CI170A / CI170C

Intel ® Kaby Lake-S / Skylake-S Core™ I processor + Intel Q170, DDR4 2133 MT/s / LAN / DVI / HDMI / DP / USB / PCIe mini card

All-In-One

6th / 7th gen. Intel Kaby Lake-S / Skylake-S Core™ I CPU

DVI, HDMI, LVDS, DP, LVDS (eDP), PCIe mini card

Multi-COM Board, Audio, LAN, SATA, USB

NO. CI170A/C
Release date: April 28th 2017

Contents

CI170A/C

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User Manual edition 0.1, April. 28th . 2017

Warning !

1. Battery
   Batteries on board are consumables.
   The life time of them are not guaranteed.

2. Fless solution with HDD
   The specification & limitation of HDD should be considered carefully when the fanless solution is implemented.

3. We will not give further notification in case of changes of product information and manual.

4. SATA interface does not support Hot SWAP function.

5. There might be a 20% inaccuracy of WDT at room temperature.

6. Please make sure the voltage specification meets the requirement of equipment before plugging in.

7. Caution! Please notice that the heat dissipation problem could cause the MB system unstable. Please deal with heat dissipation properly when buying single MB set.

8. Please avoid approaching the heat sink area to prevent users from being scalded with fanless products.

9. If users repair, modify or destroy any component of product unauthorizedly, We will not take responsibility or provide warranty anymore.

10. DO NOT apply any other material which may reduce cooling performance onto the thermal pad.

11. It is important to install a system fan toward the CPU to decrease the possibility of overheating / system hanging up issues, or customer is suggested to have a fine cooling system to dissipate heat from CPU.

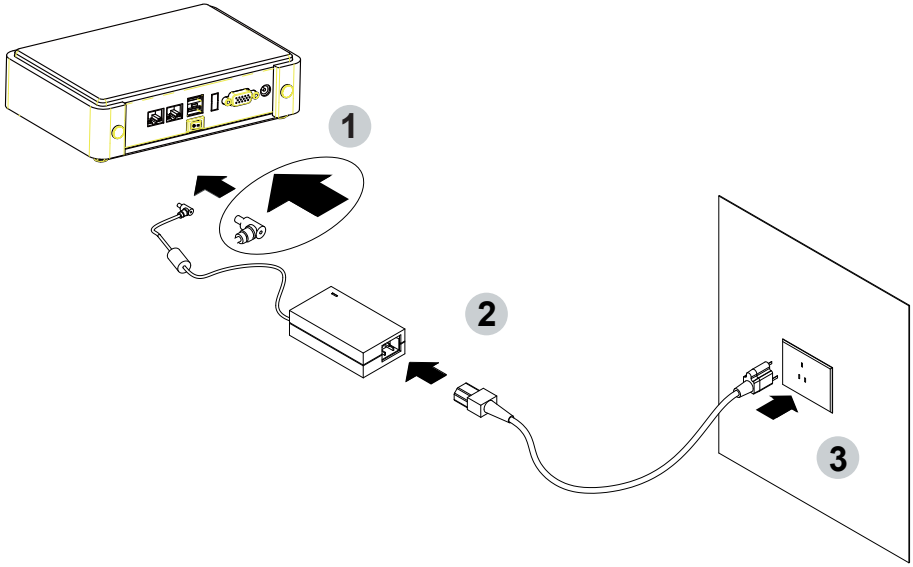
✱ Hardware Notice Guide

1. Before linking power supply with the motherboard, please attach DC-in adapter to the motherboard first. Then plug the adapter power to AC outlet.
   Always shut down the computer normally before you move the system unit or remove the power supply from the motherboard. Please unplug the DC-in adapter first and then unplug the adapter from the AC outlet.
   Please refer photo 1 as standard procedures.
2. In case of using DIRECT DC-in (without adapter), please check the allowed range for voltage & current of cables. And make sure you have the safety protection for outer issues such as short/broken circuit, overvoltage, surge, lightning strike.
3. In case of using DC-out to an external device, please make sure its voltage and current comply with the motherboard specification.
4. The total power consumption is determined by various conditions (CPU/motherboard type, device, application, etc.). Be cautious to the power cable you use for the system, one with UL standard will be highly recommended.
5. It's highly possible to burn out the CPU if you change/ modify any parts of the CPU cooler.
6. Please wear wrist strap and attach it to a metal part of the system unit before handling a component. You can also touch an object which is ground connected or attached with metal surface if you don't have wrist strap.
7. Please be careful to handle & don't touch the sharp-pointed components on the bottom of PCBA.
8. Remove or change any components form the motherboard will VOID the warranty of the motherboard.
9. Before you install/remove any components or even make any jumper setting on the motherboard, please make sure to disconnect the power supply first. (follow the aforementioned instruction guide)
10. "POWERON after PWR-Fair" function must be used carefully as below:
    When the DC power adaptor runs out of power, unplug it from the DC current;
    Once power returns, plug it back after 5 seconds.
    If there is a power outage, unplug it from the AC current, once power returns, plug it back after 30 seconds. Otherwise it will cause system locked or made a severe damage.

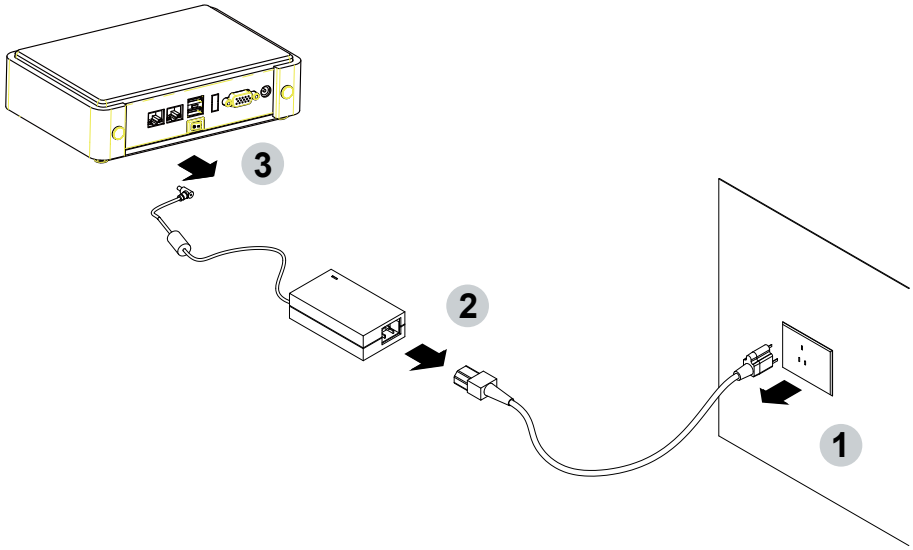
Remark 1:
Always insert/unplug the DC-in horizontally & directly to/from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The CI170A/C is an All-In-One board which is 7th/6th Gen Intel® Core™ i7/i5/i3 and Pentium®/Celeron® Processor (formerly codenamed Skylake-S) based industrial motherboard in the LGA1151 package with Intel® Q170 Express chipset. The CI170A/C supports high-speed data transfer interfaces such as PCIe3.0, USB 3.0, and SATA 6 Gb/s (SATA III), with dual-channel DDR4 2133 MHz memory up to 32 GB in two SO-DIMM slots and supports 4 USB 3.0, 5 USB 2.0, 10 COM and 4 SATA III ports, as well as graphics interface for DVI-D, HDMI and DisplayPort displays.

High-performance and power-efficient communication platform, the embedded motherboard of CI170A/C is specially designed for IoT, industrial, digital signage, medial, POS, retail and factory automation applications.CI170A/C with a wide variety of expansion options including PCIe(x16), PCIe(x8), PCIe(x4), PCIe(x1), or 2 PCIe(x8), 2 PCIe(x4), 2 PCIe(x1), selectable by raiser cards. The platform comes with five Intel Gigabit Ethernet controllers and supports Wake-On LAN, vPro with TPM 2.0 and the PXE function in BIOS for Intel LAN chipset, it is perfect control board for networking devices.

The CI170A/C also supports up to ten of serial ports RS232/RS422/RS485 auto switch by BIOS settings and +5V/12V selectable by jumper. In addition, there are multi-ports of Hi-Speed USB 3.0/2.0 to enhance the host controller interface which will ensure the high performance level and flexible expansion. The expandable interfaces include 1 full-size PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface, and 1 full-size PCIe Mini card for PCIe x 1 and USB interface. There are two SIM socket onboard for the mini cards to get the 3G/4G communication easier and quickly.

The CI170C supports LVDS interface and touch controller onboard for touch panel and 1 panel inverter power for panel dimming control. It suitable for ALL-IN ONE Panel PC, POS, Kiosk and automation control systems. The All-In-One motherboard is fully compatible with industry standards, plus technical enhancements and thousands of software applications developed for IBM PC/AT compatible computers. These control logic provides high-speed performance for the most advanced multi user and multitasking applications available today.

1-1 Major Feature

1. The Desktop Skylake S-Platform processor includes Integrated Display Engine, GPU and Integrated Memory Controller. The processor is designed be offered in a LAG1151 package.
2. Intel Q170 Chipset Family Platform Controller Hub (PCH)
3. Supports Two Channels of DDR4 SO-DIMM SDRAM, Max. 32GB, data transfer rates of 1866MT/s and 2133 MT/s
4. Intel Desktop Skylake S-Platform Processor Integrated Graphics. GEN 9 architecture supports up to 72 Execution Units (EUs), depending on the processor SKU.
5. Integrated Gigabit LAN Controller with Intel I219LM Gigabit Ethernet PHY supports vPro. *1 Support 4 x 10/100/1000 Mbps Intel LAN ports.*2
6. Support DP, HDMI, DVI eDP1.3 2 lanes &18/24 bits dual channel LVDS Interface on Board. *3
7. Support 10 x RS232 auto switch to RS485/RS422 by BIOS, 4 port external, 6 port internal. *4
8. 4 x type A USB3.0 external and 5 x USB 2.0 internal
9. ALC886 HD Audio Specification 1.0 Two channels sound. Two channel Class D Audio Amplifier. *5
10. Four SATA ports 3.0 Data transfer rates up to 6.0 Gb/s (600 MB/s)
11. Support extended 1 x Mini PCIe card for PCIe x 1, mSATA and USB interface, 1 x Mini PCIe card for PCIe x 1 and USB interface. There are 2 x SIM Card Socket for these two mini cards. (3G/4G LTE module)
12. One M.2 B-Key 2242 for PCIe & mSATA devices
13. USB touch screen controller for CI170C only
14. Hardware digital Input & Output, 8 x DI / 8 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
15. PCIe x 16 Golden Finger supports 1 PCIe x 1, 4, 8,16 or 2 PCIe x 1, 4, 8 with Riser Cards
16. Support TPM 2.0 *6
17. PCB Dimension: 200 x 150 mm

*1 & *6 CI170C only

*2 CI170A supports 2 LAN ports

*3 eDP & LVDS shared the same signal, LVDS for CI170C only

*4 CI170A supports 6 COM

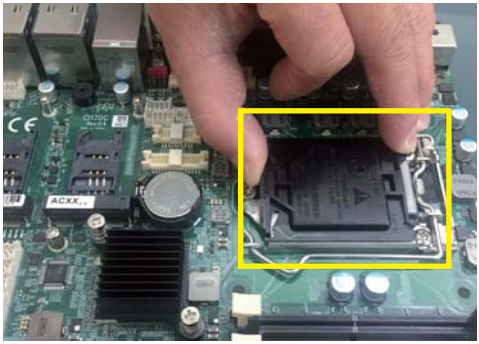
*5 Audio Amplifier for CI170C only

1-2 Specification

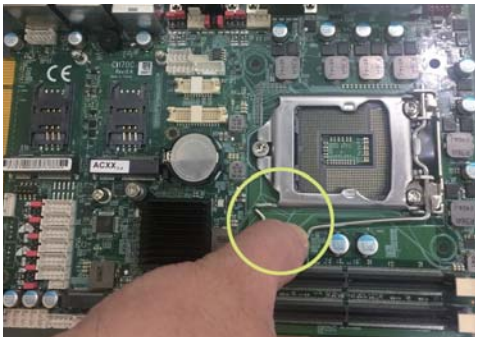
1. **CPU:** Desktop Skylake S-Platform processor. The processor is designed be offered in a LAG1151 package.
2. **Memory:** Two SO-DIMM slots for DDR4 SDRAM, Max. 32GB, data transfer rates of 1866MT/s and 2133 MT/s
3. **Graphics:** Intel Desktop Skylake S-Platform Processor Integrated Graphics. GEN 9 architecture supports up to 72 Execution Units (EUs), depending on the processor SKU. eDP 1.3 2 Lanes up to 1920 x 1200, DVI 1.2 2048 x 1080, DP 1.2 4096 x 2160, HDMI 1.3 up to 3840 x 2160
4. **SATA:** Integrated Serial ATA Host Controller Up to 4 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
5. **LAN:** Intel I210-AT LAN chipset or Intel I211-IT LAN chipset (Option) with 10/100/1000 Mbps
6. **I/O Chip:** Chipsets for 10 ports RS232/422/485
7. **USB:** 4 type A USB 3.0 connector onboard and 6 USB 2.0 (internal)
8. **Sound:** Support line in, line out and MIC in, Audio Amplifier: Ti TPA2012D2RTJ Class D 2.1W Audio amplifier
9. **LVDS:** support 24bits/2ch LVDS interface
10. **WDT/DIO:** Hardware digital Input & Output, 8 x DI / 8 x DO / Hardware Watch Dog Timer, 0~255 sec programmable
11. **Expansion interface:** one full-size PCIe Mini card for PCIe x 1, mSATA and USB interface, one full-size Mini PCIe card for PCIe x 1 and USB interface with 2 SIM sockets. 1 M.2 for mSATA or PCIe devices.
12. **Touch screen:** C8051F321 USB interface touch screen controller, support 4-, 5-, 8-wire Analog resistive touch screen
13. **Golden Finger:** PCIe x 16 Golden Finger supports 1 PCIe x 1, 4, 8,16 or 2 PCIe x 1, 4, 8 with Riser Cards
14. **TPM:** Infineon SLB 9665 TT 2.0 Trusted Platform Module
15. **BIOS:** AMI UEFI BIOS
16. **Dimension:** 200 x 150 mm
17. **Power:** DC IN +12V

1-3 Installing the CPU / PCH Heatsink. (Socket Version)

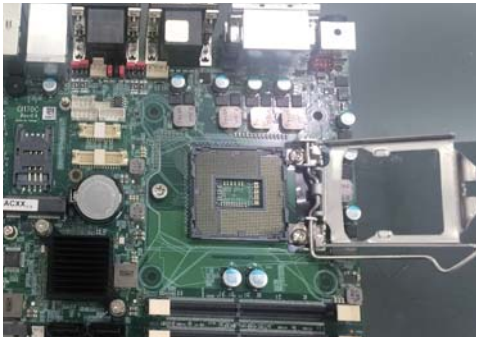
1. Install CPU bracket under the CPU first.



2.1. Locate Pin1 in the socket,look for a golden narrow.



2. Use screw driver and screw the socket screw in anti-clockwise direction.

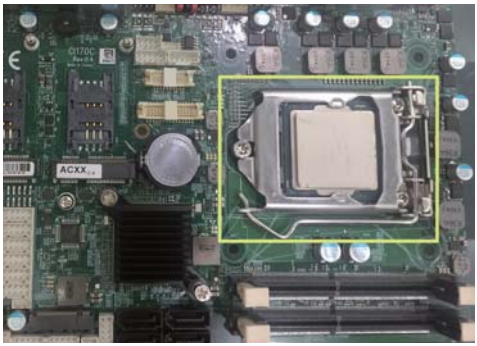


2.2. Lock the CPU socket by securing the screw in an anti-clockwise direction .

3. Peel-off the Elastic Silicone sticker under the Heat Sink.

3.2 Insert the system fan power cable to the pin header (FAN1) on board.

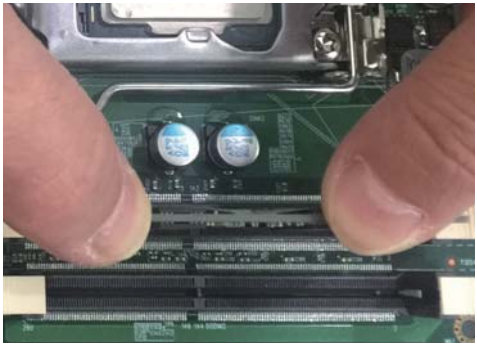
3.1 Tighten the HEAT SINK on the motherboard.
Pay attention to tighten the screws diagonally.



1-4 Vertical SO-DIMM assembly guide

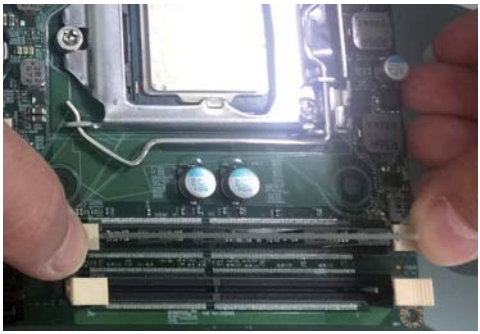
1. Install the memory into SODIMM.

2. Press down firmly to ensure the memory is locked.



Uninstall

1. Pull open both sides of the memory slot.

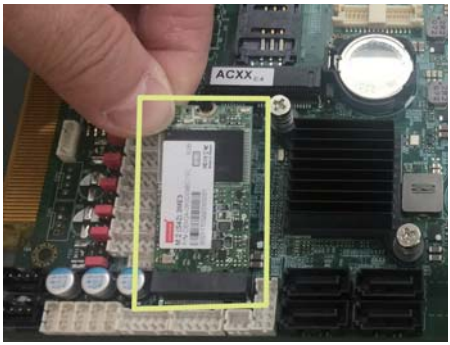


2. Take out the memory.

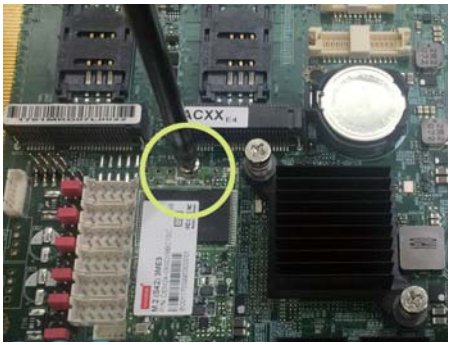
1-5 Directions for installing the Mini Card

1. Unscrew the screw on the board

2. Plug in the Mini Card in a 45 angle



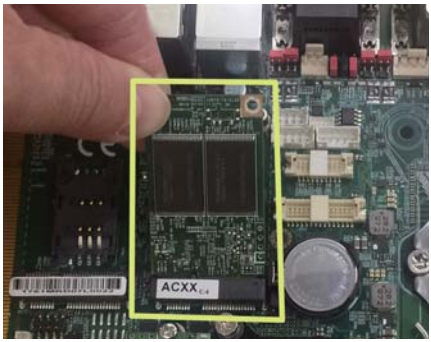
3. Gently push down the Mini Card and screw the screw back.



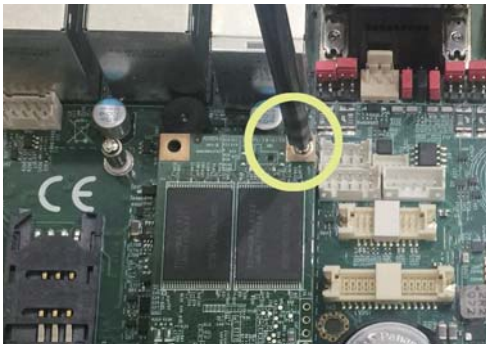
1-6 Directions for installing the Mini PCI-e Card (Full Size)

1. Unscrew the screw on the board

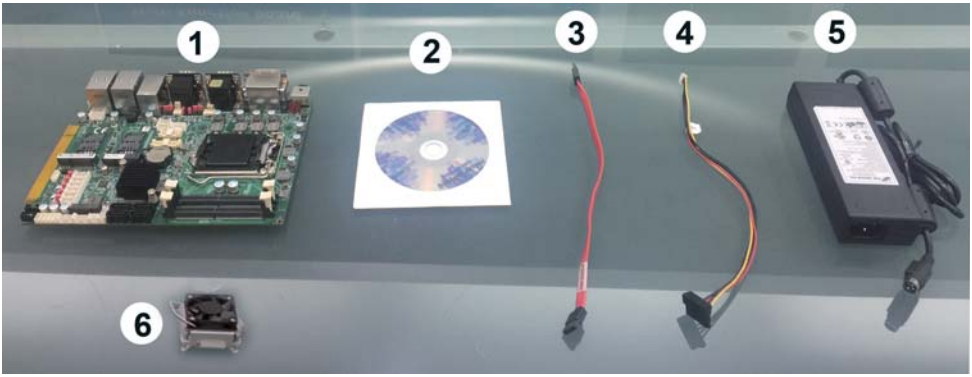
2. Plug in the Mini Card in a 45 angle



3. Gently push down the Mini Card and screw the screw back.



1-7 Packing List



	Material Code	Description	Detail Specification	Quantit
1	7G1901-1650001-0	MB-CI170C-ACXX-001	LF, CI170C-ACXX, Rev.:001	1
2	6G8006-2349-0100	LEX Product Driver DVD	LF, Intel Baytrail Driver, Windows 7/8.1 32/64	1
3	6G6001-2203-0100	SATA DATA Cable (Red)	LF, L=25cm	1
4	6G6003-1009-0100	SATA Power Cable	LF, L=25cm, 1*5/2.0 to 180° SATA 15p	1
5	6G6003-1009-0100	120W Power Adapter,12V	LF, M4P/Lock, FSP120-AHAN1, FSP	1
6		COOLER		1

*The packing list above is for the users who purchase single motherboard. The users who purchase the board with chassis may refer to the packing list in the Assembly Guide.

Please contact with your dealer if any of these items is missing or damaged on delivery. And please keep all parts of the delivery package with packing materials in case if you need to deliver or store the product in the future.

Chapter-2

Hardware Installation

2-1 Unpacking Precaution

This chapter provides the information how to install the hardware of CI170A/C. Please follow section 1-7, 2-1 and 2-2 to check the delivery package and unpack carefully. Please follow the jumper setting procedure.

NOTE!

1. Do not touch the board or any other sensitive components without all necessary anti-static protection.
2. Please pay attention to the voltage limitation of DC-IN12V 5%.
   Overuse of DC-IN voltage limitation or change to another power adapter (not provided with this system) will VOID warranty.

You should follow these steps to protect the board from the static electric discharge whenever you handle the board:

1. Ground yourself by a grounded wrist strap at all times when you handle the CI170A/C.
   Well secure the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please put on and connect the strap before handling the CI170A/C for harmlessly discharge any static electricity through the strap.

2. Please use anti-static pad to put any components, parts, or tools on the pad whenever you work on them outside the computer. You may also use the anti-static bag instead of the pad. Please ask your local supplier for necessary parts on anti-static requirement.

3. Do not plug any connector or set any jumper when the power is on.

2-2 Unpacking checkup

First of all, please follow all necessary steps of section 2-1 to protect CI170A/C from electricity discharge. With reference to section 1-7 please check the delivery package again with following steps:

1. Unpack the CI170A/C board and keep all packing material, manual and driver disc etc, do not dispose !

2. Is there any components lose or drops from the board?
   DO NOT CONTINUE TO INSTALL THIS BOARD!
   CONTACT THE DEALER YOU PURCHASED
   THIS BOARD FROM, IMMEDIATELY.

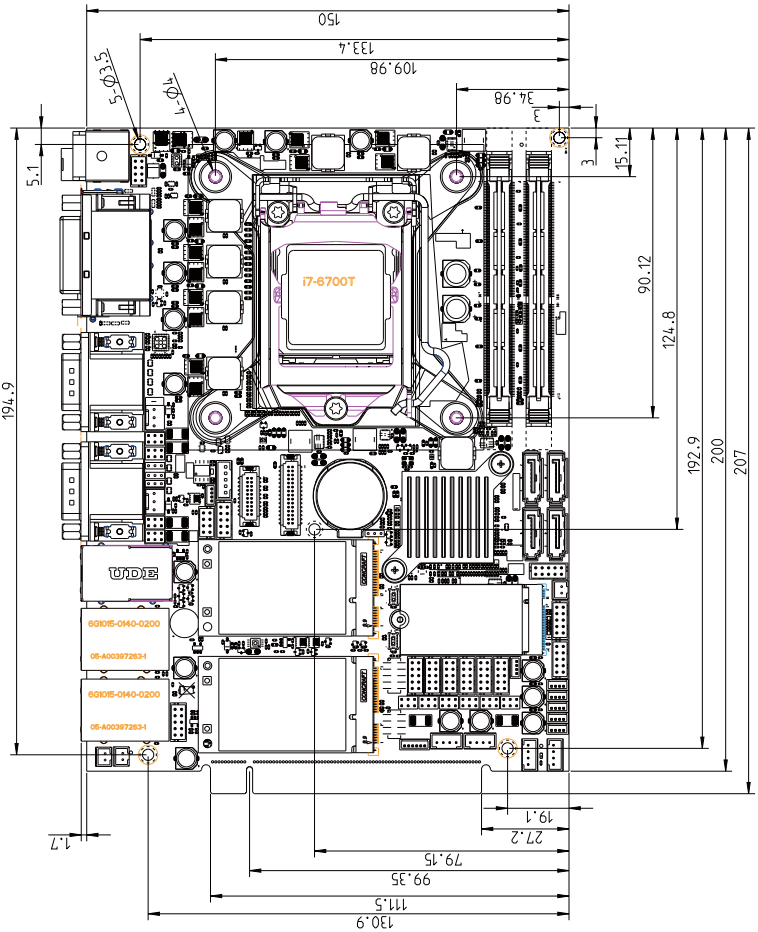
3. Is there any visible damage on the board?
   DO NOT CONTINUE TO INSTALL THIS BOARD!CONTACT
   THE DEALER YOU PURCHASED THIS BOARD FROM, IMMEDIATELY.

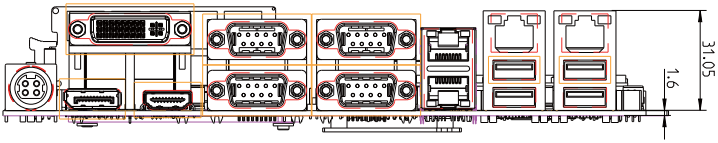
4. Check your optional parts (i.e. DDR, CF etc.), all necessary jumpers setting to jumper pin-set, and CMOS setup correctly.
   Please also refer to all information of jumper settings in this manual.

5. Check your external devices (i.e. Add-On-Card, Driver Type etc.) for complete add-in or connection and CMOS setup correctly.
   Please also refer to all information of connector connection in this manual.

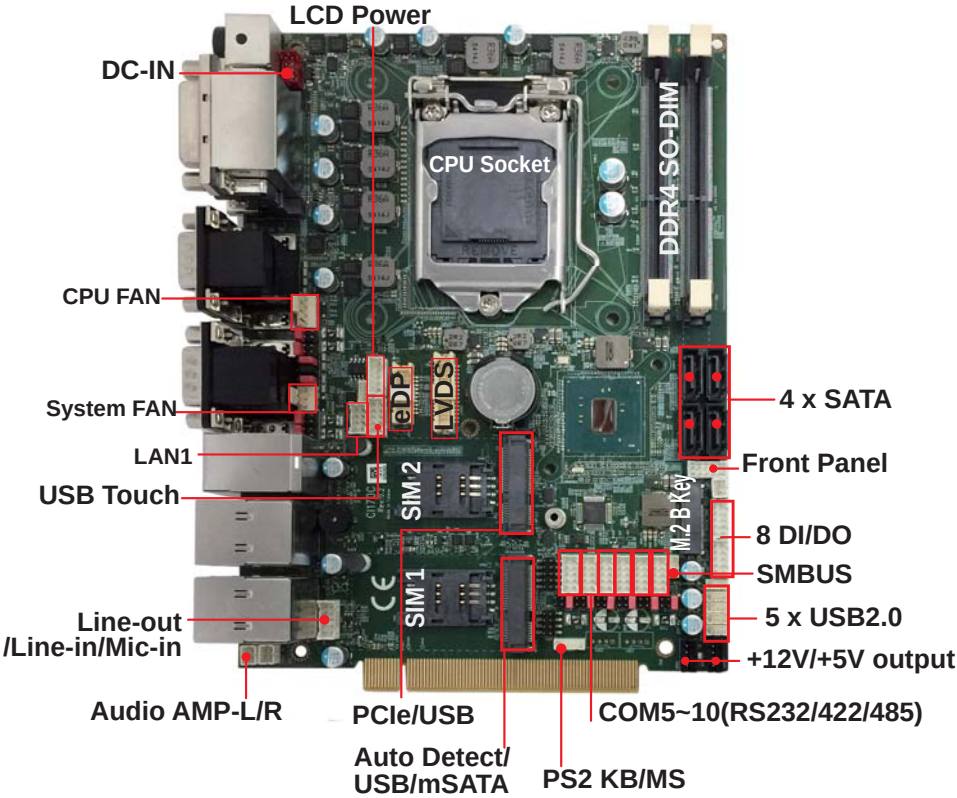
6. Please keep all necessary manual and driver disc in a good condition for future re-installation if you change your Operating System.

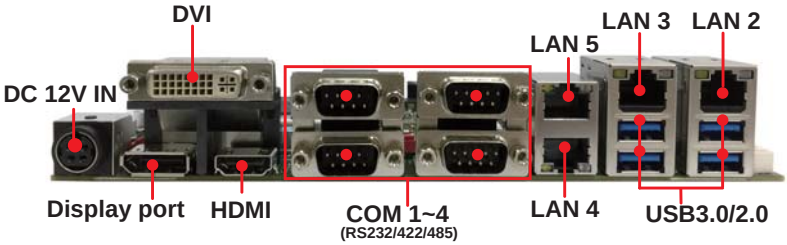
2-3 Dimension-CI170A/C



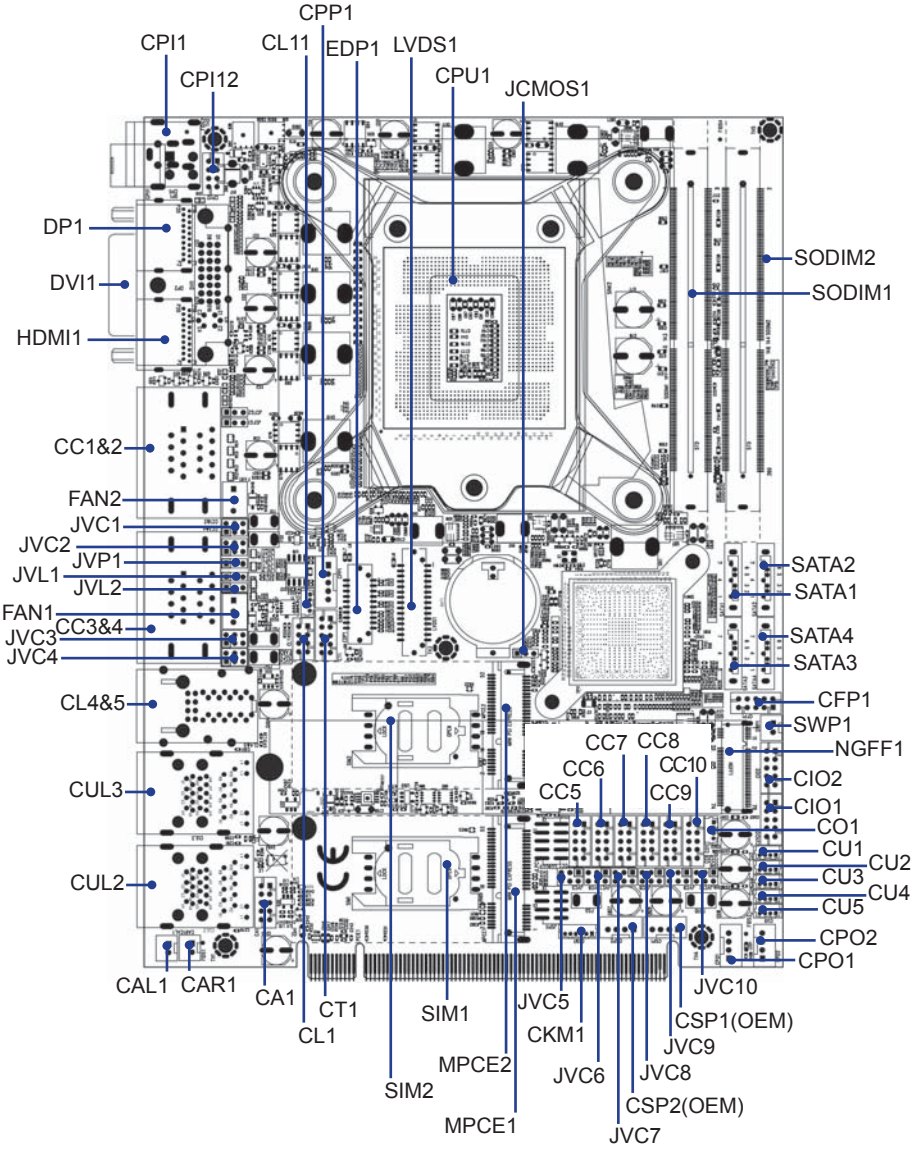


2-4 Function MAP-CI170A/C

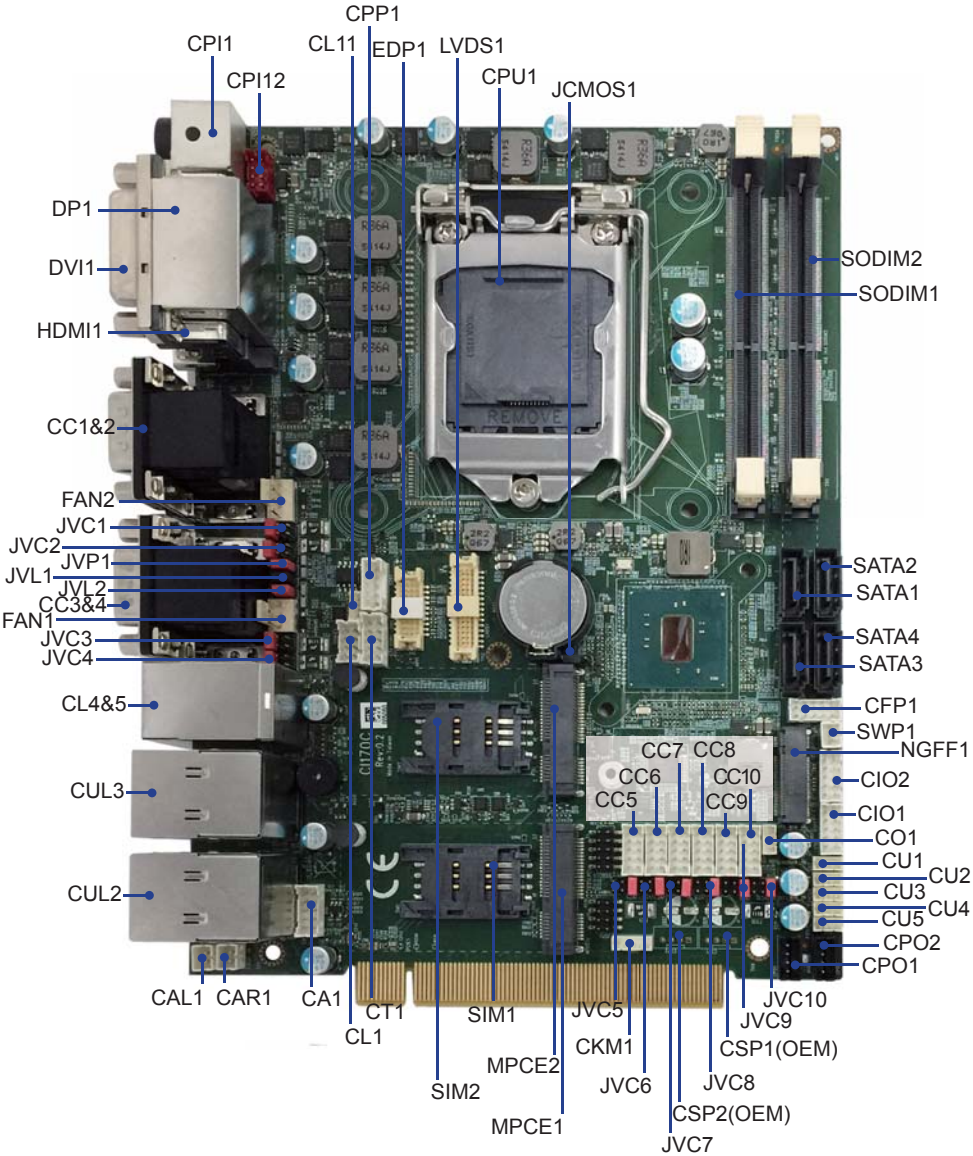




2-5 Connector MAP-CI170A/C



2-6 Diagram-CI170A/C



2-7 Install Memory

This motherboard provides one 260-pin Small Outline Dual In-line Memory Module (SODIMM) socket for memory expansion available maximum to of 4GB/8GB/16GB DDR4 SDRAM.
DDR4 clock supports: DDR4 1866/2133MT/S

Valid Memory Configurations

DIMM1 / 2	System Accept or Not	Total Memory
		Max.
DS	Accept	16GB

NOTE!

The detected memory size is less than actual installed memory size since some memory has been allocated for system use.
That's how PC works with system memory.

Please refer to page 9 for installation of memory module.

2-8 List of Jumpers

JCMOS1: CMOS clear select

JVC1: COM1 voltage select

JVC2: COM2 voltage select

JVC3: COM3 voltage select

JVC4: COM4 voltage select

JVC5: COM5 voltage select

JVC6: COM6 voltage select

JVC7: COM7 voltage select

JVC8: COM8 voltage select

JVC9: COM9 voltage select

JVC10: COM10 voltage select

JVP1: LVDS Panel Inverter power select

JVL2: LVDS/eDP Panel power select

2-9 Jumper Setting Description

A jumper is ON as a closed circuit with a plastic cap covering two pins. A jumper is OFF as an open circuit without the plastic cap. Some jumpers have three pins, labeled 1, 2, and 3. You could connect either pin 1 and 2 or 2 and 3.The below figure 2.2 shows the examples of different jumper settings in this manual.

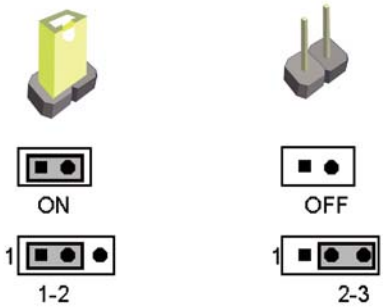


Figure 2.2

All jumpers already have its default setting with the plastic cap inserted as ON, or without the plastic cap as OFF. The default setting may be referred in this manual with a " * " symbol .

2-10 JCMOS1: CMOS DATA Clear

A battery must be used to retain the motherboard configuration in CMOS RAM.

Close Pin1 and pin 2 of JCMOS1 to store the CMOS data.

To clear the CMOS,follow the procedures below:

1. Turn off the system and unplug teh AC power
2. Remove DC IN power cable from DC IN power connector
3. Locate JCMOS1 and close pin 1-2 for few seconds
4. Return to default setting
5. Connect DC IN power cable back to DC IN Power connector

JCMOS1	Description
*1-2	Normal set
short	CMOS data clear

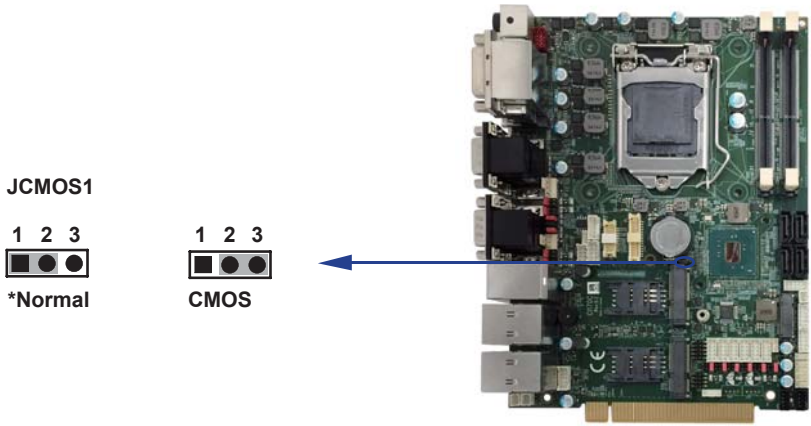
Note: Normal work is open jumper

Note: Do not clear CMOS unless

1. Troubleshooting

2. Forget password

3. You fail over-clocking system

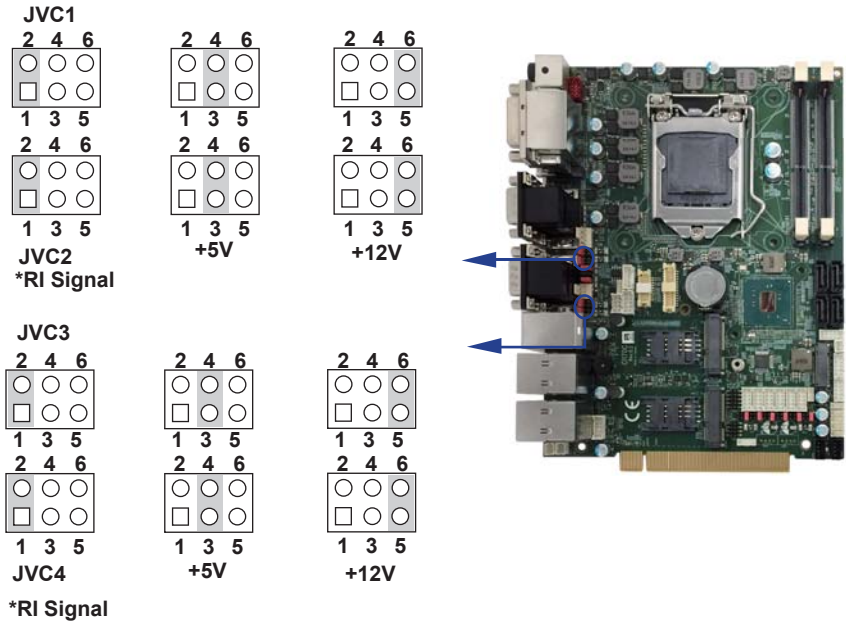


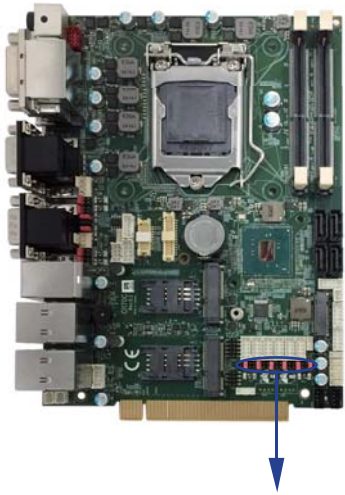
2-11 COM port pin9 select RI signal or Voltage source

JVC1: COM1 PIN9 select JVC2: COM2 PIN9 select
JVC3: COM3 PIN9 select JVC4: COM4 PIN9 select
JVC5: COM5 PIN9 select JVC6: COM6 PIN9 select
JVC7: COM7 PIN9 select JVC8: COM8 PIN9 select
JVC9: COM9 PIN9 select JVC10: COM10 PIN9 select

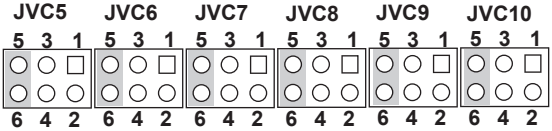
JVC1/2/3/4/5/6/7/8/9/10	DESCRIPION
*1-2	COM port pin9 use RI signal
3-4	COM port pin9 use +5V voltage
5-6	COM port pin9 use +12V voltage

Note: 1.Attention! Check Device Power in spec
2.If want to use +5V/+12V need check system power design spec

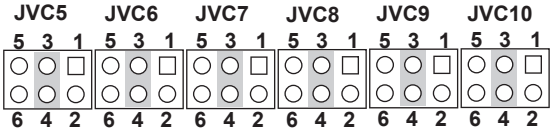




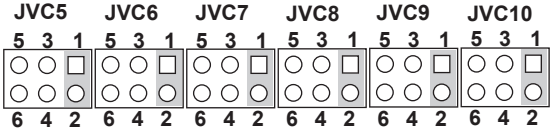
*RI Signal



+5V



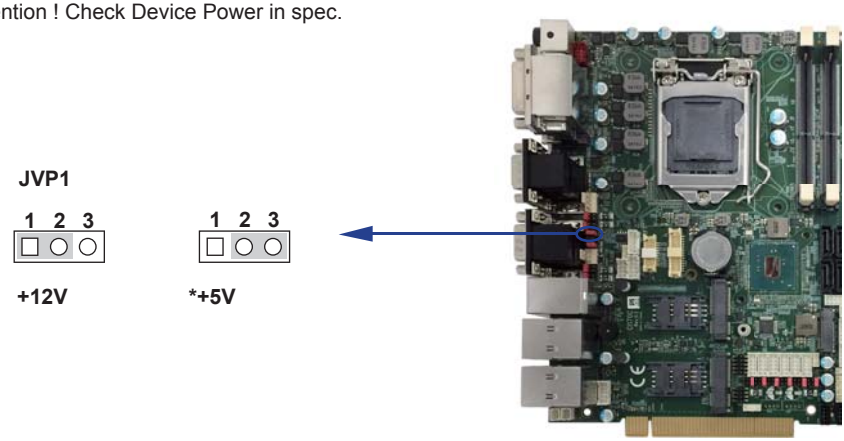
+12V



2-12 JVP1: LVDS panel Inverter power select

JVP1	Description
1-2	+12V
*2-3	+5V

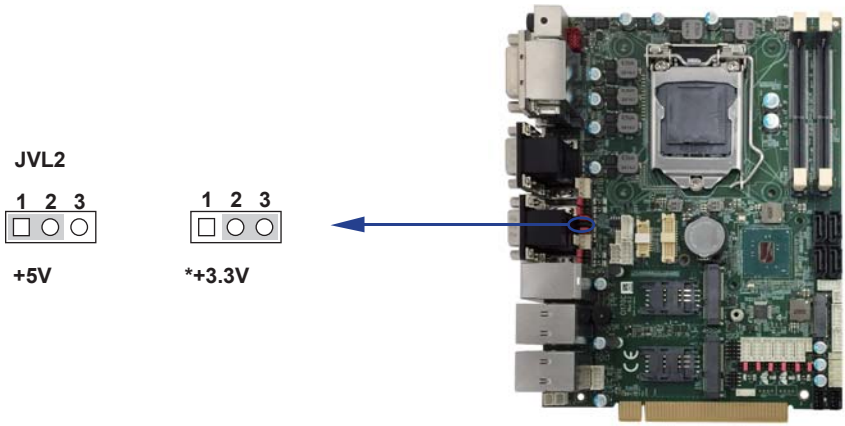
Note : Attention ! Check Device Power in spec.



2-13 JVL2: LVDS/eDP panel power select

JVL2	Description
1-2	+5V
*2-3	+3.3V

Note : Attention ! Check Device Power in spec.



Chapter-3

Connection

This chapter provides all necessary information of the peripheral's connections, switches and indicators. Always power off the board before you install the peripherals.

3-1 List of Connectors

CPI1: DC 12V-in DIN external connector (4pin mini din connector)
CPI12: DC-in 2x4 pin (2.00mm) Red wafer connector
DP1: Display Port
HDMI1: HDMI Connector
DVI1: DVI Connector
CC1&2/CC3&4: COM port DB9 Connector
CL4&5: LAN RJ45 connector
CUL2/CUL3: USB port 3.0/2.0 and LAN RJ45 connector
FAN1: Syatem Fan 1x3 pin (2.54mm) wafer
FAN2: CPU Fan 1x4 pin (2.54mm) wafer
CA1: Line-out/Line-in/Mic-in 2x5 pin (2.00mm) wafer
CAL1: Amplifier Line-out Left channel 2pin (2.00mm) wafer
CAR1: Amplifier Line-out Right channel 2pin (2.00mm) wafer
CL1: LAN1 2x4 pin (2.00mm) wafer
CL11: LAN1 LED 1x4 pin (1.25mm) wafer
CPP1: Panel inverter power connector 1x5 pin (2.00mm) wafer
CT1: Touch screen device 2x5 pin (2.00mm) Wafer
EDP1: eDP 2x10 pin (1.25mm) connector
LVDS1: LVDS 2x15 pin (1.25mm) connector
BAT1: Li 3V battery holder
MPCE1/MPCE2: Full size Mini card port sockets 52pin
SIM1/SIM2: SIM port 1/2 card socket
NGFF1: B Key Type 2242 size M.2 card Sockets
SATA1/2/3/4: SATA Connectors 7pin
CFP1: Front panel port 2x5 pin (2.00mm) wafer
SWP1: Power On/Off switch wafer
CIO1: DI port 0~3, DO port 0~3 2x5 pin (2.00mm) wafer
CIO2: DI port 4~7, DO port 4~7 2x5 pin (2.00mm) wafer
CU1/CU2/CU3/CU4/CU5: USB port 4pin (1.25mm) wafer
CPO1/CPO2: DC +5/+12V output 1x4 pin (2.00mm) Black wafer connector
CSP1/CSP2: DC +5V output 1x4 pin (2.00mm) Black wafer connector (Option)

CO1: I2C 4pin (1.25mm) wafer
CC5/CC6/CC7/CC8/CC9/CC10: COM 2x5pin (2.00mm) wafer
CKM1: KB/MS port 1x6 pin (1.25mm) wafer connector
SODIM1/ SODIM2: SO-DIM DDR4 1.2V DRAM Socket

3-2 DC 12V-IN external Connector

● CPI1: DC 12V-IN external Connector (4pin mini din connector)

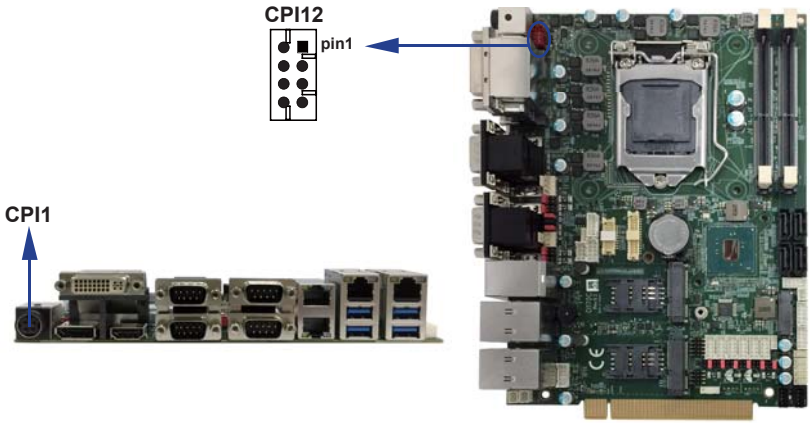
PIN NO.	Description
1,2	+12V DC-IN
3,4	GND

Note: DC in from adapter plug in

● CPI12: DC-IN Internal Connector (2x4pin 2.0mm Red Wafer)

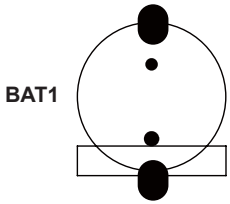
PIN NO.	Description	PIN NO.	Description
1	GND	2	GND
3	DC-IN	4	DC-IN
5	DC-IN	6	DC-IN
7	GND	8	GND

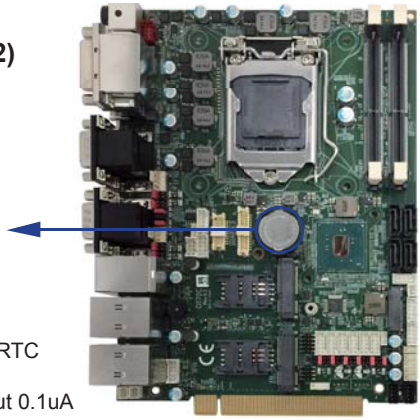
Note:
1.DC in from adapter plug in
2.Share CPI1 Connector
3.Mating connector: JST B8B-PHDSS or compatible
4.Cable housing: JST PHDR-08VS or compatible



3-3 Battery Input

- **BAT1: 3V Battery hold 2pin**
- **BAT1: Battery use Li 3V/220mAh (CR2032)**





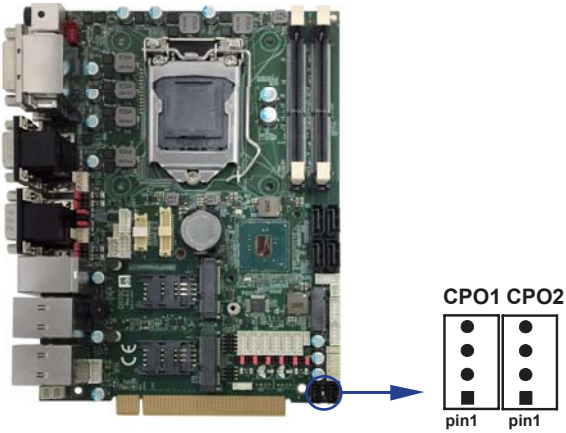
Note:
1. When board without Adaptor plug in, this board power RTC consumption about 2.7uA
2. If adaptor always plug in RTC power consumption about 0.1uA

3-4 DC Power output

- **CPO1/CPO2: +12V/+5V DC voltage output (1 X 4 pin 2.00mm Black wafer)**

PIN NO	DESCRIPTION
1	+5V
2	GND
3	GND
4	+12V *

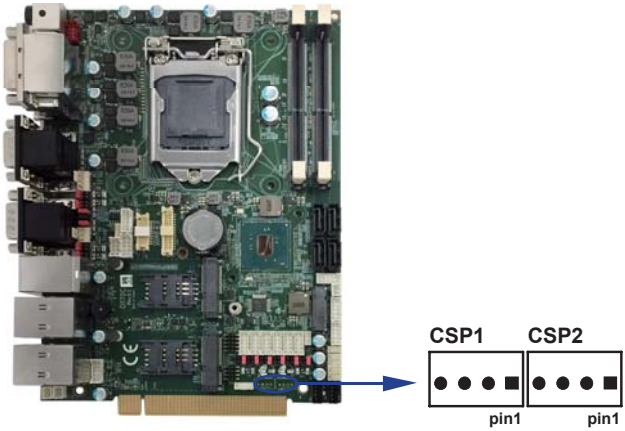
Note: 1. DC in +12V by switch to DC-out voltage +12V, so DC in need stable +12V input
2. Mating connector: JST B4B-PH-KL or compatible
3. Cable housing: JST PHR-4 or compatible



• CSP1/CSP2: +5V DC voltage output (Option)

PIN NO	DESCRIPTION
1	+5V
2	+5V
3	GND
4	GND

*Note: 1. Mating connector: JST B2B-PH-KL or compatible
2. Cable housing:JST PHR-2 or compatible



3-5 Front panel & FAN

- **CFP1 Front panel wafer (2 X 5 pin 2.0mm wafer)**

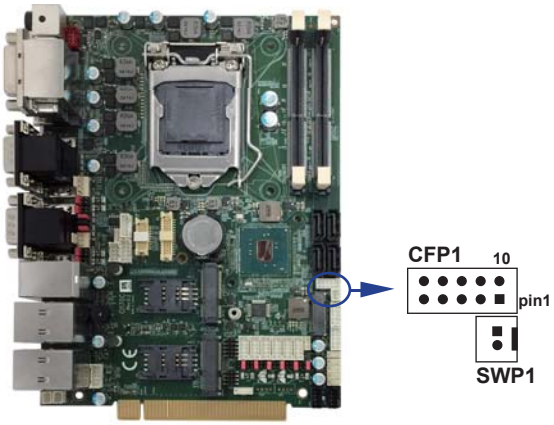
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Power button GND	2	Power button pin
3	Reset GND	4	Reset pin
5	Power LED-	6	Power LED+
7	HDD LED-	8	HDD LED+
9	LAN LED-	10	LAN LED+

*Note: 1. Mating connector: JST B10B-PHDSS or compatible
2. Cable housing: JST PHDR-10VS or compatible

- **SWP1 Power On/off switch Wafer (1 X 2 pin 2.00mm wafer)**

PIN NO.	DESCRIPTION
1	Power button pin
2	Power button GND

*Note: 1. Mating connector: JST B2B-PH-KL or compatible
2. Cable housing: JST PHR-2 or compatible



3-6 FAN connectors

- **FAN1: System FAN Connector (1 X 3 pin 2.54mm wafer)**

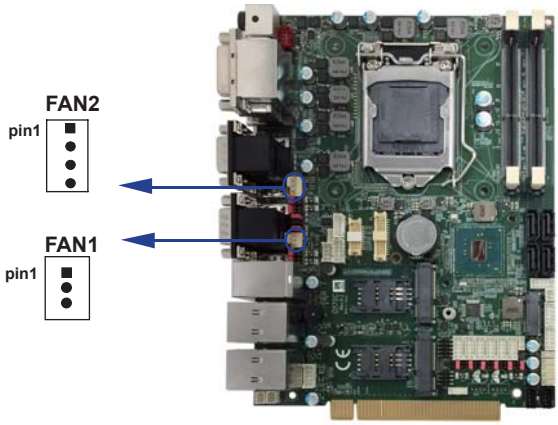
PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FAN speed detect

Note: 1. DC in +12V by switch to FAN power +12V, so DC in need stable +12V input
2. Mating connector: MOLEX 7879-3 or compatible
3. Cable housing: MOLEX 7880-3 or compatible

- **FAN2: CPU FAN Connector (1 X 4 pin 2.54mm wafer)**

PIN NO.	DESCRIPTION
1	GND
2	+12V
3	FAN speed detect
4	FAN speed Control

Note: DC in +12V by switch to FAN power +12V, so DC in need stable +12V input



3-7 Display & Touch interface

● DVI1: DVI-D 12bit connector Up side (DVI Connector)

PIN NO.	Description	PIN NO.	Description	PIN NO.	Description
1	Data 2-	9	Data 1-	17	Data 0-
2	Data 2+	10	Data 1+	18	Data 0+
3	GND	11	GND	19	GND
4	NC	12	NC	20	NC
5	NC	13	NC	21	NC
6	I^2C-CLK	14	+5V	22	GND
7	I^2C-DATA	15	GND	23	CLK+
8	NC	16	DVI-DETECT	24	CLK-

● DP1 : Display Port connector down side

PIN	Description	PIN	Description
1	Lane 0+	2	GND
3	Lane 0-	4	Lane 1+
5	GND	6	Lane 1-
7	Lane 2+	8	GND
9	Lane 2-	10	Lane 3+
11	GND	12	Lane 3-
13	GND	14	GND
15	AUX_CH+	16	GND
17	AUX_CH-	18	H.P. Detect
19	GND	20	+5V

3-8 HDMI interface

● **HDMI1 : HDMI connector down side**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TMDS DATA2+	2	GND
3	TMDS DATA2-	4	TMDS DATA1+
5	GND	6	TMDS DATA1-
7	TMDS DATA0+	8	GND
9	TMDS DATA0-	10	TMDS CLK+
11	GND	12	TMDS CLK-
13	NC	14	NC
15	DDC CLOCK	16	DDC DATA
17	GND	18	+5V
19	H.P. Detect		

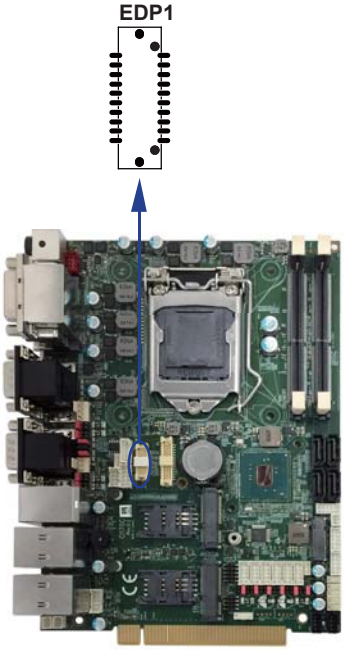
HDMI
HDMI1

3-9 EDP interface

- **EDP1: eDP interface (2 X 10 pin 1.25mm wafer)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Lane 0-	2	+5V
3	Lane 0+	4	+5V
5	Lane 1-	6	GND
7	Lane 1-	8	GND
9	ENBKL (3.3V)	10	GND
11	PWM dimming	12	GND
13	SMB_CLK	14	+LCD (5V or 3.3V)
15	SMB_DATA	16	+LCD (5V or 3.3V)
17	AUX_CH+	18	+LCD (5V or 3.3V)
19	AUX_CH-	20	H.P. Detect

Note: 1. JVL2: eDP panel +5V/+3.3V Voltage select

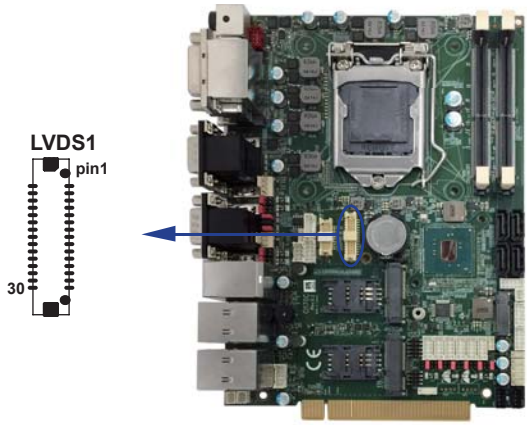


3-10 LVDS interface

● **LVDS1: LVDS interface (2x15 pin 1.25mm wafer)**

PIN NO.	Description	PIN NO.	Description
1	PWM dimming	2	+5V
3	+LCD(5V or 3.3V)	4	+LCD(5V or 3.3V)
5	Channel-1-DATA3+	6	Channel-0-DATA3+
7	Channel-1-DATA3-	8	Channel-0-DATA3-
9	Channel-0-DATA2+	10	Channel-0-CLK+
11	Channel-0-DATA2-	12	Channel-0-CLK-
13	GND	14	GND
15	Channel-0-DATA1+	16	Channel-0-DATA0+
17	Channel-0-DATA1-	18	Channel-0-DATA0-
19	GND	20	GND
21	+LCD(5V or 3.3V)	22	+LCD(5V or 3.3V)
23	Channel-1-DATA2+	24	Channel-1-CLK+
25	Channel-1-DATA2-	26	Channel-1-CLK-
27	Channel-1-DATA1+	28	Channel-1-DATA0+
29	Channel-1-DATA1-	30	Channel-1-DATA0-

Note: 1. LVDS interface support 18/24bits two channel
2. JVL2: LVDS panel +5V/+3.3V Voltage select
3. LVDS1 PIN 1 for panel backlight active, Default active setup by DPC Control
4. Pin 1 back light dimming control. Provided 200Hz / 275Hz / 380Hz / 20KHz / 25KHz And adjust PWM duty cycle by software program
5. Mating connector：HIROSE DF13-30DS-1.25C or compatible
6. Cable housing：HIROSE DF13-30DP-1.25V or compatible

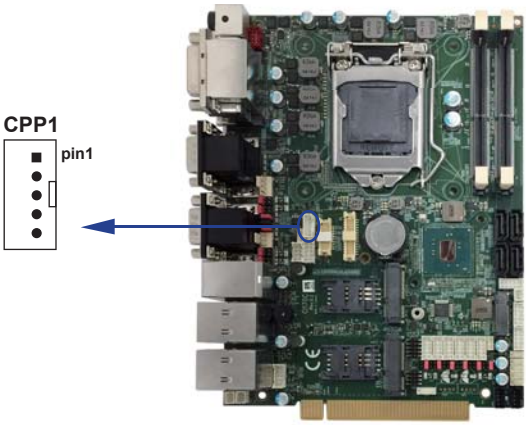


3-10-1 Panel Inverter power

● **CPP1: Panel Inverter power (1 X 5 pin 2.0mm wafer)**

PIN NO.	Description
1	+12V
2	GND
3	PWM dimming
4	ENBKL (3.3V)
5	ENBKL (5V)

Note：1. JVP1 Inverter Voltage select
2. CPP1 PIN 3 and LVDS1 PIN1 is same signal. Default active setup by DPC Control
3. Pin 3 back light dimming Control. Provided 200Hz / 275Hz / 380Hz / 20KHz / 25KHz And adjust PWM duty cycle by software program.
4. Mating connector: JST B5B-PH-KL or compatible
5. Cable housing: JST PHR-5 or compatible



3-11 Touch screen device

- **CT1: Touch screen (2x5 pin 2.0mm wafer)**
  Default use USB interface
- **For 8-wire type pin define**

PIN NO.	Description	PIN NO.	Description
1	Bottom	2	Bottom Sense
3	Top Sense	4	Top
5	Right	6	Right Sense
7	Left	8	Left Sense
9	GND	10	N/A

Note：1. For eight wire type cable Pin 3 and Pin4 need short.
2. Touch controller use USB port 8
3. Mating connector: JST B10B-PHDSS or compatible
4. Cable housing: JST PHDR-10VS or compatible

- **For 4-wire type pin define**

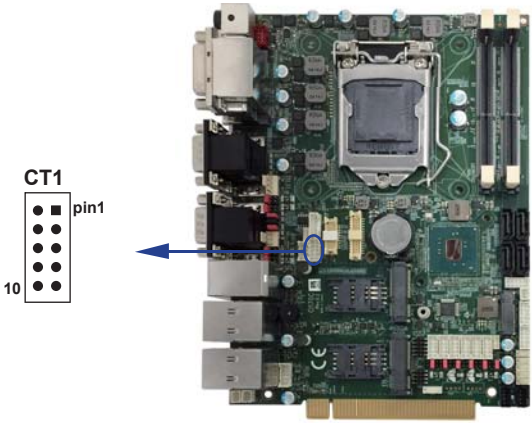
PIN NO.	Description	PIN NO.	Description
1	Bottom	2	N/A
3	N/A	4	Top
5	Right	6	N/A
7	Left	8	N/A
9	GND	10	N/A

Note：1. For four wire type cable Pin 3 and Pin4 need short.
2. Touch controller use USB port 8
3. Mating connector: JST B10B-PHDSS or compatible
4. Cable housing: JST PHDR-10VS or compatible

- **For 5-wire type pin define**

PIN NO.	Description	PIN NO.	Description
1	UR(H)	2	N/A
3	Sense	4	UL(Y)
5	LR(X)	6	N/A
7	LL(L)	8	N/A
9	GND	10	N/A

Note: 1. Touch controller use USB port 8
2. Mating connector: JST B10B-PHDSS or compatible
3. Cable housing: JST PHDR-10VS or compatible

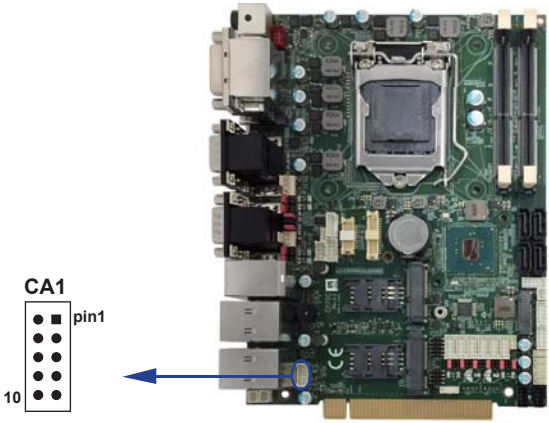


3-12 Audio interface

● **CA1: Line-out/Line-in/Mic-in (2 X 5 pin 2.00mm wafer)**

PIN NO.	Description	PIN NO.	Description
1	Line-out-R	2	MIC-IN
3	Line-in-R	4	GND
5	GND	6	NC
7	Line-in-L	8	+5V
9	Line-out-L	10	MIC-IN

Note: 1. Mating connector: JST B10B-PHDSS or compatible
2. Cable housing: JST PHDR-10VS or compatible



- **CAR1: Audio Amplifier Line out Right (1 X 2 pin 2.00mm wafer)**

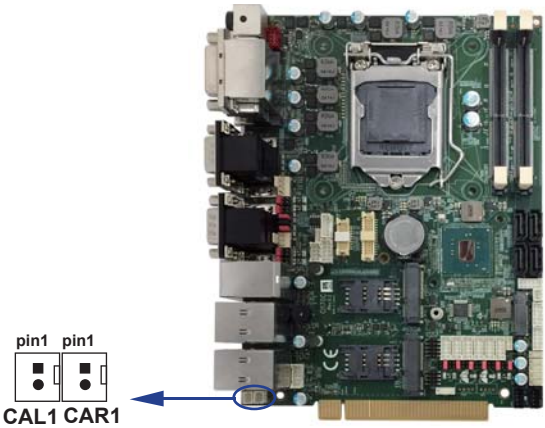
PIN NO.	DESCRIPTION
1	LINE-OUT_R+
2	LINE-OUT_R-

Note: 1. Mating connector: JST B2B-PH-KL or compatible
2. Cable housing: JST PHR-2 or compatible

- **CAL1: Audio Amplifier Line out Left (1 X 2 pin 2.00mm wafer)**

PIN NO.	DESCRIPTION
1	LINE-OUT_L+
2	LINE-OUT_L-

Note: 1. Mating connector: JST B2B-PH-KL or compatible
2. Cable housing: JST PHR-2 or compatible



3-13 I/O Interface

- **COM ports**
  COM1/2/4/5/6/7/8/9/10 default support RS232/RS422/RS485 mode

- **RS232 mode ports (D-SUB 9pin)**
  CC1&2: COM1 (up side)/COM2 (down side) port connector
  CC3&4: COM3 (up side)/COM4 (down side) port connector

PIN NO.	Description	PIN NO.	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI/Voltage		

Note: 1. Pin 9 RI and Voltage setting only for COM 1/2/3/4 ports
JVC1 for COM1,JVC2 for COM2 , JVC3 for COM3,JVC4 for COM4
2. default support RS232/RS422/RS485 by BIOS selected

- **RS485 mode ports (D-SUB 9pin)**
  CC1&2: COM1 (up side)/COM2 (down side) port connector
  CC3&4: COM3 (up side)/COM4 (down side) port connector

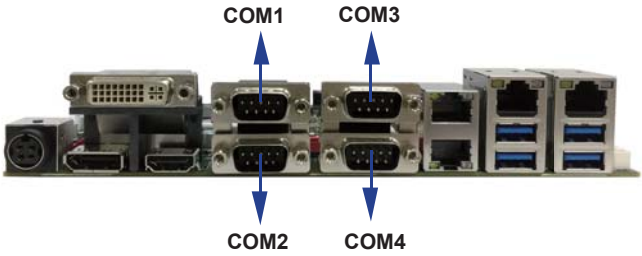
PIN NO.	Description	PIN NO.	Description
1	RS485 TX-	2	RS485 TX+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC		

Note: 1. BIOS need setting to RS485 mode

- **RS422 mode ports (D-SUB 9pin)**
  CC1&2: COM1 (up side)/COM2 (down side) port connector
  CC3&4: COM3 (up side)/COM4 (down side) port connector

PIN NO.	Description	PIN NO.	Description
1	RS422 TX-	2	RS422 TX+
3	RS422 RX+	4	RS422 RX-
5	GND	6	NC
7	NC	8	NC
9	NC		

Note: 1. BIOS need setting to RS422 mode



- RS232 mode ports (2 X 5 pin 2.00mm wafer)

  CC5：COM5　CC6：COM6
  CC7：COM7　CC8：COM8
  CC9：COM9　CC10：COM10

PIN NO.	Description	PIN NO.	Description
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI/Voltage	10	+5V

Note: 1. Pin 9 RI and Voltage setting only for COM 5/6/7/8/9/10 ports
JVC5 for COM5, JVC6 for COM6, JVC7 for COM7, JVC8 for COM8, JVC9 for COM9, JVC10 for COM10
2. default support RS232/RS422/RS485 by BIOS selected
3. Mating connector: JST B10B-PHDSS or compatible
4. Cable housing: JST PHDR-10VS or compatible

- RS485 mode ports (2 X 5 pin 2.00mm wafer)

  CC5：COM5　CC6：COM6
  CC7：COM7　CC8：COM8
  CC9：COM9　CC10：COM10

PIN NO.	Description	PIN NO.	Description
1	RS485 TX-	2	RS485 TX+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

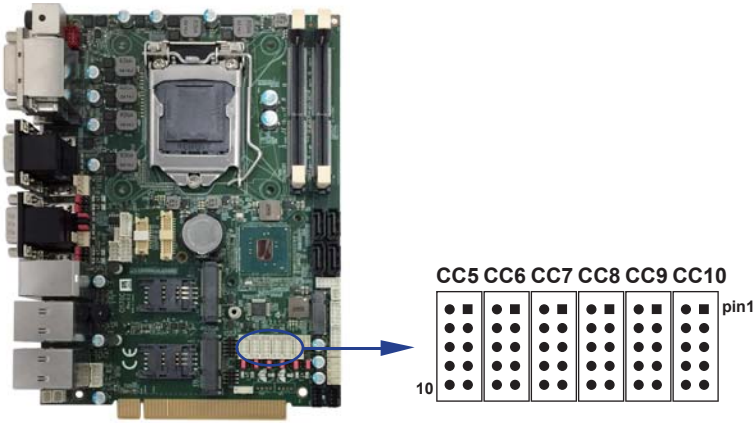
Note: 1. BIOS need setting to RS485 mode
2. Mating connector: JST B10B-PHDSS or compatible
3. Cable housing: JST PHDR-10VS or compatible

- RS422 mode ports (2 X 5 pin 2.00mm wafer)

  CC5：COM5　CC6：COM6
  CC7：COM7　CC8：COM8
  CC9：COM9　CC10：COM10

PIN NO.	Description	PIN NO.	Description
1	RS422 TX-	2	RS422 TX+
3	RS422 RX+	4	RS422 RX-
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

Note: 1. BIOS need setting to RS422 mode
2. Mating connector: JST B10B-PHDSS or compatible
3. Cable housing: JST PHDR-10VS or compatible

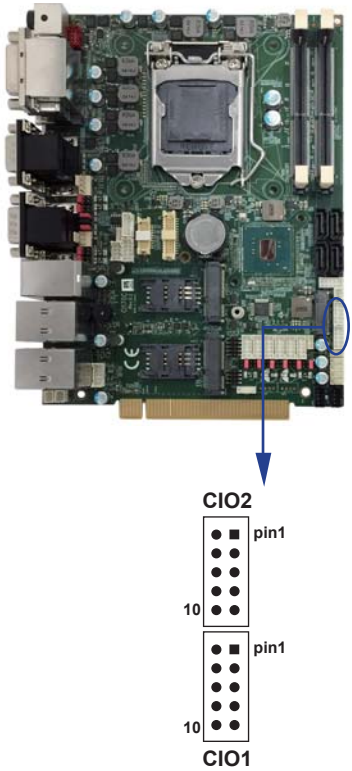


3-14 Digital Input / Output / Watch Dog Time

●CIO1 DIO 0 ~ 3 (2x5pin 2.0mm wafer)

PIN NO.	Description	PIN NO.	Description
1	DI-0	2	DO-3
3	DI-1	4	DO-2
5	DI-2	6	DO-1
7	DI-3	8	DO-0
9	GND	10	+5V

Note: 1. DI pin default pull up 10KΩ to +5V
2. If use need isolate circuit to control external device
3. F75111N-1 I^2C bus address 0x9c
4. Mating connector: JST B10B-PHDSS or compatible
5. Cable housing: JST PHDR-10VS or compatible



● CIO2 DIO 4 ~ 7 (2x5pin 2.0mm wafer)

PIN NO.	Description	PIN NO.	Description
1	DI-4	2	DO-7
3	DI-5	4	DO-6
5	DI-6	6	DO-5
7	DI-7	8	DO-4
9	GND	10	+5V

Note: 1. DI pin default pull up 10KΩ to +5V
2. If use need isolate circuit to control external device
3. F75111N-1 I^2C bus address 0x9c
4. Mating connector: JST B10B-PHDSS or compatible
5. Cable housing; JST PHDR-10VS or compatible

● For F75111N I^2C watch dog timer device:

DC spec:
Input low Voltage (VIL): +0.8 Max
Input High Voltage (VIH): +2V Min
Output low Current (IOL): 10mA (Min) VOL=0.4V
Output High Current (IOH): -10mA (Min) VOH=2.4V
Watch Dog Time value 0~255 sec
The system will be issued reset. When WDT is enable the hardware start down counter to zero. The reset timer have 10~20% tolerance upon the Temperature.
Note: If want to SDK support. Please contact to sales window.

3-8-1 IO Device: F75111 under DOS

The Sample code source you can download from

Source file: F75111_Dos_Src.rar http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_DOS

Binary file: F75111_Dos_Bin.rar

USERNAME & PASSWORD: sf

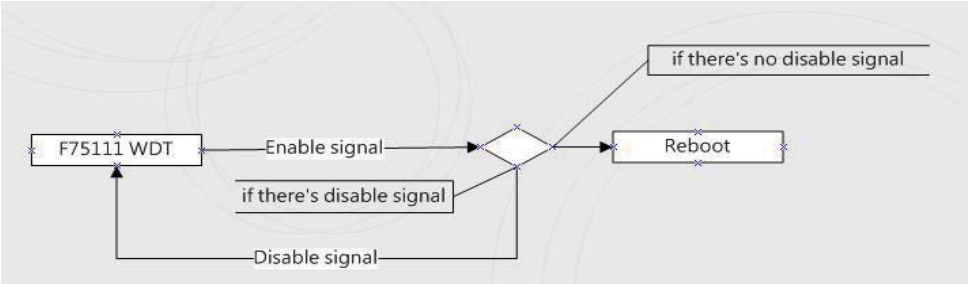
How to use this Demo Application

1.Boot Ms-Dos Operating System

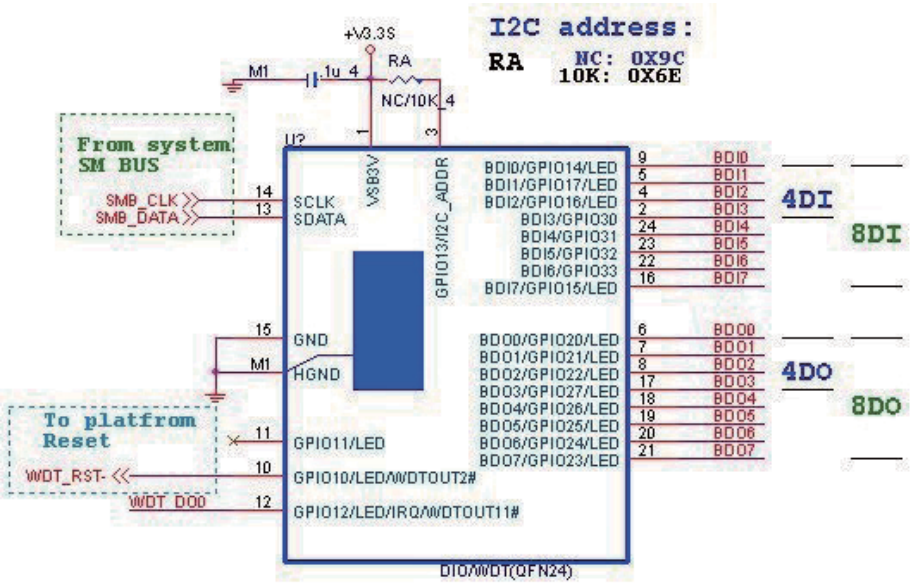
2.execute "75WDT.EXE" binary file

3.Input 1 to Enable WDT timer or input 0 to Disable it.

4.input numbers of second for chip countdown and Reset Computer



F75111 Layout Picture



Introduction

How to use this Demo Application

```
WriteI2CByte(I2CADDR, CONFIG, 0x03);//Set Watch Dog Timer function
WriteI2CByte(I2CADDR, WDT_TIMER, timer);//Set Watch Dog Timer range from 0-255.
WriteI2CByte(I2CADDR, WDT_TIMER_CTL, 0x73);//Enable Watch Dog Timer in second and pulse mode
```

How to use this Demo Application

```
WriteI2CByte(I2CADDR, WDT_TIMER_CTL, 0x00);
```

How to use this Demo Application

```
void pause(int time)
  {
     asm mov ah,0h;     //Ah = 00 Read System Time Counter
     asm int 1ah;       //read time from Time Counter and store it in DX register
     asm add dx,time;
     asm mov bx,dx;
     label:
     asm int 1ah;
     asm cmp bx,dx;
     asm jne label;
  }
```

3-8-2 IO Device: F75111 under Windows

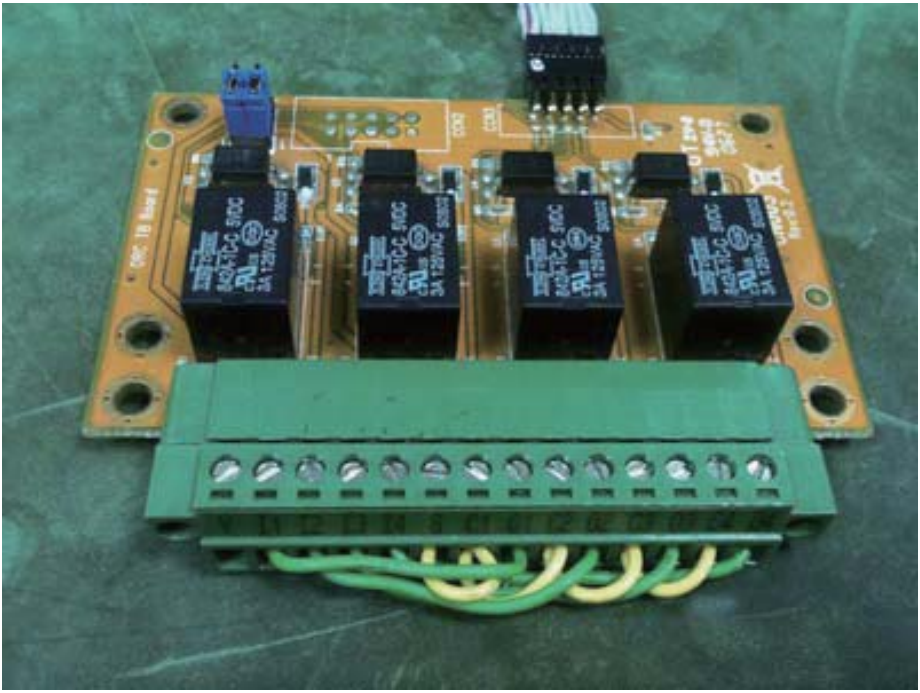
The Sample code source you can download from

Source file: F75111_DIO_Src_v2.8W(32bit).zip http://tprd.info/lexwiki/index.php/IO_Device:F75111

Binary file: F75111_DIO_Bin_v2.8W(32bit).zip

USERNAME & PASSWORD: sf

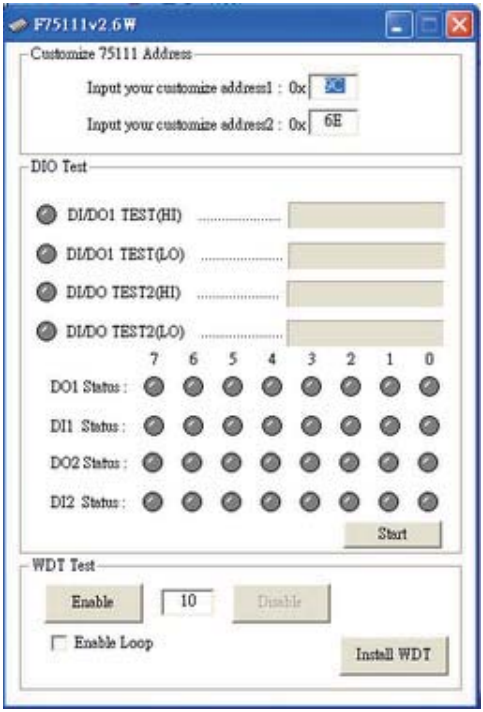
We do the demo test with a test tool which DIx connect to DOx with Relay.



How to use this Demo Application

one F75111

two F75111



Attention Please: You must be install vcredist_x86.exe when first time you run the F75111_DIO.exe DEMO AP,The vcredist_x86.exe include all required DLL file.

WARNING: win7 system architecture, use the system administrator to open DIO utility

1. Press the "Start" button to test DIO function

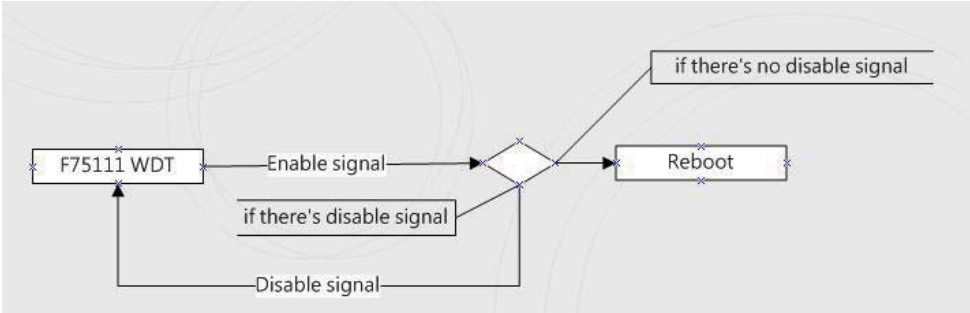
2. Press the "Enable" button to test WDT function

3. Press the "Disable" button to disable WDT

4. Check the "Enable Loop" box and press "Enable" to do WDT loop test

5. Press "Install WDT" to set the system to autorun this application when booting, press again to remove this application when booting.

**6. If WDT enable, system icon will be  . if disable, system icon will be  **



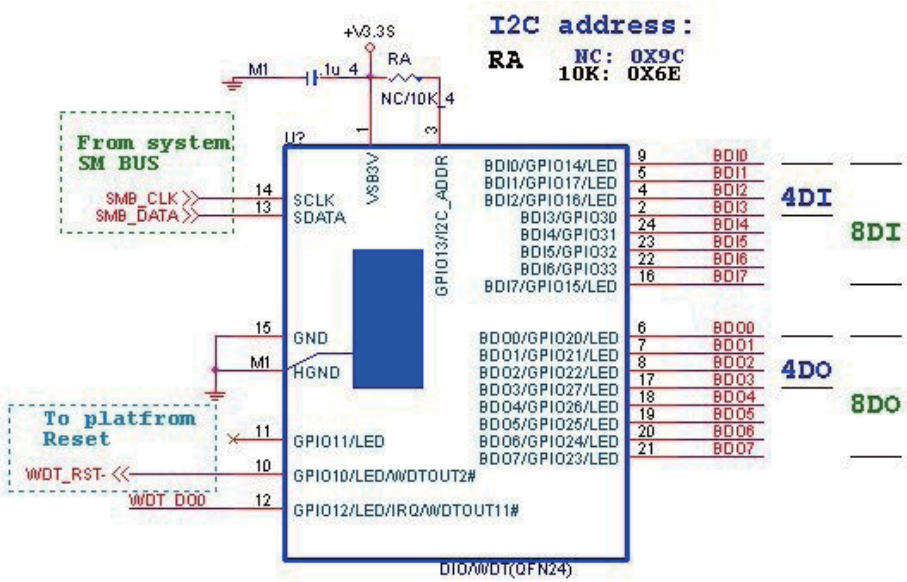
p.s.

f75111 send "F75111_SetWDTEnable(BYTE byteTimer)" including a parameter "timer",

if there's no disable signal (F75111_SetWDTDisable()) to stop it before timer countdown to 0, System will reboot.

if there's disable signal received, resent Enable WDT signal, for a loop to prevent from reboot

F75111 Layout Picture



Introduction

Initial Internal F75111 port address (0x9c)

define GPIO1X, GPIO2X, GPIO3X to input or output
and Enable WDT function pin

Set F75111 DI/DO (sample code as below Get Input value/Set output value)

DO: InterDigitalOutput(BYTE byteValue))
DI: InterDigitalInput()

Enable/Disable WDT

```
Enable : F75111_SetWDTEnable (BYTE byteTimer)
Disable: F75111_SetWDTDisable ()
```

PULSE mode

Sample to setting GP33, 32, 31, 30 output 1mS low pulse signal.

```
{
   this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_CONTROL,              0x00);   //This is setting low pulse output
   this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_PULSE_WIDTH_CONTROL,   0x01);   //This selects the pulse width to 1mS
   this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_CONTROL_MODE,              0x0F);   //This is setting the GP33, 32, 31, 30 to output function.
   this->Write_Byte(F75111_INTERNAL_ADDR, GPIO3X_Output_Data ,                 0x0F);   //This is setting the GP33, 32, 31, 30 output data.
}
```

Initial internal F75111

```
void F75111::InitInternalF75111()
{
   this->Write_Byte(F75111_INTERNAL_ADDR,GPIO1X_CONTROL_MODE  ,0x00);      //set GPIO1X to Input  function
   this->Write_Byte(F75111_INTERNAL_ADDR,GPIO3X_CONTROL_MODE  ,0x00);      //set GPIO3X to Input  function
   this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_CONTROL_MODE  ,0xFF);      //set GPIO2X to Output function

   this->Write_Byte(F75111_INTERNAL_ADDR,F75111_CONFIGURATION, 0x03);          //Enable WDT OUT function
}
```

Set output value

```
void F75111::InterDigitalOutput(BYTE byteValue)
{
    BYTE byteData = 0;
    byteData = (byteData & 0x01 )? byteValue + 0x01 : byteValue;
    byteData = (byteData & 0x02 )? byteValue + 0x02 : byteValue;
    byteData = (byteData & 0x04 )? byteValue + 0x04 : byteValue;
    byteData = (byteData & 0x80 )? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x40 )? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20 )? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x10 )? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x08 )? byteValue + 0x80 : byteValue;                    // get value bit by bit

    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_OUTPUT_DATA,byteData);    // write byteData value via GPIO2X output pin
}
```

Get Input value

```
BYTE F75111::InterDigitalInput()
{
    BYTE byteGPIO1X = 0;
    BYTE byteGPIO3X = 0;
    BYTE byteData       = 0;

    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO1X_INPUT_DATA,&byteGPIO1X) ;   // Get value from GPIO1X
    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO3X_INPUT_DATA,&byteGPIO3X) ;   // Get value from GPIO3X

    byteGPIO1X = byteGPIO1X  & 0xF0;                                        // Mask unuseful value
    byteGPIO3X = byteGPIO3X  & 0x0F;                                        // Mask unuseful value

    byteData = ( byteGPIO1X & 0x10 )? byteData + 0x01 : byteData;
    byteData = ( byteGPIO1X & 0x80 )? byteData + 0x02 : byteData;
    byteData = ( byteGPIO1X & 0x40 )? byteData + 0x04 : byteData;
    byteData = ( byteGPIO3X & 0x01 )? byteData + 0x08 : byteData;

    byteData = ( byteGPIO3X & 0x02 )? byteData + 0x10 : byteData;
    byteData = ( byteGPIO3X & 0x04 )? byteData + 0x20 : byteData;
    byteData = ( byteGPIO3X & 0x08 )? byteData + 0x40 : byteData;
    byteData = ( byteGPIO1X & 0x20 )? byteData + 0x80 : byteData;           // Get correct DI value from GPIO1X & GPIO3X

    return byteData;
}
```

Enable WatchDog

```
void F75111_SetWDTEnable (BYTE byteTimer)
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_TIMER_RANGE  ,byteTimer);                    // set WatchDog range and timer
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,WDT_TIMEOUT_FLAG | WDT_ENABLE | WDT_PULSE | WDT_PSWIDTH_100MS);
                                                                                    // Enable WatchDog, Setting WatchDog configure
}
```

Disable WatchDog

```
void F75111_SetWDTDisable ()
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,0x00);                         // Disable WatchDog
}
```

define F75111 pin in F75111.h

```
//-----------------------------------------------------------------------------------------------------
#define    F75111_INTERNAL_ADDR                                    0x9C   //  OnBoard  F75111 Chipset
#define    F75111_EXTERNAL_ADDR                                    0x6E   //  External F75111 Chipset
//-----------------------------------------------------------------------------------------------------
#define    F75111_CONFIGURATION                                    0x03   //  Configure GPIO13 to WDT2 Function
//-----------------------------------------------------------------------------------------------------
#define    GPIO1X_CONTROL_MODE                                     0x10   //  Select Output Mode or Input Mode
#define    GPIO2X_CONTROL_MODE                                     0x20   //  Select GPIO2X Output Mode or Input Mode
#define    GPIO3X_CONTROL_MODE                                     0x40   //  Select GPIO3X Output Mode or Input Mode
```

```
//-----------------------------------------------------------------------------------------------
#define   GPIO1X_INPUT_DATA                                    0x12  //  GPIO1X Input
#define   GPIO3X_INPUT_DATA                                    0x42  //  GPIO3X Input
//-----------------------------------------------------------------------------------------------
#define   GPIO2X_OUTPUT_DATA                                   0x21  //  GPIO2X Output
//-----------------------------------------------------------------------------------------------
#define   GPIO1X_PULSE_CONTROL                                 0x13  //  GPIO1x Level/Pulse Control Register
                                                                     //  0:Level Mode
                                                                     //  1:Pulse Mode
#define   GPIO1X_PULSE_WIDTH_CONTROL                           0x14  //  GPIO1x Pulse Width Control Register
#define   GP1_PSWIDTH_500US                                    0x00  //  When select Pulse mode: 500 us.
#define   GP1_PSWIDTH_1MS                                      0x01  //  When select Pulse mode: 1 ms.
#define   GP1_PSWIDTH_20MS                                     0x02  //  When select Pulse mode: 20 ms.
#define   GP1_PSWIDTH_100MS                                    0x03  //  When select Pulse mode: 100 ms.
//-----------------------------------------------------------------------------------------------
#define   GPIO2X_PULSE_CONTROL                                 0x23  //  GPIO2x Level/Pulse Control Register
                                                                     //  0:Level Mode
                                                                     //  1:Pulse Mode
#define   GPIO2X_PULSE_WIDTH_CONTROL                           0x24  //  GPIO2x Pulse Width Control Register
#define   GP2_PSWIDTH_500US                                    0x00  //  When select Pulse mode: 500 us.
#define   GP2_PSWIDTH_1MS                                      0x01  //  When select Pulse mode: 1 ms.
#define   GP2_PSWIDTH_20MS                                     0x02  //  When select Pulse mode: 20 ms.
#define   GP2_PSWIDTH_100MS                                    0x03  //  When select Pulse mode: 100 ms.
//-----------------------------------------------------------------------------------------------
#define   GPIO3X_PULSE_CONTROL                                 0x43  //  GPIO3x Level/Pulse Control Register
                                                                     //  0:Level Mode
                                                                     //  1:Pulse Mode
#define   GPIO3X_Output_Data                                   0x41  //  GPIO3x Output Data Register
#define   GPIO3X_PULSE_WIDTH_CONTROL                           0x44  //  GPIO3x Pulse Width Control Register
#define   GP3_PSWIDTH_500US                                    0x00  //  When select Pulse mode: 500 us.
#define   GP3_PSWIDTH_1MS                                      0x01  //  When select Pulse mode: 1 ms.
#define   GP3_PSWIDTH_20MS                                     0x02  //  When select Pulse mode: 20 ms.
#define   GP3_PSWIDTH_100MS                                    0x03  //  When select Pulse mode: 100 ms.
//-----------------------------------------------------------------------------------------------
#define   WDT_TIMER_RANGE                                      0x37  //  0-255 (secord or minute program by WDT_UNIT)
#define   WDT_CONFIGURATION                                    0x36  //  Configure WDT Function
#define   WDT_TIMEOUT_FLAG                                     0x40  //  When watchdog timeout.this bit will be set to 1.
#define   WDT_ENABLE                                           0x20  //  Enable watchdog timer
#define   WDT_PULSE                                            0x10  //  Configure WDT output mode
                                                                     //  0:Level Mode
                                                                     //  1:Pulse Mode

#define   WDT_UNIT                                             0x08  //  Watchdog unit select.
                                                                     //  0:Select second.
                                                                     //  1:Select minute.

#define   WDT_LEVEL                                            0x04  //  When select level output mode:
                                                                     //  0:Level low
                                                                     //  1:Level high

#define   WDT_PSWIDTH_1MS                                      0x00  //  When select Pulse mode: 1 ms.
#define   WDT_PSWIDTH_20MS                                     0x01  //  When select Pulse mode: 20 ms.
#define   WDT_PSWIDTH_100MS                                    0x02  //  When select Pulse mode: 100 ms.
#define   WDT_PSWIDTH_4000MS                                   0x03  //  When select Pulse mode: 4 s.
```

3-8-3 IO Device: F75111 VB6 under Windows

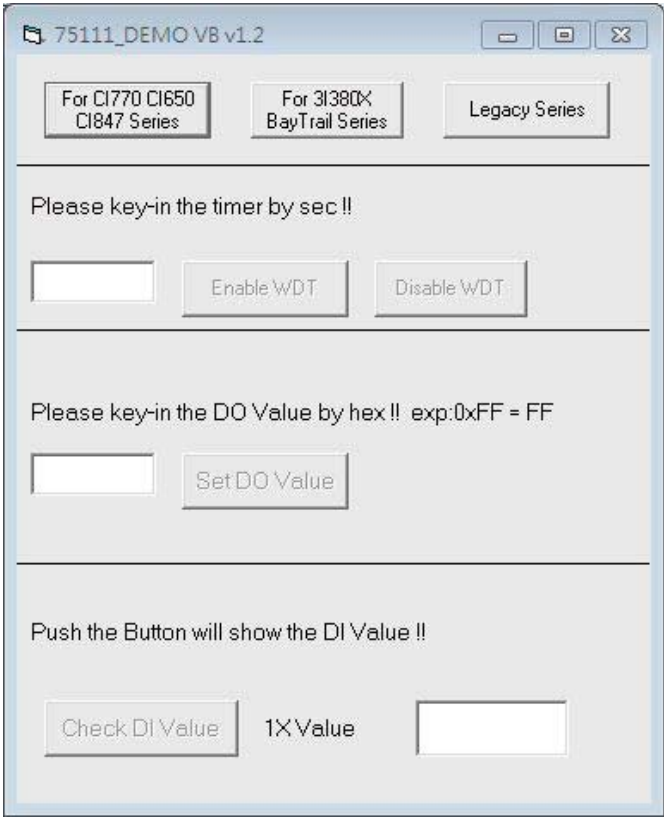
The Sample code source you can download from

Source file: 75111_VB_v1.2.rar http://tprd.info/lexwiki/index.php/IO_Device:F75111_VB6

Binary file: 75111_VB_Src1.2.rar

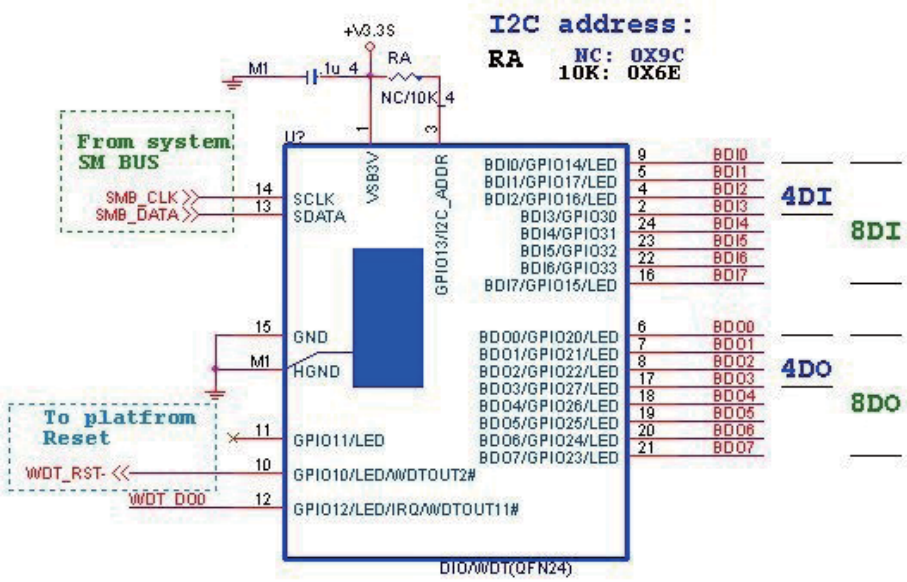
USERNAME & PASSWORD: sf

How to use this Demo Application



- **A Function - Choose your motherboard model**
- **B Function - Enable WDT timer ,Key-in the value by seconds then system will reboot after value which you key-in in left text box !!**
- **C Function - Disable WDT timer ,Push down the button then WDT timer value will be clear !!**
- **D Function - Set DO Value ,Key-in the DO value by hex then push the button !!**
- **E Function - Check DI Value ,The right side two text box will display DI 1X & 2X Value when you push down the button!!**

F75111 Layout Picture



SDK Function Introduction

Function EnableWDT

```
Function EnableWDT(timer As Integer)

Call WriteI2CByte(&H3, &H3)
Call WriteI2CByte(&H37, timer)
Call WriteI2CByte(&H36, &H73)

  End Function
```

Function DisableWDT

```
Function DisableWDT()

Call WriteI2CByte(&H36, &H0)

  End Function
```

Function SetDOValue

```
Function SetDOValue(dovalue As Integer)

Dim Data As Integer
Dim Value As Integer

Data = 0
Value = dovalue

If (Value And &H1) <> 0 Then
   Data = Data + &H1
End If

If (Value And &H2) <> 0 Then
   Data = Data + &H2
End If

If (Value And &H4) <> 0 Then
   Data = Data + &H4
End If

If (Value And &H80) <> 0 Then
   Data = Data + &H8
End If

If (Value And &H40) <> 0 Then
   Data = Data + &H10
End If

If (Value And &H20) <> 0 Then
   Data = Data + &H20
End If

If (Value And &H10) <> 0 Then
   Data = Data + &H40
End If

If (Value And &H8) <> 0 Then
   Data = Data + &H80
End If

Call WriteI2CByte(&H23, &H0)
Call WriteI2CByte(&H20, &HFF)
Call WriteI2CByte(&H2B, &HFF)
Call WriteI2CByte(&H21, Data)

End Function
```

Function CheckDIValue

```
Function CheckDIValue()
Dim GPIO1X     As Integer
Dim GPIO3X     As Integer
Dim DI1Xhex    As String
Dim DI3Xhex    As String

Dim Data As Long

Data = 0

Call ReadI2CByte(&H12, GPIO1X)
Call ReadI2CByte(&H42, GPIO3X)

GPIO1X = GPIO1X And &HF0
GPIO3X = GPIO3X And &HF

If (GPIO1X And &H10) <> 0 Then
   Data = Data + &H1
End If

If (GPIO1X And &H80) <> 0 Then
   Data = Data + &H2
End If

If (GPIO1X And &H40) <> 0 Then
   Data = Data + &H4
End If

If (GPIO3X And &H1) <> 0 Then
   Data = Data + &H8
End If

If (GPIO3X And &H2) <> 0 Then
   Data = Data + &H10
End If

If (GPIO3X And &H4) <> 0 Then
   Data = Data + &H20
End If

If (GPIO3X And &H8) <> 0 Then
   Data = Data + &H40
End If

If (GPIO1X And &H20) <> 0 Then
   Data = Data + &H80
End If

DI1Xhex = Hex(Data)

Text3.Text = "0x" + DI1Xhex

End Function
```

3-8-4 IO Device: F75111 under linux

The Sample code source you can download from

Source file: F75111v2.4L_SRC.tar.gz http://tprd.info/lexwiki/index.php/IO_Device:F75111_under_linux

Binary file: F75111v2.4L_BIN.tar.gz

USERNAME & PASSWORD: sf

How to compile source code

1. Compile source code with Code::Blocks

download and install the Code::Block with command "apt-get install codeblocks"

Open an exist project(F75111.cbp) in Code::Blocks, click the compile button

(add an option 'pkg-config --libs gtk+-2.0 gthread-2.0' in "Project->Build Option->Linker Setting->Other linker option")

2. Compile source code with "make"

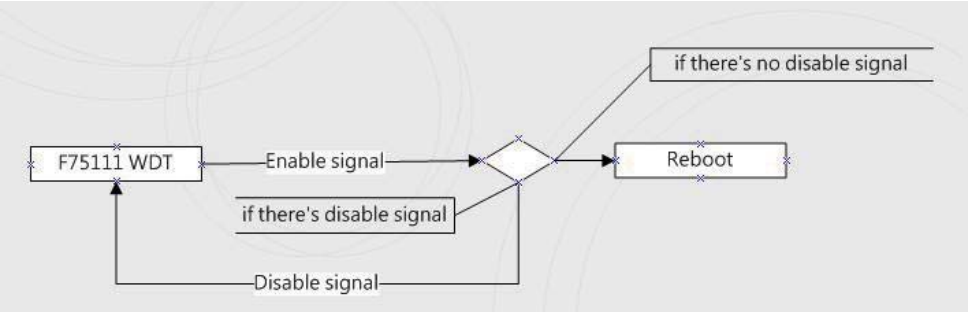
1. cd F75111

1. make

1. src/f75111 // execute the binary file

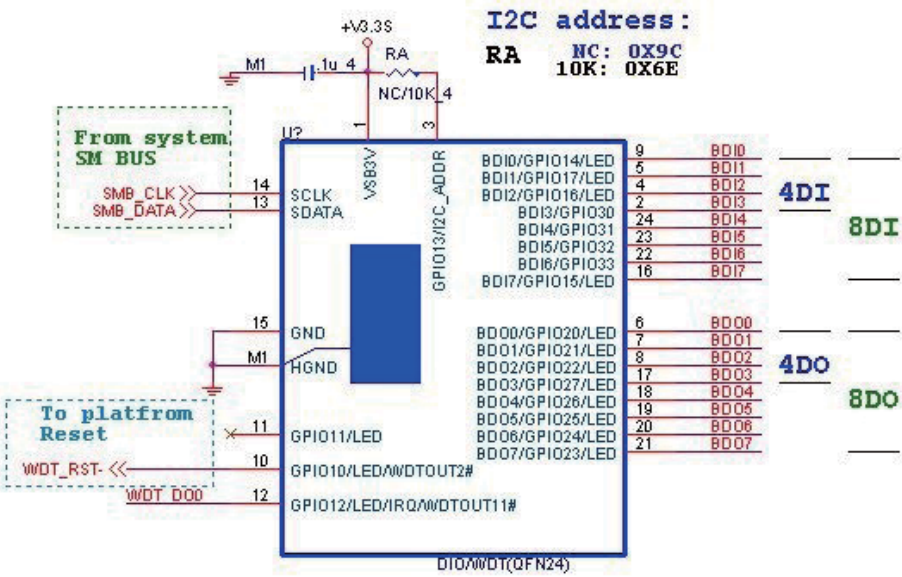
How to use this Demo Application

1. **Press the "Start" button to test DIO function**
2. **Press the "Enable" button to test WDT function**
3. **Press the "Disable" button to disable WDT**
4. **Check the "Enable Loop" box and press "Enable" to do WDT loop test**
5. **Press "Install" to set the system to autorun this application when booting, press "Uninstall" to remove this application when booting.**
6. **If WDT enable, system icon will be blinking.**



p.s.
f75111 send "F75111_SetWDTEnable(BYTE byteTimer)" including a parameter "timer",
if there's no disable signal (F75111_SetWDTDisable()) to stop it before timer countdown to 0, System will reboot.
if there's disable signal received, resent Enable WDT signal, for a loop to prevent from reboot p.s.

F75111 Layout Picture



Introduction

IO function In file SMBus.c

```
void SMBusIoWrite(BYTE byteOffset,BYTE byteData)
{
    outb( byteData , m_SMBusMapIoAddr + byteOffset);
}

BYTE SMBusIoRead(BYTE byteOffset)
{
    DWORD dwAddrVal;

    dwAddrVal = inb(m_SMBusMapIoAddr + byteOffset);
    return (BYTE)(dwAddrVal & 0x0FF);
}
```

Initial internal F75111

```
void F75111::InitInternalF75111()
{
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO1X_CONTROL_MODE  ,0x00);        //set GPIO1X to Input  function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO3X_CONTROL_MODE  ,0x00);        //set GPIO3X to Input  function
    this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_CONTROL_MODE  ,0xFF);        //set GPIO2X to Output function

    this->Write_Byte(F75111_INTERNAL_ADDR,F75111_CONFIGURATION, 0x03);          //Enable WDT OUT function
}
```

Set output value

```
void F75111::InterDigitalOutput(BYTE byteValue)
{
    BYTE byteData = 0;
    byteData = (byteData & 0x01 )? byteValue + 0x01 : byteValue;
    byteData = (byteData & 0x02 )? byteValue + 0x02 : byteValue;
    byteData = (byteData & 0x04 )? byteValue + 0x04 : byteValue;
    byteData = (byteData & 0x80 )? byteValue + 0x08 : byteValue;
    byteData = (byteData & 0x40 )? byteValue + 0x10 : byteValue;
    byteData = (byteData & 0x20 )? byteValue + 0x20 : byteValue;
    byteData = (byteData & 0x10 )? byteValue + 0x40 : byteValue;
    byteData = (byteData & 0x08 )? byteValue + 0x80 : byteValue;                    // get value bit by bit

   this->Write_Byte(F75111_INTERNAL_ADDR,GPIO2X_OUTPUT_DATA,byteData);   // write byteData value via GPIO2X output pin
}
```

Get Input value

```
BYTE F75111::InterDigitalInput()
{
    BYTE byteGPIO1X = 0;
    BYTE byteGPIO3X = 0;
    BYTE byteData   = 0;

    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO1X_INPUT_DATA,&byteGPIO1X) ;   // Get value from GPIO1X
    this->Read_Byte(F75111_INTERNAL_ADDR,GPIO3X_INPUT_DATA,&byteGPIO3X) ;   // Get value from GPIO3X

    byteGPIO1X = byteGPIO1X  & 0xF0;                                        // Mask unuseful value
    byteGPIO3X = byteGPIO3X  & 0x0F;                                        // Mask unuseful value

    byteData = ( byteGPIO1X & 0x10 )? byteData + 0x01 : byteData;
    byteData = ( byteGPIO1X & 0x80 )? byteData + 0x02 : byteData;
    byteData = ( byteGPIO1X & 0x40 )? byteData + 0x04 : byteData;
    byteData = ( byteGPIO3X & 0x01 )? byteData + 0x08 : byteData;

    byteData = ( byteGPIO3X & 0x02 )? byteData + 0x10 : byteData;
    byteData = ( byteGPIO3X & 0x04 )? byteData + 0x20 : byteData;
    byteData = ( byteGPIO3X & 0x08 )? byteData + 0x40 : byteData;
    byteData = ( byteGPIO1X & 0x20 )? byteData + 0x80 : byteData;          // Get correct DI value from GPIO1X & GPIO3X

    return byteData;
}
```

Enable WatchDog

```
void F75111_SetWDTEnable (BYTE byteTimer)
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_TIMER_RANGE  ,byteTimer);            // set WatchDog range and timer
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,WDT_TIMEOUT_FLAG | WDT_ENABLE | WDT_PULSE | WDT_PSWIDTH_100MS);
                                                                            // Enable WatchDog, Setting WatchDog configure
}
```

Disable WatchDog

```
void F75111_SetWDTDisable ()
{
    WriteByte(F75111_INTERNAL_ADDR,WDT_CONFIGURATION,0x00);                 // Disable WatchDog
}
```

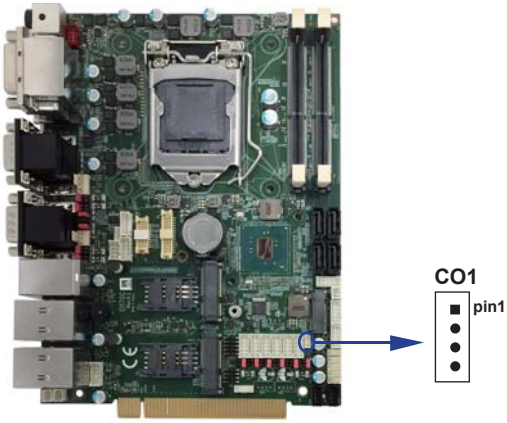
```
//-----------------------------------------------------------------------------------------------------
#define F75111_INTERNAL_ADDR                                    0x9C    //      OnBoard  F75111 Chipset
#define F75111_EXTERNAL_ADDR                                    0x6E    //      External F75111 Chipset
//-----------------------------------------------------------------------------------------------------
#define F75111_CONFIGURATION                                    0x03    //      Configure GPIO13 to WDT2 Function
//-----------------------------------------------------------------------------------------------------
#define GPIO1X_CONTROL_MODE                                     0x10    //      Select Output Mode or Input Mode
#define GPIO2X_CONTROL_MODE                                     0x20    //      Select GPIO2X Output Mode or Input Mode
#define GPIO3X_CONTROL_MODE                                     0x40    //      Select GPIO3X Output Mode or Input Mode
//-----------------------------------------------------------------------------------------------------
#define GPIO1X_INPUT_DATA                                       0x12    //      GPIO1X Input
#define GPIO3X_INPUT_DATA                                       0x42    //      GPIO3X Input
//-----------------------------------------------------------------------------------------------------
#define GPIO2X_OUTPUT_DATA                                      0x21    //      GPIO2X Output
//-----------------------------------------------------------------------------------------------------
#define GPIO2X_OUTPUT_DRIVING                                   0x2B    //      Select GPIO2X Output Mode or Input Mode
//-----------------------------------------------------------------------------------------------------
#define WDT_TIMER_RANGE                                         0x37    //      0-255 (secord or minute program by WDT_UNIT)
//-----------------------------------------------------------------------------------------------------
#define                 WDT_CONFIGURATION                       0x36    //      Configure WDT Function
#define                 WDT_TIMEOUT_FLAG                        0x40    //      When watchdog timeout.this bit will be set to 1.
#define                 WDT_ENABLE                              0x20    //      Enable watchdog timer
#define                 WDT_PULSE                               0x10    //      Configure WDT output mode
                                                                                //      0:Level  Mode
                                                                                //      1:Pulse  Mode
#define                 WDT_UNIT                                0x08    //      Watchdog unit select.
                                                                                //      0:Select second.
                                                                                //      1:Select minute.
#define                 WDT_LEVEL                               0x04    //      When select level output mode:
                                                                                //      0:Level low
                                                                                //      1:Level high
#define                 WDT_PSWIDTH_1MS                         0x00    //      When select Pulse mode: 1 ms.
#define                 WDT_PSWIDTH_20MS                        0x01    //      When select Pulse mode: 20 ms.
#define                 WDT_PSWIDTH_100MS                       0x02    //      When select Pulse mode: 100 ms.
#define                 WDT_PSWIDTH_4000MS                      0x03    //      When select Pulse mode:  4 s.
//-----------------------------------------------------------------------------------------------------
typedef struct F75111_Address
{
    BYTE bAddress;
}F75111_Address;
F75111_Address m_F75111;

bool            F75111_Init();
BYTE            F75111_GetDigitalInput ();
void            F75111_SetDigitalOutput(BYTE byteValue);

BYTE            F75111_GetWDTMode();
void            F75111_SetWDTMode(BYTE dwvalue);

void            F75111_SetWDTEnable    (BYTE byteTimer);
void            F75111_SetWDTDisable   ();
```

3-15 I²C Bus Interface

● CO1: I²C (SM) bus connector (1 x 4 pin 1.25mm wafer)

PIN NO.	1	2	3	4
Description	+3.3V	GND	SMB_CLK	SMB_DATA

Note: 1. Mating connector: MOLEX 53047-0410 or compatible
2. Cable housing: MOLEX 51021-0400 or compatible

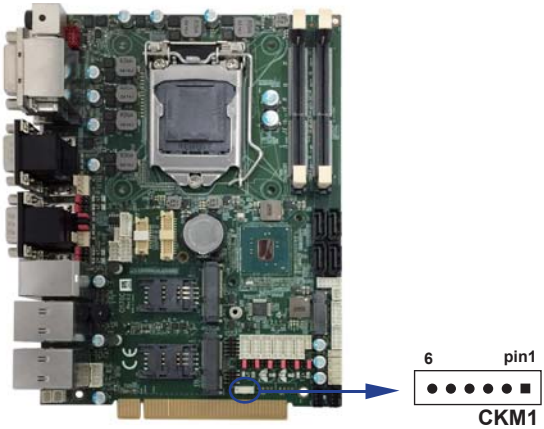


3-16 PS2 KB/MS

● CKM1: KB/MS port (1 X 6 pin 1.25mm wafer)

PIN NO.	1	2	3	4	5	6
Description	+5V	KB/DAT	KB/CLK	GND	MS/DAT	MS/CLK

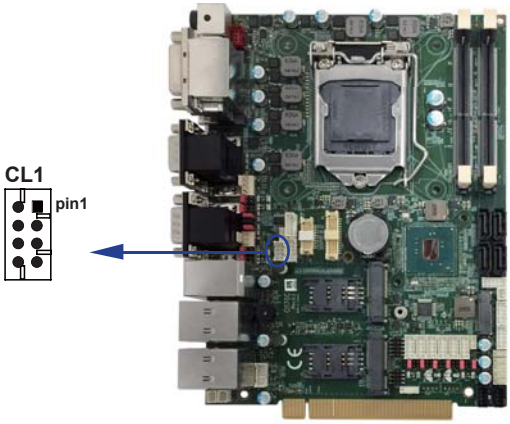
Note: 1. Mating connector: MOLEX 53047-0610 or compatible
2. Cable housing: MOLEX 51021-0600 or compatible



3-15 LAN+USB Interface

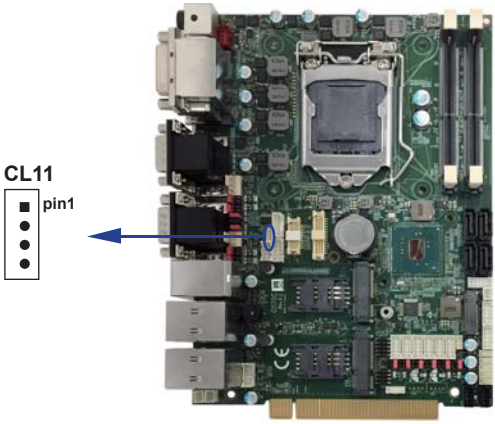
● CL1: LAN Giga/100Mb (2 x 4pin 2.00mm wafer)

PIN NO.	Description	PIN NO.	Description
1	TR0-/TX-	2	TR0+/TX+
3	TR2+/NC	4	TR1+/RX+
5	TR1-/RX-	6	TR2-/NC
7	TR3-/NC	8	TR3+/NC



● CL11: LAN LED (1 x 4pin 1.25mm wafer)

PIN NO.	1	2	3	4
DESCRIPTION	Vcc	Active LED	100Mb LAN	GIGA LAN

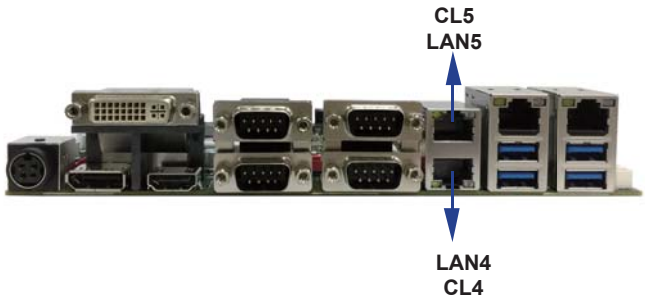


- **CL4&5: LAN Giga/100Mb (RJ45 Jack)**
  CL4&5: LAN4 (down side)/LAN5 (up side) port connector

PIN NO.	Description	PIN NO.	Description
1	TD0-/TX+	2	TD2-/NC
3	TD0+/TX-	4	TD2+/RX-
5	TD1-/RX+	6	TD3-/NC
7	TD1+/NC	8	TD3+/NC

- **RJ45 LAN Connector---LED define Giga/100MB Connector**

Speed	10 Mbps			100 Mbps			1000 Mbps		
Indicate	Back Side		Front Sid	Back Side		Front Side	Back Side		Front Side
	Link LED	ACT LED	ACT LED	Link LED	ACT LED	ACT LED	Link LED	ACT LED	ACT LED
LAN Light	X	Orange	Orange	Green	Orange	Orange	Red	Orange	Orange



• CUL2/CUL3 LAN + USB Connector

CUL2/CUL3 (Down side): USB3.0/2.0 Type A jack

PIN NO.	Description	PIN NO.	Description
		1	USB3.0 TX+
1	+5V		
2	USB 2.0 D-	2	USB3.0 TX-
		3	GND
3	USB 2.0 D+	4	USB3.0 RX+
4	GND		
		5	USB3.0 RX-

Note: 1. USB 3.0 and USB 2.0 combo Type A Jack

• CUL2/CUL3 (Up side): LAN Giga/100Mb RJ45 Jack

PIN NO.	Description	PIN NO.	Description
1	TD0-/TX+	2	TD2-/NC
3	TD0+/TX-	4	TD2+/RX-
5	TD1-/RX+	6	TD3-/NC
7	TD1+/NC	8	TD3+/NC

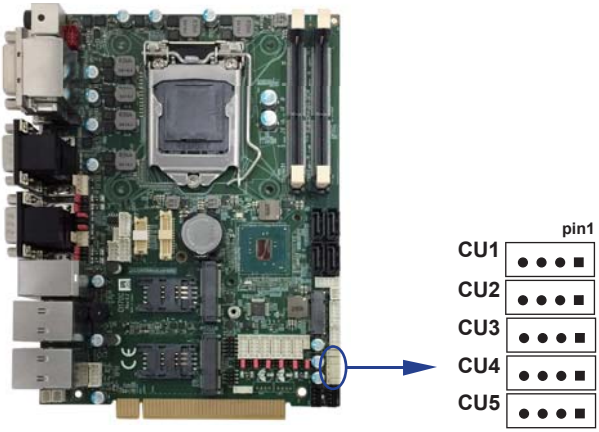
• RJ45 LAN Connector---LED define Giga/100/10MB Connector

Back side con	RED LED	GREEN LED	YELLOW LED
Indicate	GIGA LAN Link(light)	100Mb LAN Link(light)	Active LED Link(Blink)

● **CU1/CU2/CU3/CU4/CU5: USB2.0 ports**

PIN NO.	Description
1	+5V
2	USB DATA -
3	USB DATA +
4	GND

Note: 1. Attention! Check Device Power in spec
2. Mating connector: MOLEX 53047-0410 or compatible
3. Cable housing: MOLEX 51021-0400 or compatible

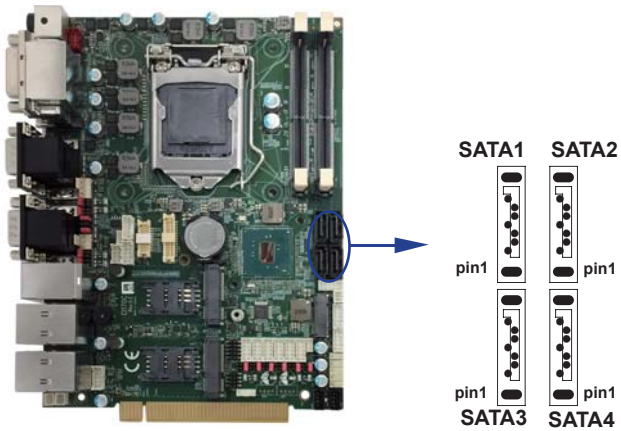


3-16 SATA interface

● **SATA1/SATA2/SATA3/SATA4: SATA connectors**

PIN NO.	Description
1	GND
2	DATA TX+
3	DATA TX-
4	GND
5	DATA RX-
6	DATA RX+
7	GND

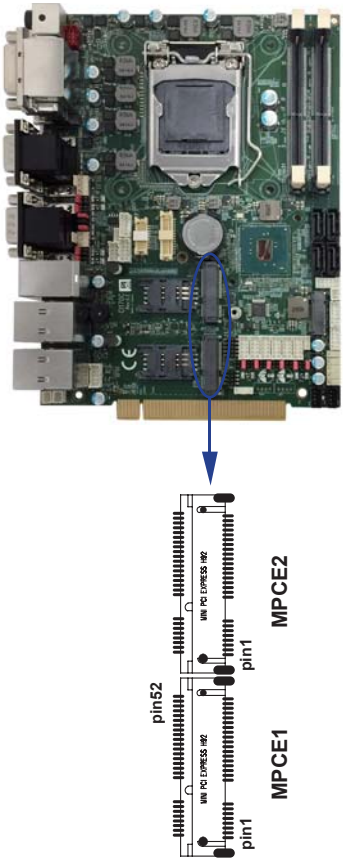
Note: 1. Support SATA 3.0 spec update 6Gb/sec .
2. CPO1, CPO2 provide SATA HDD power +12V, GND, +5V



3-17 Module socket

- **Mini card & SIM card & M.2 card**
- **MPCE1/MPCE2: Support USB and PCIe or SATA by one Interface (Mini card socket 52pin)**

PIN NO.	Description	PIN NO.	Description
1	NC	2	+3.3V
3	NC	4	GND
5	NC	6	+1.5V
7	NC	8	SIM Power
9	GND	10	SIM Data
11	PCIe-CLK-	12	SIM CLK
13	PCIe-CLK+	14	SIM Reset
15	GND	16	SIM RFU
KEY	KEY	KEY	KEY
17	NC	18	GND
19	NC	20	NC
21	GND	22	RST-
23	PCIe-RX-/mSATA-RX+	24	+3.3V
25	PCIe-RX+/mSATA-RX-	26	GND
27	GND	28	+1.5V
29	GND	30	SMB-CLK
31	PCIe-TX-/mSATA-TX-	32	SMB-DATA
33	PCIe-TX+/mSATA-TX+	34	GND
35	GND	36	USB-DATA-
37	GND	38	USB-DATA+
39	+3.3V	40	GND
41	+3.3V	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	mSATA-Detect	52	+3.3V



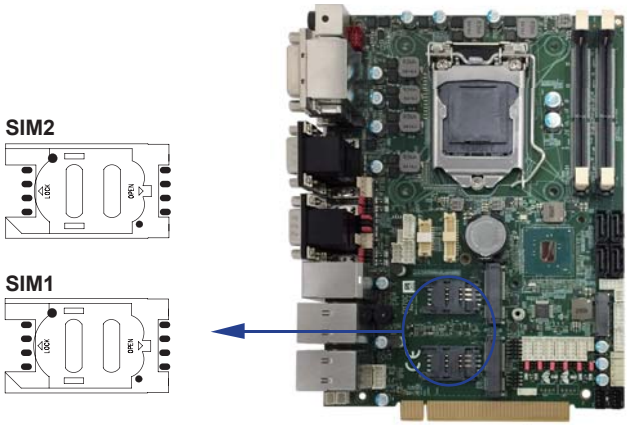
Note: 1. MPCE1/MPCE2 Full size
2. MPCE1/MPCE2 Pin 8, 10,12,14,16 for SIM1 card reader use
3. MPCE1 Pin23, 25, 31, 33 supported mSATA device and PCIe device alternatively
4. MPCE1 Pin51 mSATA/PCIe auto detect function
5. MPCE2 Pin 23, 25, 31, 33 for PCIe Only
6. MPCE2 Pin51 for NC

3-18 SIM socket

- **SIM1/SIM2: SIM card socket pin define is follow ISO 7816-2 smart card standard.**

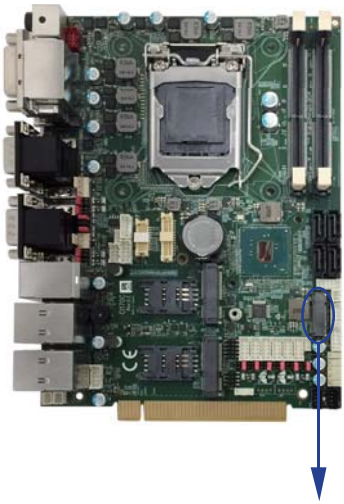
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Vcc	5	GND
2	RST	6	Vpp
3	CLK	7	DATA
4	RUF	8	RUF

Note: 1. MPCE1 Pin 8, 10,12,14,16 for SIM1 card reader use.



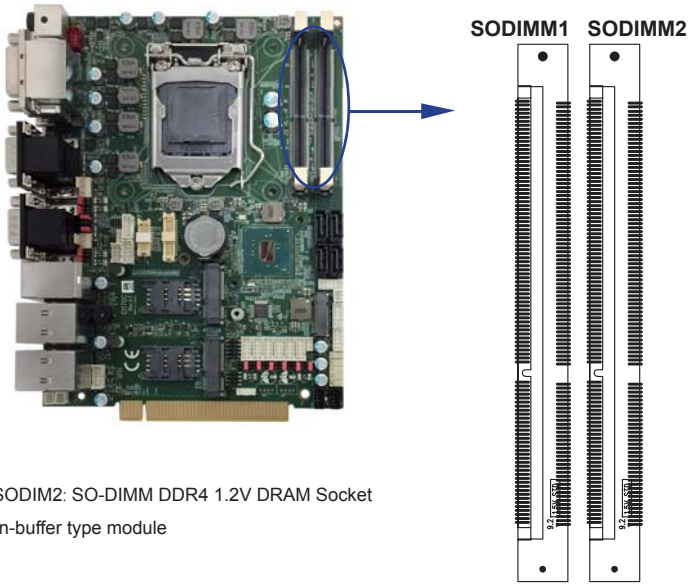
• NGFF1: Support M.2 B key Type 22110 SATA Interface

PIN NO.	DESCRIPTION Top Side	PIN NO.	DESCRIPTION Bottom Side
75	GND		
73	GND	74	+3.3V
71	GND	72	+3.3V
69	SATA-Detect	70	+3.3V
67	NC	68	NC
65	NC	66	NC
63	NC	64	NC
61	NC	62	NC
59	NC	60	NC
57	GND	58	NC
55	PCIe-CLK+	56	NC
53	PCIe-CLK-	54	NC
51	GND	52	NC
49	PCIe0-TX+/SATA-TX+	50	PCIe-RST-
47	PCIe0-TX-/SATA-TX-	48	NC
45	GND	46	NC
43	PCIe0-RX+/SATA-RX-	44	NC
41	PCIe0-RX-/SATA-RX+	42	NC
39	GND	40	NC
37	PCIe1-TX+	38	+3.3V
35	PCIe1-TX-	36	NC
33	GND	34	NC
31	PCIe1-RX+	32	NC
29	PCIe1-RX-	30	NC
27	GND	28	NC
25	NC	26	NC
23	NC	24	NC
21	GND	22	NC
		20	NC
Mechanical Key			
PIN NO.	DESCRIPTION Top Side	PIN NO.	DESCRIPTION Bottom Side
11	NC		
9	NC	10	NC
7	NC	8	NC
5	NC	6	NC
3	GND	4	+3.3V
1	GND	2	+3.3V



Note: 1. Support SATA / PCIe Based SSD Module
2. No Support PCIe / USB 3.0 / SSIC Based WWAN Module

3-19 SODIMM socket



Note: 1.SODIM1/ SODIM2: SO-DIMM DDR4 1.2V DRAM Socket

2. Support un-buffer type module

3-20 PCIe X16 Gold Finger PIN Define

PIN NO.		PIN NO.	
A1	NC	B1	+12V
A2	+12V	B2	+12V
A3	+12V	B3	+12V
A4	GND	B4	GND
A5	+3.3V	B5	SMB_CLK
A6	+3.3V	B6	SMB_DATA
A7	+3.3V	B7	GND
A8	+3.3V	B8	+3.3V
A9	+3.3V	B9	+3.3V
A10	+3.3V	B10	+3.3VAUX
A11	PCIEX16_PLT_RST#	B11	PCIE_WAKE#
Mechanical Key			
A12	GND	B12	NC
A13	CLK_PCIEX16_P	B13	GND
A14	CLK_PCIEX16_N	B14	PEG_TXP0
A15	GND	B15	PEG_TXN0
A16	PEG_RXP0	B16	GND
A17	PEG_RXN0	B17	PCIEX16_CLKREQ#
A18	GND	B18	GND
A19	NC	B19	PEG_TXP1
A20	GND	B20	PEG_TXN1
A21	PEG_RXP1	B21	GND
A22	PEG_RXN1	B22	GND
A23	GND	B23	PEG_TXP2
A24	GND	B24	PEG_TXN2
A25	PEG_RXP2	B25	GND
A26	PEG_RXN2	B26	GND
A27	GND	B27	PEG_TXP3
A28	GND	B28	PEG_TXN3
A29	PEG_RXP3	B29	GND
A30	PEG_RXN3	B30	NC
A31	GND	B31	PCIEX16_CLKREQ#
A32	NC	B32	GND

PIN NO.		PIN NO.	
A33	NC	B33	PEG_TXP4
A34	GND	B34	PEG_TXN4
A35	PEG_RXP4	B35	GND
A36	PEG_RXN4	B36	GND
A37	GND	B37	PEG_TXP5
A38	GND	B38	PEG_TXN5
A39	PEG_RXP5	B39	GND
A40	PEG_RXN5	B40	GND
A41	GND	B41	PEG_TXP6
A42	GND	B42	PEG_TXN6
A43	PEG_RXP6	B43	GND
A44	PEG_RXN6	B44	GND
A45	GND	B45	PEG_TXP7
A46	GND	B46	PEG_TXN7
A47	PEG_RXP7	B47	GND
A48	PEG_RXN7	B48	PCIEX16_CLKREQ#
A49	GND	B49	GND
A50	NC	B50	PEG_TXP8
A51	GND	B51	PEG_TXN8
A52	PEG_RXP8	B52	GND
A53	PEG_RXN8	B53	GND
A54	GND	B54	PEG_TXP9
A55	GND	B55	PEG_TXN9
A56	PEG_RXP9	B56	GND
A57	PEG_RXN9	B57	GND
A58	GND	B58	PEG_TXP10
A59	GND	B59	PEG_TXN10
A60	PEG_RXP10	B60	GND
A61	PEG_RXN10	B61	GND
A62	GND	B62	PEG_TXP11
A63	GND	B63	PEG_TXN11
A64	PEG_RXP11	B64	GND
A65	PEG_RXN11	B65	GND
A66	GND	B66	PEG_TXP12
A67	GND	B67	PEG_TXN12

PIN NO.		PIN NO.	
A68	PEG_RXP12	B68	GND
A69	PEG_RXN12	B69	GND
A70	GND	B70	PEG_TXP13
A71	GND	B71	PEG_TXN13
A72	PEG_RXP13	B72	GND
A73	PEG_RXN13	B73	GND
A74	GND	B74	PEG_TXP14
A75	GND	B75	PEG_TXN14
A76	PEG_RXP14	B76	GND
A77	PEG_RXN14	B77	GND
A78	GND	B78	PEG_TXP15
A79	GND	B79	PEG_TXN15
A80	PEG_RXP15	B80	GND
A81	PEG_RXN15	B81	PCIEX16_CLKREQ#
A82	GND	B82	NC

Chapter-4

Introduction of BIOS

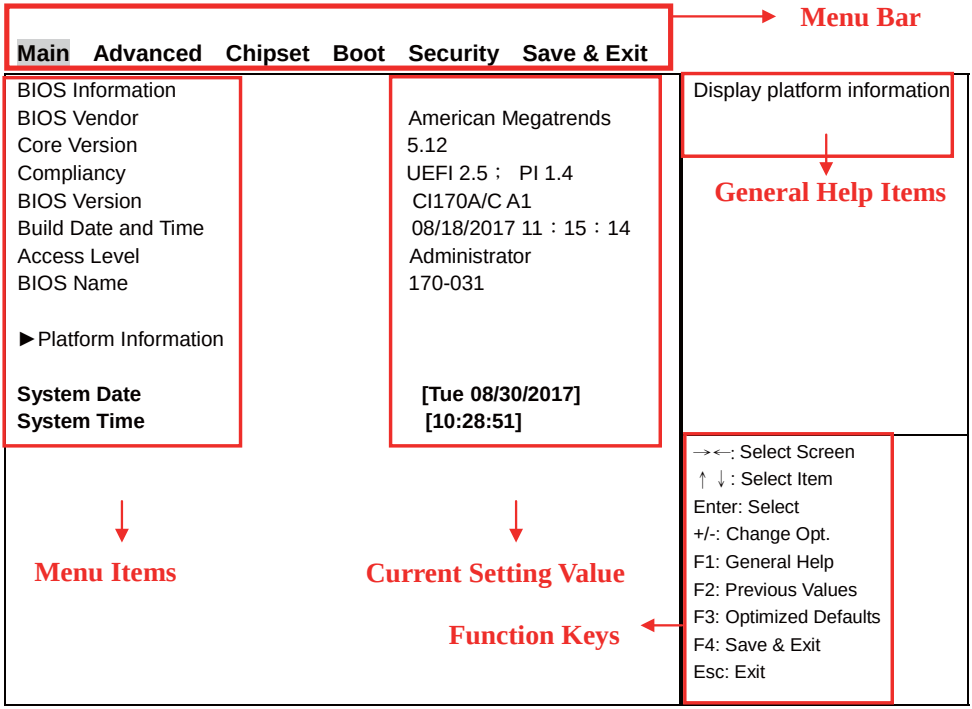
The BIOS is a program located in the Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program gains control. The BIOS first operates an auto-diagnostic test called POST (Power on Self Test) for all the necessary hardware, it detects the entire hardware devices and configures the parameters of the hardware synchronization. After these tasks are completed, BIOS will give control of the computer back to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate with, it is the key factor of system stability and of ensuring your system performance at best.

4-1 Enter Setup

Power on the computer and press <Del> key immediately to enter Setup.
If the message disappears before your respond but you still wish to enter Setup, restart the system by turning it OFF then ON. You may also restart the system by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the proper time and the system does not boot, an error message will display and you will be asked to

4-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen



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4-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press ←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous value.
- [F3]: Optimized defaults.
- [F4]: Save & exit.
- Press <Esc> to quit the BIOS Setup.

4-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

4-5 Menu Bars

There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Boot	To change boot settings
Security	Password settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar.
The selected one is highlighted.

4-6 Main

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

BIOS Information		Display platform information
BIOS Vendor	American Megatrends	
Core Version	5.12	
Compliancy	UEFI 2.5； PI 1.4	
BIOS Version	CI170A/C A1	
Build Date and Time	08/18/2017 11：15：14	
Access Level	Administrator	
BIOS Name	170-031	
►Platform Information		
System Date	**[Tue 08/30/2017]**	→←: Select Screen
System Time	**[10:28:51]**	↑ ↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

Platform Information

Display platform information

System Date

Set the Date. Please use [Tab] to switch between data elements.

System Time

Set the Time. Please use [Tab] to switch between data elements.

4-7 Advanced

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

► CPU Configuration ►Trusted Computing ► ACPI Settings ►F81966 Super IO Configuration ►Hardware Monitor ►F81216SEC Super IO Configuration ►Serial Port Console Redirection ►Intel TXT Information ►Network Stack Configuration ►CMS Configuration ►USB Configuration	CPU Configuration Parameters →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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CPU Configuration

Please refer section 1-7-1

Trusted Computing

Please refer section 1-7-2

ACPI Settings

Please refer section 1-7-3

F81966 Super IO Configuration

Please refer section 1-7-4

Hardware Monitor

Please refer section 1-7-5

F81216SEC Super IO Configuration

Please refer section 1-7-6

Serial Port Console Redirection

Please refer section 1-7-7

Intel TXT Information

Please refer section 1-7-8

Network Stack Configuration

Please refer section 1-7-9

CMS Configuration

Please refer section 1-7-10

USB Configuration

Please refer section 1-7-11

4-7-1 CPU Configuration

Press [Enter] to view CPU Configuration.

4-7-2 Trusted Computing

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Configuration Security Device Support **[Disabled]** NO Security Device Found	Enables or Disables BIOS support for security Device. O.S. Will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Security Device Support

Use this item to enable or disable Security Device.

4-7-3 ACPI Settings

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

ACPI Settings		Enables or Disables System ability to Hibernate (DS/S4 Sleep State). This option may not be effective with some operating systems.
Enable Hibernation	**[Enabled]**	
ACPI Sleep State	**[S3 (Suspend to RAM)]**	
USB Power state in S3-S5	**[Enabled]**	
Power Failure	**[Keep last state]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Critical Trip Point	**[103 C]**	

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Enable Hibernation

This item allows you to Enabled / Disabled the Hibernate feature.

ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

The optional settings: Suspend Disabled / S3 (Suspend to RAM).

USB Power state in S3-S5

Enabled / Disabled USB Power delivery in S3 (Sleep). S4 (Hibernate) and S5 (Soft off) States.

Power Failure

This item specifies whether your system will reboot after a power failure or interrupt occurs.

[Keep last state] Restores the system to the status before power failure or interrupt occurred.

[Always on] Leaves the computer in the power on state.

[Always off] Leaves the computer in the power off state.

Critical Trip Point

This value controls the temperature of the ACPI Critical Trip Point – the point in which the OS will shut the system off.

The optional settings: Disabled / 119 C / 111 C / 103 C / 100 C / 95 C / 87 C / 79 C / 71 C / 63 C / 55 C / 47 C / 39 C / 31 C / 23 C / 15 C.

4-7-4 F81966 Super IO Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

F81966 Super IO Configuration Super IO Chip F81966 ►Serial Port 1 Configuration ►Serial Port 2 Configuration ►Serial Port 3 Configuration ►Serial Port 4 Configuration ►Serial Port 5 Configuration ►Serial Port 6 Configuration	Set Parameters of Serial Port 1(COMA) →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Serial Port 1 Configuration

Please refer section 1-7-4-1

Serial Port 2 Configuration

Please refer section 1-7-4-2

Serial Port 3 Configuration

Please refer section 1-7-4-1

Serial Port 4 Configuration

Please refer section 1-7-4-1

Serial Port 5 Configuration

Please refer section 1-7-4-1

Serial Port 6 Configuration

Please refer section 1-7-4-1

4-7-4-1 ►Serial Port 1 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 1 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=3F8h; IRQ=4;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 1 IO=3F8h; IRQ=4;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=3F8h; IRQ=4;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-4-2 ►Serial Port 2 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=2F8h; IRQ=3;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 2 IO=2F8h; IRQ=3;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=2F8h; IRQ=3 ;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-4-3 ►Serial Port 3 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 3 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=3E8h; IRQ=7;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 3 IO=3E8h; IRQ=7;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=3E8h; IRQ=7 ;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-4-4 ►Serial Port 4 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 4 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=2E8h; IRQ=7;	
Change Settings	**[AUTO]**	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 4 IO=2E8h; IRQ=7;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=2E8h; IRQ=7 ;

IO=3F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-4-5 ►Serial Port 5 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 5 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=2F0h; IRQ=7;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 5 IO=2F0h; IRQ=7;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=2F0h; IRQ=7 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-4-6 ►Serial Port 6 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 6 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=2E0h; IRQ=7;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 6 IO=2E0h; IRQ=7;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=2E0h; IRQ=7 ;

IO=3E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E8h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2F0h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=2E0h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-5 Hardware Monitor

Press [Enter] to view PC health status.
This section shows the status of your CPU, Fan, and overall system. This is only available when there is Hardware Monitor function onboard.

4-7-6 F81216SEC Super IO Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

F81216SEC Super IO Configuration Super IO Chip F81216SEC ►Serial Port 1 Configuration ►Serial Port 2 Configuration ►Serial Port 3 Configuration ►Serial Port 4 Configuration	Set Parameters of Serial Port 1(COMA) →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Serial Port 1 Configuration

Please refer section 1-7-6-1

Serial Port 2 Configuration

Please refer section 1-7-6-2

Serial Port 3 Configuration

Please refer section 1-7-6-1

Serial Port 4 Configuration

Please refer section 1-7-6-1

4-7-6-1 ►Serial Port 1 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 1 Configuration Serial Port **[Enabled]** Device Settings IO=240h; IRQ=5; Change Settings **[AUTO]** Uart Mode **[RS232]**	Enable or Disable Serial Port (COM) →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 1 IO=240h; IRQ=5;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=240h; IRQ=5;

IO=240h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=248h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=250h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=258h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-6-2 ►Serial Port 2= Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 2 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=248h; IRQ=5;	
Change Settings	**[AUTO]**	→←: Select Screen
Uart Mode	**[RS232]**	↑ ↓ : Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 2 IO=248h; IRQ=5;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=248h; IRQ=5;

IO=240h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=248h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=250h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=258h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-6-3 ►Serial Port 3 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 3 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=250h; IRQ=5;	
Change Settings	**[AUTO]**	→←: Select Screen
Uart Mode	**[RS232]**	↑ ↓ : Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 3 IO=250h; IRQ=5;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=250h; IRQ=5;

IO=240h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=248h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=250h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=258h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-6-4 ►Serial Port 4 Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Serial Port 4 Configuration		Enable or Disable Serial Port (COM)
Serial Port	**[Enabled]**	
Device Settings	IO=258h; IRQ=5;	
Change Settings	**[AUTO]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Uart Mode	**[RS232]**	

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Serial Port

Use this item to enable or disable serial port (COM).

The optional settings are: Enabled, Disabled.

Device Settings

Serial Port 4 IO=258h; IRQ=5;

Change Settings

Use this item to select an optimal setting for super IO device.

The optional settings are:

AUTO

IO=258h; IRQ=5;

IO=240h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=248h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=250h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

IO=258h; IRQ=3, 4, 5, 6, 7, 9,10,11,12 ;

Uart Mode

Use this item to select COM Port as RS232, RS422 or RS485 mode.

4-7-7 Serial Port Console Redirection

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

COM0 Console Redirection **[Disabled]** ►Console Redirection Settings Legacy Console Redirection ► Legacy Console Redirection Settings	Console Redirection Enable or Disable. →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Console Redirection

Use this item to enable or disable Console Redirection.

The optional settings are: Enabled, Disabled.

4-7-8 Intel TXT Information

Press [Enter] to view Intel TXT Information.

4-7-9 Network Stack Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Network stack **[Disabled]**	Enable/Disable UEFI network stack. →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Network Stack

Enable/Disable UEFI network stack.

The optional settings are: Disabled, Enabled.

4-7-10 CSM Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

Compatibility Support Module Configuration CSM Support **[Disabled]**	Enable/Disable CSM Support.
	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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CSM Support

Enable/Disable CSM Configuration.

The optional settings are: Disabled, Enabled.

4-7-11 USB Configuration

Main **Advanced** **Chipset** **Boot** **Security** **Save & Exit**

USB Configuration USB Module Version 17 USB Controllers : 1 XHCI USB Devices : 1 Mouse Legacy USB Support **[Enabled]** XHCI Hand-off **[Enabled]** USB Mass Storage Driver Support **[Enabled]** Port 60/64 Emulation **[Disabled]**	Enables Legacy USB support AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.
	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

The optional settings are: Enabled, Disabled.

XHCI Hand-off

This is a workaround for OSes without XHCI handoff support. The XHCI ownership change should be claimed by XHCI driver.

The optional settings are: Enabled, Disabled.

USB Mass Storage Driver Support

Enabled/Disabled USB Mass Storage Driver Support.

The optional settings are: Enabled, Disabled.

Port 60/64 Emulation

Enabled I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard legacy support for non-USB aware OSes.

The optional settings are: Enabled, Disabled.

4-8 Chipset

Main Advanced Chipset Boot Security Save & Exit

►System Agent (SA) Configuration ►PCH-IO Configuration	PCH Parameters
	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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System Agent (SA) Configuration

Please refer section 1-8-1

PCH-IO Configuration

Please refer section 1-8-2

4-8-1 System Agent (SA) Configuration

Main Advanced Chipset Boot Security Save & Exit

System Agent (SA) Configuration		Memory Configuration Parameters
SA PCIe Code Version	1.4.1.0	
VT-d	Supported	
►Memory Configuration		→←: Select Screen
►Graphics Configuration		↑ ↓ : Select Item
►PEG Port Configuration		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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Memory Configuration

Please refer section 1-8-1-1

Graphics Configuration

Please refer section 1-8-1-2

PEG Port Configuration

Please refer section 1-8-1-3

4-8-1-1 Memory Configuration

Press [Enter] to view Memory Information.

4-8-1-2 Graphics Configuration

Main Advanced Chipset Boot Security Save & Exit

Graphics Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
Primary Display	**[Auto]**	
Internal Graphics	**[Auto]**	
Active LFP	**[No eDP]**	
		→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Primary Display

Select which of IGFX/PEG Graphics device should be Primary Display Or select SG for Switchable Gfx.

The optional settings are: Auto, IGFX, PEG.

Internal Graphics

Keep IGFX enabled based on the setup options.

The optional settings are: Auto, Enabled, Disabled.

Active LFP

Select the Active LFP Configuration.

No eDP: VBIOS does not enabled LFP.

eDP Port-A: LFP Driven by Int-DisplayPort encoder from Port-A.

The optional settings are: No eDP, eDP Port-A.

4-8-1-3 PEG Port Configuration

Main Advanced Chipset Boot Security Save & Exit

PEG Port Configuration		PEG Lane Configuration
PEG Lane	**[1x16]**	
PEG 0:1:0	Not Present	
Enable Root Port	**[Auto]**	
Max Link Speed	**[Auto]**	
PEG 0:1:1	Not Present	
Enable Root Port	**[Auto]**	
Max Link Speed	**[Auto]**	
PEG 0:1:2	Not Present	
Enable Root Port	**[Auto]**	
Max Link Speed	**[Auto]**	
		→←: Select Screen
		↑ ↓ : Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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PEG Lane

PEG Lane Configuration

1x16: Support One x16 PCIe.

2x8: Support Two x8 PCIe.

1x8, 2x4: Support One x8 and Two x4 PCIe.

The optional settings are: 1x16, 2x8, 1x8,2x4.

PEG 0: 1:0 / PEG 0:1:1 / PEG 0:1:2

view PEG Lane Port Information.

Enable Root Port

Enabled or Disabled the Root Port.

The optional settings are: Auto, Enabled, Disabled.

Max Link Speed

Configure PEG Port Max Speed.

The optional settings are: Auto, Gen1, Gen2, Gne3.

4-8-2 PCH-IO Configuration

Main Advanced Chipset Boot Security Save & Exit

PCH-IO Configuration ►PCI Express Configuration ►SATA And RST Configuration	PCI Express Configuration settings →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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PCI Express Configuration

Please refer section 1-8-2-1

SATA And RST Configuration

Please refer section 1-8-2-2

4-8-2-1 PCI Express Configuration

Main Advanced Chipset Boot Security Save & Exit

PCI Express Configuration PCIE Port assigned to LAN 4 ►PCI Express Root Port 5 (I210/I211 LAN2) ►PCI Express Root Port 6 (I210/I211 LAN3) ►PCI Express Root Port 7 (I210/I211 LAN4) ►PCI Express Root Port 8 (I210/I211 LAN5) ►PCI Express Root Port 10 (Mini PCIe1) ►PCI Express Root Port 11 (Mini PCIe2) ►PCI Express Root Port 19 (M.2 PCIe x2)	PCI Express Configuration settings →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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PCI Express Root Port 5/6/7/8 (I210/I211 LAN2/3/4/5)

Please refer section 1-8-2-1-1

PCI Express Root Port 10/11 (Mini PCIe1/2)

Please refer section 1-8-2-1-1

PCI Express Root Port 19 (M.2 PCIe x2)

Please refer section 1-8-2-1-1

4-8-2-1-1 PCI Express Root Port 5/6/7/8 (I210/I211 LAN2/3/4/5)

Main Advanced Chipset Boot Security Save & Exit

PCI Express Root Port 5/6/7/8	**[Enabled]**	Control the PCI Express Root Port.
ASPM	**[Disabled]**	
PCIe Speed	**[Auto]**	
Detect Timeout	0	
		→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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PCI Express Root Port 5/6/7/8

Control the PCI Express Root Port.

The optional settings are: Enabled, Disabled.

ASPM

Select the ASPM Level.

The optional settings are: Auto, L0sL1, L1, L0s, Disabled.

PCIe Speed

Select PCI Express port speed.

The optional settings are: Auto, Gen1, Gen2, Gen3.

Detect Timeout

The number of milliseconds reference code will wait for link to exit Detect state for enabled ports before assuming there is no device and potentially disabling the port.

4-8-2-2 SATA And RST Configuration

Main Advanced Chipset Boot Security Save & Exit

SATA And RST Configuration		Enable / Disable SATA Device.
SATA Controller(S)	**[Enabled]**	
SATA Mod Selection	**[AHCI]**	
SATA Controller Speed	**[Default]**	
SATA1	Empty	
Port 0	**[Enabled]**	
SATA Device Type	**[Hard Disk Drive]**	
SATA2	Empty	
Port 1	**[Enabled]**	
SATA Device Type	**[Hard Disk Drive]**	
SATA3	Empty	
Port 2	**[Enabled]**	→←: Select Screen
SATA Device Type	**[Hard Disk Drive]**	↑ ↓ : Select Item
SATA4	Empty	Enter: Select
Port 3	**[Enabled]**	+/-: Change Opt.
SATA Device Type	**[Hard Disk Drive]**	F1: General Help
SATA5 (mSATA)	Empty	F2: Previous Values
Port 4	**[Enabled]**	F3: Optimized Defaults
SATA Device Type	**[Hard Disk Drive]**	F4: Save & Exit
SATA6 (M.2)	Empty	Esc: Exit
Port 5	**[Enabled]**	
SATA Device Type	**[Hard Disk Drive]**	

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SATA Controller(S)

Enable / Disable SATA Device.

The optional settings are: Enabled, Disabled.

SATA Mod Selection

Determines how SATA controller(s) operate.

The optional settings are: AHCI, Intel RST Premium.

SATA Controller Speed

Indicates the maximum speed the SATA controller can support.

The optional settings are: Default, Gen1, Gen2, Gen3.

SATA1/ SATA2/ SATA3/ SATA4/ SATA5 (mSATA)/ SATA6 (M.2)

View SATA Port Information.

Port 0/ Port 1/ Port 2/ Port 3/ Port 4/ Port 5

Enable / Disable SATA Port.

The optional settings are: Enabled, Disabled.

SATA Device Type

Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

The optional settings are: Hard Disk Drive, Solid State Drive.

4-9 Security

Main Advanced Chipset Boot Security Save & Exit

Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator right. The password length must be in the following range: Minimum length 3 Maximum length 20 Administrator Password User Password	Set Administrator Password →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Administrator Password & User Password

To set up an administrator password:

1. Select Administrator / User Password. The screen then pops up an Create New Password dialog.
2. Enter your desired password that is no less than 3 characters and no more than 20 characters.
3. Hit [Enter] key to submit.

4-10 Boot

Main Advanced Chipset Boot Security Save & Exit

Boot Configuration		Number of seconds to wait for setup activation Key. 65535(0xFFFF) means indefinite waiting.
Setup Prompt Timeout	1	
Bootup NumLock State	**[On]**	
Quiet Boot	**[Enabled]**	
Driver Option Prioritiies		
New Boot Option Policy	**[Default]**	
		→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Setup Prompt Timeout

Number of seconds to wait for setup activation Key. 65535(0xFFFF) means indefinite waiting.

Bootup NumLock State

Use this item to select keyboard NumLock State.

The optional settings are: On, Off.

Quiet Boot

The optional settings are: Enabled, Disabled.

New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

The optional settings are: Default, Place First, Place Last.

4-11 Save & Exit

Main Advanced Chipset Boot Security Save & Exit

Save Options Save Changes and Reset Discard Changes and Reset Default Options Restore Defaults Boot Override Launch EFI shell from filesystem device	Reset the system after saving the changes. →←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system setup without saving any changes.

Restore Defaults

Use this item to restore load default values for all the setup options.

Launch EFI shell from filesystem device

Attempts to launch EFI shell application (Shell.efi) from one of the available filesystem device.

Chapter-5

DRIVER INSTALLATION

There is a system installation DVD in the package. This DVD does not only include all the drivers you need but also some other free application programs and utility programs.
In addition, this DVD also includes an auto detect software telling you which hardware is installed and which driver is needed so that your system can function properly. We call this auto detect software SYSTEM INSTALL.

SYSTEM INSTALL Supports Windows 7 / Windows 10

Insert the DVD into your DVD-ROM drive and the SYSTEM INSTALL menu should appear as below. If the menu does not appear, double-click MY COMPUTER and double-click DVD-ROM drive or click START, click RUN, and type X:\autorun.EXE (assuming your DVD-ROM drive is X).

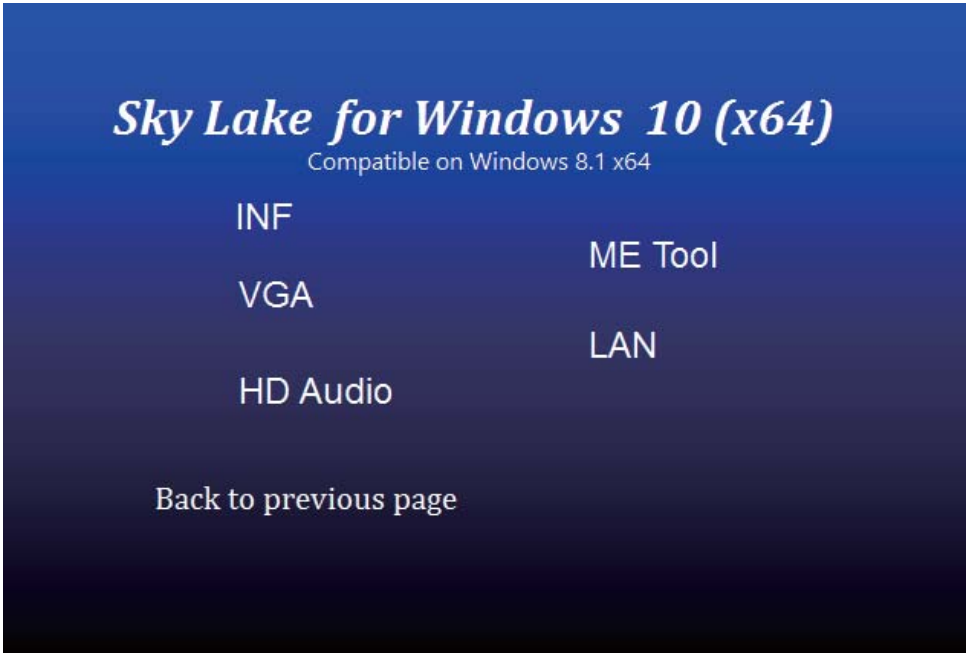
Make your selection from SYSTEM INSTALL menu:

1 . Auto Detect Main board and OS to AUTOMATIC DRIVER INSTALLATION menu
2 . Browse DVD to view the contents of the DVD
3. Exit to exit SYSTEM INSTALL menu

AUTOMATIC DRIVER INSTALLATION menu

1. INF install Intel SkyLake chipset driver
2. VGA install onboard VGA driver
3. HD Audio install ALC HD Audio Codec driver
4. ME Tool install Intel Management Engine Interface driver
5. LAN install LAN driver

Each selection is illustrated below:

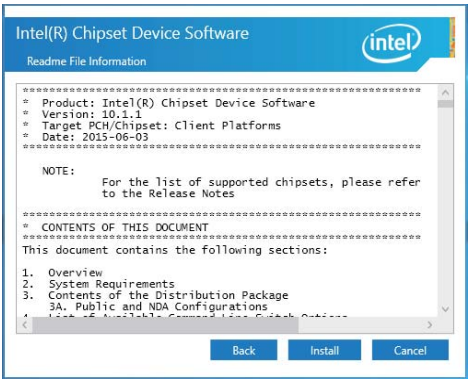


5-1 INF Install Intel SkyLake Chipset Driver

1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "INF".

2. At the "Intel® Chipset Device Software" screen, click "Next".

3. At the "License Agreement" screen, click "Accept"



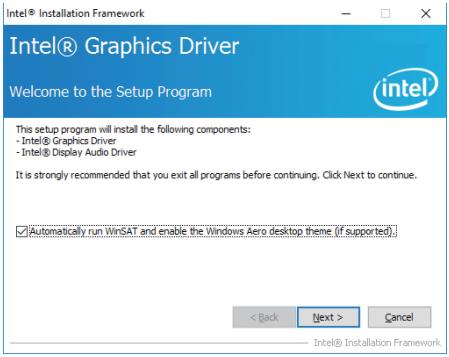
4. At the "Readme File Information" screen, Click "Install".

5. Click "Restart Now" to restart computer.

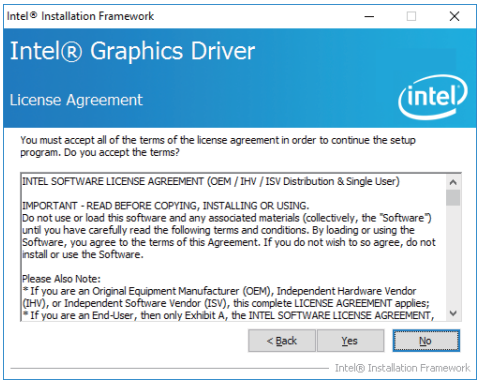
NOTE: SYSTEM INSTALL will auto detect file path For Windows 7 64/32-bit and windows 10 64bit X:\driver\sky_lake\INF\SetupChipset.exe

5-2 VGA Install Intel SkyLake VGA Driver

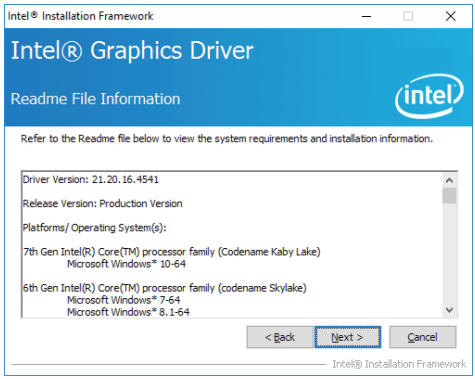
1. At the "AUTOMATIC DRIVER INSTALLATION menu "screen, click "VGA".



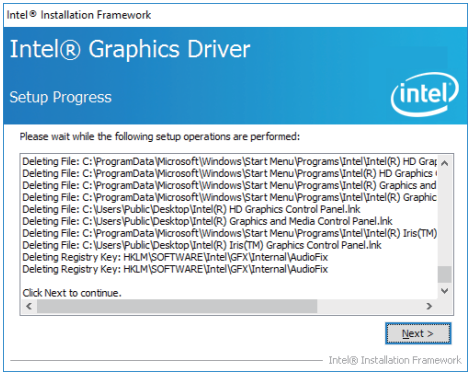
2. At the "Welcome to the Setup Program" screen, Click "Next".



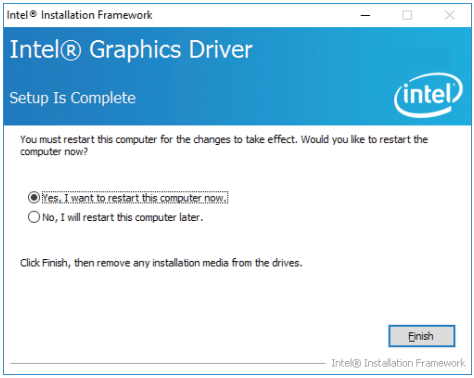
3. At the "License Agreement" screen, Click "Next".



4. At the "Readme File Information" screen, Click "Yes".



5. At the "Setup Progress" screen, Click "Next".

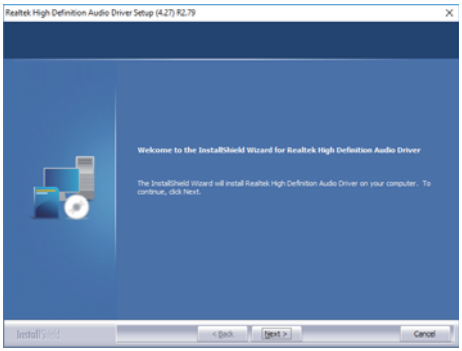


6. Click "Finish" to restart computer.

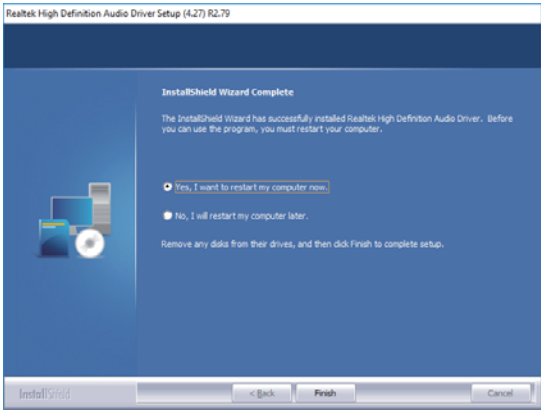
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64bit / Windows 10 64bit
X:\driver\sky_lake\VGA\x64\Setup.exe
For Windows 7 32bit
X:\driver\sky_lake\VGA\x86\Setup.exe

5-3 HD Audio Install Realtek High Definition Audio Driver

1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "HD Audio".



2. Click "Next".

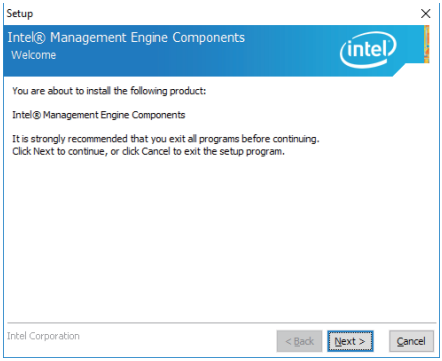


3. Click "Finish" to restart computer

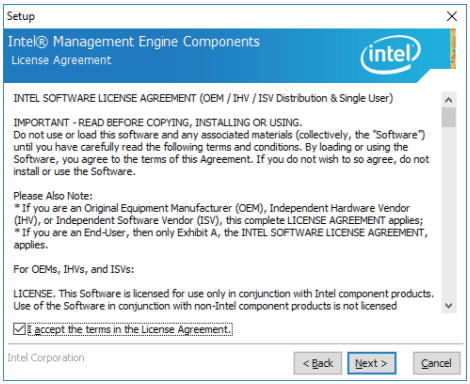
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64 bit / Windows 10 64 bit
X:\driver\sky_lake\Audio\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
For Windows 7 32bit
X:\driver\sky_lake\Audio\Win7_Win8_Win81_R273.exe

5-4 ME Tools Install Intel Management Engine Interface Driver

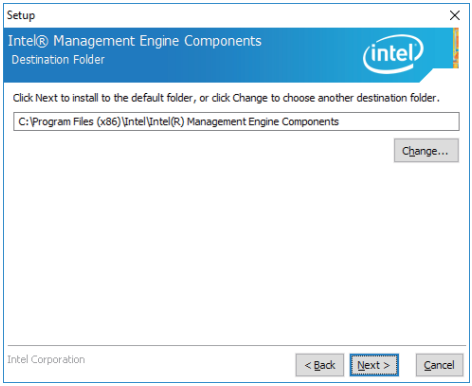
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "ME Tool"



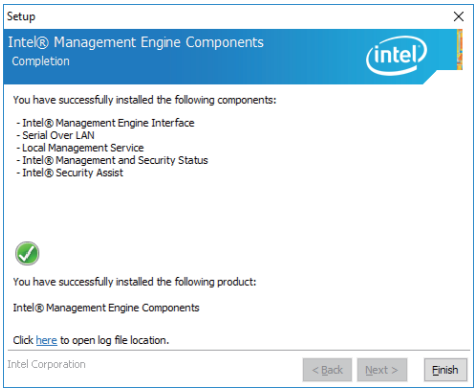
2. At the "Intel® Management Engine Components Driver" screen, Click" Next.



3. At the "License Agreement" screen, Click "Yes".



4. At the "Readme File Information" screen, Click "Next".

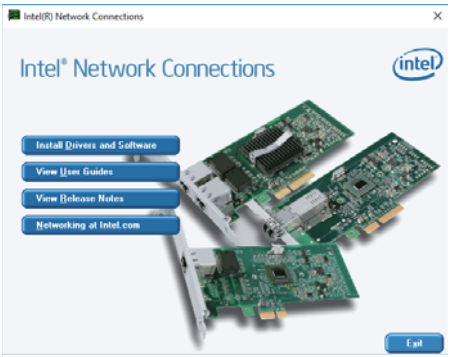


5. Click "Finish" to restart computer.

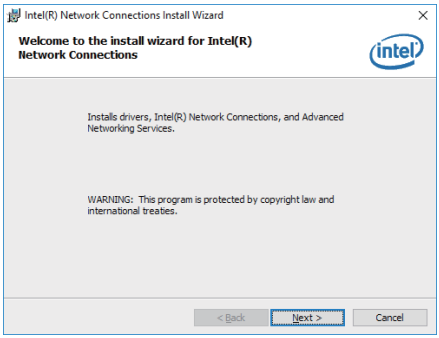
NOTE: The path of the file
For Windows 7 32-bit
X:\driver\sky_lake\ME\SetupME.exe
KMDF 1.11 installation required before Intel ME 10 driver installed
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x86.msu
For Windows 7 64-bit
X:\driver\sky_lake\ME\SetupME.exe
KMDF 1.11 installation required before Intel ME 10 driver installed
driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x64.msu
For Windows 10 64-bit
X:\driver\sky_lake\ME\SetupME.exe

5-5 LAN Install Intel LAN Driver

1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "LAN"

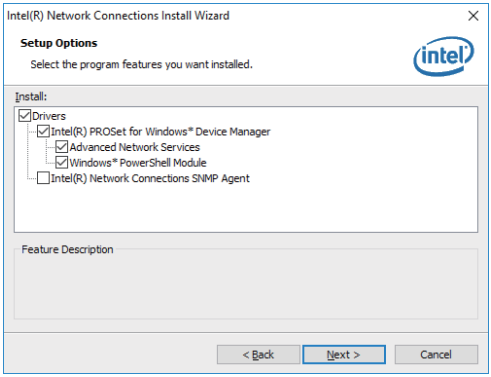


2. At the "Intel® Network Connections" screen, Click" Install Drivers and Software.

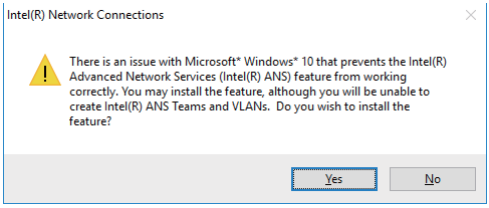


3. Click "Next".

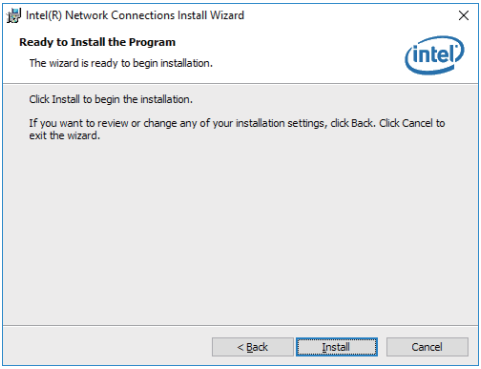
4. At the "License Agreement" screen, Click "Next".



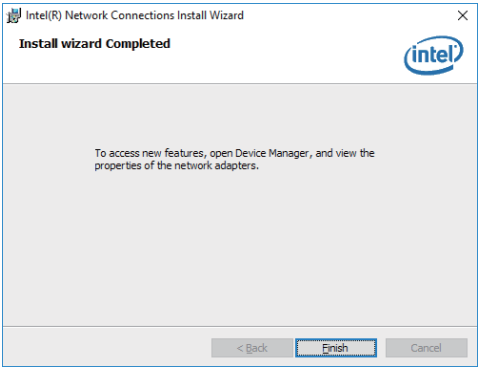
5. At the "Setup Options" screen, Click "Next".



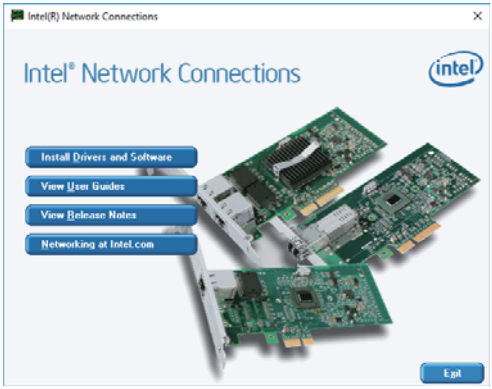
6. Click "Next".



7. At the "Ready to Install the Program screen, Click "Insatll".



8. Click "Finish".



8. Click "Exit".

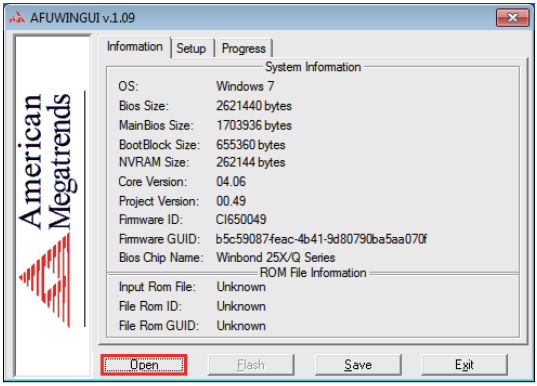
NOTE: The path of the file

For Windows 7 64/32-bit / Windows 10 64-bit

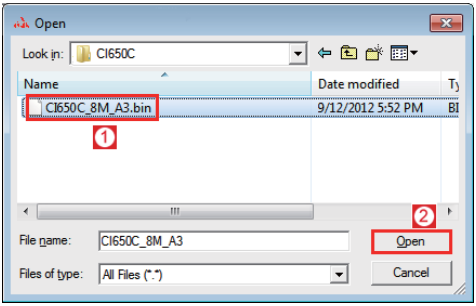
X:\driver\sky_lake\LAN\Autorun.exe

5-6 How to update Insyde BIOS

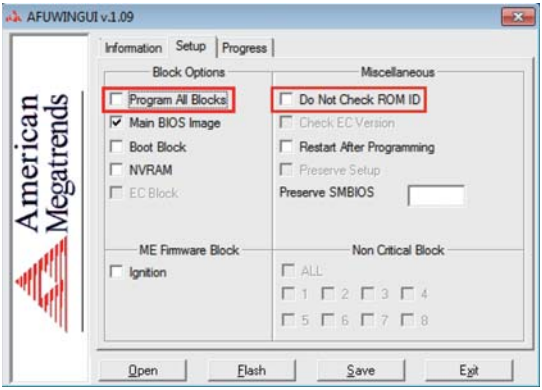
Step 1. To run afuwingui.exe then click "Open"



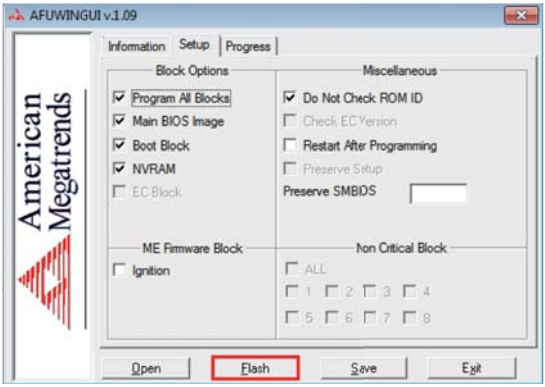
Step 2. Click the new version BIOS (download from the website)



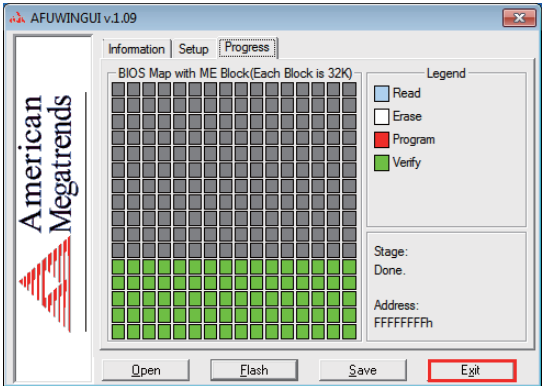
Step 3. Choose "ProgramAll Blocks" and "Do Not Check ROM ID"



Step 4. Click "Flash"



Step 5. Click "Exit" and restart computer.



Appendix A: Power Consumption Test

Condition

Item	Spec
CPU	Intel Skylake-S
Memory	SODIMM DDR4 2133 16GB x 2
Operating System	Windows 10_64bit
Test Program	3D Mark 06
HDD 3.5" SATA	Standard HDD
HDD 2.5" SATA	Slim Type HDD
mSATA	16GB

Test Result for reference only !

Hard Disk	Processor	Power off	Start up		Operation	Shut down	In Put Voltage
			Maximum	Stable	Maximum	Maximum	
3.5"HDD	i7-6700TE	0.18A	3.75A	1.17A	4.73A	2.4A	12V
	i5-6500	0.18A	3.5A	1.23A	5.48A	2.46A	12V
	i5-6500TE	0.18A	3.55A	1.21A	4.45A	2.24A	12V
	i3-6100	0.18A	3.77A	1.22A	5.58A	2.34A	12V
	G4400TE	0.18A	3.06A	1.18A	2.91A	2.01A	12V

Hard Disk	Processor	Power off	Start up		Operation	Shut down	In Put Voltage
			Maximum	Stable	Maximum	Maximum	
2.5"HDD	i7-6700TE	0.19A	2.61A	0.86A	4.34A	2.29A	12V
	i5-6500	0.18A	3.27A	0.89A	5.38A	2.31A	12V
	i5-6500TE	0.18A	2.7A	0.88A	4.26A	2.24A	12V
	i3-6100	0.18A	2.76A	0.86A	5.19A	2.25A	12V
	G4400TE	0.18A	2.23A	0.86A	2.57A	1.72A	12V

Hard Disk	Processor	Power off	Start up		Operation	Shut down	In Put Voltage
			Maximum	Stable	Maximum	Maximum	
mSATA	i7-6700TE	0.18A	3.31A	0.89A	4.23A	2.2A	12V
	i5-6500	0.18A	3.04A	0.9A	5.07A	2.6A	12V
	i5-6500TE	0.18A	2.51A	0.88A	4.04A	2.09A	12V
	i3-6100	0.18A	2.71A	0.88A	4.79A	2.31A	12V
	G4400TE	0.18A	2.22A	0.86A	2.58A	1.57A	12V

The power consumption depends on your device choice!

Appendix B: Resolution list

640 x 480 x (256 / 16bit / 32bit)
800 x 600 x (256 / 16bit / 32bit)
1024 x 768 x (256 / 16bit / 32bit)
1152 x 864 x (256 / 16bit / 32bit)
1280 x 600 x (256 / 16bit / 32bit)
1280 x 720 x (256 / 16bit / 32bit)
1280 x 768 x (256 / 16bit / 32bit)
1280 x 800 x (256 / 16bit / 32bit)
1280 x 960 x (256 / 16bit / 32bit)
1280 x 1024 x (256 / 16bit / 32bit)
1400 x 1050 x (256 / 16bit / 32bit)
1440 x 900 x (256 / 16bit / 32bit)
1600 x 900 x (256 / 16bit / 32bit)
1600 x 1200 x (256 / 16bit / 32bit)
1680 x 1050 x (256 / 16bit / 32bit)
1920 x 1080 x (256 / 16bit / 32bit)
1920 x 1200 x (256 / 16bit / 32bit)