

CHAPTER 1

Introduction

The ROBO-538 all-in-one single board computer is designed to fit a high performance Pentium-based CPU and compatible for high-end computer system with PCI Local Bus architecture. It is made to meet today's demanding pace, and keep complete compatibility with hardware and software designed for the IBM PC/AT. It's beneficial to build up a high performance and high data availability system for VARs, or system integrators. The optional on-board IEEE-1394 provides one high – speed interface port with data transfer rate 400Mbits/s.

This single board computer can run with Intel Pentium or compatible processor up to 333 MHz, and support DIMM up to 256MB DRAM. The enhanced on-board PCI IDE interface can support 4 drives up to PIO mode 4 timing and Ultra DMA/33 synchronous mode feature. The on-board Super I/O Chipset integrates floppy controller, two serial ports, one IrDA (Standard & Fast Infrared) port and one parallel port. Two high performance 16C550-compatible UARTs provide 16-byte send/receive FIFOs, and the multi-mode parallel port supports SPP/EPP/ECP function. Besides, two USB (Universal Serial Bus) ports provide high-speed data communication between peripherals and PC.

The PICMG standard makes the ROBO-538 works with the legacy ISA, ISA/PCI or multi-slots PCI-bus backplane. The three on-board 32-pin DIP sockets support M-system Disk-on-Chip products up to 432MB, and one PC/104 interface provides flexible embedded platform. The Watch-dog Timer function can monitor your system status. Two 6-pin Mini-DIN connectors are provided to connect PS/2 Mouse and Keyboard. The on board Flash ROM is used to make the BIOS update easier. A standard P8 power connector is reserved for getting more power energy in high power applications, the additional 5-pin shrouded connector is reserved for connecting Keyboard interface on the backplane. The high precision Real Time Clock/calendar is built in for accurate scheduling and storing configuration information. One 4-pin header is designed to support ATX power function. All these features make ROBO-538 excellent in stand- alone applications.

1-1 Check List

The ROBO-538 package includes the following basic items accompany with this manual.

- One ROBO-538 single board computer
- One Serial/Parallel port cable
- One FDC cable
- One IDE cable
- One 5-pin to 5-pin keyboard cable for backplane connection
- One 4-pin ATX power control cable for backplane connection
- Two diskettes support Windows 95 OSR2.1 driver for IEEE-1394 (**ROBO-538E only**)

If any of these items is damaged or missed, please contact your vendor and save all packing materials for future replacement and maintenance.

1-2 Product Specifications

- **Main processor**
Intel Pentium P54C/P55C, AMD K5/K6/K6-2 series, Cyrix M1/M2 series or compatible up to 333 MHz
 - ◇ CPU bus clock : 60/66 MHz
 - ◇ CPU core/bus clock ratio : X1.5 to X5.5
 - ◇ CPU Vcore Voltage : 1.8V to 3.5V
- **BIOS**
AMI system BIOS with 128KB Flash ROM
- **Main Memory**
Two 168-pin DIMM sockets, supporting 3.3V SDRAM or EDO DRAM up to 256MB
- **L2 Cache Memory**
On-board 512KB Pipeline Burst Static RAM and 64MB DRAM Cacheability
- **Chipset**
Intel 82430TX PCIset
- **Bus Interface**
Follow PICMG standard (32-bit PCI and 16-bit ISA)
Fully complies with PCI bus specification V2.1
- **PCI IDE Interface**
Supports two enhanced IDE ports up to four HDD devices with PIO mode 4 and Ultra DMA/33 mode 2 timing transfer
- **Floppy Drive Interface**
Supports one FDD port up to two floppy drives and 5-1/4"(360K, 1.2MB), 3-1/2" (720K, 1.2MB, 1.44MB, 2.88MB) diskettes
- **Serial Ports**
Support two high-speed serial ports with 16-byte FIFOs
- **IR Interface**
Supports one 6-pin header for serial Standard/Fast Infrared wireless communication
- **Parallel Port**
Supports one SPP, EPP/ECP bi-directional parallel port

- **USB Interface**
Supports two USB (Universal Serial Bus) ports for high speed I/O peripheral devices
- **PS/2 Mouse and Keyboard Interface**
Supports two 6-pin Mini-DIN connectors and one 5-pin shrouded connector for PS/2 mouse, keyboard and backplane connection
- **ATX Power Control Interface**
One 4-pin header to support ATX power control with Modem Ring-On and Wake-On-LAN function
- **Auxiliary I/O Interfaces**
System reset switch, external speaker, Keyboard lock and HDD active LED
- **Real Time Clock/Calendar (RTC)**
Real Time Clock/calendar with battery backup for 10-year data retention
- **Watchdog Timer**
0.5,1,2,4,8,16,32,64 sec. time-out intervals by jumper setting or 255 intervals from 0.5 min. to 254.5 min. by software programming
- **Disk-On-Chip (DOC) Feature**
Reserved three 32-pin sockets for M-system Flash Disk up to 432MB
- **Optional IEEE-1394 Feature**
One high-speed serial port with data transfer rate 400Mbits/s
- **CPU Temperature Control**
Automatically control CPU speed to prevent it from over heating
- **High Driving Capability**
Supports high driving capability for multi-slots ISA-bus
- **External Power Connector**
Supports one standard P8 power connector to enhance power driving
- **Power Good**
On-board power good generator with reset time, 300ms ~ 500ms

- **Physical and Environmental Requirements**

- ◆ Outline Dimension (L X W) : 339.5mm (13.36") X 121.5mm (4.78")
- ◆ Board Weight : 0.86 lb. (0.39kg)
- ◆ PCB layout : 6 layer
- ◆ Power Requirements : +5V @5.0A (typ.), +12V @80mA, -12V @30mA
- ◆ Operating Temperature : 0°C ~ 60°C (32°F ~ 140°F)
- ◆ Storage Temperature : -20°C ~ 80°C
- ◆ Relative Humidity : 5% ~ 95%, non-condensing

1-3 System Architecture

The following illustration of block diagram will show you how does ROBO-538 give you a highly integrated system solution. The most up-to-date system architecture of ROBO-538 is based on Intel 430TX PCIset , which consists of the 82439TX System Controller (MTXC) and the 82371AB PCI ISA IDE Xcelerator (PIIX4). This equips ROBO-538 to support Pentium Processor, SDRAM, PDSRAM L2 Cache, PCI bus interface, ACPI compliant power management, USB port, SMBus communication, and Ultra DMA/33 IDE Master. The on-board super I/O chip, W83977ATF, will support PS/2 Keyboard/Mouse, two UARTs, FDC, Parallel and Infrared interface. In addition, the on-board optional IEEE-1394 interface will give user more flexibility in high-speed data transferring applications.

The North Bridge 82439TX provides a completely integrated solution for the system controller and data path components in a Pentium processor system. The MTXC supports all compatible Pentium family processors since P54C. It has 64-bit Host and DRAM Bus Interface, 32-bit PCI bus interface, Second level Cache Interface with 64MB DRAM cacheability, and it will integrate 3 or 4 PCI masters which depend on number of enabling on-board PCI device to support external backplane.

The South Bridge, 82371AB, provides a highly integrated multifunction PCI-to-ISA bridge solution for the best industry application. It supports 2-channel dedicated Ultra DMA/33 IDE master interfaces, full Plug-and-Play compatibility, and APIC (Advanced Programmable Interrupt Controller) interface. It also supports 2-port USB (Universal Serial Bus feature) and PCI 2.1 Compliance operation. It fully supports Operating System Directed Power Management via the Advanced Configuration and Power Interface (ACPI) specification. In addition, it also provides XD-bus via buffer logic control to support BIOS read/write access and external real-time clock (RTC) to maintain date and time of a system.

The Super I/O chip W83977ATF, which integrates two high-speed serial ports, one parallel port, FIR/SIR interface, 8042 keyboard controller with PS/2 mouse ports and FDD interface. This parallel port supports one PC-compatible Standard Printer Port (SPP), Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP).

The optional IEEE-1394 interface enables PC to connect to current and emerging 1394 peripherals, including DV camcorders, digital VCRs, color printers, scanners, digital still cameras, DVD players, 1394 HDDs, and more. This PCI-to-1394 Host Controller is composed of Adaptec's AIC-5800 400Mb/s link controller chip and a IBM 21S850 400Mb/s PHY interface chip to connect up to 63 devices using easy-to-use cables and six-pin connector for true plug-and-play and "hot swapping" of peripherals.

Two 16-bit ISA-bus interfaces, standard ISA and PC/104 bus, are applied for all of slower I/O operations. In ROBO-538, it contains Watch-dog Timer (WDT) enabled by jumper setting and triggered by software, Disk-on-Chip (DOC) for M-system Flash disk, and ISA buffer driving for special I/O applications and multi-ISA slots. Besides, an advanced feature is used on current ROBO-538 DOC architecture to expand storage size by cascading three flash disks. The detail operating relations are shown in Figure 1-1 ROBO-538 System Block Diagram.

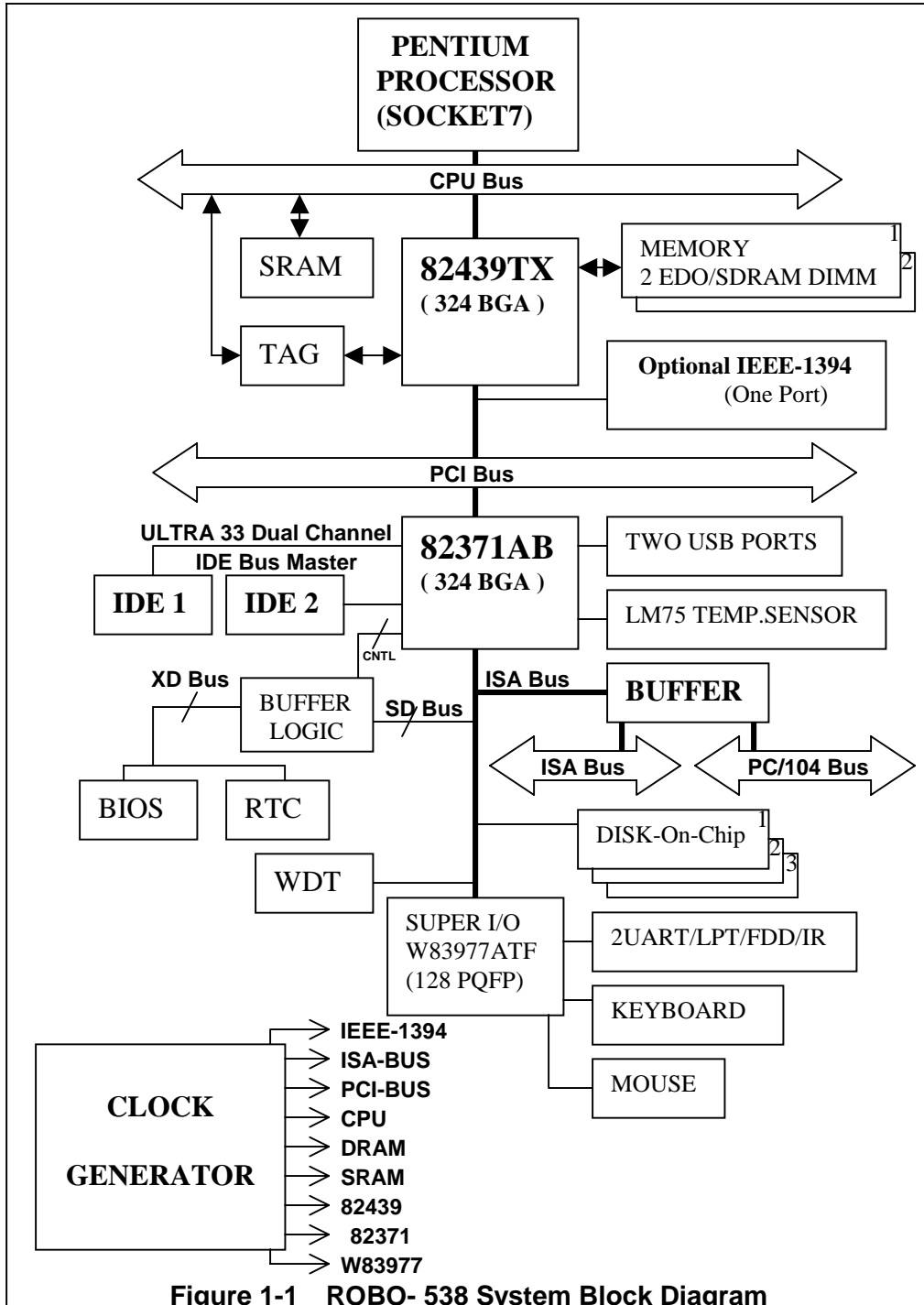


Figure 1-1 ROBO-538 System Block Diagram