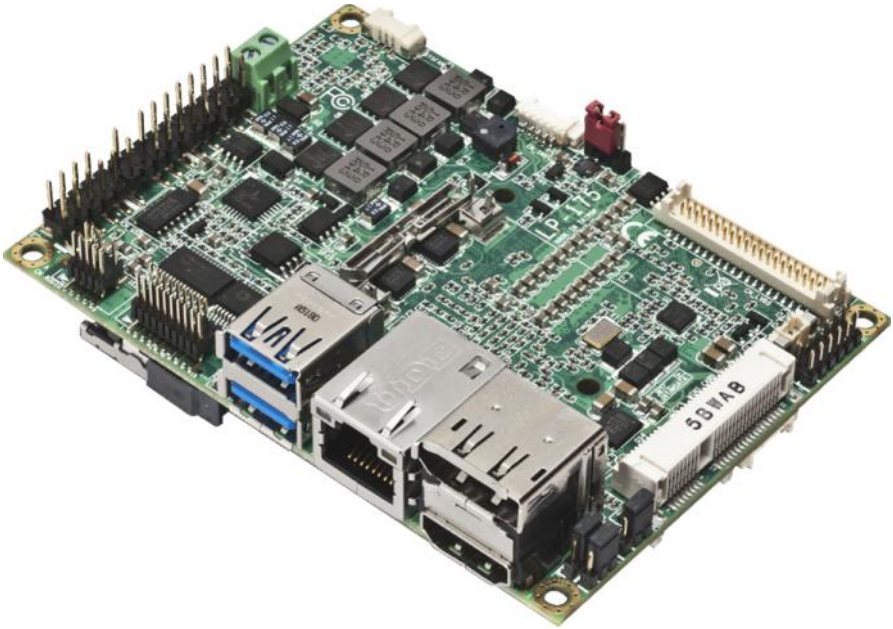
LP-175

Pico-ITX Motherboard

User's Manual

Edition 1.5
2017/07/24



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Packing List:

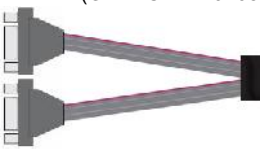
Please check the package content before you starting using the board.

1 x LP-175 Pico-ITX Motherboard

1 x SATA & SATA Power Cable
(OALSATA22B-PM15SH15 / 1040512)

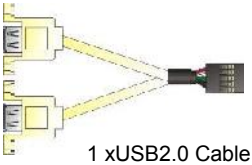
1 xDC Input Power Cable
(OALDC-B / 1040513)

1 x PS/2 Keyboard & Mouse cable
(OALPS2/KM / 1040131)



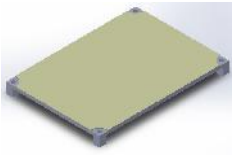
1 x Dual COM Cable
(OALES-BKU2NB / 1040090)

1 x Audio cable
(OALPJ-HDUNB / 1040123)



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

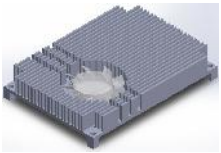
1 x DDR4 SO-DIMM (Optional)
(DSDM4GB-DDR4-2133-SO-1.2V / 1140099)
(DSDM8GB-DDR4-2133-SO-1.2V / 1140100)



1 x Heat spreader(Optional)
(OHS-175 / 2181110014)

1 x Heatsink(Optional)
(OHS-175-01 / 2181110025)

1 x Driver CD
(Including User's Manual)



1 x Cooler fan (Optional)
(OHSF-175 / 2181010024)

Index

Chapter 1 <Introduction>

1.1 <Product Overview>

LP-175 is Pico-ITX Motherboard which supports 6th / 7th Generation Intel® Core™ U-series i7, i5, i3, Celeron Mobile Processor with Sunrise Point PCH-LP, integrated HD Graphics, DDR4 memory, Realtek High Definition Audio, Intel Gigabit LAN, Serial ATA3 with AHCI function for a system.

Intel Skylake-U/ Kabylake-U Processor with Sunrise Point PCH-LP

The 6th / 7th Generation Intel® Core™ U-series processor family is the next generation, multi-core mobile processor built on 14 nanometer process with MCP technology.

The Skylake-U/Kabylake-U have a lower TDP, it provides new HD Graphics support triple display at the same time, maximum supported is up to 16GB of DDR4, better performance, flexibility and more enhanced security that is suitable for a variety of intelligent systems the ideal choice.

All in One multimedia solution

The board provides high performance onboard graphics, 24-bit dual channel LVDS interface, DisplayPort and VGA choosable, HDMI, and High Definition Audio, to meet the very requirement of the multimedia application.

Flexible Expansion Interface

The board provides one MiniPCIe and support mSATA.

Kaby Lake only support Windows10 64bit

Intel only support Windows 10 64bit. It may lose some drivers if you use other Windows version.

1.2 <Product Specification>

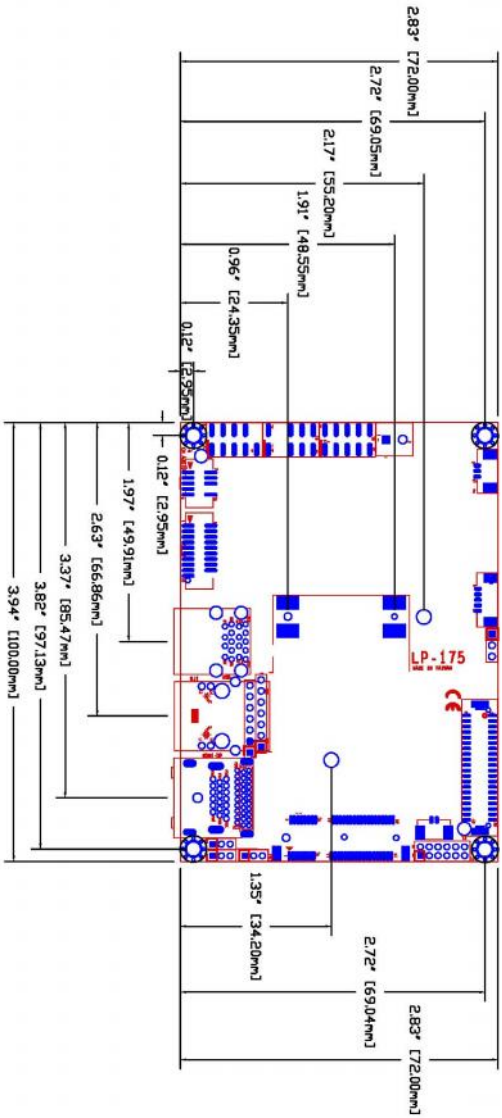
System	
Processor	Intel® 6th / 7th Gen Core™ U-series Processor, FCBGA1356 package
Chipset	Sunrise Point-LP
Memory	1 x DDR4 SO-DIMM 1866/2133 MHz up to 16GB Support Non-ECC memory
Watchdog Timer	Generates a system reset with internal timer for 1min/s ~ 255min/s
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Expansion	1 x MiniPCIe (support mSATA)
Graphics	
Chipset	Intel® 9th Gen integrated HD Graphics
Display Interface	1 x HDMI, 1 x DisplayPort/VGA, 1 x LVDS
LAN	
Chip	1 x Intel® I219-LM Gigabit PHY LAN (Support iAMT11.0)
I/O	
Serial ATA	1 x SATA3
Audio	Realtek ALC262 HD Audio
Internal I/O	1 x SATA3, 2 x RS232, 2 x USB2.0, 1 x LVDS, 1 x LPC, 1 x Audio, 1 x LCD inverter, 1 x DC Out, 1 x PS/2, 1 x VGA for optional
Rear I/O	1 x DisplayPort for optional, 1 x HDMI, 2 x USB3.0, 1 x LAN
Mechanical & Environmental	
Power Requirement	DC 5V
Size	100mm 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: If you need to change DisplayPort to VGA, it requires Commell ADP-3355 DP to VGA module, but LP-175T series not attached ADP-3355 and DisplayPort I/O not retain.

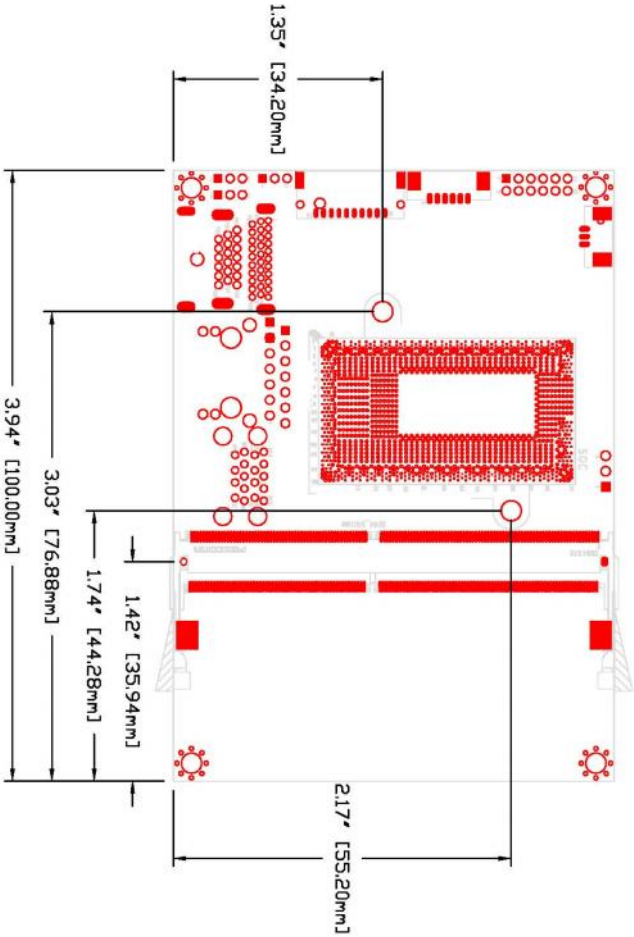
Note2: If you need a wider power input, please refer Commell DC-DC3-5V power module.(input voltage 5~35V)

1.3 <Mechanical Drawing>

Positive

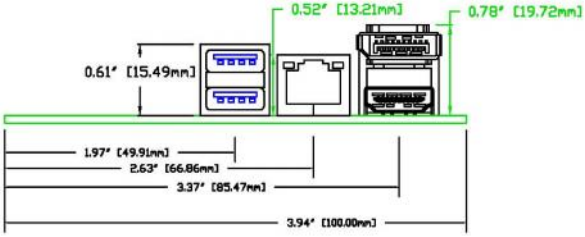


Back

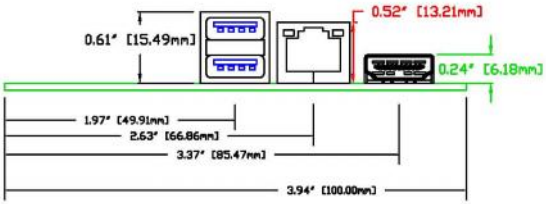

2.17" [55.20mm]
1.42" [35.94mm]
1.74" [44.28mm]
3.03" [76.88mm]
3.94" [100.00mm]
1.35" [34.20mm]

I/O

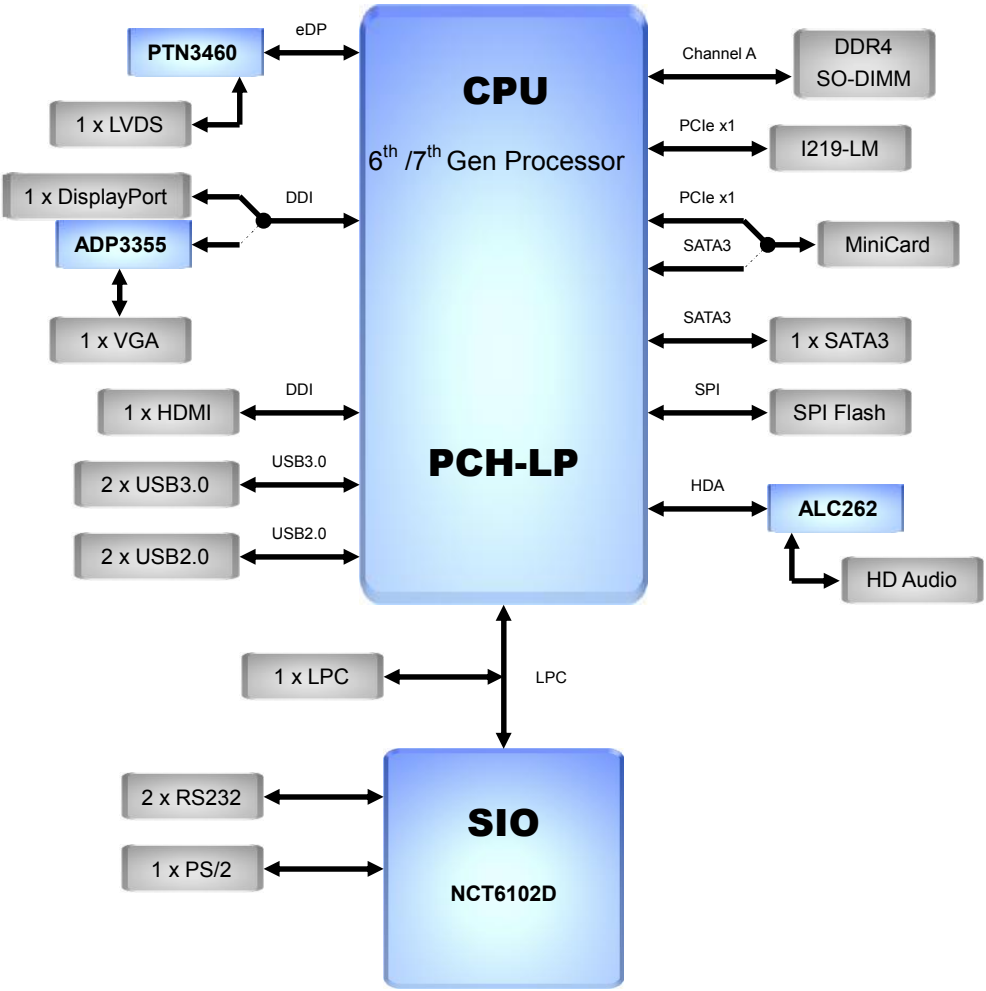
LP-175P



LP-175T

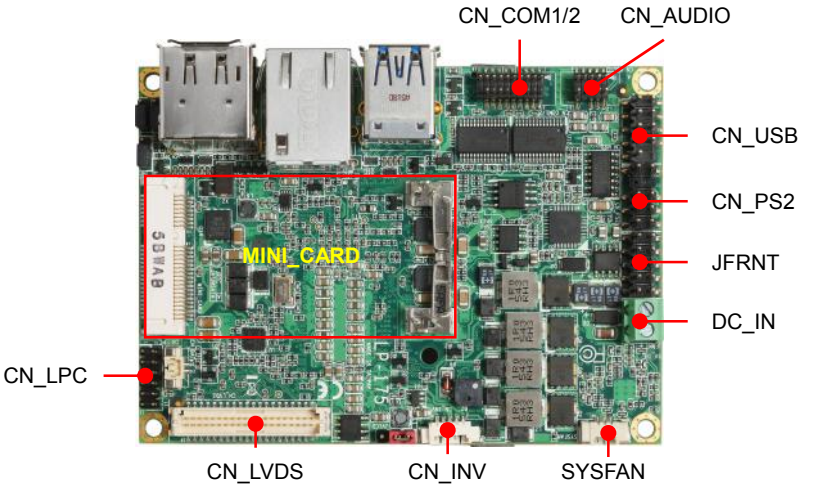


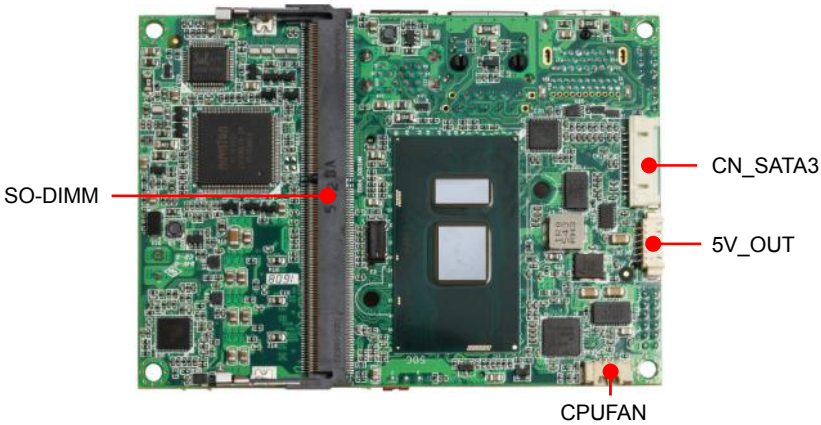
1.4 <Block Diagram>

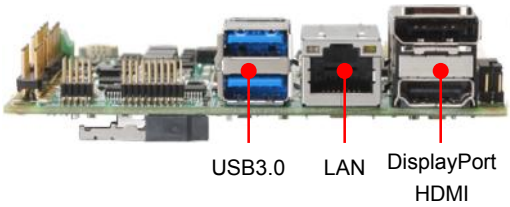


Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>







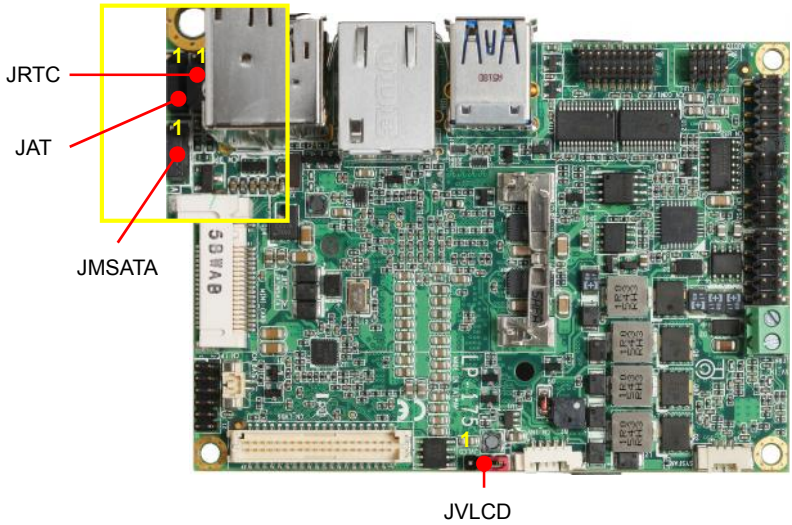
2.1.1 <Internal connectors list>

Connector	Function
SO-DIMM	260-pin DDR4 SO-DIMM slot
CN_SATA3	10-pin Serial ATA3 connector
CN_AUDIO	5 x 2-pin audio pin header
CN_LPC	6 x 2-pin LPC pin header
CN_LVDS	20 x 2-pin LVDS connector
CN_INV	5-pin LCD inverter connector
CN_COM1/2	20-pin RS232 connector
CN_USB	5 x 2-pin USB2.0 pin header
CN_DP	10 x 2-pin DP to VGA module connector
CN_PS2	5 x 2-pin PS/2 pin header
CPUFAN	3-pin CPU fan connector
SYSFAN	3-pin system fan connector
JFRNT	5 x 2-pin front panel switch/indicator pin header
MINI_CARD	52-pin MiniPCIe card slot
5V_OUT	6-pin 5V SATA Power connector
DC_IN	2-pin power input Terminal Block

2.1.2 <External connectors list>

Connector	Function
HDMI	HDMI connector
DisplayPort	DisplayPort connector for optional
USB	2 x USB3.0 connector
LAN	RJ45 connector

2.2 <Jumper Location and Reference>



2.2.1 <Jumper list>

Jumper	Function
JAT	Power mode select
JRTC	CMOS Normal/Clear Setting
JVLCD	Panel Voltage Setting
JMSATA	MiniCard mSATA 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)

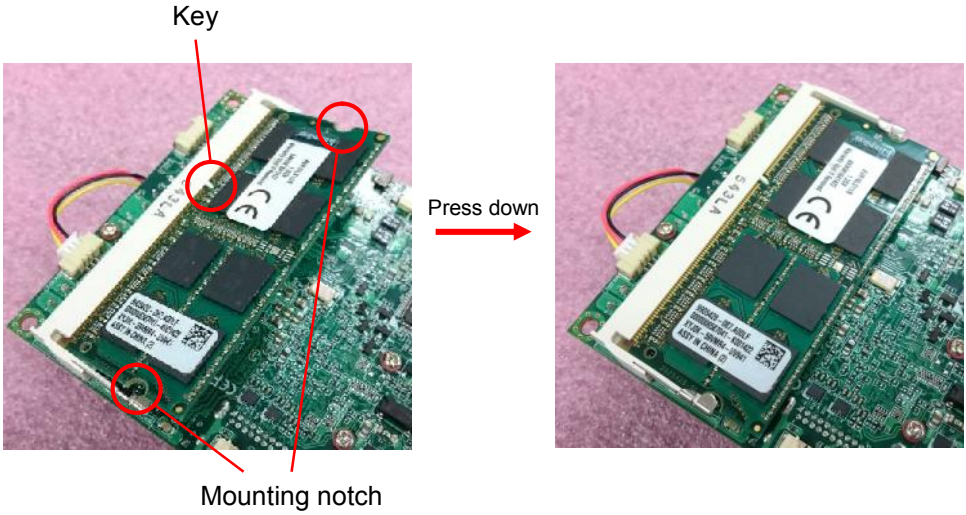
JAT: AT/ATX mode select jumper

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

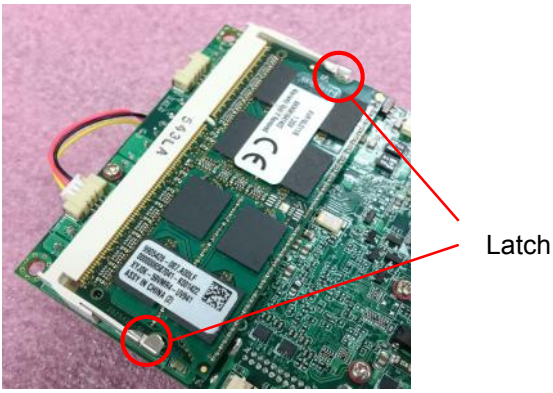
2.3 <Installing the Memory>

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.

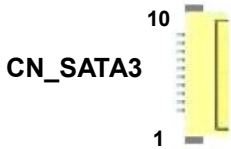


2.4 <I/O interface>

2.4.1 <Serial ATA interface>

CN_SATA3: SATA3 10-pin connector

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	NC
6	NC
7	GND
8	RX-
9	RX+
10	GND



2.4.2 <Ethernet interface>

The board provides I219-LM Gigabit Ethernet which supports WOL on rear I/O.

It supports Intel® AMT 11.0 feature on I219-LM.

(Note that the CPU must support vPro technology, ex: i5-6300U)

I219-LM

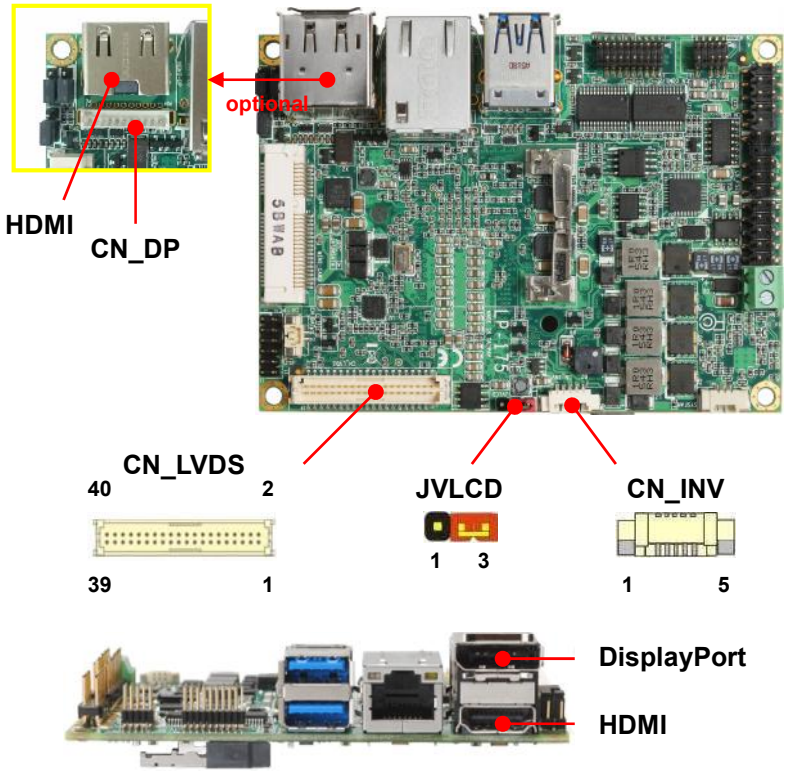
2.4.3 <Display interface>

Based on the 6th / 7th Gen CPU with built-in HD Graphics, the DisplayPort resolution up to **3840x2160 @ 60Hz** or **4096x2304 @ 60Hz**, the HDMI up to **4096x2304 @ 24Hz** and LVDS up to **1920x1200 @ 60Hz** support 18/24-bit color depth and dual channel. About select LCD Panel Type in BIOS, please refer **Appendix C**.

The built-in HD Graphics support triple display function with clone mode and extended mode.

Note: 1. The HDMI-DP dual layer connector can be changed HDMI & CN_DP to use VGA module.

2. LP-175T series has a CRT, it's no need install extra driver. Here is ADP-3355 Setup manual Link.



CN_LVDS: LVDS 40-pin connector (Model: HIROSE DF13-40DP-1.25V compatible)

Pin	Signal	Pin	Signal
2	Set by JVLCD	**1**	Set by JVLCD
4	Detect (Active low)	**3**	GND
6	A_LVDS_0-	**5**	B_LVDS_0-
8	A_LVDS_0+	**7**	B_LVDS_0+
10	GND	**9**	GND
12	A_LVDS_1-	**11**	B_LVDS_1-
14	A_LVDS_1+	**13**	B_LVDS_1+
16	GND	**15**	GND
18	A_LVDS_2-	**17**	B_LVDS_2-
20	A_LVDS_2+	**19**	B_LVDS_2+
22	GND	**21**	GND
24	A_LVDS_CLK-	**23**	B_LVDS_3-
26	A_LVDS_CLK+	**25**	B_LVDS_3+
28	GND	**27**	GND
30	A_LVDS_3-	**29**	B_LVDS_CLK-
32	A_LVDS_3+	**31**	B_LVDS_CLK+
34	GND	**33**	GND
36	LVDS_DDCSCL	**35**	NC
38	LVDS_DDCSDA	**37**	NC
40	NC	**39**	NC

Note: Pin4 only need to be connected to GND

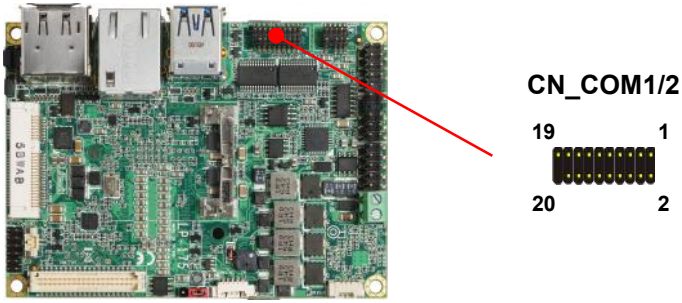
CN_INV: LVDS 5-pin Backlight power connector

Pin	Signal
1	3.3V
2	Backlight Control
3	5VSB
4	GND
5	Enable Backlight

JVLCD: LVDS panel power select jumper

Jumper settings	Function
1-2	3.3V (Default)
2-3	5V

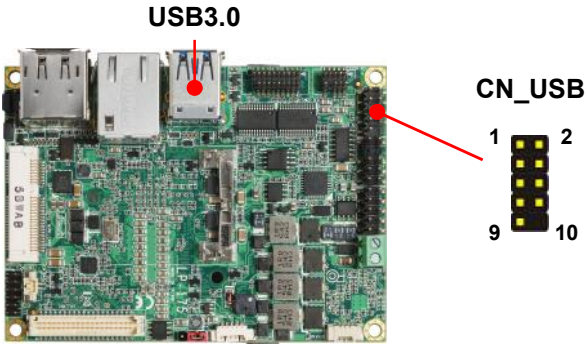
2.4.4 <Serial Port interface>



CN_COM1/2: RS232 20-pin header (Pitch 1.27mm x 2.54mm)

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

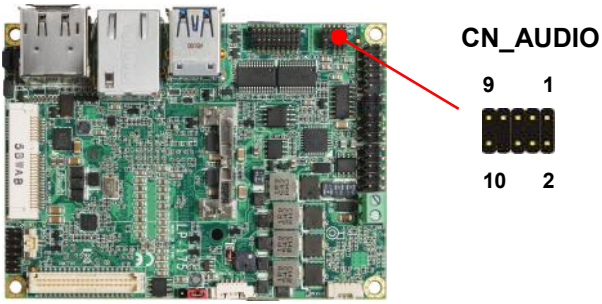
2.4.5 <USB interface>



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

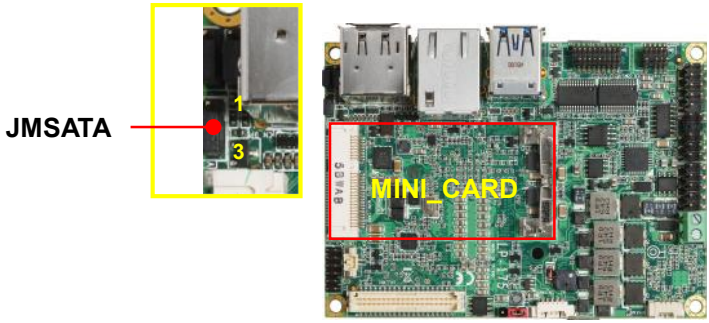
2.4.6 <Audio interface>



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>

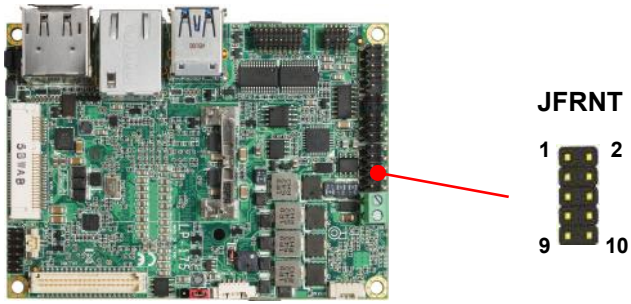


MINI_CARD have some special design to compatible our MiniPCIe card (ex: MPX-574D2, MPX-210D2 etc) and support mSATA set by JMSATA

JMSATA: Setting MINI_CARD to support PCIe/mSATA

Jumper settings	Function
1-2	Support mSATA
2-3	Normal operation (Default)

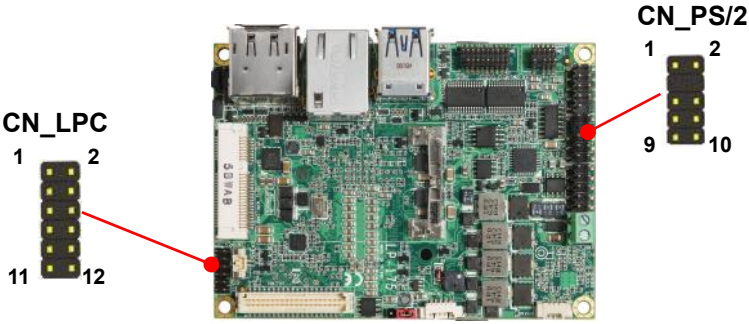
2.4.8 <Front panel switch and indicator>



JFRNT: Front panel switch and indicator 14-pin header (Pitch 2.54mm)

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_LPC: LPC 12-pin header (Pitch 2.00mm) (Support COMMELL TPM module.)

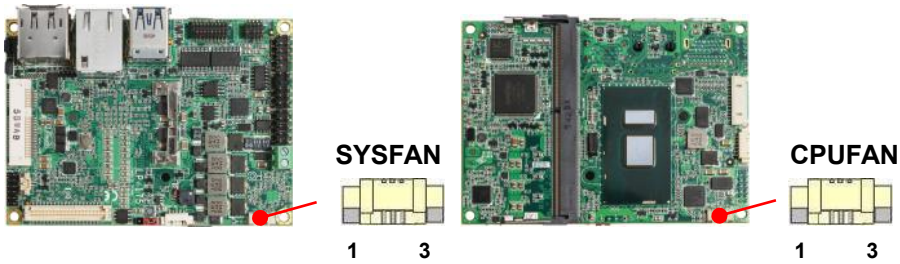
Pin	Signal	Pin	Signal
1	CLK	2	RST
3	-LFRAME	4	LAD3
5	LAD2	6	LAD1
7	LAD0	8	3.3V
9	SERIRQ	10	GND
11	3.3VSB	12	NC

CN_PS/2: PS/2 10-pin header (Pitch 2.54mm)

Pin	Signal	Pin	Signal
1	KB_DATA	2	M_DATA
3	NC	4	NC
5	GND	6	GND
7	VCC	8	VCC
9	KB_CLK	10	M_CLK

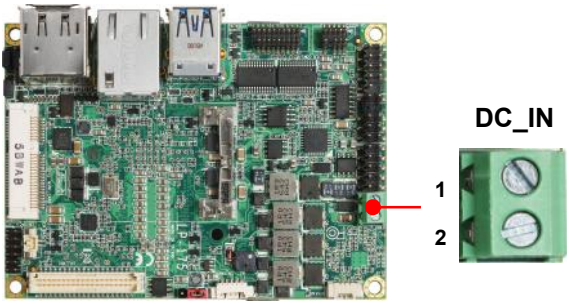
CPUFAN / SYSFAN : CPU cooler fan 3-pin connector

Pin	1	2	3
Signal	GND	5V	Sensor



2.5 <Power supply>

2.5.1 <Power input>



Only supports 5V power input.

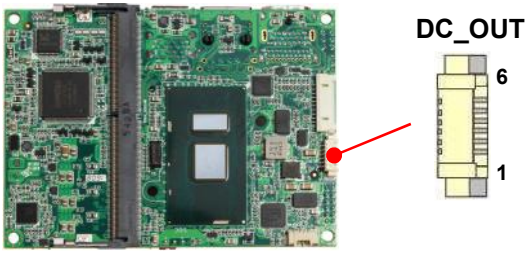
DC_IN: Terminal Block 2-pin power connector

Pin	Signal	Pin	Signal
1	GND	2	Power in

2.5.2 <Power output>

DC_OUT: SATA 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:

LP-175 reflash 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. Please make a bootable UFD which can boot into DOS enviroment.
2. Unzip the flash tool and copy it into bootable UFD.
3. Add a bin file to the same folder..
4. Power on the system and flash the BIOS under the DOS environment.

   (Command: fpt –savemac –f xxx.bin)
5. Power off the system and then power on.

Appendix B <Win7 Installation Notes>

B.1 <ME driver> (For 6th gen CPU)

Before installing, it need to install Microsoft Hotfix KB2685611 first for Win7 32/64 bit. More information please refer https://www.microsoft.com/en-us/download/details.aspx?id=38423

B.2 <USB3.0 driver> (For 6th gen CPU)

The Skylake platform removed EHCI host controller, therefore, before install new Win7 OS, need to embed the USB3.0 driver to Win7 installation image file, for more information, please refer Intel document.

Appendix C <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.

BIOS panel type selection form (BIOS Version:1.0)			
Single / Dual channel		Single / Dual channel	
NO.	Type	NO.	Type
1	640 x 480	9	1680 x 1050
2	800 x 600	10	1920 x 1200
3	1024 x 768	11	1440 x 900
4	1280 x 1024	12	1600 x 900
5	1400 x 1050 Reduced Blanking	13	1024 x 768
6	1400 x 1050 non-Reduced Blanking	14	1280 x 800
7	1600 x 1200	15	1920 x 1080
8	1366 x 768	16	OEM Keep (Ver 1.0)

Appendix D <Programmable Watch Dog Timer>

Timeout value range

1 to 255 Minute and Second

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 F5
-o 4F 00        ;set "00" is second mode, set "04" is minute mode
-o 4E F6
-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 NCT6106D 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.

Taiwan Commate computer Inc.

Address	19F., NO.94, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22102, Taiwan.
TEL	+886-2-26963909
FAX	+886-2-26963911
Website	www.commell.com.tw
E-mail	info@commell.com.tw (General infomation) tech@commell.com.tw (Technical Support)

Commell is a brand name of Taiwan Commate computer Inc.