

# cExpress-SL

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

### Features

- 6th Generation Intel® Core™ and Celeron® Processors
- Up to 32GB Dual Channel non-ECC DDR4 at 1867/2133MHz
- Two DDI channels, one LVDS (build option 4 lanes eDP), supports up to 3 independent displays
- GbE, up to 6 PCIe x1 (build option)
- Up to three SATA 6 Gb/s, four USB 3.0 and four USB 2.0
- Supports Smart Embedded Management Agent (SEMA®) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option)

New



### Specifications

#### • Core System

##### CPU

6th Generation Intel® Core™ and Celeron® Processors - Mobile 14nm process (formerly "Skylake-U")

Core™ i7-6600U 2.6/3.4GHz (Turbo), 4M, 15W (7.5W cTDP)(2C/GT2)

Core™ i5-6300U 2.4/3.0GHz (Turbo), 3M, 15W (7.5W cTDP) (2C/GT2)

Core™ i3-6100U 2.3GHz, 3M, 15W (7.5W cTDP) (2C/GT2)

Celeron® 3955U 2GHz, 2M, 15W (10W cTDP) (2C/GT1)

Supports: Intel® VT, 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.

Note: Availability of features may vary between processor SKUs.

##### Memory

Dual channel 1867/2133 MHz non-ECC DDR4 memory up to 32GB in dual SODIMM socket

##### Embedded BIOS

AMI EFI with CMOS backup in 8MB SPI BIOS with Intel® AMT 11.0 support (AMT support available on Core™ i7/i5 only)

##### Cache

4MB For Core™ i7, 3MB for Core™ i5 and Core™ i3, 2MB for Celeron®

##### Expansion Busses

Up to 6 PCI Express x1 (AB): Lanes 0-5 (configurable to x2, x4, Lane 5 by build option)

Note: Gen3 for Core™ i7/i5/i3, Gen2 for Celeron® 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

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

#### • Video

##### GPU Feature Support

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

Hardware encode/transcode HD content (including HEVC DirectX 12, DirectX 11.2, DirectX 11.1, DirectX 11, DirectX 10.1, DirectX 10, DirectX 9 support

OpenGL 5.0, 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

##### LVDS

Single/dual 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 Express-BASE6 (ALC886 standard support)

#### • Ethernet

Intel® MAC/PHY: i219LM with AMT 11.0 support

Interface: 10/100/1000 GbE connection

#### • I/O Interfaces

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

SATA: Up to three ports SATA 6 Gb/s (SATA 0,1,2; Celeron® supports two ports only)

Serial: 2 UART ports with console redirection

GPIO: 4 GPO and 4 GPI from BMC

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.

## Specifications

- **Super I/O**

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

- **TPM**

Chipset: Atmel AT97SC3204

Type: TPM 1.2

- **Power**

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

Wide Input: ATX = 5-20V / 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

- **Operating Systems**

- **Standard Support**

Windows 7 32/64-bit, Windows 10/8.1 64-bit, Linux 64-bit

- **Extended Support (BSP)**

WES7 32/64-bit, Linux 64-bit

- **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™: -40°C to +85°C (build option)

- **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

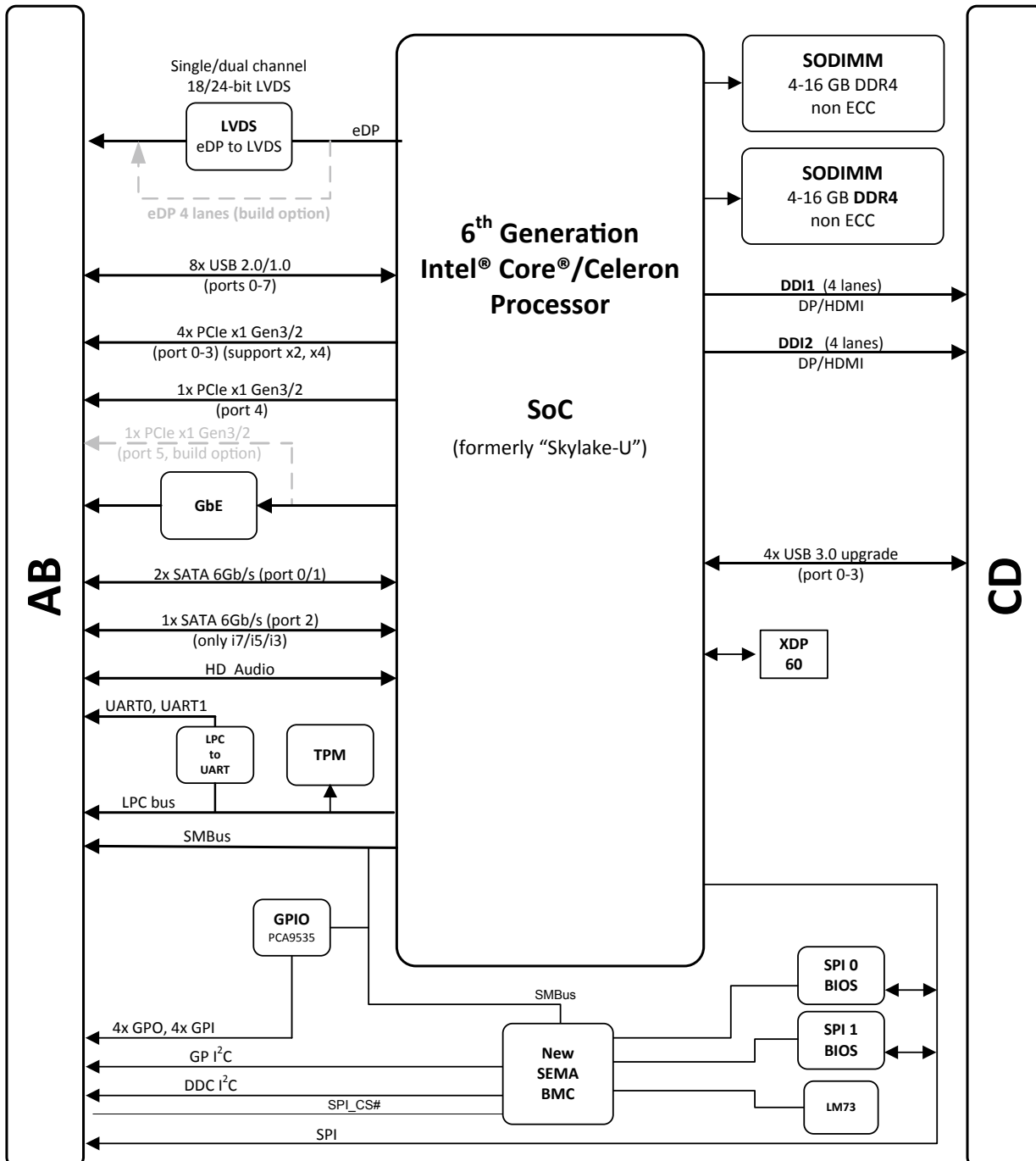
- **HALT**

Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

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 part numbers for SKUs with "build options" will need to be created and may cause production lead times.

## Functional Diagram



## Ordering Information

- **cExpress-SL-i7-6600U**  
Compact COM Express® Type 6 module with Intel® Core™ i7-6600U and GT2 graphics
- **cExpress-SL-i5-6300U**  
Compact COM Express® Type 6 module with Intel® Core™ i5-6300U and GT2 graphics
- **cExpress-SL-i3-6100U**  
Compact COM Express® Type 6 module with Intel® Core™ i3-6100U and GT2 graphics
- **cExpress-SL-3955U**  
Compact COM Express® Type 6 module with Intel® Celeron® 3955U and GT1 graphics

## Starter Kit

- **COM Express Type 6 Starter Kit Plus**  
COM Express formfactor starter kit with Express-BASE6 board, power supply, and accessory kit

## Accessories

### Heat Spreaders

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

### Passive Heatsinks

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

### Active Heatsink

- **THSF-cSL-B**  
High profile heatsink with Fan for cExpress-SL with threaded standoffs for bottom mounting