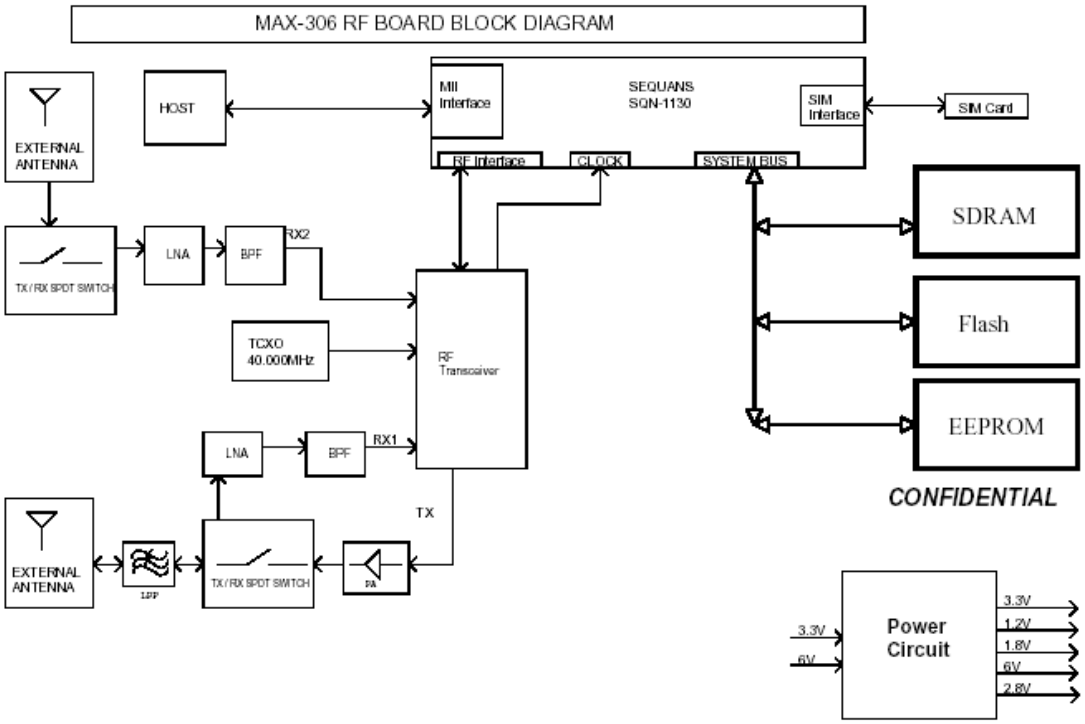
Technical Description of MAX-306



Critical Components:

1. **Baseband SoC**

Sequans SQN1130 System-on-Chip (SoC) is a full-featured, single-chip baseband WiMAX controller that performs MAC and PHY functions specified by the IEEE 802.16e-2005 mobile WiMAX standard. The SQN1130 SoC is designed to be integrated into Mobile Station products. The SQN1130 SoC supports a variety of RF front-ends thanks to a flexible RF control interface.

2. **RF Transceiver**

The MAX2839 single-chip Direct Conversion RF transceiver IC is designed for 2 GHz NLOS wireless broadband MIMO systems. It incorporates one transmitter and two receivers, with 25dB isolation between each receiver. The IC includes all circuitry required to implement the complete RF transceiver function, providing fully integrated receive paths, transmit path, VCO & tank, frequency synthesis, and baseband/control interface. It includes a fast-settling Sigma-Delta RF Fractional Synthesizer with ~25Hz frequency step size. The IC also integrates on-chip AM detector for measuring transmitter I/Q imbalance and LO leakage. An internal transmit to receive loop back mode allows for receiver IQ imbalance calibration. The Local Oscillator IQ quadrature phase error can be digitally corrected in ~0.25$_{o}$ steps. The IC supports full duplex mode

of operation for either internal or external loop back.

Key Features:
- 0 dBm linear OFDM Transmit Power, -70dBc spectral emission mask
- 2.4dB receiver noise for each receiver
- On-chip TX I/Q error & LO leakage detection and adjustment
- Monolithic low-noise VCO with -39dBc integrated phase noise
- Fully integrated programmable I/Q low-pass RX channel filters
- Programmable TX I/Q low-pass anti-aliasing filters
- Fractional PLL with 4-wire bidirectional serial interface
- 60dB transmit power control range with 0.5dB step size, digitally controlled
- 94dB receive gain control range, 1dB steps, digitally controlled
- Both serial and parallel gain control for transmitter and receiver
- RSSI with 60dB dynamic range
- Digital TX/RX Mode control
- Digitally tunable Crystal Oscillator
- Single +2.7V to 3.6V supply
- Shutdown mode (Icc < 100uA)

3. SDRAM

The K4M56163PI is 268,435,456 bits synchronous high data rate Dynamic RAM organized as 4 x 4,194,304 words by 16 bits, fabricated with SAMSUNG's high performance CMOS technology. Synchronous design allows precise cycle control with the use of system clock and I/O transactions are possible on every clock cycle. Range of operating frequencies, programmable burst lengths and programmable latencies allow the same device to be useful for a variety of high bandwidth and high performance memory system applications.

4. FLASH

The MX25L6405DZNI-12G features a serial peripheral interface and software protocol allowing operation on a simple 3-wire bus. The three bus signals are a clock input (SCLK), a serial data input (SI), and a serial data output (SO). Serial access to the device is enabled by CS# input.

After program/erase command is issued, auto program/erase algorithms which program/erase and verify the specified page or sector/block locations will be executed. Program command is executed on byte basis, or page (256bytes) basis, or word basis for Continuously program mode, and erase command is executes on sector (4K-bye), or block (64K-byte), or whole chip basis.

Advanced security features enhance the protection and security functions.

5. TCXO

The 7Q40000013 is a temperature controlled crystal oscillator that oscillates at the frequency of 40MHz with +/-2ppm tolerance. Supply voltage is 2.8V operating at -40 to 85 degrees Celsius temperature range.

6. Band Pass Filter
The LFB2H2G60BB1B973 is a dielectric band pass filter plus balun by Murata. The pass band center frequency is 2.6GHz with pass band range of +/-100.0MHz. The insertion loss is 3.3dB max under typical conditions. The impedance at unbalance port is 50 ohms and 100 ohms at the balanced port.

7. Power Amplifier
The MGFS36E2527 is a GaAs RF amplifier designed for WiMAX CPE with output power in 2.5-2.7GHz band utilizing InGaP HBT process. The device can deliver 27dBm output power under 64QAM OFDM modulation, with 2.5% EVM at Vcc=6V.

Key Features:
- 6V Operation
- 27dBm Linear Output Power
- 33dB Linear Gain
- Integrated Output Power Detector
- Integrated 1-bit 19dB Step Attenuator

8. Transmit/Receive Switch
The HWS466 is a GaAs PHEMT MMIC SPDT switch operating at DC-6GHz in a low cost miniature SON6L (2 x 3 mm) plastic lead (Pb) free package. The HWS466 features low insertion loss and high linearity with very low DC power consumption.

Key Features:
- Insertion Loss = 0.50dB typical @ 2.30-2.70GHz
- Isolation = 25.0dB typical @ 2.30-2.70GHz
- Return Loss = 12dB
- P1dB = 36dBm @ +3V
- Second and Third Harmonics = -75dBc @ Pin = 20dBm
- Switching Time = 50nsec