

IPCTECH Motherboard User's Manual

QY-MB-H470-ATX

1.Models and Attentions

1.1 Models

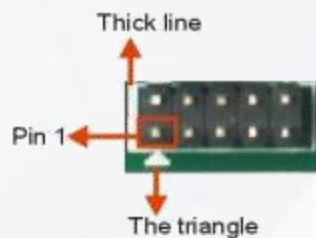
This manual is applied to following models:

Chipset	COM	LAN	USB	PCIE	PCI	M.2 KEY-E	M.2 KEY-M	DVI	HDMI	VGA	eDP	SATA 3.0
H420E	6	2	9	1*16X 1*2X 1*1X	4	PCIE+ USB2.0	SATA	1	1	1	1	3
H470	6	2	13	1*16X 1*2X 1*4X	4	PCIE+ USB2.0	SATA	1	1	1	1	3

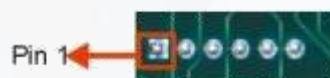
1.2 Attentions

1. Notes under a table or figure indicate the difference of models, or alternative definition of specific pin of the header (jumper/connector).
2. How to identify the first pin of a header or jumper

Usually, there is a thick line or a triangle near the header' s or jumper' s pin 1.



Square pad, which you can find on the back of the motherboard, is usually used for pin 1.



2.Specification

Model	QY-MB-H420E-ATX		QY-H470-ATX
CPU	Intel® 10th Generation Core i3/5/7/9, Pentium® , Celeron® Processors, Comet Lake-S, Support MAX CPU TDP: Hexa-Core 65W, Deca-Core 35W		
Chipset	Intel® H420E, TDP 6W		Intel® H470, TDP 6W
Display ^[1]	1 * DVI-D(DVI-I): Support DVI-D with max resolution up to 1920x1200@60Hz 1 * HDMI 1.4b (TYPE-A): Support max resolution up to 4096x2160@30Hz 1 * VGA (DB15/F): Support max resolution up to 1920x1200@60Hz 1 * eDP: Support max resolution up to 4096*2304@60Hz		
Memory ^[2]	Support DDR4- 2133/2400/2666/2933MHz, 2 * U-DIMM Slot, Up to 64GB		
Storage ^[3]	3 * SATA 3.0 Connector (Only Q470 support RST RAID 0,1,5,10) 1 * M.2 Key-M Slot (PCIE 2x/SATA, Default SATA, Support SATA SSD, 2242/2280)		
Ethernet	1 * Intel I219-V GBE LAN Chip (RJ45, 10/100/1000 Mbps) 1 * Intel I225-V GBE LAN Chip (RJ45, 10/100/1000 Mbps)		
Audio	Realtek Audio HDA Codec, 1 * Line-Out + MIC + Line-In 3.5mm Jack 1 * Front Audio Header (Line-Out + MIC) 1 * SPDIF Out Header		
Expansion Slots	1 * PCI-E 16x Slot 1 * M.2 Key-E Slot (PCIE+USB2.0, Support WIFI+ BlueTooth, 2230) 1 * PCIE4X Slot (PCIE 2X, PCIE4X_2) 4 * PCI Slot		
	1 * PCIE4X Slot (PCIE 1X, PCIE4X_3)		1 * PCIE4X Slot (PCIE 4X, PCIE4X_3)
COM	1 * RS232 (COM1, DB9/M) 3 * RS232 (COM2/5/6, BOX Header) 2 * RS232/RS485 (COM3/4, BOX Header)		
USB	2 * USB2.0 (Header, Internal) 1 * USB2.0 (TYPE-A, Internal) 6 * USB3.0 (TYPE-A, Rear IO)		4 * USB2.0 (Header, Internal) 2 * USB3.0 (BOX Header, Internal) 1 * USB2.0 (TYPE-A, Internal) 6 * USB3.0 (TYPE-A, Rear IO)
Other Ports	8 * GPIO 1 * PS/2 Connector (Keyboard & Mouse) 1 * Front Panel Header 2 * System FAN Header 1 * CPU FAN Header 1 * SMBUS Header 1 * Case Open Header 1 * AT or ATX Select Jumper 1 * Power LED Header		

TPM	Supports onboard TPM 1.2/2.0 (optional, not onboard by default)
System	Windows 10(64bit), Linux
Temperature	Storage: -20~75°C Operating: 0~60°C
BIOS	AMI UEFI BIOS (Support Watchdog Timer)
Power Supply	ATX Standard (24P + 8P) 1 * ATX 8P CPU Power Input Connector 1 * ATX 24P Power Input Connector
Factory	305mm * 220mm

Notes:

[1]: Intel® H420E supports two independent displays. Intel® Q470 support three independent displays.

[2]: The maximum memory frequency depends on CPU.

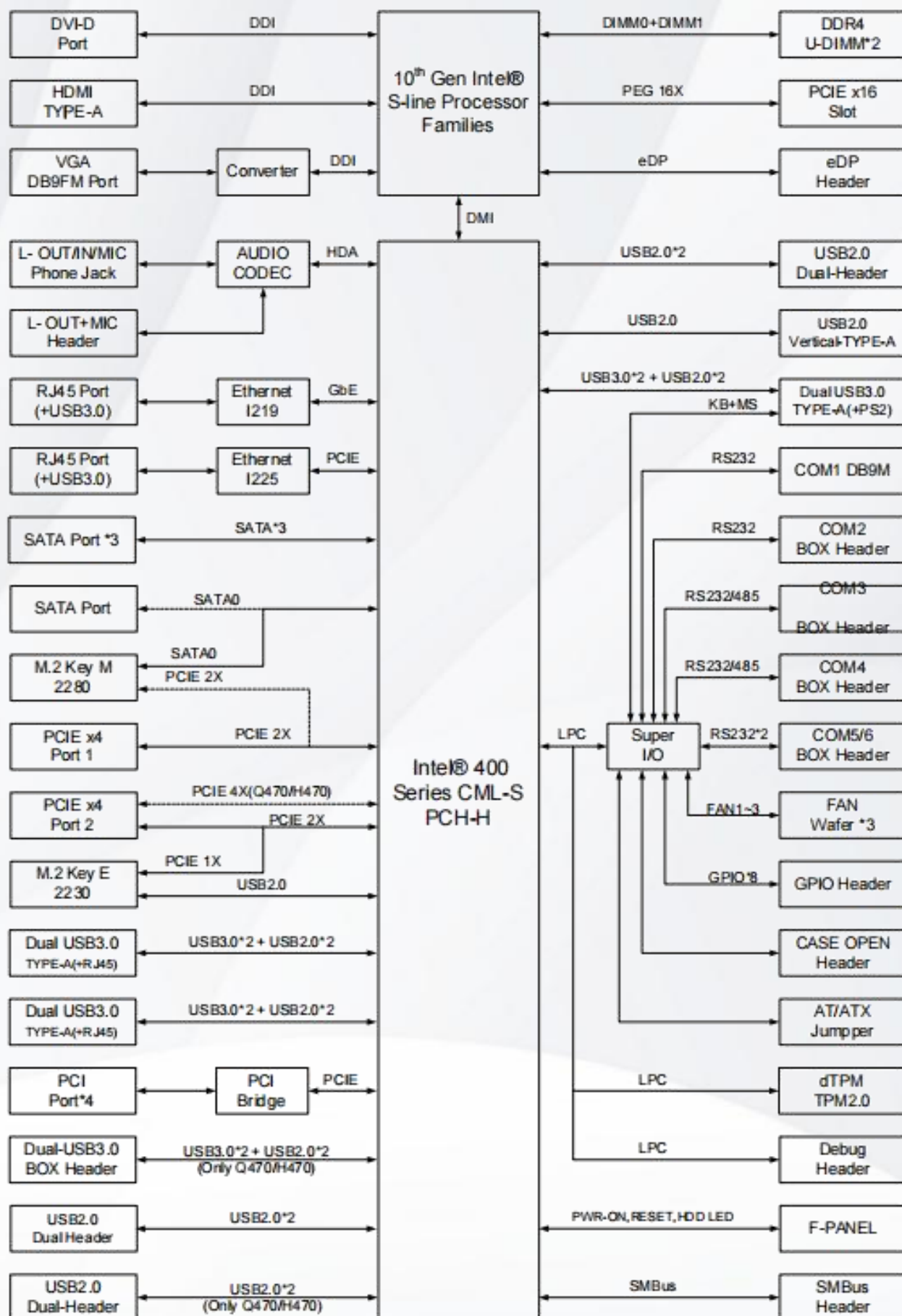
[3]: M2_M_PCIESSD1 and SATA1 share the same SATA3.0 signal, they can't be accessed simultaneously (support M2_M_PCIESSD1 by default). And Q470 can support them both.

[4]: I219-V doesn't support Intel AMT 12.0 and Intel vPro competent by default.

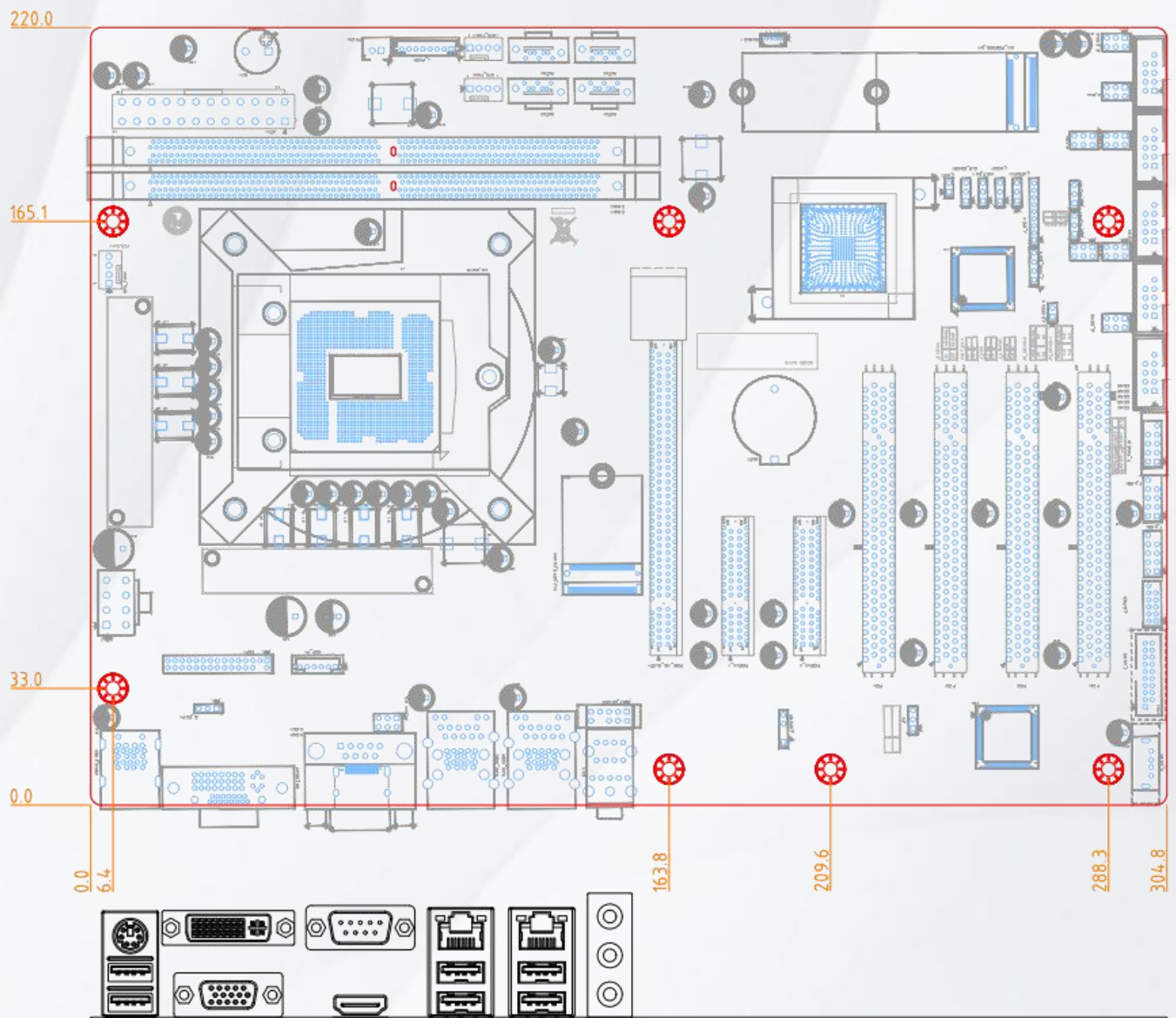
[5]: M2_M_PCIESSD1 and PCIE4X_1 share PCIE 2x signal, they can't be accessed simultaneously (support PCIE4X_1 by default). PCIE4X_2 and M2_E_WLAN1 share PCIE signal (support M2_E_WLAN1 by default). Q470 can support M2_E_WLAN1 and PCIE4X_2(PCIE-x4) both.

[6]: H420E not support F_USB3 and F_USB2 by default.

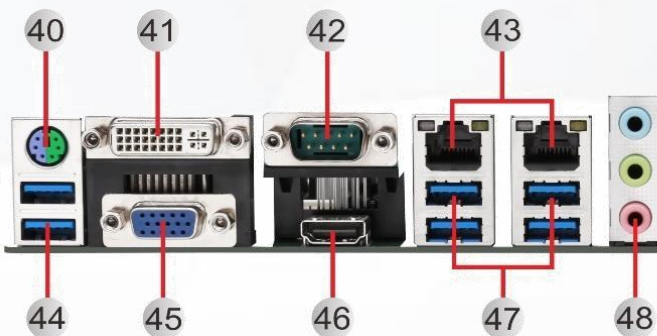
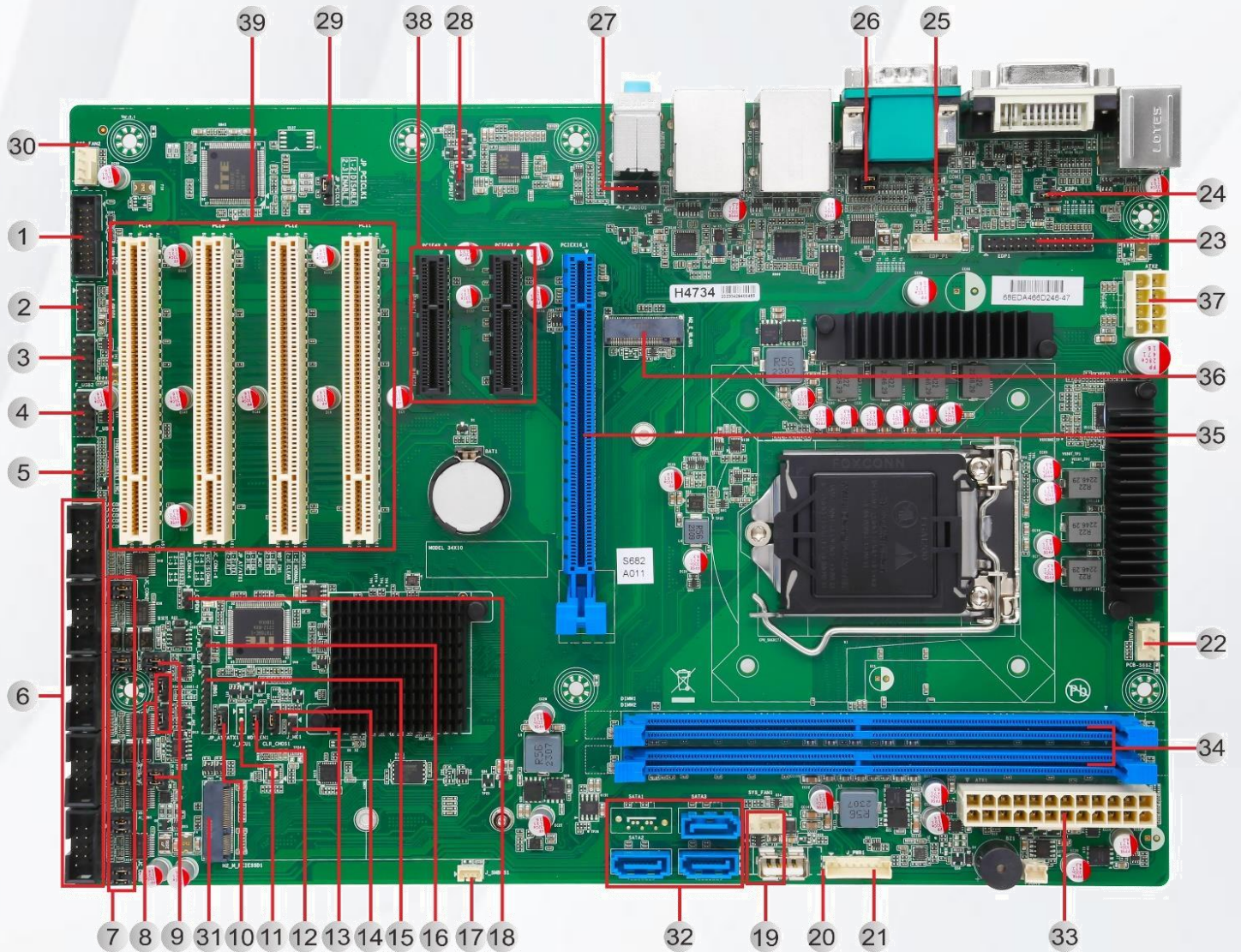
3.Functional Block Diagram

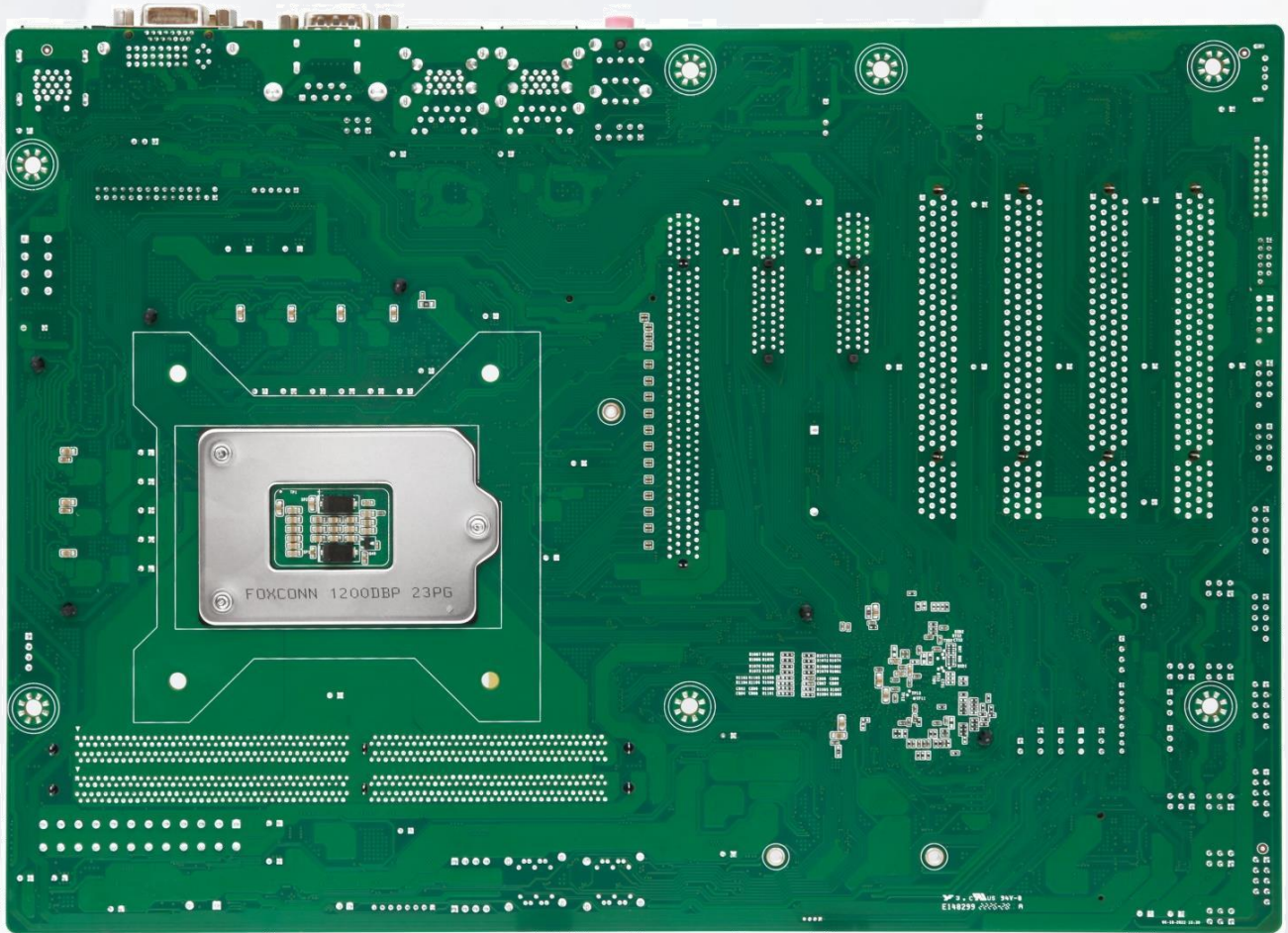


4.Mechanical Drawing



5. Jumpers / Headers and Connectors





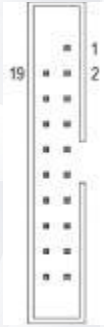
Jumpers / Headers and Connectors

1	F_USB3	Front USB3.0 BOX Header
2	J_GPIO1	GPIO Header
3	F_USB2	Front USB2.0 Header
4	F_USB1	Front USB2.0 Header
5	F_PANEL1	Front Panel Header
6	J_COM2-6	COM2-6 Headers
7	JC_COM2-6	COM2-6 DCD/5V+ RI/12V Select Jumper
8	RS485_LOAD1-2	COM3-4 RS485 Signal 120Ω Resistive Termination Select Jumper
9	JM_COM3-4	COM3-4 RS232/RS485 Select Jumpers
10	JP_AT/ATX1	AT or ATX Select Jumper
11	J_MCU1	MCU Debug Header
12	WDT_EN1	Watch Dog Reset Enable/Disable Select Jumper
13	J_ME1	ME Flash Header

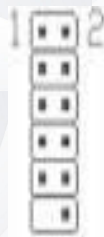
14	CLR_CMOS1	CMOS Clear Select Jumper
15	J_DBG1	LPC Debug Header
16	J_PWR_LED	Power LED Header
17	J_SMBUS1	SMBus Wafer
18	J_COPEN1	Case Open Header
19	SYS_FAN1-2	System FAN1-2 Headers
20	J_PWR1	Power Expand Wafer
21	PSON1	Power On Wafer
22	CPU_FAN1	CPU Fan Wafer
23	EDP1	EDP Signal Header
24	JC_EDP1	eDPVDD Select Jumper
25	EDP_P1	eDP Backlight Control Header
26	JC_COM1	COM1 DCD/5V+ RI/12V Select Jumper
27	F_AUDIO1	Front Audio Header
28	F_SPDIF1	SPDIF Out Header
29	JP_PCICLK1	PCI CLK 66MHz Disable/ Enable Select Jumper
30	R_USB1	USB2.0 TYPE-A Up-right Connector
31	M2_M_PCIESSD1	M.2 Key-M Slot (PCIe 2x/SATA, Default SATA, Support SATA SSD, 2242/2280)
32	SATA1-4	SATA3.0 Connector1-4
33	ATX1	ATX 24P Power Input Connector
34	DIMM1-2	DDR4 CHA/B DIMM Slot
35	PCIEX16_1	PCI-E 16x Slot
36	M2_E_WLAN1	M.2 Key-E Slot (PCIe+USB2.0, Support WIFI+ BlueTooth, 2230)
37	ATX2	ATX 8P CPU Power Input Connector
38	PCIE4X_2-3	PCIE4X Slot1-2
39	PCI1-4	PCI Slot1-4
40	KBMS_USB1 (PS/2)	PS/2 Connector (keyboard & mouse)
41	DVI_VGA1 (DVI)	DVI-I 24+4P/F Connector (Support DVI-D)
42	COM1	COM1 Connector
43	RJ45_USB1-2 (LAN)	GBE LAN RJ45 Connector1-2
44	KBMS_USB1 (USB)	Dual USB3.0 TYPE-A Connector
45	DVI_VGA1 (VGA)	VGA DB15 Connector
46	HDMI1	HDMI TYPE-A Connector
47	RJ45_USB1-2 (USB)	Dual USB3.0 TYPE-A Connector1-2
48	AUDIO1	Line-Out + MIC + Line-In 3.5mm Jack

6.Definition of Jumpers / Headers and Connectors

1) F_USB3 (Front USB3.0 BOX Header 10*2 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
			1	VCC5
	19	VCC5	2	USB3.0_2_RX-
	18	USB3.0_1_RX-	3	USB3.0_2_RX+
	17	USB3.0_1_RX+	4	GND
	16	GND	5	USB3.0_2_TX-
	15	USB3.0_1_TX-	6	USB3.0_2_TX+
	14	USB3.0_1_TX+	7	GND
	13	GND	8	USB2.0_2-
	12	USB2.0_1-	9	USB2.0_2+
	11	USB2.0_1+	10	N/C

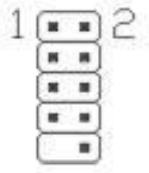
2) J_GPIO1 (GPIO Header 6*2 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
	1	SIO_GPI70 (0xA06 Bit0, H [1])	2	SIO_GPI71 (0xA06 Bit1, H [1])
	3	SIO_GPI72 (0xA06 Bit2, H [1])	4	SIO_GPI73 (0xA06 Bit3, H [1])
	5	GND	6	SIO_GPO74 (0xA06 Bit4, H [1])
	7	SIO_GPO75 (0xA06 Bit5, H [1])	8	SIO_GPO76 (0xA06 Bit6, H [1])
	9	SIO_GPO77 (0xA06 Bit7, H [1])	10	VCC5
			12	N/C

Notes:

[1]: “H” or “L” means the default voltage is High or Low level. (5V GPIO)

3) F_USB2 (Front USB2.0 Header2 3*2 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	VCC5	2	VCC5
	3	USB2.0_1-	4	USB2.0_2-
	5	USB2.0_1+	6	USB2.0_2+
	7	GND	8	GND
			10	N/C

4) F_USB1 (Front USB2.0 Header1 5*2 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	VCC5	2	VCC5
	3	USB2.0_1-	4	USB2.0_2-
	5	USB2.0_1+	6	USB2.0_2+
	7	GND	8	GND
			10	N/C

5) F_PANEL1 (Front Panel Header 5*2 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	HDD 3.3V LED+	2	Power 3.3V LED+
	3	HDD 3.3V LED-	4	Power 3.3V LED-
	5	RESET-	6	Power+
	7	RESET+	8	Power-
	9	N/C		

6) J_COM2-6 (COM2-6 Pin Headers 5*2 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
 J COM2	1	COM2_PIN1 ^[1]	2	COM2_DSR#
	3	COM2_RXD	4	COM2_RTS#
	5	COM2_TXD	6	COM2_CTS#
	7	COM2_DTR#	8	COM2_PIN8 ^[1]
	9	GND		
 J COM3	1	COM3_PIN1 ^[2]	2	COM3_DSR#
	3	COM3_PIN3 ^[3]	4	COM3_RTS#
	5	COM3_PIN5	6	COM3_CTS#
	7	COM3_PIN7#	8	COM3_PIN8 ^[2]
	9	GND		
 J COM4	1	COM4_PIN1 ^{[4] [5]}	2	COM4_DSR#
	3	COM4_PIN3 ^[5]	4	COM4_RTS#
	5	COM4_TXD	6	COM4_CTS#
	7	COM4_DTR#	8	COM4_PIN8 ^[4]
	9	GND		
 J COM5	1	COM5_PIN1 ^[6]	2	COM5_DSR#
	3	COM5_RXD	4	COM5_RTS#
	5	COM5_TXD	6	COM5_CTS#
	7	COM5_DTR#	8	COM5_PIN8 ^[6]
	9	GND		
 J COM6	1	COM6_PIN1 ^[7]	2	COM6_DSR#
	3	COM6_RXD	4	COM6_RTS#
	5	COM6_TXD	6	COM6_CTS#
	7	COM6_DTR#	8	COM6_PIN8 ^[7]
	9	GND		

Notes:

[1]: PIN1 of COM2 can be DCD# (default) /5V and Pin8 of COM2 can be RI# (Default) / 12V, selectable by “COM2 DCD/5V+RI/12V Select Jumper” . (JC_COM2, Location 7)

[2]: PIN1 of COM3 can be DCD# (default) /5V and Pin8 of COM3 can be RI# (Default) / 12V, selectable by “COM3 DCD/5V+RI/12V Select Jumper” . (JC_COM3, Location 7)

[3]: COM3 can be RS232 (default) / RS485 selecting by “COM3 RS232/RS485 Select Jumper” . (JM_COM3, Location 9).

[4]: PIN1 of COM4 can be DCD (default) /5V and Pin8 of COM4 can be RI(Default) / 12V, selectable by “COM4 DCD/5V+RI/12V Select Jumper” . (JC_COM4, Location 7)

[5]: COM4 can be RS232 (default) / RS485 selecting by “COM4 RS232/RS485 Select Jumper” . (JM_COM4, Location 9)

[6]: PIN1 of COM5 can be DCD (default) /5V and Pin8 of COM5 can be RI(Default) / 12V, selectable by “COM5 DCD/5V+RI/12V Select Jumper” . (JC_COM5, Location 7)

[7]: PIN1 of COM6 can be DCD (default) /5V and Pin8 of COM6 can be RI(Default) / 12V, selectable by “COM6 DCD/5V+RI/12V Select Jumper” . (JC_COM6, Location 7)

7) JC_COM2-6 (COM2-6 DCD/5V+ RI/12V Select Jumper 3*2 Pin 2.54 mm)

Graphic	Setting	Function
	1-3, 2-4	PIN1: VCC5 PIN8: VCC12
	3-5, 4-6(Default)	PIN1: DCD PIN8: RI

Notes:

*: Jumper 1-3/3-5 select the PIN1 signal. Jumper 2-4/4-6 select the PIN8 signal.

8) RS485_LOAD1-2 (COM3-4 RS485 Signal 120Ω Resistive Termination Select Jumper 3*1 Pin 2.54m)

Graphic	Setting	Function
	1-2 (Default)	Disable
	2-3	Enable



9) JM_COM3-4 (COM3/4 RS232/RS485 Select Jumpers 3*2 Pin 2.54 mm)

Graphic	Setting	Function
	1-3, 2-4	RS485 (PIN1: RS485- PIN3: RS485+)
	3-5, 4-6(Default)	RS232 (PIN1: DCD PIN3: RXD)

10) JP_AT/ATX1 (AT or ATX Select Jumper 3*2 Pin 2.54mm)

Graphic	Setting	Function
	1-2 (Default)	ATX Mode
	2-3	AT Mode

11) J_MCU1 (MCU Debug Header 3*1 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	TTL_RX	3	GND
	2	TTL_TX		

12) WDT_EN1 (Watch Dog Reset Enable/Disable Select Jumper 3*1 Pin 2.54mm)

Graphic	Setting	Function
	1-2 (Default)	Disable
	2-3	Enable

13) CLR_CMOS1 (CMOS Clear Jumper 3*1 Pin 2.54mm)

Graphic	Setting	Function
	1-2 (Default)	Normal
	2-3	Clear CMOS

14) J_ME1 (ME Flash Header 2*1 Pin 2.54mm)

Graphic	Setting	Function
	1-2: Open (Default)	ME Protect Enable
	1-2: Connected	ME Protect Disable

15) J_DBG1 (LPC Debug Header 9*1 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
	1	LFRAME_N	6	GND
	2	LPC_DATA3	7	N/C
	3	LPC_DATA 2	8	LPC_CLK
	4	LPC_DATA 1	9	VCC3.3
	5	LPC_DATA 0		

16) J_PWR_LED1 (Power LED Header 4*1 Pin 2.54 mm)

Graphic	Pin	Definition	Pin	Definition
	1	VCC3.3	3	GPIO_R
	2	PWR_LED_N ^[1]		GND

Notes:

[1]: PWR_LED is controlled by SIO_GPIO5B

17) J_SMBUS1 (SMB Wafer 4*1 Pin 1.25mm)

18) Graphic	Pin	Definition	Pin	Definition
	1	GND	3	SMB_CLK
	2	SMB_DATA	4	VCC5 [1]

Notes:

[1]: Power on this Pin is 5V by default, 3.3V is available if specified. (resistor selectable)

19) SYS_FAN1/2 (System Fan Wafer 4*1 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	GND	3	FAN Speed Detection
	2	VCC12	4	FAN Speed Control

20) J_PWR1 (Power Expand Wafer 8*1 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
	1	VCC5A	5	VCC5S
	2	GND	6	VCC3.3S
	3	GND	7	VCC12_N
	4	VCC5N_S	8	VCC12S

21) P_SON1 (Power On Wafer 2*1 Pin 2.54mm)

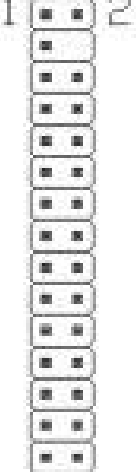
Graphic	Pin	Definition	Pin	Definition
	1	PSON_N	2	GND

22) CPU_FAN1 (CPU Fan Header 4*1 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	GND	3	FAN Speed Detection
	2	VCC12	4	FAN Speed Control



23) EDP1 (EDP Signal Header 15*2 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
	1	VDD_PANEL [1]	2	VDD_PANEL [1]
	3	VDD_PANEL [1]		
	5	EDP_HPD	6	EDP_HPD
	7	N/C	8	N/C
	9	N/C	10	N/C
	11	N/C	12	N/C
	13	GND	14	GND
	15	N/C	16	N/C
	17	EDP_TX3-	18	EDP_TX3+
	19	EDP_TX0-	20	EDP_TX0+
	21	EDP_TX1-	22	EDP_TX1+
	23	EDP_TX2-	24	EDP_TX2+
	25	GND	26	GND
	27	N/C	28	N/C
	29	EDP_AUX-	30	EDP_AUX+

Notes:

[1]: Panel Power VDD can be 3.3V (default) /5V selectable by eDP VDD Select Jumper” (JC_EDP1 Location 24).

24) JC_EDP1 (eDP VDD Select Jumper 3*1 Pin 2.54mm)

Graphic	Setting	Function
	1-2(Default)	VCC3.3
	2-3	VCC5

25) EDP_P1 (eDP Backlight Control Wafer 6*1 Pin 2.00mm)

Graphic	Pin	Definition	Pin	Definition
	1	GND	4	EDP_BKLT_EN
	2	GND	5	VCC12
	3	EDP_BKLT_CTL	6	VCC12

26) JC_COM1 (COM1 DCD/5V+ RI/12V Select Jumper 3*2 Pin 2.54mm)

27) Graphic	Setting	Function
	1-3, 2-4	PIN1: VCC5 PIN8: VCC12
	3-5, 4-6(Default)	PIN1: DCD PIN8: RI

Notes:

*: Jumper 1-3/3-5 select the PIN1 signal. Jumper 2-4/4-6 select the PIN8 signal.

28) F_AUDIO1 (Front Audio Header 5*2 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	MIC_IN_L	2	GND
	3	MIC_IN_R	4	VCC3.3
	5	LINE_OUT_R	6	MIC_RET
	7	GND		
	9	LINE_OUT_L	10	LINE_OUT_RET

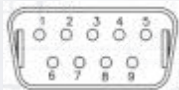
29) F_SPDIF1 (SDPIF Out Header 4*1 Pin 2.54mm)

Graphic	Pin	Definition	Pin	Definition
	1	VCC5	3	SPDIF_OUT
			4	GND

30) JP_PCICLK1 (PCI CLK 66MHz Enable/Disable Select Jumper 3*1 Pin 2.54mm)

Graphic	Setting	Function
	1-2 (Default)	PCI CLK is 66MHz
	2-3	PCI CLK is 33MHz

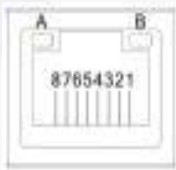
42) COM1(COM1 DB9/M Connector)

Graphic	Pin	Definition	Pin	Definition
	1	PIN1 ^[1]	6	DSR
	2	RXD	7	RTS
	3	TXD	8	CTS
	4	DTR	9	PIN9 ^[1]
	5	GND		

Notes:

[1]: PIN1 of COM1 can be DCD (default) /5V and Pin9 of COM1 can be RI(Default) / 12V, selectable by “COM1 DCD/5V+RI/12V Select Jumper” . (JC_COM1, Location 26)

43) RJ45_USB1-2 (LAN) (GBE LAN RJ45 Connector1-2)

Graphic	Pin	Definition	Pin	Definition
	1	MDI_0+	5	MDI_2+
	2	MDI_0-	6	MDI_2-
	3	MDI_1+	7	MDI_3+
	4	MDI_1-	8	MDI_3-
	A	Speed LED	B	Active LED
		1000M/2.5G: Turn Orange		ACT: Twinkling Yellow
		100M: Turn Green		Only LINK: Lights On
		10M: Lights Off		Stop: Lights Off

[END]