Theory of transmitter for QP-650

The QP650 radio utilizes a multi-function transceiver IC1403 with fully integrated synthesizer, IF selectivity and base-band signal processing. This IC uses a digital low-IF architecture and integrates a low noise amplifier, a quadrature image-reject mixer, an analog band pass filter to rejection out band noise, a programmable gain control, high resolution analog-to-digital converters, DSP core and high-fidelity digital-analog converters .The DSP core includes IF down-converter, FM modem, RSSI calculation, AFC control loop, audio/subaudio filter banks and CTCSS/CDCSS matched filter etc. the block diagram is as following:

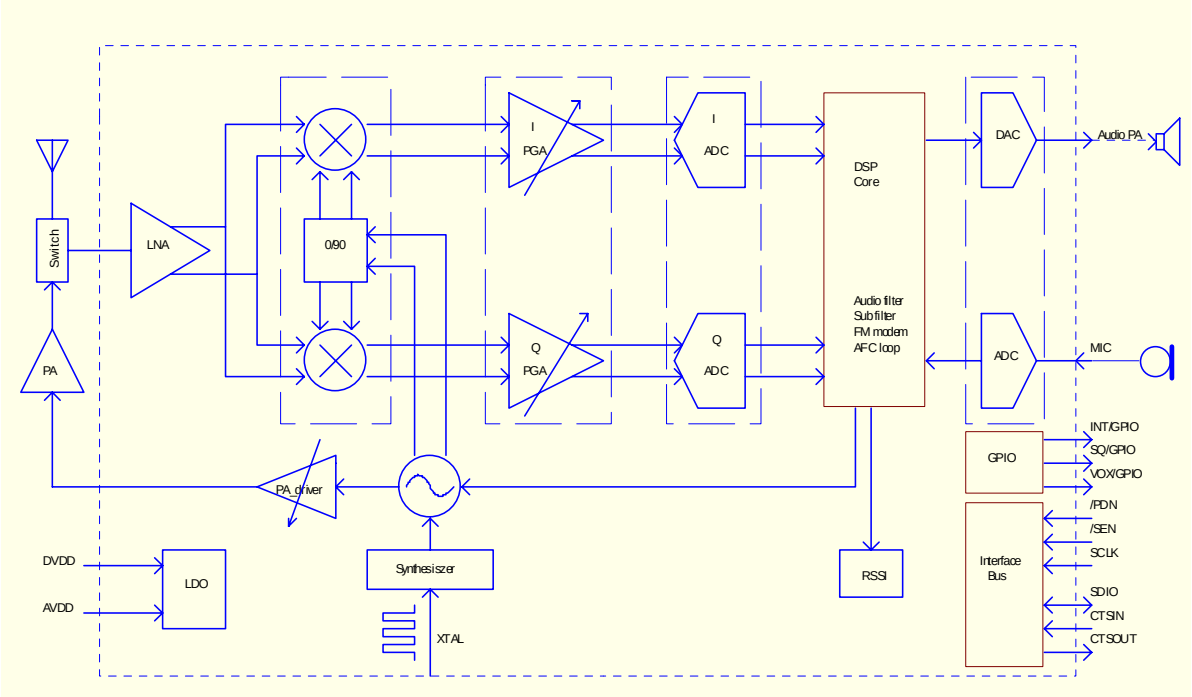

Fig.1 QP650 block diagram

Transmit audio

The audio signal from microphone is amplified, pre-emphasized, filtered, and FM modulation in IC1403.

CTCSS/CDCSS Encoder

The necessary frequency for CTCSS/CDCSS encoder is generated by IC505 and then enter IC1403 to FM-modulated

RF amplifier

The transmit signal obtained from IC1403 is amplified by Q1102. This amplified signal

is passed to power amplifier Q1105 and Q1107, and is capable of producing a 5.5W RF power.

Antenna Switch and LPF

The RF amplifier output signal is passed through a low-pass filter network and a transmit/receive switch circuit before it is passed to the antenna terminal. The transmit/receive switch circuit is comprised of D1101 and D1102, D1103. They is turned on in transmit mode and off in receive mode.