

# TFT-DISPLAY DATASHEET

ONation  
Model: OT101BBWDLT-00

## BRIEF SPEC.:

Main Feature	Landscape Type White LED Backlight Wide Viewing Angle
Active Screen Area	216.96 x 135.6 (mm)
Diagonal   Format	10,1"   16:10
Resolution	1280 x 800
Colors	R.G.B Stripe
Backlight	LED, White
Brightness	280 cd/m <sup>2</sup>
LED Life Time	15,000h (Typ.)
Interface	LVDS
Viewing Angle	-75~85(H), -75~85(V)
Touchscreen	no
Power Supply	3,3V (Typ.)
Module Outline	229.46 x 149.1 x 5.08 (mm)
Operation Temperature	-20... +70 °C
Storage Temperature	-30... +80 °C
Surface Treatment	N/A



# ONation Corporation

## TFT COLOR LCD MODULE

**MODEL: OT101BBWDLT-00**  
(Complied with RoHS)

**WXGA**  
**LVDS interface (1port)**

**Version: P0.1**

<b>Customer :</b> _____
<b>Approved By :</b> _____
<b>Date:</b> _____

ONATION		
APPROVAL	CHECKER	PREPARE
<i>Jan</i>	<i>Jan</i>	<i>Josh</i>

## C O N T E N T S

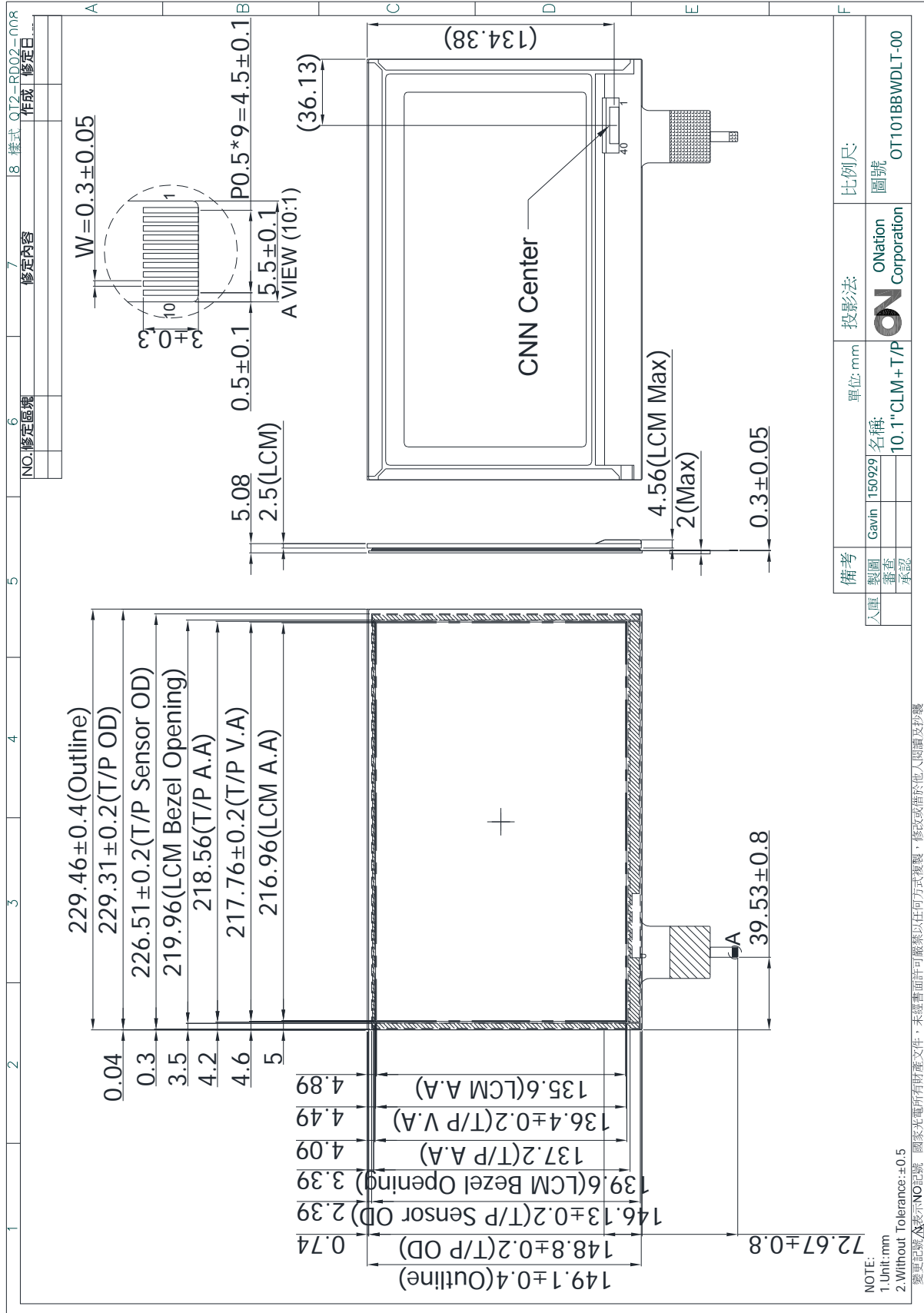
<b>NO.</b>	<b>ITEM</b>	<b>PAGE</b>
1	RECORD OF REVISION	0-1
2	MECHANICAL SPECIFICATIONS	1
3	OUTLINE DIMENSIONS	2
4	INTERFACE PIN CONNECTION	3 ~ 4
5	BLOCK DIAGRAM	5
6	ABSOLUTE MAXIMUM RATINGS	6
7	ELECTRICAL CHARACTERISTICS	7
8	OPTICAL CHARACTERISTICS	8 ~ 10
9	PROJECTIVE CAPACITIVE TOUCH PANEL SPECIFICATIONS	11~14
10	TIMING SPECIFICATIONS	15~17
11	RELIABILITY TEST	18
12	LCM INSPECTION STANDARD	19
13	PACKAGE INFORMATION	19
14	PRECAUTIONS FOR USE	20



## 2.MECHANICAL SPECIFICATIONS

(1)	Number Of Dots (Dots)	1280(R.G.B) X 800
(2)	Module Size(mm)	229.46(H) X 149.1(V) X 5.08(D)
(3)	Active Area(mm)	216.96(H) X 135.6(V)
(4)	Pixel Pitch(mm)	0.1695 (H) X 0.1695(V)
(5)	LCD Model	TFT , Transmissive, Normally/ Black,
(6)	CTP Top Surface Type	Clear
(7)	Backlight Color	White, LED
(8)	Viewing Direction	Wide Viewing Angle Horizontal : Right side 85°(typ.), Left side 85°(typ.) Vertical : Up side 85°(typ.), Down side 85°(typ.)
(9)	Gray Scale Inversion Direction	No GSI
(10)	Electrical Interface	LVDS Interface
(11)	Color Configuration	R.G.B Stripe
(12)	Module Weight(g)	TBD±5%

### 3. OUTLINE DIMENSIONS



## 4. INTERFACE PIN CONNECTION

### 4.1 LCM PANEL DRIVING SECTION

Connector: Starconn 300E40-0010RA-G3 or Equivalent

PIN NO	SYMBOL	FUNCTION	REMARK
1	NC	No Connection	
2	VCC	Power Supply	
3	VCC	Power Supply	
4	NC	No Connection	
5	NC	No Connection	
6	NC	No Connection	
7	NC	No Connection	
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	CKIN-	-LVDS Differential Data Input	
18	CKIN+	+LVDS Differential Data Input	
19	GND	Ground	
20	Rxin3-	-LVDS Differential Data Input	
21	Rxin3+	+LVDS Differential Data Input	
22	GND	Ground	
23	VLED-	Ground for LED Driving	
24	VLED-	Ground for LED Driving	
25	VLED-	Ground for LED Driving	
26	NC	No Connection	
27	PWM	PWM Input Signal for LED Driver	
28	EN	LED Enable Pin	
29	NC	Reserved For CABC	
30	NC	No Connection	
31	VLED+	Power Supply for LED Driver	
32	VLED+	Power Supply for LED Driver	
33	VLED+	Power Supply for LED Driver	

PIN NO	SYMBOL	FUNCTION	REMARK
34	NC	No Connection	
35	BIST	BIST pin	Connect to Ground Directly or though 0 Ohm
36	NC	No Connection	
37	NC	No Connection	
38	NC	No Connection	
39	NC	No Connection	
40	NC	No Connection	

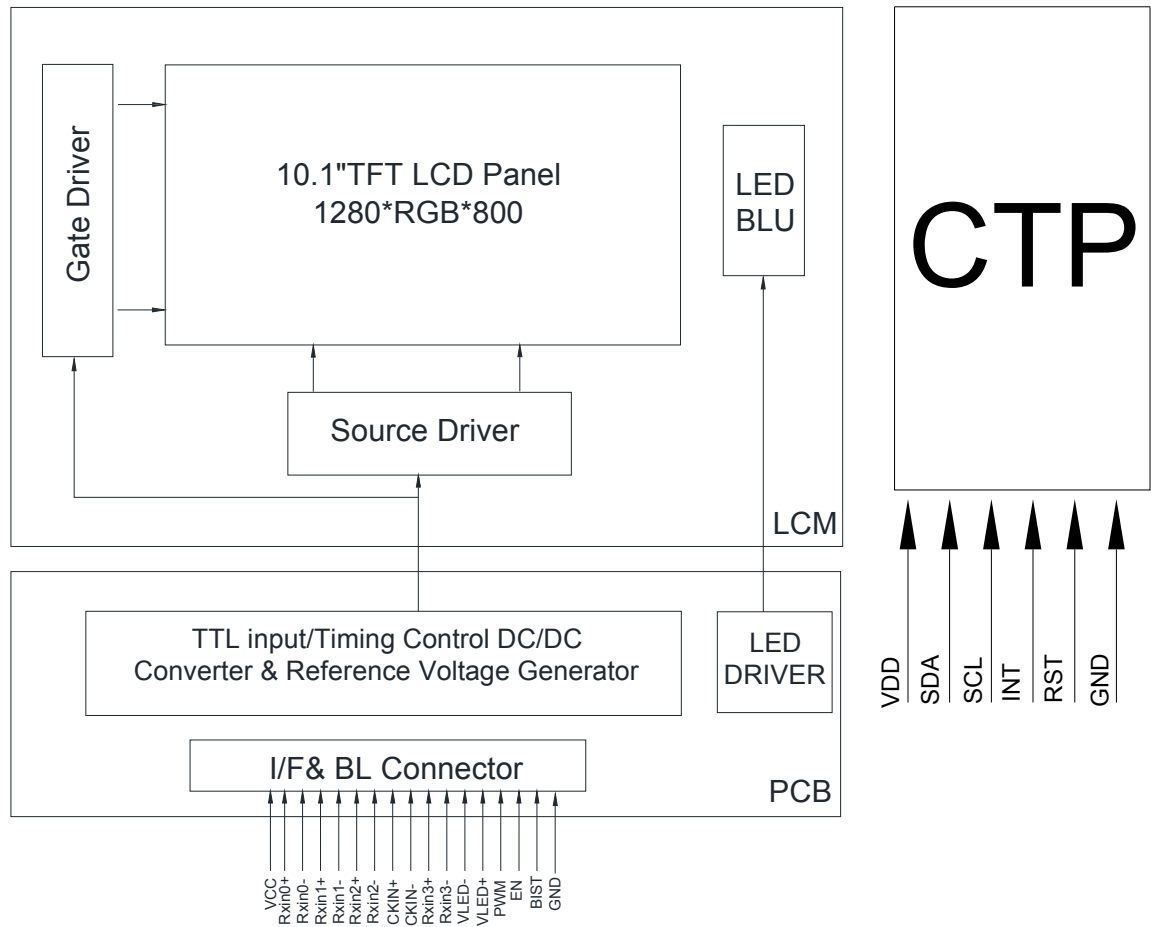
## 4.2 TOUCH PANEL PIN ASSIGNMENT

Mating Connector: ZIF 10 pin, pitch:1.0mm

PIN NO.	SIGNAL	FUNCTION
1	GND	Ground
2	VDD	CTP Supply voltage
3	SCL	Serial Clock
4	SDA	Serial Data
5	INT	External interrupt to the host
6	RST	External reset, Low is active
7	NC	No Connection
8	NC	No Connection
9	NC	No Connection
10	NC	No Connection



### 5. BLOCK DIAGRAM



## 6. ABSOLUTE MAXIMUM RATINGS

### 6.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

ITEM	SYMBOL	MIN.	MAX.	UNIT	REMARK
Power Supply Voltage	VCC	-0.3	7.0	V	
	VLED	-0.3	24.0	V	
	VDD	-0.3	3.6	V	

Note1 : The absolute maximum rating values of this product not allowed to be exceeded at any times. Should be module be used with any of absolute maximum ratings exceeded. The characteristics of the module may not be recovered, or in an extreme case, the module may be permanently destroyed.

### 6.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		REMARK
	MIN.	MAX.	MIN.	MAX.	
Ambient Temperature(°C)	-20	70	-30	80	Note 1,2,3
Humidity(% RH)	Note 3		Note 3		Note 3

Note 1 : The response time will become lower when operated at low temperature.

Note 2 : Background color changes slightly depending on ambient temperature.

Note 3 : Storage Ta= (40)°C & H= (90) % ≤(96) Hrs.

## 7. ELECTRICAL CHARACTERISTICS

### 7.1 ELECTRICAL CHARACTERISTICS OF LCD

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Power Voltage for LCD	VCC	(3.0)	(3.3)	(3.6)	V
	ICC** (VCC=3.3V)	-	(270)	-	mA
Differential Input High	VTH	-	-	+100	mV
Differential Input Low	VTL	-100	-	-	mV

\*\*test pattern : ALL White

### 7.2 BACKLIGHT UNITS

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK	
LED Driving Voltage	VLED	(6)	(12)	(21)	V	(Duty=100%)	
LED Driving Current	ILED (VLED=12V)	-	(210)	(410)	mA	(Duty=100%)	
LED Forward Voltage	VF	(2.9)	-	(3.2)	V	Note 2	
LED Forward Current	IF		(20)		mA		
PWM Signal Voltage	V <sub>PWM-EN</sub>	High	(3.0)	-	(3.6)		V
		Low	(0)	-	(0.4)		
LED Enable Voltage	V <sub>LED-EN</sub>	High	(3.0)	-	(3.6)	V	
		Low	(0)	-	(0.4)		
Input PWM Frequency	FPWM	(1)	-	(2)	KHz	Duty $\geq$ 1% Note 2	
		(2)	-	(5)		Duty $\geq$ 2.5% Note 2	
		(5)	-	(10)		Duty $\geq$ 5% Note 2	
		(10)	-	(20)		Duty $\geq$ 10% Note 2	
LED Life Time (For Reference only)	Ta=25°C 60-70%RH(Note1)	(15,000)	-	-	Hrs	Note 1	

Note 1 : The LED of B/L is drive by current only, drive voltage is for reference only. drive voltage can make driving current under safety area(current between minimum and maximum).(15,000) hours is only an estimate for reference.

Note 2: The lifetime of LED is defined as the time when it continues to operate under the conditions at Ta = 25 ±2°C and PWM = 100% until the brightness becomes  $\leq$  50% of its original value.

### 7.3 CTP ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	REMARK
Power Voltage For CTP	VDD	2.8	3.0	3.3	V	

### 8. OPTICAL CHARACTERISTICS

Ta=25°C

ITEM	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	REMARK
Contrast Ratio	CR	Viewing Normal Angle $\Theta_x=\Theta_y=0^\circ$	(250)	(350)	-	-	Note 1
Response Time	TR+TF		-	(25)	(50)	ms	Note 2
	White		x	(0.248)	(0.298)	(0.348)	-
		y	(0.280)	(0.330)	(0.380)	-	
Viewing Angle	Hor.	$\theta_{x+}$	75	85	-	Deg.	Note 3
		$\theta_{x-}$	75	85	-		
	Ver.	$\theta_{y+}$	75	85	-		
		$\theta_{y-}$	75	85	-		
Luminance	L	PWM=100%	(240)	(280)	-	cd/m2	
Luminance Uniformity	YU		70	75	-	%	Note 5

Note 1 : Definition of Contrast Ratio (CR) :

The contrast ratio can be calculated by the following expression.

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

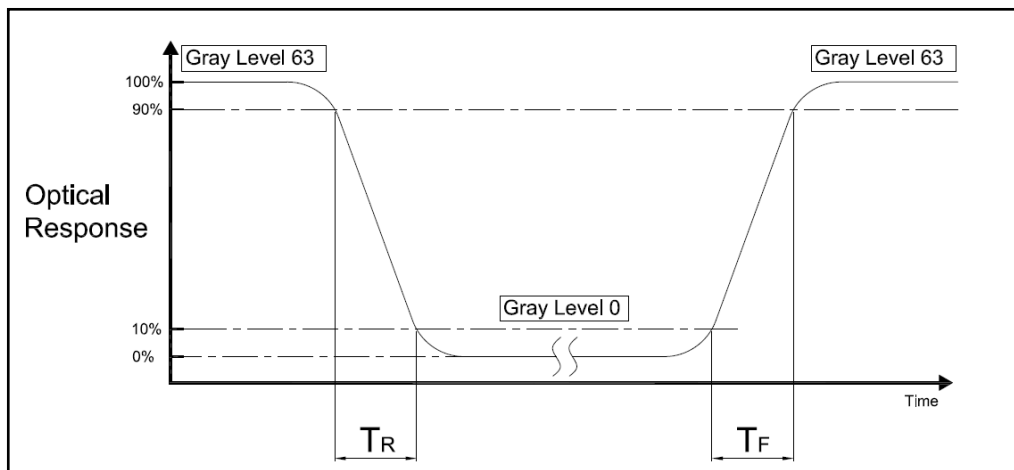
L63 : Luminance of gray level 63

L0 : Luminance of gray level 0

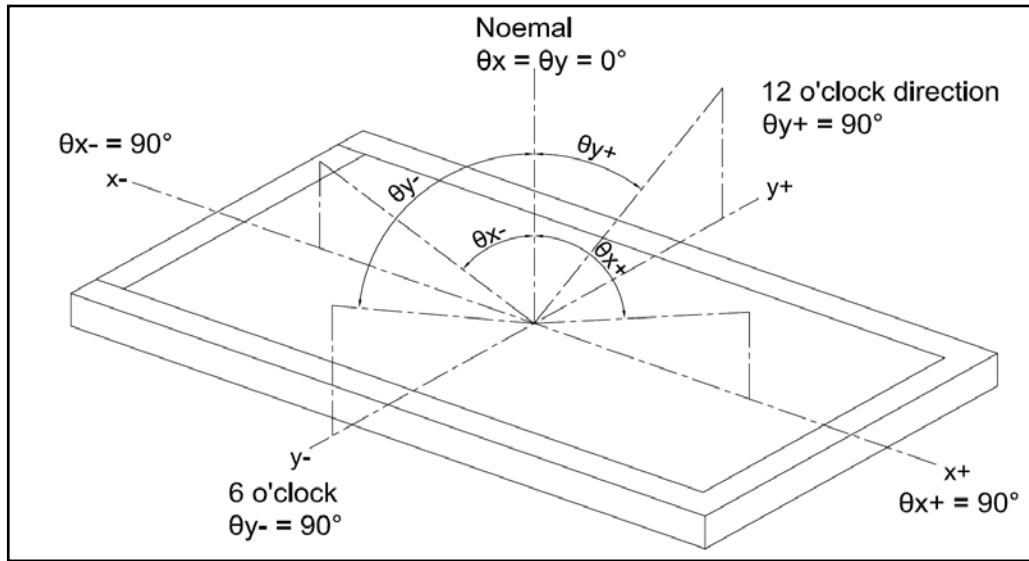
$$CR = CR(5)$$

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

Note 2 : Definition of Response Time (TR.TF)

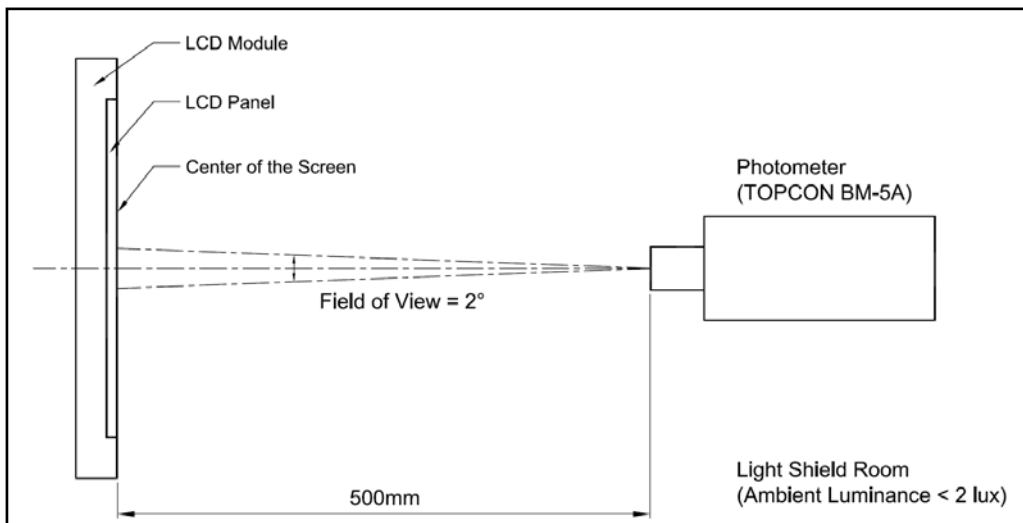


Note 3 : Definition of Viewing Angle

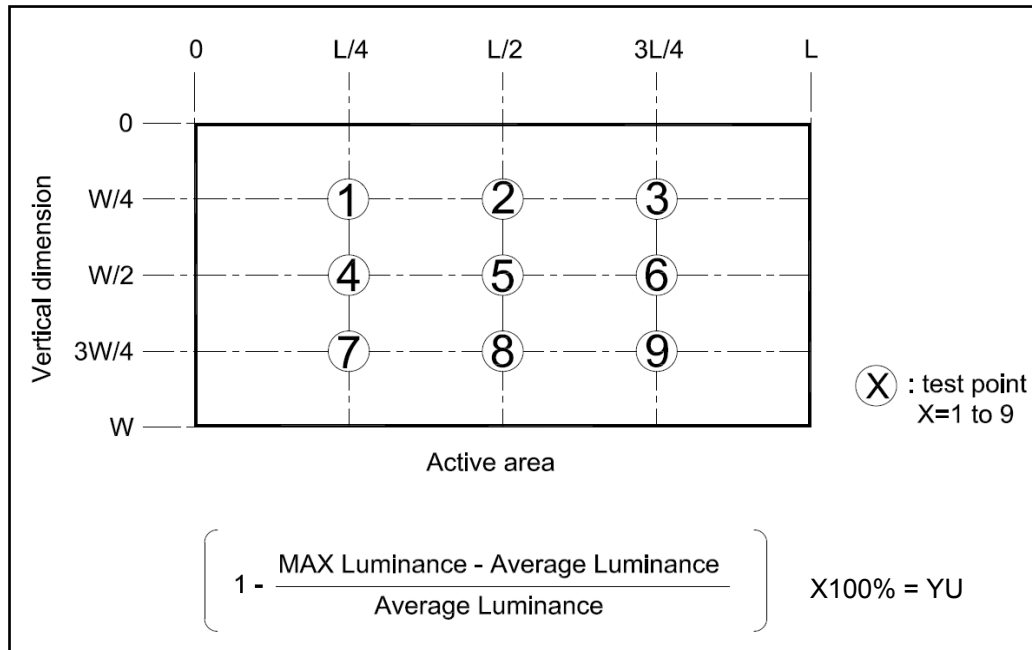


Note 4 : Measurement Set-Up:

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



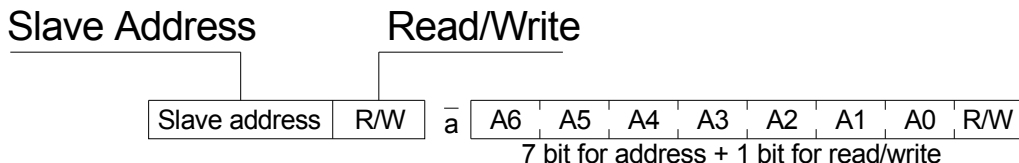
Note 5 :



## 9. PROJECTIVE CAPACITIVE TOUCH PANEL SPECIFICATIONS

### 9.1 DATA FORMAT

Device Slave Address =0x38 (Write:0x70 Read:0x71)



Address	Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	Host Access	
Op,00h	DEVIDE_MODE		Device Mode[2:0]							RW	
Op,01h	GEST_ID	Gesture ID[7:0]									R
Op,02h	TD_STATUS					Number of touch points					R
Op,03h	TOUCH1_XH	1 <sup>st</sup> Event Flag		1 <sup>st</sup> Touch X Position[11:8]							R
Op,04h	TOUCH1_XL	1 <sup>st</sup> Touch X Position [7:0]									R
Op,05h	TOUCH1_YH	1 <sup>st</sup> Touch ID [3:0]			1 <sup>st</sup> Touch Y Position [11:8]						R
Op,06h	TOUCH1_YL	1 <sup>st</sup> Touch Y Position [7:0]									R
Op,07h	Reserved										
Op,08h	Reserved										
Op,09h	TOUCH2_XH	2 <sup>nd</sup> Event Flag		2 <sup>nd</sup> touch X Position[11:8]							R
Op,0Ah	TOUCH2_XL	2 <sup>nd</sup> touch X Position[7:0]									R
Op,0Bh	TOUCH2_YH	2 <sup>nd</sup> Touch ID[3:0]			2 <sup>nd</sup> Touch Y Position [11:8]						R
Op,0Ch	TOUCH2_YL	2 <sup>nd</sup> Touch Y Position[7:0]									R
Op,0Dh	Reserved										
Op,0Eh	Reserved										
Op,0Fh	TOUCH3_XH	3 <sup>st</sup> Event Flag		3 <sup>st</sup> Touch X Position[11:8]							R
Op,10h	TOUCH3_XL	3 <sup>st</sup> Touch X Position[7:0]									R
Op,11h	TOUCH3_YH	3 <sup>st</sup> Touch ID[3:0]			3 <sup>st</sup> Touch Y Position[11:8]						R
Op,12h	TOUCH3_YL	3 <sup>st</sup> Touch Y Position[7:0]									R
Op,13h	Reserved										
Op,14h	Reserved										
Op,15h	TOUCH4_XH	4 <sup>st</sup> Event Flag		4 <sup>st</sup> Touch X Position[11:8]							R
Op,16h	TOUCH4_XL	4 <sup>st</sup> Touch X Position[7:0]									R
Op,17h	TOUCH4_YH	4 <sup>st</sup> Touch ID[3:0]			4 <sup>st</sup> Touch Y Position[11:8]						R
Op,18h	TOUCH4_YL	4 <sup>st</sup> Touch Y Position[7:0]									R
Op,19h	Reserved										
Op,1Ah	Reserved										
Op,1Bh	TOUCH5_XH	5 <sup>st</sup> Event Flag		5 <sup>st</sup> Touch X Position[11:8]							R
Op,1Ch	TOUCH5_XL	5 <sup>st</sup> Touch X Position[7:0]									R
Op,1Dh	TOUCH5_YH	5 <sup>st</sup> Touch ID[3:0]			5 <sup>st</sup> Touch Y Position[11:8]						R
Op,1Eh	TOUCH5_YL	5 <sup>st</sup> Touch Y Position[7:0]									R
Op,1Fh	Reserved										
Op,20h	Reserved										
Op,21h	TOUCH6_XH	6 <sup>st</sup> Event Flag		6 <sup>st</sup> Touch X Position[11:8]							R
Op,22h	TOUCH6_XL	6 <sup>st</sup> Touch X Position[7:0]									R
Op,23h	TOUCH6_YH	6 <sup>st</sup> Touch ID[3:0]			6 <sup>st</sup> Touch Y Position[11:8]						R
Op,24h	TOUCH6_YL	6 <sup>st</sup> Touch Y Position[7:0]									R
Op,25h	Reserved										
Op,26h	Reserved										
Op,27h	TOUCH7_XH	7 <sup>st</sup> Event Flag		7 <sup>st</sup> Touch X Position[11:8]							R
Op,28h	TOUCH7_XL	7 <sup>st</sup> Touch X Position[7:0]									R
Op,29h	TOUCH7_YH	7 <sup>st</sup> Touch ID[3:0]			7 <sup>st</sup> Touch Y Position[11:8]						R
Op,2Ah	TOUCH7_YL	7 <sup>st</sup> Touch Y Position[7:0]									R

Op,2Bh	Reserved		
Op,2Ch	Reserved		
Op,2Dh	TOUCH8_XH	8 <sup>st</sup> Event Flag	8 <sup>st</sup> Touch X Position[11:8] R
Op,2Eh	TOUCH8_XL	8 <sup>st</sup> Touch X Position[7:0]	R
Op,2Fh	TOUCH8_YH	8 <sup>st</sup> Touch ID[3:0]	8 <sup>st</sup> Touch Y Position[11:8] R
Op,30h	TOUCH8_YL	8 <sup>st</sup> Touch Y Position[7:0]	R
Op,31h	Reserved		
Op,32h	Reserved		
Op,33h	TOUCH9_XH	9 <sup>st</sup> Event Flag	9 <sup>st</sup> Touch X Position[11:8] R
Op,34h	TOUCH9_XL	9 <sup>st</sup> Touch X Position[7:0]	R
Op,35h	TOUCH9_YH	9 <sup>st</sup> Touch ID[3:0]	9 <sup>st</sup> Touch Y Position[11:8] R
Op,36h	TOUCH9_YL	9 <sup>st</sup> Touch Y Position[7:0]	R
Op,37h	Reserved		
Op,38h	Reserved		
Op,39h	TOUCH10_XH	10 <sup>st</sup> Event Flag	10 <sup>st</sup> Touch X Position[11:8] R
Op,3Ah	TOUCH10_XL	10 <sup>st</sup> Touch X Position[7:0]	R
Op,3Bh	TOUCH10_YH	10 <sup>st</sup> Touch ID[3:0]	10 <sup>st</sup> Touch Y Position[11:8] R
Op,3Ch	TOUCH10_YL	10 <sup>st</sup> Touch Y Position[7:0]	R
Op,3Dh	Reserved		
Op,3Eh	Reserved		
...	...	...	...
Op,FEh	LOG_MSG_CNT	The log MSG count	R
Op,FFh	LOG_CUR_CHA	Current character of log message, will point to the next character when one character is read	R

### 9.1.1 DEVICE\_MODE

This register is the device mode register, user the get current the device mode.

Bit Address	Register Name	Description
6:4	Device Mode[2:0]	000b Normal operating Mode 001b System Information Mode (Reserved) 100b Test Mode – read raw data (Reserved)

### 9.1.2 GEST\_ID

This register describes the gesture of a valid touch.

Bit Address	Register Name	Description
7:0	Gesture ID[7:0]	Gesture ID 0x10 Single Touch Pan North 0x14 Single Touch Pan East 0x18 Single Touch Pan South 0x1C Single Touch Pan West 0x20 Single Touch Single Click 0x22 Single Touch Double Click 0x28 Single Touch Rotate Clockwise 0x29 Single Touch rotate Counter Clockwise 0x40 Zoom In 0x49 Zoom Out



### 9.1.3 TD\_STATUS

This register is the Touch Data status register.

Bit Address	Register Name	Description
3:0	Number of touch points[3:0]	How many points detected. 1-5 is valid

### 9.1.4 TOUCHn\_XH (n:1-10)

This register describes MSB of the X coordinate of the nth touch point and the corresponding event flag

Bit Address	Register Name	Description
7:6	Event Flag	00b: Put Down 01b: Put Up 10b: Contact 11b: Reserved
5:4		Reserved
3:0	Touch X Position[11:8]	MSB of Touch X Position in pixels

### 9.1.5 TOUCHn\_XL (n:1-10)

This register describes LSB of the X coordinate of the nth touch point

Bit Address	Register Name	Description
7:0	Touch X Position[7:0]	LSB of the Touch X Position in Pixels

### 9.1.6 TOUCHn\_YH (n:1-10)

This register describes MSB of the Y coordinate of the nth touch point and corresponding touch ID.

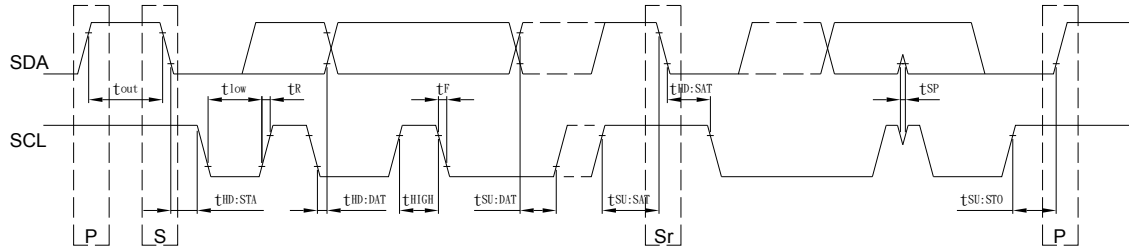
Bit Address	Register Name	Description
7:4	Touch ID[3:0]	Touch ID of Touch Point
3:0	Touch X Position[11:8]	MSB of Touch Y Position in pixels

### 9.1.7 TOUCHn\_YL (n:1-10)

This register describes LSB of the Y coordinate of the nth touch point.

Bit Address	Register Name	Description
7:0	Touch X Position[7:0]	LSB of The Touch Y Position in pixels

## 9.2 AC CHARACTERISTICS OF THE SDA AND SCL BUS LINES FOR I<sup>2</sup>C BUS DEVICES

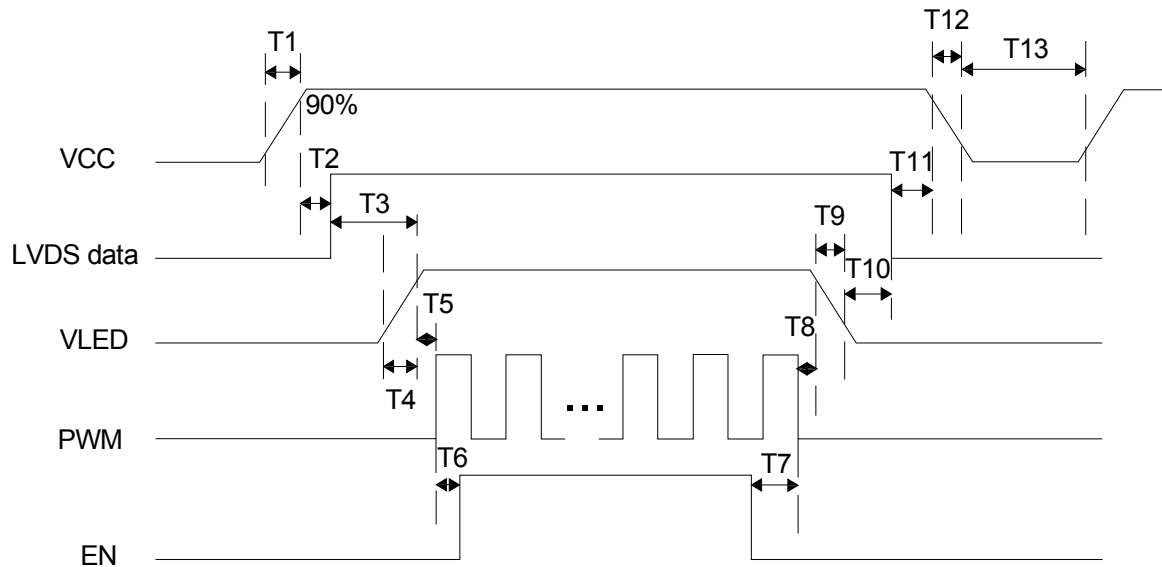


PARAMETER	SYMBOL	STANDARD-MODE I <sup>2</sup> C-BUS		FAST-MODE I <sup>2</sup> C-BUS		UNIT
		MIN.	MAX.	MIN.	MAX.	
SCL clock frequency	f <sub>SCL</sub>	0	100	0	400	KHz
Bus free time between STOP and START condition	t <sub>BUF</sub>	4.7	-	1.3	-	μs
Hold time (repeated) START condition. After this period, the first clock pulse is generated	t <sub>HD:STA</sub>	4.0	-	0.6	-	μs
LOW period of the SCL clock	t <sub>LOW</sub>	4.7	-	1.3	-	μs
HIGH period of the SCL clock	t <sub>HIGH</sub>	4.0	-	0.6	-	μs
Set-up time for a repeated START condition	t <sub>SU:STA</sub>	4.7	-	0.6	-	μs
Data hold time	t <sub>HD:DAT</sub>	0	-	0	0.9	μs
Data set-up time	t <sub>SU:DAT</sub>	250	-	100	-	μs
Rise time of both SDA and SCL signals	t <sub>R</sub>	-	1000	20+0.1 <sub>b</sub>	300	μs
Fall time of both SDA and SCL signals	t <sub>F</sub>	-	300	20+0.1 <sub>b</sub>	300	μs
Set-up time for STOP condition	t <sub>SU:STO</sub>	4.0	-	0.6	-	μs
Capacitive load for each bus line.	C <sub>b</sub>	-	400	-	400	pF

## 10. TIMING SPECIFICATIONS

### 10.1 POWER ON/OFF SEQUENCE

Power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VCC is off.

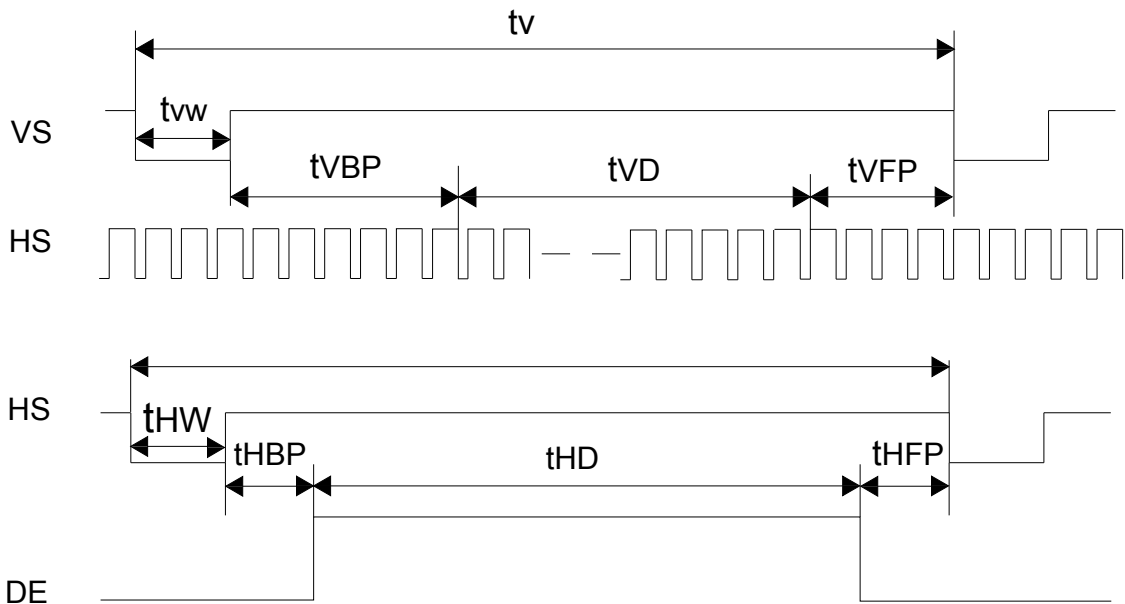


PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
VIN Rise Time	T1	0.5	--	10	ms
VIN Good to Signal Valid	T2	30	--	90	ms
Signal Valid to Backlight On	T3	200	--	--	ms
Backlight Power On Time	T4	0.5	--	--	ms
Backlight VDD Good to System PWM	T5	10	--	--	ms
System PWM ON to Backlight Enable ON	T6	10	--	--	ms
Backlight Enable Off to System PWM Off	T7	0	--	--	ms
System PWM Off to B/L Power Disable	T8	10	--	--	ms
Backlight Power Off Time	T9	0.5	10	30	ms
Backlight Off to Signal Disable	T10	200	--	--	ms
Signal Disable to Power Down	T11	0	--	50	ms
VIN fall Time	T12	0.5	10	30	ms
Power Off	T13	500	--	--	ms

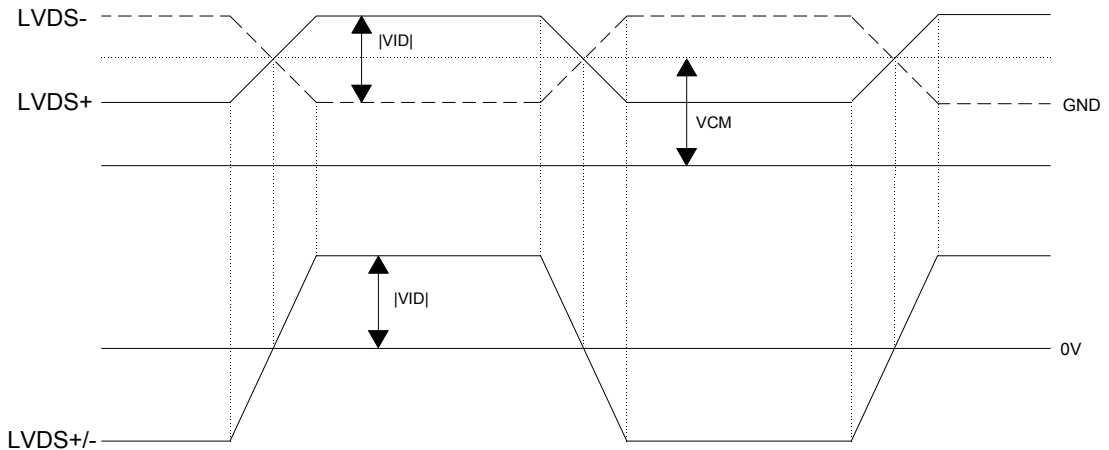
## 10.2 TIMING CHARACTERISTICS

TIMING CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP..	MAX	UNIT.
Frame Rate	--	-	60		Hz
Frame Period	$t_v$	(815)	(823)	(1023)	line
Vertical Display Time	$t_{VD}$	800			line
Vertical Blanking Time	$t_{VW}+t_{VBP}+t_{VFP}$	(15)	(23)	(33)	line
1 Line Scanning Time	$t_H$	(1410)	(1440)	(1470)	clock
Horizontal Display Time	$t_{HD}$	1280			clock
Horizontal Blanking Time	$t_{HW}+t_{HBP}+t_{HFP}$	(60)	(160)	(190)	clock
Clock Rate	1/TC	(68.9)	(71.1)	(73.4)	MHz



Voltage Definitions





## 11. RELIABILITY TEST

ENVIRONMENTAL TEST				
NO.	ITEM	CONDITIONS	TIME PERIOD	REMARK
1	High Temperature Storage	(80°C)	(96HRS)	
2	Low Temperature Storage	(-30°C)	(96HRS)	
3	High Temperature Operation	(70°C)	(96HRS)	
4	Low Temperature Operation	(-20°C)	(96HRS)	
5	Temperature Cycle	(-30°C~80°C)	0.5HRS/ 10CYCLE	
6	High Temperature Humidity Storage	(40°C 90%RH)	(96HRS)	

Note 1: a. The module should work properly.  
 b. Before and after function test, The difference of consumptive current. Should be within 10%

Note 2: a. The module should work properly.  
 b. The module won't be deformative, Color changeable or broken.  
 c. The modules can't be apart.

Note 3: a. Before cosmetic and function test, The product must have enough recovery time, At least 24 hours at room temperature.

## 12. LCM INSPECTION STANDARD

Inspection specifications refer ONation Corporation LCM INSPECTION  
STANDARD Document.  
Document Number : TBD

## 13. PACKAGE INFORMATION

LCM MODEL	LCM QTY. IN THE BOX	INNER BOX SIZE (mm)	WEIGHT	REMARK
OT101BBWDLT-00	TBD	TBD	TBD	

## 14.PRECAUTIONS FOR USE

### 14.1 SAFETY

- (1) Do not swallow any liquid crystal, even if there is no proof that liquid crystal is poisonous.
- (2) If the LCD panel breaks, be careful not to get liquid crystal to touch your skin.
- (3) If skin is exposed to liquid crystal, wash the area thoroughly with alcohol or soap.

### 14.2 STORAGE CONDITIONS

- (1) Store the panel or module in a dark place where the temperature is  $23\pm 5^{\circ}\text{C}$  and the humidity is below  $50\pm 20\%\text{RH}$ .
- (2) Store in anti-static electricity container.
- (3) Store in clean environment, free from dust, active gas, and solvent.
- (4) Do not place the module near organics solvents or corrosive gases.
- (5) Do not crush, shake, or jolt the module.

### 14.3 HANDLING PRECAUTIONS

- (1) Avoid static electricity which can damage the CMOS LSI.
- (2) The polarizing plate of the display is very fragile. So, please handle it very carefully.
- (3) Do not give external shock.
- (4) Do not apply excessive force on the surface.
- (5) Do not wipe the polarizing plate with a dry cloth, as it may easily scratch the Surface of plate.
- (6) Do not use ketonics solvent & Aromatic solvent, use with a soft cloth soaked with a cleaning naphtha solvent.
- (7) Do not operate it above the absolute maximum rating.
- (8) Do not remove the panel or frame from the module.
- (9) When the module is assembled, it should be attached to the system firmly, Be careful not to twist and bend the module.
- (10) Wipe off water droplets or oil immediately . If you leave the droplets for a long time, staining and discoloration may occur.
- (11) 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, legs or clothes, it must be washed away thoroughly with soap.

### 14.4 WARRANTY

- (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 12 months since the date of shipping out under normal using and storage conditions.