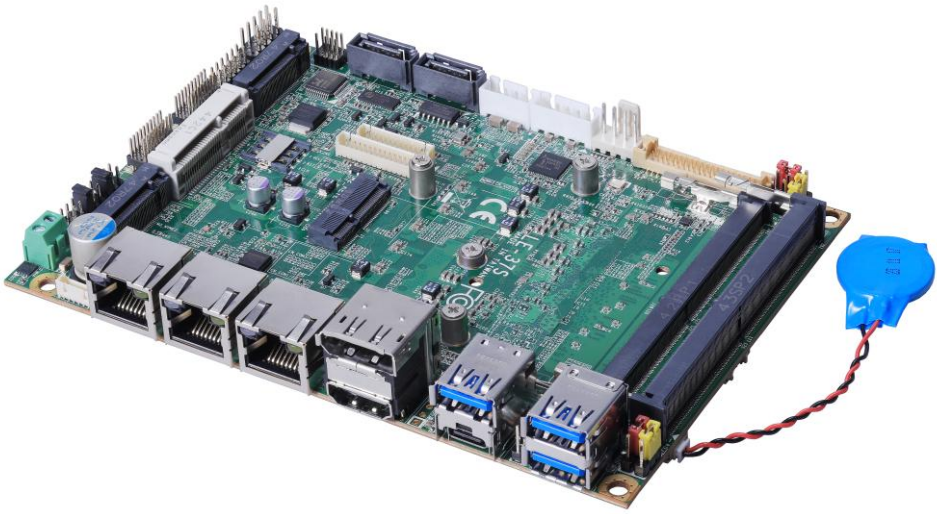
LE-37S

3.5 inch Motherboard

User's Manual

Edition 1.2
2026/04/15



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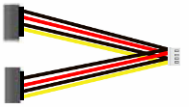
Packing List:

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

1 x LE-37S 3.5 inch Miniboard
(Include cooler fan)



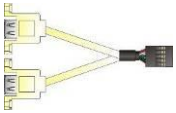
1 x SATA Power Cable
(OALSATA15-2PJ / 1040613)

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

1 x Audio cable
(OALPJ-HDUNB / 1040123)

2 x SATA Cable
(OALSATA3-L) / (1040529)

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



1 x USB2.0 cable
(OALUSBA-3 / 1040173)
(Optional)

Index

Chapter 1 <Introduction>

1.1 <Product Overview>

LE-37S is a 3.5" Motherboard which supports Ultra H/U Processor(MTL-H/U Platform), integrated DDR5 memory, Realtek High Definition Audio, Intel Gigabit LAN, USB3.2 Gen2, SATA3, Type C 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 one MiniPCIe slot (support mSATA), one M.2 2230 slot, two M.2 2280 slot (PCIe Gen4), and supports Type C (Alt mode), HDMI, 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™ MTL Ultra H/U Processors FCBGA2049 package
Memory	2 x DDR5 SO-DIMM up to 5600 MHz 96GB, 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 MiniPCIe with SIM Slot (support mSATA) (Note1) 1 x M.2 2230 Key E for Wi-Fi and Bluetooth 2 x M.2 2280 Key M support PCIe Gen4 for NVMe

Graphics

Chipset	Intel® Arc™ Graphics(Note2) Intel® Graphics
Display Interface	1 x LVDS (Note3) ,1 x DisplayPort ++, 1 x HDMI, 1 x eDP, 1 x Type-C (DP Alt. Mode)

LAN

Chip	1 x Intel® I226-LM Gigabit LAN (up to 2.5GbE) 2 x Intel® I226-V Gigabit LAN (up to 2.5GbE)

I/O

Serial ATA	2 x SATA3 (Note1)
Audio	Realtek ALC888S HD Audio
Internal I/O	2 x SATA3, 2 x USB2.0, 1 x eDP, 2 x RS232, 2 x RS232/485/422 1 x LVDS, 1 x LCD inverter connector, 1 x GPIO, 1 x Audio, 1 x SMBus, 1 x Audio Amplifier(Note4)
Rear I/O	1 x DisplayPort ++, 1 x HDMI, 1 x Type-C (DP Alt. Mode), 3 x USB3.2 Gen2, 3 x LAN

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

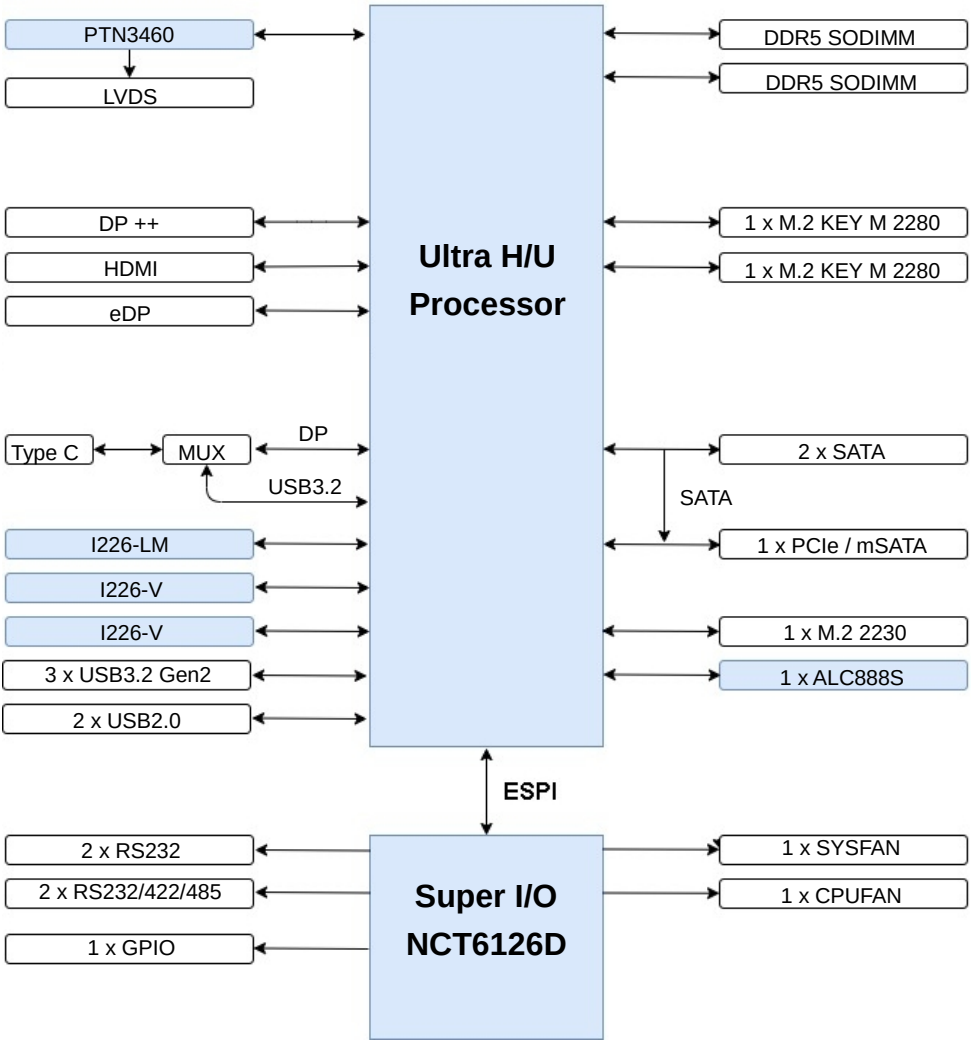
Note1: mSATA and SATA2 can't use at the same time

Note2: Intel® Arc™ Graphics requires at least 16GB of system memory and two memory cards installed. (MTL-H Platform)

Note3: Onboard 18/24-bit single/dual channel +3.3V/ +5V/ +12V LVDS.

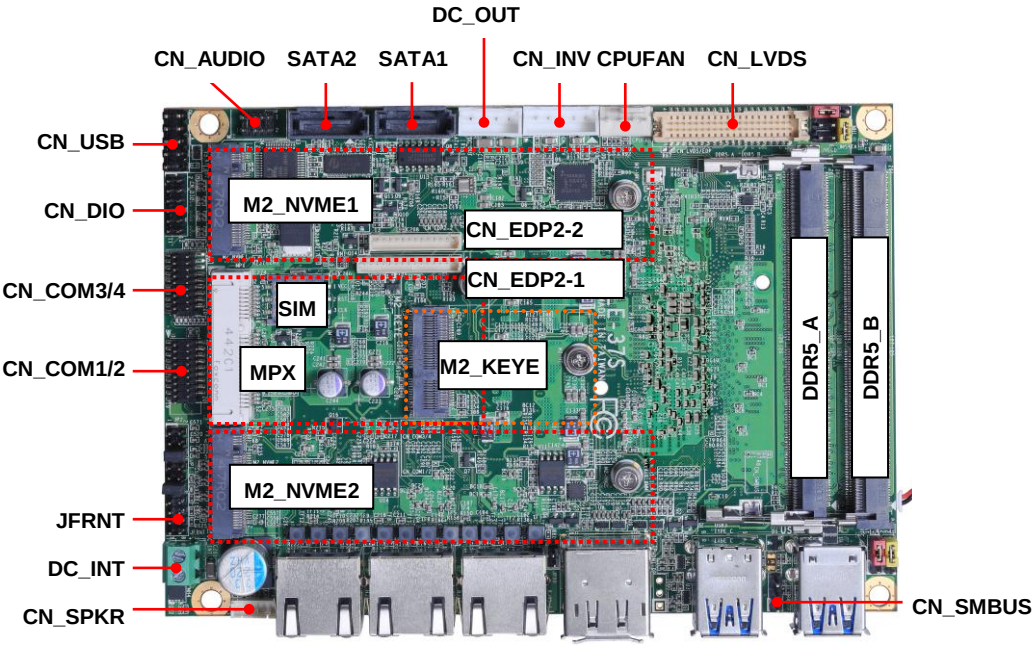
Note4: Audio Amplifier with 3Watt for 4ohm speaker

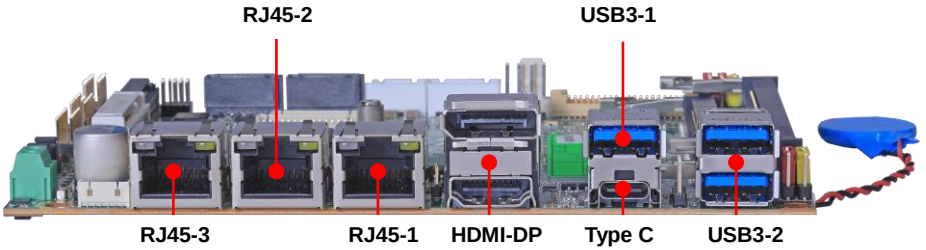
1.3 <Block Diagram>



Chapter 2 <Hardware setup>

2.1 <Connector Location and Reference>





2.1.1 <Internal connectors list>

Connector	Function
DDR5_A/B	262-pin DDR5 SO-DIMM slot
SATA1/2	7-pin SATA3 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_SMBUS	3-pin SMBus connector
CN_COM 1/2	20-pin RS232/RS422/RS485 connector
CN_COM 3/4	20-pin RS232 connector
CN_USB	5 x 2-pin USB2.0 pin header
CN_DIO	6 x 2-pin digital I/O connector
CN_BAT	2-pin Battery connector
CN_SPKR	6-pin Speaker connector
CPUFAN	4-pin CPU fan connector
SYSFAN	4-pin system fan connector
JFRNT	8-pin front panel switch/indicator connector
MPX	52-pin MiniPCIe card slot
M2_KEYE	75-pin M.2 Key E slot
M2_NVME1/2	75-pin M.2 2280 Key M slot support PCIe Gen4
DC_INT	2-pin power input Terminal Block
DC_OUT	4-pin SATA Power connector
SIM	6-pin SIM socket

2.1.2 <External connectors list>

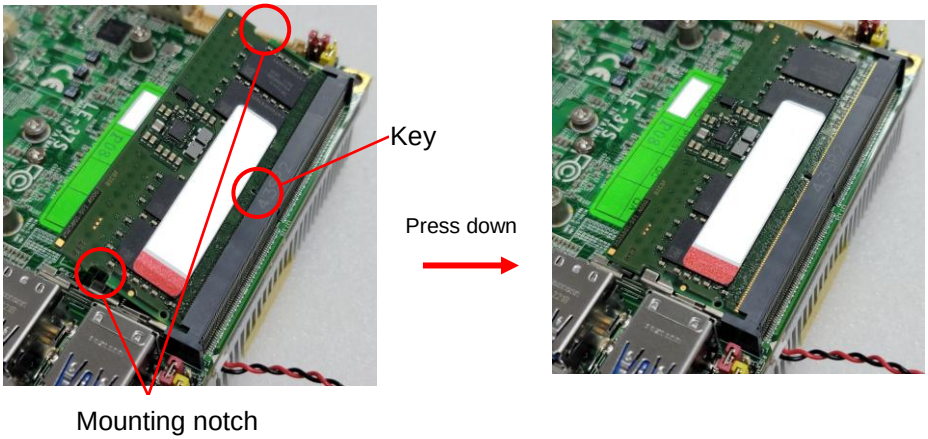
Connector	Function
HDMI-DP	DisplayPort ++ and HDMI dual layer connector
USB3	1 x USB3.2 Gen2 connector
USB	2 x USB3.2 Gen2 connector
RJ45-1	RJ45 connector (I226-LM)
RJ45-2/3	RJ45 connector (I226-V)
Type C	Support USB3.2 gen2 or DP

2.2 <Memory Setup>

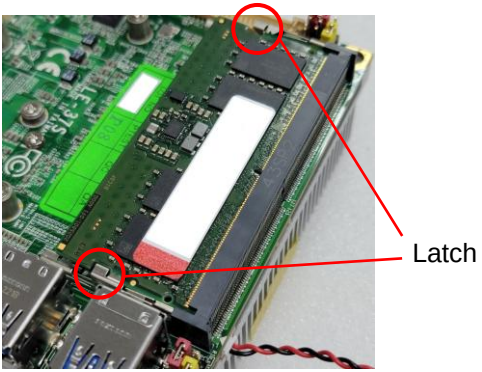
LE-37S has 262-pin DDR5 SODIMM support up to 96GB of memory capacity and 1.1 Voltage. Only Non-ECC memory is supported.

In the process, the board must be powered off.

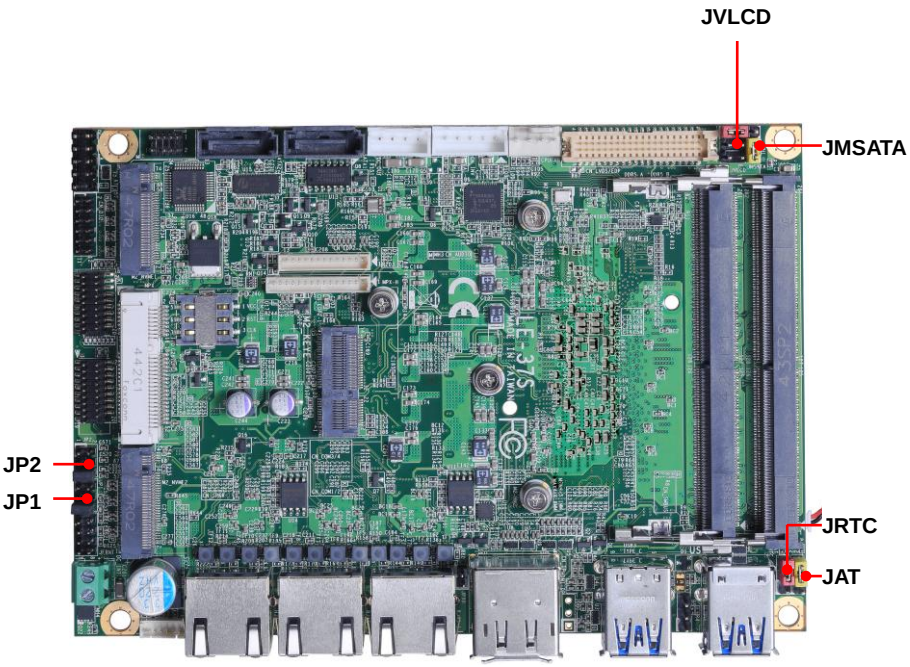
1. Put the memory tilt into the slot. Note the Memory notch key aligned slot key.
2. Then press down till lock into the mounting notch.



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



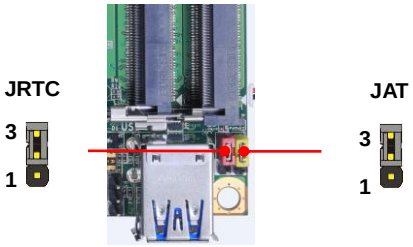
2.3 <Jumper Location and Reference>



2.3.1 <Jumper list>

Jumper	Function
JAT	Power mode select
JRTC	CMOS Normal/Clear Setting
JVLCD	Panel Voltage Setting
JMSATA	MiniCard mSATA Setting
JP1	COM1 Voltage Setting (For Pin 9)
JP2	COM2 Voltage Setting (For Pin 9)

2.3.2 <Clear CMOS and Power on type selection>



JAT: AT/ATX mode select jumper

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

JRTC: Clear CMOS data jumper

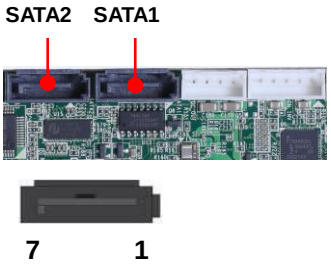
Jumper settings	Function
1-2	Clear CMOS
2-3	Normal (Default)

2.4 <I/O interface>

2.4.1 <Serial ATA interface>

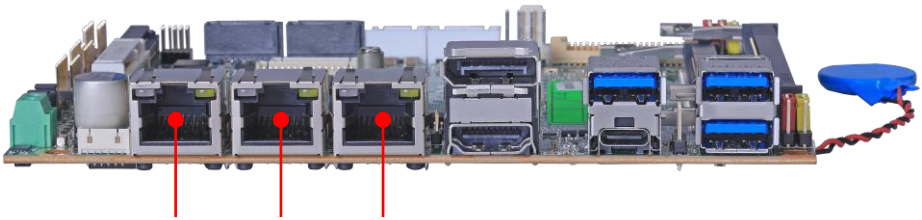
SATA 1/2 : SATA3 7-pin connector

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



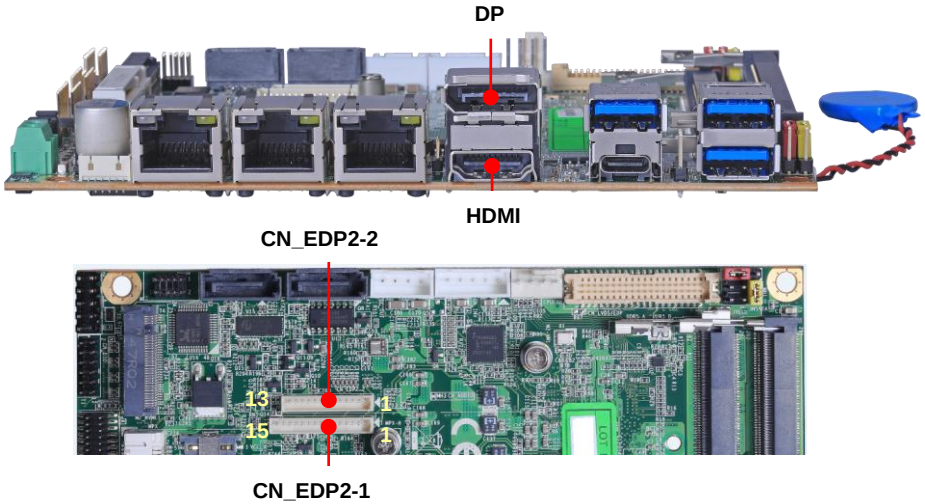
2.4.2 <Ethernet interface>

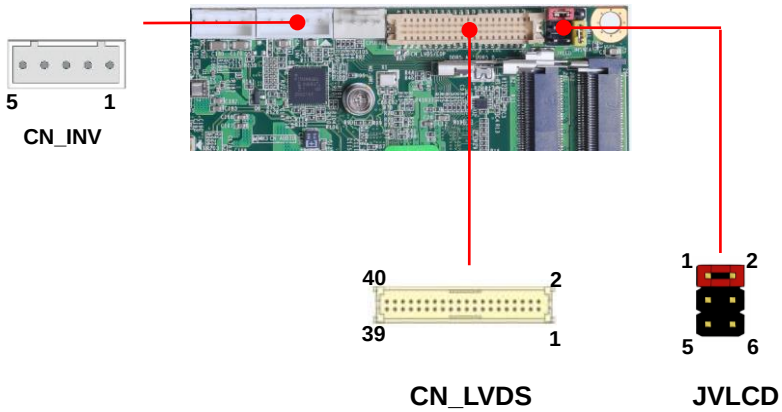
The board provides I226-LM & I226-V 2.5Gigabit Ethernet which supports WOL on rear I/O.



2.4.3 <Display interface>

Based on the Ultra CPU (MTL-H/U Platform) with built-in Intel® Arc™ Graphics (MTL-H Platform) and Intel® Graphics(MTL-U Platform), 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_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	5V
4	GND
5	Enable Backlight

JVLCD: LVDS panel power select jumper

Jumper settings	Function
1-2	3.3V (Default)
3-4	5V
5-6	12V

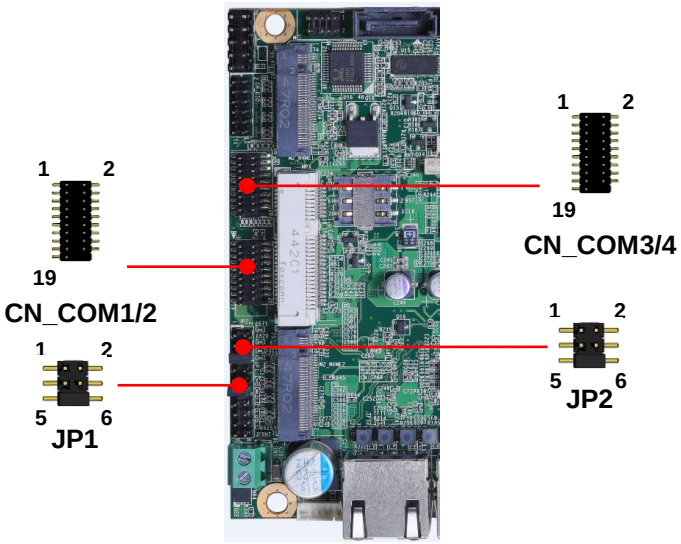
CN_EDP2-1 : EDP connector

Pin	Signal	Pin	Signal
1	eDP0+	9	GND
2	eDP0–	10	HPD
3	GND	11	+3.3 V
4	eDP1+	12	+3.3 V
5	eDP1–	13	GND
6	GND	14	Backlight Control
7	eDP_AUX+	15	Enable Backlight
8	eDP_AUX–		

CN_EDP2-2 : EDP connector

Pin	Signal	Pin	Signal
1	eDP2+	9	GND
2	eDP2–	10	+12 V
3	GND	11	+12 V
4	eDP3+	12	+12 V
5	eDP3–	13	+12 V
6	GND		
7	SMBDATA		
8	SMBCLK		

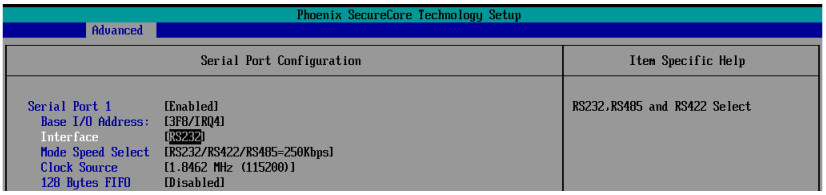
2.4.4 <Serial Port interface>



`**CN_COM1/2**: RS232/422/485 20-pin header (Pitch 2.54 x 1.27mm)

Pin	Signal	Pin	Signal
1	DCD1/ 422TX-/ 485-	**2**	RXD1/ 422TX+/ 485+
3	TXD1/ 422RX+	**4**	DTR1/ 422RX-
5	GND	**6**	DSR1
7	RTS1	**8**	CTS1
9	Set by JP1	**10**	NC
11	DCD2/ 422TX-/ 485-	**12**	RXD2/ 422TX+/ 485+
13	TXD2/ 422RX+	**14**	DTR2/ 422RX-
15	GND	**16**	DSR2+
17	RTS2	**18**	CTS2
19	Set by JP2	**20**	N/A

CN_COM1/2 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



JP1, JP2: COM1, COM2 pin-9 setting

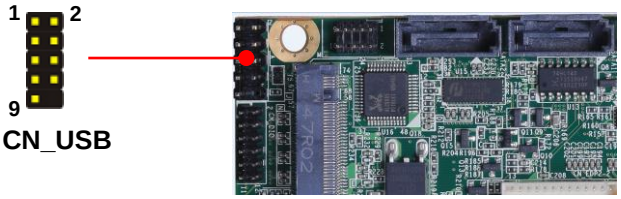
Jumper settings	Function
1-2	5V
3-4	12V
5-6	RI (Default)

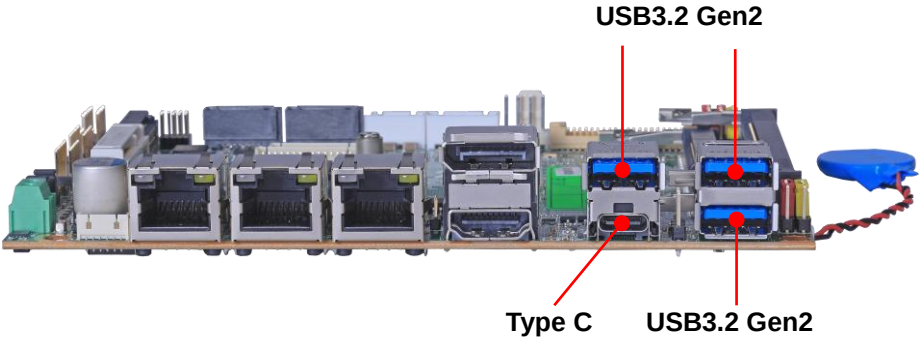
Effective patterns of connection:
1-2 / 3-4 / 5-6
Other may cause damage

CN_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**	N/A

2.4.5 <USB interface & Type C >



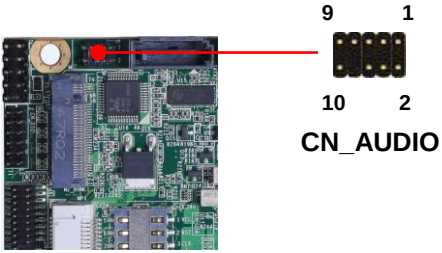


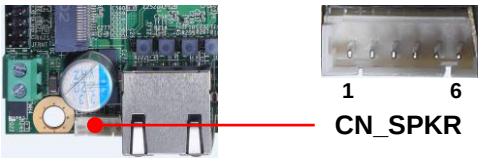
CN_USB: USB2.0 10-pin header (Pitch 2.54 mm)

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

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

2.4.6 <Audio interface>





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

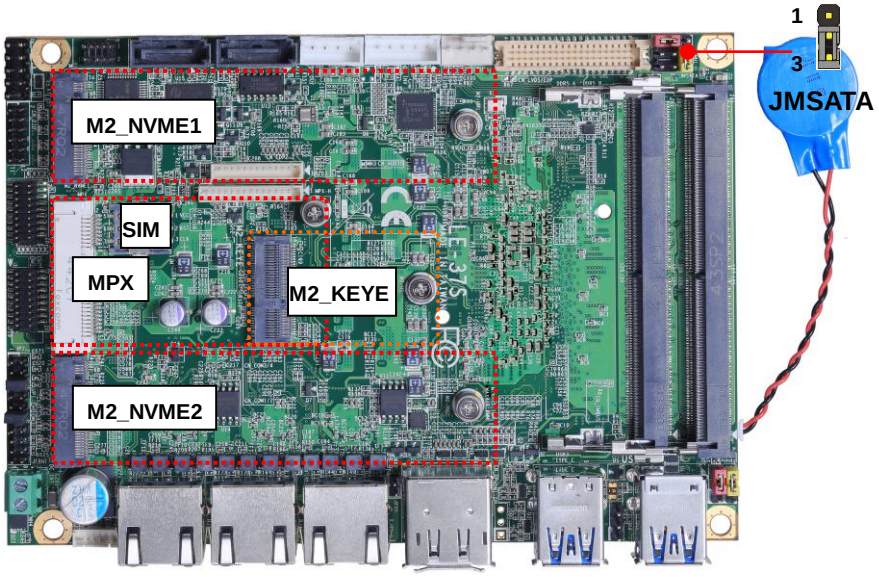
Pin	Signal	Pin	Signal
1	MIC_L	**2**	GND
3	MIC_R	**4**	NC
5	FP_OUT_R	**6**	MIC_DETECT
7	SENSE	**8**	N/A
9	FP_OUT_L	**10**	FP_OUT_DETECT

CN_SPKR: 6-pin Two channel Audio Amplifier

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

To enable audio output, please short Pin 3 (JD_Front) and Pin 4 (GND)

2.4.7 <Expansion slot>



MINI_CARD support mSATA by JMSATA, and connect SIM card

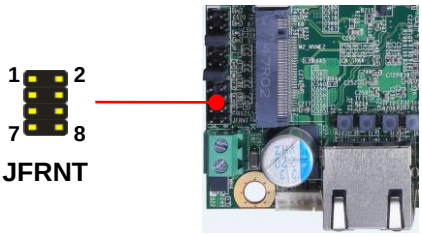
M.2_NVME1/2 support PCIe Gen4

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

JMSATA: Setting MINI_CARD to support PCIe/mSATA

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

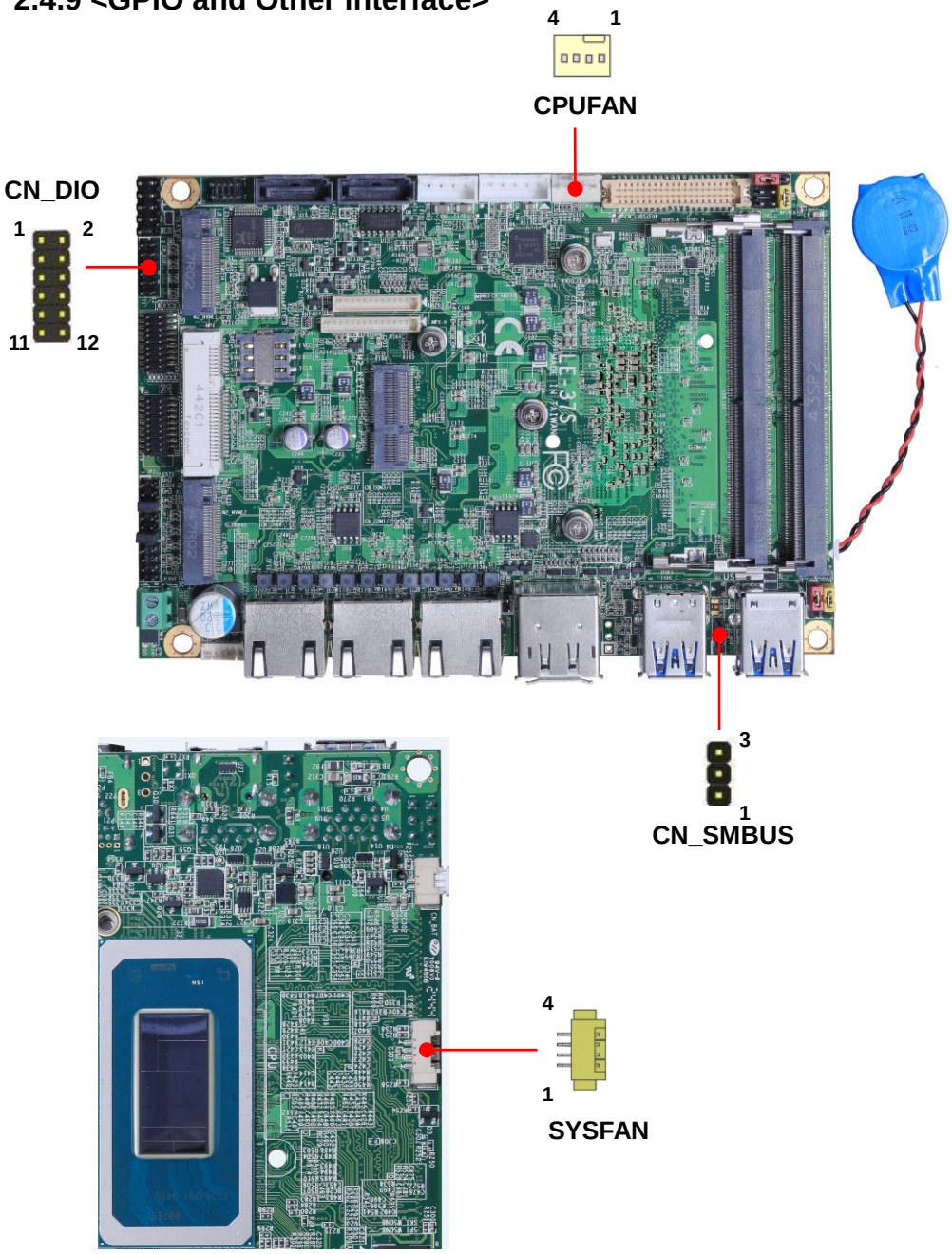
2.4.8 <Front panel switch and indicator>



JFRNT: Front panel switch and indicator 8-pin header

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-

2.4.9 <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 (open drain mode)

Parameter	SYM	MIN	TYP	MAX	UNIT	Conditions
Input Low Voltage	V_{IL}			0.8	V	
Input High Voltage	V_{IH}	2.0			V	
Output Low Voltage	V_{OL}			0.4	V	I_{OL} =12mA
Input High Leakage	I_{LIH}			+10	µA	V_{IN} =3.3V
Input Low Leakage	I_{LIL}			-10	µA	V_{IN} =0V

Please refer to **Appendix D** to program the configuration register

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

Pin	Signal	Pin	Signal
1	GND	2	GND
3	GP0	4	GP4
5	GP1	6	GP5
7	GP2	8	GP6
9	GP3	10	GP7
11	5V	12	N/A

CN_SMBUS: SMBus 3-pin connector (Pitch 2.54mm)

Pin	1	2	3
Signal	SMBCLK	GND	SMBDAT

CPUFAN: CPU cooler fan 4-pin connector

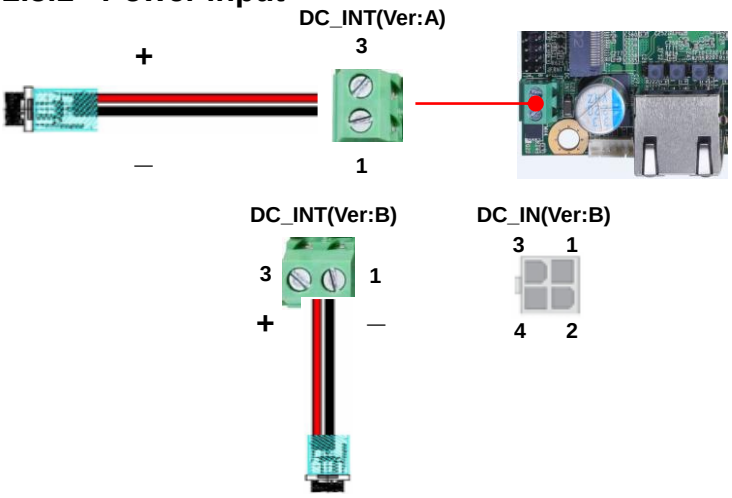
Pin	1	2	3	4
Signal	GND	12V	Sensor	Control

SYSFAN: System cooler fan 4-pin connector

Pin	1	2	3	4
Signal	GND	12V	Sensor	Control

2.5 <Power supply>

2.5.1 <Power input>



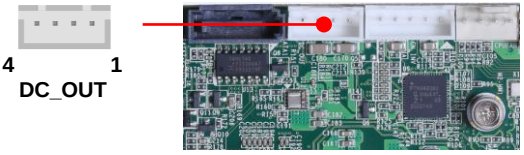
DC_INT: Terminal block 2-pin power connector(Standard)

Pin	Signal	Pin	Signal
1	GND	**3**	DC input 9~35V

DC_IN: 4-pin power connector(OEM)(Ver:B)

Pin	Signal	Pin	Signal
1	GND	**2**	GND
3	DC input 9~35V	**4**	DC input 9~35V

2.5.2 <Power Output>



DC_OUT: SATA power 4-pin connector

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

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.

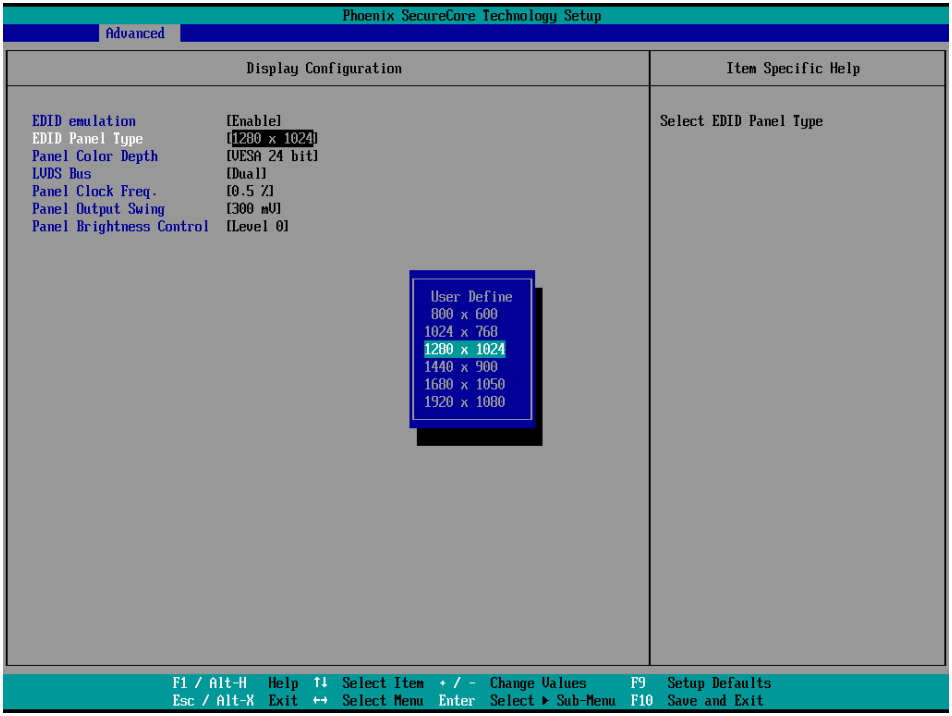
Find the setting from

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



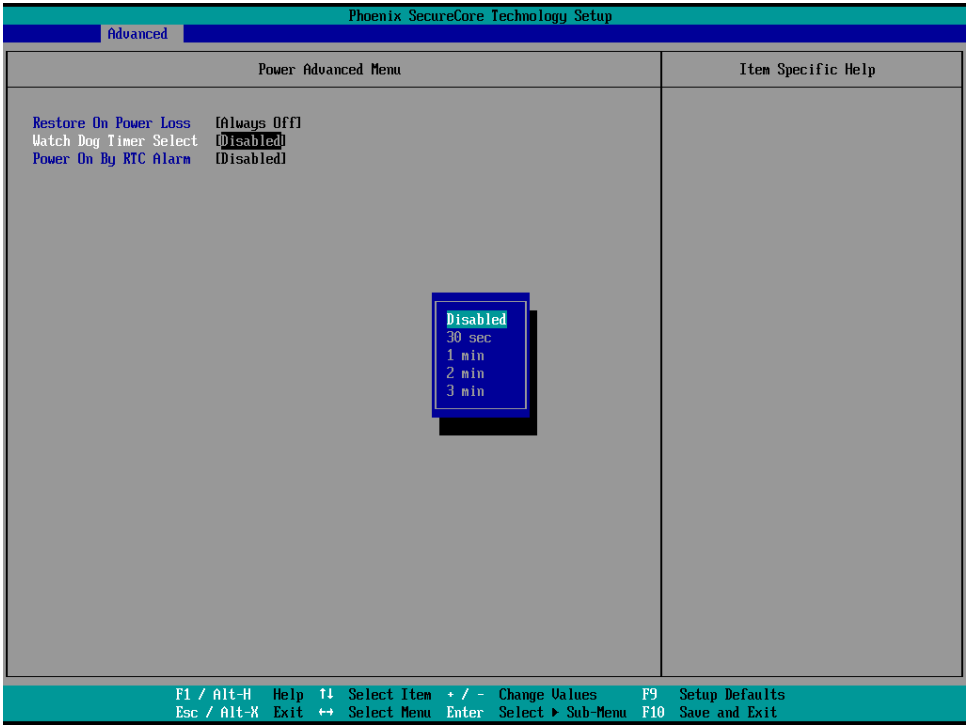
Appendix B <Programmable Watch Dog Timer>

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.)
```

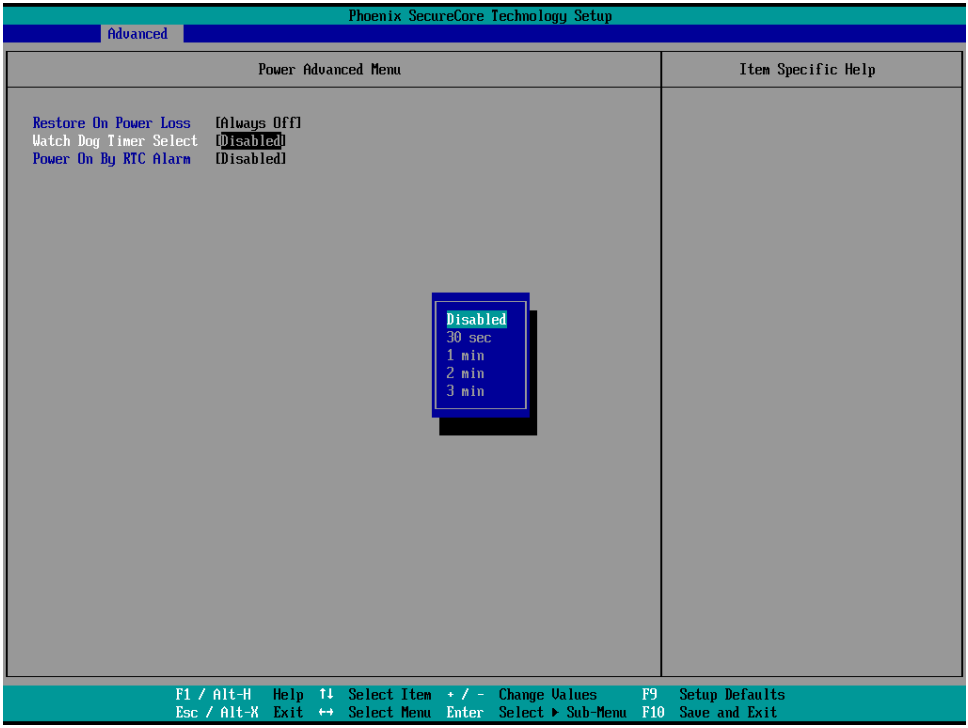
For further information, please refer to Nuvoton NCT6126D datasheet

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 18 ;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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