

MB966

**Intel® Xeon® / Core™ i3/i5/i7
Motherboard**

USER'S MANUAL

Version 1.3

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Introduction

Product Description

MB966 incorporates Intel® 3450 PCH chipset. Currently, the board is available in three models, namely:

Model	Chipset	LAN Bypass	Watchdog Timer
MB966	Intel® 3450 PCH	Yes	Yes
MB966-NB	Intel® 3450 PCH	No	Yes

MB966 Features

- Supports 6 Intel® 10/100/1000 LAN ports with 2 segments Bypass
- Supports Intel® Xeon® / Core™ i7/i5/i3/Pentium® G6950 processor
- DDR3 x4, up to 16GB
- Mini PCI-e (mSATA compatible) slot, Compact Flash socket
- Hardware LAN Bypass function on Eth 1/2 & 3/4 (MB966)

Specifications

Product Name	MB966
Processor	<p>Support for Intel® Lynnfield and Clarkdale processors which fall within mainstream TDP envelope, up to 95W TDP.</p> <p>Support for the following Intel® technologies:</p> <ul style="list-style-type: none"> • Turbo Boost • Intel® 64 (64-bit extensions) • XD (Execution Disable Bit) • Hyper-Threading • VT-d (Intel® Virtualization Technology for Directed I/O) • TXT (Trusted Execution Technology)
Processor Speed	<ul style="list-style-type: none"> • Intel® Xeon X3450, X3430 • Intel® Core i7-860 • Intel® Core i5-750 • Intel® Core i5-660 (integrated graphics support) • Intel® Core i3-540 (integrated graphics support) • Intel® Pentium® Processor G6950 (integrated graphics support)
CPU VRD	Appropriate VRD for Lynnfield and Clarkdale
Chipset	Intel® 3450 PCH chip (single chip w/o ICH)
BIOS	AMI BIOS

INTRODUCTION

Memory	<ul style="list-style-type: none">• Dual channel DDR3 up to 1333MHz• Unbuffered with ECC or Unbuffered & non-ECC• Four DIMM sockets for max. 16GB memory
Video	<ul style="list-style-type: none">• Intel® Core™ i5 / Pentium integrated
Network Controller	<ul style="list-style-type: none">• MGN1: Intel® Nineveh Gigabit PHY (82578DM) w/ AMT support• LAN1~6: Intel® 82574L Gigabit Ethernet NIC Supports SNMP, PXE & Wake-on-LAN
Network Bypass (MB966)	<ul style="list-style-type: none">• Supports two bypass segments• Control by GPIO / Watchdog
SATA II	Intel® 3450 built-in SATA II controller (3.0Gb/sec), 3 ports
Compact Flash	CF Flash type II

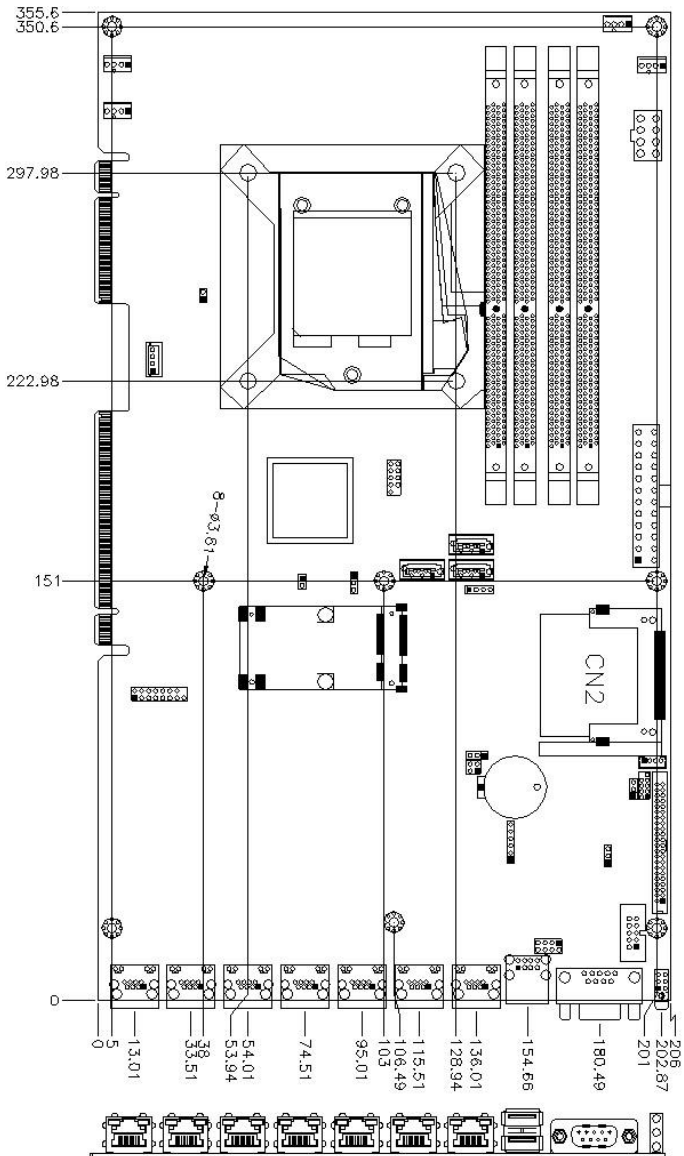
USB	Intel® 3450 built-in High Speed USB host controller, use 4 ports: <ul style="list-style-type: none">• 2-port at front panel• 2-port USB by box header 2x4
LPC I/O	Winbond W83627DHG: <ul style="list-style-type: none">• COM1 by pin header 1x8• KB/Mouse by pin header 1x6• Hardware monitor (3 thermal inputs, 4 voltage monitor inputs & 2 fan headers)
RTC	Intel® 3450 built-in RTC with on-board lithium battery & holder
Expansion	Two PCI-e x8 (Golden Finger) One Type II CF (Internal socket)
Front Panel LEDs	Status LED function as follows: #1 LED: System Power (Green, defined by S/W) #2 LED: Status2 / Alarm (Red / Green, defined by S/W) #3 LED: Status1 (Red / Yellow, defined by S/W)
Front Panel Connectors	<ul style="list-style-type: none">• One Dual layer USB type A connector• One RJ-45 for Management port• Six RJ-45 with Link/Act, Speed LED for 10/100/1000M Ethernet• Three status LED
Fan Connectors	<ul style="list-style-type: none">• 4 pins pin-header x2 for CPU fan (near CPU w/ tachometer sense)• 4 pins pin-header x2 for System fan (near rear side)
Power Connector	Supports 24pins + 8pins
Power Management	ACPI compliant – 5 levels: Full-on (S0) / Stop Grant (S1) / Suspend to Disk (S4) / Soft-off (S5)
Watchdog Timer	Yes (256 segments, 0, 1, 2...255 sec/min)
TPM	Winbond WPCT200 TPM1.2 controller x1 for Trust Platform 1.2
RoHS Compliant	Yes
MTBF	100,000
Board Size	8.11" x 14" (206 x 355.6 mm)

Checklist

Your MB966 package should include the items listed below.

- The MB966 motherboard
- The MB966 Driver DVD

Board Dimensions



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Installations

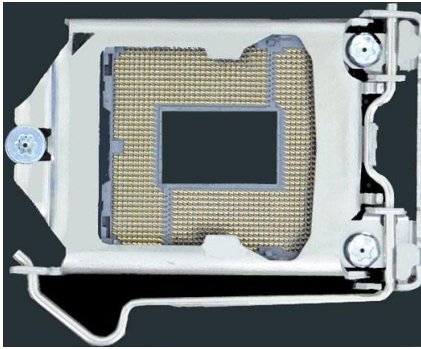
This section provides information on how to use the jumpers and connectors on the MB966 in order to set up a workable system. The topics covered are:

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Installing the CPU

The MB966 board supports an LGA1156 Socket (shown below) for Intel Clarkdale processors.

To install the CPU, unlock first the socket by pressing the lever sideways, then lift it up to a 90-degree. Then, position the CPU above the socket such that the CPU corner aligns with the gold triangle matching the socket corner with a small triangle. Carefully insert the CPU into the socket and push down the lever to secure the CPU. Then, install the heat sink and fan.



NOTE: *Ensure that the CPU heat sink and the CPU top surface are in total contact to avoid CPU overheating problem that would cause your system to hang or be unstable.*

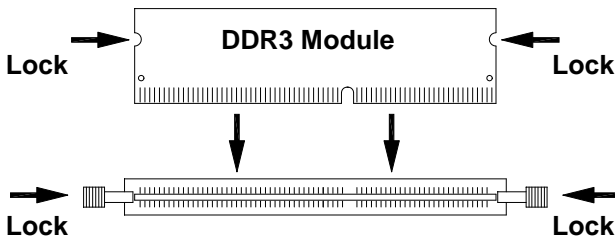
Installing the Memory

The MB966 board supports four DDR3 memory socket for a maximum total memory of 16GB in DDR3 DIMM memory type.

Installing and Removing Memory Modules

To install the DDR3 modules, locate the memory slot on the board and perform the following steps:

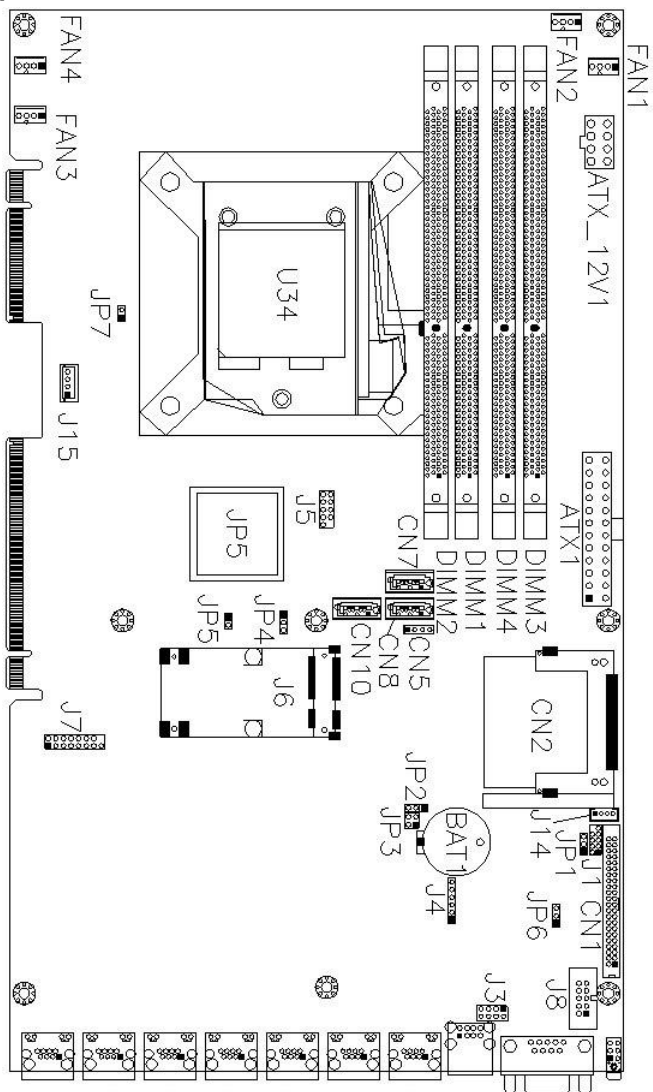
1. Hold the DDR3 module so that the key of the DDR3 module aligned with that on the memory slot.
2. Gently push the DDR3 module in an upright position until the clips of the slot close to hold the DDR3 module in place when the DDR3 module touches the bottom of the slot.
3. To remove the DDR3 module, press the clips with both hands.



Setting the Jumpers

Jumpers are used on MB966 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on MB966 and their respective functions.

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

JP2, JP3: Watchdog Timer & CN11~CN14 LAN Bypass Settings

JP4: Clear CMOS Contents





JP6: ATX / AT Power Mode Setting

JP7: PCIE1 & PCIE2 Golden Finger PCI-e Configuration

Jumper Settings on MB966**JP1: TPM Enable/Disable Setting**



JP1	Setting	Function
	Pin 1-2 Short/Closed	Enable
	Pin 2-3 Short/Closed	Disable

JP2, JP3: Watchdog Timer & LAN Bypass Settings (MB966)



JP2, JP3	Setting	Function	Power Off	Power On OS Run Software
	<u>JP2</u> Pin 2-3 Closed	System LAN bypass function is controlled by Super I/O GP23	LAN Bypass	GP23 Active: Low: Bypass High: Normal
	<u>JP3</u> Pin 1-2 Open & 3-4 Closed	System will reboot upon the time out of watchdog timer.		WDT Reboot System
	<u>JP2</u> Pin 1-2 Closed	System will bypass LAN upon the time out of watchdog timer.	LAN Bypass	
	<u>JP3</u> Pin 1-2 & 3-4 Open			
 (Default)	<u>JP2</u> Pin 2-3 Closed	System LAN bypass function is controlled by Super I/O GP23.	LAN Bypass	GP23 Active: Low: Bypass High: Normal
	<u>JP3</u> Pin 1-2 & 3-4 Open			
	<u>JP2</u> Pin 1-2 Closed	System LAN is at normal	LAN Bypass	LAN Always Normal
	<u>JP3</u> Pin 1-2 & 3-4 Closed	System will reboot upon the time out of watchdog timer.		WDT Reboot System

JP4: Clear CMOS Contents



Use JP4 to clear the CMOS contents. *Note that the ATX-power connector should be disconnected from the board before clearing CMOS.*

JP4	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	Normal
 1 2 3	Pin 2-3 Short/Closed	Clear CMOS



JP5: ME (Intel® Management Engine) Enable/Disable

JP5	Setting	Function
 Open	Open	Enable
 Short	Short/Closed	Disable

JP6: ATX / AT Power Mode Setting

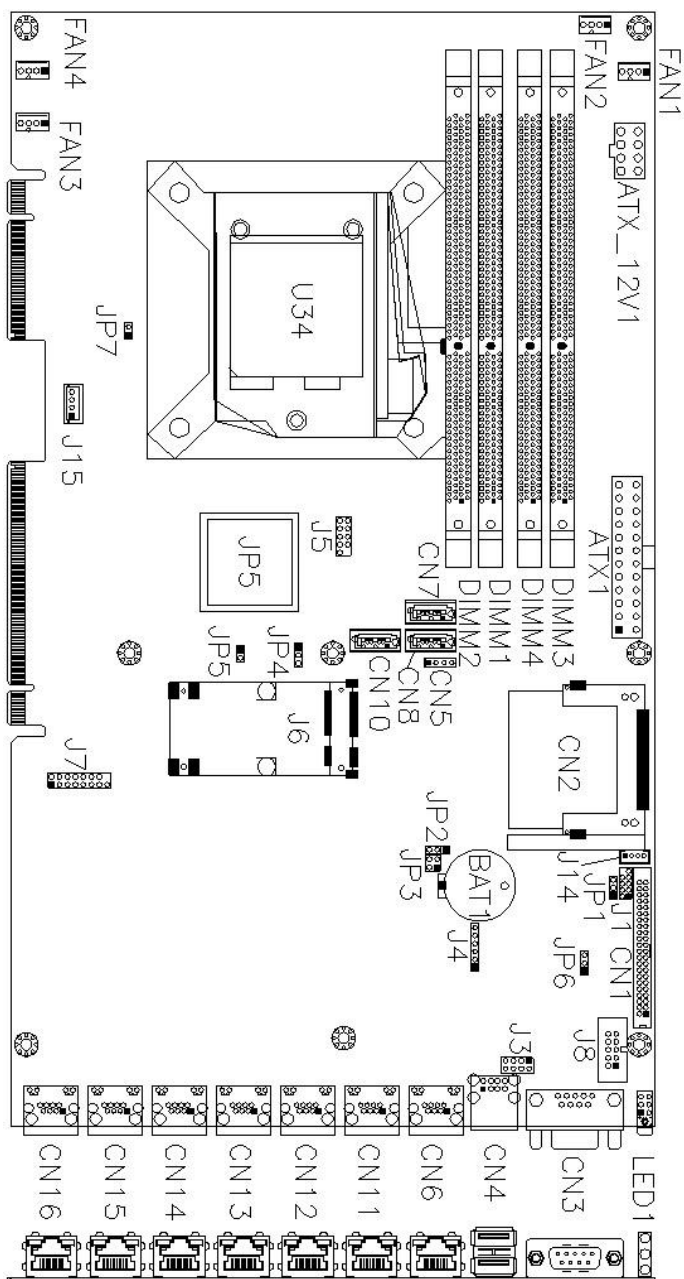
JP1	Setting	Function
 1 2 3	Pin 1-2 Short/Closed	ATX
 1 2 3	Pin 2-3 Short/Closed	AT

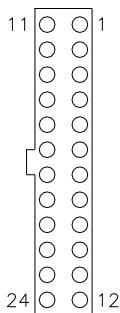
JP7: PCIE1 & PCIE2 Golden Finger PCI-e Configuration

JP7	Setting	Function	Remarks
 Open	Open	Combine to 1x16	For CPU with Integrated Graphics support
 Short	Short/Closed	Separate to 2x8	Default for CPU without Integrated Graphics support

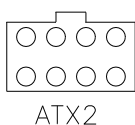
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Connector Locations on MB966


USB_LAN1: 10/100/1000 RJ-45 (MB966) and USB1/2 Ports**ATX1: 24-pin ATX Power Connector**

Signal Name	Pin #	Pin #	Signal Name
3.3V	13	1	3.3V
-12V	14	2	3.3V
Ground	15	3	Ground
PS-ON	16	4	+5V
Ground	17	5	Ground
Ground	18	6	+5V
Ground	19	7	Ground
-5V	20	8	Power good
+5V	21	9	5VSB
+5V	22	10	+12V
+5V	23	11	+12V
Ground	24	12	+3.3V

ATX_12V1: ATX 12V Power Connector

Signal Name	Pin #	Pin #	Signal Name
+12V	5	1	Ground
+12V	6	2	Ground
+12V	7	3	Ground
+12V	8	4	Ground

DIMM1, DIMM2: Channel A DDR3 Socket

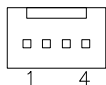
DIMM1 and DIMM2 are the first-channel DDR3 sockets.

DIMM3, DIMM4: Channel B DDR3 Socket

DIMM3 and DIMM4 are the second-channel DDR3 sockets.

FAN1/2: CPU Fan Power Connectors

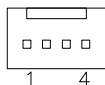
FAN1/2 are 4-pin headers for system fan power. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

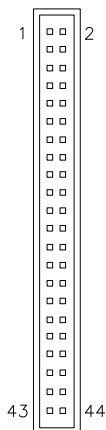
FAN3/4: System Fan Power Connectors

FAN3/4 are 4-pin headers for system fan power. The fan must be a 12V fan.



Pin #	Signal Name
1	Ground
2	+12V
3	Rotation detection
4	Control

CN1: Front Side Bridge Board to ID370

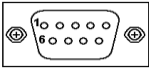


Signal Name	Pin #	Pin #	Signal Name
PWR-SW	1	2	GND
Reset-SW	3	4	GND
Speaker	5	6	VCC
VCC	7	8	VCC
GND (Power)	9	10	Pull up to VCC
HDD LED	11	12	Pull up to VCC
RELAY LED	13	14	Pull up to VCC
GND	15	16	GND
GND	17	18	GND
GPO0	19	20	GPI0
GPO1	21	22	GPI1
GPO2	23	24	GPI2
GPO3	25	26	GPI3
GPO4	27	28	GPI4
GPO5	29	30	GPI5
GPO6	31	32	GPI6
GPO7	33	34	GPI7
VCC	35	36	VCC
GPIO31	37	38	GPIO56
GPIO46	39	40	GPIO57
GPIO47	41	42	GPIO73
VCC3	43	44	VCC3

CN2: Slim Type II Compact Flash Connector

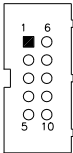
CN3: COM1 Serial Port

CN3 (COM1) is a DB-9 connector.



J8: COM2 Serial Port

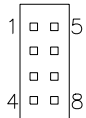
Pin #	Signal Name (RS-232)
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	Ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator
10	No Connect.



CN4: USB Connector

J3: USB Header

Signal Name	Pin #	Pin #	Signal Name
VCC	1	5	Ground
USB2-	2	6	USB3+
USB2+	3	7	USB3-
Ground	4	8	VCC



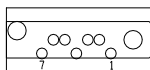
CN5: SGPIO Connector



Pin #	Signal Name
1	SCLOCK
2	SLOAD
3	SDATAOUT0
4	SDATAOUT1

CN6, CN9, CN11, CN12, CN13, CN14, CN15, CN16: LAN RJ-45

CN7, CN8, CN10: SATA HDD Connector



Pin #	Signal Name
1	Ground
2	TX+
3	TX-
4	Ground
5	RX-
6	RX+
7	Ground

J1: LPC Debug Port (Factory use only)

J4: PS2 Keyboard/Mouse Connector



Pin #	Signal Name
1	KBDATA
2	KBCLK
3	MSDATA
4	MSCLK
5	GND
6	+5V

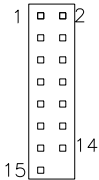
J5: SPI Debug Port (Factory use only)

J6: Mini-Card Connector

INSTALLATIONS

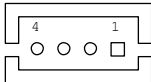
J7: VGA Box Header

(Available for Integrated Graphics in selected CPU only)



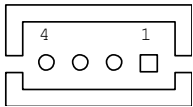
Signal Name	Pin	Pin	Signal Name
R	1	2	+5V
G	3	4	GND
B	5	6	NC
NC	7	8	SPD1
GND	9	10	Hsync
GND	11	12	Vsync
GND	13	14	SPCLK
GND	15		

J14: Power Output Connector



Pin #	Signal Name
1	+5V
2	GND
3	GND
4	+12V

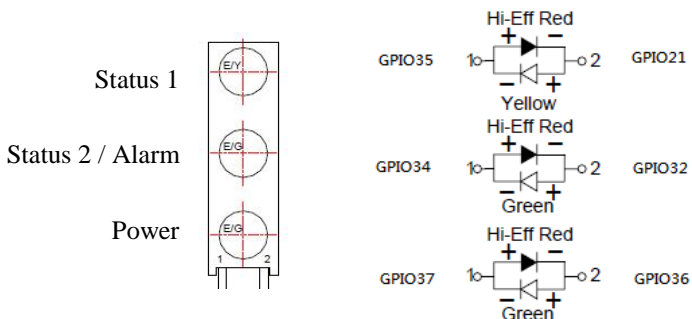
J15: Power Output Connector



Pin #	Signal Name
1	+5V
2	GND
3	GND
4	+12V

LED GPIO Definition

This chapter describes GPIO definition of three LEDs on front panel.



Status1 LED	GPIO35	GPIO21
RED	H	L
YELLOW	L	H

Status2 / Alarm LED	GPIO34	GPIO32
RED	H	L
GREEN	L	H

Power LED	GPIO37	GPIO36
RED	H	L
GREEN	L	H

Digital I/O Sample Configuration

Filename : Main.cpp

```
//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627DHG.H"
//-----

int main (void);

void Dio2Initial(void);
void Dio2SetOutput(unsigned char);
unsigned char Dio2GetInput(void);
void Dio2SetDirection(unsigned char);
unsigned char Dio2GetDirection(void);

void Dio3Initial(void);
void Dio3SetOutput(unsigned char);
unsigned char Dio3GetInput(void);
void Dio3SetDirection(unsigned char);
unsigned char Dio3GetDirection(void);
//-----
int main (void)
{
    char SIO;

    SIO = Init_W627DHG();
    if (SIO == 0)
    {
        printf("Can not detect Winbond 83627DHG, program abort.\n");
        return(1);
    }

    Dio2Initial();
    Dio3Initial();

    //for GPIO30..37
    Dio3SetDirection(0x0F);    //GP30..33 = input, GP34..37=output
    printf("Current DIO direction = 0x%X\n", Dio3GetDirection());

    printf("Current DIO status = 0x%X\n", Dio3GetInput());

    printf("Set DIO output to high\n");
    Dio3SetOutput(0x0F);

    printf("Set DIO output to low\n");
    Dio3SetOutput(0x00);

    return 0;
}
//-----
void Dio2Initial(void)
{
    unsigned char ucBuf;

    //switch GPIO multi-function pin
    ucBuf = Get_W627DHG_Reg(0x24);
    ucBuf &= 0xFE;
    Set_W627DHG_Reg(0x24, ucBuf);

    Set_W627DHG_LD(0x09);    //switch to logic device 9

    //enable the GP2 group

```

```

        ucBuf = Get_W627DHG_Reg(0x30);
        ucBuf |= 0x01;
        Set_W627DHG_Reg(0x30, ucBuf);
    }
//-----
void Dio2SetOutput(unsigned char)
{
    Set_W627DHG_LD(0x09);
    Set_W627DHG_Reg(0xE4, NewData);
}
//-----
unsigned char Dio2GetInput(void)
{
    unsigned char result;

    Set_W627DHG_LD(0x09);
    result = Get_W627DHG_Reg(0xE4);
    return (result);
}
//-----
void Dio2SetDirection(unsigned char)
{
    //NewData : 1 for input, 0 for output
    Set_W627DHG_LD(0x09);
    Set_W627DHG_Reg(0xE3, NewData);
}
//-----
unsigned char Dio2GetDirection(void)
{
    unsigned char result;

    Set_W627DHG_LD(0x09);
    result = Get_W627DHG_Reg(0xE0);
    return (result);
}
//-----
void Dio3Initial(void)
{
    unsigned char ucBuf;

    //switch GPIO multi-function pin
    ucBuf = Get_W627DHG_Reg(0x2C);
    ucBuf &= 0x1F;
    Set_W627DHG_Reg(0x2C, ucBuf);
    //clear

    Set_W627DHG_LD(0x09);
    //switch to logic device 9

    //enable the GP3 group
    ucBuf = Get_W627DHG_Reg(0x30);
    ucBuf |= 0x02;
    Set_W627DHG_Reg(0x30, ucBuf);

    //input detect type
    Set_W627DHG_Reg(0xFE, 0xFF);
}
//-----
void Dio3SetOutput(unsigned char NewData)
{
    Set_W627DHG_LD(0x09);
    Set_W627DHG_Reg(0xF1, NewData);
}
//-----
unsigned char Dio3GetInput(void)
{
    unsigned char result;

    Set_W627DHG_LD(0x09);
    result = Get_W627DHG_Reg(0xF1);
    return (result);
}
//-----
void Dio3SetDirection(unsigned char NewData)
{

```

INSTALLATIONS

```
//NewData : 1 for input, 0 for output
Set_W627DHG_LD(0x09);
Set_W627DHG_Reg(0xF0, NewData);
//switch to logic device 9

}
//-----
unsigned char Dio3GetDirection(void)
{
    unsigned char result;

    Set_W627DHG_LD(0x09);
    result = Get_W627DHG_Reg(0xF0);
    return (result);
    //switch to logic device 9
}
//-----
```

Filename : W627DHG.cpp

```
//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include "W627DHG.H"
#include <dos.h>
//-----
unsigned int W627DHG_BASE;
void Unlock_W627DHG (void);
void Lock_W627DHG (void);
//-----
unsigned int Init_W627DHG(void)
{
    unsigned int result;
    unsigned char ucDid;

    W627DHG_BASE = 0x4E;
    result = W627DHG_BASE;

    ucDid = Get_W627DHG_Reg(0x20);
    if (ucDid == 0xA0)
    {
        goto Init_Finish;
    }
    else if (ucDid == 0xB0)
    {
        goto Init_Finish;
    }
    //W83627DHG
    //W83627DHG-P

    W627DHG_BASE = 0x2E;
    result = W627DHG_BASE;

    ucDid = Get_W627DHG_Reg(0x20);
    if (ucDid == 0xA0)
    {
        goto Init_Finish;
    }
    else if (ucDid == 0xB0)
    {
        goto Init_Finish;
    }
    //W83627DHG
    //W83627DHG-P

    W627DHG_BASE = 0x00;
    result = W627DHG_BASE;

Init_Finish:
    return (result);
}
//-----
void Unlock_W627DHG (void)
{
    outportb(W627DHG_INDEX_PORT, W627DHG_UNLOCK);
    outportb(W627DHG_INDEX_PORT, W627DHG_UNLOCK);
}
//-----
void Lock_W627DHG (void)
{
    outportb(W627DHG_INDEX_PORT, W627DHG_LOCK);
}
//-----
```

```

void Set_W627DHG_LD( unsigned char LD)
{
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, W627DHG_REG_LD);
    outportb(W627DHG_DATA_PORT, LD);
    Lock_W627DHG();
}
//-----
void Set_W627DHG_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, REG);
    outportb(W627DHG_DATA_PORT, DATA);
    Lock_W627DHG();
}
//-----
unsigned char Get_W627DHG_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, REG);
    Result = inportb(W627DHG_DATA_PORT);
    Lock_W627DHG();
    return Result;
}
//-----

```

Filename : W627DHG.h

```

//-----
//
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// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#ifndef __W627DHG_H
#define __W627DHG_H                1
//-----
#define W627DHG_INDEX_PORT        (W627DHG_BASE)
#define W627DHG_DATA_PORT        (W627DHG_BASE+1)
//-----
#define W627DHG_REG_LD            0x07
//-----
#define W627DHG_UNLOCK            0x87
#define W627DHG_LOCK              0xAA
//-----
unsigned int Init_W627DHG(void);
void Set_W627DHG_LD( unsigned char);
void Set_W627DHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627DHG_Reg( unsigned char);
//-----
#endif //__W627DHG_H

```

Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

This code and information is provided "as is" without warranty of any kind, either expressed or implied, including but not limited to the implied warranties of merchantability and/or fitness for a particular purpose.

Filename : Main.cpp

```
//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include <dos.h>
#include <conio.h>
#include <stdio.h>
#include <stdlib.h>
#include "W627DHG.H"
//-----
int main (void);

void WDTInitial(void);
void WDTEnable(unsigned char);
void WDTDisable(void);

//-----
int main (void)
{
    char SIO;

    SIO = Init_W627DHG();
    if (SIO == 0)
    {
        printf("Can not detect Winbond 83627DHG, program abort.\n");
        return(1);
    }

    WDTInitial();

    WDTEnable(10);

    WDTDisable();

    return 0;
}
//-----
void WDTInitial(void)
{
    unsigned char bBuf;

    bBuf = Get_W627DHG_Reg(0x2D);
    bBuf &= (~0x01);
    Set_W627DHG_Reg(0x2D, bBuf);           //Enable WDTO
}
//-----
```

```

void WDTEnable(unsigned char NewInterval)
{
    unsigned char bBuf;

    Set_W627DHG_LD(0x08);                //switch to logic device 8
    Set_W627DHG_Reg(0x30, 0x01);          //enable timer

    bBuf = Get_W627DHG_Reg(0xF5);
    bBuf &= (~0x08);
    Set_W627DHG_Reg(0xF5, bBuf);          //count mode is second

    Set_W627DHG_Reg(0xF6, NewInterval);    //set timer
}
//-----
void WDTDisable(void)
{
    Set_W627DHG_LD(0x08);                //switch to logic device 8
    Set_W627DHG_Reg(0xF6, 0x00);          //clear watchdog timer
    Set_W627DHG_Reg(0x30, 0x00);          //watchdog disabled
}
//-----

```

Filename : W627DHG.cpp

```

//-----
//
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// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#include "W627DHG.H"
#include <dos.h>
//-----
unsigned int W627DHG_BASE;
void Unlock_W627DHG (void);
void Lock_W627DHG (void);
//-----
unsigned int Init_W627DHG(void)
{
    unsigned int result;
    unsigned char ucDid;

    W627DHG_BASE = 0x4E;
    result = W627DHG_BASE;

    ucDid = Get_W627DHG_Reg(0x20);
    if (ucDid == 0xA0)                //W83627DHG
    {   goto Init_Finish;   }
    else if (ucDid == 0xB0)            //W83627DHG-P
    {   goto Init_Finish;   }

    W627DHG_BASE = 0x2E;
    result = W627DHG_BASE;

    ucDid = Get_W627DHG_Reg(0x20);
    if (ucDid == 0xA0)                //W83627DHG
    {   goto Init_Finish;   }
    else if (ucDid == 0xB0)            //W83627DHG-P
    {   goto Init_Finish;   }

    W627DHG_BASE = 0x00;
    result = W627DHG_BASE;

Init_Finish:
    return (result);
}
//-----
void Unlock_W627DHG (void)
{
    outportb(W627DHG_INDEX_PORT, W627DHG_UNLOCK);
    outportb(W627DHG_INDEX_PORT, W627DHG_UNLOCK);
}

```

INSTALLATIONS

```
}
//-----
void Lock_W627DHG (void)
{
    outportb(W627DHG_INDEX_PORT, W627DHG_LOCK);
}
//-----
void Set_W627DHG_LD( unsigned char LD)
{
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, W627DHG_REG_LD);
    outportb(W627DHG_DATA_PORT, LD);
    Lock_W627DHG();
}
//-----
void Set_W627DHG_Reg( unsigned char REG, unsigned char DATA)
{
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, REG);
    outportb(W627DHG_DATA_PORT, DATA);
    Lock_W627DHG();
}
//-----
unsigned char Get_W627DHG_Reg(unsigned char REG)
{
    unsigned char Result;
    Unlock_W627DHG();
    outportb(W627DHG_INDEX_PORT, REG);
    Result = inportb(W627DHG_DATA_PORT);
    Lock_W627DHG();
    return Result;
}
//-----
```

Filename : W627DHG.h

```
//-----
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//-----
#ifndef __W627DHG_H
#define __W627DHG_H                1
//-----
#define W627DHG_INDEX_PORT        (W627DHG_BASE)
#define W627DHG_DATA_PORT         (W627DHG_BASE+1)
//-----
#define W627DHG_REG_LD            0x07
//-----
#define W627DHG_UNLOCK            0x87
#define W627DHG_LOCK              0xAA
//-----
unsigned int Init_W627DHG(void);
void Set_W627DHG_LD( unsigned char);
void Set_W627DHG_Reg( unsigned char, unsigned char);
unsigned char Get_W627DHG_Reg( unsigned char);
//-----
#endif // __W627DHG_H
```

BIOS Setup

This chapter describes the different settings available in the AMI BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction	30
BIOS Setup	30
Main BIOS Setup	31
Advanced Settings	32
PCIPnP Settings	44
Boot Settings	46
Security Settings	47
Advanced Chipset Settings	48
Exit Setup	51
Load Optimal Defaults	51
Load Failsafe Defaults	51

BIOS Introduction

The BIOS (Basic Input/Output System) installed in your computer system's ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

BIOS Setup

The BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the BIOS is immediately activated. Pressing the key immediately allows you to enter the Setup utility. If you are a little bit late pressing the key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

Press to Enter Setup

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Main BIOS Setup

This setup allows you to view processor configuration used in your computer system and set the system time and date.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Processor Intel(R) Core(TM) i5 CPU 660 @ 3.33GHz Speed : 3333MHz Count : 1				Use[ENTER], [TAB] or [SHIFT-TAB] to select a field.		
System Memory Size : 8056MB				Use [+] or [-] to configure system Time.		
System Time [02:29:50]				<- Select Screen		
System Date [Fri 01/02/2009]				↑ ↓ Select Item		
				+- Change Field		
				Tab Select Field		
				F1 General Help		
				F10 Save and Exit		
				ESC Exit		

Note: *If the system cannot boot after making and saving system changes with Setup, the AMI BIOS supports an override to the CMOS settings that resets your system to its default.*

Warning: *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both AMI and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

Advanced Settings

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanced Settings WARNING: Setting wrong values in below sections may cause system to malfunction.				Configure CPU.		
<ul style="list-style-type: none"> ► CPU Configurations ► IDE Configuration ► SuperIO Configuration ► Hardware Health Configuration ► ACPI Configuration ► AHCI Configuration ► Event Log Configuration ► Intel AMT Configuration ► Intel VT-d Configuration ► MPS Configuration ► PCI Express Configuration ► Remote Access Configuration ► Trusted Computing ► USB Configuration ► Clock Generator Configuration 				<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

The Advanced BIOS Settings configurations are shown in the following pages, as seen in the computer screen. Please note that setting the wrong values may cause the system to malfunction.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Configure advanced CPU settings Module Version: 01.08				Configure CPU.		
Manufacturer: Intel Intel(R) Core(TM) i5 CPU Frequency : 3.33GHz BLCK Speed : 133MHz Cache L1 : 128KB Cache L2 : 512KB Cache L3 : 4096KB Ratio Status: Unlocked (Min:09, Max:25) Ratio Actual Value: 9.5				<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		
Ratio CMOS Setting 25 MPS and ACPI MADT ordering Modern ordering Max CPUID Value Limit Disabled Intel(R) Virtualization Tech Disabled Active Processor Cores All A20M Disabled ► Intel PPM Configuration						

The CPU Configuration menu shows the following CPU details including the manufacturer, CPU type, its frequency and cache levels. Other options include:

Ratio CMOS Setting

Sets the ratio between CPU core clock and the FSB frequency.

MPS and ACPI MADT ordering

Modern ordering for Windows XP or later OSes. Legacy ordering for Windows 2000 or earlier OSes.

Max CPU ID Value Limit

Disabled for Windows XP.

Intel Virtualization Tech

When enabled, a VMM can utilize the additional HW Caps. Provided by Intel Virtualization Tech. Note: A full reset is required to change the setting.

Active Processor Cores

Number of cores to enable in each processor package.

A20M

Legacy OSes and Aps may need A20 M enabled.

Intel PPM Configuration

This configuration includes the following options:

Intel SpeedStep tech

Disable: Disable GV3 Enable: Enable GV3

Intel TurboMode tech

Turbo mode allows processor cores to run faster than marked frequency in specific condition.

Intel C-STATE tech

CState: CPU idle is set to C2/C3/C4.

C State package limit setting

Selected option will program into C State package limit register.

C3 State / C6 State

Nehalem C state action select.

C1 Auto Demotion

When enabled, CPU will conditionally demote C3/C6/C7 requests to C1 based on uncore auto-demote information.

C3 Auto Demotion

When enabled, CPU will conditionally demote C6/C7 requests to C3 based on uncore auto-demote information.

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
IDE Configuration						
Mirrored IDE Configuration			[Disabled]			
Configure SATA#1 as			[IDE]			
SATA#1 IDE Configuration			[Compatible]			
SATA#2 IDE Configuration			[Enhanced]			
▶ Primary IDE Master			: [Hard Disk]			
▶ Primary Slave Master			: [Not Detected]			
▶ Secondary IDE Master			: [Not Detected]			
▶ Secondary IDE Slave			: [Not Detected]			
▶ Third IDE Master			: [Not Detected]			
▶ Fourth IDE Master			: [Not Detected]			
Hard Disk Write Protect			{Disabled}			
IDE Detect Time Out (Sec)			[35]			
ATA(Pi) 80Pin Cable Detection			[Host & Device]			
				<- Select Screen ↑ ↓ Select Item + - Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

The IDE Configuration menu is used to change and/or set the configuration of the IDE devices installed in the system.

Hard Disk Write Protect

Disable/Enable device write protection. This will be effective only if device is accessed through BIOS.

IDE Detect Time Out (Sec)

Select the time out value for detecting ATA/ATAPI device(s).

ATA(Pi) 80pin Cable Detection

Select the mechanism for detecting 80pin ATA(Pi) cable.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Configure Win627UHG Super IO Chipset						
Serial Port1 Address		[3F8]				
Serial Port2 Address		[2F8]				
Restore on AC Power Loss		[Power Off]				
Power On Function		[None]				
				<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

Onboard Serial Port/Parallel Port

These fields allow you to select the onboard serial ports and their addresses. The default values for these ports are:

Serial Port 1	3F8
Serial Port 2	2F8/

Restore on AC Power Loss

This field sets the system power status whether *on* or *off* when power returns to the system from a power failure situation.

Power On Function

This field is related to how the system is powered on. The options are *None*, *Mouse Left*, *Mouse Right*, and *Any Key*.

BIOS SETUP UTILITY						
Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
Hardware Health Configuration						
System Temperature		:34°C/93°F				
CPU Temperature		:38°C/100°F				
PCH Temperature		:38°C/100°F				
Fan1 Speed		:0 RPM				
Fan2 Speed		:1074RPM				
FAN3 Speed		:0RPM				
FAN4 Speed		:0RPM				
VcoreA		:1.176 V		<- Select Screen		
3VCC		:3.472 V		↑ ↓ Select Item		
12V		:12.408 V		+- Change Field		
VcoreB		:1.552 V		Tab Select Field		
VCCIN		:5.196 V		F1 General Help		
VSB		:0.100V		F10 Save and Exit		
SYS SMART FAN Setting		: Disabled		ESC Exit		
CPU SMART FAN Setting		: Disabled				
ACPI Shut down Temperature		: Disabled				

The Hardware Health Configuration menu is used to show the operating temperature, fan speeds and system voltages.

SYS smart fan

The options are *Disabled and Enabled (Default)*

CPU smart fan

The options are *Disabled and Enabled (Default)*

ACPI Shutdown Temperature

The options are *Disabled, 70°C/158°F, 75°C/167°F, 80°C/176°F, 85°C/185°F, 90°C/194°F, and 95°C/203°F.*

BIOS SETUP UTILITY

Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
ACPI Settings				General ACPI Configuration settings <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		
► General ACPI Configuration						

BIOS SETUP UTILITY

Main	Advanced	PCI/PnP	Boot	Security	Chipset	Exit
General ACPI Configuration				General ACPI Configuration settings <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		
Suspend mode [S1 (POS)]						

Suspend Mode

The options of this field are *S1*, *S3*.

Repost Video on S3 Resume

Determines whether to invoke VGA BIOS post on S3/STR resume.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
AHCI Settings						
AHCI BIOS Support		Enabled				
<div>▶ AHCI Port0 [Not Detected]</div> <div>▶ AHCI Port1 [Not Detected]</div> <div>▶ AHCI Port2 [Not Detected]</div> <div>▶ AHCI Port3 [Not Detected]</div> <div>▶ AHCI Port4 [Not Detected]</div> <div>▶ AHCI Port05[Not Detected]</div>					<div><- Select Screen</div> <div>↑ ↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div>	

AHCI BIOS Support

Enables for supporting AHCI controller operates in AHCI mode during BIOS control otherwise operates in IDE mode

AHCI Port

While entering setup, BIOS auto detects the presence of IDE devices. This displays the status of auto detection of IDE devices.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Event Logging details				view all unread events on the Event Log		
<div>View Event Log</div> <div>Mark all events as read</div> <div>Clear Event Log</div> <div>ECC Event Logging [Disabled]</div> <div>PCIe Error Log [Disabled]</div>						
				<div><- Select Screen</div> <div>↑ ↓ Select Item</div> <div>+ - Change Field</div> <div>Tab Select Field</div> <div>F1 General Help</div> <div>F10 Save and Exit</div> <div>ESC Exit</div>		

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Intel AMT Configuration					Options: Disabled Enabled <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
Intel AMT Support			[Enabled]			
AMT/ME BIOS Extension (MEBx) Configuration						
ME BIOS Extension (MEBx)			[Enabled]			
Unconfigure AMT/ME			[Disabled]			
MEBx Ctrl+P Delay (Seconds)			256			

The Intel AMT Configuration configures the Intel Active Management Technology (AMT) options.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
					Options: Disabled Enabled <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	
Intel VT-d			[Disabled]			

VT-d

Virtualization solutions allow multiple operating systems and applications to run in independent partitions all on a single computer. Using virtualization capabilities, one physical computer system can function as multiple "virtual" systems.

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
MPS Configuration				Select MPS Revision		
MPS Revision VT-d [1.4]				 <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

MPS Version Control for OS

This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability.

The default setting is **1.4**.

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
PCI Express Configuration				Enable/Disable PCI Express L0s and L1 link power states		
Active State Power Management				[Disabled]		
				<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Configure Remote Access type and parameters				Select Remote Access type.		
Remote Access				Enabled		
Serial port number				[COM1]		
Base Address, IRQ				[3F8h, 4]		
Serial Port Mode				[1115200 8,n,1]		
Flow Control				[None]		
Redirection After BIOS POST				Always		
Terminal Type				ANSI		
VT-UTF8 Combo Key Support				Enabled		
Sredir Memory Display Delay				No Delay		
				<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

When enabled, the Remote Acces type and parameters are shown:

Serial port number - Select Serial Port for console redirection.

Serial port mode - Select Serial Port settings.

Flow Control - Select Flow Control for console redirection.

Redirection After BIOS POST

Disable: Turns off the redirection after POST.

Boot Loader: Redirection is active during POST and during Boot Loader.

Always: Redirection is always active. (Some OSs may not work if set to Always.)

Terminal Type - Select the target terminal type.

VT-UTF8 Combo Key Support – Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

Sredir Memory Display Delay – Gives the delay in seconds to display memory information.

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Trusted Computing				Enable/Disable TPM		
TCG/TPM SUPPORT				No		
				TCG (TPM 1.1/1.2) supp in BIOS		
				<- Select Screen		
				↑ ↓ Select Item		
				+- Change Field		
				Tab Select Field		
				F1 General Help		
				F10 Save and Exit		
				ESC Exit		

USB Configuration

This option is used to configure USB mass storage class devices.

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
USB Configuration				Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.		
Module Version – 2.24.5.14.4						
USB Devices Enabled: 2 Hubs						
Legacy USB Support				[Enabled]		
USB 2.0 Controller Mode				[HiSpeed]		
BIOS EHCI Hand-Off				[Disabled]		
Legacy USB1.1 HC Support				[Enabled]		
USB Beep Message				[Disabled]		
				<- Select Screen		
				↑ ↓ Select Item		
				+- Change Field		
				Tab Select Field		
				F1 General Help		
				F10 Save and Exit		
				ESC Exit		

Legacy USB Support

Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

Legacy USB1.1 HC Support

Support USB 1.1 HC.

USB Beep Message

Enables the beep during USB device enumeration.

Clock Generator Configuration

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Spectrum Enable/Disable			[Disable]	Epectrum Enable/Disable		
				 <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

PCIPnP Settings**BIOS SETUP UTILITY**

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanced PCI/PnP Settings				Clear NVRAM during System Boot		
WARNING: Setting wrong values in below sections may cause system to malfunction.						
Clear NVRAM		[No]				
Plug & Play O/S		[No]				
PCI Latency Timer		[64]				
Allocate IRQ to PCI VGA		[Yes]				
Palette Snooping		[Disabled]				
PCI IDE BusMaster		[Enabled]				
OffBoard PCI/ISA IDE Card		[Auto]				
IRQ3		[Available]		<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		
IRQ4		[Available]				
IRQ5		[Available]				
IRQ7		[Available]				
IRQ9		[Available]				
IRQ10		[Available]				
IRQ11		[Available]				
IRQ14		[Available]				
IRQ15		[Available]				
DMA Channel 0		[Available]				
DMA Channel 1		[Available]				
DMA Channel 3		[Available]				
DMA Channel 5		[Available]				
DMA Channel 6		[Available]				
DMA Channel 7		[Available]				
Reserved Memory Size		[Disabled]				

Clear NVRAM

This item is used for clearing NVRAM during system boot.

Plug & Play O/S

This lets BIOS configure all devices in the system or lets the OS configure PnP devices not required for boot if your system has a Plug and Play OS.

PCI Latency Timer

This item sets value in units of PCI clocks for PCI device latency timer register. Options are: 32, 64, 96, 128, 160, 192, 224, 248.

Allocate IRQ to PCI VGA

This assigns IRQ to PCI VGA card if card requests IRQ or doesn't assign IRQ to PCI VGA card even if card requests an IRQ.

Palette Snooping

This informs the PCI devices that an ISA graphics device is installed in the system so the card will function correctly.

PCI IDE BusMaster

This uses PCI busmastering for BIOS reading / writing to IDE devices.

OffBoard PCI/ISA IDE Card

Some PCI IDE cards may require this to be set to the PCI slot number that is holding the card. *AUTO*: Works for most PCI IDE cards.

IRQ#

Use the IRQ# address to specify what IRQs can be assigned to a particular peripheral device.

Reserved Memory Size

Size of memory block to reserve for legacy ISA devices.

Boot Settings

This option configures the settings during system boot including boot device priority and HDD/CD/DVD drives.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Boot Settings ► Boot Settings Configuration ► Boot Device Priority ► Hard Disk Drives				Configure Settings during System Boot. <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

Boot Settings Configuration

This configuration includes the following items:

Quick Boot - Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.

Quiet Boot – *Disabled*: Displays normal POST messages. *Enabled*: Displays OEM Logo instead of POST messages.

Bootup Num-Lock – Select Power-on state for Numlock.

PS/2 Mouse Support – Select support for PS/2 Mouse.

Wait for 'F1' If Error – Wait for F1 key to be pressed if error occurs.

Hit 'DEL' Message Display – Displays “Press DEL to run Setup” in POST.

Interrupt 19 Capture – This allows option ROMs to trap interrupt 19.

Boot Device Priority

This specifies the boot sequence from the available devices. A device enclosed in parenthesis has been disabled in the corresponding type menu.

Hard Disk Drives

This specifies the Boot Device Priority sequence from available Hard Drives.

Security Settings

This setting comes with two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Security Settings Supervisor Password : Not Installed User Password : Not Installed Change Supervisor Password Change User Password Boot Sector Virus Protection [Disabled]				Install or Change the Password. <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

Advanced Chipset Settings

This setting configures the north bridge, south bridge and the ME subsystem. **WARNING!** Setting the wrong values may cause the system to malfunction. -

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Advanced Chipset Settings WARNING: Setting wrong values in below sections may cause system to malfunction. ▶ North Bridge Configuration ▶ South Bridge Configuration ▶ ME Subsystem Configuration				Configure North Bridge features. <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
North Bridge Chipset Configuration Memory Remap Feature [Enabled] PCI MMIO Allocation: 4GB To 3072 MB DRAM Frequency [Auto] Configure DRAM Timing by SPD [Auto] Memory Hole [Disabled] Initiate Graphic Adapter [PEG/PCI] IGD Graphics Mode Select [Enabled, 32MB] NB PCIE Configuration PEG Port [Auto] PEG Force GEN1 [Disabled] ▶ Video Function Configuration				Disabled 15MB-16MB <- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit		

Memory Remap Feature

This allows remapping of overlapped PCI memory above the total physical memory.

DRAM Frequency

The options are *Auto*, *1067 MHz* and *1333 MHz*.

Configure DRAM Timing by SPD

The options are *Auto* and *Manual*.

Memory Hole

This option is used to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly.

Initiate Graphic Adapter

This option selects which graphics controller to use as the primary boot device.

IGD Graphics Mode Select

This option selects the amount of system memory used by the internal graphics device.

PEG Port

The options are *Auto* and *Disabled*.

PEG Force GEN1

Some non-graphics PCI-E devices may not follow PCI-E specifications and may incorrectly report their GEN capability or link width.

Video Function Configuration

The configuration allows setting to DVMT/FIXED memory.

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Video Function Configuration					DVMT Mode	
DVMT Mode Select [DVMT Mode]						
DVMT/FIXED Memory [256MB]						
PAVP Mode [Lite]						
Boot Display Device [CRT]						
					<- Select Screen ↑ ↓ Select Item +- Change Field Tab Select Field F1 General Help F10 Save and Exit ESC Exit	

BIOS SETUP UTILITY

Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
South Bridge Chipset Configuration					Enabled Disabled	
USB Function					[Enabled]	
EHCI Controller#1					[Enabled]	
EHCI Controller#2					[Enabled]	
GbE Controller					[Enabled]	
Wake On PCIE LAN					[Enabled]	
Wake On RTC Alarm					[Disabled]	
SLP_S4# Min. Assertion Width					[4 to 5 seconds]	
					<- Select Screen	
					↑ ↓ Select Item	
					+- Change Field	
					Tab Select Field	
					F1 General Help	
					F10 Save and Exit	
					ESC Exit	

Exit Setup

The exit setup has the following settings that are:

BIOS SETUP UTILITY						
Main	Advanced	PCIPnP	Boot	Security	Chipset	Exit
Exit Options				Exit system setup after saving the changes.		
Save Changes and Exit				<- Select Screen		
Discard Changes and Exit				↑ ↓ Select Item		
Discard Changes				+- Change Field		
Load Optimal Defaults				Tab Select Field		
Load Failsafe Defaults				F1 General Help		
				F10 Save and Exit		
				ESC Exit		

Save Changes and Exit

This option allows you to determine whether or not to accept the modifications and save all changes into the CMOS memory before exit.

Discard Changes and Exit

This option allows you to exit the Setup utility without saving the changes you have made in this session.

Discard Changes

This option allows you to discard all the changes that you have made in this session.

Load Optimal Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

Load Failsafe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

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Drivers Installation

This section describes the installation procedures for software and drivers under the Windows. The software and drivers are included with the board. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility	54
Intel Graphics Driver Installation	56
LAN Drivers Installation	58
Intel® Management Engine Interface	60

IMPORTANT NOTE:

After installing your Windows operating system, you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

Intel Chipset Software Installation Utility

The Intel® Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the. (Before installed Intel Chipset Software Installation Utility.

1. Insert the DVD that comes with the board. Click **Intel** and then **Intel(R) Chipset Software Installation Utility**.



3. When the Welcome screen appears, click **Next** to continue.
4. Click **Yes** to accept the software license agreement and proceed with the installation process.
5. On the Readme Information screen, click **Next** to continue the installation.

6. When the Setup Progress screen appears, click *Next* to continue.

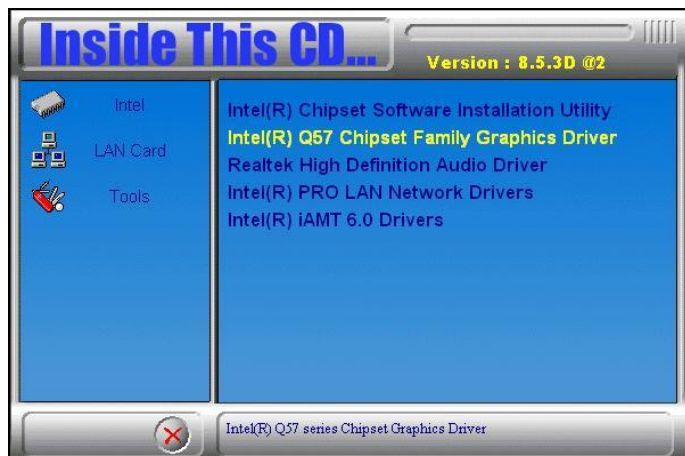


7. The Setup process is now complete. Click *Finish* then restart the computer and for changes to take effect.



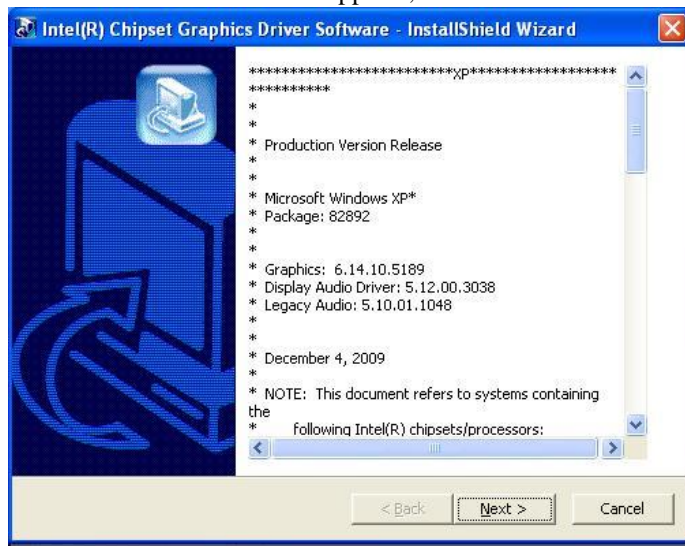
Intel Graphics Driver Installation

1. Insert the DVD that comes with the board. Click **Intel** -> **Intel® Q57 Chipset Family Graphics Driver**.

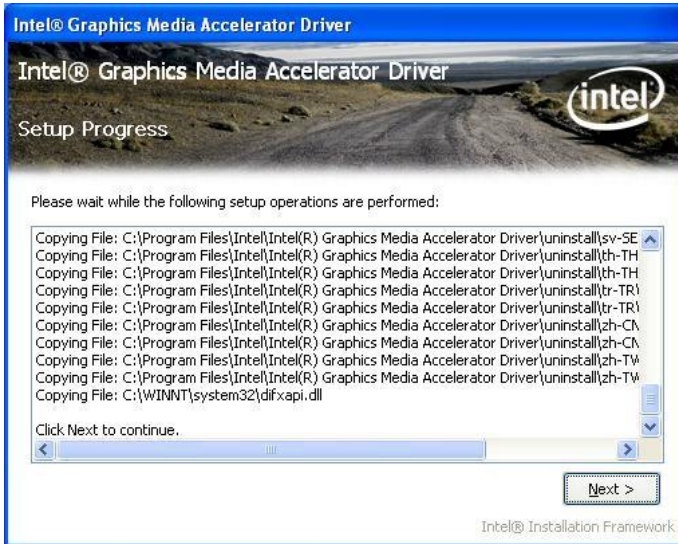


2. When the InstallShield Wizard screen appears, click **Next**.

3. When the Welcome screen appears, click **Next** to continue.



4. Click **Yes** to accept the software license agreement and proceed with the installation process.
5. On Readme File Information screen, click **Next** to continue.
6. On Setup Progress screen, click **Next** to continue the installation.



7. The Setup process is now complete. Click **Finish** to restart the computer and for changes to take effect.

LAN Drivers Installation

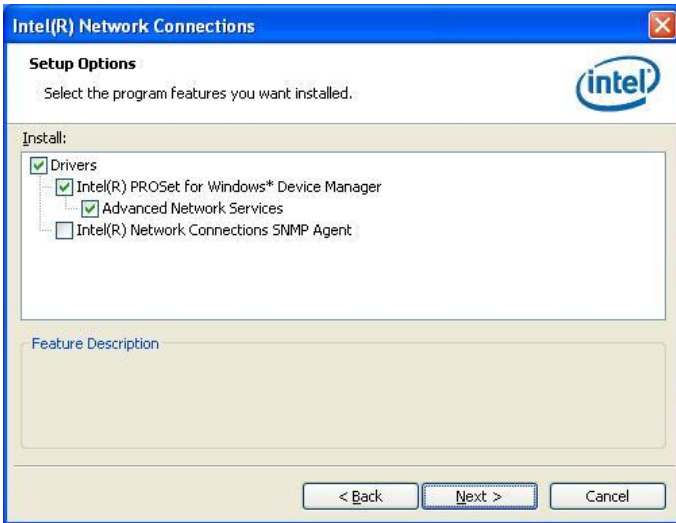
Follow the steps below to start installing the Intel LAN drivers.

1. Insert the DVD that comes with the board. Click **Intel** and then **Intel(R) PRO LAN Network Drivers**.
2. Click **Intel(R) PRO LAN Network Drivers**.

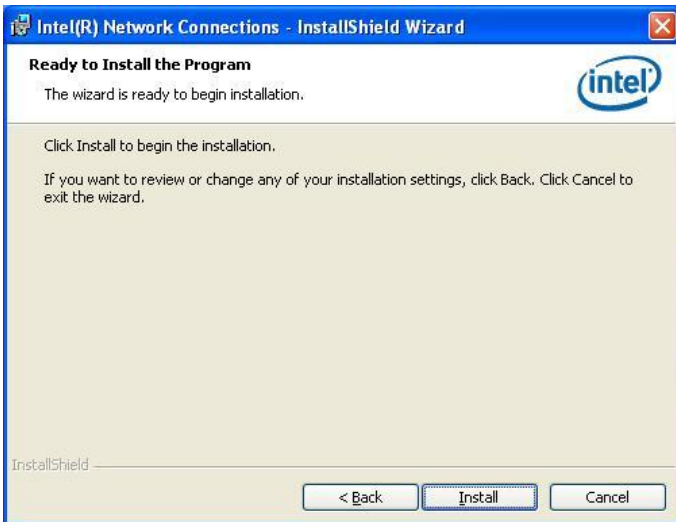


3. On the next screen, click **Install Drivers** to start the drivers installation.
4. When the Welcome screen appears, click **Next** to continue.
5. In the License Agreement screen, click **I accept the terms in license agreement** and **Next** to accept the software license agreement and proceed with the installation process.

6. When the Setup Options appears, click **Drivers** as shown below and **Next** to continue.



7. When the Ready to Install the Program screen appears, click **Install** to continue.

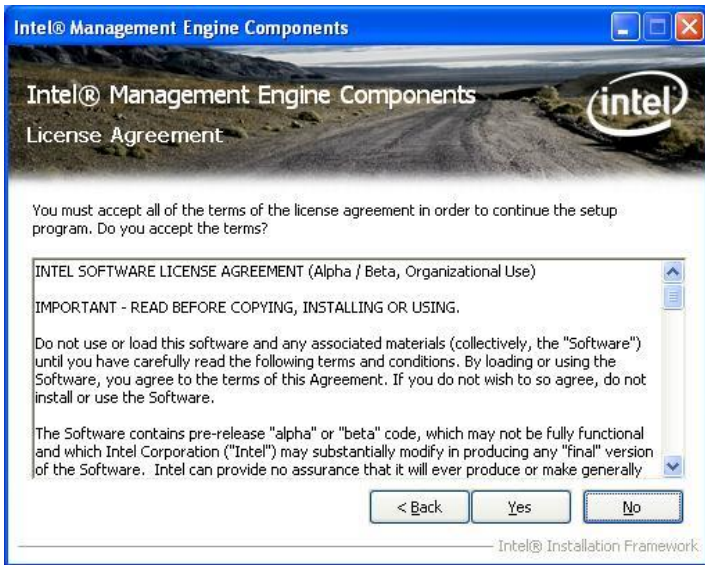


8. The Setup process is now complete (InstallShield Wizard Completed). Click **Finish** to restart the computer and for changes to take effect.

Intel® Management Engine Interface

1. Insert the drivers disc that comes with the motherboard. Click **Intel** and then **Intel(R) AMT 6.0 Drivers**. When the welcome screen of the Intel® Management Engine Components appears, click **Next** to continue. On the next screen, click **Next** to agree to the license agreement.





2. On the next screen, the Readme File Information shows the system requirements and installation information, click **Next**.



3. When the Setup Progress screen appears, click **Next** to continue. Then, click **Finish** when the setup progress has been successfully installed to restart the computer.

