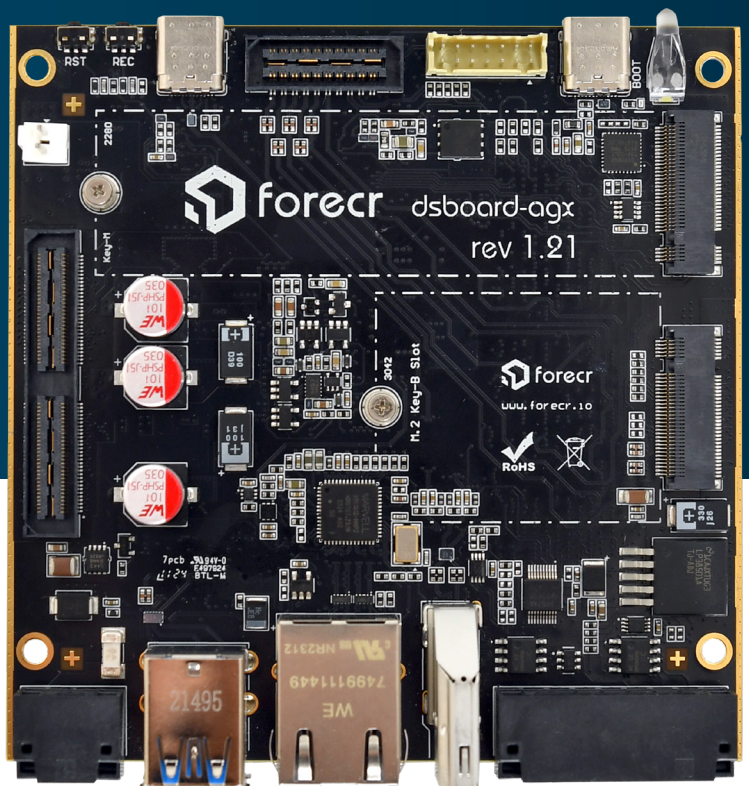
forecr



DSBOARD AGX Rev 1.21

USER MANUAL

UM-DSBDAGX-01
Revision 1.4
11/10/2024

Forecr
https://www.forecr.io
support@forecr.io

NVIDIA Preferred Partner

Table of Contents

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 carrier board. Therefore, this manual only represents the technical status of Forecr carrier board 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 carrier board, please reach out to the Forecr reseller from which you purchased the carrier board.

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

Contact Information

E-mail Address	For information requests: info@forecr.io For support requests: support@forecr.io For wholesale inquiries: sales@forecr.io
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Website	https://www.forecr.io

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Symbols

ElectroStatic Discharge (ESD) Sensitive Device!

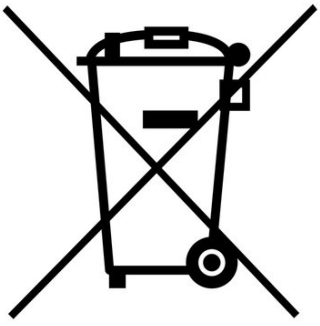
Electronic boards and their components are sensitive to static electricity. When handling any circuit board assemblies, it is recommended that ESD safety precautions be observed.

ESD safe best practices include, but are not limited to:

- Do not handle the carrier board out of its antistatic packaging while it is not used for operational purposes unless it is otherwise protected.
- Whenever possible, unpack or pack this product only at ESD safe work stations.
- Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools.
- Try to handle the board by the edges, avoiding contact with components.

HOT Surface!

Do not touch. Contact may cause burns. Allow to cool before servicing.



Waste Electrical and Electronic Equipment (WEEE)!

The carrier board should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.

Restriction of Hazardous Substances (RoHS)!

The carrier board complies with the regulations and restrictions established by the ROHS Directive and does not contain hazardous substances in concentrations that may be harmful to health or the environment.

Limited Product Warranty

Forecr provides a 1-year Warranty for the carrier board. This warranty period is valid from the original purchase date of the carrier board. In order to maintain warranty, the carrier board must not be altered or modified in any way. Changes or modifications to the board, 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 carrier board 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
rev 1.0	28.03.2024	Preliminary Release
rev 1.1	14.06.2024	Fan voltage has been corrected in section 3.3.8.
rev 1.2	17.07.2024	JetPack 6.x has been added to the 2.1 Technical Specification Section and the 4.1 Installation Section.
rev 1.3	02.09.2024	Key-M and Key-B connector pinouts have been added to section 3.3.5 and 3.3.6.
rev 1.31	01.10.2024	Ordering information has been edited in Section 9.
rev 1.32	04.10.2024	Power connector voltage range has been edited in Section 3.3.1.
rev 1.4	11.10.2024	The revision of the DSBOARD-AGX has been changed. Section 5.2.3 - Serial Communication Interface has been corrected. Section 9 - Accessories have been added.

1. Introduction

DSBOARD-AGX is a powerful and reliable edge computing device designed for industrial applications that require high processing power and ruggedness. It is based on the NVIDIA Jetson AGX Orin systemon-module (SOM), which features an NVIDIA Ampere GPU with 1024 CUDA cores and up to 275 TOPS (trillion operations per second) of AI performance. The AGX Orin SOM also includes a 12-core ARMv8.2 CPU and a dedicated deep learning accelerator for efficient inferencing.

The DSBOARD-AGX features a wide range of connectivity options, including Gigabit Ethernet, USB 3.0, HDMI, and RS-232, as well as multiple expansion slots for adding additional peripherals such as MIPI CSI2 cameras.

The DSBOARD-AGX runs on the NVIDIA JetPack SDK, providing a complete software development environment for building and deploying AI applications in industrial environments. With its powerful AGX Orin SOM, the DSBOARD-AGX is capable of running complex AI algorithms and processing large amounts of data in realtime, making it an ideal choice for industrial applications such as robotics, automation, and surveillance.

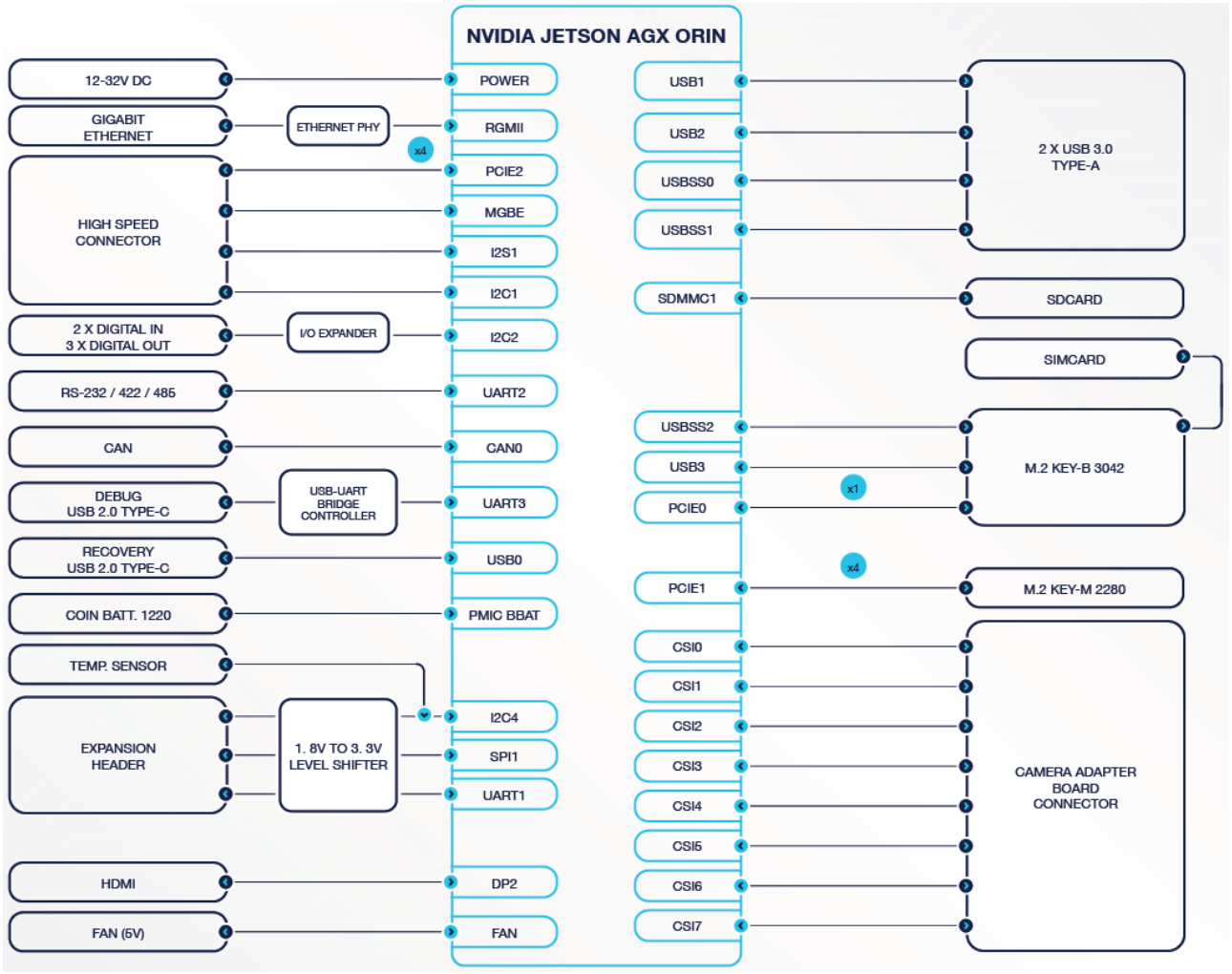
Latest revision of this user manual, datasheet, and 3D model can be downloaded from Forecr Web Page.

2. Product Specification

2.1 Technical Specification

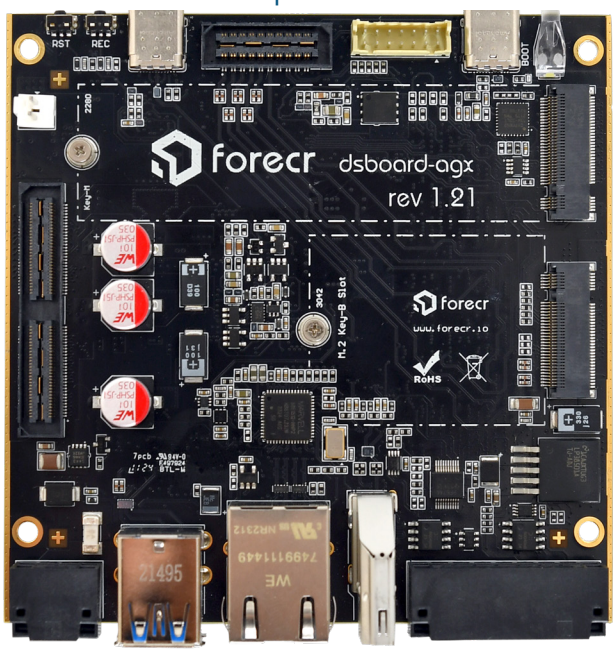
Supported Modules	NVIDIA Jetson AGX Orin 32GB NVIDIA Jetson AGX Orin 64GB
Memory	32 GB 256-bit LPDDR5x 64 GB 256-bit LPDDR5x
Graphics Interfaces	1x HDMI 2.0(max resolution 3840x2160)
Interfaces	1x Gigabit Ethernet 2x USB 3.1 Type-A 1x CAN Bus 1x RS232/422/485 (software configurable) 2x USB-C (Debug/Recovery) 2x Digital Input 3x Digital Output
Wireless Communication	LTE/5G Connectivity by extension sockets
Power Supply	12-30 VDC
Extension Sockets	1x M.2 Key-B, 1x SIM, 1x MicroSD, 1x 5V Fan 1x SPI, 1x UART, 1x I2C, 1x PCIE (x4), 1x I2S, 1 x XFI for 10G, 1x Camera Connector (6 CSI camera support)
Mass Storage	64 GB eMMC 5.1 Flash 1x M.2 Key-M SSD Slot
Ambient Conditions	-25°C ... +85°C
Form Factor / Dimensions	100 mm x 100 mm, 103gr
Operating Systems	Ubuntu Linux 20.04 Ubuntu Linux 22.04
JetPack Support	JetPack 5.x JetPack 6.x

2.2 Block Diagram

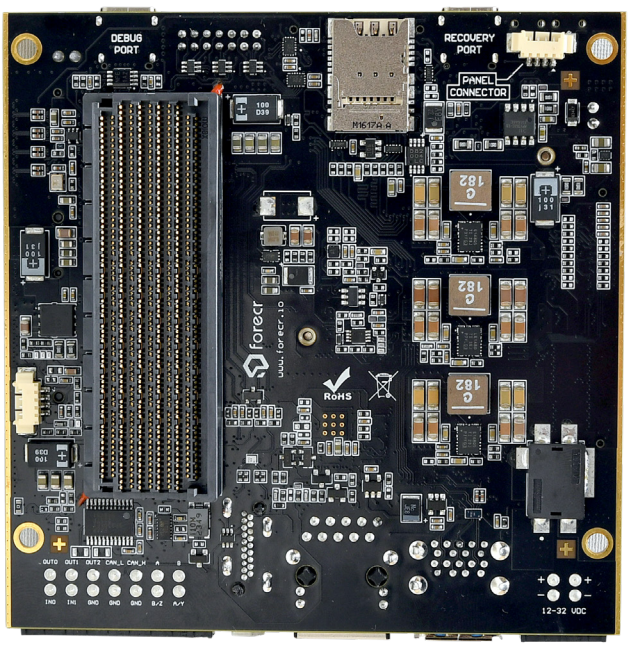


2.3 Board Visuals

Top Side



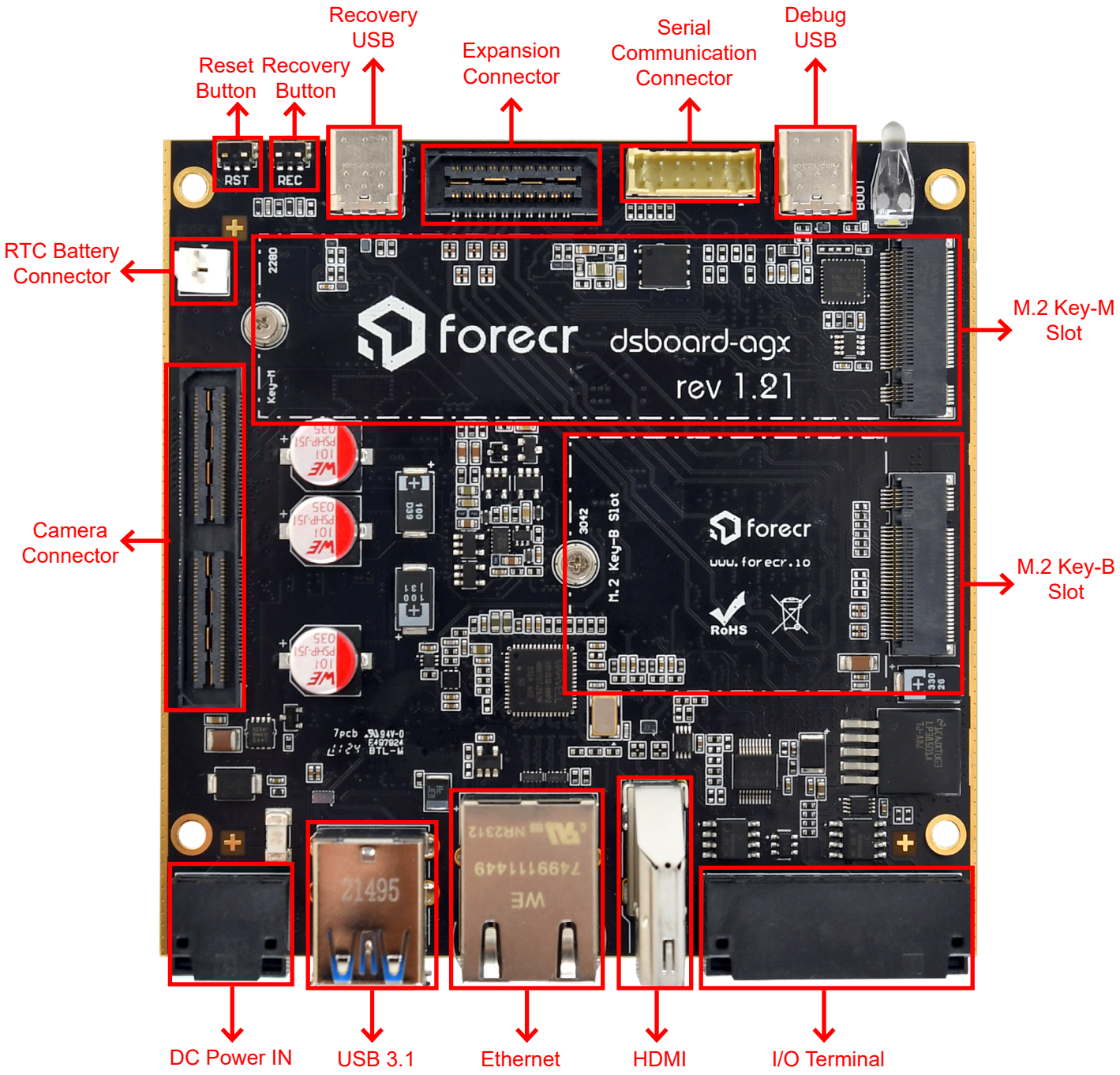
Bottom Side



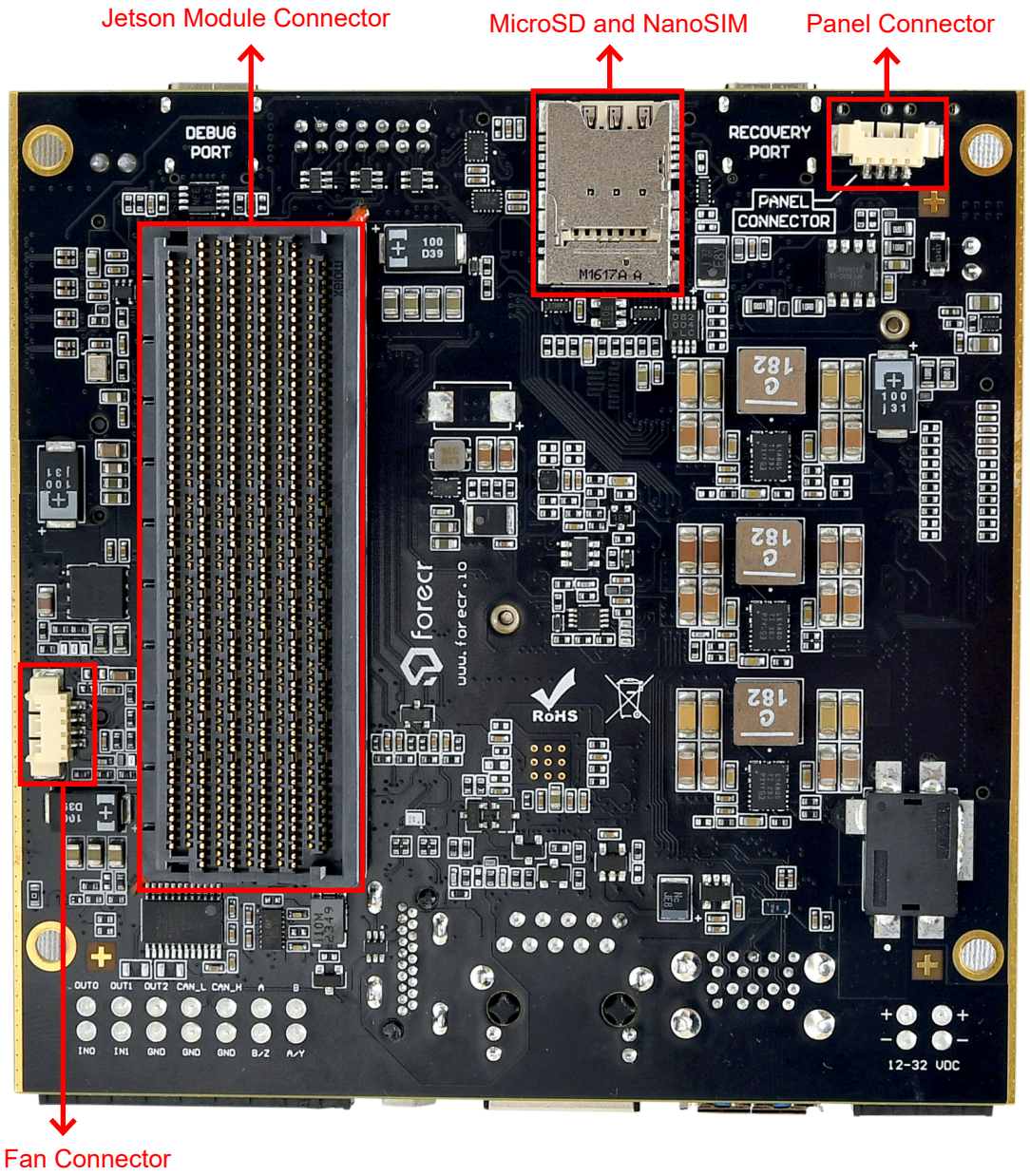
3. Hardware Information

3.1 Connector and Button Location

3.1.1 Top Side



3.1.2 Bottom Side



3.2 List of Connectors and Buttons

Connectors
DSBOARD-AGX Power Connector
DSBOARD-AGX Camera Connector
DSBOARD-AGX 2-Pin Header for RTC Battery
DSBOARD-AGX SD Card Connector
DSBOARD-AGX M.2 Key-M Connector
DSBOARD-AGX M.2 Key-B Connector
DSBOARD-AGX I/O Terminal Connector
DSBOARD-AGX Fan Connector
DSBOARD-AGX High Speed Expansion Connector
DSBOARD-AGX Serial Communication Connector
DSBOARD-AGX HDMI Connector
DSBOARD-AGX USB 3.1 Type-A Connector
DSBOARD-AGX 10/100/1000 Ethernet Connector
DSBOARD-AGX Recovery Mode Type-C USB Connector
DSBOARD-AGX Debug Mode Type-C USB Connector
DSBOARD-AGX Panel Connector
Buttons
DSBOARD-AGX Recovery Pushbutton
DSBOARD-AGX Reset Pushbutton

3.3 The Definition of Each Connector

3.3.1 Power Connector

Function	Description	
Mating Connector	1708595	
Minimum Input Voltage	+12V	
Maximum Input Voltage	+30V	
Pinout	**Pin**	**Description**
	1	Positive
	2	Positive
	3	Negative
	4	Negative

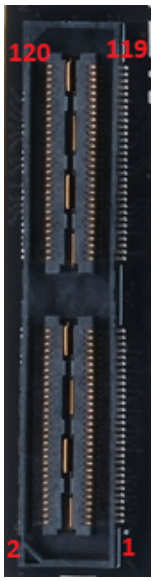
3.3.2 2-Pin Header for RTC Battery

Description	
Mating Connector	0014562021from Molex
Input Voltage Range	1.85V to 5.5V

3.3.3 SD Card Connector

Description
The DSBOARD-AGX implements a micro SD Card connector and nano SIM card connector together. The bottom part is used for micro SD card and the upper part is used for nano SIM card connector.

3.3.4 Camera Connector



Function	Description							
Connector Type	QSH-060-01-H-D-A-K-TR							
Pinout	**Pin**	**Description**	**Pin**	**Description**	**Pin**	**Description**	**Pin**	**Description**
	1	CSI0.D0_P	37	CSI4.D0_P	73	CSI5.D1_N	109	CAM_BACKLIGHT_PWM
	2	CSI1.D0_P	38	CSI6.D0_P	74	CSI7.D1_N	110	VDD_3V3
	3	CSI0.D0_N	39	CSI4.D0_N	75	CAM_I2C.SCL	111	NC
	4	CSI1.D0_N	40	CSI6.D0_N	76	CAM_ERROR1	112	NC
	5	GND	41	GND	77	CAM_I2C.SDA	113	NC
	6	GND	42	GND	78	CAM_ERROR2	114	NC
	7	CSI0.CLK_P	43	CSI4.CLK_P	79	GND	115	GND
	8	CSI1.CLK_P	44	CSI6.CLK_P	80	GND	116	GND
	9	CSI0.CLK_N	45	CSI4.CLK_N	81	AVDD_CAM_ZV8	117	CAM_INT1
	10	CSI1.CLK_N	46	CSI6.CLK_N	82	AVDD_CAM_ZV8	118	VDD_3V3
	11	GND	47	GND	83	AVDD_CAM_ZV8	119	CAM_VDD_SYS_EN
	12	GND	48	GND	84	CAM_ERROR3	120	VDD_3V3
	13	CSI0.D1_P	49	CSI4.D1_P	85	CAM_FRSYNC1		
	14	CSI1.D1_P	50	CSI6.D1_P	86	CAM_ERROR4		
	15	CSI0.D1_N	51	CSI4.D1_N	87	I2C2.SCL		
	16	CSI1.D1_N	52	CSI6.D1_N	88	CAM1.MCLK		
	17	GND	53	GND	89	I2C2.SDA		
	18	GND	54	GND	90	CAM1.PWDN		
	19	CSI2.D0_P	55	NC	91	CAM0.MCLK		
	20	CSI3.D0_P	56	NC	92	CAM1.RST		
	21	CSI2.D0_N	57	NC	93	CAM0_PWDN		
	22	CSI3.D0_N	58	NC	94	CAM2.MCLK		
	23	GND	59	CSI5.D0_P	95	CAM0.RST		
	24	GND	60	CSI7.D0_P	96	CAM_FRSYNC4		
	25	CSI2.CLK_P	61	CSI5.D0_N	97	CAM_FRSYNC3		
	26	CSI3.CLK_P	62	CSI7.D0_N	98	CAM_FRSYNC2		
	27	CSI2.CLK_N	63	GND	99	GND		
	28	CSI3.CLK_N	64	GND	100	GND		
	29	GND	65	CSI5.CLK_P	101	CAM_TE_RSV		
	30	GND	66	CSI7.CLK_P	102	VDD_1V8		
	31	CSI2.D1_P	67	CSI5.CLK_N	103	CAM_INT3		
	32	CSI3.D1_P	68	CSI7.CLK_N	104	CAM_INT4		
	33	CSI2.D1_N	69	GND	105	I2C5.SCL		
	34	CSI3.D1_N	70	GND	106	CAM_INT2		
	35	GND	71	CSI5.D1_P	107	I2C5.SDA		
	36	GND	72	CSI7.D1_P	108	VDD_3V3		

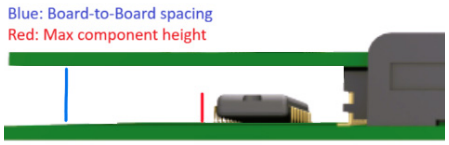
3.3.5 M.2 Key-M Connector

Description

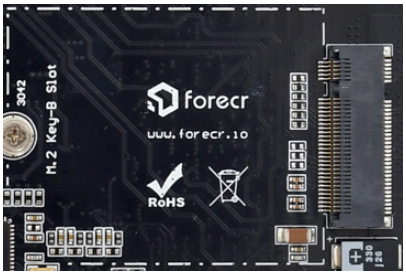
Pinout

Pin	Description	Pin	Description	Pin	Description
1	DGND	24	NC	47	UPHY_TX12_N
2	VDD_3V3	25	UPHY_TX14_P	48	NC
3	DGND	26	NC	49	UPHY_TX12_P
4	VDD_3V3	27	DGND	50	PEX.L5_RST_N
5	UPHY.RX15_N	28	NC	51	DGND
6	NC	29	UPHY.RX13_N	52	PEX.L5_ CLKREQ_N
7	UPHY.RX15_P	30	NC	53	PEX.CLK5_N
8	NC	31	UPHY.RX13_P	54	GPIO29_M2_ KEYM_PEWAKE*
9	DGND	32	NC	55	PEX.CLK5_P
10	NC	33	DGND	56	NC
11	UPHY_TX15_N	34	NC	57	DGND
12	VDD_3V3	35	UPHY_TX-13_N	58	NC
13	UPHY_TX15_P	36	NC	67	NC
14	VDD_3V3	37	UPHY_TX13_P	68	32KHZ_CLK
15	DGND	38	NC	69	NC
16	VDD_3V3	39	DGND	70	VDD_3V3
17	UPHY.RX14_N	40	I2C2.SCL	71	DGND
18	VDD_3V3	41	UPHY.RX12_N	72	VDD_3V3
19	UPHY.RX14_P	42	I2C2.SDA	73	DGND
20	NC	43	UPHY.RX12_P	74	VDD_3V3
21	DGND	44	GPIO34_ M2_KEYM_ ALERT*	75	DGND
22	NC	45	DGND	MNT1	DGND
23	UPHY_TX14_N	46	NC	MNT2	DGND

Board to board spacing=2.45 mm
Max component height=1.25 mm



3.3.6 M.2 Key-B Connector

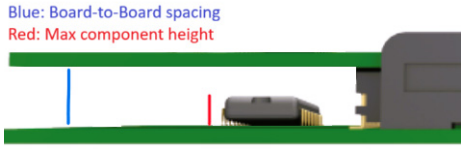


Description

Pinout

Pin	Description	Pin	Description
1	NC	44	NC
2	VDD_3V8	45	DGND
3	DGND	46	NC
4	VDD_3V8	47	UPHY_TX21_N
5	DGND	48	NC
6	M2B_FULLCARD_PWOFF#	49	UPHY_TX21_P
7	USB3.D_P	50	PEX.L7_RST_N
8	M2B_W_DISABLE1#	51	DGND
9	USB3.D_N	52	PEX.L7_CLKREQ_N
10	NC	53	PEX.CLK6_N
11	DGND	54	PCIE_WAKE_N
20	NC	55	PEX.CLK6_P
21	NC	56	NC
22	NC	57	DGND
23	NC	58	NC
24	NC	59	NC
25	NC	60	NC
26	M2B_W_DISABLE2#	61	NC
27	DGND	62	NC
28	NC	63	NC
29	USBSS_P2_ORN.RX_N	64	NC
30	M2_USIM_RST	65	NC
31	USBSS_P2_ORN.RX_P	66	NC
32	M2_USIM_CLK	67	M2B_RESET
33	DGND	68	NC
34	M2_USIM_DAT	69	NC
35	USBSS_P2_ORN.TX_N	70	VDD_3V8
36	M2_USIM_VDD	71	DGND
37	USBSS_P2_ORN.TX_P	72	VDD_3V8
38	NC	73	DGND
39	DGND	74	VDD_3V8
40	NC	75	NC
41	UPHY.RX21_N	MNT1	DGND
42	NC	MNT2	DGND
43	UPHY.RX21_P		

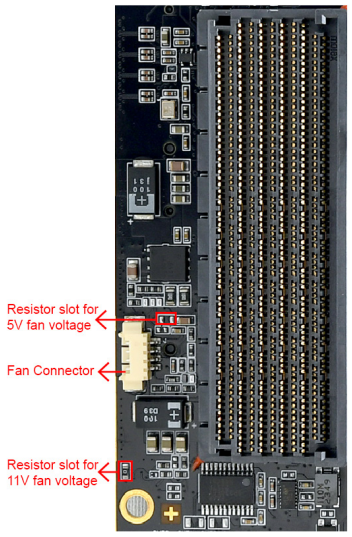
Board to board spacing=2.45 mm
Max component height=1.6 mm



3.3.7 I/O Terminal Connector

Function	Description		
Mating connector	1790344 (DFMC 1,5/ 7-STF-3,5) from Phoenix Contact.		
Pinout	**Pin**	**Description**	**I/O Type**
	1	RS422 B	I/O
	2	RS422 Y / RS485 A	I/O
	3	RS232 RX / RS422 A	I/O
	4	RS232 TX / RS422 Z / RS485 B	I/O
	5	CAN_H	I/O
	6	GROUND	Power
	7	CAN_L	I/O
	8	GROUND	Power
	9	DIGITAL_OUT2 Note: Up to 24V,1A max, low-side switch	Output
	10	ISOLATED GROUND	Power
	11	DIGITAL_OUT1 Note: Up to 24V,1A max, low-side switch	Output
	12	DIGITAL_IN1	Input
	13	DIGITAL_OUT0 Note: Up to 24V,1A max, low-side switch	Output
	14	DIGITAL_IN0	Input

3.3.8 Fan Connector



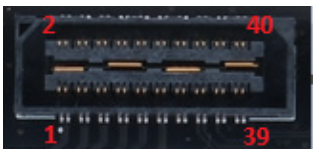
Function	Description	
Mating Connector	0510210400 from Molex Picoblade series	
Pinout	**Pin**	**Description**
	1	GND
	2	+11V (Optional 5V with resistor change)
	3	TACH
	4	PWM

NOTE

*FAN voltage is 11V by default. There is a 0R 0603 resistor installed at 11V FAN voltage slot.

*To change FAN voltage to 5V, resistor at 11V slot must be removed first. Then a 0R 0603 resistor must be installed at the 5V slot.

3.3.9 High Speed Expansion Connector



Function	Description			
Connector Type	QSH-020-01-L-D-DP-A from Samtec			
Mating connector	QTH-020-01-L-D-DP-A-K			
Pinout	**Pin**	**Description**	**Pin**	**Description**
	1	UPHY.TX10_N	21	PEX.CLK4_N
	2	UPHY.RX10_N	22	PEX.L4_RST_N
	3	UPHY.TX10_P	23	PEX.CLK4_P
	4	UPHY.RX10_P	24	PEX.L4_CLKREQ_N
	5	UPHY.TX11_N	25	GPIO25_XF10_ MDIO
	6	UPHY.RX11_N	26	XF10_RST_N
	7	UPHY.TX11_P	27	GPIO26_XF10_MDC
	8	UPHY.RX11_P	28	XF10_INT_N
	9	UPHY.TX22_N	29	I2S1.CLK
	10	UPHY.RX22_N	30	I2S1.FS
	11	UPHY.TX22_P	31	I2S1.SDIN
	12	UPHY.RX22_P	32	I2S1.SDOUT
	13	UPHY.TX23_N	33	MCLK01_AUDIO
	14	UPHY.RX23_N	34	VDD_5V
	15	UPHY.TX23_P	35	NA
	16	UPHY.RX23_P	36	VDD_5V
	17	UPHY.TX6_N	37	I2C1_SDA
	18	UPHY.RX6_N	38	VDD_5V
	19	UPHY.TX6_P	39	I2C1_SCL
	20	UPHY.RX6_P	40	VDD_5V

3.3.10 Serial Communication Connector

Function	Description			
Connector Type	1-1470109-4 from TE Connectivity			
Mating connector	1-111626-8			
Pinout	**Pin**	**Description**	**Pin**	**Description**
	1	+5V (1A max)	8	SPI1_MOSI
	2	+3.3V (1A max)	9	I2C4_SCL
	3	GND	10	I2C4_SDA
	4	GND	11	UART1_TX
	5	SPI1_CS0	12	UART1_RTS
	6	SPI1_SCK	13	UART1_RX
	7	SPI1_MIS0	14	UART1_CTS

3.3.11 HDMI Connector

	Description
	The NVIDIA® Jetson AGX Orin module will output video via the DSBOARD-AGX vertical HDMI connector that is HDMI 2.0 capable.

3.3.12 USB 3.1 Type-A Connector

	Description
	The DSBOARD-AGX incorporates 2 USB 3.1 Type-A connectors with a 2A current limit per connector.

3.3.13 10/100/1000 Ethernet Connector

	Description
	The DSBOARD-AGX implements RJ-45 ethernet connector for internet communication. RJ-45 connector is connected directly to the NVIDIA Jetson module.

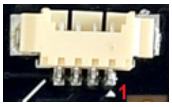
3.3.14 Recovery Mode Type-C USB Connector

	Description
	The DSBOARD-AGX implements a Type-C USB connector to allow to install or upgrade the operating system.

3.3.15 Debug Mode Type-C USB Connector

	Description
	The DSBOARD-AGX implements a Type-C USB connector to access the module by using serial connection.

3.3.16 Panel Connector

	Function	Description	
	Mating Connector	0510210400 from Molex Picoblade series	
	Pinout	**Pin**	**Description**
		1	GROUND
		2	RESET
		3	GROUND
		4	RECOVERY

3.4 The Definition of Buttons

3.4.1 Recovery Pushbutton

	Description
	The DSBOARD-AGX implements a recovery pushbutton. Recovery button should be pressed with reset button at the same time. After released reset button, recovery button should be pressed a little bit more (min. 250 ms).

3.4.2 Reset Pushbutton

	Description
	The DSBOARD-AGX implements a reset button to reset the Jetson SoM.

4. Software Information

4.1 Installation

JetPack-5.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-5-x-installation-for-dsboard-agx

JetPack-6.x Installation can be found here: https://www.forecr.io/blogs/installation/jetpack-6-x-installation-for-dsboard-agx

5. Connectivity

5.1 General Purpose Input/Output (GPIO)

MODULE PIN NUMBER	I/O NAME	MODULE PIN NAME	TYPE	DESCRIPTION
A54	M2B_W_DISABLE2#	GPIO17	OUTPUT	GNSS disable control. Drive low to disable GNSS. Drive high for normal operation.
C55	M2B_W_DISABLE1#	GPIO18	OUTPUT	LTE/5G module airplane mode control. Drive low to enable airplane mode. Drive high for normal operation.
J55	M2B_RESET	GPIO32	OUTPUT	LTE/5G module reset control input. Drive low to trigger reset. Drive high for normal operation.
B59	M2B_FULLCARD_PWROFF#	GPIO04	OUTPUT	LTE/5G module power on/off control. Drive low to power off the module. Drive high for normal operation.
A59	M2B_PWR_ON#	GPIO05	OUTPUT	LTE/5G module 3.8V power supply LDO enable control. Drive high to disable LDO. Drive low for normal operation.
A47	RS485_CTRL	GPIO38	OUTPUT	Receiver or driver control for RS-485. Drive low to enable receiver. Drive high to enable driver.
D54	RS485/RS232	GPIO03	OUTPUT	Serial communication control for SP330EEY-L transceiver. Drive low to enable RS-232. Drive high to enable RS-485.
H52	HALF/FULL	GPIO27	OUTPUT	Half duplex or full duplex control for RS-485 communication protocol. Drive low for full duplex communication. Drive high for half duplex communication.

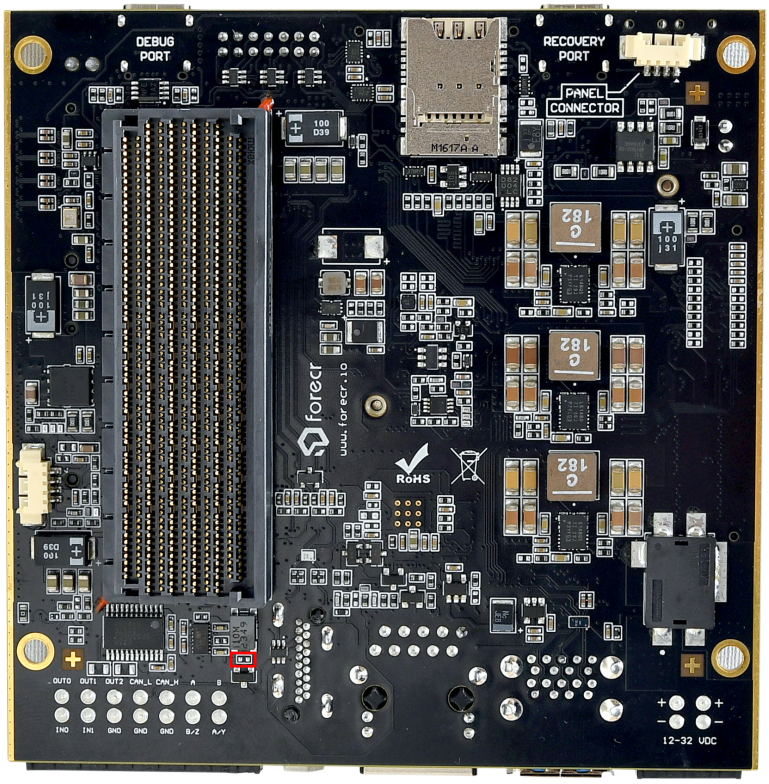
5.2 I/O Connector

On the connector, there are 4 serial communication, 3 ground, 2 CANBus, 2 digital input and 3 digital output pins.

5.2.1 CANBus Interface

There is a single CAN Bus interface on the DSBOARD-AGX. MAX3051 transceiver is used between native CAN pins of the Jetson and connector. There is a 0402 size 120R termination resistor between CAN_H and CAN_L pins on the board, which is not populated by default. A standard resistor with above specs can be fitted if termination resistor is needed on the DSBOARD-AGX side.

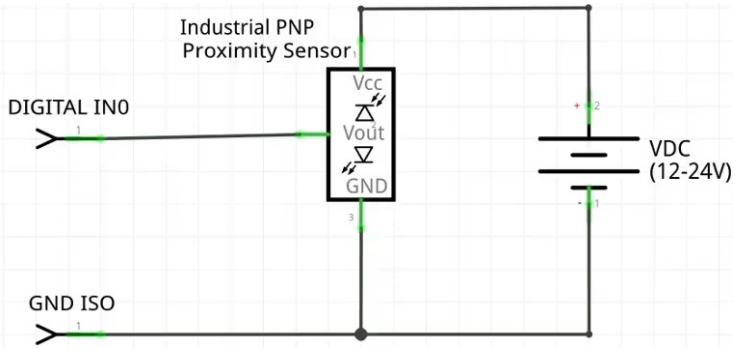
CANBus Termination Resistor



5.2.2 Industrial Input Output Interface

5.2.2.1 Setting and Reading Input Pin

Digital input side accepts signals between 12-24V (rated for 2.25mA). In our application, we used Heschen M12 Inductive Proximity Sensor (PNP & Normally Open(NO)) with 24V voltage source.



Find sysfs equivalent of the connected output pin from the table below. For this setup, it is DIGITAL_IN0. After proper hardware connection with industrial LED, we can continue with the software side.

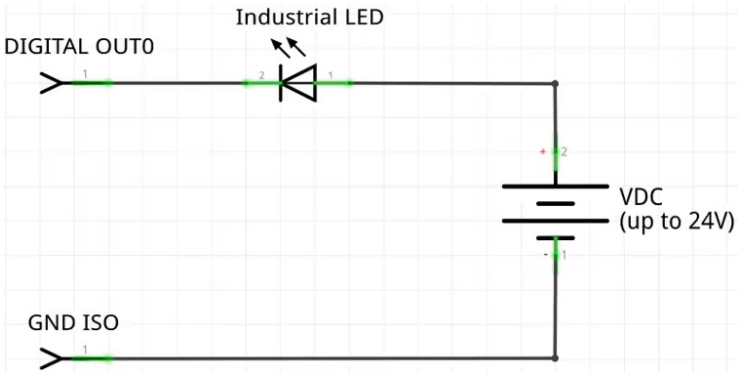
Pin Name	Sysfs Name
DIGITAL_IN0	gpio-308
DIGITAL_IN1	gpio-309
GROUND	GND

Set DIGITAL_IN0 as input and read sensor value. To do this, you should use the commands below.

```
sudo sh -c “echo 308 > /sys/class/gpio/export”
sudo sh -c “echo in > /sys/class/gpio/gpio308/direction”
sudo sh -c “cat /sys/class/gpio/gpio308/value”
```

5.2.2.2 Setting Digital Output as High and Low

Digital output side can drive loads up to 24V and has a current limit of 1A. They work as low side switches, open-close between them and GND. So, you should have a circuitry as in the schematic below. In our application, we used GASH-ER 24V Indicator Light with 24V voltage source.



Find sysfs equivalent of the connected output pin from the table below. For this setup, it is DIGITAL_OUT0. After proper hardware connection with industrial LED, we can continue with the software side.

Pin Name	Sysfs Name
DIGITAL_OUT0	gpio-312
DIGITAL_OUT1	gpio-313
DIGITAL_OUT2	gpio-314
GROUND	GND

Then, set DIGITAL_OUT0 as output and control light state. To do this, you should use the commands below.

```
sudo sh -c “echo 312 > /sys/class/gpio/export”
sudo sh -c “echo out > /sys/class/gpio/gpio312/direction”
```

To short output:

```
sudo sh -c “echo 1 > /sys/class/gpio/gpio312/value”
```

To open output:

```
sudo sh -c “echo 0 > /sys/class/gpio/gpio312/value”
```

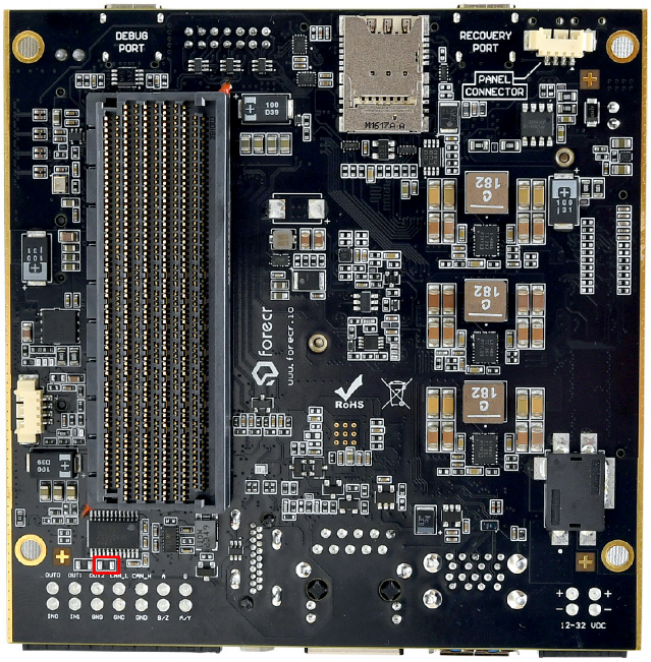
5.2.3 Serial Communication Interface

5.2.3.1 RS232/RS422/RS485

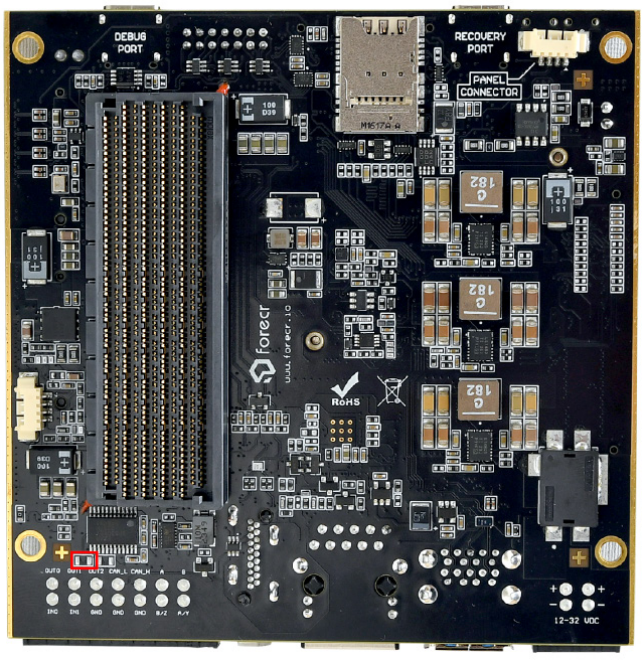
SP330EEY-L from MaxLinear is used to UART2 to RS422/RS232 from Jetson. An example application can be found on the Forecr blog webpage https://www.forecr.io/blogs/connectivity/dsboard-agx-serial-communication-interfaces-tutorial

There are two 0805 size 120R termination resistors, one between transmit lanes and one between receive lanes. These are not populated by default. In case termination resistors are needed on the DSBOARD-AGX side, standard resistors with above specs can be fitted.

RS422 RX (A/B) Termination Resistor



RS422 TX (Z/Y) Termination Resistor



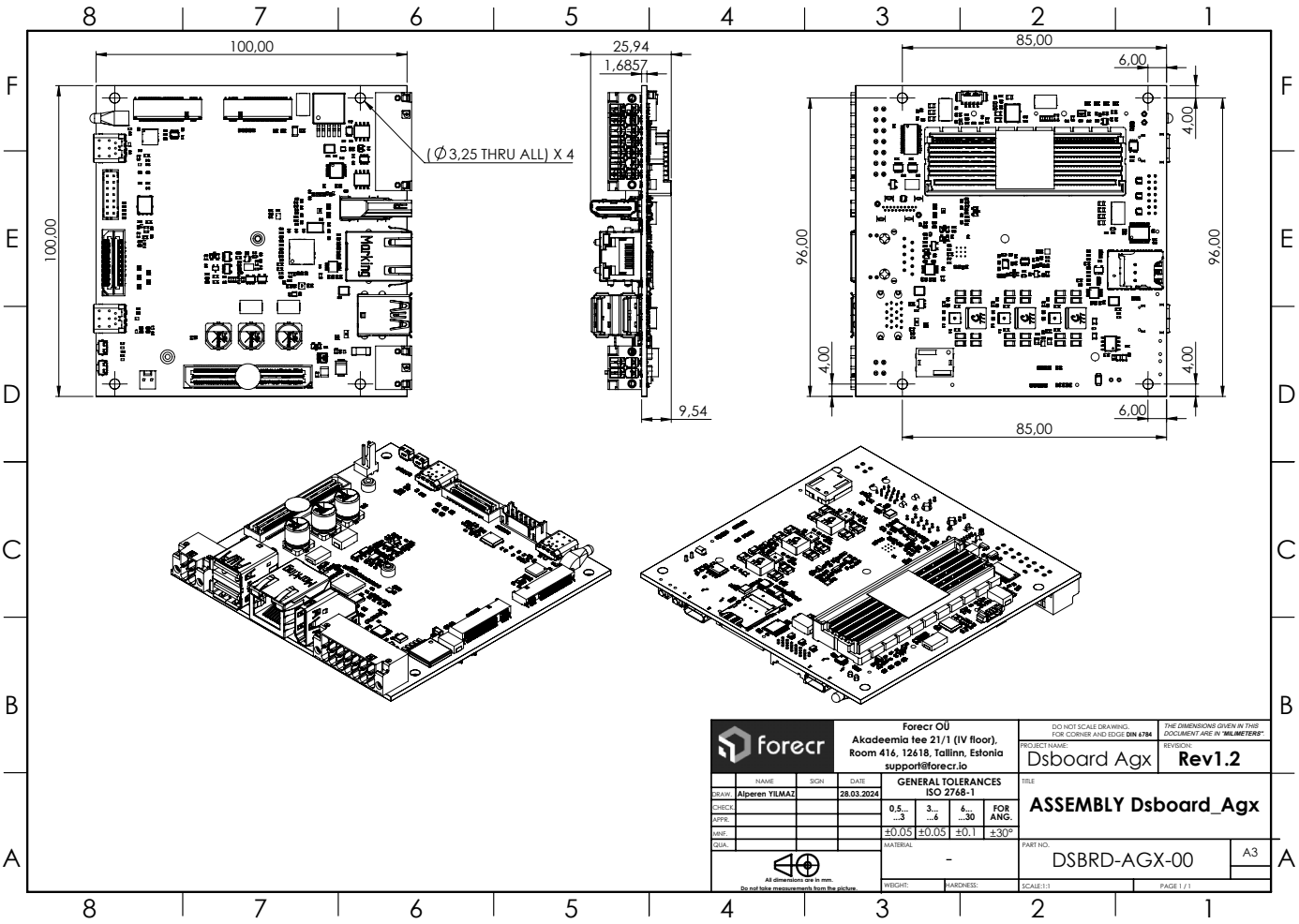
For RS422 communication protocol, RS485/RS232 GPIO from Jetson should be driven high. To use half-duplex mode, HALF/FULL GPIO should be driven high. To use full-duplex mode, HALF/FULL GPIO should be driven low. In half-duplex mode, RS485_CTRL GPIO must be used to switch between driver or receiver mode. To enable receiver mode, RS485_CTRL GPIO should be driven low. To enable driver mode, RS485_CTRL GPIO should be driven high.

For RS232 communication protocol RS485/RS232 GPIO should be driven low. HALF/FULL and RS485_CTRL GPIOs are not used in this mode.

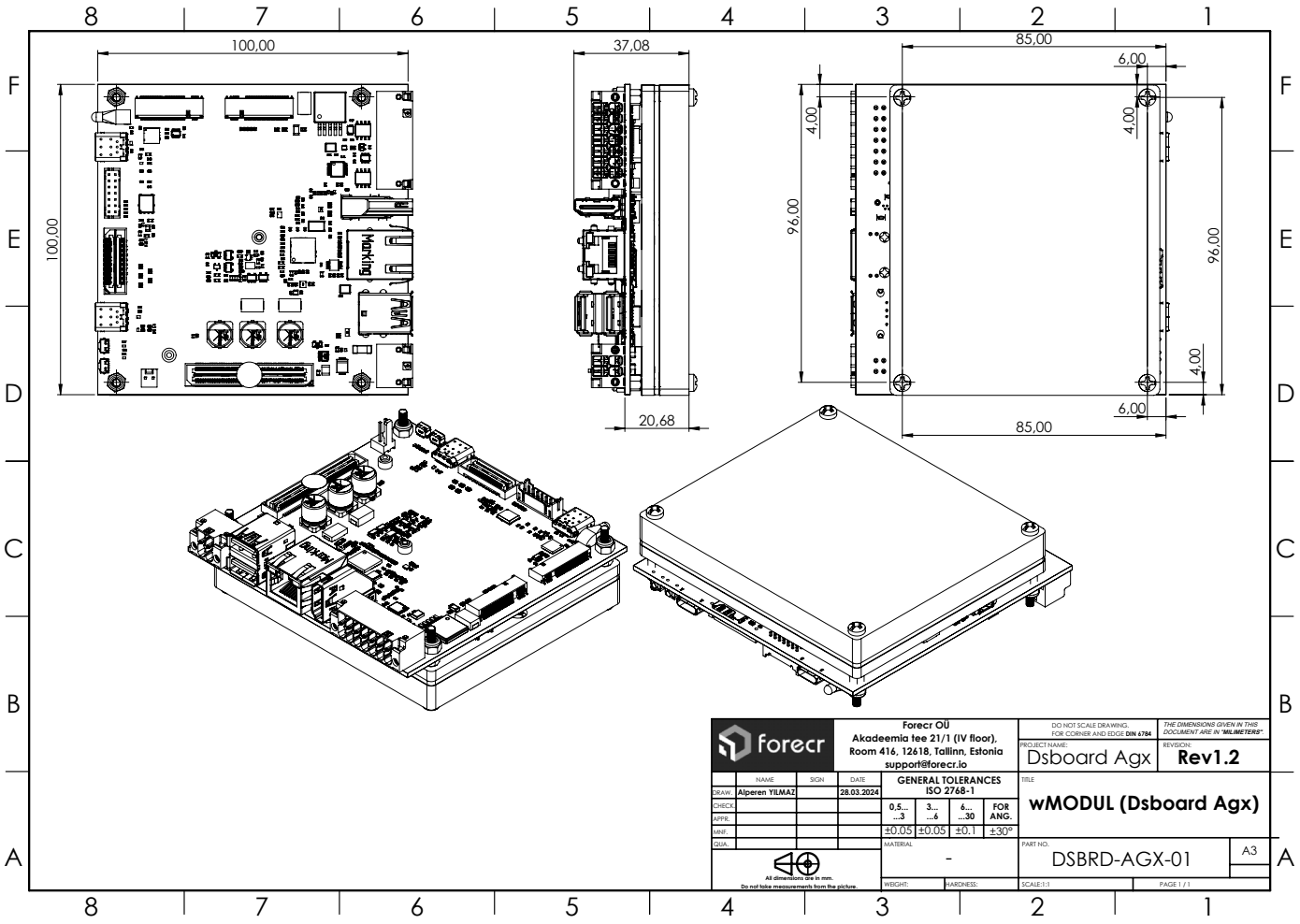
6. 3D Model & Mechanical Information

Full 3D models of all DSBOARD-AGX Carrier Board can be found here: https://github.com/forecr/forecr_3d_models/tree/master/DSBOARD-AGX

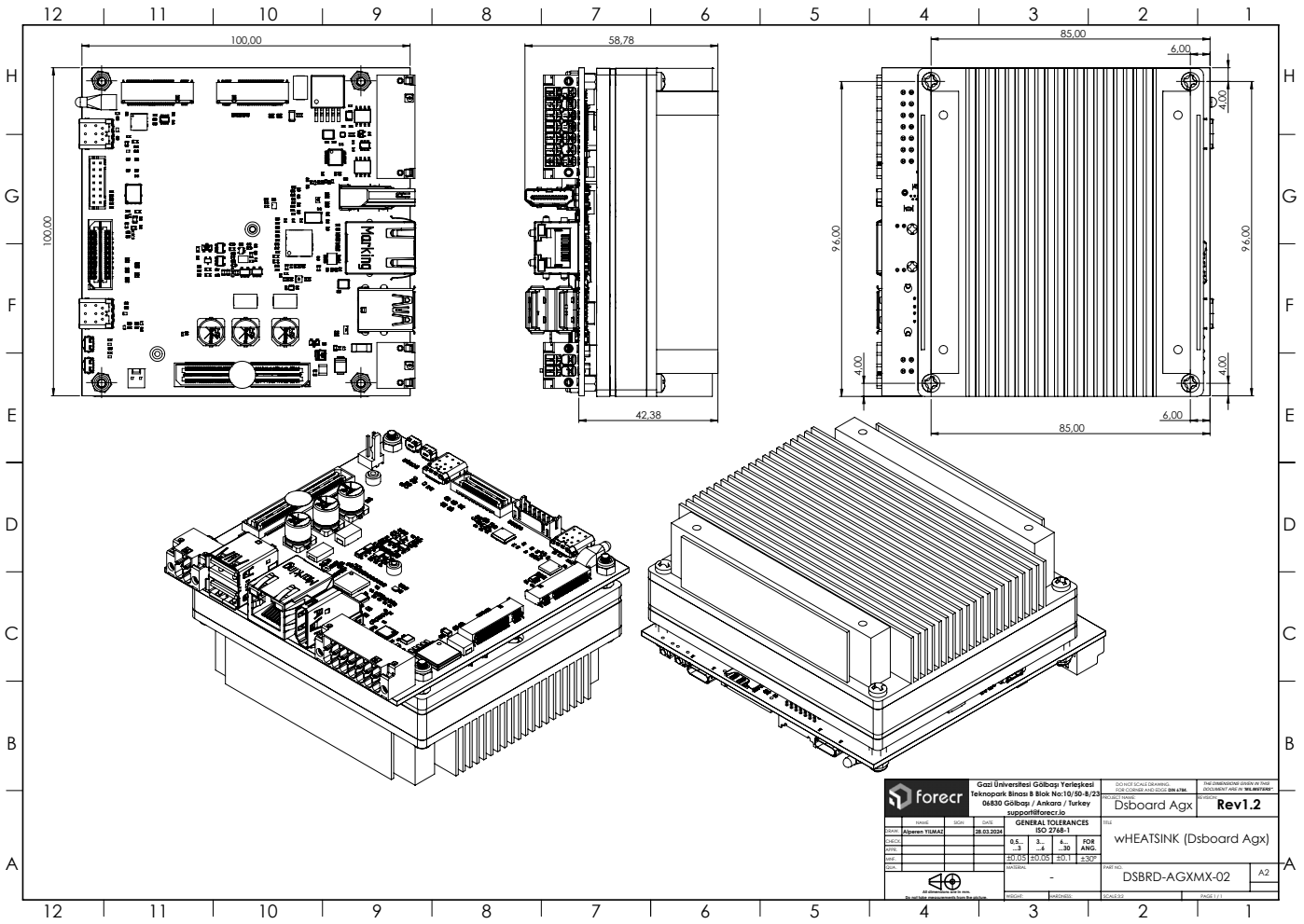
DSBOARD-AGX Stand Alone



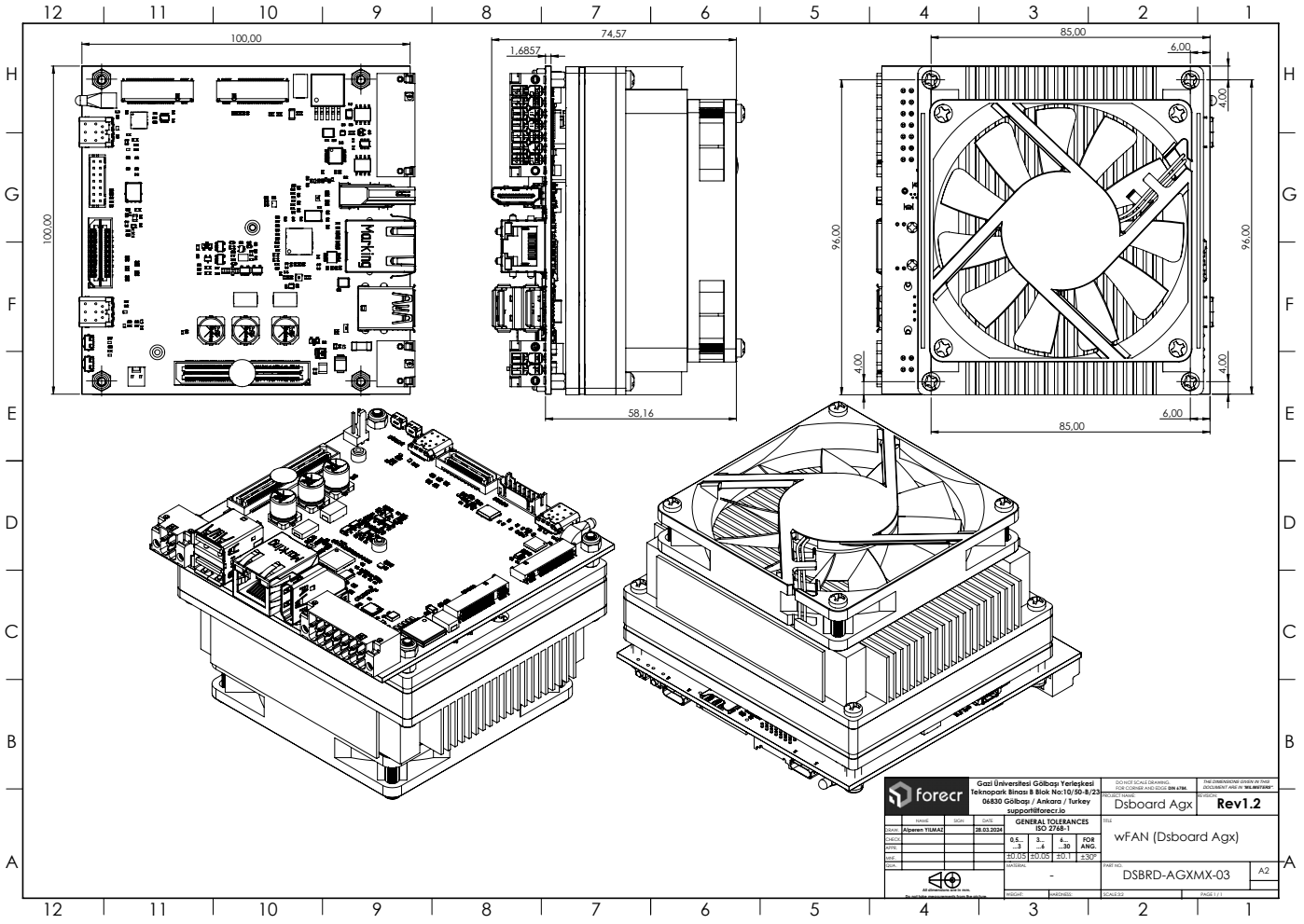
DSBOARD-AGX with Jetson AGX Orin Module



DSBOARD-AGX with Jetson AGX Orin Module and Heatsink Integration Details



DSBOARD-AGX with Jetson AGX Orin Module, Heatsink and Thermal Integration Details



7. Power Consumption

7.1 AGX Orin 32GB

Power Supply: 24V-5A

All CPU and GPU cores are %100 loaded.

	Power Up Sequence	15W (4 core)		30W (8 core)		40W (8 core)		MAXN (8 core)	
		Avg	Peak	Avg	Peak	Avg	Peak	Avg	Peak
Current (A)	~1	0,92	0,98	1,4	1,45	1,75	1,89	2,2	2,36
Power (W)	24	22,08	23,52	33,6	34,8	42	45,36	52,8	56,64

7.2 AGX Orin 64GB

Power Supply: 24V-5A

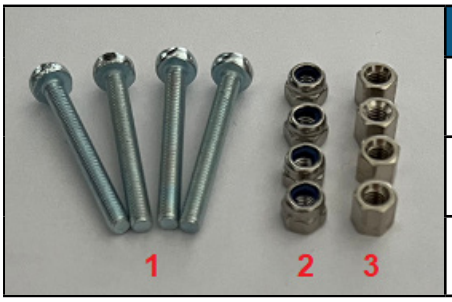
All CPU and GPU cores are %100 loaded.

	Power Up Sequence	15W (4 core)		30W (8 core)		50W (12 core)		MAXN (12 core)	
		Avg	Peak	Avg	Peak	Avg	Peak	Avg	Peak
Current (A)	~1,5	0,89	0,92	1,2	1,38	1,7	1,98	3,45	3,6
Power (W)	36	21,36	22,08	28,8	33,12	40,8	47,52	82,8	86,4

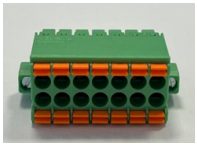
8. MTBF Prediction

Prediction method	Mil Hdbk 217F2, parts count
Environment	GF - Ground Fixed, T_A=40^{0}C, T_J=60^{0}C
Date	19-Feb-2024
Total Failure Rate	8.044760 (FPMH)
MTBF	124305 (Hours), 14.19 (Years)

9. Accessories



#	Description	Quantity
1	M3X30 Screw	4
2	M3 Lock Nut	4
3	M3X4.5 Standoff	4

	Part Number	Description	Quantity
	1790344	IO Connector	1

	Part Number	Description	Quantity
	1708595	Power Connector	1

10. Ordering Information