



MS-5197 Mainboard Specification & User's Guide

1. Introduction

The MS-5197 mainboard is a high-performance all-in-one Set Top Box mainboard. This mainboard supports Intel® Pentium® processor/Pentium® processor with MMX™ technology, AMD® K5/K6/K6-2, and Cyrix® 6x86/6x86L/6x86MX processors. This mainboard combines leading edge ATI technology in graphics, Creative® CT5880 PCI Enhanced technology in audio, and Sigma Design EM8220 MPEG-2 Decoder. The mainboard also supports two 32-bit PCI (Peripheral Component Interconnect) Local Bus standard slots.

The mainboard uses the highly integrated Aladdin® 5 chipset to support the PCI/ISA and Green standards, and to provide the Host/AGP bridge. The Aladdin® 5 chipset integrates all system control functions such as ACPI (Advanced Configuration and Power Interface). The ACPI provides more Energy Saving Features for the OSPM(OS Direct Power Management) function. The Aladdin® 5 chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfer data at the rate of 33MB/s.



2. Mainboard Specification

CPU

- Socket 7 supports Intel® Pentium® processor/Pentium® processor with MMX™ technology.
- Cyrix® 6x86/6x86L/6x86MX/MII are supported.
- AMD® K6/K6-2/K6-3 processors are supported.

Chipset

- Aladdin® 5 M1541/M1543C chipset.

FSB (Front Side Bus)

- 100/95/83.3/75/66MHz clocks are supported.

Cache Memory

- Support 512K Pipelined Burst cache memory.

Switching Regulator

- Provides CPU with voltage ranging from 1.8V to 3.5V
- Support VI/O 3.45 for AMD K6 300 processor

Main Memory

- Support six memory banks using two 168-pin unbuffered DIMM.
- Support a maximum memory size of 512MB.
- Support 3.3v SDRAM DIMM.

Slots

- One 32-bit PCI Bus riser slot. (Extend to two PCI slots)
- Supports 3.3v/5v PCI bus Interface.

On-Board IDE

- An IDE controller on the Aladdin® M1543C PCI Chipset provides IDE HDD/CD-ROM with PIO, DMA and Ultra DMA/33 operation modes.
- Connect up to four IDE devices.
- 1 44-pin header for mini size HD or DOM (shared primary IDE interface)

Video

- ATI® RAGE XL
 - Running on PCI BUS.
 - Onboard 8MB SGRAM
 - 3D acceleration
- ATI® RAGE Theater
 - Support TV-Out, SPDIF out and Video Input
 - Support S-Video/AV-Composite Output and Input
 - AMC Interface with Rage XL

Audio

- Creative® CT5880
 - PCI 2.2 Compliant
 - 3D Audio Effects
 - 32-voice XG wavetable synthesizer
 - Direct Sound/Music Hardware Accelerator
 - Full Duplex Stereo
 - Support SPDIF Connector

Network

- Realtek 8139B 10/100 Ethernet
 - WFW baseline & Net PC specification compliant
 - ACPI
 - magic packet filtering to wake-up on LAN
 - ARP & Flexible frame filtering
 - Software drivers are backwards compatible

1394 Controller

- 1394 PHY Controller (optional)
 - TI TSB41LV02 PHY Digital-to-Analog Transceiver
 - Support up to two 1394/1394A V2.0 compatible data channels
- 1394 Link Layer Controller (optional)
 - TI TSB12LV26 1394 Link Layer Host Controller
 - IEEE 1394, 1394 OHCI V1.0 & 1394A V2.0 compatible
 - Supports 100/200/400 Mbps High Throughput
 - 3.3V & 5V Operation for PCI-to 1394 Interface

Hardware DVD Decoder

- SIGMA Designs EM8220
 - Integrated MPEG-2 Video and Audio Decoder
 - Built in Serial Audio Output
 - Built in S/PDIF encoder



On-Board Peripherals

- On-Board Peripherals include:
 - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes.
 - 1 serial port header (COM1)
 - 1 parallel port supports SPP/EPP/ECP mode
 - 2 USB rear port with 1 USB header for front side USB ports
 - 1 IrDA connector for SIR/FIR.
 - 1 VGA port
 - 2 S-VIDEO for Video Output and Input
 - 2 AV-composite jacks for video output and input
 - 4 RCA jacks for mono audio output and input
 - 1 SPDIF Jack for SPDIF output
 - 1 RJ45 LAN port
 - 1 Game port header
 - 2 1394 ports

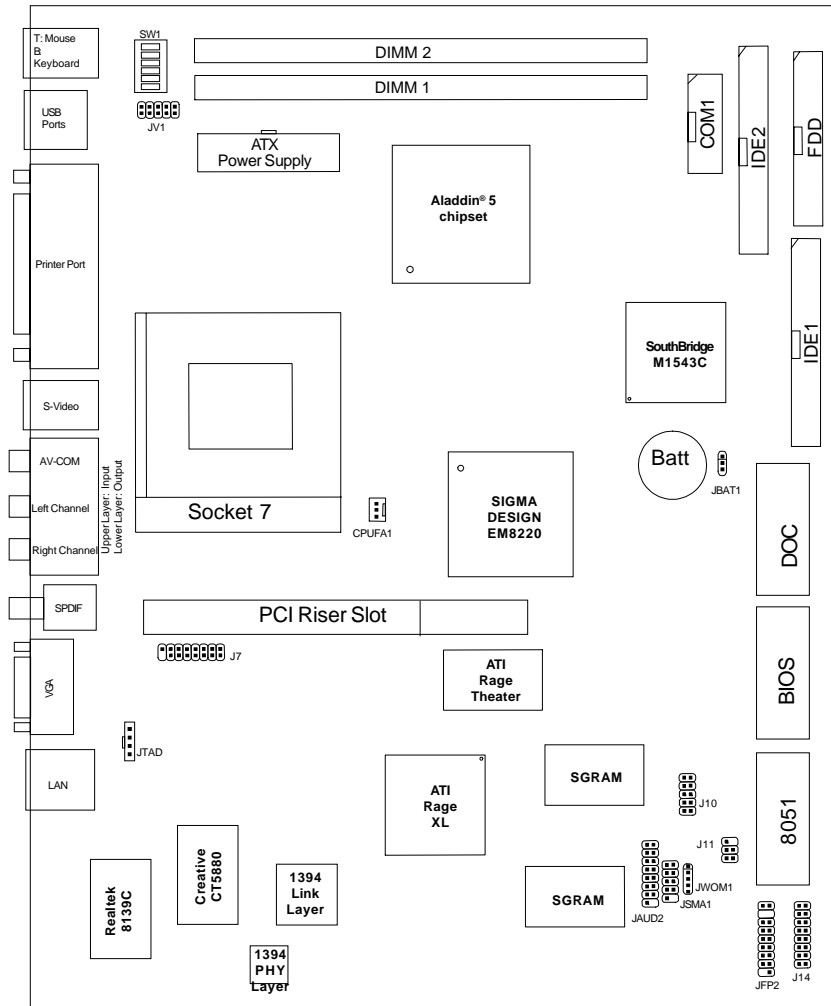
BIOS

- The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- The mainboard provides a Desktop Management Interface(DMI) function which records your mainboard specifications.

Mounting

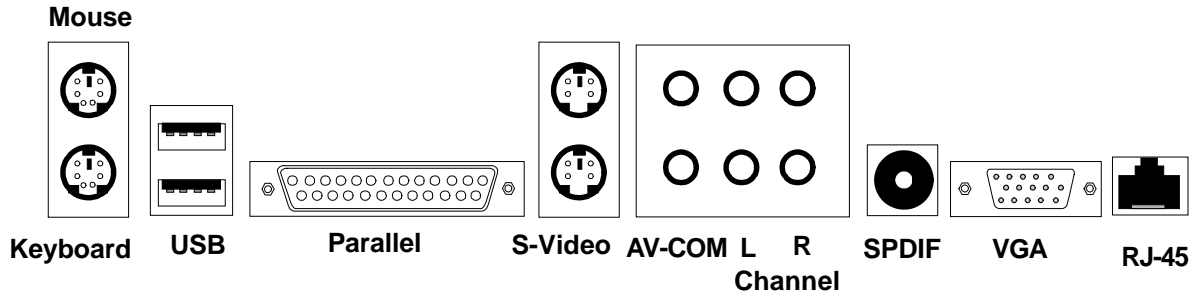
- 8 mounting holes.

3. Mainboard Layout



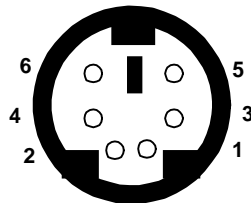
MS-5189 MICRO ATX AL13 Mainboard

4. Backpanel Layout



4.1 Connectors

4.1-1 Mouse Connector

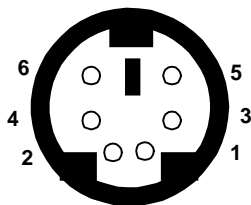


PS/2 Mouse (6-pin Female)

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

PS/2 Mouse Pin Definition

4.1-2 Keyboard Connector

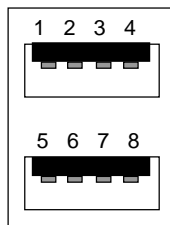


PS/2 Keyboard (6-pin Female)

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

PS/2 Keyboard Pin Definition

4.1-3 USB Connectors

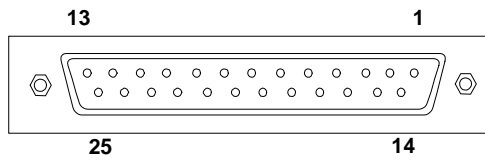


USB Ports

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data 0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

USB Port Description

4.1-4 Parallel Port Connector



LPT 25-Pin Male Connectors

PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground1

5. Memory Addressing

Table 5.1 EDO DRAM Memory Addressing

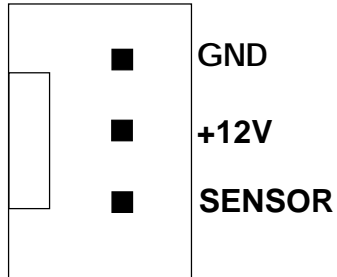
DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	SYMM	10	10	8MBx4	16MBx8
	1Mx16	ASYM	12	8	8MBx4	16MBx8
	2Mx8	ASYM	11	10	16MBx8	32MBx16
	2Mx8	ASYM	12	9	16MBx8	32MBx16
	4Mx4	SYMM	11	11	32MBx16	64MBx32
	4Mx4	ASYM	12	10	32MBx16	64MBx32
64M	2Mx32	ASYM	11	10	16MBx2	32MBx4
	2Mx32	ASYM	12	9	16MBx2	32MBx4
	2Mx32	ASYM	13	8	16MBx2	32MBx4
	4Mx16	SYMM	11	11	32MBx4	64MBx8
	4Mx16	ASYM	12	10	32MBx4	64MBx8
	8Mx8	ASYM	12	11	64MBx8	128MBx16

Table 5.2 SDRAM Memory Addressing

DRAM Tech.	DRAM Density & Width	DRAM Addressing	Address Size		MB/DIMM	
			Row	Column	Single no. Side(S) pcs.	Double no. Side(D) pcs.
16M	1Mx16	ASYM	11	8	8MBx4	16MBx8
	2Mx8	ASYM	11	9	16MBx8	32MBx16
	4Mx4	ASYM	11	10	32MB	64MB
64M	2Mx32	ASYM	11	9	32MBx2	64MBx4
	2Mx32	ASYM	12	8	16MBx2	32MBx4
	4Mx16	ASYM	11	10	32MB	64MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	16Mx4	ASYM	13	10	128MB	256MB
64M	2Mx32	ASYM	11	8		
	4Mx16	ASYM	12	8		
	8Mx8	ASYM	12	9		
	16Mx4	ASYM	12	10		



6. CPU Fan Power Connector





Appendix A

DIP Switch

CPU Core Speed Derivation Procedure

1. The DIP Switch SW1 (4, 5, & 6) is used to adjust the CPU clock frequency.

SW1			CPU
4	5	6	Clock
OFF	OFF	OFF	100MHz
ON	OFF	OFF	95MHz
OFF	ON	OFF	83MHz
OFF	OFF	ON	75MHz
OFF	ON	ON	66MHz
ON	ON	ON	60MHz
ON	OFF	ON	68MHz

2. The DIP Switch SW1 (1, 2, and 3) is used to set the Core/Bus (Fraction) ratio of the CPU. The actual core speed of the CPU is the Host Clock Frequency multiplied by the Core/Bus ratio. For example:

If CPU Clock = 66MHz
Core/Bus ratio = 3/2
then CPU core speed = Host Clock x Core/Bus ratio
 = 66MHz x 3/2
 = 100MHz

SW1			CPU
1	2	3	Core/Bus Ratio
OFF	OFF	ON	5.5x
OFF	ON	ON	5x
ON	ON	ON	4.5x
ON	OFF	ON	4x
OFF	OFF	OFF	3.5x
OFF	ON	OFF	3x
ON	ON	OFF	2.5x
ON	OFF	OFF	2x






CPU Voltage Setting: JV1

1	2	3	4	5	V/O	VCore
OFF	OFF	OFF	OFF	ON	3.45	1.3
ON	OFF	OFF	OFF	ON	3.45	1.35
OFF	ON	OFF	OFF	ON	3.45	1.4
ON	ON	OFF	OFF	ON	3.45	1.45
OFF	OFF	ON	OFF	ON	3.45	1.5
ON	OFF	ON	OFF	ON	3.45	1.55
OFF	ON	ON	OFF	ON	3.45	1.6
ON	ON	ON	OFF	ON	3.45	1.65
OFF	OFF	OFF	ON	ON	3.45	1.7
ON	OFF	OFF	ON	ON	3.45	1.75
OFF	ON	OFF	ON	ON	3.45	1.8
ON	ON	OFF	ON	ON	3.45	1.85
OFF	OFF	ON	ON	ON	3.45	1.9
ON	OFF	ON	ON	ON	3.45	1.95
ON	ON	ON	ON	ON	3.45	2.0
ON	OFF	OFF	OFF	OFF	3.45	2.1
OFF	ON	OFF	OFF	OFF	3.45	2.2
ON	ON	OFF	OFF	OFF	3.45	2.3
OFF	OFF	ON	OFF	OFF	3.45	2.4
ON	OFF	ON	OFF	OFF	3.45	2.5
OFF	ON	ON	OFF	OFF	3.45	2.6
ON	ON	ON	OFF	OFF	3.45	2.7
OFF	OFF	OFF	ON	OFF	3.45	2.8
ON	OFF	OFF	ON	OFF	3.45	2.9
OFF	ON	OFF	ON	OFF	3.45	3.0
ON	ON	OFF	ON	OFF	3.45	3.1
OFF	OFF	ON	ON	OFF	3.45	3.2
ON	OFF	ON	ON	OFF	3.45	3.3
OFF	ON	ON	ON	OFF	3.45	3.4
ON	ON	ON	ON	OFF	3.45	3.5



Clear CMOS Jumper: JBAT1

A battery must be used to retain the mainboard configuration in CMOS RAM. If you use the on-board battery, you must short 1-2 pins of JBAT1 to keep the CMOS data.

JCMOS1	Function
Short 1-2 	Normal Operation
Short 2-3 	Clear CMOS & Password
Open 	Flash Recovery

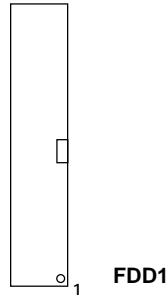
Note: You can clear CMOS by shorting 2-3 pin, while the system is off. Then, return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard. Always unplug the power cord from the socket wall.



Connectors

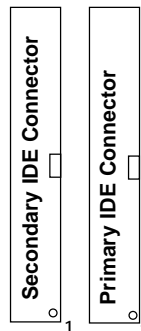
Floppy Disk Connector: FDD1

The mainboard also provides a standard floppy disk connector FDC that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types. This connector supports the provided floppy drive ribbon cable.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE Controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33 function. It has two HDD connectors IDE1 (primary) and IDE2 (secondary). You can connect up to four hard disk drives, CD-ROM, LS-120, ATAPI ZIP drive and other devices to IDE1 and IDE2. These connectors support the provided IDE hard disk cable.



IDE1(Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

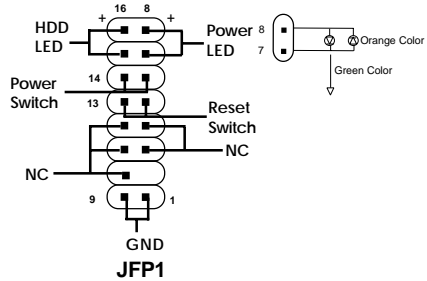
IDE2(Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.



Case Connector: JFP2

The Power Switch, Reset Switch, Key Lock, Power LED, Speaker and HDD LED are all connected to the JFP1 connector block.



Power Switch

Connect to a 2-pin push button switch. This switch has the same function with JRMS1.

Reset Switch

Reset switch is used to reboot the system rather than turning the power ON/OFF. Avoid rebooting while the HDD LED is lit. You can connect the Reset switch from the system case to this pin.

Power LED

The Power LED is always lit while the system power is on. You can connect the Power LED from the system case to this pin.

Green Color: Indicate the system is in full on mode.

Orange Color: Indicate the system is in suspend mode.

NC

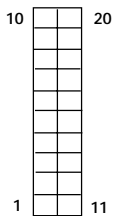
Not Connected.

HDD LED

HDD LED shows the activity of a hard disk drive. Avoid turning the power off while the HDD led is lit. You can connect the HDD LED from the system case to this pin.

ATX 20-pin Power Connector: J1

This connector supports the power button on-board. Using the ATX power supply, functions such as Modem Ring Wake-Up and Soft Power Off are supported by this mainboard.

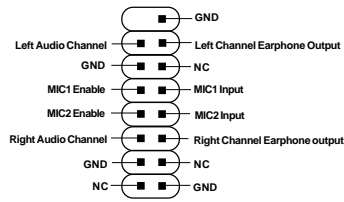


ATX Power Connector

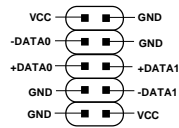
PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V



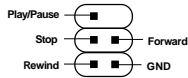
Front Side Audio Connector: J7



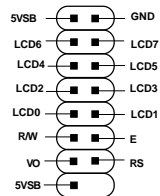
Front Side USB Header: J10



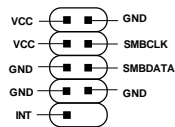
Playback Controller Header: J11



LCM Header: J14

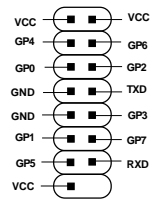


Smart Card Header: JSMA1





Game Port Header: JAUD2





Appendix B - Schematics



Notes



Appendix C - Bill for Materials



Notes



Appendix D - Mechanical Drawings



Notes



Appendix E - Test Report

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