

# MSI MS- 7168 Manual

## Specifications

### Form Factor

- $\mu$ ATX 24.3 cm x 24.3 cm ATX Form Factor

### CPU Support

- Socket 939
- Support AMD Sempron, Athlon 64 and Athlon 64FX processors.
- Support 800 and 1000Mhz HyperTransport (HT) interface speeds.

### System Memory

- Four 184-pin DDR SDRAM DIMM sockets.
- Serial Presence Detect
- Support for single-sided or double-sided DIMMs (DDR 333 / DDR400)
- Support for up to 4 GB system memory
- Asynchronous HyperTransport and memory controller interface speeds
- Supports dynamic link width and frequency change
- Non-ECC RAM (ECC memory will run in non-ECC mode)
- Single and dual channel mode operation:
  - Single channel mode with single DIMM, non-symmetrical population or non-identical DIMMs
  - Dual channel mode with 2 or 4 identical DIMMs, populated symmetrically

### Core Logic (Chipset)

- The ATI RS480 + SB400 chipset

### Audio Subsystem

- AC'97 using the Realtek ALC655 codec.

### Ethernet Controller

- Realtek RTL8100C(L) 10/100 Mbps controller

### IEEE1394 Controller

- VIA VT6307 100/200/400 Mbps controller

### I/O controller

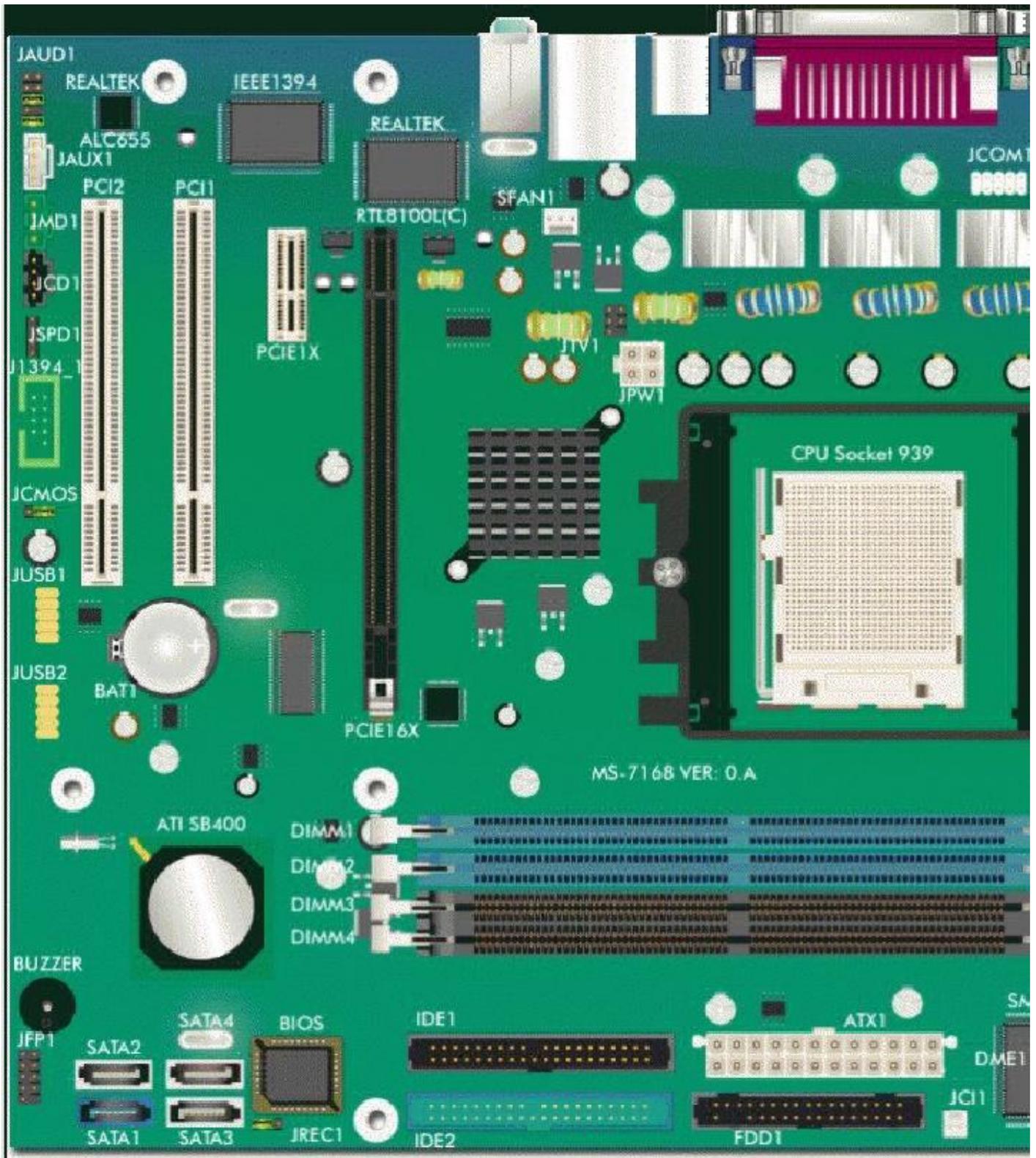
- LPC Bus I/O controller (SMSC DME1737-NR) I/O controller

### Orion Motherboard BIOS Release Notes

Here you will find the BIOS revision history for the Orion motherboard. Please note that not all BIOS versions may be available as download. [Click here](#) to see the list of available BIOS downloads.

Version	Notes
2.0D	<ul style="list-style-type: none"> <li>Initial release.</li> </ul>
2.00	<ul style="list-style-type: none"> <li>Hide VGA BIOS information when PCI-E VGA card installed.</li> <li>Improved detection of HyperTransport speed during startup.</li> <li>Improved fan noise during POST.</li> </ul>
2.6K	<ul style="list-style-type: none"> <li>Support for E4 and E6 stepping CPUs</li> <li>Support for all dual core Athlon 64 X2 CPUs.</li> <li>Support for Sempron with E6 stepping.</li> <li>Improved fan noise during POST.</li> </ul>
2.96	<ul style="list-style-type: none"> <li>Fixed: boot from USB2-key from front USB port.</li> <li>New Packard Bell Logo</li> <li>F3 key function to open CD/DVD drive before Windows starts</li> <li>Enable USB polling code</li> <li>S3 wake up by space key</li> <li>Fix WMI bios version number</li> <li>Improved support for San Diego and Venice core CPUs</li> </ul>
3.03	<ul style="list-style-type: none"> <li>Cool 'n' Quiet disabled by default for Athlon 64 X2 CPUs</li> <li>Add support for Athlon 64 3200+/3500+/3700+/4000+ E6 stepping</li> </ul>
3.07	<ul style="list-style-type: none"> <li>Improved compatibility for systems with 4GB RAM</li> <li>Fixed: Cannot boot from USB key with FAT32 partition</li> </ul>

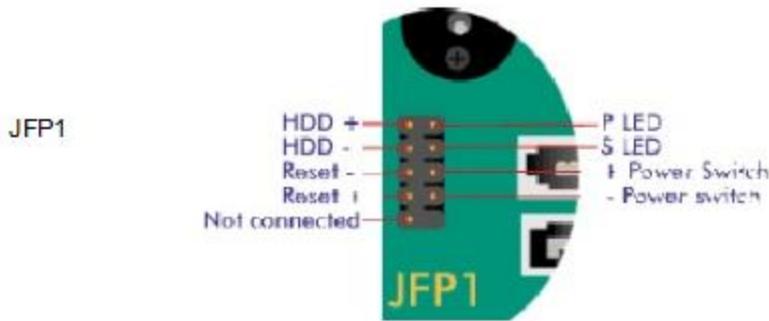
Orion (MS-7168 Ver 0.A) I/O Ports & Connectors



## Internal connectors

Denomination on drawing	Name	Type
ATX	Power Connector	24 pin Keyed Connector
PCI E1_X16	PCI Express x16 connector	PCI expansion slots
PCI E1_X1	PCI Express x1 connector	PCI expansion slots
SFAN1	System fan connector	3 pin header
+12V PWR	Power Connector	4 pin Keyed Connector
FDD	Floppy Drive connector	34 (2x17) pin Shrouded Header
IDE	IDE connector	40 (2x20) pin header (white)
SATA-0, 1, 2 & 3 Serial ATA connectors		
PCI 1 & 2	PCI connectors	standard PCI expansion slots
CPU	CPU connector	939 Pin socket
J1394	IEEE 1394 connector	2x5 pin header (-1key)
JSPD1	SPDIF connector	3 pin header
JUSB1 & JUSB2	USB connector	2x4 pin header
CFAN1	CPU Fan connector	3 or 4 pin header
DIMM1, 2, 3 & 4	DIMM sockets	184 pin standard sockets
JMD1	Modem connector	4 pin header (green)
JAUX1	Auxiliary connector	4 pin header (white)
JCD1	CD-ROM Audio Line In	4 pin header (black)
JAUD1	Audio connector	2x5 pin header (- 1 key)
JCI1	Chassis intrusion connector	2 pin header
BAT1	CMOS battery socket	

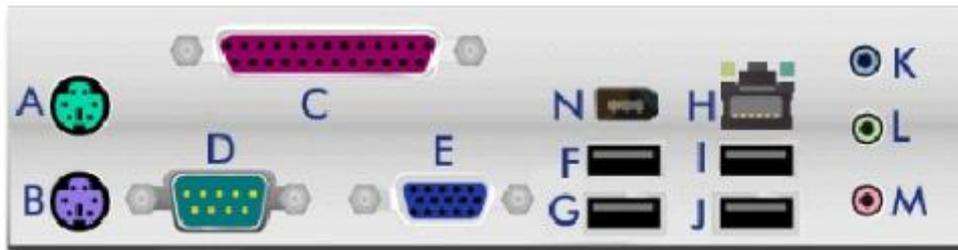
Front panel Connector 2x5 pin header (- 1 key)



I/O Ports

Back panel connectors

Name Function Type



Name	Function	Type
A	PS/2 Mouse port	6 Pin Mini-DIN
B	PS/2 Keyboard port	6 Pin Mini-DIN
C	Parallel port	25 pin SUB D
D	Serial port	9 pin SUB D
E	VGA port	9 pin SUB D
F	USB port 1	
G	USB port 2	
H	RJ45 LAN	RJ45 connector
I	USB port 3	
J	USB port 4	
N	IEEE1394	IEEE 1394 connector
K	Audio Line In	jack socket
L	Audio Line Out	jack socket
M	Stereo Microphone in	jack socket

## Orion (MS-7168 Ver 0.A) Jumpers

The Orion motherboard has three jumper settings:

- AUDIO jumper
- Clear CMOS jumper
- Recovery jumper

JAUD1: Front Audio

5-6

Usually the cable for the front audio is connected here.  
If no cable is connected, pins 5-6 and 9-10 are jumpered to enable the back audio connectors.



JCMOS: Clear CMOS Jumper

1-2: Enable

2-3: Normal (Default)



JREC1: Safe Mode/Recovery/Normal Selection Jumper

1-2 Normal (default)

2-3 Maintenance Mode

Removed BIOS Recovery



**ATI SB400 SouthBridge**

## SouthBridge Specification

- Supports up to 8 USB 2.0 ports.
- 2 PCI v2.3
- Provides LPC (Low Pin Count) and SM (System Management) bus management and arbitrations.
- Serial ATA controller supports the advanced high speed serial ATA connection; with hot plug and RAID 0,1 function to enhance performance and data security.
- Supports PC "Legacy" compatible functions,
- RTC (Real Time Clock)
- Interface and power management support for all AMD 64-bit processors.
- TPM 1.1 and 1.2 support

## Chipset Specification

## PCI Express Interface

- Compliant with the PCI Express 1.0a Specifications

## Graphics

- UMA mode operation requires no external memory
- **3D Graphics:**
  - Full DirectX 9.0 Support (Vertex Shader v2.0 and Pixel Shader v2.0)
  - Up to 4 Multiple-Render-Targets (MRTs)
  - Support for up to 12-bit per pixel formats
  - Supports Microsoft's next generation GDI+ user interface
  - Anti-Aliasing using multi-sampling algorithm with support for 2,4, and 6 samples
  - Hidden surface removal using 16, 24, or 32-bit Z-Buffering
- **2D Graphics:**
  - Highly optimized 128-bit engine capable of processing multiple pixels per clock
  - Game acceleration including support for Microsoft's DirectDraw, Double Buffering, Virtual Sprites.
- **Multiple Display Feature**
  - SURROUNDVIEW™ support for up to three monitors with an ATI discrete graphics card
  - Dual independent displays: CRT/LCD, TV/LCD
  - 8-bit alpha blending of graphics and video overlay
- **TV out:**
  - Integrated TV encoder (simultaneous output for TV and CRT is not supported)
  - Support for Macrovision 7.1 copy protection standard
  - 1024x768 32bpp support
  - CGMS-A DVD copy management support in VBI

## Power Management Features

- Fully supports ACPI states S3, S4 and S5
- Support for AMD Cool'n'Quiet™ technology to conserve power

**Firewire (IEEE1394) Interface Port****The IEEE 1394 Standard**

IEEE 1394, also known as FireWire, is an external bus standard that supports data transfer rates of up to 400 Mb/s. The IEEE 1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.

**Main Features**

- Data transfer rates of up to 400 Mbps
- A single port can be used to connect up to 63 external devices
- Isochronous data transfers, implying data delivering at a guaranteed rate. This makes it ideal for devices that need to transfer high levels of data in real-time, such as video devices.
  
- Plug and Play and hot plugging compatible
- Provides power to the peripheral devices connected

**Connectors**

Two types of IEEE 1394 plugs exist.



**Realtek RTL8100CL Network Controller****General Description**

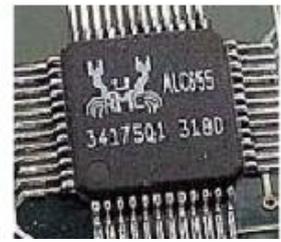
The Realtek RTL8100CL is a highly integrated and cost-effective single-chip Fast Ethernet controller. It is enhanced with an ACPI (Advanced Configuration Power Interface) management function for PCI in order to provide efficient power management for advanced operating systems with OSPM (Operating System Directed Power Management).

The RTL8100CL also supports remote wake-up (including AMD Magic Packet<sup>®</sup> and Microsoft<sup>®</sup> Wake-up frame) to increase cost-efficiency in network maintenance and management.

**Features**

- 128-pin PQFP/LQFP (PQFP package pin-to-pin compatible with Realtek RTL8110S-32 Single-Chip Gigabit Ethernet Controller)
- Supports PCI/mini-PCI interfaces
- Integrates Fast Ethernet MAC, physical chip, and transceiver onto a single chip
- 10Mbps and 100Mbps operation
- Supports 10Mbps and 100Mbps N-way auto-negotiation
- Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- Complies with PC99/PC2001 standards
- Supports ACPI power management
- Provides PCI bus master data transfer
- Provides PCI memory space or I/O space mapped data transfer
- Supports PCI clock speed of 16.75MHz-40MHz
- Advanced power saving mode
- Supports Wake-on-LAN and remote wake-up (AMD Magic Packet<sup>™</sup>, Link Change, and Microsoft<sup>®</sup> Wake-up frame)
- Half/Full duplex capability
- Supports Full Duplex Flow Control (IEEE 802.3x)
- Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- Provides PCI clock run pin
- Provides LED pins for network operation status indication
- 2.5/3.3V power supply with 5V tolerant I/Os
- 0.25 $\mu$ m CMOS process

## Realtek ALC655 Audio System



### Description

The ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs.

The ALC655 incorporates proprietary converter technology to meet performance requirements for PC99/2001 systems. The ALC655 CODEC provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions to provide a complete integrated audio solution for PCs.

The digital interface circuitry of the ALC655 CODEC operates from a 3.3V power supply for use in notebook and PC applications. An integrated 50mW/20ohm headset audio amplifier for Front-Out and Surround-Out, a 14.318MHz -> 24.576MHz PLL, and a PCBEEP generator cut BOM costs. The ALC655 also supports S/PDIF input and output for easy connection of PCs to consumer electronic products, such as AC3 decoders/speakers and mini-disk devices.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
  - Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
  - 14.318MHz -> 24.576MHz PLL to eliminate crystal
  - 12.288MHz BITCLK input
  - Integrated PCBEEP generator to save buzzer
  - Interrupt capability
- Three analogue line-level stereo inputs with 5-bit volume control, LINE\_IN, CD, AUX
- High-quality differential CD input
- Two analogue line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analogue 3.3V/5V
- Standard 48-pin LQFP package
- EAX 1.0 & 2.0 compatible
- Direct Sound 3D compatible
- A3D compatible
- I3DL2 compatible
- HRTF 3D positional audio
- Sensaura 3DPA enhancement (optional)
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

**Radeon XPress 200(M) Video****Built-in DirectX 9.0 and OpenGL graphics**

The Radeon Xpress 200M offers a Radeon graphics core, that is a derivative of Radeon X300 PCI Express technology designed for DirectX 9.0 and OpenGL compatible games. It offers high-performance graphics, unleashing the competitive power you need for playing the latest game titles on your system.

**Specifications****3D Graphics**

- Full DirectX 9.0 Support (Vertex Shader v2.0 and Pixel Shader v2.0)
  - Full precision floating point pixel pipeline
  - Up to 4 Multiple-Render-Targets (MRTs)
  - Support for up to 12-bit per pixel formats
- Supports Microsoft's next generation GDI+ user interface
- Supports resolution up to 2536x2536@32bpp
- Anti-aliasing using multi-sampling algorithm with support for 2,4, and 6 samples
- Hidden surface removal using 16, 24, or 32-bit Z-Buffering

**2D Graphics**

- Highly optimized 128-bit engine capable of processing multiple pixels per clock