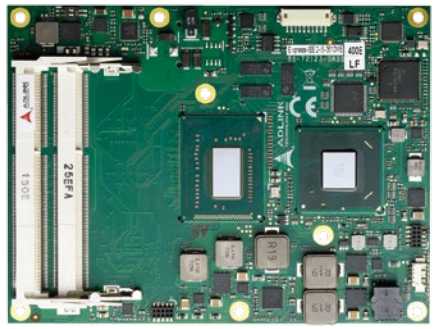
# Express-IBE2

*COM Express® Basic Size Type 2 Module with Intel® Core™ and Celeron® Processor*

## Features

- Intel® quad or dual Core™ i7/i5/i3 and Celeron® Processor with Mobile Intel® QM77 Express Chipset
- Up to 16GB Dual Channel DDR3 SDRAM at 1600MHz with ECC
- Single/dual channel 18/24-bit LVDS and SDVO
- Five PCIe x1, one PCIe x16 (Gen3) for graphics (or general purpose x8/4/1)
- GbE, four SATA, one PATA IDE, GbE and eight USB 2.0
- Supports Smart Embedded Management Agent (SEMA®) functions
- Extreme Rugged operating temperature: -40°C to +85°C (build option)



## Specifications

### Core System

#### CPU

Intel® "Ivy Bridge" 22nm process, BGA type

Intel® Core™ i7-3615QE 2.3GHz, 6MB L3 cache, 45W (4C
Intel® Core™ i7-3612QE 2.1GHz, 6MB L3 cache, 35W (4C)
Intel® Core™ i7-3555LE 2.5GHz, 4MB L3 cache, 25W (2C)
Intel® Core™ i7-3517UE 1.7GHz, 4MB L3 cache, 17W (2C) Intel® Core™ i5-3610ME 2.7GHz, 3MB L3 cache, 35W (2C) Intel® Core™ i3-3120ME 2.4GHz, 3MB L3 cache, 35W (2C) Intel® Core™ i3-3217UE 1.6GHz, 3MB L3 cache, 17W (2C)
Intel® Celeron® 1020E 2.2 GHz (no Turbo) 35W (2C)
Intel® Celeron® 1047UE 1.4 GHz (no Turbo) 17W (2C)
Intel® Celeron® 927UE 1.5 GHz (no Turbo) 17W (1C)

#### Memory

Dual channel 1333/1600 MHz DDR3 memory with ECC support up to 16GB in dual stacked SODIMM socket

#### Chipset

Intel® Mobile QM77 Express Chipset

#### L3 Cache

6MB (i7-3615QE and i7-3612QE), 4MB (i7-3555LE and i7-3517UE), 3MB (i5-3610ME, i3-3120ME and i3-3217UE)

#### BIOS

AMI EFI with CMOS backup in 16 Mbit SPI flash

#### Hardware Monitor

Supply voltages and CPU temperature

#### Debug Interface

XDP SFF-26 extension for ICE debug

#### Watchdog Timer

Programmable timer range to generate RESET

#### Expansion Busses

PCI Express x16 (Gen3) bus for discrete graphics solution or general purpose PCI Express (2 x8 or 1 x8 with 2 x4)

5 PCI Express x1: Lanes 0/1/2/3/4 are free, lane 5 is occupied by PATA, lane 6 is occupied by PCI bus and lane 7 is occupied by GbE

LPC bus, SMBus (system) , I²C (user)

### Video

#### Integrated in Processor

Intel® HD Graphics 4000 at 650–1200 MHz (depending on processor)

#### Integrated Video

DirectX 11, OpenGL 3.1, OpenCL 1.1

#### Feature Support

Intel® Clear Video HD Technology

Advanced Scheduler 2.0, 1.0, XPDM support

DirectX Video Acceleration (DXVA) support for full AVC/VC1/MPEG2 hardware decode

#### VGA

Analog VGA support with 300 MHz DAC

Analog monitor support up to QXGA (2048 x 1536) and VGA hot plug

#### LVDS

Single/dual channel 18/24-bit LVDS

#### SDVO

SDVO multiplexed with PCIe x16 lane 0-7

### Audio

#### Chipset

Integrated in Intel® PCH QM77

#### Audio Codec

On Express-BASE carrier (ALC886)

### SEMA® BMC

Voltage and Current Monitoring, Flat Panel Control, I²C bus 100/200/400, Failsafe Dual BIOS, Module Logistics, Runtime information, User Flash Area, Power Control, and ECO mode support

### Ethernet

Chipset: Intel® Gigabit Ethernet PHY WG82579LM

Interface: 10/100/1000 Mbps Ethernet

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

## I/O Interfaces

Chipset: Integrated in Mobile Intel® QM77

USB: 8 ports USB 2.0 (USB0~7)

SATA: Supports two SATA ports at 6 Gb/s and two ports at 3 Gb/s with support for RAID 0,1,5,10

IDE (PATA): SATA to PATA bridge on SATA channel 1, Master only

## Super I/O

Connected to LPC bus on carrier if needed

## TPM

Chipset: Atmel AT97SC3209

Type: TPM 1.2

## Power

Input Power: AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)

Power States: Supports S0, S1, S3, S4, S5

Smart Battery Support: Yes

Power Consumption: 43W with i7-3612QE and 8GB memory typical

## Mechanical and Environmental

Dimension: Basic size: 125 mm x 95 mm

### Operating Temperature

Standard: 0°C to +60°C

Extreme Rugged™: -40°C to +85°C (build option)

Storage Temperature: -20°C to +80°C

### Humidity

90% at +60°C

### Shock

15G peak-to-peak, 11ms duration, non-operating

### Vibration

Non-operating: 1.88Grms, 5-500Hz, each axis

Operating: 0.5Grms, 5-500Hz, each axis

Compatibility: COM Express® Type 2

Certification: CE, FCC, HALT

## Operating Systems

### Standard Support

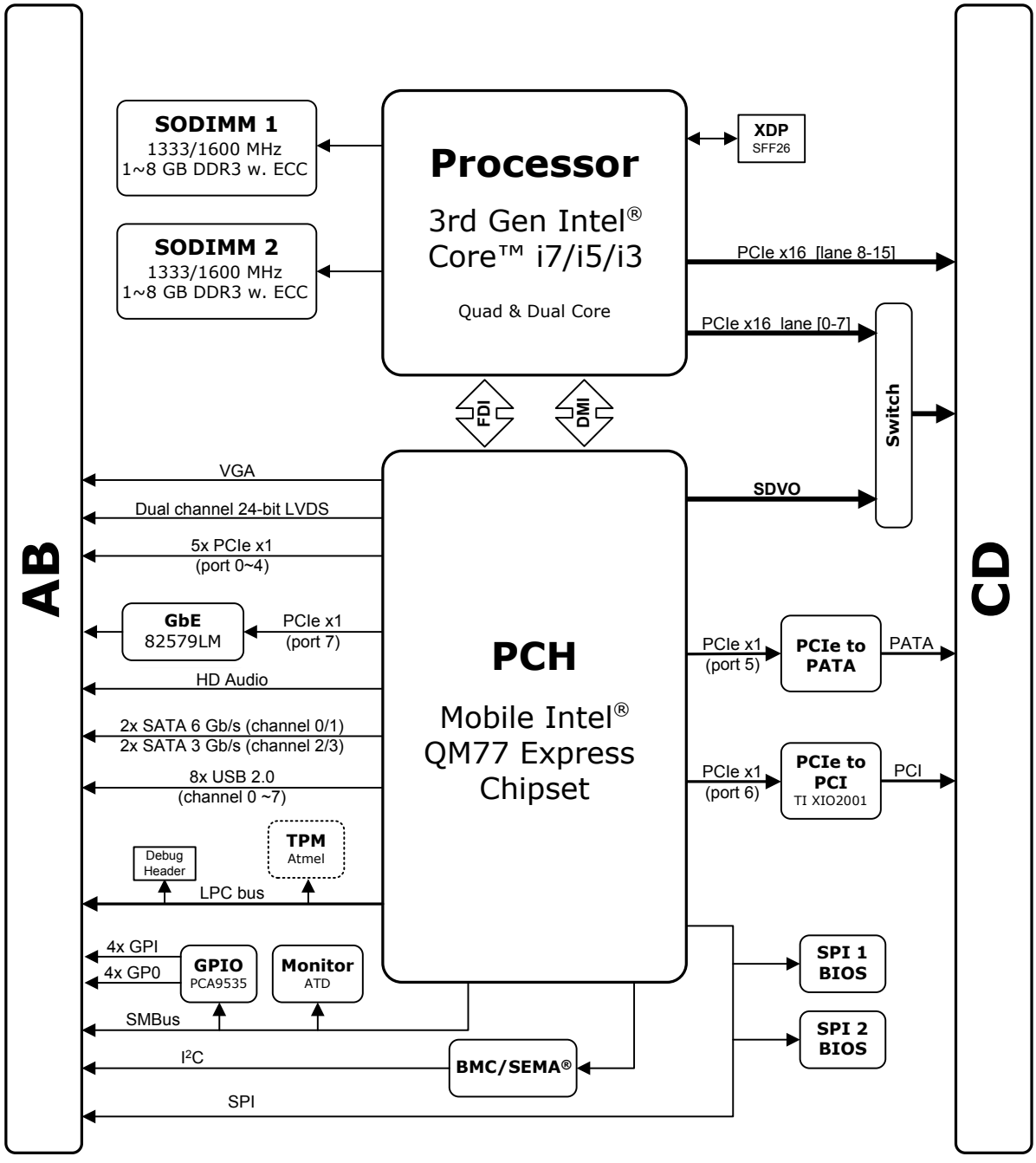
Windows 7, Linux

### Extended Support (BSP)

Embedded XP support package, Linux BSP, VxWorks 6.x, AIDI Library for Windows and Linux

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

- **Express-IBE2-i3-3120ME**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i3-3120ME SV at 2.4 GHz
- **Express-IBE2-i3-3217UE**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i3-3217UE ULV at 1.6 GHz
- **Express-IBE2-i5-3610ME**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i5-3610ME SV 2.7 GHz
- **Express-IBE2-i7-3517UE**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-3517UE ULV at 1.7 GHz
- **Express-IBE2-i7-3555LE**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-3555LE LV at 2.5 GHz
- **Express-IBE2-i7-3612QE**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-3612QE SV at 2.1 GHz
- **Express-IBE2-i7-3615QE**
  COM Express® Basic Size Type 2 Module with Intel® Core™ i7-3615QE SV at 2.3 GHz
- **Express-IBE2-1020E**
  COM Express® Basic Size Type 2 Module with Intel® Celeron® 1020E at 2.2GHz
- **Express-IBE2-1047UE**
  COM Express® Basic Size Type 2 Module with Intel® Celeron® 1047UE at 1.4GHz
- **Express-IBE2-927UE**
  COM Express® Basic Size Type 2 Module with Intel® Celeron® 927UE at 1.5GHz

## Accessories

### Heat Spreaders

- **HTS-IBE2-B**
  Heatspreader for Express-IBE2 for bottom mountning

### Passive Heatsinks

- **THS-IBE2-BL**
  Low Profile Heatsink for Express-IBE2 for bottom mountning
- **THSH-IBE2-BL**
  High Profile Heatsink for Express-IBE2 for bottom mountning

### Active Heatsink

- **THSD-IBE2-BL**
  High Performance Heatsink with Fan for Express-IBE2 for bottom mountning

## Starter Kit

- **COM Express Type 2 Starter Kit Plus**
  COM Express formfactor starter kit with Express-BASE board, power supply, and accessory kit