HITACHI

KAOHSIUNG HITACHI
ELECTRONICS CO.,LTD
P.O. BOX 26-27
2,13TH EAST ST. K.E.P.Z.
KAOHSIUNG TAIWAN R.O.C.
TEL:(07) 8211101(10 LINE)
TELEX:81903 KHE
FAX:(07) 821-5860

FOR MESSRS : _____ DATE : May.28,2007

CUSTOMER'S ACCEPTANCE SPECIFICATIONS

LMG7525RPFF

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* WHEN PRODUCT WILL BE DISCONTINUED, CUSTOMER WILL BE INFORMED BY HITACHI WITH TWELVE MONTHS PRIOR ANNOUCEMENT.
* THIS PRODUCT IS INHIBITED TO APPLY IN ANY LIFE SUPPORT INSTRUMENT.

ACCEPTED BY; _____ PROPOSED BY; Dan Chang

RECORD OF REVISION

<table>
<tr><th>DATE</th><th>SHEET No.</th><th>SUMMARY</th></tr>
<tr><td>MAY.13.'98</td><td>7B64PS 2703-
LMG7525RPFF-2
PAGE 3-3/1</td><td>(8)LCD
THE UPPER POLARIZER TYPE CHANGED.
ANTI – GLARE → GLARE</td></tr>
<tr><td></td><td>7B64PS 2705-
LMG7525RPFF-2
PAGE 5-1/2</td><td>5.1 ELECTRICAL CHARACTERISTICS
RECOMMENDED LC DRIVING VOLTAGE
CHANGED.
Ta = 0 °C , (24.1V) → 24.8V
Ta = 25°C , (23.0V) → 23.8V
Ta = 40°C , (21.6V) → 23.0V
N OTE2 VDD - VEE = (23.0) → 23.8V</td></tr>
<tr><td></td><td>7B64PS 2705-
LMG7525RPFF-2
PAGE 5-2/2</td><td>5.2 ELECTRICAL CHARACTERISTICS
FREQUENCY CHANGED
70 (TYP) , 85 (MAX) → 30 (MIN)</td></tr>
<tr><td></td><td>7B64PS 2706-
LMG7525RPFF-2
PAGE 6-1/2</td><td>6.1 OPTICAL CHARACTERISTICS
CONTRAST RATIO CHANGED
(8) (TYP) → 5 (TYP)</td></tr>
<tr><td></td><td>7B64PS 2706-
LMG7525RPFF-2
PAGE 6-2/2</td><td>6.2 OPTICAL CHARACTERISTICS OF BACKLIGHT
BRIGHTNESS CHANGED
80.0 (MIN) , (100) (TYP) → 15 (MIN) , 26 (TYP)</td></tr>
<tr><td></td><td>7B64PS 2709-
LMG7525RPFF-2
PAGE 9-1/2</td><td>9.1 DIMENSIONAL OUTLINE
DOT & VIEWING AREA MEASUREMENT
CHANGED
(6.815) → 6.815 ± 0.3
4.8 ± 0.3 → (4.8)
(14.065) → 14.065 ± 0.3
12.3 ± 0.3 → (12.3)</td></tr>
<tr><td>Mar.16.'00</td><td>7B64PS 2701-
LMG7525RPFF-3
PAGE 1-1/1</td><td>ADD : * THE PRODUCT IS INHIBITED TO APPLY
IN ANY LIFE SUPPORT INSTRUMENT.</td></tr>
<tr><td></td><td>7B64PS 2704-
LMG7525RPFF-3
PAGE 4-1/1</td><td>CHANGE : 4.2 ENVIRONMENTAL ABSOLUTE
MAXIMUM RATINGS.
<table><tr><th rowspan="2">ITEM</th><th colspan="2">OPERATING</th><th rowspan="2">→</th><th colspan="2">OPERATING</th></tr><tr><th>MIN</th><th>MAX</th><th>MIN</th><th>MAX</th></tr><tr><td>AMBIENT TEMPERATURE</td><td>0°C</td><td>40°C</td><td>-10°C</td><td>40°C</td></tr></table></td></tr>
</table>

RECORD OF REVISION

<table>
<tr><th>DATE</th><th>SHEET No.</th><th>SUMMARY</th></tr>
<tr><td rowspan="3">May.28,'07</td><td>7B63PS 2709-LMG7525RPFF-4
PAGE 9-1/3</td><td>9.1 DIMENSIONAL OUTLINE
Changed :
CN1 : Mitsumi M63M83 – 04 → JAE IL-G-4S-S3C2-SA</td></tr>
<tr><td>7B64PS 2709-LMG7525RPFF-4
PAGE 9-3/3</td><td>9.3 Internal Pin Connection
Changed :
CFL I / F : Mitsumi M63M83 – 04 → JAE IL-G-4S-S3C2-SA</td></tr>
<tr><td>7B64PS 2712-LMG7525RPFF-4
PAGE 12-1/1</td><td>12. DESIGNATION OF LOT MARK
Added
<table>
<tr><th>REV No.</th><th>ITEM</th><th>LOT No.</th></tr>
<tr><td>A</td><td>CCFL tube diameter
(ϕ2.6 →ϕ 2.4)</td><td>-</td></tr>
<tr><td>B</td><td>CFL I/F Connector :
Mitsumi M63M83-04 →
JAE IL-G-4S-S3C2-SA</td><td>7102T</td></tr>
</table>
</td></tr>
</table>

3. MECHANICAL DATA

(1)	PART NAME	LMG7525RPFF
(2)	MODULE SIZE	129.6 (W)mm×174.0 (H)mm×7.5 (D)mm
(3)	EFFECTIVE DISPLAY AREA	100.0min×75.5min
(4)	DOT SIZE	0.285 (W)mm×0.285 (H)mm
(5)	DOT PITCH	0.3 (W)mm×0.3 (H)mm
(6)	NUMBER OF DOTS	320 (W) ×240 (H)DOTS
(7)	DUTY	1/240
(8)	LCD	FILM TYPE BLACK/WHITE (NEGATIVE TYPE) THE UPPER POLARIZER IS ANTI-GLARE TYPE. THE BOTTOM POLARIZER IS TRANSFLECTIIVE TYPE.
(9)	VIEWING DIRECTION	6 O'CLOCK
(10)	BACK LIGHT	COLD CATHODE FLUORESCENT LAMP
(11)	WEIGHT	110g

4. ABSOLUTE MAXIMUM RATINGS

4.1 ELECTRICAL ABSOLUTE MAXIMUM RATINGS. VSS=0V:STANDARD

ITEM	SYMBOL	MIN.	MAX.	UNIT	COMMENT
POWER SUPPLY FOR LOGIC	VDD-VSS	0	6.5	V	
POWER SUPPLY FOR LC DRIVE	VDD-VEE	0	27.5	V	
INPUT VOLTAGE	Vi	-0.3	VDD+0.3	V	NOTE 1
INPUT CURRENT	Ii	0	1	A	

NOTE 1 :$\overline{\text{DISP.OFF}}$,FRAME,LOAD,CP,UD0~UD3,LD0~LD3.

NOTE 2 :.MAKE CERTAINS YOU ARE GROUNDED WHEN HANDLING LCM.

4.2 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS.

ITEM	OPERATING		STORAGE		COMMENT
	MIN.	MAX.	MIN.	MAX.	
AMBIENT TEMPERATURE	-10°C NOTE 6	45°C	-20°C	60°C	NOTE 2,3
HUMIDITY	NOTE 1		NOTE 1		WITHOUT CONDENSATION
VIBRATION	-	2.45m/s^2 (0.25G)	-	11.76m/s^2 (1.2G) NOTE 5	NOTE 4
SHOCK	-	29.4m/s^2 (3G)	-	490m/s^2 (50G)	XYZ DIRECTIONS NOTE 5
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 -25°C-------< 48H,AT 60°C-------< 168HRS.

NOTE 3 :BACKGROUND COLOR CHANGES SLIGHTLY DEPENDING ON AMBIENT TEMPERATURE. THIS PHENOMENON IS REVERSIBLE.

NOTE 4 :5Hz~500Hz (EXCEPT RESONANCE FREQUENCY , X/Y/Z EACH DIRECTION WITHIN 1 HOUR).

NOTE 5 :THIS MODULE SHOULD BE OPERATED NORMALLY AFTER FINISH THE TEST.

NOTE 6 :HIGHER STARTING VOLTAGE OF CFL AND HIGHER LCD DRIVING VOLTAGE ARE NEEDED WHILE OPERATING AT 0°C. THE LIFE TIME OF CFL WILL BE REDUCED WHILE OPERATING AT 0°C. NEED TO MAKE SURE OF VALUE OF IL AND CHARACTERISTICS OF INVERTER. ALSO THE RESPONSE TIME AT 0℃ WILL BE SLOWER.

5. ELECTRICAL CHARACTERISTICS OF LCM

5.1 ELECTRICAL CHARACTERISTICS

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
POWER SUPPLY VOLTAGE FOR LOGIC	VDD-VSS	-	3.0	5.0	5.25	V
POWER SUPPLY VOLTAGE FOR LC DRIVING	VEE-VSS		-	-22.0		V
INPUT VOLTAE NOTE 1	VI	H LEVEL	0.8VDD	-	VDD	V
		L LEVEL	0	-	0.2VDD	V
POWER SUPPLY CIRCUIT FOR LOGIC CURRENT NOTE 2	IDD	VDD-VSS=5.0V VDD-VSS=-22.0V	-	8.0	-	mA
POWER SUPPLY CIRCUIT FOR LC DRIVING NOTE 2	IEE	VDD-VSS=3.30V VDD-VSS=5.0V	-	6.0	-	mA
RECOMMENDED LC DRIVING VOLTAGE NOTE 3	VDD-VEE	Ta= 0°C , ϕ=10°	-	24.8	-	V
		Ta= 25°C , ϕ=10°		23.8	-	V
		Ta=45°C , ϕ=10°	-	23.0	-	V
FRAME FREQUENCY NOTE4	fFRAME	-	70	-	(140)	Hz

NOTE 1 :$\overline{\text{DISP.OFF}}$,FRAME,LOAD,CP,D0~D3.

NOTE 2 :fFRAME=75Hz, D0~D3=0,1,0,1,....
VDD-VEE=23.8V,Ta=25°C

NOTE 3 :RECOMMENDED LC DRIVING VOLTAGE FLUCTUATES ABOUT +/-1.0V BY EACH MODULE.
TEST PATTERN IS ALL "Q" .

NOTE 4 :NEED TO MAKE SURE OF FLICKRING AND RIPPLING OF DISPLAY WHEN SETTING THE FRAME FREQUENCY IN YOUR SET.

5.2 ELECTRICAL CHARACTERISTICS OF BACKLIGHT

(LCM, BACKLIGHT ON, Ta=25°C)

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
LAMP VOLTAGE	VL	-	60.0	-	V	Ta=25°C
FREQUENCY	fL	30	-	-	kHz	Ta=25°C
LAMP CURRENT	IL	4	5	6	mA	Ta=25°C
STARTING DISCHARGE VOLTAGE	VS NOTE 2	(1000)	-	-	V	Ta=25°C

NOTE 1 : PLEASE CERTAINLY INFORM HITACHI BEFORE DESIGNING LAMP DRIVE CIRCUIT ACCORDING TO THE ABOVE SPECIFICATIONS.

NOTE 2 : STARTING DISCHARGE VOLTAGE IS INCREASED WHEN LCM IS . PLEASE CHECK THE CHARACTERISTICS OF INVERTER BEFORE APPLING TO YOUR SET.

NOTE 3 : AVERAGE LIFE TIME OF CFL WILL BE DECREASED WHEN LCM IS OPERATING AT LOWER TEMPERATURE.

NOTE 4 : UNDER LOWER DRIVING FREQUENCY OF THE INVERTER , A CERTAIN BACKLIGHT (FROM CFL & CFL REFLECTION SHEET) MAY GENERATE SOUND NOISE. BEFORE DESIGNING THE INVERTER , PLEASE CONSIDER BACKLIGHT SYSTEM.

6. OPTICAL CHARACTERISTICS

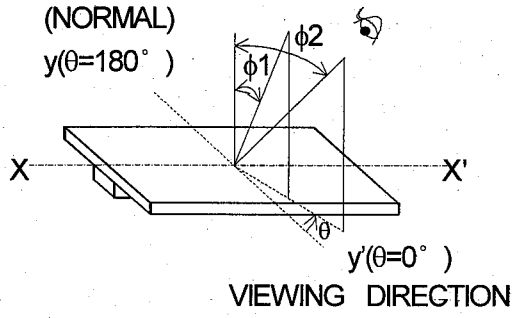
6.1 OPTICAL CHARACTERISTICS

Ta=25°C (BACKLIGHT ON)

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	NOTE
VIEWING AREA	$\phi 2-\phi 1$	K>=2.0	-	40	-	deg	1,2
CONTRAST RATIO	K	$\phi=0^\circ$ $\theta=0^\circ$	-	5	-	-	3
RESPONSE TIME (RISE)	tr	$\phi=0^\circ$ $\theta=0^\circ$	-	250	-	ms	4
RESPONSE TIME (FALL)	tf	$\phi=0^\circ$ $\theta=0^\circ$	-	350	-	ms	4

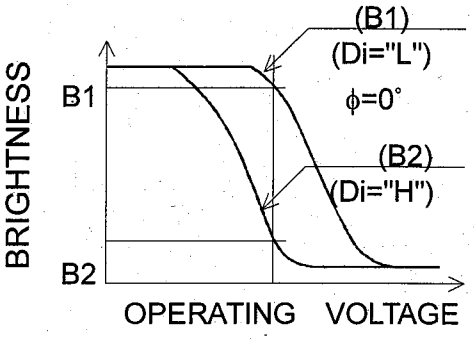
(MEASURE CONDITION BY HITACHI)

NOTE 1.DEFINITION OF θ AND ϕ

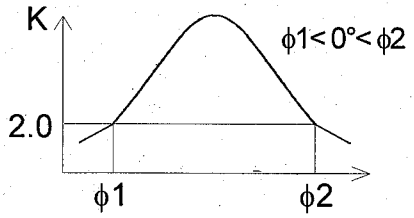


NOTE 3.DEFINITION OF CONTRAST "K"

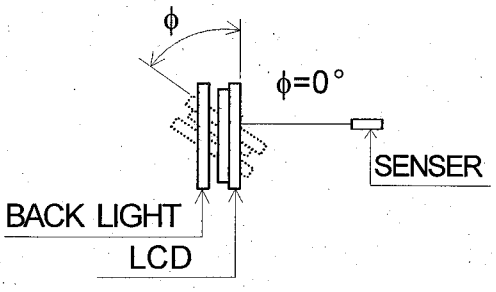
$$K = \frac{\text{BRIGHTNESS ON NON-SELECTED DOT (B2)}}{\text{BRIGHTNESS ON NON-SELECTED DOT (B1)}}$$



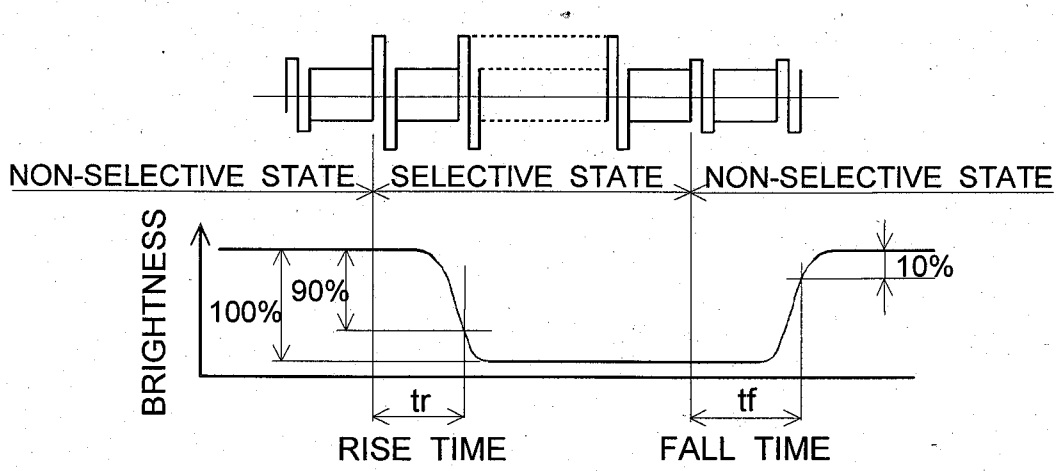
NOTE 2.DEFINITION OF VIEWING ANGLE $\phi 1$ AND $\phi 2$



CONTRAST RATIO K VS VIEWING ANGLE ϕ



NOTE 4.DEFINITION OF OPTICAL RESPONSE



6.2 OPTCICAL CHARACTERISTICS OF BACKLIGHT

(LCM, BACKLIGHT ON, Ta=25°C)

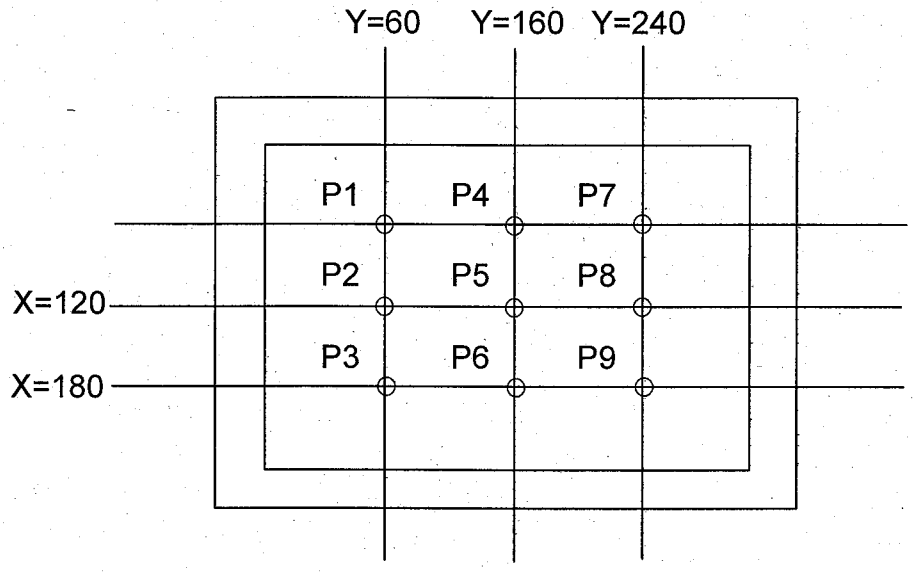
ITEM	MIN.	TYP.	MAX.	UNIT	NOTE
BRIGHTNESS	15	25	-	cd/m^2	IL=5mA NOTE 1,2
RISE TIME	-	5	-	MINUTE	IL=5mA NOTE 1,2
BRIGHTNESS UNIFORMITY	-	-	±30	%	UNDERMENTIONED NOTE 1,3

CFL INITIAL , Ta=25°C , VDD-VEE=23.8V
DISPLAY DATA SHOULD BE ALL "ON".

NOTE 1 MEASUREMENT AFTER 10 MINUTES OF CFL OPERATING.

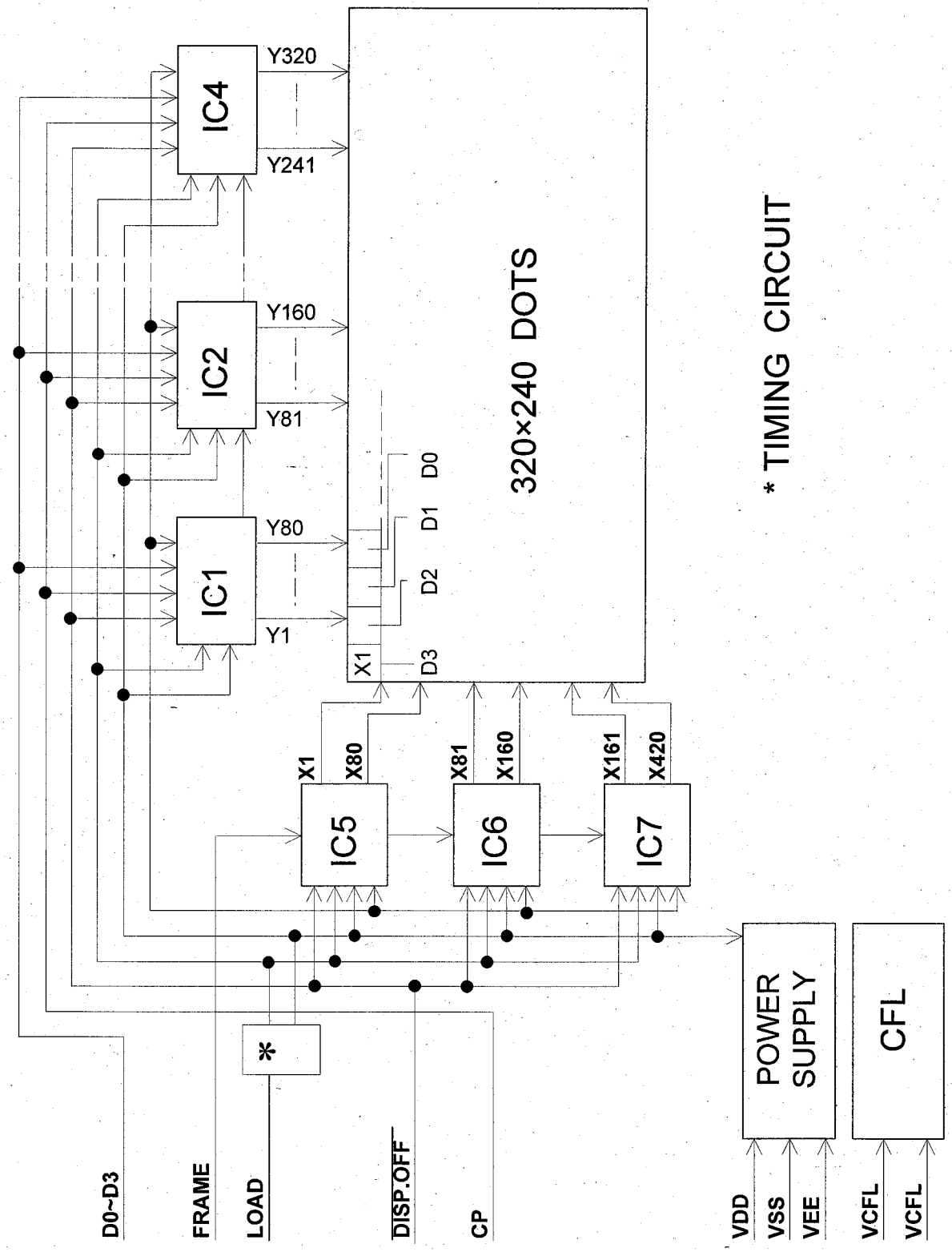
NOTE 2 BRIGHTNESS CONTROL : 100%

NOTE 3 MEASUREMENT OF THE FOLLOWING 9 PLACES ON THE DISPLAY.
DEFINITION OF THE BRIGHTNESS TOLERANCE.



$$\left(\frac{\text{MAX OR MIN BRIGHTNESS - AVERAGE BRIGHTNESS}}{\text{AVERAGE BRIGHTNESS}}\right) \times 100\%$$

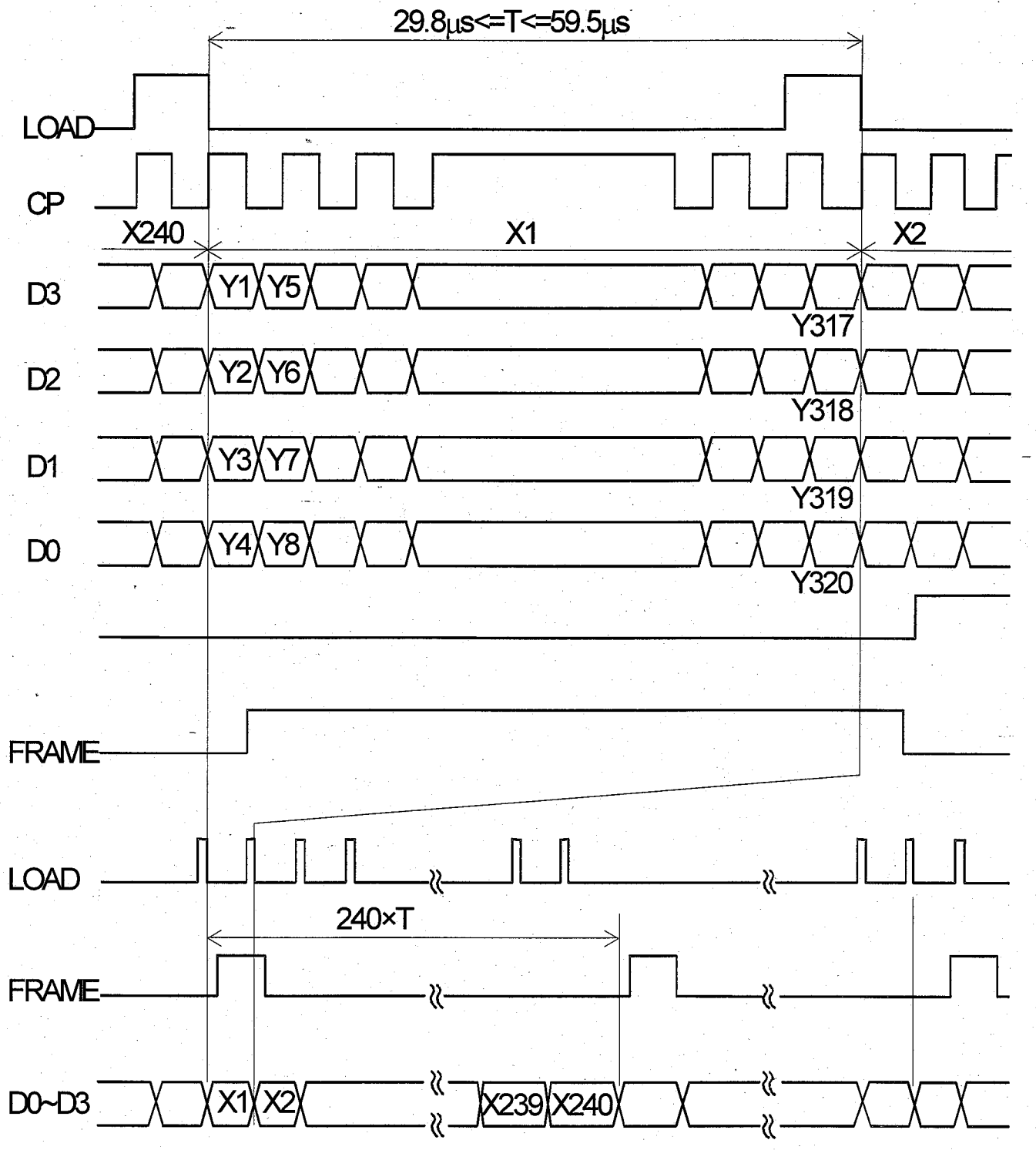
7. BLOCK DIAGRAM



KAOHSIUNG HITACHI ELECTRONICS CO.,LTD.	DATE	May.28,'07	Sh. No.	7B64PS 2706-LMG7525RPFF -4	PAG	7-1/1

8. INTERFACE TIMING CHART

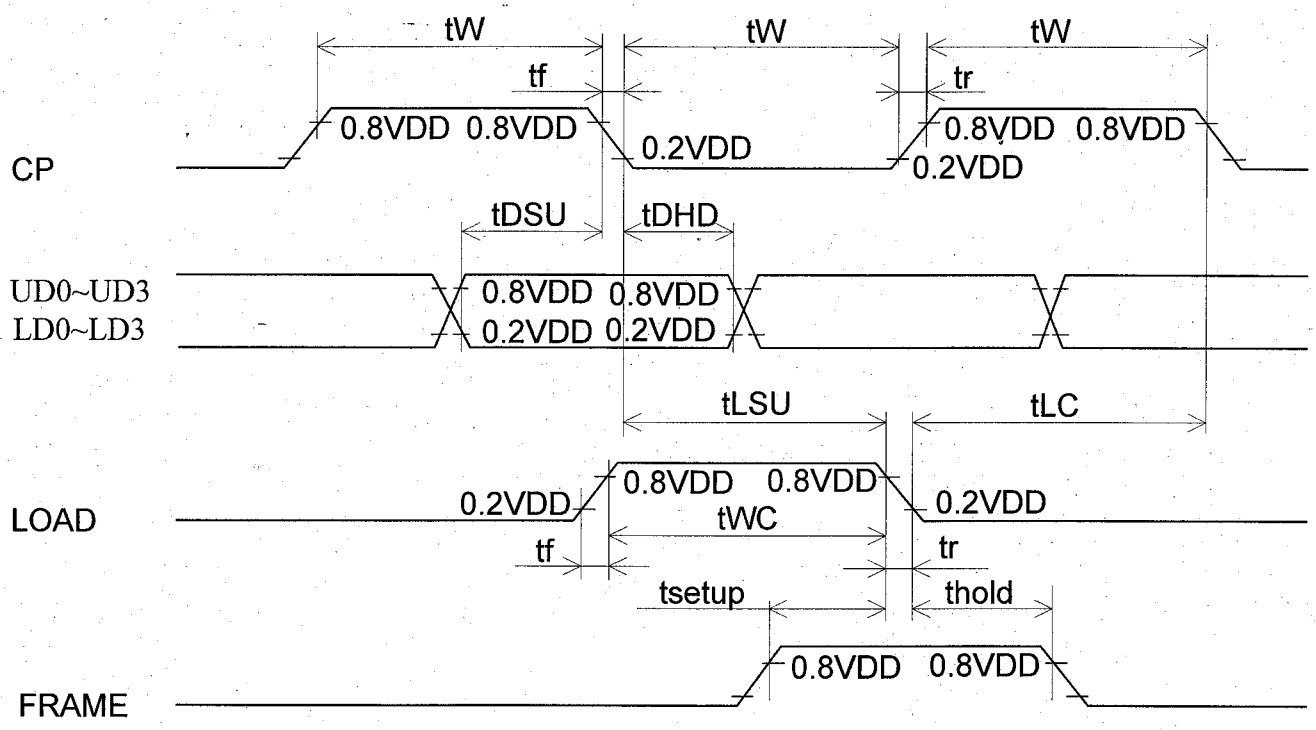
8.1 TIMING CHART



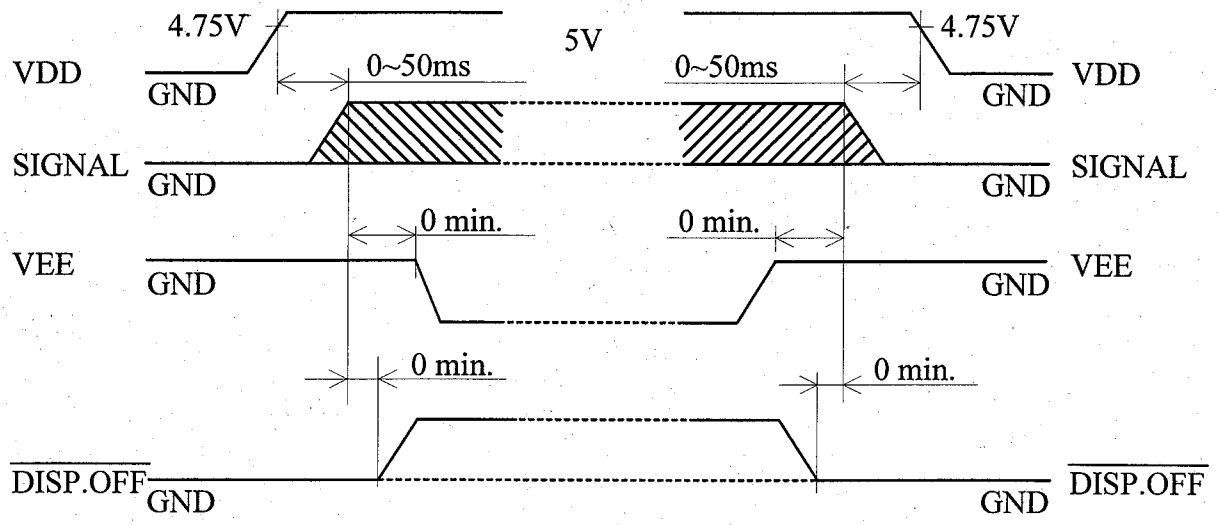
8.2 TIMING CHARACTERISTICS

0°C<=Ta<=40°C
VDD=35V+/-5%

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
CLOCK FREQUENCY	FCP	-	-	6.5	MHz
CLOCK PULSE WIDTH	Tw	63	-	-	ns
CLOCK RISE , FALL TIME	tr,tf	-	-	20	ns
DATA SET UP TIME	TDSU	50	-	-	ns
DATA HOLD TIME	TDHD	50	-	-	ns
LOAD SET UP TIME	TLSU	80	-	-	ns
LOAD→CLOCK TIME	TLC	80	-	-	ns
"FRAME" SET UP TIME	TSETUP	100	-	-	ns
"FRAME" HOLD TIME	THOLD	100	-	-	ns
"LOAD" PULSE WIDTH	TWC	125	-	-	ns



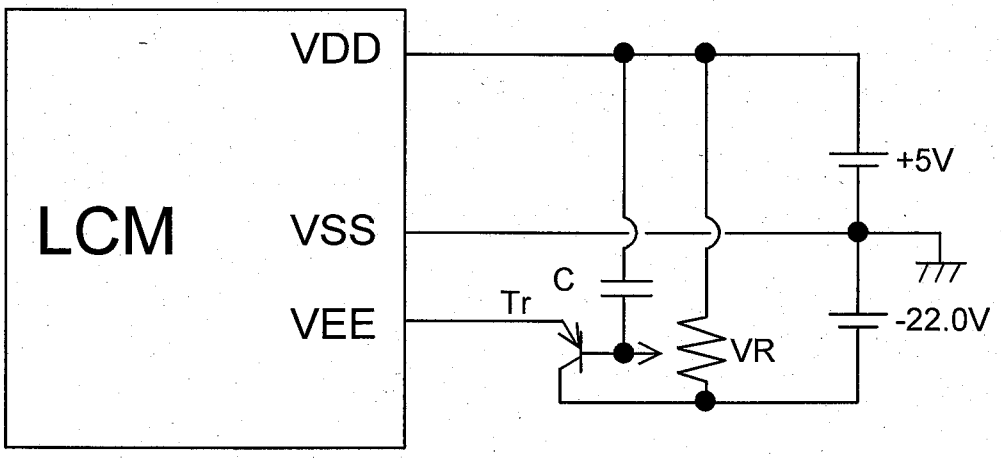
8.3 TIMING OF POWER SUPPLY AND INTERFACE SIGNAL



POWER ON POWER OFF

THE MISSING PIXELS MAY OCCUR WHEN THE LCM IS DRIVEN EXCEPT ABOVE POWER INTERFACE TIMING SEQUENCE.

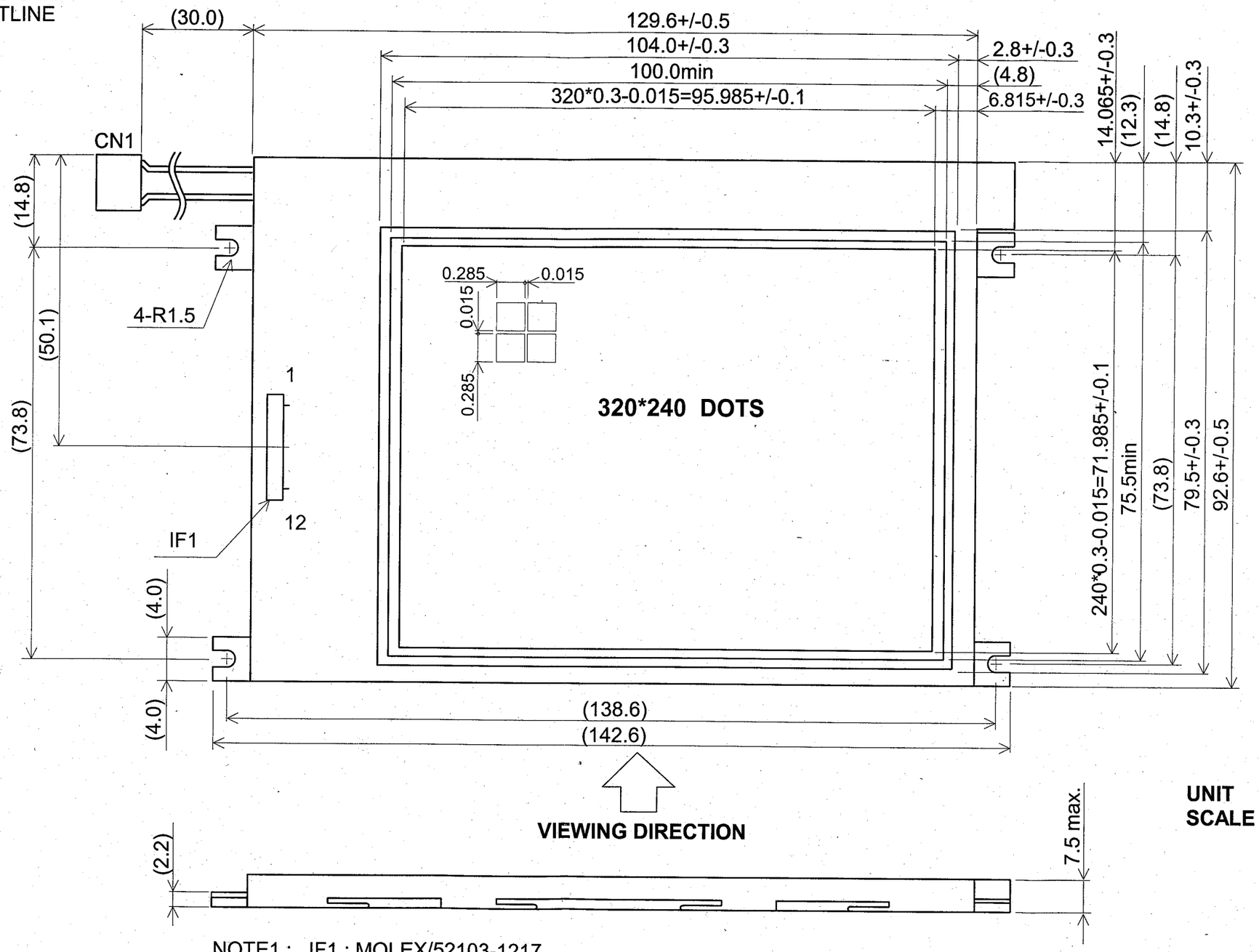
8.4 POWER SUPPLY FOR LCM



C : 3.3μF(ALUMINIUM ELECTROLYTIC CAPACITOR)
VR : 10~20KΩ
Tr : 2SA673APKC (HFE=100,IC=500mA)OR EQUIVALENT Tr.

9. DIMENSIONAL OUTLINE

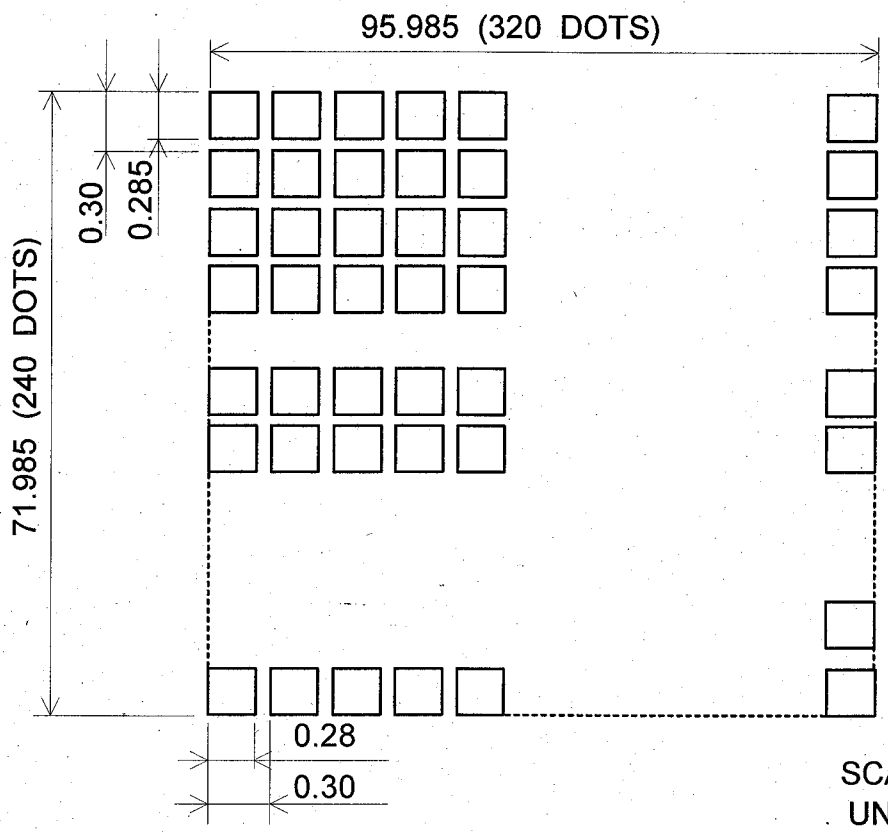
9.1 DIMENSIONAL OUTLINE



UNIT : mm
SCALE : NTS

NOTE1 : IF1 : MOLEX/52103-1217
CN1 : JAE IL-G-4S-S3C2-SA
NOTE2 : THE COSMETIC INSPECTION SHOULD BE NEGLECTED ON LCD WITH PROTECTIVE FILM.
NOTE3 : THE PROTECTIVE FILM SHOULD BE TAKEN OFF BEFORE USE.

9.2 DISPLAY PATTERN



SCALE : NTS
UNIT : mm
MEASURMENT TOLERANCE : +/-0.1

9.3 INTERNAL PIN CONNECTION

IF/F1 : MOLEX/52103-1217

(SUITABLE FPC : 1.0PITCH , 12PIN , 0.3^{t})

INTERFACE		PIN NO.	SIGNAL	LEVEL	FUNCTION
LCM	I/F1	1	FRAME	H	FIRST LINE MARKER
		2	LOAD	H→L	DATA LATCH
		3	CP	H→L	DATA SHIFT
		4	$\overline{\text{DISP.OFF}}$	H/L	H : ON / L : OFF
		5	VDD	-	POWER SUPPLY FOR LOGIC
		6	VSS	-	GND
		7	VEE	-	POWER SUPPLY FOR LC
		8	UD0	H/L	DISPLAY DATA (UPPER HALF)
		9	UD1		
		10	UD2		
		11	UD3		
		12	LD0	H/L	DISPLAY DATA (LOWER HALF)
		13	LD1		
		14	LD2		
		15	LD3		

I/F1 : MOLEX / 53261-1510

(SUITABLE CONNECTOR : MOLEX / 51021-1500)

INTERFACE		PIN NO.	SIGNAL	LEVEL	FUNCTION
CFL	CFL I/F	1	GND	-	CFL GND
		2	N.C	-	-
		3	N.C	-	-
		4	H.V	-	POWER SUPPLY FOR CFL

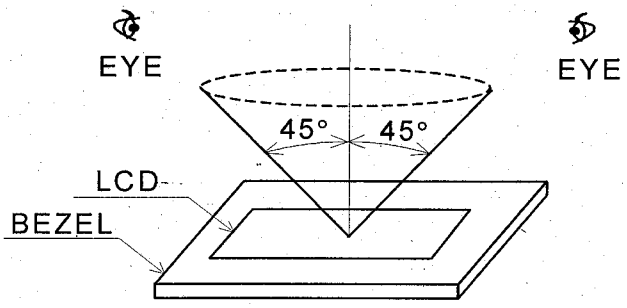
CFL I/F1 : JAE IL-G-4S-S3C2-SA

10. APPEARANCE STANDARD

10.1 APPEARANCE INSPECTION CONDITION

VISUAL INSPECTION SHOULD BE DONE UNDER THE FOLLOWING CONDITION.

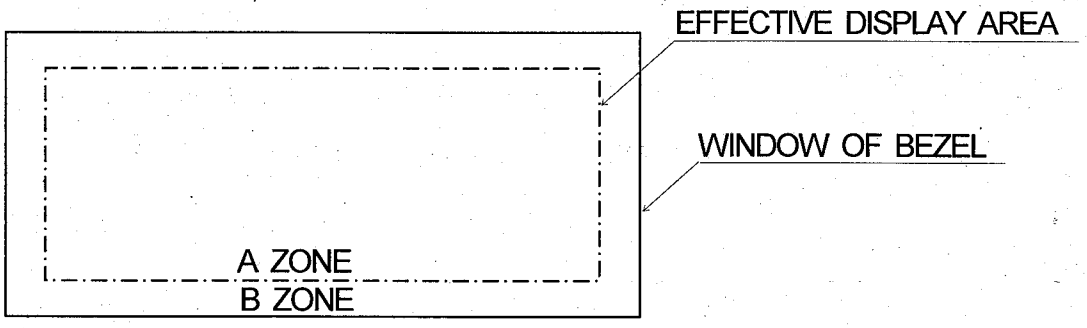
(1) IN THE DARK ROOM
(2) WITH CFL PANEL LIGHTED WITH PRESCRIBED INVERTER CIRCUIT.
(3) WITH EYES 25cm DISTANCE FROM LCM.
(4) VIEWING ANGLE WITHIN 45 DEGREES FROM THE VERTICAL LINE TO THE CENTER OF LCD.



10.2 DEFINITION OF EACH ZONE

A ZONE : WITHIN THE EFFECTIVE DISPLAY AREA SPECIFIED AT PAGE 9-1/3 OF THIS DOCUMENT.

B ZONE : AREA BETWEEN THE WINDOW OF BEZEL LINE AND THE EFFECTIVE DISPLAY AREA LINE SPECIFIED AT PAGE 9-1/3 OF THIS DOCUMENT.



10.3 APPEARENCE SPECIFICATION

(1) LCD APPEARANCE

*) IF THE PROBLEM OCCURES ABOUT THIS ITEM, THE RESPONSIBLE PERSON OF BOTH PARTY (CUSTOMER AND HITACHI) WILL DISCUSS MORE DETAIL.

No.	ITEM	CRITERIA			A	B
LCD	SCRATCHES	DISTINGUISHED ONE IS NOT ACCEPTABLE (TO BE JUDGED BY HITACHI STANDARD)			*	-
	DENT	SAME AS ABOVE			*	-
	WRINKLES IN POLARIZER	SAME AS ABOVE			*	-
	BUBBLES	AVERAGE DIAMERET D(mm)	MAXIMUM NUMBER ACCEPTABLE		O	-
		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			O	*
		LENGTH L(mm)	WIDTH W(mm)	MAXIMUM NUMBER ACCEPTABLE		
		L<=2.0	W<=0.03	IGNORED		
		L<=3.0	0.03<W<=0.05	6		
		-	0.05<W	NONE		
		ROUND			O	*
		AVERAGE DIAMETER D(mm)	MAXIMUM MUNBER ACCEPTABLE	MINIMUM SPACE		
		D<0.2	IGNORED	-		
		0.2<=D<0.3	6	10 mm		
		0.3<=D<0.4	4	30 mm		
		0.4<=D	NONE	-		
		THE WHOLE NUMBER	FILAMENTOUS + ROUND = 10			
		THOSE WIPED OUT EASILY ARE ACCEPTABLE			O	O
	COLOR TONE	TO BE JUDGED BY HITACHI STANDARD			O	-
	COLOR UNIFORMITY	SAME AS ABOVE			O	-
	PINHOLE	(A+B)/2<=0.15 MAXIMUM NUMBER : IGNORED			O	-
		0.15<(A+B)/2<=0.3 MAXIMUM NUMBER : 10				
		C<=0.03 MAXIMUM NUMBER : IGNORED				

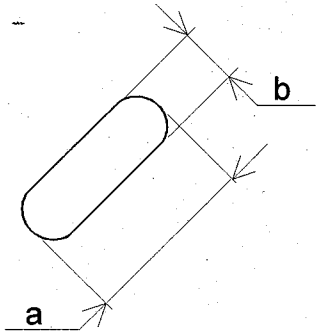
No.	ITEM	CRITERIA				A	B
L C D	CONTRAST IRREGULARITY (SPOT)	AVERAGE DIAMETER D(mm)	CONTRAST	MAXIMUM NUMBER ACCEPTABLE	MINIMUM SPACE	O	-
		D<=0.3	TO BE JUDGED BY HITACHI STANDARD	IGNORED	-		
		0.3 <D<=0.45		15	20mm		
		0.45<D<=0.6		5	20mm		
		0.6 <D<=0.8		3	50mm		
		0.8 <D		NONE	-		
	CONTRAST IRREGULARITY (LINE) (A PAIR OF SCRATCH)	WIDTH W(mm)	LENGTH L(mm)	MAXIMUM NUMBER ACCEPTABLE	MINIMUM SPACE	O	-
		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 STANDRD					

(2) CFL BACKLIGHT APPEARANCE

No.	ITEM	CRITERIA			A	B
CFL BACKLIGHT	DARK SPOTS WHITE SPOT FOREIGN MATERIALS (SPOT)	AVERAGE DIAMERTER D(mm)		MAXIMUM NUMBER ACCEPTABLE	O	-
		D<=0.4		IGNORED		
		0 .4<D		NONE		
	FOREIGN MATERIALS (LINE)	WIDTH W(mm)	LENGTH L(mm)	MAXIMUM NUMBER ACCEPTABLE	O	-
		W<=0.2	L<=2.5	1		
			2.5<L	NONE		
		0.2<W	-	NONE		
	SCRATCHES	WIDTH W(mm)	LENGTH L(mm)	MAXIMUM NUMBER ACCEPTABLE	O	-
		W<=0.1	-	IGNORED		
		0.1<W<=0.2	L<=11.0	1		
			11.0<L	NONE		
		0.2<W	-	NONE		

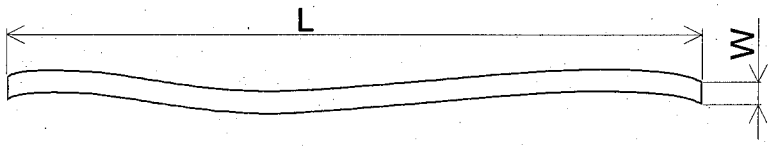
NOTE

(1) DEFINITION OF AVERAGE DIAMETER D

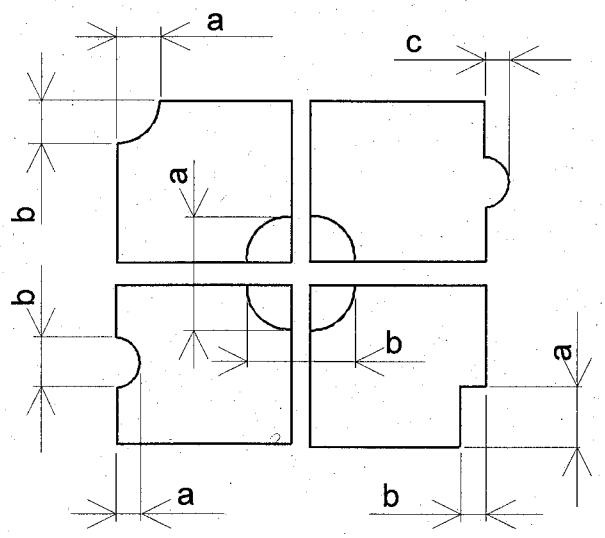


$$D=\frac{a+b}{2}$$

(2) DEFINITION OF LENGTH L AND WIDTH W



(3) DEFINITION OF PINHOLE



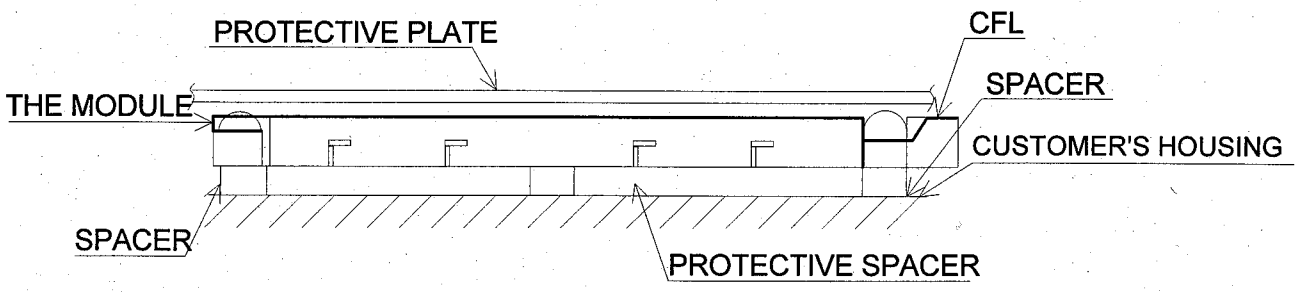
C : SALIENCE

KAOHSIUNG HITACHI ELECTRONICS CO.,LTD.	DATE	May.28,'07	Sh. No.	7B64PS 2710-LMG7525RPFF -4	PAG	10-5/5

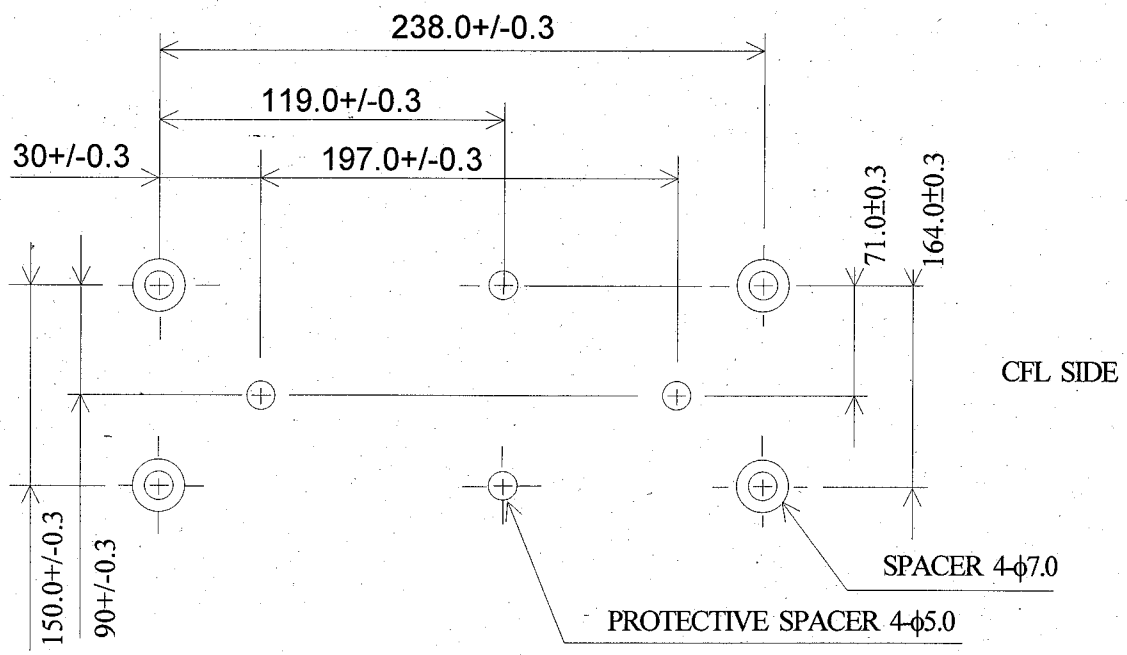
11. PRECAUTION IN DESIGN

11.1 MOUNTING METHOD

SINCE THE MODULE IS SO CONSTRUCTED AS TO BE FIXED BY UTILIZING FITTING HOLES IN THE MODULE AS SHOWN BELOW, IT IS NECESSARY TO TAKE CONSIDERATION THE FOLLWING ITEMS ON ATTACHMENT TO A FRAME.



EXAMPLE OF MOUNTING



LOCATION OF SPACERS

UNIT:mm
SCALE:NTS

(1) USE OF PROTECTIVE PLATE, MADE OF AN ACRYLIC PLATE, ETC, IN ORDER TO PROTECT A POLARIZER AND LC CELL.

(2) TO PREVENT THE MODULE COVER FROM BEING PRESSED, THE SPACERS BETWEEN THE MODULE AND THE FITTING PLATES SHOULD BE LONGER THAN 0.5mm.

(3) WE RECOMMEND YOU TO USE PROTECTIVE SPACER AS FIGURE FOR PROTECTING THE MODULE FROM ANY KIND OF SHOCK TO YOUR SET.

11.2 LC DRIVING VOLTAGE (VEE) AND VIEWING ANGLE RANGE.

SETTTING VEE OUT OF THE RECOMMENDED CONDITION WILL BE A CAUSE FOR A CHANGE OF VIEWING ANGLE RANGE.

11.3 CAUTION AGAINST STATIC CHARGE

AS THIS MODULE IS PROVIDED WITH C-MOS LSI, THE CARE TO TAKE SUCH A PRECAUTION AS TO GROUNDING THE OPERATOR'S BODY IS REQUIRED WHEN HANDLING IT.

11.4 POWER ON SEQUENCE

INPUT SIGNALS SHOULD NOT BE APPLIED TO LCD MODULE BEFORE POWER SUPPLY VOLTAGE IS APPLIED AND REACHES TO SPECIFIED VOLTAGE (5+/-0.25V).
IF ABOVE SEQUENCE IS NOT KEPT, C-MOS LSIS OF LCD MODULES MAY BE DAMAGED DUE TO LATCH UP PROBLEM.

11.5 PACKAGING

(1) NO. LEAVING PRODUCTS IS PREFERABLE IN THE PLACE OF HIGH HUMIDITY FOR A LONG PERIOD OF TIME. FOR THEIR STORAGE IN THE PLACE WHERE TEMPERATURE IS 35°C OR HIGHER, SPECIAL CARE TO PREVENT THEM FROM HIGH HUMIDITY IS REQUIRED. A COMBINATION OF HIGH TEMPERATURE AND HIGH HUMIDITY MAY CAUSE THEM POLARIZATION DEGRADATION AS WELL AS BUBBLE GENERATION AND POLARIZER PEEL-OFF. PLEASE KEEP THE TEMPERATURE AND HUMIDITY WITHIN THE SPECIFIED RANGE FOR USE AND STORING.

(2) SINCE UPPER POLARIZERS AND LOWER ALUMINUM PLATES TEND TO BE EASILY DAMAGED, THEY SHOULD BE HANDLED WITH FULL CARE SO AS NOT TO GET THEM TOUCHED, PUSHED OR RUBBED BY A PIECE OF GLASS, TWEEZERS AND ANYTHING ELSE WHICH ARE HARDER THAN A PENCIL LEAD 3H.

(3) AS THE ADHESIVES USED FOR ADHERING UPPER/LOWER POLARIZERS AND ALUMINUM PLATES ARE MADE OF ORGANIC SUBSTANCES WHICH WILL BE DETERIORATED BY A CHEMICAL REACTION WITH SUCH CHEMICALS AS ACETONE, TULUENE ETHANOLE AND ISOPROPYLALCOHOL. THE FOLLOWING SOLVENTS ARE RECOMMENDED FOR USE:

NORMAL HEXANE

PLEASE CONTACT US WHEN IT IS NECESSARY FOR YOU TO USE CHEMICALS OTHER THAN THE ABOVE.

(4) LIGHTLY WIPE TO CLEAN THE DIRTY SURFACE WITH ABSORBENT COTTON WASTE OR OTHER SOFT MATERIAL LIKE CHAMOIS, SOAKED IN THE CHEMICALS RECOMMENDED WITHOUT SCRUBBING IT HARDLY. 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.

(5) IMMEDIATELY WIPE OFF ASLIVA OR WATER DROP ATTACHED ON THE DISPLAY AREA BECAUSE ITS LONG PERIOD ADHERANCE MAY CAUSE DEFORMATION OR FADED COLOR ON THE SPOT.

(6) FOGY DEW DEPOSITED ON THE SURFACE AND CONTACT TERMINALS DUE TO COLDNESS WILL BE A CAUSE FOR POLARIZER DAMAGE, STAIN AND DIRT ON PRODUCT. WHEN NECESSARY TO TAKE OUT THE PRODUCTS FROM SOME PLACE AT LOW TEMPERATURE FOR TEST, ETC. IT IS REQUIRED FOR THEM TO BE WARMED UP IN A CONTAINER ONCE AT THE TEMPERATURE HIGHER THAN THAT OF ROOM.

(7) TOUCHING THE DISPLAY AREA AND CONTACT TERMINALS WITH BARE HANDS AND CONTAMINATING THEM ARE PROHIBITED, BECAUSE THE STAIN ON THE DISPLAY AREA AND POOR INSULATION BETWEEN TERMINALS ARE OFTEN CAUSED BY BEING TOUCHED BY BARE HANDS.
(THERE ARE SOME COSMETICS DETRIMENTAL TO POLARIZERS.)

(8) IN GENERAL THE QUALITY OF GLASS IS FRAGILE SO THAT IT TENDS TO BE CRACKED OR CHIPPED IN HANDLING, SPECIALLY ON ITS PERIPHERY PLEASE BE CAREFUL NOT GIVE IT SHARP SHOCK CAUSED BY DROPPING DOWN, ECT.

11.6 CAUTION FOR OPERATION

(1) IT IS AN INDISPENSABLE CONDITION TO DRIVE LCD'S WITHIN THE SPECIFIED VOLTAGE LIMIT SINCE THE HIGHER VOLTAGE THAN THE LIMIT CAUSES THE SHORTER LCD LIFE. AN ELECTROCHEMICAL REACTION DUE TO DIRECT CURRENT CAUSES LCD'S UNDESIRABLE DETERIORATION, SO THAT THE USE OF DIRECT CURRENT DRIVER SHOULD BE AVOIDED.

(2) 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 BULE COLOR IN THEM. .HOWEVER THOSE PHENOMENA DO NOT MEAN INPEDIMENT OR OUT OF ORDER WITH LCD'S WHICH WILL COME BACK IN THE SPECIFIED OPERATING TEMPERATURE RANGE.

(3) IF THE DISPLAY AREA IS PUSHED HARD DURING OPERATION, SOME FONT WILL BE ABNORMALLY DISPLAYED BUT IT RESUMES NORMAL CONDITION AFTER TURNING OFF ONCE.

(4) A SLIGHT DEW DEPOSITING ON TERMINALS IS A CAUSE FOR ELECTROCHEMICAL REACTION RESULTING IN TERMINAL OPEN CIRCUIT. USAGE UNDER THE RELATIVE CONDITION OF 40°C 50%RH LESS IS REQUIRED.

11.7 STORAGE

IN CASE OF STORING FOR A LONG PERIOD OF TIME (FOR INSTANCE, FOR YEARS) FOR THE PURPOSE OF REPLACEMENT USE, THE FOLLOWING WAYS ARE RECOMMENDED.

(1) STORAGE IN A POLYETHYLENE BAG WITH THE OPENING SEALED SO AS NOT TO ENTER FRESH AIR OUTSIDE IN IT, AND WITH NO DESICCANT.

(2) THE PLACING IN A DARK ROOM WHERE NEITHER EXPOSURE TO DIRECT SUNLIGHT NOR LIGHT IS, KEEPING TEMPERATURE IN THE RANGE FROM 0°C TO 35°C.

(3) STORING WITH NO TOUCH ON POLARIZER SURFACE BY ANYTHING ELSE.
(IT IS RECOMMENDED TO STONE THEM AS THEY HAVE BEEN CONTAINED IN THE INNER CONTAINER AT THE TIME OF DELIVERY FROM US.)

11.8 SAFETY

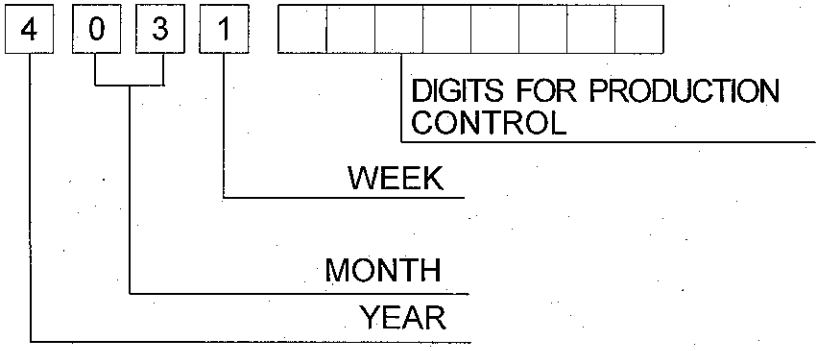
(1) IT IS RECOMMENDABLE TO CRASH DAMAGED OR UNNECESSARY LCD'S INTO PIECES AND WASH OFF LIQUID CRYSTAL BY EITHER OF SOLVENTS SUCH AS ACETONE AND ETHANOL, WHICH SHOUD BE BURNED UP LATER.

(2) WHEN ANY LIQUID LEAKED OUT OF A DAMAGED GLASS GALL COMES IN CONTACT WITH YOUR HANDS, PLEASE WASH IT OFF WELL WITH SOAP AND WATER.

12. DESIGNATION OF LOT MARK

12.1 LOT MARK

LOT MARK IS CONSISTED OF 4 DIGITS FOR PRODUCTION.
LOT AND 8 DIGITS FOR PRODUCTION CONTROL.



YEAR	FIGURE IN LOT MARK
2007	7
2008	8
2009	9
2010	0
2011	1

MONTH	FIGURE IN LOT MARK	MONTH	FIGURE IN LOT MARK
JAN.	01	JULY.	07
FEB.	02	AUG.	08
MAR.	03	SEPT.	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.
A	CCFL tube diameter (ϕ2.6 → ϕ 2.4)	-
B	CFL I/F Connector : Mitsumi M63M83-04 → JAE IL-G-4S-S3C2-SA	7102T

12.3 LOCATION OF LOT MARK

on the back side of LCM

4 0 3 1 * * * * * * * *

13. PRECAUTION FOR USE

(1) A LIMIT SAMPLE SHOULD BE PROVIDED BY THE BOTH PARTIES ON AN OCCASION WHEN THE BOTH PARTIES AGREED ITS NECESSITY. JUDGEMENT BY A LIMIT SAMPLE SHALL TAKE EFFECT AFTER THE LIMIT SAMPLE HAS BEEN EATABLISHED 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 IN CUSTOMER IS REPORTED TO HITACHI, AND SOME PROBLEM IS ARISEN IN THIS SPECIFICATION DUE TO THE CHANGE.
(4) WHEN A NEW PROBLEM IS ARISEN AT THE CUSTOMER'S OPERATING SET FOR SAMPLE EVALUATION IN THE CUSTOMER SITE.

(3) REGARDING THE TREATMENT FOR MAINTENANCE AND REPAIRING, BOTH PARTIES WILL DISSCUSS IT IN SIX MONTHS LATER AFTER LATEST DELIVERY OF THIS PRODUCT.

THE PRECAUTION THAT SHOULD BE OBSERVED WHEN HANDLING LCM HAVE BEEN EXPLAIND ABOVE. IF ANY POINTS ARE UNCLEAR OF IF YOU HAVE ANY REQUESTS, PLEASE CONTACT HITACHI.