EXHIBIT B

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

"Description of Circuit Functions"

21115EE3-A
2.4GHz DSS ONE LINE MULTI HANDSET
Technical Specification

Specifications
Circuit Diagrams
Technical Description

PROPRIETARY INFORMATION
NO DISSEMINATION OR USE ALLOWED
WITHOUT PRIOR WRITTEN PERMISSION

FCC ID: G9H2-1115A
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EXHIBIT B(1)-1

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I. Introduction

The 21115EE3-A Cordless Telephone is a DSS transmitter to be compliance with US (FCC Part 15.247) and Canadian (RSS-210) regulations for license free use in the 2400-2483.5MHz ISM band.

The 21115EE3-A Cordless Telephone operates in the ISM (Industrial Scientific and Medical) band (2400 ~ 2483.5 MHz). The 20dB bandwidth of the hopping channels used in 21115EE3-A is less than 1MHz. And the number of channels used in 21115EE3-A is 90. It complies with FCC part 15.247(a)(1)(ii). The 21115EE3-A is a Digital spread spectrum, it uses the full available frequencies in the ISM band for operation and can make it difficult for other 2400MHz devices to operate correctly.

The 20dB bandwidth of the hopping channels is about 670 KHz and any two consecutive channels are separated by a bandwidth greater than 670 KHz. It complies with FCC part 15.247(a)(1).

The maximum power used in 21115EE3-A base station and handset are 11.0 mW and 7.08 mW respectively. It complies with FCC part 15.247(b)(2).

Each 21115EE3-A base station supports up to four handsets and uses Time Division Duplex to distinguish the four handsets.

II. Specifications

Operating Frequency Range:	2400 ~ 2483.5 MHz
Number of Used Channels:	(87 Channels Possibility) 75 Channels Used
RF Output Power:	mW (Handset) / mW (Base)
Range:	90m/600m (In Door/Out Door)
Type of Spread Spectrum:	Frequency Hopping Spread Spectrum
Bandwidth of Channel:	≤ 1MHz (It is 670 KHz.)
Channel Separation:	≥ 670KHz (It is 891.871 KHz.)
Duplexing:	Time Division Duplex
Power Supply:	3.6VDC (Handset) / 120VAC/9VDC Adapter (Base)

III. Technical Description

1. General

The 21115EE3-A Cordless Telephone is a Digital spread spectrum transmitter to be compliance with US (FCC Part 15.247) and Canadian (RSS-210) regulations for license free use in the 2400-2483.5MHz ISM band. The 21115EE3-A is a multiple-handset, single-base cordless telephone system, which provides a full-integrated mobility solution for your business. The 21115EE3-A handset allows you to freely move around your working space while on a call, and still maintain access to all your telephone system features.

The 21115EE3-A telephone uses advanced Digital Spread Spectrum (DSS) technology to provide a quality audio path over a 2400MHz radio link. Establishing a call over a radio link is comparable to a wire line communication.

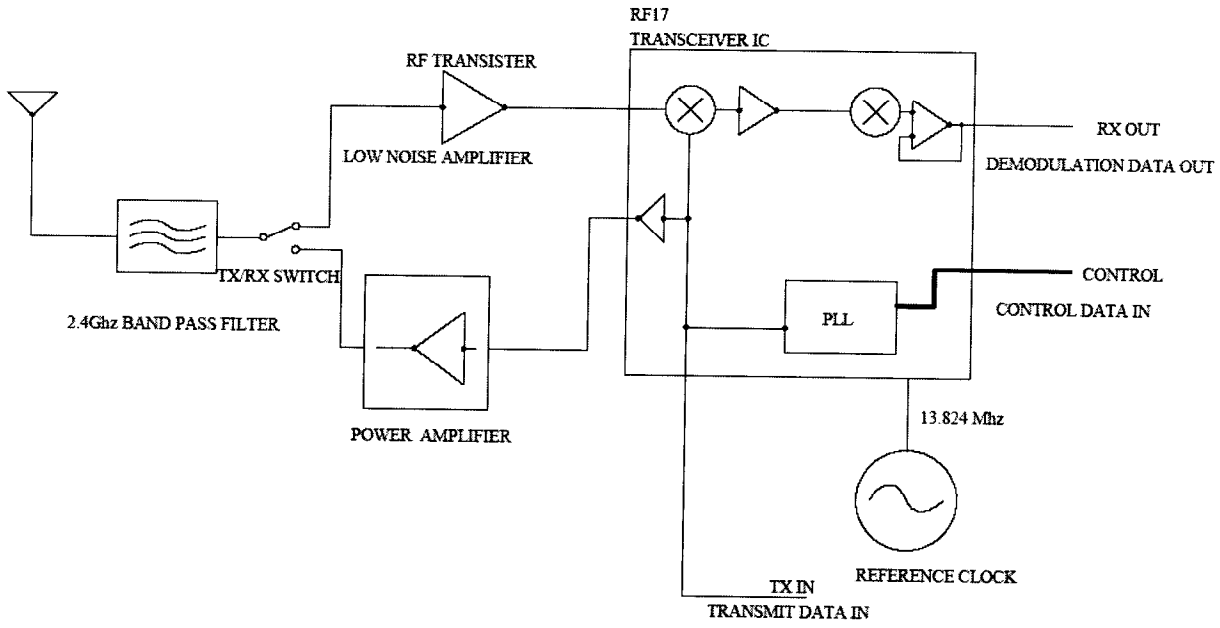
The frequency band is divided into 87 channels in 21115EE3-A. And 87 channels are used for each 21115EE3-A base and handset. Each message from 21115EE3-A base to handset is four frames in length. That is the message from 21115EE3-A base to handset hops on four different channels. The 21115EE3-A handset receiver gets the message from four different channels.

The message from 21115EE3-A handset to base is six frames in length. That is the message from 21115EE3-A handset to base hops on six different channels. The 21115EE3-A base receiver receives the message from six different channels. It complies with FCC part 15.247(g).

21115EE3-A base and handset use same algorithm to control the hopping sequence. The key of the hopping sequence bases on the "System Security Code". When 21115EE3-A base chooses a System Security Code, it will hop in a sequence calculated from the algorithm accordingly. 21115EE3-A handset hops using the same sequence and tries to synchronize to 21115EE3-A base. That is the hopping sequence selected within 21115EE3-A is controlled by the base station and is not coordinated in any way with devices outside of 21115EE3-A. It complies with FCC part 15.247(h).

Each base station has a unique security code. All four handsets registered to the base station must share the same security code. Each of the four handsets assigned to a base station must also have a unique identification. Each base station provides four independent time compression multiplexing (TCM) line connections to the telephone system.

2. Block Diagram of RF Module



RF Module Circuit Characteristics:

Antenna：Receive 2.4GHZ signal；

2.4 GHZ Band Pass Filter：Filter 2.4GHZ outband signal；

F_C=2450MHZ；

Pass Band=2400 ~ 2500MHZ； Insertion Loss=2.5dB (max)；

TX/RX Switch(NJG1523)：Switch TX path and RX path

TX MODE：TR_SW=High；

Insertion Loss=0.5 ~ 1.0dB；

RX MODE：TR_SW=Low；

Insertion Loss=0.5 ~ 1.0dB；

Low Noise Amplifier：

Use low noise amplifier to receive weak signal.

V=2.5V

I=30 ~ 35mA

G=12dB

Power Amplifier:Used to boost up transmit signal

V=3.6V

I=110 ~ 160mA

G=20 ~25dB

Transceiver (RF17):Transceiverwork in 2.4GHZ band , intergrade PLL,VCO,Mixer,IF Amplifier,IF Limiter,Frequency Discriminator and RSSI function,it's high intergrade RF IC.

MIXER:F_{RF}=2.4 ~ 2.5GHZ,F_{IF}=2MHZ,G=13dB.

IF Amplifier:G=16dB.

TXMODE:I_{RF17}=117mA.

RX MODE:I_{RF17}=75mA.

Discriminator:$V_{OUT(PK-PK)}$ =1V,V_{DC} =1V.

Reference Clock:support 13.824MHZ reference clock to RF17.

3. Functional Description

3.1. Radio Section

The radio uses GMSK modulation at 576k bits per second, and utilizes channels of 670KHz bandwidth. All transmissions are hopped over 87 channels chosen from a pseudo-random table, with equal transmission time on all channels.The length of frame is typically of 10 ms duration on a given channel, and never exceed 400 ms in 10 seconds period. The radio is TDMA full-duplex; meaning it is either receiving or transmitting at any given time. These comply with FCC 15.247(a).

3.1.1. Antenna

The antenna used is a vertical di-pole antenna that protrudes from the top of the handset unit. Because of its small size and the limited size of the "ground plane" in the antenna system, the gain of this antenna configuration is -1dBi.

3.1.1.1. 13.824 MHz Crystal circuit

A crystal circuit at 13.824 MHz with 13.824MHz crystal is used as the reference frequency for the phase-lock loop. This reference oscillator is specified to be accurate to within ±10ppm over the temperature range of 0 to +50° C.

3.1.1.2. Phase Lock Loop

The phase-lock loop integrated circuit tunes the voltage-controlled oscillator to a given channel based on the control words received from the microprocessor. Tuning is achieved in 300μs.

3.1.2. Receiver

The receiver architecture is down-conversion, with intermediate frequencies of 2 MHz. The conversion is performed in theTranciver Chip,. The bandwidth of receiving channel 670 KHz. The channel separation is 891.871 KHz.

3.1.2.1. 2400-2450 MHz Ceramic Band-pass Filter

A ceramic band-pass filter has been used at the antenna port of the radio receiver front-end. Note that this filter also appears in the transmission signal path. The selected filter has excellent out-of-band rejection to eliminate undesired signals received at the antenna, and to reduce emissions other than the desired RF output during transmission.

3.1.2.2. Transmit/Receive Switch

The RF switch ic are used to switch the antenna between transmit and receive functions. The unit does not transmit and receive simultaneously.

3.1.3. Transmitter

In a manner quite analogous to the receiver, the transmitter uses GMSK architecture. The signal is modulated at internal VCO and finally to the desired RF frequency in the 2400 to 2483.5 MHz range. Transmit power is typically mW for Handset and mW for Base at the antenna port with the antenna gain is -1dBi.

3.1.3.1. Power Amplifier

An integrated circuit power amplifier boost the transmission signal level to nominal 20dBm for Handset and 20dBm for Base at the radio output port.

3.1.3.2. 2400-2500 MHz Ceramic Band-pass Filter

As mentioned above in the receiver section, this final filter in the transmission chain is also shared with the receive chain. The selected filter has excellent out-of-band rejection to reduce undesired emissions.

3.2. Digital Section

A baseband modem, an audio modem and a controller are all integrated onto the baseband processor. The baseband processer perform all of the protocol, data formatting, spread spectrum and audio processing in conformance with United States FCC regulation Part 15.247.

The baseband processer portion of the digital section is composed of an 16-bit single-chip microprocessor. The functions performed include control of the radio section (frequency tuning and transmit/receive control), receive data decoding, transmit data generation, and control of ADPCM, LED indicator, ringing signal and key scanning.

3.3. Frequency Plan

The transmitter can be set to operate on any one of 87 frequency channels in the 2400 ~ 2483.5MHz ISM band. Each frequency is used equally by the spread spectrum transmitter in a pseudorandom sequence. The frequency plan is in the following table.

FREQUENCY TABLE

Physical Channel Number	Centre Frequency (MHz)	Physical Channel Number	Centre Frequency (MHz)	Physical Channel Number	Centre Frequency (MHz)
1	2401.808203	31	2428.564307	61	2455.320410
2	2402.698096	32	2429.454199	62	2456.210303
3	2403.591943	33	2430.348047	63	2457.104150
4	2404.481836	34	2431.237939	64	2457.994043
5	2405.375684	35	2432.131787	65	2458.887891
6	2406.265576	36	2433.021680	66	2459.777783
7	2407.159424	37	2433.915527	67	2460.671631
8	2408.050000	38	2434.805420	68	2461.561523
9	2408.943164	39	2435.699268	69	2462.455371
10	2409.833057	40	2436.589160	70	2463.345264
11	2410.726904	41	2437.483008	71	2464.239111
12	2411.616797	42	2438.372900	72	2465.129004
13	2412.510645	43	2439.266748	73	2466.022852
14	2413.400537	44	2440.156641	74	2466.912744
15	2414.294385	45	2441.050488	75	2467.806592
16	2415.184277	46	2441.940381	76	2468.696484
17	2416.078125	47	2442.834229	77	2469.590332
18	2416.968018	48	2443.724121	78	2470.480225
19	2417.861865	49	2444.617969	79	2471.374072
20	2418.751758	50	2445.507861	80	2472.263965
21	2419.645605	51	2446.401709	81	2473.157813
22	2420.535498	52	2447.291602	82	2474.047705
23	2421.429346	53	2448.185449	83	2474.941553
24	2422.319238	54	2449.075342	84	2475.831445
25	2423.213086	55	2449.969189	85	2476.725293
26	2424.102979	56	2450.859082	86	2477.615186
27	2424.996826	57	2451.752930	87	2478.509033
28	2425.886719	58	2452.642822	88	2479.398926
29	2426.780566	59	2453.536670		

30	2427.670459	60	2454.426563		

Channel 71 is not use.

4. Precautions Taken to Avoid Interference

4.1. RF Filtering

The transmit signal passes through a ceramic bandpass filter before reaching the output port. These filters greatly reduce spurious signals, harmonics, and out-of-band transmitter phase noise.

4.2. Shielding

The circuit boards are contained in a shielded enclosure formed by metal housing, which also provides the antenna ground plane.