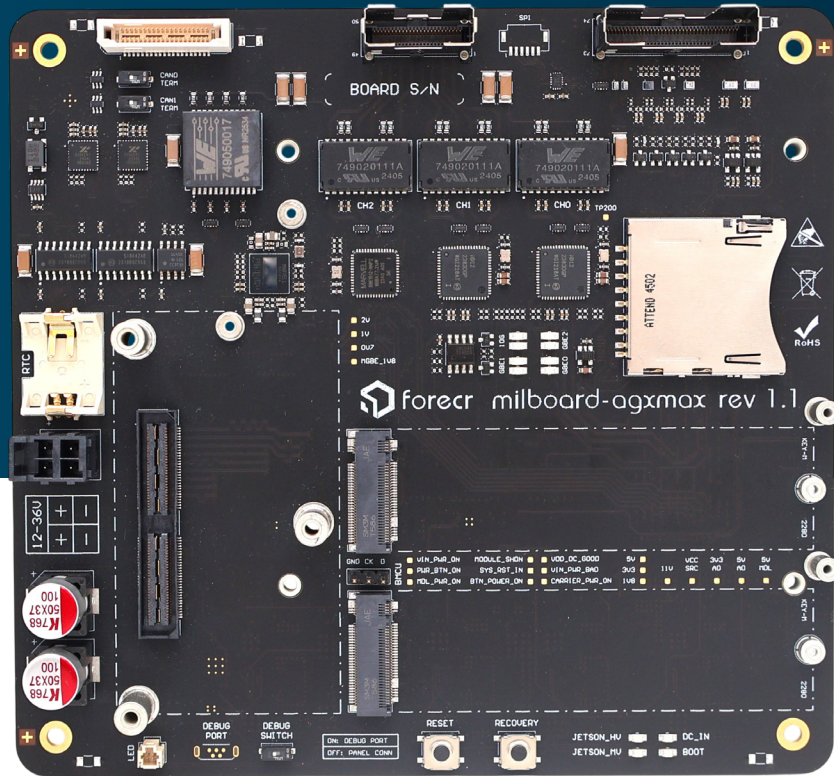




# MILBOARD-AGXMAX

# USER MANUAL

UM-MLBDAGXMAX-01

Document Revision: 1.01

24/09/2026



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## Preface

### Disclaimer

Forecr emphasizes that the information contained in this user manual is continuously updated in line with the technical modifications and enhancements made by Forecr to its MILBOARD-AGXMAX. Therefore, this manual only represents the technical status of Forecr MILBOARD-AGXMAX at the time of publishing.

Forecr shall not be held responsible for any damages that may occur directly or indirectly as a result of any technical or typographical errors or omissions found in this document or for any discrepancies between the product and the user's manual.

### Customer Support

In case you encounter any challenges after reading the user manual and/or using the MILBOARD-AGXMAX, please reach out to the Forecr reseller from which you purchased the MILBOARD-AGXMAX.

See the contact information section below for more information on how to contact us directly.

### Contact Information

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## Limited Product Warranty

Forecr provides a 1-year Warranty for the MILBOARD-AGXMAX. This warranty period is valid from the original purchase date of the MILBOARD-AGXMAX. In order to maintain warranty, the MILBOARD-AGXMAX must not be altered or modified in any way. Changes or modifications to the MILBOARD-AGXMAX that are not explicitly approved by Forecr and described in this user manual or received from Forecr Support as a special handling instruction, will void your warranty. To receive warranty service, the MILBOARD-AGXMAX must be delivered to Forecr within the warranty period together with the original invoice or proof of purchase.

## Revision History

| Revision No | Revision Date | Revision Description                                                                                                                                                                                                                                                  |
|-------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0         | 24.11.2025    | Preliminary Release                                                                                                                                                                                                                                                   |
| 1.01        | 24.09.2026    | Added software installation, power consumption, and MTBF details. Updated the block diagram. Added connector type information for the fan and Key-M connectors. Added a Connectivity section. Corrected the mating connector information for the low-speed connector. |

## 1. Introduction

The MILBOARD-AGXMAX is a robust, MIL-grade carrier board engineered to unlock the full potential of the NVIDIA® Jetson AGX Orin™ platform in mission-critical edge AI applications. Designed for extreme performance and durability, it delivers high-bandwidth connectivity with 10G Ethernet, multi-camera support, isolated industrial interfaces, and wide power input flexibility. Its robust thermal tolerance of -40°C to +85°C ensures reliable operation in harsh defense, aerospace, and industrial environments where stability and high compute capability are non-negotiable.

Built for advanced AI workloads, the MILBOARD-AGXMAX integrates essential security and system sensors, including TPM 2.0, a 6-axis IMU & temperature sensor, and a long-life 10-year RTC making it ideal for long-duration deployments. With 64GB eMMC, dual M.2 NVMe slots, versatile I/O such as CAN FD, RS232/422, digital I/O, and multiple USB ports, it offers exceptional expandability for complex systems. Combining rugged engineering with powerful AI acceleration, this carrier board provides a reliable foundation for next-generation autonomous systems and field-ready intelligent machines.

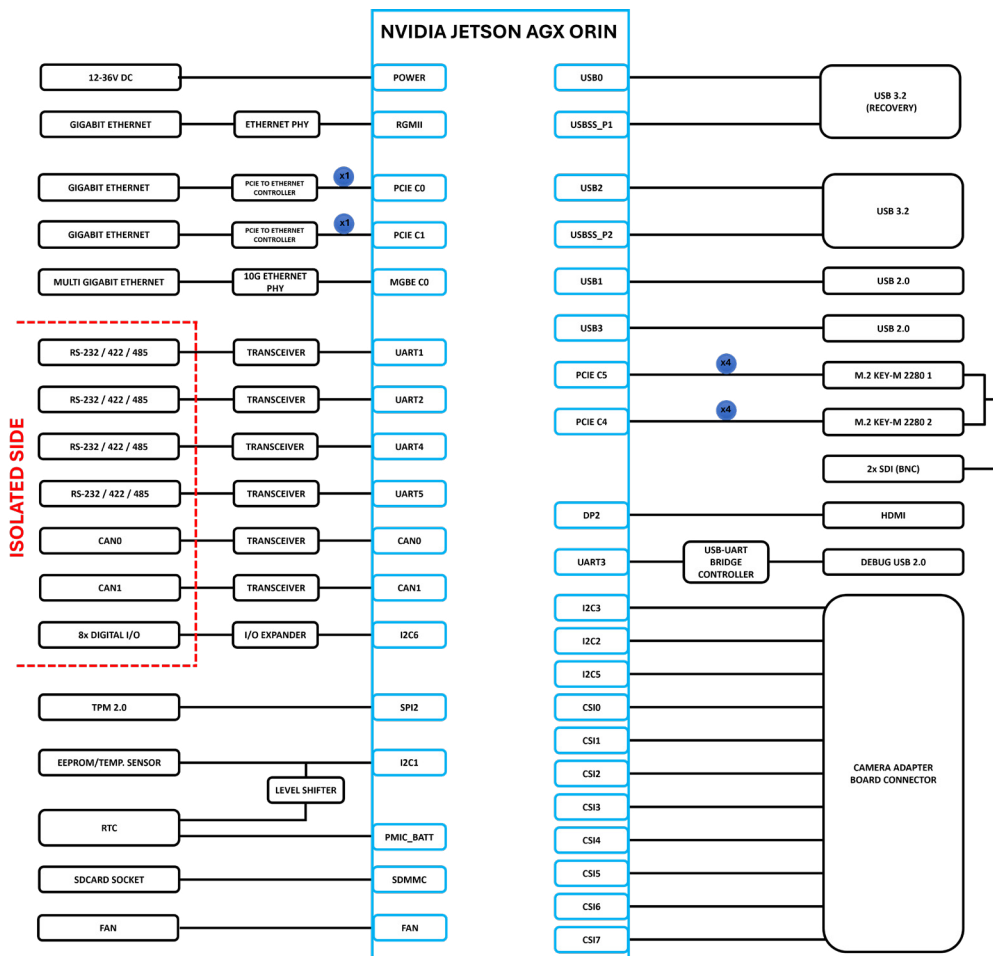
The latest revision of this user manual, datasheet, and 3D model can be downloaded from the [Forecr](#) website.

## 2. Product Specification

### 2.1 Technical Specification

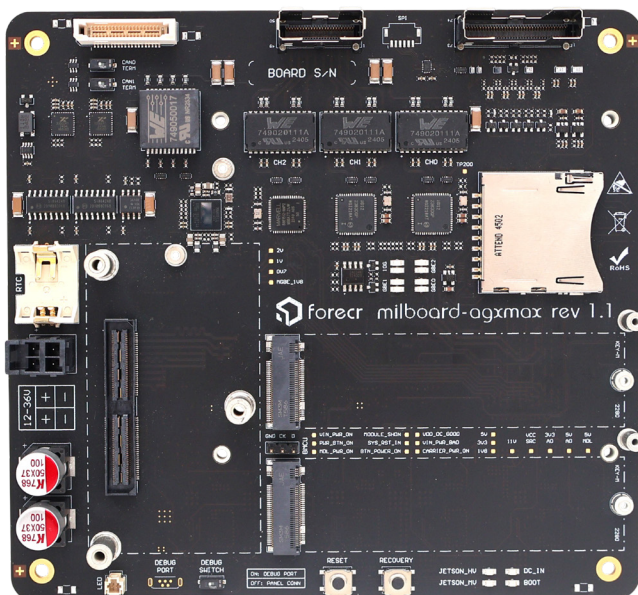
|                                 |                                                                                                                                                                                                                                                               |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Supported Modules</b>        | NVIDIA Jetson AGX Orin 32GB<br>NVIDIA Jetson AGX Orin 64GB<br>NVIDIA Jetson AGX Orin Industrial                                                                                                                                                               |
| <b>Memory</b>                   | 32 GB 256-bit LPDDR5x<br>64 GB 256-bit LPDDR5x                                                                                                                                                                                                                |
| <b>Graphics Interfaces</b>      | 1x HDMI 2.1                                                                                                                                                                                                                                                   |
| <b>Interfaces</b>               | 3x Gigabit Ethernet<br>1x 10G Ethernet<br>2x USB 3.2 Gen2<br>2x USB 2.0<br>1x USB 2.0 (Serial Console)<br>2x CAN Bus (FD supported, 5Mbps)<br>4x RS232/422 (Software Configurable, Isolated)<br>8x Digital IO (3.3V Level, Isolated)<br>4x BNC (Configurable) |
| <b>Other Features</b>           | TPM 2.0 Chipset for Enhanced Security<br>EEPROM, 6-Axis IMU & Temperature Sensor<br>RTC (Onboard external RTC chip for 10+ years battery life)                                                                                                                |
| <b>Wireless Communication</b>   | None                                                                                                                                                                                                                                                          |
| <b>Power Supply</b>             | 12-36 VDC (28 VDC Nominal)                                                                                                                                                                                                                                    |
| <b>Extension Sockets</b>        | 1x Camera Expansion Connector (6x 2-Lane or 4x 4-Lane)<br>Fan Connector (11V Default, 5V Optional)                                                                                                                                                            |
| <b>Mass Storage</b>             | 64 GB eMMC 5.1 Flash<br>2x M.2 Key-M 2280 SSD Slot (PCIe Gen4 x4)<br>SD Card                                                                                                                                                                                  |
| <b>Ambient Conditions</b>       | -40°C ... +85°C                                                                                                                                                                                                                                               |
| <b>Form Factor / Dimensions</b> | 150 mm x 140 mm, 139,2gr                                                                                                                                                                                                                                      |
| <b>Operating Systems</b>        | Ubuntu Linux 20.04 / 22.04 / 24.04                                                                                                                                                                                                                            |
| <b>JetPack Support</b>          | JetPack 5.x / 6.x / 7.2+                                                                                                                                                                                                                                      |

## 2.2 Block Diagram

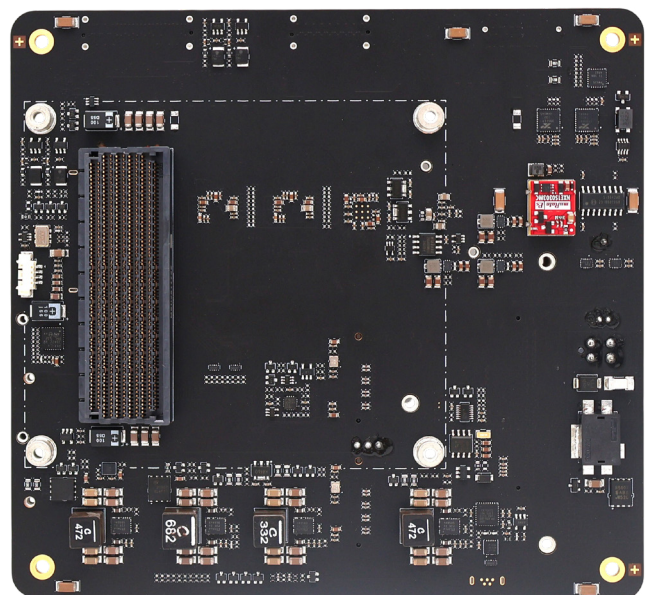


## 2.3 MILBOARD Visuals

Front Side



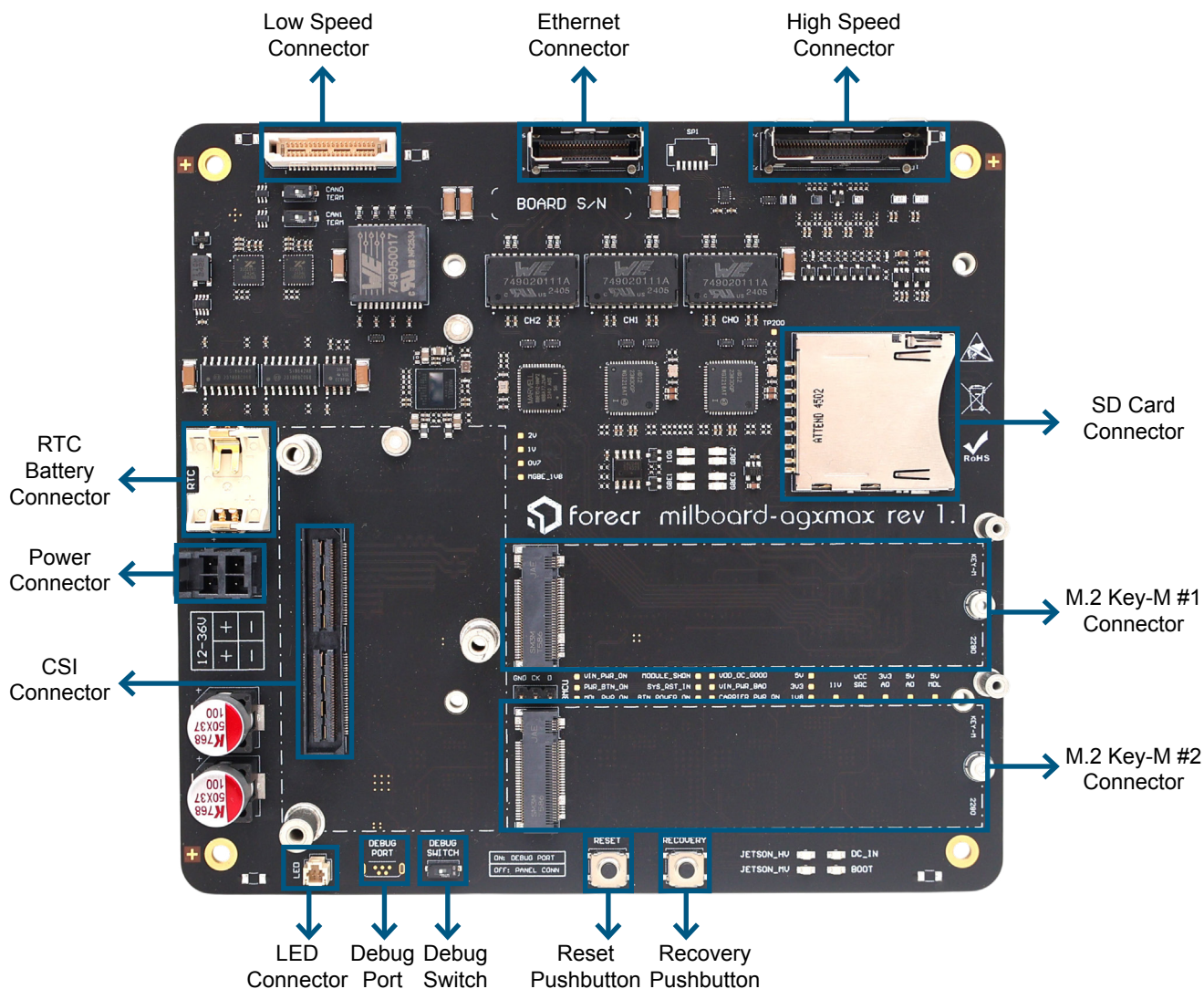
Rear Side



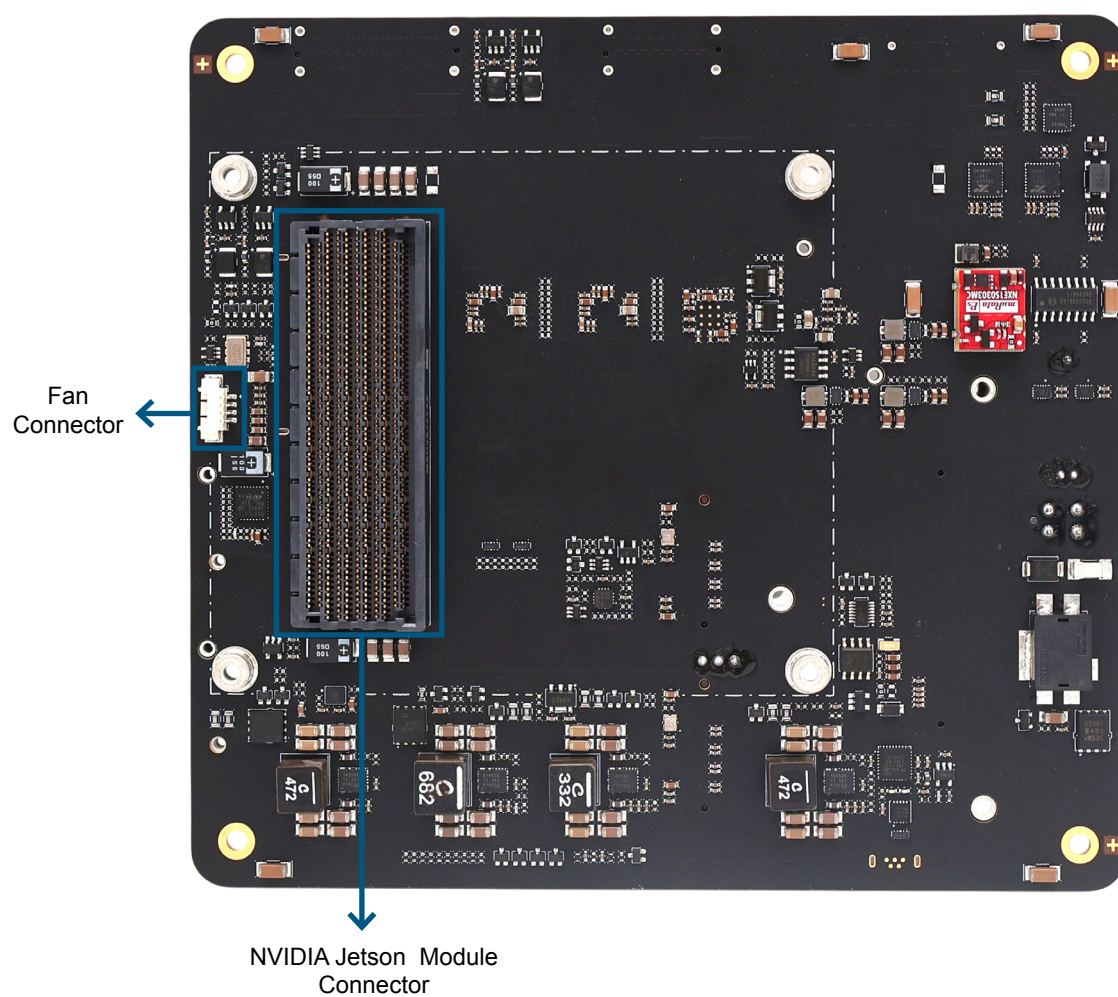
### 3. Hardware Information

#### 3.1 Connector, Button, and Switch Location

##### 3.1.1 Front Side



### 3.1.2 Rear Side

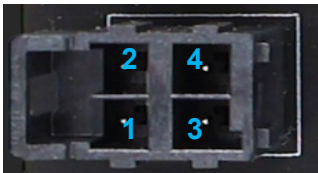


### 3.2 List of Connectors, Buttons, and Switches

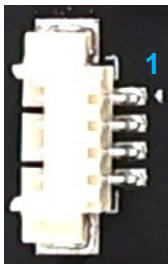
| Connectors                                       |
|--------------------------------------------------|
| MILBOARD-AGXMAX Power Connector                  |
| MILBOARD-AGXMAX Fan Connector                    |
| MILBOARD-AGXMAX Low-Speed Connector              |
| MILBOARD-AGXMAX High-Speed Connector             |
| MILBOARD-AGXMAX Ethernet Connector               |
| MILBOARD-AGXMAX CSI Connector                    |
| MILBOARD-AGXMAX M.2 Key-M #1 Connector           |
| MILBOARD-AGXMAX M.2 Key-M #2 Connector           |
| MILBOARD-AGXMAX Led Connector                    |
| MILBOARD-AGXMAX Debug Mode USB Micro-B Connector |
| MILBOARD-AGXMAX RTC Battery Connector            |
| MILBOARD-AGXMAX SD Card Connector                |
| Buttons and Switches                             |
| MILBOARD-AGXMAX Recovery Pushbutton              |
| MILBOARD-AGXMAX Reset Pushbutton                 |
| MILBOARD-AGXMAX Debug Switch                     |

### 3.3 Definition of Each Connector

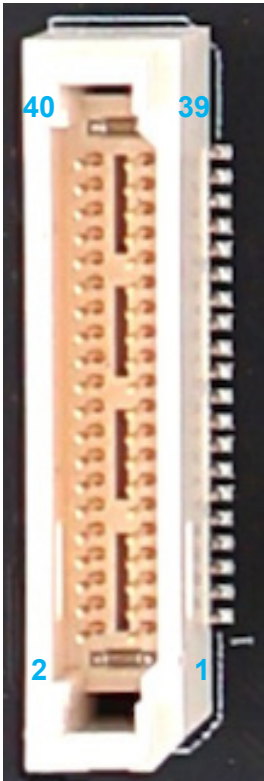
#### 3.3.1 Power Connector

|                                                                                   |                  |  |                            |                    |
|-----------------------------------------------------------------------------------|------------------|--|----------------------------|--------------------|
|  | <b>Function</b>  |  | <b>Description</b>         |                    |
|                                                                                   | Connector Type   |  | 1722981104                 |                    |
|                                                                                   | Mating Connector |  | 1722583104                 |                    |
|                                                                                   | Voltage Range    |  | 12-36 VDC (28 VDC Nominal) |                    |
|                                                                                   | X1-Pinout        |  | <b>Pin</b>                 | <b>Description</b> |
|                                                                                   |                  |  | 1                          | VDD_DC_IN          |
|                                                                                   |                  |  | 2                          | VDD_DC_IN          |
|                                                                                   |                  |  | 3                          | DC_GND             |
|                                                                                   |                  |  | 4                          | DC_GND             |

#### 3.3.2 Fan Connector

|                                                                                     |                                                                                                                                                |  |                                        |                    |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------|--------------------|
|  | <b>Function</b>                                                                                                                                |  | <b>Description</b>                     |                    |
|                                                                                     | Connector Type                                                                                                                                 |  | 53261-0471                             |                    |
|                                                                                     | Mating Connector                                                                                                                               |  | 0510210400 from Molex Picoblade series |                    |
|                                                                                     | Pinout                                                                                                                                         |  | <b>Pin</b>                             | <b>Description</b> |
|                                                                                     |                                                                                                                                                |  | 1                                      | DGND               |
|                                                                                     |                                                                                                                                                |  | 2                                      | VDD_FAN (11V)      |
|                                                                                     |                                                                                                                                                |  | 3                                      | FAN_TACH (1.8V)    |
|                                                                                     |                                                                                                                                                |  | 4                                      | FAN_PWM (11V)      |
|                                                                                     | <b>Note:</b> VDD_FAN is set to 11 V by default. By configuring the corresponding 0 $\Omega$ resistor, VDD_FAN can alternatively be set to 5 V. |  |                                        |                    |

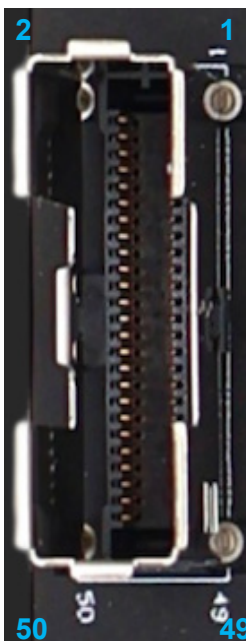
### 3.3.3 Low-Speed Connector

|  | Function       |  | Description            |                |     |                  |
|------------------------------------------------------------------------------------|----------------|--|------------------------|----------------|-----|------------------|
|                                                                                    | Connector Type |  | TEM-120-02-03.0-G-D-L1 |                |     |                  |
|                                                                                    | Mating Cable   |  | SESDT-20-32-G-XX.X-L1  |                |     |                  |
|                                                                                    | Pinout         |  | Pin                    | Description    | Pin | Description      |
|                                                                                    |                |  | 1                      | DIGITAL_IO_CH4 | 21  | RS422_CH3.TX_P   |
|                                                                                    |                |  | 2                      | DIGITAL_IO_CH3 | 22  | RS422_CH2.TX_P   |
|                                                                                    |                |  | 3                      | DIGITAL_IO_CH5 | 23  | RS422_CH3.TX_N   |
|                                                                                    |                |  | 4                      | DIGITAL_IO_CH2 | 24  | RS422_CH2.TX_N   |
|                                                                                    |                |  | 5                      | DIGITAL_IO_CH6 | 25  | RS422_CH3.RX_N   |
|                                                                                    |                |  | 6                      | DIGITAL_IO_CH1 | 26  | RS422_CH2.RX_N   |
|                                                                                    |                |  | 7                      | DIGITAL_IO_CH7 | 27  | RS422_CH3.RX_P   |
|                                                                                    |                |  | 8                      | DIGITAL_IO_CH0 | 28  | RS422_CH2.RX_P   |
|                                                                                    |                |  | 9                      | GND_ISO        | 29  | GND_ISO          |
|                                                                                    |                |  | 10                     | GND_ISO        | 30  | GND_ISO          |
|                                                                                    |                |  | 11                     | RS422_CH0.TX_P | 31  | CAN0_CONN.C0_P   |
|                                                                                    |                |  | 12                     | RS422_CH1.TX_P | 32  | CAN1_CONN.C1_N   |
|                                                                                    |                |  | 13                     | RS422_CH0.TX_N | 33  | CAN0_CONN.C0_N   |
|                                                                                    |                |  | 14                     | RS422_CH1.TX_N | 34  | CAN1_CONN.C1_P   |
|                                                                                    |                |  | 15                     | RS422_CH0.RX_N | 35  | GND_ISO          |
|                                                                                    |                |  | 16                     | RS422_CH1.RX_N | 36  | GND_ISO          |
|                                                                                    |                |  | 17                     | RS422_CH0.RX_P | 37  | I2C6_3V3_ISO.SDA |
|                                                                                    |                |  | 18                     | RS422_CH1.RX_P | 38  | VDD_3V3_ISO      |
|                                                                                    |                |  | 19                     | GND_ISO        | 39  | I2C6_3V3_ISO.SCL |
|                                                                                    |                |  | 20                     | GND_ISO        | 40  | GND_ISO          |

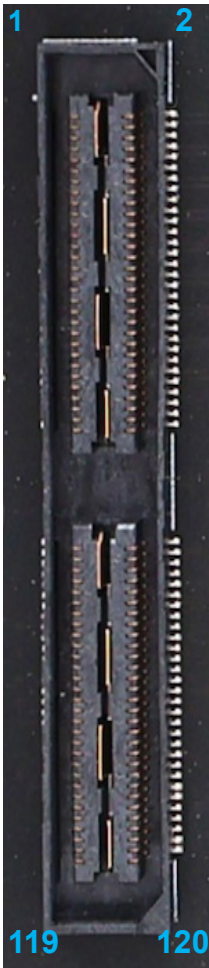
### 3.3.4 High-Speed Connector

|                |                        |                    |      |                   |
|----------------|------------------------|--------------------|------|-------------------|
| Function       | Description            |                    |      |                   |
| Connector Type | ARF6-24-S-D-A-K-TR     |                    |      |                   |
| Mating Cable   | ARC6-24-XX.X-LU-LU-3-1 |                    |      |                   |
| Pinout         | Pin                    | Description        | Pin  | Description       |
|                | 1                      | DGND               | 38   | DGND              |
|                | 2                      | DGND               | 39   | HDMI_CON.TXD1_P   |
|                | 3                      | USBSS_P2_CONN.RX_P | 40   | VDD_5V_HDMI_CON   |
|                | 4                      | USBSS_P1_CONN.RX_P | 41   | HDMI_CON.TXD1_N   |
|                | 5                      | USBSS_P2_CONN.RX_N | 42   | VBUS_DEBUG        |
|                | 6                      | USBSS_P1_CONN.RX_N | 43   | DGND              |
|                | 7                      | DGND               | 44   | DGND              |
|                | 8                      | DGND               | 45   | HDMI_CON.TXD0_P   |
|                | 9                      | USBSS_P2_CONN.D_P  | 46   | RESET*_CON        |
|                | 10                     | USBSS_P1_CONN.D_P  | 47   | HDMI_CON.TXD0_N   |
|                | 11                     | USBSS_P2_CONN.D_N  | 48   | RECOVERY*_CON     |
|                | 12                     | USBSS_P1_CONN.D_N  | 49   | DGND              |
|                | 13                     | DGND               | 50   | DGND              |
|                | 14                     | DGND               | 51   | VDD_3V3           |
|                | 15                     | USBSS_P2_CONN.TX_P | 52   | VDD_5V            |
|                | 16                     | USBSS_P1_CONN.TX_P | 53   | VDD_3V3           |
|                | 17                     | USBSS_P2_CONN.TX_N | 54   | VDD_5V            |
|                | 18                     | USBSS_P1_CONN.TX_N | 55   | DGND              |
|                | 19                     | DGND               | 56   | DGND              |
|                | 20                     | DGND               | 57   | USBHS_P1_CONN.D_P |
|                | 21                     | USBSS_P1_VBUS      | 58   | USBHS_P1_VBUS     |
|                | 22                     | USBSS_P2_VBUS      | 59   | USBHS_P1_CONN.D_N |
|                | 23                     | USBSS_P1_VBUS      | 60   | USBHS_P1_VBUS     |
|                | 24                     | USBSS_P2_VBUS      | 61   | DGND              |
|                | 25                     | DGND               | 62   | DGND              |
|                | 26                     | DGND               | 63   | USBHS_P2_CONN.D_P |
|                | 27                     | HDMI_CON.TXD2_P    | 64   | USBHS_P2_VBUS     |
|                | 28                     | HDMI_CON.HPD       | 65   | USBHS_P2_CONN.D_N |
|                | 29                     | HDMI_CON.TXD2_N    | 66   | USBHS_P2_VBUS     |
|                | 30                     | HDMI_CON.CEC       | 67   | DGND              |
|                | 31                     | DGND               | 68   | DGND              |
|                | 32                     | DGND               | 69   | DBG_USB_PANEL.D_P |
|                | 33                     | HDMI_CON.TXC_P     | 70   | I2C4_3V3.SCL      |
|                | 34                     | HDMI_CON.SDA       | 71   | DBG_USB_PANEL.D_N |
|                | 35                     | HDMI_CON.TXC_N     | 72   | I2C4_3V3.SDA      |
|                | 36                     | HDMI_CON.SCL       | 73   | DGND              |
| 37             | DGND                   | 74                 | DGND |                   |

### 3.3.5 Ethernet Connector

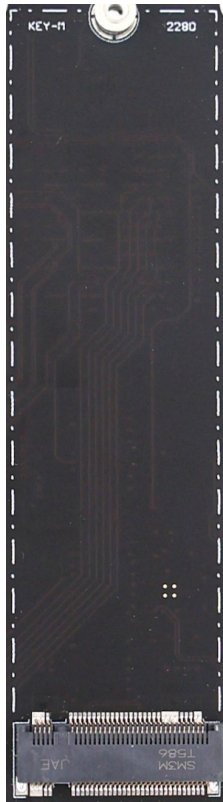
|  | Function       |  | Description            |                 |     |                 |
|------------------------------------------------------------------------------------|----------------|--|------------------------|-----------------|-----|-----------------|
|                                                                                    | Connector Type |  | ARF6-16-S-D-A-K-TR     |                 |     |                 |
|                                                                                    | Mating Cable   |  | ARC6-16-XX.X-LU-LU-3-1 |                 |     |                 |
|                                                                                    | Pinout         |  | Pin                    | Description     | Pin | Description     |
|                                                                                    |                |  | 1                      | CGND            | 26  | CGND            |
|                                                                                    |                |  | 2                      | CGND            | 27  | ENET2_CONN.D3_N |
|                                                                                    |                |  | 3                      | ENET1_CONN.D3_N | 28  | ENET_10G.D3_N   |
|                                                                                    |                |  | 4                      | ENET0_CONN.D3_N | 29  | ENET2_CONN.D3_P |
|                                                                                    |                |  | 5                      | ENET1_CONN.D3_P | 30  | ENET_10G.D3_P   |
|                                                                                    |                |  | 6                      | ENET0_CONN.D3_P | 31  | CGND            |
|                                                                                    |                |  | 7                      | CGND            | 32  | CGND            |
|                                                                                    |                |  | 8                      | CGND            | 33  | ENET2_CONN.D2_N |
|                                                                                    |                |  | 9                      | ENET1_CONN.D2_N | 34  | ENET_10G.D2_P   |
|                                                                                    |                |  | 10                     | ENET0_CONN.D2_N | 35  | ENET2_CONN.D2_P |
|                                                                                    |                |  | 11                     | ENET1_CONN.D2_P | 36  | ENET_10G.D2_N   |
|                                                                                    |                |  | 12                     | ENET0_CONN.D2_P | 37  | CGND            |
|                                                                                    |                |  | 13                     | CGND            | 38  | CGND            |
|                                                                                    |                |  | 14                     | CGND            | 39  | ENET2_CONN.D1_N |
|                                                                                    |                |  | 15                     | ENET1_CONN.D1_N | 40  | ENET_10G.D1_N   |
|                                                                                    |                |  | 16                     | ENET0_CONN.D1_N | 41  | ENET2_CONN.D1_P |
|                                                                                    |                |  | 17                     | ENET1_CONN.D1_P | 42  | ENET_10G.D1_P   |
|                                                                                    |                |  | 18                     | ENET0_CONN.D1_P | 43  | CGND            |
|                                                                                    |                |  | 19                     | CGND            | 44  | CGND            |
|                                                                                    |                |  | 20                     | CGND            | 45  | ENET2_CONN.D0_N |
|                                                                                    |                |  | 21                     | ENET1_CONN.D0_N | 46  | ENET_10G.D0_P   |
|                                                                                    |                |  | 22                     | ENET0_CONN.D0_N | 47  | ENET2_CONN.D0_P |
|                                                                                    |                |  | 23                     | ENET1_CONN.D0_P | 48  | ENET_10G.D0_N   |
|                                                                                    |                |  | 24                     | ENET0_CONN.D0_P | 49  | CGND            |
|                                                                                    |                |  | 25                     | CGND            | 50  | CGND            |

### 3.3.6 CSI Connector

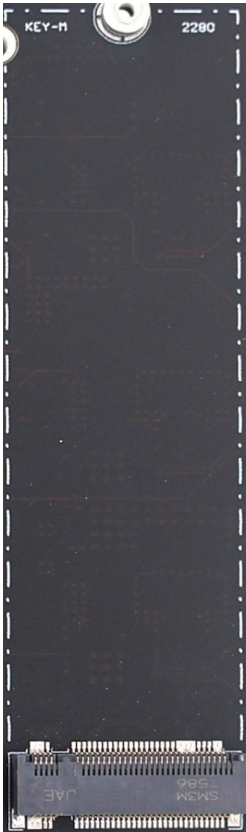
|  | Function         | Description           |             |     |             |
|------------------------------------------------------------------------------------|------------------|-----------------------|-------------|-----|-------------|
|                                                                                    | Connector Type   | QSH-060-01-L-D-A-K-TR |             |     |             |
|                                                                                    | Mating Connector | QTH-060-01-L-D-A-K-TR |             |     |             |
|                                                                                    | Pinout           | Pin                   | Description | Pin | Description |
|                                                                                    |                  | 1                     | CSI0.D0_P   | 61  | CSI5.D0_N   |
|                                                                                    |                  | 2                     | CSI1.D0_P   | 62  | CSI7.D0_N   |
|                                                                                    |                  | 3                     | CSI0.D0_N   | 63  | DGND        |
|                                                                                    |                  | 4                     | CSI1.D0_N   | 64  | DGND        |
|                                                                                    |                  | 5                     | DGND        | 65  | NC          |
|                                                                                    |                  | 6                     | DGND        | 66  | NC          |
|                                                                                    |                  | 7                     | CSI0.CLK_P  | 67  | NC          |
|                                                                                    |                  | 8                     | CSI1.CLK_P  | 68  | NC          |
|                                                                                    |                  | 9                     | CSI0.CLK_N  | 69  | DGND        |
|                                                                                    |                  | 10                    | CSI1.CLK_N  | 70  | DGND        |
|                                                                                    |                  | 11                    | DGND        | 71  | CSI5.D1_P   |
|                                                                                    |                  | 12                    | DGND        | 72  | CSI7.D1_P   |
|                                                                                    |                  | 13                    | CSI0.D1_P   | 73  | CSI5.D1_N   |
|                                                                                    |                  | 14                    | CSI1.D1_P   | 74  | CSI7.D1_N   |
|                                                                                    |                  | 15                    | CSI0.D1_N   | 75  | CAM_I2C.SCL |
|                                                                                    |                  | 16                    | CSI1.D1_N   | 76  | NC          |
|                                                                                    |                  | 17                    | DGND        | 77  | CAM_I2C.SDA |
|                                                                                    |                  | 18                    | DGND        | 78  | NC          |
|                                                                                    |                  | 19                    | CSI2.D0_P   | 79  | DGND        |
|                                                                                    |                  | 20                    | CSI3.D0_P   | 80  | DGND        |
|                                                                                    |                  | 21                    | CSI2.D0_N   | 81  | NC          |
|                                                                                    |                  | 22                    | CSI3.D0_N   | 82  | NC          |
|                                                                                    |                  | 23                    | DGND        | 83  | NC          |
|                                                                                    |                  | 24                    | DGND        | 84  | NC          |
|                                                                                    |                  | 25                    | CSI2.CLK_P  | 85  | NC          |
|                                                                                    |                  | 26                    | CSI3.CLK_P  | 86  | NC          |
|                                                                                    |                  | 27                    | CSI2.CLK_N  | 87  | I2C2.SCL    |
|                                                                                    |                  | 28                    | CSI3.CLK_N  | 88  | CAM1.MCLK   |
|                                                                                    |                  | 29                    | DGND        | 89  | I2C2.SDA    |
|                                                                                    |                  | 30                    | DGND        | 90  | CAM1_PWDN   |
|                                                                                    |                  | 31                    | CSI2.D1_P   | 91  | CAM0.MCLK   |
|                                                                                    |                  | 32                    | CSI3.D1_P   | 92  | CAM1_RST    |
|                                                                                    |                  | 33                    | CSI2.D1_N   | 93  | CAM0_PWDN   |
|                                                                                    |                  | 34                    | CSI3.D1_N   | 94  | CAM2.MCLK   |
|                                                                                    |                  | 35                    | DGND        | 95  | CAM0_RST    |
|                                                                                    |                  | 36                    | DGND        | 96  | NC          |
|                                                                                    |                  | 37                    | CSI4.D0_P   | 97  | NC          |
|                                                                                    |                  | 38                    | CSI6.D0_P   | 98  | NC          |
|                                                                                    |                  | 39                    | CSI4.D0_N   | 99  | DGND        |
|                                                                                    |                  | 40                    | CSI6.D0_N   | 100 | DGND        |

|  |    |            |     |          |
|--|----|------------|-----|----------|
|  | 41 | DGND       | 101 | NC       |
|  | 42 | DGND       | 102 | VDD_1V8  |
|  | 43 | CSI4.CLK_P | 103 | NC       |
|  | 44 | CSI6.CLK_P | 104 | NC       |
|  | 45 | CSI4.CLK_N | 105 | I2C5.SCL |
|  | 46 | CSI6.CLK_N | 106 | NC       |
|  | 47 | DGND       | 107 | I2C5.SDA |
|  | 48 | DGND       | 108 | VDD_3V3  |
|  | 49 | CSI4.D1_P  | 109 | NC       |
|  | 50 | CSI6.D1_P  | 110 | VDD_3V3  |
|  | 51 | CSI4.D1_N  | 111 | NC       |
|  | 52 | CSI6.D1_N  | 112 | NC       |
|  | 53 | DGND       | 113 | NC       |
|  | 54 | DGND       | 114 | NC       |
|  | 55 | NC         | 115 | DGND     |
|  | 56 | NC         | 116 | DGND     |
|  | 57 | NC         | 117 | NC       |
|  | 58 | NC         | 118 | VDD_3V3  |
|  | 59 | CSI5.D0_P  | 119 | NC       |
|  | 60 | CSI7.D0_P  | 120 | VDD_3V3  |

### 3.3.7 M.2 Key-M #1 Connector

|  | Function       | Description         |               |     |                  |
|------------------------------------------------------------------------------------|----------------|---------------------|---------------|-----|------------------|
|                                                                                    | Connector Type | SM3ZS067U410AMR1000 |               |     |                  |
|                                                                                    | Pinout         | Pin                 | Description   | Pin | Description      |
|                                                                                    |                | 1                   | DGND          | 35  | PCIE_C5.TX1_N    |
|                                                                                    |                | 2                   | VDD_3V3       | 36  | NC               |
|                                                                                    |                | 3                   | DGND          | 37  | PCIE_C5.TX1_P    |
|                                                                                    |                | 4                   | VDD_3V3       | 38  | NC               |
|                                                                                    |                | 5                   | PCIE_C5.RX3_N | 39  | DGND             |
|                                                                                    |                | 6                   | NC            | 40  | NC               |
|                                                                                    |                | 7                   | PCIE_C5.RX3_P | 41  | PCIE_C5.RX0_N    |
|                                                                                    |                | 8                   | NC            | 42  | NC               |
|                                                                                    |                | 9                   | DGND          | 43  | PCIE_C5.RX0_P    |
|                                                                                    |                | 10                  | NC            | 44  | NC               |
|                                                                                    |                | 11                  | PCIE_C5.TX3_N | 45  | DGND             |
|                                                                                    |                | 12                  | VDD_3V3       | 46  | NC               |
|                                                                                    |                | 13                  | PCIE_C5.TX3_P | 47  | PCIE_C5.TX0_N    |
|                                                                                    |                | 14                  | VDD_3V3       | 48  | NC               |
|                                                                                    |                | 15                  | DGND          | 49  | PCIE_C5.TX0_P    |
|                                                                                    |                | 16                  | VDD_3V3       | 50  | PCIE_C5_RST_N    |
|                                                                                    |                | 17                  | PCIE_C5.RX2_N | 51  | DGND             |
|                                                                                    |                | 18                  | VDD_3V3       | 52  | PCIE_C5_CLKREQ_N |
|                                                                                    |                | 19                  | PCIE_C5.RX2_P | 53  | PCIE_C5.CLK_N    |
|                                                                                    |                | 20                  | NC            | 54  | NC               |
|                                                                                    |                | 21                  | DGND          | 55  | PCIE_C5.CLK_P    |
|                                                                                    |                | 22                  | NC            | 56  | NC               |
|                                                                                    |                | 23                  | PCIE_C5.TX2_N | 57  | DGND             |
|                                                                                    |                | 24                  | NC            | 58  | NC               |
|                                                                                    |                | 25                  | PCIE_C5.TX2_P | 67  | NC               |
|                                                                                    |                | 26                  | NC            | 68  | SUSCLK(32KHz)    |
|                                                                                    |                | 27                  | DGND          | 69  | NC               |
|                                                                                    |                | 28                  | NC            | 70  | VDD_3V3          |
|                                                                                    |                | 29                  | PCIE_C5.RX1_N | 71  | DGND             |
|                                                                                    |                | 30                  | NC            | 72  | VDD_3V3          |
|                                                                                    |                | 31                  | PCIE_C5.RX1_P | 73  | DGND             |
|                                                                                    |                | 32                  | NC            | 74  | VDD_3V3          |
|                                                                                    |                | 33                  | DGND          | 75  | DGND             |
|                                                                                    |                | 34                  | NC            |     |                  |

### 3.3.8 M.2 Key-M #2 Connector

|                                                                                    | Function       | Description         |               |     |                  |
|------------------------------------------------------------------------------------|----------------|---------------------|---------------|-----|------------------|
|                                                                                    | Connector Type | SM3ZS067U410AMR1000 |               |     |                  |
|                                                                                    | Pinout         | Pin                 | Description   | Pin | Description      |
|  |                | 1                   | DGND          | 35  | PCIE_C4.TX1_N    |
|                                                                                    |                | 2                   | VDD_3V3       | 36  | NC               |
|                                                                                    |                | 3                   | DGND          | 37  | PCIE_C4.TX1_P    |
|                                                                                    |                | 4                   | VDD_3V3       | 38  | NC               |
|                                                                                    |                | 5                   | PCIE_C4.RX3_N | 39  | DGND             |
|                                                                                    |                | 6                   | NC            | 40  | NC               |
|                                                                                    |                | 7                   | PCIE_C4.RX3_P | 41  | PCIE_C4.RX0_N    |
|                                                                                    |                | 8                   | NC            | 42  | NC               |
|                                                                                    |                | 9                   | DGND          | 43  | PCIE_C4.RX0_P    |
|                                                                                    |                | 10                  | NC            | 44  | NC               |
|                                                                                    |                | 11                  | PCIE_C4.TX3_N | 45  | DGND             |
|                                                                                    |                | 12                  | VDD_3V3       | 46  | NC               |
|                                                                                    |                | 13                  | PCIE_C4.TX3_P | 47  | PCIE_C4.TX0_N    |
|                                                                                    |                | 14                  | VDD_3V3       | 48  | NC               |
|                                                                                    |                | 15                  | DGND          | 49  | PCIE_C4.TX0_P    |
|                                                                                    |                | 16                  | VDD_3V3       | 50  | PCIE_C4_RST_N    |
|                                                                                    |                | 17                  | PCIE_C4.RX2_N | 51  | DGND             |
|                                                                                    |                | 18                  | VDD_3V3       | 52  | PCIE_C4_CLKREQ_N |
|                                                                                    |                | 19                  | PCIE_C4.RX2_P | 53  | PCIE_C4.CLK_N    |
|                                                                                    |                | 20                  | NC            | 54  | NC               |
|                                                                                    |                | 21                  | DGND          | 55  | PCIE_C4.CLK_P    |
|                                                                                    |                | 22                  | NC            | 56  | NC               |
|                                                                                    |                | 23                  | PCIE_C4.TX2_N | 57  | DGND             |
|                                                                                    |                | 24                  | NC            | 58  | NC               |
|                                                                                    |                | 25                  | PCIE_C4.TX2_P | 67  | NC               |
|                                                                                    |                | 26                  | NC            | 68  | SUSCLK(32KHz)    |
|                                                                                    |                | 27                  | DGND          | 69  | NC               |
|                                                                                    |                | 28                  | NC            | 70  | VDD_3V3          |
|                                                                                    |                | 29                  | PCIE_C4.RX1_N | 71  | DGND             |
|                                                                                    |                | 30                  | NC            | 72  | VDD_3V3          |
|                                                                                    |                | 31                  | PCIE_C4.RX1_P | 73  | DGND             |
|                                                                                    |                | 32                  | NC            | 74  | VDD_3V3          |
|                                                                                    |                | 33                  | DGND          | 75  | DGND             |
|                                                                                    |                | 34                  | NC            |     |                  |

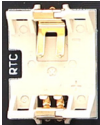
### 3.3.9 Led Connector

|                                                                                   |                  |                    |                    |
|-----------------------------------------------------------------------------------|------------------|--------------------|--------------------|
|  | <b>Function</b>  | <b>Description</b> |                    |
|                                                                                   | Connector Type   | TIM-02-F-SV-L-P    |                    |
|                                                                                   | Mating Connector | ISS1-02-L          |                    |
|                                                                                   | Pinout           | <b>Pin</b>         | <b>Description</b> |
|                                                                                   |                  | 1                  | 5V                 |
|                                                                                   |                  | 2                  | RESET              |

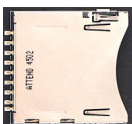
### 3.3.10 Debug Mode USB Micro-B Connector

|                                                                                   |                                                                                                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|  | <p>The MILBOARD-AGXMAX includes a USB Micro-B connector to access the module by using a serial connection.</p> |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|

### 3.3.11 RTC Battery Connector

|                                                                                    |                                                                                                                                                           |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>The MILBOARD-AGXMAX features an RTC battery connector. A CR1225 size battery is used for the RTC and must be used with the “BHSD-1225-COVER” part.</p> |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3.3.12 SD Card Connector

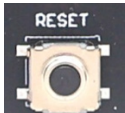
|                                                                                     |                                                                    |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------|
|  | <p>The MILBOARD-AGXMAX includes a full-size SD Card connector.</p> |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------|

## 3.4 Definition of Each Button and Switch

### 3.4.1 Recovery Pushbutton

|                                                                                     |                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>The MILBOARD-AGXMAX provides a recovery pushbutton. The recovery pushbutton should be pressed with the reset pushbutton at the same time. After releasing the reset pushbutton, the recovery pushbutton should be held down for a minimum of 250 ms.</p> |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 3.4.2 Reset Pushbutton

|                                                                                     |                                                                                    |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  | <p>The MILBOARD-AGXMAX provides a reset pushbutton to reset the Jetson module.</p> |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

### 3.4.3 Debug Switch

|                                                                                     |                                                                                                                                                     |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>ON:</b> Debug interface is routed to the USB Micro-B connector.</p> <p><b>OFF:</b> Debug interface is routed to the High-Speed Connector.</p> |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

## 4. Software Information

### 4.1 Installation

The JetPack-5.x installation guide can be found [here](#).

The JetPack-6.x installation guide can be found [here](#).

The JetPack-7.2+ installation guide can be found [here](#).

## 5. Connectivity

### 5.1 General Purpose Input/Output (GPIO)

| MODULE PIN NUMBER | I/O NAME              | MODULE PIN NAME | TYPE   | DESCRIPTION                                                         |
|-------------------|-----------------------|-----------------|--------|---------------------------------------------------------------------|
| L14               | TPM_SPI_RST*          | I2S1_CLK        | OUTPUT | TPM chip reset signal.                                              |
| L15               | TPM_SPI_PIRQ*         | GPIO14          | INPUT  | TPM chip interrupt signal.                                          |
| F10               | CAM1_PWDN             | GPIO15          | OUTPUT | Camera 1 power down (1.8V Level)                                    |
| F9                | CAM1_RST              | GPIO16          | OUTPUT | Camera 1 reset. (1.8V Level)                                        |
| H5                | ENET2_RST             | ENET_RST_N      | OUTPUT | Reset pin for RGMII to GBE transceiver (1.8V Level)                 |
| J5                | ENET2_INT             | ENET_INT        | INPUT  | Interrupt pin for RGMII to GBE transceiver (1.8V Level)             |
| L6                | GPIO2_SD_DET          | GPIO02          | INPUT  | SD card insertion detection signal. (1.8V Level)                    |
| L49               | CAM0_PWDN             | UART4_CTS       | OUTPUT | Camera 0 power down (1.8V Level)                                    |
| L9                | TPM_GPIO_LP           | GPIO28          | OUTPUT | TPM chip low power/standby mode signal.                             |
| L50               | TPM_GPIO_PP           | GPIO35          | OUTPUT | TPM chip physical presence signal.                                  |
| J54               | CAM0.MCLK             | MCLK02          | OUTPUT | Camera 0 reference clock (1.8V Level)                               |
| H53               | CAM1.MCLK             | MCLK03          | OUTPUT | Camera 1 reference clock (1.8V Level)                               |
| H55               | CAM2.MCLK             | MCLK04          | OUTPUT | Camera 2 reference clock (1.8V Level)                               |
| A54               | CAM0_RST              | GPIO17          | OUTPUT | Camera 0 reset. (1.8V Level)                                        |
| E54               | FAN_TACH              | FAN_TACH        | INPUT  | Fan Tachometer signal                                               |
| D56               | XFI0_RST_N            | SPI3_MISO       | OUTPUT | Reset pin for 10G Ethernet PHY (1.8V Level)                         |
| C57               | XFI0_INT_N            | SPI3_CS0_N      | INPUT  | Interrupt pin for 10G Ethernet PHY (1.8V Level)                     |
| F54               | GPIO22_USB_VBUS_EN0   | GPIO22          | OUTPUT | Connect to enable and overcurrent pins of load switch. (1.8V Level) |
| B58               | GPIO21_SD_POWER_SW_ON | GPIO21          | OUTPUT | Enable pin for SD Card power switch (1.8V Level)                    |
| K62               | FAN_PWM               | FAN_PWM         | OUTPUT | Fan Pulse Width Modulation signal.                                  |
| K49               | XFI0_MDIO             | GPIO25          | BIDIR  | Data line for the 10G ETH (1.8V Level)                              |
| H51               | XFI0_MDC              | GPIO26          | OUTPUT | Clock line for the 10G ETH (1.8V Level)                             |

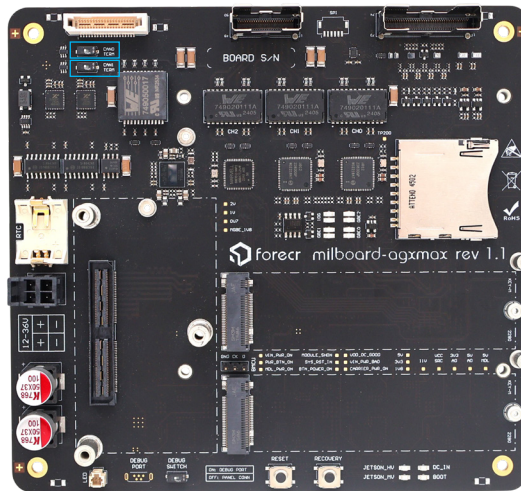
## 5.2 Digital Input Output Interface

For Digital I/O operations, the DIGITAL\_IO\_CH# GPIO corresponding to the relevant channel should be used. Users can use the `gpioget` command to read input values and the `gpioset` command to set output values. Here, “#” represents the channel number.

## 5.3 CANBus Interface

There are four CAN Bus interfaces on the MILBOARD-AGXMAX. A TCAN332 transceiver with FD support is utilized between native CAN pins of the Jetson and the connector. Integrated DIP switches allow configuration of the 120R termination resistors across the CAN\_H and CAN\_L lines. The termination resistors can be enabled by setting the respective DIP switch to ON position.

CANBus Termination Switch



## 5.4 Serial Communication Interface

For RS422 communication protocol, the SERIAL\_CH#.RS485/RS232 GPIO for the corresponding channel should be driven high. Additionally, to enable 120  $\Omega$  termination, the SERIAL\_CH#.TERM GPIO for the corresponding channel should be driven high.

For RS232 communication protocol, the SERIAL\_CH#.RS485/RS232 GPIO for the corresponding channel should be driven low. Additionally, to disable 120  $\Omega$  termination, the SERIAL\_CH#.TERM GPIO for the corresponding channel should be driven low.

Here, “#” represents the channel number.

Example scripts can be found [here](#).

## 5.5 On-Board I2C Devices List

### 5.5.1 I2C1 Bus

- External RTC (P/N: PCF8523T/1,118) - 0x68 (68h)
- 6-Axis IMU & Temperature Sensor (P/N: 2536030320001) - 0x6B (6Bh)
- EEPROM (P/N: CAT24C04WI-GT3) - 0x56 (56h)
- EEPROM (on Jetson SOM) – 0x50 (50h)

### 5.5.2 I2C2 Bus

- Power monitor (on Jetson SOM)-0x40, 0x41 (40h, 41h)

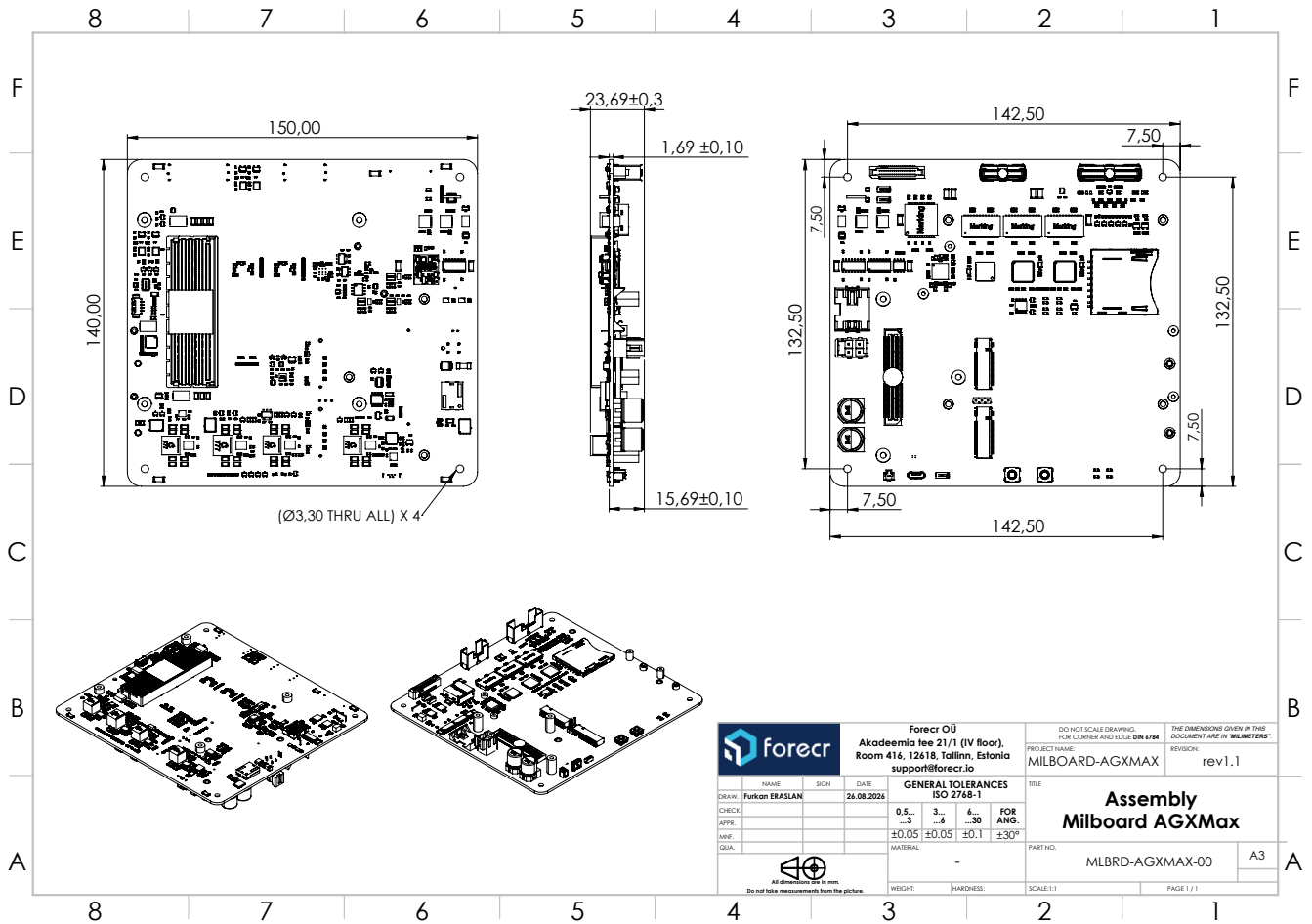
### 5.5.3 I2C6 Bus

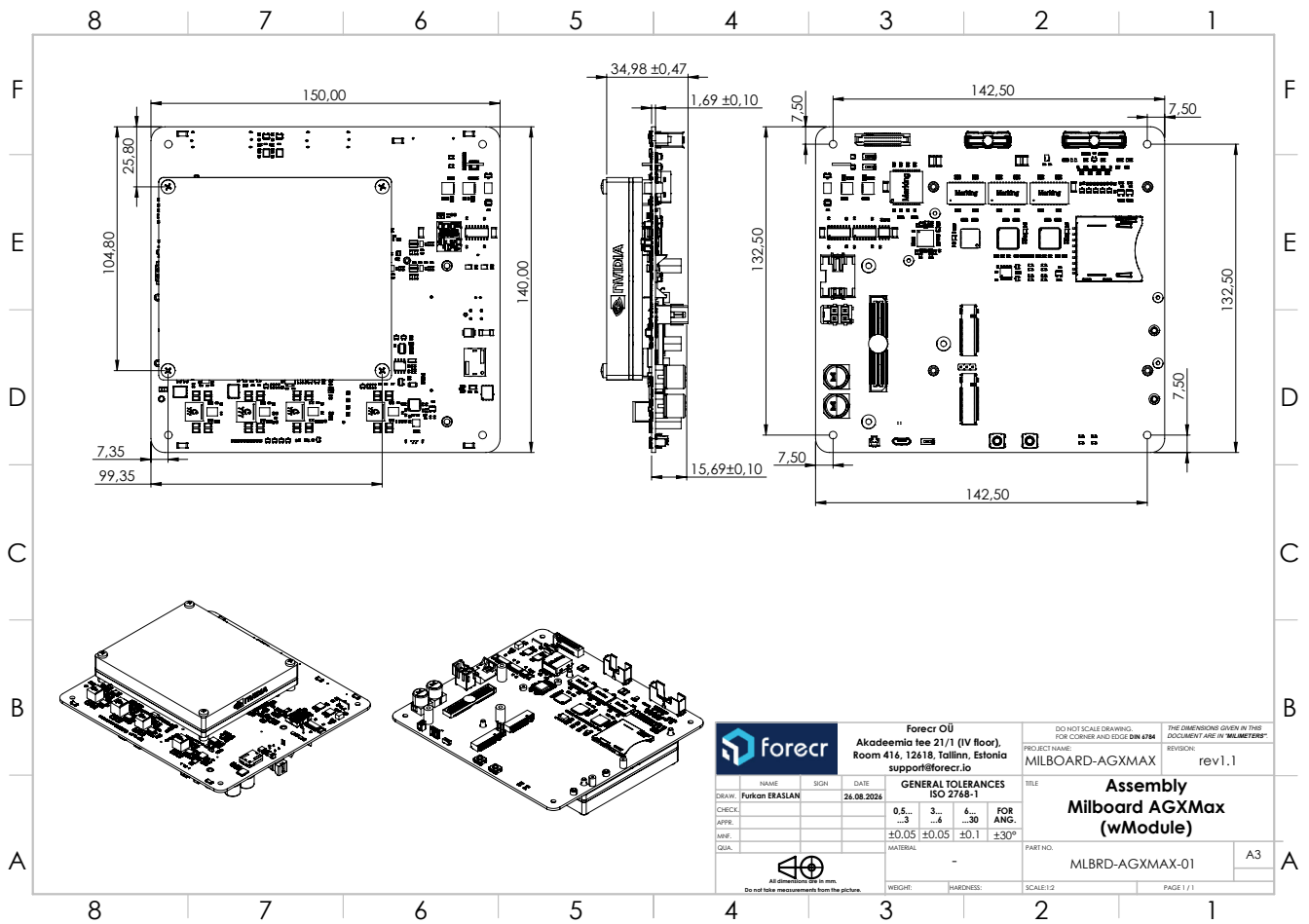
- IC Expander (P/N: TCA9535RTWR) - 0x22 (22h)

## 6. 3D Model & Mechanical Information

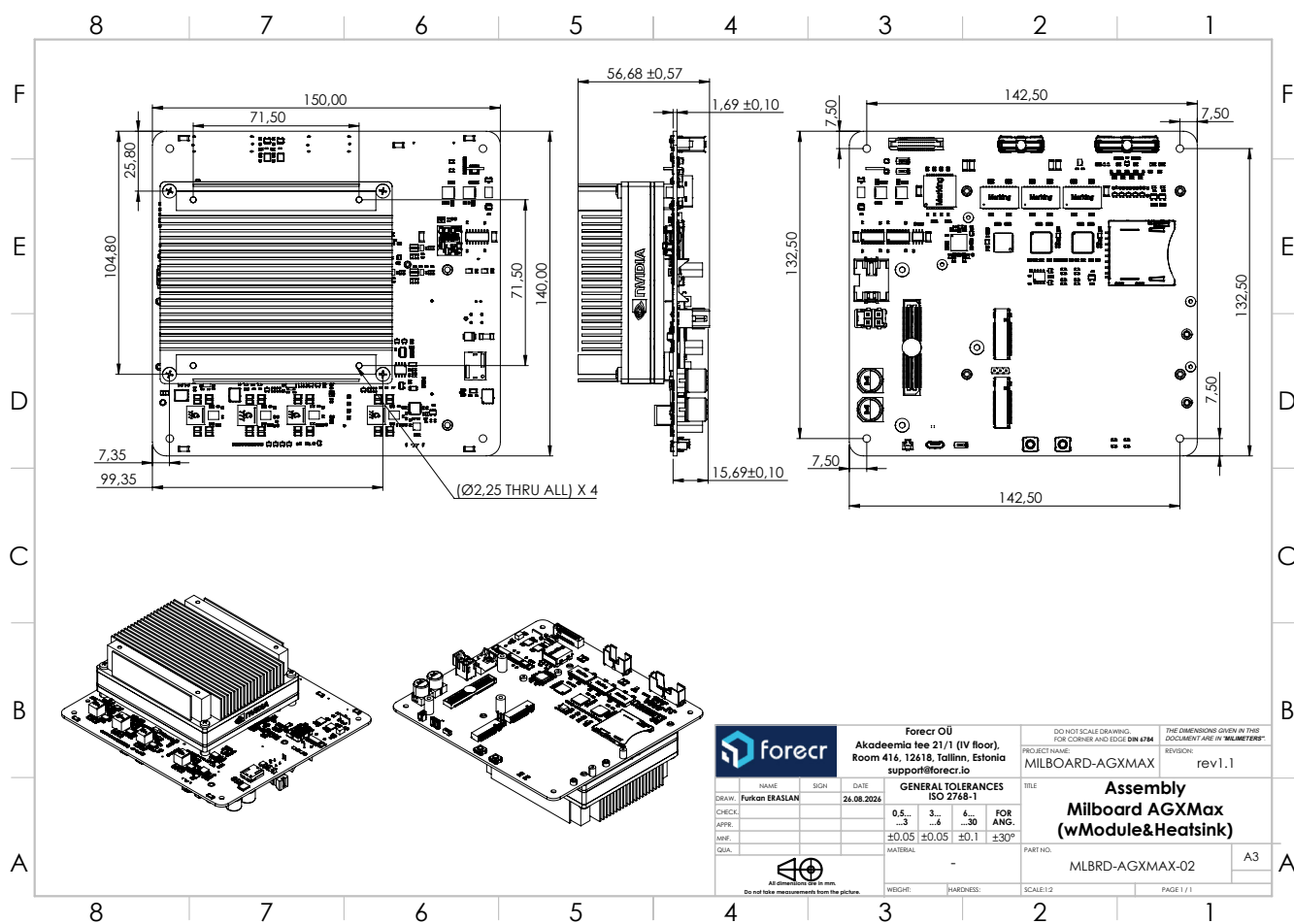
The full 3D models of MILBOARD-AGXMAX can be found [here](#).

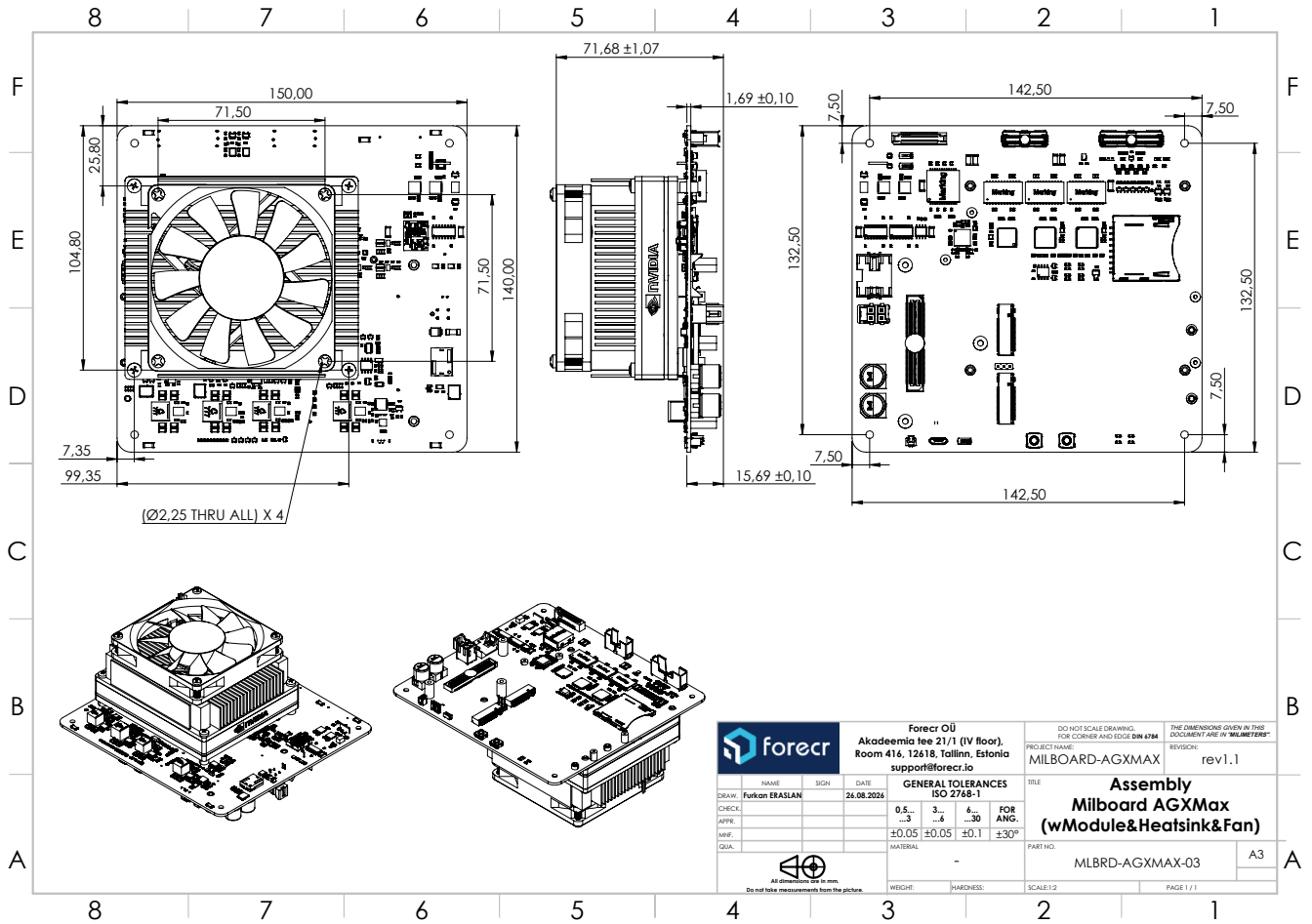
### MILBOARD-AGXMAX Stand Alone



**MILBOARD-AGXMAX with Jetson AGX Orin Module**


## MILBOARD-AGXMAX with Jetson AGX Orin Module and Heatsink Integration Details



**MILBOARD-AGXMAX with Jetson AGX Orin Module, Heatsink, Thermal Integration Details**


## 7. Power Consumption

### 7.1 AGX Orin Industrial

Input Voltage: 24V

All CPU and GPU cores are %100 loaded.

|             | Power Up Sequence | Idle | Standby (Suspend mode) | 15W (4 core) | 35W (8 core) | 60W (12 core) | MAXN (12 core) |
|-------------|-------------------|------|------------------------|--------------|--------------|---------------|----------------|
| Current (A) | 1.83              | 0.65 | 0.2                    | 1            | 1.51         | 2.26          | 3.62           |
| Power (W)   | 43.92             | 15.6 | 4.8                    | 24           | 36.24        | 54.24         | 86.88          |

## 8. MTBF Prediction

|                       |                                             |
|-----------------------|---------------------------------------------|
| Methodology           | Telcordia SR-332 (Parts Count) *Preliminary |
| Operating Environment | Ground Benign (GB), Controlled              |
| Ambient Temperature   | 25 °C                                       |
| Board Failure Rate    | 0.881 failures / 10 <sup>6</sup> hours      |
| MTBF                  | 1,135,439 (Hours), 129.53 (Years)           |

|                       |                                             |
|-----------------------|---------------------------------------------|
| Methodology           | Telcordia SR-332 (Parts Count) *Preliminary |
| Operating Environment | Ground Fixed (GF), Uncontrolled             |
| Ambient Temperature   | 40 °C                                       |
| Board Failure Rate    | 3.668 failures / 10 <sup>6</sup> hours      |
| MTBF                  | 272,645 (Hours), 31.10 (Years)              |

## 9. Ordering Information

