

# LE-37A

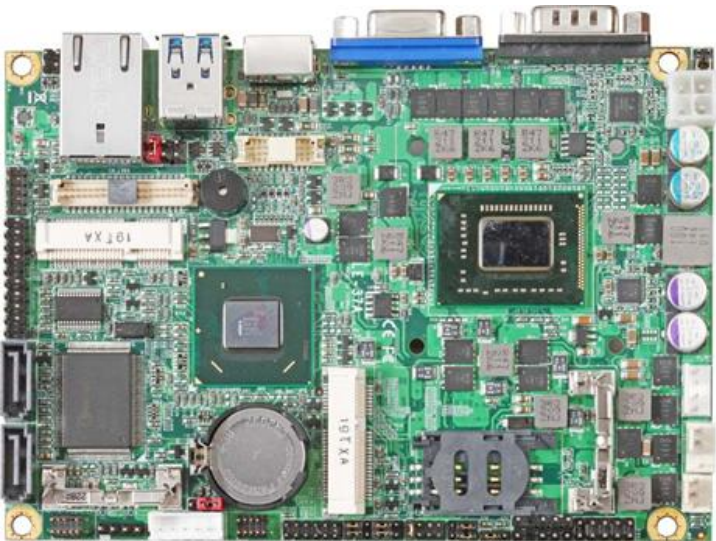
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## 3.5 inch Motherboard

### User's Manual

Edition 1.1

2012/08/14





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## Packing List:

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

### Hardware:

LE-37A 3.5" Miniboard x 1

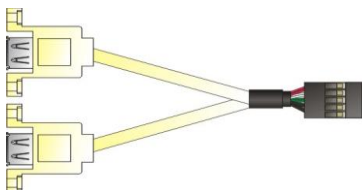
### Cable Kit:



SATA Cable x 1  
(OALSATA-L)



DC Power Cable x 1  
(OALDC-A)



USB Cable x 1  
(OALUSBA-3)



DVI Module With DVI Cable x 1  
(BADPDVI-A + OALDVI-DF13)



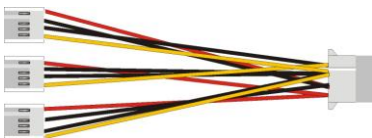
PS/2 Keyboard & Mouse Cable x 1  
(OALPS2/MK)



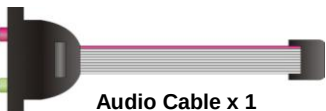
SATA Power Cable x 1  
(OAL4P-S2)



COM Port Cable x 1  
(OALES-BKU1NB)



1 to 3 power output cable x 1  
(OAL4P-2)



Audio Cable x 1  
(OALPJ-HDUNB)



CPU Cooler x 1  
(OHS-P-M-7)

### Printed Matters:

Driver CD (Including User's Manual) x 1

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## **Chapter 1 <Introduction>**

### **1.1 <Product Overview>**

**LE-37A** the 2<sup>nd</sup> Generation Intel of the Mini-ITX motherboard, supports 2<sup>nd</sup> Generation Intel Celeron® Processor 807UE/827E/847E and features Intel HM65 chipset, integrated HD Graphics, DDR3 memory, REALTEK High Definition Audio, Serial ATA and Intel Gigabit LAN.

#### **Intel Sandy Bridge Processor**

The 2nd Generation Intel Celeron® Processor 807UE/827E/847E is the next generation of 64-bit, multi-core mobile processor built on 32- nanometer process technology. Based on a new micro-architecture.

#### **New features for Intel QM67 chipset**

The board integrates Intel HM65 chipset, supports integrated HD Graphics, built-in high speed mass storage interface of serial ATA, High Definition Audio with 2 channels surrounding sound.

#### **All in One multimedia solution**

Based on Intel HM65 chipset, the board provides high performance onboard graphics, 24-bit dual channel LVDS interface, DVI and 2 channels High Definition Audio, to meet the very requirement of the multimedia application.

#### **Flexible Extension Interface**

The board provides two PCIE mini card socket.



## 1.2 <Product Specification>

### General Specification

|                 |                                                                                                                                                                                       |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Form Factor     | 3.5 inch miniboard                                                                                                                                                                    |
| CPU             | Intel® Celeron® Processor 807UE 1.0GHz (LE-37ANB)<br>Intel® Celeron® Processor 827E 1.4GHz (LE-37AC6)<br>Intel® Celeron® Processor 847E 1.1GHz (LE-37ABU)<br>Package type : FCBGA1023 |
| Memory          | 1 x DDRIII SO-DIMM 1066/1333 MHz up to 4GB (LE-37ANB)<br>1 x DDRIII SO-DIMM 1066/1333 MHz up to 8GB (LE-37AC6 / LE-37ABU)<br>Support Non-ECC, unbuffered memory only                  |
| Chipset         | Intel® HM65                                                                                                                                                                           |
| Watchdog Timer  | Generates a system reset with internal timer for 1min/s ~ 255min/s                                                                                                                    |
| Real Time Clock | Chipset integrated RTC with onboard lithium battery                                                                                                                                   |
| Serial ATA      | 2 x serial ATAIII interface with 600MB/s transfer rate<br>Optional support mSATA(SATAII) for Mini_Card2                                                                               |

### Multi-I/O Port

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| Chipset     | Winbond W83627DHG-P                                                    |
| Serial Port | One RS-232/422/485 serial port and one RS-232                          |
| USB Port    | Six Hi-Speed USB 2.0 ports<br>with 480Mbps of transfer rate            |
| IrDA Port   | One IrDA compliant Infrared interface supports SIR                     |
| K/B & Mouse | PS/2 keyboard and mouse port                                           |
| GPIO        | One 12-pin Digital I/O connector with 8-bit programmable I/O interface |

### VGA Display Interface

|              |                                                                                                          |
|--------------|----------------------------------------------------------------------------------------------------------|
| Chipset      | Intel® HD Graphics                                                                                       |
| Display Type | CRT, LCD monitor with analog display, single channel LVDS<br>Can support MPX-SDVOD/X for Mini_Card1      |
| Connector    | External DB15 female connector<br>Onboard 40-Pin LVDS and 5-Pin inverter connector<br>Onboard 20-Pin DVI |

### Ethernet Interface

|            |                                                                                                     |
|------------|-----------------------------------------------------------------------------------------------------|
| Controller | 1 x Intel® 82579LM Gigabit Ethernet controller                                                      |
| Type       | Triple speed 10/100/1000Base-T<br>Auto-switching Fast Ethernet<br>Full duplex, IEEE802.3U compliant |
| Connector  | One External RJ45 connector with LED                                                                |

**Audio Interface**

|           |                                         |
|-----------|-----------------------------------------|
| Chipset   | REALTEK ALC888                          |
| Interface | Stereo audio Line-out and MIC-in        |
| Connector | Onboard audio connector with pin header |

**Expansive Interface**

|                |                           |
|----------------|---------------------------|
| PCIE Mini Card | 2 x PCIE Mini Card socket |
|----------------|---------------------------|

**Power and Environment**

|                   |                                                      |
|-------------------|------------------------------------------------------|
| Power Requirement | DC 9V~24V input with onboard 4-pin connector         |
| Dimension         | 146 (L) x 101(H) mm                                  |
| Temperature       | Operating within 0 ~ 60℃<br>Storage within -20 ~ 85℃ |

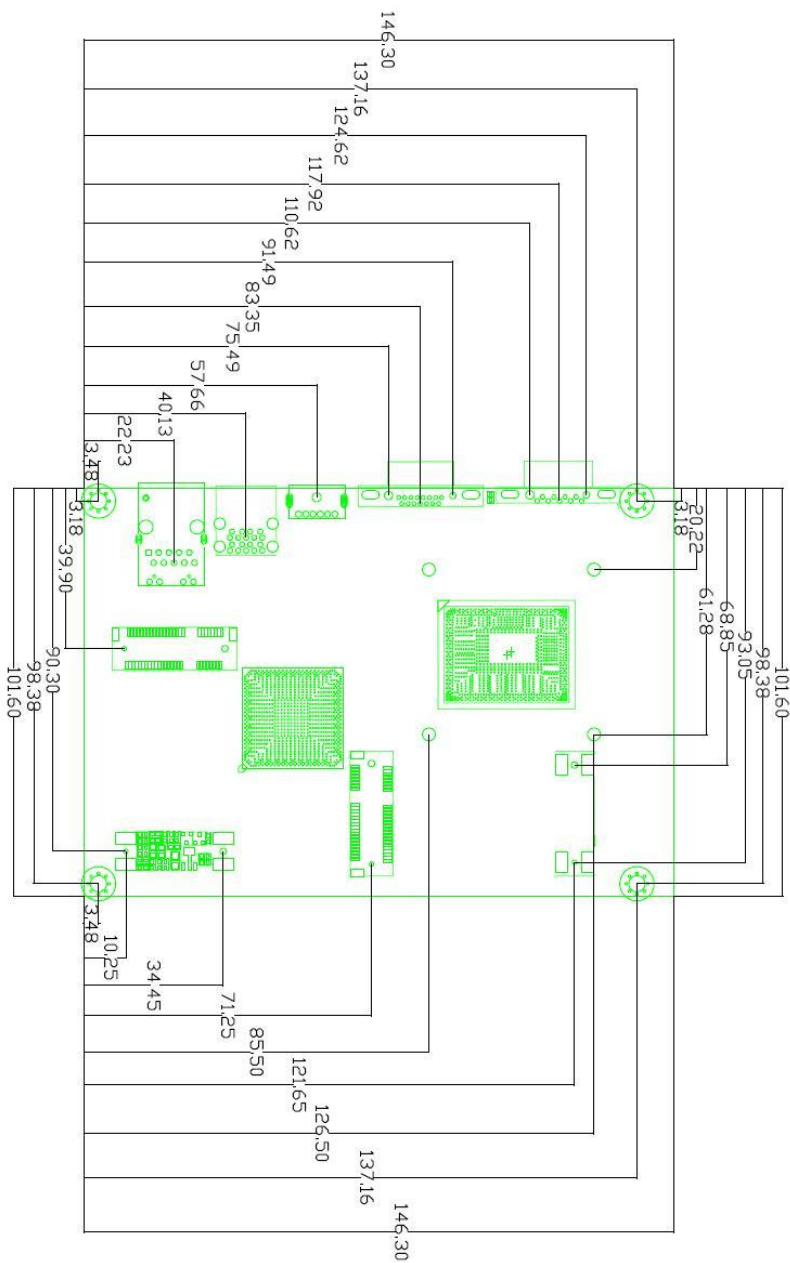
**Ordering Code**

|                  |                                                                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LE-37ANB</b>  | Intel® Celeron® Processor <b>807UE</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card        |
| <b>LE-37ANBS</b> | Intel® Celeron® Processor <b>807UE</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card, mSATA |
| <b>LE-37AC6</b>  | Intel® Celeron® Processor <b>827E</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card         |
| <b>LE-37AC6S</b> | Intel® Celeron® Processor <b>827E</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card, mSATA  |
| <b>LE-37ABU</b>  | Intel® Celeron® Processor <b>847E</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card         |
| <b>LE-37ABUS</b> | Intel® Celeron® Processor <b>847E</b> with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAIII, SMBUS, LPC, GPIO, PCIE mini card, mSATA  |

The specifications may be different as the actual production.

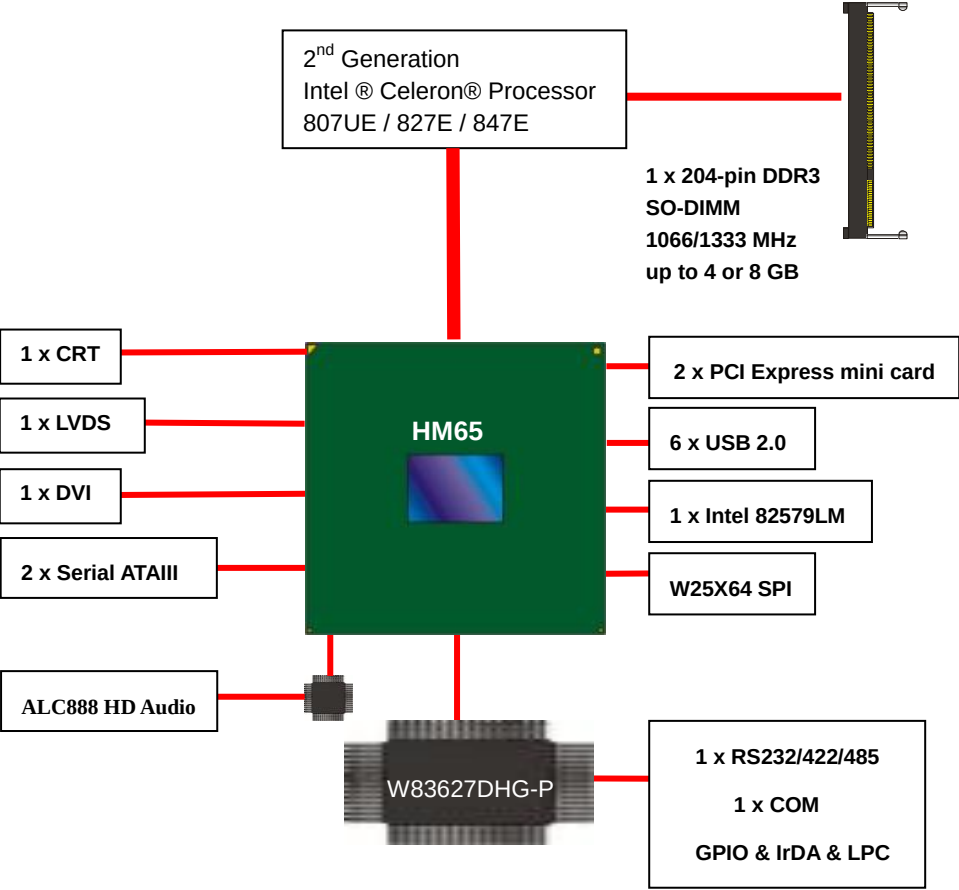
For further product information please visit the website at <http://www.commell.com.tw>

## 1.3 <Mechanical Drawing>



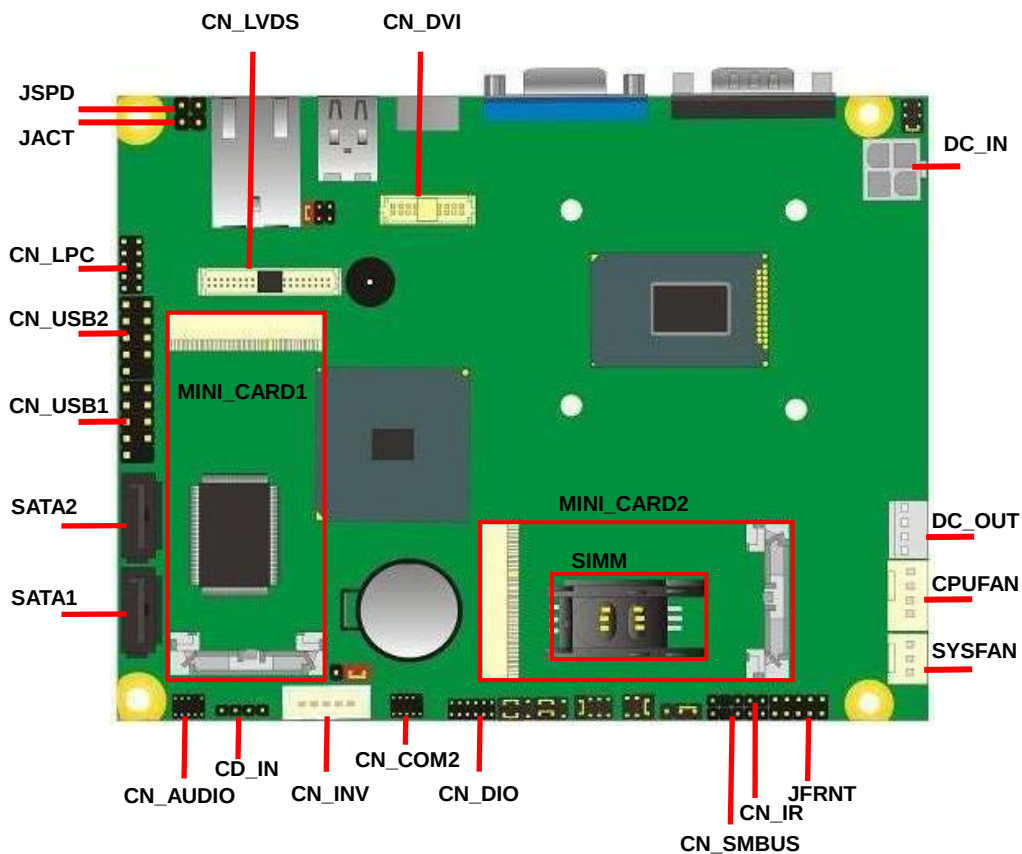
Unit: mm

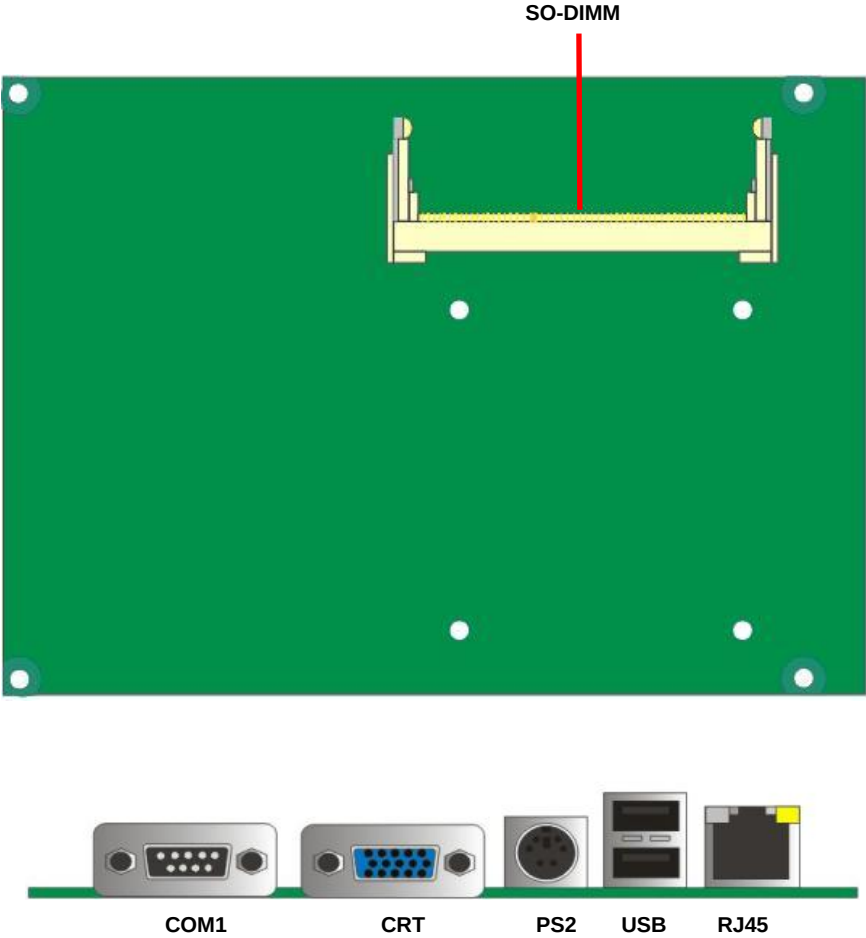
1.4 <Block Diagram>



## Chapter 2 <Hardware Setup>

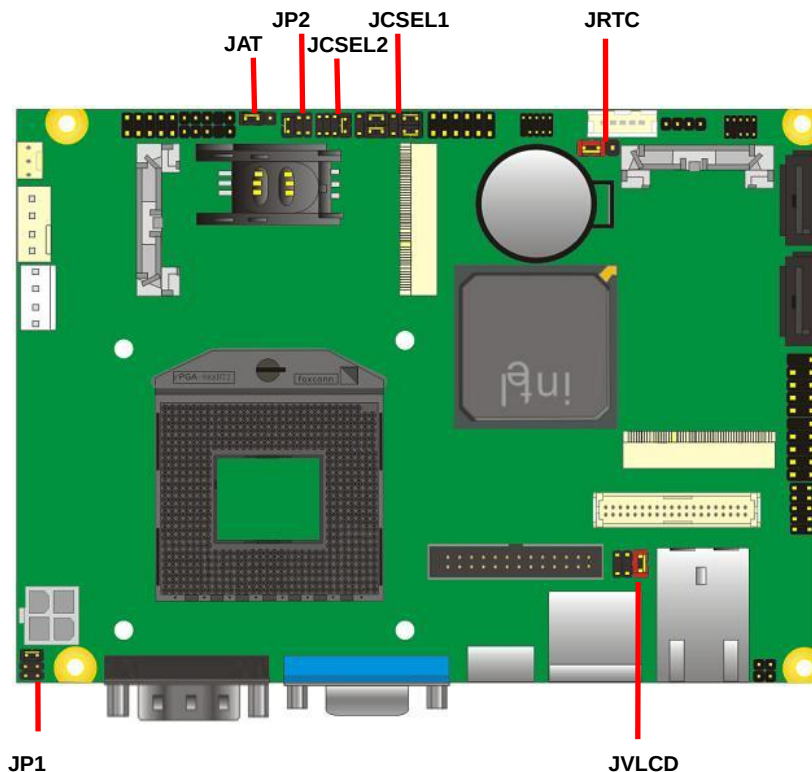
### 2.1 <Connector Location>





## 2.2 <Jumper Location & Reference>

| Jumper | Function                           |
|--------|------------------------------------|
| JRTC   | CMOS Operating/Clear Setting       |
| JVLCD  | Panel Voltage Setting              |
| JAT    | Power mode select                  |
| JP1    | Com1 Voltage Setting (For Pin 9)   |
| JP2    | Com2 Voltage Setting (For Pin 9)   |
| JCSEL1 | CN_COM2 RS-232 RS422 RS485 Setting |
| JCSEL2 | CN_IR IrDA Setting                 |



## 2.3 <Connector Reference>

### 2.3.1 <Internal Connectors>

| Connector    | Function                                      | Remark |
|--------------|-----------------------------------------------|--------|
| SO-DIMM      | 204 -pin DDR3 SO-DIMM socket                  |        |
| SATA 1/2     | 7-pin Serial ATAIII connector                 |        |
| DC_IN        | DC 9~24V input connector                      |        |
| DC_OUT       | 4-pin DC output connector                     |        |
| CN_AUDIO     | 5 x 2-pin audio connector                     |        |
| CD_IN        | 4-pin CD-ROM audio input connector            |        |
| CN_DIO       | 6 x 2-pin digital I/O connector               |        |
| CN_USB 1/2   | 5 x 2-pin USB connector                       |        |
| CPUFAN       | 4-pin CPU cooler fan connector                |        |
| SYSFAN       | 3-pin system cooler fan connector             |        |
| CN_LVDS      | 20 x 2-pin LVDS connector                     |        |
| CN_INV       | 5-pin LCD inverter connector                  |        |
| CN_IR        | 5-pin IrDA connector                          |        |
| CN_COM2      | 9-pin RS232/485/422                           |        |
| CN_LPC       | 5 x 2-pin LPC connector                       |        |
| JFRNT        | 10-pin front panel switch/indicator connector |        |
| Mini-PCIE1/2 | 52-pin Mini-PCIE socket                       |        |
| JAT          | Power mode select                             |        |
| JSPD         | LAN Speed LED connector                       |        |
| JACT         | LAN Activity LED connector                    |        |

### 2.3.2 <External Connectors>

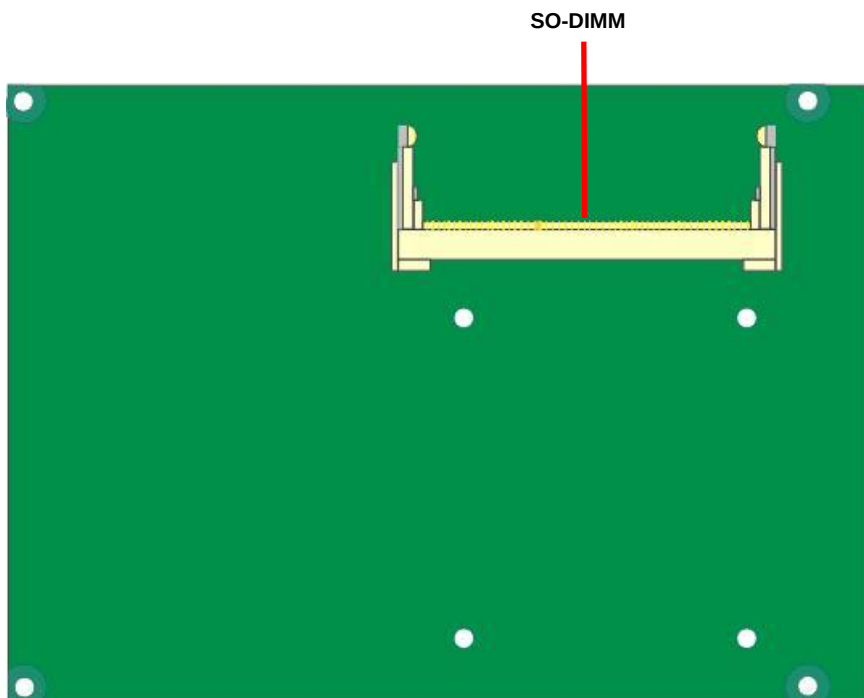
| Connector | Function                                     | Remark |
|-----------|----------------------------------------------|--------|
| COM1      | DB9 Serial port connector                    |        |
| CRT       | DB15 VGA connector                           |        |
| PS2       | PS/2 keyboard and mouse connector            |        |
| USB       | Dual USB 3.0 connector for USB 2.0 Interface |        |
| RJ45      | RJ45 LAN connector                           |        |



## 2.4 <CPU and Memory Setup>

### 2.4.2 <Memory Setup>

The board provides 204-pin DDR3 SO-DIMM to support 1066/1333MHz DDR3 memory module up to 4GB(LE-37ANB) or 8GB(LE-37AC6/BU).



## 2.5 <CMOS & ATX Setup>

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

**Jumper: JRTC**  
**Type: Onboard 3-pin jumper**

| JRTC | Mode             |
|------|------------------|
| 1-2  | Clear CMOS       |
| 2-3  | Normal Operation |

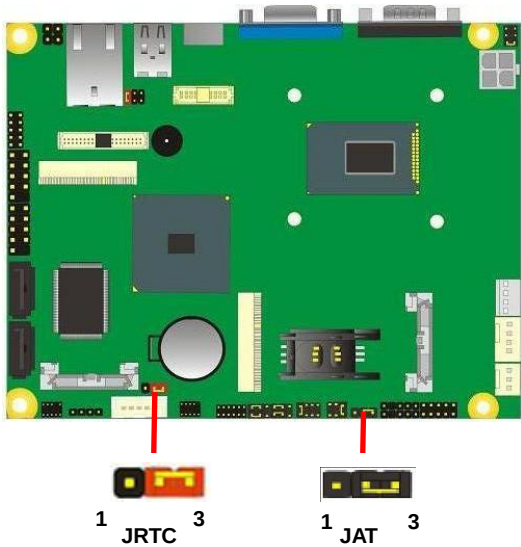
Default setting: 2-3

The board has a jumper to switch AT power mode (automatic power on) or standard ATX mode (manual power on).

**Jumper: JAT**  
**Type: onboard 3-pin jumper**

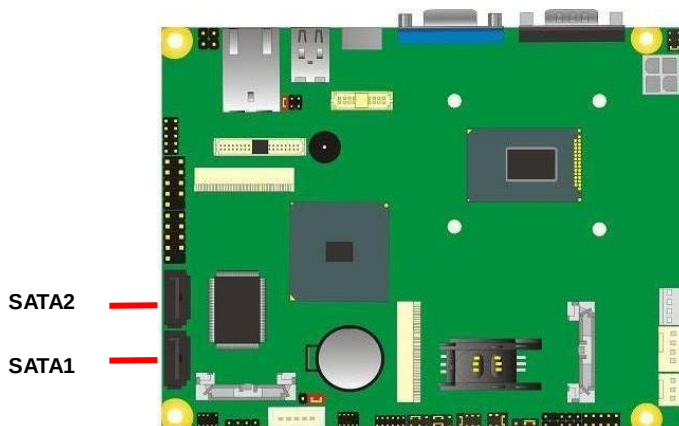
| JAT | Mode     |
|-----|----------|
| 1-2 | AT Mode  |
| 2-3 | ATX Mode |

Default setting:2-3



## 2.6 <Serial ATA Interface>

Based on Intel PCH, the board provides two Serial ATAIII interfaces with up to 600MB/s of transfer rate .



## 2.7 <Ethernet Interface>

The board integrates with one Intel 82579LM controllers, The Intel Gigabit Ethernet supports triple speed of 10/100/1000Base-T, with IEEE802.3 compliance.



## 2.8 <Onboard Display Interface>

Based on Intel **Sandy Bridge** CPU with built-in HD Graphic, the board provides one DB15 connector on rear external I/O port, one 40-pin LVDS interface with 5-pin LCD backlight inverter connector and provides 26-pin DVI interface.

The board provides dual display function with clone mode and extended desktop mode for CRT, LCD and DVI.

### 2.8.1 <Analog Display>

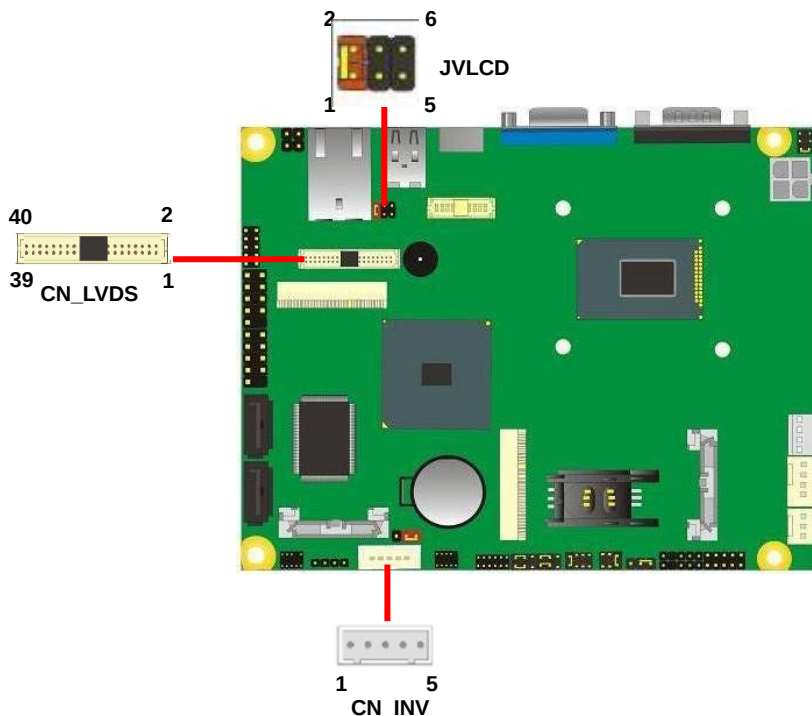
Please connect your CRT or LCD monitor with DB15 male connector to the onboard DB15 female connector on rear I/O port.



CRT

## 2.8.2 <Digital Display>

The board provides one 40-pin LVDS connector for 24-bit single/dual channel panels, supports up to 2048 x 1536 (UXGA) resolution, with one LCD backlight inverter connector and one jumper for panel voltage setting.



**Effective patterns of connection: 1-2 / 3-4 / 5-6**



**Warning: others cause damages**

Connector: **CN\_INV**

Type: 5-pin LVDS Power Header

| Pin | Description     |
|-----|-----------------|
| 1   | +12V            |
| 2   | Reserved (Note) |
| 3   | GND             |
| 4   | GND             |
| 5   | ENABKL          |

Note: Reserved for MB internal test  
Please treat it as NC.

Connector: **JVLCD**

Type: 6-pin Power select Header

| Pin | Description   |
|-----|---------------|
| 1-2 | LCDVCC (3.3V) |
| 3-4 | LCDVCC (5V)   |
| 5-6 | LCDVCC (12V)  |

**Default: 1-2**Connector: **CN\_LVDS**

Type: onboard 40-pin connector for LVDS connector

Connector model: **HIROSE DF13-40DP-1.25V**

| Pin | Signal   | Pin | Signal  |
|-----|----------|-----|---------|
| 2   | LCDVCC   | 1   | LCDVCC  |
| 4   | GND      | 3   | GND     |
| 6   | ATX0-    | 5   | BTX0-   |
| 8   | ATX0+    | 7   | BTX0+   |
| 10  | GND      | 9   | GND     |
| 12  | ATX1-    | 11  | BTX1-   |
| 14  | ATX1+    | 13  | BTX1+   |
| 16  | GND      | 15  | GND     |
| 18  | ATX2-    | 17  | BTX2-   |
| 20  | ATX2+    | 19  | BTX2+   |
| 22  | GND      | 21  | GND     |
| 24  | ACLK-    | 23  | BTX3-   |
| 26  | ACLK+    | 25  | BTX3+   |
| 28  | GND      | 27  | GND     |
| 30  | ATX3-    | 29  | BCLK-   |
| 32  | ATX3+    | 31  | BCLK+   |
| 34  | GND      | 33  | GND     |
| 36  | DDCPCLK  | 35  | SMBCKL  |
| 38  | DDCPDATA | 37  | SMBDATA |
| 40  | N/C      | 39  | SPDIFO  |

## LE-37A User's Manual

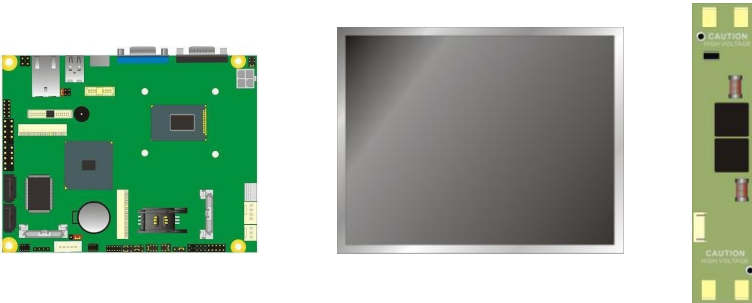
To setup the LCD, you need the component below:

1. A panel with LVDS interfaces.
2. An inverter for panel's backlight power.
3. A LCD cable and an inverter cable.

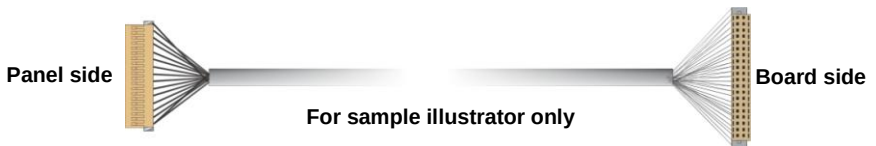
For the cables, please follow the pin assignment of the connector to make a cable, because every panel has its own pin assignment, so we do not provide a standard cable; please find a local cable manufacture to make cables.

### LCD Installation Guide:

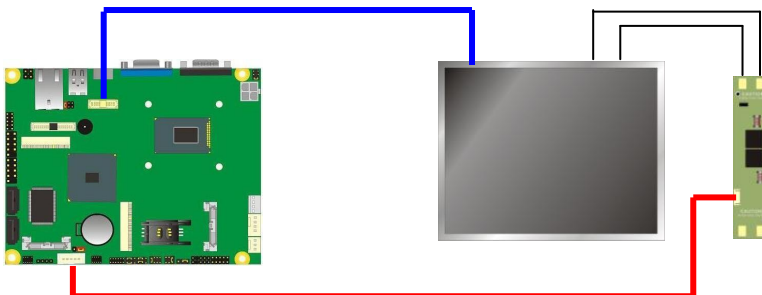
1. Preparing the **LS-378**, **LCD panel** and the **backlight inverter**.



2. Please check the datasheet of the panel to see the voltage of the panel, and set the jumper **JVLCD** to +12V or +5V or +3.3V.
3. You would need a LVDS type cable.



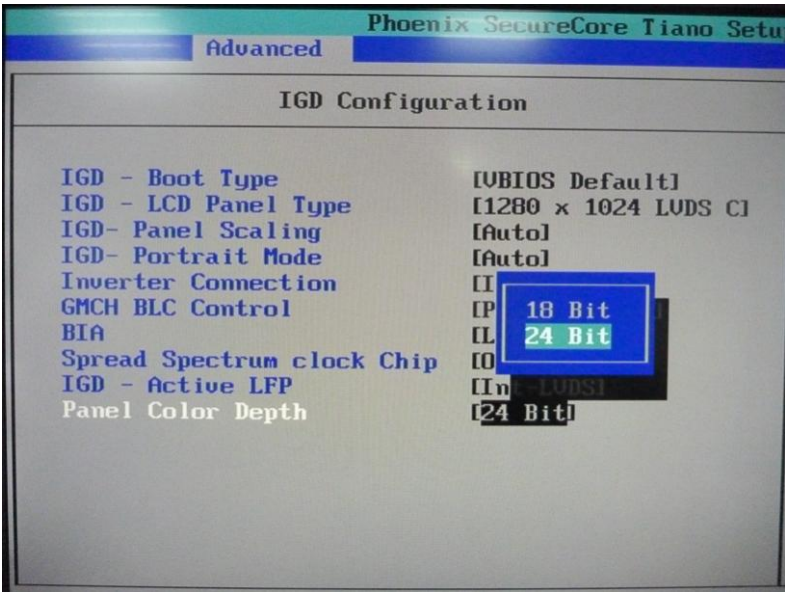
4. To connect all of the devices well.



After setup the devices well, you need to select the LCD panel type in the BIOS.

The panel type mapping is list below:

| BIOS panel type selection form (BIOS Version:1.0) |                                  |                       |               |
|---------------------------------------------------|----------------------------------|-----------------------|---------------|
| Single / Dual channel                             |                                  | Single / Dual channel |               |
| NO.                                               | Output format                    | NO.                   | Output format |
| 1                                                 | 640 x 480                        | 9                     | 1680 x 1050   |
| 2                                                 | 800 x 600                        | 10                    | 1920 x 1200   |
| 3                                                 | 1024 x 768                       | 11                    | 1440 x 900    |
| 4                                                 | 1280 x 1024                      | 12                    | 1600 x 900    |
| 5                                                 | 1400 x 1050 Reduced Blanking     | 13                    | OEM Keep      |
| 6                                                 | 1400 x 1050 non-Reduced Blanking | 14                    | 1280 x 800    |
| 7                                                 | 1680 x 1200                      | 15                    | 1920 x 1080   |
| 8                                                 | 1366 x 768                       | 16                    | 2048 x 1536   |



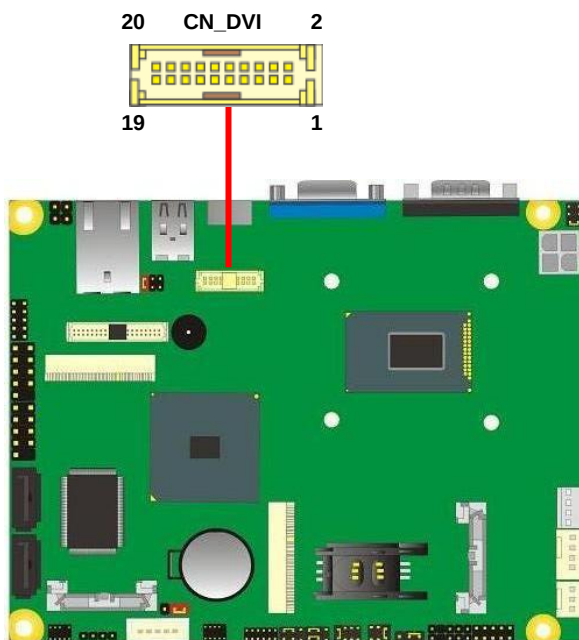


### 2.8.3 <DVI Interface>

Connector: **CN\_DVI**

Connector type: HIROSE DF13-20DP-1.25V

| Pin Number | Assignment | Pin Number | Assignment |
|------------|------------|------------|------------|
| 1          | +5V        | 2          | +3.3V      |
| 3          | HPD        | 4          | Ground     |
| 5          | TMDSTX0N   | 6          | TMDSTX0P   |
| 7          | Ground     | 8          | TMDSTX1N   |
| 9          | TMDSTX1P   | 10         | Ground     |
| 11         | TMDSTX2N   | 12         | TMDSTX2P   |
| 13         | Ground     | 14         | TMDSTXCN   |
| 15         | TMDSTXCP   | 16         | Ground     |
| 17         | DVI_DA     | 18         | DVI_SL     |
| 19         | AUXN       | 20         | AUXP       |



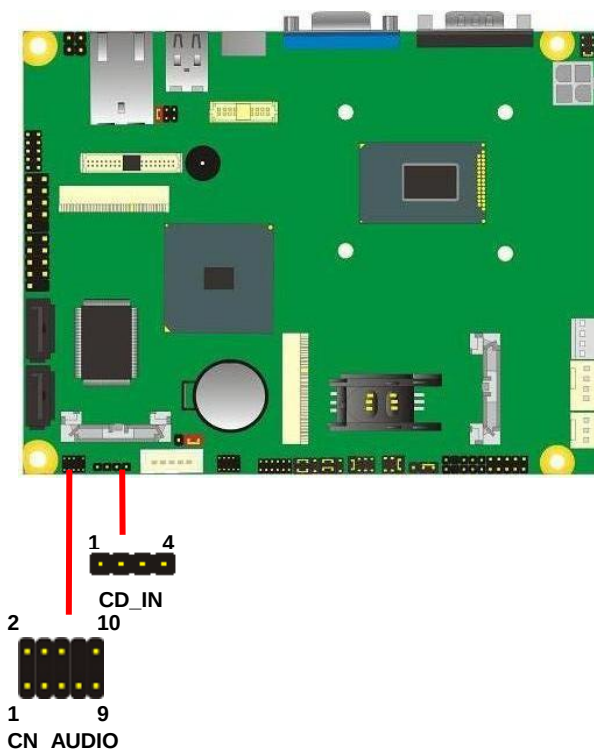
## 2.9 <Integrated Audio Interface>

The board integrates onboard audio interface with REALTEK ALC888 codec, with Intel next generation of audio standard as High Definition Audio, it offers more vivid sound and other advantages than former HD audio compliance.

The main specifications of ALC888 are:

- **High-performance DACs with 100dB S/N ratio**
- **2 DAC channels support 16/20/24-bit PCM format for 2 audio solution**
- **16/20/24-bit S/PDIF-OUT supports 44.1K/48K/96kHz sample rate**
- **Compatible with HD**
- **Meets Microsoft WHQL/WLP 2.0 audio requirements**

The board provides 2 channels audio phone jacks on rear I/O port, Line-in/MIC-in ports for front I/O panel through optional cable.



**Connector: CN\_AUDIO**

Type: 10-pin (2 x 5) 1.27mm x 2.54mm-pitch header



| Pin | Description | Pin | Description    |
|-----|-------------|-----|----------------|
| 1   | MIC_L       | 2   | Ground         |
| 3   | MIC_R       | 4   | N/C            |
| 5   | Speaker_R   | 6   | MIC Detect     |
| 7   | SENSE       | 8   | N/C            |
| 9   | Speaker_L   | 10  | Speaker Detect |

**Connector: CDIN**

Type: 4-pin header (pitch = 2.54mm)



| Pin | Description |
|-----|-------------|
| 1   | CD – Left   |
| 2   | Ground      |
| 3   | Ground      |
| 4   | CD – Right  |

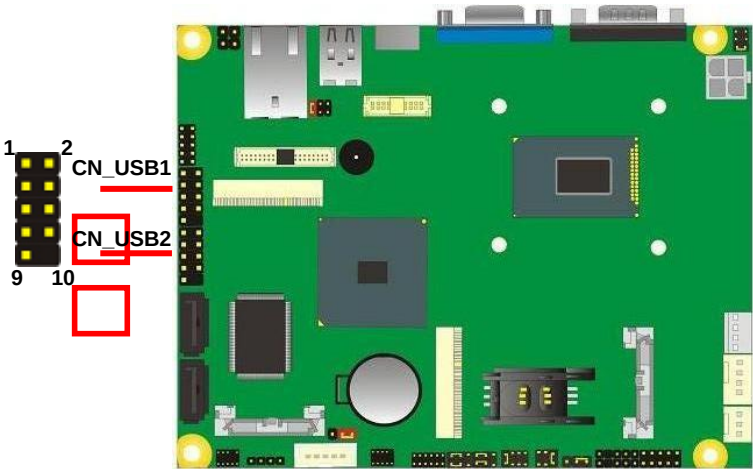
## 2.10 <USB Interface>

LE-37A integrates six USB2.0 ports. The specifications of USB2.0 are listed below:

| Interface     | USB2.0        |
|---------------|---------------|
| Controller    | Intel®HM65    |
| Transfer Rate | Up to 480Mb/s |
| Voltage       | 5V            |



USB1/2



Connector: **CN\_USB1/2**

Type: 10-pin (2 x 5) header (pitch = 2.54mm)

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | VCC         | 2   | VCC         |
| 3   | Data0-      | 4   | Data1-      |
| 5   | Data0+      | 6   | Data1+      |
| 7   | Ground      | 8   | Ground      |
| 9   | Ground      | 10  | N/C         |

2.11 <Serial Port>

The board supports Three RS232 serial port and one jumper selectable RS232/422/485 serial ports. The jumper JCSEL1 & JCSEL2 can let you configure the communicating modes for COM2.



Connector: **COM1**  
Type: 9-pin D-sub male connector on bracket for COM1/3

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | DCD         | 2   | RXD         |
| 3   | TXD         | 4   | DTR         |
| 5   | GND         | 6   | DSR         |
| 7   | RTS         | 8   | CTS         |
| 9   | RI          | 10  | N/C         |

Connector: **COM2**  
Type: 10-pin (5 x 2) 1.27mm x 2.54mm-pitch header for COM2

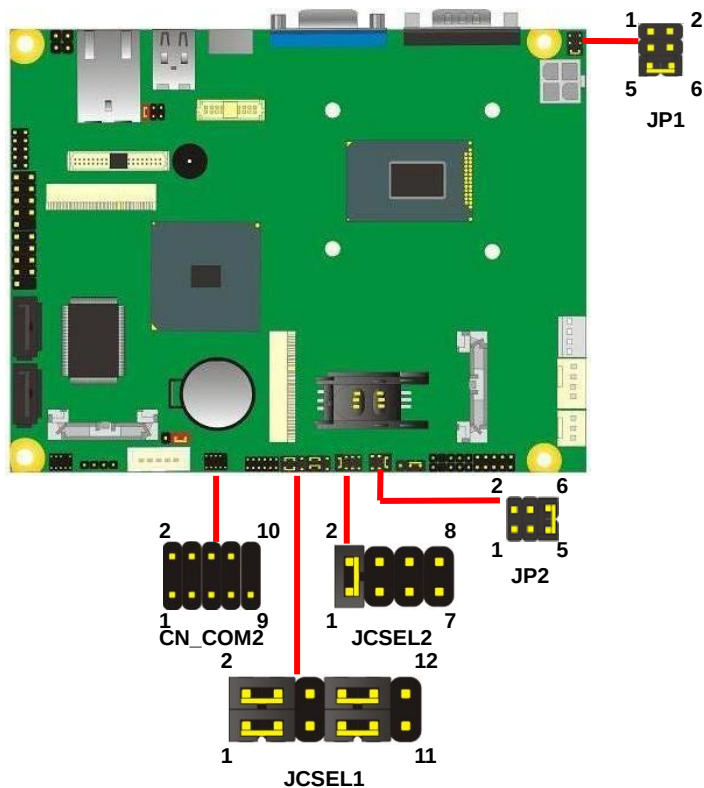
| Pin | Description     | Pin | Description     |
|-----|-----------------|-----|-----------------|
| 1   | DCD/422TX-/485- | 2   | RXD/422TX+/485+ |
| 3   | TXD/422RX+      | 4   | DTR/422RX-      |
| 5   | GND             | 6   | DSR             |
| 7   | RTS             | 8   | CTS             |
| 9   | RI              | 10  | N/C             |

Setting RS-232 & RS-422 & RS-485 for COM2

Jumper: **JCSEL1,JCSEL2**  
Type: 12-pin (6 x 2) & 8-pin (4 x 2) for set COM2 mode jumper

|        | RS232 | RS485 | RS422 | IrDA |
|--------|-------|-------|-------|------|
| JCSEL1 |       |       |       |      |
| JCSEL2 |       |       |       |      |

Default: RS232



Jumper: **JP1/JP2 (COM1/2)**

Type: onboard 6-pin header

| Power Mode           | JP1/2/3/4              |
|----------------------|------------------------|
| Pin 9 with 5V Power  | 1-2                    |
| Pin 9 with 12V Power | 3-4                    |
| Standard COM port    | 5-6<br>Default Setting |

## 2.12 <PCIE Mini Card and SIM Interface>

The board provides two PCIE mini card slots and a SIM socket.

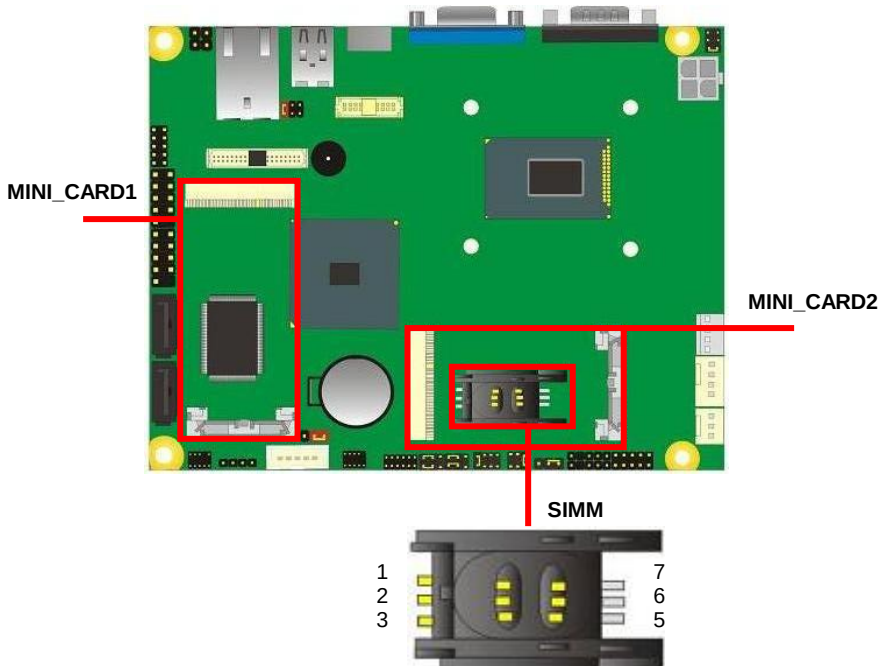
MINI\_CARD1 is the first Mini-PCle slot for long size Mini-PCle cards.

Please be noted that the MPX-SDVOD card must be placed in this slot. The MPX-SDVOD card will not work if it is placed in other slot.

Please also be noted that this slot is the only slot for MPX-SDVOX card but a customized BIOS is needed for the MPX-SDVOX card. Please contact Commell for customized BIOS for your MPX-SDVOX card.

MINI\_CARD2 is the second Mini-PCle slot for long size Mini-PCle cards.

However, if you are trying to use 3G Mini-PCle card with a SIM card then place your 3G Mini-PCle card in this slot and put your SIM card into the SIM card socket beneath this MINI\_CARD2 slot, and option support mSATA



Connector: **SIMM**

Type: 6-pin SIM socket

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | SIMVCC      | 2   | SIMRST      |
| 3   | SIMCLK      | 4   | NC          |
| 5   | GND         | 6   | SIMVPP      |
| 7   | SIMDATA     |     |             |

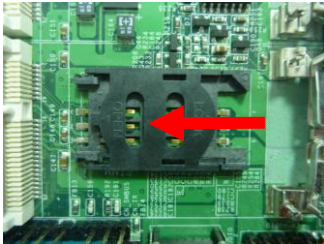


### 2.12.1 <SIM Setup>

#### Step1.

SIM card holder is marked by circle.

Slide the cap toward OPEN direction.



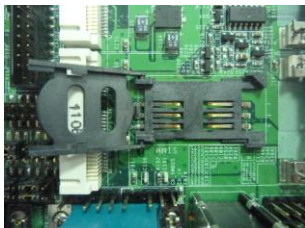
#### Step 2.

Make sure that the cap is now at the OPEN position.



#### Step 3.

Flip the cap up for inserting a SIM card into.



### Step 4.

Insert a SIM card as shown in the photo.

Be sure that the corner cut is on top and the golden pads are up.



### Step 5.

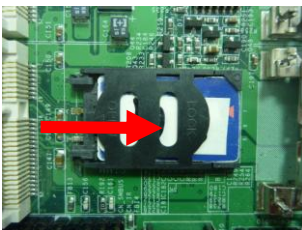
Now, flip down the cap as shown in the photo.



### Step 6.

Press down and slide the cap to the CLOSE position.

Be sure that the cap is tightly held with the socket.



## 2.13 <GPIO and SMBUS Interface>

The board provides a programmable 8-bit digital I/O interface; you can use this general purpose I/O port for system control like POS or KIOSK.

Connector: **CN\_DIO**

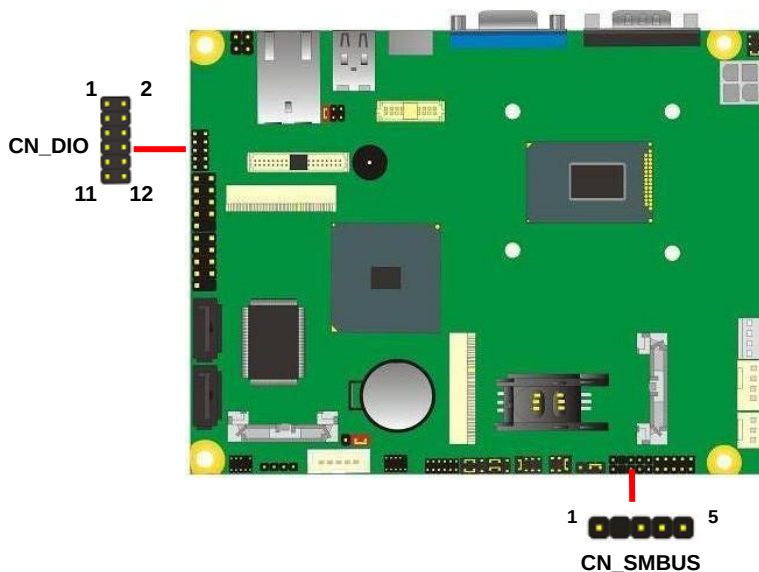
Type: 12-pin (6 x 2) header (pitch = 2.0mm)

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | Ground      | 2   | Ground      |
| 3   | GP10        | 4   | GP14        |
| 5   | GP11        | 6   | GP15        |
| 7   | GP12        | 8   | GP16        |
| 9   | GP13        | 10  | GP17        |
| 11  | 5V          | 12  | 12V         |

Connector: **CN\_SMBUS**

Type: 5-pin header for SMBUS Ports

| Pin | Description |
|-----|-------------|
| 1   | VCC         |
| 2   | N/C         |
| 3   | SMBDATA     |
| 4   | SMBCLK      |
| 5   | Ground      |



## 2.14 <Power Supply and Fan Interface >

### 2.14.1 <Power Input>

The board requires DC input with 4-pin header, the input voltage range is from 9V to 24V, for the input current, please take a reference of the power consumption report on appendix.

Connector: **DC\_IN**  
Type: 4-pin DC power connector

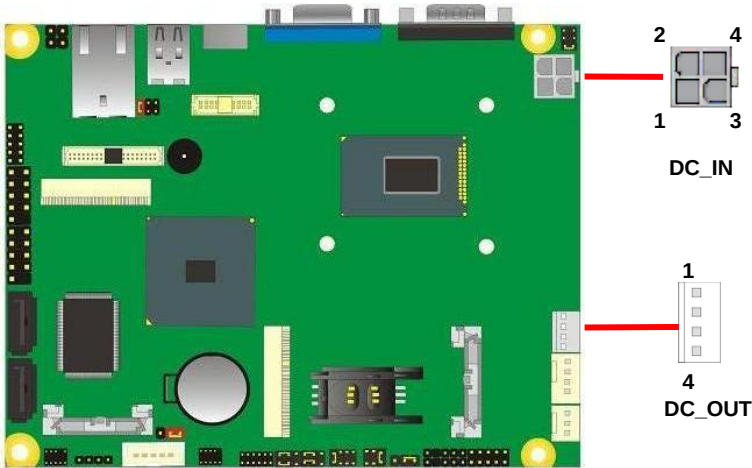
| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | Ground      | 2   | Ground      |
| 3   | +9~+24V     | 4   | +9~+24V     |

### 2.14.2 <Power Output>

Connector: **DC\_OUT**  
Type: 4-pin connector for +5V/+12V **output**

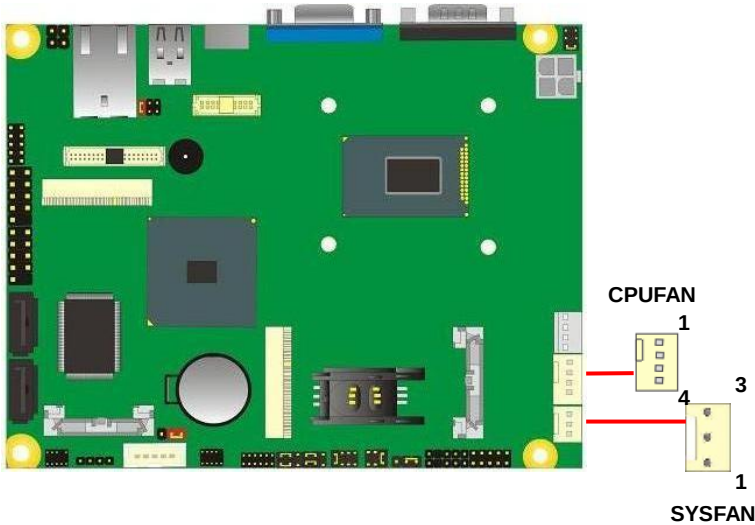
| Pin | Description | Pin | Description | Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|-----|-------------|-----|-------------|
| 1   | +12V        | 2   | Ground      | 3   | Ground      | 4   | +5V         |

**Note: Maximum output current 12V/3A, 5V/3A**



### 2.14.3 <Fan connector>

The board provides one **4-pin** fan connectors supporting smart fan for CPU cooler and one **3-pin** cooler fan connectors for system.



Connector: **CPUFAN**

Type: 4-pin fan wafer connector

| Pin | Description         | Pin | Description |
|-----|---------------------|-----|-------------|
| 1   | Ground              | 2   | +12V        |
| 3   | Fan Speed Detection | 4   | Fan Control |

Connector: **SYSFAN**

Type: 3-pin fan wafer connector

| Pin | Description | Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|-----|-------------|
| 1   | Ground      | 2   | +12V        | 3   | Sense       |

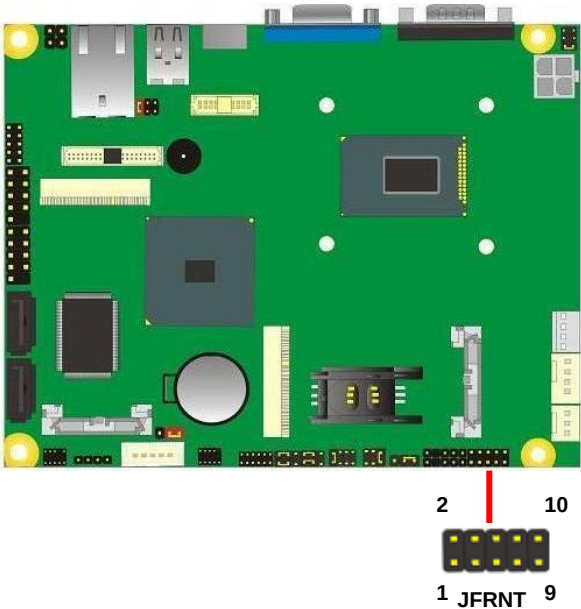
## 2.15 <Switch and Indicator>

The **JFRNT** provides front control panel of the board, such as power button, reset and beeper, etc. Please check well before you connecting the cables on the chassis.

Connector: **JFRNT**

Type: onboard 10-pin (2 x 5) 2.54-pitch header

| Function  | Signal  | PIN |    | Signal  |
|-----------|---------|-----|----|---------|
| Power     | PWRBT-  | 1   | 2  | PWRBT+  |
| Speaker   | SPK-    | 3   | 4  | SPK+    |
| HDD LED   | HLED-   | 5   | 6  | HLED+   |
| Power LED | PWRLED- | 7   | 8  | PWRLED+ |
| Reset     | Reset+  | 9   | 10 | Reset-  |

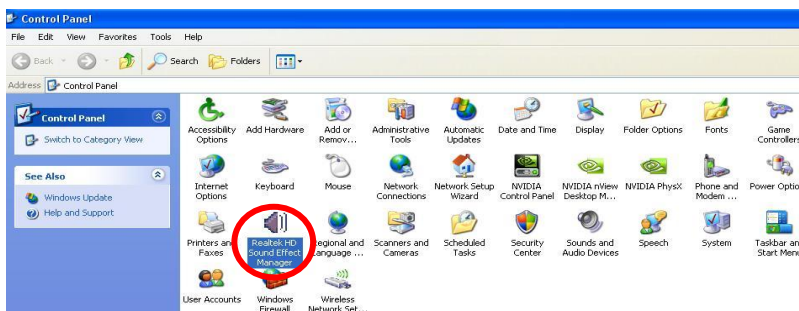


## Chapter 3 <System Setup>

### 3.1 <Audio Configuration>

The board integrates Intel® HM65 with REALTEK® ALC888 codec. It can support 2-channel sound under system configuration. Please follow the steps below to setup your sound system.

1. Install REALTEK HD Audio driver.
2. Launch the control panel and Sound Effect Manager.



3. Select Speaker Configuration

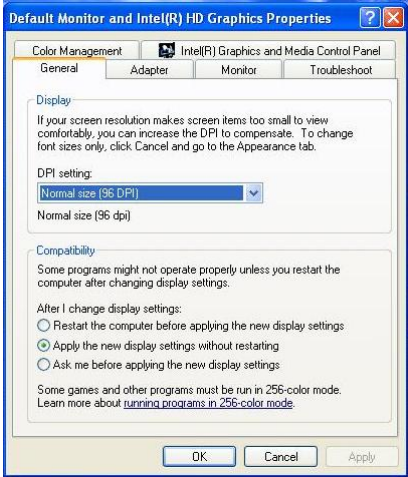


## 3.2 <Display Properties Setting>

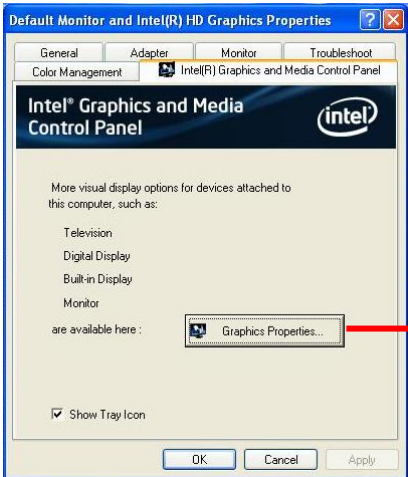
Based on Intel HM65 with HD Graphic, the board supports two DACs for display device as different resolution and color bit.

Please install the Intel Graphic Driver before you starting setup display devices.

1. Click right button on the desktop to lunch **display properties**



2. Click **Advanced** button for more specificity setup.

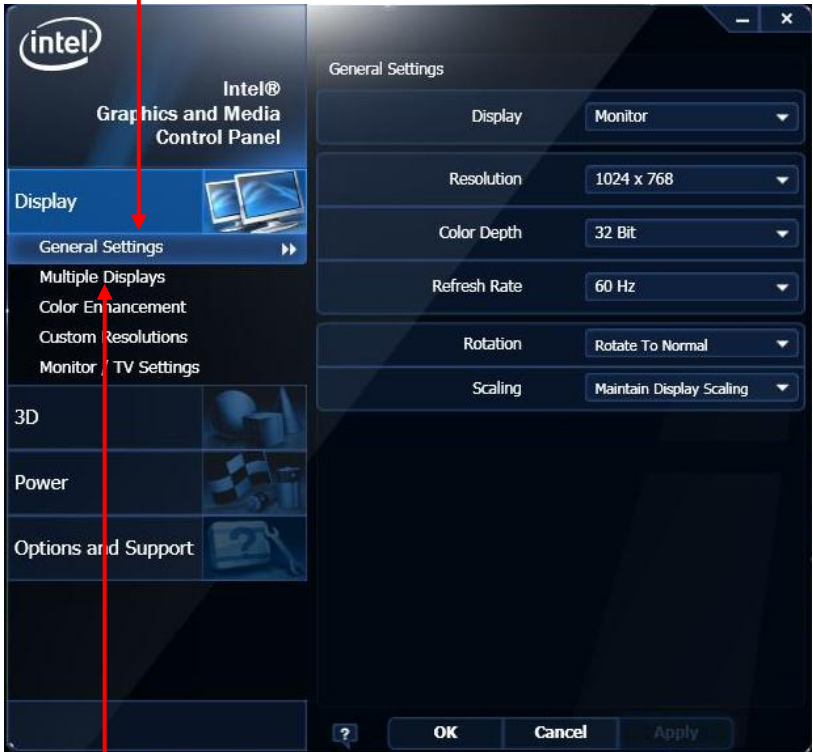


Click Graphics Properties... for advanced setup



3. This setup options can let you define each device settings.

Click **Monitor** to setup the CRT monitor for Resolution and Refresh Rate



Click **Intel® Dual Display Clone** to setup the dual display mode as same screen

## Chapter 4 <BIOS Setup>

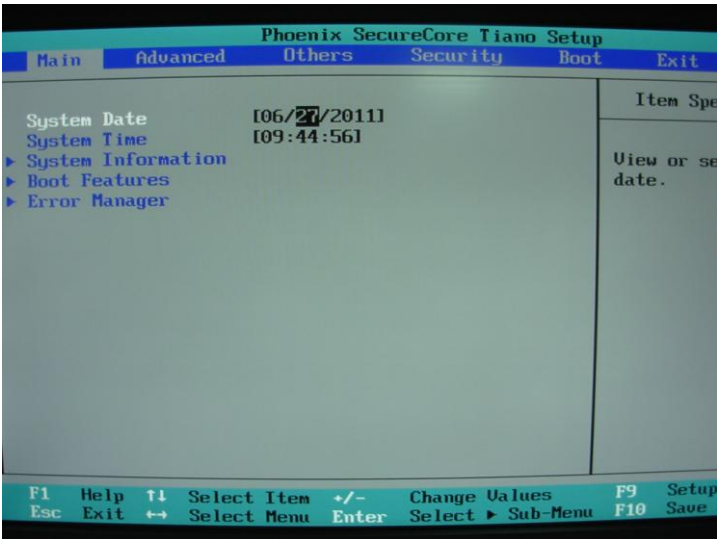
The motherboard uses the Phoenix BIOS for the system configuration. The Phoenix BIOS in the single board computer is a customized version of the industrial standard BIOS for IBM PC AT-compatible computers. It supports Intel x86 and compatible CPU architecture based processors and computers. The BIOS provides critical low-level support for the system central processing, memory and I/O sub-systems.

The BIOS setup program of the single board computer let the customers modify the basic configuration setting. The settings are stored in a dedicated battery-backed memory, NVRAM, retains the information when the power is turned off. If the battery runs out of the power, then the settings of BIOS will come back to the default setting.

The BIOS section of the manual is subject to change without notice and is provided here for reference purpose only. The settings and configurations of the BIOS are current at the time of print, and therefore they may not be exactly the same as that displayed on your screen.

To activate CMOS Setup program, press <DEL> key immediately after you turn on the system. The following message “Press DEL to enter SETUP” should appear in the lower left hand corner of your screen. When you enter the CMOS Setup Utility, the Main Menu will be displayed as **Figure 4-1**. You can use arrow keys to select your function, press <Enter> key to accept the selection and enter the sub-menu.

Figure 4-1 CMOS Setup Utility Main Screen



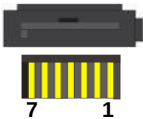
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# Appendix A <I/O Port Pin Assignment>

## A.1 <Serial ATA Port>

Connector: **SATA1/2**

Type: 7-pin wafer connector



| 1   | 2          | 3          | 4   | 5          | 6          | 7   |
|-----|------------|------------|-----|------------|------------|-----|
| GND | RSATA_TXP1 | RSATA_TXN1 | GND | RSATA_RXN1 | RSATA_RXP1 | GND |

## A.2 <IrDA Port>

Connector: **CN\_IR**

Type: 5-pin header for SIR Ports

*JCSEL1 must jump to “SIR”*

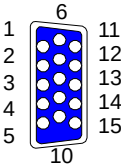
| Pin | Description |
|-----|-------------|
| 1   | VCC         |
| 2   | N/C         |
| 3   | IRRX        |
| 4   | Ground      |
| 5   | IRTX        |



## A.3 <VGA Port>

Connector: **CRT**

Type: 15-pin D-sub female connector on bracket

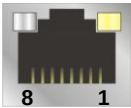


| Pin | Description | Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|-----|-------------|
| 1   | RED         | 6   | Ground      | 11  | N/C         |
| 2   | GREEN       | 7   | Ground      | 12  | DDCDA       |
| 3   | BLUE        | 8   | Ground      | 13  | HSYNC       |
| 4   | N/C         | 9   | N/C         | 14  | VSYNC       |
| 5   | Ground      | 10  | Ground      | 15  | DDCCLK      |

## A.4 <LAN Port>

Connector: **RJ45**

Type: RJ45 connector with LED on bracket



| Pin         | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
|-------------|------|------|------|------|------|------|------|------|
| Description | MI0+ | MI0- | MI1+ | MI2+ | MI2- | MI1- | MI3+ | MI3- |

A.5 <LAN LED Port>

Connector: **JSPD1/2**

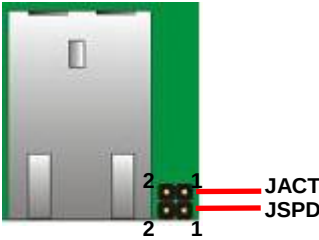
Type: 5-pin header for LAN Speed LED connector

When Lan speed 10/100Mbps

| Pin | Description |
|-----|-------------|
| 1   | LED-        |
| 2   | LED+        |

When Lan speed 1Gbps

| Pin | Description |
|-----|-------------|
| 1   | LED+        |
| 2   | LED-        |



Connector: **JATC1/2**

Type: 5-pin header for LAN Activity LED connector

| Pin | Description |
|-----|-------------|
| 1   | LED-        |
| 2   | LED+        |

A.6 <LPC Port>

Connector: **CN\_LPC**

Type: 10-pin header for LPC Port



| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1   | LPC_CLK     | 2   | RESET-      |
| 3   | LFRAME-     | 4   | LAD3        |
| 5   | LAD2        | 6   | LAD1        |
| 7   | LAD1        | 8   | +3.3V       |
| 9   | Ground      | 10  | Ground      |

## Appendix B <Flash BIOS>

### B.1 <Flash Tool>

The board is based on Phoenix BIOS and can be updated easily by the BIOS auto flash tool. You can download the tool online at the address below:

<http://www.phoenix.com/en/home/>

[http://www.commell.com.tw/Support/Support\\_SBC.htm](http://www.commell.com.tw/Support/Support_SBC.htm)

File name of the tool is "Phlash16.exe", it's the utility that can write the data into the BIOS flash ship and update the BIOS.

### B.2 <Flash BIOS Procedure>

1. Please make a bootable floppy disk.
2. Get the last .bin files you want to update and copy it into the disk.
3. Copy Phlash.exe to the disk.
4. Power on the system and flash the BIOS.  
(Example: C:/Pflash XXX.bin /bbl /cvar /sa)
5. Restart the system.

Any question about the BIOS re-flash please contact your distributors or visit the web-site at below:

<http://www.commell.com.tw/support/support.htm>

## Appendix C <System Resources>

### C.1 <I/O Port Address Map>

#### Input/output (IO)

|                                                                                     |                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
|    | [00000000 - 0000001F] Direct memory access controller                         |
|    | [00000000 - 00000CF7] PCI bus                                                 |
|    | [00000020 - 00000021] Programmable interrupt controller                       |
|    | [00000024 - 00000025] Programmable interrupt controller                       |
|    | [00000028 - 00000029] Programmable interrupt controller                       |
|    | [0000002C - 0000002D] Programmable interrupt controller                       |
|    | [0000002E - 0000002F] Motherboard resources                                   |
|    | [00000030 - 00000031] Programmable interrupt controller                       |
|    | [00000034 - 00000035] Programmable interrupt controller                       |
|    | [00000038 - 00000039] Programmable interrupt controller                       |
|    | [0000003C - 0000003D] Programmable interrupt controller                       |
|    | [00000040 - 00000043] System timer                                            |
|    | [0000004E - 0000004F] Motherboard resources                                   |
|    | [00000050 - 00000053] System timer                                            |
|    | [00000060 - 00000060] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
|    | [00000061 - 00000061] Motherboard resources                                   |
|    | [00000063 - 00000063] Motherboard resources                                   |
|    | [00000064 - 00000064] Standard 101/102-Key or Microsoft Natural PS/2 Keyboard |
|    | [00000065 - 00000065] Motherboard resources                                   |
|    | [00000067 - 00000067] Motherboard resources                                   |
|    | [00000070 - 00000070] Motherboard resources                                   |
|    | [00000070 - 00000077] System CMOS/real time clock                             |
|    | [00000080 - 00000080] Motherboard resources                                   |
|    | [00000081 - 00000091] Direct memory access controller                         |
|    | [00000092 - 00000092] Motherboard resources                                   |
|    | [00000093 - 0000009F] Direct memory access controller                         |
|    | [000000A0 - 000000A1] Programmable interrupt controller                       |
|    | [000000A4 - 000000A5] Programmable interrupt controller                       |
|    | [000000A8 - 000000A9] Programmable interrupt controller                       |
|   | [000000AC - 000000AD] Programmable interrupt controller                       |
|  | [000000B0 - 000000B1] Programmable interrupt controller                       |
|  | [000000B2 - 000000B3] Motherboard resources                                   |
|  | [000000B4 - 000000B5] Programmable interrupt controller                       |
|  | [000000B8 - 000000B9] Programmable interrupt controller                       |
|  | [000000BC - 000000BD] Programmable interrupt controller                       |
|  | [000000C0 - 000000DF] Direct memory access controller                         |
|  | [000000F0 - 000000F0] Numeric data processor                                  |
|  | [00000274 - 00000277] ISAPNP Read Data Port                                   |
|  | [00000279 - 00000279] ISAPNP Read Data Port                                   |
|  | [000002F8 - 000002FF] Communications Port (COM2)                              |
|  | [000003B0 - 000003BB] Intel(R) HD Graphics Family                             |
|  | [000003C0 - 000003DF] Intel(R) HD Graphics Family                             |
|  | [000003F8 - 000003FF] Communications Port (COM1)                              |
|  | [00000400 - 00000453] Motherboard resources                                   |
|  | [00000454 - 00000457] Motherboard resources                                   |
|  | [00000458 - 0000047F] Motherboard resources                                   |
|  | [000004D0 - 000004D1] Programmable interrupt controller                       |
|  | [00000500 - 0000057F] Motherboard resources                                   |
|  | [00000680 - 0000069F] Motherboard resources                                   |
|  | [00000A79 - 00000A79] ISAPNP Read Data Port                                   |
|  | [00000D00 - 0000FFFF] PCI bus                                                 |
|  | [00001000 - 0000100F] Motherboard resources                                   |
|  | [0000164E - 0000164F] Motherboard resources                                   |
|  | [00002000 - 0000203F] Intel(R) HD Graphics Family                             |

|                                                                                  |                                                                                                                |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | [00002060 - 0000207F] Intel(R) 82579LM Gigabit Network Connection #2                                           |
|  | [00002080 - 0000208F] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [00002090 - 0000209F] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [000020A0 - 000020AF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [000020B0 - 000020BF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [000020C0 - 000020C7] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [000020C8 - 000020CF] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [000020D0 - 000020D7] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [000020D8 - 000020DF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [000020E0 - 000020E3] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [000020E4 - 000020E7] Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09 |
|  | [000020E8 - 000020EB] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [000020EC - 000020EF] Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01 |
|  | [0000EFA0 - 0000EFBF] Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22                     |
|  | [0000FFFF - 0000FFFF] Motherboard resources                                                                    |
|  | [0000FFFF - 0000FFFF] Motherboard resources                                                                    |



## C.2 <Memory Address Map>

| Memory                 |                                                                                  |
|------------------------|----------------------------------------------------------------------------------|
| [000A0000 - 000BFFFF]  | Intel(R) HD Graphics Family                                                      |
| [000A0000 - 000BFFFF]  | PCI bus                                                                          |
| [20000000 - 201FFFFFF] | System board                                                                     |
| [40000000 - 401FFFFFF] | System board                                                                     |
| [DFA00000 - FEAFFFFFF] | PCI bus                                                                          |
| [E0000000 - EFFFFFFF]  | Intel(R) HD Graphics Family                                                      |
| [F0000000 - F03FFFFFF] | Intel(R) HD Graphics Family                                                      |
| [F0400000 - F041FFFF]  | Intel(R) 82579LM Gigabit Network Connection #2                                   |
| [F0420000 - F0423FFF]  | Microsoft UAA Bus Driver for High Definition Audio                               |
| [F0424000 - F04240FF]  | Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22             |
| [F0426000 - F04263FF]  | Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26 |
| [F0427000 - F04273FF]  | Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D |
| [F0428000 - F0428FFF]  | Intel(R) 82579LM Gigabit Network Connection #2                                   |
| [F8000000 - FBFFFFFF]  | Motherboard resources                                                            |
| [FED00000 - FED003FF]  | High precision event timer                                                       |
| [FED10000 - FED17FFF]  | Motherboard resources                                                            |
| [FED18000 - FED18FFF]  | Motherboard resources                                                            |
| [FED19000 - FED19FFF]  | Motherboard resources                                                            |
| [FED1C000 - FED1FFFF]  | Motherboard resources                                                            |
| [FED20000 - FED3FFFF]  | Motherboard resources                                                            |
| [FED40000 - FED44FFF]  | PCI bus                                                                          |
| [FED45000 - FED8FFFF]  | Motherboard resources                                                            |
| [FED90000 - FED93FFF]  | Motherboard resources                                                            |
| [FEE00000 - FEEFFFFFF] | Motherboard resources                                                            |
| [FF000000 - FFFFFFFF]  | Intel(R) 82802 Firmware Hub Device                                               |
| [FF000000 - FFFFFFFF]  | Motherboard resources                                                            |

## C.3 <System DMA & IRQ Resources>

### DMA:

-  Direct memory access (DMA)
-  4 Direct memory access controller

### IRQ:

-  Interrupt request (IRQ)
  -  (ISA) 0 System timer
  -  (ISA) 1 Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
  -  (ISA) 3 Communications Port (COM2)
  -  (ISA) 4 Communications Port (COM1)
  -  (ISA) 8 System CMOS/real time clock
  -  (ISA) 9 Microsoft ACPI-Compliant System
  -  (ISA) 12 PS/2 Compatible Mouse
  -  (ISA) 13 Numeric data processor
  -  (PCI) 9 Intel(R) 6 Series/C200 Series Chipset Family SMBus Controller - 1C22
  -  (PCI) 16 Intel(R) 6 Series/C200 Series Chipset Family PCI Express Root Port 1 - 1C10
  -  (PCI) 16 Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C2D
  -  (PCI) 16 Intel(R) HD Graphics Family
  -  (PCI) 19 Intel(R) 6 Series/C200 Series Chipset Family 2 port Serial ATA Storage Controller - 1C09
  -  (PCI) 19 Intel(R) 6 Series/C200 Series Chipset Family 4 port Serial ATA Storage Controller - 1C01
  -  (PCI) 20 Intel(R) 82579LM Gigabit Network Connection #2
  -  (PCI) 22 Microsoft UAA Bus Driver for High Definition Audio
  -  (PCI) 23 Intel(R) 6 Series/C200 Series Chipset Family USB Enhanced Host Controller - 1C26

## Appendix D <Programming GPIO's>

The GPIO can be programmed with the MSDOS debug program using simple IN/OUT commands. The following lines show an example how to do this.

GPIO0.....GPIO7    bit0.....bit7

```
-o 2 E 87                                ;enter configuration
-o 2 E 87
-o 2 E 07
-o 2 F 09                                ;enable GPIO function
-o 2 E 30
-o 2 F 02                                ;enable GPIO configuration
-o 2 E F0
-o 2 F xx                                ;set GPIO as input/output; set '1' for input,'0'for
output
-o 2 E F1
-o 2 F xx                                ;if set GPIO's as output,in this register its value can
be set
```

Optional :

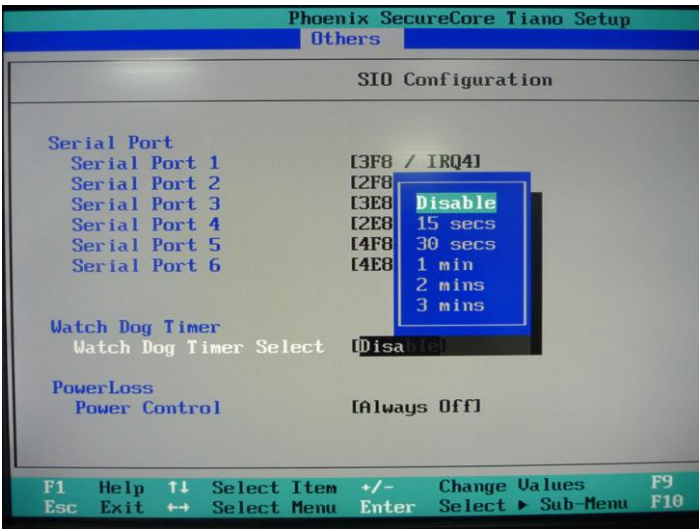
```
-o 2 E F2
-o 2 F xx                                ; Data inversion register ; '1' inverts the current valus
of the bits ,'0' leaves them as they are
-o 2 E 30
-o 2 F 01                                ; active GPIO's
```

For further information, please refer to Winbond W83627DHG datasheet.

## Appendix E <Programming Watchdog Timer >

The watchdog timer makes the system auto-reset while it stops to work for a period.

The integrated watchdog timer can be setup as system reset mode by program.



### Timeout Value Range

- 1 to 255
- Second or Minute

### Program Sample

Watchdog timer setup as system reset with 5 second of timeout

---

|        |                  |
|--------|------------------|
| 2E, 87 |                  |
| 2E, 87 |                  |
| 2E, 07 |                  |
| 2F, 08 | Logical Device 8 |
| 2E, 30 | Activate         |
| 2F, 01 |                  |
| 2E, F5 | Set as Second*   |
| 2F, 00 |                  |
| 2E, F6 | Set as 5         |
| 2F, 05 |                  |

---

\* Minute: bit 3 = 0; Second: bit 3 = 1

You can select Timer setting in the BIOS, after setting the time options, the system will reset according to the period of your selection.

## Contact Information

Any advice or comment about our products and service, or anything we can help you please don't hesitate to contact with us. We will do our best to support you for your products, projects and business

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