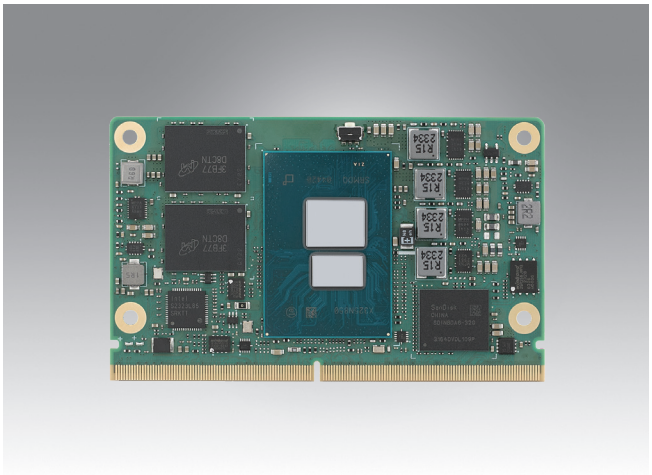
SOM-2533/R

Intel® Core-i®/Pentium®/Celeron® 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 IBECC
- Triple displays up to 4K2K (DP++, HDMI, LVDS/eDP/MIPI-DSI)
- 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: Watchdog, I²C, SMBus, H/W Monitor, GPIO, Brightness

Windows Embedded iManager WISE-DeviceOn

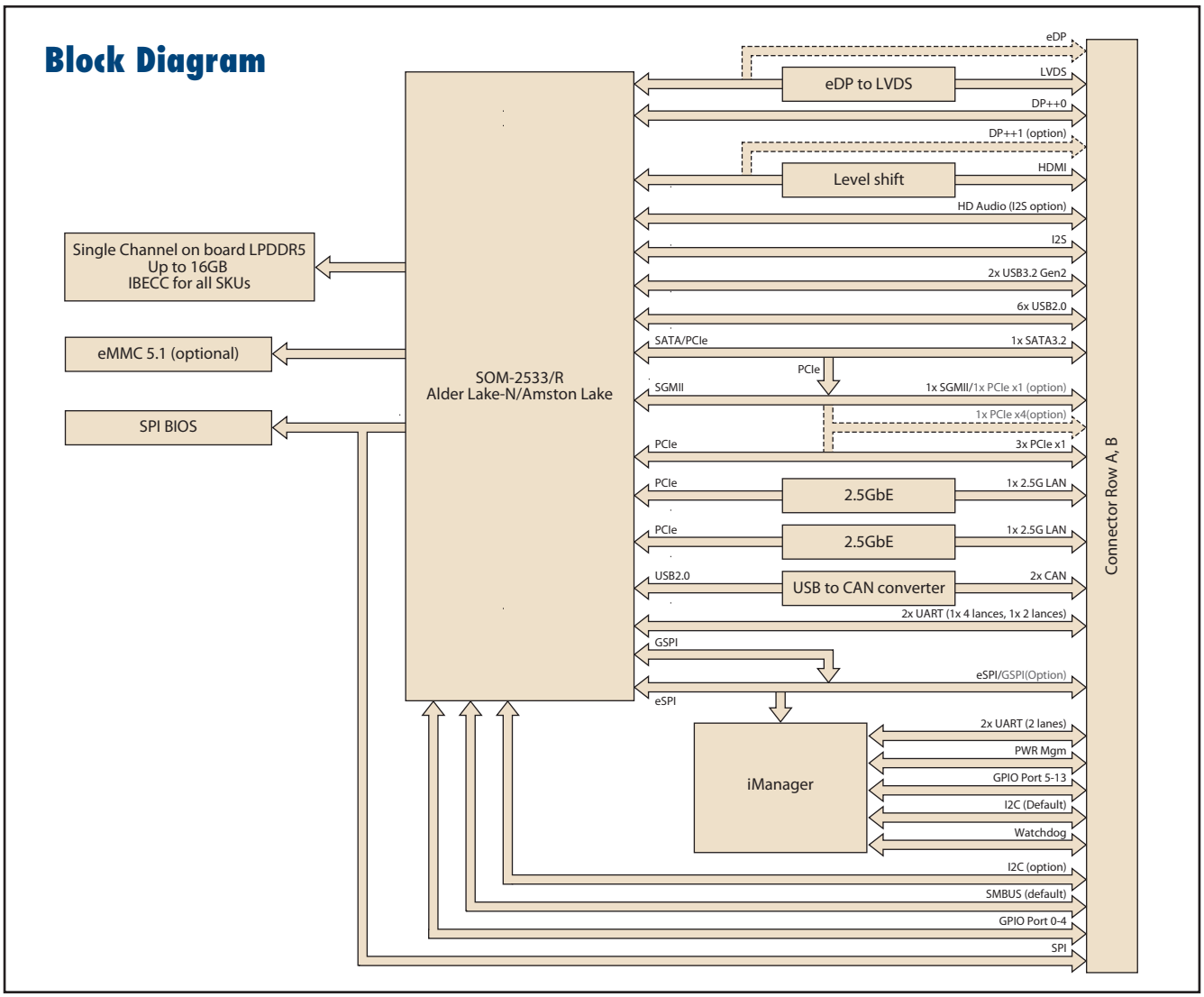
Specifications

Form Factor	Form Factor	SMARC							
	Pin-out Type	SMARC2.1.1							
Processor System	CPU	N50	N97	N200	i3-N305	x7425E	x7832RE	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
	IBECC	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							
	ECC Support	IBECC Supported by Specific CPU SKUs							
Graphics	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	750 MHz	1.2 GHz	750 MHz	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							
I/O	SATA3.0	1 Port (6 Gbps)							
	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: Vin, VSB; AT: Vin							
	Supply Voltage	Vin: 4.75-5.25V, RTC Battery: 2.0V ~ 3.3V							
	Power Consumption (Max.)	TBD							
	Power Consumption (Idle)	TBD							
Environment	Operating Temperature	Standard: 0 ~ 60 °C (32 ~ 140 °F) 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							
	Vibration Resistance	3.5 Grms							
Mechanical	Dimensions	84 mm x 50 m							

All product specifications are subject to change without notice.

Last updated: 27-Mar-2024

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-S5A1	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-2533CN0C-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-2533BN0C-U0A1	N97	4	12W	2.0 GHz	3.6 GHz	850 MHz	1.2 GHz	4GB	32GB	LVDS	N/A	2 Ports	N/A	Passive	0 – 60°C
SOM-2533BN0C-S0A1	N200	4	6W	1.0 GHz	3.7 GHz	450 MHz	750 MHz	4GB	32GB	LVDS	N/A	2 Ports	N/A	Passive	0 – 60°C
SOM-2533AN0C-S0A1	N50	2	6W	1.0 GHz	3.4 GHz	600 MHz	750 MHz	4GB	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	Passive	-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	Passive	-40 – 85°C
SOM-2533RBC0X-S0A1	x7211RE	2	6W	1.0 GHz	3.2 GHz	400 MHz	800 MHz	4GB	N/A	LVDS	Yes	2 Ports	N/A	Passive	-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
1970005111T011	Semi-Heatsink

Packing List

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

Embedded OS

OS	Part No	Description
Wn10 (VL)	20706WX1VS0081	img W10 21VL SOM-2533 64b 21H2 ENU
Wn10 (HL)	20706WX1HS0081	img W10 21HL SOM-2533 64b 21H2 ENU
Wn10 (EL)	20706WX1ES0081	mg W10 21EL SOM-2533 64b 21H2 ENU
Ubuntu 22.04	20706U22DS0040	img UbuntuD SOM-2533 64b 22.04 ENU