

Circuit Description

1. Introduction

The model S998A is a 40 channel (902-927 ISM band) cordless telephone. The whole unit is divided into two main parts as follows:

One remote handset

One Base unit

2. Functional Blocks of Remote Handset

- Keyboard Matrix and function LED
- MCU and MCU interface
- Antenna
- RF module
- Audio Amplifier
- Compander
- Low battery detector
- Datashaper
- Charge detector
- Buzzer amplifier

3. Circuit Description

3.1 Keyboard matrix and Function LED

Pin4 to Pin11 of MCU form a keyboard

Talk LED is controlled by Pin13.

3.2 MCU and MCU interface

Pin 16 – Pin 18 of MCU 87C405-HM communicate with the PLL of the RF module.

Pin 12 and Pin 21 of MCU control the audio path of incoming and outgoing audio signal

Transmitter DC power is controlled by Pin 22 of MCU

Receiver DC power is controlled by Pin 15 of MCU

Data communication between Handset and Base is via Pin 24 and Pin 19 by the RF link.

3.3 Antenna

ANT is a transmit and receive signal antenna.

3.4 RF module

The RF module includes the following parts:

- a. Saw duplexer
- b. Receiver amplifier
- c. Demodulator
- d. Transmitter amplifier
- e. Transmitter oscillator and modulator
- f. 1st local oscillator
- g. Phase lock loop and loop filter
- h. Noise detector

3.5 Audio Amplifier

U1A (LM324) and U2 (MC34119D) is the receive audio amplifier

U1D (LM324) is the transmit audio amplifier

3.6 Compander

U3 (DBL5015) is a compander IC which performs compress at transmitted signal via pin 3 of U3 and expand the received signal via pin 19.

3.7 Low battery detector

Low battery detect output is from pin 8 of U1C (LM324)

3.8 Datashaper

Pin 7 of U1B is a datashaper which send the information from BASE to the MCU pin 24 (RX_DATA)

3.9 Charge detector

D2, D3, D13, D14, R47 and R48 form a charge detector to direct the charging signal to the pin 25 of MCU

3.10 Buzzer amplifier

Q3 is a buzzer amplifier driven directly by the MCU pin 23.

4. Functional Blocks of the Base unit

Power supply

MCU and MCU interface

Antenna

Audio Amplifier

Compander

Datashaper

Noise detector

Charge detector

Line audio interface

Ringer detector

Function of LED

Power fail detector

5. Circuit Block description

5.1 Power supply

BU5 LM7805 regulate the input DC9V which provides 5VDC power to every part of the circuit.

5.2 MCU and MCU interface

Pin 19 – Pin 21 of MCU 87C405-BM communicate with the PLL of the RF module .

Pin 18 of MCU control the audio path of incoming and outgoing audio signal

Transmitter DC power is controlled by Pin 12 of MCU

Data communication between Handset and Base is via Pin 4 and Pin 24 by the RF link.

5.3 Antenna

ANT is a transmit and receive signal antenna.

5.4 RF module

The RF module includes the following parts:

- a. Saw Duplexer
- b. Receiver amplifier
- c. Demodulator
- d. Transmitter amplifier
- e. Transmitter oscillator and modulator

- f. 1st local oscillator
- g. Phase lock loop and loop filter
- h. Noise detector

5.5 Audio Amplifier

BU1A (LM324) and BU1D (LM324) is the receive audio amplifier
 BU1C (LM324) is the transmit audio amplifier

5.6 Comander

BU2 (DBL5015) is a comander IC which performs compress at transmitted signal via pin 3 of U3 and expand the received signal via pin 19.

5.7 Datashaper

Pin 7 of BU1B is a datashaper which send the information from BASE to the MCU pin 4 (RX_DATA)

5.8 Noise detector

It can detect the high frequency noise and the signal is given out from pin10 of RF module and via a buffer BQ6 to pin16 of MCU

5.9 Charge detector

BQ2 is a charge detector to direct the charging signal to the MCU pin 25.

5.10 Line audio interface

BT1 line transformer are the audio interface to the telephone line. The transformer is also for telephone line isolation.

5.11 Ring detector

Br49, BR68, BU4 (TLP-521-1), BC19, BZ1 and BZ2 form a ring detector to control the pin 26 of MCU

5.12 Function of Led

BLED1 is for power
 BLED2 is for charge and in use.

5.13 Power failure detector

BQ3, BZ3, BR53, BR55 and BR58 form a power failure detector. The power failure signal is sent to pin 13 of MCU

4. 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

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