Chapter 1

Overview

MX59 Pro II is an all-in-one Pentium$^{\circledR}$-based motherboard that features **VIA MVP4** chipset with **onchip high performance 2D/3D AGP graphics controller and a 16-bit sound processor**. This motherboard utilizes the PCI/ISA architecture and Micro ATX form factor and integrates Super I/O controller, a PCI mode 4 enhanced IDE controller with bus master and Ultra DMA/66 to enhance system performance. It has **512KB** pipelined-burst second-level cache onboard and supports two Dual in-line memory module (DIMM) slots that allow the installation of **SDRAM** memory and expansion up to a maximum of **512MB**.

In addition to the above features, MX59 Pro II also implements plenty of special features.

Full-range CPU core voltage This motherboard supports the CPU core voltage from 1.3V to 3.5V, that can be applied to various CPU type in future.

High Efficient Synchronous Switching Power Regulator Most of the current switching designs are asynchronous mode, which from the technical point of view, still consumes very high power as well as heat. This motherboard implements high efficient Synchronous switching design that the temperature of MOS FET is less than 36 degree C comparing with 57 degree Schottky diode of Asynchronous design.

Zero Voltage Wake on Modem In conjunction with ATX soft power On/Off, it is possible to have system totally power off and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. The most important break through is not only external box modem but also internal modem card can be used to support 0V Wake On Modem. The MX59 Pro II and FM56-P internal modem card implement special circuit (patent applied) to make sure the modem card work properly without any power.

Wake on LAN This feature is very similar as 0V Wake On Modem, but it is through local area network. To use Wake on LAN function, you must have a network card that supports this feature and also need to install a network management software.

Overview

Wake on RTC Timer The Wake Up Timer is more like an alarm, which wakes up and power on your system at a pre-defined time for specific application. It can be set to wake up everyday or on specific date within a month. The date/time accuracy is second.

Over Current Protection Circuit The Over Current Protection was very popular implemented on the Baby AT or ATX +5V/+12V switching power supply. It is very useful to prevent accidental short circuit when you install the motherboard, HDD, add-on cards into housing. But unfortunately, the new generation CPU and chipset use 3.3V/2.8V Voltage which has regulator to transfer 5V to 3.3V (Vcpuio, chipset, PBSRAM, SDRAM) and 2.8V (CPU Vcore), and makes 5V Over Current Protection useless. MX59 Pro II supports 3.3V and 2.8V Over Current Protection, in conjunction with 5V/12V power supply provide the full line Over Current Protection.

CPU Thermal Protection MX59 Pro II has a special thermal detection circuit to have warning through application software when the temperature is higher than a predefined value.

CPU and Housing Fan Monitoring MX59 Pro II has one more "fan monitoring" function to prevent system overheat. There are two fan connectors, one is for CPU and the other can be an extra housing fan. The system will report and alarm fan malfunction though utility software such as Hardware Monitor utility (named AOhw100, where 100 means version number).

System Voltage Monitoring Furthermore, MX59 Pro II implements a voltage monitoring system, As you turn on your system, this smart design will continue to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm though software such as Hardware Monitor utility for a warning to user.

Resetable Fuse MX59 Pro II implements resetable fuses to prevent any accidental short circuit caused by keyboard or USB devices hot plug.

FCC DoC Certificate MX59 Pro II has passed FCC DoC test. The radiation is very low, you can use any kind of housing.

Powerful Utility Software Included Motherboard Installation CD disc contains many useful utilities, such as Norton Antivirus, AOchip, Hardware Monitoring Utility, and Suspend to Hard Drive utility.

Multi-language BIOS This breakthrough will help you set BIOS items without the language barrier.
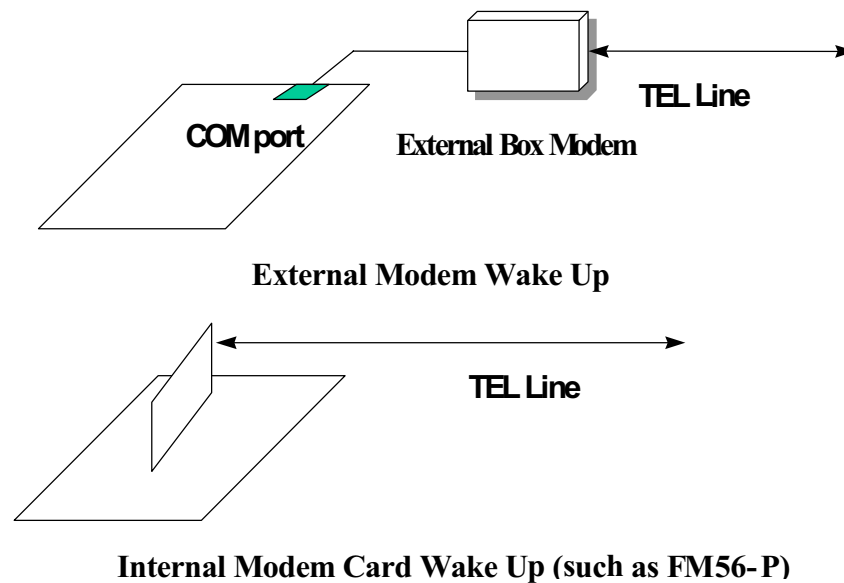
Overview

1.1 Specifications

Form Factor	Micro ATX
Board Size	220 mm x 245 mm
CPU	Intel Pentium Processor P54C, PP/MT (P55C), AMD K5/ K6/K6-2/K6-III, Cyrix 6x86/M2 and IDT C6.
System Memory	DIMM 168-pin x2, maximum 512MB.
Second-level Cache	512KB pipelined-burst cache onboard
Chipset	VIA MVP4
Expansion Slots	ISA x1 and PCI x4
VGA (AGP)	High performance 2D/3D graphics controller onchip in VIA MVP4
Serial Port	Two serial ports UART 16C550 compatible
Parallel Port	One parallel port supports standard parallel port (SPP), enhanced parallel port (EPP) or extended capabilities port (ECP).
Floppy Interface	Floppy interface supports 3.5 inches drives with 720KB, 1.44MB or 2.88MB format or 5.25 inches drives with 360KB, 1.2MB format
IDE Interface	Dual-channel IDE interface support maximum 4 IDE hard disks or CDROM, mode 4, bus master hard disk drives and Ultra DMA/66 mode hard drives are also supported.
USB Interface	Two USB ports supported by USB bracket, the BIOS also supports USB driver to simulate legacy keyboard.
PS/2 Mouse	Mini-Din PS/2 mouse connector onboard.
Keyboard	Mini-Din PS/2 keyboard connector onboard.
RTC and Battery	RTC build in chipset, Lithium (CR-2032) battery.
BIOS	AWARD Plug-and-Play, 2M bit Flash ROM BIOS. Multi-language versions supported.

Overview

1.2 Zero Voltage Wake on Modem

The Wake on Modem discussed here is to wakeup from true power off (identified by fan of power supply is off), This motherboard still supports traditional green PC suspend mode but it is not discussed here.

With the help ATX soft power On/Off, it is possible to have system totally power off (The traditional suspend mode of power management function does not really turn off the system power supply), and wakeup to automatically answer a phone call such as answering machine or to send/receive fax. You may identify the true power off by checking fan of your power supply. Both external box modem and internal modem card can be used to support 0V Wake On Modem, but if you use external modem, you have to keep the box modem always power-on. MX59 Pro II and internal modem card implement special circuit (patent applied) and make sure the modem card works properly without any power.

External Modem Wake Up

Internal Modem Card Wake Up (such as FM56-P)

For Internal Modem Card (AOpen FM56-P):

1. Go into BIOS setup, Power Management → 0V Wake On Modem, select Enabled.
2. Setup your application, put into Windows 95.
3. Turn system power off by soft power switch.
4. Connect 4-pin Modem Ring-On cable from FM56-P RING connector to MX59 Pro II connector WKUP.
5. Connect telephone line to FM56-P. You are now ready to use Wake On Modem.

For External Box Modem:

1. Go into BIOS setup, Power Management → 0V Wake On Modem, select Enabled.
2. Setup your application, put into Windows 95 Start Up.
3. Turn system power off by soft power switch.
4. Connect RS232 cable of external box Modem to COM1 or COM2.
5. Connect telephone line to external box Modem. Turn on Modem power (you must keep Modem power always on). You are now ready to use Wake On Modem.

Tip: External 0V Wake On Modem signal is detected through COM1 or COM2. Internal modem card wake up signal is detected through cable from connector RING (on modem card) to WKUP (on mainboard).
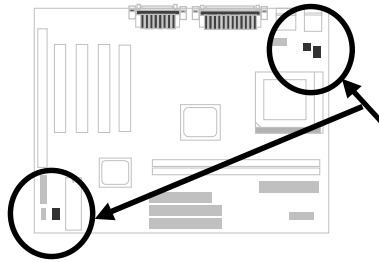
Note: If you use external modem, the power of external modem must be kept on to receive signal from telephone line. Internal modem card has no such limitation.

Overview

1.3   System Voltage Monitoring

This motherboard implements a voltage monitoring system. As you turn on your system, this smart design will continue to monitor your system working voltage. If any of the system voltage is over the component's standard. There will be alarm through application software such as Hardware Monitor utility for a warning to user. System voltage monitoring function monitors CPU core voltage. It is automatically implemented by BIOS and Hardware Monitor utility (the file name is like aohw100.exe, where 100 means the version number, no hardware installation is needed.

1.4   Fan Monitoring

There are three fan connectors, two is for CPU, the other can be a housing fan. The fan monitoring function is implemented by connecting fan to 3-pin fan connector **CPUFAN1 and FAN**, and installing Hardware Monitoring Utility.

Note: You need 3-pin fan that supports SENSE signal for fan monitoring function to work properly.

1.5   CPU Thermal Protection

This motherboard implements special thermal protection circuit below the CPU. When temperature is higher than a predefined value, the CPU speed will automatically slow down and there will be warning from BIOS and also Hardware Monitoring Utility software.

CPU Thermal Protection is automatically implemented by BIOS and utility software, no extra hardware installation is needed.