Winstar Display Co., LTD
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E-mail: sales@winstar.com.tw
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SPECIFICATION

CUSTOMER : _____

MODULE NO.: WO12864H-TFH#

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

SALES BY	APPROVED BY	CHECKED BY	PREPARED BY

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2011/10/14		First issue

RECORDS OF REVISION

DOC. FIRST ISSUE

VERSION	DATE	REVISED PAGE NO.	SUMMARY
0	2011/10/14		First issue

Contents

1.Module Classification Information

W O	12864	H－	T F H	#
① ②	③	④	⑤ ⑥ ⑦	⑧

① Brand：WINSTAR DISPLAY CORPORATION

② Display Type：H→Character Type, G→Graphic Type O→COG Type

③ Display Font：128 x 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	P→LED, Blue

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 Polarize Type/ Temperature range/ View direction

A→Reflective, N.T, 6:00	H→Transflective, W.T,6:00
D→Reflective, N.T, 12:00	K→Transflective, W.T,12:00
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 Directions 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.
(8) Winstar have the right to change the passive components, including R3,R6 & backlight adjust resistors. (Resistors,capacitors and other passive components will have different appearance and color caused by the different supplier.)
(9)Winstar have the right to change the PCB Rev. (In order to satisfy the supplying stability, management optimization and the best product performance...etc, under the premise of not affecting the electrical characteristics and external dimensions, Winstar have the right to modify the version.)

3.General Specification

Item	Dimension	Unit
Number of Characters	128 x 64 dots	—
Module dimension	80.0x 54.0 x9.5	mm
View area	70.7 x 38.8	mm
Active area	66.52 x 33.24	mm
Dot size	0.48 x0.48	mm
Dot pitch	0.52 x 0.52	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	1/65 , 1/9 Bias	
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	℃
Storage Temperature	T_{ST}	-30	—	+80	℃
Input Voltage	V_I	-0.3	—	V_{DD}+0.3	V

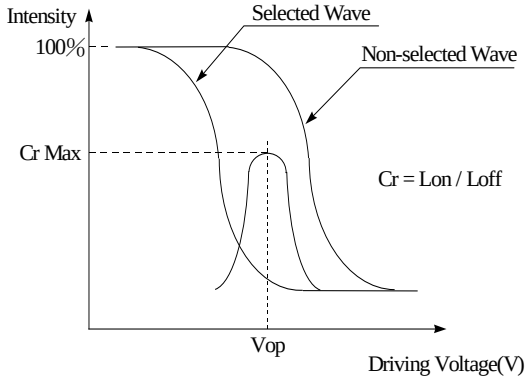
5.Electrical Characteristics

Item	Symbol	Condition	Min	Typ	Max	Unit
Supply Voltage For Logic	V_{DD}-V_{SS}	—	3.0	3.3	3.6	V
Supply Voltage For LCM	V_{DD}-V_5	Ta=-20℃ Ta=25℃ Ta=70℃	— — —	— 10.0 —	— — —	V V V
Input High Volt.	V_{IH}	—	0.7 V_{DD}	—	V_{DD}	V
Input Low Volt.	V_{IL}	—	Vss	—	0.3 V_{DD}	V
Output High Volt.	V_{OH}	—	0.8 V_{DD}	—	V_{DD}	V
Output Low Volt.	V_{OL}	—	Vss	—	0.2V_{DD}	V
Supply Current(No include LED Backlight)	I_{DD}	V_{DD}=3.3V	—	2.0	—	mA

6.Optical Characteristics

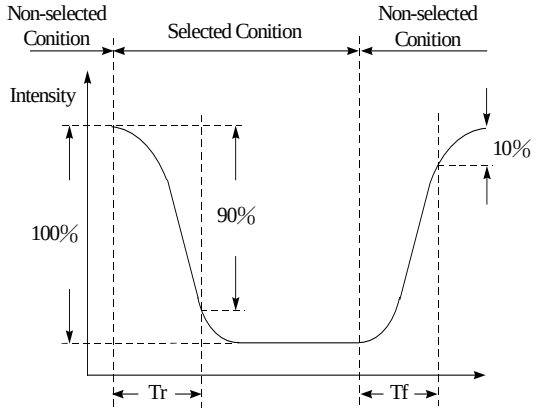
Item	Symbol	Condition	Min	Typ	Max	Unit
View Angle	(V) θ	CR≧2	30	—	60	deg
	(H) φ	CR≧2	-45	—	45	deg
Contrast Ratio	CR	—	—	5	—	—
Response Time	T rise	—	—	350	500	ms
	T fall	—	—	150	200	ms

Definition of Operation Voltage (Vop)



[positive type]

Definition of Response Time (Tr , Tf)



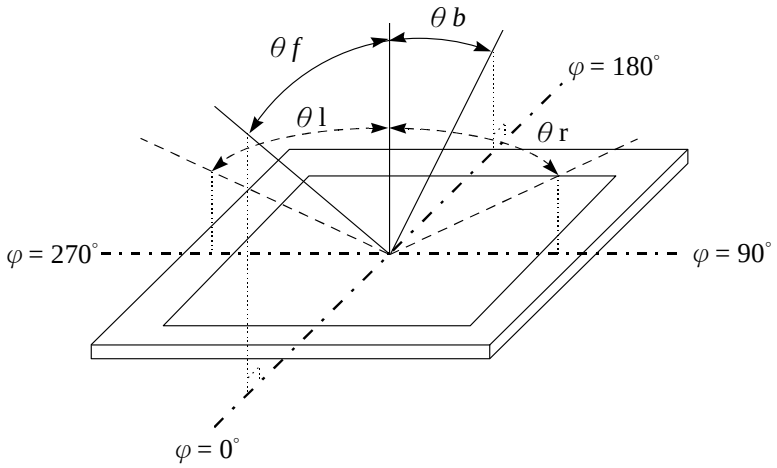
[positive type]

Conditions :

Operating Voltage : Vop Viewing Angle(θ ， φ) : 0°， 0°

Frame Frequency : 64 HZ Driving Waveform : 1/N duty , 1/a bias

Definition of viewing angle(CR≧2)



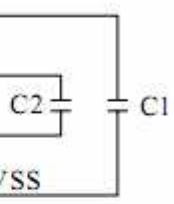
7.Interface Pin Function

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Level</th><th>Description</th></tr>
<tr><td>1</td><td>PSB</td><td>I</td><td>PSB selects the interface type: Serial or Parallel.</td></tr>
<tr><td>2</td><td>C86</td><td>I</td><td>C86 selects the microprocessor type in parallel interface mode.
<table>
<tr><th>PSB</th><th>C86</th><th>Selected Interface</th></tr>
<tr><td>“H”</td><td>“H”</td><td>Parallel 6800 Series MPU Interface</td></tr>
<tr><td>“H”</td><td>“L”</td><td>Parallel 8080 Series MPU Interface</td></tr>
<tr><td>“L”</td><td>“X”</td><td>Serial 4-Line SPI Interface</td></tr>
</table>
Please refer to “APPLICATION NOTES” and “Microprocessor Interface” (Section 6) for detailed connection of the selected interface.</td></tr>
<tr><td>3</td><td>VG</td><td>Power</td><td>VG is the LCD driving voltage for segment circuits.</td></tr>
<tr><td>4</td><td>XV0</td><td>Power</td><td>XV0 is the LCD driving voltage for common circuits at positive frame.</td></tr>
<tr><td>5</td><td>V0</td><td>Power</td><td>V0 is the LCD driving voltage for common circuits at negative frame.</td></tr>
<tr><td>6</td><td>VSS</td><td></td><td>This is a 0V terminal connected to the system GND.</td></tr>
<tr><td>7</td><td>VDD</td><td></td><td>Shared with the MPU power supply terminal VDD. (3.3 V)</td></tr>
<tr><td>8</td><td>D7</td><td rowspan="8"></td><td rowspan="8">When using 8-bit parallel interface: (6800 or 8080 mode)
8-bit bi-directional data bus. Connect to the data bus of 8-bit microprocessor.
When CSB is non-active (CSB=“H”), D[7:0] pins are high impedance.
When using serial interface: 4-LINE
D7=SDA : Serial data input.
D6=SCL : Serial clock input.
D[5:0] are not used and should connect to “H” by VDD1 or VDDH.
When CSB is non-active (CSB=“H”), D[7:0] pins are high impedance.</td></tr>
<tr><td>9</td><td>D6</td></tr>
<tr><td>10</td><td>D5</td></tr>
<tr><td>11</td><td>D4</td></tr>
<tr><td>12</td><td>D3</td></tr>
<tr><td>13</td><td>D2</td></tr>
<tr><td>14</td><td>D1</td></tr>
<tr><td>15</td><td>D0</td></tr>
<tr><td>16</td><td>ERD</td><td>I</td><td>Read/Write execution control pin. When PSB is “H”,
<table>
<tr><th>C86</th><th>MPU Type</th><th>ERD</th><th>Description</th></tr>
<tr><td>H</td><td>6800 series</td><td>E</td><td>Read/Write control input pin.
R/W=“H”: When E is “H”, D[7:0] are in output mode.
R/W=“L”: Signals on D[7:0] are latched at the falling edge of E signal.</td></tr>
<tr><td>L</td><td>8080 series</td><td>/RD</td><td>Read enable input pin.
When /RD is “L”, D[7:0] are in output mode.</td></tr>
</table>
ERD is not used in serial interface and should fix to “H” by VDD1 or VDDH.</td></tr>
</table>

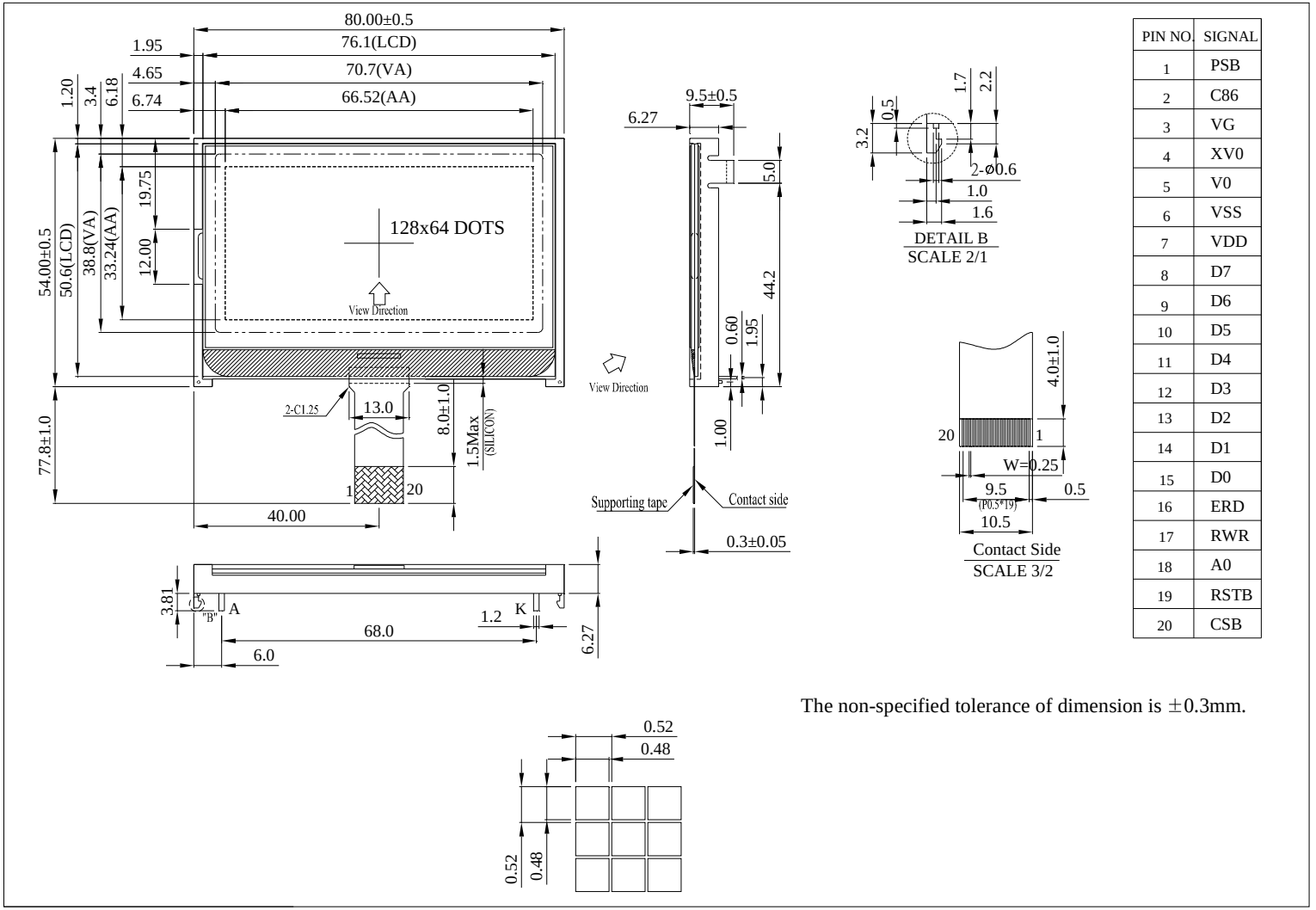
<table>
<tr><td>17</td><td>RWR</td><td>I</td><td>Read/Write execution control pin. When PSB is “H”,
<table>
<tr><th>C86</th><th>MPU Type</th><th>RWR</th><th>Description</th></tr>
<tr><td>H</td><td>6800 series</td><td>R/W</td><td>Read/Write control input pin.
R/W=“H”: read.
R/W=“L”: write.</td></tr>
<tr><td>L</td><td>8080 series</td><td>/WR</td><td>Write enable input pin.
Signals on D[7:0] will be latched at the rising edge of /WR signal.</td></tr>
</table>
RWR is not used in serial interface and should fix to “H” by VDD1 or VDDH.</td></tr>
<tr><td>18</td><td>A0</td><td>I</td><td>It determines whether the access is related to data or command.
A0=“H” : Indicates that signals on D[7:0] are display data.
A0=“L” : Indicates that signals on D[7:0] are command.</td></tr>
<tr><td>19</td><td>RSTB</td><td>I</td><td>Hardware reset input pin. When RSTB is “L”, internal initialization is executed
and the internal registers will be initialized.</td></tr>
<tr><td>20</td><td>CSB</td><td>I</td><td>Chip select input pin. Interface access is enabled when CSB is “L”.When CSB is non-active (CSB=“H”), D[7:0] pins are high impedance.</td></tr>
</table>

C1=C2=1UF/0805

PIN NO.	SIGNAL	
1	PSB	P3.6
2	C86	P3.6
3	VG	
4	XV0	C2
5	V0	
6	VSS	VSS
7	VDD	VDD
8	D7	P1.7
9	D6	P1.6
10	D5	P1.5
11	D4	P1.4
12	D3	P1.3
13	D2	P1.2
14	D1	P1.1
15	D0	P1.0
16	ERD	P3.4
17	RWR	P3.7
18	A0	P3.0
19	RSTB	P3.2
20	CSB	P3.3

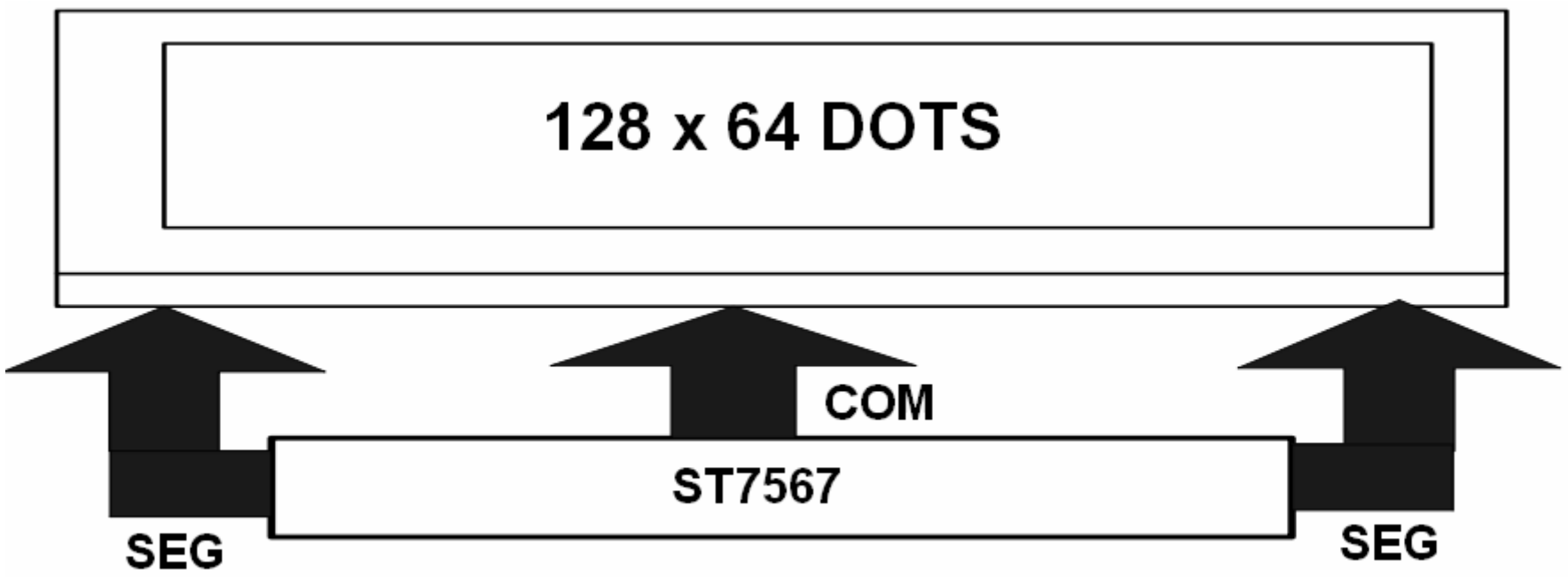


8.Contour Drawing &Block Diagram



PIN NO.	SIGNAL
1	PSB
2	C86
3	VG
4	XV0
5	V0
6	VSS
7	VDD
8	D7
9	D6
10	D5
11	D4
12	D3
13	D2
14	D1
15	D0
16	ERD
17	RWR
18	A0
19	RSTB
20	CSB

The non-specified tolerance of dimension is ±0.3mm.

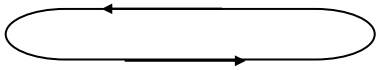

128 x 64 DOTS
COM
ST7567
SEG
SEG

9. Timing Characteristics

Please consult the spec of ST7567

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 : 1.5mm 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

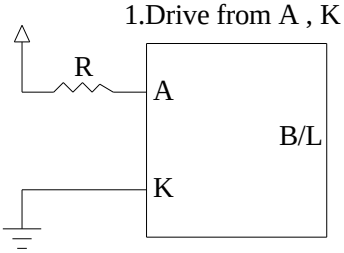
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITION
Supply Current	ILED	86.4	96	144	mA	V=3.5V
Supply Voltage	V	3.4	3.5	3.6	V	
Reverse Voltage	VR	—	—	5	V	—
Luminous Intensity (Without LCD)	IV	672.8	755	—	CD/M^2	ILED=96mA
LED Life Time (For Reference only)	—	—	50K	—	Hr.	I_{LED}≦96mA 25℃,50-60%RH, (Note 1)
Color	White					

Note: The LED of B/L is drive by current only；driving voltage is only for reference To make driving current in safety area (waste current between minimum and maximum).

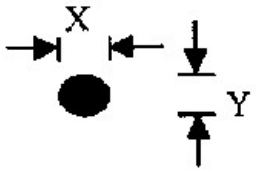
Note 1:50K hours is only an estimate for reference.

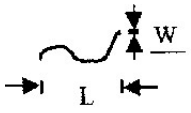
LED B\L Drive Method

1.Drive from A , K



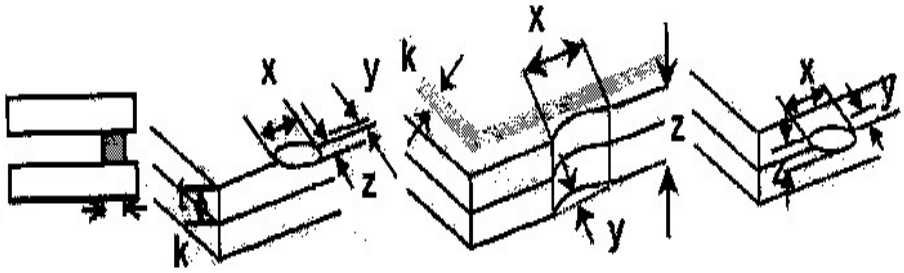
12. Inspection specification

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>01</td><td>Electrical Testing</td><td>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.</td><td>0.65</td></tr>
<tr><td>02</td><td>Black or white spots on LCD (display only)</td><td>2.1 White and black spots on display ≦0.25mm, no more than three white or black spots present.
2.2 Densely spaced: No more than two spots or lines within 3mm</td><td>2.5</td></tr>
<tr><td rowspan="2">03</td><td rowspan="2">LCD black spots, white spots, contamination (non-display)</td><td>3.1 Round type : As following drawing
Φ=(x + y) / 2
 

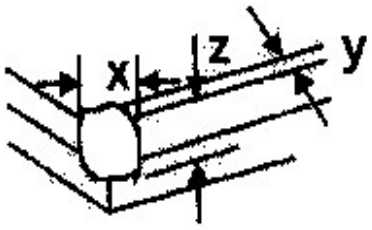
<table>
<tr><th>SIZE</th><th>Acceptable Q TY</th></tr>
<tr><td>Φ ≦0.10</td><td>Accept no dense</td></tr>
<tr><td>0.10＜ Φ ≦0.20</td><td>2</td></tr>
<tr><td>0.20＜ Φ ≦0.25</td><td>1</td></tr>
<tr><td>0.25＜ Φ</td><td>0</td></tr>
</table></td><td>2.5</td></tr>
<tr><td>3.2 Line type : (As following drawing)
 

<table>
<tr><th>Length</th><th>Width</th><th>Acceptable Q TY</th></tr>
<tr><td>---</td><td>W≦0.02</td><td>Accept no dense</td></tr>
<tr><td>L≦3.0</td><td>0.02＜W≦0.03</td><td rowspan="2">2</td></tr>
<tr><td>L≦2.5</td><td>0.03＜W≦0.05</td></tr>
<tr><td>---</td><td>0.05＜W</td><td>As round type</td></tr>
</table></td><td>2.5</td></tr>
<tr><td>04</td><td>Polarizer bubbles</td><td>If bubbles are visible, judge using black spot specifications, not easy to find, must check in specify direction.
<table>
<tr><th>Size Φ</th><th>Acceptable Q TY</th></tr>
<tr><td>Φ ≦0.20</td><td>Accept no dense</td></tr>
<tr><td>0.20＜ Φ ≦0.50</td><td>3</td></tr>
<tr><td>0.50＜ Φ ≦1.00</td><td>2</td></tr>
<tr><td>1.00＜ Φ</td><td>0</td></tr>
<tr><td>Total Q TY</td><td>3</td></tr>
</table></td><td>2.5</td></tr>
</table>

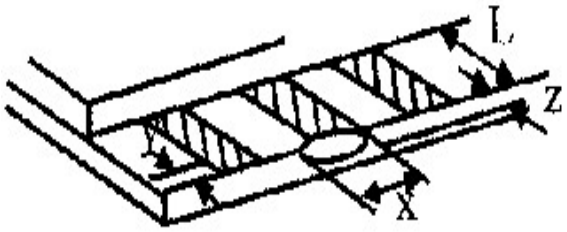
<table>
<tr><td>NO</td><td>Item</td><td>Criterion</td><td>AQL</td></tr>
<tr><td>05</td><td>Scratches</td><td>Follow NO.3 LCD black spots, white spots, contamination</td><td></td></tr>
<tr><td>06</td><td>Chipped glass</td><td>Symbols Define:
x: Chip length y: Chip width z: Chip thickness
k: Seal width t: Glass thickness a: LCD side length
L: Electrode pad length:

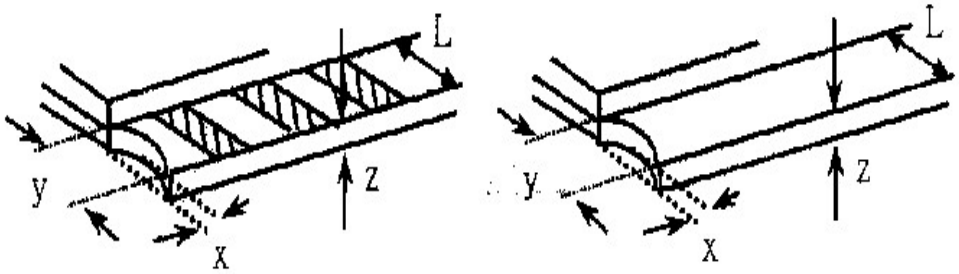
6.1 General glass chip :
6.1.1 Chip on panel surface and crack between panels:
 

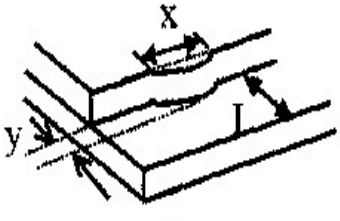
<table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr><tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr></table>⊙If there are 2 or more chips, x is total length of each chip.

6.1.2 Corner crack:
 

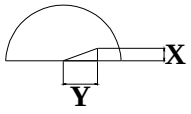
<table><tr><td>z: Chip thickness</td><td>y: Chip width</td><td>x: Chip length</td></tr><tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr><tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr></table>⊙If there are 2 or more chips, x is the total length of each chip.</td><td>2.5</td></tr>
</table>

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>06</td><td>Glass crack</td><td>
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≦0.5mm</td><td>x≦1/8a</td><td>0 ＜ z ≦ 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≦ L</td><td>x≦1/8a</td><td>0 ＜ z ≦ 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≦1/3L</td><td>x ≦ a</td></tr>
</table>
</td><td>2.5</td></tr>
</table>

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

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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.

14. Recommendable storage

1. Place the panel or module in the temperature 25°C±5°C and the humidity below 65% RH
2. Do not place the module near organics solvents or corrosive gases.
3. Do not crush, shake, or jolt the module

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：A ☐ 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** <<

5、Electronic Characteristics of Module：

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、Summary：

Sales signature：_____

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