USER MANUAL

EPIA-M920

Mini-ITX embedded board

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Regulatory Compliance

FCC-A Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

Notice 3

The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.

CE

FC Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE

Battery Recycling and Disposal

- ☐ Only use the appropriate battery specified for this product.
- ☐ Do not re-use, recharge, or reheat an old battery.
- ☐ Do not attempt to force open the battery.
- ☐ Do not discard used batteries with regular trash.
- ☐ Discard used batteries according to local regulations.

Safety Precautions

- ☐ Always read the safety instructions carefully.
- ☐ Keep this User's Manual for future reference.
- ☐ All cautions and warnings on the equipment should be noted.
- ☐ Keep this equipment away from humidity.
- ☐ Lay this equipment on a reliable flat surface before setting it up.
- ☐ Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
- ☐ Place the power cord in such a way that people cannot step on it.
- ☐ Always unplug the power cord before inserting any add-on card or module.
- ☐ If any of the following situations arises, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has penetrated into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment has not worked well or you cannot get it work according to User's Manual.
  - The equipment has dropped and damaged.
  - The equipment has obvious sign of breakage.
- ☐ Do not leave this equipment in an environment unconditioned or in a storage temperature above 60°C (140°F). The equipment may be damaged.
- ☐ Do not leave this equipment in direct sunlight.
- ☐ Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- ☐ Do not place anything over the power cord.
- ☐ Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating

Box Contents and Ordering Information

Model Number	CPU Frequency	Description
EPIA-M920-10E	1.0GHz Eden™ X2	Standard kit ☐ 1 x SATA cable ☐ 1 x I/O bracket
EPIA-M920-12Q	1.2GHz QuadCore	Standard kit ☐ 1 x SATA cable ☐ 1 x I/O bracket

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1. Product Overview

The VIA EPIA-M920 Mini-ITX mainboard is a high performance native x86 mainboard designed mainly for embedded, POS, Kiosk, ATM and digital media application. It can also be used for various domain applications such as desktop PC, industrial PC, etc. The mainboard is based on the VIA VX11H MSPIII (Media System Processor) chipset that features the VIA Chrome™ 640 DX11 with 2D/3D graphics and video accelerators for rich digital media performance.

The VIA EPIA-M920 includes a powerful, secure, and efficient VIA Eden™ X2 / VIA QuadCore processor. The VIA Eden ™ X2 processor includes the VIA Padlock Security Engine, VIA CoolStream™ Architecture, VIA StepAhead™ Technology Suite, and VIA TwinTurbo™ technology. Whereas the VIA QuadCore processor includes the VIA AES Security Engine, VIA CoolStream™ Architecture and VIA PowerSaver™ Technology.

The VIA EPIA-M920 has two 1333 MHz DDR3 SODIMM slots that support up to 16 GB memory size. The VIA EPIA-M920 provides support for high fidelity audio with its included VIA VT2021 High Definition Audio Codec. In addition it supports two SATA 3Gb/s storage devices.

The VIA EPIA-M920 is compatible with a full range of Mini-ITX chassis as well as FlexATX and MicroATX enclosures and power supplies. The VIA EPIA-M920 is fully compatible with Microsoft® and Linux operating systems.

1.1. Key Features and Benefits

1.1.1. VIA QuadCore /VIA Eden™ X2 Processor

The VIA QuadCore is a 64-bit superscalar x86 quad core (Isaiah) processor combine on two dies. It is based on advanced 40 nanometer process technology packed into an ultra compact NanoBGA2 package measuring 21mm x 21mm. The VIA QuadCore processor delivers a superb performance on multi-tasking, multimedia playback, productivity and internet browsing in a low power budget.

The VIA Eden X2 is a 64-bit superscalar x86 dual core processor based on a 40 nanometer process technology. Packed into an ultra compact NanoBGA2 package (measuring 21mm x 21mm), it delivers an energy-efficient yet powerful performance, with cool and quiet operation.

Note:

For Windows 7 and Windows Server 2008 R2 users only:
If encounter the issue such as the operating system recognize the VIA Dual-Core CPU as two processors instead of one processor with two cores. Download and install the hotfix released by Microsoft to address this issue. The downloadable hotfix is available at **http://support.microsoft.com/kb/2502664**

Both VIA QuadCore and Eden X2 processors are ideal for embedded system applications such as industrial PCs, test machines, measuring equipment, digital signage, medical PCs, monitoring systems, gaming machines, in-vehicle entertainment, etc.

1.1.2. VIA VX11H MSPIII Chipset

The VIA VX11H is the fourth generation, highly integrated Media System Processor which provides high quality digital video streaming and high definition video playback. It features the VIA Chrome™ 640 DX11 2D/3D graphics and video processor, High Definition video decoder and supports DDR3 1333 controller and USB 3.0 interface.

The VIA VX11H offers superb-graphics performance, immersive visual experience, and supports DirectX 11.0 that allows realistic 3D rendering and increased visual acuity. It is also based on a highly sophisticated power efficient architecture that enables such rich integration into a compact package.

1.1.3. Modular Expansion Options

The VIA EPIA-M920 ensures long-term usability with its support for industry standard expansion options. Its support for legacy PCI expansion cards helps to smooth and reduce the costs of transitioning to newer expansion technologies. The VIA EPIA-M920 enables companies to slowly roll out upgrades as necessary instead of having to replace everything all at once. This ensures that companies using the EPIA-M920 obtain the maximum benefits from its past investments in PCI expansion cards.

The VIA EPIA-M920 also includes a 4-Lane PCI Express 2.0 expansion slot that provides protection against obsolescence.

1.2. Product Specifications

- **Processor**
  - VIA Nano X4 1.2GHz+ with fansink (27.5W)
  - VIA Eden X2 1.0GHz+ fanless
  - 7 bit VID

- **Chipset**
  - VIA VX11H MSPIII 33 x 33mm

- **System Memory**
  - 2 x DDR3 1333 SODIMM
  - Supports up to 16 GB memory size

Note:

The real memory size may show less than 16GB due to some capacity are used for BIOS or other functions.

- **VGA**
  - Integrated VIA Chrome™ 640 HD DX11 3D/2D graphics with MPEG2, WMV9/VC1, H.264 decoding acceleration

- **Onboard Peripherals**
  - **Serial ATA**
    - 2 SATA connectors
  - **Onboard LAN**
    - 2 x VIA VT6130 PCIe Gigabit Ethernet Controller
  - **Onboard Audio**
    - VIA VT2021 High Definition Audio Codec
  - **Onboard Super I/O**
    - Fintek F71869E

- **Onboard I/O Connectors**
  - 2 x USB 2.0 pin headers for 4 ports
  - 1 x USB3.0 pin header for 1 port
  - 2 x SATA connectors
  - 2 x SATA DOM Power selectors
  - 1 x Dual channel 18/24-bit LVDS (DVP, VT1636)
  - 1 x Single channel 18/24-bit LVDS (VX11H internal)
  - 2 x Backlight control connectors for inverter power and brightness control

- 1 x Front audio pin header (Line-out/MIC-in)
- 1 x PS/2 keyboard/mouse pin header
- 3 x RS232 pin header (2 from VX11H, configurable 5V/12V)
- 1 x LPC pin header
- 1 x SMBus pin header
- 1 x S/PDIF Out connector
- 1 x Digital I/O pin headers (GPI x 4, GPO x 4)
- 1 x Front panel pin header
- 2 x Smart Fan pin headers for CPU and System
- 1 x ATX power connector
- 1 x PCIex4 slot
- 1 x SD card (SDHC/SDXC)
- 1 x SPI
- 1 x Clear CMOS

- **Back Panel I/O**
  - 1 x Serial port (powered with selectable 5V/12V) + VGA port
  - 2 x HDMI® ports
  - 1 x GigaLAN port + 2 x USB3.0 ports
  - 1 x GigaLAN port + 2 x USB2.0 ports
  - 3 x Audio jacks: Line-in, Line-out and MIC-in
  - 2 x PS/2 KB/MS ports

- **I/O Bracket**
  - Standard

- **BIOS**
  - AMI BIOS ROM APTIO uEFI 4MB

- **Operating System**
  - Windows 7
  - Windows Embedded Standard 7
  - Windows Embedded POSReady 7
  - Windows XP
  - Windows Embedded Standard
  - Linux

- **Power**
  - ATX Power connector

- **System Monitoring & Management**
  - Wake-on-LAN
  - Keyboard Power-on
  - Timer Power-on
  - System power management
  - AC power failure recovery
  - Watch Dog Timer

- **Operating Conditions**
  - **Operating Temperature**
    - 0°C up to 60°C
  - **Operating Humidity**
    - 0% ~ 95% (relative humidity; non-condensing)

- **Form Factor**
  - Mini-ITX (8-layer)
  - 17 cm x 17 cm

- **Compliance**
  - CE
  - FCC
  - BSMI
  - RoHS

1.3. Layout Diagram

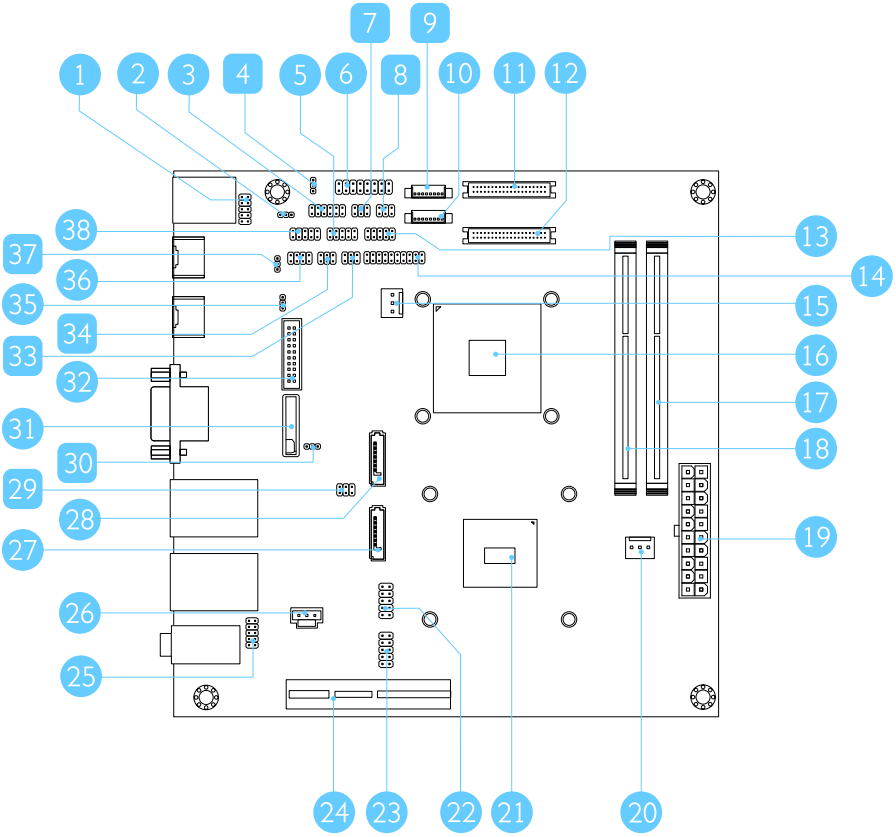


Figure 1: Layout diagram of the EPIA-M920 mainboard (top view)

Item	Description
1	PS/2 keyboard and mouse pin header (JKBMS)
2	SMBus pin header (SMBUS1)
3	Digital I/O pin headers (DIO1)
4	VDD Power Select jumper (J9)
5	COM4 pin header
6	Front panel pin header (F_PANEL)
7	LVDS1 power select jumper (J14)
8	LVDS2 power select jumper (J15)
9	LVDS inverter connectors (INVERTER2)
10	LVDS inverter connectors (INVERTER1)
11	LVDS connectors (LVDS2)
12	LVDS connectors (LVDS1)
13	COM3 pin header
14	LPC pin header (LPC1)
15	System fan connector (SYSFAN)
16	VIA VX11H chipset
17	Memory slots (SODIMM2)
18	Memory slots (SODIMM1)
19	ATX power supply connector (ATX_POWER2)
20	CPU fan Connector (CPUFAN)
21	VIA Nano X4/ VIA Eden X2 CPU
22	USB pin header (USB_1)
23	USB pin header (USB_2)
24	PCIE x4 slot
25	Front audio pin header (F_AUDIO1)
26	SPDIF connector (SPDIF1)
27	SATA connector (SATA1)
28	SATA connector (SATA2)
29	SATA DOM power select jumper (J12)
30	Clear CMOS jumper (J10)
31	CMOS battery socket (BAT1)
32	USB3.0 Connector (J8)
33	COM3 and COM4 Voltage Select Jumper (J13)
34	COM1 and COM2 Voltage Select Jumper (J11)
35	External Thermal Resister jumper (J7)
36	SPI1 pin header
37	SPI Address Select jumper (J6)
38	COM2 pin header

1.4. Product Dimensions

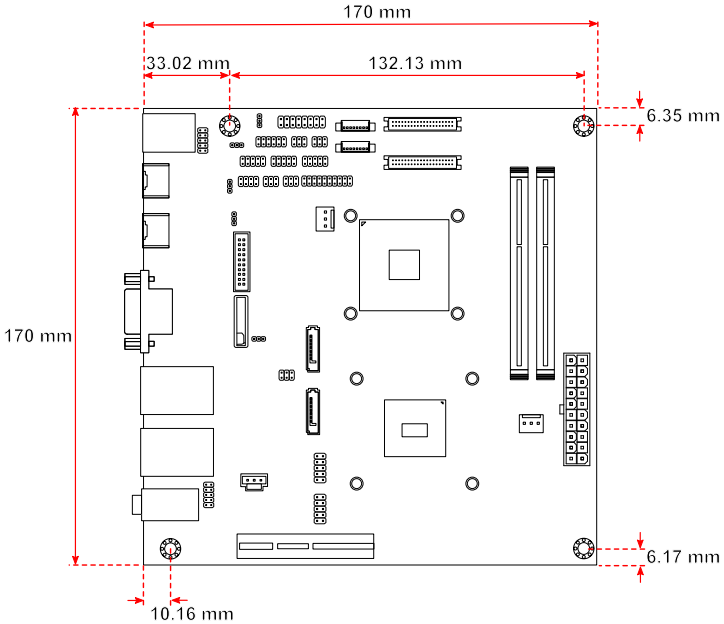
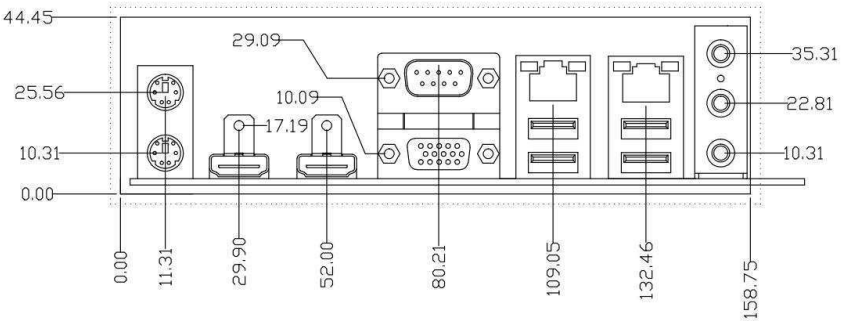


Figure 2: Mounting holes and dimensions of the EPIA-M920 mainboard



Unit: mm

Figure 3: External I/O port dimensions of the EPIA-M920 mainboard

1.5. Height Distribution

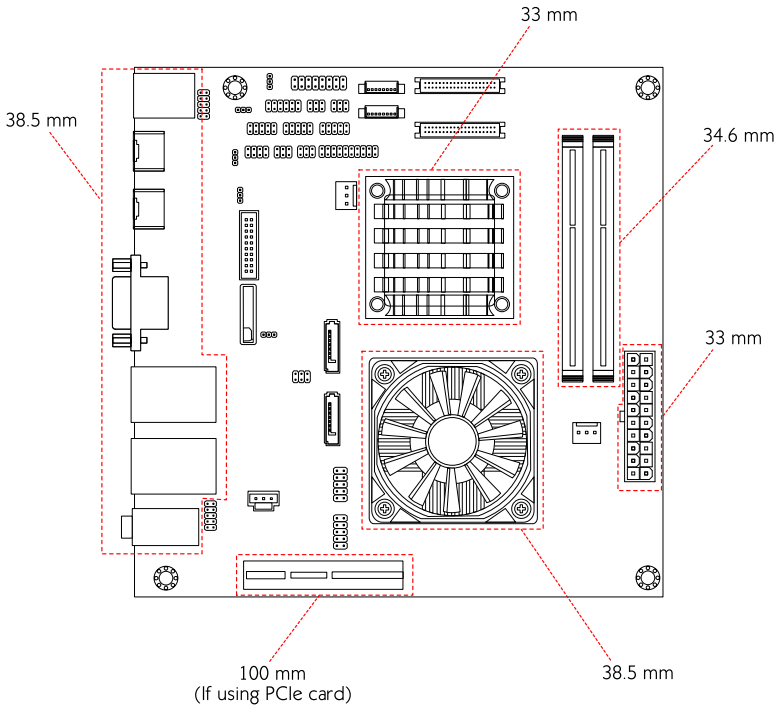


Figure 4: Height distribution of the EPIA-M920 mainboard (for Quad Core model)

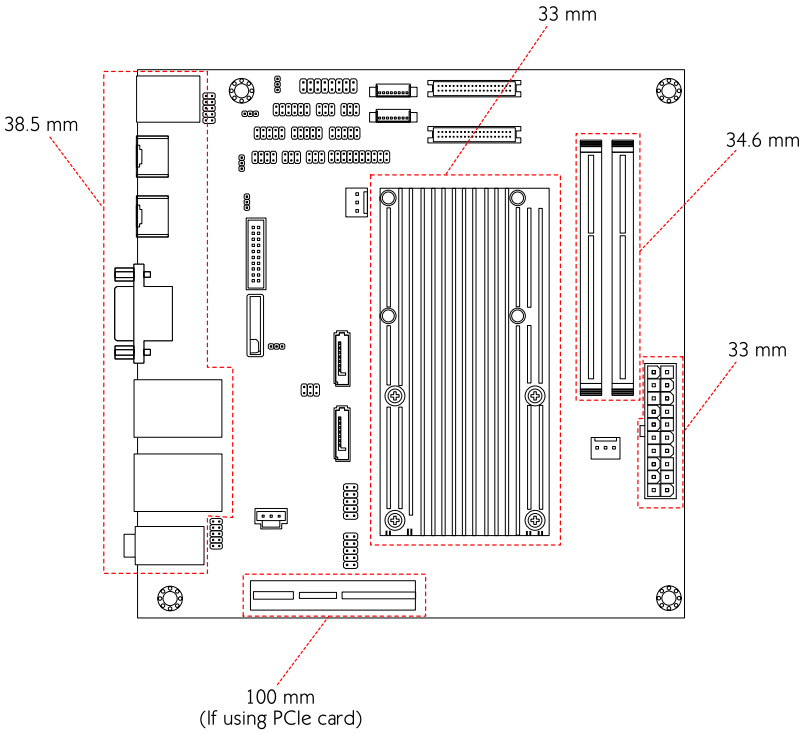


Figure 5: Height distribution of the EPIA-M920 mainboard (for Dual Core model)

Note:

All other heights are under 21.00 mm.

2. I/O Interface

The VIA EPIA-M920 has a wide selection of interfaces integrated into the board. It includes a selection of frequently used ports as part of the external I/O coastline.

2.1. External I/O Ports

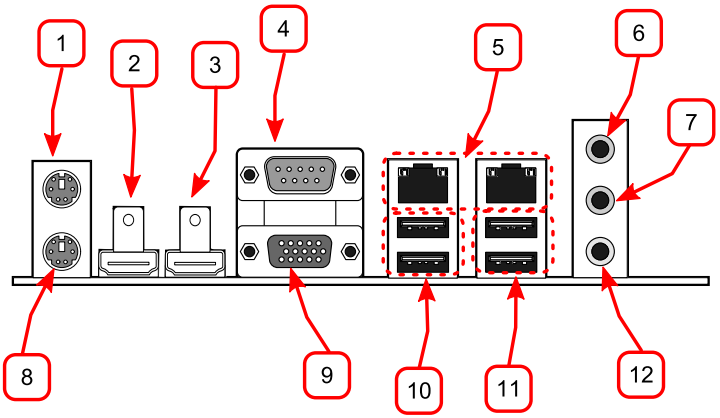


Figure 6: External I/O ports

Item	Description
1	PS/2 mouse port
2	HDMI1 port
3	HDMI2 port
4	COM1 port
5	Gigabit Ethernet ports
6	Line-in 3.5 mm TRS jack
7	Line-out 3.5 mm TRS jack
8	PS/2 keyboard port
9	VGA port
10	USB 3.0 ports
11	USB 2.0 ports
12	Microphone 3.5 mm TRS jack

2.1.1. PS/2 Port

The mainboard has two integrated PS/2 ports for keyboard and mouse. Each port is using the 6-pin Mini-DIN connector. The color purple is used for a PS/2 keyboard while the color green is used for a PS/2 mouse. The pinout of the PS/2 port are shown below.

Pin	Signal
1	Data
2	NC
3	Ground
4	+5V
5	Clock
6	NC

Table 1: PS/2 port pinout

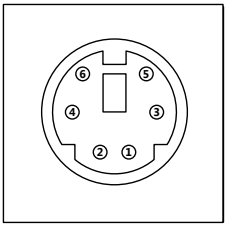


Figure 7: PS/2 port pinout diagram

2.1.2. HDMI® Port

The integrated 19-pin HDMI® port uses an HDMI® Type A receptacle connector as defined in the HDMI® specification. The HDMI® (High Definition Multimedia Interface) port is for connecting the high definition video and digital audio. It allows you to connect the digital video devices which utilize a high definition video signal. The pinout of the HDMI® port is shown below.

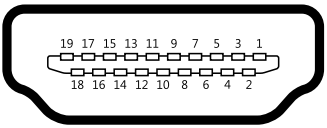


Figure 8: HDMI® port pinout diagram

Pin	Signal	Pin	Signal
1	TX2+	2	Ground
3	TX2-	4	TX1+
5	Ground	6	TX1-
7	TX0+	8	Ground
9	TX0-	10	TXC+
11	Ground	12	TXC-
13	key	14	key
15	DDCSCL	16	DDCSDA
17	Ground	18	+5V
19	Hot Plug Detect		

Table 2: HDMI® port pinout

2.1.3. COM Port

The integrated 9-pin COM port uses a male DE-9 connector. The COM (COM1) port supports the RS-232 standard. The pinout of the COM port is shown below.

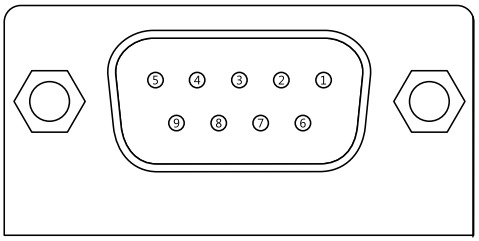


Figure 9: COM port pinout diagram

Pin	Signal	Pin	Signal
1	DCD	6	DSR
2	RxD	7	RTS
3	TxD	8	CTS
4	DTR	9	RI
5	GND		

Table 3: COM port pinout

2.1.4. RJ45 LAN port: Gigabit Ethernet

The integrated 8-pin Gigabit Ethernet port is using an 8 Position 8 Contact (8P8C) receptacle connector (commonly referred to as RJ45). The pinout of the Gigabit Ethernet port is shown below.

Pin	Signal
1	Signal pair 1+
2	Signal pair 1-
3	Signal pair 2+
4	Signal pair 3+
5	Signal pair 3-
6	Signal pair 2-
7	Signal pair 4+
8	Signal pair 4-

Table 4: Gigabit Ethernet port pinout

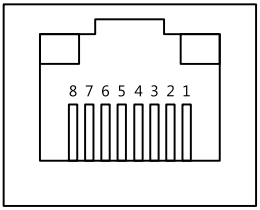


Figure 10: Gigabit Ethernet port pinout diagram

There are two RJ-45 ports and each port has two individual LED indicators located on the front side to show its Active/Link status and Speed status.

	Active LED (Left LED on RJ-45 connector)	Link LED (Right LED on RJ-45 connector)
Link Off	Off	The LED is always On in Orange color
Speed_10Mbit	Flash in Green color	The LED is always On in Orange color
Speed_100Mbit	Flash in Green color	The LED is always On in Green color
Speed_1000Mbit	Flash in Green color	The LED is always On in Red color

Table 5: Gigabit Ethernet LED color definition

2.1.5. Audio Ports

There are three audio jack receptacles integrated into a single stack on the I/O coastline. Each receptacle can fit a 3.5 mm Tip Ring Sleeve (TRS) connector to enable connections to Line-in, Line-out, and MIC-in.

Wiring	Line-in	Line-out	MIC-in
Tip	Left channel in	Left channel	Left channel
Ring	Right channel in	Right channel	Right channel
Sleeve	Ground	Ground	Ground

Table 6: Audio jack receptacle pinout

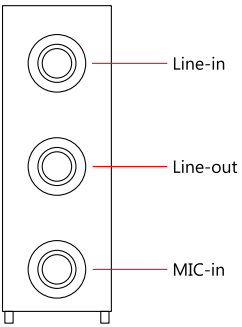


Figure 11: Audio jack receptacle stack

2.1.6. VGA Port

The integrated 15-pin VGA port uses a female DE-15 connector. The VGA port is for connecting to analog displays. The pinout of the VGA port is shown below.

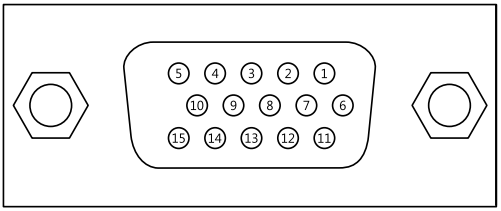


Figure 12: VGA port pinout diagram

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V
10	NC
11	NC
12	SDA
13	HSync
14	VSync
15	SCL

Table 7: VGA port pinout

2.1.7. USB 2.0 Port

There are two integrated USB 2.0 ports in EPIA-M920 mainboard. The USB-interface port gives complete Plug and Play and hot swap capability for external devices and it complies with USB UHCI, rev. 2.0. Each USB port is using the USB Type A receptacle connector. The pinout of the typical USB port is shown below.

Pin	Signal
1	+5VSUS
2	Data-
3	Data+
4	Ground

Table 8: USB port pinout

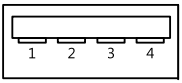


Figure 13: USB port pinout diagram

2.1.8. USB 3.0 Port

The EPIA-M920 mainboard provides two USB 3.0 ports, also known as SuperSpeed USB. The USB 3.0 port has a maximum data transfer rate up to 5 Gbps and offers a backwards compatible with previous USB 2.0 specifications. The USB 3.0 port is using the USB Type-A receptacle connector. The pinout of the typical USB 3.0 port is shown below.

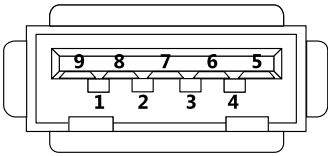


Figure 14: USB 3.0 port pinout diagram

Pin	Signal
1	+5V
2	Data-
3	Data+
4	GND
5	Rx-
6	Rx+
7	GND
8	Tx-
9	Tx+

Table 9: USB 3.0 port pinout

2.2. Onboard Connectors

2.2.1. ATX Power Connector

The mainboard has a 20-pin ATX power connector onboard. The ATX power connector is labeled as "ATX_POWER1". The pinout of the ATX power connector is shown below.

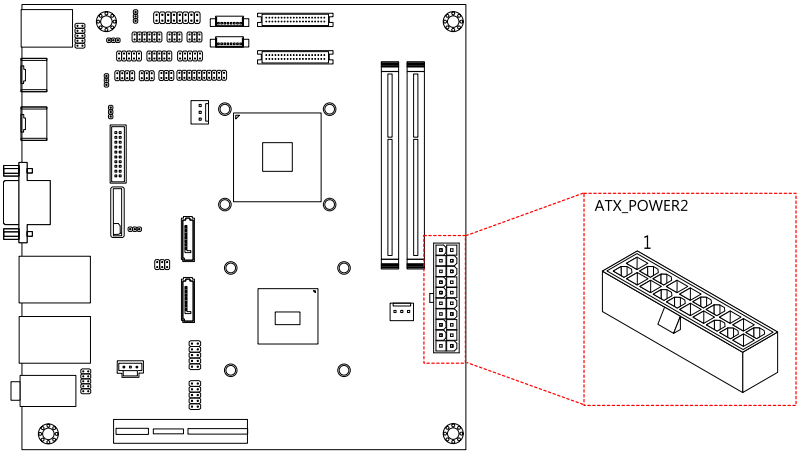


Figure 15: ATX power connector

Pin	Signal	Pin	Signal
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	Ground	13	Ground
4	+5V	14	PS_ON
5	Ground	15	Ground
6	+5V	16	Ground
7	Ground	17	Ground
8	PW-OK	18	-5V
9	+5VSUS	19	+5V
10	+12V	20	+5V

Table 10: ATX power connector pinout

2.2.2. LVDS panel connectors

The mainboard has two LVDS panel connectors: LVDS1 and LVDS2. LVDS1 connector is controlled by VIA VX11H chipset while the LVDS2 connector is controlled by VT1636 LVDS transmitter.

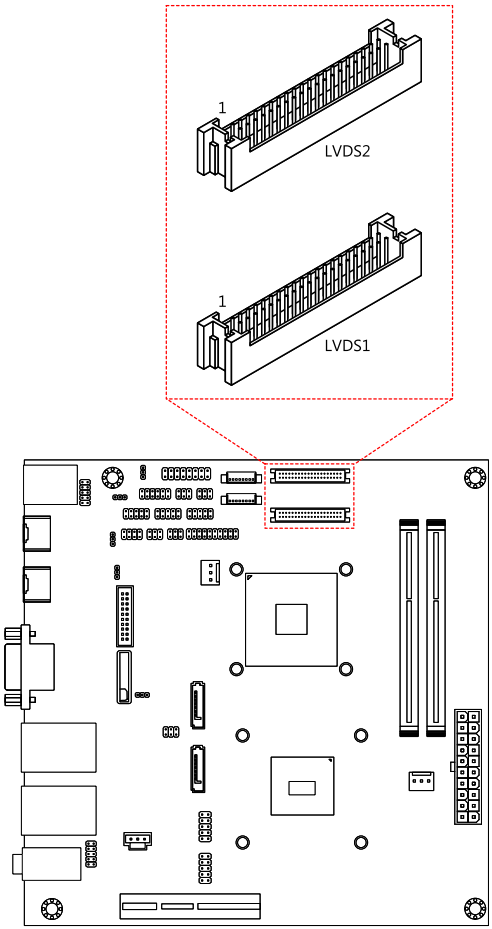


Figure 16: LVDS panel connector

Pin	Signal	Pin	Signal
M1	GND		
2	PVDD1	1	NC
4	PVDD1	3	NC
6	GND	5	GND
8	GND	7	NC
10	-LD1C0	9	NC
12	+LD1C0	11	GND
14	GND	13	NC
16	-LD1C1	15	NC
18	+LD1C1	17	GND
20	GND	19	NC
22	-LD1C2	21	NC
24	+ LD1C2	23	GND
26	GND	25	NC
28	-LCLK1	27	NC
30	+ LCLK1	29	NC
32	GND	31	GND
34	-LD1C3	33	NC
36	+ LD1C3	35	NC
38	LVDSPCLK	37	NC
40	LPDSPD	39	NC

Table 11: LVDS1 panel pinout

Pin	Signal	Pin	Signal
M1	GND		
2	PVDD2	1	-A4_L
4	PVDD2	3	A4_L
6	GND	5	GND
8	GND	7	-A5_L
10	-A0_L	9	A5_L
12	A0_L	11	GND
14	GND	13	-A6_L
16	-A1_L	15	A6_L
18	A1_L	17	GND
20	GND	19	-CLK2_L
22	-A2_L	21	CLK2_L
24	A2_L	23	GND
26	GND	25	-A7_L
28	-CLK1_L	27	A7_L
30	CLK1_L	29	NC
32	GND	31	NC
34	-A3_L	33	NC
36	A3_L	35	NC
38	DVPSPCLK	37	NC
40	DVPSPD	39	NC

Table 12: LVDS2 panel pinout

2.2.3. LVDS Inverter Connector

The mainboard has two inverters for controlling the LVDS panel backlight and brightness. INVERTER1 corresponds to the LVDS1 panel connector. INVERTER2 corresponds to the LVDS2 panel connector.

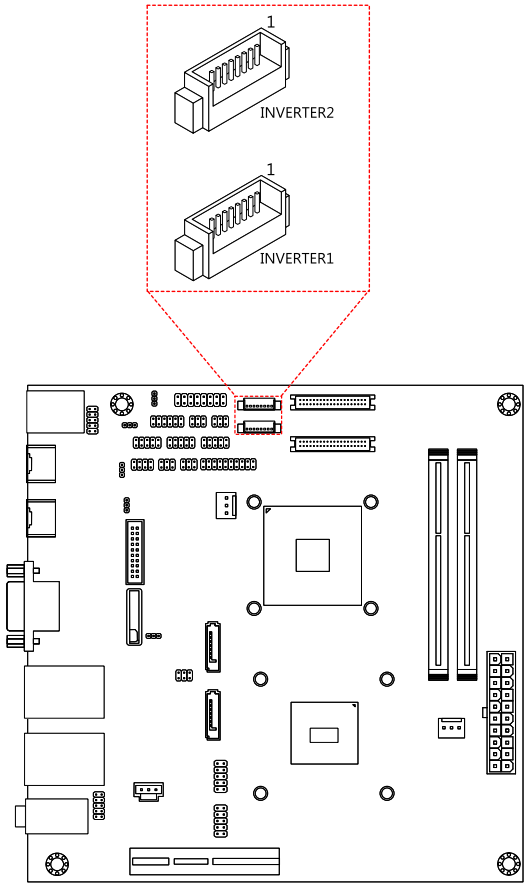


Figure 17: LVDS Inverter connector

Inverter 1			Inverter 2	
Pin	Signal		Pin	Signal
1	INV1_12		1	IVDD2
2	INV1_12		2	IVDD2
3	BLON1		3	BAKLITE
4	VX11PWM_CTL1		4	VX11PWM_CTL2
5	BLON1		5	BAKLITE
6	BRIGHTNESS1_CTL1		6	BRIGHTNESS2_CTL2
7	GND		7	GND
8	GND		8	GND

Table 13: LVDS Inverter connector pinout

2.2.4. Digital I/O pin headers

The mainboard includes one Digital I/O pin header that supports four GPO and four GPI pins.

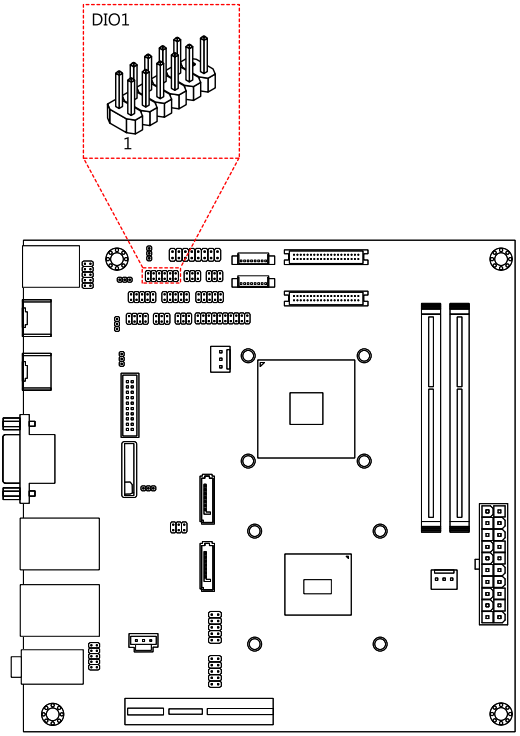


Figure 18: Digital I/O pin headers

DIO 1			
Pin	**Signal**	**Pin**	**Signal**
1	5V_DIO	2	12V_DIO
3	GPO_37	4	GPI_53
5	GPO_36	6	GPI_52
7	GPO_35	8	GPI_51
9	GPO_34	10	GPI_50
11	GND		

Table 14: Digital I/O pin headers pinout

2.2.5. External Thermal Resister

The mainboard supports a pin header (3-pin) that allows the connection of a temperature sensor cable for detecting the system's internal air temperature. The temperature reading can be seen in the BIOS Setup Utility. The pin header is labeled as "J7". The pinout of the temperature sensor pin header is shown below.

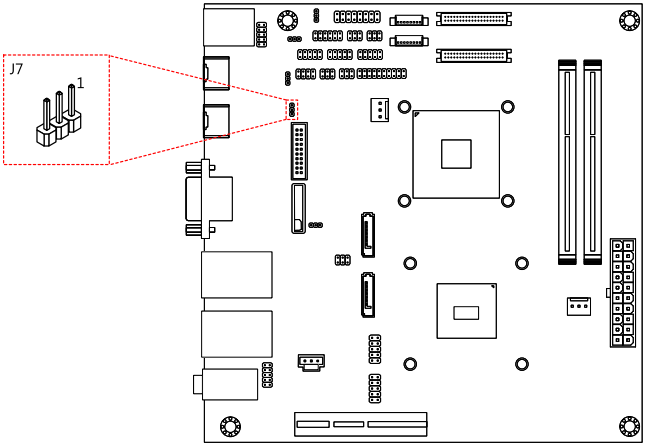


Figure 19: External Thermal Resister

J7	
Pin	Signal
1	TMPIN2
2	TMPIN2
3	HWMGND

Table 15: External thermal resister pinout

2.2.6. Front Panel Pin Header

The front panel pin header consists of 15 pins in a 16-pin block. Pin 15 is keyed. The front panel pin header is labeled as "F_PANEL1". It provides access to system LEDs, power, reset, system speaker and HDD LED. The pinout of the front panel pin header is shown below.

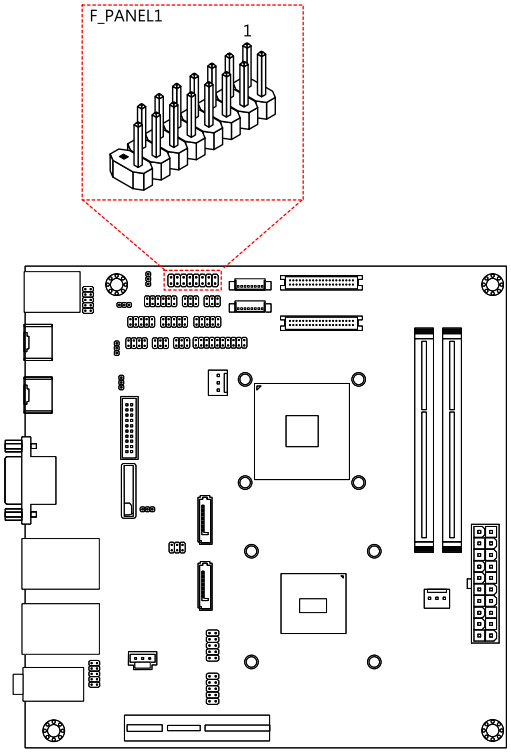


Figure 20: Front panel pin header

Pin	Signal	Pin	Signal
1	+5VDUAL	2	+3.3V
3	+5VDUAL	4	SATA_LED
5	PWR_LED	6	PWR_BTN
7	+5V	8	Ground
9	NC	10	-RST_SW
11	NC	12	Ground
13	SPEAK	14	+5V
15	__	16	-SLEEPLED

Table 16: Front panel pin header pinout

2.2.7. SMBus Pin Header

The SMBus pin header consists of three pins that allow connecting the SMBus devices. Devices communicate with a SMBus host and/or other SMBus devices using the SMBus interface. It is labeled as "SMBUS". The pinout of the SMBus pin header is shown below.

Pin	Signal
1	SMBCK
2	SMBDT
3	Ground

Table 17: SMBus pin header pinout

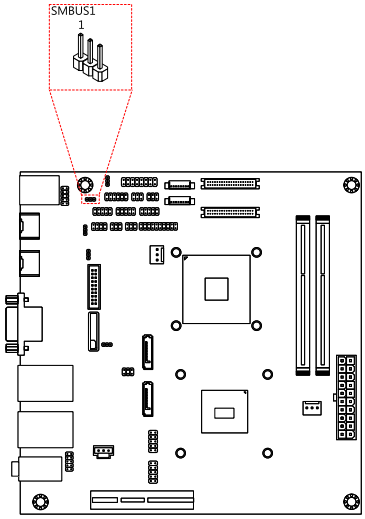


Figure 21: SMBus pin header

2.2.8. CPU and System Fan Connectors

There are two fan connectors on board: one for the CPU and one for the chassis. The fan connector for the CPU is labeled as "CPUFAN1" and the fan connector for the system is labeled as "SYSFAN1". The fans provide variable fan speeds controlled by the BIOS. The pinout of the fan connectors is shown below.

CPU fan (CPUFAN1)	
Pin	**Signal**
1	F_I01
2	F_PWM1
3	Ground

System fan (SYSFAN1)	
Pin	**Signal**
1	F_I02
2	F_PWM2
3	Ground

Table 18: CPU and System Fan connector pinouts

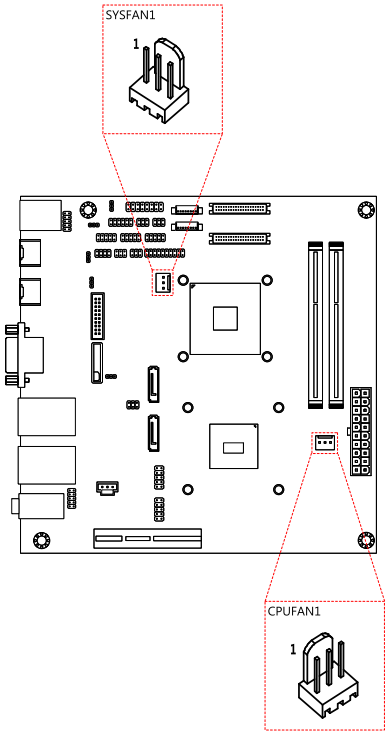


Figure 22: CPU and System Fan connectors

2.2.9. SATA Connectors

The two SATA connectors on board can support up to 3 Gb/s transfer speeds. The SATA connectors are labeled as "SATA1" and "SATA2". The pinout of the SATA connectors are shown below.

SATA1	
Pin	**Signal**
1	Ground
2	STXP_0
3	STXN_0
4	Ground
5	SRXN_0
6	SRXP_0
7	SATA1_+5V

SATA2	
Pin	**Signal**
1	Ground
2	STXP_1
3	STXN_1
4	Ground
5	SRXN_1
6	SRXP_1
7	SATA2_+5V

Table 19: SATA connector pinouts

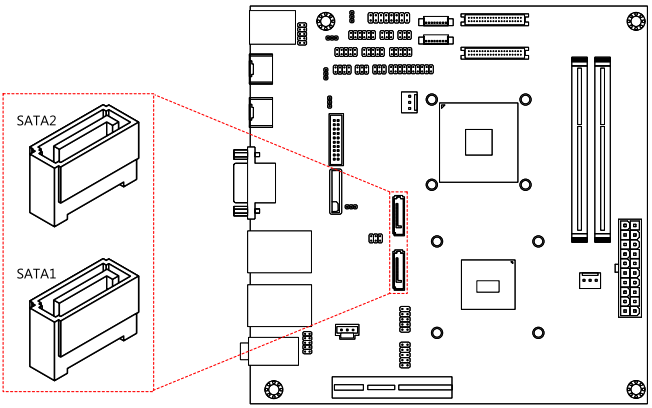


Figure 23: SATA connectors

Note:

If users want to use the SATA Disk-on-Module flash drive on the board, please use the SATA2 connector.

2.2.10. USB 2.0 Pin Headers

The mainboard has two USB 2.0 pin header blocks that support up to four USB 2.0 ports. The pin header blocks are labeled as "USB_1"and "USB_2. The pinout of the USB pin headers are shown below.

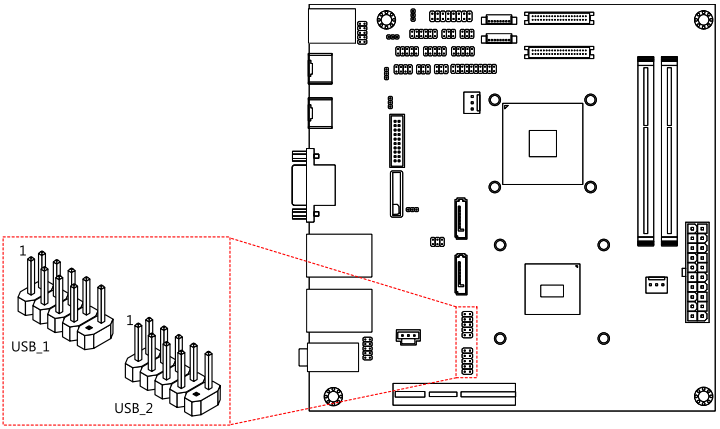


Figure 24: USB pin headers

USB_1			
Pin	**Signal**	**Pin**	**Signal**
1	+5CDUAL	2	+5CDUAL
3	USBD_T1-	4	USBD_T0-
5	USBD_T1+	6	USBD_T0+
7	Ground	8	Ground
9	—	10	Ground

USB_2			
Pin	**Signal**	**Pin**	**Signal**
1	+5CDUAL	2	+5CDUAL
3	USBD_T3-	4	USBD_T2-
5	USBD_T3+	6	USBD_T2+
7	Ground	8	Ground
9	—	10	Ground

Table 20: USB pin header pinouts

2.2.11. COM Pin Header for COM2~COM4

There are a total of three COM pin headers on the mainboard. Each COM pin header supports the RS-232 standard. The pin headers are labeled as "COM2", "COM3", and "COM4". All of the COM pin headers can support +5V or +12V. The pinout of the COM pin headers are shown below.

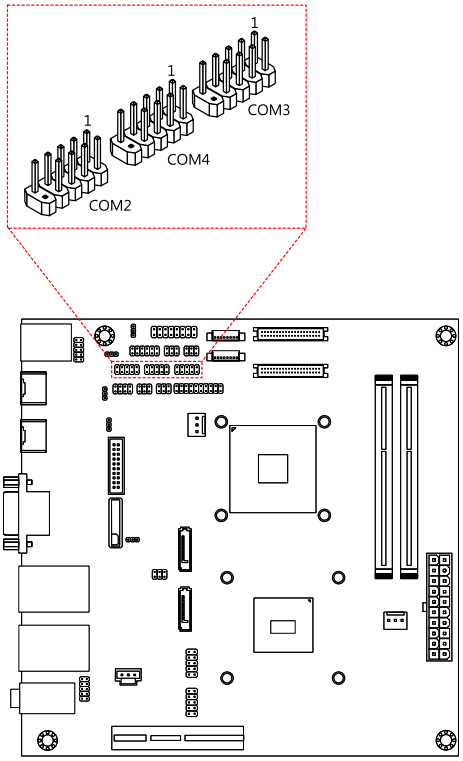


Figure 25: COM pin headers

Pin	Signal	Pin	Signal
1	COM_DCD	2	COM_RXD
3	COM_TXD	4	COM_DTR
5	Ground	6	COM_DSR
7	COM_RTS	8	COM_CTS
9	COM_RI	10	—

Table 21: COM pin header pinout

2.2.12. PS/2 Keyboard and Mouse Pin Header

The mainboard has a pin header for a PS/2 keyboard and mouse. The pin header is labeled as "JKBMS". The pinout of the pin header is shown below.

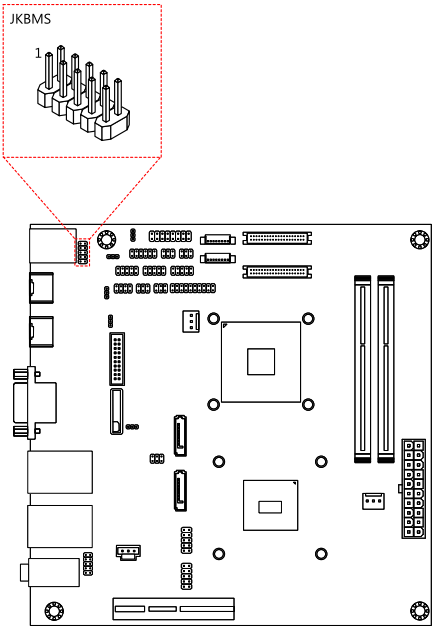


Figure 26: PS/2 keyboard and mouse pin header

Pin	Signal	Pin	Signal
1	VCCE	2	Ground
3	KBCK	4	KBDT
5	EKBCLK	6	EKBDATA
7	MSCK	8	MSDT
9	EMSCLK	10	EMSDATA

Table 22: PS/2 keyboard and mouse pin header pinout

Note:

When the pin header is not in use, please short pin 3&5, pin 4&6, pin 7&9 and pin 8&10

2.2.13. Front Audio Pin Header

In addition to the TRS audio jacks on the external I/O coastline, the mainboard has a pin header for Line-Out and MIC-In. The pin header is labeled as "F_AUDIO1". The pinout of the pin header is shown below.

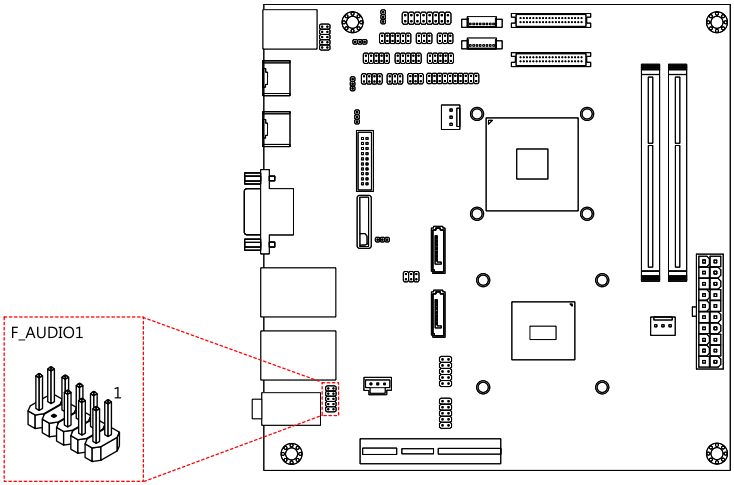


Figure 27: Front audio pin header

Pin	Signal	Pin	Signal
1	MIC2IN_L	2	AGND
3	MIC2IN_R	4	AGND
5	HPOUTR	6	MIC2_JD
7	F_AUDIO_SENSE	8	—
9	HPOUTL	10	HPOUT_JD

Table 23: Front audio pin header pinout

2.2.14. SPI address select

The connector is labeled as "J6". The pinout of the SPI address select is shown below.

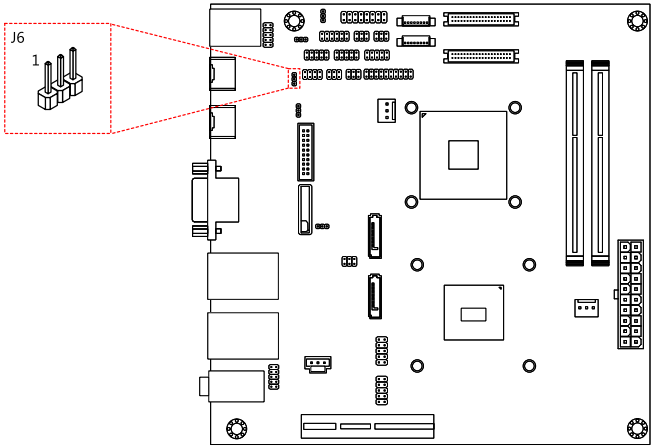


Figure 28: SPI address select

Pin	Signal
1	MSPISS0
2	MSPISA
3	MSPISS1

Table 24: SPI address select pinout

2.2.15. SPI Pin Header

The mainboard has one 8-pin SPI pin header. The SPI (Serial Peripheral Interface) pin-header is used to connect to the SPI BIOS programming fixture. The pin header is labeled as "SPI1". The pinout of the pin header is shown below.

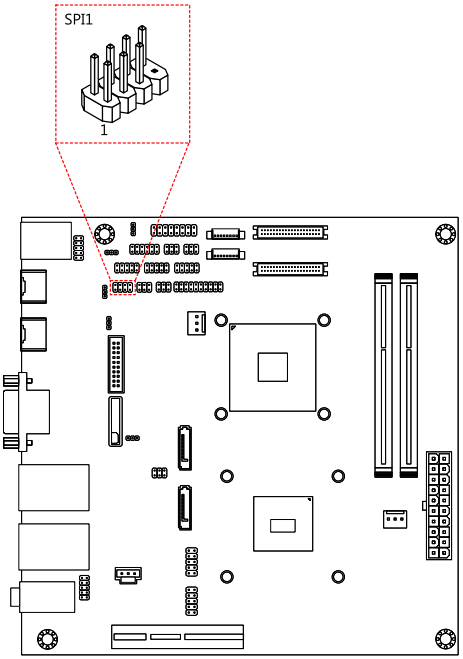


Figure 29: SPI pin header

Pin	Signal	Pin	Signal
1	SPIVCC	2	Ground
3	MSPISA	4	MSPICLK
5	MSPIDI	6	MSPIDO
7	—	8	-PCIRST

Table 25: SPI pin header pinout

2.2.16. LPC Pin Header

The mainboard has one LPC pin header for connecting LPC devices. The pin header is labeled as "LPC". The pinout of the pin header is shown below.

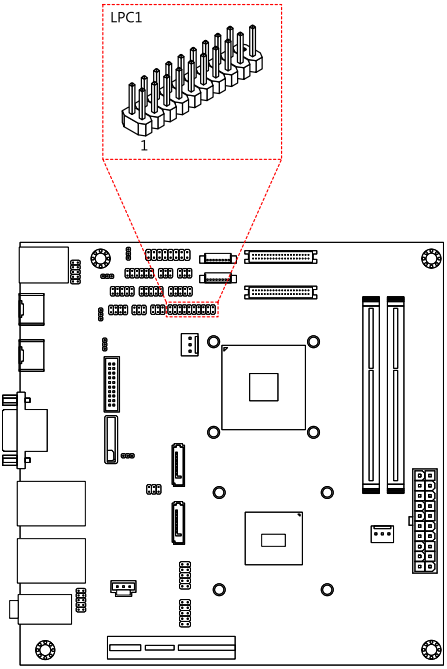


Figure 30: LPC pin header

Pin	Signal	Pin	Signal
1	LPCAD1	2	LPC33CLK
3	-LPCRST	4	Ground
5	LPCAD0	6	LPC48CLK
7	LPCAD2	8	-LPCFRAME
9	SERIRQ	10	LPCAD3
11	-LPCDRQ1	12	-EXTSMI
13	+5V	14	+3.3V
15	+5V	16	+3.3V
17	Ground	18	Ground
19	Ground		

Table 26: LPC pin header pinout

2.2.17. SPDIF Connector

The mainboard has one 3-pin SPDIF (Sony Philips Digital Interface) connector. The SPDIF output provides digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder. The connector is labeled as "SPDIF". The pinout of the connector is shown below.

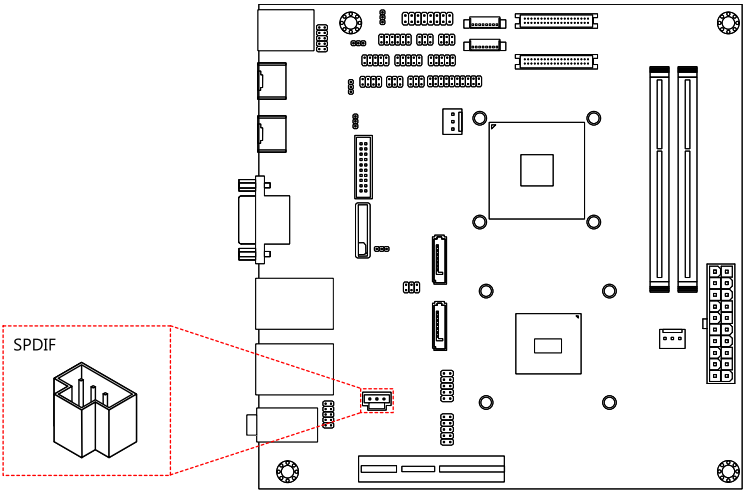


Figure 31: SPDIF connector

Pin	Signal
1	+5V
2	SPDIFO
3	GND

Table 27: SPDIF connector pinout

2.2.18. CMOS Battery Slot

The mainboard is equipped with a CMOS battery slot, which is compatible with CR2032 coin batteries. The CMOS battery slot is labeled as "BAT2". When inserting a CR2032 coin battery, be sure that the positive side is facing the locking clip.

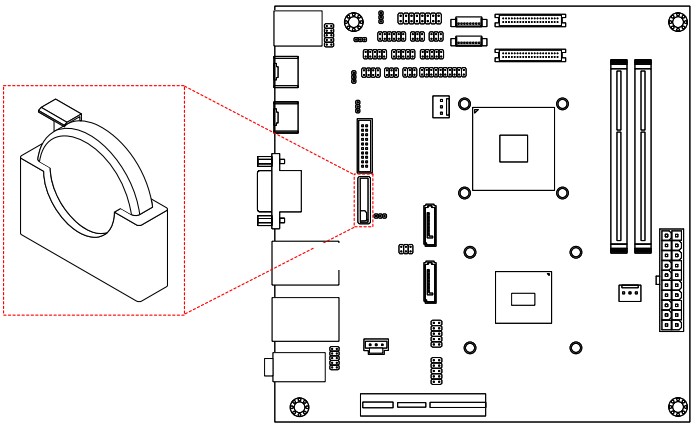


Figure 32: CMOS battery slot

Pin	Signal
1	Ground
2	+3V

Table 28: CMOS battery slot pinout

2.2.19. USB3.0 Connector

The mainboard has onboard USB connector that enables additional USB 3.0 connector. The connector is labeled as "J8". The pinout of the USB connector is shown below.

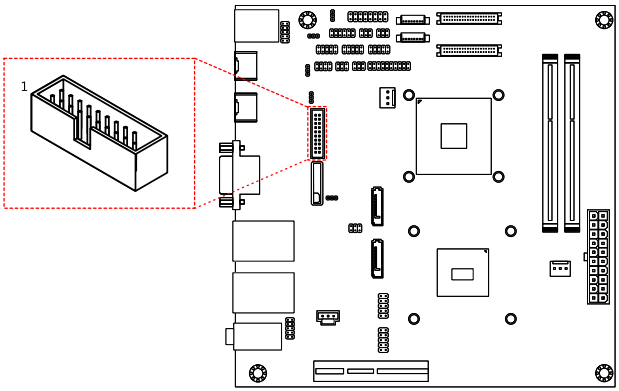


Figure 33: USB 3.0 connectors

Pin	Signal	Pin	Signal
1	-USBH OC8	2	USBSSRX_N2
3	USBSSRX_P2	4	GND
5	USBSSTX_N2	6	USBSSTX_P2
7	GND	8	USBHP_N8
9	USBHP_P8	10	_
11	_	12	_
13	GND	14	_
15	_	16	GND
17	_	18	_
19	+5VSUS		

Table 29: USB 3.0 connector pinout

3. Jumpers

3.1. Clear CMOS Jumper

The onboard CMOS RAM stores system configuration data and has an onboard battery power supply. To reset the CMOS settings, set the jumper on pins 2 and 3 while the system is off. Return the jumper to pins 1 and 2 afterwards. Setting the jumper while the system is on will damage the mainboard. The default setting is on pins 1 and 2.

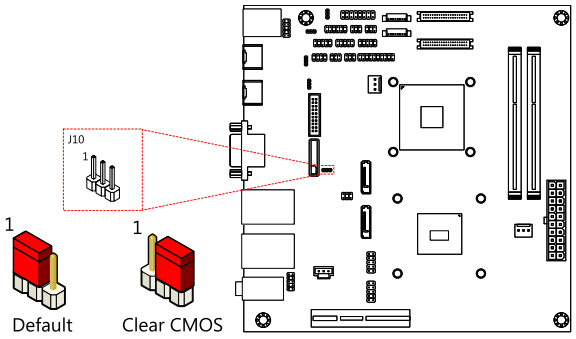


Figure 34: CLEAR CMOS jumper

Setting	Pin 1	Pin 2	Pin 3
Regular (default)	On	On	Off
Clear CMOS	Off	On	On

Table 30: CLEAR CMOS jumper settings

Note:

Except when clearing the RTC RAM, never remove the cap from the CLEAR_CMOS jumper default position. Removing the cap will cause system boot failure. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

3.2. SATA DOM Power Select Jumper

The SATA connectors can be used to support Disk-on-Module flash drives. The power for SATA DOM is controlled by the jumper labeled as "J12".When the jumpers are set, +5V will be delivered to the 7th pin of the SATA connectors. The jumper settings are shown below.

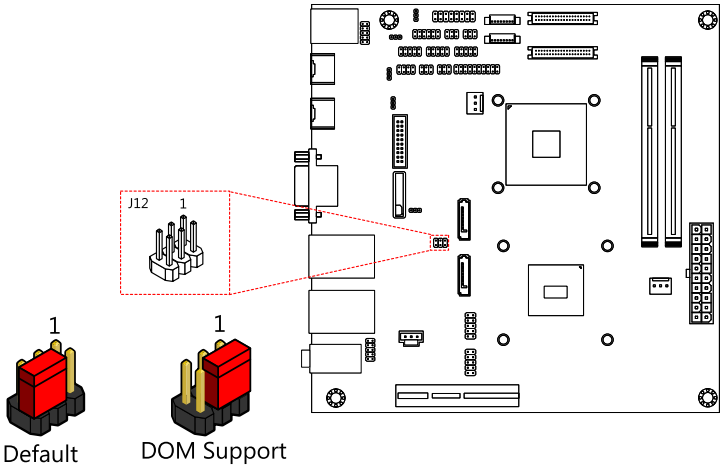


Figure 35: SATA DOM voltage select jumper

SATA1 Setting	Pin 2	Pin 4	Pin 6
DOM support	On	On	Off
Regular (default)	Off	On	On
SATA2 Setting	**Pin 1**	**Pin 3**	**Pin 5**
DOM support	On	On	Off
Regular (default)	Off	On	On

Table 31: SATA DOM voltage select jumper settings

3.3. COM1 and COM2 Voltage Select Jumper

The voltage for COM1 and COM2 is controlled by the jumper labeled as "J11". The voltage can be either +5V or +12V. +5V is the default setting. The odd pin numbers correspond to COM1. The even pin numbers correspond to COM2. The jumper settings are shown below.

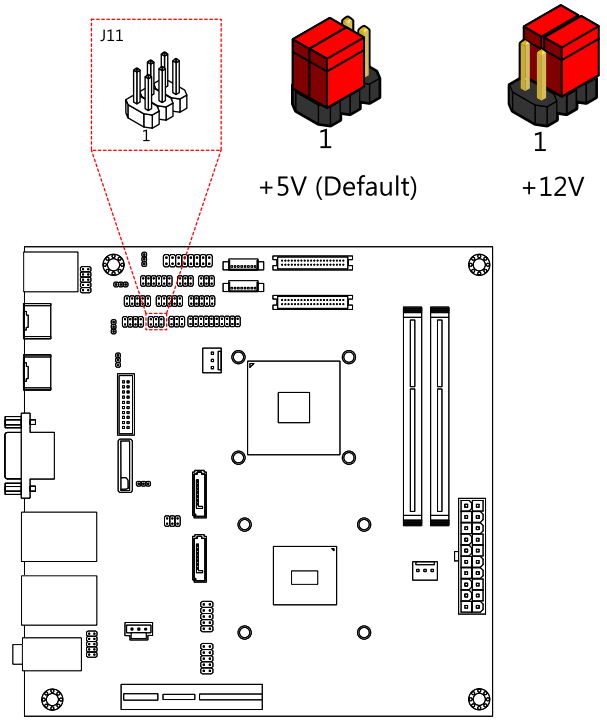


Figure 36: COM1 and COM2 voltage select jumper

COM1 Setting	Pin 1	Pin 3	Pin 5
+5V (default)	On	On	Off
+12V	Off	On	On
COM2 Setting	**Pin 2**	**Pin 4**	**Pin 6**
+5V (default)	On	On	Off
+12V	Off	On	On

Table 32: COM1 and COM2 voltage select jumper settings

3.4. COM3 and COM4 Voltage Select Jumper

The voltage for COM3 and COM4 is controlled by the jumper labeled as "J13". The voltage can be either +5V or +12V. +5V is the default setting. The odd pin numbers correspond to COM3. The even pin numbers correspond to COM4. The jumper settings are shown below.

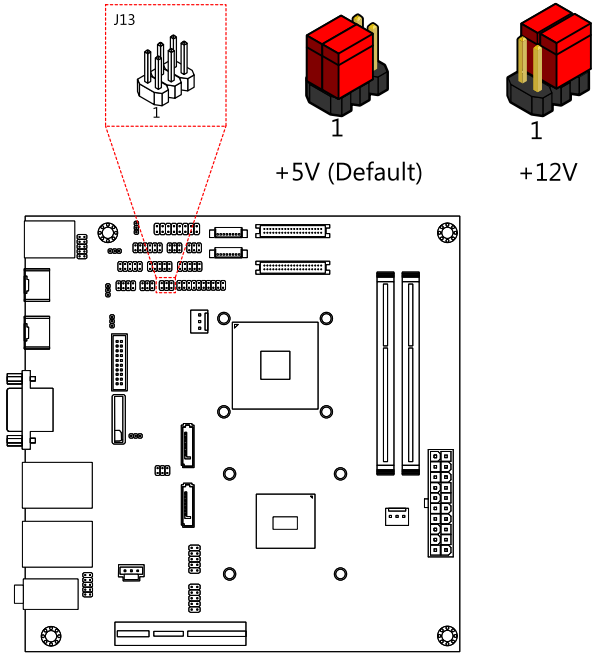


Figure 37: COM3 and COM4 voltage select jumper

COM3 Setting	Pin 2	Pin 4	Pin 6
+5V (default)	On	On	Off
+12V	Off	On	On
COM4 Setting	**Pin 1**	**Pin 3**	**Pin 5**
+5V (default)	On	On	Off
+12V	Off	On	On

Table 33: COM3 and COM4 voltage select jumper settings

3.4.1. VDD Power Select

The connector is labeled as "J9". The pinout of the VDD power select is shown below.

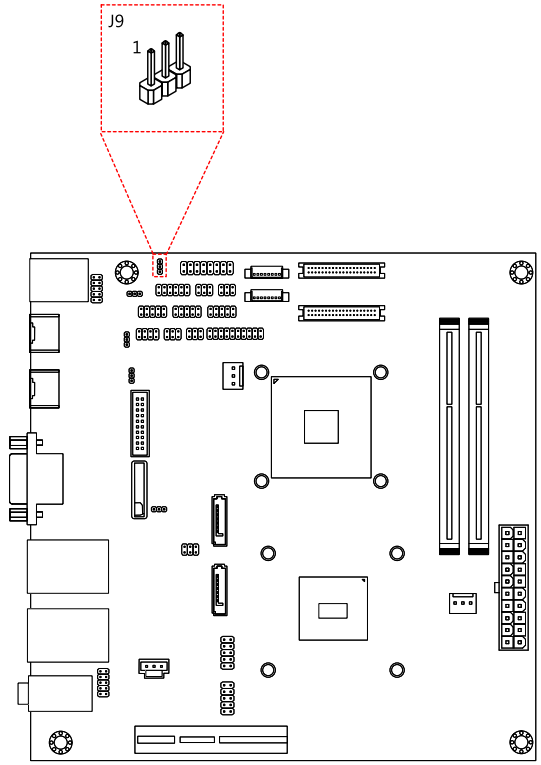


Figure 38: VDD Power Select

Pin	Signal
1	Ground
2	VDD_VSEL
3	MSPVID

Table 34: VDD Power Select pinout

3.5. LVDS Jumper Settings

The LVDS connectors and LVDS inverters can operate on different input voltages. The mainboard has one jumper (J14) that controls the voltage delivered to the LVDS1 panel connector and input voltage delivered to the INVERTER1 connector. The mainboard has one jumper (J15) that controls the voltage delivered to the LVDS2 panel connector and input voltage delivered to the INVERTER2 connector.

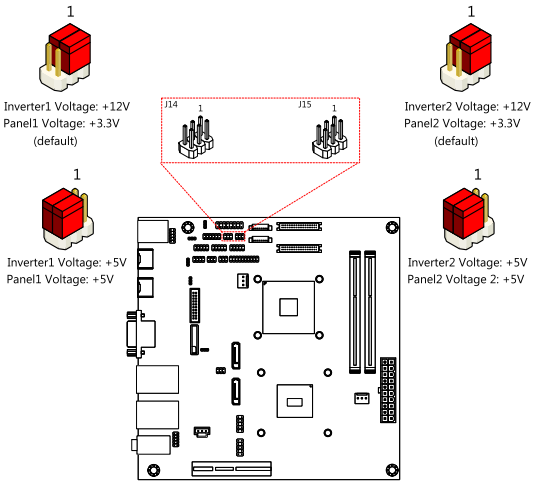


Figure 39: LVDS jumper settings

LVDS1 (J14)

Inverter1 power	Pin 1	Pin 3	Pin 5
+12V (default)	On	On	Off
+5V	Off	On	On
LVDS1 power	**Pin 2**	**Pin 4**	**Pin 6**
+3.3V (default)	On	On	Off
+5V	Off	On	On

LVDS2 (J15)

Inverter2 power	Pin 1	Pin 3	Pin 5
+12V (default)	On	On	Off
+5V	Off	On	On
LVDS2 power	**Pin 2**	**Pin 4**	**Pin 6**
+3.3V (default)	On	On	Off
+5V	Off	On	On

Table 35: LVDS jumper settings

4. Expansion Slots

4.1. DDR3 Memory Slots

The mainboard provides two DDR3 SODIMM memory slots. The memory slot can accommodate up to 8 GB of 1333 MHz memory per slot. The memory slots are labeled as "SODIMM1" and "SODIMM2". The location of the DDR3 memory slots are shown below.

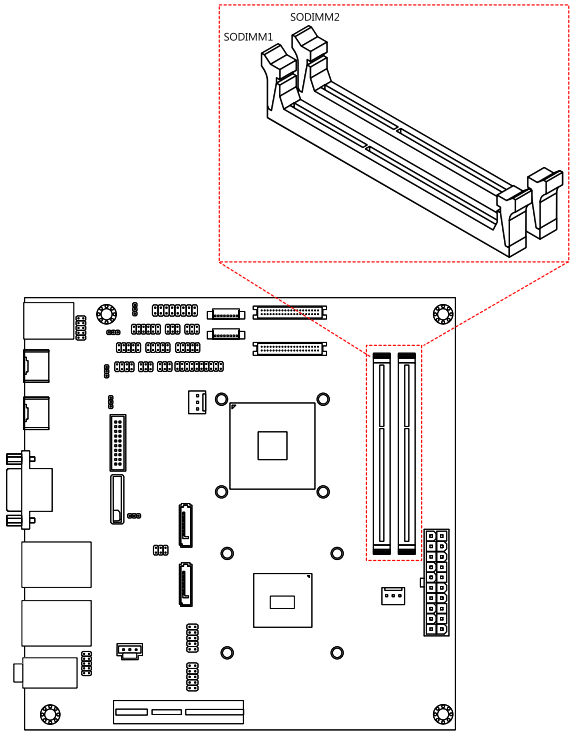


Figure 40: DDR3 memory slots

4.1.1. Installing a Memory Module

Step 1

Disengage the locking clasps at both ends of the memory socket. Align the notch on the bottom of the DDR3 memory module with the notch wedge in the slot.

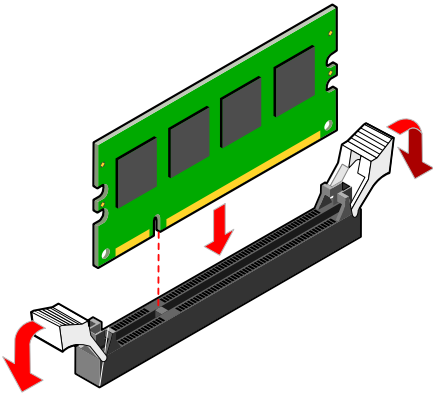


Figure 41: Inserting the memory module

Step 2

Slide the DDR3 memory module into the side grooves and push the module into the socket until the locking clasps snap into the closed position.

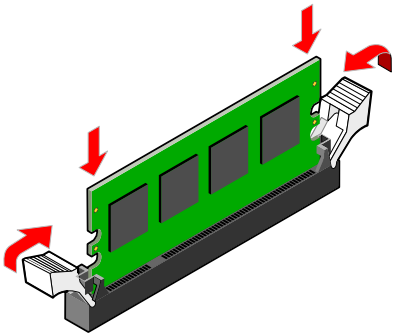


Figure 42: Locking the memory module

4.1.2. Removing a Memory Module

Step 1

Disengage the locking clasps at both ends of the memory socket.

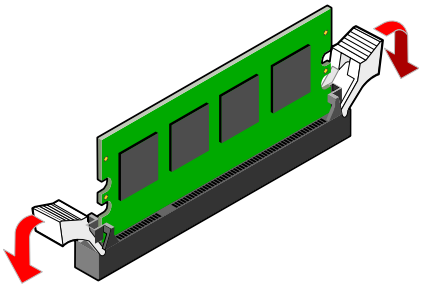


Figure 43: Disengaging the SODIMM locking clips

Step 2

When the locking clips have cleared, the SODIMM memory module will automatically pop up. Remove the memory module.

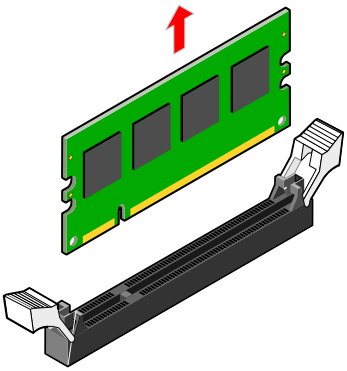


Figure 44: Removing the memory module

4.1.3. PCI Express Slot

The PCI Express slot provides support for 4-lane cards. Due to the orientation of the slot, a riser card module[1] must be used. The location of the PCI Express slot is shown below.

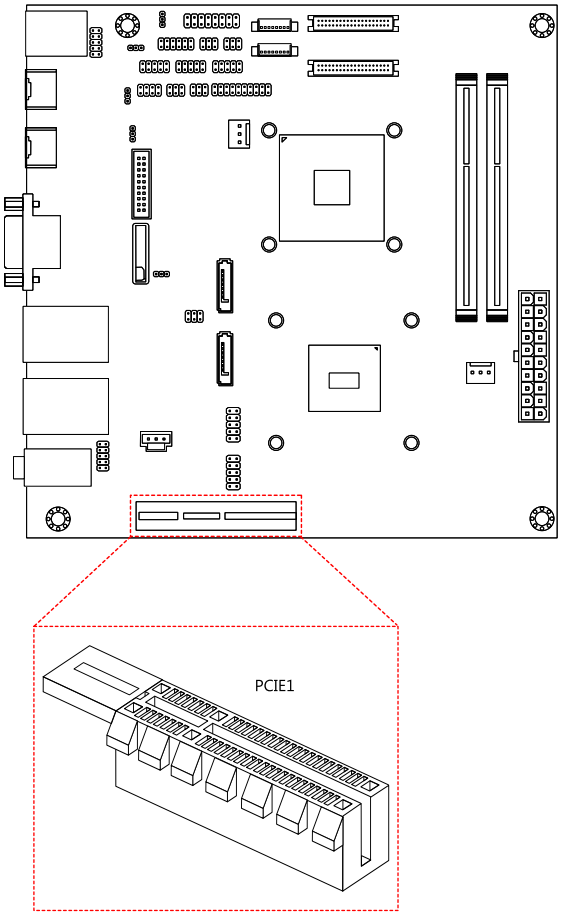


Figure 45: PCI Express slot

Note:

1. The optional riser card module is PCIE-03. PCIE-03 is a combination riser card that connects to both the PCI Express and PCI slots.

5. Hardware Installation

5.1. Installing into a Chassis

The EPIA-M920 can be fitted into any chassis that has the mounting holes for compatible with the standard Mini-ITX mounting hole locations. Additionally, the chassis must meet the minimum height requirements for specified areas of the mainboard. If a riser card module is being used, the chassis will need to accommodate the additional space requirements.

5.1.1. Suggested minimum chassis dimensions

The figure below shows the suggested minimum space requirements that a chassis should have in order to work well with the EPIA-M920.

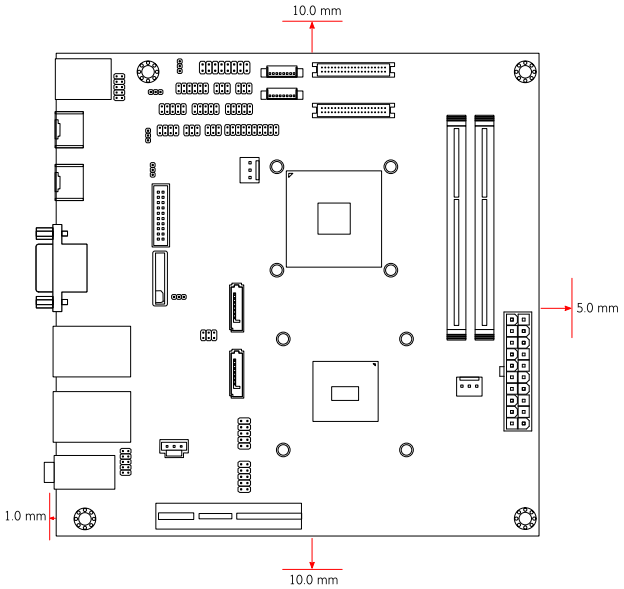


Figure 46: Suggested minimum chassis dimensions

Each side of the mainboard should have a buffer zone from the internal wall of the chassis. The side of the mainboard that accommodates the I/O coastline should have a buffer of 1.00 mm. The side on the opposite end of the I/O coastline should have a buffer of at least 5.00 mm. The two sides adjacent to the I/O coastline should have at least a 10.00 mm buffer.

For the side that is close to the PCI slot, the buffer should be at least 100.00 mm if a riser card module will be used.

5.1.2. Suggested minimum chassis height

The figure below shows the suggested minimum height requirements for the internal space of the chassis. It is not necessary for the internal ceiling to be evenly flat. What is required is that the internal ceiling height must be strictly observed for each section that is highlighted. The highest part of the ceiling will be above the PCI slot.

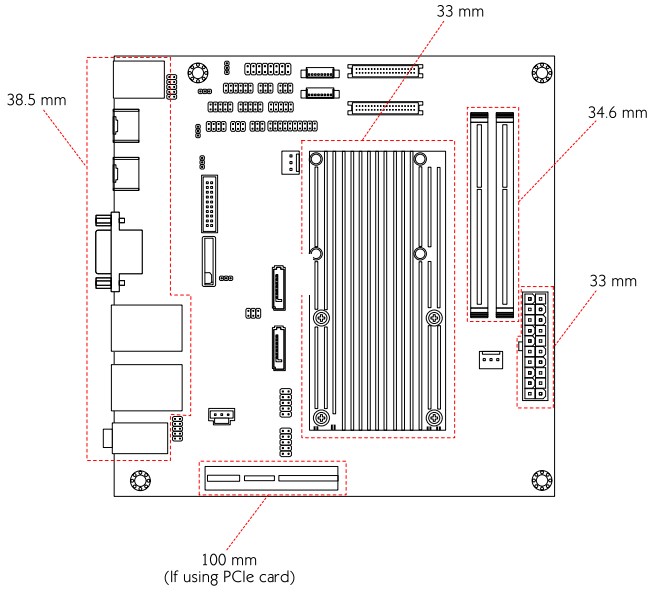


Figure 47: Suggested minimum internal chassis ceiling height (for dual core model)

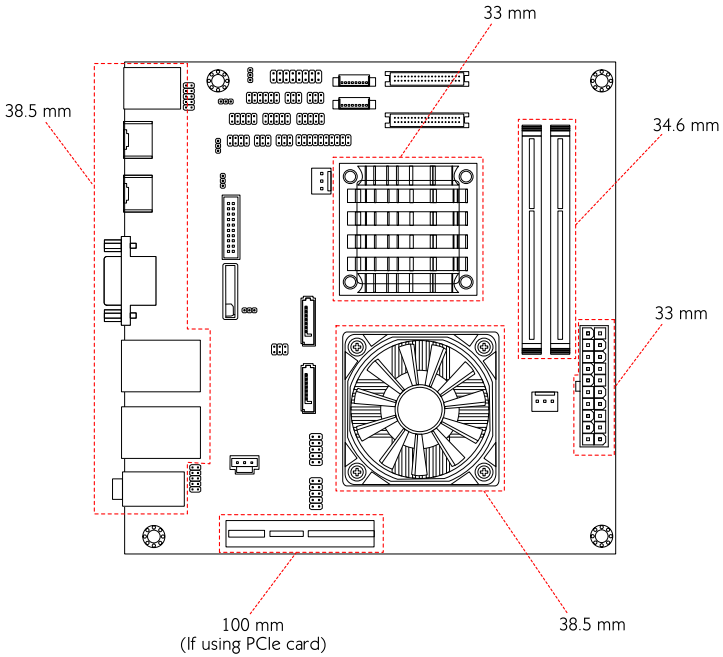


Figure 48: Suggested minimum internal chassis ceiling height (for quad core model)

5.1.3. Suggested keepout areas

The figure below shows the areas of the mainboard that is highly suggested to leave unobstructed.

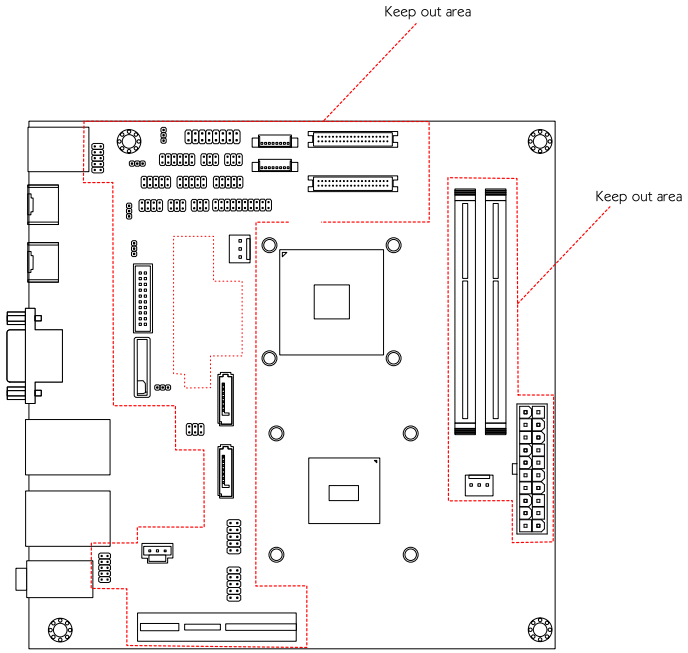


Figure 49: Suggested keepout areas

6. BIOS Setup Utility

6.1. Entering the BIOS Setup Utility

Power on the computer and press **Delete** during the beginning of the boot sequence to enter the BIOS Setup Utility. If the entry point has passed, restart the system and try again.

6.2. Control Keys

Up Move up one row

Down Move down one row

Left Move to the left in the navigation bar

Right Move to the right in the navigation bar

Enter Access the highlighted item / Select the item

Esc Jumps to the Exit screen or returns to the previous screen

Page up / +[1] Increase the numeric value

Page down / -[1] Decrease the numeric value

F1 General help[2]

F5 Restore the previous CMOS value

F7 Load optimized defaults

F10 Save all the changes and exit

Note:

1. Must be pressed using the 10-key pad.
2. The General help contents are only for the Status Page and Option Page setup menus.

6.3. Navigating the BIOS Menus

The main menu displays all the BIOS setup categories. Use the <**Left**>/<**Right**> and <**Up**>/<**Down**> arrow keys to select any item or sub-menu. Descriptions of the selected/highlighted category are displayed at the bottom of the screen.

The small triangular arrowhead symbol next to a field indicates that a sub-menu is available (see figure below). Press <**Enter**> to display the sub-menu. To exit the sub-menu, press <**Esc**>.

6.4. Getting Help

The BIOS Setup Utility provides a "**General Help**" screen. This screen can be accessed at any time by pressing **F1**. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press **Esc** to exit the help screen.

6.5. Main Menu

The System Overview screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the "Main" label.

Figure 50: Illustration of the Main menu screen

6.5.1. BIOS Information

The content in this section of the screen shows the information about the vendor, the Core version, UEFI specification version, the project version and date & time of the project build.

6.5.2. Memory Information

This section shows the amount of memory that is installed on the hardware platform.

6.5.3. System Language

This option allows the user to configure the language that the user wants to use.

6.5.4. System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].

6.5.5. System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

6.6. Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

Figure 51: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- ACPI Settings
- S5 RTC Wake Settings
- CPU Information
- SATA Configuration
- F71869 Super IO Configuration
- F71869 H/W Monitor
- Clock Generator Configuration
- On Board Configuration

6.6.1. ACPI Settings

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

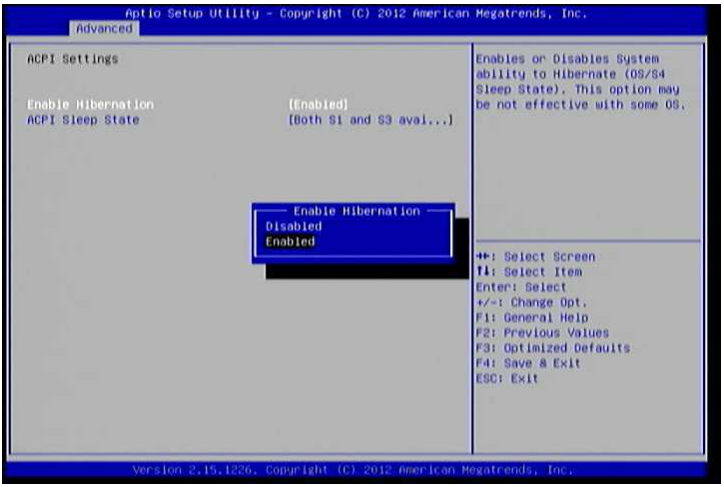


Figure 52: Illustration of the ACPI Settings screen

6.6.1.1. Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

6.6.1.2. ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed. Available options are: Suspend Disabled/S1 only (CPU Stop Clock)/S3 only (Suspend to RAM)/Both S1 and S3 available for OS to choose from.

6.6.2. S5 RTC Wake Settings

Enable system to wake from S5 using RTC alarm.

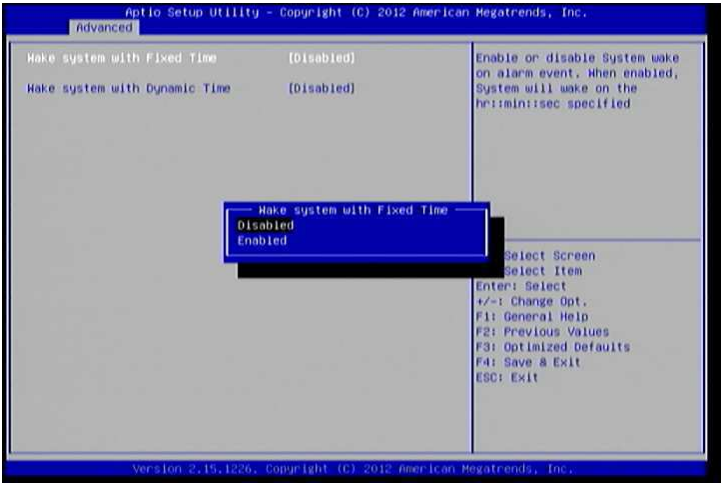


Figure 53: Illustration of S5 RTC Wake Settings screen

6.6.2.1. Wake system with Fixed Time

This feature has 2 options: Enable or Disable system wake on alarm event. When enabled, system will wake on the hr:min:sec specified.

6.6.2.2. Wake system with Dynamic Time

This feature has 2 options: Enable or Disable system wake on alarm event. When enabled, system will wake on the current time + increase minute(s).

6.6.3. CPU Information

The CPU Information screen shows detailed information about the built-in processor.

Figure 54: Illustration of CPU Information screen

6.6.4. SATA Configuration

The SATA Configuration screen allows the user to view and configure the settings of the SATA configuration settings.

Figure 55: Illustration of SATA Configuration screen

6.6.4.1. SATA Mode

This option allows the user to manually configure SATA controller for a particular mode.

IDE Mode

Set this value to change the SATA to IDE mode.

AHCI Mode

Set this value to change the SATA to AHCI mode.

6.6.5. F71869 Super IO Configuration

The F71869 Super IO Configuration screen allows the user to set system Super IO Chip parameters.

Figure 56: Illustration of F71869 Super IO Configuration screen

6.6.5.1. Serial Port 0 Configuration

Set parameters of Serial Port 0 (COMA).

6.6.5.1.1. Serial Port

This feature has 2 options: Enable or Disable Serial Port (COM).

6.6.5.2. Serial Port 1 Configuration

Set parameters of Serial Port 1 (COMB)

6.6.5.2.1. Serial Port

This feature has 2 options: Enable or Disable Serial Port (COM).

6.6.5.2.2. Device Mode

Change the Serial Port mode. Select <High Speed> or <Normal Mode> mode.

6.6.6. F71869 H/W Monitor

F71869 H/W Monitor shows Monitor hardware status.

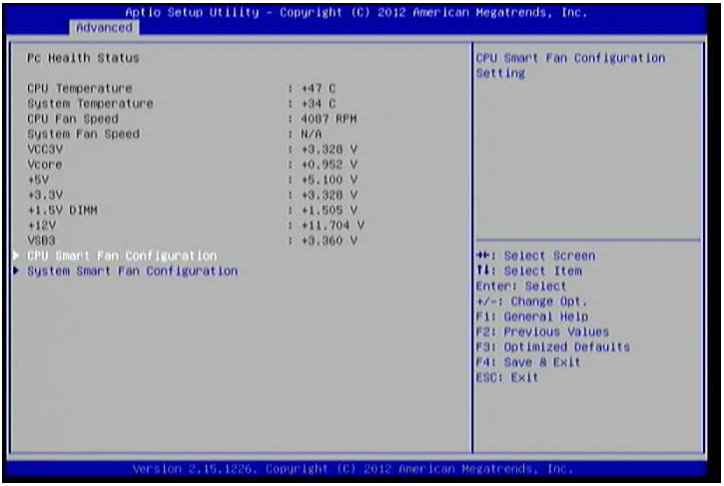


Figure 57: Illustration of F71869 H/W Monitor screen

6.6.6.1. CPU Smart Fan Configuration

CPU Smart Fan Configuration Setting

6.6.6.1.1. Smart Fan Support

This feature has 2 options: Enable or Disable Smart Fan.

6.6.6.2. System Smart Fan Configuration

System Smart Fan Configuration Setting

6.6.6.2.1. Smart Fan Support

This feature has 2 options: Enable or Disable Smart Fan.

6.6.7. Clock Generator Configuration

The Clock Generator Configuration screen enables access to the Spread Spectrum Setting feature.

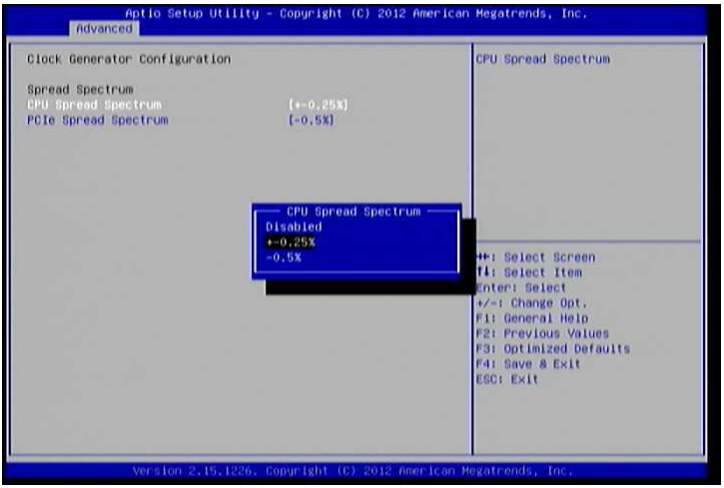


Figure 58: Illustration of Clock Generator Configuration screen

6.6.7.1. CPU Spread Spectrum

The Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has 3 options: Disable, +-0.25% and -0.5%.

6.6.7.2. PCIe Spread Spectrum

Select PCIe Spread Spectrum. This feature has 2 options: Disable and -0.5%.

6.6.8. On Board Configuration

The OnBoard Device Configuration screen has the following features.

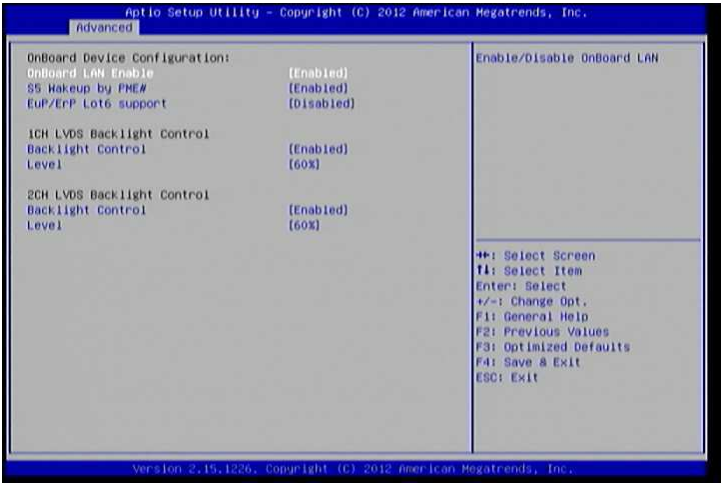


Figure 59: Illustration of On Board Configuration screen

OnBoard Device Configuration

6.6.8.1. OnBoard LAN Enable

The OnBoard LAN Enable feature determines whether the onboard LAN controller will be used or not.

6.6.8.2. S5 Wakeup by PME#

The S5 Wakeup by PME# feature enables the BIOS to allow remote wake-up from the S5 power off state through the PCI bus.

6.6.8.3. EuP/ErP Lot6 support

The EuP/ErP Lot6 Support feature enables the BIOS to reduce the power draw to less than 1W when the system is in standby mode. This feature has two options: enabled and disabled.

6.6.8.4. 1CH LVDS Backlight Control

Backlight Control

The Backlight Control feature control by VX11H enables the user to control the brightness of the 1CH LVDS backlight. This feature has six options.

Level

0%, 20%, 40%, 60%, 80% and 100%.

6.6.8.5. 2CH LVDS Backlight Control

Backlight Control

The Backlight Control feature control by VX11H enables the user to control the brightness of the 2CH LVDS backlight. This feature has six options.

Level

0%, 20%, 40%, 60%, 80% and 100%.

6.7. Chipset Settings

The Chipset Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

Figure 60: Illustration of Chipset Settings screen

The Chipset Settings screen contains the following links:

- DRAM Configuration
- Video Configuration
- UART Configuration
- PMU-ACPI Configuration
- HDAC Configuration
- SDIO_CR Configuration
- Others Configuration

6.7.1. DRAM Configuration

The DRAM Configuration screen has two features for controlling the system DRAM. All other DRAM features are automated and cannot be accessed.

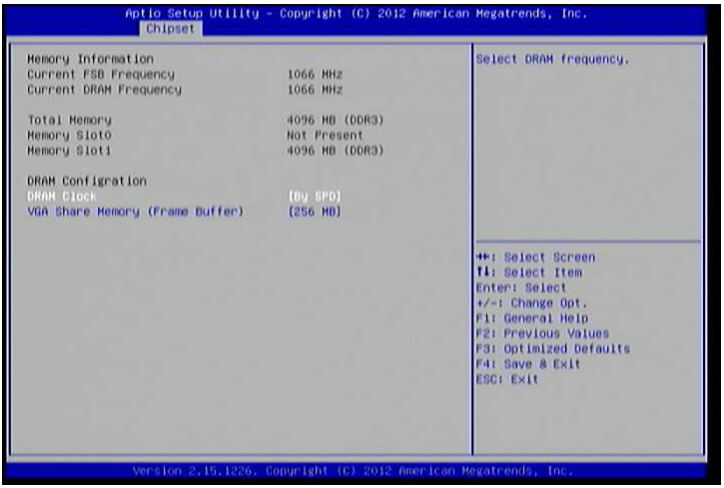


Figure 61: Illustration of DRAM Configuration screen

6.7.1.1. DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has eleven options.

By SPD

By SPD option enables the BIOS to select a compatible clock frequency for the installed memory.

400 MHz

The 400 MHz option forces the BIOS to be fixed at 800 MHz for DDR3 memory modules.

533 MHz

The 533 MHz option forces the BIOS to be fixed at 1066 MHz for DDR3 memory modules.

566 MHz

The 566 MHz option forces the BIOS to be fixed at 1132 MHz for DDR3 memory modules.

600 MHz

The 600 MHz option forces the BIOS to be fixed at 1200 MHz for DDR3 memory modules.

633 MHz

The 633 MHz option forces the BIOS to be fixed at 1266 MHz for DDR3 memory modules.

667 MHz

The 667 MHz option forces the BIOS to be fixed at 1334 MHz for DDR3 memory modules.

700 MHz

The 700 MHz option forces the BIOS to be fixed at 1400 MHz for DDR3 memory modules

733 MHz

The 733 MHz option forces the BIOS to be fixed at 1466 MHz for DDR3 memory modules

766 MHz

The 766 MHz option forces the BIOS to be fixed at 1532 MHz for DDR3 memory modules

800 MHz

The 800 MHz option forces the BIOS to be fixed at 1600 MHz for DDR3 memory modules

6.7.1.2. VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 256MB and 512MB.

6.7.2. Video Configuration

The Video Configuration screen has features for controlling the integrated graphics controller in the VX11H chipset.

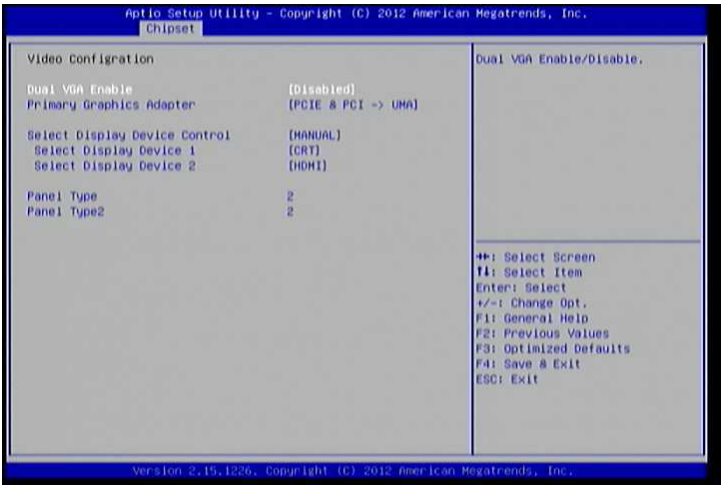


Figure 62: Illustration of Video Configuration screen

6.7.2.1. Dual VGA Enable

This feature has 2 options: Enable/Disable Dual VGA.

6.7.2.2. Primary Graphics Adapter

The Primary Graphics Adapter option enables the user to change the order in which the BIOS seeks for a graphics adapter. There are three paths that can be chosen.

PCIE & PCI -> UMA

UMA -> PCIE & PCI

6.7.2.3. Select Display Device Control

Available selections are: Auto and Manual.

6.7.2.4. Select Display Device 1 and 2

The Select Display Device feature enables the user to choose a specific display interface. This feature has four options: CRT, LCD, LCD2, HDMI and HDMI2. If both Select Display Device 1 and Select Display Device 2 are set to the same interface, then any display device connected to the other interface will not function. For example, if both Select Display 1 and 2 are set to CRT, then no data will be sent to the LCD, LCD2, HDMI and HDMI2 port.

6.7.2.5. Panel Type

The Panel Type feature enables the user to specify the resolution of the display being used with the system. The panel types are predefined in the VGA VBIOS.

Panel Type	Resolution		Panel Type	Resolution
00	640 x 480		08	800 x 480
01	800 x 600		09	1024 x 600
02	1024 x 768		10	1366 x 768
03	1280 x 768		11	1600 x 1200
04	1280 x 1024		12	1680 x 1050
05	1400 x 1050		13	1920 x 1200
06	1440 x 900		14	1920 x 1080
07	1280 x 800		15	1024 x 576

6.7.2.6. Panel Type2

The Panel Type feature enables the user to specify the resolution of display 2 being used with the system. The panel types are predefined in the VGA VBIOS.

Panel Type	Resolution		Panel Type	Resolution
00	640 x 480		08	800 x 480
01	800 x 600		09	1024 x 600
02	1024 x 768		10	1366 x 768
03	1280 x 768		11	1600 x 1200
04	1280 x 1024		12	1680 x 1050
05	1400 x 1050		13	1920 x 1200
06	1440 x 900		14	1920 x 1080
07	1280 x 800		15	1024 x 576

6.7.3. UART Configuration

The UART Configuration screen allows the user to set UART configuration parameters.

Figure 63: Illustration of UART Configuration screen

6.7.3.1. UART 0 Enable

This feature has 2 options: Enable/Disable UART 0.

6.7.3.2. UART 1 Enable

This feature has 2 options: Enable/Disable UART 1.

6.7.4. PMU_ACPI Configuration

The PMU_ACPI Configuration screen can be used to set a number of power management related functions.

Figure 64: Illustration of PMU_ACPI Configuration screen

6.7.4.1. Other Control

Figure 65: Illustration of Other Control screen

6.7.4.1.1. AC Loss Auto-restart

AC Loss Auto-restart defines how the system will respond after AC power has been interrupted while the system is on. There are three options.

Power Off

The Power Off option keeps the system in an off state until the power button is pressed again.

Power On

The Power On option restarts the system when the power has returned.

Last State

The Last State option restores the system to its previous state when the power was interrupted.

6.7.4.1.2. USB S4 WakeUp

The USB S4 WakeUp enables the system to resume through the USB device port from S4 state. There are two options: "Enabled" or "Disabled".

6.7.5. HDAC Configuration

HDAC Configuration Parameters.

Figure 66: Illustration of HDAC Configuration screen

6.7.5.1. OnChip HDAC Device

This feature has 2 options: Enable or Disable HDAC Control.

6.7.6. SDIO_CR Configuration

The SDIO_CR Configuration screen can be used to set SDIO_CR configuration parameters.

Figure 67: Illustration of SDIO_CR Configuration screen

6.7.6.1.1. SDIO Host Controller

This feature has 2 options: Enable or Disable SDIO Host controller.

6.7.6.1.2. SDIO Specification Ver3.0 Support

This feature has 2 options: Enable or Disable SDIO Specification Ver3.0 Support.

6.7.6.1.3. Voltage Support 1.8v

This feature has 2 options: Enable or Disable Voltage Support 1.8v.

6.7.6.1.4. High Speed Support

This feature has 2 options: Enable or Disable High Speed Support.

6.7.6.1.5. Driver Type Select

Select Driver Type from Type A Type B, Type C and Type D.

6.7.6.1.6. SDR50 Support

This feature has 2 options: Enable or Disable SDR50 Support.

6.7.6.1.7. SDR104 Support

This feature has 2 options: Enable or Disable SDR104 Support.

6.7.6.1.8. DDR50 Support

This feature has 2 options: Enable or Disable DDR50 Support.

6.7.6.1.9. SDR50 Tuning Enable

This feature has 2 options: Enable or Disable SDR50 Tuning Enable.

6.7.6.1.10. Timer Count for Re-Tuning

SDIO Timer Count for Re-Tuning. Available options are Re-Tuning Timer Disabled/1 sec/2 sec/4 sec/8 sec/16 sec/32 sec/64 sec/128 sec/256 sec/512 sec/1024 sec/Get information from other source.

6.7.7. Others Configuration

The Others Configuration screen can be used to set Watchdog Timer Configuration and Keyboard/Mouse Wakeup Configuration.

Figure 68: Illustration of Others Configuration screen

6.7.7.1. WATCHDOG Timer Enable

When this feature is enabled, an embedded timing device automatically prompts corrective action upon system malfunction detection.

6.7.7.2. Keyboard/Mouse Wakeup Control

When this feature is enabled, pressing any key of the keyboard or moving the mouse can wake up the system from suspend.

6.8. Boot Settings

The Boot Settings screen has a single link that goes to the **Boot Configuration,** and **Boot Option Priority** screens.

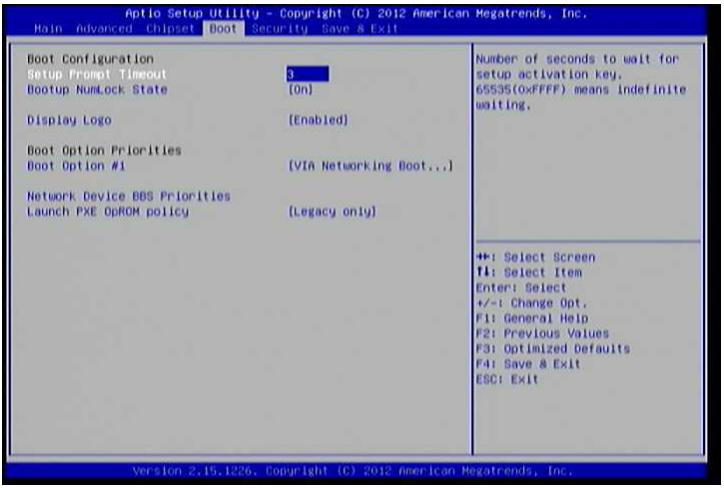


Figure 69: Illustration of Boot Settings screen

6.8.1. Boot Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

6.8.1.1. Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

6.8.1.2. BootupNumLock State

Select the keyboard NumLock state from On and Off.

6.8.1.3. Display Logo

The Display Logo feature hides all of the Power-on Self Test (POST) messages during the boot sequence. Instead of the POST messages, the user will see an OEM logo. This feature has two options: enabled and disabled

6.8.2. Boot Option Priorities

The Boot Option Priorities screen lists all bootable devices.

6.8.2.1. Boot Option #1

Sets the system boot order. This feature has two options: VIA Networking Bootagent/Disabled.

6.8.3. Network Device BBS Priorities

6.8.3.1. Launch PXE OpROM policy

Do not launch

Prevent the option for Legacy Network Device.

Legacy only

Allow the option for Legacy Network Device.

6.9. Security Settings

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.

Figure 70: Illustration of Security Settings screen

6.9.1. Security Settings

6.9.1.1. Administrator Password / User Password

This option is for setting a password for accessing the BIOS setup utility. When a password has been set, a password prompt will be displayed whenever the BIOS setup utility is launched. This prevents an unauthorized person from changing any part of the system configuration.

When a supervisor password is set, the **Password Check** option will be unlocked.

6.9.1.2. Password Check

This feature is compulsory when the **Change Supervisor Password** option is set. The user will have up to three chances to enter the correct password before the BIOS forces the system to stop booting. If the user does not enter the correct password, the keyboard will also lock up. The only way to get past this is to do a hard reboot (i.e., use the system reset button or cut off the power to the system). A soft reboot (i.e., Ctrl+Alt+Del) will not work because the keyboard will be locked. This feature has two options.

Setup

The Setup option forces users to enter a password in order to access the BIOS Setup Utility.

Always

The Always option forces users to enter a password in order to boot up the system.

6.10. Save & Exit Options

The Save & Exit Configuration screen has the following features:

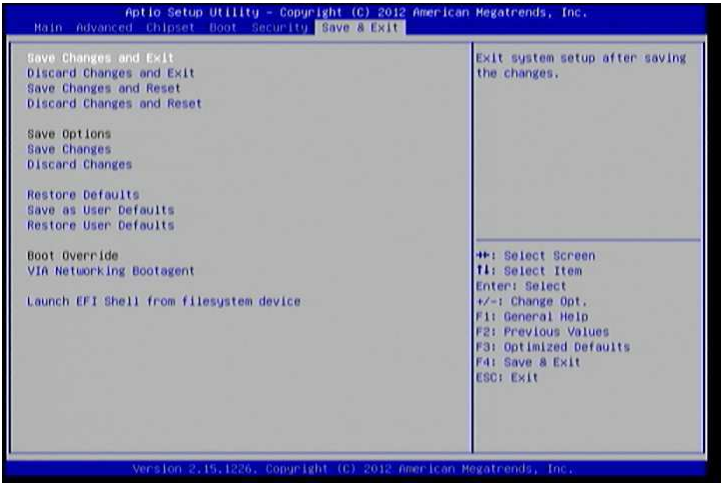


Figure 71: Illustration of Save & Exit Options screen

6.10.1. Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The "F10" hotkey can also be used to trigger this command.

6.10.2. Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The "Esc" hotkey can also be used to trigger this command.

6.10.3. Save Changes and Reset

Save all changes to the BIOS and reboot the system. The new system configuration parameters will take effect.

6.10.4. Discard Changes and Reset

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched. The "F7" hotkey can also be used to trigger this command.

Save Options

6.10.5. Save Changes

Save Changes done so far to any of the setup options.

6.10.6. Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

Boot Override

6.10.7. VIA Networking Bootagent

6.10.8. Launch EFI Shell from filesystem device

Attempts to Launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

7. Driver Installation

7.1. Microsoft Driver Support

The VIA EPIA-M920 mainboard is compatible with Microsoft operating systems. The latest Windows drivers can be downloaded from the VIA Embedded website at www.viaembedded.com.

For embedded operating systems, the related drivers can be found in the VIA Embedded website at www.viaembedded.com.

7.2. Linux Driver Support

The VIA EPIA-M920 mainboard is highly compatible with many Linux distributions.

Support and drivers are provided through various methods including:

- Drivers provided by VIA (binary only). An ARCM or NDA/BSLA may be asked in order to get the drivers, please contact our sales representative to submit a request.
- Using a driver built into a distribution package
- Installing a third party driver (such as the ALSA driver from the Advanced Linux Sound Architecture project for integrated audio)

For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Contact VIA Embedded to submit a request.

Appendix A.
Power Consumption Report

Power consumption tests were performed on the VIA EPIA-M920. The following tables represent the breakdown of the voltage, amp and wattage values while running common system applications.

A.1. EPIA-M920 Rev. 2 DVT ATX POWER

The tests were performed based on the following additional components:

- **CPU:** CNQ 1.0G Dual-core (U4200E)
- **Memory:** Transcend DDR3-1333 8GB
- **HDD:** SATA 250G Hitachi
- **DVD:** SONY

A.1.1. Playing DVD – Power DVD 5.0

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.102	0.198	0.614
Main Board +5V	4.812	1.566	7.536
Main Board 5VSB	4.771	0.853	4.070
Main Board +12V	11.579	1.079	12.494
Main Board Power Consumption			24.713

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.042	0.184	0.560
Main Board +5V	4.715	1.277	6.021
Main Board 5VSB	4.700	0.845	3.972
Main Board +12V	11.484	0.647	7.430
Main Board Power Consumption			17.982

A.1.2. Playing MP3-Media Player

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.150	0.198	0.624
Main Board +5V	4.873	0.961	4.683
Main Board 5VSB	4.806	0.868	4.172
Main Board +12V	11.652	1.149	13.388
Main Board Power Consumption			22.866

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.125	0.189	0.591
Main Board +5V	4.845	0.769	3.726
Main Board 5VSB	4.785	0.843	4.034
Main Board +12V	11.553	0.532	6.146
Main Board Power Consumption			14.496

A.1.3. Running Network Application

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	2.892	0.183	0.529
Main Board +5V	4.774	1.299	6.201
Main Board 5VSB	4.622	2.105	9.729
Main Board +12V	11.444	1.276	14.603
Main Board Power Consumption			31.063

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	2.812	0.161	0.453
Main Board +5V	4.715	1.099	5.182
Main Board 5VSB	4.602	2.097	9.650
Main Board +12V	11.283	1.206	13.607
Main Board Power Consumption			28.892

A.1.4. IDLE

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.124	0.169	0.528
Main Board +5V	4.850	0.711	3.448
Main Board 5VSB	4.783	0.865	4.137
Main Board +12V	11.618	0.450	5.228
Main Board Power Consumption			13.342

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.097	0.167	0.517
Main Board +5V	4.834	0.698	3.374
Main Board 5VSB	4.763	0.841	4.006
Main Board +12V	11.504	0.438	5.039
Main Board Power Consumption			12.936

A.1.5. RUN Burn-in Test

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	3.304	0.186	0.615
Main Board +5V	4.719	2.021	9.537
Main Board 5VSB	4.690	0.991	4.648
Main Board +12V	11.489	1.397	16.050
Main Board Power Consumption			30.850

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	2.972	0.178	0.529
Main Board +5V	4.627	1.347	6.233
Main Board +12V	4.622	0.980	4.530
Main Board 5VSB	11.380	1.218	13.861
Main Board Power Consumption			25.152

A.1.6. S3

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.045	0.427	2.154
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			2.154

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.033	0.408	2.053
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			2.053

A.1.7. S5

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.093	0.286	1.457
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			1.457

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.078	0.264	1.341
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			1.341

A.1.8. EuP/ErP Enable S3

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.281	0.117	0.618
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			0.618

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.272	0.116	0.612
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			0.612

A.1.9. EuP/ErP Enable S5

MAX	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.410	0.043	0.233
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			0.233

MEAN	Measured Voltage	Measured Amp.	Watts
Main Board +3.3V	0.000	0.000	0.000
Main Board +5V	0.000	0.000	0.000
Main Board 5VSB	5.403	0.041	0.222
Main Board +12V	0.000	0.000	0.000
Main Board Power Consumption			0.222

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