

43-3101 circuit description

Door Bell Unit:

Transmitter section:

The transmitter VCO composes of transistor Q2 and varactor diodes VD1 and VD2. The operation channel frequencies are 49.835MHz –49.885MHz for 3 channels with 25KHz channel spacing. The VCO output is amplified by buffer amplifier Q4 and power amplifier Q5. The amplified signal pass through the antenna switching diodes of D1 and D2 and then being feed to antenna.

RX amplifier:

The receiver amplifier composes of Q13 and Q1. The received RF signal is amplified by Q13 and Q1 and then being feed into combo IC (U1) via transformer L1.

Combo IC:

The Combo IC MC13111A (U1) composes of dual conversion receiver, 450KHz detector, compander, expander, dual PLL, low battery detect, mic amplifier.

There are two internal mixers that down convert the received RF signal 10.7MHz (1st IF) and 450KHz (2nd IF) respectively. The two IF output signals are filtered by 10.7MHz ceramic filter X2 and 450KHz ceramic filter X3 respectively. The 450KHz 2nd IF is then demodulated by 450KHz detector. The detector output signal is applied to expander and then amplified via internal speaker amplifier. The amplified signal is further amplified by external audio amplifier NJM2073 (U2).

The audio cut off is controlled by squelch circuit formed by U5 (LM358), U6 (BAV99).

TX modulation:

The audio input signal is amplified by internal mic amplifier inside combo IC and then being feed to TX VCO. The modulation can be adjusted by tuning variable resistor (R35).

Transistor switches:

Transistors Q7, Q12 act as switch that control TX_V+ on and off. Transistor Q8 and Q11 act as switch that control the RX_V+ on and off. Transistor Q14 and Q15 act as switch that control the 3V_OPAMP on and off. Transistor Q9 and Q10 act as switch that control the SPK_V+ on and off.

MCU TMP87C405

The MCU TMP87C405 (U3) controls all transistor switches and channel switching and volume switching. It also acts as interface with combo IC MC13111A (U1).

Reset circuit

Transistor Q6 acts as reset circuit to reset the MCU once the unit is powered up.