Model: MGA2.4G_Cordless/257813

TECHNICAL DESCRIPTION

Content

HANDSET

1. RF/Audio Section

The radio link Handset and Base is full duplex at 2475/2403MHz with the 40 channels. FM modulation is used for the link. The 1st IF frequency is 10.7MHz and the 2nd IF frequency is 455KHz. The operating frequency for the cordless phone is selected from one of the following channels and controlled by the synthesizer IC1 which is programmed by the MCU. Please refer to Table 1 for the Channel Frequency Table.

This section is common to both handset and base as the same ICs are used: LMX1602(U2), KA3361(U1) is made up of dual serial input PLL frequency synthesizer with 2.4GHz prescaler. KA3361 is a narrow-band IF detector IC.

1.1 Receiver

The receiver section is made of double conversion with 10.7MHz as the first and second IF. Rx signal from the duplexer circuit is amplified by a Low Noise RF transistor and passed to a Mixer (Q2), and it is converted to 10.7MHz IF and it is then double converted to 450kHz IF in the internal mixer of U1. Voice/data signal is demodulated and output from pin 9 of U1. The demodulated signal is then divided into two paths, a path is fed into the data amplifier Q201, Q202. The recovered data signal RX-DATA is extracted from the output of Q202. The other path will go through a de-emphasized amplifier and an expander in U102. Recovered signal can be muted by the pin 13 of U102, the 4 volume levels of the signal can be controlled by the volume key.

1.2 Transmitter

Audio signal(from Microphone for handset/Tip & Ring for base) is first fed into the amplifier and compressor inside U102. The signal will pass through a limiter. The AGC and the limiter has the property to limit the maximum signal which feed into the transmitter so that the RF deviation is limited. The transmitter section mainly divided into two parts. They are the voice/data modulator and the Tx power amplifier. The voltage controlled oscillator VCO operated at the Tx frequency controlled by the synthesizer is modulated by the audio and data signals. Modulated signal is amplified by the RF amplifier and sending the signal to the dupliexer for radiation by the antenna.

1.3 Duplexer

Two band-pass filter are matched to use as duplexer. The function of the duplexer is to multiplex the transmitting and receiving signals to a common antenna while providing isolation and rejection of interference and other spurious signals.

1.4 Alerter

The alerting signals include the following: Ringing, Paging, Key Beep and Low battery warning tone. These tones are generated by the MCU to the alert or through the driving circuit formed Q8 and the associated components.

1.5 microphone

The condenser microphone is in the headset and it biased by the resistor R313. The signal is applied to the amplifier inside U102.

1.6 Antenna description

The antennas are two 1/4 wavelength #24 wires based on the 2.4Ghz for transmitting and receiving.

2. MCU

2.1Battery Detect

The voltage detector is composed of Q1 which is used to detect battery low condition. The detecting accuracy of the voltage detector is +/-0.2V. The detect pin BAT-LOW is connected to the pin 18 of the MCU.

2.2 Carrier Detection

This 40 channels cordless has the features of auto-scanning. This is done by the detection of the RSSI at pin 96 of MCU of handset. During PHONE on or CHANNEL changing, the MCU will select the clearest channel for the RF communication.

BASE

3. RF/Audio sections/ Antenna description

The operation of the RF/Audio section are similar to that of the handset. Antenna description: The antennas are two 1/4 wavelength #24 wires based on the 2.4Ghz for transmitting and receiving.

4. Telephone Network

4.1 Telephone Interface

Fuse F1 is for over-voltage protection. Relay RL101 controls the on/off hook state and pulse dialing. The Tip&Ring are isolated from the base circuit by the pin 3 of MCU , relay RL101.

4.2 Ring Detect

When ring signal is present on the Tip/ Ring, and envelope waveform of the ring pattern will transfer to pin 69 of MCU by the Q102. The MCU will read this waveform and determine whether it will send ringer command.

4.3 Sidetone Cancellation Network

The sidetone cancellation is a hybrid circuit of the Tx and Rx paths of

the telephone circuit formed by the C60, C108, R113, R114

5. MCU

5.1 Charging Network

Base charging circuit provides a DC current for handset batter. Resistor R56 controls the current flow.

5.2 Carrier Detection

This is similar to the handset counterpart.

FREQUENCY TABLE

UNIT: MHZ

Channel		BASE TX	BASE LOCAL		HAND TX	HAND LOCAL
1	2403.05	801.0166667	828.2333333	2474.00	824.6666667	804.5833333
2	2403.10	801.0333333	828.2500000	2474.05	824.6833333	804.6000000
3	2403.15	801.0500000	828.2666667	2474.10	824.7000000	804.6166667
4	2403.20	801.0666667	828.2833333	2474.15	824.7166667	804.6333333
5	2403.25	801.0833333	828.3000000	2474.20	824.7333333	804.6500000
6	2403.30	801.1000000	828.3166667	2474.25	824.7500000	804.6666667
7	2403.35	801.1166667	828.3333333	2474.30	824.7666667	804.6833333
8	2403.40	801.1333333	828.3500000	2474.35	824.7833333	804.7000000
9	2403.45	801.1500000	828.3666667	2474.40	824.8000000	804.7166667
10	2403.50	801.1666667	828.3833333	2474.45	824.8166667	804.7333333
11	2403.55	801.1833333	828.4000000	2474.50	824.8333333	804.7500000
12	2403.60	801.2000000	828.4166667	2474.55	824.8500000	804.7666667
13	2403.65	801.2166667	828.4333333	2474.60	824.8666667	804.7833333
14	3403.70	801.2333333	828.4500000	2474.65	824.8833333	804.8000000
15	2403.75	801.2500000	828.4666667	2474.70	824.9000000	804.8166667
16	2403.80	801.2666667	828.4833333	2474.75	824.9166667	804.8333333
17	2403.85	801.2833333	828.5000000	2474.80	824.9333333	804.8500000
18	2403.90	801.3000000	828.5166667	2474.85	824.9500000	804.8666667
19	2403.95	801.3166667	828.5333333	2474.90	824.9666667	804.8833333
20	2404.00	801.3333333	828.5500000	2474.95	824.9833333	804.9000000
21	2404.05	801.3500000	828.5666667	2475.00	825.0000000	804.9166667
22	2404.10	801.3666667	828.5833333	2475.05	825.0166667	804.9333333
23	2404.15	801.3833333	828.6000000	2475.10	825.0333333	804.9500000
24	2404.20	801.4000000	828.6166667	2475.15	825.0500000	804.9666667

25	2404.25	801.4166667	828.6333333	2475.20	825.0666667	804.9833333
26	2404.30	801.4333333	828.6500000	2475.25	825.0833333	805.0000000
27	2404.35	801.4500000	828.6666667	2475.30	825.1000000	805.0166667
28	2404.40	801.4666667	828.6833333	2475.35	825.1166667	805.0333333
29	2404.45	801.4833333	828.7000000	2475.40	825.1333333	805.0500000
30	2404.50	801.5000000	828.7166667	2475.45	825.1500000	805.0666667
31	2404.55	801.5166667	828.7333333	2475.50	825.1666667	805.0833333
32	2404.60	801.5333333	828.7500000	2475.55	825.1833333	805.1000000
33	2404.65	801.5500000	828.7666667	2475.60	825.2000000	805.1166667
34	2404.70	801.5666667	828.7833333	2475.65	825.2166667	805.1333333
35	2404.75	801.5833333	828.8000000	2475.70	825.2333333	805.1500000
36	2404.80	801.6000000	828.8166667	2475.75	825.2500000	805.1666667
37	2404.85	801.6166667	828.8333333	2475.80	825.2666667	805.1833333
38	2404.90	801.6333333	828.8500000	2475.85	825.2833333	805.2000000
39	2404.95	801.6500000	828.8666667	2475.90	825.3000000	805.2166667
40	2405.00	801.6666667	828.8833333	2475.95	825.3166667	805.2333333