

nanoX-AL

COM Express Mini Size Type 10 Module with Intel Atom® E3900 series SoC and Pentium®/Celeron® SoC

Features

- Intel Atom® E3900 series (formerly codename: Apollo Lake) and Pentium®/Celeron® SoC, supporting full virtualization (VT-d/VT-x)
- Up to 8GB Dual Channel soldered non-ECC DDR3L at 1867/1600MHz
- Newest Intel® Gen9 Low Power graphics, up to 4k resolution and H.265 codec
- Multiple PCIe x1 Gen2 (configurable to x2, x4), GbE
- Two SATA 6 Gb/s, two USB 3.0 and six USB 2.0, eMMC 5.0 (build option)
- Supports Smart Embedded Management Agent (SEMA) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option for E39XX SKUs)



Specifications

• Core System

CPU

Intel Atom® E3900 series (formerly codename: Apollo Lake) and Pentium®/Celeron® SoC

Atom™ E3950 1.6/2.0GHz (Turbo), 12W (4C/1866)

Atom™ E3940 1.6/1.8GHz (Turbo), 9W (4C/1866)

Atom™ E3930 1.3/1.8GHz (Turbo), 6W (2C/1866)

Pentium® N4200 1.1/2.5GHz (Turbo), 6W (4C/1866) (by project basis)

Celeron® N3350 1.1/2.3GHz (Turbo), 6W (2C/1866) (by project basis)

Supports: Intel® TXT, Intel® SSE4.2, Intel® 64 Architecture, IA 32-bit, Intel® AES-NI, dual or quad Out-of-Order Execution (OOE) processor cores, PCLMULQDQ Instruction DRNG

Note: Availability of features may vary between processor SKUs.

Memory

Up to 8 GB Dual channel DDR3L at 1867/1600 MHz non-ECC

2GB is single channel

4/8GB is dual channel

Embedded BIOS

AMI EFI with CMOS backup in 16MB SPI BIOS

Cache

2MB for all SKUs

Expansion Busses

Multiple PCI Express x1 Gen2: Lanes 0/1/2/3 (configurable to 3x1, 1x4, 1x2+2x1)

LPC bus, SMBus (system), I²C (user)

SEMA® Board Controller

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

Debug Headers

40-pin multipurpose flat cable connector for use with DB-40 debug module providing BIOS POST code LED, BMC access, SPI BIOS flashing, power testpoints, debug LEDs

MIPI60 header for ICE debug of CPU/chipset on break out board (build option)

• Video

GPU Feature Support

Intel® Generation 9 LP Graphics Core Architecture, supporting 2 independent and simultaneous display combinations of DisplayPort, HDMI, LVDS or eDP outputs

Hardware encode/transcode (including HEVC)

DirectX 12, DirectX 11.3, DirectX 10, DirectX 9.3 support

OpenGL 4.3 and ES 3.0 support

OpenCL 2.0 support

Digital Display Interface

DDIO supports DisplayPort/HDMI/DVI

LVDS

Single channel 18/24-bit LVDS from eDP-to-LVDS IC

eDP

4 lane support (build option, in place of LVDS)

• Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

On carrier miniBASE-10R

• Ethernet

Intel® MAC/PHY: Intel® Ethernet i210

Interface: 10/100/1000 GbE connection

Notes:

- Intel® Ethernet i211 is supported by project basis

- Support IEEE 1588 and GbE0_SDP

Specifications

• I/O Interfaces

USB: 2x USB 1.1/2.0/3.0 (USB 0,1) and 6x USB 1.1/2.0 (USB 2,3,4,5,6,7)

USB OTG support on USB 2.0 port 7 with Yocto Linux

SATA: Two ports SATA 6Gb/s (SATA0,1)

Serial: 2 UART ports

eMMC: eMMC 5.0 (8/16/32GB, build option)

GPIO/SD: 4 GPO and 4 GPI

SD signal is a build option supported by project basis

Note: eMMC/SD boot device support depends on OS

• Super I/O

Supported on carrier if needed (standard support for W83627DHG-P)

• TPM (build option)

Chipset: Infineon

Type: TPM 2.0

• Power

Standard Input: ATX: 12V±5%, 5Vsb ±5%; AT: 12V±5%

Wide Input: ATX: 4.75-20 V, 5Vsb ±5%; AT: 4.75-20V (Standard Temp. only)

Management: ACPI 5.0 compliant, Smart Battery support

Power States: C1-C6, S0, S3, S4, S5 and 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 2.1, Type 10

Dimension: Compact size: 84 mm x 55 mm

Operating Temperature

Standard: 0°C to 60°C

Extreme Rugged: -45°C to +85°C (build option with E39XX SoC SKUs)

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

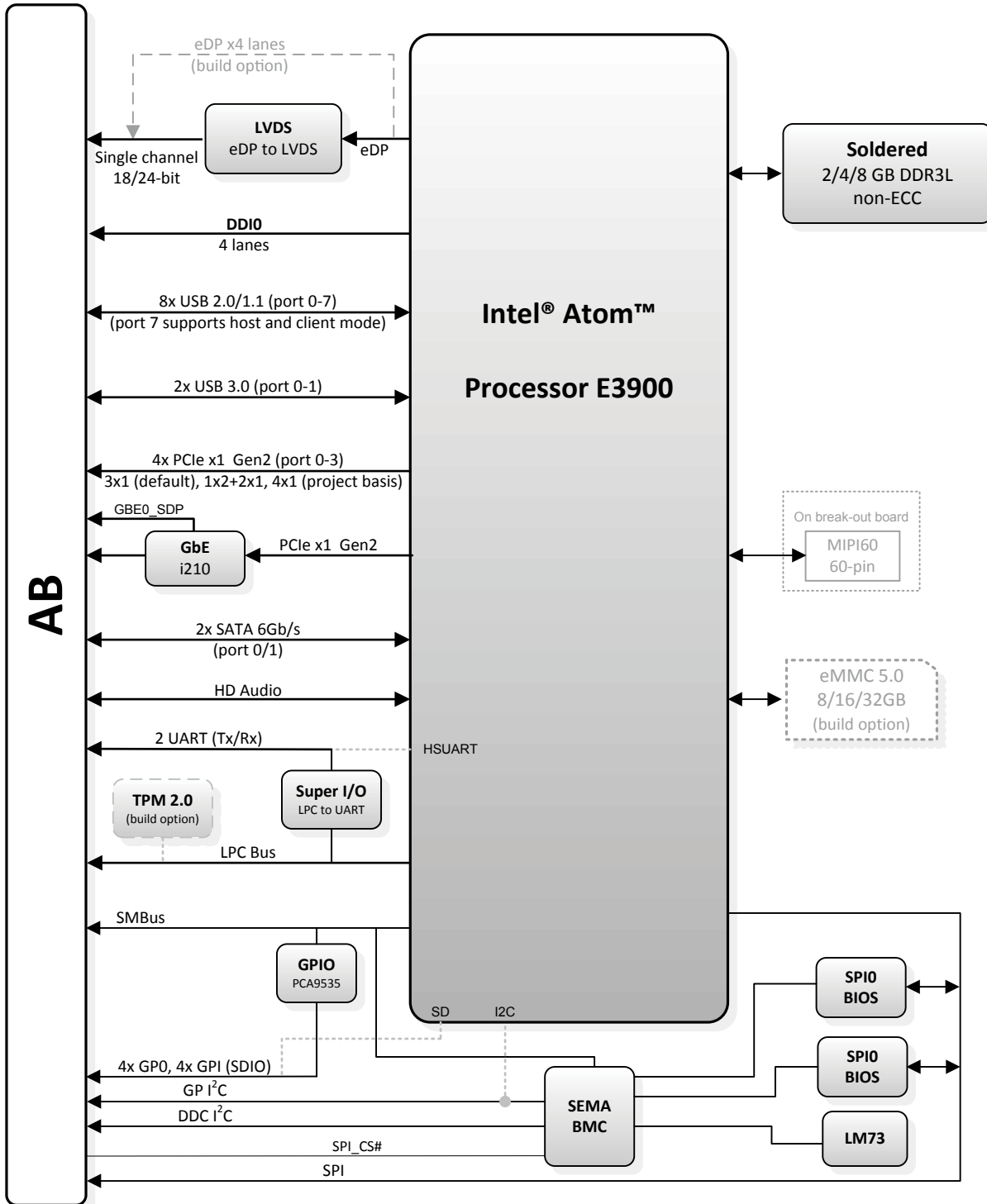
Windows 10 64-bit, Linux 64-bit, VxWorks 64-bit

Extended Support (BSP)

Linux 64-bit, VxWorks 64-bit

Note: "build option" indicates an alternative BOM configuration to support additional or alternative functions that are not available on the standard product.
Be aware that these "build option" part numbers will need to be newly created and this will result in production lead times.

Functional Diagram



Ordering Information

- **nanoX-AL-E3950-2G**
Mini COM Express Type10 with Intel® Apollo Lake-I Atom™ E3950 (4C), 2G memory
- **nanoX-AL-E3940-2G**
Mini COM Express Type10 with Intel® Apollo Lake-I Atom™ E3940 (4C), 2G memory
- **nanoX-AL-E3930-2G**
Mini COM Express Type10 with Intel® Apollo Lake-I Atom™ E3930 (2C), 2G memory
- **nanoX-AL-N4200-2G**
Mini COM Express Type10 with Intel Apollo Lake Pentium® N4200 (4C)
- **nanoX-AL-N3350-2G**
Mini COM Express Type10 with Intel Apollo Lake Celeron® N3350 (2C)

Notes:

1. Notes: the combination not listed above might be supported by project basis
2. N4200/N3350 is supported by project basis

Starter Kit

- **COM Express Type 10 Starter Kit Plus**
Starter Kit Plus Starter kit for COM Express Type 10

Accessories

Heat Spreaders

- **HTS-nXAL-B-I**
Heatspreader for nanoX-AL Atom® with threaded standoffs for bottom mounting
- **HTS-nXAL-BT-I**
Heatspreader for nanoX-AL Atom® with through hole standoffs for top mounting
- **HTS-nXAL-B**
Heatspreader for nanoX-AL Pentium®/Celeron® with threaded standoffs for bottom mounting
- **HTS-nXAL-BT**
Heatspreader for nanoX-AL Pentium®/Celeron® with through hole standoffs for top mounting

Passive Heatsinks

- **THS-nXAL-B-I**
Low profile heatsink for nanoX-AL Atom® with threaded standoffs for bottom mounting
- **THS-nXAL-BT-I**
Low profile heatsink for nanoX-AL Atom® with through hole standoffs for top mounting
- **THS-nXAL-B**
Low profile heatsink for nanoX-AL Pentium®/Celeron® with threaded standoffs for bottom mounting
- **THS-nXAL-BT**
Low profile heatsink for nanoX-AL Pentium®/Celeron® with through hole standoffs for top mounting
- **THSH-nXAL-B-I**
High profile heatsink for nanoX-AL Atom® with threaded standoffs for bottom mounting