Axiado Project Tahoe DC-SCM 2.0 1U VFF

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Contribution Overview

- **Project:** Hardware Management Project
- **Working body:** Hardware Management Module Subproject
- **Contributor(s):** Axiado
- **Contribution Type:** Design Specification, design files and necessary software
  - **Derived from Base Specification(s):** DC-SCM Rev2.0 Ver1.0 Base Specification

In Progress, Submitted, and Published Contributions

Name	Type	Project	Status	Published Date
Axiado DC-SCM2.0 1U VFF OCP inspired design	Specification	Hardware Management	Submitted	—
Project Tahoe DC-SCM 2.0	Specification	Hardware Management	Submitted	—
Tahoe DC-SCM2.0 1U VFF schematic	Design File	Hardware Management	In Progress	—

Contribution Overview

- OCP DC-SCM2.0 has established control, management and security function modularity in the industry
- DC-SCM2.0 defines horizontal and vertical 2U form factor cards
- The current contribution from Axiado is a vertical 1U form factor specification and design files
- Axiado's Trusted Compute/control unit (TCU) is a single chip integration of all major components of DC-SCM - lower power, smaller footprint, greater security and better scalability (Checkout demo's at Axiado booth during OCP Global'23)
- TCU enables expansion of DC-SCI inspired connectors for switches, base stations and other infrastructure elements (future contribs from Axiado)

Axiado Company Overview

Axiado is a cybersecurity semiconductor company deploying a novel, hardware-anchored, AI-driven approach to **platform security** against ransomware, supply chain, side-channel and other cyberattacks in the growing ecosystem of cloud data centers, 5G networks and network switching.

COMPANY

Founded 2019 in San José, California

Size 100+ employees

Locations San José, USA; Ottawa, ON, Canada; Hyderabad, India; Taipei, Taiwan

MARKETS

Data centers, 5G base stations, network

Trusted Control/Compute Unit (TCU)
Ground-up built SoC with AI

Smart Secure Control Module (SCM) horizontal form factor
OCP DC-SCM compliant

AFFILIATIONS

OPEN COMMUNITY®
OpenPOWER™
OpenBMC
LINUX FOUNDATION
GSA Where Leaders Meet
DMTF Redfish

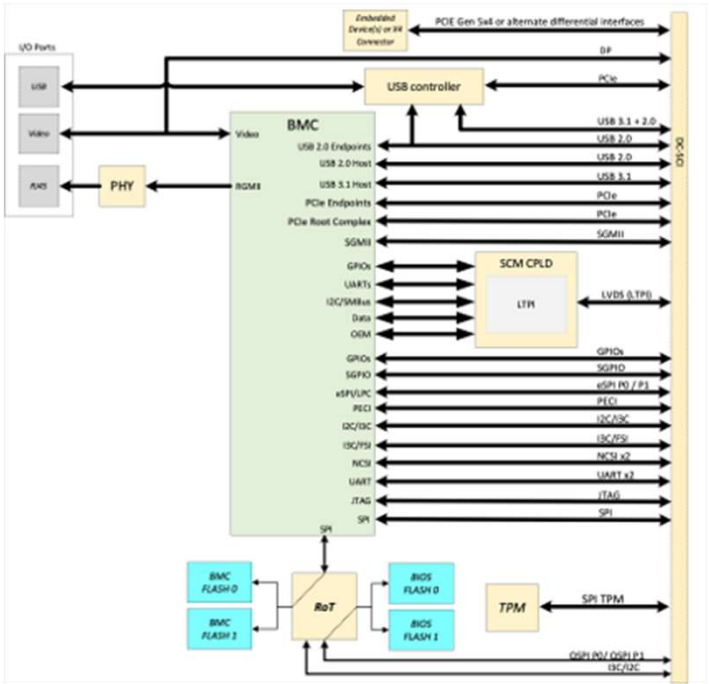
COMPLIANCE STANDARDS

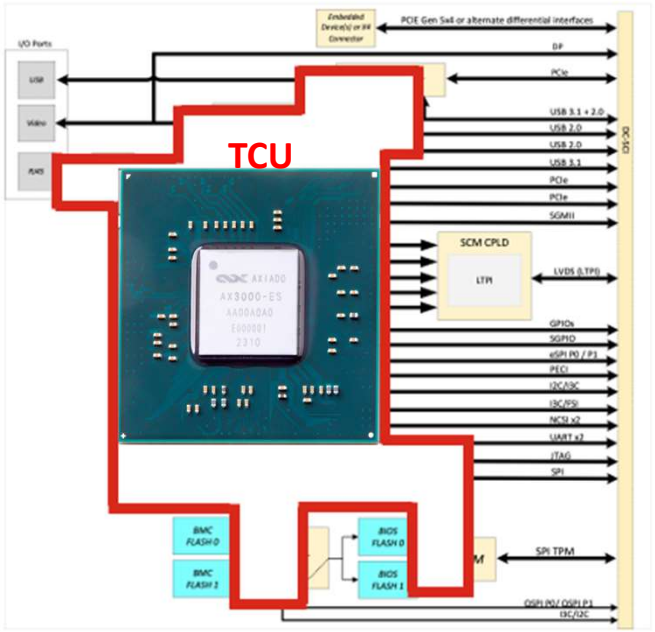
FIPS 140-3™
NIST
CNSA 2.0

- OCP-DC-SCM2.0
- TPM2.0

Smart Secure Control Module (SCM) vertical form factor (1U)
OCP DC-SCM compliant

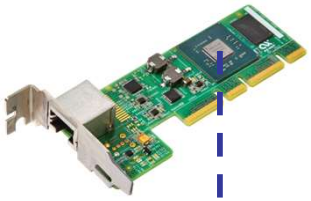
TCU is “DC-SCM on a chip”





TCU = BMC + RoT + TPM + CPLD + Smart NIC + USB Controller + AI/ML

Axiado’s single-chip DC-SCM



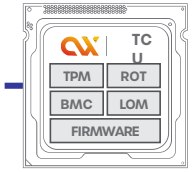
AXIADO SMART-SCM

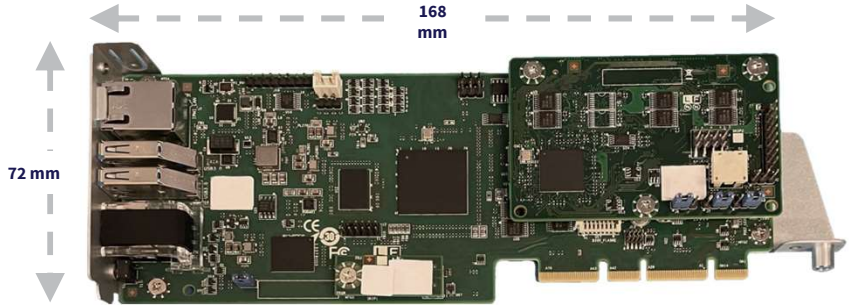
Single-chip SoC with AI

Smart-SCM vertical form factor (1U)

OCP DC-SCM compliant

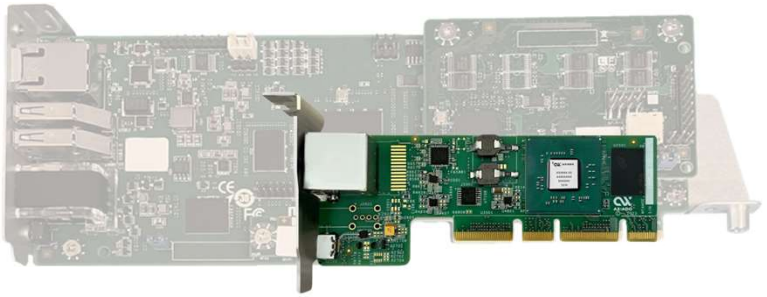
The only one for 1U server (60+% of the market)



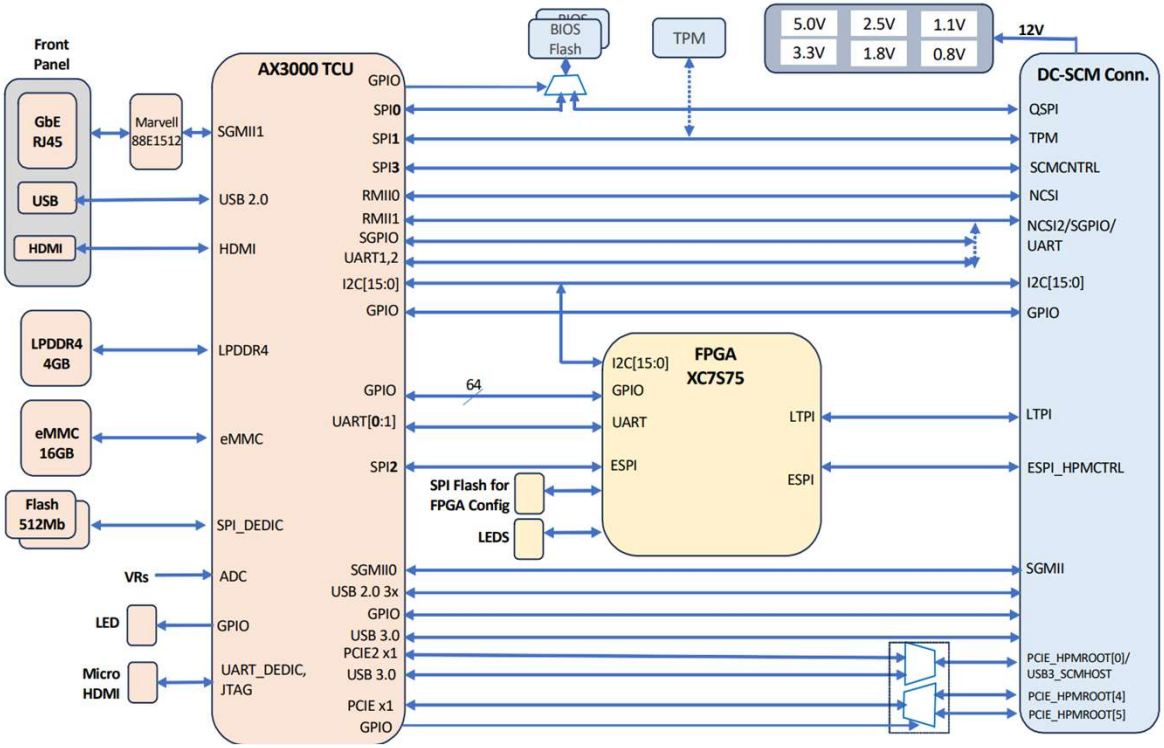


MAINSTREAM DC-SCM

Multi-chip, no AI



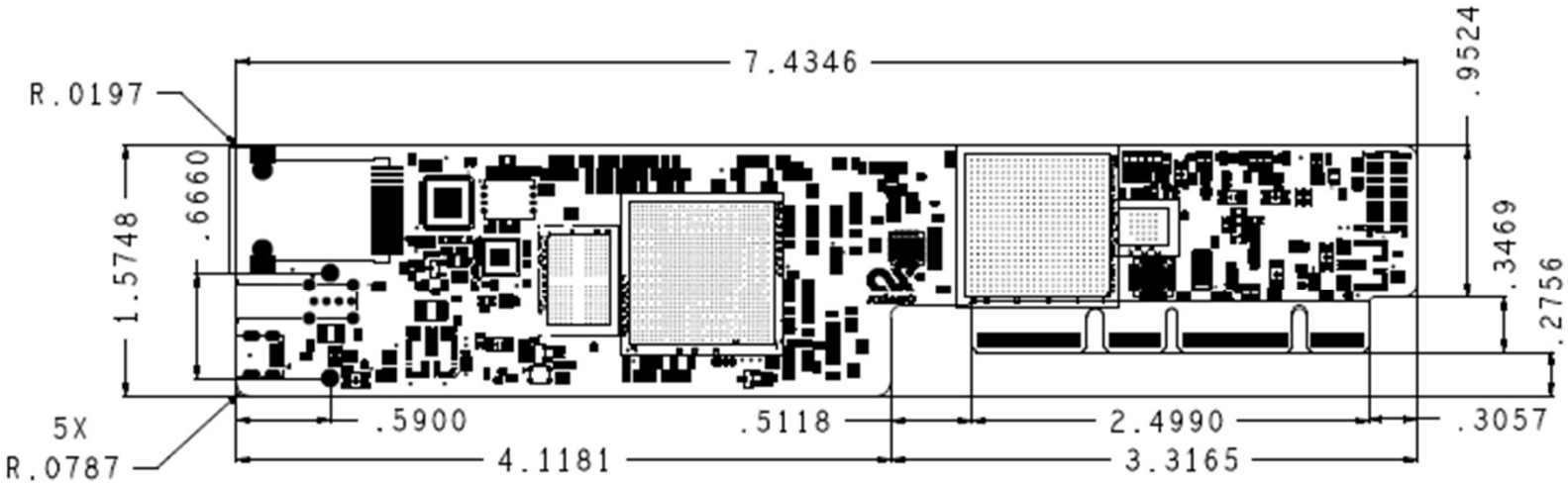
Tahoe Block Diagram



OCP Tenets

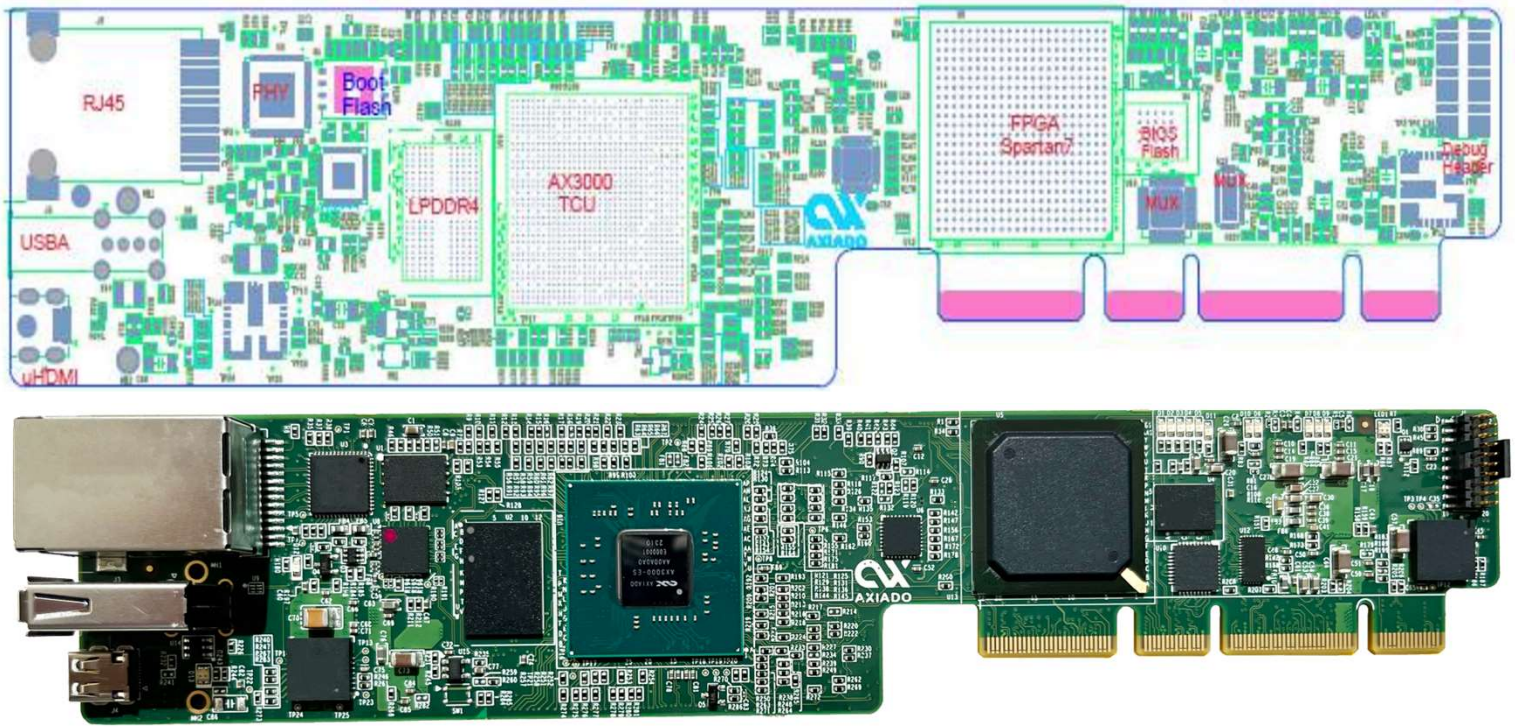
OCP Tenet	Proposed solution meets or exceeds
Openness	The Project Tahoe DC-SCM is an open-source design that adheres to the DC-SCM 2.0 specification. The deliverable includes reference design files and associated software required to recreate the design.
Efficiency	Tahoe reduces the form factor of the design and consolidates many discrete parts into one SoC leading to higher power/thermal efficiency. This also leads to reduced software variants across discrete chips and homogeneity drives efficiency. This also results in reducing latencies at the platform level and increases security.
Impact	Current DC-SCM2.0 VFF only addresses 2U and above server form factors. However there is a large 1U and edge servers that are un-addressed. Tahoe contribution has a major impact as it helps address all server form factors.
Scale	The multiple on-chip processing elements and wide variety of external interfaces make the Project Tahoe board ideal for large scale implementations. It enables the design and deployment of the HPM and DC-SCM with increased efficiency for time to market.
Scalability	The Project Tahoe board is a modular design that is lead-free and RoHS compliant. It can work with any HPM implementation that complies with the DC-SCM specification. By following the DC-SCI pinout and definition, the common server management, security, and control features can be used across multiple platforms of the same generation and across platforms of different generations

Tahoe Dimensions

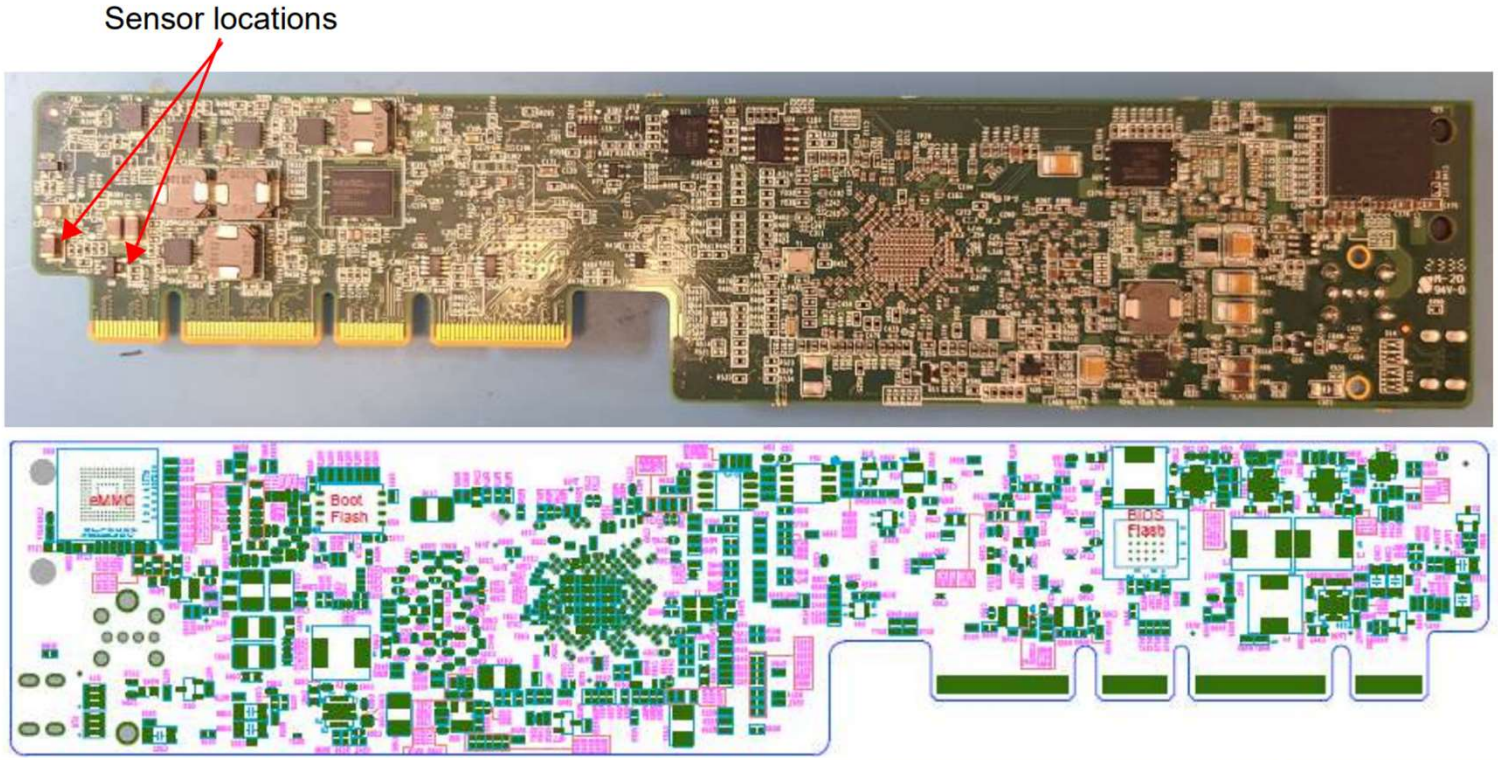


ALL DIMENSIONS ARE IN INCHES

Tahoe – Top View



Tahoe – Bottom View



DC-SCI Pinout Summary

Function
12V Aux Power
Power Sequencing & Presence Detection
LTPI (LVDS)
2x BMC PCIe x1 End Point
3x BMC USB 2.0 Host or Endpoint
Up to 2x BMC USB 3.0 Host
eSPI (Single Node/CPU P0)
QSPI (Single Node/CPU P0)
SPI
10 x I2C/I3C @ 3.3V
5 x I2C/I3C @ 1.8V
2 x I2C/I3C @ 1.0V
Up to 26 GPIO's
SGPIO
Up to 2 UART ports
JTAG

Thank you!

BACKUP SLIDES

Base Definition

- DC-SCM specifies a Vertical Form Factor (VFF) in DC-SCM 2.1
- The Project Tahoe DC-SCM complies to DC-SCM 2.0, because the module implements a different VFF (for use in a 1U chassis)
- The HW Module subproject's DC-SCM workstream is considering a similar VFF

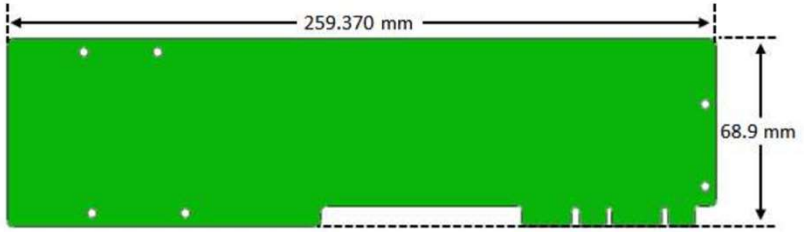


Figure 31: Long Vertical Form Factor Board Overall Dimensions

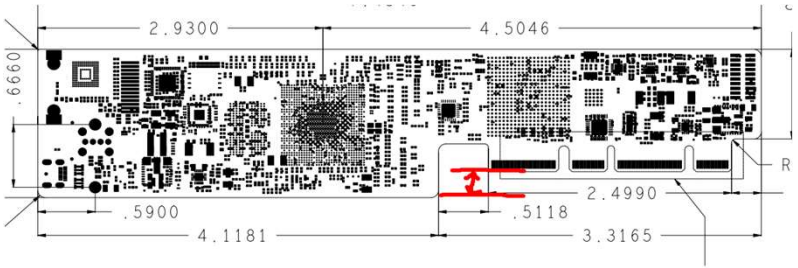


Figure 5. Tahoe Board Mechanical Dimensions