

LP-179

Pico-ITX Motherboard

User's Manual

Edition 1.81

2024/11/29



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Packing List:

Please check the package content before you starting using the board.



1 x LP-179 Pico-ITX Motherboard
(Including Cooler Fan)



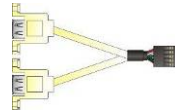
1 xDC Input Power Cable
(OALDC-B / 1040513)



1 x SATA & SATA Power Cable
OALSATA22B-PM10SL10/ (1040671)



1 x Dual COM Cable
(OALES-BKU2-H14NB / 1040379)



1 xUSB2.0 cable
(OALUSBA-3 / 1040173)



1 x Audio cable
(OALPJ-HDUNB / 1040123)

Optional module:



ADP-3355
DisplayPort to VGA module



ADP-3460E
DisplayPort to LVDS module

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Chapter 1 <Introduction>

1.1 <Product Overview>

LP-179 is a Pico-ITX Motherboard which supports 11th Generation Intel® Core™ U-Series processors, integrated Intel® UHD Graphics, DDR4 memory, Realtek High Definition Audio, Intel Gigabit LAN, USB3.2 Gen2, SATA3 with AHCI function for a system.

New feature for Tiger Lake

Tiger Lake UP3 processors are based on the 10nm process node, and offer long-life availability. They have a PCIe Gen4 for M.2 2280 slot.

All in One multimedia solution

The board provides high performance onboard graphics, and supports DisplayPort, HDMI, and High Definition Audio, to meet the very requirement of the multimedia application.

Tiger Lake support Windows10 version 2004 64bit and Linux kernel 5.8

Intel recommends using Windows 10 version 2004 64bit. It may lose some drivers if you use other Windows version.

Support OpenVINO for AI Computing

You can find more information at [Intel website](#)

1.2 <Product Specification>

System

Processor	Intel® Tiger Lake UP3 Processor FCBGA1449 package
Memory	1 x DDR4 SO-DIMM 3200 MHz up to 32GB, Support Non-ECC, unbuffered memory
Watchdog Timer	Generates a system reset with internal timer for 1min/s ~ 255min/s
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Expansion	1 x M.2 (Key E) for Wi-Fi and Bluetooth 2230mm 1 x M.2 2280 (Key M) support PCIe Gen4

Graphics

Chipset	Intel® UHD Graphics
Display Interface	1 x DisplayPort, 1 x HDMI

LAN

Chip	1 x Intel® I219-LM Gigabit PHY LAN 1 x Intel® I225-LM Gigabit LAN (up to 2.5GbE)
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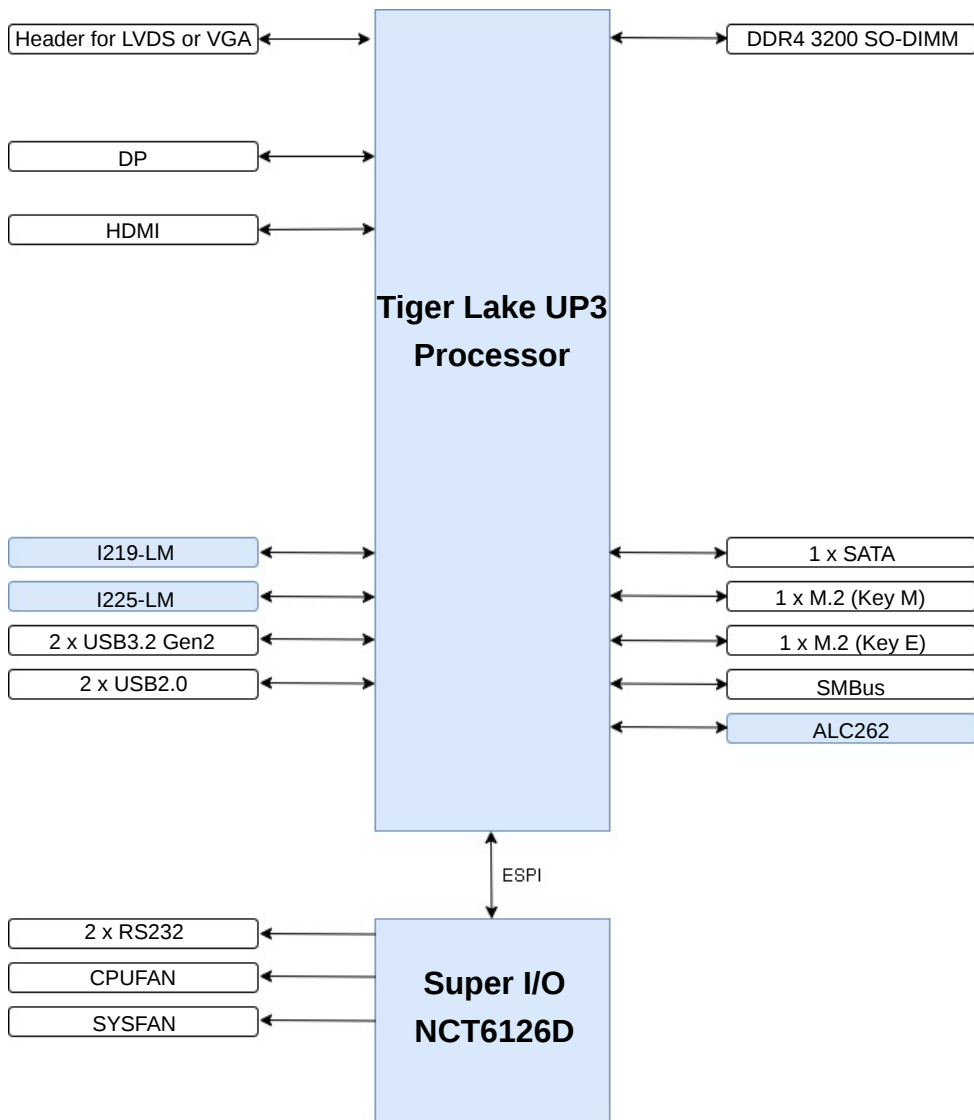
I/O

Serial ATA	1 x SATA3
Audio	Realtek ALC262 HD Audio
Internal I/O	1 x SATA3, 2 x USB2.0, 2 x RS232, 1 x Header for LVDS or VGA, 1 x Audio, 1 x SMBus, 1 x RJ45 LED Connector
Rear I/O	1 x DisplayPort, 1 x HDMI, 2 x USB3.2 Gen2, 2 x LAN

Mechanical & Environmental

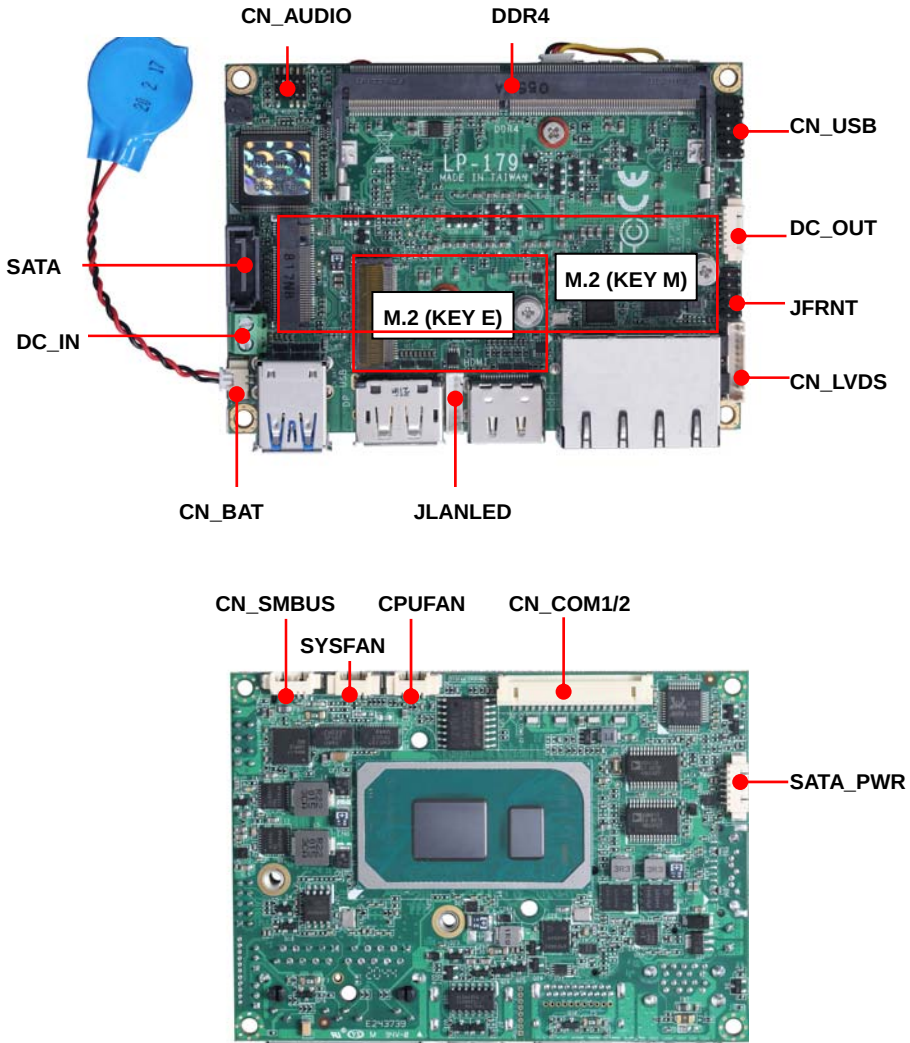
Power Requirement	DC input 12V±5%
Size	100 mm x 72mm (L x W)
Temperature	Operating within 0°C~60°C (32°F~140°F) Storage within -20°C~80°C (-4°F~176°F)
Relative Humidity	10%~90%, non-condensing

1.3 <Block Diagram>



Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>





USB DP HDMI RJ-45-1 RJ-45-2

2.1.1 <Internal connectors list>

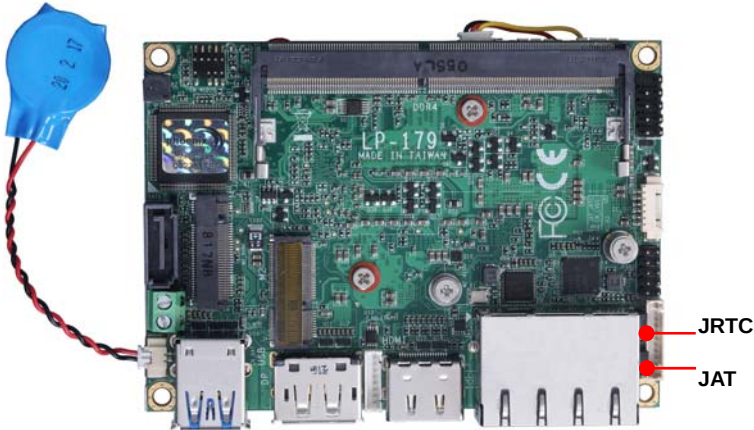
Connector	Function
DDR4	260-pin DDR4 SO-DIMM slot
CN_AUDIO	5 x 2-pin audio pin header
CN_LVDS	11-pin connector (For ADP-3460E or ADP-3355)
CN_COM1/2	19-pin RS232 connector
CN_USB	5 x 2-pin USB2.0 pin header
CN_SMBus	5-pin SMBus connector
CPUFAN	4-pin CPU fan connector
SYSFAN	4-pin System fan connector
JFRNT	5 x 2-pin front panel switch/indicator pin header
JLANLED	8 pin RJ45 LED connector
M2 (KEY E)	75-pin M.2 Key E slot
M2 (KEY M)	75-pin M.2 Key M slot 2280 only
DC_OUT	6-pin Power connector
SATA_PWR	6-pin SATA Power connector
DC_IN	2-pin power input Terminal Block (DC 12V±5% ONLY)

2.1.2 <External connectors list>

Connector	Function
HDMI	HDMI connector
DP	DisplayPort connector
USB	2 x USB3.2 Gen2 connector
RJ-45-1	RJ45 connector (I219)
RJ-45-2	RJ45 connector (I225)

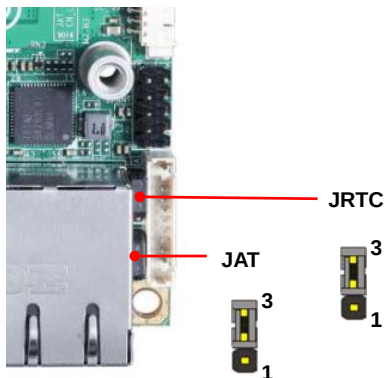
2.2 <Jumper Location and Reference>

2.2.1 <Jumper list>



Jumper	Function
JAT	Power mode select
JRTC	CMOS Normal/Clear Setting

2.2.2 <Clear CMOS and Power on type selection>



JRTC: Clear CMOS data jumper

Jumper settings	Function
1-2	Clear CMOS
2-3	Normal (Default)

JAT: AT/ATX mode select jumper

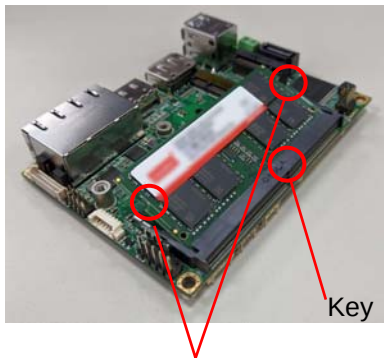
Jumper settings	Function
1-2	AT mode
2-3	ATX mode (Default)

2.3 <Installing the Memory>

LP-179 has 260-pin DDR4 SODIMM support up to 32GB of memory capacity and 1.2 Voltage. Only Non-ECC memory is supported.

In the process, the board must be powered off.

1. Put the memory tilt into the slot. Note the Memory notch key aligned slot key.
2. Then press down till lock into the mounting notch.

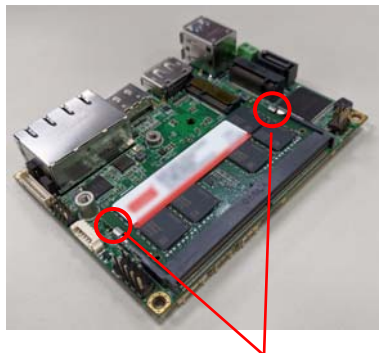


Press down



Mounting notch

3. To remove the memory, push outward on both sides of the latch.



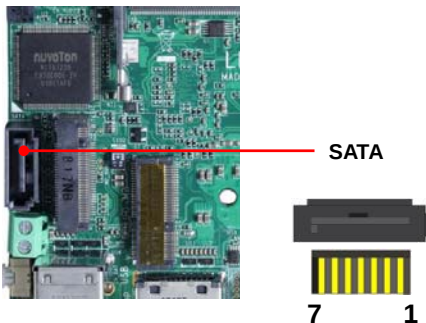
Latch

2.4 <I/O interface>

2.4.1 <Serial ATA interface>

SATA : SATA3 7-pin connector

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND



2.4.2 <Ethernet interface>

The board provides I225-LM and I219-LM Gigabit Ethernet which support Wake on LAN.



I219 I225

2.4.3 <Display interface>

Based on the 11th Gen CPU with built-in Intel® UHD Graphics, the DisplayPort resolution up to 3840x2160 @ 60Hz or 4096x2304 @ 60Hz, the HDMI up to 4096x2304 @ 24Hz and LVDS up to 1920x1200 @ 60Hz supports single bus or dual bus LVDS signaling with color depths of 18 bits or 24 bits. About select LCD Panel Type in BIOS, please refer [Appendix B](#). The built-in HD Graphics support triple display function with clone mode and extended mode.



CN_LVDS

11

1



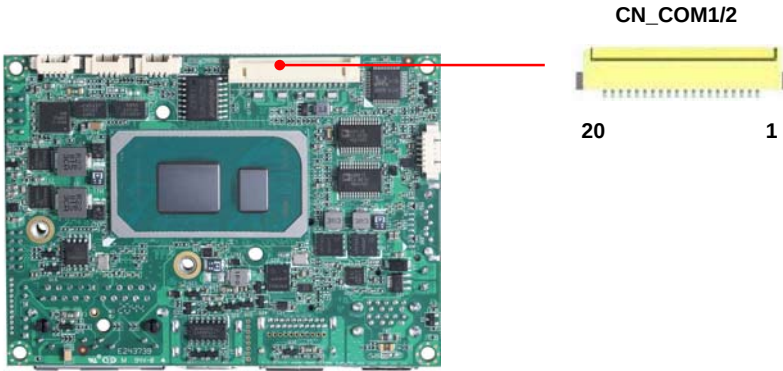
DP HDMI

CN_LVDS: 11-pin connector

Pin	Signal	Pin	Signal
1	eDP_0+	2	eDP_0-
3	GND	4	eDP_1+
5	eDP_1-	6	GND
7	eDP_AUX+	8	eDP_AUX-
9	GND	10	HPD
11	3.3V		

There are two modules [ADP-3355](#) and [ADP-3460E](#), you can choose the one to support VGA or LVDS, please refer [Appendix E](#).

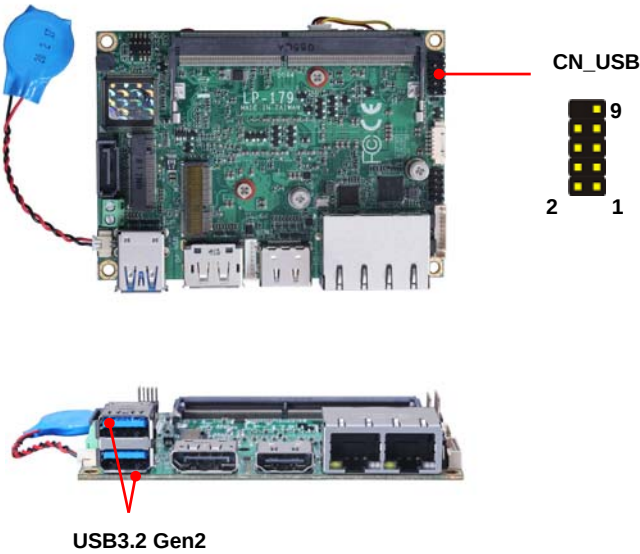
2.4.4 <Serial Port interface>



CN_COM1/2: RS232 20-pin connector

Pin	Signal	Pin	Signal
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	RI1	10	NC
11	DCD2	12	RXD2
13	TXD2	14	DTR2
15	GND	16	DSR2
17	RTS2	18	CTS2
19	RI2	20	Key

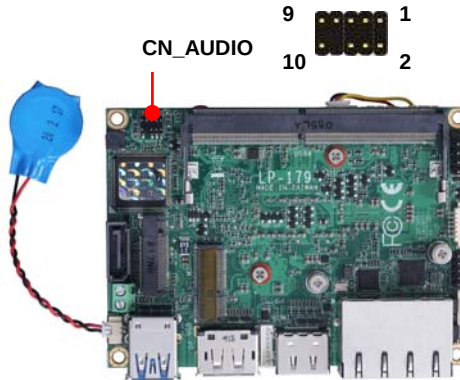
2.4.5 <USB interface>



CN_USB: Front panel USB2.0 10-pin header (Pitch 2.54mm)

Pin	Signal	Pin	Signal
1	5VSB	2	5VSB
3	DATA0-	4	DATA1-
5	DATA0+	6	DATA1+
7	GND	8	GND
9	GND	10	Key

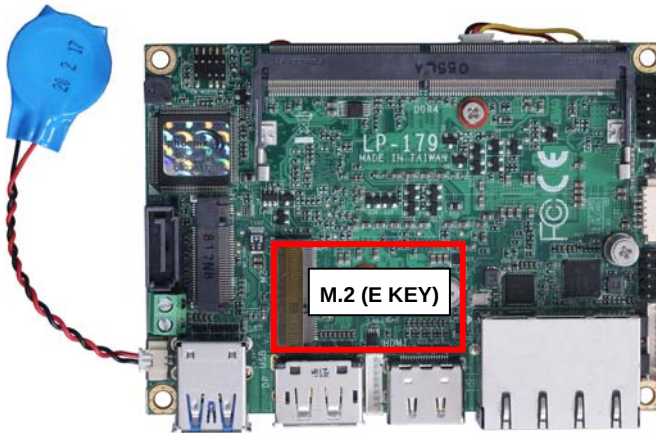
2.4.6 <Audio interface>



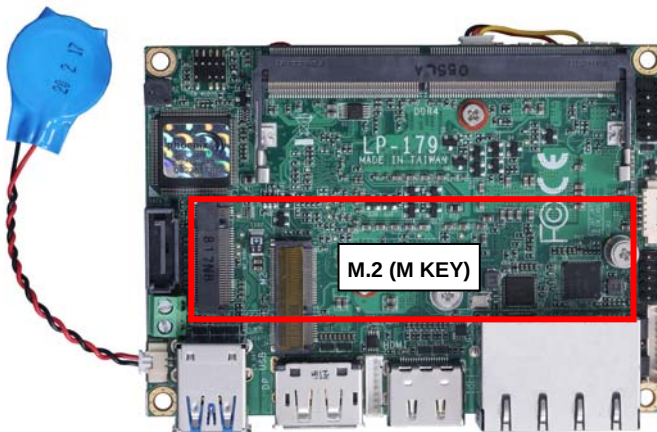
CN_AUDIO: Front panel audio 10-pin header (Pitch 1.27mm x 2.54mm)

Pin	Signal	Pin	Signal
1	MIC_L	2	GND
3	MIC_R	4	NC
5	FP_OUT_R	6	MIC_DETECT
7	SENSE	8	Key
9	FP_OUT_L	10	FP_OUT_DETECT

2.4.7 <Expansion slot>



M2 (Key E) with 2 x PCI Express x1 support WI-FI and Bluetooth Module



M2 (Key M) with 4 x PCIe Gen4 support NVMe SSD

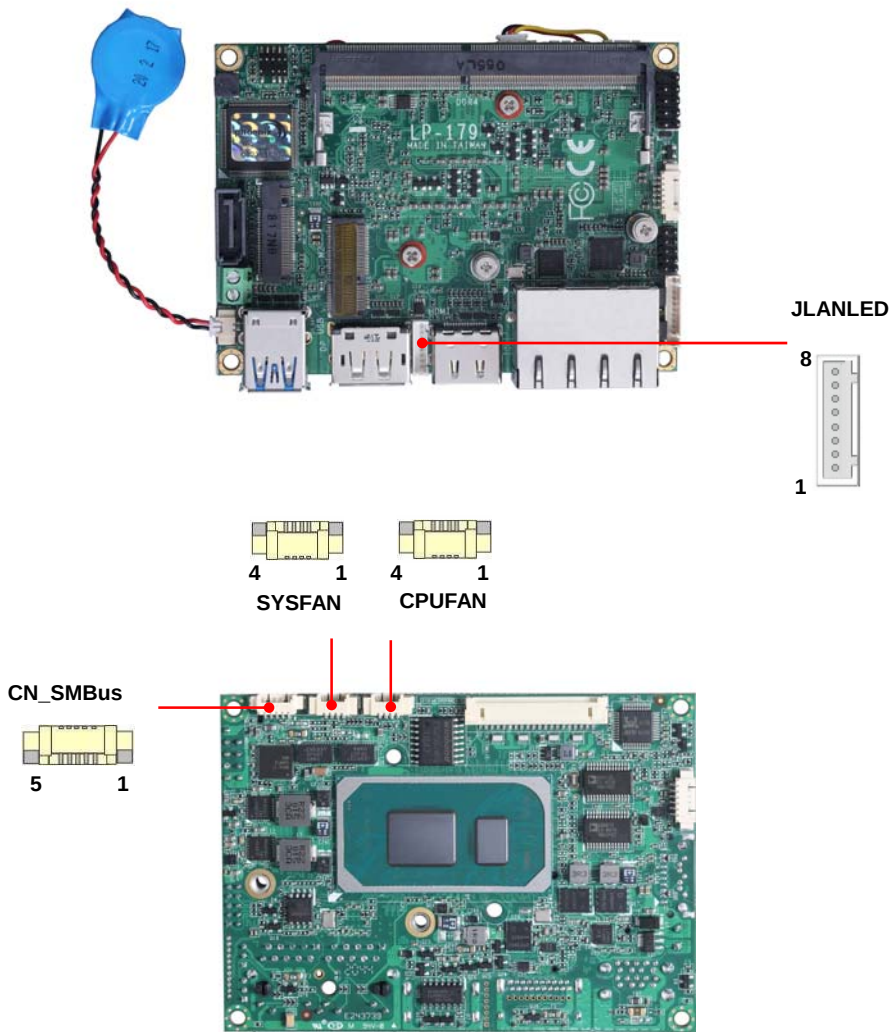
2.4.8 <Front panel switch and indicator>



JFRNT: Front panel switch and indicator 10-pin header (Pitch 2.00mm)

Pin	Signal	Pin	Signal
1	Power_ON-	2	Power_ON+
3	Speaker-	4	Speaker+
5	HDD_LED-	6	HDD_LED+
7	Power_LED-	8	Power_LED+
9	Reset+	10	Reset-

2.4.9 <SMBus and Other Interface>



JLANLED: RJ45 LED 8-pin connector

Pin	Signal
1	I219 SPEED LED+ (1G) / I219 SPEED LED- (10/100M)
2	I219 SPEED LED- (1G) / I219 SPEED LED+ (10/100M)
3	I219 ACT LED-
4	I219 ACT LED+
5	I225 SPEED LED+ (2.5G) / I225 SPEED LED- (1G)
6	I225 SPEED LED- (2.5G) / I225 SPEED LED+ (1G)
7	I225 ACT LED-
8	I225 ACT LED+

CN_SMBus: SMBus 5-pin connector

Pin	Signal
1	5V
2	NC
3	SMBDAT
4	SMBCLK
5	GND

CPUFAN: CPU cooler fan 4-pin connector

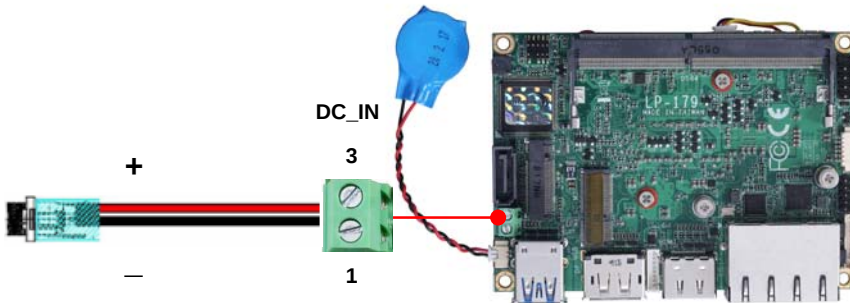
Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

SYSFAN: System cooler fan 4-pin connector

Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

2.5 <Power supply>

2.5.1 <Power input>



DC_IN: Terminal block 2-pin power connector

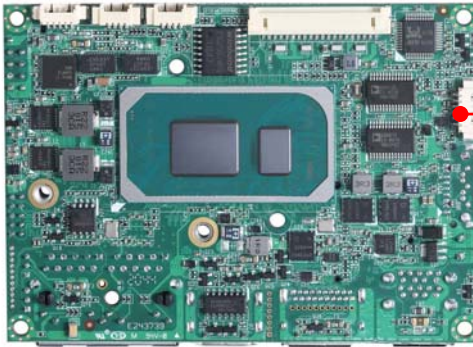
Pin	Signal	Pin	Signal
1	GND	3	12V $\pm 5\%$

2.5.2 <Power output>

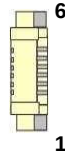


DC_OUT: power 6-pin connector

Pin	Signal
1	12V
2	12V
3	GND
4	GND
5	5V
6	5V



SATA_PWR



SATA_PWR: power 6-pin connector

Pin	Signal
1	NC
2	NC
3	GND
4	GND
5	5V
6	5V

Appendix A <Flash BIOS>

A.1 <Flash tool>

The board is based on Phoenix BIOS and can be updated easily by the BIOS auto flash tool. You can download the tool online at the address below:

[FPT Tool](#)

The tool's file name is "FPT.efi", it's the utility that can write the data into the BIOS flash chip and update the BIOS.

A.2 <Flash BIOS process>

- 1.Extract the zip file(re-flash tool and BIOS file) to root of the USB flash drive.
- 2.Insert your USB flash drive in USB port of the board and power on the system.
- 3.Press F5 in the Phoenix Logo screen
- 4.Click the Internal Shell, then input the "fs0:" command to switch to the root of the USB flash drive.
5. Type the " fpt -savemac -f xxx.bin" command to start flash BIOS processes.
(xxx.bin means the BIOS file that you want to update)
6. When it finished all update processes, restart the system.

```

UEFI Interaction Shell v2.7
EDX 11
UEFI v2.70 (Phoenix Technologies Ltd., 0x1234567D)
Mapping table
FS0: 011as62-H0065535a11:BLK2:
      PciRoot(0x0)/Pci(0xL,0x0)/Sata(0x2,0x0FFF,0x0)/HD(1,GPT,355c6b01-1EEE-436E-8CF4-31CDB90E390F,0x800,0x100000)
BLK0: 011as62:
      PciRoot(0x0)/Pci(0xL,0x0)/Sata(0x1,0x0FFF,0x0)
BLK1: 011as62:
      PciRoot(0x0)/Pci(0xL,0x0)/Sata(0x2,0x0FFF,0x0)
BLK2: 011as62:
      PciRoot(0x0)/Pci(0xL,0x0)/Sata(0x2,0x0FFF,0x0)/HD(2,GPT,47E45D01-0C06-4F3F-B90E-128ED00C0808,0x100080,0x763F000)
Press ESC in 2 seconds to skip startup.nsh or any other key to continue.
Shell>
Shell>
Shell> Fs0:
FS0-> fpt -savemac -f G71210_bin_

```

Appendix B <LCD Panel Type select>

According your panel, it needs to select the correct resolution in the BIOS. If there is no fit your panel type, please feedback for us to make OEM model.

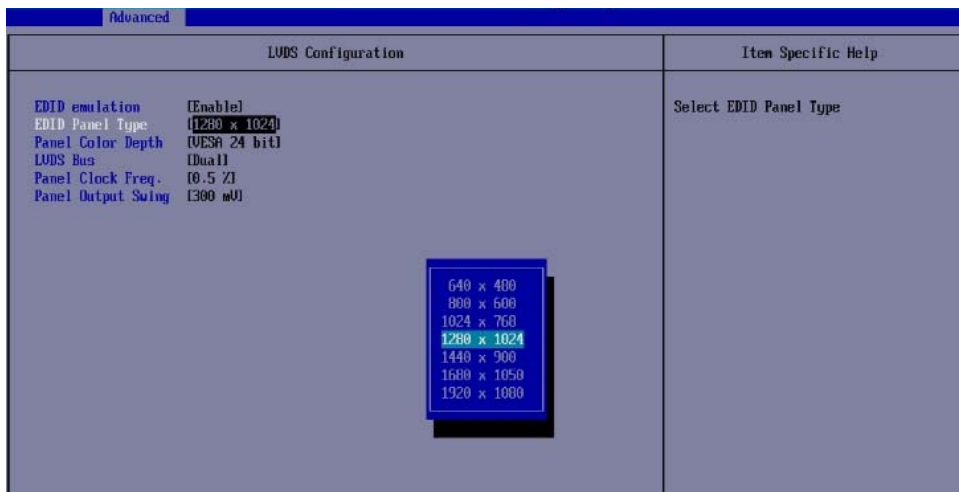
Find the setting from

Advanced->Motherboard Advanced menu->LVDS Configuration

EDID Panel type: There are 7 resolutions in LCD Panel Type, if your panel is not in the list, please contact tech@commell.com.tw

LVDS Bus: Select Single / Dual channel

Panel Color Depth: Select VESA 24 bit / JEIDA 24 bit / VESA and JEIDA 18 bit



Appendix C <Programmable Watch Dog Timer>

The watchdog timer makes the system auto-reset while it stops to work for a period. The integrated watchdog timer can be setup as system reset mode by program. You can select Timer setting in the BIOS, after setting the time options, the system will reset according to the period of your selection.

Find the setting from

Advanced→Motherboard Advanced Menu->Power Advanced menu->

Watch dog timer select



Program sample

Watchdog timer setup as system reset with 5 second of timeout

```
-o 4E 87      ;enter configuration
-o 4E 87
-o 4E 07
-o 4F 08      ;select Logical Device
-o 4E 30
-o 4F 01      ; activate WDTO# function
-o 4E F0
-o 4F 00      ;set "00" is second mode, set "08" is minute mode
-o 4E F1
-o 4F 05      ;00h: Timeout Disable
                ;01h: Timeout occurs after 1 minute only
                ;02h: Timeout occurs after 2 second/minute
                ;03h: Timeout occurs after 3 second/minute
                ;
                ;FFh: Timeout occurs after 255 second/minute
                (The deviation is approx 1 second.)
```

For further information, please refer to Nuvoton NCT6126D datasheet

Appendix D <Hardware Monitor>

Find the setting from

Advanced→ Motherboard Advanced Menu→ Advanced→Super IO
Configuration→Hardware Monitor

Advanced	
Hardware Monitor	
System Temperature	[31 C]
PECI Temperature	[31 C]
System Fan Speed	[0 RPM]
CPU Fan Speed	[4530 RPM]
Battery 3V (VBAT)	[2.976 V]
CPU VCCORE	[1.312 V]
12V	[12.030 V]
5V	[5.040 V]
3.3V	[3.312 V]

Appendix E <Setup ADP-3355,ADP-3460E>

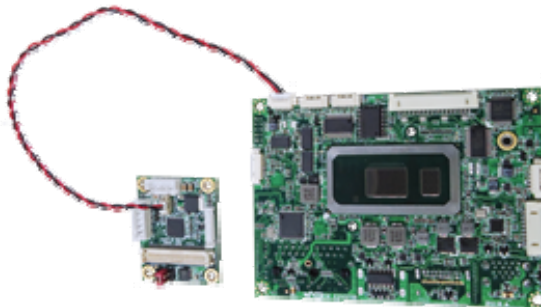
LP-179 have a Header for VGA or LVDS , it's no need install extra driver.

You have to connect SMBus cable to LP-179 (Please see the [picture](#) below), then LVDS Configuration in BIOS Setup menu can work.

For further information, please refer to the manual.

[ADP-3355 manual](#)

[ADP-3460 manual](#)



Contact information

Any advice or comment about our products and service, or anything we can help you please don't hesitate to contact with us. We will do our best to support you for your products, projects and business.

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