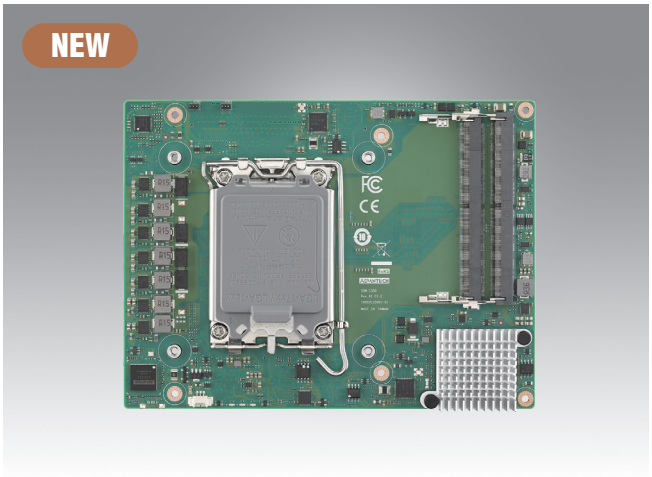
SOM-C350/R

Intel® 12th/13th Gen Core Processors (Code Name: Alder Lake-S/Raptor Lake-S) COM-HPC® Client Size C Module



Windows Server Windows Embedded WISE-PaaS/DeviceOn iManager CE FC

Features

- COM-HPC® client size C module pin out
- High scalability with socket type LGA 1700 CPU + R680E PCH
- 4 SODIMM DDR5 w/ ECC/non-ECC, max. 128GB
- High performance iRIS Xe graphic engine and PCIe x16 Gen5
- High speed Ethernet 2.5GbE and USB 3.2 Gen2x2
- Supports iManager, WISE-PaaS/DeviceOn and embedded software APIs

Software APIs: Watchdog, I²C, SMBus, H/W Monitor, GPIO

Utilities: BIOS flash, Monitoring, Embedded Security ID

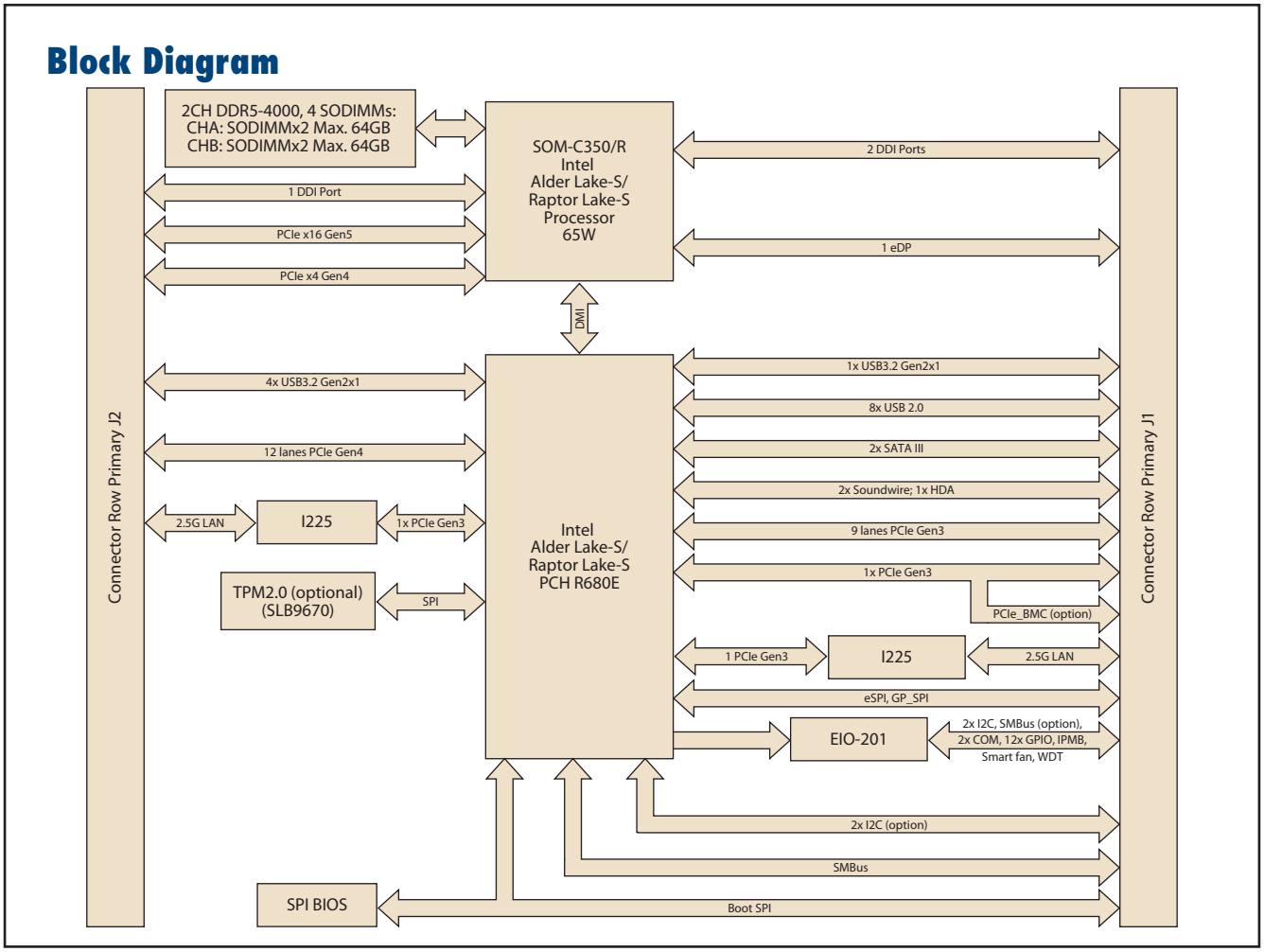
Specifications

Form Factor	Form Factor	COM-HPC® Size C Module								
	Pin-out Type	Client pin out								
Processor System	CPU	i9-12900E	i7-12700E	i5-12500E	i3-12100E	G7400E	i9-13900E	i7-13700E	i5-13500E	i3-13100E
	P-Core Base Frequency	2.3GHz	2.1GHz	2.9GHz	3.2GHz	3.6GHz	1.8GHz	1.9GHz	2.4GHz	3.3GHz
	P-Core Max Turbo Frequency	5.0GHz	4.8GHz	4.5GHz	4.2GHz	3.6GHz	5.2GHz	5.1GHz	4.6GHz	4.4GHz
	E-Core Base Frequency	1.7GHz	1.6GHz	NA	NA	NA	1.3GHz	1.3GHz	1.5GHz	NA
	E-Core Max Turbo Frequency	3.8GHz	3.6GHz	NA	NA	NA	4.0GHz	3.9GHz	3.3GHz	NA
	Core (P+E)	16C (8+8)	12C (8+4)	6C (6+0)	4C (4+0)	2C (2+0)	24C (8+16)	16C (8+8)	14C (6+8)	4C (4+0)
	LLC	30MB	25MB	18MB	12MB	6MB	36MB	30MB	20MB	12MB
	TDP	65W	65W	65W	60W	46W	65W	65W	65W	65W
	Socket Type	LGA 1700								
	Platform Controller Hub	Intel R680E								
	BIOS	AMI UEFI 256Mbit								
Memory	Technology	DDR5 3600 MT/s 1 DIMM 1R/2R-4000 (BIOS Setting Option) 2 DIMMs 1R-4000 (BIOS Setting Option) 2 DIMMs 2R-4000 (BIOS Setting Option)								
	ECC Support	ECC or non-ECC								
	Max. Capacity	up to 128GB								
	Memory Type	4 SODIMM sockets								
Display	Interface	3 PORT DDI								
	Resolution	Up to 8k								
Expansion	PCI Express x16	1 PCIe x16 Gen5, and bifurcatable to 2 x8								
	PCI Express x1 (Gen4)	1 port PCIe x4 Gen4 (from CPU) and 12 ports PCIe x1 Gen4 (from PCH)								
	PCI Express x1 (Gen3)	9 ports PCIe x1 Gen3 and 1port PCIe x1 Gen3 reserved for BMC								
Serial Bus	SMBus	Yes								
	I²C Bus	Yes. 1 port from EC (100kb/s & 400kb/s master mode support) and 1 port from PCH								
Ethernet	2.5GbE	2 port 2.5GbE								
I/O	SATA	2 ports support SATA III 6.0Gb/s								
	USB3.2 Gen2x2	2 ports (Option)								
	USB3.2 Gen2x1	8 ports (only for Type A)								
	USB2.0	8 ports								
	SPI Bus	2 ports (for BIOS ROM and GP_SPI)								
	GPIO	12 ports GPI/O								
	Watchdog	65536 level, 0 ~ 65535 sec								
	COM Port	2 Ports (2-Wire)								
	TPM	Optional TPM 2.0 (Infineon 9670)								
	Smart Fan	2 Ports (for COM Module and carrier board. support 12V Fan)								
Power	Type	ATX: Vin, VSB, AT: Vin								
	Supply Voltage	Vin: 12V, VSB: 5V±5%, RTC Battery: 2.0-3.3V								
	Power Consumption (Max.)	N/A								
	Power Consumption (Idle)	N/A								
Environment	Temperature	Operating Standard: 0 ~ 60° C (32 ~ 140° F), Storage: -40 ~ 85° C (-40 ~ 185° F)								
	Humidity	Operating: 40 °C @ 95% relative humidity, non-condensing Storage: 60 °C @ 95%relative humidity, non-condensing								
Mechanical	Dimensions	160 x 120 mm (6.30" x 4.73")								

All product specifications are subject to change without notice.

Last updated: 8-Dec-2023

Block Diagram



Ordering Information

Part No.	CPU	Cores (P+E)	CPU TDP	CPU Threads	P-Cores Freq.	E-Cores Freq.	Graphic Execution Units	Temp.
SOM-C350C9R-U3A1	i9-12900E	16C (8+8)	65W	24	2.3GHz/5.0GHz	1.7GHz/3.8GHz	32 EU	0~60 °C
SOM-C350C7R-U1A1	i7-12700E	12C (8+4)	65W	20	2.1GHz/4.8GHz	1.6GHz/3.6GHz	32 EU	0~60 °C
SOM-C350C5R-U9A1	i5-12500E	6C (6+0)	65W	12	2.9GHz/4.5GHz	NA	32 EU	0~60 °C
SOM-C350C3R-H2A1	i3-12100E	4C (4+0)	60W	8	3.2GHz/4.2GHz	NA	24 EU	0~60 °C
SOM-C350PTR-H6A1	G7400E	2C (2+0)	46W	4	3.6GHz	NA	16 EU	0~60 °C
SOM-C350RC9R-S8A1	i9-13900E	24C (8+16)	65W	32	1.8GHz/5.2GHz	1.3GHz/4.0GHz	32 EU	0~60 °C
SOM-C350RC7R-S9A1	i7-13700E	16C (8+8)	65W	24	1.9GHz/5.1GHz	1.3GHz/3.9GHz	32 EU	0~60 °C
SOM-C350RC5R-U4A1	i5-13500E	14C (6+8)	65W	24	2.4GHz/4.6GHz	1.5GHz/3.3GHz	24 EU	0~60 °C
SOM-C350RC3R-H3A1	i3-13100E	4C (4+0)	65W	8	3.3GHz/4.4GHz	NA	24 EU	0~60 °C

Packing List

Part No.	Description	Quantity
-	SOM-C350/R CPU Module	1
1970005474T001	Heatspreader of SOM-C350/R	1

Optional Accessories

Part No.	Description
1970005475T001	Semi-Cooler 120*120* 34mm
1970005473T001	QFCS 2.0 120 *143 *29mm

Development Board

Part No.	Description
SOM-DH3000-00A1	COM-HPC Development Board for Client Pinout with 5mm High Board to Board Connector (Alderlake-S)
SOM-DH3000R-00A1	COM-HPC Development Board for Client Pinout with 5mm High Board to Board Connector (Raptorlake-S)

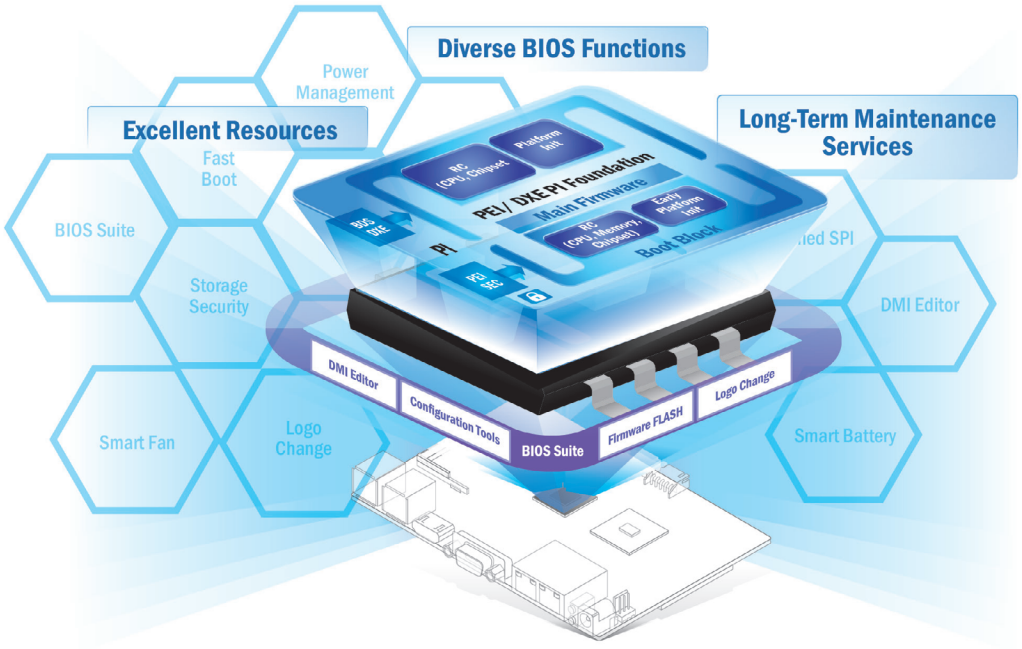
Embedded OS

OS	Part No.	Description
Win10	20706WX1HS0004	img W10 21HL SOM-C350 64b 21H2 ENU
Win10	20706WX1VS0004	img W10 21VL SOM-C350 64b 21H2 ENU
Win10	20706WX1ES0004	img W10 21EL SOM-C350 64b 21H2 ENU
Win10	20706WX1HS0062	img W10 21HL SOM-C350R 64b 21H2 ENU
Win10	20706WX1VS0062	img W10 21VL SOM-C350R 64b 21H2 ENU
Win10	20706WX1ES0062	img W10 21EL SOM-C350R 64b 21H2 ENU

Reliable Embedded BIOS Solutions

Custom BIOS services with long-term support

Advantech's high-quality embedded BIOS solutions deliver rapid execution and feature expert BIOS team support. These solutions feature multi-functional designs that ensure security and enable power/boot management. Advantech further provides 10+ years of BIOS version management, internal management, and longevity support for both hardware and BIOS — enhancing application efficiency, diversifying functionality, and optimizing performance.



Embedded BIOS Solution Advantages

Sufficient Sources

- Strong partnership with BIOS vendors
- 50+ engineers with extensive industrial BIOS experience

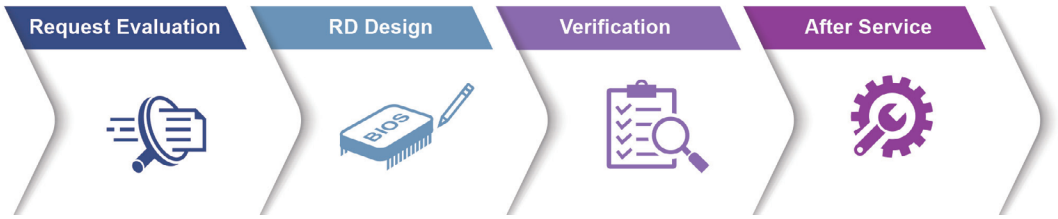
Diverse BIOS Functions

- Multi-layer security
- 3 second fast boot
- Power management
- BIOS suite utility

Long-Term Maintenance Services

- Platform longevity support
- 10-year BIOS version control
- BIOS remote backup

Value-Added Customization Process



WISE-DeviceOn

Massive IoT Device Management Utility

IoT deployment and management typically involves numerous disparate devices installed on multiple sites. These devices require effective monitoring, managing, and tracking. Advantech's easy-to-use WISE-DeviceOn interface enables users to remotely monitor device health, troubleshoot problems, and send software/firmware updates over-the-air (OTA). In sum, DeviceOn empowers quick real-time responsiveness to emerging problems.



Features

Comprehensive Management	Remote Access	Efficient Operations
• Devices status • Peripherals/firmware • Open for extension	• Real-time monitoring • Remote controls • Troubleshooting	• Zero-touch on-boarding • OTA updates • Batch control

Product Highlights



SOM-6883
High-performance 11th Gen Intel® COMe Type 6 Module



MIO-5375
Compact 11th Gen Intel® Outdoor Focused 3.5" SBC



EPC-B5587
10th Gen Intel® Xeon® based Edge server



EPC-R3220
Arm based IoT Edge Gateway

Edge AI Suite

AI development for diverse application at the Edge

Increasing demand for AI inference/analytic capabilities at the Edge make AI training models, software development environments, and hardware configuration key factors in successful solution deployment. Advantech's Edge AI Suite helps users build AI demo devices quickly and choose optimal hardware solutions easily.



5x Performance Boost	All-in-one Installation	One Click AI Experience	Plug-and-play Environment	Discover Cost-effective Hardware
• Integrated Intel® OpenVINO™ technology • Boost AI using Advantech hardware	• Build AI environment in under 5 minutes • Ready-to-use configuration	• User friendly configuration guidance • One-click Benchmark acquisition	• Easy access to 100+ AI inference extensions • Software development package available	• Diverse CPU/RAM options • Find hardware solutions for AI development

Embedded Linux Support and Design-in Services

Hardware Certified Ubuntu and Yocto with Eco Partner Services

Linux is the most popular embedded OS for transportation, outdoor services, factory automation, and mission critical applications. Its open source and kernel reliability features ease security updates, and make it particularly adaptable to new AI and Edge computing technology. Advantech has cooperated with Canonical and other software partners to provide hardware certified Ubuntu image and Yocto BSP as Linux offerings. The Advantech, Embedded Linux, and Android Alliance (ELAA) delivers local software services and consultation.



Features

Certified OS and BSP

- Platform compatibility tests
- Preloaded functional driver and software stacks

Licensed Services

- License authorized Canonical delivers 10-years of bug fixes and security updates
- In-house bundled service

Numerous AI and Edge Resources

- Containerized technology for service provision and deployment
- AI resources from Caffe, TensorFlow, and mxnet

Local Partner Alliance

- Embedded Linux and Android Alliance (ELAA)