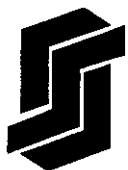




EXHIBIT 4

EXPOSITORY STATEMENT



FCC ID: CLHSKYHAWK98

S.MEGGA Telecommunications Limited

S.Megga Industrial Building, 1 Kwai Hei Street, Kwai Chung, N.T. Hong Kong
TELEX: 36251 MEGGA HX CABLE ADD: SELECINDUS TEL: 852-26141111 FAX: 852-26146649

1. General & ENVIRONMENTAL SPECIFICATIONS

1.1 Specification

1.1.1 Feature List

1. 24-bits I.D
2. Auto phone on (for incoming call)
3. Last number redial (32-digits)
4. Flash button for PSTN (call waiting)
6. PAGING from Base to Handset
7. AUTO INTERCOM from Handset to Base
8. 16 char. dot matrix LCD on Handset
9. Switchable Pulse or Temporary Tone dialling
10. Selectable Tone/Pulse Hard switch
11. Out Of Range warning on LCD
12. Low Battery Warning on LCD
13. Ringer ON/OFF switch (Base only)
14. Adjustable Receiver volume (8 levels)
16. Key beep
17. Rechargeable batteries(3.6V)
18. LEDs indication on Base
19. New message LED on Base for Caller ID reception
20. Mic mute for Handset
21. 10 memories dialling (16 digits)
22. Fixed Length Handset Antenna
23. Base Antenna
24. Handset Operation Time: Standby > 5 days
(600mAh)NiCd
Talk(low power operation) > 3.5 hours
(600mAh)NiCd
25. Walk Range: > 350m (Open area)
26. 20 channels only (Time division duplexing)
27. Channel Bandwidth 1.2 MHz

1.2 Technical Specification

- 902-928MHz ISM Band operation
- Direct Sequence Spread Spectrum system
- FCC Part 15 and Part 68



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- UL 1459 and EIA-470
- Voice coder: 32 kb/s ADPCM
- Talk Range (3.6V, 100mW): up to 1 km for open site, 250m typical (fading & some mutipath)
- level power management: 1mW, 10mW, 100mW
- Direct conversion
- Three battery cell design operating 3.6V nominal
- Talk time (600mAh pack)
 - low Power mode: 3.5 hours
 - standby mode : 5 days
- User-customizable phone control software
- Channel spacing: 1.3MHz
- No. of Channels: 20 channels
- Frame time: 4ms (2ms Tx, 2ms Rx)
- Rx sensitivity: -104dBm, -84dBm(fading)
- Processing Gain: about 11dB (960kchip/s & 2samples/chip)

2. TECHNICAL DESCRIPTION

2.1 Theory of Operation

Introduction

Spread spectrum is a modulation technique as a secure means of communication unencumbered by natural noise and other signal interference. The FCC authorized the technology for commercial use in 1983. The spread spectrum modulation signal is uniformly spread over a wide range of frequencies for transmission, allowing the signal to avoid or eliminate interference and noise from other signals. The two most popular techniques utilized for encoding spread spectrum signals are direct sequence and frequency hopping.

DSS-9260 spread spectrum phones utilize direct sequence encoding to ensure fast and reliable connections. With direct sequence, the voice conversation to be transferred is broken into "chips" or blocks of data and spread over the transmitting bandwidth, which reduces the power density of the signal. AT the receiving end, the digital "chips" are combined and demodulated.

Direct sequence modulation allows for freedom in selecting the channel that have the least amount of traffic and interference in their area. Dss-9260 phone does this automatically intelligently finding the nearest and clearest channel at all times to ensure



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crisp communication. This smart hopping technique avoids the burst errors and interference encountered in frequency hopping systems. Users are able to continue their conversations undisturbed, while spread spectrum technology maintains a clear connection.

The **RDSSS9M Enhanced Device Set** (include ASIC & CODEC) provides a highly integrated Solution for 900 MHz Spread-Spectrum Digital Cordless Telephone (DCT). The Device Set performs all protocol, data formatting, spread spectrum, audio processing and peripheral functions for spread-spectrum DCT in conformance with United States FCC regulation Part 15.247. The Device Set is self-configurable for use in handset or base station.

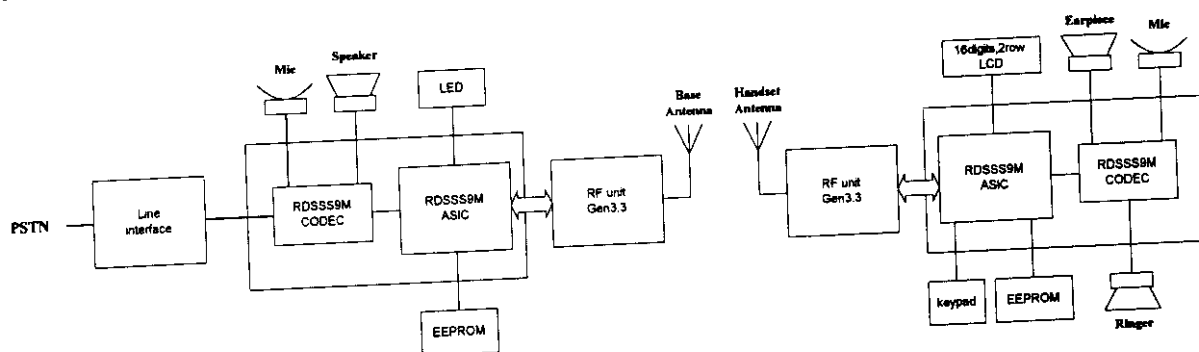


Fig.1

The RDSSS9M Device Set Consists of 2 devices: 1) An **ASIC**, into which are integrated a Direct-Sequence Spread-Spectrum (DSSS) **Baseband Modem**, and **Audio Modem**, and a **Controller**; 2) A linear voice **Codec**.

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

The **Audio Modem** consists of an ITU G.721-compliant 32 Kbps ADPCM engine. The engine interfaces to RDSSS9M Codec unit. Built-in DTMF, ring tone and noise generators with audio path control complete the interface for audio support functions.

The **Controller** and embedded MC19 (65C02) micro-controller core, performs all control and monitoring functions required for spread-spectrum telephone. Interfaces are provided for all peripheral functions required for a complete spread-spectrum telephone, such as keypad, LED, LCD and EEPROM. System performance is further enhanced by



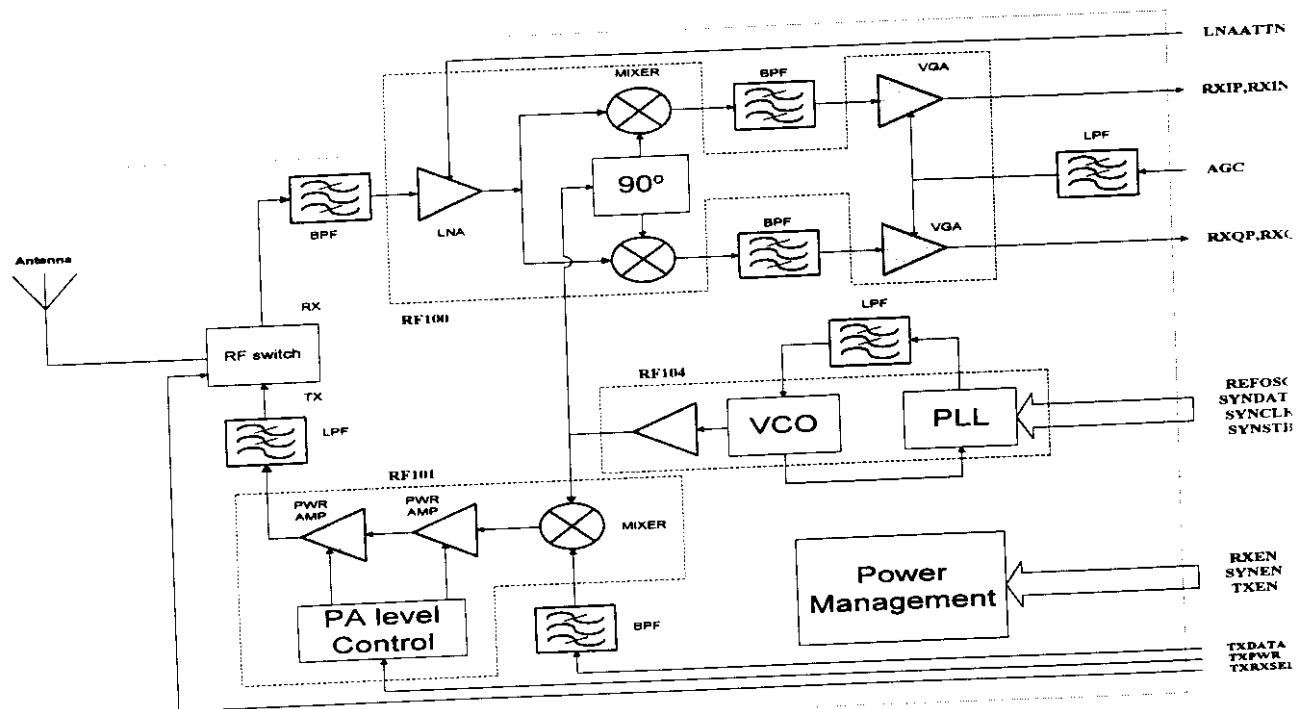
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control functions for a secure serial link between handset and base station, and by power management algorithms. The power management, along with the system's operating voltage of 2.7 V, provides >5-day standby and ≈ 3.5 hours of talk time on 3-cell battery operation.

The **Codec** is used to convert 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.

The **Direct-Conversion Transceiver RF Module** is a complete transmitter and receiver that provides all of the necessary baseband-to-RF and RF-to-baseband signal conversion functions for 902-928 MHz digital communications. Figure 2 shows the functional block diagram of the RF Module.



Transmit Path

The TXDATA baseband digital data input signal is filtered and up-converted to RF by the DBPSK modulator.

High, medium, or low PA output power levels are selectable via the TXPWR control lines (2). The PA output is lowpass filtered to remove harmonics, then routed



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through the transmit/receive (T/R) switch before exiting the module at the ANTENNA port.

Receive Path

From the ANTENNA port, the RF signal passes through the T/R switch, and the RF bandpass filter. Filtering before the low noise amplifier (LNA) attenuates signals outside the 902-928 MHz band.

The LNA provides two gain levels for coarse automatic gain control (AGC), which are selected via the LNAATTN control. Down-conversion to quadrature baseband signals is done using a matched pair of mixers and a 90° phase splitter for the LO.

The quadrature baseband signals are lowpass and highpass filtered to attenuate out-of-channel signals and remove low-frequency (down to DC) energy component.

A matched pair of variable gain amplifiers (VGA) provide fine AGC. The differential in-phase and quadrature baseband signals are DC-coupled to the RXIP, RXIN, RXQP and RXQN outputs, respectively.

Frequency Synthesizer

The RF LO is generated by a programmable phase-locked loop filter, the external reference oscillator, and the frequency synthesizer programming.

Power Management

Independent power-up/power-down control of the transmit path, receive path, and frequency synthesizer is provided by the TXEN, RXEN and SYNEN controls, respectively. When all of the functions are powered down, current drain (i.e., standby current) from the voltage supply (VBATT) is 3 mA max.

2.2 INTERFACE SPECIFICATIONS

The RF Modem interface defined herein is the interface to the Baseband Modem.

TxRXSEE (Transmit / Receive Select)

This control bit toggles the RF T/R switch between the transmit and receive paths. A "1" selects the transmit path

TXEN Transmit Enable)

This active high control bit enables bias power to the transmitter circuitry.

RXEN (Receive Enable)



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This active high control bit enables bias power to the receiver circuitry.

SYNEN (Synthesizer Enable)

This active high control bit enables bias power to the synthesizer circuitry.

TXPWRI, TXPWRO (PA Transmit Power)

These two control bits select the PA output power according to the decoded values given in Table 2.

Table 2. TXPWR Control Word and PA Transmit Power

TXPWRO	TXPWRI	PA Transmit Power
0	0	high
0	1	Medium
1	0	Low
1	1	Undefined

LNAATTIN (LNA Attenuator)

This control bit toggles the LNA gain between the tow gain state and the high gain state. A "1" selects the low gain state of the LNA, i.e. attenuator on.

SYNCLK (Synthesizer Programming Clock)

This control signal, which is the programming clock signal provides one wire of the 3-wire serial bus that programs the synthesizer.

SYNDATA (Synthesizer Programming Data)

This control signal, which is the programming data signal, provides one wire of the 3-wire serial bus that programs the synthesizer.

SYNSTB (Synthesizer Programming Strobe)

This control signal which is the programming strobe signal, provides one wire of the 3-wire serial bus that programs the synthesizer.

TXCATA Transmit Data)

The TXDATA line takes a single-ended signal generated by the Easeband Modem. The data signal shalt be a non-CMOS binary waveform with voltage levels of 0 V and 1.2 V. The load is 2.5 Kn from DC to greater than 1 MHz.

RXIP (Received In-Phase Signal, Positive)

RXIN (Received In-Phase Signal, Negative)

This data signal pair from the AF Modem is the differential baseband 960 Kbps NRZ in-phase received data. The signal is differentially driven with a maximum peak voltage of



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0.25 ± 0.1 V (differential output level is 0.5 ± 0.2 V) within the AGC operating range. The common mode voltage is subject to the I/O DC offset specification. The DC load impedance exceeds 100 K Ω . The filtered signal bandwidth is less than 1 MHz.

RXOP (Received Quadrature Signal, Positive)

RXON (Received Quadrature Signal, Negative)

This data signal pair from the RF Modem is the differential baseband 960 Kbps NRZ quadrature received data. The signal is differentially driven with a maximum peak voltage of 0.25 ± 0.1 V (differential output level is 0.5 ± 0.2 V) within the AGC operating range. The common mode voltage is subject to the I/O DC offset specification. The DC load impedance exceeds 100 K Ω . The filtered signal bandwidth is less than 1 MHz.

AGC (Auto Gain Control)

This analog control signal from the Baseband Modem adjusts the gain of the baseband variable gain amplifiers in the RF Modem. An increase in the AGC voltage causes decreased gain (greater attenuation) in the baseband variable gain amplifiers. The voltage range of this signal is 1.1 - 2.0 V into the RF Modems load impedance of greater than 10 K Ω .

REFOSC (Reference Oscillator)

This clock signal from the Baseband Modem provides the frequency reference for the synthesizer. It should be a CMOS-level NRZ square-wave. If a 9.6 MHz reference signal is supplied, and the RDSSS9M chip set is used, the channel spacing will be 1.2 MHz.

Power Supply Terminals

VBATT (Positive Voltage Terminal)

This is the power supply positive terminal for the RF Modem. The voltage range with respect to the ground terminal is +3.0 to +5.0 V.