

MX680RD (71876)

Intel® R680E PCH
Supports LGA1700 Alder Lake-S (12th Gen)
, Raptor Lake-S (13th Gen), Raptor Lake-Refresh (14th Gen)
(BCM P/N# 71876 ONLY)
Core™ i9, Core i7, Core i5, Core i3, Pentium, Celeron
(up to **65W TDP max**) with DDR5-4800 SODIMM
Mini-ITX Motherboard

User's Quick Start Card

Version 1.03

<http://www.bcmcom.com>

• Inspect the Package:



• Responsibility:

This manual is provided "As-Is" with no warranties of any kind, it will neither expressed or implied, including, but not limited to the implied warranties or conditions of this product's fitness for any particular purpose. In no event shall we be liable for any loss of profits, loss of business, loss of data, interruption of business, or indirect, special, incidental, or consequential damages of any kind, even the possibility of such damages arising from any defect or error in this manual or product. We reserve the right to modify and update the user manual without prior notice.

WARNING: CMOS Battery Damage

Replace your system's CMOS RAM battery only with the identical CR-2032 3V Lithium-Ion coin cell (or equivalent) battery type to avoid risk of personal injury or physical damage to your equipment. Always dispose of used batteries according to the manufacturer's instructions, or as required by the local ordinance (where applicable). The damage due to not following this warning will void your motherboard's manufacturer warranty.

Perchlorate Material- Special Handling May Apply.

See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>

ATTENTION: Incorrect BIOS Setup

If you do not know how to handle BIOS setup or how to set it up properly, it is strongly advisable that you do not modify any of the settings than otherwise instructed in the User's Quick Start Card. Even a seemingly small incorrect adjustment or modification in the BIOS setup can render your system unstable or unusable. The incorrect BIOS setup is not covered by your motherboard's manufacturer warranty.

• Additional Information:

Additional information on setting this board up can be found in the User's Manual from BCM website. The Online User's Manual can be found on our website by visiting our website: <http://www.bcmcom.com>. If your question is not answered in our FAQ/Knowledge Base, visit our forums and post your messages or submit a new FAQ through FAQ Submittal form for us to add your question in our FAQ with our answer.

WARNING: Electrostatic Sensitive Device (ESD)

Static electricity can easily damage your motherboard and will void your motherboard warranty. Keep the motherboard and other system components in their anti-static packaging until you are ready to install them. Touch a grounded surface before you remove any system component from its protective anti-static packaging. Unpacking and installation should be done on a grounded, anti-static mat. The operator should be wearing an anti-static wristband, grounded at the same points as the anti-static mat. During configuration and installation touch a grounded surface frequently to discharge any static electrical charge that may have built up in your body. Avoid touching the components when handling the motherboard or a peripheral card. Handle the motherboard and peripheral cards either by the edges or by the peripheral card case-mounting bracket.

WARNING: Misplaced Jumper Damage

Incorrect setting jumpers and connectors may lead to damage to your motherboard and will void your motherboard warranty. Please pay special attention not to connect these headers in wrong directions. **DO NOT** change ANY jumpers while the motherboard has the power!

• **Application Note:**

1. PXE Boot:

- a. Connect ethernet cable with desired LAN1 or LAN2 port at rear I/O of MX680RD board.

NOTE:

Where “LAN1” is located right next to the rear I/O audio port. “LAN2” is located next to the rear I/O USB-C port (USB-P7).

- b. Enter BIOS menu.
- c. Under “Advanced”->“Network Stack Configuration”; enable “Network Stack”, and then enable the desired “IPv4 PXE Support” or “IPv6 PXE Support” (choose only one).
- d. under “Chipset”->“PCH-IO Configuration”; enable the desired “LAN1 PXE OpROM” or “LAN2 PXE OpROM” (choose only one).
- e. Under “Boot”; change “Boot Option #1” to “Network”.
- f. Under “Save & Exit”, click on “Save Changes and Exit”.
- g. Under the system reboot, the screen shall prompted with message “Checking Meia Presence....”, “Media Present.....”, “Start PXE over IPv# (# is either 4 or 6, depending on what you had chosen at step C) on MAC (showing the MAC address of chosen LAN port).

2. TPM Support (Infineon TPM (IFX), or Intel PTT (INTC)):

- a. Enter BIOS menu.
- b. Under “Advanced”->“Trusted Computing”;
- i. Under “TPM Device Selection”; choose the desired TPM device “dTPM” for Infineon TPM (IFX), or “PTT” for Intel PTT (INTC).
- ii. Under “Security Device Support”, change it to “Enable”.
- c. Under “Save & Exit” option, choose “Save Changes and Exit”.
- d. The system shall reboot once. Enter BIOS menu again.
- e. Enter “Advanced”->“Trusted Computing”.
- i. If you selected “TPM Device Selection” as “dTPM”, make sure “Vendor” section is shown as “IFX”.

- ii. if you chose “TPM Device Selection” as “PTT”, make sure “Vendor” section is shown as “INTC”.

- f. Let the system reboot into Windows environment, under “Search”, type “Device Manager”. And make sure the Device Manager displays the option “Security devices”->“Trusted Platform Module 2.0” and there is no any exclamation mark or question mark associated with it.
- g. Under “Search”, type “Manage BitLocker”; the menu “BitLocker Drive Encryption” shall be prompted. Click on “TPM Administration” at lower left-hand corner of its screen.
- h. The next screen shall prompt with the status of TPM;
- i. Make sure “Status” section is indicating “The TPM is ready to use”.
- ii. Under “TPM Manufacturer Information” section, the “Manufacturer Name” is shown as “IFX” if you chose “dTPM” under step“2b” above.
- Or
- “INTC” if you selected “PTT” under step “2b” above.
- i. If the information at “2f”, “2g”, & “2h” were verified to be corrected, you may click on “Turn on BitLocker” option under “BitLocker Drive Encryption” screen to start BitLocker execution process.

3. Clear CMOS when a different model of CPU is installed:

If a different model of CPU is being installed with the same MX680RD board, it is recommended to clear the CMOS once in order to be sure previous CPU information stored at NVRAM is cleared.

4. First Boot Time after a new CPU is installed, or power on at first time:

The first boot time (system post) when changed a new processor or system power on first time will be longer (about 30 seconds or more), which is normal. The subsequent boot times (system post) will be shorter.

5. Multiple Displays (through Intel Video Graphic):

- a. Due to the limitations of Intel video driver, 4 display outputs are the maximum of multiple video outputs available with MX680RD board.
- b. It is recommended that if user prefer to have multiple display outputs, the physical display devices (DP monitors, LVDS or eDP panels) can be connected to the desired video port before power on the system. (maximum 4 display output connections).

NOTE:

LVDS panel and eDP panel can't be used simultaneously. Only either one of them can be connected at once.

- c. Once the system is loaded into Windows desktop, user may conduct further adjustments through Window's "Display Settings" (right click on the Windows desktop), and/or through "Intel Graphics Command Center" (through Windows Start Menu).

6. The optional Realtek Audio Console Installation:

The optional "Realtek Audio Console" will be installed after the Win10 is being updated to Version "22H2" (through "Windows Update").

7. Intel VMD (RAID):

- a. For RAID 0/1: Install two PCIe (NVMe) SSDs on both M.2 slots. Or two SATA signal SSDs on two SATA ports of MX680RD.
- b. For RAID 5: Install 3 SATA signal SSDs on both SATA ports and M.2 slots.
- c. For RAID 10: Install 4 SATA signal SSDs on both SATA ports and M.2 slots.

NOTE: For the RAID configuration:

- a. Use only all SATA signal SSDs, OR all M.2 PCIe (NVMe) SSDs.
- b. Do not mix SATA signal SSDs with M.2 PCIe (NVMe) SSDs. Only either type of SSD can be used on the same board for RAID configuration.
- d. Turn-on system, enter BIOS.
- e. Enter "Chipset"->"System Agent (SA) Configuration"->"VMD Setup menu"->"Enable VMD Controller"; set it to "enabled">. Then save and exit BIOS.
- f. Enter BIOS again. Enter "Advanced"->"Intel Rapid Storage Technology", where it displays the model name of installed two M.2 NVME SSDs (or model names of installed two SATA disks).
- g. Click on "Create RAID Volume", and set the "RAID level" as "RAID 0 (Stripe)" or "RAID 1 (Mirror)".
- h. Under "Select Disks", mark "x" on both identified disks.
- i. Click on "Create Volume". The BIOS will prompt with screen that shows "Volume1, RAID mode, storage capacity, normal".
- j. Save and exit BIOS.
- k. Insert USB keys that contains the Win10 installation files and BCM provided driver "(OPTIONAL) RST_19.2.0.1003" to MX680RD board.
- l. Turn-on system, the Win10 installation process begins.
- m. Under the screen "Where do you want to install Windows" (the HDD partitions), there is no any partition displays on the list. Click on "Load driver" Option.

- n. Click on "Browse", then point to the directory where the BCM provided driver "(OPTIONAL RST_19.2.0.1003"->"F6 (browse during Win installation)"->"VMD"->"f6vmdflpy-x64", then click on "OK".
- o. Click on the option "Intel RST VMD Controller 467F", then click on "Next" to proceed.
- p. The partition will be displayed, click on "Next" to continue Win10 installation process.
- q. After the Win10 installation is completed, install the Intel RST driver.

8. The "JAMP1" audio header:

When the rear I/O audio port is connected with speakers, there is no audio output on "JAMP1" header, unless the speaker connection on the rear I/O connection is disconnected.

9. The Intel "MEBx" (iAMT):

- a. Enter BIOS menu.
 - b. Enter "MEBx" option (on far right of BIOS menu).
 - c. Click on "Intel ME Password. For the 1st time enter, type "admin" first, then Intel MEBx will ask for a new password setup.
- NOTE:**
- Intel® ME passwords must be between 8 and 32 characters long, have at least one upper case character, one lower case character, one number, and a special character (for example: !, @, #, \$, %, ^, &, *).
- d. The MEBx menu will be prompted.

10. Driver Installation Recommendations:

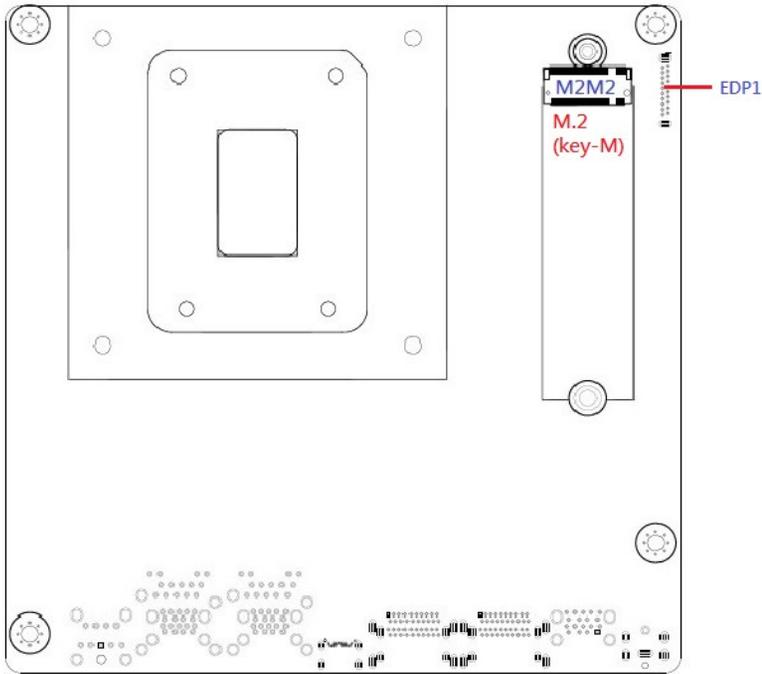
A. Intel DTT driver installation (This driver will remove the exclamation mark for):

- i. "PCI Data Acquisition and Signal Processing Controller" (after DTT driver installed, it becomes "Intel(R) Innovation Platform Framework Processor Participant").
- ii. "Unknown device" (after DTT driver installed, it becomes "Intel(R) Innovation Platform Framework Manager").

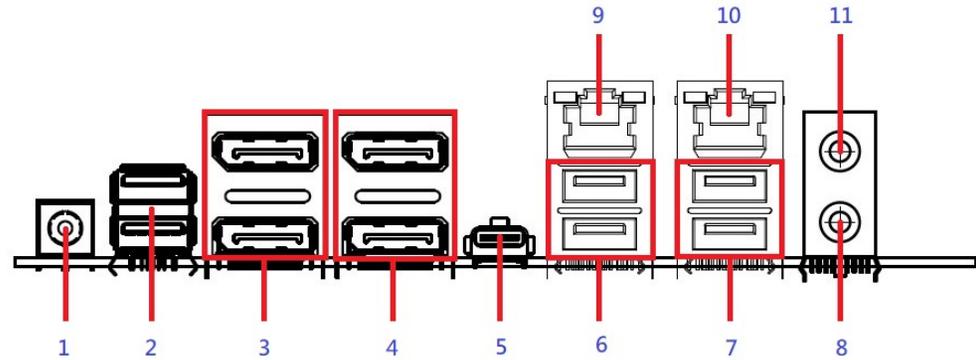
Here is recommended installation procedure:

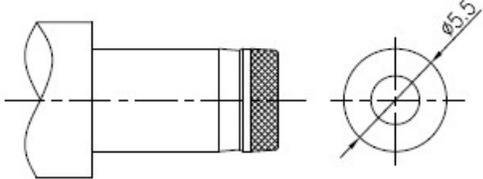
- a. After BCM MX680RD driver package 1~7 was installed, check under Windows "Device Manager", there are two items with exclamation marks; "PCI Data Acquisition and Signal Processing Controller" and one "Unknown Device".
- b. Go to "Device Manager", then click on "PCI Data Acquisition and Signal Processing Controller"->"Driver"->"Update Driver"->"Browse my computer for drivers"->click on "Browse".
- c. Then point the link to BCM driver package "8. Intel DTT_1.0.11400.36477"->"IPF"->"ipf-core-1.0.11400.36477"->"drivers"->"x64". And then click on "Next" for driver installation. The "PCI Data Acquisition and Signal Processing Controller" shall be disappeared from Device Manager list, and becomes "Intel(R) Innovation Platform Framework Processor Participant".
- d. Go to "Device Manager", then click on "Unknown Device"->"Driver"->"Update Driver"->"Browse my computer for drivers"->click on "Browse".
- e. Then point the link to BCM driver package "8. Intel DTT_1.0.11400.36477"->"IPF"->"ipf-core-1.0.11400.36477"->"drivers"->"x64". And then click on "Next" for driver installation. The last "Unknown Device" shall be disappeared from Device Manager list, and becomes "Intel(R) Innovation Platform Framework Manager".

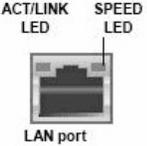
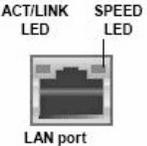
(Bottom Side)



• Back Panel (Rear IO):



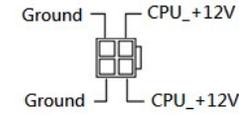
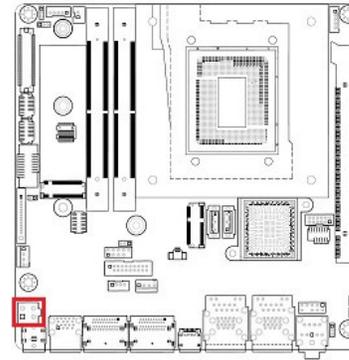
Item	Name	Function	Description
1	DC_IN	DC-in connector	<p>The connector is for DC-in (12V~24V) (19V recommended, 8A max)</p> <p>DC Mate Plug: DIA. 5.5mm (Outer) x 2.5mm (Inner).</p> 
2	USB3_P910 (Red)	USB 3.2 Connectors (Dual-Stacked, Type A)	These two Universal Serial Bus (USB) ports are available for connecting USB 3.2 devices.
3	DP2	Display Port (Dual-Stacked)	Two Display Port Connectors (DP++, 1.4a supported)
4	DP1	Display Port (Dual-Stacked)	Two Display Port Connectors (DP++, 1.4a supported)
5	USB_P7	USB 3.2 Connector (Type C)	This Universal Serial Bus (USB) port is available for connecting USB 3.2 Type C devices.
6	USB34A (Red)	USB 3.2 Connectors (Dual-Stacked, Type A)	These two Universal Serial Bus (USB) ports are available for connecting USB 3.2 devices.

7	USB12A (Red)	USB 3.2 Connectors (Dual-Stacked, Type A)	These two Universal Serial Bus (USB) ports are available for connecting USB 3.2 devices.																				
9	LAN2	2.5G LAN (RJ-45) Connectors  LAN port	This port allows 2.5G connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. <table border="1"> <thead> <tr> <th colspan="2">ACT/Link LED</th> <th colspan="2">Speed LED</th> </tr> <tr> <th>Status</th> <th>Description</th> <th>Status</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>No link</td> <td>OFF</td> <td>10/100Mbps connection</td> </tr> <tr> <td>Orange</td> <td>Linked</td> <td>Green</td> <td>1Gbps connection</td> </tr> <tr> <td>Blinking</td> <td>Data activity</td> <td>Orange</td> <td>2.5Gbps connection</td> </tr> </tbody> </table>	ACT/Link LED		Speed LED		Status	Description	Status	Description	OFF	No link	OFF	10/100Mbps connection	Orange	Linked	Green	1Gbps connection	Blinking	Data activity	Orange	2.5Gbps connection
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10	LAN1	2.5G LAN (RJ-45) Connectors  LAN port	This port allows 2.5G connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications. <table border="1"> <thead> <tr> <th colspan="2">ACT/Link LED</th> <th colspan="2">Speed LED</th> </tr> <tr> <th>Status</th> <th>Description</th> <th>Status</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>No link</td> <td>OFF</td> <td>10/100Mbps connection</td> </tr> <tr> <td>Orange</td> <td>Linked</td> <td>Green</td> <td>1Gbps connection</td> </tr> <tr> <td>Blinking</td> <td>Data activity</td> <td>Orange</td> <td>2.5Gbps connection</td> </tr> </tbody> </table>	ACT/Link LED		Speed LED		Status	Description	Status	Description	OFF	No link	OFF	10/100Mbps connection	Orange	Linked	Green	1Gbps connection	Blinking	Data activity	Orange	2.5Gbps connection
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8	AUDIO (Pink)	Microphone port	This port connects a microphone.																				
11	AUDIO (Green)	Line-out port	This port connects a headphone or a speaker.																				

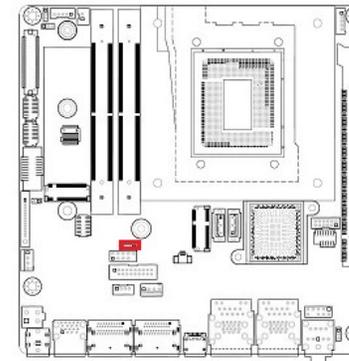
Jumpers, Connectors, & Headers:

- **ATX 4-Pins Power Connector (12V~24V, A PSU with 23A min (34A for CPU peak current) on its “12V2” rail (for connecting with this 2x2 connector) is recommended): ATX12V1**

(Use only either the “DC-IN” connector at rear I/O, or this connector for power connection of MX680RD).



- **Clear CMOS Jumper: CLCMOS1**



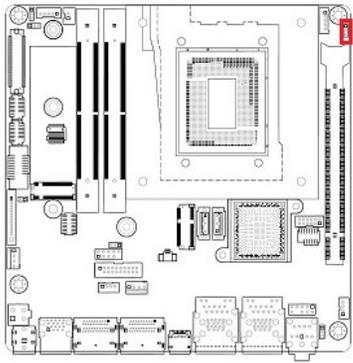
Normal (Default)



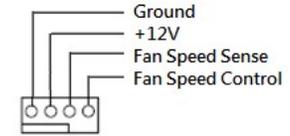
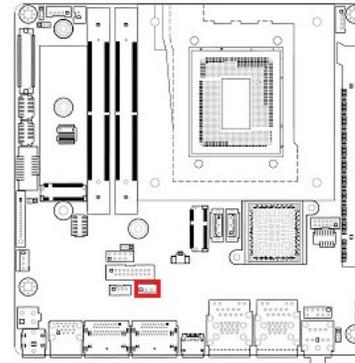
Clear CMOS



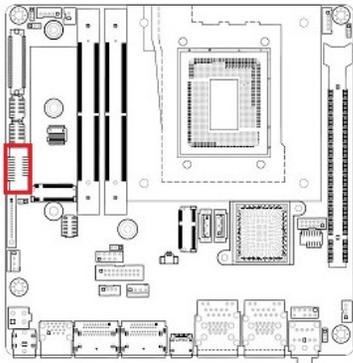
• ATX/AT Mode Selection: JPSON1



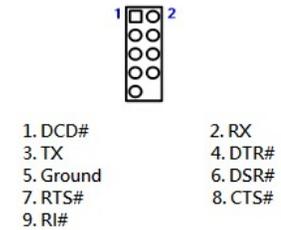
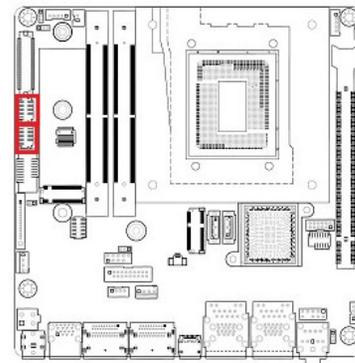
• Fan Connectors: SYS_FAN1



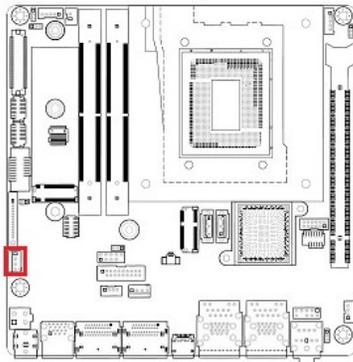
• Front Panel Connector: F_PANEL1



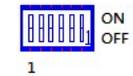
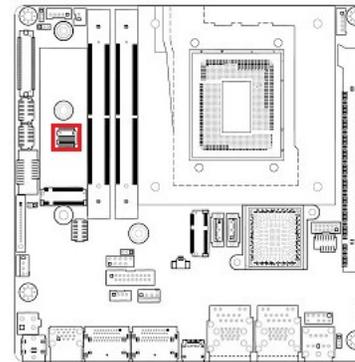
• Serial Port Connectors: COM1, COM2



• Fan Connectors: CPU_FAN1



• COM Mode Setting for COM1, COM2: RI_SEL1

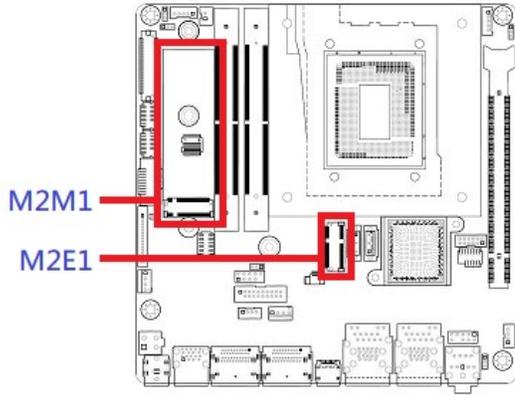


Switch:
COM1:
Pin#1: Ringin (Default)
Pin#2: +12V
Pin#3: +5V

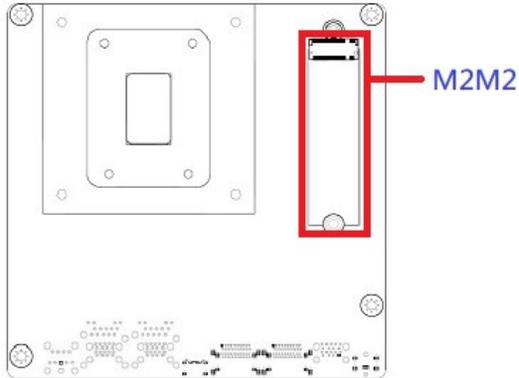
COM2:
Pin#4: Ringin (Default)
Pin#5: +12V
Pin#6: +5V

• M.2 Connectors: M2E1, M2E1, M2M2

Top Side:

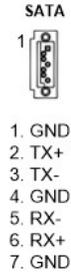
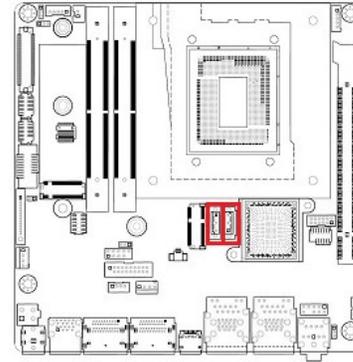


Bottom Side:

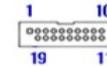
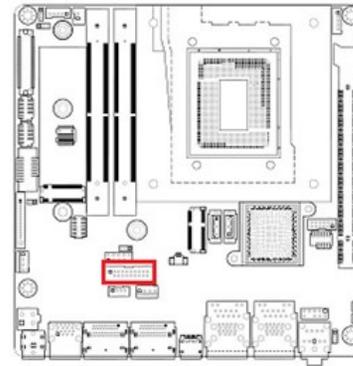


Item	Description	Note
M2E1	M.2 Key-E Slot (2230)	Supports PCIe x1, USB2.0, CNVi
M2M1	M.2 Key-M Slot (2242/ 2280) (Top Side)	Supports PCIe x4, SATA
M2M2	M.2 Key-M Slot (2280) (Bottom side)	Supports PCIe x4, SATA

• SATA 3.0 Ports: SATA1, SATA2

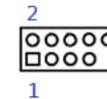
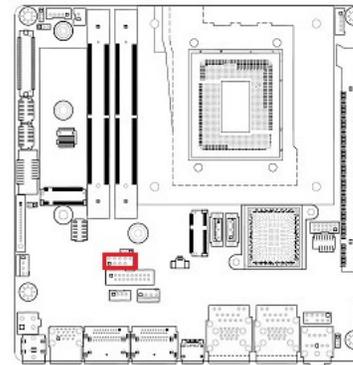


• Front USB 3.2 Headers: USB3_P56



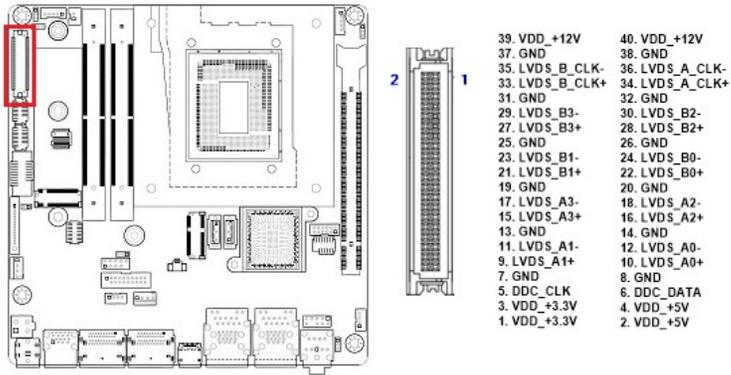
- 1. +5V
- 2. USB3_RX-
- 3. USB3_RX+
- 4. Ground
- 5. USB3_TX-
- 6. USB3_TX+
- 7. Ground
- 8. USB-
- 9. USB+
- 10. NC
- 11. USB+
- 12. USB-
- 13. Ground
- 14. USB3_TX+
- 15. USB3_TX-
- 16. Ground
- 17. USB3_RX+
- 18. USB3_RX-
- 19. +5V

• Front USB 2.0 Headers: USB1112

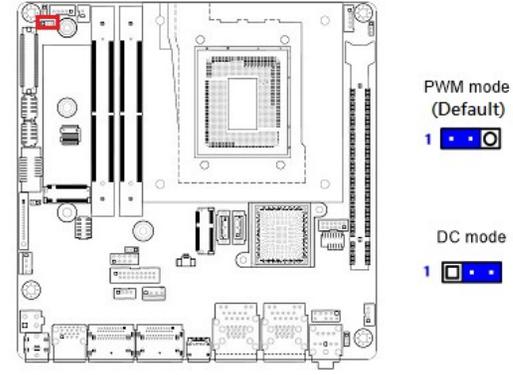


- 1. USB+5V
- 2. USB+5V
- 3. USB-
- 4. USB-
- 5. USB+
- 6. USB+
- 7. Ground
- 8. Ground
- 9. NC

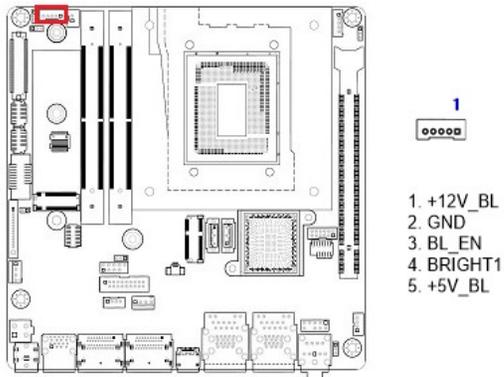
• LVDS panel connector: LVDS1



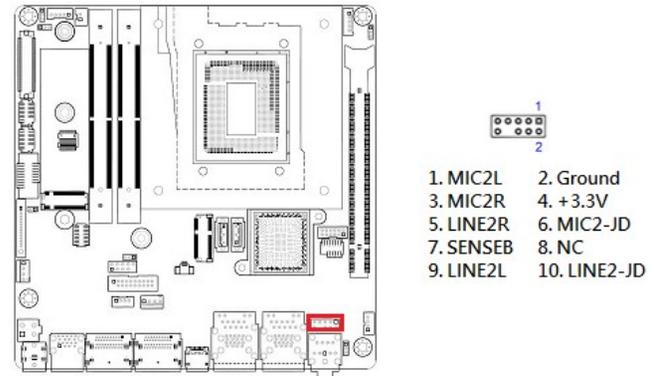
• LVDS Brightness Control Mode Selection: JLVD_BKL1



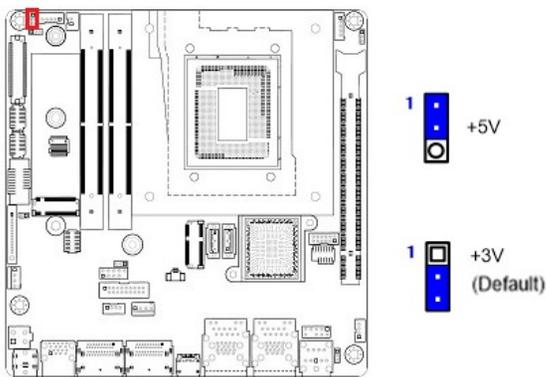
• LVDS panel backlight connector: JBKL1



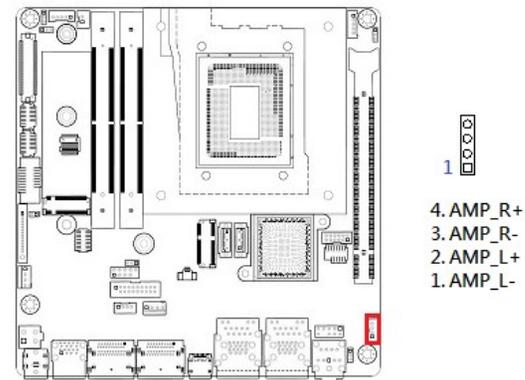
• Front Panel Audio Connector: FP_AUDIO1



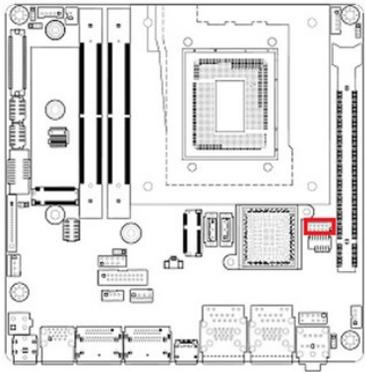
• LVDS Panel Voltage Selection: JBKLVOL1



• Audio Amplifier Connector: JAMP1

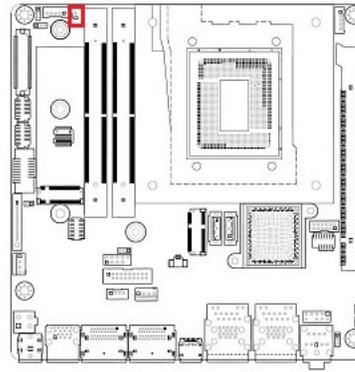


• Digital I/O (GPIO) Header: JDIO1



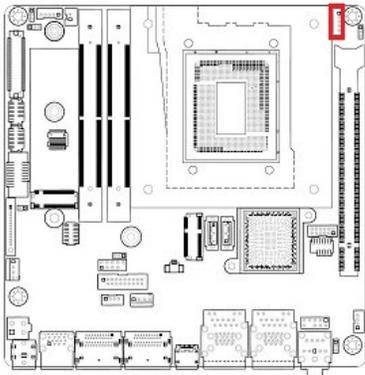
- | | |
|-------------------|---------------------|
| 1. SIO_GPIO0 | 2. SIO_GPIO4 |
| 3. SIO_GPIO1 | 4. SIO_GPIO5 |
| 5. SIO_GPIO2 | 6. SIO_GPIO6 |
| 7. SIO_GPIO3 | 8. SIO_GPIO7 |
| 9. SMB_CLK_RESUME | 10. SMB_DATA_RESUME |
| 11. Ground | 12. +5VSB |

• Chassis Intrusion Connector: JCASE1



1. SIO_CASEOPEN#
2. Ground

• SMBus Header: SMBUS1



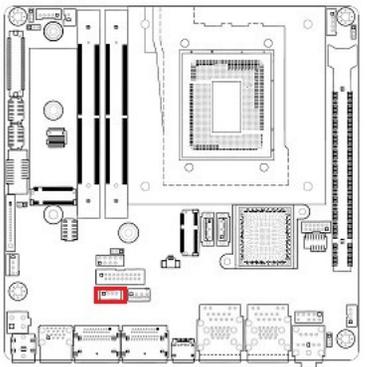
1. SMB_CLK
2. SMB_DATA
3. SMB_ALT
4. Ground
5. +3.3V

• Save the Processor Socket Cover

After removing the processor cover during processor installation, please save the processor socket cover. In the event that the desktop board needs to be returned for service or any time the processor is removed, the cover should be placed on the processor socket.



• I2C connector: I2C1



1. +3.3V
2. I2C_SCL
3. I2C_SDA
4. Ground

• Do not Touch Socket Contact

