

億力光電股份有限公司
EVERVISION ELECTRONICS CO., LTD.

Product Specification For LCD Module

(KVPF-7B-002-16)

Model NO. : VGG106018-0TSLWB(RoHS)

REVISION : 1

☒ **APPROVAL FOR SPECIFICATIONS ONLY**





☐ **APPROVAL FOR SPECIFICATIONS AND SAMPLE**

CUSTOMER :

STD.

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[illegible]

3. Module Numbering System

V G G 1060 18 – 0 T S L W B

Serial No.:A~Z

Backlight Color:

N:Without Backlight;
A:Amber; **B:**Blue; **G:**Green;
L:Yellow; **O:**Orange; **R:**Red;
W:White; **Y:**YellowGreen;
X:Others

Backlight Type:

N:Without Backlight; **E:**EL; **F:**CCFL;
L:General LED; **H:**High NTSC LED ;
R:RGB LED; **X:**Others

LCD Model:

A:ASTN; **B:**STN Blue; **C:**CSTN; **D:**DSTN;
F:TFT; **G:**STN Gray; **H:**HTN; **I:**IBN;
K:Black Mask TN **L:**LTPS; **M:**MVA;
N:others; **O:**OLED; **P:**PLED; **S:**IPS;
T:TN; **U:**FSC TN; **W:**FSTN Black/white;
X:FFSTN; **Y:**STN Yellow;

LCD Type:

R: Reflective/Positive;
S : Reflective/Negative ;
F : Transflective/Positive ;
G: Transflective/Negative ;
U: Transmissive/Positive ;
T: Transmissive/Negative ; **N:**Others

Temperature Range & View Direction:

General Purpose : **1:**6H **2:**12H **3:**3H **4:**9H **5:**Others
 High Performance: **6:**6H **7:**12H **8:**3H **9:**9H **0:**Others

STD Product Serial No.: 01~99

Customer Made Serial No.: A1,A2...A9,B1,B2...B9,C1..

Display Function:

Segment Number / Characters Lines / Column and Row Dots
 / Length * Width of Other

Display Type:

C:Character Type; **G:**Graphic Type; **S:**Segment Type; **O:**Other

Package Type:

B:COB; **F:**COF; **G:**COG; **H:**Heat Seal; **S:**SMT; **T:**TAB; **O:**Others

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4. Application


This specification is applied to the 8 inch WSVGA supported TFT-LCD module, and can display true 16.7M colors (8 bit/ color). This module is composed of a 8" TFT-LCD panel, a driver circuit, and backlight.

5. Features

- WSVGA (1024×600 pixels) resolution.
- 6/8 bit LVDS Interface
- Projected Capacitive Touch
 - I2C Interface
 - Multi Touch (10 points)
 - 16384 x 16384 resolution
- Use Double Sided Tape Bonding Between PCAP And LCM
- Use Optical Bonding Between PCAP And CG

6. General Specifications

Item	Specifications	Unit
Screen Size	8 (Diagonal)	inch
Display Format	1024RGB(H)×600(V)	dot
Active Area	176.64(H)×99.36(V)	mm
Pixel Pitch	0.1725(H)×0.1656(V)	mm
Pixel Configuration	RGB Vertical Stripe	-
Display Mode	IPS Type / Transmissive Mode / Normally Black	-
Surface Treatment	Anti-Glare	-
Viewing Direction	Full view angle	-
Outline Dimension	192.8(W×116.9(V) ×7.95(D)	mm
Weight	(TBD)	g
RoHS Compliance	RoHS Compliance	-

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7. Absolute Maximum Ratings

7.1 Absolute Ratings of Environment

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	T _{ST}	-30	+80	°C	(1)(2)
Operating Temperature	T _{OP}	-20	+70	°C	(1)(2)

Note1: Background color changes slightly depending on ambient temperature.

This phenomenon is reversible.

Note2: Please refer to item of RELIABILITY.

7.2 Electrical Absolute Ratings

7.2.1 TFT-LCD Module

(Ta=25±2°C, GND=V_{SS}=0V)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Digital Power Supply Voltage	V _{DD}	-0.3	5.0	V	-
	AV _{DD}	6.5	13.5	V	-
	V _{GH}	-0.3	42	V	-
	V _{GL}	-20.0	0.3	V	-
	V _{GH} -V _{GL}	-	40	V	-

8. Electrical Characteristics

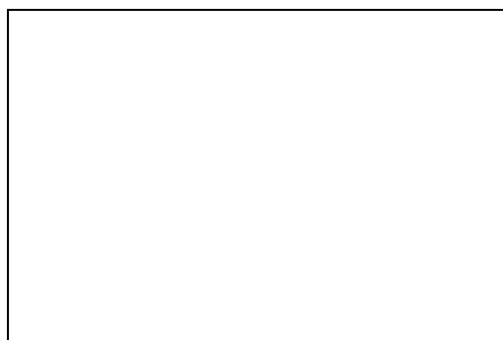
8.1 TFT-LCD Module

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{DD}	3.0	3.3	3.6	V	-
Power Supply Current	I _{DD}	6	24	40	mA	(1)
Power Supply Voltage	AV _{DD}	12.9	13	13.1	V	-
Power Supply Current	I AV _{DD}	10.5	42	70	mA	-
Power Supply Voltage	V _{GH}	23.5	24	24.5	V	-
Power Supply Current	I _{GH}	0.07	0.30	1.0	mA	-
Power Supply Voltage	V _{GL}	-6.1	-5.6	-5.1	V	-
Power Supply Current	I _{GL}	0.08	0.31	1.0	mA	-
Input logic high voltage	V _{IH}	0.7 V _{DD}	0.9 V _{DD}	V _{DD}	V	-
Input logic low voltage	V _{IL}	0	0.1 V _{DD}	0.3 V _{DD}	V	-

Note (1) The specified power consumption is under the conditions at V_{DD} =3.3V,
F_V=60Hz, whereas a power dissipation check pattern below is displayed.

White Pattern / 255 Gray



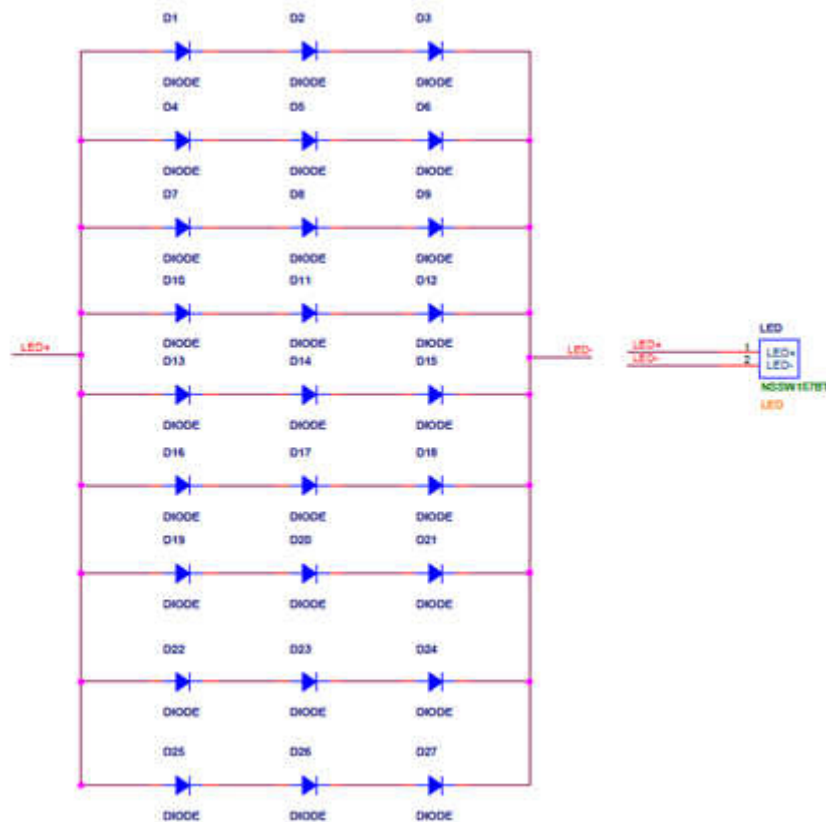
Active Area

8.2 LED Driver Unit

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Voltage of LED Driver Unit	VLED	8.4	9.3	10.2	V	-
Current of LED Driver Unit	ILED	-	540	585	mA	
LED Life Time(25°C)	-	20000	-	-	hr	(1)

Note (1) : LED life time is defined as under 25±2°C , when the average brightness decrease to 50% of original brightness



8.3 Projected Capacitive Touch

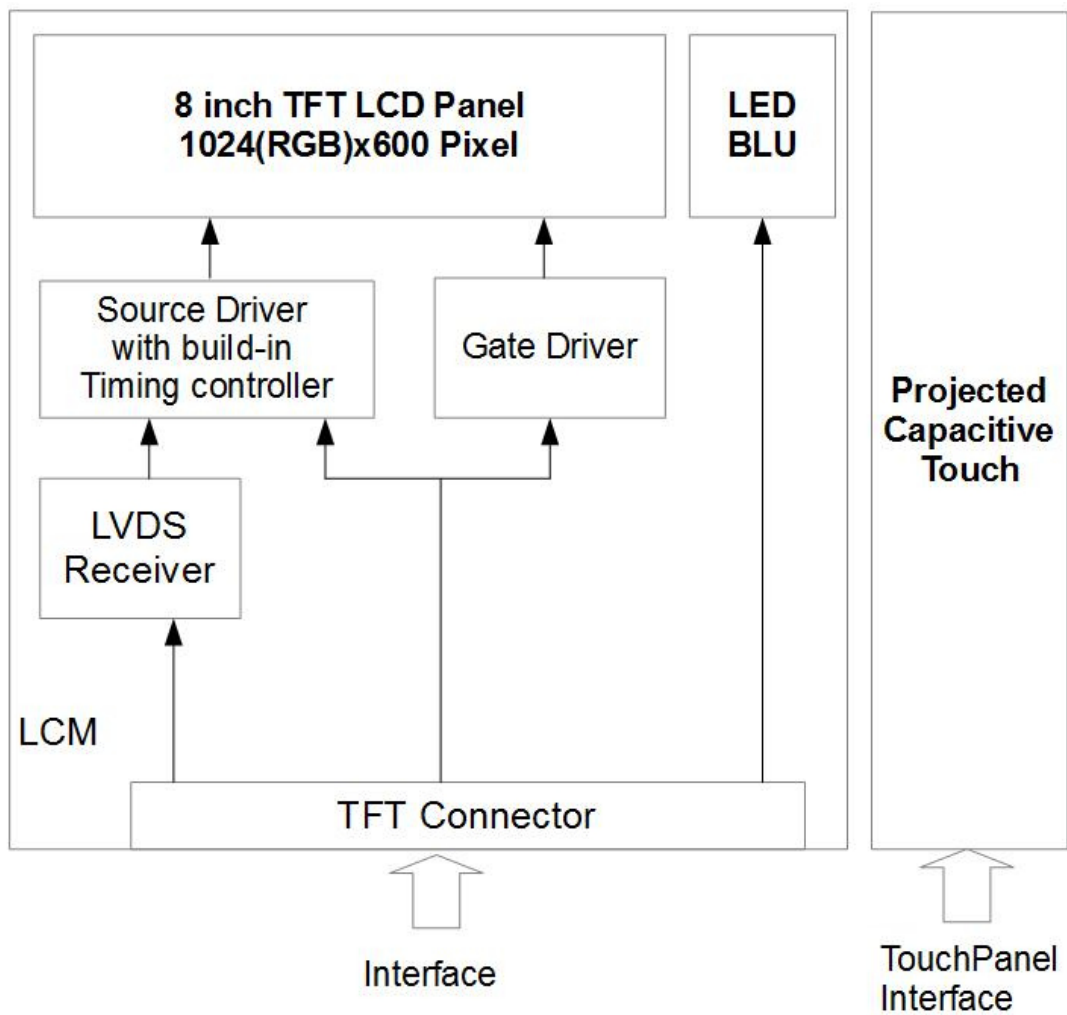
(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{TP}	3.0	3.3	3.6	V	-
Power Supply Current	I _{TP}	-	(TBD)	(TBD)	mA	(1)
Input High Threshold Voltage	V _{IH}	0.7VDD	-	VDD	V	-
Input Low Threshold Voltage	V _{IL}	-0.3	-	0.3VDD	V	-
Output High Threshold Voltage	V _{OH}	0.7VDD	-	-	V	-
Output Low Threshold Voltage	V _{OL}	-	-	0.3VDD	V	-
Report Rate	R _R	-	60	-	Hz	-
Interface		I ² C				-
Function		Multi Touch				-
IC Type		ILI2132				-
FW Version		(TBD)				-

Note (1) This test condition is touched with 10 points.

9. Block Diagram

9.1 TFT-LCD Module with Backlight Unit



10. Input / Output Terminals Pin Assignment

10.1 TFT-LCD Module

FPC: FH12A-40S-0.5SH or Equivalent

Pin No.	Symbol	Description	Note
1	NC	No connection	(4)
2	V _{DD}	Power Voltage for digital circuit	-
3	V _{DD}	Power Voltage for digital circuit	-
4	NC	No connection	(4)
5	Reset	Global reset pin	-
6	STBYB	Standby mode, Normally pulled high STBYB = "1", normal operation STBYB = "0", timing controller, source driver will turn off, all output are High-Z	-
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	-
20	RXIN3-	- LVDS differential data input	-
21	RXIN3+	+ LVDS differential data input	-
22	GND	Ground	-
23	NC	No connection	(4)
24	NC	No connection	(4)
25	GND	Ground	
26	NC	No connection	(4)
27	DIMO	Backlight CABC controller signal output	(3)
28	SELB	6bit/8bit mode select	(1)
29	AV _{DD}	Power for Analog Circuit	-
30	GND	Ground	-

31	VLED-	LED Cathode	-
32	VLED-	LED Cathode	-
33	L/R	Horizontal inversion	(2)
34	U/D	Vertical inversion	(2)
35	V _{GL}	Gate OFF Voltage	-
36	CABCEN1	CABC H/W enable	(3)
37	CABCEN0	CABC H/W enable	(3)
38	V _{GH}	Gate ON Voltage	-
39	VLED+	LED Anode	-
40	VLED+	LED Anode	-

Note1: If LVDS input data is 6 bits, SELB must be set to High

If LVDS input data is 8 bits, SELB must be set to Low

Note2: When L/R="0", set right to left scan direction.

When L/R="1", set left to right scan direction.

When U/D="0", set up to down scan direction.

When U/D="1", set down to up scan direction.

Note3: When CABC_EN[1:0]="00", CABC OFF(Default)

When CABC_EN[1:0]="01", user interface image.

When CABC_EN[1:0]="10", still picture.

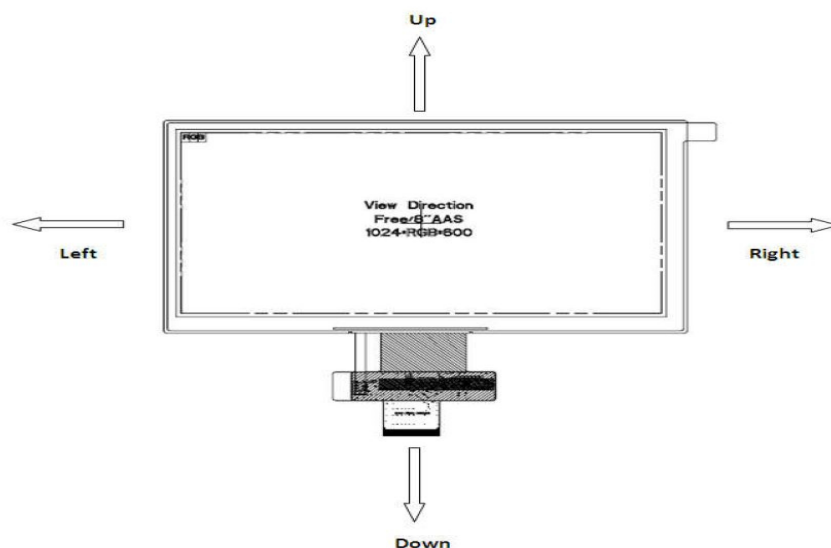
When CABC_EN[1:0]="11", moving image.

If CABC no using, DIMO must be NC, Else DIMO is controlled by CABC.

Note4: NC pin must be floated.

Note5: Definition of scanning direction.

Refer to the figure as below:



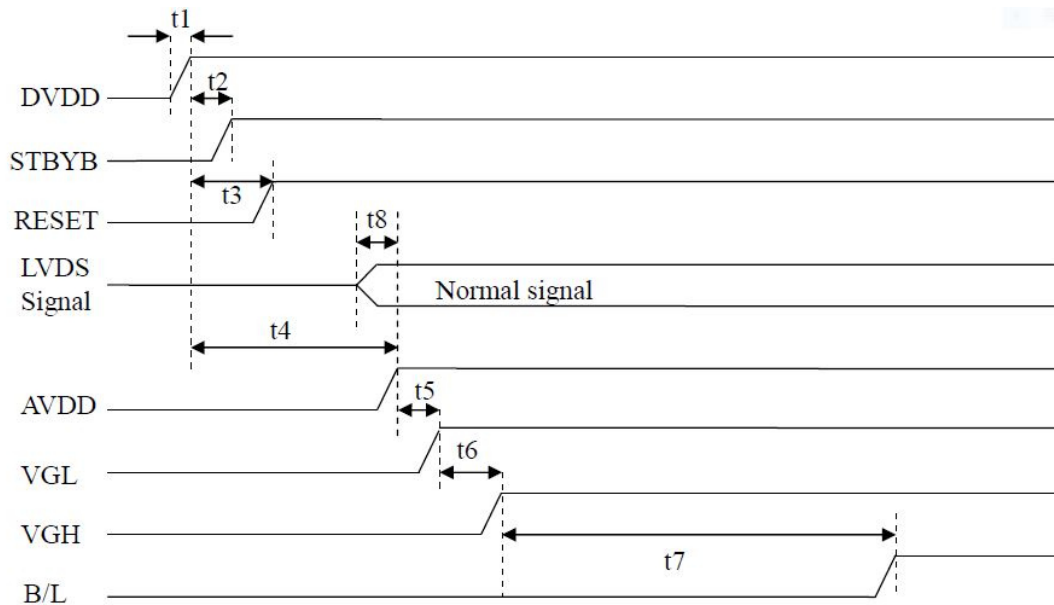
10.2 Improved Projected Capacitive Touch

Connector: CVILUX CF25101D0R0-05

Pin No.	Symbol	I/O	Description
1	GND	I	System ground.
2	V _{TP}	I	+3.3V power supply.
3	/RST	I	External reset signal, active low.
4	/INT	O	Interrupt signal, active low, asserted to request Host start a new transaction.
5	SDA	I/O	I ² C data signal.
6	SCL	I	I ² C clock signal.
7	NC	-	Not Connection
8	NC	-	Not Connection
9	NC	-	Not Connection
10	GND	I	System ground.

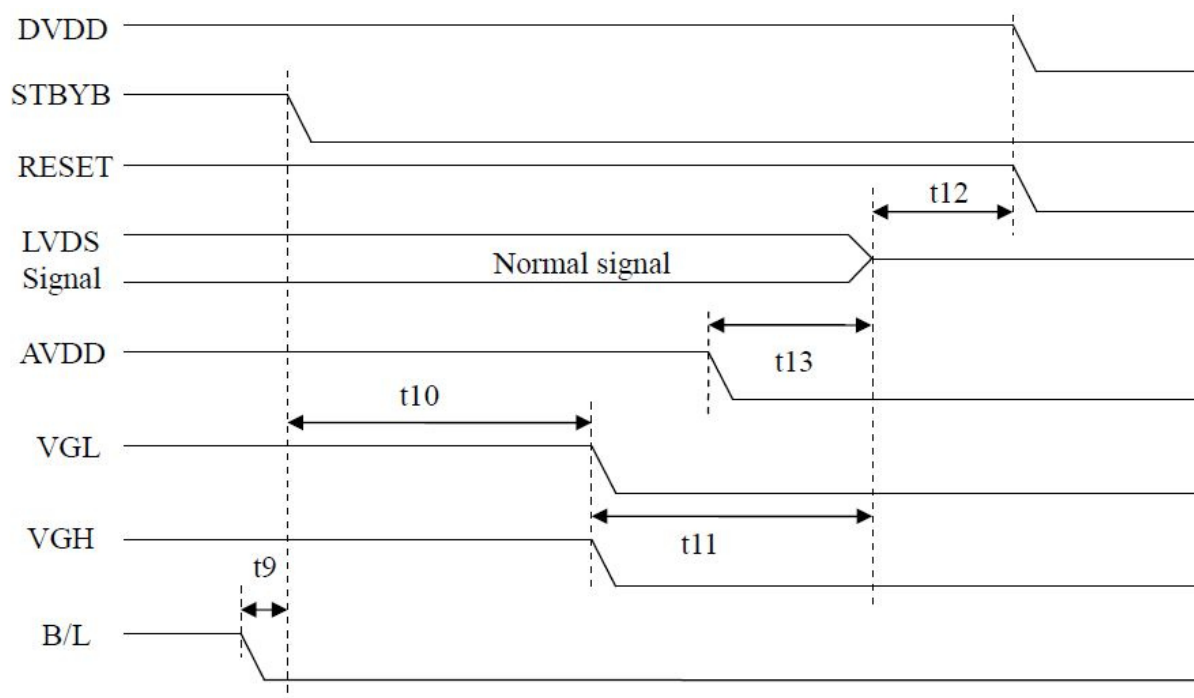
10.4 Power ON/OFF Sequence

a. Power on:



Symbol	SPEC			Unit
	Min.	Typ.	Max.	
t1	1	10	20	ms
t2	20	35	50	us
t3	0.5	1	16	ms
t4	16	50	100	ms
t5	20	70	120	us
t6	40	90	140	ms
t7	150	170	200	ms
t8	0.1	1	16	ms

b.Power off:



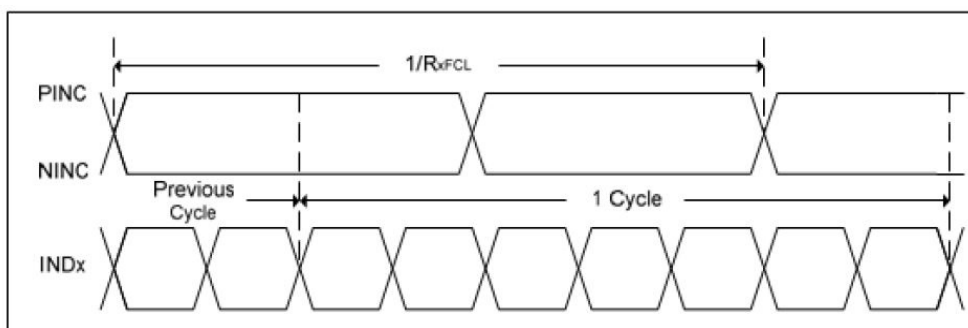
Symbol	SPEC			Unit
	Min.	Typ.	Max.	
t9	0.1	1	10	ms
t10	100	120	200	ms
t11	50	100	200	ms
t12	0.1	10	100	ms
t13	1	10	20	ms

11. Interface Timing

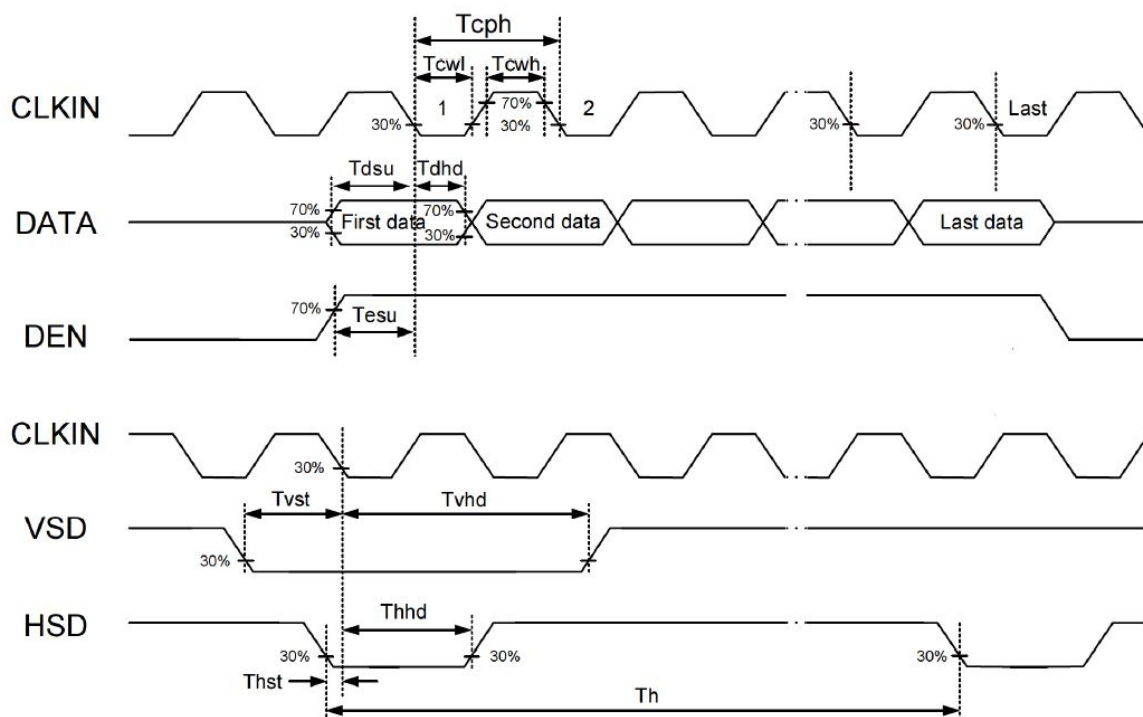
11.1 Input Signal Characteristics

11.1.1. AC Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
Clock frequency	RxFCLK	26.2	51.2	71	MHz	
Input data skew margin	TRSKM	500	500	$1/(2 \times \text{RxFCLK})$	ps	$ V_{ID} =400\text{mv}$ $R_{xVCM}=1.2\text{V}$ $R_{x\text{FCLK}}=71\text{MHz}$ $V_{DD_LVDS}=3.3\text{V}$
Clock high time	TLVCH	$4/(7 \times \text{RxFCLK})$			ns	
Clock low time	TLVCL	$3/(7 \times \text{RxFCLK})$			ns	
VSD setup time	TenPLL	$0 < \text{TenPLL} < 150$			us	



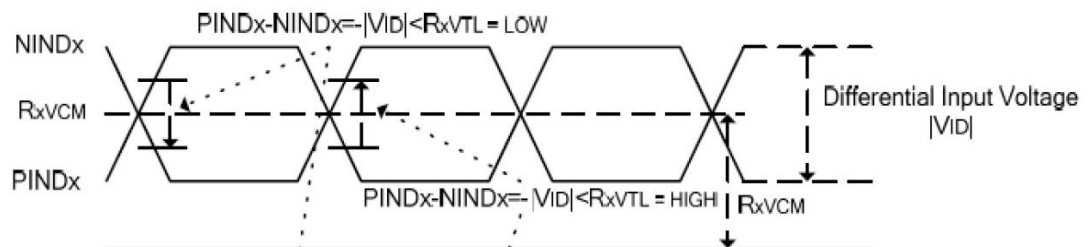
11.1.12. Input Clock and Data Timing Diagram



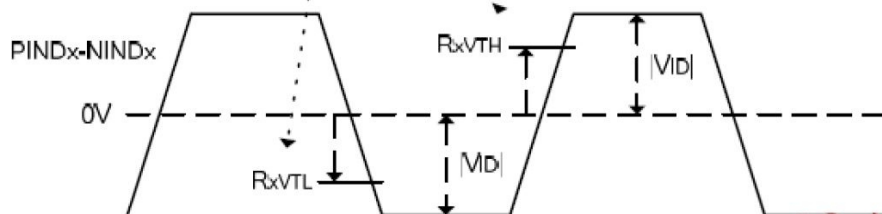
11.1.3. DC Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Conditions
Differential input high threshold voltage	RxVTH	0.1	0.2	VID	V	RxVCM=1.2V
Differential input low threshold voltage	RxVTL	- VID	-0.2	-0.1	V	
Input voltage range (singled-end)	RxVIN	0	1.2±0.4	2.4	V	
Differential input common mode voltage	RxVCM	VID /2	1.2	2.1- VID /2	V	
Differential input voltage	VID	0.2	0.4	0.6	V	
Differential input leakage current	RVxliz	-10	0	+10	uA	
LVDS Digital Operating Current	Iddlvds	8	22	30	mA	Fclk=65MHz, VDD=3.3V
LVDS Digital Standby Current	Istlvds	0	200	300	uA	Clock & all Functions are stopped

Single end signals



Differential signals



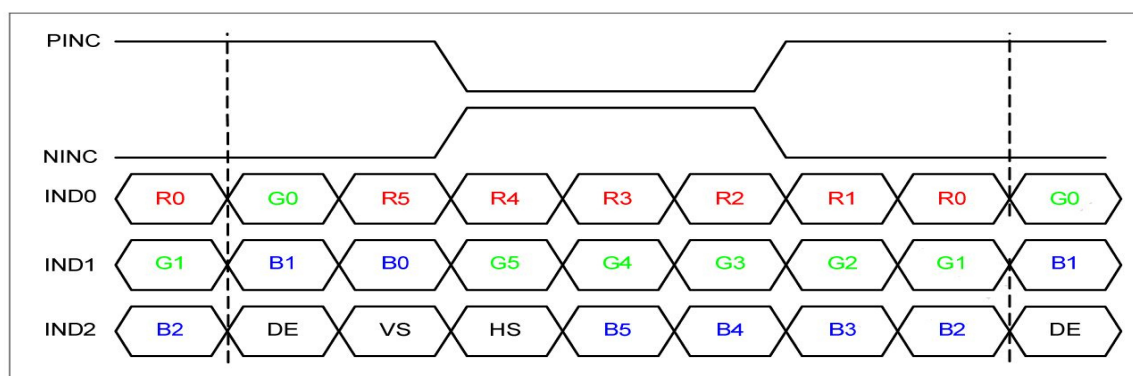
11.1.4. Timing

Parameter	Symbol	Value			Unit
		Min	Typ.	Max	
DCLK frequency Frame rate = 60Hz	fclk	42.6	51.2	67.2	MHz
Horizontal display area	thd	1024			DCLK
HSYNC period time	th	1164	1344	1400	DCLK
HSYNC blanking	thb+thfp	140	320	376	DCLK
Vertical display area	tvd	600			H
VSYNC period time	tv	610	635	800	H
VSYNC blanking	tvb+tvfp	10	35	200	H

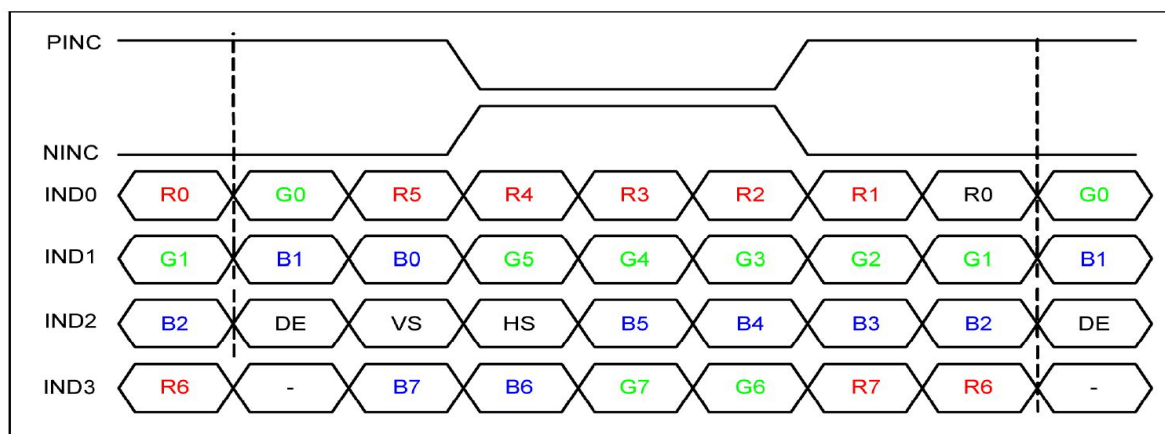
Note : Frame rate is 60Hz.

11.1.5. LVDS Data Input Format

6bit LVDS input



8bit LVDS input



Note: Support DE mode only, SYNC mode not support

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11.3 Timing Requirement of Projected Capacitive Touch

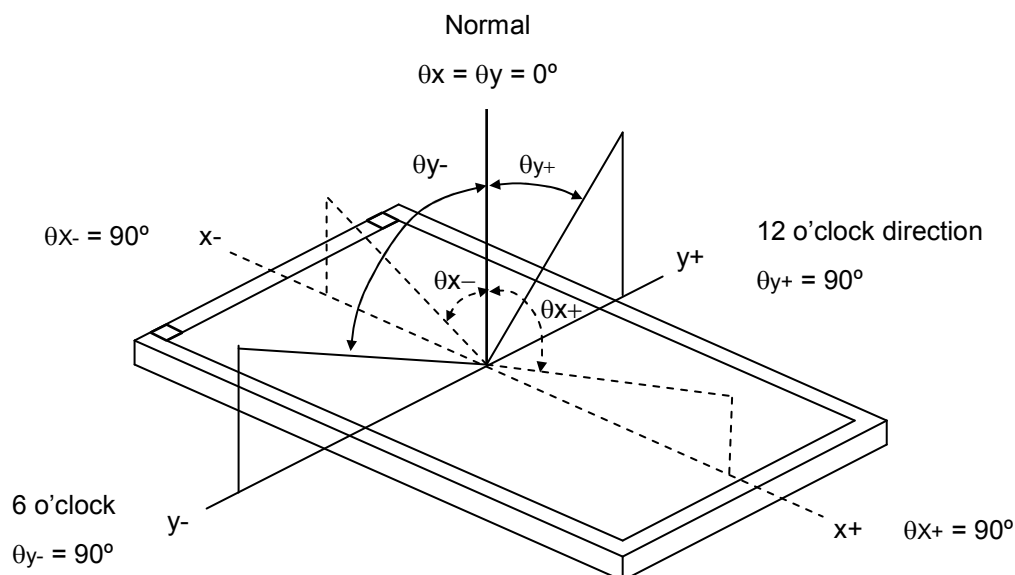
(TBD)

12. Optical Characteristics

The optical characteristics should be measured in a dark environment (≤ 1 lux) or equivalent state with the methods shown in Note (4).

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Note
Contrast Ratio		CR	$\theta_x=0^\circ, \theta_y=0^\circ$ Viewing Normal Angle	600	(1000)	-	-	(2)
Response Time		$T_{R+} T_F$		-	25	50	ms	(3)
Luminance(Center)		Y		350	(435)	-	cd/m ²	(4)
Brightness uniformity		BUNI		70	(75)	-	%	(5)
Color Chromaticity	White	Wx		0.260	0.310	0.360	-	(1),(4)
		Wy		0.280	0.330	0.380	-	
Viewing Angle	Horizontal	θ_{x+}	CR \geq 10	75	(85)	-	deg.	
		θ_{x-}		75	(85)	-		
	Vertical	θ_{y+}		75	(85)	-		
		θ_{y-}		75	(85)	-		

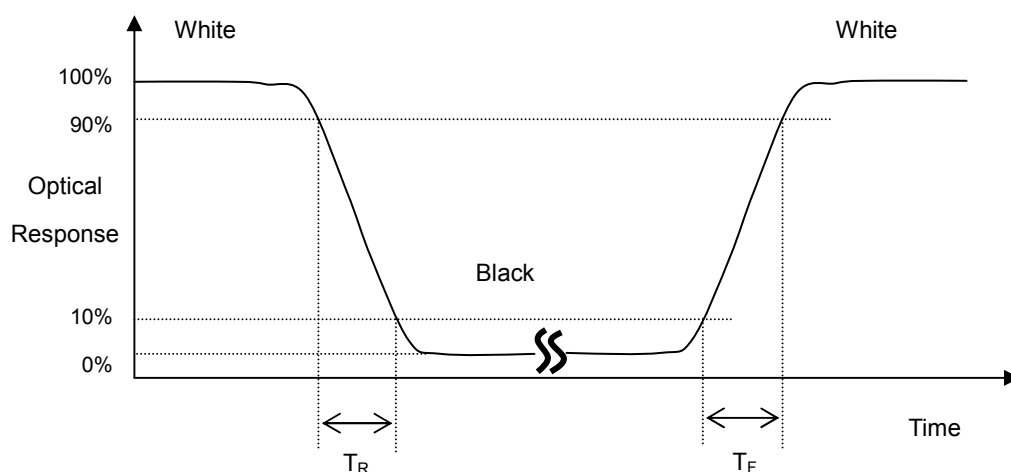
Note (1) Definition of Viewing Angle (θ_x , θ_y):



Note (2) Definition of Contrast Ratio (CR):

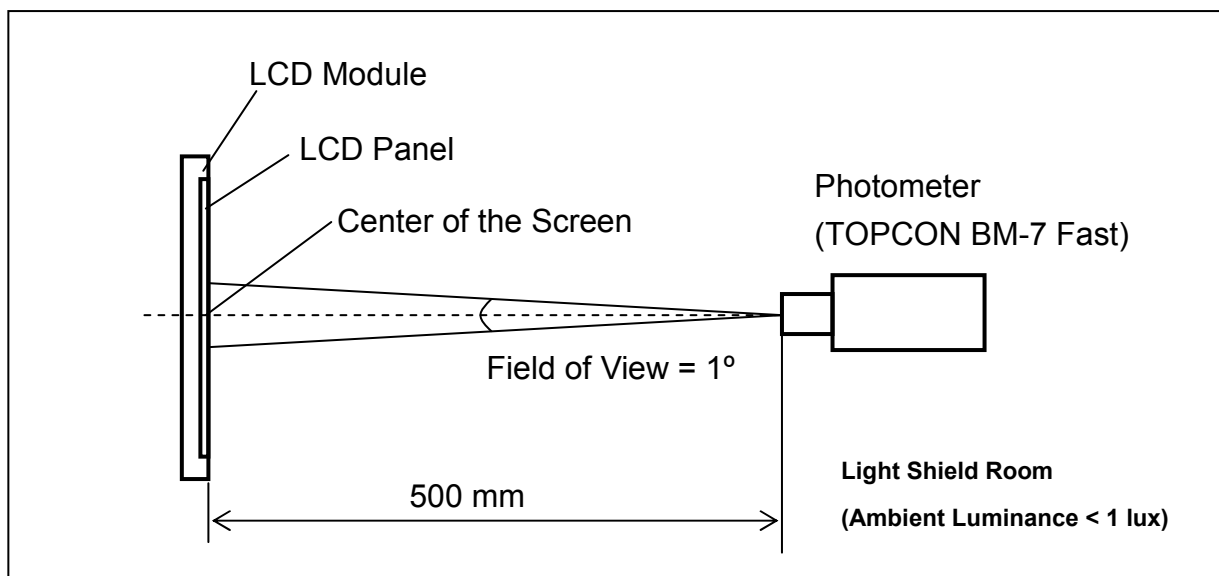
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

Note (3) Definition of Response Time (T_R , T_F):

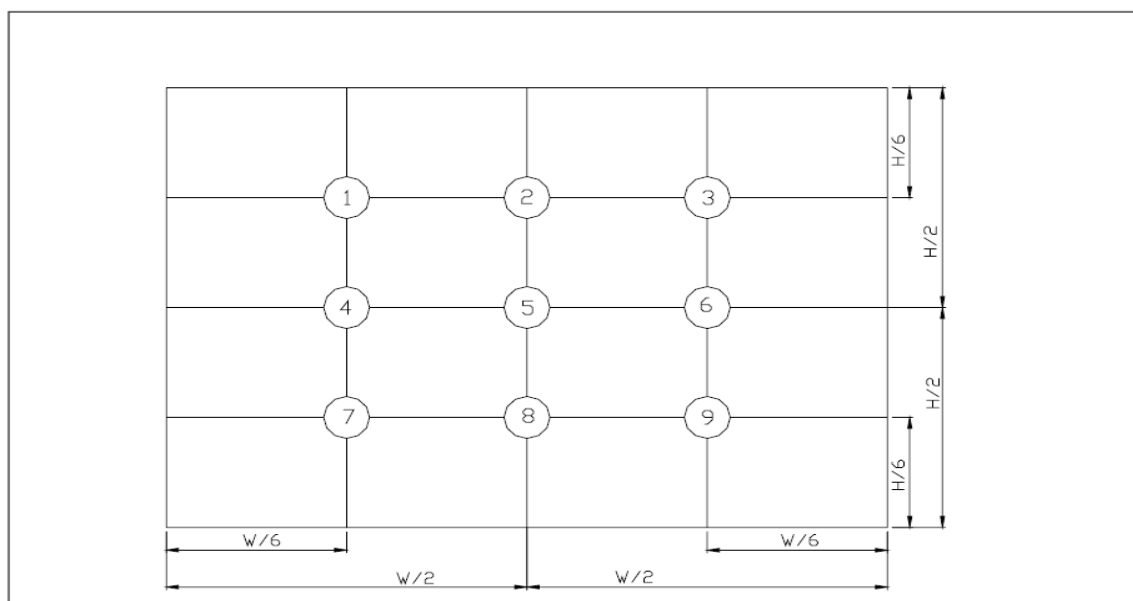


Note (4) Measurement Set-Up:

The LCD module should be stabilized at a given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a dark room or equivalent condition.


Note (5) Definition of brightness uniformity

Brightness uniformity=(Min Luminance of 9 points)/(Max Luminance of 9 points)×100%



(單位 : mm)

13. Reliability Test

No.	Test Items	Test Condition	Remark
1	High Temperature Storage Test	$T_a = 80^{\circ}\text{C}$ 240 hours	(1),(3),(4),(5)
2	Low Temperature Storage Test	$T_a = -30^{\circ}\text{C}$ 240 hours	(1),(3),(4)
3	High Temperature Operation Test	$T_s = 70^{\circ}\text{C}$ 240 hours	(2),(3),(4),(5)
4	Low Temperature Operation Test	$T_a = -20^{\circ}\text{C}$ 240 hours	(1),(3),(4)
5	High Temperature and High Humidity Operation Test	$T_a = 60^{\circ}\text{C}$ 90%RH 240 hours	(3),(4),(5)
6	Electro Static Discharge Test (non-operating)	$\pm 2\text{kV}$, Human Body Mode 100pF/1500 Ω	(3)
7	Mechanical Shock Test (non-operating)	Half sine wave, 100G, 6ms 3 times shock of each six surfaces	(3)
8	Vibration Test (non-operating)	Sine wave : 10 ~ 55 ~ 10Hz amplitude : 1.5mm 3 axis · 2 hours/axis	(3)
9	Thermal Shock Test (non-operating)	-30°C (30min) ~ 80°C (30min), 10 cycles	(3),(4),(5)
10	Drop Test(with Carton)	Height: 80cm 1 corner, 3 edges, 6 surfaces	(3)

Note 1 : T_a is the ambient temperature of samples.

Note 2 : T_s is the temperature of panel's surface.

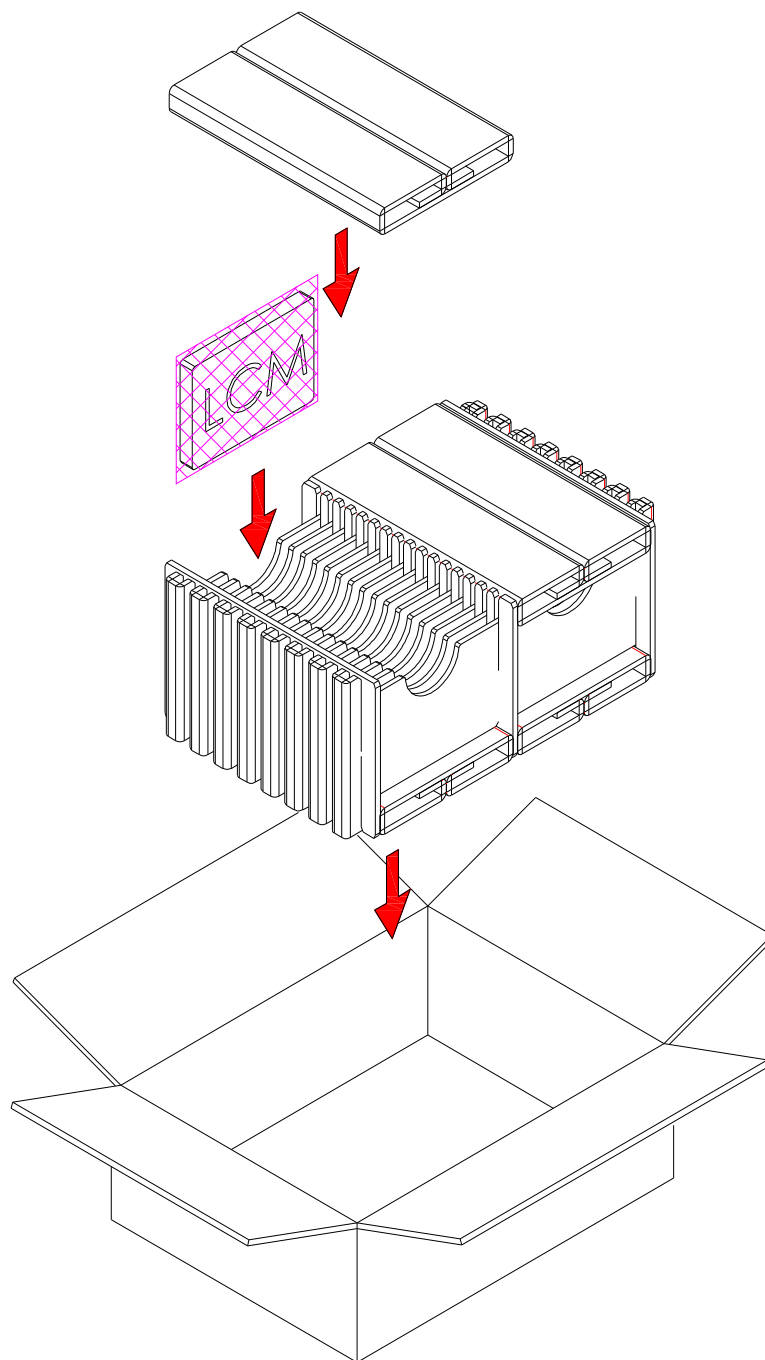
Note 3 : In the standard condition, there shall be no practical problem that may affect the display function. After the reliability test, the product only guarantees operation, but don't guarantee all of the cosmetic specification.

Note 4 : Before cosmetic and function test, the product must have enough recovery time, at least 2 hours at room temperature.

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Note 5: A certain level of Mura (non-uniformity) of dark / black image will happen several days after high temperature testing (H.T.T.). There is a slowly part recovery over a long time (several months). Such a long exposure time like in H.T.T. will normally not happen in a real application. Therefore the test H.T.T. was introduced to simulate cycles with normal conditions in-between but with the same total exposure time what show a significant reduced Mura. The root cause is related to tension generated due to different amount of shrinking in the stack of layers in the polarizer sheet. The effect is more significant on larger displays like this size. An investigation into alternative polarizer material showed that there is no better alternative currently available.

14. Packaging



PARTS LIST

	PARTS LIST				
	ITEM	SIZE(L×W×H) unit : mm	MATERIAL	Q.T.Y	NOTE
1	ANTI-STATIC PE BAG	230×240×0.08		30	
2	CARD BOARD	350×221×8	CARTON	3	
3	CARD BOARD	515×26.7×221	CARTON	8	
4	CARD BOARD	22.1×350×37.5	CARTON	4	
5	EXTERNAL BOX	520x355x241	CARTON	1	
6	PRODUCT	192.8×116.9×7.95		30	

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15. Precautions

15.1 Assembly and Handling Precautions

- (1) Do not apply rough force such as bending or twisting to the module during assembly.
- (2) It's recommended to assemble or to install a module into the user's system in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) Don't apply pressure or impulse to the module to prevent the damage of LCD panel and Backlight.
- (4) Always follow the correct power-on sequence when the LCD module is turned on. This can prevent the damage and latch-up of the CMOS LSI chips.
- (5) Do not plug in or pull out the I/F connector while the module is in operation.
- (6) Do not disassemble the module.
- (7) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (8) Moisture can easily penetrate into LCD module and may cause the damage during operation.
- (9) High temperature or humidity may deteriorate the performance of LCD module. Please store LCD module in the specified storage conditions.
- (10) When ambient temperature is lower than 10°C, the display quality might be reduced. For example, the response time will become slow.

15.2 Safety Precautions

- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the module's end of life, it is not harmful in case of normal operation and storage.

15.3 Terms of Warrant

- (1) Acceptance inspection period
The period is within one month after the arrival of contracted commodity at the buyer's factory site.
- (2) Applicable warrant period
The period is within twelve months since the date of shipping out under normal using and storage conditions.

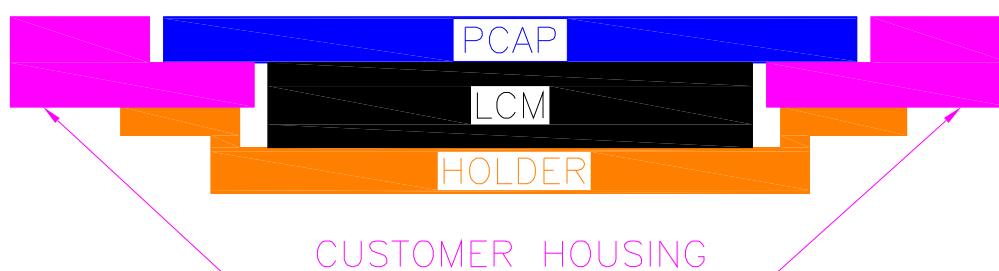
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15.4 Caution

This Evervision LCD module has been specifically designed for use only in electronic devices in the areas of audio control, office automation, industrial control, home appliances, etc. The modules should not be used in applications where module failure could result in physical harm or loss of life, and Evervision expressly disclaims any and all liability relating in any way to the use of the module in such applications.

15.5 Cautions for LCM installation

To secure the LCM within customer housing, having appropriate structural support underneath the LCM is a must. The recommended LCM installation with a holder type of the structure into the customer housing is shown below figure. By attaching ONLY the protruding edges of the PCAP with cover lens onto the customer housing does not provide a proper structural support required for the LCM. Such construction may deteriorate the adhesivity between the PCAP with cover lens and the TFT module, especially after a long period of time or from the vibrations encountered during product transportation.



15.6 Precautions of Storage

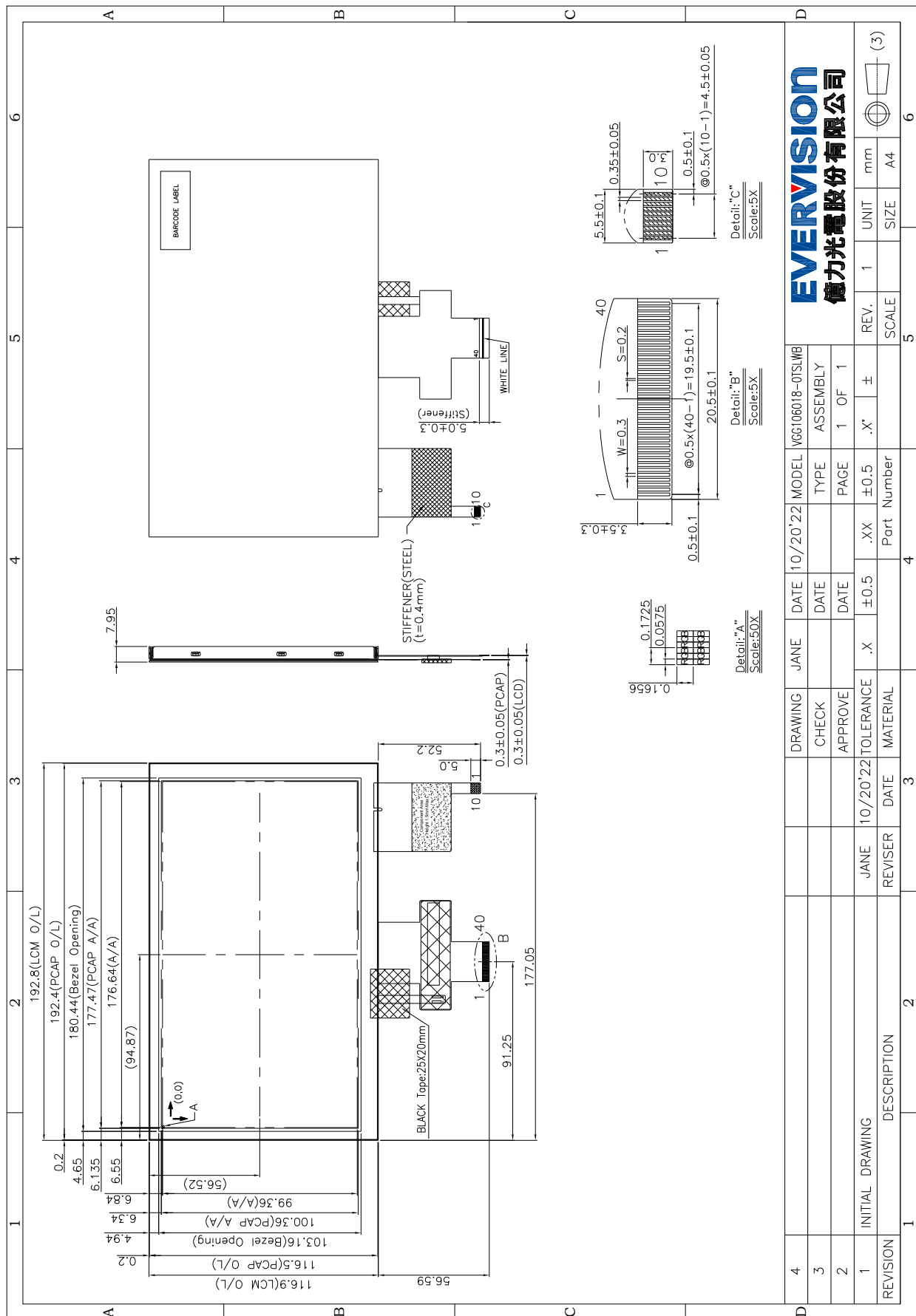
If the displays are going to be stored for years, please be aware the following notices.

- (1) Please store the displays in a dark room to avoid any damages from sunlight and other sources of UV light.
- (2) The recommended long term storage temperature is between 10 ~35°C and <60% humidity to avoid causing bubbles between polarizer and LCD glasses, and polarizer peeling from LCD glasses.
- (3) It would be better to keep the displays in the container, which is shipped from Evervision, and do not unpack it.
- (4) Please do not stick any labels on the display surface for a long time, especially on the polarizer.

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15.7 Cautions for PCAP

To prevent un-expected touch issue and suppress influence noise from system, the LCM metal frame should be connected to system ground in customer's device.



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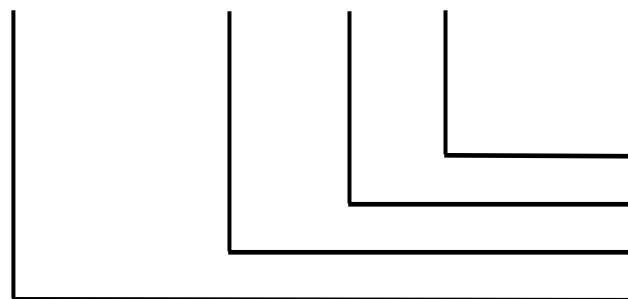
17.Definition of Labels

The bar code nameplate is pasted on each module as illustration, and its definitions are as following explanation.



- (a) Module Name : VGG106018-0TSLWB
- (b) Serial ID :

A B C D E F G H I J K L



Serial No.
Factory Code
Manufactured Date
Screen Size

Serial ID includes the information as below :

- (a) Screen size (Diagonal) : Inch Code (ABCD)
3.5" → 0350
10.4" → 1040
- (b) Manufactured Date : Year, Month, Day (EFG)

Year (E)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Mark	0	1	2	3	4	5	6	7	8	9
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Mark	A	B	C	D	E	F	G	H	I	J
Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Mark	K	L	M	N	O	P	Q	R	S	T
Year	2030	2031	2032	2033	2034	2035				
Mark	U	V	W	X	Y	Z				

Month (F)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

Day (G)

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mark	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Day	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Mark	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	

(c) Factory Code (H) :

For EVERVISION internal use.

(d) Serial No. (IJKL) :

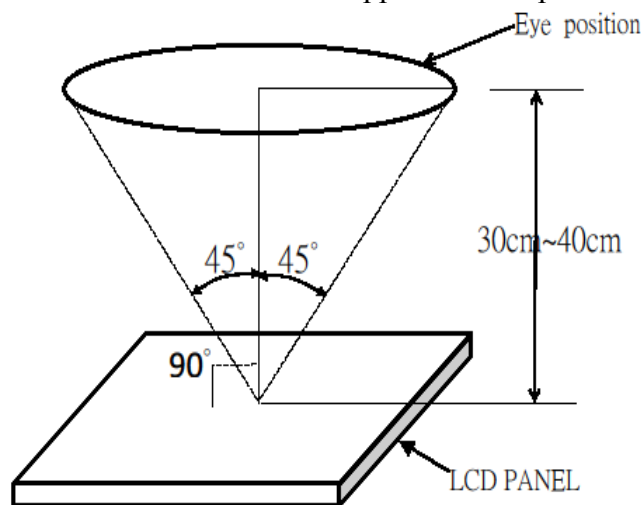
Manufacturing sequence of product, for example : 0001~9999.

18. Incoming Inspection Standards

18.1 The environmental condition of inspection

The environmental condition and visual inspection shall be conducted as below.

- (1) Ambient temperature $25 \pm 5^{\circ}\text{C}$
- (2) Humidity: 25 ~ 75 % RH
- (3) Viewing distance is approximately 30 ~ 40 cm
- (4) Viewing angle is normal to the LCD panel as Fig _1 ($\pm 45^{\circ}$)
- (5) Ambient Illumination: 200 ~ 500 Lux for external appearance inspection



Fig_1

18.2. The defects classify of AQL as following:


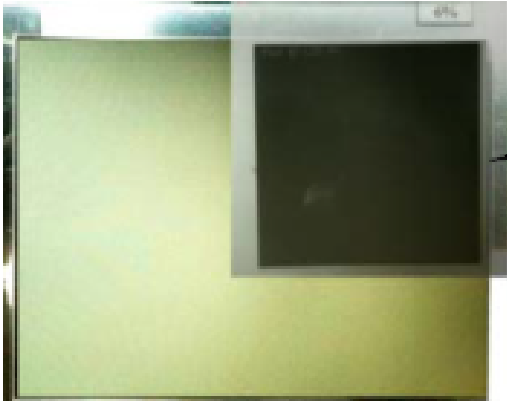
- (1) Test method: According to ANSI/ASQC Z 1.4 .General Inspection Level II take a single time
- (2) The defects classify of AQL as following:

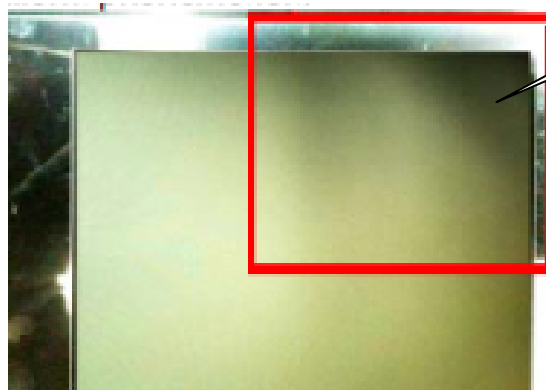
Class of defects	AQL	Definition
Major	0.65%	It is defect that is likely to result in failure or to reduce materially the usability of the intended function.
Minor	1.5%	It is a defect that will not result in functioning problem with deviation classified.

18.3 Inspection Parameters

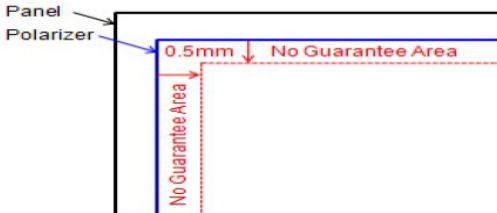
Item		Specification/Description	Note
Display	Function	No Display	-
		Malfunction	-
Operating	Contrast ratio	Out of Spec	-
	Line defect	No obvious Vertical and Horizontal line defect in bright , dark and colored.	-

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Item		Specification/Description		Note
Display	Function	No Display		-
		Malfunction		-
Operating	Contrast ratio	Out of Spec		-
	Line defect	No obvious Vertical and Horizontal line defect in bright , dark and colored.		-
	Point Defect (red ,green ,blue ,dark ,white)	Item	Acceptable number	Note: 1 、 4 、 5
		bright dot	$N \leq 3$	
		dark dot	$N \leq 4$	
		2 bright dots adjacent	NOT ALLOWED	
		2 dark dots adjacent	$N \leq 1$	
		3 bright dots adjacent	NOT ALLOWED	
		3 dark dots adjacent	NOT ALLOWED	
		total	$N \leq 7$	
		Distance	$\geq 5\text{mm}$	
	MURA	Has the non-uniform phenomenon		Note: 4
		<div></div>		
		Weak defect will be defined as mura if it can be observed through ND filter 5%		
		<div></div>		

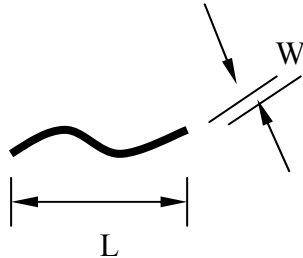


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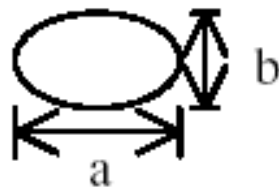
Item		Specification/Description			Note
External Inspection (non-operating or operating)	Polarizer Scratch (in display area)	L(mm)	W(mm)	Acceptable number	Note:2
		-	$W \leq 0.07$	Disregard	
		$L \leq 5$	$0.07 < W \leq 0.1$	4	
	Polarizer dent or bubble (in display area)	Dimension(mm)		Acceptable number	Note:3
		$D \leq 0.3$		Disregard	
		$0.3 < D \leq 0.5$ Distance $\geq 5\text{mm}$		4	
	Line Shape (Particles and Lint in display area)	L(mm)	W(mm)	Acceptable number	Note:2
		-	$W \leq 0.07$	Disregard	
		$L \leq 5$	$0.07 < W \leq 0.1$	4	
	Dot Shape (Particle in Display area)	Dimension(mm)		Acceptable number	Note:3
		$D \leq 0.3$		Disregard	
		$0.3 < D \leq 0.5$ Distance $\geq 5\text{mm}$		4	
	Metal Frame (Bezel) Scratch	Noticeable scratch and exfoliation coating are not permitted. The oxidized metal is not permitted			
	No Guarantee Area for Polarizer	From the edge $\leq 0.5\text{mm}$. 			

Note1. The definition of dot defect : The dot defect was judged after repair and the size of a defective dot over 1/2 of whole dot is regarded as one defective dot.

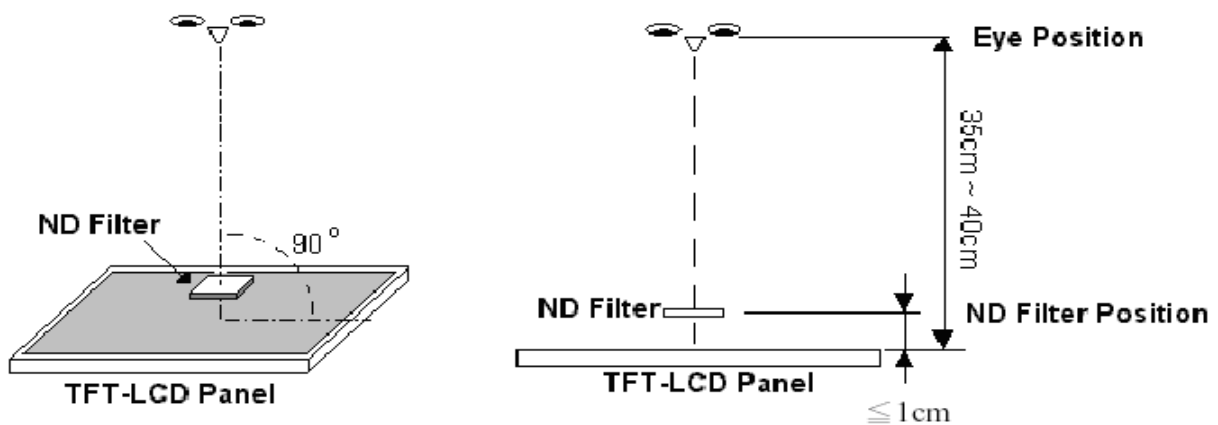
Note2.



Note3. D : Diameter $D=(a+b)/2$




Note4. Bright dot is defined through 2% transmission ND Filter as following.



Note5. ADJACENT DOT



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Incoming Inspection Touch Panel

(TBD)

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18.4 Handling of LCM

- (1)Don't give external shock.
- (2)Don't apply excessive force on the surface.
- (3)Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- (4)Don't operate it above the absolute maximum rating.
- (5)Don't disassemble the LCM.