HITACHI

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FOR MESSRS : _____ DATE : Sep.12,2001

CUSTOMER'S ACCEPTANCE SPECIFICATIONS

SX14Q001-ZZA

CONTENTS

*WHEN PRODUCT WILL BE DISCONTINUED, CUSTOMER WILL BE INFORMED BY HITACHI WITH TWELVE MONTHS PRIOR ANNOUNCEMENT.

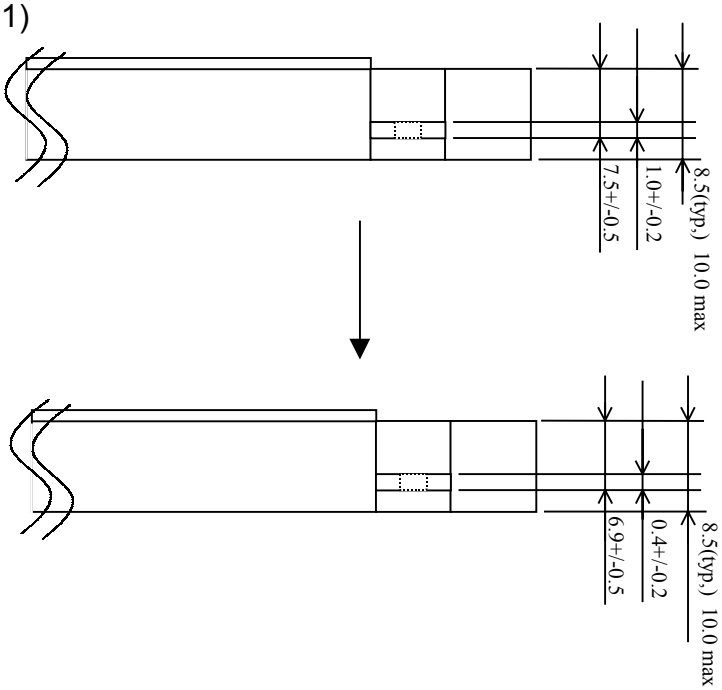
ACCEPTED BY; _____

PROPOSED BY; M.C. Chen

RECORD OF REVISION

DATE	SHEET No.	SUMMARY
May.11.'01	7B64PS2703-SX14Q001-ZZA-2 PAGE 3-1/1	CHANGED: (8) Backlight (50kh life (at 25℃) and replaceable) is canceled (11) power supply voltage 3.3V only ⟶ 3.3V
May.11.'01	7B64PS2704-SX14Q001-ZZA-2 PAGE 4-1/2	4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS (TOUCH PANEL) CHANGED: Operating voltage : (T.B.D) max ⟶ 7V Contact current : (T.B.D) max ⟶ 20mA ADDED PARTS: Operating temperature: 0~50℃, 80%RH max Storage temperature : -20~70℃, 90%RH max Note : Without condensation
May.11.'01	7B64PS2704-SX14Q001-ZZA-2 PAGE 4-2/2	CHANGED: 4.3 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS Ambient temperature: Operating min 5℃ ⟶ 0℃ max 40℃ ⟶ 50℃
May.11.'01	7B64PS2705-SX14Q001-ZZA-2 PAGE 5-2/3	5.2.1 OPERATING CONDITION CHANGED: Operating voltage : (T.B.D) ⟶ 5VDC Operating current : (T.B.D) ⟶ 10~20mA 5.2.2 ELECTRICAL CHARACTERISTICS CHANGED:SPECIFICATION Linearity X: 1.5% max ⟶ 2.0% max Y: 1.5% max ⟶ 2.0% max Chattering (T.B.D) ⟶ Bounce chattering 10msec max ADDED PARTS: SPECIFICATION Resistance factor: X1-X2 10% max Y1-Y2 10% max 5.2.3 MECHANICAL CHARACTERISTICS CHANGED: SPECIFICATION Pen input pressure : (T.B.D) ⟶ 80g max Surface hardness : (T.B.D) ⟶ 2H (1)ADDED PART:SPECIFICATION Finger : 100g max (20ADDED PARTS:NOTE Pen input pressure : R0.8, polyacetal pen Finger :R8, silicon rubber

RECORD OF REVISION

DATE	SHEET No.	SUMMARY
May.11.'01	7B64PS2709-SX14Q001-ZZA-2 PAGE 9-1/1	CHANGED: 9.1 DIMENSION OUTLINE (1)  (2) FFC DIMENSION CHANGED PARTS: DETAIL B parts 0.85±0.2 ⟶ 0.65±0.15 1.25±0.1 ⟶ 1.0±0.05 0.8±0.1 ⟶ 0.7±0.1 21.25±0.3 ⟶ 17.0±0.1
May.11.'01	7B64PS2708-SX14Q001-ZZA-2 PAGE 8-2/6	8.2 TIMING CHARACTERICS Ta=5℃～40℃ ⟶ Ta=0℃～50℃
May.11.'01	7B64PS2708-SX14Q001-ZZA-2 PAGE 8-6/6	8.6 INTERNAL PIN CONNECTION CN1: FPC PITCH 1.25mm 16PINS ↓ CN1: FFC PITCH 1.0mm 16PINS
Sep.12.'01	7B64PS2709-SX14Q001-ZZA-3 PAGE 9-1/1	Update all page. FFC CONTACT SIDE : BOTTOM → TOP

3.GENERAL DATA

(1)	Part Name	SX14Q001-ZZA
(2)	Module Size	167.0(W)mmx109.0(H)mmx11.6max(D)mm
(3)	Dot Pitch	0.12(W)mmx0.36(H)mm
(4)	Number of Dots	320x3(R,G,B))(W)x240(H) dots
(5)	Duty	1/240
(6)	LCD	Color Transmissive type; (negative type)
(7)	Viewing Direction	6 O'clock
(8)	Backlight	Cold Cathode Fluorescent Lamp (CFL)x1
(9)	Power Consumption(Total)	(1.9W) Except inverter
(10)	Brightness	110cd/m^2 (typ.)
(11)	Power Supply Voltage	3.3V
(12)	Touch panel	Resistance type

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS(LCM) VSS=0V:Standard

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
Power Supply for Logic	VDD-VSS	0	6.0	V	
Contrast Adjustment Voltage	VCON-VSS	0	VDD	V	
Input Voltage	Vi	-0.3	VDD+0.3	V	Note 1
Input Current	Ii	0	1	A	
Static Electricity	-	-	-	-	Note 2

Note (1):$\overline{\text{DISP}}$•OFF,FLM,CL1,CL2,D0~D7.

Note (2):Make certains you are grounded when handling LCM.

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS (TOUCH PANEL)

ITEM	SPECIFICATION	NOTE
Operating Voltage	7V	Without condensation
Contact Current	20mA	
Operating temperature	0~50°C, 80%RH max	
Storage temperature	-20~70°C, 90%RH max	

4.3 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

I T E M	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
Ambient temperature	0°C	50°C	-20°C	60°C	NOTE 2,3,6
Humidity	Note 1		Note 1		Without condensation
Vibration	-	2.45m/s^2	-	11.76m/s^2 Note 5	1 h max Note 4
Shock	-	29.4m/s^2	-	490m/s^2 Note 5	XYZ directions 11ms
Corrosive Gas	Not acceptable		Not acceptable		

NOTE (1) Ta<=40°C :85%RH max.
Ta>40°C :Absolute humidity must be lower than the humidity of 85%RH at 40°C.

Note (2) Ta at -20°C------< 48h , at 60°C------< 168h.

Note (3) Background color changes slightly depending on ambient temperature This phenomenon is reversible.

Note (4) 5Hz~100Hz(Except resonance frequency)

Note (5) This module should be operated normally after finish the test.

Note (6) This LCM will be operated less than 5°C. The life time of CFL will reduced need to make sure of value IL and characteristics of inverter, also the response time less than 5°C will be slower.

5. ELECTRICAL CHARACTERISTICS

5.1 ELECTRICAL CHARACTERISTICS OF LCD

I T E M	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Power Supply Voltage	VDD	VDD-VSS	3.15	3.30	3.45	V
Contrast Adjustment Voltage (Note 1)	VCON	-	0.8	-	2.8	V
Input Voltage for Logic Circuits (Note 2)	VI	"H" level	0.8VDD	-	VDD	V
		"L" level	0	-	0.2VDD	
Power Supply Current (Note 4)	IDD	VDD-VSS=3.3V	-	30	35	mA
Input Leak Current	Icon(Note5)	Vcon=0.8~2.8V	-	-	20	μA
	Iin(Note2)	Vin=VDDorVSS	-	-	±1.0	
Contrast Adjustment Voltage (Note 6)	V_{CON}	Ta= 5°C , ϕ=0°	1.5	(2.0)	-	V
		Ta=25°C , ϕ=0°	-	(2.0)	-	
		Ta=40°C , ϕ=0°	-	(2.0)	2.5	
Frame Frequency (Note 7)	fFLM	-	60	70	80	Hz

(Note 1) In proportion as the VCON voltage decrease the brightness will increase.
(Note 2) $\overline{DISP}$ • OFF ,FLM ,CL1 ,CL2 ,D0~D7.
(Note 3) fFLM=70Hz Ta=25°C,Display pattern : Checker pattern.
(Note 4) Rush Current of Power ON : 1A(PK) × 1ms + 0.15A(PK)×20ms
(Note 5) VCON
(Note 6) Recommended Contrast Adjustment Voltage fluctuates about ±0.3V by each module.
Temperature compensation circuit included in LCM. (only typ values)
(Note 7) Need to make sure of flickering and rippling of display when setting the Frame Frequency in your set.
(Note 8) Some points for attention while setting driving condition of appliance
(1) Frame Frequency
Please set the frame frequency as the typical value (central vale) which in CAS. According to the characteristic or response time of LC material, that setting the frame frequency near the mininum value or under the minimum value shown in CAS will cause a frame with moving phenomenon.
(2) Setting value Vcon
Vcon, adjusted to get the best contrast ratio of LCD module, is adjusted to be distributed within the tolerance ±0.3V of central value in CAS before LCD modules ship the factory.
The below items are recommended at customer side.
(i) When designing the appliance, please set the Vcon value as an Adjustable value.
(ii) And the Vcon value must be able to be adjusted to match most suitable Vcon to get the best contrast ratio. A fixed Vcon value a little different from the most suitable Vcon value of LCD module and causes a misjudgment.
(ii) The Vcon adjustment(when D/A [Digital/Analogue] converter is used) is recommended to be set as 50mV at most per step. That one step is more than 50mV may cause the input value to be not able match the most suitable value.
The characteristic of contrast ratio can not present absolutely.

5.2 ELECTRICAL CHARACTERISTICS OF TOUCH PANEL

5.2.1 OPERATING CONDITION

ITEM	SPECIFICATION
Operating Voltage	5VDC
Operating Current	10~20mA

5.2.2 ELECTRICAL CHARACTERISTICS

ITEM		SPECIFICATION	NOTE
Resistance Between terminal	X1-X2	150~1300 ohm	
	Y1-Y2	150~1300 ohm	
Insulance Resistance	X-Y	20M ohm	Operating Voltage 25V
Linearity	X	10%	Condition See Note 1
	Y	10%	
Bounce Chattering		10 msec max	

5.2.3 MECHANICAL CHARACTERISTICS

ITEM	SPECIFICATION	NOTE
Pen input pressure	80g max	R0.8, polyacetal pen
Finger	100g max	R8, silicon rubber
Surface hardness	2H	

5.2.4 OPTICAL CHARACTERISTICS

ITEM	SPECIFICATION	NOTE
Transparency	76%(min)	Wave length 450~700nm

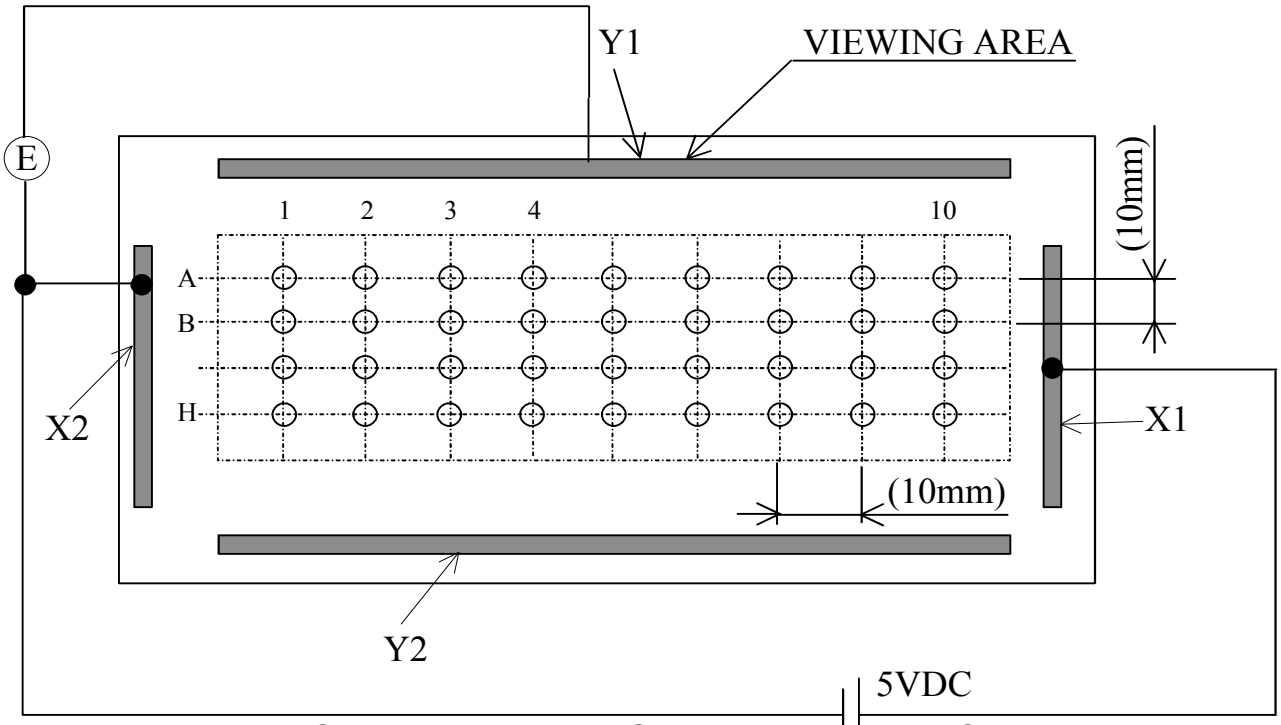
NOTE 1

(1) LINEARITY

LINEARITY DEVIATION : 2% max

(2) TESTING CIRCUIT

(a) Y AXIS LINEARITY TESTING METHOD , 100g ,VX1-VX2=5V , VOUT=VY1.

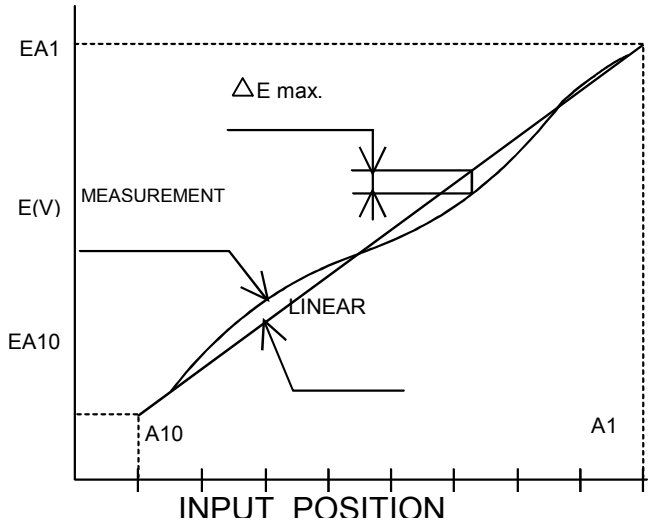


(b) X AXIS LINEARITY METHOD , VY1 –VY2=5V , VOUT=VX1

(3) CALCULATION

(a) Y AXIS LINEARITY

$$\text{LINEARITY} = \frac{\triangle E \text{ max.}}{E_{A1} - E_{A10}} * 100(\%)$$



5.3 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

ITEM	SYMBOL	MIN	TYP	MAX	UNIT	NOTE
Lamp Voltage	VL	-	(325)	-	Vrms	Ta=25°C 5.5 mA
Frequency	fL	-	(T.B.D)	-	kHz	
Lamp Current (1Lamp)	IL	5.0	5.5	6.0	mA	Ta=25°C
Starting discharge Voltage	VS (Note 2)	(1000)	-	-	Vrms	Ta=0°C

(Note 1) Please design your lamp driving circuit (inverter) according to the above specifications, and inform Hitachi of it.

(Note 2) Starting discharge voltage is increased when LCM is operating at low temperature.
Please check the characteristics of your inverter before applying to your set.

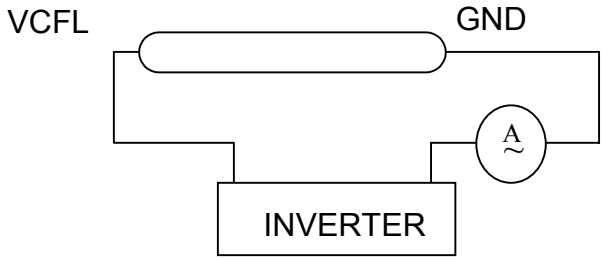
(Note 3) Average life time of CFL will be decreased when LCM is operating at low temperature.

(Note 4) Under lower driving frequency of an inverter, a certain backlight system (CFL & CFL reflection sheet) may generate a sound noise. Before designing the inverter, please consider the driving frequency and noise.

(Note 5) Absolute maximum ratings voltage of CFL cable for this module is as follows.

VCFL Side : 2kV
VSS Side : 300V
This inverter design shall not exceed the rated voltage.

(Note 6)



(Note 7) We recommend to equip protection circuit (to stop output) which works under abnormal operation to the inverter for CFL.

6. OPTICAL CHARACTERISTICS

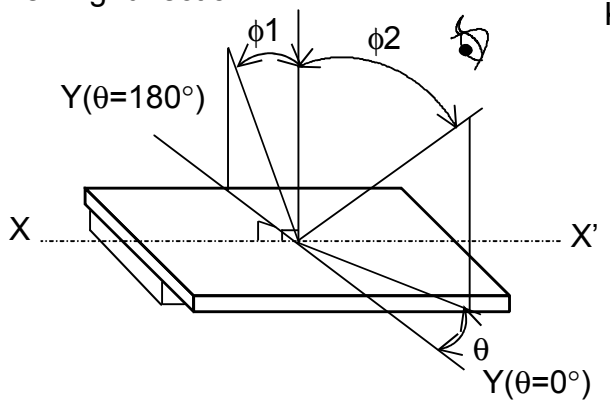
6.1 OPTICAL CHARACTERISTICS OF LCD Ta=25°C(Backlight on)

ITEM		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
Viewing area		$\phi 2$-$\phi 1$	$\theta=0°$,K≧2.0	-	(40)	-	deg	1,2
Contrast ratio		K	$\phi=0°$ $\theta=0°$	-	(40)	-	-	3,5,6
Response time (rise)		tr	$\phi=0°$ $\theta=0°$	-	(250)	-	ms	4
Response time (fall)		tf	$\phi=0°$ $\theta=0°$	-	(200)	-	ms	4
Color tone (Primary Color)	Red	x	$\phi=0°$ $\theta=0°$	-	(0.54)	-	-	7
		y		-	(0.33)	-	-	
	Green	x		-	(0.30)	-	-	
		y		-	(0.51)	-	-	
	Blue	x		-	(0.17)	-	-	
		y		-	(0.17)	-	-	
	White	x		-	(0.30)	-	-	
		y		-	(0.33)	-	-	

(Measurement condition : Hitachi standard)

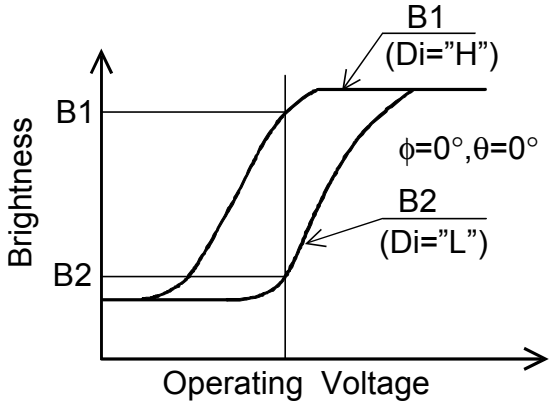
Note 1)~7) : See next page.

Note 1.Definition of θ and ϕ
(Normal)
Viewing direction Z

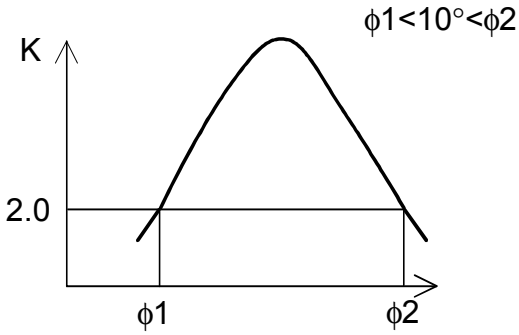


Note 3.Definition of contrast "K"

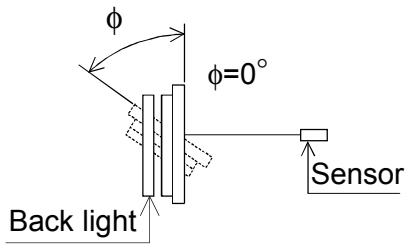
$$K = \frac{\text{Brightness on selected area (B1)}}{\text{Brightness on non-selected area (B2)}}$$



Note 2.Definition of viewing angle ϕ1 and ϕ2



Contrast ratio k vs viewing angle ϕ

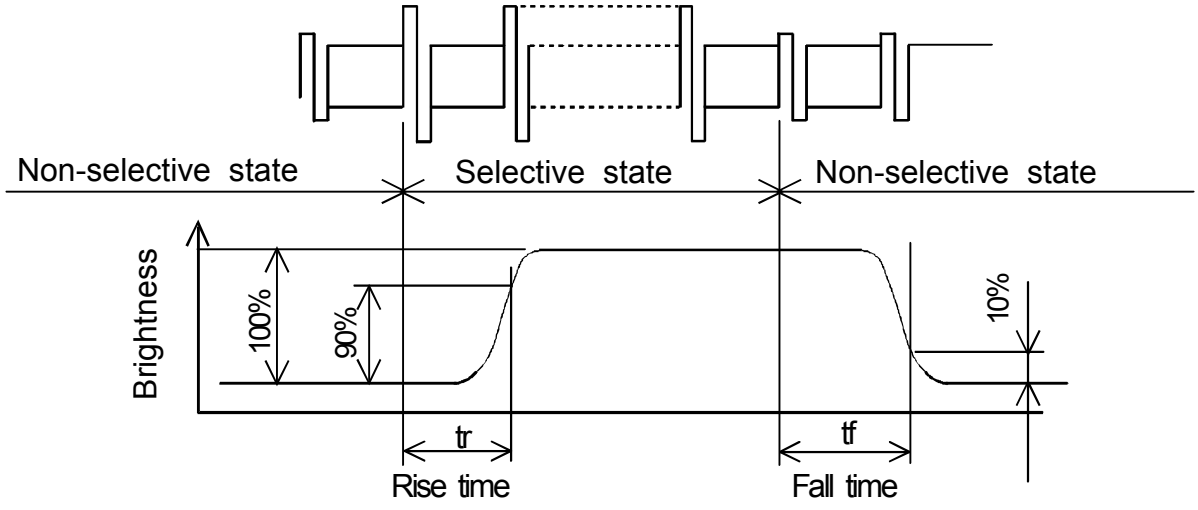


Brightness : BM-7

Aperture : 1°

Distance : 0.4m

Note 4.Definition of optical response time



Note5. Hitachi will not do 100% inspection for minimum value. Minimum value is for reference.

Note6. Hitachi will do sampling inspection for minimum value.

Note7 The LCD driving voltage should be adjusted at the voltage where the peak contrast is obtained.

6.2 POTICAL CHARACTERISTICS OF BACKLIGHT

ITEM	MIN.	TYP.	MAX.	UNIT	NOTE
Brightness	-	110	-	cd/m^2	IL=5.5mA (Note1),(Note2)
Rise time	-	(5)	-	Minute	IL=5.5mA, Brightness 80%
Brightness uniformity	-	-	±30	%	Undermentioned Note 1,3

(Measurement condition : Hitachi standard)

CFL : INITIAL , Ta=25°C

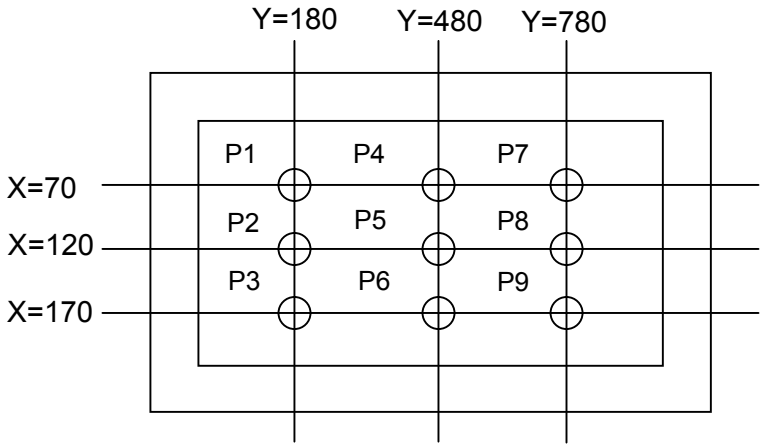
Display data should be all "ON"

The LCD driving voltage should be adjusted so as to obtain maximum contrast, when display pattern is all "Q".

(Note 1) Measurement after 10 minutes from CFL operating.
Average value of 9 points (Note 3)

(Note 2) Brightness control : 100%.

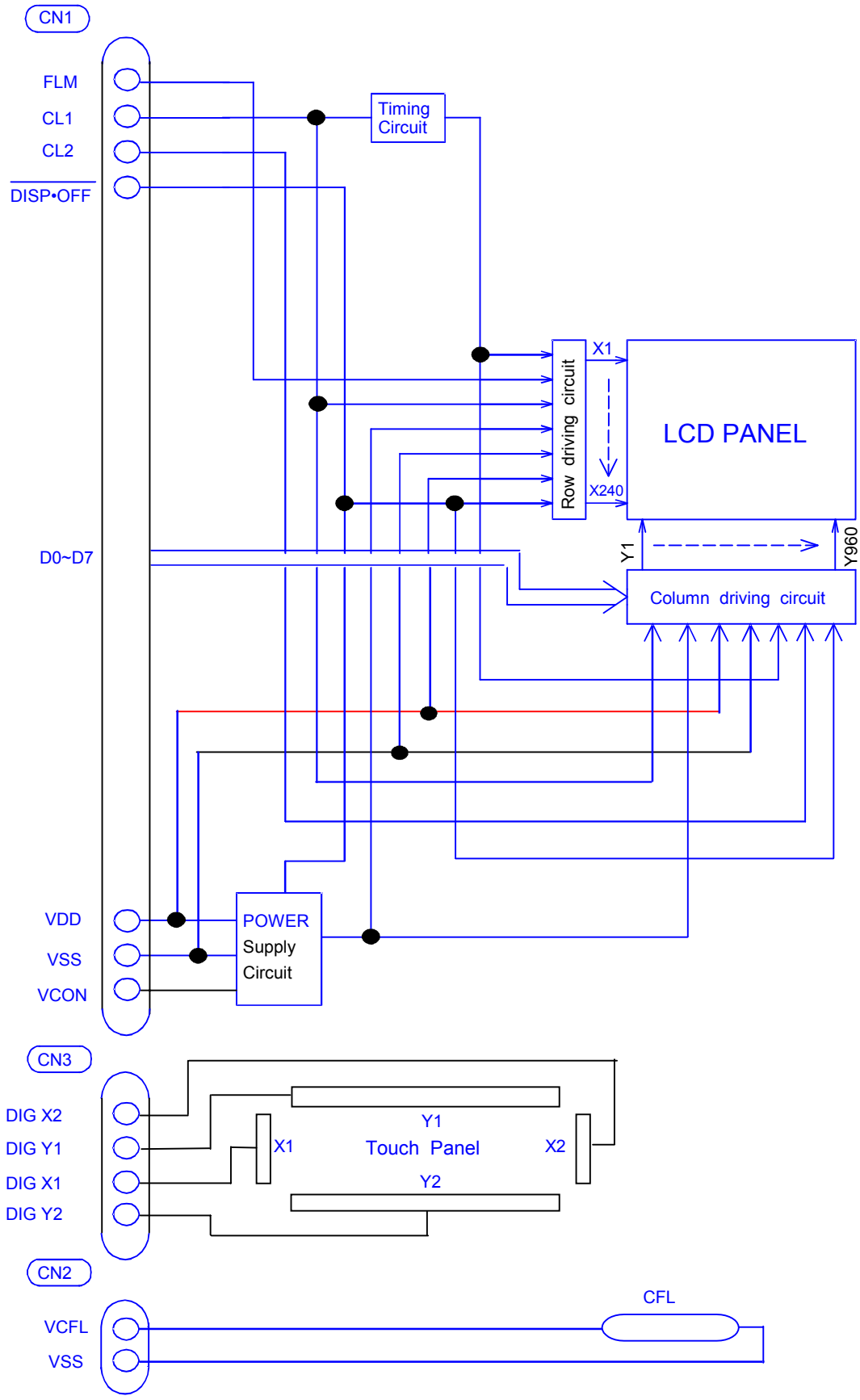
(Note 3) Measurement of the following 9 places on the display.



(Note 4) Definition of the brightness tolerance.

$$\left(\frac{\text{Max brightness or Min brightness - Average brightness}}{\text{Average brightness}}\right) \times 100$$

7. BLOCK DIAGRAM



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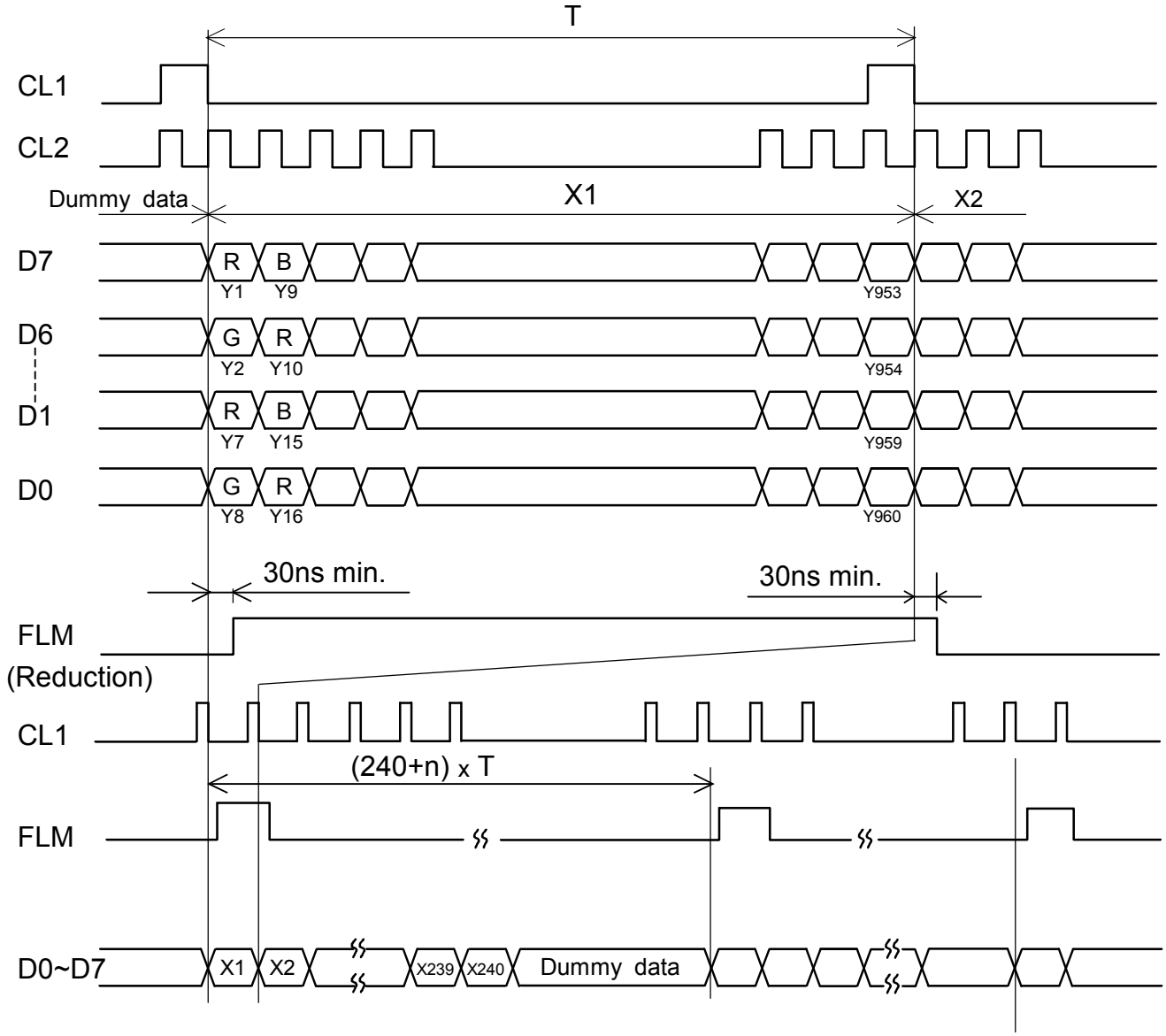
8.INTERFACE TIMING CHART

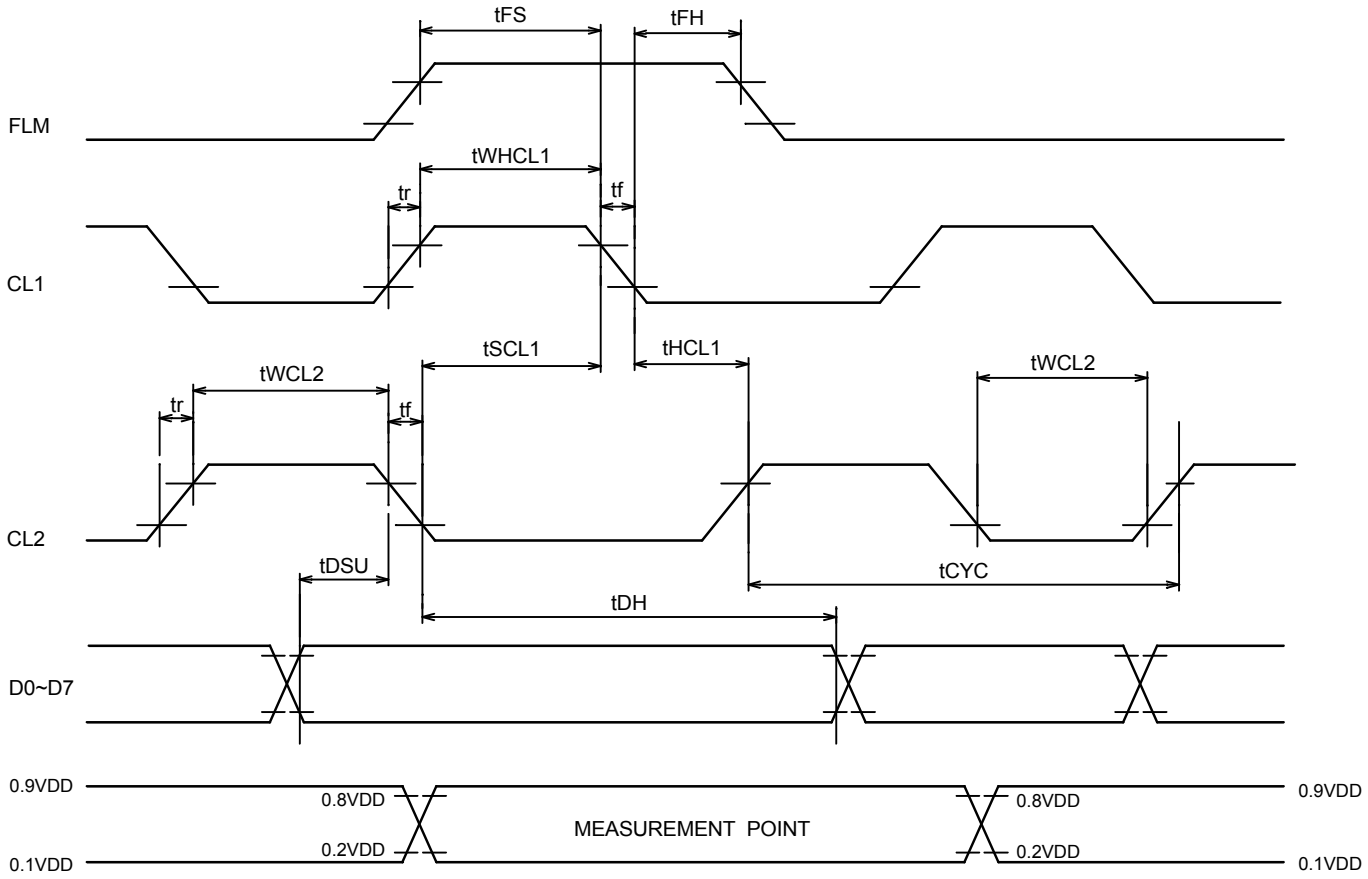
8.1 TIMING CHART



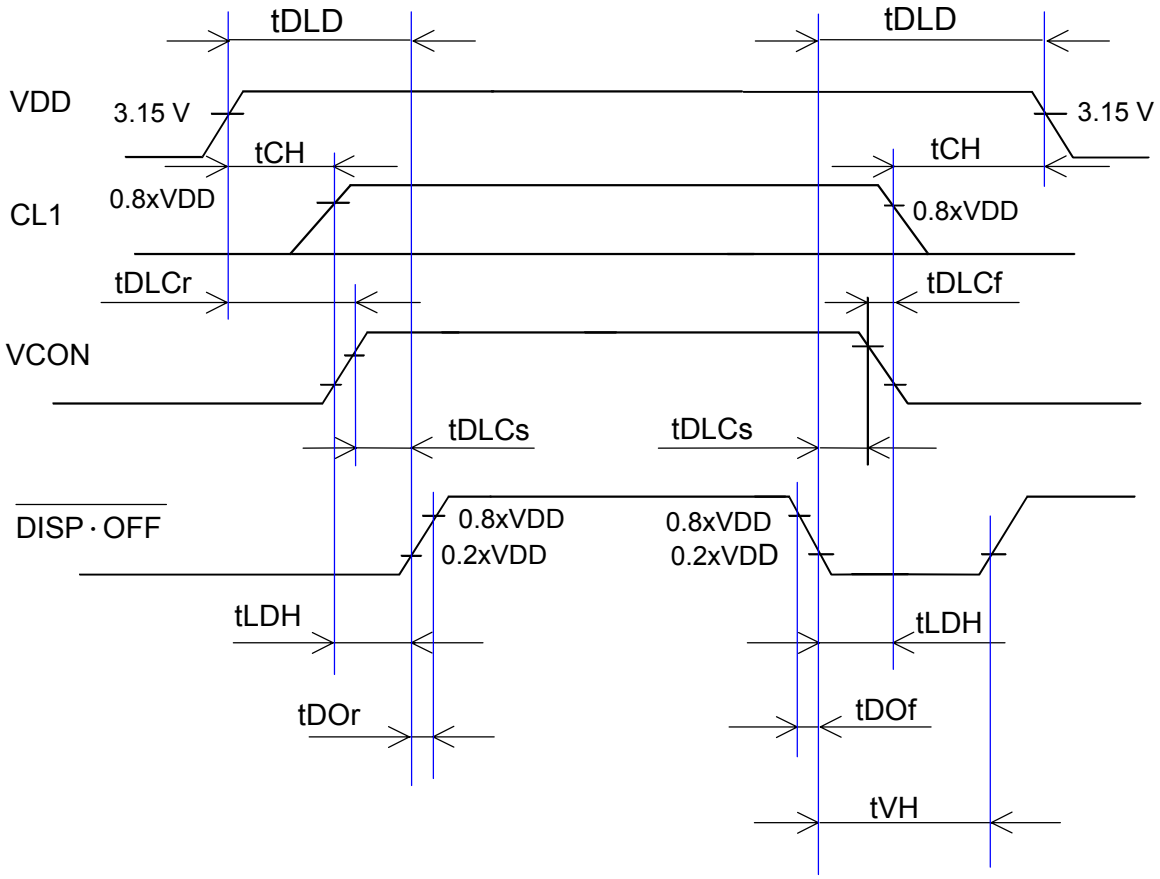
8.2 TIMING CHARACTERISTICS

VDD=3.3V,VSS=0V,Vcon=0.8~2.8V,Ta=0~50°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UMIT
CL1 Pulse width "H"	tWHCL1	100	-	-	ns
Clock cycle time	tCYC	60	-	-	ns
CL2 pulse width	tWCL2	30	-	-	ns
Clock set up time	tSCL1	40	-	-	ns
Clock hold time	tHCL1	80	-	-	ns
Clock rise fall time	tr,tf	-	-	30	ns
Data set up time	tDSU	20	-	-	ns
Data hold time	tDH	20	-	-	ns
"FLM" set up time	tFS	100	-	-	ns
"FLM" hold time	tFH	50	-	-	ns



8.3 POWER ON/OFF SEQUENCE



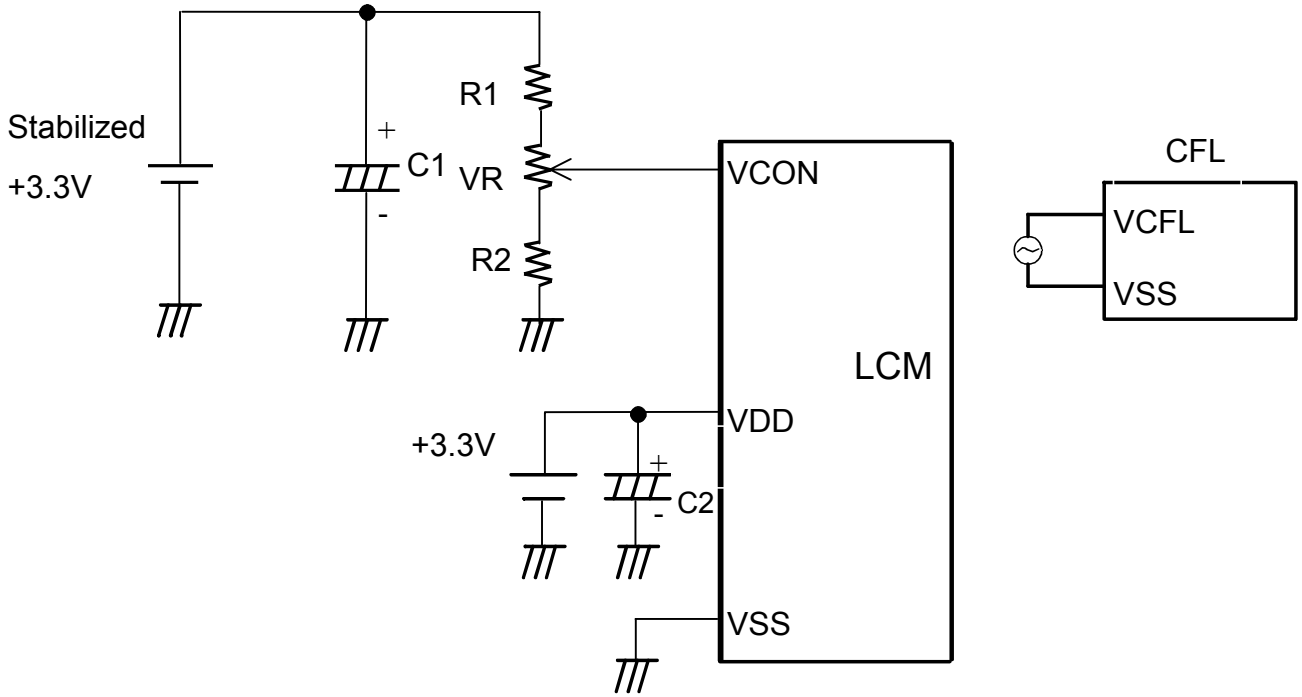
SYMBOL	MIN	MAX	UNIT	COMMENT
tDLD	200	-	ms	
tCH	0	-	ms	
tLDH	0	-	ms	(Note 1)
tDOr	-	100	ns	
tDOf	-	100	ns	
tDLCr	20	-	ms	(Note 2)
tDLCf	0	-	ms	
tDLCs	20	-	ms	
tVH	200	-	ms	

(Note 1) Please keep the specified sequence because wrong sequence may cause permanent damage to the LCD panel.

(Note 2) Hitachi recommends you to use DISP•OFF function.
Display quality may deteriorate if you don‘t use DISP•OFF function.

8.4 POWER SUPPLY FOR LCM

Example



8.5 INPUT DATA ALLOCATION TABLE

Data Signal	D7	D6	D5	D4	D3	D2	D1	D0	D7	D6	D5	D4	----------	D4	D3	D2	D1	D0
Y / X	1	2	3	4	5	6	7	8	9	10	11	12	----------	956	957	958	959	960
1	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
2	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
3	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
4	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
5	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
138	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
139	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
140	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
141	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
142	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
143	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
144	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
145	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
238	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
239	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B
240	R	G	B	R	G	B	R	G	B	R	G	B	----------	G	B	R	G	B

R : RED
G : GREEN
B : BLUE

8.6 INTERNAL PIN CONNECTION

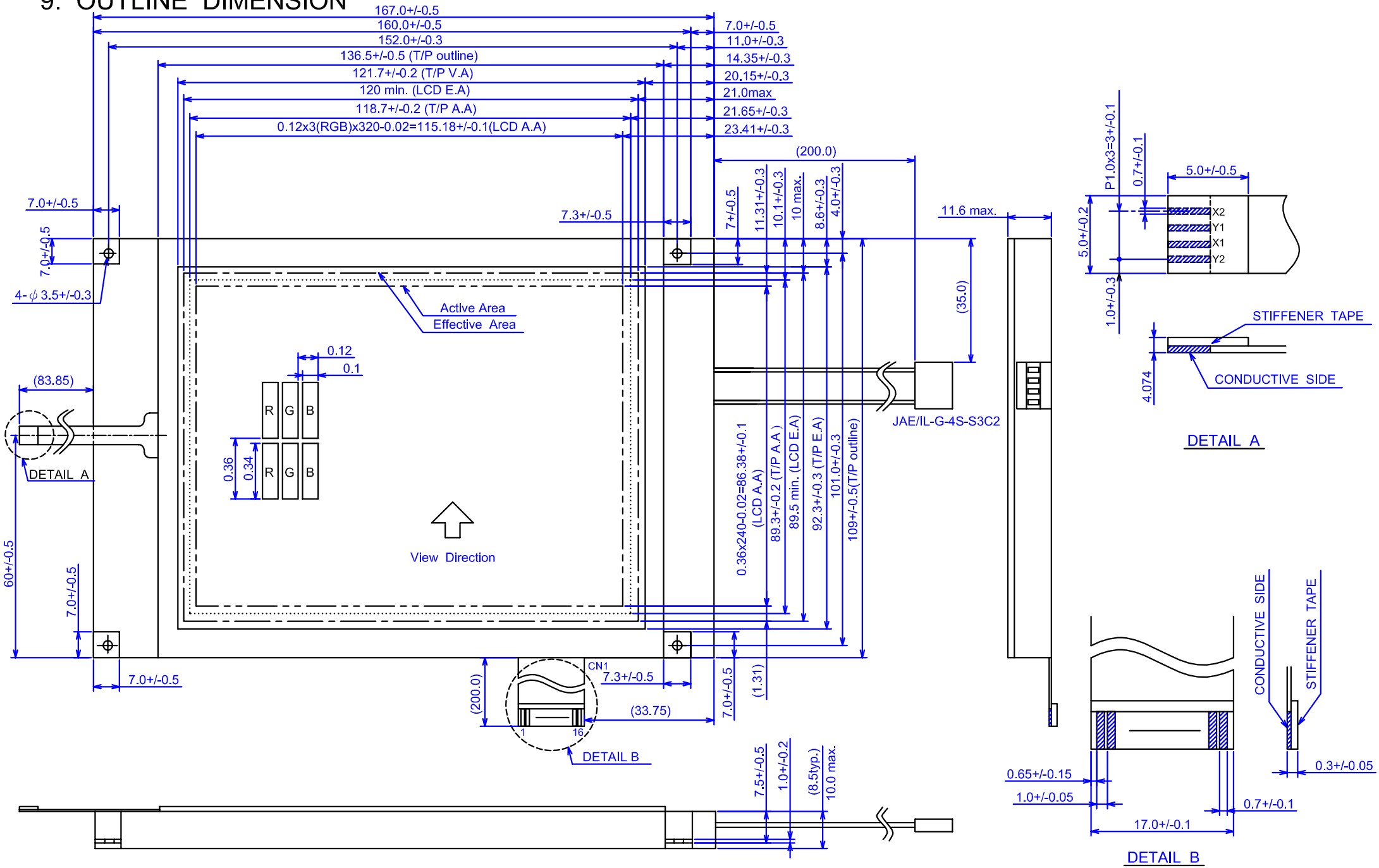
CN1: FFC : PITCH 1.0mm 16Pins

PIN No.	SIGNAL	Description	Level
1	FLM	First Line Marker	H
2	CL1	Data Latch	H ⟶ L
3	CL2	Data Shift	H ⟶ L
4	$\overline{\text{DISP OFF}}$	H(ON),L(OFF)	H / L
5	VDD	Power supply for Logic	-------
6	VSS	GND	-------
7	VCON	Contrast adjust	-------
8	D0	Display data	H / L
9	D1		
10	D2		
11	D3		
12	D4		
13	D5		
14	D6		
15	D7		
16	VSS	GND	-------

CFL IF : JAE/IL-G-4S-S3C2

PIN No.	SIGNAL	LEVEL	FUNCTION
1	VCFL	-	Power Supply for CFL
2	N.C	-	----------
3	N.C	-	----------
4	VSS	-	GND for CFL

9. OUTLINE DIMENSION



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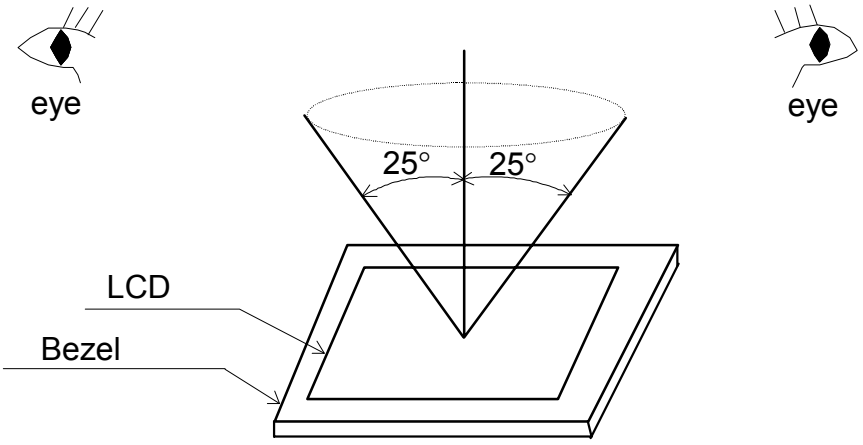
10. APPEARANCE STANDARD

10.1 APPEARANCE INSPECTION CONDITION

Visual inspection should be done under the following condition.

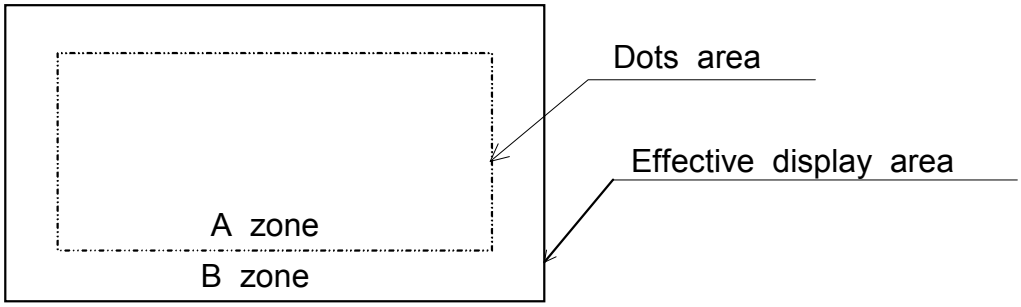
(1) The inspection should be done in a dark room.
(2) The CFL should be lighted with the prescribed inverter.
(3) The distance between eyes of an inspector and the LCD module is 25cm.
(4) The viewing zone is shown the figure.
Viewing angle<=25° .



10.2 DEFINITION OF ZONE

A zone : The dots area specified at page 9-1/1 of this document.

B zone : Area between the effective display area line and the dots area (A zone) line specified at page 9-1/1 of this document.



10.3 APPEARENCE SPECIFICATION

(1)LCD APPEARANCE

* If the problem related to this section occures about this item， the responsible persons of both party (Customer and Hitachi) will discuss the matter in detail.

No.	ITEM	CRITERIA			APPLIED ZONE
LCD	Scratches	Distinguished one is not acceptable (To be judged by HITACHI SRANDARD)			A
	Dent	Same as above			A
	Wrinkles in Polarizer	Same as above			A
	Bubbles	Average diameter D(mm)	Maximum number Acceptable		A
		D≦0.2	ignored		
		0.2<D≦0.3	12		
		0.3<D≦0.5	3		
		0.5<D	none		
	Stains, Foreign Materials Dark spot	Filamentous (Line shape)			A,B
		Length L(mm)	Width W(mm)	Maximum accept -able number	
		L≦2.0	W≦0.03	ignored	
		L≦3.0	0.03<W≦0.05	6	
		L≦2.5	0.05<W≦0.1	1	
		Round(Dot shape)			A,B
		Average diameter D(Mm)	Maximum acceptable number	Minimum Space	
		D<0.2	ignored	-	
		0.2≦D<0.3	10	10 mm	
		0.3≦D<0.4	5	30 mm	
		0.4≦D	none	-	
		The total number	Filamentous+Round=10		
		Those wiped out easily are acceptable			
	Color tone	To be judged by HITACHI STABDARD			A
	Color uniformity	Same as above			A

No.	ITEM	CRITERIA				APPLIED ZONE
LCD	Contrast irregularity (Spot)	Average diameter D(mm)	Contrast	Maximum acceptable number	Minimum space	A
		D≦0.25	To be Judge by HITACHI STANDARD	ignored	-	
		0.25<D≦0.35		10	20mm	
		0.35<D≦0.5		4	20mm	
		0.5 <D≦0.7		3	50mm	
		0.7 <D		None	-	
	Contrast irregularity (Line) (A pair of scratches)	Width W(mm)	Length L(mm)	Maximum Acceptable number	Minimum space	A
		W≦0.25	L≦1.2	2	20mm	
		W≦0.2	L≦1.5	3	20mm	
		W≦0.15	L≦2.0	3	20mm	
		W≦0.1	L≦3.0	4	20mm	
		The whole number		6		
	Rubbing Scratch	To be judged by HITACHI STANDARD				-

(2) CFL BACKLIGHT APPEARANCE

No.	ITEM	CRITERIA			APPLIED ZONE
CFL BACKLIGHT	Dark spots White spots Foreign materials (Spot)	Average diameter D(mm)	Maximum Acceptable number		A
		D≦0.4	ignored		
		0.4<D	none		
	Foreign materials (Line)	Width W(mm)	Length L(mm)	Maximum Acceptable number	A
		W≦0.2	L≦2.5	1	
			2.5<L	None	
		0.2<W	-	none	
	Scratches	Width W(mm)	Length L(mm)	Maximum acceptable number	A
		W≦0.1	-	ignored	
		0.1<W≦0.2	L≦11.0	1	
			11.0<L	None	
		0.2<W	-	none	

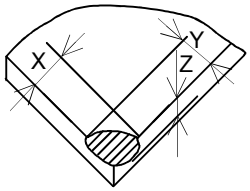
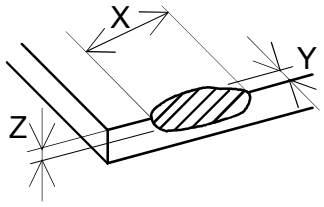
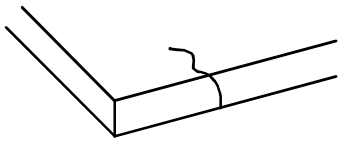
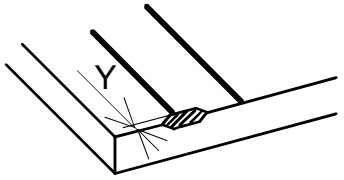
(3) TOUCH PANEL APPEARANCE

Item	CRITERIA		
Scratch	W>0.1	L>12	None
	0.10≧W0.05	L≦12	5 or less for ok
	0.05≧W	L≦12	ignored
Dust(Linear)	W>0.10	L>2	None
	0.10≧W>0.05	L≦5	3 or less for ok
	0.05≧W	L≦12	ignored
Dust(Circular)	D>0.3		None
	0.3≧D>0.1		5 or less for ok
	D≦0.1		ignored

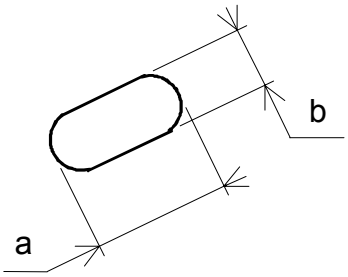
Applied only in the active area. Scratches or dusts in the outside of the active area are acceptable unless the electrical characteristics are affected.

- Dirt

  Acceptable if not noticeable on a black mat.
- Interference Fringes (Newton Rings) must not be recognized under 3wavelength fluorescent light.
- Tip, crack (applicable to glass only)

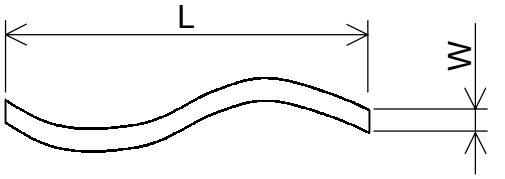
Item	CRITERIA			
Tip Corner		X	≦2.5	Not acceptable if the film is damaged
		Y	≦2.5	
		Z	≦1.1	
Tip Side		X	≦5	Not acceptable if the film is damaged
		Y	≦3	
		Z	≦1.1	
Crack				None
Other	 Y≦1			Not acceptable if the electrical Characteristics is affected

Note (1) Definition of average diameter (D)



$$D=\frac{a+b}{2}$$

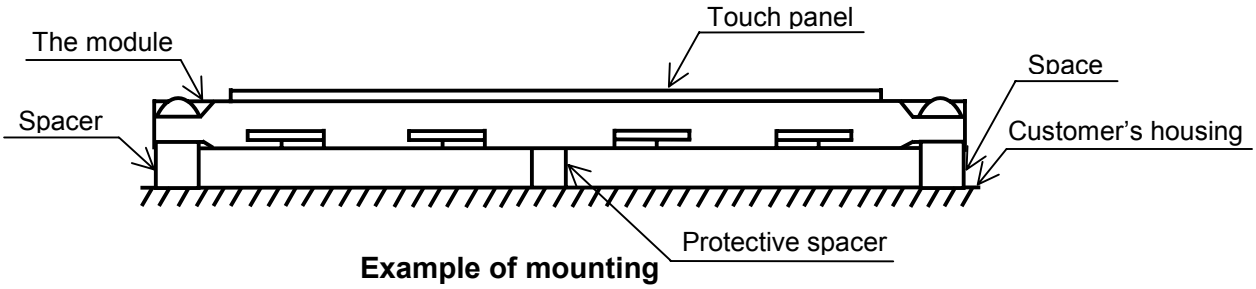
Note (2) Definition of length (L) and width (W)



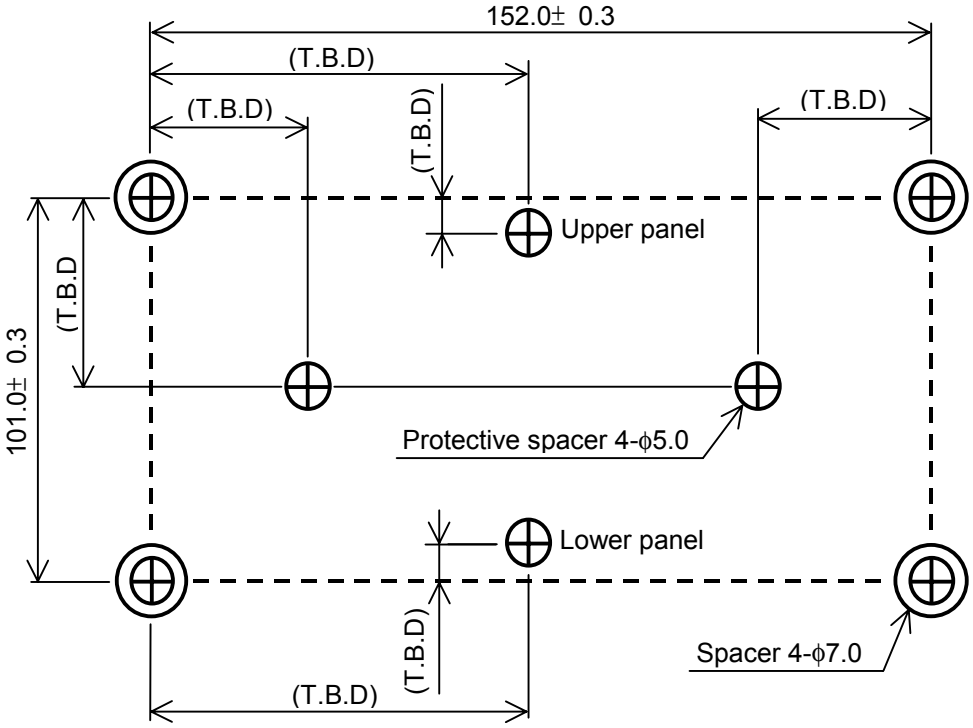
11. PRECAUTION IN DESIGN

11.1 MOUNTING PRECAUTION

Please mount the LCD Module by using mounting holes provided. While mounting please pay attention to the followings.



Example of mounting



Unit : mm

Scale: NTS

Location of spacers

(1) To prevent the module cover from being pressed, the distance netw een the module and the fitting plate, which means the length of the spacerrs, should be shorter than 1.0mm.

(2) The use of protective spacers are recommend in order to protect the module from shock.

(3) For the module to be used at uproght position, the case shall have a structure where the touch panel screen does not shift with its own weight.

(2) As the adhesives used for adhering upper/lower polarizers and aluminum plate are made of organic substances which will be deteriorated by a chemical reaction with such chemicals as acetone, toluene, ethanol and isopropylalcohol. The following are recommended for use : Normal hexane
Please contact us when is it is necessary for you to use chemicals other than the above.

(3) Lightly wipe to clean the dirty surface with absorbent cotton or other soft material like chamois, soaked in the recommended chemicals without scrubbing it hardly.
Always wipe the surface horizontally or vertically. Never give a wipe in a circle.
To prevent the display surface from damage and keep the appearance in good state, it is sufficient, in general, to wipe it with absorbent cotton.

(4) Immediately wipe off saliva or water drop attached on the display area because it may cause deformation or faded color.

(5) Fogy dew deposited on the surface may cause a damage, stain or dirt to the polarizer.
When you need to take out the LCD module from some place at low temperature for test, etc.
It is required to be warmed them up to temperature higher than room temperature before taking them out.

(6) Touching the display area or I/F pins with bare hands or contaminating them are prohibited, because the stain on the display area and poor insulation between terminals are often caused by being touched with bare hands.
(Some cosmetics are detrimental to polarizers.)

(7) In general, the glass is fragile so that, especially on its periphery, tends to be cracked or chipped in handling. Please not give the LCD module sharp shocks by falling etc.

(8) Maximum pressure to the surface must be less than 1.96×10^4 Pa.
And if the pressure area is less than $1cm^2$, maximum pressure must be less than 1.96N.

(9) Since the metal width is narrow on these locations (see page 9-1/1), please careful with handling.

(10) Top sheets shall be cleaned gently using a soft cloth such as those used for glasses.
Hard wiping accumulated dust will leave scars on the surface even using a cloth.

11.5 OPERATION PRECAUTION

(1) Using a LCM module beyond its maximum ratings may result in its permanent destruction.
LCM module's should usually be used under recommended operating conditions shown in chapter 5. Exceeding any of these conditions may adversely affect its reliability.

(2) Response time will be extremely delayed at lower temperature than the specified operating temperature range and on the other hand LCD's shows dark blue at higher temperature.
How ever those phenomena do not mean defects of the LCD module. Those phenomena will disappear in the specified operating temperature range.

(3) If the display area is pushed hard during operation, some display patterns will be abnormally display.

(4) A slight dew depositing on terminals may cause electrochemical reaction which leads to terminal open circuit. Please operate the LCD module under the relative condition of 40℃ 85%RH.

(5) Resistance range : Your controller shall be set up to allow the resistance range of touch panel specified in our CAS.

(6) Pointed position of touch panel may shift owing to a change in resistance of touch panel depending on the operation condition . To compensate this shift, the set shall be given a calibration function.

(7) Input shall be made with a stylus pen (polyacetal , R0.8). Chances are very high that use of a metal piece including a ball point pen or sharp edge will impair accuracy.

(8) The touch panel is an auxiliary input device. The system shall be designed to have other input device.

11.6 STORAGE

In case of storing LCD module for a long period of time (for instance, for years) for The purpose of replacement use, the following precautions necessary.

(1) Store the LCD modules in a dark place; do not expose them to sunlight or ultraviolet rays.

(2) Keep the temperature between 10℃ and 35℃ at normal humidity.

(3) Store the LCD modules in the container which is used for shipping from us.

(4) No articles shall be left on the surface over an extended period of time.

11.7 SAFETY

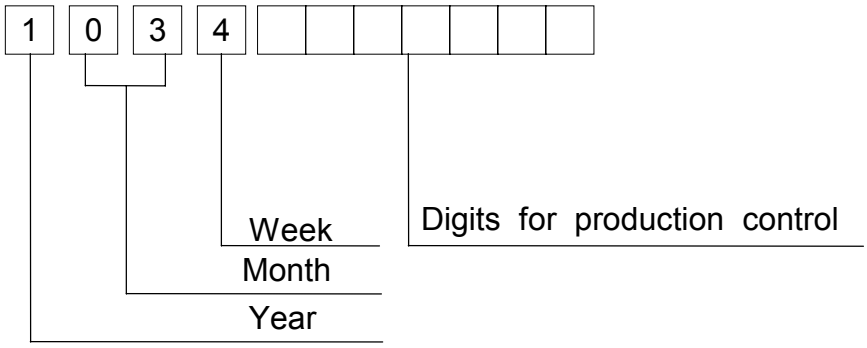
The LCD modules include Cold Cathode Fluorescent Lamp(CFL). CFL contains a small amount of mercury. Please follow local ordinances or regulations for disposal.

Wear finger cots or gloves whenever handling or assembling a touch panel its Glass edges are sharp.

12. DESIGNATION OF LOT MARK

12.1 LOT MARK

Lot mark is consisted of 4 digits for production lot and 6 or 7 digits for production control.



Year	Figure in lot mark
2001	1
2002	2
2003	3
2004	4
2005	5

Month	Figure in lot mark	Month	Figure in lot mark
Jan.	01	July	07
Feb.	02	Aug.	08
Mar.	03	Sep.	09
Apr.	04	Oct.	10
May	05	Nov.	11
June	06	Dec.	12

Week (day in calendar)	Figure in lot mark
1~ 7	1
8~14	2
15~21	3
22~28	4
29~31	5

12.2 REVISION

REV No.	ITEM	LOT No.	PRODUCTION CONTROL No.
A	-		00001~

12.3 LOCATION OF LOT MARK

On the back side of LCM

13. PRECAUTIPON FOR USE

(1) A limit sample should be provided by the both parities on an occasion when the both parties agree to its necessity.
Judgement by a limit sample shall take effect after the limit sample has been established and confirmed by the both parties.

(2) On the following occasions, the handling of the problem should be decided through discussion and agreement between responsible persons of the both parties.

(1) When a question is arisen in the specifications.

(2) When a new problem is arisen which is not specified in this specifications.

(3) When an inspection specifications change or operating condition change by customer is reported to HITACHI, and some problem is arisen in the specification due to the change.

(4) When a new problem is arisen at the customer‘s operating set for sample evaluation.

(3) Regarding the treatment for maintenance and repairing, both parties will discuss it in six month later after latest delivery of this product.

The precaution that should be observed when handling LCM have been explained above.
If any points are unclear or if you have any requests , please contact HITACHI.