



FLAT DISPLAY TECHNOLOGY



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§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No LP104CWWB~~X~~-F~~X~~R

Description: 10.4" Digital TFT-LCD Module

SPEC No.: SAS-1212002

Version: 0.1

Issue Date: October 18, 2013

※ This approval sheet contains 23 pages including the cover and appendix.

Customer:

Date: / / 13

APPROVED BY:

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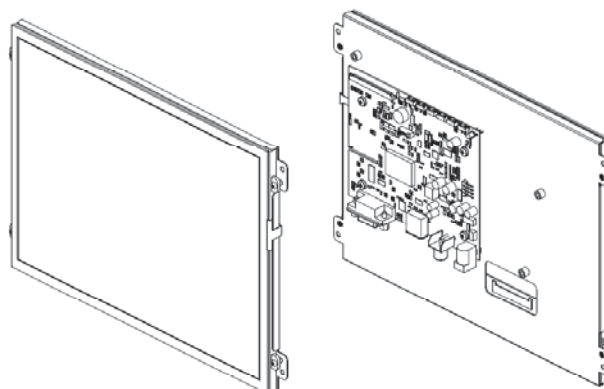
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FLAT DISPLAY TECHNOLOGY

10.4" Digital TFT-LCD Module



■ LP104CWWB~~x~~-F~~x~~R

1. General Description

1.1 Features

- 10.4" Digital TFT LCD
- Ultra Compact
- NTSC/PAL/SECAM Video Auto Switch
- Single Operation Voltage +12V
- CVBS / Analog RGB (PC Mode) Signal Input
- All Functions can be controlled by UART
- Support Touch Screen Function (Option)

1.2 Applications

- Portable product
- Industrial
- Hand-held
- Security
- Instrument Display
- Office Electronics

1.3 Application Precautions

Do not use the products herein for the following equipment which demands extremely high performance in terms of functionality, reliability, or accuracy.

- Aerospace equipment
- Communication equipment for trunk lines.
- Control equipment for the nuclear power industry.
- Medical equipment related to life support, etc.

The other application that demands high reliability and functionality should first contact a sales representative.

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2. Contents

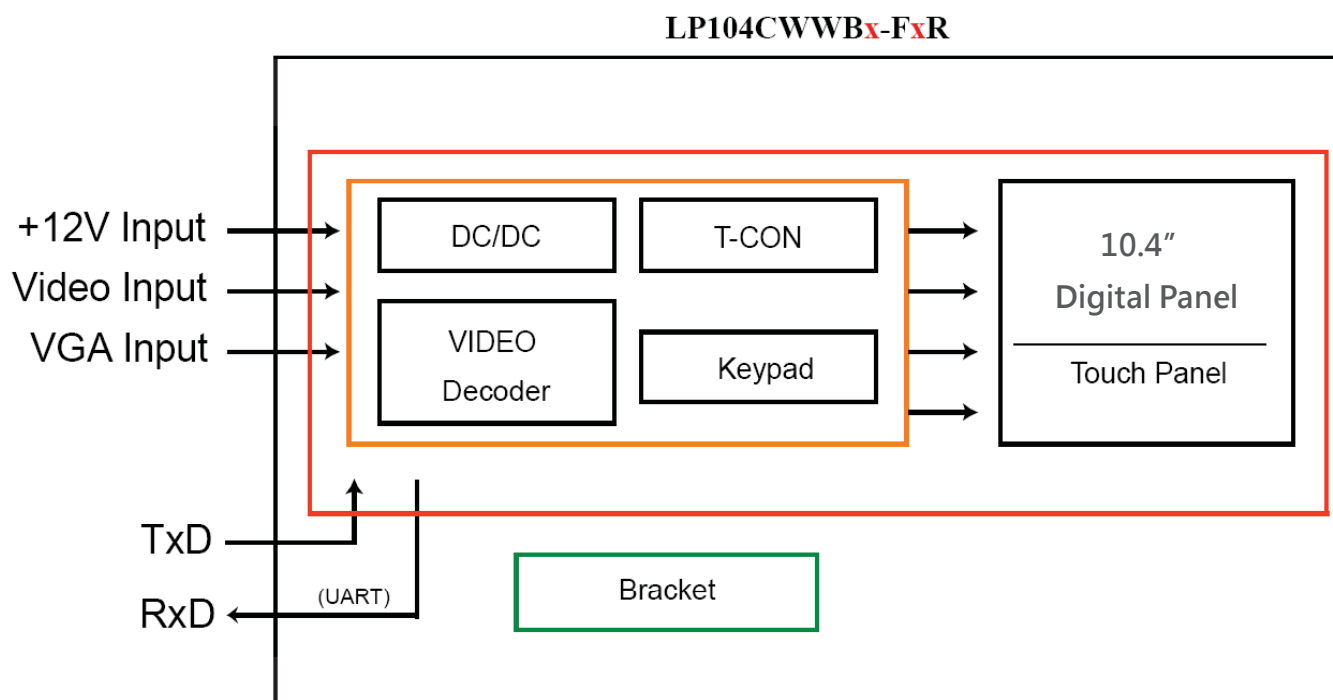
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Preliminary

3. Block Diagram

3.1 Block Diagram



4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

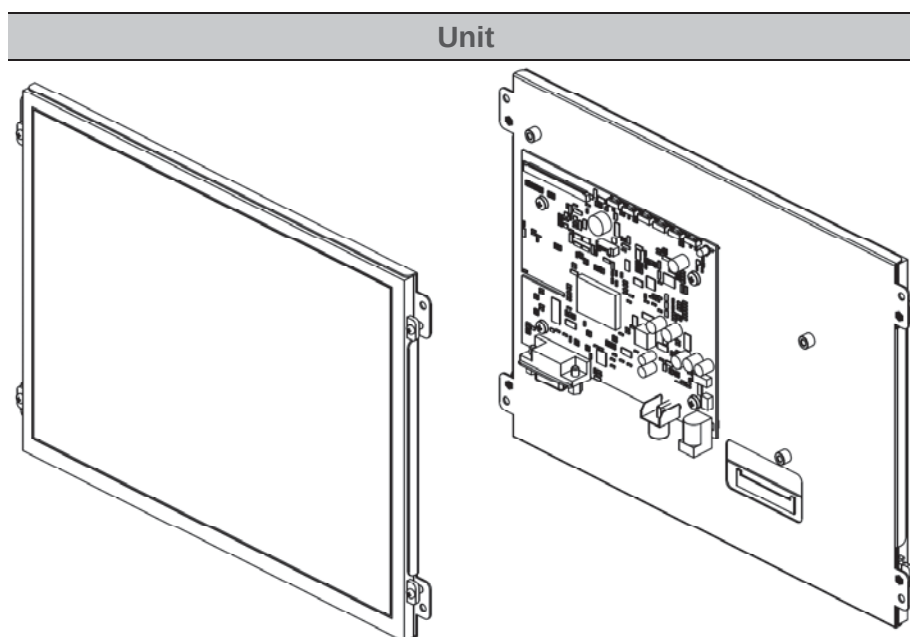
Parameter	Specifications	Unit
Screen Size	10.4 (diagonal)	inch
Display Format	1024 x (R.G.B) x 768	dot
Active Area	211.2 (H) x 158.4 (V)	mm
Pixel Pitch	0.20625 (H) x 0.20625 (V)	mm
Pixel Arrangement	RGB vertical stripe	
Number of colors	262,144	
Surface Treatment	Anti-Glare Hardness: 3H	

4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	65	75	---	deg	
		Right	65	75	---		
	Vertical	Top	50	60	---	deg	
		Bottom	70	80	---	deg	
Contrast Ratio	CR	At optimized Viewing angle			---	---	
Response time	Rise Fall	Tr + Tf	$\theta = 0^\circ$	25	30	ms	
Brightness	L		320	400	---	cd/m ²	
White Chromaticity	x	$\theta = 0^\circ$	0.273	0.313	0.353		
	y	$\theta = 0^\circ$	0.289	0.329	0.369		
LED Life Time		25°C	20000	---	---	Hr	

5. Order Information

5.1 Unit



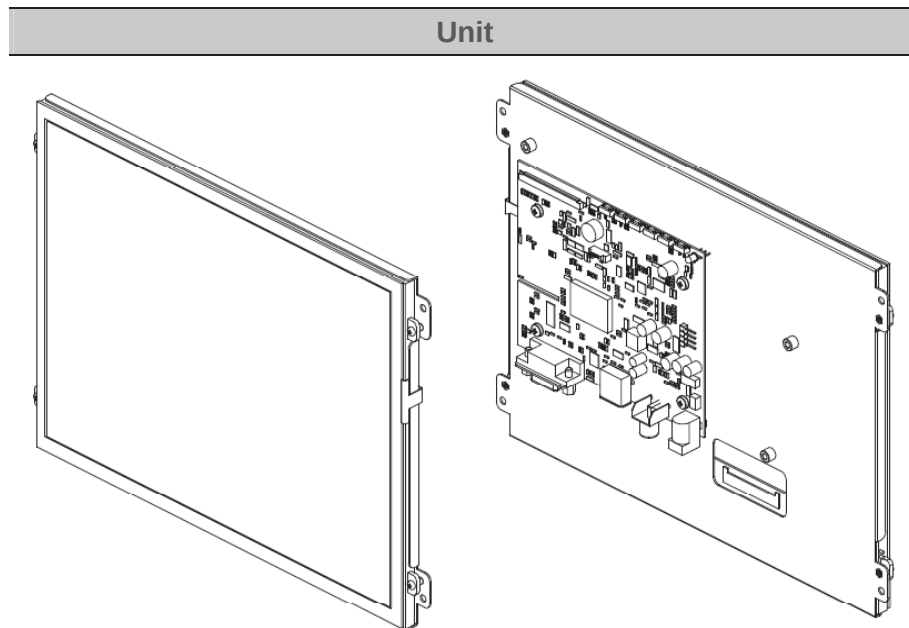
Parameter	LP104CWWB1-FBR	LP104CWWB1-FNR	Unit
CVBS	1	1	
VGA (D-Sub15 / 2.0mm 14Pin)	D-Sub15	D-Sub15	
LVDS Cable 30P-30P 1.0mm L: 200mm	⊙	⊙	
AC to DC Adapter 12V/3A (LASTD12030-FDR)	⊙	-	
Power Cord Plug Type B for USA (LAACD18000-FDR)	⊙	-	
Video Cable (LAVDO18000-FDR)	⊙	-	
VGA Cable (LAVGA16000-FDR)	⊙	-	

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5.2 Unit (Touch)



Parameter	LP104CWWB4-FBR	LP104CWWB5-FBR	LP104CWWB4-FNR	LP104CWWB5-FNR	Unit
CVBS	1	1	1	1	
VGA (D-Sub15 / 2.0mm 14Pin)	D-Sub15	D-Sub15	D-Sub15	D-Sub15	
Touch Panel Type	4W Resistive	4W Resistive	4W Resistive	4W Resistive	
Touch Screen Interface	USB	RS232	USB	RS232	
LVDS Cable 30P-30P 1.0mm L: 200mm	⊙	⊙	⊙	⊙	
AC to DC Adapter 12V/3A (LASTD12030-FDR)	⊙	⊙	-	-	
Power Cord Plug Type B for USA (LAACD18000-FDR)	⊙	⊙	-	-	
Video Cable (LAVDO18000-FDR)	⊙	⊙	-	-	
VGA Cable (LAVGA16000-FDR)	⊙	⊙	-	-	
USB Cable (LAUSB18000-FDR)	⊙	-	-	-	
RS-232 Cable (LARS218000-FDR)	-	⊙	-	-	
Touch Screen Driver CD Disk	⊙	⊙	⊙	⊙	

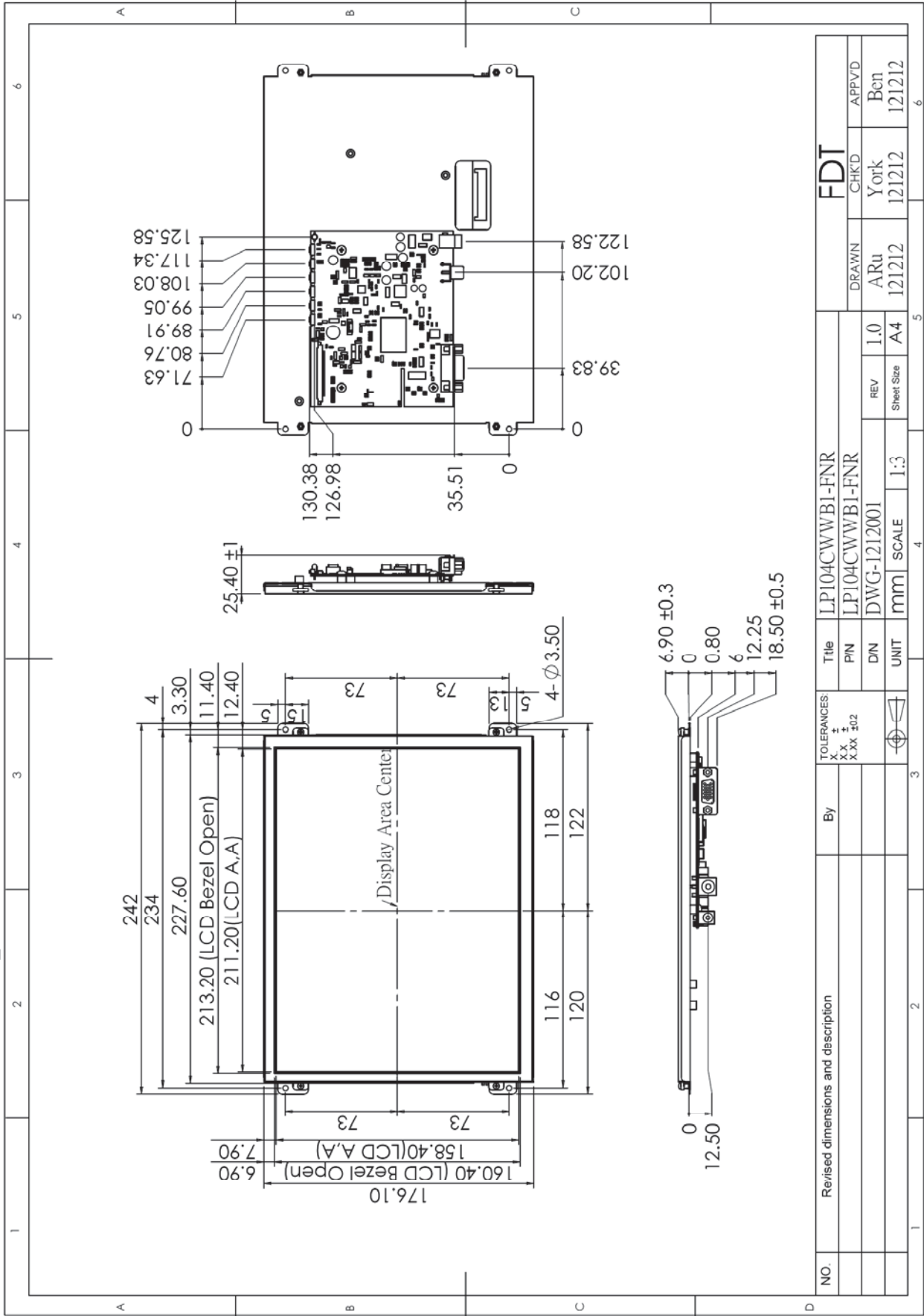
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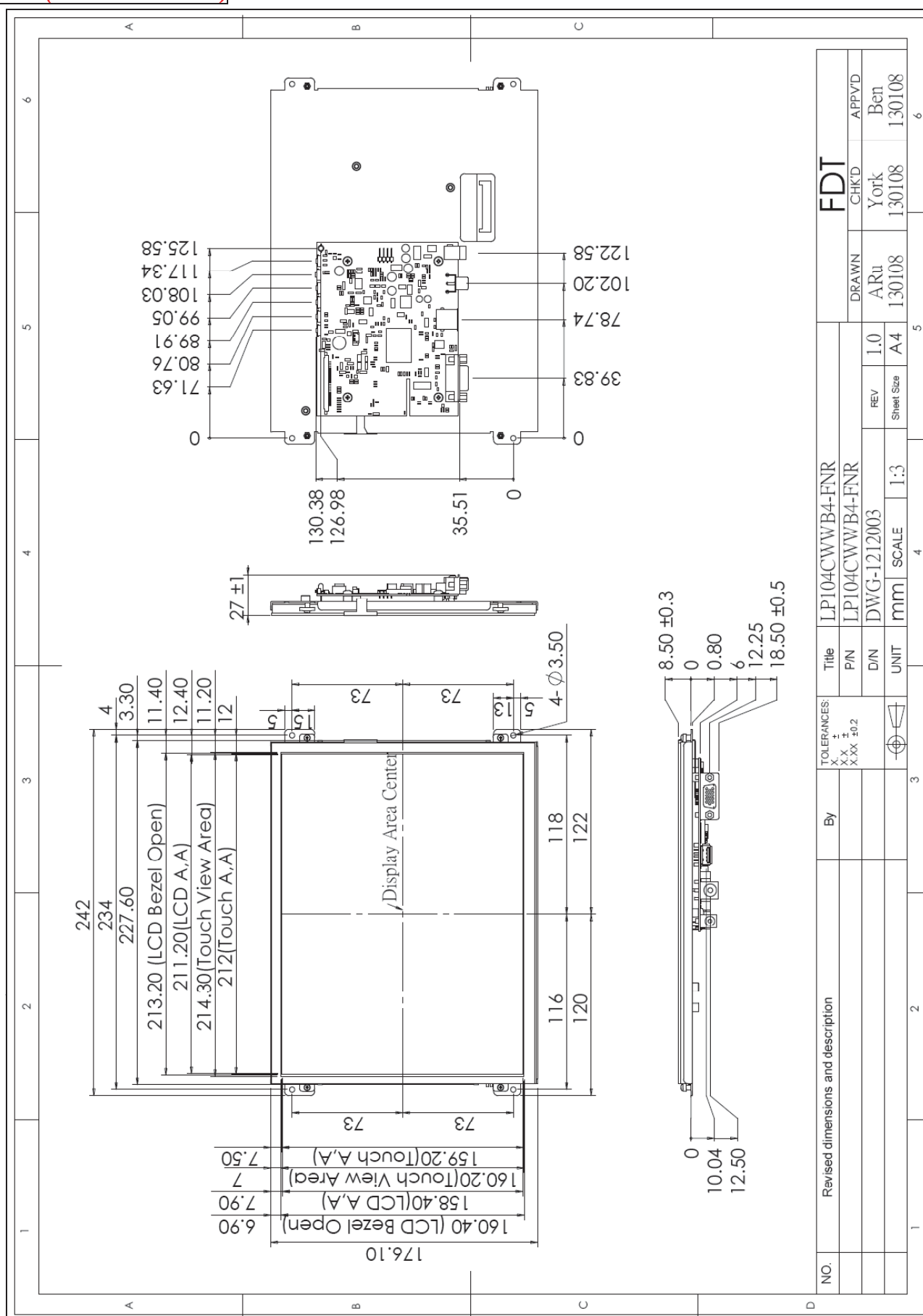
6. Dimension Information

6.1 Unit (LP104CWWB1-FNR)



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6.2 Unit (LP104CWWB4-FNR)

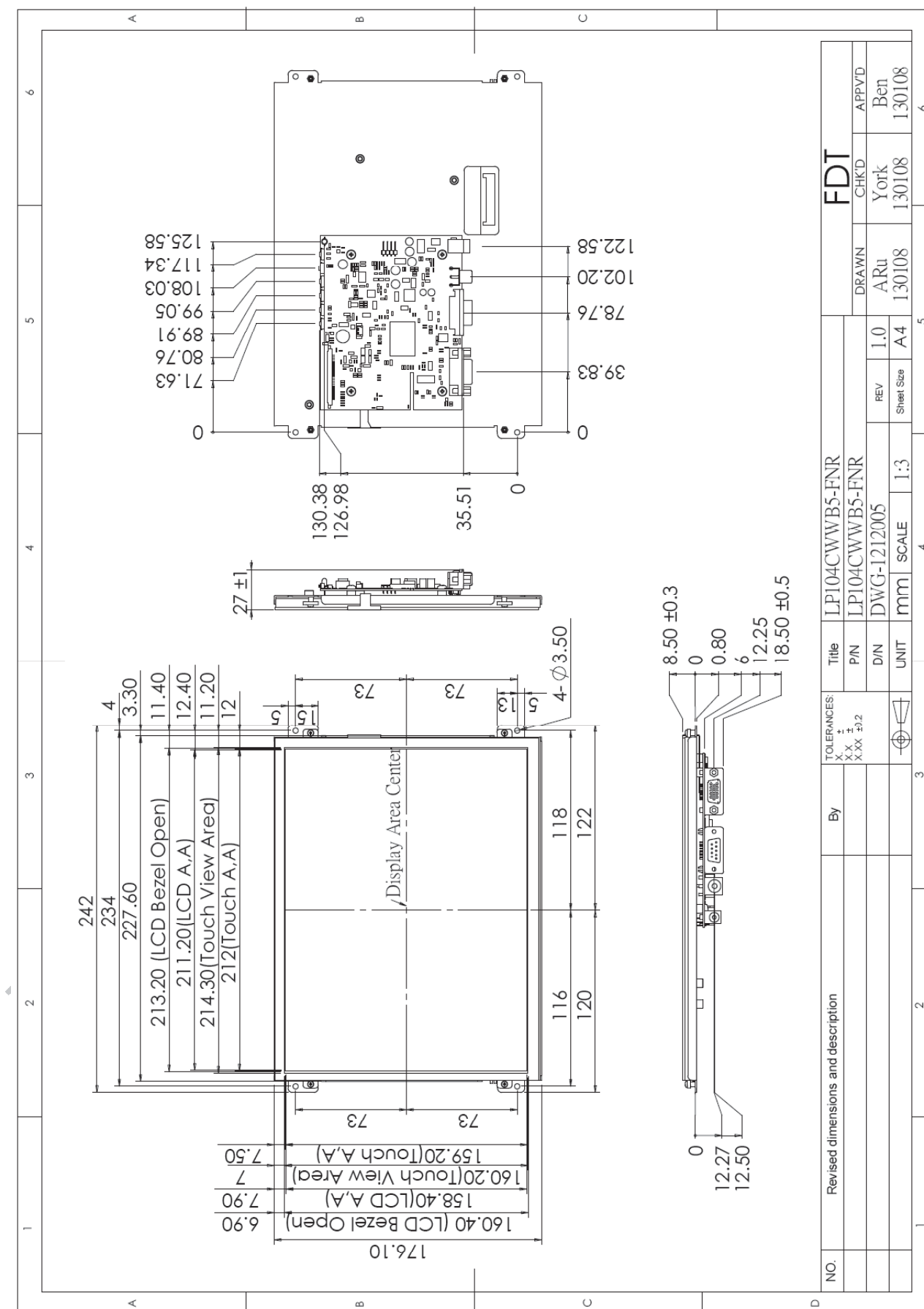


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6.3 Unit (LP104CWWB5-FNR)



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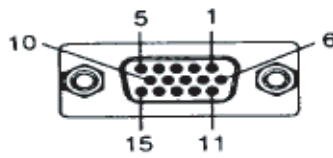
7. Pin Description

7.1 J301 : CPT LCD Panel I/O Terminals (Pitch 1.0mm 30Pin, Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	GND	P	Ground	
2	VCC	I	Power supply: +3.3V	
3	VCC	I	Power supply: +3.3V	
4	NC	P	No Connection	
5	NC	P	No Connection	
6	NC	P	No Connection	
7	GND	P	Ground	
8	RX0-	I	Negative transmission data of pixel 0	
9	RX0+	I	Positive transmission data of pixel 0	
10	GND	P	Ground	
11	RX1-	I	Negative transmission data of pixel 1	
12	RX1+	I	Positive transmission data of pixel 1	
13	GND	P	Ground	
14	RX2-	I	Negative transmission data of pixel 2	
15	RX2+	I	Positive transmission data of pixel 2	
16	GND	P	Ground	
17	RXCLK-	I	Negative of clock	
18	RXCLK+	I	Positive of clock	
19	GND	P	Ground	
20	NC	P	No Connection	
21	NC	P	No Connection	
22	GND	P	Ground	
23	NC	P	No Connection	
24	NC	P	No Connection	
25	GND	P	Ground	
26	NC	P	No Connection	
27	NC	P	No Connection	
28	NC	P	No Connection	
29	NC	P	No Connection	
30	NC	P	No Connection	

7.2 J106B : Pin Assignment of Analog RGB Input (D-Sub 15Pin)

Pin No	Symbol	I/O	Description	Remark
1	RI+	I	Analog Red Signal	
2	GI+	I	Analog Green Signal	
3	BI+	I	Analog Blue Signal	
4	NC	-	No Connection	
5	GND	-	Ground	
6	AGND	-	Analog Ground	
7	AGND	-	Analog Ground	
8	AGND	-	Analog Ground	
9	NC	-	No Connection	
10	NC	-	No Connection	
11	NC	-	No Connection	
12	NC	-	No Connection	
13	HS_IN	I	TTL Horizontal sync	
14	VS_IN	I	TTL Vertical sync	
15	NC	-	No Connection	

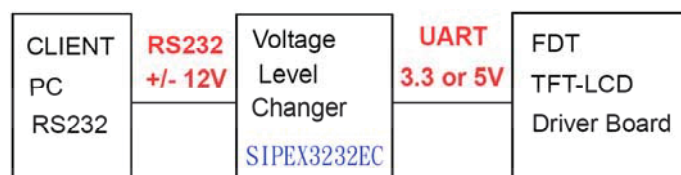


7.3 J104: Pin Assignment of UART (Pitch 1.25mm 4Pin, Top Entry Type)

- ※ FDT Connector Part No.: MS24014 (STM) [Same as 53398-0471 (MOLEX)];
- ※ FDT Matching Connector Part No.: P24014 (STM) [Same as 51021-0400 (MOLEX)].

Pin No	Symbol	I/O	Description	Remark
1	TX	O	UART Transmission Data	
2	RX	I	UART Receive Data	
3	GND	-	Ground	
4	+3.3V	O	+3.3V Output Voltage	

Note: All Functions can be controlled by UART, About UART command list please contact FDT sales.



7.4 DC 101: Pin Assignment of Power Input (Inside Diameter:2.1 ϕ Outside Diameter:5.5 ϕ Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	VIN	I	+12V Input Voltage	
2	GND	-	Power Ground	

7.5 RCA 101: Pin Assignment of Video Input (RCA JACK Yellow, Side Entry Type)

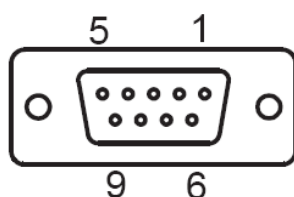
Pin No	Symbol	I/O	Description	Remark
1	Video	I	Video Input	
2	AGND	-	Analog Ground	

7.6 J404 : Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type)(Option)

Pin No	Symbol	I/O	Description	Remark
1	DGND	-	Digital Ground	
2	D+	-	DATA (+)	
3	D-	-	DATA (-)	
4	VBUS	-	USB VCC	

7.7 DB401 : Pin Assignment of Touch RS232 (D-SUB 9 FEMALE)(Option)

Pin No	Symbol	I/O	Description	Remark
1	NC	-	No Connection	
2	TXD	-	Transmit Data	
3	RXD	-	Receive Data	
4	NC	-	No Connection	
5	GND	-	Ground	
6	NC	-	No Connection	
7	NC	-	No Connection	
8	NC	-	No Connection	
9	NC	-	No Connection	



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8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	Vin	+10	+13.2	V	
Video Input Signal	Video in	0.5	2.0	Vp-p	@75Ω
Analog RGB Input Signal	Analog RGB in	0.5	2.0	Vp-p	@75Ω
Digital Input Signal	TTL	+0.3	+3.6	V	
Operating Temperature		-20	+70	°C	
Storage Temperature		-30	+80	°C	
Operating Temperature With TSP		-5	+60	°C	
Storage Temperature With TSP		-30	+70	°C	

9. Recommended operating conditions

9.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	Vin	I	+10.8	+12	+13	V	
Total Current	Iin (+12V)	I		510		mA	±15%
Power Consumption		I		6.12		W	
Output Voltage	VDD	O	+3.2	+3.3	+3.4	V	I=10mA
Video Input Signal	Video in	I		1.0		Vp-p	@75Ω
Analog RGB Input Signal	Analog RGB in	RGB	I	0.7		Vp-p	@75Ω

9.2 VGA Mode Characteristics

Dots per inch	Hor.	Unit	Polarity	Ver.	Unit	Polarity	Note
640*480	31.469	KHz	Negative	59.941	Hz	Negative	
800*600	37.879	KHz	Positive	60.317	Hz	Positive	
1024*768	48.363	KHz	Negative	60.004	Hz	Negative	

10. 4W Resistance Touch Panel Characteristics

10.1 Pin assignment

Pin No	Symbol	Description	Remark
1	YD	Upper Electrode Y (Down Side)	
2	XL	Lower Electrode X (Left Side)	
3	YU	Upper Electrode Y (Upper Side)	
4	XR	Lower Electrode X (Right Side)	

10.2 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	200	-	1000	Ω	
	Y	100	-	800	Ω	
Linearity		-	-	2.0	%	
Insulation Impedance		10	-	-	M Ω	DC 25V
Response Time		-	-	20	ms	

10.3 Optical Performance

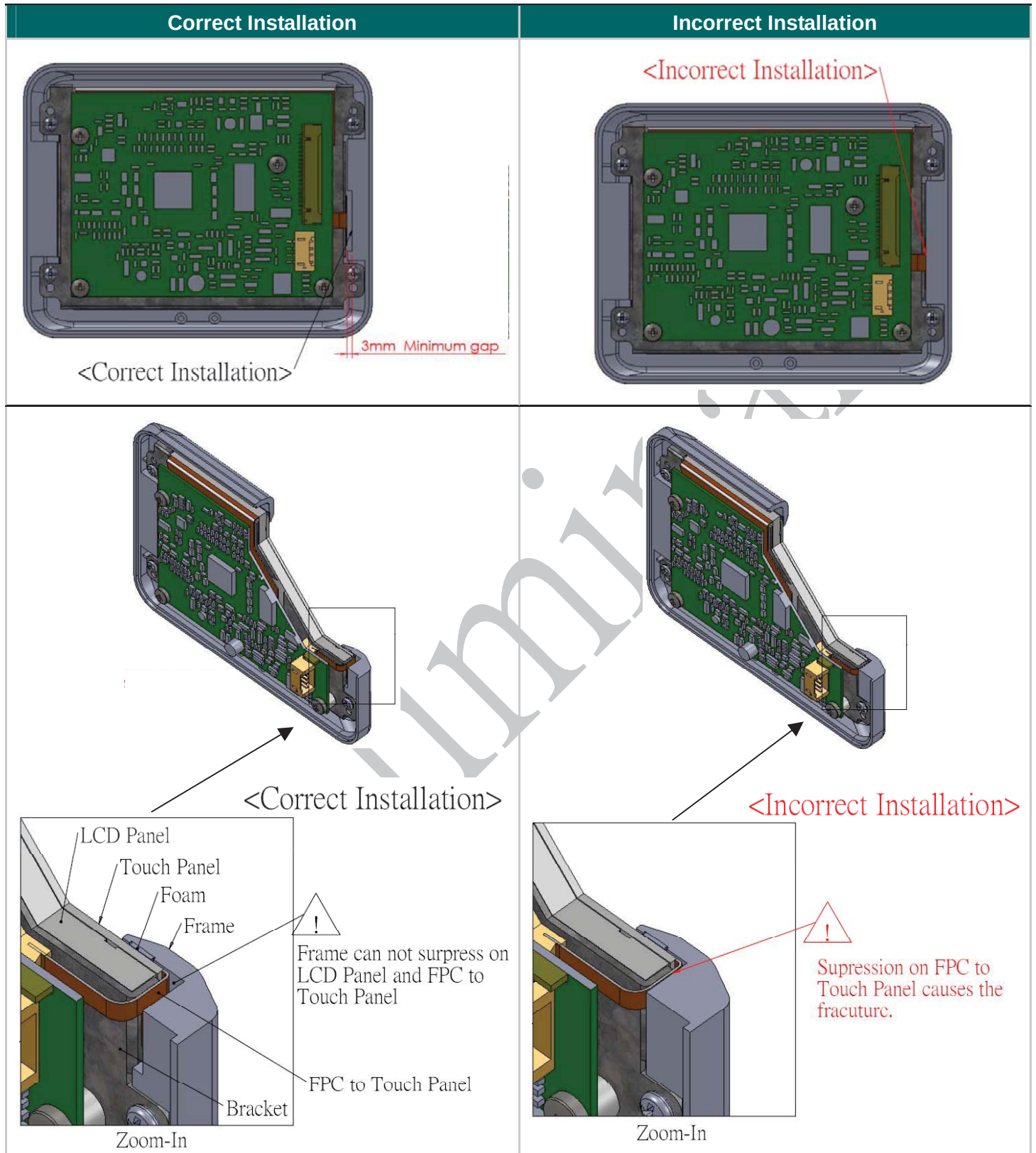
Parameter	Specifications
Light Transmittance	82.5% (Typ)
Haze	8 $\pm$ 4% (Typ)

10.4 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	$\leq$ 80g
Surface Hardness	3H or more

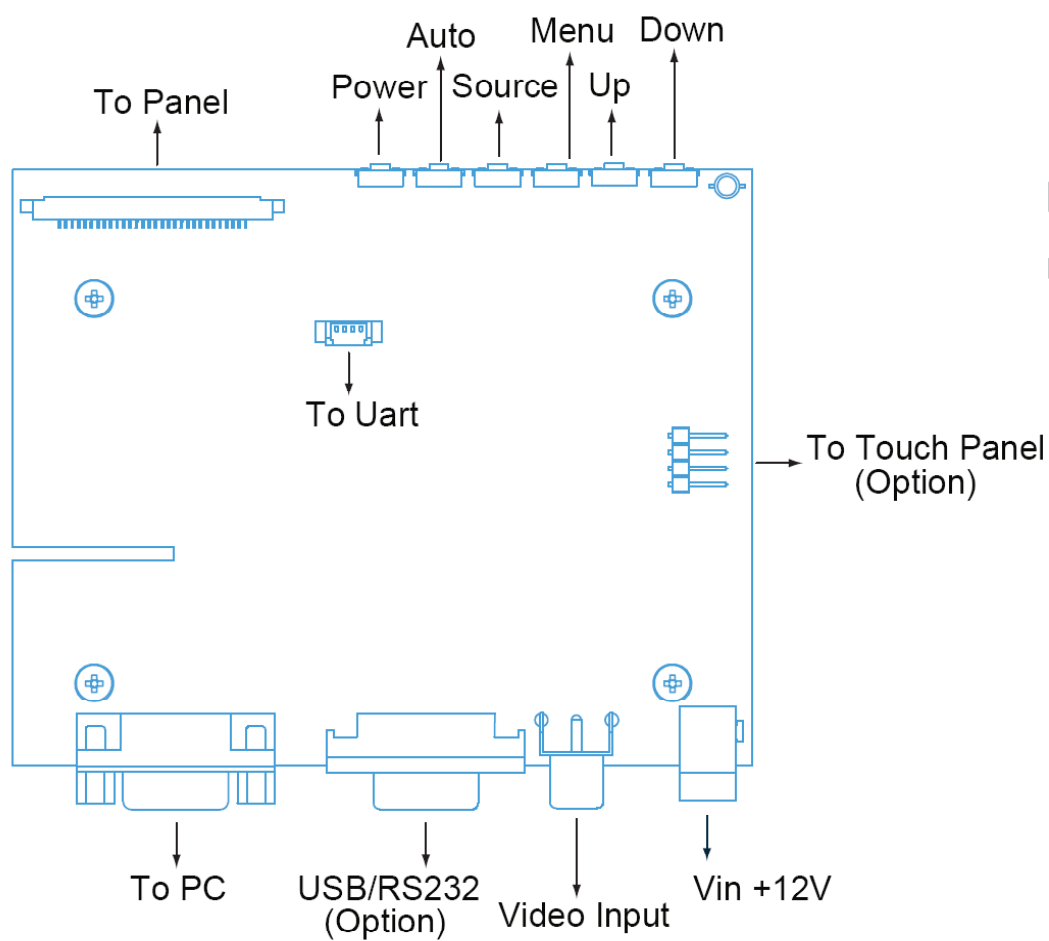
10.5 Durability Performance

Parameter	Specifications
Hitting Durability	$\geq$ 1000000 times, with R8.0 mm silicon rubber,200g
Sliding Durability	$\geq$ 100000 times, with R0.8 mm polyacetal stylus, 250g



11. Operation manual

11.1 Driver Board Manual



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12. Packing List

Before you begin installing the KIT, please make sure that the following materials have been shipped:



A. LASTD12030-FDR



B. LAACD18000-FDR



C. LAVDO18000-FDR



D. LAVGA16000-FDR



E. LAUSB18000-FDR



F. LARS218000-FDR



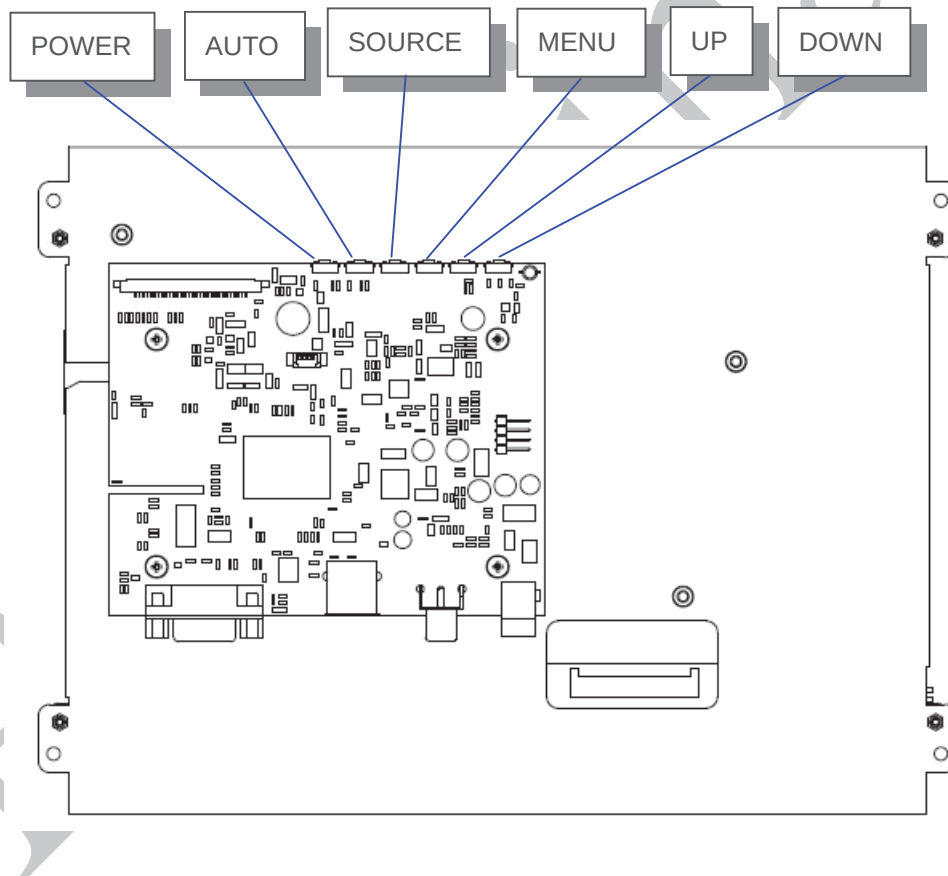
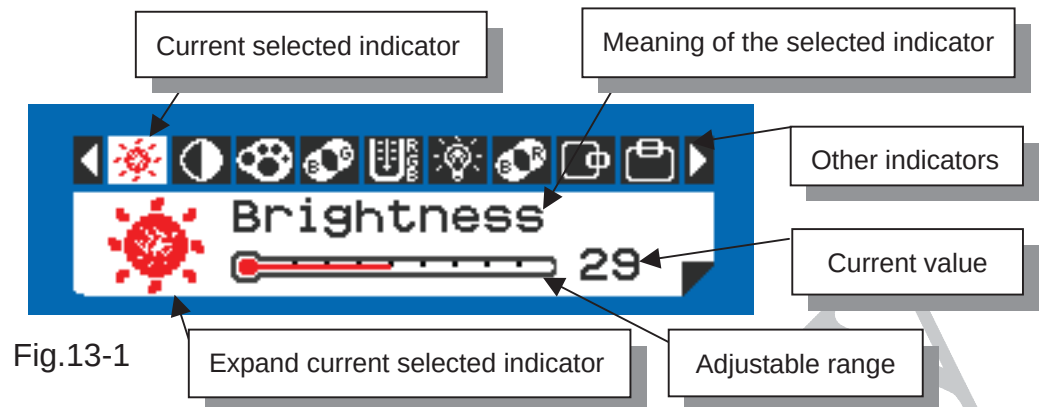
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- A. AC to DC Adapter (L: 1500mm, 100-240VAC 50-60Hz to +12VDC @ 3A)
- B. Power Cord (L: 1800mm, Plug Type B for USA)
- C. Video Cable (L: 1800mm)
- D. VGA Cable (L: 1600mm)
- E. USB Cable (L: 1800mm, Only LP104CWWB4-FXR)
- F. RS-232 Cable (L: 1800mm, Only LP104CWWB5-FXR)
- G. Touch Screen Driver CD Disk / User Manual (Only LP104CWWB4-FXR, LP104CWWB5-FXR)

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

13. Key Function by OSD

13.1 Menu Operation



Operations of key board :

1. To navigate the menu, press [MENU]. (Fig.13-1)
2. The indicator lighting up in white color is the selected adjustment item.
3. To Next Item of the menu, press [MENU] again.
4. The operations below are only available when "Menu" is started.
5. Press [UP] / [DOWN] to adjust the value of the selected item.

Overview of the menu :

Firmware must be $\geq$ VER 0.26

Indicator	Meaning	Adjustable range	For	Remark
	Brightness	0 ~ 64	AV / VGA	Adjust-Bar
	Contrast	0 ~ 64	AV / VGA	Adjust-Bar
	Color	0 ~ 64	AV	Adjust-Bar
	Tint	0 ~ 32	AV	Adjust-Bar
	Sharpness	0 ~ 16	AV	Adjust-Bar
	Dimmer	0 ~ 9	AV / VGA	
	Color Tone	Normal / Warm / Cool	AV / VGA	
	H-Position	-25 ~ +25	AV / VGA	Balance-Bar
	V-Position	-10 ~ +10	AV / VGA	Balance-Bar
	Auto		VGA	
	Scan	Over Scan / Under Scan	AV	
	Information		AV / VGA	Fig.13-2
	Setup		AV / VGA	Fig.13-3
	Factory Set		AV / VGA	
	Exit		AV / VGA	

Fig.13-2

? INFORMATION	
Video Source	AV1
Video System	NTSC
H-Freq	15.7KHz
V-Freq	60Hz
Program Ver	0.26
Command Ver	0.24
Graphic Ver	0.13

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Setup Menu :



Fig.13-3

Indicator	Meaning	Adjustable range	Function	Remark
	Show Status	ON / OFF	Show signal status.	ON: Show OFF: Hidden
	Blue Screen	ON / OFF	If loss signal will put on the blue or black screen.	ON: Blue OFF: Black
	Auto Power On	ON / OFF	Power input module will be auto turn on.	ON: Auto OFF: Manual
	Auto Saving	OFF / 3s / 5s / 15s / 30s	If signal lost over setting times will be power off.	ON: Auto OFF: Normal
	Detect Source	ON / OFF	Auto detection which source is existence and change.	ON: Auto OFF: Normal
	Return			

Note : VGA only type don't have Detect Source function.

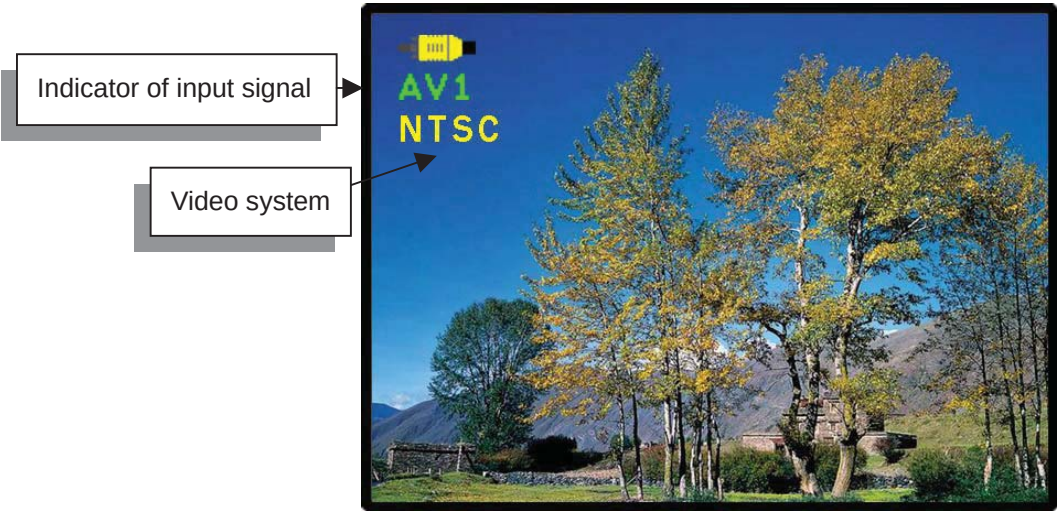


Fig.13-4

[Power] : Monitor power on / off
[Source] : Input signal switch

Overview of input signals :

Indicator	Input signal	Interface	Video system
	AV1	Composite	NTSC / PAL / SECAM
	VGA	Analog RGB	640x480_60 / 800x600_60 / 1024x768_60

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