

## ATSAMB11-ZR210CA DESIGN-IN GUIDELINES

ATSAMB11-ZR210CA module is based on Microchip Atmel's industry-leading low-power 2.4GHz Bluetooth Low Energy (BLE) ATSAMB11-XR2100A SiP (System in a Package).

The ATSAMB11-XR2100A is an ultra-low power Bluetooth SMART (BLE 4.1) System in a Package with Integrated MCU, Transceiver, Modem, MAC, PA, TR Switch, Power Management Unit (PMU), and a 26MHz crystal. It is a stand-alone Cortex-M0 application processor with embedded Flash memory and BLE connectivity.

The qualified Bluetooth Smart protocol stack is stored in dedicated ROM, the firmware includes L2CAP service layer protocols, Security Manager, Attribute protocol (ATT), Generic Attribute Profile (GATT) and the Generic Access Profile (GAP). Additionally, application profiles such as Proximity, Thermometer, Heart Rate, Blood Pressure, and many others are supported and included in the protocol stack.

The ATSAMB11-ZR210CA module contains the ATSAMB11-XR2100A SiP, a 2.4 – 2.5GHz antenna, RF matching. The following connections are required for proper operation:

- Power supply, minimum 2.3V, typically 3.6V, maximum 4.3V, to power the BLE module (VBAT)
- Power supply, minimum 2.3V, typically 3.3V, maximum 3.6V for VDDIO. Note that VBAT must be greater than or equal to VDDIO
- Logic control for Chip\_En signal
- A 32.768KHz real time clock or crystal

When the module is placed in the system, a provision for the antenna must be made. There should be nothing under the portion of the module which contains the antenna. This means the antenna should not be placed directly on top of the motherboard PCB. This can be accomplished by, for example, placing the module at the edge of the board such that the antenna extends beyond the board edge by 3.0mm. Alternatively, a cut out in the motherboard can be provided under the antenna. The cutout should be at least 7.5mm x 3.0mm. Ground vias should be placed all around the perimeter of the cutout. No large component should be placed near the antenna.

The module is too small (7.5 x 10.5mm) to put the FCC ID on the module and to be readable. Microchip has applied for the FCC ID to be added to the Datasheet and to the shipping package instead of the module. In addition, the product User Manual must contain the following statement:

“Contains Transmitter Module FCC ID: 2ADHKBZR or Contains FCC ID: 2ADHKBZR

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation”.

A sample label is shown below.

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| Contains Transmitter Module FCC ID: 2ADHKBZR<br>Or<br>Contains FCC ID: 2ADHKBZR<br>This device complies with Part 15 of the FCC rules.<br>Operation is subject to the following two conditions:<br>(1) This device may not cause harmful interference, and<br>(2) this device must accept any interference received, including interference that may cause undesired operation. |
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The module must be installed into the end product to provide a separation distance of at least 5mm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

If the module's label is not visible when installed, then an additional permanent label referring to the enclosed module "Contains Transmitter Module FCC ID: 2ADHKBZR" or "Contains Transmitter Module IC: 20266-SAMB11ZR" must be installed on the product in a visible location.

A user's manual for the finished product should include the following statement:

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the module/product
- Increase the separation between the equipment and the module/product
- Consult the dealer or an experienced radio/TV technician for help

Changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

### **Industry Canada**

This device complies with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.