History of Version

Version	Contents	Date	Note
a1	**NEW VERSION**	**27.Jan.2004**	**SPEC.**
a2	**Change as follow by customer:** 1.Modify 3.2 Mechanical Diagram 2.Modify 4.2-1 Standard Specifications for Reliability of LCD Module	**31.Jan.2004**	**SPEC.**
a3	**Change as follow by customer:** 1.Modify 3.2 Mechanical Diagram: Add DCT 2.Modify 1.2 Electrical Characteristics: VDD: 2.4(min) 2.7(min), 2.8(type) 3.0(type) **Change as follow by WINTEK:** 3.Modify 3.3 Back-light Specification: Luminous Intensity: 40(min) 80(min), 50(type) 110(type)		**SPEC. &16.Apr.2004 SAMPLE**
a4	**Change as follow by customer:** 1.2 Electrical Characteristics	**21.Apr.2004&**	**SPEC. SAMPLE**
a5	**Change as follow by customer:** 1.5.3 Initialization Table 2.1 Electro-optical Characteristics	**24.Apr.2004&**	**SPEC. SAMPLE**
a6	**Change as follow by WINTEK:** 1.Modify 3.3 Back-light Specification: Luminous Intensity: 80(min) 60(min), 110(type) 80(type)	**25.Jun.2004&**	**SPEC. SAMPLE**

Contents Page

Reference Data :
SOLOMON SSD1770 Specifications

(1) Electronic Units

1.1 Absolute Maximum Ratings

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
OPERATING TEMPERATURE	T_{OP}	-20	-	+70	℃
STORAGE TEMPERATURE	T_{ST}	-30	-	+80	℃
INPUT VOLTAGE	V_{CI}	Vss-0.3	-	4.0	V
SUPPLY VOLTAGE FOR LOGIC	V_{DD}	-0.3	-	4.0	V
SUPPLY VOLTAGE FOR LCD	V_{LCD} -V_{SS}	-0.3	-	15	V
STATIC ELECTRICITY	Be sure that you are grounded when handing LCM.				

1.2 Electrical Characteristics

(Ta=25℃,V_{DD}=2.8V)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
SUPPLY VOLTAGE FOR LOGIC	V_{DD} -V_{SS}	-	2.7	3.0	3.3	V
INPUT HIGH VOL.	V_{IH}	-	0.8V_{DD}	-	V_{DD}	V
INPUT LOW VOL.	V_{IL}	-	0	-	0.2V_{DD}	V
OUTPUT HIGH VOL.	V_{OH}	I_{OH}=-100uA	0.9V_{DD}	-	V_{DD}	V
OUTPUT LOW VOL.	V_{OL}	I_{OL}=100uA	V_{SS}	-	0.1V_{DD}	V
SUPPLY CURRENT FOR LOGIC	*I_{DD}	-	-	1.35	**1.8**	mA
USED IC	SSD1770					

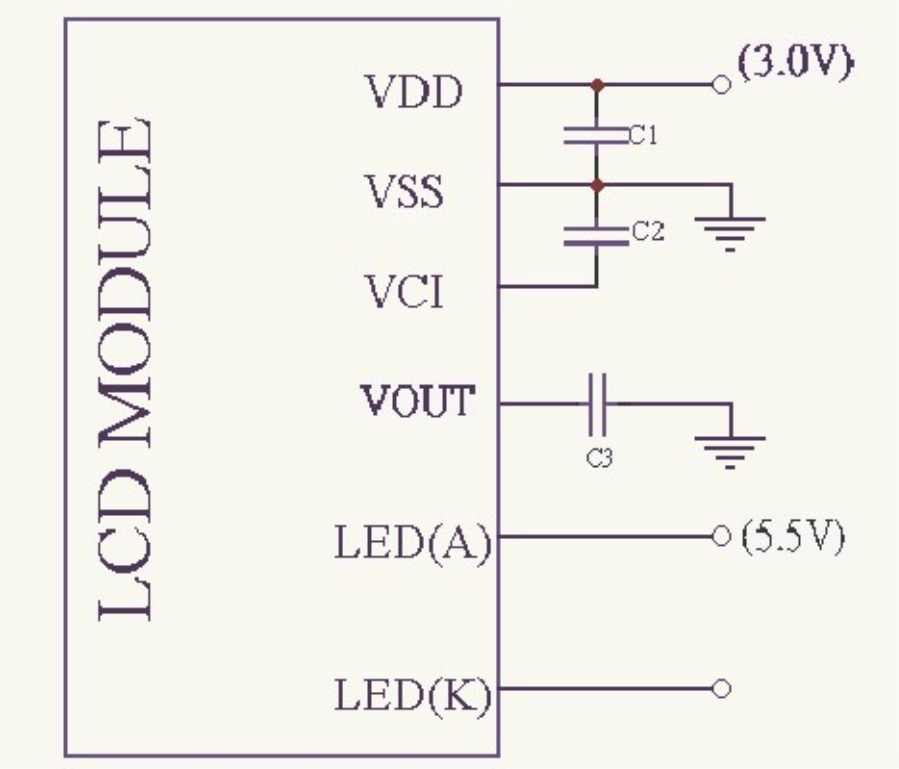
*I_{DD} Measurement condition is for all pixels on display

1.3 Interface Pin Function

CN1:

NO	SYMBOL	I/O	FUNCTION
1.	PS1	I	INTERFACE MODE SELECTION INPUT “H”=6800；”L”=8080
2.	/CS	I	CHIP SELECTION INPUT
3.	/RES	I	RESET SIGNAL INPUT
4.	D/C	I	DATA/COMMAND CONTROL
5.	R/W	I	6800 MODE：READ/WRITE SELECTION INPUT；8080 MODE：WRITE CONTROL SIGNAL INPUT
6.	E	I	6800 MODE：ENABLE SIGNAL；8080 MODE：READ CONTROL SIGNAL INPUT
7.	D0	I	8 BIT DATA BUS
8.	D1	I	
9.	D2	I	
10.	D3	I	
11.	D4	I	
12.	D5	I	
13.	D6	I	
14.	D7	I	
15.	VDD	P	POWER SUPPLY FOR LOGIC
16.	VCI	P	REFERENCE VOLTAGE INPUT FOR INTERNAL DC-DC CONVERTER
17.	VSS	P	GROUND
18.	VOUT	P	POWER SUPPLY FOR LCD
19.	LED(A)	P	LED POWER SUPPLY INPUT
20.	LED(K)	P	LED POWER SUPPLY INPUT

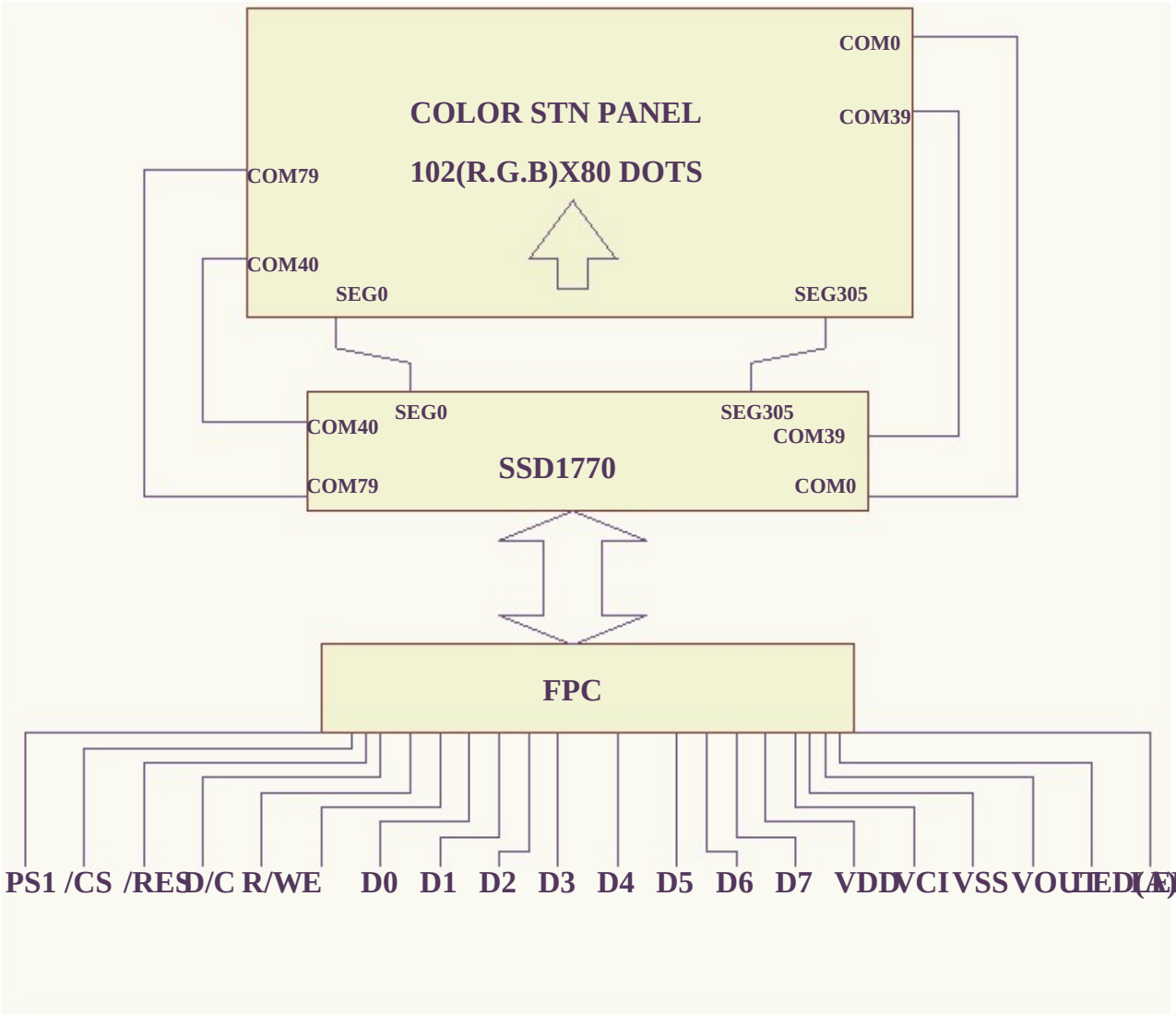
1.4 Power Supply for LCD Module



Note1: Using Internal Voltage Generator V_{DD}=V_{CI}=3.0V.
Note2: We recommend C1,C2=1.0uF/16V ~2.2uF/16 #0805 ,
C3=2.2uF/16V ~4.7uF/16 #0805

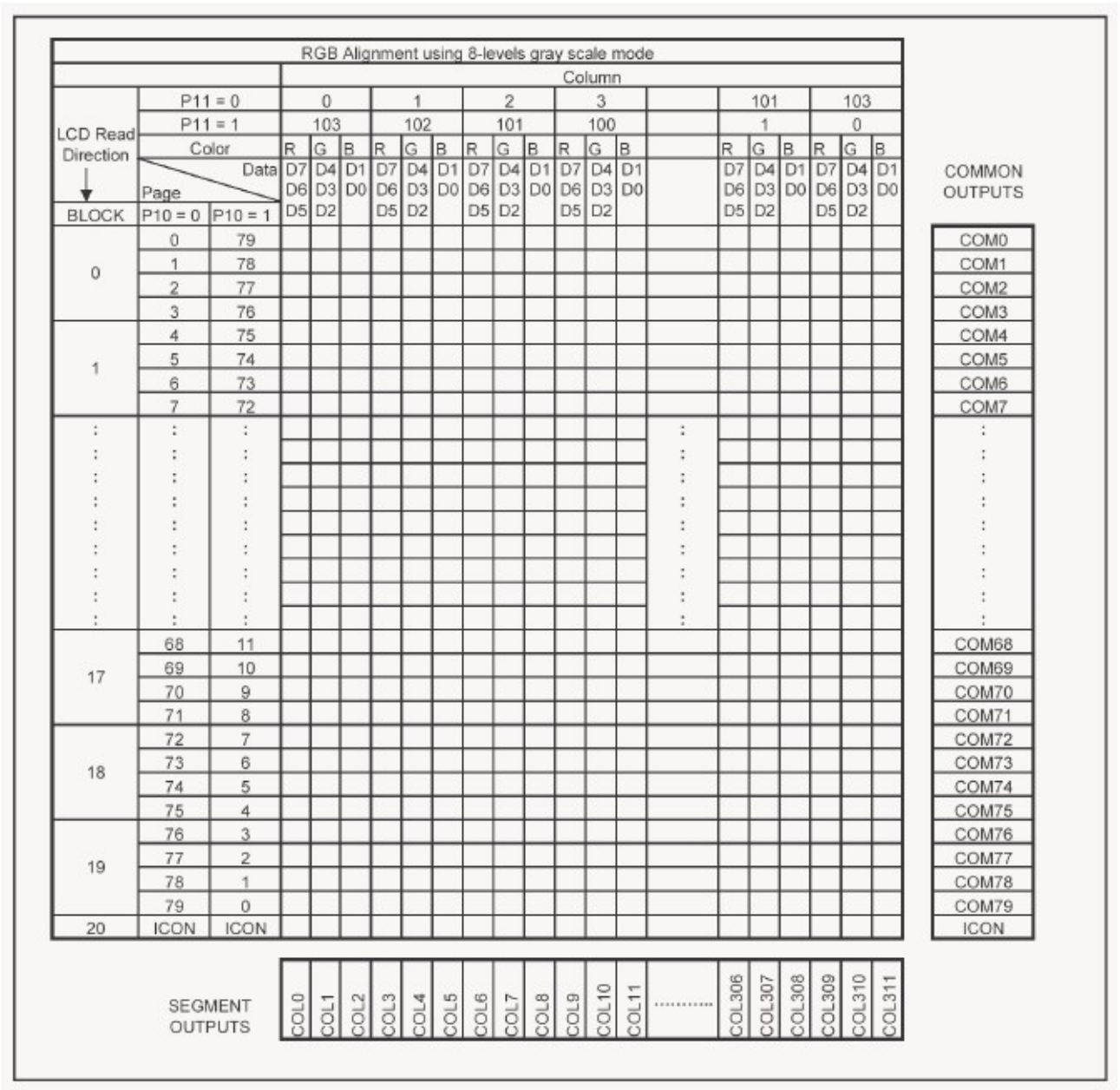
1.5 Block Diagram with Display Ram Address and Initialization Table

1.5.1 Block Diagram

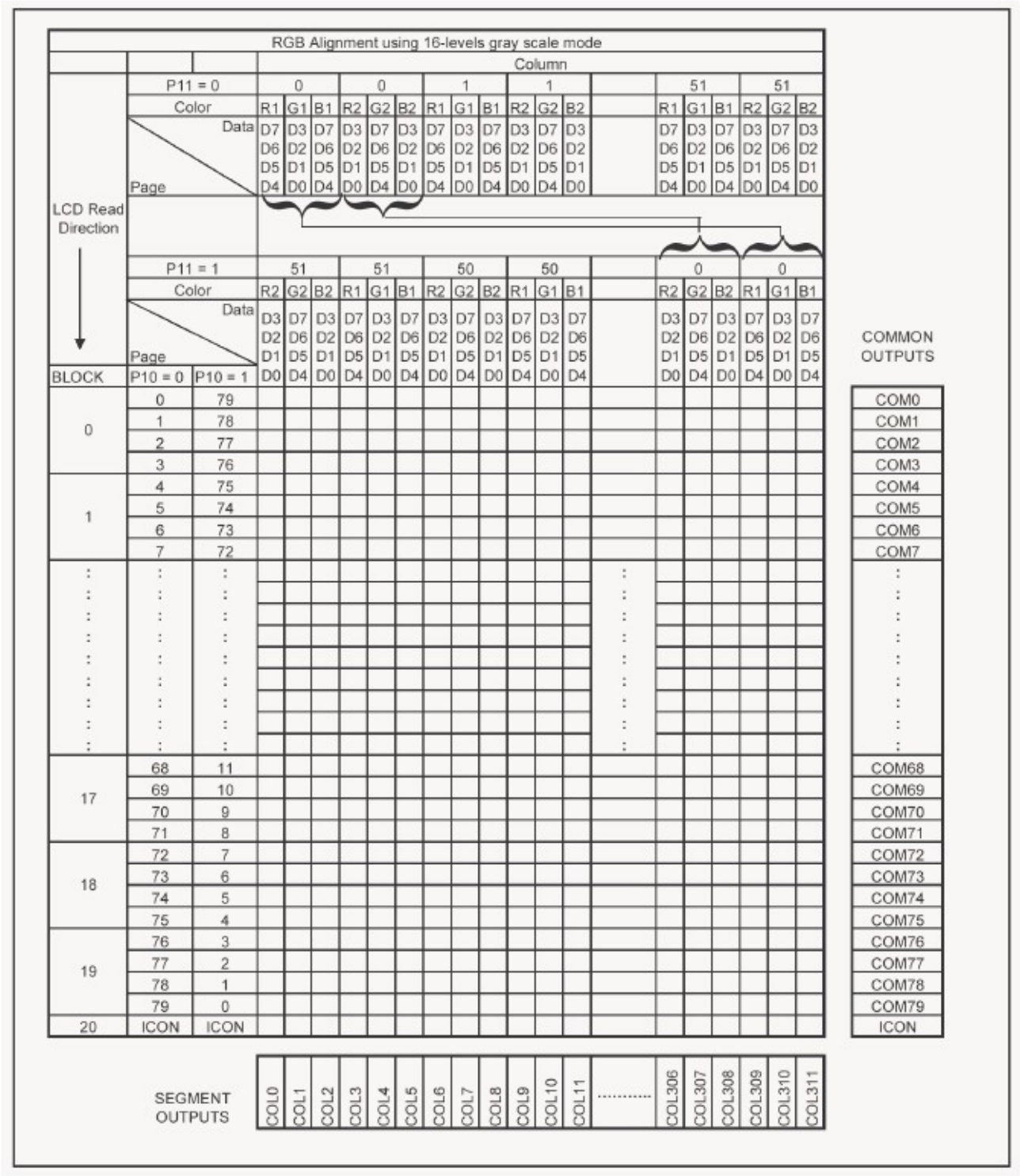


1.5.2 Display Ram Address

1.RAM arrangements of 8 gray-scale



2.RAM arrangements of 16 gray-scale



1.5.3 Initialization Table

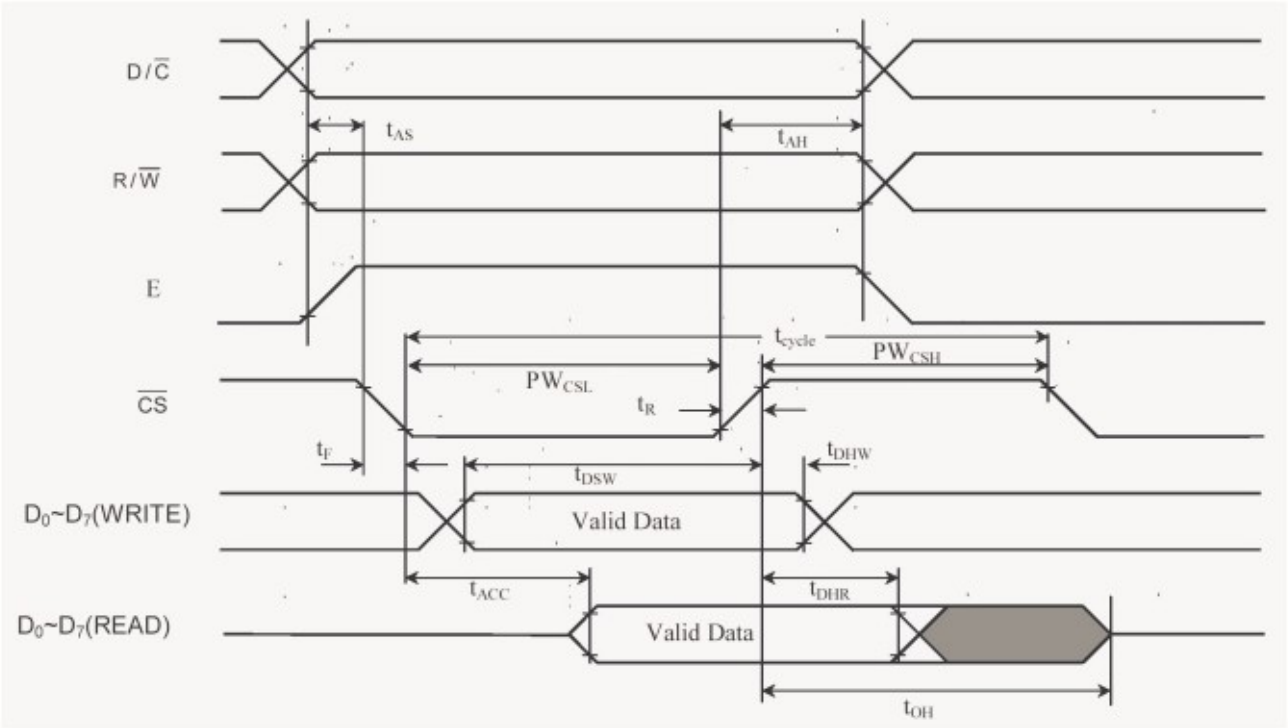
	Instruction	Code	Description
1.	Set COM scan direction	**10111011** **xxxx0001**	MUX68/80=VSS COM0 COM33,COM34 COM39, COM79 COM64,COM63 COM40
2.	Set power control register	**00100000** **xxxx1111**	Turn on the reference voltage generator Turn on the internal regulator and voltage follower Booster level 6X
3.	Set contrast control register & internal regulator resistor ratio	**10000001** **xx010100** **xxxxx110**	EVR=14H 1+R2/R1=8.03
4.	Set internal oscillator	**11010001** **11111011**	Internal oscillator status: on
5.	Set biasing bias	**xxxx0100** **11110010**	Bias=1/8
6.	Set frame frequency	**00001000** **x0000110** **11110111**	FLM=78Hz 7-line inversion
7.	Select PWM/FRC	**00101000** **00101100** **00000101** **10000010** ********00**	Set 4 bits PWM
8.	Set Temperature compensation coefficient		-0.1%/oC

1.6 Timing Characteristic

Read / Write Characteristics (6800-series MPU)

Table 15 – Parallel Timing Characteristics (T_A = -40 to 85°C, V_{DD} = 2.6V to 3.6V)

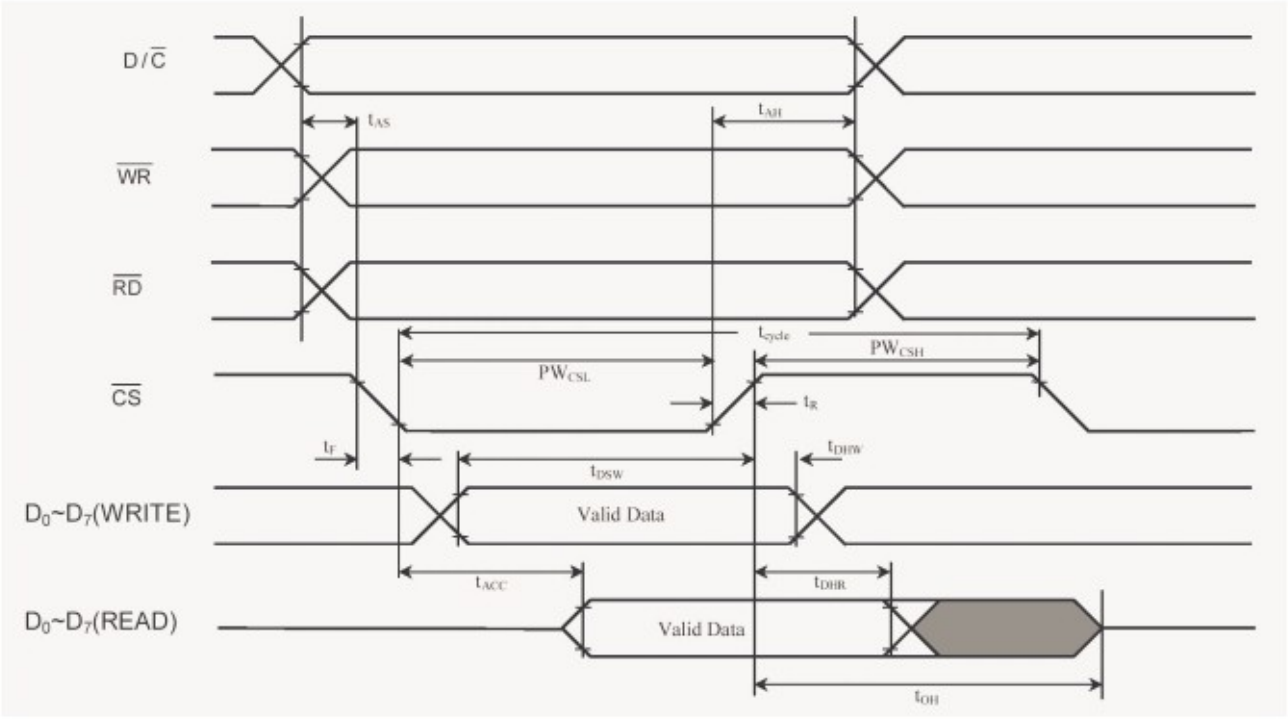
Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time (write cycle)	166.6	-	-	ns
t_{AS}	Address Setup Time	15	-	-	ns
t_{AH}	Address Hold Time	10	-	-	ns
t_{DSW}	Data Setup Time	10	-	-	ns
t_{DHW}	Data Hold Time	20	-	-	ns
t_{ACC}	Data Access Time	15	-	200	ns
t_{OH}	Output Hold time	20	-	60	ns



Read / Write Characteristics (8080-series Microprocessor)

Table 16 – Parallel Timing Characteristics (T_A = -40 to 85°C, V_{DD} = 2.6V to 3.6V)

Symbol	Parameter	Min	Typ	Max	Unit
t_{cycle}	Clock Cycle Time (write cycle)	166.6	-	-	ns
t_{AS}	Address Setup Time	15	-	-	ns
t_{AH}	Address Hold Time	10	-	-	ns
t_{DSW}	Data Setup Time	10	-	-	ns
t_{DHW}	Data Hold Time	20	-	-	ns
t_{ACC}	Data Access Time	15	-	170	ns
t_{OH}	Output Hold time	20	-	60	ns

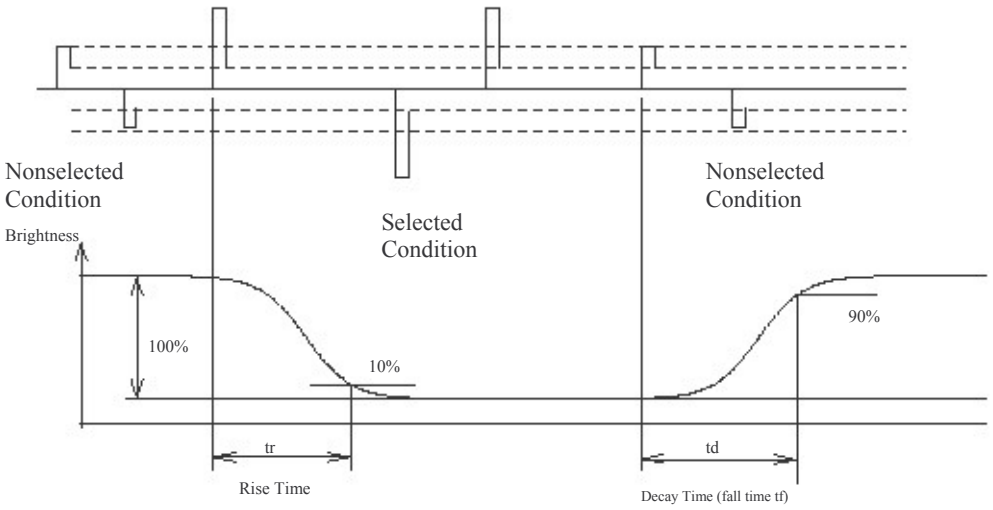


(2) Electro-optical Units

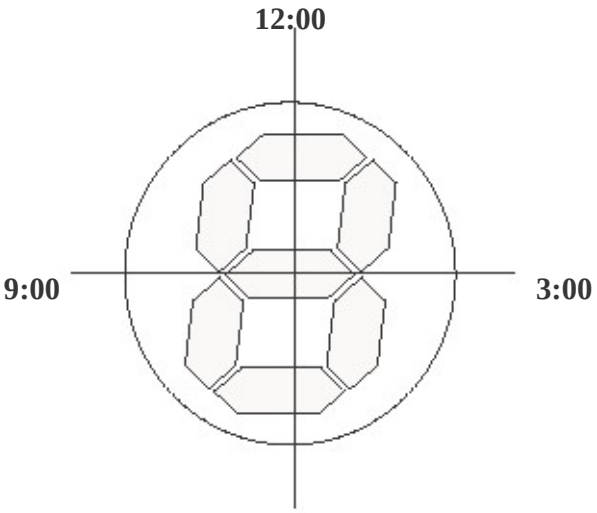
2.1 Electro-optical Characteristics

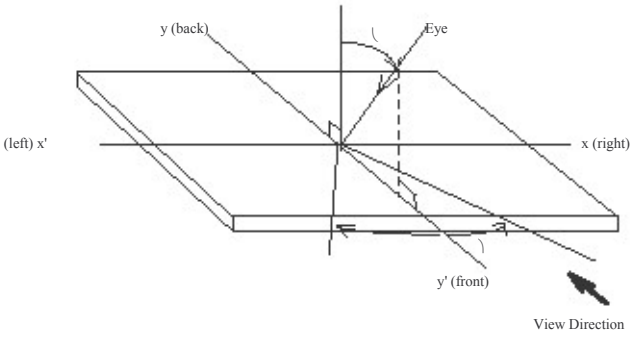
ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
VIEW ANGLE (V)	θ	CR≧2	-45-		+50	deg.
VIEW ANGLE (H)	ϕ	CR≧2	-30-		+40	deg.
CONTRAST RATIO	CR	Reflective(Ta=25℃)	47		-	-
		Transmissive(Ta=25℃)	1015		-	-
RESPONSE TIME	tr	Ta=25℃	-200		300	ms
RESPONSE TIME	td	Ta=25℃	-130		195	ms
Red x-coord	Rx	Ta=25℃	0.43	0.49	0.55	-
Red y-coord	Ry		0.27	0.33	0.39	
Green x-coord	Gx		0.26	0.32	0.38	
Green x-coord	Gy		0.32	0.38	0.44	
Blue x-coord	Bx				0.25	
Blue x-coord	By		0.13	0.19	0.27	
White x-coord	Wx		0.15	0.21	0.36	
White x-coord	Wy		0.24	0.30	0.37	
	DUTY		0.25	0.31		
	BIAS		1/80			
			1/8			
DRIVE METHOD		CSTN (Negative/Transflective)				
		6 O'CLOCK				
LCD TYPE						
VIEWING DIRECTION						

2.2 Optical Definitions

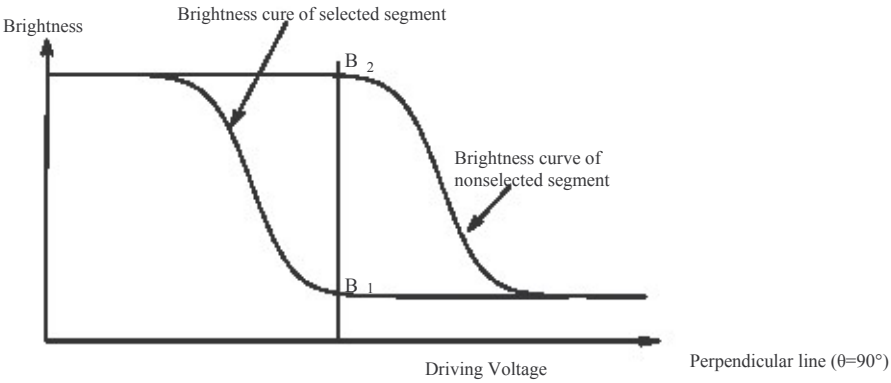


Response Time





View Angle



$$\text{Contrast ratio} = \frac{\text{Brightness at nonselected segment (B2)}}{\text{Brightness at selected segment (B1)}}$$

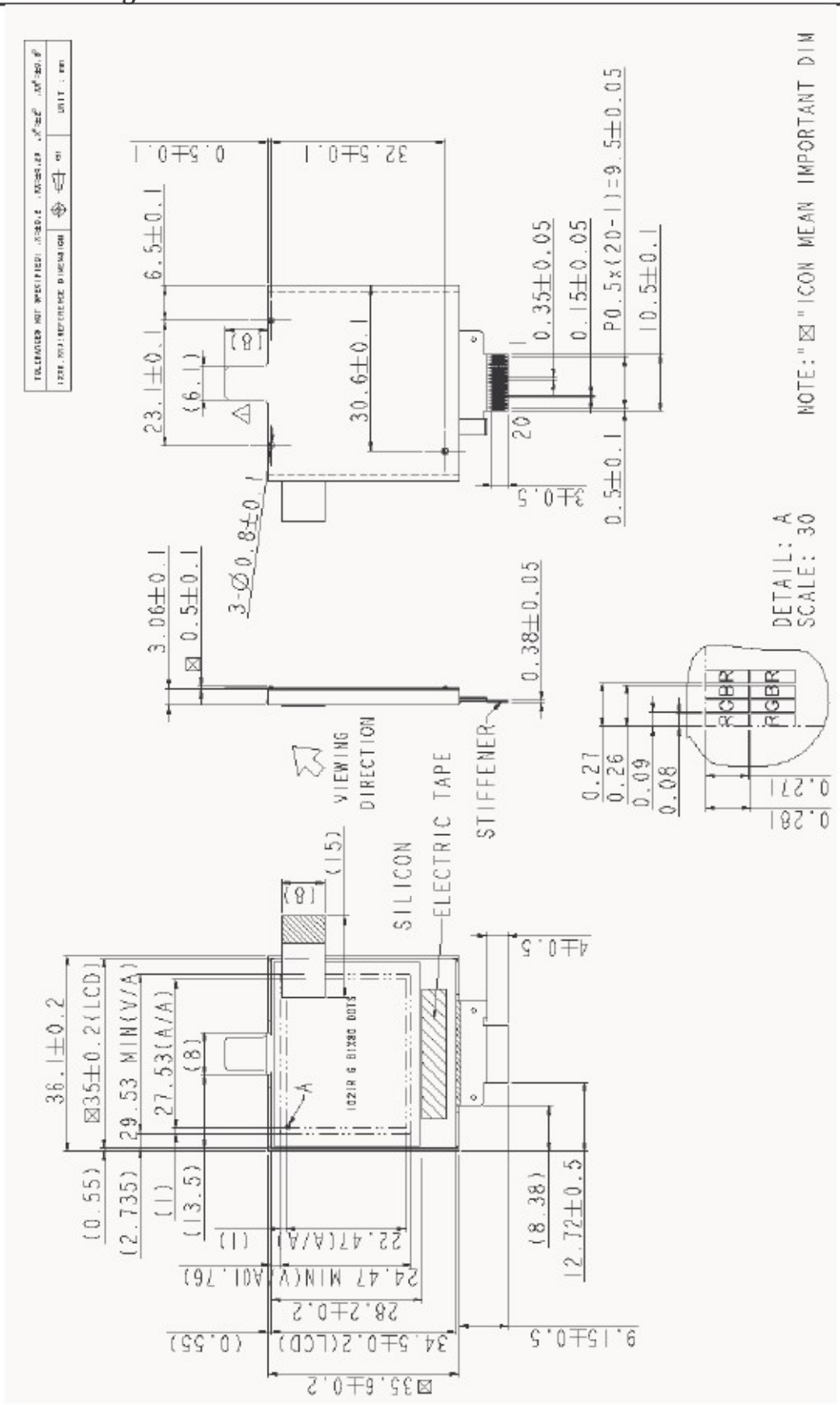
Contrast ratio (CR)

(3) Mechanical Units

3.1 Mechanical Specification

ITEM	STANDARD VALUE	UNIT
NUMBER OF DOTS	102 (RGB) · 80	dots
MODULE DIMENSION	36.1 (W) · 35.6 (H) · 3.06 (T)	mm
VIEWING AREA	29.53 (W) · 24.47 (H)	mm
ACTIVE AREA	27.53 (W) · 22.47 (H)	mm
DOT SIZE	0.08 (W) · 0.271 (H)	mm
DOT PITCH	0.09 (W) · 0.281 (H)	mm
PIXEL SIZE	0.26 (W) · 0.271 (H)	mm
PIXEL PITCH	0.27 (W) · 0.281 (H)	mm
APPROX. WEIGHT	6.5	g
BACK LIGHT	LED (white)	

3.2 Mechanical Diagram



3.3 Back-light Specification

The LED chips are distributed over the whole light area of the illumination unit, which gives the most uniform light.

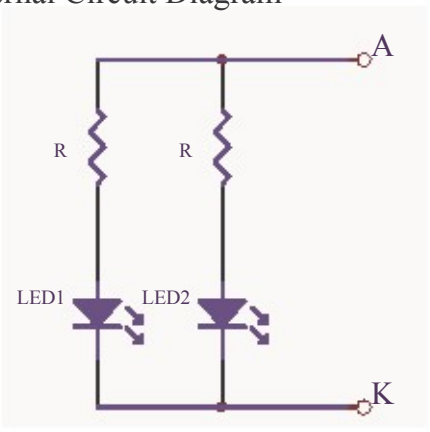
1. Data About LED Backlight:

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT		TEST CONDITION	NOTE
Supply Current	I	-	40	-	mA		V_{AK}=5.5V	-
Forward Voltage (Single chip)	VAK	-	5.5	6.0	V		IAK=40mA	-
Reverse Voltage (Single chip)	VR	-	-	5	V		-	-
Luminous Intensity	IV	60	80	-	$cd\Delta m^2$		IAK=40mA	1 (With LCD)
Luminous Intensity Ratio	-	-	-	30	%		-	2

NOTE：

1. Average Luminous Intensity Of P1 – P9
2. Luminous Intensity Ratio =(MAX – MIN)/MAX · 100%

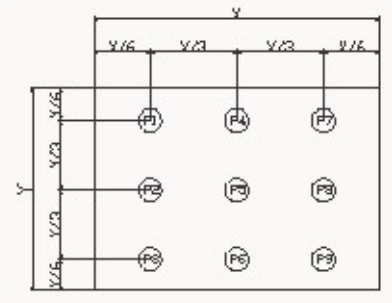
2.Internal Circuit Diagram



V_{AK}

R=100Ω

3. MEASURED METHOD (X*Y: Light Area)



(Effective spatial Distribution)

Hole Diameter φ3mm;1 to 9 per Position Measured Luminous Intensity

3.4 Packing Method

1. Packaging Material : (per carton)

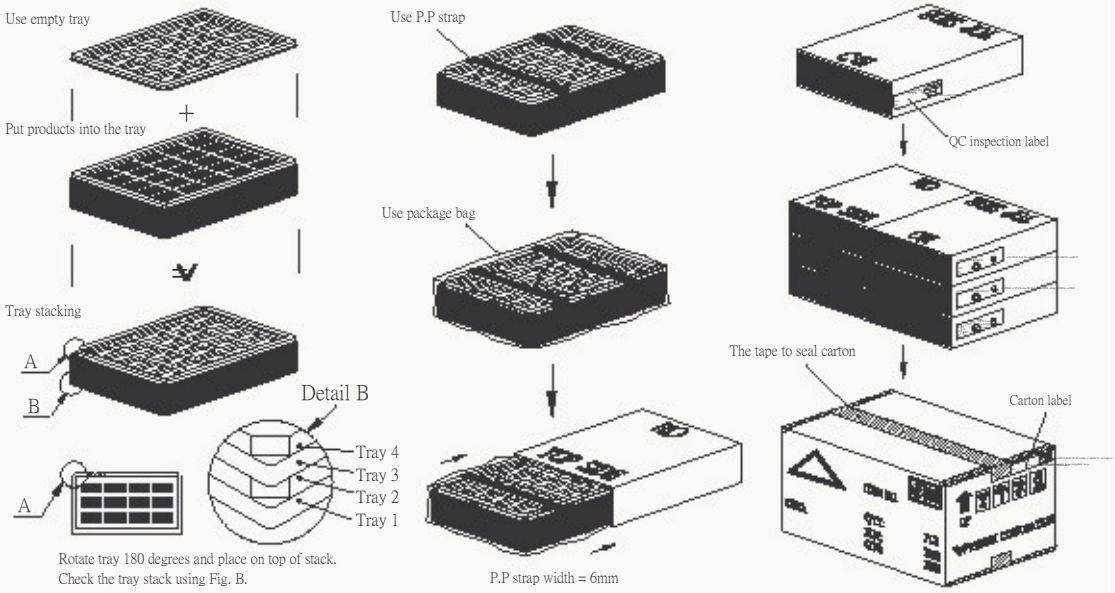
NO.	Item	Model	Dimensions (mm)	Unit Weight (Kg)	Quantity
1	LCM Module	WD-Z1008V-6CLWa	36.1*45.1	0.0065	1440
2	Tray	VC58 PETA	320*217*12*0.4	0.04	66
3	Product Box	C01	320*219*70	0.131	6
4	Carton	C62	475*345*250	0.857	1
5	Package Bag	C5	467*321*0.08	0.023	6
6	Total Weight	13.8	Kg± 5%		

2. Packaging Specifications and Quantity :

(1) LCM quantity per tray : quantity per row 6 x quantity per column 4 = 24

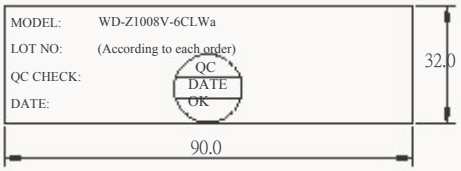
(2) LCM quantity per box : quantity per tray 24 x quantity of trays 10 = 240

(3) Total LCM quantity in carton : quantity per box 240 x quantity of boxes 6 = 1440



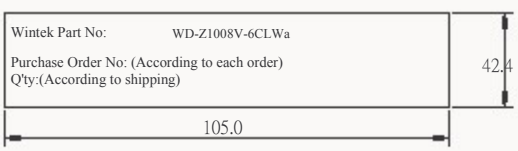
3. Label Specifications :

(1) QC Inspection Label



Label Color----Green

(2) Carton Label



Label Color----White

Remark

(4) Quality Units

4.1 Specification of Quality Assurance

4.1-1.Purpose

This standard for Quality Assurance should affirm the quality of LCD module products to supply to purchaser by WINTEK CORPORATION (Supplier).

4.1-2.Standard for Quality Test

a. Inspection :

Before delivering, the supplier should take the following tests, and affirm the quality of product.

b. Electro-Optical Characteristics:

According to the individual specification to test the product.

c. Test of Appearance Characteristics:

According to the individual specification to test the product.

d. Test of Reliability Characteristics:

According to the definition of reliability on the specification for testing products.

e. Delivery Test:

Before delivering, the supplier should take the delivery test.

(i) Test method: According to **ANSI/ASQC Z1.4-1993.General Inspection Level Ⅱ take a single time.**

(ii) The defects classify of AQL as following:

Major defect: AQL=0.65
Minor defect: AQL=2.5
Total defects: AQL=2.5

4.1-3.Nonconforming Analysis & Deal With Manners

a. Nonconforming analysis:

(i) Purchaser should supply the detail data of non-conforming sample and the non-suitable state.

(ii) After accepting the detail data from purchaser, the analysis of nonconforming should be finished in two weeks.

(iii) If supplier can not finish analysis on time, must announce purchaser before two weeks.

b. Disposition of nonconforming:

(i) If find any product defect of supplier during assembly time, supplier must change the good product for every defect after recognition.

(ii) Both supplier and customer should analyze the reason and discuss the disposition of nonconforming when the reason of nonconforming is not sure.

4.1-4. Agreement items

Both sides should discuss together when the following problems happen.

a. There is any problem of standard of quality assurance, and both sides think that it must be modified.

b. There is any argument item which does not record in the standard of quality assurance.

c. Any other special problem.

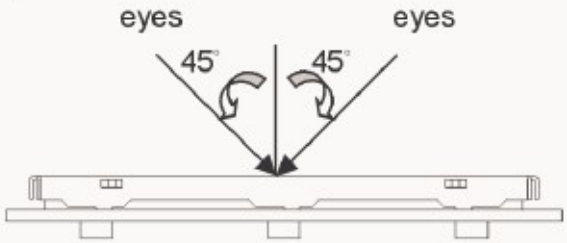
4.1-5. Standard of The Product Appearance Test

a. Manner of appearance test:

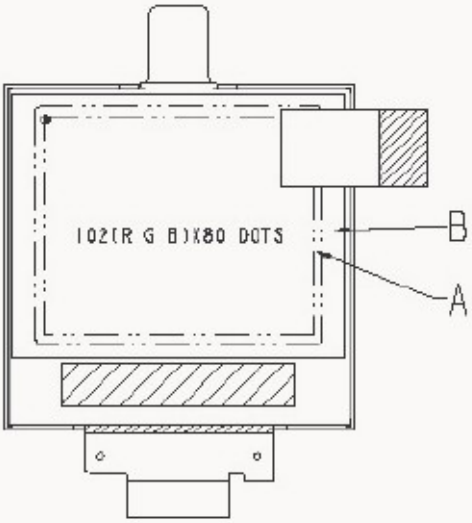
(i) The test must be under 20W × 2 or 40W fluorescent light, and the distance of view must be at 30 cm.

(ii) When test the model of transmissive product must add the reflective plate.

(iii) The test direction is base on about around 45° of vertical line.



(iv) Definition of area:



A Area : Viewing area.

B Area : Out of viewing area.
(Outside viewing area)

b. Basic principle:

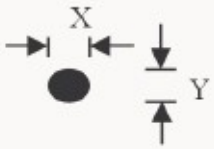
(i) It will accord to the AQL when the standard can not be described.

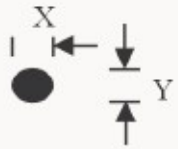
(ii) The sample of the lowest acceptable quality level must be discussed by both supplier and customer when any dispute happened.

(iii) Must add new item on time when it is necessary.

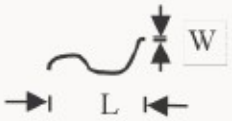
c. Standard of inspection:(Unit: mm)

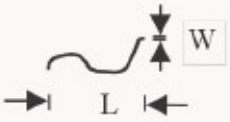
4.1-6. Inspection specification

<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 rowspan="2">02</td><td rowspan="2">LCD black spots, white spots
LCD black spots, white blurred spots</td><td>2.1 Round type：non display
$\phi = (x + y) / 2$
 

<table>
<tr><th>Diameter (mm)</th><th>Number</th><th>Min. Space</th></tr>
<tr><td>$\phi \leqq 0.20$</td><td>Ignore</td><td></td></tr>
<tr><td>$0.20 < \phi \leqq 0.30$</td><td>10</td><td>10mm</td></tr>
<tr><td>$0.30 < \phi \leqq 0.40$</td><td>5</td><td>30mm</td></tr>
<tr><td>$0.40 < \phi$</td><td>0</td><td></td></tr>
</table></td><td>2.5</td></tr>
<tr><td>2.2 Round type：at light condition or display
$\phi = (x + y) / 2$
 

<table>
<tr><th>Diameter (mm)</th><th>Number</th><th>Min. Space</th></tr>
<tr><td>$\phi \leqq 0.25$</td><td>Ignore</td><td></td></tr>
<tr><td>$0.25 < \phi \leqq 0.35$</td><td>10</td><td>20mm</td></tr>
<tr><td>$0.35 < \phi \leqq 0.50$</td><td>4</td><td>20mm</td></tr>
<tr><td>$0.50 < \phi \leqq 0.75$</td><td>3</td><td>50mm</td></tr>
<tr><td>$0.75 < \phi$</td><td>0</td><td></td></tr>
</table></td><td>2.5</td></tr>
</table>

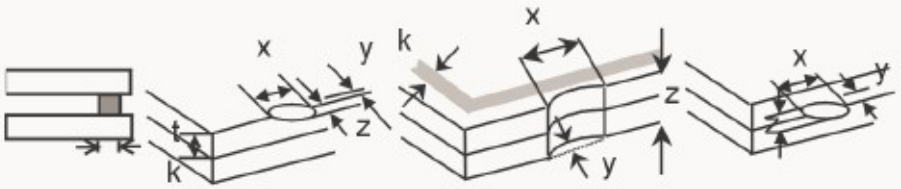
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td rowspan="2">03</td><td rowspan="2">LCD black spots, white spots</td><td>3.1 Line type： At non-light condition or non-display


<table>
<tr><th>Length (mm)</th><th>Width (mm)</th><th>Number</th></tr>
<tr><td>-----</td><td>W≦0.03</td><td>Ignore</td></tr>
<tr><td>L≦3.0</td><td>0.03＜W≦0.05</td><td>6</td></tr>
<tr><td>L≦2.5</td><td>0.05＜W≦0.10</td><td>1</td></tr>
<tr><td>----</td><td>0.10＜W</td><td>0</td></tr>
</table></td><td>2.5</td></tr>
<tr><td>3.2 Line type：At light condition or display


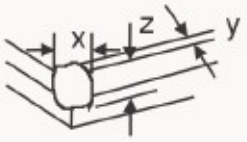
<table>
<tr><th>Length (mm)</th><th>Width (mm)</th><th>Number</th><th>Space (mm)</th></tr>
<tr><td>L≦1.2</td><td>W≦0.25</td><td>2</td><td>20</td></tr>
<tr><td>L≦1.5</td><td>W≦0.20</td><td>3</td><td>20</td></tr>
<tr><td>L≦2.0</td><td>W≦0.15</td><td>3</td><td>20</td></tr>
<tr><td>L≦3.0</td><td>W≦0.10</td><td>4</td><td>20</td></tr>
<tr><td colspan="2">Whole number</td><td colspan="2">6</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 ψ</th><th>Acceptable Q□TY</th></tr>
<tr><td>ψ ≦0.20</td><td>Accept no dense</td></tr>
<tr><td>0.20＜ψ ≦0.50</td><td>3</td></tr>
<tr><td>0.50＜ψ ≦1.00</td><td>2</td></tr>
<tr><td>1.00＜ψ</td><td>0</td></tr>
<tr><td>Total Q’ TY</td><td>3</td></tr>
</table></td><td>2.5</td></tr>
<tr><td>05</td><td>Scratches</td><td colspan="2">Follow NO.3 LCD black spots, white spots, contamination</td></tr>
</table>

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>06</td><td>Chipped glass</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

6.1 General glass chip :

6.1.1Chip on panel surface and crack between panels :


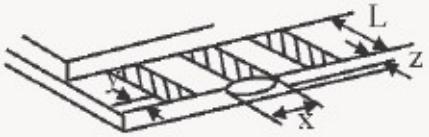
<table>
<tr><th>z : Chip thickness</th><th>y : Chip width</th><th>x : Chip length</th></tr>
<tr><td>Z≦1/2t</td><td>Not over viewing area</td><td>x≦1/8a</td></tr>
<tr><td>1/2t＜z≦2t</td><td>Not exceed 1/3k</td><td>x≦1/8a</td></tr>
</table>
⊙If there are 2 or more chips, x is the total length of each chip.

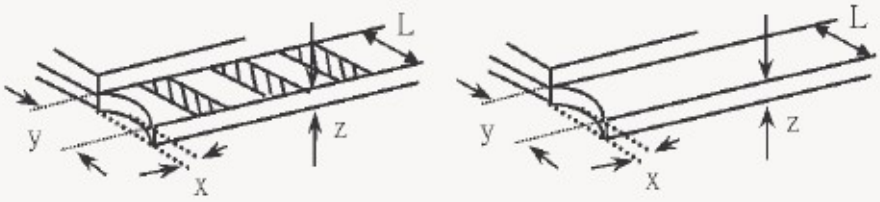
6.1.2 Corner crack :


<table>
<tr><th>z : Chip thickness</th><th>y : Chip width</th><th>x : Chip length</th></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>

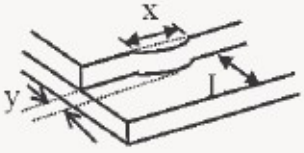
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>AQL</th></tr>
<tr><td>06</td><td>Glass crack</td><td>
Symbols：
x：Chip length　y：Chip width　z：Chip thickness
k：Seal width　t：Glass thickness　a：LCD side length
L：Electrode pad length

6.2 Protrusion over terminal：

6.2.1 Chip on electrode pad：


<table>
<tr><th>y：Chip width</th><th>x：Chip length</th><th>z：Chip thickness</th></tr>
<tr><td>y≦ 0.5 mm</td><td>x≦1/8a</td><td>0 < z ≦t</td></tr>
</table>
6.2.2 Non-conductive portion：


<table>
<tr><th>y：Chip width</th><th>x：Chip length</th><th>z：Chip thickness</th></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 must not be damaged.

6.2.3 Substrate protuberance and internal crack.


<table>
<tr><th>y： width</th><th>x：length</th></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 scratches that appear when lit must be judged . using LCD spot, lines and contamination standards. 8.3 Backlight doesn't light or color is wrong.	0.65 2.5 0.65
09	General appearance	9.1 No oxidation, contamination, curves or, bends on interface Pin (OLB) of TCP. 9.2 No cracks on interface pin (OLB) of TCP. 9.3 No contamination, solder residue or solder balls on product. 9.4 The IC on the TCP may not be damaged, circuits. 9.5 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. 9.6 The residual rosin or tin oil of soldering (component or chip component) is not burned into brown or black color. 9.7 Sealant on top of the ITO circuit has not hardened 9.8 Pin type must match type in specification sheet. 9.9 LCD pin loose or missing pins. 9.10 Product packaging must the same as specified on packaging specification sheet. 9.11 Product dimension and structure must conform to product specification sheet . 9.12 The appearance of Heat Seal should not admit any dirt and break.	2.5 0.65 2.5 2.5 2.5 2.5 2.5 0.65 0.65 0.65 0.65

4.2 Standard Specification for Reliability

4.2-1.Standard Specifications for Reliability of LCD Module

No	Item	Description
01	High temperature	The sample shall be free from defects after it has been allowed to stand at 70 ℃ ± 2 ℃ for 240 hours under driving conditions.operation
02	Low temperature	The sample shall be free from defects after it has been allowed to stand at -20 ℃ ± 2 ℃ for 240 hours under driving conditions.operation
03	High temperature resistancethen	The sample shall be free from defects after it has been allowed to stand at 80 ℃ ± 3 ℃ for 240 hours under no-load condition, returning it to normal temperature condition, and allowing it stand for 30 minutes.
04	Low temperature resistancethen	The sample shall be free from defects after it has been allowed to stand at -30 ℃ ± 3 ℃ for 240 hours under no-load condition, returned it to normal temperature condition and allowed to stand for 24 hours.
05	Moisture resistance	The sample shall be free from defects after it has been allowed to stand at 60℃±3 ℃, 90% RH for 240 hours under no-load conditions including the polarizer ,then taken it out and driven it at normal temperature.
06	Thermal shock resistance	The sample shall be free from defects after it has been subjected to the following cycle of operation ,repeated 10 times. -30℃ for 30 minutes → normal temperature for 5 minutes → +80℃ for 30 minutes → normal temperature for 5 minutes This is one cycle.
07	High temp./High humidity operation	The sample shall be free from defects after it has been allowed to stand at 40℃±3 ℃, 90% RH for 48 hours under driving conditions excluding the polarizer ,then taken it out and driven it at normal temperature.

4.2-2. Testing Conditions and Inspection Criteria

For the final test the testing sample must be stored at room temperature for 24 hours, after the tests listed in Table 4.2,Standard specifications for Reliability have been executed in order to ensure stability.

NO	Item	Test Model	Inspection Criteria
01	Current Consumption	Refer To Specification	The current consumption should conform to the product specification.
02	Contrast	Refer To Specification	After the tests have been executed, the contrast must be larger than half of its initial value prior to the tests.
03	Appearance	Visual inspection	Defect free.

4.2-3. Life Time

Life time	Functions, performance, appearance, etc. shall be free from remarkable deterioration within 50,000 hours under ordinary operating and storage conditions room temperature (25 ±10℃), normal humidity (45 ±20% RH), and in area not exposed to direct sun light. (Life time of backlight, please refer to Data about backlight.)

Note: From our experience the life time of high humidity operation and high temperature operation as above mentioned could be achieved.

4.3 Precautions in Use of LCM

4.3-1 Handling of LCM

- Don't give external shock.
- Don't apply excessive force on the surface.
- Liquid in LCD is hazardous substance. Must not lick and swallow. when the liquid is attach to your hand, skin, cloth etc. Wash it out thoroughly and immediately.
- Don't operate it above the absolute maximum rating.
- Don't disassemble the LCM.

4.3-2 Storage

- Store in an ambient temperature of 5℃ to 45℃, and in a relative humidity of 40% to 60%. Don't expose to sunlight or fluorescent light.
- Storage in a clean environment, free from dust, active gas, and solvent.
- Store in anti-static electricity container.
- Store without any physical load.

4.3-3 Soldering

- Use the high quality solder. (60-63% tin mixed with lead)
- Iron: no higher than 260℃ and less than 3-4 sec during soldering.
- Soldering: only to the I/O terminals.
- Rewiring: no more than 3 times.

4.3-4 Assembly

- The front polarizer is covered with a protective foil which should be removed before use.