



AI Accelerator Card

CRL-G18U-P3DF/CRL-G116U-P3DF

Hardware User Manual

E17709

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Conventions used in this manual

To highlight key information in this manual, some text are presented as follows:

IMPORTANT! This message contains vital information that must be followed to complete a task.

NOTE: This message contains additional information and tips that can help complete tasks.

WARNING! This message contains important information that must be followed to keep you safe while performing certain tasks and prevent damage to your Single Board Computer's data and components.

Typography

Bold text Indicates a menu or an item to select.

Italic This indicates sections that you can refer to in this manual.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

ASUS Websites

The ASUS websites worldwide (<https://www.asus.com/>) provide updated information on ASUS hardware and software products. The ASUS websites are listed in the ASUS Contact Information on the inside front cover of this installation guide.

Optional Documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

1

Product Overview

1.1 Introduction

ASUS AI accelerator card is a full height, half length, PCIe Gen3 AI acceleration card based on Google Coral Edge TPU processor. It allows users to build intelligent devices that are efficient, private and ideal for edge AI inference. With twin Axial-tech turbofans which propel cool air over a Copper heatsink in order to dispatch the most heat from the cores, the optimized thermal solution guarantees the best performance at high workload.

The heart of ASUS Edge AI accelerators is the Edge TPU coprocessor. It's a small-yet-mighty, low-power ASIC (Application-specific integrated circuit) that provides high performance neural net inferencing. Edge TPU is optimized for TensorFlow Lite models, which means common ML models can be easily compiled and run on the ASUS AI accelerator card.

1.2 Features

CRL-G18U-P3DF/CRL-G116U-P3DF features are listed below

- Eight Google Coral Edge TPU
- Interface: PCIe Gen. 3 x16
- Dual Active Turbofan
- High performance: INT8, 32TOPS/64TOPS
- Supports TensorFlow Lite framework for on-device deep learning inference
- Easy IoT integration between edge AI solution and cloud TPU

1.3 Product specification

		CRL-G18U-P3DF	CRL-G116U-P3DF
Main Chip	Core	Google® Coral Edge TPU Processor	
PCI Express interface		PCI Express 3.0 x16	
Software	Supported Framework	TensorFlow lite	
	Precision	INT8	
	Performance	32 TOPS	64 TOPS
Thermal Solution	FAN design	Active Fan	
Power	Power Connector	1 x 6-pin 12V External Power	
	Power Consumption	36 W	52 W
Operating System	Linux	Ubuntu 18.04, Debian 10 * For latest OS support list, please check the Software User Manual at https://iot.asus.com/products/AI-accelerator/AI-Accelerator-PCIe-Card/	
Environment	Operating Temperature	0~55°C	
	Non-Operating Temperature	-40~85°C	
	Relative Humidity	0%~85%	
Dimensions	Width	42.1 mm	
	Height	126.3 mm	
	Depth	186.3 mm	
Weight		516 g	530 g

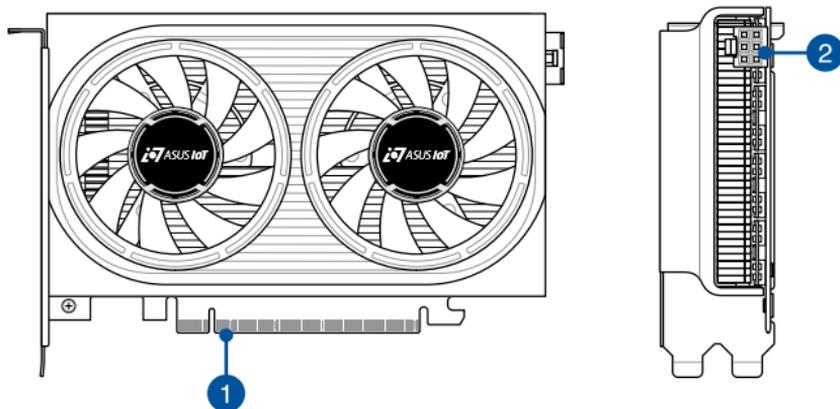
1.4 Package contents

Check your package for the following items:

- 1 x AI Accelerator Card
- 1 x Hardware User Manual

NOTE: If any of the above items is damaged or missing, please contact your distributor or sales representative immediately.

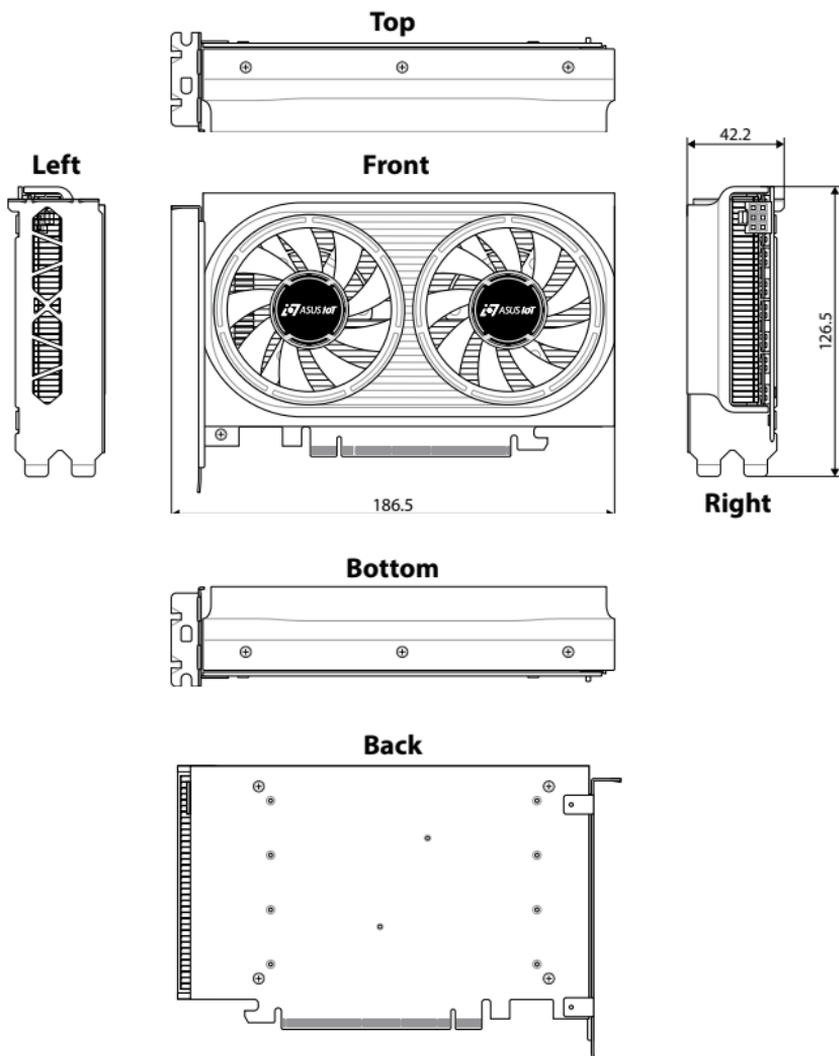
1.5 Card layout



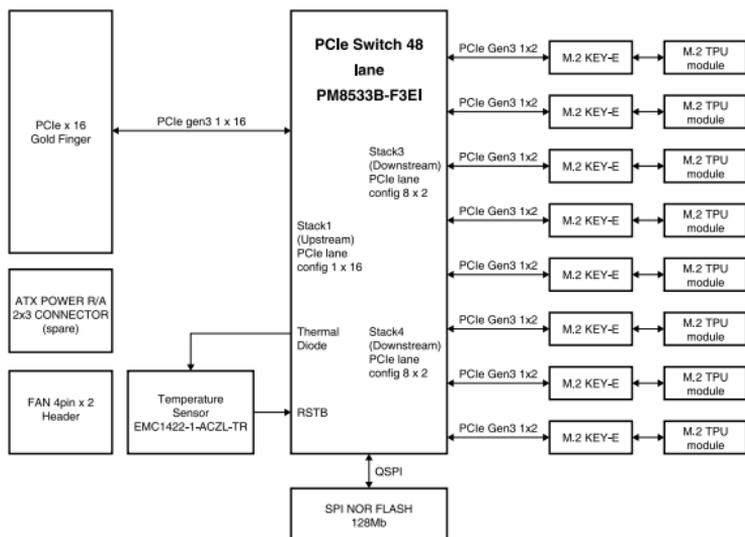
Layout contents

- | | |
|----|-----------------------|
| 1. | Golden fingers |
| 2. | 6-pin Power connector |

1.6 Dimensions (mm)



1.7 Block diagram



2

Hardware Installation

2.1 Before you proceed

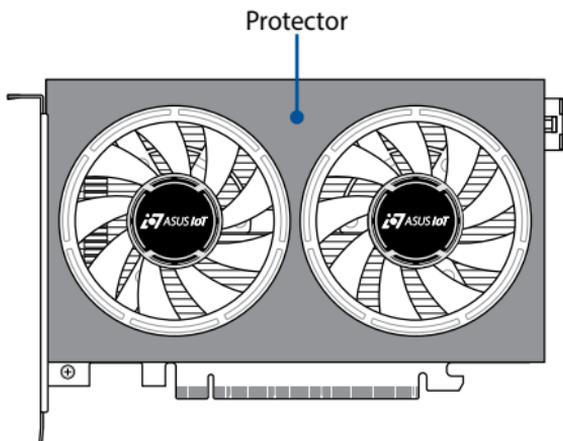
Take note of the following precautions before you install the AI accelerator card or change any settings.

WARNING!

- Unplug the power cord from the wall socket before touching any component.
 - Before handling components, use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, to avoid damaging them due to static electricity.
 - Hold components by the edges to avoid touching the ICs on them.
 - Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
 - Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, or components.
 - We do not recommend removing or changing the M.2, doing so may cause damage to your AI accelerator card or M.2.
-

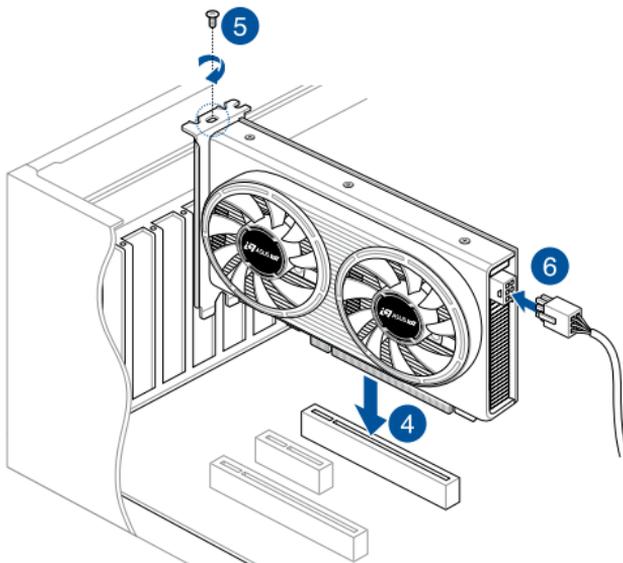
2.2 Card installation

1. Power off your system and unplug the power cables connected to your system.
2. Remove your system's chassis cover and locate the PCI Express slot.
3. Prepare the AI accelerator card and peel off the protector in the highlighted area.



4. Insert the AI accelerator card into the PCIe slot, then push down until it is firmly in place.
5. Secure the card into the slot with a screw.
6. Connect a power cable to the AI accelerator card.

NOTE: There is an auxiliary power connector which supports the power to this AI acceleration card, connect the appropriate power plug from the system power supply to the AI acceleration card's auxiliary power connector.



7. Replace your system's chassis cover.
8. Reconnect all power cables

Appendix

Safety information

Your AI Accelerator card is designed and tested to meet the latest standards of safety for information technology equipment. However, to ensure your safety, it is important that you read the following safety instructions.

Electrical safety

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing devices on your motherboard, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and extreme temperature. Do not place the product in any area where it may be exposed to moisture.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

Care during use

- Do not walk on the power cord or allow anything to rest on it.
- Do not spill water or any other liquids on your system.
- When the system is turned off, a small amount of electrical current still flows. Always unplug the power cord from the power outlets before cleaning the system.
- If you encounter the following technical problems with the product, unplug the power cord and contact a qualified service technician or your retailer.
 - The power cord or plug is damaged.
 - Liquid has been spilled into the system.
 - The system does not function properly even if you follow the operating instructions.
 - The system was dropped or the cabinet is damaged.
 - The system performance changes.

Lithium-Ion Battery Warning

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

NO DISASSEMBLY

The warranty does not apply to the products that have been disassembled by users



DO NOT throw the Single Board Computer in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical, electronic equipment, and mercury-containing button cell battery) should not be placed in municipal waste. Check local technical support services for product recycling.

Notices

FCC Compliance Information

Responsible Party: Asus Computer International

Address: 48720 Kato Rd., Fremont, CA 94538, USA

Phone / Fax No: (510)739-3777 / (510)608-4555

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Compliance Statement of Innovation, Science and Economic Development Canada (ISED)

This device complies with Innovation, Science and Economic Development Canada licence exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

CAN ICES-3(B)/NMB-3(B)

Déclaration de conformité de Innovation, Sciences et Développement économique Canada (ISED)

Le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

La bande 5150–5250 MHz est réservée uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

CAN ICES-3(B)/NMB-3(B)

VCCI: Japan Compliance Statement

Class B ITE

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

VCCI-B

KC: Korea Warning Statement

B급 기기 (가정용 방송통신기자재)

이 기기는 가정용(B급) 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

*담해 무선설비는 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없습니다.

Declaration of compliance for product environmental regulation

ASUS follows the green design concept to design and manufacture our products, and makes sure that each stage of the product life cycle of ASUS product is in line with global environmental regulations. In addition, ASUS disclose the relevant information based on regulation requirements.

Please refer to <http://csr.asus.com/Compliance.htm> for information disclosure based on regulation requirements ASUS is complied with:

EU REACH and Article 33

Complying with the REACH (Registration, Evaluation, Authorisation, and Restriction of Chemicals) regulatory framework, we published the chemical substances in our products at ASUS REACH website at <http://csr.asus.com/english/REACH.htm>.

EU RoHS

This product complies with the EU RoHS Directive. For more details, see <http://csr.asus.com/english/article.aspx?id=35>

India RoHS

This product complies with the “India E-Waste (Management) Rules, 2016” and prohibits use of lead, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) in concentrations exceeding 0.1% by weight in homogenous materials and 0.01% by weight in homogenous materials for cadmium, except for the exemptions listed in Schedule II of the Rule.

Vietnam RoHS

ASUS products sold in Vietnam, on or after September 23, 2011, meet the requirements of the Vietnam Circular 30/2011/TT-BCT.

Các sản phẩm ASUS bán tại Việt Nam, vào ngày 23 tháng 9 năm 2011 trở về sau, đều phải đáp ứng các yêu cầu của Thông tư 30/2011/TT-BCT của Việt Nam.

Turkey RoHS

AEEE Yönetmeliğine Uygundur

ASUS Recycling/Takeback Services

ASUS recycling and takeback programs come from our commitment to the highest standards for protecting our environment. We believe in providing solutions for you to be able to responsibly recycle our products, batteries, other components as well as the packaging materials. Please go to <http://csr.asus.com/english/Takeback.htm> for detailed recycling information in different regions.



DO NOT throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.



DO NOT throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

Regional notice for California



WARNING

Cancer and Reproductive Harm -
www.P65Warnings.ca.gov

ASUS contact information

ASUSTeK COMPUTER INC.

Address	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Telephone	+886-2-2894-3447
Fax	+886-2-2890-7798
Web site	www.asus.com

Technical Support

Telephone	+86-21-38429911
Fax	+86-21-5866-8722, ext. 9101#
Online support	https://www.asus.com/support/Product/ContactUs/Services/questionform/?lang=en

ASUS COMPUTER INTERNATIONAL (America)

Address	48720 Kato Rd., Fremont, CA 94538, USA
Telephone	+1-510-739-3777
Fax	+1-510-608-4555
Web site	http://www.asus.com/us/

Technical Support

Support fax	+1-812-284-0883
Telephone	+1-812-282-2787
Online support	https://www.asus.com/support/Product/ContactUs/Services/questionform/?lang=en-us

ASUS COMPUTER GmbH (Germany and Austria)

Address	Harkortstrasse 21-23, 40880 Ratingen, Germany
Web site	https://www.asus.com/de
Online contact	https://www.asus.com/support/Product/ContactUs/Services/questionform/?lang=de-de

Technical Support

Telephone (DE)	+49-2102-5789557
Telephone (AT)	+43-1360-2775461
Online support	https://www.asus.com/de/support

Call center:	https://www.asus.com/support/CallUs
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