

PB-FREE

# SPECIFICATION FOR APPROVAL

Description	AD Board for TFT LCD Monitor	
MODEL	PART NO.	REMARKS
FSB1340F	VMT-0181AE	For LVDS / V-by-1 / e-DP 1.1 / e-DP 1.2a Panel →DP Daisy chain / e-DP1.2(HBR2) - Option
FSB1340L	VMT-0181AE	For LVDS Panel →DP Daisy chain
FSB1340V	VMT-0181AE	For V-by-1 / e-DP 1.1 Panel →DP Daisy chain
FSB1340E	VMT-0181AE	For e-DP 1.2a Panel



Draft	Checked	Approved

**Revision History**

No.	Description	Revision	Page	Date
1	Release for Approval	A1		2014-11-05
2	2 <sup>nd</sup> PCB Version	AA		2014-11-25
3	Modified OSD Key MAP	AA	17	2015-03-05
4	3rd PCB Version H/W 1. HDMI Input Wafer Add 2. RS232 Port Add 3. Panel Power Port Add S/W 4. PIP(4P)/PBP Function 5. e-DP output 6. Remote Function 7. RS232 Function	AB	All Page	2015-03-30
5	4th PCB Version H/W 1. Wafer ready for e-DP 1.2 Panel 2. I2C Port Add 3. Panel Power Add on LVDS 41Pin Wafer	AC	1,10,11, 15,17,18	2015-06-03
6	S/W Function added 1. Low Blue Light 2. Sleep Mode (0mim ~ 240mim)	AC	1	2015-06-22
7	S/W Function added 1. Free Sync (30Hz ~ 144Hz) 2. Apply Remote control (VRC-1340)	AC	1	2015-07-31
8	S/W Function added 1. 3D Function – Remote Hot Key Ready → Only support With VSB4KFRC Board for 120Hz Panel	AC	1	2015-11-10
9	5th PCB Version H/W 1. Changed Wafer for 120hz FRC Power(CN9) 4P → 6P 2. Changed Wafer for I2C Control(CN12) 4P → 5P	AD	10,16, 17	2015-11-19
10	6th PCB Version H/W 1. Added CN13, CN14 Wafer (Reserved) 2. I2C Ready for LVDS Output	AE	3,7,11, 17	2017-01-31
11				

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## 1. Executive Summary

**FSB1340** is a high-quality, LCD Monitor Main board

### 1. Purpose of Document

This document indicates the general and engineering specification for **FSB1340**.

### 2. Key features

- **UHD(3840x2160, 4096x2160) resolution display format.**
  - Up scaling can do VGA, SVGA, XGA, SXGA, SXGA, UXGA to UHD VESA Standard Mode.
  - Provides up to 30-bit color and 8Ch **LVDS / V-by-1 / e-DP1.1(HBR1)/e-DP1.2(HBR2) Interface**
  - HDMI connector HDMI 2.0(4K2K@60Hz) 1Port / HDMI1.4(4K2K@30Hz) 3Port, MHL
  - DP connector 4K2K@60Hz 1Port / **Daisy chain 1Port (Option)**
  - **PIP/ PBP(L/R, Top/Bottom)/4P(4Windows) Function**
  - 3D Function(Side by Side, Top and Bottom, Off) – Remote Hot Key Ready (Option)  
→ Only support With VSB4KFRC Board for 120Hz Panel
  - OSD/Display Rotation(0°/90°/270°) Function
  - Over driver / Over scan Function
  - Free Sync (30Hz ~ 144Hz)
  - 6Color control
  - PCM(Precise color management)
  - Sharpness/Hue/Color Support
  - Gamma Control
  - Color Effect Function
  - Response time Control
  - Remote Control
  - UART for RS232 Control
  - Light Sensor Control
  - DP MST(Multi Stream, up to FHD 4 EA) or Daisy chain Output.
  - Speaker 20Wx2ch(8ohm)-24V or 8Wx2ch(8ohm)-12V/SMPS
  - PIP Sound Choice
  - Low Blue Light
  - **Video wall(FSB1340M) Function by Special Software (Option)**
    - Input Port : HDMI + DP
    - Output Port : DP
    - Input Resolution : 4K2K(UHD), FHD
    - Support Panel Resolution : Up to 4K2K(UHD)
    - PC Program : Not Support
- In case of V-by-1 16 Lanes type TFT-LCD module, this driving board can be integrated with a FRC board Separately which is shown on the separated spec file.

### 1.3 How to Proceed

- Ensure that you have all parts & they are correct, refer to:
  - Connection diagram
  - Connector reference
  - Assembly notes
- Check cables before connecting to AD board (errors may damage the panel)
- Connect the parts
- Understand the operation & functions

#### 4. Important usage note

This equipment is for use by developers and integrators. The manufacturer accepts no liability for damage or injury caused by the use of this product. It is the responsibility of the developer, integrators or other users of this product to:

- Ensure that all necessary and appropriate safety measures are taken.
- Obtain suitable regulatory approvals as may be required.
- Check power settings to all component parts before connection.

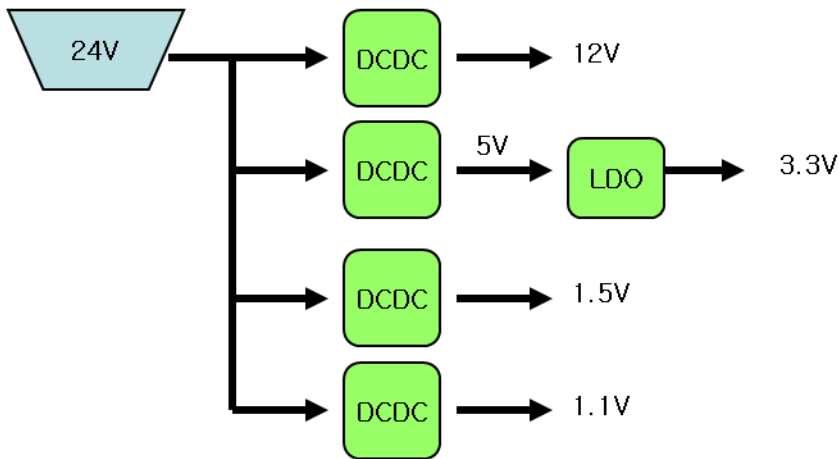
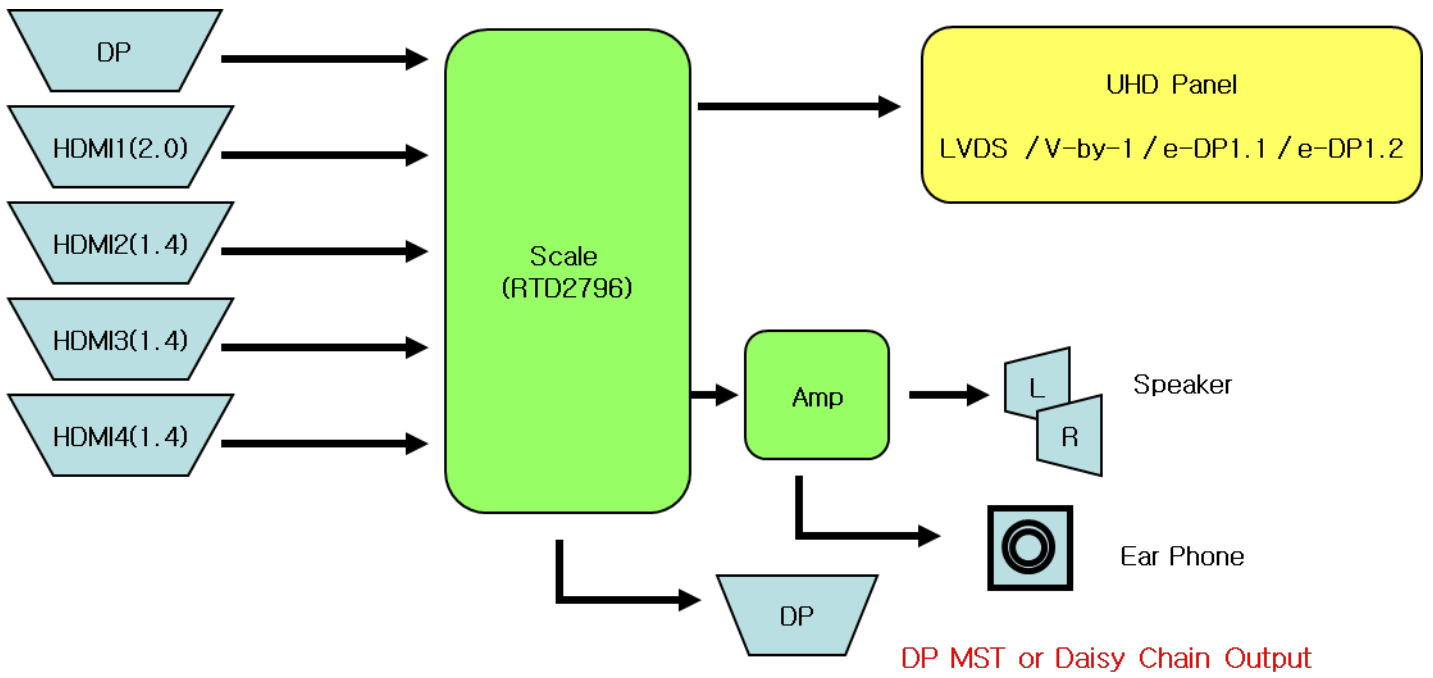
**2. General Specification.**

NO.	ITEM	DESCRIPTION		REMARKS
1	MODEL NAME	<b>FSB1340</b>		
2	BUYER			
3	TARGET PANEL	MAKER	SAMSUNG, LGD, Sharp, AUO, Innolux, Panasonic, BOE, etc.	With FRC Board to 120Hz 4K2K Panel
		TYPE	- 15.6"/23.8"/27"/28"/31"/31.5"/32"/34"/40"/42"/43"/48"/49"/50"/55"/58"/65"/75"/84"/85"/98", etc UHD PANEL - 4K2K@120Hz Panel with FRC Board (VSB4KFRC & VSB4KFRC2)	
4	INPUT FREQUENCY	H : 31 ~ 130KHz		
		V : 56 ~ 75Hz		
5	CONTROL	OSD	Power, Menu, Source, Exit/Up/MEMC, Enter/Down, Left/volume-, Right/Volume+, IR 2Color_LED →Video Wall(FSB1340M) : 1Color_LED	7KEY, 2 LED
		P&P	DDC2B	
		REMOTE	Infrared-Rays NEC Format.	
		RS232	PC Application	
6	SYNC. TYPE	SEPARATE SYNC		
7	Input Power	TYPE:	12V / 24V DC JACK or Wafer, SMPS (or LIPS)	
8	SIGNAL INPUT	DIGITAL	19Pin HDMI Connector	4K2K@60 1EA 4K2K@30Hz 3EA
			20Pin Display Port Connector	4K2K@60Hz 1 EA
9	AUDIO	INPUT	HDMI, DP	HDMI Jack, Display Port Jack
		OUTPUT	Head Phone	3.5ø Stereo Jack
			Speaker	4Pin Wafer

### 3. Engineering Spec.

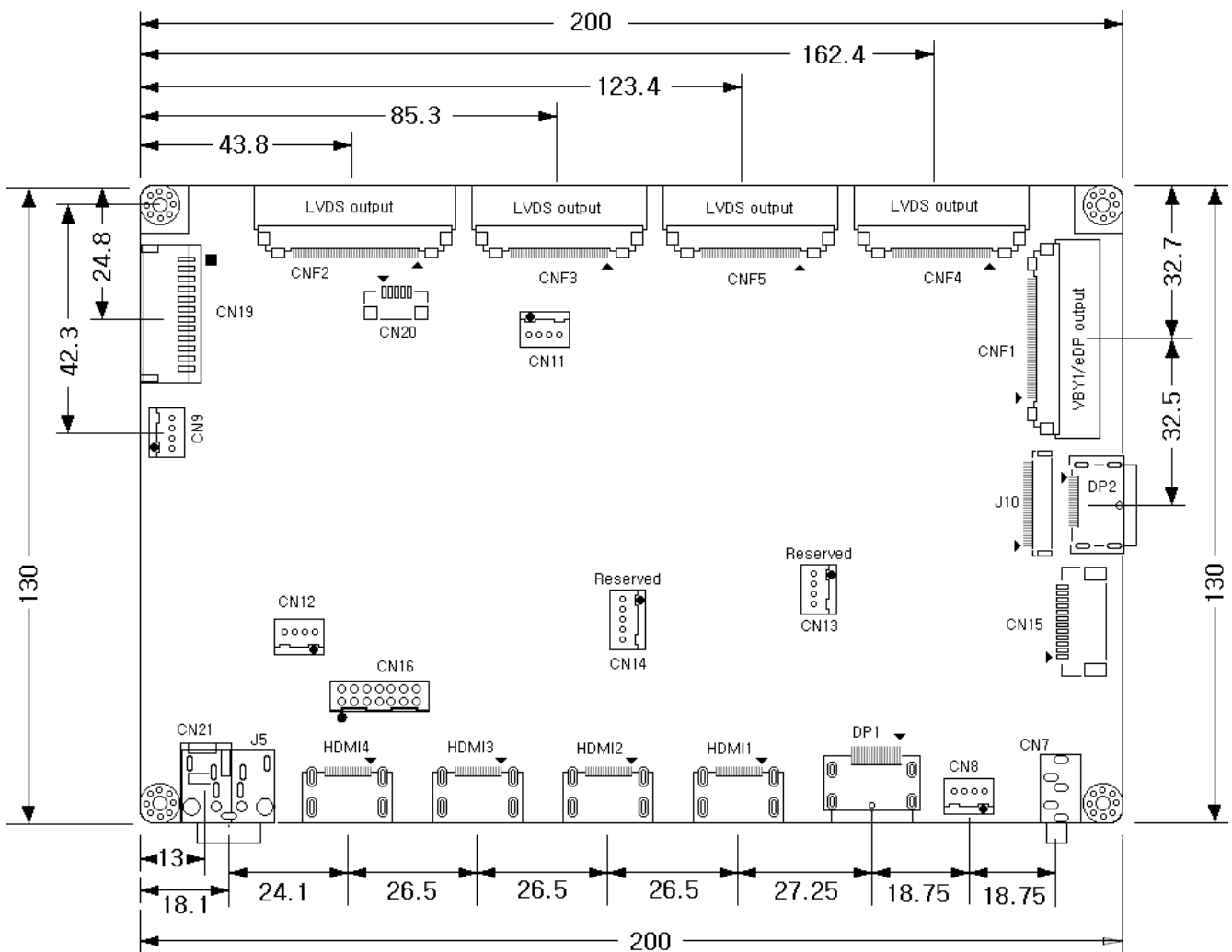
No.	Item		Description			Remarks		
			Min	Typical	Max			
1	Power Supply	Stand-by +5VS	Min	Typical	Max	Option (Adaptor, SMPS)		
			4.8	5.0	5.2			
		5V	5.3	5.5	5.7			
		12V	11.4	12.0	12.6			
		24V	22.8	24.0	25.2			
2	Power	Power Off	+5VS	-		≤ 1W	LED : off	
		Stand By, Sleep & Suspend Mode	+5VS	-	TBD		≤ 1W	LED : red Blinking
		Normal	+5VS	-	TBD	-		LED : green
			1.2V	-	0.44		0.49	without Panel Interface
	3.3V	-	0.48		0.59			
3	Power consumption	12V/SMPS Input			TBD		Depend on Panel	
		24V Input			TBD			
4	Audio AMP	Power	Typical	-12V/SMPS: 8Wrms+8Wrms (± 10%), 8Ω -24V: 20Wrms+20Wrms (± 10%), 8Ω		Volume :Adjust		
		Response Frequency		100Hz ~ 20KHz				
		T.H.D		10% Under				
		Input		0.400Vrms				
		S/N		TBD				
5	Speaker	Type		External				
		Impedance		8Ω		8W or 20W x 2CH		

### 4. Block Diagram



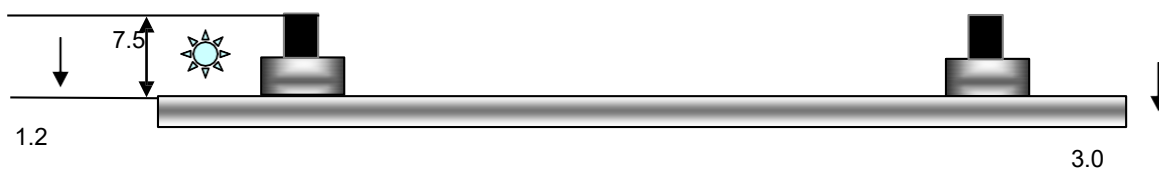


### 5. Board Dimension



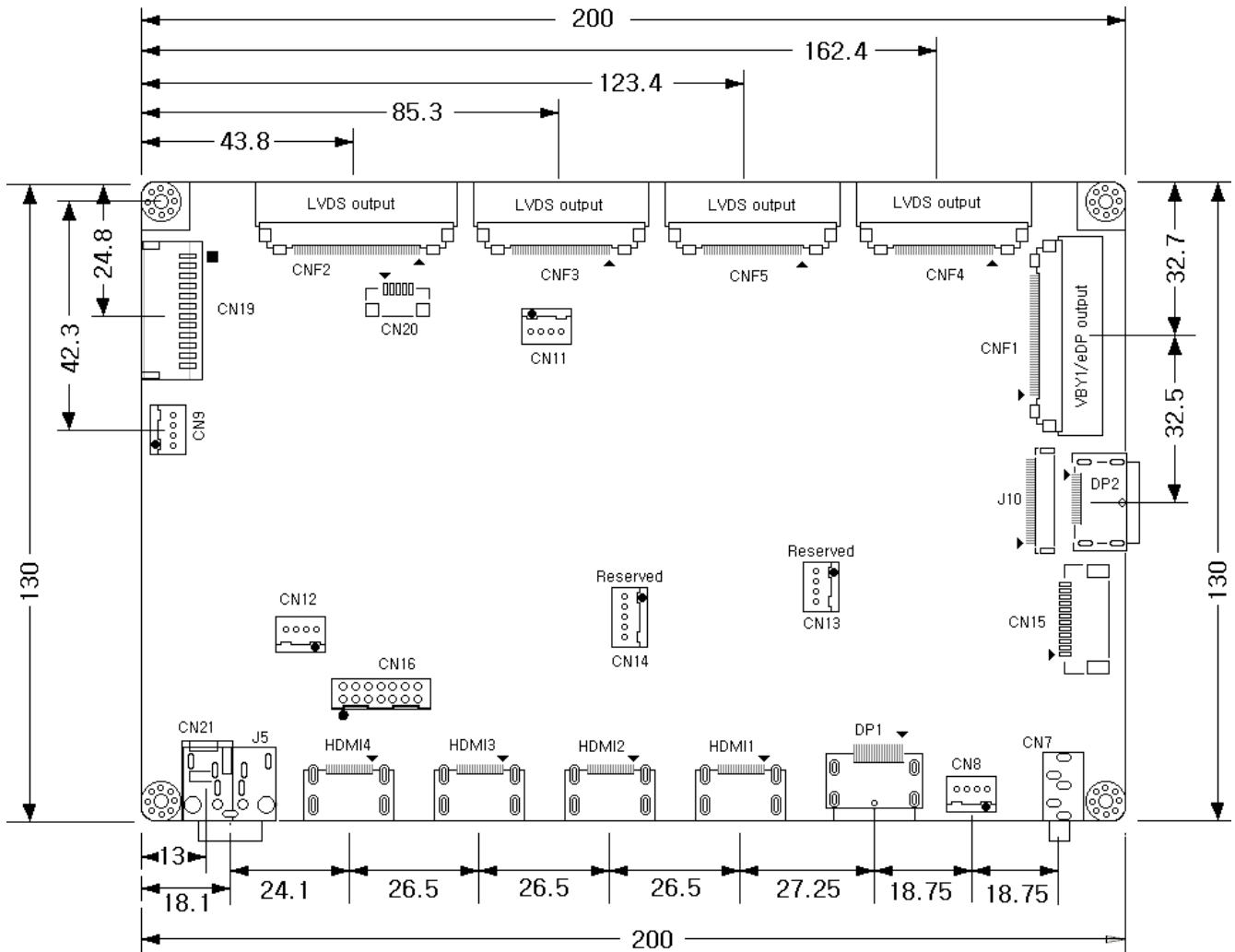
- Dimension(W x L x H) : 200 x 130 x 16mm

OSD Board Model Name : VOB1079D



- Dimension(W x L x H) : 150mm x 16mm x 8.7mm

### 6. Summary for connectors



Reference	Item	Description	Type	Manufacture
CNF1	V-by-1 Wafer	<b>For V-by-1 or e-DP(1.1) Panel</b>	FI-RE51S-HF	JAE or equivalent
CNF2	LVDS-1 Wafer	<b>For LVDS AB Panel</b>	FI-RE51S-HF	JAE or equivalent
CNF3 CNF4 CNF5	LVDS-2/3/4 Wafer	<b>For LVDS CD/EF/GH Panel</b>	FI-RE41S-HF	JAE or equivalent
J10	Wafer	<b>For e-DP(1.2) Panel</b> <i>(Option)</i>	20347_30	I-PEX
CN7	Phone Jack	For Headphone Output	SJ3501-5 H7	CHANGCHUN or equivalent
CN8	Wafer	For Speaker	SMW200-04	YEONHO or equivalent
CN9	Wafer	For 120HZ FRC POWER	SMW200-06	YEONHO or equivalent

CN11	Wafer	For RS232 Control	20010WS-04	YEONHO or equivalent
CN12	Wafer	For I2C Control	20010WS-05	YEONHO or equivalent
CN13	Wafer	Reserved	20010WS-04	YEONHO or equivalent
CN14	Wafer	For HCDP2.2 Down road	20010WS-05	YEONHO or equivalent
CN15	Wafer	For OSD Control key	12505WR-12	YEONHO or equivalent
CN16	Wafer	For HDMI Wafer Input (Option)	YDW200-14	YEONHO or equivalent
CN19	Wafer	For Inverter or SMPS	20037WR-12	YEONHO or equivalent
CN20	Wafer	For PANEL POWER	12505WS-6P	YEONHO or equivalent
CN21	DC Power Jack	For 12V DC Power	DJ05H-250	CHANG CHUN
J5	DC Power Jack	For 24V DC Power	KPJ-4S-S_4P	CHANG CHUN
DP1	DP Jack	For DP Input	DPCON_SINK	MOLEX or equivalent
DP2	DP Jack	For DP Output ( Daisy Chain )	DPCON_SINK	MOLEX or equivalent
HDMI1	HDMI Jack	<b>For HDMI(2.0)</b> Input	51L019S-36DN-A	FREEPOR or equivalent
HDMI2 HDMI3 HDMI4	HDMI Jack	<b>For HDMI(1.4)</b> Input	51L019S-36DN-A	FREEPOR or equivalent

## 7. Pin Assignment & Description

### 1) CNF1 : For V-by-1 Output, Wafer

Pin No.	Symbol	Description
1	GND	GROUND
2	VB1_TX7P	V by One Positive data input Lane 7
3	VB1_TX7N	V by One Negative data input Lane 7
4	GND	GROUND
5	VB1_TX6P	V by One Positive data input Lane 6
6	VB1_TX6N	V by One Negative data input Lane 6
7	GND	GROUND
8	VB1_TX5P	V by One Positive data input Lane 5
9	VB1_TX5N	V by One Negative data input Lane 5
10	GND	GROUND
11	VB1_TX4P	V by One Positive data input Lane 4
12	VB1_TX4N	V by One Negative data input Lane 4
13	GND	GROUND
14	VB1_TX3P	V by One Positive data input Lane 3
15	VB1_TX3N	V by One Negative data input Lane 3
16	GND	GROUND
17	VB1_TX2P	V by One Positive data input Lane 2
18	VB1_TX2N	V by One Negative data input Lane 2
19	GND	GROUND
20	VB1_TX1P	V by One Positive data input Lane 1
21	VB1_TX1N	V by One Negative data input Lane 1
22	GND	GROUND
23	VB1_TX0P	V by One Positive data input Lane 0
24	VB1_TX0N	V by One Negative data input Lane 0
25	GND	GROUND
26	VB1_PLL_LOCK	Lock Detection
27	VB1_HPD	Hot Plug Detection
28~31	N.C	No Connection
32	VB1_SDA	I2C Data Line
33	VB1_SCL	I2C Clock Line
34~40	N.C	No Connection
41~42	GND	GROUND
43	N.C	No Connection
44~51	LCD_VDD	12V, VDD For LCD Module

**1) CNF1 : For e-DP(1.1) Output, Wafer**

Pin No.	Symbol	Description
1	GND	GROUND
2	1 <sup>st</sup> LANE3P	eDP 1 <sup>st</sup> Positive data input Lane 3
3	1 <sup>st</sup> LANE3N	eDP 1 <sup>st</sup> Negative data input Lane 3
4	GND	GROUND
5	1 <sup>st</sup> LANE2P	eDP 1 <sup>st</sup> Positive data input Lane 2
6	1 <sup>st</sup> LANE2N	eDP 1 <sup>st</sup> Negative data input Lane 2
7	GND	GROUND
8	1 <sup>st</sup> LANE1P	eDP 1 <sup>st</sup> Positive data input Lane 1
9	1 <sup>st</sup> LANE1N	eDP 1 <sup>st</sup> Negative data input Lane 1
10	GND	GROUND
11	1 <sup>st</sup> LANE0P	eDP 1 <sup>st</sup> Positive data input Lane 0
12	1 <sup>st</sup> LANE0N	eDP 1 <sup>st</sup> Negative data input Lane 0
13	GND	GROUND
14	2 <sup>nd</sup> LANE3P	eDP 2 <sup>nd</sup> Positive data input Lane 3
15	2 <sup>nd</sup> LANE3N	eDP 2 <sup>nd</sup> Negative data input Lane 3
16	GND	GROUND
17	2 <sup>nd</sup> LANE2P	eDP 2 <sup>nd</sup> Positive data input Lane 2
18	2 <sup>nd</sup> LANE2N	eDP 2 <sup>nd</sup> Negative data input Lane 2
19	GND	GROUND
20	2 <sup>nd</sup> LANE1P	eDP 2 <sup>nd</sup> Positive data input Lane 1
21	2 <sup>nd</sup> LANE1N	eDP 2 <sup>nd</sup> Negative data input Lane 1
22	GND	GROUND
23	2 <sup>nd</sup> LANE0P	eDP 2 <sup>nd</sup> Positive data input Lane 0
24	2 <sup>nd</sup> LANE0N	eDP 2 <sup>nd</sup> Negative data input Lane 0
25	GND	GROUND
26	VB1_PLL_LOCK	Lock Detection
27	HPD	Hot Plug Detection
28	NC	No Connection
29	1 <sup>st</sup> AUX_P	eDP 1 <sup>st</sup> Positive AUX Channel
30	1 <sup>st</sup> AUX_N	eDP 1 <sup>st</sup> Negative AUX Channel
31,32	NC	No Connection
33	VB1_SCL	I2C Clock Line
34	VB1_SDA	I2C Data Line
35	NC	No Connection

36	2 <sup>nd</sup> AUX_P	eDP 2 <sup>nd</sup> Positive AUX Channel
37	2 <sup>nd</sup> AUX_N	eDP 2 <sup>nd</sup> Negative AUX Channel
38~40	N.C	No Connection
41,42	GND	GROUND
43	N.C	No Connection
44~51	LCD_VDD	12V, VDD For LCD Module

## 2) CNF2 : For LVDS Master Output, Wafer

Pin No.	Symbol	Description	Pin No.	Symbol	Description
51	NC	No Connection			
50	SCL	Signal for SCL	25	NC	No Connection
49	SDA	Signal for SDA	24	TXB 0-	2nd Channel 0-
48	8/10bit	8bit / 10bit Option	23	TXB 0+	2nd Channel 0+
47	OPT2	Reserved 2	22	TXB 1-	2nd Channel 1-
46	NC	No Connection	21	TXB 1+	2nd Channel 1+
45	LVDS Format	VESA / JADA Option	20	TXB 2-	2nd Channel 2-
44	NC	No Connection	19	TXB 2+	2nd Channel 2+
43	NC	No Connection	18	GND	GROUND
42	NC	No Connection	17	TXB C-	2nd Channel C-
41	GND	GROUND	16	TXB C+	2nd Channel C+
40	TXA 0-	1st Channel 0-	15	GND	GROUND
39	TXA 0+	1st Channel 0+	14	TXB 3-	2nd Channel 3-
38	TXA 1-	1st Channel 1-	13	TXB 3+	2nd Channel 3+
37	TXA 1+	1st Channel 1+	12	TXB 4-	2nd Channel 4-
36	TXA 2-	1st Channel 2-	11	TXB 4+	2nd Channel 4+
35	TXA 2+	1st Channel 2+	10	NC	No Connection
34	GND	GROUND	9	NC	No Connection
33	TXA C-	1st Channel C-	8	GND	GROUND
32	TXA C+	1st Channel C+	7	GND	GROUND
31	GND	GROUND	6	GND	GROUND
30	TXA 3-	1st Channel 3-	5	NC	No Connection
29	TXA 3+	1st Channel 3+	4	LCD_VDD	VDD For LCD
28	TXA 4-	1st Channel 4-	3	LCD_VDD	VDD For LCD
27	TXA 4+	1st Channel 4+	2	LCD_VDD	VDD For LCD
26	NC	No Connection	1	LCD_VDD	VDD For LCD

## 3) CNF 3/4/5 : For LVDS Slave Output, Wafer

Pin No.	Symbol	Description	Pin No.	Symbol	Description
41	NC	No Connection			
40	<b>LCD_VDD</b>	<b>VDD For LCD</b>	20	TX C/E/G 4-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 4-
39	<b>LCD_VDD</b>	<b>VDD For LCD</b>	19	TX C/E/G 4+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 4+
38	<b>LCD_VDD</b>	<b>VDD For LCD</b>	18	GND	GROUND
37	NC	No Connection	17	GND	GROUND
36	NC	No Connection	16	TX D/F/H 0-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 0-
35	NC	No Connection	15	TX D/F/H 0+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 0+
34	NC	No Connection	14	TX D/F/H 1-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 1-
33	GND	GROUND	13	TX D/F/H 1+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 1+
32	TX C/E/G 0-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 0-	12	TX D/F/H 2-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 2-
31	TX C/E/G 0+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 0+	11	TX D/F/H 2+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 2+
30	TX C/E/G 1-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 1-	10	GND	GROUND
29	TX C/E/G 1+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 1+	9	TX D/F/H C-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel C-
28	TX C/E/G 2-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 2-	8	TX D/F/H C+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel C+
27	TX C/E/G 2+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 2+	7	GND	GROUND
26	GND	GROUND	6	TX D/F/H 3-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 3-
25	TX C/E/G C-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel C-	5	TX D/F/H 3+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 3+
24	TX C/E/G C+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel C+	4	TX D/F/H 4-	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 4-
23	GND	GROUND	3	TX D/F/H 4+	4 <sup>rd</sup> /6 <sup>th</sup> /8 <sup>th</sup> Channel 4+
22	TX C/E/G 3-	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 3-	2	GND	GROUND
21	TX C/E/G 3+	3 <sup>rd</sup> /5 <sup>th</sup> /7 <sup>th</sup> Channel 3+	1	GND	GROUND

## 4) J10 : For e-DP(1.2) Panel, Wafer

Pin No.	Symbol	Description
1	1 <sup>st</sup> AUX_P	eDP 1 <sup>st</sup> Positive AUX Channel
2	1 <sup>st</sup> AUX_N	eDP 1 <sup>st</sup> Negative AUX Channel
3	GND	GROUND
4~6	NC	NC
7	HPD	Hot Plug Detection
8~10	NC	NC
11	CONFIG2	Pull down resistor 100KR
12	CONFIG1	Pull down resistor 100KR
13	GND	GROUND
14	1 <sup>st</sup> LANE3N	eDP 1 <sup>st</sup> Negative data input Lane 3

15	1 <sup>st</sup> LANE3P	eDP 1 <sup>st</sup> Positive data input Lane 3
16	GND	GROUND
17	1 <sup>st</sup> LANE2N	eDP 1 <sup>st</sup> Negative data input Lane 2
18	1 <sup>st</sup> LANE2P	eDP 1 <sup>st</sup> Positive data input Lane 2
19	GND	GROUND
20	1 <sup>st</sup> LANE1N	eDP 1 <sup>st</sup> Negative data input Lane 1
21	1 <sup>st</sup> LANE1P	eDP 1 <sup>st</sup> Positive data input Lane 1
22	GND	GROUND
23	1 <sup>st</sup> LANE0N	eDP 1 <sup>st</sup> Negative data input Lane 0
24	1 <sup>st</sup> LANE0P	eDP 1 <sup>st</sup> Positive data input Lane 0
25,26	GND	GROUND
28~30	LCD_VDD	VDD For LCD

5) CN7 : For Audio Output, Head Phone Jack

Pin No.	Symbol	Description	Remarks
1	GND	GROUND	
2,4	DET	Detection	
3	R	Audio Right Input Signal	
5	L	Audio Left Input Signal	

6) CN8 : For Speaker Output, wafer

Pin No.	Symbol	Description	Remarks
1	SP_L+	Audio Left Speaker Output Positive	
2	SP_L-	Audio Left Speaker Output Negative	
3	SP_R+	Audio Right Speaker Output Positive	
4	SP_R-	Audio Right Speaker Output Negative	

7) CN9 : **For 120Hz FRC(VSB4KFRC&VSB4KFRC2)** Power, wafer

Pin No.	Symbol	Description	Remarks
1,2,3	FRC POWER	12V For FRC POWER	
4,5,6	GND	GROUND	

8) CN11 : For RS232 Control, wafer

Pin No.	Symbol	Description	Remarks
1	GND	GROUND	
2	TXD	Signal for TX	



3	RXD	Signal For RX	
4	5V	5V Power	

## 9) CN12 : For I2C Control, wafer

Pin No.	Symbol	Description	Remarks
1	GPIO	GPIO OPTION	
2	GND	GROUND	
3	SDA	Signal for SDA	
4	SCL	Signal For SCL	
5	5V	5V Power	

## 10) CN14 : For HDCP2.2 Downroad, wafer

Pin No.	Symbol	Description	Remarks
1	HMCU-OP		
2	GND		
3	HMCU-P71		
4	HMCU-P70		
5	VDD		

## 11) CN15 : For OSD Control Key, Wafer

Pin No.	Symbol	Description	Remarks
1	LED GREEN_KEY	LED drive for GREEN Color	
2	LED RED_KEY	LED drive for RED Color	
3	IR_KEY	IR Receiver	
4	GND	GROUND	
5	3.3V_KEY	3.3V	
6	PWR_KEY	POWER key	
7	Exit_KEY	Exit key	
8	UP_KEY	UP key	
9	DOWN_KEY	DOWN key	
10	RIGHT_KEY	<b>RIGHT/Source</b> key	
11	LEFT_KEY	LEFT key	
12	MANUE_KEY	MENU/Enter key	

12) CN16 : For HDMI Input(HDMI4\_1.4), wafer

Pin No.	Symbol	Description	Remarks
1	HDMI_DDC5V	5V Power Supply	
2	HDMI_HOT_PLUG	HDMI Hot Plug	
3	HDMI_SCL	HDMI Clock Line	
4	HDMI_SDA	HDMI Data Line	
5	GND	Ground	
6	GND	Ground	
7	RX0+	HDMI DATA0 Differential Positive Signal	
8	RX0-	HDMI DATA0 Differential Negative Signal	
9	RX1+	HDMI DATA1 Differential Positive Signal	
10	RX1-	HDMI DATA1 Differential Negative Signal	
11	RX2+	HDMI DATA2 Differential Positive Signal	
12	RX2-	HDMI DATA2 Differential Negative Signal	
13	RXC+	HDMI CLOCK Differential Positive Signal	
14	RXC-	HDMI CLOCK Differential Negative Signal	

13) CN19 : For Inverter or SMPS, wafer

Pin No.	Symbol	Description	Remarks
1	DIM-ADJ	DIMMING ADJUSTMENT	
2	INVON	INVERTER POWER ON, OFF	0V (Off), 5V(On)
3	PWM	PWM DIMMING CONTROL	
4,5	GND	GROUND	
6	PWR_CTRL	Power Control OUT (SMPS), NC(Inverter)	0V (Off), 5V(On)
7	5VS	5VS IN (SMPS), NC(Inverter)	5V ± 1%
8	5V	5V IN (SMPS), NC(Inverter)	5V ± 1%
9,10,11,12	24V	24V IN or 12V IN(SMPS), 24V OUT(Inverter)	24V ± 5% 12V ± 3%

14) CN20 : For Panel Power

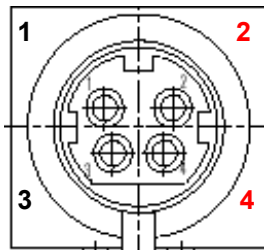
Pin No.	Symbol	Description	Remarks
1,2,3	GND	GROUND	
4,5,6	Panel Power	Power of Panel	

16) CN21 : For 12V DC Power, Jack

Pin No.	Symbol	Description	Remarks
1	12V	12V Power Input	12V ± 5%
2,3	GND	GROUND	

17) J5 : For 24V DC Power, Jack

Pin No.	Symbol	Description	Remarks
1,3	GND	GROUND	
2,4	24V	24V Power Input	24V ± 5%



18) DP1 : For DP Input, DP Jack

Pin No.	Symbol	Description	Remarks
1	LANE3-	Negative Signal for Main Link 3	
3	LANE3+	Positive Signal for Main Link 3	
4	LANE2-	Negative Signal for Main Link 2	
6	LANE2+	Positive Signal for Main Link 2	
7	LANE1-	Negative Signal for Main Link 1	
9	LANE1+	Positive Signal for Main Link 1	
10	LANE0-	Negative Signal for Main Link 0	
12	LANE0+	Positive Signal for Main Link 0	
13	CA DET		
14	DP DET		
15	AUX CH+	Positive Signal for Auxiliary Channel	
17	AUX CH-	Negative Signal for Auxiliary Channel	
18	HPD	Identify the presence of a monitor	
19	RETURN		
20	PWR OUT		
2, 5, 8, 11, 16	GND	GROUND	

19) DP2 : For DP Output, DP Jack(Daisy chain)

Pin No.	Symbol	Description	Remarks
1	LANE0+	Positive Signal for Main Link 0	
3	LANE0-	Negative Signal for Main Link 0	

4	LANE1+	Positive Signal for Main Link 1	
6	LANE1-	Negative Signal for Main Link 1	
7	LANE2+	Positive Signal for Main Link 2	
9	LANE2-	Negative Signal for Main Link 2	
10	LANE3+	Positive Signal for Main Link 3	
12	LANE3-	Negative Signal for Main Link 3	
13	CONFIG1	Pull down resister 100KR	
14	CONFIG2	Pull down resister 100KR	
15	AUX CH+	Positive Signal for Auxiliary Channel	
17	AUX CH-	Negative Signal for Auxiliary Channel	
18	HPD	Hot Plug Detection	
19	RETURN	No Connection	
20	PWR OUT	3.3V	
2, 5, 8, 11, 16	GND	GROUND	

## 20) HDMI 1/2/3/4 : For HDMI Input, HDMI Jack

Pin No.	Symbol	Description	Remarks
1	RX2+	HDMI DATA2 Differential Positive Signal	
2	GND	GROUND	
3	RX2-	HDMI DATA2 Differential Negative Signal	
4	RX1+	HDMI DATA1 Differential Positive Signal	
5	GND	GROUND	
6	RX1-	HDMI DATA1 Differential Negative Signal	
7	RX0+	HDMI DATA0 Differential Positive Signal	
8	GND	GROUND	
9	RX0-	HDMI DATA0 Differential Negative Signal	
10	RXC+	HDMI CLOCK Differential Positive Signal	
11	GND	GROUND	
12	RXC-	HDMI CLOCK Differential Negative Signal	
13,14	NC	NO CONNECTION	
15	HDMI_SCL	HDMI Clock Line	
16	HDMI_SDA	HDMI Data Line	
17	HDMI_CHK	HDMI Check	
18	HDMI_DDC5V	5V Power Supply	
19	HDMI_HOT_PLUG	HDMI Hot Plug	
20,21	GND	GROUND	

### 8. Supporting Mode

The microprocessor measures the H-sync, V-sync and V-sync/ H-sync polarity for RGB inputs, and uses this Timing information to control all of the display operation to get the proper image on a screen.

This board can detect all VESA standard and MAC graphic modes shown on the table below and provide more clear and stable image on a screen.

Analog RGB & DVI Input format

ITEM	STD	Resolution	Pixel Frequency (MHz)	Vertical Frequency (Hz)	Horizontal Frequency (KHz)	Sync. Polarity (H/V)	Remark
1	VESA	640*350	31.500	85.080	37.861		
2		640*400	25.175	59.940	31.469		
3	VESA	640*400	31.500	85.080	37.861		
4		640*480	25.175	59.940	31.469		
5	VESA	640*480	25.200	60.000	31.500		
6	VESA	640*480	31.500	72.809	37.861		
7	VESA	640*480	31.500	75.000	37.500		
8	VESA	640*480	36.000	85.008	43.269		
9	IBM	720*400	28.322	70.087	31.469		
10	VESA	720*400	35.500	85.039	37.927		
11	VESA	800*600	36.000	56.250	35.156		
12	VESA	800*600	40.000	60.317	37.879		
13	VESA	800*600	50.000	72.188	48.077		
14	VESA	800*600	49.500	75.000	46.875		
15	VESA	800*600	56.250	85.061	53.674		
16	VESA	1024*768	65.000	60.000	48.363		
17	VESA	1024*768	75.000	70.069	56.476		
18	VESA	1024*768	78.750	75.029	60.023		
19	VESA	1024*768	94.500	84.997	68.677		
20		1152*864	94.500	70.012	63.851		
21	VESA	1152*864	108.000	75.000	67.500		
22		1280*720	74.501	59.856	44.772		
23		1280*768	79.499	59.870	47.776		
24	VESA	1280*960	108.000	60.000	60.000		
25	VESA	1280*960	148.500	85.002	85.938		
26		1360*768	72.000	59.960	47.368		
27		1360*768	109.001	74.892	60.288		
28	VESA	1280*1024	108.000	60.020	63.981		
29	VESA	1280*1024	135.000	75.025	79.976		
30	VESA	1280*1024	157.500	85.024	91.146		
31		1680*1050	146.250	59.954	65.290		
32	VESA	1600*1200	162.000	60.000	75.000		
33		1920*1080	138.500	59.934	66.587		
34		1920*1080	148.500	60.000	67.500		
35		1920*1080	148.352	59.940	67.433		
36		1920*1200	154.125	59.999	74.099		
37		2560*1440	241.625	59.982	88.833		
38		2560*1600					
39		3840*2160					
40		4096*2160					

### 9. Out-going Condition

- stored Setting value respectively as per input signal
- Common factory conditions : AC Power Off, Power Off, Source HDMI

Item		Menu & Control Range	Default	Remark
Main Menu	Sub Menu			
PICTURE	Backlight	0 ~ 100		
	Brightness	0 ~ 100		
	Contrast	0 ~ 100		
	Sharpness	0 ~ 4		
COLOR	Gamma	off, 2.8, 2.0, 2.4		
	Temperature	9300, 7500, 6500, 580, SRGB, User		
	Color Effect	Standard, Game, Movie, Photo, Vivid, User		
	Hue	0 ~ 100		
	SAT	0 ~ 100		
ADVANCE	Aspect Ration	Full, 16:9, 4:3, 5:4, 1:1		
	Over scan	On, off		
	Over drive	On off, OD Gain		
	DP Option	1.1, 1.2		
	DP EDID	1080p, 2560 x 1440, 4k2k 30Hz, 4K2K 60Hz		
INPUT	Auto Select, D0:DP, D1:HDMI, D2:MHL, D3:HDMI, D4:HDMI			
OTHER	Reset			
	Menu Time	10 ~ 60		
	H Position	0 ~ 100		
	V Position	0 ~ 100		
	Language	English, Korean		
	Transparency	0 ~ 100		
	Rotate	OSD Menu (0, 90, 27)		
INFORMATION	Display Information			
AUDIO	Volume	0~100		

### 10. Remote Control

- Use a remote control up to 7 meters distance and 30 degree (left/right) within the receiving unit scope.

#### FSB1340 apply Remocon (VRC-1340)

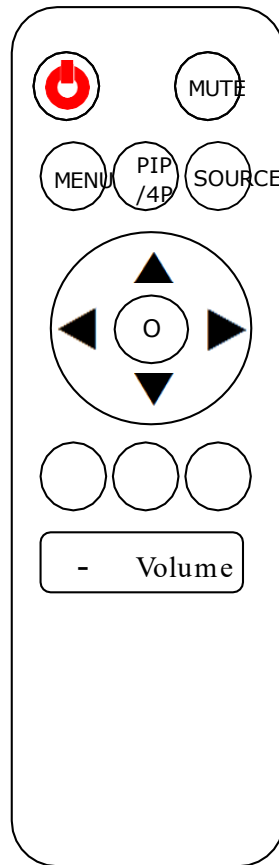
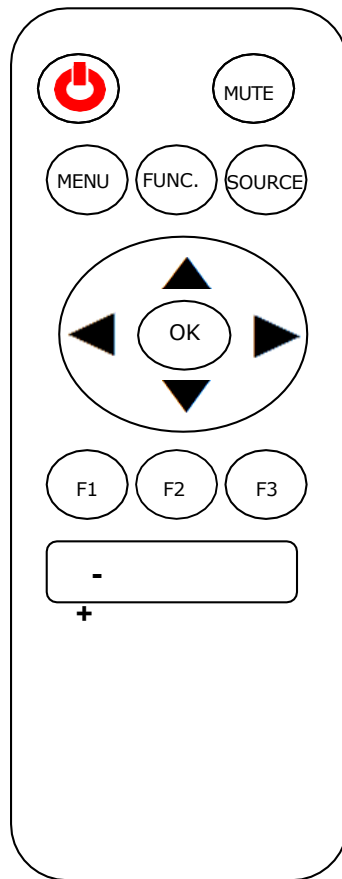
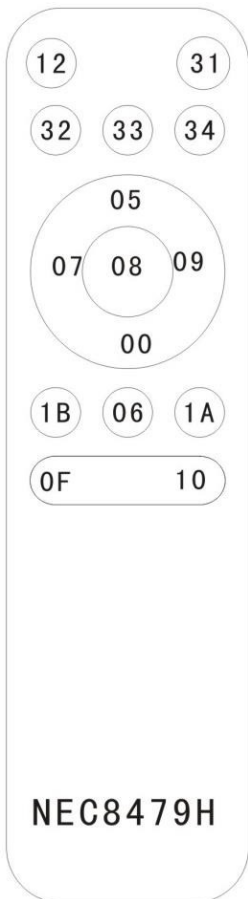
-Format : NEC

-Custom code : 8479H(Hex)

Data Code (Hex)

**Hot key  
Function**

**Menu Fu  
nction**



F1 : 3D Function

**FSB1340M(Video Wall) apply Remocon (JJ-1223A)**

-Format : NEC

-Custom code : OOFFH(Hex)





### 11. RS232 Communication

- 1. Communication Parameters
  - I. Baudrate :9600bps
  - II. Data length : 8 bits
  - III. Parity : None
  - IV. Stop bit : 1bit
  - V. Communication : ASCII CODE
- 2. Communication Spec

**Please refer to separately commandlist for details**
- 3. RS232C CONTROL

