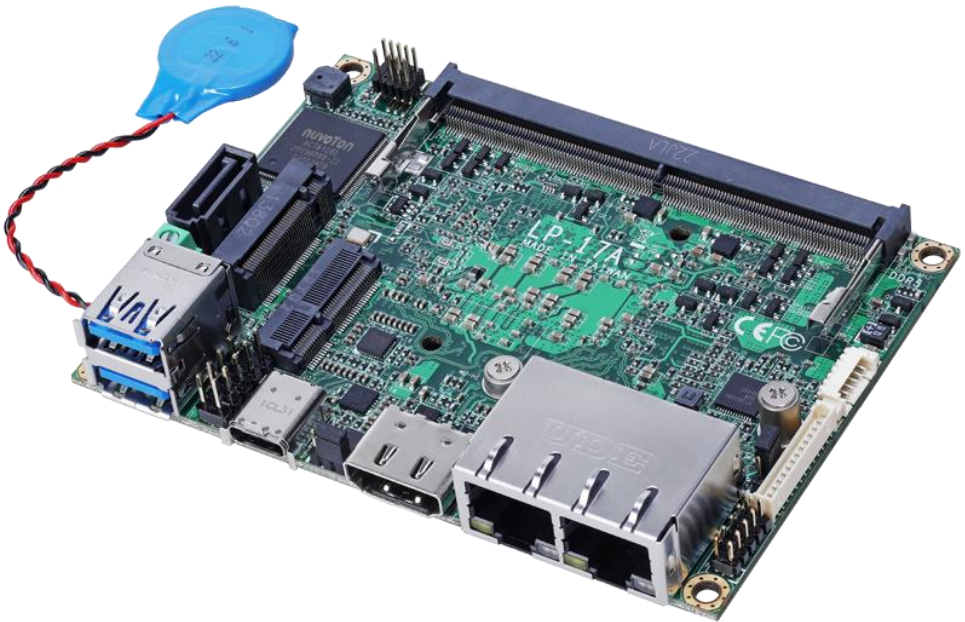




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Packing List:

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



**1 x LP-17A Pico-ITX Motherboard
(Including Cooler Fan)**



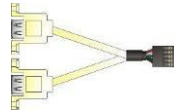
**1 xDC Input Power Cable
(OALDC-B / 1040513)**



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



**1 x COM Cable
(OALCS-BKU1-H14NB / 1040378)**



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



**1 x Audio cable
(OALPJ-HDUNB / 1040123)**

Optional module:



**ADP-3460SMB
DisplayPort to LVDS module
((Including CN_EDP Cable)**

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Chapter 1 <Introduction>

1.1 <Product Overview>

LP-17A is a Pico-ITX Motherboard which supports 12th & 13th Gen U Processors, integrated Intel® UHD Graphics, DDR5 memory, Realtek High Definition Audio, Intel Gigabit LAN, USB3.2 Gen2, SATA3 with AHCI function for a system.

New feature for Alder Lake(12th) & Raptor Lake(13th)

12th & 13th Gen Processors are based on the 7nm SuperFin process, and offer long-life availability. i7-1265UE / i7-1365UE processor with 2 P-cores and 8 E-cores. P-cores can help you handle heavy tasks, and E-cores run background tasks efficiently to save power.

All in One multimedia solution

The board provides high performance onboard graphics, and supports Type C (Alt mode), HDMI, and High Definition Audio, to meet the very requirement of the multimedia application.

Alder Lake support Windows 10 version 21H2 64bit and Linux 5.18

Intel recommends using Windows 10 version 21H2 64bit. It may lose some drivers if you use other Windows version.

1.2 <Product Specification>

System

Processor	12 th & 13 th Gen Intel® Core™ U Processor FCBGA1744 package
Memory	1 x DDR5 SO-DIMM 4800 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 2230 Key E for Wi-Fi and Bluetooth 1 x M.2 2280 Key M support PCIe Gen4 or SATA

Graphics

Chipset	Intel® UHD Graphics
Display Interface	1 x Type-C (DP Alt. Mode), 1 x HDMI

LAN

Chip	1 x Intel® I219-LM Gigabit PHY LAN (supports Intel® AMT 16) 1 x Intel® I226-LM Gigabit LAN (up to 2.5GbE)
------	---

I/O

Serial ATA	1 x SATA3
Audio	Realtek ALC888S HD Audio
Internal I/O	1 x SATA3, 2 x USB2.0, 1 x Audio, 1 x GPIO 1 x RS232/ RS422/ RS485 1 x Header for LVDS (Note1)
Rear I/O	1 x Type-C (DP Alt.Mode), 1 x HDMI, 2 x LAN, 2 x USB3.2 Gen2

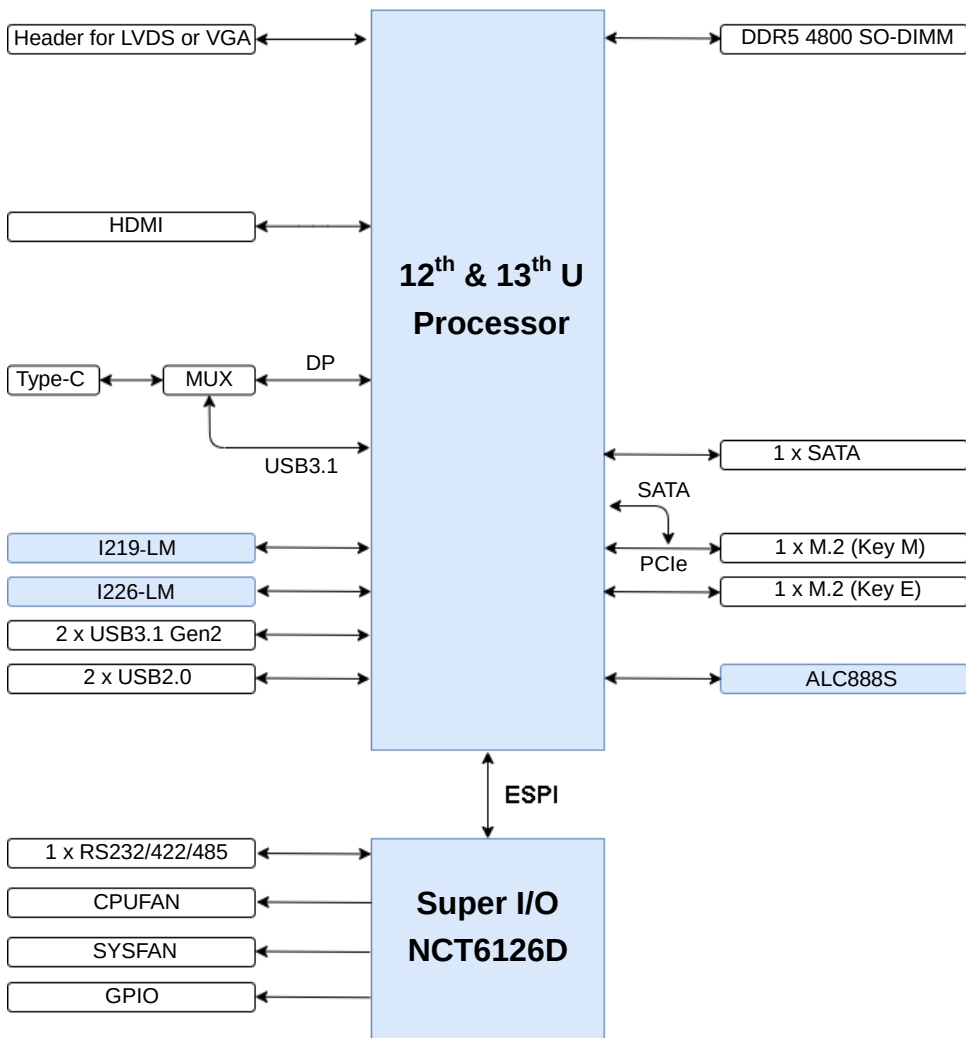
Mechanical & Environmental

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

Note1: Add ADP-3460SMB supports LVDS.

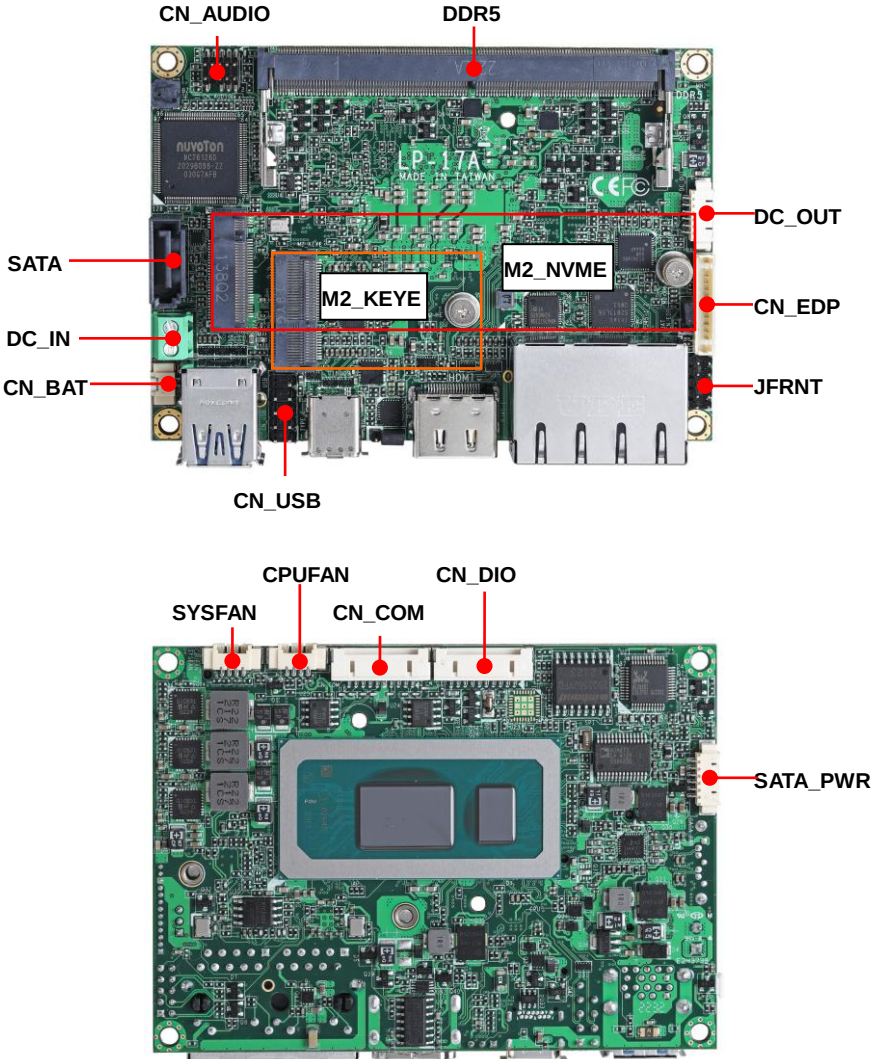
Note2: If you want to use VGA (ADP-3355), please contact with our sales for oem version.

1.3 <Block Diagram>



Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>





USB Type C HDMI RJ-45-1 RJ-45-2

2.1.1 <Internal connectors list>

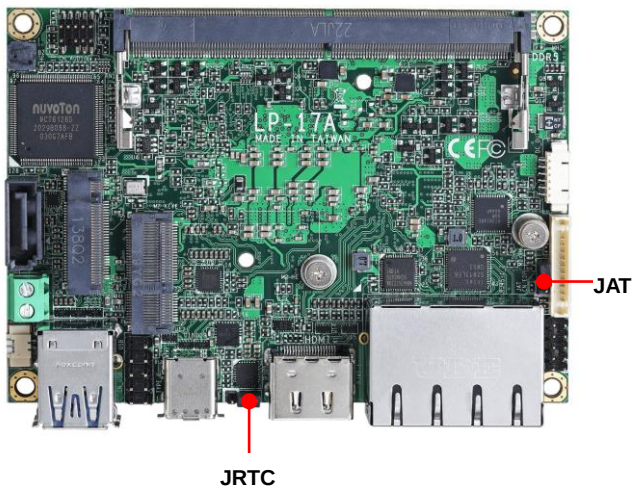
Connector	Function
DDR5	262-pin DDR5 SO-DIMM slot
CN_AUDIO	5 x 2-pin audio pin header
CN_EDP	13-pin connector (For ADP-3460 or ADP-3355)
CN_COM	10-pin RS232/RS422/RS485 connector
CN_USB	5 x 2-pin USB2.0 pin header
CPUFAN	4-pin CPU fan connector
SYSFAN	4-pin System fan connector
JFRNT	5 x 2-pin front panel switch/indicator pin header
M2_KEYE	75-pin M.2 Key E slot
M2_NVME	75-pin M.2 2280 Key M support PCIe Gen4 and SATA
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
Type C	Support USB3.2 gen2 or DP
USB	2 x USB3.2 Gen2 connector
RJ-45-1	RJ45 connector (I219)
RJ-45-2	RJ45 connector (I226)

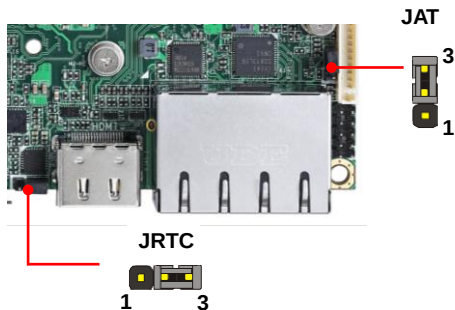
2.2 <Jumper Location and Reference>

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

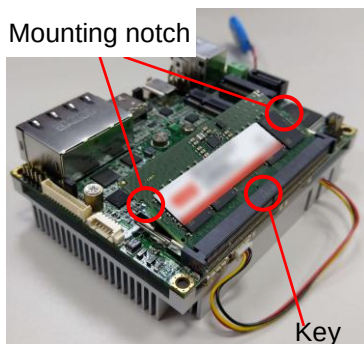
Jumper settings	Function
1-2	AT mode
2-3	ATX mode (Default)

2.3 <Installing the Memory>

LP-17A has 262-pin DDR5 SODIMM support up to 32GB of memory capacity and 1.1 Voltage. Only Non-ECC memory is supported.

In the process, the board must be powered off.

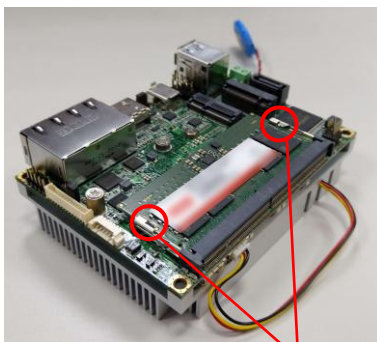
1. Put the memory tilt into the slot. Note the Memory notch key aligned slot key.
2. Then press down till lock into the mounting notch.



Press down



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



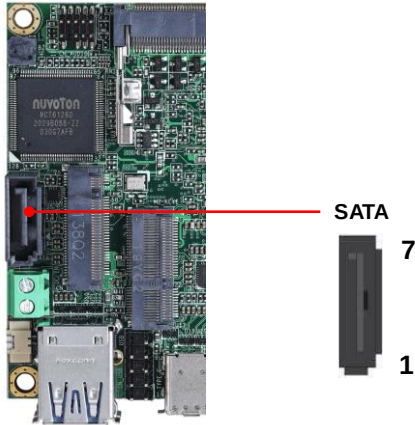
Latch

2.4 <I/O interface>

2.4.1 <Serial ATA interface>

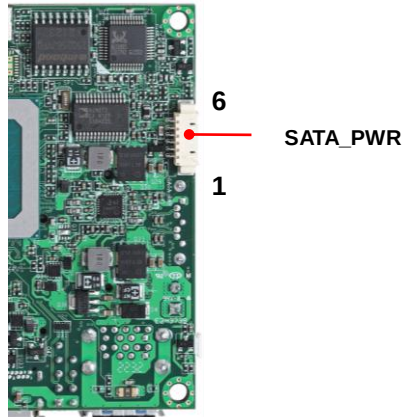
SATA : SATA3 7-pin connector

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



SATA_PWR : SATA3 Power connector

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



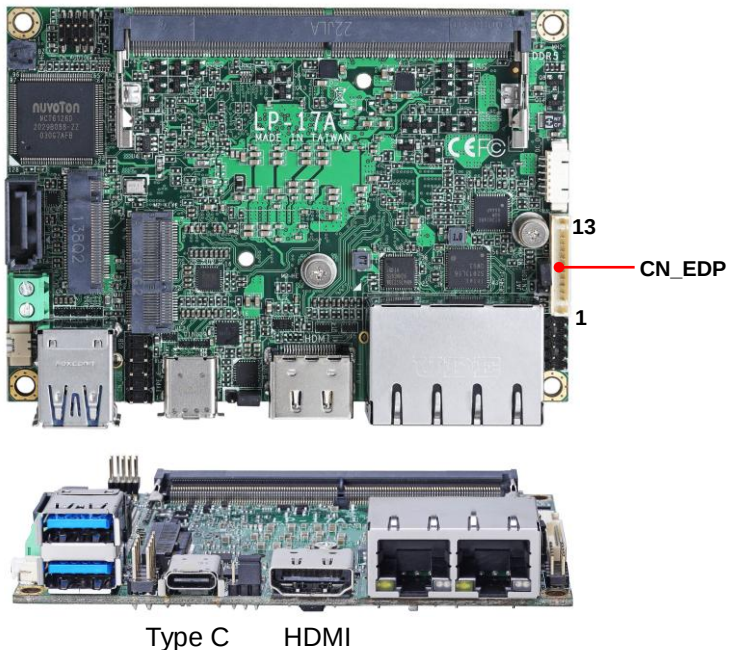
2.4.2 <Ethernet interface>

The board provides I226-LM and I219-LM Gigabit Ethernet which support Wake on LAN.



2.4.3 <Display interface>

Based on the 12th & 13th 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.



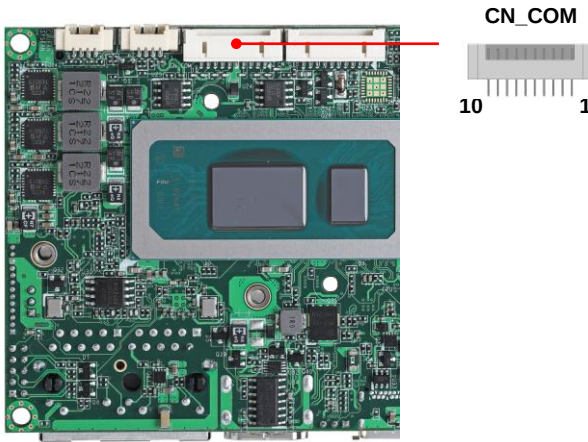
CN_EDP: 13-pin connector

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	12	SMBDATA
13	SMBCLK		

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

If you want to use ADP-3355, please contact sales for oem version.

2.4.4 <Serial Port interface>



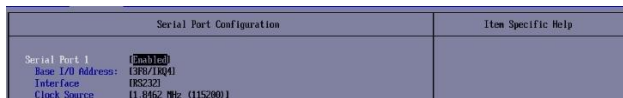
CN_COM: RS232/RS422/RS485 10-pin connector

Pin	Signal	Pin	Signal
1	DCD1/ 422TX-/ 485-	2	RXD1/ 422TX+/ 485+
3	TXD1	4	DTR1
5	GND	6	DSR1/ 422RX+
7	RTS1	8	CTS1/ 422RX-
9	RI1	10	NC

RS-232/422/485 can set by BIOS.

You can find the setting from

Advanced-> Motherboard Advanced menu-> Super IO configuration-> Serial Port configuration->Interface

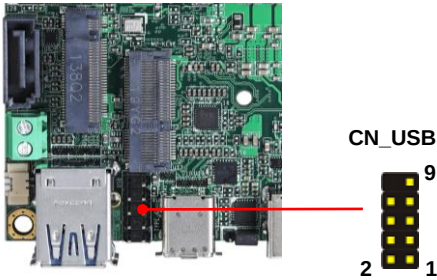


If you want to use RS485, please follow below step before connection. .

COM1 RTX- Data- : short Pin1& Pin8

COM1 RTX+ Data+ : short Pin2& Pin6

2.4.5 <USB interface>

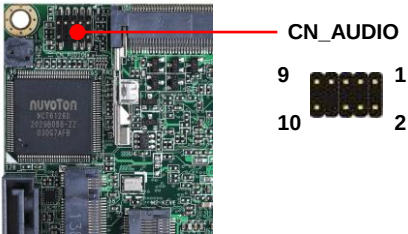


USB3.2 Gen2

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

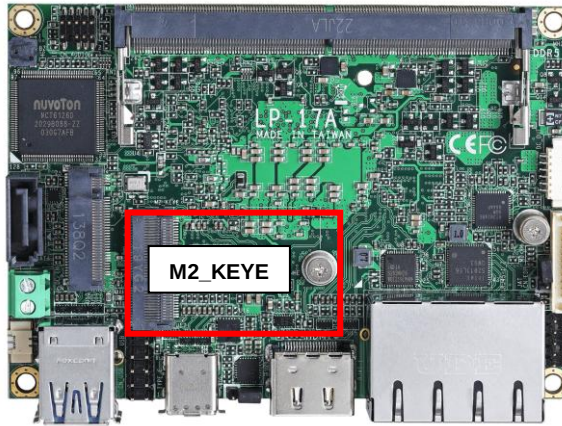
2.4.7 <Type C>



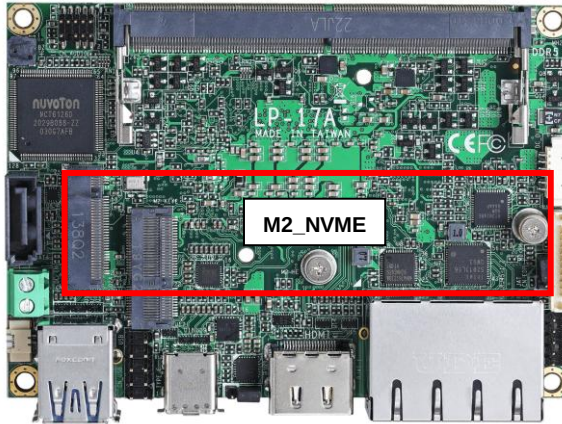
Type C

Type C supports USB 3.1 gen2 and DP Alt. mode, and provides 5V at 3A.

2.4.8 <Expansion slot>

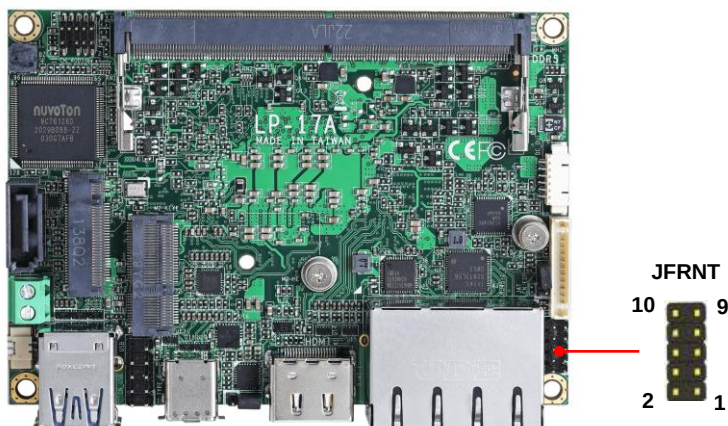


M2_KEYE with 1 x PCI Express x1 support WI-FI and Bluetooth Module



M2_NVME support PCIe Gen4 or SATA

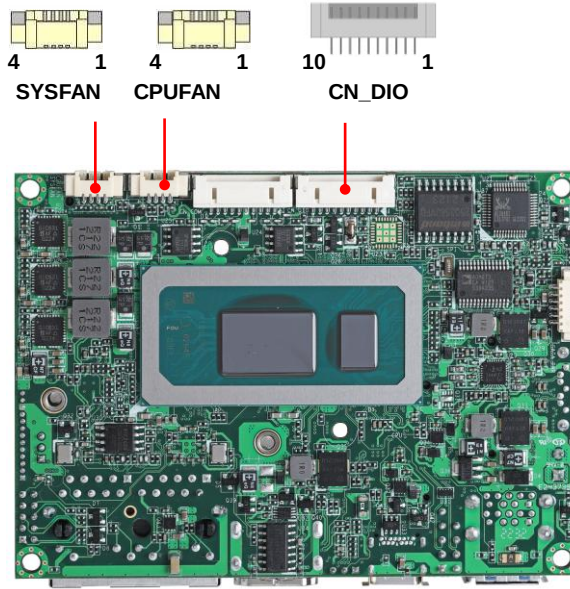
2.4.8 <Front panel switch and indicator>



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 <Other Interface>



CN_DIO: GPIO 10-pin connector

Pin	1	2	3	4	5
Signal	GPIO0	GPIO1	GPIO2	GPIO3	GND
Pin	6	7	8	9	10
Signal	GPIO4	GPIO5	GPIO6	GPIO7	5V

CPUFAN: CPU cooler fan 4-pin connector

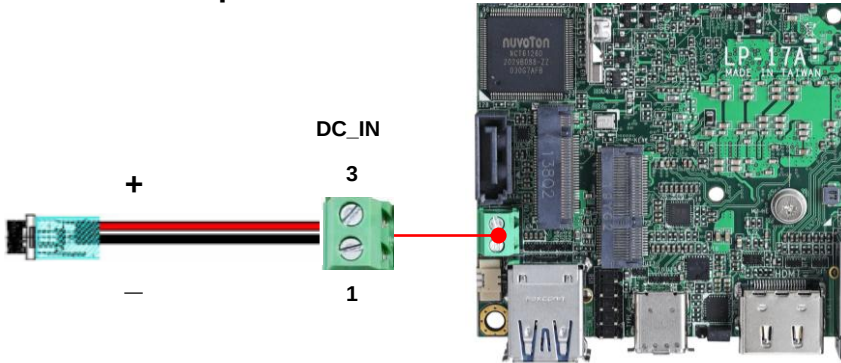
Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

SYSFAN: System cooler fan 4-pin connector

Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

2.5 <Power supply>

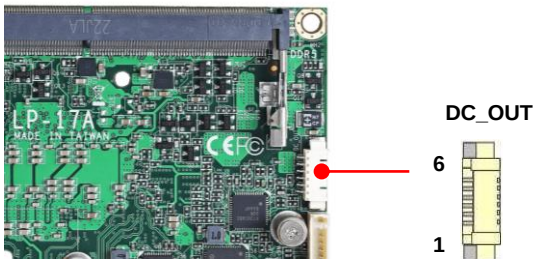
2.5.1 <Power input>



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

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.exe", 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 Interactive Shell v2.2
EDK II
UEFI v2.70 (Phoenix Technologies Ltd., 0x12345678)
Mapping table
FS0: Alias(s) :HD0p0b::BLK1:
    PciRoot (0x0)/Pci (0x14,0x0)/USB (0xF,0x0)/HD (1,GPT,C98627CA-4DD0-443C-B57C-965C9767287B,0x800,0x3947303)
FS1: Alias(s) :HD1b::BLK3:
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x1,03-12-04-00-00-3E-69-24)/HD (1,GPT,FC7D92D0-5901-4BB4-B962-417B361798AC,0x800,0x3200
0)
BLK0: Alias(s) :
    PciRoot (0x0)/Pci (0x14,0x0)/USB (0xF,0x0)
BLK2: Alias(s) :
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x1,03-12-04-00-00-3E-69-24)
BLK7: Alias(s) :
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x2,04-12-04-00-00-3E-69-24)
BLK4: Alias(s) :
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x1,03-12-04-00-00-3E-69-24)/HD (2,GPT,03602963-A321-4529-A295-076CF6748D24,0x32800,0x80
00)
BLK5: Alias(s) :
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x1,03-12-04-00-00-3E-69-24)/HD (3,GPT,7043D5DE-C9A7-45EA-B25F-8CDD2FDC016D,0x36800,0x1B
DEA28D)
BLK6: Alias(s) :
    PciRoot (0x0)/Pci (0xE,0x0)/NvMe (0x1,03-12-04-00-00-3E-69-24)/HD (4,GPT,E12B4413-6F65-4A2B-A7B3-D46626789E08,0x1BE25000,0
xFE800)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
Shell>
Shell> fs0:
FS0:\> fpt -savemac -f 6715.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.

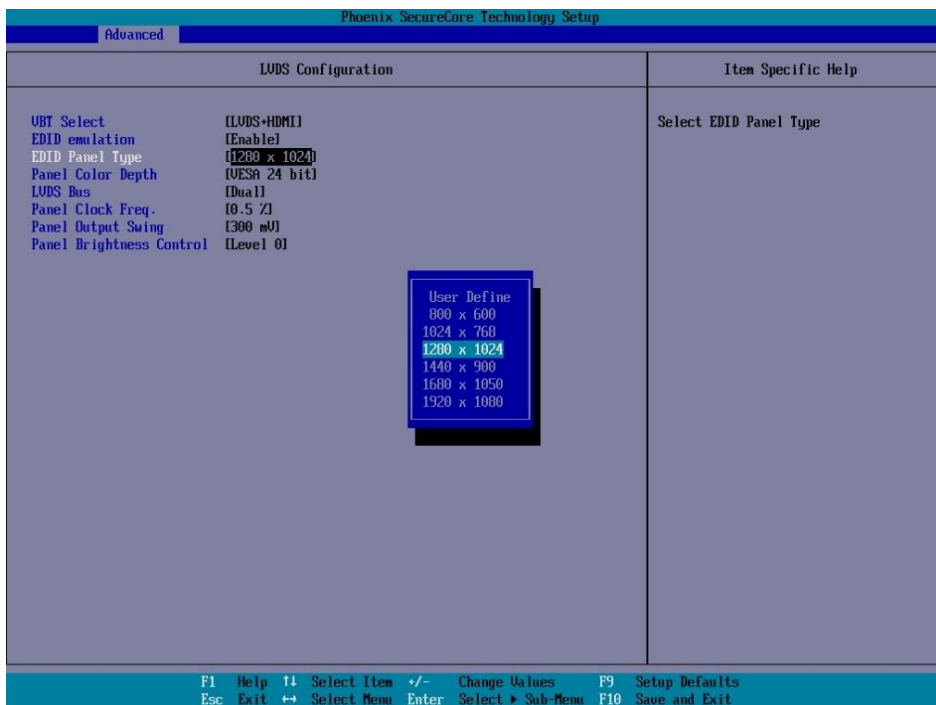
Find the setting from

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-> 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 <Programmable GPIO>

The GPIO can be programmed with the MS-DOS debug program using simple IN/OUT commands.

GPIO	0	1	2	3	4	5	6	7
bit	0	1	2	3	4	5	6	7

-o 4E 87 ;enter configuration
-o 4E 87
-o 4E 07
-o 4F 07 ;select Logical Device
-o 4E 30
-o 4F 18 ;activate GPIO function (The board use GPIO4)
-o 4E F0
-o 4F XX ;set "01" GPIO as input, set "00" GPIO as output
-o 4E F1
-o 4F XX ;if set GPIO as output, this register's value can be set "00~ FF"

Optional

-o 4E F2
-o 4F XX ;set "01", the respective bit are inverted (Both input and output)
 ;set "00", the respective bit are normal

For further information, please refer to Nuvoton NCT6126D datasheet

Appendix F <Setup ADP-3460SMB>

LP-17A have a Header for LVDS , it's no need install extra driver.

You have to use [CN EDP cable](#) to connect the motherboard.

For further information, please refer to the 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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