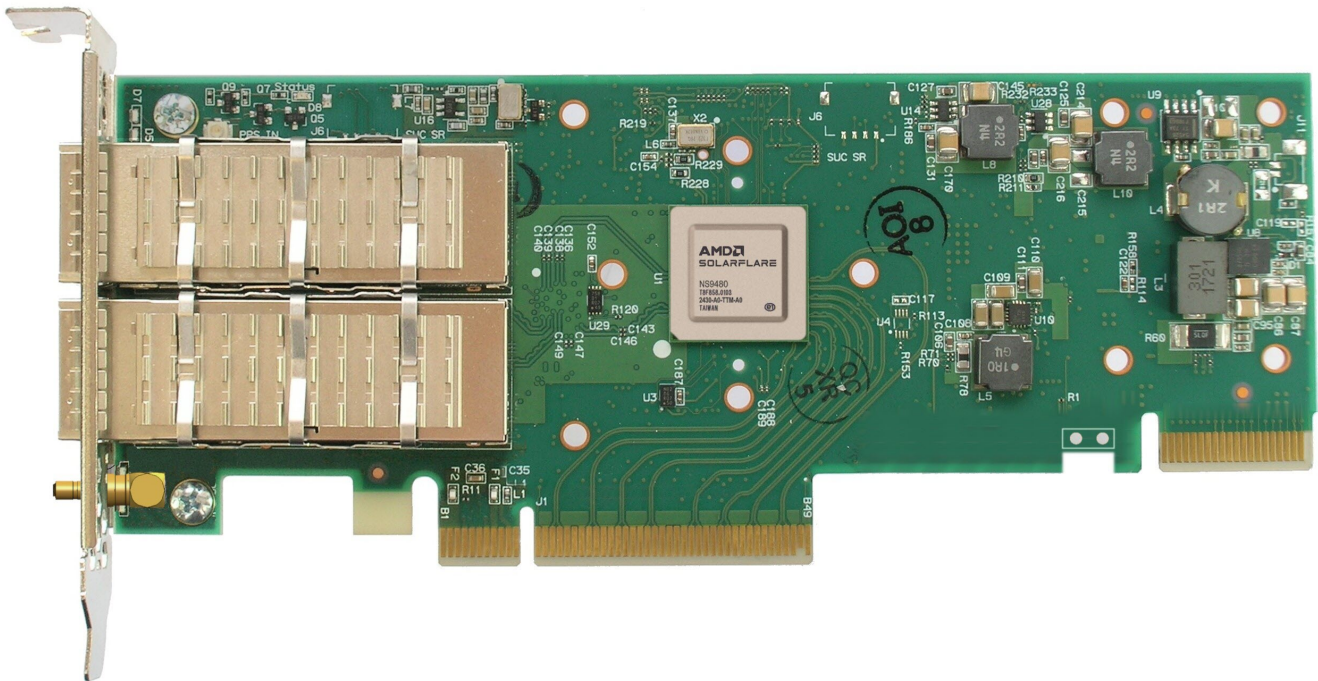


Summary

The AMD Solarflare™ X4542 Ethernet adapter provides low latency networking, network acceleration capabilities, and Enterprise class Ethernet functionality. As shown in the following figure, it is a single slot, half length, half height form factor passively cooled card.

Figure 1: AMD Solarflare X4542 Ethernet Adapter



X30541-021725

It uses a custom ASIC. It has two QSFP56 network connections and a PCI Express® Gen5 x8 edge-finger interface connected to the ASIC. Each QSFP56 cage supports a single port at 1 GbE / 10 GbE / 25 GbE / 40 GbE / 50 GbE / 100 GbE. Alternatively, one QSFP56 cage supports four ports at 1 GbE / 10 GbE / 25 GbE, and the other QSFP56 cage is administratively shutdown and is assigned for future expansion. See [Figure 2: X4542 Block Diagram](#).

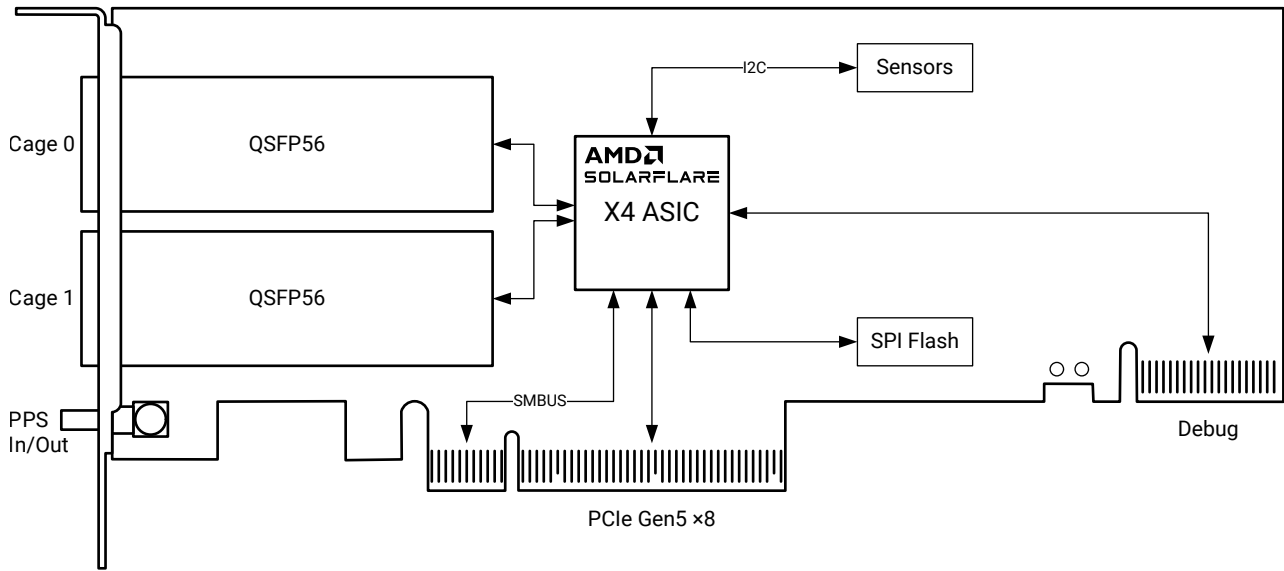
The adapter has a maximum electrical card load of 23.2W using Direct Attach Copper (DAC) cables.

It offers PCIe link, out of band management, and firmware upgrade using devlink.

Block Diagram

A block diagram of the X4542 is shown in the following figure.

Figure 2: X4542 Block Diagram



X30627-061025

Product Details

Table 1: AMD Solarflare X4542 Ethernet Adapter Product Details

| Specification | AMD Solarflare X4542 Ethernet Adapter |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Production product SKU | X4542 X4542-PLUS X4542-PLUS-5YW |
| Add regulatory product code | SR243 |
| Typical electrical card load | 23.2W using DAC cables (2 × 100 GbE, both cages active) |
| Thermal cooling solution | Passive |
| Form factor | Half height, half length |
| Network interface | 2 × QSFP56, each of which supports a single port at 1 GbE / 10 GbE / 25 GbE / 40 GbE / 50 GbE / 100 GbE. Alternatively, one QSFP56 cage supports four ports at 1 GbE / 10 GbE / 25 GbE, and the other QSFP56 cage is administratively shutdown and is assigned for future expansion |
| PCIe interface | Gen5 x8, PCIe CEM 5.0 compliant |

Table 1: AMD Solarflare X4542 Ethernet Adapter Product Details (cont'd)

| Specification | AMD Solarflare X4542 Ethernet Adapter |
|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feature summary | <ul style="list-style-type: none"> Secure firmware upgrade and hardware root of trust OS support: <ul style="list-style-type: none"> Red Hat Enterprise Linux (RHEL) Ubuntu UEFI boot support PXE over UEFI NC-SI/PLDM MCTP over SMBus and PCIe VDM Onload™ support TCPDirect support ef_vi support |

Card Specifications

Dimensions

AMD Solarflare X4542 Ethernet adapters are compliant with the PCIe CEM rev. 5.0 specification as single slot, half height, half length cards. The dimensions in the following table do not include the bracket.

Table 2: Card Dimensions

| Parameter | Dimension |
|-----------|----------------------|
| Height | 0.72 inch (18.3 mm) |
| Width | 2.73 inch (68.90 mm) |
| Length | 6.6 inch (167.65 mm) |

Network Interfaces and Manageability

The X4542 Ethernet adapter supports both in-band and out-of-band communication with the host.

Inband communication is provided over the PCIe bus. Link and speed are set during PCIe enumeration, with eight lanes allocated to the X4 device. The sensor values can be read using the sensors command from the lm_sensors package in your Linux distribution.

For out-of-band communications, the platform management subsystem on the adapter uses Platform Management Components Infrastructure (PMCI) conformance standards and command implementations. Adapter manageability is supported through the platform level data model (PLDM) and network controller sideband interface (NC-SI) specifications. Limited link, self-test, and diagnostics is also available through the unified extensible firmware interface (UEFI) interface.

The X4542 Ethernet adapter supports the following manageability protocols:

- PLDM
- NC-SI

The X4542 Ethernet adapter supports the following manageability transports:

- MCTP SMBus
- MCTP PCIe VDM

Operating System Compatibility

The AMD Solarflare X4542 Ethernet adapter is supported on:

- RedHat Enterprise Linux.
- Canonical Ubuntu Server LTS.

For more information refer to the *Release Notes* for the X4542 drivers and other software that you are using.

Thermal Specifications

AMD Solarflare X4542 Ethernet adapters support airflow in either direction:

- Normal flow, where airflow is out from the I/O bracket.
- Reverse flow, where airflow is into the I/O bracket.

Figure 3: Airflow Direction for X4542 Ethernet Adapters



X30629-021925

The following table shows requirements for AMD Solarflare X4542 Ethernet adapters that are dependent on airflow direction.

Table 3: Airflow Direction Dependent Requirements

| Specification | Requirements |
|---------------------------------------------------------|-----------------------------------------------------------------------|
| Inlet temperature | $\leq 55^{\circ}\text{C}$ |
| Inlet air speed | ≥ 300 LFM uniform velocity |
| Minimum air velocity pressure | 0.7 inAq |
| QSFP case temperature for airflow entering PCIe bracket | QSFP ($\leq 2.5\text{W}$) case should be rated 70°C |
| QSFP case temperature for airflow exiting PCIe bracket | QSFP ($\leq 2.5\text{W}$) case should be rated 85°C |
| Airflow entering PCIe bracket area | 66.87 mm x 13.18 mm |
| Airflow exiting PCIe bracket area | 56.51 mm x 20.33 mm |

Operating and Storage Conditions

Table 4: Operating and Storage Environmental Conditions

| Specification | Requirements |
|------------------------------------|-----------------------------------------------------|
| Storage temperature | -40°C to 75°C |
| Storage humidity, non-condensing | 5% to 95% |
| Operating temperature gradient | $15^{\circ}\text{C}/\text{hour}$ |
| Operating humidity, non-condensing | 8% to 90%, and a dew point of -12°C |

Notes:

1. The above operating conditions are based on preliminary data. X4542 Ethernet adapters are targeted to operate between an inlet ambient from 5°C to 55°C . For more information, contact your AMD sales representative.

International Compliance Information

This section details the worldwide compliance information for this product, which is manufactured to be compliant in the regions where it is sold.


Any modifications to this device or its usage in an open chassis if not expressly approved by Advanced Micro Devices, Inc. may impact its compliance.

FCC Compliance Information (USA) - Class A

This product complies with FCC Rules Part 15. Operation is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his own expense.

 **WARNING!** *Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

FCC Part 15, Subpart B, Class A

For Further Compliance Information:

Advanced Micro Devices, Inc.
ATTN: General Counsel
P.O. Box 3453
Sunnyvale, CA 94088-3453
USA Tel: 408-749-4000

ISED Compliance Information (Canada) - Class A

This Class A digital apparatus complies with Canadian ICES-003: CAN ICES-3(A)/NMB-3(A).

Cet appareil numérique de la Classe A est conforme à la norme CAN ICES-3(A)/NMB-3(A) du Canada.

UKCA Compliance Information (United Kingdom)



This device complies with the following Directives:


- S.I. 2016/1091: Electromagnetic Compatibility Regulations 2016
- S.I. 2016/1101: Electrical Equipment (Safety) Regulations 2016
- S.I. 2012/3032: The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

A copy of the Declaration of Conformity (DoC) to essential requirements may be obtained from:

Attention: NIC Product Applications Engineering,
Advanced Micro Devices (U.K.), Ltd.,
196 Cambridge Science Park, Milton Road,
Cambridge, CB4 0AB, U.K.

CE Compliance Information (European Union) - Class A



 **WARNING!** This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

This device complies with the following Directives:

- EMC Directive 2014/30/EU
- LVD Directive 2014/35/EU
- RoHS Directive 2011/65/EU

A copy of the Declaration of Conformity (DoC) to essential requirements may be obtained from:

Attention: Quality Director
Logic Drive, Bianconi Avenue,
Citywest, Dublin, D24 T683, Ireland
Email: product-compliance@amd.com

Electrical Safety



- USA: ANSI/UL 62368-1
- Canada: CSA C22.2 No. 62368-1
- European Union (EU): EN 62368-1
- International: IEC 62368-1

VCCI ITE Compliance Information (Japan) - Class A



この装置は、クラス A 機器です。この装置を住宅環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A

Translation:

This is a Class A equipment. Operation of this equipment in a residential environment could cause radio interference. In such a case, the user may be required to take corrective actions. VCCI - A

KC Compliance Information (Korea) - Class A



이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

Translation:

This device is a business-use (Class A) EMC-compliant device. The seller and user are advised to be aware of this fact. This device is intended for use in areas outside home.

BSMI Compliance Information (Taiwan) - Class A



警告：為避免電磁干擾，本產品不應安裝或使用於住宅環境。

Translation:

Warning: To avoid electromagnetic interference, this product should not be installed or used in a residential environment.

Morocco Compliance Information



Moroccan Regulatory Framework (CMIM)

RCM Compliance Information (Australia and New Zealand)



This device complies with the requirements of the relevant Australian Communications and Media Authority (ACMA) Standards made under the Radio communications Act 1992 and the Telecommunications Act 1997.

Environmental Information

This section details the environmental information for this product.

BSMI RoHS Table

The following is the BSMI table for X4542.

| Item 項目 | Restricted Substances and their Chemical Symbols 限用物質及其化學符號 | | | | | |
|---------------------------------------------------|----------------------------------------------------------------|----------------------|----------------------|---------------------------------------------------|-----------------------------------------------|----------------------------------------------------------|
| | Lead 鉛 (Pb) | Mercury 汞 (Hg) | Cadmium 鎘 (Cd) | Hexavalent Chromium 六價鉻 (Cr ⁺⁶) | Polybrominate d Biphenyls 多溴聯苯 (PBB) | Polybrominate d Diphenyl Ethers 多溴二苯醚 (PBDE) |
| | | | | | | |
| Electrical Enclosures 电气外壳 | ○ | ○ | ○ | ○ | ○ | ○ |
| Fasteners 紧固件和彈簧 | ○ | ○ | ○ | ○ | ○ | ○ |
| PCBAs 印刷电路板組裝 | ○ | ○ | ○ | ○ | ○ | ○ |
| Mechanical Parts 機械零件 | ○ | ○ | ○ | ○ | ○ | ○ |
| Other Electrical Enclosure Components 其他电气外壳組件 | ○ | ○ | ○ | ○ | ○ | ○ |

| Item 項目 | Restricted Substances and their Chemical Symbols 限用物質及其化學符號 | | | | | |
|-------------------------------------|----------------------------------------------------------------|----------------------|----------------------|---------------------------------------------------|-------------------------------------------|---------------------------------------------------|
| | Lead 鉛 (Pb) | Mercury 汞 (Hg) | Cadmium 鎘 (Cd) | Hexavalent Chromium 六價鉻 (Cr ⁺⁶) | Polybrominated Biphenyls 多溴聯苯 (PBB) | Polybrominated Diphenyl Ethers 多溴二苯醚 (PBDE) |
| | | | | | | |
| Plastic and Rubber Parts 塑料和橡膠零件 | ○ | ○ | ○ | ○ | ○ | ○ |

Notes:

- "Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.
"超出 0.1 wt %" 及 "超出"0.01 wt %" 係指限用物質之百分比含量超出百分比含量基準值。
- "○" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.
"○" 係指該項限用物質百分比含量未超出百分比含量基準值。
- The "-" indicates that the restricted substance corresponds to the exemption.
"-" 係指該項限用物質為豁免項目。

Product Environmental Compliance



For information on China RoHS, EU RoHS, or EU REACH compliance, refer to Product Environmental Compliance on the AMD Web site.

Waste Electrical and Electronic Equipment (WEEE) Directive Compliance (European Union)



Revision History

The following table shows the revision history for this document.

| Section | Revision Summary |
|------------------------|------------------|
| 10/06/2025 Version 1.0 | |
| Initial release. | N/A |

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