MULTI-INNO TECHNOLOGY CO., LTD.

www.multi-inno.com

LCD MODULE SPECIFICATION

Model : MI240160E-G-1

This module uses ROHS material

For Customer's Acceptance:

Customer	
Approved	
Comment	

This specification may change without prior notice in order to improve performance or quality. Please contact Multi-Inno for updated specification and product status before design for this product or release of this order.	Revision	1.1
	Engineering	
	Date	2013-10-09
	Our Reference	

RECORDS OF REVISION

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
04/08/2010	01		New Drawing		
05/02/2010	1.0		New Sample SPEC		
10/09/2013	1.1		Correct IO description		

Contents

1. SPECIFICATIONS
- 1.1 Features
- 1.2 Mechanical Specifications
- 1.3 Absolute Maximum Ratings
- 1.4 DC Electrical Characteristics
- 1.5 Optical Characteristics
- 1.6 Backlight Characteristics

2. MODULE STRUCTURE
- 2.1 Counter Drawing
- 2.2 Interface Pin Description
- 2.3 Timing Characteristics

3. QUALITY ASSURANCE SYSTEM
- 3.1 Quality Assurance Flow Chart
- 3.2 Inspection Specification

4. RELIABILITY TEST
- 4.1 Reliability Test Condition

5. PRECAUTION RELATING PRODUCT HANDLING
- 5.1 Safety
- 5.2 Handling
- 5.3 Storage
- 5.4 Terms of Warranty

Appendix: LCM Drawing
LCM Packaging

6.OUTLINE

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	240*160 Dots
LCD Type	FSTN, Transflective, Positive, Extended Temp.
Driver Condition	LCD Module : 1/160 Duty , 1/14Bias
Viewing Direction	6 O'clock
Backlight	White
Weight	30.5g
Interface	Support 8 Bit Parallel interface with 8080 / 6800 MPU
Other(controller / driver IC)	SITRONIX – ST7586S
ROHS	

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	83.8 (L) * 60.0(w) * 6.7(H)	mm
Viewing Area	69.6 (L) * 47.6 (w)	mm
Active Area	65.985 (L) * 43.985 (w)	mm
Dot Size	0.26 (L) * 0.26 (w)	mm
Dot Pitch	0.275 (L) * 0.275 (w)	mm

Note：For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	VDD	—	-0.3	3.6	V
LCD Driver Supply Voltage	V0-XV0	—	-0.3	19	V
Input Voltage	V_{IN}	—	-0.3	VDD+0.3	V
Operating Temperature	T_{OP}	—	-10	60	℃
Storage Temperature	T_{ST}	—	-20	70	℃
Storage Humidity	H_D	Ta＜60 ℃	-	90	%RH

1.4 DC Electrical Characteristics

VSS= 0V, Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	VDD	-	2.7	3	3.3	V
"H" Input Voltage	V_{IH}	-	0.7VDD	-	VDD	V
"L" Input Voltage	V_{IL}	-	VSS	-	0.3VDD	V
Supply Current	I_{DD}	VDD=3V;VOP=17.5V; Pattern= Full display	-	1.6	-	mA
		VDD=3V;VOP=17.5V; Pattern= Horizontal line*1	-	2.8	5.0	
LCM Driver Voltage	VOP*2	-10℃	17.9	18.1	18.3	V
		25℃	17.3	17.5	17.7	
		60℃	15.7	15.9	16.1	

NOTE: *1 The Maximum current display

*2 The VOP test point is V0- XV0

1.5 Optical Characteristics

LCD Panel：1/160Duty，1/14Bias，VLCD=17.5V，Ta =25℃

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	C≥2.0, ∅ =270°	-	150	225	ms	Note2
	Fall	tf		-	370	555		
Viewing angle range	Top	ΘY+		-	40	-	Deg.	Notes 1
	Bottom	ΘY-		-	40	-		
	Left	ΘX-		-	40	-		
	Right	ΘX+		-	40	-		
Contrast Ratio		C	θ = 0°, ∅ =270°	-	6.9	-	-	Note 3
Average Brightness (with LCD) *2		IV	VF=3.2V	30	45	-	cd/m^2	Note 4
Uniformity *1		△B		70	-	-	%	

Note 4 ：

1：△B=B(min) / B(max) * 100%

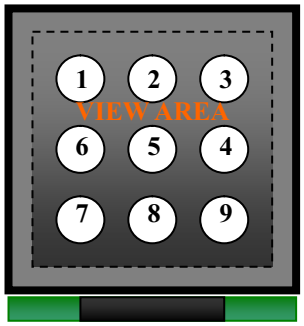
2：Measurement Condition for Optical Characteristics:

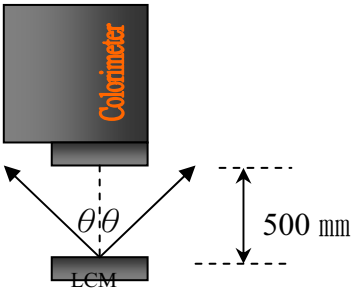
a：Environment: 25℃±5℃ / 60±20%R.H，no wind，dark room below 10 Lux at typical lamp current and typical operating frequency.

b：Measurement Distance: 500 ± 50 ㎜ ，(θ= 0°)

c：Equipment: TOPCON BM-7 fast，(field 1°)，after 10 minutes operation.

d：The uncertainty of the C.I.E coordinate measurement ±0.01，Average Brightness ± 4%



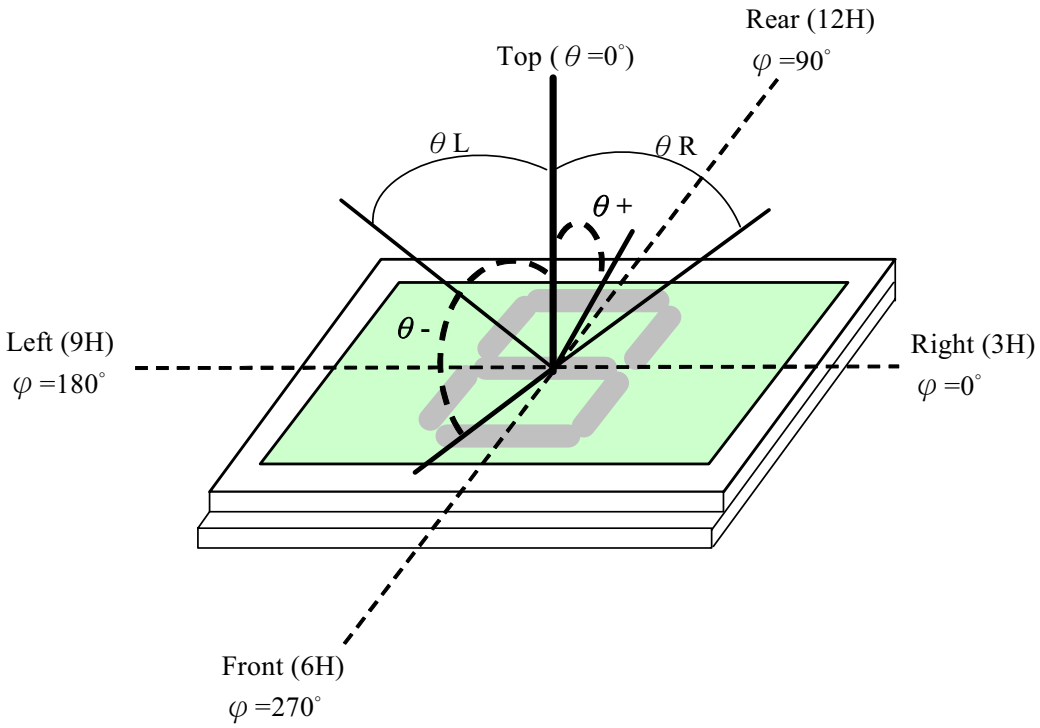


Colorimeter=BM-7 fast

Note 1.

Optical characteristics-2

Viewing angle

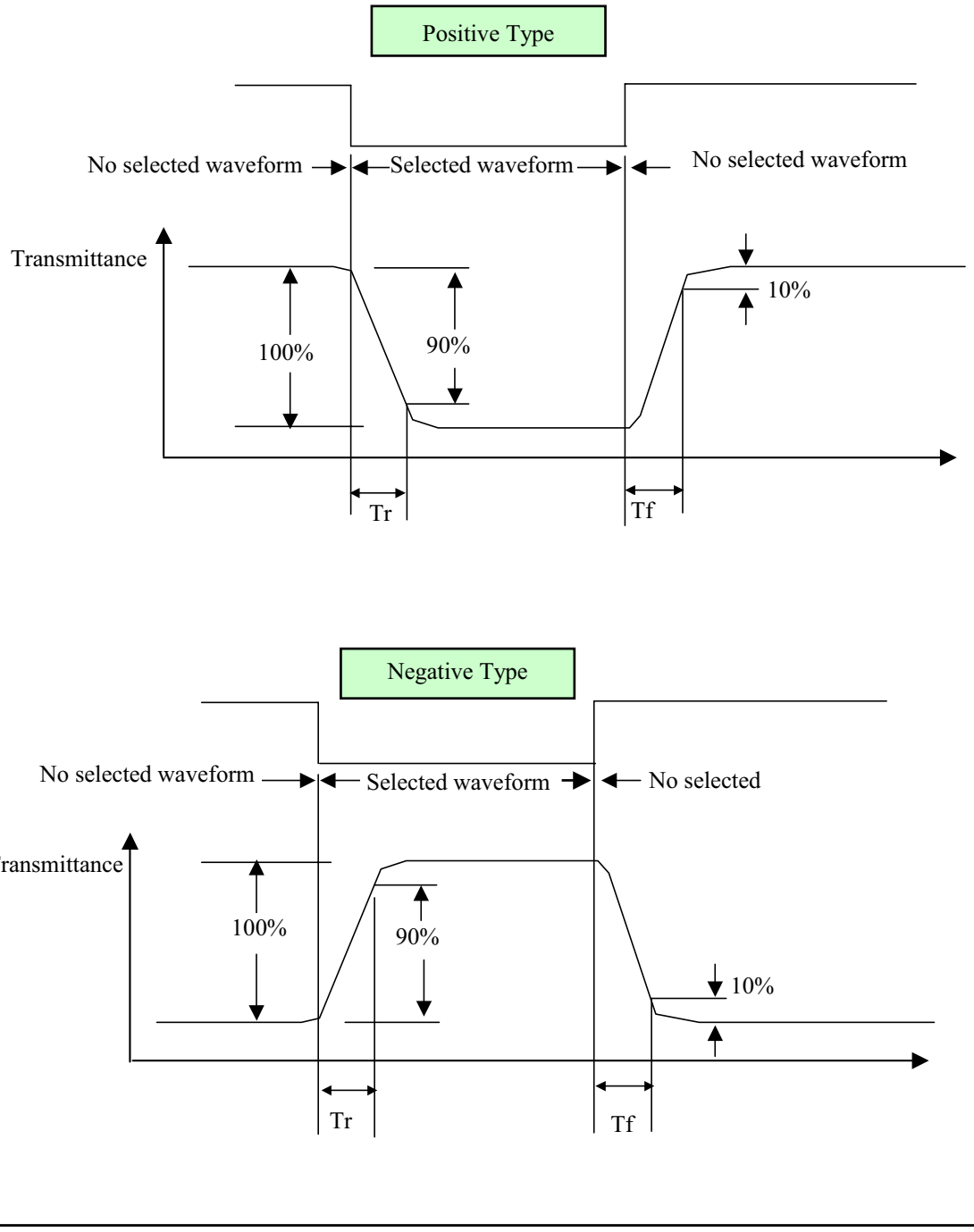


Viewing angle

Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

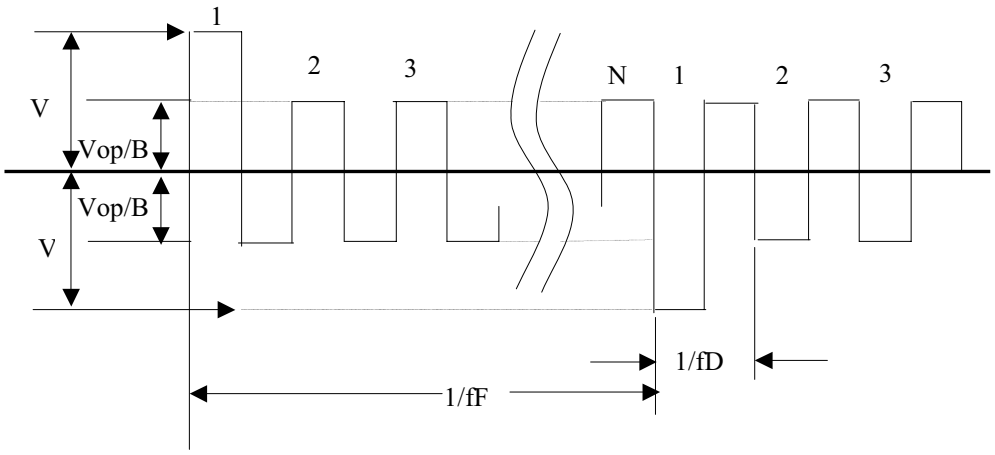
※2 Drive waveform

Vop: Drive voltage fF: Frame frequency

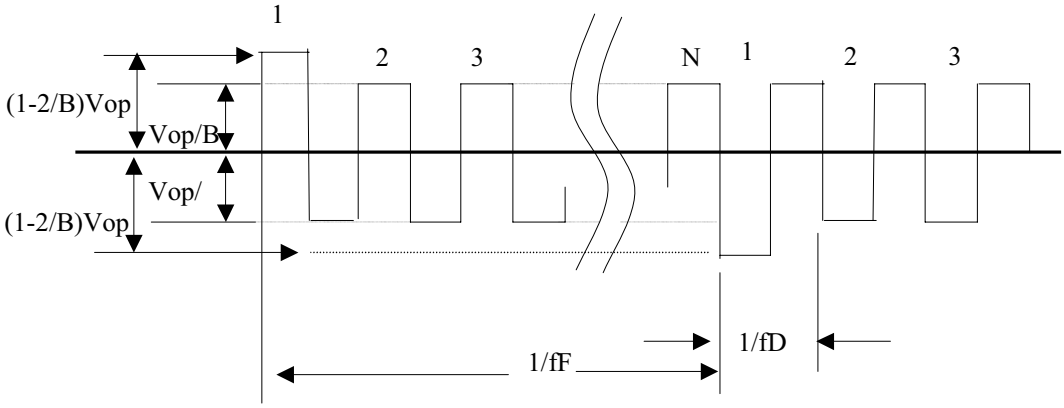
1/B: Bias fD: Drive frequency

N: Duty

(1) Selected waveform



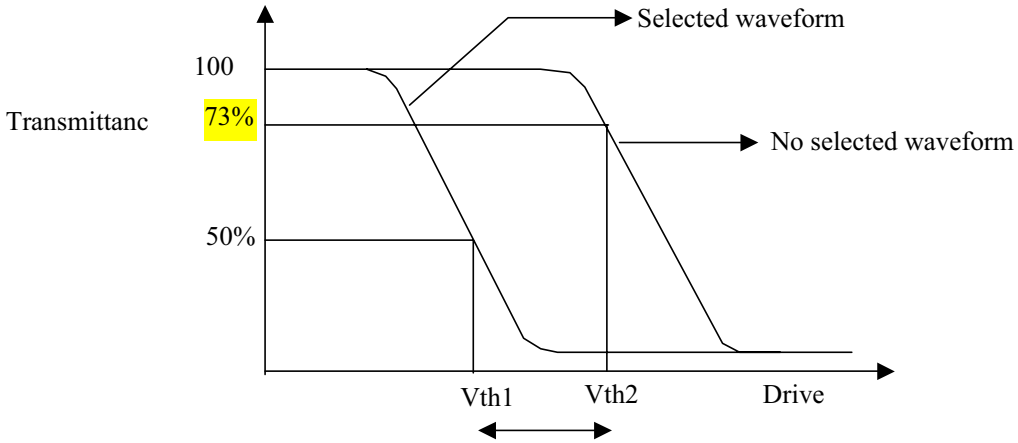
(2) Non- Selected wave form



Note:

Frame frequency is defined as follows: Common side supply voltage peak - to - peak /2 = 1 period

Note 3. : Definition of Vth

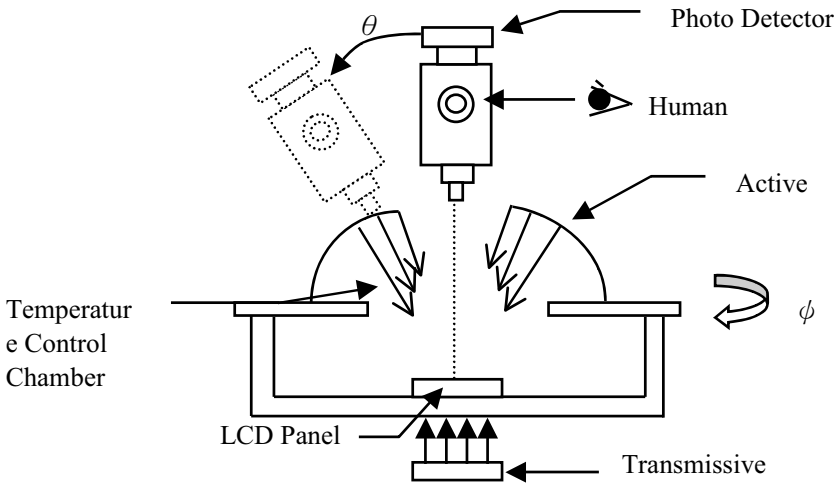


Active voltage range

	Vth1	Vth2
View direction	10°	40°
Drive waveform	(Selected waveform)	(No selected waveform)
Transmittance	50%	73%

※1 Contrast ratio
= (Brightness in OFF state) / (Brightness in ON state)

Outline of Electro-Optical Characteristics Measuring System



Measuring System: Autronic DMS-803

1.6 Backlight Characteristics

LCD Module with LED Backlight

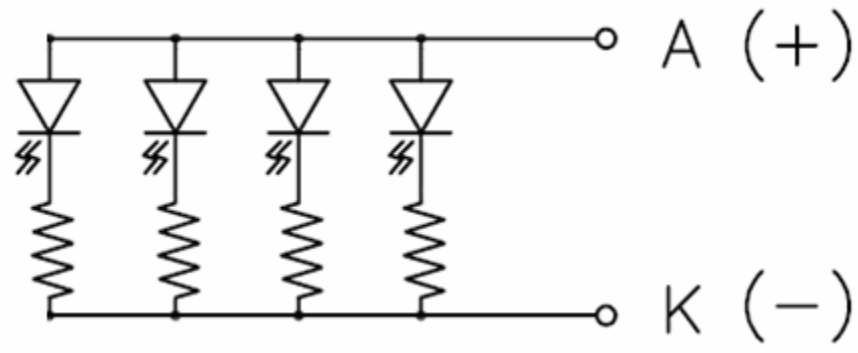
Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25℃	-	100	mA
Reverse Current	IF	Vr=4V	-	200	uA
Power Dissipation	PD	Ta =25℃	-	240	mW

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Current	VF	VF=3.2V	-	80	100	mA
Average Brightness (without LCD)	IV		200	500	-	cd/m^2
CIE Color Coordinate (Without LCD)*	X		0.27	-	0.30	-
	Y		0.275	-	0.305	
Color	White					

Internal Circuit Diagram:



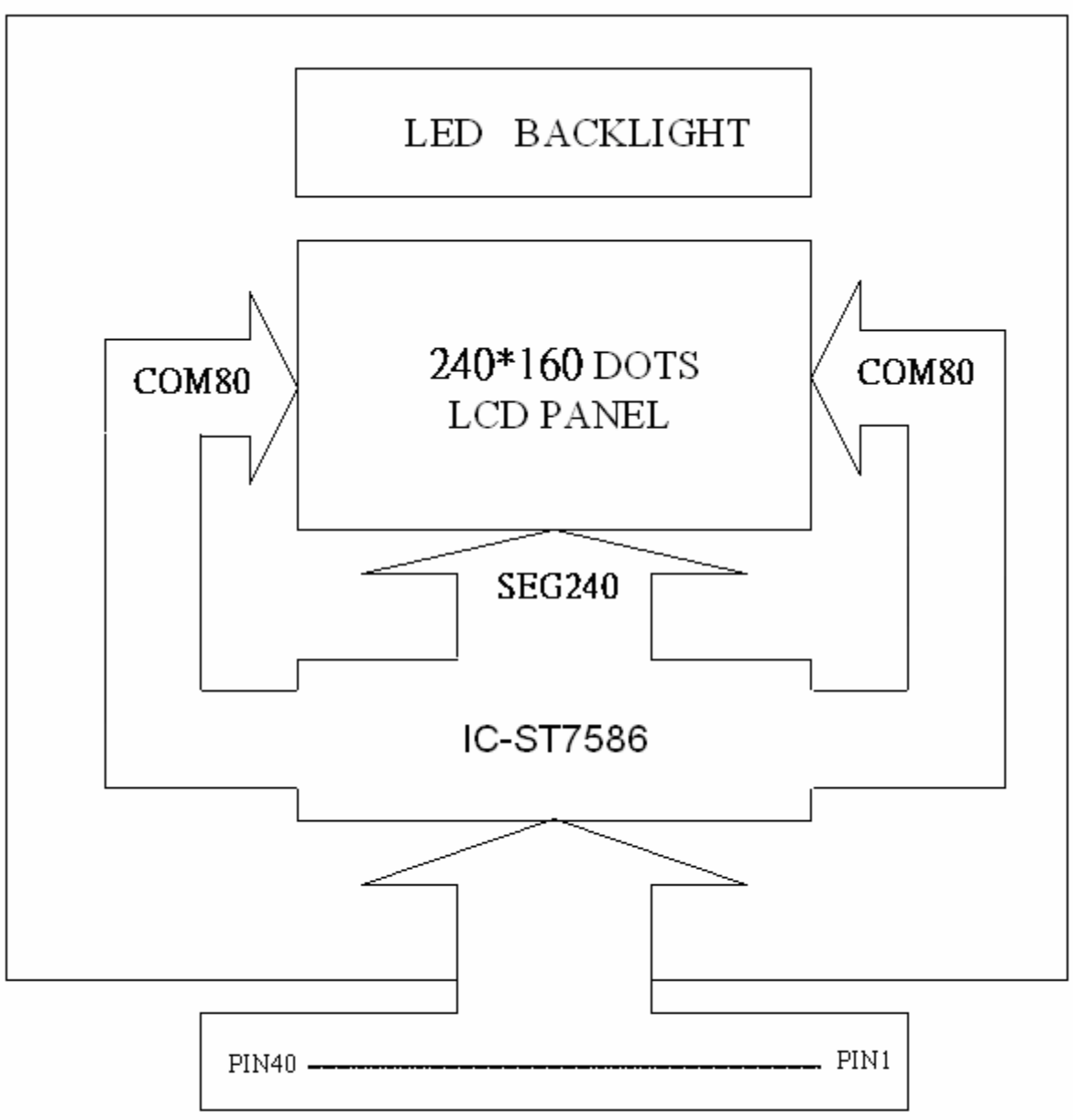
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



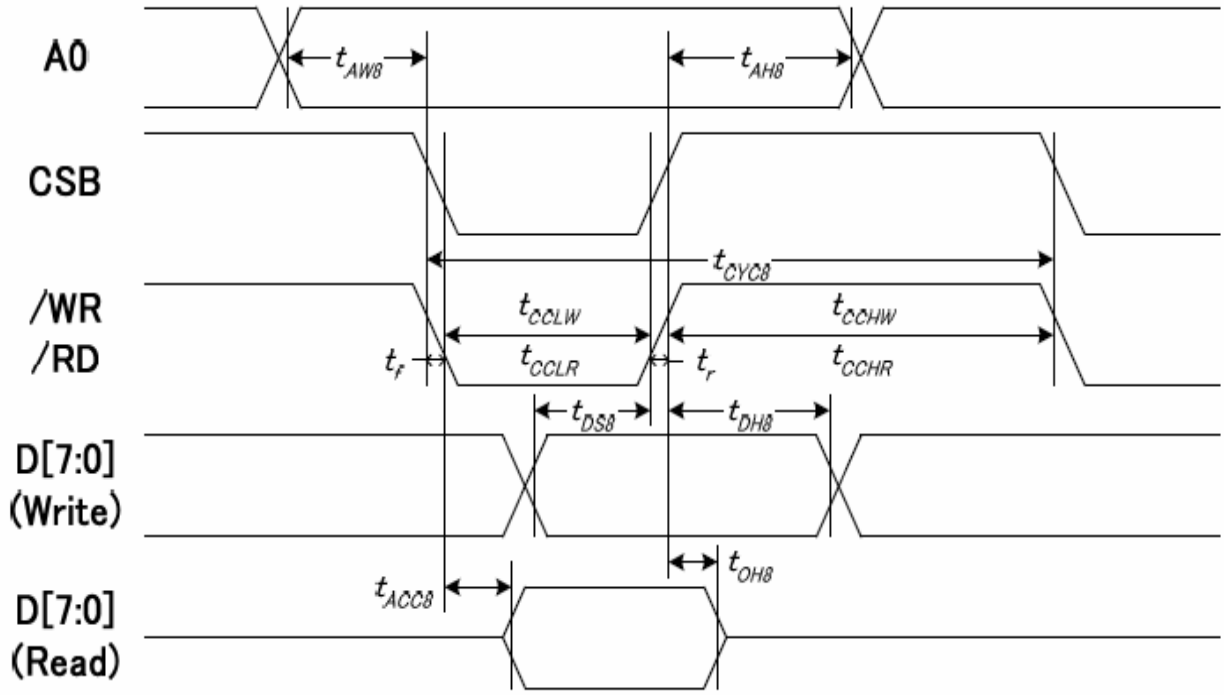
Please refer interface pin description for detail

2.2 Interface Pin Description

<table>
<tr><th>Pin No.</th><th>Symbol</th><th>Function</th></tr>
<tr><td>1</td><td>A</td><td>Power supply for Backlight (anode)</td></tr>
<tr><td>2</td><td>K</td><td>Power supply for Backlight (cathode)</td></tr>
<tr><td>3</td><td>A0</td><td>Register select input pin
– A0 = "H": DB0 to DB7 are display data
– A0 = "L": DB0 to DB7 are control data</td></tr>
<tr><td>4</td><td>WR</td><td>Write signal. Low active</td></tr>
<tr><td>5</td><td>DB0</td><td rowspan="8">The 8 bit bi-directional bus</td></tr>
<tr><td>6</td><td>DB1</td></tr>
<tr><td>7</td><td>DB2</td></tr>
<tr><td>8</td><td>DB3</td></tr>
<tr><td>9</td><td>DB4</td></tr>
<tr><td>10</td><td>DB5</td></tr>
<tr><td>11</td><td>DB6</td></tr>
<tr><td>12</td><td>DB7</td></tr>
<tr><td>13</td><td>RD</td><td>Read signal, low active</td></tr>
<tr><td>14</td><td>RES</td><td>Reset input pin. When RST is “L”, initialization is executed.</td></tr>
<tr><td>15</td><td>IF2</td><td rowspan="2">These pins select interface operation mode.
<table><tr><th>IF2</th><th>IF1</th><th>MPU interface type</th></tr><tr><td>H</td><td>L</td><td>80 series 8-bit parallel</td></tr><tr><td>L</td><td>L</td><td>68 series 8-bit parallel</td></tr></table></td></tr>
<tr><td>16</td><td>IF1</td></tr>
<tr><td>17</td><td>XCS</td><td>Chip select input pin
Data/instruction I/O is enabled only when XCS is “L”. When chip select is non-active, DB0 to DB7 may be high impedance.</td></tr>
<tr><td>18</td><td>VDD</td><td>Power supply for LCD model (VDD=3.0 V)</td></tr>
<tr><td>19</td><td>VSS</td><td>Power ground</td></tr>
<tr><td>20</td><td>VDD</td><td>Power supply for LCD mode (VDD=3.0 V)</td></tr>
<tr><td>21-33</td><td>NC</td><td>Not used</td></tr>
<tr><td>34</td><td>VM</td><td>LCD bias supply voltage</td></tr>
<tr><td>35</td><td>V0</td><td>Positive LCD driver supply voltages</td></tr>
<tr><td>36</td><td>XV0</td><td>Negative LCD driver supply voltages</td></tr>
<tr><td>37</td><td>VG</td><td>Bias LCD driver supply voltages</td></tr>
<tr><td>38</td><td>VD1</td><td>Connect a capacitor between VD1 and VSS</td></tr>
<tr><td>39-40</td><td>NC</td><td>Not used</td></tr>
</table>

2.3 Timing Characteristics

System Bus Timing for 8080 MCU Interface

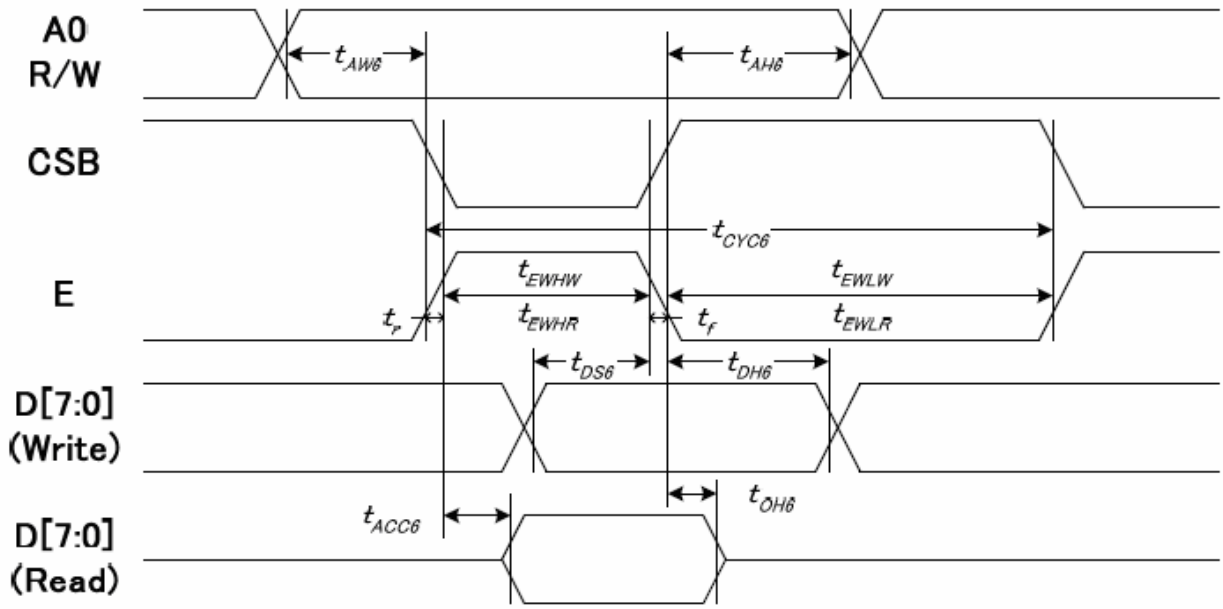


Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW8		0	—	ns
Address hold time		tAH8		0	—	
System cycle time (WRITE)	/WR	tCYC8		240	—	
/WR L pulse width (WRITE)		tCCLW		100	—	
/WR H pulse width (WRITE)		tCCHW		100	—	
System cycle time (READ)	RD	tCYC8		500	—	
/RD L pulse width (READ)		tCCLR		220		
/RD H pulse width (READ)		tCCHR		220		
WRITE Data setup time	D[7:0]	tDS8		20	—	
WRITE Data hold time		tDH8		20	—	
READ access time		tACC8	CL = 30 pF	—	100	
READ Output disable time		tOH8	CL = 30 pF	10	110	

Note:

1. The input signal rise time and fall time (tr, tf) is specified at 15 ns or less. When the system cycle time is extremely fast, (tr + tf) ≦ (tCYC8 – tCCLW – tCCHW) for (tr + tf) ≦ (tCYC8 – tCCLR – tCCHR) are specified.
2. All timing is specified using 20% and 80% of VDD1 as the reference.
3. tCCLW and tCCLR are specified as the overlap between CSB being "L" and WR and RD being at the "L" level.

System Bus Timing for 6800 MCU Interface

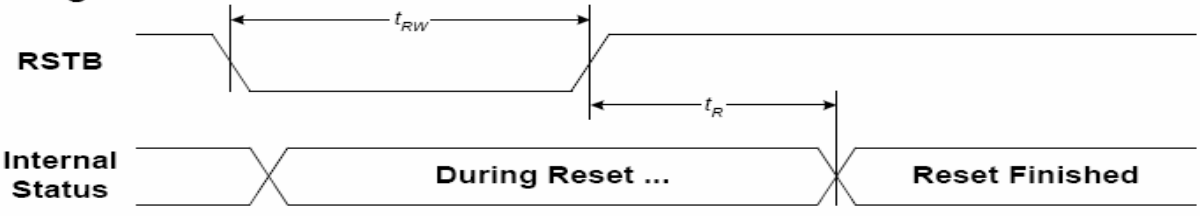


Item	Signal	Symbol	Condition	Min.	Max.	Unit
Address setup time	A0	tAW6		0	—	ns
Address hold time		tAH6		0	—	
System cycle time (WRITE)	E	tCYC6		240	—	
Enable L pulse width (WRITE)		tEWLW		100	—	
Enable H pulse width (WRITE)		tEWHW		100	—	
System cycle time (READ)		tCYC6		500		
Enable L pulse width (READ)		tEWLR		220	—	
Enable H pulse width (READ)		tEWHR		220		
Write data setup time	D[7:0]	tDS6		20	—	
Write data hold time		tDH6		20	—	
Read data access time		tACC6	CL = 16 pF	—	100	
Read data output disable time		tOH6	CL = 16 pF	10	110	

Note:

1. The input signal rise time and fall time (tr, tf) is specified at 15 ns or less. When the system cycle time is extremely fast, (tr + tf) ≦ (tCYC6 – tEWLW – tEWHW) for (tr + tf) ≦ (tCYC6 – tEWLR – tEWHR) are specified.
2. All timing is specified using 20% and 80% of VDD1 as the reference.
3. tEWLW and tEWLR are specified as the overlap between CSB being "L" and E.

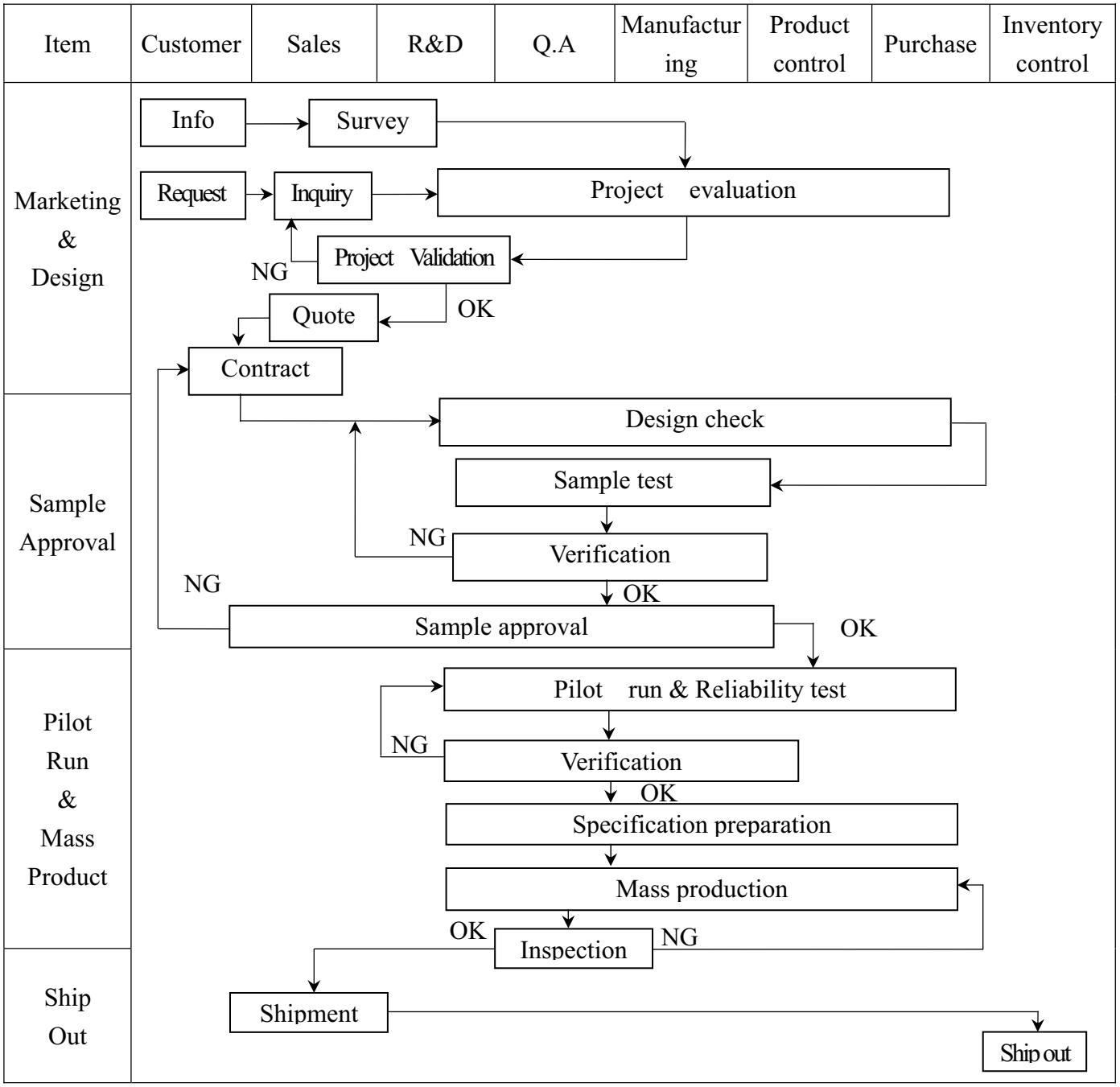
Reset Timing

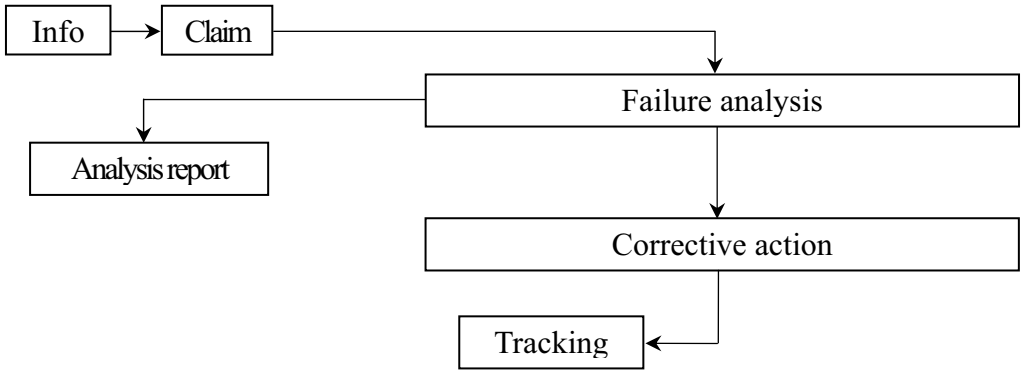


Item	Symbol	Condition	Min.	Max.	Unit
Reset time	tR		120	—	ms
Reset "L" pulse width	tRW		10	—	us

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



Item	Customer	Sales	R&D	Q.A	Manufactu ring	Product control	Purchase	Inventory control
Sales Service								
Q.A Activity	1. ISO 9001 Maintenance Activities 2. Process improvement proposal 3. Equipment calibration 4. Education And Training Activities 5. Standardization Management							

3.2. Inspection Specification

◆Scope : The document shall be applied to LCD Module for Monotype and Color STN(Ver. B01).

◆Inspection Standard : MIL-STD-105E Table Normal Inspection Single Sampling Level Ⅱ .

◆Equipment : Gauge、MIL-STD、Powertip Tester、Sample

◆Defect Level : Major Defect AQL：0.4 ; Minor Defect：AQL： 1.5 .

◆OUT Going Defect Level : Sampling .

◆Manner of appearance test :

(1). The test be under 20W×2 fluorescent light ' and distance of view must be at 30 cm.

(2). Standard of inspection： (Unit：mm)

(3). The test direction is base on about around 45°of vertical line. (Fig. 1)

(4). Definition of area . (Fig. 2)

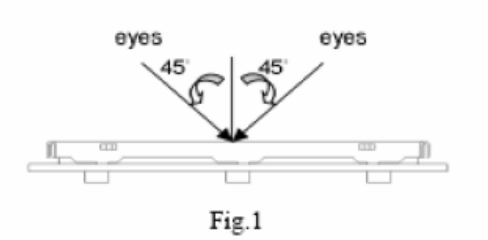


Fig.1

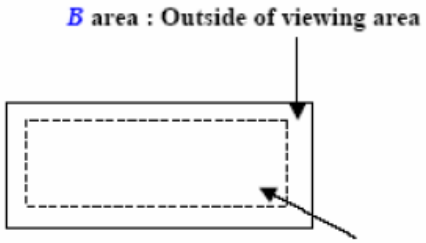


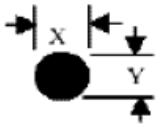
Fig. 2 A area : viewing area

◆ Specification:

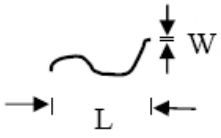
NO	Item	Criterion	Level
01	Product condition	1.1 The part number is inconsistent with work order of Production.	Major
		1.2 Mixed production types.	Major
		1.3 Assembled in inverse direction.	Major
02	Quantity	2.1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	3.1 Product dimension and structure must conform to Structure diagram.	Major
04	Electrical Testing	4.1 Missing line character and icon.	Major
		4.2 No function or no display.	Major
		4.3 Output data is error.	Major
		4.4 LCD viewing angle defect.	Major
		4.5 Current consumption exceeds product specifications.	Major

◆Specification For Monotype and Color STN： (Ver. B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>05</td><td>Black or white dot、scratch、contamination

Round type
 

Φ=(x+y)/2

Line type
 
</td><td>5. 1 Round type:
5. 1. 1 display only :
• White and black spots on display ≦ 0. 30 mm , no more than 4 white or black spots present.
• Densely spaced : NO more than two spots or lines within 3 mm.

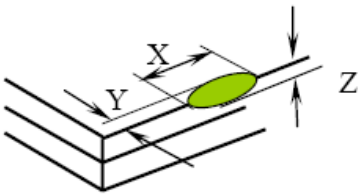
5. 1. 2 Non-display :
<table><tr><th rowspan="2">Dimension (diameter : Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ≦ 0. 10</td><td>Accept no dense</td><td rowspan="4">Ignore</td></tr><tr><td>0. 10 ＜ Φ ≦ 0. 20</td><td>3</td></tr><tr><td>0. 20 ＜ Φ ≦ 0. 30</td><td>2</td></tr><tr><td>Total quantity</td><td>4</td></tr></table>
5. 1. 3 Line type:
<table><tr><th colspan="2">Dimension</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>Length (L)</th><th>Width (W)</th><th>A area</th><th>B area</th></tr><tr><td>---</td><td>W ≦ 0. 03</td><td>Accept no dense</td><td rowspan="3">Ignore</td></tr><tr><td>L ≦ 3. 0</td><td>0. 03 ＜ W ≦ 0. 05</td><td rowspan="2">4</td></tr><tr><td>L ≦ 2. 5</td><td>0. 05 ＜W ≦ 0. 075</td></tr><tr><td>---</td><td>W ＞0. 075</td><td colspan="2">As round type</td></tr></table></td><td>Minor</td></tr>
<tr><td>06</td><td>Polarizer Bubble</td><td><table><tr><th rowspan="2">Dimension (diameter : Φ)</th><th colspan="2">Acceptance (Q'ty)</th></tr><tr><th>A area</th><th>B area</th></tr><tr><td>Φ ≦ 0. 20</td><td>Accept no dense</td><td rowspan="5">Ignore</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>Φ ＞ 1. 00</td><td>0</td></tr><tr><td>Total quantity</td><td>4</td></tr></table></td><td>Minor</td></tr>
</table>

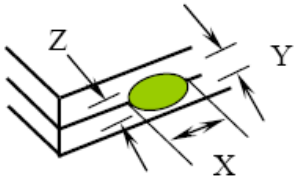
◆Specification For Monotype and Color STN： (Ver. B01)

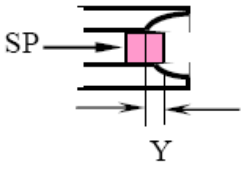
<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>07</td><td>The crack of glass</td><td>
Symbols：

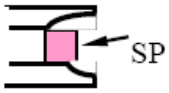
X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

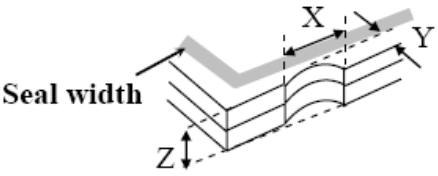
7.1 General glass chip：
7.1.1 Chip on panel surface and crack between panels:







【OK】


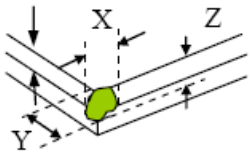
【NG】


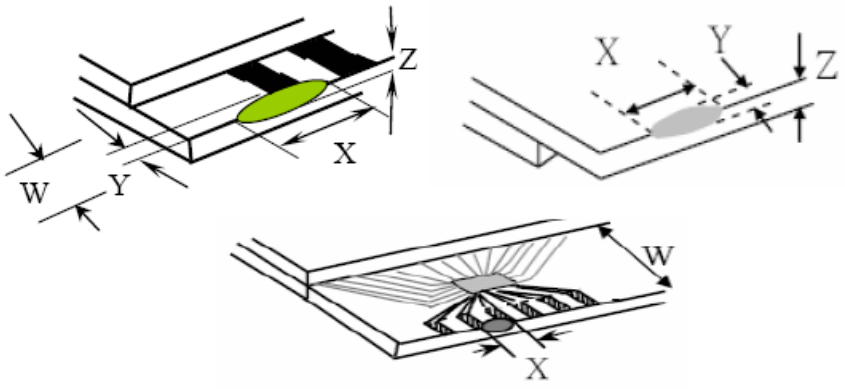
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦ a</td><td>Crack can't enter viewing area</td><td>≦1/2 t</td></tr>
<tr><td>≦ a</td><td>Crack can't exceed the half of SP width.</td><td>1/2 t ＜ Z ≦2 t</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

◆**Specification For Monotype and Color STN：** (Ver.B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td rowspan="2">07</td><td rowspan="2">The crack of glass</td><td>
Symbols：

X : The length of crack　　Y : The width of crack.
Z : The thickness of crack　　W : terminal length
t : The thickness of glass　　a : LCD side length

7.1.2 Corner crack：


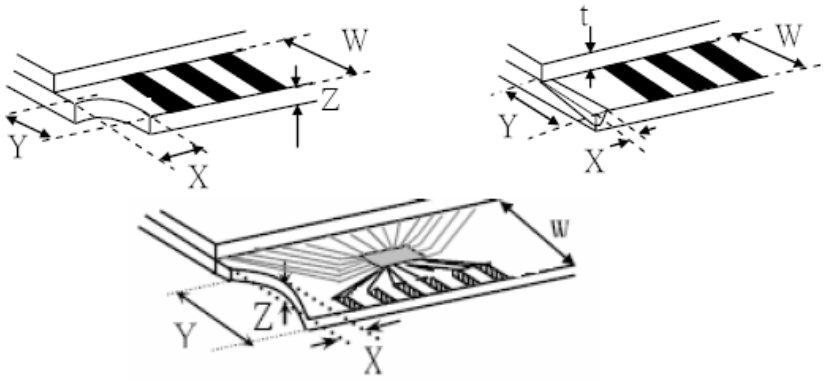
<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/5 a</td><td>Crack can’t enter viewing area</td><td>Z ≦ 1/2 t</td></tr>
<tr><td>≦1/5 a</td><td>Crack can’t exceed the half of SP width.</td><td>1/2 t < Z ≦ 2 t</td></tr>
</table>
</td><td rowspan="2">Minor</td></tr>
<tr><td>
7.2 Protrusion over terminal：
7.2.1 Chip on electrode pad：


<table>
<tr><th></th><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>Front</td><td>≦ a</td><td>≦ 1/2 W</td><td>≦ t</td></tr>
<tr><td>Back</td><td colspan="3">Neglect</td></tr>
</table>
</td></tr>
</table>

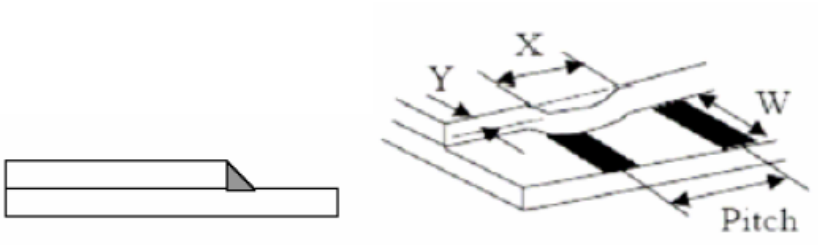
◆**Specification For Monotype and Color STN：** (Ver. B01)

<table>
<tr><th>NO</th><th>Item</th><th>Criterion</th><th>Level</th></tr>
<tr><td>07</td><td>The crack of glass</td><td>
Symbols：

X : The length of crack Y : The width of crack.
Z : The thickness of crack W : terminal length
t : The thickness of glass a : LCD side length

7.2.2 Non-conductive portion：


<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦1/3 a</td><td>≦W</td><td>≦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.

7.2.3 Glass remain：


<table>
<tr><th>X</th><th>Y</th><th>Z</th></tr>
<tr><td>≦ a</td><td>≦ 1/3 W</td><td>≦ t</td></tr>
</table>
</td><td>Minor</td></tr>
</table>

◆Specification For Monotype and Color STN： (Ver. B01)

NO	Item	Criterion	Level
08	Backlight elements	8. 1 Backlight can't work normally.	Major
		8. 2 Backlight doesn't light or color is wrong.	Major
		8. 3 Illumination source flickers when lit.	Major
09	General appearance	9. 1 Pin type must match type in specification sheet.	Major
		9. 2 No short circuits in components on PCB or FPC.	Major
		9. 3 Product packaging must the same as specified on packaging specification sheet.	Minor
		9. 4 The folding and peeled off in polarizer are not acceptable.	Minor
		9. 5 The PCB or FPC between B/L assembled distance (PCB or FPC) is ≦1. 5 mm.	Minor

4. RELIABILITY TEST

4.1 Reliability Test Condition (Ver.B01)

<table>
<tr><th>NO.</th><th>TEST ITEM</th><th>TEST CONDITION</th></tr>
<tr><td>1</td><td>High Temperature Storage Test</td><td>Keep in 70 ±2℃ 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>2</td><td>Low Temperature Storage Test</td><td>Keep in -20 ±2℃ 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td>3</td><td>High Temperature / High Humidity Storage Test</td><td>Keep in 60℃ / 90% R.H duration for 96 hrs
Surrounding temperature, then storage at normal condition 4hrs.
(Excluding the polarizer)</td></tr>
<tr><td>4</td><td>Temperature Cycling Storage Test</td><td>-20℃ → +25℃ → 70℃ → +25℃
(30mins) (5mins) (30mins) (5mins)
10 Cycle
Surrounding temperature, then storage at normal condition 4hrs.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">ESD Test</td><td>Air Discharge:
Apply 2 KV with 5 times
Discharge for each polarity +/-
Contact Discharge:
Apply 250 V with 5 times
discharge for each polarity +/-</td></tr>
<tr><td>1. Temperature ambiance : 15℃～35℃
2. Humidity relative : 30%～60%
3. Energy Storage Capacitance(Cs+Cd) : 150pF±10%
4. Discharge Resistance(Rd) : 330Ω±10%
5. Discharge, mode of operation :
Single Discharge (time between successive discharges at least 1 sec)
(Tolerance if the output voltage indication : ±5%)</td></tr>
<tr><td>6</td><td>Vibration Test (Packaged)</td><td>1. Sine wave 10～55 Hz frequency (1 min/sweep)
2. The amplitude of vibration :1.5 mm
3. Each direction (X、Y、Z) duration for 2 Hrs</td></tr>
<tr><td>7</td><td>Drop Test (Packaged)</td><td><table><tr><th>Packing Weight (Kg)</th><th>Drop Height (cm)</th></tr><tr><td>0 ~ 45.4</td><td>122</td></tr><tr><td>45.4 ~ 90.8</td><td>76</td></tr><tr><td>90.8 ~ 454</td><td>61</td></tr><tr><td>Over 454</td><td>46</td></tr></table>Drop Direction :※1 corner / 3 edges / 6 sides each 1time</td></tr>
</table>

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.

5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

5.2.1 Avoid any strong mechanical shock which can break the glass.

5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.

5.2.3 Do not remove the panel or frame from the module.

5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)

5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.

5.2.6 Do not touch the display area with bare hands , this will stain the display area.

5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.

5.2.8 To control temperature and time of soldering is 320±10℃and 3-5 sec.

5.2.9 To avoid liquid (include organic solvent) stained on LCM .

5.3 STORAGE

5.3.1 Store the panel or module in a dark place where the temperature is 25℃ ±5℃ and the humidity is below 65% RH.

5.3.2 Do not place the module near organics solvents or corrosive gases.

5.3.3 Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

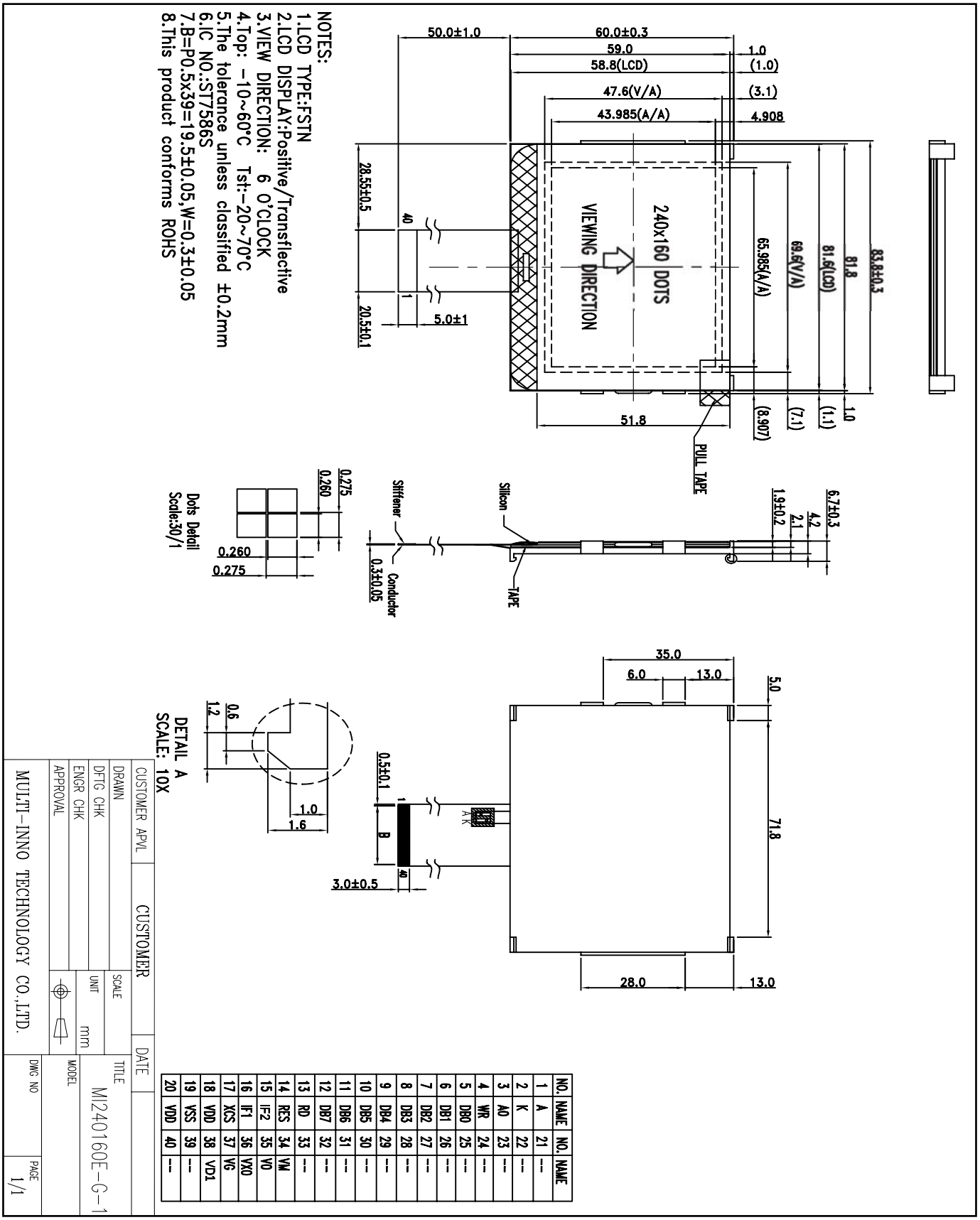
5.4.1 Applicable warrant period

The period is within thirteen months since the date of shipping out under normal using and storage conditions.

5.4.2 Unaccepted responsibility

This product has been manufactured to your company’s specification as a part for use in your company’s general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

6.OUTLINE



NO.	NAME	NO.	NAME
1	A	21	---
2	K	22	---
3	A0	23	---
4	WR	24	---
5	DB0	25	---
6	DB1	26	---
7	DB2	27	---
8	DB3	28	---
9	DB4	29	---
10	DB5	30	---
11	DB6	31	---
12	DB7	32	---
13	RD	33	---
14	RES	34	VM
15	IF2	35	VO
16	IF1	36	VX0
17	XCS	37	VG
18	VDD	38	VD1
19	VSS	39	---
20	VDD	40	---