

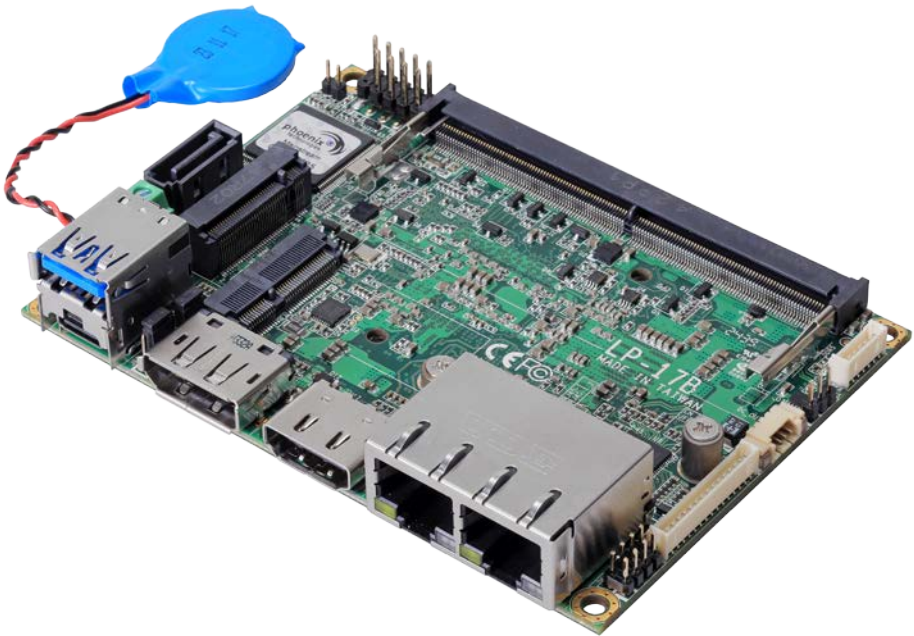
LP-17B

Pico-ITX Motherboard

User's Manual

Edition 1.0

2024/11/06



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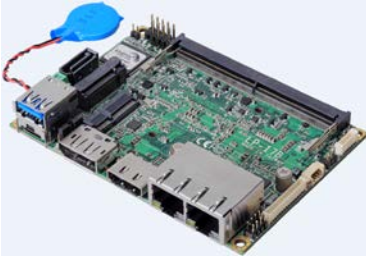
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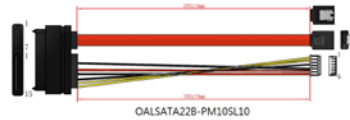
Please check the package content before you starting using the board.



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



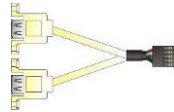
**1 x DC Input Power Cable
(OALDC-B / 1040513)**



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



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



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

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Chapter 1 <Introduction>

1.1 <Product Overview>

LP-17B is a Pico-ITX Motherboard which Ultra U Processors, integrated Intel® Graphics, DDR5 memory, Realtek High Definition Audio, Intel Gigabit LAN, USB3.2 Gen2, SATA3 with AHCI function for a system.

New feature for Meteor Lake

Ultra Processor Features up to 12 cores/14 threads, with built-in NPUs for AI accelerator.

And feature 3D performance hybrid architecture, combining two core microarchitectures on a single processor chip, prioritizing and distributing workloads to optimize performance.

All in One multimedia solution

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

Meteor Lake support Windows10 & 11 64bit and Linux

Intel recommends using Windows 10 & 11 64bit. It may lose some drivers if you use other Windows version.

Note

Refer to OS Vendor site for more information regarding latest OS revision support.

1.2 <Product Specification>

System

Processor	Intel® Core™ Ultra U Processor (MTL-U Platform) FCBGA2049 package
Memory	1 x DDR5 SO-DIMM 5600 MHz up to 48GB, 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® Graphics
Display Interface	1 x HDMI, 1 x DisplayPort ++, 1 x Type-C (DP Alt. Mode),

LAN

Chip	1 x Intel® I226-LM Gigabit LAN (up to 2.5GbE) 1 x Intel® I226-V Gigabit LAN (up to 2.5GbE)
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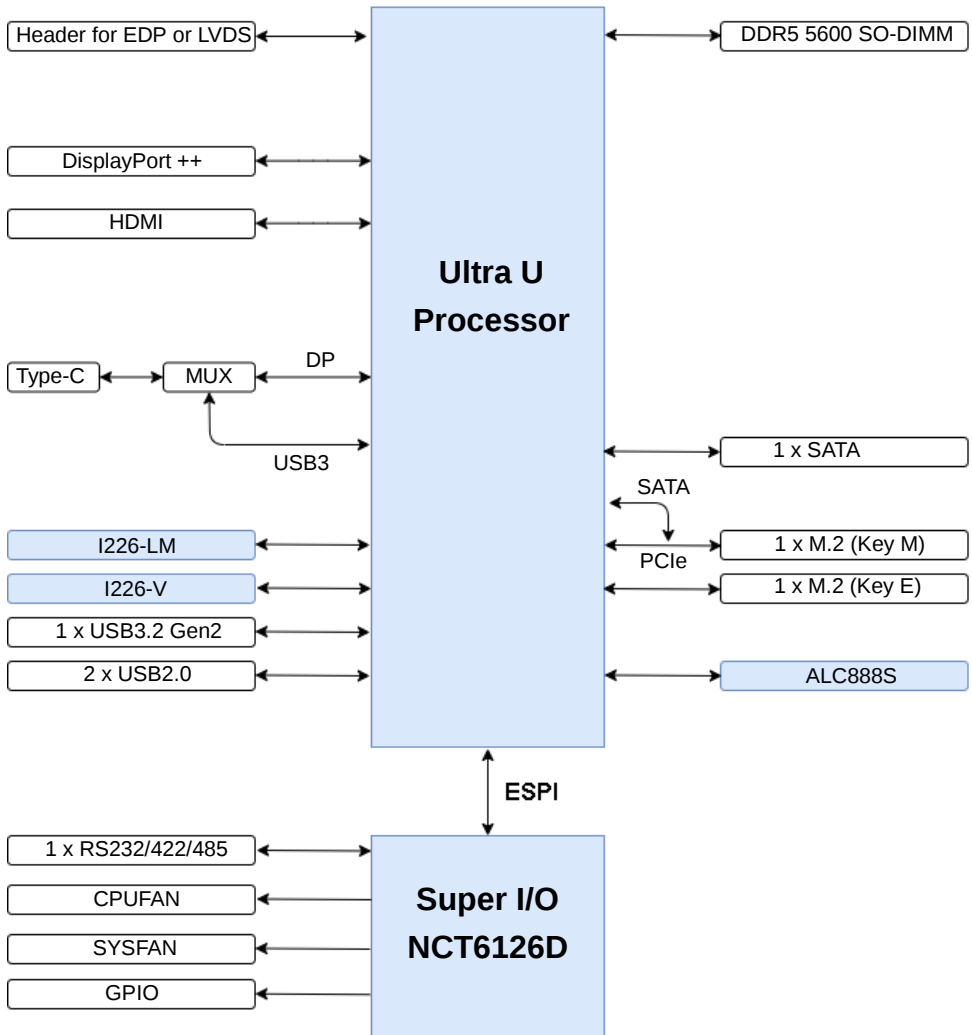
I/O

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

Mechanical & Environmental

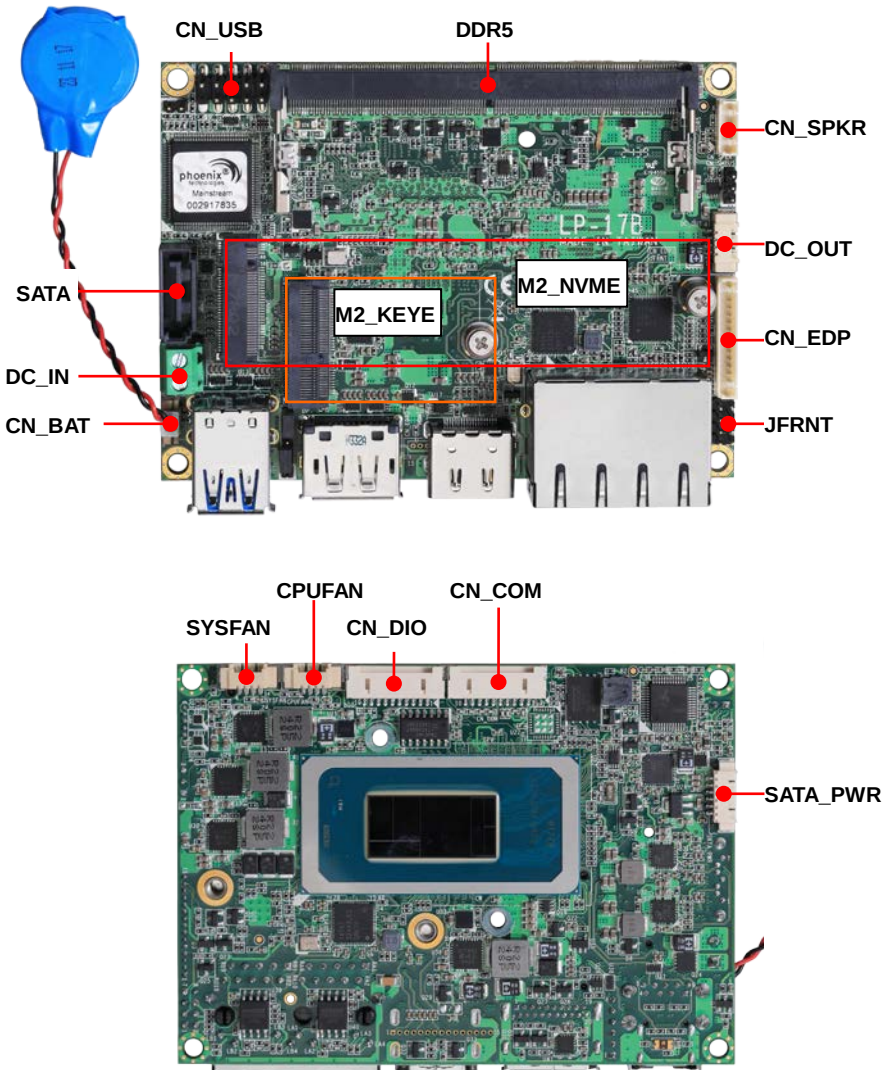
Power Requirement	DC input 12V±5%
Size	100 mm x 72mm (L x W)
Temperature	Operating within 0°C~60°C (32°F~140°F) Storage within -20°C~80°C (-4°F~176°F)
Relative Humidity	10%~90%, non-condensing

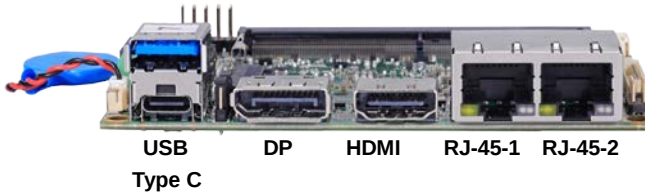
1.3 <Block Diagram>



Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>





2.1.1 <Internal connectors list>

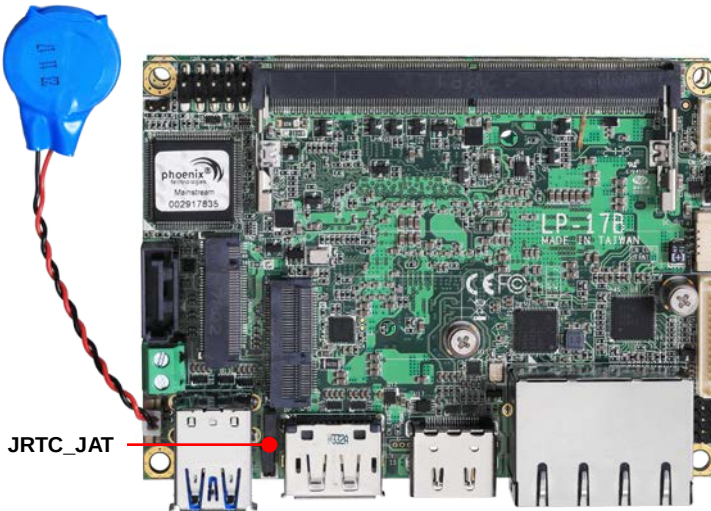
Connector	Function
DDR5	262-pin DDR5 SO-DIMM slot
SATA	7-pin SATA3 connector
CN_SPKR	6-pin audio pin header
CN_EDP	15-pin connector (For ADP-3460)
CN_COM	10-pin RS232/RS422/RS485 connector
CN_USB	5 x 2-pin USB2.0 pin header
CPUFAN	4-pin CPU fan connector
SYSFAN	4-pin System fan connector
JFRNT	4 x 2-pin 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	4-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
Type C	Support USB3.2 Gen2 or DP
USB	1 x USB3.2 Gen2 connector
RJ-45-1	RJ45 connector (I226-LM)
RJ-45-2	RJ45 connector (I226-V)

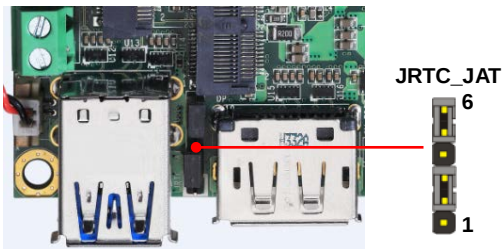
2.2 <Jumper Location and Reference>

2.2.1 <Jumper list>



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

2.2.2 <Clear CMOS and Power on type selection>



JRTC: Clear CMOS data jumper

JAT: AT/ATX mode select jumper

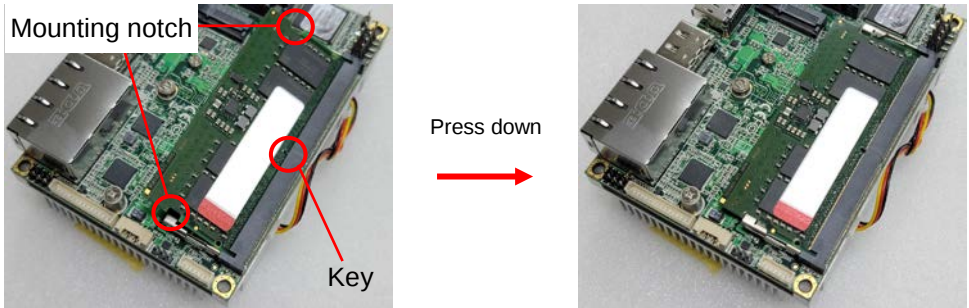
Jumper settings	Function
1-2	Clear CMOS
2-3	Normal (Default)
4-5	AT mode
5-6	ATX mode (Default)

2.3 <Installing the Memory>

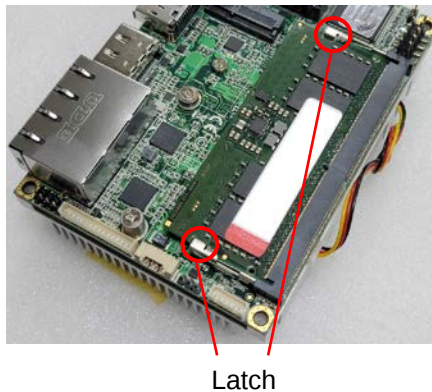
LP-17B has 262-pin DDR5 SODIMM support up to 48GB of memory capacity and 1.1 Voltage. Only Non-ECC memory is supported.

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.



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

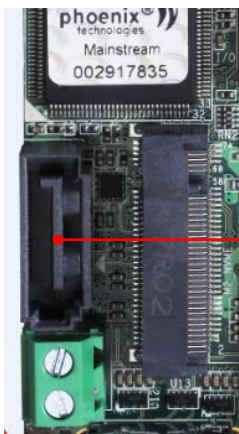


2.4 <I/O interface>

2.4.1 <Serial ATA interface>

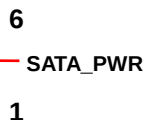
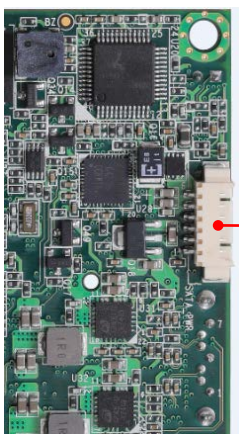
SATA : SATA3 7-pin connector

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 I226-V Gigabit Ethernet which support Wake on LAN.

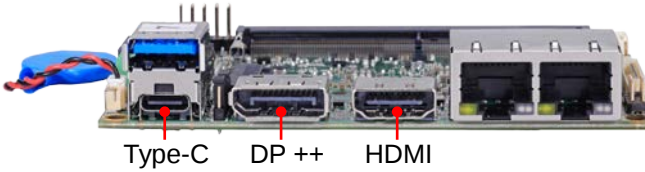


I226-LM I226-V

2.4.3 <Display interface>

Based on the Ultra CPU (MTL-U Platform) with built-in Intel® Graphics, the DisplayPort ++ resolution up to 3840x2160 @ 60Hz or 4096x2304 @ 60Hz, the HDMI up to 4096x2304 @ 24Hz, the Type-C(DP Alt. Mode) 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 A](#). The built-in Graphics support Quad display function with clone mode and extended mode.

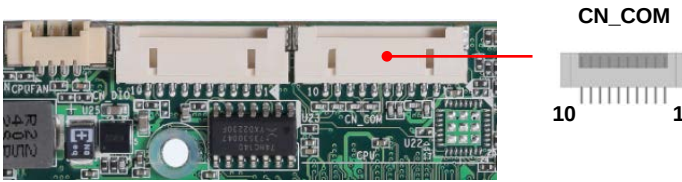




CN_EDP: 15-pin connector

Pin	Signal	Pin	Signal
1	eDP_0+	9	GND
2	eDP_0-	10	HPD
3	GND	11	3.3V
4	eDP_1+	12	3.3V
5	eDP_1-	13	GND
6	GND	14	Backlight Control
7	eDP_AUX+	15	Enable Backlight
8	eDP_AUX-		

2.4.4 <Serial Port interface>



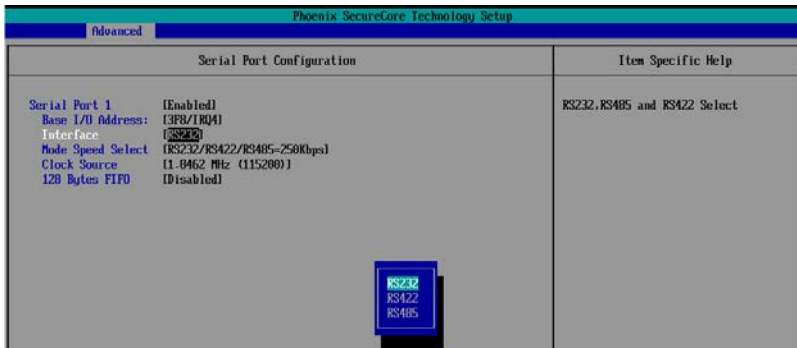
CN_COM: RS232/RS422/RS485 10-pin connector

Pin	Signal	Pin	Signal
1	DCD/ 422TX-/ 485-	2	RXD/ 422TX+/ 485+
3	TXD/ 422RX+	4	DTR/ 422RX-
5	GND	6	DSR
7	RTS	8	CTS
9	RI	10	NC

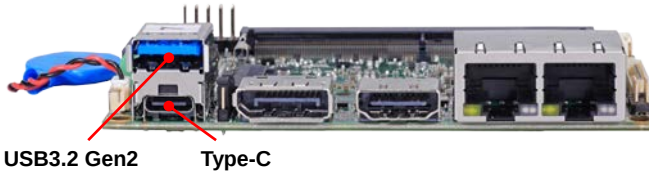
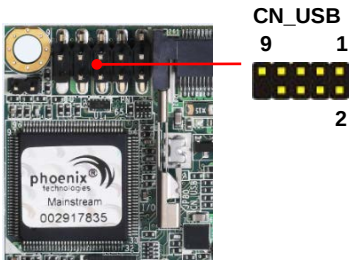
RS-232/422/485 can set by BIOS.

You can find the setting from

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



2.4.5 <USB interface>



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

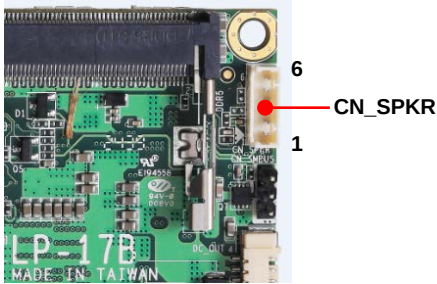
Pin	Signal	Pin	Signal
1	5VSB	2	5VSB
3	DATA0-	4	DATA1-
5	DATA0+	6	DATA1+
7	GND	8	GND
9	GND	10	N/A

2.4.6 <Type C>



Type C supports USB 3.2 Gen2 and DP Alt. mode, and provides 5V at 3A.

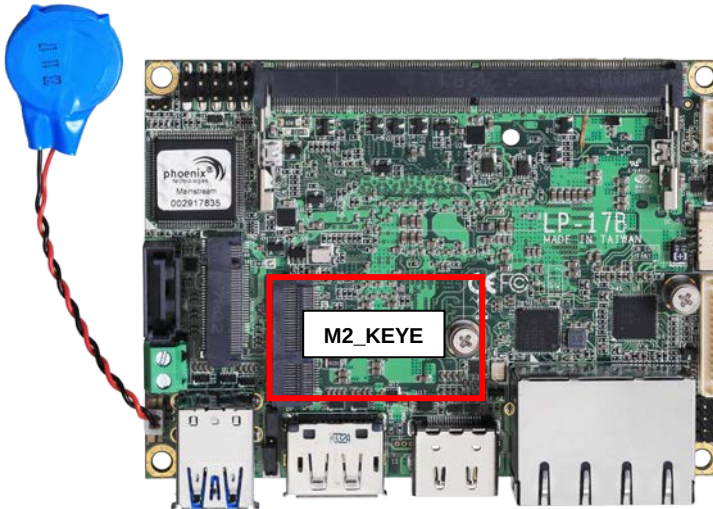
2.4.7 <Audio interface>



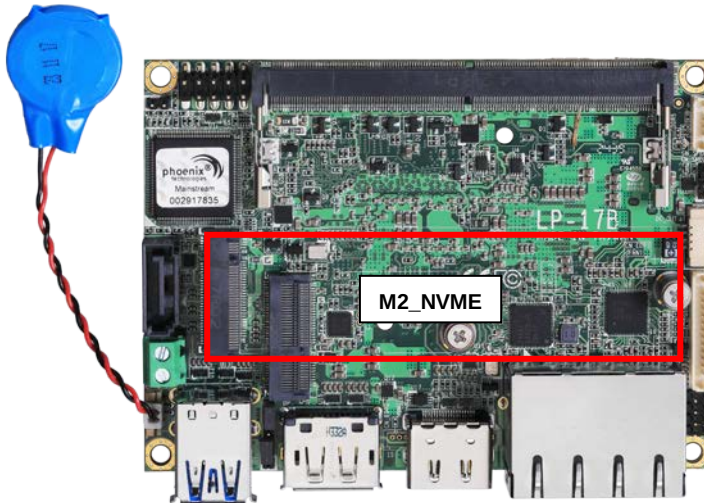
CN_SPKR: 6-pin Two channel Audio Amplifier, 3Watt amplifier for 4 ohm speaker.

Pin	Signal	Pin	Signal
1	FP_OUT_L_P	2	FP_OUT_L_N
3	JD_Front	4	GND
5	FP_OUT_R_P	6	FP_OUT_R_N

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

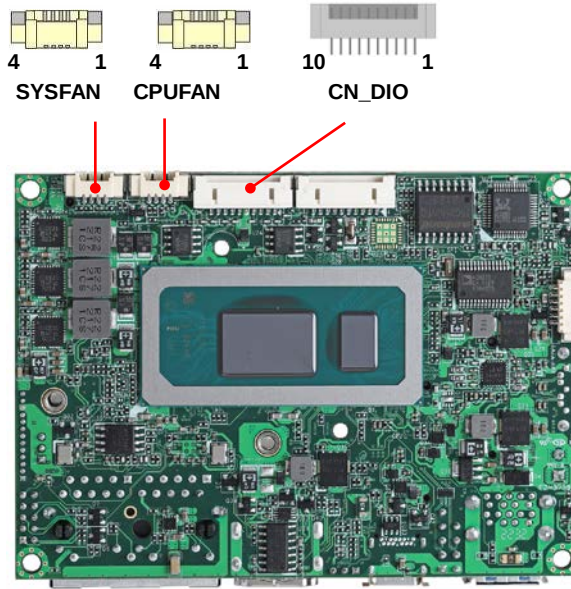
2.4.9 <Front panel switch and indicator>



JFRNT: Front panel switch and indicator 8-pin header (Pitch 2.00mm)

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

2.4.10 <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	N/A

CPUFAN: CPU cooler fan 4-pin connector

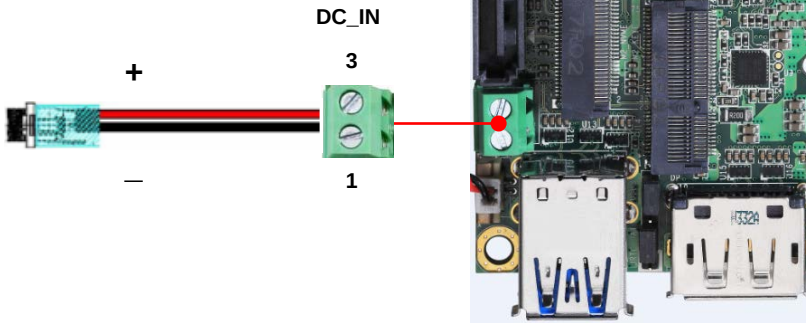
Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

SYSFAN: System cooler fan 4-pin connector

Pin	1	2	3	4
Signal	GND	5V	Sensor	Control

2.5 <Power supply>

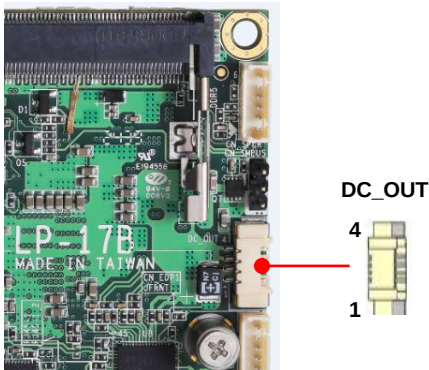
2.5.1 <Power input>



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 4-pin connector

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

Appendix A <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.

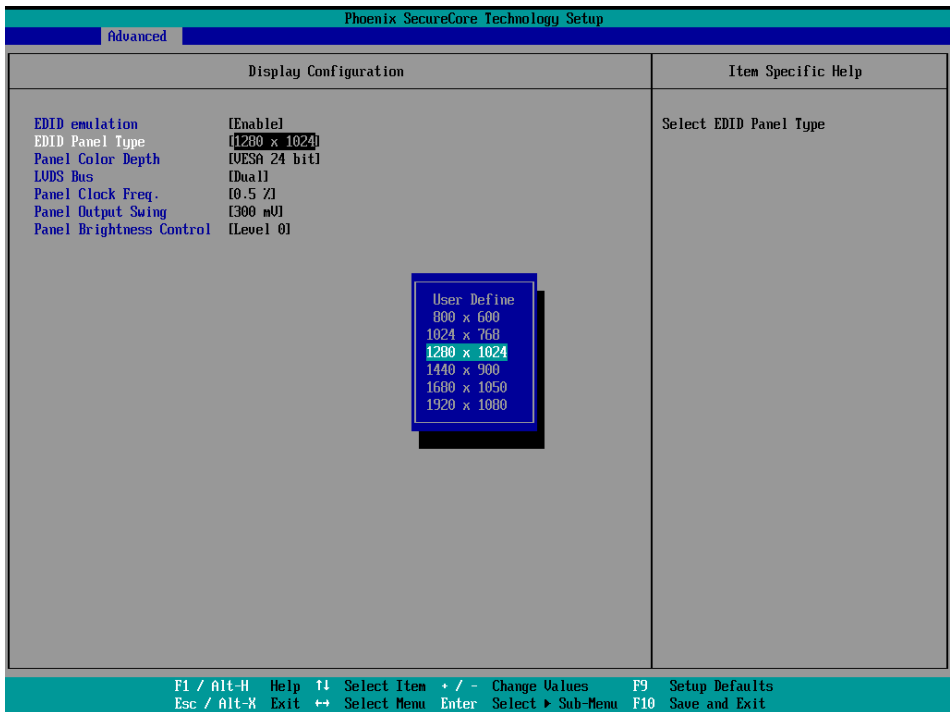
Find the setting from

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



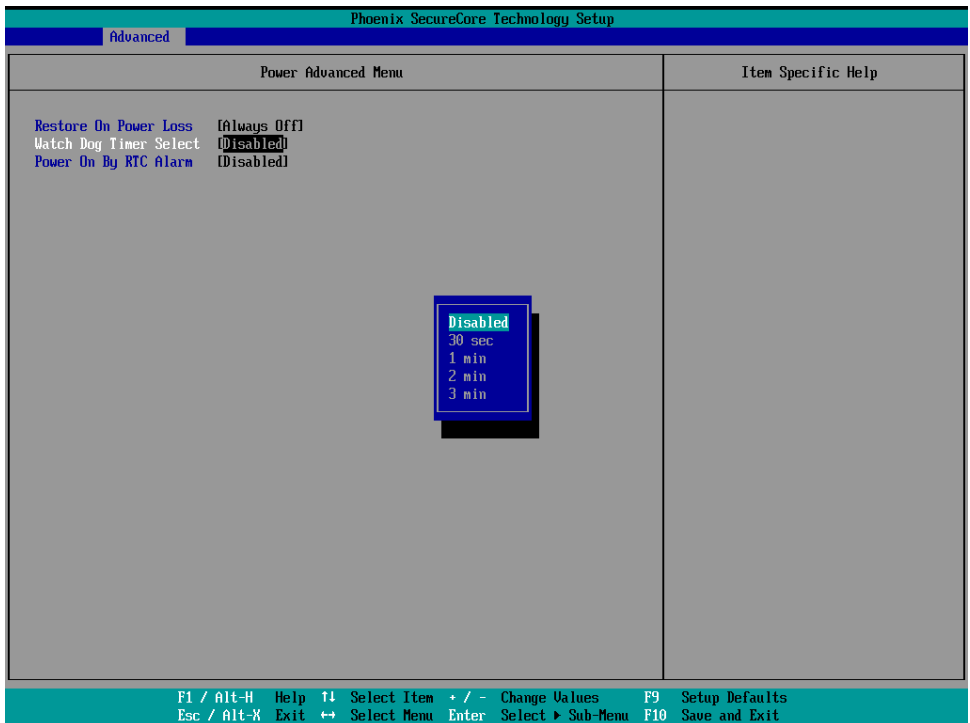
Appendix B <Programmable Watch Dog Timer>

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.)
```

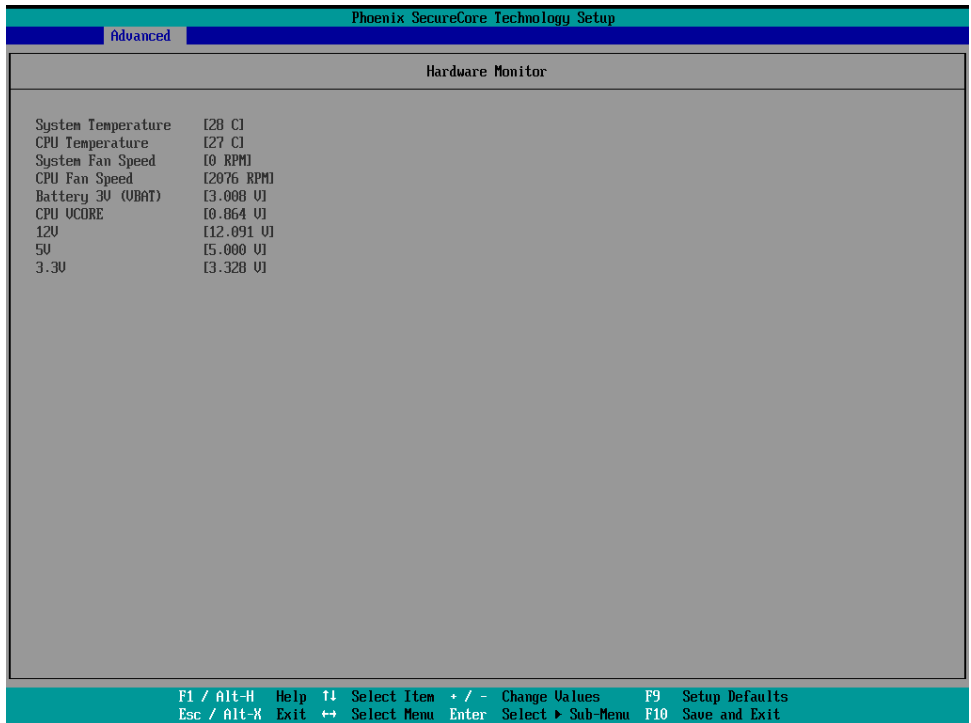
For further information, please refer to Nuvoton NCT6126D datasheet

Appendix C <Hardware Monitor>

Find the setting from

Advanced-> Motherboard Advanced menu-> Super IO configuration->

→Hardware Monitor



Appendix D <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 08 ;activate GPIO function (The board use GPIO3)
-o 4E EC
-o 4F XX ;set "01" GPIO as input, set "00" GPIO as output
-o 4E ED
-o 4F XX ;if set GPIO as output, this register's value can be set "00~ FF"

Optional

-o 4E EE
-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

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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