

SAMSUNG

PORTABLE CELLULAR TELEPHONE SCH-3500 Series

SERVICE *Manual*

PORTABLE CELLULAR TELEPHONE



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1. General Introduction

The SCH-3500 DBDM(Dual Band Dual Mode) phone functions as both analog phone working in AMPS (Advanced Mobile Phone Service) mode and digital phone working in PCS (Personal Communication Service) mode.

The following standards and minimum performance standards shall be met or exceeded by each subscriber unit.

Air Interface

The Subscriber Unit shall be Dual mode and Dual band in compliance with ANSI J-STD-008 and TIA/EIA IS-95A(Analog).

ANSI J-STD-008 : Personal Station-Base Station Compatibility Requirements for 1.8 to 2.0 GHz CDMA PCS.

ANSI J-STD-018 : Recommended Minimum Performance Requirements for 1.8 to 2.0 GHz CDMA Personal Stations.

CDG Ref. Document #27 : High Rate Speech Service Option for Wideband Spread Spectrum System.

TIA/EIA IS-96A : Speech Service Option 1 Standard for Dual mode Wideband Spread Spectrum Cellular Systems.

TIA/EIA IS-125 : Recommended Minimum Performance standards for Digital Cellular Wideband Spread Spectrum Speech Service Option1.

TIA/EIA IS-126-A : Mobile Station Loop back Service Option standard.

TIA/EIA IS-95A : Mobile Station-Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular Systems;for the analog air interface.

TIA/EIA IS-98A : Recommended Minimum Performance Requirements for 1.8 to 2.0 GHz CDMA Personal Stations.

CDMA Receiver/Transmitter Specifications and Requirements

The Subscriber Unit shall comply with ANSI J-STD-008 and meet or exceed TIA/EIA IS-98A. The Subscriber Unit shall comply with Personal Station Class II.

Analog Receiver/Transmitter Specifications and Requirements

The Subscriber Unit shall comply with TIA/EIA IS-95A and meet or exceed TIA/EIA IS-95. The Subscriber Unit shall comply with Mobile Station Power Class III (600 mW).

2. Specification

2-1 General

| | | |
|---|--|--|
| Frequency Range Transmitter Receiver | PCS Mode 1850 ~ 1910 MHz 1930 ~ 1990 MHz | AMPS Mode 824 ~ 849 MHz 869 ~ 894 MHz |
| Channel Spacing | 1.25 MHz | 30 kHz |
| Number of Channels | 1200 | 832 |
| Duplex Spacing | 80 MHz | 45 MHz |
| Frequency Stability | (FRX - 80 MHz) ± 150 Hz | ± 2.5 ppm |
| Operating Temperature | -30 °C ~ 60 °C | |
| Operating Voltage HHP Hands-free | 3.6V DC (± 10%) 13.7V DC (± 10%) | |
| Size and Weight Including standard battery Including extended-life battery | 11.2 x 5.2 x 2.5 cm, 146 cc, 146 g (5.1 ounces) 11.2 x 5.2 x 3.0 cm, 175 cc, 166 g (5.8 ounces) | |

2-2 AMPS Mode

TRANSMITTER

| | |
|---|---|
| RF output power | : 0.6 W (+2/ - 4 dB) |
| Carrier ON/OFF Conditions | |
| "ON" Condition | : within ± 3 dB of specification output (in 2mS) |
| "OFF" Condition | : below - 60 dBm (in 2mS) |
| Compressor | |
| Compression Rate | : 2:1 |
| Attack Time | : 3 mS |
| Recovery Time | : 13.5 mS |
| Reference Input | : Input level for producing a nominal ± 2.9 kHz peak frequency deviation of transmitted carrier |
| Preamphasis | : 6 dB/OCT within 0.3 ~ 3 kHz |
| Maximum Frequency Deviation | |
| F3 of G3 | : ± 12 kHz (± 10 %) |
| Supervisory Audio Tone | : ± 2 kHz (± 10 %) |
| Signaling Tone | : ± 8 kHz (± 10 %) |
| Wideband Data | : ± 8 kHz (± 10 %) |
| Post Deviation Limiter Filter | |
| 3.0 kHz ~ 5.9 kHz | : above 40LOG (F/3000) dB |
| 5.9 kHz ~ 6.1 kHz | : above 35 dB |
| 6.1 kHz ~ 15 kHz | : above 40 LOG (F/3000) dB |
| Over 15 kHz | : above 28 dB |
| Spectrum Noise Suppression | |
| For All Modulation | |
| $f_0 + 20$ kHz ~ $f_0 + 45$ kHz | : above 26 dB |
| For Modulation by Voice and SAT | |
| $f_0 + 45$ kHz | : above 63 + 10LOG (Py) dB |
| For Modulation by WBD (without SAT) and ST (with SAT) | |
| $f_0 + 45$ kHz ~ $f_0 + 60$ kHz | : above 45 dB |
| $f_0 + 60$ kHz ~ $f_0 + 90$ kHz | : above 65 dB |
| $f_0 + 90$ kHz ~ $2f_0$ | : above 63 + 10LOG (Py) dB (where f_0 = carrier frequency, Py = mean output power in watts) |
| Harmonic and Conducted Spurious Emissions | : above 43 + 10 LOG (Py) dB |

RECEIVER

DE-Emphasis : -6 dB/OCT within 0.3 ~ 3 kHz

Expander

Expansion Rate : 1:2
 Attack Time : within 3 mS
 Recovery Time : within 13.5 mS
 Reference Input : Output level to a 1000 Hz tone from a carrier within \pm 2.9 kHz peak frequency deviation

Sensitivity : 12 dB SINAD/-116 dBm

Intermodulation Spurious Response Attenuation : above 65 dB

RSSI Range : above 60 dB

Protection Against Spurious Response Interference : above 60 dB

In Band Conducted Spurious Emissions

Transmit Band : below -60 dBm
 Receive Band : below -80 dBm

Out of Band Conducted Spurious Emissions : below - 47 dBm

Radiated Spurious Emissions

| Frequency Range | Maximum Allowable EIRP |
|-----------------|------------------------|
| 25 ~ 70 MHz | -45 dBm |
| 70 ~ 130 MHz | -41 dBm |
| 130 ~ 174 MHz | -41 ~ -32 dBm |
| 174 ~ 260 MHz | -32 dBm |
| 260 ~ 470 MHz | -32 ~ -26 dBm |
| 470 ~ 1 GHz | -21 dBm |

2-3 PCS Mode

TRANSMITTER

| | |
|---|-------------------------|
| Waveform Quality | : 0.944 or more |
| Open loop Power Control Range | |
| -25 dBm | : -60.5 dBm ~ 41.5 dBm |
| -65 dBm | : -20.5 dBm ~ -1.5 dBm |
| -104 dBm | : +15.0 dBm ~ +30.0 dBm |
| Minimum Tx Power Control | : -50 dBm below |
| Closed Loop Power Control Range | : ± 24 dB |
| Maximum RF Output Power | : 200 mW (+23 dBm) |
| Occupied Bandwidth | : 1.23 MHz |
| Conducted Spurious Emissions @ 1.25 MHz | : -42 dBc/30 KHz |

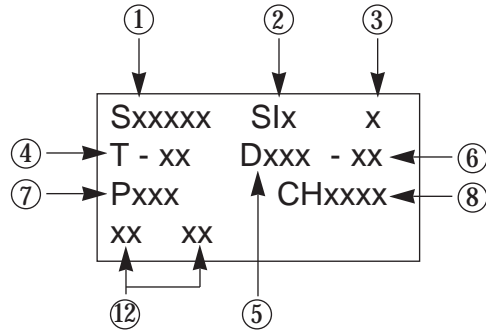
RECEIVER

| | |
|--|---|
| Rx Sensitivity and Dynamic Range (Rate Set 2) | : -104 dBm, FER=0.5% or less : -25 dBm, FER=0.5% or less |
| Conducted Spurious Emission | |
| 1930 ~ 1990 MHz | : < -81 dBm |
| 1850 ~ 1910 MHz | : < -61 dBm |
| All Other Frequencies | : < -47 dBm |
| Single Tone Desensitization | : lower than 1% |
| Rx power = -101 dBm | |
| Tx power = +15 dBm(According to IS-98C) | |
| Tone power = -30 dBm | |
| Tone offset from carrier = ± 1.25 MHz | |
| Intermodulation Spurious Response Attenuation | : lower than 1% |
| Rx power = -101 dBm | |
| Tone power 1 = -43 dBm | |
| Tone power 2 = -43 dBm | |
| Tone 1 offset from carrier = ± 1.25 MHz | |
| Tone 2 offset from carrier = ± 2.05 MHz | |

2-4 PCS Debug Display Information

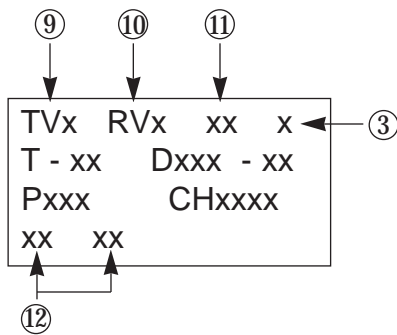
To select debug display mode : Press [MENU] + [9] + [0], and press [0] + [4] + [0] + [7] + [9] + [3], and press [1].

IN IDLE MODE



- ① Sxxxxx : SID (System Identification) toggle
Nxxxxx : NID (Network Identification) toggle
- ② Slx : Slot cycle index (lowest between the system and the phone will be used)
 - 1. SI0 : Slot Index 0
 - 2. SI1 : Slot Index 1
 - 3. SI2 : Slot Index 2
- ③ Handset Status : 0 - NO SVC
 - 1 - Synchronization
 - 2 - Paging (Idle)
 - 3 - Reg. Access state
 - 4 - Traffic Initialization
 - 5 - Waiting for order
 - 6 - Waiting for answer
 - 7 - Conversation state
 - 8 - Exit

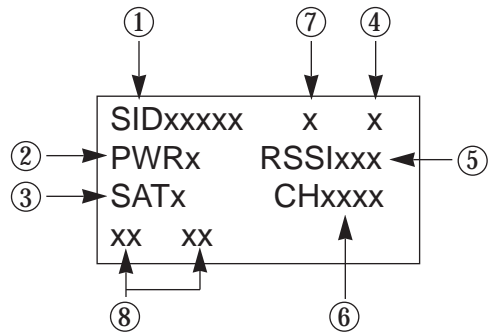
IN CONVERSATION MODE



- ④ T-xx : Tx adjust, Value ranges from -63~+63dB
- ⑤ Dxxx : Sector power in dBm
- ⑥ -xx : e_c/I₀
- ⑦ Pxxx : PN offset
- ⑧ CHxxxx : Channel number
- ⑨ TV : Tx vocoder rate (8 is full rate, 1 is 1/8th rate)
- ⑩ RV : Rx vocoder rate (8 is full rate, 1 is 1/8th rate)
- ⑪ xx : Walsh code used in traffic channel
- ⑫ System acquisition state

2-5 AMPS Debug Display Information

To select debug display mode : Press [MENU] + [9] + [0], and press [0] + [4] + [0] + [7] + [9] + [3], and press [1].

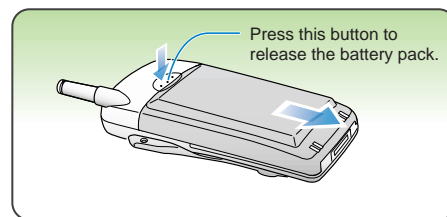
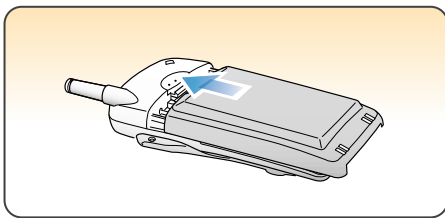


- ① SIDxxxxx : AMPS Home System ID
- ② PWRx : Power Level 0 ~ 7
- ③ SATx : Supervisory Audio Tone code (0 ~ 2)
- ④ x (Using Frequency Band) : A Band or B Band
- ⑤ RSSIxxx : RSSI value
- ⑥ CHxxxx : Channel number
- ⑦ Handset Status : 1 - Initialization state
2 - Idle state
3 - System Access state
4 - Voice channel state
- ⑧ System acquisition state

3. Installation

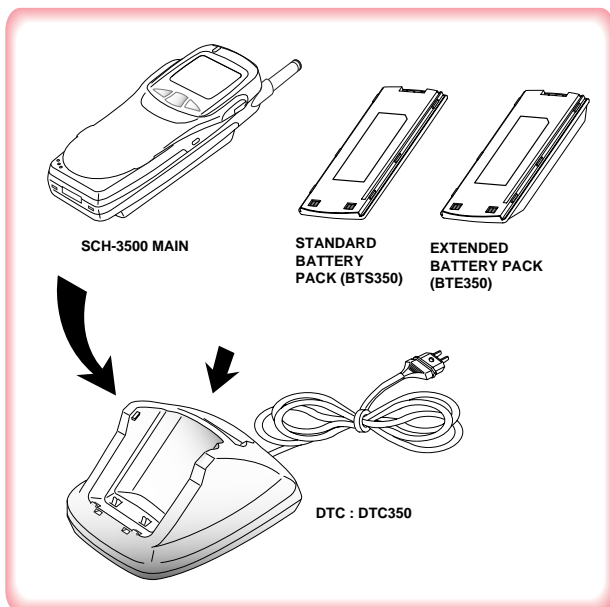
3-1 Installing a Battery Pack

1. To attach the battery pack after charging, align it with the phone about 1cm (1/2") away from its place so that the two arrows on the phone are seen, the battery charge contacts pointing downward.
2. Slide the battery pack upwards until it clicks firmly into position. The phone is now ready to be turned on.
3. To remove the battery pack, release it by pressing the button on the rear of the phone.
4. Slide the battery pack downward about 1cm (1/2") and lift it away from the phone.



3-2 For Desk Top Use

1. Choose a proper location to install the charger for desk top use.
2. Plug the power cord of the charger into an appropriate wall socket. When the power is connected correctly, the lamps turn on briefly.
3. To charge the battery pack, insert the battery pack into the rear slot of the charger. The lamp marked BATT on the front panel of the charger lights up red.
4. If you do not wish to use the phone while charging the battery, insert the phone with the battery pack attached into the front slot of the charger. The lamp marked PHONE on the front panel of the charger lights up red.



Specifications using DTC (Desk Top Charger)

| Battery Type | Standard Battery (Li-ion, 1000mAh) | Extended battery (Li-ion, 1600mAh) |
|---------------|------------------------------------|------------------------------------|
| Charging Time | 3 hours | 4 hours |
| SEC Code | GH43-10316B | GH43-00121A |

Figure 3-1 Charging the Phone and Battery

3-3 For Mobile Mount

3-3-1 Antenna

1. Choose a proper location to install the antenna.
 - The center of the roof top provides the best performance.
 - The edge of the rear trunk also provides a good performance. However, the antenna should be higher than the roof of the car.
 - In case of on-glass antenna, you should align the antenna base with the round plate to connect the cables correctly.
2. Mount the antenna vertically, connect the antenna cable.
3. Tighten the antenna nut fully.

3-3-2 Cradle

1. Choose a location where it is easy to reach and does not interfere with the driver's safe operation of the car.
2. Separate the two halves of the clamshell by removing the two large slotted screws. See the figure 3-2.
3. Drill holes and mount the lower half of the clamshell by using the screws.
4. Place the cradle onto the remaining half of the clamshell and assemble them by using the screws.
5. Reassemble the two halves of the clamshell together. Adjust the mounting angle and tighten the two slotted screws.

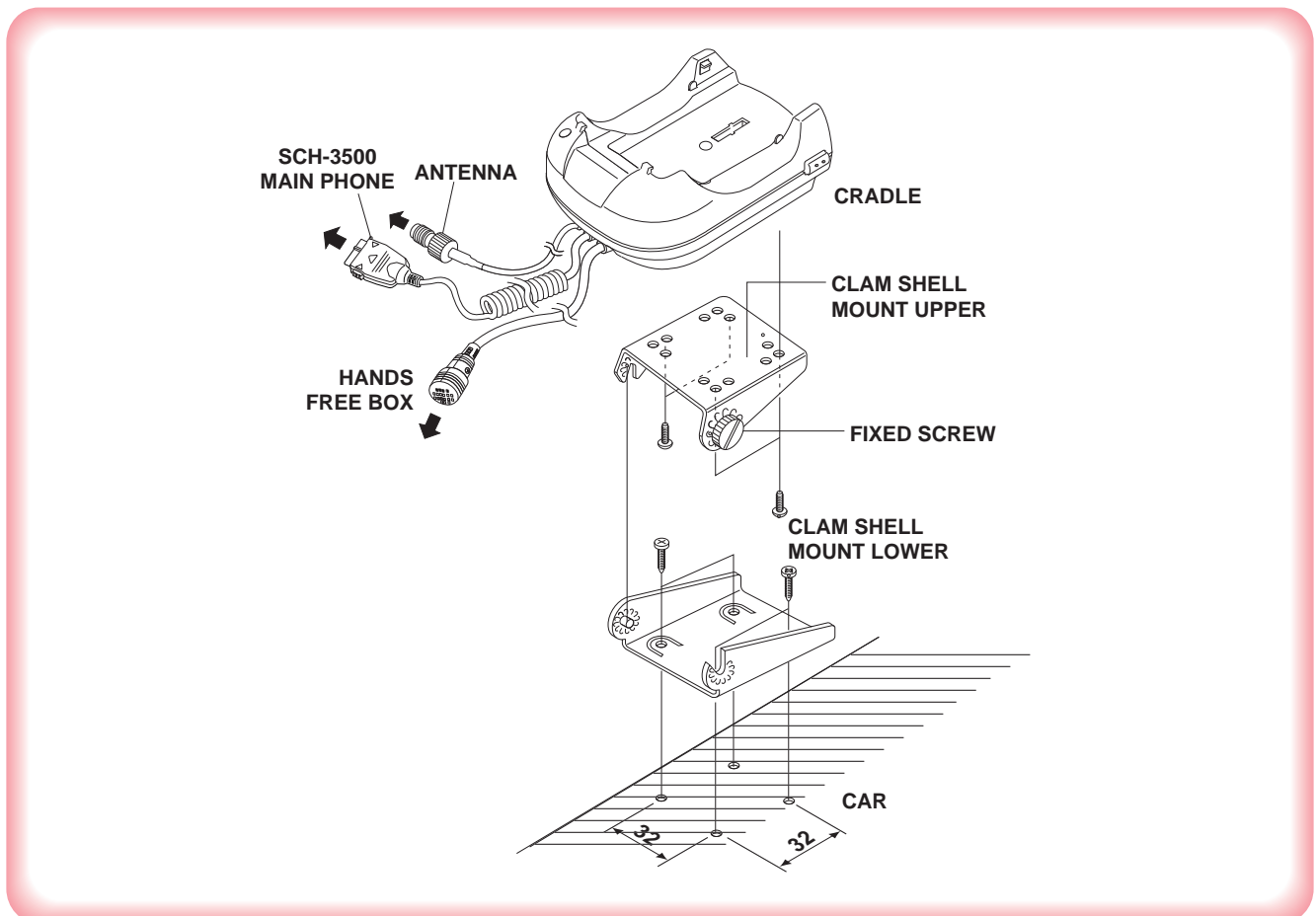


Figure 3-2 Cradle Installation

3-3-3 Hands-Free Box

1. Drill holes in a proper location for the hands-free box, attach the mounting bracket by using the screws. See the figure 3-3.
2. Install the hands-free box into the bracket.

3-3-4 Speaker

1. Install the speaker into the appropriate position.

3-3-5 Hands-Free Microphone

1. It is recommended to install the microphone where it is 30-45 cm (12-18") away from the driver. Choose the location where is least susceptible to interference caused by external noise sources, ie, adjacent windows, car audio speakers, etc. Normal place is the sun visor.
2. Once the microphone has been correctly positioned, connect the microphone wire to the **MIC** jack on the hands-free box.

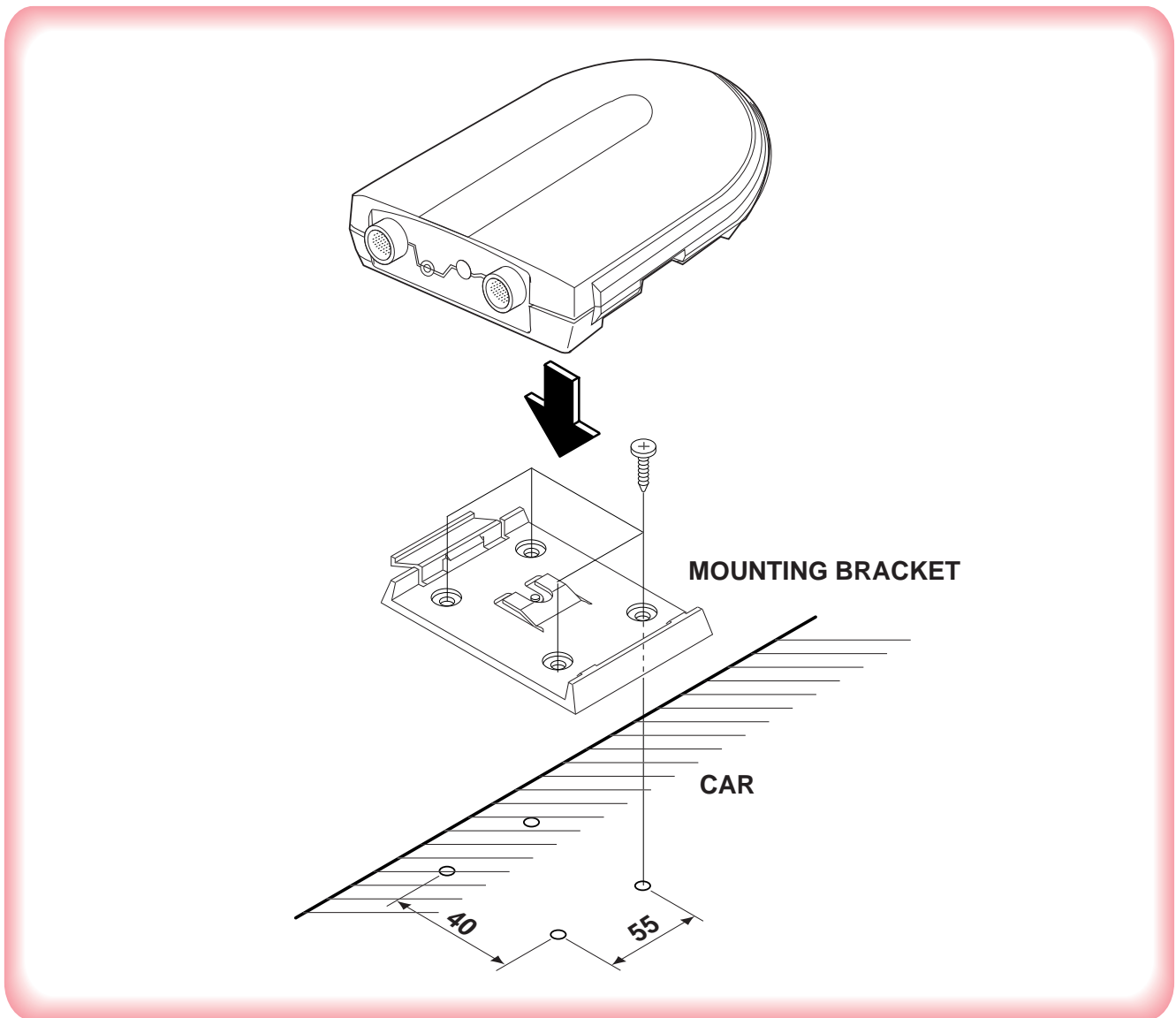


Figure 3-3 Hands-Free Box Installation

3-3-6 Cables

1. Connect the cradle and the hands-free box with the data cable. See the figure 3-4.
2. Connect the antenna cable to the RF jack of the cradle.
3. Connect the red wire to the battery (+) terminal, black wire to the vehicle chassis, brown wire to the Car Audio Mute port and orange wire to the ignition port in the key box of vehicle or battery (+) terminal.
4. Connect the other end of the power cable to the PWR jack of the hands-free box.

Notes:

- It is recommended to connect the power cable directly to the battery to avoid power noise.
- Make sure the connection between the battery (-) terminal and vehicle chassis is made correctly.
- Make sure the fuse having a proper capacity is used on the power cable.
- Make sure the cables do not pass over any sharp metal edge that may damage it.

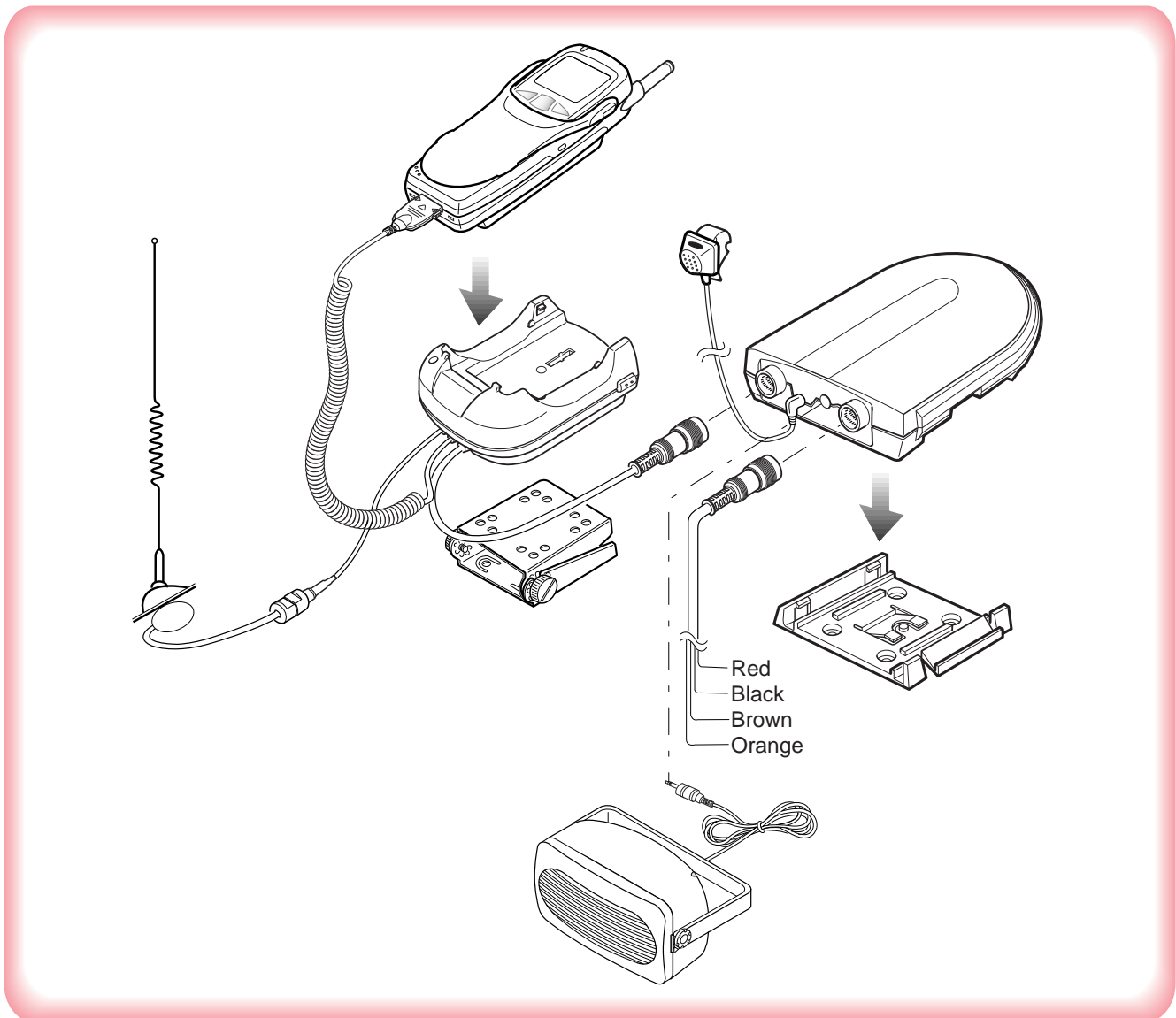


Figure 3-4 Cable Connections

4. NAM Programming

NAM features can be programmed as follows:

Notes:

- If you enter the NAM program mode, each item shows the currently stored data. Go to the next item by pressing **OK**.
- You can modify the data by entering a new data.
- If you enter a wrong digit, press **CLR** to delete the last digit. Press and hold **CLR** to delete all digit.
- To scroll items backwards press the **VOLUME** button on the left side of the phone.

4-1 Single NAM

4-1-1 General Setup

| LCD Display | Key in | Function |
|---|---------------------------|---|
| | Menu, 6, 0 | Select NAM programming |
| Enter Lock ??????? | 6-digit code | Enter random 6 digit code (MSL) |
| SVC Menui m 1:Phone# 2:General 3:NAM | 2 | Choose 'General' |
| ESN B0000000 | Volume „ | Electronic Serial Number of the phone is displayed |
| CAI version 1 | Volume „ | Common Air Interface version is displayed |
| VOC8/13/EVRC SO_VOICE_13K | Volume „ | |
| SCM 10101010 | Volume „ | Station Class Mark displays the power class, transmission, slotted class, dual mode. |
| Lock Code 0000 | 4-digit code OK | Lock code, current status is displayed. -to change, enter new code. -stores it. |
| Slot Mode Yes | ^ or □ OK | Slot mode. 'Yes' indicates the slot mode. -changes the status. -store it. |
| Slot Index 2 | 0 ~ 7 OK | Slot mode index. The higher, the longer sleeping time. -to change, enter new one. -stores it. |

4-1-2 Phone

| LCD Display | Key in | Function |
|--|---------------------------|------------------|
| SVC Menu m 1:Phone# 2:General 3:NAM | 1 | Choose 'Phone#'. |
| Phone # 1234567890 | Phone number OK | |
| Mobile ID # 1234567890 | Mobile ID OK | |

4-1-3 Setting Up NAM

| LCD Display | Key in | Function |
|--|---------------------------|---|
| SVC Menu m 1:Phone# 2:General 3:NAM | 3 | Choose 'NAM'. |
| IMSI_MCC 310 | Number OK | IMSI Mobile Country Code, current code is displayed. -to change, enter new one. -stores it. |
| IMSI_MNC 00 | Number OK | IMSI Mobile Network Code, current code is displayed. -to change, enter new one. -stores it. |
| CDMA ACCOLC 0 | Class number OK | CDMA Access Overload Class, current status is displayed. -to change, enter new one. -stores it. |
| CDMA HomeSID Yes | ^ or □ OK | CDMA Home system ID, current status is displayed -change the status -store it. |

| LCD Display | Key in | Function |
|------------------|---------------------|---|
| CDMA fSID Yes | ^ or □ OK | CDMA foreign SID, current status is displayed. -change the system. -store it. |
| CDMA fNID Yes | ^ or □ OK | CDMA foreign NID, current status is displayed. -change the system -store it. |
| HOME SID 4120 | Number OK | SID written in the list, current status is displayed. -to change, enter new one. -store it. |
| NID 65535 | Number OK | NID written in the list, current status is displayed. -to change, enter new one. -store it. |

5. Product Support Tools

5-1 General

IMPORTANT INFORMATION

Purpose

The Product Support Tool (PST) offers you the ability to interface with the SAMSUNG DBDM telephone using a PC. With this tool you can program the phones network system requirements and functionality, swap phone data, and download software upgrades. This document supports UniPST version x.xx.

NOTE: This software must be executed in the Windows95/98 mode.

EQUIPMENT REQUIRED

Make sure you have the following equipment setup:

1. Minimum PC configuration: 586 CPU, 16MB RAM, Windows95/98, 5MB of disk space free for software upgrade.
2. PST Software with appropriate cable (DM Cable for SAMSUNG DBDM phone).
3. Serial Port (16550 Serial Interface Card).
4. Power Supply (3.8 V) or Battery.

INSTALLATION

Software

1. Insert the PST floppy disk into drive (A:\).
2. Create an appropriate directory on the C:\ drive for PST software, Execute Setup.exe file, The installation program creates folder and task bar on the windows95/98 start bar.

SAMSUNG DBDM Phone

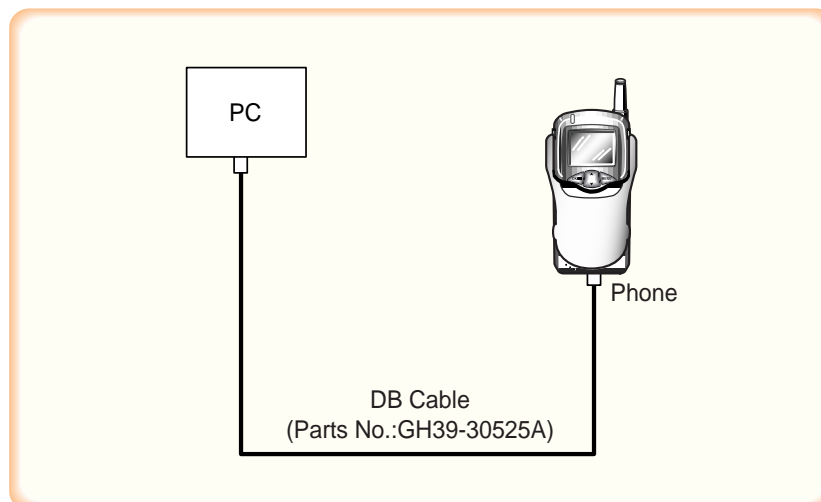
The serial port should be configured to COM1 or COM2.

Use the following procedure to connect the phone, cable, and PC .

Plug the female end of the DM Cable into the 16550 card.

Pull the black rubber connector away from the socket at the base of the phone.

Plug the special connector on the cable into the socket at the base of the phone.



5-2. PST (Product Support Tool)

5-2-1 Getting Started

MAIN MENU SCREEN

1. At the Windows95/98, Double Click “UniPst.exe”.
2. The Main Menu Screen will be displayed.
The Main Menu Screen shows the basic tasks that are available.

CAUTION: DO NOT attempt to program phone with a low battery.

PST SETUP

UniPst supports SAMSUNG DBDM portable telephone. You can select serial port COM1 or COM2.

5-2-2 Operation Procedure

Service Programming

The Service Programming screens enable you to set and change the service activation parameters of the phones. These items can be changed individually or as a group via the “Edit Items” Property Sheet of the PST. There are several pages on the Service Programming Property Sheet (See below Figure).

Read Data from File

Click “open” icon to select the name of a file whose extension is “mmc”. The values will be read from the named file, and will initialize the parameter values seen on the Service programming screen

Read Data from Phone

Click Read from the Phone icon to upload the current programmable parameters of the phone. The values are read from the phone, so the phone must have the power ON and be properly connected to the PST.

NOTE: To actually view the data you need to go to the Edit Items screens.

Edit Items

Click this icon to edit Number Assignment Module (NAM) items or UI items.

There are two types of screens:

1. Parameters associated with a particular Number Assignment Module (NAM)
2. UI items settings

Phone Book

Click this icon to edit Phone Book.

While you edit cell, you can use <Enter> and < UP , DOWN,LEFT,LIGHT Arrow> and <SPACE> key. If you want to edit phone number or name, you must move rectangle box to cell where you want to edit, Write it down. If <UP and DOWN Arrow> key is pressed, the cursor moves to next cell or previous cell.

Save Data to File

Click this icon to save the current parameters to a file. Once you enter a filename, Click <OK> button to write all current parameters to that file. This way the same information can be downloaded into multiple phones.

Write to Phone

Click this icon to write the selected parameter values to the phone. Writing the selected values to the phone may take up to a minute.

If there are dependencies in a field you can make all the changes in the proper fields and download the information all together.

If you intend to use this "Write to Phone" feature, it is recommended that you do a "Read Data from Phone" first, and then make the changes, so that nothing gets inadvertently overwritten.

NOTE: DO NOT TOUCH THE PHONE WHILE WRITING IS IN PROGRESS.

Software Download and Upgrade Screen

To begin a software upgrade or download, perform the following steps:

1. From the main menu screen choose DOWNLOAD MODE?
Click open icon to choose a BIN file of the new software to be loaded. Choose the appropriate BIN file, then Click <Open> (see below figure).
2. Click Download? to begin downloading the file. You will notice various messages and a progress bar that informs the user what percentage of the downloading has already occurred.
3. Click Mode Select box, then Select SERVICE MODE?to return to the Service Mode Screen.

NOTE: DO NOT POWER OFF WHILE THE PHONE IS BEING DOWNLOADED!

6. Circuit Description

6-1 Logic Section

6-1-1 Power Supply

With the battery installed on the phone and by pressing the PWR key, the VBATT and ON_SW signals will be connected. This will turn on Q905 (2SC4081BR). This in turn will be supplied to regulators (U905 and U907), thus releasing them from the shut-down state to output regulated 3.0V.

The VBATT applied to ON_SW will turn on Q907 (DTC144EE) resulting in the signal ON_SW_SENSE to change state from HIGH to LOW. This will allow MSM to send out PS_HOLD (logical HIGH) to turn on Q905 even after the PWR key is released.

The voltage (+3.0VD) from U907 is used in the digital parts of MSM. The voltage (+3.0VA) from U905 is used in the analog part.

6-1-2 Logic Part

The Logic part consists of internal CPU of MSM, Memory and EEPROM. The MSM receives TCXO and CHIPX8 clock signals from the IFR and controls the phone during the CDMA and the FM mode. The major components are as follows:

- CPU : ARM7TDMI Micro-processor
- Memory : U801 (MB84VD21194-85-PBS)
16M Flash ROM, 4M SRAM
- EEPROM : U903 (M24256)
256K Serial EEPROM

CPU

ARM7TDMI microprocessor is used for the main processing. The CPU controls all the circuitry. For the CPU clock, 27 MHz resonator is used.

MEMORY (U801)

16M Flash and 4 M SRAM one package is used to store the terminals programs, the internal flag information, call processing data, and timer data. Using the down-loading program, the program can be changed even after the terminal is fully assembled.

EEPROM (U903)

One 256 kbit EEPROM is used to store ESN, NAM, power level, volume level, and telephone number.

KEYPAD

For key recognition, key matrix is setup using SCAN0-6 of STORE signals and KEY0-3 of input ports of MSM. Ten LEDs and backlight circuitry are included in the keypad for easy operation in the dark.

LCD MODULE

LCD module contains a controller which will display the information onto the LCD by 8-bit data from the MSM.

6-1-3 Baseband Part

MOBILE SYSTEM MODEM (MSM)

The MSM equipped with the ARM7TDMI core is an important component of the CDMA cellular phone. The MSM comes in a 196 pins BGA package. The interface block diagram is shown on page 6-3.

MICROPROCESSOR INTERFACE

The interface circuitry consists of reset circuit, address bus (A0-A19), data bus (AD0-AD15), and memory controls (ALE, DT_R, HWR/, LWR/, ROM_CS).

INPUT CLOCK

- CPU clock: 27 MHz
- TXCO(pin L2): 4.92 MHz. This clock signal from the IFR is the reference clock for the MSM except in CDMA mode.
- CHIPX8(pin H2) : 9.8304 MHz. The reference clock used during the CDMA mode.
- SLEEP-XTAL-IN/OUT(pins M10, P12) : 32.768 kHz

IFT/IFR INTERFACE

CDMA, FM Data Interface

- TXIQDATA0-7 (pins L1, J3, K2, K1, J4, H3, J1, J2) : TX data bus used during both CDMA and FM mode.
- C_RX_IDATA0-3 (pins G1-G4) and C_RX_QDATA0-3 (pins F1-F4) : RX data bus used during CDMA mode.
- FM_RX_IDATA (pin E4) and FM_RX_QDATA (pin E3) : RX data bus used during FM mode.

Clock

- TX_CLK (pin H1), TX_CLK/(pin H4) : Analog to Digital Converter (ADC) reference clock used in TX mode.
- CHIPX8 : ADC reference clock used in CDMA RX mode.
- FMCLK : Reference clock in FM RX mode.

ADC Interface

ADC_CLK (pin C1), ADC_ENABLE (pin C2) and ADC_DATA (pin B1) are required to control the internal ADC in the IFT/IFR.

Data Port Interface

Includes the UART. Also, supports Diagnostic Monitor (DM) and HP equipment interface.

CODEC Interface

The MSM outputs 2.048 MHz PCM_CLK (pin B11) and 8 kHz PCM_SYNC (pin C11) to the CODEC (U902). The voice PCM data from the MSM (U908) PCM_DIN (pin A12) is compressed into 8 kHz by QCELP algorithm in the CDMA mode. In FM mode, the data is processed by D_FM.

RF Interface

TX : TX_AGC_ADJ (pin K3) port is used to control the TX power level and PA_ON (pin L4) signal is used to control the power amplifier.

RX : RX_AGC_ADJ (pin M1) port is used to control the RX gain and TRK_LO_ADJ (pin N3) is used to compensate the TCXO clock.

General Purpose I/O Register Pins

Input/output ports to control external devices.

Power Down Control

When the IDLE/ signal turns LOW, only the TX sections will be disabled. If both the IDLE/ and SLEEP/ changes to LOW, all the pins except for the TXCO is disabled.

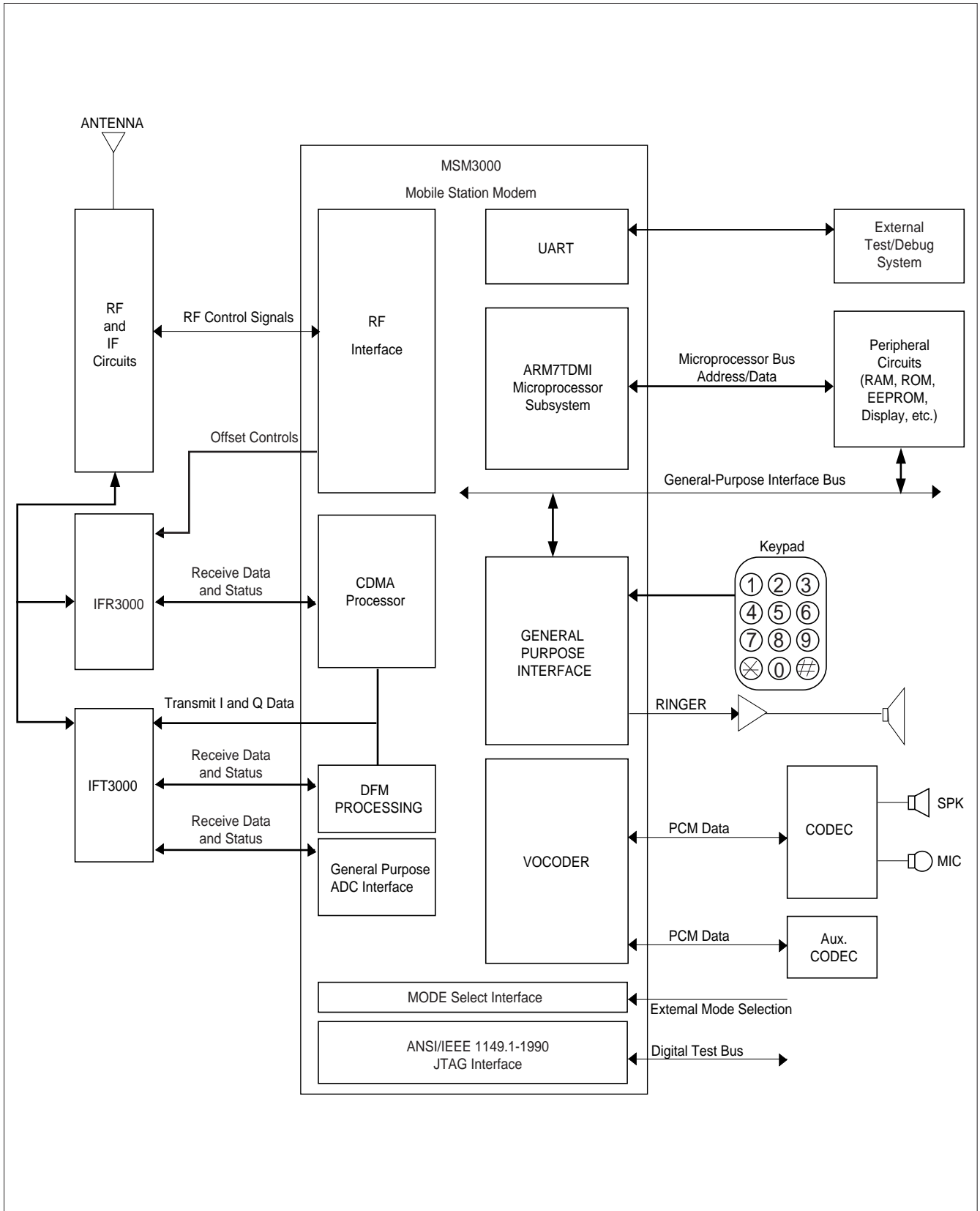


Figure 6-1 Baseband Block Diagram

6-1-4 Audio Part

TX AUDIO PATH

The voice signal output from microphone is filtered and amplified by the internal OP-AMP and is converted to PCM data by the CODEC (U902). This signal is then applied to the MSM (U908)'s internal vocoder.

RX AUDIO PATH

The PCM data out from the MSM is converted to audio signal by ADC of CODEC (U902), is then amplified by CODEC (U902) to be sent to the speaker unit.

FM TX PATH

Pre-Emphasis Circuit

The circuit features +6dB/oct to reduce signal loss and noise in Tx path.

Compressor

The compressor features 2:1 level to reduce signal loss and noise in Tx path. The zero crossing level of the compressor is ± 2.9 kHz/dev, attack time is 3 mS, and release time is 13.5 mS.

Limiter

The limiter performs to cut ± 0.53 Vp-p or higher audio signal level so that the FM frequency deviation is not over ± 12 kHz/dev. The function is used to avoid confusion over phone line. LPF is used to reduce a specific high frequency of limited signal.

RX AUDIO PATH

De-Emphasis Circuit

This circuit is 1st LPF featuring -6dB/oct to reduce signal loss and noise in Rx path.

Expander

The expander features 1:2 level to reduce signal loss and noise in Rx path. The zero crossing level of the expander is ± 2.9 kHz/dev, attack time is 3 mS, and release time is 13.5 mS.

Volume Adjust

Volume can be adjusted up to 6 steps for the user to obtain a proper loudness of received signal.

6-1-5 TX WBD, ST, And SAT

These signals are generated from MSM. The modulation level of TX WBD and ST is ± 8 kHz/dev, and SAT is ± 2 kHz/dev.

6-1-6 Buzzer Driving Circuitry

Buzzer generates alert tone. When the buzzer receives the timer signal from the MSM, it generates alert tone. The buzzer level is adjusted by the alert signal's period generated from the MSM timer.

6-2 Receiver (For PCS)

LOW NOISE AMPLIFIER (LNA)

The low noise amplifier featuring 1.6 dB Noise Figure and 20dB gain amplifier a weak signal receiver from the base station to obtain the optimum signal level.

DOWN CONVERTER (MIXER)

First local signal is applied to this down converter. The down converter transfers the signal amplified at the LNA into 210.38 MHz IF signal. 210.38 MHz IF signal is made by subtracting 1960 ± 30 MHz RF signal from 1750 ± 30 MHz first local signal. The LAN is Q101 and down converter is U101.

LOCAL BUFFER AMPLIFIER

Buffer (Q203) amplifies signal to be applied to the local input of the down converter (U101) when a phase is locked between U201 and U204.

RF BAND PASS FILTER (BPF)

The RF BPF (F104) passes only a specific frequency (1960 ± 30 MHz) from the signal received from the mobile station. The band width is 60MHz.

IF SAW BAND PASS FILTER

IF SAW BPF (F106) is used for CDMA system having 1.23MHz wide band and ± 630 kHz bandwidth. The filter also eliminates spurious signals generated at the mixer.

VOLTAGE CONTROLLED OSCILLATOR

The VCO (U201) generates the signal having 1750 MHz center frequency and ± 30 MHz deviation with voltage control. PLL IC (U204) controls this signal.

PHASE LOCKED LOOP (PLL)

Input reference frequency is generated at VCTCXO (U205) and the divider signal is generated at VCO. PLL compares the two signals and generates the desired signal with a preprogrammed counter which controls voltage.

VOLTAGE CONTROLLED TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

It provides 19.68 MHz reference frequency to PLL (U204) and IFT (U501), IFR (U103). A correct frequency tuning is made by the voltage control.

TEMPERATURE TO VOLTAGE CONVERTER

The Temperature to Voltage Converter (U341) detects temperature. It is used to compensate active component characteristics due to the temperature difference.

DUPLEXER

Duplexer (F101) controls to transmit through the antenna only the signals within acceptable Tx frequency range (1880 ± 30 MHz). It also matches LNA (U401) input in receiving part and PA out in transmitter part with the antenna.

IFT3000 FEATURES

- Dual-mode operation for CDMA and AMPS
- 8-bit DACs convert digital baseband to analog baseband
- CDMA and FM signal paths include low-pass filters for I and Q output waveform smoothing
- IF mixer up-converts analog baseband to IF
- Controls Tx power level with AGC amplifier having 84 dB dynamic range
- Programmable Tx PLL for generating Tx IF frequency
- VCO for generation of transmit LO mixing signal
- 8-bit general-purpose ADC with 3-input analog multiplexer
- Operational modes compatible with MSM2300 and MSM3000
- Three-line Serial Bus Interface (SBI) for control of the IFT3000 via the MSM3000
- 48-lead TQFP packaging for dense mechanical assemblies

IFR3000 FEATURES

- Dual-mode operation for CDMA and AMPS
- Rx power level with 90 dB dynamic analog baseband
- IF mixer down-converts Rx IF to quadrature analog baseband
- CDMA and FM signal paths include low-pass filters for accurate selection of I and Q baseband components
- 4-bit ADCs convert CDMA I and Q analog baseband signals to digital baseband data
- 8-bit ADCs convert FM I and Q analog baseband signals to digital baseband data
- RX Slotting operation for very low power consumption in CDMA and FM signal paths
- Clock generators for CDMA and AMPS operation
- VCO for generation of receive LO mixing signal
- I and Q offset control inputs drive baseband DC offsets to zero in CDMA and FM signal paths
- Operational modes compatible with MSM2300 and MSM3000
- Three-line Serial Bus Interface for initializing and control of the IFR3000 from the MSM3000
- 48-lead TQFP (JEDEC Pub 95 MS-026 BBC) packaging for dense circuit boards

6-3 Receiver (For AMPS)

LOW NOISE AMPLIFIER (LNA)

The low noise amplifier featuring 1.6 dB Noise Figure and 20 dB gain amplifier a weak signal receiver from the base station to obtain the optimum signal level.

DOWN CONVERTER (MIXER)

First local signal is applied to this down converter. The down converter transfers the signal amplified at the LNA into 85.38 MHz IF signal. 85.38 MHz IF signal is made by subtracting 881 ± 12.5 MHz RF signal from 966 ± 12.5 MHz first local signal. The LNA is Q102 and down converter is U102.

LOCAL BUFFER AMPLIFIER

Buffer (Q204) amplifies signal to be applied to the local input of the down converter (U412) when a phase is locked between U202 and U204.

RF BAND PASS FILTER (BPF)

The RF BPF (F105) passes only a specific frequency (881.49 ± 12.5 MHz) from the signal received from the mobile station. The band width is 25 MHz.

IF SAW BAND PASS FILTER

IF SAW BPF (F107) is used for AMPS system having 30kHz channel spacing and ± 15 kHz bandwidth. The filter also eliminates the spurious signals at the mixer.

VOLTAGE CONTROLLED OSCILLATOR

The VCO (U202) generates the signal having 966MHz center frequency and ± 12.5 MHz deviation with voltage control. PLL IC (U204) controls this signal.

PHASE LOCKED LOOP (PLL)

Input reference frequency is generated at VCTCXO (U205) and the divider signal is generated at VCO. PLL compares the two signals and generates the desired signal with a preprogrammed counter which controls voltage.

VOLTAGE CONTROLLED TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

It provides 19.68 MHz reference frequency to PLL (U204) and IFR (U103), IFT(U501). A correct frequency tuning is made by the voltage control.

DUPLEXER

Duplexer (F103) controls to transmit through the antenna only the signals within acceptable Tx frequency range (836 ± 12.5 MHz). It also matches LNA (Q102) input in receiving part and PA out in transmitter part with the antenna.

6-4 Transmitter Section (For PCS)

POWER AMP

Power Amp module (U412) amplifier signal to be sent out to the base station through the antenna.

DRIVER AMP

The driver amp (U409) allows the signal input to the Power Amp module (U412) to be within a specified level.

UP CONVERTER (MIXER)

The up converter (U406) receives the first local signal to generate 1880±30 MHz. 1880 ±30 MHz signal comes out from the mixer output by adding 130MHz IF signal to 1750±30 MHz first local signal. Up converter's reference number is U406.

ANTENNA

Antenna allows signal to send to receive from the base station.

RF BAND PASS FILTER (BPF)

The RF BPF (F403, F404) accepts only specific frequency (1880±30 MHz) to send it out to power and Power Amp module. The band width is 60 MHz.

ISOLATOR

Isolator (U413) is used to reduce a reflected signal to protect the power amp module from being damaged.

POWER SUPPLY REGULATOR

The power supply regulator (U344) supplies a regulated power to each part of transmitter. VBatt is connected to power Amp Module (U412) directly. U344 supplies 3.0 V to the others.

6-5 Transmitter Section (For AMPS)

POWER AMP MODULE

Power Amp module (U411) amplifier signal to be sent out to the base station through the antenna.

UP CONVERTER (MIXER)

The up converter (U407) receives the first local signal to generate 836±12.5 MHz. 836 ±12.5 MHz signal comes out from the mixer output by adding 130MHz IF signal to 966±12.5 MHz first local signal.

ANTENNA

Antenna allows signal to send to receive from the base station.

RF BAND PASS FILTER (BPF)

The RF BPF (F402, F405) accepts only specific frequency (836±12.5 MHz) to send it out to base station module. The band width is 25 MHz.

POWER SUPPLY REGULATOR

The power supply regulator (U343) supply a regulated power to each part of transmitter. U343 supplies 3.0V to TX driver (U408), mixer (U407) and VBatt is connected to Power Amp Module (U411) directly.

6-6 Test Command Table

To change the phone from normal mode to test mode, you should enter the following keys. :
Press [4 7 * 8 6 9 # 1 2 3 5]

| Command No. (OP, AB, RB) | Command SW Name | Description |
|-----------------------------|------------------------------|--|
| 01(1F, 0, 0) | T_SUSPEND_I | Terminate the normal mode, enter to the test mode. |
| 02(3f, 0, 0) | T_RESTART_I | Terminate the test mode, enter to the normal mode. |
| 03(FD, 0, 0) | T_SAVE_VAL_I | Save value in EEPROM. (Only for Auto test) |
| 04(1D, 0, 1) | T_GET_MODE_I | Get mode. (CDMA or AMPS) |
| 05(1C, 1, 0) | T_SET_MODE_I | Set mode to CDMA or AMPS. (Only for Auto test) |
| 06(1E, 0, 0) | T_WRITE_NV_I | Write an EEPROM item. (one of the NV items) |
| 07(81, 0, 0) | T_CARRIERON_I | Turn the carrier on. |
| 08(82, 0, 0) | T_CARRIEROFF_I | Turn the carrier off. |
| 09(83, 4, 0) | T_LOADSYN_I ²⁾ | Set the synthesizer to the channel specified by ch_data. |
| 10(84, 1, 0) | T_PWRLEVEL_I ²⁾ | Set the RF power attenuation to the specified value. |
| 11(85, 0, 0) | T_RXMUTE_I | Mute the receive-audio signal. |
| 12(86, 0, 0) | T_RXUNMUTE_I | Unmute the receive-audio signal. |
| 13(87, 0, 0) | T_TXMUTE_I | Mute the transmit-audio signal. |
| 14(88, 0, 0) | T_TXUNMUTE_I | Unmute the transmit-audio signal. |
| 16(8F, 0, 0) | T_STON_I | Transmit a continuous Signaling Tone (ST). |
| 17(90, 0, 0) | T_STOFF_I | Stop transmit a continuous Signaling Tone (ST). |
| 20(94, 4, 0) | T_TEST_SYS_I | Roam Test System |
| 22(91,96,96) | T_SNDNAM_I ¹⁾ | Display and send NAM information. |
| 23(95, 3, 4) | T_SNDVERSION_I ¹⁾ | Display and return S/W version. |
| 24(9F, 7, 8) | T_SNDESN_I ¹⁾ | Display and return ESN. |
| 25(92, 0, 0) | T_BACKLIGHT_ON_I | Turn on the backlight. |
| 26(93, 0, 0) | T_BACKLIGHT_OFF_I | Turn off the backlight. |
| 27(96, 0, 0) | T_LAMP_ON_I | Turn on the LAMP. |
| 28(97, 0, 0) | T_LAMP_OFF_I | Turn off the LAMP. |
| 30(9D,16, 0) | T_PLINE_I | Display and return production date. |
| 32(A0, 1, 0) | T_SATON_I* ²⁾ | Enable the transmission of SAT. |
| 33(A1, 0, 0) | T_SATOFF_I* | Disable the transmission of SAT. |
| 34(A2, 0, 0) | T_CDATA_I | Transmit continuous 5-word Reverse CTL CH message. |
| 35(A3, 0, 0) | T_VOLUME_UP_I | Increase value of the last command. (Only for autotest) |
| 36(A4, 0, 0) | T_VOLUME_DOWN_I | Decrease value of the last command. (Only for autotest) |
| 42(AA, 1, 0) | T_DTMFON_I ²⁾ | Activate DTMF generator with keycode. |

| Command No. (OP, AB, RB) | Signal. Name | Description |
|-----------------------------|-------------------------------------|--|
| 43(AB, 0, 0) | T_DTMFOFF_I | Deactivate DTMF generator. |
| 44(B0, 0, 0) | T_COMPANDORON_I | Enable the compressor and expander. |
| 45(B1, 0, 0) | T_COMPANDOROFF_I | Disable the compressor and expander. |
| 46(B2, 0, 0) | T_AMPS_VCLINE_I* | Enter Analog voice channel state. |
| 47(B3, 3, 0) | T_AMPS_AUD_GAIN_I | FM audio gain. |
| 48(B4, 0, 0) | T_VIBRATOR_ON_I | Activate a vibrator. |
| 49(B5, 0, 0) | T_VIBRATOR_OFF_I | Deactivate a vibrator. |
| 50(B6, 0, 4) | T_BATT_TYPE_I | Battery type. |
| 51(B7, 1, 1) | T_BBA_I | BASIC supplier |
| 52(B9, 2, 2) | T_HW_VERSION_I | HW version |
| 57(BC, 0, 0) | T_MIC_ON_I | Mic path on. |
| 58(BD, 0, 0) | T_MIC_OFF_I | Mic path off. |
| 59(BE, 0, 0) | T_ALLPATH_I | Set RX Path, TX path Unmute to Earpiece. |
| 60(BF, 3, 0) | T_AMPS_TX_GAIN_I ²⁾³⁾ | AMPS TX Audio Gain Control. |
| 61(C0, 3, 0) | T_AMPS_RX_GAIN_I ²⁾³⁾ | AMPS RX Audio Gain Control. |
| 62(C1, 3, 0) | T_DTMF_VOL_TX_I ²⁾³⁾ | AMPS TX DTMF Gain Control. |
| 63(C2, 3, 0) | T_TX_LIMITER_I ²⁾³⁾ | AMPS TX Limiter Gain Control. |
| 64(C3, 3, 0) | T_AMPS_SAT_LEVEL_I ²⁾³⁾ | AMPS TX SAT level Control. |
| 65(C4, 3, 0) | T_AMPS_FREQ_SGAIN_I ²⁾³⁾ | AMPS TX Master Gain Control. |
| 66(C5, 3, 0) | T_AMPS_ST_GAIN_I ²⁾³⁾ | AMPS TX ST Gain Control. |
| 67(C6, 3, 6) | T_READ_BATT_I ¹⁾ | Read low batt in the standby, talk mode. |
| 68(C8, 0, 3) | T_VBATT1_I ³⁾ | Set the low battery position in the standby. |
| 69(C9, 0, 3) | T_VBATT2_I ³⁾ | Set the low battery position in the talking. |
| 70(CA, 3, 0) | T_WRITE_BATT_I ³⁾³⁾ | Write low battery Level Value to NVM. |
| 71(D1, 3, 0) | T_CDMA_TXADJ_I ²⁾ | Change pdm TX AGC in CDMA. |
| 72(D2, 3, 0) | T_AMPS_TXADJ_I ²⁾ | Change pdm TX AGC in AMPS. |
| 73(D3, 1, 0) | T_SET_PA_R_I ²⁾ | Set PA R1, R0 in CDMA. |
| 74(D4, 4, 0) | T_TXRAS_ADJ_I | TX Ras table adjust. |
| 75(D5, 0, 3) | T_READ_RSSI_I ³⁾ | Read a RSSI. |
| 76(D5, 3, 0) | T_WRITE_RSSI_I ³⁾ | Writes RSSI. |

| Command No. (OP, AB, RB) | Signal. Name | Description |
|-----------------------------|-----------------------------------|--------------------------------------|
| 77(D7, 0, 3) | T_READ_TEMP_I | Read Temp. |
| 78(D8, 0, 3) | T_READ_HDET_I | Read High Detect. |
| 79(D9, 1, 0) | T_BUZZER_ON_I ²⁾ | Buzzer On at DTMF 0 key. |
| 80(DA, 0, 0) | T_BUZZER_OFF_I | Buzzer Off. |
| 81(E3, 0, 0) | T_VOC_PCMLPON_I | Play a PCM LOOP BACK. |
| 82(E4, 0, 0) | T_VOC_PCMLPOFF_I | Play off a PCM LOOP BACK. |
| 85(E7, 0, 0) | T_SPEAKER_ON_I | Turn on the speaker path. |
| 86(E8, 0, 0) | T_SPEAKER_OFF_I | Turn off the speaker path. |
| 87(E9, 0, 0) | T_AMPS_LOOP_TEST_I | Play a PCM AMPS loopback. |
| 88(EA, 0, 0) | T_TRK_ADJ_I ³⁾ | RM TRK_LO_ADJ control. |
| 89(EB, 0, 0) | T_CD_TRK_ADJ_I | CDMA TRK_LO_ADJ control. |
| 90(F0, 4, 0) | T_HW_CHANFLAT_I | HW flatness channel. |
| 91(F1, 4, 0) | T_SW_CHANFLAT_I | SW flatness channel. |
| 92(F2, 3, 0) | T_AMPS_TX_PWR_2_I ²⁾³⁾ | Setting the volume for Power Level. |
| 93(F3, 3, 0) | T_AMPS_TX_PWR_3_I ²⁾³⁾ | Adjust the channel flatness of AMPS. |
| 95(F4, 4, 0) | T_PCS_HW_CHANFLAT_I | PCS HW flatness channel |
| 96(F5, 4, 0) | T_PCS_SW_CHANFLAT_I | PCS SW flatness channel. |
| 97(F6, 4, 0) | T_PCS_CH_CHANFLAT_I | PCS channel flatness adjust. |
| 98(F6, 0, 0) | T_DATASVC_ON_I | “DATA SVC ON” |
| 99(F7, 0, 0) | T_DATASVC_OFF_I | “DATA SVC OFF” |
| 100(FF, 4, 0) | T_MAX_I | |

- 1) The AB (Input Argument Byte Number) values of these commands are used only in the manual test. In automatic test mode, the AB is regarded as 0.
- 2) You can assign the value for these commands. If the AB value is assigned without argument, the test is achieved with the value stored in EEPROM.
- 3) After you get a desired test value by performing these commands, if you want to save the value into EEPROM, use T-SAVE-VAL-I command to store the test value into the corresponding position.

*OP: Operation Command Number
 AB: Input Argument Byte Number
 RB: Return Byte Number

*SAT 32, 33 are not operating in MSM2 CHIP test

*46 command is required in Rx, and Tx path test at AMPS mode.

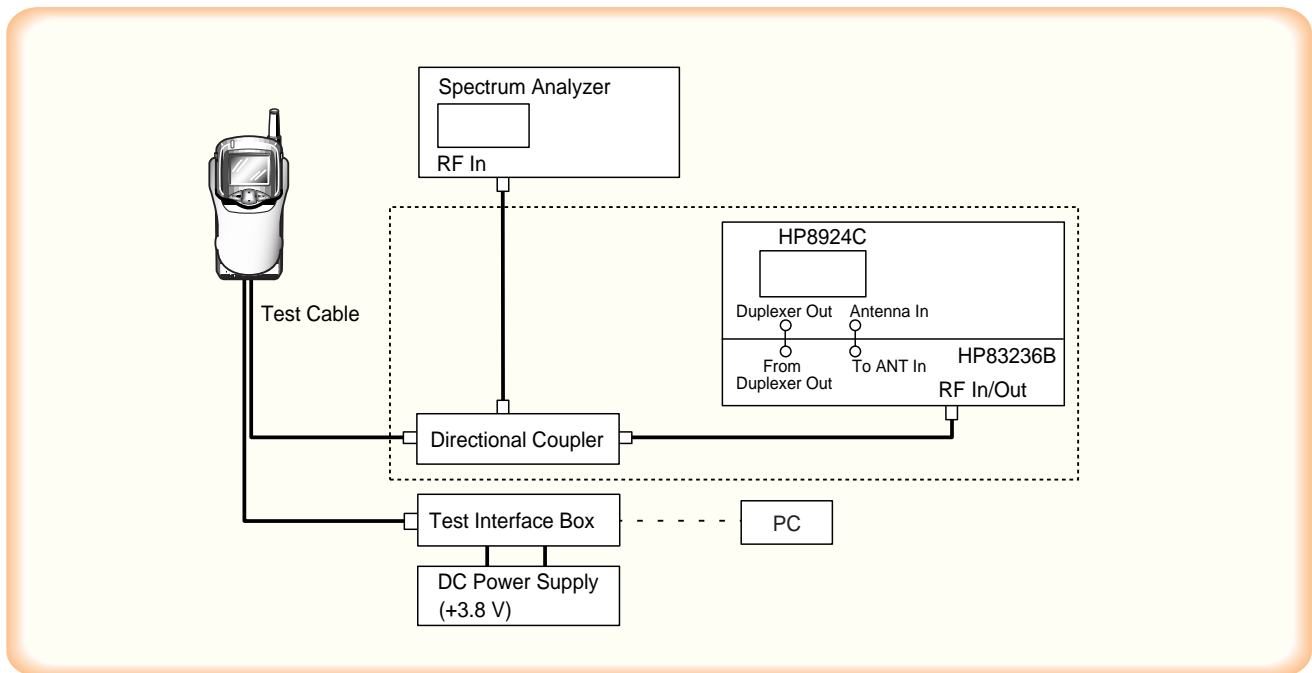
7. Test Procedure

7-1 List of Equipment

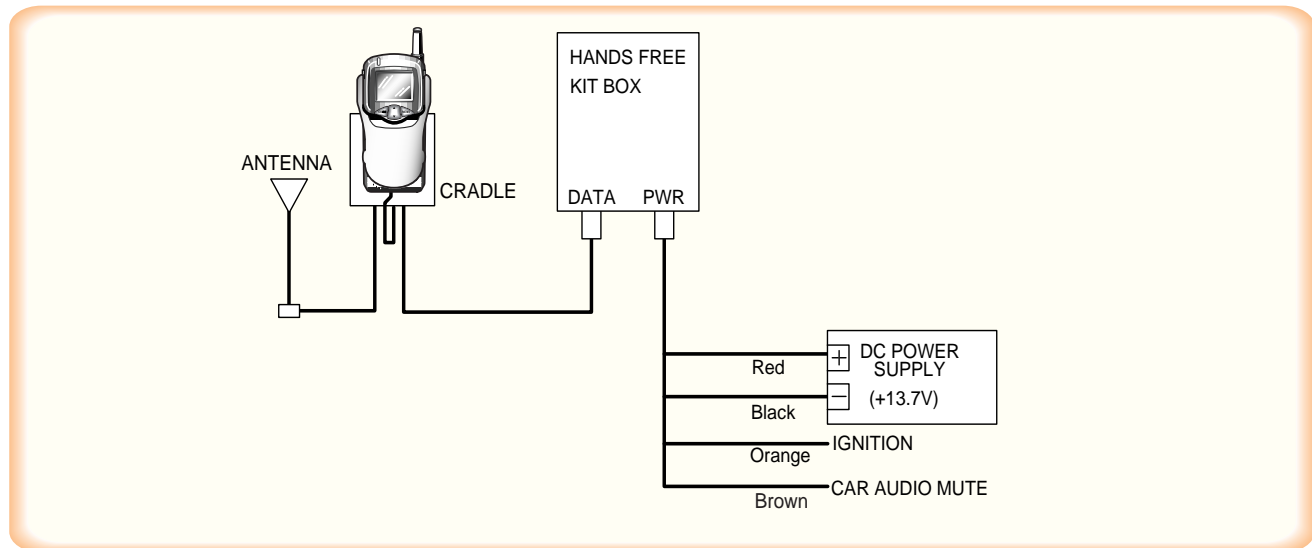
- DC Power Supply
- Test Interface Box
- Test Cable
- CDMA Mobile Station Test Set
- Spectrum Analyzer (include CDMA test mode)
- HP8924C, HP83236B, CMD-80, etc
- HP8596E

7-2 Configuration of Test

7-2-1 Hand Set

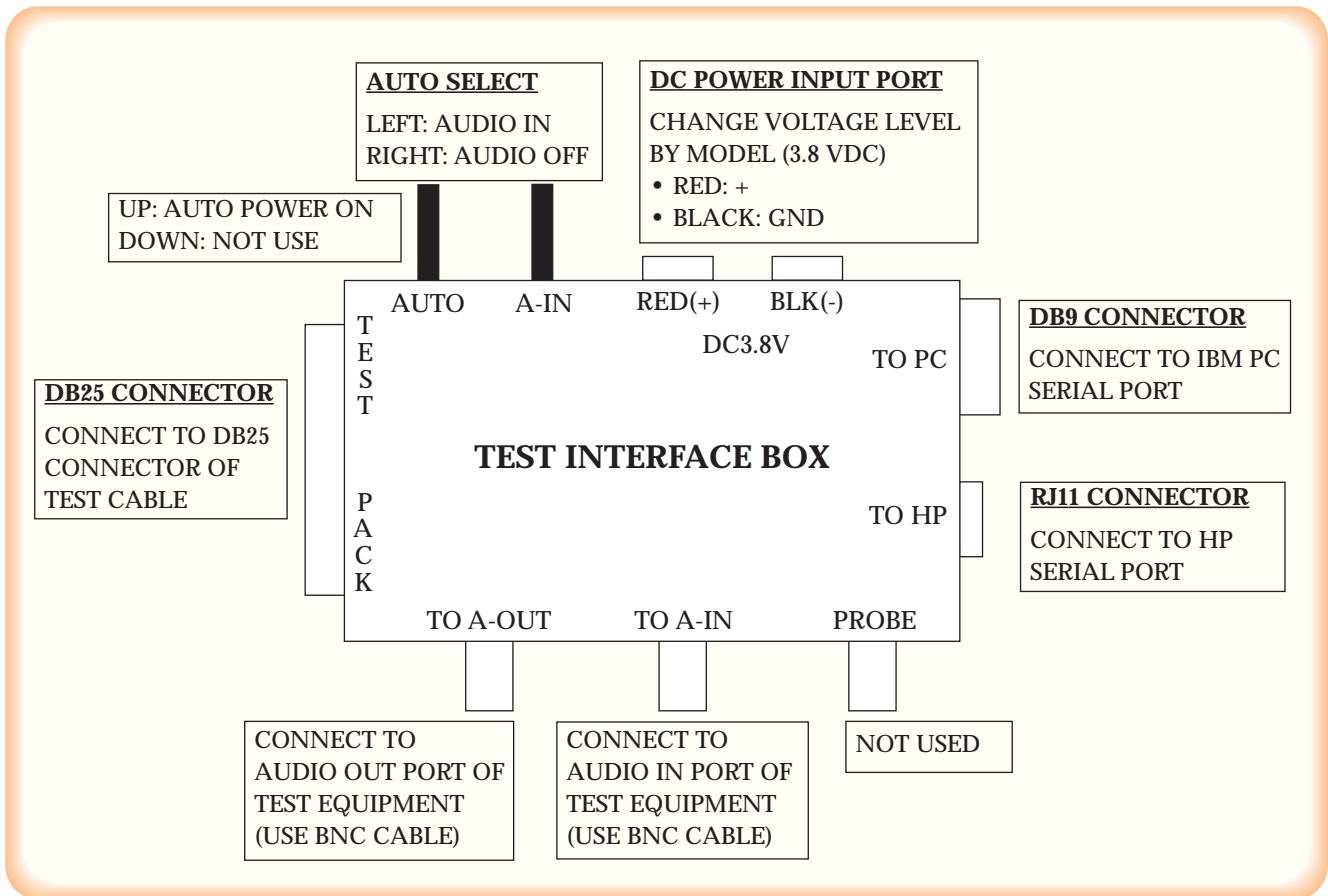


7-2-2 Hands-Free

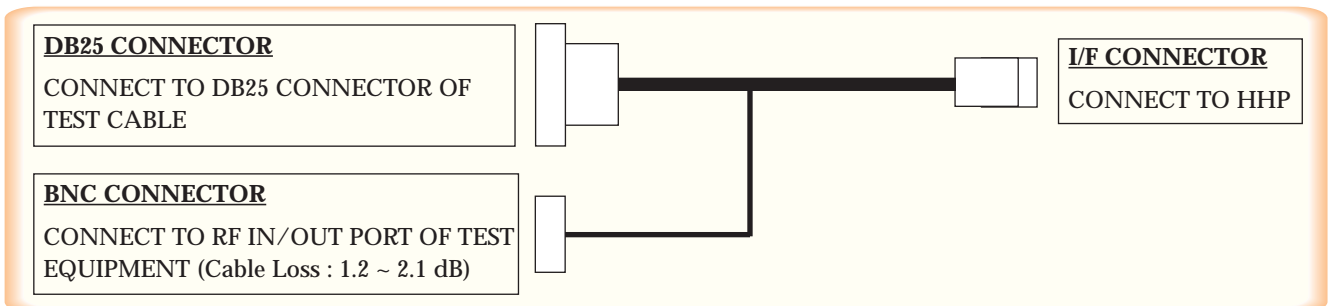


7-2-3 Test Cable Connection Diagram

TEST INTERFACE BOX



TEST CABLE



Items needed to purchase from SAMSUNG

| ITEMS | PARTS# | REMARK |
|--------------------|-------------|---|
| TEST CABLE | GH39-30529A | * Cable Loss : 1.9 GHz (PCS) 2.1 dB, 800 MHz (Cellular) 1.2 dB (1.5 m) |
| TEST INTERFACE BOX | GH80-00001A | Including 1. Power Cable (Black, Red) 2. 9-pin RS 232 Cable for PC. |
| DM Cable | GH39-30525A | Connection between Phone and PC |

7-3 Test Procedure

7-3-1 Change the test mode

- A. To change the phone from normal mode to test mode, you should enter the following keys.
: Press [4 7 * 8 6 9 # 1 2 3 5]
- B. The command [0 1] (Suspend) is entered to start test.
: Press [0 1]
- C. To finish the test mode, you should enter the command [0 2]
: Press [0 2]

7-3-2 Channel selection and Tx power output level control

1.9 GHz (PCS)

- A. To select PCS mode, you should enter the following keys.
1) Press [4 7 * 8 6 9 # 1 2 3 5]
2) Press [2 0 3 0 0 0] + [OK] + [0 2]
- B. You should change the phone from normal mode to test mode
: Press [4 7 * 8 6 9 # 1 2 3 5]
- C. You should change [0 1] (Suspend) is entered to start test.
: Press [0 1]
- D. You should enter the following keys.
: Press [0 9 0 6 0 0] + [#] + [0 7] + [3 4] + [7 1 4 0 0]
- If you enter the command [0 9] you can select the channel.
ex) [0 9 X X X X] ; Under bar means channel number, and channel number must be 4 digits.
 - The command [0 7] means carrier on.
 - If you enter the command [3 4] you can spread the carrier.

- If you enter the command [7 1] you can control the power output level. Following under bar means AGC code. And you can control the power output level using [TALK]/[END/Ⓞ] keys.
ex) [7 1 X X X]
- [#] key means the escape of current command.

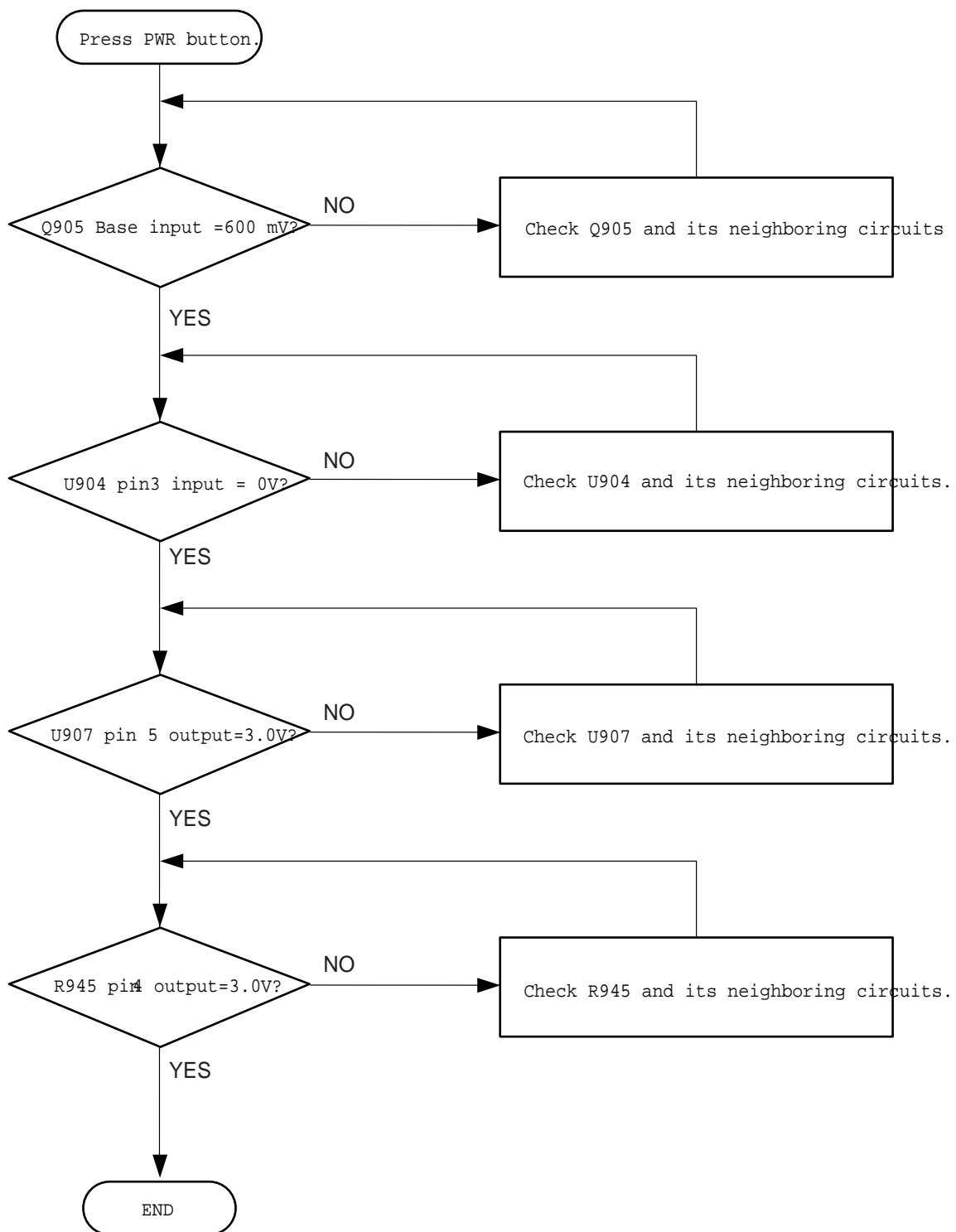
800 MHz CELLULAR (AMPS)

- A. To select AMPS mode, you should enter the following keys.
1) Press [4 7 * 8 6 9 # 1 2 3 5].
2) Press [2 0 1 0 0 0] + [OK] + [0 2]
ex) [1 0 0 0] means SYS_A, and [1 0 0 1] means SYS_B.
- B. You should change the phone from normal mode to test mode.
: Press [4 7 * 8 6 9 # 1 2 3 5]
- C. The command [0 1 4 6 0 1] (Suspend) is entered to start test.
: Press [0 1] + [4 6] + [0 1]
- D. You should enter the following keys.
: Press [0 9 0 3 6 3] + [#] + [0 7] + [7 2 3 6 3]
- If you enter the command [0 9] you can select the channel.
ex) [0 9 X X X X] ; Under bar means channel number, and channel number must be 4 digits.
 - The command [0 7] means carrier on.
 - If you enter the command [7 2] you can control the power output level. Following under bar means AGC code. And you can control the power output level using [TALK]/[END/Ⓞ] keys.
ex) [7 2 X X X]
 - [#] key means the escape of current command.

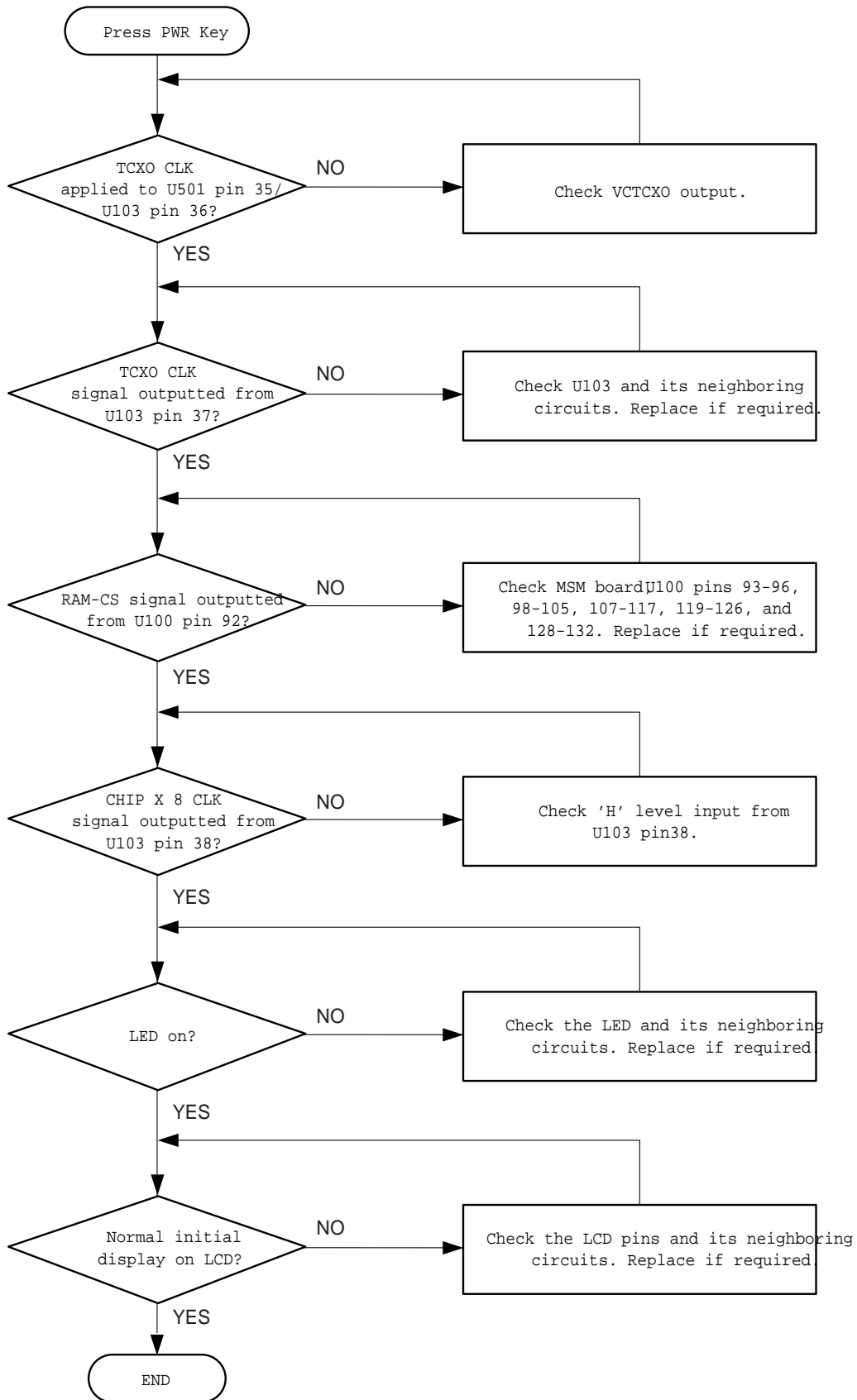
8. Trouble Shooting

8-1 Logic Section

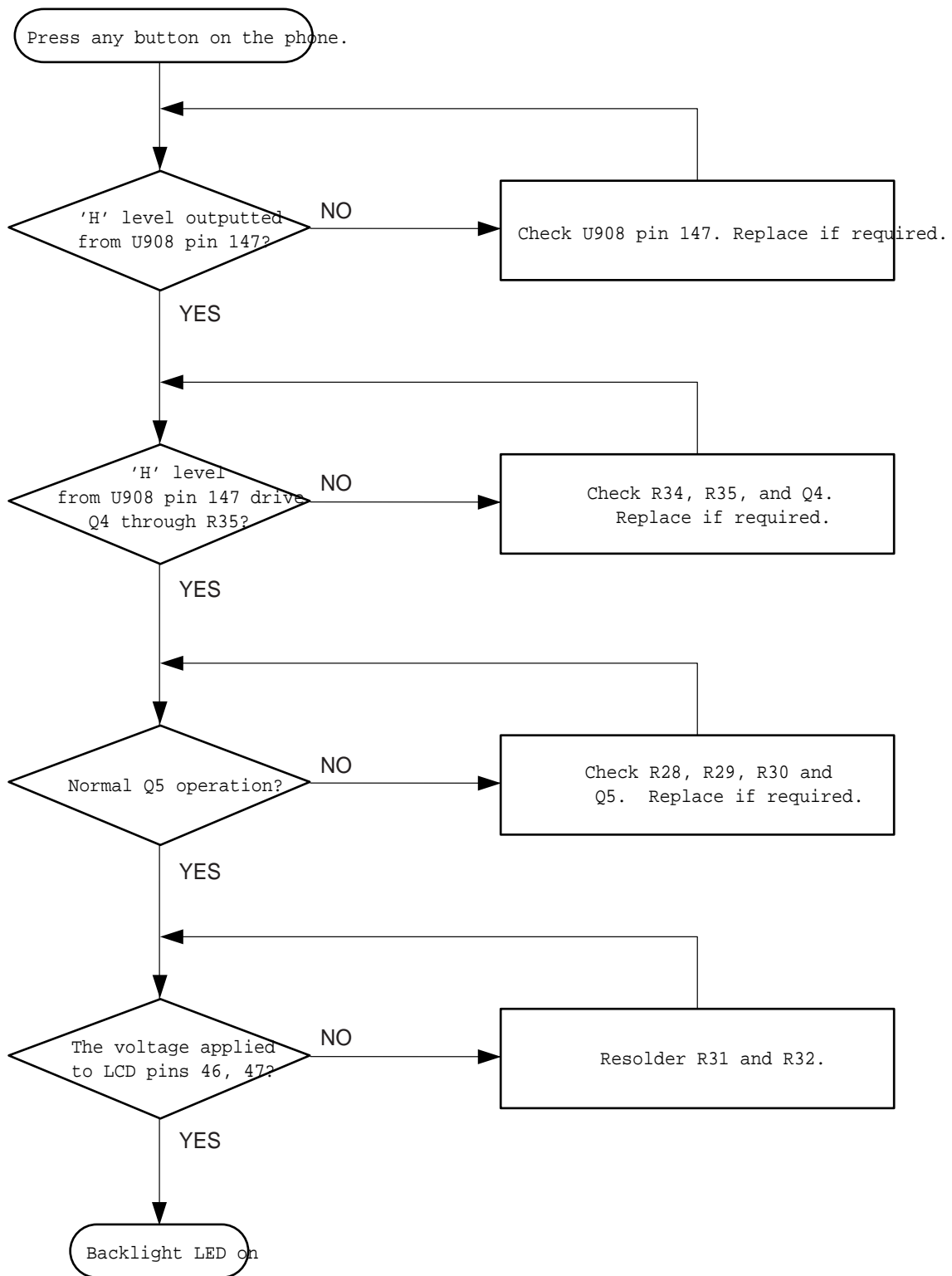
8-1-1 No Power



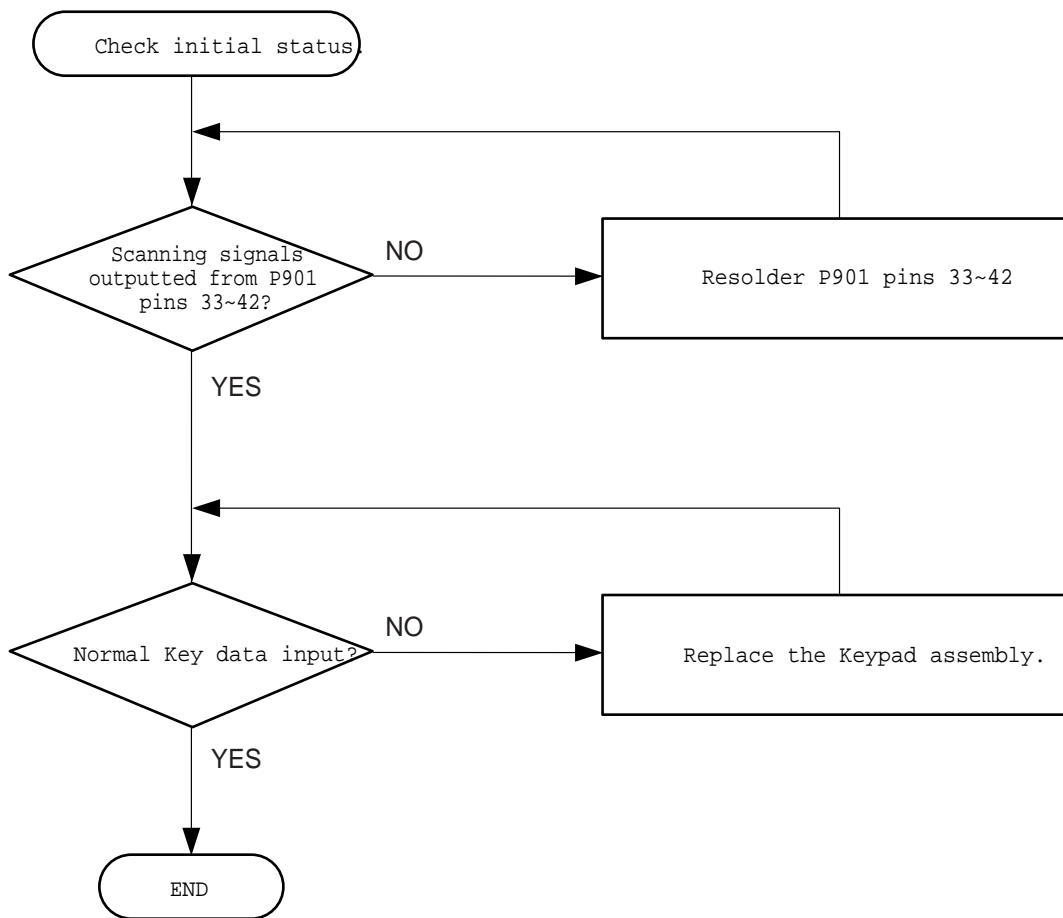
8-1-2 Abnormal initial operation (Normal +3.0V voltage source)



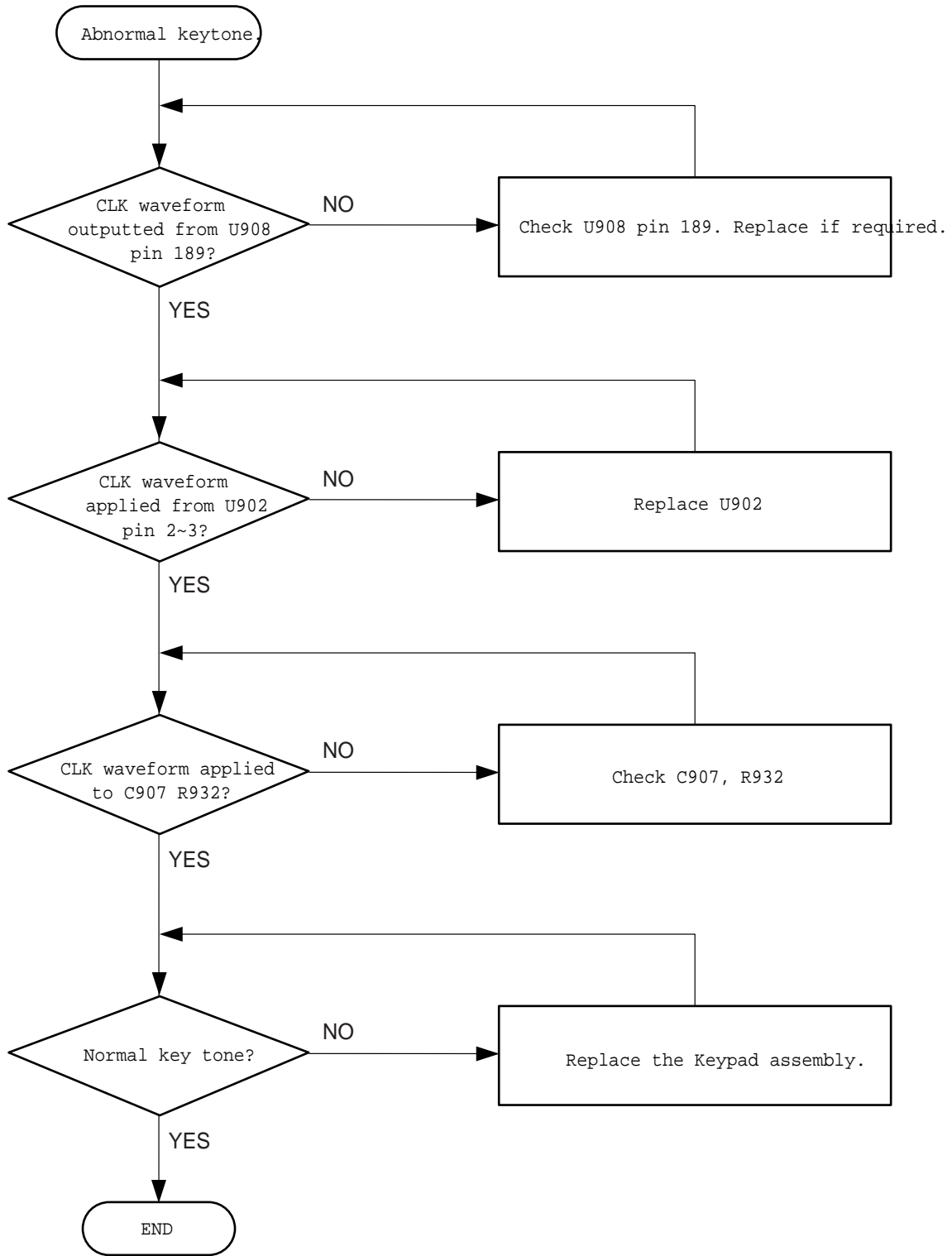
8-1-3 Abnormal Backlight Operation



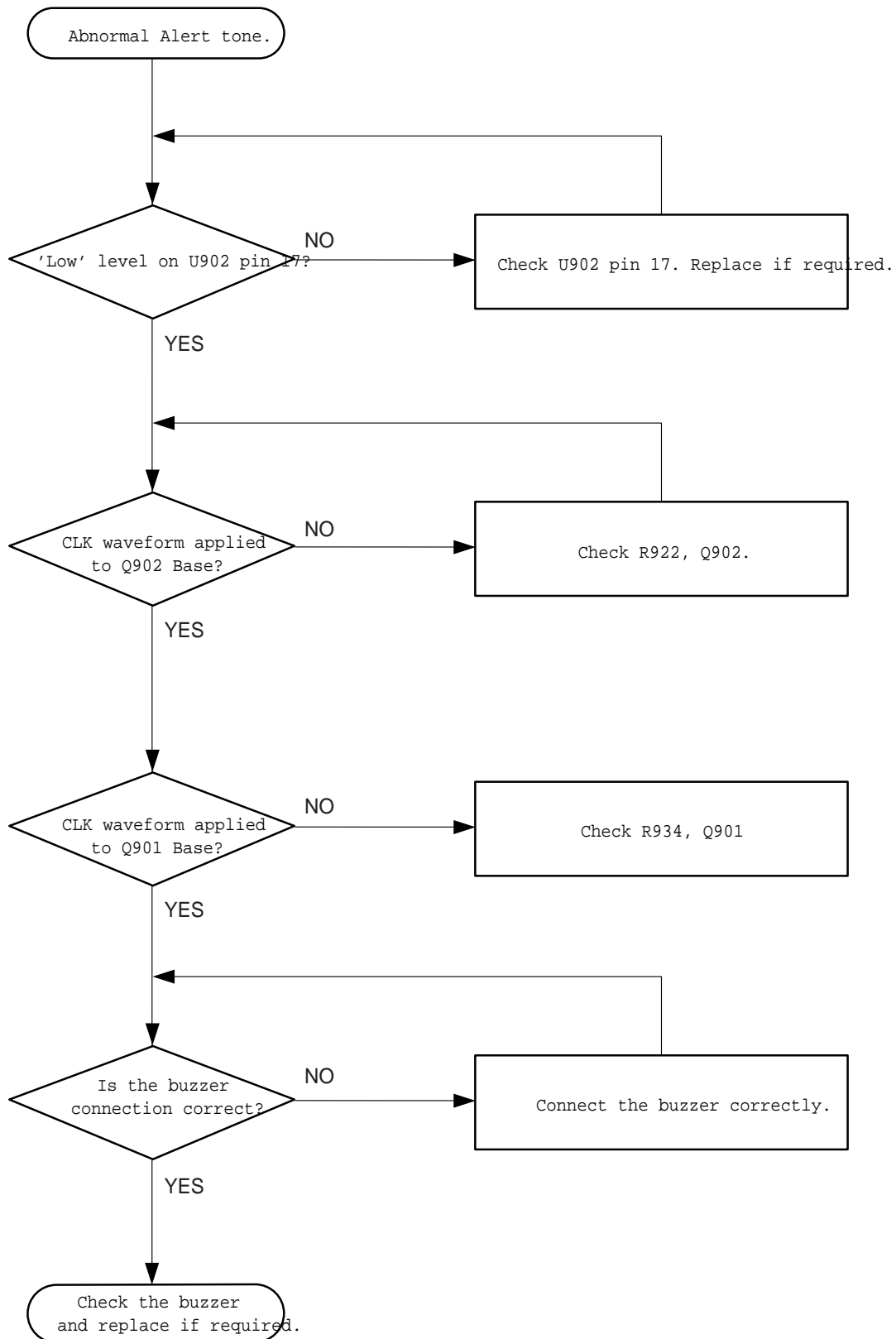
8-1-4 Abnormal Key Data Input



8-1-5 Abnormal Key tone

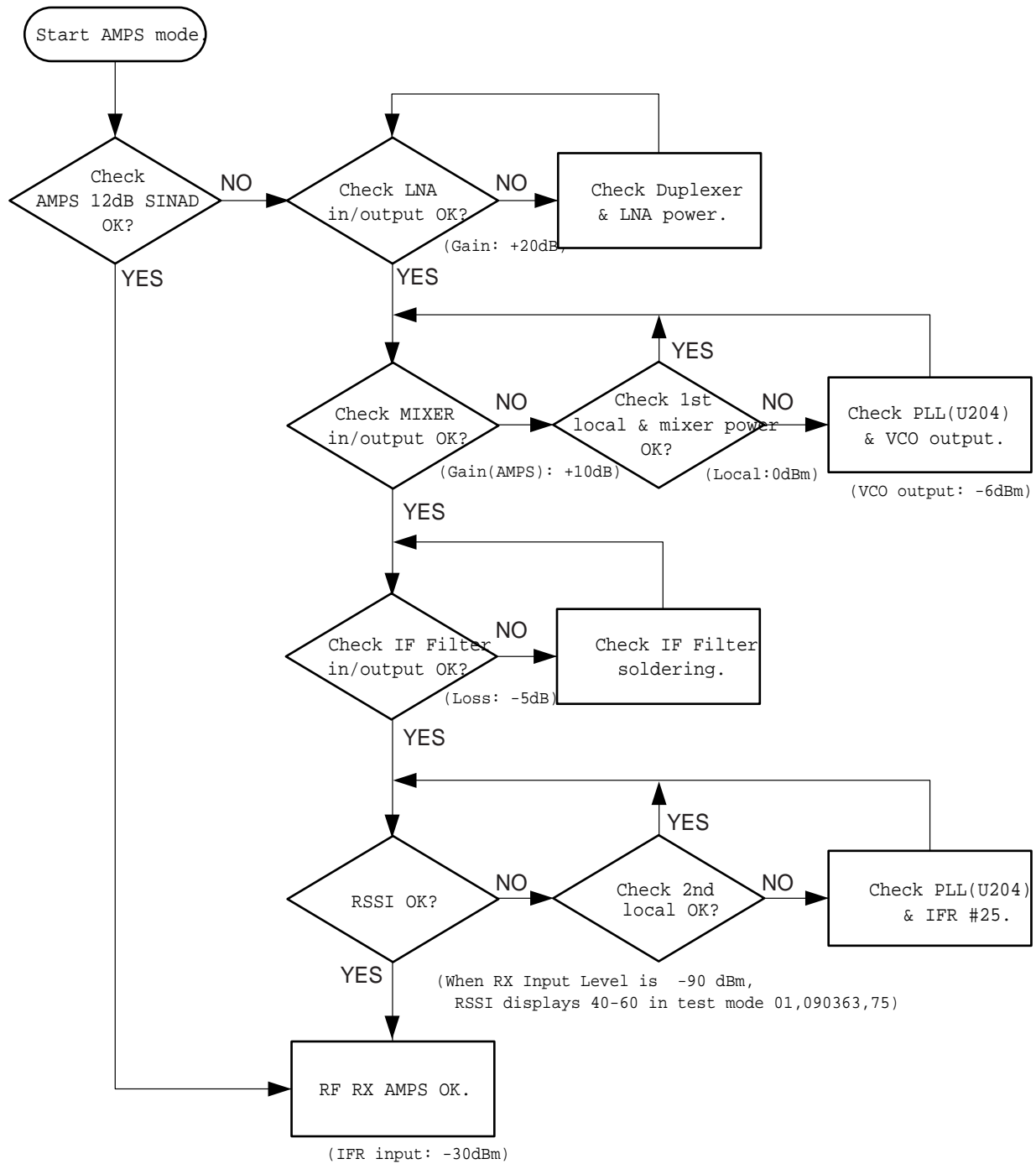


8-1-6 Abnormal Alert Tone

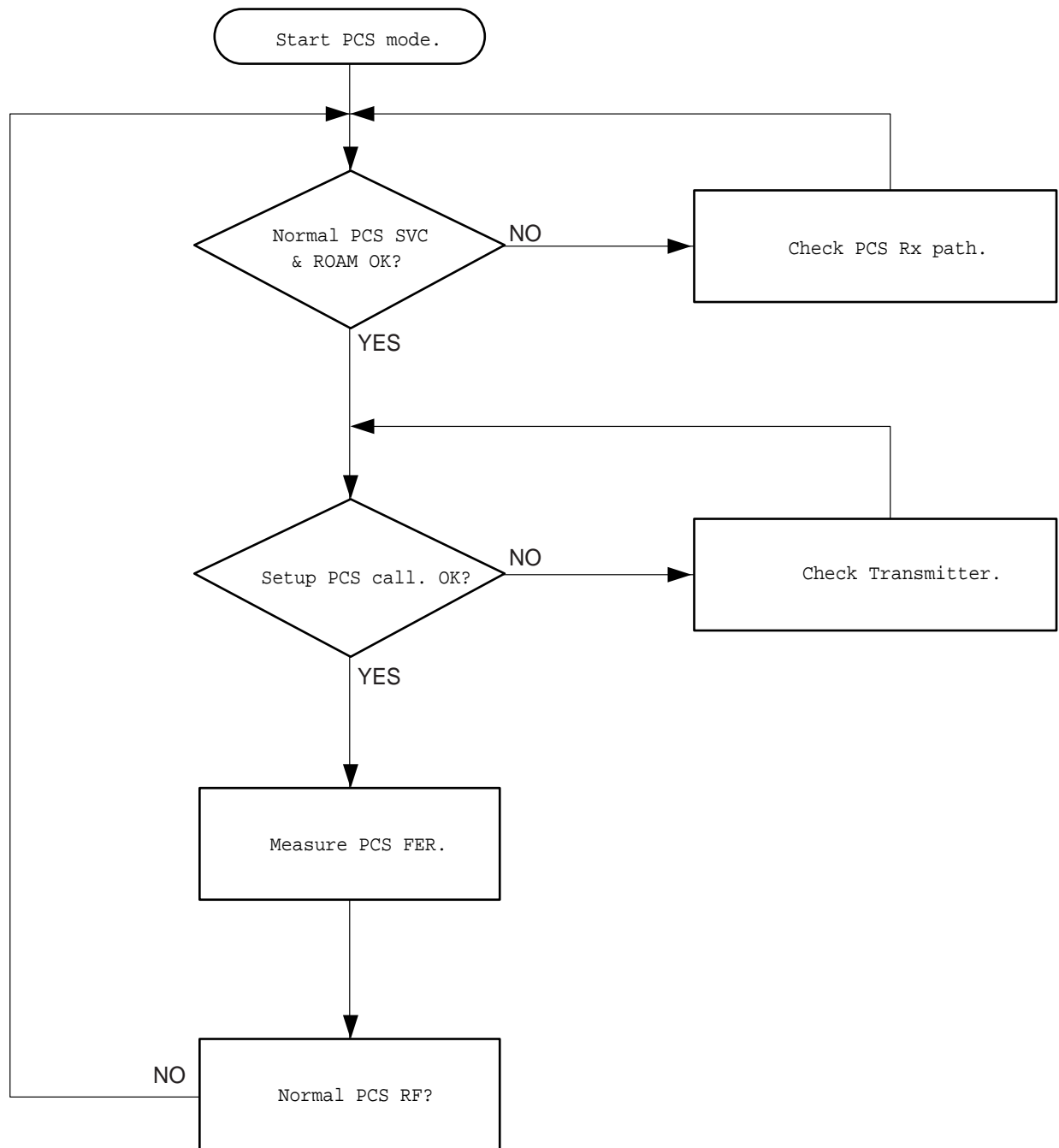


8-2 Receiver Section

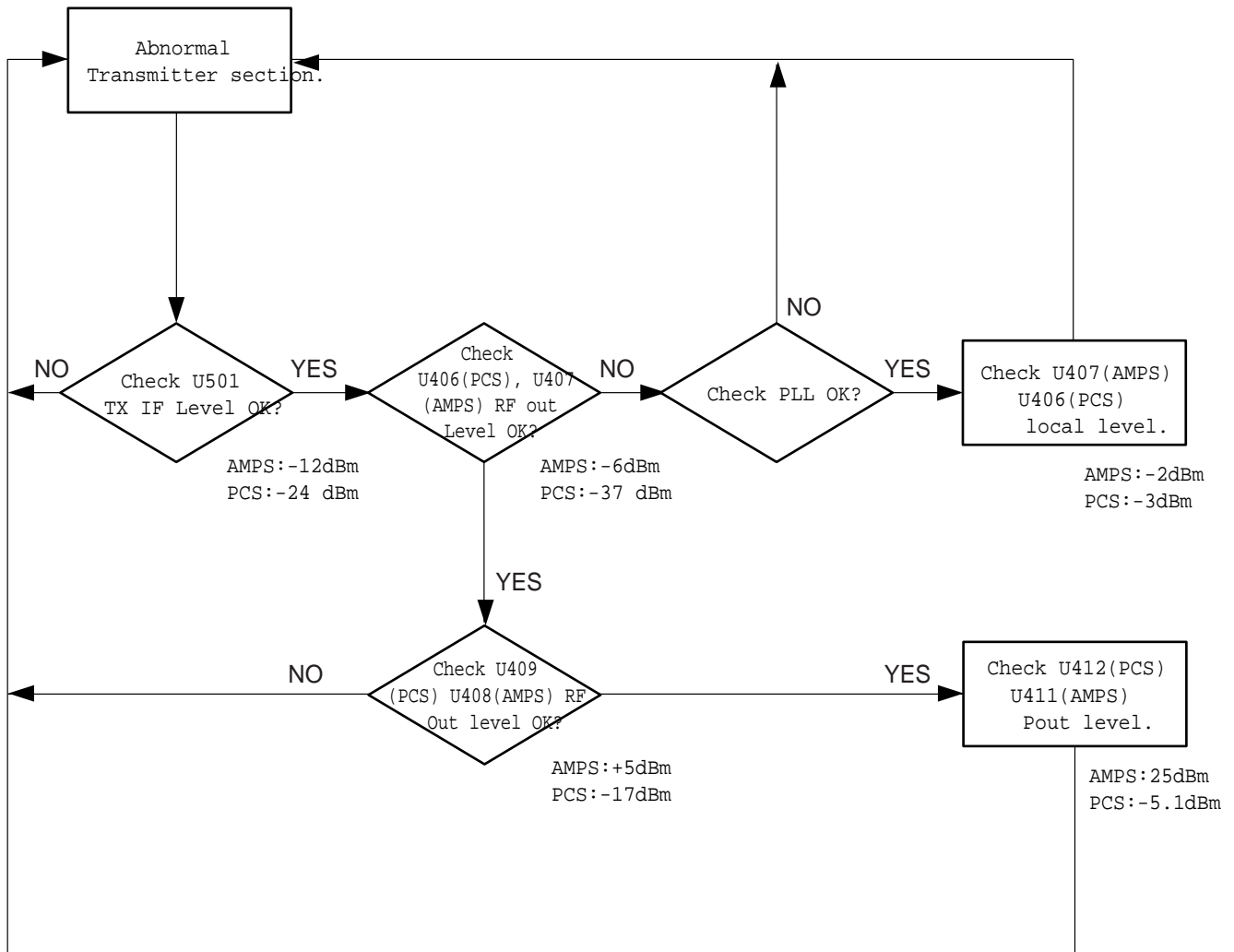
8-2-1 AMPS mode



8-2-2 PCS mode

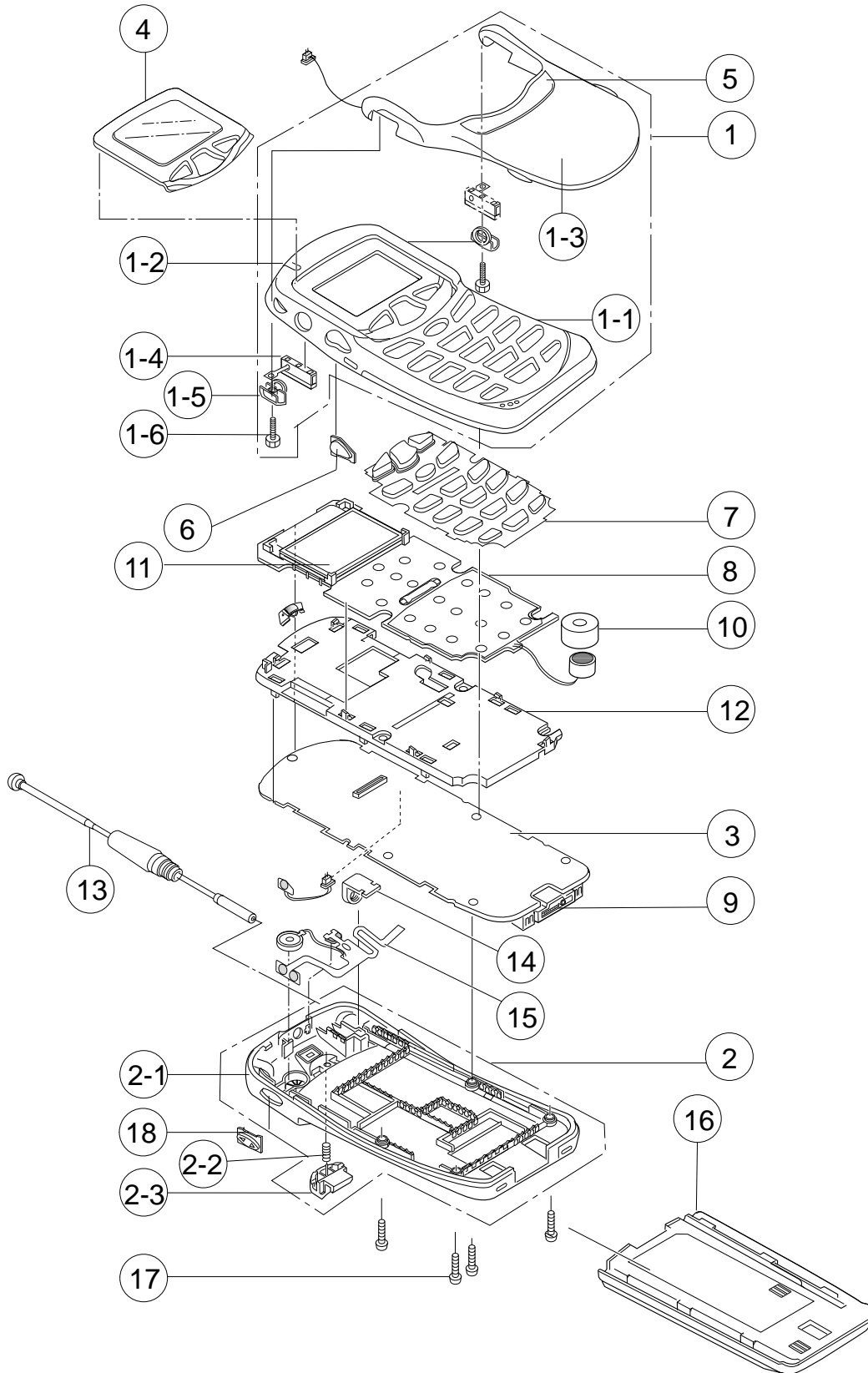


8-3 Transmitter Section



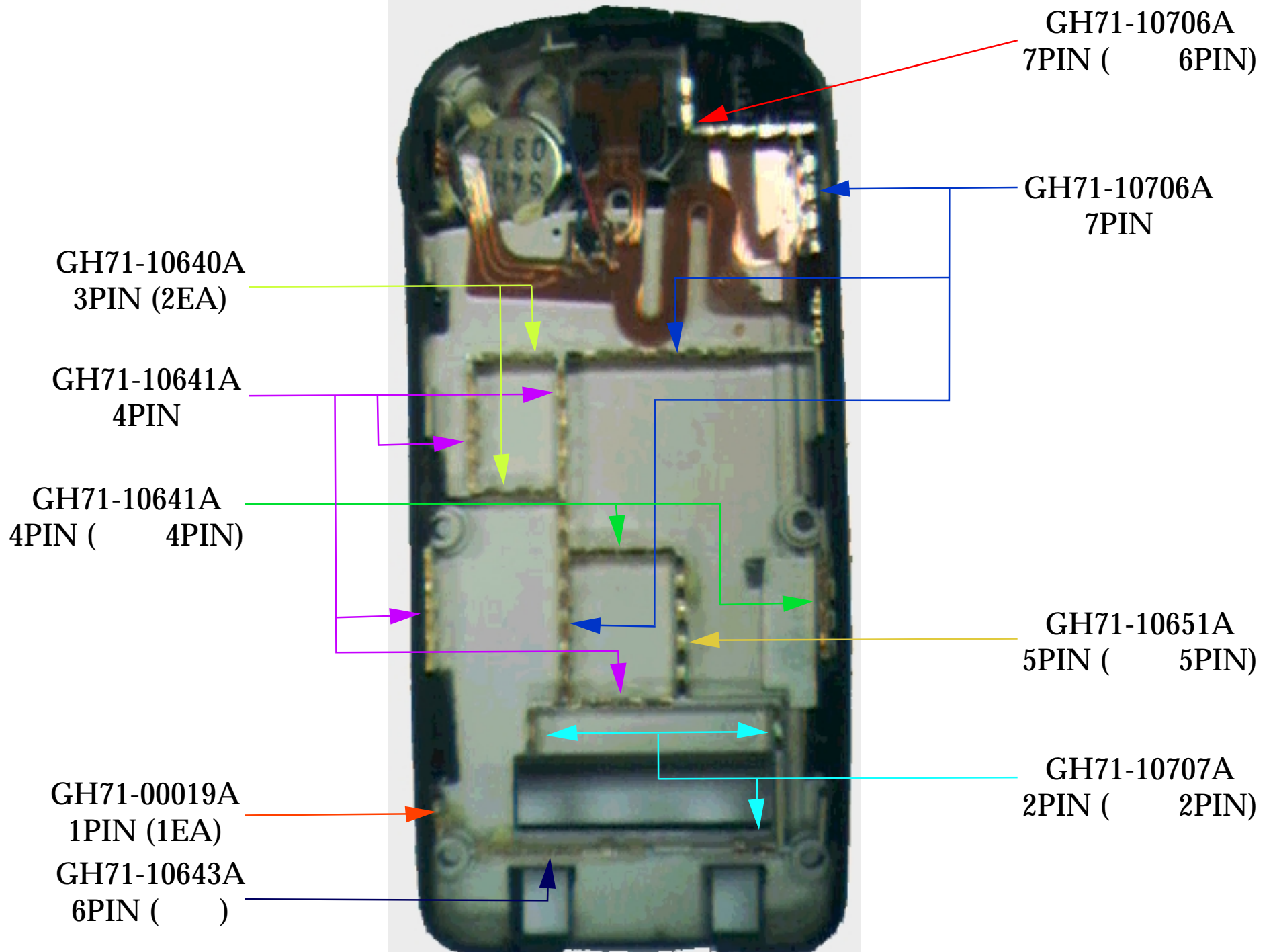
9. Exploded View and Parts List

9-1 DBDM Phone Exploded View

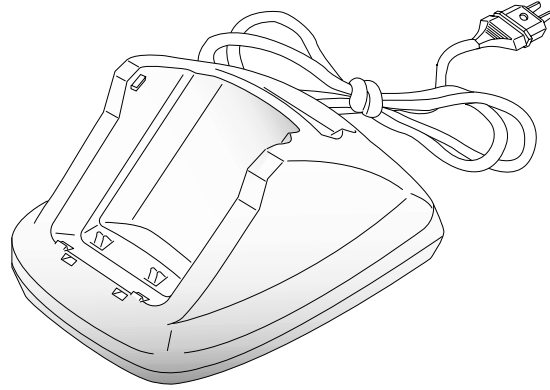


9-2 SCH-3500 Phone Parts List

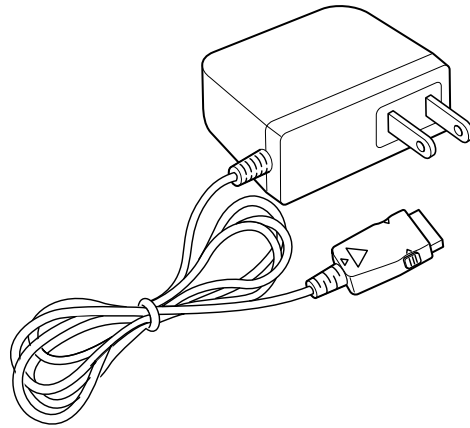
| Location No. | | Description | SEC Code | Remark |
|--------------|-----|-------------------------|-------------|--------|
| ① | | MEA-FRONT COVER | GH75-00093C | |
| | 1-1 | PMO-FRONT COVER | GH72-00203C | SNA |
| | 1-2 | PRO-REFLECTOR LED | GH72-00013A | SNA |
| | 1-3 | PMO-FLIP UPPER | GH72-00206C | SNA |
| | 1-4 | MEC-FLIP BRACKET(L) | GH75-11146A | SNA |
| | | MEC-FLIP BRACKET(R) | GH75-11146B | SNA |
| | 1-5 | PMO-FLIP DUMMY(L) | GH71-00072A | SNA |
| | | PMO-FLIP DUMMY(R) | GH71-00072B | SNA |
| | 1-6 | SCREW-MACHINE | 6001-001155 | SNA |
| ② | | MEC-REAR COVER | GH75-00092A | |
| | 2-1 | PMO-REAR COVER | GH72-00202A | SNA |
| | 2-2 | IPR-SPRING LOCKER | GH70-10516A | SNA |
| | 2-3 | LOCKER-BATT | GH64-30028B | SNA |
| ③ | | PBA MAIN | GH92-00776A | |
| ④ | | PMO-WINDOW LCD | GH72-00204B | |
| ⑤ | | PMO-FLIP WINDOW | GH72-00205B | |
| ⑥ | | PMO-KNOB RECORD | GH73-00002A | |
| ⑦ | | PMO-KEY PAD | GH72-00199A | |
| ⑧ | | KEY PAD ASS'Y | GH59-00029A | |
| ⑨ | | RMO-CONNECTOR COVER | GH73-40659B | |
| ⑩ | | MPR-MIC ADHESIVE RUBBER | GH74-00325A | |
| ⑪ | | DISPLAY-LCD | GH07-00003A | |
| ⑫ | | PMO-SHIELD CAN MAIN | GH72-00198A | |
| ⑬ | | ANTENNA | GH42-00019A | |
| ⑭ | | NPR-ANT BRACKET | GH71-00097A | |
| ⑮ | | UNIT-KEY ASS'Y | GH59-00030A | |
| ⑯ | | BATTERY | GH43-10316B | 1000mA |
| ⑰ | | SCREW-MACHINE | 6001-001046 | 4 PCS |
| ⑱ | | PMO-EARP. DUMMY | GH72-41693A | |



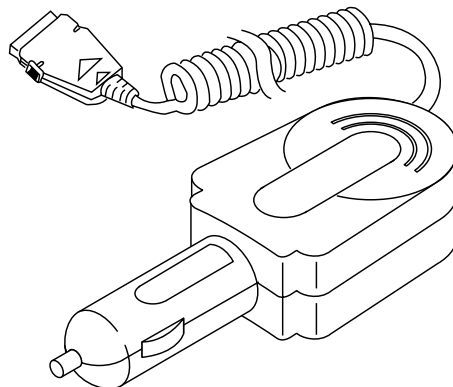
9-3 Desk-Top Rapid Charger Ass'y (DTC350, GH44-00084A)



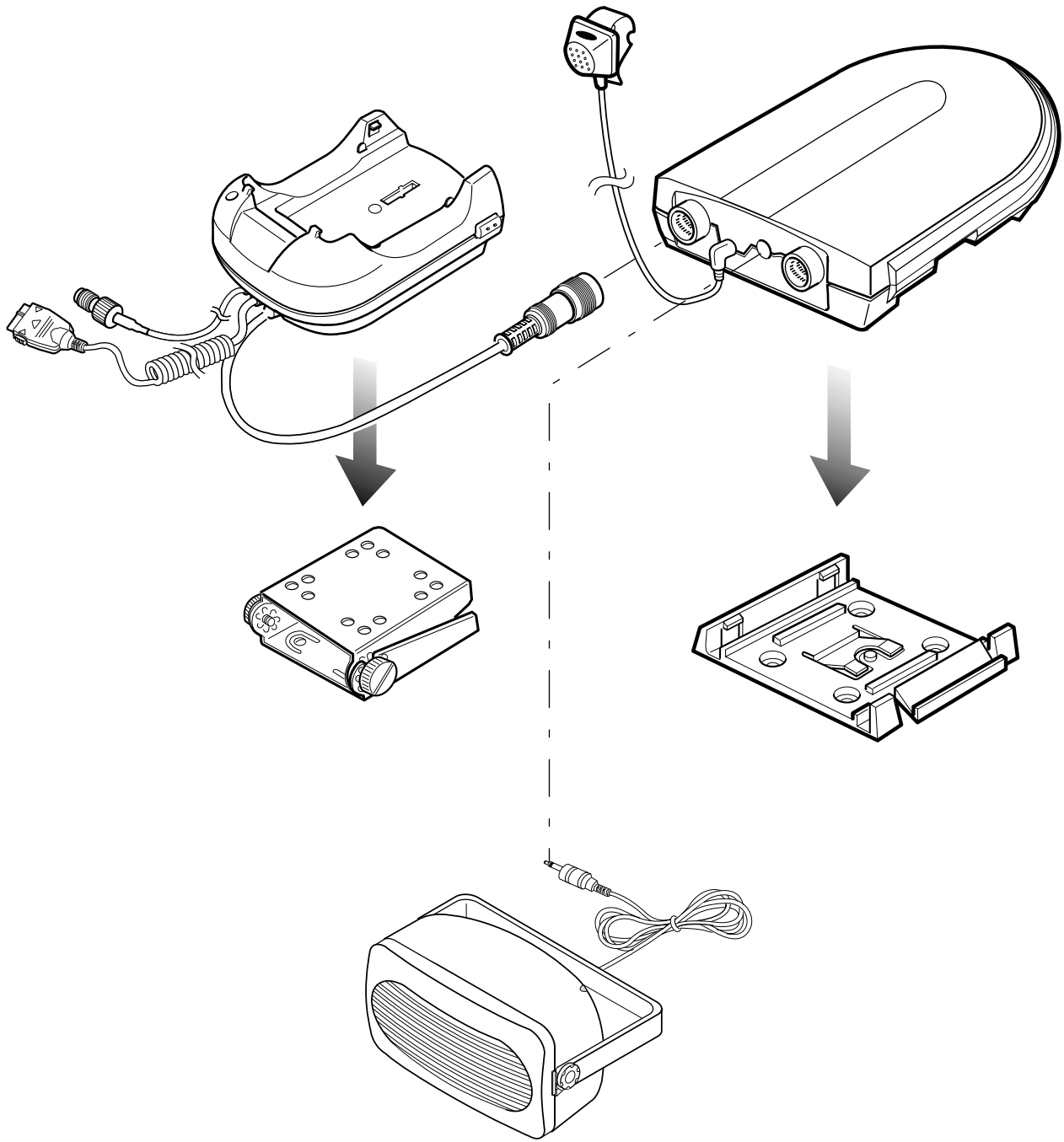
9-4 Travel Charger Ass'y (TC20, GH44-40090A)



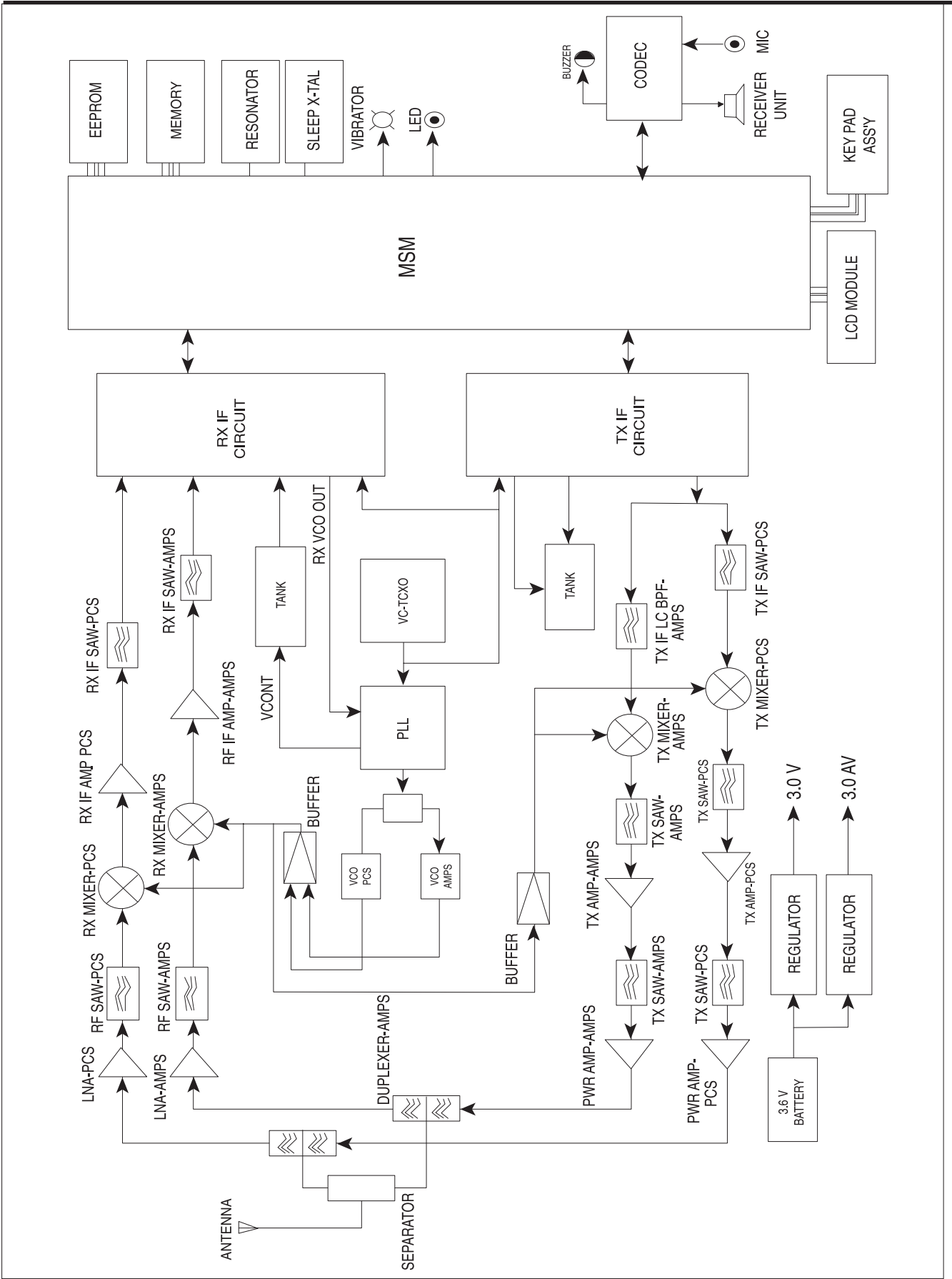
9-5 Cigarette Lighter Adaptor Ass'y (CLC020, GH44-00021F)



9-6 Hands Free Kit Ass'y (HFC350, GH59-00046A)



10. Block Diagram



11. Electrical Parts List

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 1 | - | 1 | DISPLAY LCD-SCH-3500 SCH-3500, 38.4 x 51.0 x 4.8 | GH07-00014A |
| 1 | - | 1 | CBF INTERFACE-SCH-3500 SCH-3500, SEMIRIGID | GH39-00031A |
| 1 | - | 1 | ANTENNA-SCH-3500 SCH-3500, -, 2+-1DBI, 50 ohm | GH42-00019A |
| 1 | - | 1 | BATTERY-SCH-3500 3.6 V, 1000 MAH, 1CELL | GH43-10316B |
| 1 | - | 1 | CHARGER-SCH-3500 SCH-3500, -, -, 85-132VAC | GH44-00084A |
| 1 | - | 1 | UNIT-SCH-3500 KEYPAD ASS'Y SCH-3500 | GH59-00029A |
| 1 | - | 1 | PBA MAIN-SCH-3500 SCH-3500, SPRINT, USA | GH92-00776A |
| 2 | D101 | 1 | DIODE-SWITCHING, 30 V, 100 mA, USC | 0401-000160 |
| 2 | D500, D501 | 1 | DIODE-VARACTOR, 15 V, 3nA, USC, TP | 0405-001035 |
| 2 | D102 | 1 | DIODE-VARACTOR, 10 V, 3NA, ESC, TP | 0405-001068 |
| 2 | D301 | 1 | DIODE-TVS, 6 V, 300 W, SOT-23-6 | 0406-001051 |
| 2 | D900 | 1 | DIODE-TVS, 6 V, 300 W, SOT-23-6 | 0406-001051 |
| 2 | D341, D905, D906 | 3 | DIODE-ARRAY, 20 V, 100 mA, C2-3 | 0407-000102 |
| 2 | D322, D344, D903 | 3 | DIODE-ARRAY, 80 V, 100 mA, CA2-3 | 0407-000115 |
| 2 | D907 | 1 | DIODE-ARRAY, 80 V, 100 mA, CA2-3 | 0407-000115 |
| 2 | D321, D342, D343 | 3 | DIODE-ARRAY, 80 V, 100 mA, CK2-3 | 0407-000117 |
| 2 | D901, D902 | 2 | DIODE-ARRAY, 80 V, 300 mA, C2-3 | 0407-000122 |
| 2 | Q210 | 1 | TR-SMALL SIGNAL, PNP, 200 mW | 0501-000162 |
| 2 | Q401, Q403, Q904 | 3 | TR-SMALL SIGNAL, PNP, 200 mW | 0501-000162 |
| 2 | Q402, Q905 | 2 | TR-SMALL SIGNAL, NPN, 200 mW | 0501-000218 |
| 2 | Q901 | 1 | TR-SMALL SIGNAL, NPN, 225 mW | 0501-000457 |
| 2 | Q103, Q104, Q201, Q202 | 4 | TR-SMALL SIGNAL, NPN, 200 mW | 0501-002060 |
| 2 | Q203, Q204 | 2 | TR-SMALL SIGNAL, NPN, 200 mW | 0501-002060 |
| 2 | Q105, Q342 | 2 | TR-DIGITAL, NPN, 100 mW, 10K/10K | 0504-000167 |
| 2 | Q211 | 1 | TR-DIGITAL, NPN, 100 mW, 10K/10K | 0504-000167 |
| 2 | Q600 | 1 | TR-DIGITAL, NPN, 100 mW, 10K/10K | 0504-000167 |
| 2 | Q903, Q907 | 2 | TR-DIGITAL, NPN, 100 mW, 47K/47K | 0504-000168 |
| 2 | Q906 | 1 | TR-DIGITAL, NPN, 100 mW, 47K/47K | 0504-000168 |
| 2 | Q902 | 1 | TR-DIGITAL, PNP, 100 mW, 47K/47K | 0504-000172 |
| 2 | Q341, Q404 | 2 | TR-DIGITAL, PNP, 150 mW, 10K/10K | 0504-001016 |
| 2 | U345, U904 | 2 | FET-GAAS, 20 V, +-8 V, 3.3A, 2 W, TSOP-6 | 0505-001121 |
| 2 | U600 | 1 | FET-GAAS, 20 V, +-8 V, 3.3A, 2 W, TSOP-6 | 0505-001121 |
| 2 | Q101 | 1 | FET-GAAS, 5 V, -3 V, 80 mA, 125 mW, SOT | 0505-001183 |
| 2 | Q102 | 1 | FET-GAAS, 5 V, -3 V, 80 mA, 125 mW, SOT | 0505-001183 |
| 2 | D904 | 1 | LED CHIP, RED, 2.0 x 1.6 mm, 660 nm | 0601-000355 |
| 2 | U342, U404 | 2 | IC-CMOS LOGIC, INVERTER, SOT-25, 5P | 0801-002192 |
| 2 | U203 | 1 | IC-ANALOG SWITCH, SPDP, SOT-26 | 1001-001048 |
| 2 | U903 | 1 | IC-EEPROM, 32K x 8 BIT, SOP, 8P, 200MIL | 1103-001131 |
| 2 | U801 | 1 | IC-ETC. MEMORY, 2MX8 OR 1MX16 BIT | 1109-001133 |
| 2 | U405 | 1 | IC-OPAMP, SOT-23, 5P, -, SINGLE | 1201-001006 |
| 2 | U408 | 1 | IC-PREAMP, SOP, 6P, 59MIL, SINGLE | 1201-001175 |
| 2 | U411 | 1 | IC-POWERAMP, LCC, 8P, -, SINGLE | 1201-001259 |
| 2 | U412 | 1 | IC-POWERAMP, LCC, 8P, -, SINGLE | 1201-001305 |
| 2 | U409 | 1 | IC-RFAMP, SOP, 12P, PLASTIC, 8 V, 450 mW | 1201-001468 |
| 2 | U901 | 1 | IC-VOLTAGE COMP., SSOP, 8P, 110MIL | 1202-001022 |
| 2 | U301, U321, U322, U323 | 4 | IC-SWITCH VOL. REG, SOT-23, 5P, 150MIL | 1203-001285 |
| 2 | U343, U344, U905 | 3 | IC-SWITCH VOL. REG, SOT-23, 5P, 150MIL | 1203-001285 |
| 2 | U403 | 1 | IC-SWITCH VOL. REG, SOT-23, 5P, 150MIL | 1203-001285 |
| 2 | U907 | 1 | IC-VOLTAGE REGULATOR, SOP, 8P, 118MIL | 1203-001767 |
| 2 | U406, U407 | 2 | IC-MODULATOR, SOT-23, 6P, 59MIL | 1204-001013 |

Electrical Parts List

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|---|-------------|
| 2 | U902 | 1 | IC-ENCODER/DECODER ST5092TQFPTR, QFP | 1204-001375 |
| 2 | U103 | 1 | IC-RX IF CIRCUIT, TQFP, 48P, -, PLASTIC, 3.5V | 1204-001504 |
| 2 | U501 | 1 | IC-TX IF CIRCUIT, TQFP, 48P, -, PLASTIC, 3.5V | 1204-001505 |
| 2 | U908 | 1 | IC-TRANSCEIVER, PBGA, 196P | 1205-001670 |
| 2 | U204 | 1 | IC-PLL/SYNTHESISER, SOP, 24P | 1209-001128 |
| 2 | U341 | 1 | THERMISTOR-NTC 10 kohm, 5 %, 3650K, -, TP | 1404-001040 |
| 2 | U500 | 1 | THERMISTOR-NTC 10 kohm, 3 %, 4100K, 30MW/C | 1404-001165 |
| 2 | L117 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L123, L131 | 2 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L124 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L415 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L423 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L426 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L602 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | L901 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1608 | 2007-000070 |
| 2 | R110 | 1 | R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000138 |
| 2 | R203, R207 | 2 | R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000138 |
| 2 | R219, R302 | 2 | R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000138 |
| 2 | R305, R306, R307 | 3 | R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000138 |
| 2 | R112, R217 | 2 | R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000140 |
| 2 | R213 | 1 | R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000140 |
| 2 | R222 | 1 | R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000140 |
| 2 | R223, R224, R342, R512 | 4 | R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000140 |
| 2 | R906, R907, R923, R934 | 4 | R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000140 |
| 2 | R102, R118, R938 | 3 | R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000141 |
| 2 | R225 | 1 | R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000141 |
| 2 | R230 | 1 | R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000141 |
| 2 | R347, R429 | 2 | R-CHIP 2.7 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000142 |
| 2 | R945 | 1 | R-CHIP 2.7 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000142 |
| 2 | R904, R908 | 2 | R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000143 |
| 2 | R960 | 1 | R-CHIP 6.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000145 |
| 2 | R514 | 1 | R-CHIP 8.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000147 |
| 2 | C962 | 1 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R119, R221, R345, R508 | 4 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R210, R220 | 1 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R500 | 1 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R801, R804 | 2 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R905, R925 | 2 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R940 | 1 | R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000148 |
| 2 | R924 | 1 | R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000151 |
| 2 | R916, R917, R918, R921 | 4 | R-CHIP 20 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000152 |
| 2 | R946 | 1 | R-CHIP 20 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000152 |
| 2 | R105 | 1 | R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000153 |
| 2 | R107 | 1 | R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000153 |
| 2 | R206, R208, R301, R303 | 4 | R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000153 |
| 2 | R353, R428, R915 | 3 | R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000153 |
| 2 | R955 | 1 | R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000153 |
| 2 | R321, R322, R323, R911 | 4 | R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000157 |
| 2 | R520 | 1 | R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000157 |
| 2 | R912 | 1 | R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000157 |

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 2 | R937 | 1 | R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000157 |
| 2 | R922 | 1 | R-CHIP 56 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000159 |
| 2 | R513 | 1 | R-CHIP 68 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000160 |
| 2 | R122, R437, R505 | 3 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R411, R413, R414 | 3 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R902, R903, R939 | 3 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R930, R947 | 2 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R942 | 1 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R943, R951 | 2 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R954 | 1 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R957 | 1 | R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000162 |
| 2 | R941 | 1 | R-CHIP 120 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000163 |
| 2 | R308, R351, R352, R409 | 4 | R-CHIP 150 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000164 |
| 2 | R952 | 1 | R-CHIP 150 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000164 |
| 2 | R349 | 1 | R-CHIP 470 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000168 |
| 2 | R600 | 1 | R-CHIP 470 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000168 |
| 2 | R919 | 1 | R-CHIP 1 mohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000170 |
| 2 | C218 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R111 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R113 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R116, R123, R417, R501 | 4 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R419 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R425 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R506, R803, R806, R913 | 4 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R901, R910 | 2 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R920 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R931 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R932 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R949 | 1 | R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000171 |
| 2 | R106, R121 | 2 | R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000172 |
| 2 | R211, R215, R432 | 3 | R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000172 |
| 2 | R502 | 1 | R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000172 |
| 2 | R101, R214 | 2 | R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000173 |
| 2 | R104 | 1 | R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000173 |
| 2 | R209 | 1 | R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000173 |
| 2 | R212 | 1 | R-CHIP 47 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000174 |
| 2 | R400 | 1 | R-CHIP 1.5 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000242 |
| 2 | R140 | 1 | R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000758 |
| 2 | R958 | 1 | R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000758 |
| 2 | R117 | 1 | R-CHIP 33 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000775 |
| 2 | R202, R204 | 2 | R-CHIP 33 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000775 |
| 2 | R114, R115 | 2 | R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000932 |
| 2 | R304, R914, R935, R936 | 4 | R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000932 |
| 2 | R431 | 1 | R-CHIP 5.6 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-000982 |
| 2 | R218 | 1 | R-CHIP 680 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001119 |
| 2 | R423 | 1 | R-CHIP 30 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001291 |
| 2 | R201 | 1 | R-CHIP 68 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001301 |
| 2 | R933 | 1 | R-CHIP 150 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001306 |
| 2 | R422, R424 | 2 | R-CHIP 180 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001307 |
| 2 | R926, R927 | 2 | R-CHIP 330 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001313 |

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 2 | R346 | 1 | R-CHIP 1.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001319 |
| 2 | R950 | 1 | R-CHIP 1.2 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001319 |
| 2 | R504 | 1 | R-CHIP 1.8 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001320 |
| 2 | R900 | 1 | R-CHIP 18 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001333 |
| 2 | R415 | 1 | R-CHIP 180 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001339 |
| 2 | R961 | 1 | R-CHIP 180 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-001339 |
| 2 | R108 | 1 | R-CHIP 15 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-002965 |
| 2 | R103 | 1 | R-CHIP 56 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-002970 |
| 2 | R205 | 1 | R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-003112 |
| 2 | R436 | 1 | R-CHIP 51 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-007014 |
| 2 | R503 | 1 | R-CHIP 75 kohm, 5 %, 1/16 W, DA, TP, 1005 | 2007-007021 |
| 2 | R511 | 1 | R-CHIP 100 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007107 |
| 2 | R343 | 1 | R-CHIP 13 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007131 |
| 2 | R341 | 1 | R-CHIP 15 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007132 |
| 2 | R509 | 1 | R-CHIP 18 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007135 |
| 2 | R348 | 1 | R-CHIP 4.7 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007136 |
| 2 | R909 | 1 | R-CHIP 4.7 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007136 |
| 2 | R421 | 1 | R-CHIP 10 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007142 |
| 2 | R426 | 1 | R-CHIP 33 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007308 |
| 2 | R427 | 1 | R-CHIP 2.4 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007697 |
| 2 | R507 | 1 | R-CHIP 2 kohm, 1 %, 1/16 W, DA, TP, 1005 | 2007-007766 |
| 2 | C101, C106, C114, C115 | 4 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C145 | 1 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C156 | 1 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C157, C424, C503 | 3 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C161, C163, C237, C245 | 4 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C246, C252, C253, C254 | 4 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C255, C311, C312, C313 | 4 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C314, C400, C410, C418 | 4 | C-CERAMIC, CHIP 100 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000233 |
| 2 | C256 | 1 | C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NPO, TP, 1608 | 2203-000236 |
| 2 | C165, C166, C169, C247 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C258, C301, C302, C303 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C304, C317, C321, C323 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C324, C326, C327 | 3 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C331, C341, C343, C344 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C340 | 1 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C345, C347, C348 | 3 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C350 | 1 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C352, C353, C355, C356 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C360 | 1 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C406, C408, C413, C425 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C432, C434, C501, C502 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C513, C162, C164 | 3 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C801, C803, C804 | 3 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C901, C909, C913, C914 | 4 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C921, C923 | 2 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C950 | 1 | C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-000254 |
| 2 | C125 | 1 | C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-000278 |
| 2 | C203 | 1 | C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-000278 |
| 2 | C423 | 1 | C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-000278 |

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 2 | C430 | 1 | C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-000278 |
| 2 | C441 | 1 | C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-000278 |
| 2 | C138 | 1 | C-CERAMIC, CHIP 12 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000330 |
| 2 | C154 | 1 | C-CERAMIC, CHIP 12 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000330 |
| 2 | C168, C342 | 2 | C-CERAMIC, CHIP 15 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000386 |
| 2 | C460 | 1 | C-CERAMIC, CHIP 15 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000386 |
| 2 | R953 | 1 | C-CERAMIC, CHIP 18 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000425 |
| 2 | C103, C107, C108, C109 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C111, C112, C113, C117 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C118, C119, C121, C123 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C126, C129, C132, C134 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C128 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C137, C139, C144, C147 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C142 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C148, C149, C151, C153 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C201, C204, C213 | 3 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C215, C235, C236, C238 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C216 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C217 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C221 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C244, C315, C316, C346 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C358, C402, C403 | 3 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C405, C407, C414, C415 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C417 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C419, C429, C431, C438 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C444, C445, C446 | 3 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C449, C452, C453, C514 | 4 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C915, C938, C941 | 3 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C944, C946, C949 | 3 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C957 | 1 | C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000438 |
| 2 | C100, C202 | 2 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C122, C124 | 2 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C155 | 1 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C214 | 1 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C411 | 1 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C428 | 1 | C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000466 |
| 2 | C305 | 1 | C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000489 |
| 2 | C333, C334, C335, C455 | 4 | C-CERAMIC, CHIP 220 pF, 10 %, 50 V, X7R, TP, 1005 | 2203-000585 |
| 2 | C228 | 1 | C-CERAMIC, CHIP 22 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000628 |
| 2 | C932, C933 | 2 | C-CERAMIC, CHIP 27 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000679 |
| 2 | C105, C211 | 2 | C-CERAMIC, CHIP 2 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000696 |
| 2 | C140, C243 | 2 | C-CERAMIC, CHIP 2 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000696 |
| 2 | C172, C173, C206 | 3 | C-CERAMIC, CHIP 2 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000696 |
| 2 | C222 | 1 | C-CERAMIC, CHIP 2 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000696 |
| 2 | C422, C433 | 2 | C-CERAMIC, CHIP 2 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000696 |
| 2 | C239 | 1 | C-CERAMIC, CHIP 3.9 nF, 10 %, 50 V, X7R, TP, 1005 | 2203-000725 |
| 2 | C136, C427, C436, C437 | 4 | C-CERAMIC, CHIP 33 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000812 |
| 2 | C212 | 1 | C-CERAMIC, CHIP 39 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000854 |
| 2 | C152, C401 | 2 | C-CERAMIC, CHIP 3 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000870 |
| 2 | C160 | 1 | C-CERAMIC, CHIP 3 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-000870 |

| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 2 | C159 | 1 | C-CERAMIC, CHIP 470 pF, 10 %, 50 V, X7R, TP, 1005 | 2203-000940 |
| 2 | C249, C309, C935, C936 | 4 | C-CERAMIC, CHIP 470 pF, 10 %, 50 V, X7R, TP, 1005 | 2203-000940 |
| 2 | C329 | 1 | C-CERAMIC, CHIP 470 pF, 10 %, 50 V, X7R, TP, 1005 | 2203-000940 |
| 2 | C205, C516 | 2 | C-CERAMIC, CHIP 47 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000995 |
| 2 | C412 | 1 | C-CERAMIC, CHIP 47 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000995 |
| 2 | C807 | 1 | C-CERAMIC, CHIP 47 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-000995 |
| 2 | C150 | 1 | C-CERAMIC, CHIP 4 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-001017 |
| 2 | C226 | 1 | C-CERAMIC, CHIP 4 pF, 0.25 pF, 50 V, NPO, TP, 1005 | 2203-001017 |
| 2 | C131, C902, C904, C955 | 4 | C-CERAMIC, CHIP 680 pF, 10 %, 50 V, X7R, TP, 1005 | 2203-001124 |
| 2 | C511, C512 | 2 | C-CERAMIC, CHIP 68 pF, 5 %, 50 V, NPO, TP, 1005 | 2203-001153 |
| 2 | C133 | 1 | C-CERAMIC, CHIP 6 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-001178 |
| 2 | C404 | 1 | C-CERAMIC, CHIP 7 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-001201 |
| 2 | C500 | 1 | C-CERAMIC, CHIP 7 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-001201 |
| 2 | C925, C926, C927, C928 | 4 | C-CERAMIC, CHIP 8.2 nF, 10 %, 16 V, X7R, TP, 1005 | 2203-001210 |
| 2 | C170 | 1 | C-CERAMIC, CHIP 8 pF, 0.5 pF, 50 V, NPO, TP, 1005 | 2203-001259 |
| 2 | C306 | 1 | C-CERAMIC, CHIP 0.5 pF, 0.25 pF, 50 V, NPO, TP | 2203-001383 |
| 2 | C308 | 1 | C-CERAMIC, CHIP 0.5 pF, 0.25 pF, 50 V, NPO, TP | 2203-001383 |
| 2 | C470 | 1 | C-CERAMIC, CHIP 0.5 pF, 0.25 pF, 50 V, NPO, TP | 2203-001383 |
| 2 | C104, C223 | 2 | C-CERAMIC, CHIP 1.5 pF, 0.25 pF, 50 V, NPO, TP | 2203-001385 |
| 2 | C241 | 1 | C-CERAMIC, CHIP 22 nF, 20 %, 25 V, Y5 V, TP | 2203-001405 |
| 2 | C515 | 1 | C-CERAMIC, CHIP 33 nF, 10 %, 16 V, Y5 V, TP | 2203-001416 |
| 2 | C143 | 1 | C-CERAMIC, CHIP 47 nF, 10 %, 16 V, Y5 V, TP | 2203-001432 |
| 2 | C234 | 1 | C-CERAMIC, CHIP 47 nF, 10 %, 16 V, Y5 V, TP | 2203-001432 |
| 2 | C450 | 1 | C-CERAMIC, CHIP 3.3 pF, 0.25 pF, 50 V, NPO, TP | 2203-005052 |
| 2 | C158, C517 | 2 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C208, C219, C224 | 3 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C227, C233, C257 | 3 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C506, C507, C508 | 3 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C805, C906 | 2 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C900 | 1 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C908, C911, C912, C917 | 4 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C918, C919, C922, C924 | 4 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C929, C931, C951 | 3 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C981 | 1 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C982 | 1 | C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP | 2203-005061 |
| 2 | C961 | 1 | C-CERAMIC, CHIP 100 nF, 10 %, 16 V, X7R, TP, 1608 | 2203-005148 |
| 2 | C505 | 1 | C-TA, CHIP 1 uF, 20 %, 16 V, -, TP, 3216 | 2404-000151 |
| 2 | C251 | 1 | C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216 | 2404-000167 |
| 2 | C242 | 1 | C-TA, CHIP 1.5 uF, 20 %, 16 V, -, TP, 3216 | 2404-000274 |
| 2 | C940 | 1 | C-TA, CHIP 1 uF, 20 %, 10 V, GP, TP, 2012, 2, 0 | 2404-001017 |
| 2 | C357 | 1 | C-TA, CHIP 10 uF, 20 %, 10 V, GP, TP, 3216, 3.2 | 2404-001020 |
| 2 | C102, C116, C127 | 3 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C167, C207, C209, C248 | 4 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C318, C322, C325 | 3 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C332, C351, C354 | 3 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C409, C416 | 2 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C439, C448, C451, C454 | 4 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C509, C612, C806 | 3 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C903, C916, C942, C945 | 4 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C947 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |

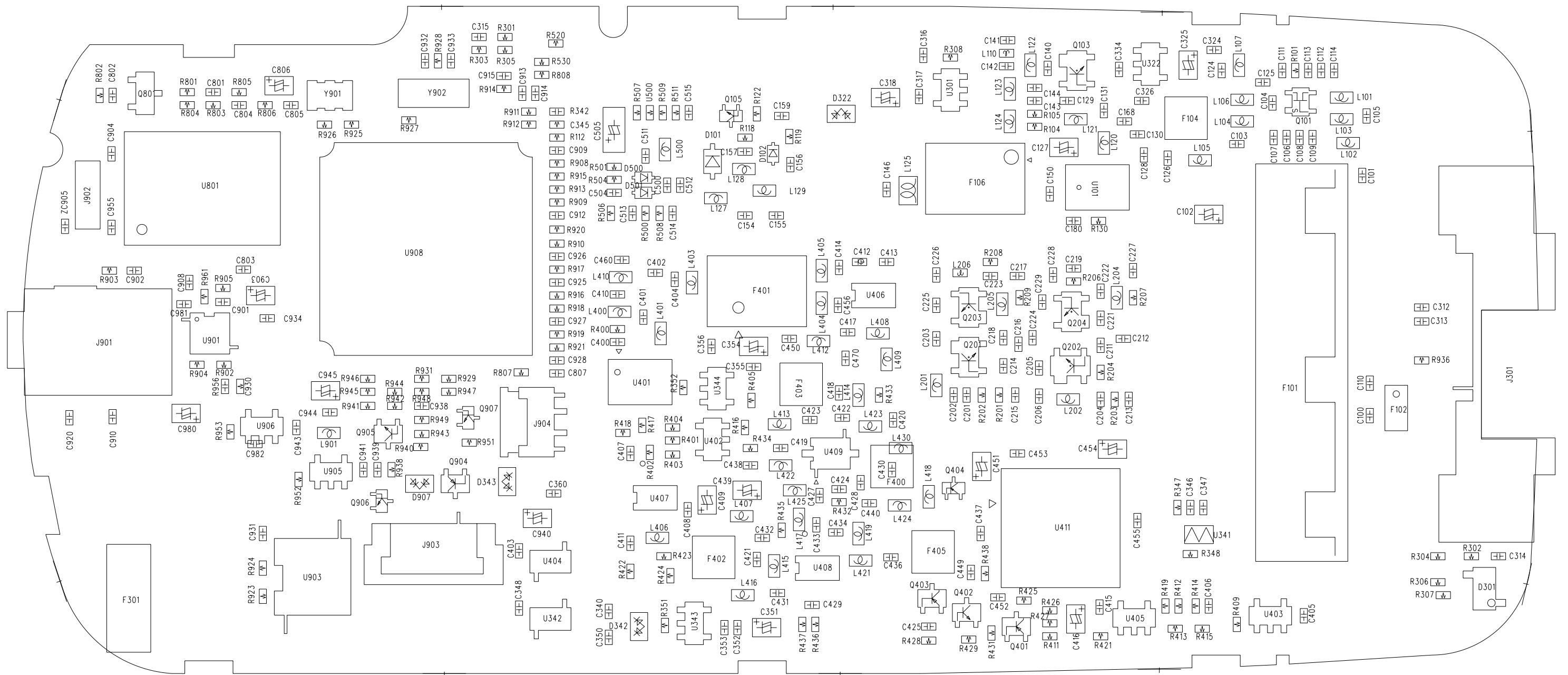
| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------|----------|---|-------------|
| 2 | C948 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C952 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C953 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C954 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C958 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C980 | 1 | C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001064 |
| 2 | C426 | 1 | C-TA, CHIP 3.3 uF, 20 %, 6.3 V, GP, TP, 2012 | 2404-001087 |
| 2 | C907 | 1 | C-TA, CHIP 68 uF, 10 %, 10 V, GP, TP, 6032 | 2404-001140 |
| 2 | C231, C232 | 2 | C-TA, CHIP 22 uF, 10 %, 6.3 V, GP, TP, 3216 | 2404-001141 |
| 2 | L126 | 1 | INDUCTOR-SMD 470 nH, 10 %, 0.8 x 1.6 x 0.8 mm | 2703-000213 |
| 2 | L400 | 1 | INDUCTOR-SMD 220 nH, 10 %, 0.8 x 1.6 x 0.8 mm | 2703-000295 |
| 2 | L105, L108, L407 | 3 | INDUCTOR-SMD 1 uH, 10 %, 0.8 x 1.6 x 0.8 mm | 2703-000300 |
| 2 | L210 | 1 | INDUCTOR-SMD 1 uH, 10 %, 0.8 x 1.6 x 0.8 mm | 2703-000300 |
| 2 | L409, L418, L422 | 3 | INDUCTOR-SMD 1 uH, 10 %, 0.8 x 1.6x0.8 mm | 2703-000300 |
| 2 | L116 | 1 | INDUCTOR-SMD 10 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001040 |
| 2 | L205 | 1 | INDUCTOR-SMD 15 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001041 |
| 2 | L406 | 1 | INDUCTOR-SMD 15 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001041 |
| 2 | L421 | 1 | INDUCTOR-SMD 15 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001041 |
| 2 | L103, L114, L115 | 3 | INDUCTOR-SMD 8.2 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001080 |
| 2 | L302 | 1 | INDUCTOR-SMD 8.2 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001080 |
| 2 | L102 | 1 | INDUCTOR-SMD 6.8 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001113 |
| 2 | L109, L121 | 2 | INDUCTOR-SMD 100 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001172 |
| 2 | L408 | 1 | INDUCTOR-SMD 100 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001172 |
| 2 | L128 | 1 | INDUCTOR-SMD 12 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001173 |
| 2 | L113 | 1 | INDUCTOR-SMD 33 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001174 |
| 2 | L110 | 1 | INDUCTOR-SMD 56 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001175 |
| 2 | L118 | 1 | INDUCTOR-SMD 56 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001175 |
| 2 | L120, L125 | 2 | INDUCTOR-SMD 56 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001175 |
| 2 | L206 | 1 | INDUCTOR-SMD 27 nH, 10 %, 1 x 0.5 x 0.5 mm | 2703-001181 |
| 2 | L111 | 1 | INDUCTOR-SMD 18 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001189 |
| 2 | L424 | 1 | INDUCTOR-SMD 18 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001189 |
| 2 | L301 | 1 | INDUCTOR-SMD 2.2 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001205 |
| 2 | L430 | 1 | INDUCTOR-SMD 2.2 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001205 |
| 2 | L106 | 1 | INDUCTOR-SMD 4.7 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001206 |
| 2 | L413 | 1 | INDUCTOR-SMD 4.7 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001206 |
| 2 | L132 | 1 | INDUCTOR-SMD 3.3 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001258 |
| 2 | L412 | 1 | INDUCTOR-SMD 3.3 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001258 |
| 2 | L101 | 1 | INDUCTOR-SMD 47 nH, 5 %, 1.6 X 0.8 X 0.8 MM | 2703-001259 |
| 2 | L417 | 1 | INDUCTOR-SMD 47 nH, 5 %, 1.6 X 0.8 X 0.8 MM | 2703-001259 |
| 2 | L104 | 1 | INDUCTOR-SMD 3.9 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001295 |
| 2 | L401 | 1 | INDUCTOR-SMD 68 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001308 |
| 2 | L428 | 1 | INDUCTOR-SMD 68 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001308 |
| 2 | L419 | 1 | INDUCTOR-SMD 27 nH, 10 %, 1.6 x 0.8 x 0.8 mm | 2703-001413 |
| 2 | L129 | 1 | INDUCTOR-SMD 22 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001422 |
| 2 | L201, L202 | 2 | INDUCTOR-SMD 5.6 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001441 |
| 2 | L204 | 1 | INDUCTOR-SMD 5.6 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001441 |
| 2 | L414 | 1 | INDUCTOR-SMD 5.6 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001441 |
| 2 | L425 | 1 | INDUCTOR-SMD 5.6 nH, 0.3 nH, 1.6 x 0.8 x 0.8 mm | 2703-001441 |
| 2 | L500 | 1 | INDUCTOR-SMD 27 nH, 5 %, 1.8 x 1.12 x 1.02 mm | 2703-001512 |
| 2 | L203, L207 | 2 | INDUCTOR-SMD 33 uH, 20 %, 1.6 x 0.8 x 0.8 mm | 2703-001707 |

Electrical Parts List

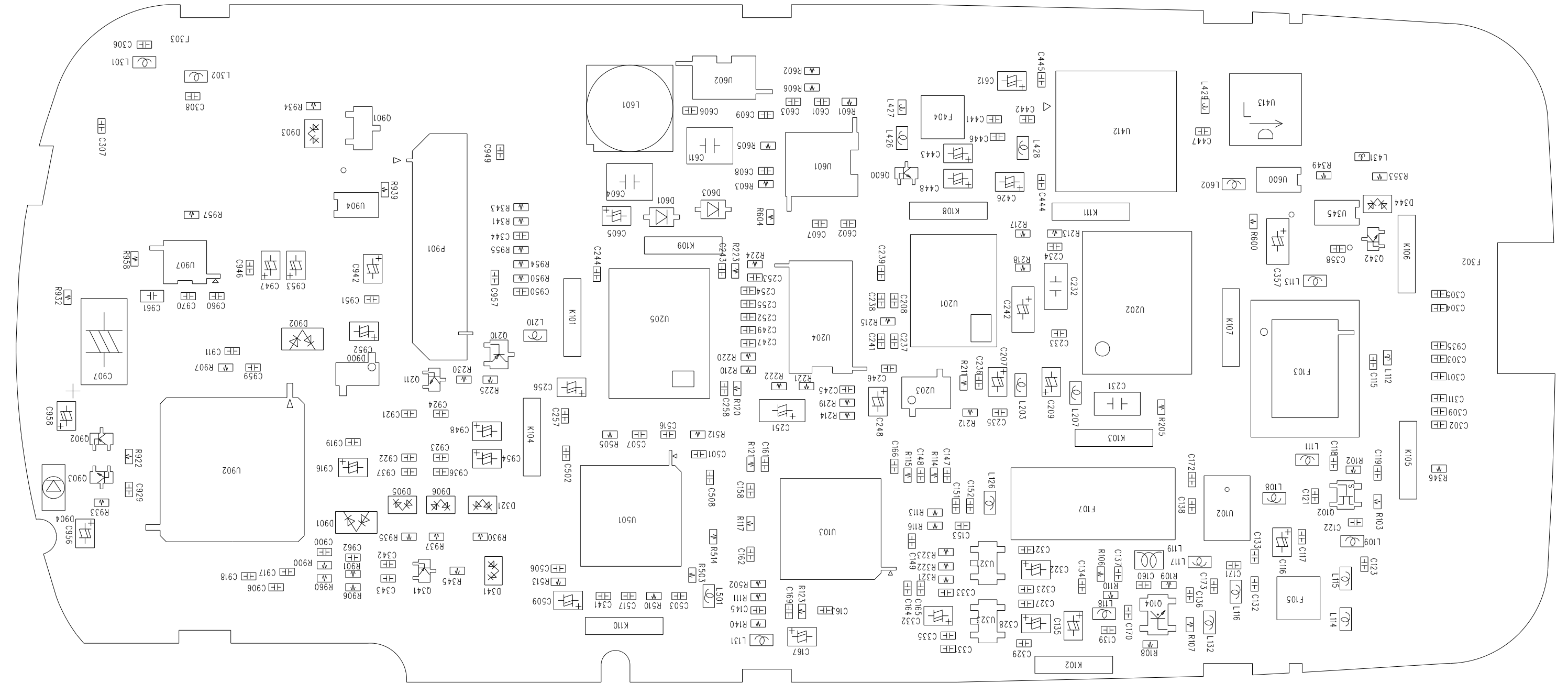
| Level | Location No. | Quantity | Description | SEC Code |
|-------|------------------------|----------|--|-------------|
| 2 | C447 | 1 | INDUCTOR-SMD 1.2 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm | 2703-001724 |
| 2 | C442 | 1 | INDUCTOR-SMD 1.5 nH, 0.3 nH, 1 x 0.5 x 0.5 mm | 2703-001728 |
| 2 | L127, L403, L404, L405 | 4 | INDUCTOR-SMD 100 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001838 |
| 2 | L501 | 1 | INDUCTOR-SMD 100 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001838 |
| 2 | L122, L410 | 2 | INDUCTOR-SMD 82 nH, 5 %, 1.6 x 0.8 x 0.8 mm | 2703-001839 |
| 2 | L119 | 1 | INDUCTOR-SMD 220 nH, 5 %, 2 x 1.25 x 1.2 mm | 2703-001861 |
| 2 | Y902 | 1 | CRYSTAL-SMD .032768 MHz, 30PPM, 28-ACM, 9 pF | 2801-003747 |
| 2 | Y901 | 1 | RESONATOR-CERAMIC 27 MHz, 0.5 %, TP | 2802-001104 |
| 2 | U201 | 1 | OSCILLATOR-VCO 1750 MHz, -, -, TP, 3 V, 7 mA | 2806-001193 |
| 2 | U202 | 1 | OSCILLATOR-VCO 967.5 MHz, -, -, TP, 2.7 V, 30 mA | 2806-001211 |
| 2 | U205 | 1 | OSCILLATOR-VCTCXO 19.68 MHz, 2 ppm, -, TP, 3 V | 2809-001216 |
| 2 | F403, F404 | 2 | FILTER-SAW 1880 MHz, 60 MHz | 2904-001020 |
| 2 | F104 | 1 | FILTER-SAW 1960 MHz, 60 MHz | 2904-001021 |
| 2 | F107 | 1 | FILTER-SAW 85.380 MHz, 13 kHz, +-13 kHz/1.5dB | 2904-001074 |
| 2 | F402 | 1 | FILTER-SAW 836.5 MHz, 25 MHz, +-25 MHz/0.9 dB | 2904-001135 |
| 2 | F105 | 1 | FILTER-SAW 881.5 MHz, 25 MHz, +-25 MHz/0.9 dB | 2904-001136 |
| 2 | F405 | 1 | FILTER-SAW 836.50 MHz, -, 849 MHz/1 dB, TP, 849M | 2904-001138 |
| 2 | F401 | 1 | FILTER-SAW 130.38 MHz, .63MHz, 0.7 dB, TP, 5.5 dB | 2904-001176 |
| 2 | F106 | 1 | FILTER-SAW 210.38M, .79M, +-0.3M/0.5 dB, TP | 2904-001191 |
| 2 | F103 | 1 | FILTER-DUPLEXER 881.5M, 836.5M, 3.8/2DB, TP | 2909-001082 |
| 2 | F101 | 1 | FILTER-DUPLEXER 1.96G, 1.88G, 4.4/3.6DB, TP | 2909-001096 |
| 2 | U401 | 1 | FILTER-LC 130.38M, .7M, 5 dB, TP, 32DB/85.38M | 2909-001105 |
| 2 | J903 | 1 | CONNECTOR-FPC/FC/PIC 8P, 0.5 mm, SMD-A, SN | 3708-001180 |
| 2 | J902 | 1 | CONNECTOR-SOCKET 2P, 1R, 1.27 mm, SMD-S | 3710-001105 |
| 2 | J301 | 1 | CONNECTOR-SOCKET 18P, 1R, 0.5 mm, SMD-A | 3710-001302 |
| 2 | J904 | 1 | CONNECTOR-SOCKET 2P, 1R, 1.27 mm, SMD-A | 3710-001436 |
| 2 | P901 | 1 | CONNECTOR-HEADER NOWALL, 50P, 2R, 1.25 mm | 3711-002048 |
| 2 | J901 | 1 | JACK-AC POWER 2P, 2.6PI, AU, BLK, NO | 3722-001172 |
| 2 | U101 | 1 | FREQ-MIXER 210.38 MHz, -, 10.5 dB, -, 18 dB, 20 dB | 4709-001103 |
| 2 | U102 | 1 | FREQ-MIXER 85 MHz, -, -, 10 dB, 20 dB, 10 dB | 4709-001104 |
| 2 | U413 | 1 | FREQ-ISOLATOR 1.85~1.91 GHz, 15 dB, 0.6 dB, 1.5 | 4709-001127 |
| 2 | F102 | 1 | FREQ-SEPARATOR 824-894 MHz, 1850-1990 MHz | 4709-001145 |
| 2 | PCB | 1 | PCB-SCH-3500, FR-4, -, 0.8T, 118 x 138 | GH41-00032A |
| 2 | K101, K102, K103 | 3 | NPR-GROUNDING TERMINAL SCH-510, C1720, T0.1 | GH71-00002A |
| 2 | K104, K105, K106, K107 | 4 | NPR-GROUNDING TERMINAL SCH-510, C1720, T0.1 | GH71-00002A |
| 2 | K108, K109, K110, K111 | 4 | NPR-GROUNDING TERMINAL SCH-510, C1720, T0.1 | GH71-00002A |
| 1 | - | 1 | MEA REAR-COVER, SAMSUNG, USA | GH97-00891A |
| 2 | - | 1 | UNIT-SCH-3500 KEY ASS'Y, YWC3500 | GH59-00030A |
| 1 | - | 1 | MEA FRONT-COVER(SIL) SCH-3500, -, KORA, SIL | GH97-00892C |
| 2 | - | 1 | UNIT-SCH-3500REC KEY ASS'Y | GH59-00031A |
| 2 | - | 2 | GASKET-SCH-3500, CONDUCTIVE FABLIC | GH63-00010A |

12. PCB Diagram

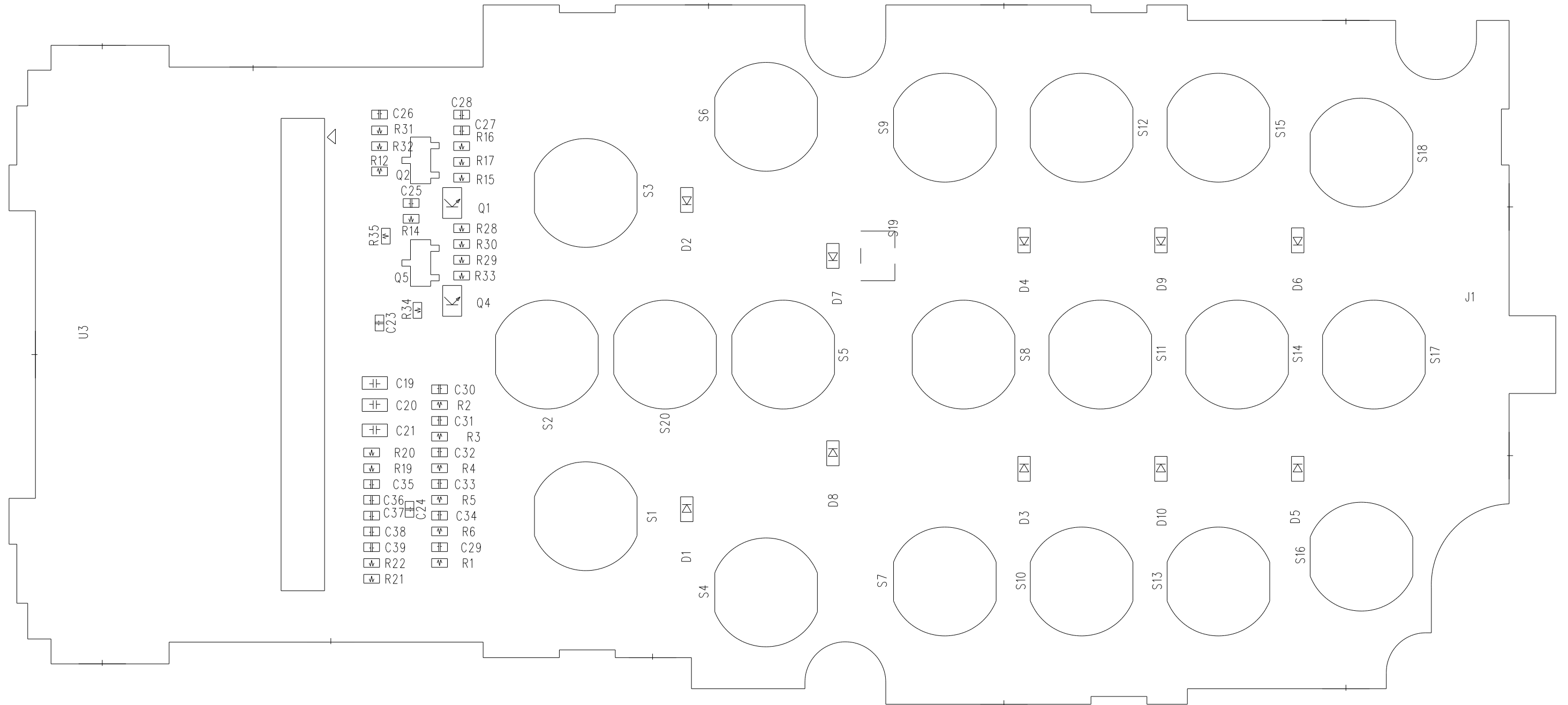
12-1 Main PCB Top Diagram



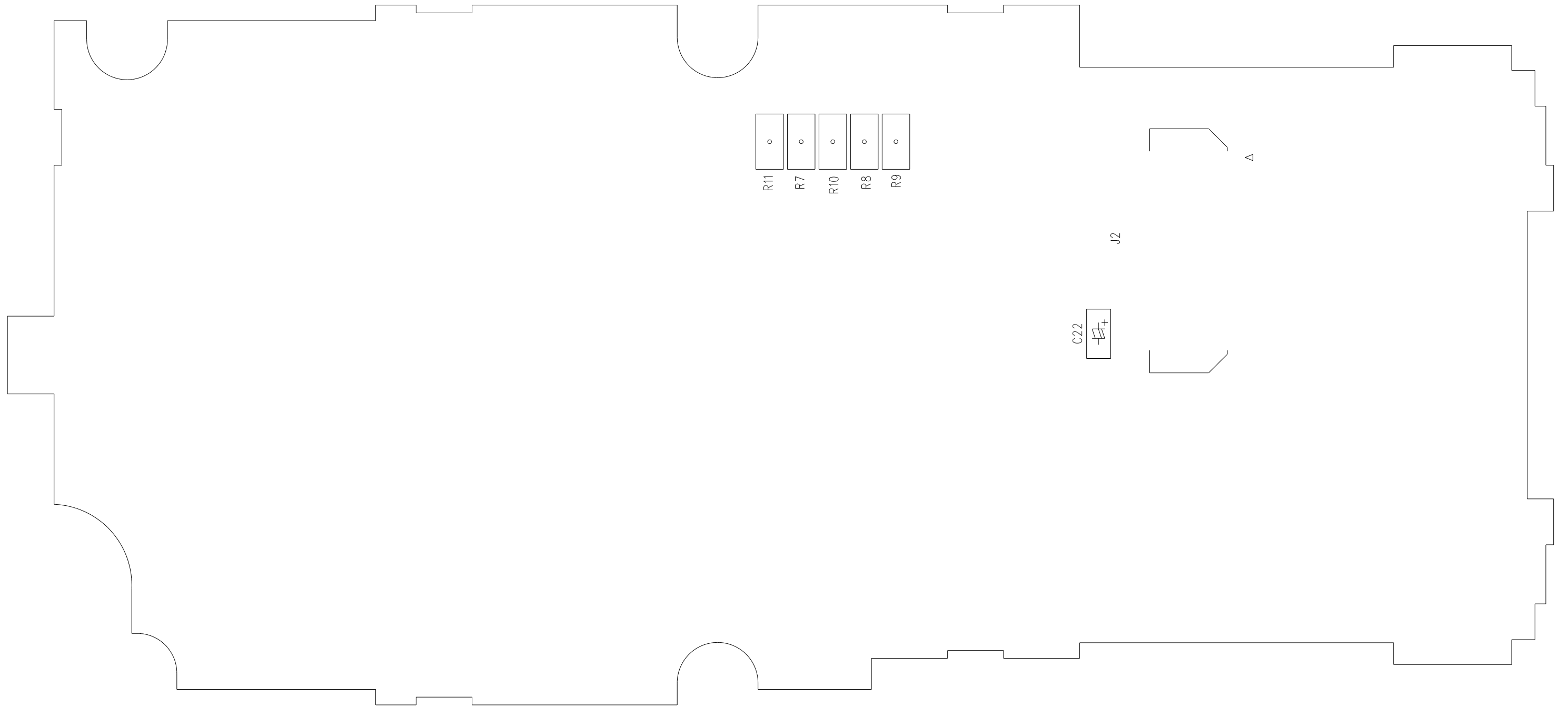
12-2 Main PCB Bottom Diagram



12-3 Key PCB Top Diagram

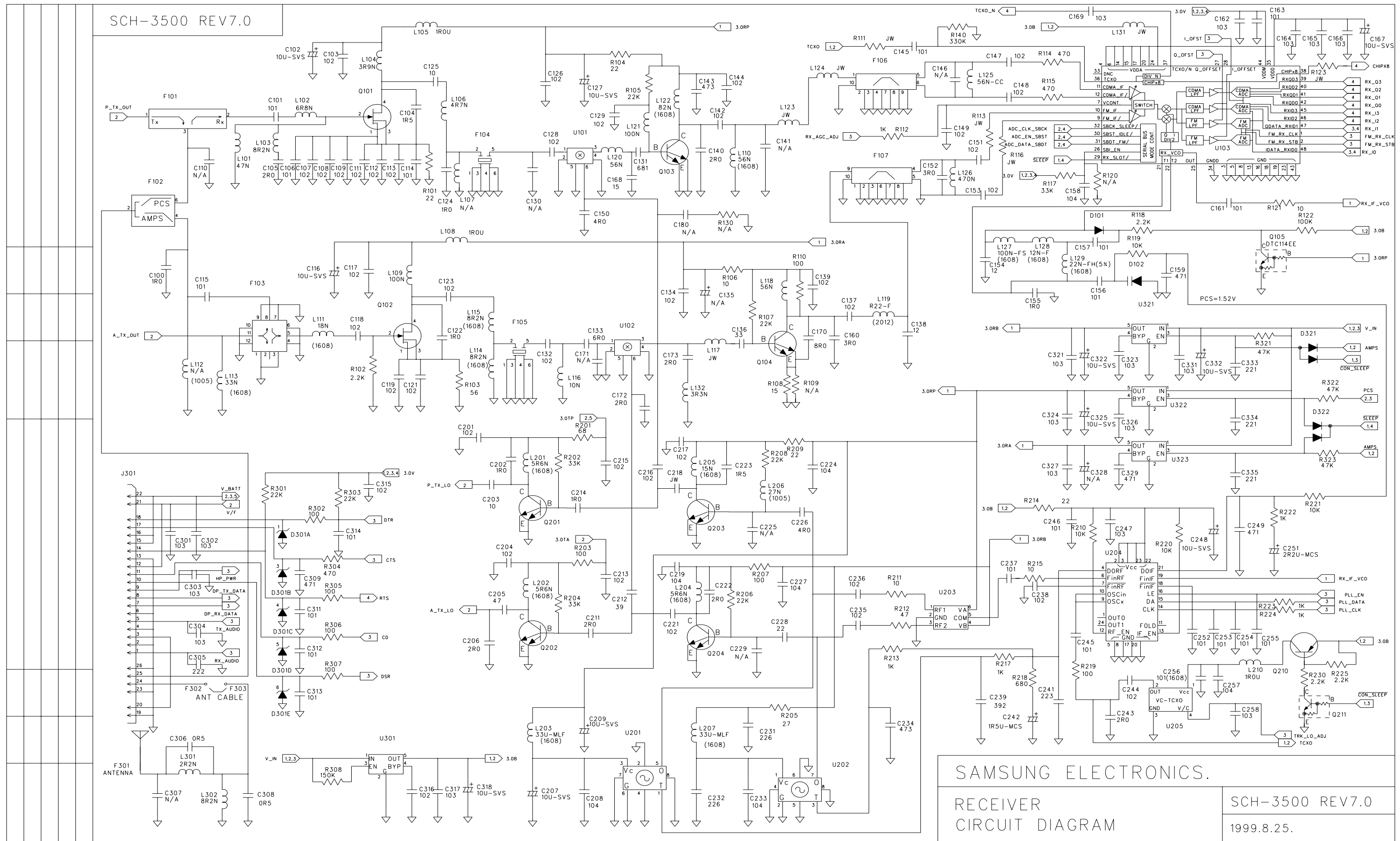


12-4 Key PCB Bottom Diagram



13. Circuit Diagrams

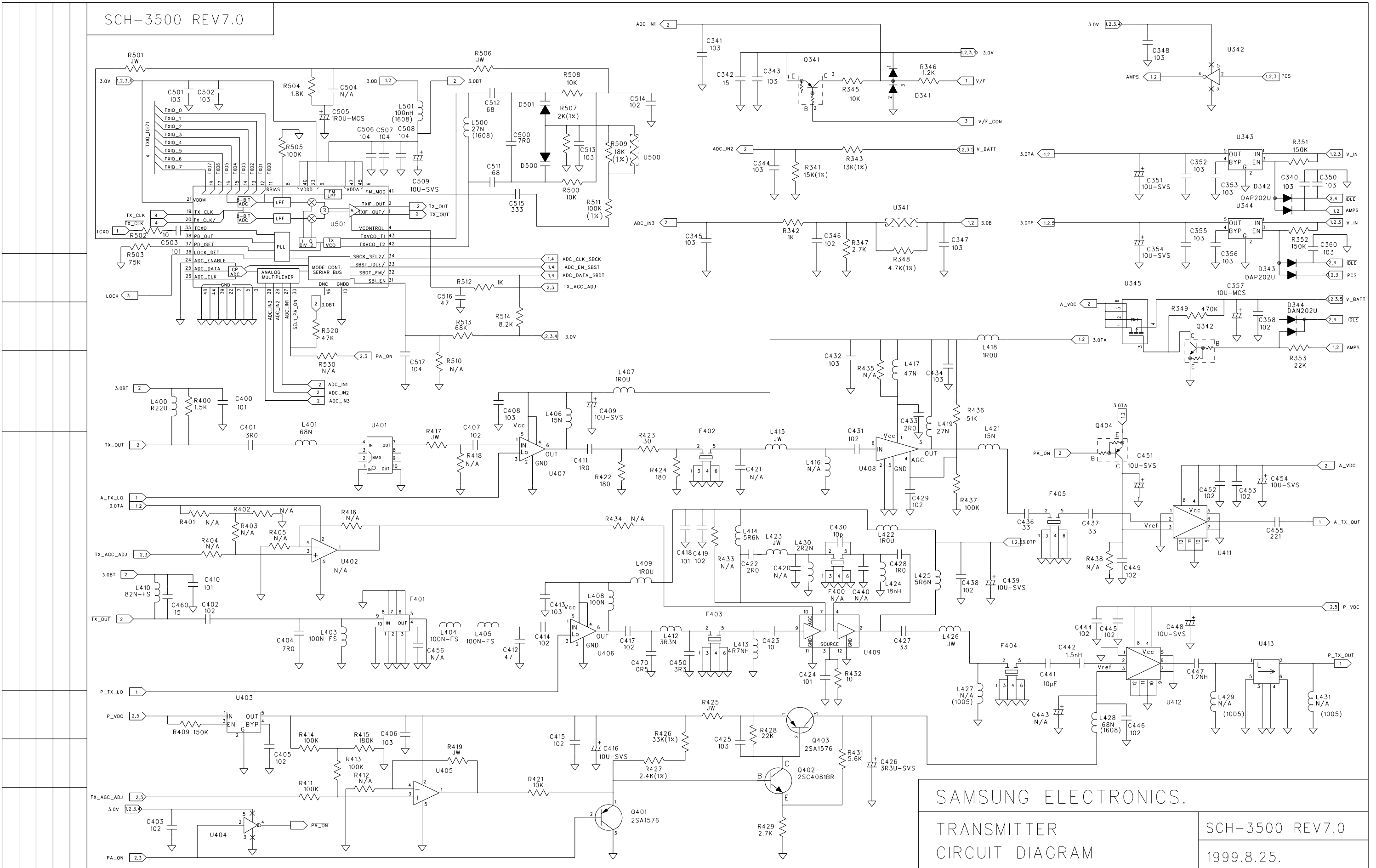
13-1 Receiver Circuit Diagram



SAMSUNG ELECTRONICS.
 RECEIVER
 CIRCUIT DIAGRAM

SCH-3500 REV7.0
 1999.8.25.

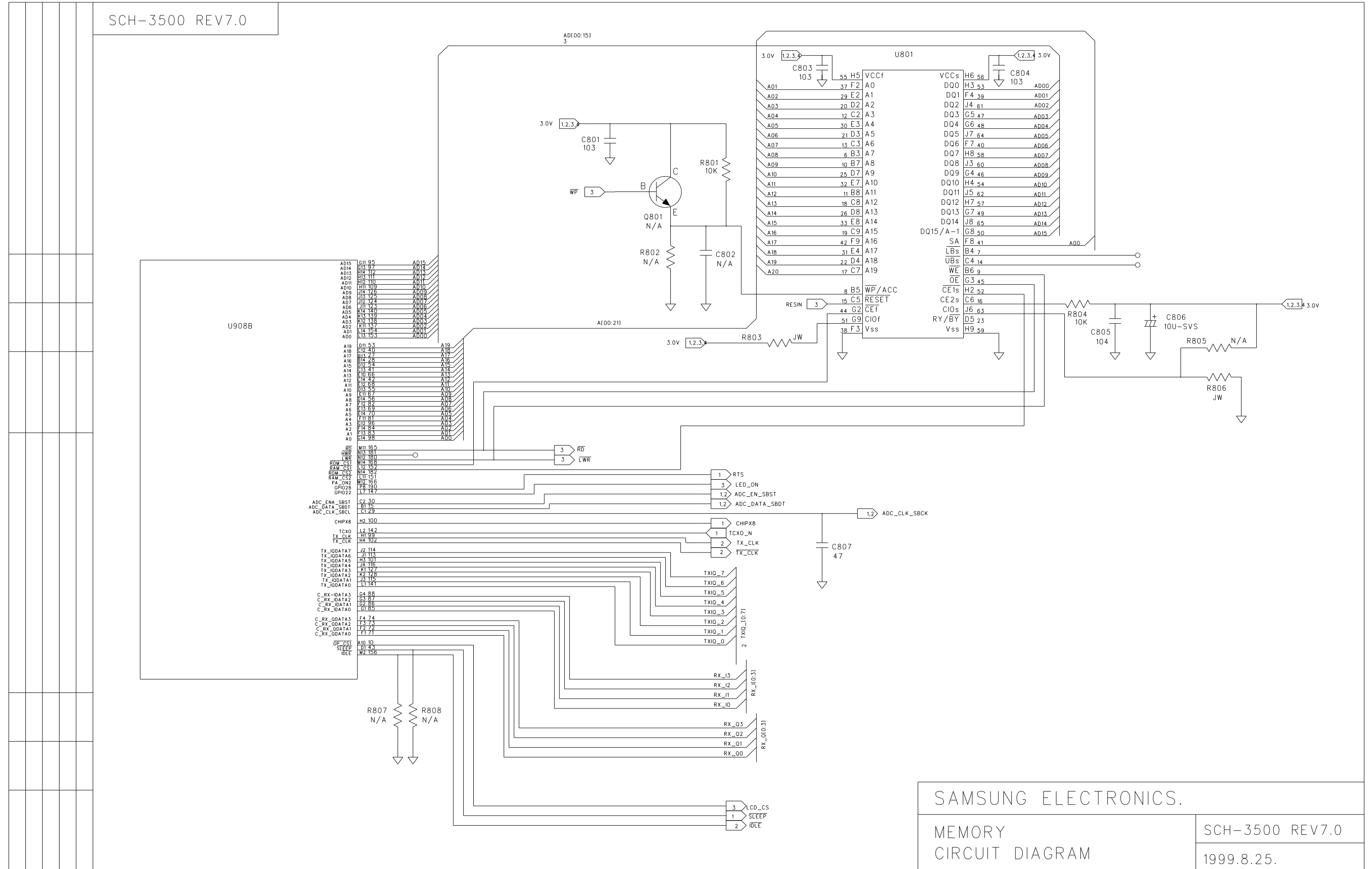
13-2 Transmitter Circuit Diagram



SAMSUNG ELECTRONICS.
TRANSMITTER
CIRCUIT DIAGRAM

SCH-3500 REV7.0
1999.8.25.

13-3 Memory Circuit Diagram

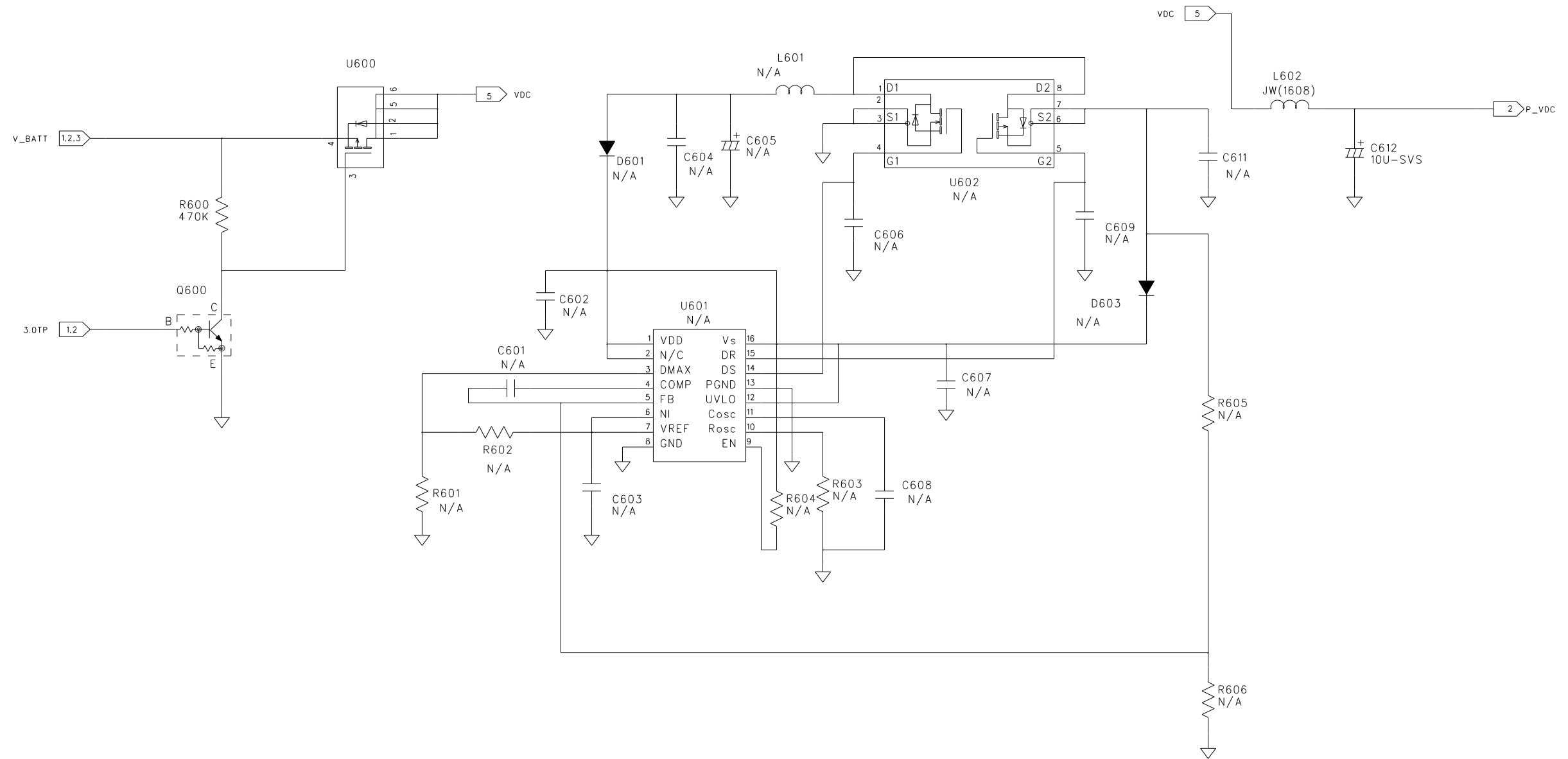


SAMSUNG ELECTRONICS.
 MEMORY
 CIRCUIT DIAGRAM

SCH-3500 REV7.0
 1999.8.25.

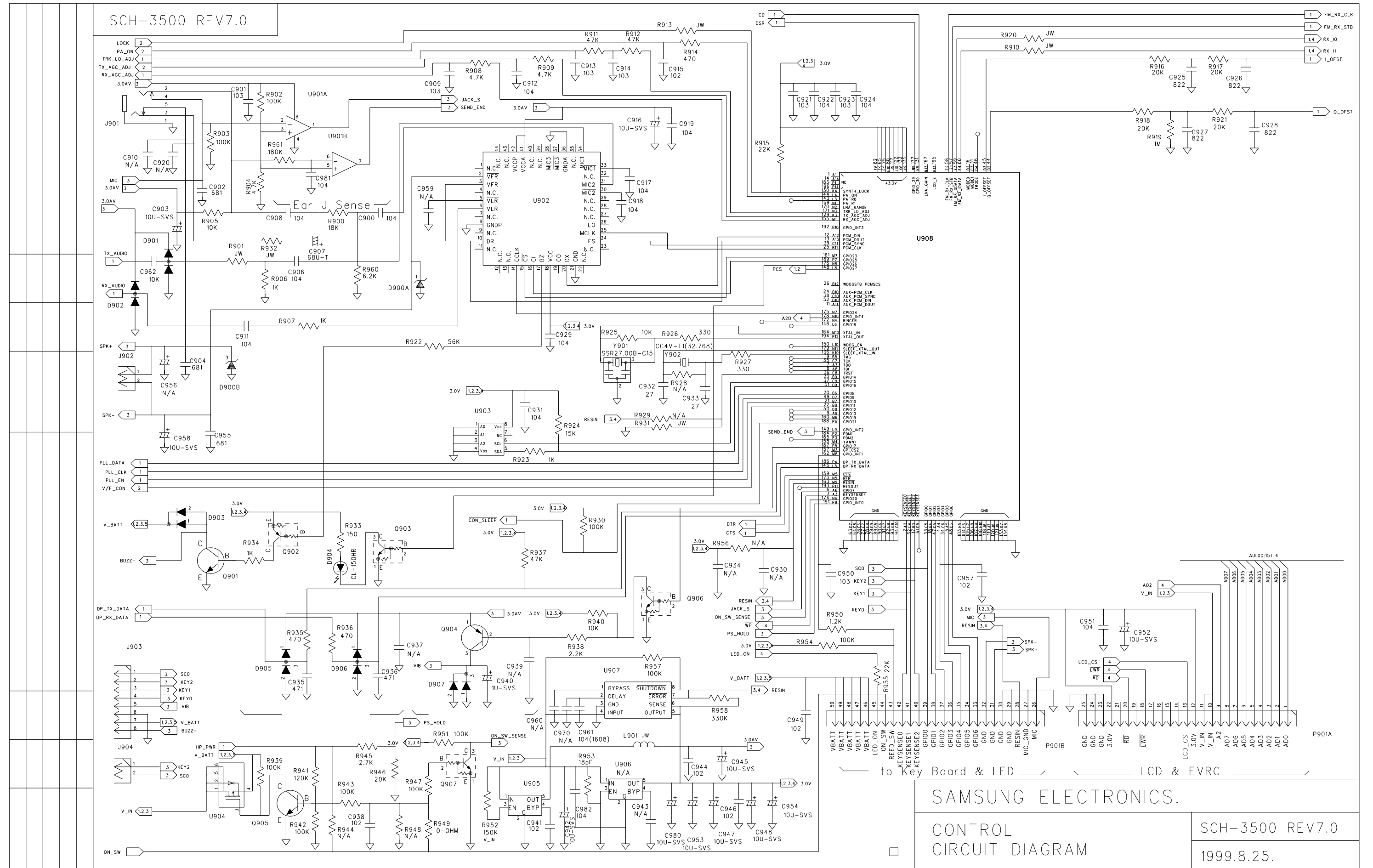
13-4 DC-DC Converter Circuit Diagram

SCH-3500 REV7.0



| | |
|----------------------|-----------------|
| SAMSUNG ELECTRONICS. | |
| DC-DC CONVERTER | SCH-3500 REV7.0 |
| | 1999.8.25. |

13-5 Control Circuit Diagram





ELECTRONICS