

## CIRCUIT DESCRIPTION AND DIGITAL SECURITY CODE INFORMATION

### CIRCUIT DESCRIPTION

#### 1.OVER VIEW

The device is a digital spread spectrum cordless telephone which meets with FCC Part 15 requirements. It provides the following features:

Direct Sequence Spread Spectrum Modulation

30 Radio frequency Channels in 2406– 2476MHz ISM band

13mW maximum output power

Time Division Duplex operation

32kbps ADPCM voice CODEC

65536 security codes

Auto Channel codes

Auto Interference Avoidance

#### 2. Configurations

##### 2.1 Transmission

The voice signal is converted into 32kbps digital data by ADPCM CODEC. The digital data is fed to scrambler, differential encoder, spreader which is responsible for the Spread Spectrum modulation. The SS Chip sends out digital data which is made by the spread spectrum sequence. This digital data having a 1.366Mbps data rate is filtered and upper converted to RF by FSK (Frequency Shift Keying) modulator. Then, filtered by LPF (Low Pass Filter) to suppress the out-of-band spurious of the antenna transmission signal.

##### 2.2 Reception

The receiver is dual conversion type. The incoming signal is passed through the LNA (Low Noise Amplifier) and the RF BPF (Band Pass Filter). Down-conversion to base band signal is done using 1<sup>st</sup> , 2<sup>nd</sup> mixers and demodulated by quadrature detector. The SS Chip calculates the correlation from the spreading code and the outputs the detected voice data

to ADPCM CODEC. Finally, the ADPCM CODEC outputs received analog signal.

### 2.3 Duplexing

This DEVICE can communicate by using Time Division Duplexing and Frequency Division Duplexing. It uses same frequency in both transmission and reception. It has 2.25mS msec time frame of one transmission and reception cycle. This frame signal is generated by SS Chip and is provided to all other circuits.

### 2.4 Control

The CPU controls the RF frequency channel. And the ASIC controls ADPCM CODEC and audio signal switching also set up the spreading code. Before established the communication link, THIS DEVICE searches vacant RF channel and then transmits RF signal at the vacant channel. The CPU generates a random security code out of 65536 codes, which can protects customers privacy.

## 3. Specification

Item	Specification
Frequency	2406 – 2476MHz
Channel	30
Channel Separation	2.048MHz
Spread Spectrum method	Direct Sequence (FSK modulation)
Chip rate	1.366Mbps
RF Output Power	13mW (Max.)
Duplexing	Time Division Duplex & Frequency Division Duplex
Burst Frame	2.25msec
Voice Coding	ADPCM
Power Supply	3.6VDC Battery (Handset) / 120VAC Adapter (Base unit)
Operating temperature:	0 to 50 deg C          Humidity: Up to 90%

#### *Digital Security Code Information*

**65536 Digital Security Code:**

This cordless telephone system provides the random digital security code.

**Equipment Description:**

This device is a telephone terminal device that is designed for voice operation in a similar fashion to an ordinary residential or business telephone without the inconvenience and restraint of a handset cord. This device consists of a base unit and a handset. The base unit is intended to connect to standard telephone modular jacks and is supplied electric power from a standard AC power line by using with the AC Adapter. The handset is powered from an internal battery pack.

This device operates by means of a full duplex radio frequency TX/RX system in 2406 – 2476 MHz band with Spread Spectrum Technology. These radio frequency systems operate in accordance with Part 15 of the FCC Rules. This device has been specifically designed to comply with the requirements set forth in Part 68 of the FCC Rules as well as the Part15 requirements. The specifications are below:

**General:**

Modulation : Direct Sequence Spread Spectrum Modulation  
Operating Temperature : 0 deg. C to +50 deg. C  
Security Codes : 65536 Codes

**Base Unit:**

Frequency Band : 2406 MHz – 2476 MHz  
Power Requirements : 9V DC 210mA (Use with AC Adapter)

**Handset:**

Frequency Band : 2406 MHz – 2476 MHz  
Power Requirements : 3.6V DC (Rechargeable Nickel–Cadmium Battery)

1. Antenna Gain for both Units:

SUPPLEMENTAL INFORMATION

Gain respect to dipole	Gain respect to isotropic
Base unit: + 3.16 dB	+ 5.3 dBi (= +3.16 + 2.14)
Handset : +0.36 dB	+ 2.5 dBi (= +0.36 + 2.14)

Note that antenna gain measurement was conducted based on substitution method using with double ridged guide antenna.

2. Channel List (Center frequency for both units):

CH	Base TX Frequency	Portable TX Frequency
1	2406.912MHz	2416.128MHz
2	2408.960MHz	2418.176MHz
3	2411.008MHz	2420.224MHz
4	2413.056MHz	2422.272MHz
5	2415.104MHz	2424.320MHz
6	2417.152MHz	2426.368MHz
7	2419.200MHz	2428.416MHz
8	2421.248MHz	2430.464MHz
9	2423.296MHz	2432.512MHz
10	2425.344MHz	2434.560MHz
11	2427.392MHz	2436.608MHz
12	2429.440MHz	2438.656MHz
13	2431.488MHz	2440.704MHz
14	2433.536MHz	2442.752MHz
15	2435.584MHz	2444.800MHz
16	2437.632MHz	2446.848MHz
17	2439.680MHz	2448.896MHz
18	2441.728MHz	2450.944MHz
19	2443.776MHz	2452.992MHz
20	2445.824MHz	2455.040MHz
21	2447.872MHz	2457.088MHz
22	2449.920MHz	2459.136MHz
23	2451.968MHz	2461.184MHz
24	2454.016MHz	2463.232MHz
25	2456.064MHz	2465.280MHz
26	2458.112MHz	2467.328MHz
27	2460.160MHz	2469.376MHz
28	2462.208MHz	2471.424MHz
29	2464.256MHz	2473.472MHz
30	2466.304MHz	2475.520MHz

As you can see in the table above, the lowest frequency is 2406.912MHz and the highest frequency is 2475.52MHz.

3. Maximum allowable output power:

Please be advised that we designed the rated output power for both unit as +11dBm (= 0.0126 W: 1 dB above 0.01 watts).