

ATC 3750-A6CR

High Performance NVIDIA® Jetson AGX Orin™
Edge AI Computer for Railway Applications



Main Features

- Built-in NVIDIA® Jetson AGX Orin™ SoM, up to 200/275 INT8 Sparse TOPS AI performance
- Designed to be fanless, rugged, and compact
- 6 x GbE PoE+ port for IP CAM/LiDAR sensors, optional 1 x 10GbE port
- HEVC/H.265 hardware decode, supports up to 7 x 4K30
- Wide range operating temperature of -25°C~70°C (OT3)
- Ultra-speed PCIe 4.0 x4 NVMe SSD for data integrity
- Expandable for GNSS, LTE/5G NR & Wi-Fi 5/6
- 24V DC-in for rail, ignition control & OCP/OVP
- NEXCOM Acceleration Linux (NAL) integrated w/ JetPack 6.1
- Military standard of MIL-STD-810H for anti-vibration/shock
- CE/FCC, UKCA, EN 50155 (EN 55011, EN 50121-3-2, EN 61373, OT3, EN 45545) certified

Product Overview

AI has become an essential component of automated vehicle technologies. With its built-in high performance NVIDIA® Jetson AGX Orin™ SoM, the ATC 3750-A6CR can deliver up to 200/275 TOPS workload on Artificial Intelligence (AI) processing and inference, supporting applications such as ADAS in Transportation/Construction, ANPR, AMR, Machine Learning (ML), ITS and factory automation.

Thanks to NEXCOM's excellent thermal solutions, the ATC 3750-A6CR can work through its defined TDP (15W to 60W) in harsh environments without a fan kit to achieve 200/275 TOPS workload performance.

The ATC 3750-A6CR is a rugged, compact-size in-vehicle AI powered computer that features DC 24V (power isolation) with IGN control, 6 PoE+ (X-coded) for accessing IP CAM/LiDAR sensors, and rich peripheral ports, USB 3.2, isolation CAN bus, RS-232, Console, DI/DO, OTG and HDMI®. With the installation of 5G NR, Wi-Fi 5/6 modules, the ATC 3750-A6CR can collaborate with CPS for AI model re-training, making it suitable for deployment in sophisticated applications such as ADAS/ANPR/AIaided ITS/Construction, etc. In harsh environments, the ATC 3750-A6CR can operate at a wide temperature range of -25°C to 70°C and meet the MIL-STD-810H military standard for anti-vibration and shock. For regulation, the ATC 3750-A6CR is certified by CE/FCC Class A, UKCA, EN 45545 and EN 50155.

Specifications

NVIDIA® Jetson AGX Orin™ SoM

- Jetson AGX Orin™ 32GB
 - CPU: 8-core Arm® Cortex®-A78AE v8.2 64-bit, 2MB L2 + 4MB L3
 - GPU: 1792-core NVIDIA® Ampere architecture with 56 Tensor Cores
 - Memory: 32GB 256-bit LPDDR5, 204.8GB/s
 - AI performance: 200 INT8 Sparse TOPS
 - 2 x NVDLA v2.0 engines: 1.4 GHz, 46 INT8 Sparse TOPS each
 - Video encode: 1 x 4K60/3 x 4K30/6 x 1080p60/12 x 1080p30 (H.265)
 - Video decode: 1 x 8K30/2 x 4K60/4 x 4K30/9 x 1080p60/18 x 1080p30 (H.265)
- Jetson AGX Orin™ 64GB
 - CPU: 12-core Arm® Cortex®-A78AE v8.2 64-bit, 3MB L2 + 6MB L3
 - GPU: 2048-core NVIDIA® Ampere architecture with 64 Tensor Cores
 - Memory: 64GB 256-bit LPDDR5, 204.8GB/s
 - AI performance: 275 INT8 Sparse TOPS
 - 2 x NVDLA v2.0 engines: 1.6 GHz, 52.5 INT8 Sparse TOPS each
 - Video encode: 2 x 4K60/4 x 4K30/8 x 1080p60/16 x 1080p30 (H.265)
 - Video decode: 1 x 8K30/3 x 4K60/7 x 4K30/11 x 1080p60/22 x 1080p30 (H.265)
- OpenGL 4.6+, OpenGL ES 3.2, CUDA® 10.2+, and Vulkan 1.2+
- NVIDIA® JetPack 6.1

Storage

- 64GB eMMC 5.1 flash storage, 200MHz (HS400 or HS533)
- 1 x Accessible SD card (SDXC-I/UHS-I, SD 3.0)
- 1 x M.2 Key M 2280 (PCIe 4.0 x4) NVMe SSD

Expansion

- 1 x Full size Mini PCIe slot (PCIe 4.0, USB 2.0)
- 1 x M.2 Key B 3042/3052 (USB 3.2/2.0), 2 x nano-SIM
- 1 x M.2 Key E 3030 (PCIe 4.0, USB 2.0) for Wi-Fi 5/6

Display

- 1 x HDMI® 2.0a/b, up to 3840x2160@60Hz

G-Sensor

- 3D accelerometer and 3D gyroscope, ST LSM6DSLTR

PoE+

- 6 x 1GbE M12 X-coded PoE connector
 - 9Kbyte Jumbo frame
 - IEEE 802.3af/at, total 80W
 - IEEE1588 supported
 - PSE on/off & Watt monitoring
 - GIGA LAN switch: KSZ9477STXI

USB

- 2 x USB 3.2 Gen 2, Type-A
 - 5V@900mA each
 - Up to 10Gbit/s link speed & compliance with USB 2.0 (LS/FS/HS link speed)
- 1 x OTG, Micro-USB

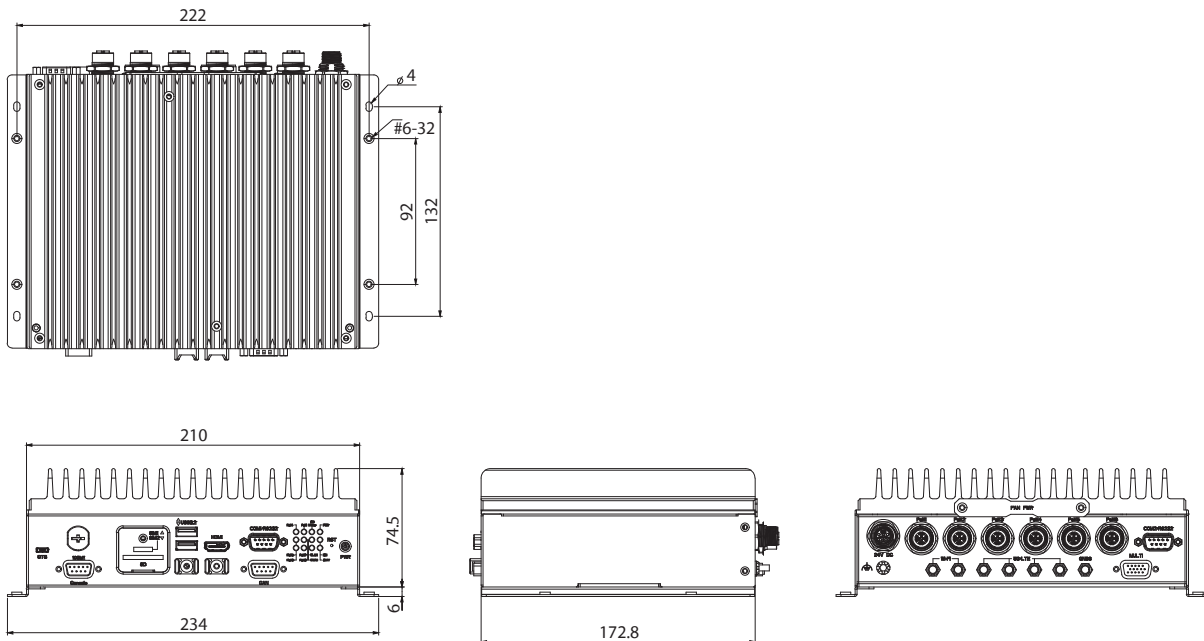
Serial Port

- 2 x RS-232 (Tx, Rx, RTS, CTS)
- 1 x Console (Tx, Rx)
- RS-232 working voltage $\pm 9V$, baud rate up to 115.2kb/s

DI/DO

- 4-bit input
 - Source: DC 9V~36V (12V@1.1mA/24V@2.2mA)
 - External: DC 0V~33V pull-high, high-level, DC 3.3V~33V; low-level, DC 0V~2V
- 4-bit output
 - Source: DC 9V~36V (nominal 35mA@24V)

Dimension Drawing



- External: DC 5V~27V pull-high, sink current w/ 220mA for each bit, 500mA max (@25C)
- Source or external can be selected by software (default: source type)

CAN bus

- 2 x CAN FD, compatible with CAN 2.0A/2.0B
- IEC 61000-4-2 Electrostatic Discharge (ESD): $\pm 8\text{KV}/15\text{KV}$ (contact/air)
- Up to 5Mb/s in data transmit, 2.5KV isolated

10GbE, X-coded (optional)

- Ethernet PHY: Marvell AQR113C-BO-I
- 10GBASE-T/5GBASE-T/2.5GBASE-T/1000BASE-T/100BASE-TX/10BASE-T
- Compliant with IEEE 802.3az
- 9Kbyte Jumbo frame
- IEEE 1588 supported

Watch Dog Timer

- Yes, through MCU

Remote ATX PWR & Reset Trigger

- Reserved, wafer-type

GNSS

- u-blox NEO-M9N GNSS module for GPS/GLONASS/QZSS/Galileo/Beidou
- Optional DR (Dead Reckoning) function

Power Supply (K-coded)

- Nominal voltage: DC 24V (14.4V~33.6V), K-coded connector
- OCP & UVP (shut down once exceeding 37V)
- Ignition on/off control & programmable on/off delay timer
- Optional for remote power on/off control

I/O Ports, Front-Plate

- 1 x ATX power button
- 1 x Reset button
- 12 x LED Indicator
- 2 x USB 3.2, Type-A
- 1 x Console (DB9)
- 2 x CAN (DB9)
- 1 x COM port1 (DB9), supports RS-232
- 2 x nano-SIM
- 1 x HDMI®
- 1 x SD
- 1 x OTG

I/O Ports, Rear-Plate

- 1 x COM port2 (DB9), supports RS-232
- 6 x 1GbE M12 X-coded PoE connector
- 1 x Multi (DI/DO, DR signal)

- 1 x SMA for GNSS
- 2 x RP-SMA for Wi-Fi
- 4 x SMA for LTE/5G
- 24V DC-in

Dimension & Weight

- Dimensions: 234.0mm (W) x 172.8mm (D) x 80.5mm (H) w/ mount bracket
- weight: 3.5kg

Environment

- Operating temperature: $-25^{\circ}\text{C}\sim 70^{\circ}\text{C}$ (OT3) (TDP 15W~60W, fanless, w/ 80W PoE)
- Storage temperature: $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$
- Relative humidity: 10%~95% (non-condensing)

Vibration & Shock

- Vibration in operating:
 - MIL-STD-810H, 514.8C Procedure 6, Category 4
 - IEC 60068-2-64: 2.0g@5Hz~500Hz
- Vibration in storage:
 - MIL-STD-810G, 514.6E Procedure 1, Category 24, 7.7g
- Shock:
 - MIL-STD-810G, 516.6 Procedure I, trucks and semi-trailers=40g
 - Crash hazard: Procedure V, ground equipment=75g

Certifications

- CE approval, FCC Class A, UKCA, EN 45545 and EN 50155 certified

Operating System

- NEXCOM Aided Linux (NAL) w/ Jetpack 6.1 integrated
 - NEXCOM custom functions (GNSS, 5G/NR, 6-axis sensor, MCU control)
 - Ubuntu 22.04 (L4T 36.3, Linux Kernel 5.15)

External Cable (optional)

- DB15 multi-port adapter cable, 20cm

Ordering Information

- **ATC 3750-A6CR (P/N: 10AT0375002X0)**
NVIDIA® Jetson AGX Orin™ 32GB, 64GB eMMC, 6 x PoE+ (X-coded), 2 x USB 3.2, 2 x RS-232, OTG/Console, DC 24V for rail
- **ATC 3750-A6CR-64 (P/N: 10AT0375003X0)**
NVIDIA® Jetson AGX Orin™ 64GB, 64GB eMMC, 6 x PoE+ (X-coded), 2 x USB 3.2, 2 x RS-232, OTG/Console, DC 24V for rail
- **VTK PWA20-01 (P/N: 10VK00PWA01X0)**
DC/DC converter 24V, 200W, w/ power isolation, A-coded to K-code adapter cable