

ATX motherboard supports 14nm LGA1151 6th Generation Intel® Core™ i7/i5/i3, Celeron® and Pentium® processor, DDR4, dual independent displays DVI-I/HDMI/iDP, dual Intel® GbE LAN, USB 3.0, SATA 6Gb/s, HD Audio and RoHS

IMBA-H110

Quick Installation Guide **Version 1.0**

Jan 19, 2017.

Package List

IMBA-H110 package includes the following items:

- 1 x IMBA-H110 single board computer
- 1 x I/O shielding
- 2 x SATA cable
- 1 x One Key Recovery CD
- 1 x QIG
- 1 x Utility CD



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Specifications

- CPU:
LGA1151 socket supports 6th generation Intel® Core™ i7/i5/i3, Celeron® and Pentium® processor
- Chipset: Intel® H110
- Memory:
Two 288-pin 2133 MHz dual-channel DDR4 SDRAM unbuffered DIMMs support up to 64 GB
- BIOS: UEFI BIOS
- Graphic Engine:
Intel® HD Graphics Gen 9 engine with 16 low-power execution units supports DX2015, OpenGL 5.X and OpenCL2.x, ES 2.0
- Display Output:
Dual independent display
1 x DVI-I (up to 2560x1200@60Hz)
1 x HDMI 1.4 (up to 4096x2160@24Hz)
1 x iDP interface for HDMI, LVDS, VGA, DVI, DP (up to 4096x2304@60Hz)
- Ethernet:
LAN1: Intel® I219V PHY
LAN2: Intel® I211 PCIe controller
- External I/O Interface:
4 x USB 3.0
2 x USB 2.0
2 x RS-232
- Internal I/O Interface:
1 x KB/MS (1x6 pin)
1 x USB 2.0 (type A)
2 x RS-232 (2x5 pin, P=2.54)
1 x RS-232/422/485 (2x5 pin, P=2.54)
1 x LPT (2x13 pin, P=2.54)

- 2 x USB 2.0 (2x4 pin, P=2.54)
- 4 x SATA 6Gb/s (support hot plug)
- Audio:
 - Realtek ALC662 HD codec supports 5.1-channel
 - 3 x Audio jacks (line-out, line-in, mic-in) on rear IO
 - 1 x Front audio (2x5 pin)
- Front Panel:
 - 1 x Front panel (2x7 pin, power LED, HDD LED, speaker, power button, reset button)
- LEN LED: 2 x LAN LED (1x2 pin)
- TPM: 1 x TPM (2x10 pin)
- SMBus: 1 x SMBus (1x4 pin)
- I²C: 1 x I²C (1x4 pin)
- Expansion:
 - 1 x Full-size PCIe Mini card slot (support mSATA)
 - 1 x PCIe x16 slot (Gen3)
 - 6 x PCI slot
- Watchdog Timer:
 - Software programmable support 1~255 sec. system reset
- Digital I/O: 8-bit digital I/O (2x5 pin)
- Fan Connector:
 - 1 x CPU smart fan (1x4 pin)
 - 1 x System smart fan (1x4 pin)
- Power supply: ATX/AT power supply
- Power Consumption:
 - 3.3V@1.53A, 5V@2.95A, 12V@8.38A, 5VSB@3.2A
 - (Intel® Core™ i7 6700K 4.0GHz CPU with 16GB (two 8GB) 2133 MHz DDR4 memory)
- Operation Temperature: -20°C ~ 60°C
- Operation Humidity: 5% ~ 95%, non-condensing
- Dimensions: 244mm x 305mm
- Weight (GW/NW): 1200g/700g

Ordering Information

- **IMBA-H110-R10:**
ATX motherboard supports 14nm LGA1151 6th Generation Intel® Core™ i7/i5/i3, Celeron® and Pentium® processor, DDR4, dual independent displays DVI-I/HDMI/iDP, dual Intel® GbE LAN, SATA 6Gb/s, USB 3.0, HD Audio and RoHS
- **19800-000049-RS:** LPT cable, 25-pin (2x13) female, P=2.54
- **19800-000051-RS:** RS-232 cable, 230mm (P=2.54)
- **19800-000075-RS:** PS/2 KB/MS Y-cable with bracket, 220mm
- **32102-000100-200-RS:**
SATA power cable, MOLEX 5264-4P to SATA15P
- **CF-1156A-RS-R11:** High performance LGA1155/LGA1156 cooler kit, 1U chassis compatible, 73W
- **CF-1156C-RS:**
LGA1155/1156 kit, 1U chassis compatible, 45W
- **CF-1156D-RS:**
LGA1155/1156 kit, 1U chassis compatible, 65W
- **CF-1156E-R11:**
High performance LGA1155/LGA1156 cooler kit, 95W
- **DP-DP-R10:**
DisplayPort to DisplayPort converter board (For iEi IDP connector)
- **DP-DVI-R10:**
DisplayPort to DVI-D converter board (For iEi IDP connector)
- **DP-HDMI-R10:**
DisplayPort to HDMI converter board (For iEi IDP connector)
- **DP-LVDS-R10:**
DisplayPort to 24 bit dual channel LVDS converter board (For iEi IDP connector)
- **DP-VGA-R10:**
DisplayPort to VGA converter board (For iEi IDP connector)
- **TPM-IN01-R11:** 20-Pin Infineon TPM module, software management tool, firmware V3.17

Jumpers setting and connectors

LABEL	FUNCTION
J_ATX_AT1	AT/ATX mode select switch
J_CMOS1	Clear CMOS button
USB SW1, USB SW2	USB power setting
J_FLASH1	Flash Descriptor Security Override
F_PANEL1	PWR & RST Buttons and indicators
VIDEO1	DVI-I Connector
HDMI1	HDMI Connector
DP1	DP Connector
LAN1_USB1	RJ-45 LAN and USB 3.0 Connector
LAN2_USB2	RJ-45 LAN and USB 3.0 Connector
K/M_USB1	Keyboard & Mouse And USB 2.0 Connector
KBMS1	6 Pin-header Keyboard & Mouse Connector
USB1, USB2	Internal USB 2.0 Connectors
USB3-1	Internal USB3.0 Connector
COM1, COM2	External Serial Port DB-9 Connector
COM3, COM4	Internal Serial Port Connectors
COM5	Internal Serial Port RS-232/422485 Connector
AUDIO_CV1	HD Audio Connector
FRONT_PANEL1	Front Panel Audio Connector
SATA1, SATA2 SATA3, SATA4	Serial ATA 3.0 Connectors
MPCIE1	Mini PCI-E Card Connector
CPU_FAN1	CPU Fan Connector
SYS_FAN1, SYS_FAN2	System Fan Connectors
DIO1	Digital I/O Connector
ATX1	24-Pin ATX Power Source Connector
CPU12V1	+12V Power Source Connector
ATXPWR1	PCI-E Power Connector
TPM1	TPM Connector
CN1	EC Debug Port Connector
JSPI1	Flash SPI ROM
JSPI2	Flash EC ROM

SMB1	SMBUS Connector
I2C1	I2C Connector (to EC)
LED_LAN1	LAN1 LINK LED Connector
LED_LAN2	LAN2 LINK LED Connector
CHASSIS1	Chassis Status Connector

J_ATX_AT1: AT/ATX mode select switch

PIN NO.	DESCRIPTION
Short 1 - 2	ATX Mode (default)
Short 2 - 3	AT Mode

J_CMOS1: Clear CMOS button

PIN NO.	DESCRIPTION
NC (default)	Keep CMOS Setup (Normal Operation)
Press button	Clear CMOS Setup

PCIEX16 Power: PCIEX16 channel mode setting

PCIEX16	DESCRIPTION
1 x16 PCIe (default)	(Normal Operation)

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Chipset

Auto Power Button Status [Disabled(ATX)]

Restore AC Power Loss [Last State] -----

> PCI Express Configuration

> PCI Azalia Configuration

Power Saving Function(ERP) [Disabled]

PCIEX16 Power [1 x16 PCIe]

USB SW1 [+5V DUAL]

USB SW2 [+5V DUAL]

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USB SW1, USB SW2: USB power setting	
USB SW1	DESCRIPTION
+5V DUAL	Normal Operation (default)
+5V	

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Chipset

Auto Power Button Status	[Disabled(ATX)]	
Restore AC Power Loss	[Last State]	-----
> PCI Express Configuration		
> PCI Azalia Configuration		
Power Saving Function(ERP)	[Disabled]	
PCIEX16 Power	[1 x16 PCIE]	
USB SW1	[+5V DUAL]	
USB SW2	[+5V DUAL]	

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J_FLASH1: Flash descriptor security override	
PIN NO.	DESCRIPTION
Short 1 - 2	Disabled (default)
Short 2 - 3	Enabled

F_PANEL1: PWR & RST buttons and indicators					
	PIN	DESCRIPTION	PIN	DESCRIPTION	
PWR LED	1	+5V	2	BEEP_PWR	SPKR
	3	NC	4	IPMI ID_LED+	IPMI LED
	5	GND	6	IPMI ID_LED-	
PWR BTN	7	PWRBTN_SW#	8	PC_BEEP	SPKR
	9	GND	10	NC	
HDD LED	11	+5V	12	EXTRST-	RESET
	13	SATA_LED#	14	GND	

VIDEO1: 15-pin Female Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
V1	RED	V2	GREEN
V3	BLUE	V4	NC
V5	GND	V6	GND
V7	GND	V8	GND
V9	VCC	V10	GND
V11	NC	V12	DDCDA
V13	HSYNC	V14	VSYNC
V15	DDCCLK		

VIDEO1: DVI-I(Dual Link)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
C1	RED	10	DVI_DATA1
C2	GREEN	11	GND
C3	BLUE	12	N/C
C4	HS	13	N/C
C5	GND	14	+5V
C6	NC	15	GND
1	DVI_DATA2#	16	HPDET
2	DVI_DATA2	17	DVI_DATA0#
3	GND	18	DVI_DATA0
4	N/C	19	GND
5	N/C	20	N/C
6	DDC CLK	21	N/C
7	DDC DATA	22	N/C
8	VS	23	DVI_CLK
9	DVI_DATA1#	24	DVI_CLK#

HDMI1: HDMI Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	HDMI_DATA2	13	N/C
2	GND	14	N/C
3	HDMI_DATA2#	15	HDMI_SCL
4	HDMI_DATA1	16	HDMI_SDA
5	GND	17	GND
6	HDMI_DATA1#	18	+5V
7	HDMI_DATA0	19	HDMI_HPD
8	GND	20	HDMI_GND
9	HDMI_DATA0#	21	HDMI_GND
10	HDMI_CLK	22	HDMI_GND
11	GND	23	HDMI_GND
12	HDMI_CLK#		

DP1 : Internal Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	11	AUXP
2	LANE1N	12	AUXN
3	LANE1P	13	GND
4	GND	14	LANE2P
5	LANE3N	15	LANE2N
6	LANE3P	16	GND
7	GND	17	LANE0P
8	AUX_CTRL_DET_D	18	LANE0N
9	GND	19	+3.3V
10	HPD		

LAN1_USB1: Ethernet and USB 3.0 connectors			
USB1: External USB 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+
LAN1: RJ-45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

LAN2_USB2: Ethernet and USB 3.0 connectors			
USB2: External USB 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	10	VCC
2	USB_DATA-	11	USB_DATA-
3	USB_DATA+	12	USB_DATA+
4	GND	13	GND
5	USB3_RX-	14	USB3_RX-
6	USB3_RX+	15	USB3_RX+
7	GND	16	GND
8	USB3_TX-	17	USB3_TX-
9	USB3_TX+	18	USB3_TX+
LAN2: RJ-45 LAN connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
20	LAN1_MDI0P	24	LAN1_MDI2P
21	LAN1_MDI0N	25	LAN1_MDI2N
22	LAN1_MDI1P	26	LAN1_MDI3P
23	LAN1_MDI1N	27	LAN1_MDI3N

K /M_USB1: PS/2 Keyboard & Mouse AND USB2.0 Port Connector			
USB1: External USB2.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	USB_DATA-	6	USB_DATA-
3	USB_DATA+	7	USB_DATA+
4	GND	8	GND
KB_MS1: PS/2 Keyboard and mouse connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	GND	10	KEYBOARD DATA
11	MOUSE DATA	12	VCC
13	KEYBOARD CLOCK	14	MOUSE CLOCK

KB_MS1: 6-pin header Keyboard/Mouse Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	Mouse Data
3	Mouse Clock	4	Keyboard Data
5	Keyboard Clock	6	GND

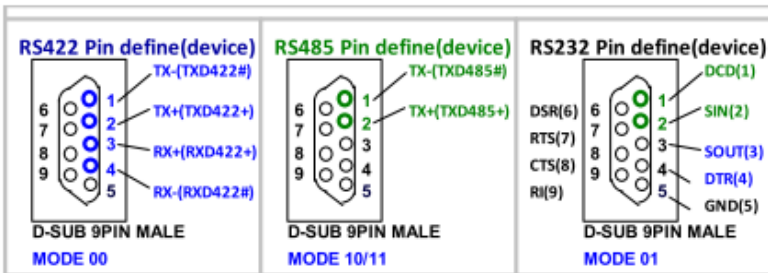
USB3-1 : Internal USB 3.0 Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	11	USB_DATA+
2	USB3_RX-	12	USB_DATA-
3	USB3_RX+	13	GND
4	GND	14	USB3_TX+
5	USB3_TX-	15	USB3_TX-
6	USB3_TX+	16	GND
7	GND	17	USB3_RX+
8	USB_DATA-	18	USB3_RX-
9	USB_DATA+	19	VCC
10	NC		

COM1: External RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND1	6	DSR1
7	RTS1	8	CTS1
9	RI1		

COM2: External RS-232 serial port connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD2	2	RXD2
3	TXD2	4	DTR2
5	GND2	6	DSR2
7	RTS2	8	CTS2
9	RI2		

COM3, COM4: Internal RS-232 serial port connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND

COM5: Internal RS-232/422/485 serial port connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	DSR
3	RXD	4	RST
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	GND



AUDIO_CV1 : Audio Line-In/Out MIC Connector	
PIN NO.	DESCRIPTION
Line_In (Blue)	CD/DVD or other audio source input port
Line_Out (Green)	Connect this port to headphone or speaker
Microphone (Pink)	Connect this port to microphone

FRONT-PANEL 1 : Audio Source Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	MIC2-L	2	GND
3	MIC2-R	4	Presence#
5	LINE2-R	6	MIC2-JD
7	FRONT-IO	8	NC
9	LINE2-L	10	LINE2-JD

SATA1, SATA2, SATA3: Serial ATA 3.0 connectors			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND	8	N/C

SATA4 : Serial ATA 3.0 Connector or mSATA(MPCI E1)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	5	SATA_RX-
2	SATA_TX+	6	SATA RX+
3	SATA_TX-	7	GND
4	GND	8	N/C

CN2: M-SATA card connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	+3.3V
3	N/C	4	GND
5	N/C	6	1.5V
7	N/C	8	N/C
9	GND	10	N/C
11	MSATA_CLK#	12	N/C
13	MSATA_CLK	14	N/C
15	GND	16	N/C
17	PLTRST_N	18	GND
19	N/C	20	+3.3V
21	GND	22	PLTRST_N
23	SATA_RX+	24	+3.3V
25	SATA_RX-	26	GND
27	GND	28	1.5V
29	GND	30	SMB_CLK
31	SATA_TX-	32	SMB_DATA
33	SATA_TX+	34	GND
35	GND	36	USB_DATA-
37	GND	38	USB_DATA+
39	+3.3V	40	GND
41	+3.3V	42	N/C
43	+3.3V	44	N/C
45	CLINK_CLK	46	N/C
47	CLINK_DATA	48	1.5V
49	CLINK_RST#	50	GND
51	MSATA_DET	52	+3.3V

CPU_FAN1: CPU fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+12V
3	FANIO	4	PWM

SYS_FAN1, SYS_FAN2: System fan connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FANIO	2	+12V (PWM)
3	GND		

DIO1 : Digital Input / Output Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

ATX1: 24-pin ATX power source connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power good	20	-5V
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

CPU12V1: +12V power source connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

ATXPWR1: Additional Power Source Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+12V	2	GND
3	GND	4	VCC

TPM1: Trusted Platform Module Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND
3	LFRAME#	4	KEY
5	LRERST#	6	+5V
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND	18	GLKRUN#
19	LPCPD#	20	LDRQ#

CN1: EC debug connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	EC_EPP_STB#	2	EC_EPP_AFD#
3	EC_EPP_PD0	4	NC
5	EC_EPP_PD1	6	EC_EPP_INIT#
7	EC_EPP_PD2	8	EC_EPP_SLIN#
9	EC_EPP_PD3	10	GND
11	EC_EPP_PD4	12	NC
13	EC_EPP_PD5	14	EC_EPP_BUSY
15	EC_EPP_PD6	16	EC_EPP_KSI5
17	EC_EPP_PD7	18	EC_EPP_KSI4

JSPI1: Flash SPI ROM connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

JSPI2: Flash EC ROM connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3V	2	SPI_CS#
3	SPI_SO	4	NC
5	GND	6	SPI_CLK
7	SPI_SI	8	NC

SMB1: SMBus Connector			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	SMB_DATA
3	SMB_CLK	4	+5V

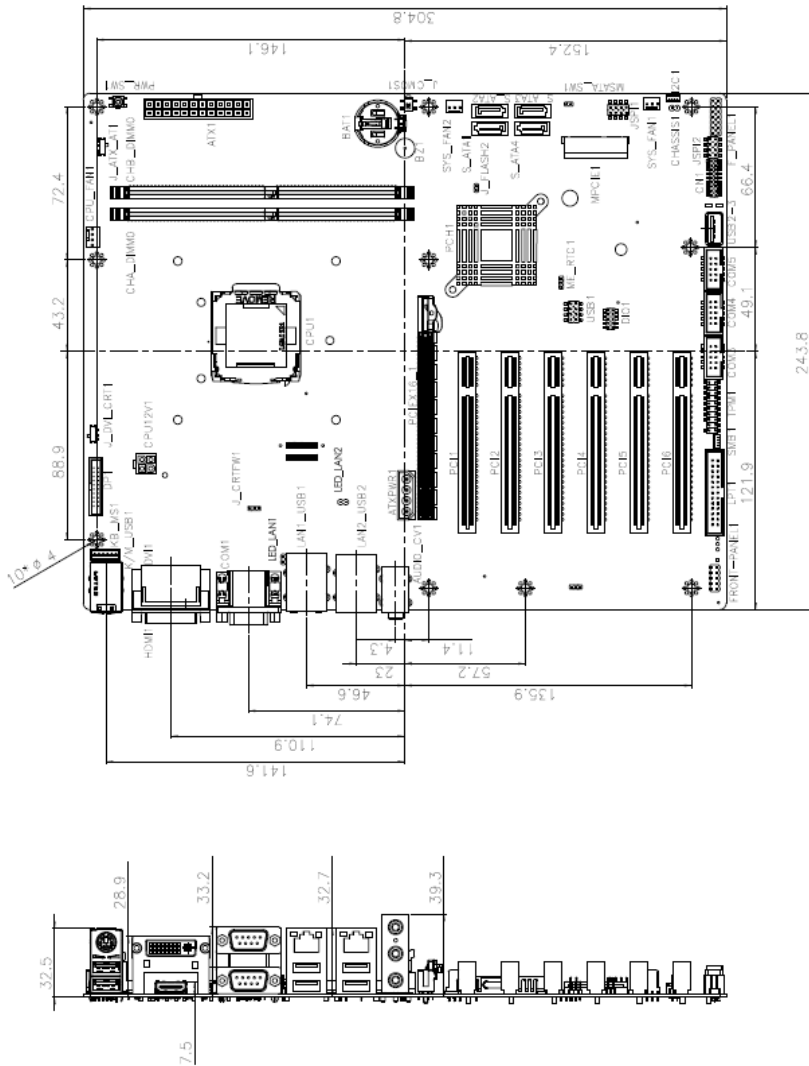
I2C1: I2C Connector (to EC)			
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	PCH_GP38
3	PCH_GP39	4	+5V

LED_LAN1: LAN Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN1_LED_LNK#_ACT

LED_LAN2: LAN Link LED Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3V	2	LAN2_LED_LNK#_ACT

CHASSIS1: Chassis Status Connector			
PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3VSB	2	CHASSIS OPEN

Board Layout: Jumper and Connector Locations



(Unit: mm)