

A09-2528 DESIGN-IN GUIDELINES

The A09-2528 device MR110CA is an ultra-low power Bluetooth® SMART (BLE 4.1) module with Integrated Transceiver, Modem, MAC, PA, TR Switch, and Power Management Unit (PMU). It can be used as a Bluetooth Low Energy link controller or data pump with external host MCU.

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 module contains all circuitry required including a ceramic high gain antenna, 26MHz crystal and PMU circuitry. The customer simply needs to plug the module into an appropriate Xplained Pro board such as the SAMD21 Xplained Pro board.

The following connections are required for the proper operation:

- 1.8V – 4.3V VCC supply to power the BLE module and all components including supplying the on-chip regulators which supply the Power Amplifier.
- Chip_En signal to the module.

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 6.5mm. Alternatively, a cut out in the motherboard can be provided under the antenna. The cutout should be at least 22mm x 6.5mm. Ground vias spaced 2.5mm apart should be placed all around the perimeter of the cutout. No large components should be placed near the antenna.

Each module has a label with an FCC ID, however the product User Manual must contain the following statement: “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”.

The module must be installed into the end product to provide a separation distance of at least 5 mm 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: 2ADHKA092528” must be installed on the product in a visible location.

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:

- Reorient or relocate the module/product.
- Increase the separation between the equipment and 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.