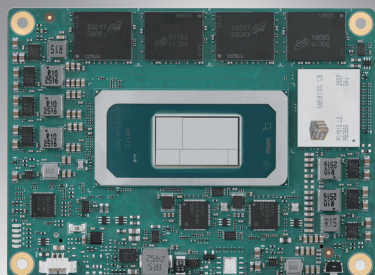


SOM-M250

Intel® Core Ultra 300 Series Processors (Code Name: Panther Lake-H) COM HPC Mini v1.2 Module

Preliminary



Features

- COM HPC Mini Module
- Intel® Core™ Ultra 300 series processors, Up to 16C/25W
- Intel Xe3 graphic up to 192EU, integrated NPU
- Dual-CH onboard LPDDR5 up to 9600MT/s
- Multiple I/O expansion: PCIe Gen5, Dual 2.5GbE, USB3.2 Gen2, SATA3.0
- Support wide temperature -40~85°C, wide voltage, onboard SSD up to 1TB
- AS9100 compliance

Software APIs:

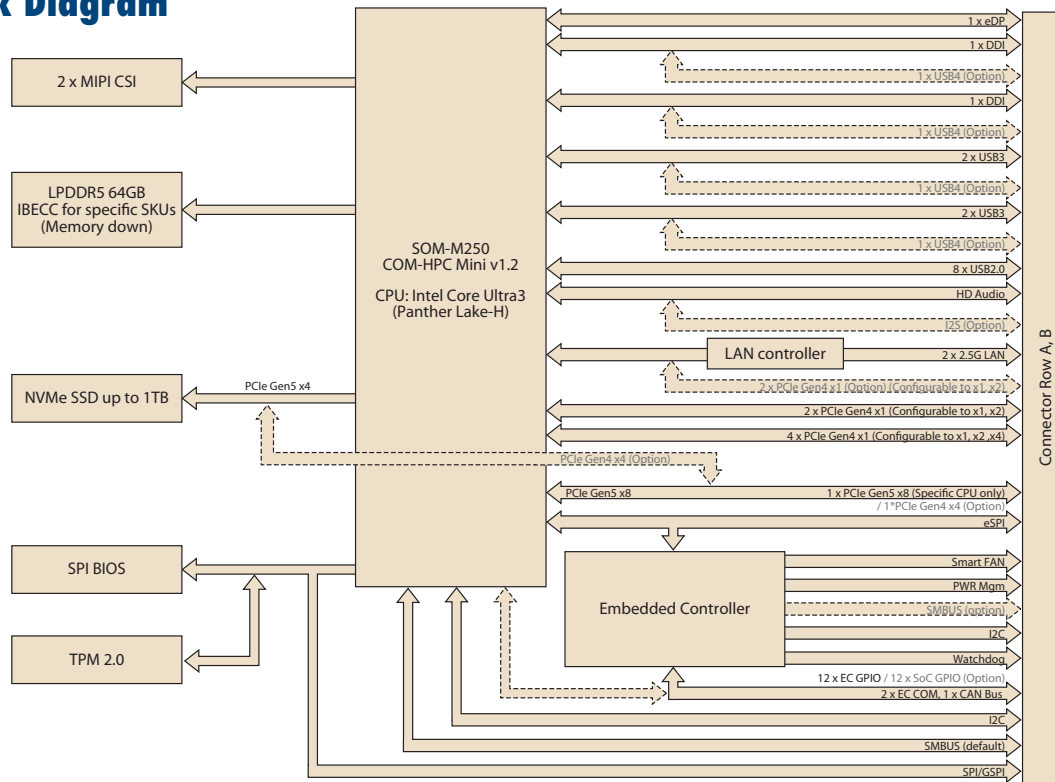


Windows Embedded DeviceOn CE FC

Specifications

Form Factor	Form Factor	COM HPC Mini						
	Pin-out Type	COM HPC Mini v1.2						
Processor System	CPU	388H (Core UltraX9)	386H (Core Ultra9)	366HRE (Core Ultra7)	336HRE (Core Ultra5)	335RE (Core Ultra5)	325 (Core Ultra5)	
	Cores	16C (4P+8E+4LPE)	16C (4P+8E+4LPE)	16C (4P+8E+4LPE)	12C (4P+4E+4LPE)	12C (4P+4E+4LPE)	8C (4P+4LPE)	
	Base Frequency	2.1 GHz	2.1 GHz	TBD	TBD	TBD	2.1 GHz	
	Max Turbo Frequency	5.1 GHz	4.9 GHz	TBD	TBD	TBD	4.4 GHz	
	LLC	18M	18M	18M	18M	12M	12M	
	Default TDP	25W	25W	25W	25W	25W	25W	
	vPRO	Yes	Yes	Yes	Yes	Yes	No	
	BIOS	AMI UEFI 256Mbit						
Memory	Technology	LPDDR5x						
	Speed	9600 MT/s						
	Max. Capacity	Up to 64GB						
	Channel/Socket	Dual Channel						
Graphics	ECC Support	IB ECC						
	Controller	Intel® Xe LPG						
	Graphics EU	192EU	64EU	64EU	64EU	64EU	64EU	
	Max. Frequency	2.25GHz	2.25GHz	TBD	TBD	TBD	2.2GHz	
	Graphic pTOPs	122	50	TBD	TBD	TBD	47	
	3D/HW Acceleration	HW Encode: Supports AVC/H264, HEVC/H265, VP9, JPEG and AV1. HW Decode: Supports MPEG2, AVC/H264, JPEG/MJPEG, HEVC/H265, VP9, AV1 and VVC/H266						
Display	eDP	eDP 4096 x 2304 @60Hz						
	DisplayPort/HDMI	2x DisplayPort/HDMI -HDMI 2.1: 4096 x 2304 @ 60Hz -DisplayPort 2.1 HBR3: 4096 x 2304 @ 60Hz						
	Multiple Display	Tripple Simultaneous Independent Display						
Expansion	PCI Express	1x PCIe Gen 5 x8 (Bifurcate to x4, x8) 1x PCIe Gen4 x4 (Option without NVMe SSD, bifurcate to x2, x4) 4x PCIe Gen4 x1 (Bifurcate to x1, x2, x4) 2x PCIe Gen4 x1 (Up to 4x PCIe Gen4 x1 without LAN, bifurcate to x1, x2, x4)						
		SMBus	Yes					
Serial Bus	I2C Bus	Yes						
Ethernet	Gigabit	2x LAN ; Speed: 10M / 100M / 1000M / 2.5G speeds						
Onboard Storage	NVMe SSD	By PCIe Gen4 x4, up to 1TB						
	SSIO	Support config 1-5, please refer to SSIO table (DDI, USB3, USB4)						
I/O	USB4	Up to 4 ports, Co-lay with DP/HDMI & USB3, Support by SOM-MZ40						
	USB3.2 (Gen2)	4 Ports (10 Gbps)						
	USB2.0	8 Ports (480 Mbps)						
	SPI Bus	Yes. For BIOS EEPROM						
	GPIO	8-bit, Default from Embedded Controller, Option from CPU						
	eSPI	Yes						
	Audio Interface	Default HD Audio, option I2S						
	Watchdog	65536 level, 0 ~ 65535 sec						
	COM Port	2 Ports (2-Wire)						
	CAN Bus	Yes						
Power	MIPI-CSI	2 x MIPI-CSI, 4-wires + 2-wires						
	TPM	TPM2.0						
	Type	ATX: Vin, VSB; AT: Vin						
	Supply Voltage	Vin: 8.5V ~ 20V; VSB: 4.75V ~ 5.25V; RTC Battery: 2.0V ~ 3.3V						
Environment	Power Consumption (Max.)	TBD						
	Power Consumption (Idle)	TBD						
Mechanical	Operating Temperature	Standard: 0 ~ 60 °C (32 ~ 140 °F); Extended: -40 ~ 85 °C (-40 ~ 185 °F)						
	Storage Temperature	-40 ~ 85 °C (-40 ~ 185 °F)						
	Humidity	Operating: 40° C @95% relative humidity, non-condensing; Storage: 60° C @95% relative humidity, non-condensing						
Mechanical	Vibration Resistance	3.5 Grms						
	Dimensions	95 mm x 70 mm (3.74" x 2.75")						

Block Diagram



SSIO Table

SS Lanes	Config 1	Config 2	Config 3	Config 4	Config 5
SS Lane 0	DDI #0	DDI #0	DDI #0	USB4 #2	USB4 #2
SS Lane 1					
SS Lane 2	DDI #1	USB4 #0	USB4 #0	USB4 #0	USB4 #0
SS Lane 3					
SS Lane 4	USB #3	USB #3	USB4 #1	USB4 #1	USB4 #1
SS Lane 5	USB #2	USB #2	USB #1	USB #1	USB4 #3
SS Lane 6	USB #1	USB #1	USB #0	USB #0	
SS Lane 7	USB #0	USB #0			

Ordering Information

Part No.	CPU	Core	LLC	TDP	Graphics	Base Freq.	P-Core Max Turbo Freq.	GPU Max Freq./PTOPS	Memory Speed	Onboard Memory	Onboard SSD	PCIe lanes	vPro	Thermal solution	Operating Temp.
SOM-M250FCDC-U1A1	Intel Core Ultra 9 388H	16C (4P+8E+4LPE)	18MB	25W	12Xe (192EU)	2.1GHz	4.9GHz	2.5GHz/122	9600MT/s	32GB	128GB	12	Yes	Active	0-60°C
SOM-M250DCDC-U1A1	Intel Core Ultra 9 386H	16C (4P+8E+4LPE)	18MB	25W	4Xe (64EU)	2.1GHz	4.9GHz	2.5GHz/40	8533MT/s	16GB	128GB	20	Yes	Active	0-60°C
TBD	Intel Core Ultra 7 366HRE	16C (4P+8E+4LPE)	18MB	25W	4Xe (64EU)	TBD	TBD	TBD	8533MT/s	16GB	128GB	20	Yes	Active	-40-85°C
TBD	Intel Core Ultra 5 336HRE	12C (4P+4E+4LPE)	18MB	25W	4Xe (64EU)	TBD	TBD	TBD	8533MT/s	16GB	128GB	20	Yes	Active	-40-85°C
TBD	Intel Core Ultra 5 335SRE	8C (4P+0E+4LPE)	12MB	15W	4Xe (64EU)	TBD	TBD	TBD	8533MT/s	16GB	128GB	20	Yes	Active	-40-85°C
SOM-M250FC0C-U1A1	Intel Core Ultra 5 325	8C (4P+0E+4LPE)	12MB	15W	4Xe (64EU)	2.1GHz	4.4GHz	2.45GHz/40	6800MT/s	16GB	128GB	12	No	Active	0-60°C

Any other SKUs or combination is project based support. Please contact sales for details.

Development Board

Part No.	Description
SOM-DH2000-00A1	COM HPC Mini Carrier Board

Optional Accessories

Part No.	Description
TBD	Semi-Heatsink
TBD	QFCS Cooler

Packing List

Part No.	Description	Quantity
-	SOM-M250 COM module	1
TBD	Heatspreader	1

Embedded OS

OS	Part No.	Description
Win11	TBD	TBD
Ubuntu	TBD	TBD
VxWorks	TBD	TBD