

# LEC-BW

## SMARC<sup>®</sup> Short Size Module with Intel<sup>®</sup> Pentium<sup>®</sup> and Celeron<sup>®</sup> Processor N3000 Series System-on-Chip

### Features

- Dual or quad-core Intel<sup>®</sup> Pentium<sup>®</sup> and Celeron<sup>®</sup> Processor N3000 Series SoC
- Up to 8 GB DDR3L at 1333/1600 MT/s
- LVDS, HDMI and DP
- 2x camera interfaces, GbE
- 1x SDIO/SD/MMC, 2x SATA3 6Gbit/s, 1x USB 3.0, 2x USB 2.0, 12x GPIO, 2x SPI, 4x I2C



### Specifications

#### • Core System

##### CPU

Intel<sup>®</sup> Pentium<sup>®</sup> N3710, 4 cores, 1.6GHz, 6W TDP  
Intel<sup>®</sup> Celeron<sup>®</sup> N3160, 4 cores, 1.6GHz, 6W TDP  
Intel<sup>®</sup> Celeron<sup>®</sup> N3060, 2 cores, 1.6GHz, 6W TDP  
Intel<sup>®</sup> Celeron<sup>®</sup> N3010, 2 cores, 1.0GHz, 4W TDP  
Intel<sup>®</sup> Atom™ x5-E8000, 4 cores, 1.0GHz, 5W TDP

##### Memory

Up to 8 GB DDR3L at 1333/1600 MT/s single channel, 64bit

##### Embedded BIOS

AMI UEFI with CMOS backup in 8 MB SPI BIOS, Fast Boot support

##### Cache

512 kB to 2 MB L2 cache

##### SEMA Board Controller

Supports: Voltage/Current monitoring, Power Sequencing, Logistics and Forensic Information, Flat Panel Control, I<sup>2</sup>C Bus Control, GPIO Control, User Flash, Failsafe BIOS (dual BIOS), Watchdog Timer and Fan Control

#### • Ethernet

##### Intel<sup>®</sup> MAC/PHY

1x Intel<sup>®</sup> i210IT Ethernet controller

##### Interface

10/100/1000 GbE

#### • Video

##### GPU Feature Support

8th generation Intel<sup>®</sup> graphics core architecture with sixteen execution units, supports three independent displays 4K video (up to 3840 x 2160 @ 30fps), 2D and 3D graphics hardware acceleration

Support for DirectX 12/11.2, OpenGL 4.2/3.3, OpenCL 1.2

Video decode HW acceleration for H.265, H.264, MPEG2, MVC, VC-1, WMV9, JPEG, VP8

Video encode HW acceleration for H.264, MVC, JPEG

##### LVDS

Single channel 18/24-bit LVDS

##### HDMI

HDMI (3840 x 2160 @ 30Hz)

##### Custom option

3rd display HDMI/DP, 2nd LVDS channel

#### • Power

##### Standard Input

3.0 V ~ 5.25 V DC ±5%

##### Power States

Supports C0-C6, S0, S3, S4, S5

#### • Audio

##### Chipset

Intel<sup>®</sup> HD Audio integrated in SOC

##### Ports

I<sup>2</sup>S and HDA for audio codec on carrier

## Specifications

- **I/O Interfaces**

**PCIe**

3x PCIe x1 Gen2

**USB**

1x USB 3.0 host, 2x USB 2.0 host, 1x USB 2.0 client

**SATA**

2x SATA3 6 Gbit/s

**Flash storage**

1x SDIO (4bit), 1x eMMC (8bit)

**GPIO**

12x GPIO

**Camera**

2x MIPI CSI 4L/2L

**Serial**

2x SPI, 4x I<sup>2</sup>C, 2x UART, 1x SMBus, 1x LPC, 1x DB40

- **Operation System**

**Standard Support**

Windows 7/8.1/10, Linux, Android

**On Request**

QNX, Android

- **Mechanical and Environmental**

**Form Factor**

SMARC Specifications v1.1

**Dimension**

SMARC short size module, 82 mm x 50 mm

**Operating Temperature**

Standard: 0°C to +60°C

**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-202 F, 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

- **Intelligent Middleware**

**SEMA<sup>®</sup>**

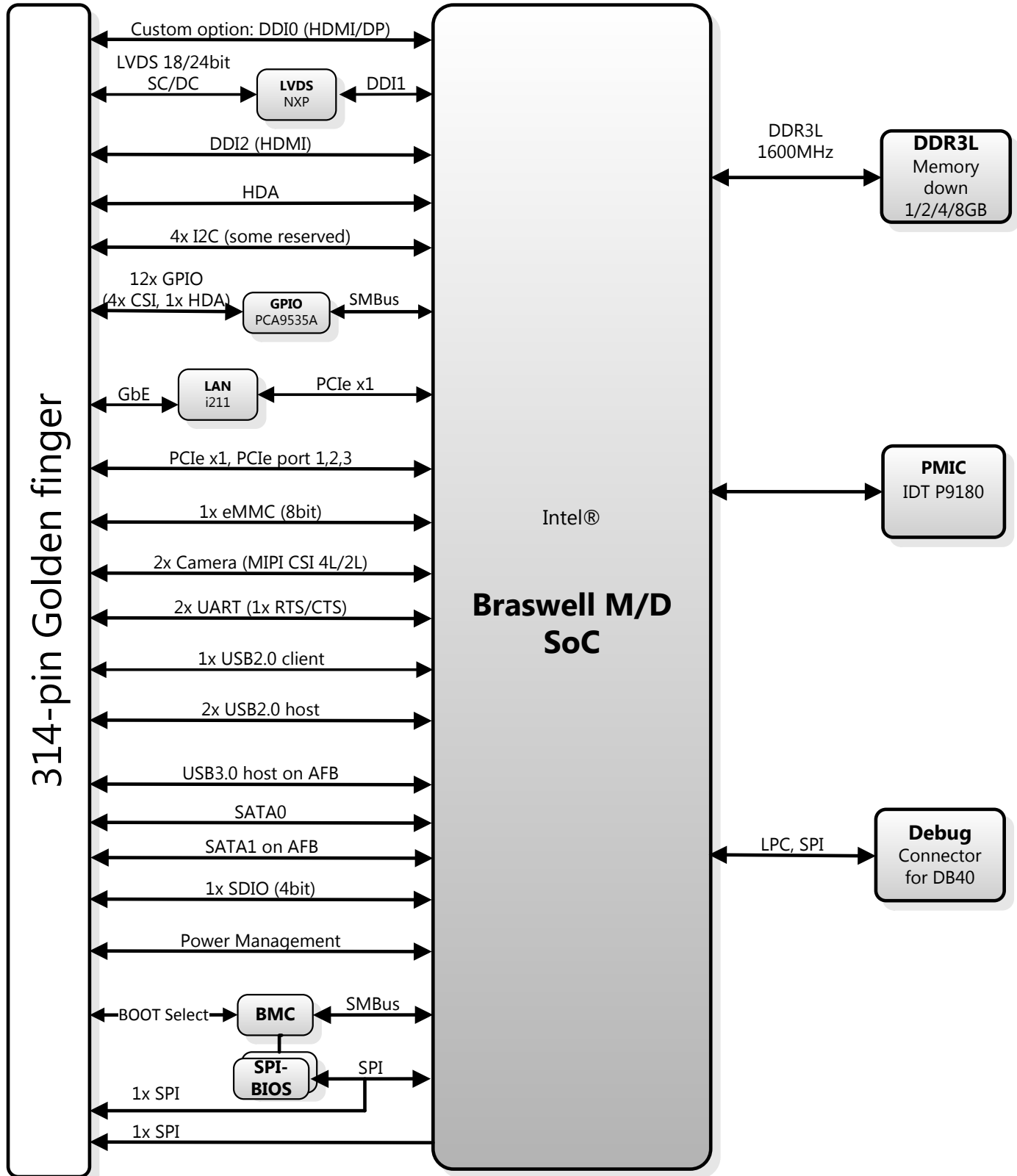


Local management, control of embedded computer systems

Extended EAPI for monitoring, controlling and analytics applications

Multiple OS support and across platforms (x86, ARM)

# Functional Diagram



## Ordering Information

- **LEC-BW42-4G-CT**  
SMARC Short Size Module with Intel® Pentium® N3710, Quad core, 4 GB DDR3L, 0°C to 60°C
- **LEC-BW41-4G-CT**  
SMARC Short Size Module with Intel® Celeron® N3160, Quad core, 4 GB DDR3L, 0°C to 60°C
- **LEC-BW21-2G-CT**  
SMARC Short Size Module with Intel® Celeron® N3010, Dual core, 2 GB DDR3L, 0°C to 60°C
- **LEC-BW22-2G-CT**  
SMARC Short Size Module with Intel® Celeron® N3060, Dual core, 2 GB DDR3L, 0°C to 60°C
- **LEC-BW43-4G-CT**  
SMARC Short Size Module with Intel® Atom™ x5-E8000, Quad core, 4 GB DDR3L, 0°C to 60°C
- **LEC-BW42-8G-CT**  
SMARC Short Size Module with Intel® Pentium® N3710, Quad core, 8 GB DDR3L, 0°C to 60°C
- **LEC-BW-HS**  
Heatspreader for LEC-BW
- **LEC-BW-HS2**  
Passive Heatsink for LEC-BW

\*other configurations by request