MI1061

Intel® H610

Mini-iTx

Socket LGA1700
Support Intel® 12/13/14th Generation Core i3/5/7/9, Pentium®, Celeron® Processors

MAX CPU TDP 65W

USER'S MANUAL

Version 1.2

1 Acknowledgments

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1.1 Compliance

CE

This product has passed CE tests for environmental specifications and limits. This product is in accordance with the directives of the European Union (EU). In a domestic environment, this product may cause radio interference in which case users may be required to take adequate measures.
This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

FCC

This product has been tested and found to comply with the limits for a Class B device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications.

WEEE

This product must not be disposed of as normal household waste, in accordance with the EU directive of for waste electrical and electronic equipment (WEEE - 2012/19/EU). Instead, it should be disposed of by returning it to a municipal recycling collection point. Check local regulations for disposal of electronic products.

Green product RoHS

This product complies with RoHS 2 restrictions, which prohibit the use of certain hazardous substances in electrical and electronic equipment. The following substances must not exceed the specified concentrations:
• Hexavalent chromium: 1,000 ppm
• Poly-brominated biphenyls (PBBs): 1,000 ppm
• Poly-brominated diphenyl ethers (PBDEs): 1,000 ppm
• Cadmium: 100 ppm
• Mercury: 1,000 ppm
• Lead: 1,000 ppm
• Bis(2-ethylhexyl) phthalate (DEHP): 1,000 ppm
• Butyl benzyl phthalate (BBP): 1,000 ppm
• Dibutyl phthalate (DBP): 1,000 ppm
• Diisobutyl phthalate (DIBP): 1,000 ppm

Documentation Revision Control
1.0 Initial release
1.1 Specific adaptation
1.2 Specification of network card change to Dual Intel

1.2 Important Safety Information

Carefully read the precautions before using the board.

ENVIRONNEMENT OF USE

Environmental conditions:

• Use this product in environments with ambient temperatures between 0˚C and 60˚C.

• Do not leave this product in an environment where the storage temperature may be below -20° C or above 80° C. To prevent from damages, the product must be used in a controlled environment.

TAKING CARE

Care for your industrial products from IBT:

• Before cleaning the PCB, unplug all cables and remove the battery.

• Clean the PCB with a circuit board cleaner or degreaser, or use cotton swabs and alcohol.

• Vacuum the dust with a computer vacuum cleaner to prevent the fan from being clogged.

WARNING

Attention during use:

• Do not use this product near water.

• Do not spill water or any other liquids on this product.

• Do not place heavy objects on the top of this product.

Anti-static precautions

• Wear an anti-static wrist strap to avoid electrostatic discharge.

• Place the PCB on an anti-static kit or mat.

• Hold the edges of PCB when handling.

• Touch the edges of non-metallic components of the product instead of the surface of the PCB.

• Ground yourself by touching a grounded conductor or a grounded bit of metal frequently to discharge any static.

CAUTION

Danger of explosion if the internal lithium-ion battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer’s instructions or recycle them at a local recycling facility or battery collection point.

1.3 Warranty Policy

- **IBT industrial standard products:**

24-month (2-year) warranty from the date of shipment. If the date of shipment cannot be ascertained, the product serial numbers can be used to determine the approximate shipping date.

- **3rd-party parts:**

12-month (1-year) warranty from delivery for the 3rd-party parts that are not manufactured by us, such as CPU, CPU cooler, memory, storage devices, power adapter, panel and touchscreen.

- **MISUSE**

* PRODUCTS THAT FAIL DUE TO MISUSE, ACCIDENT, IMPROPER, INSTALLATION OR UNAUTHORIZED REPAIR SHALL BE TREATED AS OUT OF WARRANTY AND CUSTOMERS SHALL BE BILLED FOR REPAIR AND SHIPPING CHARGES

1.4 Technical Support & Services

1. Visit our website at www.ibt.ca to find the latest information about the product.
Search for **MI1061.**
2. If you need any further assistance from your distributor or sales representative, prepare the following information of your product and elaborate upon the problem.

- Product model name
- Product serial number
- Detailed description of the problem
- The error messages in text or in screenshots if there is any
- The arrangement of the peripherals
- Software in use (such as OS and application software, including
- the version numbers)

3. If repair service is required, please contact us at support@ibt.ca or your distributor or sales representative for assistance

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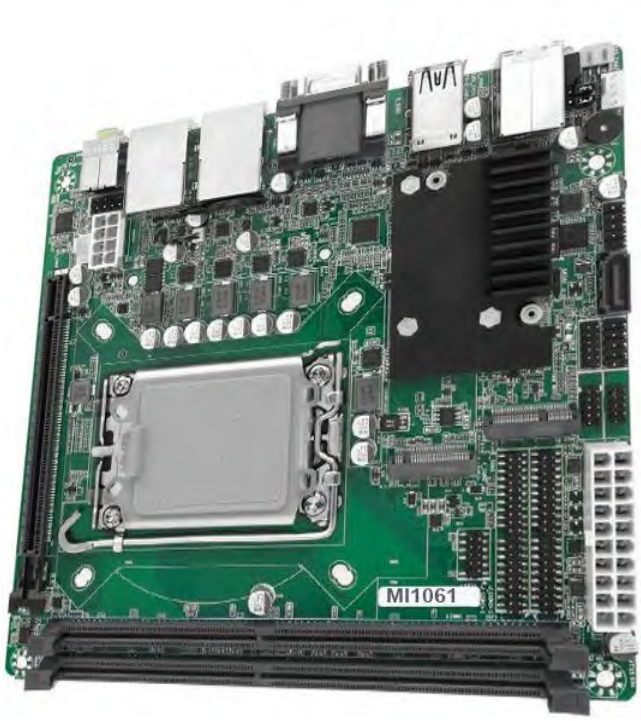
3 Introduction

MI1061 is a Mini ATX motherboard based on 14th Gen Intel® Core DT processors, supported by the Intel® H610. With support for two DDR4 (3200) slots accommodating up to 32GB memory, it supports independent displays with HDMI, VGA and eDP/LVDS interface for a total of 3 channels video. The MI1061 was optimized for a maximum of USB ports giving a total of 12 USB and up to 10 serials.This high-performance platform meets demands in next-generation applications in imaging, AI, and edge computing



4 Models and Attentions

4.1 Model resume

This manual is applied to following models:

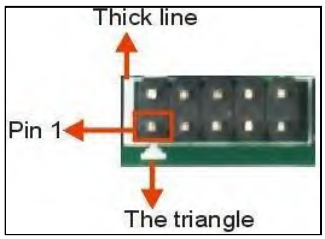
Model	Chipset	COM	LAN	USB	VGA	HDMI	PCI-E x16	M.2 KEY-M	M.2 KEY-E	SATA 3.0
MI1061	INTEL H610	10*	2	12	1	1	1	PCIE 4x	PCIE+ USB2.0	1

* COM include all I/O like RS232, RS485, TTL, Async

4.2 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.

5 Specification

5.1 General specifications

Specifications		
Model	Model	**MI1061**
Processor System	Processor	Support Intel® 12/13/14th Generation Core i3/5/7/9, Pentium®, Celeron® Processors, LGA1700, Support MAX CPU TDP 65W
	PCH	Intel® H610, TDP 6W
	BIOS	AMI UEFI BIOS (Support Watchdog Timer)
Memory	Slot Type	2, DDR4 Non-ECC U-DIMM
	Memory Type	DDR4 3200 MT/s
	Max Memory	Support 32GB each channel
	Channels	Dual
Display	VGA	1, VGA, max 1920*1200@60Hz
	HDMI	1, HDMI, max 4096*2160@30Hz
Audio	Codec	Realtek Audio HDA codec
	Audio	1, Line-Out 1, MIC 1, Line-Out + MIC (Header)
Storage	SATA	1, SATA Gen3 6Gbps
	M.2 SSD	1, M.2 M-Key 2280, PCIe x4 GEN3, Support PCIe x4 GEN3 NVMe SSD Notes: BOM optional support SATA SSD.
Expansion Slot	M.2	1, M.2 E-Key 2230, PCIE+USB2.0, support WiFi+ Bluetooth
	PCIe	1, PCI-E 16x Gen4
Ethernet	Chipset	2 2.5 GbE Ethernet Controller, Intel 226, Intel 210AT
USB	USB3.0	4, USB3.2 5Gbps
	USB2.0	8, USB2.0

Specifications (CONT.)

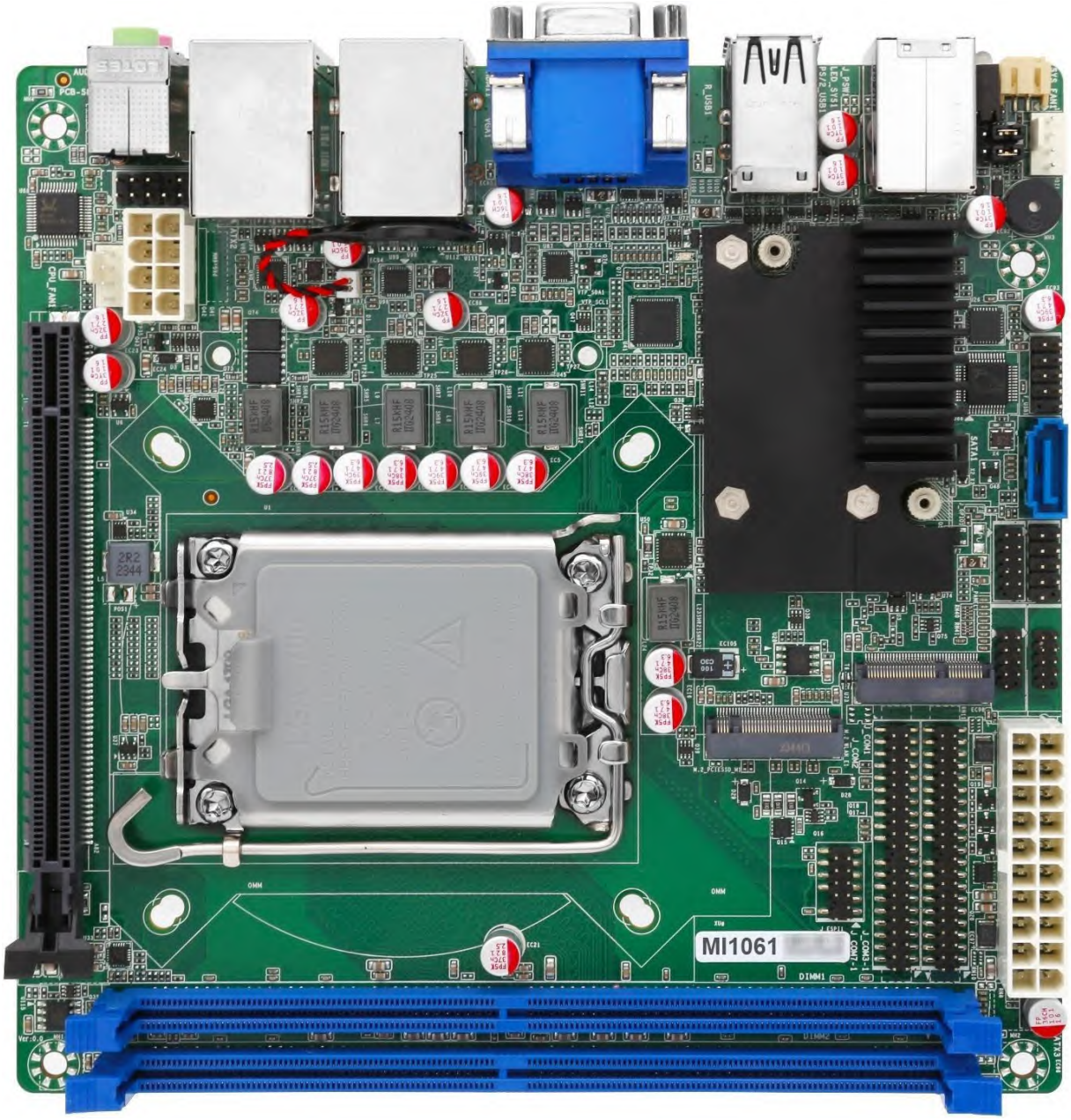
I/O	Serials	2	RS232, COM1-2, full lines
		4	RS232, COM3-6, full lines, BOM optional DCD or 5V, default DCD
		1	RS232, COM7, full lines
		3	RS232, COM8-10, 2Lines
	PANEL		PWR On +Reset +PWR-LED +HDD-LED
	PS/2	1	
	FAN	2	CPU FAN, System FAN
	Power ON		AT/ATX Select, 2-wires
	Debug	1	ESPI
	LED	2	Power LED and System LED
GPIO	GPIO	1	4* GPI+ 4* GPO, non-isolated 3.3V (5V Optional)
Power	Power in		ATX Standard (20P + 8P)
TPM	TPM		SLB 9670VQ2.0, TPM2.0 (not onboard by default), Support Intel PTT Default
OS	OS Supported		Windows 10/11 64bit, Linux
Environment	Temperature		Operation: 0 ~ 60℃ Storage: -20 ~ 75℃
	Humidity		5 ~ 95%, non-condensing
Mechanical	Dimension		Mini-ITX (170mm*170mm)
	Height		35mm (PCB: 1.6mm)

5.2 Interface specification

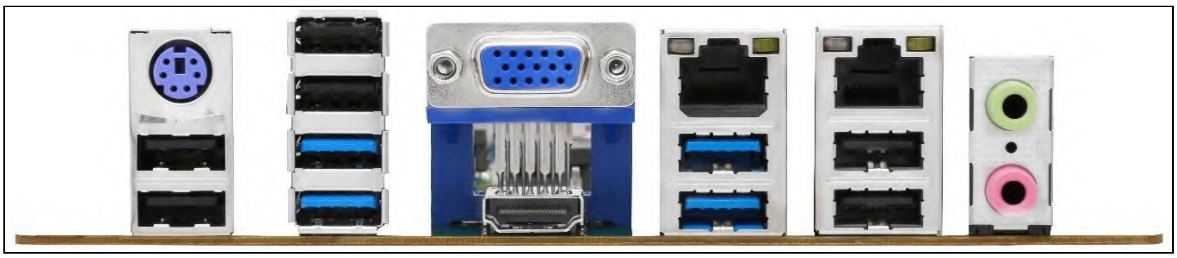
Interfaces		
Model	Model	**MI1061**
Rear I/O	Power On	1, Wafer
	LED	1, Power LED+ SSD LED
	PS/2	1, Keyboard+ Mouse
	USB3.0	4, USB3.0 Type-A
	USB2.0	6, USB2.0 Type-A
	VGA	1, VGA DB15/FM
	HDMI	1, HDMI Type-A
	LAN	2, RJ45
	Audio	1, Φ3.5mm TRS Jack, Line-Out 1, Φ3.5mm TRS Jack, MIC
	Audio	1, Header, Line-Out + MIC
	Storage	1, SATA 7P Port 1, M.2 M-Key 2280, PCIe x4 GEN3, Support PCIe x4 GEN3 NVMe SSD
	Expansion	1, M.2 E-Key 2230, PCIE+USB2.0 Support WiFi+ Bluetooth Module 1, PCI-E 16x Slot
Internal I/O	USB2.0	2, Header
	Serial	7, Header, RS232 full Lines, COM1-7 3, Header, RS232 2 Lines, COM7-10
	GPIO	1, Header, 8 * GPIO
	Front Panel	1, Header
	FAN	2, Wafer
	Debug	1, Header, ESPI
	Jumper	1, AT or ATX mode Select 1, CMOS Clear Select
Others	LED	1, Power LED+ SSD LED
	RTC	1, Wafer
	Buzzer	1

6 Motherboard overview

6.1 Top View of MI1061

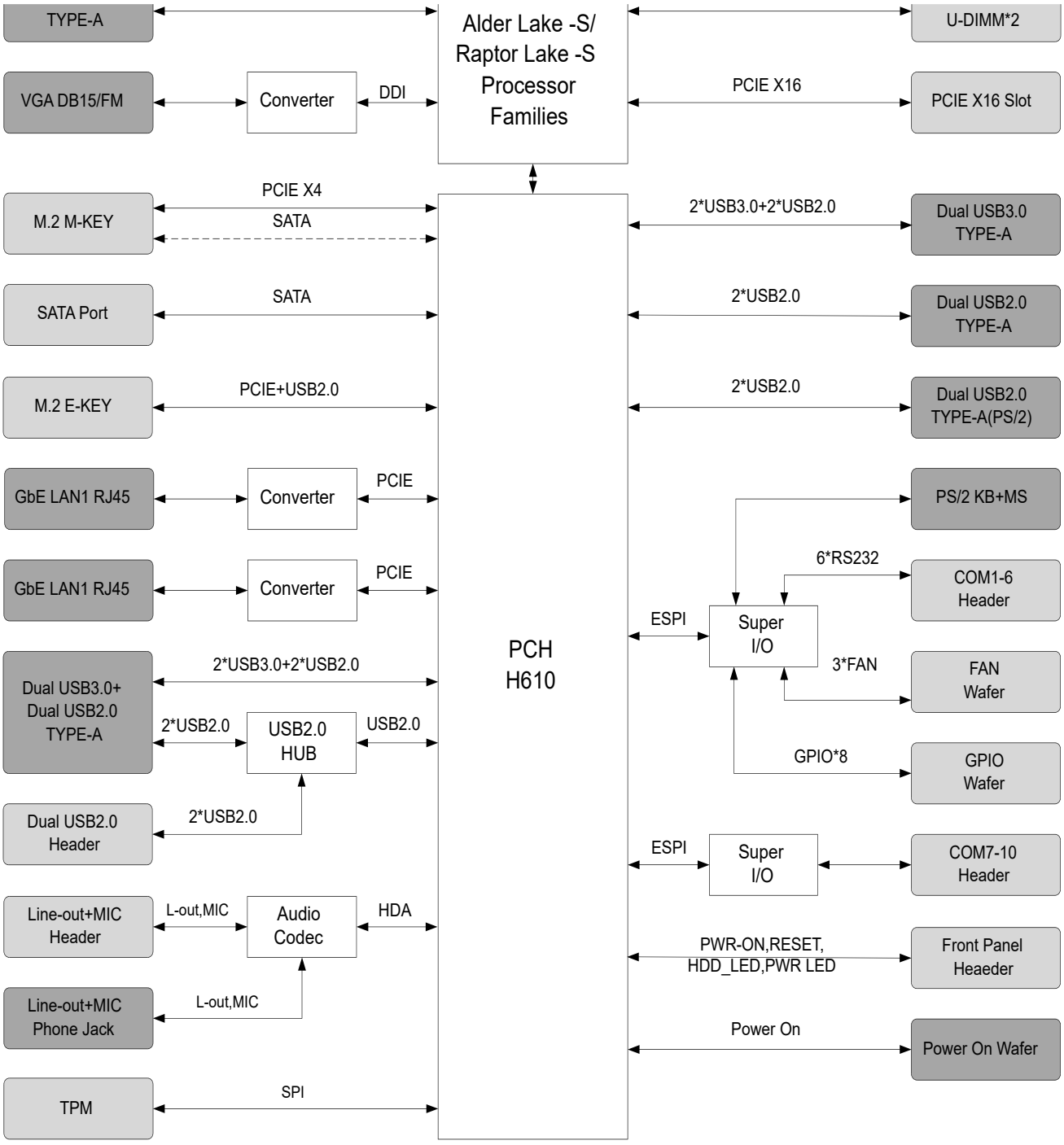


6.2 Side view of I/O CONNECTORS ON EDGE

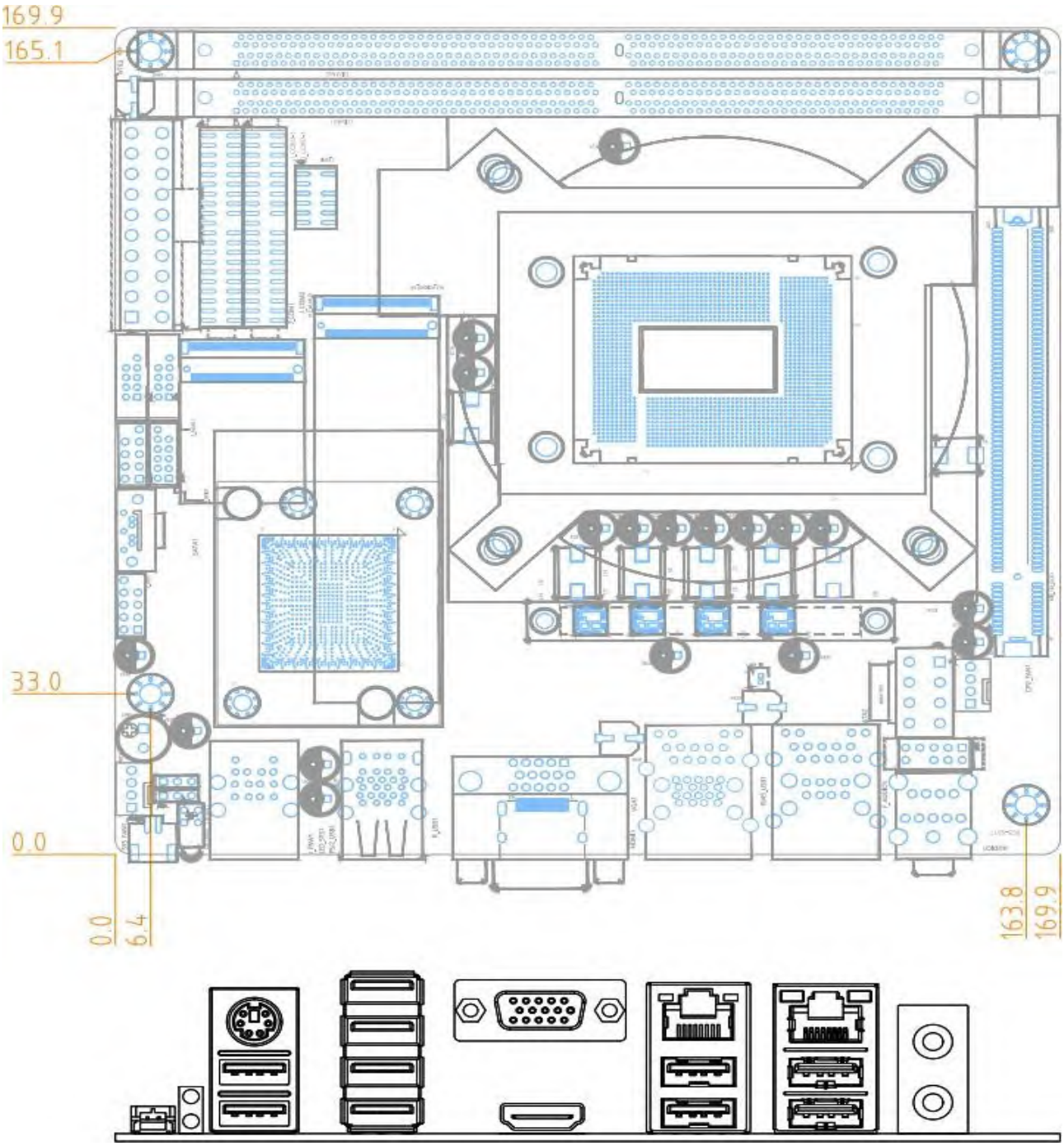


6.3 Bottom view of MI1061

7 Block Diagram

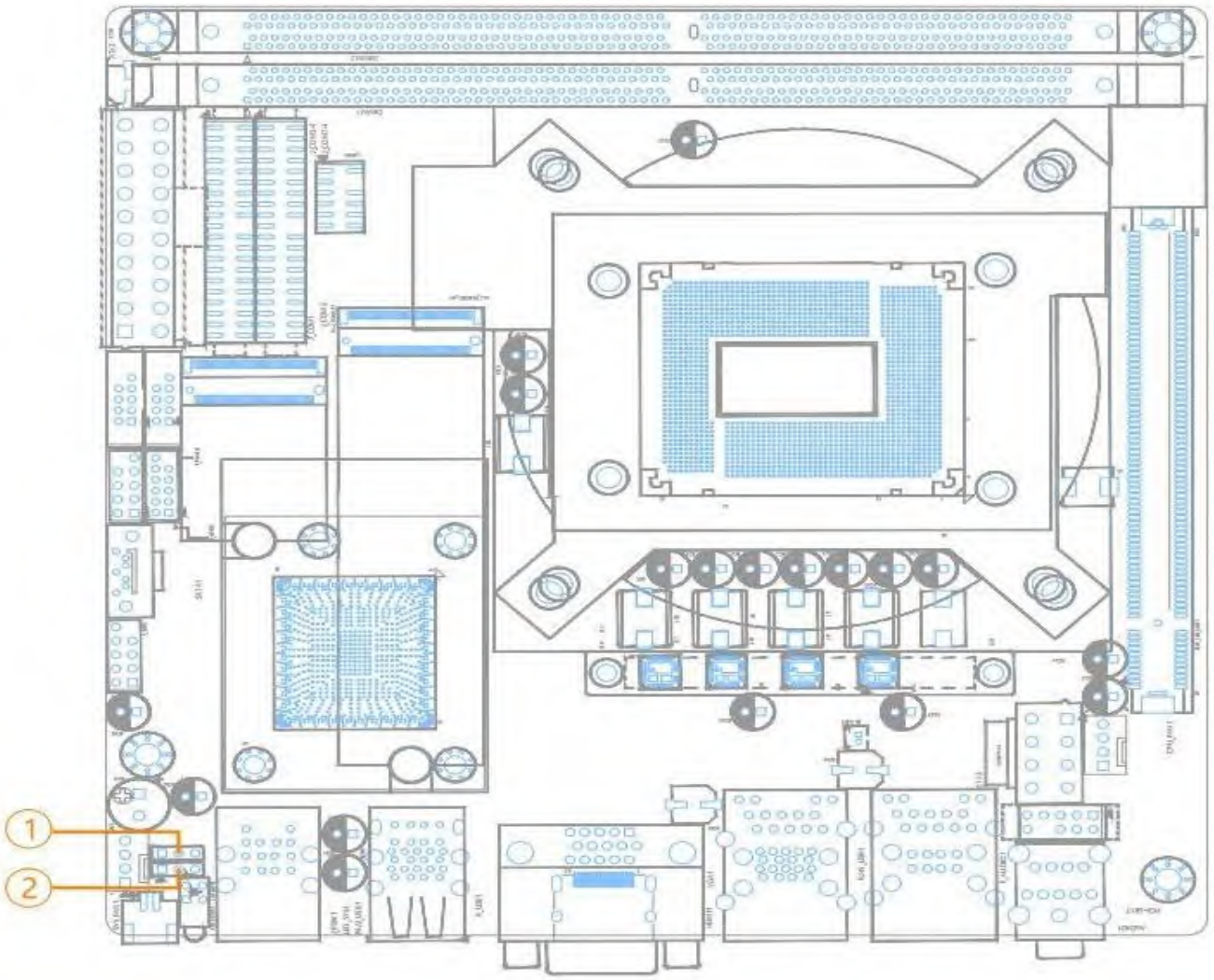


8 Mechanical Drawing



9 Jumpers

9.1 Jumpers Location



9.2 Jumpers name and applications

Jumpers		
1	CLR_CMOS1	CMOS Clear Select Jumper
2	J_AT/ATX1	AT or ATX Select Jumper

9.3 Jumpers definition

9.4 CMOS Clear Select: Jumper, 3*1P, 2.54mm (Ref.ID-1, CLR_CMOS1)

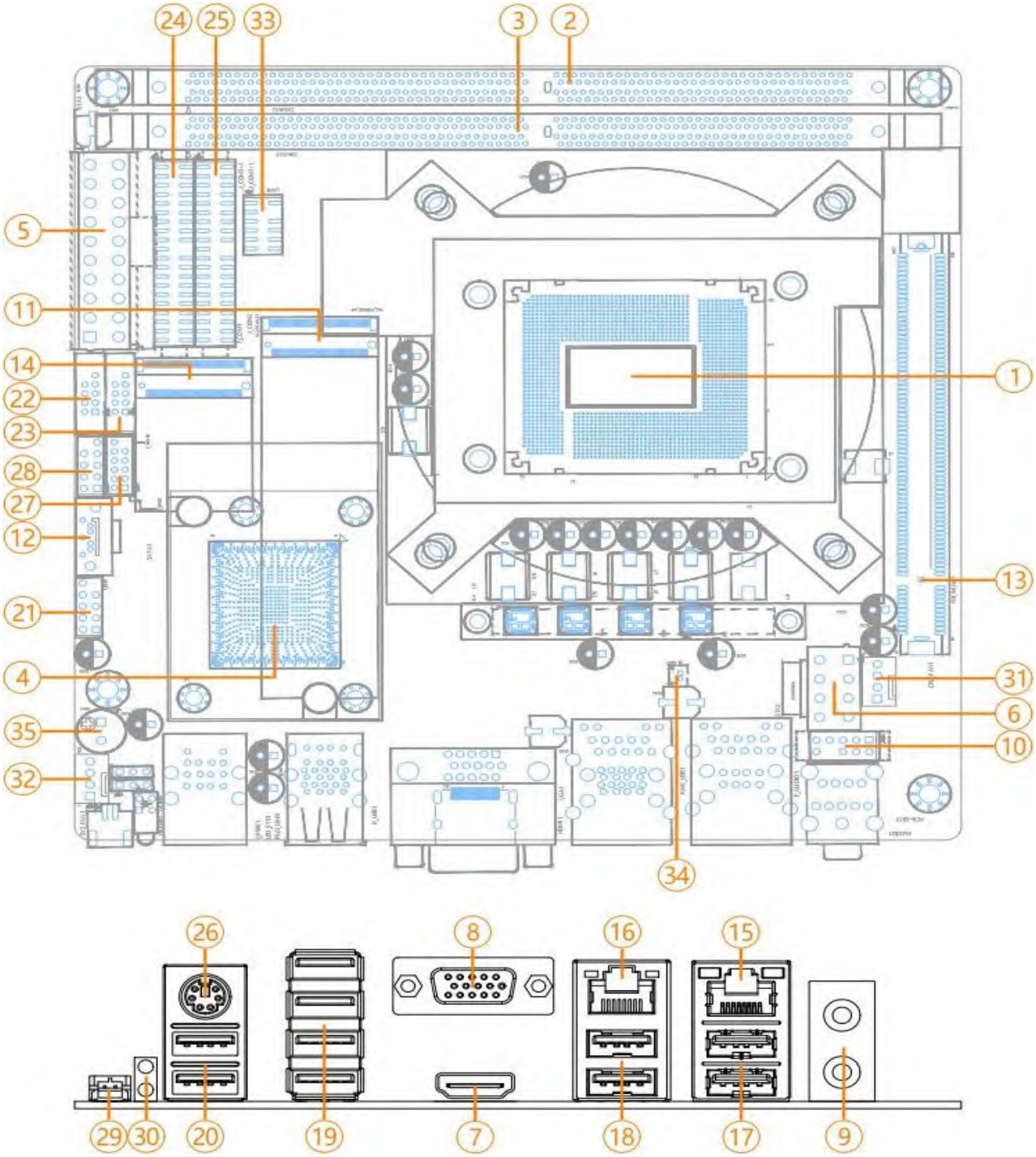
Graphic	Setting	Function
	1-2 (Default)	Normal
	2-3	Clear CMOS

9.5 AT or ATX Select: Jumper, 3*2P, 2.54mm (Ref.ID-2, J_AT/ATX1)

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

10 Headers / Wafers and Connectors

10.1 Connectors reference ID location

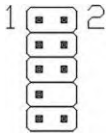


10.2 Connectors reference ID list

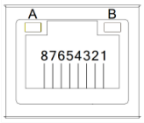
Headers / Wafers and Connectors		
1	U1	CPU
2	DIMM1	DDR4 SO-DIMM Slot
3	DIMM2	DDR4 SO-DIMM Slot
4	U2	PCH
5	ATX3	ATX 20P Power Input Connecter
6	ATX2	ATX 8P Power Input Connecter
7	HDMI	HDMI TYPE-A Connecter
8	VGA1	VGA DB15/FM Connecter
9	AUDIO1	Line-Out + MIC Φ3.5mm TRS Phone Jack
10	F_AUDIO1	Front Audio Header (Line-out+ MIC)
11	M.2_PCIESSD_M1	M.2 M-Key Slot (PCIe x4 Gen3/SATA, 2280)
12	SATA1	SATA3.0 7P Connector
13	PCIE_16X_SLOT1	PIC-E 16x Slot
14	M.2_WLAN_E1	M.2 E-Key Slot (PCIE+USB2.0, 2230)
15	RJ45_USB1(LAN)	GbE LAN RJ45 Connector1
16	RJ45_USB2(LAN)	GbE LAN RJ45 Connector2
17	RJ45_USB1(USB)	Dual USB2.0 TYPE-A Connector
18	RJ45_USB2(USB)	Dual USB3.0 TYPE-A Connector
19	R_USB1	Dual USB3.0 + Dual USB2.0 TYPE-A Connector
20	PS/2_USB1(USB)	Dual USB2.0 TYPE-A Connector
21	F_USB1	Front Dual USB2.0 Header
22	J_COM1	COM1 Header
23	J_COM2	COM2 Header
24	J_COM3-1	COM3-6 Header
25	J_COM7-1	COM7-10 Header
26	PS/2_USB1(PS/2)	PS/2 Connecter (Keyboard & Mouse)
27	J_GPIO1	GPIO Header
28	F_PANEL1	Front Panel Header
29	J_PSW1	Power on Wafer
30	LED_SYS1	Power on LED+SSD LED
31	CPU_FAN1	CPU FAN Wafer
32	SYS_FAN1	System FAN Wafer
33	J_EPSI1	ESPI Header
34	BAT1	CMOS Battery Wafer
35	BZ1	Buzzer

11 Definition of Connectors

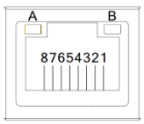
11.1Front Audio: Header, 5*2P, 2.54mm (Ref.ID-10, F_AUDIO1)

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	OUT_RET

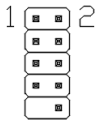
11.2GbE LAN: RJ45, 8P (Ref.ID-15, RJ45_USB1(LAN))

Graphic	Pin	Definition		Pin	Definitio n	
	1	MDI0+		5	MDI2+	
	2	MDI0-		6	MDI2-	
	3	MDI1+		7	MDI3+	
	4	MDI1-		8	MDI3-	
	A	Speed LED	1000M: Turn Orange	B	Active LED	ACT: Twinkling Yellow
			100M: Turn Green			Only LINK: Lights Off
			10M: Lights Off			No LINK: Lights Off

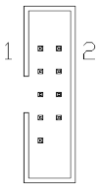
11.3GbE LAN: RJ45, 8P (Ref.ID- 16, RJ45_USB2(LAN))

Graphic	Pin	Definition		Pin	Definitio n	
	1	MDI0+		5	MDI2+	
	2	MDI0-		6	MDI2-	
	3	MDI1+		7	MDI3+	
	4	MDI1-		8	MDI3-	
	A	Speed LED	1000M: Turn Orange	B	Active LED	ACT: Twinkling Yellow
			100M: Turn Green			Only LINK: Lights Off
			10M: Lights Off			No LINK: Lights Off

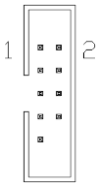
11.4Front Dual USB2.0: Wafer, 5*2P, 2.54mm (Ref.ID-21, F_USB1)

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

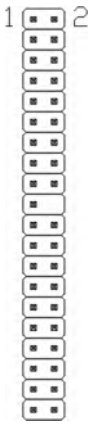
11.5COM1: Header, 5*2P, 2.00mm (Ref.ID-22, J_COM1)

Graphic	Pin	Definition	Pin	Definition
	1	DCD	2	RXD
	3	TXD	4	DTR
	5	GND	6	DSR
	7	RTS	8	CTS
	9	RI		

11.6COM2: Header, 5*2P, 2.00mm (Ref.ID-23, J_COM2)

Graphic	Pin	Definition	Pin	Definition
	1	DCD	2	RXD
	3	TXD	4	DTR
	5	GND	6	DSR
	7	RTS	8	CTS
	9	RI		

11.7COM3-6: Header, 20*2P, 2.00mm (Ref.ID-24, J_COM3-6)

Graphic		Pin	Definition	Pin	Definition
	COM3	1	DCD/VCC5 [1]	2	RXD
		3	TXD	4	DTR
		5	GND	6	DSR
		7	RTS	8	CTS
		9	RI	10	GND
	COM4	11	DCD/VCC5 [1]	12	RXD
		13	TXD	14	DTR
		15	GND	16	DSR
		17	RTS	18	CTS
		19	RI	**KEY**	**KEY PIN**
	COM5	21	DCD/VCC5 [1]	22	RXD
		23	TXD	24	DTR
		25	GND	26	DSR
		27	RTS	28	CTS
		29	RI	30	GND
	COM6	31	DCD/VCC5 [1]	32	RXD
		33	TXD	34	DTR
		35	GND	36	DSR
		37	RTS	38	CTS
		39	RI	40	GND

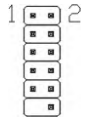
Notes:

[1]: PIN1 of COM3/4/5/6 can be DCD (default) /5V, selectable by resistor.

11.8COM7-10: Header, 20*2P, 2.00mm (Ref.ID-25, J_COM7-10)

Graphic		Pin	Definition	Pin	Definition
	COM7	1	DCD/VCC5 [1]	2	RXD
		3	TXD	4	DTR
		5	GND	6	DSR
		7	RTS	8	CTS
		9	RI	10	GND
	COM8 ; TWO-WIRES	11	N/C	12	RXD
		13	TXD	14	N/C
		15	GND	16	N/C
		17	N/C	18	N/C
		19	N/C	**KEY**	**Key pin**
	COM9 two wires	21	N/C	22	RXD
		23	TXD	24	N/C
		25	GND	26	N/C
		27	N/C	28	N/C
		29	N/C	30	N/C
	COM10 two wires	31	N/C	32	RXD
		33	TXD	34	N/C
		35	GND	36	N/C
		37	N/C	38	N/C
		39	N/C	40	N/C

11.9GPIO: Header, 6*2P, 2.00mm (Ref.ID-27 J_GPIO1)

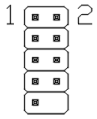
Graphic	Pin	Definition	Pin	Definition
	1	SIO_GPI70 (0xA06 Bit0, H [1])	2	SIO_GPI71 (0xA06 Bit1, H [1])
	3	SIO_GPI72 (0xA06 Bit2, H [1])	4	SIO_GPI73 (0xA06 Bit3, H [1])
	5	GND	6	SIO_GPO74 (0xA06 Bit4, H [1])
	7	SIO_GPO75 (0xA06 Bit5, H [1])	8	SIO_GPO76 (0xA06 Bit6, H [1])
	9	SIO_GPO77 (0xA06 Bit7, H [1])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

Notes:

[1] : "H" or "L" means the default voltage is High or Low level (3.3V GPIO).

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

11.10 Front Panel: Wafer, 5*2P, 2.54mm (Ref.ID-28, F_PANEL1)

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 On+
	7	Reset+	8	Power On-
	9	N/C		

11.11 Power on: Wafer, 2*1P, 2.00mm (Ref.ID-29, J_PSW1)

Graphic	Pin	Definition	Pin	Definition
	1	Power On+	2	Power On-

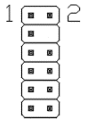
11.12 CPU FAN: Wafer 4*1P, 2.54mm (Ref.ID-31, CPU_FAN1)

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

11.13 System FAN: Wafer 4*1P, 2.54mm (Ref.ID-32, SYS_FAN1)

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

11.14 ESPI: Wafer, 6*2P, 2.00mm (Ref.ID-33, J_ESPI1)

Graphic	Pin	Definition	Pin	Definition
	1	ESPI_IO0	2	VCC3.3
	3	ESPI_IO1		
	5	ESPI_IO2	6	ESPI_CLK
	7	ESPI_IO3	8	GND
	9	ESPI_CS0-	10	VCC3.3
	11	ESPI_ALERT0_N	12	PLTRST_N [1]

Notes:

[1]: Signal on this Pin is PLT_RST_N by default, ESPI_RST0_N is available if specified. (resistor selectable).

11.15 CMOS Battery: Wafer, 2*1P, 1.25mm (Ref.ID-34, BAT1)

Graphic	Pin	Definition	Pin	Definition
	1	VCC_BAT	2	GND

12 BIOS Setup

See “BIOS documentation for Intel H610 chipsets for MI1061” for detail information of BIOS setup.