



§ **SPECIFICATION APPROVAL SHEET** §

Fdt Tech Module No LP102V8IB~~x~~-F~~x~~R

Description: 10.2" Digital TFT-LCD Module

SPEC No.: SAS-1003003

Version: 0.0

Issue Date: March 9, 2010

※ This approval sheet contains 25 pages including the cover and appendix.

Customer:

Date: / / 10

APPROVED BY:

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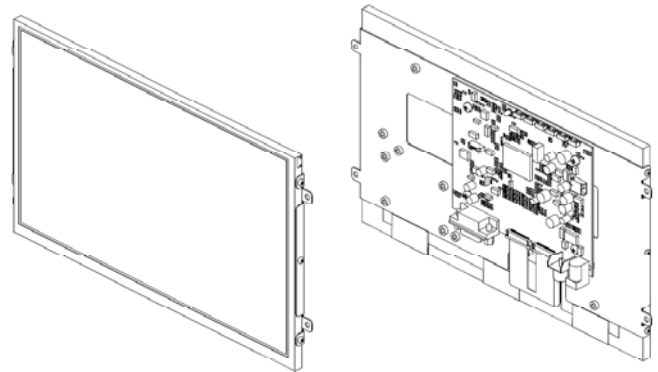
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FLAT DISPLAY TECHNOLOGY

10.2" Digital TFT-LCD Module



■ LP102V8IB~~x~~-F~~x~~R

1. General Description

1.1 Features

- INNOLUX AT102TN03 V8 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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■ LP102V8IB~~x~~-F~~x~~R V0.0



2. Contents

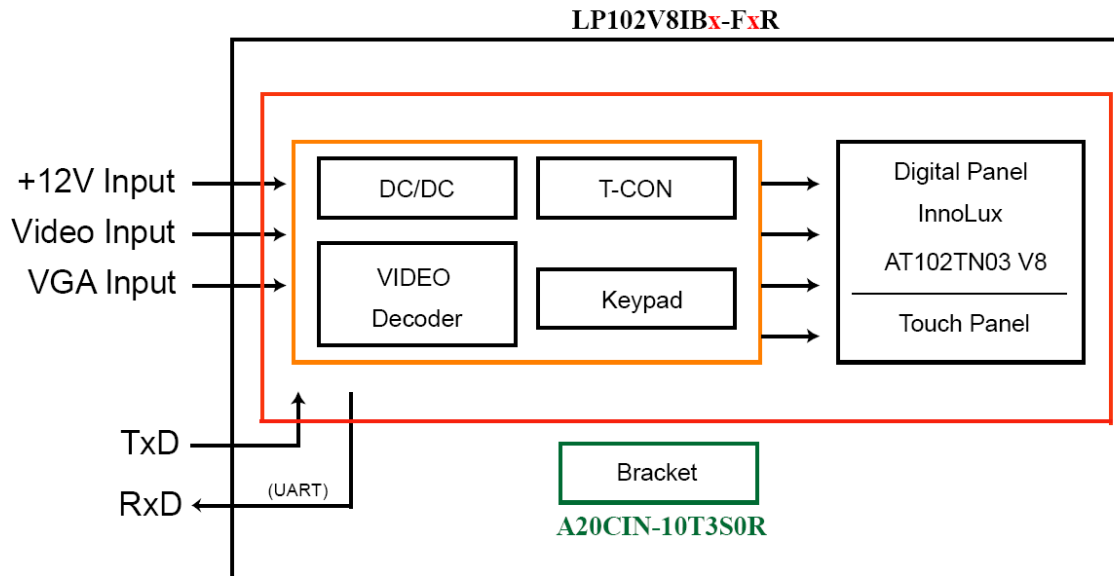
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Tentative

3. Block Diagram

3.1 Block Diagram



Tent

4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	10.2 (diagonal)	inch
Display Format	800 x (R.G.B) x 480	dot
Active Area	222.0 (W) x 132.48 (H)	mm
Pixel Pitch	0.2775(W) x 0.276 (H)	mm
Pixel Configuration	Stripe	
Outline Dimension	235 (W) x 145.8 (H) x 6.1(D)	mm
Surface Treatment	Anti – Glare	
Weight	332 (Typ)	g

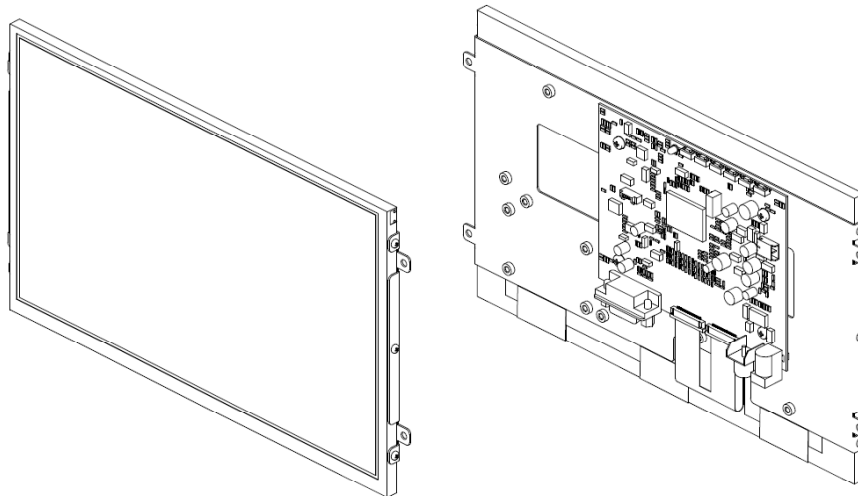
4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	55	65	---	deg	
		Right	55	65	---		
	Vertical	Top	CR >10	35	45	---	deg
		Bottom		55	65	---	deg
Contrast Ratio	CR	At optimized Viewing angle	250	300	---	---	
Response time	Rise Fall	Tr	---	15	30	ms	
		Tf	$\theta = 0^\circ$	---	20	40	ms
Uniformity	U		70	75	---	%	
Brightness	L		280	350	---	cd/m ²	
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°C	20000	---	---	Hr	

5. Order Information

5.1 Unit

Unit



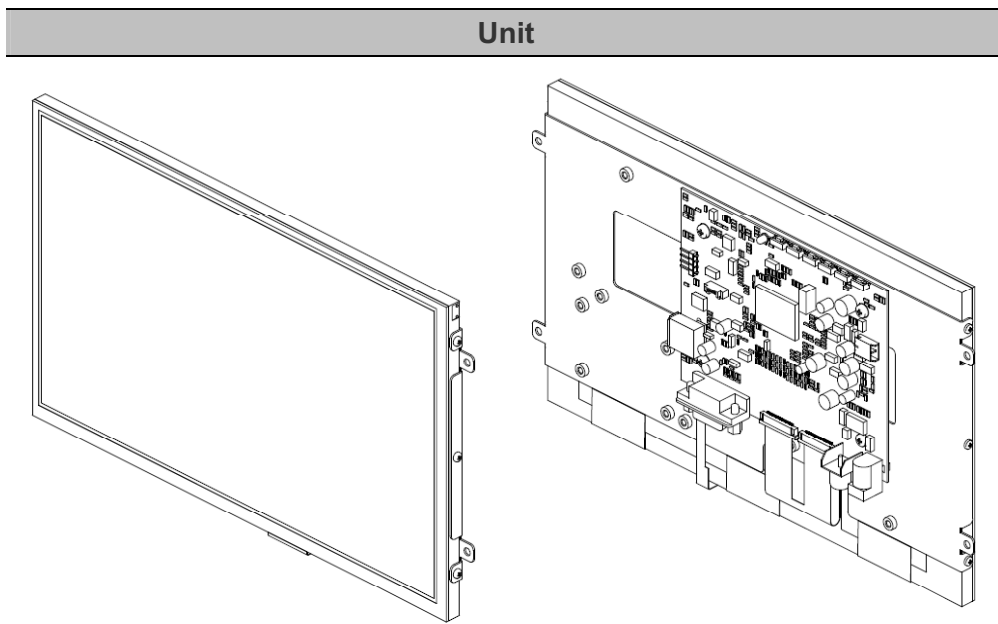
Parameter	LP102V8IB1-FBR	LP102V8IB1-FNR	Unit
CVBS	1	1	
VGA (D-Sub15 / 2.0mm 14Pin)	D-Sub15	D-Sub15	
AC to DC Adapter 12V/2.5A (LASTD12025-FDR)	⊙	-	
Power Cord Plug Type B for USA (LAAC818000-FDR)	⊙	-	
Video Cable (LAVDO18000-FDR)	⊙	-	
VGA Cable (LAVGA16000-FDR)	⊙	-	

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5.2 Unit (Touch)



Parameter	LP102V8IB4-FBR	LP102V8IB5-FBR	LP102V8IB4-FNR	LP102V8IB5-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	
AC to DC Adapter 12V/2.5A (LASTD12025-FDR)	⊙	⊙	-	-	
Power Cord Plug Type B for USA (LAAC818000-FDR)	⊙	⊙	-	-	
Video Cable (LAVDO18000-FDR)	⊙	⊙	-	-	
VGA Cable (LAVGA16000-FDR)	⊙	⊙	-	-	
USB Cable (LAUSB18000-FDR)	⊙	-	-	-	
RS-232 Cable (LARS218000-FDR)	-	⊙	-	-	
Touch Screen Driver CD Disk	⊙	⊙	⊙	⊙	

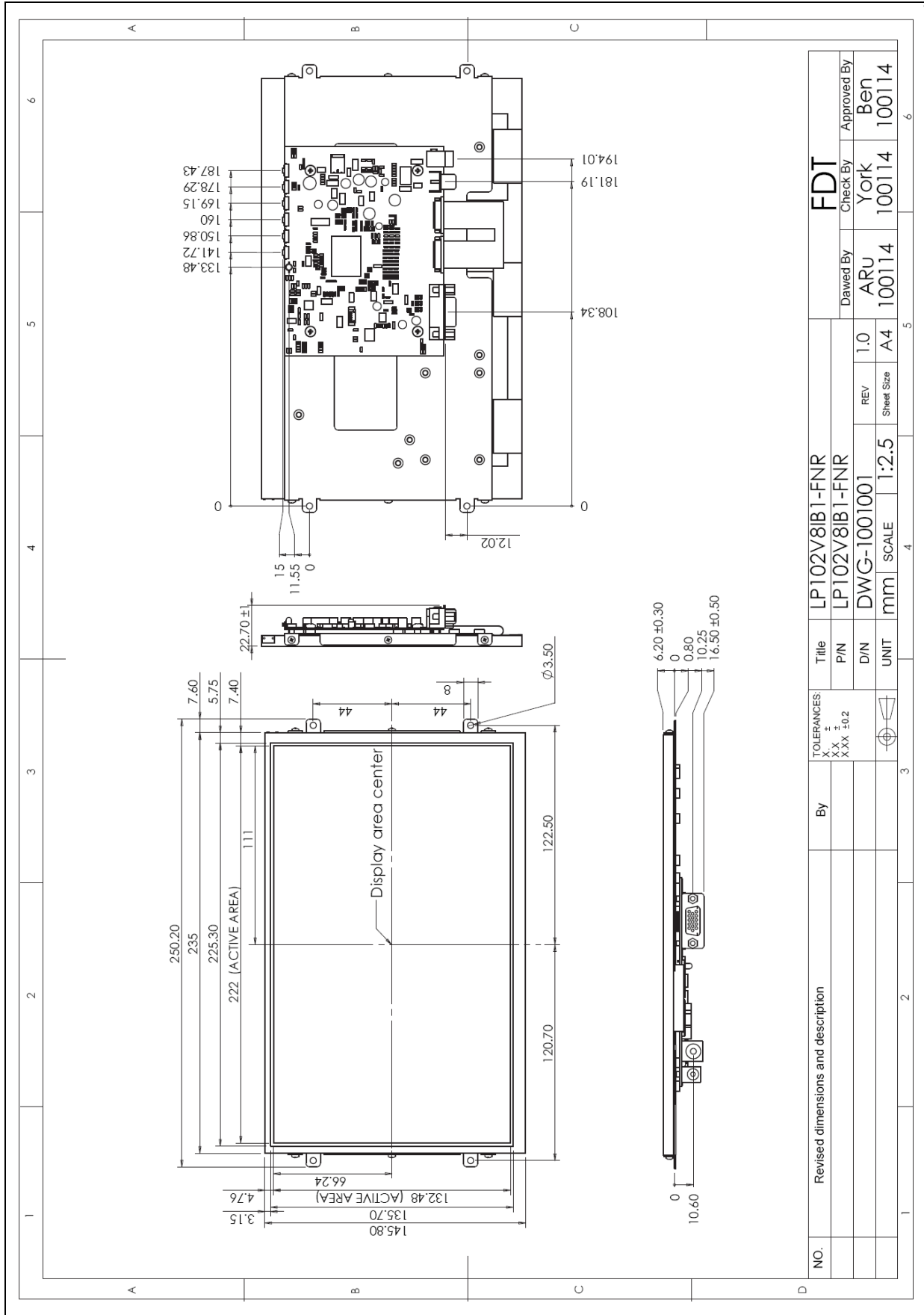
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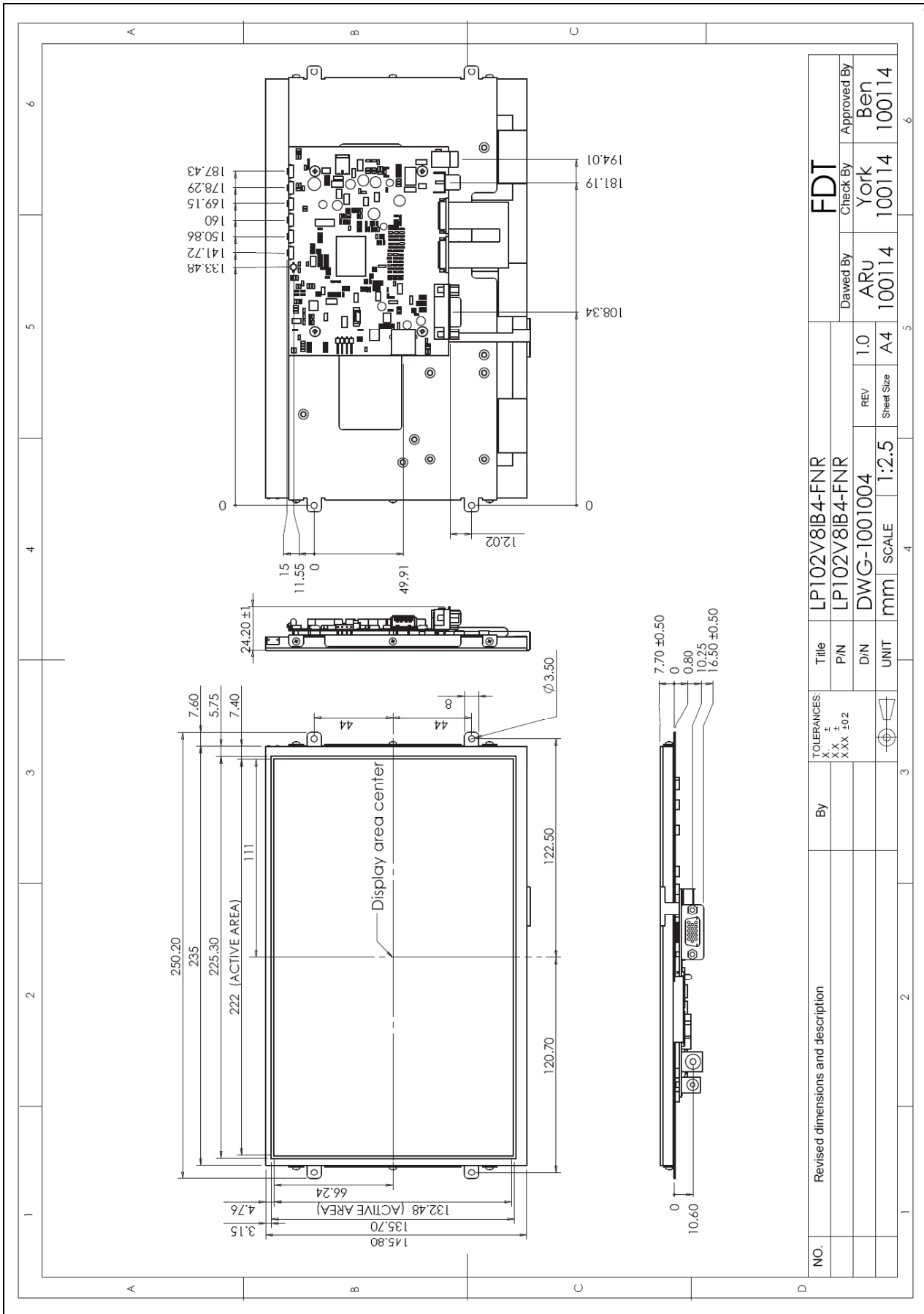


6. Dimension Information

6.1 Unit (LP102V8IB1-FNR)



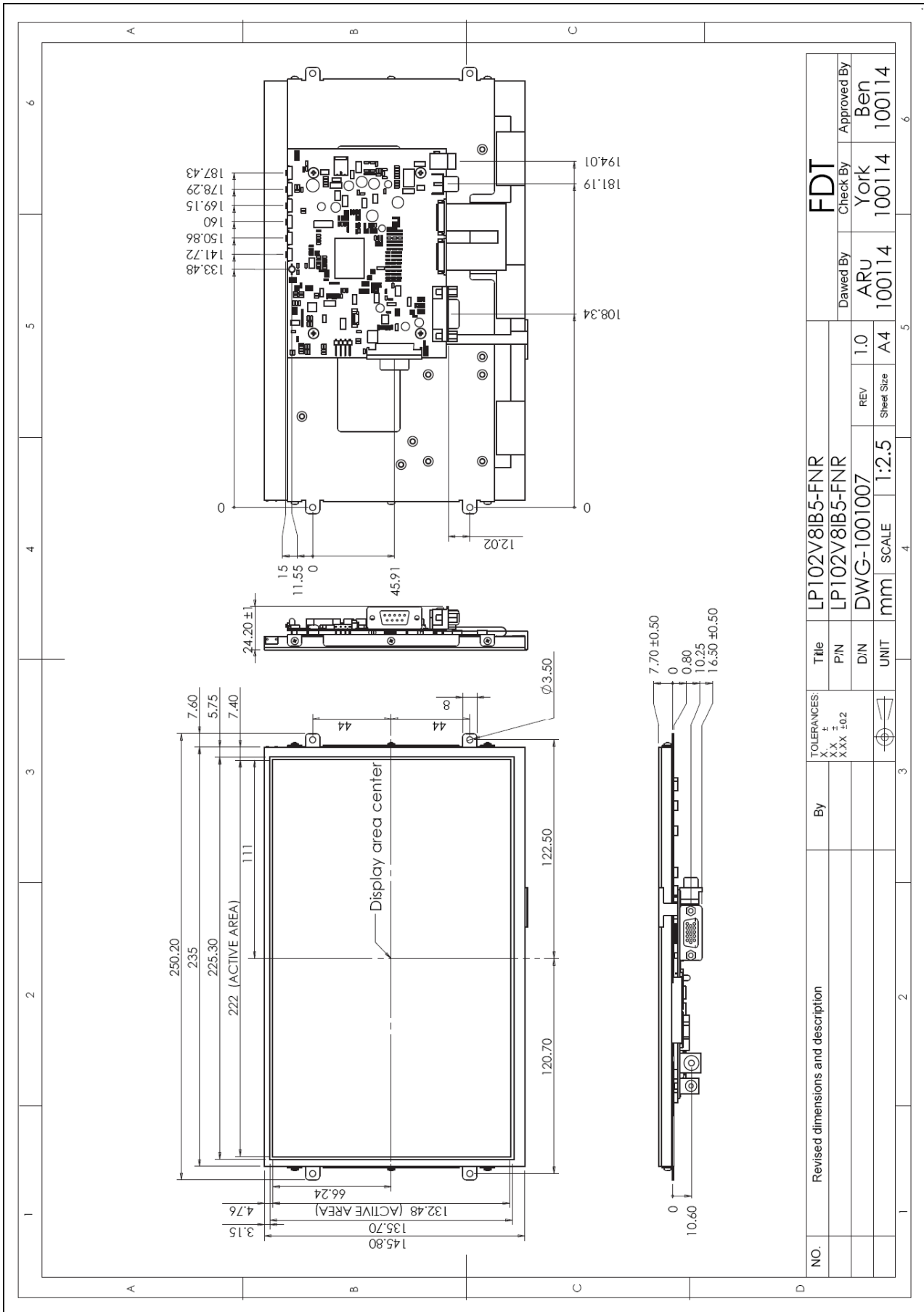
6.2 Unit (LP102V8IB4-FNR)



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LP102V8IBx-FxR V0.0 

6.3 Unit (LP102V8IB5-FNR)



NO.	Revised dimensions and description	By	TOLERANCES: X.X ± X.XX ± X.XX ±0.2	Title	LP102V8IB5-FNR	FDT	
				PIN	LP102V8IB5-FNR	Drawn By	Check By
				DIN	DWG-1001007	ARU	York
				UNIT	mm	1.0	100114
				SCALE	1:2.5	REV	100114
					A4	Sheet Size	100114
						Approved By	Ben
							100114

7. Pin Description

7.1 CNI : TFT-LCD Panel I/O Terminals (FPC 30 Pin Below Contact Type)

Pin No	Symbol	I/O	Description	Remark
1	POL	I	Polarity selection	
2	STVD	I/O	Vertical start pulse input when U/D= H	
3	OEV	I	Output enable	
4	CKV	I	Vertical clock	
5	STVU	I/O	Vertical start pulse input when U/D= L	
6	GND	P	Power ground	
7	EDGSL	I	Select rising edge or rising/falling edge	
8	VCC	P	Power supply for digital circuit	
9	V9	I	Gamma voltage level 9	
10	VGL	P	Gate OFF voltage	
11	V2	I	Gamma voltage level 2	
12	VGH	P	Gate ON voltage	
13	V6	I	Gamma voltage level 6	
14	U/D	I	Up/down selection	
15	VCOM	I	Common voltage	
16	GND	P	Power ground	
17	AVDD	P	Power supply for analog circuit	
18	V14	I	Gamma voltage level 14	
19	V11	I	Gamma voltage level 11	
20	V8	I	Gamma voltage level 8	
21	V5	I	Gamma voltage level 5	
22	V3	I	Gamma voltage level 3	
23	GND	P	Power ground	
24	R5	I	Red data(MSB)	
25	R4	I	Red data	
26	R3	I	Red data	
27	R2	I	Red data	
28	R1	I	Red data	
29	R0	I	Red data(LSB)	
30	GND	P	Power ground	

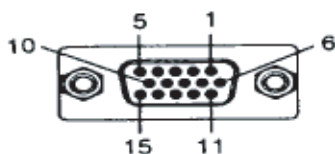
7.2 CN2 : TFT-LCD Panel I/O Terminals (FPC 30 Pin Below Contact Type)

Pin No	Symbol	I/O	Description	Remark
31	GND	P	Power ground	
32	G5	I	Green data(MSB)	
33	G4	I	Green data	
34	G3	I	Green data	
35	G2	I	Green data	
36	G1	I	Green data	
37	G0	I	Green data(LSB)	
38	STHL	I/O	Horizontal start pulse input when R/L = L	
39	REV	P	Control signal are inverted or not	
40	GND	I	Power ground	
41	DCLK	I	Sample clock	
42	VCC	P	Power supply for digital circuit	
43	STHR	I/O	Horizontal start pulse input when R/L = H	
44	LD	I	Latches the polarity of outputs and switches the new data to outputs	
45	B5	I	Blue data (MSB)	
46	B4	I	Blue data	
47	B3	I	Blue data	
48	B2	I	Blue data	
49	B1	I	Blue data	
50	B0	I	Blue data (LSB)	
51	R/L	I	Right/ left selection	
52	V1	I	Gamma voltage level 1	
53	V4	I	Gamma voltage level 4	
54	V7	I	Gamma voltage level 7	
55	V10	I	Gamma voltage level 10	
56	V12	I	Gamma voltage level 12	
57	V13	I	Gamma voltage level 13	
58	AVDD	P	Voltage for analog circuit	
59	GND	P	Power ground	
60	VCOM	I	Common voltage	



7.3 J405 : Pin Assignment of Analog RGB Input (D-Sub 15Pin)

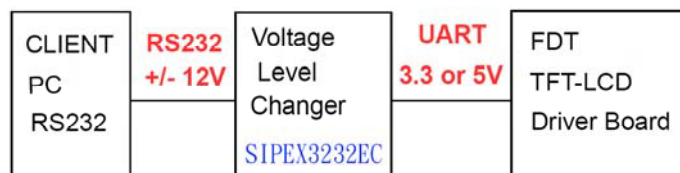
Pin No	Symbol	I/O	Description	Remark
1	RI+	I	Analog Red Signal	
2	GI+	I	Analog Green Signal	
3	BI+	I	Analog Blue Signal	
4	NC	-	No Connection	
5	GND	-	Ground	
6	AGND	-	Analog Ground	
7	AGND	-	Analog Ground	
8	AGND	-	Analog Ground	
9	NC	-	No Connection	
10	NC	-	No Connection	
11	NC	-	No Connection	
12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



7.4 J101: Pin Assignment of UART (Pitch 1.25mm 4Pin, Side Entry Type)

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.



7.5 DC 401: 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	

7.6 RCA 401: 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	

7.7 J601 : 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	

7.8 DB601 : 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	

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 Without TSP		-20	+70	°C	
Operating Temperature With TSP		-5	+60	°C	
Storage Temperature Without TSP		-20	+70	°C	
Storage Temperature With TSP		-20	+70	°C	



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	I		-		mA	
Power Consumption		I		-		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		0.7		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	

9.3 Optics Sample Test Data

Parameter	White Window	Red	Green	Blue	Remark
S/N : 001 x	-	-	-	-	
.y	-	-	-	-	±15%
L(cd/m ²)	-	-	-	-	
TC(°K)	-	-	-	-	

Note: 1. Luminance Meter : BM-7 FAST(TOPCON)

2.Video Pattern Generator: FLUKE PM54200

3. Measurement Distance : 500mm±50mm

4. TOPCON BM-7 Luminance Meter 2° filed of view is used in the testing

(After 10min ~20min operation)

10.4W Resistive Touch Panel Characteristics

10.1 Pin assignment (Pitch :1.0 mm)

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

10.2 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	250	-	1200	Ω	
	Y	100	-	600	Ω	
Input Voltage	VT	-	-	7.0	V	
Linearity		-	-	1.5	%	
Insulation Impedance		25	-	-	M Ω	DC 25V

10.3 Optical Performance

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

10.4 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	Max: 80gf
Surface Hardness	3H

10.5 Durability Performance

Parameter	Specifications
Pen Sliding Durability	\geq 50000 words, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec
Finger knocking Durability	\geq 1000000 times, with R8.0 mm silicon rubber, 250g, 5Hz

10.6 Environmental

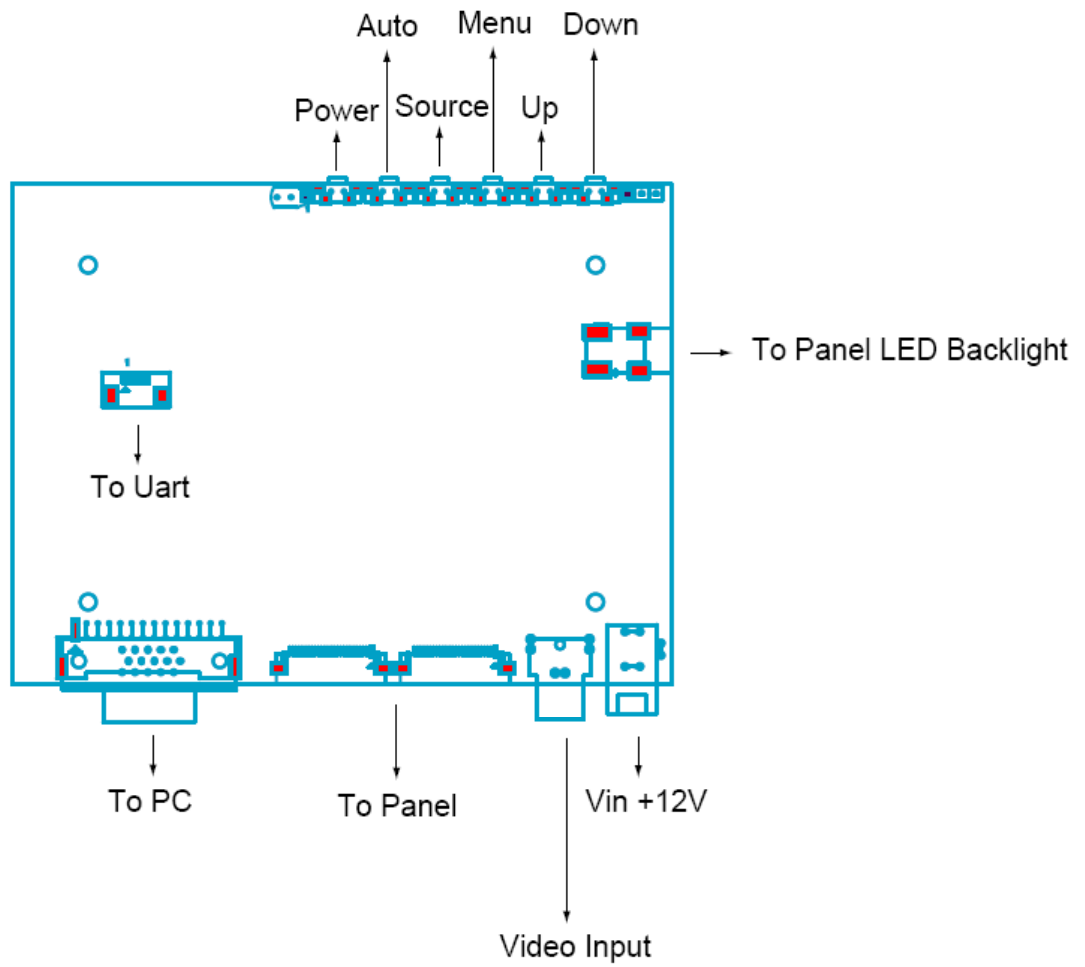
Parameter	Specifications
Operating Temp.	-5°C~60°C (Except dew condensation)
Storage Temp.	-20°C~70°C (Except dew condensation)
Operating Humidity (Non Condensing)	20% RH~ 90%RH
Storage Humidity (Non Condensing)	10% RH~ 90%RH

10.7 Reliability test procedure

Parameter	Specifications
High temperature storage test	70°C for 240 hours.
Low temperature storage test	-20°C for 240 hours.
Thermal Cycling	-20°C (0.5 hr each)~70°C (0.5 hr each) for 50 cycles.
High temperature and high humidity	40°C, 95%RH for 240 hours.

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



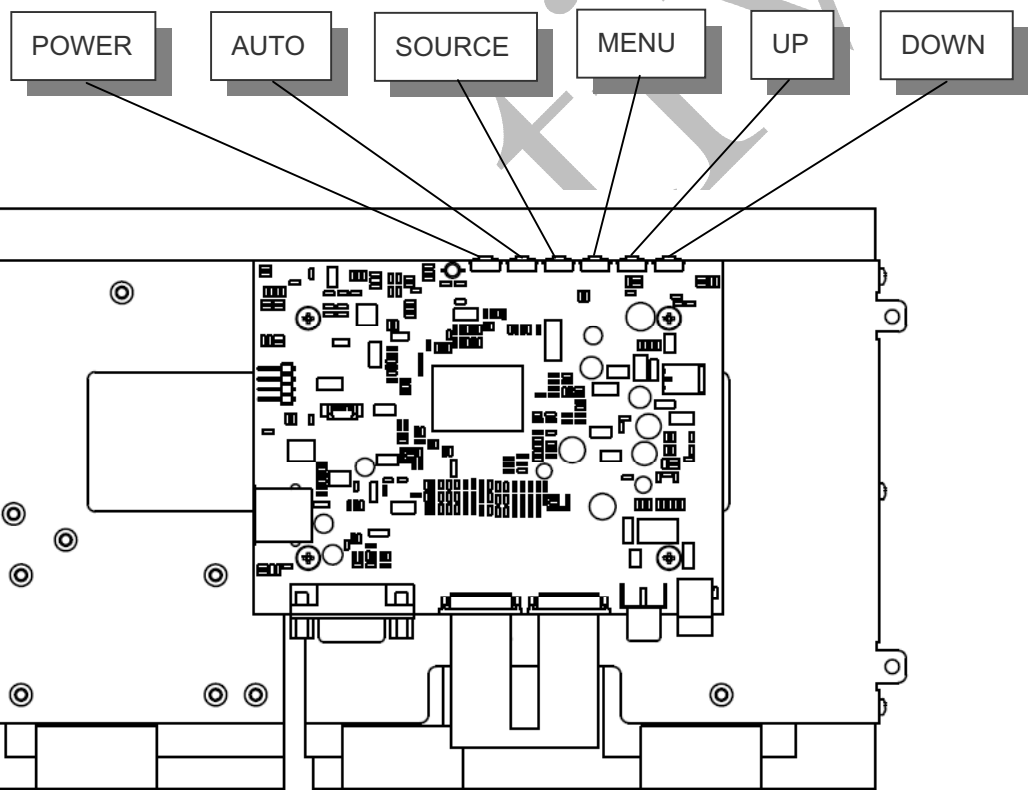
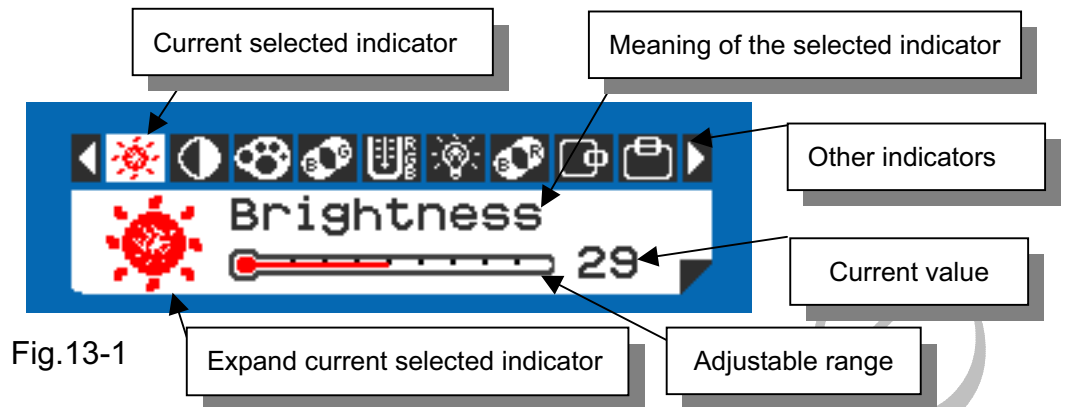
G.

- A. AC to DC Adapter (100-240VAC 50-60Hz to +12VDC @ 2.5A)
- B. Power Cord (Plug Type B for USA)
- C. Video Cable
- D. VGA Cable
- E. USB Cable
- F. RS-232 Cable
- G. Touch Screen Driver CD Disk / User Manual

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.

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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	
	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
	Scale	Full / 4:3	AV / 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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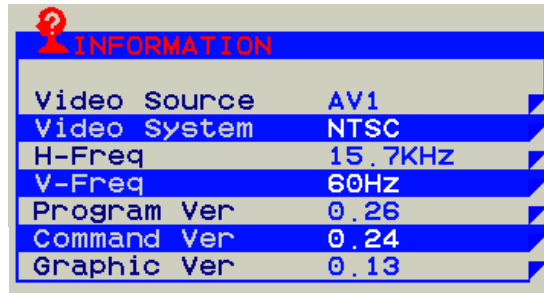


Fig.13-2

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

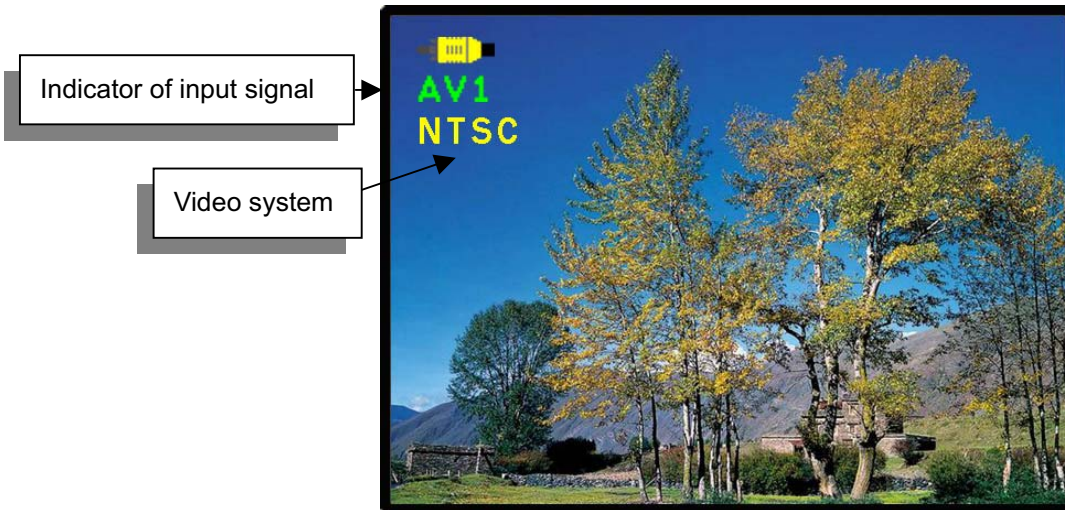




Fig.13-4

[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