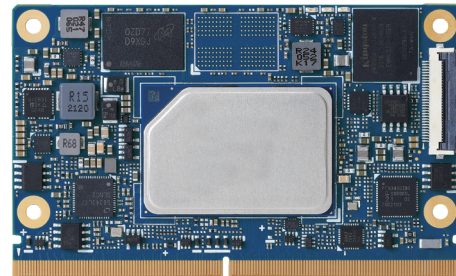


# LEC-EL

## SMARC 2.1 Short Size Module with intel Atom® series

### Features

- Dual or quad-core Intel Atom® Series
- SMARC revision 2.1.1 compliant
- Up to 8GB LPDDR4 at 4266 MT/s
- Dual channel LVDS 918/24-bit)
- DP++, DP++ / HDMI
- 1x SATA Gen 3 / onboard eMMC up to 256 GB
- 10 year product availability
- Dual CAN bus
- USB2/ USB 3 interfaces
- Dual 2.5 gigabit ethernet ports



### Specifications

#### • Core System

##### CPU

Intel Atom® X6425E, 4 cores, 1.8GHz, 12W TDP  
 Intel Atom® X6413, 4 cores, 1.5GHz, 9W TDP  
 Intel Atom® X6211E, 2 cores, 1.2GHz, 6W TDP  
 Intel Atom® X6200FE, 2 cores, 1.0GHz, 4.5W TDP (FUSA)  
 Intel Atom® X6414RE, 4 cores, 1.5GHz, 9W TDP  
 Intel Atom® X6425RE, 4 cores, 1.9GHz, 12W TDP

##### Memory

2, 4, 8 GB LPDDR4L-4266 (In Band ECC)

##### Cache

1.5 MB system L2 cache 4MB LLC

##### Security

Intel® Boot Guard  
 Intel® OS Guard  
 Intel® Platform Trust Technology (Intel® PTT)  
 Intel® AES-New Instruction, Intel® SHA Extensions  
 Intel® Secure Key  
 Digital Rights Management HDCP 2.3-Playready 4  
 SMx Crypto Support  
 Intel® Virtualization Technology (Intel® VT)  
 Intel® Dynamic Application Loader (Intel® DAL)  
 Optional ATECC608 Crypto chip  
 Optional TPM 2.0 module

#### • Video

##### GPU Core

Gen 11LP 4Kp60 @ 3 displays simultaneous

##### GPU Feature Support

11th generation Intel® graphics core architecture with up to 32 execution units (selected SKUs), supports three independent displays 2D and 3D graphics hardware acceleration

Support for DirectX 12, OpenGL 4.2, OpenCL 1.2 Video decode HW acceleration for H.265/HEVC, H.264, MPEG2, MVC, VC-1, WMV9, JPEG/MJPEG, VP8, VP9 Video encode HW acceleration for H.265/HEVC, H.264, MPEG2, MV

##### HDMI

HDMI 2.0b 4K@60 Hz

##### LVDS

Dual Channel LVDS 18/24 bit

#### • System Storage

##### SDIO

1x SDIO (4-bit) compatible with SD/SDIO standard, up to version 3.0

##### eMMC

16, 32, 64 or 128 GB (build option)  
 Compatible with eMMC specification 4.41, 4.51, 5.0 and 5.1

##### SATA

1x SATA Gen3

## Specifications

### • 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

#### Debug Header

30-pin multipurpose flat cable connector for use with optional DB-30 debug module  
 Provides JTAG, BMC access; UART, power testpoints; diagnostic LEDs, Power, Reset, Boot configuration

### • Audio

#### Audio Codec

HDA Audio codec (located on carrier)

### • Dual Ethernet

#### Primary LAN

10/100/1000/ 2.5 Gbit Ethernet

#### Secondary LAN

10/100/1000/ 2.5 Gbit Ethernet

### • Extension Busses

#### USB

2x USB 3.0, 4x USB 2.0

#### UART

Four UART interfaces, SER1 and SER3(CTS/RTS)/SER0 SER2(TX/RX/CTS/RTS)

#### CAN

2x CAN2.0B only or mixed CAN2.0B and CAN FD mode, data bit rate up to 8 Mbps

#### SPI

2x SPI

#### I<sup>2</sup>S

2x I2S interfaces with audio resolution from 16-bits to 32-bits and sample rate up to 192KHz (see Audio Codec support)

#### I<sup>2</sup>C

Four I2C interfaces

- Support for 7-bit and 10-bit address mode  
 - Software programmable clock frequency of 100 kbit/s in Standard-mode, 400 kbit/s in the Fast-mode or 1 Mbit/s in Fast-mode Plus"

#### GPIO

14x GPIO with interrupt, one GPIO with PWM

#### PCIe

4x PCIe x1 Gen3

### • Power

#### Input

5Vdc +/- 5%

### • Mechanical and Environmental

#### Form Factor

SGET SMARC Specifications 2.1

#### Dimension

SMARC short size module 82 mm x 50 mm

#### Operating Temperature

Standard: 0°C to +60°C

Rugged: -40°C to +85°C (optional)

#### 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

### • Operating systems

#### Standard Support

Windows 10 IoT Enterprise 64-bit, Windows 10 64-bit, Yocto Linux 64-bit, Ubuntu (TBC)

#### Extended Support (BSP)

Yocto project based Linux 64-bit, VxWorks 64-bit (TBC)

## Functional Diagram

