

Receiver Description of Operation

The receiver is used in an automotive remote function actuation system, powered by the vehicle 12 Volt source. It is contained in the Passenger Side Door Module (PDM), located in the passenger compartment. The PDM also has switches that control various interior functions and communicates with the rest of the vehicle over a communications bus.

The PDM is designed to receive a 315 MHz signal that has on off keyed modulation at a digital data rate of 2 kHz. It is a superheterodyne type using a Surface Acoustic Wave (SAW) resonator controlled 304.3 MHz local oscillator. The resulting received digital data is decoded by a microcontroller on the PDM.

The internal antenna is impedance matched to the input of the 315 MHz Surface Acoustic Wave (SAW) band pass filter. The output of the SAW filter is impedance matched to the input of the single transistor Low Noise Amplifier (LNA). The output of the LNA drives the RF input of a superheterodyne receiver integrated circuit (IC).

The receiver IC has the active circuitry to perform the mixer, local oscillator, intermediate frequency (IF) amplifier, limiter amplifier and demodulator functions. The RF output from the LNA is combined with the local oscillator in the mixer. The 10.7 MHz IF output of the mixer drives a discrete inductor and capacitor band pass filter. The output of the discrete filter drives the input of the IF amplifier. The output of the IF amplifier is connected to the input of the ceramic band pass filter. The output of the ceramic filter is connected to the input of the limiter amplifier. The output of the limiter is internally connected to the demodulator. The demodulator output is connected to the input of the data slicer. The digital data output of the data slicer is connected to the data input of the microcontroller. The microcontroller decodes the received digital data and then issues the appropriate actuation instructions.