

APPLICATIONS

This specification is applied to the following TFT Liquid Crystal Display Module with Back-light unit.

Note : Inverter device for Back-light is not built in so it should be prepared by yourself.

- Type name : TX34D62VC1CAC
- Display Area : H270.3×V202.8 [mm]
- Display Dots : H(1024×3)×V768 [dots]
(Display Pixels) (H1024×V768 pixels)
- Power Supply : 3.3V
- Pixel Pitch : H0.264×V0.264
- Color Pixel Arrangement : R·G·B Vertical Stripe
- Display Mode : Transmissive Mode
Normally White Mode
- Color Number : 262k Colors
- Viewing Angle : 6:00 Direction
- Dimensions Outlines : H296.5×V214.5×t7.0MAX [mm]
- Weight : Approximately 530 [g]
- Interface : LVDS Texas Instrument
SN75LVDS86 Equivalent

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE MAXIMUM RATINGS

ITEM	OPERATING		STORAGE		UNIT	NOTE
	MIN.	MAX.	MIN.	MAX.		
Ambient Temperature	10	40	-20	60	°C	1)
Humidity	2)		2)		%RH	1)
Vibration	-	4.9 (0.5G)	-	19.6 (2G)	m/s ²	3), 5)
Shock	-	29.4(3G)	-	490 (50G)		4), 5)
Corrosive Gas	NOT ACCEPTABLE		NOT ACCEPTABLE		-	
Illuminance of LCD surface	-	50,000	-	50,000	lx	

Note 1) Environmental temperature and humidity of this unit, not of system installed with this unit.

At low temperature the brightness of CFL drop and the life time of CFL become to be short.

- 2) Ambient temp. $T_a \leq 40^\circ\text{C}$: 85%RH MAX. without condensation
 $T_a > 40^\circ\text{C}$: Absolute humidity must be lower than the humidity of 85%RH at 40°C . without condensation

3) 20~50Hz. (Except resonance frequency)

4) 7ms.

5) With mounting protective spacer(ref. page 4-2/2)

1.2 ELECTRICAL ABSOLUTE MAXIMUM RATINGS

(1) TFT LIQUID CRYSTAL DISPLAY MODULE

$V_{SS}=0V$

ITEM	SYMBOL	MIN.	MAX.	UNIT	NOTE
Power Supply Voltage	VDD	0	4.0	V	
Electrostatic Durability	VESD0	±100		V	1), 2)
	VESD1	± 8		kV	1), 3)

Note 1) 200pF-250Ω, 25°C-70%RH.

2) I/F Connector pins are subjected.

3) The Surface of Metal bezel and LCD are subjected.

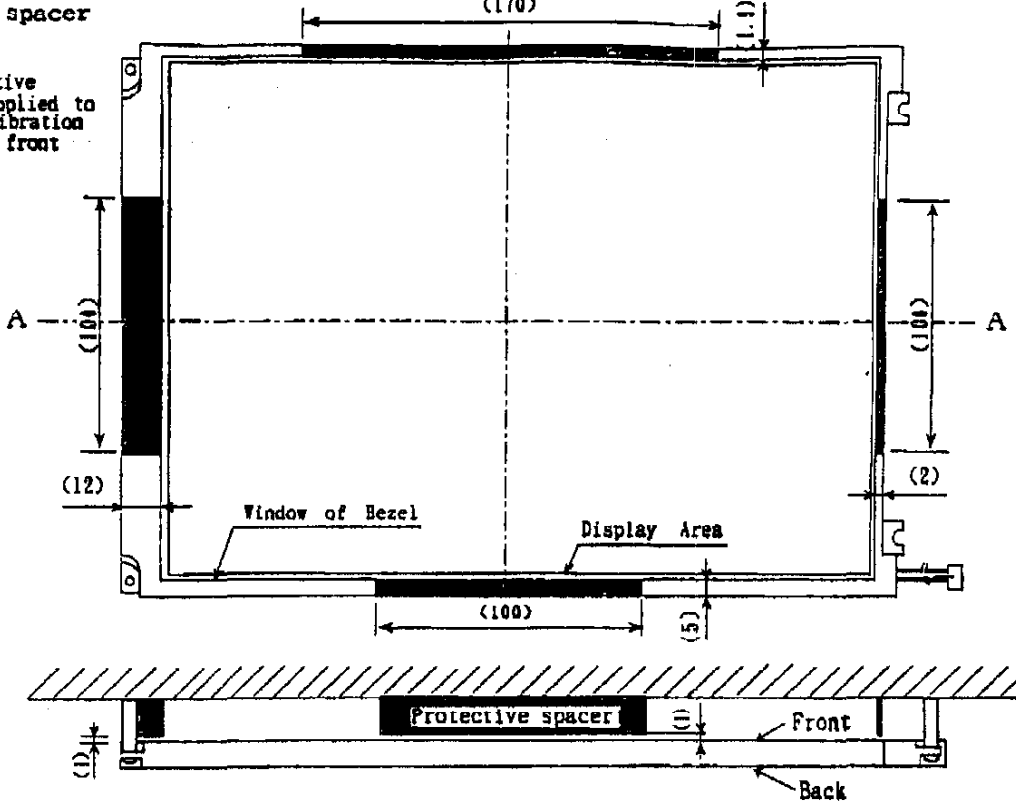
(2) BACK-LIGHT UNIT

$GND=0V$

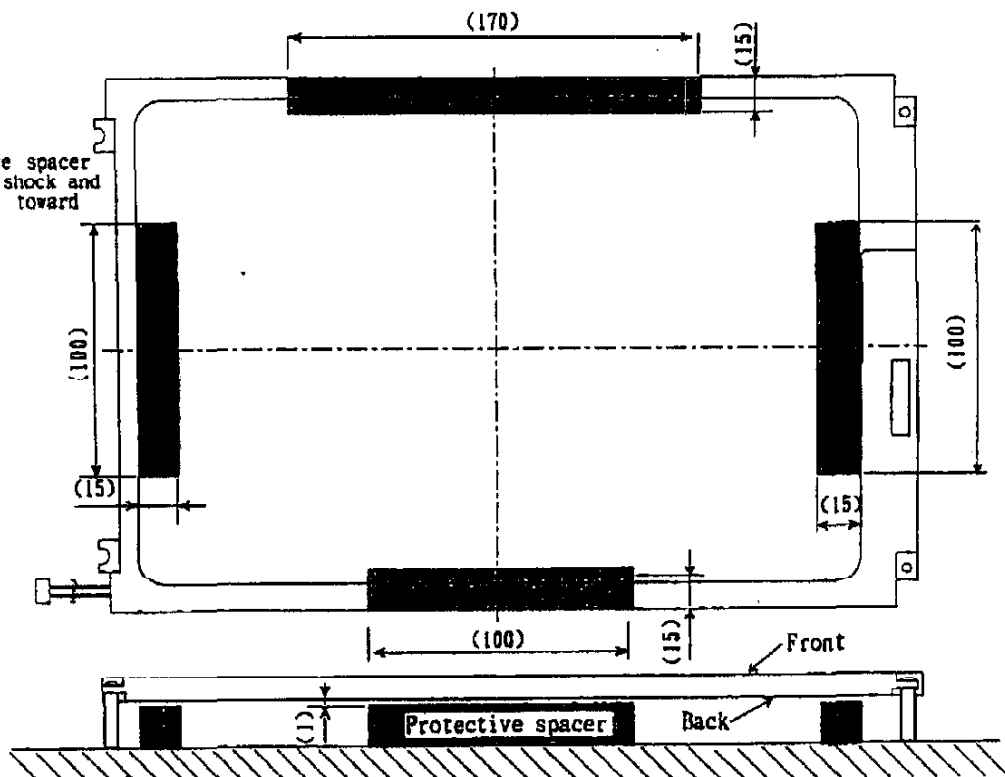
ITEM	SYMBOL	MIN.	MAX.	UNIT
Lamp Current	IL	0	7.5	mA _{rms}
Lamp Voltage	VL	0	(2000)	V _{rms}

Protective spacer

(1) This protective spacer is applied to shock and vibration test toward front surface



(2) This protective spacer is applied to shock and vibration test toward back surface



5. INTERFACE PIN CONNECTION

(1) TFT LIQUID CRYSTAL DISPLAY MODULE

CN1 (JAE FI-SE20P-HF)

Pin No	SYMBOL	FUNCTION	NOTE
1	VDD	Power Supply 3.3V nominal	2)
2	VDD	Power Supply 3.3V nominal	2)
3	VSS	Ground	1)
4	VSS	Ground	1)
5	Rin0-	Receiver Signal(-)	
6	Rin0+	Receiver Signal(+)	
7	VSS	Ground	1)
8	Rin1-	Receiver Signal(-)	
9	Rin1+	Receiver Signal(+)	
10	VSS	Ground	1)
11	Rin2-	Receiver Signal(-)	
12	Rin2+	Receiver Signal(+)	
13	VSS	Ground	1)
14	CLK-	Clock Signal(-)	
15	CLK+	Clock Signal(+)	
16	VSS	Ground	1)
17	NC	Reserved	
18	IC		3)
19	VSS	Ground	1)
20	VSS	Ground	1)

Note 1) All Vss pins should be connected to GND(0V).

Metal bezel is connected internally to Vss.

2) All Vdd pins should be connected to +3.3V.

3) Keep Open. Hitachi test use only.

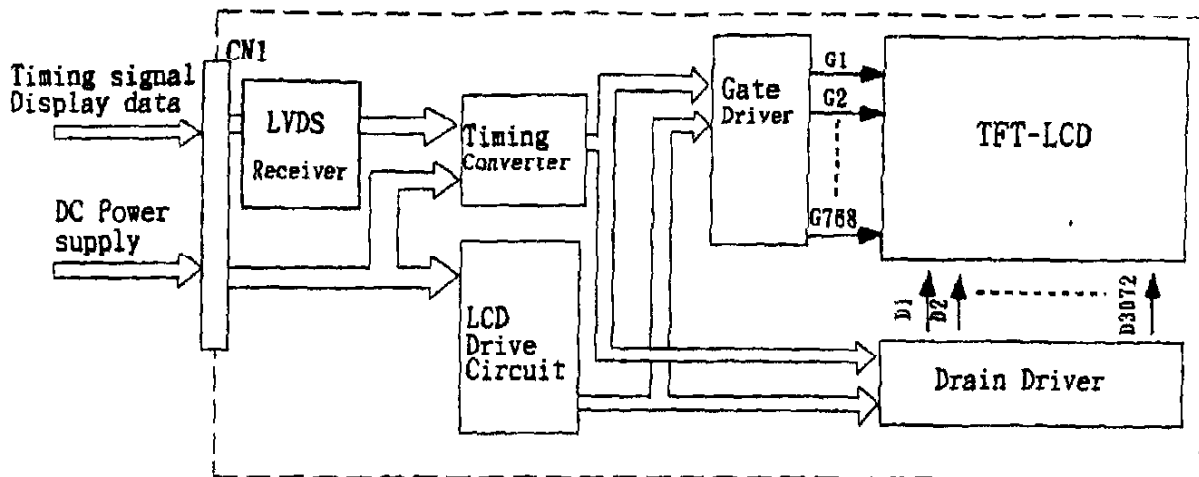
(2) BACK-LIGHT UNIT

CN2

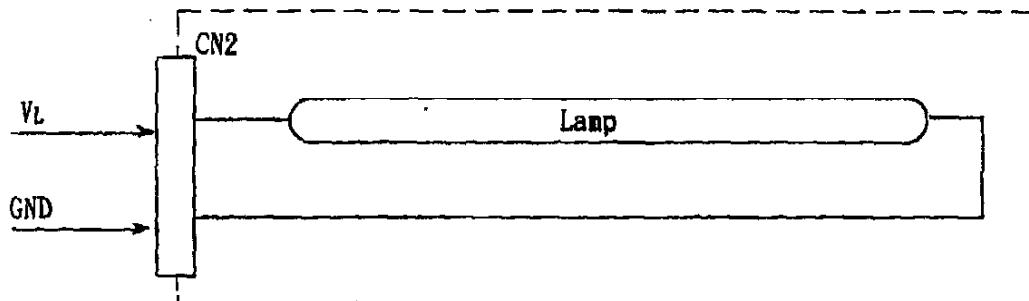
Pin No	SYMBOL	DESCRIPTION
1	V _L	Power Supply
2	GND	GND (0V)

4. BLOCK DIAGRAM

(1) TFT LIQUID CRYSTAL DISPLAY MODULE



(2) BACK-LIGHT UNIT



1. ELECTRICAL CHARACTERISTICS

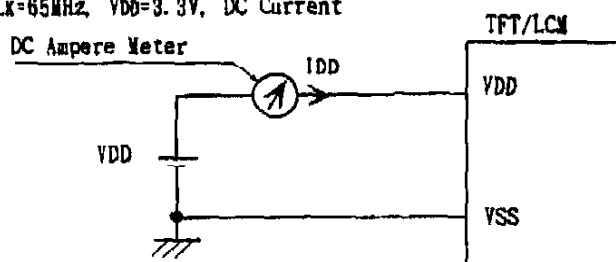
(1) TFT LIQUID CRYSTAL DISPLAY MODULE

Ta=25°C. Vss=0V

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Power Supply Voltage	VDD	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold	Hi	—	—	+100	mV	1)
	Lo	-100	—	—		
Power Supply Current	IDD	—	390	640	mA	2), 3)
Vsync Frequency	fv	59	60	65	Hz	4)
Hsync Frequency	fH	—	(48.5)	(52.4)	kHz	4)
DCLK Frequency	fCLK	63	65	67	MHz	4)

Note 1) VCM=+1.25V

2) fv=60Hz, fCLK=65MHz, VDD=3.3V, DC Current



Typical value is measured when displaying vertical 64 gray scale.
Maximum is measured when displaying Vertical-stripe(Black-Gray7)

- 3) Current capacity for VDD power source should be larger than 2A.
4) For LVDS Transmitter Input.

(2) BACK-LIGHT UNIT

Ta=25°C

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Lamp Current	IL	3.0	4.5	7.0	mA _{rms}	1), 2), 6)
		—	—	11	mA _{0-peak}	
Lamp Voltage	VL	—	650	—	V _{rms}	
Frequency	fL	50	60	80	kHz	3)
Starting Lamp Voltage	Vs	1300	—	—	V _{rms}	4)
		1550	—	—		4), 5)

NOTE 1) Higher IL cause the short life time of CFL.

2) DC current cause irregular fluorescence and the short life of CFL.

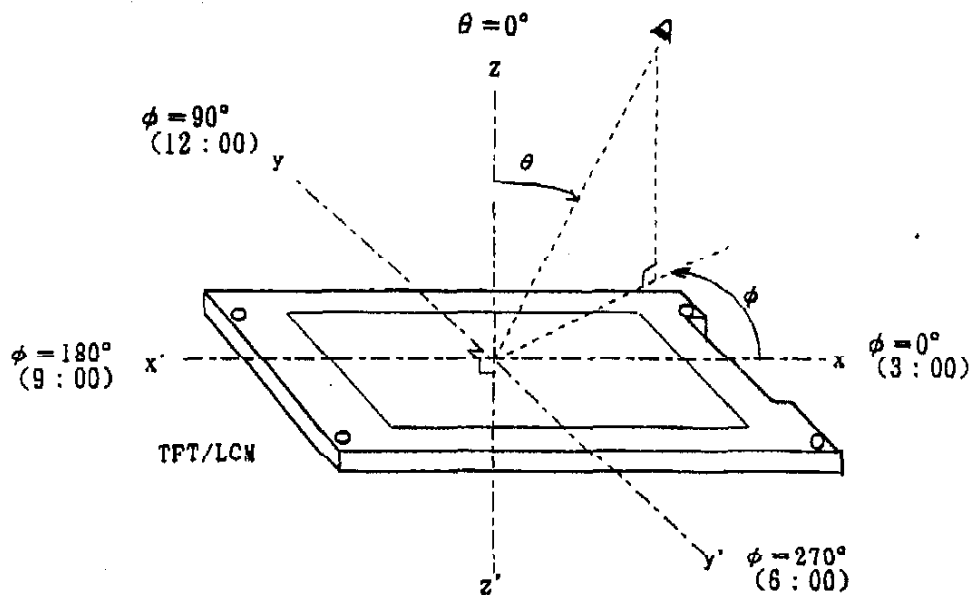
3) Lamp frequency may produce interference with Hsync frequency, causing best or flicker on the display. Therefore lamp frequency shall be as different as possible from Hsync frequency, to avoid interference.

4) Starting Lamp Voltage is applied more than Vs(min)

5) Ta=10°C

6) Reducing Lamp current increases Lamp voltage and generally increases Lamp frequency. So all the parameters of an inverter should be carefully designed so as not to produce too much leakage current from high-voltage output of the inverter.

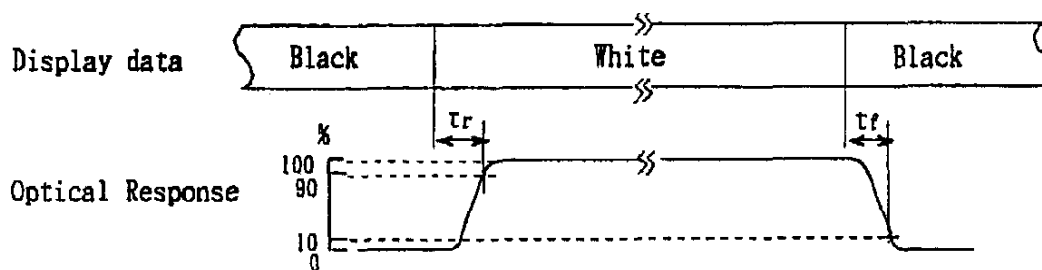
Note 1) Definition of Viewing Angle



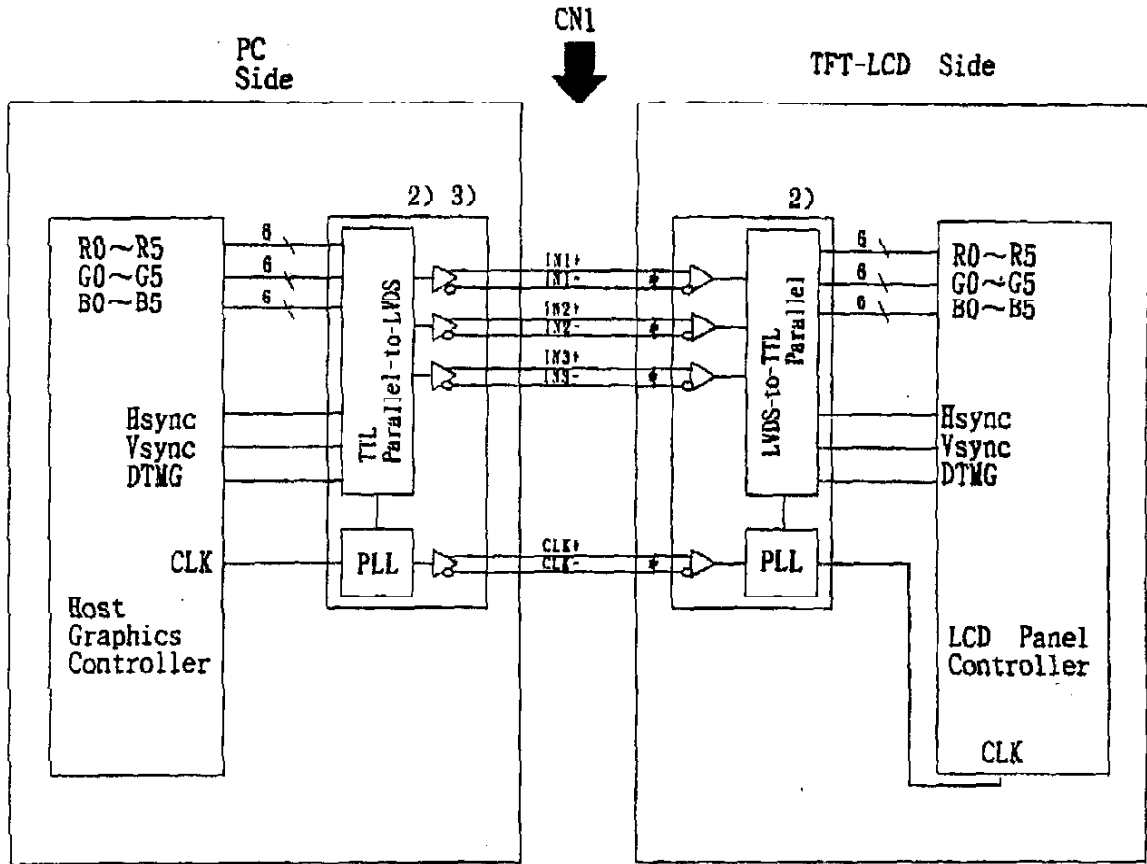
Note 2) Definition of Contrast Ratio (CR)

$$CR = \frac{\text{Brightness when displaying White raster}}{\text{Brightness when displaying Black raster}}$$

Note 3) Definition of Response Time



LVDS INTERFACE



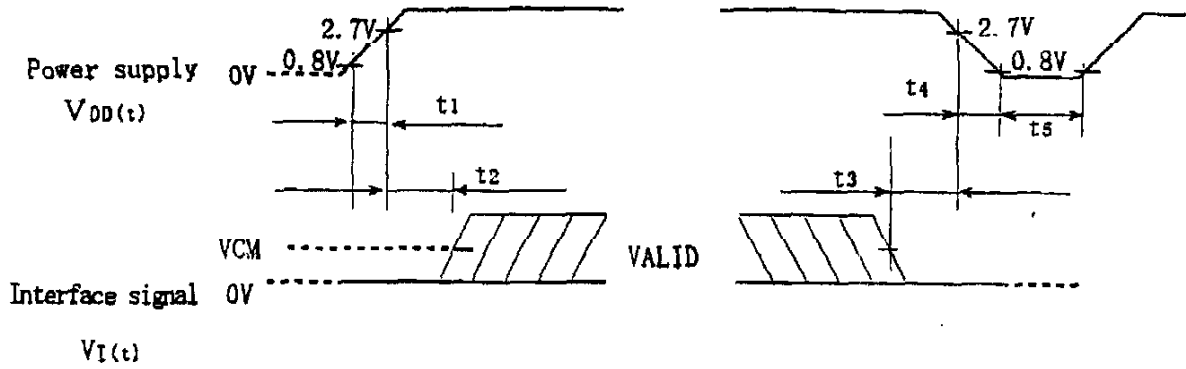
- NOTE: 1) LVDS cable impedance is 100 ohms per signal line when two are used differentially...
- 2) Transmitter : Texas Instruments SN75LVDS84 Equivalent.
Receiver : Texas Instruments SN75LVDS86 Equivalent.
National Semi Conductor DS90CF364 Equivalent.
- 3) Transmitter is not contained in Module.

(2) INTERFACE TIMING SPECIFICATION FOR LVDS TRANSMITTER

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE	
DCLK	Period	tCLK	14.9	15.4	—	ns	
	Width-Low	twCL	0.35	0.5	0.65	tCLK	
	Width-Hi	twCH	0.35	0.5	0.65		
	Rise Time	trCLK	—	—	8	ns	
	Fall Time	tfCLK	—	—	8		
	Duty	D	0.45	0.5	0.55	—	D=tCLKL/tCLK
Hsync	Set up Time	tSH	5	—	—	ns	for DCLK
	Hold Time	tHH	4	—	—		
	Period	tHP	1128	1344	2400	tCLK	
	Width-Active	tWH	10	136	240		
	Rise/Fall Time	tHR, tHF	—	—	5	ns	
Vsync	Set up Time	tSV	-2	—	—	tCLK	for Hsync
	Hold Time	tHV	0	—	—		
	Period	tVP	771	806	1000	tHP	
	Width-Active	tWV	1	6	120		
	Rise/Fall Time	tVR, tVF	—	—	5	ns	
DTMG	Set up Time	tSI	5	—	—	ns	for DCLK
	Hold Time	tHI	4	—	—		
	Rise/Fall Time	tIR, tIF	—	—	5	ns	
	Horizontal Back Poach	tHBP	32	—	416	tCLK	
	Horizontal Front Poach	tHFP	16	—	—		
	Vertical Back Poach	tVBP	0	—	—	tHP	1)
	Vertical Front Poach	tVFP	1	—	—		
DATA	Set up Time	tSD	5	—	—	ns	for DCLK
	Hold Time	tHD	4	—	—		
	Rise/Fall Time	tDR, tDF	—	—	5	ns	

Note 1) $tVBP + tVFP \geq 3 tHP$

(3) TIMING BETWEEN INTERFACE SIGNAL AND POWER SUPPLY



POWER_ON

$$t_1 \leq 15\text{ms}$$

$$40\text{ms} < t_2 \leq 56\text{ms}$$

POWER_OFF

$$0 \leq t_3 \leq 40\text{ms}$$

$$0 \leq t_4 \leq 16\text{ms}$$

$$0.1\text{s} \leq t_5$$

INPUT SIGNAL FOR LVDS

	INPUT SIGNAL	TRANSMITTER DS90CF383	TRANSMITTER SN75LVDS84	INTERFACE CONNECTOR(CN1)		Receiver DS90CF364 or SN75LVDS86	
				PC	TFT-LCD		
LVDS	R0	IN0	IN0(44)	OUT0+	IN0+	OUT0	
	R1	IN1	IN1(45)			OUT1	
	R2	IN2	IN2(47)			OUT2	
	R3	IN3	IN3(48)			OUT3	
	R4	IN4	IN4(1)	OUT0-	IN0-	OUT4	
	R5	IN6	IN5(3)			OUT5	
	G0	IN7	IN6(4)			OUT6	
	G1	IN8	IN7(6)			OUT7	
	G2	IN9	IN8(7)	OUT1+	IN1+	OUT8	
	G3	IN12	IN9(9)			OUT9	
	G4	IN13	IN10(10)			OUT10	
	G5	IN14	IN11(12)			OUT11	
	B0	IN15	IN12(13)	OUT1-	IN1-	OUT12	
	B1	IN18	IN13(15)			OUT13	
	B2	IN19	IN14(16)			OUT14	
	B3	IN20	IN15(18)			OUT15	
	B4	IN21	IN16(19)	OUT2+	IN2+	OUT16	
	B5	IN22	IN17(20)			OUT17	
	HSYNC	IN24	IN18(22)			OUT18	
	VSYNC	IN25	IN19(23)			OUT19	
	DTMG	IN26	IN20(25)	OUT2-	IN2-	OUT20	
		DCLK	CLK IN	CLK IN(26)	CLK OUT+	CLK IN+	CLK OUT
					CLK OUT-	CLK IN-	

1) Transmitter () Values show IC pin No.

RELATIONSHIP BETWEEN DISPLAYED COLOR AND INPUT DATA

INPUT DATA COLOR		R DATA						G DATA						B DATA					
		R5	R4	R3	R2	R1	R0	G5	G4	G3	G2	G1	G0	B5	B4	B3	B2	B1	B0
		MSB			LSB			MSB			LSB			MSB			LSB		
BASIC COLOR	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0
	BLUE(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
	CYAN	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
	MAGENTA	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1
	YELLOW	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0
	WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
RED	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	RED(1)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	RED(2)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

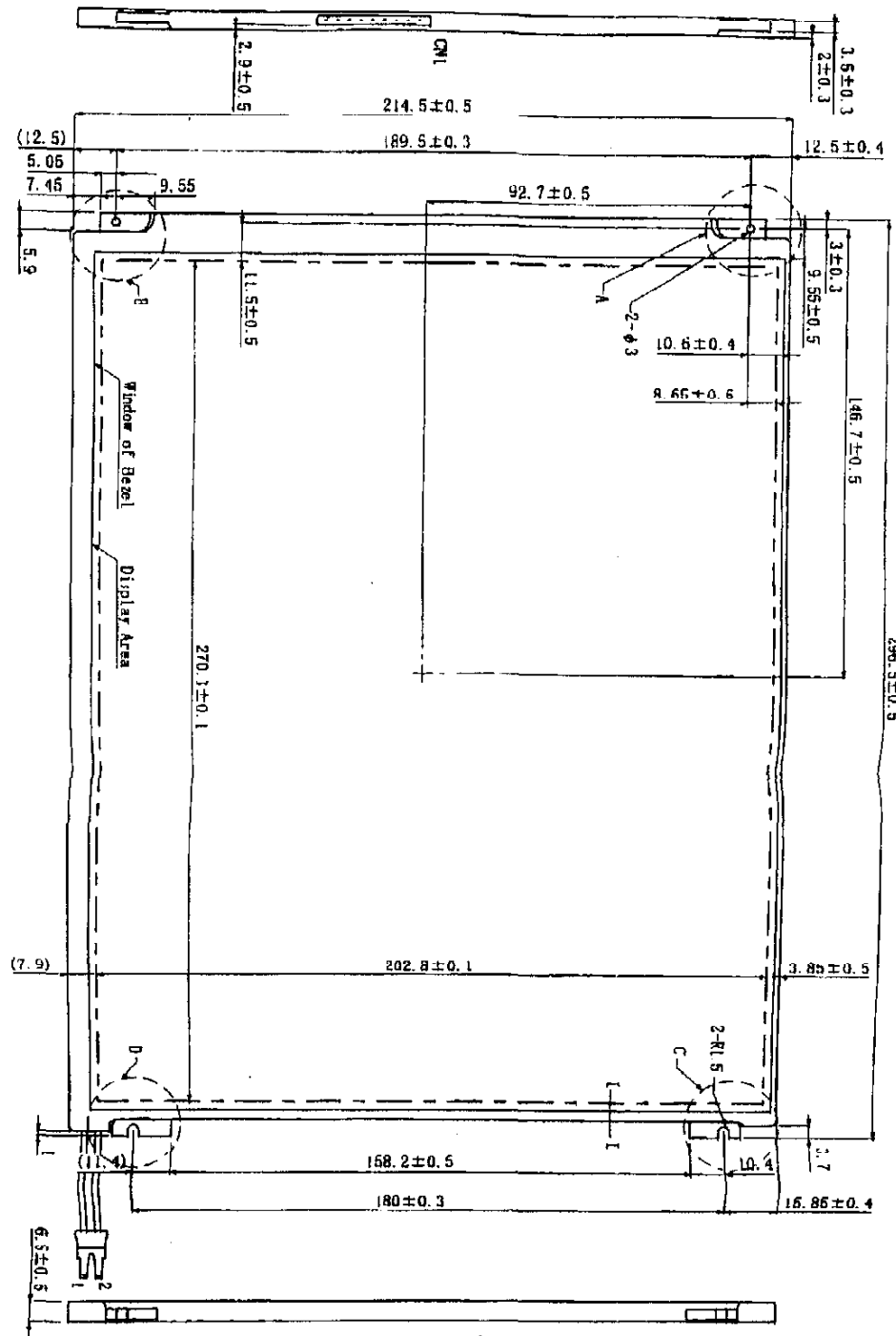
	RED(61)	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
	RED(62)	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
RED(63)	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
GREEN	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	GREEN(1)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	GREEN(2)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0

	GREEN(61)	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0
	GREEN(62)	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
GREEN(63)	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	
BLUE	BLACK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	BLUE(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	BLUE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

	BLUE(61)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1
	BLUE(62)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
BLUE(63)	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	

Note 1) Definition of gray scale :
 Color(n) --- n indicates gray scale level.
 Higher n means brighter level.
 2) Data : 1:Hi, 0:Lo

L. DIMENSIONAL OUTLINE
(1) FRONT VIEW

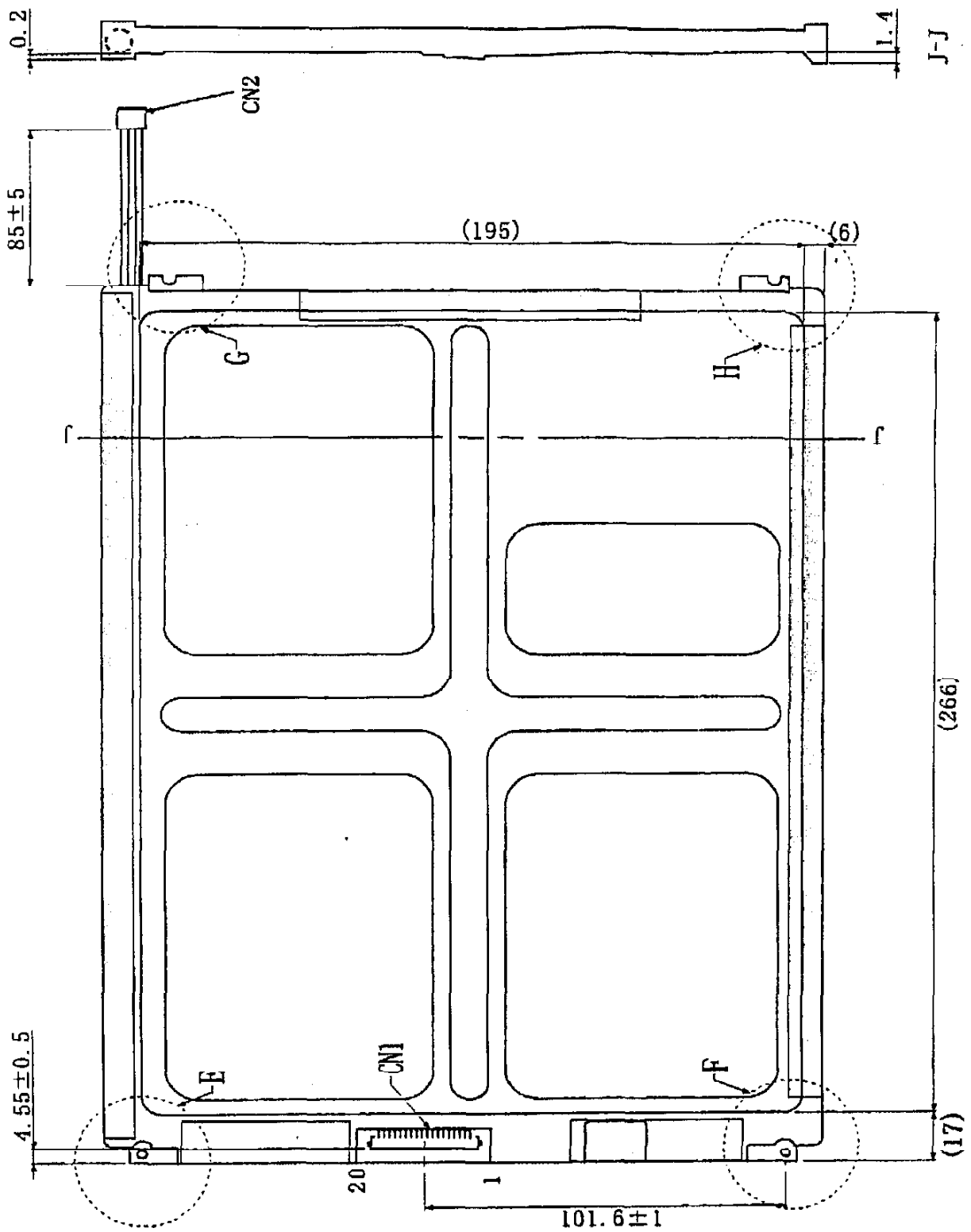


UNIT: mm
SCALE: 1:1
MEASUREMENT TOLERANCE: ±0.5

- Note
- 1) CNT : JAE FT-5200-HP
Mating plug connector
FT-5200-Cable type
FT-5200-PC type
 - 2) CNT : JST GBR-02V-01
Mating size connector
SMR-055-1
 - 3) Tolerance not specified
is ±0.5mm
 - 4) Dimensions in parentheses
are reference values.
 - 5) Position, size and form of
tab and grooves on metal
bezel are not specified.

Attachment, Ltd.	Date	Apr. 06, '98	Sh. No.	3284PS 2610-TX34052VC10C-1	Page	10-1/3
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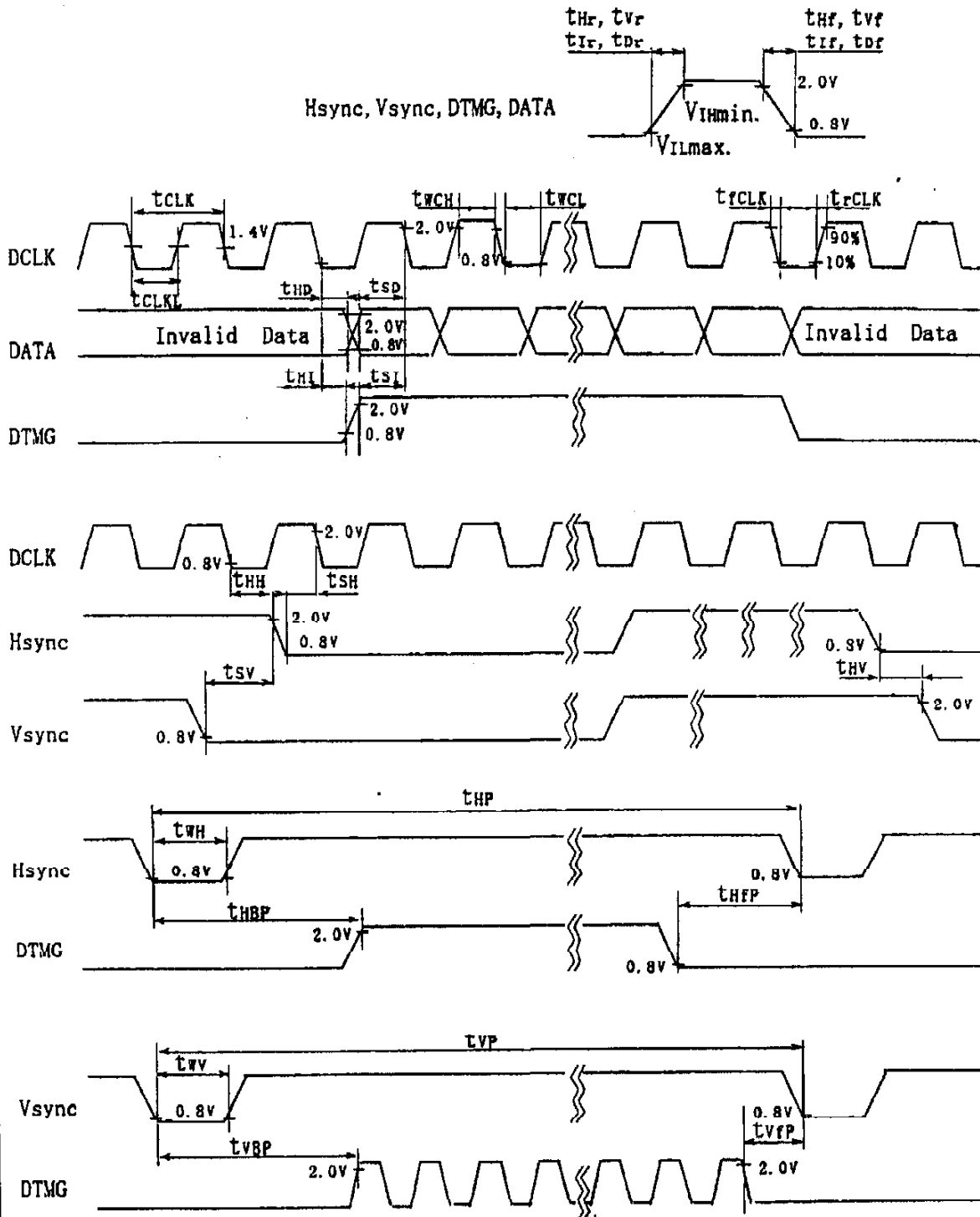
(2) BACK SIDE VIEW

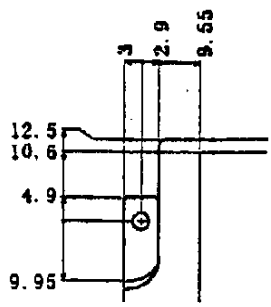


6. INTERFACE TIMING FOR LVDS TRANSMITTER

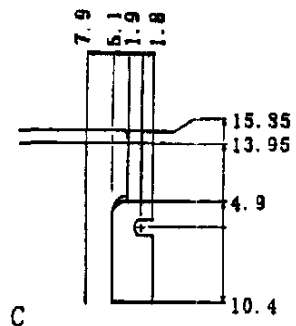
(1) TIMING CHART

(Data : Latched at Fall edge of DCLK)

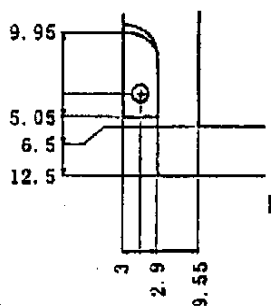




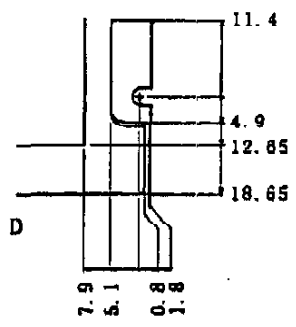
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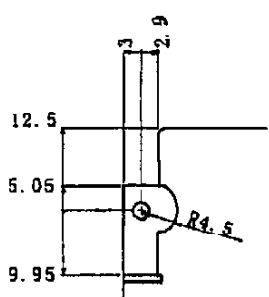
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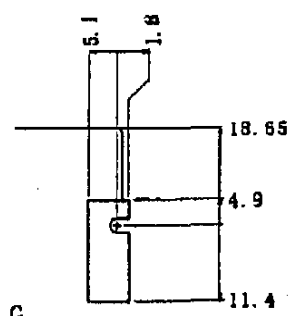
B



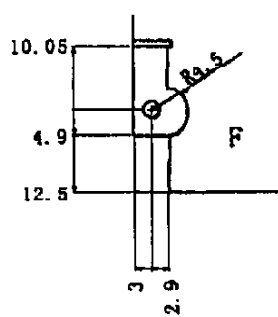
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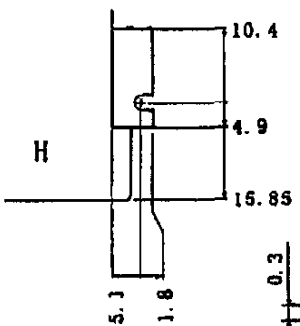
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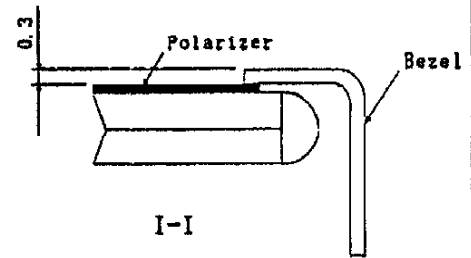
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F



H

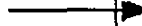


I-I

8.3 LOCATION OF LOT MARK

Label is being attached on the back side of module.

Lot No. &
Production Control No.



10.2 OPERATING PRECAUTION

- (1) Response time depends on the temperature. (In lower temperature, it becomes longer).
And also Transmittance and Color depend on the temperature.
- (2) Brightness depends on the temperature. (In lower temperature, it becomes lower).
And in lower temperature, response time (required time that brightness is stable after turn on) becomes longer.
- (3) Be careful for condensation at sudden temperature change.
Condensation make damage to polarizer or electrical contact part.
And after fading condensation, smear or spot will occur.
- (4) When fixed patterns are displayed at long times, afterimage is likely to occur.
- (5) The Module have high frequency circuit. If you need to shield the electromagnetic noise, please do in yours.
- (6) When Back-light unit is operating, it sounds.
If you need to shield the noise, please do in yours.
- (7) Please connect the Back-light connector to the inverter circuit directly.
The long cable between CFL and the inverter may cause the brightness drop of CFL and may cause the rise of starting lamp Voltage(Vs).
- (8) Do not connect or remove the module from main system with power applied.

10.3 ELECTROSTATIC DISCHARGE CONTROL

Since Module is composed with electronic circuit, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through list band etc.. And don't touch I/F pin directly.

10.4 PRECAUTION FOR STRONG LIGHT EXPOSURE

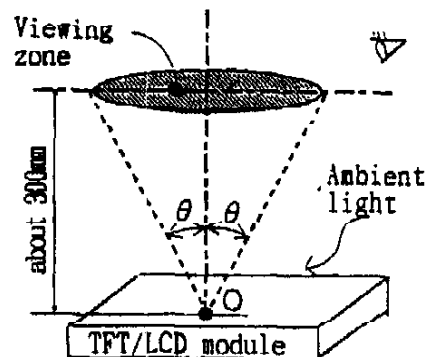
Strong light exposure causes degradation of polarizer and color filter.

9. COSMETIC SPECIFICATIONS

9.1 CONDITIONS FOR COSMETIC INSPECTION

(1) Viewing zone

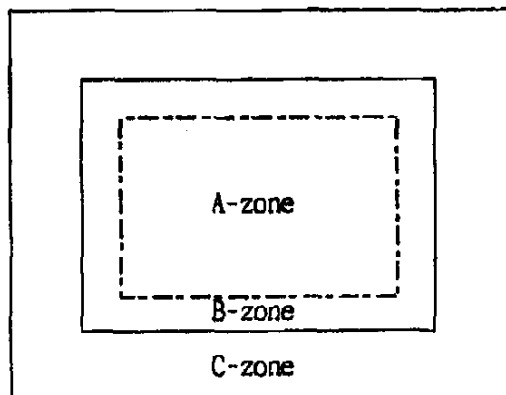
- i) The figure shows the correspondence between eyes (of inspector) and TFT/LCD module.
 - $\theta \leq 45^\circ$ when non-operating inspection
 - $\theta \leq 5^\circ$ when operating inspection
- ii) Inspection should be executed only from front side, and only A-zone. Cosmetic of B-zone and C-zone are ignored.
(refer to 9.2 DEFINITION OF ZONE)



(2) Environmental

- i) Temperature : 25°C
When operating inspection, surface temperature of LCD panel is 25°C.
 - ii) Ambient light : More than 800 [lx] and non-directive.
 - iii) Back-light : When non-operating inspection, Back-light should be off.
- (3) Operating inspection
Operating inspection should be done with 8 color mode (without gray scale).

9.2 DEFINITION OF ZONE



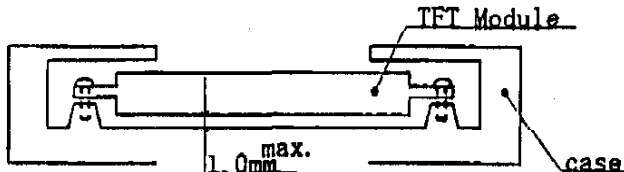
- A-zone : Display area (pixel area).
- B-zone : Area between A-zone and C-zone.
- C-zone : Metal bezel area.
(Include I/F connector)

10. PRECAUTIONS

Please pay attention to the followings when you use this TFT/LCD module with Back-light unit.

10.1 MOUNTING PRECAUTION

- (1) You must mount Module using mounting holes arranged in 4 corners tightly.
- (2) You should consider the mounting structure so that uneven force (ex. twisted stress) is not applied to Module. And the case which Module is mounted should have sufficient strength so that external force is not transmitted directly to Module.
- (3) To improve the strength of module against the mechanical shock the space between module and the case should be less than 1.0mm.



- (4) You should adopt radiation structure to satisfy the temperature specification.
- (5) Acetic acid type and choline type materials for the cover case are not desirable because the former generate corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- (6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub by dustclothes with chemical treatment. Do not touch the surface of polarizer with bare hand or greasy close. (Some cosmetics are detrimental to the polarizer.)
- (7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials chamois soaked petroleum benzin. Normal-Hexane is recommended for cleaning the adhesives used to attach front /rear polarizers. Do not use acetone, toluen and alcohol because they cause chemical damage to the polarizer.
- (8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (9) Do not open the case because inside circuits have not sufficient strength.
- (10) Use fingerstalls of soft gloves in order to keep clean display quality, when you handle the device for incoming inspection and assembly.
- (11) Do not pull or do not fold the CFL cable.

No.	ITEM			MAXIMUM ACCEPTABLE NUMBER		NOTE
				A-zone	UNIT	
8	Polarizer	Bubbles, Peeling in Polarizer D:average dia. (mm)	$D \leq 0.3$	Ignore	pcs	8)
			$D \leq 0.5$	10		
			$D \leq 1.0$	5		
			$D > 1.0$	0		
9		Wrinkles		Serious one is no good.	-	-

- Note
- 1) Dot Defect : Defect area > 1/2 dot
 - 2) Sparkle mode : Brightness of dot is more than 30% at Black raster.
(Visible to eye)
 - 3) Black mode : Brightness of dot is less than 70%
at white raster. (Visible to eye)
 - 4) 1 dot : defect dot is isolated, not attached to other
defect dot.
 - 5) N dots : N defect dots are consecutive.
(N means the number of defect dots.)
 - 6) Density : Number of defect dots inside of $\phi 20\text{mm}$.
 - 7) Those stains which can be wiped out easily are acceptable.
 - 8) Polarizer area inside of B-zone is not applied.

9.3 COSMETIC SPECIFICATIONS

When displaying condition is not stable (ex. at turn on or off), the following specifications are not applied.

No.	ITEM		MAXIMUM ACCEPTABLE NUMBER		NOTE	
			A-zone	UNIT		
1	Dot Defect	Sparkle mode	1dot	15	pcs	1), 2), 4)
			2dots	4	units	
			3dots	1		
			4dots	0		
			Density	3		pcs/φ20
			Total	15	pcs	
		Black mode	1dot	15	pcs	1), 3), 4)
			2dots	4	units	
			3dots	1		
			4dots	0		
			Density	3		pcs/φ20
			Total	15	pcs	
		Total		30	pcs	1)
2	Line Defect		Serious one is no good.		-	
3	Uneven Brightness		-		-	
4	Stain Inclusion Line shape W:width[mm] L:length[mm]	W≤0.02	L:Ignore	Ignore	pcs	7)
		W≤0.03	L≤2.0	10		
			L>2.0	0		
		W≤0.06	L≤1.0	10		
			L>1.0	0		
W>0.06	—	By Dot shape				
5	Stain Inclusion Dot shape D:average dia. [mm]	D≤0.22		Ignore	pcs	7)
		D≤0.33		5		
		D>0.33		0		
6	Scratch on polarizer Line shape W:width[mm] L:length[mm]	W≤0.01	L:Ignore	Ignore	pcs	8)
		W≤0.02	L≤40	10		
			L>40	0		
		W≤0.04	L≤20	10		
			L>20	0		
7	Scratch on polarizer Dot shape D:average dia. [mm]	D≤0.2		Ignore	pcs	8)
		D≤0.4		10		
		D>0.4		0		

10.5 STORAGE

When storing Module as spares for long time, the following precautions are necessary.

- (1) Store them in a dark place ; do not expose them to sunlight or fluorescent light.
Keep the temperature between 5°C and 35°C at normal humidity.
- (2) The polarizer surface should not come in contact with any other object. It is recommended that they be stored in the container in which they were shipped.

10.6 HANDLING PRECAUTIONS FOR PROTECTIVE FILM

- (1) When the protective film is peeled off, static electricity is generated between the film and the polarizer.
This film should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- (2) The protective film is attached to the polarizer with a small amount of glue. If some stress is applied to rub the protective film against the polarizer during the time you peel off the film, the glue is apt to remain more on the polarizer. So please carefully peel off the protective film without rubbing it against the polarizer.
- (3) When the Module with protective film attached is stored for long time, sometimes there remains a very small amount of glue, still on the polarizer after the protective film is peeled off.
Please refrain from storing the Module at the high temperature and high humidity for glue is apt to remain in these condition.
- (4) The Glue may be taken for the Modules failure, but you can remove the Glue easily.
When the glue remains on the polarizer surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with Normal-hexane.

10.7 SAFETY

- (1) If Module is broken, be careful to handle not to injure. (TFT/LCD and Lamp are made of glass.)
Please wash hands sufficiently when you touch the liquid crystal coming out from broken LCDs.
- (2) As Back-light unit has high voltage circuit internal, do not open the case and do not insert foreign materials in the case.
- (3) The LCD Modules include Cold Cathode Fluorescent Lamp(CFL).
CFL contains a small amount of mercury. Please follow local ordinances or regulations for disposal.