

A110LR09x Radio Modules Block Diagram

Below is a block diagram for each of the A110LR09A and A110LR09C modules.

- **Antenna**
 - The antenna couples energy between the air and the AIR module. For applications where installations are done by an end user (non-professional), an omni-directional antenna pattern is desired such that the application will work equally well in every direction. Similarly for peer to peer or point to multipoint applications, an omni-directional pattern is desired such that all nodes have a fair chance of communicating. The A110LR09A module has an integral antenna that is near omni-directional, whereas the A110LR09C has approved antenna options ranging from near omni-directional to shaped front/back patterns (useful for inline, professional installations). Note that the end radiation pattern depends not only on the antenna, but also on the ground plane, enclosure and installation environment.
- **Filtering**
 - Filtering removes spurious signals to comply with regulatory intentional radiator requirements.
- **Matching**
 - Matching provides the correct loading of the transmit amplifier to achieve the highest output power, as well as the correct loading for the receive LNA to achieve the best sensitivity.
- **Physical**
 - The physical layer provides conversions between data, symbol and RF signal.
- **MAC**
 - The MAC layer is part of the Logical Link Layer and provides frame handling, addressing and medium access services. For CE operations, part of the MAC is implemented in the S/W.
- **Microcontroller Interface**
 - The microcontroller interface exposes registers and commands for the physical and MAC layers to a microcontroller.
- **Power Management**
 - Power management ensures a stable supply for the internal functions, as well as providing means for a low power sleep mode (in which case, most of the transceiver is power off).

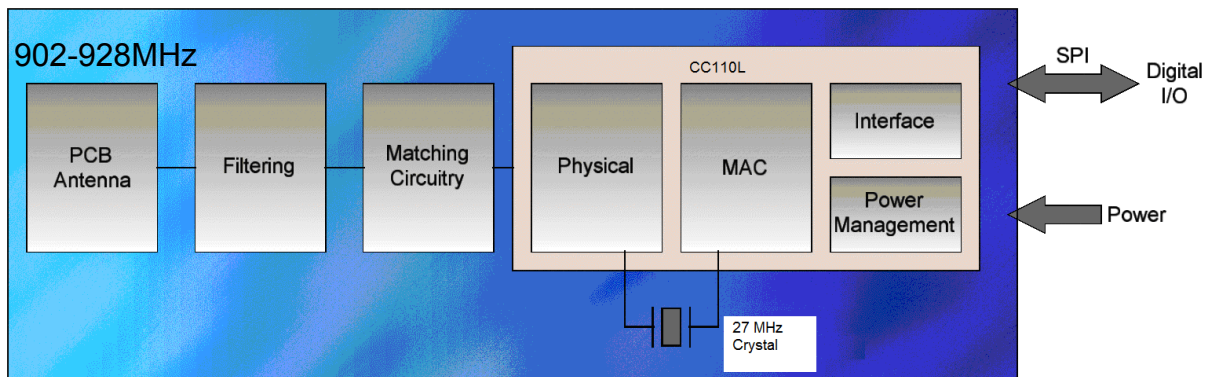


Figure 1 The functionality of the A110LR09A, using an integral antenna

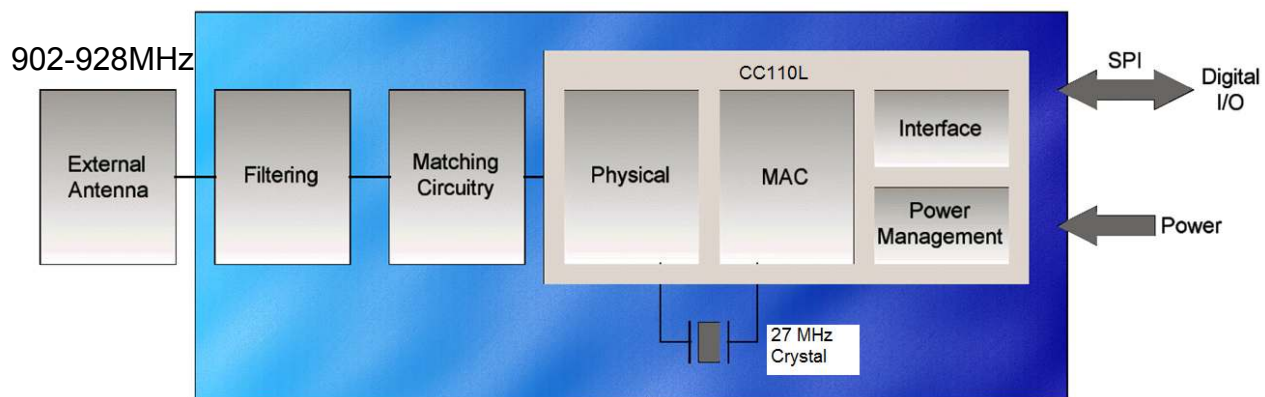


Figure 2 The functionality of the A110LR09C, using an external antenna.

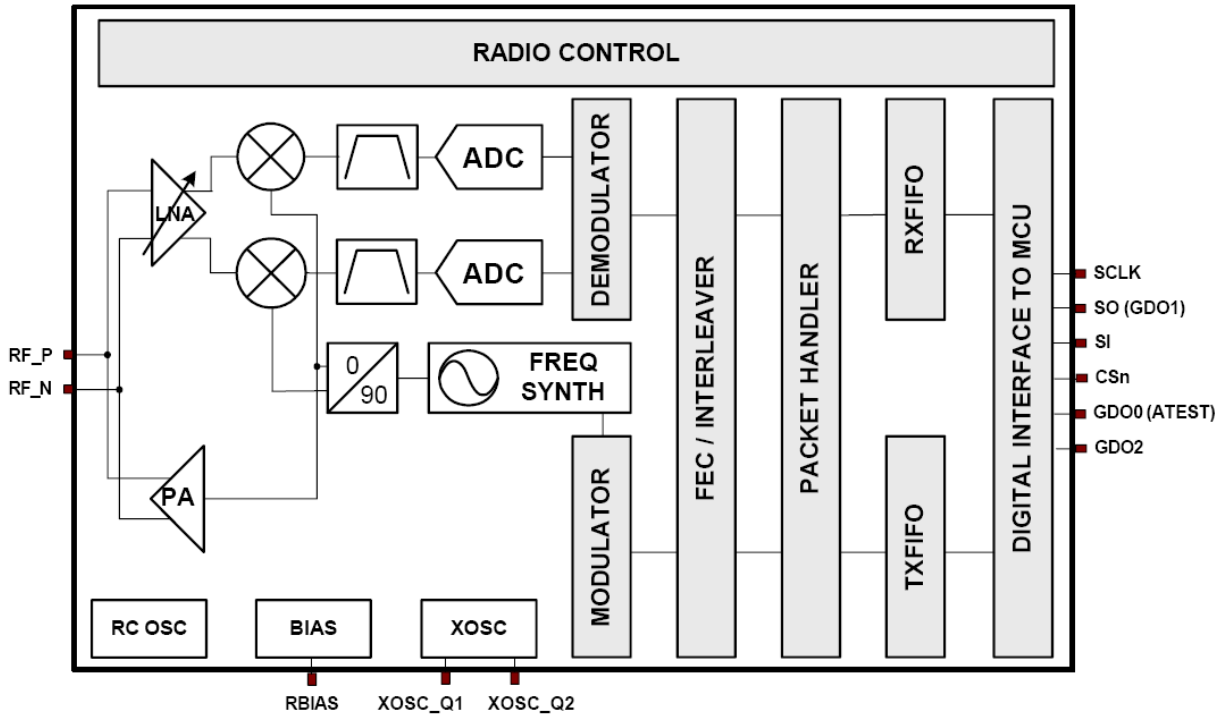


Figure 3 Transceiver IC block diagram.