# **SPECIFICATION**



Page: 1

**OF** 

# LIQUID CRYSTAL DISPLAY MODULE

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ment Revision	:8			
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Revision 8; UMSH-8252MD-3T(REVT) Ver. 0; December-10-2018

**U.R.T.** 

Revision record						
Document	Model No.	D	Revision			
Revision	Version No.	Description	by			
	†		H.C. Lin			
0	UMSH-8252MD-T		Jeffry Chen			
	Version No. 0		19-Nov-2008			
	VD 46VV 00 50V 45		H.C. Lin			
1	UMSH-8252MD-1T	Add touch panel on LCM.	Jeffry Chen			
	Version No. 0	•	5-Jan-2008			
	LIMELL COSOME AT		Yu-Lun TSENG			
2	UMSH-8252MD-1T Version No. 1	Modify the initial code.	Jeffry Chen			
	version No. 1		31-Jul-2009			
3	UMSH-8252MD-1T		Jeffry Chen			
3	Version No. 2	Modify the Back-light only Specification.	Ken Lin			
	version No. 2		17-Sep-2009			
4	UMSH-8252MD-1T		Ken Lin			
4		Modify the initial code.	Jeffry Chen			
	Version No. 3		05-Mar-2010			
5	UMSH-8252MD-3T	1. Change to the anti-newton film of T/P.	Jenny Huang			
3	Version No. 0	2. Modify module number from	Jeffry Chen			
	version No. 0	UMSH-8252MD-1T toUMSH-8252MD-3T	28-Jul-2011			
6	UMSH-8252MD-3T		William Don			
6	Version No. 1	Modify the initial code to improve the contrast.	Jeffry Chen			
			23-Jan-2014			
7		1. Change TP material.	William Don			
7	UMSH-8252MD-3T(REVT)	2. Modify module number from	Danny Jhuaung			
	Version No. 0	UMSH-8252MD-3T (REV1) to UMSH-8252MD-3T.(REVT)				
		UMSH-8232MD-31 (REV1) to UMSH-8232MD-31.(REV1)	13-Aug-2014			
8	UMSH-8252MD-3T(REVT)		Design Section			
O	Version No. 0	Modify the packing mode.	10-Dec-2018			
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#### 1. BASIC SPECIFICATION

1.1 Mechanical specifications

Items	Nominal Dimension	Unit
Active screen size	3.5" diagonal	-
Dot Matrix	320*RGB*240	dots
Module Size (W x H x T)	76.9 x 63.9 x 4.3	mm.
Active Area (W x H)	70.08 x 52.56	mm.
Dot Pitch (W x H)	0.219 x 0.219	mm.
Color depth	262K	color
Interface	<ol> <li>8/9/16/18-bit 6800-series / 8080-series Parallel Interface</li> <li>Serial Peripheral Interface (SPI)</li> <li>18-/6-bit RGB interface (DEN, DOTCLK, HSYNC, VSYNC, DB[17:0])</li> <li>VSYNC interface (system interface + VSYNC)</li> <li>WSYNC interface (system interface + WSYNC)</li> </ol>	-
Driving IC Package	COG	-
Module weight	32	g

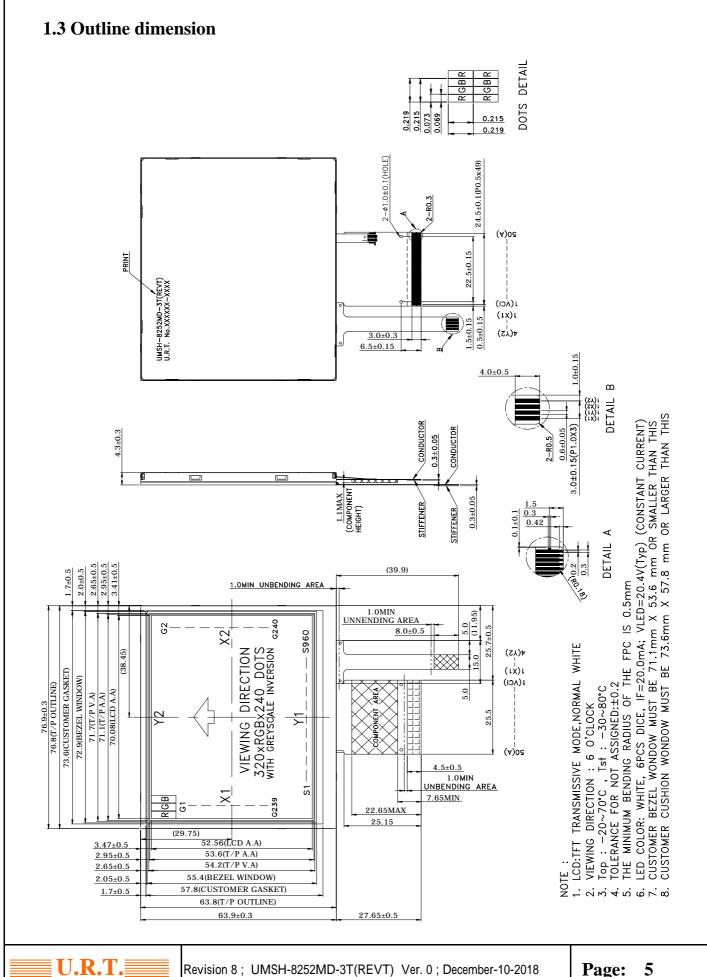
<sup>\*</sup> The maximum color depth of this driver IC is 262K colors ,not 16.7M.

1.2 Display specification

Display	Descriptions	Note
LCD Type	a-Si TFT	-
LCD Mode	TN / Normal white	-
Polarizer Mode	Transmissive	-
Polarizer Surface	Normal	-
Pixel arrangement	RGB-stripe	-
Backlight Type	LED	-
Viewing Direction(Gray inversion)	6 O'clock Direction	1

Color tone is slightly changed by temperature and driving voltage.

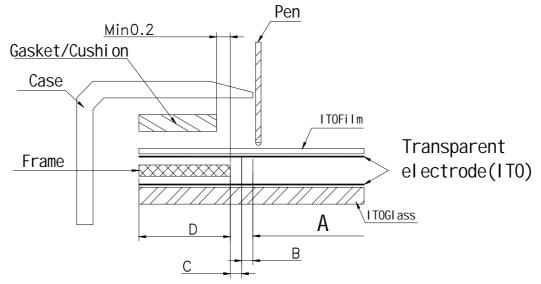
Note 1: The viewing direction defined in this specification is according to the rubbing direction of its TFT surface treatment by the TFT glass manufacturer. The grayscale inversion is at this direction as well. However, the optimal viewing direction for human view is normally where the color does NOT change to grayscale inversion, and this would be the opposite site of the specified viewing direction in this specification. In any case we advise customers to judge by themselves, and be aware of this phenomenon.



U.R.T.

### 1.3 Outline dimension

# Structure and Area definition



### A:Active area

The area which guarantees a touch panel operation with the following characteristics when passed.

- (1)Operation force, (2)Electric characteristics,
- (3) Tapping durability, (4) Pen sliding durability.

### B:operatiom non-guaranteed area

The area which does not guarantee a touch panel operation and its function.when this area is pressed, touch panel shows degradation of its performance and durability such as a pensliding durability becomes about one-tenth compared with theactive area(Area-(a) as guaranteed area) and its operation forcerequires about double. About 0.5mm outside from a boundary of the active corresponds to this area.

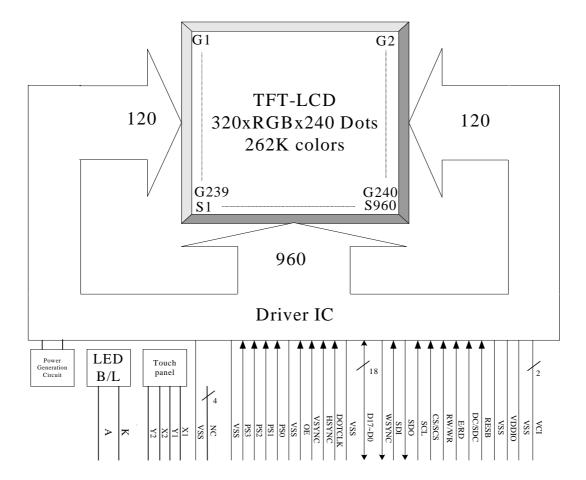
## C:Pressing prohibition area.

The area which forbids pressing, because an excessive load is applied a transparent electrode and a serious damage is given to touch panel function by pressing.

#### D:Non-Active area

The area which does not activate even if passed.

# 1.4 Block diagram:



# 1.5 Interface pin:

Pin No.	Pin Name	I/O	Description			
1~2	VCI	P	Booster input voltage pin.			
3	VSS	P	System ground pin of the IC.			
4	VDDIO	P	Voltage input pin for logic I/O.			
5	VSS	P	System ground pin of the IC.			
6	RESB	I	System reset pin.  - An active low pulse at this pin will reset the IC, Connect to VDDIO in normal operation.			
7	DC/SDC	I	Data or command.  DC : Parallel Interface.  SDC : Serial Interface.			
8	E/RD	I	6800-system : E (enable signal) 8080-system : RD (read strobe signal) Serial mode : Not used and should be connected to VDDIO or Vs			
9	RW/WR	I	6800-system: RW (indicates read cycle when High, write cycle when Low) 8080-system: WR (write strobe signal)			
10	CS/SCS	I	CS: Chip Select pin for 6800/8080 Parallel Interface. SCS: Chip Select pin for Serial Mode Interface.			
11	SCL	I	Serial clock input.			
12	SDO	0	Data output pin in serial interface.			
13	SDI	I	Data input pin in serial interface.			
14	WSYNC	0	Ram Write Synchronization outputLeave it OPEN when not used.			

Pin No.	Pin Name	I/O	Description
15	D17		
16	D16	1	
17	D15	1	
18	D14	1	
19	D13	1	
20	D12	1	
21	D11	1	
22	D10	1	
23	D9	1	For parallel mode, 8/9/16/18 bit interface.
24	D8	I/O	Please refer to Table 1.
25	D7	-	Unused pins should connect to VSS.
26	D6	-	
27	D5	-	
28	D4	1	
29	D3	1	
30	D2	1	
31	D1	-	
32	D0	-	
33	VSS	P	System ground pin of the IC.
34	DOTCLK	I	Dot-clock signal and oscillator source.
35	HSYNC	I	Line Synchronization input.
36	VSYNC	I	Frame/Ram Write Synchronization input.
37	OE	I	Display enable pin from controller.
38	VSS	P	System ground pin of the IC.
39	PS0		
40	PS1	I	Please refer to Table 1.
41	PS2		Ticase refer to Table 1.
42	PS3		
43	VSS	P	System ground pin of the IC.
44~47	NC	-	No connection.
48	VSS	P	System ground pin of the IC.
49	K	P	Backlight LED's cathode.
50	A	P	Backlight LED's anode.

# Touch panel:

Pin No.	Pin Name	I/O	Description
1	X1	I/O	Touch screen.
2	Y1	I/O	Touch screen.
3	X2	I/O	Touch screen.
4	Y2	I/O	Touch screen.

## Table 1.

PS3	PS2	PS1	PS0	Interface Mode	Data bus input
0	0	0	0	16-bit 6800 parallel interface	D[17:10], D[8:1]
0	0	0	1	8-bit 6800 parallel interface	D[17:10]
0	0	1	0	16-bit 8080 parallel interface	D[17:10], D[8:1]
0	0	1	1	8-bit 8080 parallel interface	D[17:10]
				9-bit generic D[9:16] (262k	
0	1	o	0	colour) + 3-wire SPI If 65K	
"	1	"	0	color, D12 shorts to D17	
				internally	
0	1	0	1	16-bit generic (262k colour) + 3-wire SPI	
0	1	1	0	18-bit generic (262k colour) + 3-wire SPI	
0	1	1	1	6-bit generic D[8:3] (262k colour) +	
	1	1	1	3-wire SPI	
1	0	0	0	18-bits 6800 parallel interface	D[17:0]
1	0	0	1	9-bits 6800 parallel interface	D[17:9]
1	0	1	0	18-bit 8080 parallel interface	D[17:0]
1	0	1	1	9-bit 8080 parallel interface	D[17:9]
1	1	1	0	3-wire SPI	
1	1	1	1	4-wire SPI	

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# 2. ELECTRICAL CHARACTERISTICS

# **2.1 Absolute Maximum Ratings**

Items	Symbol	Min.	Max.	Unit
Input voltage	VCI	VSS-0.3	5.0	V
Supply Voltage	VDDIO	VSS-0.3	4.0	V
Operate temperature range	ТОР	-20	70	°C
Storage temperature range	TST	-30	80	°C

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### 2.2 DC Characteristics

Items	Symbol	Min.	Тур.	Max.	Unit	Condition
Power supply voltage	VCI	2.5	3.3	3.6	v	
Power supply pin of IO pins	VDDIO	1.4	3.3	3.6	v	
Current consumption	IVCI+IVDDIO	-	-	10	mA	NOTE
Dot Clock	DCK	-	5.5	8.2	MHz	

NOTE: The method to illuminate the LCD panel is using the 2-5-4commend under the measuring condition.

Measuring Condition:

Standard Value MAX.

Ta = 25°C

 $V_{CI} = 3.3V$ 

VDDIO = 3.3V

Dot Clock = 5.5MHz

Display Patten = Checkered pattern



0 gray black pattern

## 2.2.1 Back-light Characteristics

Parameter	Symbol	Min	Тур	Max	Unit	Test Condition	Note
Supply Current	If	-	20	-	mA	Ta=25°℃	-
Supply Voltage	VF	18.6	20.4	22.2	V	Ta=25°℃	-
Half-Life Time	Lf	-	50000	-	hrs	Ta=25°C	1

Note1: The "Half-Life Time" is defined as the LED chip brightness decreases to 50% than original brightness, Based on Ta 25±2°C,60±10% RH condition.

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# 2.3 Command ( Recommend by U.R.T. )

# 1. LCD\_Initial\_SSD2119:(for 16bit 8080 interface)

COMMAND	CODE	DESCRIPTION
ROOH	0001	OSCEN=1
R10H	0000	Sleep=0
R07H	0033	Display control. CM=0
R11H	6870	65K color, X, Y auto increase ,updated in horizontal direction
RO2H	0600	line inversion
R03H	4A38	VGH/VGL=5/-3
R01H	70EF	Gate lines =240
ROFH	0000	Start scan line = 0
R25H	A000	Frame frequency
R28H	0006	Enable R25, R29 register
R12H	0999	Sleep mode
R26H	3800	Analogue setting
ROBH	5308	Frequency
ROCH	0004	VCIX2
RODH	000F	VLCD63
R0EH	1B00	VCOML
R1EH	00B5	VСОМН
R44H	EF00	HAS and HEA station
R45H	0000	Vertical address start station
R46H	013F	Vertical address end station
R30H	0000	Gamma B control 1
R31H	0101	Gamma B control 2
R32H	0100	Gamma B control 3
R33H	0305	Gamma B control 4
R34H	0707	Gamma B control 5
R35H	0305	Gamma B control 6
R36H	0707	Gamma B control 7
R37H	0201	Gamma B control 8
R3AH	1200	Gamma B control 9
R3BH	0900	Gamma B control 10
R22H		Write data to RAM

# 2. LCD\_Initial\_SSD2119:(for 18bit+3wire SPI and 4wire SPI)

COMMAND	CODE	DESCRIPTION
R00H	0001	OSCEN=1
R10H	0000	Sleep=0
R07H	0033 Display control. CM=0	
		DFM[1:0] : 262k Color Mode
		DenMode = 1 : RGB interface ignore
R11H	4E70	HSYNC, VSYNC pin and HBP, VBP
		WMode = 1 : Write RAM from Generic
		RGB data (POR, if PS:00xx)
R02H	0600	line inversion
R03H	6A38	VGH/VGL=5/-3
R01H	70EF	Gate lines =240
R28H	0006	Enable R25, R29 register
R12H	0999	Sleep mode
R26H	3800	Analogue setting
ROCH	0004	VCIX2
R0DH	000F	VLCD63
ROEH	1B00	VCOML
R1EH	00B5	VCOMH
R15H	0058	Entry mode
R30H	0000	Gamma B control 1
R31H	0101	Gamma B control 2
R32H	0100	Gamma B control 3
R33H	0305	Gamma B control 4
R34H	0707	Gamma B control 5
R35H	0305	Gamma B control 6
R36H	0707	Gamma B control 7
R37H	0201	Gamma B control 8
R3AH	1200	Gamma B control 9
R3BH	0900	Gamma B control 10
R22H		Write data to RAM

### 2.4 AC Characteristics

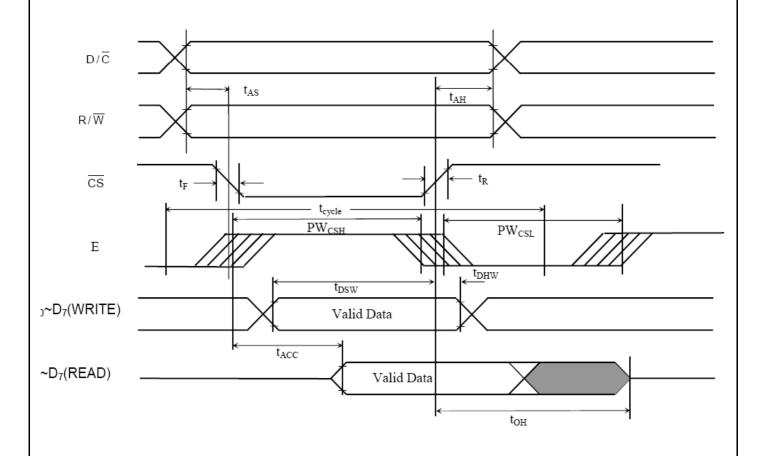
## 2.4.1 Parallel 6800 Timing Characteristics

(T<sub>A</sub> = -40 to 85°C,  $V_{DDIO}$  = 1.4V to 3.6V)

Symbol	Parameter	Min	Тур	Max	Unit
t <sub>cycle</sub>	Clock Cycle Time (write cycle)	75	-	-	ns
t <sub>cycle</sub>	Clock Cycle Time (read cycle)	1000	-	-	ns
t <sub>AS</sub>	Address Setup Time (R/W)	0	-	-	ns
t <sub>AH</sub>	Address Hold Time $(R/\overline{W})$	0	-	-	ns
t <sub>DSW</sub>	Data Setup Time (D0~D7, WRITE)	5	-	-	ns
t <sub>DHW</sub>	Data Hold Time (D0~D7, WRITE))	5	-	-	ns
t <sub>ACC</sub>	Data Access Time (D0~D7, READ)	250	-	-	ns
toH	Output Hold time (D0~D7, READ)	100	-	-	ns
PW <sub>CSL</sub>	Pulse width /CS low (write cycle)	40	-	-	ns
PW <sub>CSH</sub>	Pulse width /CS high (write cycle)	25	-	-	ns
PW <sub>CSL</sub>	Pulse width /CS low (read cycle)	500	-	-	ns
PWcsh	Pulse width /CS high (read cycle)	500	-	-	ns
t <sub>R</sub>	Rise time (/CS)	-	-	4	ns
t <sub>F</sub>	Fall time (/CS)	-	-	4	ns

Note: CS can be pulled low during the write cycle, only /RW is needed to be toggled

### Parallel 6800-series Interface Timing Characteristics



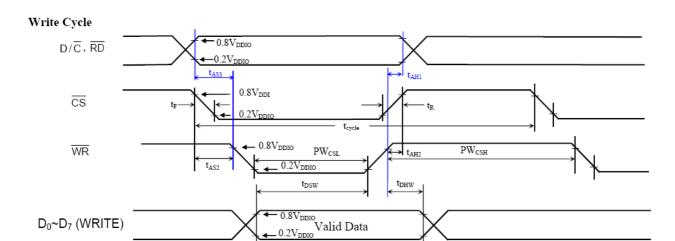
## 2.4.2 Parallel 8080 Timing Characteristics

 $(T_A = -40 \text{ to } 85^{\circ}\text{C}, V_{DDIO} = 1.4 \text{V to } 3.6 \text{V})$ 

Symbol	Parameter	Min	Тур	Max	Unit
t <sub>cycle</sub>	Clock Cycle Time (write cycle)	75	-	-	ns
t <sub>cycle</sub>	Clock Cycle Time (read cycle)	1000	-	-	ns
t <sub>AS1</sub>	Address Setup Time between (R/ $\overline{\mathrm{W}}$ ) and D/ $\overline{\mathrm{C}}$	0	-	-	ns
t <sub>AH1</sub>	Address Hold Time between ( $R/\overline{W}$ ) and $D/\overline{C}$	0	-	-	ns
t <sub>AS2</sub>	Address Setup Time between ( $R/\overline{W}$ ) and $\overline{CS}$	0	-	-	ns
t <sub>AH2</sub>	Address Hold Time between ( $R/\overline{W}$ ) and $\overline{CS}$	0	-	-	ns
t <sub>DSW</sub>	Data Setup Time (D0~D7, WRITE)	5	-	-	ns
t <sub>DHW</sub>	Data Hold Time (D0~D7, WRITE))	5	-	-	ns
t <sub>ACC</sub>	Data Access Time (D0~D7, READ)	250	-	-	ns
t <sub>OH</sub>	Output Hold time (D0~D7, READ)	100	-	-	ns
$PW_{CSL}$	Pulse width /CS low (write cycle)	40	-	-	ns
PWcsh	Pulse width /CS high (write cycle)	25	-	-	ns
$PW_{CSL}$	Pulse width /CS low (read cycle)		-	-	ns
PWcsh	Pulse width /CS high (read cycle)	500	-	-	ns
t <sub>R</sub>	Rise time (/CS)	-	-	4	ns
$t_{F}$	Fall time (/CS)	-	-	4	ns

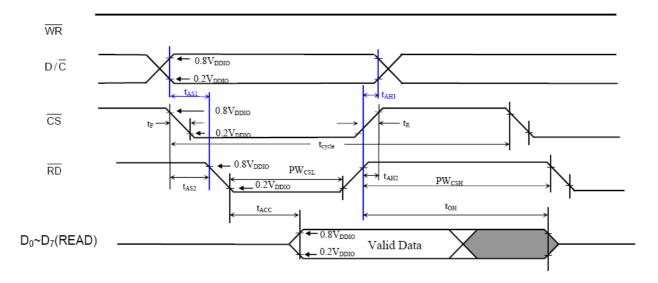
Note: CS can be pulled low during the write cycle, only /RW is needed to be toggled

### Parallel 8080-series Interface Timing Characteristics



Remark: It's highly recommended that  $\overline{\text{RD}}$  remains high for the whole write cycle

#### Read Cycle



**U.R.T.** 

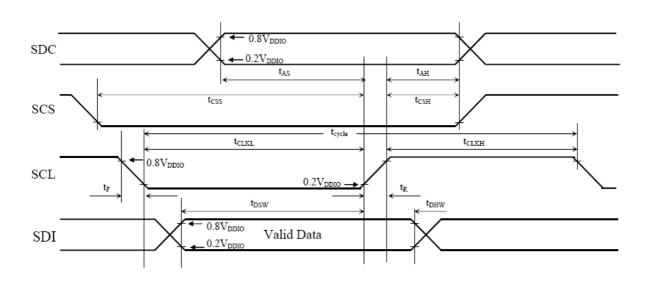
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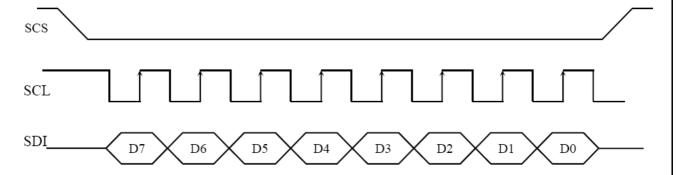
# **2.4.3** Serial Timing Characteristics

(T<sub>A</sub> = -40 to 85°C,  $V_{DDIO}$  = 1.4V to 3.6V )

Symbol	Parameter	Min	Тур	Max	Unit
t <sub>cycle</sub>	Clock Cycle Time	77	-	-	ns
f <sub>CLK</sub>	Serial Clock Cycle Time SPI Clock tolerance = +/- 2 ppm	-	-	15	MHz
t <sub>AS</sub>	Register select Setup Time	4	-	-	ns
t <sub>AH</sub>	Register select Hold Time	5	-	-	ns
t <sub>CSS</sub>	Chip Select Setup Time	2	-	-	ns
t <sub>CSH</sub>	Chip Select Hold Time	10	-	-	ns
t <sub>DSW</sub>	Write Data Setup Time	5	-	-	ns
t <sub>OHW</sub>	Write Data Hold Time	10	-	-	ns
t <sub>CLKL</sub>	Clock Low Time	38	-	-	ns
t <sub>CLKH</sub>	Clock High Time	38	-	-	ns
t <sub>R</sub>	Rise time	-	-	4	ns
t <sub>F</sub>	Fall time	-	-	4	ns

### 4 wire Serial Timing Characteristics





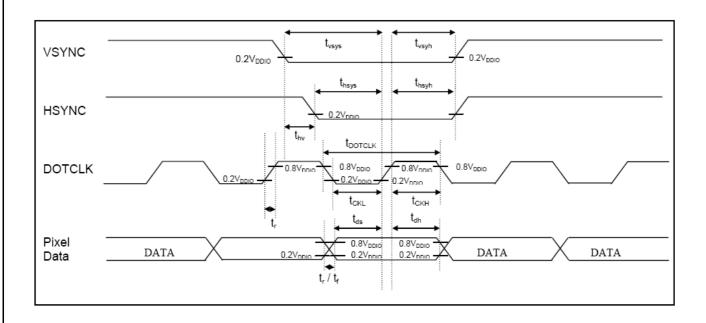
# 2.4.4 RGB Timing Characteristics

 $(T_A = -40 \text{ to } 85^{\circ}\text{C}, V_{DDIO} = 1.4 \text{V to } 3.6 \text{V})$ 

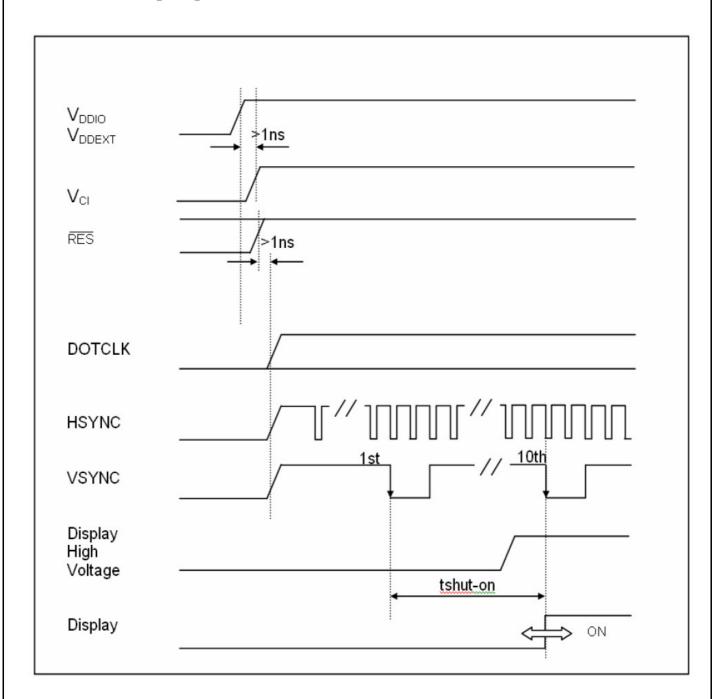
Symbol	Parameter	Min	Тур	Max	Unit
fDOTCLK	DOTCLK Frequency (70Hz frame rate)	1	5.5	8.2	MHz
tDOTCLK	DOTCLK Period	122	182	1000	us
t <sub>VSYS</sub>	Vertical Sync Setup Time	20	-	-	ns
t <sub>VSYH</sub>	Vertical Sync Hold Time	20	-	-	ns
t <sub>HSYS</sub>	Horizontal Sync Setup Time	20	-	-	ns
t <sub>HSYH</sub>	Horizontal Sync Hold Time	20	-	-	ns
t <sub>HV</sub>	Phase difference of Sync Signal Falling Edge	0	-	320	tDOTCLK
t <sub>CLK</sub>	DOTCLK Low Period	61	-	-	ns
t <sub>CKH</sub>	DOTCLK High Period	61	-	-	ns
t <sub>DS</sub>	Data Setup Time	25	-	-	ns
t <sub>DH</sub>	Data hold Time	25	-	-	ns
t <sub>RES</sub>	Reset pulse width	8			ns

Note: External clock source must be provided to DOTCLK pin of SSD2119. The driver will not operate in absence of the clocking signal.

## **RGB Timing Characteristics**

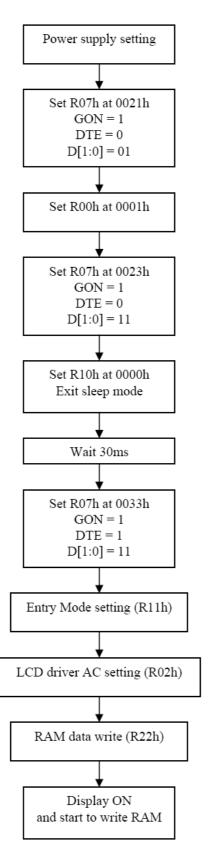


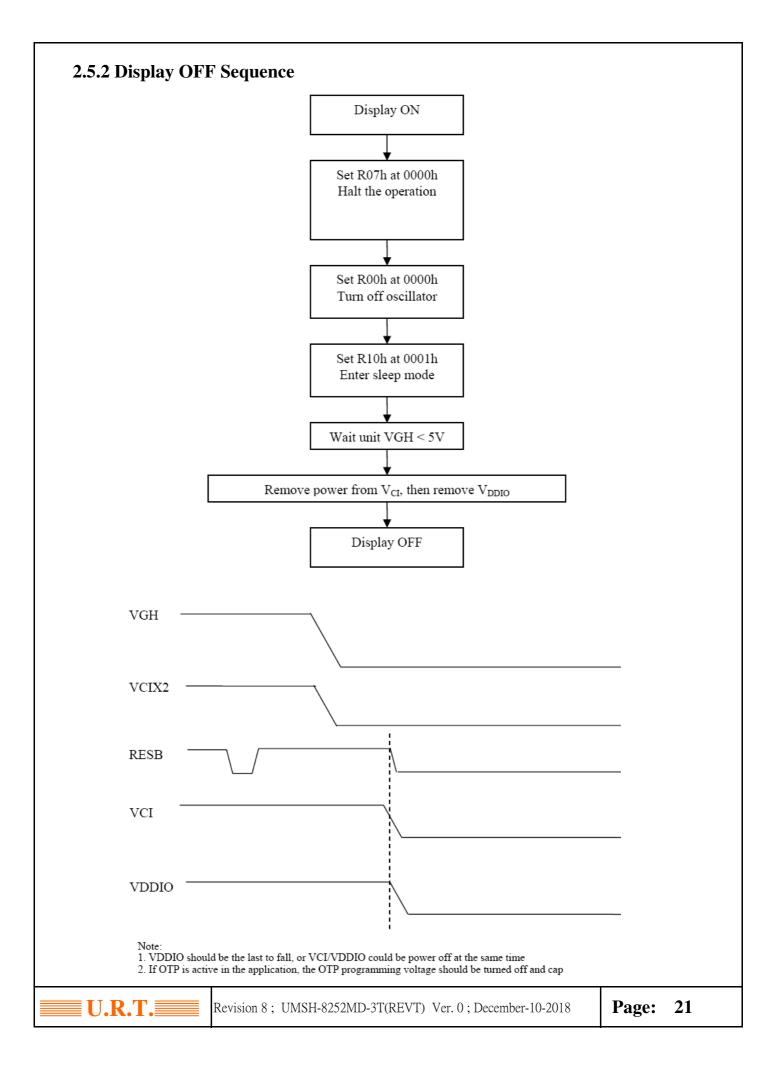
# 2.4.5 Power Up Sequence



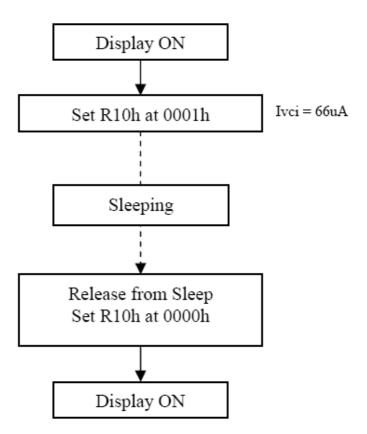
## 2.5 DISPLAY SETTING SEQUENCE

## 2.5.1 Display ON Sequence





# 2.5.3 Sleep Mode Display Sequence



# 2.6 Touch Panel Specifications

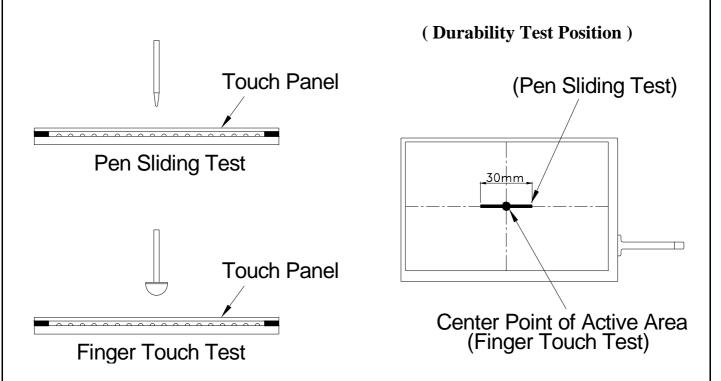
Display	Descriptions	Note
Туре	4-wires Analog Resistive Touch Panel	-
Structure	ITO Film: T=0.188mm	-
Structure	ITO Glass: T=0.7mm	-
Surface Hardness	3Н	3H pencil, pressure 500g/45°
Input mode	Stylus or Finger	-
Operating Force	> 80gf	Stylus R0.8mm (Active Area
Connector Type	FPC	

# 2.6.1 Electric Characteristics

Items	Descriptions	Note
Linearity	X-axis 1.5%	Active Area toward
Linearity	Y-axis 1.5%	inner 2mm
Terminal Resistance	X-axis: 450 1050Ω	-
Terminal Resistance	Y-axis: 50 650Ω	-

# 2.6.2 Durability Test

Items	Condition
Finger Touch Test	Repeating impact the surface of touch panel 1,000k times by R8.0 silicon rubber under 250g loading and 2 times/sec speed.
Pen Sliding Test	Drawing line in 30mm length at same location of touch panel surface 100k times by R0.8mm plastic stylus under 250g loading and 60mm/sec moving speed.



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## 3. OPTICAL CHARACTERISTICS

## 3.1 Characteristics

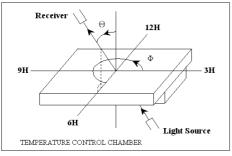
Electrical and Optical Characteristics

No.	Item	-		symbol /	temp.	Min.	Тур.	Max.	Unit	Note
1	Response	Time	2	Tr+Tf	θ=Φ=0°	-	25	-	ms	2
		Hon		$\theta_{2+}$	Ф=0°	60	70	-		
2	Viewing	Hor.	C. > 10	$\theta_{2}$	Ф=180°	60	70	-	doomoo	3
2	Angle	Von	Cr≧10	$\theta_{1+}$	Ф=270°	60	70	-	degree	3
		Ver.		$\theta_{1}$	Ф=90°	45	60	ı		
3	Contrast	Ratio		Cr	25 ℃	150	200		-	4
	Red x-code Red y-code		Rx		0.55	0.60	0.65			
			Ry		0.29	0.34	0.39			
	Green x-c	code		Gx		0.29	0.34	0.39		
	Green y-c	code		Gy		0.54	0.59	0.64	-    -	5
4	Blue x-co	ode		Bx	25 ℃	0.09	0.14	0.19		
	Blue y-co	ode		Ву		0.05	0.10	0.15		
	White x-code White y-code Brightness			Wx		0.27	0.32	0.37		
				Wy		0.30	0.35	0.40		
			Y		220	280	ı	cd/m <sup>2</sup>		
5	Brightnes Uniform				25 ℃	80	-	-	%	6

## 3.2 Definition of optical characteristics

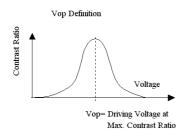
#### **Measurement condition:**

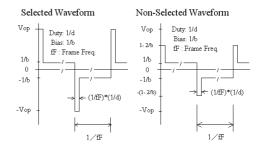
Transmissive and Transflective type



PHOTAL LCD-5000

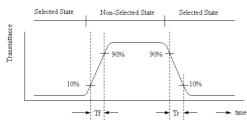
### [Note 1] Definition of LCD Driving Vop and Waveform :





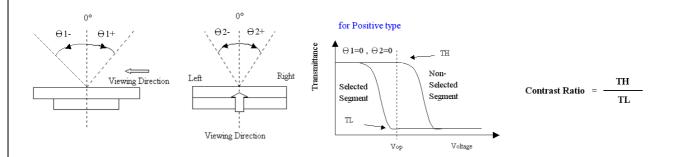
### [Note 2] Definition of Response Time

for Positive type

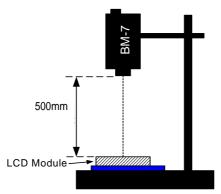


### [Note 3] Definition of Viewing Angle:

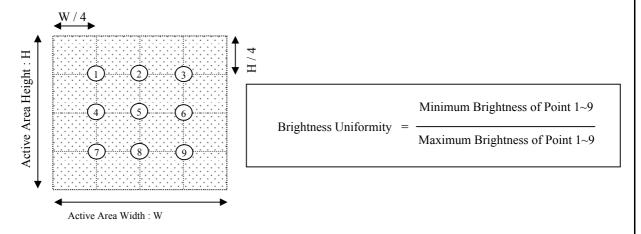
### [Note 4] Definition of Contrast Ratio:



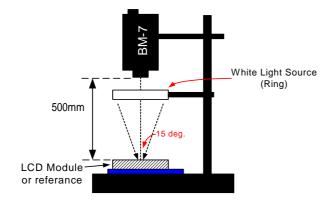
[Note 5] Definition of measurement of Color Chromaticity and Brightness



[Note 6] Definition of Brightness Uniformity



[Note 7] Definition of Measurement of Reflectance



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### 4. RELIABILITY:

Item No	Items	Condition	Note
1	High temperature operating	70 , 200 hours	1
2	Low temperature operating	-20 , 200 hours	1
3	High temperature storage	80 , 200 hours	1
4	Low temperature storage	-30 , 200 hours	1
5	High temperature & humidity storage	60 , 90%RH, 100 hours	2
6	Thermal Shock storage	-30 , 30min.<=> 80 , 30min. 10 Cycles	1
7	Vibration test	10 => 55 => 10 => 55 => 10 Hz, within 1 minute Amplitude: 1.5mm. 15 minutes for each Direction ( X,Y,Z )	
8	Drop test	Packed, 100CM free fall, 6 sides, 1 corner, 3edges	
9	Life time	50,000 hours 25 , 60%RH , specification condition driving	

- Note 1: The product move into the room temperature for at least 2 hours with no condensation.
- Note 2: The product move into the room temperature for at least 24 hours with no condensation.
- Note 3: Please change the display picture (autorun) during operating mode. Avoid displaying static images to avoid image sticking, and the image sticking is accelerated by temperature.
  - \* One single product test for only one item.
  - \* Judgment after test: keep in room temperature for more than 2 hours.
    - Current consumption < 2 times of initial value
    - Contrast > 1/2 initial value
    - Function : work normally

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#### 5. PRODUCT HANDLING AND APPLICATION

#### PRECAUTION FOR HANDLING LCM

The LCD module contains a C-MOS LSI. People who operate the LCM should wear

ESD protection eguipement to prevent ESD hurt on products.

Do not input any signal before power is turned on.

Do not take LCM from its packaging bag until it is assembled.

Peel off the LCM protective film slowly since static electricity may be generated.

Pay attention to the humidity of the work shop, 50~60%RH is satisfactory.

Use a non-leak iron for soldering LCM.

Do not touch the display surface or connection terminals area with bare hands. Smudges on the display surface reduce the insulation between terminals.

Cautions for soldering to LCM:

Condition for soldering I/O terminals:

Temperature at iron tip:  $350 \pm 15$ .

Soldering time: 3~4sec./ terminals.

Type of solder: Eutectic solder(rosin flux filled).

#### PRECAUTION IN USE OF LCD

Do not contact or scratch the front surface and the contact pads of a LCD panel with hard materials such as metal or glass or with one's nail.

To clean the surface, wipe it gently with soft cloth dampened by alcohol.

Do not attempt to wiped off the contact pads.

Keep LCD panels away from direct sunlight, also avoid them in high-temperature & high humidity environment for a long period.

Do not drive LCD panels by DC voltage.

Do not expose LCD panels to organic solvent.

Liquid in LCD is hazardous substance. In case a contact with liquid crystal material is occured, be sure to immediately wash such material away by soap and water.

The polarizer is easily damaged and should be handle with special care. Don't press or rub it with hard objects.

#### PRECAUTION FOR STORING AND USE OF LCM

To avoid degradation of the device , do not store the module under the conditions of direct sunlight , high temperature or high humidity . Keep the module in bags designed to prevent static electricity charging under low temperature / normal humidity conditions(avoid high temperature / high humidity and low temperature below 0 )

Never use the LCD , LCM under  $45~\mathrm{Hz}$  , the liquid crystal will decomposition and cause permently damage on display !!

#### USING ON MEDICAL CARE, SAFETY OR HAZARDOUS APPLICATION OR SYSTEM

For the application in medical care, safety and hazardous products or systems, an authorization from URT is required. URT will not responsible for any damage or loss which caused by the products without any authorization given by URT.

This product is not allowed to be designed and used for military application and/or purpose.

The delivery of this product to the countries and/or regions where the embargoes are imposed by U.N. is prohibited.

The application and delivery of this product must comply with Startegic High-Tech Commodities (SHTC) export control and the sales to the embargoed and/or sanctioned countries or regions are strictly prohibited.

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### 6. DATE CODE OF PRODUCTS

Date code will be shown on each product :

**YY MM DD** - **XXXX** 

Year Month Day - Production lots

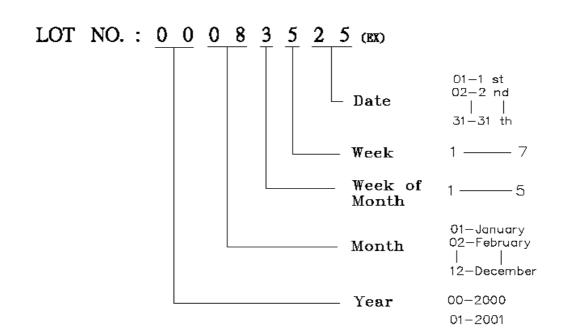
Example: 121108 - 0003 ==> Year 2012, November,8th, Batch no.0003

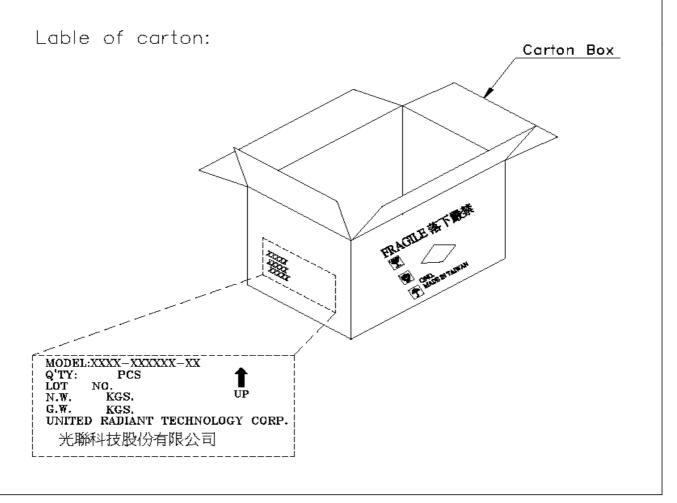
Note: The lot no. attached on the packing box will be used for tracking once the part is too small to print the date code.

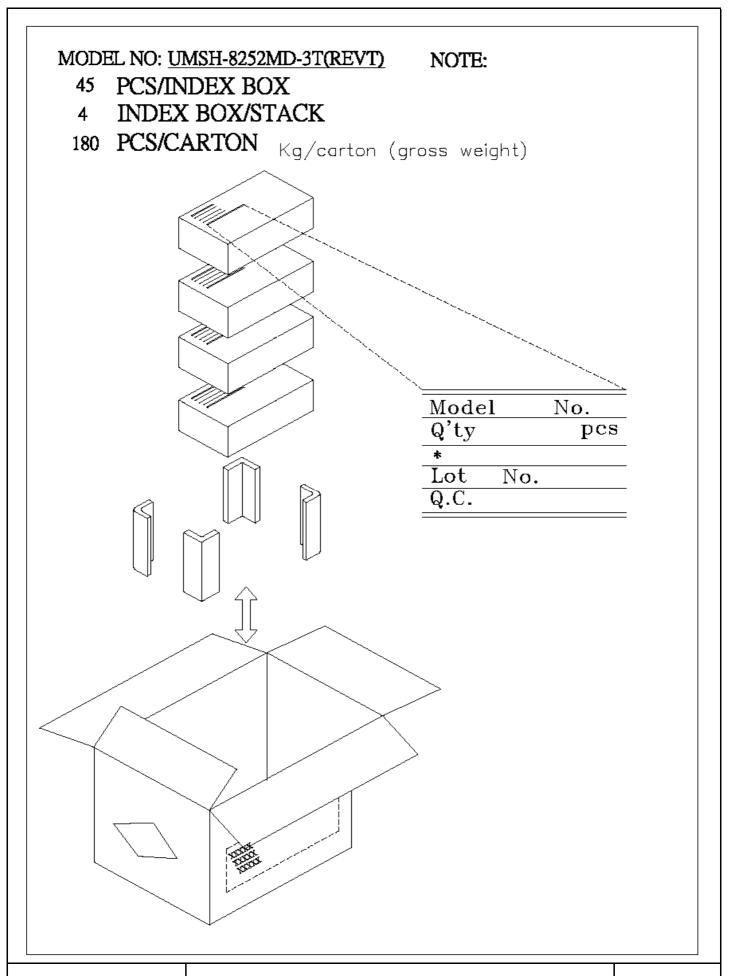
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### 7. PACKING

Instruction of lot number:







### 8. INSPECTION STANDARD

### **8.1. QUALITY:**

THE QUALITY OF GOODS SUPPLIED TO PURCHASER SHALL COME UP TO THE FOLLOWING STANDARD.

#### 8.1.1. THE METHOD OF PRESERVING GOODS

AFTER DELIVERY OF GOODS FROM U.R.T. TO PURCHASER. PURCHASER SHALL CONTROL THE LCM
AT -10 40 ,AND IT MIGHT BE DESIRABLE TO KEEP AT THE NORMAL ROOM TEMPERATURE
AND HUMIDITY UNTIL INCOMING INSPECTION OR THROWING INTO PROCESS LINE.

#### 8.1.2. INCOMING INSPECTION

(A) THE METHOD OF INSPECTION

IF PURCHASER MAKE AN INCOMING INSPECTION, A SAMPLING PLAN SHALL BE APPLIED ON THE CONDITION THAT QUALITY OF ONE DELIVERY SHALL BE REGARDED AS ONE LOT.

(B) THE STANDARD OF QUALITY

ISO-2859-1 (SAME AS MIL-STD-105E), LEVEL SINGLE PLAN.

CLASS	AQL(%)
CRITICAL	0.4 %
MAJOR	0.65 %
MINOR	1.5 %
TOTAL	1.5 %

EVERY ITEM SHALL BE INSPECTED ACCORDING TO THE CLASS.

#### (C) MEASURE

IF AS THE RESULT OF ABOVE RECEIVING INSPECTION , A LOT OUT IS DISCOVERED. PURCHASER SHALL BE INFORM SELLER OF IT WITHIN SEVEN DAYS. BUT FIRST SHIPMENT WITHIN FOURTEEN DAYS.

#### 8.1.3. WARRANTY POLICY

U.R.T. WILL PROVIDE ONE-YEAR WARRANTY FOR THE PRODUCTS ONLY IF UNDER SPECIFICATION OPERATING CONDITIONS. U.R.T. WILL REPLACE NEW PRODUCTS FOR THESE DEFECT PRODUCTS WHICH UNDER WARRANTY PERIOD AND BELONG TO THE RESPONSIBILITY OF U.R.T.

#### 8.2. CHECKING CONDITION

- **8.2.1.** CHECKING DIRECTION SHALL BE IN THE 45 DEGREE AREA TO FACE THE SAMPLE.
- **8.2.2.** CHECKER SHALL SEE OVER 300±25 mm. WITH BARE EYES FAR FROM SAMPLE AND USING 2 PCS. OF 20W FLUORESCENT LAMP.

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# 8.3. INSPECTION PLAN:

CLASS	ITEM	JUDGEMENT	CLASS
PACKING &	1. OUTSIDE AND INSIDE PACKAGE	"MODEL NO.", "LOT NO." AND "QUANTITY" SHOULD INDICATE ON THE PACKAGE.	Minor
INDICATE	2. MODEL MIXED AND QUANTITY	OTHER MODEL MIXEDREJECTED QUANTITY SHORT OR OVERREJECTED	Critical
	3. PRODUCT INDICATION	"MODEL NO." SHOULD INDICATE ON THE PRODUCT	Major
ASSEMBLY	4. DIMENSION, LCD GLASS SCRATCH AND SCRIBE DEFECT.	ACCORDING TO SPECIFICATION OR DRAWING.	Major
	5. VIEWING AREA	POLARIZER EDGE OR LCD'S SEALING LINE IS VISABLE IN THE VIEWING AREAREJECTED	Minor
	6. BLEMISH、BLACK SPOT、 WHITE SPOT IN THE LCD AND LCD GLASS CRACKS	ACCORDING TO STANDARD OF VISUAL INSPECTION (INSIDE VIEWING AREA)	Minor
APPEARANCE	7. BLEMISH、BLACK SPOT WHITE SPOT AND SCRATCH ON THE POLARIZER	ACCORDING TO STANDARD OF VISUAL INSPECTION ( INSIDE VIEWING AREA )	Minor
	8. BUBBLE IN POLARIZER	ACCORDING TO STANDARD OF VISUAL INSPECTION ( INSIDE VIEWING AREA )	Minor
	9. LCD'S RAINBOW COLOR	STRONG DEVIATION COLOR (OR NEWTON RING) OF LCDREJECTED. OR ACCORDING TO LIMITED SAMPLE (IF NEEDED, AND INSIDE VIEWING AREA)	Minor
	10. ELECTRICAL AND OPTICAL CHARACTERISTICS (CONTRAST, VOP, CHROMATICITY ETC)	ACCORDING TO SPECIFICATION OR DRAWING . ( INSIDE VIEWING AREA )	Critical
ELECTRICAL	11.MISSING LINE	MISSING DOT, LINE, CHARACTERREJECTED	Critical
	12.SHORT CIRCUIT, WRONG PATTERN DISPLAY	NON DISPLAY、WRONG PATTERN DISPLAY、CURRENT CONSUMPTION OUT OF SPECIFICATION REJECTED	Critical
	13. PIN HOLE、PATTERN DEFORMITY	ACCORDING TO STANDARD OF VISUAL INSPECTION	Minor

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# 8.4. STANDARD OF VISUAL INSPECTION NO CLASS ITEM

NO. CLAS	S ITEM	JUDGEM	IENT				
		(A) ROUND TYPE:	(A) ROUND TYPE: unit : mm.				
		DIAMETER (mm.)	ACCEPTABLE Q'TY				
		0.1	DISREGARD				
		0.1 < 0.3	3				
	BLACK AND WHITE SPOT	0.25 <	0				
R 4 1 MINO	FOREIGN MATERIEL R DUST IN THE CELL	NOTE: =(LENGTH+WIDTH)/2					
).4.1 NIII (C	BLEMISH	(B) LINEAR TYPE:	unit : mm.				
	SCRATCH	LENGTH WIDTH	ACCEPTABLE Q'TY				
		W 0.	03 DISREGARD				
		L 5.0 0.03 < W 0.	07 3				
		0.07< W	FOLLOW ROUND TYPE				
			unit : mm.				
		DIAMETER	ACCEPTABLE Q'TY				
	BUBBLE IN POLARIZER	0.2	DISREGARD				
3.4.2 MINO	R DENT ON POLARIZER	0.2 < 0.5	2				
		0.5 <	0				
	Dot Defect	Items Bright dot Dark dot	ACC. Q'TY  N 4  N 4				
3.4.3 MINO	R	Note 3: Dark dot: Dots appear da	e size of a defective dot ove ed as one defective dot. oright and unchanged in size splaying under black pattern				

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NO.	CLASS	ITEM	JUDGEMENT	
8.4.4	MINOR	CHIPPING	S	Y > S REJ.
8.4.5	MINOR	CHIPPING	SXX	X  or  Y > S REJ.
8.4.6	MAJOR	GLASS CRACK	Y	Y > (1/2) T REJ.
8.4.7	MAJOR	SCRIBE DEFECT	$A_{\uparrow} \stackrel{\downarrow}{\vdash}_{a} \stackrel{\downarrow}{\rightarrow} B$	<ol> <li>a&gt; L/3 , A&gt;1.5mm. REJ.</li> <li>B: ACCORDING TO DIMENSION</li> </ol>
8.4.8	MINOR	CHIPPING (ON THE TERMINAL AREA)	T	= (x+y)/2 > 2.5 mm REJ.
8.4.9	MINOR	CHIPPING (ON THE TERMINAL SURFACE)	T Z X	Y > (1/3) T REJ.
8.4.10	MINOR	CHIPPING	T T Z	Y > T REJ.

### 8.5 INSPECTION STANDARD OF TOUCH PANEL

NO.	CLASS	ITEMS		JUDGEMENT				
8.5.1	MAJOR	To	ouch Panel Crack	Reject		et		
8.5.2	MINOR	Touch Panel Chipping	Corner	X Y T	Not CNC Products  CNC Products	X 2mm, Y 2mm, Z < 1/2T For CNC Outline Dimension	Accept Accept	
			Edge	x y	Not CNC Products  CNC Products	X 3mm, Y 3mm, Z < 1/2T For CNC Outline Dimension	Accept Accept	
				W 0.05, I	L 10mm	Acce	pt	
8.5.3	MINOR	Scratch Dust and Foreign materiel (Linear Type)		07mm; L 5.0n en seratch > 5.0m		_		
			W>(	0.07mm	Rejec	et		
8.5.4	MINOR	Scratch Dust and Foreign materiel (Round Type: =(Length+Width)/2)		0.25mm <	0.25mm 0.35mm een spots > 5.0mm	Acce Acce 5 ea I	ot	
				> 0.35mm		Rejec		
8.5.5	MINOR	Touch Panel Dent / Fish Eyes		0.35mm < Distance	1.0mm > 5.0mm	Acce Acce 3 ea l	pt	
				> 1.0mm		Rejec		
8.5.6	MINOR	INOR Touch Panel Air Bubble		0.2mm  0.2mm < 0.5mm  Distance between bubbles > 5.0mm		Acce Acce 3 eal	pt	
				> 0.5mm		Rejec	et	
	8.5.7 MINOR	INOR Touch Panel Printing area Scratch	W 0.03, L 10mm		Acce	pt		
8.5.7			0.03mm < W 0.05mm, L 5mm Distance between scratch > 5.0mm			_		
			W > 0.05mm or L > 5mm ( W>0.05 Follow 8.5.4 Round type )		Reje	ct		
8.5.8	MINOR		ouch Panel Jaze Mark / Dust	Can not be removed		Rejec	Reject	

NO.	CLASS	ITEMS	JUDEGMENT		
8.5.9	MINOR -	Inerratic Newton ring (For Resistive Touch Panel)	1.Dimension of Newton ring > 1/3 V.A. area.  2.Dimension of Newton ring < 1/3 V.A. area, not affect font effec	Reject	
		Atactic Newton ring (For Resistive Touch Panel)	1.Dimension of Newton ring > 1/2 V.A. area.  2.Dimension of Newton ring < 1/2 V.A. area, not affect font effec	Reject	
8.5.10	MINOR	Touch Panel Film Bulge	Not affect the transmittance and clarity under lighting ambient.	Accept	