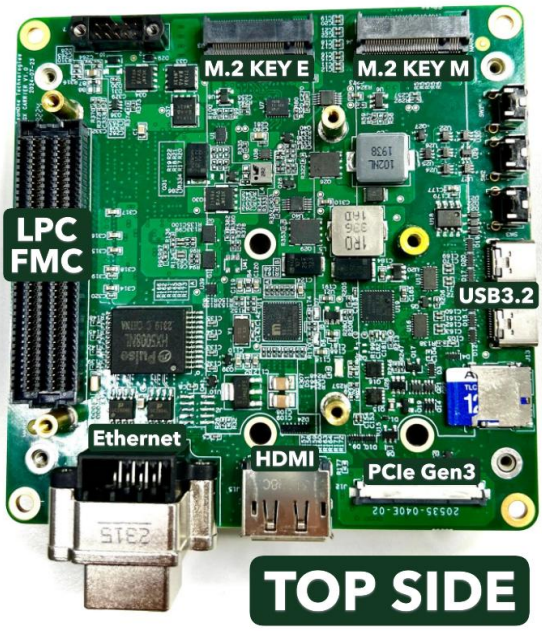
T1-MAP AGX Orin Module

Application Package

Introducing the innovative AGX Orin Module Application Package, a comprehensive solution engineered to streamline product development and deployment. This system is meticulously designed around the FMC (FPGA Mezzanine Card) Adaptor standard, renowned for its scalability, flexibility, and adherence to industry standards. The FMC standard facilitates seamless integration, enabling rapid development of new products and effortless extension of existing ones, significantly reducing time-to-market and development costs. The AGX Orin Module Application Package leverages the proven advantages of the FMC standard, including its modular architecture that supports a wide range of COTS (Commercial Off-The-Shelf) modules. This standardization ensures compatibility across various platforms and simplifies customization, making it an ideal choice for diverse applications in industrial automation, automotive, and other heavy-duty environments.



Designed with durability in mind, this system features a ruggedized construction suitable for harsh environments. It is engineered to withstand the rigors of heavy industrial settings, automotive applications, and military-grade operations. The design incorporates MIL-STD compliance, ensuring

resilience against vibrations, shocks, and extreme temperatures. Additionally, the system supports a robust DC power supply, providing stable and reliable power delivery essential for mission-critical applications.

The AGX Orin Module Application Package is crafted for ease of connection and integration, simplifying setup and reducing complexity. It offers advanced features such as PCIe Gen3 Root or device functionalities, enabling high-speed data transfer and expanded connectivity options. These capabilities are particularly beneficial for data-intensive applications requiring fast communication channels and versatile interfacing capabilities.

In summary, the AGX Orin Module Application Package combines industry-standard FMC adaptability, ruggedized construction, and advanced connectivity features to provide a versatile, reliable, and scalable platform. It is ideally suited for developers seeking a flexible solution that can adapt to evolving technological demands while ensuring durability and ease of integration in demanding environments.

Revolutionize AI at the Edge with Our Advanced PCB Assembly

Introducing the **Jetson AGX Orin Carrier Board**, a state-of-the-art PCB assembly tailored for high-performance computing and AI-based solutions. Engineered for the NVIDIA Jetson AGX Orin platform, this carrier board serves as the backbone for a wide range of demanding applications, including robotics, autonomous systems, and edge AI computing. With an exceptional focus on compactness, rugged reliability, and comprehensive interfacing options, our carrier board stands out in the crowded field of Jetson carrier boards and development kits.

Key Features at a Glance

- **Compact Size:** Optimized for seamless integration in confined spaces.
- **Ruggedized Design:** Industrial-grade materials for durability in extreme conditions.
- **Reliable Power Management:** Wide input voltage support and advanced protection mechanisms.

- **Extensive Interfaces:** Supporting 2x USB 3.2 Type-C, 2x GbE Ethernet, HDMI, RS232/RS422, 16x Discrete I/Os, PCIe Gen 3, and more.
- **Expandable Storage:** Built-in M.2 Key M and Key E slots.
- **Broad Protocol Support:** Compatibility with UART, I2C, SPI, and GPIO.
- **Optimized for JetPack SDK:** Leverages NVIDIA's extensive software tools and libraries.

Rugged and Compact Design

- **Compact Dimensions:** At just **85mm x 56mm**, the carrier board offers unmatched portability for tight spaces and compact device enclosures.
- **Ruggedized Structure:** Constructed with industrial-grade PCB materials and reinforced connectors, it ensures long-term reliability in harsh environments, including industrial automation, outdoor robotics, and more.
- **Wide Operating Temperature Range:** Rated for **-20°C to 70°C**, enabling use in extreme environments.

Power Management: Engineered for Reliability

Reliable power delivery is critical for any embedded computing platform, and our carrier board delivers exceptional performance in this domain:

- **Wide Input Voltage Range:** Supports 9V-36V input to accommodate diverse applications, from industrial automation to mobile robotics.
- **Advanced Protection Features:** Over-voltage, under-voltage, over-current, and short-circuit protection to ensure safe operation in all conditions.
- **Low Power Mode:** Ideal for battery-powered systems, enabling extended operational times without sacrificing performance.

Unmatched Interface Connectivity

Our carrier board maximizes the potential of the NVIDIA Jetson AGX Orin module, offering a comprehensive suite of interfaces that cater to a wide range of applications:

High-Speed Networking

- **2x Gigabit Ethernet Ports (GbE):** Ensure reliable, high-speed wired network connections with low latency, ideal for data-intensive edge computing applications.

USB Support

- **2x USB 3.2 Type-C Ports:** High-speed data transfer rates for peripherals, external storage, and power delivery support.
- **USB 2.0 Ports:** Retains backward compatibility for legacy devices.

HDMI Interface

- **1x HDMI Port:** Supports video output up to 4K resolution, ideal for applications involving AI-based vision systems or edge devices requiring real-time monitoring.

PCIe Expansion

- **8 Lanes of PCIe Gen 3:** Provide ample bandwidth for connecting high-speed peripherals such as NVMe SSDs, GPUs, or custom accelerators.

M.2 Expansion Slots

- **1x M.2 Key M Slot:** Optimized for high-speed NVMe SSDs, enabling ultra-fast storage solutions for data-heavy applications like video processing.
- **1x M.2 Key E Slot:** Ideal for Wi-Fi, Bluetooth, or other wireless modules, offering flexibility in connectivity.

Serial Communication

- **RS232 and RS422 Ports:** Ensure compatibility with industrial communication protocols, making the board a perfect fit for factory automation and industrial robotics.

General-Purpose Input/Output (GPIO)

- **16x Discrete I/Os:** Enable seamless integration with sensors, actuators, and control systems, providing unmatched flexibility for robotics and automation.

FMC VITA57.1 LPC expansion port

- **1x LPC FMC port:** Enable seamless integration with COTS FMC modules(such as ADC, Video I/O, Discrete I/O, Networking, Communication....) or customized FMC modules.

Application-Driven Hardware Features

Our carrier board is carefully designed to meet the needs of diverse industries, ensuring flexibility and scalability:

Camera Support

- **Multi-CSI Camera Inputs:** Ideal for computer vision applications such as autonomous vehicles, robotics, and security systems.

AI-Optimized Design

- Leverages the Jetson AGX Orin's powerful GPU for running multiple neural networks simultaneously, accelerating AI inference workloads.

Industrial Protocols

- **RS232 and RS422 Ports:** Widely used in industrial automation systems, these protocols allow seamless communication with industrial devices and sensors.

Storage Expansion

- With support for NVMe SSDs via the **M.2 Key M Slot**, the board provides high-speed, high-capacity storage capabilities essential for data-intensive AI workloads.

Optimized for NVIDIA Jetson AGX Orin

The PCB assembly is specifically optimized to bring out the best in the Jetson AGX Orin platform:

- **Support for JetPack SDK:** Ensures seamless integration with NVIDIA's software tools, including CUDA libraries, TensorRT, and DeepStream.
- **Enhanced AI Capabilities:** Supports concurrent execution of multiple AI models, perfect for complex applications like real-time video analytics, object detection, and autonomous navigation.
- **High-Speed Data Processing:** The 8-lane PCIe Gen 3 interface ensures fast data transfer between peripherals and the GPU, reducing latency and increasing throughput.

Applications Across Multiple Domains

Our carrier board is designed to cater to a broad spectrum of industries and use cases:

Autonomous Machines

- Enable real-time decision-making in drones, autonomous vehicles, and robotic arms with low-latency processing and extensive interfacing options.

Industrial Automation

- Power predictive maintenance systems, quality control mechanisms, and robotic process automation with support for RS232, RS422, and discrete I/Os.

Healthcare and Life Sciences

- Drive AI-powered imaging solutions in diagnostics, including MRI and X-ray analysis, with the board's high-speed PCIe and USB connectivity.

Smart Cities

- Deploy the board in applications such as traffic monitoring, intelligent lighting, and public safety systems, leveraging its robust AI processing and networking capabilities.

Edge Computing

- Ideal for edge AI systems requiring real-time analytics, the board minimizes dependency on cloud processing while maintaining high performance.

Detailed Specifications

Feature	Specification
Dimensions	85mm x 56mm
Power Input	9V-36V
USB Ports	2x USB 3.2 Type-C, 2x USB 2.0
Ethernet Ports	2x Gigabit Ethernet
PCIe Lanes	8 Lanes Gen 3
GPIO	16x Discrete I/Os
Serial Ports	1x RS232, 1x RS422
Video Output	1x HDMI
M.2 Slots	1x Key M, 1x Key E
Operating Temperature	-20°C to 70°C

Feature	Specification
JetPack SDK Support	Yes
FMC x 1	**VIA57.1 LPC**

Feature	Our Carrier Board
Compact Size	✅ Compact
Ruggedized Structure	✅ Industrial-grade
USB 3.2 Type-C Ports	2
Gigabit Ethernet Ports	2
PCIe Gen3 Lanes	8
Discrete I/Os	16
Serial Ports (RS232/RS422)	✅ Included
FMC LPC	1x VITA57.1 LPC

Why Choose Our Carrier Board?

Comprehensive Connectivity

With 2x GbE Ethernet, USB 3.2 Type-C, HDMI, PCIe Gen 3, FMC and discrete I/Os, our board supports a wide variety of applications and devices.

Developer-Friendly Features

Includes UART for debugging, GPIO for customization, and support for M.2 expansion.

Superior Build Quality

Industrial-grade materials and robust connectors ensure reliability in demanding environments.

Future-Proof Design

With support for NVIDIA's JetPack SDK and expansion options like M.2 and PCIe, the board is ready for future upgrades.

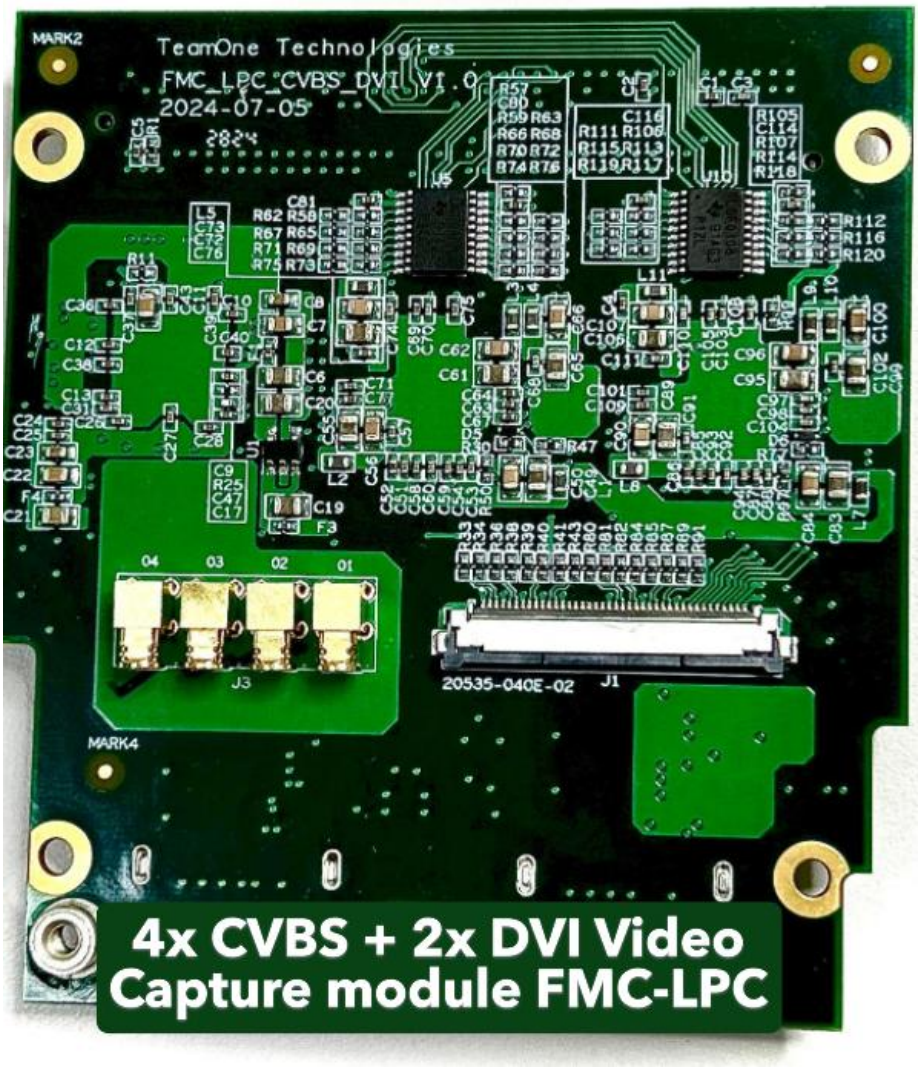
Packaging and Support

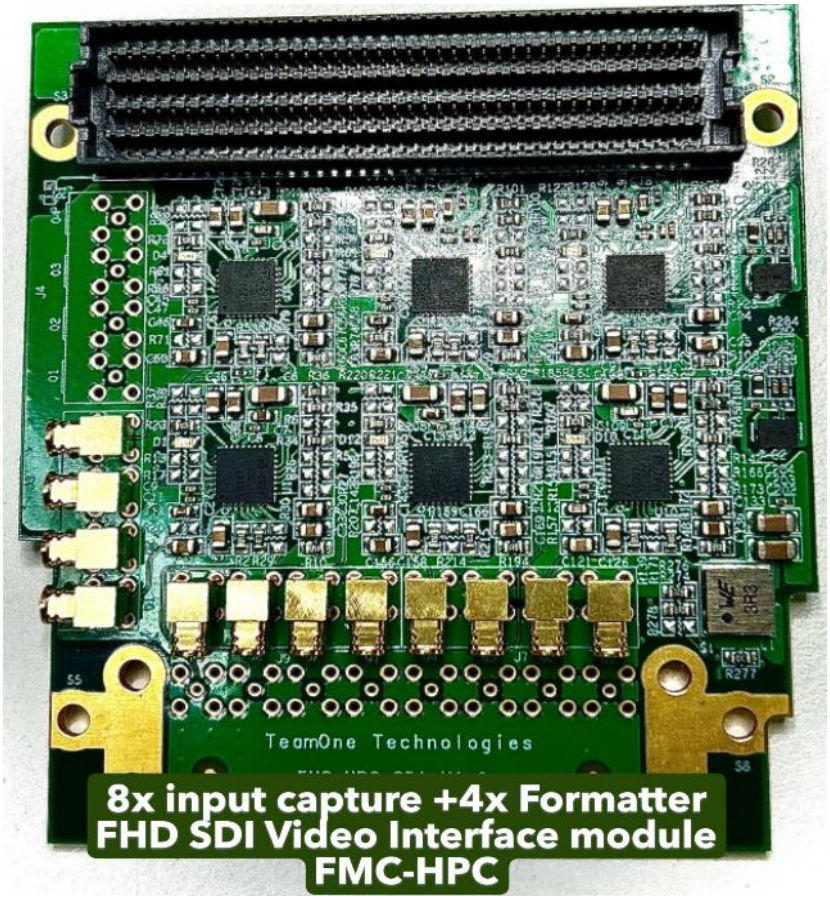
Every purchase includes:

- The carrier board with pre-assembled Jetson AGX Orin.
- Comprehensive user documentation and schematics.
- Access to an online developer community for collaboration and support.

The **Jetson AGX Orin Carrier Board** is your ideal choice for harnessing the power of edge AI computing. Its compact design, rugged build, and extensive interfacing capabilities ensure exceptional performance across industries and applications.

Teamone Standard off-the-shell FMC modules.




TeamOne Technologies
8x input capture +4x Formatter
FHD SDI Video Interface module
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