Issued Date:2008/05/09
Doc. No.:

EASTTOP DISPLAY CO., LTD.

PRODUCT SPECIFICATION

MONO LCD MODULE
MODEL: G0801A0SGW7B-A0 Ver:1.0

< ◇> Preliminary Specification

< ◆> Finally Specification

CUSTOMER'S APPROVAL	
CUSTOMER :	
SIGNATURE:	DATE:

APPROVED BY	PM REVIEWED	PD REVIEWED	PREPARED BY

Revision Status

Version	Revise Date	Page	Content	Modified By
Ver. 1.0	**2008.5.9**		**First Issued**	

Table of Contents

No.	Contents	Page
1.	FEATURES	4
2.	MECHANICAL SPECIFICATIONS	4
3.	ELECTRICAL SPECIFICATIONS	4
4.	ELECTRO – OPTICAL CHARACTERISTICS	6
5.	TERMINAL FUNCTIONS AND BLOCK DIAGRAM	7
6.	TIMING CHARACTERISTICS	8
7.	INSTRUCTION SET	11
8.	QUALITY SPECIFICATIONS	13
9	RELIABILITY	18
10	HANDLING PRECAUTION	19
11.	OUTLINE DIMENSION	20

1. Features

The features of LCD are as follows

* Display mode : STN/Blue, Transflective/Positive
* Drive IC : HT1650
* Display format : 80 X 16 Dots
* Interface Input Data : 4-Bit
* Driving Method : 1/16Duty, 1/5Bias
* Viewing Direction : 12 O'clock
* Backlight : LED Unit (White)
* Sample No. :

2. MECHANICAL SPECIFICATIONS

Item	Specification	Unit
Module Size	85(W) x30(H)x 13.4(T)(Max)	mm
Number of Dots	80x16 Dots	
Viewing Area	65(W) x17.2(H)	mm
Activity Area	59.95 (W)x12.75 (H)	mm
Dot Size	0.7(W) x 0.75(H)	mm
Dot Pitch	0.75(W) x0.8 (H)	mm

3. ELECTRICAL SPECIFICATIONS

3-1 ABSOLUTR MAZIMUM RATINGS (Ta = 25 °C)

Item	Symbol	Standard Value			Unit
		Min.	Typ.	Max.	
Supply Voltage For Logic	$V_{DD} – V_{ss}$	-0.3	-	5.5	V
Supply Voltage For LCD Drive	$V_{OP}= V_{LCD} – V_{SS}$	-0.3	-	7.0	V
Input Voltage	Vin	-0.3	-	$V_{DD+0.3}$	V
Operating Temp.	Top	-20	-	+70	°C
Storage Temp.	Tst	-30	-	+80	°C

*****. NOTE: The response time will be extremely slow when the operating temperature is around -10℃, and the back ground will become darker at high temperature operating.

3-2 ELECTICAL CHARACTERISTICS

Item		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Logic supply Voltage		$V_{DD} - V_{ss}$	Ta = 25 °C	2.7	5	5.2	V
LCD Drive		$V_{OP}=V_{LCD}-V_{SS}$		-	4.5	-	V
Input Voltage	"H" Level	V_{IH}	V_{DD}=5V ± 5%	0	-	1.0	V
	"L" Level	V_{IL}		4.0	-	5.0	V
Frame Frequency		f_{FLM}	V_{DD} = 5V	-	89	-	Hz
Current Consumption		I_{DD}	V_{DD} = 5V	-	1.6	-	mA

3-3. BACKLIGHT

3-3-1. Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Current	IF	Ta = 25 °C	-	-	40	mA
Reverse Voltage	VR		-	-	5	V
Power Dissipation	PD		-	-	144	mW

3-3-2. Electrical-optical Characteristics

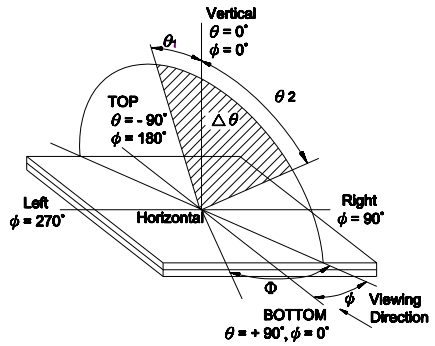
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=40mA	2.8	3.2	3.6	V
Reverse Current （Per LED）	Ir	VR =5V	-	-	100	uA
Average Luminous Intensity	Iv	IF=40mA	20	35	-	cd/m^2

The brightness is measured without LCD panel

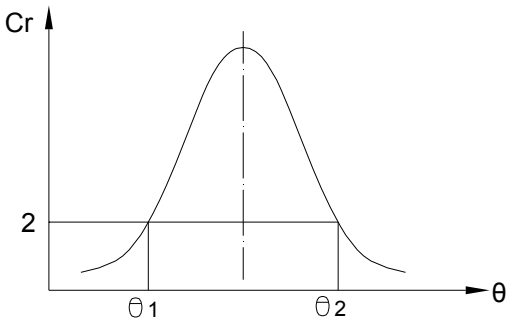
4 . ELECTRO – OPTICAL CHARACTERISTICS

Item	Symbol	Temp.	Min.	Typ.	Max.	Unit	Conditions	Note
Viewing Angle	Θ2 –Θ1	25℃	30	86	-	Deg.	-	1,2
	Φ		60	60	-			
Contrast Ratio	Cr	25℃	2	5.59	6.96	-	Θ=0° Φ=0°	3
Response Time(rise)	Tr	25℃	-	65	250			
		0℃	-	950	1150			
Response Time(fall)	Tf	25℃	-	163	250			
		0℃	-	950	1150			

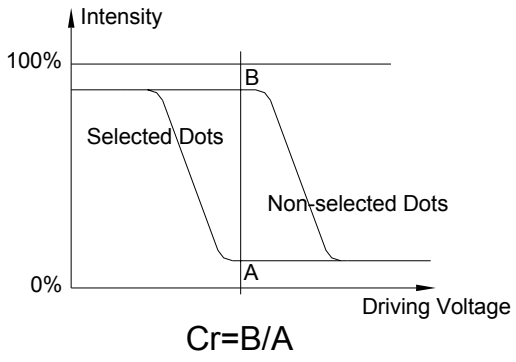
Note1 . Definition of Angle Θ&Φ



Note2. Definition of Viewing Angle Θ1&Θ1

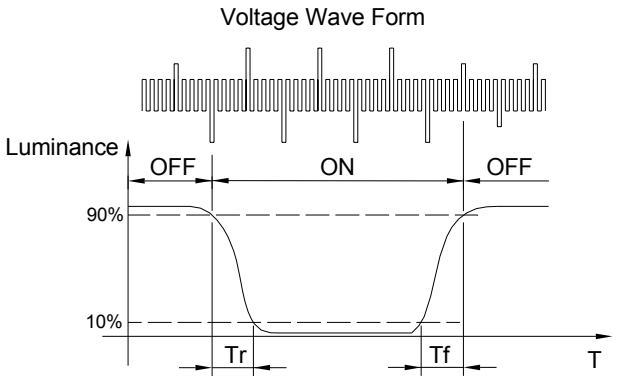


Note3 . Definition of Contrast Cr



Cr=B/A

Note4. Definition of Optical Response

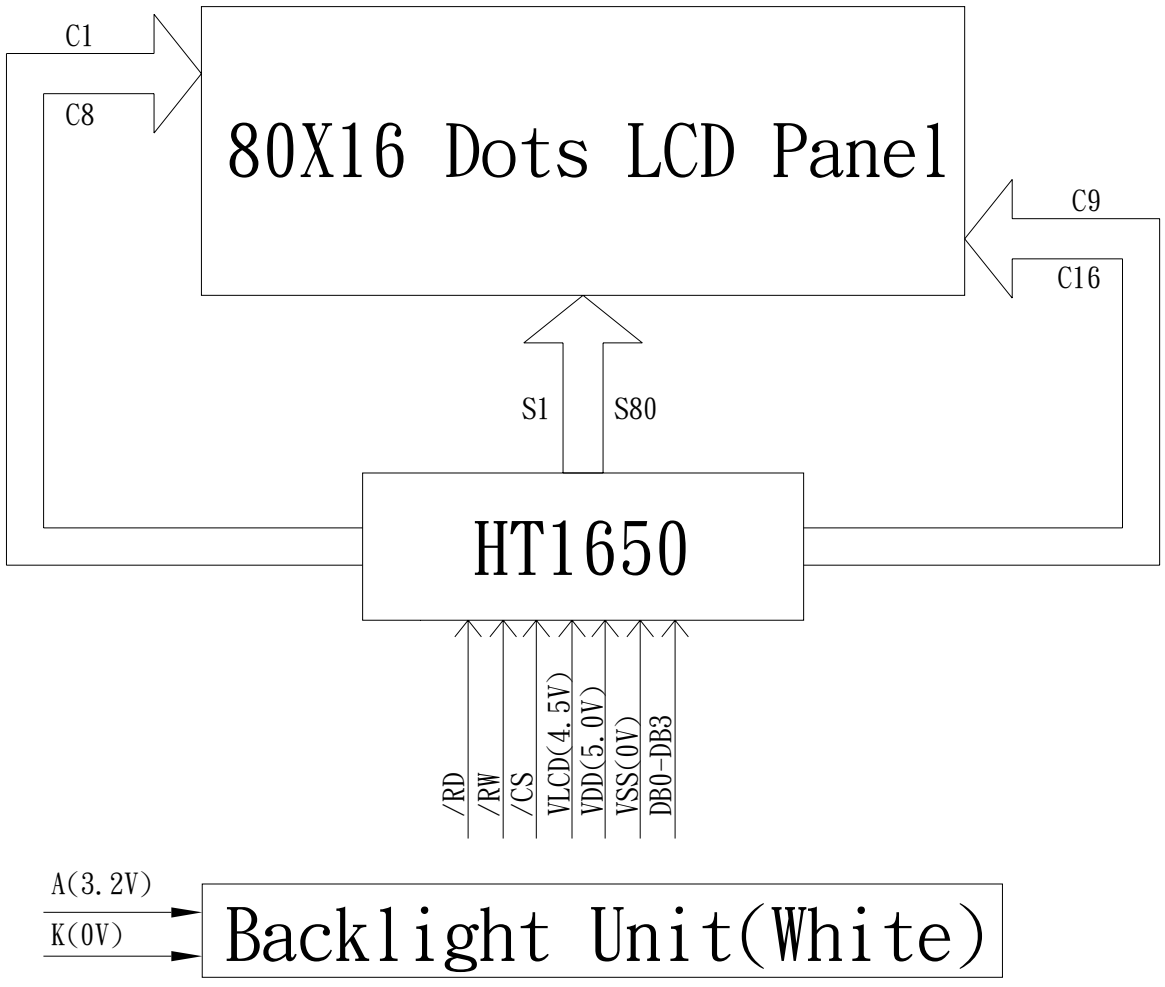


5. TERMINAL FUNCTIONS AND BLOCK DIAGRAM

5-1. INTERFACE PIN FUNCTION DESCRIPTION

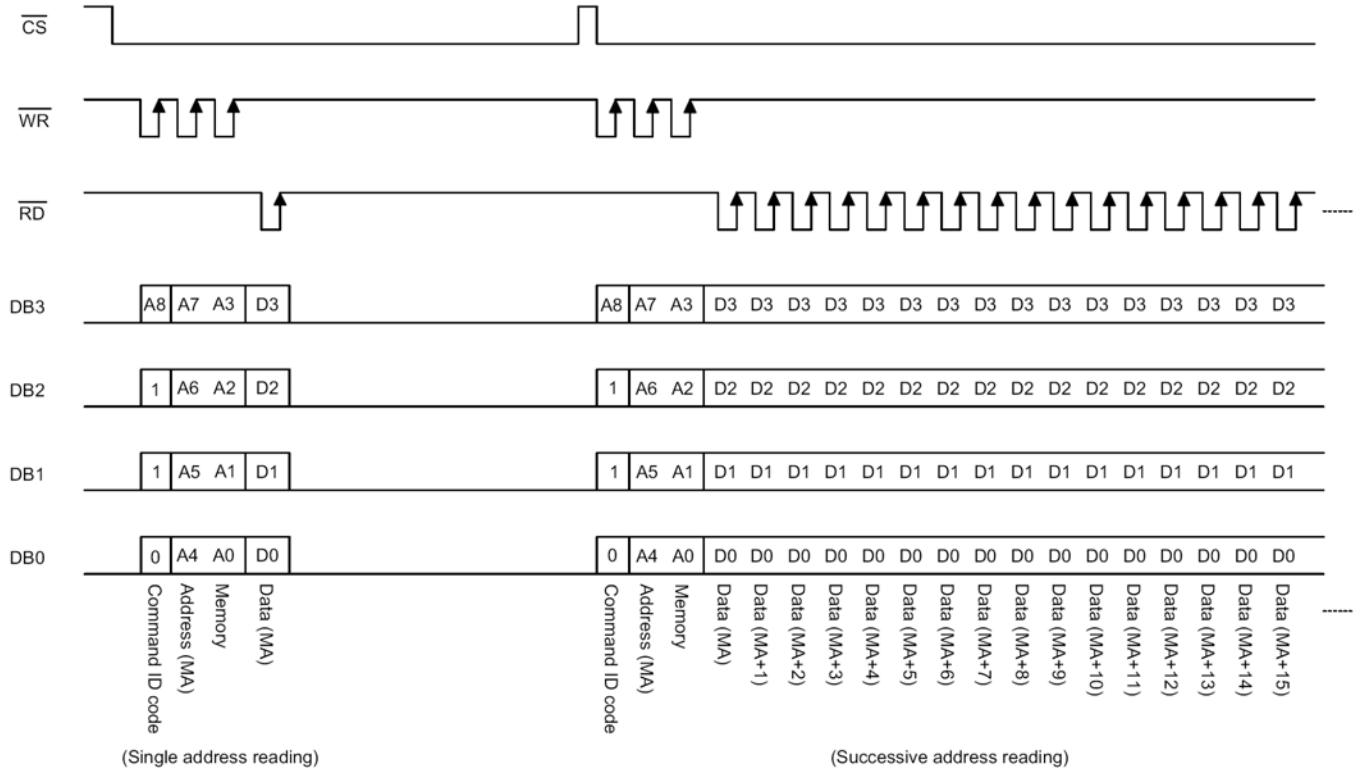
No.	Symbol	Function
1	VDD	Power Supply/5.0V
2	VSS	Power GND/0V
3	VLCD	Power Supply for LCD Driving/4.5V
4	/CS	Chip select signal
5	/RW	WRITE clock input with pull-high resistor.
6	/RD	READ clock input with pull-high resistor.
7-10	NC	No connect
11-14	DB0-DB3	4-bit Parallel data input/output with pull-high resistorl.
	A	Anode Of LED backlight unit (3.2V)
	K	Cathode Of LED backlight unit (0V)

5-2. BLOCK DIAGRAM

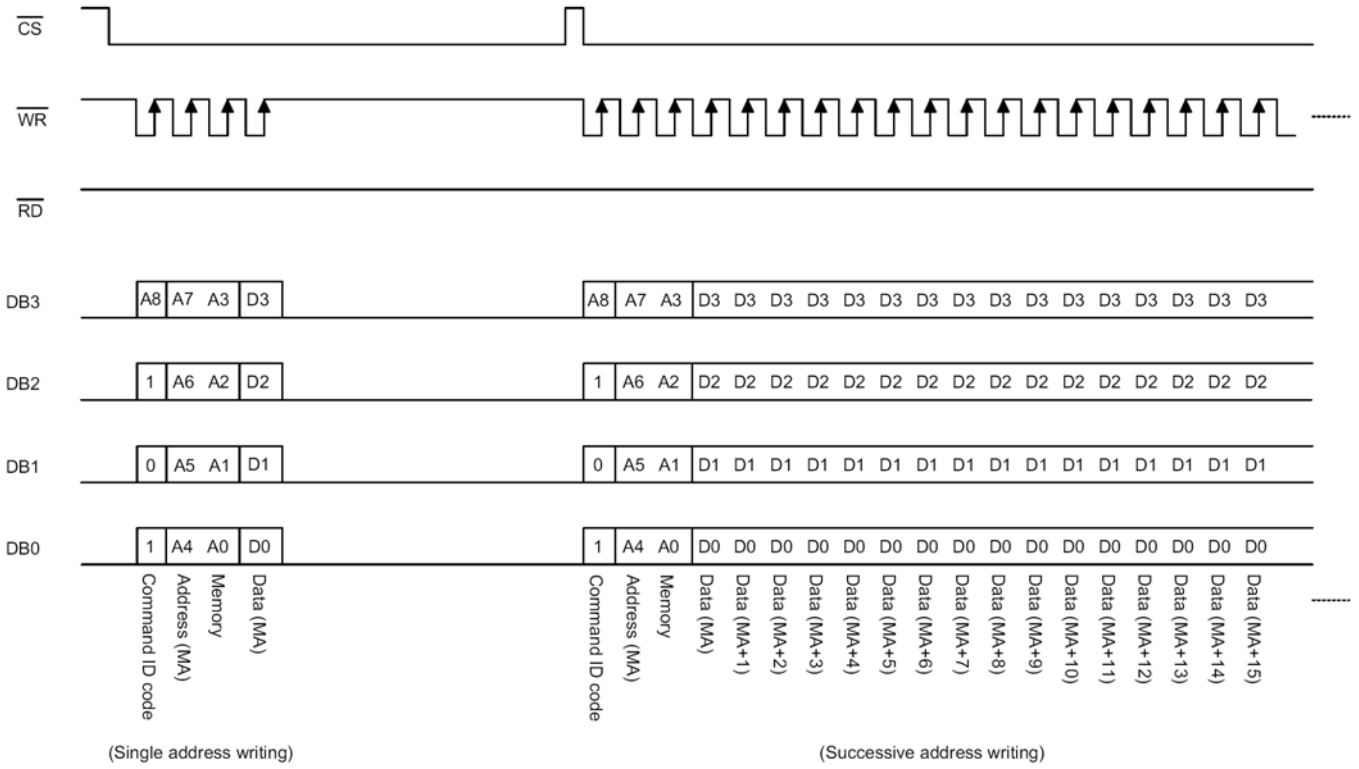


6. TIMING CHARACTERISTIC

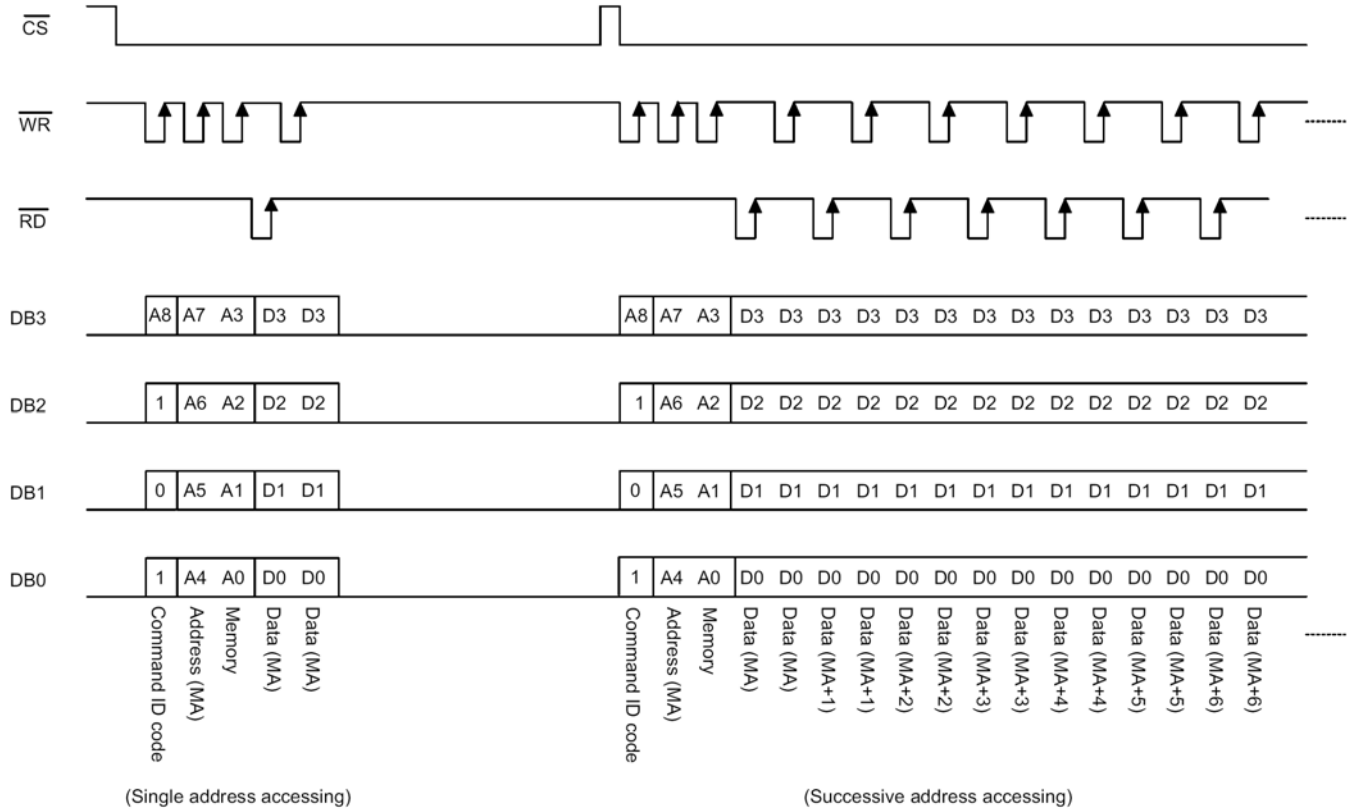
6-1. READ Mode (Command ID Code: 1 1 0)



6-2. WRITE Mode (Command ID Code: 1 0 1)



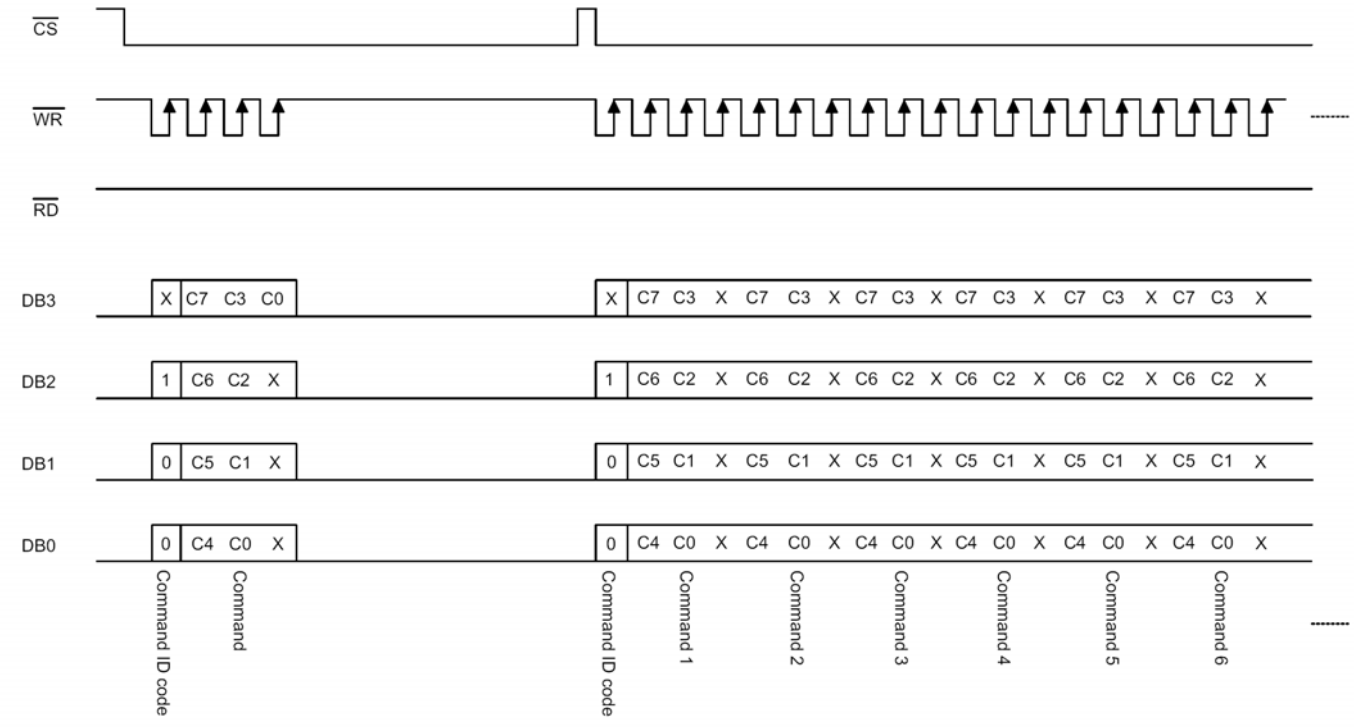
6-3. READ-MODIFY-WRITE Mode (Command ID Code: 1 0 1)



(Single address accessing)

(Successive address accessing)

6-4. Command Mode (Command ID Code: 1 0 0)



(Single command)

(Successive command)

6-5 . A.C. Characteristics

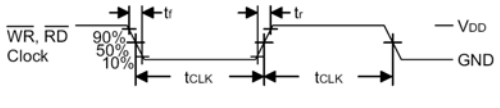


Figure 1

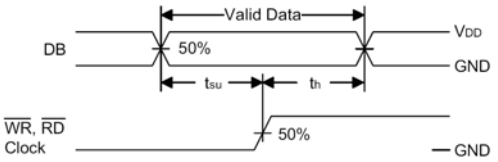
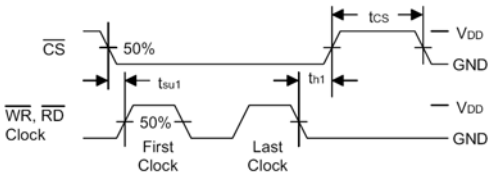


Figure 2



Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
f_{SYS1}	System Clock	3V	On-chip RC oscillator	22	32	40	kHz
		5V		24	32	40	kHz
f_{SYS2}	System Clock	3V	Crystal oscillator	—	32.768	—	kHz
		5V		—	32.768	—	kHz
f_{SYS3}	System Clock	3V	External clock source	—	32	—	kHz
		5V		—	32	—	kHz
f_{LCD1}	LCD Frame Frequency	3V	On-chip RC oscillator	61/117	89/170	111/213	Hz
		5V		61/117	89/170	111/213	Hz
f_{LCD2}	LCD Frame Frequency	3V	Crystal oscillator	—	64	—	Hz
		5V		—	64	—	Hz
f_{LCD3}	LCD Frame Frequency	3V	External clock source	—	64	—	Hz
		5V		—	64	—	Hz
t_{COM}	LCD Common Period	—	n: Number of COM	—	n/f_{LCD}	—	sec
f_{CLK1}	4-Bit Data Clock ($\overline{WR}$ Pin)	3V	Duty cycle 50%	—	—	150	kHz
		5V		—	—	300	kHz
f_{CLK2}	4-Bit Data Clock ($\overline{RD}$ Pin)	3V	Duty cycle 50%	—	—	75	kHz
		5V		—	—	150	kHz
t_{CS}	4-Bit Interface Reset Pulse Width (Figure 3)	—	$\overline{CS}$	—	250	—	ns
t_{CLK}	$\overline{WR}$, $\overline{RD}$ Input Pulse Width (Figure 1)	3V	Write mode	3.34	—	—	μs
			Read mode	6.67			
		5V	Write mode	1.67	—	—	μs
			Read mode	3.34			
t_r, t_f	Rise/Fall Time Serial Data Clock Width (Figure 1)	3V	—	—	120	—	ns
		5V					
t_{su}	Setup Time for DB to $\overline{WR}$, $\overline{RD}$ Clock Width (Figure 2)	3V	—	—	120	—	ns
		5V					
t_h	Hold Time for DB to $\overline{WR}$, $\overline{RD}$ Clock Width (Figure 2)	3V	—	—	120	—	ns
		5V					
t_{su1}	Setup Time for $\overline{CS}$ to $\overline{WR}$, $\overline{RD}$ Clock Width (Figure 3)	3V	—	—	100	—	ns
		5V					
t_{h1}	Hold Time for $\overline{CS}$ to $\overline{WR}$, $\overline{RD}$ Clock Width (Figure 3)	3V	—	—	100	—	ns
		5V					

7. INSTRUCTION SET

Name	Command Code	D/C	Function	Def.
READ	A8**110**-A7A6A5A4A3A2A1A0D3D2D1D0	D	Read data from the RAM	
WRITE	A8**101**-A7A6A5A4A3A2A1A0D3D2D1D0	D	Write data to the RAM	
READ-MODIFY-WRITE	A8**101**-A7A6A5A4A3A2A1A0D3D2D1D0	D	Read from and Write data to the RAM	
SYS DIS	X**100**-0000-0000-XXXX	C	Turn Off both system oscillator and LCD bias generator	Yes
SYS EN	X**100**-0000-0001-XXXX	C	Turn On system oscillator	
LCD OFF	X**100**-0000-0010-XXXX	C	Turn Off LCD display	Yes
LCD ON	X**100**-0000-0011-XXXX	C	Turn On LCD display	
TIMER DIS	X**100**-0000-0100-XXXX	C	Disable time base output	Yes
WDT DIS	X**100**-0000-0101-XXXX	C	Disable WDT time-out flag output	Yes
TIMER EN	X**100**-0000-0110-XXXX	C	Enable time base output	
WDT EN	X**100**-0000-0111-XXXX	C	Enable WDT time-out flag output	
TONE OFF	X**100**-0000-1000-XXXX	C	Turn Off tone outputs	Yes
CLR TIMER	X**100**-0000-1101-XXXX	C	Clear the contents of the time base generator	
CLR WDT	X**100**-0000-1111-XXXX	C	Clear the contents of the WDT stage	
TONE 4K	X**100**-0001-0000-XXXX	C	Turn on tone output, tone frequency output: 4kHz	
TONE 2K	X**100**-0001-0001-XXXX	C	Turn on tone output, tone frequency output: 2kHz	
IRQ DIS	X**100**-0001-0010-XXXX	C	Disable $\overline{\text{IRQ}}$ output	Yes
IRQ EN	X**100**-0001-0011-XXXX	C	Enable $\overline{\text{IRQ}}$ output	
RC 32K	X**100**-0001-0100-XXXX	C	System clock source, on-chip RC oscillator	Yes
EXT (X'TAL)	X**100**-0001-0101-XXXX	C	System clock source, external 32kHz clock source or crystal oscillator 32.768kHz	
LARGE BIAS	X**100**-0001-0110-XXXX	C	Large bias current option	Yes
MIDDLE BIAS	X**100**-0001-0111-XXXX	C	Middle bias current option	
SMALL BIAS	X**100**-0001-1000-XXXX	C	Small bias current option	
BIAS 1/6	X**100**-0001-1010-XXXX	C	LCD 1/6 bias option	Yes
BIAS 1/5	X**100**-0001-1001-XXXX	C	LCD 1/5 bias option	
FRAME 170Hz	X**100**-0001-1100-XXXX	C	Selects 170Hz frame frequency	
FRAME 89Hz	X**100**-0001-1101-XXXX	C	Selects 89Hz frame frequency	
FRAME 64Hz	X**100**-0001-1110-XXXX	C	Selects 64Hz frame frequency	Yes
Select 80×16	X**100**-0001-1111-XXXX	C	This command will change segment from 64 to 80 and command from 32 to 16	
F1	X**100**-1010-0000-XXXX	C	Time base clock output: 1Hz The WDT time-out flag after 4s	
F2	X**100**-1010-0001-XXXX	C	Time base clock output: 2Hz The WDT time-out flag after 2s	
F4	X**100**-1010-0010-XXXX	C	Time base clock output: 4Hz The WDT time-out flag after 1s	

Name	Command Code	D/C	Function	Def.
F8	X**100**-1010-0011-XXXX	C	Time base clock output: 8Hz The WDT time-out flag after 1/2s	
F16	X**100**-1010-0100-XXXX	C	Time base clock output: 16Hz The WDT time-out flag after 1/4s	
F32	X**100**-1010-0101-XXXX	C	Time base clock output: 32Hz The WDT time-out flag after 1/8s	
F64	X**100**-1010-0110-XXXX	C	Time base clock output: 64Hz The WDT time-out flag after 1/16s	
F128	X**100**-1010-0111-XXXX	C	Time base clock output: 128Hz The WDT time-out flag after 1/32s	Yes
TEST	X**100**-1111-1111-XXXX	C	Test mode, not for use by the user	
NORMAL	X**100**-1111-1110-XXXX	C	Normal mode, 64×32 mode will be set	Yes

Note: "X" stands for don't care

A8~A0: RAM address

D3~D0: RAM data

D/C: Data/Command mode

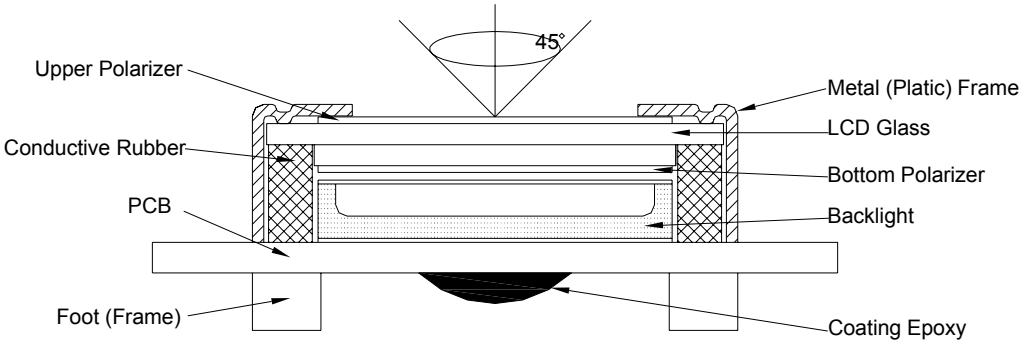
Def.: Power-on reset default

All the bold forms, namely, **1 1 0**, **1 0 1**, and **1 0 0**, are mode commands. Of these, **1 0 0** indicates the command mode ID. If successive commands have been issued, the command mode ID except for the first command will be omitted. The tone frequency source and the time base or WDT clock frequency source can be derived from an on-chip 32kHz RC oscillator, a 32.768kHz crystal oscillator, or an external 32kHz clock. Calculation of the frequency is based on the system frequency sources as stated above. It is recommended that the host controller should initialize the HT1650 after power-on reset, otherwise, power on reset may fail, which in turn leads to the malfunctioning of the HT1650.

8. QUALITY SPECIFICATIONS

8-1. LCM Appearance and Electric inspection Condition

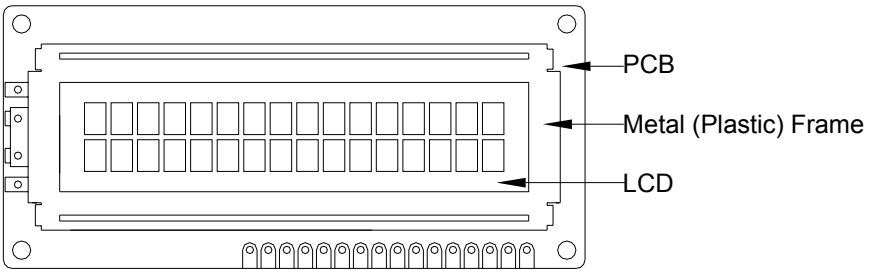
1. Inspection will be done by placing LCM 30cm away from inspector's eyeballs under normal illumination.



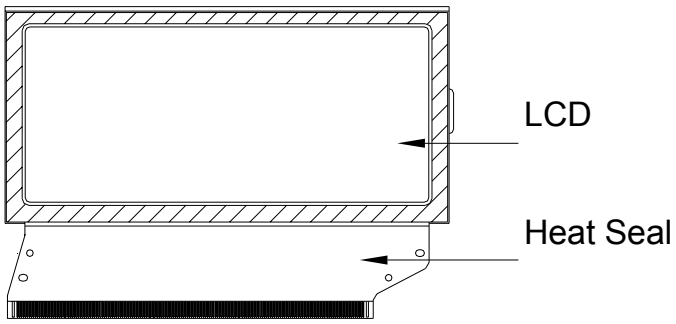
2. View Angle: with in 45˚around perpendicular line.

8-2. Definition

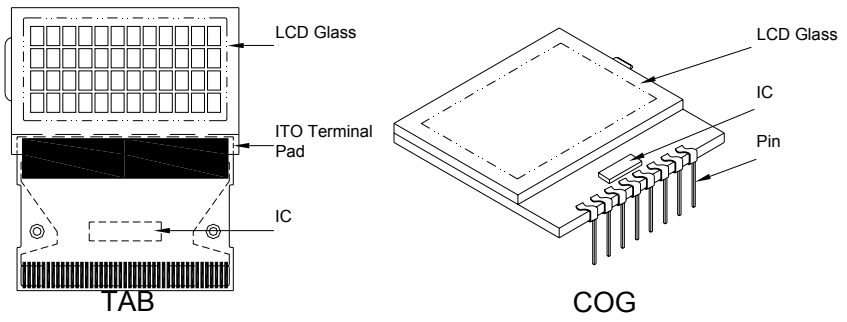
1. COB



2. Heat Seal



3. TAB and COG



8-3. Sampling Plan and Acceptance

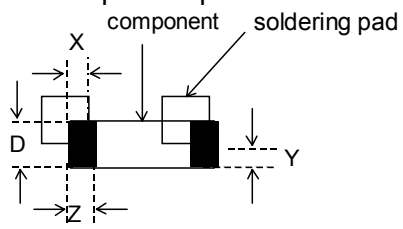
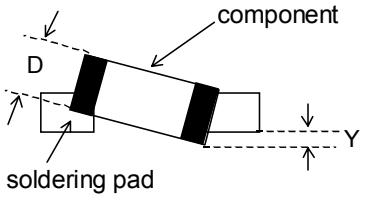
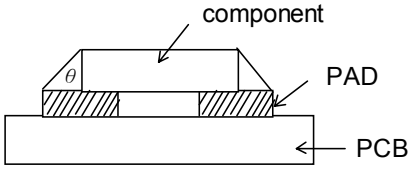
1. Sampling Plan
   MIL - STD - 105E (||) ordinary single inspection is used.
2. Acceptance
   Major defect: AQL = 0.65%
   Minor defect: AQL = 1.5%

8-4. Criteria

1. COB

Defect	Inspection Item	Inspection Standards	
Major	PCB copper flakes peeling off	Any copper flake in viewing Area should be greater than 1.0mm^2	Reject
Major	Height of coating epoxy	Exceed the dimension of drawing	Reject
Major	Void or hole of coating epoxy	Expose bonding wire or IC	Reject
Major	PCB cutting defect	Exceed the dimension of drawing	Reject

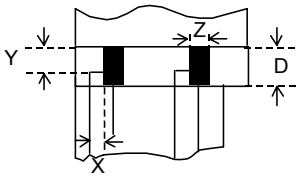
2. SMT

Defect	Inspection Item	Inspection Standards	
Minor	Component marking not readable		Reject
Minor	Component height	Exceed the dimension Of drawing	Reject
Major	Component solder defect (missing , extra, wrong component or wrong orientation		Reject
Minor	Component position shift 	X < 3/4Z Y > 1/3D	Reject Reject
Minor	Component tilt 	Y > 1/3D	Reject
Minor	Insufficient solder 	$\theta \leq 20^\circ$	Reject

3. Metal (Plastic) Frame

Defect	Inspection Item	Inspection Standards		
Major	Crack / breakage	Anywhere		Reject
Minor	Frame Scratch	W	L	Acceptable of Scratch
		w<0.1mm	Any	Ignore
		0.1≤w<0.2mm	L≤5.0mm	2
		0.2≤w<0.3mm	L≤3.0mm	1
		w≥0.3mm	Any	0
		Note : 1. Above criteria applicable to scratch lines with distance greater than 5mm. 2. Scratch on the back side of frame (not visible) can be ignored .		
Minor	Frame Dent , Prick $\Phi = \frac{L+W}{2}$			Acceptable of Dents / Pricks
		Φ≤1.0mm		2
		1.0<Φ≤1.5mm		1
		1.5mm<Φ		0
		Note : 1. Above criteria applicable to any two dents / pricks with distance greater than 5mm 2. Dent / prick on the back side of frame (not visible) can be ignored		
Minor	Frame Deformation	Exceed the dimension of drawing		
Minor	Metal Frame Oxidation	Any rust		

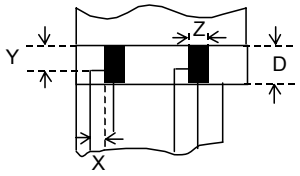
4. Flexible Film Connector (FFC)

Defect	Inspection Item	Inspection Standards	
Minor	Tilted soldering	Within the angle +5°	Acceptable
Minor	Uneven solder joint /bump		Reject
Minor	Hole $\Phi = \frac{L+W}{2}$	Expose the conductive line	Reject
		Φ > 1.0mm	Reject
Minor	Position shift 	Y > 1/3D	Reject
		X > 1/2Z	Reject

5. Screw

Defect	Inspection Item	Inspection Standards	
Major	Screw missing/loosen		Reject
Minor	Screw oxidation	Any rust	Reject
Minor	Screw deformation	Difficult to accept screw driver	Reject

6. Heatseal 、TCP 、FPC

Defect	Inspection Item	Inspection Standards	
Major	Scratch expose conductive layer		Reject
Minor	HS Hole $\Phi = \frac{L+W}{2}$	Φ> 0.5mm	Reject
Major	Adhesion strength	Less than the specification	Reject
Minor	Position shift 	Y > 1/3D	Reject
		X > 1/2Z	Reject
Major	Conductive line break		Reject

7. LED Backing Protective Film and Others

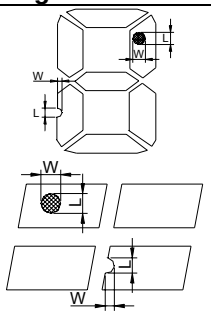
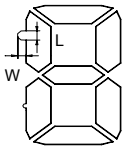
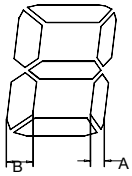
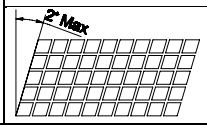
Defect	Inspection Item	Inspection Standards	
Minor	LED dirty, prick	Acceptable number of units	
		$\Phi \leq$0.10mm	Ignore
		0.10< $\Phi \leq$0.15mm	2
		0.15< $\Phi \leq$0.2mm	1
		Φ>0.2mm	0
		The distance between any two spots should be ≥5mm Any spot/dot/void outside of viewing area is acceptable	
Minor	Protective film tilt	Not fully cover LCD	Reject
Major	COG coating	Not fully cover ITO circuit	Reject

8. Electric Inspection

Defect	Inspection Item	Inspection Standards	
Major	Short		Reject
Major	Open		Reject

9. Inspection Specification of LCD

Defect	Inspect Item		Inspection Standards			
Minor	**Linear Defect**	∗ Glass Scratch ∗ Polarizer Scratch ∗ Fiber and Linear material	**W**	**W≤0.03**	**0.03<W≤0.05**	**W>0.05**
			L	**L<5**	**L<3**	**Any**
			ACC. NO.	**1**	**1**	**Reject**
			Note	**L is the length and W is the width of the defect**		
Minor	**Black Spot and Polarizer Pricked**	∗ Foreign material between glass and polarizer or glass and glass ∗ Polarizer hole or protuberance by external force	**Φ**	**Φ≤0.1**	**0.1<Φ≤0.15**	**0.15<Φ≤0.2**	**Φ>0.2**
			ACC. NO.	**3EA / 100mm²**	**2**	**1**	**0**
			Note	**Φ is the average diameter of the defect. Distance between two defects > 10mm.**		
Minor	**White Spot**	∗ Unobvious	**Φ**	**Φ≤0.3**	**0.3<Φ≤0.5**	**0.5<Φ**

	and Bubble in polarizer	**transparant foreign material between glass and glass or glass and polarizer ∗ Air protuberance between polarizer and glass**	**ACC. NO.**	**3EA / 100mm^2**	**1**	**0**	
			Note	**Φ is the average diameter of the defect. Distance between two defects > 10mm.**			
Minor	**Segment Defect**		**Φ**	**Φ≤0.10**	**0.10<Φ≤0.20**	**0.20<Φ≤0.25**	**Φ>0.25**
			ACC. NO.	**3EA / 100mm^2**	**2**	**1**	**0**
			Note	**W is more than 1/2 segment width**			**Reject**
				$\Phi = \frac{L + W}{2}$ **Distance between two defect is 10mm**			
Minor	**Protuberant Segment**	 $\Phi = (L + W) / 2$	**Φ**	**Φ≤0.10**	**0.10<Φ≤0.20**	**0.20<Φ≤0.25**	**Φ>0.25**
			W	**Glue**	**W≤1/2 Seg W≤0.2**	**W≤1/2 Seg W≤0.2**	**Ignore**
			ACC. NO.	**3EA / 100mm^2**	**2**	**1**	**0**
Minor	**Assembly Mis-alignment**		**1. Segment**				
			B	**B≤0.4mm**	**0.4<B≤1.0mm**	**B>1.0mm**	
			B-A	**B-A<1/2B**	**B-A<0.2**	**B-A<0.25**	
			Judge	**Acceptable**	**Acceptable**	**Acceptable**	
			**2. Dot Matrix**				
			Deformation>2°				**Reject**
Minor	**Stain on LCD Panel Surface**		**Accept when stains can be wiped lightly with a soft cloth or a similar one. Otherwise, judged according to the above items: "Black spot" and "White Spot"**				

9. RELIABILITY

NO.	Item	Condition	Criterion
1	High Temperature Operating	70℃, 96Hrs	No defect in cosmetic and operational function allowable. Total current Consumption should be below double of initial value.
2	Low Temperature Operating	-20℃, 96Hrs	
3	High Humidity	50℃, 90%RH, 96Hrs	
4	High Temperature Storage	80℃, 96Hrs	
5	Low Temperature Storage	-30℃, 96Hrs	
6	Vibration	Random wave 10 ~ 100Hz Acceleration: 2g 2 Hrs per direction(X,Y,Z)	
7	Thermal Shock	-20℃ to 25℃ to70℃ (60Min) (5Min) (60Min) 16Cycles	
8	ESD Testing	Contract Discharge Voltage: +1 ~ 5kV and –1 ~ –5kV	There will be discharged ten times at every discharging voltage cycle. The voltage gap is 1kV.
		Air Discharge Voltage: +1 ~ 8kV and –1 ~ -8kV	

Note: 1) Above conditions are suitable for EASSTOP DISPLAY standard products.
2) For restrict products, the test conditions listed as above must be revised.

10. HANDLING PRECAUTION

(1) Mounting Method

The panel of the LCD Module consists of two thin glass plates with polarizers which easily get damaged since the Module is fixed by utilizing fitting holes in the printed circuit board. Extreme care should be taken when handling the LCD Modules.

(2) Caution of LCD handling & cleaning

When cleaning the display surface, use soft cloth with solvent (recommended below) and wipe lightly.

- Isopropyl alcohol
- Ethyl alcohol
- Trichloro trifloro thane

Do not wipe the display surface with dry or hard materials that will damage the polarizer surface.

Do not use the following solvent:

- Water- Ketone- Aromatics

(3) Caution against static charge

The LCD Module use C-MOS LSI drivers, so we recommend that you connect any unused input terminal to VDD or VSS, do not input any signals before power is turned on. And ground your body, Work/assembly table. And assembly equipment to protect against static electricity.

(4) Packaging

- Modules use LCD elements, and must be treated as such. Avoid intense shock and falls from a height.
- To prevent modules from degradation. Do not operate or store them exposed directly to sunshine or high temperature/humidity.

(5) Caution for operation

- It is indispensable to drive LCD's within the specified voltage limit since the higher voltage than the limit shorten LCD life. An electrochemical reaction due to direct current causes LCD deterioration, Avoid the use of direct current drive.
- Response time will be extremely delayed at lower temperature than the operating temperature range and on the other hand at higher temperature LCD's show dark color in them.However those phenomena do not mean malfunction or out of order with LCD's. Which will come back in the specified operating temperature range.
- If the display area is pushed hard during operation, some font will be abnormally displayed but it resumes normal condition after turning off once.
- A slight dew depositing on terminals is a cause for electro-chemical reaction resulting in terminal open circuit.

Usage under the relative condition of 40°C, 50%RH or less is reequired.

(6) Storage

In the case of storing for a long period of time (for instance.) For years) for the purpose or replacement use, The following ways are recommended.

- Storage in a polyethylene bag with sealed so as not to enter fresh air outside in it, And with no desiccant.
- Placing in a dark place where neither exposure to direct sunlight nor light is. Keeping temperature in the specified storage temperature range.
- Storing with no touch on polarizer surface by the anything else. (It is recommended to store them as they have been contained in the inner container at the time of delivery)

(7) Safety

- It is recommendable to crash damaged or unnecessary LCD into pieces and wash off liquid crystal by using solvents such as acetone and ethanol.

Which should be burned up later.

- When any liquid crystal leaked out of a damaged glass cell comes in contac with your
- hands, please wash it off well with soap and wate.

Issued Date:2008/05/09
Doc. No.:

11. OUTLINE DIMENSION