

# **EC3-1642CLD3N**

**3.5" Single Board Computer  
with CPU and  
LCD/CRT/SSD/3LAN Interfaces**

**Version: A1**

## **Announcement**

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# Safety Instructions

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1. Before handling your EC3-1642CLD3N, read the instructions and safety guidelines on the following pages to prevent damage to the product and to ensure your own personal safety;
2. Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them;
3. Before taking board from anti-static packaging, put your hand on grounded metal object for a while (about 10 seconds) to eliminate static on your body;
4. When holding a board, wear a grounded wrist strap against your skin to eliminate static on your body. Hold a board by its edges or by its metal mounting bracket;
5. Before inserting, removing or re-configuring motherboard or expansion card, first disconnect the computer and peripherals from their power sources;
6. Before removing boards or computer , first turn off all power resources and disconnect the power cord from power source;
7. For whole set, when inserting or removing boards, first disconnect the computer and peripherals from their power sources;
8. To connect or disconnect any equipment, first turn off all power resources and disconnect the power cord from power source;
9. To avoid power on/off computer frequently, wait at least 30 seconds after turning off the computer before re-turning on the computer.

# C o n t e n t

Chapter 1 Product Introduction.....	1
Brief Introduction.....	1
Ordering Information.....	1
Environment and Dimension .....	2
Microprocessor .....	2
System Chipset.....	2
System Memory .....	2
LAN Function .....	2
Video Function.....	2
Solid Status Disk Interface.....	3
IDE Function.....	3
Power Supply Selection .....	3
BIOS .....	3
Watchdog Function .....	3
I/O Function.....	3
Chapter 2 Installation Direction.....	4
Product Layout.....	4
Interfaces Map .....	5
Jumper Function Setup.....	6
USB Interface.....	8
IDE Interface.....	9

Parallel Port and Serial Port .....	10
Video Interface .....	11
LAN Interface .....	13
Keyboard and Mouse Interface .....	14
Power Supply Interface .....	14
LCDB Interface .....	14
Power Switch and Working Status Indicators.....	15
Chapter 3 Overview of BIOS Function.....	16
Appendix .....	17
Watchdog Programming Guide .....	17
IRQ Interrupts Assignment.....	20
I/O Interfaces Address Table .....	21



# Chapter 1

## Product Introduction

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### Brief Introduction

EC3-1642CLD3N is a sort of low-cost embedded main board. The CPU uses AMD LX800 chipset. It has compact structure and high reliability.

The features are listed as follows:

- ◆ Standard board configures on-board AMD LX800 (compatible AMD LX700, LX900) ;
- ◆ One IDE interface, two sets of IDE devices;
- ◆ Support VGA, 18/24-bit TTL LCD, LVDS video, but do not support LCD and LVDS to display at the same time;
- ◆ On-board 256M DDR memory, one DDR\_SODMM memory slot;
- ◆ Three 10/100/1000Mb Ethernet Controller;
- ◆ The latest AMI kernel BIOS;

What is more, the main board also provides two USB2.0 interfaces; one parallel port; two serial ports (one of them supports RS232/422/485); one PS/2 keyboard/mouse interface and watchdog time, etc.

### Ordering Information

Model	Description
EC3-1642CLD3N	3.5 inches Single Board Computer with CPU and LCD/CRT/SSD/3LAN Interfaces

## **Environment and Dimension**

- Dimension: 146mm×102mm
- Temperature: 0°C~+60°C(-40°C-+70°C can be ordered)
- Humidity: 5%~90% (Non-condensing)

## **Microprocessor**

AMD LX800 (compatible AMD LX700, LX900)。

## **System Chipset**

South Bridge selects CS5536

## **System Memory**

On board 256M DDR memory, one SODIMM expansion slot is provided in addition, the support memory gets up to 1GB.

## **LAN Function**

The main board has integrates three 10/100/1000Mb Ethernet controller to provide you high-speed and stable LAN platform.

## **Video Function**

- Support CRT & LCD video function;
- Support CRT & LVDS video function;
- Do not support LCD & LVDS video function.

## **Solid Status Disk Interface**

One Compact Flash disk interface

## **IDE Function**

One IDE interface and two sets of IDE devices

## **Power Supply Selection**

+5V Power Supply

## **BIOS**

The latest AMI kernel BIOS

## **Watchdog Function**

- 1~255 level, programmable time to interrupts;
- 1~255 overtime event reposition system;
- 1(second/minute) resolution down counter

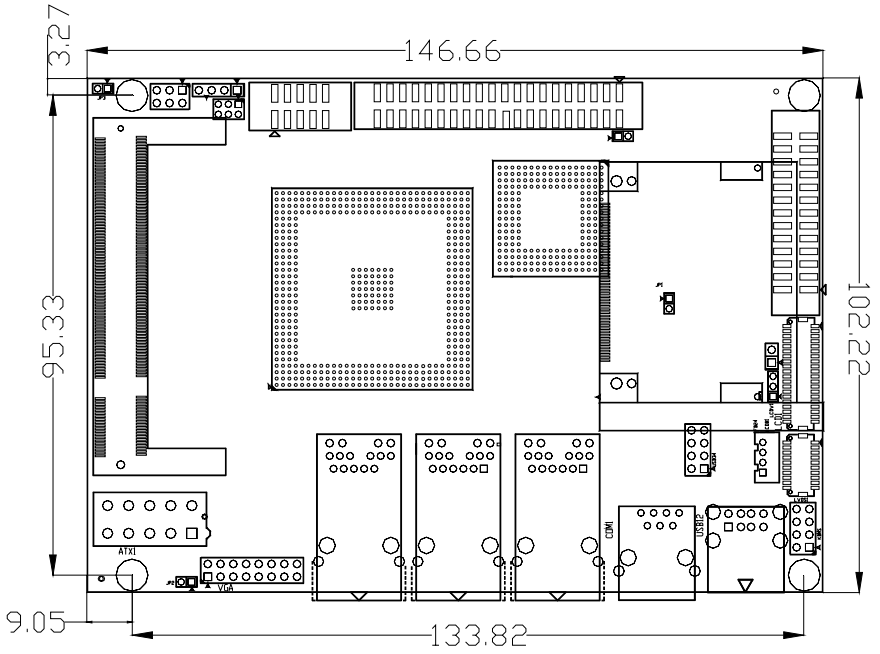
## **I/O Function**

- One high speed parallel port and two RS-232 serial ports;
- Two USB2.0 interfaces;
- One keyboard and mouse socket.

# Chapter 2

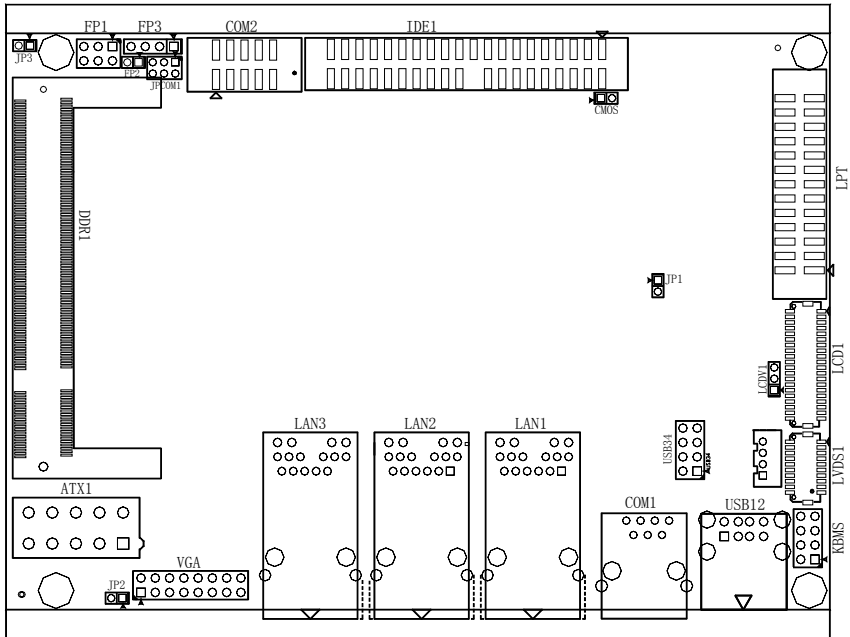
## Installation Direction

### Product Layout



Unit: mm


## Interfaces Map




## Jumper Function Setup

### (1) CMOS: CMOS Jumper Function

If the system fails to boot due to improper BIOS settings, try to clear CMOS to recover the default settings of all the system parameters, and then reboot system. Users can achieve this function by changing the status of CMOS jumper.


 CMOS	Setting	CMOS
	Open	[1-2] Normal working status (default)
	Shorted	[1-2] Clear the content of CMOS. All the BIOS setting recover to factory default.


### (2) JP1: CF Card Selection (Master or Slave)

 JP1	Setting	CMOS
	Open	[1-2] CF Card is Slave
	Shorted	[1-2] CF Card is Master

### (3) JP2, JP3: Jumper of Power

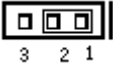

The main board provides two kinds of powers: AT and ATX. We can select power by changing the status of JP2 and JP3. The power can be normally used only when JP2 and JP3 are selected correctly.

 JP2	Setting	CMOS
	Open	[1-2] Select ATX Power
	Shorted	[1-2] Select AT Power


 JP3	Setting	CMOS
	Open	[1-2] Select ATX Power
	Shorted	[1-2] Select AT Power

#### (4) LCDV1: LCD Screen Voltage Selection


Different LCD screens may have different voltage. This main board provides two kinds of voltage: 3.3V and 5V. The LCD screen can display normally only when selected voltage is the same as working voltage.

3.3V (default)	5V
 LCDV1	 LCDV1

#### (5) JPCOM2: COM2 RS-232/RS-422/RS-485 Mode Selection

 JPCOM2	JPCOM2	Pin#		
		1-2	3-4	5-6
	RS-232	ON (default)	OFF	OFF
	RS-422	OFF	ON	OFF
RS-485	OFF	OFF	ON	

Pin definition of COM2 here:


 COM2	Pin#	Signal Name		
		RS-232	RS-422	RS-485
	1	DCD	TX-	RTX-
	2	RXD	TX+	RTX+
	8	CTS	RX+	X
9	RI	RX-	X	

## USB Interface

The main board provides two standard USB sockets and one 2×4Pin USB pin. Pin definition is showed as follows:

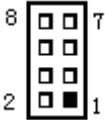
### (1) Standard USB Socket

The main board provides two standard USB socket. It can only be inserted in one direction when connecting with USB device. Pin definition of USB interface is given as follows:

 <p>USB12</p>	Pin#	Signal Name
	1	+5V
	2	USB Data-
	3	USB Data+
	4	GND

### (2) 2×4Pin USB Interface

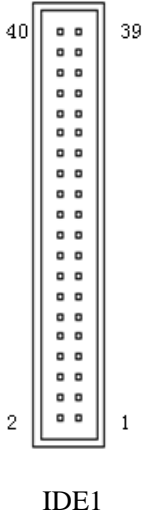
The main board provides a set of 2×4Pin USB pins. Transfer cable comes with the main board is needed to connect USB signal with standard USB socket. The pin definition is given as follows:

 <p>USB34</p>	Pin#	Signal Name	Pin#	Signal Name
	1	+5V	2	+5V
	3	D0-	4	D1-
	5	D0+	6	D1+
	7	GND	8	GND

## IDE Interface

This interface is compatible with the supplied IDE hard disk flat cable. Please connect one end to the board while connect the other end to hard disk and setup the jumper to select Master or Slave if you want to install two hard disks. Please consult the introduction about jumper setup. BIOS supports the appointed device to start.

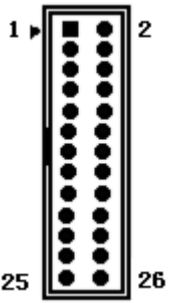
Pin#	Signal Name		Pin#	Signal Name	
1	Reset IDE		2	GND	
3	Host Data 7		4	Host Data 8	
5	Host Data 6		6	Host Data 9	
7	Host Data 5		8	Host Data 10	
9	Host Data 4		10	Host Data 11	
11	Host Data 3		12	Host Data 12	
13	Host Data 2		14	Host Data 13	
15	Host Data 1		16	Host Data 14	
17	Host Data 0		18	Host Data 15	
19	GND		20	NC	
21	DRQ0/1		22	GND	
23	Host IOW		24	GND	
25	Host IOR		26	GND	
27	IOCHRDY		28	Host ALE	
29	DACK0/1		30	GND	
31	IRQ14		32	NC	
33	Address 1		34	Unconnected	
35	Address 0		36	Address 2	
37	Chipset Selection 0		38	Chipset Selection 1	
39	Activity		40	GND	



## Parallel Port and Serial Port

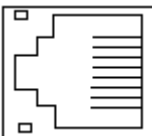
### (1) Parallel Port

Standard 26pin parallel port, which can connect to the peripheral devices according to users' requirement; the pin definition is given as follows:

 LPT1	Pin#	Signal Name	Pin#	Signal Name
		1	STROBE	2
	3	PD0 0	4	Error
	5	PD1 1	6	INIT
	7	PD2 2	8	SLIN
	9	PD3 3	10	GND
	11	PD4 4	12	GND
	13	PD5 5	14	GND
	15	PD6 6	16	GND
	17	PD7 7	18	GND
	19	ACK	20	GND
	21	Busy	22	GND
	23	PE	24	GND
	25	SLCT	26	N.C.

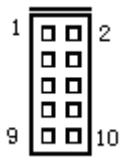
### (2) Serial Port: COM1 is RJ45 Interface

The main board provides two communication serial ports. COM1 and COM2 can be connected with the devices such as mouse, modem, numeral camera which has RS-232 standard interface.

 COM1	Pin#	Signal Name	Pin#	Signal Name
		1	DCD1	2
	3	TXD1	4	DTR1
	5	GND_COM1	6	DSR1
	7	RTS1	8	CTS1

**(3) Serial Port: COM2 RS-232/RS-422/RS-485:**

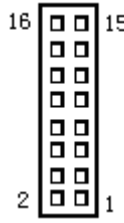
COM2 is a set of 2\*5PIN pins. Transfer cable is needed to fix it to the chassis, so that it can be connected with peripheral devices. RS-232, RS-422 or RS-485 working mode can be selected by jumpers; please refer to the introduction of JPCOM2 about the mode selection of COM2 in page 7. The pin definition is showed as follows:

 <p>COM2</p>	Pin#	Signal Name	Pin#	Signal Name
	1	DCD2	2	RXD2
	3	TXD2	4	DTR2
	5	GND_COM2	6	DSR2
	7	RTS2	8	CTS2
	9	RI2	10	N.C

**Video Interface**

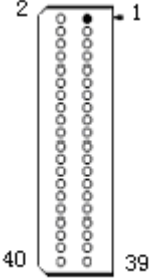
**(1) VGA Output Interface**

16 bit D style socket transferred from pins to connect VGA display. The pin definition is showed as follows:

 <p>VGA</p>	Pin#	Signal Name	Pin#	Signal Name
	1	Red	2	GND
	3	NC	4	Green
	5	GND	6	DDCADATA
	7	Blue	8	GND
	9	HSYNC	10	NC
	11	VCC	12	VSYNC
	13	GND	14	GND
	15	DDCACLK	16	NC

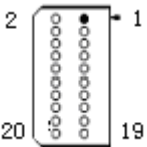
(2) LCD Output Interface

Pin#	Signal Name	Pin#	Signal Name
1	VDD	2	VDD
3	GND	4	VCC
5	GND	6	GND
7	TFT_B1	8	TFT_B0
9	TFT_B3	10	TFT_B2
11	TFT_B5	12	TFT_B4
13	TFT_B7	14	TFT_B6
15	TFT_G1	16	TFT_G0
17	TFT_G3	18	TFT_G2
19	TFT_G5	20	TFT_G4
21	TFT_G7	22	TFT_G6
23	TFT_R1	24	TFT_R0
25	TFT_R3	26	TFT_R2
27	TFT_R5	28	TFT_R4
29	TFT_R7	30	TFT_B6
31	GND	32	GND
33	VSYNC	34	TFTCLK
35	HSYNC	36	LEDMOD
37	DISPEN	38	VDDEN
39	GND	40	VCON



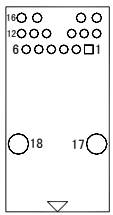
LCD1

### (3) LVDS Video Output Interface

	Pin#	Signal Name	Pin#	Signal Name
	 <p>LVDS1</p>	1	LVDS0+	2
3		GND	4	GND
5		LVDS1+	6	LVDS1-
7		GND	8	GND
9		LVDS2+	10	LVDS2-
11		GND	12	GND
13		LVDSCLK+	14	LVDSCLK-
15		GND	16	GND
17		LVDS3+	18	LVDS3-
19		VDD	20	VDD

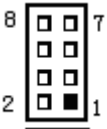
### LAN Interface

The main board provides three standard RJ45 1000M LAN interfaces, Adaptive 10/100/1000Mbps. Pin definition is shown as follows:

	Pin#	Signal Name	Pin#	Signal Name
	 <p>LAN1/2/3</p>	1	MXCT3	2
3		MX3+	4	MX2+
5		MX2-	6	MXCT2
7		MXCT4	8	MX4+
9		MX4-	10	MX1-
11		MX1+	12	MXCT1
13		LAN1_ACTIVITY	14	VDD33
15		LAN_LINK100	16	LAN_LINK1000
17		GND_CHASSIS	18	GND_CHASSIS

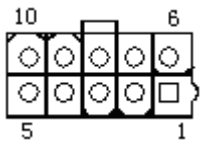
## Keyboard and Mouse Interface

The main board provides one 8 pin socket (KBMS) used by both of keyboard and mouse. PS/2 1-to-2 keyboard and mouse transfer cable comes with the main board is needed to connect the keyboard and mouse.

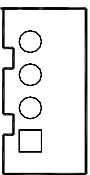
 <p>KBMS</p>	Pin#	Signal Name	Pin#	Signal Name
	1	Keyboard data	2	Mouse data
	3	Keyboard clock	4	Mouse clock
	5	GND	6	GND
	7	+5V	8	+5V

## Power Supply Interface

2x5PIN ATX power interface, whose pin definition is showed as follows:

 <p>ATX1</p>	Signal	Pin#	Pin#	Signal
	VCC5SB	6	1	PS-ON
	VCC5	7	2	GND
	VCC5	8	3	GND
	NC	9	4	NC
	GND	10	5	NC

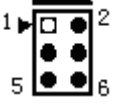
## LCDB Interface

 <p>LCDB1</p>	Pin#	Signal Name
	1	+5V
	2	NC
	3	DISPEN
	4	DGND


## Power Switch and Working Status Indicators

FP1, FP2 and FP3 are used to be connected with the functional buttons and indicators on the front panel of chassis.


### (1) FP1

 <p>FP1</p>	Pin#	Signal Name	Pin#	Signal Name
	1	PWR_BTN	2	GND
	3	EXT_RST	4	GND
	5	IDE_LED	6	VCC

### (2) FP2

 <p>FP2</p>	Pin#	Signal Name
	1	ACPI_LED+
	2	ACPI_LED-

### (3) FP3

 <p>FP3</p>	Pin#	Signal Name
	1	Speaker
	2	N.C.
	3	GND
	4	+5V

## Chapter 3

### Overview of BIOS Function

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Regarding the BIOS setup of EC3-1642CLD3N, please refer to the *AMI BIOS Setting Direction* edited by EVOC Company.

## Appendix

### Watchdog Programming Guide

EC3-1642CLD3N includes a programmable watchdog timer (WDT) which can reach 255 level and time by minute or second. Watchdog Timer can be programmed to reset system or generate shield interrupt. Below it describes WDT program in C language. Note: before running WDT, you must firstly enter WDT programming mode; after finishing WDT configuration, exit WDT.

The steps to program WDT:

- Enter WDT programming mode
- Setup WDT working methods/ start WDT/ stop WDT
- Exit WDT programming mode

The ways to program WDT: Please consult the following code:

```
//Super I/O Watchdog
#define pm_base 0x0a00
#define WRITEREG(reg,val) {tmp_reg=pm_base+reg;
outportb(tmp_reg,val);}
//1.Initial Watchdog device
short SIOWTD_Setup(short irq)
/* irq=3,4,5,6,7,9,12,0:disable interrupt,0xff:reset*/
{
    //check parameters
    //if(irq!=0xff && (irq<3 || irq>7) && irq!=9 && irq!=12 &&
irq!=0)
    // return -1;
```

```
SLOWTD_Disable();
//start programming Watchdog

//Set Watchdog Event
if(irq==0xff) //WatchDog cause System Reset
{
    WRITEREG(0x47,0x0c)
}
else //Watchdog cause System Interrupt
{
    irq=irq<<4;
    WRITEREG(0x47,0x80)
    WRITEREG(0x67,irq)
}
//end programming watchdog

return 0;
}
//2.start Watchdog to count
short SLOWTD_Enable(short time,short unit)
/*unit=0:second,=1:minutes */
{
    if(time<1 || time>255) return -1;
    if(unit<0 || unit>1) return -1;
    //start programming watchdog

    //select Watchdog Timer clock
```

```
switch(unit)
{
case 0:
    WRITEREG(0x65,0x01) //secondes
    break;
case 1:
    WRITEREG(0x65,0) //minutes
    break;
}
WRITEREG(0x66,time) //set timeout value
//end programming watchdog

return 0;
}
//3.Disable the Watchdog
short SLOWTD_Disable()
{
    //start programming watchdog

    WRITEREG(0x66,0) //set timeout value=0
    //end programming watchdog

    return 0;
}
```

## IRQ Interrupts Assignment

There are interrupt sources as follows in WinXP system. Some has been occupied by system device. Only those unoccupied interrupt sources can be designated to other devices. ISA device requests exclusive use of its interrupt; only PnP ISA device can be assigned interrupt by BIOS or operating system. While multiple PCI devices can share the same interrupt, and assigned by BIOS or operating system.

Level	Function
IRQ0	System timer
IRQ1	Standard 101/102 key or Microsoft natural PS/2 keyboard
IRQ3	Communication Port (COM1)
IRQ4	Communication Port (COM2)
IRQ5	Standard OpenHCD USB Host Controller
IRQ5	Standard Enhanced PCI to USB Host Controller
IRQ5	Realtek RTL8169/8110 Family Gigabit Ethernet NIC
IRQ5	Realtek RTL8169/8110 Family Gigabit Ethernet
IRQ5	Realtek RTL8169/8110 Family Gigabit Ethernet
IRQ6	Standard floppy disk controller
IRQ8	System CMOS/real time clock
IRQ9	Microsoft ACPI-Compliant System
IRQ1	Advanced Micro Devices Win 2K/XP Graphics Driver
IRQ1	Entertainment encrypt/decrypt controller
IRQ1	Microsoft PS/2 Mouse
IRQ1	Numeric data processor
IRQ1	Primary IDE Channel

## I/O Interfaces Address Table

The space of system I/O address is 64K. Each peripheral takes up a section of I/O space. The following table shows you part of the I/O address assignment of the CPU card. Because the address of PCI device (such as PCI network card) is configured by software, it is not listed in the table.

Address	Device Description
020h - 021h	Programmable interrupt controller
040h - 043h	System timer
060h - 060h	Standard 101/102 key or Microsoft natural PS/2 keyboard
064h - 064h	Standard 101/102 key or Microsoft natural PS/2 keyboard
070h - 071h	System CMOS/real time clock
081h - 083h	Direct memory access controller
087h - 087h	Direct memory access controller
089h - 08Bh	Direct memory access controller
08Fh - 08Fh	Direct memory access controller
0A0h - 0A1h	Programmable interrupt controller
0C0h - 0DFh	Direct memory access controller
0F0h - 0FFh	Numeric data processor
170h - 177h	Secondary IDE Channel
1F0h - 1F7h	Primary IDE Channel
2F8h - 2FFh	Communication Port (COM2)
376h - 376h	Secondary IDE Channel
378h - 37Fh	Parallel Port #1(LPT1)
3B0h - 3BAh	Advanced Micro Devices Win 2K/XP Graphics Controller
3C0h - 3DFh	Advanced Micro Devices Win 2K/XP Graphics Controller
3F6h - 3F6h	Primary IDE Channel

## Appendix

3F8h – 3FFh	Communication Port (COM1)
480h – 48Fh	Direct memory access controller
ED00h – EDFFh	Realtek RTL8169/8110 Family gigabit ethernet NIC
EE00h – EEFFh	Realtek RTL8169/8110 Family gigabit ethernet
EF00h – EEFFh	Realtek RTL8169/8110 Family gigabit ethernet
FFF0h –	Standard dual-channel PCI IDE controller

**Please refer to <http://www.evoc.com> if you want to know more information about our company.**