

APPENDIX B

(FCC Ref. 2.1033(b)(4))

"Description of Circuit Functions"

Circuit Description

System Architecture

The Thomson 2.4GHz cordless phone employs Conexant's chipset which consists of the Transceiver Chip, Power Amplifier Chip, and the ASIC. Both base and handset share similar RF circuitry. RF link between the base and the handset is established through U1 (RF transceiver), U4 (Power Amplifier) with two in-house designed antennas (Base---internal helical antenna; Handset---internal monopole antenna).

The RF transceiver is a fully integrated transceiver device, which provides the transmit, receive, and frequency synthesis functions for 2400 MHz distance™ (digital Spread Spectrum Technology) systems. It implements a direct conversion architecture and time division duplexing of the transmit and receive signals to minimize circuit complexity. The receive path of the transceiver provides complete RF-to-baseband I & Q demodulation which includes an LNA, double-balanced quadrature mixers, fully integrated channel selection filters, and baseband variable-gain amplifiers. The transmit path is a variable-gain direct conversion modulator. The block diagram of the transceiver is shown in figure 1.

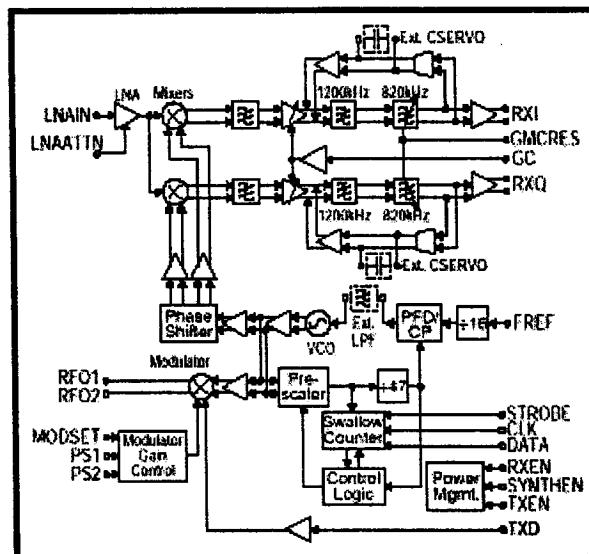


Figure 1. RF transceiver block diagram

A 2400–2483 MHz frequency synthesizer controls the frequency of an off-chip VCO, and synthesizes a carrier frequency for both transmit and receive modes. The RF transceiver, combined with the Power Amplifier, forms a complete system solution for a direct conversion 2400 MHz diSTance radio which is fully compliant with FCC Part 15 regulations in the ISM band.

Transmit side :

The 1.2 Mbps spread spectrum data from the ASIC (U7) pin 80 TXDATA first pass through a low pass filter constituted by L1 ,C9 and C10 . The filter performs waveform shaping function to limit the transmission bandwidth. The filtered data are then fed into pin 8 TXD of the transceiver chip (U1) and BPSK modulated with the TX carrier . The modulated carrier comes out from pin 15 and pin 16 and is used to drive the power amplifier.

The power amplifier (PA) operates in Class AB mode, which delivers output power proportional to input power. The following figure shows the block diagram of the power amplifier.

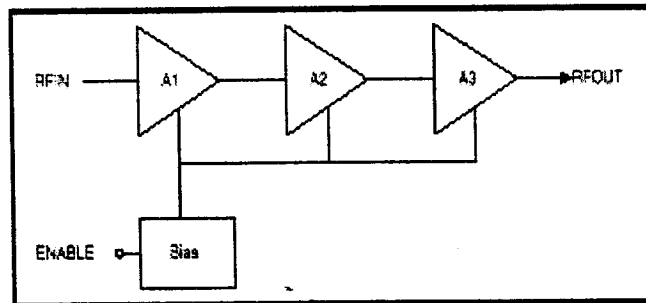


Figure 2. Block of Power Amplifier

Microstrips MS1 to MS6 performs dual functions as PA output matching and combine the differential outputs to single balanced output. The balanced output is low passed by MS9 and MS10 and C45 to C47 to suppress spurious emission. The filtered output then passes the T/R switch and is fed to the antenna through the antenna matching network.

Security Code:

The 2.4GHz cordless implements a security scheme to prevent unauthorized access of the cordless phone by using a security code. The security code is constituted by 2 byte ID code and 1 byte scramble data, with total code combination of 16777216. The 2 byte security is generated by random process during handset parking. When handset is parked on the base, the base transfers the security code to the handset through a conductive link and the handset re-transmits the code through RF link to the base. An unauthorized handset with wrong security word cannot link with the base and vice versa. In addition, the ID code and the scrambler word are input to the PN sequence generator and XOR ed with the Tx data for scrambling or XOR ed with Rx data for descrambling. Therefore, communication between only authorized base and handset is further ensured.