SPECIFICATION

CUSTOMER :

MODULE NO.:   WX12864U-TFH#

APPROVED BY:	
(FOR CUSTOMER USE ONLY)	PCB VERSION: DATA:

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
A	2008.09.15	11	Modify contour drawing.

Winstar Display Co., LTD

華凌光電股份有限公司

MODLE NO：

RECORDS OF REVISION

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2008/8/22		First issue
A	2008.09.15	11	Modify contour drawing.

Contents

1.Module Classification Information

<u>W X</u> <u>1 2 8 6 4</u> <u>U</u> － <u>T</u> <u>F</u> <u>H</u> <u>#</u>
①②   ③   ④   ⑤ ⑥ ⑦   ⑧

① Brand：WINSTAR DISPLAY CORPORATION

② Display Type：H→Character Type, G→Graphic Type, X→Tab Type

③ Display Font：Graphic 128*64 Dots

④ Model serials no.

⑤ Backlight Type：   N→Without backlight   T→LED, White

                       B→EL, Blue green   A→LED, Amber

                       D→EL, Green   R→LED, Red

                       W→EL, White   O→LED, Orange

                       F→CCFL, White   G→LED, Green

                       Y→LED, Yellow Green

⑥ LCD Mode：   B→TN Positive, Gray   T→FSTN Negative

                       N→TN Negative,

                       G→STN Positive, Gray

                       Y→STN Positive, Yellow Green

                       M→STN Negative, Blue

                       F→FSTN Positive

⑦ LCD Polarizer Type/ A→Reflective, N.T, 6:00   H→Transflective, W.T,6:00
  Temperature range/   D→Reflective, N.T, 12:00   K→Transflective, W.T,12:00
  View direction   G→Reflective, W. T, 6:00   C→Transmissive, N.T,6:00

                       J→Reflective, W. T, 12:00 F→Transmissive, N.T,12:00

                       B→Transflective, N.T,6:00 I→Transmissive, W. T, 6:00

                       E→Transflective, N.T.12:00 L→Transmissive, W.T,12:00

⑧ Special Code   #: Fit in with the ROHS directives and regulations

2.Precautions in use of LCD Modules

(1) Avoid applying excessive shocks to the module or making any alterations or modifications to it.

(2) Don't make extra holes on the printed circuit board, modify its shape or change the components of LCD module.

(3) Don't disassemble the LCM.

(4) Don't operate it above the absolute maximum rating.

(5) Don't drop, bend or twist LCM.

(6) Soldering: only to the I/O terminals.

(7) Storage: please storage in anti-static electricity container and clean environment.

3.General Specification

Item	Dimension	Unit
Number of Characters	128 x 64	—
Module dimension	58.2 x63.1 x5.5(MAX)	mm
View area	52.0x 33.5	mm
Active area	47.76x 30.29	mm
Dot size	0.4x0.35	mm
Dot pitch	0.42x 0.37	mm
LCD type	FSTN Positive Transflective (In LCD production, It will occur slightly color difference. We can only guarantee the same color in the same batch.)	
Duty	1/64	
View direction	6 o'clock	
Backlight Type	LED, White	

4.Absolute Maximum Ratings

Item	Symbol	Min	Typ	Max	Unit
Operating Temperature	T_{OP}	-20	—	+70	$^\circ$C
Storage Temperature	T_{ST}	-30	—	+80	$^\circ$C
Input Voltage	V_I	V_{SS}	—	V_{DD}	V
Supply Voltage For Logic	V_{DD}-V_{SS}	1.8	—	3.6	V
Supply Voltage For LCD	V_{OUT}-V_{SS}	6.0	—	14.2	V

5.Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	—	3.3	—	V
Supply Voltage For LCD	V_{DD}-V_{0UT}	Ta=-20°C	—	—	—	V
		Ta=25°C	—	8.5	—	V
		Ta=70°C	—	—	—	V
Input High Volt.	V_{IH}	—	0.8 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	V_{SS}	—	0.2 V_{DD}	V
Output High Volt.	V_{OH}	—	0.8 V_{DD}	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	V_{SS}	—	0.2 V_{DD}	V
Supply Current	I_{DD}	V_{DD}=3.3V	0.18	0.18	0.18	mA

6.Optical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	(V) θ	CR$\geqq$2	30	—	60	deg
	(H) φ	CR$\geqq$2	-45	—	45	deg
Contrast Ratio	CR	—	—	5	—	—
Response Time	T rise	—	—	110	220	ms
	T fall	—	—	260	520	ms

6.1   Definitions

■**View Angles**

■**Contrast Ratio**

$$CR = \frac{\text{Brightness at selected state (BS)}}{\text{Brightness at non-selected state（Bns）}}$$

(Visual angle direction)

Z

X φ

Y θ

Selected state

Non-selected state

Brightness (%)

Bs

Bns

Operating voltage for LCD driving

■**Response Time**

Nonselected Condition

Selected Condition

Nonselected Condition

Brightness

100 %

10 %

90 %

tr

Rise Time

td

Decay Time (fall time tf)
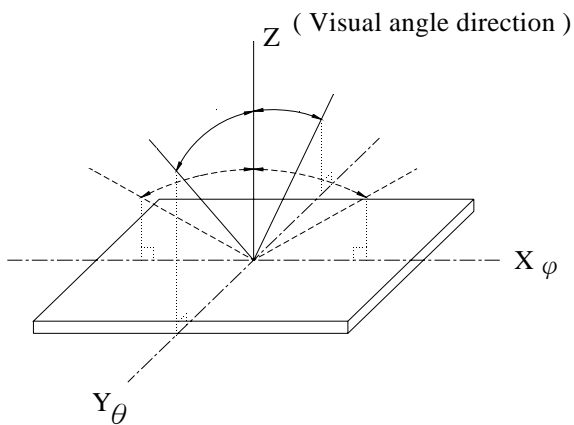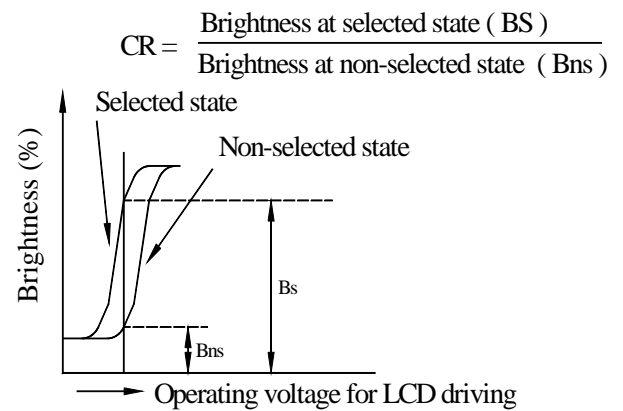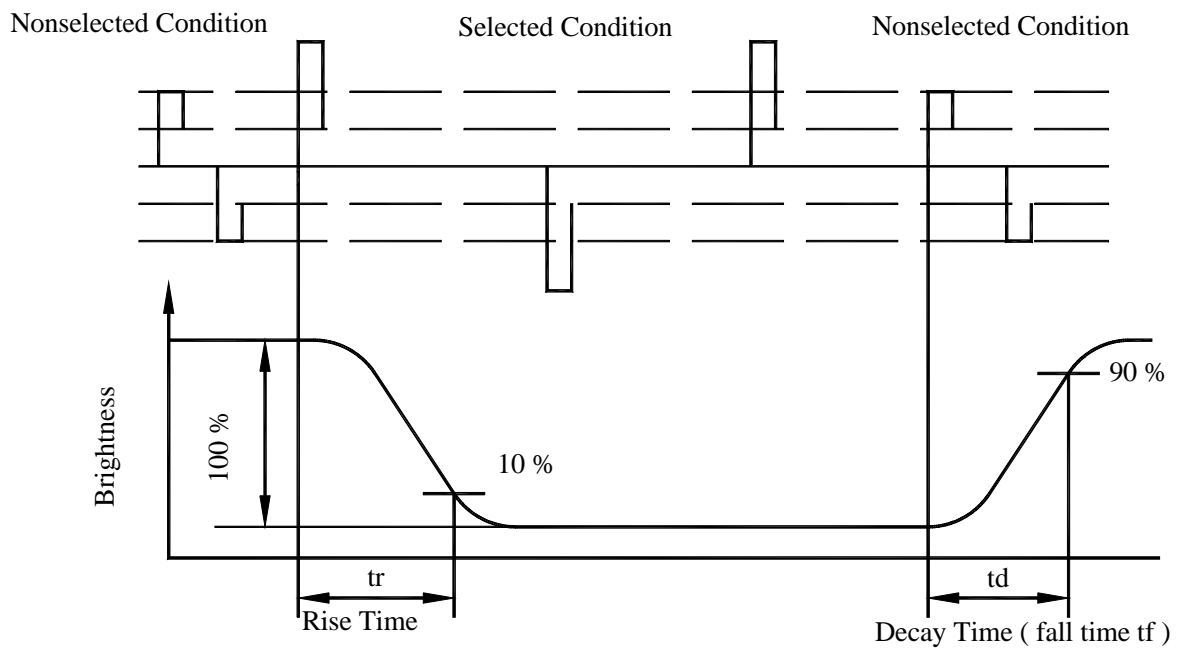
7.Interface Description
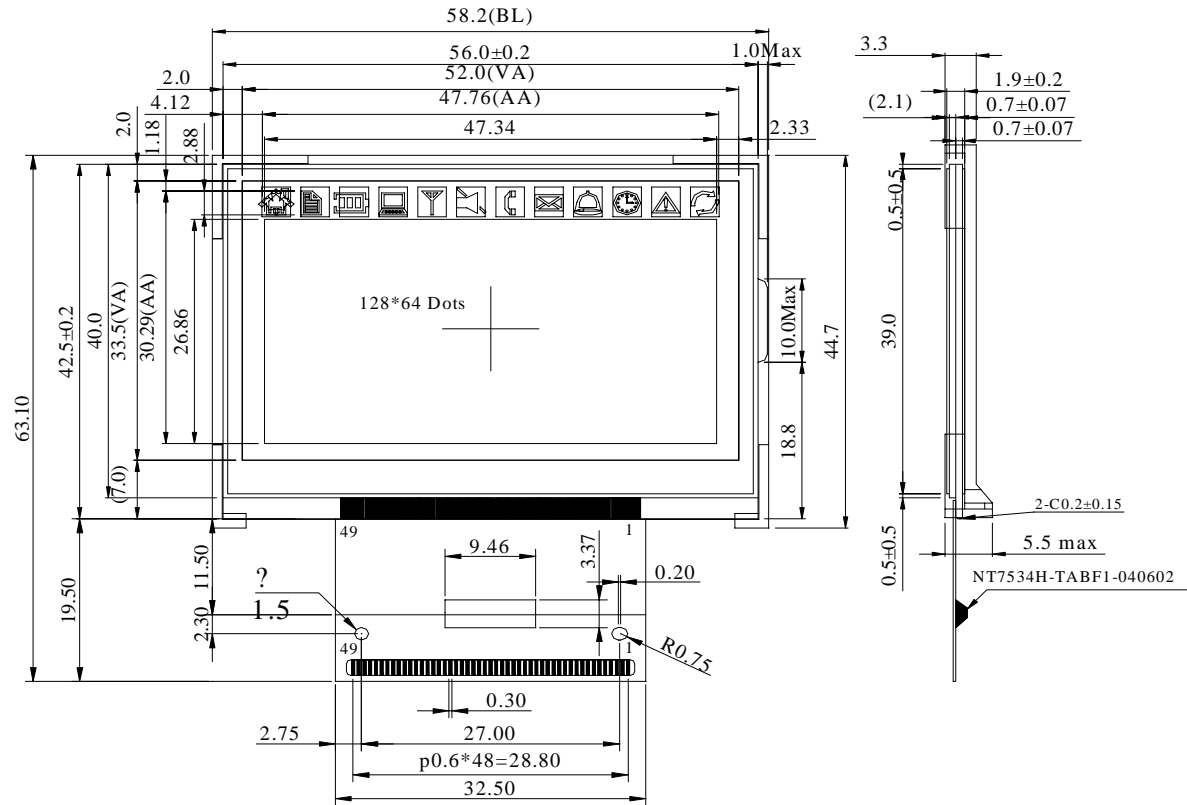
Pin No.	Symbol	I/O	Description
1	NC		No connection
2	IRS	I	This terminal selects the resistors for the V0 voltage level adjustment IRS = "H", Use the internal resistors IRS = "L", Do not use the internal resistors The V0 voltage level is regulated by an external resistive voltage divider attached to the VR terminal. This pad is enabled only when the master operation mode is selected. It is fixed to either "H" or "L" when the slave operation mode is selected
3	/HPM	I	This is the power control terminal for the power supply circuit for liquid crystal drive. /HPM = "H", Normal power mode /HPM = "L" ,High power mode This pad is enabled only when the master operation mode is selected and it is fixed to either "H" or "L" when the slave operation mode is selected.
4	P/S	I	This is the parallel data input/serial data input switch terminal P/S = "H": Parallel data input P/S = "L": Serial data input The following applies depending on the P/S status: <table><tr><td>P/S</td><td>Data/Command</td><td>Data</td><td>Read/Write</td><td>Serial Clock</td></tr><tr><td>"H"</td><td>A0</td><td>D0 to D7</td><td>/RD, /WR</td><td>-</td></tr><tr><td>"L"</td><td>A0</td><td>SI (D7)</td><td>Write only</td><td>SCL (D6)</td></tr></table> When P/S = "L", fix D0~D5 pads to VDD or VSS level. /RD(E) and /WR (R/W) are fixed to either "H" or "L". With serial data input ,RAM display data reading is not supported.
5	C86	I	This is the MPU interface switch terminal C86 = "H":6800 Series MPU interface C86 = "L":8080 Series MPU interface
6	CLS	I	Terminal to select whether enable or disable the display clock internal oscillator circuit. CLS = "H": Internal oscillator circuit for display is enabled CLS = "L": Internal oscillator circuit for display is enabled (requires external input) When CLS = "L", input the display clock through the CL pad.
7	M/S	I	This terminal selects the master/slave operation for the NT7534 chips. Master operation outputs the timing signals that required for LCD display, while slave operation inputs the timing signals required for the liquid crystal display, synchronizing the liquid crystal display system.
8	VR	I	Voltage adjustment pad. Applies voltage between V0 and VSS using a resistive divider.
9	V0	I/O	LCD driver supplies voltages. The voltage determined by the LCD cell
10	V4		is impedance-converted by a resistive driver or an operation amplifier

|			
11	V3		for application. Voltages should be according to the following relationship:
12	V2		V0≥V1≥V2≥V3≥V4≥VSS2
13	V1		When the on-chip operating power circuit is on ,the following voltages are supplied to V1 to V4 by the on-chip power circuit. Voltages selection is performed by the LCD Bias Set command.
14	NC		No connection
15	NC		No connection
16	C2-	O	Capacitor 2-pad for internal DC/DC voltage converter.
17	C2+	O	Capacitor 2+pad for internal DC/DC voltage converter.
18	C1+		Capacitor 1+pad for internal DC/DC voltage converter.
19	C1-		Capacitor 1-pad for internal DC/DC voltage converter.
20	C3+		Capacitor 3+pad for internal DC/DC voltage converter.
21	NC		No connection
22	VOUT	I/O	DC/DC voltage converter output
23	VSS	O	Ground output for pad option.
24	VDD2	Supply	These are the power supply pads for the step-up voltage circuit for the LCD. These pads must be connected to each other.
25	VDD	O	Power supply output for pad option
26	DUTY1	I	Select the maximum LCD driver duty
27	DUTY0		
28	D7	I/O	This is an 8-bit bi-directional data bus that connects to an 8-bit or 16-bit standard MPU data bus. When the serial interface is selected (P/S= "L"), then D7 serves as the serial data input terminal (SI) and D6 serves as the serial clock input terminal (SCL). When the serial interface is selected , fix D0~D5 pads to VDD or VSS level. When the chip select is inactive, D0 to D7 are set to high impedance.
29	D6		
30	D5		
31	D4		
32	D3		
33	D2		
34	D1		
35	D0		

36	/RD	I	When connected to an 8080 MPU ,it is active LOW. This pad is connected to the /RD signal of the 8080 MPU ,and the NT7534 data bus is in an output status when this signal is "L". When connected to a 6800 Series MPU, this is active HIGH. This is used as an enable clock input of the 6800 series MPU
37	/WR	I	When connected to an 8080 MPU, this is active LOW . This terminal connects to the 8080 MPU, and the NT7534 data bus are latched at rising edge of the /WR signal. When connected to an 8080 MPU, this is the read/write control signal input terminal. When R/W= "H": Read When R/W= "L": Write
38	A0	I	This is connected to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command . A0="H": Indicate that D0 to D7 are display data A0="L": Indicate that D0 to D7 are control data
39	/RES	I	When /RES is set to "L" the settings are initialized. The reset operation is performed by the /RES signal level.
40	CS2	I	This is the chip select signal
41	/CS1		This is the chip select signal
42	NC		No connection
43	/DOF	I/O	This is the liquid crystal display blanking control terminal. M/S="H":output M/S= "L":Inptu When the NT7534chip is used in master/slave mode, the various DOF terminals must be connected.
44	CL		This is the display clock input terminal .When the NT7534 chips are used in master/slave mode ,the various CL terminals must be connected.
45	FR	I/O	This is the liquid crystal alternating current signal I/O terminal M/S="H":output M/S= "L":Inptut When the NT7534chip is used in master/slave mode, the various FR terminals must be connected.
46	NC		No connection
47	NC		No connection
48	NC		No connection
49	NC		No connection

8.Contour Drawing & Block Diagram

PIN NO.	SYMBOL	PIN NO.	SYMBOL
26	DUTY1	1	NC
27	DUTY0	2	IRS
28	D7	3	/HPM
29	D6	4	P/S
30	D5	5	C86
31	D4	6	CLS
32	D3	7	M/S
33	D2	8	VR
34	D1	9	V0
35	D0	10	V4
36	/RD	11	V3
37	/WR	12	V2
38	A0	13	V1
39	/RES	14	NC
40	CS2	15	NC
41	/CS1	16	C2-
42	NC	17	C2+
43	/DOF	18	C1+
44	CL	19	C1-
45	FR	20	C3+
46	NC	21	NC
47	NC	22	VOUT
48	NC	23	VSS
49	NC	24	VDD2
		25	VDD

The non-specified tolerance of dimension is ±0.15 mm .

DOT SIZE
SCALE 10/1
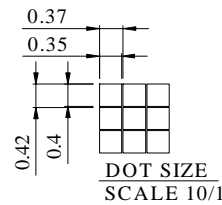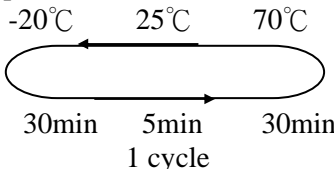
9.Fuction Description

Reference to <u>IC NT7534</u>.pdf

10.RELIABILITY

Content of Reliability Test (wide temperature, -20℃~70℃)

Environmental Test			
Test Item	**Content of Test**	**Test Condition**	**Note**
High Temperature storage	Endurance test applying the high storage temperature for a long time.	80℃ 200hrs	2
Low Temperature storage	Endurance test applying the high storage temperature for a long time.	-30℃ 200hrs	1,2
High Temperature Operation	Endurance test applying the electric stress (Voltage & Current) and the thermal stress to the element for a long time.	70℃ 200hrs	＿＿
Low Temperature Operation	Endurance test applying the electric stress under low temperature for a long time.	-20℃ 200hrs	1
High Temperature/ Humidity Operation	The module should be allowed to stand at 60℃,90%RH max For 96hrs under no-load condition excluding the polarizer, Then taking it out and drying it at normal temperature.	60℃,90%RH 96hrs	1,2
Thermal shock resistance	The sample should be allowed stand the following 10 cycles of operation -20℃　　25℃　　70℃ 30min　5min　　30min 1 cycle	-20℃/70℃ 10 cycles	＿＿
Vibration test	Endurance test applying the vibration during transportation and using.	Total fixed amplitude : 15mm Vibration Frequency : 10~55Hz One cycle 60 seconds to 3 directions of X,Y,Z for Each 15 minutes	3
Static electricity test	Endurance test applying the electric stress to the terminal.	VS=800V,RS=1.5kΩ CS=100pF 1 time	＿＿

Note1: No dew condensation to be observed.

Note2: The function test shall be conducted after 4 hours storage at the normal
　　　　Temperature and humidity after remove from the test chamber.

Note3: Vibration test will be conducted to the product itself without putting it in a container.

11.Backlight Information

Specification
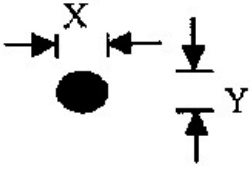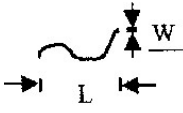
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITION
Supply Current	ILED	48	60	90	mA	V= 3.5V
Supply Voltage	V			5	V	—
Reverse Voltage	VR	3.4	3.5	3.6	V	—
Luminous Intensity	IV	120	150		CD/M^2	ILED=60mA
Life Time (For Reference only)	—	—	10K	—	Hr.	ILED=60mA 25℃,50-60%RH, (Note 1)
Color	White					
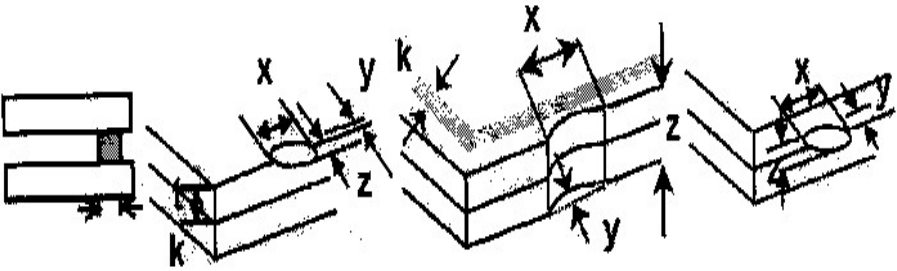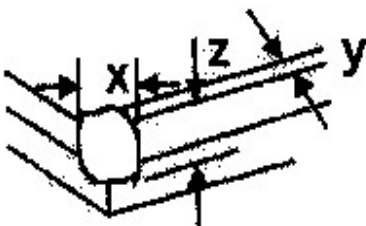
Note: The LED of B/L is drive by current only, drive voltage is for reference only.

drive voltage can make driving current under safety area (current between

minimum and maximum).

Note 1:The brightness will decrease to 50% of the original value after 10K hours

LED B\L Drive Method

Drive from A , K
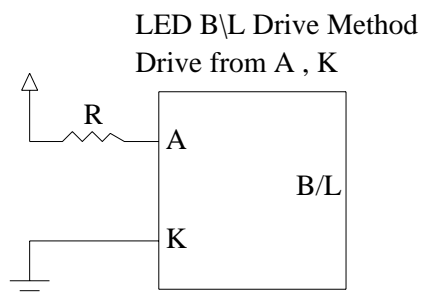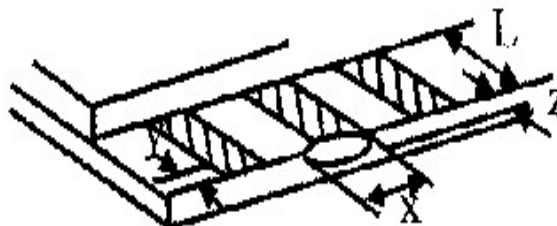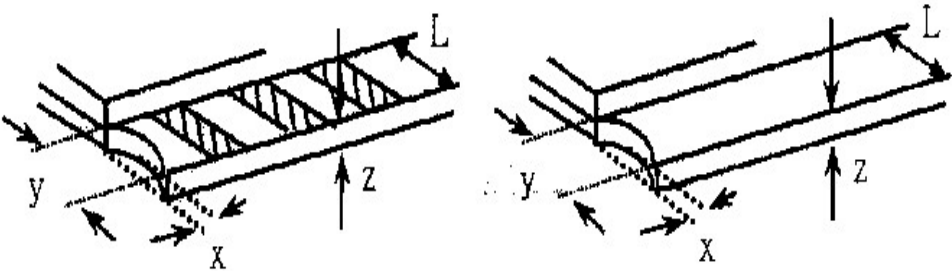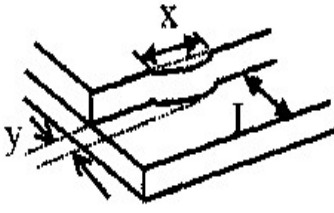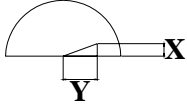
12. Inspection specification

NO	Item	Criterion	AQL
01	Electrical Testing	1.1 Missing vertical, horizontal segment, segment contrast defect. 1.2 Missing character , dot or icon. 1.3 Display malfunction. 1.4 No function or no display. 1.5 Current consumption exceeds product specifications. 1.6 LCD viewing angle defect. 1.7 Mixed product types. 1.8 Contrast defect.	0.65
02	Black or white spots on LCD (display only)	2.1 White and black spots on display $\leqq$ 0.25mm, no more than three white or black spots present. 2.2 Densely spaced: No more than two spots or lines within 3mm	2.5

03 — LCD black spots, white spots, contamination (non-display)

3.1 Round type : As following drawing

$\Phi = (x + y) / 2$

SIZE	Acceptable Q TY
$\Phi \leqq 0.10$	Accept no dense
$0.10 < \Phi \leqq 0.20$	2
$0.20 < \Phi \leqq 0.25$	1
$0.25 < \Phi$	0

AQL 2.5

3.2 Line type : (As following drawing)

Length	Width	Acceptable Q TY
---	$W \leqq 0.02$	Accept no dense
$L \leqq 3.0$	$0.02 < W \leqq 0.03$	2
$L \leqq 2.5$	$0.03 < W \leqq 0.05$	2
---	$0.05 < W$	As round type

AQL 2.5

04 — Polarizer bubbles

If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction.

Size Φ	Acceptable Q TY
$\Phi \leqq 0.20$	Accept no dense
$0.20 < \Phi \leqq 0.50$	3
$0.50 < \Phi \leqq 1.00$	2
$1.00 < \Phi$	0
Total Q TY	3

AQL 2.5

NO	Item	Criterion	AQL
05	Scratches	Follow NO.3 LCD black spots, white spots, contamination	
06	Chipped glass	Symbols Define: x: Chip length y: Chip width z: Chip thickness k: Seal width t: Glass thickness a: LCD side length L: Electrode pad length: 6.1 General glass chip : 6.1.1 Chip on panel surface and crack between panels: (table below) ⊙If there are 2 or more chips, x is total length of each chip. 6.1.2 Corner crack: (table below) ⊙If there are 2 or more chips, x is the total length of each chip.	2.5

6.1.1

z: Chip thickness	y: Chip width	x: Chip length
$Z \leqq 1/2t$	Not over viewing area	$x \leqq 1/8a$
$1/2t < z \leqq 2t$	Not exceed $1/3k$	$x \leqq 1/8a$

6.1.2

z: Chip thickness	y: Chip width	x: Chip length
$Z \leqq 1/2t$	Not over viewing area	$x \leqq 1/8a$
$1/2t < z \leqq 2t$	Not exceed $1/3k$	$x \leqq 1/8a$

NO	Item	Criterion	AQL
06	Glass crack	Symbols : x: Chip length　　y: Chip width　　z: Chip thickness k: Seal width　　t: Glass thickness　a: LCD side length L: Electrode pad length 6.2 Protrusion over terminal : 6.2.1 Chip on electrode pad : <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>y$\leqq$0.5mm</td><td>x$\leqq$1/8a</td><td>$0 < z \leqq t$</td></tr></table> 6.2.2 Non-conductive portion: <table><tr><td>y: Chip width</td><td>x: Chip length</td><td>z: Chip thickness</td></tr><tr><td>y$\leqq$ L</td><td>x$\leqq$1/8a</td><td>$0 < z \leqq t$</td></tr></table> ⊙If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. ⊙If the product will be heat sealed by the customer, the alignment mark not be damaged. 6.2.3 Substrate protuberance and internal crack. <table><tr><td>y: width</td><td>x: length</td></tr><tr><td>y$\leqq$1/3L</td><td>x $\leqq$ a</td></tr></table>	2.5

NO	Item	Criterion	AQL
07	Cracked glass	The LCD with extensive crack is not acceptable.	2.5
08	Backlight elements	8.1 Illumination source flickers when lit. 8.2 Spots or scratched that appear when lit must be judged. Using LCD spot, lines and contamination standards. 8.3 Backlight doesn't light or color wrong.	0.65 2.5 0.65
09	Bezel	9.1 Bezel may not have rust, be deformed or have fingerprints, stains or other contamination. 9.2 Bezel must comply with job specifications.	2.5 0.65
10	PCB、COB	10.1 COB seal may not have pinholes larger than 0.2mm or contamination. 10.2 COB seal surface may not have pinholes through to the IC. 10.3 The height of the COB should not exceed the height indicated in the assembly diagram. 10.4 There may not be more than 2mm of sealant outside the seal area on the PCB. And there should be no more than three places. 10.5 No oxidation or contamination PCB terminals. 10.6 Parts on PCB must be the same as on the production characteristic chart. There should be no wrong parts, missing parts or excess parts. 10.7 The jumper on the PCB should conform to the product characteristic chart. 10.8 If solder gets on bezel tab pads, LED pad, zebra pad or screw hold pad, make sure it is smoothed down. 10.9 The Scraping testing standard for Copper Coating of PCB $X * Y <= 2mm^2$	2.5 2.5 0.65 2.5 2.5 0.65 0.65 2.5 2.5
11	Soldering	11.1 No un-melted solder paste may be present on the PCB. 11.2 No cold solder joints, missing solder connections, oxidation or icicle. 11.3 No residue or solder balls on PCB. 11.4 No short circuits in components on PCB.	2.5 2.5 2.5 0.65

NO	Item	Criterion	AQL
12	General appearance	12.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP. 12.2 No cracks on interface pin (OLB) of TCP. 12.3 No contamination, solder residue or solder balls on product. 12.4 The IC on the TCP may not be damaged, circuits. 12.5 The uppermost edge of the protective strip on the interface pin must be present or look as if it cause the interface pin to sever. 12.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color. 12.7 Sealant on top of the ITO circuit has not hardened. 12.8 Pin type must match type in specification sheet. 12.9 LCD pin loose or missing pins. 12.10 Product packaging must the same as specified on packaging specification sheet. 12.11 Product dimension and structure must conform to product specification sheet.	2.5 0.65 2.5 2.5 2.5 2.5 2.5 0.65 0.65 0.65 0.65

13. Material List of Components for RoHs

1. WINSTAR Display Co., Ltd hereby declares that all of or part of products (with the mark

    "#"in code), including, but not limited to, the LCM, accessories or packages, manufactured

    and/or delivered to your company (including your subsidiaries and affiliated company)

    directly or indirectly by our company (including our subsidiaries or affiliated companies) do

    not intentionally contain any of the substances listed in all applicable EU directives and

    regulations, including the following substances.
    Exhibit A：The Harmful Material List

Material	(Cd)	(Pb)	(Hg)	(Cr6+)	PBBs	PBDEs
Limited Value	100 ppm	1000 ppm	1000 ppm	1000 ppm	1000 ppm	1000 ppm
Above limited value is set up according to RoHS.						

2.Process for RoHS requirement：
   (1) Use the Sn/Ag/Cu soldering surface；the surface of Pb-free solder is rougher than we used before.
   (2) Heat-resistance temp.：
      Reflow：250℃,30 seconds Max.；
      Connector soldering wave or hand soldering：320℃, 10 seconds max.
   (3) Temp. curve of reflow, max. Temp.：235±5℃；
      Recommended customer's soldering temp. of connector：280℃, 3 seconds.

winstar **LCM Sample Estimate Feedback Sheet**

Module Number： _____ **Page: 1**

1、Panel Specification：

   1. Panel Type： ☐ Pass ☐ NG , _____

   2. View Direction： ☐ Pass ☐ NG , _____

   3. Numbers of Dots： ☐ Pass ☐ NG , _____

   4. View Area： ☐ Pass ☐ NG , _____

   5. Active Area： ☐ Pass ☐ NG , _____

   6. Operating Temperature： ☐ Pass ☐ NG , _____

   7. Storage Temperature： ☐ Pass ☐ NG , _____

   8. Others： _____

2、Mechanical Specification：

   1. PCB Size： ☐ Pass ☐ NG , _____

   2. Frame Size： ☐ Pass ☐ NG , _____

   3. Materal of Frame： ☐ Pass ☐ NG , _____

   4. Connector Position： ☐ Pass ☐ NG , _____

   5. Fix Hole Position： ☐ Pass ☐ NG , _____

   6. Backlight Position： ☐ Pass ☐ NG , _____

   7. Thickness of PCB： ☐ Pass ☐ NG , _____

   8. Height of Frame to PCB： ☐ Pass ☐ NG , _____

   9. Height of Module： ☐ Pass ☐ NG , _____

   10. Others： ☐ Pass ☐ NG , _____

3、Relative Hole Size：

   1. Pitch of Connector： ☐ Pass ☐ NG , _____

   2. Hole size of Connector： ☐ Pass ☐ NG , _____

   3. Mounting Hole size： ☐ Pass ☐ NG , _____

   4. Mounting Hole Type： ☐ Pass ☐ NG , _____

   5. Others： ☐ Pass ☐ NG , _____

4、Backlight Specification：

   1. B/L Type： ☐ Pass ☐ NG , _____

   2. B/L Color： ☐ Pass ☐ NG , _____

   3. B/L Driving Voltage (Reference for LED Type)： ☐ Pass ☐ NG , _____

   4. B/L Driving Current： ☐ Pass ☐ NG , _____

   5. Brightness of B/L： ☐ Pass ☐ NG , _____

   6. B/L Solder Method： ☐ Pass ☐ NG , _____

   7. Others： ☐ Pass ☐ NG , _____

＞＞ **Go to page 2** ＜＜

winstar

5、 <u>**Electronic Characteristics of Module**</u>：

  1. Input Voltage：   ☐ Pass   ☐ NG , _____

  2. Supply Current：   ☐ Pass   ☐ NG , _____

  3. Driving Voltage for LCD：   ☐ Pass   ☐ NG , _____

  4. Contrast for LCD：   ☐ Pass   ☐ NG , _____

  5. B/L Driving Method：   ☐ Pass   ☐ NG , _____

  6. Negative Voltage Output：   ☐ Pass   ☐ NG , _____

  7. Interface Function：   ☐ Pass   ☐ NG , _____

  8. LCD Uniformity：   ☐ Pass   ☐ NG , _____

  9. ESD test：   ☐ Pass   ☐ NG , _____

 10. Others：   ☐ Pass   ☐ NG , _____

6、 <u>**Summary**</u>：

Sales signature： _____

Customer Signature： _____   **Date**： _____ / _____ / _____