

**aBLE**™

Connected Everyday

**ABOV Bluetooth® Low Energy SoC  
Promotion Material**

**Aug. 2018**

# aBLE SoC Introduction

## aBLE Value Proposition





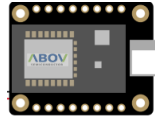



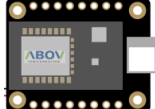


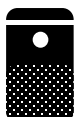
### Tier 1 Performance

- Ultra Low Sleep, Stop Current
- Lasts ~380 days on a 3V coin battery @ Active BLE RF Advertisement Mode

### Excellent Technical Support

- Tier 1 Level Software Development Kit, Documentations, Local Technical Support, and Real-time Support System



Product Name	Specifications	Applications
<b>A31R112</b> (Simple BLE)	<ul style="list-style-type: none"> <li>• BLE 4.2 Compliant</li> <li>• CPU : Cortex M0+</li> <li>• PROM : 32KB</li> <li>• Embedded DC-DC</li> <li>• 6x6 48QFN, 3.3x3.3 FOWL</li> </ul>	 Remote  Beacon  Lighting  Sensor  Module
<b>A31R118</b> (FLASH BLE)	<ul style="list-style-type: none"> <li>• BLE 4.2 compliant</li> <li>• CPU : Cortex M0+</li> <li>• Flash : 512KB</li> <li>• Embedded DC-DC, FOTA</li> <li>• 6x6 48QFN, 4.1x3.3 FOWL</li> </ul>	 Smart Building  IoT Smart Card  Wearable  Module
<b>A31R114</b> (Remocon BLE)	<ul style="list-style-type: none"> <li>• BLE 4.2 compliant</li> <li>• CPU : Cortex M0+</li> <li>• Flash : 128KB</li> <li>• DC-DC, FOTA, Embedded Voice ADC, IR</li> <li>• 7x7 56QFN</li> </ul>	 Remote  Smart Home  AI Speaker

# aBLE SoC Spec. Comparison Table

	A31R112	A31R118	A31R114
Bluetooth Version	BLE 4.2	BLE 4.2	BLE 4.2
Chip Core	ARM Cortex-M0+	ARM Cortex-M0+	ARM Cortex-M0+
	32MHz	32MHz	32MHz
Package	48QFN (6x6mm) FOWLP	48QFN (6x6mm) FOWLP	56QFN (7x7mm)
Major Features	GP ADC, DC-DC, Android 8.1 Compatible	GP ADC, DC-DC, Standard Mesh, Android 8.1 Compatible	Voice ADC, DC-DC, IR TR, IR Learning AMP, IR Blaster Function, Android 8.1 Compatible, Android TV 8.0 Voice Support
Stack	Internal ROM (128KB)	Internal ROM (128KB)	Internal ROM (128KB)
	Hard-wired BLE Stack	Hard-wired BLE Stack	Hard-wired BLE Stack
ROM	32KB OTP	512KB Flash	128KB Flash
	Dedicated to User App	Dedicated to User App	Dedicated to User App
RAM	48KB	48KB	48KB
Peak Tx / Rx			
Current [mA]	7.0 / 7.0	7.5 / 7.5	9.0 / 7.5
Deep Sleep [nA]	900	900	900
Stop [nA]	300	300	300
Sensitivity [dBm]	-94	-94	-94
Output Power [dBm]	+8 / +0	+8 / +0	+8 / +0
Codec	Internal	Internal	Internal
OTA	OTA for External MCU Possible	Internal	Internal
OS	Scheduler (Very Light / RTOS Also Supported)	Scheduler (Very Light / RTOS Also Supported)	Scheduler (Very Light / RTOS Also Supported)

# A31R11x Bluetooth® Low Energy SoC

## A31R11x Bluetooth® Low Energy SoC with ARM® Cortex®-M0+

Powered by ABOV Semiconductor's Bluetooth® Smart SoC, the first Bluetooth® solution developed in Korea, ABOV aBLE provides an optimal solution for IoT and remote controller applications.

The product provides an outstanding BLE MCU performance through its low power consumption, hardened security, mesh network, and enhanced positioning sensitivity.

### Connectivity at Optimized Performance

#### Cortex-M0+, 32-bit Core

- ▶ Max. operating frequency **32MHz**
- ▶ NVIC (Nested-Vectored Interrupt Controller)
- ▶ Hardwired BLE Stack in Mask ROM for Fast Processing

#### Memory

- ▶ **128/512KB** flash memory or **32KB** OTP memory
- ▶ **48KB** SRAM

### Compatible and Secure

#### Bluetooth SIG Certified Protocol Stack

- ▶ Commercially silicon-proven **Controller IP** licensed by global BLE chip vendors
- ▶ **aBLE Host Stack** developed in-house (Listed Dec. '16)
- ▶ Easily Expandable **aBLE Profile HTP HOGP** (Listed Jun. '17)

#### Security

- ▶ FIPS140-2/AIS.31/NIST SP800-22/NIST SP800-90B  
Compliant TRNG & AES-128

### Peripherals with Various Functions

#### Peripherals with Various Function

- ▶ 32-bit FRT / 16-bit TIMER
- ▶ 16-bit PWM
- ▶ 32-bit WDT
- ▶ UART / SPI / I2C
- ▶ 12-bit ADC @ 128ksps (R112/R118) / Voice ADC (R114)
- ▶ Keyscan, IR Carrier Generator, MIC Interface

### Characteristics & Packages

#### Voltage and Temperature

- ▶ 1.2~1.65V or 2.3~3.6V (R112) / 1.8 ~ 3.6V (R114/R118)
- ▶ -20 ~ 70°C

#### Package and I/O

- ▶ FOWLP, 6x6 48QFN, 7x7 56QFN
- ▶ Max. 28 I/O Ports

# A31R112 Key Benefits & Block Diagram

## Key Benefits & Block Diagram

### Optimized BLE SoC Performance

- ▶ Cortex-M0+, 32-bit core (Max. 32MHz)
- ▶ 32KB OTP memory
- ▶ 128KB ROM for BLE Protocol Stack
- ▶ 48KB Internal SRAM

### Easy & Comfortable solution

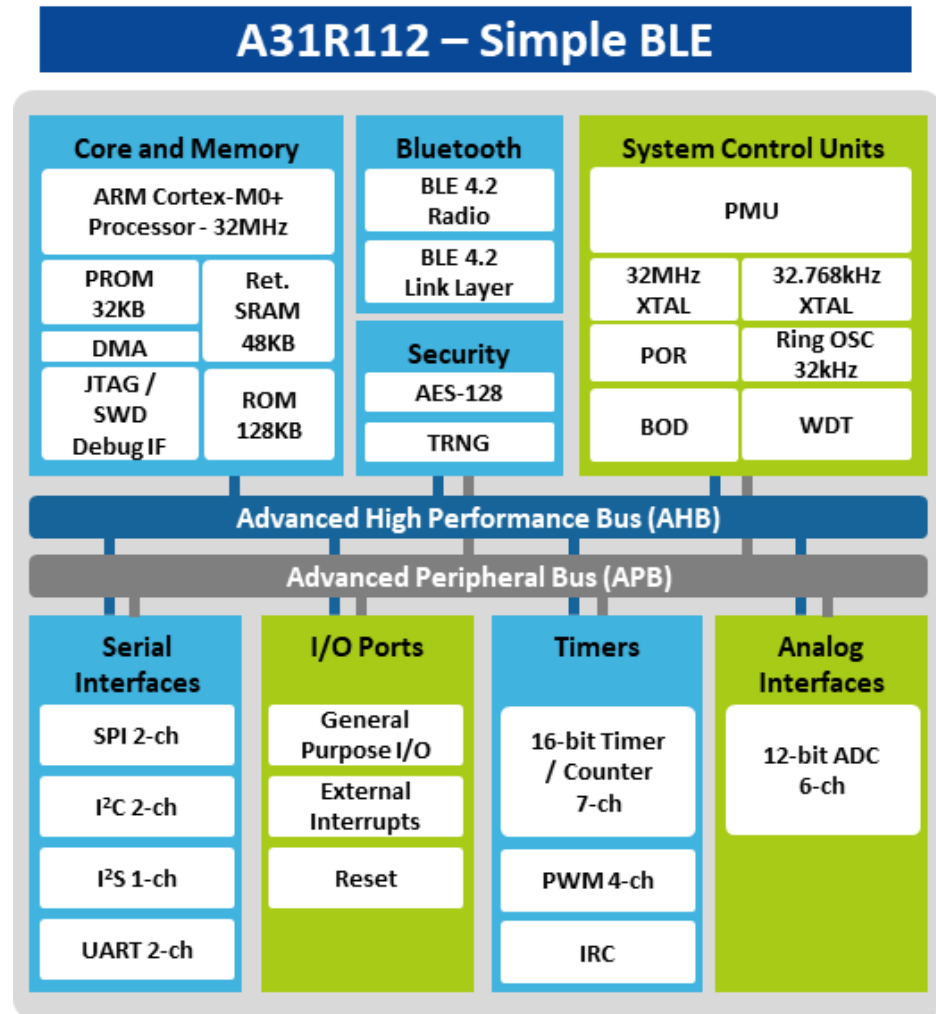
- ▶ Easy & Comfortable S/W development environment
- ▶ SDK and source code for various applications provided
- ▶ Reference design (H/W + S/W) provided
- ▶ Various application notes provided
- ▶ ARM C-M0+ ensures full compatibility to ARM open development environment

### Optimized BOM

- ▶ Optimized external LC requirement
- ▶ Features algorithm that enables LF crystal-less operation

### Convenient Product Reference Kit

- ▶ Reference H/W (EVK, schematic, BOM,
- ▶ PCB Gerber, Antenna design guide, App. note)
- ▶ Reference S/W (SDK, Application Source Code,
- ▶ Customer support issue tracking system, App. Note)



# A31R118 Key Benefits & Block Diagram

## Key Benefits & Block Diagram

### Optimized BLE SoC Performance

- ▶ Cortex-M0+, 32-bit core (Max. 32MHz)
- ▶ Large Available Memory Size: 512KB Flash memory
- ▶ 128KB ROM for BLE Protocol Stack
- ▶ 48KB Internal SRAM

### Easy & Comfortable solution

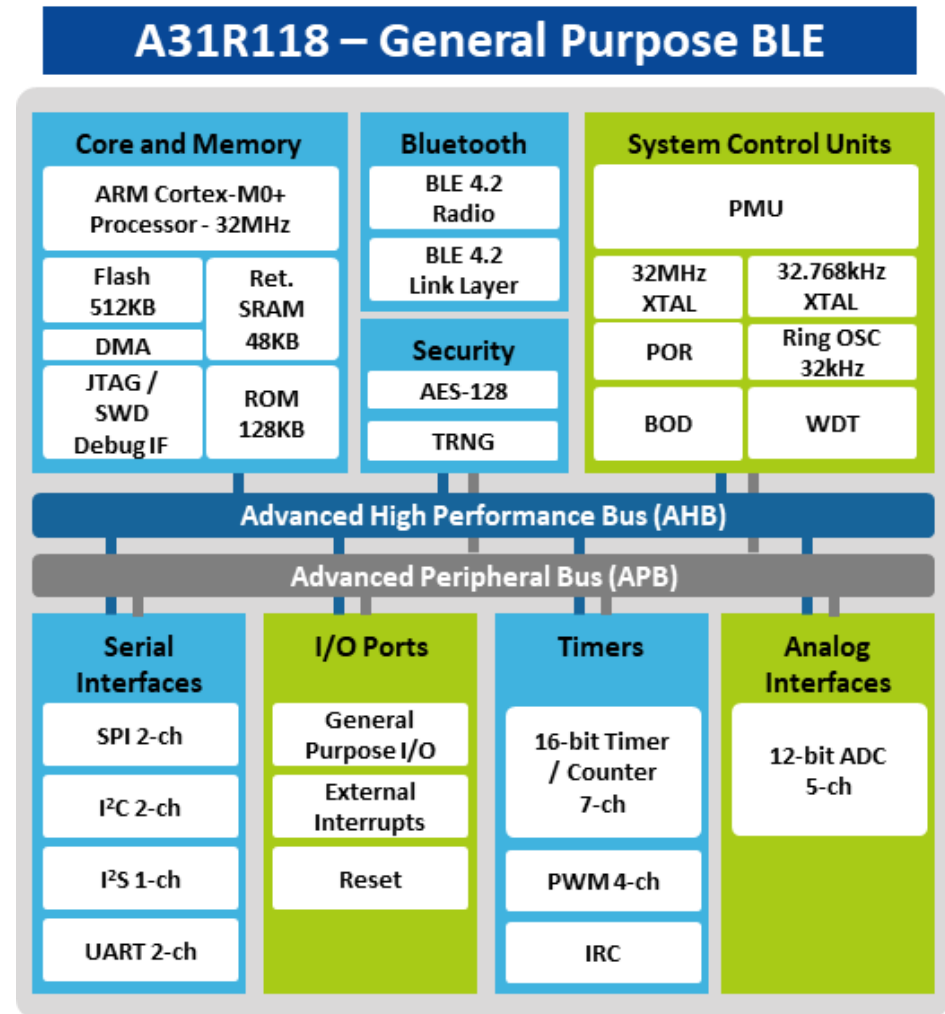
- ▶ Easy & Comfortable S/W development environment
- ▶ SDK and source code for various applications provided
- ▶ Reference design (H/W + S/W) provided
- ▶ Various application notes provided
- ▶ ARM C-M0+ ensures full compatibility to ARM open development environment

### Large Available Memory Size

- ▶ FLASH space all at user's disposal
- ▶ Sufficient space to run complicated applications such as smart mesh and mbed

### Convenient Product Reference Kit

- ▶ Reference H/W (EVK, schematic, BOM,
- ▶ PCB Gerber, Antenna design guide, App. note)
- ▶ Reference S/W (SDK, Application Source Code,
- ▶ Customer support issue tracking system, App. Note)



# A31R114 Key Benefits & Block Diagram

## Key Benefits & Block Diagram

### Optimized BLE SoC Performance

- ▶ Cortex-M0+, 32-bit core (Max. 32MHz)
- ▶ Large Available Memory Size: 128KB Flash memory
- ▶ 128KB ROM for BLE Protocol Stack
- ▶ 48KB Internal SRAM

### Easy & Comfortable solution

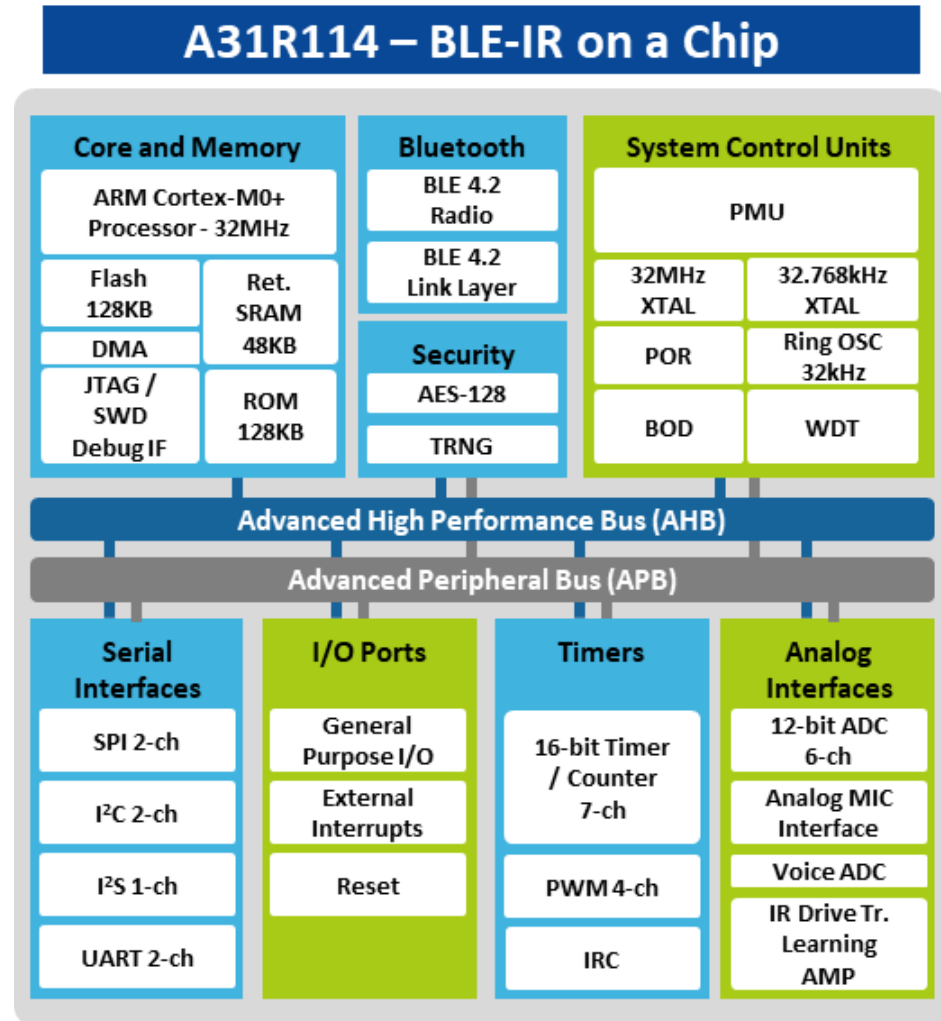
- ▶ Easy & Comfortable S/W development environment
- ▶ SDK and source code for various applications provided
- ▶ Reference design (H/W + S/W) provided
- ▶ Various application notes provided
- ▶ ARM C-M0+ ensures full compatibility to ARM open development environment

### BLE-IR on a Chip

- ▶ Minimizes BOM by integrating BLE Remote Controller features on a single chip
- ▶ BLE, FLASH (DB), IR Driver, IR Learning Function,
- ▶ Key Scan, Voice Codec, PMU

### Convenient Product Reference Kit

- ▶ Reference H/W (EVK, schematic, BOM,
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- ▶ Reference S/W (SDK, Application Source Code,
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# A31R11x Application & Package

## Target Application



Portable Electronics



Remote Controllers



IoT Device



Smart Home



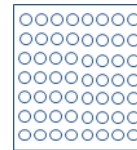
Environmental Sensor



AI Speaker

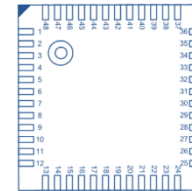
- Portable Electronics
- Remote Controllers
- IoT Devices
- Smart Home
- Environmental Sensor
- AI Speaker

## Package



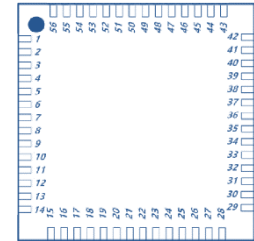
0.35T  
FOWLP

**A31R112**  
**A31R118**



48-Pin  
QFN\_06

**A31R112**  
**A31R118**



56-Pin  
QFN\_07

**A31R114**

## Product List

Device	Core	Speed	Code	SRAM	Peak Tx/Rx Current (mA)	Deep Sleep Current (nA)	Stop Current (nA)	Sensitivity (dBm)	Output Power (dBm)	Package	Sample
A31R112CW	Cortex-M0+	32MHz	32KB (OTP)	48KB	7.0 / 7.0	900	300	-94	+8 / +0	FOWLP	Under Development
A31R112CUN	Cortex-M0+	32MHz	32KB (OTP)	48KB	7.0 / 7.0	900	300	-94	+8 / +0	6x6 48QFN	<b>Available</b>
A31R114JYN	Cortex-M0+	32MHz	128KB	48KB	9.0 / 7.5	900	300	-94	+8 / +0	7x7 56QFN	<b>Available</b>
A31R118CW	Cortex-M0+	32MHz	512KB	48KB	7.5 / 7.5	900	300	-94	+8 / +0	FOWLP	Under Development
A31R118CUN	Cortex-M0+	32MHz	512KB	48KB	7.5 / 7.5	900	300	-94	+8 / +0	6x6 48QFN	<b>Available</b>

- For more information about product and package, Please contact our sales team  
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# Global Top Smart MCU Innovator



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