SPECIFICATION



Page: 1

OF

LIQUID CRYSTAL DISPLAY MODULE

Model No. :		D-3T(REVT)		
Model version:	0			
Document Revision	: <u> </u>			
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production and del order for this mode acknowledged and U.R.T. Joe Wu APPROVED	el no. will be treated a accepted by purchase UNIT Ashin Chiu CHECKED	er or customer. TED RADIANT To	Aug-13-2014 Date	

Revision 7; UMSH-8252MD-3T(REVT) Ver. 0; August-13-2014

■ U.R.T.■

		Revision record	
Document	Model No.	Description	Revision
Revision	Version No.	Description	by
	1		H.C. Lin
0	UMSH-8252MD-T		Jeffry Chen
	Version No. 0		19-Nov-2008
1	LIMOUL COCOMD 1TE		H.C. Lin
1	UMSH-8252MD-1T Version No. 0	Add touch panel on LCM.	Jeffry Chen
	version No. 0		5-Jan-2008
2	UMSH-8252MD-1T		Yu-Lun TSENG
۷	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
	V CISIOII IVO. 2		17-Sep-2009
4	UMSH-8252MD-1T		Ken Lin
-	Version No. 3	Modify the initial code.	Jeffry Chen
	version 110. 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
	, ordinar i voi o	UMSH-8252MD-1T toUMSH-8252MD-3T	28-Jul-2011
6	UMSH-8252MD-3T Version No. 1		William Don
Ü		Modify the initial code to improve the contrast.	Jeffry Chen
		1 Cl TD 4 1	23-Jan-2014
7	LINESTA COSCONED CONCENTEN	1. Change TP material.	William Don
		2. Modify module number from	Danny Jhuaung
	Version No. 0	UMSH-8252MD-3T (REV1) to UMSH-8252MD- 3T.(REVT)	13-Aug-2014
U.R.	Revision 7; U	MSH-8252MD-3T(REVT) Ver. 0 ; August-13-2014	Page: 2

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1. BASIC SPECIFICATION

1.1 Mechanical specifications

Items	Nominal Dimension	Unit
Active screen size	3.5" diagonal	ī
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	 8/ 9/ 16/ 18-bit 6800-series / 8080-series Parallel Interface Serial Peripheral Interface (SPI) 18-/6-bit RGB interface (DEN, DOTCLK, HSYNC, VSYNC, DB[17:0]) VSYNC interface (system interface + VSYNC) WSYNC interface (system interface + WSYNC) 	-
Driving IC Package	COG	1
Module weight	32	g

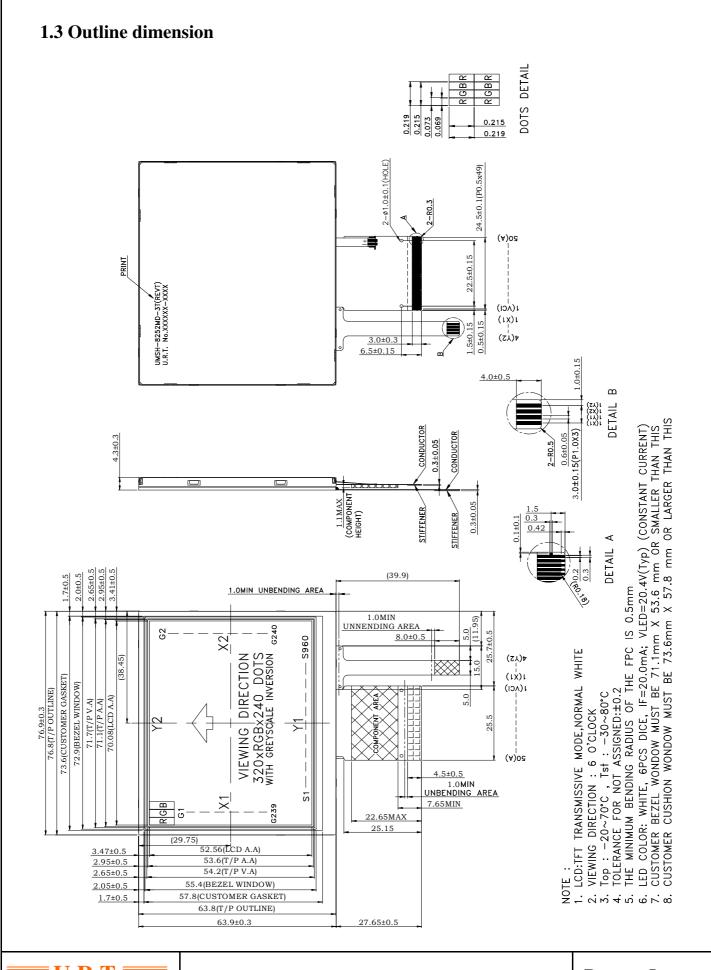
^{*} The maximum color depth of this driver IC is 262K colors ,not 16.7M.

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

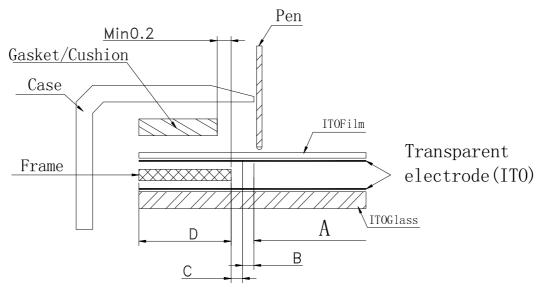
Color tone is slightly changed by temperature and driving voltage.

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.



1.3 Outline dimension

Structure and Area definition



A:Active area

The area which guarantees a touch panel operation withthefollowing 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.

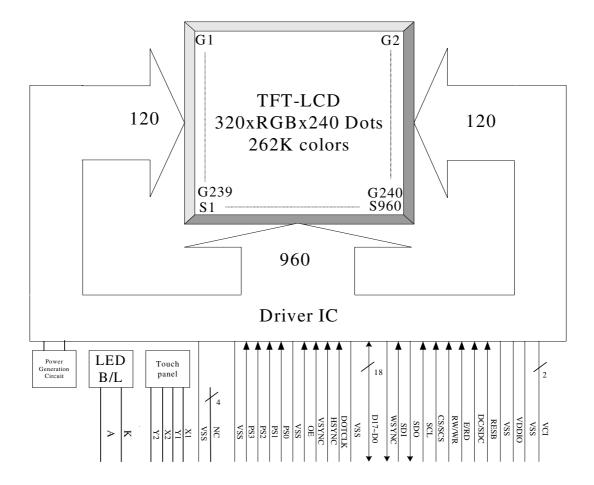
C:Pressing prohibition area.

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 V			
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	1	Unused pins should connect to VSS.
26	D6	1	
27	D5	1	
28	D4		
29	D3		
30	D2	1	
31	D1	1	
32	D0	1	
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		Truse leter 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	0	0	colour) + 3-wire SPI If 65K	
U	1	0	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) +	
0	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	

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	TOP	-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.

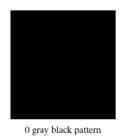
Ta = 25°C

 $V_{CI} = 3.3V$

VDDIO = 3.3V

Dot Clock = 5.5 MHz

Display Patten = Checkered pattern



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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°℃	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.

____U.R.T.____

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2-3 Command (Recommend by U.R.T.)

1. LCD_Initial_SSD2119:(for 16bit 8080 interface)

COMMAND	CODE	DESCRIPTION	
R00H	0001	OSCEN=1	
R10H	0000 Sleep=0		
R07H	0033	Display ∞ntrol. CM=0	
R11H	6870	65K color, X, Y auto increase ,updated in	
KIIH	0070	horizontal direction	
R02H	0600	line inversion	
R03H	4A38	VGH/VGL=5/-3	
R01H	70EF	Gate lines =240	
R0FH	0000	Start scan line = 0	
R25H	A000	Frame frequency	
R28H	0006	Enable R25, R29 register	
R12H	0999	Sleep mode	
R26H	3800	Analogue setting	
R0BH	5308	Frequency	
R0CH	0004	VCIX2	
R0DH	000F	VLCD63	
R0EH	1B00 VCOML		
R1EH	00B5	VCOMH	
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	
R0CH	0004	VCIX2	
R0DH	000F	VLCD63	
R0EH	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

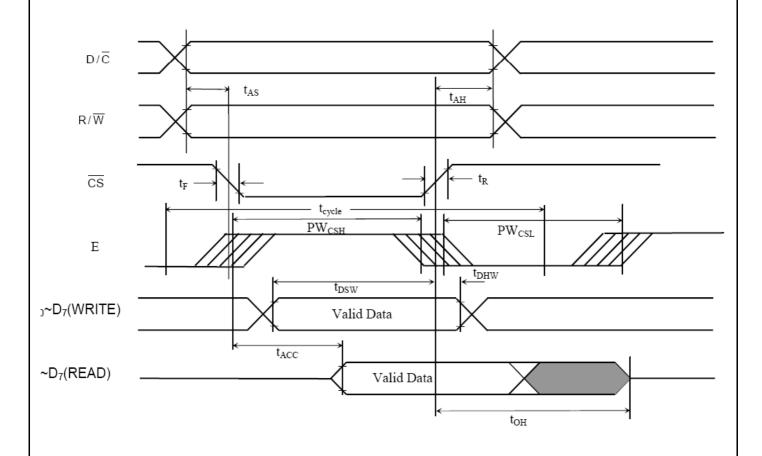
2-4-1 Parallel 6800 Timing Characteristics

(T_A = -40 to 85°C, V_{DDIO} = 1.4V to 3.6V)

Symbol	Parameter	Min	Тур	Max	Unit
t _{cycle}	Clock Cycle Time (write cycle)	75	-	-	ns
t _{cycle}	Clock Cycle Time (read cycle)	1000	-	-	ns
t _{AS}	Address Setup Time (R/W)	0	-	-	ns
t _{AH}	Address Hold Time (R/\overline{W})	0	-	-	ns
t _{DSW}	Data Setup Time (D0~D7, WRITE)	5	-	-	ns
t _{DHW}	Data Hold Time (D0~D7, WRITE))	5	-	-	ns
t _{ACC}	Data Access Time (D0~D7, READ)	250	-	-	ns
t _{OH}	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)		-	-	ns
t_R	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 6800-series Interface Timing Characteristics



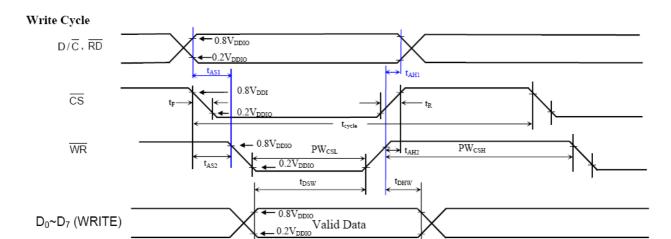
2-4-2 Parallel 8080 Timing Characteristics

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

Symbol	Parameter	Min	Тур	Max	Unit
t _{cycle}	Clock Cycle Time (write cycle)	75	-	-	ns
t _{cycle}	Clock Cycle Time (read cycle)	1000	-	-	ns
t _{AS1}	Address Setup Time between (R/ $\overline{\mathrm{W}}$) and D/ $\overline{\mathrm{C}}$	0	-	-	ns
t _{AH1}	Address Hold Time between (R/\overline{W}) and D/\overline{C}	0	-	-	ns
t _{AS2}	Address Setup Time between (R/\overline{W}) and \overline{CS}	0	-	-	ns
t _{AH2}	Address Hold Time between (R/\overline{W}) and \overline{CS}	0	-	-	ns
t _{DSW}	Data Setup Time (D0~D7, WRITE)	5	-	-	ns
t _{DHW}	Data Hold Time (D0~D7, WRITE))	5	-	-	ns
t _{ACC}	Data Access Time (D0~D7, READ)	250	-	-	ns
t _{OH}	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)		-	-	ns
t _R	Rise time (/CS)	-	-	4	ns
t_{F}	Fall time (/CS)	-	-	4	ns

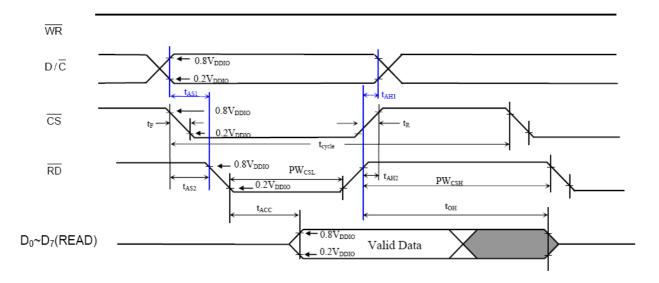
Note: CS can be pulled low during the write cycle, only /RW is needed to be toggled

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.

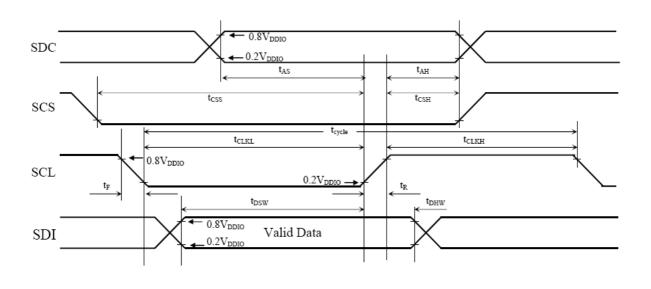
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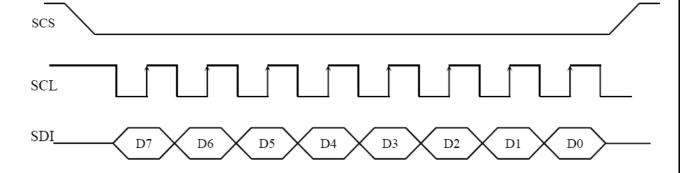
2-4-3 Serial Timing Characteristics

(T_A = -40 to 85°C, V_{DDIO} = 1.4V to 3.6V)

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

4 wire Serial Timing Characteristics





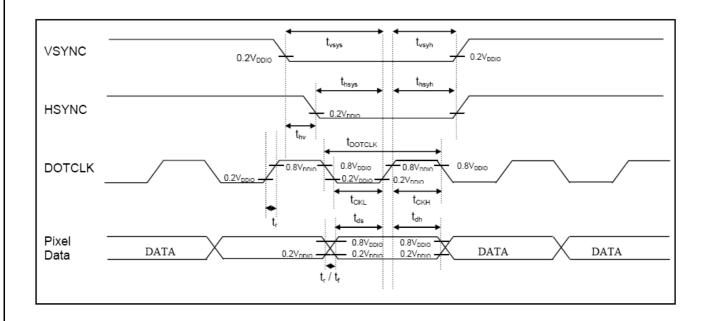
2-4-4 RGB Timing Characteristics

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

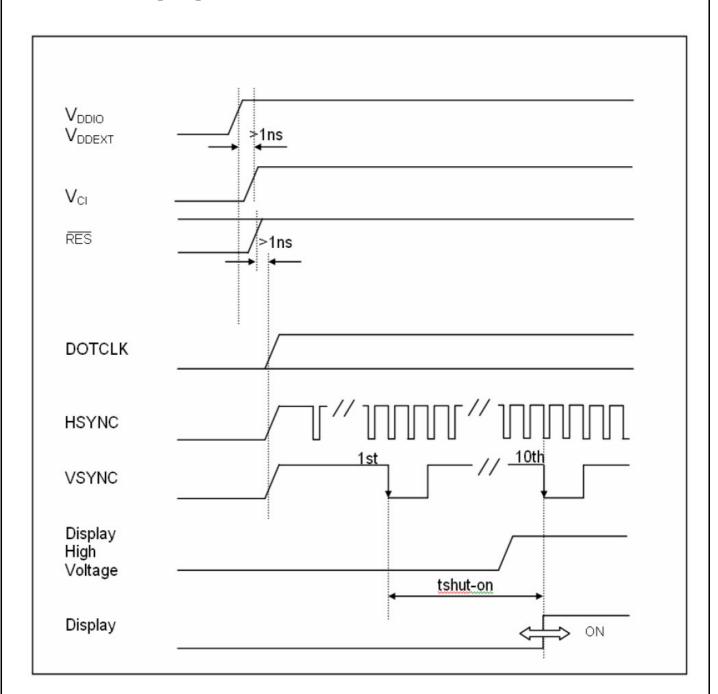
Symbol	Parameter	Min	Тур	Max	Unit
fDOTCLK	DOTCLK Frequency (70Hz frame rate)	1	5.5	8.2	MHz
tDOTCLK	DOTCLK Period	122	182	1000	us
t _{VSYS}	Vertical Sync Setup Time	20	-	-	ns
t _{VSYH}	Vertical Sync Hold Time	20	-	-	ns
t _{HSYS}	Horizontal Sync Setup Time	20	-	-	ns
t _{HSYH}	Horizontal Sync Hold Time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

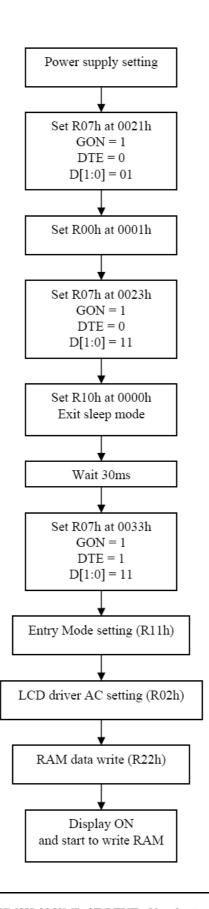


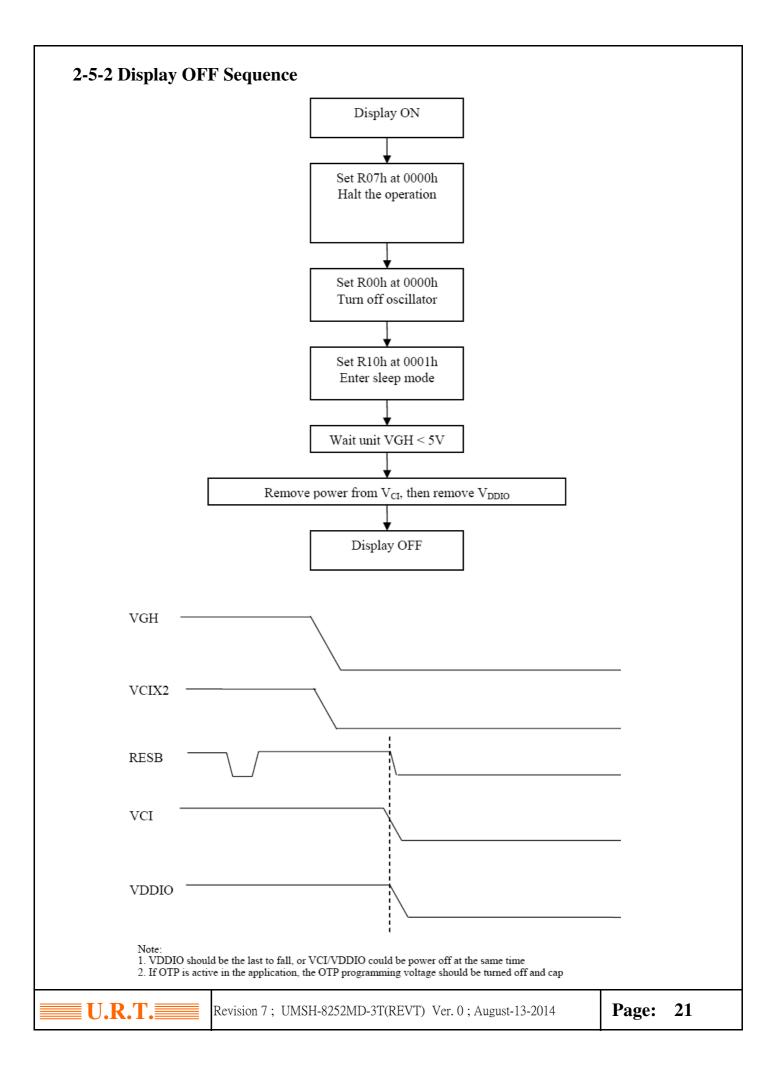
2-4-5 Power Up Sequence



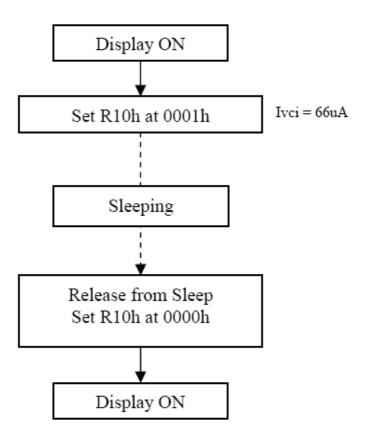
2-5 DISPLAY SETTING SEQUENCE

2-5-1 Display ON Sequence





2-5-3 Sleep Mode Display Sequence



2-6 Touch Panel Specifications

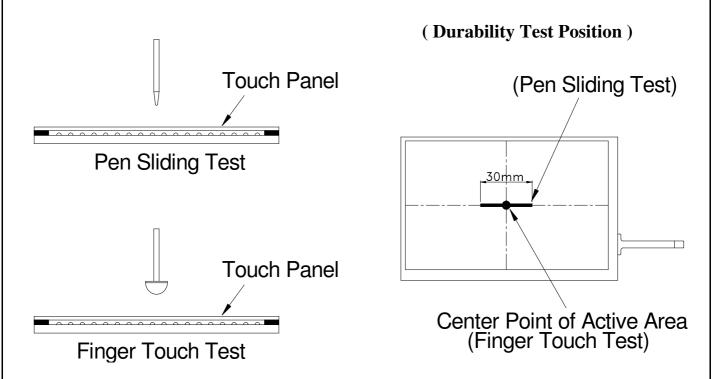
Display	Descriptions	Note
Туре	4-wires Analog Resistive Touch Panel	-
Stanistina	ITO Film: T=0.188mm	-
Structure	ITO Glass: T=0.7mm	-
Surface Hardness	≥ 3H	3H pencil, pressure 500g/45°
Input mode	Stylus or Finger	-
Operating Force	> 80gf	Stylus R0.8mm (Active Area
Connector Type	FPC	

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: $450 \sim 1050\Omega$	-
Terrimar Resistance	Y-axis: $50\sim650\Omega$	-

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

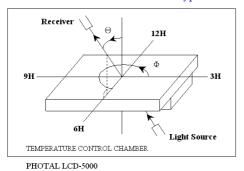
Electrical and Optical Characteristics

No.	Item		symbo	l / temp.	Min.	Тур.	Max.	Unit	Note	
1	Response Time		Tr+Tf	$\Theta = \Psi = 0^{\circ}$	ı	25	ı	ms	2	
		Hor.		⊖ ₂₊	0°	60	70	-		
	Viewing	пот.		Θ 2-	180°	60	70	-	doomoo	3
2	Angle	Ver.	Cr>=10	θ ₁₊	270°	60	70	-	degree	3
		ver.		θ ₁₋	90°	45	60	-		
3	Contrast	Ratio		Cr	25 ℃	150	200		-	4
	Red x-co	de		Rx		0.55	0.60	0.65		
	Red y-code			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		By		0.05	0.10	0.15		
	White x-code White y-code			Wx		0.27	0.32	0.37		
				Wy		0.30	0.35	0.40		
	Brightnes	SS		Y		220	280	-	cd/m ²	
5	Brightnes Uniform				25 ℃	80	-	-	%	6

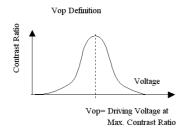
3.2 Definition of optical characteristics

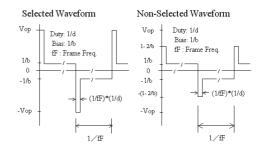
Measurement condition:

Transmissive and Transflective type



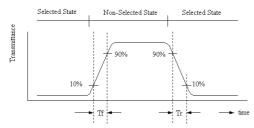
[Note 1] Definition of LCD Driving Vop and Waveform :





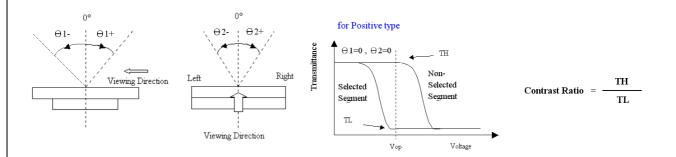
[Note 2] Definition of Response Time

for Positive type

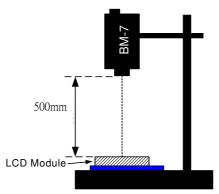


[Note 3] Definition of Viewing Angle:

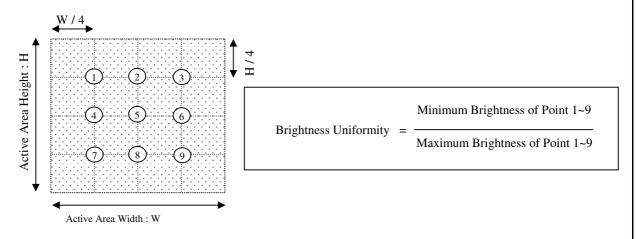
[Note 4] Definition of Contrast Ratio:



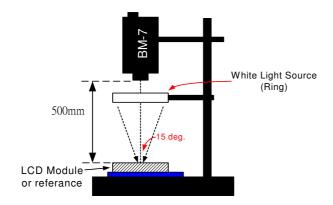
[Note 5] Definition of measurement of Color Chromaticity and Brightness



[Note 6] Definition of Brightness Uniformity



[Note 7] Definition of Measurement of Reflectance



4. RELIABILITY:

Item No	Items	Condition	Note
1	High temperature operating	70 °C , 200 hours	1
2	Low temperature operating	-20 °C , 200 hours	1
3	High temperature storage	80 °C , 200 hours	1
4	Low temperature storage	-30 °C , 200 hours	1
5	High temperature & humidity storage	60°C, 90%RH, 100 hours	2
6	Thermal Shock storage	-30°C, 30min.<=> 80°C, 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°C, 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

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°C ± 15 °C.

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 $0^{\circ}\mathbb{C}$)
- Never use the LCD, LCM under 45 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 :

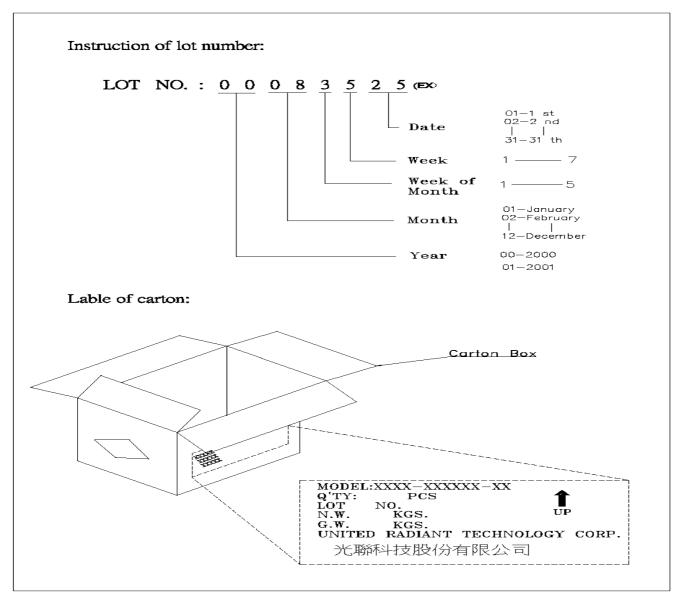
● YY MM DD - XXXX | Year Month Day - Production lots

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

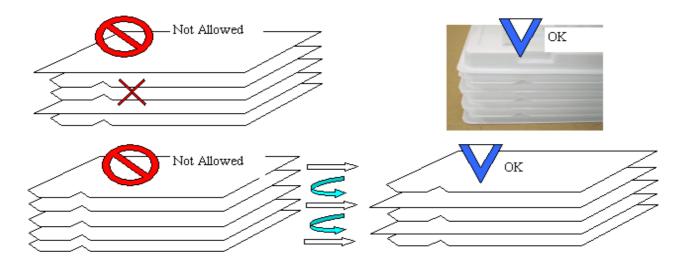
Note: The lot no. attached on the packing box will be used for tracking once the part is too small to print the date code.

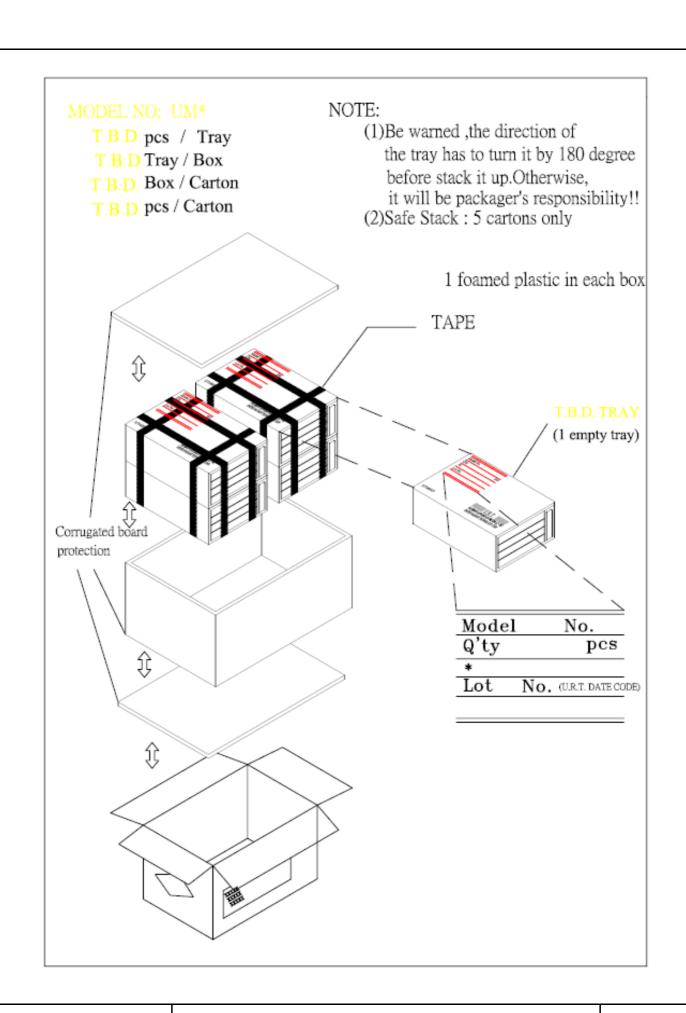
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7. PACKING



Packing tray must be stacked with alternated direction to each others. To tacks packing trays in same direction will cause product damaged.





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

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 II 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.

8.3. INSPECTION PLAN:

CLASS			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

8.4. STANDARD OF VISUAL INSPECTION

NO. C	LASS	ITEM	JUDGEMEN	T	
			(A) ROUND TYPE: unit : mm.		
			DIAMETER (mm.) ACC	CEPTABLE Q'TY	
			$\Phi \leq 0.1$	DISREGARD	
		BLACK AND WHITE SPOT	$0.1 < \Phi \leq 0.3$	3	
		FOREIGN MATERIEL	0.25 < Ф	0	
8 4 1 M	IINOR	DUST IN THE CELL	NOTE: $\Phi = (LENGTH + WIDTH)/2$		
0.4.1 W	involv	BLEMISH	(B) LINEAR TYPE:	unit : mm.	
		SCRATCH	LENGTH WIDTH	ACCEPTABLE Q'TY	
			W ≤0.03	DISREGARD	
			$L \le 5.0 0.03 < W \le 0.07$	3	
			0.07< W	FOLLOW ROUND TYPE	
				unit : mm.	
			DIAMETER ACC	CEPTABLE Q'TY	
		BUBBLE IN POLARIZER DR DENT ON POLARIZER	$\Phi \leq 0.2$	DISREGARD	
8.4.2 M	IINOR		$0.2 < \Phi \leq 0.5$	2	
			0.5 < Ф	0	
		Dot Defect	Items Bright dot Dark dot	ACC. Q'TY $ N \le 4 $ $ N \le 4 $	
Pixel Define: Pixel Pot → Dot →			Fixer —	ize of a defective dot over as one defective dot. that and unchanged in size aying under black patternand unchanged in size in	

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

8.5 INSPECTION STANDARD OF TOUCH PANEL

NO.	CLASS		ITEMS	JUDGEMENT			
8.5.1	MAJOR	To	ouch Panel Crack			Reje	ct
8.5.2	MINOR	NOR Touch Panel Chipping	Corner	X	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
				W≤0.05, I	L≦10mm	Acce	ept
8.5.3	MINOR	Scratch Dust and Foreign materiel (Linear Type)		$0.05 \text{mm} < W \le 0.07 \text{mm}$; $L \le 5.0 \text{mm}$ Distance between seratch $> 5.0 \text{mm}$		0mm Acce	
			W>0.07mm		Reje	ct	
8.5.4	MINOR	Scratch NOR Dust and Foreign materiel (Round Type: Φ=(Length+Width)/2)			0.25 mm $\Phi \le 0.35$ mm een spots > 5.0 n	Acce Acce 5 ea	
				Φ $>$ 0.35mm		Reje	ct
8.5.5	5.5 MINOR Touch Panel Dent / Fish Eyes		$\Phi \leq 0.35$ mm $< \Phi$	D ≤ 1.0mm	Acce Acce 3 ea		
				Φ>1.0mm		Reje	ct
		MINOR Touch Panel Air Bubble		$\Phi \leq 0$.	.2mm	Acce	ept
8.5.6	MINOR			$0.2 \text{mm} < \Phi \leq 0.5 \text{mm}$ Distance between bubbles $> 5.0 \text{mm}$		Acce anm 3 ea	ept Max.
			$\Phi > 0$.	.5mm	Reje	ct	
		MINOR Touch Panel Printing area Scratch	W≤0.03, I	L≦10mm	Acce	ept	
8.5.7	MINOR		0.03 mm $<$ W \leq 0.05 mm, L \leq 5 mm Distance between scratch $>$ 5.0 mm			ept Max.	
			W>0.05m (W>0.05 Follow	nm or L>5mm v 8.5.4 Round t	Reje	ect	
8.5.8	MINOR		ouch Panel Iaze Mark / Dust	Can not be removed		Reje	ct

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NO.	CLASS	ITEMS	JUDEGMENT		
8.5.9	MINOR	Atactic Newton ring (For Resistive Touch Panel) Atactic 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 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 Reject	
8.5.10	MINOR	Touch Panel Film Bulge	Not affect the transmittance and clarity under lighting ambient.	Accept	