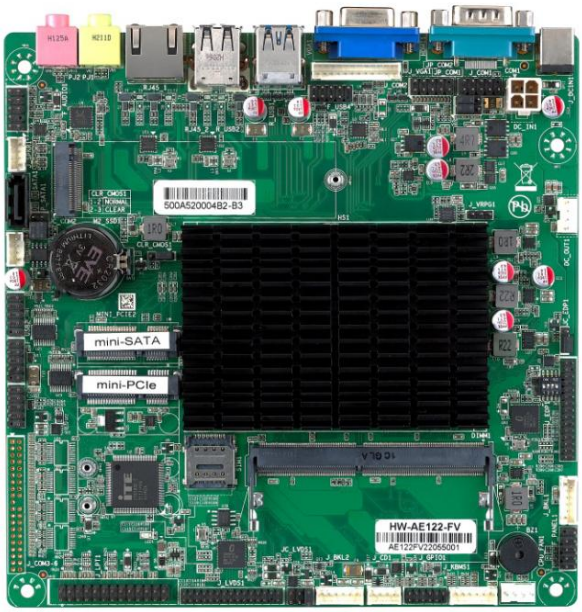
J6412 SPECIFICATIONS

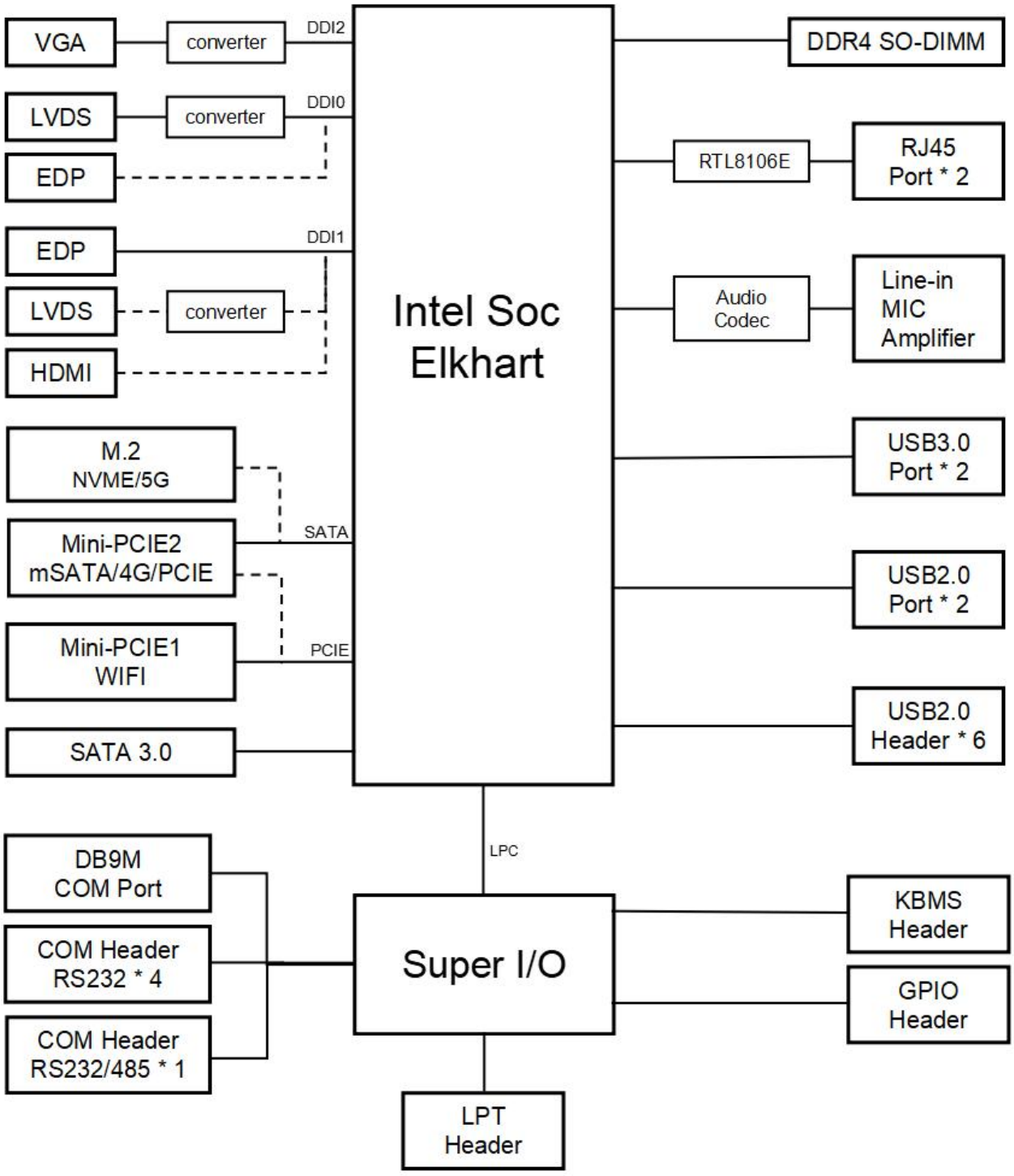
- Intel Elkhart Lake Pentium/Celeron CPU
- 2*COM, 2*USB3.0, 8*USB2.0, 1*100M LAN
- 1*LVDS/eDP, 1*eDP/LVDS/HDMI, 1*VGA
  (Support triple display simultaneously)
- 2*Mini-PCIe,support mSATA/4G/PCIE and Wifi/BT
  1*M.2,support NVME/5G
- Mini-ITX, DC 12V Power Input



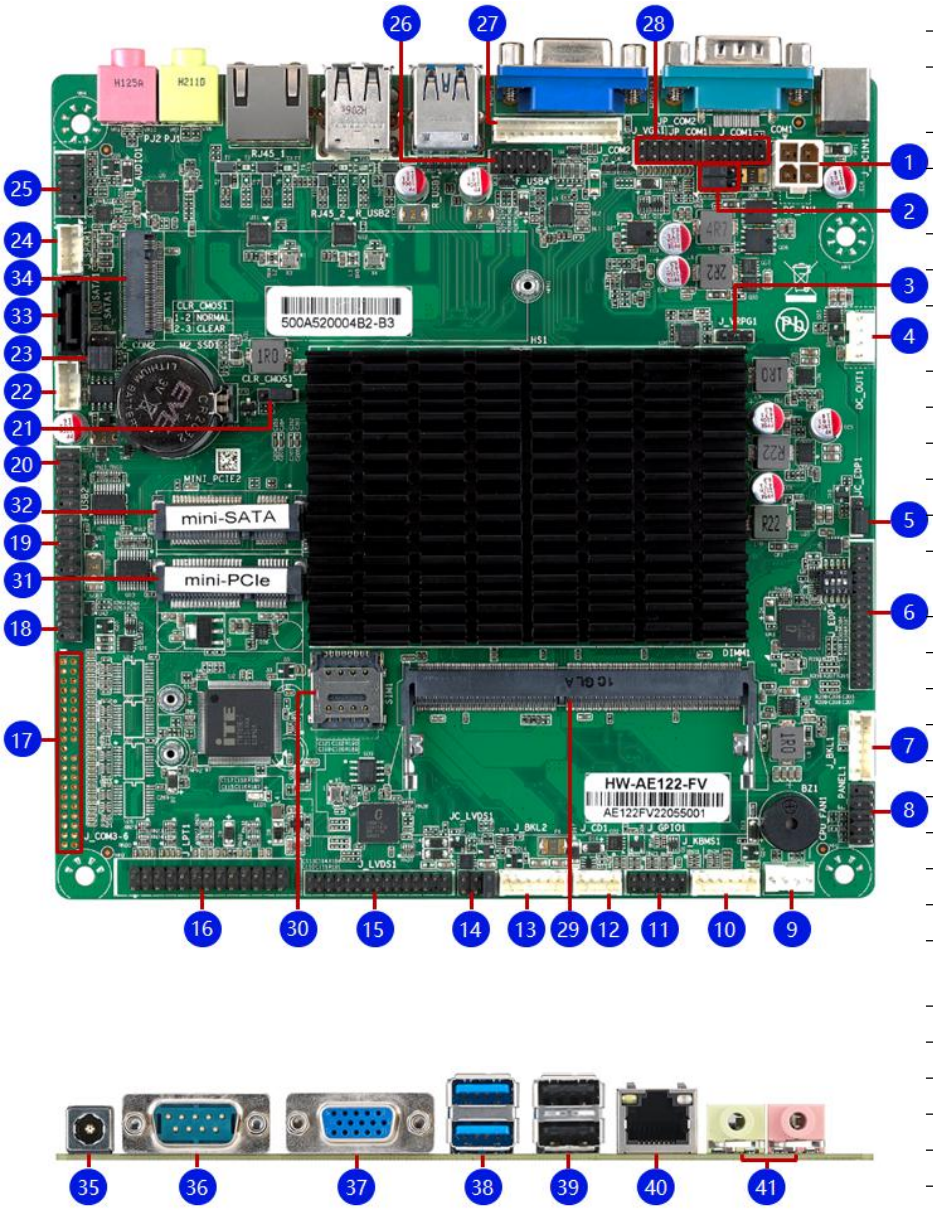
1. Specification

Model	FV	FL	FE
CPU	Intel® Celeron® J6412 Base Frequency 2.0G, Quad-core, TDP 10W		
Display	1*LVDS;1*eDP;1*VGA	2*LVDS;1*VGA	2*eDP;1*VGA
	Support quad display simultaneously: 1*LVDS/eDP: LVDS, resolution up to 1920x1200@60Hz eDP, resolution up to 4096x2160@60Hz 1*HDMI/eDP/LVDS: HDMI,resolution up to 4096x2160@24Hz eDP, resolution up to 4096x2160@60Hz LVDS, resolution up to 1920x1200@60Hz 1*VGA: max resolution up to 1920*1200@60Hz		
Memory	DDR4-3200,1*SO-DIMM, up to 32 GB		
Storage	1 * SATA3.0 7P Connector 1 * mSATA/1 * M.2		
Expansion Interface	2*Mini-PCIe (1*mSATA/PCIE/4G optional, 1*Wifi/BT optional) 1*M.2(NVME/5G optional)		
Ethernet	1*Realtek® 100M PCIe Ethernet Controller, RJ45		
Audio	Realtek® HDA Codec, with MIC/Line-out and Amplifier 1 * Front Audio Header (Line-Out + MIC) 1 * Line-Out + MIC 3.5mm Jack		
COM	5 * RS232+1*RS232/RS485 (1*Connector&5*Header)		
USB	2 * USB3.0 (Rear I/O, TYPE-A) 2 * USB2.0 (Rear I/O, TYPE-A) 6 * USB2.0 (Internal, Header)		
Other Ports	1 * Cash Drawer Header 1 * LPT Header 1 * VGA Header 1 * Micro SIM Card Slot 1 * CPU FAN Header 1 * Front Panel Header 1 * GPIO Header 1 * CMOS Clear Jumper		
System	Windows10/11, Linux		
Temperature	Storage: -20~75℃ Operating: -15°~60℃		
BIOS	AMI UEFI BIOS (Support Watchdog Timer)		
Power Input	DC 12V 1 * ATX 4P CPU Power Input Connector		
Factor	MINI-ITX Standard (170mm * 170mm)		

2. Data Flow


VGA
converter
DDI2
LVDS
converter
DDI0
EDP
EDP
DDI1
LVDS
converter
HDMI
M.2
NVME/5G
Mini-PCIE2
mSATA/4G/PCIE
SATA
Mini-PCIE1
WIFI
PCIE
SATA 3.0
Intel Soc
Elkhart
DDR4 SO-DIMM
RTL8106E
RJ45
Port * 2
Audio
Codec
Line-in
MIC
Amplifier
USB3.0
Port * 2
USB2.0
Port * 2
USB2.0
Header * 6
LPC
DB9M
COM Port
COM Header
RS232 * 4
COM Header
RS232/485 * 1
Super I/O
KBMS
Header
GPIO
Header
LPT
Header

3. Marking instruction



Connector&Header	
1	ATX 4Pin Power Connector
2	COM1/2 Pin9 Signal Select Jumpers
3	VRM Power PROGRAM I/F
4	DC12V/5V Power Output Connector
5	EDP VDD Select Jumper
6	EDP Signal Pin Header
7	EDP Backlight Control Pin Header
8	Front Panel Pin Header
9	CPU Fan Connector
10	Keyboard&Mouse Pin Header
11	GPIO Pin Header
12	Cash Drawer Pin Header
13	LVDS Backlight Control Pin Header
14	LVDS VDD Select Jumper
15	LVDS Signal Pin Header
16	LPT Signal Pin Header
17	COM3/4/5/6 Pin Header
18	Front USB Pin Header
19	Front USB Pin Header
20	Front USB Pin Header
21	CMOS Clear Jumper
22	SATA Power Pin Header
23	COM2 RS232/RS485 Signal Select Jumper
24	Amplifier Pin Header
25	Front Audio Pin Header
26	Front USB Pin Header
27	VGA Pin Header
28	COM1/2 Pin Header
29	DDR4 SO-DIMM Slot
30	SIM Card Slot
31	Mini PCI-E1 Slot (WIFI/BT)
32	Mini PCI-E2 Slot (mSATA/4G/PCIE)
33	SATA 3.0 Connector
34	M.2 Slot(NVME/5G)
35	DC 12V Power Input Connector
36	COM Connector
37	VGA Connector
38	USB3.0 Connectors
39	USB2.0 Connectors
40	LAN Connector
41	Mic/Line-in Connector

4. Definition

[1] DC12V Power Input Connector

No.	Location	Pin	Definition	Pin	Definition
1	DC_IN1	1	GND	2	GND
		3	+ 12V	4	+ 12V

[2] COM1/2 Pin9 Signal Select Jumpers (3*1 Pin 2.54mm)

No.	Location	Settings	Function
2	JP_COM1	1-2(Default)	COM1_Pin9: RI#
		2-3	COM1_Pin9: 5V
	JP_COM2	1-2(Default)	COM2_Pin9: RI#
		2-3	COM2_Pin9: 5V[1]

Note:

[1] Pin9 of COM2 also can support 12V if specified(resistor selectable).

[3] VRM Power PROGRAM I/F (3*1 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
3	J_VRPG1	1	VRM_SCL	2	GND
		3	VRM_SDA		

[4] DC12V/5V Power Output Connector (4*1 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
4	DC_OUT1	1	+ 12V	2	GND
		3	GND	4	+ 5V

[5] EDP VDD Select Jumper (3*2 Pin 2.54mm)

No.	Location	Setting	Function
5	JC_EDP1	1-2(Default)	+ 3.3V
		2-3	+ 5V

[6] EDP Signal Pin Header (15*2 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
6	J_EDP1	1	VDD [1]	2	VDD [1]
		3	VDD [1]		
		5	EDP_HPD# / LVDS_Detect#	6	EDP_HPD#/ LVDS_Detect#
		7	N/C/ LVDS_A_DATA0-	8	N/C/ LVDS_A_DATA0+
		9	N/C/ LVDS_A_DATA1-	10	N/C/ LVDS_A_DATA1+
		11	N/C/ LVDS_A_DATA2-	12	N/C/ LVDS_A_DATA2+
		13	GND	14	GND
		15	N/C/ LVDS_A_CLK-	16	N/C/ LVDS_A_CLK+
		17	N/C/ LVDS_A_DATA3-	18	N/C/ LVDS_A_DATA3+
		19	EDP_TX0-/ LVDS_B_DATA0-	20	EDP_TX0+/ LVDS_B_DATA0+
		21	EDP_TX1- / LVDS_B_DATA1-	22	EDP_TX1+/ LVDS_B_DATA1+
		23	N/C/ LVDS_B_DATA2-	24	N/C/ LVDS_B_DATA2+
		25	GND	26	GND
		27	N/C/ LVDS_B_CLK-	28	N/C/ LVDS_B_CLK+
		29	EDP_AUX-/ LVDS_B_DATA3-	30	EDP_AUX+/ LVDS_B_DATA3+

Notes:

[1] Panel Power VDD is 3.3V by default, 5V is selectable by "EDP VDD Select Jumper" (JC_EDP1, Location5).

[2] It also can support LVDS if specified(resistor selectable).

[7] EDP Backlight Control Pin Header(6*1 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
7	J_BKL1	1	GND	2	GND
		3	EDP_BKL_CTL	4	EDP_BKL_EN
		5	+ 12V	6	+ 12V

[8] Front Panel Pin Header (5*2 Pin 2.54 mm)

No.	Location	Pin	Definition	Pin	Definition
8	F_PANEL1	1	HD LED+	2	Power LED+
		3	HD LED-	4	Power LED-
		5	RESET-	6	PWR+
		7	RESET+	8	PWR-
		9	N/C		

[9] CPU Fan Connector (4*1 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
9	CPU_FAN1	1	GND	2	+ 12V
		3	FAN Speed Detection	4	FAN Speed Control

[10] Keyboard&Mouse Pin Header (6*1 Pin 2.0mm)

No.	Location	Pin	Definition	Pin	Definition
10	J_KBMS1	1	KB_CLK	2	KB_DAT
		3	MS_CLK	4	GND
		5	+ 5V	6	MS_DAT

[11] GPIO Pin Header (6*2 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
11	J_GPIO1	1	SIO_ GP10A	2	SIO_ GP23A
		3	SIO_ GP40A	4	SIO_ GP42A
		5	GND	6	SIO_ GP36

		7	SIO_ GP51	8	SIO_ GP52
		9	SIO_ GPA3	10	+ 3.3V
				12	N/C

[12] Cash Drawer Pin Header (4*1 Pin 2.0mm)

No.	Location	Pin	Definition	Pin	Definition
12	J_CD1	1	+ 12V	2	CD_RTN#
		3	CD_DEC#	4	GND

[13] LVDS Backlight Control Pin Header(6*1 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
13	J_BKL2	1	GND	2	GND
		3	LVDS_BKL_CTL	4	LVDS_BKL_EN
		5	+ 12V	6	+ 12V

[14] LVDS VDD Select Jumper (3*2 Pin 2.54mm)

No.	Location	Setting	Function
14	JC_LVDS1	1-2(Default)	+ 3.3V
		3-4	+ 5V
		5-6	+ 12V

[15] LVDS Signal Pin Header (15*2 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
15	J_LVDS1	1	VDD [1]	2	VDD [1]
		3	VDD [1]		
		5	LVDS_Detect#/ EDP_HPD#	6	LVDS_Detect#/ EDP_HPD#
		7	LVDS_A_DATA0-/ N/C	8	LVDS_A_DATA0+/ N/C
		9	LVDS_A_DATA1-/ N/C	10	LVDS_A_DATA1+/ N/C

		11	LVDS_A_DATA2-/ N/C	12	LVDS_A_DATA2+/ N/C
		13	GND	14	GND
		15	LVDS_A_CLK-/ N/C	16	LVDS_A_CLK+/ N/C
		17	LVDS_A_DATA3-/ N/C	18	LVDS_A_DATA3+/ N/C
		19	LVDS_B_DATA0-/ EDP_TX0-	20	LVDS_B_DATA0+/ EDP_TX0+
		21	LVDS_B_DATA1-/ EDP_TX1-	22	LVDS_B_DATA1+/ EDP_TX1+
		23	LVDS_B_DATA2-/ N/C	24	LVDS_B_DATA2+/ N/C
		25	GND	26	GND
		27	LVDS_B_CLK-/ N/C	28	LVDS_B_CLK+/ N/C
		29	LVDS_B_DATA3-/ EDP_AUX-	30	LVDS_B_DATA3+/ EDP_AUX+

Notes:

[1] Panel Power VDD is 3.3V by default, 5V or 12V is selectable by "LVDS VDD Select Jumper" (JC_LVDS1, Location 14).

[2] It also can support EDP if specified(resistor selectable).

[16] LPT Header(13*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
16	J_LPT1	1	STB#	2	AFD#
		3	PD0	4	ERR#
		5	PD1	6	INIT#
		7	PD2	8	SLIN#
		9	PD3	10	GND
		11	PD4	12	GND
		13	PD5	14	GND

		15	PD6	16	GND
		17	PD7	18	GND
		19	ACK#	20	GND
		21	BUSY	22	GND
		23	PE	24	GND
		25	SLCT	26	N/C

[17] COM3/4/5/6 Pin Header (5*2 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
17	J_COM3-6	1	DCD	2	RXD
		3	TXD	4	DTR#
		5	GND	6	DSR#
		7	RTS#	8	CTS#
		9	RI#		
		11	DCD	12	RXD
		13	TXD	14	DTR#
		15	GND	16	DSR#
		17	RTS#	18	CTS#
		19	RI#		
		21	DCD	22	RXD
		23	TXD	24	DTR#
		25	GND	26	DSR#
		27	RTS#	28	CTS#
		29	RI#		
		31	DCD	32	RXD
		33	TXD	34	DTR#
		35	GND	36	DSR#
		37	RTS#	38	CTS#
		39	RI#		

[18] Front USB Pin Header (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
18	F_USB3	1	+ 5 V	2	+ 5 V
		3	USB-	4	USB-[1]
		5	USB+	6	USB+[1]
		7	GND	8	GND
				10	GND

Note:

[1] This pair of F_USB3 will be invaluable if MINI-PCIE2/M2_SSD1 support 4G/5G.

[19] Front USB Pin Header (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
19	F_USB2	1	+ 5 V	2	+ 5 V
		3	USB-	4	USB-
		5	USB+	6	USB+
		7	GND	8	GND
				10	GND

[20] Front USB Pin Headers (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
20	F_USB1	1	+ 5 V	2	+ 5 V
		3	USB-	4	USB-
		5	USB+	6	USB+
		7	GND	8	GND
				10	GND

[21] CMOS Clear Jumper (3*1 Pin 2.54mm)

No.	Location	Setting	Function
21	CLR_CMOS	1-2(Default)	Normal
		2-3	Clear CMOS

[22] SATA Power Pin Header (4*1 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
22	P_SATA1	1	+ 12V	2	GND
		3	GND	4	+ 5V

[23] COM2 RS232/RS485 Select Jumper (3*2 Pin 2.54mm)

No.	Location	Settings	Function
23	JC_COM2	1-3、2-4(Default)	RS232
		3-5、4-6	RS485

[24] Amplifier Pin Header (2*1 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
24	J_SPKR1	1	SPK_L-	2	SPK_L+
		3	SPK_R-	4	SPK_R+

[25] Front Audio Pin Header (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
25	F_AUDIO1	1	FP_MIC_L	2	GND
		3	FP_MIC_R	4	+ 3.3V
		5	FP_OUT_R	6	MIC_Detect
		7	GND		
		9	FP_OUT_L	10	LINE_Detect

[26] Front USB Pin Header (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
26	F_USB4	1	+ 5 V	2	+ 5 V
		3	USB-[1]	4	USB-[1]
		5	USB+[1]	6	USB+[1]
		7	GND	8	GND
				10	GND

Note:

[1]: R_USB2 Connector and F_USB4 share the same signal and can’ t be accessed simultaneously.

[27] VGA Pin Header (12*1 Pin 2.00mm)

No.	Location	Pin	Definition	Pin	Definition
27	J_VGA1	1	GND	2	VSYNC
		3	HSYNC	4	GND
		5	RED	6	GND
		7	GREEN	8	GND
		9	BLUE	10	GND
		11	DDC data	12	DDC clock

Note:

[1] VGA (DB15) Connector and J_VGA1 share the same signal and can’ t be accessed simultaneously.

[28] COM1/2 Pin Headers (5*2 Pin 2.54mm)

No.	Location	Pin	Definition	Pin	Definition
28	J_COM1[4]	1	DCD	2	RXD
		3	TXD	4	DTR#
		5	GND	6	DSR#
		7	RTS#	8	CTS#
		9	RI#[1]		
	J_COM2	1	DCD[2]	2	RXD[2]
		3	TXD	4	DTR#
		5	GND	6	DSR#
		7	RTS#	8	CTS#
		9	RI#[3]		

Note:

[1] The signal of COM1 Pin9 also can be 5V by JP_COM1(Location 2).

[2] COM2 support RS232 by default, it also can support RS485 selected by JC_COM2(Location 23).

[3] The signal of COM2 Pin9 also can be 5V by JP_COM2(Location 2, 12V is resister selectable).

[4] COM1 (DB9) Connector and J_COM1 share the same signal and can’ t be accessed simultaneously.

【END】