nanoX-EL

COM Express Mini Size Type 10 Module with 6th Generation Intel Atom® x6000E Processor SoC

Features

- Quad-core Intel Atom® Processor SoC, Burst Frequency up to 3.0GHz
- Intel® Gen11 LP GFX for AI inference based on OpenVINO
- In-band ECC, up to 16GB LPDDR4 at up to 4267 MT/s
- TCC and 2.5GbE with TSN
- Real-time I/O via ARM Cortex-M7 processor
- USB 3.2 10Gbps



Specifications

Core System

CPU

6th Gen Intel Atom® Processor (formerly "Elkhart Lake")

- Intel Atom® x6425E 2.0GHz (3.0GHz Burst) 12W (4C/32EU, IBECC/non-ECC)
- Intel Atom® x6413E 1.5GHz (3.0GHz Burst) 9W (4C/16EU, IBECC/non-ECC)
- Intel Atom® x6211E 1.3GHz (3.0GHz Burst) 6W (2C/16EU, IBECC/non-ECC)
- Intel Atom® x6200FE 1.0GHz 4.5W (2C/No GPU, IBECC/non-ECC)
- Intel Atom® x6425RE 1.9GHz 12W (4C/32EU, IBECC/non-ECC)
- Intel Atom® x6414RE 1.5GHz 9W (4C/16EU, IBECC/non-ECC)
- Intel Atom® x6212RE 1.2GHz 6W (2C/16EU, IBECC/non-ECC)

Supports: Intel® VT, Intel® VT-d, Intel® TXT, Intel® SSE4.2, Intel® 64 Architecture, Execute Disable Bit, Intel® AES-NI, PCLMULQDQ Instruction, Intel® Secure Key

Notes: Availability of features may vary between processor SKUs.
Some of the SKUs listed above are supported by project basis only. Please contact your ADLINK representative for availability.

Memory

LPDDR4 soldered memory up to 4267 MT/s, IBECC/non-ECC up to 16GB

Memory configuration: 2/4/8/16GB (8/16GB by project basis)

In-Band ECC (IBECC), provides ECC protection without additional ECC device (dependent on SoC SKU)

Embedded BIOS

AMI UEFI with CMOS backup in 32 or 16MB SPI BIOS (dual BIOS by build option)

Cache

TBC

Expansion Busses

- 4 PCIe x1 Gen3: Lanes 0/1/2/3 (configurable to x1, x2, x4)
- LPC bus, SMBus (system) , I²C (user)

SEMA® Board Controller

Supports: Voltage/current monitoring, power sequence debug support, AT/ATX mode control, logistics and forensic information, flat panel control, general purpose I2C, watchdog timer, fan control and failsafe BIOS (dual BIOS by build option)

Debug Headers

30-pin multipurpose flat cable connector for use with DB-30 x86 debug module providing BIOS POST code LED, EC access, SPI BIOS flashing, power testpoints, debug LEDs

Video

GPU Feature Support

Intel® Gen11 LP Graphics Core Architecture, supporting multiple independent and simultaneous display combinations of DisplayPort/HDMI/LVDS or eDP outputs (max. 4K @60Hz)

- Hardware encode/transcode of HD content (including HEVC)
- DirectX 12 and Vulkan v1.1 support
- OpenGL 4.5 and ES 3.2 support
- OpenCL 1.2 support

Digital Display Interface

DDI0 supporting DisplayPort/HDMI/DVI

LVDS

Single channel 18/24-bit LVDS via eDP-to-LVDS IC
(max. resolution 1920x1200 @60Hz in dual mode)

eDP

Optional 4 lane support, in place of LVDS
(max. resolution 4096x2160 @60Hz)

Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

Located on carrier miniBASE-10R

Ethernet

Intel® MAC and external PHY

MaxLinear GPY series PHY (GPY 211/215)

TSN support on Linux

Interface

2.5Gbit/s and 1000/100/10 Mbit/s Ethernet connection

GbE0_SDP available if TSN support enabled

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Specifications

I/O Interfaces

USB: 2x USB 3.2/2.0/1.1 (USB 0,1,) and 6x USB 2.0/1.1 (USB 2,3,4,5,6,7)

SATA: 2x SATA 6Gb/s (SATA 0,1)

Serial: 2x UART ports with console redirection

eMMC: eMMC 5.0 (16/32/64GB by build option), functions as boot-up device (TBC)

GPIO/SD: 4x GPO and 4x GPI from EC (GPI with interrupt TBC)
SD/GPIO muxed design, SD is build option by project basis, SD functions as storage device only

Notes: USB 3.2 Gen2 support dependent on carrier design.

2x UART and 8x GPIO can be managed by ARM M7 processor or x86 processor. UART, GPIO managed by ARM M7 is for real-time usage.

CAN FD (build option by project basis, shared with UART 1) is managed by ARM M7 processor for real-time usage (TBC).

Super I/O

Supported on carrier if needed (standard support for W83627DHG-P, other Super I/O supported by project basis)

TPM (build option)

Chipset: Infineon

Type: TPM 2.0 (SPI based, build option by project basis)

Power

Standard Input

ATX: 12V±5% / 5Vsb ±5%; or AT: 12V±5%

Wide Input

ATX: 4.75-20 V / 5Vsb ±5%; or AT: 4.75-20V

Management

ACPI 5.0 compliant, Smart Battery support

Power States

S0, S3, S4, S5 , S5 ECO mode (Wake on USB S3/S4, WOL S3/S4/S5)

ECO mode

Supports deep S5 mode for power saving

Mechanical and Environmental

Form Factor: PICMG COM.0: Rev 3.0 Type 10

Dimension: Mini size: 84 mm x 55 mm

Operating Temperature

Standard: 0°C to 60°C (storage: -20°C to 80°C)

Extreme Rugged: -40°C to 85°C
(optional, selected SKUs; storage: -40°C to 85°C)

Humidity

5-90% RH operating, non-condensing

5-95% RH storage (and operating with conformal coating)

Shock and Vibration

IEC 60068-2-64 and IEC-60068-2-27

MIL-STD-202F, Method 213B, Table 213-I, Condition A and Method 214A, Table 214-I, Condition D

HALT

Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

Operating Systems

Standard Support

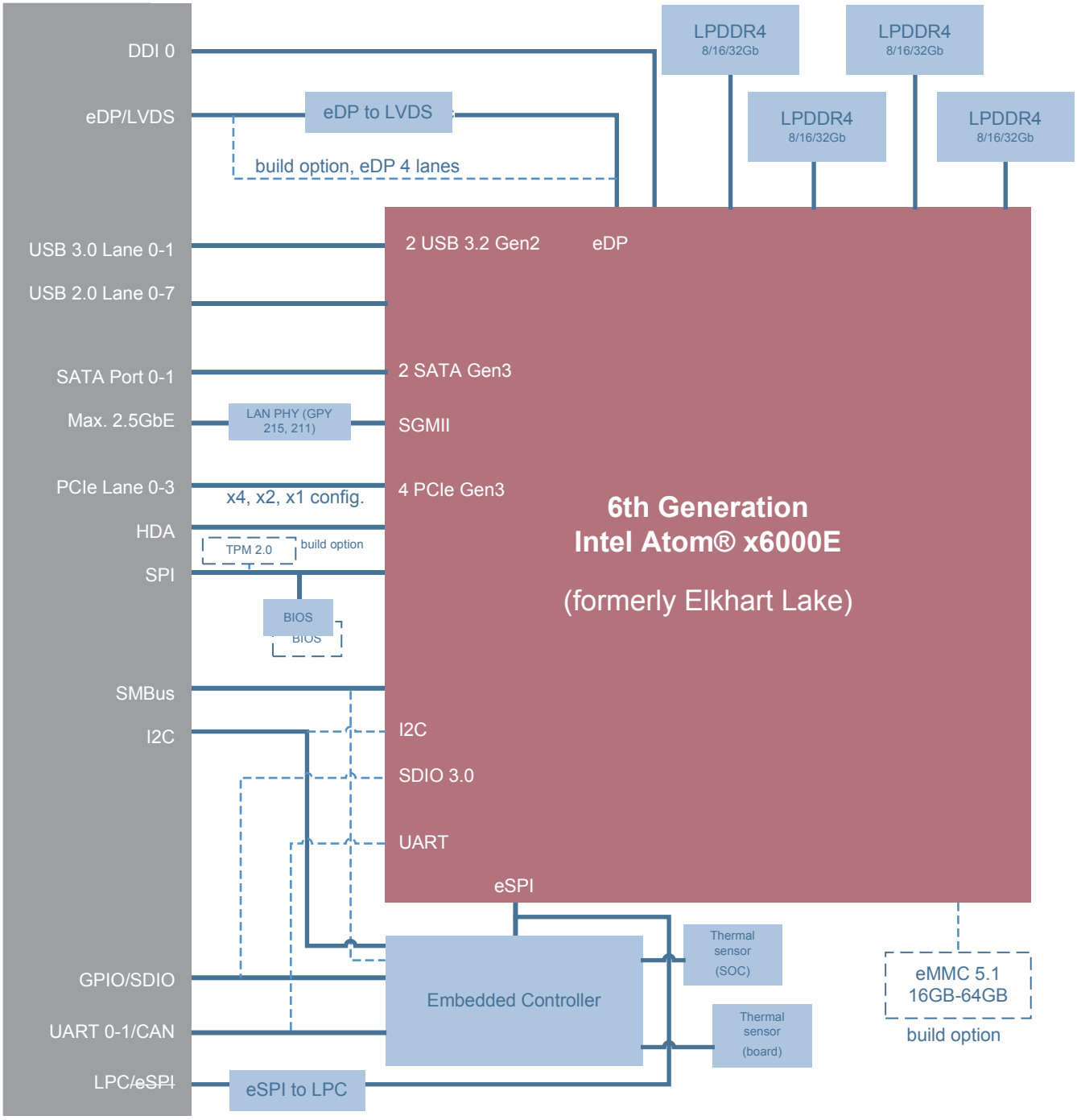
Windows 10 IOT Enterprise 64-bit, Windows 10 64-bit, Yocto Linux 64-bit, VxWorks 64-bit (TBC), Ubuntun (TBC)

Extended Support (BSP)

Yocto project based Linux 64-bit

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Functional Diagram



nanoX-EL

Ordering Information

- **nanoX-EL-x6425E-2G**
  Mini COM Express Type 10 module with Intel Atom® x6425E, 2GB memory
- **nanoX-EL-x6413E-2G**
  Mini COM Express Type 10 module with Intel Atom® x6413E, 2GB memory
- **nanoX-EL-x6211E-2G**
  Mini COM Express Type 10 module with Intel Atom® x6211E, 2GB memory
- **nanoX-EL-x6200FE-2G**
  Mini COM Express Type 10 module with Intel Atom® X6200FE (no GPU), 2GB memory
- **nanoX-EL-x6425E-4G**
  Mini COM Express Type 10 module with Intel Atom® x6425E, 4GB memory
- **t1nanoX-EL-x6425E-4G**
  Mini COM Express Mini Type 10 module with Intel Atom® x6425E, 4GB memory-40 to +85
- **t1nanoX-EL-x6211E-8G**
  Mini COM Express Type 10 module with Intel Elkhart Lake Atom x6211E, 8GB memory, -40 to +85
- **t1nanoX-EL-x6425RE-4G**
  Mini COM Express Type 10 module with Intel Elkhart Lake Atom x6425RE, 4GB memory, -40 to +85
- **t2nanoX-EL-x6211E-8G**
  Mini COM Express Type 10 module with Intel Elkhart Lake Atom x6211E, 8GB memory, -40 to +85, ETT
- **t2nanoX-EL-x6425RE-16G**
  Mini COM Express Type 10 module with Intel Elkhart Lake Atom x6425RE, 16GB memory, -40 to +85, ETT

*For processor SKUs not listed, please contact your ADLINK representative for availability.

Starter Kit

- **Starter kit for COM Express Type 10**
  Includes miniBase-10R carrier board, power adaptor and neccessory accessory

Accessories

Heat Spreaders

- **HTS-nXEL-B-I**
  Heatspreader for nanoX-EL Atom with threaded standoffs for bottom mounting
- **HTS-nXEL-BT-I**
  Heatspreader for nanoX-EL Atom with through hole standoffs for top mounting

Passive Heatsinks

- **THS-nXEL-B-I**
  Low profile heatsink for nanoX-EL Atom with threaded standoffs for bottom mounting
- **THS-nXEL-BT-I**
  Low profile heatsink for nanoX-EL Atom with through hole standoffs for top mounting
- **THSH-nXEL-B-I**
  High profile heatsink for nanoX-EL Atom with threaded standoffs for bottom mounting

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