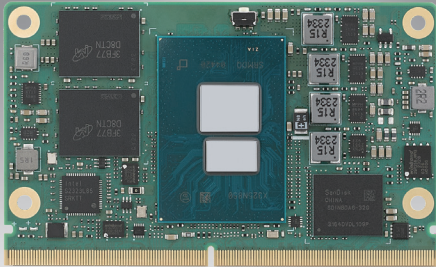


SOM-2533/R

Intel® N Series and Atom® x7000 Series Processors (Code Name: Alder Lake-N/Amston Lake) SMARC Module



Features

- SMARC2.1.1 pinout
- Intel® Core-i®/Pentium®/Celeron® and Atom® x7000 Series Processors
- Single-CH LPDDR5 4800MT/s up to 16GB, support IB ECC
- Dual 2.5GbE LAN, support Ethernet TSN & Wi-Fi TSN
- Multiple I/O expansion: PCIe gen3, USB3.2 Gen2, SATA, CAN-bus
- On board eMMC up to 64GB (Optional)
- Supports iManager, Embedded Software APIs and Wise-DeviceOn

Software APIs:



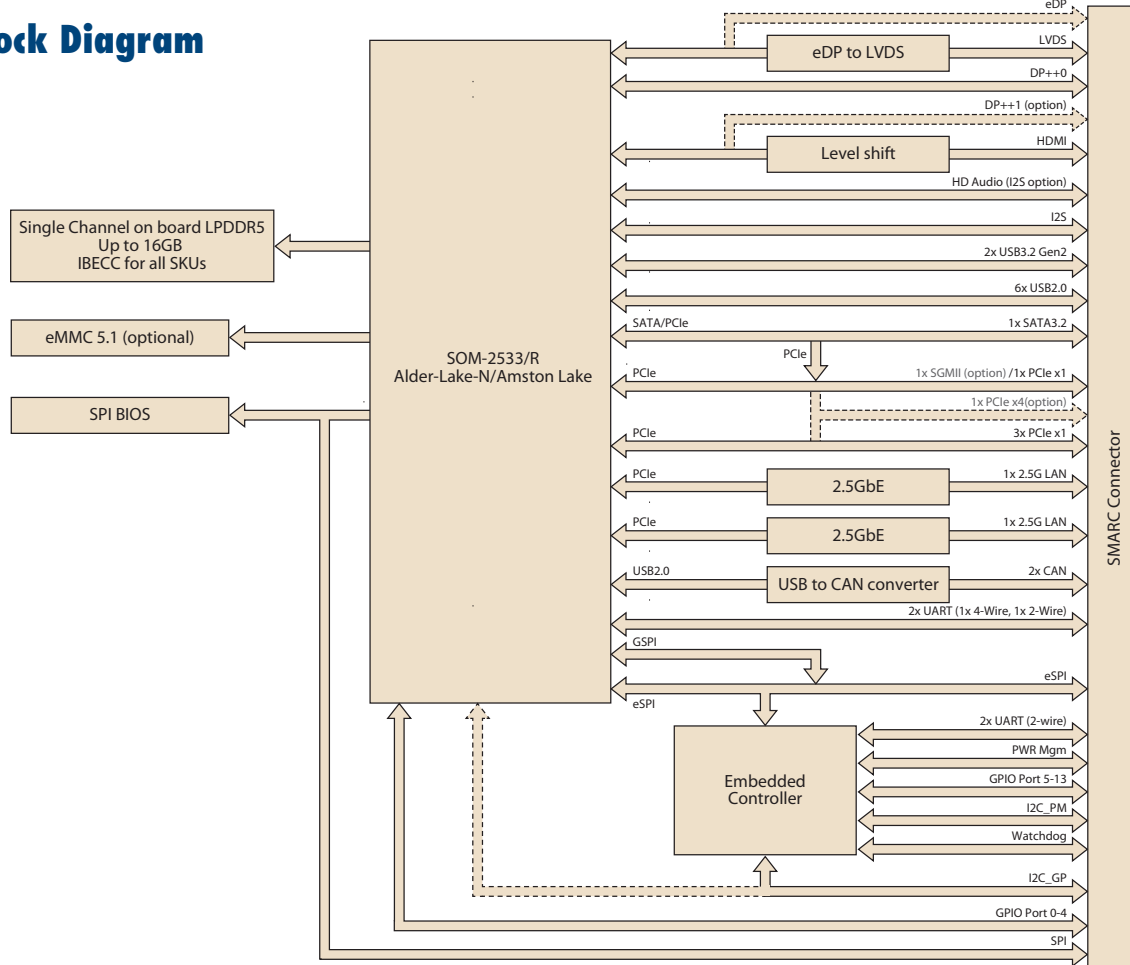
Windows Embedded

iManager WISE-DeviceOn C E FC

Specifications

Form Factor	Form Factor	SMARC							
	Pin-out Type	SMARC2.1.1							
Processor System	CPU	N50	N97	N200	i3-N305	x7425E	X7835RE	x7433RE	x7211RE
	Base Frequency	1.0 GHz	2.0 GHz	1.0 GHz	1.0/1.8 GHz	1.5 GHz	1.3 GHz	1.5 GHz	1.0 GHz
	Max Single Core Turbo Frequency	3.4 GHz	3.6 GHz	3.7 GHz	3.8 GHz	3.4 GHz	3.6 GHz	3.4 GHz	3.2 GHz
	Cores	2	4	4	8	4	8	4	2
	LLC	6 MB	6 MB	6 MB	6 MB	6 MB	6 MB	6 MB	6 MB
	CPU TDP	6W	12W	6W	9/15W	12W	12W	9W	6W
	IB ECC	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	BIOS	AMI UEFI 256Mbit							
Memory	Technology	LPDDR5							
	Speed	4800 MT/s							
	Max. Capacity	Up to 16GB							
	Channel/Socket	Single Channel / Memory down							
Graphics	ECC Support	IB ECC Supported by Specific CPU SKUs							
	Controller	Intel® UHD Graphics							
	EU	16	24	32	32	24	32	32	16
	Base. Frequency	600 MHz	850 MHz	450 MHz	1.0 GHz	800 MHz	800 MHz	600 MHz	400 MHz
	Max. Frequency	1.2 GHz	1.2 GHz	1.2 GHz	1.25 GHz	1.0 GHz	1 GHz	800 MHz	800 MHz
	3D/HW Acceleration	Open GL 4.6, DirectX 12.1 Vulkan 1.2 (Windows) Mesa 3D, Open GL 4.6, Vulkan 1.2 (Linux)							
Display	LCD (LVDS/eDP)	1port LVDS Dual Channel: 1920 x 1200 @60Hz/eDP 1920 x 1080 @60Hz (Up to eDP 4096 x 2304 by specific SKU)							
	DDI (HDMI/DisplayPort)	1 DDI Port Support Configurable HDMI/DisplayPort -HDMI 2.0b: 4096 x 2034 @ 60Hz -DisplayPort 1.4: 4096 x 2034 @ 60Hz							
	HDMI	HDMI 2.0b: 4096 x 2034 @ 60Hz							
	Multiple Display	Triple Simultaneous Independent Display							
Expansion	PCI Express x1 (Gen3)	3 PCIe x1 by default, 1 PCIe x1 by option; Support Configurable 1 PCIe x4 by option							
	Audio Interface	HD Audio/ Up to 2 I2S							
	eSPI	Yes							
Serial Bus	SMBus	Yes							
	I2C Bus	Yes							
Ethernet	Gigabit	2 Ports support 10M / 100M / 1000M / 2.5G speeds, Support TSN by specific SKU; 1 SERDES reserved by option							
	SATA3.0	1 Port (6 Gbps)							
I/O	USB3.2 (Gen2)	2 Ports (10 Gbps)							
	USB2.0	6 Ports (480 Mbps)							
	SPI Bus	Yes. For BIOS EEPROM							
	GPIO	8-bit							
	Onboard Storage	eMMC up to 64GB (Optional)							
	Watchdog	65536 level, 0 ~ 65535 sec							
	COM Port	1 Ports (4-Wire), 3 Ports (2-Wire)							
	TPM	fTPM							
	CAN Bus	2 Ports							
	Power	Type: ATX (Default) / AT (Option); Vin: 4.75-5.25V, RTC Battery: 2.0V ~ 3.3V							
Power	Supply Voltage	Vin: 4.75-5.25V, RTC Battery: 2.0V ~ 3.3V							
	Power Consumption								
	- TAT Turbo CPU+GPU 100%	18.52.W	27.88.W	21.85.W	42.87.W	26.94.W	40.81.W	26.35.W	18.62.W
	- Burn-in	15.49W	14.45W	7.40W	18.41W	26.45W	26.45W	11.82W	12.20W
Environment	Idle Consumption	5.21W	5.80W	5.96W	6.24W	5.99W	5.82W	5.15W	5.65W
	Operating Temperature	Standard: 0 ~ 60 °C (32 ~ 140 °F) Extend: -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	82 mm x 50 mm (3.23" x 1.97")							

Block Diagram



Ordering Information

Part No.	CPU	Core	CPU TDP	CPU Base Freq.	Max Single Core Turbo Frequency	GFX HFM	GFX Burst Mode	RAM	EMMC	LVDS/eDP	TSN	LAN	CAN	Thermal solution	Operating Temp.
SOM-2533DNCC-S8A1	i3-N305	8	9/15W	1.0/1.8 GHz	3.8 GHz	1.0 GHz	1.25 GHz	16GB	64GB	LVDS	N/A	2 Ports	2 Ports	Passive	0 – 60°C
SOM-2533CCBC-SSA1	x7425E	4	12W	1.5 GHz	3.4 GHz	800 MHz	1.0 GHz	8GB	32GB	LVDS	Yes	2 Ports	2 Ports	Passive	0 – 60°C
SOM-2533CNOC-S8A1	i3-N305	8	9/15W	1.0/1.8 GHz	3.8 GHz	1.0 GHz	1.25 GHz	8GB	32GB	LVDS	N/A	2 Ports	N/A	Passive	0 – 60°C
SOM-2533BNOC-U0A1	N97	4	12W	2.0 GHz	3.6 GHz	850 MHz	1.2 GHz	8GB	32GB	LVDS	N/A	2 Ports	N/A	Passive	0 – 60°C
SOM-2533BNOC-S0A1	N200	4	6W	1.0 GHz	3.7 GHz	450 MHz	1.2 GHz	8GB	32GB	LVDS	N/A	2 Ports	N/A	Passive	0 – 60°C
SOM-2533ANOC-S0A1	N50	2	6W	1.0 GHz	3.4 GHz	600 MHz	1.2 GHz	8GB	32GB	eDP	N/A	1 Ports	N/A	Passive	0 – 60°C
SOM-2533RDCBX-S3A1	x7835RE	8	12W	1.3 GHz	3.6 GHz	800 MHz	1.0 GHz	16GB	32GB	LVDS	Yes	2 Ports	2 Ports	Active	-40 – 85°C
SOM-2533RCCBX-S5A1	x7433RE	4	9W	1.5 GHz	3.4 GHz	600 MHz	800 MHz	8GB	32GB	LVDS	Yes	2 Ports	2 Ports	Active	-40 – 85°C
SOM-2533RBCOX-S0A1	x7211RE	2	6W	1.0 GHz	3.2 GHz	400 MHz	800 MHz	4GB	32GB	LVDS	Yes	2 Ports	N/A	Active	-40 – 85°C

Development Board

Part No.	Description
SOM-DB2510-00A1	SMARC R2.1 Devel. Board Rev. A1
SOM-DB2510A-00A1	SMARC R2.1 Devel. Board Rev. A1 w/eDP

Optional Accessories

Part No.	Description
197000511T011	Semi-Heatsink
1970005963T001	Semi-Cooler (For SOM-2533R series part number)

Packing List

Part No.	Description	Quantity
-	SOM-2533 COM module	1
1970005871T001	Heatspreader	1

Embedded OS

OS	Part No.	Description
Win10(VL)	20706WX1VS0081	img W10 21VL SOM-2533 64b 21H2 ENU
Win10(EL)	20706WX1ES0081	img W10 21EL SOM-2533 64b 21H2 ENU
Ubuntu 22.04	20706U22DS0040	img Ubuntu20 SOM-2533 64b 22.04 ENU
Win11(VL)	20706WL1VS0052	img W11 24VL SOM-2533 64b 24H2 ENU
Win11(EL)	20706WL1S0052	img W11 24EL SOM-2533 64b 24H2 ENU
Win11(HL)	20706WL1S0052	img W11 24HL SOM-2533 64b 24H2 ENU
Win11(VL)	20706WL1VS0015	img W11 24VL SOM-2533R 64b 24H2 ENU
Win11(EL)	20706WL1S0015	img W11 24EL SOM-2533R 64b 24H2 ENU
Win11(HL)	20706WL1S0015	img W11 24HL SOM-2533R 64b 24H2 ENU