3I170NX

Intel Skylake-S / Kaby Lake-S Core i CPU, DDR4 2133 MHz SODIMM, 4 x PoE, 1 x LAN / HDMI / USB / COM / PCIe mini card

All in One

Intel Skylake-S / Kaby Lake-S Core i CPU,

4 x PoE, 1 x Intel GbE LAN, 2 x PCIe mini card slots, HDMI, VGA,

10 x USB, 2 x COM, Wide Range DC-IN

CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

NO. 3I170NX
Release date: Aug. 28. 2019

Contents

User Manual edition 0.1, Aug. 28. 2019

Warning !

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

2. Fanless 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. There are two types of SSD, commercial grade and industrial grade, which provide different read / write speed performance, operation temperature and life cycle. Please contact sales for further information before making orders.

8. 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.

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

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

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

12. 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.

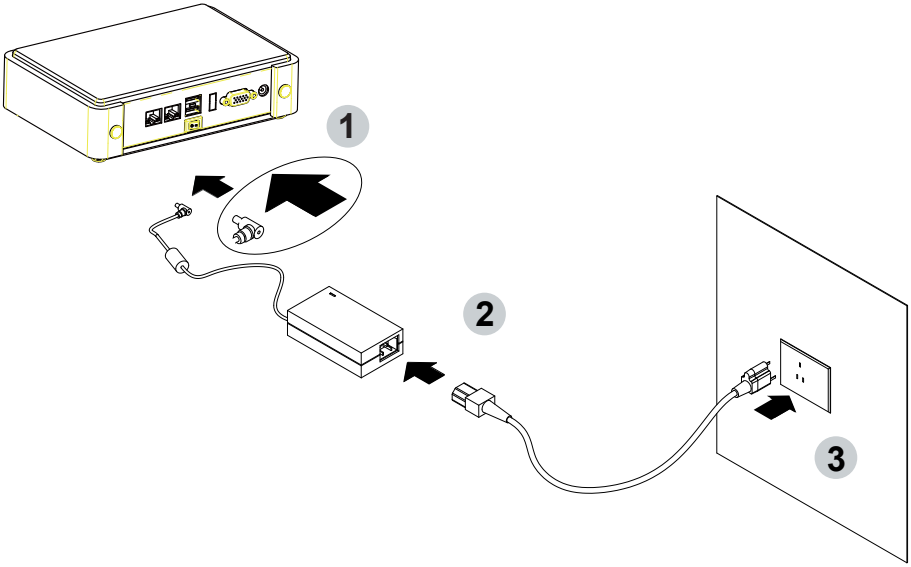
✻ Hardware Notice Guide

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-Fail" 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.

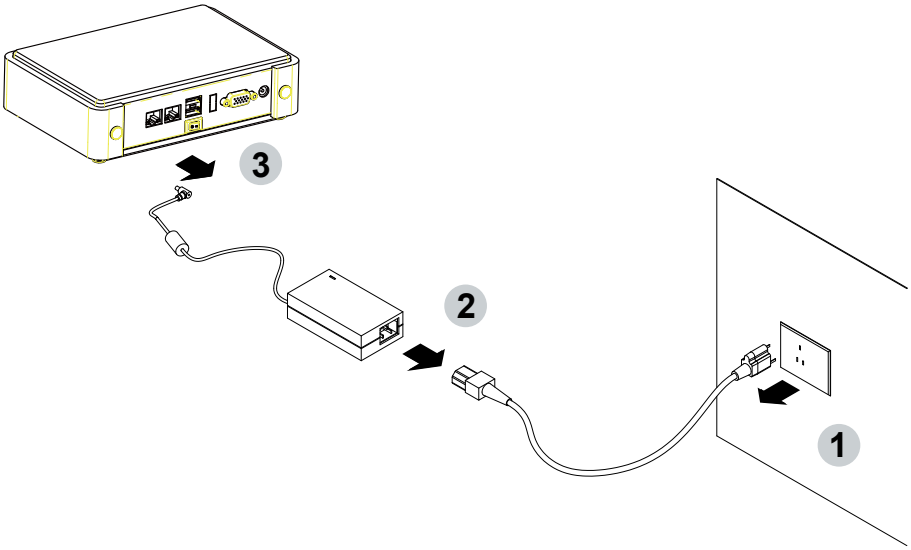
Remark 1:
Always insert / unplug the DC-in horizontally & directly to / from the motherboard. DO NOT twist, it is designed to fit snugly.
Moreover, erratic pull / push action might cause an unpredictable damage to the component & system unit.

Photo 1

Insert



Unplug



Chapter-1

General Information

The 3I170NX is an All-In-One board which is 7th / 6th Gen Intel® Core™ i7 / i5 / i3 and Pentium® / Celeron® Processor (formerly codenamed Skylake-S & Kaby Lake-S) based industrial motherboard in the LGA1151 package with Intel® Q170 Express chipset. The 3I170NX supports high-speed data transfer interfaces such as PCIe3.0, USB 3.0, and SATA 6 Gb/s (SATA III), with two-channel DDR4 2133 MHz memory up to 32GB in two SODIMM slot and supports 2 USB 3.0, 8 USB 2.0, 2 COM and 2 SATA III ports, as well as graphics interface for HDMI and VGA displays.

High-performance and power-efficient communication platform, the embedded motherboard with wide range 12~36V DC power input and integrated 1 x GbE LAN, 4 x PoE PSE GbE LAN, 10 x USB, 2 x COM Port and HDMI, VGA display interface that offer the ideal platforms for high performance applications in Networking, Smart Automation, Point-Of-Information (POI), Self-Services, In-vehicle, Industry 4.0 and any compact high-performance Internet of Things (IoT) applications.

The 3I170NX also supports two 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 one full-size & one half-size PCIe Mini card for PCIe x 1 or mSATA (auto-detection) and USB interface. There is one SIM socket onboard for the mini cards to get the 3G / 4G communication easier and quickly.

Please kindly contact LEX (info@lex.com.tw) if you have any further query or want to get the detail information.

1-1 Major Feature

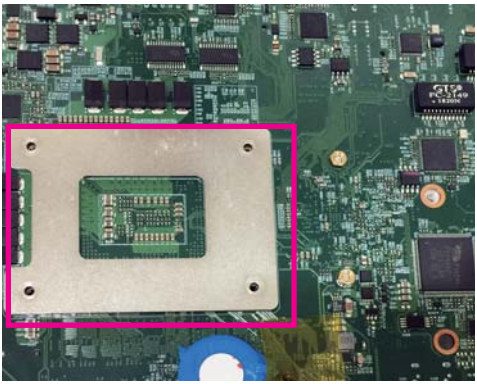
1. The Desktop Skylake-S / Kaby Lake-S Platform processor includes Integrated Display Engine, GPU and Integrated Memory Controller. The processor is designed be offered in a LAG1151 package.
2. Intel Q170 Chipset Family Platform Controller Hub (PCH)
3. Supports two Channel of DDR4 SODIMM slot, up to 32GB, data transfer rates of 1866MT/s and 2133 MT/s
4. Intel Desktop Skylake-S / Kaby Lake-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. Support 4 x 10 / 100 / 1000 Mbps Intel LAN ports with PoE PSE function.
6. Supports HDMI & VGA
7. Supports 2 x RS232 auto switch to RS485 / RS422 by BIOS
8. 2 type A USB3.0 external and 8 USB 2.0 internal
9. ALC886 HD Audio Specification 1.0 Two channels sound. Two channel Class D Audio Amplifier.
10. Two SATA ports 3.0 Data transfer rates up to 6.0 Gb/s (600 MB/s)
11. Support extended 2 x Mini PCIe card for PCIe x 1, mSATA and USB interface. There is 1 SIM Card Socket for mini card 1. (3G / 4G LTE module)
12. Hardware digital Input & Output, 8 x DI / 8 x DO, Hardware Watch Dog Timer, 0~255 sec programmable
13. Support TPM 2.0 (depends on CPU)
14. PCB Dimension: 160 x 122 mm

1-2 Specification

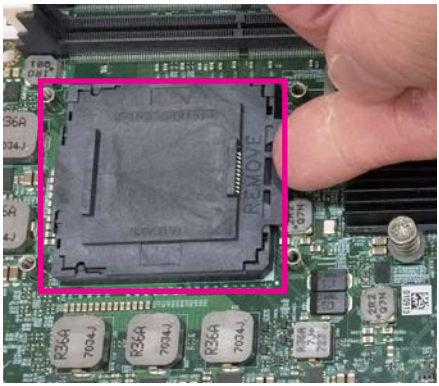
1. **CPU :** Desktop Skylake-S / Kaby Lake-S Platform processor. The processor is designed be offered in a LAG1151 package.
2. **Memory :** Two SODIMM slot for DDR4 SDRAM, Max. 32GB, data transfer rates of 1866MT/s and 2133 MT/s
3. **Graphics :** Intel Desktop Skylake-S / Kaby Lake-S Platform Processor Integrated Graphics. GEN 9 architecture supports up to 72 Execution Units (EUs), depending on the processor SKU. VGA up to 1920 x 1200, HDMI 1.3 up to 3840 x 2160
4. **SATA :** Integrated Serial ATA Host Controller Up to 2 SATA port, SATA Gen3 Data transfer rates up to 6.0 Gb/s (600 MB/s).
5. **LAN :** One Gigabit LAN Controller with Intel I219LM Gigabit Ethernet PHY & four Intel I210-IT LAN chipset or Intel I211-AT LAN chipset (Option) with 10 / 100 / 1000 Mbps with PoE PSE function.
6. **I/O Chip :** Chipsets for 2 ports RS232 / 422 / 485
7. **USB :** 2 type A USB 3.0 connector onboard and 8 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. **WDT/DIO :** Hardware digital Input & Output, 8 x DI / 8 x DO / Hardware Watch Dog Timer, 0~255 sec programmable
10. **Expansion interface :** One full-size & one half-size PCIe Mini card for PCIe x 1, mSATA and USB interface, 1 SIM socket.
11. **TPM :** Infineon SLB 9665 TT 2.0 Trusted Platform Module
12. **BIOS :** AMI UEFI BIOS
13. **Dimension :** 160 x 122 mm
14. **Power :** DC IN +12V~36V

1-3 Installing the CPU / North Bridge Chip Heatsink. (Socket Version)

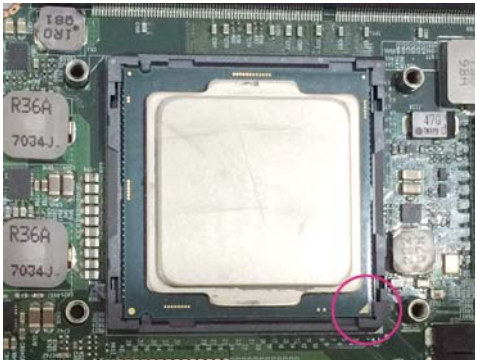
1. Put the "CPU Under Bracket" with the CPU location at the back side of motherboard



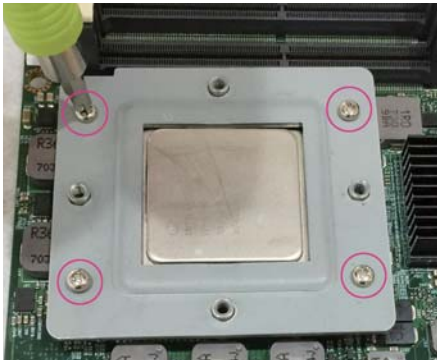
2. Open of CPU pin anti- crash cover



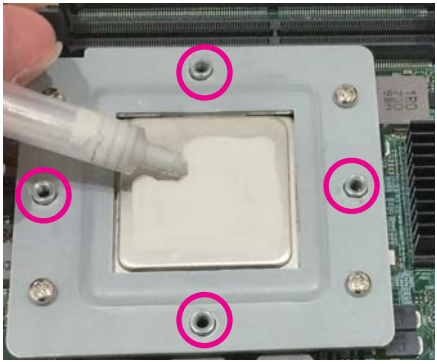
3. Install the CPU



4. Screw the CPU mounting bracket via four M2.5*4 screws



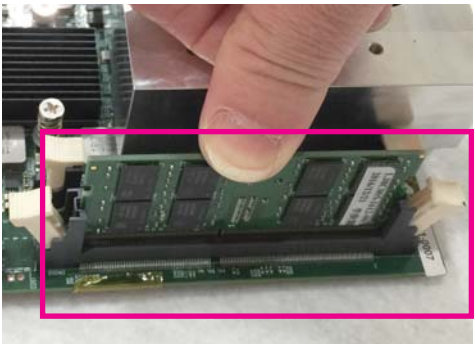
5. Apply thermal grease to the top of the CPU



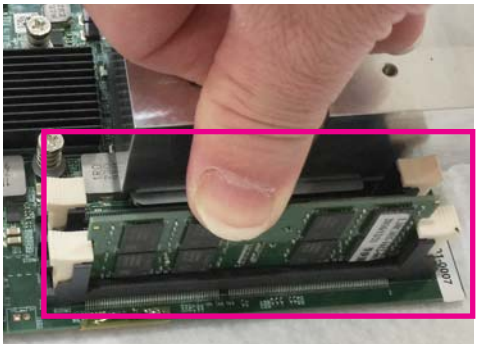
6. Insert the CPU Heat Sink above the CPU and tighten it with the diagonal screws.

1-4 Vertical SODIMM assembly guide

1. Install the memory into SODIMM



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

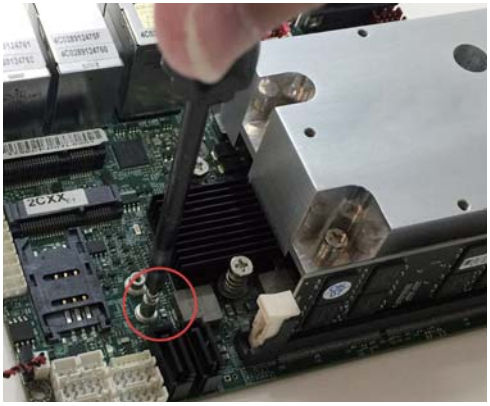


Uninstall

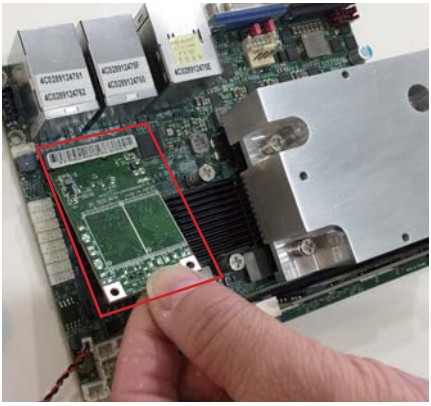
1. Pull open both sides of the memory slot.
2. Take out the memory.

1-5 Installing the Mini PCI-e Card (Full Size)

1. Unscrew the screw on the board

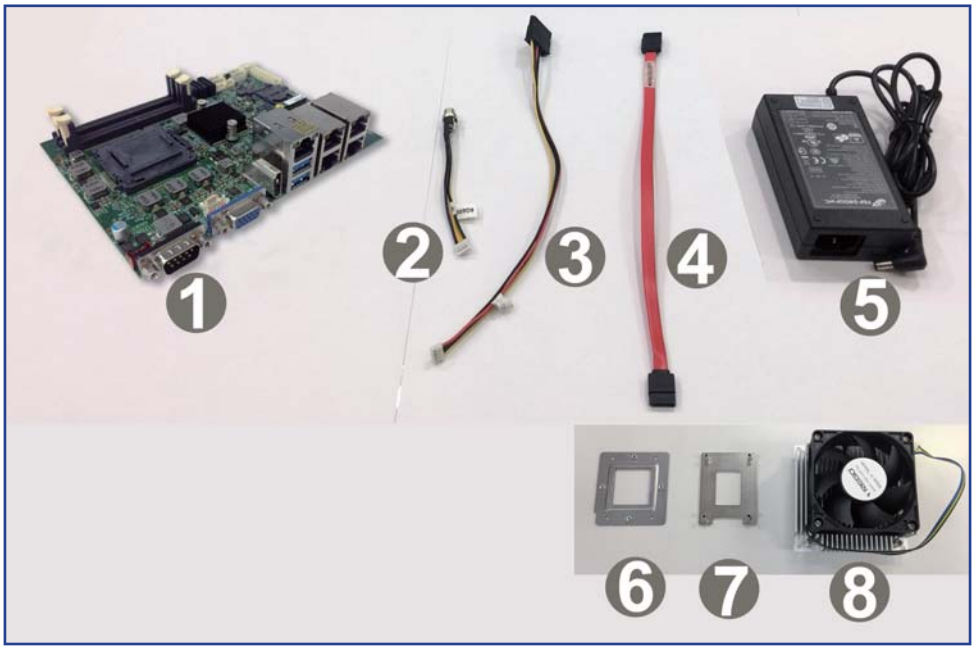


2. Plug in the Mini Card in a 45 angle



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

1-6 Motherboard & Optional Accessory



	Material Code	Description	Detail Specification	Quantity
1	7G1901-1726001-0	MB-3I170NX-2CXX-001	LF,3I170NX-2CXX,Rev.:001	1
2	6G6003-7410-0100	Power Cable	L=18cm,2.0 2*5/DC JK	1
3	6G6003-1009-0100	SATA Power Cable	LF,L=25cm,1*4/2.0 to 180° SATA 15p	1
4	6G6001-2203-0100	SATA DATA Cable (Red)	LF,L=25cm	1
5	6G5212-1209-0100	120W Power Adapter,24V/5A	LF,L Type,EA11011M-240,EDAC	1
6	6G300A-4002-0N00	CPU Holder,TYPE3	LF,SPCC=1.5,Nickel-plated,3I170NX	1
7	6G300A-3302-000B	Under Bracket,For CPU	LF,SPCC=2.0,nickel-plating,3I170NX	1
8	6G7300-5500-0100	CPU Cooler(BGA),Aluminum Heat Sink+5010 Fan 7500RPM	LF,Material,For 3I170NX	1

Optional accessories (items in addition to motherboard)
are not included in the standard packing.
Please contact your dealer to purchase the optional accessories.

Chapter-2

Hardware Installation

2-1 Unpacking Precaution

This chapter provides the information how to install the hardware of 3I170NX.
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-IN 12V 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 3I170NX. 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 3I170NX 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 3I170NX from electricity discharge. With reference to section 1-6 please check the delivery package again with following steps:

1. Unpack the 3I170NX 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.

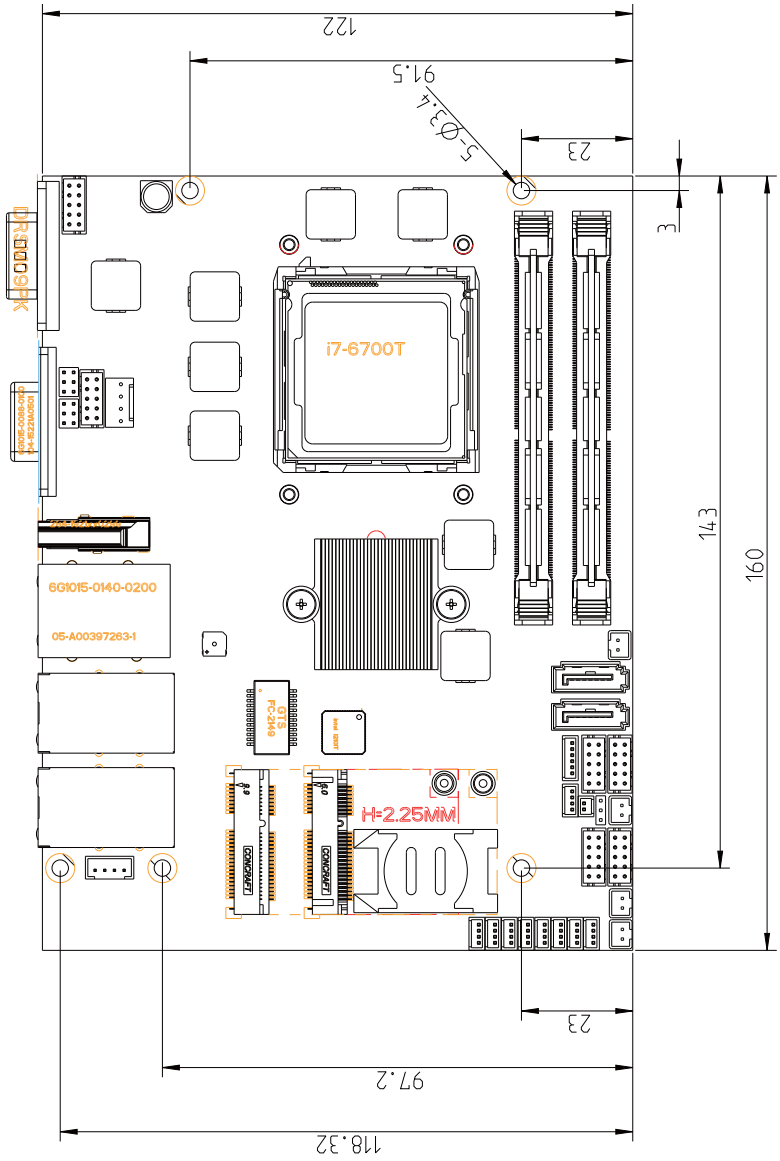
3. Is there any visible damage on the board?
   DO NOT CONTINUE TO INSTALL THIS BOARD!CONTACT
   THE DEALER YOU PURCHASED THIS BOARD FROM, IMMEDIATELY.

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.

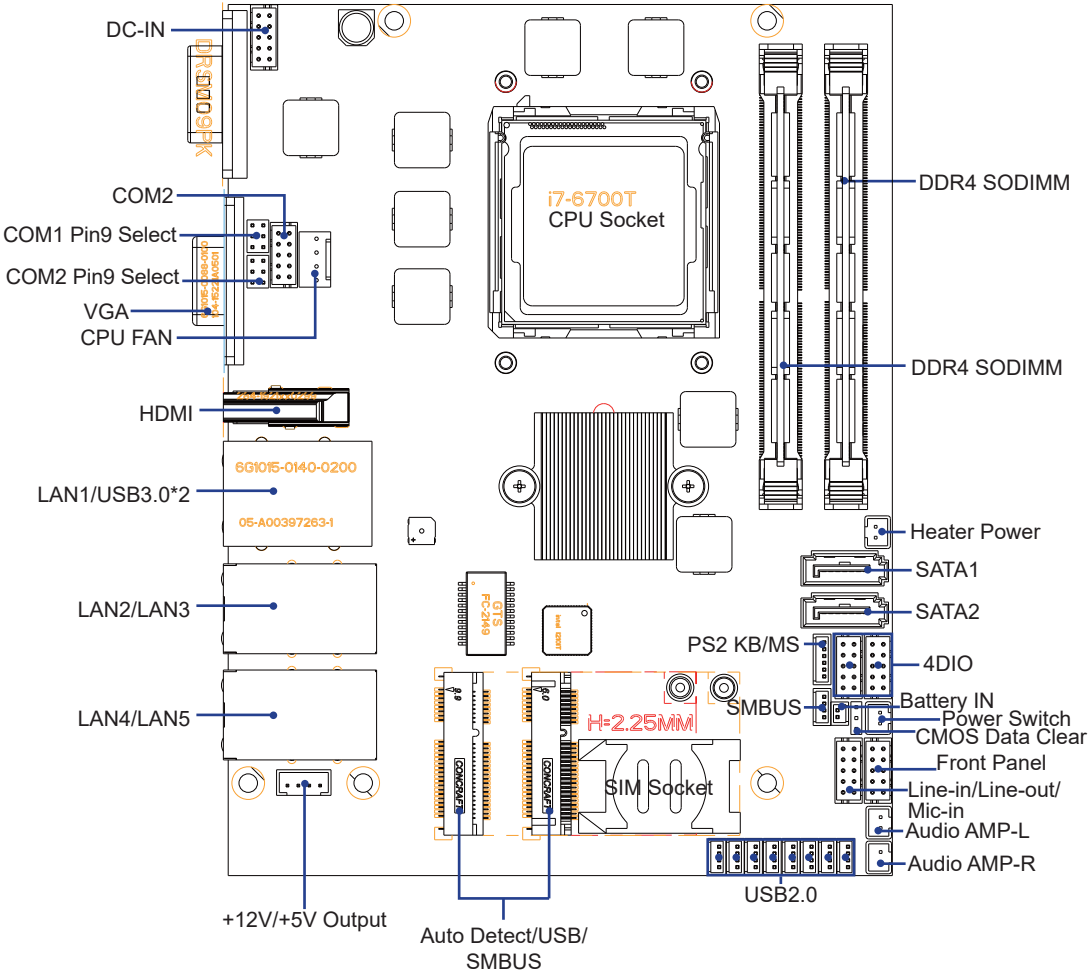
5. Check your external devices (i.e. Add-On-Card, Driver Type etc.) for complete add-in or connection and CMOS setup correctly.
   Please also refer to all information of connector connection in this manual.

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

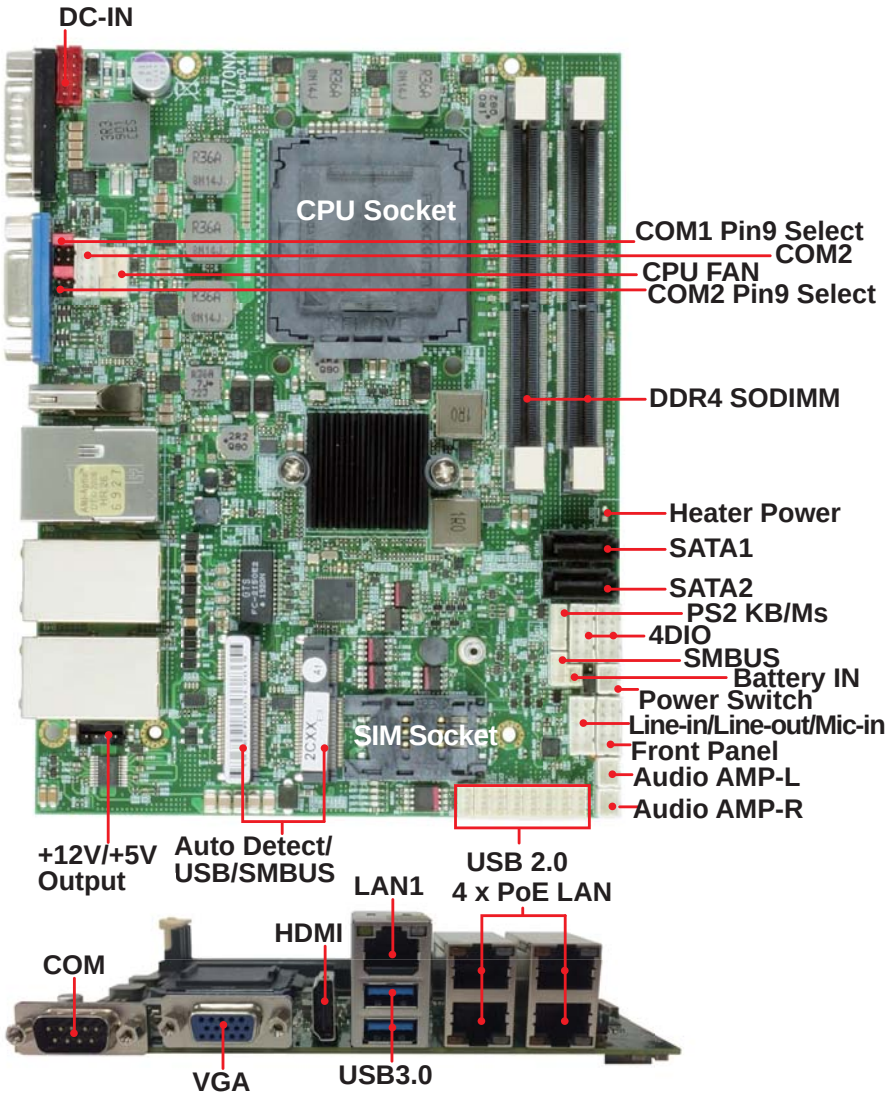
2-3 Dimension-3I170NX



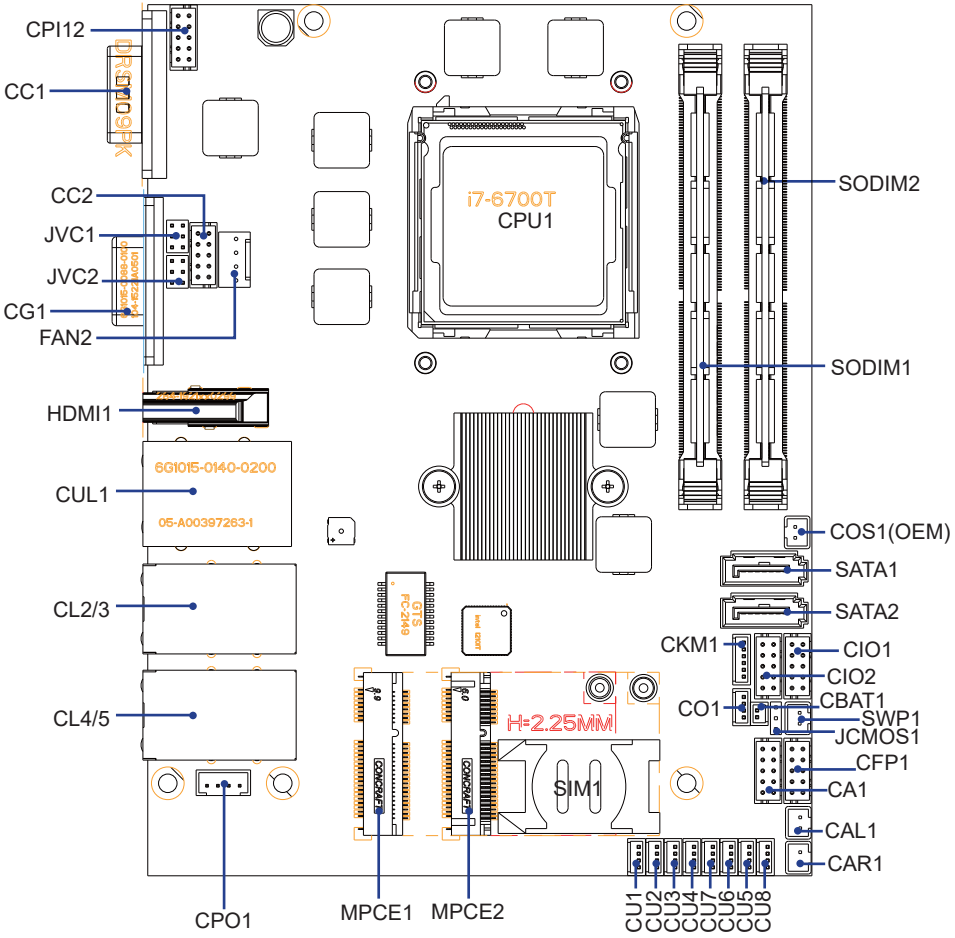
2-4 Layout-3I170NX-Function Map



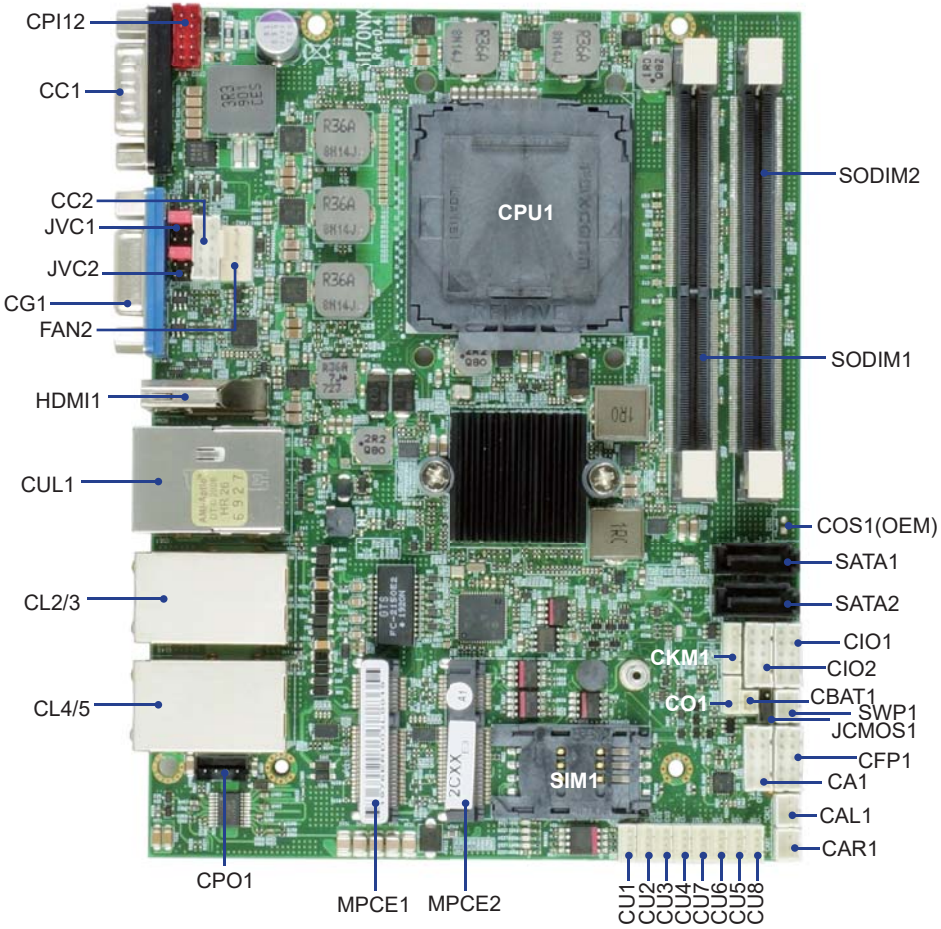
2-5 Function Map-3I170NX



2-6 Connector MAP-3I170NX



2-7 Diagram- 3I170NX



2-8 List of Jumpers

JCMOS1: CMOS clear select

JVC1: COM1 voltage select

JVC2: COM2 voltage 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.

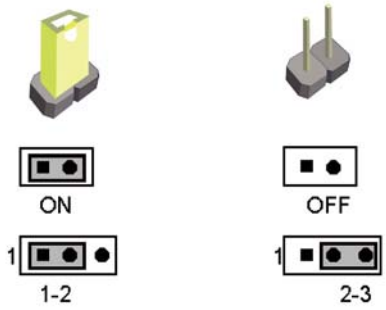


Figure 2.2

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 JSB2 to store the CMOS data.

To clear the CMOS, follow the procedures below:

1. Turn off the system and unplug the AC power
2. Remove DC IN power cable from DC IN power connector
3. Locate JSB2 and close pin 1-2 for few seconds
4. Return to default setting by Close pin 1-2
5. Connect DC IN power cable back to DC IN Power connector

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

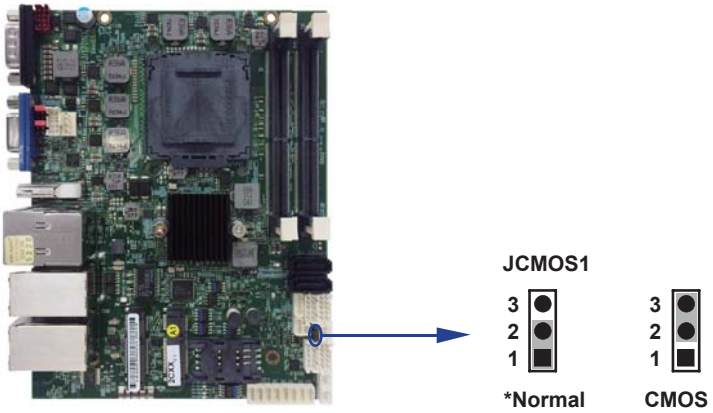
Note: Normal work is open jumper

Note: Do not clear CMOS unless

1. Troubleshooting

2. Forget password

3. You fail over-clocking system

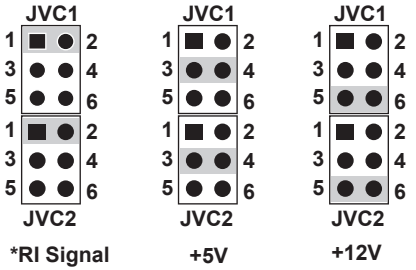


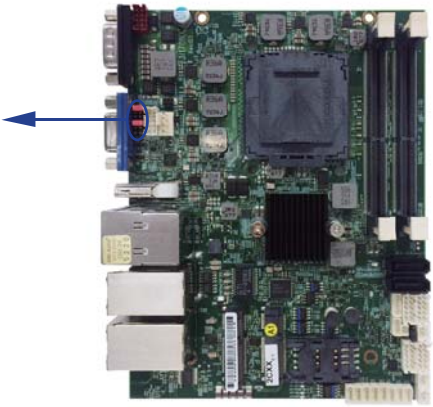
2-11 COM port pin9 select RI signal or Voltage source

- JVC1: COM1 PIN9 select
- JVC2: COM2 PIN9 select

JVC1/JVC2	DESCRIPTION
*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





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

CPI12:	DC-in 2x5 pin (2.00mm) Red wafer connector
CC1:	COM Port DB9 Connector
CG1:	VGA Port DB15 Connector
HDMI1:	HDMI Connector
CUL1:	USB port 3.0 / 2.0 and LAN RJ45 connector
CL2+3 / CL4+5:	LAN RJ45 connector
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
CBAT1:	Li 3V battery 1x2 pin (1.25mm) wafer
MPCE1:	Full size Mini card port sockets 52pin
MPCE2:	Half size Mini card port sockets 52pin
SIM1:	SIM port 1 card socket
SATA1/2:	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/CU6/CU7/CU8:	USB port 4pin(1.25mm) wafer
CPO1:	DC +5 / +12V output 1x4 pin(2.00mm) Black wafer connector
CO1:	I^2C 4pin (1.25mm) wafer
CC2:	COM 2x5pin (2.00mm) wafer
CKM1:	KB/MS port 1x6 pin (1.25mm) wafer connector
SODIM1:	SO-DIM DDR4 1.2V DRAM Socket

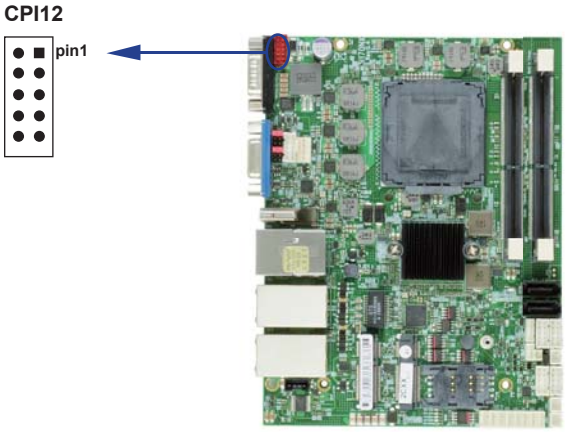
3-2 DC power input

DC-IN Connector

● CPI12: DC-IN Internal Connector (2x4 pin 2.00mm 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	DC-IN	8	DC-IN
9	GND	10	GND

Note :
1. DC in from adapter plug in
2. Mating connector: JST B10B-PHDSS or compatible
3. Cable housing: JST PHDR-10VS or compatible

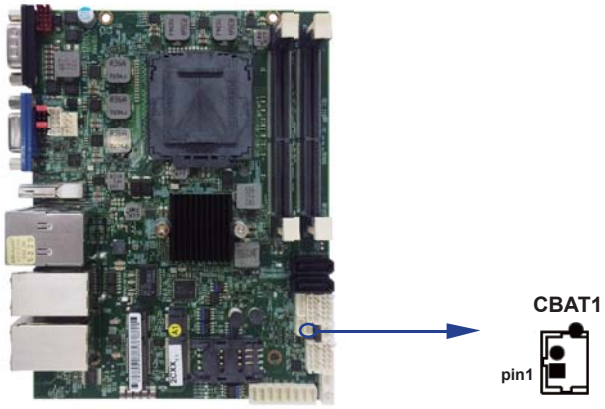


3-3 Battery Input

- CBAT1: 3V Battery 2pin (1.25mm) wafer
  (1 X 2 pin 2.0mm Black wafer)

PIN NO.	DESCRIPTION
1	GND
2	VBAT *

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

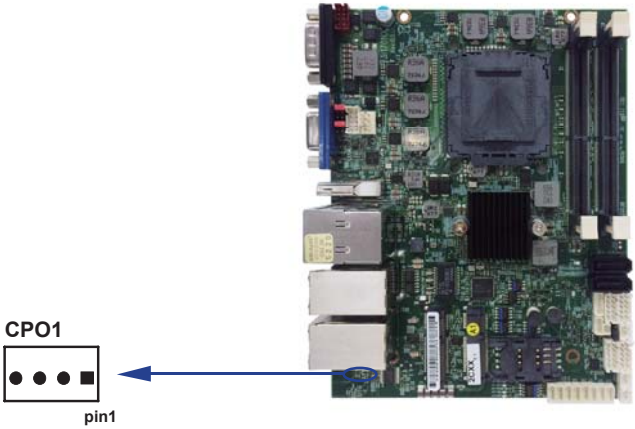


3-4 DC Power output

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

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

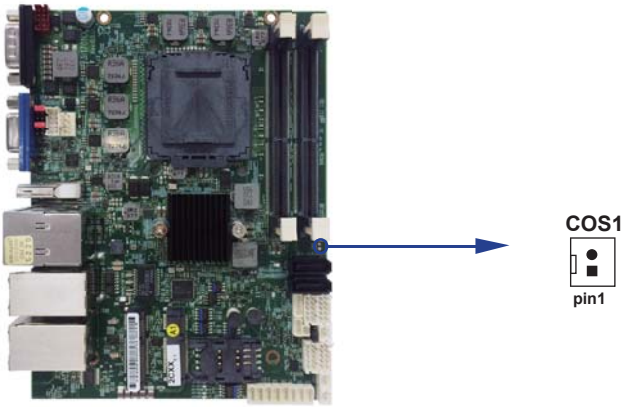
*Note:
1. DC in +12V by switch to DC-out voltage +12V, so DC in need stable +12V input
2. Mating connector: JST B4B-PH-KL or compatible
3. Cable housing: JST PHR-4 or compatible



- COS1: Heater +12V DC voltage output (Option)
  (1 X 2 pin 2.00mm wafer)

PIN NO.	DESCRIPTION
1	+12V *
2	GND

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

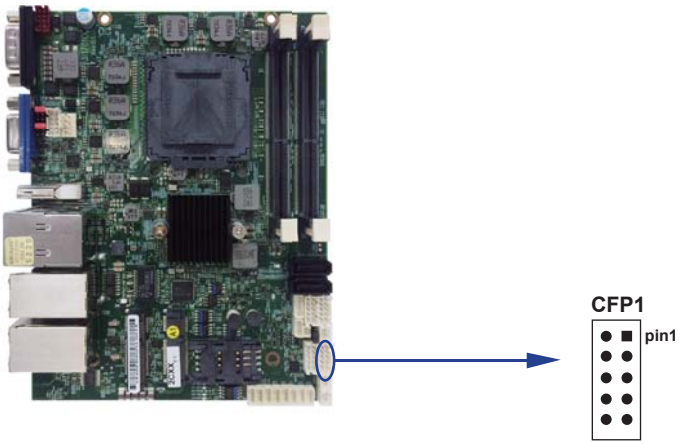


3-5 Front panel & FAN

- 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+

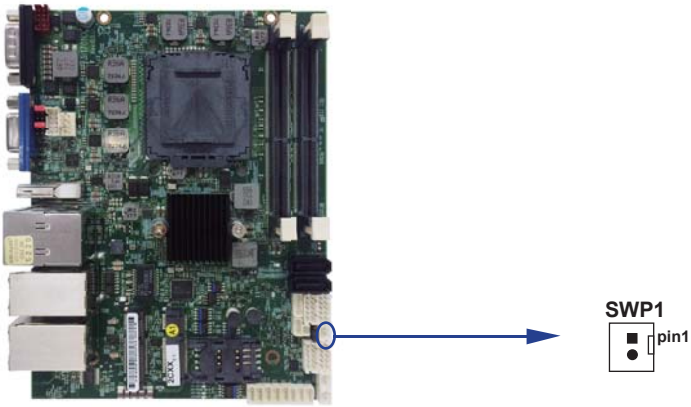
*Note:
1. Mating connector: JST B10B-PHDSS or compatible
2. Cable housing: JST PHDR-10VS or compatible



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

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

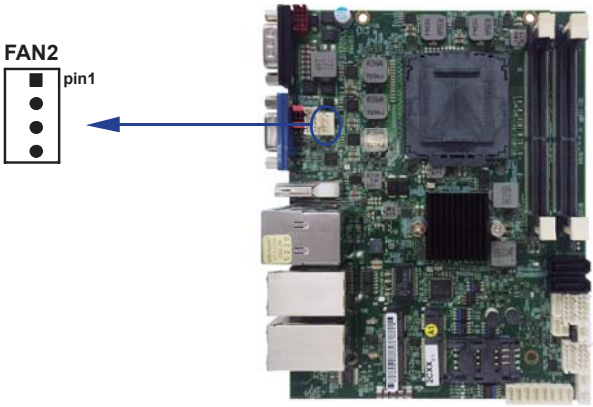
*Note:
1. Mating connector: JST B2B-PH-KL or compatible
2. Cable housing: JST PHR-2 or compatible



● FAN2: CPU FAN connectors
(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



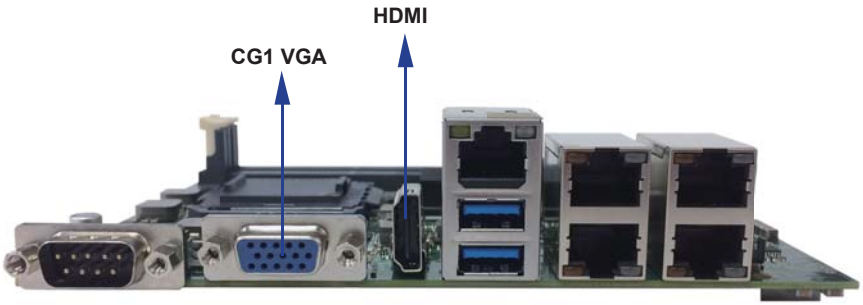
3-6 Display interface

● CG1: VGA DB15 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	NC	10	GND
11	NC	12	DDC DATA
13	H-SYNC	14	V-SYNC
15	DDC CLOCK		

● HDMI1: HDMI connector

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		

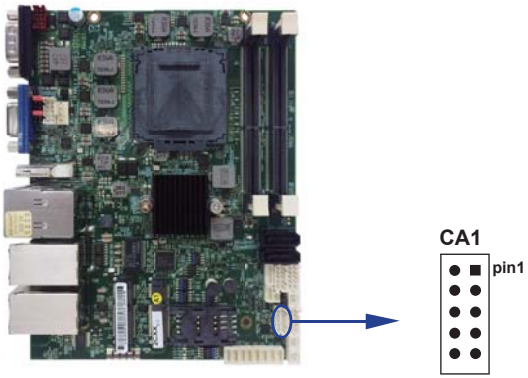


3-7 Audio interface

● CA1: Line-out / Line-in / Mic-in (2x5 pin 2.0mm Wafer)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line-out-R	2	MIC-IN
3	Line-in-R	4	GND
5	GND	6	SPDIF OUT
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



Audio Amplifier class D two channel
2.1 W/Ch (Typ.) into a 4ΩLoad
1.4 W/Ch (Typ.) into a 8ΩLoad

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

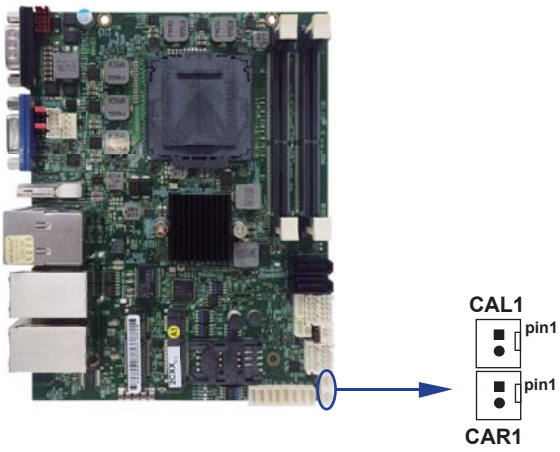
PIN NO.	DESCRIPTION
1	LINE-OUT_R+
2	LINE-OUT_R-

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



3-8 I/O Interface

COM ports

COM1 / COM2 default support RS232 / RS422 / RS485 mode

- **RS232 mode ports (D-SUB 9pin)**
  CC1: COM1 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	10	

Note: 1. JVC1 for COM1 Pin 9 RI and Voltage setting
2. default support RS232 / RS422 / RS485 by BIOS selected

- **RS485 mode ports (D-SUB 9pin)**
  CC1: COM1 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	10	

Note: 1. BIOS need setting to RS485 mode

- **RS422 mode ports (D-SUB 9pin)**
  CC1: COM1 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	10	

Note: 1. BIOS need setting to RS422 mode

3-8-1 RS232 MODE PORTS (2x5 PIN 2.0mm WAFER)

- **RS232 mode ports (2 x 5 pin 2.00mm wafer)**
  CC2: COM2 port Wafer

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. JVC2 for COM2 Pin 9 RI and Voltage setting
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)**
  CC2: COM2 port Wafer

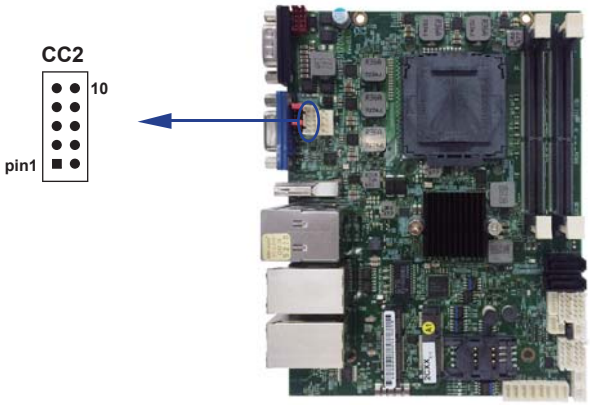
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RS485 TX-	2	RS485 TX+
3	NC	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	+5V

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)**
  CC2: COM2 port Wafer

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



3-8-2 Digital Input / Output / Watch Dog Time

● CIO1 DIO 0 ~ 3 (2 X 5 pin 2.00mm 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

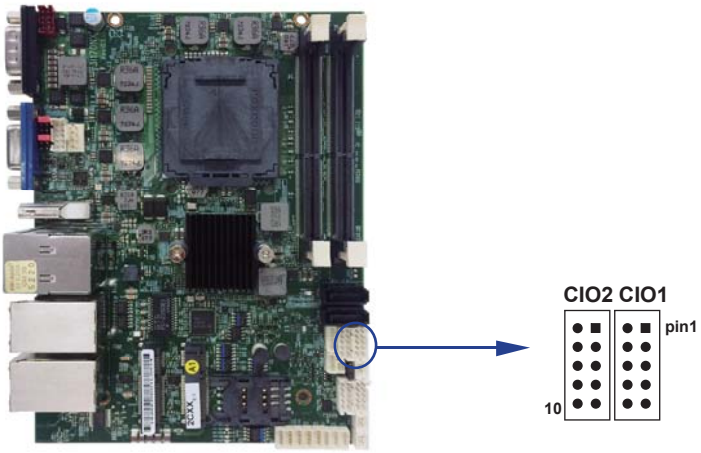
● CIO2 DIO 4 ~ 7 (2 X 5 pin 2.00mm wafer)

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 I²C 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.



3-8-2-1 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

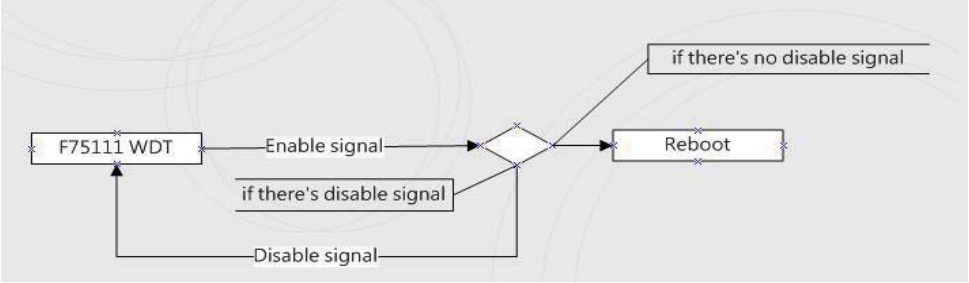
How to use this Demo Application

1.Boot Ms-Dos Operating System

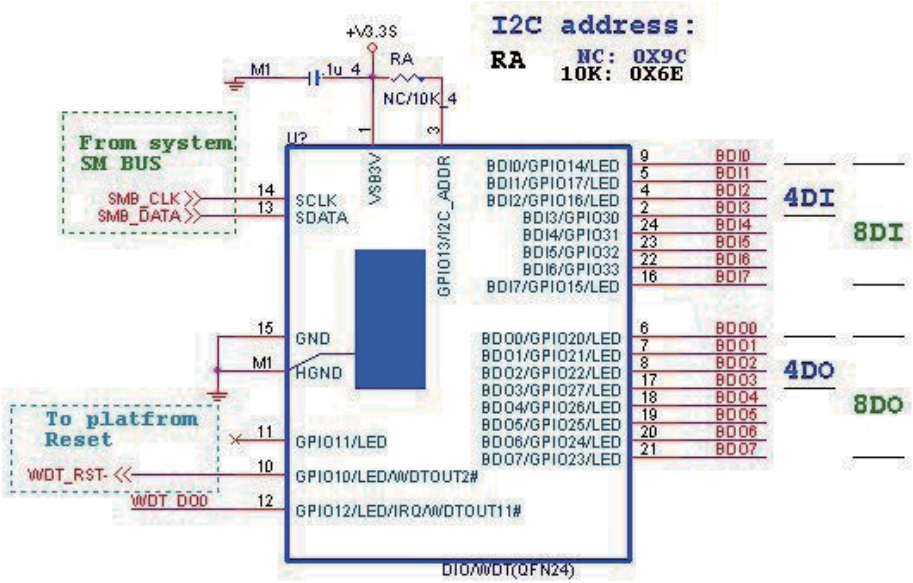
2.execute "75WDT.EXE" binary file

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;
  }
```

3-8-2-2 IO Device: F75111 under Windows

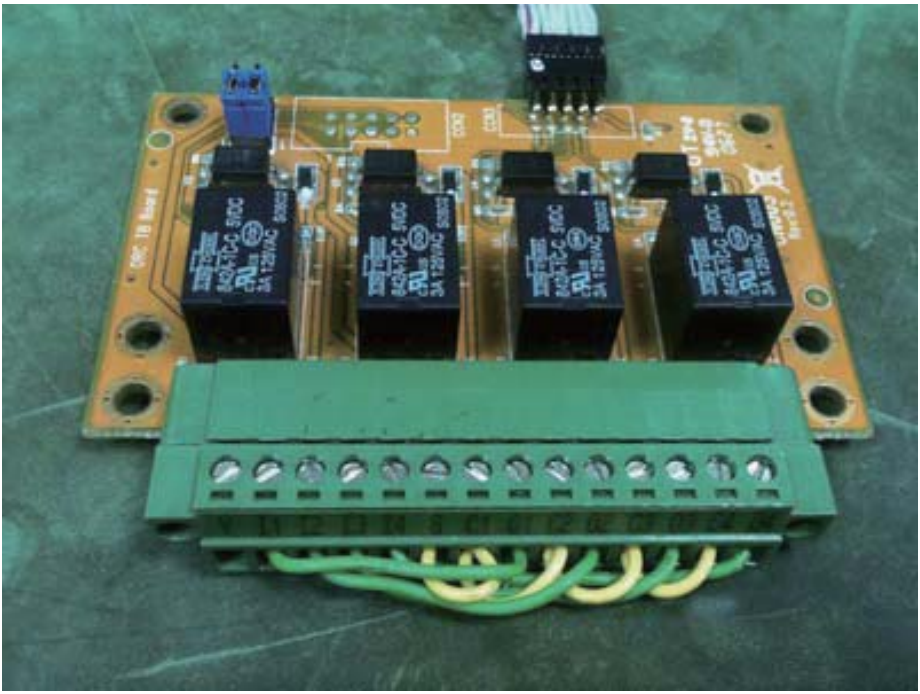
The Sample code source you can download from

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

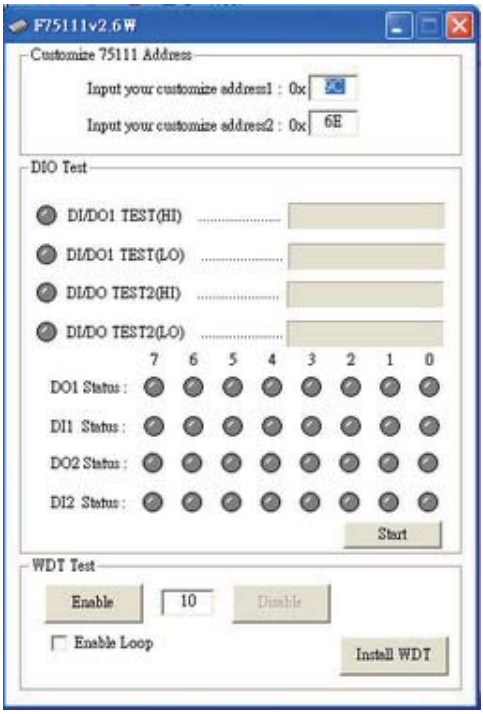
We do the demo test with a test tool which DIx connect to DOx with Relay.



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

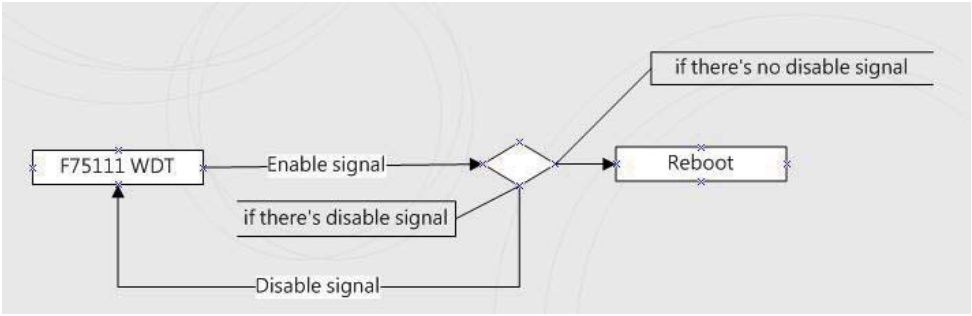
2. Press the "Enable" button to test WDT function

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** 



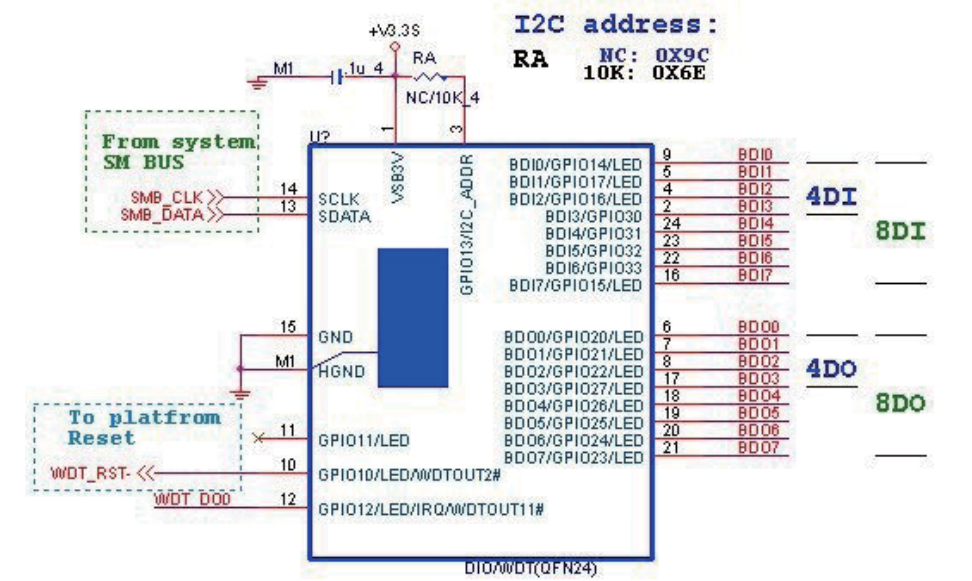
p.s.

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.
```

3-8-2-3 IO Device: F75111 VB6 under Windows

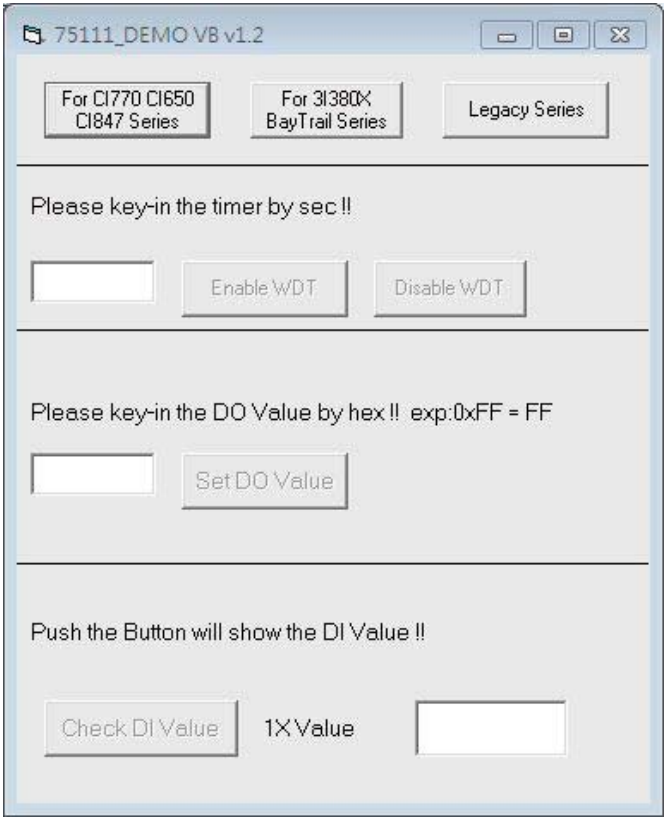
The Sample code source you can download from

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

Binary file: 75111_VB_Src1.2.rar

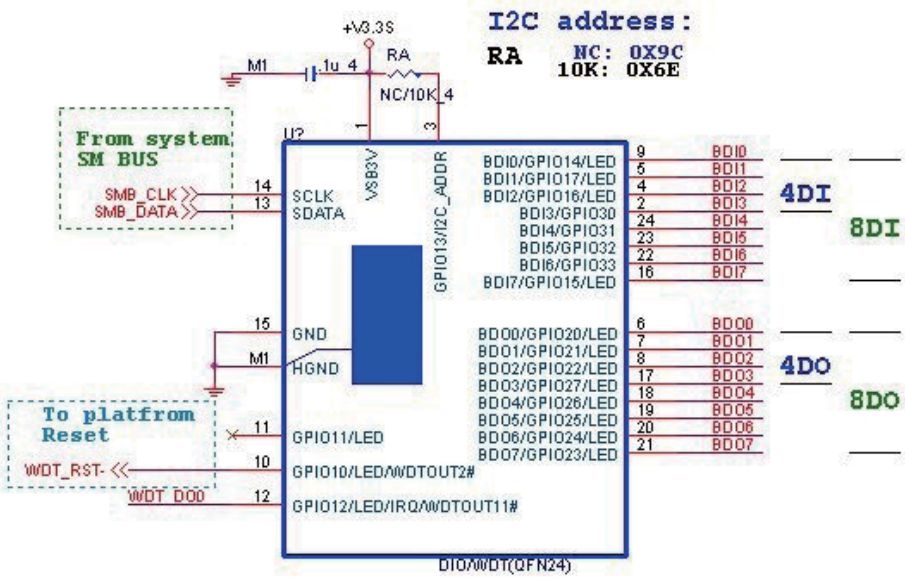
USERNAME & PASSWORD: sf

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
```

3-8-2-4 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"

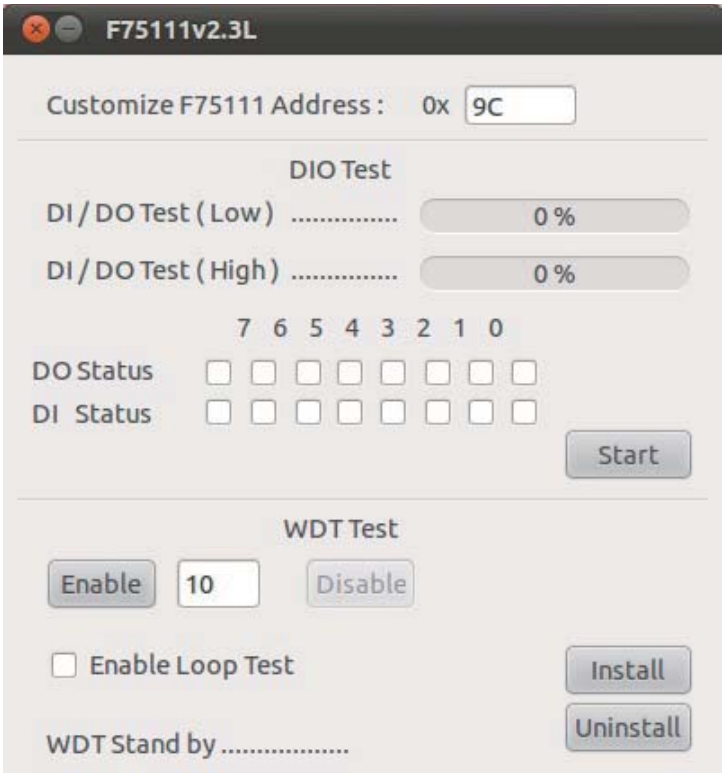
Open an exist project(F75111.cbp) in Code::Blocks, click the compile button

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

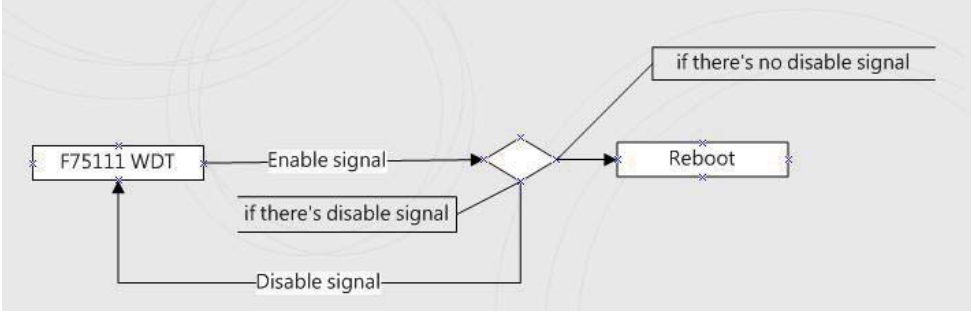
2. Compile source code with "make"

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.**



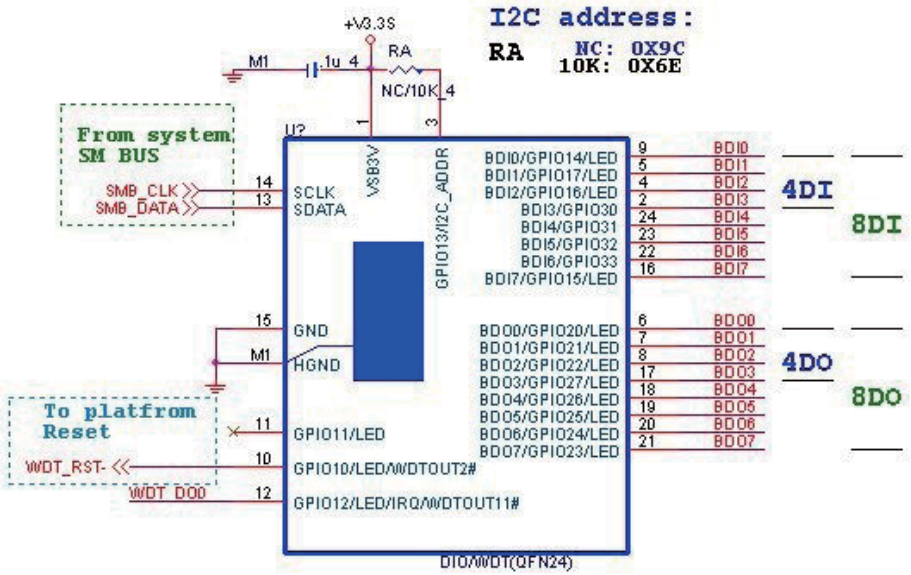
p.s.

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
}
```

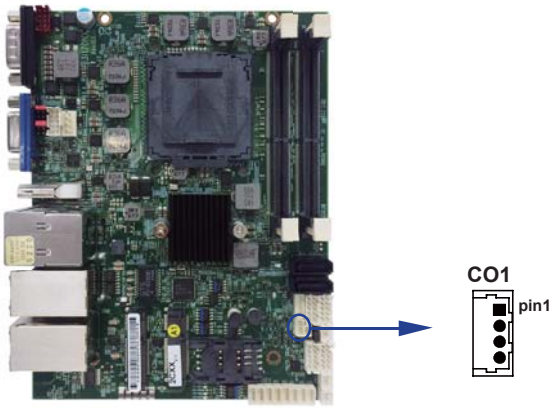
```
//-----------------------------------------------------------------------------------------------------------
#define F75111_INTERNAL_ADDR                    0x9C    //    OnBoard  F75111 Chipset
#define F75111_EXTERNAL_ADDR                    0x6E    //    External F75111 Chipset
//-----------------------------------------------------------------------------------------------------------
#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   ();
```

3-9 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

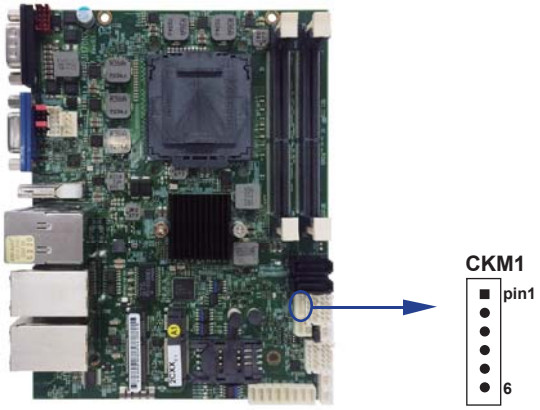


3-10 PS2 KB/MS

- **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



3-11 LAN & USB Interface

- **CUL1: LAN + USB Connector**

  CUL1 (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

- **CUL1 (Up side): LAN Giga / 100Mb RJ45 Jack**

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

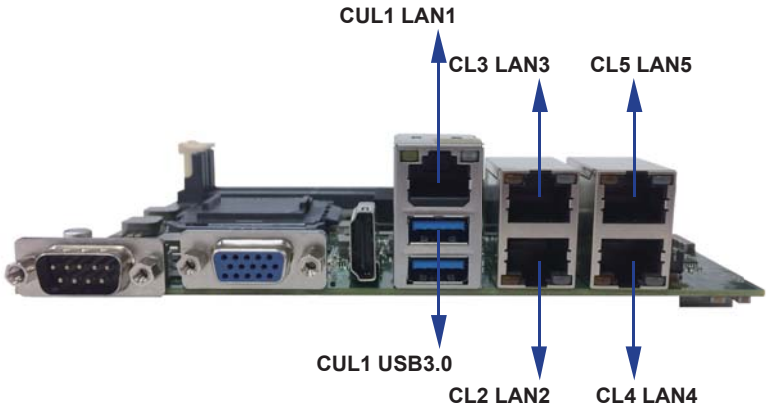
- **CL2+3 / CL4+5: LAN Giga / 100Mb (RJ45 Jack)**

  CL2+3 / CL4&5: LAN2 / 4 (down side) / LAN3 / 5 (up side) port connector

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

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

Speed	10 Mbps			100 Mbps			1000 Mbps		
Indicate	Back Side		Front Side	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

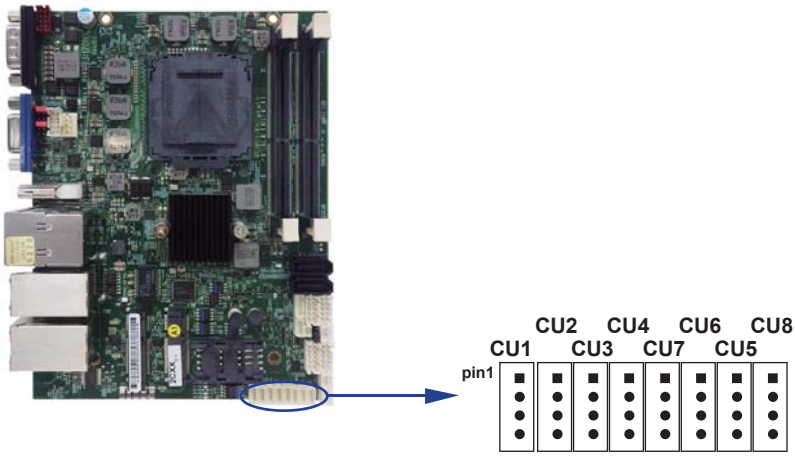


3-12 USB Interface

● CU1 / CU2 / CU3 / CU4 / CU5 / CU6 / CU7 / CU8: 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

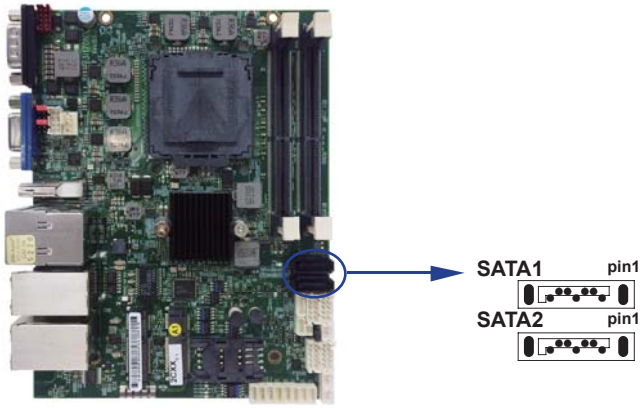


3-13 SATA interface

- **SATA1 / SATA2: 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 provide SATA HDD power +12V, GND, +5V



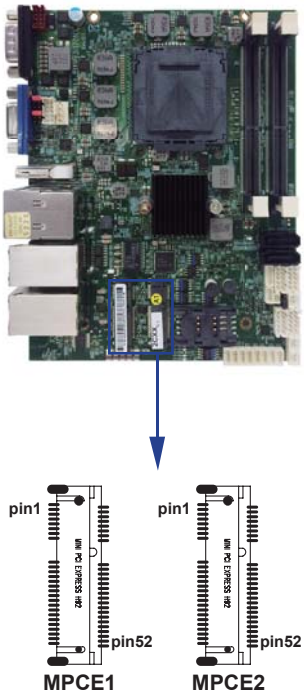
3-14 Module socket

- **Mini card & SIM 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			
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	NC	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	mSATA-Detect	52	+3.3V



Note:

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

3-15 SIM Socket

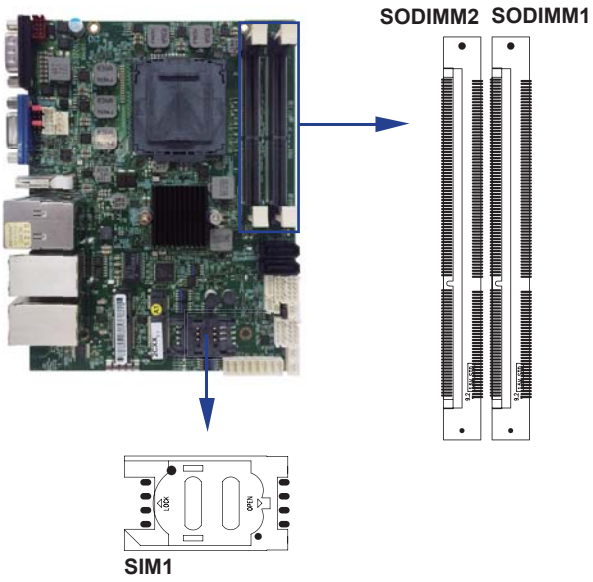
• SIM1: SIM card socket pin define is follow ISO 7816-2 smart card standard.

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.

3-16 SODIMM socket

Note:
1.SODIM1 / SODIM2: SO-DIMM DDR4 1.2V DRAM Socket
2. Support un-buffer type module



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.

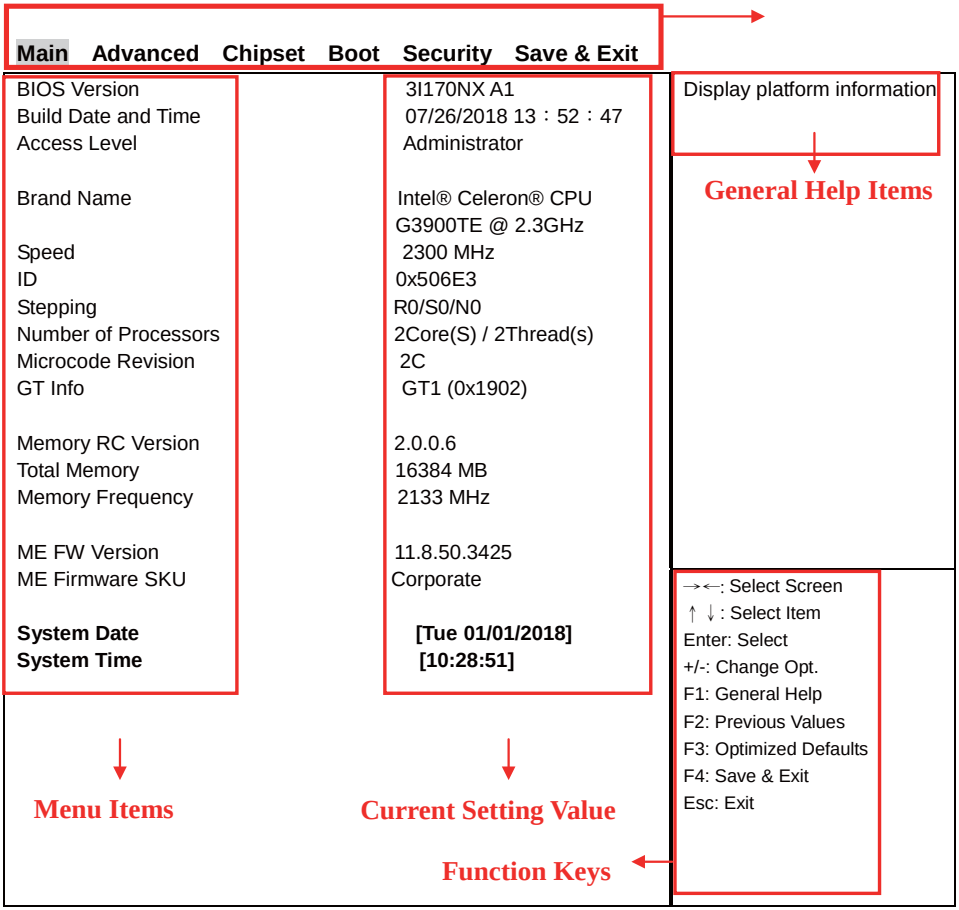
4-1 Enter Setup

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 General 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 Version	3I170NX A1	Display platform information
Build Date and Time	07/26/2018 13：52：47	
Access Level	Administrator	
Brand Name	Intel® Celeron® CPU G3900TE @ 2.3GHz	
Speed	2300 MHz	
ID	0x506E3	
Stepping	R0/S0/N0	
Number of Processors	2Core(S) / 2Thread(s)	
Microcode Revision	C2	
GT Info	GT1 (0x1902)	
Memory RC Version	2.0.0.6	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
Total Memory	16384 MB	
Memory Frequency	2133 MHz	
ME FW Version	11.8.50.3425	
ME Firmware SKU	Corporate	
System Date	**[Tue 01/01/2018]**	
System Time	**[10:28:51]**	

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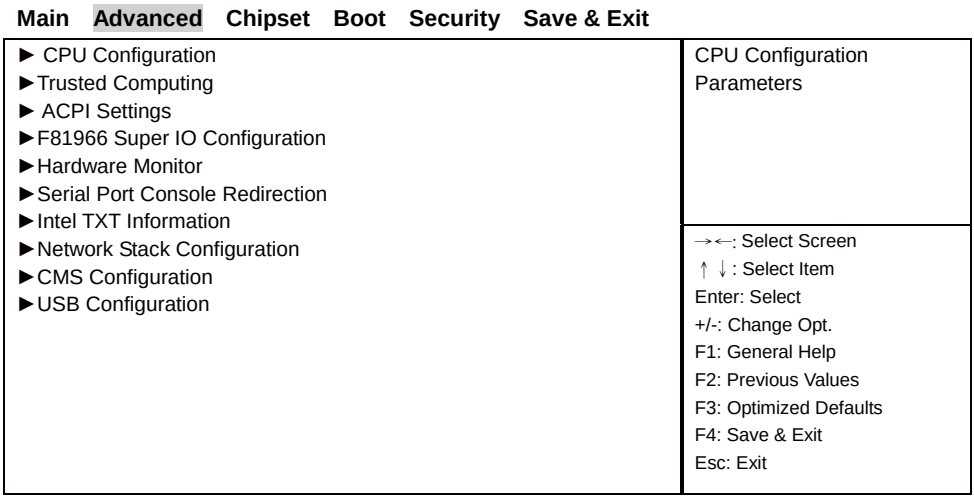
Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

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



CPU Configuration
Please refer section 4-7-1

Trusted Computing
Please refer section 4-7-2

ACPI Settings
Please refer section 4-7-3

F81966 Super IO Configuration
Please refer section 4-7-4

Hardware Monitor
Please refer section 4-7-5

Serial Port Console Redirection
Please refer section 4-7-6

Intel TXT Information
Please refer section 4-7-7

Network Stack Configuration
Please refer section 4-7-8

CMS Configuration
Please refer section 4-7-9

USB Configuration
Please refer section 4-7-10

4-7-1 CPU Configuration

Press [Enter] to view CPU Configuration.

4-7-2 Trusted Computing

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

Configuration		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.
Security Device Support	**[Disabled]**	
NO Security Device Found		
		→←: 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	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 4-7-4-1

Serial Port 2 Configuration
Please refer section 4-7-4-2

4-7-4-1 ►Serial Port 1 Configuration

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

Serial Port 1 Configuration Serial Port **[Enabled]** Device Settings IO=3F8h; IRQ=4; 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=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 ;

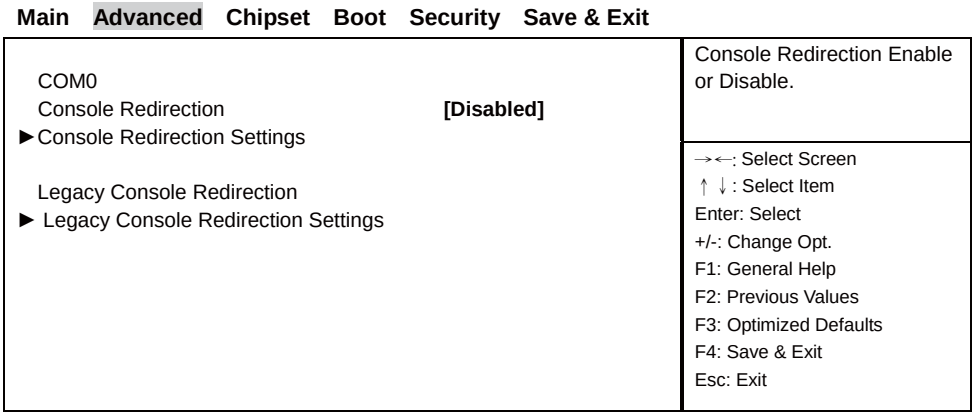
Uart Mode

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

4-7-5 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 Serial Port Console Redirection



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Console Redirection
Use this item to enable or disable Console Redirection.
The optional settings are: Enabled, Disabled.

4-7-7 Intel TXT Information

Press [Enter] to view Intel TXT Information.

4-7-8 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.

4-7-9 CSM Configuration

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

Compatibility Support Module Configuration		Enable/Disable CSM Support.
CSM Support	**[Disabled]**	
		→←: 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.

4-7-10 USB Configuration

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

USB Configuration		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.
USB Module Version	17	
USB Controllers : 1 XHCI		
USB Devices : 1 Mouse		
Legacy USB Support	**[Enabled]**	→←: Select Screen ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit
XHCI Hand-off	**[Enabled]**	
USB Mass Storage Driver Support	**[Enabled]**	
Port 60/64 Emulation	**[Disabled]**	

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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 4-8-1
PCH-IO Configuration
Please refer section 4-8-2

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 ↑ ↓ : Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit Esc: Exit

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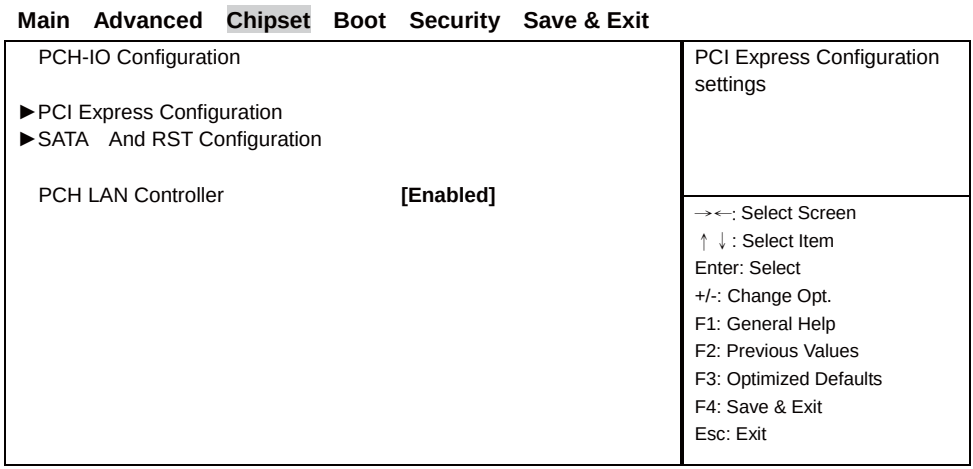
Memory Configuration
Please refer section 4-8-1-1

4-8-1-1 Memory Configuration

Press [Enter] to view Memory Information.

4-8-2 PCH-IO Configuration



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PCI Express Configuration
Please refer section 4-8-2-1

SATA And RST Configuration
Please refer section 4-8-2-2

PCH LAN Controller
Enabled / Disabled PCH LAN
The optional settings are: Enabled, Disabled.

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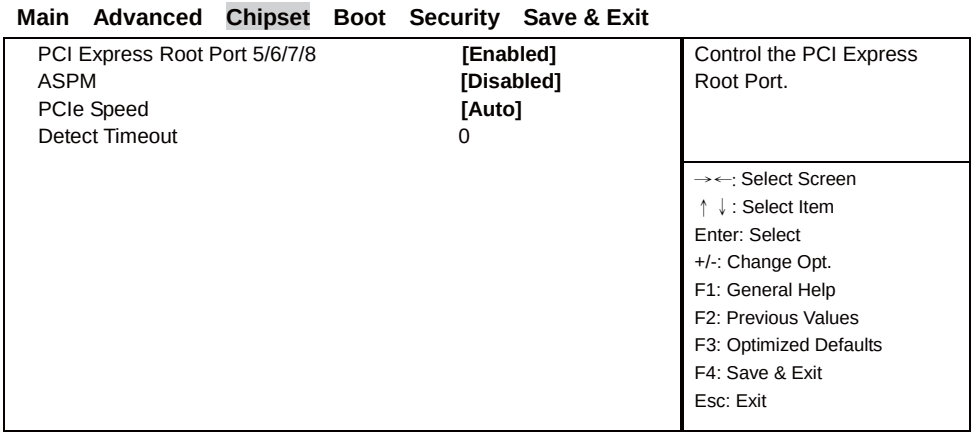
PCI Express Root Port 5 / 6 / 7 / 8 (I210 / I211 LAN2 / 3 / 4 / 5)
Please refer section 4-8-2-1-1

PCI Express Root Port 10/11 (Mini PCIe 1/2)
Please refer section 4-8-2-1-1

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



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.

4-8-2-1-2 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]**	
SATA5 (MPCE1)	Empty	
Port 4	**[Enabled]**	→←: Select Screen
SATA Device Type	**[Hard Disk Drive]**	↑ ↓ : Select Item
SATA6 (MPCE2)	Empty	Enter: Select
Port 5	**[Enabled]**	+/-: Change Opt.
SATA Device Type	**[Hard Disk Drive]**	F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		Esc: Exit

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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 / SATA5 (MPCE1) / SATA6 (MPCE2)
View SATA Port Information.

Port 0 / Port 1 / 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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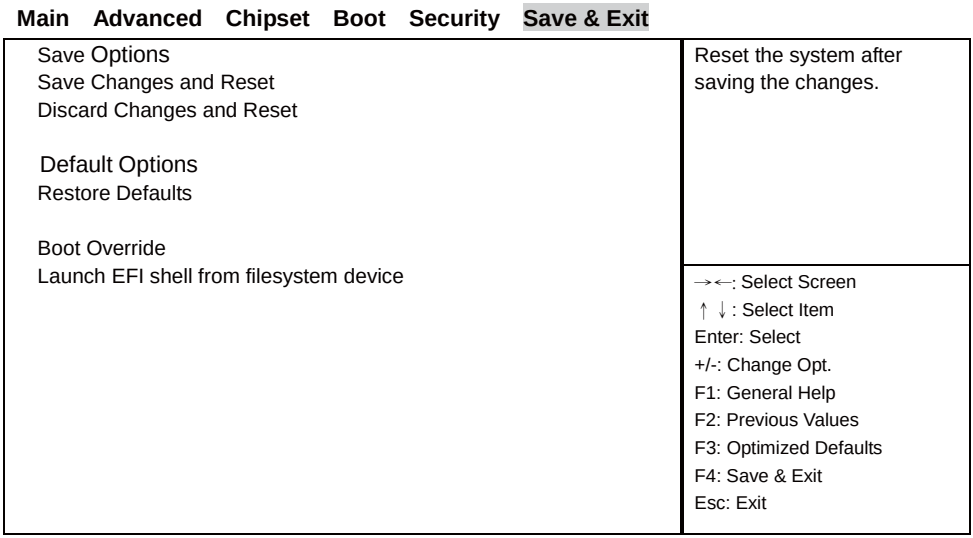
Setup Prompt Timeout
Number of seconds to wait for setup activation Key. 65535 (0xFFFF) means indefinite waiting.

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



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

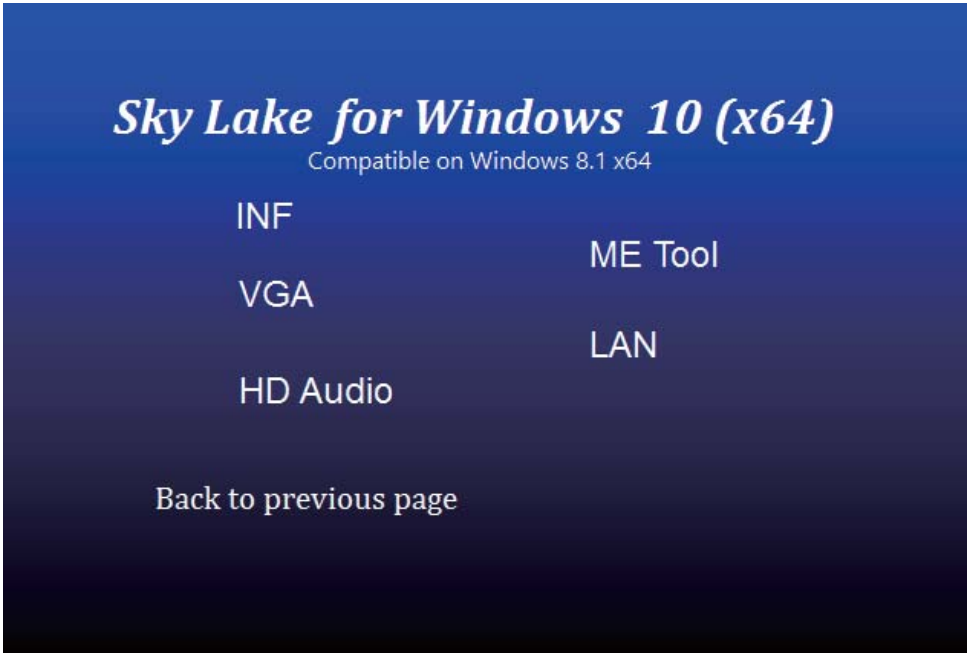
2 . Browse DVD to view the contents of the DVD

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:

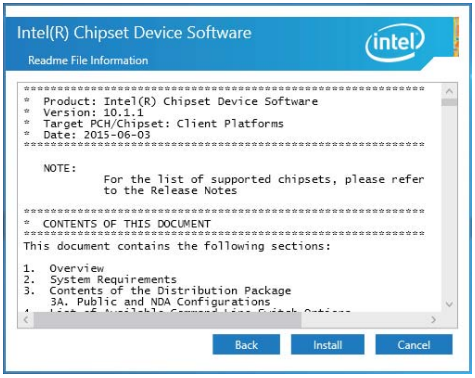


5-1 INF Install Intel SkyLake Chipset Driver

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".



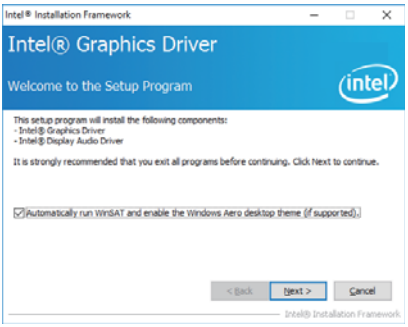
4. At the "Readme File Information" screen, Click "Install".

5. Click "Restart Now" to restart computer.

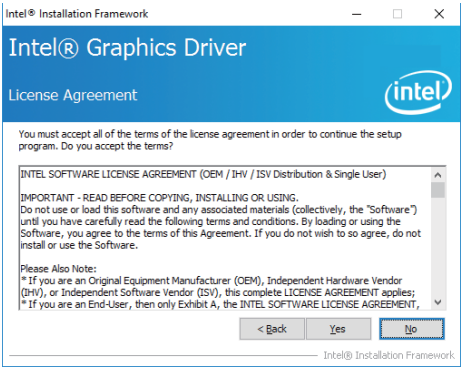
NOTE: SYSTEM INSTALL will auto detect file path For Windows 7 64/32-bit and windows 10 64bit X:\driver\sky_lake\INF\SetupChipset.exe

5-2 VGA Install Intel SkyLake VGA Driver

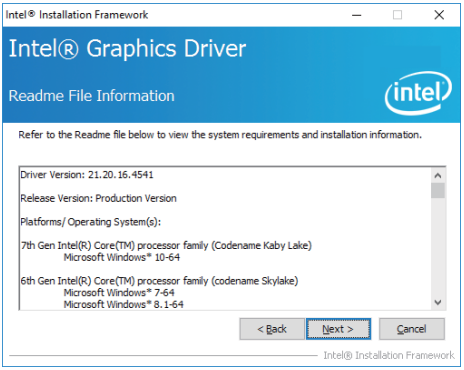
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, click "VGA".



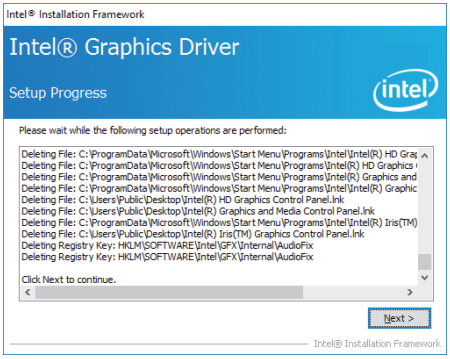
2. At the " Welcome to the Setup Program" screen, Click "Next".



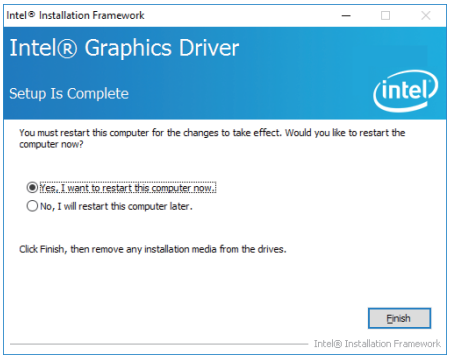
3. At the "License Agreement" screen, Click "Yes".



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



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

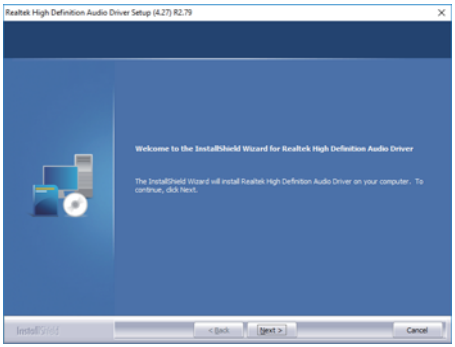


6. Click "Finish" to restart computer.

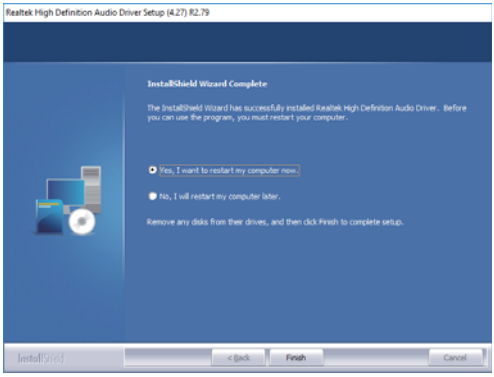
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64bit / Windows 10 64bit
X:\driver\sky_lake\VGA\x64\Setup.exe
For Windows 7 32bit
X:\driver\sky_lake\VGA\x86\Setup.exe

5-3 HD Audio Install Realtek High Definition Audio Driver

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



2. Click "Next".

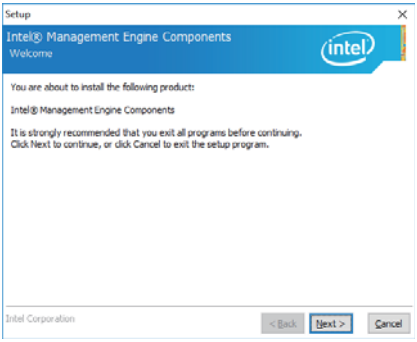


3. Click "Finish" to restart computer

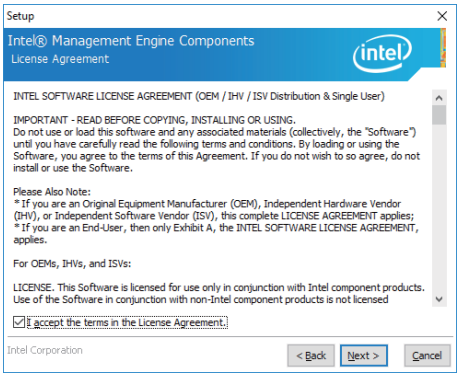
NOTE: SYSTEM INSTALL will auto detect file path
For Windows 7 64 bit / Windows 10 64 bit
X:\driver\sky_lake\Audio\0006-64bit_Win7_Win8_Win81_Win10_R279.exe
For Windows 7 32bit
X:\driver\sky_lake\Audio\Win7_Win8_Win81_R273.exe

5-4 ME Tools Install Intel Management Engine Interface Driver

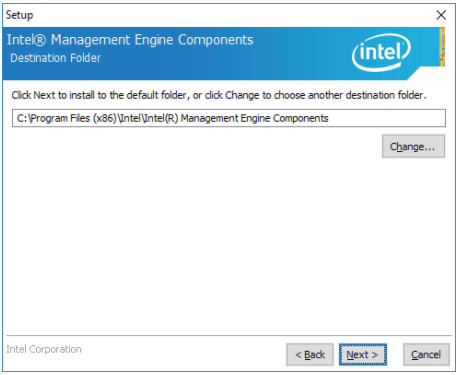
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "HD Audio"



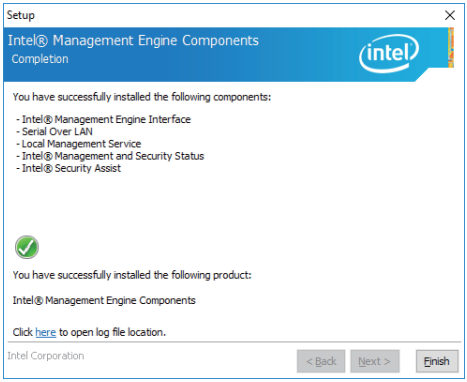
2. At the "Intel® Management Engine Components Driver" screen, Click" Next.



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



4. At the "Destination Folder" screen, Click "Next".

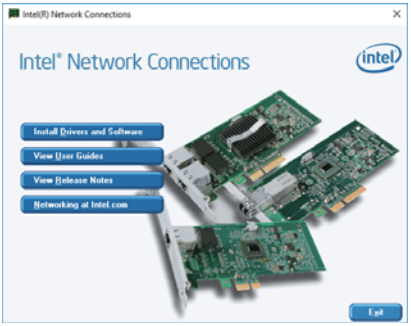


5. Click "Finish" to restart computer.

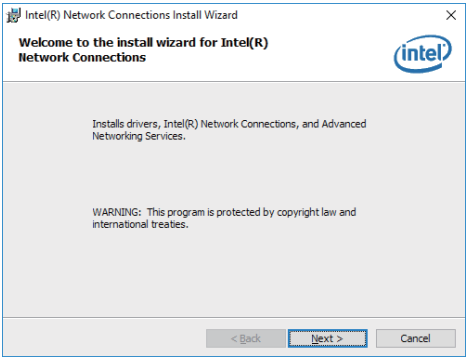
NOTE: The path of the file
For Windows 7 32-bit
X:\driver\sky_lake\ME\SetupME.exe
KMDF 1.11 installation required before Intel ME 10 driver installed
X:\driver\sky_lake\ME\KMDF_Win7\kmdf-1.11-Win-6.1-x86.msu
For Windows 7 64-bit
X:\driver\sky_lake\ME\SetupME.exe
KMDF 1.11 installation required before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

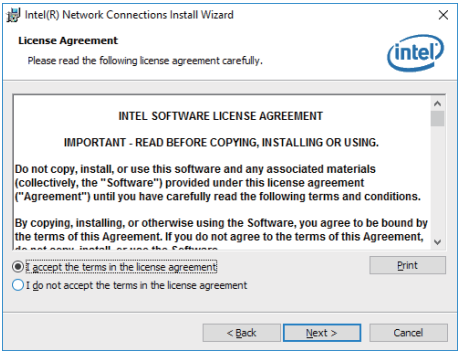
1. At the "AUTOMATIC DRIVER INSTALLATION menu" screen, Click "LAN"



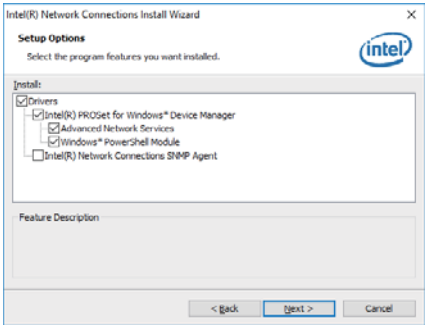
2. At the "Intel® Network Connections" screen, Click" Install Drivers and Software.



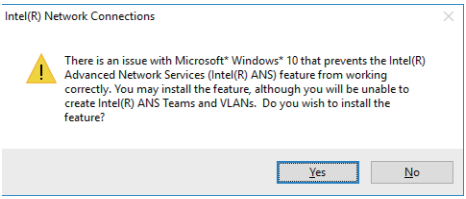
3. Click "Next".



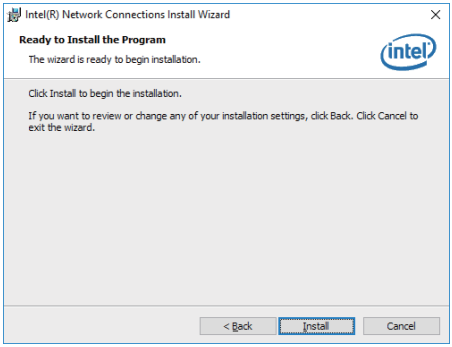
4. At the "License Agreement" screen, Click "Next".



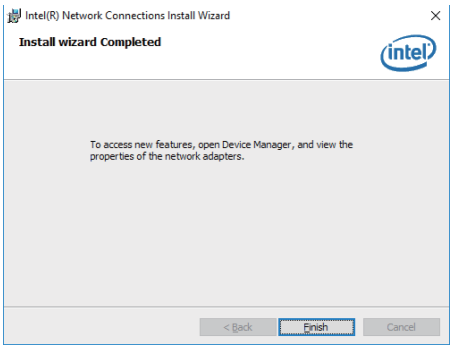
5. At the "Setup Options" screen, Click "Next".



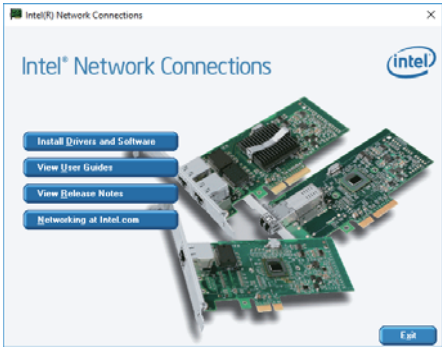
6. Click "Next".



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 AMI BIOS

STEP 1. Prepare a bootable disc.
(Storage device could be USB pen drive.)
STEP 2. Copy utility program and latest BIOS to your bootable disc.
You may download it from our website.
STEP 3. Here take 3I170NX as an example, insert your bootable disc into X: (X could be C:, A: or others.
It depends on which type of storage device you use.)

Start the computer and type
For legacy mode,
X:\>afudos.exe 3I170NXA1.bin /p /b /n /x
For UEFI mode,
X:\>AfuEfix64.efi 3I170NXA1.bin /p /b /n /x

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)