

# Express-IBR

Extreme Rugged™ COM Express® Type 6 Computer-on-Module  
with 3rd Generation Intel® Core™ i7 Processor



## Features

- Quad/dual core 3rd Generation Intel® Core™ Processor
- Mobile Intel® QM77 Express Chipset
- Up to 16GB ECC 1600MHz DDR3 memory in two SODIMM sockets
- Three Digital Display Interfaces (DDI) for DisplayPort /HDMI/DVI/SDVO
- Seven PCIe x1 (Gen 2), one PCIe x16 (Gen 3) for graphics (or general purpose x8/4/1)
- Two SATA 6 Gb/s, two SATA 3 Gb/s, Gigabit Ethernet, eight USB 2.0, 4 USB 3.0
- COM Express® COM.0 R2.1 Type 6 Pinout
- Extended Temperature: -40°C to +85°C
- 50% Thicker PCB for high vibration environments

## Choose Ampro by ADLINK™ Express-IBR for...

A modular and power efficient solution for extreme rugged and mobile environments.

### Description

The Ampro by ADLINK™ Express-IBR is a COM Express® Type 6 module with quad/dual-core 3rd Generation Intel® Core™ i7 Processor. The Express-IBR is designed Extreme Rugged to support the extremes of shock, vibration, humidity, and temperature.

## Specifications

### Core System

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU              | 3rd Generation Intel® Core™ i7/i3, 22nm process, BGA type<br>Intel® Core™ i7-3615QE 2.3GHz (up to 3.3GHz Turbo), 6MB L3 cache, 45W, quad core<br>Intel® Core™ i7-3612QE 2.1GHz (up to 3.1GHz Turbo), 6MB L3 cache, 35W, quad core<br>Intel® Core™ i7-3555LE 2.5GHz (up to 3.2GHz Turbo), 4MB L3 cache, 25W, dual core<br>Intel® Core™ i7-3517UE 1.7GHz (up to 2.8GHz Turbo), 4MB L3 cache, 17W, dual core<br>Intel® Core™ i3-3217UE 1.6GHz, 3MB L3 cache, 17W, dual core |
| Memory           | Dual channel ECC 1600 MHz DDR3 memory up to 16 GB in dual SODIMM sockets                                                                                                                                                                                                                                                                                                                                                                                                 |
| BIOS             | AMI EFI with CMOS backup in 16 Mb 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)<br>7 PCI Express x1: Lanes 0/1/2/3/4/5/6<br>LPC bus, SMBus (system), I²C (user)                                                                                                                                                                                                                                                                        |
| Technologies     | PAVP 3.0, Intel® AMT 8.0, Intel® VT, Intel® AES-NI, Intel® HT, Intel® HD Graphics with Dynamic Frequency, Intel® Turbo Boost , Dynamic Turbo, Intel® AVX 1.0, Intel® Quick Sync Video                                                                                                                                                                                                                                                                                    |

### Video

|                           |                                                                                                                                           |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Integrated in Processor   | Intel® HD Graphics 4000 at 650-1300 MHz                                                                                                   |
| Integrated Video          | DirectX 11.0, OpenGL 3.1, and OCL 1.1                                                                                                     |
| Media Processing          | Decode (HW JPEG & MJPEG decode), encode (full HW MPEG2 encode), transcode<br>Intel® Clear Video HD Technology + enhanced media processing |
| VGA Interface             | Analog VGA support with 300 MHz DAC<br>Analog monitor support up to QXGA (2048 x 1536) and VGA hot plug                                   |
| LVDS Interface            | Dual channel 18/24-bit LVDS                                                                                                               |
| Digital Display Interface | Three DDI ports supporting HDMI / DVI / DisplayPort or SDVO                                                                               |

### Audio

|             |                                                  |
|-------------|--------------------------------------------------|
| Chipset     | Integrated on Mobile Intel® QM77 Express chipset |
| Audio Codec | Implemented on carrier board                     |

### LAN

|         |                                  |
|---------|----------------------------------|
| Chipset | Intel® Gigabit LAN PHY WG82579LM |
| Speed   | 10/100/1000 Mbps Ethernet        |

### Multi I/O

|         |                                                                 |
|---------|-----------------------------------------------------------------|
| Chipset | Integrated on Mobile Intel® QM77 Express chipset                |
| USB     | Supports up to eight ports USB 2.0, 4 USB 3.0                   |
| SATA    | Two SATA 6 Gb/s, two SATA 3 Gb/s with support for RAID 0,1,5,10 |

### Super I/O

Connected to LPC bus on carrier if needed (BIOS supports W83627DHG)

### TPM

|         |                  |
|---------|------------------|
| Chipset | Atmel AT97SC3204 |
| Type    | TPM 1.2          |

### Power Specifications

|                       |                                                                                                 |
|-----------------------|-------------------------------------------------------------------------------------------------|
| Input Power           | AT mode (12 V +/- 5%) and ATX mode (12 V and 5 Vsb +/- 5%)                                      |
| Power States          | Supports S0, S1, S3, S4, S5                                                                     |
| Power Consumption     | 12W typical (i7-36xxQE)<br>8W typical (i7-3555LE/i7-3517UE/i3-3217UE)<br>S3: 0.85W<br>S5: 0.55W |
| Smart Battery Support | Yes (BIOS supports LTC4100 and LTC1760)                                                         |

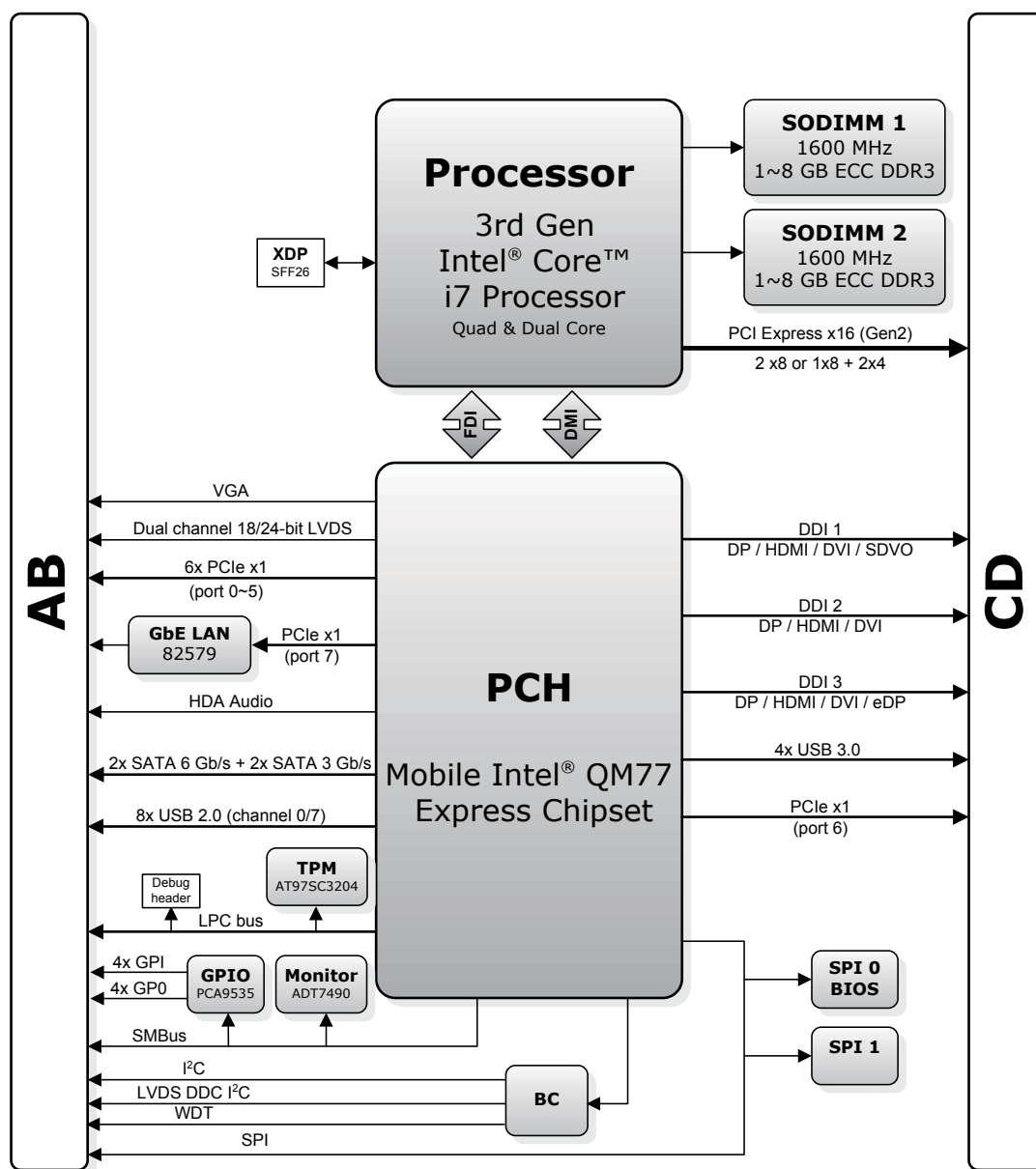
### Mechanical and Environmental

|                          |                                                                          |
|--------------------------|--------------------------------------------------------------------------|
| Size                     | COM Express Basic, 125 mm x 95 mm                                        |
| Board Thickness          | 0.093" (2.3mm)                                                           |
| Operating Temp. Standard | -20°C to 70°C                                                            |
| Operating Temp. Extended | -40°C to 85°C                                                            |
| Storage Temp.            | -55°C to 85°C                                                            |
| Humidity                 | 90% at 60°C non-condensing                                               |
| Shock                    | 50G peak-to-peak, 11ms duration, MIL-STD-202G Method 213B                |
| Vibration                | Operating: 11.96 Grms, 50-20,000 Hz, each axis, MIL-STD-202G Method 214A |
| Compatibility            | PICMG COM Express COM.0 R2.1 Type 6                                      |
| Certifications           | CE, FCC, HALT                                                            |

### Operating Systems

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| Standard Support       | Windows 7<br>Linux                                               |
| Extended Support (BSP) | WES 2009/7, WEC 7<br>Linux, VxWorks 6.9, QNX 6.5<br>AIDI Library |

## Functional Diagram



## Ordering Information

### Modules

| Model Number                   | Description/Configuration                                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Express-IBR-i7-R-3615QE</b> | Extreme Rugged COM Express Type 6 module with Intel® Core™ i7-3615QE 2.3GHz 45W Quad Core CPU, two DDR3 ECC SODIMMs supported |
| <b>Express-IBR-i7-R-3612QE</b> | Extreme Rugged COM Express Type 6 module with Intel® Core™ i7-3612QE 2.1GHz 35W Quad Core CPU, two DDR3 ECC SODIMMs supported |
| <b>Express-IBR-i7-R-3555LE</b> | Extreme Rugged COM Express Type 6 module with Intel® Core™ i7-3555LE 2.5GHz 25W Dual Core CPU, two DDR3 ECC SODIMMs supported |
| <b>Express-IBR-i7-R-3517UE</b> | Extreme Rugged COM Express Type 6 module with Intel® Core™ i7-3517UE 1.7GHz 17W Dual Core CPU, two DDR3 ECC SODIMMs supported |
| <b>Express-IBR-i3-R-3217UE</b> | Extreme Rugged COM Express Type 6 module with Intel® Core™ i3-3217UE 1.6GHz 17W Dual Core CPU, two DDR3 ECC SODIMMs supported |
| <b>Express-IBR-L</b>           | Starterkit with 2x2GB DDR3 ECC SODIMM, non-ETT, Cables, BSP/driver in USB stick and manuals                                   |

### Accessories

| Model Number                                                            | Description/Configuration                                                      |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <b>Heat Spreaders (for use with customer supplied thermal solution)</b> |                                                                                |
| HTS-IBR-BTF                                                             | Heat spreader for Express-IBR with through-hole standoffs for top-mounting     |
| HTS-IBR-B                                                               | Heat spreader for Express-IBR with threaded standoffs for bottom-mounting      |
| <b>Passive Heatsinks (for use with 17 and 25W CPUs)</b>                 |                                                                                |
| THSH-IBR-BTL                                                            | Heatsink for Express-IBR with through-hole standoffs for top-mounting          |
| <b>Active Heatsinks (recommended for 35 and 45W CPUs)</b>               |                                                                                |
| THSF-IBR-BTL-CU                                                         | Heatsink with FAN for Express-IBR with through-hole standoffs for top-mounting |