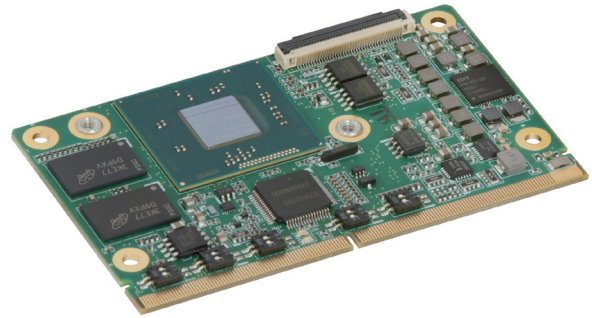# LEC-BTS

SMARC® Short Size Module with Intel® Atom™
Processor E3800 Series System-on-Chip

Features

- Single, dual or quad-core Intel® Atom™ Processor E3800 Series System-on-Chip
- Up to 4 GB DDR3L at 1066/1333 MHz (non-ECC)
- HDMI and LVDS
- GbE, camera interface
- 1x SATA 3Gb/s, 1x USB 3.0, 3x USB 2.0, max. 12x GPIO
- Extreme Rugged™ operating temperature: -40°C to 85°C

Specifications

- ### Core System

  #### CPU
  Intel® Atom ™ E3800 Series, single, dual or quad-core SoC with integrated graphics
  Atom™ E3845 (4C/1333), 1.91 GHz, Gfx 542/792 MHz (Turbo), 10 W TDP
  Atom™ E3826 (2C/1066), 1.46 GHz, Gfx 533/667 MHz (Turbo), 7 W TDP
  Atom™ E3815 (1C/1066), 1.46 GHz, Gfx 400/-MHz, 5 W TDP

  #### Memory
  Up to 4 GB DDR3L at 1066/1333 MHz, memory down non-ECC

  #### 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, I²C Bus Control, GPIO Control, User Flash, Failsafe BIOS (dual BIOS), Watchdog Timer and Fan Control

- ### Audio

  #### Chipset
  Intel® HD Audio integrated in SoC

  #### Ports
  1x I²S and 1x HDA for audio codec on carrier

- ### Ethernet

  #### Intel® MAC/PHY
  1x Intel® i210-IT Ethernet controller

  #### Interface
  10/100/1000 GbE

- ### I/O Interfaces

  #### PCIe
  3x PCIe x1 Gen2

  #### USB
  1x USB 3.0 + 3x USB 2.0

  #### SATA
  1x SATA 3 Gb/s

  #### SDIO
  1x SDIO (4-bit)

  #### Camera
  CSI 4L/1L

  #### Serial
  2x SPI, 2x I2C, 1x I2S, Power Management, 2x UART

  #### MMC
  1x MMC interface to carrier

  #### GPIO
  12x GPIO, 5x used for camera, 7x available

- ### Video

  #### GPU Feature Support
  7th generation Intel® graphics core architecture with four execution units, supports two independent displays 2D and 3D graphics hardware acceleration Support for DirectX 11.1, OGLES 2.0, OGL 3.2
  Video decode HW acceleration for H.264, MPEG2, VC1, VP8 formats
  Video encode HW acceleration for H.264, MPEG2 formats

  #### LVDS
  Single channel 18/24-bit LVDS from DDI0

  #### HDMI/DP++
  HDMI 1.4a from DDI1

- ### Power

  #### Standard Input
  3.0 V~5.25 V DC ±5%

  #### Power States
  C0-C6, S0, S3, S4, S5

● Mechanical and Environmental

Form Factor
SMARC Specifications v1.1

Dimension
SMARC full size module, 82 mm x 80 mm

Operating Temperature
Standard: 0°C to +60°C
Extreme Rugged: -40ºC to +85ºC

Humidity
5-90% RH operating, non-condensing
5-95% RH storage (and operating with conformal coating)

HALT
Thermal Stress, Vibration Stress, Thermal Shock and Combined Test

● Operation System

Standard Support
Linux, VxWorks, Windows 7/8, indows Embedded, Compact 7
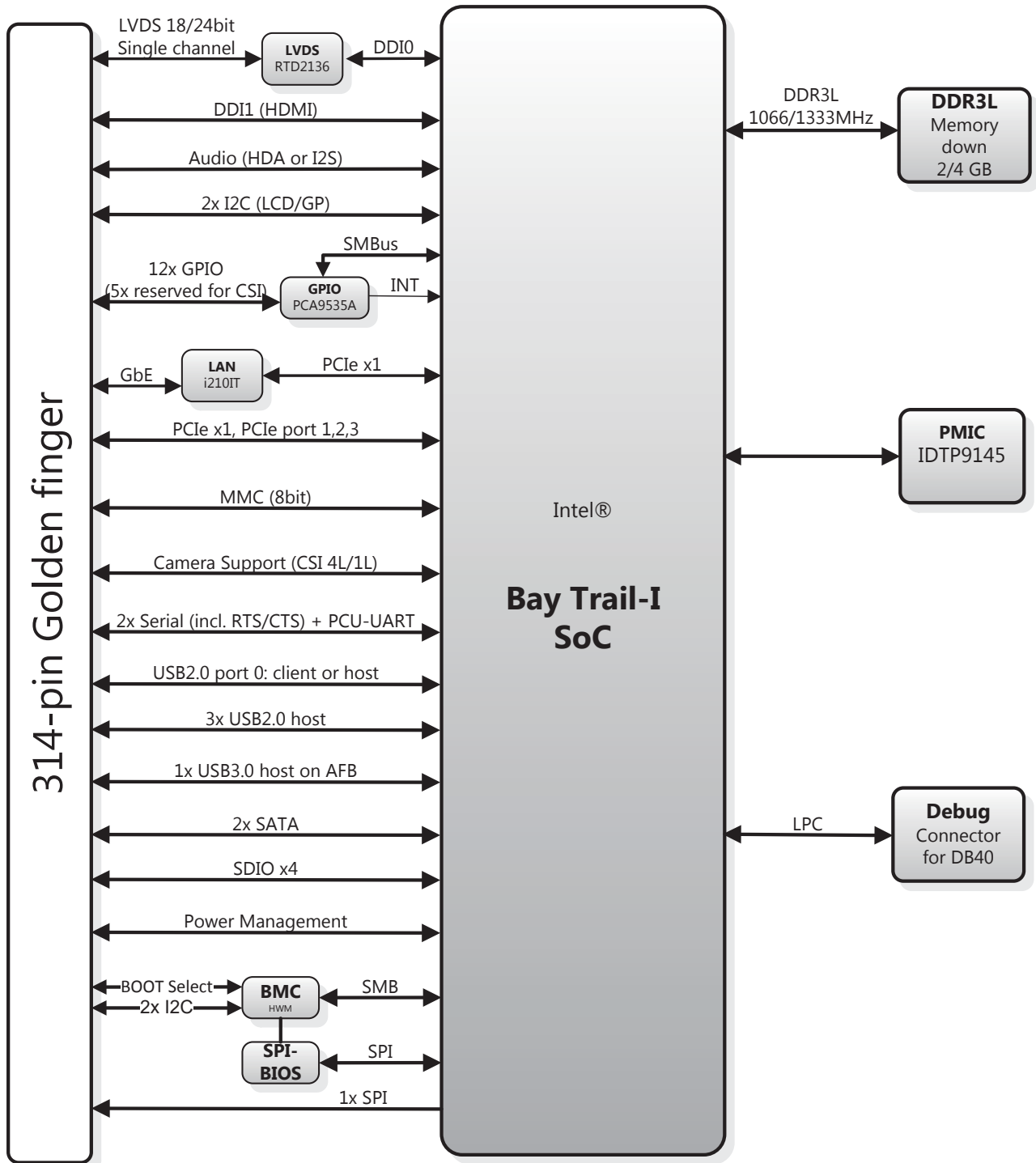
Extended Support (BSP)
QNX, Android

● Intelligent Middleware

SEMA®
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

314-pin Golden finger

LVDS 18/24bit Single channel — **LVDS** RTD2136 — DDI0

DDI1 (HDMI)

Audio (HDA or I2S)

2x I2C (LCD/GP)

SMBus

12x GPIO (5x reserved for CSI) — **GPIO** PCA9535A — INT

GbE — **LAN** i210IT — PCIe x1

PCIe x1, PCIe port 1,2,3

MMC (8bit)

Camera Support (CSI 4L/1L)

2x Serial (incl. RTS/CTS) + PCU-UART

USB2.0 port 0: client or host

3x USB2.0 host

1x USB3.0 host on AFB

2x SATA

SDIO x4

Power Management

BOOT Select — **BMC** HWM — SMB
2x I2C

SPI-BIOS — SPI

1x SPI

Intel®

Bay Trail-I SoC

DDR3L 1066/1333MHz — **DDR3L** Memory down 2/4 GB

PMIC IDTP9145

LPC — **Debug** Connector for DB40

Ordering Information

- **LEC-BTS4-2G-ER**
  SMARC Short Size Module with Intel Atom™ E3845,
  quad core, 2 GB DDR3L, -40°C to +85°C
- **LEC-BTS2-2G-ER**
  SMARC Short Size Module with Intel® Atom™ E3826,
  dual core, 2 GB DDR3L, -40°C to +85°C
- **LEC-BTS1-2G-ER**
  SMARC Short Size Module with Intel Atom™ E3815,
  single core, 2 GB DDR3L, -40°C to +85°C
- **LEC-BTS4-4G-ER**
  SMARC Short Size Module with Intel Atom E3845,
  quad core, 4 GB DDR3L, -45°C to 85°C
- **LEC-BTS20-2G-ER**
  SMARC Short Size Module with Intel Atom E3805,
  dual core, headless, 2 GB DDR3L, -45°C to 85°C
- **LEC-BTS21-2G-CT**
  SMARC Short Size Module with Intel Celeron N2807,
  dual core, 2 GB DDR3L, 0°C to 60°C
- **LEC-BTS-HS**
  Heatspreader for LEC-BTS

*other configurations by request