transflective upgrade
Electrical Interface	CMOS
Optimum Viewing Angle (Contrast ratio)	12 o'clock
Operating Temperature Range	-20~70℃
Module Size (mm)	243.0 (W) × 181.6 (H) × 12.2 (D)
Module Mass (g)	540
Backlight Unit	LED, dual edge-lit, replaceable

Note: A characteristic value shown without any note is a typical value.

3. Electrical Specifications

3.1. Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	MAX	UNIT
Power Supply Voltage for LCD	VCC	-0.3	6.5	V
Logic Input Voltage	V I	0	6.5	V
LED Current	IL	0	1.1	A
Operation Temperature (Panel) Note 1,2)	Top(Panel)	-20	70	℃
Operation Temperature (Ambient) Note 2)	Top(Ambient)	-20	70	℃
Storage Temperature Note 2)	Tstg	-20	80	℃

[Note]

1) Measured at the center of active area and at the center of panel back surface

2) Top,Tstg ≤ 40℃ : 90%RH max. without condensation Top,Tstg > 40℃ : Absolute humidity shall be less than the value of 90%RH at 40℃ without conden sation.

3.2. DC Characteristics

Ambient temperature: Ta = 25°C

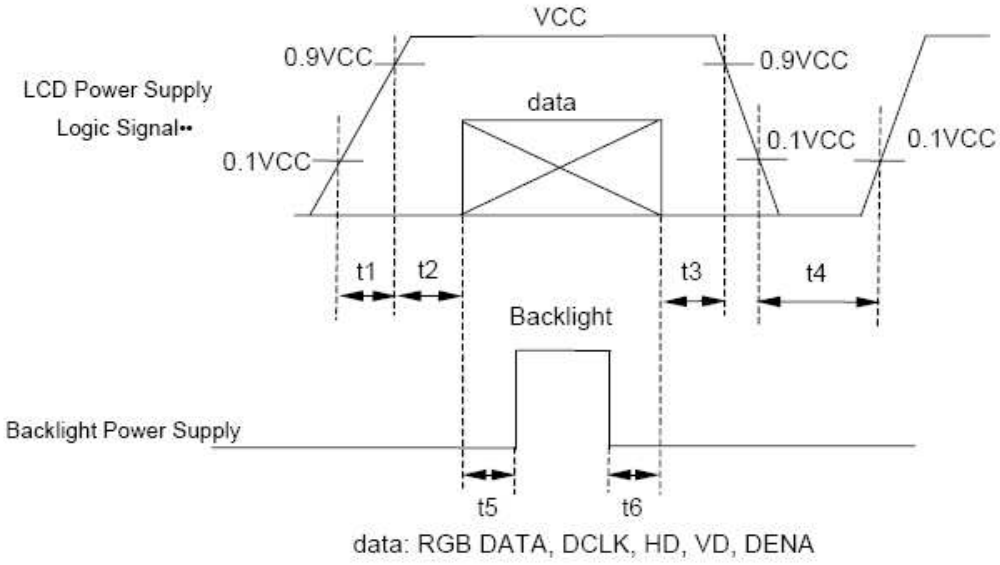
ITEM		SYMBOL	MIN.	TYP.	MAX.	UNIT	Remarks
Power Supply Voltage for LCD	3.3V power	VCC	3.0	3.3	3.6	V	*1)
	5.0V power	VCC	4.75	5.0	5.25	V	*1)
Power Supply Current for LCD	3.3V power	ICC	--	300	400	mA	VCC=3.3V, *2)
	5.0V power	ICC		200	280	mA	VCC=5.0V, *2)
Permissible Input Ripple Voltage		VRP	--	--	100	mVp-p	VCC=+3.3V/5.0V
Logic Input Voltage		VIH	2.0	--	5.25	V	
		VIL	0	--	0.8	V	

*1) Power and signals sequence:

t1 ≤ 10 ms 400 ms ≤ t4

0 < t2 ≤ 50 ms 200 ms ≤ t5

0 < t3 ≤ 50ms 0 ≤ t6



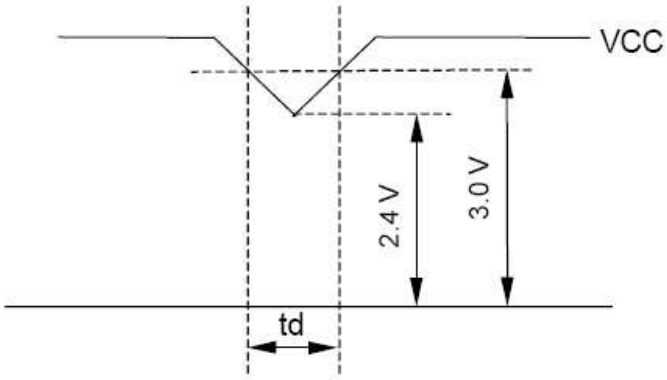
VCC-dip conditions:

a) 3.3V powered:

1) When 2.4 V ≤ VCC < 3.0 V, td ≤ 10 ms

2) When VCC < 2.4 V

VCC-dip conditions should also follow the power and signals sequence.

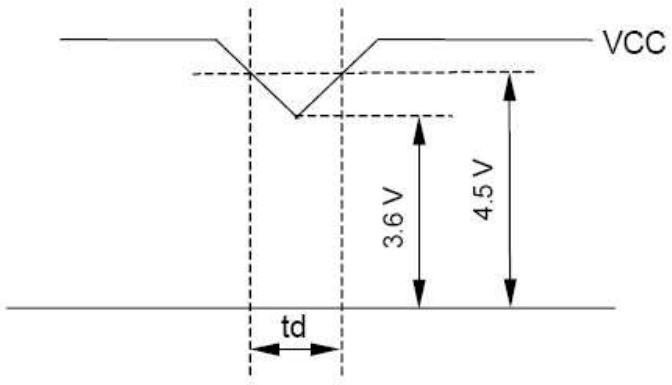


(b) 5.0V powered:

1) When 3.6 V ≤ VCC < 4.5 V, td ≤ 10 ms

2) When VCC < 3.6 V

VCC-dip conditions should also follow the power and signals sequence.



*2) Typical current condition:

64-gray-bar pattern

480 line mode

VCC = +3.3V / 5.0V, f_H=31.5 kHz, fv=60 Hz, f_{CLK}= 25 MHz

3.3. AC Characteristics

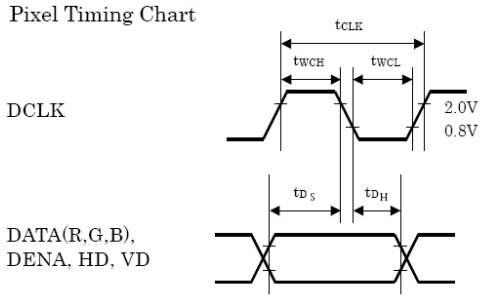
Interface Timing

ITEM		SYMBOL	MIN	TYP	MAX	UNIT
DCLK *1), *4)	Frequency	f_{CLK}	--	25	29	MHz
	Period	t_{CLK}	34.5	40	--	ns
	Low Width	t_{WCL}	12	--	--	ns
	High Width	t_{WCH}	12	--	--	ns
DATA *1) (R,G,B,DENA, HD, VD)	Setup time	t_{DS}	5	--	--	ns
	Hold Time	t_{DH}	5	--	--	ns
DENA *3)	Horizontal Active Time	t_{HA}	640	640	640	t_{CLK}
	Horizontal Front Porch	t_{HFP}	10	16	--	t_{CLK}
	Horizontal Back Porch	t_{HBP}	2	138	--	t_{CLK}
	Vertical Active Time	t_{VA}	480	480	480	t_H
	Vertical Front Porch	t_{VFP}	1	13	--	t_H
	Vertical Back Porch	t_{VBP}	2	33	--	t_H
HD *2), *4)	Frequency	f_H	27	31.5	38	kHz
	Period	t_H	26.3	31.7	37.0	µs
	Low Width	t_{WHL}	5	96	--	t_{CLK}
VD *2)	Frequency	f_V	55	60	70	Hz
	Period	t_V	14.3	16.7	18.2	ms
	Low Width	t_{WVL}	3	--	--	t_H

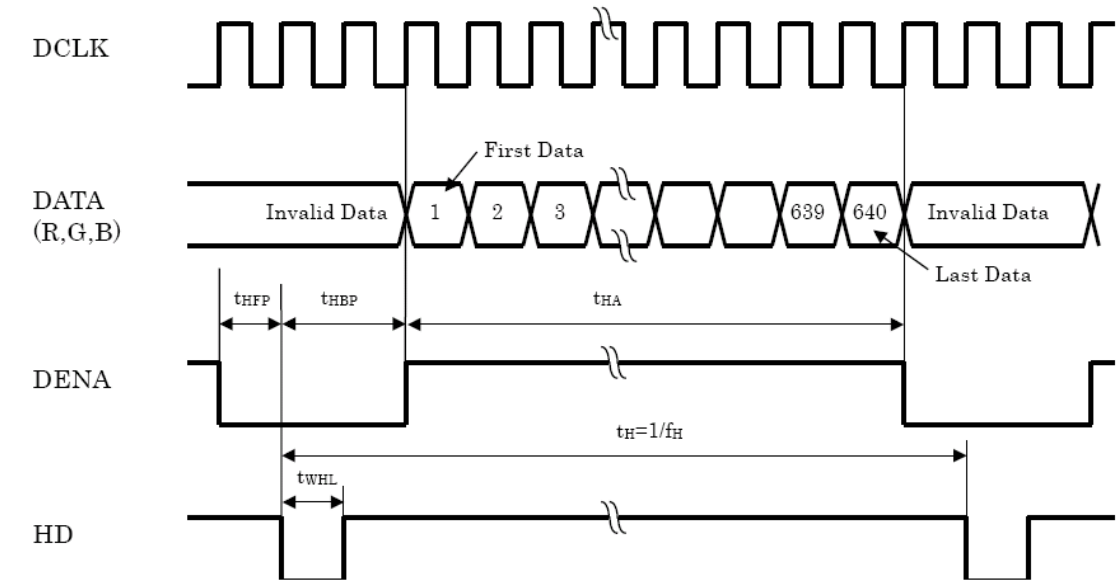
[Note]

1) Data is latched at the falling edge of DCLK in this specification.
2) Polarities of HD and VD are negative in this specification.
3) DENA (Data Enable) should always be positive polarity as shown in the timing specification.
4) DCLK should appear during all invalid periods, and HD should appear during invalid period of frame cycle.
5) $t_{HFP} + t_{HBP} \geq 20\ T_{clk}$

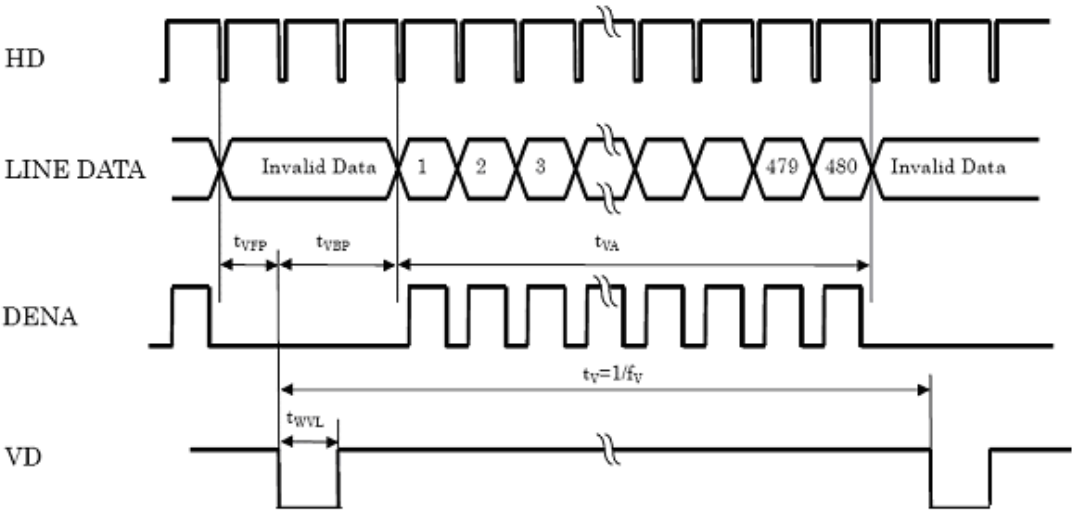
3.3.1. Pixel Timing



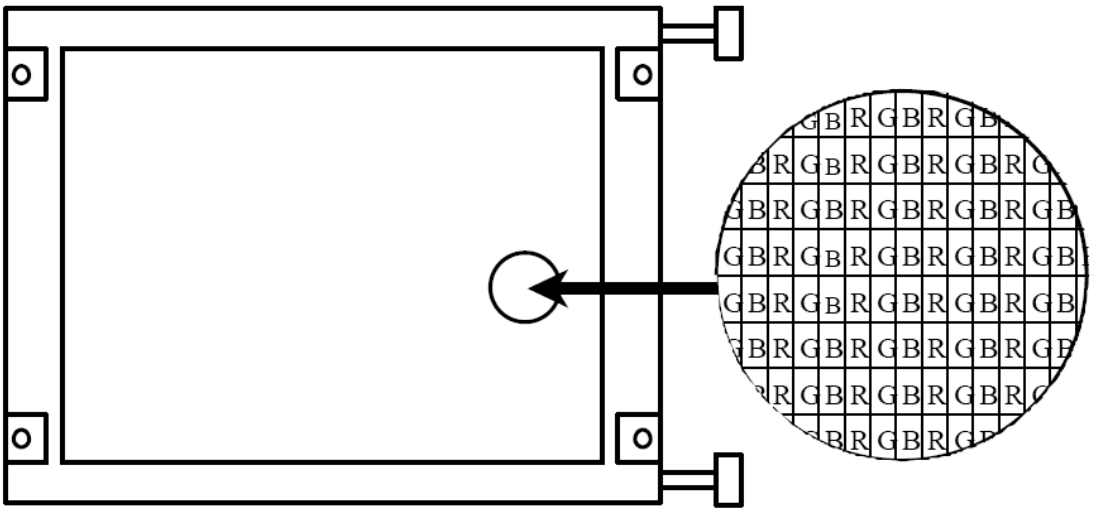
3.3.2. Horizontal Timing



3.3.3. Vertical Timing



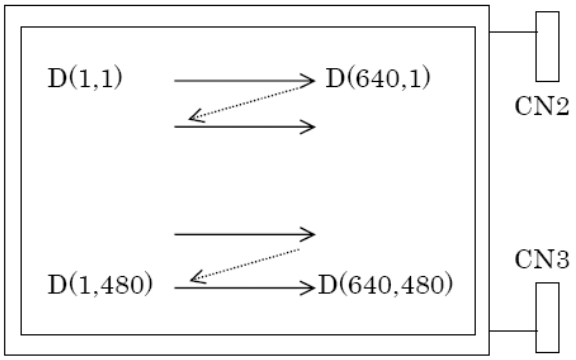
3.4. Pixel Alignment



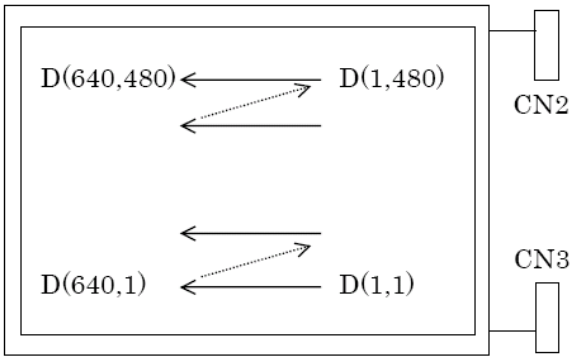
3.5. Inverted Scan Capability

D(X,Y) shows the data number of input signal for LCD panel signal processing PCB.

SC: Low or Open



SC: High



3.6. Color Data Assignment

COLOR		INPUT DATA																	
		R DATA						G DATA						B DATA					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
		MSB					LSB	MSB					LSB	MSB					LSB
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	BLUE(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	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
RED	RED(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
GREEN	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
	GREEN(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
	GREEN(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
BLUE	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	BLUE(62	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
	BLUE(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1

[Note]
1) Definition of gray scale
Color (n) --- n indicates gray scale level.
Higher n means brighter level.
2) Data
1:High, 0: Low

3.7. Backlight Specifications

$Ta = 25^{o}C$

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	Remarks
LED Voltage	V_L	--	8.46	9.36	V	*1), I_L = 400mA
LED Current	I_L	--	--	400	mA	*2),
Power Consumption	W_L	--	3.39	--	W	I_L = 400mA
Backlight Lifetime	BL	50,000	--	--	h	*3), *4), *5), I_L = 400mA

*1) VL is specified as the sum of the white LED forward voltages.

*2) LEDs are best driven using a constant current source. To avoid chromaticity shifts while dimming pulse-width modulation (PWM) techniques may be employed (0-100% duty cycle).

*3) Backlight lifetime is defined as the time when the brightness becomes 50% of the initial value.

*4) The lifetime of the backlight depends on the ambient temperature. The lifetime will decrease under high temperature.

*5) Recommended **LED backlight converter**:

PART NUMBER	MANUFACTURER
CDS-CCR2-800M-R	Apollo Display Technologies, LLC.

4. Optical Specifications

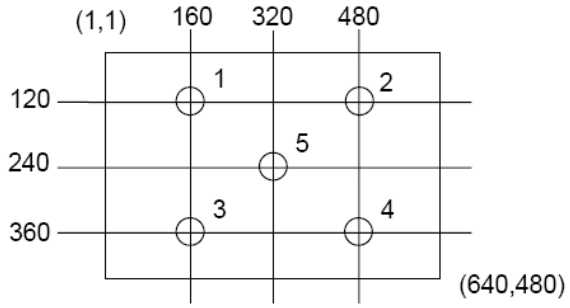
Conditions: Ta = 25℃, VCC = 3.3V, Input Signals: t ypical values, IL = 400 mA

ITEM		SYMBOL	CONDITION	MIN	TYP	MAX	UNIT	Remarks
Contrast Ratio		CR	θ = φ = 0°	350	500	--	--	*1)*2)*6
Luminance		Lw	θ = φ = 0°	1400	1600	--	cd/m²	*1)*3)*6)
Luminance Uniformity		∆Lw	θ = φ = 0°	--	--	28	%	*1)*4)*6)
Response Time		tr	θ = φ = 0°	--	10	--	ms	*1)*5)*6)
		tf	θ = φ = 0°	--	30	--	ms	*1)*5)*6)
Viewing Angle	Horizontal	φ	CR ≥ 10	-60~60	-70~70	--	°	*1)*6)
	Vertical	θ		-50~40	-60~50	--	°	*1)*6)
	Horizontal	φ	CR ≥ 5	-70~70	-80~80	--	°	*1)*6)
	Vertical	θ		-70~55	-80~65	--	°	*1)*6)
Image sticking		tis	2 h	--	--	2	s	*7)
Chromaticity	White	Wx Wy	θ = φ = 0°	--	0.325 0.350	--	--	*1)*6)

[Note]
Measured items are measured using CS1000 (MINOLTA) for color coordinates, EZContrast (ELDIM) for viewing angle, and CS1000 or BM-5A (TOPCON) for others under the dark room condition (no ambient light) after more than 30 minutes from turning on the lamp unless noted.

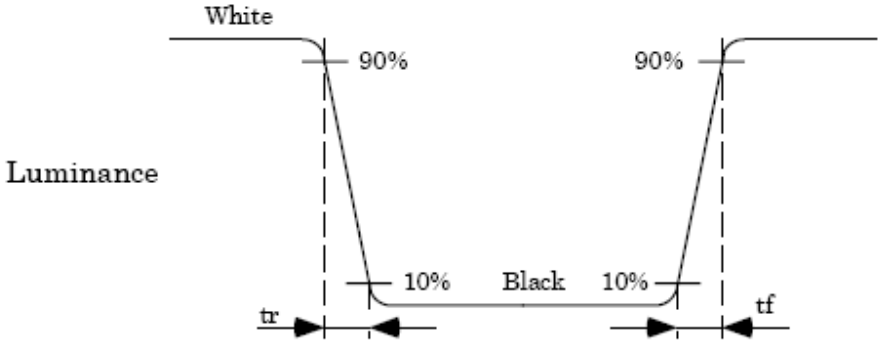
*1) Measurement Points:
Contrast Ratio, Luminance, Response Time, Viewing Angle, Color Coordinates: Display Center

Luminance Uniformity: points 1-5 shown in a figure below

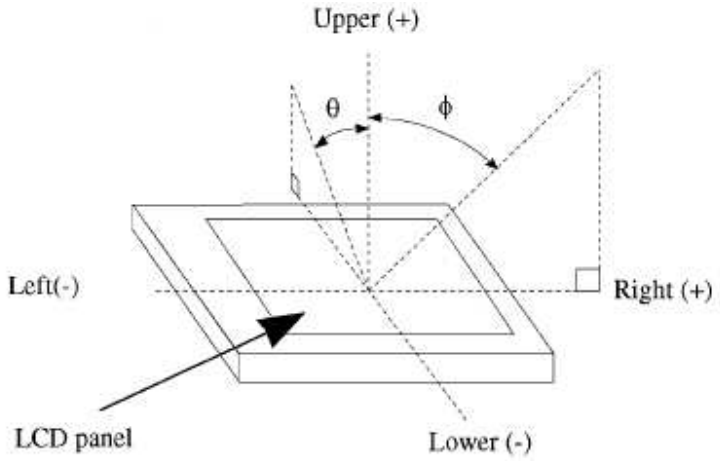


*2) Definition of Contrast Ratio:
CR=ON (White) Luminance / OFF(Black) Luminance
*3) Definition of Luminance:
Lw= ON (White) Luminance
*4) Definition of Luminance Uniformity:
∆Lw=[Lw(MAX)/Lw(MIN)-1] × 100

*5) Definition of Response Time



*6) Definition of Viewing Angle(θ , φ)



*7) Image sticking:

Continuously display the test pattern shown in the figure below for two-hours. Then display a completely white screen. The previous image shall not persist more than two seconds at 25℃.

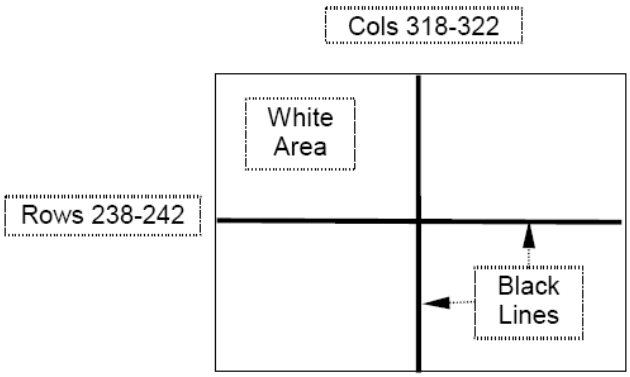


Figure: Test pattern for image sticking test

5. I/O Interface

5.1. Pin Assignments

(1) CN 1(Interface Signal)

Connector used: DF9B-31P-1V (HIROSE)

Mating connector: DF9-31S-1V (HIROSE)

Pin No.	Symbol	Function
1	GND	
2	DCLK	Clock signal for sampling data signal
3	HD	Horizontal sync signal
4	VD	Vertical sync signal
5	GND	
6	R0	Red data signal (LSB)
7	R1	Red data signal
8	R2	Red data signal
9	R3	Red data signal
10	R4	Red data signal
11	R5	Red data signal (MSB)
12	GND	
13	G0	Green data signal (LSB)
14	G1	Green data signal
15	G2	Green data signal
16	G3	Green data signal
17	G4	Green data signal
18	G5	Green data signal (MSB)
19	GND	
20	B0	Blue data signal (LSB)
21	B1	Blue data signal
22	B2	Blue data signal
23	B3	Blue data signal
24	B4	Blue data signal
25	B5	Blue data signal
26	GND	
27	DENA	Data enable signal (to settle the viewing area)
28	VCC	3.3 / 5.0V LCD Power Supply
29	VCC	3.3 / 5.0V LCD Power Supply
30	TEST	This pin should be open. Test signal output for internal use.
31	SC	Reverse scan control (Low or open: Normal , High : Reverse)

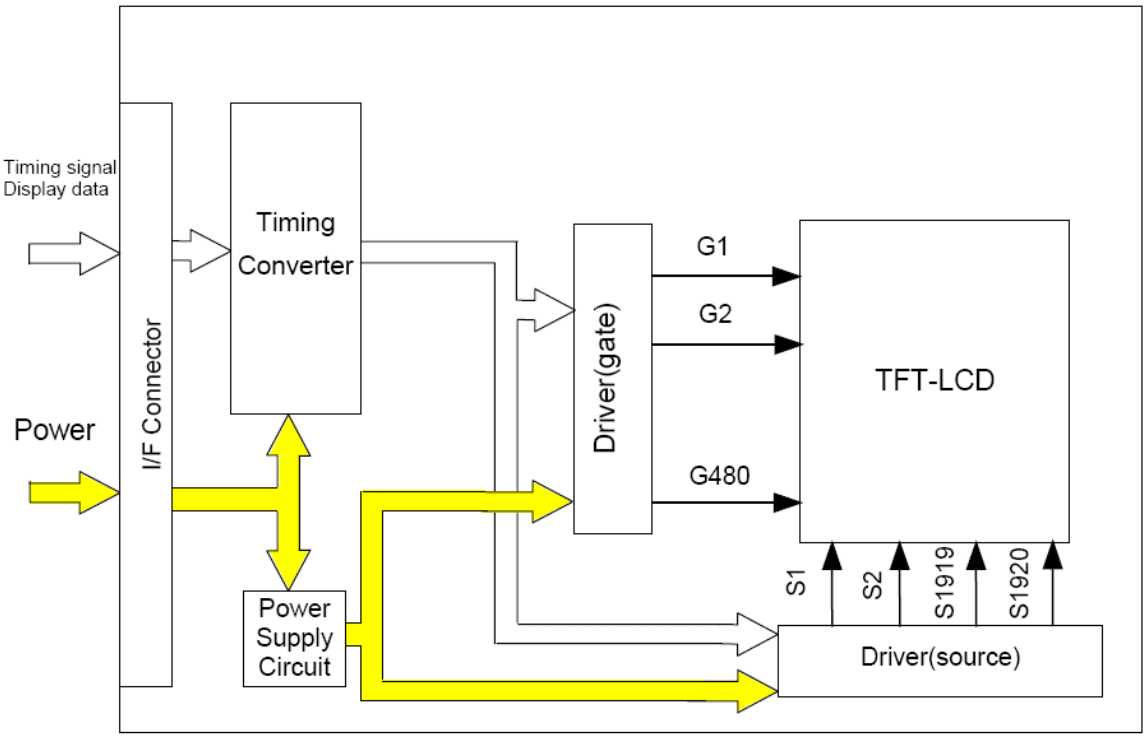
*) The shielding case is connected with GND.

(2) CN2, CN3 (Backlight)
Backlight-side connector: 22-01-3027 (Molex)
Mating connector: 22-05-3021 (Molex)

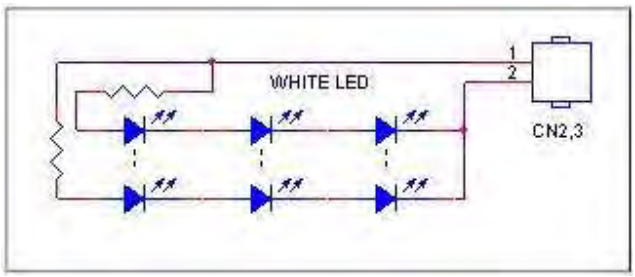
Pin No.	Symbol	Function
1	LRH	VBLH (High voltage)
2	LRL	VBLL (Low voltage)

Note] VBLH - VBLL = VL

5.2. Block Diagram



BACKLIGHT



6. Test Criteria

(1) Temperature and Humidity

TEST ITEM	CONDITIONS
HIGH TEMPERATURE HIGH HUMIDITY OPERATION	40℃, 90%RH, 240 ·h (No condensation)
HIGH TEMPERATURE STORAGE	80℃, 240 h
LOW TEMPERATURE STORAGE	-20℃, 240 h
THERMAL SHOCK (NON-OPERATION)	BETWEEN -20℃ (1h) an d 80℃(1h), 100 CYCLES

(2) Shock and Vibration

ITEM	CONDITIONS
SHOCK (NON-OPERATION)	Shock level: 1470 m/s² (150G) Waveform: half sinusoidal wave, 2 ms Number of shocks: one shock input in each direction of three mutually perpendicular axes for a total of six shock inputs.
VIBRATION (NON-OPERATION)	Vibration level: 9.8 m/s² (1.0G) Waveform: sinusoidal Frequency range: 5 to 500 Hz Frequency sweep rate: 0.5 octave /min Duration: one sweep from 5 to 500 Hz in each of three mutually perpendicular axis(each x,y,z axis: 1 hour, total 3 hours)

(3) Judgement Standard

Judgment of the above tests should be made as follows:

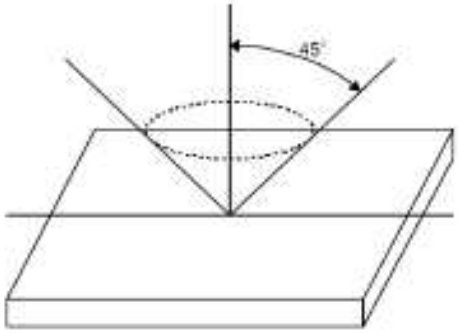
Pass: Normal display image, no damage of the display function (ex. no line defect). Partial transformation of the module parts should be ignored.

Fail: No display image, damage of the display function (ex. line defect).

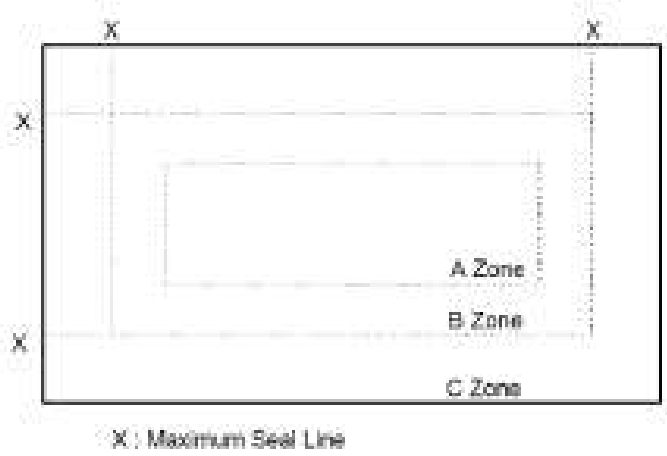
7. Appearance Standards

7.1. Inspection Conditions

The LCD shall be inspected under 40W white fluorescent light.
The distance between the eyes and the sample shall be more than 30cm.
All directions for inspecting the sample should be within 45º against perpendicular line.



7.2. Definition of Applicable Zones



Zone A: Active display area
Zone B: Out of active display area up to viewing area
Zone C: Remaining parts
Zone A + Zone B = Viewing area

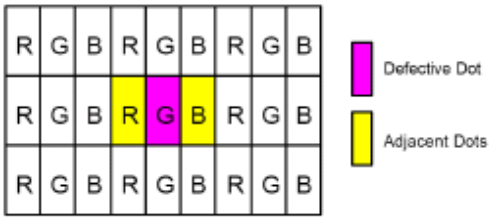
7.3. Standards

<table>
<tr><th>No.</th><th>Parameter</th><th>Criteria</th></tr>
<tr><td>1</td><td>Polarizer Scratches</td><td>
<table>
<tr><th rowspan="2">Zone
X (mm) / Y (mm)</th><th rowspan="2"></th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>L ≤ 15</td><td>0.01<W≤0.05</td><td colspan="2">4</td><td>*</td></tr>
<tr><td>L > 15</td><td>W > 0.01</td><td colspan="2">0</td><td>*</td></tr>
<tr><td>-</td><td>W > 0.05</td><td colspan="2">0</td><td>*</td></tr>
</table>
X : Length, Y : Width * : Disregard
</td></tr>
<tr><td>2</td><td>DENT</td><td>
<table>
<tr><th rowspan="2">Zone
Dimension (mm)</th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>0.30 < D ≤ 0.50</td><td colspan="2">4</td><td>*</td></tr>
<tr><td>0.50 < D</td><td colspan="2">0</td><td>*</td></tr>
</table>
D : Average Diameter = (long+short)/2 * : Disregard
</td></tr>
<tr><td>3</td><td>BLACK and WHITE SPOT BUBBLE</td><td>
<table>
<tr><th rowspan="2">Zone
Dimension (mm)</th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>0.30 < D ≤ 0.50</td><td colspan="2">5</td><td>*</td></tr>
<tr><td>0.50 < D</td><td colspan="2">0</td><td>*</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>LINT</td><td>
<table>
<tr><th rowspan="2">Zone
X (mm) / Y (mm)</th><th rowspan="2"></th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>L ≤ 3.0</td><td>W ≤ 0.15</td><td colspan="2">4</td><td>*</td></tr>
<tr><td>L > 3.0</td><td>W ≤ 0.15</td><td colspan="2">0</td><td>*</td></tr>
<tr><td>-</td><td>W > 0.15</td><td colspan="2">According to BLACK SPOT</td><td>*</td></tr>
</table>
X : Length, Y : Width * : Disregard
</td></tr>
<tr><td>5</td><td>(a) Bright Dot
(b) Dark Dot</td><td>
<table>
<tr><th rowspan="2">Zone
Dimension (mm)</th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Bright Dot</td><td colspan="2">7 (G ≤ 3)</td><td>*</td></tr>
<tr><td>Dark Dot</td><td colspan="2">7</td><td></td></tr>
<tr><td>Total</td><td colspan="3">10</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>TWO Adjacent Dot</td><td>
<table>
<tr><th rowspan="2">Zone
Dimension (mm)</th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Bright Dot</td><td colspan="2">3 PAIRS</td><td>*</td></tr>
<tr><td>Dark Dot</td><td colspan="2">3 PAIRS</td><td>*</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Three or More Adjacent Dot</td><td>NOT ALLOWED</td></tr>
<tr><td>8</td><td></td><td>
<table>
<tr><th rowspan="2">Zone
Dimension (mm)</th><th colspan="3">Acceptable Number</th></tr>
<tr><th>A</th><th>B</th><th>C</th></tr>
<tr><td>Bright Dot</td><td colspan="2">5 mm</td><td>*</td></tr>
<tr><td>Dark Dot</td><td colspan="2">5 mm</td><td>*</td></tr>
</table>
</td></tr>
<tr><td>9</td><td>Line Defect</td><td>NOT ALLOWED</td></tr>
</table>

Note 1: Bright Dot is defined as follows:
Visible through 5% transmission ND filter under the condition that black image (color 0) is on the display.

Note 2: Dark Dot is defined as follows:
Recognizable darker than around under the condition that each R(63), G(63), B(63) image is on the display.

Note 3: Definition of adjacent



8. Ordering Information

The ordering code for this module is: T-51513D104JU-FW-A-AC-V406

9. Application Precautions

Please contact us when questions and/or new problems not specified in this specification arise.

10. Precautions Relating to Product Handling

The Following precautions will guide you in handling this product correctly.

1) Liquid crystal display devices:
   a) The liquid crystal display device panel used in the liquid crystal display module is made of plate glass. Avoid any strong mechanical shock. Should the glass break, handle it with care.
   b) The polarizer adhering to the surface of the LCD is made of a soft material. Guard against scratching it.
2) Take care to guard the liquid crystal display module against static electricity discharge.
   a) When working with the module, be sure to ground your body and any electrical equipment you may be using. We strongly recommend the use of anti-static mats (made of rubber) to protect sensitive circuits against the hazards of static electricity.
   b) Avoid the use of work clothing made of synthetic fibers. We recommend cotton clothing or other conductivity treated fibers.
   c) Slowly and carefully remove the protective film from the LCD module, since this operation can generate static electricity.
3) When the LCD module must be stored for long periods of time:
   a) Protect the module from high temperature and humidity.
   b) Keep the module out of direct sunlight or direct exposure to ultraviolet rays.
   c) Protect the module from excessive external forces.
4) Use the module with a power supply that is equipped with an over current protection circuit, since the module is not provided with this protective feature.
5) Do not ingest the LCD fluid itself should it leak out of a damaged LCD module. Should hands or clothing come in contact with LCD fluid, wash immediately with soap.
6) Conductivity is not guaranteed for models that use metal holders where solder connections between the metal holder and the PCB are not used. Please contact us to discuss appropriate ways to assure conductivity.
7) For models which use touch panels:
   a) Do not stack up modules since they can be damaged by components on neighboring modules.
   b) Do not place heavy objects on top of the product. This could cause glass breakage.
8) For models which use COG, TAB, or COF:
   a) The mechanical strength of the product is low since the IC chip faces out unprotected from the rear. Be sure to protect the rear of the IC chip from external forces.
   b) Given the fact that the rear of the IC chip is left exposed, in order to protect the unit from electrical damage avoid installation configurations in which the rear of the IC chip runs the risk of making any electrical contact.
9) For models which use flexible cable, heat seal, or TAB:
   a) In order to maintain reliability, do not touch or hold by the connector area.
   b) Avoid any bending, pulling, or other excessive force, which can result in broken connections.
10) Mechanical stress can have an adverse effect on connecting parts (LCD panel-TCP / HEAT SEAL / FPC / etc., PCB-TCP / HEAT SEAL / FPC etc., TCP-HEAT SEAL, TCP-FPC, HEAT SEAL-FPC, etc.) depending on the materials used. Please check and evaluate these materials carefully before use.
11) In case an acrylic plate is attached to front side of LCD panel, cloudiness (very small cracks) can occur in the acrylic plate, being influenced by some components generated from polarizer film. Please check and evaluate the acrylic materials carefully before use.

11. Warranty

Apollo Display Technologies, LLC. offers a standard one year parts and labor guarantee on all products sold against manufacturers defect.

Customer is liable for shipping charges associated with shipment of product back to Apollo for return analysis. If product is found to be defective Apollo will repair or replace the part free of charge. Apollo will cover the shipping cost of all warranty items back to the customer (via standard ground service).

For any other use apart from general electronic equipment, we cannot take responsibility if the product is used in medical devices, nuclear power control equipment, aerospace equipment, fire and security systems, or any other applications in which there is a direct risk to human life.

1. We cannot accept responsibility for any defect, which may arise from additional manufacturing of the product (including disassembly and reassembly), after product delivery.

2. We cannot accept responsibility for any defect, which may arise after the application of strong external force to the product.

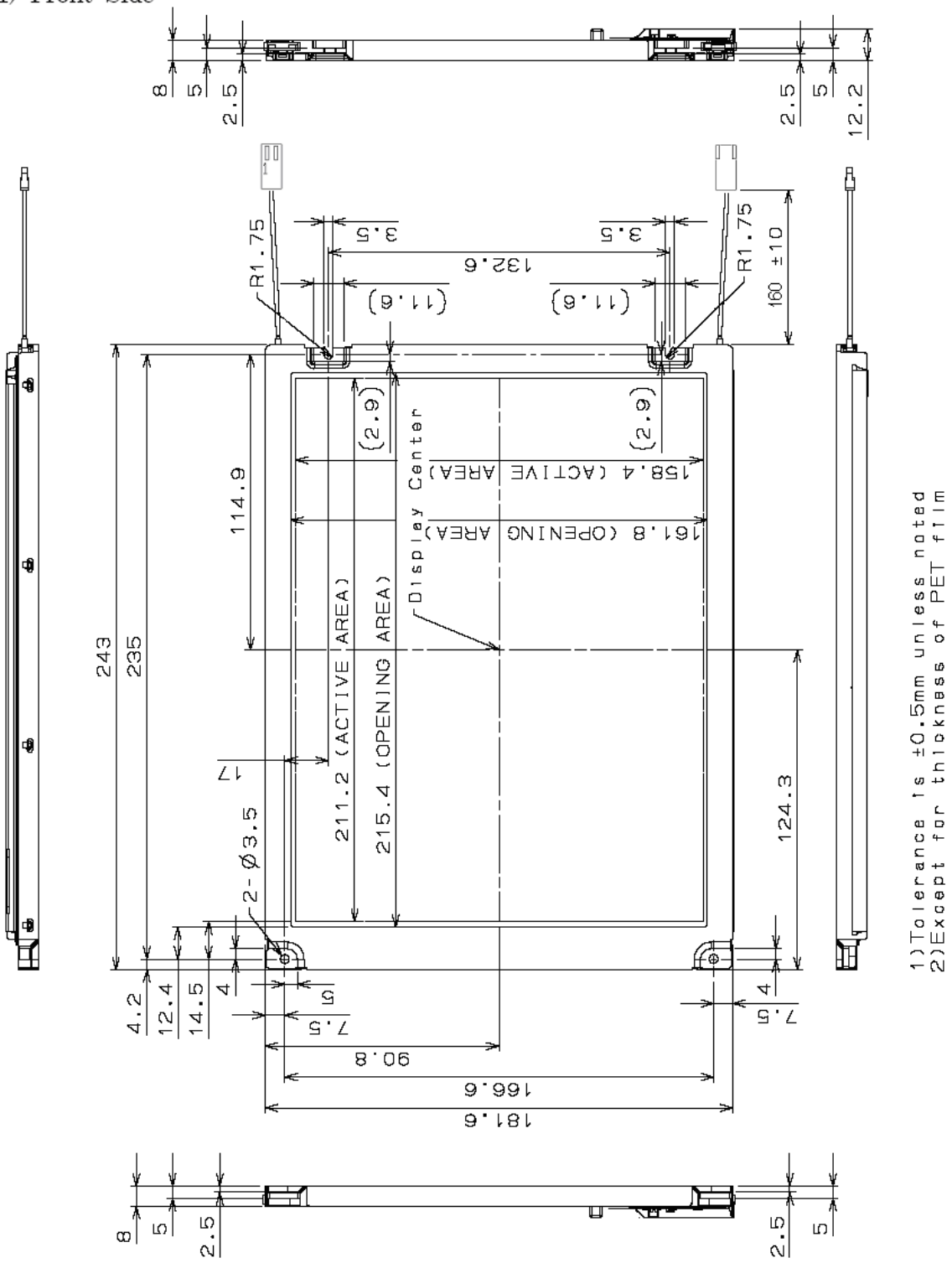
3. We cannot accept responsibility for any defect, which may arise due to the application of static electricity after the product has passed your company's acceptance inspection procedures.

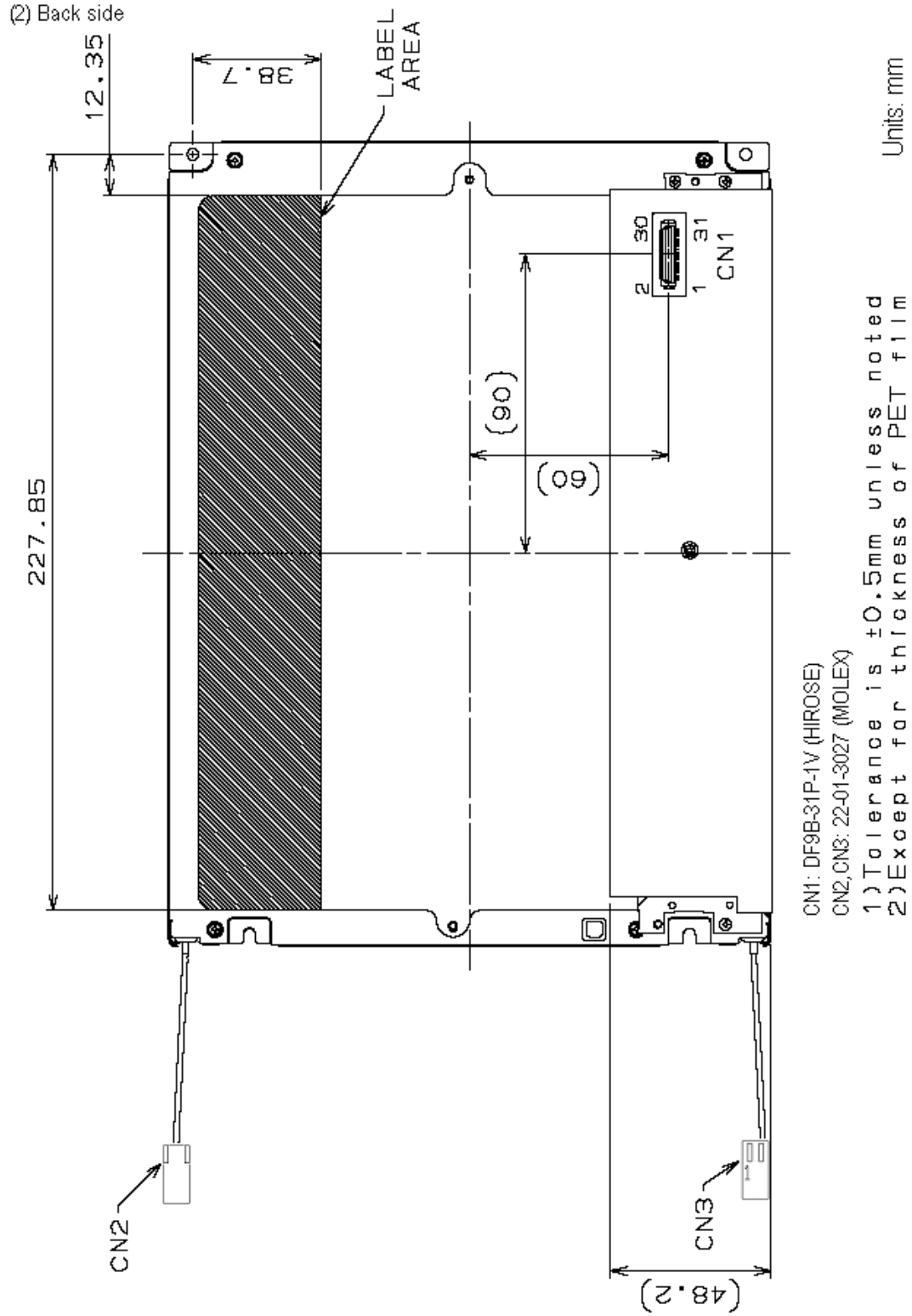
4. We cannot accept responsibility for intellectual property of a third party, which may arise through the application of our product to your assembly with exception to those issues relating directly to the structure or method of manufacturing of our product.

12. Mechanical Specifications

Mechanical specifications are found on the following page(s).

1) Front Side


8
5
2.5
2.5
5
12.2
R1.75
3.5
3.5
132.6
(11.6)
(11.6)
R1.75
160 ±10
(2.9)
(2.9)
Display Center
158.4 (ACTIVE AREA)
161.8 (OPENING AREA)
114.9
243
235
211.2 (ACTIVE AREA)
215.4 (OPENING AREA)
17
2-Ø3.5
124.3
4.2
12.4
14.5
4
5
7.5
7.5
4
90.8
166.6
181.6
8
5
2.5
2.5
5
1)Tolerance is ±0.5mm unless noted
2)Except for thickness of PET film


(2) Back side
12.35
38.7
LABEL AREA
227.85
30
31
2
1
CN1
(60)
(60)
CN2
CN3
(48.2)
Units: mm
CN1: DF9B-31P-1V (HIROSE)
CN2,CN3: 22-01-3027 (MOLEX)
1)Tolerance is ±0.5mm unless noted
2)Except for thickness of PET film