CIRCUIT DESCRIPTION AND
DIGITAL SECURITY CODE INFORMATION

Equipment Description UC360Z (EXAI2248)

This 2.4GHz/900MHz cordless telephone 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 restrain of a handset cord.

This device consists of a base unit and a handset. The base unit is connected to a standard telephone modular jack (USOC RJ 11C Type) 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 2400 – 2483.5 MHz and 902 – 928 MHz band. 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 Part 15 requirements.

Circuit Description and Operating Frequency

Overview

This device is a Cordless Telephone System, which operates within the 2.4GHz and 900MHz ISM band. This device consists of a base unit and a handset. The base unit is connected to a telephone network, and has transmitter and receiver circuits, which are served to communication with the handset. The handset also has a transmitter and receiver portions in addition to regular dialing circuit.

Both the handset and the base unit have PLL circuits, which enable to communicate in an empty channel. Pressing the CH key on the handset can last the communications moving into other open channel without cutting the line even if interfered by interruption on talks.

1. Handset

1) Local Frequencies and Intermediate Frequencies

TX VCO Frequency:	925.050348 MHz	- 927.602348 MHz
RX 1st Local Freq.:	1611.936108 MHz	- 1615.714394 MHz
RX 2nd Local Freq.:	805.968055 MHz	- 807.857198 MHz
RX VCO Frequency:	805.968055 MHz	- 807.857198 MHz
1st Intermediate Frequency:	816.507484 MHz	- 818.396627 MHz
2nd Intermediate Frequency:	10.539429 MHz	

2) Communication Link to Base unit

RX Circuit:

An incoming RF signal from the base unit is received through the antenna. COMBO IC (IC601) and RX VCO (Q357) produce RX VCO frequency. Then, this frequency is the 2nd RX Local frequency. And DOUBLER (Q355) produces 1st RX Local frequency from RX VCO frequency

This 1st local signal is applied to Mixer (Q352), which produces 1st IF of 816.507484 MHz - 818.396627 MHz. This 2nd local signal is applied to Mixer (Q354), which produces 2nd IF of 10.539429 MHz. The demodulated AF signal is amplified by IC601 an internal audio amplifier for driving a speaker.

TX Circuit:

TX VCO signal is generated at the PLL circuit and the TX VCO (Q361). Meanwhile, voice signal from the microphone (MC670) modulates the TX VCO signal at Q361. This modulated signal is the TX RF frequencies as listed in frequency chart.

Then, the TX RF signal is amplified by RF AMP (Q358/Q359) and fed into the antenna.

3) Dialing Signal

When this equipment is in Talk Mode, the transmitting circuit and dialing circuit are activated to make outgoing call. In this condition, when any number keys are pressed, the CPU (IC700) generates corresponding dial pulse codes.

2. Base Unit

1) Local Frequencies and Intermediate Frequencies

TX VCO Frequency: 809.481197 MHz – 811.370340 MHz
RX 1st Local Freq.: 935.589777 MHz – 938.141777 MHz
RX VCO Frequency: 935.589777 MHz – 938.141777 MHz
Intermediate Frequency: 10.539429 MHz

2) Communication Link to Handset

RX Circuit:

An incoming RF signal from the handset is received through the antenna.

COMBO IC (IC1) and RX VCO (Q804) produce RX VCO frequency shown above. Then, this frequency is the RX Local frequency. This local signal is applied to Mixer (Q802), which produces IF of 10.539429MHz.

The demodulated signal by IC1 contains a security code, and the code is fed to the CPU.

TX Circuit:

TX VCO signal is generated at the PLL circuit and the TX VCO (Q810). Meanwhile, voice signal from Telephone Network through the Hybrid Transformer (T1) modulates the TX VCO signal at Q810. Then Q807 is produced three times frequency from TX VCO signal. This modulated signal is the TX RF frequencies as listed in frequency chart. Then, the TX RF signal is amplified by RF AMP (Q805/Q806) and fed into the antenna.

3) Dialing Signal

Dial pulse code sent from the handset is demodulated by IC1 as mentioned above, and is fed into the CPU to control RL1.

4) Telephone Interface Circuit

Outgoing voice signal to telephone network is amplified by IC1. This signal is delivered to the telephone interface circuit through the Hybrid Transformer (T1).

Incoming voice signal also goes through T1, then it is amplified by IC1 to a proper level for frequency modulation, then it is fed to the TX circuit. To protect the TX/RX circuits from a metallic surge, the surge absorbing zener (D150) is provided at the secondary circuit of the Hybrid Transformer (T1).

5) Bell Signal

An alerting signal (Bell signal) is detected by means of a Photo Coupler (IC150) which has a sufficiently high impedance.

6) Power Supply Circuit

The power supply circuits are composed of Q157, Q159, Q160, Q161, Q163, IC154 and a zener diode type D167, D168, D171 and D169. These are voltage regulator circuits to stabilize input voltage from the AC Adapter to attain a stable operation.

Digital Security Code Information

262114 Digital Security Code

This cordless telephone system automatically selects a different security code from 262114 possible discrete digital codes each time the cordless telephone is used.

Furthermore, the security code can be changed randomly by pressing PAGE button on the base unit when the handset is placed in the base unit.

[APPENDIX] TEST MODE AND OPERATION FREQUENCY

TEST MODE

This cordless telephone has test mode function which enable to perform TX/RX testing.

Test Mode for Base Unit

To enter the test mode, connect the AC Adapter to the unit while pressing the "answer on/off" KEY. When test mode is set up, the 7 segment LED displayed "8". The unit is set for CH 10 Transmitting mode.

To change the transmitting frequency, press the "repeat/rew" KEY during the unit is set the TX Test mode, so that the channel is changed from CH 10 to CH 13. Every pressing the "repeat/rew" KEY, channel is changed as below.

10 13 17 20 3 1 2 3 - - - 19 20 1 2 3 4 ---

To cancel the test mode, place the Handset in the Base Unit, so that the STATUS LED lights and the equipment is set for normal operation mode (Standby mode).

Or, disconnect the AC Adapter and connect it again, so that the test mode is easily canceled.

Test Mode for Handset

First, disconnect the battery pack. Then, connect the battery pack again while pressing # and * keys. When test mode is set up, long beep tone is heard. The unit is set for CH 13 Transmitting mode. Every pressing the CHANNEL key, channel is changed as below.

13 10 17 20 3 1 2 3 - - - 19 20 1 2 3 4 ---

To cancel the test mode, press the TALK key.

FREQUENCY TABLE

CHANNEL	BASE (TX FREQUENCY)	PORTABLE (TX FREQUENCY)
1	2428.443592 MHz	925.050348 MHz
2	2428.741878 MHz	925.149777 MHz
3	2429.040164 MHz	925.282348 MHz
4	2429.338449 MHz	925.381777 MHz
5	2429.636735 MHz	925.514348 MHz
6	2429.935021 MHz	925.680062 MHz
7	2430.233307 MHz	925.978348 MHz
8	2430.531592 MHz	926.144062 MHz
9	2430.829878 MHz	926.243491 MHz
10	2431.128164 MHz	926.342920 MHz
11	2431.426449 MHz	926.475491 MHz
12	2431.724735 MHz	926.707491 MHz
13	2432.023021 MHz	926.806920 MHz
14	2432.321307 MHz	926.906348 MHz
15	2432.619592 MHz	927.005777 MHz
16	2432.917878 MHz	927.105205 MHz
17	2433.216164 MHz	927.304062 MHz
18	2433.514450 MHz	927.403491 MHz
19	2433.812735 MHz	927.502920 MHz
20	2434.111021 MHz	927.602348 MHz