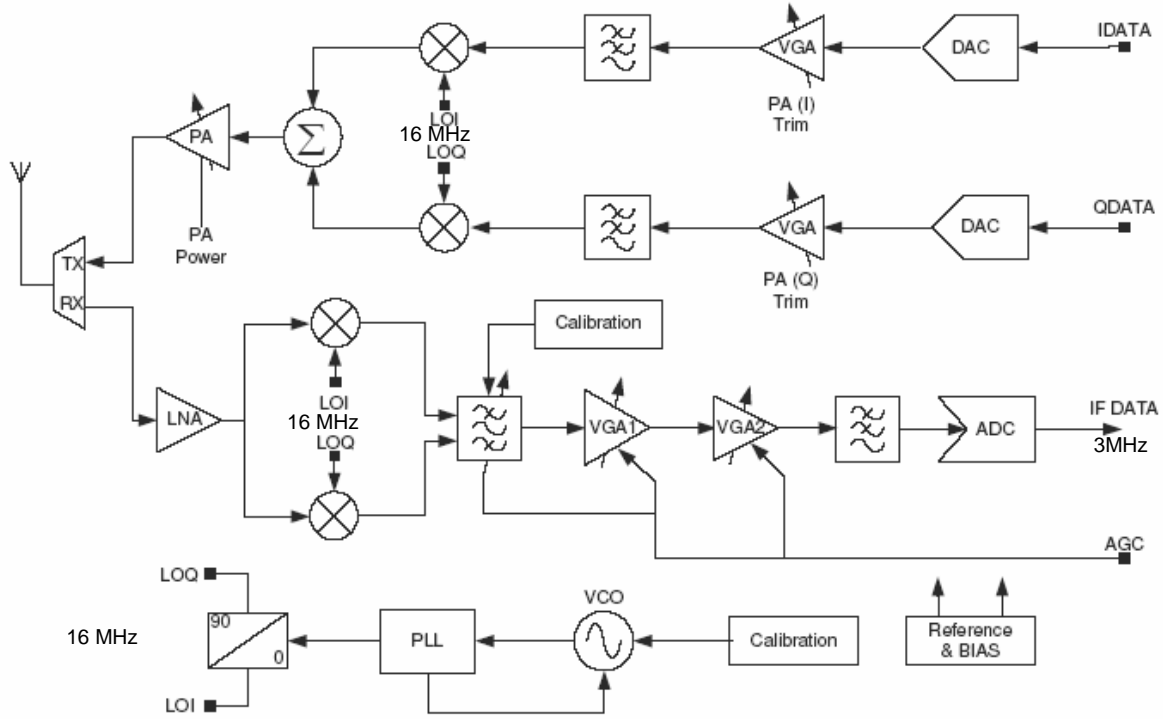## RADIO BLOCK DIAGRAM

The radio comprises a low-IF receive path and a direct up-conversion transmit path, which converge at the TX/RX switch. This switch includes the necessary matching components such that a 200Ω differential antenna may be directly connected without external components. Alternatively, a balun can be used for single ended antennas.

The 16MHz crystal oscillator feeds a divider, which provides the frequency synthesiser with a reference frequency. The synthesiser contains programmable feedback dividers, phase detector, charge pump and internal Voltage Controlled Oscillator (VCO). The VCO has no external components, and includes calibration circuitry to compensate for differences in internal component values due to process and temperature variations. The VCO is controlled by a Phase Lock Loop (PLL) that has a loop filter comprising 3 external components. A programmable charge pump is also used to tune the loop characteristic. Finally, quadrature (I and Q) local oscillator signals for the mixer drives are derived.

The receiver chain starts with the low noise amplifier / mixer combination whose outputs are passed to the polyphase bandpass filter. This filter provides the channel definition as well as image frequency rejection. The signal is then passed to two variable gain amplifier blocks. The gain control for these stages, and the bandpass filter, is derived in the automatic gain control (AGC) block within the Modem. The signal is conditioned with the anti-alias low pass filter, before being converted to a digital signal with a flash ADC.
In the transmit direction, the digital I and Q streams from the Modem are passed to I and Q quadrature DAC blocks which are buffered and low-pass filtered, before being applied to the modulator mixers. The summed 2.4 GHz signal is then passed to the RF Power Amplifier (PA), whose power control can be selected from one of six settings. The output of the PA drives the antenna via the RX/TX switch.

Channel & Frequency

Channel Number	Centre Frequency(MHz)
1	2405
2	2410
3	2415
4	2420
5	2425
6	2430
7	2435
8	2440
9	2445
10	2450
11	2455
12	2460
13	2465
14	2470
15	2475
16	2480