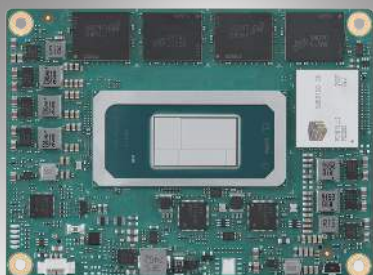


SOM-M250

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

Preliminary



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)					
Serial Bus	SMBus	Yes					
	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					
	MIPI-CSI	2 x MIPI-CSI, 4-wires + 2-wires					
	TPM	TPM2.0					
Power	Type	ATX: Vin, VSB; AT: Vin					
	Supply Voltage	Vin: 8.5V ~ 20V; VSB: 4.75V ~ 5.25V; RTC Battery: 2.0V ~ 3.3V					
	Power Consumption (Max.)	TBD					
	Power Consumption (Idle)	TBD					
Environment	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					
	Vibration Resistance	3.5 Grms					
Mechanical	Dimensions	95 mm x 70 mm (3.74" x 2.75")					

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:



Watchdog



PC



SMBus



H/W Monitor

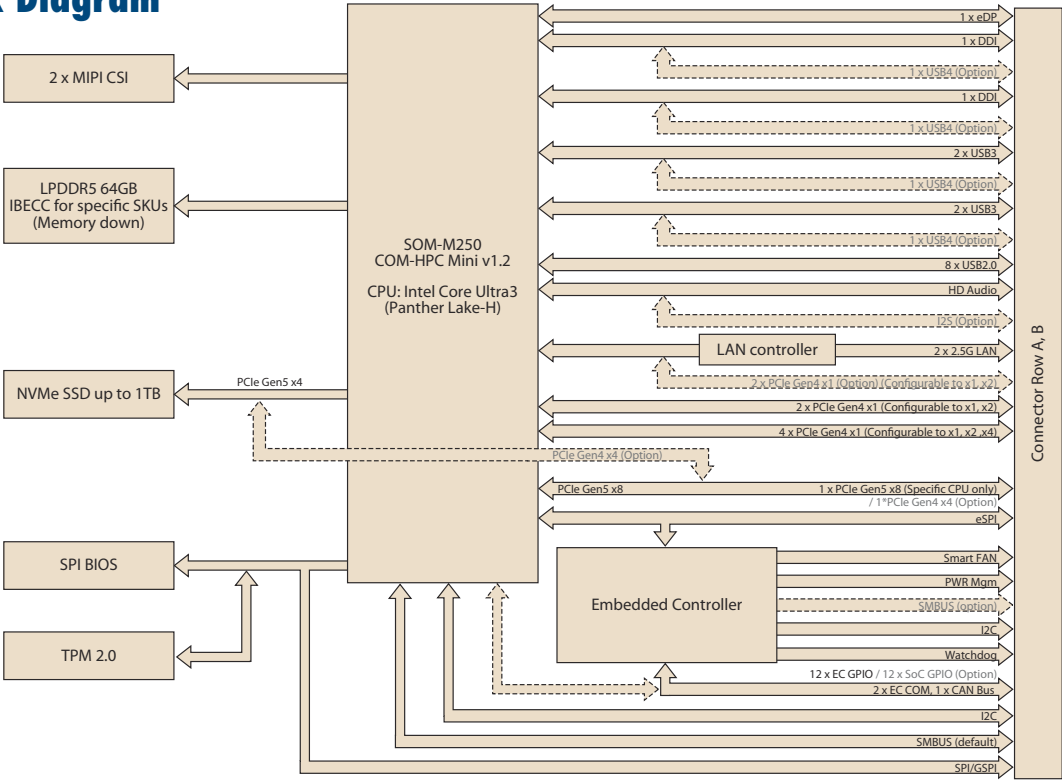


GPIO



Brightness

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 #1
SS Lane 6	USB #1	USB #1	USB #0	USB #0	USB4 #3
SS Lane 7	USB #0	USB #0	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-M250CDC-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 335RE	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