



§ SPECIFICATION APPROVAL SHEET §

**Fdt Tech Module No**      **LP080A1|~~xx~~-F~~x~~R**

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**Description:**            **8" Digital TFT-LCD Module**

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**SPEC No.:**                **SAS-1008004**

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**Version:**                 **1.0**

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**Issue Date:**            **December 4, 2014**

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※ This approval sheet contains 28 pages including the cover and appendix.

<b>Customer:</b>	<b>APPROVED BY:</b>
<b>Date:</b> /    / 14	

**APPROVED BY:**

**CHECKED BY:**

**DESIGNED BY:**

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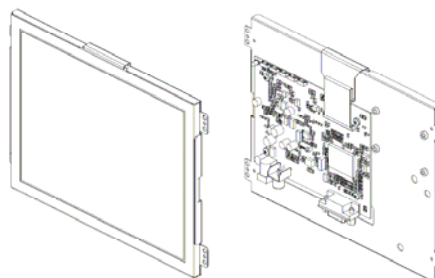
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# FLAT DISPLAY TECHNOLOGY

## 8" Digital TFT-LCD Module



### ■ LP080A1Ixx-FxR

## 1. General Descriptions

### 1.1 Features

- 8" 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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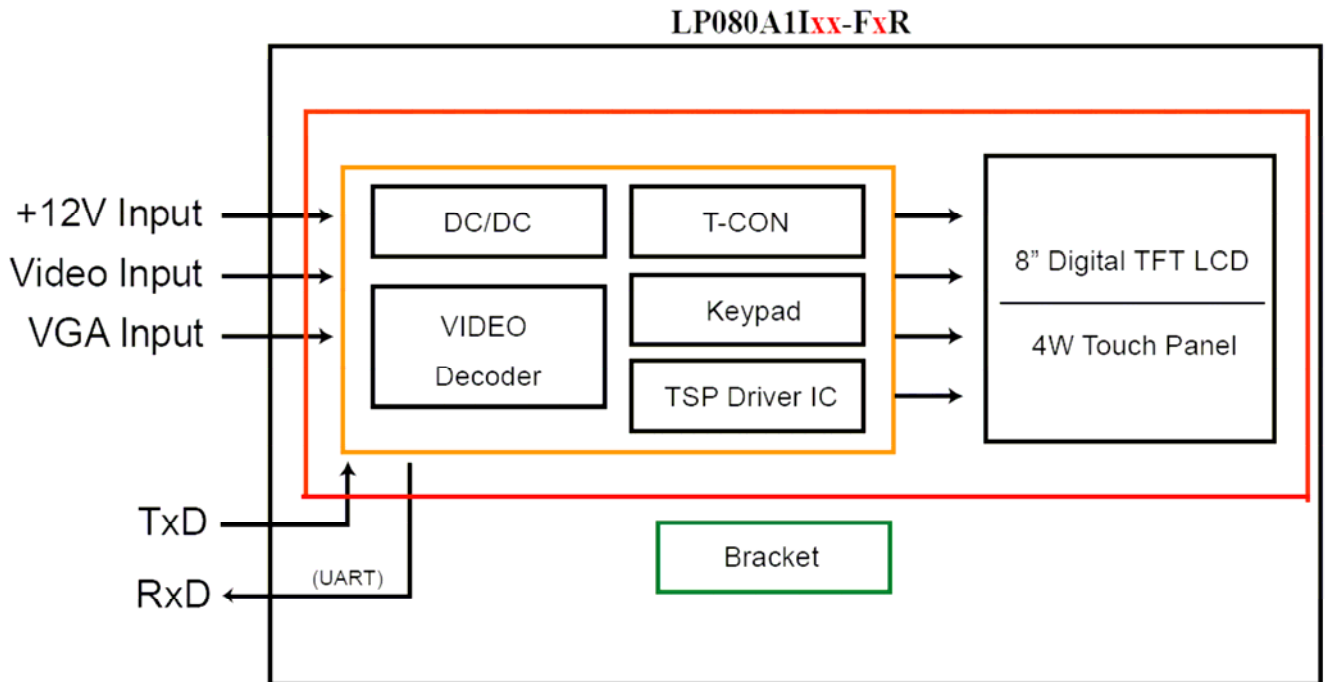
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### 3. Block Diagram

#### 3.1 Block Diagram



## 4. TFT-LCD Information

### 4.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	8.0 (diagonal)	inch
Display Format	800 x (R.G.B) x 600	dot
Active Area	162(W) x 121.5(H)	mm
Pixel Pitch	0.2025(W) x 0.2025(H)	mm
Pixel Configuration	Stripe	
Outline Dimension	183(W) x 141(H) x 6.3(D)	mm
Surface Treatment	Anti – Glare	
Weight	258(Typ)	g

### 4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	60	70	---	deg	
		Right	60	70	---	deg	
	Vertical	Top	60	70	---	deg	
		Bottom	40	50	---	deg	
Contrast Ratio	CR	$\theta = 0^\circ$	400	500	---	---	
Response time	Rise Fall	Tr	---	10	20	ms	
		Tf	---	15	30	ms	
Uniformity	U	$\theta = 0^\circ$	70	75	---	%	
Brightness	L	$\theta = 0^\circ$	200	250	---	Cd/m <sup>2</sup>	
Brightness With RTP			160	200			
White Chromaticity	x	$\theta = 0^\circ$	0.26	0.31	0.36		
	y	$\theta = 0^\circ$	0.28	0.33	0.38		
LED Life Time		+25°	20000	---	---	Hrs	Note

Note: The “LED life time” is defined as the module brightness decrease to 50% original brightness at Ta=25°C and IL =180mA.

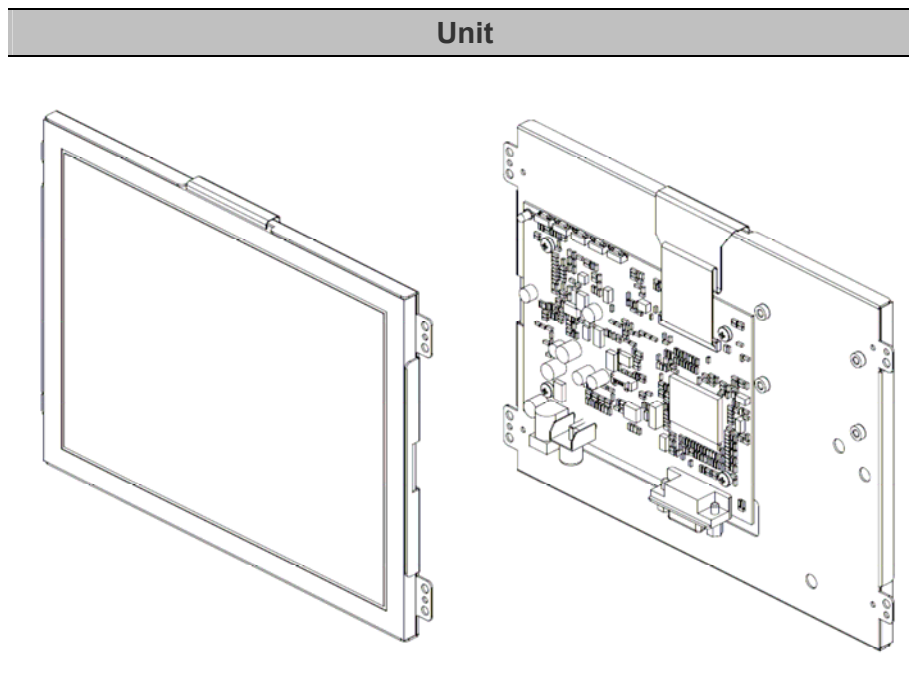
The LED lifetime could be decreased if operating IL is larger than 180 mA.

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## 5. Order Information

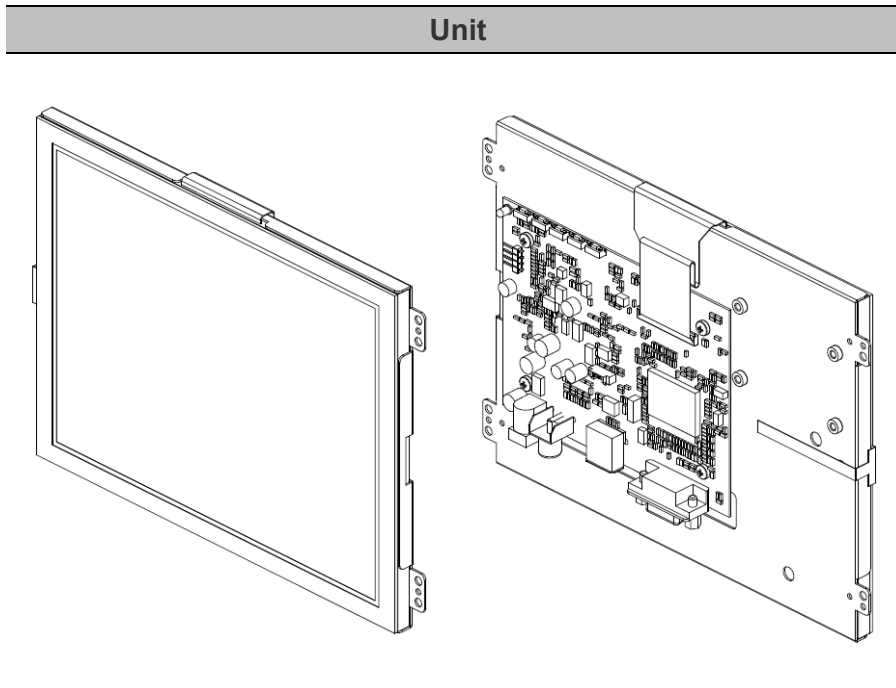
### 5.1 Unit



Parameter	LP080A1IB1-FBR	LP080A1IB1-FNR	Unit
<b>CVBS</b>	1	1	
<b>VGA (D-Sub15 / 2.0mm 14Pin)</b>	D-Sub15	D-Sub15	
<b>AC to DC Adapter 12V/2.5A</b> (LASTD12025-FDR)	⊙	-	
<b>Power Cord</b> <b>Plug Type B for USA</b> (LAAC818000-FDR)	⊙	-	
<b>Video Cable</b> (LAVDO18000-FDR)	⊙	-	
<b>VGA Cable</b> (LAVGA16000-FDR)	⊙	-	

**Note:** The assembling of panel and bracket is aimed for delivery, packaging and experiment. If the demand of shockproof and long-term fix, pls. have it into consideration of mechanism design.

**5.2 Unit (4W Touch)**



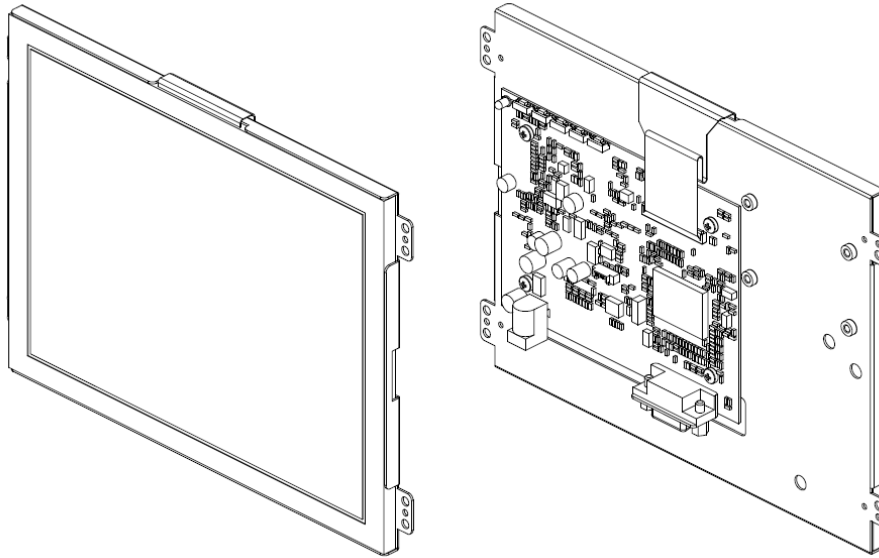
Parameter	LP080A1IB4-FBR	LP080A1IB5-FBR	LP080A1IB4-FNR	LP080A1IB5-FNR	Unit
<b>CVBS</b>	1	1	1	1	
<b>VGA (D-Sub15 / 2.0mm 14Pin)</b>	D-Sub15	D-Sub15	D-Sub15	D-Sub15	
<b>Touch Panel Type</b>	4W Resistive	4W Resistive	4W Resistive	4W Resistive	
<b>Touch Screen Interface</b>	USB	RS232	USB	RS232	
<b>AC to DC Adapter 12V/2.5A</b> (LASTD12025-FDR)	⊙	⊙	-	-	
<b>Power Cord</b> <b>Plug Type B for USA</b> (LAAC818000-FDR)	⊙	⊙	-	-	
<b>Video Cable</b> (LAVDO18000-FDR)	⊙	⊙	-	-	
<b>VGA Cable</b> (LAVGA16000-FDR)	⊙	⊙	-	-	
<b>USB Cable</b> (LAUSB18000-FDR)	⊙	-	-	-	
<b>RS-232 Cable</b> (LARS218000-FDR)	-	⊙	-	-	
<b>Touch Screen Driver CD Disk</b>	⊙	⊙	⊙	⊙	

**Note:** The assembling of panel and bracket is aimed for delivery, packaging and experiment. If the demand of shockproof and long-term fix, pls. have it into consideration of mechanism design.



**5.3 Unit (PC Only)**

**Unit**

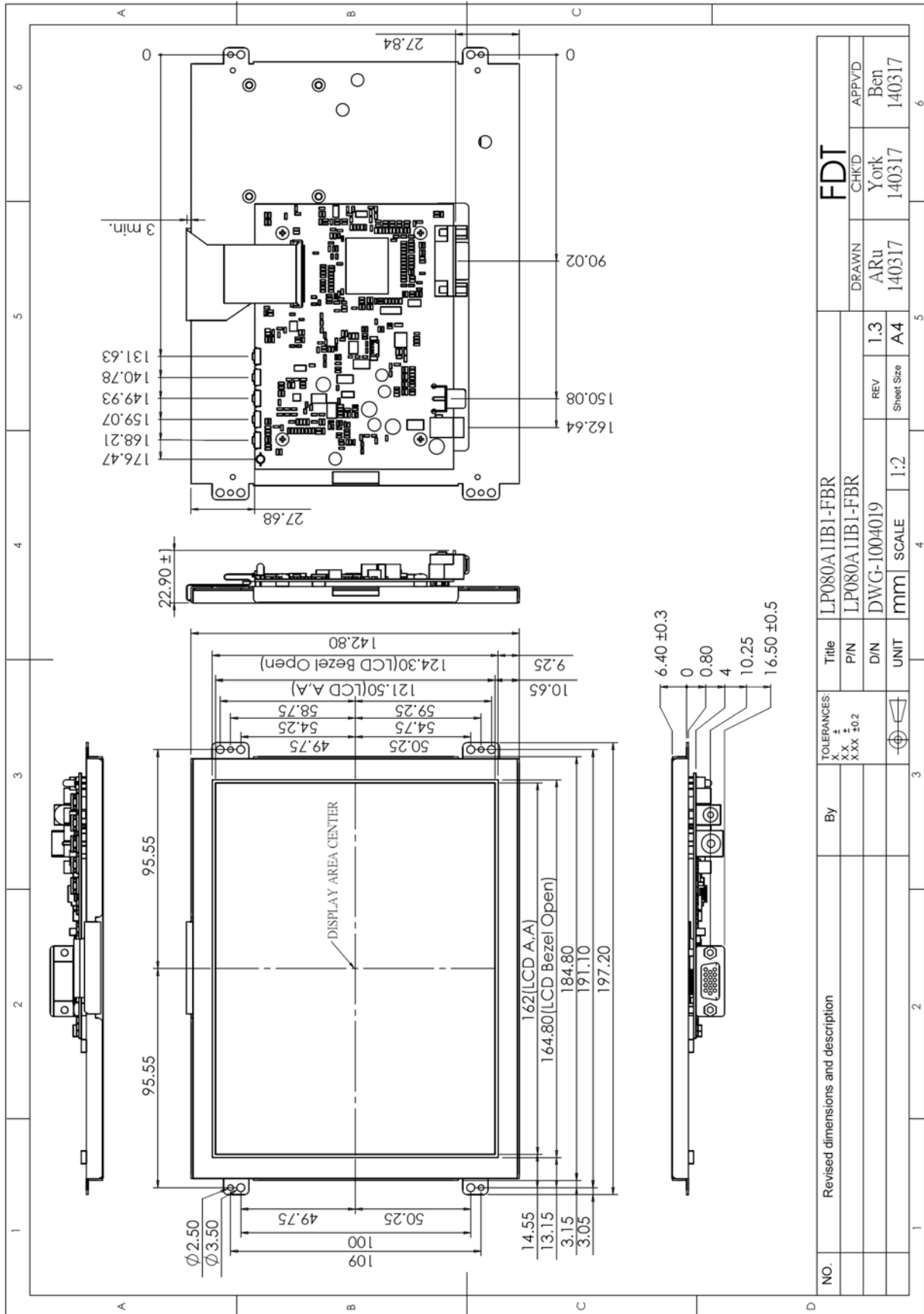


Parameter	LP080A1IC1-FBR	LP080A1IC1-FNR	Unit
<b>VGA (D-Sub15 / 2.0mm 14Pin)</b> (LASTD12025-FDR)	D-Sub15	D-Sub15	
<b>AC to DC Adapter 12V/2.5A</b> (LAAC818000-FDR)	⊙	-	
<b>Power Cord</b> <b>Plug Type B for USA</b> (LAAC818000-FDR)	⊙	-	
<b>VGA Cable</b> (LAVGA16000-FDR)	⊙	-	

**Note:** The assembling of panel and bracket is aimed for delivery, packaging and experiment. If the demand of shockproof and long-term fix, pls. have it into consideration of mechanism design.

# 6. Dimension Information

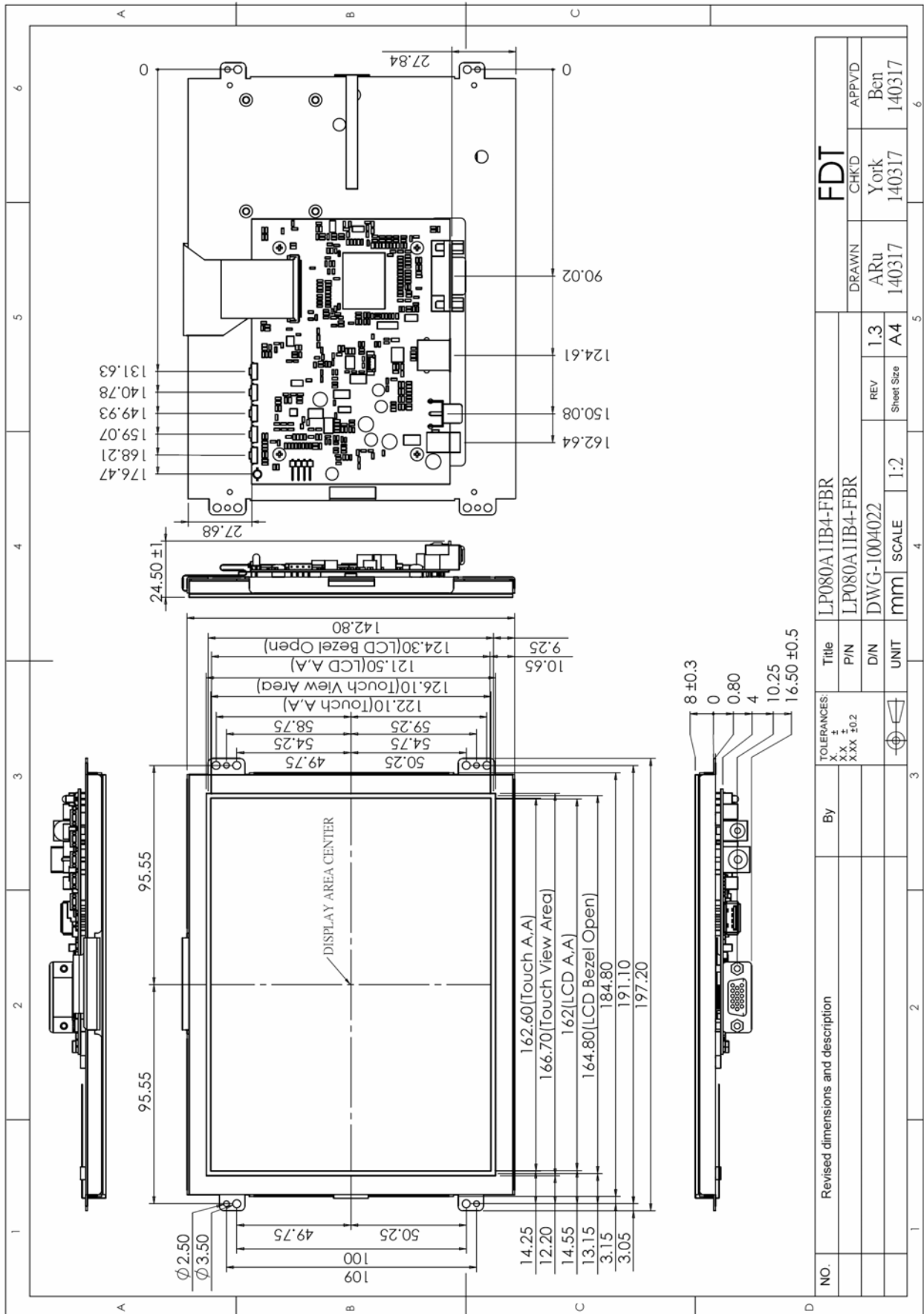
## 6.1 Unit (LP080A1IB1-FBR)



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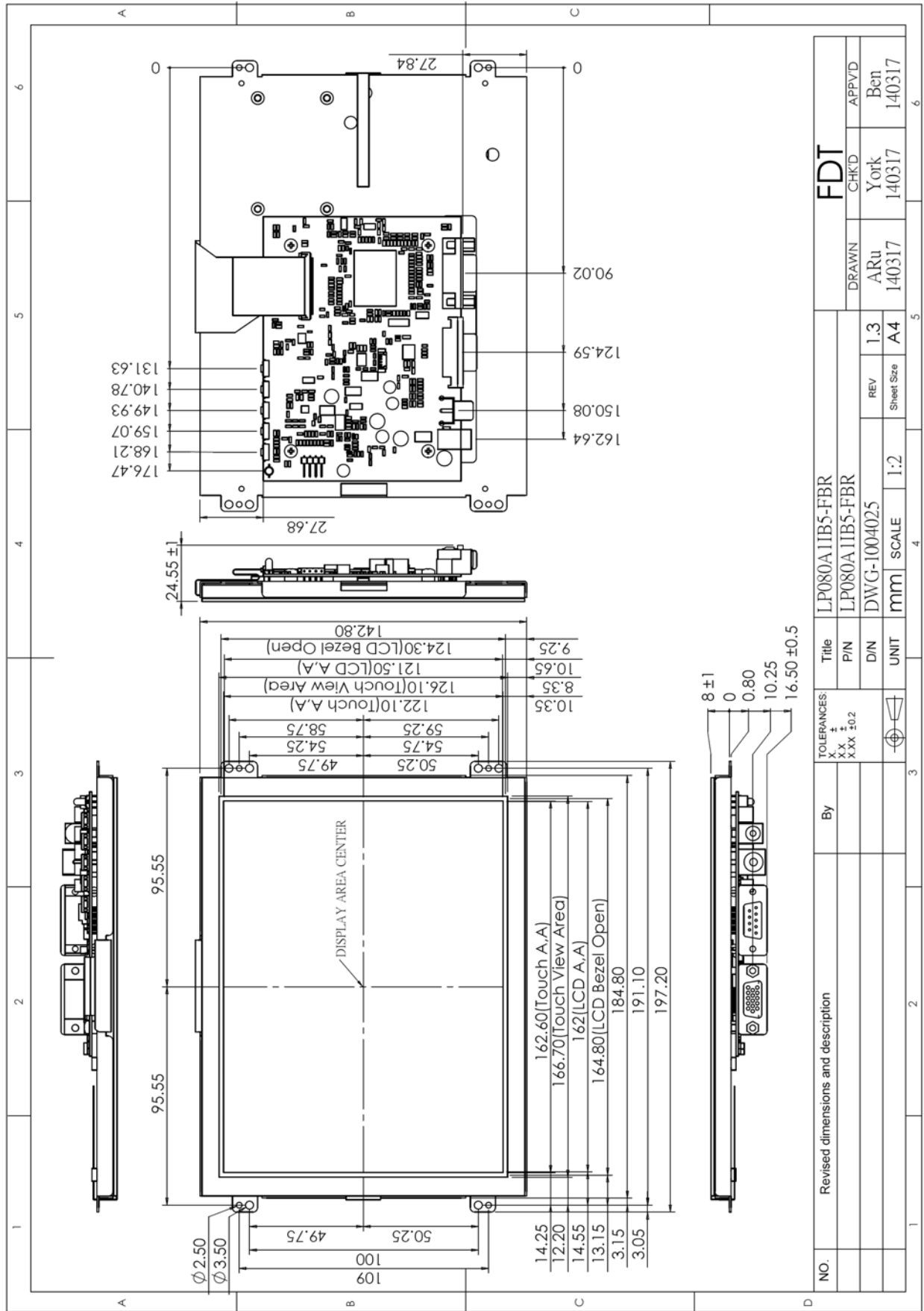
**6.2 Unit (LP080A1IB4-FBR)**



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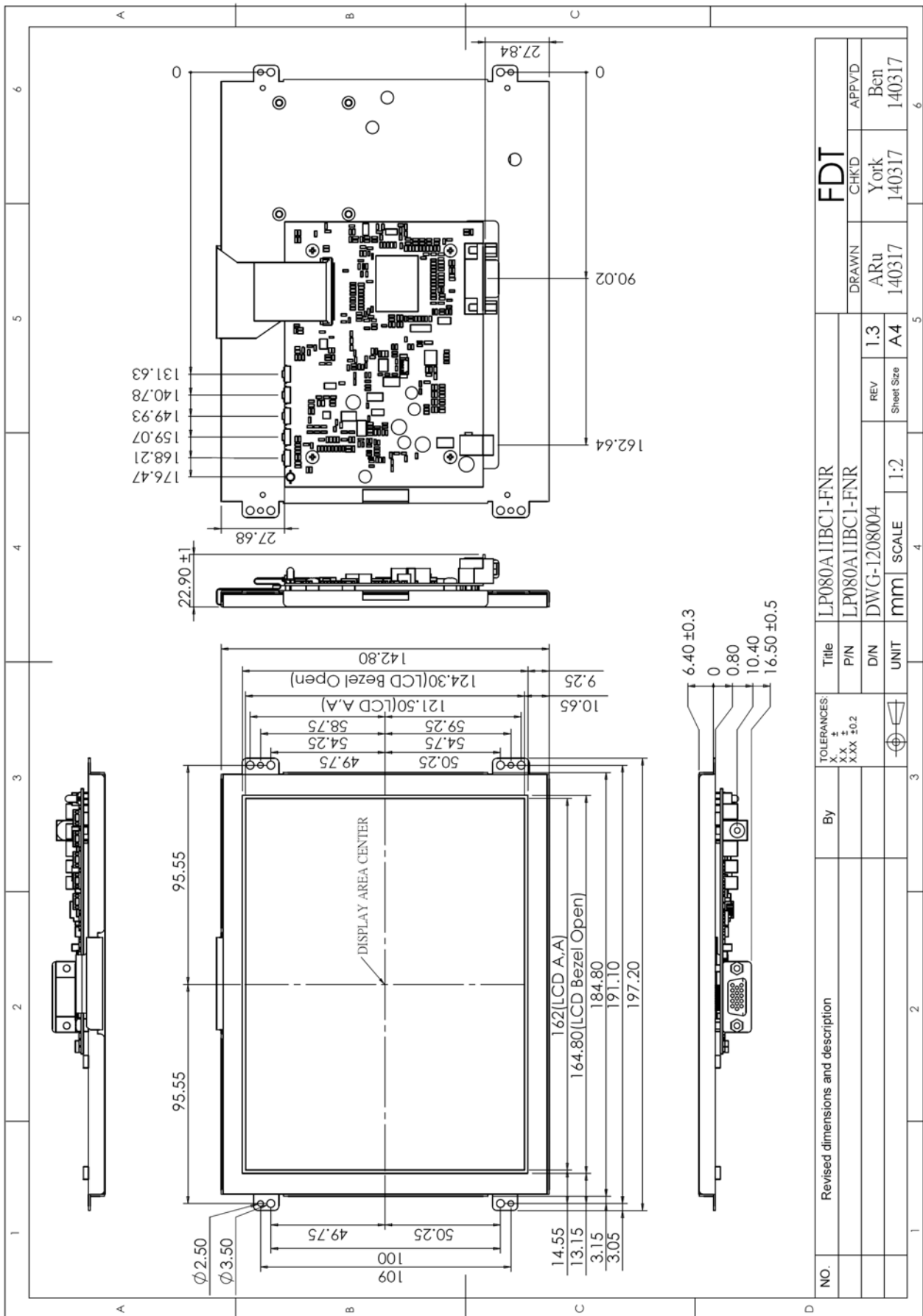
**6.3 Unit (LP080A1IB5-FBR)**



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**6.4 Unit (LP080A11C1-FNR)**



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## 7. Pin Description

### 7.1 J301 : LCD Panel I/O Terminals (FPC 50 Pin Pitch 0.5mm UP Contact Type)

Pin No	Symbol	I/O	Description	Remark
1	NC		No connection	
2	NC		No connection	
3	NC		No connection	
4	NC		No connection	
5	GND	P	Power ground	
6	VCOM	I	Common voltage	
7	VCC	P	Power for Digital circuit	
8	MODE	I	DE/SYNC mode select	
9	DE	I	Data Input Enable	
10	VS	I	Vertical Sync Input	
11	HS	I	Horizontal Sync Input	
12	B7	I	Blue data(MSB)	
13	B6	I	Blue data	
14	B5	I	Blue data	
15	B4	I	Blue data	
16	B3	I	Blue data	
17	B2	I	Blue data	
18	B1	I	Blue data	
19	B0	I	Blue data(LSB)	
20	G7	I	Green data (MSB)	
21	G6	I	Green data	
22	G5	I	Green data	
23	G4	I	Green data	
24	G3	I	Green data	
25	G2	I	Green data	
26	G1	I	Green data	
27	G0	I	Green data (LSB)	
28	R7	I	Red data (MSB)	
29	R6	I	Red data	
30	R5	I	Red data	
31	R4	I	Red data	
32	R3	I	Red data	
33	R2	I	Red data	
34	R1	I	Red data	
35	R0	I	Red data (LSB)	
36	GND	P	Power ground	
37	DCLK	I	Sample clock	

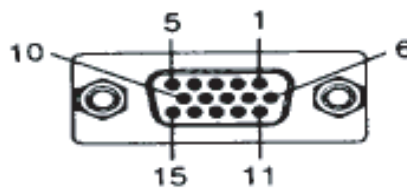
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38	GND	P	Power ground
39	L/R	I	Right/ left selection
40	U/D	I	Up/down selection
41	VGH	P	Gate ON voltage
42	VGL	P	Gate OFF voltage
43	AVDD	P	Power for Analog circuit
44	RESET	I	Global reset pin.
45	NC		No connection
46	VCOM	I	Common voltage
47	DITHB	I	Dithering function
48	GND	P	Power ground
49	NC		No connection

**7.2 J101B : 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	VGA5V	-	VGA +5V Input	
10	VGA-Det	I	VGA Detect	
11	NC	-	No Connection	
12	NC	-	No Connection	
13	HS_IN	I	TTL Horizontal sync	
14	VS_IN	I	TTL Vertical sync	
15	N.C	-	No Connection	



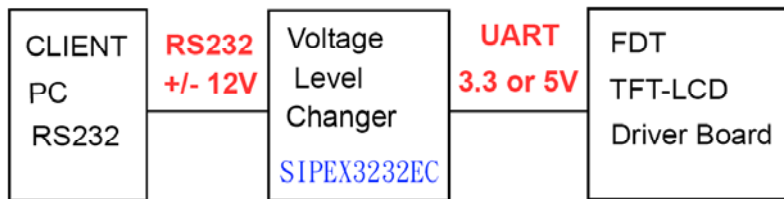
**7.3 J104: Pin Assignment of UART (Pitch 1.25mm 4Pin, Top Entry Type)**

※ 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	+5VA	O	+5V Output Voltage	

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



**7.4 DC JACK: Pin Assignment of Power Input (Inside Diameter:2.1 φOutside Diameter:5.5 φSide Entry Type)**

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

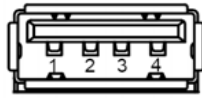
**7.5 RCA: Pin Assignment of Video Input (RCA JACK Yellow, Side Entry Type)**

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



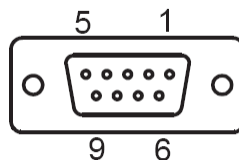
**7.6 J401B : Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type )(Option)**

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



**7.7 J401C : Pin Assignment of Touch RS232 (D-SUB 9 FEMALE)(Option)**

Pin No	Symbol	I/O	Description	Remark
1	-	-	Don't Connect	
2	TXD	-	Transmit Data	
3	RXD	-	Receive Data	
4	-	-	Don't Connect	
5	GND	-	Ground	
6	NC	-	No Connection	
7	-	-	Don't Connect	
8	-	-	Don't Connect	
9	NC	-	No Connection	



**8. Absolute Maximum Ratings**

**8.1 Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	Vin	9	15	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		-20	+70	°C	
Operating Temperature With RTP		-10	+60	°C	
Storage Temperature With RTP		-20	+70	°C	

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## 9. Recommended Operating Conditions

### 9.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	Vin	I	+10	+12	+14	V	
Total Current	Iin (+12V)	I		360		mA	±15%
Power Consumption		I		4.32		W	@+12V
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	0.6	0.7	1.0	Vp-p	@75Ω

### 9.2 VGA Mode Characteristics

Dots per inch	H	Unit	Polarity	V	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	

### 9.3 Panel Backlight Data

Parameter	Symbol	Min	Typ	Max	Unit	Note
LED Backlight Voltage	VLED	9.3	9.9	10.5	Vrms	
LED Backlight Current	ILED	162	180	198	mA	

## 10. 4W Resistance Touch Panel Characteristics

### 10.1 Pin assignment

Pin No	Symbol	Description	Remark
1	Y1	Upper Electrode Y (Down Side)	
2	X1	Lower Electrode X (Left Side)	
3	Y2	Upper Electrode Y (Upper Side)	
4	X2	Lower Electrode X (Right Side)	

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## 10.2 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	300		1100	$\Omega$	
	Y	150		650	$\Omega$	
Linearity		-	-	1.5	%	
Insulation Impedance		20	-	-	M $\Omega$	DC 25V
Response Time		-	-	10	ms	

## 10.3 Optical Performance

Parameter	Specifications
Light Transmittance	82% Typ.
Haze	5.0% Typ.

## 10.4 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	$\leq 50g$
Surface Hardness	3H or more

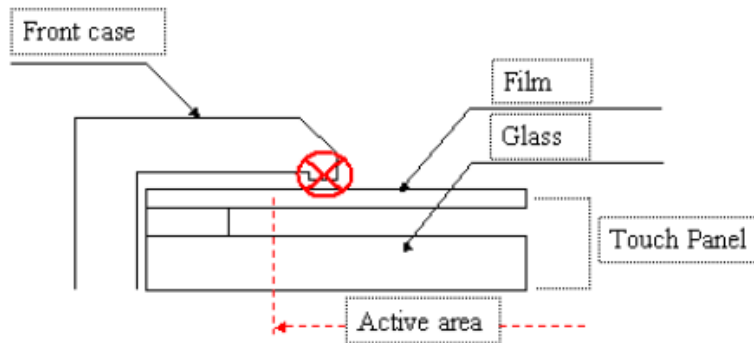
## 10.5 Durability Performance

Parameter	Specifications
Hitting Durability	$\geq 1000000$ times, with R8.0 mm silicon rubber, 200g, 5Hz
Sliding Durability	$\geq 100000$ words, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec

**10.6 Touch Screen Integration Design Guide**

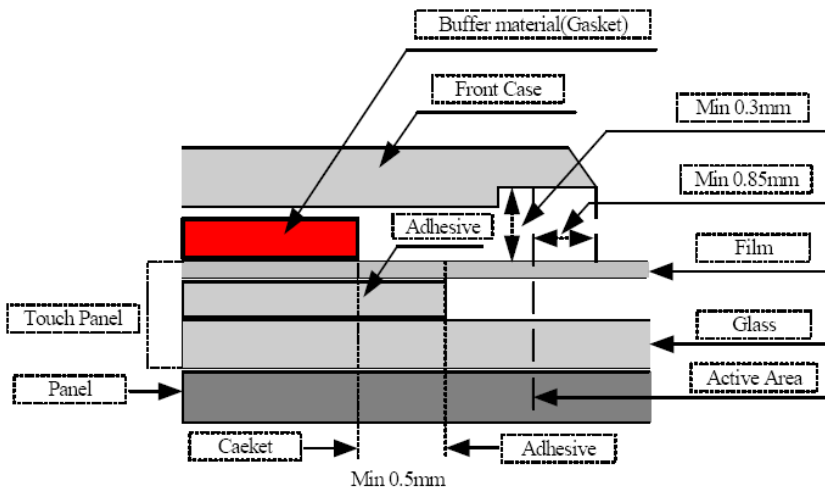
Avoid the design that Front-case overlap and press on the active area of the touch-panel.

Give enough gap (over 0.5mm at compressed) between the front case and touch-panel to protect wrong operating.



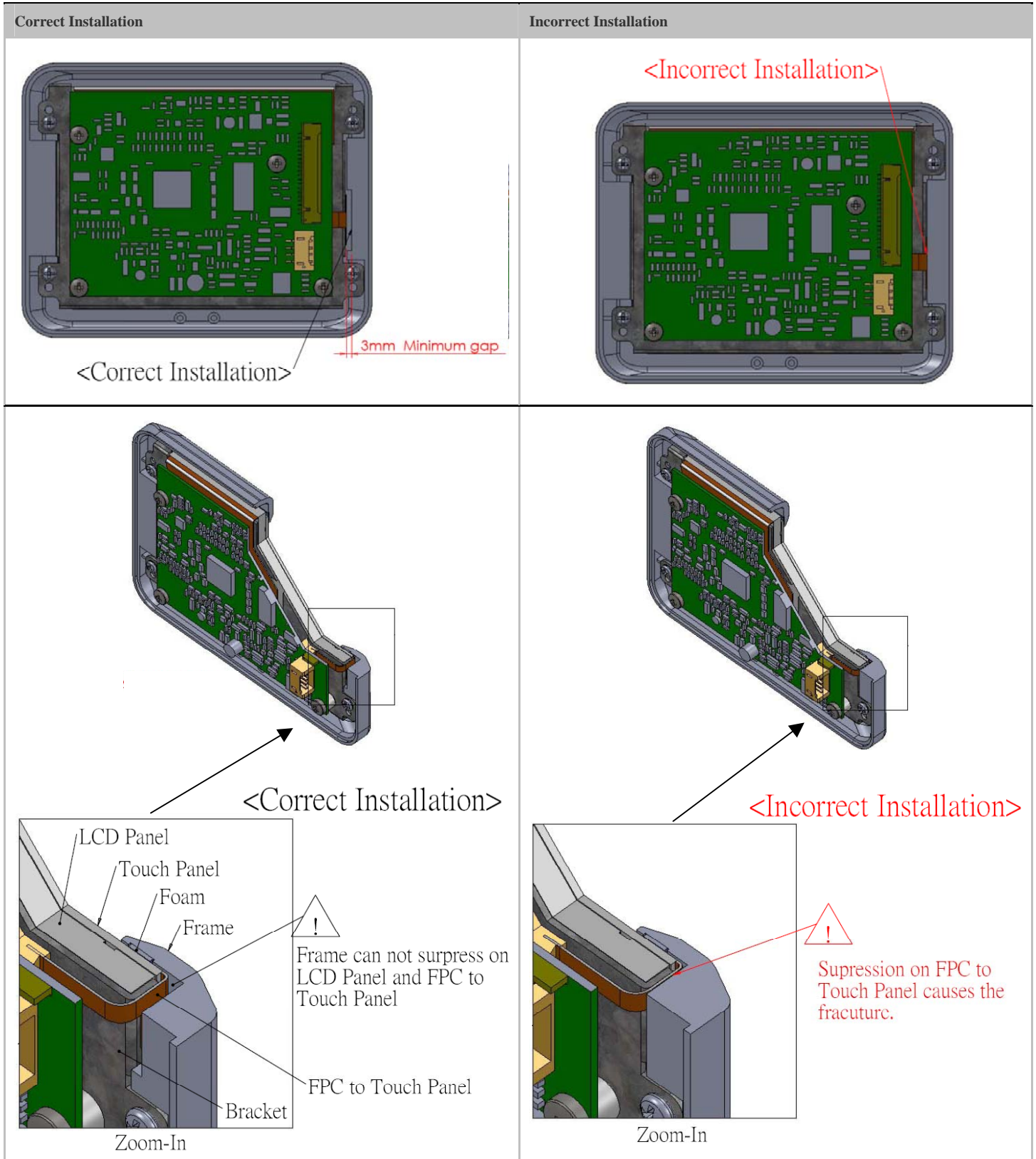
Use a buffer material (Gasket) between the touch-panel and front-case to protect damage and wrong operating.

Avoid the design that buffer material overlap and press on the inside of touch-panel viewing area.



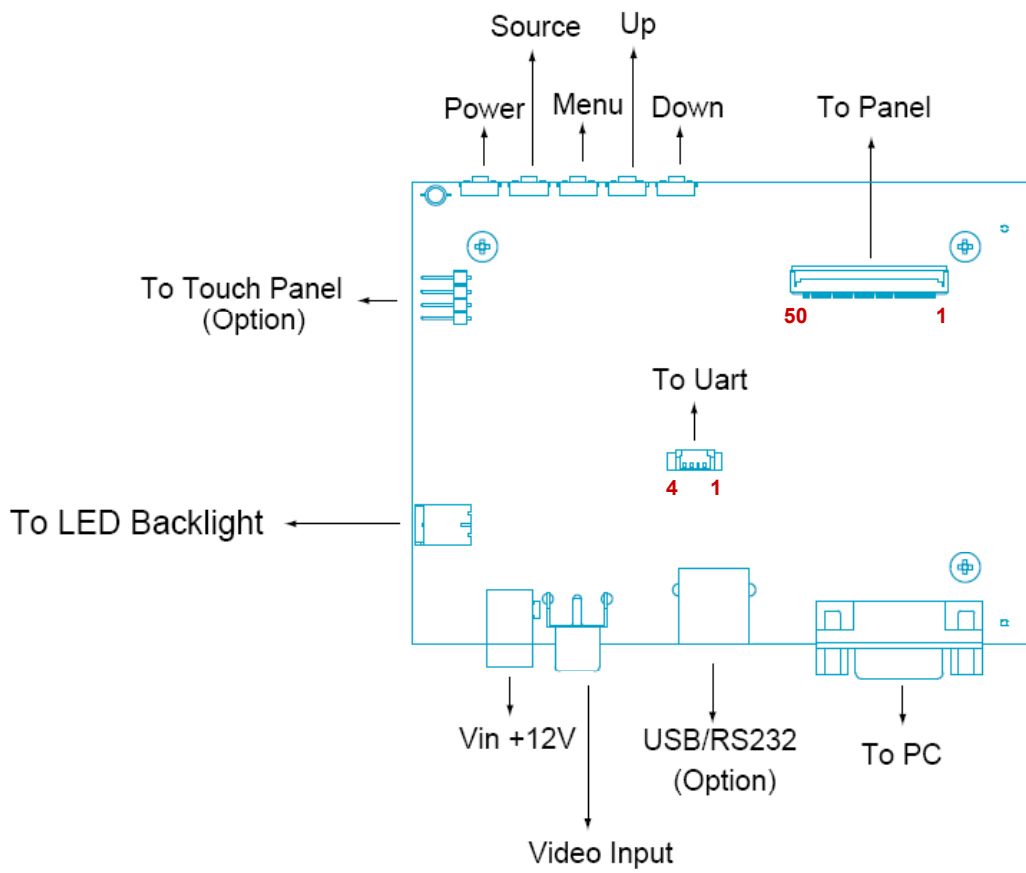
**Note: We strongly suggest to follow above design guide to avoid the linear defect happened on the touch panel.**

**10.7 Mechanical Design Notice For Touch Panel**



# 11. Operation Manual

## 11.1 Driver Board Manual



## 12. Packing List

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



A. LASTD12025-FDR



B. LAAC818000-FDR



C. LAVDO18000-FDR



D. LAVGA16000-FDR



E. LAUSB18000-FDR



F. LARS218000-FDR



G.

- A. AC to DC Adapter (L:1500mm, 100-240VAC 50-60Hz to +12VDC @ 2.5A)
- 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)
- F. RS-232 Cable (L:1800mm)
- G. Touch Screen Driver CD Disk / User Manual

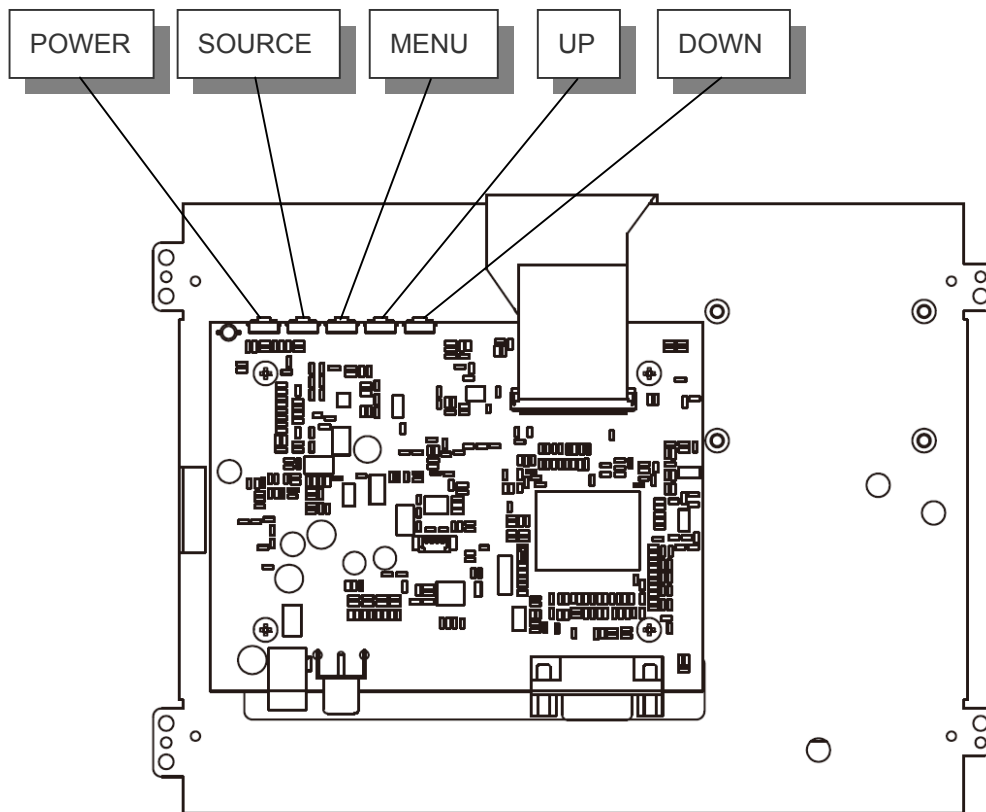
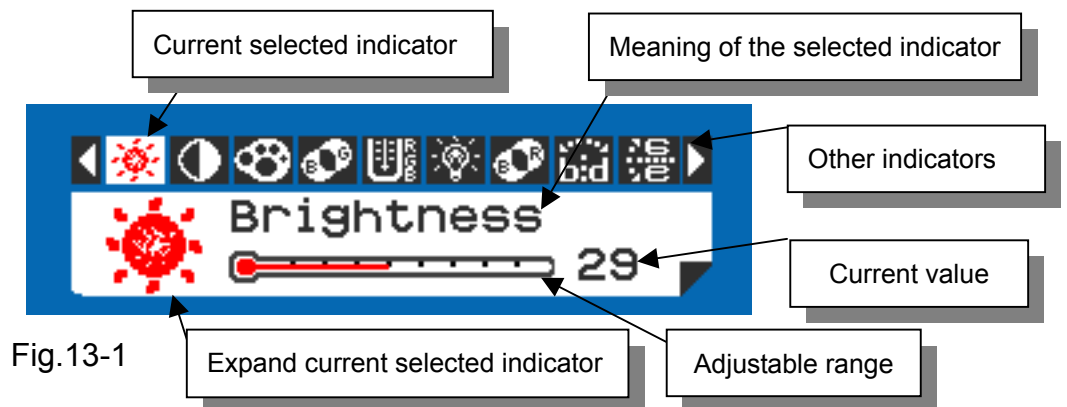
If any of these items are missing or damaged, contact your distributor or sales representative immediately.

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## 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.


















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## Overview of the menu :

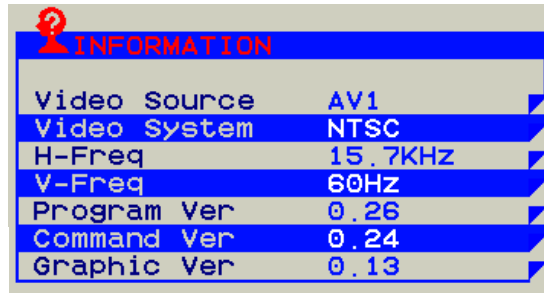
Firmware Version must be  $\geq$  VER 0.26

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	
	Mirror	OFF / ON	AV / VGA	
	Flip	OFF / ON	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	

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Fig.13-2



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.**

**13.2 Operations**

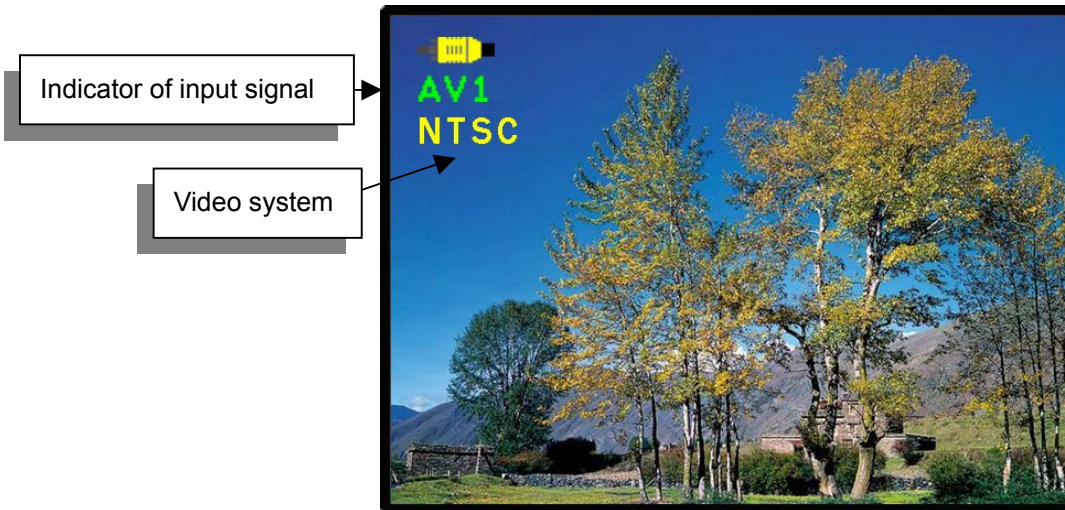




Fig.13-4

[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

