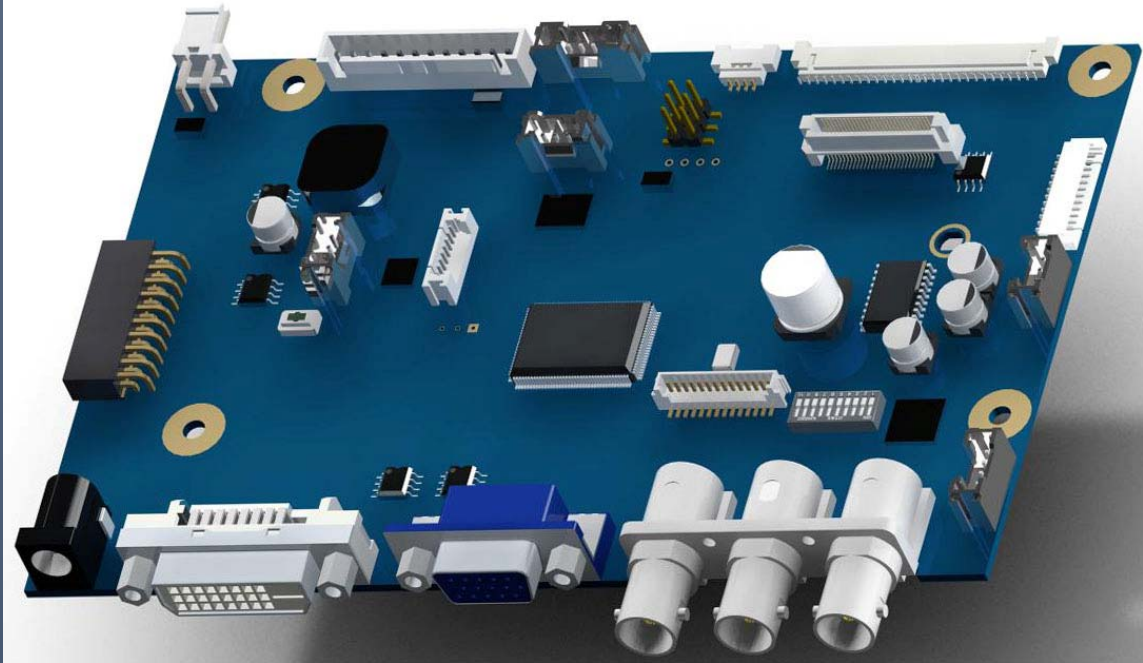


Data Sheet



Venus2 - Pro edition

3G/HD/SD-SDI(Optional),
DVI(with HDMI audio),
Analog(YPbPr/CVBS/RGB)

Model Name : Venus2 Pro
Part No. : VNS2P – xxxx.....xxxx
(xxxx.....xxxx : the targeting LCD Module part number)

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Revision History

PCB Version	Rev. date	Revision Details
ES1	Nov. 2016	Engineering Sample
PP	Dec. 2016	Initial version issued
MP	Apr. 2017	Mass Production version issued
MP	Feb. 2018	Component Change on the Audio Circuit : resister position R116 changed from 0 Ω (Ohm) to 100K Ω (Ohm).



also the firmware has been updated complying with the above hardware change (firmware version : 18.2.3 named by “ *Venus2Pro.Binary.18.2.3.bin* “)

1. Spec Summary

- **Professional** grade video and audio processing
Especially the high performance picture quality **complying with Broadcasting Monitor and Medical Monitor (DICOM : Digital Imaging and COmmunications in Medicine)**
- **Broadcast** features with SDI daughter board
- DVI-D, Analog RGB, YPbPr, CVBS and **3G/HD/SD-SDI** (Option)
- Supports all broadcast video formats
- State of the art high performance picture quality
- **10-bit data processing and 10-bit LVDS output**
- Integrated Frame Buffer Memory increases reliability
- Various output option board available for eDP, MIPI DSI, Dual-to-Single Link, Left-Right Merging and FPC
- 3D Comb-Filter for CVBS Input
- 3D Noise Reduction reduces temporal noise effectively
- Full CRT multi-sync monitor compatibility
- Multi-sync capability up to WUXGA resolution @ 60Hz, compatible standard
- DOS, VGA, SVGA, XGA and SXGA / WUXGA VESA timing
- Expand DOS, VGA and SVGA to full screen display
- Single control operated On-Screen-Display(hereafter "OSD") user interface
- Full control of all relevant display and interface parameters via OSD
- VESA DDC 1/2B compliant
- Compatible with VESA DPMS power saving modes
- Small form factor: 155 x 100 x 20 mm
- Operating temperature: -10°C ~ 70°C
- Multi-standard color system at CVBS (PAL / NTSC)
- Image **Flip / Mirror** supportable by AD board
- Serial Control (RS232C) ready / Customized protocol setting (optional contract basis)
- Audio support (2W x 2W speaker out)
- Power : 12V DC Power adaptor, SMPS (Optional select)
- Optional Power : 24V DC by an additional Daughter Board (Appendix-A, page 35~38)

2. General Description

Venus2 Pro edition creates new era in professional/broadcast highly enhanced from Venus series which is for industrial market. Pro edition features various input module and output modules for future proof concept.

Completely redesigned power circuit for lower consumption and better noise rejection to prevent Analog video noise. 3G/HD/SD-SDI input daughter board brings Venus2 Pro board into full broadcast class monitor including GPIO control and Tally support.

Universal LVDS output module connector reserves all future LCD panel including eDP, MIPI DSI, Special Power Requirement(VGH/VGL/VCOM) with FFC, Micro-Coaxial cables(IPEX).

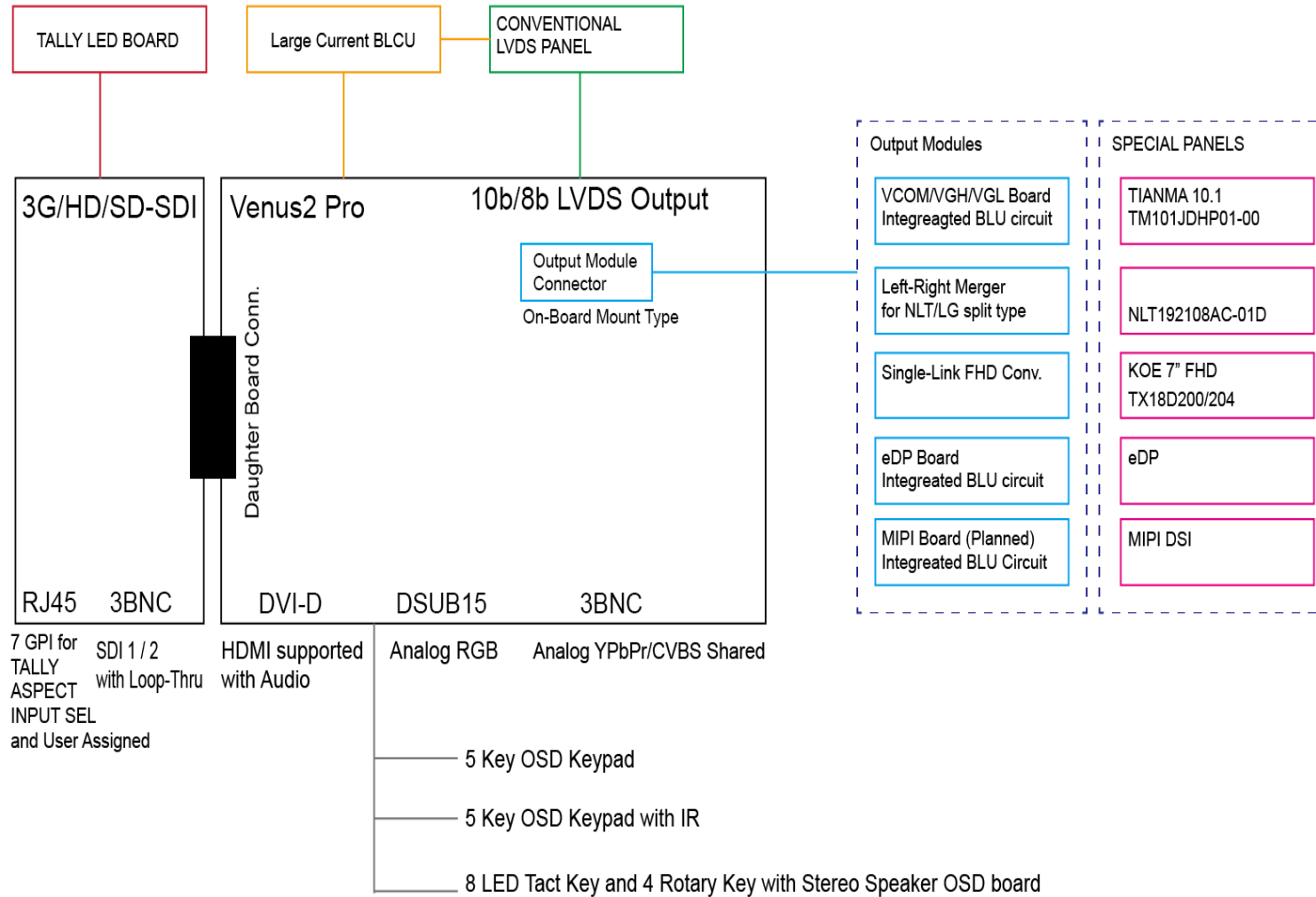
Venus2 Pro not only covers WUXGA@60P, it supports special panel such as wide aspect panel, Left-right split screen(MERGING), Single-link FHD panel and etc.

This AD Board is an advanced TFT LCD Monitor Control Board. This design enables a full conventional CRT monitor & AV Monitor replacement with a large size Active Matrix LCD module.

For optional modules, please refer to separated datasheets.

3. Block Diagram

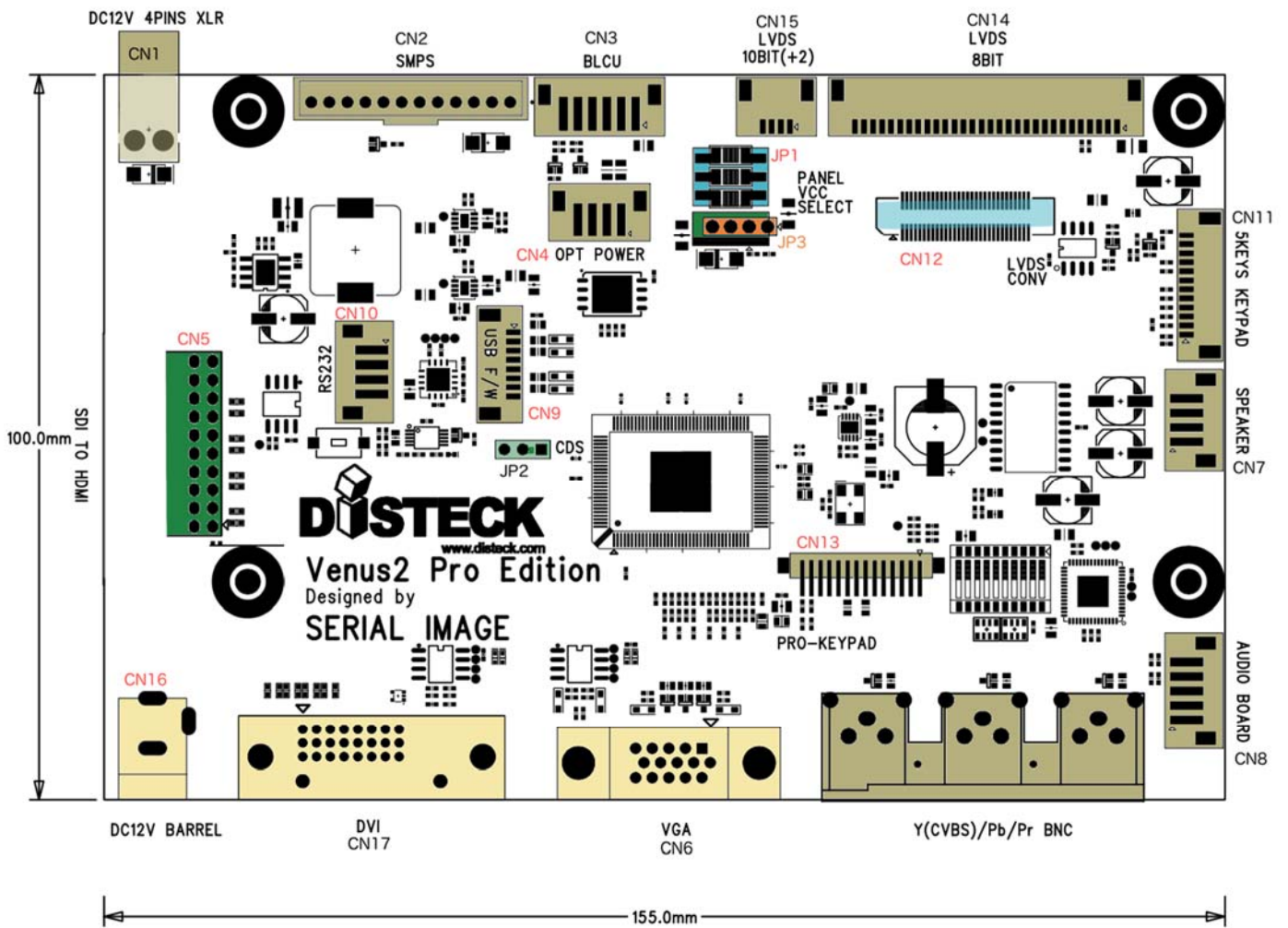
Venus2 Pro LCD and Module Connection Diagram



Datasheet for Scaler Board

4. Dimension and Pictures - Main Board

4.1 Main Board (155 x 100 mm)

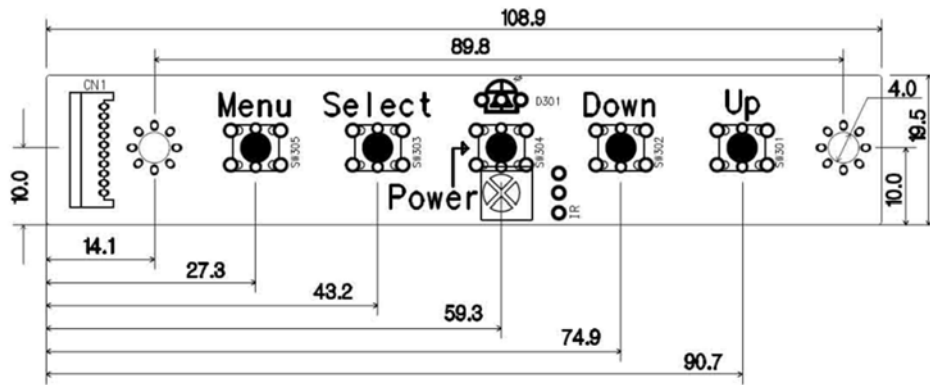


4.2 Connector Information

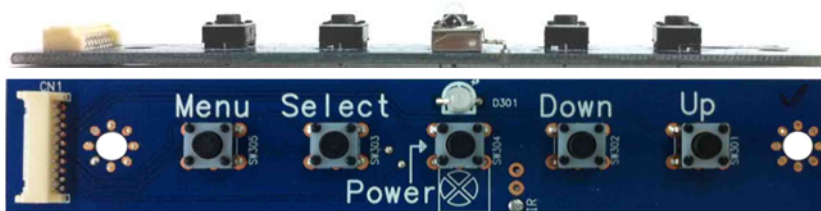
CONN	Class	Direction	Service	Note
CN1	Power	Input	Power Input for 4-Pin XLR with reverse voltage protection	Shared with CN16 Do NOT use with CN1
CN16	Power	Input	Power Input for DC12V Barrel Jack with reverse voltage protection	Shared with CN1 Do NOT use with CN16
CN2	Power	Input/Output	SMPS Connector with control	
CN3	Power	Output	Power outlet for BLU with Enable and Dimming	Unregulated(12V)
CN4	Power	Output	Power outlet for Auxiliary board	Unregulated(12V) or DC5V
CN5	HDMI	Input	HDMI Input for input module	
CN6	VGA	Input	VGA Input Port for PC	
CN7	Audio	Output	Stereo 2W+2W Amplified	Balanced (Tied to Ground)
CN8	Audio	Output	Audio signal for external amp with control	Mute/Volume control by MCU via OSD
CN9	USB	Input/Output	Dual USB for USB update and ETC.	Supported for update only
CN10	RS232	Input/Output	RS232 for remote control	RS232C Level
CN11	Control	Input/Output	5 Keys OSD Keypad with IR(Infrared)	
CN12	Video	Output	Option port for output module	LVDS with control signal
CN13	Control	Input/Output	I2C-based Keypad with Audio output	
CN14	Video	Output	8 bits LVDS output with optional I2C	with Vpanel/Vcc3.3 Channel 0 ~ 3
CN15	Video	Output	2 bits for 10 bits LVDS completion	Channel 4
CN17	Video	Input	DVI connector with HDMI support	HDMI audio supported
BNC1	Video	Input	Y/Pb/Pr analog video input	Y is shared with CVBS In

5. Dimension and Pictures - OSD Board

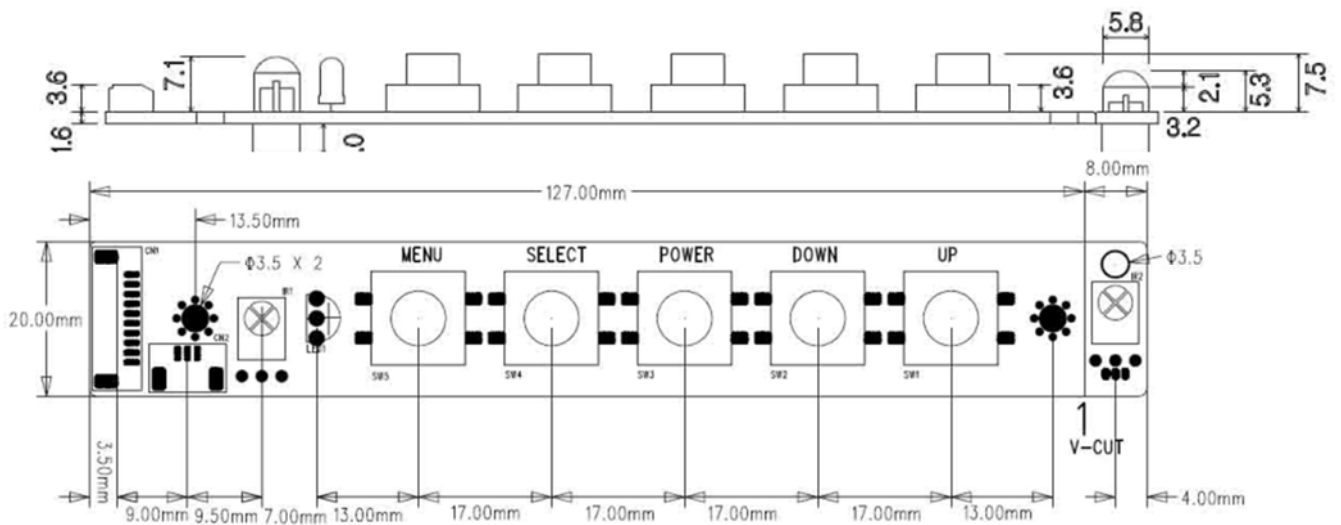
5.1 5Key OSD Board Type 1 : (108.9 x 19.5 mm)



Standard model for board kit solution



5.2 5Key OSD Board Type 2 : (127.0 x 20.0 mm)



Option model for Open Frame or complete set solution

The OSD PCB consists of all in one type and split I/R sensor part.

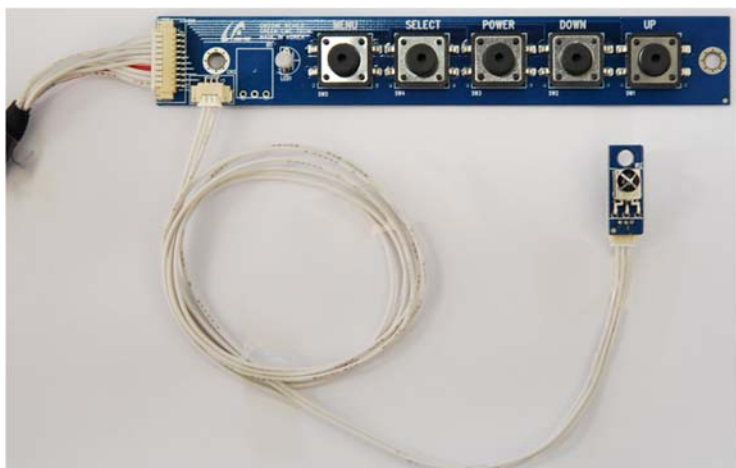
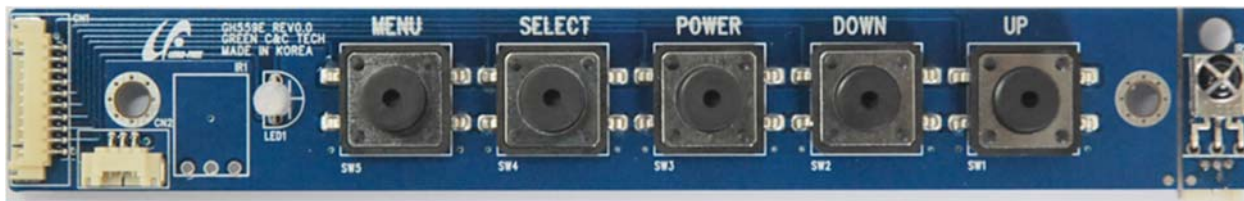
In case of split type, the user can make it two different parts by cut easily.

(the boarder line between OSD body and split I/R sensor part was made by [half cut](#) condition)

All in one type - I/R Sensor and OSD PCB



Split Type – separated I/R sensor



Laminate Sticker for fine finishing the open frame or complete set (optional)



5.3 Professional OSD Keypad (19" EIA RACK WIDTH, 1U HEIGHT)

- 8 LED integrated tact switch
- 4 Magnetic Rotary Encoder for Bright/Contrast/Chroma/Sharpness control
- Optional Stereo Speaker with Amp

PLACE HOLDER

6. Connectors and Pin information

6.1 Part numbers and mating information

CONN	Service	Description	Direction	Board Side (Wafer)	Mating (Housing)
CN1	XLR DC Input	2 Pins	Right Angle	JST B2PS-VH	Hirose HA16RS-4P
CN16	DC Jack	5.0mm diameter Positive on center pin	Right Angle	DC-005	EIAJ / DIN 5.0mm diameter
CN2	SMPS Power	12 Pins, 2.5mm pitch	Straight	Yeon-Ho SMW250-12	Yeon-Ho SMH250-12
CN3	BLU Power	6 Pins, 2.0mm pitch	Straight	Yeon-Ho SMW200-H06G	Yeon-Ho SMH200-06
CN4	Power	4 Pins	Straight	Yeon-Ho SMAW200-04	Yeon-Ho SMH200-04
CN5	HDMI	HDMI Input for input module	Right Angle	Hirose DF13C-14P-1.25V(21)	Hirose DF13C-14S-1.25C
CN6	VGA	VGA Input Port for PC	Right Angle	Standard female DB15	Standard male
CN7	Audio	Stereo 2W+2W Amplified	Straight	Yeon-Ho SMW200-H04G	Yeon-Ho SMH200-04
CN8	Pre-amp Audio	Audio signal for external amp with control	Straight	Yeon-Ho SMW200-H05G	Yeon-Ho SMH200-05
CN9	USB	Dual USB for USB update and ETC.	Straight	Yeon-Ho 12505WS-08	Yeon-Ho 12505HS-08
CN10	RS232	RS232 for remote control	Straight	Yeon-Ho SMW200-H04G	Yeon-Ho SMH200-04
CN11	Control	5 Keys OSD Keypad with IR(Infrared)	Right Angle	Yeon-Ho 12505WR-12P	Yeon-Ho 12505HS-12
CN12	Video	Option port for output module	Straight B2B	Hirose FX8C-60P-SV2	Hirose FX8C-60S-SV5
CN13	Control	I2C-based Keypad with Audio output	Straight	Connfly DS1024-2*10R0	Connfly DS1021-2*10RF11
CN14	Video	8 bits LVDS output with optional I2C	Right Angle	Yeon-Ho 12507WR-30P	Yeon-Ho 12507HS-30
CN15	Video	2 bits for 10 bits LVDS completion	Right Angle	Yeon-Ho 12507WR-04P	Yeon-Ho 12507HS-04
CN17	Video	DVI(HDMI supported with audio)	Right Angle	Standard female DVI-D	Standard male
BNC1	Video	Y/Pb/Pr analog video input	Right Angle	CANARE BCJ-BPLH3P	Standard male

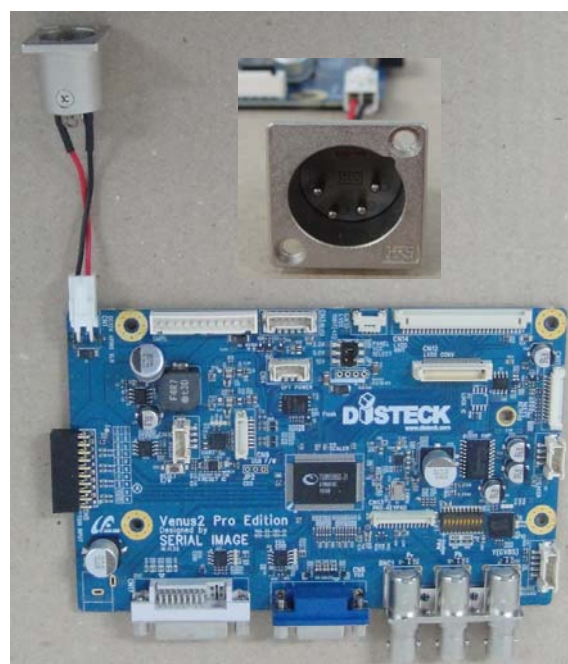
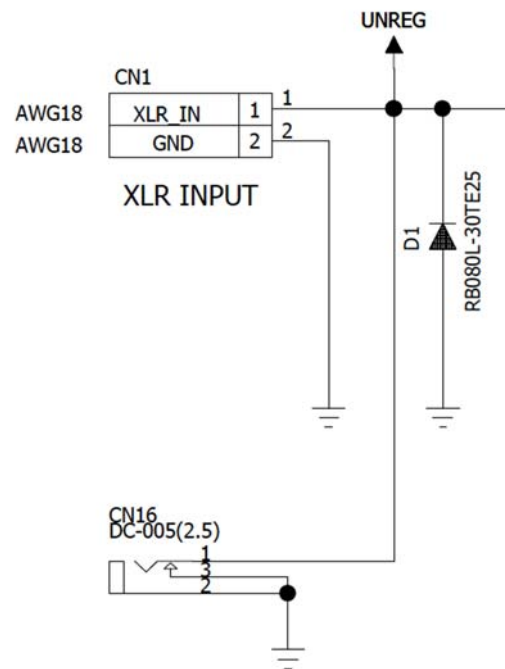
6.2 Pin Information Detail

6.2.1a CN1 Power Input for 4-Pin XLR

Pin No.	Function	Pin No	Function
1	DC IN	2	GND

- Power from CN1 is shared with CN16. Do **NOT** use with CN16 at the same time.

Equivalent Circuit Diagram

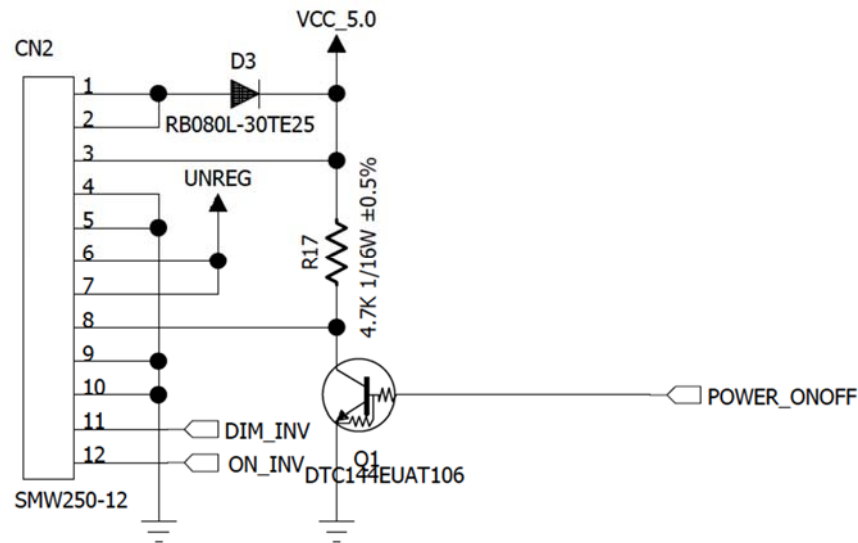


6.2.2 CN2 Power Input for SMPS

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+5V	4	GND	7	+12V	10	GND
2	+5V	5	GND	8	On/Off	11	BLCU Dimmer
3	Standby +5V	6	+12V	9	GND	12	BLCU On/Off

- Standby +5V drives main board always.
- +5V and +12V are switched power output when SMPS is enabled by Pin 8.
- Pin 11(BLU Dim) and Pin 12(BLU On/Off) are optional signal output for high current BLCU.

Equivalent Circuit Diagram

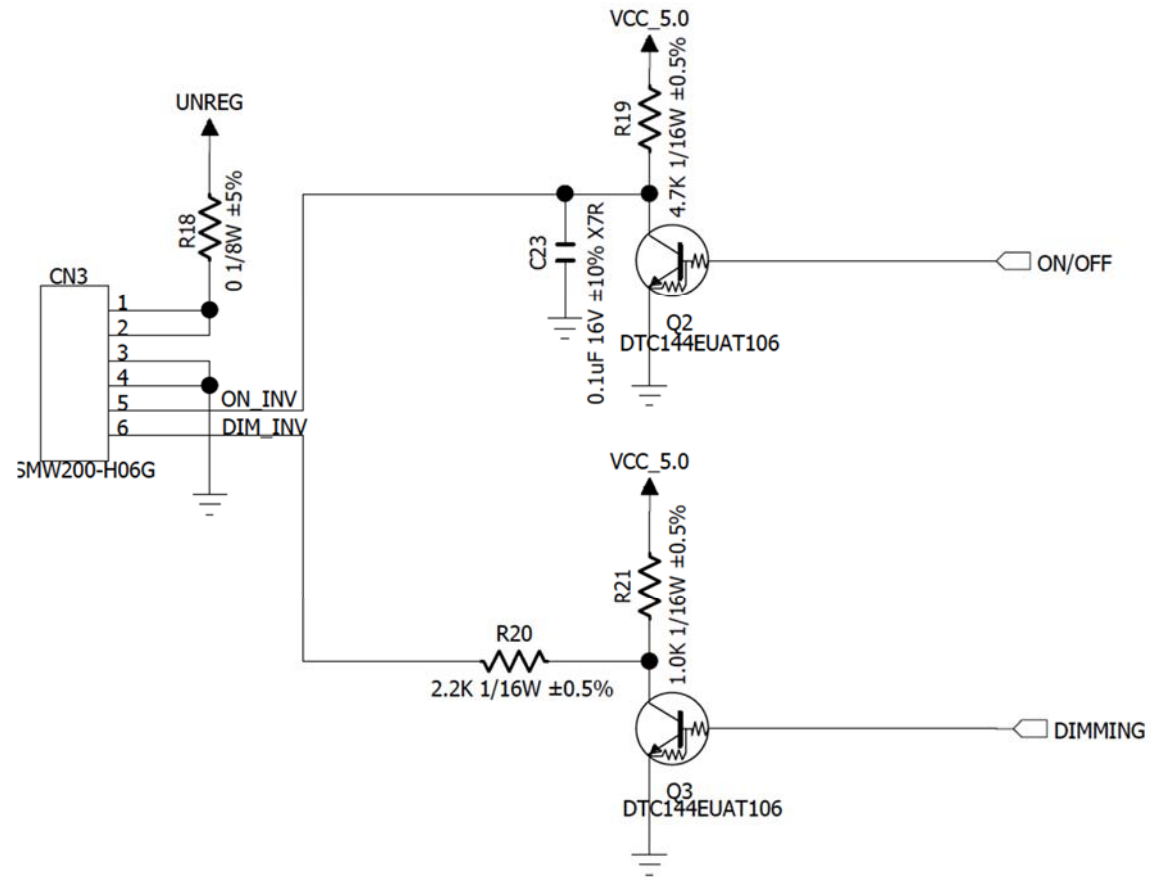


6.2.3 CN3 BLCU Connector

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	UNREG	3	GND	5	On/Off
2	UNREG	4	GND	6	Dimmer

- **UNREG** means "Unregulated power line" which is power source from **CN1** or **CN16**.
- If external power adapter supplies DC12V, **UNREG** will be DC12V as it is.

Equivalent Circuit Diagram

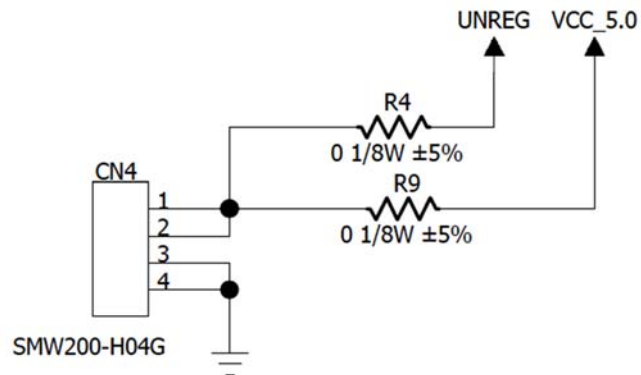


6.2.4 CN4 Auxiliary Power Outlet

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+5V(Default)UNREG(Optional)	2	+5V(Default) UNREG(Optional)	3	GND	4	GND

- Auxiliary power outlet supplies regulated DC5V to external optional boards such as touch panel controller or etc.
- Optionally **UNREG** can be routed by modifying **R4** and **R9**.

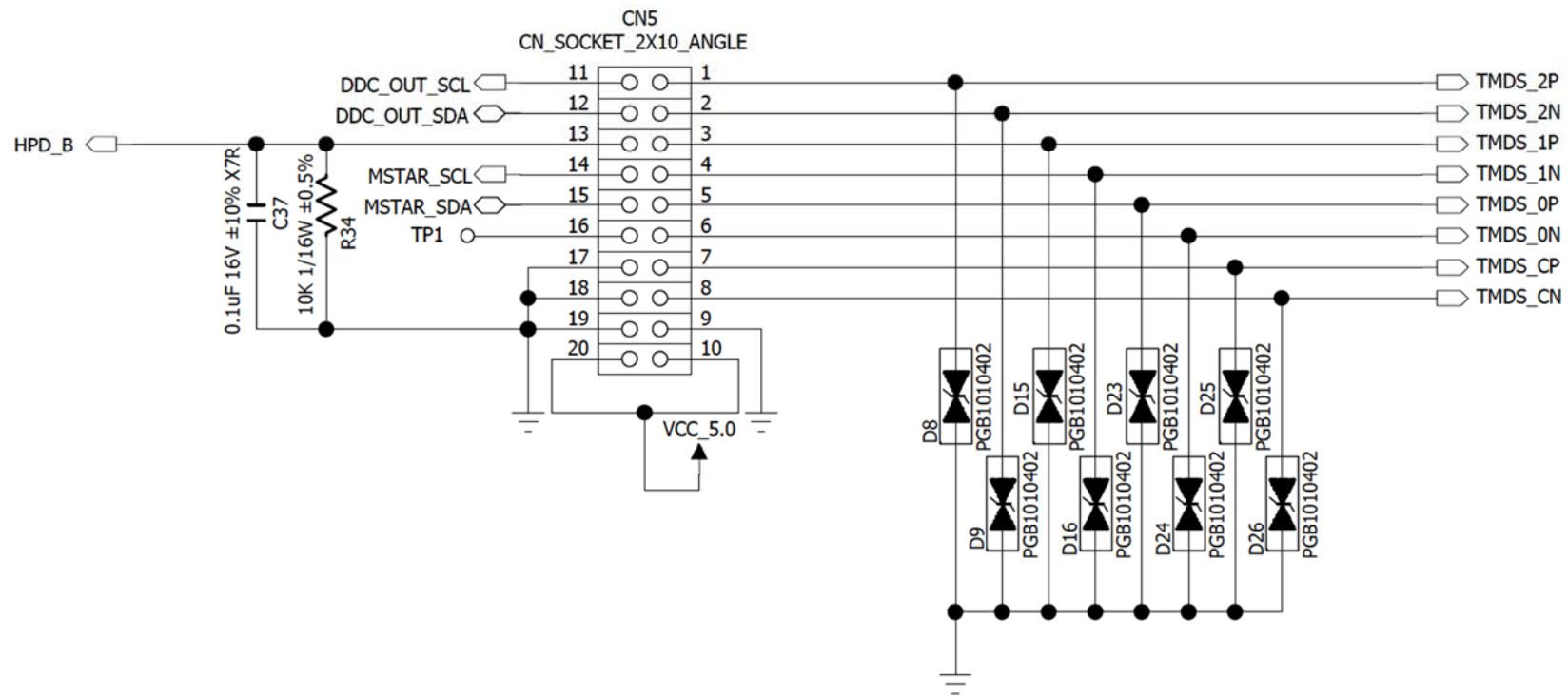
Equivalent Circuit Diagram



6.2.5 CN5 Optional HDMI Input

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Data2 +	5	Data0 +	9	GND	13	HotPlug Detect	17	GND
2	Data2 -	6	Data0 -	10	DC +5V	14	MCU SCL	18	GND
3	Data1 +	7	Clock +	11	DDC SCL	15	MCU SDA	19	GND
4	Data1 -	8	Clock -	12	DDC SDA	16	Reserved	20	DC +5V

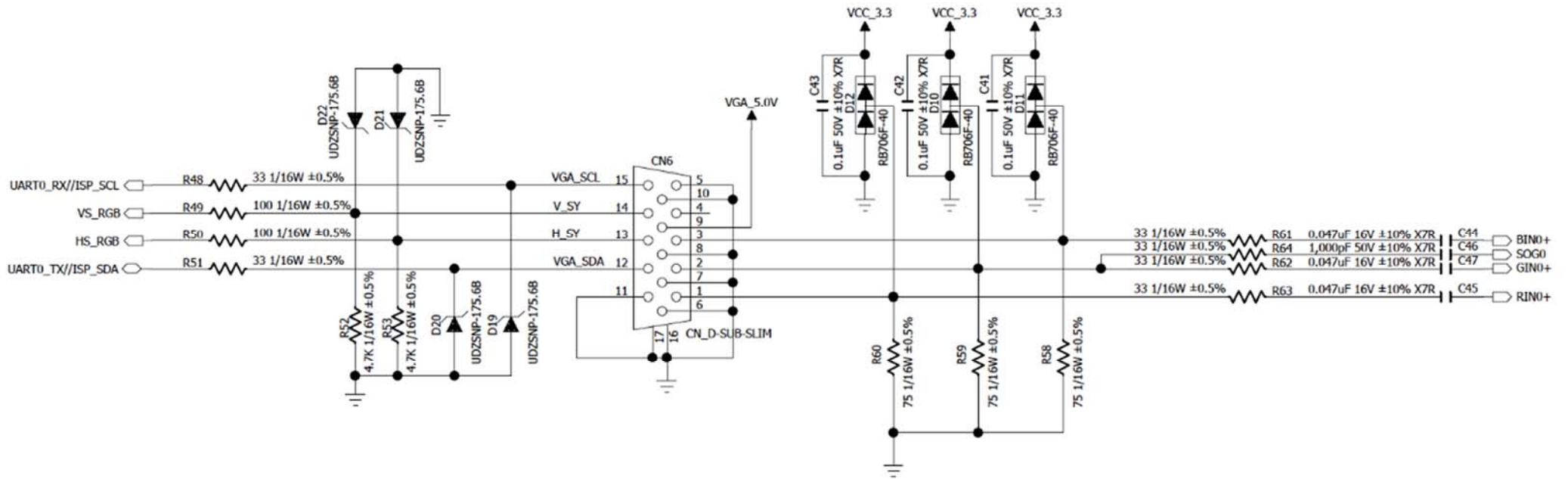
Equivalent Circuit Diagram



6.2.6 CN6 VGA Input (D-SUB 15Pin) / ISP(In-System Programming)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Red	5	Plug Detection	9	DC +5V	13	HSYNC
2	Green	6	GND	10	GND	14	VSYNC
3	Blue	7	GND	11	GND	15	DDC SCL
4	NC	8	GND	12	DDC SDA		

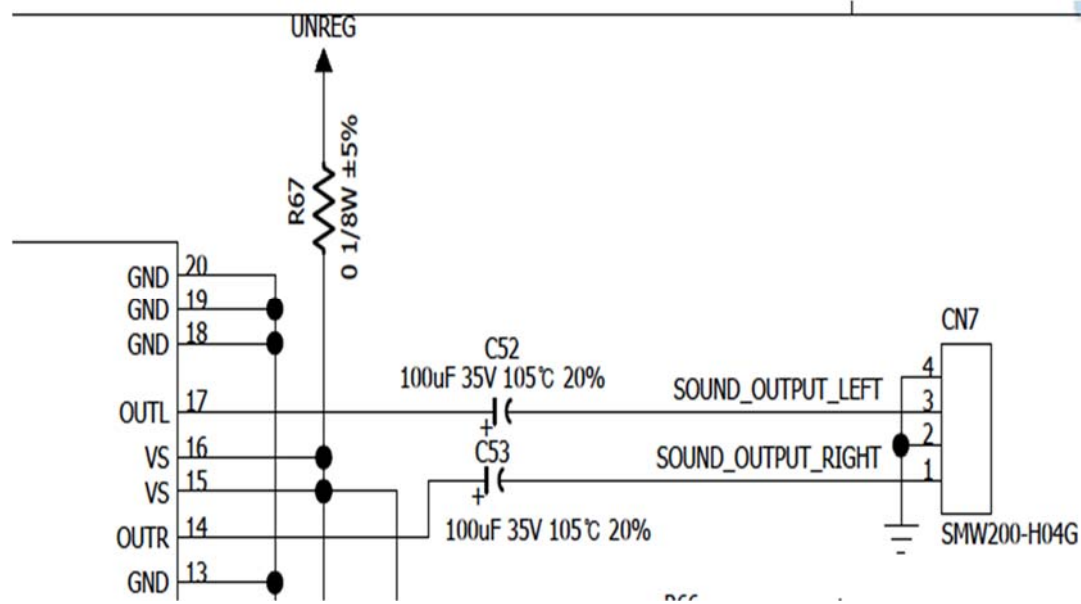
Equivalent Circuit Diagram



6.2.7 CN7 Speaker output for HDMI Audio (2W + 2W)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Right	2	GND	3	Left	4	GND

Equivalent Circuit Diagram



6.2.8 CN8 Audio output & Control

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	STAND-BY	2	Mute	3	VOL
4	LEFT-AUDIO	5	RIGHT-AUDIO		

6.2.9 CN9 Internal USB Port for faster update programming

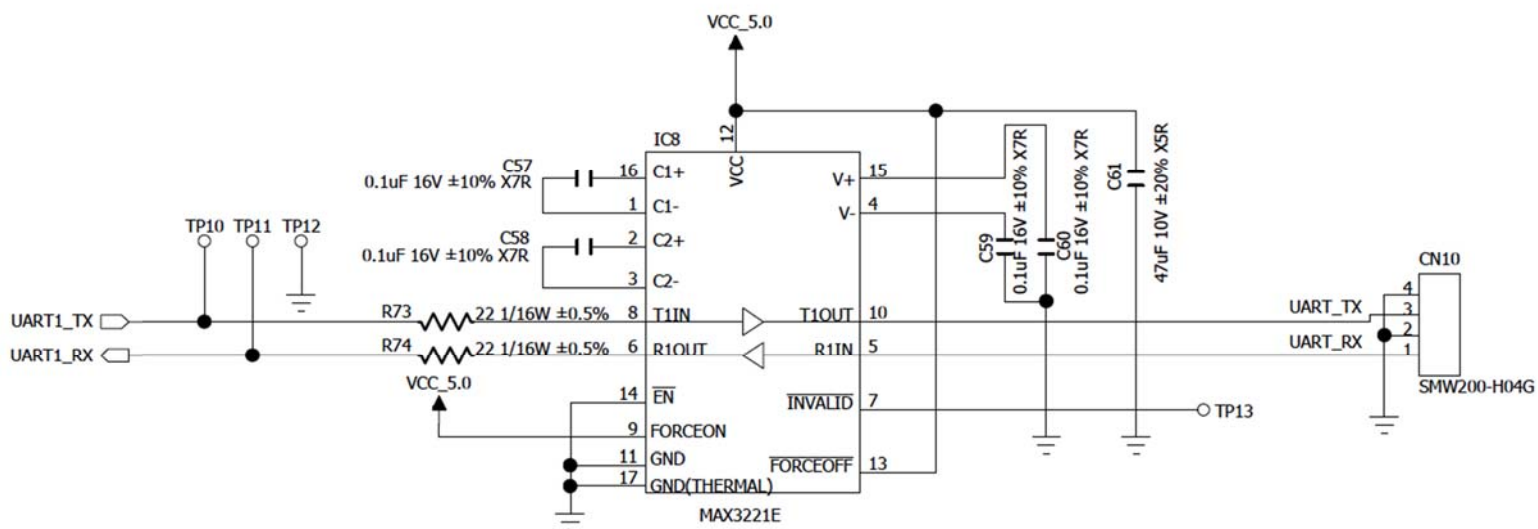
Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	DC +5V	2	D0-	3	D0+	4	GND
5	DC +5V	6	D1-	7	D1+	8	GND

6.2.10 CN10 RS232C Control

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	RX	2	GND	3	TX	4	GND

- RX(Pin 1) is "PC to AD Board"(MISO).
- TX(Pin 3) is "AD Board to PC"(MOSI).

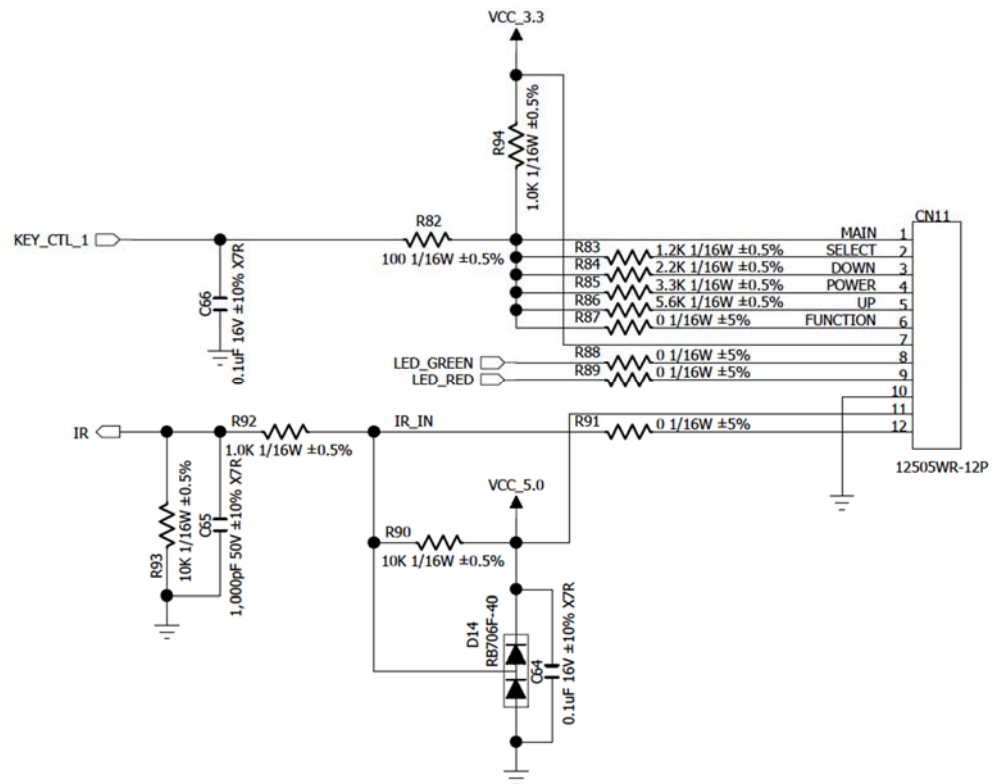
Equivalent Circuit Diagram



6.2.11 CN11 OSD Keypad Interface

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Menu	4	Power	7	DC 3.3V	10	Ground
2	Select	5	Up	8	LED Green	11	5 V
3	Down	6	Function	9	LED Red	12	IR Data In

Equivalent Circuit Diagram



6.2.12 CN12 Optional Output Module Connector (LVDS Output)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1,60	Odd4 -	7,54	Odd1 -	13,48	Odd3 -	19,42	Even2 -	25	BLCU Enable
2,59	Odd4 +	8,53	Odd1 -	14,47	Odd3 -	20,41	Even2 -	26	BLCU Dimming
3,58	Even4 -	9,52	Odd2 -	15,46	Even0 -	21,40	EvenC -	35	MCU SCL
4,57	Even4 +	10,51	Odd2 -	16,45	Even0 -	22,39	EvenC -	36	MCU SDA
5,56	Odd0 -	11,50	OddC -	17,44	Even1 -	23,38	Even3 -	27,28,33,34	GND
6,55	Odd0 +	12,49	OddC -	18,43	Even1 -	24,37	Even3 -	29,30,31,32	Vpanel

- Vpanel is selected by **JP1** or **JP3**.
- LVDS traces are designed as bypass run over for each pairs.

6.2.13 CN13 Professional OSD Keypad Interface with Audio

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Reserved	5	Pre-Amp Audio Left	9	DC +1.8V	13	MCU SDA
2	Reserved	6	Pre-Amp Audio Right	10	GND	14	MCU SCL
3	Reserved	7	DC +3.3V	11	GND		
4	GND	8	GND	12	Reserved		

6.2.14 CN14 8-bit LVDS Output

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	Vpanel	7	GND	13	TXE2-	19	TXE0-	25	TXO2+
2	Vpanel	8	TXE3+	14	GND	20	TXO3+	26	TXO2-
3	Vpanel	9	TXE3-	15	TXE1+	21	TXO3-	27	TXO1+
4	NC(SCL)	10	TXEC+	16	TXE1-	22	TXOC+	28	TXO1-
5	NC(SDA)	11	TXEC-	17	GND	23	TXOC-	29	TXO0+
6	DC +3.3V	12	TXE2+	18	TXE0+	24	GND	30	TXO0-

- Vpanel is selected by **JP1** or **JP3**.
- SCL/SDA control signals are used for in case of extra optional board such as eDP output option or 120Hz FRC converter board.
- For SCL/SDA control, it requires R100, R101 for connection with 0-ohm jumper.

6.2.15 CN15 Extra 2-Bits LVDS Output for 10-bit panel

In conjunction with CN14

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	TXE4+	2	TXE4	3	TXO4+	4	TXO4-

6.2.16 CN16 Power Input for Barrel(Cylindrical) Jack (diameter = 5.00mm)

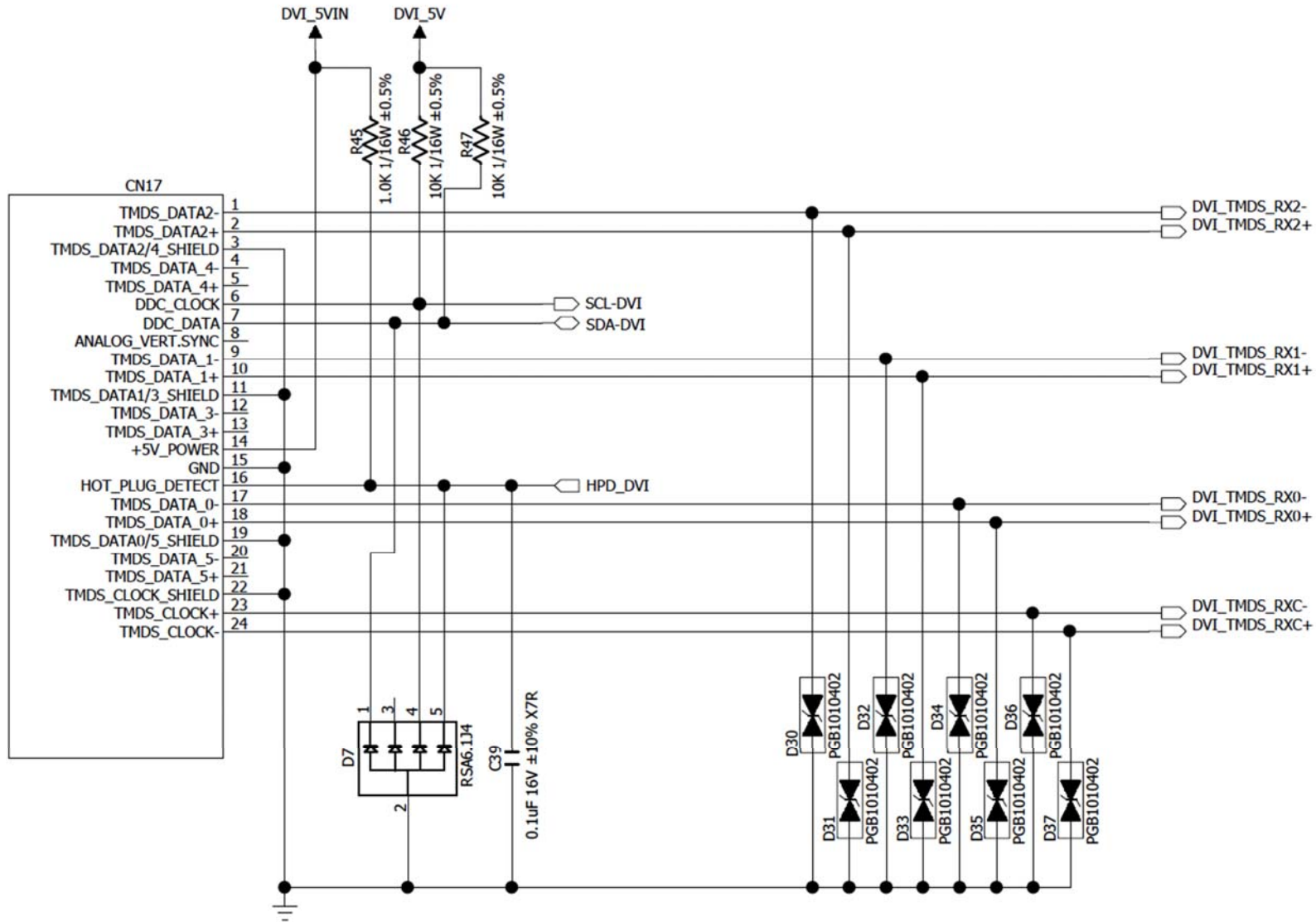
Pin No.	Function	Pin No.	Function	Pin No.	Function
1	+12V	2	Detect Not Used	3	GND

- Power from CN16 is shared with CN1. Do **NOT** use with CN1 at the same time.

6.2.17 CN17 Single-Link DVI Input (DVI D-Type) with HDMI Audio Support

Pin No.	Function	Pin No	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	TX2-	6	DDC SCL	11	TX 1/3 Shield	16	HotPlug Detect	21	NC
2	TX2+	7	DDC SDA	12	NC	17	TX0 -	22	TXClk Shield
3	Data2/4 Shield	8	NC	13	NC	18	TX0 +	23	TXCLK+
4	NC	9	TX1-	14	DC +5V	19	TX0/5 Shield	24	TXCLK-
5	NC	10	TX1+	15	Ground	20	NC		

Equivalent Circuit Diagram

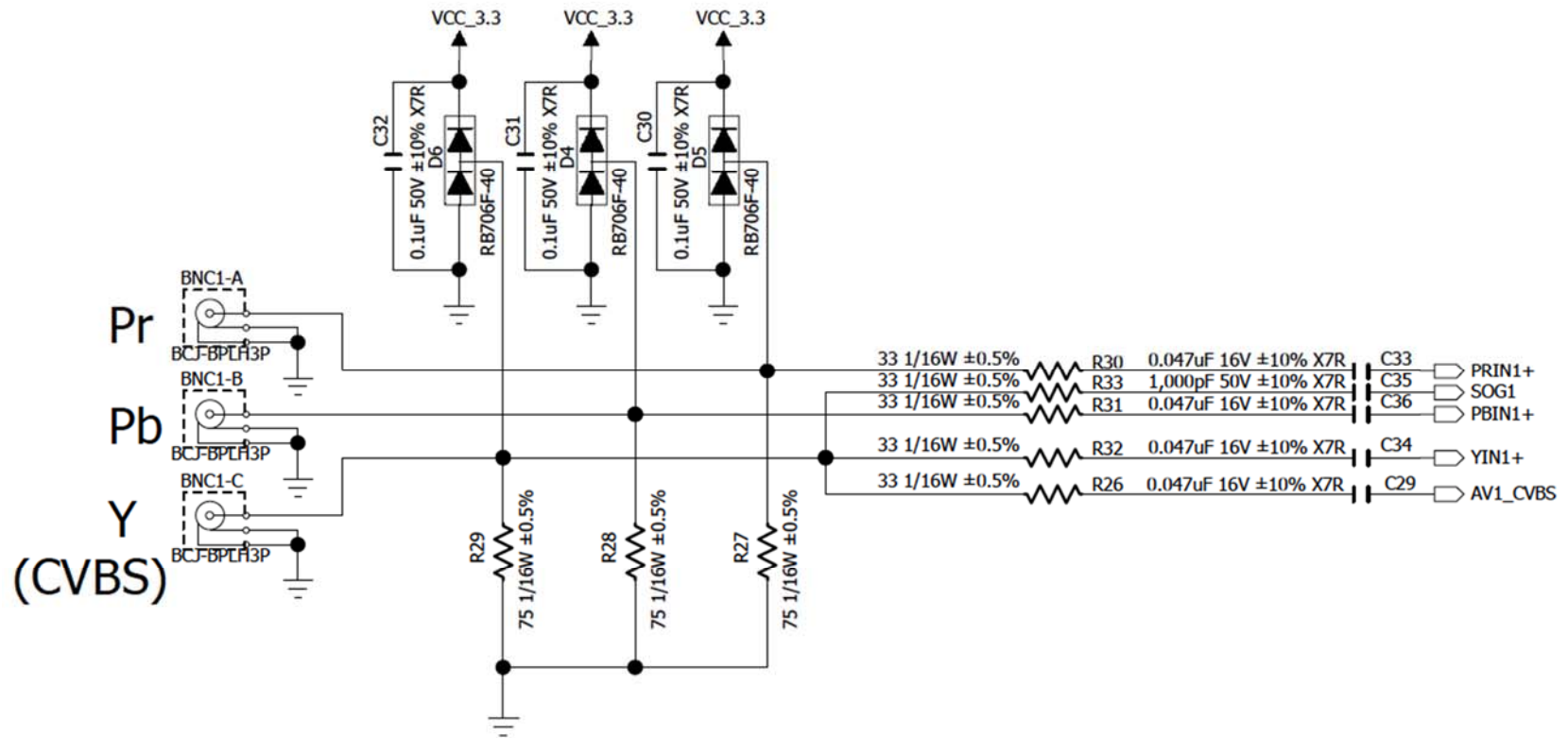


6.2.18 BNC1 Analog Video Input

Pin No.	Function	Pin No.	Function	Pin No.	Function
A	Y(CVBS)	B	Pb	C	Pr

- Internally 75-ohm terminated

Equivalent Circuit Diagram



6.2.19 JP1 Vpanel Voltage Selector

Pin No.	Function	Pin No.	Function	Pin No.	Function
1,2	DC +3.3V	3,4	DC +5.0V	5,6	UNREG

Instead of jumpers, FerriteBead or 0ohm resistor can be used.

- For DC3.3V, mount FB7.
- For DC5.0V, mount FB6.
- For Unreg(12V), mount FB5.

6.2.20 JP2 CDS Sensor(Optional) (2.54mm HEADER)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	DC +3.3V	2	CDS IN	3	GND

6.2.21 JP3 High Current Panel Power Circuit Port (2.54mm thru-hole)

Pin No.	Function	Pin No.	Function	Pin No.	Function	Pin No.	Function
1	GND	2	ADJ	3	Vout	4	Vin

- If Panel consumes more than **600mA**, use external voltage regulator instead of **JP1** or **IC12**.

6.2.20 IC12 Low Current Panel Power Circuit Port

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	ADJ	2	Vout	3	Vin

- Mounting point for **TI LM1117-ADJ TO-220** Package
- Max current of TI LM1117 is **800mA**
- Adjust **R95**(High-side,4.7K), **R96**(Low-side,33K) for custom Vpanel. (**Default** is set to **10.0V**)
- <http://www.ti.com/product/LM1117>

7. Setup for Operation

7.1 Panel Voltage Configuration

PLACE HOLDER

7.2 BLCU Voltage Configuration

PLACE HOLDER

7.3 BLCU Dimmer Configuration

PLACE HOLDER

7.4 Controller

7.4.1 Infrared Remote Controller (Optional accessory)

When user uses the remote controller, press the "SOURCE" button, then the below "Input Source" windows comes up on the right top of screen.

Then, whatever user need to settle the activation among the 4 kinds of input signal.



Datasheet for Scaler Board

8. Electronic Characteristics

8.1 Operating Range

Symbol	Description	Min	Typ.	Max	Unit
Unreg	Voltage for Board	+7.0	+12.0	+18.0	V _{rms} (DC)
V _{panel}	Voltage for Panel	+3.25	JP1	+12.6	V _{rms} (DC)
I _{panel}	Continuous Current for Panel	0	-	+3.0	A _{rms} (DC)
I _{panel-peak}	Inrush Current for Panel	0	-	+9.0	A _{peak} (DC)
V _{aux}	Voltage for Aux(CN4) When V _{aux} = 5V	+4.75	+5.0	+5.25	V _{rms} (DC)
I _{aux}	Current for Aux(CN4) When V _{aux} = 5V	-	-	+2.0	A _{rms} (DC)

8.2 Power Consumption

Test Condition

DC12.0V, Ta=25°C, Input Port = DVI, LCD Panel = LGDisplay LM240WU8, VideoFormat = 1080/60i

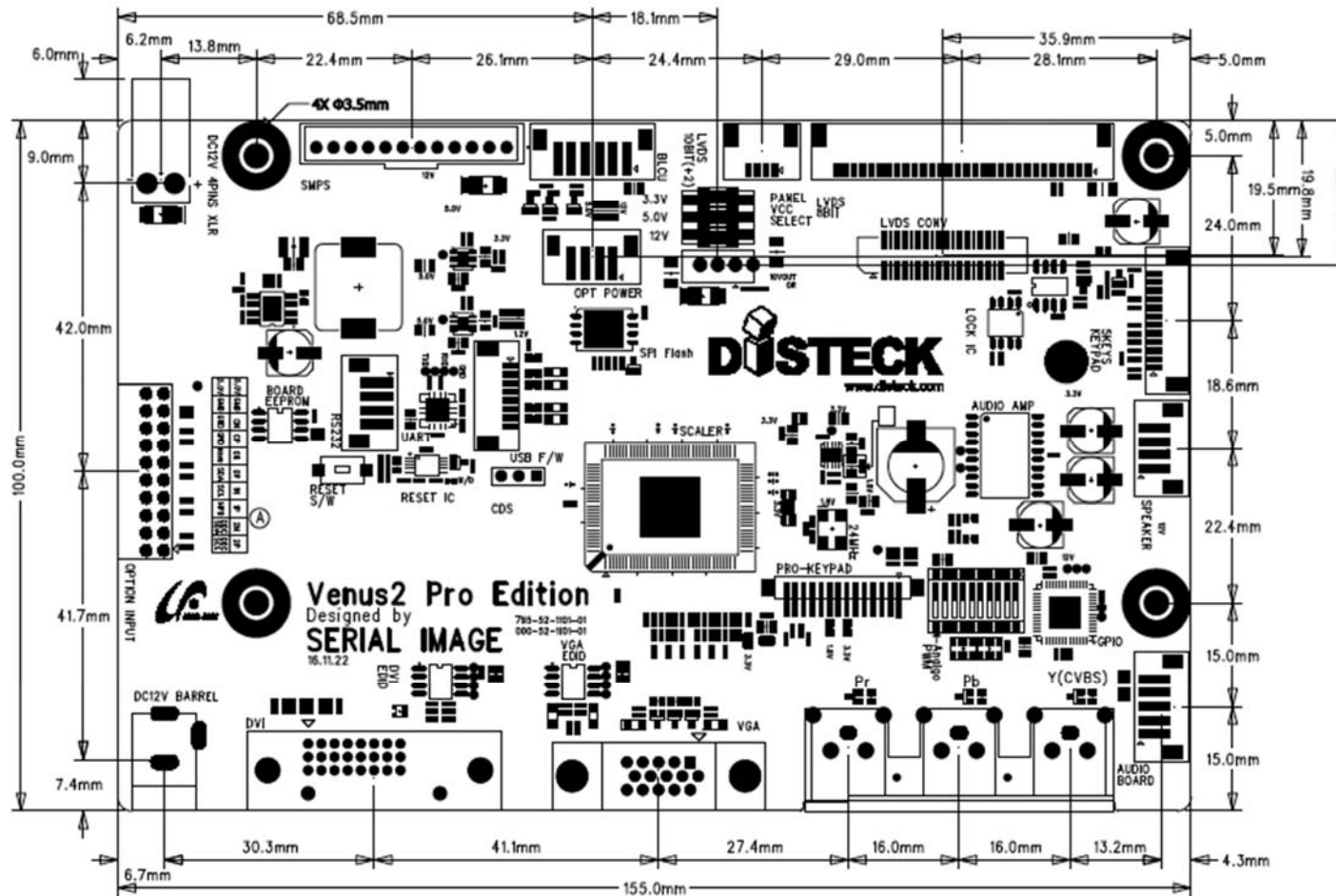
Power Consumption

Max ?? W (0.??A @ DC12V) - Board Only

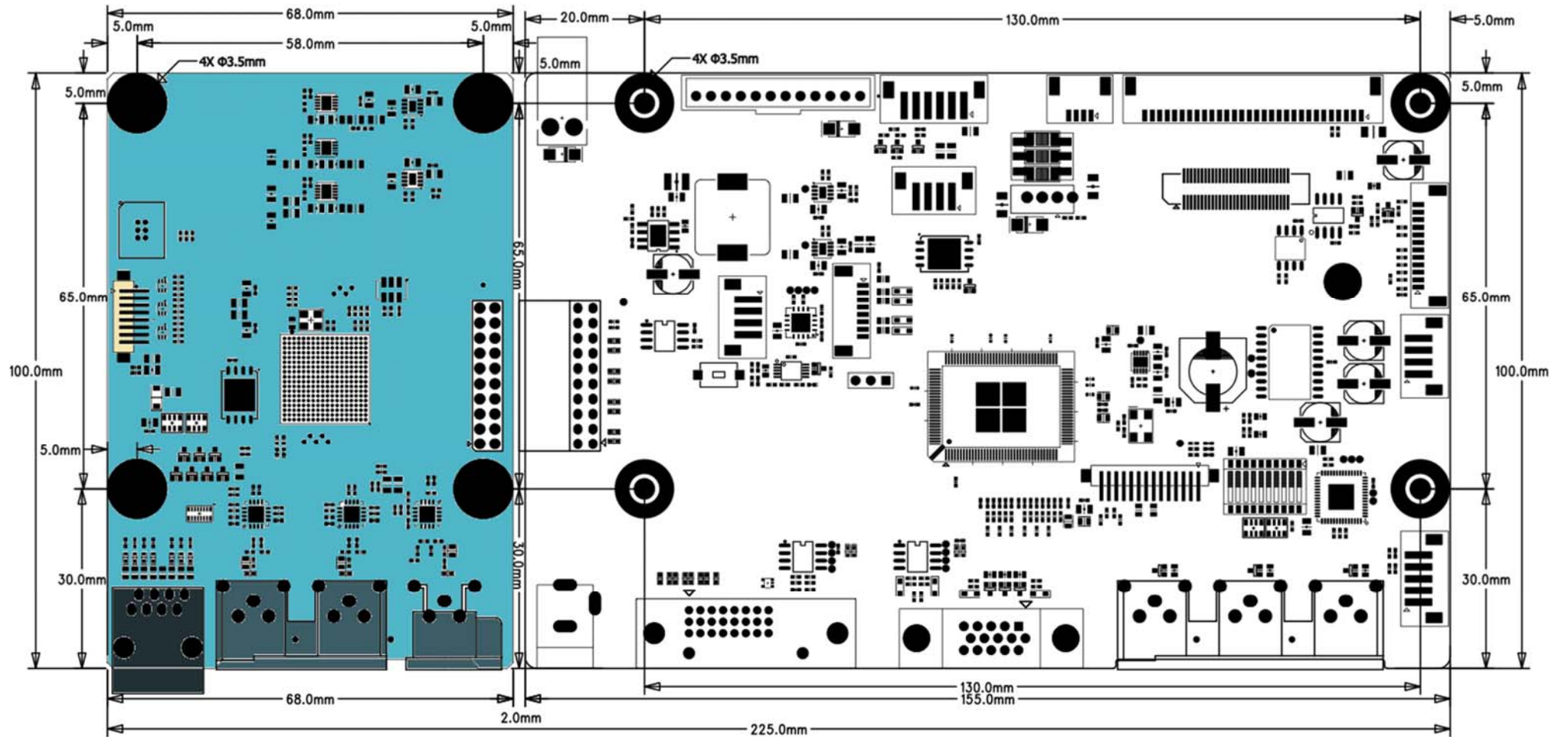
9. Mechanical Data

9.1 Standalone

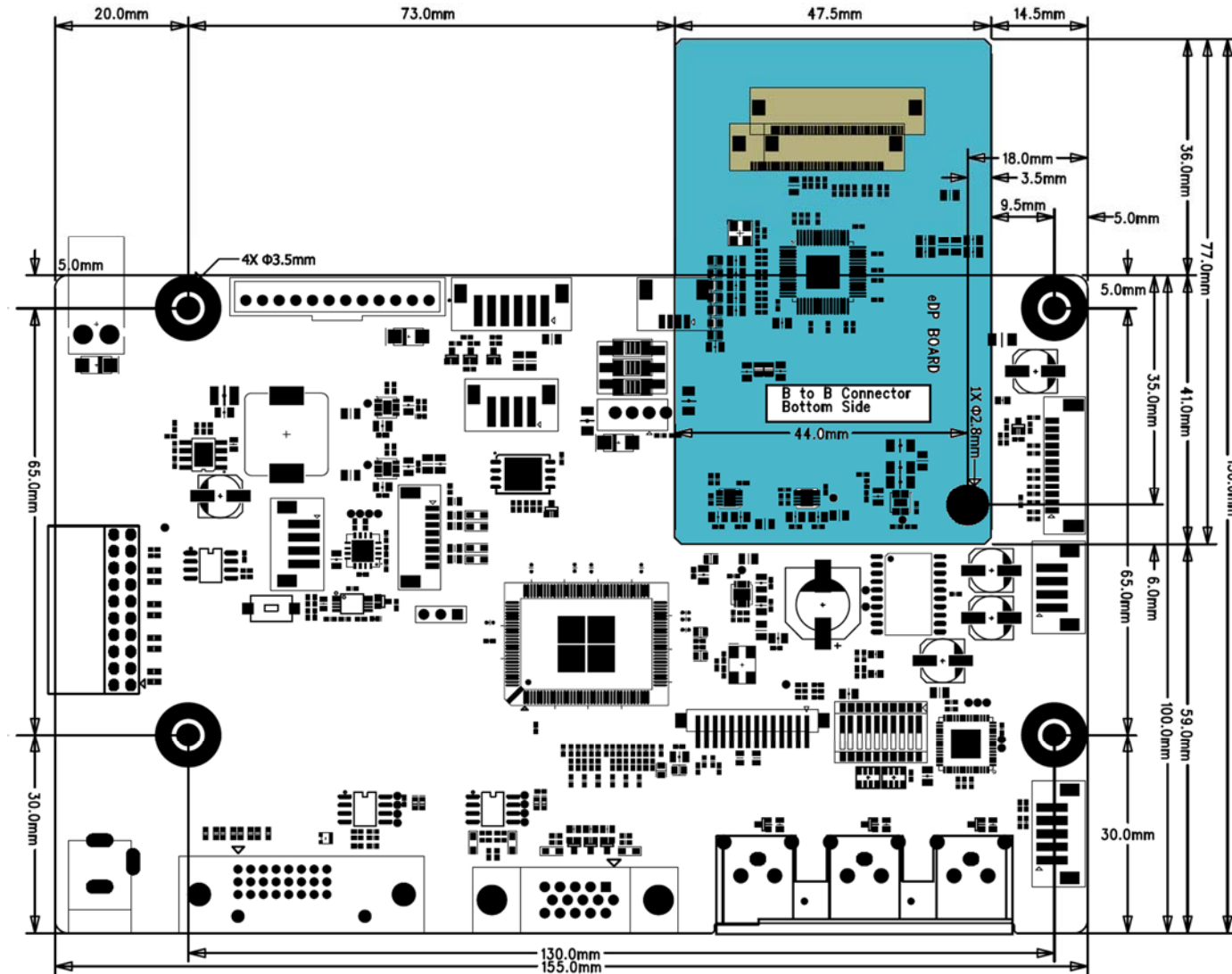
SUBJECT TO CHANGE : ⚠️ CN5 position will move to right for Mass Production.



9.2 Mating with SCV-S2H SDI Input Module



9.3 Mating with Eros eDP Output Module



10. Miscellaneous Data

10.1 Operating Temperature

Recommended

0 ~ 45 °C

Absolute

-10 ~ 60 °C

10.2 Storage Temperature

Non-operational

-20 ~ 60 °C (Non condensing)

10.3 Packaging

10.3.1 Packing

Packed with anti-static PE bag with sealing.

10.3.2 Carton Structure

TBD

10.3.3 Boxing

TBD

10.3.4 Palette

TBD

10.4 Electrostatic Discharge Caution



The board has limited built-in ESD protection.

The board has limited built-in ESD protection.

The board should be placed in conductive foam during storage or handling to prevent electrostatic damage to the board.

12. Ordering Information

12.1 Mainboard

OrderCode	V _{panel}	Status
VNS2-PRO	3.3V/5.0V/12.0V	AVAILABLE
VNS2-PRO-LDO-xx	TI LM1117 xxV	AVAILABLE
VNS2-PRO-REG-xx	3A Switching Reg xxV	UNDER DEV.

12.2 Keypad

Order Code	Description	Status
DKP-5K	Standard 5-Keys with IR	AVAILABLE
DKP-5KS	5-Keys with Split IR	AVAILABLE
DKP-R19	1RU 8-Keys, 4-Rotaries with Speakers	UNDER DEV.

12.3 Input Module

Order Code	Description	Status
SCV-S2H	3G/HD/SD-SDI to HDMI 1.4 Converter	AVAILABLE
SCV-4K2H	Quad 3G-SDI to HDMI 2.0 Converter	UNDER DEV.
SCV-O2H	Optical SFP Receiver to HDMI 1.4 Converter	PLANNED

12.4 Output Module

Order Code	Description	Status
EROS-eDP	3.3V/5.0V/12.0V	AVAILABLE
EROS-VCOM	Provides $V_{COM}/V_{GH}/V_{GL}$	UNDER DEV.
EROS-LINK	Link Mapping / Pixel Mapping converter	UNDER DEV.

Order Code	V_{panel}	Status
VNS2-PRO	3.3V/5.0V/12.0V	AVAILABLE
VNS2-PRO-LDO-xx	TI LM1117 xxV	AVAILABLE
VNS2-PRO-REG-xx	3A Switching Reg xxV	UNDER DEV.

Order Code	Description	Status
DKP-5K	Standard 5-Keys with IR	AVAILABLE
DKP-5KS	5-Keys with Split IR	AVAILABLE
DKP-R19	1RU 8-Keys, 4-Rotaries with Speakers	UNDER DEV.

Order Code	Description	Status
SCV-S2H	3G/HD/SD-SDI to HDMI 1.4 Converter	AVAILABLE
SCV-4K2H	Quad 3G-SDI to HDMI 2.0 Converter	UNDER DEV.
SCV-O2H	Optical SFP Receiver to HDMI 1.4 Converter	PLANNED

Datasheet for Scaler Board

Order Code	Description	Status
EROS-eDP	3.3V/5.0V/12.0V	AVAILABLE
EROS-VCOM	Provides $V_{COM}/V_{GH}/V_{GL}$	UNDER DEV.
EROS-LINK	Link Mapping / Pixel Mapping converter	UNDER DEV.

Appendix

Appendix A : DC 24V Input Converter

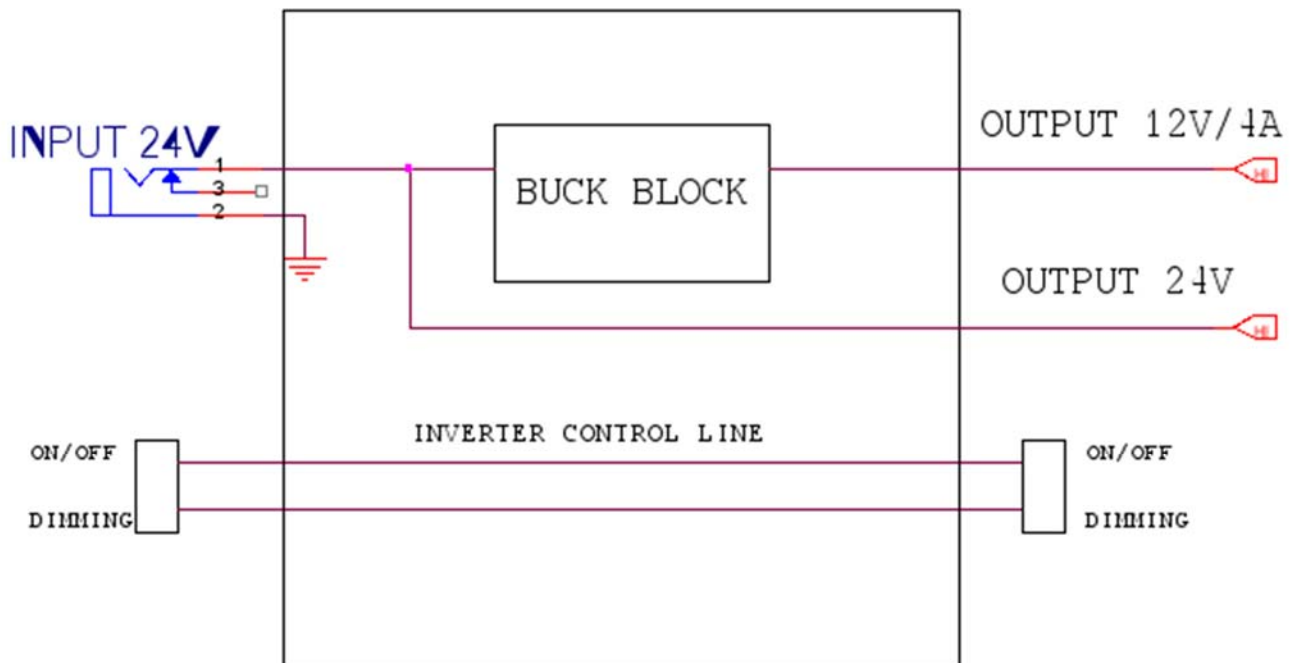
DC24V to DC12V Converter for SMPS Input

This is an optional daughter board which can support the direct power supply (24V DC) from a SMPS or System Power, then discharges the 12V DC to AD card or similar devises and the 24V DC by-pass to backlight of LCD display directly.

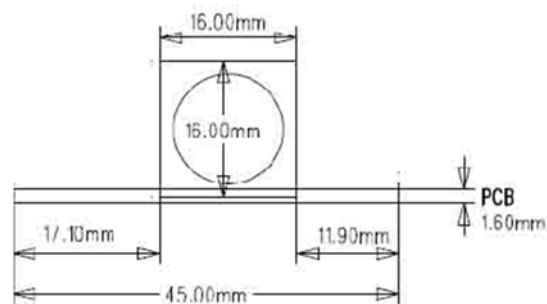
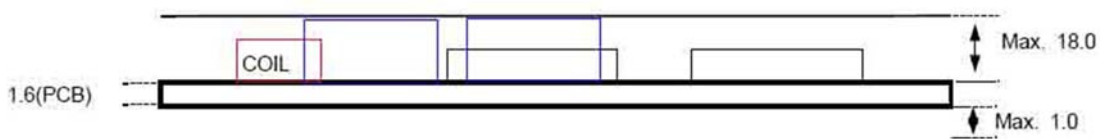
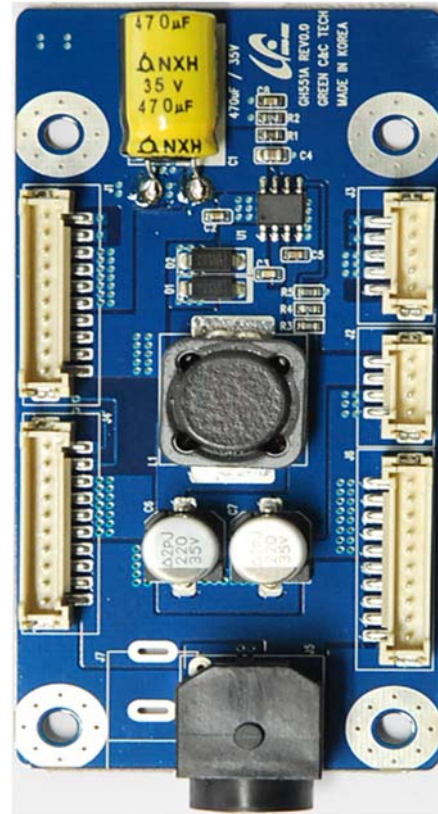
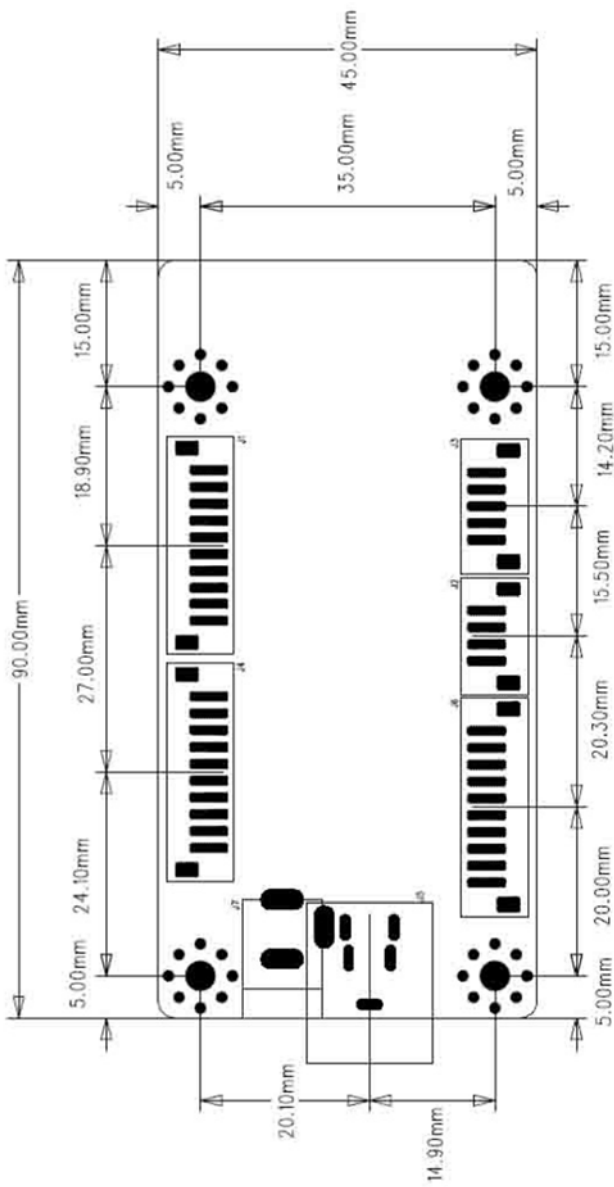
Output Characteristics

Item	Symbol	Specification			Unit
		Min.	Typ.	Max.	
Input Voltage	Vin	21.6	24	26.4	Vdc
Input Current	Iin	-	-	2.0	Adc
Output Voltage	Vout	10.8	12	13.2	Vdc
Output Current	Iout	-	-	3.0	Adc

Block Diagram



Dimension and Picture



Pin Information

J1 & J4 Inverter Control output Connector SMW200-H10G / Yeon-Ho

Pin No	Symbol	Pin No	Symbol	Pin No	Symbol	Pin No	Symbol
1	Inv. On / Off	2	Dimming	3 ~ 6	GND	7 ~ 10	24V

J2 Inverter Control input Connector SMW200-H05G / Yeon-Ho

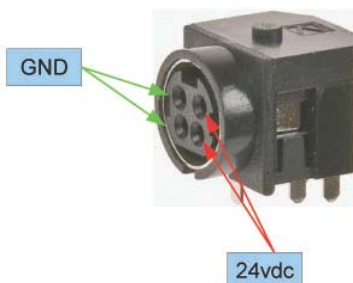
Pin No	Symbol	Pin No	Symbol	Pin No	Symbol	Pin No	Symbol
1	N.C.	2 ~ 3	GND	4	Dimming	5	Inv. On / Off

J3 12V DC Output Connector SMW200-H04G / Yeon-Ho

Pin No	Symbol	Pin No	Symbol	Pin No	Symbol	Pin No	Symbol
1	GND	2	GND	3	12V	4	12V

J5 24V DC Jack Connector DIN-422(BSUN) / Yeon-Ho

Pin No	Symbol	Pin No	Symbol	Pin No	Symbol	Pin No	Symbol
1	+24V	2	GND	3	+24V	4	GND



J6 24V DC Power Input Connector SMW200-H10G / Yeon-Ho

Pin No	Symbol	Pin No	Symbol
1 ~ 5	24V	6 ~ 10	GND

J7 24V DC Power Input Jack (round type) / Yeon-Ho

Appendix B Supported Video Format for RGB

Spec. Mode	Pixel Freq. MHz	Horizontal Timing				Vertical Timing			
		Sync Polar	Freq.	Total	Active	Sync Polar	Freq.	Total	Active
			KHz	Pixel	Pixel		Hz	Line	Line
640x350 @70Hz	25.144 VESA	P	31.430	800	640	N	70.000	449	350
720x400 @70Hz	28.287 VESA	N	31.430	900	720	P	70.000	449	400
640x480 @60Hz	25.175 MAC	N	31.469	800	640	N	59.940	525	480
640x480 @60Hz	25.175 VESA	N	31.469	800	640	N	59.940	525	480
640x480 @67Hz	30.240 MAC	N	35.000	864	640	N	66.667	525	480
640x480 @72Hz	31.500 VESA	N	37.861	832	640	N	72.809	520	480
640x480 @75Hz	31.500 VESA	N	37.500	840	640	N	75.000	500	480
832x624 @75Hz	57.284 MAC	N	49.726	1152	832	N	74.551	667	624
800x600 @56Hz	36.000 VESA	P	35.156	1024	800	P	56.250	625	600
800x600 @60Hz	40.000 VESA	P	37.879	1056	800	P	60.317	628	600
800x600 @72Hz	50.000 VESA	P	48.077	1040	800	P	72.188	666	600
800x600 @75Hz	49.500 VESA	P	46.875	1056	800	P	75.000	625	600
1024x768 @60Hz	65.000 VESA	N	48.363	1344	1024	N	60.005	806	768
1024x768 @60Hz	64.000 MAC	N	48.780	1312	1024	N	60.001	813	768
1024x768 @70Hz	75.000 VESA	N	56.476	1328	1024	N	70.070	806	768
1024x768 @75Hz	80.000 MAC	N	60.241	1328	1024	N	74.927	804	768
1024x768 @75Hz	78.750 VESA	P	60.023	1312	1024	P	75.030	800	768
1280x768 @60Hz	79,500 VESA	P	47,780	1664	1280	P	59,870	798	768
1280x1024 @60Hz	108.000 VESA	P	63.981	1688	1280	P	60.020	1066	1024
1280x1024 @75Hz	135.000 VESA	P	79.976	1688	1280	P	75.025	1066	1024
1360X768 @60Hz	85.00 VESA	P	47.712	1792	1360	P	60.015	795	768
1600x1200 @60Hz	160.875 VESA	N	74.479	2160	1600	P	59.967	1242	1200
1680x1050 @60Hz	147.000 VESA	N	65.160	2256	1680	P	59.944	1087	1050
1920x1080 @60Hz	172.750 VESA	N	67.061	2576	1920	P	59.983	1118	1080
1920X1200@60Hz	193.125 VESA	N	74.508	1292	1920	P	59,990	1242	1200