

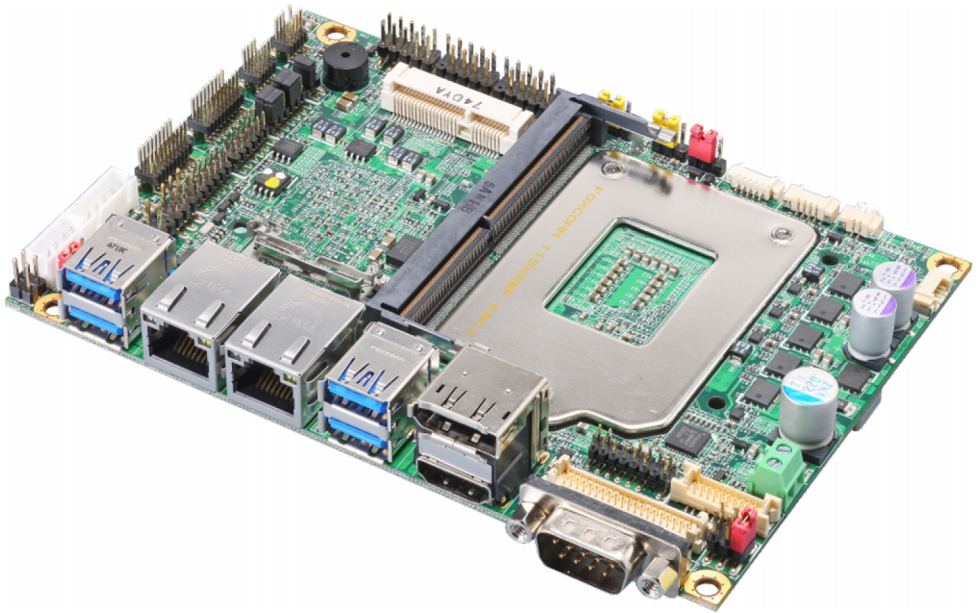
LS-37K

3.5 inch Desktop Miniboard

User's Manual

Edition 2.1

2021/07/28



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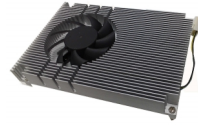
Any questions please visit our website at <http://www.commell.com.tw>

Packing List:

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



1 x LS-37K 3.5 inch Miniboard



1 x Cooler Fan
(OHSF-37K / 2181010029)



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



1 x SATA Power Cable
(OALSATA15-2PJ / 1040613)



1 x SATA CABLE
(OALSATA3-H10-L35 / 1040523)



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



1 x VGA Cable
(OALVGA-SNB-7) / (1040557)



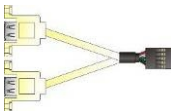
1 x DVI module
(BADPDVI_A & OALDVI-DF13)
(4120008011 & 1040483)



1 x Audio cable
(OALPJ-HDUNB / 1040123)



1 x COM Cable
(OALES-BKU1NB / 1040086)



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



1 x Dual COM cable
(OALES-BKU2NB / 1040090) (Optional)

Printed Matters:

Driver CD (Including User's Manual) x 1

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Chapter 1 <Introduction>

1.1 <Product Overview>

LS-37K is 3.5 inch Miniboard which supports 6th & 7th Generation Intel® Core™ i7/ i5/ i3, S-series and Xeon® Processor with Intel® C236 Chipset, integrated HD Graphics , DDR4 memory, Realtek High Definition Audio, Intel Gigabit LAN, Serial ATA3

Intel Skylake-S & Kaby Lake-S Processor with Intel® C236 Chipset

The 6th & 7th Intel® Core™ S-series and Xeon® processor family is new generation and multi-core processor built on 14 nanometer process.

It provide new HD Graphics support triple displays at the same time, maximum supported is up to 64GB of DDR4, better performance, flexibility and more enhanced security that is suitable for a variety of intelligent systems the ideal choice.

Flexible Expansion Interface

It includes minicard slot, 6 x COM port, 4 x USB3.0, and 4 x USB2.0.

Skylake & Kaby Lake remove EHCI, all USB ports are xHCI

When you install Windows7 with USB device(CDROM, Keyboard, Mouse...), Windows7 can not identify your usb device. You can use SATA CD-ROM and PS/2 to install Windows7.

Kaby Lake(7th gen CPU) 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 Core™ i7/ i5/ i3 and Xeon® E3-1200 v5/ v6 Processor, FCLGA1151 package (TDP up to 45W)
Chipset	Intel® C236 PCH-H
Memory	1 x DDR4 DIMM 1866/2133 MHz up to 16GB, Support Non-ECC, unbuffered memory only (Xeon® E3-1200 v5 Product support 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 MiniPCle (support mSATA)

Graphics

Chipset	Intel® 9th Gen integrated HD Graphics (Some Xeon® E3-1200 v5 Product CPU not support)
Display Interface	1 x DisplayPort, 1 x HDMI 1 x DVI, 1 x LVDS, 1 x VGA

LAN

Chip	1 x Intel® I219-LM Gigabit PHY LAN (Support iAMT11.0) 1 x Intel® I210-AT Gigabit LAN
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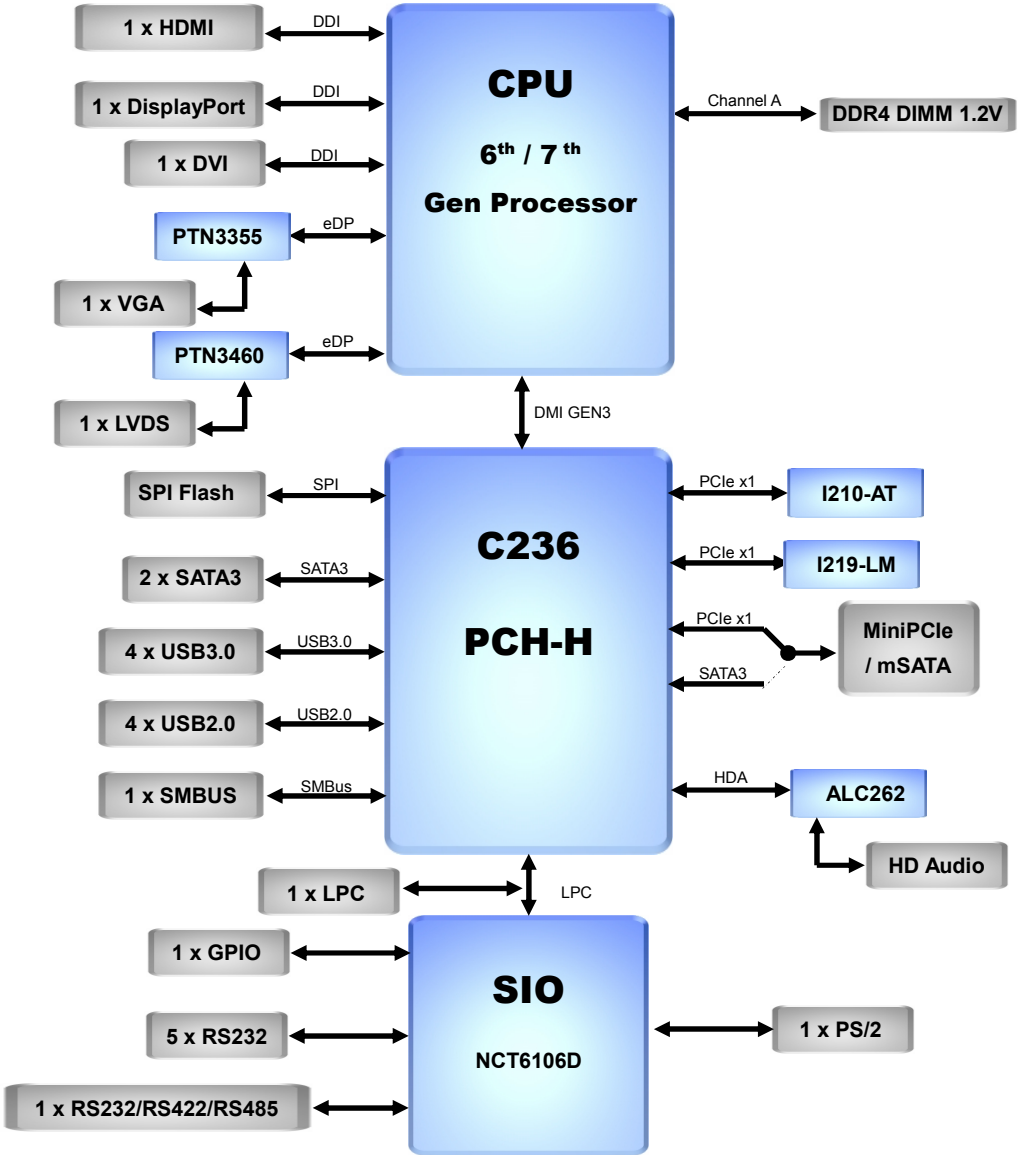
I/O

Serial ATA	2 x SATA3 interface with 600MB/s transfer rate
Audio	Realtek ALC262 HD Audio
Internal I/O	2 x SATA3, 4 x USB2.0, 4 x RS232, 1 x RS232/485/422 1 x DVI, 1 x VGA, 1 x LVDS, 1 x LCD inverter, 1 x LPC, 1 x GPIO, 1 x Audio, 1 x PS/2, 1 x SMBUS
Rear I/O	1 x DisplayPort, 1 x HDMI 4 x USB3.0, 2 x LAN, 1 x RS232

Mechanical & Environmental

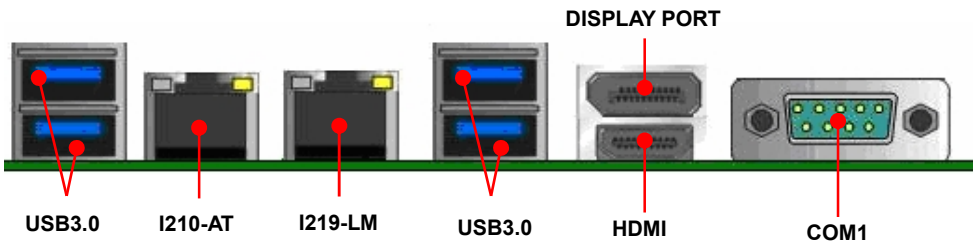
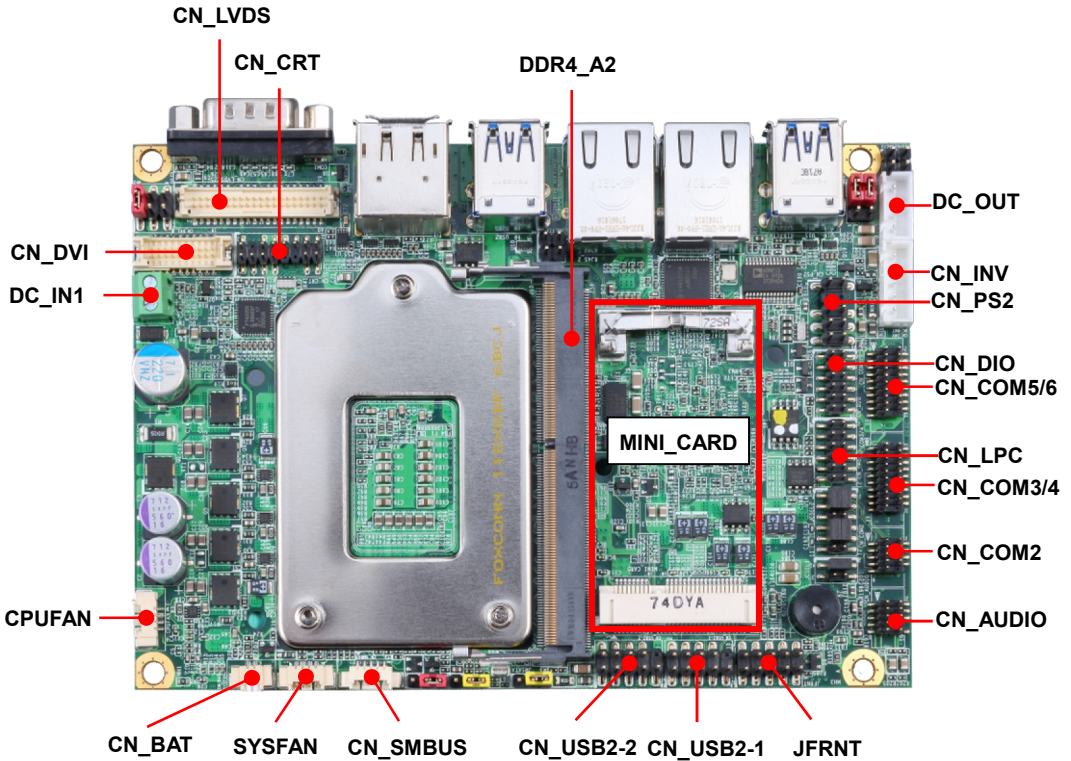
Power Requirement	DC input 9~35V
Size	146mm x 101mm (L x W)
Temperature	Operating within 0°C~60°C (32°F~140°F) Storage within -20°C~80°C (-4°F~176°F)
Relative Humidity	10%~90%, non-condensing

1.3 <Block Diagram>



Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>



2.1.1 <Internal connectors list>

Connector	Function
DDR4_A2	260-pin DDR4 SO-DIMM slot
CN_SATA3-1/2	10-pin Serial ATA3 connector
CN_AUDIO	5 x 2-pin audio pin header
CN_LVDS	20 x 2-pin LVDS connector
CN_INV	5-pin LCD inverter connector
CN_DVI	10 x 2-pin DVI connector
CN_CRT	16-pin VGA connector
CN_COM 2	9-pin RS232/RS485/422 connector
CN_COM 3/4/5/6	20-pin RS232 connector
CN_USB 2-1/2-2	5 x 2-pin USB2.0 pin header
CN_PS2	5 x 2-pin PS/2 pin header
CN_DIO	6 x 2-pin digital I/O connector
CN_SMBUS	5-pin SMBus connector
CN_BAT	2-pin Battery connector
CPUFAN	4-pin CPU fan connector
SYSFAN	4-pin system fan connector
MINI_CARD	52-pin Half-MiniPCIe card slot
JFRNT	14-pin front panel switch/indicator connector
DC_IN1	2-pin power input Terminal Block

2.1.2 <External connectors list>

Connector	Function
DisplayPort	DisplayPort connector
HDMI	HDMI connector
USB3.0 1/2	USB3.0 connector
LAN-1/2	RJ45 connector
COM1	DB9 Serial port connector

2.2 <CPU, Heatsink and Memory installation guide>

2.2.1 <CPU compatible list>

Recommended TDP less than 45W, please refer to the following models

Skylake-S and Kaby Lake-S compatible list					
Skylake	Core	TDP	Kaby Lake	Core	TDP
E3-1268L v5 _(Note1)	4	35W	i7-7700T	4	35W
E3-1260L v5 _(Note2)	4	45W	i5-7600T	4	35W
E3-1240L v5 _(Note2)	4	25W	i5-7500T	4	35W
E3-1235L v5	4	25W	i5-7400T	4	35W
i7-6700TE _(Note1)	4	35W	i3-7300T	2	35W
i7-6700T	4	35W	i3-7101TE _(Note1)	2	35W
i5-6600T	4	35W	i3-7100T	2	35W
i5-6500TE _(Note1)	4	35W	G4600T	2	35W
i5-6500T	4	35W	G4560T	2	35W
i5-6400T	4	35W	G3930TE _(Note1)	2	35W
i3-6300TE _(Note1)	2	35W	G3930T	2	35W
i3-6300T	2	35W	G3900TE _(Note1)	2	35W
i3-6100TE _(Note1)	2	35W	G4400TE _(Note1)	2	35W
i3-6100T	2	35W			
G4500T	2	35W			
G4400T	2	35W			

Note1: Embedded processors with long-term support

Note2: No Graphics Output.

2.2.2 <CPU installation>

LS-37K has a LGA1151 CPU socket onboard; please check following steps to install the processor properly.

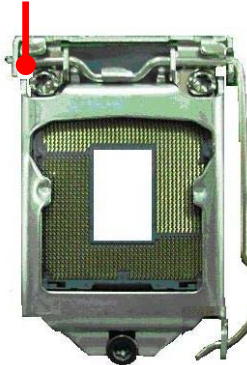
Attention If LS-37K needs RMA, please Keep CPU socket cover on the CPU Socket.

Warning If CPU Socket internal Pin damage, We could not provide warranty.

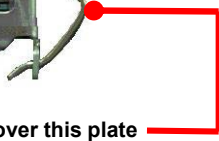


Intel® 6th & 7th Core™ i7/ i5/ i3 and Xeon® E3-1200
v5 Processor, FCLGA1151 package

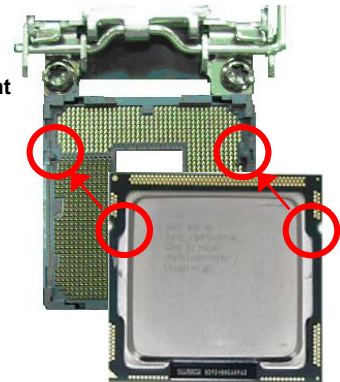
1. Lift this bar



2. Uncover this plate

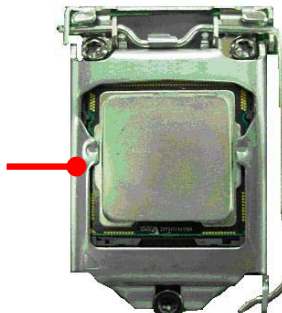


Checked point



3. Place the CPU on the top of the pins

4. Cover this plate

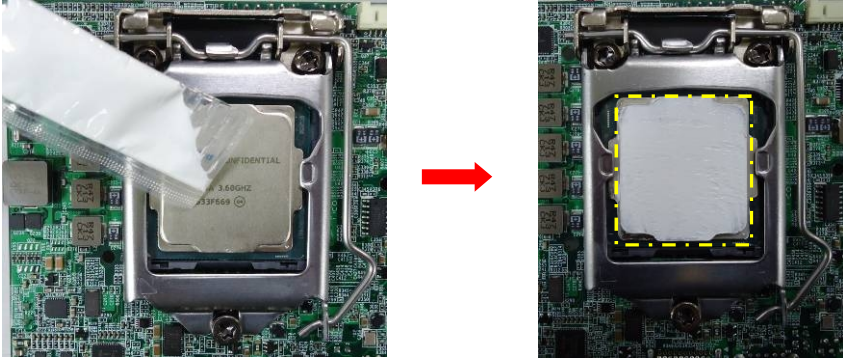


5. Lock this bar

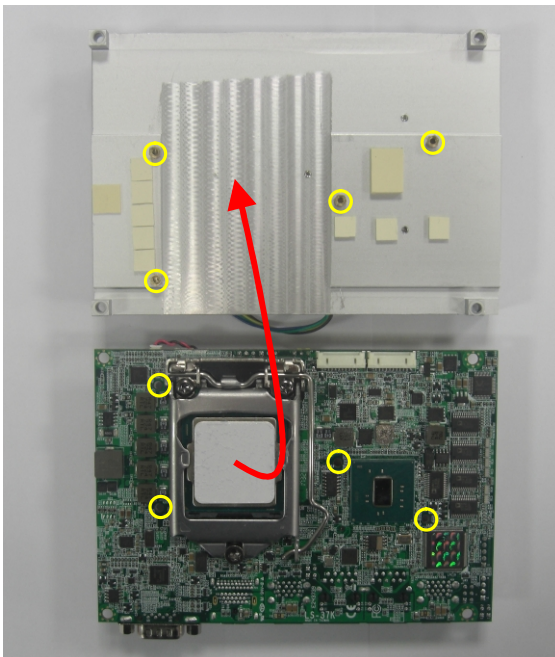


2.2.3 <Cooler Fan installation>

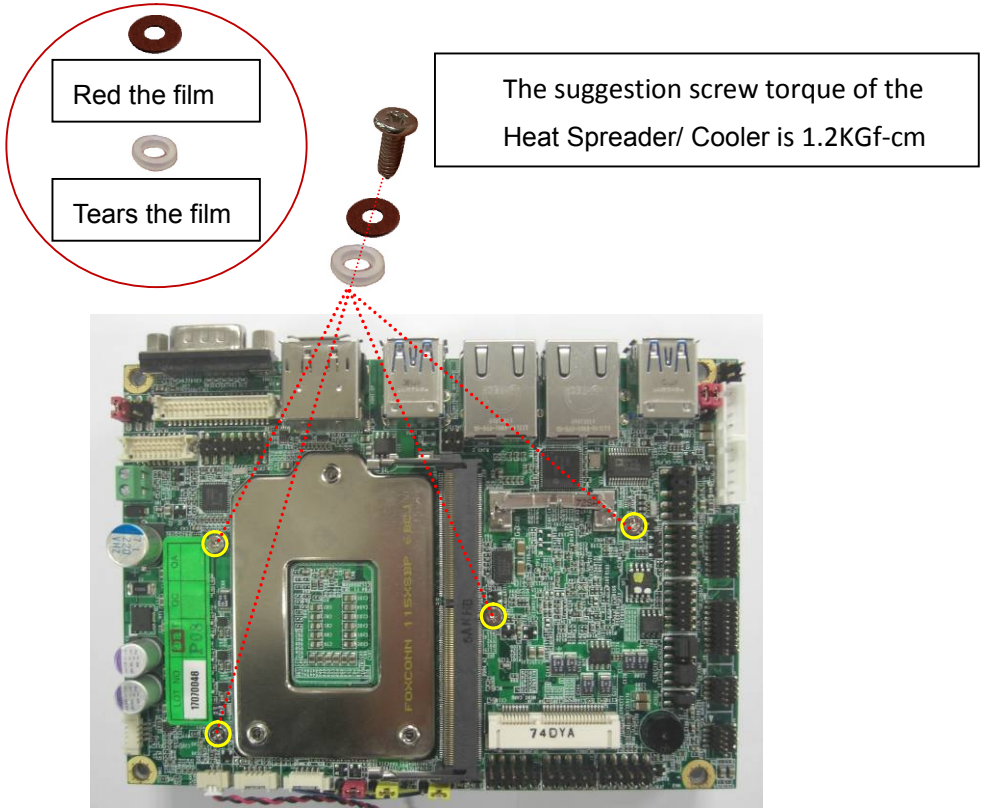
Step1. Apply Thermal Paste on the CPU.



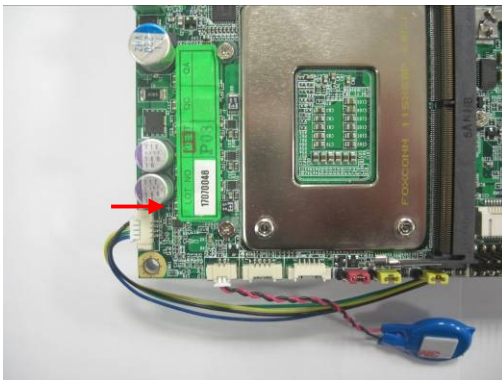
Step2. Mount the Heatsink after aligning.



Step3. Screw on the Heatsink.



Step4. Install Fan, finish.



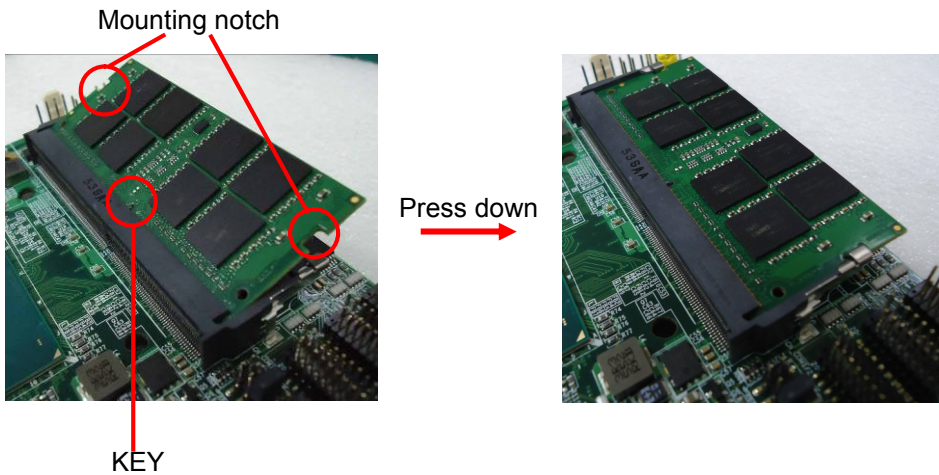
2.2.4 <Memory Setup>

LS-37K has 260-pin DDR4 DIMM support up to 16GB of memory capacity and 1.2 Voltage. The memory frequency supports 1866/2133 MHz. Only Non-ECC memory is supported.

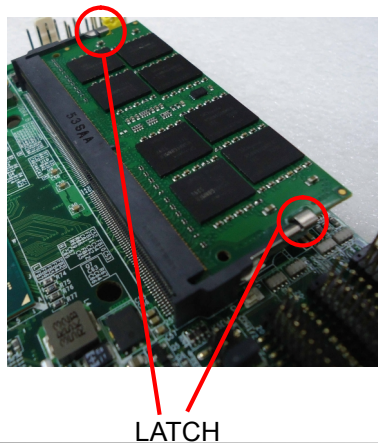
(Xeon® E3-1200 v5 / v6 Product support ECC memory)

In the process, the board must be powered off.

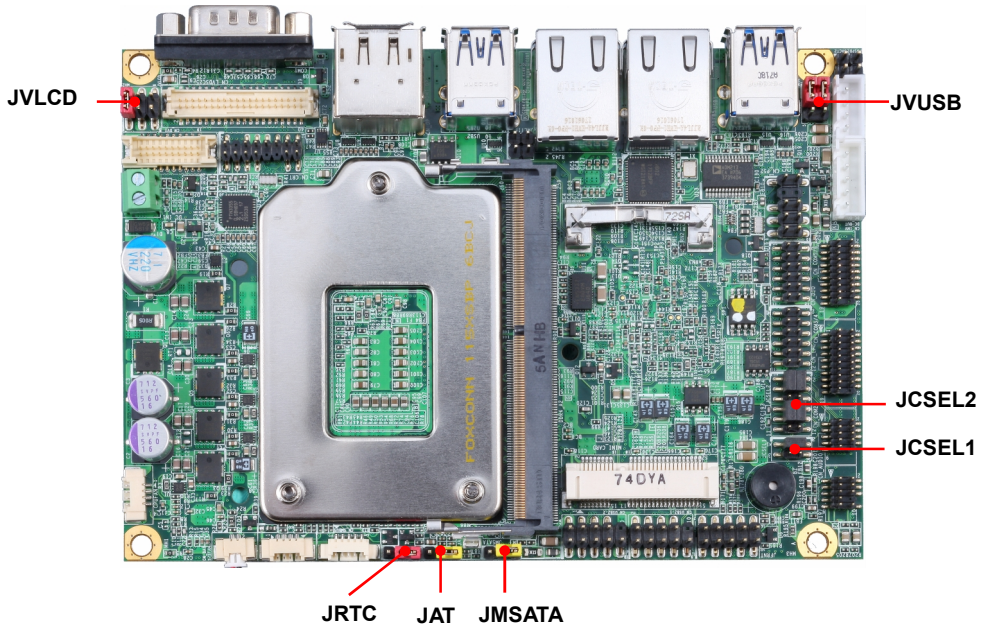
1. Put the memory tilt into the slot. Note the Memory notch key aligned slot key.
2. Then press down till lock into the mounting notch.



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



2.3 <Jumper Location and Reference>



2.3.1 <Jumper list>

Jumper	Function
JAT	Power mode select
JRTC	CMOS Normal/Clear Setting
JVLCD	Panel Voltage Setting
JMSATA	MiniCard MSATA Setting
JCSEL1	COM2 RS-232 RS422 RS485 Setting
JCSEL2	COM2 RS-232 RS422 RS485 Setting
JVUSB	USB Voltage Setting

2.3.2 <Clear CMOS and Power on type selection>

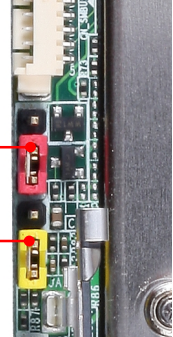
The board's data of CMOS can be setting in BIOS. If the board refuses to boot due to inappropriate CMOS settings, here is how to proceed to clear (reset) the CMOS to its default values.

JAT: AT/ATX mode select jumper

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

JRTC: Clear CMOS data jumper

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

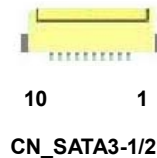


2.4 <I/O interface>

2.4.1 <Serial ATA interface>

CN_SATA3-1/2: SATA3 10-pin connector

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



CN_SATA3-2 CN_SATA3-1



2.4.2 <Ethernet interface>

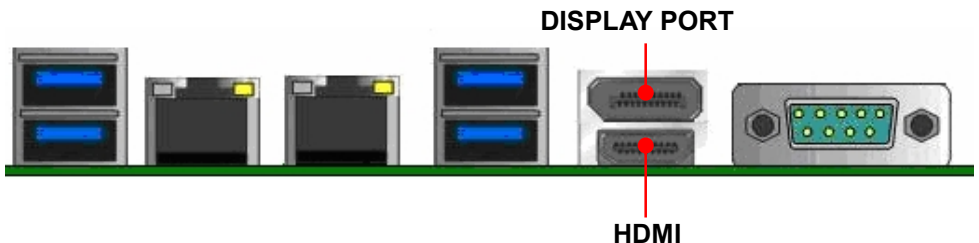
The board provide I219-LM PHY Gigabit Ethernet and I210-AT Gigabit Ethernet on rear I/O. Intel I219-LM and I210 supports operation at 10/100/1000 Mb/s data rates, with IEEE802.3 compliance and Wake-On-LAN supported.

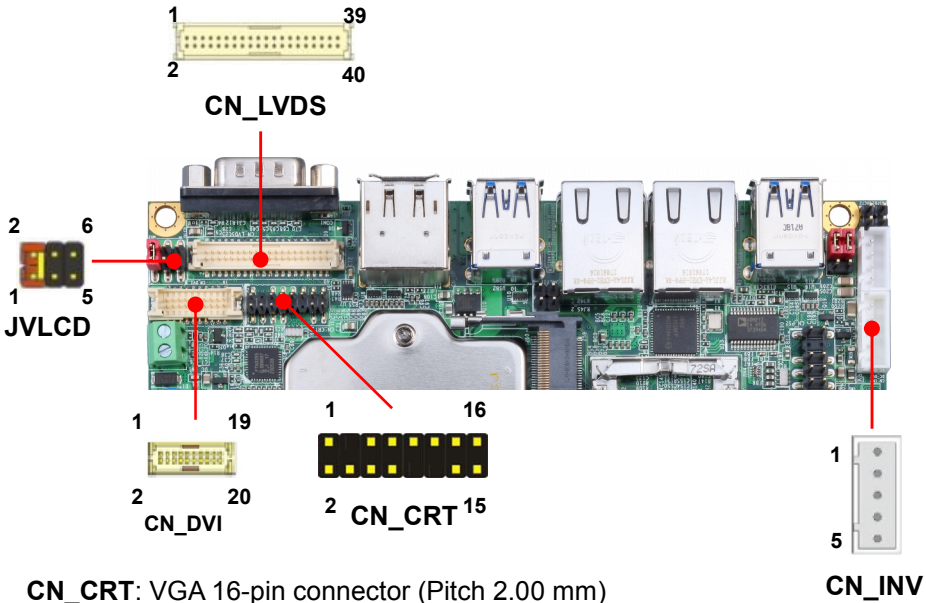


2.4.3 <Display interface>

Based on the 6th Gen CPU with built-in HD Graphics 530, VGA and DVI up to **1920x1080@60Hz**, DisplayPort up to **4096x2304@60Hz** , HDMI up to **4096x2304@24Hz** on rear IO. About the internal Display, LVDS (PTN3460) up to **1920x1200@60Hz** support 18/24-bit color depth and single/dual channel. 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_CRT: VGA 16-pin connector (Pitch 2.00 mm)

CN_INV

Pin	Signal	Pin	Signal
1	BR	2	BG
3	BB	4	NC
5	IOGND1	6	IOGND1
7	IOGND1	8	IOGND1
9	NC	10	IOGND1
11	NC	12	5VCDA
13	5HSYNC	14	5VSYNC
15	5VCLK	16	NC

CN_DVI: DVI onboard 20-pin connector

Pin	Signal	Pin	Signal
1	+5V	2	N/C
3	HPD	4	Ground
5	TMDSTX0N	6	TMDSTX0P
7	Ground	8	TMDSTX1N
9	TMDSTX1P	10	Ground
11	TMDSTX2N	12	TMDSTX2P
13	Ground	14	Ground
15	TMDSTXCP	16	Ground
17	DVI_DA	18	DVI_SL
19	N/C	20	N/C

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

Pin4 only need to be connected to GND

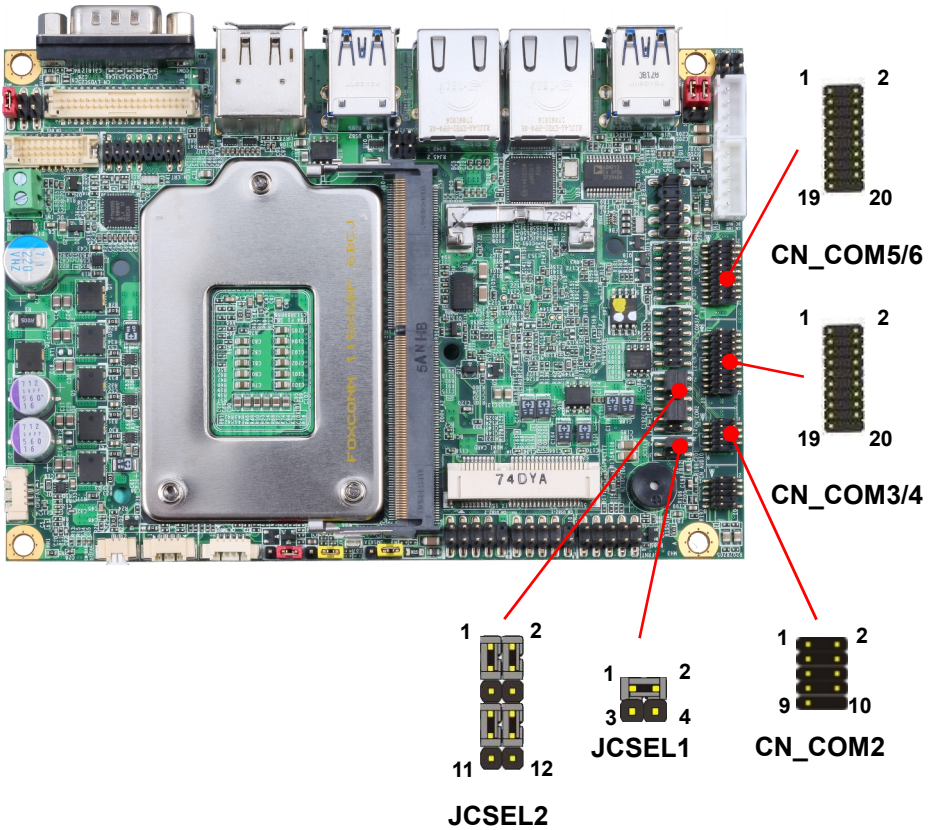
CN_INV: LVDS 5-pin Backlight power connector

Pin	Signal
1	12V
2	Backlight Control
3	GND
4	GND
5	Enable Backlight

JVLCD: LVDS panel power select jumper

Jumper settings	Function
1-2	3.3V (Default)
2-3	5V
5-6	12V

2.4.4 <Serial Port interface>



COM1: RS232 DB9 connector

Pin	Signal	Pin	Signal
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	Set by JP1		

COM2: RS232/422/485 9-pin header

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	Set by JP2		

Use JCSEL1 and JCSEL2 to select communication mode


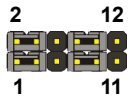

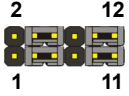

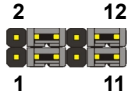
COM3/4: RS232 20-pin header (Pitch 2.54 x 1.27mm)

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

COM5/6: RS232 20-pin header (Pitch 2.54 x 1.27mm)

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

JCSEL1, JCSEL2: For configure COM2 communication mode

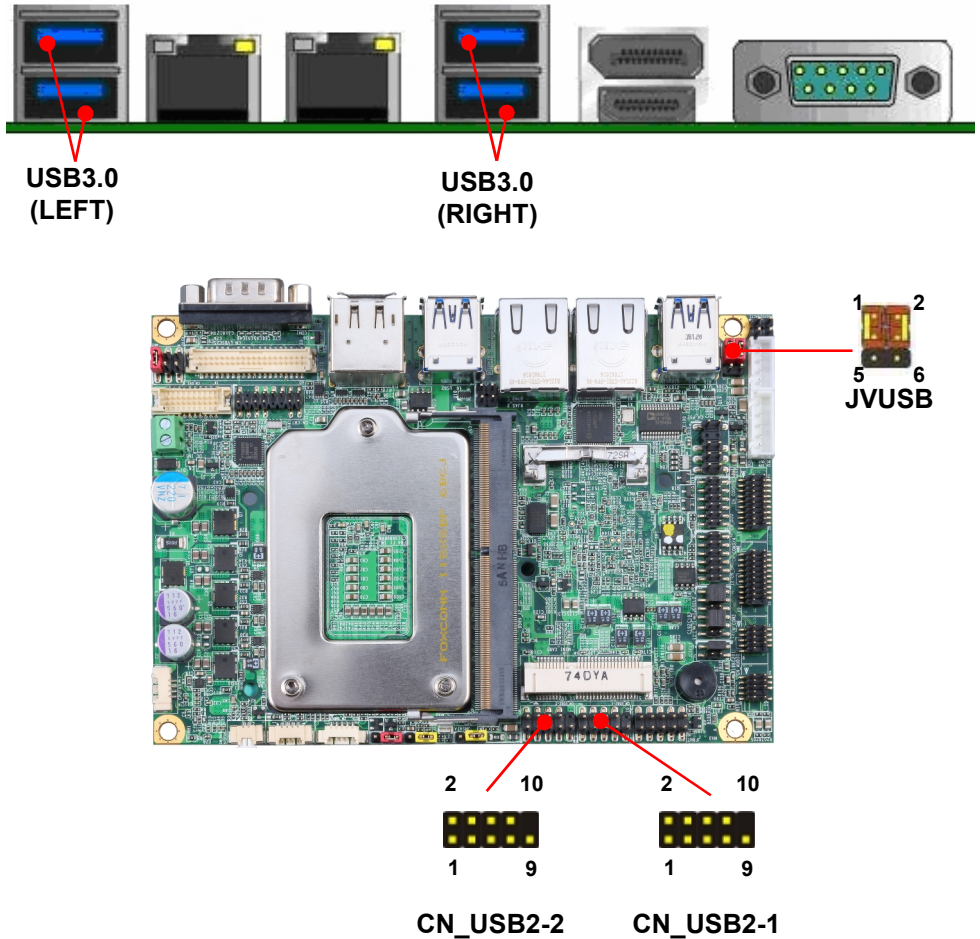
Function	JCSEL1	JCSEL2
RS232		
RS485		
RS422		

RS-485 cable modification:

CN_COM2 RTX- Data- : short Pin1& Pin4

CN_COM2 RTX+ Data+ : short Pin2& Pin3

2.4.5 <USB interface>



CN_USB 2-1/2-2: USB2.0 10-pin header (Pitch 2.54 mm)

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

Install USB3.0 Driver If you want to use CN_USB 2-1/2-2 in Windows7.

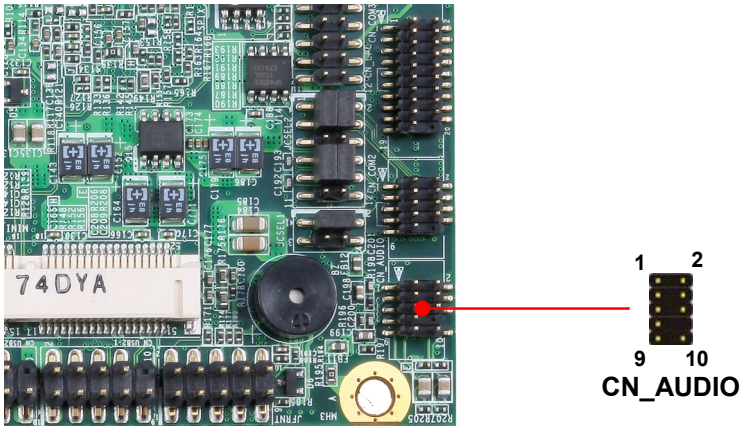
JVUSB: 6-pin Power select jumper

Pin	Description
1-3 & 2-4	5V_SB (Default)
3-5 & 4-6	5V

Effective patterns of connection: 1-3 & 2-4 or 3-5 & 4-6

JVUSB can control USB3.0(RIGHT) power.

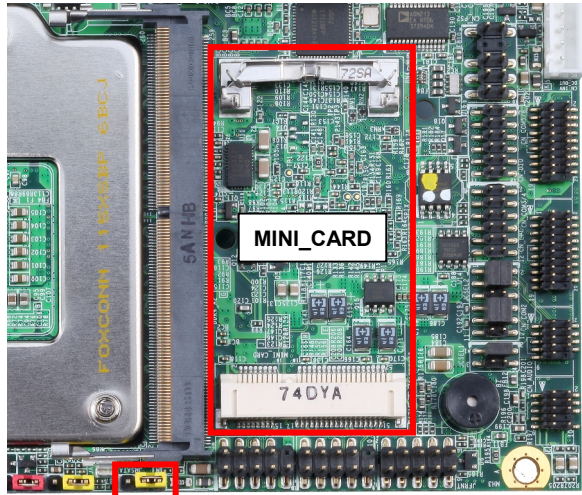
2.4.6 <Audio interface>



CN_AUDIO: Front panel audio 10-pin header (Pitch 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>



1 3



JMSATA

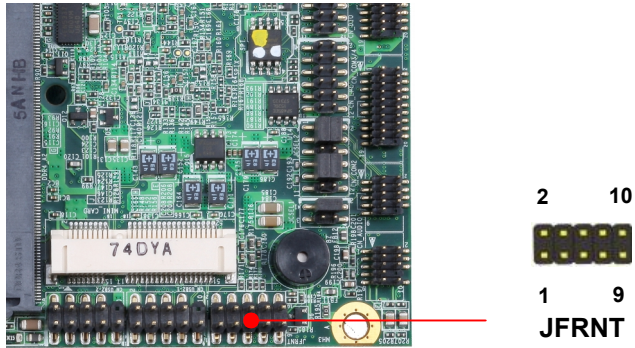
MINI_CARD have some special design to compatible our mini-PCIe card.
(ex: MPX-574D2, MPX-210D2 etc)

MINI_CARD support mSATA by JMSATA

JMSATA: Setting MINI_CARD to support PCIe/mSATA

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

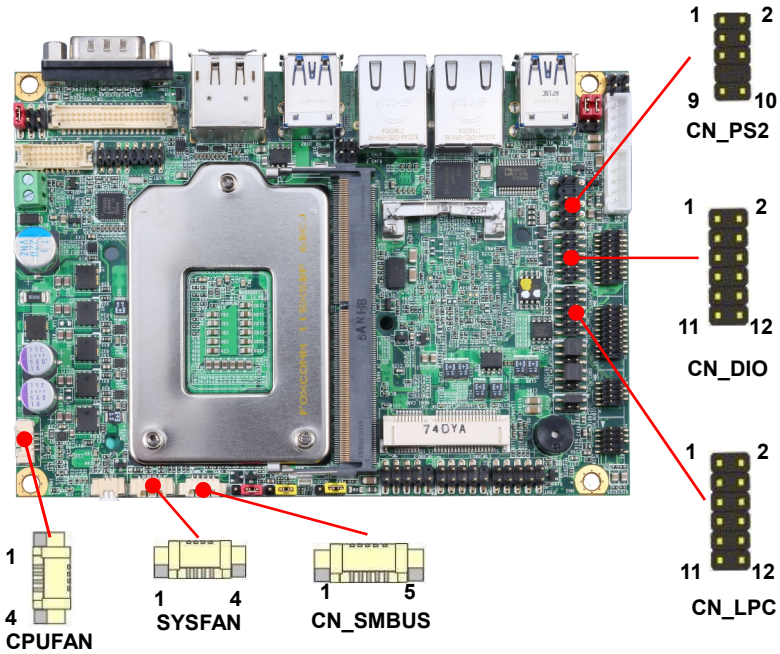
2.4.8 <Front panel switch and indicator>



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 <GPIO and Other interface>



When using GPIO function, please note:

As Output: **Open-drain**, most applications **need use an external pull up resistor.** (If not may cause damage)

As Input: **TTL-level.**

GPIO DC characteristics

Parameter	SYM	MIN	TYP	MAX	UNIT	Conditions
Input Low Voltage	V_{t-}	0.5	0.8	1.1	V	$V_{IN}=3.3V$
Input High Voltage	V_{t+}	1.6	2.0	2.4	V	$V_{IN}=3.3V$
Hystersis	V_{TH}	0.5	1.2		V	$V_{IN}=3.3V$
Input High Leakage	I_{LIH}			+10	μA	$V_{IN}=3.3V$
Input Low Leakage	I_{LIL}			-10	μA	$V_{IN}=0V$
Open-drain output pin with 12-mA sink capability						
Output Low Voltage	V_{OL}			0.4	V	$I_{OL}=12mA$

CN_DIO: GPIO 12-pin header (Pitch 2.00mm)

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GPIO0	4	GPIO4
5	GPIO1	6	GPIO5
7	GPIO2	8	GPIO6
9	GPIO3	10	GPIO7
11	5V	12	12V

CN_LPC: LPC 12-pin header (Pitch 2.00mm)

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

CN_SMBUS: SMBus 5-pin connector (Pitch 2.54mm)

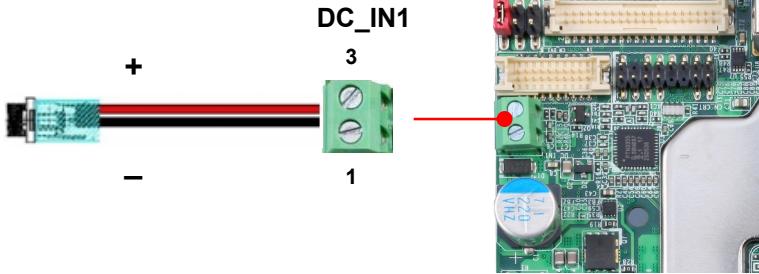
Pin	Signal
1	5V
2	NC
3	SMBDAT
4	SMBCLK
5	GND

CPUFAN & SYSFAN: cooler fan 4-pin connector

Pin	1	2	3	4
Signal	GND	12V	Sensor	Control

2.5 <Power supply>

2.5.1 <Power input>

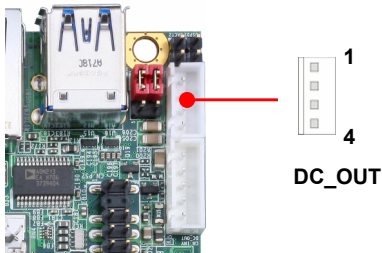


DC_IN1: Terminal Block 2-pin power connector

Pin	Signal	Pin	Signal
1	GND	3	Power in

The power support 9~35V wide voltage input.

2.5.2 <Power output>



DC_OUT: SATA power 4-pin connector

Pin	Signal
1	12V
2	GND
3	GND
4	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. Please make a bootable UFD which can boot into DOS environment.
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.

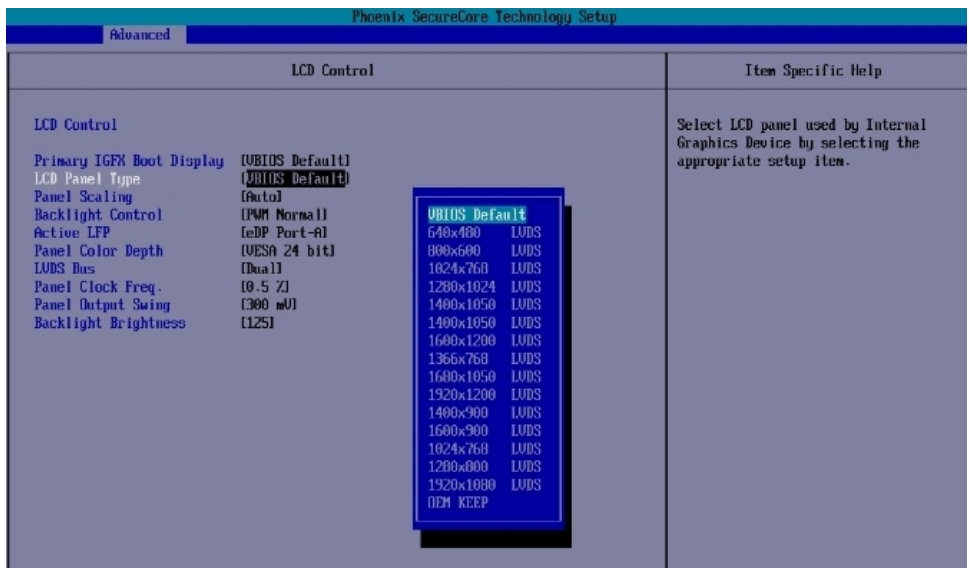
Appendix B <LCD Panel Type select>

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

You can find the setting from

Advanced → Intel Advanced Menu

SA configuration → Graphics configuration → LCD control → LCD Panel Type

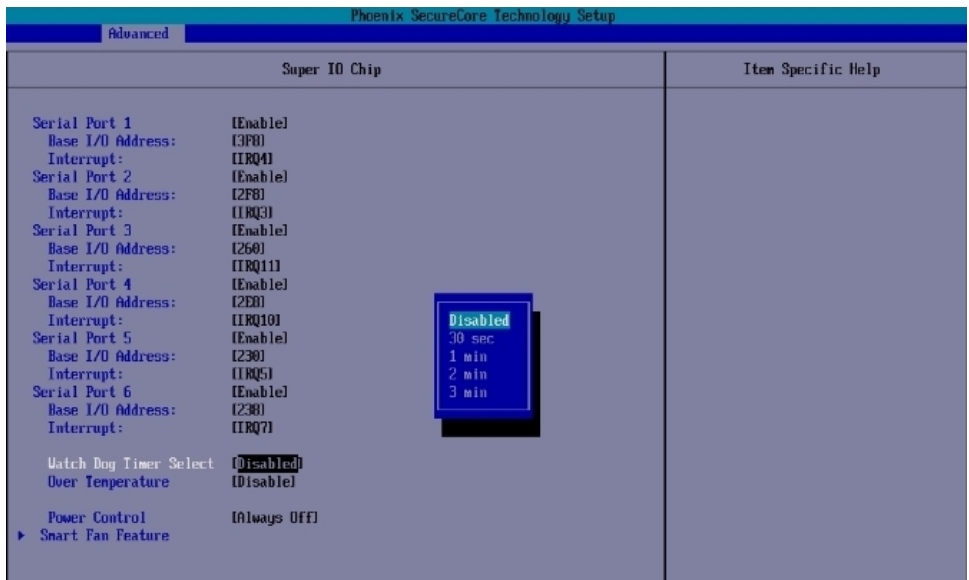


Appendix C <Programmable Watch Dog Timer>

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→Intel Advanced Menu→Super IO Chip



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 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 NCT6106D datasheet

Appendix D <Hardware monitor >

Find the setting from Misc-→SIO NCT6106D Hardware Monitor

Phoenix SecureCore Technology Setup	
Misc	
Hardware Monitor	Item Specific Help
System Temperature	128.5 Cj
CPU Temperature	128.5 Cj
System Fan Speed	0 RPM
CPU Fan Speed	1909 RPM
AUX Fan Speed	0 RPM
Battery 3V (VBAT)	3.056 Vj
CPU VCORE	0.968 Vj
12V	112.724 Vj
5V	14.808 Vj

Appendix E <Programmable GPIO >

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

The DC characteristics please refer to GPIO paragraph (Page20).

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 10 ;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

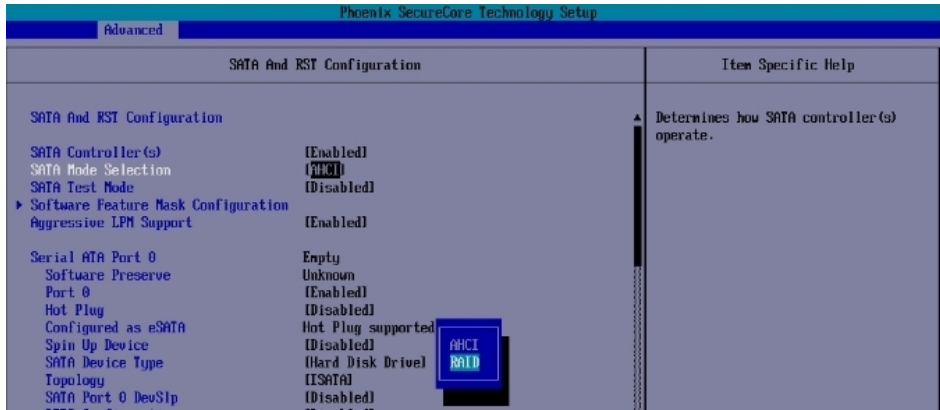
For further information, please refer to Nuvoton NCT6106D datasheet

Appendix F <RAID Setting>

When use RAID function, it need to enter the BIOS set RAID mode first.

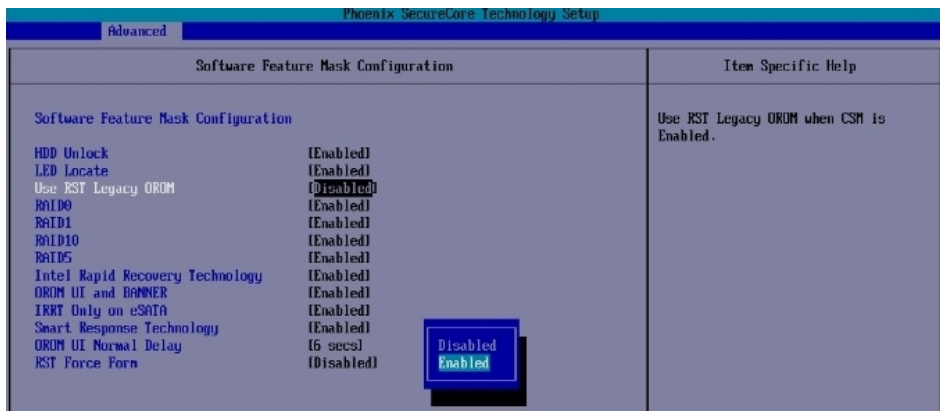
Find the setting from

[Advanced] → [Intel Advanced Menu] → [PCH-IO Configuration]
 → [SATA Configuration] → [SATA Mode Selection]



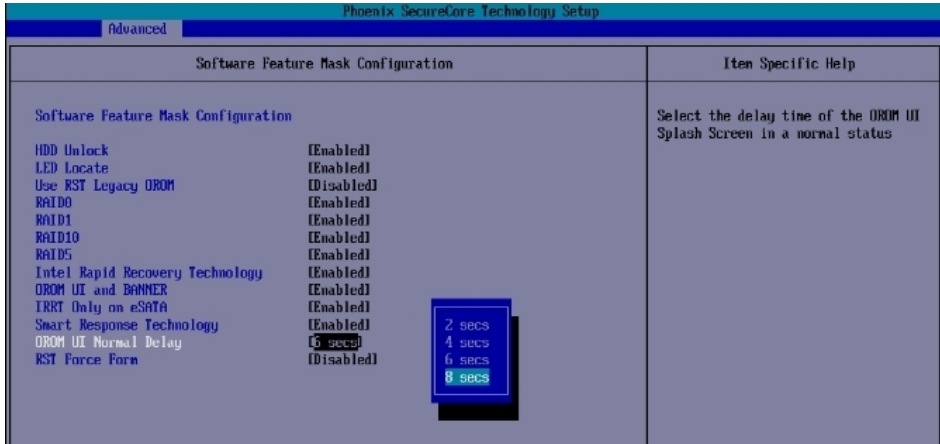
SATA And RST Configuration → Software Feature Mask Configuration

Set Use RST Legacy OROM → [Enable]



If this screen stop time is too short, it can be set in the BIOS.

- [Advanced] → [Intel Advanced Menu] → [PCH-IO Configuration]
- [SATA Configuration] → [Software Feature Mask Configuration]
- [OROM UI Normal Delay] → [8 sec] **(Need to set RAID mode first)**



At boot time, press <CTRL + I> to enter the RAID configuration menu.



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

LS-37KT series have a 2nd CRT or 2nd LVDS, it's no need install extra driver.

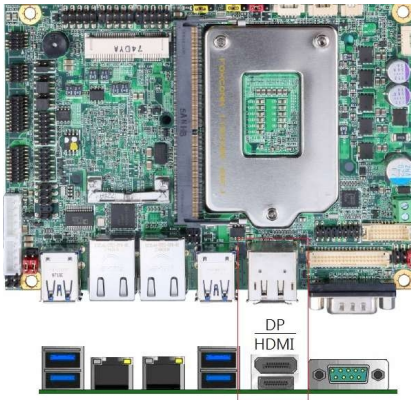
For further information, please refer to the manual.

ADP-3355 manual [Link](#)

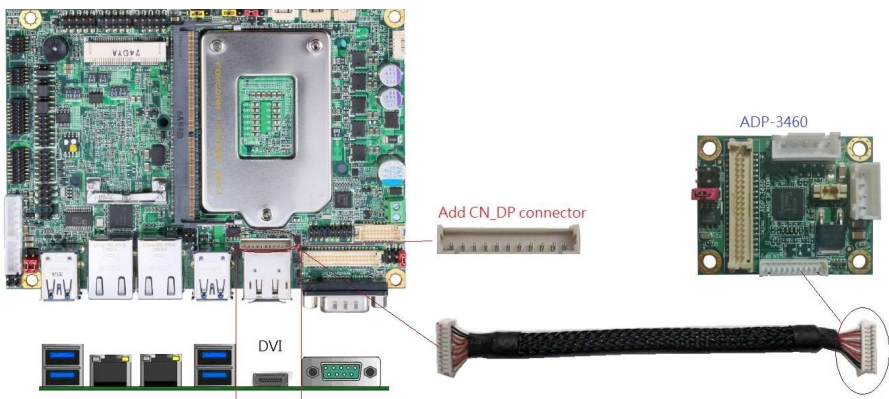
ADP-3460 manual [Link](#)

Please refer the pictures below, they show the difference between LS-37K and LS-37KT.

LS-37K



LS-37KT



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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