



Figure 2: RF transceiver block diagram

2.1 Transmitter

The transmit signal paths include a shared set of baseband amplifiers, a dedicated quadrature upconversion for each band-type (low and high), gain control RF amplification, and multiple output driver amplifiers for each band-type.

Numerous secondary TX functions are also integrated: a reference for the transmit DACs, the TX phase-locked loop, the TX VCO circuit, the TX LO generation and distribution circuits, an RMS TX power detector, and various interface, control, and status circuits.

The RF transmitter interfaces internally with the baseband circuits for its analog baseband input and

status and control signaling.

Power reduction features controlled by baseband circuits (such as selective circuit power down, gain control, and transmit puncturing) extend handset talk time.

The driver amplifier outputs are routed externally to the final stages of the transmit chains, culminating with the antenna switch whose output drives the antenna.

Sophisticated TX LO circuits implement the frequency plan and are completely integrated on-chip. All TXLO signals are generated by the on-chip TX VCO under the control of its PLL.

2.2 Receiver

The on-chip receive signal paths are functionally identical for each mode and each band-type (low or high). The external circuitry includes the antenna switch module and a filter function — either a duplexer or a bandpass filter.

All RF Rx inputs use single-ended.

The analog baseband signals are then digitized by analog-to-digital converters (ADCs) whose outputs are routed to the digital baseband circuits for further processing.

Numerous secondary Rx functions are also integrated: Rx frequency synthesizers (each having their own PLL and VCO circuits), LO generation and distribution circuits, reference and clock circuits for the ADCs, and various interface, control, and status circuits. Power reduction features (such as selective circuit power down, gain control, and bias control) extend handset standby time.

Like the TX LO, all Rx LO circuits are completely integrated. All received LO signals are generated by the on-chip Rx VCOs under control of their PLLs.

2.3 RF Circuit

SIM7500A designed by SIMCOM is a dual mode module which supports LTE-FDD B2/B4/B12 band . Transceiver circuit is based on Qualcomm MDM9207-1, MMPA is S5643-51.

From TX ports of MDM9207-1 to antenna, a LTE TX path includes a power amplifier, a duplexer and a antenna switch .For the PRX path from main antenna to PRX port of MDM9x07, a RX

path includes an antenna switch and a duplexer. LTE DRX path from DIV antenna to DRX port of MDM9207-1 includes a saw.

3. Operating mode (TX)

3.1 Transmit max power in LTE bands

Configuration of the common parameters:

BAND	Channel
LTE B2	19000
LTE B4	19950
LTE B12	23095

3.2 Output Power

BAND	Power class	M A X power	Limit
LTE B2	3	25	+/-2
LTE B4	3	25	+/-2
LTE B12	3	25	+/-2

3.3. Stop TX measurements

On hook the mobile, the test will be stop.

4. Operating mode (RX)

4.1 Receive a Bch signal in WCDMA dual bands and LTE bands

For Rx mode, common parameters can be configured:

BAND	Channel	Antenna level
		input antenna power (in dBm), so the receive path is forced to the corresponding AGC gain.
LTE B2	600	
LTE B4	1950	
LTE B12	5095	

4.2 Stop Rx mode

On hook the mobile, the test will be stop.