SPECIFICATION

Sep-4-2009

OF

LIQUID CRYSTAL DISPLAY MODULE

		0		
ocument Revis	ion :	1		
				TENTATIVE
	CUSTOMER	R APPROVED S	IGNATURE	
=	_	· -	mer as a specification of e of this specification, ar	_
production and order for this n	d delivery from Micro nodel no. will be treat and accepted by pure	otips. Without signature ted and considered that chaser or customer.	e of this specification, and this specification is auto	ny purchase matically
production and order for this n	d delivery from Micro nodel no. will be treat and accepted by pure	otips. Without signature ted and considered that chaser or customer.	e of this specification, ar	ny purchase matically
production and order for this n acknowledged	d delivery from Micro model no. will be treat and accepted by pure /////////////////////// M George Tseng	Angus Chiu	e of this specification, and this specification is auto	y purchase matically OGY
production and order for this n acknowledged	d delivery from Micro model no. will be treat and accepted by pure	otips. Without signature ted and considered that chaser or customer.	e of this specification, and this specification is auto	ny purchase matically DGY
production and order for this nacknowledged en Wang ROVED	d delivery from Micro model no. will be treat and accepted by pure M George Tseng CHECKED Lynda Drive, Ste. 110, Orlan	Angus Chiu CHECKED	e of this specification, and this specification is auto	y purchase matically OGY

Revision record							
Document	Model No.	Description	Revision				
Revision	Version No.	Description	by				
	UMSH-3267MD-UB		Ken Lin				
0	(UBSH-M150EN)		Wen-Chie Chi				
	Version No. 0		21-Aug-2009				
	UMSH-3267MD-1UB	1.Modify the color of LED B/L from white to red.	Ken Lin				
1	(UBSH-M150EN)	2.Modify the module number from	Wen-Chie Chi				
	Version No. 0	UMSH-3267MD-UB to UMSH-3267MD-1UB.	4-Sep-2009				
////	Revision 1 ;	UMSH-3267MD-1UB	Page: 2				

CONTENTS:

No.	Item	Page
	BASIC SPECIFICATION	
1	1.1 Mechanical Specification	4
	1.2 Display Specification	4
	1.3 Outline Dimension	5
	1.4 Block Diagram	6
	1.5 Interface Pin	7
	ELECTRICAL CHARACTERISTICS	
2	2.1 Absolute Maximum Ratings	8
	2.2 Command Sequence	9
	2.3 Standard Character Pattern	10
	2.4 DC Characteristics	11
	2.5 Back-light Characteristics	12
	2.6 AC Characteristics	13~14
	OPTICAL CHARACTERISTICS	
3	3.1 Condition	15
	3.2 Definition of Optical Characteristics	16
4	RELIABILITY	17
5	PRODUCT HANDING AND APPLICATION	18
6	DATECODE	19
7	PACKING & LOTNO	20~21
8	INSPECTION STANDARD	22~25



1. BASIC SPECIFICATION

1.1 Mechanical specifications

Items	Nominal Dimension	Unit
Character Line	20×2 Chars	Pixel
Module Size (W x H x T)	37.0 x 116.0 x 17.2	mm.
Viewing Area (W×H)	73.8 x 16.5	mm.
Active Area (W x H)	70.8 x 11.5	mm.
Character Font (W × H)	5×8 dots	mm.
Character Size (W × H)	3.065×5.56	mm.
Character Pitch (W × H)	3.565 × 5.94	mm.
Dot Size (W×H)	0.585 x 0.66	mm.
Dot Pitch (W x H)	0.62 x 0.7	mm.
Driving Method	1/8	Duty
Driving Method	1/4	Bias
Driving IC Package	COB	-
Module Weight	TBD	g

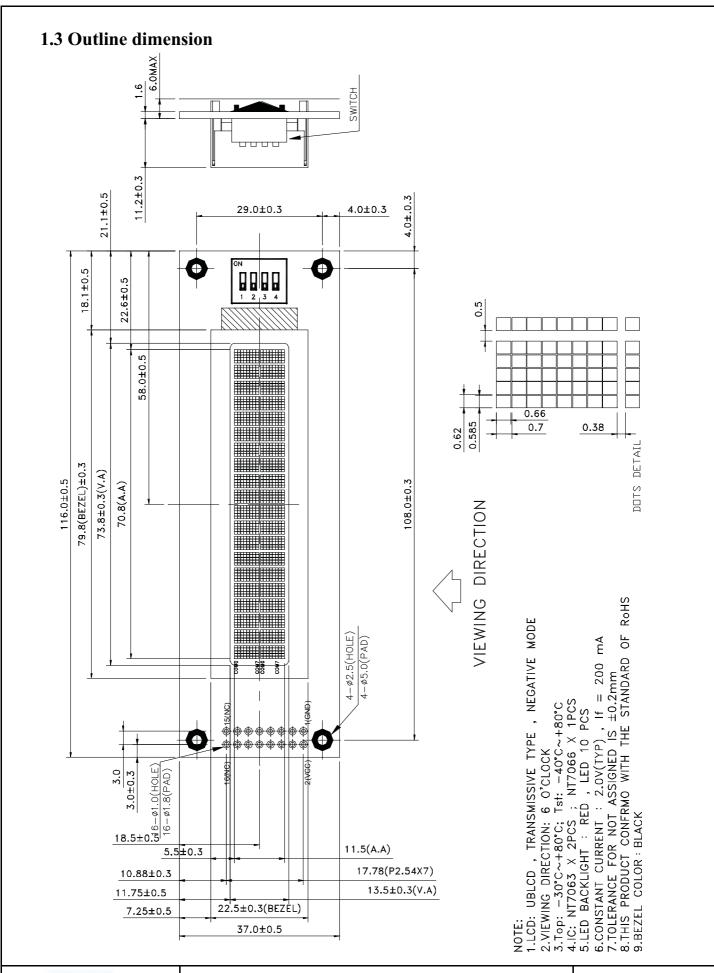
1.2 Display specification

Display	Descriptions	Note
LCD Type	2.95" UB	-
LCD Mode	Negative	-
Polarizer Mode	Transmissive	-
Polarizer UV - Cutting	Without	
Polarizer Surface	Normal	-
Backlight Type	LED	-
Backlight Color	Red	
Viewing Direction	6 O'clock Direction	-

Color tone is slightly changed by temperature and driving voltage.



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009



1.4 Block diagram: 20 Chars X 2 Lines 8 40 80 80 U1 U2 U3 NT7066U NT7063B NT7063B Bias Circuit LED & Temp. comp. B/L DIP Switch for Control LED B/L 40.60.80.100% $BBBB_1$ **L**RS− |R/W− |E− D0~D7

1.5 Interface pin:

Pin No.	Pin Name	I/O	Description	
1	GND	P	Ground.(0V)	
2	VCC	P	Power supply.(+5V)	
3	NC	-	Not connection.	
4	De	RS	I	Register select signal:
4	RS	1	0: Instruction register. 1: Data register.	
5	R/W	I	Read/Write control signal: 0:Write 1: Read	
6	E	I	Read/Write enable signal.	
7~14	D0~D7	I	Data bus(8-bits).	
15-16	NC	-	Not connection.	

Dip switch for B/L Brightness Control PIN:

1	40 % Brightness of the Backlight.
2	60 % Brightness of the Backlight.
3	80 % Brightness of the Backlight.
4	100 % Brightness of the Backlight.



2. ELECTRICAL CHARACTERISTICS

2.1 Absolute Maximum Ratings

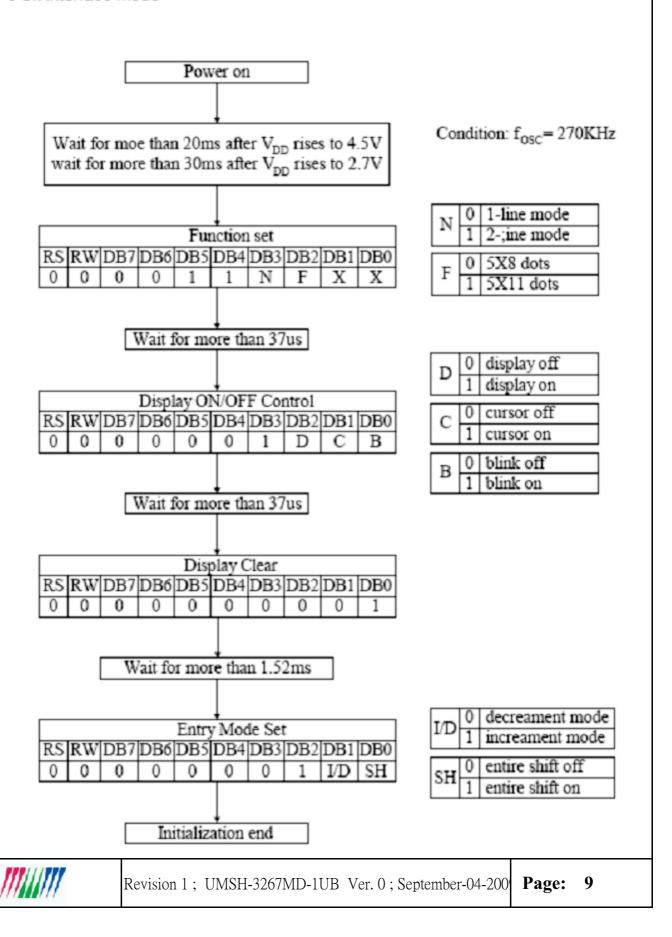
Items	Symbol	Min.	Max.	Unit
Supply voltage	VDD	-0.3	+7.0	V
Supply voltage for driving LCD	VLCD-V5	VDD-15	VDD+0.3	V
Input voltage	VIN	-0.3	VDD+0.3	V
Operate temperature range	Тор	-30	80	°C
Storage temperature range	Тѕт	-40	80	°C



2.2 Command Sequence

INITIALIZING BY INSTRUCTION

8-bit interface mode



2.3 Standard Character Pattern

Higher 4-bit of character code (Hex.)



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-200 **Page:**

10

2.4 DC Characteristics

Items	Symbol	Min.	Тур.	Max.	Unit	Condition
Supply voltage (Logic)	VDD	TBD	5.0	TBD	V	
		6.55	6.85	7.15	V	Top = 80°C
Supply Voltage (LCD)	VLCD	6.55	6.85	7.15	v	*NOTE1
		6.75	7.05	7.35	v	Top = -30°C
Input logic HIGH	V _{I H}	VDD-1.0	-	VDD	v	
Input logic LOW	V _{I L}	-0.2	-	1.0	V	
Power supply current	$\mathbf{I}_{ ext{DD}}$	-	TBD	TBD	mA	*NOTE2
Backlight Voltage	Vee	2.8	3.2	3.6	v	
Backlight current	Iee		200		mA	∦ NOTE3

^{*}NOTE1: If change the VDD, the voltage boost and contrast need to be set again.

*NOTE2: Min. and Max. Voltage is mean within the range will has optimum contrast at Ta:25°C Typ. Voltage is specified as module driving condition: Ta=25°C, V₀P at Optimum Contrast, the measuring condition as below, this value is URT recommend when customer change

the set condition , the $V_{\rm LCD}$ will be change.

*NOTE4:The Back light is constant current.

*NOTE3:

Measuring Condition:

Standard Value MAX.

= 25°C Ta VDD-VSS = 5.0 V

VEE-VSS = About 3.2V (200mA)

Fosc = 270 KHzBias = 1/4 BiasDuty = 1/8 Duty

Display Patten = Checkered pattern



2.5 Back-light Characteristics

PARAMETER	SYMBOL	MIN	TYP	MAX	Unit	Test Condition	NOTE
Supply Current	If		200		mA	Ta=25°℃	1
Supply Voltage	Vs	2.8	3.2	3.6	V	Ta=25°℃	-

Note 1: The Back light is constant current.



2.6 AC Characteristics

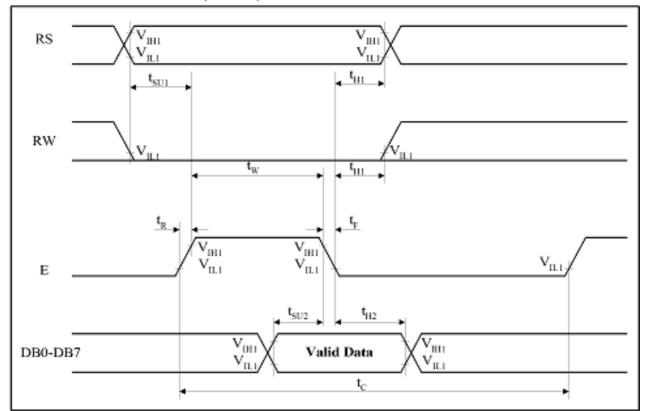
 $(V_{DD} = 4.5V \sim 5.5V, Ta = -30 \sim +85^{\circ}C)$

Mode	Characteristic	Symbol	Min.	Тур.	Max.	Unit
	E cycle time	t _C	500	-	-	
	E rise/fall time	t _R , t _F	-	-	20	
Write mode	E pulse width (high, low)	t _W	230	-	-]
(refer to Fig.6)	R/W and RS setup time	t _{su1}	40	-	-] ns
(Telef to Fig.0)	R/W and RS hold time	t _{H1}	10	-	-	
	Data setup time	t _{su2}	60	-	-]
	Data hold time	t _{H2}	10	-	-	
	E cycle time	t _C	500	-	-	
	E rise/fall time	t _R , t _F	-	-	20	
Read mode	E pulse width (high, low)	t _W	230	-	-	
(refer to Fig.7)	R/W and RS setup time	t _{su}	40	-	-	ns
(reier to Fig.7)	R/W and RS hold time	t _H	10	-	-	
	Data output delay time	t _D	-	-	120]
	Data hold time	t _{DH}	5	-	-	

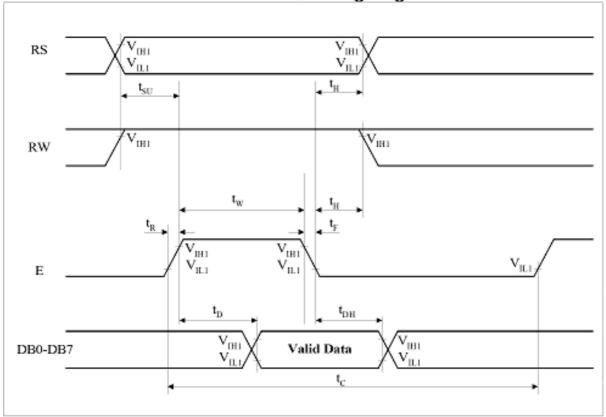


Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-200 Page: 13

2.6 AC Characteristics (Cont.)



Write mode timing diagram



Read mode timing diagram



3. OPTICAL CHARACTERISTICS

3.1 Characteristics

Electrical and Optical Characteristics

No.	Item			symb	ol / temp.	Min.	Тур.	Max.	Unit	Note	
1	Response Time			Tr	25 °C	-	80	160	ms	2	
					25 ℃	-	35	70	1113	2	
		Hor.		Θ_{2^+}	0°	60	75	-			
	Viewing	c C	-Cr>=2	Θ ₂₋	180°	60	75	-	dagraa	3	
2	Angle		ngle Ver.	C1>-2	Θ ₁₊	270°	60	75	-	degree	3
		V	VEI.		⊕ 1-	90°	40	50	-]	
3	3 Contrast Ratio		Cr	25 ℃	400	800	-	-	4		
4	4 Brightness		Y		240	400	-	cd/m ²			

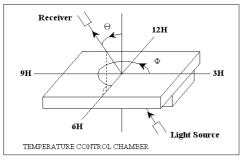


Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009

3.2 Definition of optical characteristics

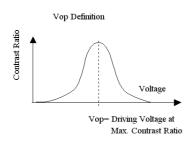
Measurement condition:

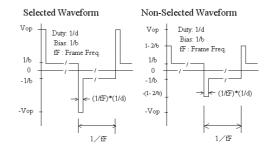
Transmissive and Transflective type



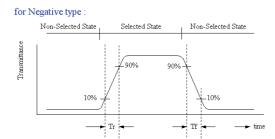
PHOTAL LCD-5000

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



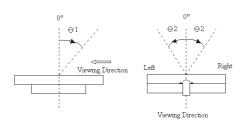


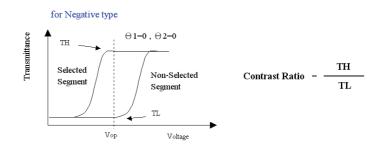
[Note 2] Definition of Response Time



[Note 3] Definition of Viewing Angle:

[Note 4] Definition of Contrast Ratio:







4. RELIABILITY:

Item No	Items	Condition			
1	High temperature operating	80 °C , 200 hours			
2	Low temperature operating	-30 °C , 200 hours			
3	High temperature storage	80 °C , 200 hours			
4	Low temperature storage	-40 °C , 200 hours			
5	High temperature & humidity storage	60°C, 90%RH, 100 hours			
6	Thermal Shock storage	-40°C, 30min.<=> 80°C, 30min. 10 Cycles			
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, 70%RH below, specification condition driving			

- * 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



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009

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 $^{\circ}$ C±15 $^{\circ}$ 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 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°C)

☐ 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 us is required. We will not responsible for any damage or loss which caused by the products without any authorization given by us.
- 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.



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009 Page: 18

6. DATE CODE OF PRODUCTS

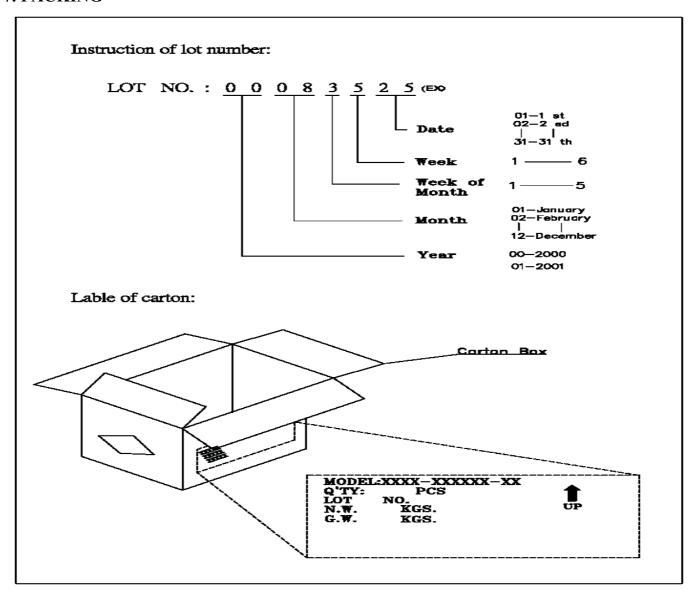
- Date code will be shown on each product :
- Example: 090508 0 0 0 3 ==> Year 2009, May., 08rd, Batch no.03



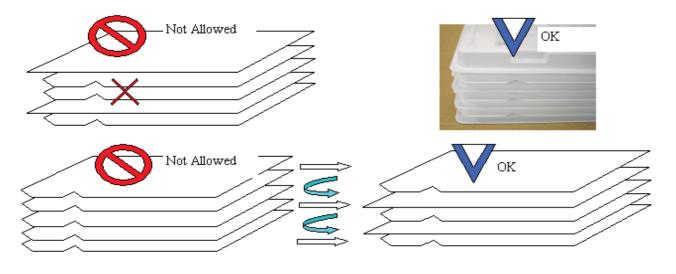
Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009

19

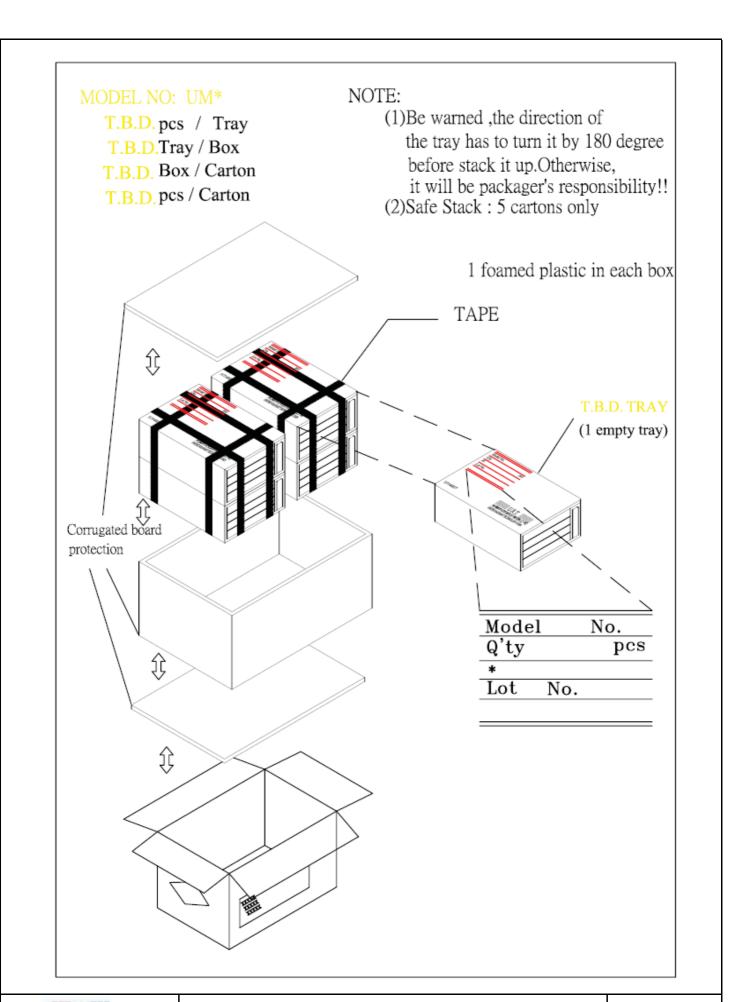
7. PACKING



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



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009



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 MICROTIPS TO PURCHASER. PURCHASER SHALL CONTROL THE LCM AT -10 $^\circ\text{C}\sim 40\,^\circ\text{C}$,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 (or 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

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

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 30 cm. WITH BARE EYES FAR FROM SAMPLE AND USING 2 PCS. OF 20W FLUORESCENT LAMP.



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009 Page: 22

8.3. INSPECTION PLAN:

CLASS	ITEM	JUDGEMENT	CLASS
	1. OUTSIDE AND INSIDE PACKAGE	"MODEL NO." , "LOT NO." AND "QUANTITY"	Minor
PACKING &		SHOULD INDICATE ON THE PACKAGE.	
INDICATE	2. MODEL MIXED AND QUANTITY	OTHER MODEL MIXEDREJECTED	Critical
		QUANTITY SHORT OR OVERREJECTED	
	3. PRODUCT INDICATION	"MODEL NO." SHOULD INDICATE ON	Major
		THE PRODUCT	
	4. DIMENSION,	ACCORDING TO SPECIFICATION OR	
ASSEMBLY	LCD GLASS SCRATCH	DRAWING.	Major
	AND SCRIBE DEFECT.		
	5. VIEWING AREA	POLARIZER EDGE OR LCD'S SEALING LINE	Minor
		IS VISABLE IN THE VIEWING AREA	
		REJECTED	
	6. BLEMISH \ BLACK SPOT \	ACCORDING TO STANDARD OF VISUAL	Minor
	WHITE SPOT IN THE LCD	INSPECTION (INSIDE VIEWING AREA)	
	AND LCD GLASS CRACKS	THE TEN (INDIE VIEWING TREET)	
	7. BLEMISH \ BLACK SPOT	ACCORDING TO STANDARD OF VISUAL	Minor
APPEARANCE	WHITE SPOT AND SCRATCH	INSPECTION (INSIDE VIEWING AREA)	TVIIIIO1
ATTEMANCE	ON THE POLARIZER	INSTECTION (INSIDE VIEWING AREA)	
	8. BUBBLE IN POLARIZER	ACCORDING TO STANDARD OF VISUAL	Minor
	0,202222 11,102,1142211	INSPECTION (INSIDE VIEWING AREA)	1,11101
	9. LCD'S RAINBOW COLOR	STRONG DEVIATION COLOR (OR NEWTON	
	o. Bebs lam do w cobole	RING) OF LCDREJECTED.	Minor
		OR ACCORDING TO LIMITED SAMPLE	IVIIIIOI
		(IF NEEDED, AND INSIDE VIEWING AREA)	
	10. ELECTRICAL AND OPTICAL	ACCORDING TO SPECIFICATION OR	Critical
	CHARACTERISTICS	DRAWING (INSIDE VIEWING AREA)	Critical
	(CONTRAST > VOP >	DRAWING.(INSIDE VIEWING AREA)	
	CHROMATICITY ETC)		
ELECTRICAL	11.MISSING LINE	MISSING DOT \ LINE \ CHARACTER	Critical
ELLETIGETE	111.113311 (0 211.12	REJECTED	Critical
	12.SHORT CIRCUIT \	NON DISPLAY > WRONG PATTERN	Critical
	WRONG PATTERN DISPLAY	DISPLAY \ CURRENT CONSUMPTION	Cinical
	WKONG FAITERN DISPLAT	OUT OF SPECIFICATION REJECTED	
	12 DIN HOLE . DATTERN DEFORMITY		Minor
	13. PIN HOLE \ PATTERN DEFORMITY	ACCORDING TO STANDARD OF VISUAL	Minor
		INSPECTION	



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009

8.4. STANDARD OF VISUAL INSPECTION

NO.	CLASS	ITEM		JUDGEMENT						
			(A) ROU	ROUND TYPE:				unit : mm.		
			D	DIAMET	ER (m	m.)	ACCEPTABLE Q'TY			
		· BLEMISH · BLACK SPOT ·			Φ	≤ 0.1		DISREG	ARD	
8.4.1	MINOR	WHITE SPOT IN THE LCD.	0	0.1 <	Φ	≦ 0.2		2		
			0	0.2 <	Φ	≤ 0.25	1			
			0	0.25 <	Φ			0		
		· BLEMISH · BLACK SPOT ·	NO	ОТЕ: Ф=	(LENGT	H+WIDTH)/	/2			•
		WHITE SPOT AND SCRATCH	(B) LINE	ER TYPE	E:				unit : n	nm.
		ON THE POLARIZER	LE	ENGTH		WIDTH		ACCEPT	ΓABLE Q'TY	7
						W	≦ 0.03	D	ISREGARD	
			L	≤ 5.0	0.03 <	W	≦ 0.05		3	
			L	≦ 5.0	0.05 <	W	≦ 0.07		1	
					0.07 <	W		FOLLOW	ROUND TYPE	
									unit : mm.	
			D	IAMETE	ER		ACC	CEPTABI	LE Q'TY	
8.4.2	MINOR	BUBBLE IN POLARIZER	$\Phi \leq 0.15$ DISRI		DISREG	ARD				
			0	0.15 <	Φ	≦ 0.5		2		
			0	0.5 <	Φ			0		
				a					unit : n	nm.
8.4.3	MINOR	PIN HOLE 、			D	DIAMETER AC		ACC. Q'T	Y	
		PATTERN DEFORMITY	La —				Φ	≤ 0.1	DISREGAL	RD
) b	0.1 <	Φ	≦ 0.25	3	
			υ <u>/</u>	J	a	0.25 <	Φ		0	
			Ф=(а	a+b)/2						

Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009

NO.	CLASS	ITEM	JUDGEMENT	
8.4.4	MINOR	CHIPPING	S	Y > S REJ.
8.4.5	MINOR	CHIPPING	ST	X or Y > S REJ.
8.4.6	MAJOR	GLASS CRACK	Y	Y > (1/2) T REJ.
8.4.7	MAJOR	SCRIBE DEFECT	$A^{\frac{1}{7}}$	1. a> L/3 , A>1.5mm. REJ. 2. B: ACCORDING TO DIMENSION
8.4.8	MINOR	CHIPPING (ON THE TERMINAL AREA)	T	Φ = (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 Z	Y>T REJ.



Revision 1; UMSH-3267MD-1UB Ver. 0; September-04-2009