

5. Circuit description

5.1 MM-5100U CDMA 1X Modem circuit description

The MM-5100U CDMA modem consists of the CDMA Engine, power generation part, digital part, RF part and connectors. The Fig 1-1 is block diagram of MM-5100U CDMA 1X modem.

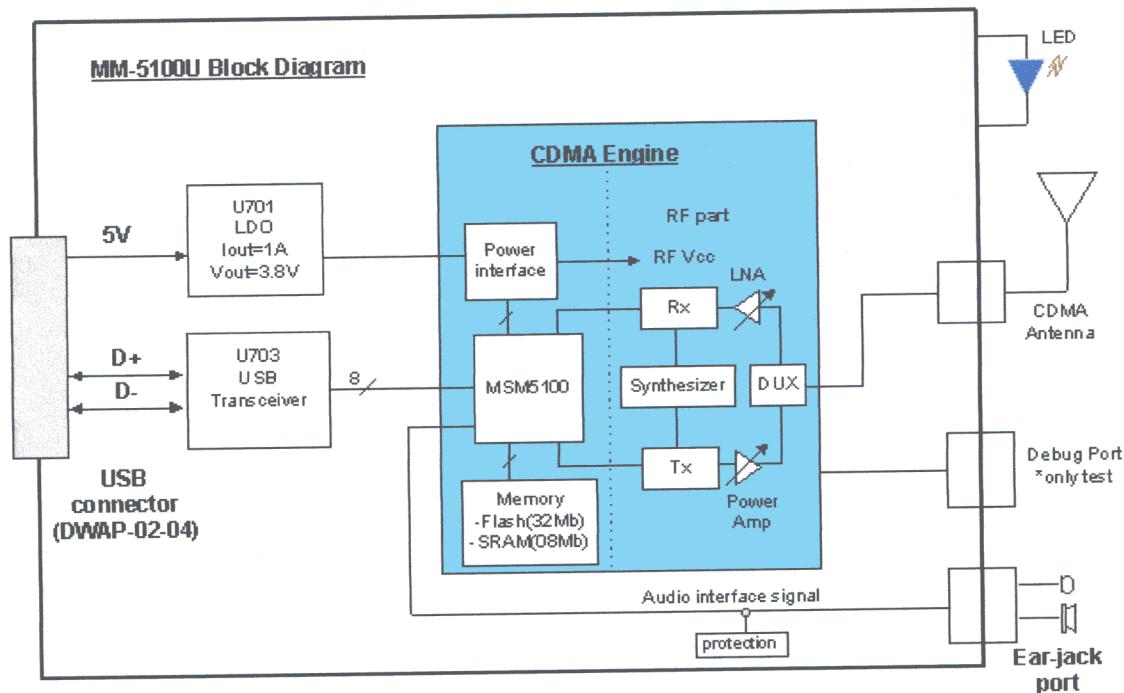


Figure 4.1 MM-5100U CDMA 1X modem block diagram

5.2 Power interface part

DC Power is supplied from the USB connector.

- LDO(U701): This component is low dropout regulator. Output voltage is about 3.8V DC.
This LDO output voltage is inputted to CDMA Engine power interface.

Each block of CDMA Engine uses low-drop-output linear regulator.

- U500 : voltage regulator for digital circuit (2.8 DC)
- U501 : voltage regulator for VC-TCXO and IFR3300 (3.0V DC)
- U502 : voltage regulator for RF Rx part (3.0V DC)
- U503 : voltage regulator for RF Tx part (2.85V DC)
- U505 : voltage regulator for digital part(2.7V DC)
- And power AMP is directly supplied.

5.3 Digital part

- U400 : MSM(Mobile Station Modem) ASIC is chip responsible for CDMA/FM mobile station's base-band digital signal processing. For this chip to function, TCXO(19.2MHz) is required as basic clocks.

And sleep crystal (32.768KHz) is used as clock source of MSM ASIC.

MSM consists of CDMA core and DFM core. CDMA core is a part for processing CDMA signal consisting of modulator/demodulator, interleaver/deinterleaver and encoder/decoder in the CDMA mode.

- U401: Memory part consists of Flash memory and SRAM.

Flash memory: store to main program.

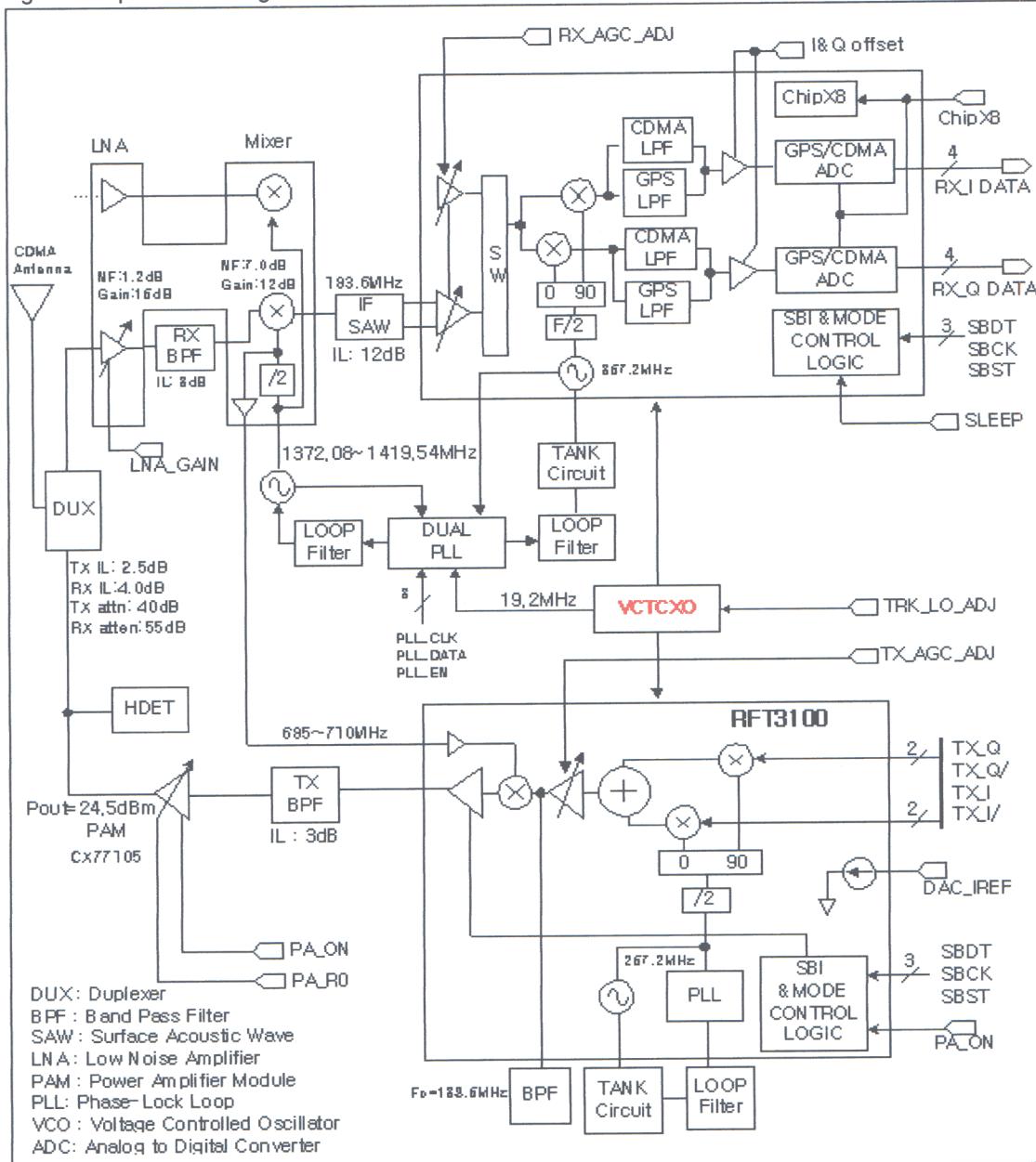
SRAM: performs to read and write data

- U703: USB transceiver is fully compliant with the USB specification Rev1.1.

5.4 RF part

RF part consists of synthesizing part, transmission and reception part.

Fig 4.2 RF part block diagram



5.4.1.1 Frequency synthesizing part

Frequency synthesizing part called PLL Synthesizer consists of three synthesizer circuit which is first local synthesizer, Tx IF synthesizer and Rx IF synthesizer. The first local synthesizer generates the primary local system oscillation frequency, operating over 1372.08 ~ 1419.54 MHz frequency range. Tx IF and Rx IF synthesizer generate the second local oscillation frequency, 267.2 MHz and 367.2 MHz respectively.

5.4.1.2 Receiving part

- Duplexer. The duplexer filters the RF signal transmitted through Antenna and sends the signals to LNA.
- LNA. This part in front-end is used to amplify the received signal with low noise figure
- Down converter. It acts as a mixer using first local frequency to produce the desired signal in the mid-range frequency of 183.6 MHz.
- Rx AGC. This part is designed to control the gain of the dynamic range of midrange frequency produced in down converter according 80 dB dynamic range.

Currently, previous BBA is divided into IFR3300(Rx IF-baseband converter) and RFT3100(Tx baseband-IF converter). IFR3300 acts as the baseband analog processor which processing the signals between the IFR3300 and digital processing circuit.

In the while, RFT3100 consists of Tx AGC and Tx part analog processor of previous BBA.

5.4.1.3 Transmission part

- Tx AGC. It is designed to be gain-controlled from 84 dB dynamic range. The gain of this part is controlled by MSM using digital control signal.
- Up converter. This part mixes the IF transmission frequency 138.6 MHz and the first local 1372.08 ~ 1419.54 MHz to generate transmission frequency of 824.64 ~ 848.37 MHz.
- Power AMP module. This part is designed to work in 824 MHz ~ 849 MHz frequency range in the CDMA mode and can generate the proper output power. The DC voltage into the power amp module is typical 3.8V.