Operational Description -   LT2510

Aerocomm's Family of 2.4Ghz proprietary FHSS transceivers

Overview

The LT2510 is a 2.4Ghz Frequency Hopping Spread Spectrum transceiver. The module is solderable and is meant to be integrated into an OEM customer's equipment. The 6 layer board utilizes multiple grounding layers to suppress unintentional radiation. It operates at +20dBm conducted transmit power and has the hardware option to use either an integral chip antenna or an external dipole, omni, or panel antenna connected by an u.fl RF connector. The Texas Instruments CC2510 is the RF engine and processor for the LT2510. OEM customer has the option to choose either an RF data rate of 280kbps operating on 79 hop bins or 500kbps operating on 43 hop bins.
The LT2510 utilizes a server-client architecture to synchronize the frequency hopping. Each network must have one radio configured as a Server and all other radios configured as Clients. When a radio is configured as a Server, it will transmit a beacon at the beginning of each hop. Radios configured as Clients will default to a receive mode where they are scanning the available frequencies listening for a beacon from a Server in their network. When a Client detects the Server's beacon, the client will synchronize to it and transition the InRange pin low. When the Server and Client are synchronized they can begin transferring data. Multiple networks can exist in the same area, provided networks are configured on different Channels. The LT2510 utilizes an intelligent Frequency Hopping algorithm which ensures minimal interference between two networks. Each different channel utilizes a different pseudorandom order of hop bins which are used equally on the average by each transmitter.

Receiver Hardware

Radiated transmit signal comes into the LT2510 through one of the agency approved 2.4Ghz antennas. It passes through the harmonic filter and is switched into the Low Noise Amplifier on board the front-end module. That amplified receive signal is then fed through a discreet TX/RX switch into the balun and then into the differential input / outputs of the CC2510 for processing.

Transmitter Hardware

Data is buffered in the CC2510 and amplified out into a discreet balun on board the LT2510. The data is then fed through a TX/RX switch and passes through a BAW filter to eliminate unwanted side band noise in the 2.4Ghz spectrum. Signal is then fed into a front-end module which amplifies the signal again and feeds it out through a 2.4Ghz low pass filter which significantly reduces the 2nd and 3rd harmonics.   The signal is then fed to one of the approved 2.4Ghz antennas and radiated out.