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Specification of FUJITSU TFT-LCD module

FLC43XWC8V-02

Approval
Date : By :

This Product is designed, developed and manufactured as contemplated for general use, including without limitation, general office use, personal use, household use, and ordinary industrial use, but is not designed, developed and manufactured as contemplated for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could lead directly to death, personal injury, severe physical damage or other loss (hereinafter "High Safety Required Use"), including without limitation, nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system. If customer's product possibly falls under the category of High Safety Required Use, please consult with our sales representatives in charge before such use. In addition, FDTTC shall not be liable against the customer and/or any third party for any claims or damages arising in connection with the High Safety Required Use of the Product without permission.

Specification No. : Tech Bes LCD-00149

Issue Date : Dec. 5, 2002

Issued by :

F. Yamada

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Director

Products Engineering Dept.

LCD Products Div.

FUJITSU DISPLAY TECHNOLOGIES CORPORATION

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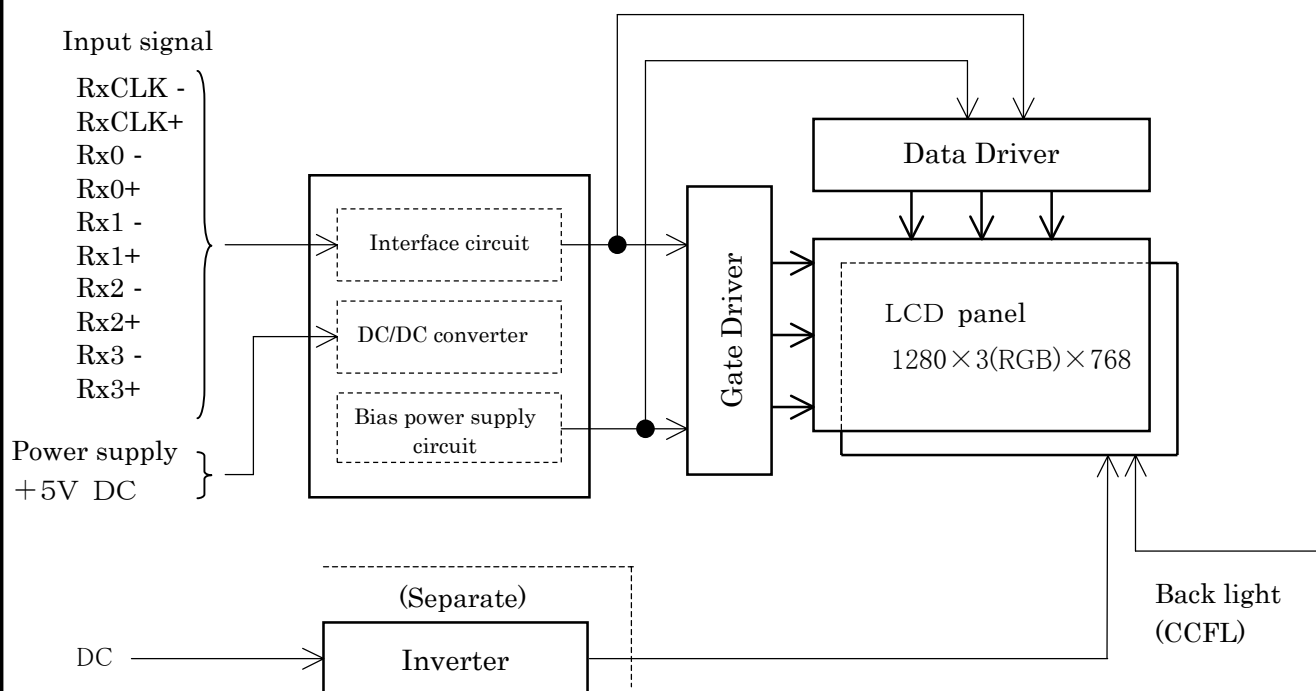


Figure 4-1. Block Diagram

5. MECHANICAL SPECIFICATIONS

Table 5-1 shows the mechanical specifications of this LCD module.

Table 5-1. Mechanical Specifications

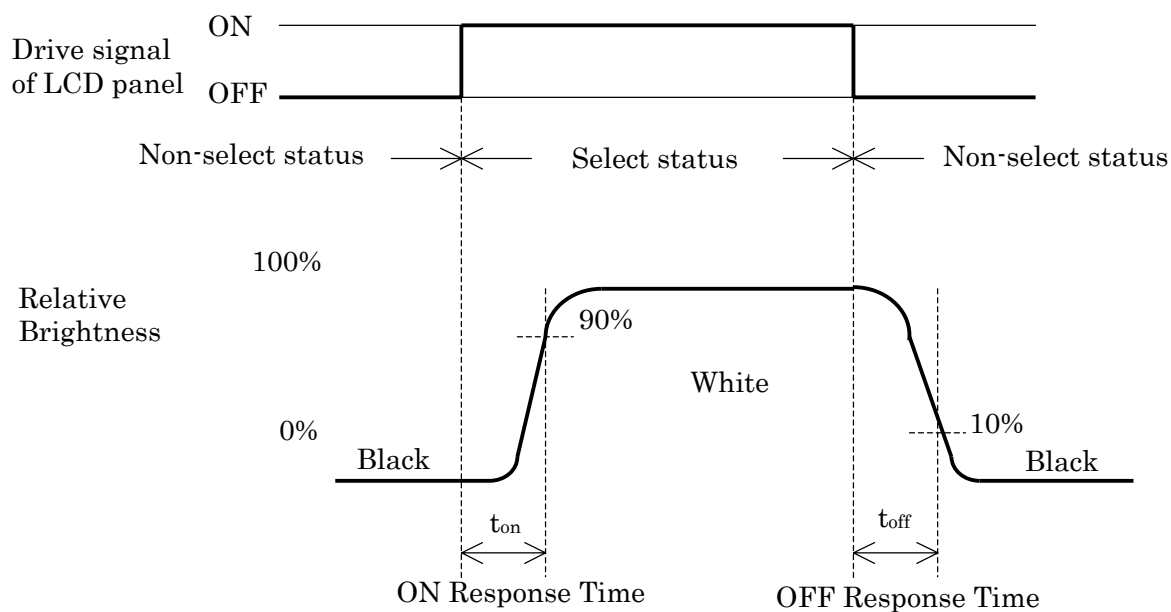
Item	Specifications	Unit	Remark
Dimensions	413.8×263.5×18.4(TYP.)	mm	Edge type backlight is used. (φ2.6 CCFL×4)
Display Resolution	(1280×3) ×768	—	
Display Dot Area	369.6×221.76	mm	
Dot Pitch	(0.09625×3) ×0.28875	mm	Outward Appearance is shown at page 32 and 33.
Aspect Ratio	1 : 1	—	
Weight	2,000 max	g	
FG-SG	Short circuit	—	

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【FLC43XWC8V-02】													
6. ABSOLUTE MAXIMUM RATINGS													
Table 6-1 shows the absolute maximum rating of this LCD module.													
Table 6-1. Absolute Maximum Ratings													
Item		Symbol		MIN.		TYP.		MAX.		Unit			
Supply Voltage		V _{CC}		- 0.3		—		6.0		V			
Input Voltage		V _{IN}		- 0.3		—		V _{CC} +0.3		V			
7. RECOMMENDED OPERATING CONDITIONS													
Table 7-1 shows the recommended operating conditions of this LCD module.													
Table 7-1. Recommended Operating Conditions													
Item		Symbol		MIN.		TYP.		MAX.		Unit			
Supply Voltage		V _{CC}		4.75		5.0		5.25		V			
Ripple Voltage (V _{CC})		V _{RP}		—		—		100		mVp-p			
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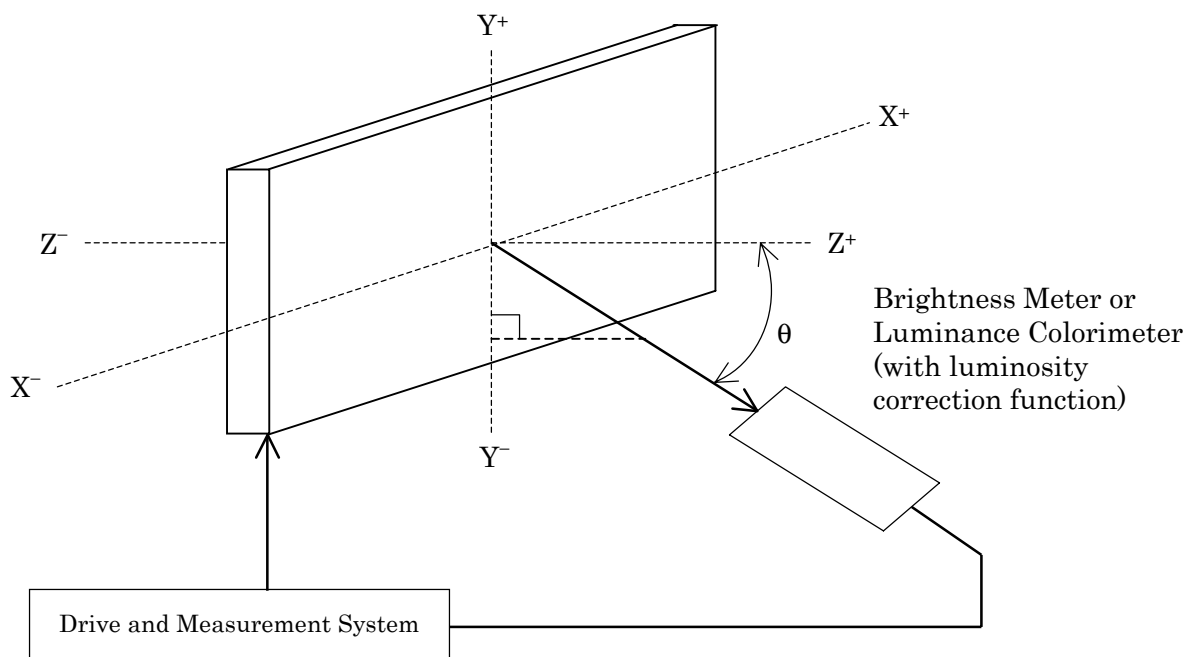
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【FLC43XWC8V-02】					
A	8. ELECTRICAL SPECIFICATIONS				
	Table 8-1 shows the electrical specifications of this LCD module.				
	Table 8-1. Electrical Specifications				
B					
C					
D					
E					
F					

Note 4) Definition of Response Time

Based on Fig.9-5.

Fig.9-5. Definition of Response TimeNote 5) Contrast Ratio and Response Measurement System

Based on Fig.9-6.

Fig.9-6. Contrast Ratio and Response Time Measurement System

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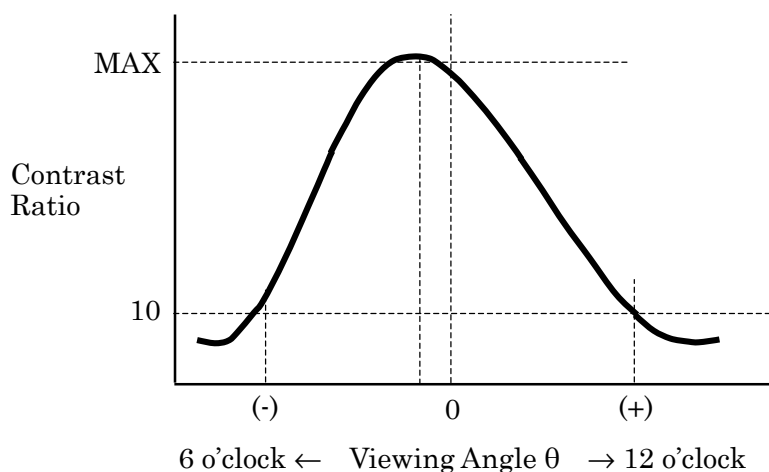
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Note 6) Definition of Optimum Viewing Angle

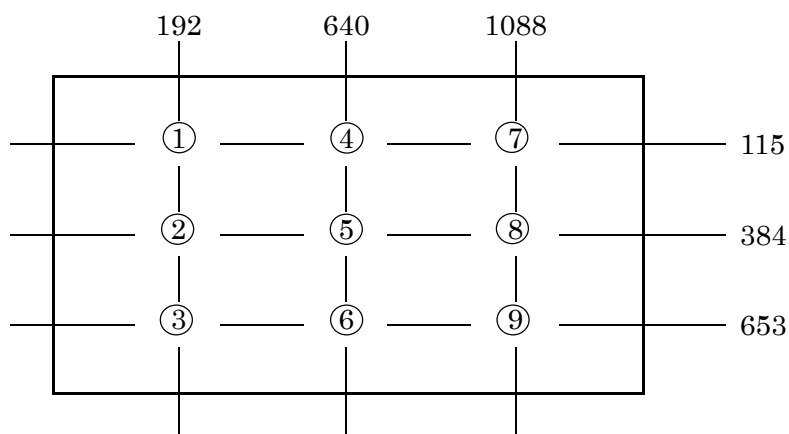
Based on Fig.9-7.

Fig.9-7. Definition of Viewing AngleNote 7) Definition of Brightness Uniformity

Brightness uniformity is defined by the following formula.

Brightness (I1~I9) are measured at the following 9 points (① ~ ⑨) on the display area shown in Fig.9-8.

$$\text{Brightness Uniformity } (\Delta L) = \frac{|\text{Min. In}|}{|\text{Max. In}|} \times 100 (\%), n=1 \text{ to } 9$$



Note) Each measurement point (① ~ ⑨) defines the center spot of Brightness Meter view.
The tolerance of measurement position is $\pm 3\text{mm}$.

Fig.9-8. Measurement Points

1		2		3		4																																																																																					
【FLC43XWC8V-02】																																																																																											
10. INTERFACE SPECIFICATIONS																																																																																											
10-1-1. Signal descriptions																																																																																											
Table 10-1 shows the description and configuration of Interface signals (CN1).																																																																																											
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<table><tr><th>Pin No.</th><th>Symbol</th><th>I/O</th><th>Function</th></tr><tr><td>1</td><td>VDD</td><td>—</td><td>+5V Power suplv</td></tr><tr><td>2</td><td>VDD</td><td>—</td><td>+5V Power suplv</td></tr><tr><td>3</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>4</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>5</td><td>RX0-</td><td>I</td><td>LVDS Receiver Signal(-)</td></tr><tr><td>6</td><td>RX0+</td><td>I</td><td>LVDS Receiver Signal(+)</td></tr><tr><td>7</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>8</td><td>RX1-</td><td>I</td><td>LVDS Receiver Signal(-)</td></tr><tr><td>9</td><td>RX1+</td><td>I</td><td>LVDS Receiver Signal(+)</td></tr><tr><td>10</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>11</td><td>RX2-</td><td>I</td><td>LVDS Receiver Signal(-)</td></tr><tr><td>12</td><td>RX2+</td><td>I</td><td>LVDS Receiver Signal(+)</td></tr><tr><td>13</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>14</td><td>RXCLK-</td><td>I</td><td>LVDS Receiver Clock Signal(-)</td></tr><tr><td>15</td><td>RXCLK+</td><td>I</td><td>LVDS Receiver Clock Signal(+)</td></tr><tr><td>16</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>17</td><td>RX3-</td><td>I</td><td>LVDS Receiver Signal(-)</td></tr><tr><td>18</td><td>RX3+</td><td>I</td><td>LVDS Receiver Signal(+)</td></tr><tr><td>19</td><td>GND</td><td>—</td><td>Ground</td></tr><tr><td>20</td><td>Data Mapping Select Input</td><td>I</td><td>Low : table 10-1-2 Open or Hi : table 10-1-3</td></tr></table>								Pin No.	Symbol	I/O	Function	1	VDD	—	+5V Power suplv	2	VDD	—	+5V Power suplv	3	GND	—	Ground	4	GND	—	Ground	5	RX0-	I	LVDS Receiver Signal(-)	6	RX0+	I	LVDS Receiver Signal(+)	7	GND	—	Ground	8	RX1-	I	LVDS Receiver Signal(-)	9	RX1+	I	LVDS Receiver Signal(+)	10	GND	—	Ground	11	RX2-	I	LVDS Receiver Signal(-)	12	RX2+	I	LVDS Receiver Signal(+)	13	GND	—	Ground	14	RXCLK-	I	LVDS Receiver Clock Signal(-)	15	RXCLK+	I	LVDS Receiver Clock Signal(+)	16	GND	—	Ground	17	RX3-	I	LVDS Receiver Signal(-)	18	RX3+	I	LVDS Receiver Signal(+)	19	GND	—	Ground	20	Data Mapping Select Input	I	Low : table 10-1-2 Open or Hi : table 10-1-3
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Upper side Interface connector LCD Module Rear side 20 1 Lower side Connector : D14H-20P-1.25H(HIROSE) User's connector : DF14-20S-1.25 (HIROSE)																																																																																											
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10-1-2. LVDS Data Mapping 1

Table 10-1-2 shows the LVDS data mapping 1.(DataMappingSelectInput = Low)

Table 10-1-2. LVDS Data Mapping 1

Transmitter (DS90CF385)		Symbol	Interface connector			Receiver (DS90CF386)		LCD Control input
Pin	INPUT		System side	Pin	LCD module	Pin	OUTPUT	
51	TxIN0	R0	TxOUT0- TxOUT0+	5 6	RX0- RX0+	27	RxOUT0	IR0
52	TxIN1	R1				29	RxOUT1	IR1
54	TxIN2	R2				30	RxOUT2	IR2
55	TxIN3	R3				32	RxOUT3	IR3
56	TxIN4	R4				33	RxOUT4	IR4
2	TxIN5	R7	TxOUT3- TxOUT3+	17 18	RX3- RX3+	34	RxOUT5	IR7
3	TxIN6	R5	TxOUT0- TxOUT0+	5 6	RX0- RX0+	35	RxOUT6	IR5
4	TxIN7	G0	TxOUT0+	6	RX0+	37	RxOUT7	IG0
6	TxIN8	G1	TxOUT1- TxOUT1+	8 9	RX1- RX1+	38	RxOUT8	IG1
7	TxIN9	G2	TxOUT1+	9	RX1+	39	RxOUT9	IG2
8	TxIN10	G6	TxOUT3- TxOUT3+	17 18	RX3- RX3+	41	RxOUT10	IG6
10	TxIN11	G7	TxOUT3+	18	RX3+	42	RxOUT11	IG7
11	TxIN12	G3	TxOUT1- TxOUT1+	8 9	RX1- RX1+	43	RxOUT12	IG3
12	TxIN13	G4				45	RxOUT13	IG4
14	TxIN14	G5				46	RxOUT14	IG5
15	TxIN15	B0				47	RxOUT15	IB0
16	TxIN16	B6	TxOUT3- TxOUT3+	17 18	RX3- RX3+	49	RxOUT16	IB6
18	TxIN17	B7	TxOUT3+	18	RX3+	50	RxOUT17	IB7
19	TxIN18	B1	TxOUT1- TxOUT1+	8 9	RX1- RX1+	51	RxOUT18	IB1
20	TxIN19	B2	TxOUT2- TxOUT2+	11 12	RX2- RX2+	53	RxOUT19	IB2
22	TxIN20	B3				54	RxOUT20	IB3
23	TxIN21	B4				55	RxOUT21	IB4
24	TxIN22	B5				1	RxOUT22	IB5
25	TxIN23	RESERVED	TxOUT3- TxOUT3+	17 18	RX3- RX3+	2	RxOUT23	Not use
27	TxIN24	RESERVED	TxOUT2- TxOUT2+	11 12	RX2- RX2+	3	RxOUT24	Not use
28	TxIN25	RESERVED				5	RxOUT25	Not use
30	TxIN26	ENAB				6	RxOUT26	ENAB
50	TxIN27	R6	TxOUT3- TxOUT3+	17 18	RX3- RX3+	7	RxOUT27	IR6
31	TxCLKIN	DCLK	TxCLKOUT- TxCLKOUT+	14 15	RXCLK- RXCLK+	26	RxCLKOUT	DCLK

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10-1-3. LVDS Data Mapping 2

Table 10-1-3 shows the LVDS data mapping 2.(DataMappingSelectInput = Open or Hi)

Table 10-1-3. LVDS Data Mapping 2

Transmitter (DS90CF385)		Symbol	Interface connector			Receiver (DS90CF386)		LCD Control input
Pin	INPUT		System side	Pin	LCD module	Pin	OUTPUT	
51	TxIN0	R2	TxOUT0- TxOUT0+	5 6	RX0- RX0+	27	RxOUT0	IR2
52	TxIN1	R3				29	RxOUT1	IR3
54	TxIN2	R4				30	RxOUT2	IR4
55	TxIN3	R5				32	RxOUT3	IR5
56	TxIN4	R6				33	RxOUT4	IR6
2	TxIN5	R1	TxOUT3- TxOUT3+	17 18	RX3- RX3+	34	RxOUT5	IR1
3	TxIN6	R7	TxOUT0- TxOUT0+	5 6	RX0- RX0+	35	RxOUT6	IR7
4	TxIN7	G2	TxOUT0- TxOUT0+	6	RX0+	37	RxOUT7	IG2
6	TxIN8	G3	TxOUT1- TxOUT1+	8 9	RX1- RX1+	38	RxOUT8	IG3
7	TxIN9	G4	TxOUT1- TxOUT1+	9	RX1+	39	RxOUT9	IG4
8	TxIN10	G0	TxOUT3- TxOUT3+	17 18	RX3- RX3+	41	RxOUT10	IG0
10	TxIN11	G1	TxOUT3- TxOUT3+	18	RX3+	42	RxOUT11	IG1
11	TxIN12	G5	TxOUT1- TxOUT1+	8 9	RX1- RX1+	43	RxOUT12	IG5
12	TxIN13	G6				45	RxOUT13	IG6
14	TxIN14	G7				46	RxOUT14	IG7
15	TxIN15	B2				47	RxOUT15	IB2
16	TxIN16	B0	TxOUT3- TxOUT3+	17 18	RX3- RX3+	49	RxOUT16	IB0
18	TxIN17	B1	TxOUT3- TxOUT3+	18	RX3+	50	RxOUT17	IB1
19	TxIN18	B3	TxOUT1- TxOUT1+	8 9	RX1- RX1+	51	RxOUT18	IB3
20	TxIN19	B4	TxOUT2- TxOUT2+	11 12	RX2- RX2+	53	RxOUT19	IB4
22	TxIN20	B5				54	RxOUT20	IB5
23	TxIN21	B6				55	RxOUT21	IB6
24	TxIN22	B7				1	RxOUT22	IB7
25	TxIN23	RESERVED	TxOUT3- TxOUT3+	17 18	RX3- RX3+	2	RxOUT23	Not use
27	TxIN24	RESERVED	TxOUT2- TxOUT2+	11	RX2- RX2+	3	RxOUT24	Not use
28	TxIN25	RESERVED		12	RX2+	5	RxOUT25	Not use
30	TxIN26	ENAB				6	RxOUT26	ENAB
50	TxIN27	R0	TxOUT3- TxOUT3+	17 18	RX3- RX3+	7	RxOUT27	IR0
31	TxCLKIN	DCLK	TxCLKOUT- TxCLKOUT+	14 15	RXCLK- RXCLK+	26	RxCLKOUT	DCLK

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10-2. Color Data Assignment

Table 10-2 shows the color data assignment.

Table 10-2. Color Data Assignment

[illegible]

Note.1) Definition of gray scale : Color (n) ---"n" indicates gray scale level.

The gray scale is brighter as the number is larger.

Note.2) Data; 1: High, 0: Low

Note.3) By inputting 8-bit data signal for each red, green and blue, this module can display 256 gray scale independently for each color.

Therefore, the module is able to display 16 million colors. Color data are 24 lines.

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10-3. Input Signal Timing

Table 10-3 and Fig.10-3 shows the input signal timing.

Table 10-3. Timing Characteristics

(T=0~50°C, V_{cc}=5±0.25V)

Item		Symbol	Min.	Typ.	Max.	Unit	Remark	
DCLK signal (Clock) ②	Period	Tc	12.500④	15.382	20.000	ns	fc=1/Tc *1	
	Frequency	fc	50.00	65.01	80.00④	MHz		
	Duty	Tch/Tc	45	50	55	%		
	High time	TelkH	5.0	—	—	ns		
	Low time	TelkL	5.0	—	—	ns		
	Rise time	Telkr	—	—	5.0	ns		
	Fall time	Telkf	—	—	5.0	ns		
DCLK-Data Timing		Setup time	Tset	(4.5)4④	—	—	ns	
		Hold time	Thold	(6.5)4④	—	—	ns	
Data-ENAB timing	Horizontal	Period	Th	1340	1344	(3012) 1688④	DCLK	
		Frequency	fh	46.6	48.3	55.5④	kHz	
		Display period	Thd	1280	1280	1280	DCLK	
	Vertical	Period	Tv	776	806	806④	Th	16.67ms
		Frequency	1/Tv	(50)④	60	(75)④	Hz	WXGA mode
		Display period	Tvd	768	768	768	Th	*2,3
	Data-ENAB timing		Tdn	0	0	0	DCLK	*4

*1) DCLK signal input must be valid while power supply is applied.

*2) Display position is specified by the ENAB signal only.

- Horizontal display position is specified by the rise of ENAB signal. The data which is latched by the falling edge of 1st DCLK right after the rise of ENAB, is displayed on the left edge of the screen.
- Vertical display position is specified by the rise of ENAB after a “Low” level period equivalent to eight times of horizontal period. The 1st data corresponding to one horizontal line after the rise of ENAB is displayed at the top line of screen.

*3) If a period of ENAB “High” is less than 1280 DCLK or less than 768 lines, the rest of the screen displays black.

*4) The display position does not fit to the screen if a period of ENAB “High” and the effective data period do not synchronize with each other.

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Fig.10-3.Input Signal Timing Chart

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10-4. Correspondence between Data and Display Position

Fig.10-4 shows the Correspondence between Data and Display Position.

S0001 S0002 S0003 S0004 S0005 S0006 S0007 S0008 ----- S3839 S3840									
C001	R	G	B	R	G	B	R	G	
	0001	0001	0001	0002	0002	0002	0003	0003	
C768	R	G	B	R	G	B	R	G	
	0001	0001	0001	0002	0002	0002	0003	0003	
								G	B
								1280	1280

Fig.10-4. Correspondence Data and Display Position

10-5. Power Supply Sequence

The sequence of input signals and On/Off of the power supply of this LCD module should be in the specification shown in Fig.10-5 to prevent latch-up of the driver ICs and DC driving of the LCD panel.

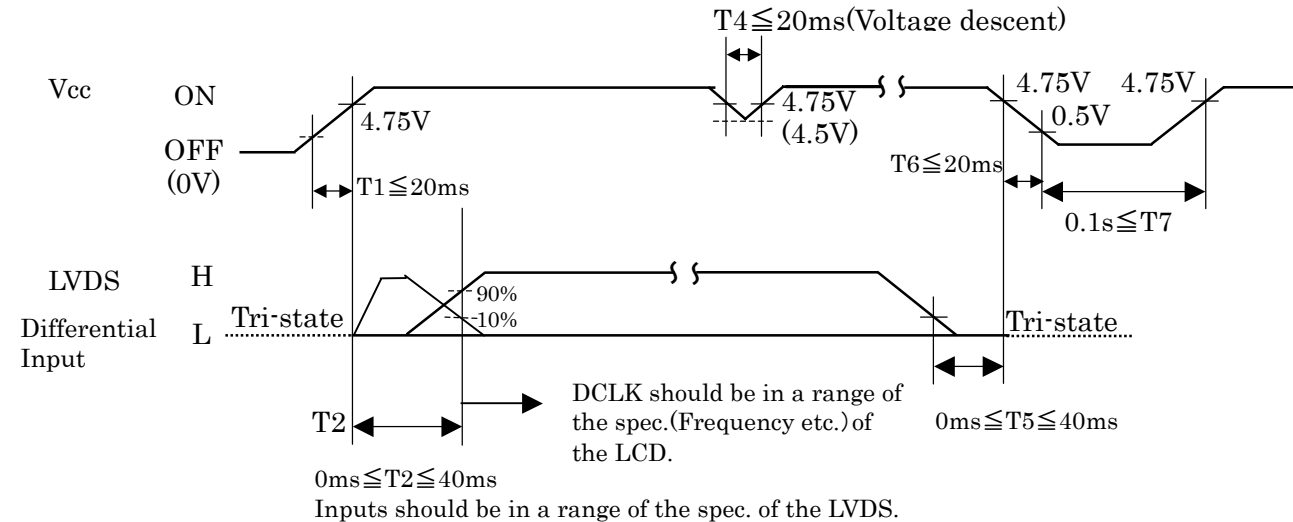


Fig.10-5. Power Supply Sequence

						FLC43XWC8V-02	
						Tech Bes LCD-00149	CUST.
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【FLC43XWC8V-02】								
11. BACKLIGHT SPECIFICATIONS								
A	<u>11-1. Pin Configuration for Backlight</u> Table 11-1(a) and 11-1(b) shows the description and pin assignment of the connectors (CN-A and B) for the Backlight of this LCD module.							A
	<u>Table 11-1(a) Pin Assignment of CN-A</u>				<u>Table11-1(b) Pin Assignment of CN-B</u>			
B	Pin No	Signal	Function	Cable color	Pin No	Signal	Function	Cable color
	1	VL1	Power supply for CCFL 1	Red	1	VL3	Power supply for CCFL 3	Red
	2	VL2	Power supply for CCFL 2	Red	2	VL4	Power supply for CCFL 4	Red
	3	NC	—	-	3	NC	—	-
	4	GND	Ground (for VL1, 2)	White	4	GND	Ground (for VL3, 4)	White
Connector : Housing : BHR-04VS-1 : Contact : SBH-001T-P0.5 User's Connector: Post with base : SM04(4.0)B-BHS-1-TB Supplier : Japan Solderless Terminal Trading Company LTD. (J.S.T.)								
C	<u>11-2. CCFL</u> Supplier : SANKEN ELECTRIC CO., LTD Part No. SD26E3850E8350B3113000							C
	<u>11-3. Life</u> The life of the backlight is a minimum of 25,000 hours at the following conditions.							
D	(1) Working conditions Ambient temperature : 25±5°C Tube current(I _L) : (10.5mA or less)							D
	(2) Definition of life Brightness becomes 50% or below 50% of the minimum brightness value shown in Table 9-1. The lamp cannot be lit by the breakdown voltage of 1600Vrms. Lamp is flashing.							
	<u>11-4. Lamp Assembly set (for replacement)</u> Lamp Assembly set (with charge) is prepared for maintenance. This set consists of an upper lamp assembly and a lower lamp assembly. Type number : FLCL-21							
FLC43XWC8V-02								
Tech Bes LCD-00149							CUST.	
FUJITSU DISPLAY TECHNOLOGIES CORPORATION							19/	
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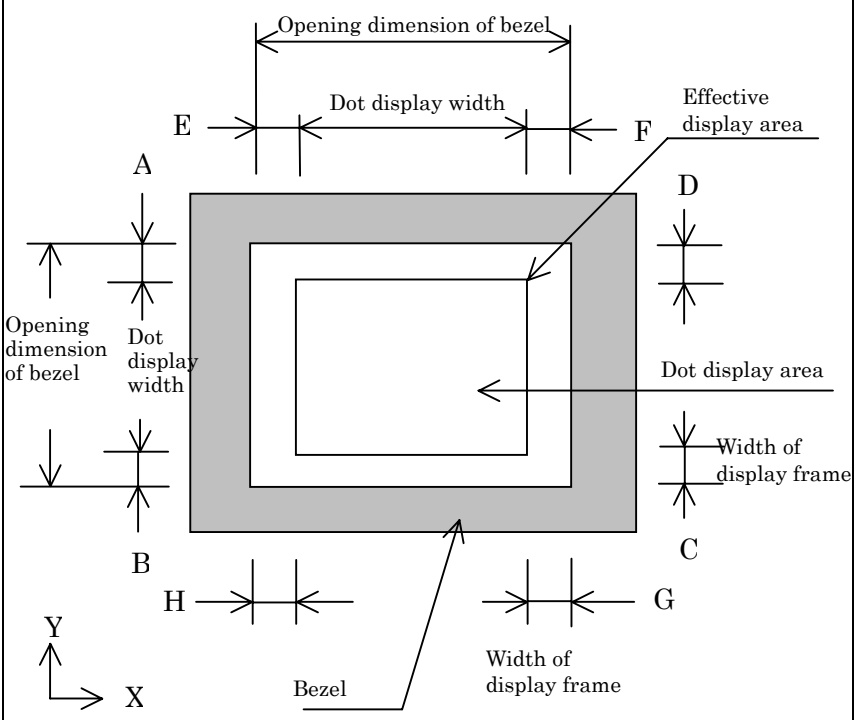
		1			2			3			4
【FLC43XWC8V-02】											
12. APPEARANCE SPECIFICATIONS											
A	<u>12-1. Zone</u> • Inside display dot area (369.6× 221.8mm) • Display dot area means active area. • One pixel consists of 3 dots (red, green and blue). • Foreign particle and scratch unharmed to display image, such as the foreign particle under polarizer film but outside of the display area and scratch on metal bezel, backlight module or polarizer film out of the display area, etc., are not counted.										
B	<u>12-2. Bright spots</u> (1) Bright spots by the defect of TFT. • Visible under bias of 2% ND filter High bright spot R・G • Visible under 5% but invisible under 2% ND filter Low bright spot R・G・B • Invisible under bias of 5% ND filter Not counted (2) Bright spots by the light passing through tears, breaks, etc in color filter. • Exceed size of a half dot High bright spot • A half dot or less Not counted (3) Bright spots by the light passing through tears, breaks, etc in chromium mask. • Exceed 50μm High bright spot • 50μm or less Not counted										
C	<u>12-3. Test condition</u> • Inspector must observe the LCD screen from the normal direction under the illumination by a single 20W fluorescent lamp. The distance between the LCD screen and the inspector should be a height of 50cm above the worktable. The vertical illuminance is 300 to 600lux (reference value). • Bright spot should be counted under entire black screen. • Dark spot should be counted under entire white screen. • Frame frequency should be 60Hz.										
D	<u>12-4. Specifications</u> Table 12-4 shows the appearance standard. (Note1) Please do not mistake a single bright spot for a bright spot connection due to Cs(supplemental capacitance) line at the center of each dot. (Note2) If a pixel is dark partially, it connects into the number of dark spots in accordance with following rule. (a) $S < 1/3$: Not count. Only one of 4 dark connection is allowed. (b) $1/3 \leq S < 2/3$: Considered as 0.5 dot. (c) $2/3 \leq S$: Considered as 1 dot. (S=Dark spot size/dot size) (Note3) Min. distance between foreign particles : 100mm										
E											
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								Tech Bes LCD-00149			
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【FLC43XWC8V-02】									
A	No.	Item				Judgment method and standard			
	1	Bright spot (high and Low)				≤3 dots (Note 1)			
	2	Bright spot connection (high and low)				≤1 pair (Note 1) (2 dot connection in horizontal)			
	3	Total of bright spot				≤3 dots			
	4	Dark spot				≤5 dots (Note 2)			
	5	Dark spot connection				≤2 pairs (2 dot connection in horizontal) (Note 2)			
	6	Total of dark spot				≤ 5dots (Note 2)			
B	7	Total of dot defect(bright and dark)				≤ 8 dots			
	8	Distance of bright spot	high-high high			≥15mm			
B			others			≥ 5mm			
	9	Distance of dark spot				≥ 5mm			
C	10	Scratch on polarizer		W≤0.03		————		Not count	
				0.03<W≤0.05		L≤6		Not count	
						6<L≤12		≤5	
						12<L		0	
				0.05<W≤0.10		L≤0.6		Not count	
						0.6<L≤5		≤3	
						5<L		0	
				0.15<W≤0.3		W×L≤0.4		≤1	
						0.4<W×L		0	
				0.10<W		————		0	
11	Dent on polarizer		D≤0.3		Not count				
			0.3<D≤0.4		≤6				
			0.4<D		0				
12	Bubble in polarizer		D≤0.3		Not count				
			D≤0.5		Not count				
			0.5<D		0				
13	Spot (black/white) by foreign particle		D<0.5		≤5				
			0.5≤D		0				
14	Bright spot by fiber foreign particle (under the polarizer. i.e. between the polarizer and the glass) (Note 3)		D≤0.2		Not count				
			0.2<D≤0.3		≤2				
			0.3<D≤0.35		1				
			0.35<D		0				
15	Line (black /white), scratch by fiber foreign particle		W≤0.03		————		Not count		
			0.03<W≤0.05		L≤6		Not count		
					6<L≤12		≤5		
					12<L		0		
			0.05<W≤0.1		L≤0.6		Not count		
					0.6<L≤5		≤3		
					5<L		0		
0.1<W		(W+L)/2=D		Count as spot (black/white) of No.13					
D:Average diameter [mm], W:Width [mm], L:Length [mm], S=(bright spot size)/(dot size)									
DATE						FLC43XWC8V-02			
						Tech Bes LCD-00149			
	04 20021205					CUST.			
	03 20020924								
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【FLC43XWC8V-02】																																																						
Applied area					Item					Condi tion					Specifi cation																																							
Display dot area					Display location					Non-lighting					As for the display position in the display dot area, the variation of tolerance between window frame of the upper bezel and dot display area (right, left, up and down) is shown in the following table.  <table><thead><tr><th>Tolerance (X direction)</th><th>Tolerance (Y direction)</th></tr></thead><tbody><tr><td> E·F ≤ 1.0mm</td><td> A·B ≤ 1.0mm</td></tr><tr><td> E·H ≤ 0.7mm</td><td> A·D ≤ 0.7mm</td></tr><tr><td> F·G ≤ 0.7mm</td><td> B·C ≤ 0.7mm</td></tr><tr><td> G·H ≤ 1.0mm</td><td> C·D ≤ 1.0mm</td></tr></tbody></table> *The dimension of effective display area, dot display area and display frame should follow the dimensions described in each specification.																				Tolerance (X direction)	Tolerance (Y direction)	E·F ≤ 1.0mm	A·B ≤ 1.0mm	E·H ≤ 0.7mm	A·D ≤ 0.7mm	F·G ≤ 0.7mm	B·C ≤ 0.7mm	G·H ≤ 1.0mm	C·D ≤ 1.0mm										
															Tolerance (X direction)	Tolerance (Y direction)																																						
															E·F ≤ 1.0mm	A·B ≤ 1.0mm																																						
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															F·G ≤ 0.7mm	B·C ≤ 0.7mm																																						
G·H ≤ 1.0mm	C·D ≤ 1.0mm																																																					
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B

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F

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【FLC43XWC8V-02】							
13. ENVIRONMENTAL SPECIFICATIONS							
Table 13-1 shows the environmental specifications.							
Table 13-1. Environmental Specifications							
Item		Condition		Remark			
Temperature		Operation	0~57°C (Note1)	Temperature on surface of LCD panel (display area.)			
		Storage	-20~60°C				
Humidity		Operation	20~85%RH	Maximum wet-bulb temperature should not exceed 29°C. No condensation.			
		Storage	5~85%RH				
Vibration		Non-operation	10~500Hz, 1 cycle/20minute, 2G, 1.5mm max, 2hour each X, Y and Z directions	For single module without package.(Note2)			
Shock		Non-operation	30G, 6ms, 1time each ±X, ±Y and ±Z directions.				
Note1: Temperature on surface of LCD panel should be under 57 .							
Note2: Table 13-2 and Fig. 13-1 show the shock resistance standard when module is packaged.							
Table 13-2. Shock Resistance Standard when Module is Packaged							
Dropping location		Dropping height		Count			
A ~ J		60cm		1 time			
Fig.13-1. Direction to apply shock to package							
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		FUJITSU DISPLAY TECHNOLOGIES CORPORATION					23/
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【FLC43XWC8V-02】																																																																							
14. INDICATIONS																																																																							
This module has the following indications.																																																																							
A	(1) Product name		: LCD unit																																																																				
	(2) Model number		: FLC43XWC8V-02																																																																				
	(3) Product drawing number		: NA19026-C071																																																																				
	(4) Manufacturing number		: 2		Y	0	0	0	0	1																																																													
B					Serial number (To be reset every month on 1st.)																																																																		
					Manufacturing month (Oct. = X, Nov. =Y, Dec. =Z)																																																																		
					Last digit of manufacturing year.																																																																		
	(5) Version number		: 01A (Example)																																																																				
			-1st 2 digits “01” means operational version.																																																																				
			-3rd alphabet means functional version.																																																																				
	(6) Country of origin		: MADE IN JAPAN																																																																				
C	(7) Company name		: FUJITSU DISPLAY TECHNOLOGIES CORP.																																																																				
	(8) Caution when changing cold-cathode tubes and disposal method of them.		(See Fig. 14-1)																																																																				
			• WHEN CHANGING COLD CATHODE FLUORESCENT LAMPS, FOLLOW OPERATING SPECIFICATIONS, ESPECIALLY BE CAREFUL ABOUT THE LAMP'S SIDE-EDGE. • 蛍光灯の交換は作業仕様書に従って行って下さい。特に蛍光灯ホルダ側面のエッジに気をつけて下さい。 • THIS TFT COLOR LCD CONTAINS COLD CATHODE FLUORESCENT LAMPS. PLEASE FOLLOW LOCAL ORDINANCES OR REGULATIONS FOR ITS DISPOSAL. • 当該液晶ディスプレイユニットには蛍光灯が組み込まれていますので、地方自治体の条例または規則に従って廃棄して下さい。 LCD unit MADE IN JAPAN FLC43XWC8V-02 0X50015 NA19026-C071 01A FUJITSU DISPLAY TECHNOLOGIES CORP.																																																																				
D			Fig.14-1 Fig.14-2 Product label (example)																																																																				
15. PACKAGING																																																																							
Separately specified in packaging specifications.																																																																							
15-1. Packaging specifications																																																																							
(1) 5 LCD modules / 1 package.																																																																							
(2) Weight: approximately 13kg / 1 package.																																																																							
(3) Outline dimensions : 348mm(W) × 328(D) × 490mm(H)																																																																							
15-2. Packaging method																																																																							
Fig.15-2 (a),(b),(c),(d) show the packing method.																																																																							
<table><tr><td colspan="6"></td><td colspan="3">FLC43XWC8V-02</td></tr><tr><td colspan="6"></td><td colspan="3"></td></tr><tr><td colspan="6"></td><td colspan="2">Tech Bes LCD-00149</td><td>CUST.</td></tr><tr><td colspan="6"></td><td colspan="2"></td><td></td></tr><tr><td>EDIT</td><td>DATE</td><td>DESIG.</td><td>CHECK</td><td>APPR.</td><td colspan="4">DESCRIPTION</td></tr><tr><td colspan="2">DESIG.</td><td colspan="2"></td><td>CHECK</td><td colspan="2"></td><td>APPR.</td><td></td></tr><tr><td colspan="2">1</td><td colspan="2"></td><td></td><td colspan="2"></td><td></td><td></td></tr></table>															FLC43XWC8V-02																		Tech Bes LCD-00149		CUST.										EDIT	DATE	DESIG.	CHECK	APPR.	DESCRIPTION				DESIG.				CHECK			APPR.		1								
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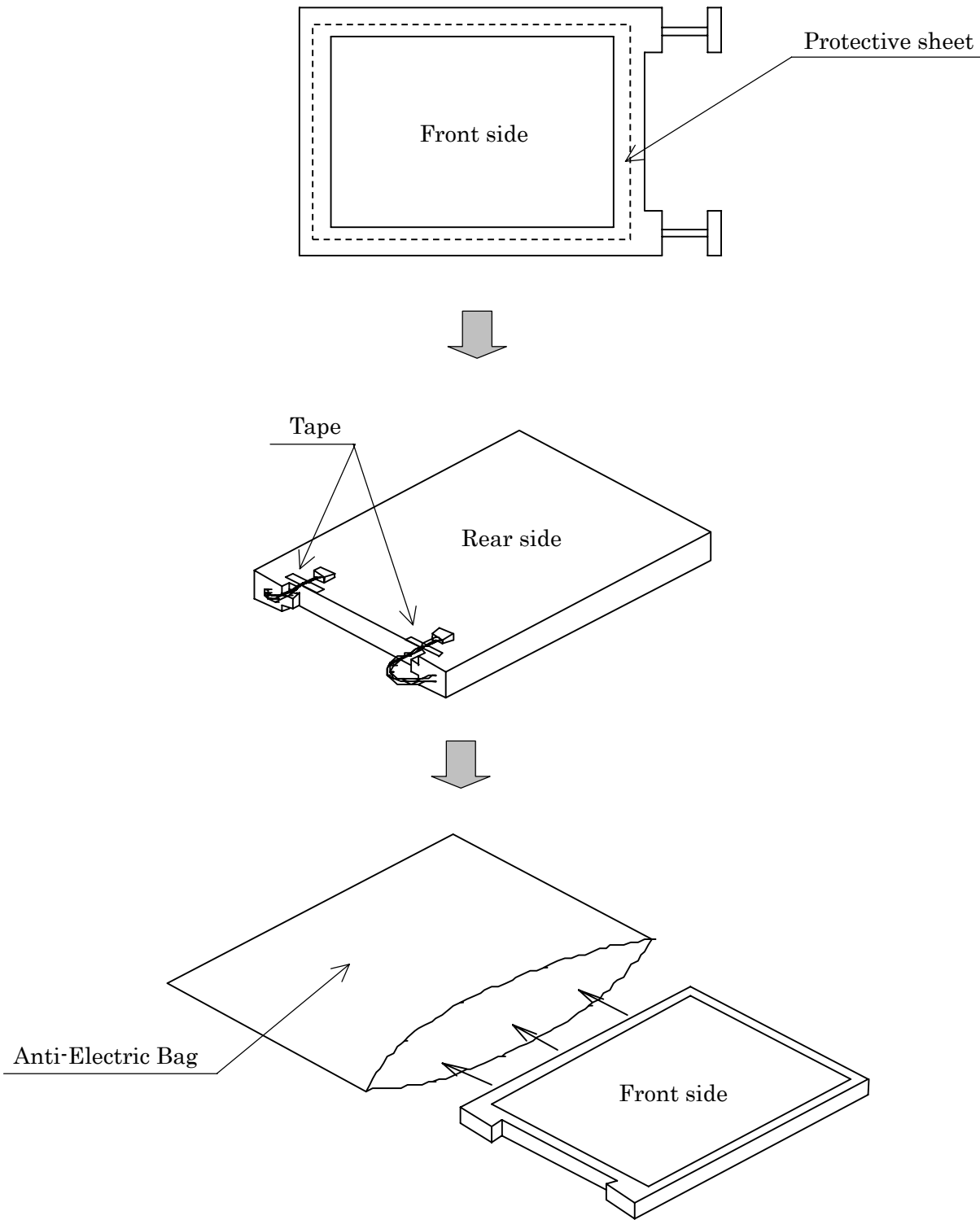


Fig.15-2(a) Packaging Method

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						Tech Bes LCD-00149			CUST.
						FUJITSU DISPLAY TECHNOLOGIES CORPORATION			
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A

Holder(bottom)

LCD unit

B

A

B

C

Holder(upper)

C

D

D

E

F

Label(example)

型 格 (TYPE)	FLC43XWC8V-02	数 量 (QTY.)	5
図 番	NA19026-C071	版 数	01A
(DRWG. NO.)		(REV. NO.)	
	9X00001		
	9X00002		
	9X00003		
	9X00004		
	9X00005		

バーコード

MADE IN JAPAN

- Taping
Upper : H or I method
Bottom : H method
- Upper and bottom holders should be anti-electrostatic type.

Fig.15-2(b) Packaging Method

FLC43XWC8V-02

Tech Bes LCD-00149

CUST.

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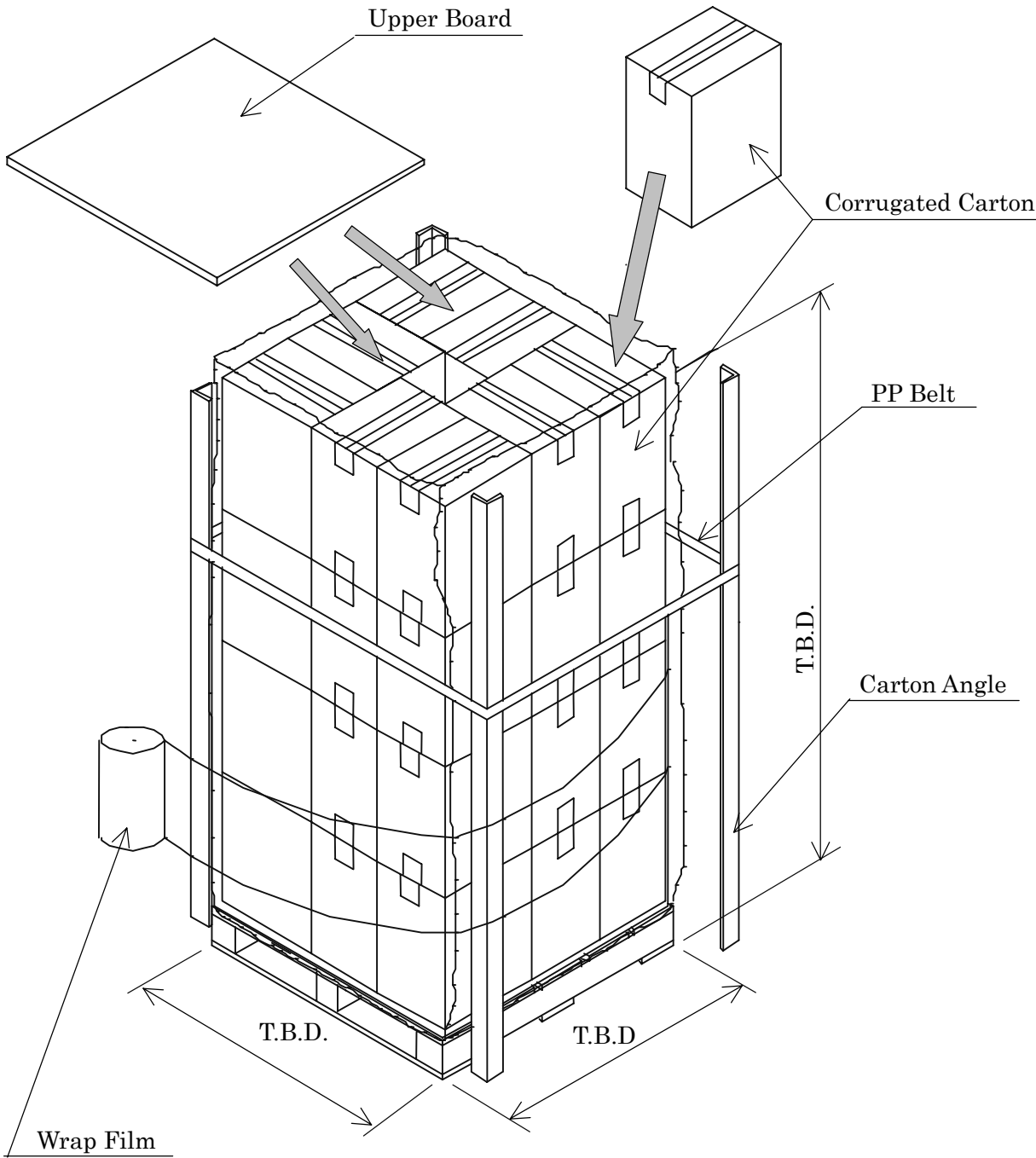


Fig.15-2(c) Packaging Method

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A

Corrugated carton(A)
With LCD modules

Cushioning material

B

A

B

Corrugated fiberboard shipping container(B)

602
(580)446
(430)646
(630)

C

C

Note 1) The carton (A) should be placed in the middle of the container(B) with enough cushioning materials.

D

D

Figure.15-2(d) Packaging Method

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FLC43XWC8V-02

Tech Bes LCD-00149

CUST.

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CORPORATION

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【FLC43XWC8V-02】																													
A	16.WARRANTY The warranty period is one year after manufacturing. Products which fail during this period are repaired or replaced without charge, unless the failure is caused by user.																												
	17.PRECAUTIONS Adhere to the following precautions to properly use this LCD module.																												
B	(1) Fail safe design LCD module has an inherent chance of failure. Customers must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.																												
	(2) Handling of LCD panel Do not apply any strong mechanical shock to the LCD panel. Since the LCD panel is made of glass, excessive shock may damage the panel or cause a malfunction.																												
C	Do not press hard on the LCD panel surface. In the LCD panel, the gap between two glass plates is kept precisely and uniformly to maintain display's characteristics and reliability. If this panel is pressed hard, the following troubles occurs. (a) Ununiformity of color (b) Orientation of liquid crystal becomes disordered Problem (a) returns to normal after a while. Problem (b) returns to normal if power is shut off once then turned on again. However these operations should be avoided to insure reliability.																												
	Do not scratch the polarizer film on the LCD panel surface. - Do not press or rub the display surface with a hard tool, pincet, etc. - For handling, use cotton or conductive gloves so that the display surface is not stained. - For If the display surface is stained by dust or dirt, clean it as follows with a soft cloth (deer skin, etc.)																												
D	[Dust] Wipe off with a soft cloth. (do not rub.) [Dirt] Wipe off lightly with a soft cloth after soaking in the clear water and squeezing hard out of water drops. Only if the dirt is hardly wiped off, use isopropyl alcohol or ethanol. Be careful not to splash the water or the solvent and water penetrated between the polarizer and the LCD panel. Do not use solvents such as ketone (acetone, etc.) and aromatics (xylene, toluene, etc.)																												
	- If saliva or water drops are left for long time, it may deform partial deformation or discolored. Wipe off immediately in the same way as for dirt. - Do not allow oil to adhere to the module, since the cleaning of oil is difficult.																												
E	Do not place or contact objects on the display surface for a long period of time. That's because this may make some parts of the LCD module distorted and the display quality may decline.																												
F						FLC43XWC8V-02																							
						Tech Bes LCD-00149			CUST.																				
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B

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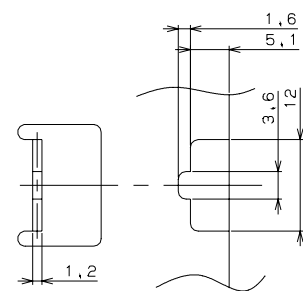
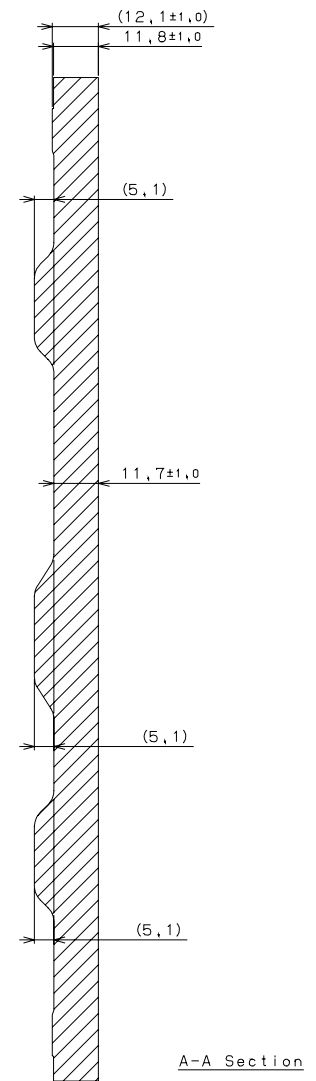
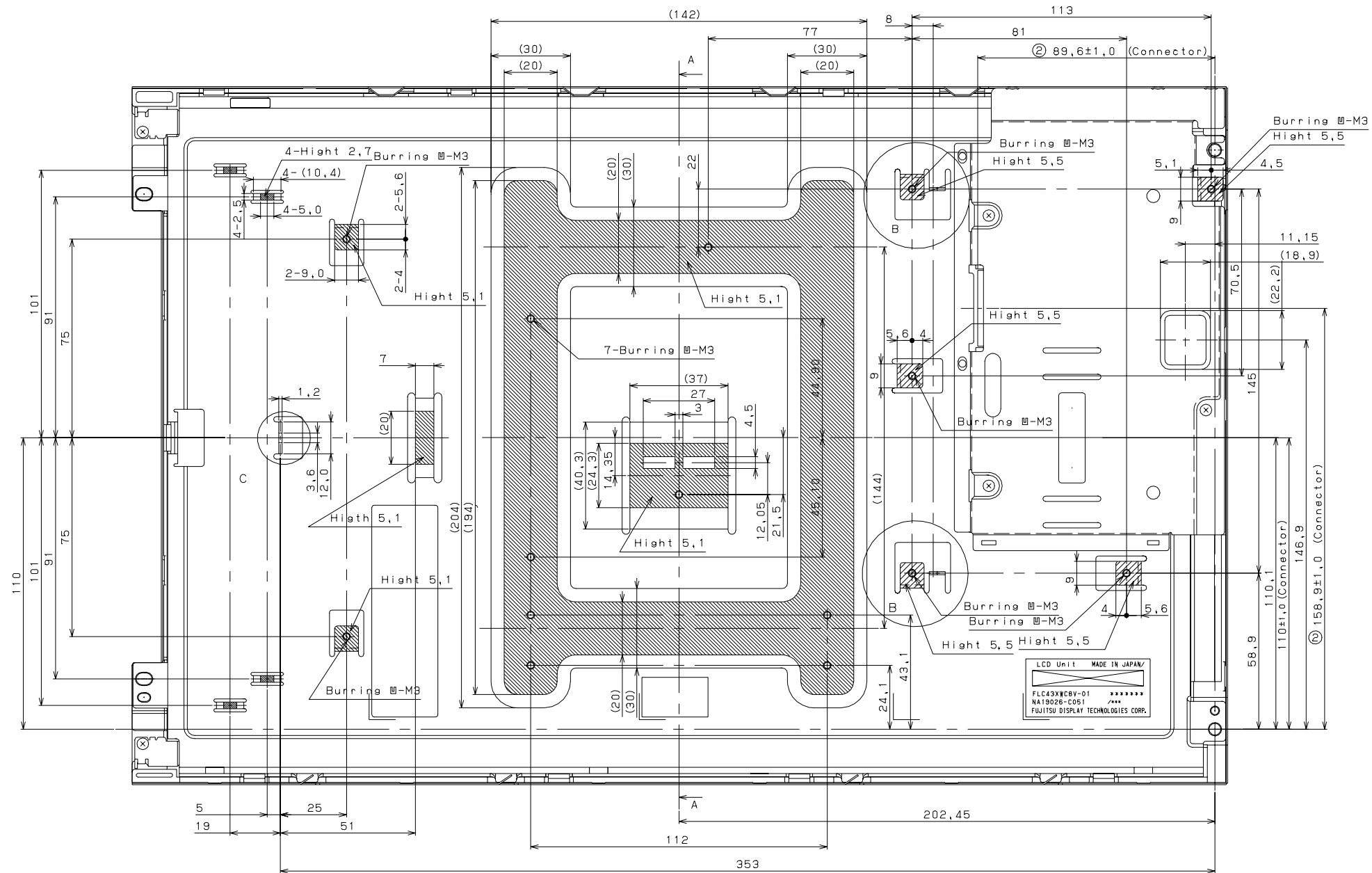
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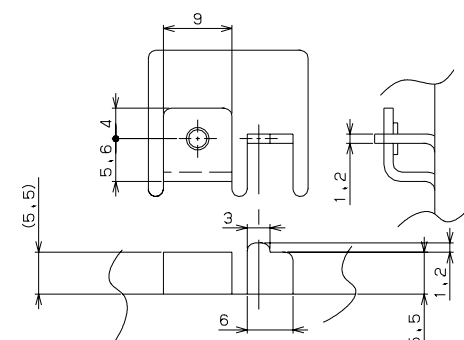
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Detail C



Detail B

				TITLE FLC43XWC8V-02			
04/2002/205				DRAW NO. Tech Bes LCD-00149			
02/2002/0807				Connector position changed			
DESIGN	DATE	DESIGN	CHECK	DESCRIPTION			
				APPR.			