



1. Transmitter path

Modulated digital signal from the Modem is converted to 6MHz IF signal in TxDAC AD9760 and after LC filtering reaches IF transceiver Max2511. In an internal image-reject mixer the 6MHz IF signal is mixed with 356MHz signal controlled by PLL LMX2330, the resulting 350MHz IF signal passes a gain controlled amplifier and TX SAW filter and reaches Up/Down Converter Max 2410. After combining with LO1 controlled by PLL LMX2330 the Tx RF signal passes BP filter, gain controlled amplifier, BP filter, pre-amplifier and finally a gain controlled PA. After passing through Transmit / Receive switch and LP filter the RF signal is radiated to the air by an internal or an external antenna.

2. Receiver path

Received from the antenna RF signal passes LP filter, Transmit / Receive switches, BP filter and is amplified by a LNA inside the UP/Down converter MAX2410. After passing BP filter it is mixed with LO2 signal controlled by PLL LMX2330. The resulting 350MHz IF signal passes an amplifier and SAW filter and reaches IF Transceiver MAX 2511. After combining with 356MHz signal 6MHz IF signal passes to the AD converter and afterwards to the Modem.

3. Determining and stabilizing frequency.

All radio and IF frequencies are generated and controlled by two PLL's LMX2330. The reference 20MHz frequency for the PLL's is generated by an oscillator based on crystal Y1. The frequency stability of the crystal is 5 ppm and its temperature stability is 5 ppm. During the production the oscillator is calibrated to 20MHz with 1ppm accuracy.

4. Suppression of spurious radiation.

Spurious radiation is suppressed by BP, LP and SAW filters. Bandwidth of all BP filters is 75MHz and the attenuation is 32dB. 3dB bandwidth of SAW filter is 4.85MHz, 35dB bandwidth is 9.68MHz.

5. Limiting modulation.

Modulation limiting is an integrated function of the Modem. The Modem is an ASIC which is designed to work in two symbol rate modes 1MSPS and 1.33MSPS. In each mode both 4-level CPFSK and 8-level CPFSK modulations can be used.

6. Limiting power.

Each BSR/SPR radio has been tested by automatic test station. As part of the test, the Maximum RF output power value has been measured. In case the RF output power is higher than specified in the System Description, the BSR/SPR radio doesn't pass the test and get Fail status. BSR/SPR radio boards with Fail status can not be assembled as part of the final product.

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