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Introduction

Direct Sequence Digital Spread Spectrum Digital Cordless Telephone

Digital Spread Spectrum Phones utilize direct sequence encoding to ensure fast and reliable connections. With direct sequence, the information (voice conversation) to be transferred is broken into "chip" or blocks of data and spread over the transmitting bandwidth, which reduces the power density of the signal. At the receiving end, the digital "chip" are combined and demodulated.

Direct frequency modulation allows for freedom in selecting the channels that have the least amount of traffic and interference in their area. Direct Sequence Spread Spectrum does this automatically - intelligently finding the nearest and clearest channel at all times to ensure crisp communication. This smart hopping technique avoids the bursty errors and interference encountered in frequency hopping systems. Users are able to continue their conversations undisturbed, while the digital spread spectrum technology maintains a clear connection.

The DSSS-DCT Device Set provides a highly integrated solution for 900MHz Spread Spectrum Digital Cordless Telephone (DCT). The Device Set perform all protocol, data formatting, spread spectrum, audio processing and peripheral functions for DCT. The Device Set is self-configurable for use in handset or base station.

The device Set consists of :1) an **ASIC**, into which are integrated a DSS **Baseband modem**, an **audio modem**, and a **controller**; and 2) a **linear audio codec**.

The **ASIC** and audio codec are packaged in a single 100-pin device to minimize system cost.

The **Baseband modem** provides all modulation, encoding, spreading, scrambling, TDD control, AGC, AFC, decoding, and timing required for a DSS system.

The **Audio modem** consists of an ITU G.726-compliant 40 kbps or 32 kbps ADPCM engine that interfaces to the audio codec. Built-in DTMF and ring tone with audio path control complete the interface for audio support functions.

The **Controller**, an embedded MC19 (65C02) micro-controller core, performs all control and monitoring functions required for a DSS telephone. Interfaces are provided for all peripheral functions needed for a complete DSS telephone, such as keypad, LED, LCD, and EEPROM. System performance is further enhanced by control functions for a secure serial link between handset and base station, and by power management algorithms.

The **Audio codec** is ITU G.714-compliant. It converts analog signals from the PSTN and microphone to and from digital voice samples for the audio modem. It has built-in electret microphone interfaces and independent audio channels for line and speaker interfaces.

For the RF circuitry, it is a direct conversion transceiver. For transmit analog wave shaped baseband data is BPSK modulated directly to the carrier frequency. For receive, the carrier is directly converted to analog baseband in-phase and quadratrure data signals. The DCT uses Time Division Duplexing (TDD) to channelize the transmit and receive data. The transmit time slot is 1ms wide, and the receive time slot is also 1ms wide. The result in a 2ms TX/RX superframe.

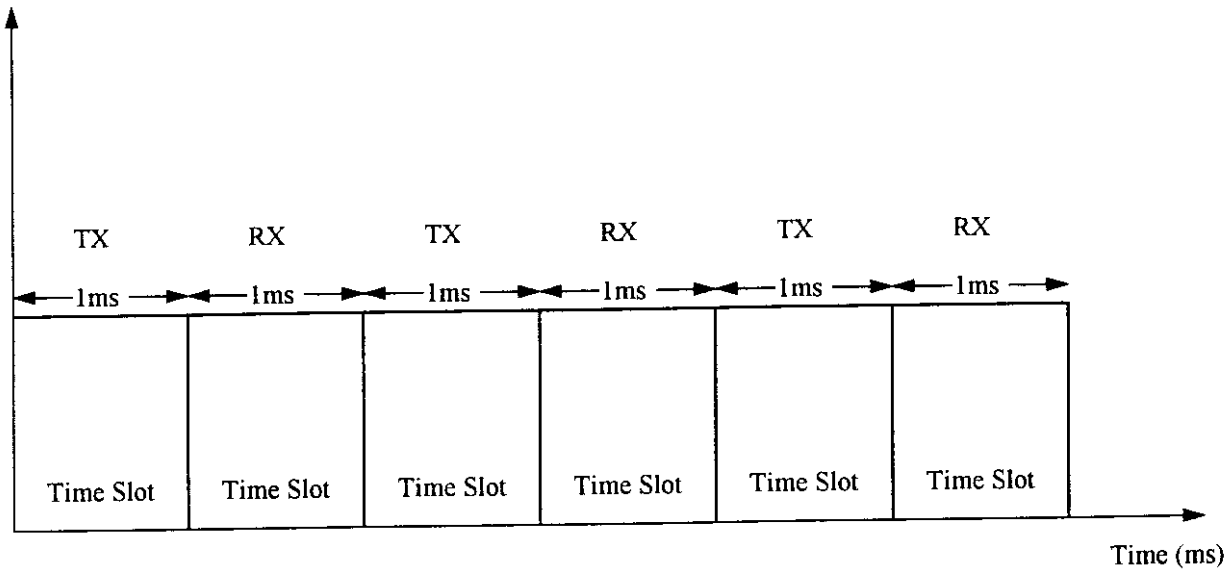
The circuitry consists of 1) **RF105 DSSS Transceiver** and 2) **900MHz Power Amplifier**.

RF105 is a fully integrated transceiver IC, provides the transmit, receive, and frequency synthesis functions for 900 MHz Digital Spread Spectrum (DSS) system, using a direct conversion architecture and time division duplexing of the transmit and receive signals to minimize circuit complexity. The receive path of it 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. A 902-928 MHz frequency synthesizer with on-chip VCO and resonator are also included to provide the LO frequency for both transmit and receive modes.

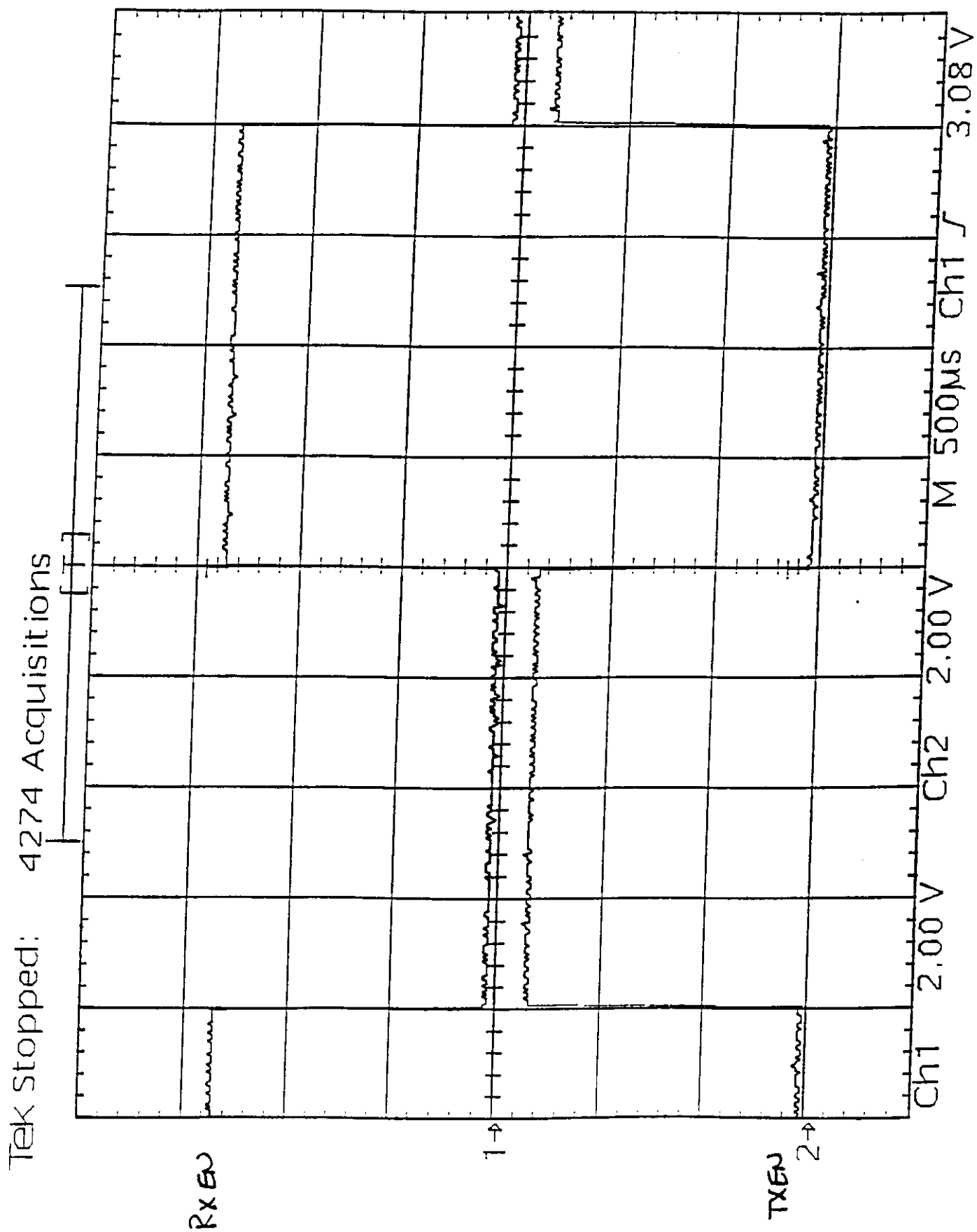
RF106 is a class AB RF power amplifier for 900 MHz ISM band applications. It delivers output power proportional to the input signal power.

TDD 50% DUTY SYSLE

The RF Modem architecture is a direct conversion transceiver. For transmit analog wave shaped baseband data is BPSK modulated directly to the carrier frequency. For receive, the carrier is directly converted to analog baseband in-phase and quadrature data signals. The DCT uses Time Division Duplexing (TDD) 50% duty cycle to channelize the transmit and receive data. The transmit time slot is 1ms wide, and the receive time slot is also 1ms wide. The result in a 2ms TX/RX superframe 50% duty cycle.



50% DUTY CUCLE OF TRANSMIT AND RECEIVE


Tek Stopped: 4274 Acquisitions
Ch1 2.00 V
Ch2 2.00 V
M 500µs Ch1 ƒ 3.08 V
RX EN
TX EN
1
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