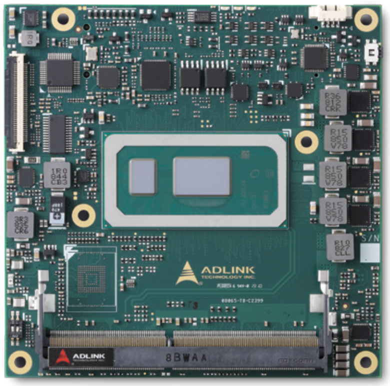
cExpress-WL

COM Express Compact Size Type 6 Module with 8th Gen Intel® Core™ and Celeron® Processors

Features

- 8th Gen quad/dual-core Intel® Core™ Processors
- Up to 64GB Dual Channel non-ECC DDR4 at 2133/2400MHz
- Two DDI channels, one LVDS (opt. 4 lanes eDP), one opt. VGA, supports up to 3 independent displays
- Up to eight PCIe lanes, GbE
- Up to three SATA 6 Gb/s, four USB 3.1 Gen2 and four USB 2.0
- Supports Smart Embedded Management Agent (SEMA) functions
- Extreme Rugged operating temperature: -40°C to +85°C (optional)



Specifications

Core System

CPU

8th Gen Intel® Core™ and Celeron® Processors - Mobile 14nm process (formerly "Whiskey Lake-U")

Core™ i7-8665UE, 1.7 (4.4 Turbo) GHz, 8MB, 15W (25W-12.5W cTDP), 4C/GT2

Core™ i5-8365UE, 1.6 (4.1 Turbo) GHz, 6MB, 15W (25W-12.5W cTDP), 4C/GT2

Core™ i3-8145UE, 2.2 (3.9 Turbo) GHz, 4MB, 15W (25W-12.5W cTDP), 2C/GT1

Celeron® 4305UE, 2.0GHz, 2MB, 15W, 2C/GT1

Supports: Intel® VT, Intel® VT-d, Intel® TXT, Intel® SSE4.2, Intel® HT Technology, Intel® 64 Architecture, Execute Disable Bit, Intel® Turbo Boost Technology 2.0, Intel® AVX2, Intel® AES-NI, PCLMULQDQ Instruction, Intel® Secure Key and Intel® TSX-NI.

Note: Availability of features may vary between processor SKUs.

Memory

Dual channel 2133/2400 MHz non-ECC DDR4 memory up to 64GB in two SODIMM sockets

Embedded BIOS

AMI EFI with CMOS backup in 32 or 16MB SPI BIOS with Intel® AMT 11.0 support (AMT support available on Core™ i7/i5 only)

Cache

8MB for Core™ i7, 6MB for Core™ i5, 4MB for Core™ i3, 2MB for Celeron®

Expansion Busses

- 6 PCI Express x1 Gen3 (AB): Lanes 0/1/2/3/4/5 (configurable to x2, x4)
- 2 PCI Express x1 Gen3 (CD): Lanes 6/7
- 1 PCI Express x1 Gen3 (CD): Lane 16 (muxed with SATA port 3, by build option)

Note: Maximum of 5 PCIe devices supported

- LPC bus, SMBus (system) , I^{2}C (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 I^{2}C, failsafe BIOS (dual BIOS, opt. support), 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

Video

GPU Feature Support

Intel® Generation 9 LP Graphics Core Architecture, supporting 3 independent and simultaneous display combinations of DisplayPort/HDMI/LVDS, eDP or VGA outputs

- Hardware encode/transcode of HD content (including HEVC)
- DirectX 12, DirectX 11.2, DirectX 11.1, DirectX 11, DirectX 10.1, DirectX 10, DirectX 9 support
- OpenGL 4.5, 4.4/4.3 and ES 2.0 support
- OpenCL 2.1, 2.0/1.2 support

Digital Display Interface

DDI1/2 supporting DisplayPort/HDMI/DVI

VGA

Support by build option through DP-to-VGA IC (in place of DDI2, max. resolution 1920x1200 @60Hz)

LVDS

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

eDP

Optional 4 lane support, in place of LVDS (max. resolution 4096x2304 @60Hz, 24bpp)

Audio

Chipset

Intel® HD Audio integrated in SoC

Audio Codec

On carrier Express-BASE6 (ALC886 standard support)

Ethernet

Intel® MAC/PHY

Intel® I219-LM/V (LM supports AMT 12.x)

Interface

10/100/1000 Mbit/s Ethernet connection

Specifications

Multi I/O and Storage

USB: 4x USB 3.1 Gen2/2.0/1.1 (USB 0,1,2,3) and 4x USB 2.0/1.1 (USB 4,5,6,7)

SATA: 3x SATA 6Gb/s (SATA 0,1,2), SATA port 3 muxed with PCIe lane 16 (SATA port 3 is default)

Serial: 2x UART ports with console redirection, from a LPC to UART IC (opt. HSUART from SOC by build option)

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

GPIO/SD: 4x GPO and 4x GPI from BMC (GPI with interrupt) SD/GPIO muxed design, switched by BIOS setting, SD functions as storage device only

Note: USB 3.1 Gen2 support dependent on carrier design

Super I/O

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

TPM **(option)**

Chipset: Infineon

Type: TPM 2.0

Power

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

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

Management: ACPI 5.0 compliant, Smart Battery support

Power States: C1-C6, S0, S1, S3, S4, S5 , S5 ECO mode (Wake on USB S3/S4, WOL S3/S4/S5)

ECO mode: support 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 (optional, selected 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

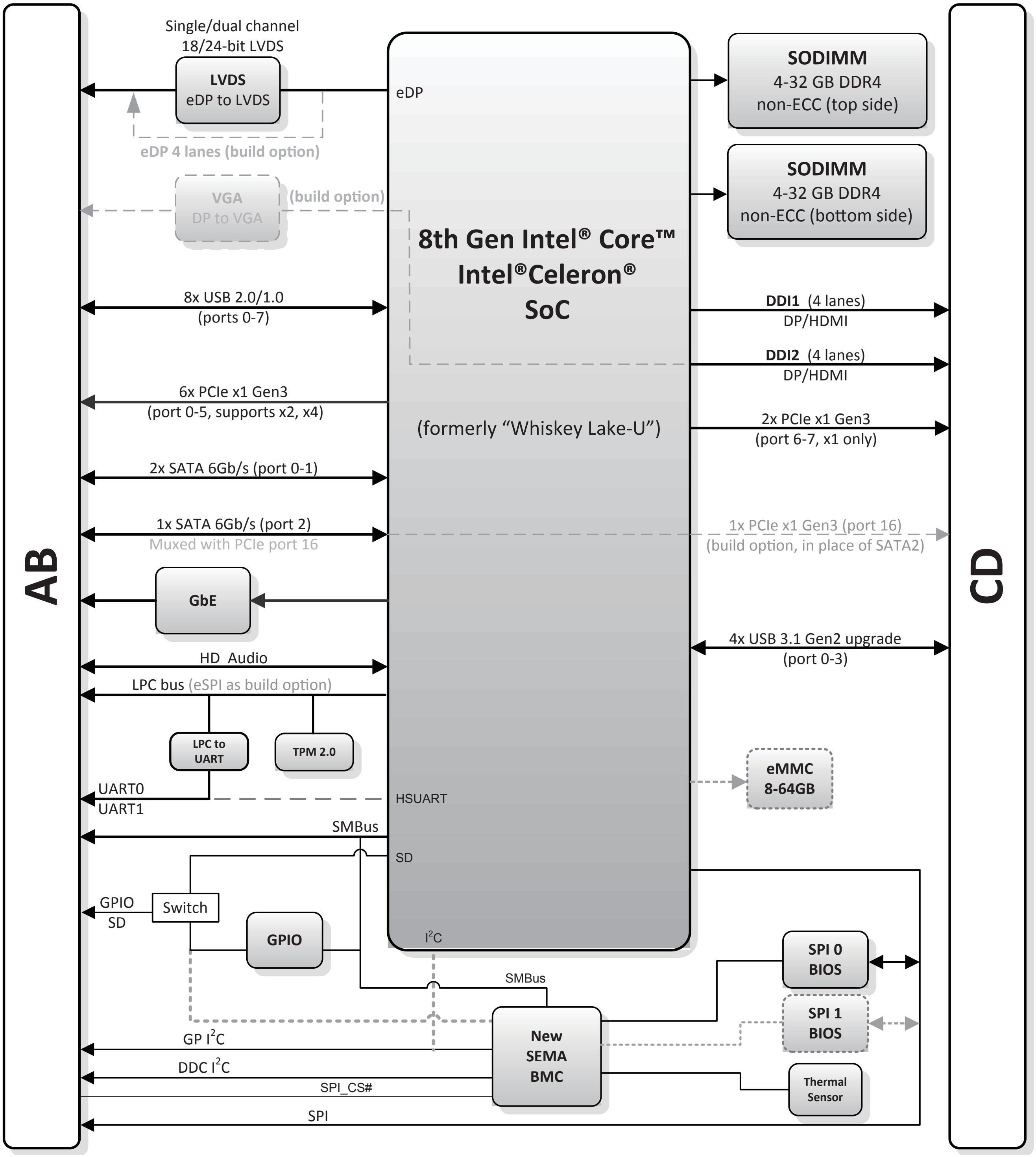
Standard Support

Windows 10 64-bit, Yocto project based Linux 64-bit, Ubuntu LTS 64-bit (TBD), CentOS 64-bit (TBD)

Extended Support (BSP)

Yocto project based Linux 64-bit

Functional Diagram



Ordering Information

- **cExpress-WL-i7-8665UE**
  Compact COM Express Type 6 module with 8th Gen Intel® Core™ i7-8665UE at 1.7GHz/4.4GHz, quad-core with GT2 level graphics
- **cExpress-WL-i5-8365UE**
  Compact COM Express Type 6 module with 8th Gen Intel® Core™ i5-8365UE at 1.6GHz/4.1GHz, quad-core with GT2 level graphics
- **cExpress-WL-i3-8145UE**
  Compact COM Express Type 6 module with 8th Gen Intel® Core™ i3-8145UE at 2.2GHz/3.9GHz, dual-core with GT2 level graphics
- **cExpress-WL-4305UE**
  Compact COM Express Type 6 module with 8th Gen Intel® Celeron® 4305UE at 2.0GHz, dual-core with GT1 level graphics

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

Accessories

Heat Spreaders

- **HTS-cWL-B**
  Heatspreader for cExpress-WL with threaded standoffs for bottom mounting
- **HTS-cWL-BT**
  Heatspreader for cExpress-WL with through hole standoffs for top mounting

Passive Heatsinks

- **THS-cWL-B**
  Low profile heatsink for cExpress-WL with threaded standoffs for bottom mounting
- **THS-cWL-BT**
  Low profile heatsink for cExpress-WL with through hole standoffs for top mounting
- **THSH-cWL-B**
  High profile heatsink for cExpress-WL with threaded standoffs for bottom mounting

Active Heatsink

- **THSF-cWL-B**
  High profile heatsink with Fan for cExpress-WL with threaded standoffs for bottom mounting

Starter Kit

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