RX8100 Operational Description

The equipment under test (EUT) is the mobile phone of Model RX8100 band UMTS (B2 /B5)、 Quad-band GSM/GPRS solution GSM(850\1900)、 LTE band(B2/ /B4/B5/B7/B12/B13/B17/B26B38/B41/B66), It supports GPRS/EDGE Class 12, HSDPA/HSUPA/HSPA+, also supports IEEE802.11a/b/g/n/ac-HT20/HT40/HT80,11acHT80 only 5G,Bluetooth version BT4.2, GPS/GLONASS/BDS

The phone use Qualcomm's SDM450 chip which include Digital Baseband controller, basic frequency is 1.8GHZ,Analog Baseband controller and Modem Processing subsystems; The PMIC is PM8953 Chip; the FDD LTE UMTS and GSM/GPRS/EDGE Power Amplifier Modules are SKY77643-21 and VC77916-21respectively.

The remainders of the major radio components are the SAW filters, and crystal. There is also a combination PCM memory IC and other peripherals such as BT, LCD, camera and etc. The system is powered by a rechargeable lithium-ion battery with a nominal voltage of 3.8 volts.

RF transmitter

The RF transmitters are capable to perform GMSK, 8-PSK as well as UMTS and HSPA+ modulation signals with excellent noise performance, thus no interstate filter in between transceiver and PA is required:

FDD LTE TX:

– Band 2 (1850 MHz -1910MHz)

– Band 4 (1710 MHz -1755MHz)

– Band 5 (824 MHz -849MHz)

– Band 7 (2500 MHz -2570MHz)

– Band 12 (699MHz -716MHz)

– Band 13 (746MHZ-756MHZ)

– Band 17 (704 MHz -716MHz)

– Band 26 (814 MHz -849 MHz)

– Band 38 (2570MHz –2620MHz)

– Band 41 (2555 MHz -2655 MHz)

– Band 66 (2110MHZ-2178MHZ)

UMTS:

– Band 2 (1985MHz-1910MHz)

– Band 5(824 MHz -849 MHz)

GSM:

– GSM 850 (824 MHz - 849 MHz)

– PCS 1900 (1850 MHz - 1910 MHz)

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. Three LTE/UMTS output drivers support one low band and two high bands; two GSM output drivers support one low-band and one high-band type (but each GSM band type is dual-band). The GSM transmitters are also supported by a PA average control path, plus the ability to route LO signals to the transmit chains for test and calibration purposes.

Numerous secondary Tx functions are also integrated: a reference for the transmit DACs, the Tx phase-locked loop (PLL), the Tx local oscillator 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 powerdown, 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 Tx LO signals are generated by the on-chip Tx local oscillator under the control of its PLL.

Modulation type
– GSM/GPRS:GMSK

– EDGE:8PSK

– WCDMA:QPSK

– HSDPA:QPSK

– HSUPA:QPSK

– LTE: 256QAM

RF receivers
For the main RXsection the IC features 13 RX inputs, which can be used for multi-mode receive, this means they can be used for GSM and CDMA and UMTS and LTE according to the operating bands for each system.
FDD LTE RX, with one low band and Two high bands selected from:

– Band 2 (1930 MHz -1990 MHz)

– Band 4 (2110MHz –2155MHz)

- Band 5 (869MHz –894MHz)
- Band 7 (2620MHz –2690MHz)
- Band 12 (729MHz –746MHz)
- Band13 (777MHZ-788MHZ)
- Band 17 (734MHz –746MHz)
- Band 26 (859MHz –894MHz)
- Band 38 (2570MHz –2620MHz)
- Band 41 (2555 MHz - 2655 MHz)
- Band 66 (2110 MHZ-2178 MHZ)

UMTS:
- Band 2 (1930 MHz -1990 MHz)
- Band 5 (869MHz –894MHz)

GSM:
- GSM 850 (869MHz –894MHz)
- PCS 1900 (1930 MHz -1990 MHz)

The on-chip receive signal paths are functionally identical for each mode (UMTS or GSM) 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 a differential configuration to maximize common-mode rejection, Tx isolation, out-of-band suppression, and second-order intermodulation performance.

The down converters output drive analog baseband filters and buffer circuits that are programmed to support the active operating mode's waveforms (LTE WCDMA or GSM). 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 local oscillator 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 powerdown, 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 local oscillators under control of their PLLs.

Statement: Non-EU bands cannot be used in the EU

For BT/WIFI/GPS

The 3-in-1 module WCN3680 integrates Bluetooth, WLAN and GPS in one chip. The WLAN function follow IEEE 802.11a/b/g/n/ac-HT20/HT40/HT80 standard. The Bluetooth function follow Bluetooth standard Bluetooth version BT4.2.

WIFI:

WCN3680supports1/2/6/9/11/12/18/24/36/48/54/MCS0~MCS7/MCS8~MCS15(ONLY 5G support) Mbps of transmitting speed. The device of RF carrier is DQPSK, DBPSK, CCK and OFDM. The device adapts direct sequence spread spectrum modulation.

WCN3680 is an IEEE 802.11a/b/g/n/ac Wireless LAN adapter. It allows your computer to connect to a wireless network and to share resources, such as files or printers without being bound to the network wires. Operation in 2.4GHz Direct Sequence Spread Spectrum (DSSS) and 2.4GHz and 5GHz Frequency Division Multiplexing (OFDM) radio transmission, this device transfers data at speeds up to 64/128-bit Wired Equivalent Protection(WEP) algorithm and the new industrial-strength WPA (Wi-Fi Protected AccessTM) security is used. In addition, its standard compliance ensures that it can communicate with any IEEE 802.11a/b/g/n/ac-HT20/HT40/HT80 network.

BT:

The WCN3680 chipset is compliant with Bluetooth Core Specification Version BT5.0 and provides excellent Bluetooth connectivity performance.

AntennaDescription

BT	PCB Antenna:-1.2dBi
WiFi2.4G	PCB Antenna:-1.2dBi
WiFi5G	PCB Antenna:-2.8dBi
GPS	Patch Antenna: -1.8dBi

2G PIFA Antenna
GSM 850:-2.6dBi
PCS1900: -1.8dBi

WCDMA PIFA Antenna
B2: -1.6dBi
B5:-1.5 dBi

LTE PIFA Antenna
B2: -1.5dBi
B4: -1.5dBi
B5: -1.5 dBi

B7:-2.2 dBi
B12: -1.5 dBi
B13: -1.7 dBi
B17: -1.5 dBi
B26: -2.2 dBi
B38: -2.2 dBi
B41: -2.2 dBi
B66: -1.8 dBi