



**MS-C923**

**Industrial Data Machine**

User Guide

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**Revision**  
V1.0, 2025/07

# Regulatory Notices

## CE Conformity

This product has been tested and found to comply with the harmonized standards for Information Technology Equipment published under Directives of Official Journal of the European Union.



The full text of the EU declaration of conformity is available at: [https:// www.msi.com](https://www.msi.com)

## FCC-B Radio Frequency Interference Statement



This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

### 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 AC power cord, if any, must be used in order to comply with the emission limits.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Notice 3

The WiFi operating in the band 5150-5350 MHz shall be restricted to indoor use only for countries listed in the table below:



|    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|
| AT | BE | BG | CH | CY | CZ | DK | DE |
| EE | EL | ES | FI | FR | HR | HU | IE |
| IS | IT | LT | LU | LV | MT | NL | PL |
| PT | RO | SI | SE | SK | NI |    |    |



UK

a. Low Power Indoor (LPI) Wi-Fi 6E devices:

The device is restricted to indoor use only when operating in the 5945 to 6425 MHz frequency range in Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Estonia (EE), France (FR), Iceland (IS), Ireland (IE), Lithuania (LT), Germany (DE), Netherlands (NL), Spain (ES).

b. b. Very Low Power (VLP) Wi-Fi 6E devices (portable devices):

The device is not permitted to be used on Unmanned Aircraft Systems (UAS) when operating in the 5945 to 6425 MHz frequency range in Belgium (BE), Bulgaria (BG), Cyprus (CY), Czech Republic (CZ), Estonia (EE), France (FR), Iceland (IS), Ireland (IE), Lithuania (LT), Germany (DE), Netherlands (NL), Spain (ES).

RED RF Output Power:

| Technologies | Frequency range(MHz) | Max. Transmit Power(EIRP) dBm |
|--------------|----------------------|-------------------------------|
| WLAN 2.4 GHz | 2400-2472 MHz        | 16.72                         |
| WLAN 5 GHz   | 5150-5250 MHz        | 19.78                         |
| WLAN 5 GHz   | 5250-5350 MHZ        | 19.69                         |
| WLAN 5 GHz   | 5470-5725 MHz        | 19.51                         |
| WLAN 6GHz    | 5925-6425 MHz        | 9.71                          |
| Bluetooth    | 2400-2472 MHz        | 14.63                         |

| Description | Frequency range(MHz) | Maximum Output Power<br>(Conducted) |
|-------------|----------------------|-------------------------------------|
| WCDMA I     | 1922.6 - 1977.4 MHz  | 25.2                                |
| WCDMA III   | 882.6 - 912.4 MHz    | 24.85                               |
| WCDMA VIII  | 880 - 915 MHz        | 24.89                               |
| LTE B1      | 1920 - 1980 MHz      | 24.94                               |
| LTE B3      | 1710 - 1785 MHz      | 24.67                               |
| LTE B5      | 824 - 849 MHz        | 24.98                               |
| LTE B7      | 2500 - 2570 MHz      | 24.18                               |
| LTE B8      | 880 - 915 MHz        | 24.99                               |
| LTE B20     | 832 - 862 MHz        | 24.99                               |
| LTE B28     | 703 - 748 MHz        | 24.34                               |
| LTE B38     | 2570 - 2620 MHz      | 24.02                               |
| LTE B40     | 2300 - 2400 MHz      | 24.37                               |
| LTE B41     | 2496 - 2690 MHz      | 23.86                               |

#### RF exposure statements

1. This Transmitter must not be co - located or operating in conjunction with any other antenna or transmitter.
2. This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body or nearby persons.

Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

## WEEE Statement

Under the European Union (“EU”) Directive on Waste Electrical and Electronic Equipment, Directive 2012/19/EU, products of “electrical and electronic equipment” cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life.



## Chemical Substances Information

In compliance with chemical substances regulations, such as the EU REACH Regulation (Regulation EC No. 1907/2006 of the European Parliament and the Council), MSI provides the information of chemical substances in products at:

<https://csr.msi.com/global/index>

## Battery Information

Please take special precautions if this product comes with a battery.

- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
- Avoid disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, which can result in an explosion.
- Avoid leaving a battery in an extremely high temperature or extremely low air pressure environment that can result in an explosion or the leakage of flammable liquid or gas.
- Do not ingest battery. If the coin/button cell battery is swallowed, it can cause severe internal burns and can lead to death. Keep new and used batteries away from children.

### European Union:



Batteries, battery packs, and accumulators should not be disposed of as unsorted household waste. Please use the public collection system to return, recycle, or treat them in compliance with the local regulations.

### BSMI:



廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

### California, USA:



The button cell battery may contain perchlorate material and requires special handling when recycled or disposed of in California.

For further information please visit:

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

## Environmental Policy

- The product has been designed to enable proper reuse of parts and recycling and should not be thrown away at its end of life.
- Users should contact the local authorized point of collection for recycling and disposing of their end-of-life products.
- Visit the MSI website and locate a nearby distributor for further recycling information.
- Users may also reach us at [gpcontdev@msi.com](mailto:gpcontdev@msi.com) for information regarding proper disposal, take-back, recycling, and disassembly of MSI products.
- Please visit <<https://us.msi.com/page/recycling>> for information regarding the recycling of your product in the US.



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MICRO-STAR INTERNATIONAL



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HIGH-DEFINITION MULTIMEDIA INTERFACE

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## Technical Support

If a problem arises with your product and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please visit <https://www.msi.com/support/> for further guidance.

# Safety Information



***Please read and follow these safety instructions carefully before installing, operating or performing maintenance on the equipment.***

## General Safety Instructions

- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- Keep this equipment in a dry, humidity-free environment.
- Ensure that all components are securely connected to prevent issues during operation.
- Do not cover the air openings to prevent overheating.
- Avoid spilling liquids into the equipment to prevent damage or electrical shock.
- Do not leave the equipment in an unconditioned environment. Storage temperatures above 60°C (140°F) may cause damage.

## Electrostatic Discharge (ESD) Precautions

The components included in this package are sensitive to electrostatic discharge. Follow these guidelines to prevent ESD-related damage:

- Hold the motherboard by the edges to avoid touching sensitive components.
- Wear an ESD wrist strap. If not available, discharge static electricity by touching a metal object before handling.
- When not installed, store the motherboard in an electrostatic shielding container or place it on an anti-static pad.

## Power Safety

- Always turn off the power supply and unplug the power cord from the outlet before installing or removing any component.
- Ensure the electrical outlet provides the same voltage as indicated on the PSU before connecting.
- Arrange the power cord to avoid tripping hazards or damage. Do not place objects over the power cord.

## **Installation Instructions**

- Lay the equipment on a stable, flat surface before setting it up.
- Before turning on the system, ensure there are no loose screws or metal components on the motherboard or within the system case.
- Do not boot the computer before completing all installations. Premature booting can cause permanent damage to components and pose safety risks.

## **When to Contact Service Personnel**

Immediately consult service personnel if any of the following situations arise:

- The power cord or plug is damaged.
- Liquid has entered the equipment.
- The equipment has been exposed to moisture.
- The equipment does not function as described in the User Guide.
- The equipment has been dropped or physically damaged.
- The equipment shows visible signs of breakage.

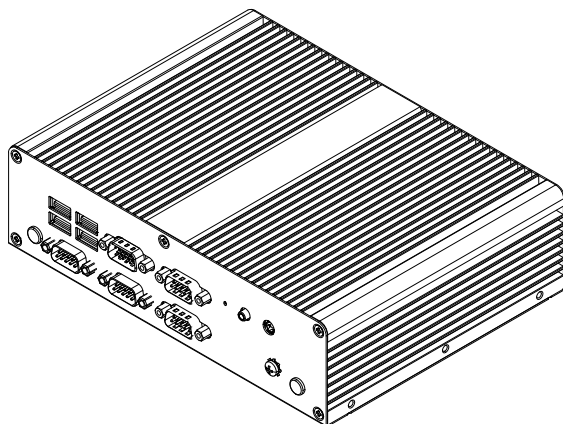
# Specifications

| Model           | MS-C923                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor       | <ul style="list-style-type: none"> <li>• Intel® Atom® x7211RE Processor, 6 MB Smart Cache, TDP 6W</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                           |
| Chipset         | Within processor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Antenna         | <ul style="list-style-type: none"> <li>• 4 x Openings reserved for antennas</li> <li>- Supports Wi-Fi/ BT/ 4G/ LTE</li> </ul>                                                                                                                                                                                                                                                                                                                                                                          |
| Network         | <ul style="list-style-type: none"> <li>• M.2 SparkLAN WiFi 6E module Wide-Temp</li> <li>• M.2 Quectel EM05-G Cat4 module Wide-Temp</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |
| Audio           | <ul style="list-style-type: none"> <li>• Realtek® ALC897 High Definition Audio codec</li> <li>- 1 x Line-out for Speaker</li> <li>- 1 x Line-out/Mic-in for Earphones</li> </ul>                                                                                                                                                                                                                                                                                                                       |
| Graphics        | <ul style="list-style-type: none"> <li>• 3 x HDMI™ 2.0b up to 1x4Kp@60Hz+2x1080p@60Hz or up to 2x4K@60Hz</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                    |
| Memory          | <ul style="list-style-type: none"> <li>• 1 x DDR4 8GB SO-DIMM Wide-Temp</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Storage         | <ul style="list-style-type: none"> <li>• M.2 2280 NVMe 128GB SSD Wide-Temp</li> <li>• 2.5" Sata 256GB SSD Wide-Temp</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| Front Panel I/O | <ul style="list-style-type: none"> <li>• 2 x Openings reserved for antennas</li> <li>• 1 x DC power jack</li> <li>• 1 x Power button/ LED</li> <li>• 3 x RS232 / 485 Serial ports (COM1~3) <ul style="list-style-type: none"> <li>- 0V/ 5V/ 12V, 0.5A each port</li> <li>(Power selection by Jumper, default: 5V)</li> </ul> </li> <li>• 4 x USB 2.0 Type-A connectors</li> <li>• 1 x CAN-BUS port</li> <li>• 1 x GPIO port</li> <li>• 1 x Grounding point</li> <li>• 1 x Clear CMOS button</li> </ul> |
| Rear Panel I/O  | <ul style="list-style-type: none"> <li>• 2 x Openings reserved for antennas</li> <li>• 1 x Line-Out jack</li> <li>• 1 x Microphone jack</li> <li>• 2 x Nano SIM holders (Up &amp; Down)</li> <li>• 2 x RJ-45 1 Gbps LAN Jacks</li> <li>• 3 x HDMI™ connectors (2.0b)</li> <li>• 4 x USB 5Gbps Type-A connectors</li> </ul>                                                                                                                                                                             |
| Power Solution  | <ul style="list-style-type: none"> <li>• 19V, 65W Power Adapter</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dimension       | 200mm (W) x 150mm (D) x 55mm (H)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

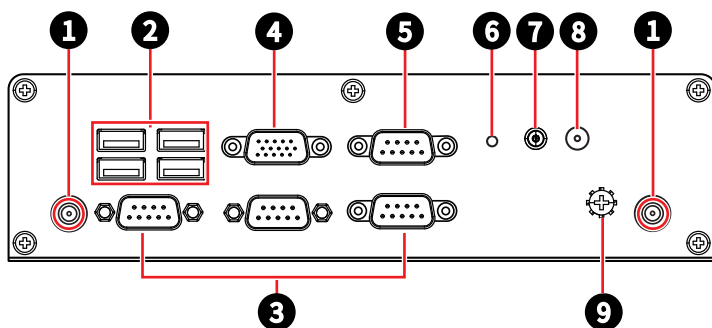
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|                              |                                                                                                                                                                                                                                           |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>                 | <b>MS-C923</b>                                                                                                                                                                                                                            |
| <b>Weight</b>                | 1.48kg                                                                                                                                                                                                                                    |
| <b>Mounting</b>              | <ul style="list-style-type: none"><li>• Wall mount</li><li>• DIN rail mount</li><li>• VESA mount (Optional)</li></ul>                                                                                                                     |
| <b>OS Support</b>            | <ul style="list-style-type: none"><li>• Windows 10 IoT Enterprise LTSC 21H2 (64-bit)</li><li>• Windows 11 IoT Enterprise LTSC 24H2 (64-Bit)</li><li>• Linux (supports by request)</li></ul>                                               |
| <b>Regulatory Compliance</b> | FCC Class B / CE / IC / MIC / RoHS Compliant                                                                                                                                                                                              |
| <b>Environment</b>           | <ul style="list-style-type: none"><li>• Operation Temperature: -20 ~ 60°C</li><li>• Operation Humidity: 10 ~ 90%, non-condensing</li><li>• Storage Temperature: -40 ~ 85°C</li><li>• Storage Humidity: 10 ~ 90%, non-condensing</li></ul> |

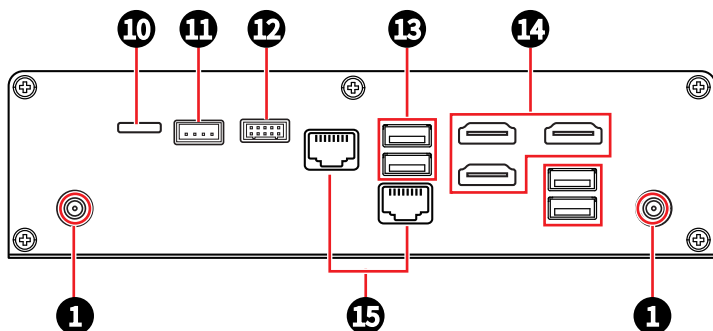
## System Overview



## Front Panel I/O



## Rear Panel I/O



1

Wi-Fi Antenna Connector (Openings reserved for antennas)

These connectors allow you to connect an external antenna for wireless communication. User may find two on the front side and 4 on the rear side of the system.

2

USB 2.0 Port

This connector is provided for USB peripheral devices.  
(Speed up to 480 Mbps)

!

Important

High-speed devices are recommended for USB 3.2 ports whereas low-speed devices, such as mouse or keyboard, are suggested to be plugged into the USB 2.0 ports.

3

RS232 / 485 Serial Port: COM1~3

The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. It supports barcode scanners, barcode printers, bill printers, credit card machine, etc.

| RS232 |           |                     | RS485 |          |                         |
|-------|-----------|---------------------|-------|----------|-------------------------|
| PIN   | SIGNAL    | DESCRIPTION         | PIN   | SIGNAL   | DESCRIPTION             |
| 1     | NDCD      | Data Carrier Detect | 1     | 485 TXD- | Transmit Data, Negative |
| 2     | NSIN      | Signal In           | 2     | 485 TXD+ | Transmit Data, Positive |
| 3     | NSOUT     | Signal Out          | 3     | NC       | No Connection           |
| 4     | NDTR      | Data Terminal Ready | 4     | NC       | No Connection           |
| 5     | GND       | Signal Ground       | 5     | GND      | Signal Ground           |
| 6     | NDSR      | Data Set Ready      | 6     | NC       | No Connection           |
| 7     | NRTS      | Request To Send     | 7     | NC       | No Connection           |
| 8     | NCTS      | Clear To Send       | 8     | NC       | No Connection           |
| 9     | 0V/5V/12V | Power Pin           | 9     | NC       | No Connection           |

Continued on next column

### GPIO Port

This connector is provided for the General-Purpose Input/Output (GPIO) peripheral module.

| GPIO |                               |              |
|------|-------------------------------|--------------|
| PIN  | SIGNAL                        | DESCRIPTION  |
| 1    | 5VSB                          | Human Sensor |
| 2    | GND                           | Human Sensor |
| 3    | GPIO                          | GPIO         |
| 4    | SIO_SYS1_FAN<br>(FANCTRL/PWM) | FAN1         |
| 5    | SYS1_FANTAC (FANIN)           | FAN1         |
| 6    | +12V                          | FAN1         |
| 7    | GND                           | FAN1         |
| 8    | SIO_SYS2_FAN<br>(FANCTRL/PWM) | FAN2         |
| 9    | SYS2_FANTAC (FANIN)           | FAN2         |
| 10   | +12V                          | FAN2         |
| 11   | GND                           | S3 Wake      |
| 12   | PCIE_WAKE#                    | S3 Wake      |
| 13   | GPIO                          | GPIO         |
| 14   | GPO0                          | GPIO         |
| 15   | GND                           | FAN2         |

### CAN-BUS Port

| CAN BUS |        |
|---------|--------|
| PIN     | SIGNAL |
| 1       | NC     |
| 2       | CAN_1L |
| 3       | GND    |
| 4       | CAN_2L |
| 5       | GND    |
| 6       | NC     |
| 7       | CAN_1H |
| 8       | CAN_2H |
| 9       | NC     |

### Clear CMOS Button

Power off your computer. Press and hold the Clear CMOS button for about 5-10 seconds to reset BIOS to default values.

Continued on next column

7



Power Button/ LED

Press the button to turn the system on or off.



| LED Status                                                                                 | Description                     |
|--------------------------------------------------------------------------------------------|---------------------------------|
|  Off      | ACPI S4/ S5/ Deep S5, Power Off |
|  Blinking | ACPI S3                         |
|  Blue     | ACPI S0                         |

8

DC Power Jack

Power supplied through this jack supplies power to the system.

9

Grounding Point

The Grounding Point is provided to connect a grounding wire.

10

Nano SIM Holder

This holder is provided for 3G, 4G, LTE Nano SIM cards

11

Line-Out Jack

This connector is provided for headphones or speakers.



| Line-Out |        |
|----------|--------|
| PIN      | SIGNAL |
| 1        | AMP_L+ |
| 2        | AMP_L- |
| 3        | AMP_R- |
| 4        | AMP_R+ |

Continued on next column

| 12     | <p><b>Mic-In Jack</b></p> <p>This connector is provided for microphones.</p>  <table><tr><th colspan="2">Mic-In</th></tr><tr><th>PIN</th><th>SIGNAL</th></tr><tr><td>1</td><td>NC</td></tr><tr><td>2</td><td>LINE2_L</td></tr><tr><td>3</td><td>LINE2_JD</td></tr><tr><td>4</td><td>GND</td></tr><tr><td>5</td><td>MIC2_JD</td></tr><tr><td>6</td><td>LINE2_R</td></tr><tr><td>7</td><td>FP_AUDIO_DET</td></tr><tr><td>8</td><td>MIC2_R</td></tr><tr><td>9</td><td>GND</td></tr><tr><td>10</td><td>MIC2_L</td></tr></table> | Mic-In |  | PIN | SIGNAL | 1 | NC | 2 | LINE2_L | 3 | LINE2_JD | 4 | GND | 5 | MIC2_JD | 6 | LINE2_R | 7 | FP_AUDIO_DET | 8 | MIC2_R | 9 | GND | 10 | MIC2_L |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|-----|--------|---|----|---|---------|---|----------|---|-----|---|---------|---|---------|---|--------------|---|--------|---|-----|----|--------|
| Mic-In |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| PIN    | SIGNAL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 1      | NC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 2      | LINE2_L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 3      | LINE2_JD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 4      | GND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 5      | MIC2_JD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 6      | LINE2_R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 7      | FP_AUDIO_DET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 8      | MIC2_R                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 9      | GND                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 10     | MIC2_L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 13     | <p><b>USB 5Gbps Type-A Ports</b></p> <p>This connector is provided for USB peripheral devices. (Speed up to 5Gbps)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 14     | <p><b>HDMI™ Connectors</b> </p> <p>HDMI™ 2.0b up to 1x4Kp@60Hz+2x1080p@60Hz or up to 2x4K@60Hz</p>                                                                                                                                                                                                                                                                                                                                                                                                                          |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |
| 15     | <p><b>1 Gbps LAN Jacks</b></p> <p>The standard RJ-45 LAN jack is provided for connection to the Local Area Network (LAN). You can connect a network cable to it.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |  |     |        |   |    |   |         |   |          |   |     |   |         |   |         |   |              |   |        |   |     |    |        |