MS-6159 MICRO ATX LX9 Mainboard Specification & User's Guide

1. Introduction

The MSI MICRO ATX LX9 mainboard is a high-performance personal computer mainboard based on the Intel® Celeron™ processor. This mainboard combines leading edge ATI® 3D RAGE PRO Turbo and Creative® ES1373 PCI technology in audio. The Intel® Celeron™ processor supports MMX™ (Multimedia Extension) technology.

The mainboard uses the highly integrated Intel® 82443LX AGPset to support the PCI/ISA and Green standards, and to provide the Host/AGP bridge. The Intel® 82371EB 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 Intel® 82371EB chipset also improves the IDE transfer rate by supporting Ultra DMA/33 IDE that transfers data at the rate of 33MB/s.

The mainboard also supports the System Hardware Monitor Controller as an optional function. Its functions include: CPU /power supply/chassis fan revolution detect, CPU/system voltage monitor, system temperature monitor, and chassis intrusion detect(optional).

2. Mainboard Specification

CPU
- Slot 370 for Intel® Celeron™ processor
- Supports 333MHz, 400MHz, and faster

Chipset
- Intel® 82440LX chipset.

FSB (Front Side Bus)
- 66.6/68MHz clocks are supported.
- 75/83MHz are only used for overclocking.

Main Memory
- Supports four memory banks using two 168-pin unbuffered DIMM.
- Supports a maximum memory size of 256MB for EDO/SDRAM.
- Supports 3.3v Extended Data Output (EDO) and SDRAM DIMM.

Slots
- Three 32-bit Master PCI Bus slots and one 16-bit ISA bus slots (shared).
- Supports 3.3v/5v PCI bus Interface.

On-Board IDE
- An IDE controller on the Intel® 82371EB PCI Chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA/33 operation modes.
- Can connect up to four IDE devices.

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 ports (COM A) + 1 serial connector (COM B)
  - 1 parallel port supports SPP/EPP/ECP mode
  - 2 USB ports
  - 1 IrDA connector for SIR.
  - 1 VGA port.

Graphics
- ATI® 3D RAGE PRO Turbo/128 VR
  - -Running on AGP BUS.
  - -Onboard 8MB SDRAM.
  - -3D Acceleration.

Sound

- Creative® ES1373
  - PCI 2.1 compliant
  - PC97/PC98 specification compliant
  - 3D audio effects.
  - 32-voice XG wavetable synthesizer
  - Direct Sound Hardware Accelerator
  - Direct Music Hardware Accelerator
  - Full-Duplex stereo

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.

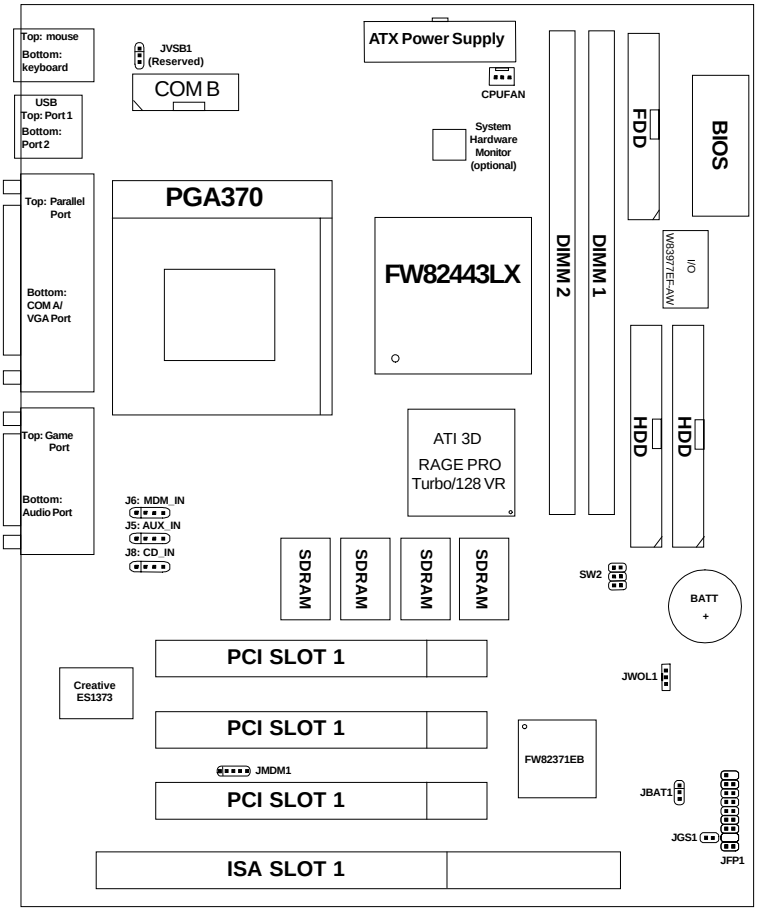
Dimension

- MICRO-ATX Form Factor : 24.4cm(L) x 19 cm(W) x 4 layers PCB

Mounting

- 6 mounting holes.

3. Mainboard Layout



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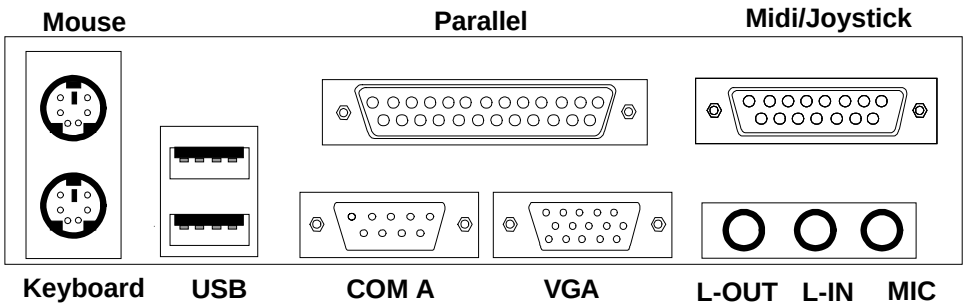
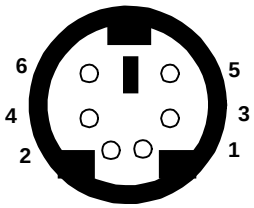
4. Backpanel Layout



4.1 Connectors

4.1-1 Mouse Connector

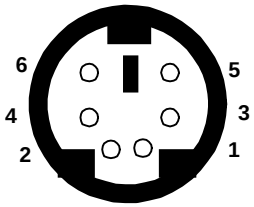


PS/2 Mouse (6-pin Female)

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

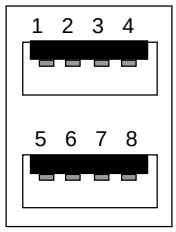


PS/2 Keyboard (6-pin Female)

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

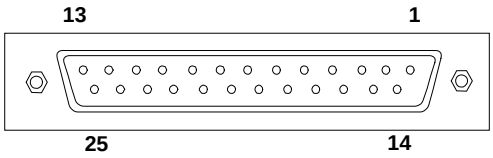


USB Ports

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

USB Port Description

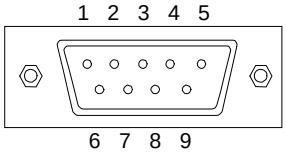
4.1-4 Parallel Port Connector



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

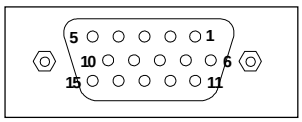
4.1-5 Serial Port Connectors



COM A / COMB 9-Pin male DIN connectors

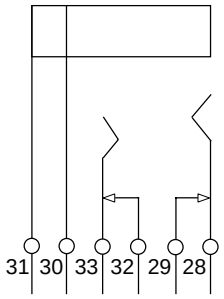
PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

4.1-6 VGA DB 15 Pin Connector



Analog Video Display Connector(DB15-S)	
Pin	**Signal Description**
1	Red
2	Green
3	Blue
4	Not used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not used
10	Ground
11	Not used
12	SDA
13	Horizontal Sync
14	Vertical Sync
15	SCL

4.1-7 Speaker

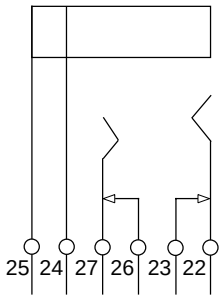


Standard Stereo Jack - Speaker Out

PIN	SIGNAL	DESCRIPTION
28	LINEOUTL	Line Out - Left
29	GND	Analog Ground
30	GND	Analog Ground
31	GND	Analog Ground
32	GND	Analog Ground
33	LINEOUTR	Line Out - Right

Speaker Jack

4.1-8 Line-In

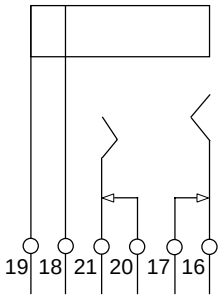


Standard Stereo Jack - Line In

PIN	SIGNAL	DESCRIPTION
22	LINEINL	Line In - Left
23	GND	Analog Ground
24	GND	Analog Ground
25	GND	Analog Ground
26	GND	Analog Ground
27	LINEINR	Line In - Right

Line In Jack

4.1-9 Microphone



Standard Stereo Jack - Mic

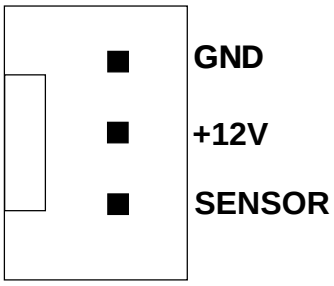
PIN	SIGNAL	DESCRIPTION
16	MIC_IN	Microphone Input
17	GND	Analog Ground
18	GND	Analog Ground
19	GND	Analog Ground
20	NC	No Connection
21	MICP3	Microphone Power

Microphone Jack

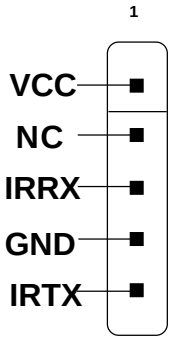
6. DIMM DRAM Addressing

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	12	8	16MB	32MB
	4Mx16	ASYM	13	8	32MB	64MB
	8Mx8	ASYM	13	9	64MB	128MB
	16Mx4	ASYM	13	10	128MB	256MB

7. CPU Fan Power Connector



8. IrDA Infrared Module Connector



Appendix A

CPU Core Speed Derivation Procedure

1. This mainboard can auto-detect the Core/Bus (Fraction) ratio of the CPU.

If	CPU Clock	=	66MHz
	Core/Bus ratio	=	3.5
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	66MHz x 3.5
		=	233MHz

CPU Bus Frequency Procedure

1. The Jumper Switch SW2 (1, 2, and 3) is used to set the Bus Frequency ratio of the CPU.

SW2			CPU
1	**2**	**3**	**Bus Frequency**
Open	Open	Open	66
Open	Short	Open	68
Short	Open	Open	75
Open	Short	Short	83

Jumpers

Clear CMOS Jumper: JBAT1

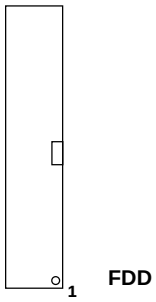
A battery must be used to retain the mainboard configuration in CMOS RAM. If you use the on-board battery, you must short 1-2 pins of this jumper to keep the CMOS data.

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.

Connectors

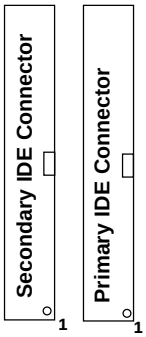
Floppy Disk Connector: FDD

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, 120MB Floppy (reserved for future BIOS) and other devices to IDE1 and IDE2. These connectors support the provided IDE hard disk cable.

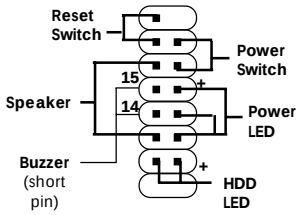


IDE1(Primary IDE Connector)
The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2(Secondary IDE Connector)
IDE2 can also connect a Master and a Slave drive.

Case Connector: JFP1

The Power Switch, Reset Switch, 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 had the same feature 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 lit while the system power is on. You can connect the Power LED from the system case to this pin. When the system enters suspend mode, the power LED will blink. (see Power Saving LED Connector: JGL1)

Speaker

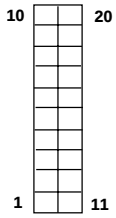
Speaker from the system case is connected to this pin.
If on-board Buzzer is available:
Short pin 14-15: On-board Buzzer Enabled.
Open pin 14-15: On-board Buzzer Disabled.

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: JWR1

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.

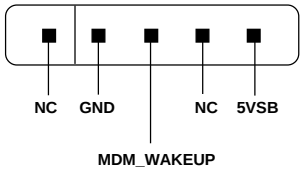


ATX
Power Connector

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

Modem Wake Up Connector: JMDM1

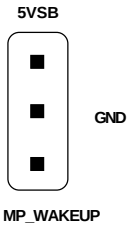
This connector is for used with Modem add-on card that supports the Modem Wake Up function.



Note: Modem wake-up signal is active "low".

Wake-Up on LAN connector: JWOL

This connector is for use with LAN add-on cards that supports Wake Up on LAN function.



Note: LAN wake-up signal is active "high".

Appendix B - Schematics

Notes

Appendix C - Bill for Materials

Notes

Appendix D - Mechanical Drawings

Notes

Appendix E - Test Reports

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