RF System Decomposition – ESP32

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Selected Device: ESP32 (Espressif Systems)

This report analyzes the RF system structure of the ESP32.

The ESP32 integrates WiFi and Bluetooth transceivers operating in the 2.4 GHz ISM band.

During transmission, digital data is processed by the MCU, modulated, upconverted, amplified, and radiated via the antenna.

During reception, RF signals are captured by the antenna, amplified by the LNA, downconverted, demodulated, and processed by the MCU.

Key RF blocks include the Power Amplifier (PA), Low Noise Amplifier (LNA), RF Matching Network, and Antenna Interface.

Understanding these blocks is essential for IoT, embedded systems, and wireless engineering careers.

RF System Block Diagram