

# cExpress-BT

## COM Express<sup>®</sup> Compact Size Type 6 Module with Intel<sup>®</sup> Atom<sup>™</sup> E3800 series or Celeron<sup>®</sup> Processor SoC

### Features

- Single, dual, quad-core Intel<sup>®</sup> Atom<sup>™</sup> or Celeron<sup>®</sup> Processor SoC
- Up to 8GB Dual Channel DDR3L at 1333MHz
- VGA and two DDI channels (build option LVDS)
- Three PCIe x1, GbE
- Two SATA 3Gb/s, one USB 3.0, seven USB 2.0
- Supports Smart Embedded Management Agent (SEMA<sup>®</sup>) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option)



### Specifications

#### Core System

CPU	Single, dual, quad-core Intel <sup>®</sup> Atom <sup>™</sup> or Celeron <sup>®</sup> Processor Atom <sup>™</sup> E3845 1.91 GHz 542/792 (Turbo) 10W (4C/1333) Atom <sup>™</sup> E3827 1.75 GHz 542/792 (Turbo) 8W (2C/1333) Atom <sup>™</sup> E3826 1.46 GHz 533/667 (Turbo) 7W (2C/1066) Atom <sup>™</sup> E3825 1.33 GHz 533 (No Turbo) 6W (2C/1066) Atom <sup>™</sup> E3815 1.46 GHz 400 (No Turbo) 5W (1C/1066) Atom <sup>™</sup> E3805 1.33 GHz (No GFX) 3W (2C/1066) Celeron <sup>®</sup> N2930 1.83/2.16 (Burst) GHz, 313/854 (Turbo) 7.5W (4C/1333) Celeron <sup>®</sup> J1900 2.0/2.42 (Burst) GHz, 688/854 (Turbo) 10W (4C/1333) Supports: Single, dual or quad Out-of-Order Execution (OOE) processor cores, Intel <sup>®</sup> VT-x, Intel <sup>®</sup> SSE4.1 and SSE4.2, Intel <sup>®</sup> 64 architecture, IA 32-bit, PCLMULQDQ Instruction DRNG, Intel <sup>®</sup> Thermal Monitor (TM1 & TM2) Note: Availability of features may vary between processor SKUs.
Memory	Dual channel non-ECC 1333/1066 MHz DDR3L memory up to 8GB in dual stacked SODIMM sockets
Embedded BIOS	AMI EFI with CMOS backup in 8MB SPI BIOS
Cache	Primary 32 KB, 8-way L1 instruction cache and 24 KB, 6-way L1 write-back data cache 2MB for E3845, N2930 and J1900 1MB for E3827, E3826, E3825 and E3805 512K for E3815
Expansion Busses	3 PCI Express x1 Gen2 (AB): lanes 0/1/2; build option PCIe x4 (lose GbE) LPC bus, SMBus (system), I <sup>2</sup> 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 <sup>2</sup> C, Failsafe BIOS (dual BIOS), Watchdog Timer and Fan Control
Debug Headers	40-pin multipurpose flat cable connector Use in combination with DB-40 debug module providing BIOS POST code LED, BMC access, SPI BIOS flashing, Power test points, Debug LEDs 26-pin XDP header for ICE debug of CPU/chipset

#### Video

GPU Feature Support	7th generation Intel <sup>®</sup> graphics core architecture with four execution units supporting two independent displays 3D graphics hardware acceleration Supports DirectX 11, OCL 1.1, OGL ES Halt/2.0/1.1, OGL 3.2 Video decode hardware acceleration including support for H.264, MPEG2, MVC, VC-1, WMV9 and VP8 formats Video encode hardware acceleration including support for H.264, MPEG2 and MVC formats
Digital Display Interface	DDI1 supporting DisplayPort/HDMI/DVI (build option dual channel 18/24-bit LVDS support) DDI2 supporting DisplayPort/HDMI/DVI
VGA	Analog VGA supporting resolutions of up to 2560 x 1600 x 24bpp @60

#### Audio

Chipset	Intel <sup>®</sup> HD Audio integrated in SoC
Audio Codec	Located on carrier Express-BASE6

#### Ethernet

Intel <sup>®</sup> MAC/PHY Interface	Intel <sup>®</sup> i210LM (MAC/PHY) Ethernet controller 10/100/1000 GbE connection
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#### I/O Interfaces

USB	1x USB 3.0 (USB 0) 6x USB 1.1/2.0 (USB 1/2/3/4/5/6, ports 3-6 from USB hub)
SATA	Two SATA 3 Gb/s ports
Serial	2 UART ports COM 0/1 (COM 0 support console redirection)
eMMC	Build option soldered on module bootable eMMC flash storage 8 to 32 GB
SDIO	On module mini SD card socket, eMMC feature may vary between OS
GPIO	4 GPO and 4 GPI

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.

# Specifications

## Super I/O

On carrier if needed (standard support for W83627DHG-P)

## TPM

Chipset Atmel AT975C3204 (build option)  
Type TPM 1.2

## 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 4.0 compliant, Smart Battery support  
Power States C0, C1, C1E, C4, C6  
S0, S3, S4, S5 (Wake on USB S3 for port 0~7/S4 for port 0~3, WOL S3/S4/S5)  
ECO mode Wake on USB S3/S4, WOL S3/S4/S5

## Mechanical and Environmental

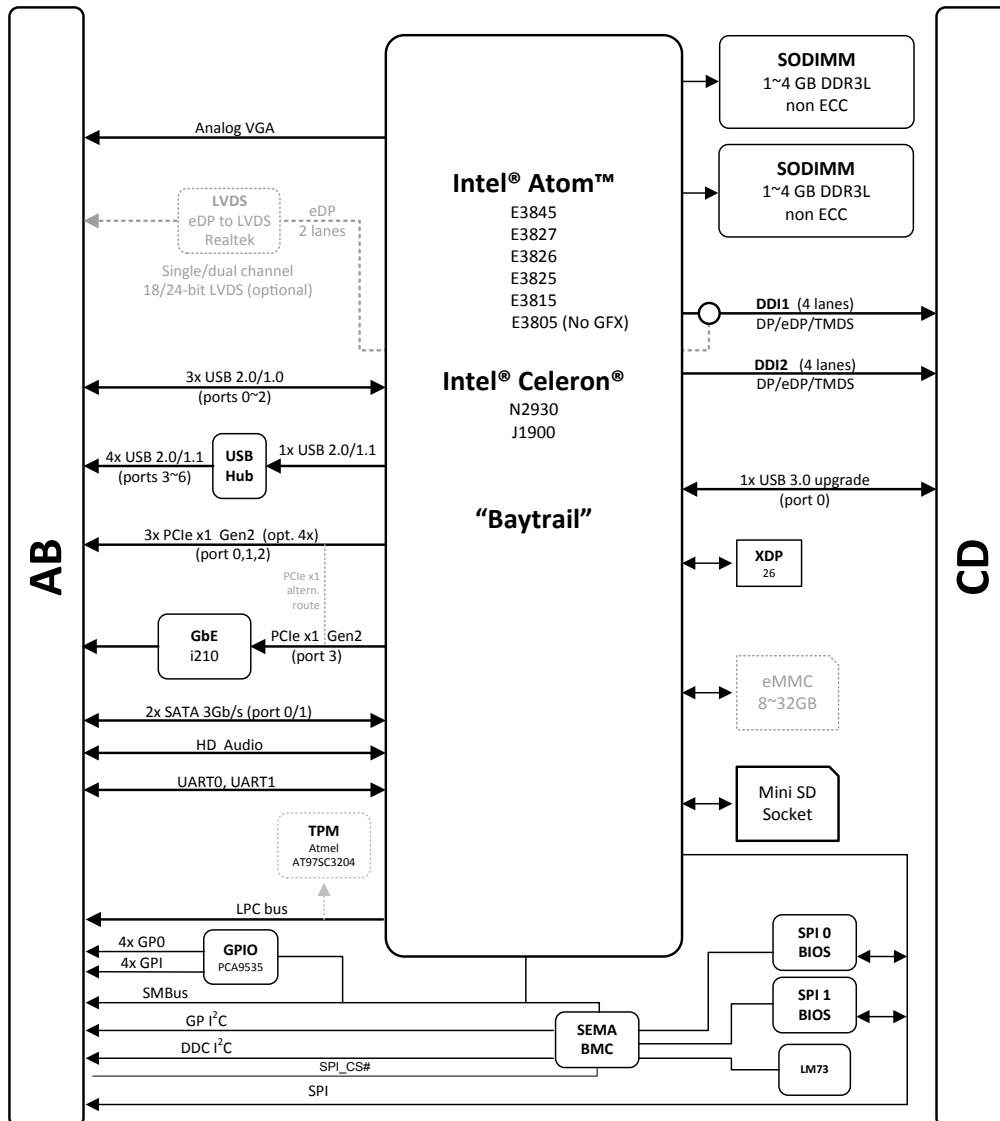
Specification PICMG COM.0: Rev 2.1 Type 6  
Form Factor Compact size: 95 mm x 95 mm  
Operating Temperature Standard: 0°C to +60°C  
Extreme Rugged™: -40°C to +85°C (build option, Atom™ E38xx series only)  
Humidity 5-90% RH operating, non-condensing  
5-95% RH storage (and operating with conformal coating)  
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 7/8 32/64-bit, Linux 32/64-bit  
Extended Support (BSP) WES7/8, Linux, VxWorks 32/64-bit WEC7 32-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 part numbers for SKUs with "build options" will need to be created and may cause production lead times.

# Functional Diagram



## Ordering Information

### Modules

Model Number	Description/Configuration
cExpress-BT-E3845	Compact COM Express® Type 6 Module with Intel® Atom™ E3845 at 1.91 GHz
cExpress-BT-E3827	Compact COM Express® Type 6 Module with Intel® Atom™ E3827 at 1.75 GHz
cExpress-BT-E3826	Compact COM Express® Type 6 Module with Intel® Atom™ E3826 at 1.46 GHz
cExpress-BT-E3825	Compact COM Express® Type 6 Module with Intel® Atom™ E3825 at 1.33 GHz
cExpress-BT-E3815	Compact COM Express® Type 6 Module with Intel® Atom™ E3815 at 1.46 GHz
cExpress-BT-E3805	Compact COM Express Type6 Module with Intel® Atom™ E3805 at 1.33 GHz
cExpress-BT-J1900	Compact COM Express® Type 6 Module with Intel® Celeron® J1900 at 2.00 GHz
cExpress-BT-N2930	Compact COM Express® Type 6 Module with Intel® Celeron® N2930 at 1.83 GHz

### Accessories

Model Number	Description/Configuration
<b>Heat Spreaders</b>	
HTS-cBT-B	Heatspreader for cExpress-BT with threaded standoffs for bottom mounting
HTS-cBT-BT	Heatspreader for cExpress-BT with through hole standoffs for top mounting
<b>Passive Heatsinks</b>	
THS-cBT-B	Low profile heatsink for cExpress-BT with threaded standoffs for bottom mounting
THSH-cBT-B	High profile heatsink for cExpress-BT with threaded standoffs for bottom mounting
<b>Active Heatsink</b>	
THSF-cBT-B	High profile heatsink with Fan for cExpress-BT with threaded standoffs for bottom mounting (-40°C to + 85°C build option)

### Starter Kit

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