Operational Description

FCC ID: OKKNMX910

Circuit Description

The channel frequency for both the transmitter and the receiver are controlled by two separate phase locked loops using a common VCTCXO reference of 9.60 MHz. The reference oscillator has a stability of +/-1 ppm over the temperature range of –30 to +60 degrees C. There is circuitry that disables the transmitter whenever the PLL is out of lock. Maximum frequency error of the transmitter is +/-1.35 KHz.

Modulation is GMSK with a BT = 0.3. The gaussian filter associated with the modulator is contained inside the modem IC (U6, type FX909AD5). The modulation level is fixed by component values, and cannot be changed by any external control. Voice modulation is not possible. The resulting emission bandwidth complies with FCC 90.210 mask J for any digital sequence. Data rate is fixed at 8.0 KHz.

The transmitter has a power leveling circuit to control the output power to within +/-2 dB. There is no external control of the power output.

The receiver uses dual conversion with a first IF of 86.85 MHz injected on the high side of the carrier.

There are not external filters associated with this product. Provision is made for the connection of an external antenna, required in normal operation.

Function and Semiconductor Devices

This description is limited to the transceiver section of the unit only. See the block diagram for the location of the devices identified by circuit reference numbers.

CVCO1	Receiver voltage controlled oscillator used as part of the RX phase locked loop to generate the first mixer injection signal. First mixer injection is on the high side.
CVCO2	Transmitter voltage controlled oscillator used as part of the TX phase locked loop. Runs at the final TX frequency.
CXTL1	Reference oscillator for both RX and TX phase locked loops. Runs at 9.6 MHz.

U7	Phase comparators and frequency dividers. Part of both the RX and TX phase locked loops.
SQ6	Frequency multiplier used in generating the second mixer injection signal. Multiplication is x 9.
SQ7	Second mixer injection amplifier.
SU6	RX front end amplifier and first mixer.
SU8	RX first IF amplifier, second mixer, second IF amplifier, and demodulator. The first IF is 86.85 MHz, the second IF is 450 KHz and the second oscillator injection is on the low side.
SU1	Level setting of the RSSI indicator from the receiver.
SQ10	TX pre-driver. Approximately 0dBm output.
SQ4	TX power amplifier driver. Approximately 9dBm output.
CU3	TX final power amplifier with power control element.
CU2	RX/TX antenna changeover switch driven by SQ2 and SQ3.
SD1	TX forward power detector. Part of the TX power control loop.
SD2	TX forward power detector. Part of the TX power control loop.
SU12	TX power control loop amplifier.
SQ5	TX output disable. Used for “out of lock” disable.
SU9	TX modulation input amplifier.