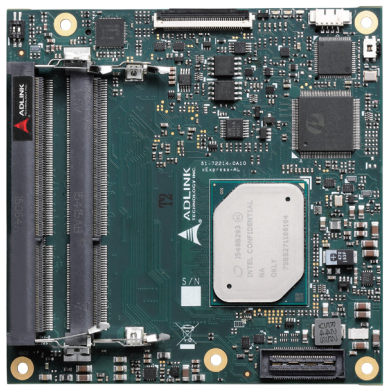
cExpress-AL

COM Express Compact Size Type 6 Module with Intel Atom® E3900 series and Pentium®/Celeron® SoC

Features



- Intel Atom® E3900 series (formerly Apollo Lake) and Pentium®/Celeron® SOC, supporting full virtualization (VT-d/VT-x)
- Supports IEEE 1588 Precision Time Protocol (PTP)
- Up to 8GB dual channel non-ECC DDR3L at 1867/1600 MHz
- Two DDI channels, one LVDS (VGA/eDP by build option), supports up to 3 independent displays
- Up to Five PCIe x1 Gen2 (by PCIe bridge IC, build option)
- Two SATA 6 Gb/s, three USB 3.0/2.0, five USB 2.0 and eMMC 5.0 (build option)
- Extreme Rugged operating temperature: -40°C to +85°C (build option for E3900 series SKUs)

Specifications

Core System

CPU

Intel Atom® E3900 series (formerly Apollo Lake)/Pentium®/Celeron® SoC on 14nm process

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)

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

Note: Pentium®/Celeron® support by project basis

Supports: Intel® VT, Intel® VT-d, 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

Notes: Availability of features may vary between processor SKUs. Pentium®/Celeron® supported by project basis.

Memory

Dual channel 1867/1600 MHz non-ECC DDR3L memory up to 8GB in dual SODIMM socket

(maximum by 2pcs 4GB or 1pcs 8GB SO-DIMM)

Embedded BIOS

AMI EFI with CMOS backup in 16MB SPI BIOS (dual BIOS by build option)

Expansion Busses

3 PCI Express x1 Gen2 (AB): Lanes 0/1/2 by default

Note: 5 PCI Express x1 Gen2 (AB): Lanes 0/1/2/3/4 through PCIe bridge IC by request.

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, 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 (build option)

Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

On carrier Express-BASE6 (ALC886 standard support)

Ethernet

Intel® Ethernet Controller I210 (Extreme Rugged operating temperature range)

Intel® Ethernet Controller I211 (standard operating temperature range)

Supports IEEE 1588 and GbE0_SDP (I210 only)

Video

GPU Feature Support

Intel® Gen9 LP Graphics Core, supporting 3 independent and simultaneous display combinations of DisplayPort/HDMI/LVDS or eDP/VGA 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

DDI1/2 supporting DisplayPort/HDMI/DVI

VGA

Build option support through DP-to-VGA IC (in place of DDI2)

LVDS

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

eDP

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

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.

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Specifications

I/O Interfaces

USB: 3x USB 3.0 (USB ports 0-2) and 5x USB 2.0 (USB ports 3-7)
USB OTG support on USB 2.0 port 0 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 muxed with GPIO, controlled by BIOS setting
Note: eMMC/SD boot device support dependent 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% or AT=12V±5%
Wide Input: ATX = 4.75-20 V / 5Vsb ±5% or 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 3.0 Type 6
Dimension: Compact size: 95 mm x 95 mm

Operating Temperature

Standard: 0°C to 60°C
Extreme Rugged: -45°C to +85°C (build option with E3900 series only)

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, Yocto project based Linux 64-bit, VxWorks 64-bit

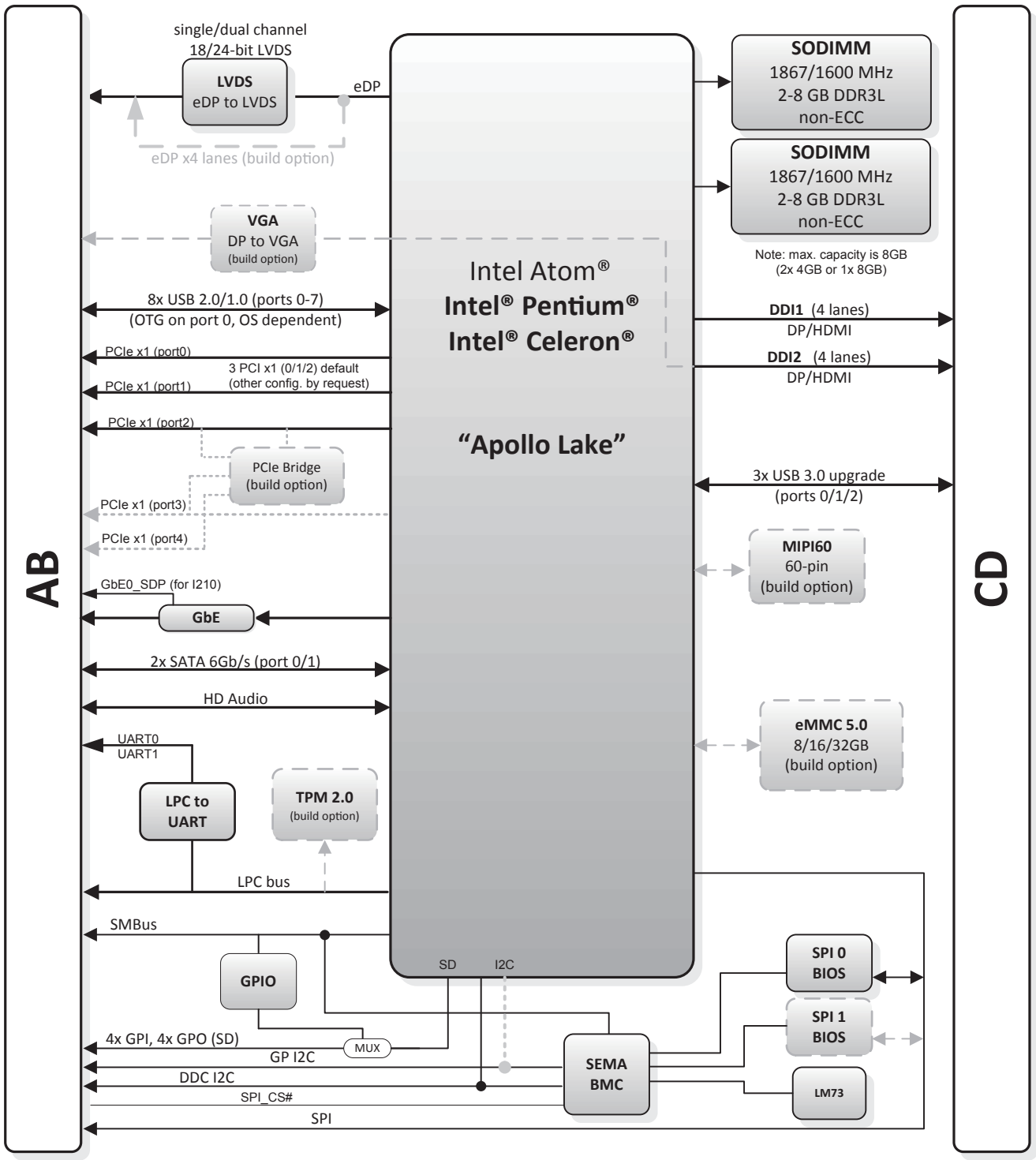
Extended Support (BSP)

VxWorks

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Functional Diagram



Ordering Information

- **cExpress-AL-E3950**
  Compact COM Express Type6 with Intel® Apollo Lake-I Atom® E3950 (4C)
- **cExpress-AL-E3940**
  Compact COM Express Type6 with Intel® Apollo Lake-I Atom® E3940 (4C)
- **cExpress-AL-E3930**
  Compact COM Express Type6 with Intel® Apollo Lake-I Atom® E3930 (2C)
- **cExpress-AL-N4200**
  Compact COM Express Type6 with Intel® Apollo Lake Pentium® N4200 (4C)
- **cExpress-AL-N3350**
  Compact COM Express Type6 with Intel® Apollo Lake Celeron® N3350 (2C)

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. Please contact local sales.

Starter Kit

- **COM Express Type 6 Starter Kit Plus**
  Starter kit for COM Express Type 6

Accessories

Heat Spreaders

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

Passive Heatsinks

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

Active Heatsink

- **THSF-cAL-B-I**
  High profile heatsink with fan for cExpress-AL Atom® with threaded standoffs for bottom mounting
- **THSF-cAL-B**
  High profile heatsink with fan for cExpress-AL Pentium®/ Celeron® with threaded standoffs for bottom mounting

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