Radxa E54C Product Brief

High-Performance AI Edge Network Computer

Revision 1.0

2025-04-08

Radxa Computer

Contents

1 Revision Control Table

Version	Date	Changes from previous version
1.0	2024/09/27	First version

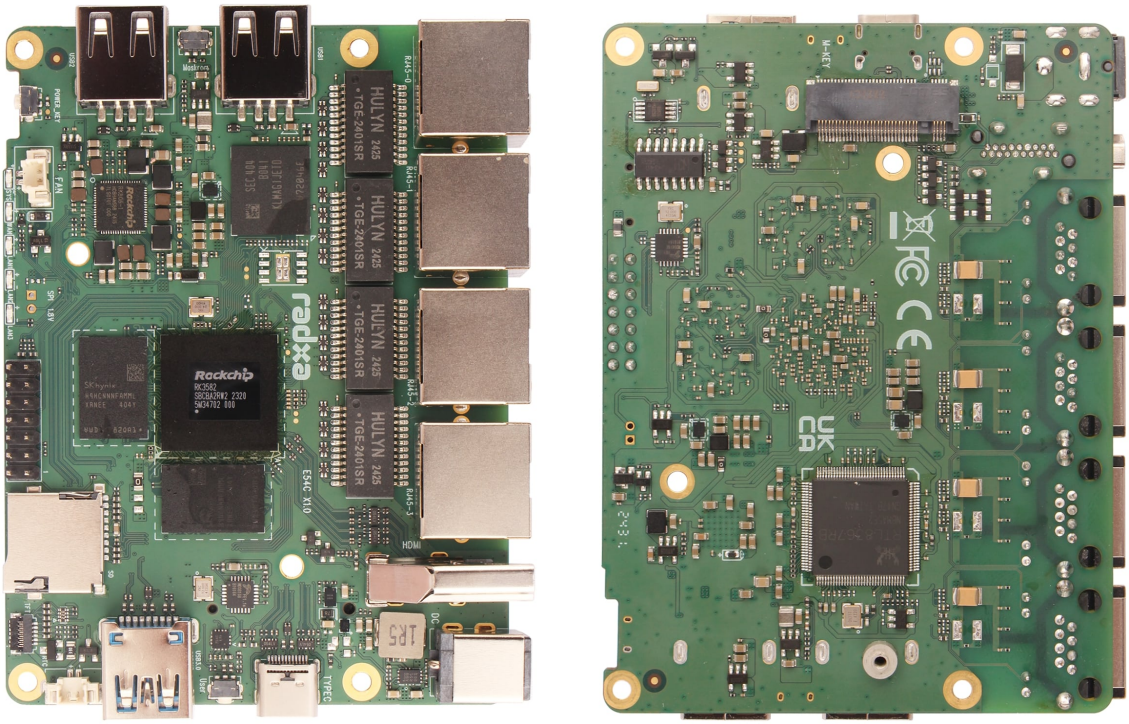
2 Introduction

The **Radxa E54C** is a cutting-edge AI network computer engineered for the demands of modern edge computing. Powered by Rockchip RK3582 SoC with dual Cortex-A76 and quad Cortex-A55 cores, combined with a high-performance 5 TOPS NPU, it delivers exceptional processing capability for AI inference workloads and real-time applications.

Designed with connectivity at its core, the E54C features four Gigabit Ethernet ports configurable for versatile network topologies, along with comprehensive I/O options including HDMI 2.1 (8K support), multiple USB ports, and expandable storage via NVMe SSD. This makes it the ideal platform for:

- **Smart Edge Networking** - AI-powered firewalls, gateways, routers
- **Industrial IoT Applications** - Data processing, machine monitoring
- **Edge AI Deployment** - On-premise AI inference, LLM hosting
- **Small Business Infrastructure** - Network management, security solutions

The E54C combines advanced AI computing power, robust networking, and industrial-grade durability in a compact edge platform.



Note: The actual board layout or component locations may change over time, but the main

connector types and locations will remain consistent.

3 Features

3.1 Hardware

- Rockchip RK3582 SoC
- Dual ARM Cortex-A76 and Quad ARM Cortex-A55 CPU
- NPU Computing Power up to 5TOPs@INT8
- LPDDR4 RAM options:
  - 2GB
  - 4GB
  - 8GB
  - 16GB
  - 32GB
- Onboard SPI Flash Optional
- Onboard eMMC options:
  - 8GB
  - 16GB
  - 32GB
- H.264, H.265 encoder by 4K@60fps
- Optional Aluminum Alloy Case for Efficient Heat Dissipation

3.2 Interface

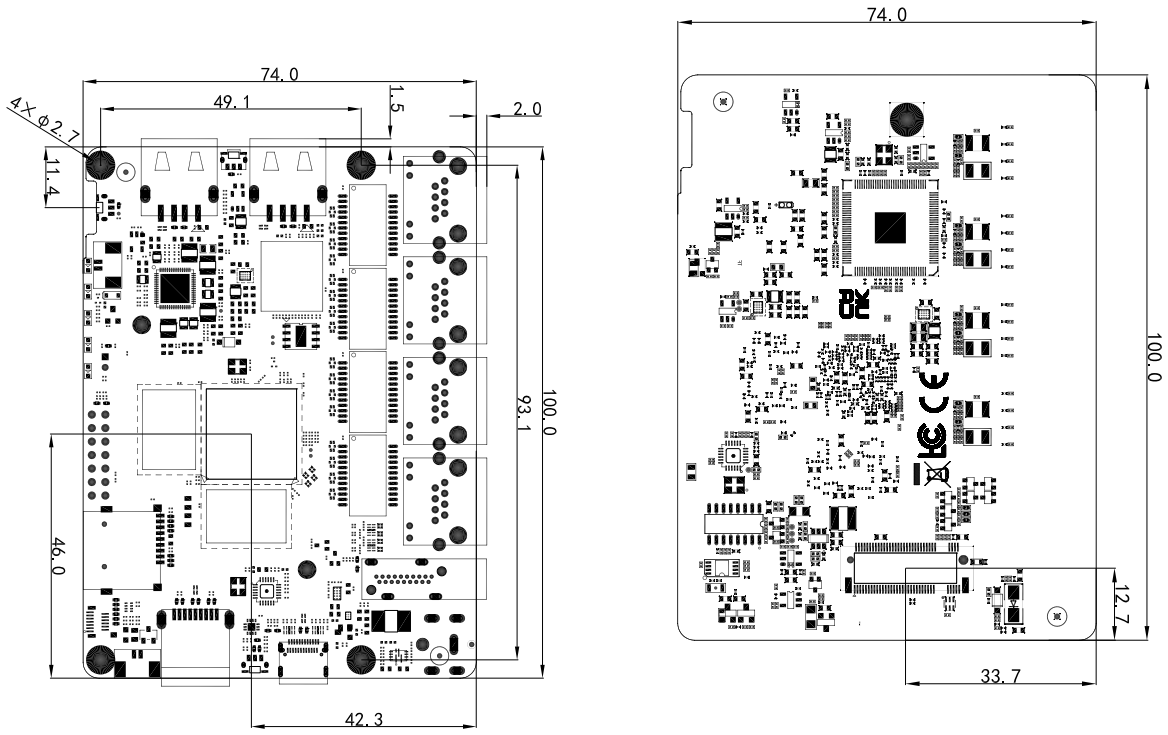
- 4x Gigabit Ethernet Ports
- 1x HDMI 2.1 supporting up to 8K
- 1x M.2 M Key Connector with PCIe 2.1 1-lane for M.2 NVMe SSD
- 1x USB 3.0 OTG Type-C Port for Data and Debug
- 1x USB 3.0 HOST Type-A Port
- 2x USB 2.0 HOST Type-A Ports
- 1x microSD Card Slot
- 1x 2-Pin 1.25mm Fan Header
- 1x 2-Pin 1.25mm RTC Battery Connector
- 1x 12V DC Jack 5525
- 1x Power Button
- 1x Maskrom Button

- 1x User Button
- 5x LED Status Indicator Lights
  - 4x Network Status Indicator Lights
  - 1x Power Status Indicator Light
- 14-Pin 0.1” (2.54mm) header supporting a wide range of interface options:
  - 1x SPI
  - 1x UART
  - 1x I2C
  - 2x 5V Power Out
  - 1x 3.3V Power Out

3.3 Software

- ARMv8 Instruction Set
- Debian Linux support
- OpenWrt support
- Hardware access/control library for Linux

4 Mechanical Specifications



5 Electrical Specifications

5.1 Power Requirements

The Radxa E54C supports power from DC Jack 5525 with 12V voltage, the suggested power source capability is 12V/3A with all the perpherials connected.

6 Peripherals

6.1 M.2 M Key Connector

The Radxa E54C is equipped with an M.2 M Key connector that offers a PCIe Gen2 1-lane interface. The M.2 M Key connector on the board is designed with a standard M.2 2280 mount-

ing hole, enabling the installation of M.2 2280 NVMe SSD. It should be noted that M.2 SATA SSDs are not supported.

6.2 USB

The Radxa E54C is equipped with three USB 2.0 HOST Type - A Ports and one USB 2.0 OTG Type - C port. The USB 2.0 OTG Type - C port can be used for UART debugging as well as data transmission, providing users with convenient options for various tasks such as device debugging and data exchange.

6.3 Network

The Radxa E54C features four Gigabit Ethernet ports (10/100/1000 Mbps) with RJ45 connectors, delivering enterprise-grade networking capabilities essential for bandwidth-intensive applications. These high-performance interfaces support:

- **Flexible Configuration**: Each of the four ports can be independently configured as WAN or LAN under OpenWrt or other OSes, allowing creation of customized network topologies
- **Network Segmentation**: Create isolated network zones for enhanced security and traffic management
- **Load Balancing**: Distribute network traffic across multiple connections for optimized performance
- **Redundancy**: Implement failover mechanisms to ensure continuous connectivity

This versatile networking architecture makes the E54C ideal for demanding use cases such as edge servers, IoT gateways, media streaming, and complex data transfer operations.

7 Availability

Radxa guarantees the availability of the E54C until at least September 2034.

8 Support

8.1 Resources

- **Documentation**: Comprehensive hardware and software documentation available on the Radxa E54C Docs

- **Community Support**: Active developer community on the Radxa Forum
- **Software Updates**: Regular firmware and OS updates

8.2 Contact

- Technical inquiries: support@radxa.com
- Enterprise solutions: sales@radxa.com