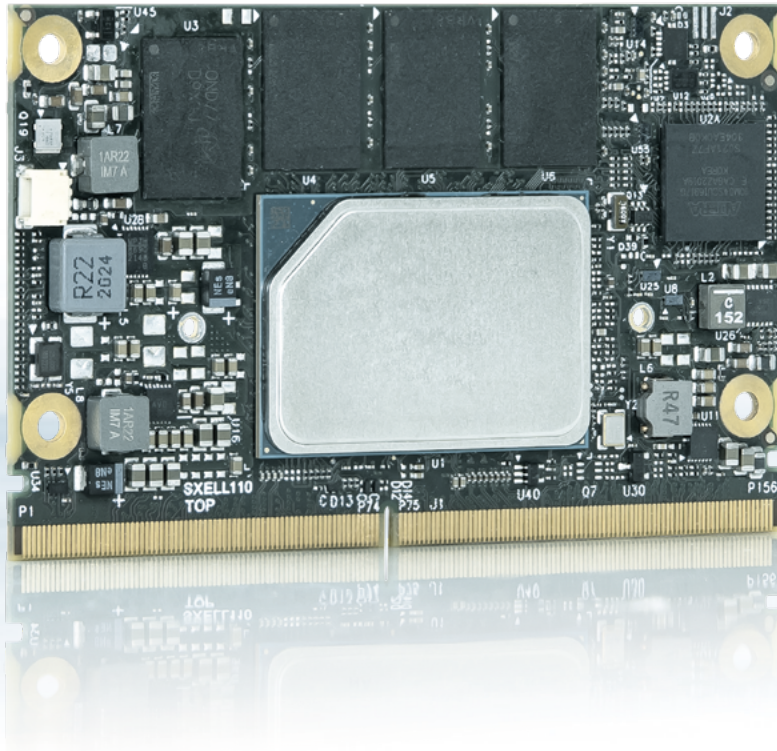


# SMARC-sXEL (E2)

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## Latest Generation Intel Atom<sup>®</sup>, Pentium<sup>®</sup> and Celeron<sup>®</sup> Processor Series

- ▶ Up to 16 GByte LPDDR4 memory down with inband ECC support
- ▶ 2x USB 3.0, 4x USB 2.0, 1x SATA, eMMC onboard, up to 2x LAN onmodule + 1 optional via SERDES
- ▶ TSN support
- ▶ Industrial grade temperature

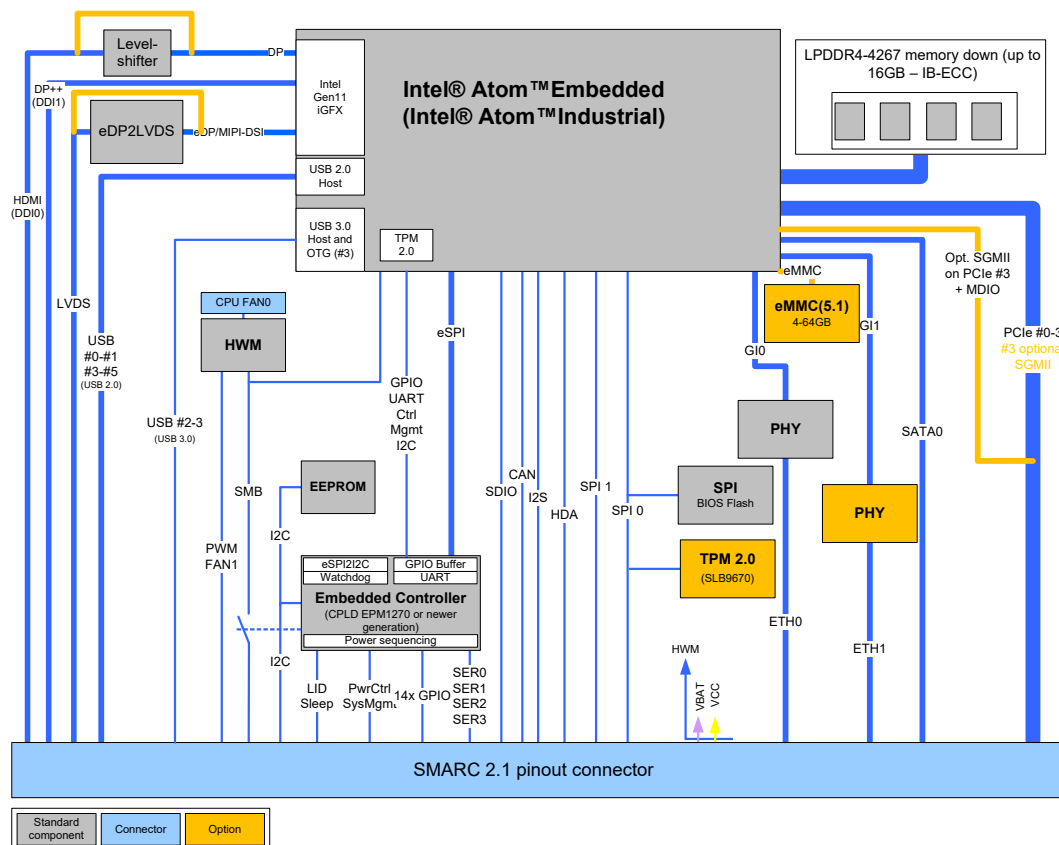
## ► TECHNICAL INFORMATION

COMPLIANCE	SMARC module 2.1
DIMENSIONS (H X W X D)	82 x 50 mm
CPU	Intel Atom®/ Pentium®/ Celeron® series For details see table (CPU Variants) given below
CHIPSET	-
MAIN MEMORY	Up to 16 GByte LPDDR4 memory down with inband ECC support
GRAPHICS CONTROLLER	Intel® UHD Gfx Gen11
ETHERNET	Up to 3x 1 Gbit LAN (2x GBE0/1 and 1x optional SGMII via SERDES)
STORAGE	1x SATA 6 Gb/s
FLASH ONBOARD	up to 128 GByte eMMC (MLC)
PCI EXPRESS®	up to 4x PCIe x1
PANEL SIGNAL	1x HDMI (on request DP), 1x DP++, 1x LVDS dual channel (on request eDP)
USB	2x USB 3.0 (incl. USB 2.0) + 4x USB 2.0, alternatively USB #3 as OTG
SERIAL	4x serial interfaces (2x RX/TX only)
OTHERS FEATURES	HD Audio and I <sup>2</sup> S, 5x I <sup>2</sup> C, 2x SPI, 14x GPIOs
SPECIAL FEATURES	Trusted Platform Module TPM 2.0 Industrial Temperature Grade versions
FEATURES ON REQUEST	4x PCI vs 3x PCIe   1x SERDES eMMC: up to 64 GByte pSLC RAM: from 2 GByte to 16 GByte LPDDR4
BIOS	AMI Aptio V
OPERATING SYSTEM	Windows® 10, Enterprise, Windows® 10 IoT, Linux
POWER SUPPLY	3.0 - 5.25 V widerange input
TEMPERATURE	SMARC-sXEL: Commercial temperature: 0 °C to +60 °C operating, -30 °C to +85 °C non-operating SMARC-sXEL E2: Industrial temperature: -40 °C to +85 °C operating, -40 °C to +85 °C non-operating
HUMIDITY	93 % relative Humidity at 40 °C, non-condensing (according to IEC 60068-2-78)

## CPU VARIANTS

BRAND	PROCESSOR NUMBER	TDP	CORES	THREADS	CACHE	BASE FREQ	MAX TURBO FREQ	GRAPHICS GEN 11	ECC	PREMIUM IO	FUNCTIONAL SAFETY CERTIFIED	USE CONDITION
Intel® Celeron® Processor	J6413	10 W	4	4	1.5 MByte	1.8 GHz	3.0 GHz	16 EU	no	Intel® PSE	no	PC Client
Intel® Pentium® Processor	J6425	10 W	4	4	1.5 MByte	1.8 GHz	3.0 GHz	32 EU	no	Intel® PSE	no	PC Client
Intel® Celeron® Processor	N6211	6 W	2	2	1.5 MByte	1.2 GHz	3.0 GHz	16 EU	no	Intel® PSE	no	PC Client
Intel® Pentium® Processor	N6415	6 W	4	4	1.5 MByte	1.2 GHz	3.0 GHz	16 EU	no	Intel® PSE	no	PC Client
Intel Atom® processor	x6211E	6 W	2	2	1.5 MByte	1.2 GHz	3.0 GHz	16 EU	Yes – In Band	Intel® PSE	no	Embedded
Intel Atom® processor	x6413E	9 W	4	4	1.5 MByte	1.5 GHz	3.0 GHz	16 EU	Yes – In Band	Intel® PSE	no	Embedded
Intel Atom® processor	x6425E	12 W	4	4	1.5 MByte	1.8 GHz	3.0 GHz	32 EU	Yes – In Band	Intel® PSE	no	Embedded
Intel Atom® processor	x6212RE	6 W	2	2	1.5 MByte	1.2 GHz	n/a	16 EU	Yes – In Band	Intel® PSE, Intel® TCC	no	Industrial
Intel Atom® processor	x6414RE	9 W	4	4	1.5 MByte	1.5 GHz	n/a	16 EU	Yes – In Band	Intel® PSE, Intel® TCC	no	Industrial
Intel Atom® processor	x6425RE	12 W	4	4	1.5 MByte	1.9 GHz	n/a	32 EU	Yes – In Band	Intel® PSE, Intel® TCC	no	Industrial

## BLOCK DIAGRAM



## ▶ VARIANTS

PART NO.	CPU	MEMORY	FLASH	ETH PHY	DISPLAY	SERDES	OP. TEMPERATURE
51016-0432-J2-4	J6425	4 GByte	32 GByte pSLC	2x1 GByte	LVDS, HDMI, DP++	No	0 °C - 60 °C
51016-0416-N1-2	N6211	4 GByte	16 GByte pSLC	2x1 GByte	LVDS, HDMI, DP++	No	0 °C - 60 °C
51017-0416-R1-2	x6212RE	4 GByte	16 GByte pSLC	2x1 GByte	LVDS, HDMI, DP++	No	-40 °C - 85 °C
51017-0432-R1-4	x6414RE	4 GByte	32 GByte pSLC	2x1 GByte	LVDS, HDMI, DP++	No	-40 °C - 85 °C
51017-0832-R2-4	x6425RE	8 GByte	32 GByte pSLC	2x1 GByte	LVDS, HDMI, DP++	No	-40 °C - 85 °C

## ▶ CARRIER

ARTICLE	PART NO.	DESCRIPTION
SMARC EVALUATION CARRIER 2.0	51300-0000-00-0	SMARC Evaluation Carrier for SMARC modules according to the SMARC 2.0 standard (without SMARC module)

## ▶ COOLING

ARTICLE	PART NO.	DESCRIPTION
HSP SMARC-sXEL	51016-0000-99-1	Heatspreader for SMARC-sXEL (only for 51016-XXXXX-XX-X)
HSP SMARC-sXEL E2	51017-0000-99-1	Heatspreader for SMARC-sXEL (only for 51017-XXXXX-XX-X)
SMARC PASSIVE UNI COOLER (W/O HSP)	51099-0000-99-1	SMARC Passive Uni Cooler

## ▶ ACCESSORIES

ARTICLE	PART NO.	DESCRIPTION
SMARC MOUNTING KIT	51117-0000-00-0	Mounting Kit for SMARC modules

## ▶ GLOBAL HEADQUARTERS

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