

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. : VGG804833-0TSLWU(RoHS)

REVISION : 2

☒ **APPROVAL FOR SPECIFICATIONS ONLY**





☐ **APPROVAL FOR SPECIFICATIONS AND SAMPLE**

CUSTOMER :

STD.

APPROVED BY :

EVERVISION LCM R&D CENTER

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[illegible]

3. Module Numbering System

V G G 8048 33 – 0 T S L W U

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 7 inch WVGA supported TFT-LCD module, and can display true 16.7M colors with dithering (8 bit/ color). This module is composed of a 7" TFT-LCD panel, a driver circuit and backlight unit and used as the input devices for general electric appliances via both finger and Capacitive stylus pen.

5. Features

- WVGA (800×480 pixels) resolution
- Digital 24 bit parallel RGB
- Projected Capacitive Touch
 - I²C Interface
 - Multi Touch (TBD points)
 - 16384 x 16384 resolution
 - 1.1mm CG Chemical Strengthening

6. General Specifications

Item	Specifications	Unit
Screen Size	7 (Diagonal)	inch
Display Format	800RGB(H)×480(V)	dot
Active Area	152.4(H)×91.44(V)	mm
Pixel Pitch	0.1905(H)×0.1905(V)	mm
Pixel Configuration	RGB Vertical Stripe	-
Display Mode	IPS / Transmissive Mode / Normally Black	-
Surface Treatment	Clear(7H)	-
Viewing Direction	Full view angle	-
Outline Dimension	182.4(W)×123.44(H)×7.65(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}	-30	+80	°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)

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Digital Power Supply Voltage	V _{DD}	-0.5	5.0	V	-

Note The absolute maximum rating values of this product are not allowed to be exceeded at any times.

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8. Electrical Characteristics

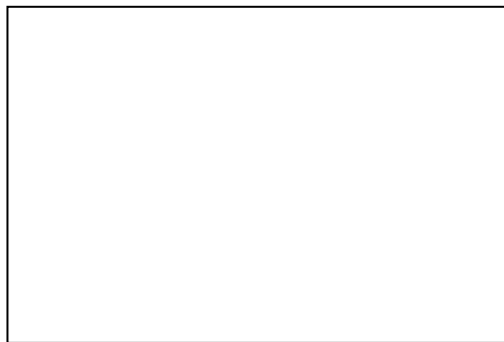
8.1 TFT-LCD Module

(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}	-	158	221.2	mA	(1)
Input High Threshold Voltage	V _{IH}	0.7V _{DD}	-	V _{DD}	V	-
Input Low Threshold Voltage	V _{IL}	0	-	0.3V _{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 Backlight Unit

(Ta=25±2°C)

Item	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Current of Backlight Unit	I _B	-	250	-	mA	-
Voltage of Backlight Unit	V _B	-	(18)	-	V	I _B =250mA,(2)
LED Life Time(25°C)	-	50000	-	-	hr	(1),(3)

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

Note (2) : The BLU is driven by constant current, the voltage value is for reference only.

Note (3) : Use JuFei LED(Global patent)

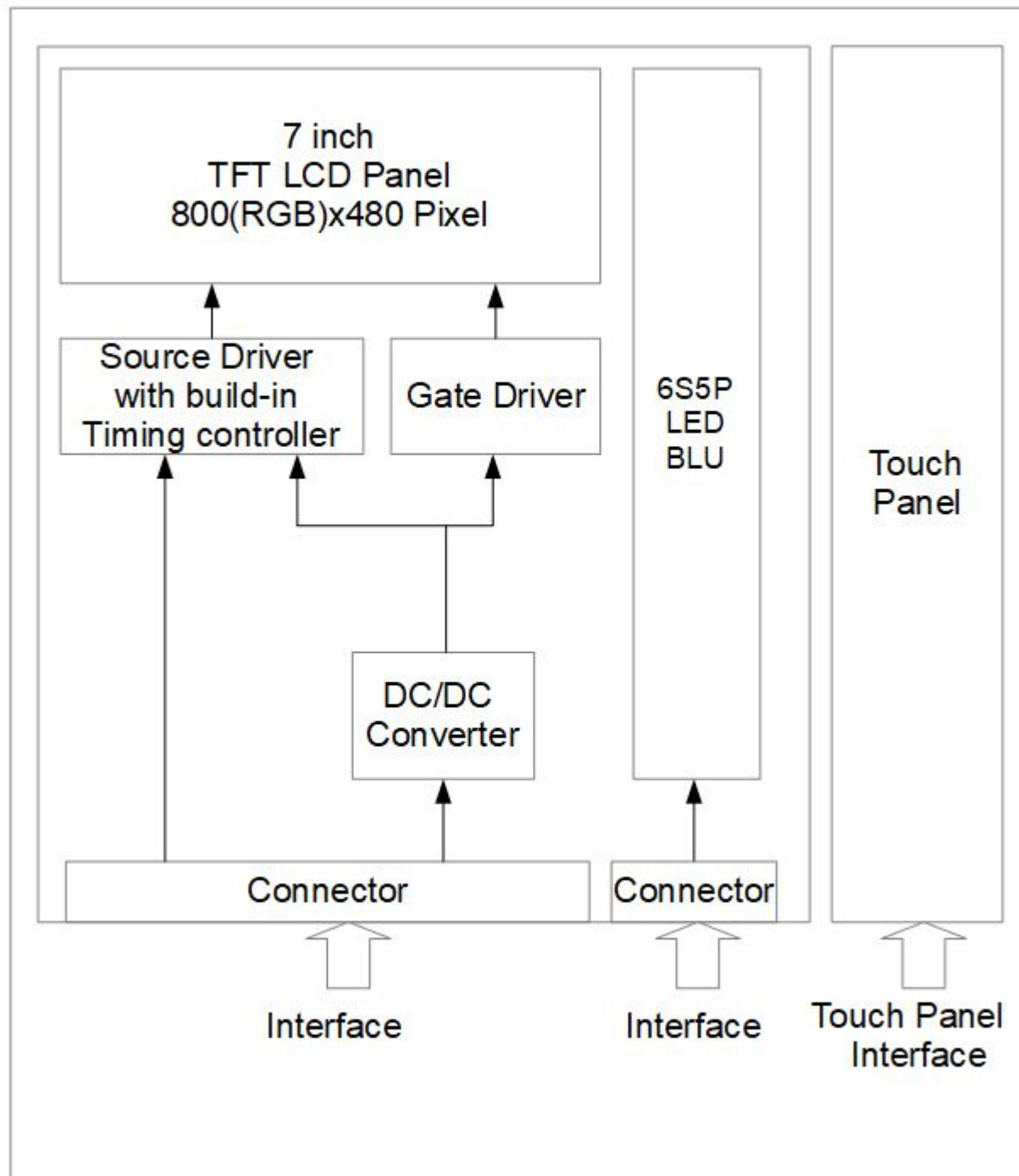
8.3 Projected Capacitive Touch

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}	0.7 V _{TP}	-	V _{TP}	V	-
Input Low Threshold Voltage	V _{IL}	-0.3	-	0.3 V _{TP}	V	-
Output High Threshold Voltage	V _{OH}	0.7 V _{TP}	-	-	V	-
Output Low Threshold Voltage	V _{OL}	-	-	0.3 V _{TP}	V	-
Power Consumption	P _L	-	(TBD)	(TBD)	mW	@3.3V
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 TBD points.

9. Block Diagram

9.1 TFT-LCD Module with Backlight Unit



10. Input / Output Terminals Pin Assignment

10.1 TFT-LCD Module

Connector: IMSA-12001S-60Y903 manufactured by IRISO

Pin No.	Symbol	I/O	Description
1	GND	P	Ground
2	NC	I	No Connect
3	VDD	P	+3.3 V Power supply
4	R0	I	RED data(LSB)
5	R1	I	RED data
6	R2	I	RED data
7	R3	I	RED data
8	R4	I	RED data
9	R5	I	RED data
10	R6	I	RED data
11	R7	I	RED data(MSB)
12	G0	I	GREEN data(LSB)
13	G1	I	GREEN data
14	G2	I	GREEN data
15	G3	I	GREEN data
16	G4	I	GREEN data
17	G5	I	GREEN data
18	G6	I	GREEN data
19	G7	I	GREEN data(MSB)
20	B0	I	BLUE data(LSB)
21	B1	I	BLUE data
22	B2	I	BLUE data
23	B3	I	BLUE data
24	B4	I	BLUE data
25	B5	I	BLUE data
26	B6	I	BLUE data
27	B7	I	BLUE data(MSB)
28	DCLK	I	Dot Clock
29	DE	I	Data Enable
30	VDD	P	+3.3 V Power supply

Pin No.	Symbol	I/O	Description
31	VDD	P	+3.3 V Power supply
32	NC	I	No Connect
33	RESET	I	Global reset pin (Default high), active low.
34	STBYB	I	Standby mode setting pin (Default high), active low.
35	SHLR	I	Horizontal scan direction (Default high), Note (1)
36	VDD	P	+3.3 V Power supply
37	UPDN	I	Vertical scan direction (Default high), Note (1)
38	GND	P	Ground
39	GND	P	Ground
40	NC	I	No Connect
41	NC	I	No Connect
42	NC	I	No Connect
43	NC	I	No Connect
44	NC	I	No Connect
45	NC	I	No Connect
46	NC	I	No Connect
47	NC	I	No Connect
48	NC	I	No Connect
49	NC	I	No Connect
50	NC	I	No Connect
51	GND	P	Ground
52	NC	I	No Connect
53	GND	P	Ground
54	VDD	P	+3.3 V Power supply
55	NC	I	No Connect
56	NC	I	No Connect
57	VDD	P	+3.3 V Power supply
58	NC	I	No Connect
59	GND	P	Ground
60	NC	I	No Connect

10.3 Projected Capacitive Touch

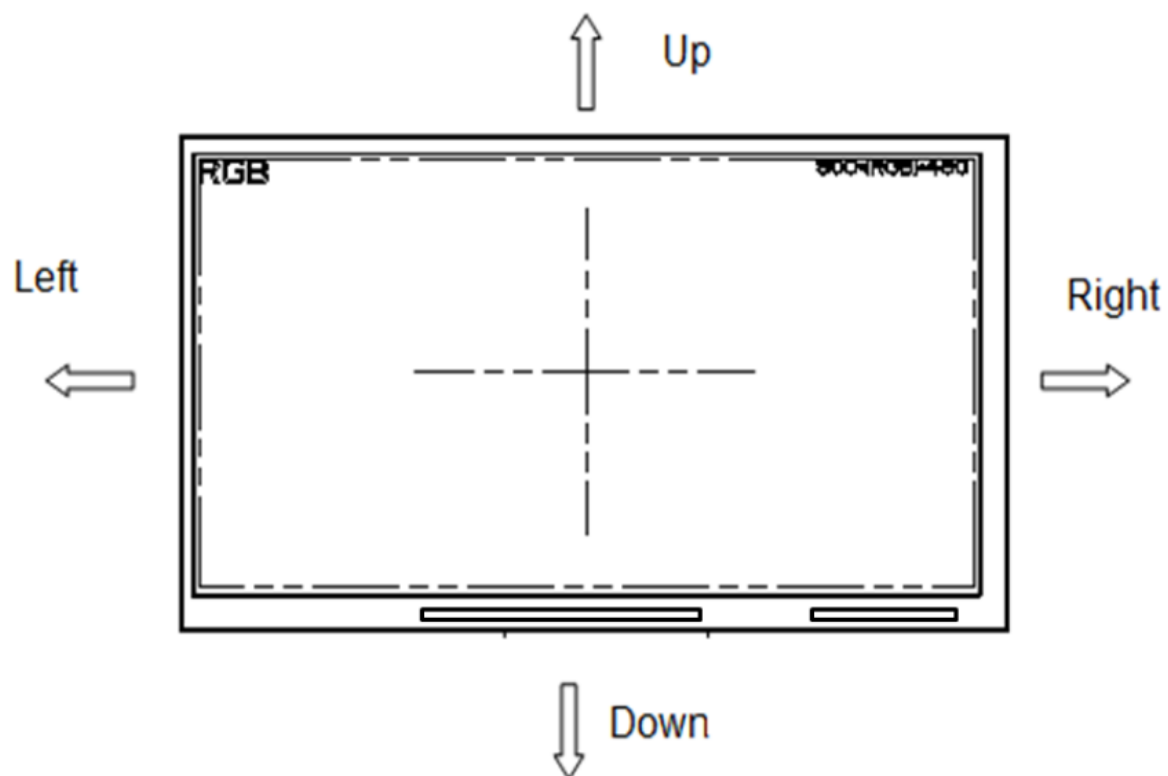
Connector: CVILUX CF25101D0R0-05 or Equivalent

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.

Note (1)

SHLR	UPDN	Data shifting
VDD	VDD	Left→Right , UP→Down(default)
VDD	GND	Left→Right , Down→UP
GND	VDD	Right→Left , UP→Down
GND	GND	Right→Left , Down→UP

Refer to the figure as below:



10.2 Backlight Unit

Connector: JST BHSR-02VS-1(N)

Pin No.	Symbol	I/O	Description	Wire Color
1	VLEDA	I	Backlight LED Anode.	Red
2	VLEDC	I	Backlight LED Cathode.	Black

10.4 Color Data Input Assignment

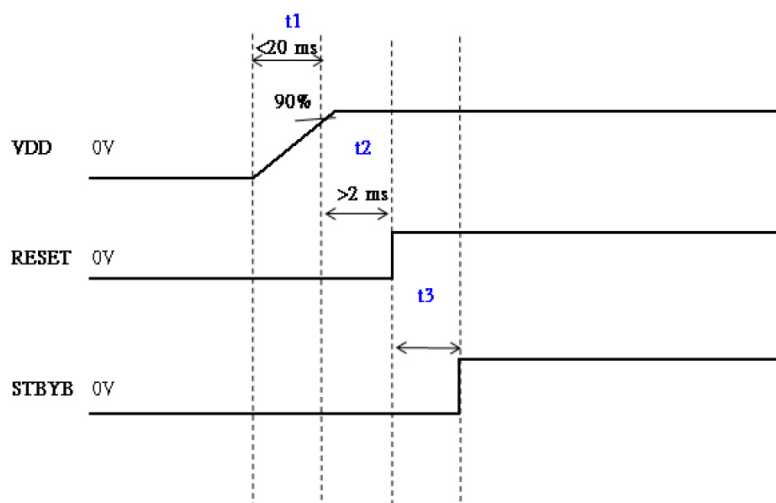
The brightness of each primary color(red, green and blue) is based on the 8 bit gray scale data input for the color. The higher the binary input, the brighter the color. The table provides the assignment of color versus data input.

Color		Data Signal																							
		Red								Green								Blue							
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
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
	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
	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
	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
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Magenta	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	Red(0) / Dark	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)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(254)	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red(255)	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	Green(0) / Dark	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(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
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	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Green(254)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green(255)	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	Blue(0) / Dark	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(1)	0	0	0	0	0	0	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	0	0	0	0	0	0	1	0
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	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Blue(254)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

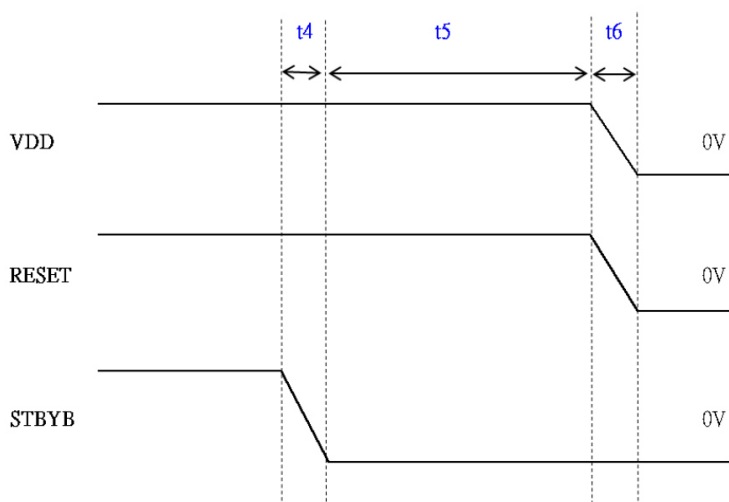
10.5 Power ON/OFF Sequence

The recommended power on sequence should be: VDD → RESET → STBYB. To power off, reverse this sequence, or turn off all signals and power simultaneously.

Power on :



Power off :



POWER SEQUENCE TABLE

Parameter	Value			Units
	Min.	Typ	Max.	
T1	0	5	20	ms
T2	2	3	5	ms
T3	0	5	10	ms
T4	0	2	5	ms
T5	8	9	10	frame
T6	0	2	5	ms

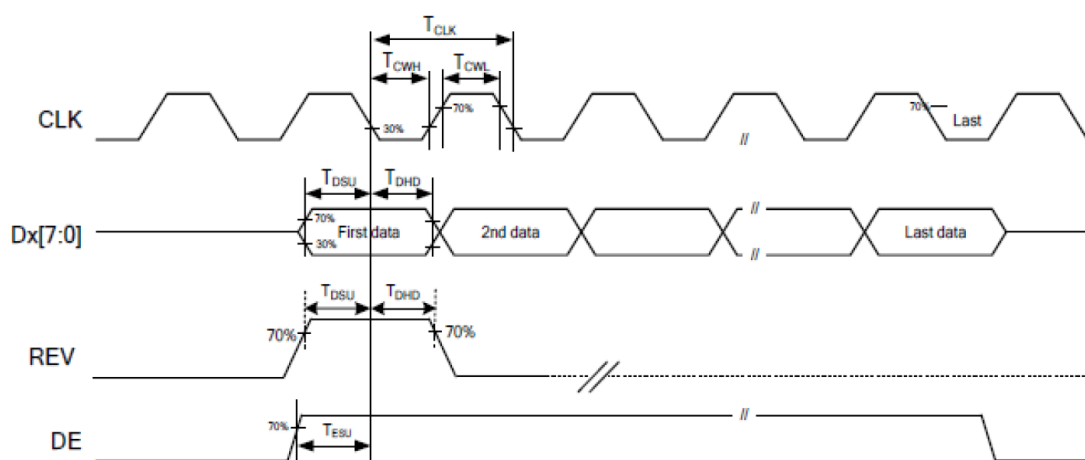
11. Interface Timing

11.1 Input Signal Characteristics

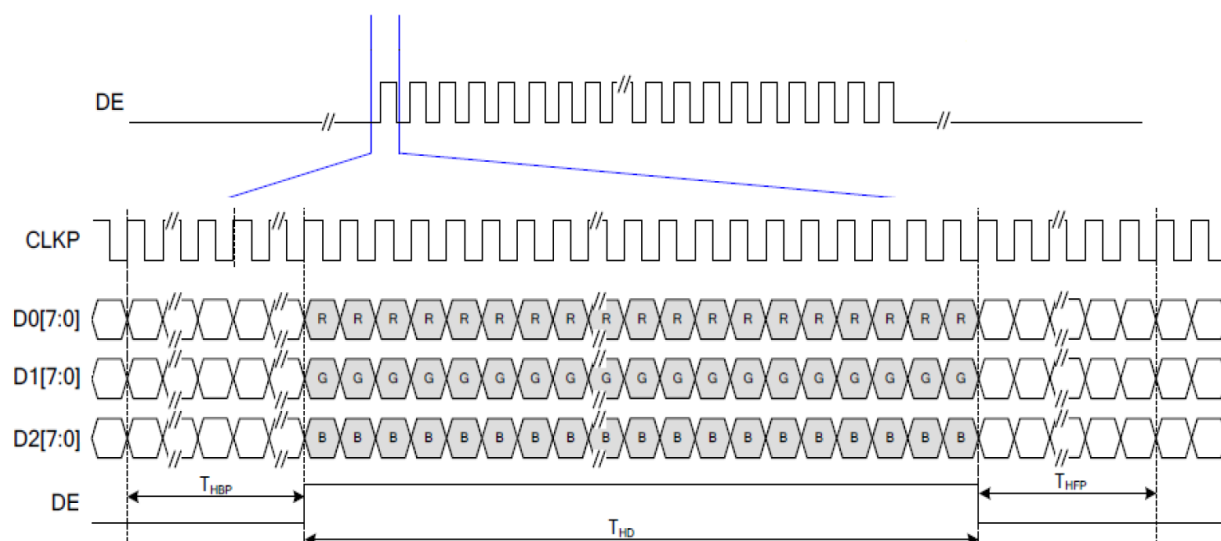
11.1.1TTL-DE Interface AC Characteristic :

(VDD= 3.0V to 3.6V, GND= 0V, Ta= +25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Clock Frequency	F_{CLK}	5	-	55	MHz	$T_{CLK} = 1/F_{CLK}$
CLK pulse width	T_{CW}	30% (*)	-	70%	T_{CLK}	(*) Over than $0.5/(F_{CLK})_{max.}$
Data setup time	T_{DSU}	6	-	-	ns	
Data hold time	T_{DHD}	6	-	-	ns	
DE setup time	T_{ESU}	6	-	-	ns	



11.1.2 Data Input Format for TTL



11.1.3 Input Timing

Only DE mode for 800x480

Parameter	Symbol	Min.	Typ.	Max.	Unit
CLK frequency	F_{CLK}	25.2	25.4	35.7	MHz
Horizontal display area	T_{HD}	800			CLK
HS period time	T_H	860	864	974	CLK
HS blanking	$T_{HFP} + T_{HBP}$	60	64	174	CLK
Vertical display area	T_{VD}	480			H
VS period time	T_V	488	490	611	H
VS blanking	$T_{VBP} + T_{VFP}$	8	10	131	H

11.1.4 DC Electrical Characteristics

TTL Interface DC Characteristic :

(VDD= 3.0V to 3.6V, GND= 0V, Ta= +25°C)

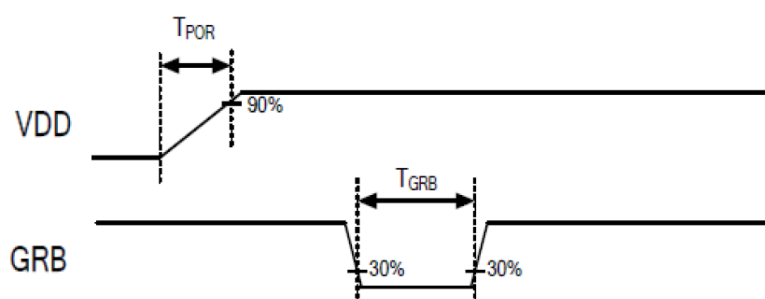
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
High Level Input Voltage	V_{IH}	0.7xVDD	-	VDD	V	
Low Level Input Voltage	V_{IL}	GND	-	0.3xVDD	V	
High Level Output Voltage	V_{OH}	VDD-0.4	-	VDD	V	VDD=3.3V @Ioh= 1mA
Low Level Output Voltage	V_{OL}	GND	-	GND+0.4	V	VDD=3.3V @Iol= -1mA
Pull-high/low Impedance	R_{PULL}	100	250	500	Kohm	VDD=3.3V, Ta =+25°C

11.1.5 AC Electrical Characteristics

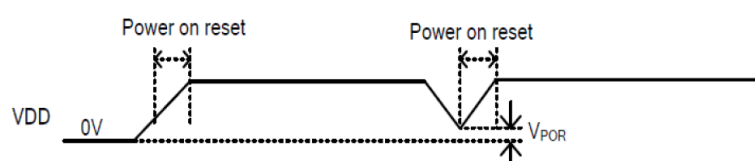
Basic Input AC Characteristic :

(VDD= 3.0V to 3.6V, GND= 0V, Ta= +25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
VDD power source slew time	T_{POR}	-	-	20	ms	From 0V to 90% VDD
GRB active pulse width	T_{GRB}	1	-	-	ms	VDD = 3.3V
Power on reset voltage	V_{POR}	0	-	100	mV	



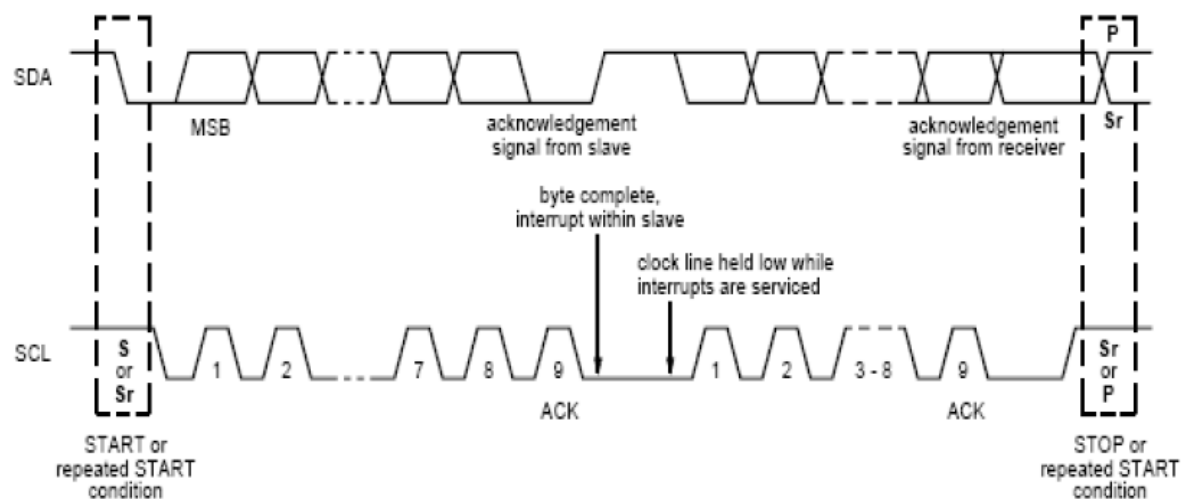
Basic AC Timing Chart



Power On Reset Chart

11.2 Timing Requirement of Projected Capacitive Touch

11.2.1 I2C Data Transfer Format



MSB	LSB
1	0/1
0	
0	
0	
0	
1	
Device Address	
	R/W

7-bit Device Address :0x41

8-bit Device Read Address :0x83

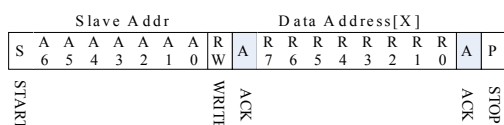
8-bit Device Write Address :0x82

Mnemonics	Description
S	I ² C Start or I ² C Restart
A[6:0]	7-bit Slave Address = 1000 001b
W	1'b0: Write
R	1'b1: Read
C	ACK
P	STOP: the indicate the end of a packet (if this bit is missing, S will indicate the end of the current packet and the beginning of the next packet)

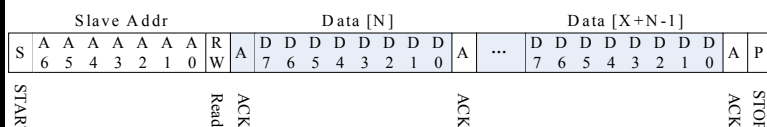
Write N bytes to I2C slave

Slave Addr	Data Address[X]	Data [X]	Data [X+N-1]
S A A A A A A R	A R R R R R R R	A D D D D D D D	A ... D D D D D D D D
6 5 4 3 2 1 0 W	7 6 5 4 3 2 1 0 A	7 6 5 4 3 2 1 0 A	7 6 5 4 3 2 1 0 A P
START	WRITE	ACK	ACK

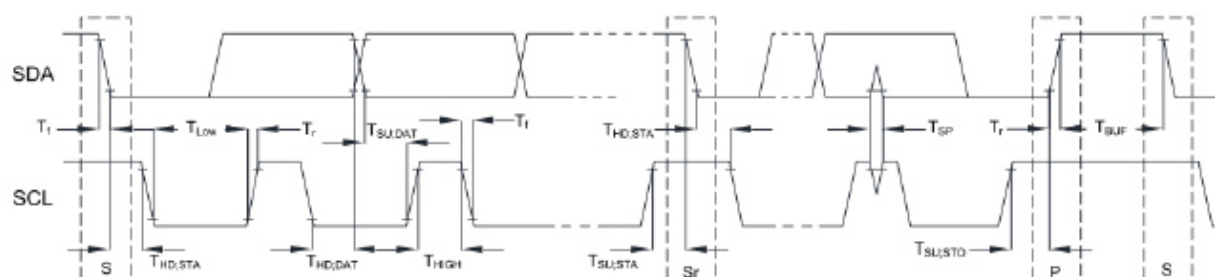
Set Data Address




Read X bytes from I²C Slave



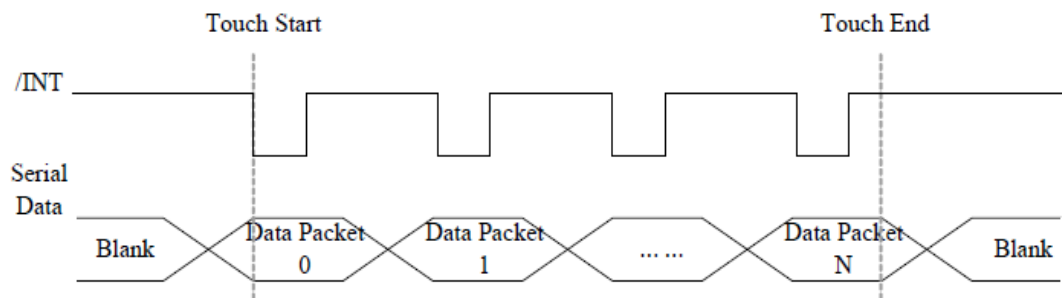
11.2.2 I2C Timing Characteristics



Item	Symbol	100kHz		400kHz		Unit
		Min.	Max.	Min.	Max.	
SCL standard mode clock frequency	F _{SCL}	0	100	0	400	kHz
Hold time (repeated) START condition. After this period, the first clock is generated.	T _{HD:STA}	4	--	0.6	--	us
LOW period of the SCL clock	T _{LOW}	4.7	--	1.3	--	us
HIGH period of the SCL clock	T _{HIGH}	4	--	0.6	--	us
Setup time for a repeat START condition.	T _{SU:STA}	4.7	--	0.6	--	us
Data hold time	T _{HD:DAT}	0	--	0	--	us
Data setup time	T _{SU:DAT}	250	--	100	--	ns
Rising time of both SDA and SCL signals	T _r	--	1000	--	300	ns
Falling time of both SDA and SCL signals	T _f	--	300	--	300	ns
Setup time for STOP condition.	T _{SU:STO}	4	--	0.6	--	us
Free time between STOP and START condition	T _{BUF}	4.7	--	1.3	--	us
Pulse width of spikes which must be suppressed by input filter	T _{SP}	--	--	0	50	ns

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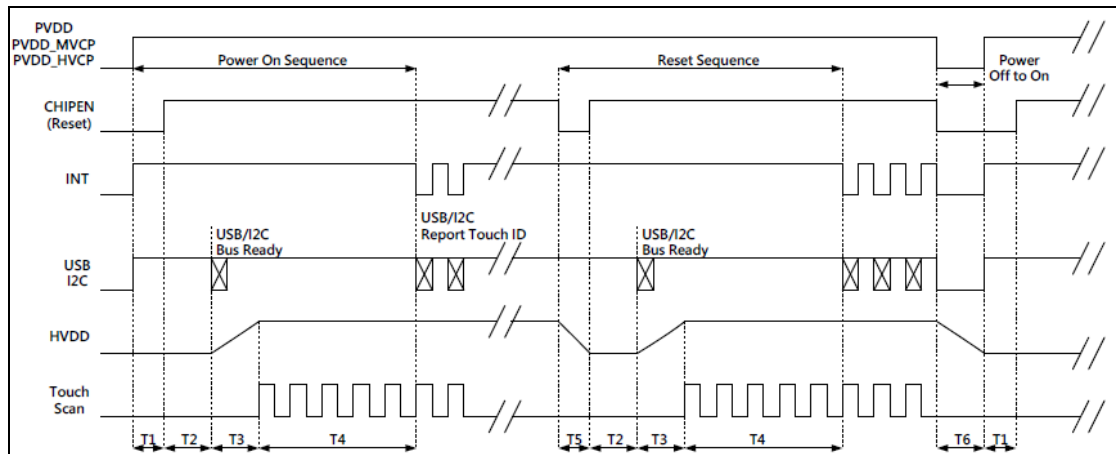
11.2.3 Interrupt Trigger Mode



11.2.4 I2C Operating Mode Register Map

(TBD)

11.2.5 POWER Sequence



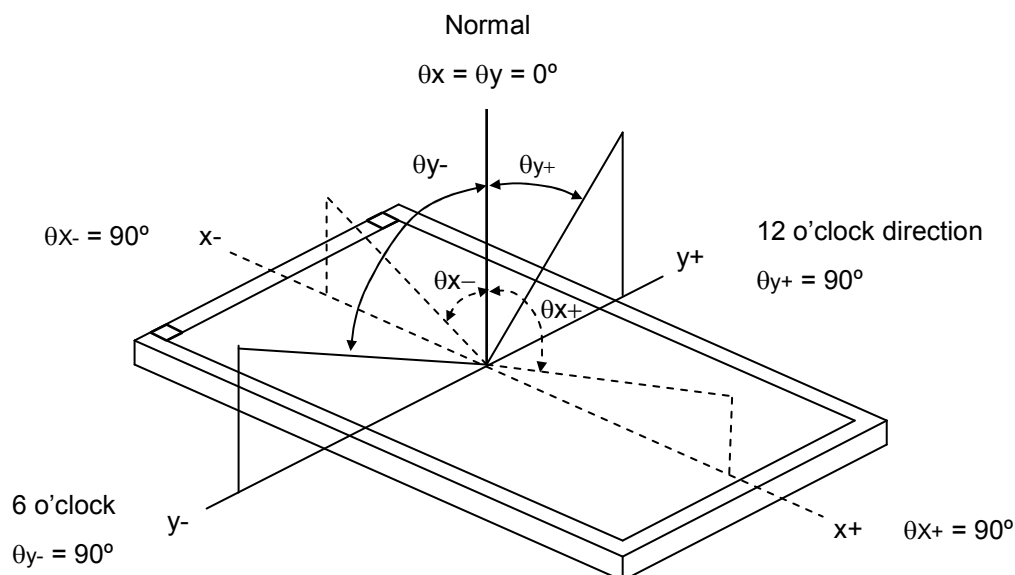
Symbol	Description	Min.	Max.	Unit.
T1	Input Power Supply PVDD, PVDD_MVCP, Power on Reset time. Host need to control Reset time to be larger than 10ms.	10	--	ms
T2	Chip initial time		400	ms
T3	HVDD start up time		300	ms
T4	Chip report Touch ID preparation time		400	ms
T5	Chip Reset and HVDD discharge time. Host need to control Reset time to be larger than 10ms.	10		ms
T6	Input Power Supply PVDD, PVDD_MVCP, and HVDD Power off discharge time. Host need to control discharge time to be larger than 100ms.	100		ms

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	700	(1200)	-	-	(2)
Response Time		T_F+T_R		-	30	45	ms	
Luminance(Center)		Y		1000	(1300)	-	cd/m ²	(4)
Brightness uniformity		BUNI		75	-	-	%	(5)
Color Chromaticity	Red	R _x		0.590	0.640	0.690	-	(1),(4)
		R _y		0.285	0.335	0.385	-	
	Green	G _x		0.275	0.325	0.375	-	
		G _y		0.575	0.625	0.675	-	
	Blue	B _x		0.090	0.140	0.190	-	
		B _y		0.030	0.080	0.130	-	
	White	W _x		0.270	0.32	0.370	-	
		W _y		0.305	0.355	0.405	-	
Viewing Angle	Horizontal	θ_{x+}	CR \geq 10	70	(80)	-	deg.	
		θ_{x-}		70	(80)	-		
	Vertical	θ_{y+}		70	(80)	-		
		θ_{y-}		70	(80)	-		

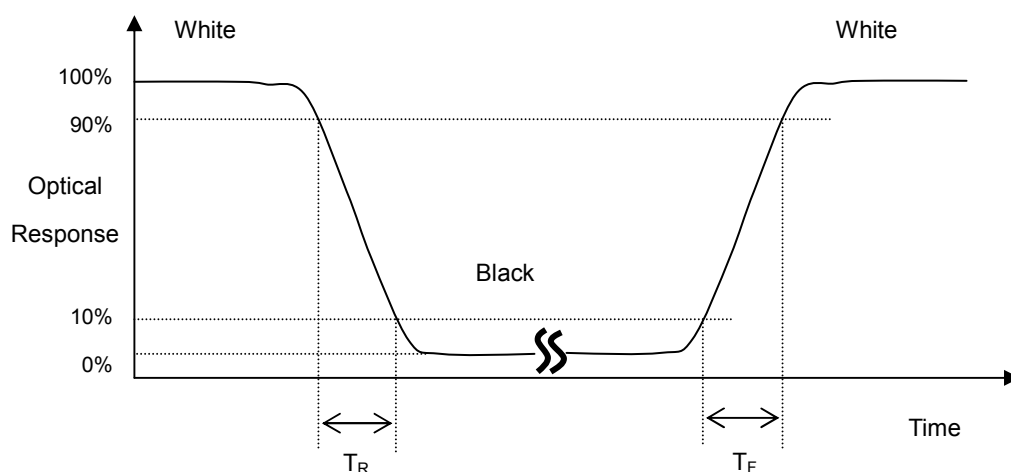
Note (1) Definition of Viewing Angle (θ_x , θ_y):



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

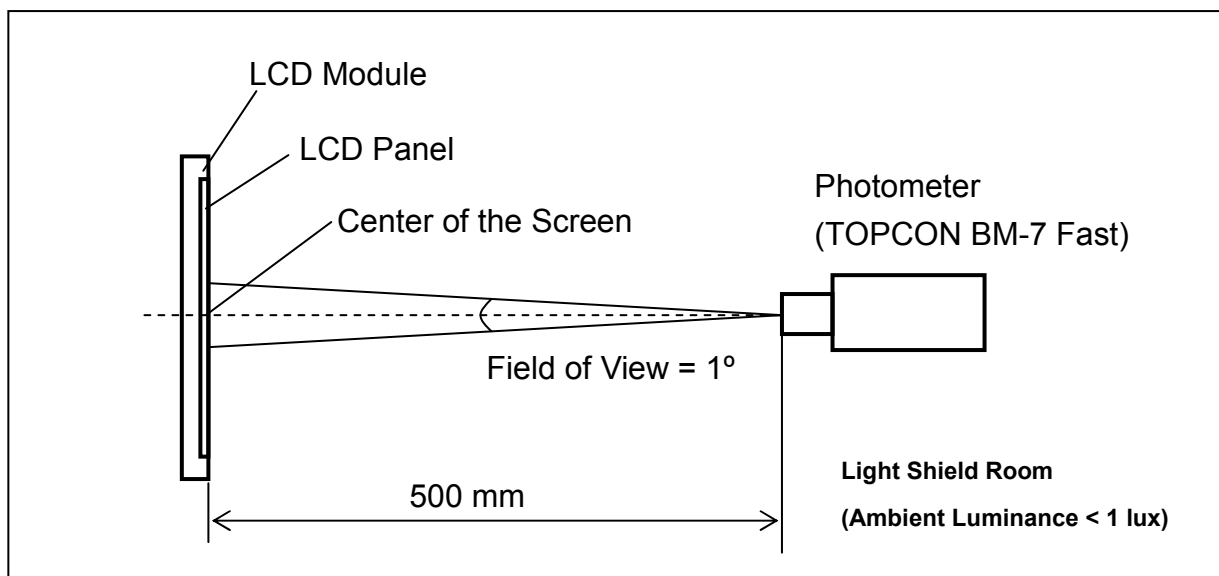
$$\text{Contrast ratio (CR)} = \frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$$

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

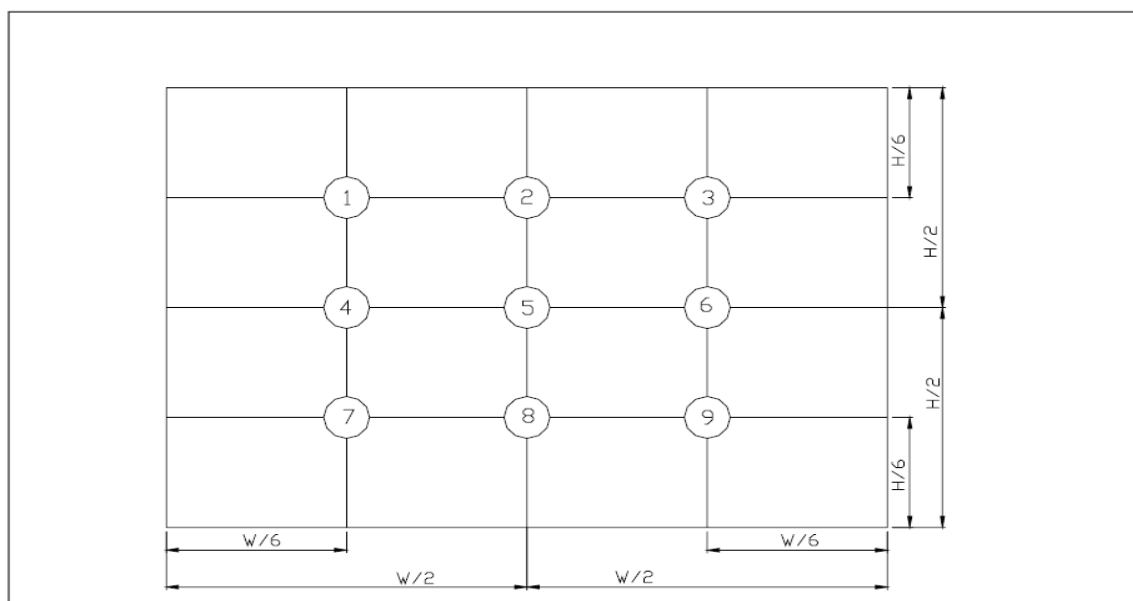


Note (4) Measurement Set-Up:


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)

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13. Reliability Test

No.	Test Items	Test Condition	Remark
1	High Temperature Storage Test	T _a = 80℃ 240 hours	(1),(2),(3),(4)
2	Low Temperature Storage Test	T _a = -30℃ 240 hours	(1),(2),(3),(4)
3	High Temperature Operation Test	T _s = 80℃ 240 hours	(1),(2),(3),(4)
4	Low Temperature Operation Test	T _a = -30℃ 240 hours	(1),(2),(3),(4)
5	High Temperature and High Humidity Operation Test	T _a =60℃ 90%RH 240 hours	(1),(2),(3),(4)
6	Electro Static Discharge Test (non-operating)	[Human Body Model] C=100pF, R=1.5KΩ ; Discharge: ±2KV	(2)
7	Vibration Test (non-operating)	Sine wave:10 ~ 55 ~ 10Hz amplitude:1.5mm 3 axis, 2 hours/axis	
8	Thermal Shock Test (non-operating)	[(-30℃ 30min)→(85℃ 30min)]/cycle , 10cycles	(1),(2),(3),(4)
9	Drop Test(with Carton)	Height: 80cm 1 corner, 3 edges, 6 surfaces	
10	Electromagnetic interference Test (EMI Test)	30-230 MHz, limit 40 dBuV/m, 230-1000 MHz, limit 47 dBuV/m	(5)

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Note 1: Ta = Ambient Temperature, Tp = Panel Surface Temperature.

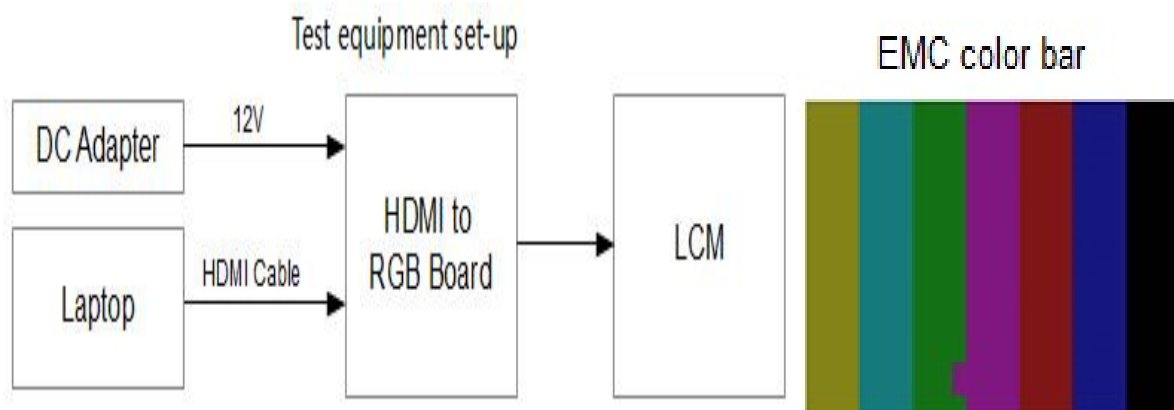
Note 2: Criteria: Normal display image with no obvious non-uniformity and no line defect.

Note 3: Evaluation should be tested after storage at room temperature for more than two hour

Note 4: 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.

Note 5 : Test Equipment

1. 3m Semi Anechoic Chamber (966)
2. Test Pattern: EMC color bar
3. Required equipment: laptop, DC adaptor, HDMI cable, HDMI to RGB Board and LCM



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14. Packaging

(TBD)

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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.

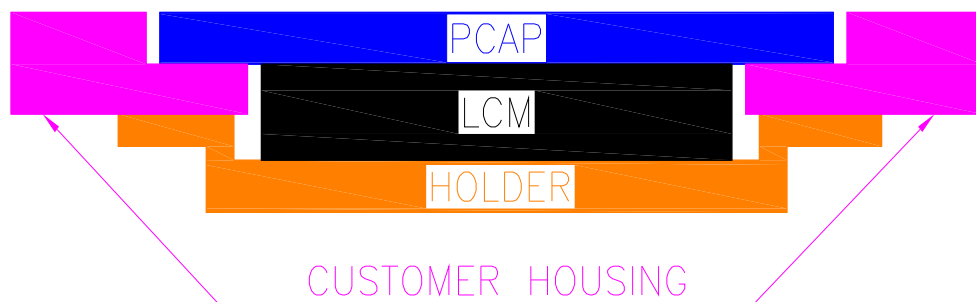
15.5 Precautions of Storage

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.

15.6 Cautions for LCM installation

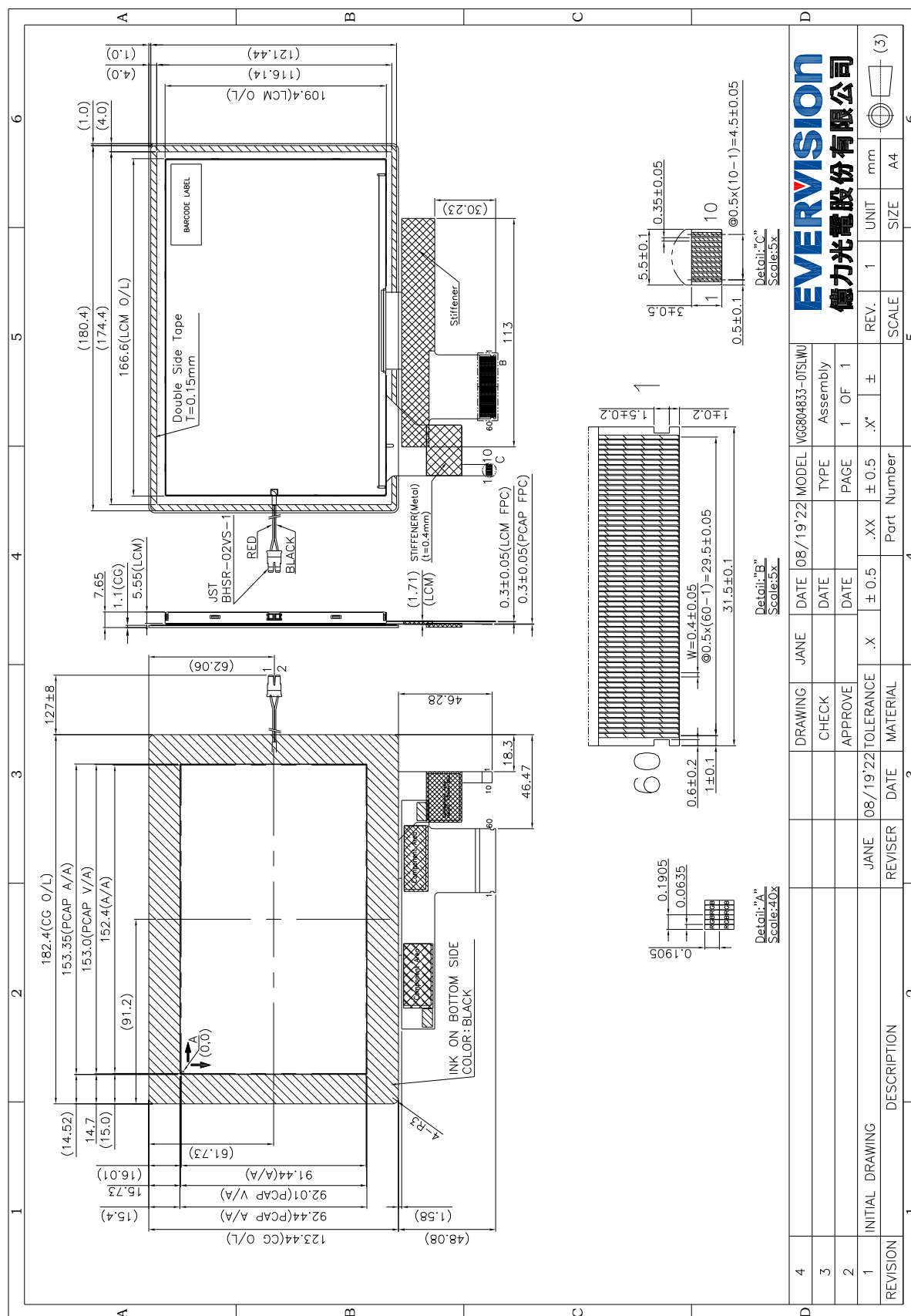
To secure the LCM within customer housing, having appropriate structural support underneath the LCM is a must. The recommended LCM installation with a holder type of the structure into the customer housing is shown below figure. By attaching ONLY the protruding edges of the PCAP with cover lens onto 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.



15.7 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.

16.Outline Drawing



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17.Definition of Labels

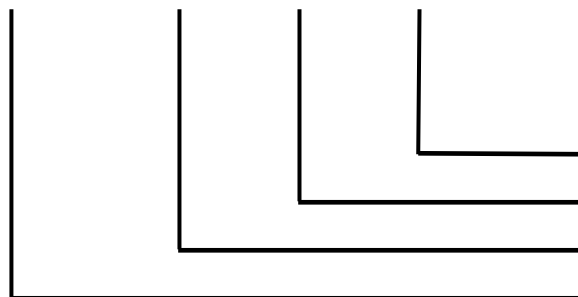
The bar code nameplate is pasted on each module as illustration, and its definitions are as following explanation.



(a) Module Name : VGG804833-0TSLWU

(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):

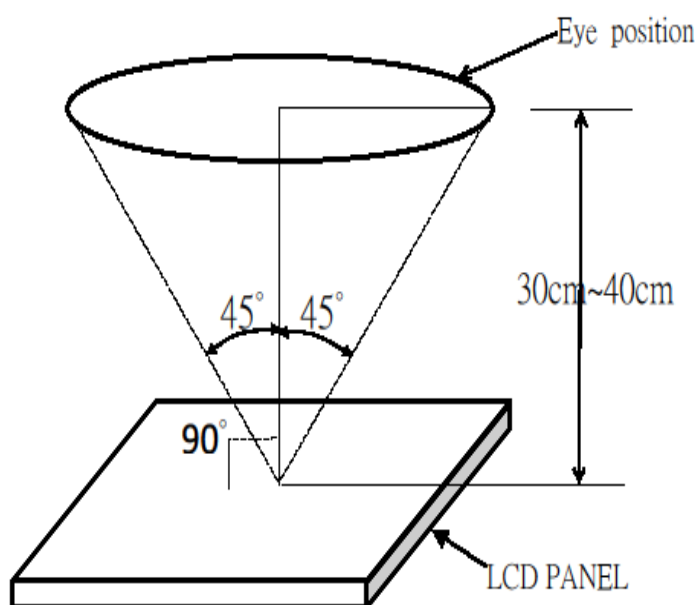
Manufacturing sequence of product, for example: 0001~9999.

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: $25 \sim 75\%$ RH
- (3) Viewing distance is approximately $30 \sim 40\text{ cm}$
- (4) Viewing angle is normal to the LCD panel as Fig_1 ($\pm 45^{\circ}$)
- (5) Ambient Illumination: $200 \sim 500\text{ Lux}$ for external appearance inspection



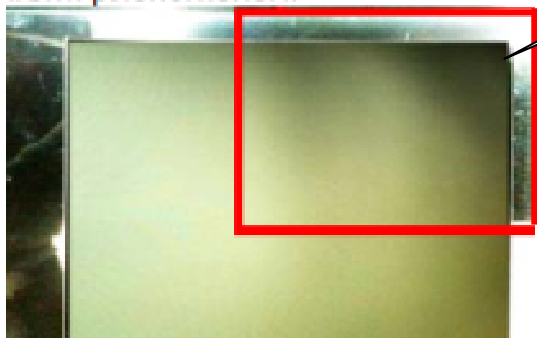

Fig_1

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.		-	
	Point Defect (red ,green ,blue ,dark ,white)	Item	Acceptable number	Note: 1 、 4 、 5	
		BRIGHT DOT	$N \leq 0$		
		DARK DOT	$N \leq 3$		
		TOTAL DOT	$N \leq 3$		
		TWO ADJACENT DOT	NOT ALLOWED		
		THREE OR MORE ADJACENT DOT	NOT ALLOWED		
		Minimum distance between full dark dots \geq 5mm			
	MURA	Has the non-uniform phenomenon		mura	
		Weak defect will be defined as mura if it can be observed through ND filter 2%		-	
					
					

Item		Specification/Description			Note
External Inspection (non-operating or operating)	Scratch (in display area)	L(mm)	W(mm)	Acceptable number	Note:2
		$L \leq 5.0$	$W \leq 0.1$	4	
		$L > 5.0$	$W > 0.1$	0	
	Polarizer dent or bubble (in display area)	Dimension(mm)		Acceptable number	Note:3
		$D \leq 0.25$		Disregard	
		$D \leq 0.5$		4	
	Line Shape (Particles and Lint in display area)	L(mm)	W(mm)	Acceptable number	Note:2
		-	$W \leq 0.07$	Disregard	
		$L \leq 5$	$W \leq 0.1$	4	
		$L \geq 5$	$W \geq 0.1$	0	
	Dot Shape (Particle in Display area)	Dimension(mm)		Acceptable number	Note:3
		$D \leq 0.25$		Disregard	
		$D \leq 0.5$		4	

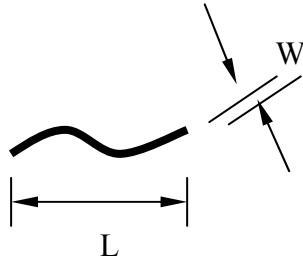
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Incoming Inspection Touch Panel

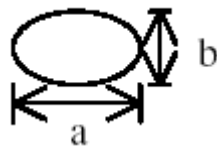
(TBD)

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.

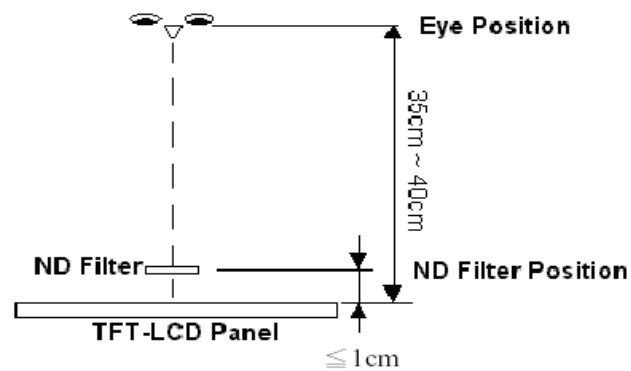
Note2.



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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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.