ASUS IoT
IN SEARCH OF INCREDIBLE

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IN SEARCH OF INCREDIBLE

intel partner Titanium

Intelligent Edge Computing Solutions and Services

Accelerating AI at the Edge

Product Guide

iot.asus.com

ASUS

TABLE OF **CONTENTS**

ABOUT ASUS

ASUS is a global technology leader with over 5,000 R&D professionals and 1,300 service centers covering 98 countries. ASUS IoT offers a comprehensive portfolio of hardware, software and tailor-made internet of things (IoT) and artificial intelligence solutions to support customers in the development of fully integrated and efficient time-to-market applications and reduce their total cost of ownership.

FORTUNE — One of the World's Most Admired Companies (for 7 years)

Interbrand — Best Global Taiwan Brand (for 9 years)

Forbes — World's Best Employers 2022

KEEPING ENVIRONMENT IN MIND

ASUS is fully committed to creating a sustainable future. We believe in adopting an eco-friendly approach towards every aspect of our business and being an active participant in environmental assessment programs for a greener tomorrow. Our GreenASUS philosophy guides both our internal practices and production processes, so we remain focused on safeguarding our planet.

Green Design
Good product design is not only about aesthetics, but also about how it is built and functions. Products should use modular components for simple repairs and prolonged lifespans, and be easily recyclable.

Green Manufacturing
Any product is only as green as its manufacturing processes. ASUS adheres to strict guidelines to ensure products are produced without hazardous substances like lead and halogens.

Green Services and Marketing
ASUS is part of environmental assessment programs and certifications such as EPEAT and TCO, ensuring the company meets or exceeds green technology standards.

Green Procurement
ASUS is not only committed to reducing its own environmental impact, but also to ensuring a greener supply chain from component sourcing to product shipping.

Internationally Certified
Enterprise-proven and with leading quality that exceeds industry standards, ASUS is certified by multiple international safety and environmental organizations, including UL and Blue Angel. ASUS provides safe, secure and sustainable solutions, making them the ideal choice for your business.

ABOUT ASUS IoT

ASUS IoT is a sub-brand of ASUS dedicated to the creation of incredible solutions in the fields of AI and IoT. Our mission is to become a trusted provider of embedded systems and partner to the wider AIoT solutions ecosystem. ASUS IoT strives to deliver best-in-class products and services across diverse vertical markets, and to partner with customers in the development of fully integrated and rapid time-to-market applications that drive efficiency – providing convenient, efficient and secure living and working environments for people everywhere.

- Leading hardware design and software development capabilities
- Exceptional quality control for reliability, compatibility and safety
- Efficient thermal design and power protection
- Product availability guarantee
- x86 and ARM-platform solutions
- Multiple compliances available

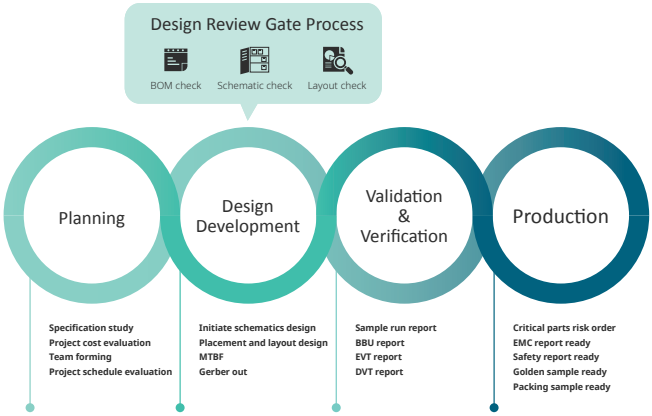
intel partner Titanium

ASUS is a Titanium tier members of Intel® Partner Alliance., one of the world's most trusted associations for delivering first-in-market IoT solutions. The membership represents a close relationship between ASUS and Intel and enables ASUS to provide clients with better strategies, support and continuous innovation.

Design & Manufacturing Service

Better Process, Better Results

ASUS is known for creating products and services that exceed industry standards. Our engineers design to exacting standards to guarantee quality, and we use only the best components to ensure real-world performance and reliability. Along with offering customized production at low or high volumes, ASUS also provides flexible options for modified standards or fully customized design and manufacturing services for modules, motherboards or systems.



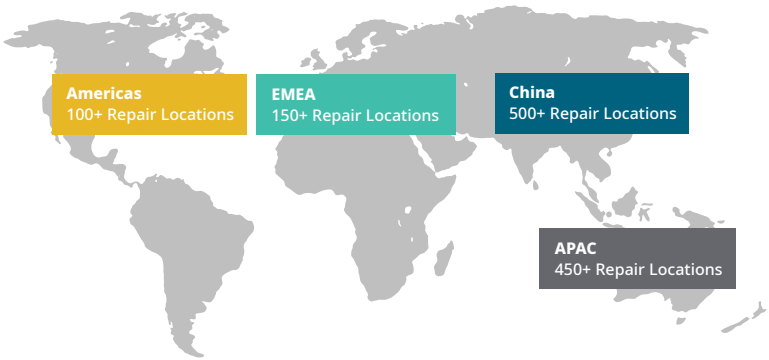
All ASUS products undergo a series of strict validations, so customers can rest assured that they will receive consistent results of the highest quality.

- Dynamic tests - Altitude, vibration, shocks, and drops
- Environment tests - Temperature, humidity, thermal, acoustic noise and hardware monitor
- Power tests - Line voltage and frequency, power consumption, power line disturbance
- Function tests - BIOS for UEFI, system utilities, OS, and external hardware compatibility
- Emissions tests - EMC, EMI

ASUS factories are certified by ISO 9001, ISO 14001, OHSAS 18001, ISO 13485, QC 080000, and ISO/TS 16949 and ASUS offers customers the opportunity to visit our production facilities. To schedule a visit, please contact with your local ASUS representative.

Global Reach, Local Touch

ASUS has hundreds of local service centers around the world that provide efficient, timely service by enabling customers to drop office items in need of repair instead of shipping them to a remote location. These service centers are either owned or operated by ASUS or by authorized service providers trained and certified by ASUS to provide the best service and quality.



Automation

ASUS IoT Automation is optimized for robustness, intelligence, flexibility and manageability and offers faster time-to-market with standards-based, pre-validated systems, plus fanless-chassis designs and purpose-built I/O adaptability to support the ever-growing spectrum of industrial and machine-vision applications.

Hospitality

ASUS IoT hospitality is designed for hotels, event centers, and travel organizations. Leveraging leading technologies and our hardware and software expertise, ASUS IoT offers tailored solutions to enhance guest experiences and to improve workflow efficiency and flexibility, increasing overall productivity.

Retail

ASUS IoT smart retail solutions are designed for retailers that need powerful systems built to withstand commercial environments and support for extensive AI capabilities. We provide a comprehensive product range and competitive tailored solutions for any retail environment, helping store owners to making the most of their budget and upgrade the operational efficiency of their business. Applications include self-service kiosks, digital signage, vending machine, point-of-sale (PoS) terminals and more.

Gaming

ASUS IoT Gaming is designed for video lottery terminals (VLT), slot and lottery machines, infotainment for electronic games and kiosks with the latest processing performance, support for new graphics technologies, security enhancements and trusted reliability to ensure great entertainment experiences for users. As a Titanium tier members of Intel® Partner Alliance, ASUS IoT offers system integrators access to new processing technologies, roadmaps and resources for planning.

Healthcare

ASUS IoT fanless systems and industrial motherboards are designed for point-of-care devices, integrated operating rooms, general wards, and medication administration. ASUS IoT fanless systems feature fully sealed, gap-free housings in addition to their fanless design to prevent accumulation of bacteria and maintain hygienic conditions at hospitals to reduce the risk of infection.

Lifestyle & Home

ASUS IoT Smart Home products are innovative solutions that implement the latest technologies to create a wholly integrated, connected smart home ecosystem. We offer a range of products designed to enhance efficiency, along with products that make your home more comfortable and secure.

Success Stories

Epidemic Prevention

During the COVID-19 pandemic, many countries have adopted strict measures, such as imposing lockdowns and closing schools to encourage social distancing. A company in China utilizes ASUS Tinker Board to develop AI Face Recognition Intelligent Column, in which high-precision temperature measurement and dynamic face recognition are implemented to help stop the spread of disease on school campuses.

Interactive Kiosks

A leading European terminal company uses Tinker Board for their interactive kiosks to allow retailers to create a real connection with their customers. The touch terminals develop in all networks, whether to develop sales (e.g., interactive range extension catalog), inform or communicate.

Warehouse Management

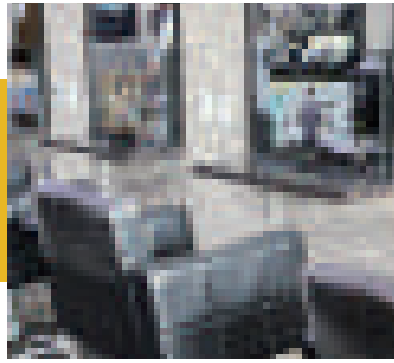
Building solution for effective tracking, sorting and distribution of packages, an IT firm from China uses the ASUS Tinker Board in a machine vision camera system to manage warehouses. The system efficiently reads package codes and performs optical character recognition (OCR). These intelligent functions, enabled by Tinker Board, enable sorting and distribution with incredible accuracy and efficiency.

ASUS IoT Tinker Edge T powers self-driving car at Maker Faire Taipei 2019

A leading manufacturer of people-counting devices uses Tinker Edge T for their smart camera to help optimize customer traffic, staff and marketing strategies to increase conversion rates and profits with actionable data.

Smart Mirror

Solmate adopts ASUS IoT EV22A and EV13A as Smart Mirror applications in hair salon, opening up a new and innovative DOOH advertising channel. EV22A and EV13A Smart Mirror products are complementary pair with larger and smaller dimensions to fit different settings. EV22A and EV13A have now been deployed in 880+ hair salons across numerous major cities and township throughout Taiwan.



EV-charging Station

Fortune Electric creates an all-new EV-charging station with the powerful and versatile ASUS IoT ALPR Edge AI Dev Kit. ALPR technology is powered by artificial intelligence (AI) and coupled with a deep-learning algorithm to minimize image noise and maximize identification of key markers, just as the license-plate boundary. In tandem with the ASUS Open Cloud Infrastructure Software (OCIS), the new charging pile is able to deliver incredible-accurate ALPR recognition of up to 99.99% for reliable automated billing – including for both parking and charging.

Vending Machine

A vending machine manufacturer is developing a next-generation vending machine with ASUS IoT PE200U that helps it better connect with customers and to offer those customers browsing and buying experiences that are several levels above traditional vending-machine experiences. ASUS IoT PE200U is an intelligent, TCO-optimized edge computer for IoT applications. It can reshape the vending-machine experience for consumers and help our client realize greater profits through improved inventory control and targeted point-of-sale advertising.

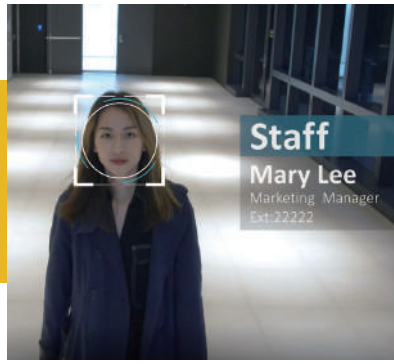
Success Stories

EHS Safety Management System

Bridgestone Taiwan partners with ASUS IoT for EHS Safety Management System implementation. Through EHS Safety Management System, operational hazards can be quantifiable and potential unknown hazards can be identified, making performance analysis and education workflows much more streamlined and effective.

Smart Access Control

The building has AI-driven facial recognition technology and a network of IP cameras that provide reliable, high-precision, monitoring in real time. The system offers flexible controls and can be set to send alerts to relevant administrators or departments if a face is not recognized, which provides efficient and effective security.

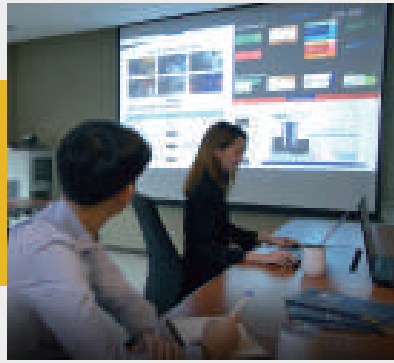


Glass-inspection Machine

A leading industrial-equipment system integrator (SI) uses ASUS IoT Q170A-IM-A industrial motherboard with an ASUS IoT EBE-4U barebones rackmount server to support a bespoke glass-inspection machine for smartphone manufacturing. The pairing of these two versatile products, with the extensive connectivity offered by Q170A-IM-A, allowed the SI to create an industrial inspection machine with scope for significant expansion.

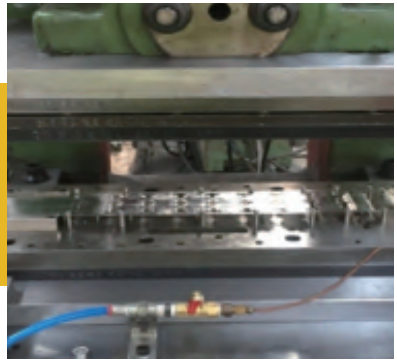
Smart Meeting Room

ASUS IoT technology allows employees to use smart meeting rooms for a variety of needs. These smart meeting rooms are-equipped with AI-enabled check-in using facial recognition technology, automated lighting after successful check-in, wireless presentation capability and thermostat controls, a real-time device status monitoring via a single dashboard screen.



Metal Stamping Inspection

A metal stamping factory uses ASUS AI Computer Vision Solution for smart manufacturing application to save metal stamping factory cost and set QC standard new height. ASUS provides complete In-line inspection and ready API to align production process. ASUS sets the quality inspection high standard to minimize the deviation to increase throughput and customer satisfaction.



Smart Gym

The ASUS IoT Smart Gym people-counting System helps to keep track of fitness equipment usage by age and gender. The back-end of the system performs integrated data analysis, and the data is then used to plan courses and schedule resources. These technologies allow managers to immediately view the overall use of the leisure center, which greatly enhances management efficiency and performance.

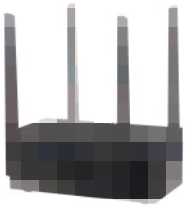
EDGE COMPUTERS

At the very frontier of AIoT and Cloud computing, edge computer is in charge of processing, filtering, analyzing and acting on data received in real-time, which not only reduces the traffic of data also provides lower latency and the cost of data transmission.

ASUS IoT Edge Computers are built for 24/7 stability and reliability, combined with our world-class after-sales service and guaranteed long-term availability - your investment for the duration of the product lifecycle is maximized.

PE100A

NXP® i.MX 8M ARM Cortex-A53 core, 4GB LPDDR4, HDMI, Dual LAN, 16G eMMC, 1*M.2 E Key slot, 1*Mini-PCIe, 1*Micro SD Card, 3*USB 3.2 Gen 1



Microsoft Azure Certified

yocto PROJECT

Coral

Features

- Certified with RF Regulation: CE-RED
- 16GB on board MMC, Mini PCIe slot for storage capacity
- Compact size gateway with low power consumption for diverse IoT applications
- Supports Linux Yocto OS, Ubuntu core and Ubuntu server
- Wide Operating Temperature Range: -20~60°C

Specifications

System	CPU	NXP® i.MX 8M ARM Cortex-A53 Quad core , 1.3 GHz
	Memory	4 GB LPDDR4 onboard
	OS Storage	16 GB eMMC onboard
Wired Interfaces	Video	1 x HDMI 2.0, supports up to 3840 x 2160 @60Hz
	Ethernet	2 x 10/100/1000 Mbps, RJ45 1 x Realtek® RTL8211, supports WOL 1 x Intel I211-AT/I210-AT, supports WOL
	USB	2 x USB 3.2 Gen.1, Type-A 1 x USB 3.2 Gen.1, supports OTG, Type-C
	COM	1 x RS-232/CANBus (by request)(COM1) 1 x RS-232/422/485 (COM2), 2 x 5 terminal block
	DIO	4 x DI, 4 x GND, 2.5 KV optical isolation 4 x DO, 4 x GND, 10KV relay isolation, 2 x 8 terminal block
Wireless Interfaces	Wi-Fi	1 x M.2 2230 E-key socket, supports 802.11 a/b/g/n/ac + BT 4.2 module
	SIM	1 x nano-SIM slot
Expansion Slot	mPCIe	1 x mPCIe socket, supports SATA or USB signal for mSATA/LTE/Google®TPU module
	M.2 E key	1 x M.2 2230 E key socket, supports PCIe or USB signal for Wi-Fi/BT
AI	Edge TPU	Google® Coral Edge TPU (mPCIe socket)
Power	Power	12 to 24 V DC, 2-pin terminal block
Mechanical	Mounting	Wall mount/ Din Rail
	Dimensions	55.5(H) x 145(W) x 78(D) mm
	Weight	0.775 KG
Environment	Operating Temp.	-20~60°C with wide temperature parts, fanless
	Storage Temp.	-40~85°C
	Relative Humidity	10 to 95% (non-condensing)
	EMC	CE(ITE), FCC, VCCI, RCM, BSMI, CCC
	RF Regulation	LTE: CE-RED
	Safety	UL,CB, CCC, BSMI, CE
	Vibration	Operating: 0.21Grms, 5~500 Hz, 20min duration
	Shock	Operating: 50 G, half sine 11ms duration
	Green	GA (RoHS)
Security	TPM header	Cooperate with TPM 2.0 powered by Nuvoton NCPT 750 (Optional)
Others	Watch dog timer	Yes. Set up by software
	Operating System	Linux Yocto, Ubuntu server/ core

PE200U

Intel® Core™ i7/i5/i3 Processor, DDR4 2400MHz, DP, HDMI, Dual-LAN, Multiple COM, 12-24V DC

Features

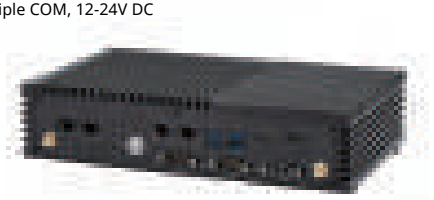
- Supports 2 x RS-232/422/485, 4 x RS-232
- Supports dual independent video outputs
- Supports Windows® 10 IoT Enterprise or Linux OS
- Wide Operating Temperature Range: -20~60°C

Specifications

System	CPU	Intel® Core™ i7-8665UE	Intel® Core™ i5-8365UE	Intel® Core™ i3-8145UE
	TDP	15W	15W	15W
	# of Cores	4	4	2
	Base Freq.	1.7GHz	1.6GHz	2.2GHz
	Max Turbo Freq.	4.4GHz	4.1GHz	3.9GHz
	Memory	1 x SO-DIMM, DDR4 2400 MHz, supports up to 32GB		
External Interfaces	Display	1 x HDMI 1.4, supports up to 4096 x 2160 @ 24 Hz 1 x DP 1.2a, supports up to 4096 x 2160 @ 60 Hz		
	Ethernet	2 x 10/100/1000 Mbps, RJ45 (1 x Intel i219-V (1Gb)/1 x Intel i211AT (1Gb)) 2 x 802.11af PSE ports, RJ45 (optional) 2 x 10/100/1000 ethernet ports, RJ45 (optional) *either one		
	USB	4 x USB 3.2 Gen 2, type A 4 x USB 2.0, type A (optional)		
	Audio	1 x Mic-in, phone jack 1 x Line-out, phone jack		
	COM	2 x COM: RS-232/422/485, DB9 4 x COM: RS232, DB9 (optional)		
	GPIO	1 x 8bit GPIO, DB9		
Storage	SATA	1 x SATA 6 connector supports 2.5'' SSD		
	mSATA	1 x mSATA slot (shared with Mini PCIe socket)		
Expansion Slot	Mini PCIe	1 x Mini PCIe socket (SATA / PCIe / USB 2.0 mode)		
	M.2 M Key	1 x M.2 2242 M-key socket, (SATA / PCIe mode)		
	M.2 E Key	1 x M.2 2230 E-key socket (PCIe / USB2.0 / CNVi mode) (supports BT/Wi-Fi module/ Google TPU module)		
	SIM	1 x nano-SIM slot		
Power	Power input	12 to 24 V DC, 2-pin terminal block		
Mechanical	Mounting	Wall-mount/ VESA mount		
	Dimensions	254 (H) x 147 (W) x 57 (D) mm		
	Weight	2.45 kg		
Environment	Operating Temp.	-20~60˚C with wide temperature parts, fanless		
	Storage Temp.	-40~85˚C		
	Relative Humidity	10 to 95% (non-condensing)		
	EMC	CE (ITE), FCC , VCCI, BSMI, RCM,KCC		
	Safety	UL,CB, CCC, BSMI, CE		
	Vibration	Operating: 0.21Grms, 5~500 Hz, 20min duration		
	Shock	Operating: 50 G, half sine 11ms duration		
	Green	GA (RoHS)		
	TPM	TPM v2.0 powered by Nuvoton NCPT 750 (Optional)		
Others	Watch dog timer	Yes. HW WDT Enable (WDT_EN)		
	Operating System	Windows® 10 IoT Enterprise (64 bit) / Linux		

PE200S

Intel Atom® X Series Processor, DDR3L SO-DIMM, DP, HDMI, Dual-LAN, Multiple COM, 12-24V DC



Features

- Supports 2 x RS-232/422/485, 4 x RS-232
- Supports dual independent video outputs
- Supports Windows® 10 IoT Enterprise or Linux OS
- Wide Operating Temperature Range: -20~60°C

Specifications

System	CPU	Intel® Atom® X5-E3930	Intel® Atom® X5-E3940	Intel® Atom® X7-E3950
	TDP	6.5W	9.5W	12W
	# of Cores	2	4	4
	Base Freq.	1.3GHz	1.6GHz	1.6GHz
	Max Turbo Freq.	1.8GHz	1.8GHz	2.0GHz
	Memory	1 x SO-DIMM, DDR3L 1866 MHz, supports up to 8GB		
External Interfaces	Display	1 x HDMI 1.4, supports up to 3840 x 2160 @ 30 Hz 1 x DP 1.2a, supports up to 4096 x 2160 @ 60 Hz		
	Ethernet	2 x 10/100/1000 Mbps, RJ45 (2 x Intel i210IT (1Gb) 2 x 802.11af PSE ports, RJ45 (optional) 2 x 10/100/1000 ethernet ports, RJ45 (optional) *either one		
	USB	4 x USB 3.2 Gen 1, type A 2 x USB 2.0, type A (optional)		
	Audio	1 x Mic-in, phone jack 1 x Line-out, phone jack		
	COM	2 x COM: RS-232/422/485, DB9 4 x COM: RS232, DB9 (optional)		
	GPIO	1 x 8bit GPIO, DB9		
Storage	SATA	1 x SATA 6 connector supports 2.5'' SSD		
	Micro SD	1 x Micro SD Card slot (on-board)		
Expansion Slot	Mini PCIe	1 x Mini PCIe socket (USB / PCIex2 mode)		
	M.2 M Key	1 x M.2 2242 M-key socket, (SATA mode)		
	M.2 E Key	1 x M.2 2230 E-key socket (PCIex2 / USB 2.0 mode) (supports BT/Wi-Fi module)		
	SIM	1 x nano-SIM slot		
Power	Power input	12 to 24 V DC, 2-pin terminal block		
Mechanical	Mounting	Wall-mount/ VESA mount		
	Dimensions	254 (H) x 147 (W) x 57 (D) mm		
	Weight	2.45 kg		
Environment	Operating Temp.	-20~60˚C with wide temperature parts, fanless		
	Storage Temp.	-40~85˚C		
	Relative Humidity	10 to 95% (non-condensing)		
	EMC	CE (ITE), FCC , VCCI, BSMI		
	Safety	UL,CB, CCC, BSMI, CE		
	Vibration	Operating: 0.21Grms, 5~500 Hz, 20min duration		
	Shock	Operating: 50 G, half sine 11ms duration		
	Green	GA (RoHS)		
Security	TPM	TPM v2.0 powered by Nuvoton NCPT 750 (Optional)		
Others	Watch dog timer	Yes. HW WDT Enable (WDT_EN)		
	Operating System	Windows® 10 IoT Enterprise (64 bit) / Linux		

PE2000U

Intel® 12th Gen Core™ i7/i5/i3 Processor, DDR5 4800MHz, DP, HDMI, Dual-LAN, Multiple COM, 9-36V DC

Features

- Supports 2 x RS-232/422/485, 2 x RS-232
- Supports triple independent video outputs
- Supports Windows® 10 IoT Enterprise, Linux
- Wide Operating Temperature Range: -20~60°C

Specifications

System	CPU	Intel® Core™ i7-1265UE	Intel® Core™ i5-1245UE	Intel® Core™ i3-1215UE
	TDP	15W	15W	15W
	# of Cores	10	10	6
	Memory	2 x SO-DIMM, DDR5 4800 MHz, supports up to 64GB		
External Interfaces	Display	2 x HDMI 2.0 1 x DP 1.4a		
	Ethernet	1x 1Gbps/100Mbps/10Mbps GbE port, RJ45 (Intel i219-LM) 1x 2.5Gbps/1Gbps/100Mbps/10Mbps GbE port, RJ45 (Intel i225-V)		
	USB	4x USB 3.2 Gen 2, type-A 2x USB 2.0, type-A		
	Audio	1 x Mic-in, phone jack 1 x Line-out, phone jack		
	COM	2 x COM: RS-232/422/485, DB9 2 x COM: RS232, DB9		
	GPIO	1 x 8bit GPIO, DB9		
Storage	SATA	1 x SATA 6 connector supports 2.5'' SSD		
	mSATA	1 x mSATA slot (shared with Mini PCIe socket)		
Expansion Slot	Mini PCIe	1 x Mini PCIe socket (PCIe / USB 2.0 mode)		
	M.2 M Key	1 x M.2 2280 M-key socket (PCIe Gen3 x4/ SATA) for NVMe SSD		
	M.2 E Key	1 x M.2 2230 E-key socket (USB2.0/ CNVi mode/ 2x PCIe x1) (supports TPU/WiFi/BT module)		
	SIM	1 x external accessible nano-SIM slot		
Power	Power input	9 to 36 V DC, 2-pin terminal block		
Mechanical	Mounting	Wall-mount/ Din Rail/ VESA mount		
	Dimensions	254 (H) x 147 (W) x 57 (D) mm		
	Weight	2.45 kg		
Environment	Operating Temp.	-20~60°C with wide temperature parts, fanless		
	Storage Temp.	-40~85°C		
	Relative Humidity	10 to 95% (non-condensing)		
	EMC	CE (ITE), FCC , VCCI, BSMI, RCM		
	Safety	UL,CB, CCC, BSMI, CE		
	Vibration	Operating, MIL-STD-810H, Method 514.8, Category 4; and 5 Grms, 5-500 Hz, 3 Axes		
	Shock	Operating, MIL-STD-810H, Method 516.8, Procedure I, Table 516.6-II; 50 Grms		
	Green	GA (RoHS)		
Security	TPM	TPM v2.0 powered by Nuvoton NCPT 750 (Optional)		
Others	Watch dog timer	Yes. HW WDT Enable (WDT_EN)		
	Operating System	Windows® 10 IoT Enterprise / Linux		

PE400D

Intel® 10th Gen Xeon® W or Core™ i9/ i7/ i5/ i3 Embedded Computer with 3 expandable PCIe slots

Features

- Diverse SKUs with Intel® 10th Gen CPU support up to 64GB DDR4 memory
- 1 x mPCIe socket for cellular, 1x M.2 for Wi-Fi/BT, 1x M.2 for storage
- 3 x independent displays and 3x PCIe slots
- Wide-operating temperature: -20°C ~60°C

Specifications

System	CPU	Intel® Xeon® W-1290TE	Intel® Core™ i9-10900E	Intel® Core™ i7-10700E	Intel® Core™ i5-10500E	Intel® Core™ i3-10100E
	TDP	35W	65W	65W	65W	65W
	# of Cores	10	10	8	6	4
	Base Freq.	1.8GHz	2.8GHz	2.9GHz	3.1GHz	3.2GHz
	Max Turbo Freq.	4.5GHz	4.7GHz	4.5GHz	4.2GHz	3.8GHz
	Memory	2 x SO-DIMM, DDR4 2666/2400/2133 MHz, ECC (only for Xeon CPU), max. 64GB				
External Interfaces	Display	1 x HDMI 2.0, supports up to 4096 x 2160 @ 60 Hz 1 x HDMI 1.4, supports up to 4096 x 2160 @ 30 Hz 1 x DP 1.2, supports up to 4096 x 2304 @ 60 Hz *Default 4096 x 2304 @60Hz supports 3 independent displays at the same time				
	Ethernet	3 x Intel® i210-IT (1 GbE, TSN), RJ45				
	USB	2 x USB 3.2 gen.2, 4 x USB 3.2 gen. 1				
	Audio	1 x Mic-in, audio jack 1 x Line-out, audio jack				
	COM/CAN*	3 x COM: RS-232/422/485, DB9 1 x COM*: RS-232/422/485, CANBus (2.0A/B), DB9 *Default RS-232, configured to CANBus by onboard jumper				
	DIO	4 x DI, 4 x DO support relay output, 2 x 8 terminal block				
	SIM	2 x nano SIM slot				
Storage	CFast	1 x Type II CFast slot for OS storage				
	SATA	2 x 2.5" HDD slots (hot-swappable, supports SATA 3.0, 7~7.5mm)				
Expansion Slot	PCIe	3 x PCIe slot *2 configuration: 1 x PCIex16 + 1 x PCIex4 or 2 x PCIex8 + 1 x PCIex4, auto-detect *Max. length<192mm; Max. 100W power supply from mainboard for total 3 slots				
	Mini PCIe	1 x Mini PCIe socket (supports mSATA or cellular module)				
	M.2 M Key	1 x M.2 2242/60/80 M-key socket (PCIex4 & SATA mode)				
	M.2 E Key	1 x M.2 2230 E-key socket (supports CNVi, Wi-Fi/BT module)				
Power	Power	9 to 36 VDC, 2-pin terminal block *System can be powered up by pressable button/remote power button *Pressable power button can be disabled by onboard jumper/BIOS setting				
Mechanical	Mounting	Desktop mount				
	Dimensions	176.6 (H) x 210 (W) x 250 (D) mm				
	Weight	6.8 kg				
Environment	Operating Temp.	-20~60°C w/ all module operating (industrial parts) at 0.3m/s air flow 0~40° w/ all module operating (commercial parts) at 0.3m/s air flow				
	Storage Temp.	-40~85°C				
	Relative Humidity	5 to 95% (non-condensing)				
	EMC	CE (IEC 61000-6-2/4), FCC, VCCI, RCM, CCC, BSMI				
	Safety	UL, CB, CCC, BSMI				
	Vibration	Operating: 0.5 Grms, sine, 5-500 Hz (with SSD)				
	Shock	Operating: 50 Grms, half sine, 11ms(with SSD)				
	Green	GA (RoHS)				
Security	TPM	TPM v2.0 powered by Nuvoton NCPT 750 (Optional)				
Others	Watch dog timer	Yes. HW WDT Enable (WDT_EN)				
	Operating System	Windows 10 IoT Enterprise				

PV100A

NXP® i.MX 8M Arm Cortex-A53 Quad Core
In-vehicle Fanless Embedded Computer

Features

- Integrated 4G LTE, Wi-Fi and GPS solution
- Intelligent Vehicle Power Management: ignition On/Off delay
- Vehicle diagnostic interface support: dual CAN (2.0 A/B, CANOpen, J1939, OBD-II)
- Wide-operating temperature with integrated 4G LTE + Wi-Fi + GPS solution: -20~60°C
- Multiple transportation compliance, including E-mark, EN50155, J1455, ISO-7637-2, MIL-STD-810G

Specifications

System	CPU	i.MX8M, 4 x Cortex-A53 Quad Core, 1.3 GHz
	Memory	2 GB DDR4 onboard
	OS Storage	16 GB eMMC onboard
External Interfaces	Video	1 x HDMI 2.0, supports up to 3840 x 2160 @60Hz
	Ethernet	2 x 10/100/1000 Mbps Ethernet ports, RJ45
	USB	2 x USB 3.2 Gen.1, Type-A 1 x USB 3.2 Gen.1, supports OTG, Type-C
	COM	1 x RS-232/422/485, DB9 1 x RS-232/422, DB9
	SIM	1 X Nano-SIM slot
	High Density Connector	4 x isolated DI, 4 x isolated DO 2 x RS-232/422/485 1 x Mic-in, 1 x Line-out 2 x CANbus (CAN2.0 A/B, CANOpen, J1939, OBDII) *all interfaces are integrated in one high density connector, please purchase high density cable from optional accessory list
Storage	Micro SD	1 x Micro SD Card slot (on-board)
	M.2 E Key	1 x mSATA slot (shared with Mini PCIe socket)
Expansion Slot	Mini PCIe	1 x Mini PCIe socket (supports SATA & PCIe & USB signal, supports mSATA up to 512 GB) * 2 signal configurations can be selected via SW: (1) PCIe & USB (2) SATA & USB
	M.2 B Key	1 x M.2 2242 B-key socket (supports UDR GPS module)
	M.2 E Key	1 x M.2 2230 E-key socket (supports BT/Wi-Fi module)
Power	Power	9 to 36 VDC, 3-pin terminal block *supports ignition ON/OFF control and remote power button
Mechanical	Mounting	Wallmount
	Dimensions	216(L) x 112(W) x 70.5(H) mm
	Weight	1.62 kg
Environment	Operating Temp.	-20~60°C w/ all module operating (industrial parts) 0~40° w/ all module operating (commercial module)
	Storage Temp.	-40~85°C
	Relative Humidity	5 to 95% (non-condensing)
	EMC	CE (ITE), FCC, VCCI, RCM, CCC
	RF Regulation	Wi-Fi: CE-RED, RCM 4G LTE: CE-RED, RCM
	Vehicle Regulation	E-Mark (12/24V), ISO-7637-2, SAE J1455, EN50155
	Military Standard	MIL-STD-810H
	Safety	UL, CE-LVD, CB, CCC, BSMI
	Shock	Operating: IEC 60068-2-27 (w/ SD card), MIL-STD-810H
	Vibration	Operating: IEC 60068-2-64 (w/ SD card), MIL-STD-810H
	Green	GA (RoHS)
Others	Watch dog timer	Yes. HW WDT Enable (WDT_EN)
	G-sensor	Triple-axis accelerometer (±2g/4g/8g)
	Operating System	Linux Yocto

PE1000N

Arm System, NVIDIA Jetson, LPDDR4, eMMC, USB3,
Dual LAN, HDMI, M.2 E, M.2 M, mini PCIe, AEM,
Dual SIM, 12-24V

Features

- Intelligent Edge AI System with NVIDIA Jetson™ Nano™, TX2 NX and Xavier™ NX
- Fanless design and diverse I/O in a compact size
- Ready to connect Wi-Fi, BT & LTE by optional modules
- Wide range of power input and operating temperature
- Support ASUS Expansion Module (AEM)

Specifications

Processor System	SoM	NVIDIA Jetson Nano™	NVIDIA Jetson TX2 NX	NVIDIA Jetson Xavier™ NX
	CPU	4 x Arm® Cortex®-A57	2 x NVIDIA Denver 2 64-Bit 4 x Arm® Cortex®-A57	6 x NVIDIA Carmel Arm®v8.2 64-bit
	GPU	128-core NVIDIA Maxwell™	256-core NVIDIA Pascal™ GPU	384-core NVIDIA Volta™ with 48 Tensor Cores
	Memory	4 GB 64-bit LPDDR4	4 GB 128-bit LPDDR4	8 or 16 GB 128-bit LPDDR4x
	eMMC	16 GB	16 GB	16 GB
Wired Interface	Ethernet	2 x 10/100/1000 Mbps, RJ45		
	USB (or Header)	3 x USB 3.2 Gen1, Type-A 1 x USB 2.0, Micro-USB for OS Flash 2 x USB 2.0, Pin Header (Internal)		
	COM	2 x RS-232/422/485, DB9	2 x RS-232/422/485, DB9 1 x CANbus, DB9	
	DIO	4 x DI, 4 x DO (2x5 Terminal Block, w/ isolation)		
	Display	1 x HDMI 2.0b, 3840 x 2160 @60Hz		
	Debug Port[1]	1 x Debug console via Micro-USB		
Wireless Interface	Wi-Fi	Optional		
	Bluetooth	Optional		
	Cellular	Optional		
	GPS	Optional		
Expansion	M.2 M key[2]	1 x 2242/2260/2280, for AEM, M.2 SSD (PCIe, I²C and SMBus)		
	M.2 E key[2]	1 x 2230, for Wi-Fi/BT (PCIe, USB 2.0, I²C and PCM)		
	Mini PCIe	1 x Full-Length socket, for 4G/LTE (USB 2.0)		
Slot	SIM	2 x nano-SIM slots		
	Micro SD	1 x Micro SD slot		
Power	Power Input	12 to 24 VDC, 3-pin terminal block (1-pin for remote button)		
Mechanical	Mounting	Wall-mount (support assembly with DIN rail clips)		
	Dimensions	Board: 3.5", 146 x 105 mm System: 152 x 114 x 62 mm		
	Weight	1.4 KG		
Environment	Operating Temp.	-20 ~ 60℃ w/ all modules operating		
	Storage Temp.	-40 ~ 85℃		
	Relative Humidity	10 ~ 95% (non-condensing)		
Security	TPM	on-board TPM v2.0		
Others	Watch Dog Timer	Yes. HW WDT		
	Operating System[1]	Ubuntu Desktop		

[1] On selected models
[2] For Jetson Nano™, the M key slot shares same PCIe with E key slot. Default occupied with WLAN module on E key slot.

PE1100N

Arm System, NVIDIA Jetson, LPDDR4, eMMC, USB3,
Dual LAN, HDMI, M.2 E, M.2 M, M.2 B, AEM,
Dual SIM, 12-24V

Features

- Intelligent Edge AI System with NVIDIA Jetson™ Orin™ NX, Orin™ Nano
- Fanless design and diverse I/O in a compact size
- Ready to connect Wi-Fi, BT & LTE by optional modules
- Wide range of power input and operating temperature
- Support ASUS Expansion Module (AEM)

Specifications

Processor System	SOM	Jetson Orin Nano 4G	Jetson Orin Nano 8G	Jetson Orin NX 8G	Jetson Orin NX 16G
	CPU	6 x Arm® Cortex®-A78AE v8.2			8 x Arm® Cortex®-A78AE v8.2
	GPU	512-core NVIDIA Ampere GPU with 16 Tensor Cores	1024-core NVIDIA Ampere GPU with 32 Tensor Cores		
	Memory	4 GB 64-bit LPDDR5	8 GB 128-bit LPDDR5	8 GB 128-bit LPDDR5	16 GB 128-bit LPDDR5
Wired Interface	Ethernet	2 x 10/100/1000 Mbps, RJ45			
	USB (or Header)	3 x USB 3.2 Gen1, Type-A 1 x USB 2.0, Micro-USB for OS Flash 2 x USB 2.0, Pin Header (Internal)			
	COM	2 x RS-232/422/485, DB9 1 x CAN bus, DB9			
	DIO	4 x DI, 4 x DO (2x5 Terminal Block, w/ isolation)			
	Display	1 x HDMI 1.4a, 3840 x 2160 @30Hz	1 x HDMI 2.0b, 3840 x 2160 @60Hz		
	Debug Port[1]	1 x Debug console via Micro-USB			
Wireless Interface	Wi-Fi	Optional			
	Bluetooth	Optional			
	Cellular	Optional			
	GPS	Optional			
Expansion	M.2 M key	1 x 2242/2260/2280, for M.2 SSD (OS disk, size option)			
	M.2 E key	1 x 2230, for Wi-Fi/BT (PCIe, USB 2.0, I2C and PCM)			
	M.2 B key	1 x 3042/3052, for 4G/5G (PCIe, USB 2.0/3.0)			
Slot	SIM	2 x nano-SIM slots			
Power	Power Input	12 to 24 VDC, 3-pin terminal block (1-pin for remote power button)			
Mechanical	Mounting	Wall-mount (support assembly with DIN rail clips)			
	Dimensions	Board: 3.5", 146 x 105 mm System: 152 x 114 x 62 mm			
	Weight	1.4 KG			
Environment	Operating Temp.	-20 ~ 60°C w/ all modules operating			
	Storage Temp.	-40 ~ 85°C			
	Relative Humidity	10 ~ 95% (non-condensing)			
Security	TPM	on-board TPM v2.0			
Others	Watch Dog Timer	Yes. HW WDT			
	Operating System[1]	Ubuntu Desktop			

[1] On selected models

PE3000G

Rugged Fanless MXM GPU Edge AI System supporting
Intel® 12th-Gen Core™ CPU (Alder Lake-P, H)

Features

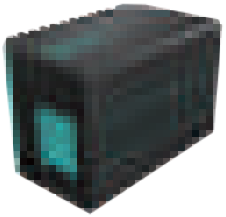
- Rugged fanless design for varied industrial applications
- Up to 64GB DDR5 4800 SDRAM
- 4x DP 1.4 from MXM, 2x DP++, 2x HDMI
- 1x M.2 M key (NVMe), 1x M.2 B key (5GNR), 1x M.2 E key (WiFi6)
- 3x 2.5GbE and 1x GigE
- 8~48V wide-range DC-in w/ built-in Ignition power control
- Withstand 5 Grms vibration

Specifications

System Core	Processor	Intel Core i7-12800HE, i5-12600HE, i3-12300HE
	Graphics	Integrated Intel® Iris® Xe Graphics (i7/i5) Integrated Intel® UHD Graphics (i3)
	Memory	Up to 64 GB DDR5 4800 SDRAM (two SODIMM slots)
	AMT	Supports Intel vPro/ AMT
	TPM	Supports dTPM 2.0
I/O Interface	Ethernet port	3x 2.5G Ethernet by I226-IT and 1x Gigabit Ethernet by I219 with screw-lock
	PoE+	IEEE 802.3at PoE+ PSE 100W total power budget (4 ports)
	USB 3.2	3x USB 3.2 Gen2x1 (10 Gbps) ports in type-A connectors with screw-lock
	USB 2.0	1x USB 2.0 port
	Video Port (Integrated Graphics)	2x HDMI, supporting supporting 4096 x 2304 resolution 2x DisplayPort ++, supporting 4096 x 2304 resolution
	Video Port (MXM Graphics)	4x DisplayPort, supporting 4K @ 60Hz (based on MXM GPU Spec.)
	Serial Port	2x configureable RS-232/ 422/ 485 ports (COM1/ COM2)
	Audio	Mic-in and speaker-out
Storage Inerface	SATA HDD	2x hot-swapable SATA port for 2.5" HDD/ SSD installation, supporting RAID 0/1
	M.2 NVMe	1x M.2 2280 M key NVMe socket (PCIe Gen4x4) for NVMe SSD
Expansion Bus	MXM	PCIe x8 slot@Gen4, 8-lanes PCIe
	M.2	1x M.2 3042/3052 B key socket with SIM slot for M.2 5G/ 4G module 1x M.2 2242/ 2252 E key for selected WiFi module (WiFi5/ WiFi6)
	mPCIe	1x mPCIe (full-size)
Power Supply	DC Input	1x 3-pin pluggable terminal block for 8 to 48V DC input
	Ignition Control	Built-in ignition power control
	Button	1 x Power button / 1 x Reset button
Mechanical	Dimension	Preliminary: 290 x 250 x 150 mm
	Weight	TBD
	Mounting	Wall-mounting / DT mounting
Environmental	Operating Temperature	Preliminary -20°C ~ 60°C (w/ 50W MXM, 45W CPU) -20°C ~ 70°C (w/o MXM)
	Storage Temperature	-40°C ~85°C
	Humidity	10%~90% , non-condensing
	Vibration	MIL-STD-810H, Method 514.6 , Category 4 & 5Grms, 5-500 Hz, 3 Axes
	Shock	MIL-STD-810H, Method 516.6, Procedure I & 20G or higher.
	EMC	EN 50155, CE/FCC Class A (or Class B, TBD), according to EN 55032 & EN 55035

PE4000G

Intel® 12th Gen Core™ i9/ i7/ i5/ i3; Ruggedized expandable computer



Features

- Rugged design for industrial domain, including in-vehicle, road-side, factory automation
- Intel® 12th Gen Core™ CPU (Alder Lake-S, R680E chipset)
- Supports single NVIDIA® GPU with up to 200W TDP
- 8-48 VDC wide-range DC-in w/ built-in Ignition power control
- Withstand 3 Grms vibration. Comply with MIL-STD 810H

Specifications

System	CPU	Intel® Core® i9-12900E	Intel® Core® i9-12900TE	Intel® Core® I7-12700E	Intel® Core® I7-12700TE	Intel® Core® I5-12500E	Intel® Core® I5-12500TE	Intel® Core® I3-12100E	Intel® Core® I3-12100TE
	TDP	65W	35W	65W	35W	65W	35W	65W	35W
	# of Cores	16	16	12	12	6	6	4	4
	P Core Base Freq.	2.3 GHz	1.1 GHz	2.1 GHz	1.4 GHz	2.9 GHz	1.9 GHz	3.2 GHz	2.1 GHz
	Max Turbo Freq.	5.0 GHz	4.8 GHz	4.8 GHz	4.7 GHz	4.5 GHz	4.3 GHz	4.2 GHz	4.0 GHz
	Chipset	R680E							
	Memory	2 x SO-DIMM, DDR5 up to 4800MHz MHz, ECC, max. 64GB							
External Interfaces	Display	2x HDMI 1.4, supports up to 4096 x 2160 @ 30 Hz 2x DP 1.2, supports up to 4096 x 2304 @ 60 Hz, DP++							
	Ethernet	1x Intel® i219 (1 GbE), support PXE boot, RJ45 1x Intel® i226 (2.5 GbE), support PXE boot, RJ45							
	USB	1x USB 3.2 Gen2x2 (20G), type C 4x USB 3.2 Gen2x1 (10G) ,type A					2x USB 3.2 Gen1 (5G), type A 2x USB2.0, type A		
	Audio	Mic in; Line out							
	COM	2x COM: RS-232/422/485, DB9 4x COM: RS-232, DB9 --- Punch-out port (optional)							
	DIO	4x DI, 4 x DO support isolation, 2 x 8 terminal block (optional)							
	LED	LED Indicators x 4 (by on-board SMD shows PWR/ storage/ watch dog/ ignition)							
	Antenna	4x cellular; 2x WiFi							
Expansion	PCIe	4 x PCIe Gen4 slot (1 x PCIex16 + 2 x PCIex4 or 2 x PCIex8 + 2 x PCIex4, auto-detect)							
	Mini PCIe	1 x Mini PCIe socket (support mSATA or cellular module) support single nano SIM							
	M.2 M Key	1 x M.2 2280 M-key socket (NVMe PCIex4)							
	M.2 E Key	1 x M.2 2230 E-key socket (support CNVi, Wi-Fi/BT module)							
	M.2 B Key	1 x 3042/3052 (support M.2 5G/ 4G module/ UDR GPS module) support dual nano SIM							
	2.5" SATA	2 x 2.5" slots (hot-swappable, supports SATA 3.0, 7~7.5mm)							
Wireless	WiFi	WiFi5, WiFi 6 (2 SMA)							
	Cellular	4G LTE, 5G NR (with GPS antenna)							
Power	System Power	1 x 4 pin pluggable terminal block for 8-48 VDC input Power button Reset power button Ignition control, header for remote power button							
	Power Supply	480W (Optional)							
	TYPE	ATX/AT							
Mechanical	Mounting	Desktop Mount							
	Dimension	225*225*350							
	Weight	TBD							
Environment	Operating Temp.	-20~60˚C w/ all module operating (industrial parts) at 0.3m/s air flow. 0~40˚ w/ all module operating (commercial parts) at 0.3m/s air flow							
	Storage Temp.	-40~85˚C							
	Relative Humidity	10 to 95% (non-condensing)							
	EMC	CE, FCC							
	Safety	CB							
	Vibration	Operating: MIL-STD 810H Method 514.8, Category 4 (Truck transportation over US highways) & 5-500 Hz; 3+ Grms (TBD), 3 Axes							
	Shock	Operating: MIL-STD 810H Method 516.8, Procedure I, Table 516.6-II; 20 G/30 G (nice to have)							
	Green	GA (RoHS)							
Security	TPM	TPM V2.0 powered by Nuvoton NCPT 750 (Optional)							
Others	Watch dog timer	HW WDT Enable (WDT_EN)							
	OS	Windows 10 IoT Enterprise, Linux(UBUNTU)							

PE6000G

Intel® 12th Gen Core™ i9/ i7/ i5/ i3; Ruggedized expandable computer

Features

- Rugged design for industrial domain, including in-vehicle, road-side, factory automation
- Intel® 12th Gen Core™ CPU (Alder Lake-S, R680E chipset)
- Supports PCIe Gen5 and single NVIDIA® GPU with up to 450W TDP
- Four hot-swappable 2.5" SSD
- 9-55 VDC wide-range DC-in w/ built-in Ignition power control
- Withstand 3 Grms vibration. Comply with MIL-STD 810H

Specifications

System	CPU	Intel® Core® i9-12900E	Intel® Core® i9-12900TE	Intel® Core® I7-12700E	Intel® Core® I7-12700TE	Intel® Core® I5-12500E	Intel® Core® I5-12500TE	Intel® Core® I3-12100E	Intel® Core® I3-12100TE
	TDP	65W	35W	65W	35W	65W	35W	65W	35W
	# of Cores	16	16	12	12	6	6	4	4
	P Core Base Freq.	2.3 GHz	1.1 GHz	2.1 GHz	1.4 GHz	2.9 GHz	1.9 GHz	3.2 GHz	2.1 GHz
	Max Turbo Freq.	5.0 GHz	4.8 GHz	4.8 GHz	4.7 GHz	4.5 GHz	4.3 GHz	4.2 GHz	4.0 GHz
	Chipset	R680E							
	Memory	2 x SO-DIMM, DDR5 up to 4800MHz MHz, ECC, max. 64GB							
External Interfaces	Display	2x HDMI 1.4, supports up to 4096 x 2160 @ 30 Hz 2x DP 1.2, supports up to 4096 x 2304 @ 60 Hz, DP++							
	Ethernet	1x Intel® i219 (1 GbE), support PXE boot, RJ45 1x Intel® i226 (2.5 GbE), support PXE boot, RJ45							
	USB	1x USB 3.2 Gen2x2 (20G), type C 4x USB 3.2 Gen2x1 (10G) ,type A					2x USB 3.2 Gen1 (5G), type A 2x USB2.0, type A		
	Audio	Mic in; Line out							
	COM	2x COM: RS-232/422/485, DB9 4x COM: RS-232, DB9 --- Punch-out port (optional)							
	DIO	4x DI, 4 x DO support isolation, 2 x 8 terminal block (optional)							
	LED	LED Indicators x 4 (by on-board SMD shows PWR/ storage/ watch dog/ ignition)							
	Antenna	4x cellular; 2x WiFi							
Expansion	PCIe	5 x PCIe slots (1 x PCIe Gen5 x16 + 3 x PCIe Gen4 x4 or 2 x PCIe Gen5 x8 + 3 x PCIe Gen4 x4, auto-detect)							
	Mini PCIe	1 x Mini PCIe socket (support mSATA or cellular module) support single nano SIM							
	M.2 M Key	1 x M.2 2280 M-key socket (NVMe PCIex4)							
	M.2 E Key	1 x M.2 2230 E-key socket (support CNVi, Wi-Fi/BT module)							
	M.2 B Key	1 x 3042/3052 (support M.2 5G/ 4G module/ UDR GPS module) support dual nano SIM							
	2.5" SATA	4 x 2.5" slots (hot-swappable, supports SATA 3.0, 7~7.5mm)							
Wireless	WiFi	WiFi5, WiFi 6 (2 SMA)							
	Cellular	4G LTE, 5G NR (with GPS antenna)							
Power	System Power	1 x 4 pin pluggable terminal block for 8-55V DC input Power button Reset power button Ignition control, header for remote power button							
	Power Supply	960W (Optional)							
	TYPE	ATX/AT							
Mechanical	Mounting	Desktop Mount							
	Dimension	225 (H) x 236 (W) x 443 (D) mm (TBD)							
	Weight	TBD							
Environment	Operating Temp.	-20~60˚C w/ all module operating (industrial parts) at 0.3m/s air flow. 0~40˚ w/ all module operating (commercial parts) at 0.3m/s air flow							
	Storage Temp.	-40~85˚C							
	Relative Humidity	10 to 95% (non-condensing)							
	EMC	CE, FCC							
	Safety	CB							
	Vibration	Operating: MIL-STD 810H Method 514.8, Category 4 (Truck transportation over US highways) & 5-500 Hz; 3+ Grms (TBD), 3 Axes							
	Shock	Operating: MIL-STD 810H Method 516.8, Procedure I, Table 516.6-II; 20 G/30 G (nice to have)							
	Green	GA (RoHS)							
Security	TPM	TPM V2.0 powered by Nuvoton NCPT 750 (Optional)							
Others	Watch dog timer	HW WDT Enable (WDT_EN)							
	OS	Windows 10 IoT Enterprise, Linux(UBUNTU)							

EBE-4U

19” Rackmount 4U Barebone

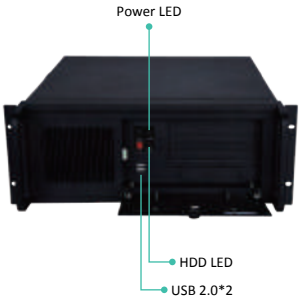
Features

- Standard 19” Rackmount 4U Chassis with 1.2mm durable SGCC & SPCC sheet metal
- Compatible with ATX, Micro ATX, Mini ITX Form Factor MB
- Excellent expansibility with up to 7 Full Height PCI/PCIE Expansion Slots at rear I/O

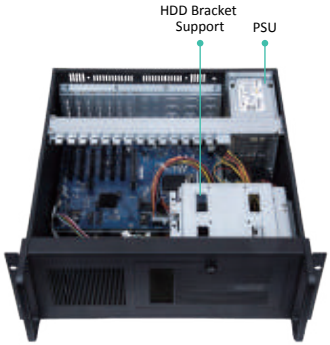
Specifications

Drive Bay	Storage	2*3.5’’HDD +1*3.5’’ Slim HDD (19mm)
Front I/O	USB2.0	2
Switch		1 x Power on/off, 1 x System Reset
Rear I/O	Standrad motherboard I/O shield	Depend on compatible motherboard design
Expansion Slot		7 slots, Full Height
Indicators	LED Indicators	Power LED, Reset LED
Cooling		1 x 12025 Fan
Power Supply	Wattage	300W Bronze or 500W GOLD ATX Power Supply
Environment	Operating Temperature	0~40˚C
	Non-Operating Temperature	-15~60˚C
	Relative Humidity	10~95%@40˚C,non-condensing
Physical Characteristics	Steel plate thickness of chassis	1.2mm SGCC &SPCC
	Dimension	430.2x457.2x175.7mm(WO/Handle)
Certification	EMI & Safety	CE

Front View



Inside View



(The pictures are for reference only, actual product may vary)

EBS-I10

Compact 2U High Mini-ITX System

Features

- Supports Intel® 9th Gen Core™ i processor (LGA1151) with Intel H310 chipset
- Two 260-pin SO-DIMM up to 32GB DDR4 2666 MHz SDRAM
- Supports dual display configurations with multiple interfaces, including dual DisplayPort, HDMI and LVDS
- Supports 5 COM Ports
- One expansion slot (low profile)
- Supports NVIDIA® RTX A2000 that offers up to 8TFLOPs GPU (Optional)

Specifications

Case Items	Key Features	Description			
System	CPU	I7-9700E	I5-9500E	I5-9500TE	I3-9100TE
	TDP	65W	65W	35W	35W
	# of Cores	8	6	6	4
	BaseFreq.	2.6GHz	3GHz	2.2GHz	2.2GHz
	MaxTurbo Freq.	4.4GHz	4.2GHz	3.6GHz	3.2GHz
	Memory	2 x SO-Dimm, DDR4 2666 MHz, max. 32GB			
Drive Bay	Storage	1 x 2.5” (256/512GB) 1 x M.2 2280 (256/512/1TB)			
Front I/O	USB	2 x USB 2.0			
	Audio Jack	2 (not available in GPU SKU)			
Rear I/O	Serial Ports	2 x RS232/422/485 3 x RS232			
	HDMI	1			
	DP	2			
	USB3.2 Gen1	4			
	Ethernet	2 x RJ45 (10/100/1000Mbps)			
	Audio Jack	2			
Internal Connector	PCIe	1 x PCIe x16			
	MiniPCIe	1 x Full/Half Mini-PCIe with SATA			
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device			
		1 x M.2 Socket 3 with M key, type 2242/2260/2280			
Expandability	Expansion Slot	1 x Low-profile add-on card (NV A2000)			
Power	Power Supply Unit	Flex ATX 250W Gold or 350W Gold			
Environment	Operating Temperature	0~40°C			
	Non-Operating Temperature	-40~85°C			
	Relative Humidity	10~95%			
Dimension	Form Factor	255 x 230 x 88mm			

EBS-I70

Embedded Mini-ITX System

Features

- Supports Intel® 10th Gen Core™ i processor (LGA1151) with Intel Q470 chipset
- Two 260-pin SO-DIMM up to 32GB DDR4 2666 MHz SDRAM
- Supports dual display configurations with multiple interfaces, including dual DisplayPort, HDMI and LVDS
- Support 4 COM Ports
- One expansion slot (low profile)
- Support NVIDIA® RTX A2000 that offers up to 8TFLOPs GPU (Optional)

Specifications

Case Items	Key Features	Description				
System	CPU	I9-10900E	I9-10900TE	I7-10700TE	I5-10500TE	I3-10100TE
	TDP	65W	35W	35W	35W	35W
	# of Cores	10	10	8	6	4
	Base Freq.	2.8GHz	1.8GHz	2.0GHz	2.3GHz	2.3GHz
	Max Turbo Freq.	4.7GHz	4.5GHz	4.4GHz	3.7GHz	3.6GHz
	Memory	2 x SO-Dimm, DDR4 2933 MHz, max. 64GB				
Drive Bay	Storage	1 x M.2 2280 (256/512/1TB)				
Front I/O	USB	2 x USB 2.0				
	Audio Jack	2 (not available in GPU SKU)				
Rear I/O	Serial Ports	1 x RS232/422/485 3 x RS232				
	DVI-D	1				
	DP	2				
	USB3.2 Gen2	3 (2*Type A, 1*Type C)				
	USB3.2 Gen1	1 (Type A)				
	USB2.0	4 (Type A)				
	Ethernet	2 x RJ45 (Teaming)				
	Audio Jack	2				
	PS/2	1 x Keyboard, 1x Mouse				
Internal Connector	LVDS/ eDP selection	1				
	PCIe	1 x PCIe 3.0/2.0 x16 Slot (Bifurcation Support: 16x to 8x+8x or 8x+4x+4x)				
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device				
		1 x M.2 Socket 3 with M key, type 2242/2260/2280				
Expandability	Expansion Slot	1 x Low-profile add-on card (NV A2000)				
Power	Power Supply Unit	Flex ATX 250W Gold or 350W Gold				
Environment	Operating Temperature	0~40°C				
	Non-Operating Temperature	-20~60°C				
	Relative Humidity	10~95%				
Dimension	Form Factor	255 x 230 x 88 mm				

EBS-P70

BOX PC, 2.5" SBC, Intel® Atom ™ Processor, LPDDR4 3200/4266 on board, HDMI, Dual-LAN,12-24V

Features

- Extreme light box PC, Easy to adapt everywhere
- Wide-temp and fanless design for rugged environments
- Supports 2.5GbE & 1GbE Ethernet for various data transmission
- Fixed holes for antenna, Wall-mount, Din-rail kit (optional)
- Excellent expansibility with essential I/O ports on front/back side bezel

Specifications

Processor System	CPU	Atom, x6211E	Atom, x6413E	Atom, x6425E	Atom, x6425RE
	Max. Frequency	3.0GHz	3.0GHz	3.0GHz	N/A
	Base Frequency	1.3GHz	1.5GHz	2.0GHz	1.9GHz
	Core/Tread	2/2	4/4	4/4	4/4
	CPU TDP	6W	9W	12W	12W
Memory	Technology	LPDDR4 4266	LPDDR4 4266	LPDDR4 4266	LPDDR4 3200
	Max.	4GB	4GB	8GB	8GB
Storage	EMMC	64 GB	64 GB	64 GB	128GB
Wired Interface	HDMI	2, HDMI 2.0, 4k, 60 Hz			
	LVDS	1 (Colay with eDP) (BOM Option)			
	Multiple displays	Max. 3 displays, HDMI+HDMI+LVDS, HDMI+HDMI+eDP			
	Speed	10/100/1000 Mbps			
	Controller	1x Intel® I226-IT (2.5 Gbe) & 1 x Intel i210-IT (1 Gbe)			
	Connector	2 x RJ-45			
	USB (or Header)	2 x USB 3.2 2 x USB 2.0			
	COM	2 x RS-232/422/485			
	GPIO	1 x GPIO			
Storage	SATA port	1			
	SATA Power	1,2 pin			
Expansion	M.2 E Key	1 x 2230 M.2 E key for WIFI/BT device			
	Mini PCIe	1 x full-size mini-PCIe (Default mSATA + USB 2.0)			
Wireless Interface	Wi-Fi	Built-in WLAN module (M.2 E Key), 802.11 a/b/g/n/ac, 2.4G/5GHz, -40 ~ 85°C O.T.			
	Bluetooth	Integrated with WLAN module, BT 5.0+			
	CANBUS Module	MPCIE TO DUAL ISOLATED CANBUS 2.0B			
Power	Power Input	12V-24V DC Input			
	Power Type	Lockable DC Jack			
Mechanical	Construction	Aluminum housing			
	Mounting	DIN-rail/Wall Mount			
Security	TPM	TPM2.0, TPM on board (optional)			
Environment	Operating Temperature	0~60° C			
	Storage Temperature	-40~85° C			
	Relative Humidity	Operational humidity: 40°C@10%~95%			
Certification	EMC ,Safety	CE, FCC, Class B			

ASUS IoT

EB-ITX-B

Compact Chassis for Mini-ITX Motherboard
with 2 PCIe x8 Expansion Slot

Specifications

Case Items	Key Features	Description
Drive Bay	Storage	1 x 3.5” or 1 x 2.5” HDD
Front I/O	USB	2 x USB 2.0
	LED	2
Rear I/O	Serial Ports	2 x RS232/422/485
		1 x RS232
	DVI-D	1
	DP	2
	USB3.2 Gen2	3 (2*Type A, 1*Type C)
	USB3.2 Gen1	1 (Type A)
	USB2.0	4
	Ethernet	2 x RJ45 (10/100/1000Mbps)
	Audio Jack	2
	PS/2	1 x KB, 1 x MS
Internal Connector	PCIe	2 x PCIe x8
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242/2260/2280
Expandability	Expansion Slot	2 x PCIe x8 add-on card
Security	TPM	1 x TPM Header
Power	Power Supply Unit	Flex ATX 250W Gold
Environment	Operating Temperature	0~40°C
	Non-Operating Temperature	-20~85°C
	Relative Humidity	10~95%
Dimension	Form Factor	310 x 252 x 109 mm (mm)

INDUSTRIAL MOTHERBOARDS & SINGLE BOARD COMPUTERS

ASUS IoT offers a wide range of long-lifecycle industrial motherboards and & single board computers in various form factors to serve different applications from customers.

ASUS IoT industrial motherboards and single board computers are manufactured with extremely durable, industrial-grade components to ensure 24/7 reliable operation in industrial settings and harsh environments like extreme temperatures, power fluctuations and high humidity.

Also, ASUS IoT provides the longevity supply guarantee, optimized service and complete reference documents for our customers. We not only provide international industry standard form factor models, but also offer customized hardware and software solutions for specific applications.

R680EI-IM-A

ITX, LGA 1700 Socket for 12th Gen. CPU, R680E Chipset, DDR5 2*SO-DIMM
1*PCIe Gen 5.0 x16 slot, DP*3, HDMI, 2*M.2 slot, USB 3.2 Gen2 port *4, USB Type C

Specifications

Processor System	CPU	LGA1700 for Intel® 12th Gen. Core™ i9/ i7/ i5/ i3/ Pentium®/ Celeron® Processors
	TDP	Max. 65W
	Chipset	Intel® R680E Chipset
Memory	Technology	Up to DDR5 4800 MHz, ECC support
	Max.	2 x 32GB (Total 64GB)
	Socket	2 x SO-DIMM
Display	Display Port	3, Supports DP 1.4, up to 4K resolution
	HDMI	1
	eDP/LVDS	1 x Header (Support either eDP or LVDS ; switched by BIOS)
Expansion Slot	PCIe	1 x PCIe 5.0 x16 Slot (Bifurcation Support: 16x to 8x+8x)
	M.2	1 x M.2 E key, Type 2230 for WIFI/BT device (PCIe & CNVi) 1 x M.2 M key, Type 2242/2260/2280 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2500Mbps
	Controller	1 x Intel® i210AT (colay i211AT), 1 x Intel® I225LM (Intel vPro supported)
	Teaming	Yes
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	4 x SATA Gen 3.0, Up to 6Gb/s, Support RAID 0,1,5,10
Rear I/O	Display Port	3
	HDMI	1
	USB3.2 Gen2	3 (2*Type A, 1*Type C)
	USB3.2 Gen1	1 (Type A)
	USB2.0	4 (Type A)
	Ethernet	2 x RJ45
	Serial Port	1 (RS232/422/485)
	Audio jack	2
	PS/2	1 x Keyboard, 1x Mouse
Internal Connector	COM header	4 x COM Header (1 x RS232/422/485, 3 x RS232)
	USB3.2 Gen1	1 x USB3.2 Gen1 Stick Connector 1 x Header Support Additional 2 x USB3.2 Gen1 Ports
	USB2.0	1 x Header Support Additional 2 x USB2.0 Ports
	CPU Fan Connector	1 x Header (PWM Mode)
	Chassis Fan Header	1 x Header (PWM Mode)
	Disable ME	1 x Header
	Front Panel Audio Connector (AAFP)	1 x Header
	System Panel Header	1 x Header
	Clear CMOS Jumper	1 x Header
	Speaker Connector	1 x Header
	LVDS/ eDP selection	1 x Header
	Panel SW	1 x Header
	SP/DIF	1 x Header
	Chassis Intrusion	1 x Header
	GPIO Header	1 x Header (8-Bit)
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	IAMT/vPRO	Yes
	Power Type	ATX / 12V DC-IN (supported by additional cable)
Operating System	Microsoft Windows	Windows 10 (64bit)
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	5%~95%
Dimension	Form Factor	Mini-IX, 170 x 170 mm
Certification	EMI & Safety	CE (Class B), FCC (Class B)

Q670EI-IM-A

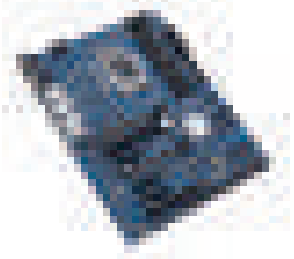
ITX, LGA 1700 Socket for 12th Gen. CPU, Q670E Chipset, DDR5 2*SO-DIMM
1*PCIe Gen 5.0 x16 slot, DP*3, HDMI, 2*M.2 slot, USB 3.2 Gen2 port *4, USB Type C

Specifications

Processor System	CPU	LGA1700 for Intel® 12th Gen. Core™ i9/ i7/ i5/ i3/ Pentium®/ Celeron® Processors
	TDP	Max. 65W
	Chipset	Intel® Q670E Chipset
Memory	Technology	Up to DDR5 4800 MHz
	Max.	2 x 32GB (Total 64GB)
	Socket	2 x SO-DIMM
Display	Display Port	3, Supports DP 1.4, up to 4K resolution
	HDMI	1
	eDP/LVDS	1 x Header (Support either eDP or LVDS ; switched by BIOS)
Expansion Slot	PCIe	1 x PCIe 5.0 x16 Slot (Bifurcation Support: 16x to 8x+8x)
	M.2	1 x M.2 E key, Type 2230 for WIFI/BT device (PCIe & CNVi) 1 x M.2 M key, Type 2242/2260/2280 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2500Mbps
	Controller	1 x Intel® i210AT (colay i211AT), 1 x Intel® I225LM (Intel vPro supported)
	Teaming	Yes
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	4 x SATA Gen 3.0, Up to 6Gb/s, Support RAID 0,1,5,10
Rear I/O	Display Port	3
	HDMI	1
	USB3.2 Gen2	3 (2*Type A, 1*Type C)
	USB3.2 Gen1	1 (Type A)
	USB2.0	4 (Type A)
	Ethernet	2 x RJ45
	Serial Port	1 (RS232/422/485)
	Audio jack	2
	PS/2	1 x Keyboard, 1x Mouse
Internal Connector	COM header	4 x COM Header (1 x RS232/422/485, 3 x RS232)
	USB3.2 Gen1	1 x USB3.2 Gen1 Stick Connector 1 x Header Support Additional 2 x USB3.2 Gen1 Ports
	USB2.0	1 x Header Support Additional 2 x USB2.0 Ports
	CPU Fan Connector	1 x Header (PWM Mode)
	Chassis Fan Header	1 x Header (PWM Mode)
	Disable ME	1 x Header
	Front Panel Audio Connector (AAFP)	1 x Header
	System Panel Header	1 x Header
	Clear CMOS Jumper	1 x Header
	Speaker Connector	1 x Header
	LVDS/ eDP selection	1 x Header
	Panel SW	1 x Header
	SP/DIF	1 x Header
	Chassis Intrusion	1 x Header
	GPIO Header	1 x Header (8-Bit)
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	IAMT/vPRO	Yes
	Power Type	ATX / 12V DC-IN (supported by additional cable)
Operating System	Microsoft Windows	Windows 10 (64bit)
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	5%~95%
Dimension	Form Factor	Mini-IX, 170 x 170 mm
Certification	EMI & Safety	CE (Class B), FCC (Class B)

Q670EA-IM-A

ATX, LGA1700 Socket for 12th Gen. CPU, Q670E/R680E Chipset, 4*U-DIMM, 3*Lan,
2*PCIe x16 slots, 2*PCI, VGA, HDMI, DP++, 2*M.2 slot, 6*COM, 7*SATA

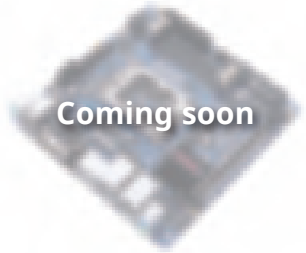


Specifications

Processor System	CPU	LGA1700 for Intel® 12th Gen. Core™ i9/ i7/ i5/ i3/ Pentium® /Celeron® Processors Max. 125W TDP *Also support 13th Gen. Intel CPU
	Chipset	Intel® Q670E Chipset
Memory	Technology	DDR5 4400MT/s (2DPC - 1DIMM 1R&2R) 4000MT/s (2DPC – 2DIMM 1R) 3600MT/s (2DPC – 2DIMM 2R)
	Max.	128GB
	Socket	4 x U-DIMM
Display	Display Port++	2, Supports DP++ 1.4, up to 3840 x 2160 @ 60Hz
	HDMI	1, Supports 2.1, up to 4096 X 2160 @ 60Hz
	VGA	1
	Multiple displays	Max.4 displays, VGA+Dual DP.+HDMI
Expansion Slot	PCIe	1 x PCIe 5.0 x16 Slot (1 x16 mode/ 2 x8 mode) 1 x PCIe 4.0 x4 Slot (x4 mode, open slot) 1 x PCIe 5.0 x16 Slot (x8 mode) 1 x PCIe 3.0 x4 Slot (x4 mode, open slot) 1 x PCIe 4.0 x4 Slot (x4 mode, open slot)
	PCI	2
	M.2	1 x M.2 M key, Type 2242/2260/2280 (PCIe x4 /SATA mode) supports NVMe 1 x M.2 E key, type 2230 for WIFI/BT device (only support Intel® CNVi)
Ethernet	Speed	10/100/1000/2500 Mbps
	Controller	1 x Intel® i210AT 1 x Intel® i226V 1 x Intel® i226LM (Intel vPro supported)
	Connector	3 x RJ-45
Audio	Codec	Realtek ALC897
Storage	SATA port	7 x SATA Gen 3.0, Up to 6Gb/s, Support RAID 0,1,5,10
Rear I/O	Display Port++	2, Supports DP++ 1.4, up to 4096 x2160 @ 60Hz
	HDMI	1, Supports 2.1, up to 4096 X 2160 @ 30Hz
	VGA	1
	USB 3.2 Gen2	6 (5 x type A, 1 x Type C)
	Ethernet	3 x RJ45
	Serial Port	1 (RS232/422/485)
	Audio jack	3 (Line-Out, Line-In, Mic in)
Internal Connector	COM Header	5 x COM Header (1 x RS232/422/485, 4 x RS232)
	USB3.0 Gen1	2 x Header Support Additional 4 x USB3.2 Gen1 Ports
	USB2.0	2 x Header Support Additional 4 x USB2.0 Ports
	CPU Fan/ Chassis Fan	1 x Header (PWM Mode) / 3 x Header (PWM Mode)
	Front Panel Audio (AAFP)	1 x Header
	System Panel	1 x Header
	Chassis Intrusion	1 x Header
	Speaker connector	1 x Header
	I²C Header	1 x Header
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	LPT port header	1 x Header
	Buzzer	1
	PS/2	1 x Header
	SPDIF	1 x Header
	GPIO	1 x Header (8 Bit)
	DIS ME jumper	1 x Header
	AT/ATX Select Header	1 x Header
	Power connector	1 x 24-pin ATX Power connector, 1 x 8-pin ATX 12V Power connector
Security	TPM	1 x SPI TPM header
Watchdog Timer	H/W	YES
Power Type	Power Type	AT mode/ ATX mode
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C (API only) ☑ Buzzer (API ony) ☑ Linux Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	Operational humidity: 40°C@10%~95%
Mechanical	Dimensions	ATX, 305 x 244 mm
Certification	EMC (CLASS B)	CE, FCC, BSMI, VCCI, RCM
	Safety	CE-LVD

Q670EM-IM-A

Micro-ATX, LGA1700 Socket for 12th Gen. CPU, Q670E/R680E chipset, 4*U-DIMM, 3*Lan, 10*COM, 2*PCIe x16 slots, 2*PCIe x4 slots, 4*DP++, 2*M.2 Slot, 7*SATA



Specifications

Processor System	CPU	LGA1700 for Intel® 12th Gen. Core™ i9/ i7/ i5/ i3/ Pentium® /Celeron® Processors Max. 125W TDP
	Chipset	Intel® Q670E Chipset
Memory	Technology	DDR5 4400MT/s (2DPC - 1DIMM 1R&2R) 4000MT/s (2DPC – 2DIMM 1R) 3600MT/s (2DPC – 2DIMM 2R)
	Max.	128GB
	Socket	4 x U-DIMM
Display	Display Port++	2, Supports DP++ 1.4, up to 3840 x 2160 @ 60Hz
Expansion Slot	PCIe	1 x PCIe 5.0 x16 Slot (1 x16 mode/ 2 x8 mode) 1 x PCIe 4.0 x4 Slot (x4 mode) 1 x PCIe 5.0 x16 Slot (x8 mode) 1 x PCIe 4.0 x4 Slot (x4 mode)
	M.2	1 x M.2 M key, Type 2242/2260/2280 (PCIe x4 /SATA mode) supports NVMe 1 x M.2 E key, type 2230 for WIFI/BT device (only support Intel® CNVi)
Ethernet	Speed	10/100/1000/2500 Mbps
	Controller	1 x Intel® i210AT 1 x Intel® i226V 1 x Intel® i226LM (Intel vPro supported)
	Connector	3 x RJ-45
Audio	Codec	Realtek ALC897
Storage	SATA port	7 x SATA Gen 3.0, Up to 6Gb/s, Support RAID 0,1,5,10
Rear I/O	Display Port++	4, Supports DP++ 1.4, up to 3840 x2160 @ 60Hz
	USB 3.2 Gen1	2
	USB 3.2 Gen2	4 (3 x type A, 1 x Type C)
	Ethernet	3 x RJ45
	Serial Port	1 (RS232/422/485)
	Audio jack	3 (Line-Out, Line-In, Mic in)
Internal Connector	COM Header	9 x COM Header (RS232)
	USB3.0 Gen1	1 x Header Support Additional 2 x USB3.2 Gen1 Ports / 1 x vertical connector
	USB2.0	2 x Header Support Additional 4 x USB2.0 Ports
	CPU Fan/ Chassis Fan	1 x Header (PWM Mode) / 3 x Header (PWM Mode)
	Front Panel Audio (AAFP)	1 x Header
	System Panel	1 x Header
	Chassis Intrusion	1 x Header
	Speaker connector	1 x Header
	I²C Header	1 x Header
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	LPT port header	1 x Header
	Buzzer	1
	PS/2	1 x Header
	SPDIF	1 x Header
	GPIO	1 x Header (8 Bit)
	DIS ME jumper	1 x Header
	AT/ATX Select Header	1 x Header
	Power connector	1 x 24-pin ATX Power connector, 1 x 8-pin ATX 12V Power connector
Security	TPM	1 x SPI TPM header
Watchdog Timer	H/W	YES
Power Type	Power Type	ATX
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C (API only) ☑ Buzzer (API ony) ☑ Linux Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	Operational humidity: 40°C@10%~95%
Mechanical	Dimensions	Micro ATX, 244 x 244 mm
Certification	EMC (CLASS B)	CE, FCC, BSMI, VCCI, RCM
	Safety	CE-LVD

Q470EA-IM-A

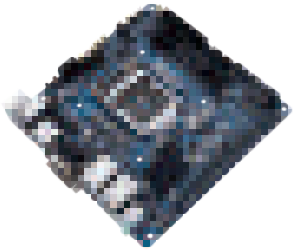
ATX, LGA 1200 Socket for 10th Gen. CPU, Q470E Chipset, 4*U-DIMM
2*PCIe x16 slots, VGA, HDMI, DP, 3*M.2 slot, USB 3.2 Gen2, USB Type C

Specifications

Processor System	CPU	Intel® Socket 1200 for 10th Generation Core™ i9/ i7/ i5/ i3/Pentium®/Celeron® Processors
	TDP	Up to 125W
	Chipset	Intel® Q470E Chipset
Memory	Technology	DDR4 2400/2666/2933 MHz
	Max.	128GB (32GB per U-DIMM)
	Socket	4 x U-DIMM
Display	VGA	1, up to 1920 x 1200 @ 60Hz
	HDMI	1, up to 4096 x 2160 @ 30Hz
	DP	2, up to 4096 x 2160 @ 60Hz
	Triple Display	VGA + HDMI + DP/ DP + HDMI + DP/ VGA + DP + DP
Expansion Slot	PCIe	2 x PCIe 3.0/2.0 x16 slot (1 x16 mode/ 2 x8 mode) *If any expansion card is installed on the second x16 slot, BIOS automatically switches the signal from 1 x16 mode to 2 x8 mode. 3 x PCIe 3.0/2.0 x4 slot (x4, x4, x2 mode)
	PCI	2
	M.2	1 x M.2 M key, type 2242/2260/2280 (PCIe x4/ SATA mode) 1 x M.2 B key, type 3042/3052/2260/2280 (PCIe x1/USB 3.2 Gen1/USB 2.0) *type 3042/3052 support 4G/5G module 1 x M.2 E key, type 2230 (PCIe x1/USB 2.0)
	SIM Socket	1
Ethernet	Speed	10/100/1000Mbps/2500Mbps
	Controller	1 x Intel® i219LM (1 GbE), support WOL/PXE 1 x Intel® i225V (2.5 GbE), support WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Line-In, Mic in
Storage	SATA port	Up to 6 x SATA Gen 3.0, up to 6Gb/s*, RAID 0/1/5/10 *If install M.2 PCIe x4/ SATA SSD on M.2 M key slot, 2/ 1 SATA port will be disabled.
Rear I/O	VGA	1
	HDMI	1
	DP	2
	USB 3.2 Gen2	4 (3 x type A, 1 x Type C)
	USB 2.0	2
	Ethernet	2
	COM Port	1 x RS232/422/485
	PS/2	1
	Audio jack	3 (Line-Out, Line-In, Mic in)
Internal Connector	COM header	1 x (RS232/422/485); 4 x RS232
	USB2.0	1 x Header support additional 2 x USB2.0 connectors 2 x Vertical connector
	USB3.2 Gen 1	1 x Header support additional 2 x USB3.2 Gen1 connectors
	CPU Fan Connector	1 (PWM mode)
	Chassis Fan Header	3 (PWM mode)
	Chassis Intrusion Header	1
	Front Panel Audio Connector (AAFP)	1
	System Panel Header	1
	Clear CMOS Jumper	1
	Speaker Connector	1
	LPC Debug Header	1
	I²C Header	1
	Parallel (LPT Header)	1
	Buzzer	1
	GPIO Header	1 (8 Bit)
	SPDIF	1
	AT/ATX Select Header	1
	Power Connector	1 x 8-pin ATX 12V Power Connector & 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	v Pro	yes
	Power Type	AT mode/ ATX mode
Operating System	Microsoft Windows	Windows 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	15%~95%
Dimension	Form Factor	ATX, 305 x 244 mm
Certification	EMI & Safety	CE (Class B), FCC (Class B)

W480EI-IM-A R3.0 / Q470EI-IM-A R3.0

Mini-ITX, LGA1200 socket for the 10th Gen CPU, Q470E chipset, 2*SO-DIMM.
1*PCIe x16, 2*DP, DVI-D, LVDS/ eDP, 2*M.2 slot, USB 3.2 Gen2, USB Type C



Specifications

Processor System	CPU	LGA1200 Socket for The 10th Generation Intel® Core™ i9/ i7/ i5/ i3/ Pentium®/ Celeron® Processors Supports 14nm CPU
	CHIPSET	Intel® W480E/Q470E Chipset
	TDP	Max. 95W
Memory	Technology	DDR4 2933/2666/2400/2133 MHz (W480EI-IM-A: ECC support)
	Max.	Overall: 64GB, Per Module:32GB
	Socket	2 x SO-DIMM
Display	DP++	2, Supports DP++ 1.4, up to 4096x2160 @ 60Hz
	DVI-D	1
	eDP/LVDS	1 x Header (Support either eDP or LVDS ; switched by BIOS)
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 Slot (Bifurcation Support: 16x to 8x+8x or 8x+4x+4x)
	M.2	1 x M.2 Socket 1 with E key, Type 2230 for WIFI/BT device (PCIe & CNVi) 1 x M.2 Socket 3 with M key, Type 2242/2260/2280 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® I211AT, 1 x Intel® I219LM
	Teaming	Yes
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC887-VD2 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	3 x SATA Gen 3.0, up to 6Gb/s
	M.2	1 x M.2 Socket 3 with M key, Type 2242/2260/2280 (PCIe x4 & SATA mode)
Rear I/O	Display Port	2
	DP++	2, Supports DP++ 1.4, up to 4096x2160 @ 60Hz
	USB 3.2 Gen2	3 (2*Type A, 1*Type C)
	USB 3.2 Gen1	1 (Type A)
	USB 2.0	4 (Type A)
	Ethernet	2 x RJ45
	Serial Port	1 (RS232/422/485)
	Audio jack	2
	PS/2	1 x Keyboard, 1 x Mouse
Internal Connector	Serial Port	4 x COM Header (1 x RS232/422/485, 3 x RS232)
	USB3.2 Gen1	1 x USB3.2 Gen1 Stick Connector 1 x Header Support Additional 2 x USB3.2 Gen1 Ports
	USB2.0	1 x Header Support Additional 2 x USB2.0 Ports
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion	1
	Disable ME	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1(10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Connector	1(4-pin)
	LVDS/ eDP selection	1
	Panel SW	1
	LPC Debug Header	1
	S/PDIF Header	1
	I^2C Header	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	1 x 8-pin ATX Power Connector, 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM header
Power	IAMT/vPRO	Yes
	Power Type	12V DC-IN (Support by power transfer card "EMA-DCB-A"). Please contact your sales window for order information
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	Safety	CE, FCC

Q370M-IM-A

Micro ATX , LGA1151 socket for 9th/8th Gen CPU, Q370 chipset, 4*U-DIMM,
1*PCIe x16,2*DP, HDMI, VGA, Intel® vPro support

Specifications

Processor System	CPU	LGA1151 socket for 9th/8th Generation Intel® Core™ i9/ i7/ i5/ i3/Pentium®/Celeron® Processors
	Chipset	Intel® Q370 Chipset
	TDP	65W
Memory	Technology	DDR4 2666/2400/2133MHz
	Max. Speed	64GB
	Socket	4 x U-DIMM
Display	Controller	Intel UHD Graphics 630/610
	HDMI	1,Supports HDMI 1.4 up to 4096 x 2160@24Hz/2560 x 1600@60Hzz
	Display Port	2,Supports DP 1.2a up to 4096 x 2304@60 Hz
	VGA	1,Supports up to 1920 x 1200@60Hz
	Multi Display	Dual DP+HDMI+VGA, DP+HDMI+VGA, Dual DP+HDMI, Dual DP+VGA,
Expansion Slot	PCIe	1 x PCI Express 3.0/2.0 x16 2 x PCI Express 3.0/2.0 x1 1 x PCI
	M.2	2 x M.2 Socket with M Key, type 2242/2260/2280 storage devices with IRST support(1@ SATA* & PCIE mode), SATA mode share with SATA6G_2. Ready for Intel® Optane Memory 1 x M.2 Socket with E Key, type 2230 Wi-Fi devices support
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® I219LM
	Connector	1 x RJ-45
Audio	Codec	Realtek® ALC887/ALC897 8-channel High Definition Audio CODEC
	Connector	Line-in, Line-out, Mic-in
Storage	SATA port	6 x SATA 6.0 Gb/s ports (gray), support Raid 0,1,5,10
Rear I/O	PS/2	1 x Keyboard (Purple), 1 x Mouse port (Green)
	DisplayPort	2
	HDMI	1
	VGA	1
	Ethernet	1
	USB	USB 3.2 Gen 2 (TypeA)x 1, USB 2.0 (TypeA) x 2
	Audio	3 Audio jacks support 8 channel
Internal Connector	Serial Port	2 (2 x RS-232 header)
	USB	2, support additional 4 x USB 3.2 Gen 1 connectors
	USB2.0	1, support additional 2 x USB2.0 connectors
	Fan header	CPU fan x 1, Chassis fan x 2
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	System panel header	1
	Clear CMOS jumper	1
	LPC Debug header	1
	LPT port header	1
	Power connector	1 x 24-pin ATX Power connector, 1 x 8-pin ATX 12V Power connector
	Speaker connector	1
	MONO-out header	1 (with AMP IC)
	DIS ME jumper	1
Security	TPM	TPM 2.0 IC Onboard (NPCT750)
Power	Power Type	ATX power
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	40~85°C
	Relative Humidity	5%~95%
Dimension	Form Factor	Micro ATX, 244 x 244 mm
Certification	EMI & Safety	CE, FCC

Q370I-IM-A R3.0

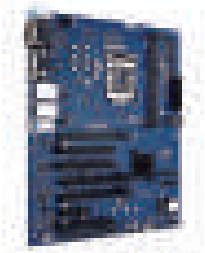
Mini-ITX, LGA1151 socket for the 9th/8th Gen CPU, Q370 chipset, 2*SO-DIMM. 1*PCIe x16, 2*DP, DVI-D, LVDS, eDP, 2*M.2 slot

Specifications

Processor System	CPU	LGA1151 socket for the 9th/8th Generation Intel® Core™ i7/ i5/ i3/ Pentium® / Celeron® processors supports 14nm CPU, Max. 65W TDP
	CHIPSET	Intel® Q370 chipset
Memory	Technology	DDR4 2666/2400/2133 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	DVI-D	1, Supports up to 1920 X 1200 @ 60 Hz
	Display Port	2, Supports DP 1.2a up to 4096 x 2160 @ 60 Hz
	LVDS	1, Supports up to 1920 x1200 @ 60Hz
	Embedded Display Port	1, 2 lanes supported (co-lay with LVDS), Supports up to 1920 x1200 @ 60Hz
	Multi Display	DVI-D+DP+LVDS, DP+DP+LVDS, DP+DP+DVI-D, DVI-D+DP+eDP, DP+DP+eDP
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 slot
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device (support Intel® CNVi,PCIe) 1 x M.2 Socket 3 with M key, type 2242/2260/2280(PCIe & SATA mode)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1 x Intel® i219LM, supports WOL/PXE 1 x Intel® i210AT colay with i211AT), supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VD2 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	DVI-D	1
	Display Port	2
	USB3.2 Gen1	4
	USB 2.0	4
	Ethernet	2
	Serial Port	1(RS232/422/485)
	Audio jack	2
	PS/2	1 x Keyboard Port, 1 x Mouse Port
Internal Connector	Serial Port	3 (RS232)
	USB3.2 Gen1	1 x Header Support Additional 2 X USB3.2 Gen1 Connectors , 1 X Stick Socket
	USB2.0	1 x Header Support Additional 2 X USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1(10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Connector	1(4-pin)
	LPC Debug Header	1
	S/PDIF Header	1
	I²C Header	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	1 X 4-pin ATX Power Connector, 1 X 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	Both ATX mode and DC in (need an extra card)
	Voltage	DC in 12V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	Safety	CE, FCC

Q170A-IM-A

ATX, LGA1151 socket for the 6th/7th Gen CPU, Q170 chipset, 2*U-DIMM. 4*PCIe, 3*PCI, HDMI, VGA, Dual LAN, M.2 slot

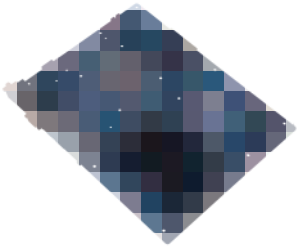


Specifications

Processor System	CPU	Intel® Socket 1151 for 7th/6th Generation Core™ i7/i5/i3/Pentium®/ supports Intel® 14 nm CPU, support max. 65W CPU
	CHIPSET	Intel® Q170 chipset
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	2 x U-DIMM
Display	VGA	1, Supports up to 1920 x 1200 @60Hz
	HDMI	1, Supports up to 4096 x 2160 @24Hz
	Dual Display	VGA+HDMI(Default)
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 slot (x16 mode) 2 x PCIe 3.0/2.0 x16 slot (x4 mode) 1 x PCIe 3.0/2.0 x4 slot
	PCI	3 x PCI
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280(SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® I219LM, 1 x Intel® I211AT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897
	Connector	Line-Out, Line-In, Mic in
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s, * SATA port 4 shared with M.2
Rear I/O	VGA	1
	HDMI	1
	USB 3.2 Gen1	4
	Ethernet	2
	Serial Port	2(RS232/422/485)
	Audio jack	3
	PS/2	1 x Keyboard Port, 1 x Mouse Port
Internal Connector	Serial Port	6 (RS232)
	USB2.0	2 x Header Support Additional 4 x USB2.0 Connectors 2 x Stick Socket
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Connector (AAFP)	1
	System Panel Header	1
	Clear CMOS Jumper	1
	SpeakerConnector	1
	LPC Debug Header	1
	I²C Header	1
	Parallel	1
	GPIO Header	1 (8 Bit)
	AT/ATXSelectHeader	1
	Power Connector	1 x 4-pin ATX Power Connector, 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	AT/ATX mode
Operating System	Microsoft Windows	Windows 7 (32/64bit) / Windows 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, Red Hat Enterprise, Fedora Workstation, Open SUSE
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	10~95%
Dimension	Form Factor	ATX, 305 x 244 mm
Certification	EMI & Safety	CE, FCC

H610A-IM-A

ATX, LGA1700 socket for the 12th Gen CPU, H610 chipset, 2*U-DIMM, 2*PCIe x16 slots, VGA, HDMI, DP, Dual LAN, M.2 slot, USB 3.2 Gen2

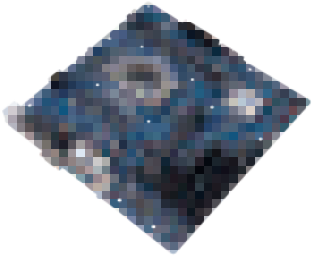


Specifications

Processor System	CPU	LGA1700 Socket for Intel® Core™ i9/ i7/ i5/ i3/ Pentium® /Celeron® Processors Max. 125W TDP
	CHIPSET	Intel® H610 chipset
Memory	Technology	Up to DDR4 2400/2666/2933/3200 MHz
	Max.	64GB
	Socket	2 x U-DIMM
Display	HDMI	1, Supports HDMI 2.1 up to 4096 x 2160 @ 60 Hz
	VGA	1, up to 1092 x 1200 @ 60 Hz
	DP	1, up to 4096 x 2160 @ 60 Hz
	Triple Display	DP+HDMI+VGA(default)
Expansion Slot	PCIe x16	1 x PCIe 5.0 x16 slot
	PCIe x4	1 x PCIe 3.0/2.0 x 16 slot (x 4mode) 1 x PCIe 3.0/2.0 x1 slot
	PCI	4 x PCI slot
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280 (SATA/PCIe x 1 mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219V, 1 x Intel® I210AT
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Mic-In
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s, * SATA port 4 shared with M.2
Rear I/O	HDMI	1
	VGA	1
	DP	1
	USB 3.2	4(2 x USB 3.2 Gen2, 2 x USB 3.2 Gen1)
	USB 2.0	4
	Ethernet	2
	Serial Port	2(RS232/422/485)
	Audio jack	2
Internal Connector	Serial Port	4 (RS232)
	USB2.0	1 x Header Support Additional 2 x USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	2 (PWM Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Connector(AAFP)	1
	System Panel Header	1 (10-1 Pin)
	Buzzer	1
	Clear CMOS Jumper	1
	Speaker Connector	1 (4-pin)
	COM Debug Header	1
	I²C Header	1
	Parallel	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	2 x 4-pin ATX Power Connector, 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	both ATX/AT mode
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	10%~95%
Dimension	Form Factor	ATX
Certification	EMI & Safety	CE, FCC

H610M-IM-A

Micro-ATX, LGA1700 socket for the 12th Gen CPU, H610 chipset,2*U-DIMM,1*PCIe x16, 1*PCIe x4, 2*PCI, 1*M.2Slot, 1* Mini PCIe,4*SATA connectors, 9*USB, 6*COM,Triple Dispaly



Specifications

Processor System	CPU	Max. 65W TDP
	CHIPSET	Intel® H610 chipset
Memory	Technology	DDR4
	Max.	64GB
	Socket	2 x U-DIMM
Display	HDMI	2, Supports HDMI 2.1 up to 4096 X 2160 @ 60 Hz
	Display Port	1, Supports 1.4 up to 4096 x 2160 @ 60 Hz
Expansion Slot	PCIe x16	1 x PCIe 5.0 x16 slot
	PCIe x4	1 x PCIe 3.0/2.0 x4 slot (x1 speed)
	PCI	2 x PCI slot
	Mini PCIe	1 x full/half mini-PCIe
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Realtek® 8111H, 1 x Intel® i219V
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Mic-In
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s (*No. 4 SATA port shared with M.2)
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280(SATA/PCIe x4 mode)
Rear I/O	HDMI	2
	Display Port	1
	VGA	1
	USB 3.2 GEN2	2
	USB 3.2 GEN1	2
	Ethernet	2
	Serial Port	2 (RS232/422/485)
	Audio jack	2
Internal Connector	Serial Port	4 (RS232)
	USB2.0	2 x Header Support Additional 4 x USB2.0 Connectors, 1 x stick socket
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1 (10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Connector	1 (4-pin)
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	PS/2(KBMS)	1
	I²C header	1
	Power Connector	1 x 8-pin ATX Power Connector, 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	both ATX/AT mode
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	10%~95%, non-coagulation
Dimension	Form Factor	Micro-ATX, 244 x 244mm
Certification	Safety	CE, FCC

H310I-IM-A R3.0

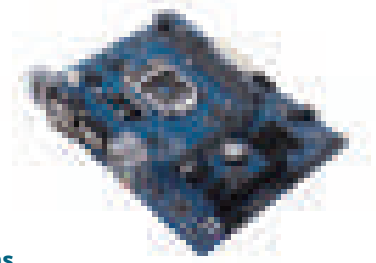
Mini-ITX, LGA1151 socket for the 9th/8th Gen CPU, H310 chipset, 2*SO-DIMM.
1*PCIe x16, 2*DP, HDMI, LVDS, 2*M.2 slot, 1*Mini-PCIe

Specifications

Processor System	CPU	LGA1151 socket for the 9th/8th Generation Intel® Core™ i7/ i5/ i3/ Pentium® / Celeron® processors supports 14nm CPU, Max. 65W TDP
	CHIPSET	Intel® H310 chipset
Memory	Technology	DDR4 2666/2400/2133 MHz
	Max.	32GB
	Socket	2 x SO-DIMM
Display	HDMI	1, Supports HDMI 1.4b up to 4096 X 2160 @ 24 Hz
	Display Port	2, Supports DP 1.2a up to 4096 x 2160 @ 60 Hz
	LVDS	1, Supports 48 bits up to 1.4b 1920 x1200 @ 60Hz
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 slot
	Mini PCIe	1 x full/half mini-PCIe with SATA
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242/2260/2280(PCIe & SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® I219V, Support WOL/PXE 1 x Intel® I210AT, Support WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897
	Connector	Line-Out, Line-In
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280(PCIe & SATA mode)
	mSATA	1 x full/half mini-PCIe with SATA
Rear I/O	HDMI	1
	Display Port	2
	USB3.2 Gen1	4
	Ethernet	2
	Serial Port	2 (RS232/422/485)
	Audio jack	2
Internal Connector	Serial Port	4 (RS232)
	USB3.2 Gen1	1 x Header Support Additional 2 x USB3.2 Gen1 Connectors
	USB2.0	2 x Header Support Additional 4 x USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1 (10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Connector	1 (4-pin)
	LPC Debug Header	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	1 X 4-pin ATX Power Connector, 1 X 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	both ATX/AT mode
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	Safety	CE, FCC

H310M-IM-A

Micro-ATX, LGA1151 socket for the 9th/8th Gen CPU, H310 chipset, 2*DIMM
1*PCIe x16, 1*DVI-D, 1*VGA, 1*M.2 slot, 4*SATA connectors

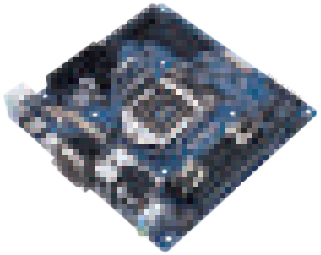


Specifications

Processor System	CPU	LGA1151 socket for the 9th/8th Generation Intel® Core™ i7/ i5/ i3/ Pentium® / Celeron® processors supports 14nm CPU.
	Max. Speed	4.9GHz eight core
	L2 Cache	12MB
	Chipset	Integrated
	TDP	65W
Memory	Technology	DDR4 2666/2400/2133 MHz, non-ECC, un-buffered memory *DDR4 2666MHz and higher memory modules will run at max. 2666MHz on Intel® 8th Gen. 6-core or higher processors.
	Max.	32GB
	Socket	2 x U-DIMM
Display	Controller	Intel UHD Graphics 630/610
	DVI-D	1, Supports 1920 x 1200 @60 Hz
	VGA	1, Supports 1920 x 1200 @60 Hz
	Multi Display	DVI-D+VGA Multi-VGA output support :DVI-D/VGA ports Supports up to 2 displays simultaneous under OS
Expansion Slot	PCIE	1x PCIE x16 2x PCIE 2.0 x1
	PCI	1x PCI
	M.2	1 x M.2 socket 3 with M key, type 2260/2280 storage devices support both SATA* & PCIe x2 mode
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Realtek RTL8111H Gb Lan
	Connector	1 x RJ-45
Audio	Codec	Realtek® ALC887/ALC 897*-VD2 High Definition Audio CODEC
	Connector	Line-out, Lin-in, Mic-in
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s, * SATA port 4 shared with M.2
Rear I/O	DVI-D	1
	VGA	1
	USB	2x USB3.2 Gen1 Type-A ports, 4xUSB 2.0 Type-A ports
	Ethernet	1
	COM port	1 (RS-232 port)
	P/S2	1 x keyboard port, 1 x mouse port
Internal Connector	Serial Port	1 (RS-232 header)
	USB3.2 Gen1 Type A header	1, support additional 2 x USB3.2 Gen1 connectors
	USB2.0 header	1, support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	System panel header	1
	Clear CMOS header	1
	Speaker connector	1
	Parallel connector	1
	LPC Debug header	1
	LPC TPM header	1
	power connector	1 x 24-pin EATX Power connector, 1 x 4-pin EATX 12V Power connector
Security	TPM	LPC TPM header
Power	Power Type	ATX Power
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Micro-ATX, 244 x 193 mm
Certification	EMI & Safety	CE, FCC

H310I-IM-B

Mini-ITX, LGA1151 socket for the 9th/8th Gen CPU, H310 chipset, 2*SO-DIMM.
1*PCIe x16, DP, DVI-D, LVDS, eDP, 2*M.2 slot

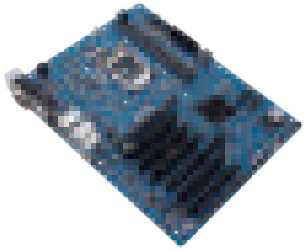


Specifications

Processor System	CPU	LGA1151 socket for the 9th/8th Generation Intel® Core™ i7/ i5/ i3/ Pentium® /Celeron® processors supports 14nm CPU
	CHIPSET	Intel® H310 chipset
	TDP	65W
Memory	Technology	DDR4 2666/2400/2133 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	DVI-D	1, Supports up to 1920 X 1200 @ 60 Hz
	Display Port	1, Supports DP 1.2a up to 4096 x 2160 @ 60 Hz
	LVDS	1, Supports up to 1920 x1200 @ 60Hz
	Embedded Display Port	1, 2 lanes supported (co-lay with LVDS), Supports up to 1920 x1200 @ 60Hz
	Multi Display	DVI-D+DP, DVI-D+LVDS, DVI-D+eDP, DP+LVDS, DP+eDP
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 slot
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device (support Intel®CNVi,PCIe) 1 x M.2 Socket 3 with M key, type 2242/2260/2280(PCIe mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219V, 1 x Intel® i211AT
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC887-VD2 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	4 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	DVI-D	1
	Display Port	1
	USB3.2 Gen1	2
	USB 2.0	3
	Ethernet	2
	Serial Port	1(RS-232/422/485)
	Audio jack	2
	PS/2	1 x Keyboard Port, 1 x Mouse Port
Internal Connector	Serial Port	3 (RS-232)
	USB3.2 Gen1	1 X Header Support Additional 2 X USB3.2 Gen1 Connectors
	USB2.0	1 X Header Support Additional 2 X USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1(10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Connector	1(4-pin)
	LPC Debug Header	1
	S/PDIF Header	1
	I²C Header	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	1 X 4-pin ATX Power Connector, 1 X 24-pin ATX Power Connector
Security	TPM	1 x SPI TPM header
Power	Power Type	both ATX mode and DC in (need an extra card)
	Voltage	DC in 12V
Dimension	Form Factor	Mini-ITX, 170 x 170 mm

H110A-IM-A

ATX, LGA1151 socket for the 6th/7th Gen CPU, H110 chipset, 2*U-DIMM.
2*PCIe x16, 5*PCI, HDMI, VGA, Dual LAN, M.2 slot

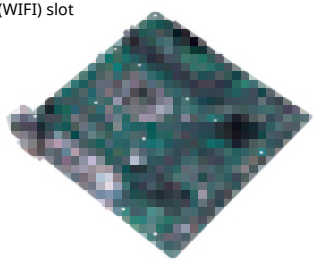


Specifications

Processor System	CPU	Intel® Socket 1151 for 7th/6th Generation Core™ i7/i5/i3/Pentium®/ Celeron® Processors supports Intel® 14 nm CPU, support max. 65W CPU
	CHIPSET	Intel® H110 chipset
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	2 x U-DIMM
Display	VGA	1, Supports up to Up to 1920 x 1200 @60Hz
	HDMI	1, Supports up to 4096 X 2160 @ 24Hz (colay with DP, optional)
	Dual Display	VGA+HDMI(Default) VGA+DP(optional)
Expansion Slot	PCIe	1 x PCIe 3.0/2.0 x16 slot (x16 mode) 1 x PCIe 2.0 x16 slot (@x4mode, x4pin)
	PCI	5 x PCI
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280(SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219V, 1 x Intel® i211AT
	Connector	2 x RJ - 45
Audio	Codec	Realtek ALC887/ALC 897*-VD2 High Definition Audio
	Connector	Line-Out, Line-In, Mic in
Storage	SATA port	3 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	VGA	1
	HDMI	1 (colay with DP, optional)
	USB 3.2 Gen1	4
	Ethernet	2
	Serial Port	2(RS232/422/485)
	Audio jack	3
	PS/2	1 x Keyboard Port, 1 x Mouse Port
Internal Connector	Serial Port	6 (RS232)
	USB2.0	2 x Header Support Additional 4 x USB2.0 Connectors 2 x stick socket
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Connector(AAFP)	1
	System Panel Header	1
	Clear CMOS Jumper	1
	Speaker Connector	1
	LPC Debug Header	1
	I²C Header	1
	Parallel	1
	GPIO Header	1 (8 Bit)
	AT/ATX Select Header	1
	Power Connector	1 x 4-pin ATX Power Connector, 1 x 24-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	AT/ATX mode
Operating System	Microsoft Windows	Windows 7 (32/64bit) / Windows 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85
	Relative Humidity	0%~85%
Dimension	Form Factor	ATX, 305 x 244 mm
Certification	EMI & Safety	CE, FCC

H110M-IM-A

Micro-ATX, LGA1151 socket for the 6th/7th Gen CPU, H110 chipset, 2*U-DIMM,1*mSATA slot, 2*PCIe x1, 1*PCIe x16, 1*Mini-PCIe, VGA+DVI-D, 20*USB,10*RS232, 1*M.2(WIFI) slot



Specifications

Processor System	CPU	Intel® Socket 1151 for 7th/6th Generation Core™ i7/i5/i3/Pentium®/ Celeron® Processors supports Intel® 14 nm CPU, support max. 65W CPU
	CHIPSET	Intel® H110 chipset
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	2 x U-DIMM
Display	VGA	1, Supports up to Up to 1920 x 1200 @60Hz
	DVI-D	1, Supports up to Up to 1920 x 1200 @60Hz
	Dual Display	VGA+DVI-D
Expansion Slot	PCIe	2 x PCIe 2.0 x 1 slot, 1 x PCIe 3.0/2.0 x16 slot (x16 mode)
	Mini PCIe	1 x full mini-PCIe 1 x SIM Card Slot (N)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VD2 High Definition Audio
	Connector	Line-Out, Line-In, Mic-In
Storage	SATA port	2 x SATA Gen 3.0, up to 6Gb/s
	mSATA	1 x mSATA 6Gb/s (1 x full/half mSATA)
Rear I/O	VGA	1
	DVI-D	1
	USB 3.2 Gen1	6
	USB 2.0	10
	Ethernet	2
	Audio jack	3
Internal Connector	Serial Port	10* RS232 (Other 2 coms are reserved and not loaded)
	USB2.0	2 x Header Support Additional 4 x USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header	1 (AAFP)
	System Panel Header	1 (10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Header	1 (4-pin)
	LPC Debug Header	1
	Speaker out Header	1 (With speaker AMP IC, 3W)
	AT/ATX select header	1
	GPIO	1
	SIM Header	1 (8-1pin SIM header, don't use with SIM Card Slot Simultaneously)
	Watchdog	1
	Power Connector	1 X 4-pin ATX 12V Power Connector, 1 X 24-pin EATX Power Connector
Security	TPM	TPM Header
Power	Power Type	AT/ATX mode
Operating System	Microsoft Windows	Windows 7 (32/64bit) / Windows 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	10%~95%, non-coagulation
Dimension	Form Factor	Micro-ATX, 244x244mm
Certification	EMI & Safety	CE, FCC

H110T-CM-A R2.0

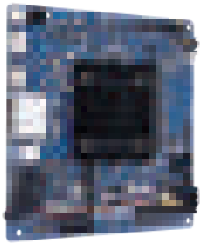
Thin Mini-ITX, H110T Chipset, 2*SO-DIMM, DP, HDMI, LVDS, 2*M.2 slot (E Key, M Key)

Specifications

Processor System	CPU	Intel® for 7th/6th Generation Core™ i7/i5/i3/Pentium®/Celeron® Processors supports Intel® 14 nm CPU, support max. 65W CPU
	Chipset	Intel® H110 chipset
Memory	Technology	DDR4 2133/1866MHz, non-ECC, un-buffered Memory
	Max.	32GB
	Socket	2 x SO-DIMM
Display	DisplayPort	1, Supports up to 4096 x 2160 @ 60 Hz
	HDMI	1, Supports up to 4096 x 2160 @ 24 Hz / 2560 x 1600 @ 60 Hz
	LVDS	1, Supports up to 1920 x1200 @ 60Hz
	Multi Display	HDMI/LVDS/DisplayPort ports, supports up to two displays simultaneously
Expansion Slot	M.2	1 x M.2 Socket 3 with M key, type 2242/2260 storage devices (SATA & PCIE mode) 1 x M.2 Socket 1 with E key, type 2230 for Wi-Fi/BT devices (PCIE/USB mode)
Ethernet	Speed	10/100/1000 Mbps
	Controller/PHY	1 x Realtek RTL8111H 1 x Intel I219V, support WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VA2 High Definition Audio
	Connector	Line-Out, Mic-In
Storage	SATA port	2 x SATA 6Gb/s port(s) 1 x SATA PWR CONN
Rear I/O	DC power input	1
	USB3.0 Port	4
	HDMI	1
	Display Port	1
	Ethernet	2 x RJ45
	Audio jack	2 (1 x LINE OUT, 1 x MIC in)
Internal Connector	Serial Port	1 (RS232)
	USB2.0 Header	3 x Headers Support Additional 5 USB 2.0 Connectors
	CPU Fan Header	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode & DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1(10-1 Pin)
	Clear CMOS Jumper	1
	Speaker Header	1 (4 pin)
	Internal Stereo Speaker Header	1 (4 pin)
	DMIC Header	1 (4 pin)
	RTC Battery Header	1 (2 pin)
	LVDS Signal Header	1 (support Dual Channel, 40 pin)
	LCD panel monitor switch Header	1 (2 pin)
	LVDS panel VCC power selection jumper	1 (6 pin)
	LVDS Backlight Panel selection header	1 (8 pin)
	Display Panel Backlight Power selection jumper	1 (3 pin)
	LPC debug header	1 (10 pin)
	DC Power Connector	1 x 2pin ATX 19V/12V
Watchdog Timer	BIOS	YES (SW porting)
Security	TPM	1 x SPI TPM header
Power	Power Type	DC in mode
	Voltage	Choose from either type below, and cannot be used at the same time -DC in 12V/19V -2 pin internal DC mode 12V / 19
Operating System	Microsoft Windows	Windows 7 / Windows 8.1 / Windows 10 (64bit)
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~50°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	5%~95%
Dimension	Form Factor	Thin Mini-ITX, 170 x 170 mm
Certification	EMC	CE, FCC

J6412T-IM-A

Thin mini ITX, Intel® J6412 SoC onboard Processors, 2*SO-DIMM.
1*PCIe x1, HDMI, LVDS, Dual LAN, M.2 slot

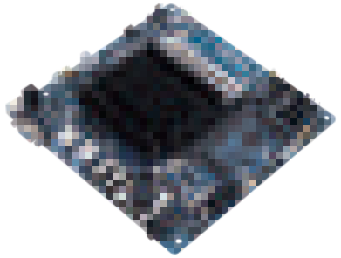


Specifications

Processor System	CPU	Intel® Celeron® Quad-Core J6412 SoC onboard Processors
Memory	Technology	DDR4 3200/3000/2800/2666/2400/2133 MHz, (non-ECC)
	Max.	32 GB
	Socket	2 x SO-DIMM
Display	HDMI	1, Supports HDMI 1.4b, up to 3840x2160 @ 30Hz (Default)
	DP1	1, Supports up to 4096x2160 @ 60Hz (Default)
	DP2 (optional by request)	1, Supports up to 4096x2160 @ 60Hz (colay with HDMI)
	LVDS	1, Supports up to 1920x1200 @ 60Hz (Default)
	Edp (optional by request)	1, Supports up to 4096x2160 @ 60Hz (colay with LVDS)
	Triple Displays	HDMI+ DP+ LVDS, HDMI(Default)+ DP+ eDP, DP+ DP+ LVDS, DP+ DP+ eDP
Expansion Slot	PCIe 3.0/2.0 x1	1
	Mini PCIe	1 x Full/Half-size PCIe mini card slot(w/ SIM holder) (PCIE x1 mode)
	M.2	1 x E key, type 2230 for WIFI/BT device (PCIE x1 /USB2.0) 1 x M key, type 2242/2260/2280 (PCIE x2 / SATA mode) supports NVMe
	SD card	1 x Full-size SD card slot
Ethernet	Speed	10/100/1000 Mbps
	Controller	2 x Realtek RTL8111H (Support WOL/PXE)
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	1 x SATA Gen 3.0, Up to 6Gb/s
Rear I/O	HDMI	1
	DP	1
	USB	3*USB 3.2 Gen2 + 1*USB 2.0
	Ethernet	2
	Audio jack	1
	DC-12V Power Input	1
Internal I/O Connectors	Serial Port	6 COM1 supports RS232/422/485: Ring/5V/12V Select, switch by jumper COM2 supports RS232:Ring/5V/12V Select, switch by jumper COM3~6 supports RS232
	USB2.0	2 (Support Additional 4 x USB2.0 Ports)
	Chassis Fan	1 (PWM)
	Front Panel Audio Header (AAFP)	1
	Front panel as Power/Reset/HDD (F_Panel)	1 (10-1 Pin)
	Chassis Intrusion	1
	Speaker	1 (4 pin)
	Stereo Out	2 (2-pin, 3 watt/channel amplifier)
	Clear CMOS	1
	COM Debug Header	1 (6 pin)
	GPIO	1 (8 Bit)
	LVDS Signal header	1 (support Dual Channel stand type, 40 pin)
	LCD panel monitor switch header	1 (2 pin)
	LVDS panel VCC power selection jumper	1 (6 pin)
	LVDS panel backlight enable signal selection jumper	1 (3 pin)
	LVDS backlight panel header	1 (5 pin)
	PS/2 Keyboard/Mouse	1 (2 x 4 Pin)
	Power in Connector	1 (4-pin ATX Power Connector, DC in mode)
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM Header
Power	Power Type	12V DC-in (1x External DC jack; 1 x Internal 4-pin power connector)
OS & Software Support	Microsoft Windows Linux	Windows® 10 (64-bit) / Windows® IoT Enterprise Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	IoT Suite	☑ HW Monitor ☑ PowerScheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO
	User Interface	☑ API ☑ GUI
Environment	Operating Temperature	0 ~ 60°C
	Non-Operating Temperature	-40 ~ 85° C
	Relative Humidity	Operational humidity: 40°C@10%~95%
Mechanical	Dimensions	Thin Mini-ITX, 170 x 170 mm
Certification	EMC	CE, FCC, VCCI, BSMI, RCM
	Safety	CE-LVD

J3455T-IM-A R2.0

Thin mini ITX, Intel® J3455 SoC onboard Processors, 2*SO-DIMM.
1*PCIe x1, HDMI, VGA, LVDS, Dual LAN, M.2 slot

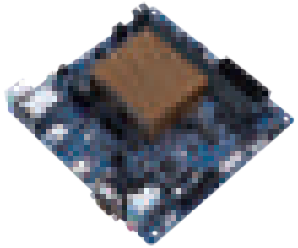


Specifications

Processor System	CPU	Build in Intel®J3455 SoC onboard Processors
Memory	Technology	DDR3L 1866 MHz Non-ECC, Un-buffered Memory
	Max.	8GB
	Socket	2 x SO-DIMM
Display	VGA	1, Supports up to 1900 X 1200 @ 60 Hz(colay with DP++)
	HDMI	1, Supports up to 3840 X 2160 @ 30Hz
	Display Port++	1, Supports up to 4096 x2160 @ 60Hz(colay with VGA)
	LVDS	1, Supports up to 1920 x1200 @ 60Hz(colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x2160 @ 60Hz(colay with LVDS, optional)
	Triple Display	VGA+HDMI+LVDS, VGA+HDMI+eDP, DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	PCIe	1 x PCIe 2.0 x1 (colay with M.2 E key)
	Mini-PCIe	1 x Full/Half-size PCIe mini card slot(w/ SIM holder)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device(colay with PCIe)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897
	Connector	Line-Out, line-In
Storage	SATA port	2 x SATA Gen 3.0, up to 6Gb/s
	mSATA	1 x Full/Half-size mSATA slot(shared with Mini PCIe)
Rear I/O	VGA	1
	HDMI	1
	Display Port++	1
	USB3.2 Gen1	4
	Ethernet	2
	Audio jack	1 (Default Line-out, switch to line-in by BIOS)
	DC IN	1
Internal Connector	Serial Header	6 (5 x RS232, 1 x RS232/422/485)
	USB 2.0	2 x Header support additional 4 x USB2.0 connectors
	8-bit GPIO Header	1
	KB/MS Header	1
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode)
	SATA Power Connector	1
	SATA Gen 3.0 Connector	2
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1
	Speaker Header	1
	AT/ATX select header	1
	ATX Power supply(5VSB) Connector	1
	Chassis intrusion header	1
	Clear CMOS Jumper	1
	I2C Header	1
	LVDS Connector	1
	eDP Connector	1 (optional)
	LPC Debug header	1
	Display Panel Backlight Power Selector	1
	Flat Panel Display Brightness Connector	1
	Display Panel VCC Power Selector	1
	LCD panel monitor switch header	1
	Power Connector	1 x 4-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	AT/ATX mode and DC in
	Voltage	DC in 12V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Thin Mini-ITX, 170 x 170 mm
Certification	EMC	CE, FCC, VCCI, BSMI, RCM
	Safety	CE-LVD

J3455I-CM-A R2.0

Mini-ITX, Intel® Celeron® Quad-Core J3455 SoC, 2*U-DIMM, 1*PCIe x4, HDMI, VGA, LVDS, 1*M.2 E Key, 6*USB3.2 Gen1, 4*USB2.0, 2*SATA, 2*COM, TPM

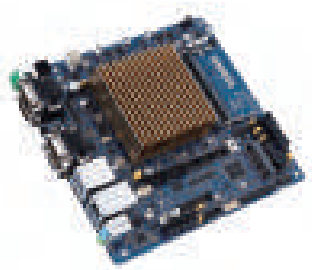


Specifications

Processor System	CPU	Build in Intel® Celeron® Quad-Core J3455 SoC onboard Processors
Memory	Technology	DDR3L 1866/1600/1333 MHz Non-ECC, Un-buffered Memory
	Max.	8GB
	Socket	2 x U-DIMM
Display	VGA	1, Supports up to 1920 X 1200 @ 60 Hz
	HDMI	1, Supports up to 3840 x 2160 @ 30 Hz
	LVDS	1, Supports up to 1920 X 1200 @ 60Hz
	Multi Display	HDMI+VGA+LVDS
Expansion Slot	PCIe	1 x PCIe 2.0 x4 (x1 mode)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Realtek® RTL8111H
	Connector	1 x RJ-45
Audio	Codec	Realtek® ALC897-VD2 8-Channel High Definition Audio
	Connector	Line-Out, Line-In, MIC
Storage	SATA port	2 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	VGA	1
	HDMI	1
	USB3.2 Gen1	4
	Ethernet	1
	Serial Port	1 (RS232)
	Audio jack	3
	PS/2	1 x Keyboard Port, 1 x Mouse Port
Internal Connector	Serial Port	1 (RS232)
	USB3.2 Gen1	1 x Header Support Additional 2 X USB3.2 Gen1 Connectors
	USB2.0	2 x Header Support Additional 4 X USB2.0 Connectors
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Parallel Port Connector	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1(10-1 Pin)
	Clear CMOS Jumper	1
	Buzzer	1
	LVDS Connector	1
	Display Panel Backlight Power Selector	1
	Flat Panel Display Brightness Connector	1
	Display Panel VCC Power Selector	1
	LCD panel monitor switch header	1
	Power Connector	1 X 4-pin ATX Power Connector, 1 X 24-pin EATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x LPC TPM header
Power	Power Type	EATX, ATX mode
Operating System	Microsoft Windows	Windows® 10 (64bit)
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~50°C
	Non-Operating Temperature	-40~70°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	Safety	CE, FCC

N5105I-IM-A R2.0

Mini-ITX, N5105 SoC, 2*SO-DIMM, VGA, HDMI, LVDS, 6*COM, 8*USB, POS market dedicated

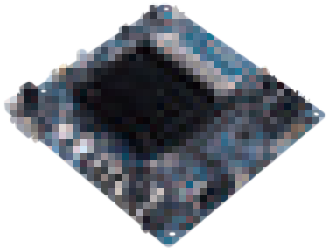


Specifications

Processor System	CPU	Intel® Celeron® Quad-Core N5105 SoC onboard Processors (Jasper Lake)
	Chipset	Integrated
Memory	Technology	DDR4 2933/2666/2400/2133 MHz
	Max.	32 GB
	Socket	2 x SO-DIMM
Display	HDMI	1,Supports HDMI 1.4b up to 4096 X 2160 @24 Hz
	VGA	1, Supports up to 1920 X 1200 @ 60 Hz
	LVDS(Colay with eDP)	1, Supports 40 bits up to 1.4b 1920 x1200 @ 60Hz (Optional BOM colay with eDP)
Expansion Slot	PCIe3.0/2.0 x1	1
	Mini PCIe	1 x mini PCIe (support PCIex1/USB2.0 mode) (w/ SIM holder)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1 x Realtek RTL8111H (Support WOL/PXE)
	Connector	1 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
	Connector	Line-Out, Line-In
Storage	SATA port	2 x SATA Gen 3.0, Up to 6Gb/s
	SATA Power connectors	2
Rear I/O	VGA	1
	HDMI	1
	USB3.2 Gen1	4
	Ethernet	1 x RJ45
	RJ11	1 x RJ11 (For cash drawer 12V/24V, optional)
	Serial Port	3 (1*RS232/422/485, 2*RS232 5/12/Ring, switched by BIOS)
	Audio jack(s)	2
	DC-12V Power Input	1 (4-pin, Lockable DC Jack 4P connector)
Internal Connector	Serial Port	3 (RS232: Ring/5V/12V Select, switched by jumper) Please keep your device around +/-12V
	USB2.0	2 x Header Support Additional 4 x USB2.0 Ports (stand by power, MOS, switch from BIOS)
	Chassis Fan	1 x Header (PWM)
	Front Panel Audio header (AAFP)	1 x Header (10-1 Pin)
	System panel header	1 x Header (10-1 Pin)
	Chassis Intrusion	1 x Header
	Buzzer	1
	Speaker	1 x Header
	Clear CMOS	1 x Header
	LPT	1 x Header (2 x 13 Pin)
	COM Debug	1 x Header
	DIO	1 x Header (8 Bit)
	Audio Amplifier connector	2 (3 Watt/Channel Amplifier IC)
	LVDS Signal header	1 (support Dual Channel stand type, 40 pin)
	LCD panel monitor switch header (Panel_SW)	1 (2 pin)
	LVDS panel VCC power selection jumper (VCC_PWR_SEZL)	1 (6 pin, support 3V/5V/12V selection)
	LVDS Panel enable signal selection jumper (BKLTEN_SEL)	1 (3 pin, default with high active)
	LVDS backlight panel header (LCD_BLK_PANEL)	1 (5 pin, support 5V/12V)
	MSR Pin Header	1 (6-pin, support both USB and PS/2 mode)
	MSR Definition Change Jumper (MSR_DAT_SEL) (MSR_CLK_SEL)	2 (3-pin)
Internal Connector	RJ11 VCC selection jumper	1 (3-pin, 12V/24)
	PS/2 Keyboard/Mouse header	1 (2 x 4 Pin)
	Power out Connector	1 x 4-pin ATX DC Power Output Connector
	Power in Connector	1 x 4-pin ATX DC Power In Connector (DC in mode)
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM Header
Power	Power Type	12V DC-IN
Operating System	Microsoft Windows	Windows® 10 (64bit) – version after 20'H1, 20'H2
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	15%~95%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm

N4200T-IM-A

Thin mini ITX, Intel® N4200 SoC onboard Processors, 2*SO-DIMM.
1*PCIe x1, HDMI, VGA, LVDS, Dual LAN, M.2 slot

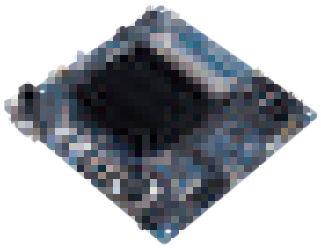


Specifications

Processor System	CPU	Build in Intel®N4200 SoC onboard Processors
Memory	Technology	DDR3L 1866 MHz Non-ECC, Un-buffered Memory
	Max.	8GB
	Socket	2 x SO-DIMM
Display	VGA	1, Supports up to 1900 X 1200 @ 60 Hz(colay with DP++)
	HDMI	1, Supports up to 3840 X 2160 @ 30Hz
	Display Port++	1, Supports up to 4096 x2160 @ 60Hz(colay with VGA)
	LVDS	1, Supports up to 1920 x1200 @ 60Hz(colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x2160 @ 60Hz(colay with LVDS,optional)
	Triple Display	VGA+HDMI+LVDS, VGA+HDMI+eDP, DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	PCIe	1 x PCIe 2.0 x1 (colay with M.2 E key)
	Mini-PCIe	1 x Full/Half-size PCIe mini card slot(w/ SIM holder)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device(colay with PCIe)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC887
	Connector	Line-Out, line-In
Storage	SATA port	2 x SATA Gen 3.0, up to 6Gb/s
	mSATA	1 x Full/Half-size mSATA slot(shared with Mini PCIe)
Rear I/O	VGA	1
	HDMI	1
	Display Port++	1
	USB3.2 Gen1	4
	Ethernet	2
	Audio jack	1(Default Line-out, switch to line-in by BIOS)
	DC IN	1
Internal Connector	Serial Header	6 (5 x RS232, 1 x RS232/422/485)
	USB 2.0	2 x Header support additional 4 x USB2.0 connectors
	8-bit GPIO Header	1
	KB/MS Header	1
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode)
	SATA Power Connector	1
	SATA Gen 3.0 Connector	2
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1
	Speaker Header	1
	AT/ATX select header	1
	ATX Power supply(5VSB) Connector	1
	Chassis intrusion header	1
	Clear CMOS Jumper	1
	I²C Header	1
	LVDS Connector	1
	eDP Connector	1(optional)
	LPC Debug header	1
	Display Panel Backlight Power Selector	1
	Flat Panel Display Brightness Connector	1
	Display Panel VCC Power Selector	1
	LCD panel monitor switch header	1
	Power Connector	1 X 4-pin ATX Power Connector
Security	TPM	1 x SPI TPM header
Power	Power Type	AT/ATX mode and DC in
	Voltage	DC in 12V
Dimension	Form Factor	Thin Mini-ITX, 170 x 170 mm

N3350T-IM-A

Thin mini ITX, Intel® N3350 SoC onboard Processors, 2*SO-DIMM.
1*PCIe x1, HDMI, VGA, LVDS, Dual LAN, M.2 slot



Specifications

Processor System	CPU	Build in Intel®N3350 SoC onboard Processors
Memory	Technology	DDR3L 1866 MHz Non-ECC, Un-buffered Memory
	Max.	8GB
	Socket	2 x SO-DIMM
Display	VGA	1, Supports up to 1900 X 1200 @ 60 Hz(colay with DP++)
	HDMI	1, Supports up to 3840 X 2160 @ 30Hz
	Display Port++	1, Supports up to 4096 x2160 @ 60Hz(colay with VGA)
	LVDS	1, Supports up to 1920 x1200 @ 60Hz(colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x2160 @ 60Hz(colay with LVDS, optional)
	Triple Display	VGA+HDMI+LVDS, VGA+HDMI+eDP, DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	PCIe	1 x PCIe 2.0 x1 (colay with M.2 E key)
	Mini-PCIe	1 x Full/Half-size PCIe mini card slot(w/ SIM holder)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device(colay with PCIe)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC887
	Connector	Line-Out, line-In
Storage	SATA port	2 x SATA Gen 3.0, up to 6Gb/s
	mSATA	1 x Full/Half-size mSATA slot(shared with Mini PCIe)
Rear I/O	VGA	1
	HDMI	1
	Display Port++	1
	USB3.2 Gen1	4
	Ethernet	2
	Audio jack	1(Default Line-out, switch to line-in by BIOS)
	DC IN	1
Internal Connector	Serial Header	6 (5 x RS232, 1 x RS232/422/485)
	USB 2.0	2 x Header support additional 4 x USB2.0 connectors
	8-bit GPIO Header	1
	KB/MS Header	1
	CPU Fan Connector	1 (PWM Mode)
	Chassis Fan Header	1 (PWM Mode)
	SATA Power Connector	1
	SATA Gen 3.0 Connector	2
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1
	Speaker Header	1
	AT/ATX select header	1
	ATX Power supply(5VSB) Connector	1
	Chassis intrusion header	1
	Clear CMOS Jumper	1
	I²C Header	1
	LVDS Connector	1
	eDP Connector	1(optional)
	LPC Debug header	1
	Display Panel Backlight Power Selector	1
	Flat Panel Display Brightness Connector	1
	Display Panel VCC Power Selector	1
	LCD panel monitor switch header	1
	Power Connector	1 X 4-pin ATX Power Connector
Security	TPM	1 x SPI TPM header
Power	Power Type	AT/ATX mode and DC in
	Voltage	DC in 12V
Dimension	Form Factor	Thin Mini-ITX, 170 x 170 mm

N420S-IM-AA R3.0

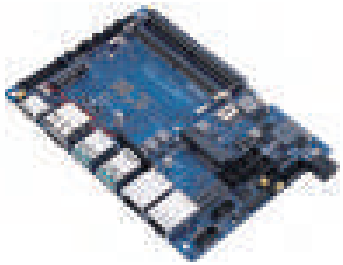
3.5” form factor, Intel® Pentium® N4200, DDR3L 1866, 1*M.2 E-key 2230, 1*M.2 M-key 2242, 2*GbE, 4*USB3.1, 2*USB2.0, 6*COM, 1*SATA3.0, 1*TPM, 12-24V DC

Specifications

Processor System	CPU	Intel® Pentium ® N4200 Processor (Quad-Core)
Memory	Technology	DDR3L 1866/1600/1333 MHz Non-ECC, Un-buffered Memory
	Max.	8GB
	Socket	1 x SO-DIMM
Display	Controller	Intel HD Graphics 505
	HDMI	1, Supports HDMI1.4b up to 3840 x 2160 @ 30 Hz
	Display Port	1, Supports DP1.2 up to 4096 x 2160 @ 60 Hz
	Embedded DisplayPort	1, Supports eDP1.3 x4 lanes, up to 3840x2160 @ 60 Hz (co-lay with LVDS)
	LVDS	1, Supports 1920 x 1080 @ 60 Hz (co-lay with eDP)
	Multi Display	HDMI+DP+LVDS
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on-board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242 (SATA mode)
	Others	1 x Micro SD Card slot (on-board)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Intel® i210IT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ® ALC897-VD2 8-Channel High Definition Audio
	Connector	Line-Out, Mic-in
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	HDMI	1
	Display Port	1
	USB3.1 Gen1	4
	Ethernet	2
Internal Connector	Serial Port	6 (2 x RS-232/422/485, 4 x RS-232)
	USB2.0	1, support additional 2 x USB2.0 connectors
	Chassis Fan Header	1 (PWM+DC Mode)
	Chassis Intrusion Header	1
	Front Panel Audio Header (AAFP)	1
	System Panel Header	1 (10-1 Pin)
	Clear CMOS Jumper	1
	SATA Power Header	1
	LPC Debug Header	1
	SMBus Header	1
	I²C Header	1
	GPIO Header	1 (8-bit)
	Power Connector	1 x 4-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	DC power input
	Voltage	12V-24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Windows 10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	3.5", 146 x 105 mm
Certification	EMC	CE, FCC
	Safety	CE-LVD

C7126ES-IM-AA

3.5” SBC, Intel® Core™ i7 Processor, DDR5 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 9-36V DC

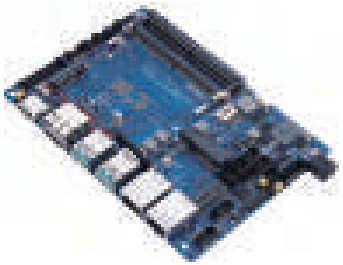


Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i7-1265UE Processor (SoC) ,15W, 10 Core, vPro supported
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I²C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ”, 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C5124ES-IM-AA

3.5" SBC, Intel® Core™ i5 Processor, DDR5 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 9-36V DC

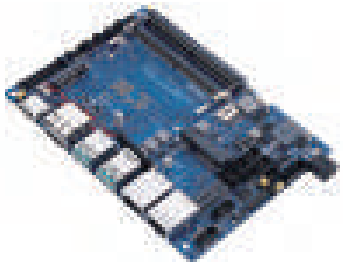


Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i5-1245UE Processor (SoC) ,15W, 10 Core, vPro supported
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I^2C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60˚C
	Non-Operating Temperature	-40~85˚C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C3121ES-IM-AA

3.5" SBC, Intel® Core™ i3 Processor, DDR5 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 9-36V DC

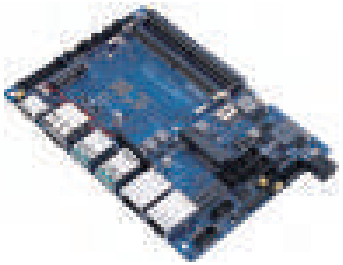


Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i3-1215UE Processor (SoC) ,15W, 6 Core
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I^2C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60˚C
	Non-Operating Temperature	-40~85˚C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C7125S-IM-AA

3.5" SBC, Intel® Core™ i7 Processor, DDR5 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 9-36V DC

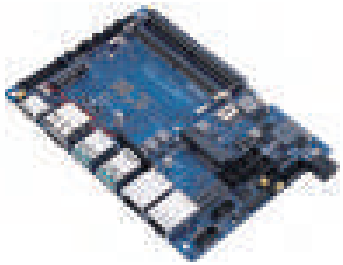


Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i7-1255U Processor (SoC) ,15W, 10 Core, vPro supported
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I²C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C5123S-IM-AA

3.5" SBC, Intel® Core™ i5 Processor, DDR5 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 9-36V DC

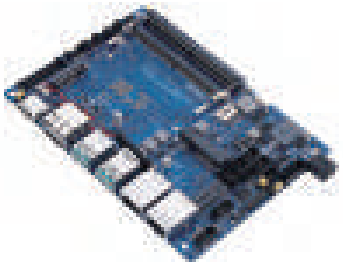


Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i5-1235U Processor (SoC) ,15W, 10 Core, vPro supported
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I²C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C3121S-IM-AA

3.5" form factor, Intel® Core™ i5-8365UE Processor, DDR4 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 12-24V DC



Specifications

Processor System	CPU (Alder Lake-P UE series)	Intel® Core™ i3-1215U Processor (SoC) ,15W, 6 Core
	MAX. SPEED	6GHz
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR5 4800 MHz
	Max.	64GB
	Socket	2 x SO-DIMM
Display	Controller	Intel® Xe Graphics architecture, 4 Independent Displays, Up to 8K Display
	HDMI	2, Supports HDMI 2.0
	Display Port	1, Supports DP 1.4a
	LVDS	1 (colay with eDP)
	Embedded Display Port	1, Support eDP 1.4b (co-lay with LVDS, reserved, support by request)
	Multi Display	HDMI + HDMI + DP + LVDS, HDMI + HDMI + DP + eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot (with on-board Nano-SIM socket*1)
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi (2*PCIe x1) 1 x M.2 Socket 3 with M key, type 2242/2280 Gen 4 (PCIe x4 & SATA mode)
Ethernet	Speed	10/100/1000Mbps/2.5G
	Controller	1 x Intel® i219LM, supports vPRO/WOL/PXE 1 x Intel® i225V, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	2
	USB3.2 gen2	4 (10G)
	LED (Back)	Power status, HDD R/W
	Ethernet	2
Internal Connector	Serial Port	4 x header (2 x RS232/422/485 w/ ring, 1 x RS232 w/ Ring/5V/12V, 1 x RS232 w/ring)
	USB2.0	1 x header support additional 2 x USB 2.0 connectors
	Chassis fan header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin), with AMP IC
	System panel header	1
	SATA power header	1 (4-pin)
	GPIO header	1 (8 bit)
	SMBus header	1, 4pin
	I²C header	1, 3pin
	Power connector	1 x 4-pin ATX power connector
Watchdog Timer	BIOS	Yes
Security	TPM	SPI TPM header
Power	Power Type	DC input
	Power Conn	ATX 2x2 pin (Jack to 4pin cable, accessory by request)
	Voltage	9-36V DC input
Operating System	Microsoft Windows	Win10 Iot Enterprise 2021 LTSC
	Linux	Ubuntu, Linux Yocto
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operating: 40° C @95% relative humidity, non-condensing Non-operating: 60° C @95% relative humidity, non-condensing
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC, Safet	CE, FCC, BSMI, VCCI, ISED, EN62368

C786ES-IM-AA R2.0

3.5" form factor, Intel® Core™ i7-8665UE Processor, DDR4 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 12-24V DC

Specifications

Processor System	CPU	Intel® Core™ i7-8665UE Processor (SoC) ,non-ECC, un-buffered memory
	Base Frequency	1.7GHz Quad-core
	L2 Cache	8MB
	Chipset	Integrated
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	1 x SO-DIMM
Display	Controller	Intel UHD Graphics 620
	HDMI	1, Supports HDMI 1.4 up to 4096 x 2160 @ 24 Hz
	Display Port	1, Supports DP 1.2a up to 4096 x 2304 @ 60 Hz
	LVDS	1, Supports 24 bits up to 1920 x 1200 @ 30Hz (colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x 2304 @ 60 Hz (co-lay with LVDS)
	Multi Display	DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on -board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi 1 x M.2 Socket 3 with M key, type 2242(PCIE & SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219LM, supports vPro/WOL/PXE 1 x Intel® i1210AT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VA2 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
	M.2	1 x M.2 Socket 3 with M key, type 2242(PCIE & SATA mode)
	mSATA	1 x Full-size (shared with Mini PCIe slot)
Rear I/O	Display Port	1
	HDMI	1
	USB3.2 gen2	4
	Ethernet	2
Internal Connector	Serial Port	6 x header (2 x RS232/422/485, 4 x RS232)
	USB2.0	2 x header support additional 4 x USB2.0 connectors
	Chassis fan header	1
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin, w/ 3 Watt/Channel Amplifier IC)
	System panel header	1
	Clear CMOS jumper	1
	SATA power header	1 (4-pin)
	LPC Debug Header	1
	GPIO header	1 (8 bit)
	SMBus header	1
	I²C header	1
	power connector	1 x 4-pin ATX power connector
Watchdog Timer	H/W	yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC input
	Voltage	12-24V DC input
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 Iot Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operational humidity: 40°C@5%~ 95%
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC	CE, FCC, CCC

C583ES-IM-AA R2.0

3.5" form factor, Intel® Core™ i5-8365UE Processor, DDR4 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 12-24V DC

Specifications

Processor System	CPU	Intel® Core™ i5-8365UE Processor (SoC) ,non-ECC, un-buffered memory
	Base Frequency	1.6GHz Quad-core
	L2 Cache	6MB
	Chipset	Integrated
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	1 x SO-DIMM
Display	Controller	Intel UHD Graphics 620
	HDMI	1, Supports HDMI 1.4 up to 4096 x 2160 @ 24 Hz
	Display Port	1, Supports DP 1.2a up to 4096 x 2304 @ 60 Hz
	LVDS	1, Supports 24 bits up to 1920 x 1200 @ 30Hz (colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x 2304 @ 60 Hz (co-lay with LVDS)
	Multi Display	DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on -board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi 1 x M.2 Socket 3 with M key, type 2242(PCIE & SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219LM, supports vPro/WOL/PXE 1 x Intel® i1210AT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VA2 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
	M.2	1 x M.2 Socket 3 with M key, type 2242(PCIE & SATA mode)
	mSATA	1 x Full-size (shared with Mini PCIe slot)
Rear I/O	Display Port	1
	HDMI	1
	USB3.2 gen2	4
	Ethernet	2
Internal Connector	Serial Port	6 x header (2 x RS232/422/485, 4 x RS232)
	USB2.0	2 x header support additional 4 x USB2.0 connectors
	Chassis fan header	1
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin, w/ 3 Watt/Channel Amplifier IC)
	System panel header	1
	Clear CMOS jumper	1
	SATA power header	1(4-pin)
	LPC Debug header	1
	GPIO header	1 (8 bit)
	SMBus header	1
	I²C header	1
	power connector	1 x 4-pin ATX power connector
Watchdog Timer	H/W	yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC input
	Voltage	12-24V DC input
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 Iot Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operational humidity: 40°C@5%~ 95%
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC	CE, FCC, CCC

C381ES-IM-AA R2.0

3.5" form factor, Intel® Core™ i3-8145UE Processor, DDR4 SO-DIMM, DP, HDMI, LVDS, Dual-LAN, Multiple COM, 12-24V DC

Specifications

Processor System	CPU	Intel® Core™ i3-8145UE Processor (SoC) ,non-ECC, un-buffered memory
	Base Frequency	2.2GHz Dual-core
	L2 Cache	4MB
	Chipset	Integrated
Memory	Technology	DDR4 2400/2133 MHz
	Max.	32GB
	Socket	1 x SO-DIMM
Display	Controller	Intel UHD Graphics 620
	HDMI	1, Supports HDMI 1.4 up to 4096 x 2160 @ 24 Hz
	Display Port	1, Supports DP 1.2a up to 4096 x 2304 @ 60 Hz
	LVDS	1, Supports 24 bits up to 1920 x 1200 @ 60Hz (colay with eDP)
	Embedded Display Port	1, Supports up to 4096 x 2304 @ 60 Hz (co-lay with LVDS)
	Multi Display	DP+HDMI+LVDS, DP+HDMI+eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on -board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device and Intel® CNVi 1 x M.2 Socket 3 with M key, type 2242(PCIE & SATA mode)
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Intel® i219LM, supports WOL/PXE 1 x Intel® i210AT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek ALC897-VA2 High Definition Audio
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
	M.2	1 x M.2 Socket 3 with M key, type 2242(PCIe & SATA mode)
	mSATA	1 x Full-size (shared with Mini PCIe slot)
Rear I/O	Display Port	1
	HDMI	1
	USB3.2 gen2	4
	Ethernet	2
Internal Connector	Serial Port	6 x header (2 x RS232/422/485, 4 x RS232)
	USB2.0	2 x header support additional 4 x USB2.0 connectors
	Chassis fan header	1
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	Internal speaker header	1 (4-pin, 3 Watt/Channel Amplifier IC)
	System panel header	1
	Clear CMOS jumper	1
	SATA power header	1 (4-pin)
	LPC Debug header	1
	GPIO header	1 (8 bit)
	SMBus header	1
	I²C header	1
	power connector	1 x 4-pin ATX power connector
Watchdog Timer	H/W	yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC input
	Voltage	12-24V DC input
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 Iot Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	Operational humidity: 40°C@5%~ 95%
Dimension	Form Factor	3.5 ", 146 x 105 mm
Certification	EMC	CE, FCC, CCC

E395S-IM-AA R3.0

3.5" form factor, Intel® Atom® x7-E3950, DDR3L 1866, 1*M.2 E-key 2230, 1*M.2 M-key 2242, 2*GbE, 4*USB3.1, 2*USB2.0, 6*COM, 1*SATA3.0, 1*TPM, 12-24V DC

Specifications

Processor System	CPU	Intel®Atom® x7-E3950 Processor (Quad-Core)
Memory	Technology	DDR3L 1866/1600/1333 MHz Non-ECC, un-buffered memory
	Max.	8GB
	Socket	1 x SO-DIMM
Display	Controller	Intel HD Graphics 505
	HDMI	1, Supports HDMI 1.4b up to 3840 x 2160 @ 30 Hz
	Display Port	1, Supports DP 1.2 up to 4096 x 2160 @ 60 Hz
	Embedded DisplayPort	1, Supports eDP1.3 x4 lanes, up to 3840x2160 @ 60 Hz (co-lay with LVDS)
	LVDS	1, Supports 1920 x 1080 @ 60 Hz (co-lay with eDP)
	Multi Display	HDMI+DP+LVDS
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on-board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242 (SATA mode)
	others	1 x Micro SD Card slot (on-board)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Intel® I210IT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897-VD2 8-Channel High Definition Audio
	Connector	Line-out, Mic-in
Storage	SATA port	1x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	1
	USB3.1 Gen1	4
	Ethernet	2
Internal Connector	Serial Port	6 (2 x RS-232/422/485, 4 x RS-232)
	USB2.0	1, support additional 2 x USB2.0 connectors
	Chassis fan header	1 (PWM+DC Mode)
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	System panel header	1 (10-1 pin)
	Clear CMOS jumper	1
	SATA power header	1
	LPC Debug header	1
	SMBus header	1
	I²C header	1
	GPIO Header	1 (8-bit)
	Power connector	1 x 4-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	DC power input
	Voltage	12V-24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Windows 10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation
Environment	Operating Temperature	-40~85°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	3.5", 146 x 105 mm
Certification	EMC	CE, FCC
	Safety	CE-LVD

E394S-IM-AA R3.0

3.5" form factor, Intel® Atom® x5-E3940, DDR3L 1866, 1*M.2 E-key 2230, 1*M.2 M-key 2242, 2*GbE, 4*USB3.1, 2*USB2.0, 6*COM, 1*SATA3.0, 1*TPM, 12-24V DC

Specifications

Processor System	CPU	Intel®Atom® x5-E3940 Processor (Quad-Core)
Memory	Technology	DDR3L 1866/1600/1333 MHz Non-ECC, un-buffered memory
	Max.	8GB
	Socket	1 x SO-DIMM
Display	Controller	Intel HD Graphics 505
	HDMI	1, Supports HDMI 1.4b up to 3840 x 2160 @ 30 Hz
	Display Port	1, Supports DP 1.2 up to 4096 x 2160 @ 60 Hz
	Embedded DisplayPort	1, Supports eDP1.3 x4 lanes, up to 3840x2160 @ 60 Hz (co-lay with LVDS)
	LVDS	1, Supports 1920 x 1080 @ 60 Hz (co-lay with eDP)
	Multi Display	HDMI+DP+LVDS, HDMI+DP+eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on-board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242 (SATA mode)
	others	1 x Micro SD Card slot (on-board)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Intel® I210IT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897-VD2 8-Channel High Definition Audio
	Connector	Line-out, Mic-in
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	1
	USB3.1 Gen1	4
	Ethernet	2
Internal Connector	Serial Port	6 (2 x RS-232/422/485, 4 x RS-232)
	USB2.0	1, support additional 2 x USB2.0 connectors
	Chassis fan header	1 (PWM+DC Mode)
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	System panel header	1 (10-1 pin)
	Clear CMOS jumper	1
	SATA power header	1
	LPC Debug header	1
	SMBus header	1
	I²C header	1
	GPIO Header	1 (8-bit)
	Power connector	1 x 4-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	DC power input
	Voltage	12V-24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Windows 10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation
Environment	Operating Temperature	-40~85°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	3.5", 146 x 105 mm
Certification	EMC	CE, FCC
	Safety	CE-LVD

E393S-IM-AA R3.0

3.5" form factor, Intel® Atom® x5-E3930, DDR3L 1866, 1*M.2 E-key 2230, 1*M.2 M-key 2242, 2*GbE, 4*USB3.1, 2*USB2.0, 6*COM, 1*SATA3.0, 1*TPM, 12-24V DC

Specifications

Processor System	CPU	Intel®Atom® x5-E3930 Processor (Quad-Core)
Memory	Technology	DDR3L 1866/1600/1333 MHz Non-ECC, un-buffered memory
	Max.	8GB
	Socket	1 x SO-DIMM
Display	Controller	Intel HD Graphics 505
	HDMI	1, Supports HDMI 1.4b up to 3840 x 2160 @ 30 Hz
	Display Port	1, Supports DP 1.2 up to 4096 x 2160 @ 60 Hz
	Embedded DisplayPort	1, Supports eDP1.3 x4 lanes, up to 3840x2160 @ 60 Hz (co-lay with LVDS)
	LVDS	1, Supports 1920 x 1080 @ 60 Hz (co-lay with eDP)
	Multi Display	HDMI+DP+LVDS, HDMI+DP+eDP
Expansion Slot	Mini PCIe	1 x Full-Length Mini PCIe slot with on-board Nano-SIM socket
	M.2	1 x M.2 Socket 1 with E key, type 2230 for WIFI/BT device 1 x M.2 Socket 3 with M key, type 2242 (SATA mode)
	others	1 x Micro SD Card slot (on-board)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Intel® I210IT, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897-VD2 8-Channel High Definition Audio
	Connector	Line-out, Mic-in
Storage	SATA port	1 x SATA Gen 3.0, up to 6Gb/s
Rear I/O	Display Port	1
	HDMI	1
	USB3.1 Gen1	4
	Ethernet	2
Internal Connector	Serial Port	6 (2 x RS-232/422/485, 4 x RS-232)
	USB2.0	1, support additional 2 x USB2.0 connectors
	Chassis fan header	1 (PWM+DC Mode)
	Chassis intrusion header	1
	Front panel audio header (AAFP)	1
	System panel header	1 (10-1 pin)
	Clear CMOS jumper	1
	SATA power header	1
	LPC Debug header	1
	SMBus header	1
	I²C header	1
	GPIO Header	1 (8-bit)
	Power connector	1 x 4-pin ATX Power Connector
Watchdog Timer	H/W	YES
Security	TPM	1 x SPI TPM header
Power	Power Type	DC power input
	Voltage	12V-24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Windows 10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation
Environment	Operating Temperature	-40~85°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	3.5", 146 x 105 mm
Certification	EMC	CE, FCC
	Safety	CE-LVD

X621EP-IM-AA

2.5"PICO-ITX, Intel® Atom ™ Processor, LPDDR4 3200/4266 on board, DP, HDMI,LVDS, Dual-LAN, 12-24V DC

Specifications

Processor System	CPU	Atom, x6211E
	Max. Frequency	3.0GHz
	Base Frequency	1.3GHz
	Core/Tread	2/2
	CPU TDP	6W
Memory	Technology	LPDDR4 4266
	Max.	4GB
Storage	EMMC	64 GB
Display	HDMI	2, HDMI 2.0, 4k, 60 Hz
	LVDS	1 (Colay with eDP) (BOM Option)
	Multiple displays	Max. 3 displays, HDMI+HDMI+LVDS, HDMI+HDMI+eDP
Expansion Slot	M.2 & Mini PCIe	1 x 2230 M.2 E key for WIFI/BT device 1 x full-size mini-PCIe (Default mSATA + USB 2.0)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1x Intel® I226-IT (2.5 Gbe) & 1 x Intel i210-IT (1 Gbe)
	Connector	2 x RJ-45
Storage	SATA port	1
	SATA Power	1,2 pin
Rear I/O	HDMI	2
	USB 3.2	2
	Ethernet	2x RJ45
	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	LED indicators	1, PCB Back
Internal Connector	Serial Port	2 x RS232/422/485, Ring/5V/12V Select, switch by jumper
	USB2.0	1 header for 2 ports
	GPIO	1 x Header
	System Panel	1 x Header
	Backlight control header	1 x Header
	I²C Connector	I²C/SMBUS (I²C as default, SMBUS selected by HW BOM)
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	Display Panel VCC Power Selection jumper	1 x Header
	AT/ATX Select Header	1 x Header
Security	TPM	TPM2.0, TPM on board (optional)
Power Type	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	Voltage	12V-24V DC Input
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C ☑ Linux GPIO Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Standard	0~60˚C
	Operating Extend	-40~85˚C
	Storage Temperature	-40~85˚C
	Relative Humidity	Operational humidity: 40˚C@10%~95%
Mechanical	Dimensions	3.94" x 2.84" (100mm x 72mm)
Certification	EMC ,Safety	CE, FCC, BSMI, VCCI, ISED, CE-LVD

X641EP-IM-AA

2.5"PICO-ITX, Intel® Atom™ Processor, LPDDR4 3200/4266 on board , DP, HDMI,LVDS, Dual-LAN, 12-24V DC

Specifications

Processor System	CPU	Atom, x6413E
	Max. Frequency	3.0GHz
	Base Frequency	1.5GHz
	Core/Tread	4/4
	CPU TDP	9W
Memory	Technology	LPDDR4 4266
	Max.	4GB
Storage	EMMC	64 GB
Display	HDMI	2, HDMI 2.0, 4k, 60 Hz
	LVDS	1 (Colay with eDP) (BOM Option)
	Multiple displays	Max. 3 displays, HDMI+HDMI+LVDS, HDMI+HDMI+eDP
Expansion Slot	M.2 & Mini PCIe	1 x 2230 M.2 E key for WIFI/BT device 1 x full-size mini-PCIe (Default mSATA + USB 2.0)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1x Intel® I226-IT (2.5 Gbe) & 1 x Intel i210-IT (1 Gbe)
	Connector	2 x RJ-45
Storage	SATA port	1
	SATA Power	1,2 pin
Rear I/O	HDMI	2
	USB 3.2	2
	Ethernet	2x RJ45
	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	LED indicators	1, PCB Back
Internal Connector	Serial Port	2 x RS232/422/485, Ring/5V/12V Select, switch by jumper
	USB2.0	1 header for 2 ports
	GPIO	1 x Header
	System Panel	1 x Header
	Backlight control header	1 x Header
	I²C Connector	I²C/SMBUS (I²C as default, SMBUS selected by HW BOM)
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	Display Panel VCC Power Selection jumper	1 x Header
	AT/ATX Select Header	1 x Header
Security	TPM	TPM2.0, TPM on board (optional)
Power Type	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	Voltage	12V-24V DC Input
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C ☑ Linux GPIO Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Standard	0~60˚C
	Operating Extend	-40~85˚C
	Storage Temperature	-40~85˚C
	Relative Humidity	Operational humidity: 40˚C@10%~95%
Mechanical	Dimensions	3.94" x 2.84" (100mm x 72mm)
Certification	EMC ,Safety	CE, FCC, BSMI, VCCI, ISED, CE-LVD

X642EP-IM-AA

2.5"PICO-ITX, Intel® Atom™ Processor, LPDDR4 3200/4266 on board, DP, HDMI,LVDS, Dual-LAN, 12-24V DC

Specifications

Processor System	CPU	Atom, x6425E
	Max. Frequency	3.0GHz
	Base Frequency	2.0GHz
	Core/Tread	4/4
	CPU TDP	12W
Memory	Technology	LPDDR4 4266
	Max.	8GB
Storage	EMMC	64 GB
Display	HDMI	2, HDMI 2.0, 4k, 60 Hz
	LVDS	1 (Colay with eDP) (BOM Option)
	Multiple displays	Max. 3 displays, HDMI+HDMI+LVDS, HDMI+HDMI+eDP
Expansion Slot	M.2 & Mini PCIe	1 x 2230 M.2 E key for WIFI/BT device 1 x full-size mini-PCIe (Default mSATA + USB 2.0)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1x Intel® I226-IT (2.5 Gbe) & 1 x Intel i210-IT (1 Gbe)
	Connector	2 x RJ-45
Storage	SATA port	1
	SATA Power	1,2 pin
Rear I/O	HDMI	2
	USB 3.2	2
	Ethernet	2x RJ45
	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	LED indicators	1, PCB Back
Internal Connector	Serial Port	2 x RS232/422/485, Ring/5V/12V Select, switch by jumper
	USB2.0	1 header for 2 ports
	GPIO	1 x Header
	System Panel	1 x Header
	Backlight control header	1 x Header
	I²C Connector	I²C/SMBUS (I²C as default, SMBUS selected by HW BOM)
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	Display Panel VCC Power Selection jumper	1 x Header
	AT/ATX Select Header	1 x Header
Security	TPM	TPM2.0, TPM on board (optional)
Power Type	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	Voltage	12V-24V DC Input
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C ☑ Linux GPIO Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Standard	0~60˚C
	Operating Extend	-40~85˚C
	Storage Temperature	-40~85˚C
	Relative Humidity	Operational humidity: 40˚C@10%~95%
Mechanical	Dimensions	3.94" x 2.84" (100mm x 72mm)
Certification	EMC ,Safety	CE, FCC, BSMI, VCCI, ISED, CE-LVD

X6425REP-IM-AA

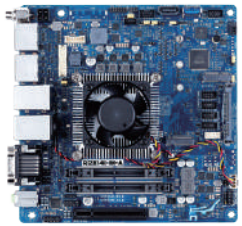
2.5"PICO-ITX, Intel® Atom™ Processor, LPDDR4 3200/4266 on board, DP, HDMI,LVDS, Dual-LAN, 12-24V DC

Specifications

Processor System	CPU	Atom, x6425E
	Max. Frequency	N/A
	Base Frequency	1.9GHz
	Core/Tread	4/4
	CPU TDP	12W
Memory	Technology	LPDDR4 3200
	Max.	8GB
Storage	EMMC	128 GB
Display	HDMI	2, HDMI 2.0, 4k, 60 Hz
	LVDS	1 (Colay with eDP) (BOM Option)
	Multiple displays	Max. 3 displays, HDMI+HDMI+LVDS, HDMI+HDMI+eDP
Expansion Slot	M.2 & Mini PCIe	1 x 2230 M.2 E key for WIFI/BT device 1 x full-size mini-PCIe (Default mSATA + USB 2.0)
Ethernet	Speed	10/100/1000 Mbps
	Controller	1x Intel® I226-IT (2.5 Gbe) & 1 x Intel i210-IT (1 Gbe)
	Connector	2 x RJ-45
Storage	SATA port	1
	SATA Power	1,2 pin
Rear I/O	HDMI	2
	USB 3.2	2
	Ethernet	2x RJ45
	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	LED indicators	1, PCB Back
Internal Connector	Serial Port	2 x RS232/422/485, Ring/5V/12V Select, switch by jumper
	USB2.0	1 header for 2 ports
	GPIO	1 x Header
	System Panel	1 x Header
	Backlight control header	1 x Header
	I²C Connector	I²C/SMBUS (I²C as default, SMBUS selected by HW BOM)
	Clear CMOS	1 x Header
	COM Debug	1 x Header
	Display Panel VCC Power Selection jumper	1 x Header
	AT/ATX Select Header	1 x Header
Security	TPM	TPM2.0, TPM on board (optional)
Power Type	Power Type	Lockable Phoenix Terminal (Colay Lockable DC Jack)
	Voltage	12V-24V DC Input
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Windows® IoT enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
	ASUS IoT Suite	☑ HW Monitor ☑ Power Scheduling ☑ Fan Control ☑ Watch Dog Timer ☑ GPIO ☑ I²C ☑ Linux GPIO Sample code
	User Interfaces	☑ API ☑ GUI
Environment	Operating Standard Operating Extend Storage Temperature	0~60° C -40~85° C -40~85° C
	Relative Humidity	Operational humidity: 40°C@10%~95%
Mechanical	Dimensions	3.94" x 2.84" (100mm x 72mm)
Certification	EMC ,Safety	CE, FCC, BSMI, VCCI, ISED, CE-LVD

R2314I-IM-A

Mini-ITX, AMD Ryzen™ Embedded R2314 APU, 2 x SO-DIMM



Specifications

Processor System	APU	AMD Ryzen™ Embedded R2314
Memory	Technology	DDR4 up to 2667 MHz, ECC support
	Max.	32GB
	Socket	2 x SO-DIMM
Display	Display Port	4, max. resolution 3840x2160 @60Hz
	Multi Display	Default: 4DP By request: 3DP+LVDS or 3DP + eDP
Expansion Slot	PCIe	1x PCIe 3.0 x8 slot (x8 mode)
	M.2	1 x M.2 Socket 1 with E key, type 2230 (PCIe x1, USB 2.0) 1 x M.2 Socket 3 with M key, type 2242/2260/2280 (PCIe x2, SATA)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H, support WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC 897 codec
	Connector	2 x Audio jacks (1 x Mic-in, 1 x Line-out) 2 x 2W Stereo Speaker output 1 x 5.1 channel (internal pin header)
Storage	Default	1 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key M, 2242 / 2260 / 2280) PCIe x2 and SATA mode* 1 x CFAST* *If CFAST is enabled, M.2 SATA mode will be disabled, and vice versa. You may configure this setting in the BIOS.
	Per request	2 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key M, 2242 / 2260 / 2280) PCIe x2
Rear I/O	Display Port	• Default: 4DP • By request: 3DP+LVDS
	USB 3.2 Gen2 Type-A ports	2 x ports
	USB 2.0 Type-A ports	2 x ports
	Ethernet	2 x RJ45 ports
	Serial Port	2 x COM connectors (support RS232/422/485)
	Audio jack	1 x Mic in 1 x Line out
	Power	1 x DC jack (lockable)
Internal I/O Connectors	Serial Port	4 x header (RS-232); COM3 colay CCtalk & COM4 colay TTL (BOM option)
	USB 3.2 Gen1	1 x Type A vertical connector
	USB 2.0	1 x header support additional 2 x USB2.0 Connectors
	CPU Fan	1 x header (PWM mode)
	Chassis Fan	1 x header (PWM mode)
	Chassis Intrusion	1 x header
	Front Panel Audio (AAFP)	2 x headers
	System Panel Header	1 x header
	Clear CMOS Jumper	1 x header
	SATA power	2 x header
	LPC Debug	1 x header
	S/PDIF	1 x header
	I²C	1 x header
	GPIO	1 x header
	AT/ATX Select	1 x header
	Power Connector	1 (4 pin)
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC-in (ATX and AT mode supported)
	Voltage	DC-in 12V ~ 24V
OS & Software Support	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise / Windows 11
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60° C
	Non-Operating Temperature	-40~85° C
	Relative Humidity	Operational humidity: 40°C@10%~95%
Mechanical	Dimensions	Mini-ITX, 170 x 170 mm
Certification	EMC	CE, FCC, VCCI, BSMI, RCM
	Safety	CE-LVD

V1605I-IM-B / R1505I-IM-B

Mini-ITX, AMD Ryzen™ Embedded V/R1000-Series V1605/R1505G APU, 2 x SO-DIMM

Specifications

Processor System	APU	AMD Ryzen™ Embedded V1605B/R1505G APUs
Memory	Technology	DDR4 2400MHz, ECC support
	Max.	32GB
	Socket	2 x SO-DIMM
Display	Display Port	3/2, DP++ supports DisplayPort 1.4 with max. resolution 3840x2160 @60Hz (V1605I-IM-B/R1505I-IM-B) 1, DP++ DisplayPort 1.4 with max. resolution 3840x2160 @60Hz (Optional, shared with LVDS and eDP)
	LVDS(default option)	1, LVDS supports LVDS with max. resolution 1920 x1200 @60Hz (Optional, shared with DisplayPort1 and eDP)
	eDP(optional)	1, eDP supports eDP 1.4 with max. resolution 3840 x 2160 @ 60Hz (Optional, shared with DisplayPort1 and LVDS)
	Multi Display	・Default: 3DP+LVDS (V1605I-IM-B) / 2DP+LVDS (R1505I-IM-B) ・Optional: 4DP or 3DP+eDP (V1605I-IM-B) / 3DP or 2DP+eDP (R1505I-IM-B) Supports up to 4/3 displays simultaneous under OS (V1605I-IM-B/R1505I-IM-B)
Expansion Slot	PCIe	1 x PCIe 3.0 x8 slot (PCIe x8 mode for V1605I-IM-B/ PCIe x4 mode for R1505I-IM-B)
	M.2	1 x M.2 Socket 1 with E key, type 2230 (PCIe x1, USB 2.0) (V1605I-IM-B only) 1 x M.2 Socket 3 with M key, type 2242/2260/2280 (PCIe x2, SATA)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897 codec
	Connector	2 x Audio jacks (1 x Mic-in, 1 x Line-out) 2 x 2W Stereo Speaker output 1 x 5.1 channel (internal pin header)
Storage	Default	1 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key B, 2242 / 2260 / 2280) PCIe x2 and SATA mode* 1 x CFAST* *If CFAST is enabled, M.2 SATA mode will be disabled, and vice versa. You may configure this setting in the BIOS.
	Per request	2 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key B, 2242 / 2260 / 2280) PCIe x2
Rear I/O	Display Port	・Default: 3DP+LVDS (V1605I-IM-B) / 2DP+LVDS (R1505I-IM-B) ・Optional: 4DP or 3DP+eDP (V1605I-IM-B) / 3DP or 2DP+eDP (R1505I-IM-B)
	USB 3.2 Gen2 Type-A ports	2 x ports
	USB 2.0 Type-A ports	2 x ports
	Ethernet	2 x RJ45 ports
	Serial Port	2 x COM connectors (support RS232/422/485)
	Audio jack	1 x Mic in , 1 x Line out
	Power	1 x DC jack (lockable)
Internal Connector	Serial Port	4 x header (RS-232); COM3 colay CCtalk & COM4 colay TTL (BOM option)
	USB 3.2 Gen1	1 x Type A vertical connector (V1605I-IM-B)
	USB 2.0	1 x header support additional 2 x USB2.0 Connectors 1 x type A vertical connector (R1505I-IM-B)
	CPU Fan	1 x header (PWM mode)
	Chassis Fan	1 x header (PWM mode)
	Chassis Intrusion	1 x header
	Front Panel Audio (AAFP)	2 x headers
	System Panel Header	1 x header
	Clear CMOS Jumper	1 x header
	SATA power	2 x headers
	LPC Debug	1 x header
	S/PDIF	1 x header
	I²C	1 x header
	GPIO	1 x header
	AT/ATX Select	1 x header
	Power Connector	1 (4 pin)
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC-in (ATX and AT mode supported)
	Voltage	DC-in 12V ~ 24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	EMC	CE, FCC

R1606I-IM-B

Mini-ITX, AMD Ryzen™ Embedded R1606G APU, 2 x SO-DIMM

Specifications

Processor System	APU	AMD Ryzen™ Embedded R1606G APU
Memory	Technology	DDR4 2400MHz, ECC support
	Max.	32GB
	Socket	2 x SO-DIMM
Display	Display Port	2, DP++ supports DisplayPort 1.4 with max. resolution 3840x2160 @60Hz 1, DP++ DisplayPort 1.4 (Optional, shared with LVDS and eDP) with max. resolution 3840x2160 @60Hz
	LVDS(default option)	1, LVDS supports LVDS with max. resolution 1920 x1200 @60Hz (Optional, shared with DisplayPort1 and eDP)
	eDP(optional)	1, eDP supports eDP 1.3 with max. resolution 3840 x 2160 @ 60Hz (Optional, shared with DisplayPort1 and LVDS)
	Multi Display	・Default: 2DP+LVDS ・Optional: 3DP or 2DP+eDP Supports up to 3 displays simultaneous under OS
Expansion Slot	PCIe	1x PCIe 3.0 x8 slot (x4 mode)
	M.2	1 x M.2 Socket 3 with M key, type 2242/2260/2280 (PCIe x2, SATA)
Ethernet	Speed	10/100/1000Mbps
	Controller	2 x Realtek® 8111H, supports WOL/PXE
	Connector	2 x RJ-45
Audio	Codec	Realtek® ALC897 codec
	Connector	2 x Audio jacks (1 x Mic-in, 1 x Line-out) 2 x 2W Stereo Speaker output 1 x 5.1 channel (internal pin header)
Storage	Default	1 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key B, 2242 / 2260 / 2280) PCIe x2 and SATA mode* 1 x CFAST* *If CFAST is enabled, M.2 SATA mode will be disabled, and vice versa. You may configure this setting in the BIOS.
	Per request	2 x SATA port Gen 3.0, up to 6Gb/s 1 x M.2 (Key B, 2242 / 2260 / 2280) PCIe x2
Rear I/O	Display Port	・Default: 2DP+LVDS ・Optional: 3DP or 2DP+eDP
	USB 3.2 Gen2 Type-A ports	2 x ports
	USB 2.0 Type-A ports	2 x ports
	Ethernet	2 x RJ45 ports
	Serial Port	2 x COM connectors (support RS232/422/485)
	Audio jack	1 x Mic in , 1 x Line out
	Power	1 x DC jack (lockable)
Internal Connector	Serial Port	4 x header (RS-232); COM3 colay CCtalk & COM4 colay TTL (BOM option)
	USB 2.0	1 x header support additional 2 x USB2.0 Connectors 1 x type A vertical connector
	CPU Fan	1 x header (PWM mode)
	Chassis Fan	1 x header (PWM mode)
	Chassis Intrusion	1 x header
	Front Panel Audio (AAFP)	2 x headers
	System Panel Header	1 x header
	Clear CMOS Jumper	1 x header
	SATA power	2 x headers
	LPC Debug	1 x header
	S/PDIF	1 x header
	I²C	1 x header
	GPIO	1 x header
	AT/ATX Select	1 x header
	Power Connector	1 (4 pin)
Watchdog Timer	H/W	Yes
Security	TPM	1 x SPI TPM header
Power	Power Type	DC-in (ATX and AT mode supported)
	Voltage	DC-in 12V ~ 24V
Operating System	Microsoft Windows	Windows® 10 (64bit) / Win10 IoT Enterprise
	Linux	Ubuntu, RedHat Enterprise, Fedora Workstation, OpenSUSE
Environment	Operating Temperature	0~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	0%~85%
Dimension	Form Factor	Mini-ITX, 170 x 170 mm
Certification	Safety	CE (Class B), FCC (Class B)

IMX8P-IM-A R2.0

NXP® i.MX 8M ARM Cortex-A53 core, 4GB LPDDR4, HDMI, Dual LAN, 16G eMMC, 1*M.2 E Key slot, 1*Micro SD Card, 3*USB 3.2 Gen 1

Specifications

Processor System	CPU	NXP® i.MX 8 M ARM Cortex-A53 core
	Max.Speed	1.3 GHz
	L2 Cache	1MB
	Integrated	Integrated
Memory	Technology	LPDDR4
	Max.	4GB on board memory
Display	HDMI	1, Supports HDMI 2.0 up to 3840 x 2160@60Hz
	MIPI DSI	1, Supports MIPI DSI (4 lane) up to 1920 x 1080@60Hz
Expansion Slot	M.2	1 x M.2 2230 E Key for BT/WiFi module (cooperate with Google EdgeTPU Module)
	Others	1 x Micro-SD Card connector
Ethernet	Speed	10/100/1000Mbps
	Controller	1 x Realtek® RTL8211, 1 x Intel I210-AT
	Connector	2 x RJ-45
Storage	eMMC	1 x 16GB onboard eMMC
Front I/O	HDMI	1
	USB3.2 Gen1	2@Type A, 5V/2A 1@Type C OTG, 5V/1.5A
	Ethernet	2
	Power Button	1
	Reset Button	1
Rear I/O	Power Connector	DC Power input
Internal Connector	GPIO Header	1 x 40-pin headers includes: - up to 6 x GPIO pins - up to 2 x I²C bus - up to 1 x UART - up to 2 x PWM - up to 1 x PCM/I2S - 2 x 5V power pins - 2 x 3.3V power pins - 8 x ground pins
	Micro-SD Card	1 Slot
	TPM Header	1 (14-1 pin)
	MIPI DSI	1, Supports MIPI DSI (4 lane) up to 1920 x 1080@60Hz
	MIPI CSI	2, support two MIPI-CSI camera inputs (4-lane each)
	I²C Header	1 (5-1 pin)
Security Module	TPM Module	TPM 2.0 power by Nuvoton NCPT 750 (Optional)
Power	Power Type	DC power input
	Voltage	12-24V DC input
Environment	Operating Temperature	-20~60°C
	Non-Operating Temperature	-40~85°C
	Relative Humidity	10~95%
Dimension	Form Factor	100mm x 72mm x 21mm

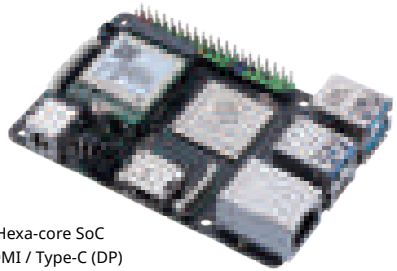
TINKER BOARD SERIES

Tinker Board Series is a Single Board Computer (SBC) in a small form factor that offers class-leading performance, greater durability, better stability and overall improved user experience for developers.

For those in search of tailor-made solutions, ASUS IoT offers custom design services such as changing your existing hardware, or creating a completely new solution according to your specific requirements. With the right skills to design, manufacture, test and support, ASUS IoT provides a one-stop service to help you manage your business in an effective, cost-saving manner.

Tinker Board 2 / Tinker Board 2S

ARM SBC, Rockchip RK3399 Hexa-core, LPDDR4 RAM, eMMC, HDMI, MIPI-DSI, MIPI-CSI, 12-19V DC in



Features

- Arm® big.LITTLE™ A72+A53 Hexa-core SoC
- Multiple MIPI-CSI & DSI / HDMI / Type-C (DP)
- USB 3.0 / Wi-Fi 802.11ac / BT 5.0 / GPIO
- 12V~19V DC-in offers stable power delivery
  Linux & Android supported

Microsoft Azure Certified

Specifications

SoC	Rockchip RK3399
CPU	Dual-core Arm® Cortex®-A72 @ 2.0 GHz + Quad-core Arm® Cortex®-A53 @ 1.5 GHz
GPU	Arm® Mali™-T860 MP4 GPU @ 800 MHz
Memory	Dual-CH LPDDR4 2/4GB
Storage	16GB eMMC* (* Only available on S model) 1 x Micro SD (TF) card slot (push & push)
Display	1 x HDMI with CEC hardware ready 1 x Type-C (DP) 1 x 22-pin MIPI DSI (4 lane)
USB	3 x USB3.2 Gen1 Type-A ports 1 x USB3.2 Gen1 Type-C OTG port
Camera Interface	1 x 15-pin MIPI CSI-2 (2 lane)
Connectivity	1 x RTL8211E/F GbE LAN 1 x 802.11 a/b/g/n/ac & Bluetooth 5.0 (2T2R)
Audio	1 x HDMI audio, 1 x I2S (40-pin), 1 x S/PDIF (40-pin)
Internal I/O	1 x 40-pin header includes: - up to 28 x GPIO pins - up to 2 x SPI bus - up to 2 x I²C bus - up to 2 x UART - up to 3 x PWM - up to 1 x PCM/I2S - up to 1 x S/PDIF TX - 2 x 5V power pins - 2 x 3.3V power pins - 8 x ground pins 1 x 2-pin Recovery header 1 x 2-pin Power-on header 1 x 2-pin Reset header 1 x 2-pin Debug UART header 1 x 2-pin DC Fan header 1 x 2-pin RTC Battery header
Power requirement	1 x 12~19V DC input (5.5/2.5 mm)
Operation Temperature	0~60°C
Non-Operation Temperature	-40~85°C
Relative Humidity	10%~85%
Operating System Support	Debian 10 / Android 11
Form Factor	3.37" x 2.125" (85 × 56 mm)

Tinker Board R2.0/ Tinker Board S R2.0

Card size SBC, Quad-core Arm processor, 2/4GB onboard memory & 16/32GB eMMC, HDMI, GbE LAN, Multiple USB

Features

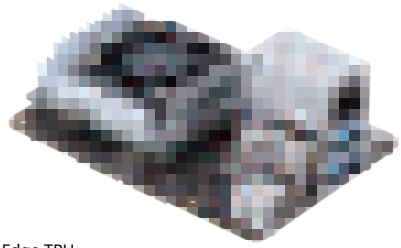
- Ultra-small form factor
- Onboard 16/32G eMMC for durability
  (for Tinker Board S R2.0)
- 40-pin GPIOs for multiple purposes
- Linux & Android supported

Specifications

SoC	Rockchip RK3288-CG.W
CPU	Quad-core Arm® Cortex®-A17 @ 1.8 GHz
GPU	Arm® Mali™-T760 MP4 GPU @ 600 MHz
Memory	Dual-CH LPDDR3 2/4GB
Storage	16/32GB eMMC (only available on Tinker Board S R 2.0) 1 x Micro SD (TF) card slot (push & pull)
Display	1 x HDMI with CEC hardware ready 1 x 15-pin MIPI DSI (2 lane)
USB	4 x USB2.0 Type-A ports
Camera Interface	1 x 15-pin MIPI CSI-2 (2 lane)
Connectivity	1 x RTL8211E/F GbE LAN 1 x 802.11 b/g/n & BT 4.2+EDR
Audio	1 x RTL ALC4030U codec with 3.5mm audio jack (with Mic & plug-in detecton)
Internal I/O	1 x 40-pin header includes: - up to 28 x GPIO pins - up to 2 x SPI bus - up to 2 x I²C bus - up to 4 x UART - up to 2 x PWM - up to 1 x PCM/I2S - up to 1 x S/PDIF TX - 2 x 5V power pins - 2 x 3.3V power pins - 8 x ground pins 1 x 2-pin Recovery header 1 x 2-pin Power-on header 1 x 2-pin Contact Point - 1 x PWM signal - 1 x S/PDIF signal
Power requirement	5V/3A DC, Micro-USB
Operation Temperature	0~60°C
Non-Operation Temperature	-40~85°C
Relative Humidity	10%~85%
Operating System Support	Debian 10/ Android 11
Form Factor	3.37" x 2.125" (85 × 56 mm)

Tinker Edge T

Card size SBC, NXP i.MX 8M Quad-core SoC, Google Edge TPU, 1GB RAM, 8GB eMMC, HDMI, MIPI-DSI, MIPI-CSI, 12-19V DC in



Features

- ML capability with Google Edge TPU
- 2 x MIPI-CSI / MIPI-DSI / HDMI
- 40-pin GPIOs for multiple purposes
- 12V~19V DC-in offers stable power delivery

Coral

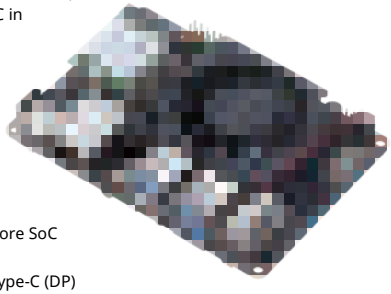
Microsoft Azure Certified

Specifications

SoC	NXP i.MX 8M
CPU	Quad-core Arm® Cortex®-A53 @ 1.5GHz, Coretex-M4
GPU	GC7000 Lite
NN Processor	Google Edge TPU ML accelerator coprocessor
Memory	LPDDR4 1GB
Storage	8GB eMMC 1 x Micro SD (TF) card slot (push & pull)
Display	1 x HDMI with CEC hardware ready 1 x 22-pin MIPI DSI
USB	2 x USB3.2 Gen1 Type-A ports 1 x USB3.2 Gen1 Type-C OTG port
Camera Interface	2 x 24-pin MIPI CSI-2
Internet	1 x RTL8211F-CG GbE LAN 1 x 802.11 a/b/g/n/ac & Bluetooth 4.2
Internal I/O	1 x 40-pin headers includes: - up to 28 x GPIO pins - up to 1 x SPI bus - up to 2 x I²C bus - up to 2 x UART - up to 3 x PWM - up to 1 x PCM/I2S - 2 x 5V power pins - 2 x 3.3V power pins - 8 x ground pins 1 x Boot mode switch 1 x 2-pin Reset header 1 x 2-pin DC Fan header
Power requirement	12~19V DC input (5.5/2.5 mm)
Operation Temperature	0~50°C
Non-Operation Temperature	-40~85°C
Relative Humidity	10%~85%
Operating System Support	Mendel
Form Factor	3.37" x 2.125" (85 × 56 mm)

Tinker Edge R

Pico-ITX SBC, Rockchip RK3399Pro Hexa-core, NPU for AI, 4GB SYS & 2GB NPU RAM, 16GB eMMC, HDMI, MIPI-DSI, MIPI-CSI, 12-19V DC in



Features

- Arm® big.LITTLE™ A72+A53 Hexa-core SoC
- ML capability with Rockchip NPU
- Multiple MIPI-CSI & DSI / HDMI / Type-C (DP)
- 40-pin GPIOs & mPCIe for multiple expansions
- 12V~19V DC-in offers stable power delivery
- Linux & Android supported

Microsoft Azure Certified

Specifications

SoC	Rockchip RK3399Pro
CPU	Dual-core Arm® Cortex®-A72 @ 1.8 GHz + Quad-core Arm® Cortex®-A53 @ 1.4 GHz
GPU	Arm® Mali™-T860 MP4 GPU @ 800 MHz
NN Processor	Rockchip NPU
Memory	Dual-CH LPDDR4 4GB (SYSTEM) + LDPPR3 2GB (NPU) or Dual-CH LPDDR4 2GB (SYSTEM) + LDPPR3 1GB (NPU)Memory
Storage	16GB eMMC 1 x Micro SD (TF) card slot (push & pull)
Display	1 x HDMI with CEC hardware ready 1 x Type-C (DP) 1 x 22-pin MIPI DSI (4 lane)
USB	3 x USB3.2 Gen1 Type-A ports 1 x USB3.2 Gen1 Type-C OTG port
Camera Interface	1 x 22-pin MIPI CSI-2 (4 lane) 1 x 22-pin MIPI CSI-2/DSI (4 lane)
Connectivity	1 x RTL8211F-CG GbE LAN 1 x 802.11 a/b/g/n/ac & Bluetooth 5.0 (2T2R)
Expansions	1 x Mini PCIe slot (Full-Length, nano-SIM socket, for 4G/LTE)
Audio	1 x 3.5mm audio jack (with Mic & plug-in detection)
Internal I/O	1 x 40-pin headers includes: - up to 28 x GPIO pins - up to 2 x SPI bus - up to 2 x I²C bus - up to 2 x UART - up to 3 x PWM - up to 1 x PCM/I2S - up to 1 x S/PDIF TX - 2 x 5V power pins - 2 x 3.3V power pins - 8 x ground pins 1 x 2-pin Recovery header 1 x 2-pin Power-on header 1 x 2-pin Reset header 1 x 2-pin DC Fan header 1 x 2-pin RTC Battery header
Power requirement	Dual 12-19V DC input (5.5/2.5 mm Barrel jack, 4-Pin header)
Operation Temperature	0~60°C
Non-Operation Temperature	-40~85°C
Relative Humidity	10%~85%
Operating System Support	Debian 10 / Android 9
Form Factor	Pico-ITX, 3.9" x 2.8" (100 × 72 mm)

Tinker System 2

Arm SBC with Aluminum Case, Rockchip RK3399 Hexa-core, LPDDR4 RAM, eMMC, HDMI, 12-19.5V DC in

Features

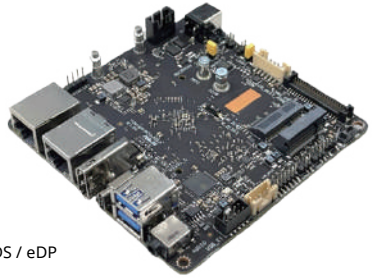
- Fanless design: Great heat conductive with fanless support
- Certified with RF Regulation: Wi-Fi (CE, FCC, VCCI, BSMI)
- High peripheral extensibility: Reserved I/O for antenna and accessory extension
- +12-19.5V DC-in offers stable power delivery
- Linux & Android supported

Specifications

SoC	Rockchip RK3399
CPU	Dual-core Arm® Cortex®-A72 @ 2.0 GHz + Quad-core Arm® Cortex®-A53 @ 1.5 GHz
GPU	Arm® Mali™-T860 MP4 GPU @ 800 MHz
Memory	Dual-CH LPDDR4 2/4GB
Storage	16/32GB eMMC
Display	1 x HDMI with CEC hardware ready 1 x Type-C (DP) 1 x 22-pin MIPI DSI (4 lane)
USB	3 x USB3.2 Gen1 Type-A ports 1 x USB3.2 Gen1 Type-C OTG port
Camera Interface	1 x 15-pin MIPI CSI-2 (2 lane)
Connectivity	1 x RTL8211F-CG GbE LAN 1 x 802.11 a/b/g/n/ac & Bluetooth 5.0 (2T2R)
Audio	1 x HDMI audio, 1 x I2S (40-pin), 1 x S/PDIF (40-pin)
Internal I/O	1 x 2-pin Recovery header 1 x 2-pin Power-on header 1 x 2-pin Reset header 1 x 2-pin Debug UART header 1 x 2-pin DC Fan header 1 x 2-pin RTC Battery header
Power requirement	12V~19.5V DC input (5.5/2.5 mm)
Operation Temperature	0~50°C
Non-Operation Temperature	-40~85°C
Relative Humidity	10%~85%
Operating System Support	Debian 10 / Android 11
Form Factor	3.583" x 2.638" x 1.772" (91 x 67 x 45 mm)

Tinker Board 3

Arm SBC, Rockchip RK3568 Quad-core, LPDDR4X RAM, eMMC, HDMI, LVDS, eDP, Dual Lan, POE, COM 232/422/485, CAN Bus



Features

- Quad-core ARM Cortex-A55 SoC
- Multiple displays support HDMI / LVDS / eDP
- COM RS-232/422/485, CAN Bus 2.0
- Wide range 12V~24V DC power in offers stable delivery
- Wide operating temperature up to -40~85°C
- Linux Debain 11, Yocto, Android 12 supported

Specifications

Processor	SoC	Rockchip RK3568	
	CPU	Quad-core Arm® Cortex®-A55	
	GPU	Arm® Mali™-G52 GPU	
Memory	Technology	Dual-CH LPDDR4X On-board	
	Size*	2GB / 4GB / 8GB	
Storage	Memory Card	1 x Micro SD (TF) card slot (push & pull)	
	eMMC*	32GB / 64GB	
	SPI Flash*	16MB	n/a
Ethernet	Speed	10/100/1000 Mbps	
	Controller*	2 x Realtek RTL8211F/FI (one support POE-IN module, 802.3at)	1 x Realtek RTL8211F
Expansion	M.2 E key 2230	1 x for Wi-Fi 5/Wi-Fi 6/BT (PCIe, USB 2.0)	
	M.2 B key 3042/3052* with nano-SIM slot*	1 x for 4G/5G (PCIe, USB 3.0, USB 2.0)	n/a
Display	HDMI	1 x Supports up to 4096 x 2160 @ 60 Hz	
	LVDS	1 x Supports up to 1920 x 1080 @ 60 Hz (Dual-link)	
	eDP	1 x Supports up to 2560 x 1600 @ 60 Hz	
	Multi Display	HDMI (4K)+ eDP (2K) or HDMI (4K)+LVDS (1080p)	
Audio	Audio Out	1 x 3.5 Phone Jack with Mic-in	
	Speaker Out	1 x 4-pin stereo, 4ohm, 2x3W	
	S/PDIF	1 x 1-pin in GPIO header	
Rear I/O	USB 3.2 Gen1	2 x Type-A 1 x Type-C OTG	
	Ethernet	2 x RJ45 LAN	
	HDMI	1 x Type-A	
Internal I/O & Header	USB 2.0	1 x 9-pin (2 ports)	
	COM 232 with flow control*	2 x 5-Pin (2 ports)	1 x 5-Pin
	COM 232/422/485*	1 x 5-Pin	n/a
	CAN Bus 2.0B FD*	1 x 3-Pin	n/a
	12-pin GPIO	up to 4 x PWM up to 2 x UART up to 1 x SPI bus (2 select) up to 1 x S/PDIF 2 x ACD (8 bit) 1 x I^2C bus 1 x GND	
	Debug UART	1 x 3-pin	
	Power-on and Reset	1 x 4-pin	
	Recovery	1 x 2-pin	
	DC Fan Connector	1 x 4-pin	
	RTC Battery	1 x 2-pin	
	Maskrom switch	1 x 2-pin	
	IR Receiver	1 x 3-pin	
	LED side view	3 x Power/Disk/Reserve	
Power	Power Input (12 ~ 24V)	1 x DC Barrel Power Input Jack (5.5/2.5 mm) 1 x 4-Pin Power In Header (also for POE-IN module)	
Environment	Operating Temperature*	0 ~ 60°C / -40 ~ 85°C	
	Storage Temperature	-40 ~ 85°C	
	Relative Humidity	10 ~ 85% (non-condensing)	
Others	Operating System	Linux Debian 11, Yocto, Android 12	
	Dimensions	4" x 4" (100 × 100 mm)	

10.1” Open Frame Panel PC PP-101W-3399

10.1 Inch ARM-based Touch PC, great for kiosks, POS displays, and other retail and commercial applications.

Specifications

Panel	Panel Type	Vertical Alignment
	Screen Size	10.1“
	Pixel Pitch	0.1695(H)x0.1695(V)
	Refresh Rate	60 Hz
	Aspect Ratio	16:9 (H:V）
	Active Area	216.96(H) × 135.6(V)
	Resolution	1280(RGB)×800
	Brightness (typical)	250±50cd/m²
	Contrast Ratio	800(Typical),600(Min.)
	Viewing Angle	89/89/89/89 (Typ.)(CR≥10)
Touch Display	Touch screen	Full flat projective capacitive touch panel
	Touch Capacity	Multi-Touch (10 points)
	Surface Hardness	7H
System	Chip Supplier	Rockchip RK3399
	CPU	2xArm® Cortex®-A72 @ 2.0 GHz + 4 x Arm® Cortex®-A53 @ 1.5 GHz
	GPU	Arm® Mali™ T860 MP4 GPU @ 800 MHz
	Memory Capacity	Dual-CH LPDDR4 On-board 2/4* GB *Spec by SKU
	eMMC Capacity	16GB *Spec by SKU
	Memory Card	1 x Micro SD (TF) card slot (push & pull)
	Operating System	Linux Debian 10, Android (AOSP) 11
	Wireless	802.11 a/b/g/n/ac & Bluetooth 5.0
	Audio	Optional to add additional audio line-up
Rear I/O	USB (Type A)	3 x USB 3.2 Type-A
	USB Type C	1 x USB 3.2 Type-C
	Display Input	1 x HDMI output up to 4K HD video resolution
	Ethernet Port	1 x 1 GbE LAN Port with optional IEEE 802.3at/af PoE-PD module support
Power Input	Power Supply	12 to 19 VDC
Physical Characteristics	Enclosure	Steel Housing, Fan-less design
	Mounting	VESA Mount 100 x 100, Panel, Stand
	Weight	1.4 kg(NW)
	Dimensions	249.66(H) x 168.3 (V) x 52.9 (T) mm
Environment	Operating Temperature	0~50°C
	Storage Temperature	-40~85°C
	Relative Humidity	10 ~ 85%, non-condensing
Certification	EMC	CE, FCC
	Safety	CB, BSMI

15.6” Open Frame Panel PC PP-156W-3399

15.6 Inch ARM-based Touch PC, great for kiosks, POS displays, and other retail and commercial applications.

Specifications

Panel	Panel Type	Vertical Alignment
	Screen Size	15.6“
	Pixel Pitch	0.17925(H)x0.17925(V)
	Refresh Rate	60 Hz
	Aspect Ratio	16:9 (H:V)
	Active Area	344.16(H) × 193.59(V)
	Resolution	1280(RGB)×800
	Brightness (typical)	400±100cd/m²
	Contrast Ratio	1000(Typical),700(Min.)
	Viewing Angle	89/89/89/89 (Typ.)(CR≥10)
Touch Display	Touch screen	Full flat projective capacitive touch panel
	Touch Capacity	Multi-Touch (10 points)
	Surface Hardness	7H
System	Chip Supplier	Rockchip RK3399
	CPU	2xArm® Cortex®-A72 @ 2.0 GHz + 4 x Arm® Cortex®-A53 @ 1.5 GHz
	GPU	Arm® Mali™ T860 MP4 GPU @ 800 MHz
	Memory Capacity	Dual-CH LPDDR4 On-board 2/4* GB *Spec by SKU
	eMMC Capacity	16GB *Spec by SKU
	Memory Card	1 x Micro SD (TF) card slot (push & pull)
	Operating System	Linux Debian 10, Android (AOSP) 11
	Wireless	802.11 a/b/g/n/ac & Bluetooth 5.0
	Audio	Optional to add additional audio line-up
Rear I/O	USB (Type A)	3 x USB 3.2 Type-A
	USB Type C	1 x USB 3.2 Type-C
	Display Input	1 x HDMI output up to 4K HD video resolution
	Ethernet Port	1 x 1 GbE LAN Port with optional IEEE 802.3at/af PoE-PD module support
Power Input	Power Supply	12 to 19 VDC
Physical Characteristics	Enclosure	Steel Housing, Fan-less design
	Mounting	VESA Mount 100 x 100, Panel, Stand
	Weight	2.5 kg(NW)
	Dimensions	383.56(H) x 232.99(V) x 52.9 (T) mm
Environment	Operating Temperature	0~50°C
	Storage Temperature	-40~85°C
	Relative Humidity	10 ~ 85%, non-condensing
Certification	EMC	CE, FCC
	Safety	CB, BSMI

COMPUTER ON MODULES (COM) SERIES

ASUS IoT COM series integrate processor, chipset, memory, storage and cooler/heat sink into a small form factor component modules which are fully compliant with the PICMG COM-HPC & COM-Express standard.

With the modular design, ASUS IoT COM series relieves equipment developers from many aspects of complex computer system design and focus on system oriented carrier board development, in result that minimizes development effort and shortens time-to-market adopting ASUS IoT Computer-on-Module.

ASUS IoT offers Customization Service such as
*Customized hardware and software solutions
*Carrier board reference design & review
*Thermal simulation and design service
*Standard and custom API/SDK release and integration

ICLHE-IM-A

Intel® 12th Gen FCBGA2579 COM-HPC® Server, Size E module. Supports 8x DDR4 ECC ULP DIMM, 2x PCIe Gen4 x16, 1x PCIe Gne3 x8, 2x PCIe Gen3 x4 and 4x 25/10GbE KR Ethernet, 4x 10GbE KR Ethernet

Specifications

Processor System	Processor	FCBGA2579 Socket				
		D-2796TE	D-2775TE	D-2733NT	D-2752TER	D-2712T
	Cores	20	16	8	12	4
	Base Freq. GHz	2.0G	2.0G	2.1G	1.8G	1.9G
	Max Turbo Freq. GHz	3.1G	3.1G	3.2G	2.8G	3.0G
	Cache	30MB	25MB	15MB	20MB	15MB
	Max Memory MT/s	2933 MT/s	2933 MT/s	2667 MT/s	2667 MT/s	2667 MT/s
	ECC Support	Yes	Yes	Yes	Yes	Yes
	Processor TDP	118W	100W	80W	77W	65W
	eTEMP	Yes	Yes	No	Yes	No
Memory	Technology	ECC ULP DIMM				
	Max.	Up to 1024GB				
	Socket	8 x ULP DIMM				
Display	eDP	No				
	DDI	No				
Expansion Slot	PCIe Gen4	2x PCIe Gen4 x16				
	PCIe Gen3	1x PCIe Gen3 x8 2x PCIe Gen3 x4				
Ethernet	SOC	4x 25 or 10GbE KR Ethernet 4x 10GbE KR Ethernet				
Ethernet	PCIe	1x 2.5G NBase-T				
Audio	Interface	No				
Serial Bus	SMBus	Yes, Baud Rate : 100KHz				
	I²C	Yes, Baud Rate : 400KHz				
	UART	2 Ports (TX/RX)				
I/O	SATA	2 x SATA III				
	USB3.2 Gen1	4 Ports				
	USB2.0	4 Ports				
	GPIO	12x GPI & 12x GPO				
	eSPI Bus	1 Port				
	Watchdog	Support				
	TPM	TPM 2.0 (SLB9670)				
Power	Type & Voltage	12V DC Input, AT/ATX mode				
Environment	Operating Temperature	0°C to 60°C (Option SKU: -40 to +85°C)				
	Storage Temperature	-20°C to 80°C				
OS	Windows	Windows 10				
	Linux	Ubuntu, CentOS, Yacto				
Mechanical	Dimension	200 x 160mm				

ADLHC-IM-A

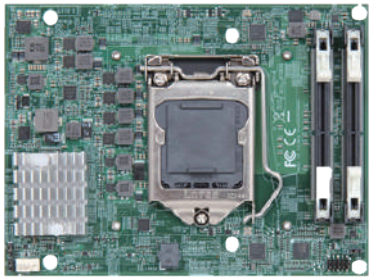
Intel® Alder Lake-S LGA 1700 CPU (65W), 4x ECC / Non-ECC SO-DIMMs, 1x PCIe Gen 5 x16 & PCIe Gen 4/3 support, eDP, DDI, 2.5G NBASE-T, USB 3.2/2.0, 2x SATA III

Specifications

Processor System	Processor	LGA 1700 Socket Type			
		i9-12900E	i7-12700E	i5-12500E	I3-12100E
	Cores/Threads	(8P+8E)/24	(8P+4E)/20	(6P+0E)/12	(4P+0E)/8
	P-Cores Freq. GHz	2.3 / 5.0 GHz	2.1 / 4.8 GHz	2.9 / 4.5 GHz	3.2 / 4.2 GHz
	E-Cores Freq. GHz	1.7 / 3.8 GHz	1.6 / 3.6 GHz	NA	NA
	Intel® Smart Cache	14 MB	12MB	8MB	8MB
	Intel® UHD Gfx EU	32 EU	32 EU	32 EU	24 EU
	HW Acceleration	DirectX 12, Open GL 4.5, OpenCL 2.1			
	Processor TDP/cTDP	65W	65W	65W	60W
	PCH	R680E			
Memory	Technology	DDR5 SO-DIMM 4800MT			
	Max.	Up to 128GB			
	Socket	4 x SO-DIMM			
Display	eDP	eDP 1.4b Up to 2880 x 1800 @60Hz			
	DDI	3 Ports			
Expansion Slot	PEG	1x PCIe Gen 5.0 x16 (can be configured to 1 x16 / 2 x8 / 1 x8 + 2 x4)			
	PCIe	1x PCIe Gen 4 x4 (CPU, x4 only) 1x PCIe Gen 4 x12 (PCH, can be configured to 12 x1, 3 x4, 6 x2) 1x PCIe Gen 3 x12 (PCH, can be configured to 12 x1, 3 x4, 6 x2)			
Ethernet	GbE	2x 2.5G NBASE-T Ethernet (via Intel I225LM/IT)			
Audio	Interface	Intel HD Audio			
Serial Bus	SMBus	Yes, Baud Rate : 100KHz			
	I²C	Yes, Baud Rate : 400KHz			
	UART	2 Ports (TX/RX)			
I/O	SATA	2 x SATA III			
	USB3.2 Gen2	4 Ports			
	USB2.0	8 Ports			
	GPIO	6x GPI & 6x GPO			
	SPI Bus	1x BIOS EEPROM/ Optional TPM, 1x EC Flash			
	Watchdog	Support			
	TPM	TPM 2.0 (SLB9670)			
Power	Type & Voltage	12V & 5V Standby DC Input, AT/ATX mode			
Environment	Operating Temperature	0˚C to 60˚C (Option -40 to +85˚C)			
	Storage Temperature	-20˚C to 80˚C			
OS	Windows	Windows 10			
	Linux	Ubuntu, CentOS, Yacto			
Mechanical	Dimension	120 x 160mm			

CMLHC-IM-A

Intel® Comet Lake-S CPU and COM-HPC® Client, Size C module Supports both ECC/Non-ECC DDR4, 1x PCIex16, 4x USB 3.2 Gen2, 2x SATAIII, PCIe storage and up to 20 PCIe x1 lanes

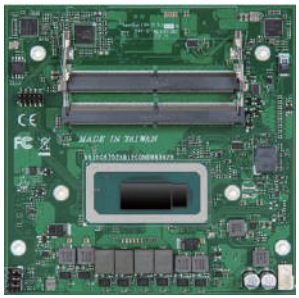


Specifications

Processor System	Processor	FCLGA1200 Socket															
		Xeon W				Core i9	Core i7	Core i5		Core i3		Pentium		Celeron			
		1250E	1290TE	1270TE	1250TE	10900TE	10700TE	10500E	10500TE	10100E	10100TE	G6400E	G6400TE	G5900E	G5900TE		
	Cores	6	10	8	6	10	8	6	6	4	4	2	2	2	2		
	Threads	12	20	16	12	20	16	12	12	8	8	4	4	2	2		
	Base Freq. GHz	3.5G	1.8G	2.0G	2.4G	1.8G	2.0G	3.1G	2.3G	3.2G	2.3G	3.8G	3.2G	3.2G	3.0G		
	Max Turbo Freq. GHz	4.7G	4.5G	4.4G	3.8G	4.5G	4.4G	4.2G	3.7G	3.8G	3.6G	3.8G	3.2G	3.2G	3.0G		
	Cache	12MB	20MB	16MB	12MB	20MB	16MB	12MB	12MB	6MB	6MB	4MB	4MB	2MB	2MB		
	Max Memory MT/s	2933 MT/s						2666 MT/s				2400 MT/s					
	ECC Support	Yes				No				Yes		No					
	Processor TDP	80W	35W	35W	35W	35W	35W	65W	35W	65W	35W	65W	35W	65W	35W		
	W480E Chipset	Yes										No					
	Q470E Chipset	No				Yes											
Memory	Technology	Non-ECC/ECC SO-DIMM															
	Max.	Up to 64GB															
	Socket	2 x SO-DIMM															
Display	eDP	eDP 1.4 Up to 4096 x 2304@60Hz															
	DDI	3 Ports															
Expansion Slot	PEG	1x PCIe Gen 3 x16 (can be configured to 1 x16 / 2 x8 / 1 x8 + 2 x4)															
	PCIe	8x Gen 3 x1 (Group 0 Low) 2x Gen 3 x4 (Group 0 High) 1x Gen 3 x4 (Group 2, #32 ~ #35)															
NVME	PCIe	2x PCIe NVME Gen3 x4, with Intel® RST															
Ethernet	GbE	2x 2.5G NBASE-T Ethernet (via Intel I225LM/IT)															
Audio	Interface	Intel HD Audio															
Serial Bus	SMBus	Yes, Baud Rate : 100KHz															
	I²C	Yes, Baud Rate : 400KHz															
	UART	2 Ports (TX/RX)															
I/O	SATA	2 x SATA III															
	USB3.2 Gen2	4 Ports															
	USB2.0	8 Ports															
	GPIO	6x GPI & 6x GPO															
	SPI/eSPI Bus	1 Port/ 1Port															
	Watchdog	Support															
	TPM	TPM 2.0 (SLB9670)															
Power	Type & Voltage	12V DC Input, AT/ATX mode															
Environment	Operating Temperature	0˚C to 60˚C															
	Storage Temperature	-20˚C to 80˚C															
OS	Windows	Windows 10															
	Linux	Ubuntu, CentOS, Yacto															
Mechanical	Dimension	160 x 120mm															

ADLHB-IM-A

12th Gen Intel® Core™ ,Celeron® Series processors in Intel 7 lithography 2x DDR5 Non-ECC SO-DIMMs, 1x PCIe Gen4 x8, 2x Gen4 x4, 8x PCIe Gen3 x1 and 2x USB4, 2x USB3.2 Gen 2, 8x USB2.0, 2x SATAIII, 3x DDI, eDP

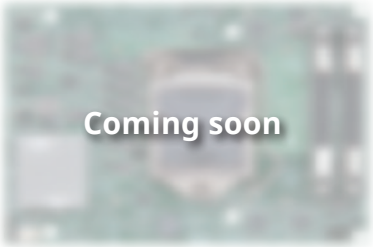


Specifications

Processor System	Processor	H series			P series			U series			
		i7-12800HE	i5-12600HE	i3-12300HE	i7-1270PE	i5-1250PE	i3-1220PE	i7-1265UE	i5-1245UE	i3-1215UE	Celeron 7305E
	Cores	6P + 8E	4P + 8E	4P + 4E	4P + 8E	4P + 8E	4P + 4E	2P + 8E	2P + 8E	2P + 4E	1P + 4E
	Threads	20T	16T	12T	16T	16T	12T	12T	12T	8T	5T
	Base Freq. GHz	2.4G	2.5G	1.9G	1.8G	1.7G	1.5G	1.7G	1.5G	1.2G	1.0G
	Max Turbo Freq. GHz	4.6G	4.5G	4.3G	4.5G	4.4G	4.2G	4.7G	4.4G	4.4G	N/A
	Cache	24MB	18MB	12MB	18MB	12MB	12MB	12MB	12MB	10MB	8MB
	Intel® Gfx EU	96EU	80EU	48EU	96EU	80EU	48EU	96EU	80EU	64EU	48EU
	Graphics Max Freq.	1.35 GHz	1.30 GHz	1.15 GHz	1.35 GHz	1.30 GHz	1.25 GHz	1.25 GHz	1.20 GHz	1.10 GHz	1.10 GHz
	Processor TDP	45W/35W			28W			15W			
	PCH	SOC									
Memory	Technology	DDR5 4800 MT/s Non-ECC									
	Max.	Up to 64GB									
	Socket	2 x SO-DIMM									
Display	eDP	eDP 1.4 Up to 4096 x 2304@60Hz									
	DDI	3 Ports									
	MIPI CSI	2 Ports									
Expansion Slot	PCIe Gen4	1x Gen4 x8 (selected SKU), 2x Gen4 x4									
	PCIe Gen3	8x Gen 3.0 x1 (2 lanes share with SATA)									
NVME	PCIe	N/A									
Ethernet	GbE	2x 2.5G NBASE-T Ethernet (via Intel I225LM/IT)									
Audio	Interface	HDA									
Serial Bus	SMBus	Yes, Baud Rate : 100KHz									
	I²C	Yes, Baud Rate : 400KHz									
	UART	2 Ports (TX/RX)									
I/O	SATA	2 x SATA III (share with PCIe lane)									
	USB4	2 Ports									
	USB3.2 Gen2	2 Ports									
	USB2.0	8 Ports									
	GPIO	4x GPI & 4x GPO									
	SPI/eSPI Bus	1 Port/ 1Port									
	Watchdog	Support									
	TPM	TPM 2.0 (SLB9670)									
Power	Type & Voltage	12V DC Input, AT/ATX mode									
Environment	Operating Temperature	0˚C to 60˚C									
	Storage Temperature	-20˚C to 80˚C									
OS	Windows	Windows 10/11									
	Linux	Ubuntu									
Mechanical	Dimension	120 x 120mm									

ADLB6-IM-A

12th Gen Intel® Core™ Series processors (H/P/U line), Support DDR5 Non-ECC, PCIE, USB 3.2/2.0, LVDS/eDP, VGA, DDI, SATA III, 2.5G NBASE-T. And design compatibility for Raptor Lake-P

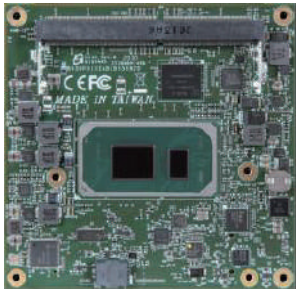


Specifications

Processor System	Processor	i7-12800HE	i5-12600HE	i3-12300HE	i7-1270PE	i5-1250PE	i3-1220PE	i7-1265UE	i5-1245UE	i3-1215UE	Celeron 7305E
	Cores/ Threads	6P+8E/20	4P+8E/16	4P+4E/12	4P+8E/16	4P+8E/16	4P+4E/12	2P+8E/12	2P+8E/12	2P+4E/8	1P+4E/5
	Frequency	3.5 GHz	3.3 GHz	3.3 GHz	3.3 GHz	3.2GHz	3.1GHz	3.5GHz	3.3GHz	3.3GHz	1.0GHz
	Turbo	4.60 GHz	4.5 GHz	4.3 GHz	4.5 GHz	4.4 GHz	4.2 GHz	4.7 GHz	4.4 GHz	4.4 GHz	NA
	Smart Cache	24 MB	18MB	12MB	18MB	12MB	12MB	12MB	12MB	10MB	8MB
	Graphics	Iris Xe		UHD	Iris Xe		UHD	Iris Xe		UHD	
	Graphics Freq.	1.35 GHz	1.30 GHz	1.15 GHz	1.35 GHz	1.30 GHz	1.25 GHz	1.25 GHz	1.25 GHz	1.1 GHz	1.1 GHz
	HW Acceleration	DirectX 12.1, Open GL 4.6, OpenCL 3.0									
	Thunderbolt™ 4	Support									
	Base Power	45W	45W	45W	28W	28W	28W	15W	15W	15W	15W
Memory	Technology	DDR5 4800 MT/s (Non-ECC)									
	Max.	Up to 64GB									
	Socket	2 x SO-DIMM									
Display	HDMI	HDMI 2.1 Up to 4096 x 2304 @ 60Hz									
	Display Port	DP1.4a Up to 7680 x 4320 @ 60Hz									
	LVDS	Dual Channel, 24bit Up to 1920 x 1200 @60Hz									
	eDP	eDP 1.4b Up to 4096 x 2304 @ 120Hz									
	VGA	Up to 1920 x 1200 @60Hz									
Expansion Slot	PEG	1x PCIe Gen 4.0 x16 (can be configured to 1 x16 or 1 x8 + 2 x4)									
	PCIe	8x PCIe Gen 3.0 x1 (can be configured to 8 x1, 4 x4, or 2 x4) Support Intel® RST for PCIe Storage for both x4 Link									
Ethernet	GbE	1x 2.5G NBASE-T (Intel I225LM)									
Audio	Interface	Intel HD Audio									
	SMBus	Yes, Baud Rate : 100KHz									
Serial Bus	I2C	Yes, Baud Rate : 400KHz									
	UART	2 Ports (TX/RX)									
I/O	SATA	2x SATA III (6GT/s)									
	USB3.2 Gen2	3x USB 3.2 Gen2 x1 (10Gbps)									
	USB2.0	8x USB 2.0									
	GPIO	4x GPI & 4x GPO									
	SPI Bus	1x BIOS EEPROM/ Optional TPM, 1x EC Flash									
	Watchdog	Support									
	TPM	TPM 2.0 (SLB9670)									
Power	Type & Voltage	12V & 5V Standby Input, AT/ATX mode									
Environment	Operating Temperature	0˚C to 60˚C (Option -40 to +85˚C)									
	Storage Temperature	-20˚C to 80˚C									
OS	Windows	Windows 10									
	Linux	Ubuntu, CentOS, Yacto									
Mechanical	Dimension	125 x 95mm									

TGLC6-IM-A

11th Gen. Intel® Core™ i3/i5/i7/Celeron CPU, 2*SO-DIMM, Dual Channel, LVDS/eDP/DP/HDMI/VGA, 1* PCIex 4, 1* PCIex 1, 12* USB 3.2/2.0, 2* SATA III



Specifications

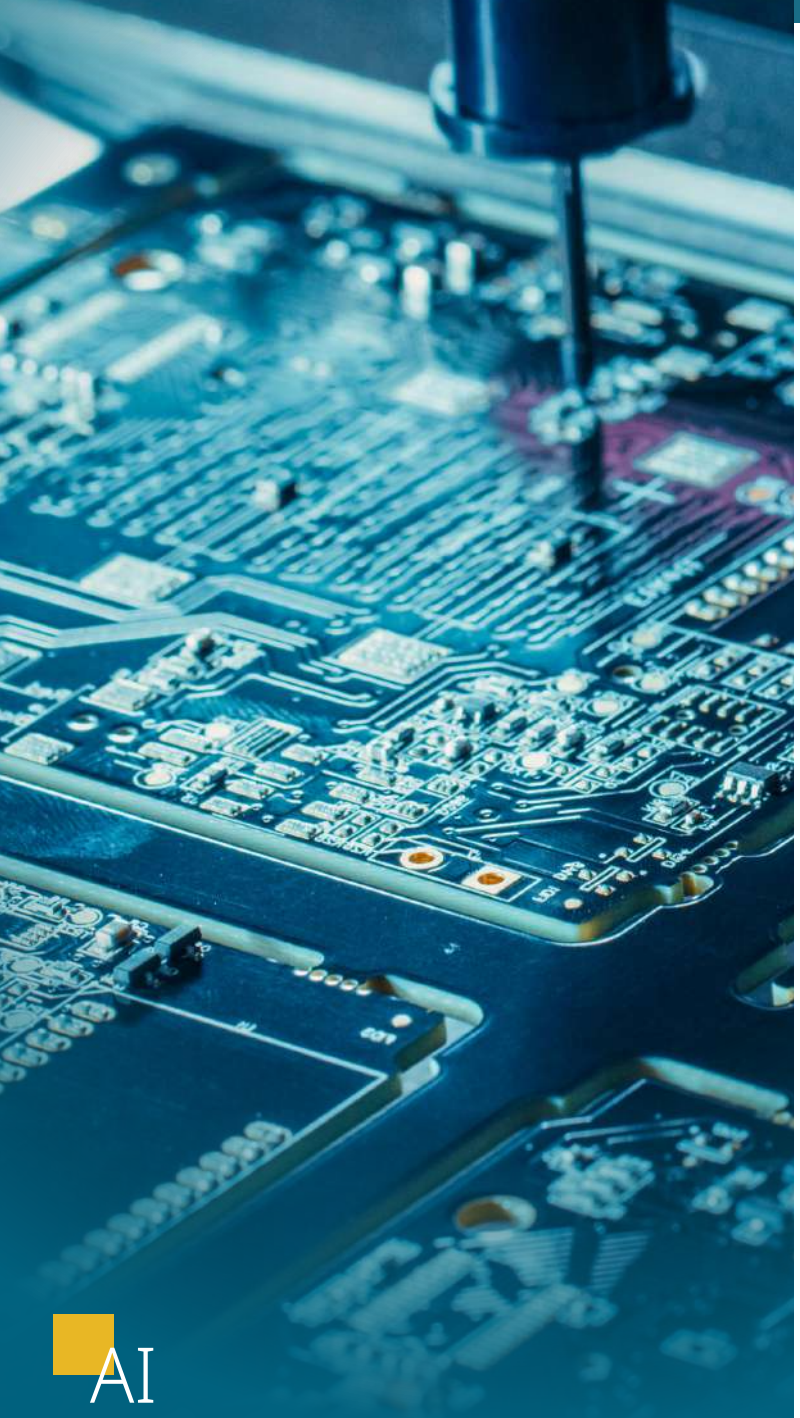
Processor System	Processor	Intel® Core™ i7-1185G7E i7-1185GRE	Intel® Core™ i5-1145G7E i5-1145GRE	Intel® Core™ i3-1115G4E i3-1115GRE	Intel® Celeron® 6305E
	Core	4	4	2	2
	Base Freq. @ TDP/cTDP	2.8/1.8/1.2 GHz	2.6/1.5/1.1 GHz	3.0/2.2/1.7 GHz	1.80 GHz
	Turbo	4.4 GHz	4.1 GHz	3.9 GHz	N/A
	Cache	12MB	8MB	6MB	4MB
	Processor Graphics	Iris® Xe Graphics	Iris® Xe Graphics	Iris® Xe Graphics	UHD Graphics
	Graphics Max Dynamic Frequency	1.35 GHz	1.30 GHz	1.25 GHz	1.25 GHz
	HW Decoding	AV1, VP9 8/10/12 bit, H.265/HEVC 8/10/12 bit, H.264/AVC, MPEG2			
	Processor TDP/cTDP	28/15/12W	28/15/12W	28/15/12W	15W
	Chipset	N/A	N/A	N/A	N/A
Memory	Technology	DDR4 3200MHz, In-Band ECC support for Industrial SKUs			
	Max.	Up to 64GB			
	Socket	2 x SO-DIMM			
Display	HDMI	Up to 4096x2304 @ 60Hz 24 bpp			
	Display Port	DP1.4 Up to 5120x3200 @ 60Hz 24 bpp			
	LVDS	Dual Channel, 24bit,Up to 1920x1200 @ 60Hz			
	eDP	Up to 4096x2304 @ 60Hz 24 bpp			
	VGA	Up to 1920x1200 @ 60Hz			
Expansion Slot	PEG	1 x PCIe 4.0x4			
	PCIe x4	1 x PCIe 3.0x4 (configurable to 2 x PCIex2/ 4 x PCIex1/ 1 x PCIex2 + 2 x PCIex1)			
	PCIe x1	1 x PCIe 3.0x1			
Ethernet	Connector	Intel® I225IT, Up to 2.5GbE			
Audio	Interface	Intel HD Audio			
Serial Bus	SMBus	Yes, Baud Rate : 100KHz			
	I²C	Yes, Baud Rate : 400KHz			
	UART	2 Ports (TX/RX)			
I/O	SATA	2 x SATA III			
	USB3.2 Gen2	4 Ports (10 Gbps)			
	USB2.0	8 Ports (480 Mbps)			
	GPIO	4x GPI & 4x GPO			
	SPI Bus	For BIOS EEPROM			
	Watchdog	Support			
	TPM	TPM 2.0 (Infineon SLB9670)			
Power	Type & Voltage	ATX: +12V, +5VSB ; AT: +12V			
Environment	Operating Temperature	0°C to 60°C (Optional Industrial SKU: -40°C to 85°C)			
	Storage Temperature	-40°C to 85°C			
OS	Windows	Windows 10 support			
	Linux	Red Hat, Ubuntu, CentOS support			
Mechanical	Dimension	95 x 95 mm			

EHLMA-IM-A

Intel® Atom® x6000 series SoC based on Type 10 mini COM-Express® module with LPDDR4 SDRAM, provides LVDS, and high quantity HDMI, eDP, DP with 4K resolution.. And supports PCIe 3.0 x 1, USB 3.2, USB 2.0 and 2 x SATA III interface.

Specifications

Processor System	Processor	Intel® Pentium® J6426	Intel® Celeron® N6211	Intel® Atom® x6211E	Intel® Atom® x6413E	Intel® Atom® x6425E	Intel® Atom® x6425RE
	Core	4	2	2	4	4	4
	Frequency	2.0 GHz	1.2 GHz	1.3 GHz	1.5 GHz	2.0 GHz	1.9 GHz
	Turbo	3.0 GHz	3.0 GHz	3.0 GHz	3.0 GHz	3.0 GHz	N/A
	Cache	1.5MB	1.5MB	1.5MB	1.5MB	1.5MB	1.5MB
	Processor Graphics	Intel® UHD Graphics for 10th Gen Intel® Processors					
	Graphics Max Dynamic Frequency	850 MHz	750 MHz	750 MHz	750 MHz	750 MHz	N/A
	HW Decoding	H.264, MPEG2, V1-1/WMV9, H.265/HEVC, VP8/9, JPEG/MPEG					
	Processor TDP	10W	6.5W	6W	9W	12W	12W
Memory/ eMMC	Technology	On board LPDDR4 DRAM up to 8GB					
	In-Band ECC	N/A	N/A	Support	Support	Support	Support
	On Board LPDDR4	8GB 3200 MT/s	4GB 3200 MT/s	4GB 3200 MT/s	8GB 3200 MT/s	8GB 3200 MT/s	8GB 4267 MT/s
	On Board eMMC	32GB	16GB	16GB	16GB	32GB	16GB
Display	HDMI	up to 4096x 2160 @ 60Hz					
	Display Port	up to 4096x 2160 @ 60Hz					
	LVDS	Dual Channel, up to 2560x 1600 @ 60Hz					
	eDP	up to 4096x 2160 @ 60Hz					
	VGA	N/A					
Expansion Slot	PEG	N/A					
	PCIe	4 x PCIe 3.0 x 1					
Ethernet	Interface	2.5 GbE with GPY215					
Audio	Interface	Intel HD Audio					
Serial Bus	SMBus	Yes, Baud Rate: 100KH					
	I²C	Yes, Baud Rate: 400KHz					
	UART	2 Ports (TX/RX)					
I/O	SATA	2 x SATA III					
	USB3.2	2 Ports					
	USB2.0	6 Ports					
	GPIO	8 x GPIO					
	SPI Bus	For BIOS/TPM					
	Watchdog	Support					
	TPM	TPM 2.0, Intel® AES					
Power	Type & Voltage	4.75V to 20V, AT/ATX Mode					
Environment	Operating Temperature	0°C to 60°C -40°C to 85°C (Selected SKU)					
	Storage Temperature	-40°C to 85°C					
OS	Windows	Win 10 IoT Enterprise					
	Linux	Ubuntu , Yocto					
Mechanical	Dimension	84 x 55 mm					



AI EQUIPMENT

ASUS IoT AISDIS 100D

AI-powered, AOI-driven DIP-insertion-process defect detection

AI-powered automated optical inspection, or AOI, is now leading technology for the inspection and detection of defects during the process of inserting dual-inline-package (DIP) components. ASUS IoT AISDIS 100D empowers AOI checks for DIP-insertion defects. It takes just a single golden sample to configure the intuitive, no-code inspection setup — and the machine has the flexibility to accommodate diverse board sizes, including unusual shapes and proprietary designs. It also enables effective traceability via automated scanning of serial numbers and other production messages.

Features

- Suitable for diverse PCBA sizes and designs
- Both top and underside cameras for dual-sided inspection
- Easy AI modeling with as little as a single golden sample
- In-line PCBA inspection prevents boards with defective DIP components entering wave-soldering process
- Automatic logging of production data for clear traceability

Specifications

Vision System	
Method	AI algorithm, image comparision
Camera	15KP Color line scan Camera*2
Lens	(Front) 40um/px (Back) 35.7um/px
Imaging Resolution	0.04mm
Lighting	White LED Light
Inspection Performance	
Imaging Speed	50mm/sec
Board Handling	
Max PCB Size	550mm x 510mm
PCB Thickness	0.6-2.4 mm
Max PCBA Height	125mm
Conveyor	Height 710~790mm
Functions	
Recognition	Bar code: code 39, code 93, Code 128, UPC-A
Inspection	Two-dimensional barcode: QR Code, DataMatrix Missing, Reverse polarity, Rotation, Skew, Bent pin/pin loss
Industrial computer	
PC	ASUS Workstation
Display	24" LCD
OS	Windows 10 Pro
Dimensions	
WxHxD	1500mmL x 1100.2mmW x 1860mmH (conveyor included) 747mmL x 1100.2mmW x 1860mmH (conveyor not included)
Weight	180 kg

ASUS IoT AISDIS 100P

AI-powered, AOI-driven board-packaging, defect-inspection process

AI-powered computer vision is evolving into a key technology for final inspections before products are packaged. ASUS IoT AISDIS 100P empowers detailed checks for defects in the final testing and packaging stage of motherboard production. It takes just a single finished sample to configure the intuitive, no-code inspection setup — with effective traceability via automated scanning of serial numbers and other production messages.

Features

- Easy AI modeling with as little as a single golden sample
- Automatic detection of serial numbers and other necessary machine-readable information
- Designed for final inspection prior to product packaging
- MES connect for production alignment and traceability

Specifications

Vision System	
Method	AI algorithm, image comparision
Camera	15KP Color line scan Camera
Lens	40um/px M95 Mount
Imaging Resolution	0.04mm
Lighting	White LED Light
Inspection Performance	
Imaging Speed	50mm/sec
Board Handling	
Max PCB Size	610mm x 510mm
PCB Thickness	0.6-2.4 mm
Max PCBA Height	125mm
Conveyor	Height 710~790mm
Inspection Functions	
Recognition	Bar code: code 39, code 93, Code 128, UPC-A Two-dimensional barcode: QR Code, DataMatrix
Component	Missing, polarity, Rotation, Shift, Defective, Upside Down, Foreign Material
Industrial computer	
PC	ASUS Workstation
Display	24" LCD
OS	Windows 10 Pro
Dimensions	
WxHxD	1500mmL x 943mmW x 1800H (Conveyor included) 745mmL x 943mmW x 1800H (Conveyor not included)
Weight	150 kg

ASUS IoT

MARKET READY SOLUTION

ALPR Edge AI Dev Kit

ASUS IoT ALPR Dev Kit is a comprehensive automatic license-plate recognition (ALPR) solution that includes both the necessary hardware and software to enable systems integrators (SIs) to create edge applications that mesh seamlessly with existing ALPR infrastructure. Powered by ASUS IoT Tinker Board Edge R, the single-board computer for AI applications, ALPR Dev Kit is capable of up to 99% accuracy with high, 100ms inference performance. It integrates easily with existing USB or IP cameras and, with built-in machine-learning (ML) technology, it's able to learn from each inference – delivering continuously improving detection. ASUS IoT is able to fine-tune the ALPR software to service specific needs or cater to particular demands, empowering ALPR Dev Kit to provide accurate, fast and tailor-made detection that is ideal for almost any scenario.

Highly-flexible mounting methods

Novelty license-plate noise reduction

Edge AI empowers ALPR accuracy

Usage Scenario

Parking Lot

- Access Control
- Vehicle-tracking
- EV-charge Monitoring
- Custom Vehicle Tags
- Parking Analysis Reports

Government / Security Service

- Access Control
- Monitoring Potential Threat
- Improve Law Enforcement
- Connect to Smart Home
- Real-time Notification

Retail / Hospitality

- Auto car wash or service
- Drive-thru Restaurant
- Upgrade retailers' existing camera to AI camera

Solution Portfolio

ASUS IoT Tinker Edge R

Rockchip RK3399Pro
CPU: Dual-core 1.8 GHz ARM Cortex A72 + Quad-core 1.4 GHz ARM Cortex A53
GPU: 800 MHz ARM Mali T860 MP4
Rockchip NPU processor
Memory: 4 GB dual-channel LPDDR4 for system + 2 GB LPDDR3 for NPU
Operating system: Debian 9 / Android 9

ASUS IoT ALPR Software

Supported car-plate regions: Taiwan, United Kingdom
Supported OS: Debian 9 on Tinker Edge R
Inference performance: 160 ms
Accuracy: 99% within 3- to 5-meter range, with custom retraining service available
Supported cameras: USB webcams, and IP cameras on a project-by-project basis.

Face Recognition Edge AI Dev Kit

ASUS IoT Face Recognition Edge AI Dev Kit is a one-stop solution with latest AI technology to identify faces and other key personal markers. This solution provides precise and stable security monitoring, simplifies security processes and improves operational efficiency. Pairing the renowned ASUS IoT Tinker Board 2 with FaceMe® SDK from CyberLink, Face Recognition Edge AI Dev Kit creates a powerful package that's capable of recognition with up to 99% accuracy, and at fast 154 ms inference speeds. In addition, this solution is able to assess and infer attributes such as age, gender and head orientation. This enables a powerful platform for diverse business applications in enterprise, retail, hospitality and public space fields.

Face Detection

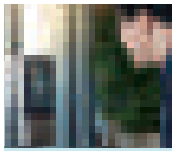
Face Recognition

Face Attributes

Mask Detection & Recognition

Anti-spoofing

Usage Scenario



Enterprise
- Door Access Control
- Attendance Management
- Meeting Room Capacity Management

Retail
- Customer Segmentation
- VIP-targeted Marketing
- Emotion Detection
- Heatmap Analysis
- Mask Detection

Hospitality
- Membership Management
- Contactless Check-in/out
- Mask Detection

Factory & Warehouse
- Door Access Control
- Contactless Delivery or Restocking
- Forbidden Zone Monitoring

Solution Portfolio

ASUS IoT Tinker Board 2

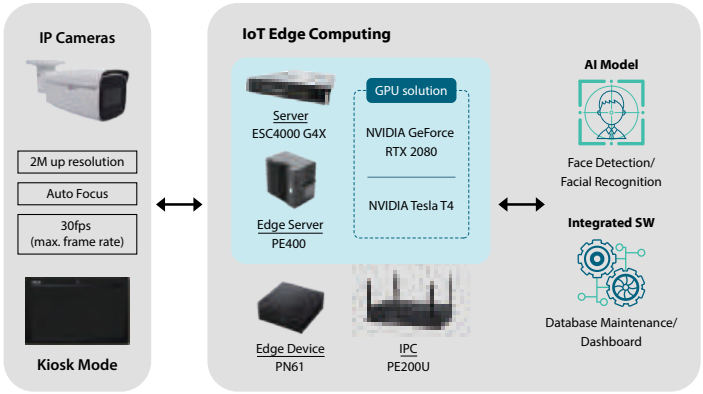
Rockchip RK3399
CPU: Dual-core ARM Cortex A72 @ 1.8 GHz and Quad-core Arm Cortex A53 @ 1.4 GHz
GPU: Arm Mali T860 MP4 @ 800 MHz
Memory: Dual-channel LPDDR4 2/4 GB
Operating system: Debian 10 / Android 11

CyberLink FaceMe®

Accuracy rate (TAR) of 99.7% at 10-4 FAR
Highly ranked in NIST FRVT 1:1
Face recognition, including masked faces
Android OS 10
CyberLink FaceMe SDK

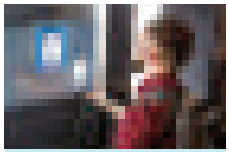
AI Security Solution

ASUS IoT AI Security Solution is a face recognition system powered by artificial intelligence that enables accurate and stable security monitoring. Ideal for schools and workplaces of all types, AI Security Solution simplifies security processes and improves operational efficiency to deliver comprehensive yet easy to manage security package.



Usage Scenario

Building
- Access Control
- Office Access
- Visitor self-check-in



Enterprise
- Attendance Management
- Access Control

Surveillance
- Restricted Area Control
- Anti-trailing
- Intrusion Detection
- Asset Protection

Product Advantage

Quick Photo Validation

Photo Scoring System

ID Classification

SOFTWARE & SERVICES

ASUS IoT Cloud Console

ASUS IoT Cloud Console (AICC) is a unified platform for managing and analyzing big data collected by IoT devices running different operating systems. With an intuitive user interface and advanced data-encryption technology, AICC enables you to collect and analyze comprehensive information in a variety of smart-technology sectors, such as transportation, retail and farming, to assist you in making the best decisions at the right times to seize business opportunities.

Dashboard Menu

Visualization Chart

Usage Scenario

Smart Traffic

Remotely manage traffic monitors on highways and overpasses to analyze traffic flow.

Smart Retail

Manage POS systems and data-analysis boxes in retail stores.

Smart Farms

Collect and analyze information about soil, temperature, sunlight and more.

Product Advantage

Intuitive Interface

Reliability

Data Monitoring

Responsive Web Design

Free Trial

ASUS IoT Middleware

ASUS IoT Middleware simplifies system customization and application development on ASUS IoT platforms, by providing easy-to-use tools to configure and protect systems. It takes just a few clicks to configure a plethora of interfaces and options, including GPIO, UART, I²C, I²S, SPI, PWM, boot logo, power-on schedule, fan-trigger thresholds, watchdog and more.

The suite also provides a rich set of APIs that empower you to take full advantage of ASUS hardware. These include an SDK, sample code and programming guides. It also offers cross-platform support for Windows, Linux and Android.

In addition to the provision of industrial protocols such as Modbus, MQTT, BACnet, ASUS IoT Middleware enables automatic network recovery and network failover to eliminate worries about disconnections — and ensuring that systems are always online and available.

Key Features

Config & Protection Tools

- Easily builds and testing
- Watchdog and fan control
- Scheduled power cycling

API

- Fully access ASUS IoT hardware
- Supports Windows, Linux, Android
- EAPI supported

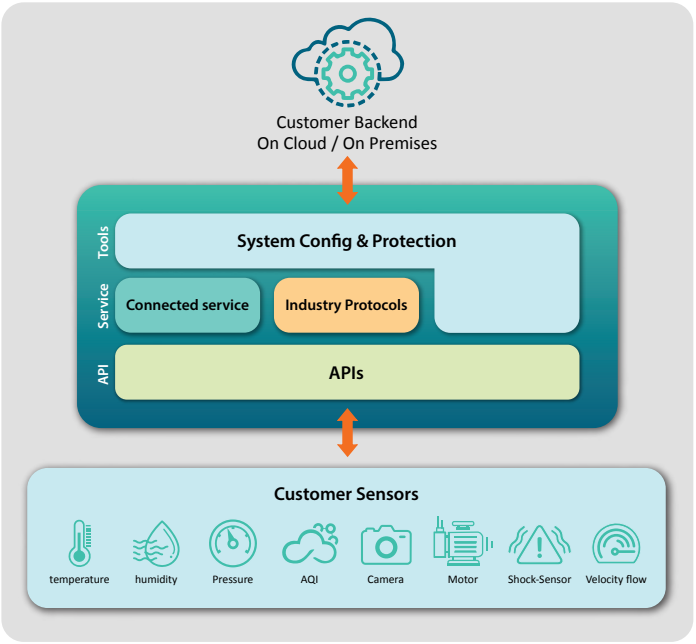
Always Connected

- Network auto-recover
- Network auto-failover
- Always connected

Protocols & Framework

- Supports Modbus, MQTT, and BACnet
- Connect sensors and backends
- Pluggable edge intelligence

System Diagram



Key Features

Function	API classes
System monitoring and Protection	Hardware monitor and board-info API
	Fan-control API
	Scheduled power-cycling API
	Watchdog API
	Buzzer API
Peripheral	G sensor / RTC / COM / Wakeup API
	GPIO (DIO) API
	I²C API
	SPI API
	UART API
	PWM API
Connectivity	Automatic network recovery
	Automatic networks failover
Protocols and framework	Sensor framework
	Protocols (MQTT, Modbus, BACnet)

ASUS Industrial Android FOTA

Android has become one of the fastest-growing IoT standard OS as it's open source, touch-panel friendly and also a part of the Google ecosystem. However rigorous Android architecture also cause higher systemic risk if software update ongoing without expert assistance. ASUS IoT Industrial Android FOTA Service offers single window support system to ensure the efficiently of OTA update. The ASUS IoT Industrial Android FOTA (firmware over-the-air) wireless firmware update supports embedded systems developed with Tinker Board and enables you to update the system firmware, operating system and drivers remotely. ASUS IoT Industrial Android FOTA reduces the need for onsite personnel support and system disassembly, and removes the possibility of operation errors and safety concerns caused by manual USB updates.

City Surveillance
Smart cameras or IP cameras in most embedded systems have computer vision and security concern. With the ASUS Industrial Android FOTA update system, cameras can receive stable updates of AI and computer-vision algorithms, giving you the ability to update the visual interaction content according to the needs of different scenes.

Retail
In retail industry, a smart vending machine may have a BI engine that enables it to perform tasks, such as recognizing the environment, identifying users, and providing different responses based on the characteristics of individual users or the environment. If the smart vending machine needs to support a new payment service, the BI engine can update the firmware and software remotely through ASUS Industrial Android FOTA simultaneously, improving the efficiency of maintenance.

Robotics
For better joint movement and environmental perception, robots can have dozens or even hundreds of built-in sensors. Each sensor is operated by a software driver. ASUS Industrial Android FOTA can update the drivers for all sensors remotely as needed to ensure that the optimal robot movement.

Product Advantage

Solid service experience with over 20 million devices upgrade in mobile market

Single Interface with global content delivery network

Enhanced system flexibility, remote functions and long-term maintenance

Report Management with progress, quantity and problem

AI
SOLUTION

AI
SOLUTION

AI-BASED WORKPLACE SAFETY PLATFORM DRIVING ACTION ABLE INSIGHTS TO INCREASE SECURITY VISIBILITY IN YOUR WORKPLACE

Features

- **Intuitive video clips to identify hazards**
  AI knowledge is not required for operating ASUS EHS platform -- users only have to identify hazards and confirm them in video clip without extra effort
- **Powerful dashboard to visualize hazards**
  A comprehensive dashboard provides various metrics for analysis
- **Real-time notifications**
  Receive real-time notifications by e-mail and audible alarms when suspicious behavior is detected

The AISEHS Management Service Platform is an AI-based SaaS designed to improve standard operating procedures for worker safety and to minimize potential risks through artificial intelligence (AI). It also provides visualization risk report to EHS managers, helping to achieve greater production optimization and management.

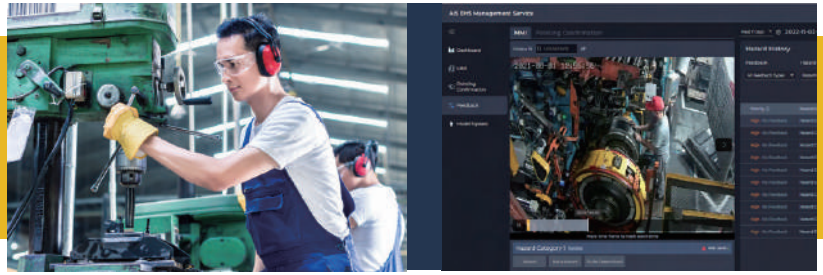
No-code AI
Leverage AI technology to increase workplace safety

Dashboard
Visualize potential risks to increase workplace safety

Smart safety AI applications, safety in every corner

Risk identification for man-machine interaction (MMI)

Identify complex operational actions based on pre-defined standard operating procedures, such as a worker operating the machine.



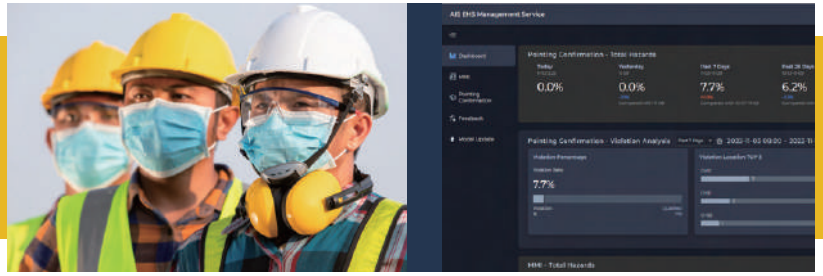
Pointing confirmation

Dynamically detect the pointing-confirmation procedures of all personnel, including finger pointing and gaze detection.

Identification of personal protective equipment (PPE)*

Identify the safety of work attire, such as hard-hats, masks and high-visibility vests.

* For details, please contact ASUS.



Hazardous area identification (Virtual electric fence)*

Prevent workers from entering restricted areas, or detect whether triangular trafic cones and scaolding are properly placed when constructing in dangerous areas such as where large holes in the ground may be present.

Benefits

Immediate alerts to notify of any security concerns

In the past, CCTV equipment was only used to access records after dangerous behaviors occurred. But now, an existing CCTV system installed in factory can be used for data collection with AI modules and analytics to actively identify dangerous behaviors.

Leverage AI technology to increase workplace safety

Deep-learning AI technology can interpret complex dangerous behaviors. Users can get started easily without expertise in AI or programming code.

Turn invisible risk hazards into at-a-glance data

A dashboard tracks dangerous behaviors to help users analyze potential risk factors, so that EHS managers can effectively monitor unsafe behaviors and strengthen safety training.

Successfully establish worker safety SOP

This platform can also serve as an auxiliary system to improve standard operating procedures for occupational safety and to minimize incident rates.

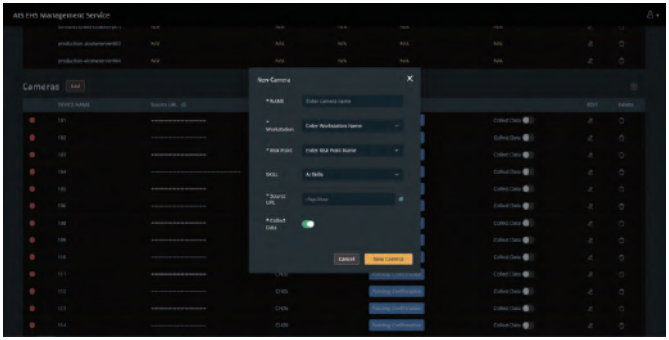
Partner with ASUS IoT for workplace safety

The AISEHS Management Service Platform not only provides complete SaaS platform and service training, but it is also a portal with system integration (SI) as a tenet to manage multiple customers.

Multi-tenant architecture
The SI portal empowers system integrators to manage multiple clients, ensuring the quality of customer service.

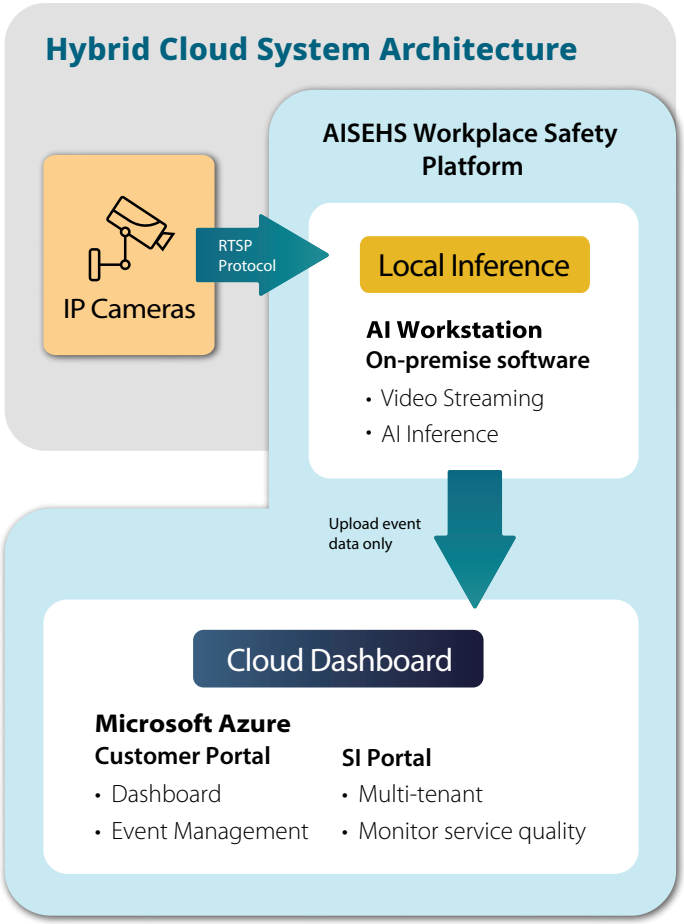
Monitor AI model performance
The SI portal can track AI model performance. The training data of different clients is kept separate to ensure data security.

Monitor service quality
The SI portal can instantly view the health status of AI worksta tions, including CPUs, GPUs, memory, storage and more.

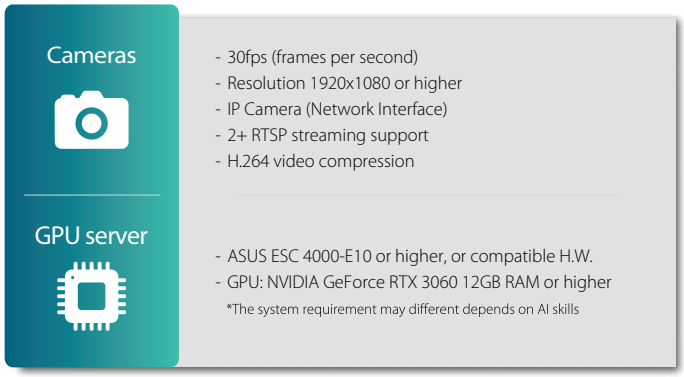


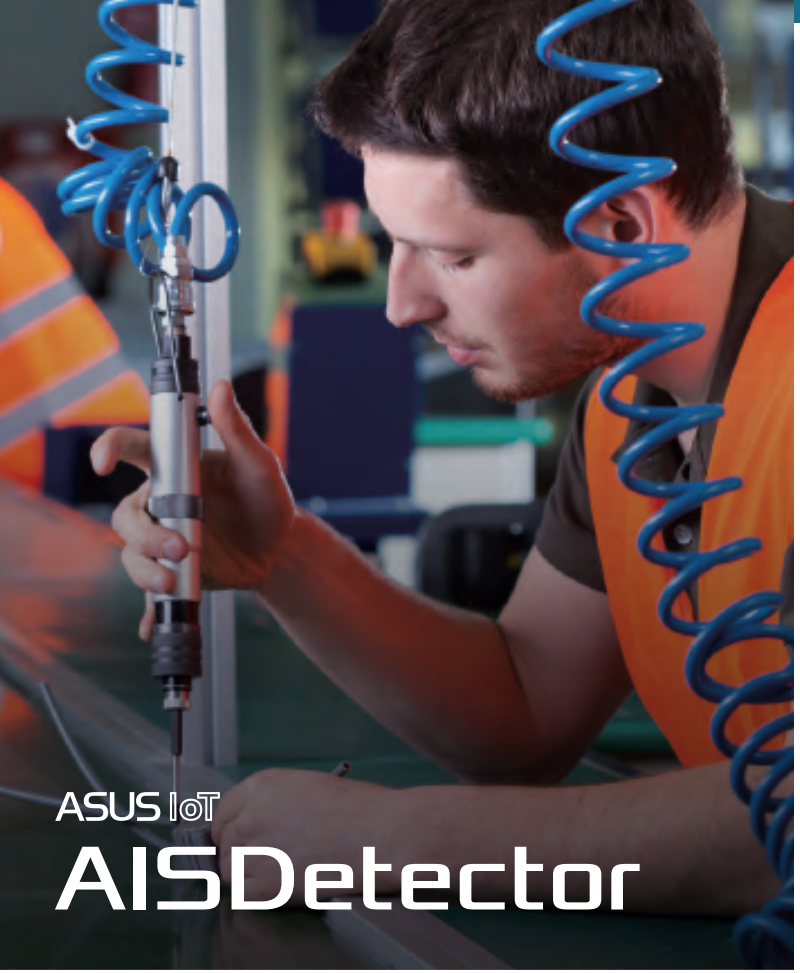
Achieve rapid deployment
System integrators can leverage the SI portal to help customers to set up local workstation and IP cameras just with few clicks, which can dramatically reduce deployment time.

Hybrid Cloud System Architecture



On-premise System Requirements





ASUS IoT

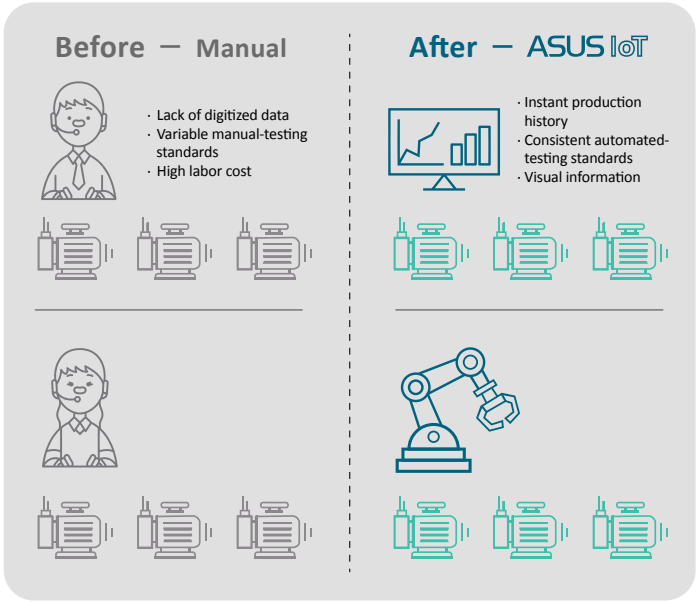
AISDetector

Powered by AI technology, detection models can be established in as little as one minute, with just a small amount of good product data. The solution is ideal for replacing traditional manual-inspection pipelines, and is suitable diverse production processes. It also creates digitally-traceable production records, enabling the digital transformation of manufacturing.

Main Function

- Deep learning
- Edge AI
- AI Model in 1 min
- Traceable records

System Diagram



Key Features

Build AI model in one minute*

Three 30-second good-product training sessions is enough to build a **complete AI model** ready for anomaly detection, with GPU acceleration required.

*i9 CPU, 32GB RAM

Instant AI analysis

By learning good products, the solution quickly simulates the ability of human beings to judge defects, avoiding the outflow of abnormal products.

Waveform analysis

Anomalous signals can be detected for analog signals such as vibration, voiceprints, voltages and current. Both online measurement and offline data import are supported.

Easy to use

The **training mode** enables AI models to be built in just four steps, while the **inference mode** prevent the operator from accidentally interacting with the management interface.

ASUS IoT

AISVision

An easy-to-use AI toolkit and SDK for computer vision, AI model training and inference.

Ease-of-use: Just four steps for AI precision — choose project type, label image, and then train and verify model.

No code required: Build AI models in moments, without the need for specialist knowledge.

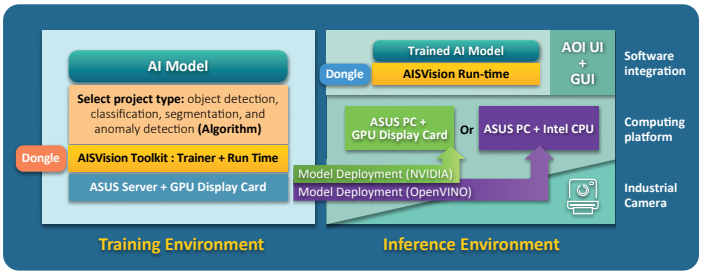
High-precision diverse algorithms: Empowers both supervised and non-supervised algorithms for different application scenarios.

Main Function

- Deep learning
- Edge AI
- AI models
- Anomaly detection
- Model management

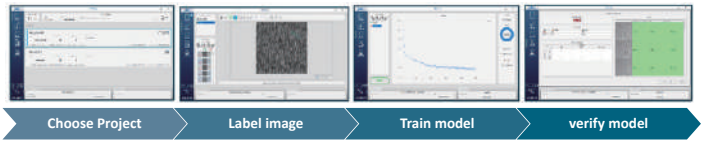
AI-lifecycle management

System diagram: How AISVision works?



Key Features

Intuitive, simple, and quick project set-up



Flexible model-training configuration

It takes just one click to train an AI model or user-configurable hyperparameter to come out a customized training steps.

Intuitive labelling tool

Easy-to-use and intuitive integrated labelling, including pen, polygon, ellipse, rectangle and line tools.

Dual inference architecture

Unique model capabilities, backed by NVIDIA® and the Intel® OpenVINO framework, empowers efficient, high-accuracy inferencing in diverse scenarios.

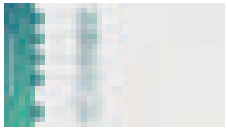
User-friendly software development

Strong API support for customized development, including C, C++ and C#.

ASUS IoT
AI Accelerator PCIe Card

The first PCI Express® expansion card with multiple Coral Edge TPUs for AI inferencing. Designed for inferencing at the edge, it runs API-based transfer-learning from a pre-trained model to achieve a fine-tuned model. Rapid response, easy to use, running multiple AI models in parallelize.

Machine learning performance is enhanced with its pipelining technology. AI Accelerator PCIe Card is designed for applications that require fast response or large-model execution, pipelining techniques enable you to partition models into several smaller models.

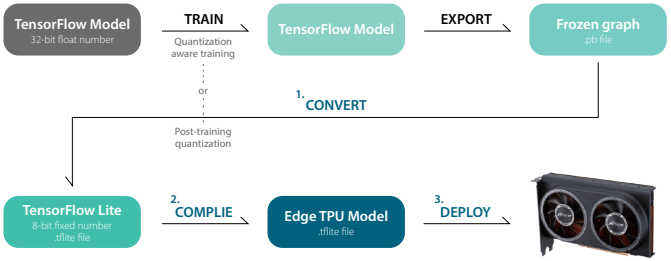


Parallel ML inferences with low latency

Maximize ML result with small datasets

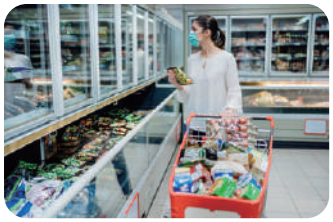
Prototype AI applications in minutes

Workflow



Applications

Manufacturing



Retail

Transportation

Surveillance

Specification

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