



§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No: **LP070A065x-FNR**

Description: **7" Digital TFT-LCD Module**

SPEC No.: **SAS-1406003**

Version: **0.1**

Issue Date: **June 17, 2014**

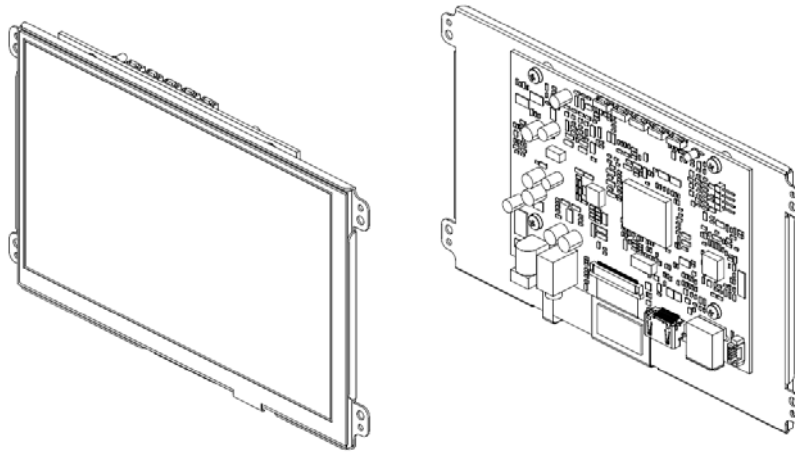
※ This approval sheet contains 21 pages including the cover and appendix.

Customer:	Approved By:
Date: / / 14	

Approved By:

Checked By:

Designed By:



1. General Description

1.1 Features

- 7" (1024x600) Digital TFT LCD
- Aspect Ratio: 16:9
- Input Signal HDMI 1.3a
- Maximum Support Resolution 1920x1080
- Headphone Driver, 46mW@32Ω
- Touch Screen 4W Resistive
- 5 Key Buttons Control
- UART / RS232 Serial Remote Control (Optional)
- 8 Language OSD Menu
- LED Backlight
- Single Operation Voltage +5V

1.2 Applications

- Industrial
- Medical Environment
- Instrument Display
- Kiosk
- Security
- Signage
- Office Electronics
- Home Application
- Educate Application

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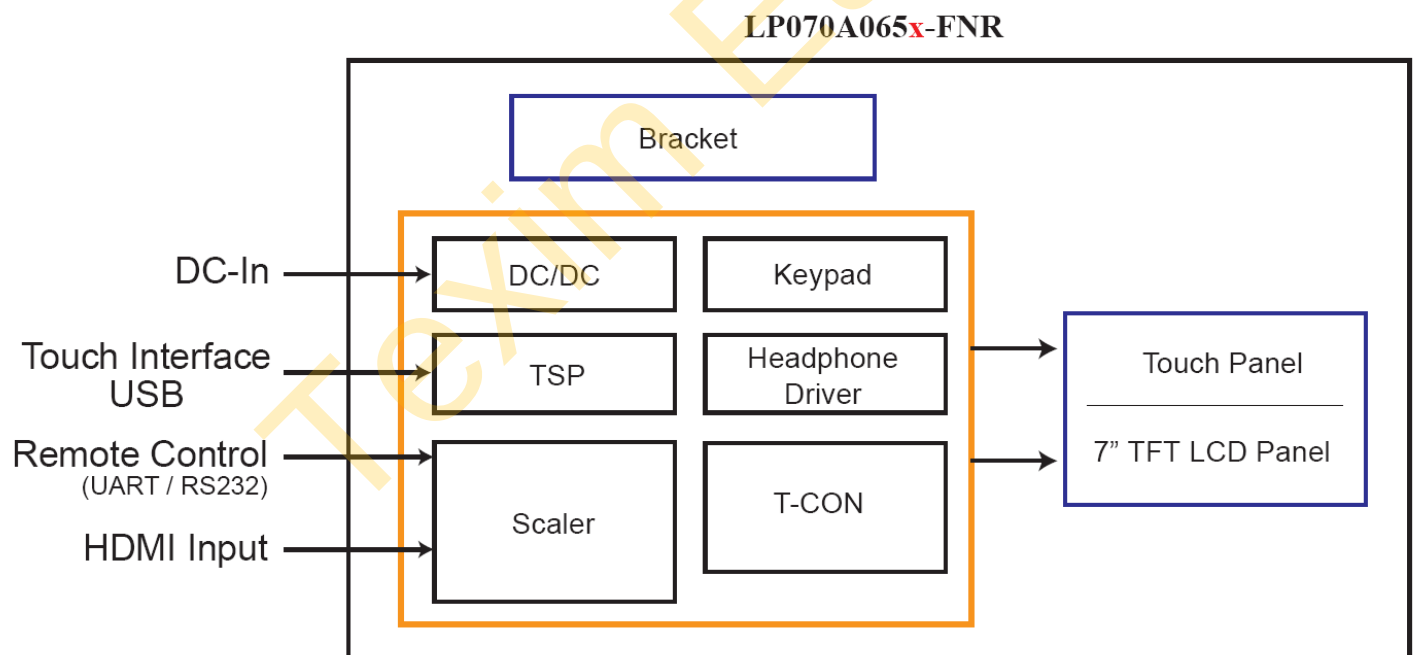
Texim Europe

3. Specifications

LCD	
Panel Size	7"
Resolution (Pixels)	1024x600
Color	262K
Luminance w/o RTP	250 cd/m ²
Luminance (RTP)	200 cd/m ²
Contrast Ratio	700
Viewing Angle	75 / 75 / 70 / 75
Backlight Life Time (LED)	15K (Min)
Power Requirement	
Power Input (DC Jack 2.5 ϕ)	+5V _{DC}
Power Consumption	3.6 Watts
Touch Screen	
Resistive Type	USB Interface
Resistive Type Support OS	Windows / Linux / DOS / Mac / QNX

<i>Input Signal</i>	
HDMI	1.3a
<i>Audio</i>	
Headphone Driver	46mW@32Ω
	Phone Jack ϕ 3.5
<i>Controls</i>	
Key	5 Buttons
Serial Remote Control	UART / RS232 (Optional)
<i>Environment</i>	
Operating Temp. w/o RTP	-10~+50(Ts)°C
Storage Temp. w/o RTP	-20~+60°C
Operating Temp. 4W RTP	-10~+50(Ts)°C
Storage Temp. 4W RTP	-20~+60°C

4. Block Diagram



5. TFT-LCD Information

5.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	7 (diagonal)	Inch
Display Format	1024 x (R.G.B) x 600	Dot
Active Area	153.6(W) × 90.0(H)	mm
Pixel Pitch	0.15(H) x 0.15(V)	mm
Pixel Arrangement	RGB-stripe	
Surface Treatment	Clear	

5.2 TFT-LCD Optical Characteristics

Parameter		Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	CR ≥ 10	65	75	---	deg	
		Right		65	75	---	deg	
	Vertical	Top		60	70	---	deg	
		Bottom		65	75	---	deg	
Contrast Ratio		CR	At optimized Viewing angle	500	700	---	---	
Luminance w/o RTP		L		200	250	---	cd/m ²	
Backlight Life Time (LED)			25°C	15000	---	---	Hrs	

6. Order Information

6.1 *Unit*

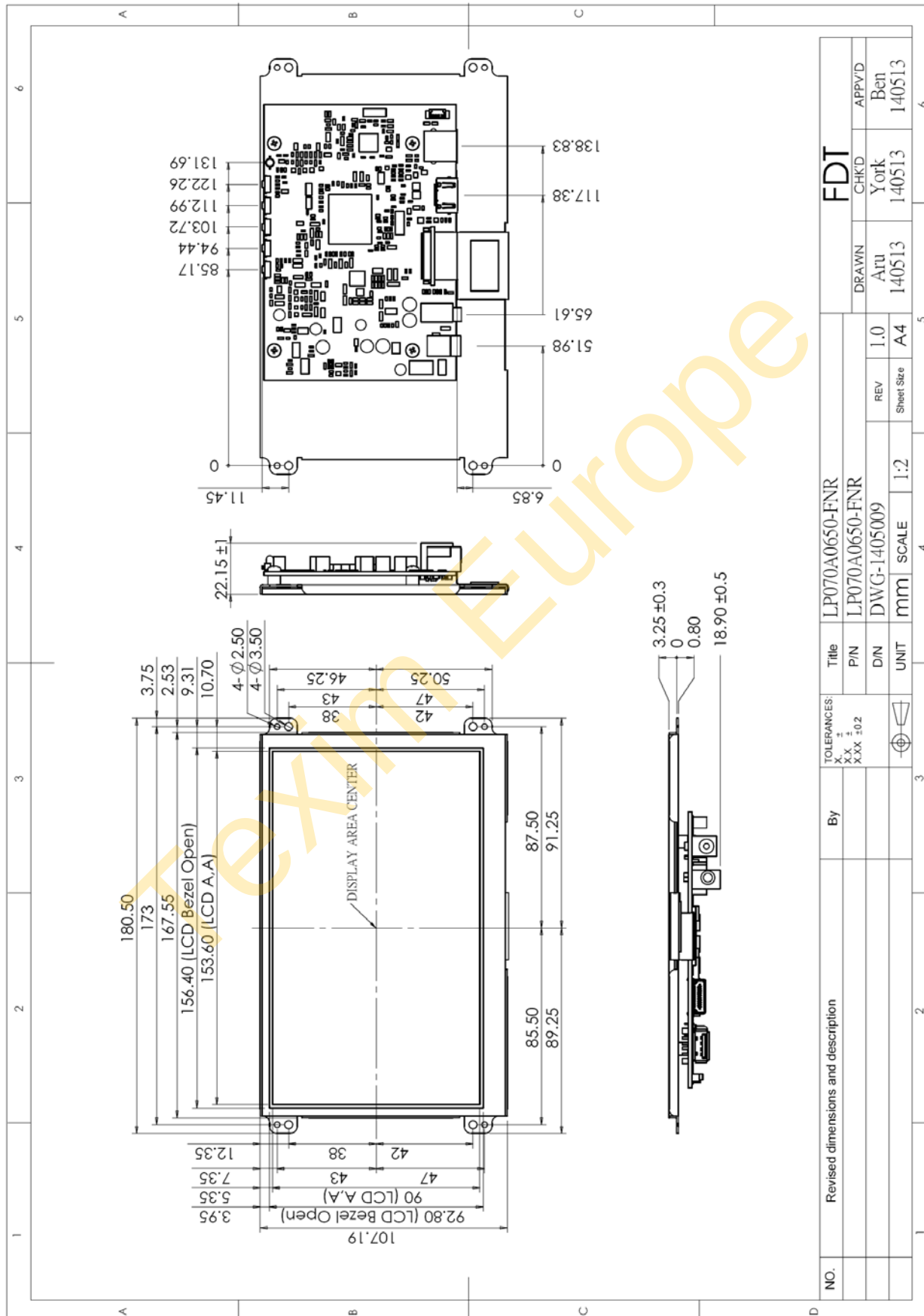
Parameter	LP070A0650-FNR	LP070A0654-FNR
HDMI	⊙	⊙
Touch Panel Type	-	4W Resistive
Touch Screen Interface	-	USB
Headphone Driver	⊙	⊙
5 Keys	⊙	⊙
UART Remote Control	⊙	⊙

Note: 1.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.

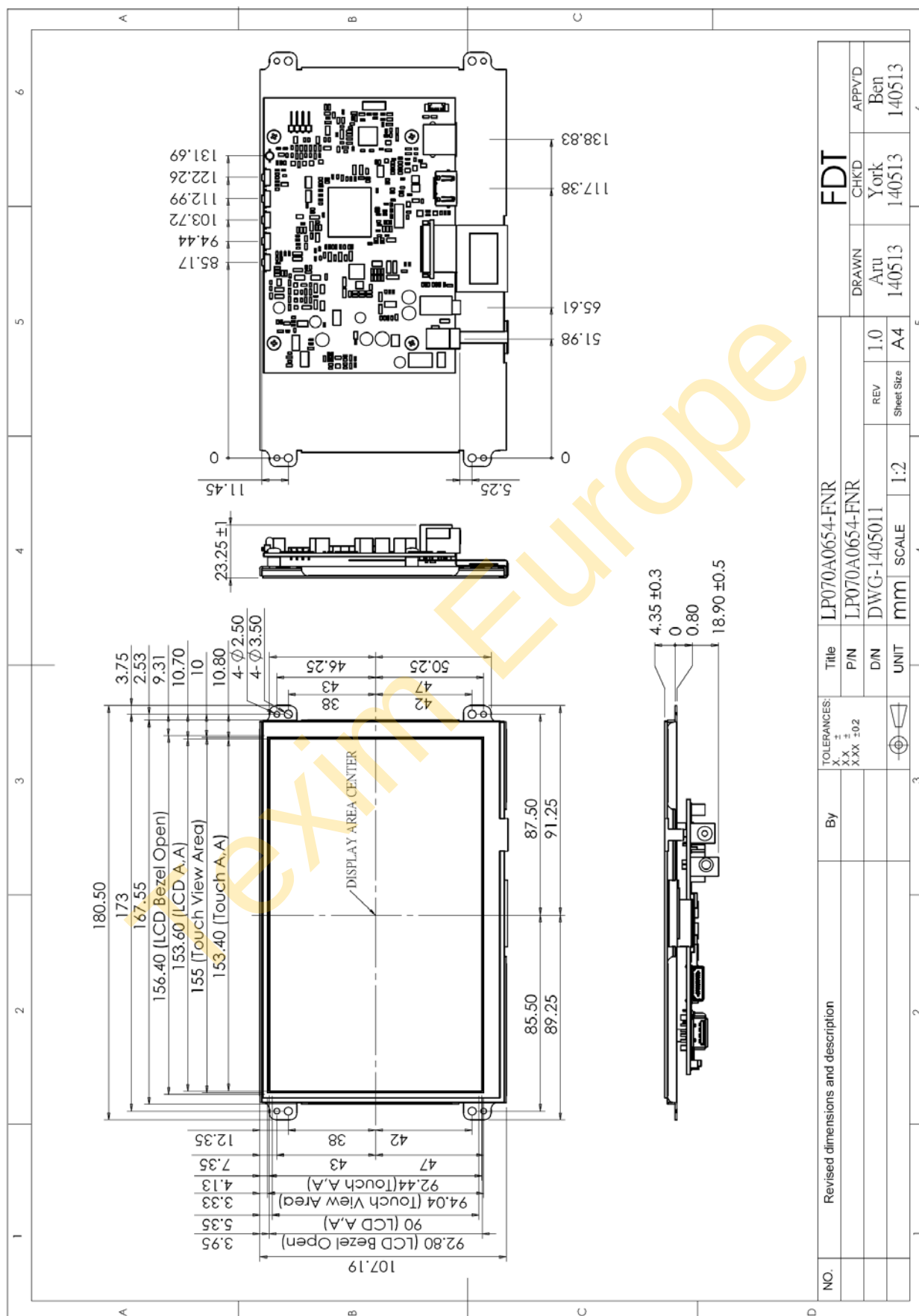
Optional Functions	
Parameter	- RS232 Remote Control - External Key - Accessories (Refer to Page 22)

7. Dimension Information

7.1 Unit (LP070A0650-FNR)



7.2 Unit (LP070A0654-FNR)



8. Pin Description

8.1 J101 : Pin Assignment of Power Input (DC Jack Inside Diameter:2.5 ϕ Outside Diameter:5.5 ϕ Side Entry Type)

Pin No.	Symbol	I/O	Description	Remark
1	DC-In	I	+5 Vdc Input Voltage	
2	GND	-	Power Ground	

8.2 J702 : Pin Assignment of UART (Pitch 1.25mm 4Pin, Top Entry Type)

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

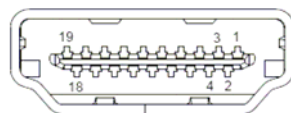
※ FDT Matching Connector Part No.: P24014 (STM) [Same as 51021-0400 (MOLEX)].

Pin No.	Symbol	I/O	Description	Remark
1	TX / RS232 TX (Option)	O	UART / RS232 (Option) Transmission Data	
2	RX / RS232 RX (Option)	I	UART / RS232 (Option) Receive Data	
3	GND	-	Ground	
4	+3.3Vdc	O	+3.3Vdc Output Voltage	

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

8.3 J401 : Pin Assignment of HDMI-A Type Input (HDMI 1.3a -19Pin Female)

Pin No.	Symbol	I/O	Description	Remark
1	DATA2+	I	Positive HDMI Input for B Link Data Channel 2	
2	DET_HDMI	-	HDMI Detect	
3	DATA2-	I	Negative HDMI Input for B Link Data Channel 2	
4	DATA1+	I	Positive HDMI Input for B Link Data Channel 1	
5	GND	-	Ground	
6	DATA1-	I	Negative HDMI Input for B Link Data Channel 1	
7	DATA0+	I	Positive HDMI Input for B Link Data Channel 0	
8	GND	-	Ground	
9	DATA0-	I	Negative HDMI Input for B Link Data Channel 0	
10	DCLK+	I	Positive HDMI Input for B Link Clock Channel	
11	GND	-	Ground	
12	DCLK-	I	Negative HDMI Input for B Link Clock Channel	
13	NC	-	No Connection	
14	NC	-	No Connection	
15	HDMI_SCL	I	DDC2 Clock	
16	HDMI_SDA	I	DDC2 Data	
17	GND	I	DDC/CEC Ground	
18	HDMI5V	I	HDMI +5Vdc Input	
19	HDMI_HPD	I	Hot Plug Detect	



8.4 J601D : Pin Assignment of Key Board (Pitch 1.25mm 12Pin , Side Entry Type)(Option)

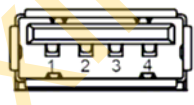
※ FDT Connector Part No.: MS240112R (STM) [Same as 53261-1219 (MOLEX)] ;

※ FDT Matching Connector Part No.: P240112 (STM) [Same as 51021-1200 (MOLEX)].

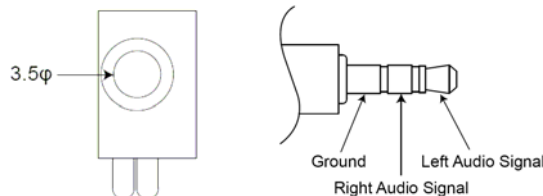
Pin No.	Symbol	I/O	Description	Remark
1	-	-	Don't Connect	
2	SW5	I	EXIT	
3	SW4	I	DOWN	
4	SW3	I	UP	
5	SW2	I	MENU / S	
6	SW1	I	POWER / SOURCE	
7	GND	-	Ground	
8	VDDP	-	VDDP +3.3Vdc Output Voltage	
9	-	-	Don't Connect	
10	RED	O	Indicator red LED for power off control	
11	GREEN	O	Indicator green LED for power on control	
12	GND	-	Ground	

8.5 J701 : Pin Assignment of Touch USB (USB A Type - 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	



8.6 J301 : Pin Assignment of Phone Jack (Outside Diameter:3.5 φ Side Entry Type)



9. Absolute Maximum Ratings

9.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	V _{in}	+4.5	+6	V	
Digital Input Signal	TTL	0.3	3.6	V	
HDMI Input Signal		-	165	MHz	
Operating Temp. w/o TP		-10	+50 (Ts)	°C	
Storage Temp. w/o TP		-20	+60	°C	
Operating Temp. 4W RTP		-10	+50 (Ts)	°C	
Storage Temp. 4W RTP		-20	+60	°C	

10. Recommended Operating Conditions

10.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	DC-in	I	+4.8	+5	+5.8	V	
Total Current	I _{in}	I		720		mA	+5V
Power Consumption		I		3.6		W	
Output Voltage	VDD	O	3.2	3.3	3.4	V	
HDMI Input Signal				165	MHz		

10.2 Support Display Mode Characteristics

Dots per inch	H	Unit	Polarity	V	Unit	Polarity	Note
800*600	37.88	KHz	Positive	60.3	Hz	Positive	
1024*600	37.54	KHz	Positive	60	Hz	Positive	
1024*768	48.36	KHz	Positive	60	Hz	Positive	
1280 × 1024	63.98	KHz	Positive	60	Hz	Positive	
1600 × 1200	75	KHz	Positive	60	Hz	Positive	
1920 × 1080	67.5	KHz	Positive	60	Hz	Positive	

11. 4W Resistive Touch Panel Characteristics

11.1 4W Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Note
Terminal Resistance	X	20		500	Ω	
	Y	20		500	Ω	
Linearity				1.5	%	
Insulation Impedance		20			M Ω	DC 25V
Response Time				10	ms	

11.2 4W Optical Performance

Parameter	Specifications
Light Transmittance	>80%
Haze	< 10%

11.3 4W Mechanical Performance

Parameter	Specifications
Input Method	Stylus or Finger
Operating Force	100g, R8 Silicon Rubber, 60HS
Surface Hardness	3H pencil, pressure 1N/45°

11.4 4W Durability Performance

Parameter	Specifications
Knock Test	1,000,000 times, Weight $\leq$ 100g. 2 times/sec (Tip R8 mm Silicone rubber)
Pen Sliding Test	100,000 times, Weight $\leq$ 100g. 30 times/sec (Tip R0.8 mm Stylus pen)

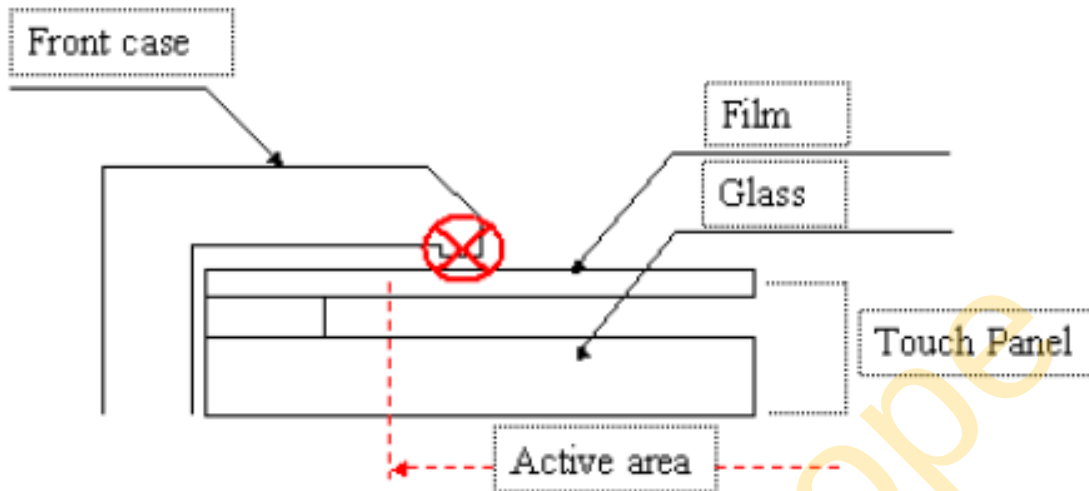
11.5 Resistive Touch Panel Operation System Support

OS	Version	Interface
Windows	Windows Vista, XP / 200, 9x / ME	USB
	Windows Embedded	
	Windows 7	
	Windows 8 / 8.1	
Linux	Kernel 2.4.x (x86 32bit)	USB
	Kernel 2.6.x Upwards (x86 32 / 64bit)	
	Kernel 2.6.24 Upwards (ARM , MIPS)	
	Android 1.5 / 1.6 / 2.x / 4.x – Google	USB
Mac	Mac OS9, Mac OS X (IBM, Intel CPU)	USB
QNX	QNX RTOS v6.3	USB

11.6 Resistive Touch Panel Integration Design Guide

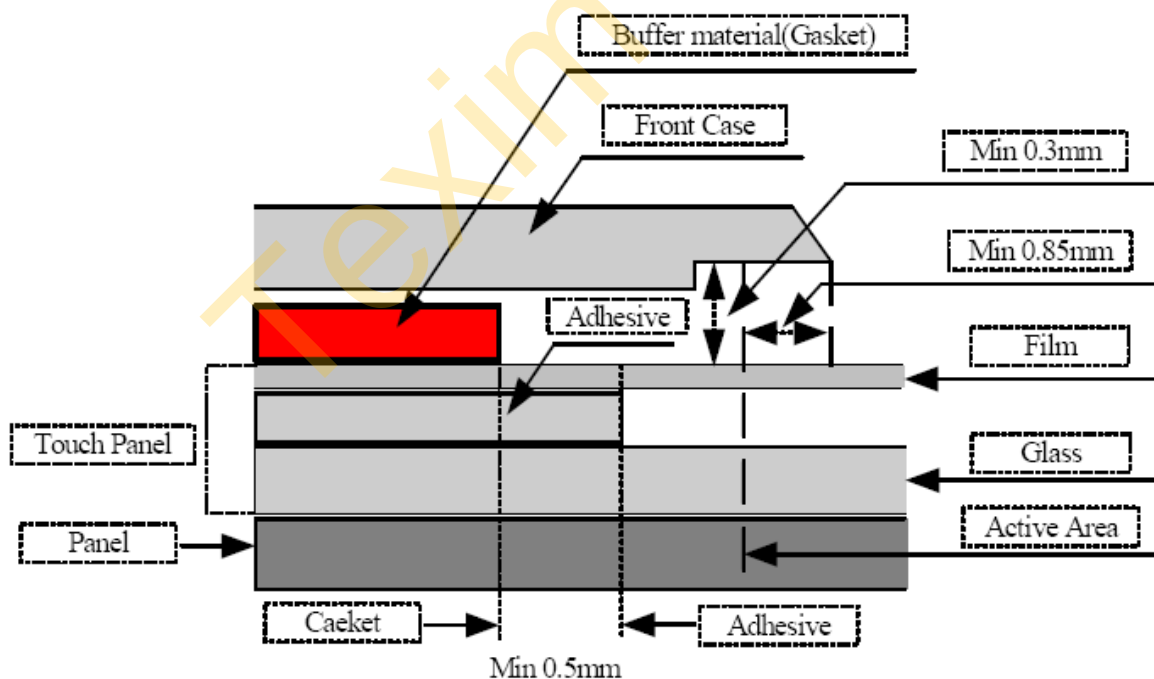
Avoid the design that Front-case overlap and press on the active area of the touch-panel.

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

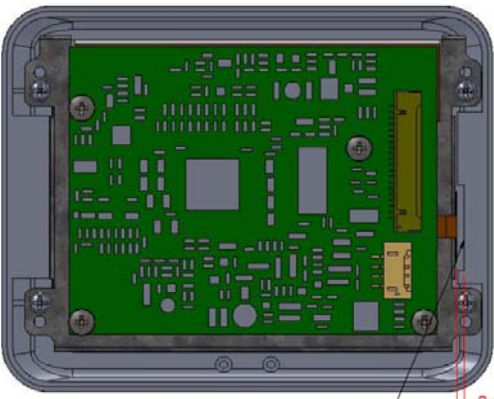
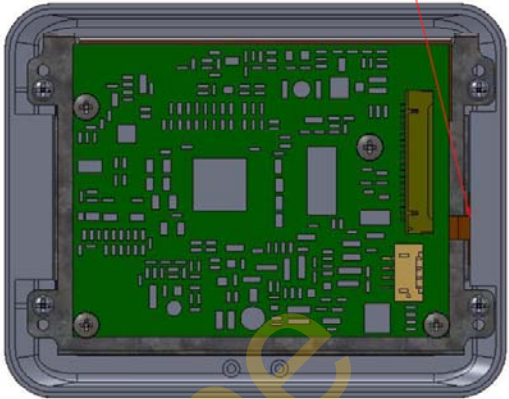
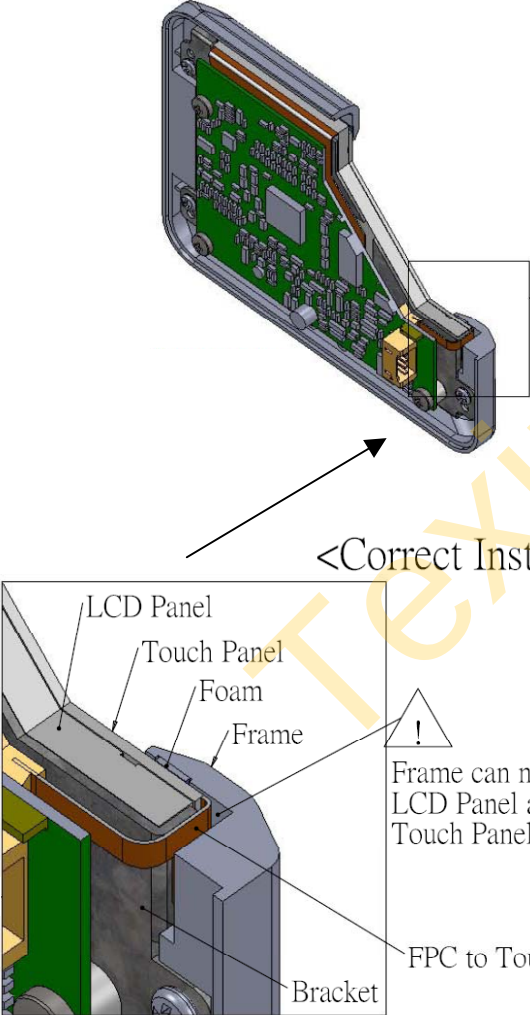
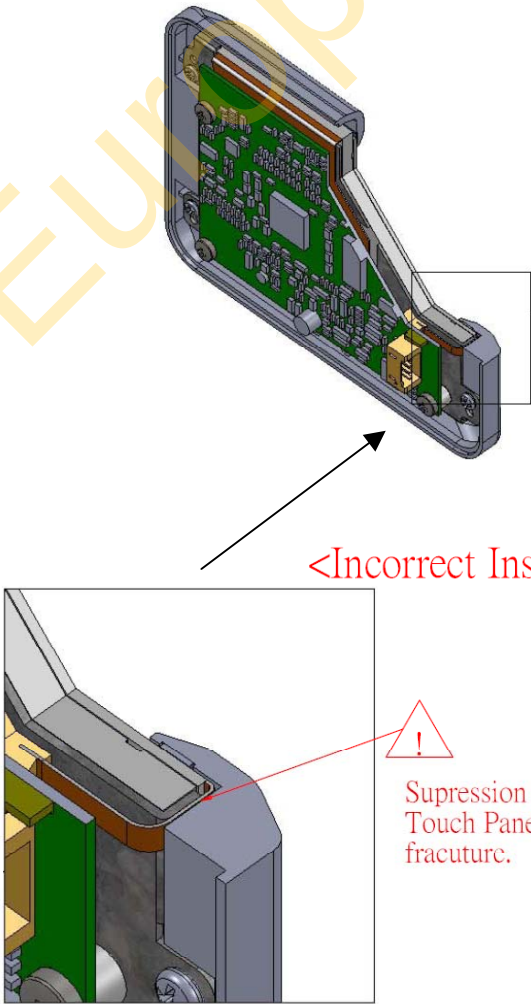


Use a buffer material (Gasket) between the touch-panel and front-case to protect damage and wrong operating.

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

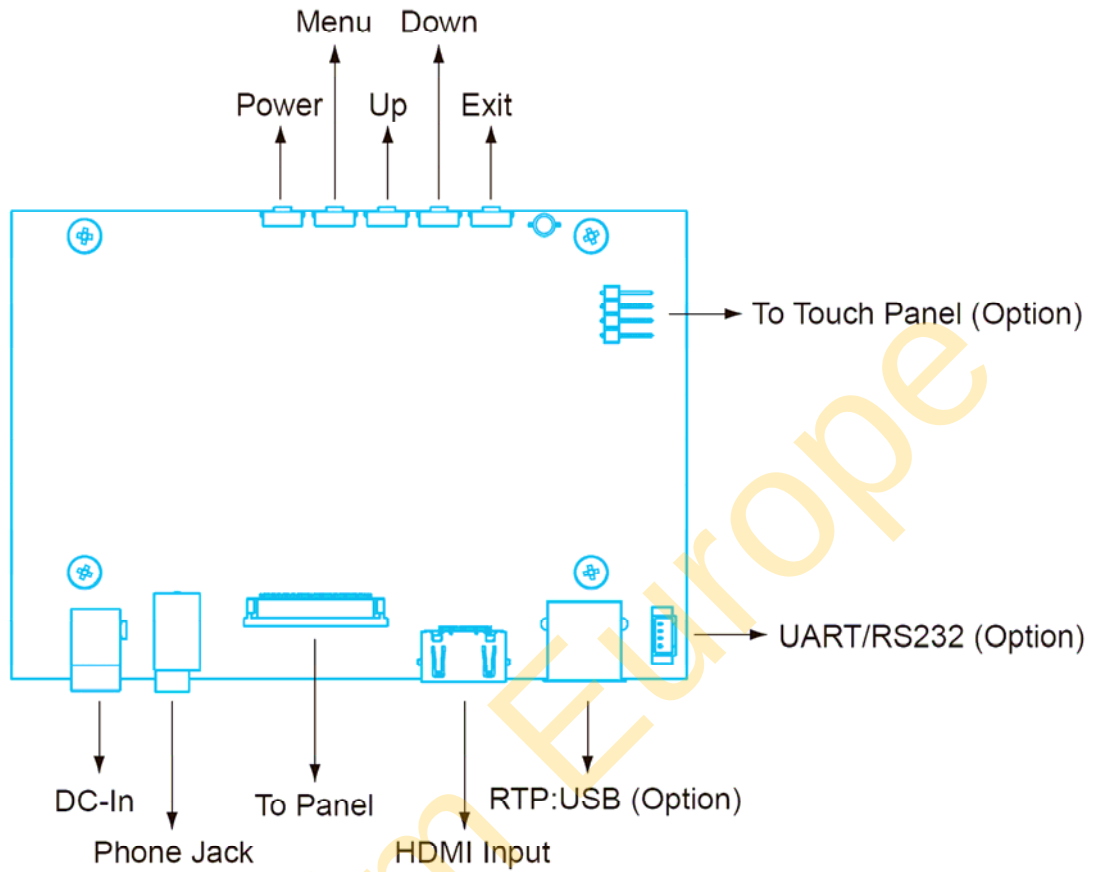


11.7 Mechanical Design Notice For Resistive Touch Panel

Correct Installation	Incorrect Installation
 <Correct Installation> 3mm Minimum gap	 <Incorrect Installation>
 <Correct Installation> Zoom-In LCD Panel Touch Panel Foam Frame Bracket FPC to Touch Panel ! Frame can not surpress on LCD Panel and FPC to Touch Panel	 <Incorrect Installation> Zoom-In ! Supression on FPC to Touch Panel causes the fracature.

12. Operation manual / Connection

12.1 Driver Board Manual



13. Accessories (Option)

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



A. LASTD05030-FDR



B. LAAC818000-FDR



C. LACABLE068-FDR



D. LAUSB18000-FDR



E. LACABLE070-FDR

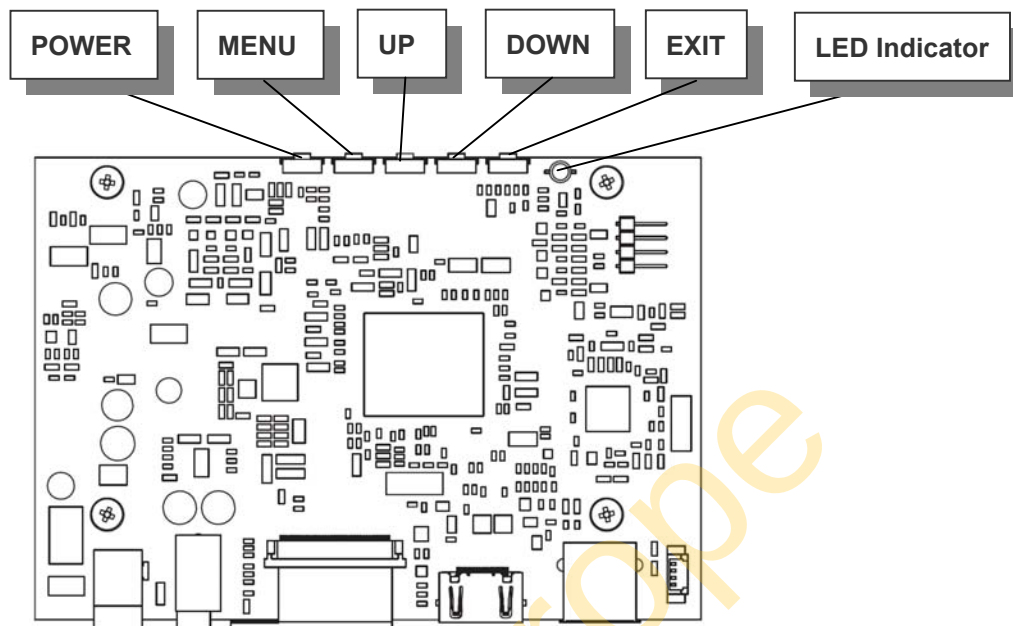


F. LAVCD00002-FDR

- A. AC to DC Adapter (L:1500mm,100-240V_{AC} 50-60Hz to +5V_{DC} @ 3A, ϕ 2.5)
- B. Power Cord (L:1800mm, Plug Type B for USA)
- C. HDMI Cable (L:2000mm)
- D. USB Cable (L:1800mm)
- E. AUDIO Cable (L:1800mm)
- F. Touch Screen Driver CD Disk / User Manual

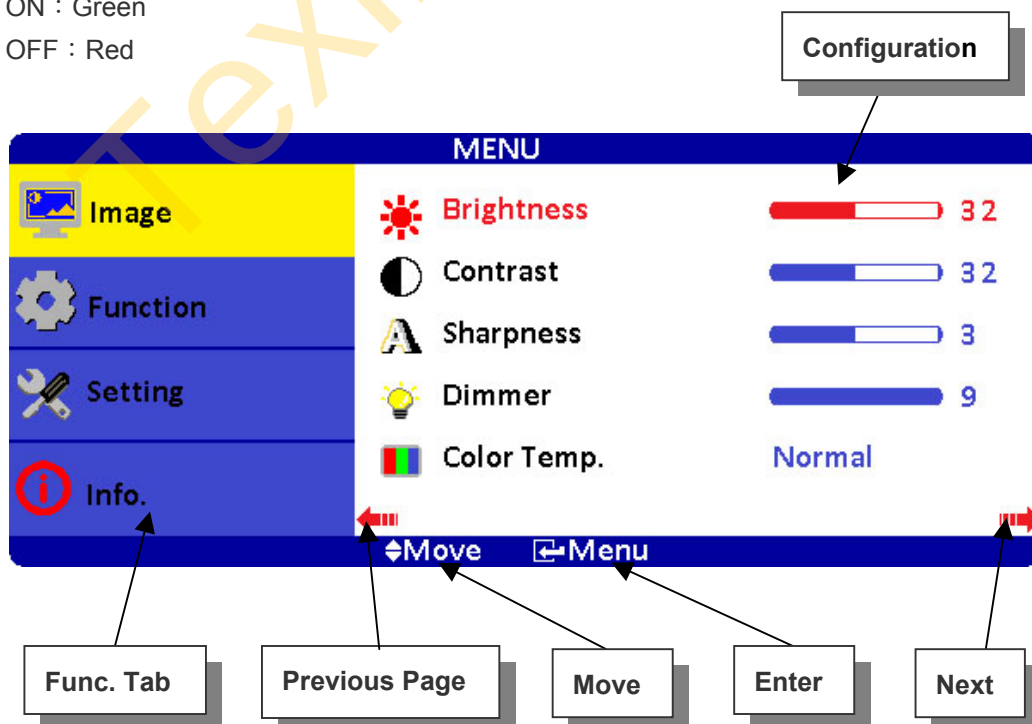
14. Key Function by OSD

14.1 Menu Operation



OSD ICON Instructions :

1. POWER : Power On/Off
2. MENU : Enter
3. UP : Move Upward / Increase Value / Option Switch
4. DOWN : Move Downward / Decrease Value / Option Switch
5. EXIT : Return to Previous Page
6. LED Indicator
 - 6.1 Waiting : Flickering Green
 - 6.2 Power ON : Green
 - 6.3 Power OFF : Red



Overview of the Menu :



Image

Indicator	Meaning	Default	Adjustable range	Remark
	Brightness	32	0~63	Adjust-Bar
	Contrast	32	0~63	Adjust-Bar
	Sharpness	3	1~5	Adjust-Bar
	Dimmer	15	0~15	Adjust-Bar
	Color Temp.	Normal	Normal / Warm / Cool	
	Exit			



Function

ICON	Meaning	Default	Adjustable range	Function	Remark
	Show Status	On	On / Off	Information of input source	ON: Show ; OFF: Hidden
	Blue Screen	On	On / Off	No signal input shows blue or black screen.	ON: Blue ; OFF: Black
	Auto Power On	On	On / Off	Modules turns on automatically w/o power input.	ON: Auto ; OFF: Manual
	Auto Power Saving	Off	6s / 15s / 30s / Off	Modules go ready when no input source is detected.	ON: Auto ; OFF: Normal
	Auto Sleep	Off	15M / 30M / 60M / Off	Modules go sleep when set timing is out.	ON: Auto ; OFF: Normal
	Exit				

Note : After configuration is set, RESET won't restore to default setting.



Setting

Indicator	Meaning	Default	Adjustable range	Remark
	Volume	32	0~63	
	Mute	Off	On / Off	On : Mute · Off : Sound
	Mirror	Off	On / Off	Left-right reversal
	Flip	Off	On / Off	Upside down
	Language	English	English / 中文 / 日本語 / 한국의 / Française / Deutsch / Italiano / Española / Português	
	Reset			Restore to default
	Exit			



Info.

MENU



Image

Source : HDMI



Function

Resolution : 1024x600



Setting

H-Position : 37.5KHz

V-Position : 59.8Hz



Information

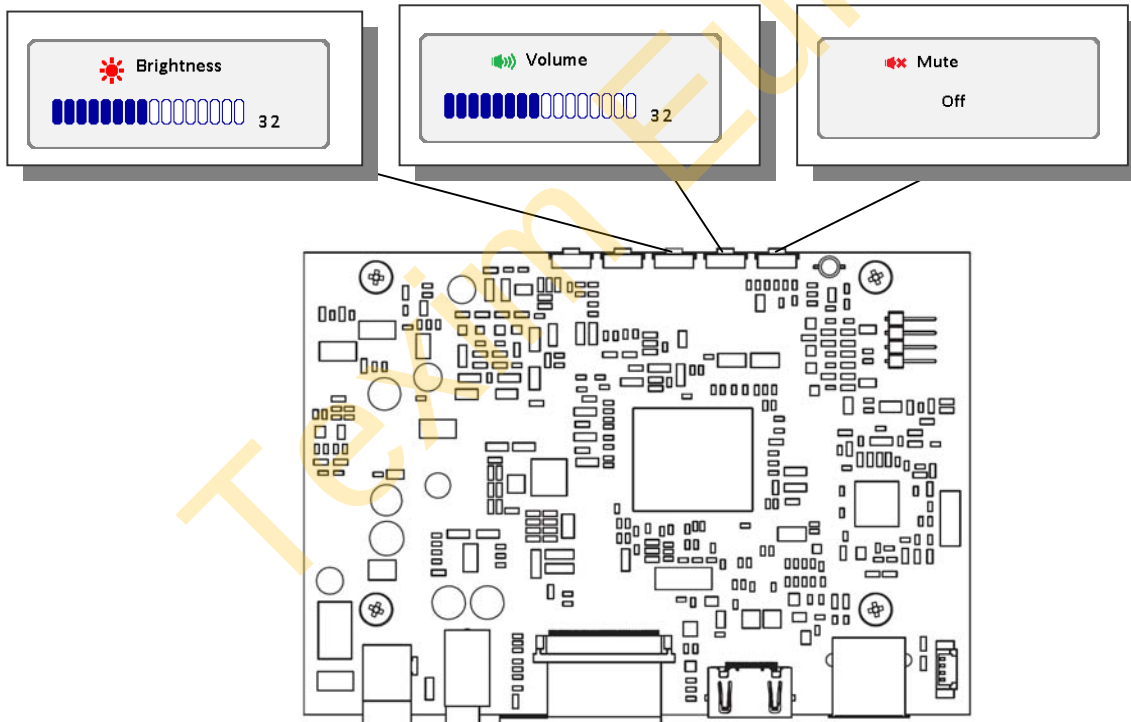
Program Ver : 1.00

Command Ver : 1.00

Move

Exit / Menu

Hot Key When OSD Menu is Off :



Information of Input Source and Functionality :



[Source] : Input Signal Switch

Overview of Input Signals :

Indicator	Interface
	HDMI