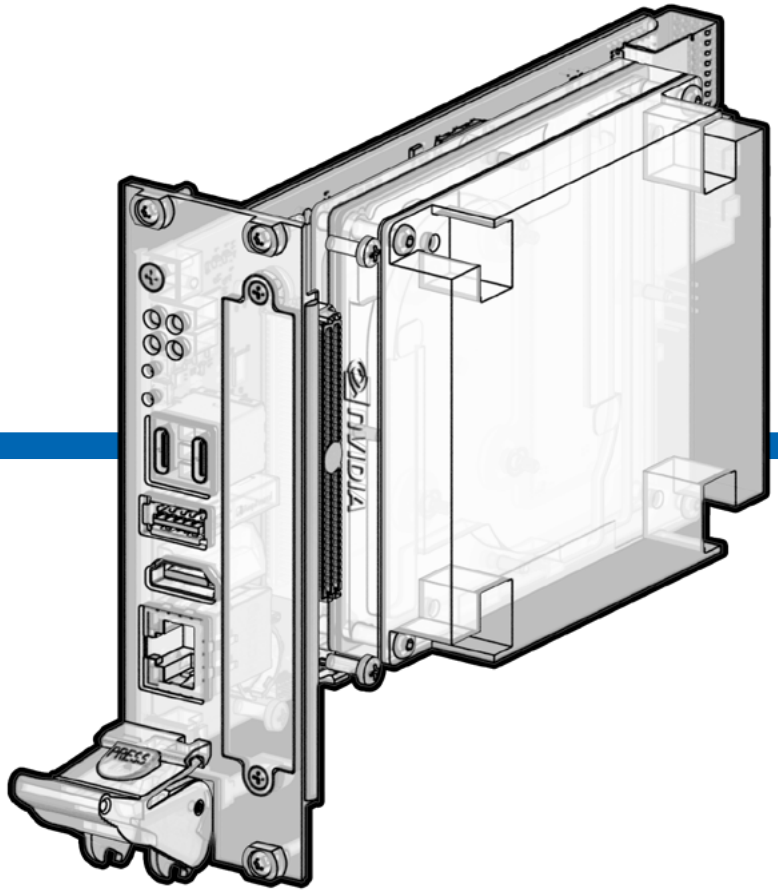
Datasheet



DE160200

PXIe Jetson AGX Xavier Module

DEICO

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Contents

1. Description

The PXIe Jetson AGX Xavier Module is a high-performance edge AI platform designed to meet the computational demands of next-generation AI applications. Built around NVIDIA's powerful Jetson AGX Xavier system-on-module (SoM), this module is optimized for real-time processing and advanced AI workloads, including computer vision, deep learning, and sensor data analysis. By integrating this SoM into the PXIe form factor, the module provides a flexible, modular solution for industries requiring high-performance edge computing.

A standout feature of the PXIe Jetson AGX Xavier Module is its Add-on Board Connector, which allows users to expand and customize the platform by adding Add-on Boards. The integration of specialized hardware, such as GMSL2 and 3G-SDI interfaces is enabled by this connector through custom-designed Add-on Boards. The signals for these high-bandwidth interfaces are routed directly from the Jetson platform, ensuring seamless communication and fast data transfer between the module and external sensors or devices.

This modular approach gives users the flexibility to tailor the system to specific project needs, adding new capabilities as required without redesigning the entire platform. The ability to add GMSL2 and 3G-SDI interfaces through Add-on Boards allows the system to handle high-bandwidth sensor data streams and video signals, making it ideal for applications such as real-time video processing, autonomous vehicles, industrial IoT, and surveillance systems.

The PXIe Jetson AGX Xavier Module includes the powerful GPU, deep learning processors, and an octa-core ARM CPU required to run complex AI models directly at the edge. This enables real-time decision-making with minimal latency, reducing the reliance on cloud infrastructure and ensuring faster response times in critical applications.

1.1. Key Features

- **Jetson AGX Xavier SoM Integration:** Powered by the NVIDIA Jetson AGX Xavier SoM, which includes a high-performance GPU, AI processors, and an octa-core ARM CPU, optimized for edge AI workloads.
- **PXIe Form Factor:** Modular design that fits into the PXIe chassis, providing an ideal solution for scalable edge AI systems and easy integration into larger test and measurement environments.
- **Add-on Board Connector:** Supports the addition of Add-on Boards, enabling the integration of specialized features like GMSL2 and 3G-SDI interfaces. These high-bandwidth interfaces are routed from the Jetson platform via the Add-on Boards, allowing for flexible customization.
- **Edge AI Optimization:** Designed to run AI algorithms locally at the edge, minimizing data transfer to the cloud and reducing latency for faster, real-time processing.
- **Customizable and Scalable:** The modular design allows users to expand the platform with custom Add-on Boards to meet specific project requirements and ensure scalability for a wide range of applications.

2. Hardware Overview

2.1. Circuitry

The PXIe Jetson AGX Xavier Module integrates the NVIDIA Jetson AGX Xavier SoM, which includes a high-performance GPU (Volta architecture), deep learning accelerators (NVIDIA Tensor Cores), and an octa-core ARM CPU. The system is designed to run intensive AI models directly at the edge, ensuring real-time processing. Additionally, the module supports modular I/O expansion via the Add-on Board Connector, enabling custom hardware additions such as GMSL2 and 3G-SDI for high-speed data transfer.

2.2. Hardware Specifications

- **Processor:** NVIDIA Jetson AGX Xavier SoM with Volta GPU, 8-core ARM v8.2 64-bit CPU, and Tensor Cores
- **Memory:** 32 GB LPDDR4x, 136,5 GB/s memory bandwidth
- **Storage:** 64 GB eMMC, microSD slot for external storage
- **Video Outputs:** Supports HDMI, DisplayPort (via USB C or Add-on Boards) and various high-performance visual outputs (via Add-on Boards)
- **I/O Connectivity:** USB, Gigabit Ethernet, HDMI, and additional options via Add-on Board connector

2.3. Electrical

The power supply requirements of the DE160200 module are given in Table 1.

Table 1: Power Supply Requirements

Specification	Min	Typical	Max	Units
Power supply current of +12 V (In full operation)	-	-	7.4	A
Power supply current of +3.3 V (In full operation)	-	-	7	A
Power supply current of +5 V AUX (In full operation)	-	-	0.1	A

2.4. Physical

DE160200 is compatible with 2 slot 3U PXIe Peripheral Module.

2.5. Environmental

The environmental specifications of the module are given in Table 2.

Table 2: Environmental Specification

Specification	Condition	Value
Operating Humidity	Relative, non-condensing	10% - 90%
Storage Humidity	Relative, non-condensing	5% - 95%
Operating Temperature	Forced-air cooling from chassis	0 °C - 40 °C
Storage Temperature	–	-40 °C - 85 °C

3. Signal Connections

The PXIe Jetson AGX Xavier Module supports a variety of communication interfaces, including:

- Ethernet (1 GB) for standard network communication
- USB 3.0 for peripheral connectivity
- HDMI and DisplayPort (via USB C or Add-on Boards) for visual output
- Add-on Board Connector: Custom I/O expansion with the ability to integrate custom hardware additions such as GMSL2 and 3G-SDI for high-speed data transfer

3.1. DisplayPort Configuration

The module is equipped with two DisplayPort channels, which can be routed through either USB-C or the Add-on Board Connector using a hardware-configurable switch. This provides flexible options for users to connect external displays or monitors depending on the specific use case.

Configuration options for DisplayPort:

- Via USB-C for direct display connection.
- Via Add-on Board Connector for additional custom interfaces and configurations.

This configuration allows for seamless video output for high-performance AI and visualization tasks.

The Add-on Board connector pinout is given in Table 3.

Table 3: The Add-on Board Connector Pinout

Pin	A	B	C	D	E	F
1	CSI1_D1_P	GND	CSI3_D1_P	GND	DP0_AUX_CH_EXT_P	GND
2	CSI1_D1_N	GND	CSI3_D1_N	GND	DP0_AUX_CH_EXT_N	GND
3	GND	CSI1_D0_P	GND	CSI3_D0_P	GND	HDMI_DP0_TX3_EXT_P
4	GND	CSI1_D0_N	GND	CSI3_D0_N	GND	HDMI_DP0_TX3_EXT_N
5	CSI1_CLK_P	GND	CSI3_CLK_P	GND	HDMI_DP0_TX2_EXT_P	GND
6	CSI1_CLK_N	GND	CSI3_CLK_N	GND	HDMI_DP0_TX2_EXT_N	GND
7	GND	CSI0_D1_P	GND	CSI2_D1_P	GND	HDMI_DP0_TX1_EXT_P
8	GND	CSI0_D1_N	GND	CSI2_D1_N	GND	HDMI_DP0_TX1_EXT_N
9	CSI0_D0_P	GND	CSI2_D0_P	GND	HDMI_DP0_TX0_EXT_P	GND
10	CSI0_D0_N	GND	CSI2_D0_N	GND	HDMI_DP0_TX0_EXT_N	GND
11	GND	CSI0_CLK_P	GND	CSI2_CLK_P	GND	DP1_AUX_CH_EXT_P
12	GND	CSI0_CLK_N	GND	CSI2_CLK_N	GND	DP1_AUX_CH_EXT_N
13	CSI5_D1_P	GND	CSI7_D1_P	GND	HDMI_DP1_TX3_EXT_P	GND
14	CSI5_D1_N	GND	CSI7_D1_N	GND	HDMI_DP1_TX3_EXT_N	GND
15	GND	CSI5_D0_P	GND	CSI7_D0_P	GND	HDMI_DP1_TX2_EXT_P
16	GND	CSI5_D0_N	GND	CSI7_D0_N	GND	HDMI_DP1_TX2_EXT_N
17	CSI5_CLK_P	GND	CSI7_CLK_P	GND	HDMI_DP1_TX1_EXT_P	GND
18	CSI5_CLK_N	GND	CSI7_CLK_N	GND	HDMI_DP1_TX1_EXT_N	GND
19	GND	CSI4_D1_P	GND	CSI6_D1_P	GND	HDMI_DP1_TX0_EXT_P
20	GND	CSI4_D1_N	GND	CSI6_D1_N	GND	HDMI_DP1_TX0_EXT_N
21	CSI4_D0_P	GND	CSI6_D0_P	GND	DP0_HPD_LS_EXT	GND

Pin	A	B	C	D	E	F
22	CSI4_D0_N	GND	CSI6_D0_N	GND	DP1_HPD_LS_EXT	HDMI_CEC_EXT
23	GND	CSI4_CLK_P	GND	CSI6_CLK_P	GND	PEX_L4_CLKREQ_N
24	GND	CSI4_CLK_N	GND	CSI6_CLK_N	GND	PEX_L4_RST_N
25	MCLK02	GND	MCLK04	GND	UPHY_TX8_P	GND
26	I2C3_DAT	GND	CAM1_RST/ GPIO16	GND	UPHY_TX8_N	GND
27	I2C3_CLK	MCLK03	CAM1_PWDN/ GPIO15	MCLK05	GND	UPHY_RX8_N
28	I2C2_DAT	CAM0_RST/ UART4_TX	AVDD_CAM_2V8_ ENABLE/GPIO36	FPGA_PS_RST	GND	UPHY_RX8_P
29	I2C2_CLK	CAM0_PWDN/ UART4_CTS	VDD_SYS_ENABLE/ GPIO25	GND	UPHY_TX9_N	GND
30	I2C4_DAT	GND	DMIC_IN_CLK/ GPIO09	GND	UPHY_TX9_P	GND
31	I2C4_CLK	AUD_MCLK/ MCLK01	DMIC_IN_DAT/ GPIO08	FPGA_PS_ UART1_RX	GND	UPHY_RX9_N
32	GND	I2S1_SDIN	GND	FPGA_PS_ UART1_TX	GND	UPHY_RX9_P
33	UART5_CTS	I2S1_FS	CAN1_DIN	GND	PEX_CLK4_N	GND
34	UART5_RX	I2S1_SDOUT	CAN1_DOUT	GND	PEX_CLK4_P	GND
35	UART5_TX	AUD_CODEC_ INT/ GPIO11	SPI1_CS1_N	FPGA_TDO	GND	PEX_WAKE_N
36	UART5_RTS	I2S1_CLK	SPI1_CS0_N	FPGA_TDI	FPGA_ PROGRAM_B	GND
37	GND	SPI1_CLK	SPI1_MISO	FPGA_TMS	GND	VDD_5V0
38	VDD_3V3	GND	SPI1_MOSI	FPGA_TCK	GND	VDD_5V0
39	VDD_3V3	GND	GND	GND	GND	VDD_5V0
40	VDD_3V3	GND	VDD_1V8	VDD_1V8	GND	VDD_5V0

4. Safety Guidelines

ESD can damage electronic components without adequate protection and may cause permanent damage to the device.

DE160200 doesn't support hot-plug therefore do not insert or remove the device when chassis power is on.