

## Circuit Description of Cordless Headset Telephone (CT10)

The BE-900MHZCID Cordless headset telephone with caller ID is 900MHz band(ISM BAND) Cordless Telephone and Full DUPLEX System.

It performs Transmission and reception through the ANTENNA of the module. It has 40 channels with 50KHz channel spacing

General RF specifications are below

### ■ Remote

- (1) TX Frequency : 925.30 ~ 927.25MHz (Attached Frequency table)
- (2) RX Frequency : 902.80 ~ 904.75MHz (Lower Heterodyne)
- (3) Channel Number : 40 Channel Full Duplex
- (4) Channel Separation : 50KHz
- (5) 1<sup>st</sup> IF : 10.7MHz
- (6) 2<sup>nd</sup> IF : 450KHz
- (7) 2<sup>nd</sup> Local frequency : 10.25MHz
- (8) Modulation : FM
- (9) Standard Test Modulation : Modulation Frequency 1KHz  
Standard Deviation 6KHz
- (10) Power supply voltage range : 3.3 to 5.0VDC

### ■ Base

- (1) TX frequency : 902.80 ~ 904.75MHz
- (2) RX frequency : 925.30 ~ 927.25MHz
- (3) Channel Number : 40channel Full Duplex
- (4) Channel Separation : 50KHz
- (5) 1<sup>st</sup> IF : 10.7MHz
- (6) 2<sup>nd</sup> IF : 450KHz
- (7) 2<sup>nd</sup> Local Frequency : 10.25MHz
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Standard Deviation 6KHz
- (10) Power Supply Voltage Range : 3.3 to 5.0VDC

## 1. BASE UNIT

### 1.1 Power supply and Regulator circuit

- AC/DC adapter converts 120V AC/60Hz to DC 9V 800mA and supplies 9VDC to the base unit.
- Regulated voltage used IC306(KIA7805) and IC307(KIA7806)

### 1.2 Charge circuit

- Whenever the handset cradles on the charge contacts, base unit starts battery charge on handset and charge LED on base unit lights blink.
- Charge circuit designed with Q304~Q307 and Q311,312.
- If the battery voltage is less than 4.0 volt, battery will be charged during 5hours, 0.2C.
- If the battery voltage is more than 4.0 volt, battery will be trickle charged, 0.02C.

### 1.3 Speech circuit

- 1.3.1 ZD301 is for surge protection and there are RF interference protection components L302, L303, L334, and C370.

**1.3.2 IC308, C361, R355 and R376 are for ringer circuitry.**

When the base unit receives a ring signal, a pulse on pin 4 of IC308 inputs pin25 of IC301 then pin 28 of IC301 sends a data output to handset.

**1.3.3 When there is an audio signal on telephone line, the audio signal through speech IC304 applies pin 8 of IC302 (compander) for compressing audio signal, then the compressed audio signal outputs from pin 12 of IC302.**

RV301 adjusts the compressed audio signal to keep proper modulation ratio.

**1.3.4 Receive signal from handset is detected by RF module then expended by the IC302 (compander), and RV303 adjusts the expressed audio signal output to keep proper level. The audio level is adjusted by IC304 and supplis to telephon line.**

**1.3.5 Dialing function**

When a dial data from handset is received by base unit, the detected dial data by RF module applies to pin 15 of IC301 through IC303 (comparator).

Then the dial data in IC301 is changed to DTMF data by DTMF generator in IC301.

IC301 drives the output level of DTMF data on pin 23 of IC301 then supplies the data to speech IC.

**1.4 RF module curcuit**

The RF module includes Duplexer, RF receive circuit, Receive VCO, FM Detector.

**1.5 Audio transmit signal flow**

Telephone line (tip/ring) → pin 1 of IC304 → pin 4 of IC304 → T301 → pin 8 of IC302 → pin 1 of IC302 → RF module → antenna.

**1.6 Audio receive signal flow**

Antenna → pin 11 of RF module → pin 14 of IC302 → pin 19 of IC302 → T302 → pin 11 of IC304 → Telephone line (tip/ring)

**1.7 Data transmit flow**

Telephone line (ring signal) → pin4 of IC308 → pin 25 of IC301 → RF module → antenna.

**1.8 Data receive flow**

Antenna → pin11 of RF module → pin3 of IC303 → pin7 of IC303 → pin15 of IC301.

■ Frequency Table

| CH NO | BASE   |        |        | HAND   |        |        |
|-------|--------|--------|--------|--------|--------|--------|
|       | RX     | LOCAL  | TX     | RX     | LOCAL  | TX     |
| CH1   | 925.30 | 936.00 | 902.80 | 902.80 | 892.10 | 925.30 |
| CH2   | 925.35 | 936.05 | 902.85 | 902.85 | 892.15 | 925.35 |
| CH3   | 925.40 | 936.10 | 902.90 | 902.90 | 892.20 | 925.40 |
| CH4   | 925.45 | 936.15 | 902.95 | 902.95 | 892.25 | 925.45 |
| CH5   | 925.50 | 936.20 | 903.00 | 903.00 | 892.30 | 925.50 |
| CH6   | 925.55 | 936.25 | 903.05 | 903.05 | 892.35 | 925.55 |
| CH7   | 925.60 | 936.30 | 903.10 | 903.10 | 892.40 | 925.60 |
| CH8   | 925.65 | 936.35 | 903.15 | 903.15 | 892.45 | 925.65 |
| CH9   | 925.70 | 936.40 | 903.20 | 903.20 | 892.50 | 925.70 |
| CH10  | 925.75 | 936.45 | 903.25 | 903.25 | 892.55 | 925.75 |
| CH11  | 925.80 | 936.50 | 903.30 | 903.30 | 892.60 | 925.80 |
| CH12  | 925.85 | 936.55 | 903.35 | 903.35 | 892.65 | 925.85 |
| CH13  | 925.90 | 936.60 | 903.40 | 903.40 | 892.70 | 925.90 |
| CH14  | 925.95 | 936.65 | 903.45 | 903.45 | 892.75 | 925.95 |
| CH15  | 926.00 | 936.70 | 903.50 | 903.50 | 892.80 | 926.00 |
| CH16  | 926.05 | 936.75 | 903.55 | 903.55 | 892.85 | 926.05 |
| CH17  | 926.10 | 936.80 | 903.60 | 903.60 | 892.90 | 926.10 |
| CH18  | 926.15 | 936.85 | 903.65 | 903.65 | 892.95 | 926.15 |
| CH19  | 926.20 | 936.90 | 903.70 | 903.70 | 893.00 | 926.20 |
| CH20  | 926.25 | 936.95 | 903.75 | 903.75 | 893.05 | 926.25 |
| CH21  | 926.30 | 937.00 | 903.80 | 903.80 | 893.10 | 926.30 |
| CH22  | 926.35 | 937.05 | 903.85 | 903.85 | 893.15 | 926.35 |
| CH23  | 926.40 | 937.10 | 903.90 | 903.90 | 893.20 | 926.40 |
| CH24  | 926.45 | 937.15 | 903.95 | 903.95 | 893.25 | 926.45 |
| CH25  | 926.50 | 937.20 | 904.00 | 904.00 | 893.30 | 926.50 |
| CH26  | 926.55 | 937.25 | 904.05 | 904.05 | 893.35 | 926.55 |
| CH27  | 926.60 | 937.30 | 904.10 | 904.10 | 893.40 | 926.60 |
| CH28  | 926.65 | 937.35 | 904.15 | 904.15 | 893.45 | 926.65 |
| CH29  | 926.70 | 937.40 | 904.20 | 904.20 | 893.50 | 926.70 |
| CH30  | 926.75 | 937.45 | 904.25 | 904.25 | 893.55 | 926.75 |
| CH31  | 926.80 | 937.50 | 904.30 | 904.30 | 893.60 | 926.80 |
| CH32  | 926.85 | 937.55 | 904.35 | 904.35 | 893.65 | 926.85 |
| CH33  | 926.90 | 937.60 | 904.40 | 904.40 | 893.70 | 926.90 |
| CH34  | 926.95 | 937.65 | 904.45 | 904.45 | 893.75 | 926.95 |
| CH35  | 927.00 | 937.70 | 904.50 | 904.50 | 893.80 | 927.00 |
| CH36  | 927.05 | 937.75 | 904.55 | 904.55 | 893.85 | 927.05 |
| CH37  | 927.10 | 937.80 | 904.60 | 904.60 | 893.90 | 927.10 |
| CH38  | 927.15 | 937.85 | 904.65 | 904.65 | 893.95 | 927.15 |
| CH39  | 927.20 | 937.90 | 904.70 | 904.70 | 894.00 | 927.20 |
| CH40  | 927.25 | 937.95 | 904.75 | 904.75 | 894.05 | 927.25 |

## **2. Handset**

### **2.1 Power supply**

- 3.6VDC 550mAh NiMH battery

### **2.2 Speech circuit**

- Received signal is detected by RF module and supplies IC102 (expander) through IC103B. The expanded audio signal output on pin 14 of IC102 is supplied to speaker after being adjusted the level by R139~142 volume control.
- Audio signal input on microphone is supplied to pin 8 of IC102 (comparator) and the compressed output signal level on pin 1 of IC102 is adjusted the level by RV101 to keep proper modulation ratio.

### **2.3 Audio transmit signal route**

- Microphone → pin 8 of IC102 → RV101 → RF module → antenna

### **2.4 Audio receive signal route**

- Antenna → pin 11 of RF module → pin 3 of IC103 → pin 14 of IC102 → TP2 → speaker

### **2.5 Data transmit route**

- Talk data → pin 27 of IC101 → pin 1 of RF module → antenna

### **2.6 Data receive route**

- Antenna → pin 11 of RF module → IC103B → IC103A → pin 31 of IC101