

cExpress-AL

COM Express Compact Size Type 6 Module with next gen Intel® Atom™ and Pentium®/Celeron® SoC

Features

- Next generation Intel® Atom™/Pentium®/Celeron® SoC
- 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 (configurable to x2, x4)
- Two SATA 6 Gb/s, two USB 3.0, six USB 2.0, and eMMC 5.0 (build option)
- Supports Smart Embedded Management Agent (SEMA®) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option for selected SKUs)

Preliminary



Specifications

Core System

CPU

Next Generation Intel® Atom™/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)
 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
 Note: Availability of features may vary between processor SKUs.

Memory

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

Embedded BIOS

AMI EFI with CMOS backup in 16MB SPI BIOS

Expansion Busses

Up to 5 PCI Express x1 Gen2 (AB): Lanes 0/1/2/3/4 (configurable to x2, x4; up to four simultaneous PCIe devices; lane 4 by build option)
 LPC bus, SMBus (system), I²C (user)

Note: Optional PCIe bridge IC to support more than four PCIe x1 devices

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
 60-pin XDP header for ICE debug of CPU/chipset

Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

On carrier Express-BASE6 (ALC886 standard support)

Ethernet

Intel® MAC/PHY: Intel® Ethernet Controller I210
 Interface: 10/100/1000 GbE connection

Video

GPU Feature Support

Intel® Gen9 LP Graphics Core, supporting 3 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

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 (Build option, in place of eDP)

eDP

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

Specifications

● I/O Interfaces

USB: 2x USB 3.0 (USB 0,1) and 6x USB 2.0 (USB 2,3,4,5,6,7)
SATA: Two ports SATA 6Gb/s (SATA0,1)
Serial: 2 UART ports (console redirection TBD)
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

● 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 2.1 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 selected 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

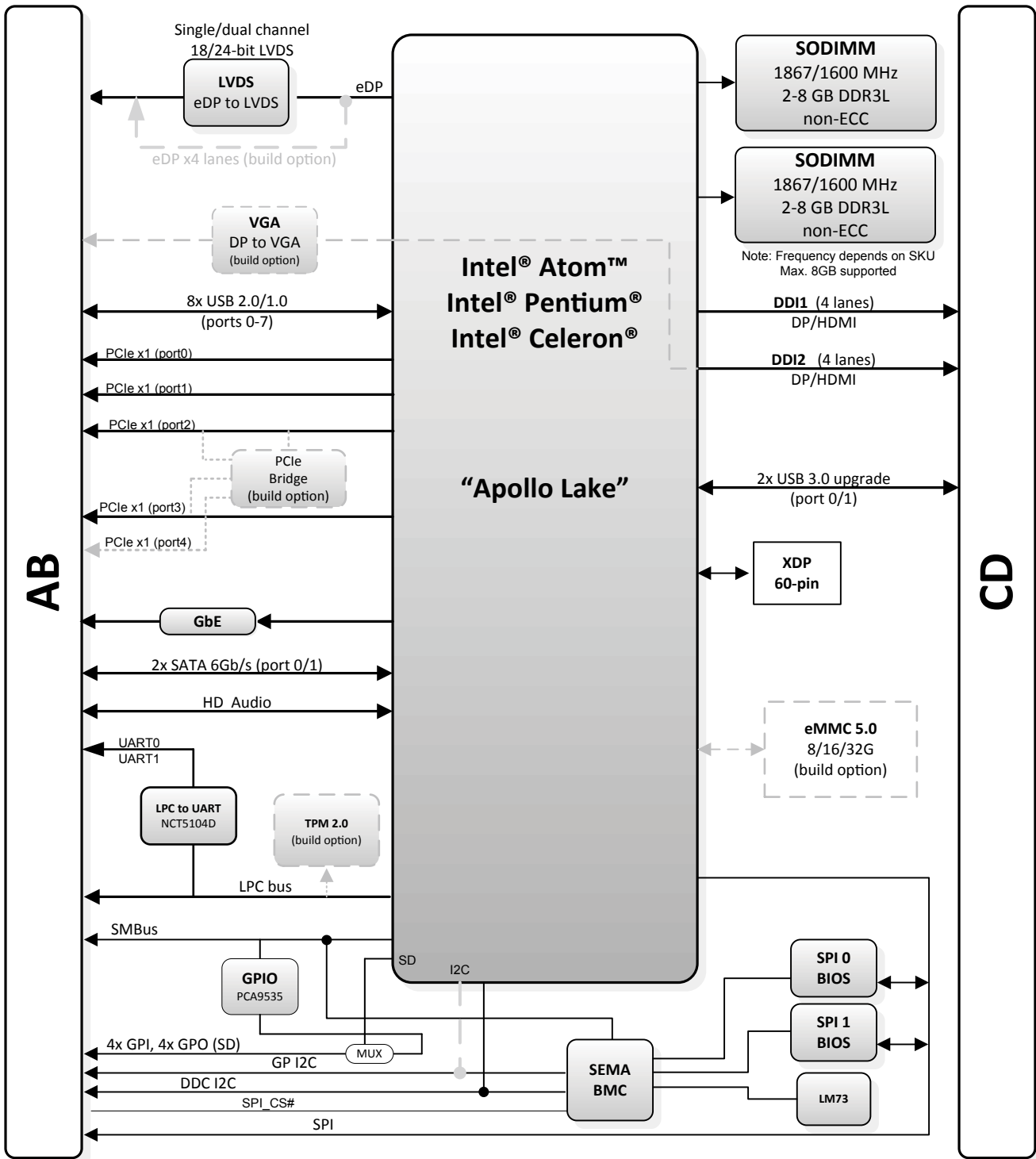
Windows 10 64-bit, Linux 64-bit, VxWorks 64-bit (TBD)

Extended Support (BSP)

Linux 64-bit, VxWorks 64-bit (TBD)

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

- **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)

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
- **TSHS-cAL-B-I**
High profile heatsink for cExpress-AL Atom™ with threaded standoffs for bottom mounting
- **TSHS-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