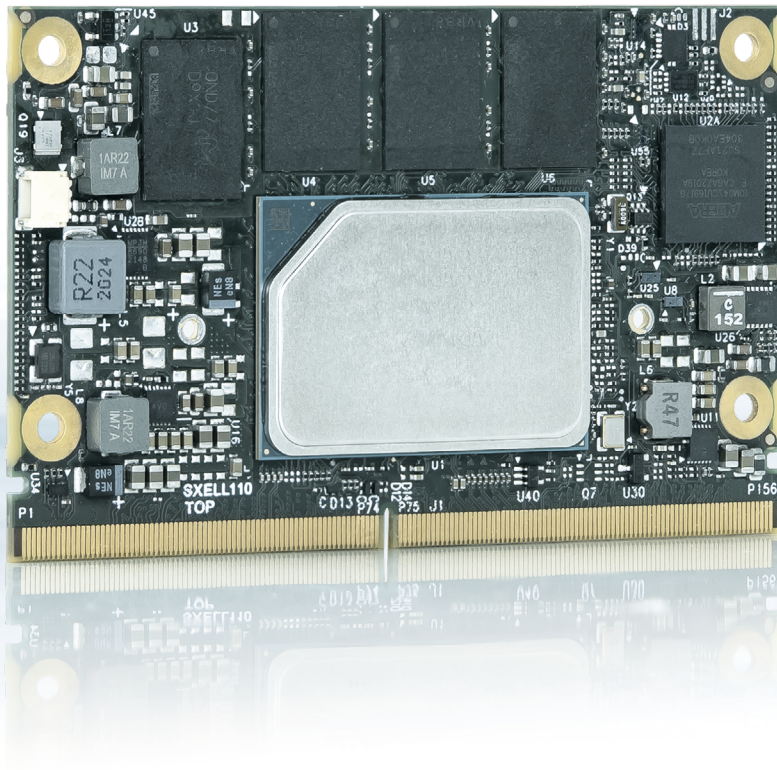


# SMARC-sXEL (E2)

---



## 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

POSSIBILITIES START HERE

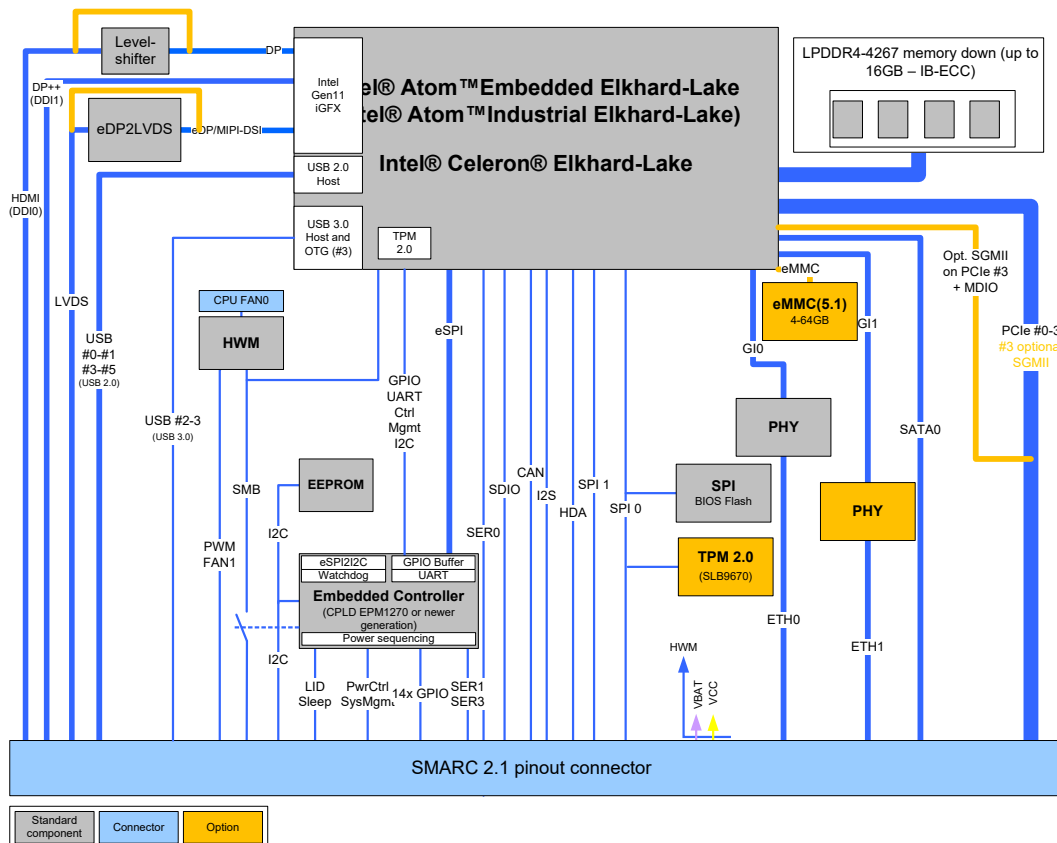
## ▶ TECHNICAL INFORMATION

|                        |   |
|------------------------|---|
| COMPLIANCE             | SMARC module 2.1  |
| DIMENSIONS (H X W X D) | 82 x 50 mm  |
| CPU                    | Intel Atom®/ Pentium®/ Celeron® series<br>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                 | 3x 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<br>Industrial Temperature Grade versions  |
| FEATURES ON REQUEST    | 4x PCI vs 3x PCIe   1x SERDES<br>eMMC: up to 64 GByte pSLC<br>RAM: from 2 GByte to 16 GByte LPDDR4  |
| BIOS                   | AMI Aptio V   |
| OPERATING SYSTEM       | Windows® 10, Enterprise, Windows® 10 IoT, Linux   |
| POWER SUPPLY           | 3.3 – 5.25 V widerange input  |
| TEMPERATURE            | SMARC-sXEL: Commercial temperature: 0 °C to +60 °C operating, -30 °C to +85 °C non-operating<br>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 | J6426            | 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 | J6426   | 4 GByte | 32 GByte | 2x 1 GByte | LVDS, HDMI, DP++ | No     | 0 °C - 60 °C    |
| 51016-0416-N1-2 | N6211   | 4 GByte | 16 GByte | 2x 1 GByte | LVDS, HDMI, DP++ | No     | 0 °C - 60 °C    |
| 51017-0416-R1-2 | x6212RE | 4 GByte | 16 GByte | 2x 1 GByte | LVDS, HDMI, DP++ | No     | -40 °C - 85 °C  |
| 51017-0432-R1-4 | x6414RE | 4 GByte | 32 GByte | 2x 1 GByte | LVDS, HDMI, DP++ | No     | -40 °C - 85 °C  |
| 51017-0832-R2-4 | x6425RE | 8 GByte | 32 GByte | 2x 1 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

### Kontron Europe GmbH

Gutenbergstraße 2  
85737 Ismaning, Germany  
Tel.: +49 821 4086-0  
Fax: +49 821 4086-111  
info@kontron.com

[www.kontron.com](http://www.kontron.com)