

AD BOARD

Specifications

HN100E

Approval

Rev. 01

Issue Date. 2017. 12. 21

Doc No. HN100E V1.0

Note | Specification is subject to change without notice.
Consequently it is better to contact to our company before
proceeding with the design of your product incorporating
this board

Prepared	Checked I	CheckedII	Approved
			
KB.PARK			YH. HAN

Revision History

Rev.	ECN No.	Description of Changes	Date	Prepared
V1.0		Initial Release	2017. 12. 21	KB.PARK

1. General Specification

No.	Item	Description		
1	Model Name	HN100E		
2	LCD Module	eDP 1920X1080 60Hz 8bit		
3	Input	HDMI 1.4*1(TMDs), RGB Support, DVI		
4	Resolution Support	H: 31 ~ 135kHz		
		V: 55 ~ 76Hz		
5	OSD Control	Menu, Select, Down, Up, Power		5 key
	Plug & Play	VESA DDC 2B Ver1.4		
6	Power Consumption	Supply Voltage	12Vdc	
		Power	-	Board Only
Digital		HDMI 1.4(TMDs), Display Port		
		HDCP Ver1.1		
Analog		DVI , (R, G, B Separate H, V Sync)		
Audio		3W x 3W		
8	Board Size	W x H x D(mm)	135 x 75 x 17	



2. ELECTRICAL SPECIFICATION

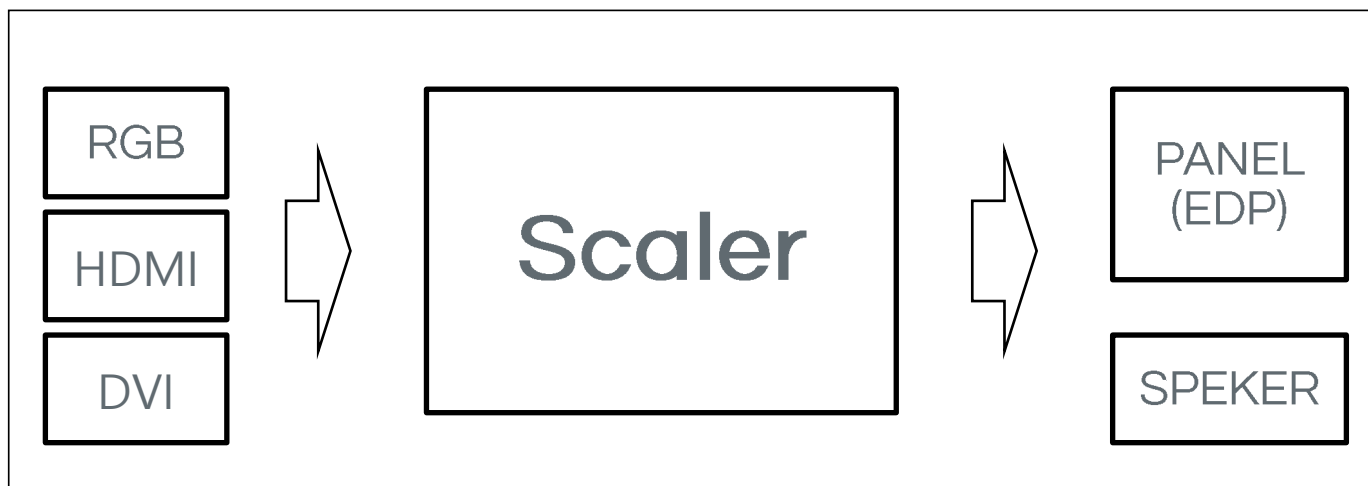
2.1. Input characteristic

Description	Signal	Unit	Min	Typical	Max	Remarks
Power In (12Vdc)						
	Input	12VDC	11.4	12	12.6	
	Consumption	Watt				
HDMI Input						
	TMDS	mVp-p	450		900	
DVI Input						
	TMDS	mVp-p	450	500	900	
RGB Input						
	Analog RGB	VPP	0	0.7	-	
	Sync	VDC	0	5	5.5	
	H Frequency	KHz	31		80	Depends on Mode
	V Frequency	Hz	55	75	77	Depends on Mode

2.2. Output characteristic

Description	Signal	Unit	Min	Typical	Max	Remarks
Panel Power						
	LCD Power(12V)	VDC	11.4	12	12.6	
	LCD Power(5V)	VDC	4.5	5	5.5	
	LCD Power(3.3V)	VDC	3.16	3.3	3.5	
AUDIO Interface						
	Output	Watt		3		
	Frequence	Hz	20Hz		20KHz	
	THD	POUT=3W@ 4Ω, THD 10%(at 5V)				
Inverter Interface						
	Power	V	11.4	12	12.6	Depends on Power
	On/Off control	V	0		3.3	L=off, H=on
	Brightness control	V	3.3		0	Option
			0		4.0	Option

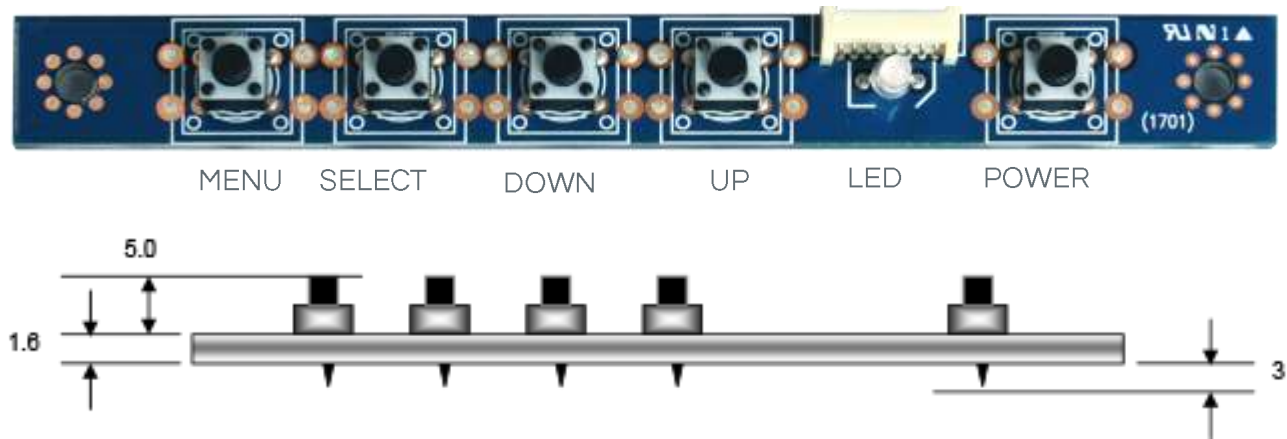
3. FUNCTIONAL BLOCK DIAGRAM



4. OSD Control Board

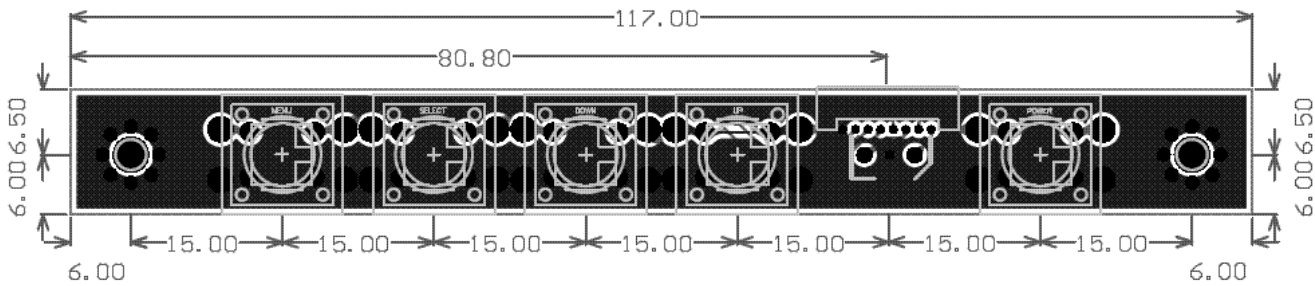
The OSD (On Screen Display) provides certain functions to have clear image and others. This board supports 5 buttons OSD operation as a standard. The control functions defined on OSD operation are as below. (Unit: mm)

Appearance



Board Size (W x H x D) : 112 x 12.5 x 6.6 mm

Button	Function	Status	HOT Key
LED	Indicates operation status	Green/ Red	On: Green Off: Red
POWER	Power on/off	On/Off	
MENU	Activate menu / Exit Menu		
SELECT	Input Select / Source		
DOWN	Cursor control Down		
UP	Cursor control Up / Volume Select		



5-1. OSD FUNCTION



Luminance page

OSD Menu			
Brightness	Brightness level Control		
	Range of Value	MIN	0
		MAX	100
Contrast	Contrast level Control		
	Range of Value	MIN	0
		MAX	100
Gamma	Gamma value Select		
	Mode	ON	
		OFF	
DCR (Dynamic Contrast Ration)	DCR mode Select		
	Mode	OFF	
		DBC	
		DCR	
Super Resolution	Super Resolution mode Select		
	Mode	OFF	
		Weak	
		Median	
		Strong	
		Strongest	

5-2. OSD FUNCTION



Color page

OSD Menu			
Color Temperature	Color Temperature mode Select		
	Mode	5000K	
		6500K	
		7500K	
		8200K	
		9200K	
		9300K	
		11500K	
		SRGB	
		User Define	
Color Value Select			
Red,Green,Blue	Range of Value	MIN	0
		MAX	100

5-3. OSD FUNCTION



OSD Settings page

OSD Menu			
Horizontal	OSD Horizontal position Control		
	Range of Value	MIN	0
		MAX	100
Vertical	OSD Vertical position Control		
	Range of Value	MIN	0
		MAX	100
Transparency	Transparency level Control		
	Range of Value	MIN	0
		MAX	4
OSD Time Out	OSD Time Out level Control		
	Range of Value	MIN	0
		MAX	60

5-4. OSD FUNCTION

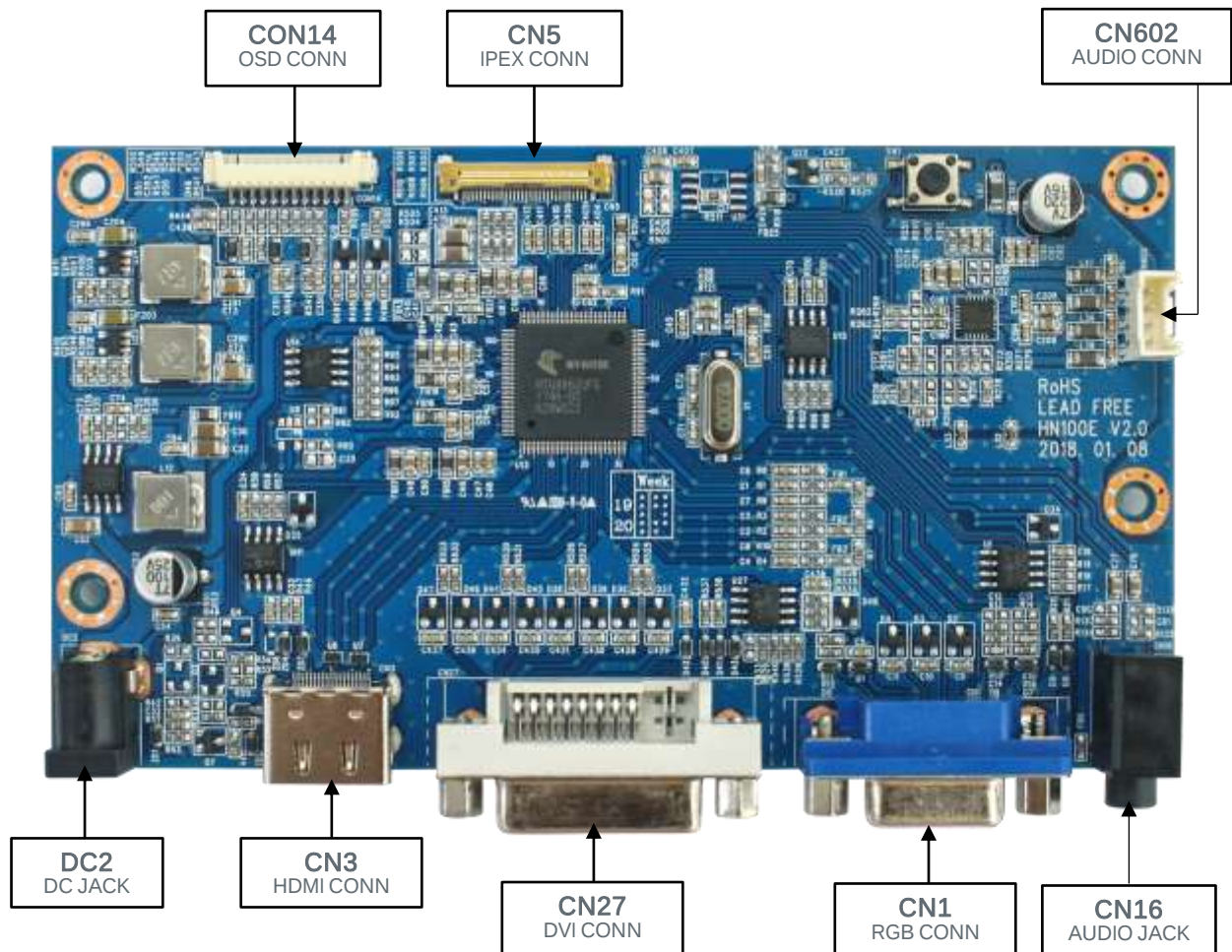


Setup page

OSD Menu				
Language	Aspect Ratio Mode Select			
	English	Spanish	French	German
	Italian	Portuguese	Russian	Chinese
Mute	Audio Mute Select			
	Mode	ON		
		OFF		
Input	Input signal Select			
	Mode	RGB		
		DVI		
		HDMI		
Display Size	Display Size Select			
	Mode	Full Screen		Smart Fit
		4:3		Smart 4:3
Over Scan	Over Scan Mode Select			
	Mode	ON		
		OFF		
Over Driver	Over Driver Mode Select			
	Mode	ON		
		OFF		
Reset	Restore to default Value			
	Mode	ON		
		OFF		

6. CONNECTOR, PINOUT & JUMPERS

The various connector are:



Summary:

Reference	Item	Description	Type	Manufacture
CON14	Connector	OSD CONNECTOR	12505WR-12P	YEONHO
CN5	Connector	IPEX CONNECTOR	IPEX-20455-030E-02	IPEX
CN602	Connector	AUDIO CONNECTOR	SMW200-04P	YEONHO
CN16	JACK	AUDIO JACK	PJ-325D	LONGFA
CN1	Connector	RGB CONNECTOR	D-SUB DSH-15FR	YENDA
CN27	Connector	DVI CONNECTOR	DVI 25PIN 3LAYER	CFD
CN3	Connector	HDMI CONNECTOR	51U019S-30SIN-A4R-SD	CFD ELEC
DC2	JACK	12V DC Power Input	2.5ø DC Jack	CFD

CON14: OSD Connector

Pin No.	Symbol	Description
1	LED-Red	Red Color
2	LED-Green	Green Color
3	GND	Ground
4	INPUT	For INPUT Switch
5	MENU	For Menu Switch
6	VOL+	For Volume Up Switch
7	VOL-	For Volume Down Switch
8	CH-	For Up Switch
9	CH+	For Down Switch
10	POWER	For Power Switch
11	IR_OUT	IR DATA
12	+3V3	IR Power 3.3V

CON5: IPEX Connector

Pin No.	Symbol	Description
1	-	NC
2	GND	Ground
3	EDP_TX1N	LANE1_N
4	EDP_TX1P	LANE1_P
5	GND	Ground
6	EDP_TX0N	LANE0_N
7	EDP_TX0P	LANE0_P
8	GND	Ground
9	TX_AUXP	AUX_P
10	TX_AUXN	AUX_N
11	GND	Ground
12	VCC	VCC
13	VCC	VCC
14	-	NC
15	GND	Ground
16	GND	Ground
17	HPD	Hot Plug
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	LED_EN	LED Enable Pin
23	PWM	LED_PWM
24~26	-	NC
27~29	LED VCC	LED VCC
30	-	NC

CN602: AUDIO Connector

Pin No.	Symbol	Description
1	R-	Speaker Right -
2	R+	Speaker Right +
3	L+	Speaker Left +
4	L-	Speaker Left -

CN16: AUDIO Jack

Pin No.	Symbol	Description
1	GND	Ground
2	-	NC
3	L_IN1	AIN_L
4	-	NC
5	R_IN1	AIN_R

CN1: ANALOG RGB INPUT (D-Sub 15P)

Pin No.	Symbol	Description
1	Red1	Red analog input
2	Green1	Green analog input
3	Blue1	Blue analog input
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	NC	Not connected
10	GND	Ground
11	GND	Ground
12	DSDA	DDC-SDA
13	HSYNC	Horizontal Sync
14	VSYNC	Vertical Sync
15	DSCL	Serial Clock Input

CN27: DVI-D Input Connector

Pin No.	Symbol	Description
1	TMDS DATA2-	TMDS DATA2 Differential Negative Signal
2	TMDS DATA2+	TMDS DATA2 Differential Positive Signal
3	TMDS DATA2 Shield	Shield for TMDS Channel #2
4	NC	No Connection
5	NC	No Connection
6	DDC Clock	The Data Line for the DDC Interface
7	DDC Data	The Clock Line for the DDC Interface
8	NC	No Connection
9	TMDS DATA1-	TMDS DATA1 Differential Negative Signal
10	TMDS DATA1+	TMDS DATA1 Differential Positive Signal
11	TMDS DATA1 Shield	Shield for TMDS Channel #1
12	NC	No Connection
13	NC	No Connection
14	+5V Power	+5 Volt signal for EDID (Un-powered Monitor)
15	GND(for +5V)	Ground for +5 Volt Power pin, Sync return
16	HPD	Identify the presence of a monitor
17	TMDS DATA0-	TMDS DATA0 Differential Negative Signal
18	TMDS DATA0+	TMDS DATA0 Differential Positive Signal
19	TMDS DATA0 Shield	Shield for TMDS Channel #0
20	NC	No Connection
21	NC	No Connection
22	TMDS CLOCK Shield	Shield for TMDS Clock differential Pair
23	TMDS CLOCK+	TMDS DATA0 Differential Positive Signal
24	MDS CLOCK-	TMDS DATA0 Differential Negative Signal

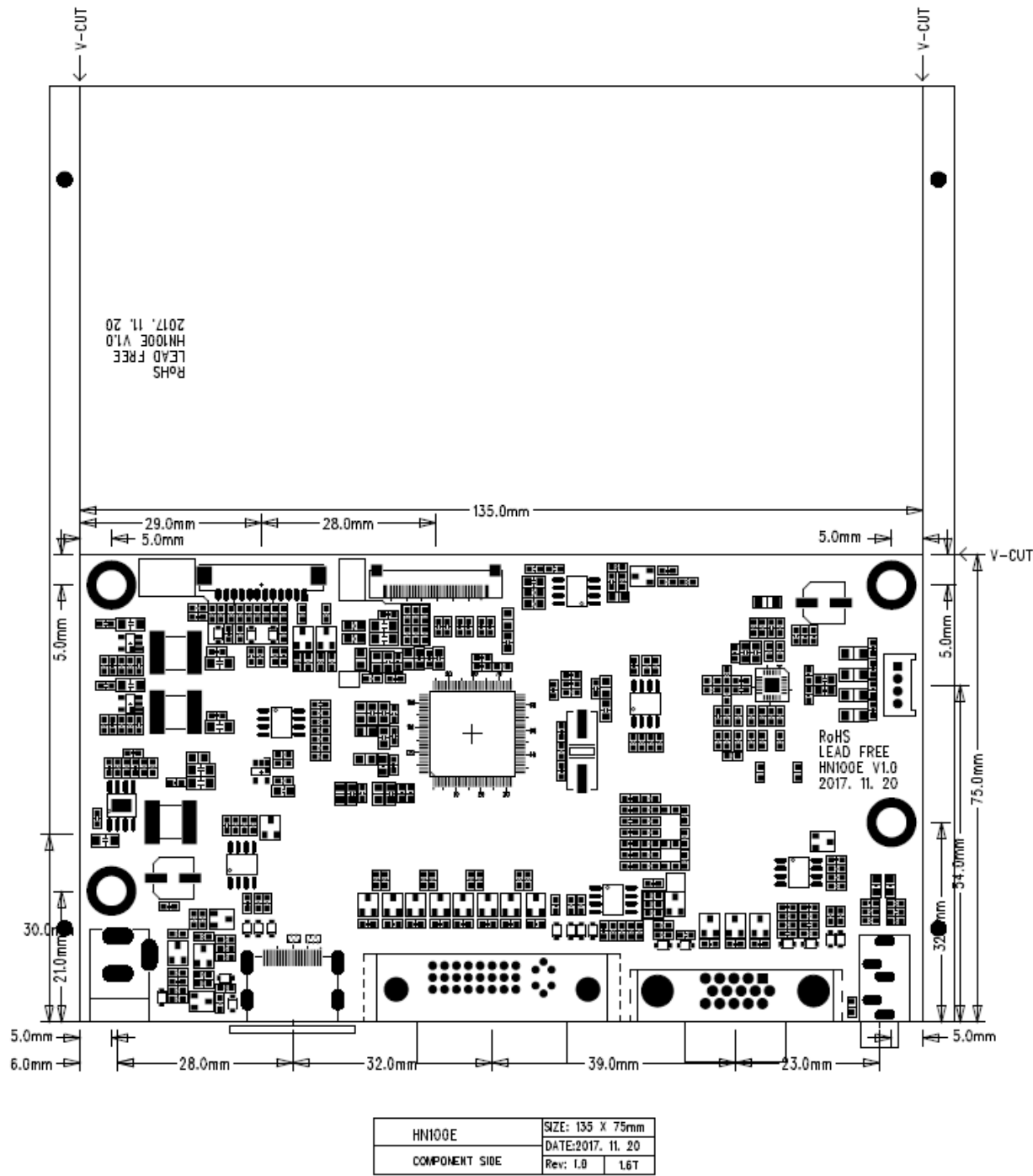
DC2: DC power Input Jack(12V)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
Center	Vcc	12V	Shell	GND	Ground

CN3: HDMI Connector

Pin No.	Symbol	Description
1	HDMI0-RX2P	HDMI 2line 2data +
2	GND	Ground
3	HDMI0-RX2N	HDMI 2line 2data -
4	HDMI0-RX1P	HDMI 2line 1data +
5	GND	Ground
6	HDMI0-RX1N	HDMI 2line 1data -
7	HDMI0-RX0P	HDMI 2line 0data +
8	GND	Ground
9	HDMI0-RX0N	HDMI 2line 0data -
10	HDMI0-CLKP	HDMI 2line CLK+
11	GND	Ground
12	HDMI0-CLKN	HDMI 2line CLK -
13	CEC	HDMI CEC
14	HDMI_ARC	Opt
15	HDMI0-DDC-SCL	HDMI DDC SCL
16	HDMI0-DDC-SDA	HDMI DDC SDA
17	GND	Ground
18	HDMI0/5V	HDMI POWER SIGNAL
19	HDMI0-HPD	HPD pin

7. CONTROLLER DIMENSIONS



[DIMENSION DOWNLOAD](#)

9. APPLICATION NOTES

A. USING THE CONTROLLER WITHOUT BUTTONS ATTACHED:

This is very straightforward:

- ▷ Firstly setup the controller/display system with the buttons. With the attached controllers and display system active make any settings for color, contrast and image position as required then switch everything off.
- ▷ Remove the control switches, the 7-way cable.
- ▷ Refer to inverter specifications for details as to fixing brightness to a desired level, this may require a resistor, an open circuit or closed circuit depending on inverter

B. INVERTER CONNECTION:

There are 3 potential issues to consider with inverter connection:

- ▷ Power
- ▷ ON/OFF
- ▷ Brightness (DIM-ADJ)

Inverter power : This should be matched with the inverter specification.

Inverter ON/OFF : This is a pin provided on some inverter for ON/OFF function and is used by this panel controller for VESA DPMS compliance. If the inverter does not have on/off pin or the on/off pin is not used DPMS will not operate. Pin5 should be matched to the inverter specification for the ON/OFF pin.

Brightness Dimming control : This controller boards are supported analog dimming and PWM dimming control method too. And it is important to consider the specifications for the inverter to be used.

9. APPLICABLE GRAPHIC MODE

The microprocessor measures the, H – sync V – sync and 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 Graphic modes shown on the table below and Provide more clear and stable image on a screen

RGB input format

Mode \ Spec	Pixel Freq.	Horizontal Timing			Vertical Timing		
		Sync Polar	Freq.	Active	Sync Polar	Freq.	Active
	MHz		KHz	Pixel		Hz	Line
640*480@60Hz	28.175	N	31.469	640	N	59.940	480
640*480@72Hz	31.500	N	37.861	640	N	72.809	480
640*480@75Hz	31.500	N	37.500	640	N	75.000	480
800*600@60Hz	40.000	P	37.879	800	P	60.317	600
800*600@72Hz	50.000	P	48.077	800	P	72.188	600
800*600@75Hz	49.500	P	46.875	800	P	75.000	600
1024*768@60Hz	65.000	N	48.363	1024	N	60.005	768
1024*768@75Hz	75.000	N	56.476	1024	P	70.070	768
1280*720@60Hz	74.500	P	44.772	1280	P	59.855	720
1360*768@60Hz	84.75	P	47.72	1360	P	59.799	768
1440*900@60Hz	106.500	N	55.935	1440	P	59.887	900
1280*1024@60Hz	108.000	P	63.981	1280	P	60.020	1024
1280*1024@75Hz	135.000	P	79.976	1280	P	75.035	1024
1600*1200@60Hz	162.000	P	75.000	1600	p	60.000	1200
1680*1050@60Hz	119.000	P	64.674	1680	N	59.883	1050
1920*1080@60Hz	138.500	P	66.587	1920	N	59.934	1080
1920*1200@60Hz	154.000	P	74.038	1920	N	59.950	1200

HDMI input format

Mode \ Spec	Horizontal Timing		Vertical Timing	
	Freq.	Active	Freq.	Active
	KHz	Pixel	Hz	Line
720X480(P)	31.469	720	59.94	480
1280X720(P)	45	1280	60	720
1920X540(P)	33.75	1920	60	540
720X576(P)	31.25	720	50	576
1280X720(P)	37.50	720	50	720
1920X1080(P)	67.432	1920	59.940	1080
1920X1080(P)	56.250	1920	50	1080