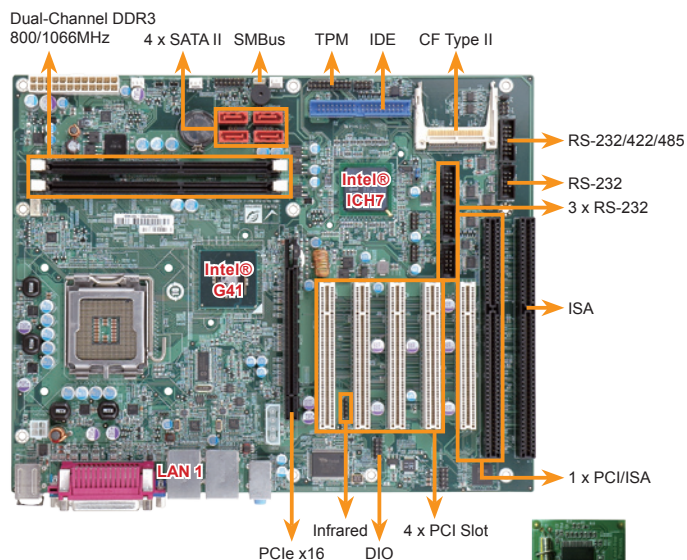


# IMBA-G412ISA

ATX Motherboard supports LGA775 Intel® Core™2 Duo/Core™2 Quad CPU with up to FSB 1333 MHz FSB, DDR3, dual PCIe GbE, ISA, PCI, PCIe x16, COM, LPT, SATA II, IDE, USB 2.0, Audio and RoHS



**New**

Multi Functionality supports either two ISA slots or five PCI slots type present. The mechanics of ISA slot and PCI slot will conflict but you have choice to select what you desire to.



**One Key Recovery**  
iEi symantec



## Specifications

TPM 1.2 Support

- ◆ CPU  
LGA775 45nm Intel® Core™2 Quad, Core™2 Duo, Pentium® D, Celeron® at FSB 800/1066/1333MHz processors
- ◆ System Chipset  
Intel® G41+ICH7
- ◆ Memory  
Two 240-pin 4GB (max.) 800/1066MHz dual-channel DDR3 SDRAM DIMM supported (System max. 8GB)
- ◆ BIOS  
UEFI BIOS
- ◆ Graphic Engine  
Intel® GMA X4500
- ◆ Display Interface  
VGA supports analog CRT up to 2048x1536 @75MHz
- ◆ Ethernet  
Dual Realtek RTL8111E PCIe GbE controller, LAN 1 with ASF2.0 support
- ◆ Super I/O  
Fintek F81865
- ◆ ISA Bridge  
ITE IT8888
- ◆ Audio  
Realtek ALC888 HD Audio Codec
- ◆ I/O Interface
 

5 x RS-232	1 x RS-232/422/485 with Auto Flow control
4 x SATA II	8 x USB 2.0
1 x CF Type II	1 x IDE
1 x LPT	
- ◆ Expansion
 

1 x ISA slot	1 x PCI/ISA slot
4 x PCI slot	1 x PCIe x16 slot
- ◆ Infrared Interface  
1 x 5-pin header
- ◆ TPM  
2 x 10-pin header
- ◆ SMBus  
1 x 4-pin wafer
- ◆ Digital I/O  
8-bit digital I/O, 4-bit input / 4-bit output
- ◆ Power Supply  
ATX power supply
- ◆ Power Consumption  
12V@2.01A, -12V@0.05A, 3.3V@0.15A, 5V@5.06A  
(Intel® Core™ Duo CPU E7400@2.8GHz with 1GB DDR3 memory)
- ◆ Temperature  
Operation: -10°C ~ 60°C
- ◆ Humidity  
Operation: 5% ~ 95%, non-condensing
- ◆ Dimensions  
305mm x 244mm
- ◆ Weight  
GW: 1200g / NW: 650g

## Features

1. Support the next generation 45nm LGA775 Intel® Core™2 processor family with higher system performance
2. Intel® GMA X4500 delivers an excellent blend of graphics performance
3. Intergrated VGA and PCIe x16 SDVO card interface for dual display
4. Support dual channel DDR3 800/1066MHz up to 8GB
5. TPM V1.2 hardware security function supported by TPM module
6. Expansion slot supports either five PCI and one ISA or four PCI and two ISA slots
7. IEI One Key Recovery solution allows you to create rapid OS backup and recovery

## Packing List

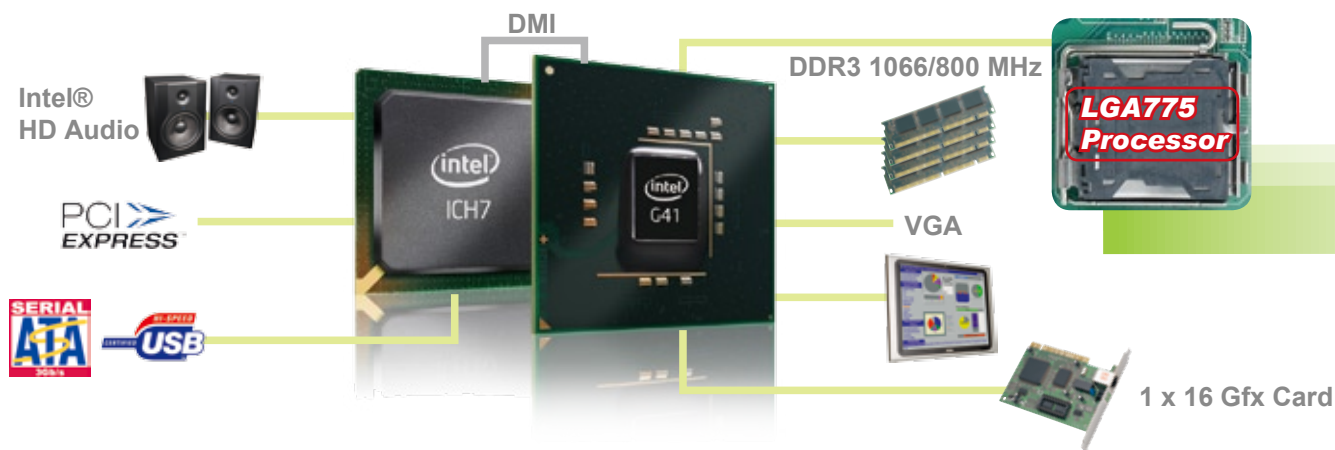
1 x IMBA-G412ISA single board computer	
1 x Dual Ports RS-232 cable with Bracket (P/N: 19800-000051-RS)	
1 x I/O shielding (P/N: 45014-0017C0-00-RS)	
4 x SATA cable (P/N: 32000-062800-RS)	1 x Mini jumper pack
1 x Utility CD	1 x QIG

## Ordering Information

Part No.	Description
IMBA-G412ISA-R10	ATX Motherboard Supports LGA775 Intel® Core™2 Duo/Core™2 Quad CPU up to FSB 1333MHz, DDR3, Dual PCIe GbE, ISA, PCI, PCIe x16, COM, LPT, SATA II, IDE, USB 2.0, Audio and RoHS
32102-000100-200-RS	SATA Power cable
32200-000052-RS	IDE cable
CB-USB02-RS	Dual-Port USB cable with bracket
CF-775A-RS	CPU cooler for 130W
CF-520-RS-R11	CPU cooler for 115W
CF-775B-RS	1U CPU cooler for 90W
SDVO-100DVI-R10	PCIe x16 DVI output SDVO card support dual display (IEI CPU Board Only)
SDVO-100VGA-R10	PCIe x16 VGA output SDVO card support dual display (IEI CPU Board Only)
TPM-IN01-R11	20-pin INFINEON TPM Module, S/W management Tool, Firmware V3.17

# Intel® G41 Chipset

## The Best Choice of Performance Chipset for LGA775 Platform

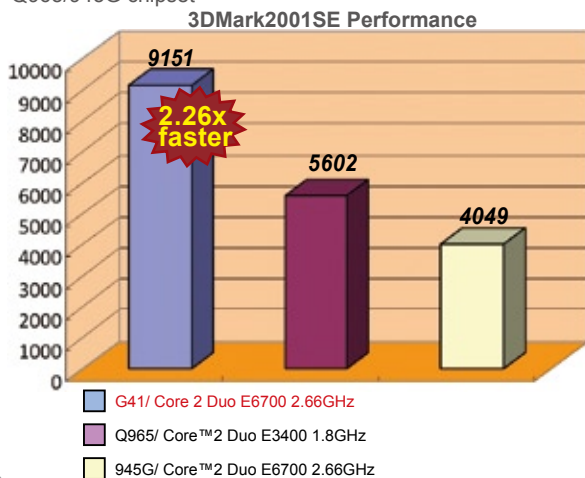


### LGA775 Processor Supported by Intel® G41

Brand Name	CPU Code	CPU No.	Process	Clock speed	FSB MHz	L2 cache	TDP
Core 2 Quad	Yorkfield	Q9400	45nm	2.66G	1333	6M	95W
Core 2 Duo	Wolf dale	E8400	45nm	3.0G	1066	6M	65W
		E7400	45nm	2.8G		3M	65W
Pentium D Dual Core	Wolfdale	E6500	45nm	2.93G	1066	2M	65W
		E5300	45nm	2.6G	800	2M	65W
Core 2 Duo	Conroe	E6400	65nm	2.13G	1066	2M	65W
		E4300	65nm	1.8G	800	2M	65W
Pentium D Dual Core	Conroe	E2160	65nm	1.8G	800	1M	65W
Celeron Dual Core	Conroe	E3400	45nm	2.4G	800	512K	65W
		E1500	65nm	2.2G		512K	65W
Celeron	Conroe L	440	65nm	2.0G	800	512K	35W

### Performance Comparison

Intel® G41 chipset features not only complete CPU support list but also an excellent graphic performance compared with Q965/945G chipset



### Intel® Desktop Chipset Specification Comparison Table

Northbridge	Intel® G41	Intel® G45	Intel® Q45	Intel® Q35	Intel® Q965	Intel® 945G
CPU FSB	1333MHz 45nm/65nm	1333MHz 45nm/65nm	1333MHz 45nm/65nm	1333MHz 45nm/65nm	1066MHz 65nm	1066MHz 65nm
Graphic	GMAX4500 Direct* X10	GMAX4500HD Direct* X10	GMAX4500 Direct* X10	GMA3100 Direct* X 9.0c	GMA3000 Direct* X 9.0c	GMA 950 Direct* X 9.0c
Full H/W decode acceleration MPEG2/4, VC1 & AVC	N/A	Yes	N/A	N/A	N/A	N/A
Memory	DDR3-1066 8GB	DDR3-1066 16GB	DDR3-1066 16GB	DDR2-800 8GB	DDR2-800 8GB	DDR2-667 4GB
PCIe x16	Gen1	Gen2	Gen2	Gen1	Gen1	Gen1
Southbridge	ICH7 / ICH7R	ICH10	ICH10DO	ICH9DO	ICH8DO	ICH7/ICH7R
PCI	6	4	4	4	6	6
PCIe x1 Lanes	6 (ICH7R) 4 (ICH7)	6	6	6	6	6 (ICH7R) 4 (ICH7)
USB 2.0	8	12	12	12	10	8
SATA II	4	6	6	6	6	4
Intel AMT	N/A	N/A	Yes	Yes	Yes	N/A

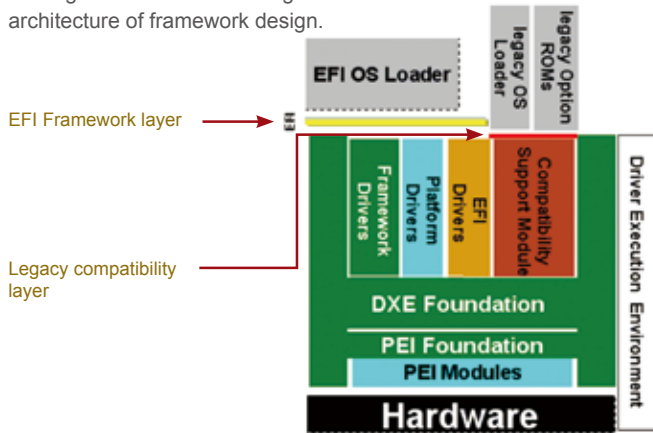
# UEFI Introduction

- **UEFI (Unified Extensible Firmware Interface) BIOS** is next-generation BIOS firmware based on UEFI specifications and the Intel® Platform Innovation Framework for EFI.
- **UEFI BIOS** can be expanded by using a variety of drivers, development tools, support utilities and pre-boot application (PBA) solutions.



## UEFI Architecture

This figure shows a block diagram level architecture of framework design.



## Legacy BIOS V.S. UEFI

	Legacy BIOS	UEFI
Language	Assembly	C (99%)
Resource	Interrupt Hardcode Memory Access Hardcode I/O Access	Driver \ Protocols
Processor	x86 16-bits	CPU Protected Mode (Flat Mode)
Target	Binary Code	Removable Binary Drivers
Expand	Hook Interrupt	Load Driver
OS Bridge	ACPI (SMI, INT Service)	RunTime Driver Service AED (ACPI EFI Protocol Driver) (ACPI, SMI)
3rd Party ISV & IHV	Bad for Support	Easy for Support and for Multi Platforms

The architecture represents a structured implementation composed primarily of the following:

- Foundation code that binds the pieces together
- Modular elements of code that perform the functional job of enumerating and initializing the platform

## UEFI Benefits

### Expansibility –

ODM/OEM and customers can add their own PBA easily. PBA can be integrated in BIOS flash or placed in external mass storage devices.

### Migration ability –

Drivers, PBA can be migrated easily from one platform to another because they're designed highly modularize on a unified framework.

## IEI UEFI BIOS Features

### 1. Familiarity –

Providing advanced UEFI functionality with a familiar BIOS setup interface.

### 2. Compatibility –

Designed to extend BIOS compatibility into UEFI solutions. Supporting legacy Option Rom binaries and operating systems requiring a legacy BIOS runtime interface.



## IEI Products with UEFI BIOS

### 1.QM57/HM55 chipset family.

KINO-QM57A, KINO-HM551, NOVA-HM551, NANO-QM57A, NANO-HM551

### 2.G41 chipset family

IMBA-G410, IMBA-G412ISA, KINO-G410

### 3. D525/D425/ N455 family

UEFI BIOS has a better compatibility with the dual ranks x16 DRAM memory module for D425/D525/N455 series

### 3. Functionality –

- (1) Compliant with iSMM H/W monitor utility
- (2) Dynamic LOGO
- (3) Fast boot
- (4) ICP Standard Feature – AT/ATX, WDT, DIO
- (5) BIOS setup with touch device support
- (6) HDD/Storage support over 2.2TB with 64-bit operation system

### 4. Extensibility –

- Allowing to add and execute pre-boot applications (PBA) in a protected hidden partition
- (1) HDD Security
  - (2) Shell environment
  - (3) Pre-boot messenger (Third Party)
  - (4) Pre-boot Network Browser (Third Party)
  - (5) Pre-boot Antivirus (Third Party)

# IEI One Key Recovery Solution

IEI unique one key recovery solution includes exclusive technology to recover and backup your operating system by just one click without any complicated settings. IEI freely bundled recovery CD is shipped with every IEI SBC, embedded system and all-in-one panel PC products.



## Recovery Tool for IEI Products Only

The IEI recovery CD includes a system recovery software developed by IEI with the Windows PE 2.0. The recovery CD helps to create full system backup and restore from system failures. Users don't need to spend additional cost for other system backup and recovery tools.

### System Recovery

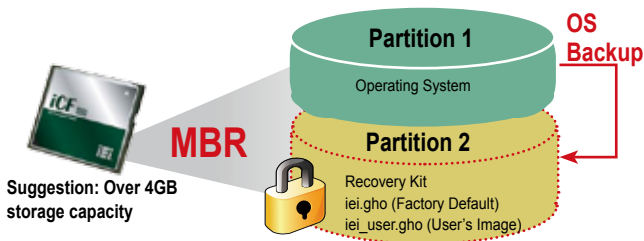


### System Backup



Hidden partition is a logical section of a disk which is not accessible to the operating system. You can use a partition tool such as SPFDISK to create a hidden partition first. It may be used to protect confidential data or store backup of the system.

### Recovery Partition



#### IEI Recovery Solution Advantages:

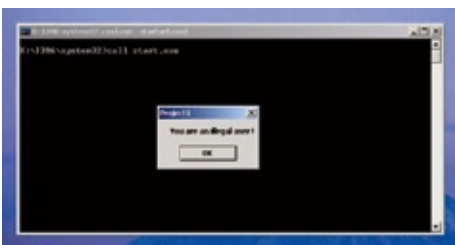
- No need to make recovery discs by yourself nor follow the trivial imaging procedures
- Simple steps to backup or restore the system. No IT personnel are required.
- Backup/Restore system easily through unique multi-menu
- One key to make recovery disc
- One key to restore system

### IEI Products Only



#### IEI Certified Sticker

The IEI recovery CD is only for IEI products. A message will show to warn "you are an illegal user" if using the CD for non-IEI products. This protection is detected through the BIOS of the IEI boards.



#### Support OS List

Windows® XP	Windows® Vista
Windows® 7	Windows® CE 5.0
Windows® CE 6.0	Windows® XP Embedded
Linux OS	
1.Red Hat RHEL- 5.4	
2.Fedora Core 7, 8, 10, 11, 12	
3.Ubuntu 6.10, 7.10, 8.10	
4.Debien 4.0, 5.0	
5. SuSe 11.2	

# Rapid Imaging/ Migration through One Touch Hot Key



Neither specialized IT staff nor consultants are required in order to implement the system imaging and data migration. Just press the F3 key to get access to the recovery menu. The one key operation simplifies the imaging or migration process to help IT staff up and running quickly.

**EASY WAY**



## One-Key Recovery

- Factory restore: restore your system to default setting (iei.gho)
- Restore your last backup: recover the last system configuration (iei\_user.gho)



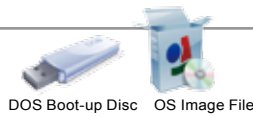
```

1. Factory Restore
2. Backup system
3. Restore your last backup.
4. Manual
5. Quit
Please type the number to select and then press Enter: _
    
```



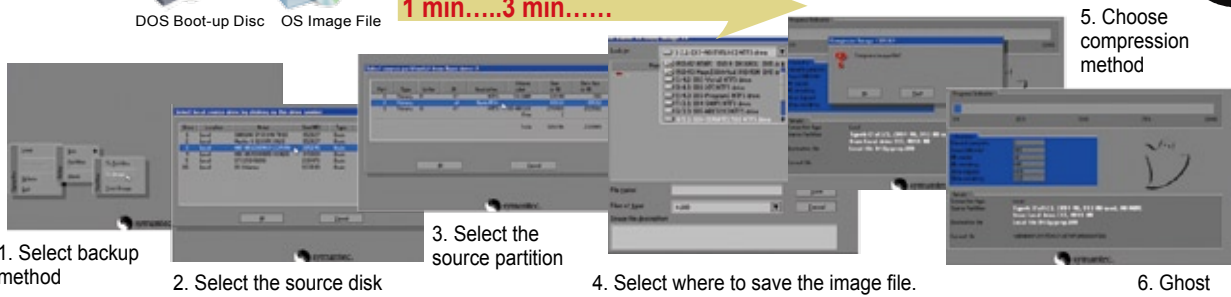
## One-Key Backup

Backup your operating system to the secure hidden partition. You can create your own ghost image as "iei\_user.gho" including your application programs set-ups.



## Traditional Imaging Process

1 min.....3 min.....



## Benefits

### Remote Maintenance Reduces the Cost of IT Infrastructure

All migration tasks can be performed remotely from a central management console. It will save a lot of cost from reducing physical visits.

2 Use the recovery tool to restore your OS at the local site

1 When the system is infected by virus or has a blue screen.

**One Key Restore + Remote KVM**

3 **OK**



Remote Troubleshooting

# IEI Intelligent System Management Module

## What is the IEI Intelligent System Management Module (iSMM) ?

# iSMM

IEI iSMM is a system health supervision API which utilizes sensor chips on IEI motherboards to track system and CPU temperatures, voltages, cooling fan speed., WDT and Digital I/O set up status. By quickly capturing and reporting system health data, users can prevent disasters such as system instability or damage.

### Features

- External and on-chip voltages data feedback
- CPU and system temperature data feedback
- Cooling fan speed data feedback
- Cooling fan speed controlled by PWM/ On-Off/ Automatic Mode
- Warning signals by beeper and sound effect
- WDT Test
- Programmable Digital I/O
- System health configurations save and load

### Available Models

iSMM support below super I/O:

- Winbond W83627
- ITE IT8712
- ITE IT8718
- Fintek F81216D
- Fintek F81865

### Available Operation System

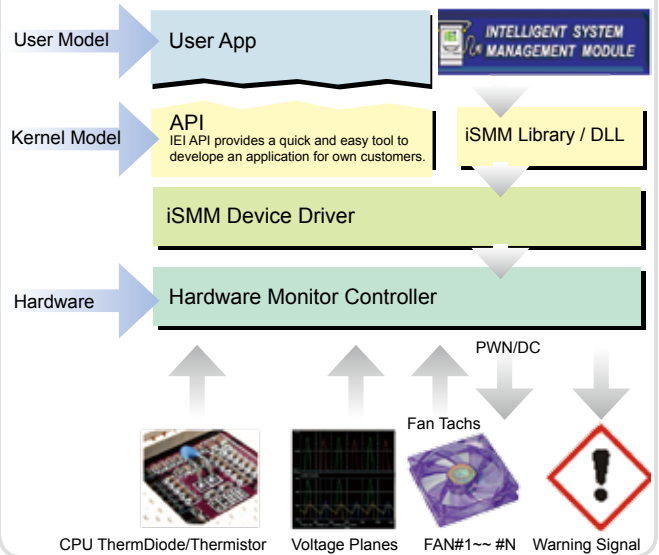
- Windows XP
- Windows Vista
- Windows 7

Note: Please disable UAC function before install iSMM software under Windows Vista and Windows 7.

### Advantages

Know that your system is running within safe limits !!  
Prevent disasters such as system instability or damage.

### Architecture



## IEI Exclusive Diagnosis Software

Full Graphic Interface,  
Real-time, 6 in 1 Modules !!



IEI Solutions  
Compliance Only

### Functions

<b>Temp.</b> CPU + System temperature monitoring	<b>Fan</b> Dynamic fan speed controlling	<b>Voltage.</b> Real time voltage alarm	<b>DIO</b> Easy Digital I/O configuration	<b>WDT</b> Trouble free watch dog timer testing	<b>Save/Load</b> Flexibility user profile recover	<b>Cash drawer</b> Cash drawer status monitoring