To : Mr. H Y Vu

Date : Jan. 8, 1999
Rev. : 1.0

Model : 39525

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TECHNICAL   DESCRIPTION

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Table 1   Channel Frequency Table

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HANDSET

1. RF/Audio Sections

The radio link between Handset and Base is full duplex at 902/928MHz within the 40 channels.   FM modulation is used for the link.   The 1st IF frequency is 10.7MHz and the 2nd IF frequency is 450kHz. The operating frequency for the cordless phone is selected from one of the following channels and controlled by the synthesizer IC2 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 : TB31206 (IC2), KA3361 (IC1).   TB31206 is made up of dual serial input PLL frequency synthesizer with 1000MHz prescaler.   KA3361 is a narrow-band IF detector IC.

1.1 Receiver

The receiver section is of double conversion with 10.7MHz and 450kHz 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 IFT1), and it is converted to 10.7MHz IF and it is then double converted to 450kHz IF in the internal mixer of IC1.   Voice/data signal is demodulated and output from pin 9 of IC1   The demodulated signal is then divided into two paths, a path is fed into the data amplifier Q606, Q605 and Q611.   The recovered data signal RX_DATA is extracted from the output of Q611.   The other path will go through a de-emphasized amplifier and a expander in IC11B.   The recovered audio will pass through the audio amplifier Q603 and to the receiver. The recovered signal can be muted by the pin 13 of IC11B, the 2 volume levels of the signal can be controlled by the switch SW1.

1.2 Transmitter

Audio signal (from Microphone for handset / Tip & Ring for base) is first fed into the mic. amplifier and compressor inside IC11A.   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 duplexer for radiation by the antenna.

1.3 Duplexer

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

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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 alerter through the driving circuit formed by Q608 and the associated components.

1.5 Microphone

The condenser microphone is biased by the resistor R622.   The signal is applied to the mic. amplifier inside IC11A.

2. MCU

2.1 Battery Detect

IC12 is a voltage detector which is used to detect battery low condition.   The detecting accuracy of the voltage detector is +/- 0.15V.   The detect pin, BAT_LOW is connected to the pin 8 of the MCU (IC10).

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 9 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

The operation of the RF/Audio sections are similar to that of the handset.

4. Telephone Network

4.1 Telephone Interface

Fuse FUSE1 is for over-voltage protection.   Relay RL1 controls the on/off hook state and pulse dialing. The Tip & Ring are isolated from the base circuit by the hybrid transformer HYB1, relay RL1, and the photo-coupler IC12.

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4.2 Ring Detect

When ring signal is present on the Tip Ring, and envelope waveform of the ring pattern will transfer to pin 40 of MCU IC7 by the photo-coupler IC12 which is used as isolation between Tip Ring and the digital circuit.   The MCU will read this waveform and determine whether it will connect the appropriate path.

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 hybrid transformer.

5. MCU

5.1 Charging Network

Base charging circuit provides a DC current for handset batter.   Resistor R52 controls the current flow.

5.2 LED Display

Direct driving is employed in the control of LED indicators.   The indicator are IN USE and CHARGE, which were used to indicate the corresponding functions are activated.

5.3 Carrier Detection

This is similar to the handset counterpart.

6. Speakerphone

The IC5 MC34018 is used to perform the speakerphone function.   The audio paths are routed by analog switches IC3 which are controlled by MCU.

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Table 1 : Channel Frequency Table

CH	BASE (MHz)			HANDSET (MHz)		
	TX	RX	RX LOCAL	TX	RX	RX LOCAL
1	902.025	926.025	915.325	926.025	902.025	912.725
2	902.075	926.075	915.375	926.075	902.075	912.775
3	902.125	926.125	915.425	926.125	902.125	912.825
4	902.175	926.175	915.475	926.175	902.175	912.875
5	902.225	926.225	915.525	926.225	902.225	912.925
6	902.275	926.275	915.575	926.275	902.275	912.975
7	902.325	926.325	915.625	926.325	902.325	913.025
8	902.375	926.375	915.675	926.375	902.375	913.075
9	902.425	926.425	915.725	926.425	902.425	913.125
10	902.475	926.475	915.775	926.475	902.475	913.175
11	902.525	926.525	915.825	926.525	902.525	913.225
12	902.575	926.575	915.875	926.575	902.575	913.275
13	902.625	926.625	915.925	926.625	902.625	913.325
14	902.675	926.675	915.975	926.675	902.675	913.375
15	902.725	926.725	916.025	926.725	902.725	913.425
16	902.775	926.775	916.075	926.775	902.775	913.475
17	902.825	926.825	916.125	926.825	902.825	913.525
18	902.875	926.875	916.175	926.875	902.875	913.575
19	902.925	926.925	916.225	926.925	902.925	913.625
20	902.975	926.975	916.275	926.975	902.975	913.675
21	903.025	927.025	916.325	927.025	903.025	913.725
22	903.075	927.075	916.375	927.075	903.075	913.775
23	903.125	927.125	916.425	927.125	903.125	913.825
24	903.175	927.175	916.475	927.175	903.175	913.875
25	903.225	927.225	916.525	927.225	903.225	913.925
26	903.275	927.275	916.575	927.275	903.275	913.975
27	903.325	927.325	916.625	927.325	903.325	914.025
28	903.375	927.375	916.675	927.375	903.375	914.075
29	903.425	927.425	916.725	927.425	903.425	914.125
30	903.475	927.475	916.775	927.475	903.475	914.175
31	903.525	927.525	916.825	927.525	903.525	914.225
32	903.575	927.575	916.875	927.575	903.575	914.275
33	903.625	927.625	916.925	927.625	903.625	914.325
34	903.675	927.675	916.975	927.675	903.675	914.375
35	903.725	927.725	917.025	927.725	903.725	914.425
36	903.775	927.775	917.075	927.775	903.775	914.475
37	903.825	927.825	917.125	927.825	903.825	914.525
38	903.875	927.875	917.175	927.875	903.875	914.575
39	903.925	927.925	917.225	927.925	903.925	914.625
40	903.975	927.975	917.275	927.975	903.975	914.675