SAMSUNG

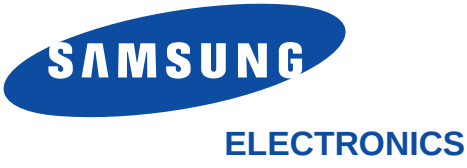
PORTABLE CELLULAR TELEPHONE

SCH-1500 Series

SERVICE *Manual*

PORTABLE CELLULAR TELEPHONE

CONTENTS



Samsung Electronics Co.,Ltd.

1. General Introduction

The SCH-1500 DBDM 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.

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 (600mW).

Memo

2. Specification

2-1 General

Frequency Range	PCS Mode	AMPS Mode
Transmitter	: 1850 ~ 1910 MHz	824 ~ 849 MHz
Receiver	: 1930 ~ 1990 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 - 80MHz) ± 150Hz	± 2.5 ppm
Operating Temperature	: -30 °C ~ 60 °C	
Operating Voltage		
HHP	: 7.2V DC (± 10%)	
Hands-free	: 13.7V DC (± 10%)	
Size and Weight		
including standard battery	: 14.6 x 5.4 x 2.5 cm, 191 cc, 220 g (7.7 ounces)	
including extended-life battery	: 14.6 x 5.4 x 3.35 cm, 250 cc, 226 g (7.9 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	: ± 8kHz (± 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 ± 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

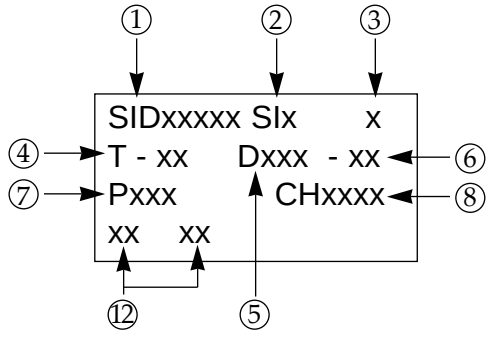
RECEIVER

Rx Sensitivity and Dynamic Range	: -104 dBm, FER=0.5% or less
(Rate Set 1)	: -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	
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	

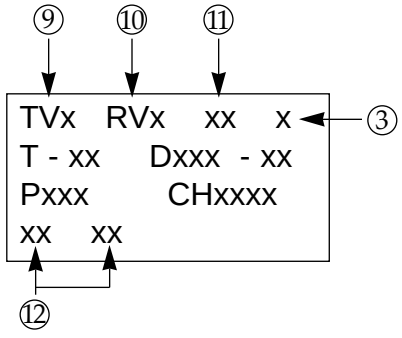
2-4 PCS Debug Display Information

To select debug display mode : Press [MENU] + [8] + [0], and press [0] + [4] + [0] + [7] + [9] + [3] or press [0] + [0] + [0] + [0] + [0] + [0].

IN IDLE MODE



IN CONVERSATION MODE



① Sxxxxx : SID (System Identification) toggle
Nxxxxx : NID (Network Identification) toggle

② SIx : 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

④ T-xx : Tx adjust, Value ranges from +63~0~63dB

⑤ Dxxx : Sector power in dBm

⑥ -xx : e_c/I_o

⑦ Pxxx : PN offset

⑧ CHxxxx : Channel number

⑨ TV : Tx vocoder rate (8 is full rate, 1 is 1/8th rate)

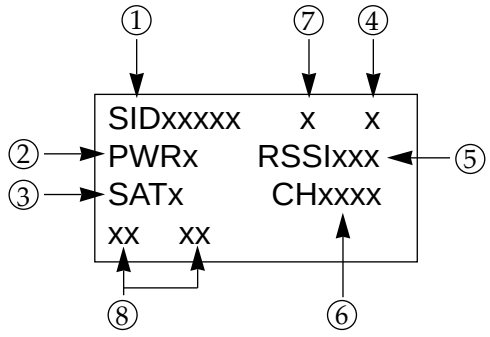
⑩ RV : Rx vocoder rate (8 is full rate, 1 is 1/8th rate)

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] + [8] + [0], and press [0] + [4] + [0] + [7] + [9] + [3] or press [0] + [0] + [0] + [0] + [0] + [0].



① SIDxxxxx : AMPS Home System ID

② PWRx : Power Level 0 ~ 7

③ SATx : Supervisory Audio Tone code (0 ~ 3)

④ x (Using Frequency Band) : A Band or B Band

⑤ RSSIxxx : RSSI value

⑥ CHxxx : Using Channel

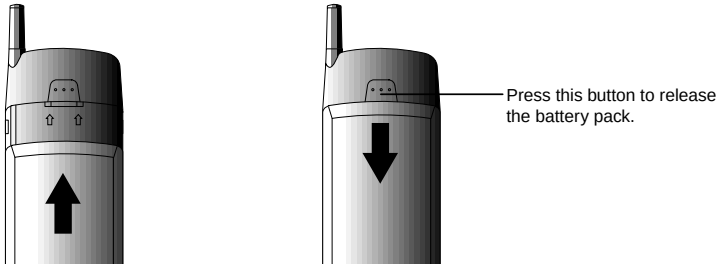
⑦ Handset Status : 1 - Initialization state
2 - Idle state
3 - System Access state
4 - Voice channel state

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 BAT 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.

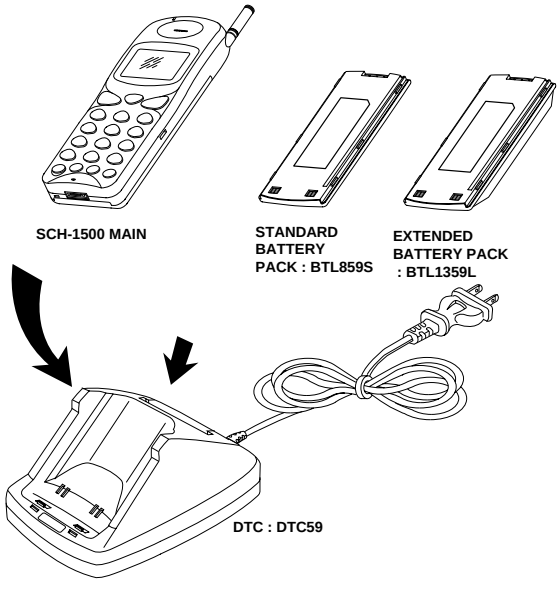


Figure 3-1 Charging the Phone and Battery

Specifications using DTC

Battery Type	Standard Battery (Li-Ion, 850mAH)	Extended battery (Li-Ion, 1350mAH)
Charging Time	3 hours	5 hours
SEC. code	GH43-10114A	GH43-10113A

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.

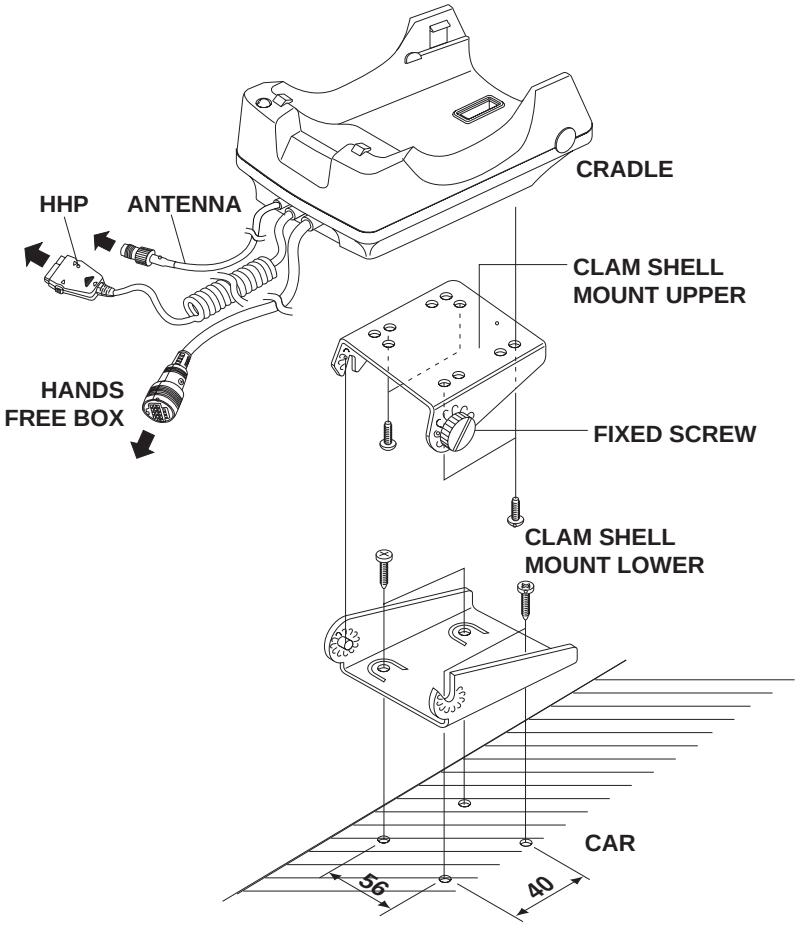


Figure 3-2 Cradle Installation

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 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, radio 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.

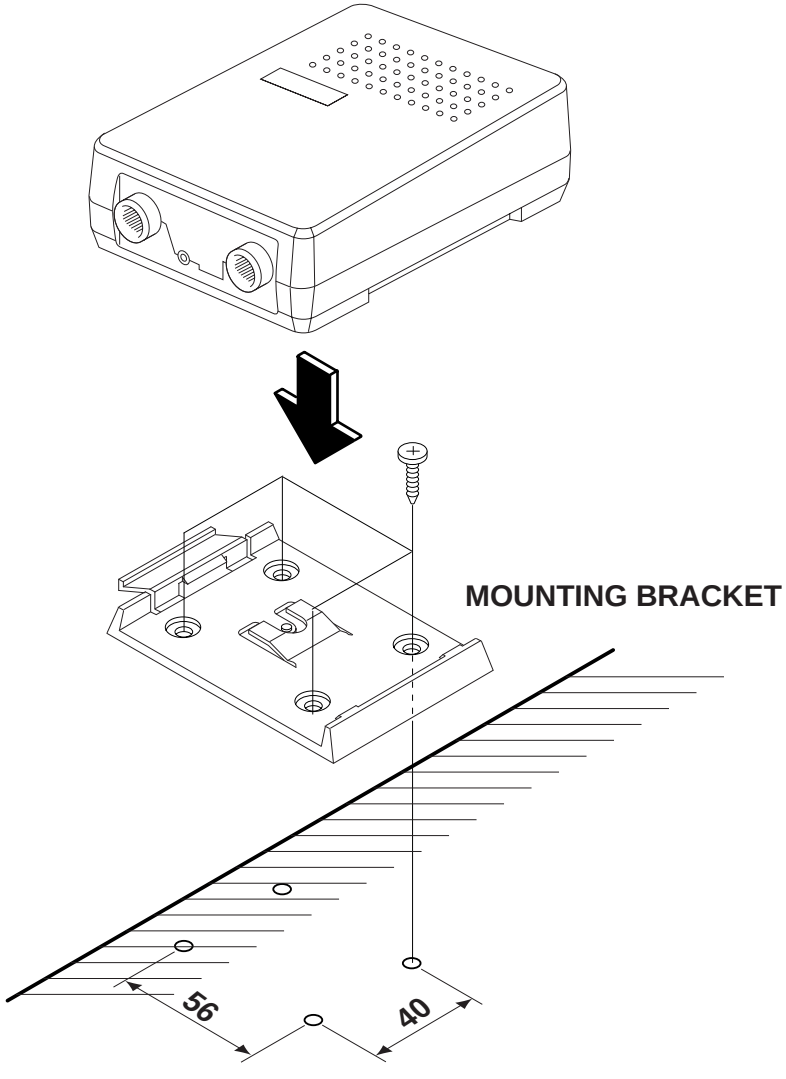


Figure 3-3 Hands-Free Box Installation

3-3-5 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 one of the power cable to the battery or ignition terminal. Connect the red wire to the battery (+) terminal, black wire to the vehicle chassis. Then connect the battery (-) terminal to the vehicle chassis.

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.

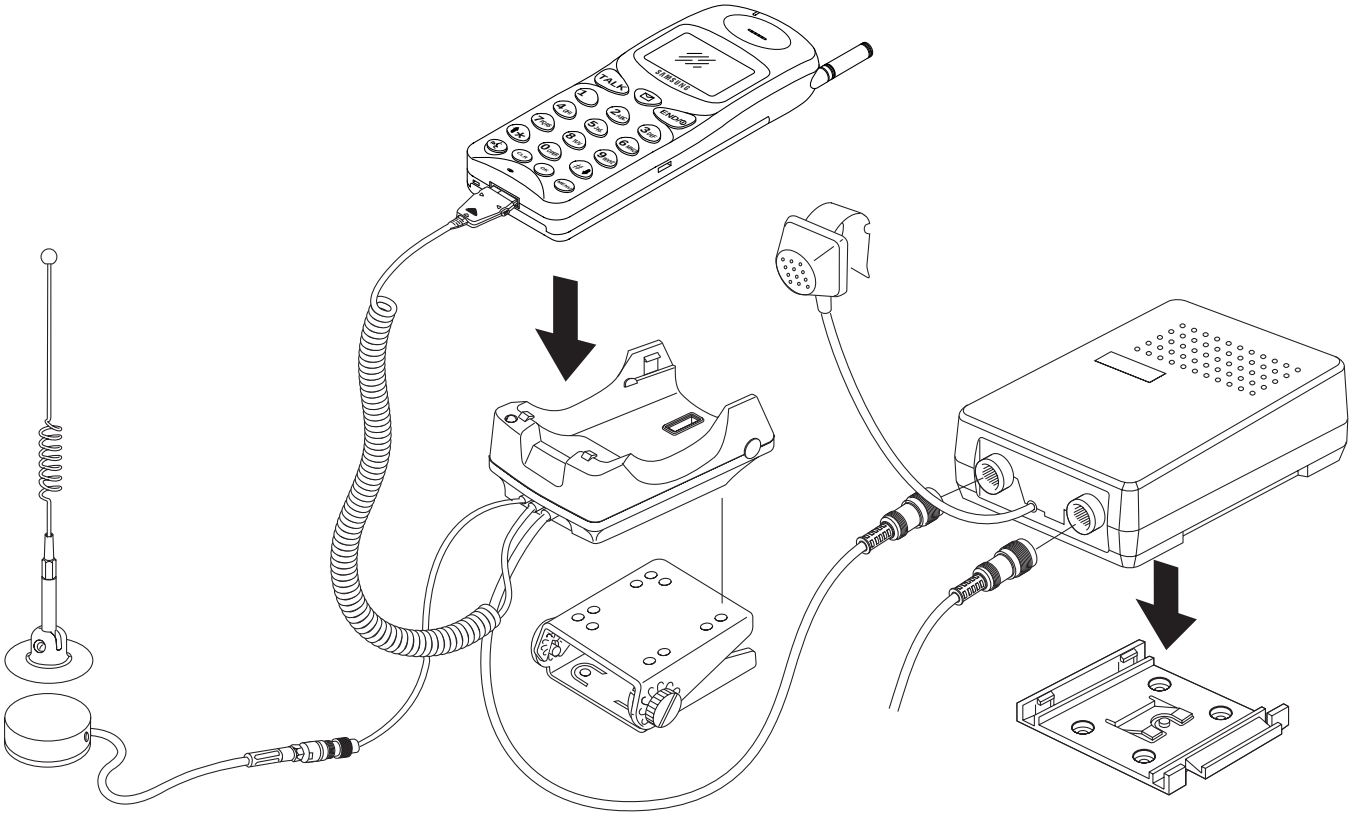


Figure 3-4 Cable Connections

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, **5**, **0**	Select NAM programming
`Enter Lock` `??????`	6-digit code	Enter random 6 digit code (MSL)

`SVC Menu↓ ↑`
`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
`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` `No`	 ↓ 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↓ ↑ 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↓ ↑ 1:Phone# 2:General 3:NAM	Volume ▲	NAM Programming Menu is displayed.
SVC Menu↓ ↑ 3:NAM	**3**	Choose 'Setup 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.

LCD Display	Key in	Function
CDMA Home SID Yes	↓ or ↑ **OK**	CDMA Home system ID, current status is displayed -changes the status -stores it.
CDMA fSID Yes	↓ or ↑ **OK**	CDMA foreign SID, current status is displayed. -changes the system. -stores it.
CDMA fNID Yes	↓ or ↑ **OK**	CDMA foreign NID, current status is displayed. -changes the system -stores it.
HOME SID 1700	Number **OK**	SID written in the list, current status is displayed. -to change, enter new one. -store it.
NID 1	Number **OK**	NID written in the list, current status is displayed. -to change, enter new one. -stores it.

4-2 Dual NAM

4-2-1 General Setup

LCD Display	Key in	Function
	Menu, **5**, **0**	Select NAM programming
`Enter Lock` `??????`	6-digit code	Enter random 6 digit code (MSL)

`SVC Menu`↓ ↑
`1:Phone#`
`2:General`
`3:NAM1`
`4:NAM2`
	2	Choose 'GENERAL'

`ESN` `B0000000`	Volume ▲	Electronic Serial Number of the phone is displayed
`CAI version` `1`	Volume ▲	Common Air Interface version is displayed
`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` `No`	↓ 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.

4-2-2 Phone # NAM1

LCD Display	Key in	Function
SVC Menu⬇ ⬆ 1:Phone# 2:General 3:NAM1 4:NAM2	**1**	Choose 'Phone#'
Phone # 1:NAM1 2:NAM2	**1**	Choose 'NAM1'
Phone # 1234567890	Phone number **OK**	
Mobile ID # 1234567890	Mobile ID **OK**	

4-2-3 Phone # NAM2

LCD Display	Key in	Function
SVC Menu⬇ ⬆ 1:Phone# 2:General 3:NAM1 4:NAM2	**1**	Choose 'Phone#'.
Phone # 1:NAM1 2:NAM2	**2**	Choose 'NAM2'.
Phone # 1234567890	Phone number **OK**	
Mobile ID # 1234567890	Mobile ID **OK**	

4-2-4 Setting Up NAM1

LCD Display	Key in	Function
SVC Menu↓ ↑ 1:Phone# 2:General 3:NAM1 4:NAM2	Volume ▲	NAM Programming Menu is displayed.
SVC Menu↓ ↑ 3:NAM1	**3**	Choose 'Setup NAM1'.
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 Home SID Yes	↓ or ↑ **OK**	CDMA Home system ID, current status is displayed -changes the status -stores it.
CDMA fSID Yes	↓ or ↑ **OK**	CDMA foreign SID, current status is displayed. -changes the system. -stores it.
CDMA fNID Yes	↓ or ↑ **OK**	CDMA foreign NID, current status is displayed. -changes the system -stores it.
HOME SID 1700	Number **OK**	SID written in the list, current status is displayed. -to change, enter new one. -store it.
NID 1	Number **OK**	NID written in the list, current status is displayed. -to change, enter new one. -stores it.

4-2-5 Setting Up NAM2

LCD Display	Key in	Function
SVC Menu↓ ↑ 1:Phone# 2:General 3:NAM1 4:NAM2	Volume ▲	NAM Programming Menu is displayed.
SVC Menu↓ ↑ 4: NAM2	**4**	Choose 'Setup NAM2'.
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 Home SID Yes	↓ or ↑ **OK**	CDMA Home system ID, current status is displayed -changes the status -stores it.
CDMA fSID Yes	↓ or ↑ **OK**	CDMA foreign SID, current status is displayed. -changes the system. -stores it.
CDMA fNID Yes	↓ or ↑ **OK**	CDMA foreign NID, current status is displayed. -changes the system -stores it.
HOME SID 1700	Number **OK**	SID written in the list, current status is displayed. -to change, enter new one. -store it.
NID 1	Number **OK**	NID written in the list, current status is displayed. -to change, enter new one. -stores it.

Memo

5. Product Support Tools

5-1 General

These tools enable you to edit or transfer all the EEPROM data of SCH-1500 DBDM phone.

Equipment Required

- IBM compatible PC (above 386, 33MHz, 8MB RAM, DOS 5.0, 500K of memory free to execute program, and 1MB of disk space free for software upgrade.)
- SCH-1500 DM cable
- SCH-1500 Battery

Connection

Connect the test jig to COM1 port on the PC and connect the interface cable of the test jig to the phone.

Caution : When you use the PST program with a notebook PC, you might encounter some problems. Check your serial port setup in your notebook PC (see your notebook PC manual).

Don't worry about the serial port setup when you use a desktop PC.

Software Installation

1. Insert the PST floppy disk into drive (A:).
2. Create an appropriate directory to the drive (C:) for PST software.
3. Copy all files of the drive (A:) to the directory you made.
4. Execute PSTxx.EXE to run the PST program.

Note : There are three executable files in the new directory you made:
PSTxx.EXE: PST program where xx is the PST version number.

5-2 Product Support Tool (PST)

The Product Support Tool(PST) offers you the ability to interface with the SCH-1500 DBDM phone using a personal computer. You can program the phone, swap phone data, and download software upgrades.

Notes :
- This software is made to be executed on the MS-DOS, not on the DOS mode within Windows95. If this software is executed on Windows 95 by mistake, it may work abnormally and damage the phone especially while downloading. Please check the mode you are using.
- You can transfer EEPROM data one unit at a time.
- It is illegal to copy to several units.

5-2-1 Getting Started

MAIN MENU SCREEN

1. At the DOS prompt, type "PSTxx" where xx is the release version.
2. The Main Menu screen is displayed.

Notes :
- The Main Menu screen shows the basic tasks that are available.
- Move the cursor through the menu choices and press <Enter> key to select a task.

EXITING THE PROGRAM

1. Press <Esc> key until you find the Main Menu screen.
2. Select the "QUIT" option on the Main Menu or press <Alt-X> key, and the PST program is over.

EDITING FIELDS

Once you are in a particular screen, you may want to change a value of any field. A highlighted cursor can be moved to each editable field by using the arrow keys. A field can only be edited if the cursor is on that field (that is, if the field is highlighted.)

1. Begin the editing process by pressing <Enter> key.
2. To accept the new value, press <Enter> key. To about edit mode and return to the old value, press <Esc> key.
3. The value of some field that is fixed types will be changed by just pressing <Enter> key.

See table 5-1 for the list of editing keys.

5-2-2 Operation Procedure

SERVICE PROGRAMMING

The Service Programming screens enable you to set and change the service parameters of the phones, read and write to internal phone book, and transfer phone book data to other phone. There five options listed on the Service Programming Main Menu.

The parameter modification is done on the "Edit Parameters" screens. The variables found on those screens can be preset from a phone or a previously saved file. Select "Read Data from File" or "Read Data from Phone" to preset the values.

READ DATA FROM FILE

Use this command to enter the name of a file whose extension is "mmc". The values read from the named file will initialize the parameter values seen on the "Edit Parameters."

READ DATA FROM PHONE

Use this command to replace the current programmable parameter values with the values that are currently programmed into the phone. The values are read from the phone that must be properly connected to the PST with power on.

EDIT PARAMETERS

Use this command to edit Number Assignment Module (NAM) items and User Preference (U1) items
There are five screens.
1. General Settings: some writable, some read only.
2. Parameters associated with NAM 1.
3. Parameters associated with NAM 2.
4. First User Preferences.
5. Second User Preferences.

Function Keys

Esc : Save and Exit

F1 : Displays help message about a selected field.

F6 : Takes you to the General parameters screen.

F7 : Takes you to the NAM 1 parameters screen.

F8 : Takes you to the NAM 2 parameters screen.

F9 : Takes you to the first UI preferences.

F10 : Takes you to the second UI preferences.

Valid & Invalid Data

Upon startup, all items are initialized “invalid”. All fields display the question marks instead of data. After reading from a phone or a file, if the question marks still show in a field, then that item has never been written to the phone or saved to the file.

SAVE DATA TO FILE

Use this command to save the current parameters in a file. Once you enter a filename, press <Enter> key to write all current parameters to the file.

WRITE ALL TO PHONE

Use this command to write the changed parameter values to the phone.
Writing the changed values to the phone may take up to a minute.

Notes :
- Some items have dependencies on other items, and they will be written to the phone together.
- If you intend to use this “Write All 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.

SOFTWARE DOWNLOADER

Use this screen to download new software to the phone. The various windows are displayed to inform the user of the phone data and the progress of download.

The software downloader task of the PST is responsible for downloading a BIN file into the flash memory on the phone. It verifies that the given BIN file is compatible with the target phone, and performs all the protocol necessary to successfully download the file.

To begin a software downloader, use the following procedure.

1. Press <F4> key to choose a BIN file of the new software to be loaded into the phone. An Edit box will pop up asking for BIN file name. Enter full file name or press <Enter> key to see the lists of BIN files in the current directory. Using the arrow key, choose the appropriate BIN file, then press <Enter> key.

2. Press <F8> key to change the mode of the phone from hands-free mode to DM offline mode. This function is to view the software and hardware version of the phone. By setting the phone to DM offline mode, the upper left window should display the phone's data. If the phone fails to change mode, an error sound and message will occur. In that case, please check the power, link, and COM port configuration.

3. Press <ALT-D> key to begin download. Various messages and progress bar will inform the user of the progress of the download.

Caution : DO NOT REMOVE POWER WHILE THE PHONE IS BEING DOWNLOADED !

4. Press <Esc> key to return to Main Menu.

SETUP

You can setup SCH-1500 only. Use this screen to choose com.port. you want to setup.

Function keys

SPACE : Scroll through menu.

ENTER : Accepts the phone type chosen.

ESC and ALT-x : Cancel operation and returns to Main Menu.

QUIT

You can exit the PST program.

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 Q110 (2SC4081BR) and will drive DC-DC converter (U130) to output 5.2V. This in turn will be supplied to regulators (U110 and U120), thus releasing them from the shut-down state to output regulated 3.3V.

The VBATT applied to ON_SW will turn on Q111 (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 Q110 even after the PWR key is released.

The voltage (+3.3VD) from U120 is used in the digital parts of MSM and BBA. The voltage (+3.3VA) from U110 is used in the analog part of BBA and Audio circuit.

6-1-2 Logic Part

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

- CPU : INTEL 80186 core
- FROM : U126 (MBM29LV800T) - 8MBIT FLASH ROM
- SRAM : U127 (KM68U2000LTGI) - 2MBIT STATIC RAM
- EEPROM : U113 (AT24C128W) - 128KBIT SERIAL EEPROM

CPU

INTEL 80186 CMOS type 16-bit microprocessor is used for the main processing. The CPU controls all the circuitry. For the CPU clock, 27MHz resonator is used.

FLASH ROM (U106)

One 8 MBIT FROM is used to store the terminal's program. Using the down-loading program, the program can be changed even after the terminal is fully assembled.

SRAM (U107)

One 2 MBIT SRAM is used to store the internal flag information, call processing data, and timer data.

EEPROM (U108)

One 128 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. Eight 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. It also consists a DC-DC converter to supply -3.5V for fine view angle and LCD reflector to improve the display efficiency.

6-1-3 Baseband Part

MOBILE SYSTEM MODEM (MSM)

The MSM equipped with the INTEL 80186 CPU core is an important component of the CDMA cellular phone. The MSM comes in a 176 pins TQFP 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/, RAM_CS/, ROM_CS).

INPUT CLOCK

- CPU clock: 27 MHz
- TXCO/4 (pin 34): 4.92 MHz. This clock signal from the BBA is the reference clock for the MSM except in CDMA mode.
- CHIPX8 : 9.8304 MHz. The reference clock used during the CDMA mode.

BBA INTERFACE

CDMA, FM Data Interface

- TXIQDATA0-7 (pins 24-32) : TX data bus used during both CDMA and FM mode.
- C_RX_IDATA0-3 (pins 16-20) and C_RX_QDATA0-3 (pins 12-15) : RX data bus used during CDMA mode.
- FM_RX_IDATA (pin 7) and FM_RX_QDATA (pin 8) : RX data bus used during FM mode.

Clock

- TX_CLK (pin 22), TX_CLK/(pin 23) : 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 3), ADC_ENABLE (pin 1) and ADC_DATA (pin 2) are required to control the internal ADC in the BBA.

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 19) and 8 KHz CODEC_SYNC (pins 16,20) to the CODEC (U310). The voice PCM data from the MSM (U101) PCM_DIN (pin135) is compressed into 8KHz by QCELP algorithm in the CDMA mode. In FM mode, the data is processed by D_FM.

RF Interface

TX : TX_AGC_ADJ (pin 35) port is used to control the TX power level and PA_ON (pin 44) signal is used to control the power amplifier.

RX : AGC_REF (pin 36) port is used to control the RX gain and TRK_LO_ADJ (pin 45) 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.

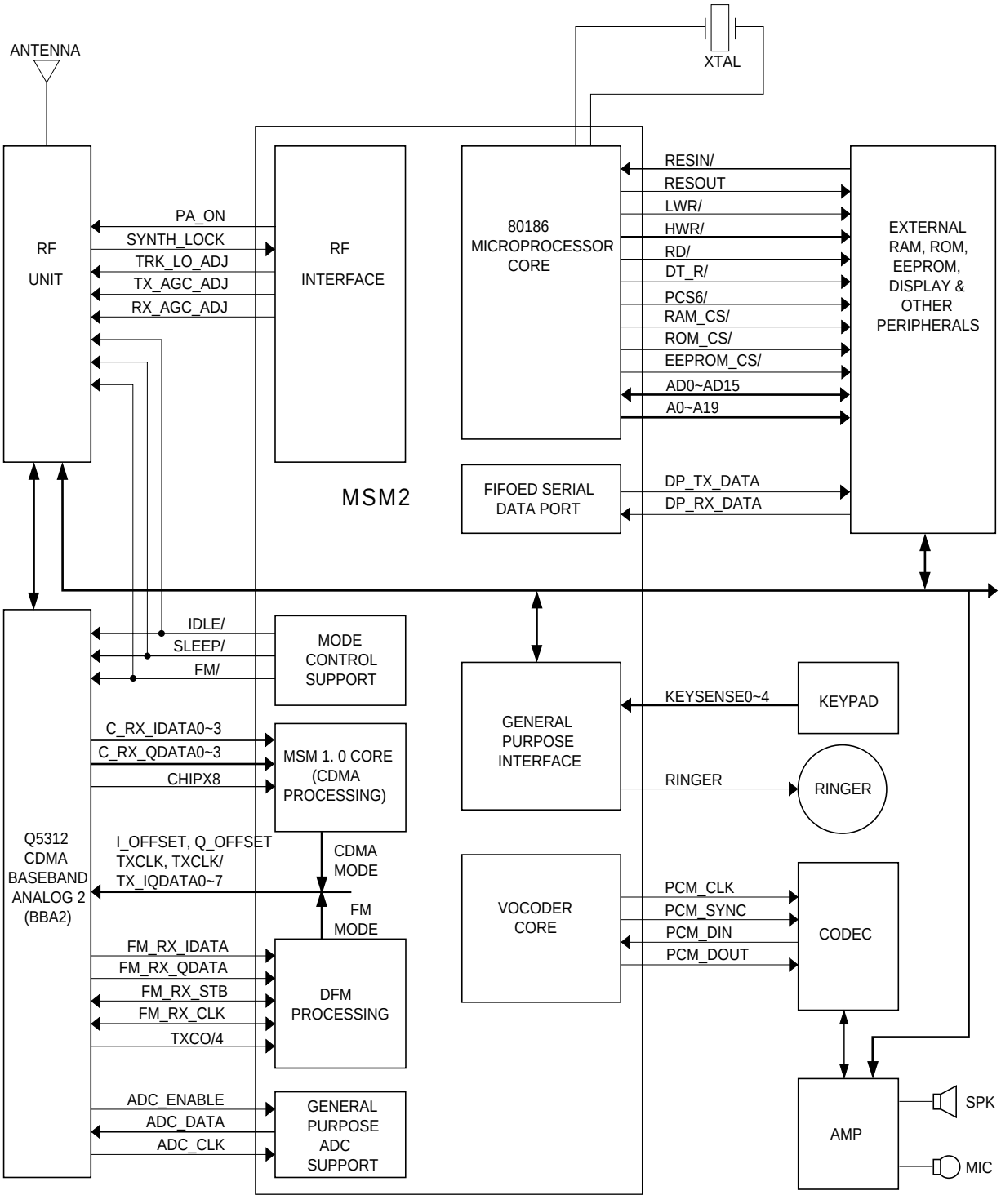


Figure 6-1 Baseband Block Diagram

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 (U310). This signal is then applied to the MSM (U100)'s internal vocoder.

RX AUDIO PATH

The PCM data out from the MSM is converted to audio signal by ADC of CODEC (U310), is then amplified by the speaker amplifier (U330) 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 ±12kHz/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 ±8kHz/dev, and SAT is ±2kHz/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.

6-1-7 Key Tone Generator

Ringer signal (pin 49) out from MSM (U100) is passed through 2 serial LPF consisting of R341, C342, R340, and C341, amplified at the speaker amp (U330), and comes out to speaker. In hands-free mode, the key tone is applied to RX audio line through the LPF and C338, R335.

6-2 Receiver (For PCS)

LOW NOISE AMPLIFIER (LNA)

The low noise amplifier featuring 1.6dB Noise Figure and 16dB 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. 210.38MHz IF signal is made by subtracting 1960 ±30 MHz RF signal from 1750 ± 30 MHz first local signal. The LAN is U401 and down converter is U407.

LOCAL BUFFER AMPLIFIER

Buffer (U408) amplifies signal to be applied to the local input of the down converter (U407) when a phase is locked between U616 and U640.

IF AUTOMATIC AGIN CONTROLLER (AGC) AMP

210.38MHz IF signal is applied to IF AGC amplifier. AGC output level is applied to BBA (Base Band Analog). The AGC amp (U403) keep the signal at a constant level by controlling the gain. Dynamic range is 90dB, up gain +45dB, and down gain -45dB.

RF BAND PASS FILTER (BPF)

The RF BPF (F401) passes only a specific frequency (1960±30MHz) from the signal received from the mobile station. The band width is 60MHz.

IF SAW BAND PASS FILTER

IF SAW BPF (F402) is used for CDMA system having 1.23MHz wide band and ±630kHz bandwidth. The filter also climinates spurious signals generated at the mixer.

VOLTAGE CONTROLLED OSCILLATOR

The VCO (U616) generates the signal having 1750MHz center frequency and ±30MHz deviation with voltage control. PLL IC (U640) controls this signal.

PHASE LOCKED LOOP (PLL)

Input reference frequency is generated at VCTCXO (U680) 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 19.68MHz reference frequency to PLL (U640) and BBA (U600). A correct frequency turning is made by the voltage control.

TEMPERATURE TO VOLTAGE CONVERTER

The Temperature to Voltage Converter (U691) detects temperature. It is used to compensate active component characteristics due to the temperature difference.

DUPLEXER

Duplexer (F406) controls to transmit through the antenna only the signals within acceptable Tx frequency range (1880 ±30MHz). It also matches LNA (U401) input in receiving part and PA out in transmitter part with the antenna.

6-3 Receiver (For AMPS)

LOW NOISE AMPLIFIER (LNA)

The low noise amplifier featuring 1.6dB Noise Figure and 16dB 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. 85.38MHz IF signal is made by subtracting 881 ±12.5 MHz RF signal from 966 ± 12.5 MHz first local signal. The LAN is U404 and down converter is U412.

LOCAL BUFFER AMPLIFIER

Buffer (U411) amplifies signal to be applied to the local input of the down converter (U412) when a phase is locked between U660 and U640.

IF AUTOMATIC AGIN CONTROLLER (AGC) AMP

85.38MHz IF signal is applied to IF AGC amplifier. AGC output level is applied to BBA (Base Band Analog). The AGC amp (U403) keep the signal at a constant level by controlling the gain. Dynamic range is 90dB, up gain +45dB, and down gain -45dB.

RF BAND PASS FILTER (BPF)

The RF BPF (F403) passes only a specific frequency (881.49±12.5MHz) from the signal received from the mobile station. The band width is 25MHz.

IF SAW BAND PASS FILTER

IF SAW BPF (F404) is used for AMPS system having 30kHz channel spacing and ±15kHz bandwidth. The filter also climinates the spurious signals at the mixer.

VOLTAGE CONTROLLED OSCILLATOR

The VCO (U660) generates the signal having 966MHz center frequency and ±12.5MHz deviation with voltage control. PLL IC (U640) controls this signal.

PHASE LOCKED LOOP (PLL)

Input reference frequency is generated at VCTCXO (U680) 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 ASCILLATOR

It provides 19.68MHz reference frequency to PLL (U640) and BBA (U600). A correct frequency turing is made by the voltage control.

DUPLEXER

Duplexer (F405) controls to transmit through the antenna only the signals within acceptable Tx frequency range (836 ±12.5MHz). It also matches LNA (U404) input in receiving part and PA out in transmitter part with the antenna.

6-4 Transmitter Section (For PCS)

POWER AMP

Power Amp module (U550) amplifier signal to be sent out to the base station through the antenna.

DRIVER AMP

The driver amp (U522) allows the signal input to the Power Amp module (U550) to be within a specified level.

UP CONVERTER (MIXER)

The up converter (U521) receives the first local signal to generate 1880±30 MHz from the signal controlled by TX AGC amp (U501). 1880 ±30 MHz signal comes out from the mixer output by adding 130MHz IF signal to 1750±30MHz first local signal. The driver amp's reference number is U522 and up converter's reference number is U521.

IF AUTOMATIC GAIN CONTROLLER AMP

The signal out to BBA (Base Band Analog) should be a constant level. The TX IF AGC amp (U501) controls power to keep the signal at a constant level. Dynamic range is 85dB, up gain -40dB, and down gain -45dB.

ANTENNA

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

RF BAND PASS FILTER (BPF)

The RF BPF (F522, F521) accepts only specific frequency (1880±30MHz) to send it out to power and Power Amp module. The band width is 60MHz.

ISOLATOR

Isolator (U542) is used to reduce a reflected signal to protect the power amp module from being damaged.

POWER SUPPLY REGULATOR

The power supply regulator (U751, U130) supply a regulated power to each part of transmitter. U130 supplies 4.8V to Power Amp module (U550). U751 supplies 4.2V to the others.

6-5 Transmitter Section (For AMPS)

POWER AMP MODULE

Power Amp module (U571) amplifier signal to be sent out to the base station through the antenna.

UP CONVERTER (MIXER)

The up converter (U561) receives the first local signal to generate 836±12.5 MHz from the signal controlled by TX AGC amp (U501). 836 ±12.5 MHz signal comes out from the mixer output by adding 130MHz IF signal to 966±12.5MHz first local signal.

IF AUTOMATIC GAIN CONTROLLER AMP

The signal out to BBA (Base Band Analog) should be a constant level. The TX IF AGC Amp (U501) controls power to keep the signal at a constant level. Dynamic range is 85dB, up gain -40dB, and down gain -45dB.

ANTENNA

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

RF BAND PASS FILTER (BPF)

The RF BPF (F562) accepts only specific frequency (836±12.5MHz) to send it out to base station module. The band width is 25MHz.

POWER SUPPLY REGULATOR

The power supply regulator (U751, U130) supply a regulated power to each part of transmitter. U751 supplies 4.2V to TX driver (U562), mixer (U561) and TX AGC Amp (U501). U130 supplies 4.8V to power amp (U571).

6-6 Desk-Top Rapid Charger

The Desk-Top Rapid Charger DTC58 consists of power supply and controller.

6-6-1 Flyback type SMPS

AC INPUT SECTION

AC power protector and regulator

Alternating line current is converted to a high dc voltage after being rectified with BD1 and C2. This circuit also includes AC surge protector MOV1, fuse F1 to protect circuit from overcurrent, and EMI noise filter consisting of C1 and LF1.

Switching controller and transformer

Switching controller IC1 supplies a constant voltage and current to the secondary through a photo coupler IC7. Transformer consists of four coils of wire wound together. W1 is connected to the primary, W2 supplies power to IC1, W3 and W4 are connected to the secondary and supply power. D1 and D2 is a snubber circuit and absorbs a reverse voltage generated when the transformer's primary winding is off.

DC OUTPUT SECTION

Constant voltage output : HIC, IC7, VR1

HIC detects the voltage output from secondaries and feeds back to primary after converting current using IC7A. The converted current controls IC1 through D3 and IC7B.

half-wave rectifier : D4, D5, C8, C11

This circuit converts the transformer's alternating current output to direct current.

Secondary filter : L1, L2, C9, C12

This circuit minimizes the ripple noise in the dc signal output from the rectifier.

Secondary regulator : Q2, D8, L3, C19

The rectified dc voltage by D4 and C8 changes to a constant dc voltage through this circuit.

Inverse voltage protector : D6,D7

This circuit protects voltage leakage from the battery pack when power is off.

6-6-2 Controller

MICRO CONTROLLER : HIC

HIC consists of u-COM which controls whole charging system, and others as follows:
-I/O port
-A/D converter
-Power on delay
-Timer

It detects battery install, charging status, output terminal short, and temperature.

BATTERY INSTALL DETECTION : HIC

HIC recognizes that the battery is installed or not by detecting the voltage between C/F terminal of battery and GND.

CURRENT DETECTION: R5, R6, R11, R12, HIC

The battery charged current is converted to DC by R5, R6, R11, R12. The voltage is amplified 16 times through HIC, then applies to u-COM.

VOLTAGE DETECTION : HIC

HIC pin 12 and 13 detect the input voltage which applies to u-COM A/D terminal.

BATTERY TEMPERATURE DETECTION : HIC, TH1

HIC calculates the thermistor TH1 resistance value to determine the battery battery temperature.

CURRENT LIMITER : HIC

It limits current flowing to the battery if the current is higher than the reference voltage in HIC.

6-7 Travel Charger

Rapid charger, TC59-US is composed of power supply part and control part.

6-7-1 Power Supply Part (Flyback Type Smps Circuit)

AC INPUT SECTION

AC input protection circuit and rectifier circuit

AC power through the AC plug is rectifiered to DC power of high voltage through the D1, D2, D3, D4, C1 and C2. MOV1 is used by protection circuit from AC power surge. F1 is fuse to prevent overcurrent. L1 and L2 is EMI noise protection filter of switching power.

Switching controller and transformer

U1 supplies constant voltage and constant current to secondary circuit through the transformer. D5, D6 absorbs the reverse voltage when transformer winding turns off.

SECONDARY POWER SECTION

Output constant voltage circuit : U4, D24, R17

The HIC detects output voltage and compares it with reference voltage in HIC. The error is fed to primary circuit by U2B. The feedback error is converted to current by U2A and D7. The current controlls U1.

Secondary rectifier circuit : D21, C21

The secondary AC output of transformer is rectified to DC voltage.

Secondary filter circuit : L20, C22

It minimizes the high frequency ripple noise, which is caused by primary oscilation.

Reverse current protection circuit : D20

When power is off, it protects the reverse flow of current from battery pack.

6-7-2 Control part

MICOM CONTROLLER : U4

U4 is include u-COM to controlled whole charging system and include following internal circuit.
- General input / Output port
- A/D converter
- Reset delay circuit (power on delay)
- Timer

It is carried following functions
- Battery recognition
- Charging termination condition detection
- Output short detection and output protection
- Temperature detection

BATTERY RECOGNITION CIRCUIT : U4

Battery identity detection on determined to voltage detection battery internal between ID and GND.

CURRENT DETECTION CIRCUIT : R14, R15, R16, U4

Battery charging current is changed voltage through R14, R15, R16. This voltage inputted U-COM to 16 times amplifiered through U4.

VOLTAGE DETECTION CIRCUIT : U4

U-COM A/D through U4 pin15 detected voltage.

BATTERY TEMPERATURE DETECTION CIRCUIT : U4

Battery temperature detection determined temperature by use of thermistor resistor variation of battery by U4.

CURRENT LIMIT CIRCUIT : U4

When soft-change, current detection circuit limited current flow to battery, reference voltage mode than detected current, detected current and U4 internal reference voltage.

6-8 Cigarette Lighter Adaptor

6-8-1 Functional Specification

SUMMERY

This standard describes on the specifications of CLA (Cigarette Lighter Adapter) for the SCH-1500 DBDM phone of SAMSUNG.

CLA AS ADAPTER AND CHARGER

- Adapter
  directly supplies power in order to operate DBDM phone independent of the battery pack.
- Charger
  for the Li-ion battery pack.

ELECTRICAL SPECIFICATION

- Input Voltage : 11V to 30V DC (normal voltage : 13.7V DC)
- Output Current
  - HHP power & battery power setting : 8.2V DC ±0.05V/ 0mA
  - Output current : 0mA to 660mA
  - Current limit of this unit should be kept 660mA ± 40mA.
  - Output voltage range : 8.2V -0.4/ +0.2
  - LED green : 180mA±30mA
- Ripple & Noise : 100mVp-p
- Normal Fuse Capacity : 250V, 2A
- Charging Time
  STD : about 4 hours
  EXT : about 5 hours

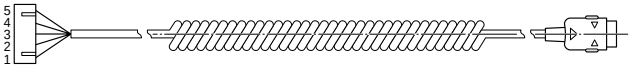
ENVIRONMENTAL SPECIFICATION

- Temperature
  - Operating Temperature : -30°C to 75°C
  - Storage Temperature : -35°C to 85°C
- Humidity
  - Operating Humidity : 5% to 90%
  - Storage Humidity : 5% to 95%

FUNCTIONS OF CLA

- Protection Circuit
  Protection Circuit is the circuit against the electrical stress which is occured at unexpected conditions of the source power of CLA unit such as reverse voltage or overcurrent.
- Detection of DBDM phone
  If cellular phone is connected to CLA, the CLA lamp is on to display whether charge will be done normally or not.
- Detect Carrier-On
  In the case of Carrier-On, CLA detects the resistance of the Cellular Phone and reduces the charge current.
- Detect Full-Charge
  If the temperature of the battery pack is higher than the temperature outside of the cellular phone, CLA detects the battery fully charged and the state will be converted to the Trickle Charge.

CLA CURL CABLE CONNECTION



PIN NO (CLC)	Description	PIN NO (HHP)
#1	HP power	9
#2	V-BATT	12/13/16
#3	V-F	N.C
#4	C/F	3
#5	GND	2/4/6

6-8-2 Circuit description

POWER SUPPLY

This circuit supplies HHP& battery with power received from Cigar Lighter jack of automobile.

POWER CIRCUIT OF CHARGE FOR HHP POWER & BATTERY

This Switching Regulator produces needed power for charging HHP power & battery, supplied U1, D1, D2, C1, C2, L1, R25 from Cigar Lighter jack of automobile.

CONFIRMING CIRCUIT OF EXITING BATTERY OR NOT

U3A reads separated voltage between resistance battery C/F and R20, controls no. 5 pin of U1 through reference voltage and comparator then decides to produce Vcc or not.

CHARGE CURRENT CONTROL CIRCUIT

U2A, U4, Q1 and side circuit detects R4's flowing current, controls no 5 pin of U1 then charge current and charge voltage.

LED ACTIVATING CIRCUIT

LED activating circuit compares to voltage difference between R4 source and D4 PROP controls Q3, Q4 through U2B comparator for Q6 and side circuit then activates LED.

AUTO POWER ON CIRCUIT

Q9, Q10 and side circuit makes power on the circuit allowed Vcc power to no 9 HHP pin (power on) by turned on Q9, following up the producing Vcc.

6-9 Hands-Free Kit

6-9-1 Charging Circuit

A constant voltage is used for the hands-free kit. This circuit converts DC 12-24V input current to 8.4V DC to charge the battery. When the battery is fully charged, the charge current drops and the circuit operates as a constant voltage.

6-9-2 u-Processor

Micro processor controls charging power and charging current to protect the phone. It also allows to communicate with a HHP, and to convert from hands-free mode to private mode, and vice verse. It adjusts speaker volume at 8 steps and attenuates echo and noise occurred during conversation.

6-9-3 Speaker circuit

This circuit eliminates HHP noise, and controls the sound quality and speaker volume using analog C-mos IC which checks the speaker signal up to 8 steps. 5W audio amplifier amplifies the speaker signal.

6-9-4 Microphone Circuit

This circuit separates ground to eliminate the noise occurring from the HHP antenna and microphone. u-processor controls this circuit to attenuate echo which may occur in Land side.

6-10 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_ON_I	Turn off the LAMP.
29(9A, 5, 0)	T_REBUILD_I	Rebuild EEPROM.
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)

Command No. (OP, AB, RB)	Signal. Name	Description
42(AA, 1, 0)	T_DTMFON_I[2)]	Activate DTMF generator with keycode.
43(AB, 0, 0)	T_DTMFOFF_I	Deactivate DTMF generator.
44(B0, 0, 0)	T_COMPANDORON_I	Enable the compressor and expandor.
45(B1, 0, 0)	T_COMPANDOROFF_I	Disable the compressor and expandor.
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.

Command No. (OP, AB, RB)	Signal. Name	Description
76(D5, 3, 0)	T_WRITE_RSSI_I[3)]	Writes RSSI.
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(F7, 4, 0)	T_PCS_CH_MAX_MIN_I	Edge channel Max.Min power code.
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.

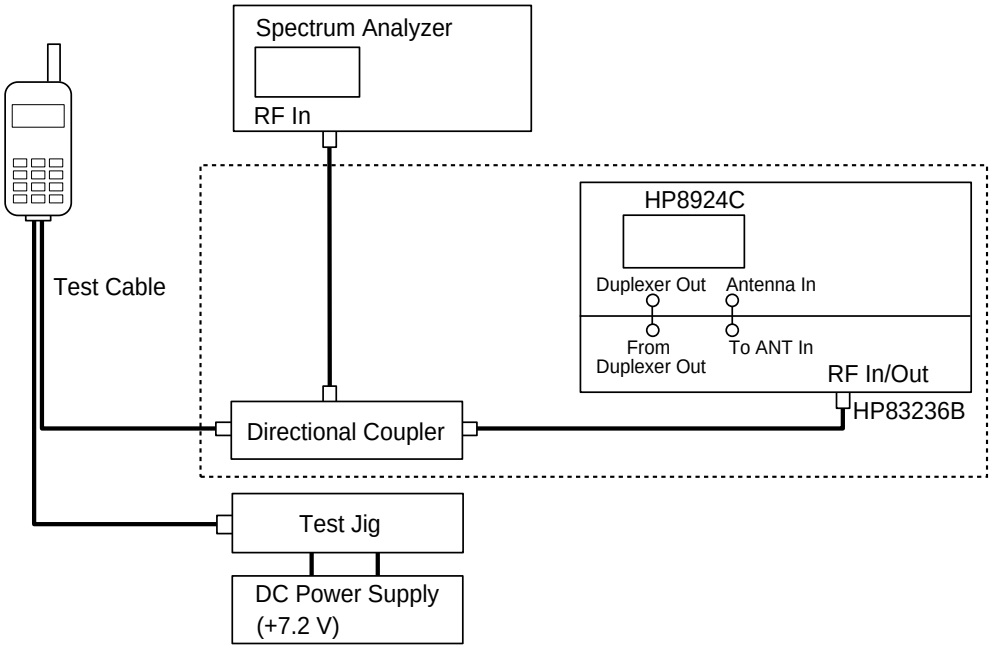
7. Test Procedure

7-1 List of Equipment

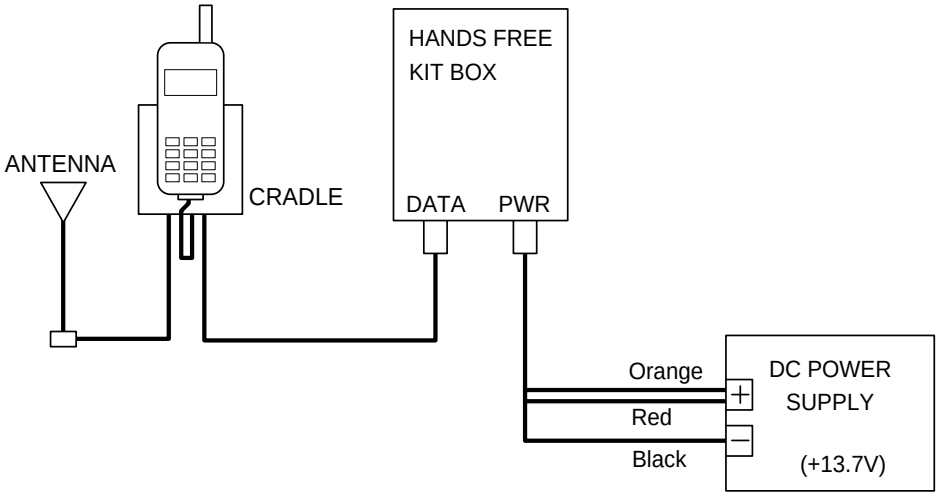
- DC Power Supply
- Test Jig
- Test Cable
- CDMA Mobile Station Test Set — HP8924C, HP83236B, CMD-80, etc
- Spectrum Analyzer (include CDMA test mode) — HP8596E

7-2 Configuration of Test

7-2-1 Hand Set

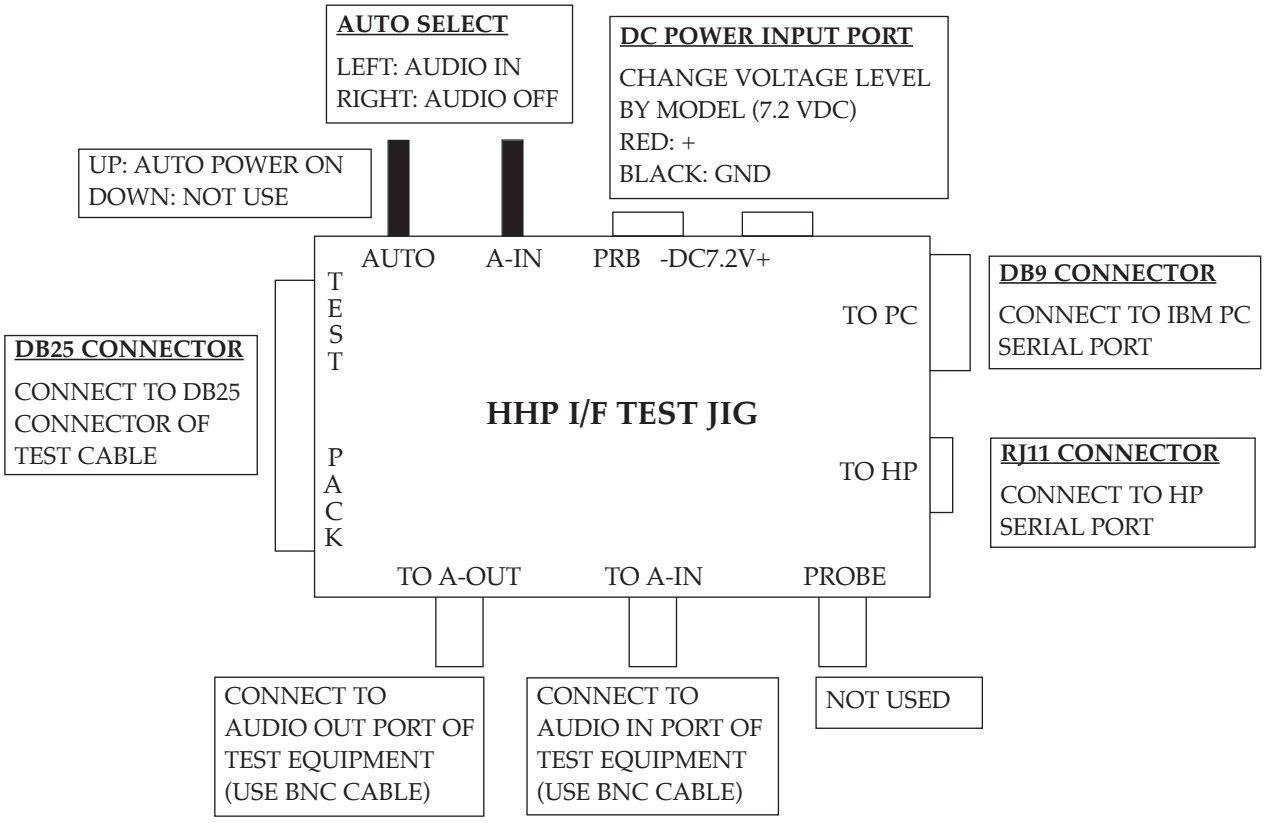


7-2-2 Hands-Free

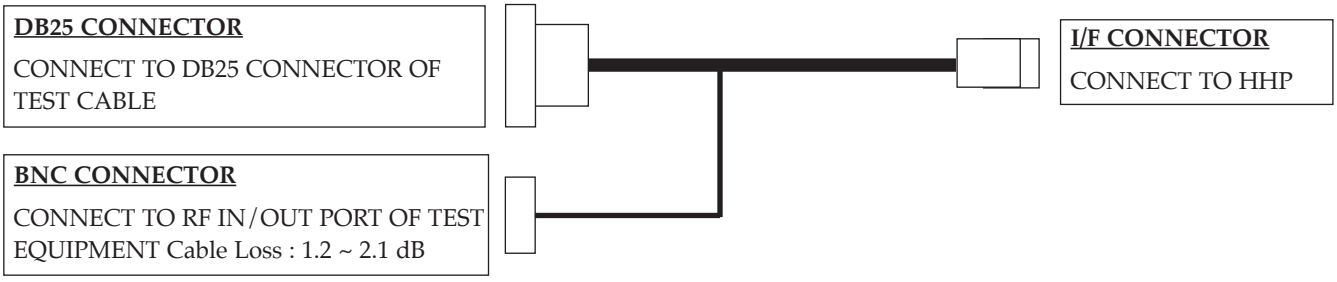


7-2-3 Test Cable Connection Diagram

TEST JIG



TEST CABLE



Items needed to purchase from SAMSUNG

ITEMS	PARTS#	REMARK
RF TEST CABLE	GH97-00687A	* Cable Loss : 1.9 GHz (PCS) 2.1 dB, 800 MHz (Cellular) 1.2 dB
RF I/F Pack Ass'y	GH80-10502A	Including 1. Power Cable (Black, Red) 2. 9-pin RS 232 Cable
DM Cable	GH39-30515A	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

1.9GHZ (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 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 [SEND]/[END/⏻] keys.
  ex) [7 1 X X X]
- [#] key means the escape of current command.

800MHZ 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 0] + [OK] + [0 2]
ex) [1 0 0 0 0] means SYS_A, and [1 0 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]

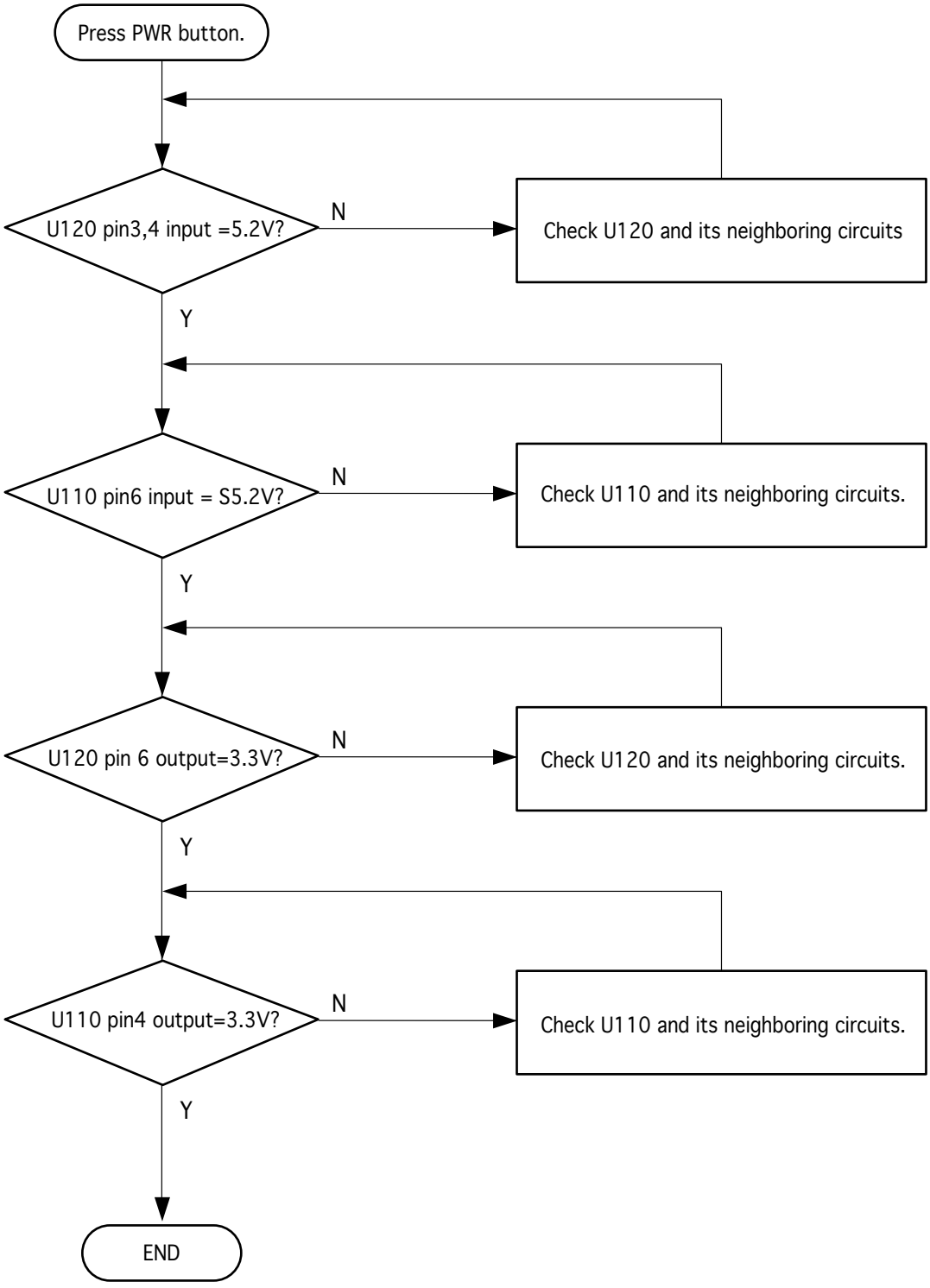
- If you enter the command [0 9] you can select the channel.
  ex) [0 9 X X X X] ; Under bar means channel number, and channel number must be 4 digits.
- The command [0 7] means carrier on.
- If you enter the command [7 2] you can control the power output level. Following under bar means AGC code. And you can control the power output level using [SEND]/[END/⏻] keys.
  ex) [7 2 X X X]
- [#] key means the escape of current command.

Memo

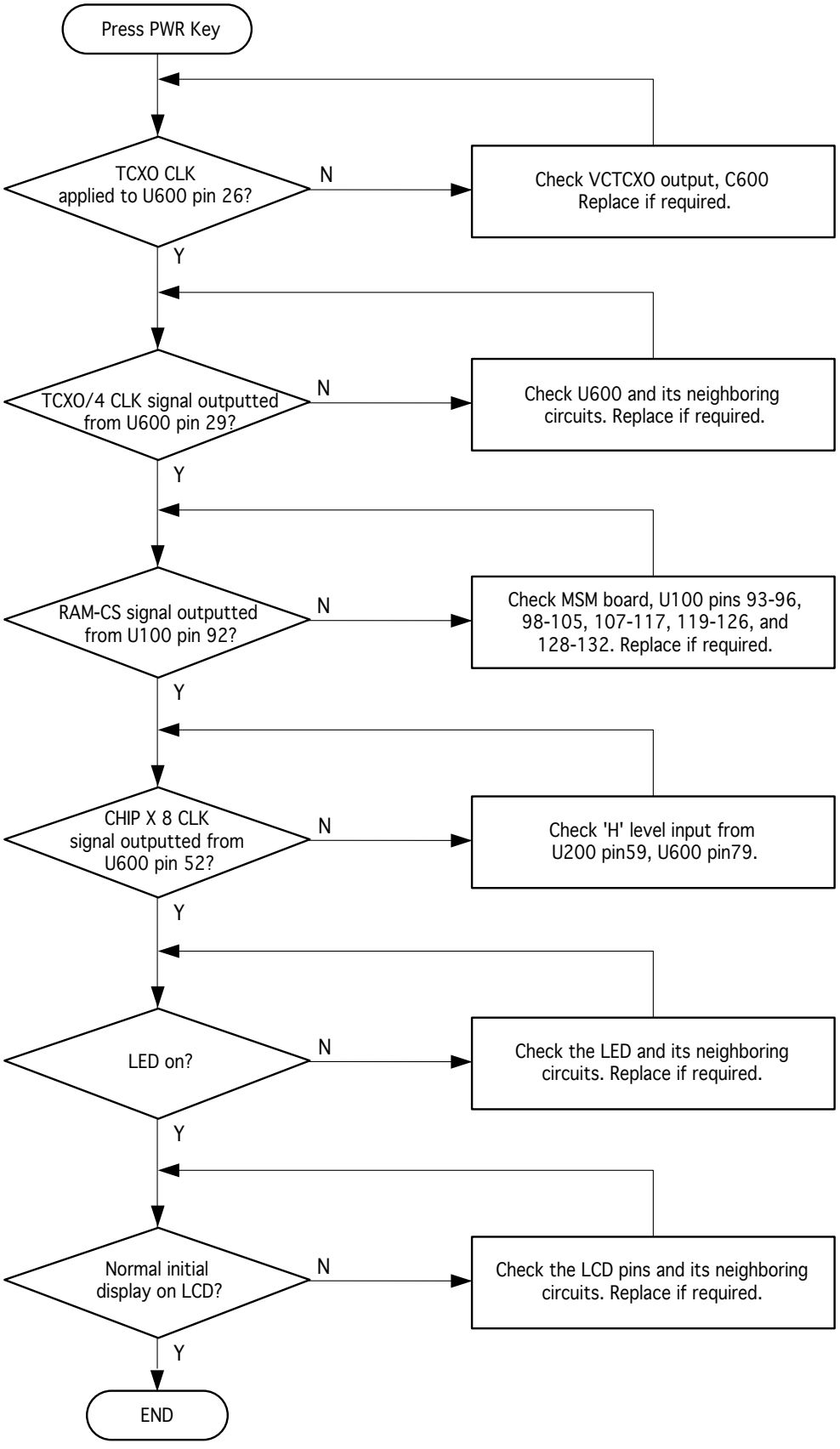
8. Troubleshooting

8-1 Logic Section

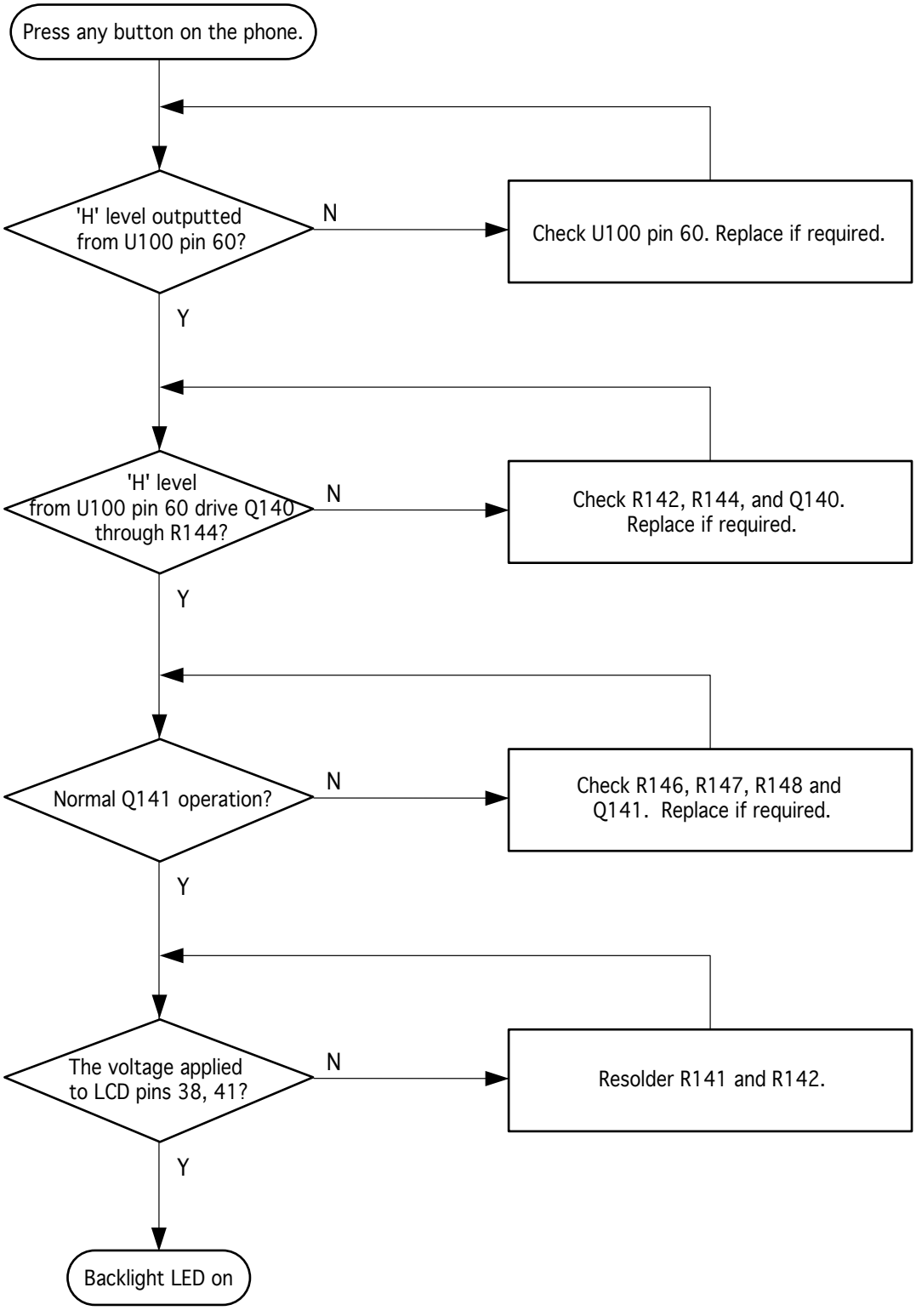
8-1-1 No Power



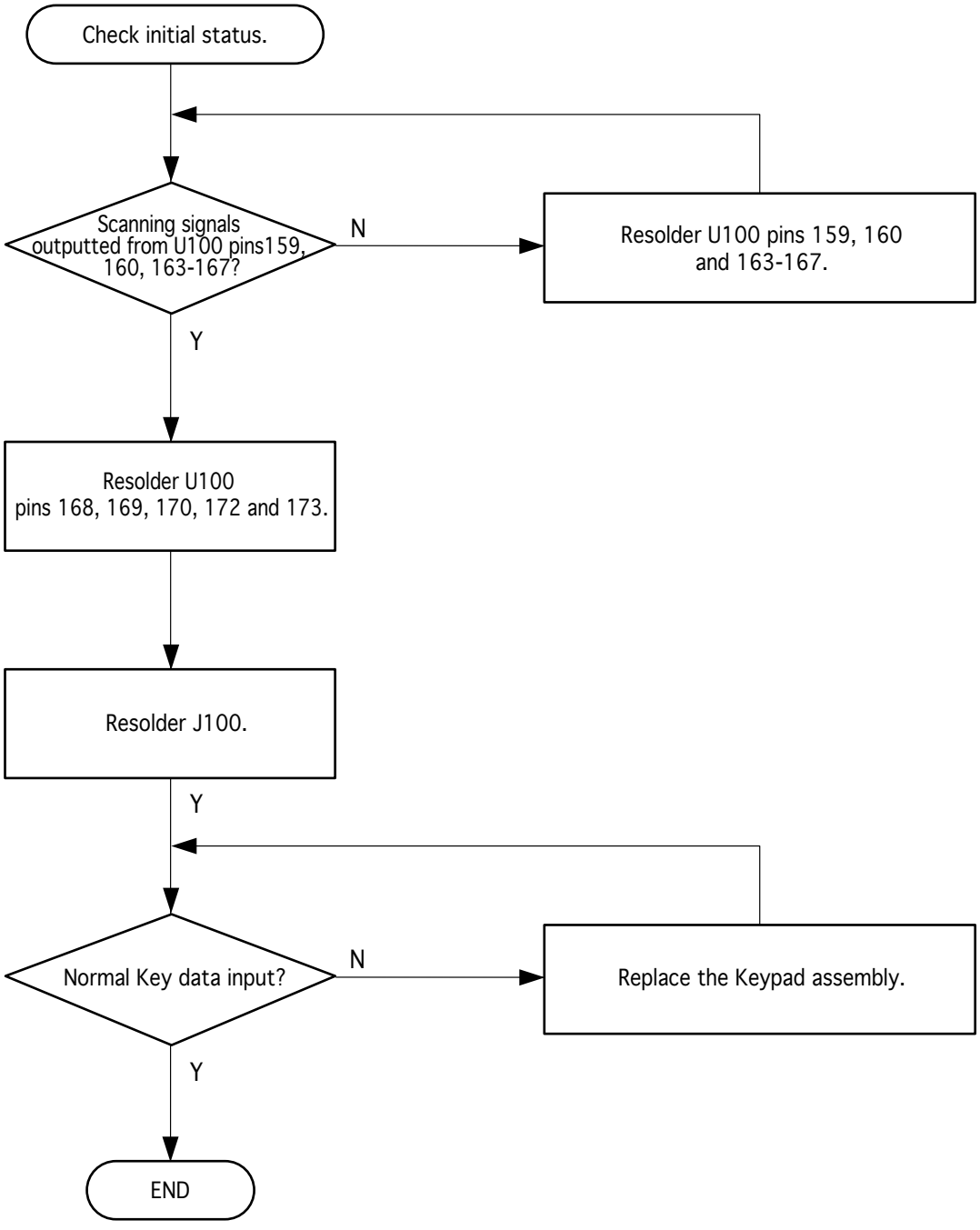
8-1-2 Abnormal initial operation (Normal +3.3V voltage source)



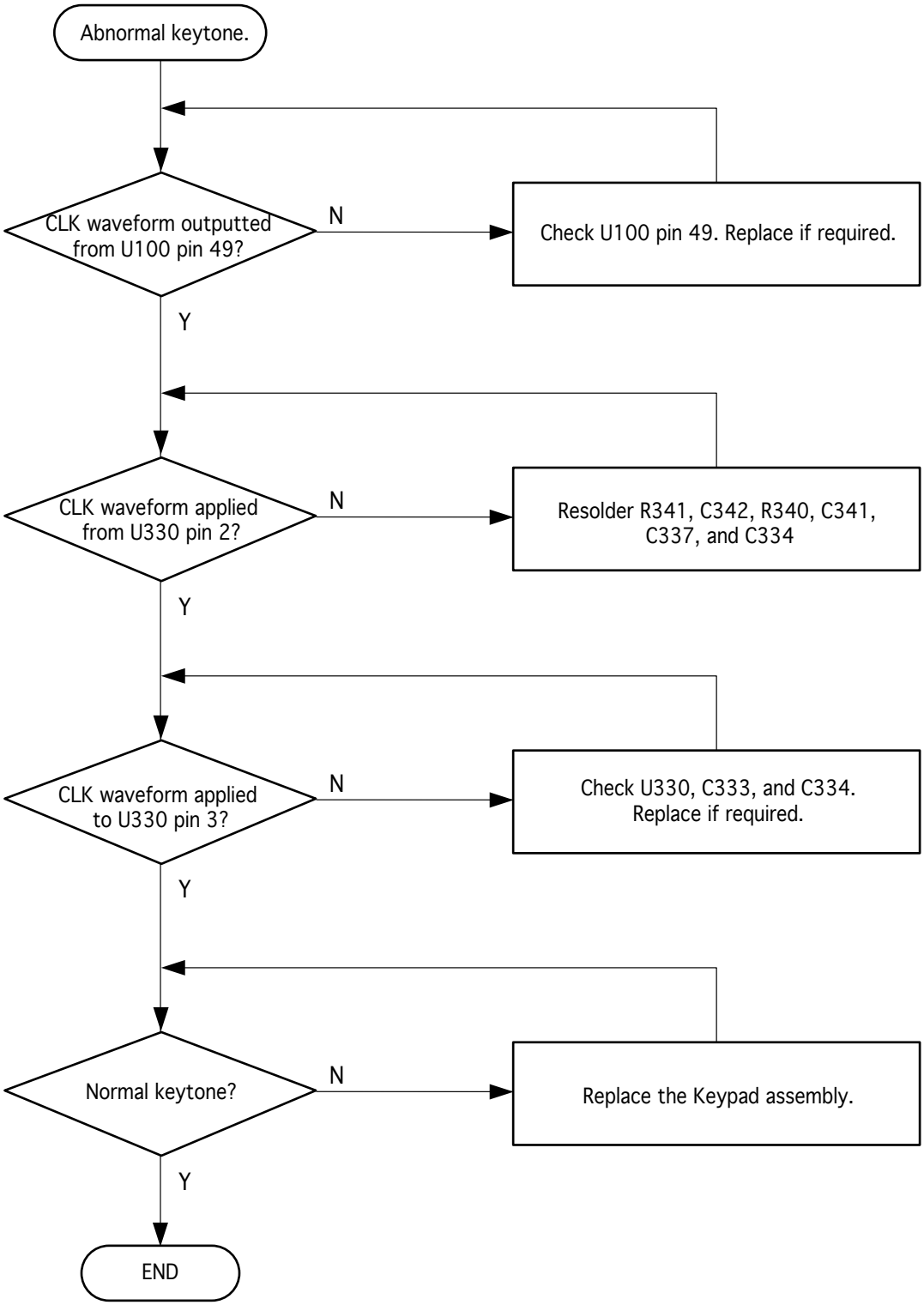
8-1-3 Abnormal Backlight Operation



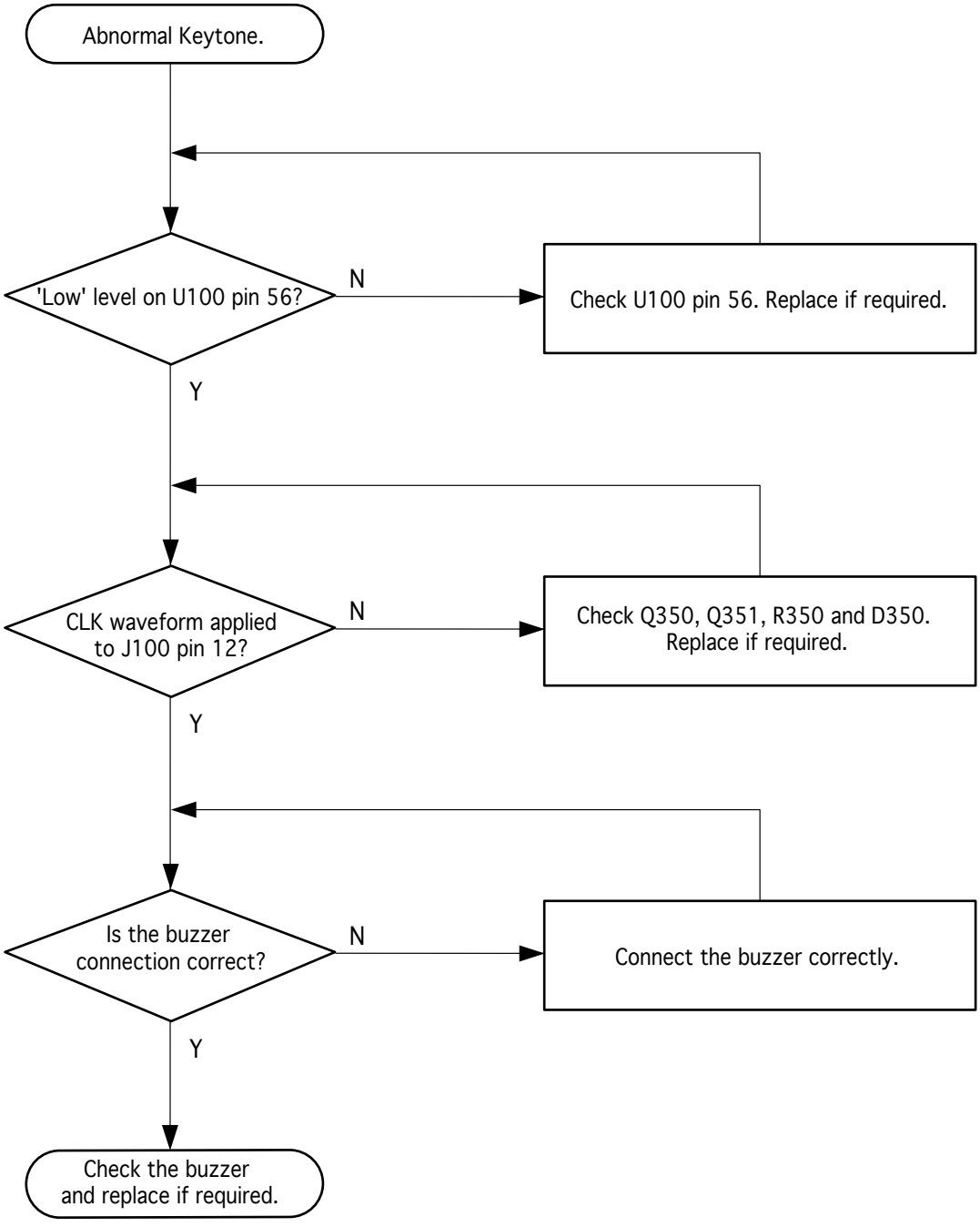
8-1-4 Abnormal Key Data Input



8-1-5 Abnormal Keytone

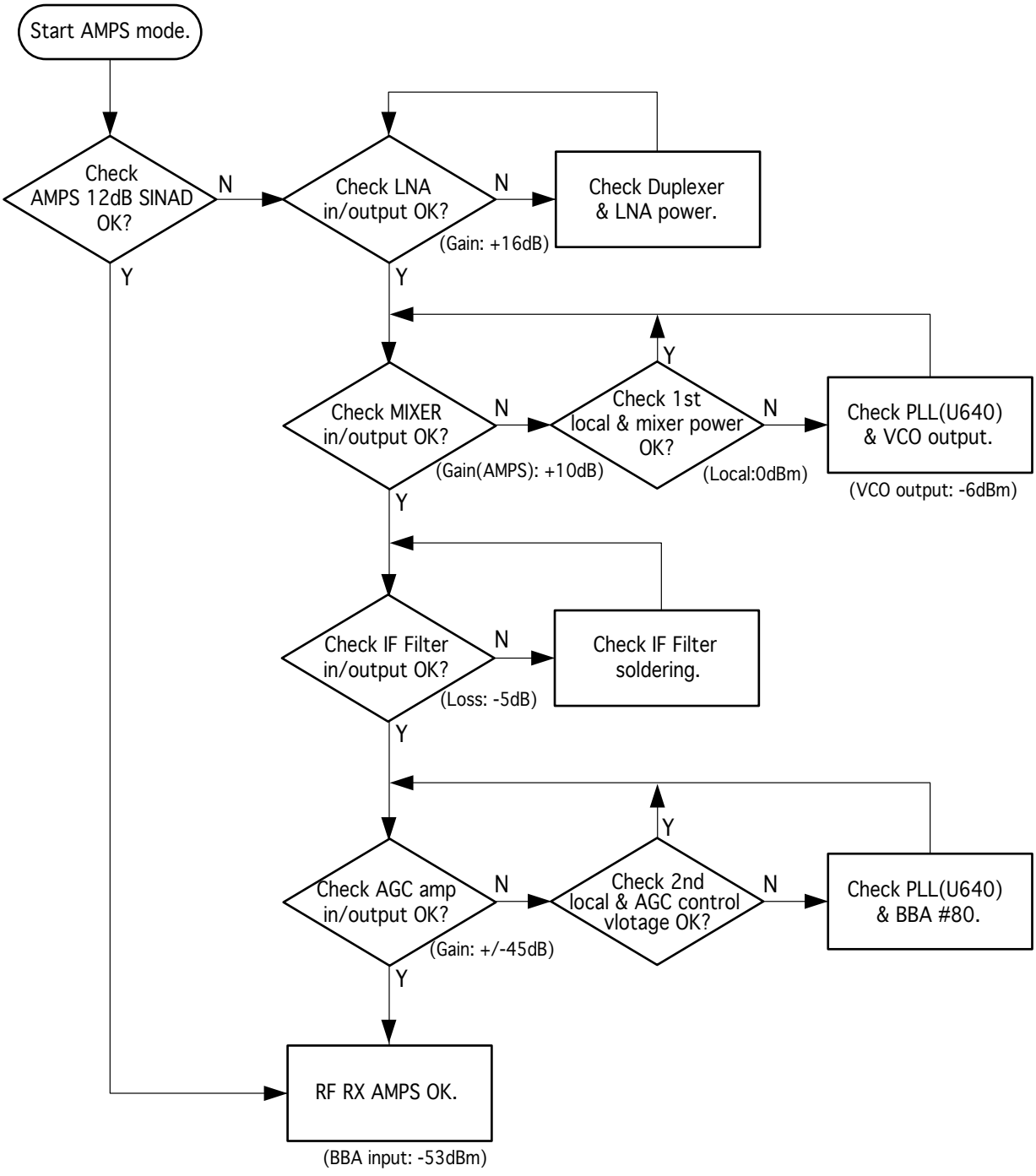


8-1-6 Abnormal Alert Tone

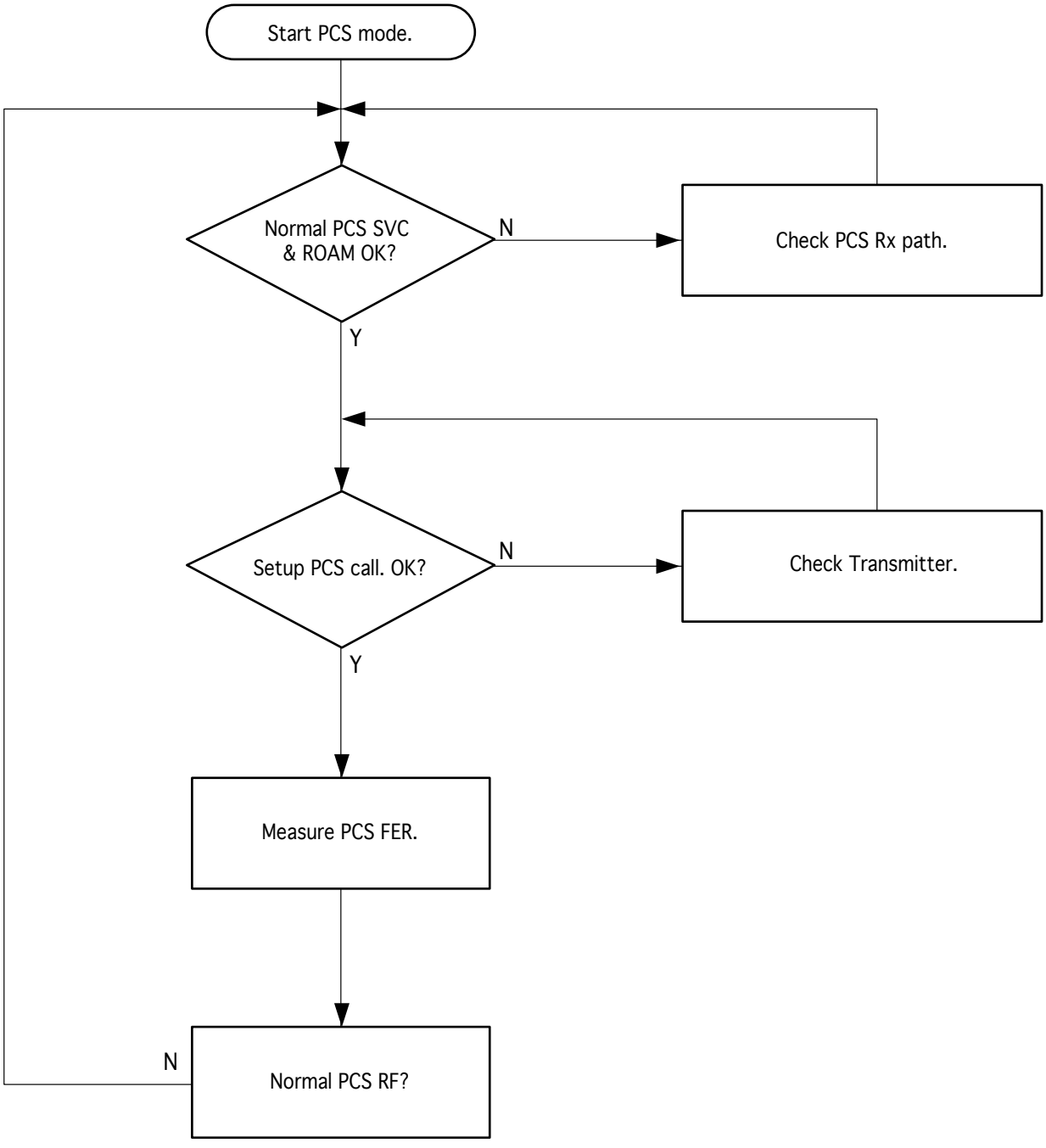


8-2 Receiver Section

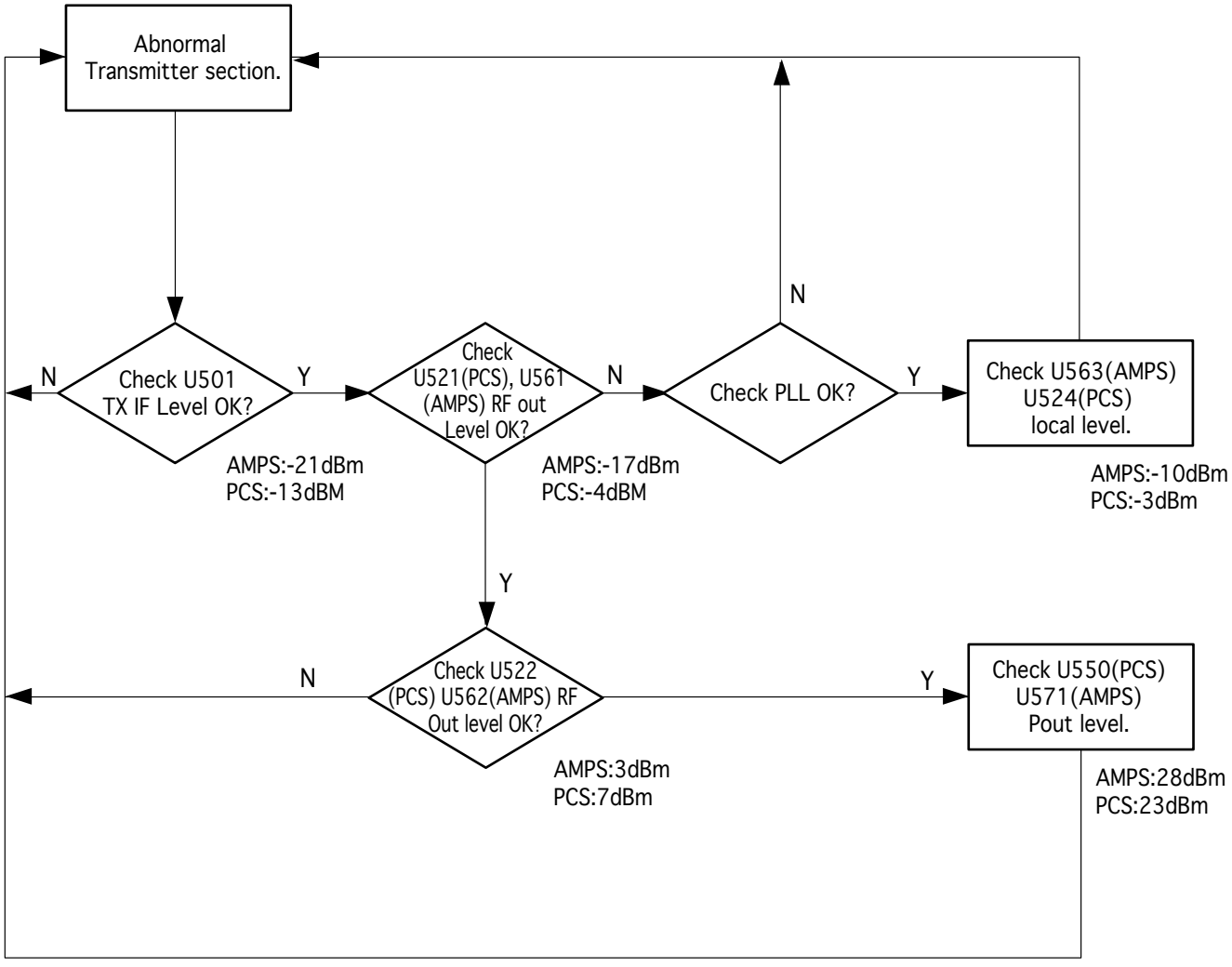
8-2-1 AMPS mode



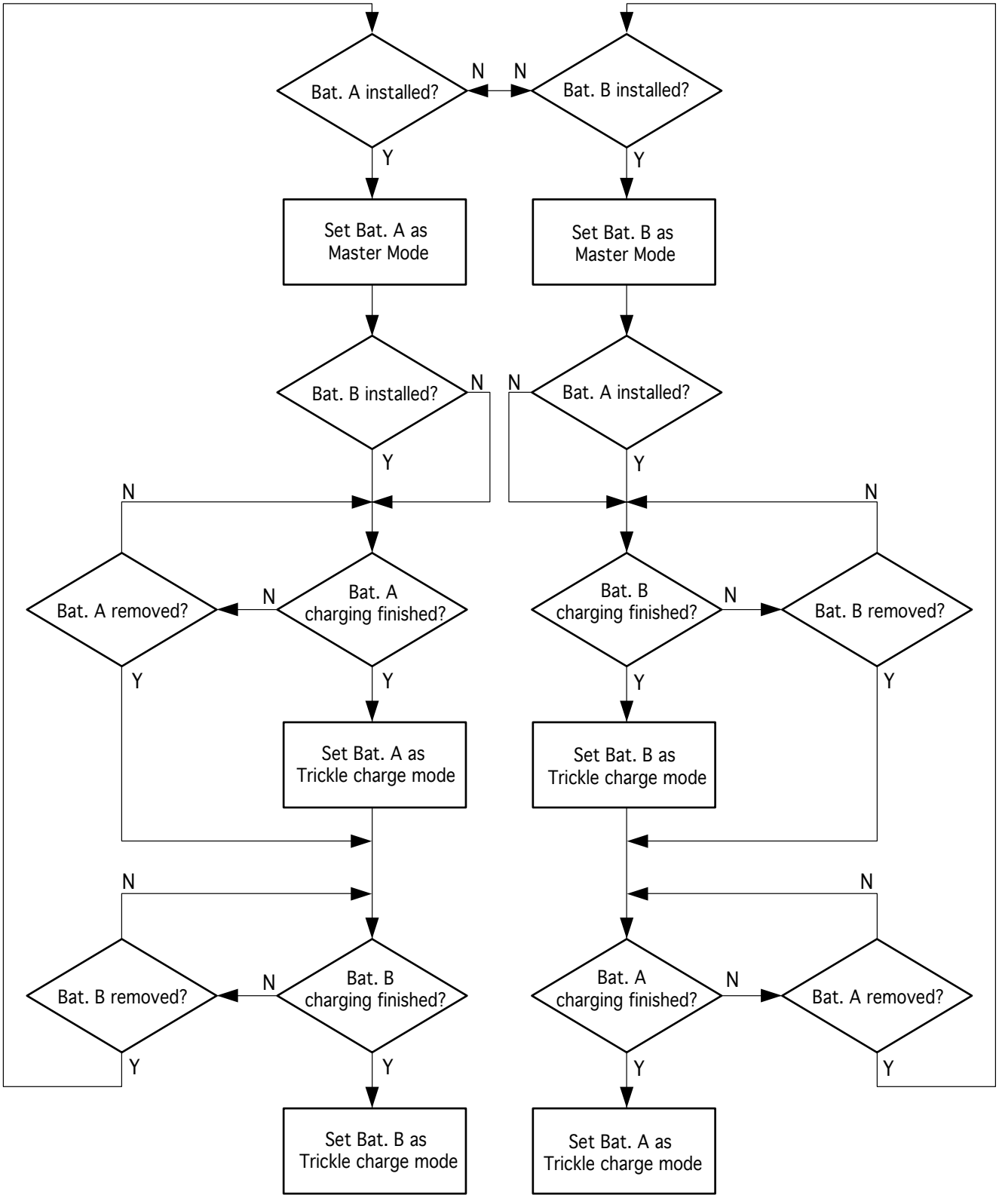
8-2-2 PCS mode


Start PCS mode.
Normal PCS SVC & ROAM OK?
N
Check PCS Rx path.
Y
Setup PCS call. OK?
N
Check Transmitter.
Y
Measure PCS FER.
Normal PCS RF?
N

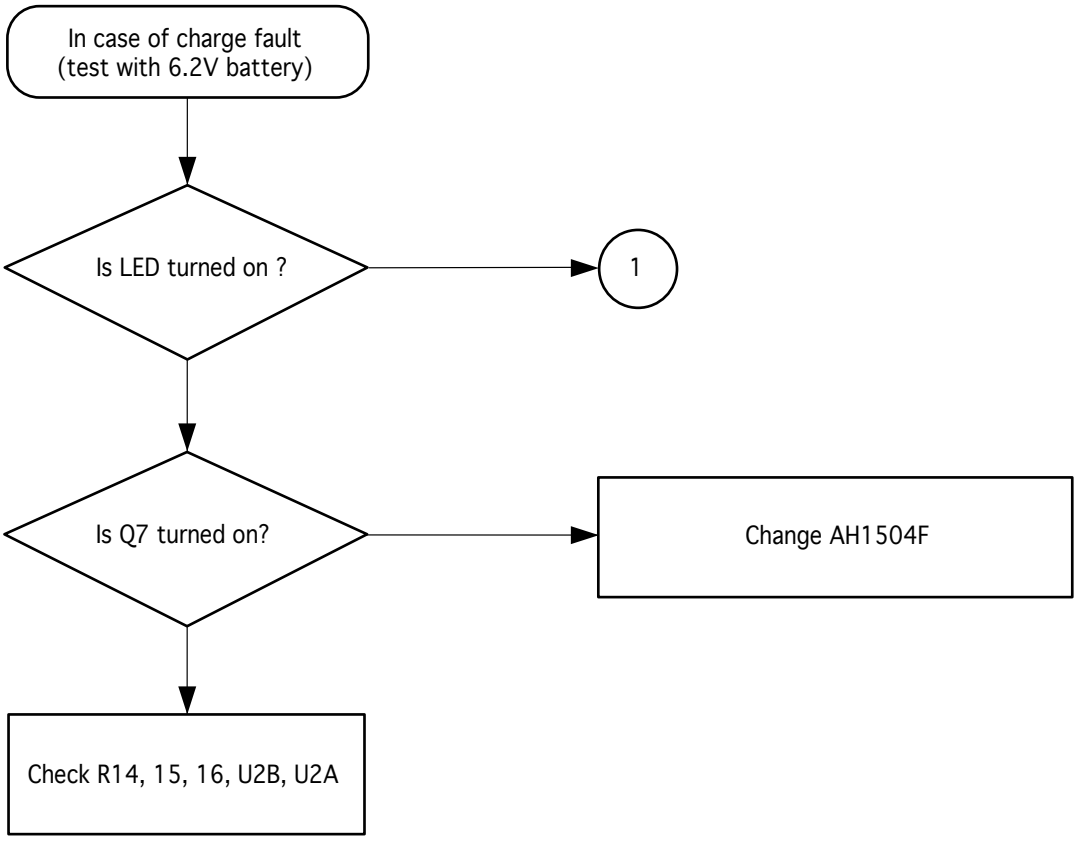
8-3 Transmitter Section

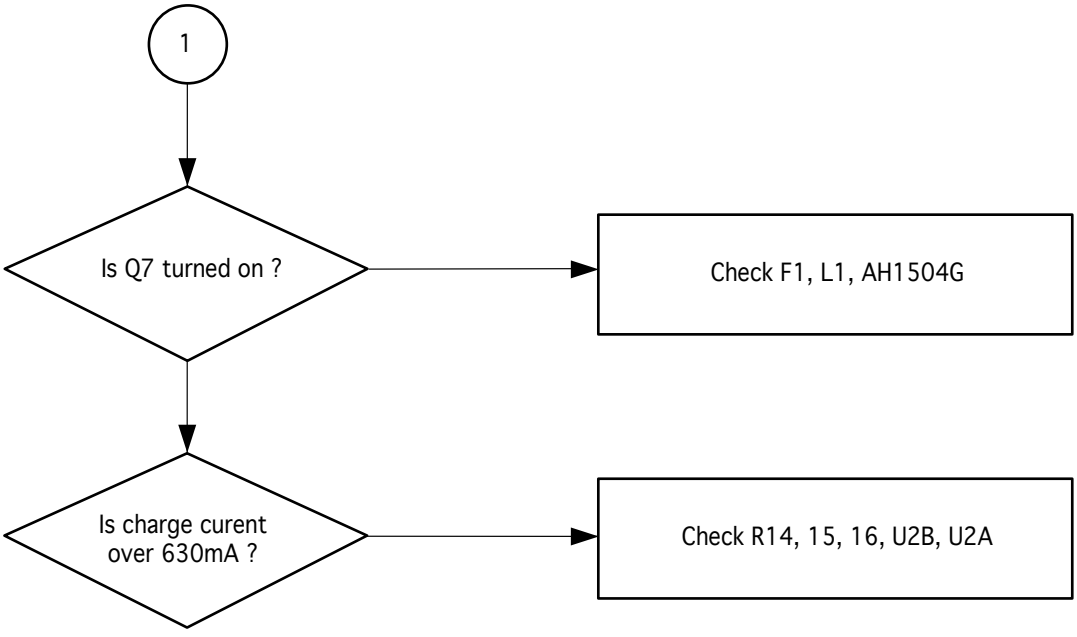


8-4 Desk-Top Rapid Charger

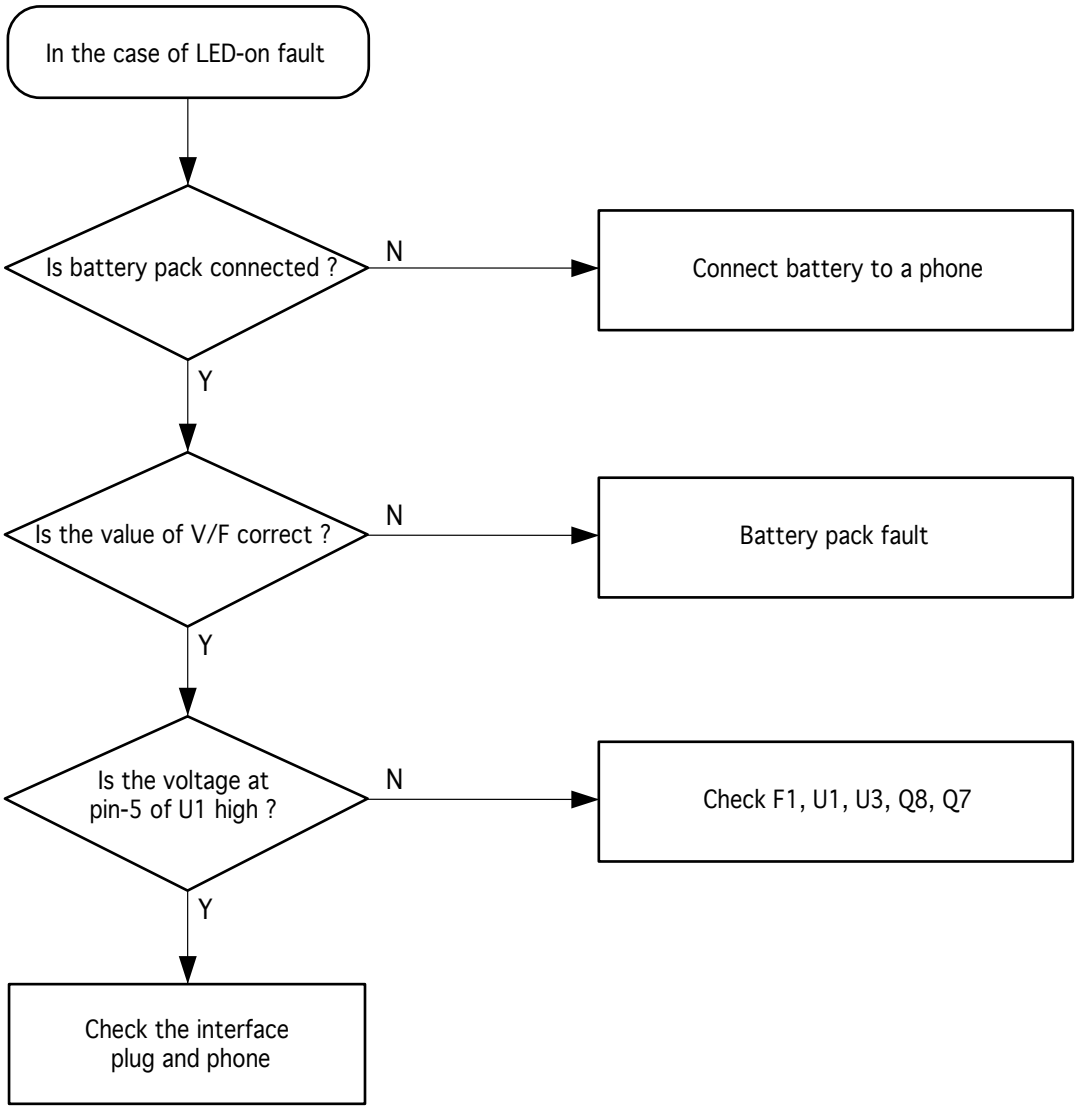


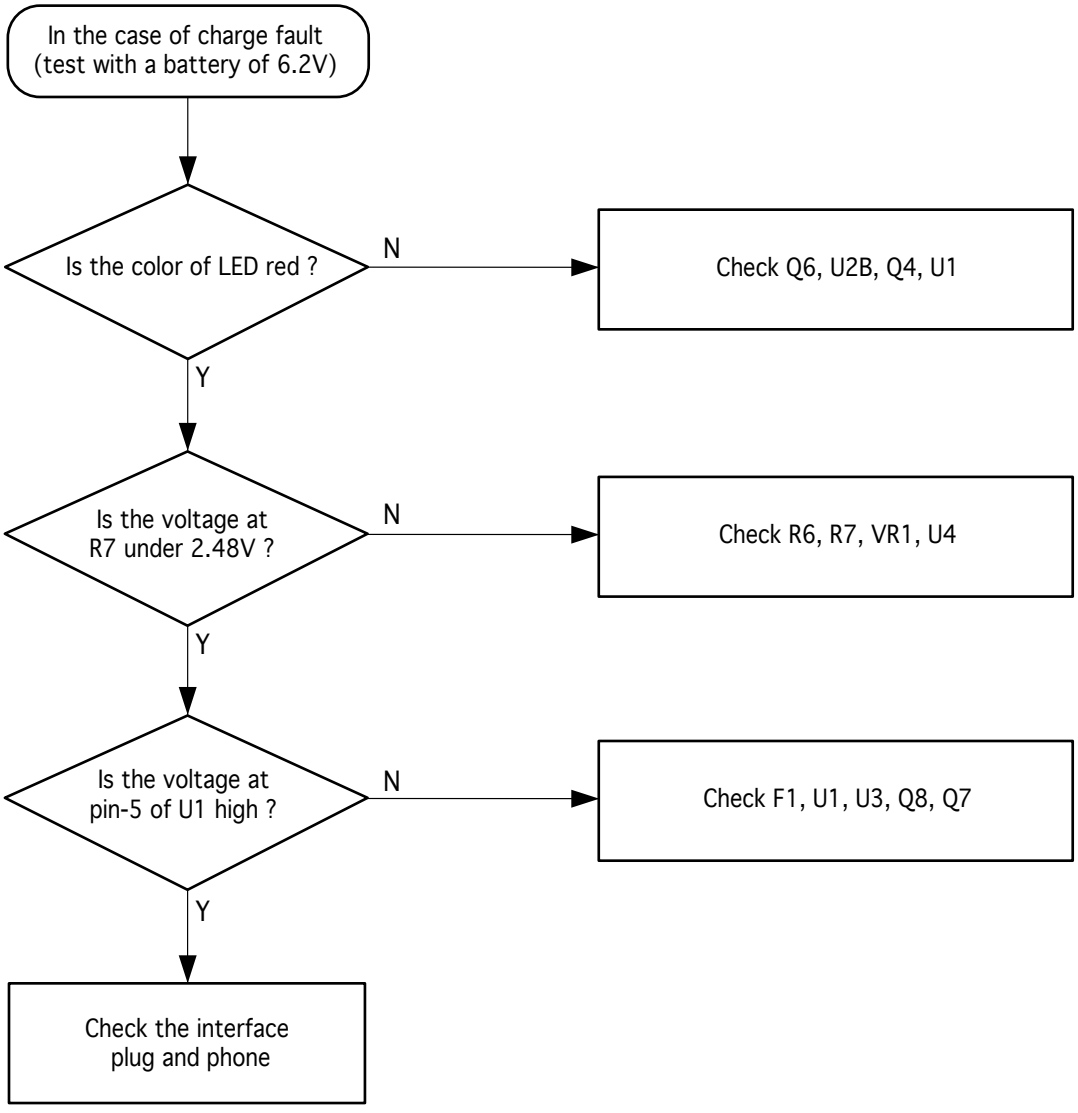
8-5 Travel Charger





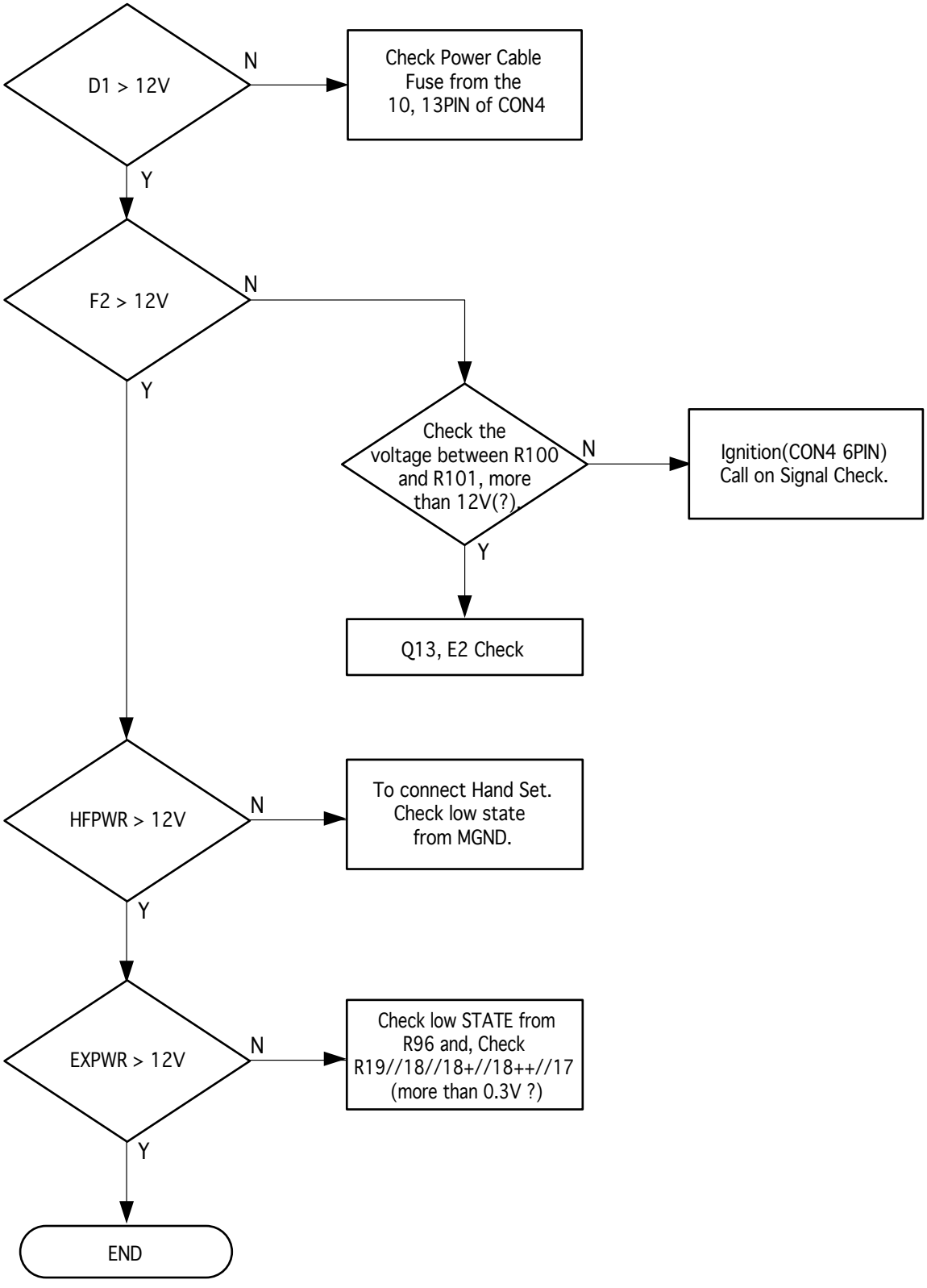
8-6 Cigarette Lighter Adaptor



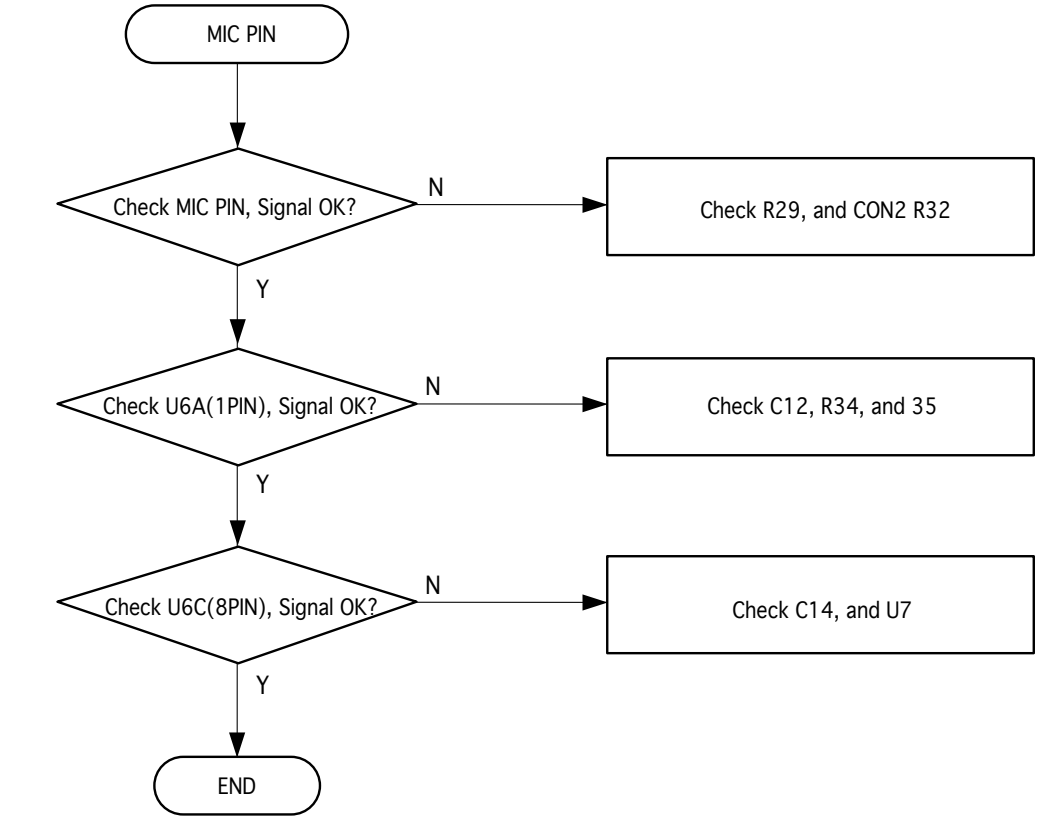

In the case of charge fault
(test with a battery of 6.2V)
Is the color of LED red ?
N
Check Q6, U2B, Q4, U1
Y
Is the voltage at
R7 under 2.48V ?
N
Check R6, R7, VR1, U4
Y
Is the voltage at
pin-5 of U1 high ?
N
Check F1, U1, U3, Q8, Q7
Y
Check the interface
plug and phone

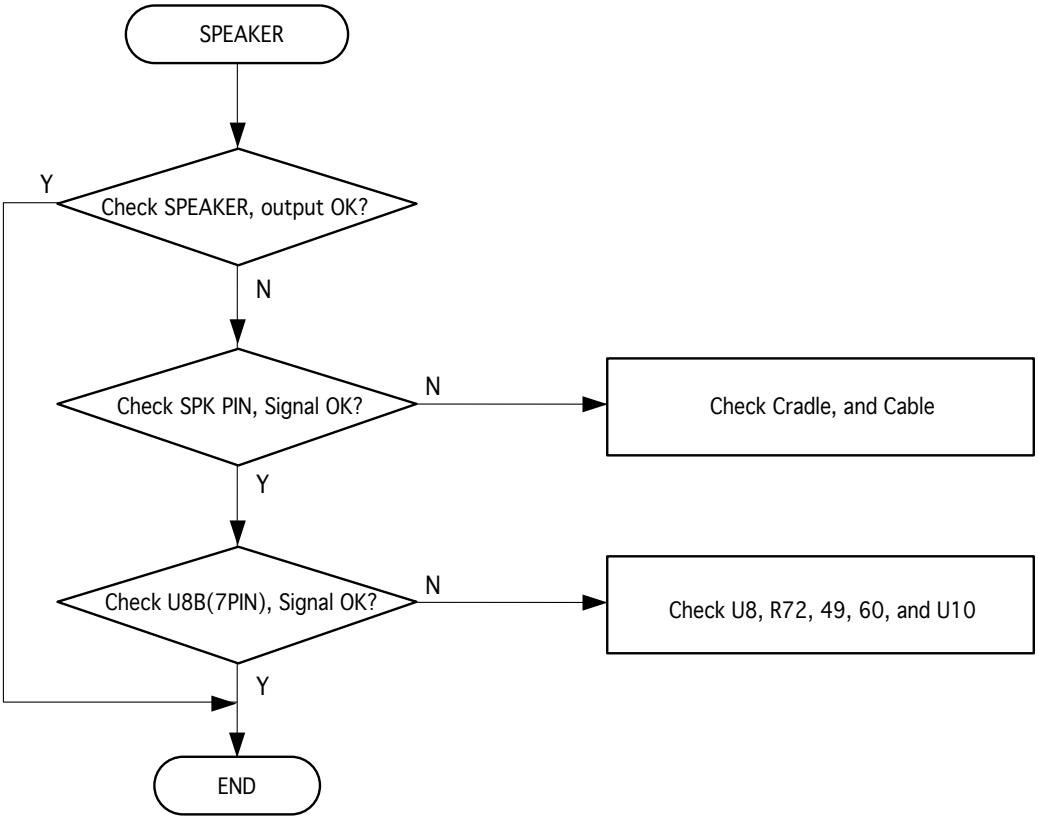
8-7 Hands Free Kit

8-7-1 Power

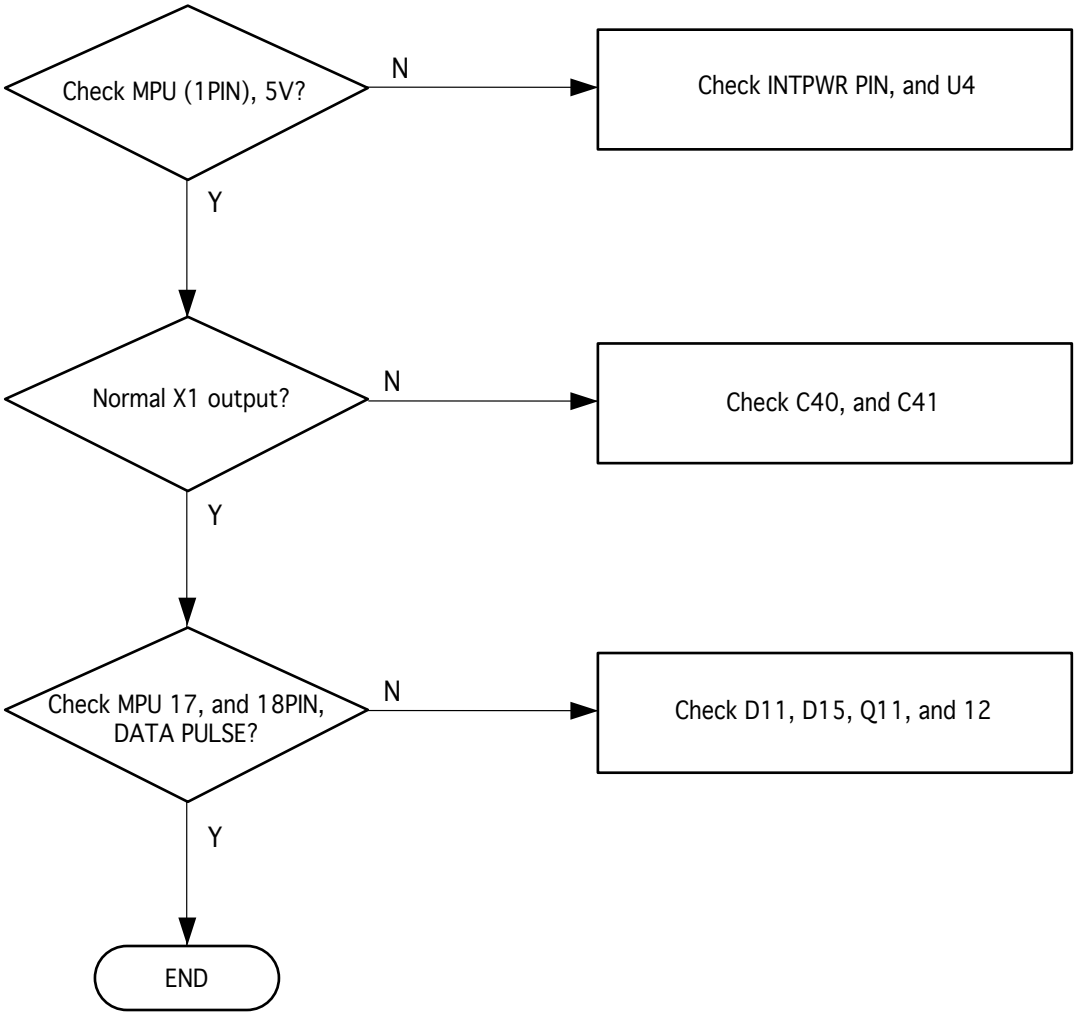


8-7-2 Audio Part



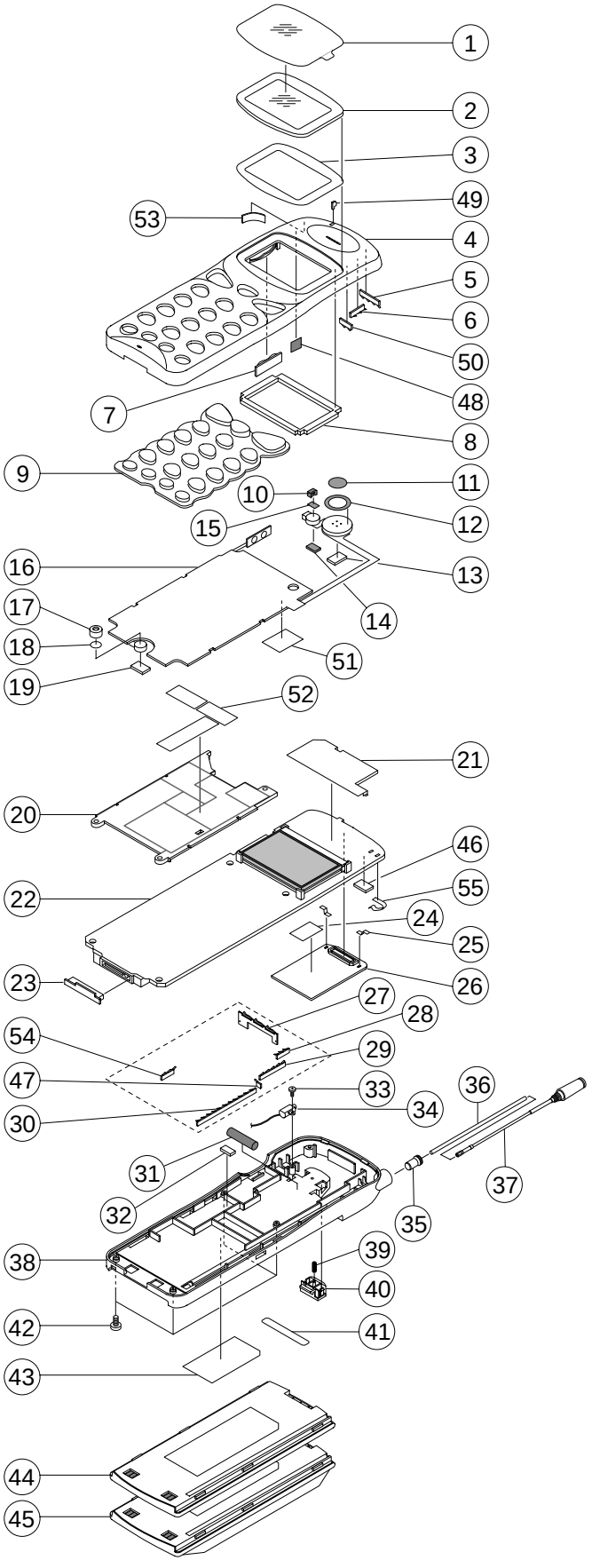


8-7-3 Data Comm & Cont.



9. Exploded Views and Parts List

9-1 DBDM Phone Exploded View

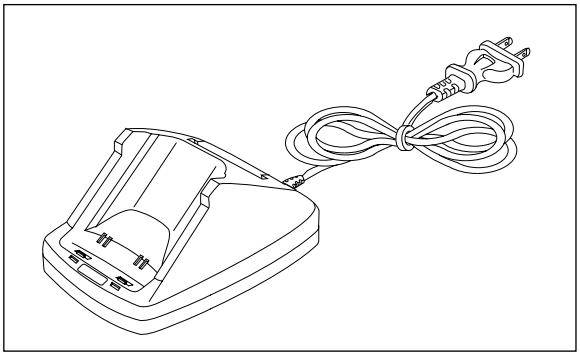


9-2 DBDM Phone Parts List

NO	LEVEL			DESCRIPTION	SEC. CODE	Q'TY	REMARK
	1			MEA FRONT ASS'Y	GH97-01297A	1	
		2		MEC FRONT ASS'Y	GH75-00032A	1	SCH-1500
					GH75-11185A	1	SCH-1510/1530/1531
3			3	TAPE WINDOW	GH74-10657A	1	
4			3	FRONTCOVER	GH72-41604A	1	
8			3	SPONGE LCD	GH73-10513A	1	
12			3	TAPE SPEAKER	GH74-10546A	1	
49			3	REFLECT LED	GH72-40008A	1	
1		2		TAPE WINDOW BOHO	GH72-10001A	1	
2		2		WINDOW LCD	GH72-30011A	1	SCH-1500
					GH72-30015A	1	SCH-1510
					GH72-30017A	1	SCH-1530
					GH72-30019A	1	SCH-1531
5		2		SHIELD STRIP(C)	GH71-10641A	1	
6		2		SHIELD STRIP(B)	GH71-10640A	1	
7		2		KNOB VOLUME	GH64-10017A	1	
9		2		KEYPAD RUBBER	GH73-40652A	1	SCH-1500
					GH73-40710A	1	SCH-1510/1530/1531
10		2		BUZZER HOLDER	GH73-40709A	1	
11		2		CLOTH POLYESTER	0107-001004	1	
13		2		SPONGE	GH74-10743A	1	
14		2		RUBBER BUZZER	GH73-40649A	1	
15		2		BUZZER TAPE	GH74-10742A	1	
16		2		KEYPAD PCB ASS'Y	GH59-10072A	1	
17		2		HOLDER MIC	GH73-40538A	1	
18		2		CLOTH POLYESTER	GH63-20001A	1	
19		2		RUBBER BUZZER	GH73-40649A	1	
20		2		SHIELD COVER	GH72-41557A	1	
48		2		GASKET CLOTH BUZZER	GH63-20001A	1	
50		2		SHIELD STRIP(A)	GH71-10639A	1	
51		2		SHIELD TAPE	GH74-00100A	2	
52		2		SHIELD COVER SPONGE	GH74-00082A	3	
53		2		GASKET	GH63-00002A	1	

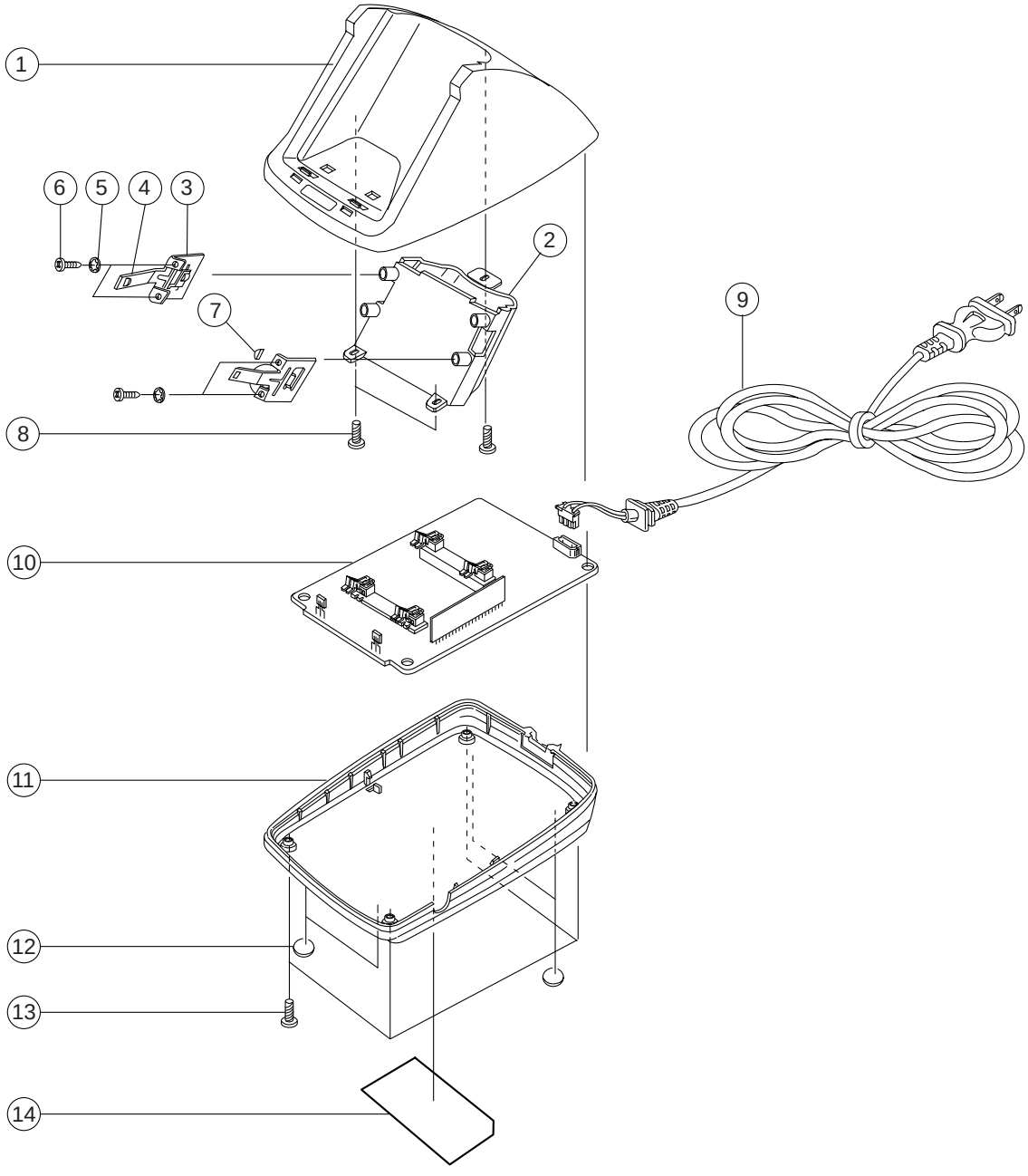
NO	LEVEL			DESCRIPTION	SEC. CODE	Q'TY	REMARK
	1			MEA REAR ASS'Y	GH97-01296A	1	
		2		MEC REAR ASS'Y	GH75-11186A	1	
35			3	BUSHING ANTENNA	GH71-40004A	1	
38			3	REAR COVER	GH72-41559A	1	
39			3	SPRING LOCKER	GH70-10516A	1	
40			3	LOCKER MAIN	GH72-41560A	1	
27		2		SHIELD FRAME	GH71-10003A	1	
28		2		SHIELD STRIP(B)	GH71-10640A	1	
29		2		SHIELD STRIP(D)	GH71-10643A	1	
30		2		SHIELD STRIP	GH71-10644A	1	
32		2		SPONGE	GH74-10526A	1	
33		2		TAPTITE SCREW (M2.6 X 4)	6003-000366	1	
34		2		MOTOR	GH31-10002A	1	
47		2		SHIELD STRIP(F)	GH71-00019A	1	
54		2		SHIELD STRIP(B)	GH71-10640A	1	
21	1			SHIELD CAN	GH71-10727A	1	
22	1			PBA MAIN-1500 PBA	GH92-01165A	1	
23	1			COVER CONNECTOR	GH73-40005A	1	
24	1			D-BOARD TAPE	GH74-10723A	1	EXCEPT SCH-1530/1531
25	1			HOLDER PLATE	GH71-10009A	2	EXCEPT SCH-1530/1531
26	1			D-BOARD	GH41-10638A	1	EXCEPT SCH-1530/1531
31	1			SHIELD SPONGE	GH74-10585A	1	EXCEPT SCH-1530/1531
36	1			ANTENNA TUBE	-	1	
37	1			ANTENNA	GH42-10521A	1	
41	1			BAR CODE LABEL	JF68-30527H	1	
42	1			MACHINE BH M2 L8 STAR	6001-000101	4	
43	1			LABEL ID MAIN	GH68-31107A	1	SCH-1500
					GH68-31166A	1	SCH-1510
					GH68-31168A	1	SCH-1530/1531
44	1			STD BATT. ASS'Y	GH43-10114A	1	
45	1			LONG BATT. ASS'Y	GH43-10113A	1	
46	1			CONTACT SPONGE	GH74-00065A	1	
55	1			ANTENNA CONTACT	GH71-10694A	1	

9-3 Desk-Top Rapid Charger Exploded View



Desk-Top Rapid Charger Ass'y : GH44-40072A

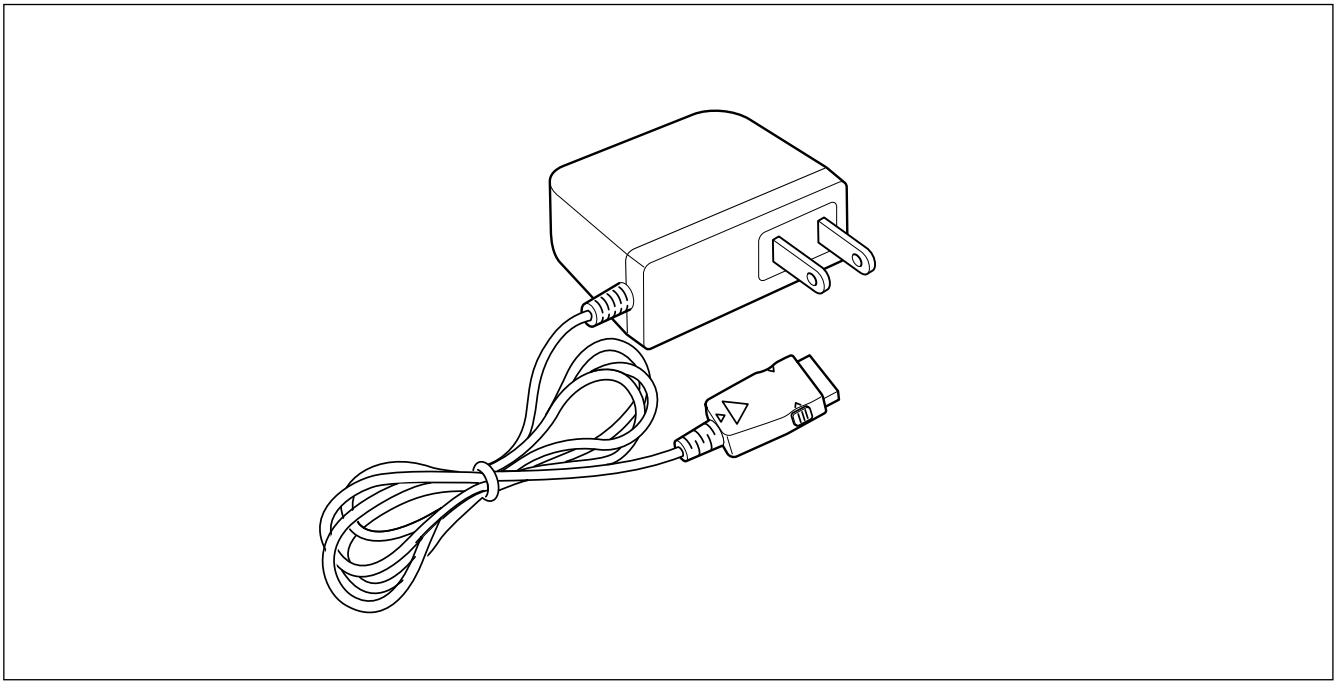
Charging Time	Standard Battery (850mAH)	3 hours
	Extended Battery (1350mAH)	5 hours
Environmental	Charge	0 °C ~ 40 °C
Specification	Storage	-30 °C ~ 80 °C



9-4 Desk-Top Rapid Charger Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	CASE, TOP		1	
2	HOUSING, BATTERY		1	
3	HOOK, PLATE (LARGE)		1	
4	HOOK (B)		2	
5	WASHER		4	
6	VH, M2.6, L6 (2W), BLK		4	
7	HOOK (A)		2	
8	VH, M3, L8, BLK		3	
9	ASS'Y, AC POWER CORD		1	
10	ASS'Y, R/C BOARD		1	
11	CASE, BOTTOM		1	
12	BUMPON		4	
13	VH, M2.6, L12(2W), BLK		4	
14	LABEL, ID, R/C		1	

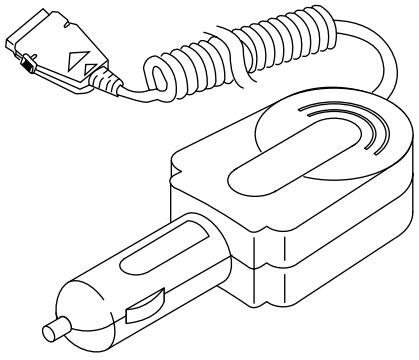
9-5 Travel Charger



Travel Charger Ass'y : GH44-40082A

Charging Time	Standard Battery (850mAH)	3 hours
	Extended Battery (1350mAH)	6 hours
Environmental Specification	Charge	0 °C ~ 40 °C
	Storage	-30 °C ~ 80 °C

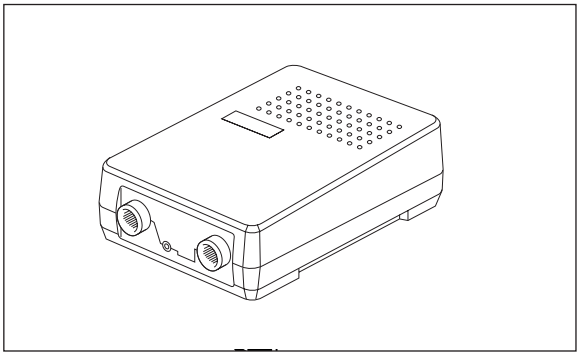
9-6 Cigarette Lighter Adaptor



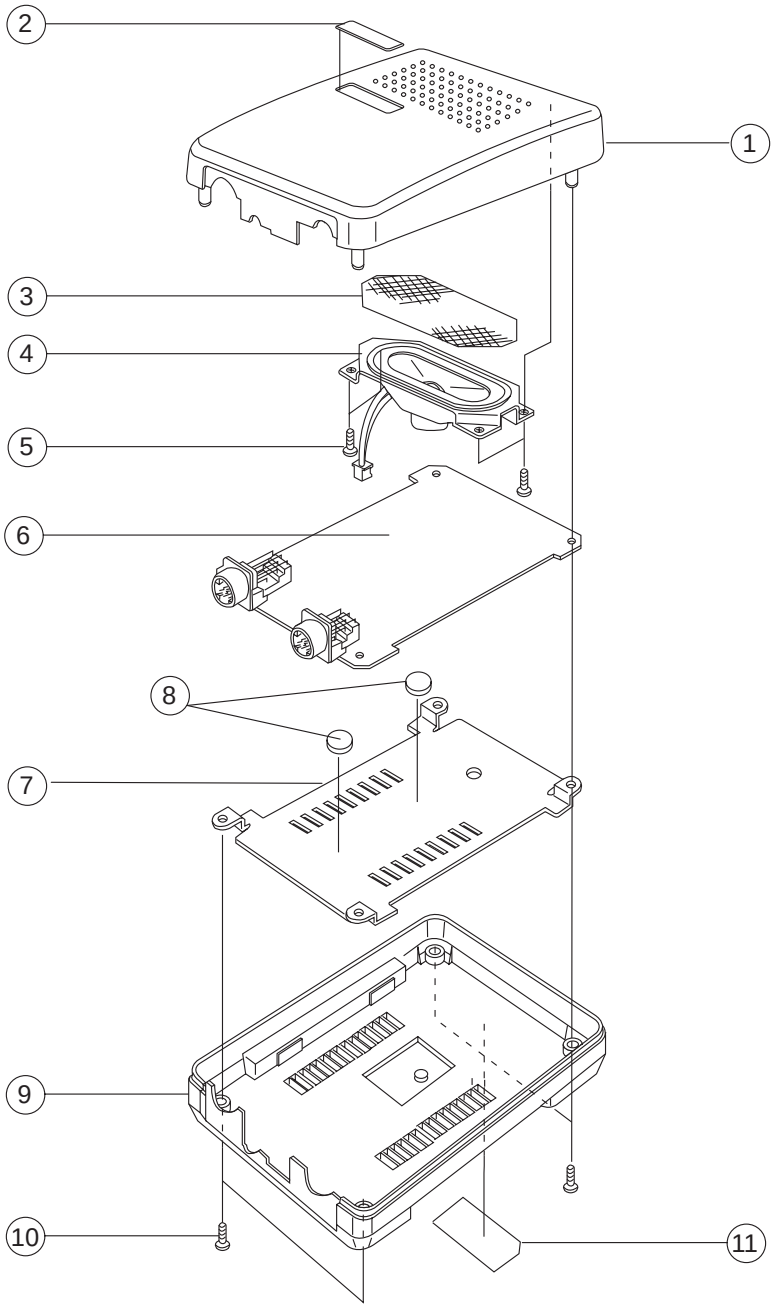
Cigatte Lighter Adaptor Ass'y : GH44-40075A

Charging Time	Standard Battery (850mAH)	4 hours
	Extended Battery (1350mAH)	5 hours
Environmental Specification	Charge	0 °C ~ 40 °C
	Storage	-30 °C ~ 80 °C

9-7 Hands Free Kit Exploded View



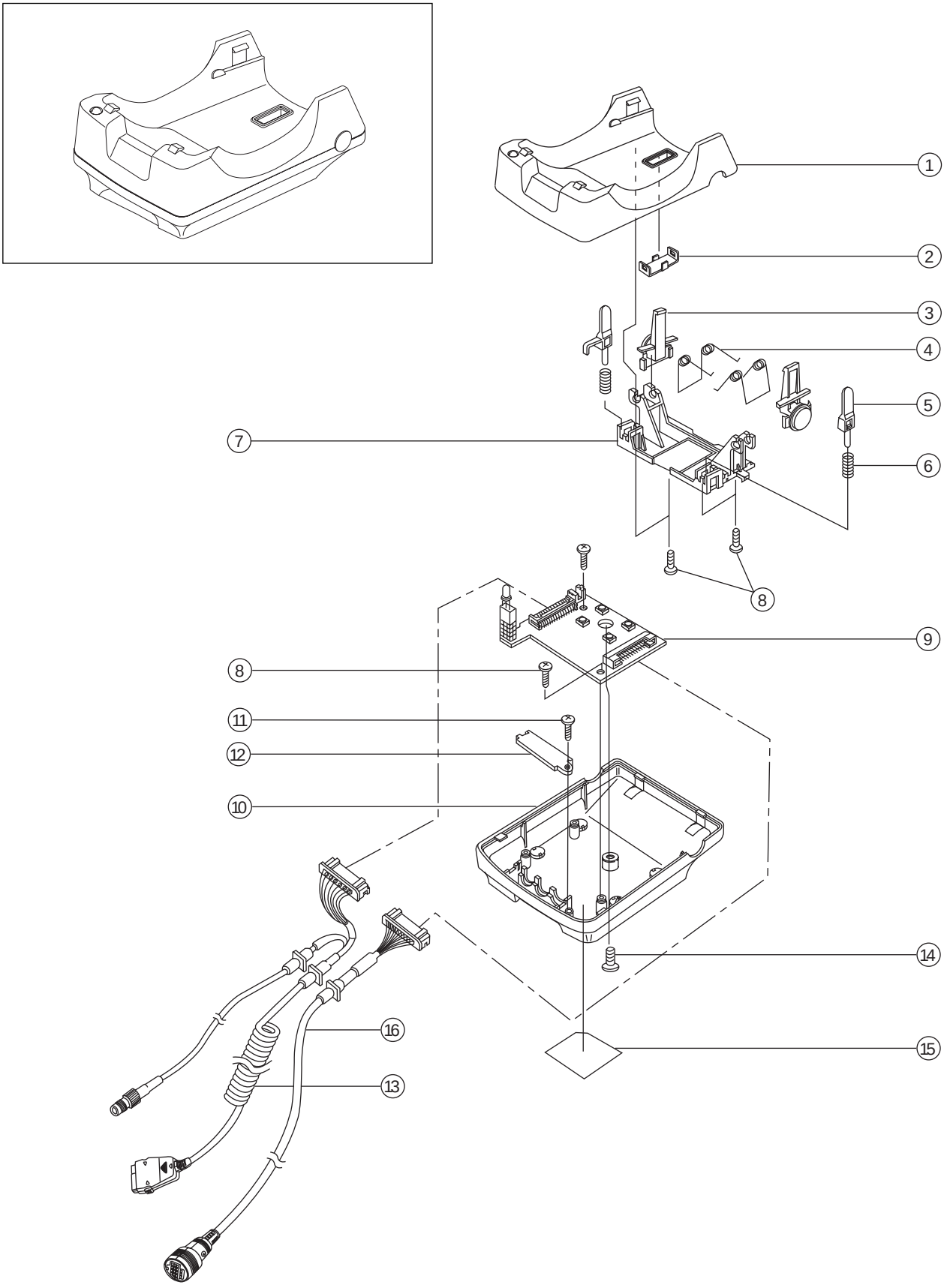
Hands Free Kit Ass'y : GH96-01103A



9-8 Hands Free Kit Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	HOUSING, UPPER, H/F	GH97-00693A	1	
2	LABEL, LOGO, H/F	GA68-30642A	1	
3	FELT, SPEAKER, H/F	GH74-10521A	1	
4	AUDIO SPEAKER, C/D	3001-000186	1	
5	TAPTITE, B, BH, +, M3, L6	6003-000115	4	
6	PBA	GH41-1056AA(100)	1	
7	HEATSINK, H/F	GH71-10559A	1	
8	BUMPON		2	
9	HOUSING, LOWER, H/F	GH97-00694A	1	
10	TAPTITE, B, BH, +, M3, L12	6003-000161	4	
11	LABEL, ID, HFK	GH68-30841A	1	

9-9 Cradle Exploded View

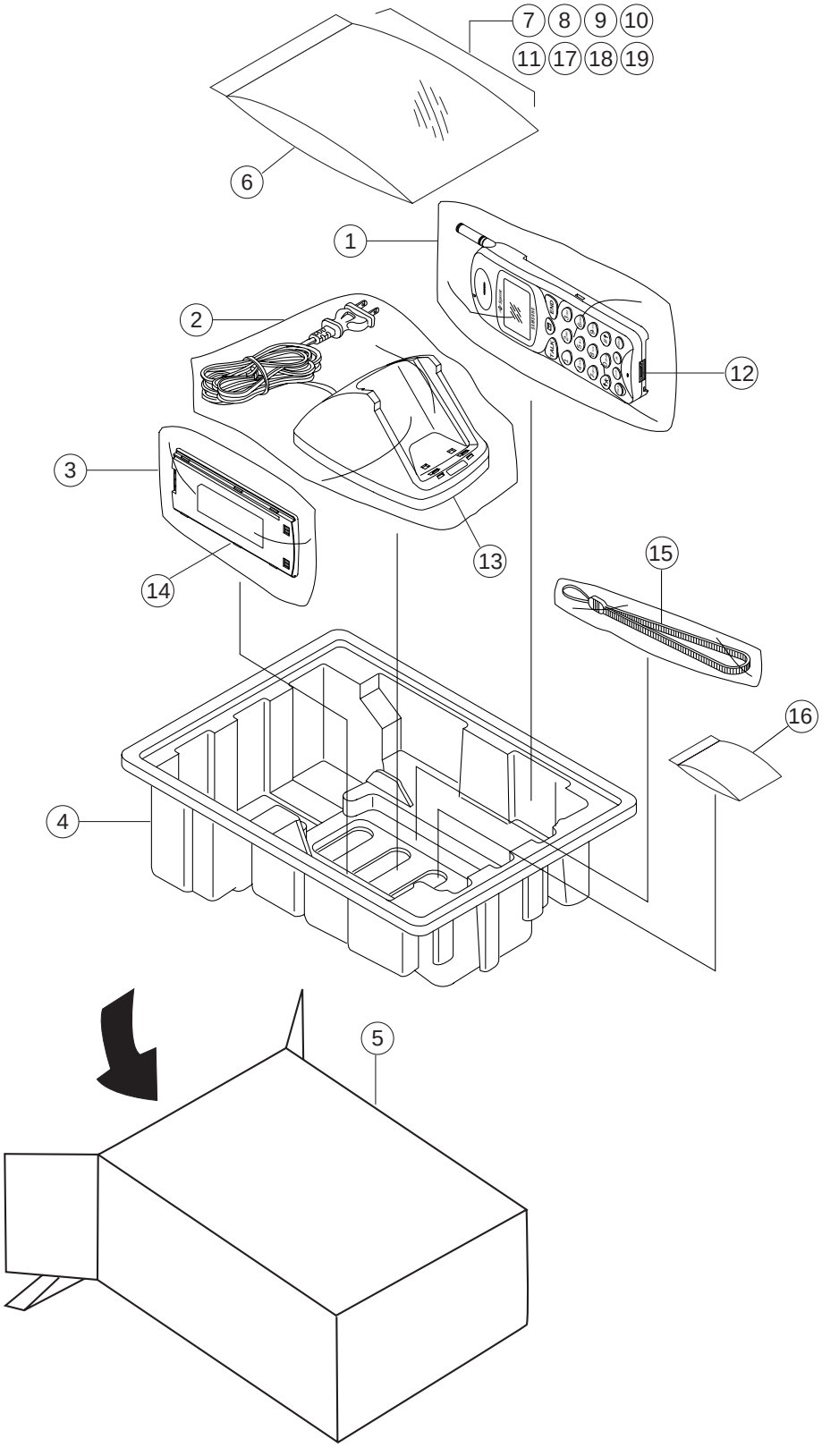


9-10 Cradle Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	HOUSING, UPPER	GH72-40739A	1	
2	SOCKET, PLATE	GH70-10526A	1	
3	LOCKER	GH72-40742A	2	
4	SPRING, TORTION	GH70-10527A	2	
5	EJECTOR	GH72-40743A	1	
6	SPRING, EJECTOR	GH70-10520A	2	
7	FRAME	GH72-40741A	1	
8	TAPTITE, B, BH, +, M2.6, L6, C BLK	6003-000107	6	
9	PBA, CRADLE	GH41-10573A	1	
10	HOUSING, LOWER	GH72-40740A	1	
11	TAPTITE, B, BH, +, M2, L6, C BLK	6002-000342	1	
12	HOLDER, CRADLE	GH72-40622A	1	
13	CURL CORD	GH39-60506A	1	
14	MAS, B, BH, +, M3, L8	6001-000133	1	
15	LABEL, ID	GH68-30832A	1	
16	DATA CABLE	GH81-10504A	1	

9-11 Main Packing Layout

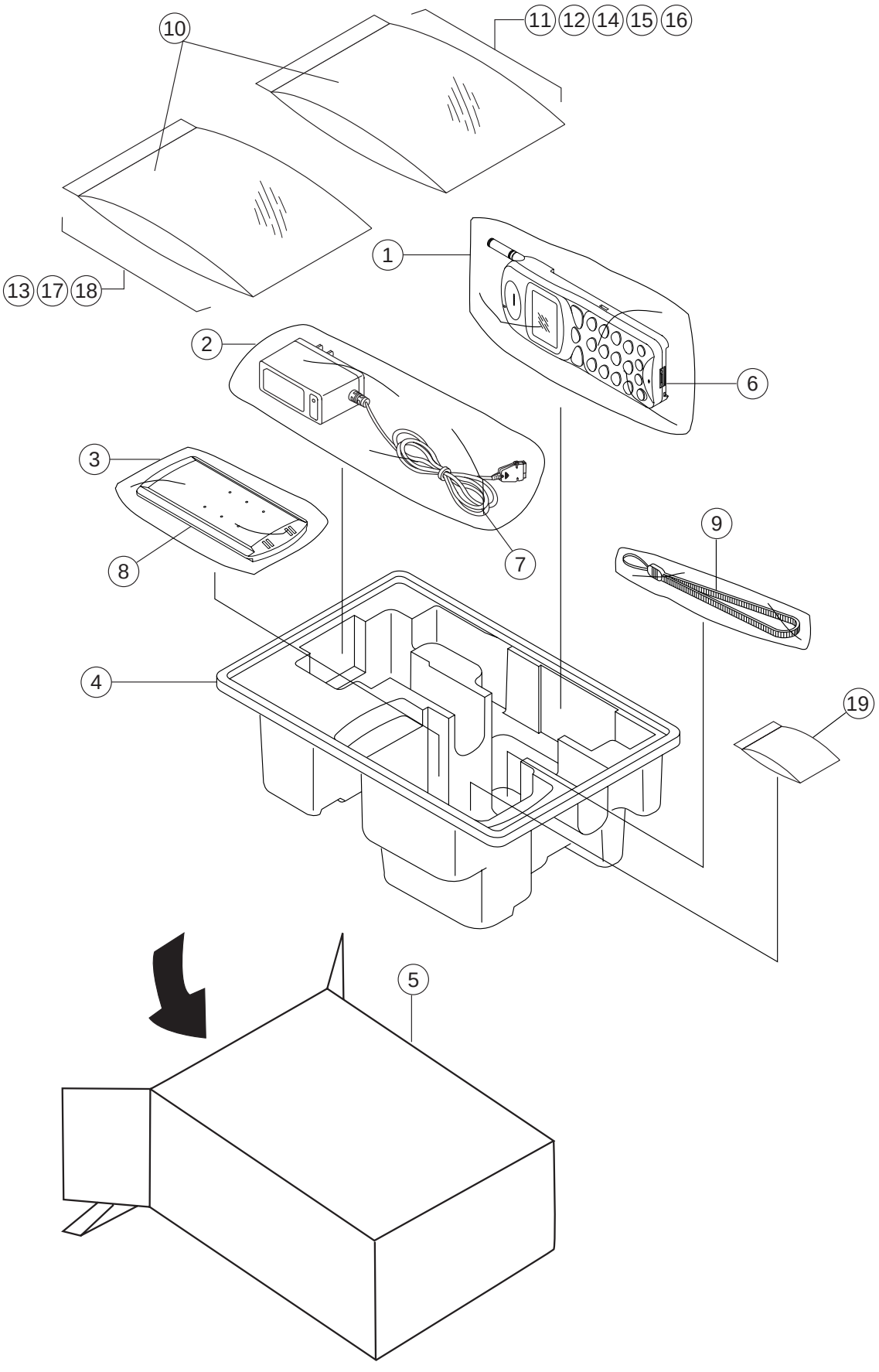
9-11-1 Main Packing Layout (with DTC)



9-11-2 Main Packing Parts List (with DTC)

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	SHIELDING BAG	GH69-30500A	1	
2	PE BAG	GG69-30517A	1	
3	BAG STD. BATT.	GH69-30503A	1	
4	CUSHION CASE MAIN	GH69-20680A	1	
5	BOX GIFT MAIN	GH69-11146A	1	
6	PP-BAG MANUAL	GH69-30518A	1	
7	USER MANUAL	GH68-60671A	1	
8	IPR CARD	GH68-60564A	1	
9	QUICK REFERENCE	GH68-70688A	1	
10	WARRANTY CARD	GH68-70560A	1	
11	MAN(BOOK)-INSURANCE	GH68-60564A	1	
12	MAIN SET	SCH-1500B/XAR	1	
13	DTC	GH44-40072A	1	
14	STD BATTERY	GH43-10114A	1	
15	HANGER STRAP	GH72-41051A	1	
16	SILICAGEL	GA69-90502A	1	
17	ACCESSORY GUIDE	GH68-00218A	1	
18	ACTIVITY CARD	GH68-70750A	1	
19	TERMS & CONDITION CARD	GH68-70751A	1	

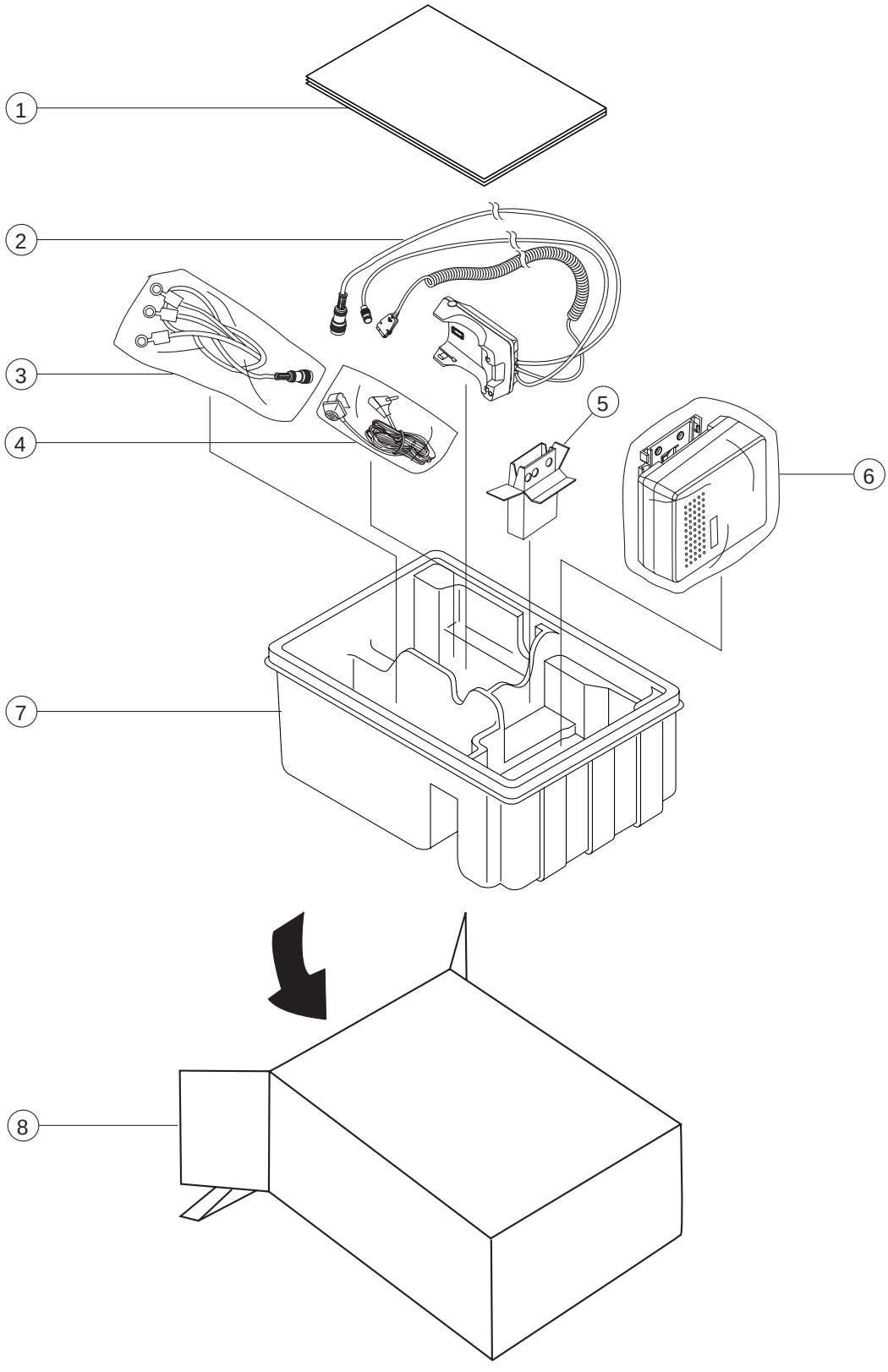
9-11-3 Main Packing Layout (with TC)



9-11-4 Main Packing Parts List (with TC)

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	SHIELDING BAG	GH69-30500A	1	
2	PE BAG	GG69-30517A	1	SCH-1510
		GA69-30533A	1	SCH-1530/1531
3	BAG STD. BATT.	GH69-30503A	1	
4	CUSHION CASE MAIN	GH69-20769A	1	
5	BOX GIFT MAIN	GH69-11266A	1	SCH-1510
		GH69-11268A	1	SCH-1530/1531
6	MAIN SET	SCH-1510B/CDT	1	SCH-1510
		SCH-1500BB/XAR	1	SCH-1530/1531
7	TC	GH44-40082A	1	
8	STD BATTERY	GH43-10114A	1	
9	HANGER STRAP	GH72-41051A	1	
10	PP-BAG MANUAL	GH69-30518A	2	SCH-1510 : 1EA
11	IPR CARD	GH68-70752A	1	EXCEPT SCH-1510
12	QUICK REFERENCE (ENGLISH)	GH68-00051A	1	EXCEPT SCH-1510
13	QUICK REFERENCE (FRENCH)	GH68-00053A	1	EXCEPT SCH-1510
14	WARRANTY CARD	GH68-70737A	1	EXCEPT SCH-1510
15	RESISTRATION CARD	GH68-70735A	1	EXCEPT SCH-1510
16	USER MANUAL (ENGLISH)	GH68-00050A	1	EXCEPT SCH-1510
17	USER MANUAL (FRENCH)	GH68-00052A	1	EXCEPT SCH-1510
18	USER MANUAL	GH68-00244A	1	SCH-1510
19	SILICAGEL	GA69-90502A	1	

9-12 Hands-Free Kit Packing Layout



9-13 Hands-Free Kit Packing Parts List

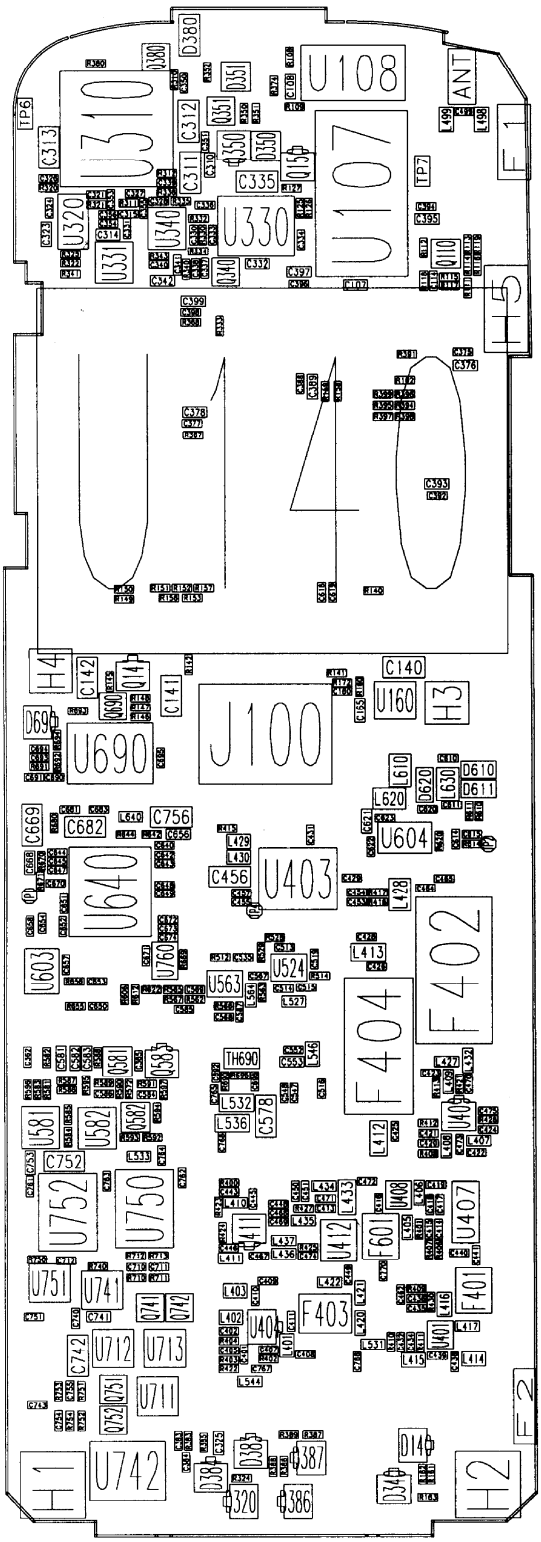
NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	USER'S MANUAL, H/F	GH68-60560A	1	
2	ASS'Y, CRADLE	GH90-00578A	1	
3	POWER CABLE	GH39-10501A	1	
4	ASS'Y, HANDS-FREE MICROPHONE		1	
5	CLAMSHELL, MOUNT		1	
6	ASS'Y, HANDS-FREE KIT/BRACKET MOUNTING	GH90-00577A	1	
7	CUSHION, BASE	GH69-20550A	1	
8	BOX, GIFT	GH69-10842A	1	

10. PCB Diagrams

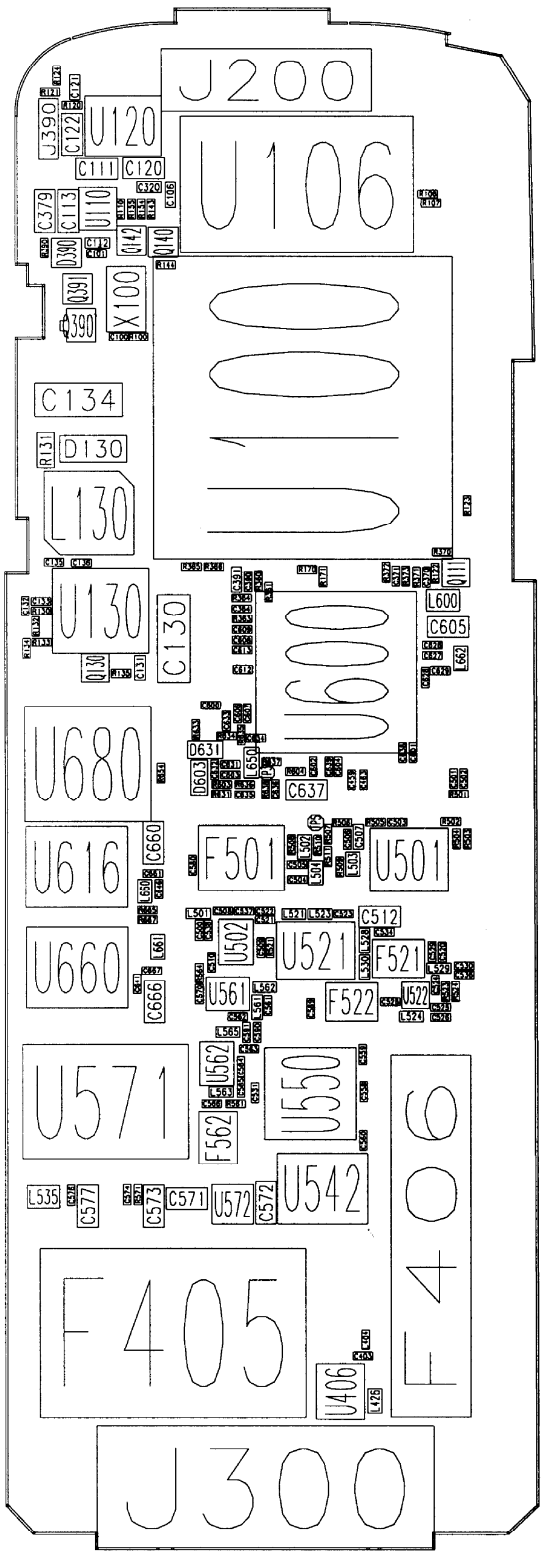
10-1 DBDM Phone

10-1-1 Main Board PCB (REV : 2.1)

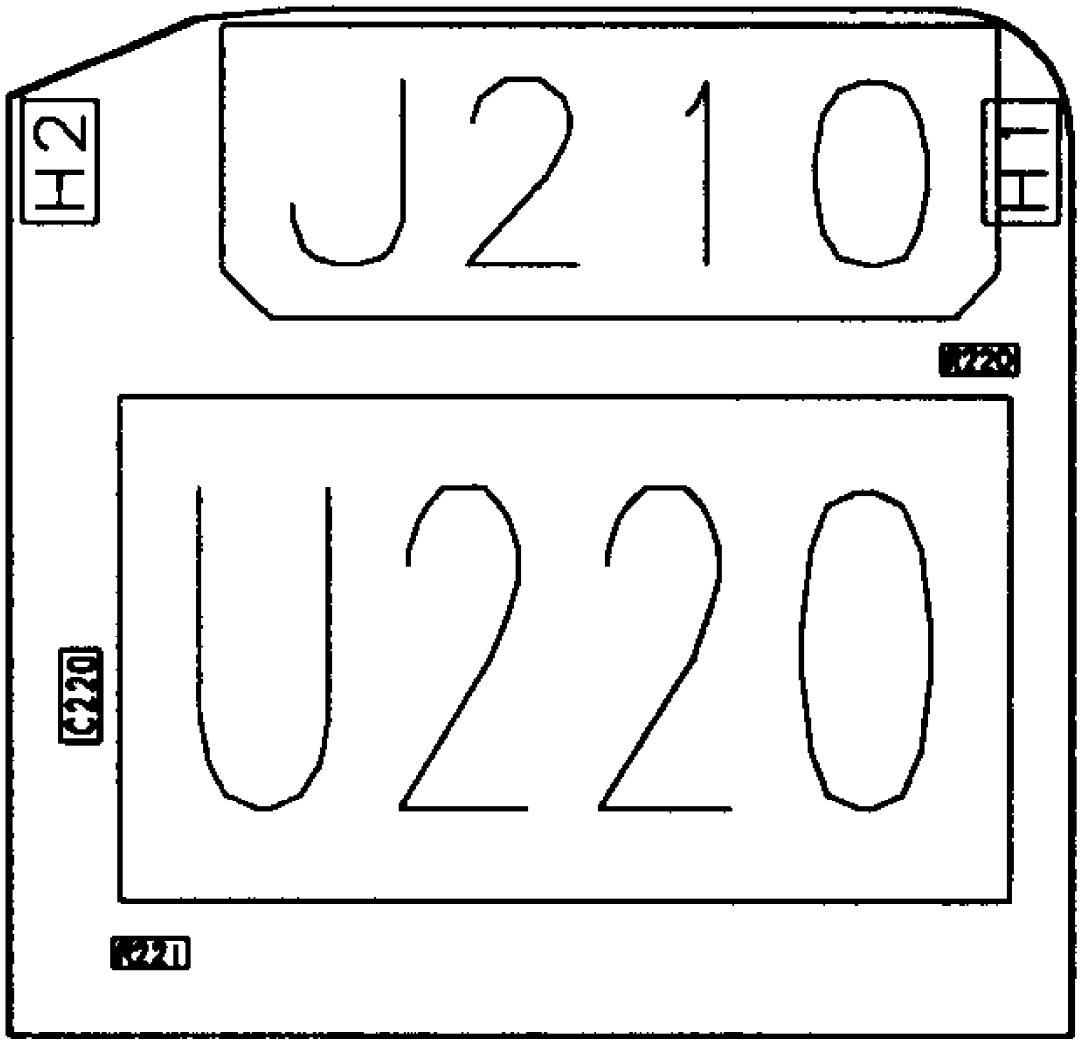
Top View



Bottom View

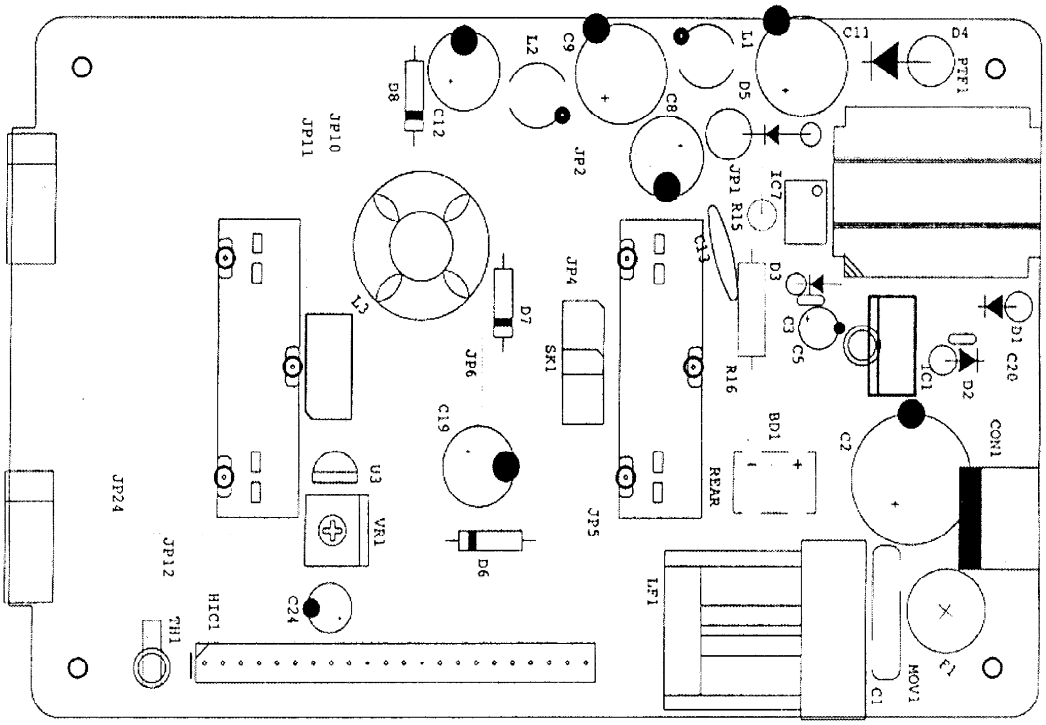


10-1-2 Memory Board PCB (REV : 2.0)

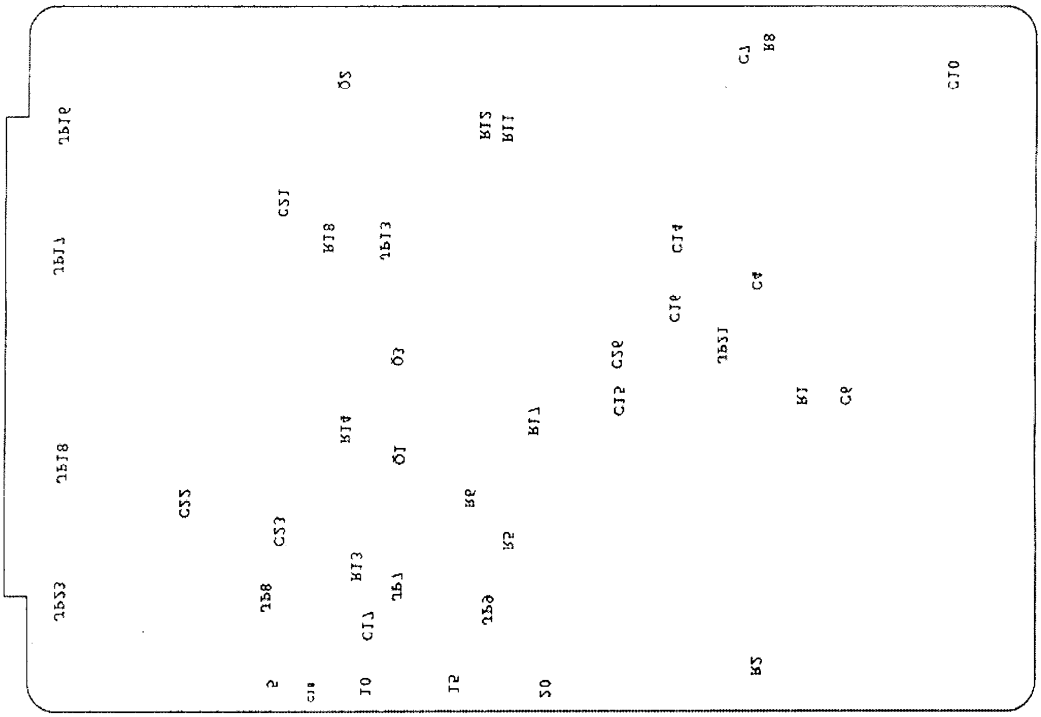


10-2 Desk-Top Rapid Charger Board PCB

Top View

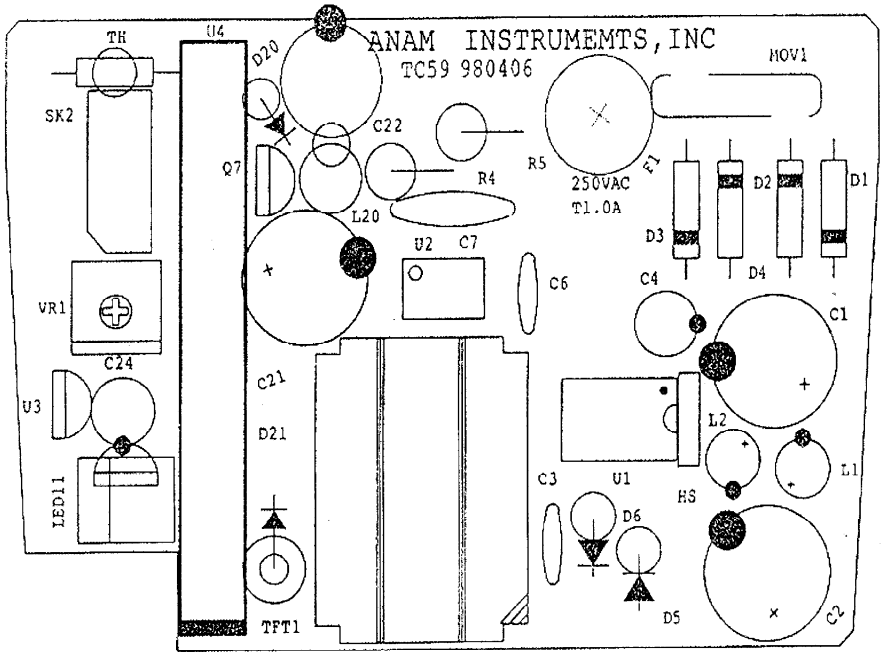


Bottom View

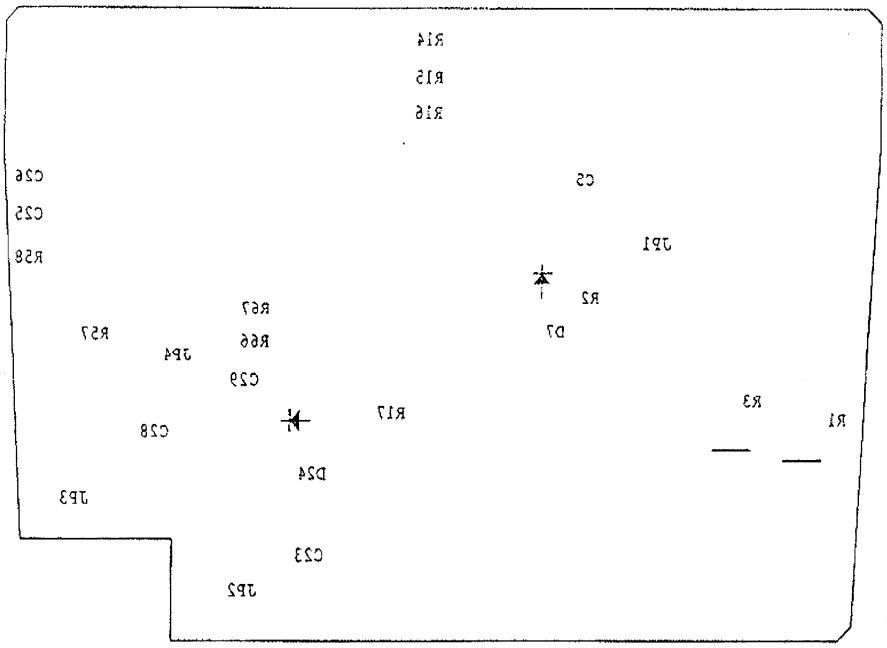


10-3 Travel Charger Board PCB

Top View

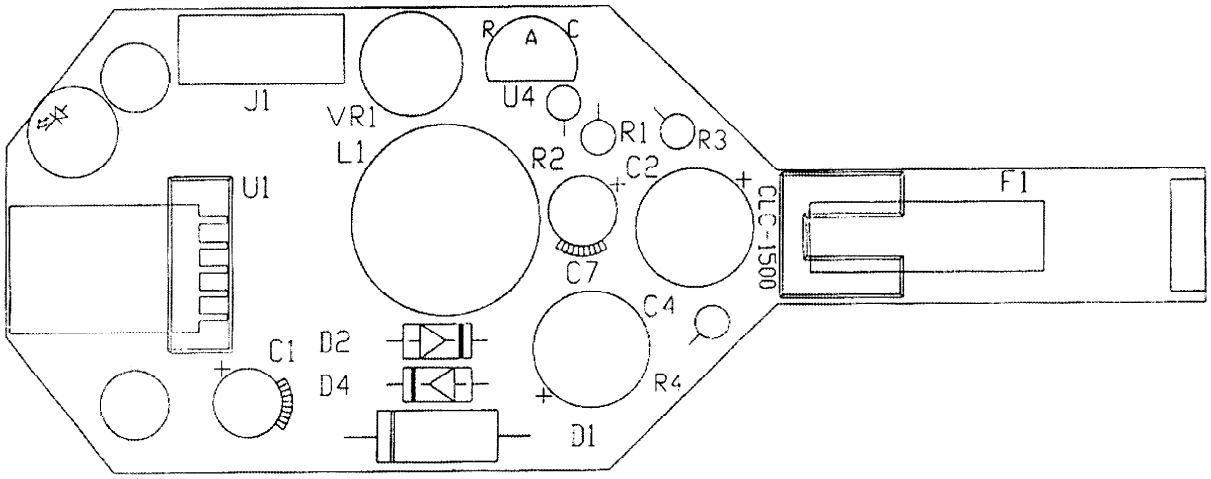


Bottom View

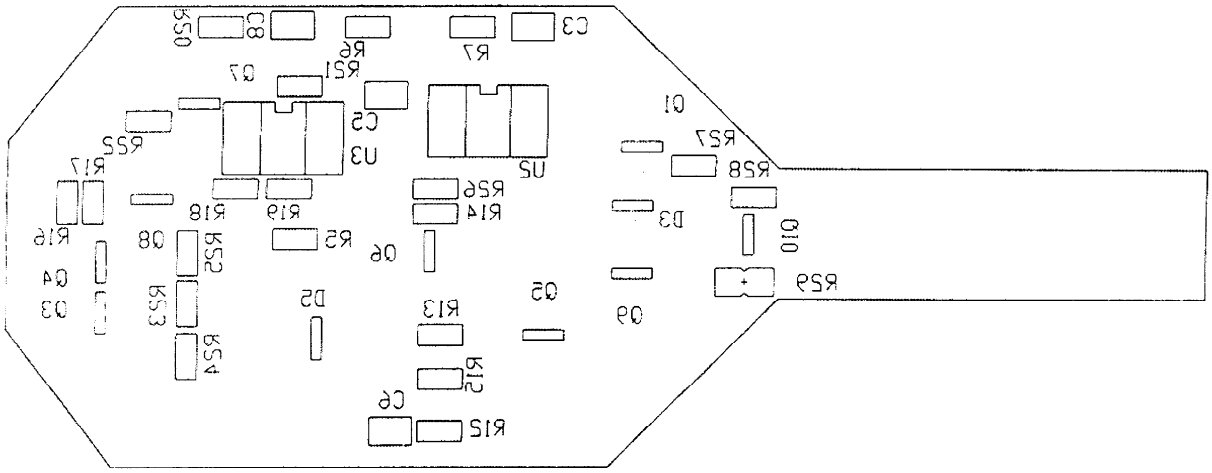


10-4 Cigarette Lighter Adaptor Board PCB

Top View

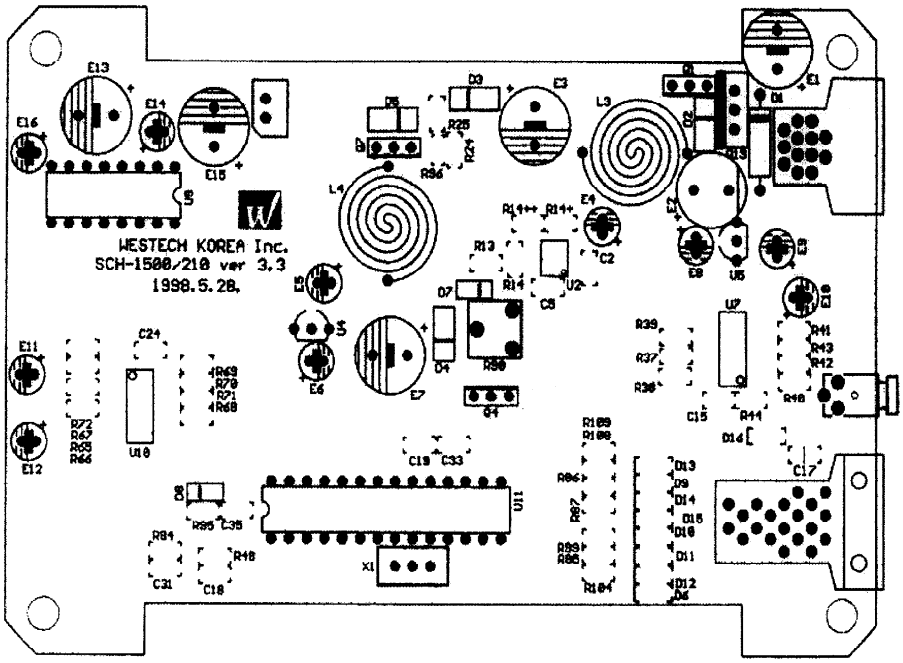


Bottom View

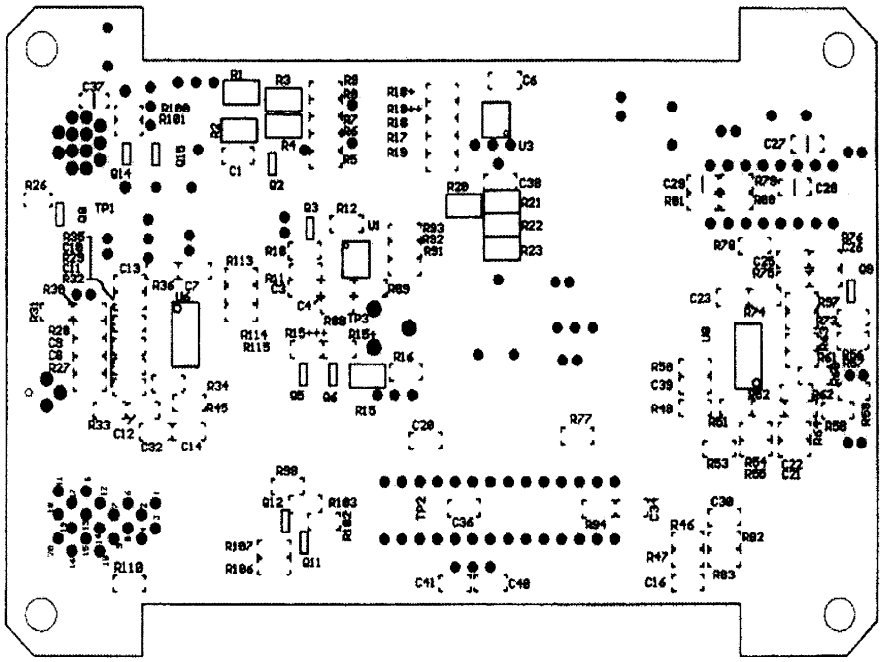


10-5 Hands-Free Kit Board PCB

Top View

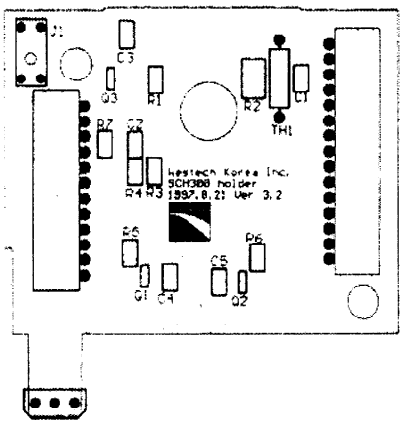


Bottom View

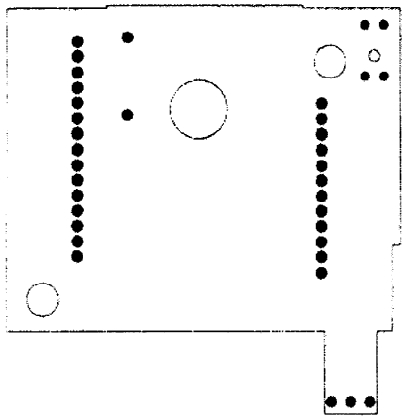


10-6 Cradle PCB

Top View



Bottom View



Memo

11. Electrical Parts List

11-1 DBDM Phone

11-1-1 Main Board Assembly

NO	DESCRIPTION	SEC.CODE	REMARK
	- Capacitors -		
C100,C101	Ceramic, 18P	2203-000425	
C106,C107,C108	Ceramic, 0.1U	2203-000189	
C111	Tantalum, Chip 1U/16V	2404-000151	
C112	Ceramic, 0.1U	2203-000189	
C113	Tantalum, Chip 10UF/6.3V	2404-000139	
C114	Ceramic, 1000P	2203-000438	
C120	Tantalum, Chip 1U/16V	2404-000151	
C121	Ceramic, 0.1U	2203-000189	
C122	Tantalum, Chip 10UF/6.3V	2404-000139	
CI30	Tantalum, Chip 100U/16V	2404-001003	
C131	Ceramic, 0.1U	2203-000189	
C132	Ceramic, 3300P	2203-000714	
C133	Ceramic, 27P	2203-000679	
C134	Tantalum, Chip 220U/10V	2404-001025	
C135	Ceramic, 1000P	2203-000438	
C136	Ceramic, 100P	2203-000234	
C140.C141	Tantalum, Chip 1U/16V	2404-000151	
C142	Tantalum, Chip 4.7U/10V	2404-000232	
C160	Ceramic, 0.01U	2203-000254	
C165,C310	Ceramic, 0.1U	2203-000189	
C311,C312,C313	Tantalum, Chip 1U/16V	2404-000151	
C314	Ceramic, 1U	2203-005065	
C315	Ceramic, 39P	2203-000854	
C320	Ceramic, 0.1U	2203-000189	
C321	Ceramic, 220P	2203-000585	
C323	Ceramic, 1U	2203-005065	
C324	OPEN_C	OPEN_C	
C325	Ceramic, 0.1U	2203-000189	
C326,C327,C328	Ceramic, 15P	2203-000386	
C330	Ceramic, 1500P	2203-000138	
C331	Ceramic, 5600P	2203-001033	
C332	Ceramic, 0.1U	2203-000189	
C333,C334	Ceramic, 680P	2203-001124	

NO	DESCRIPTION	SEC.CODE	REMARK
C335	Tantalum, Chip 4.7U/10V	2404-000232	
C336	Ceramic, 2200P	2203-000489	
C337	Ceramic, 0.01U	2203-000254	
C338	Ceramic, 5600P	2203-001033	
C339	Ceramic, 0.01U	2203-000254	
C340	Ceramic, 390P	2203-000836	
C341	Ceramic, 0.022U	2203-001405	
C342	Ceramic, 0.1U	2203-000189	
C350,C351,C353,	Ceramic, 15P	2203-000386	
C354,C355,C356			
C362	Ceramic, 0.033UF	2203-001416	
C364	Ceramic, 0.01U	2203-000254	
C365	Ceramic, 1000P	2203-000438	
C370,C371	Ceramic, 8200P	2203-001210	
C375	Ceramic, 0.01U	2203-000254	
C376	Ceramic, 0.1U	2203-000189	
C377	Ceramic, 0.01U	2203-000254	
C378	Ceramic, 0.1U	2203-000189	
C379	Tantalum, Chip 1U/16V	2404-000151	
C383,C384	Ceramic, 470P	2203-000941	
C388	Ceramic, 0.01U	2203-000254	
C389	Ceramic, 0.1U	2203-000189	
C390	Ceramic, 0.01U	2203-000254	
C391	Ceramic, 0.1U	2203-000189	
C392	Ceramic, 0.01U	2203-000254	
C393	Ceramic, 0.1U	2203-000189	
C394	Ceramic, 0.01U	2203-000254	
C395	Ceramic, 0.1U	2203-000189	
C396	Ceramic, 0.01U	2203-000254	
C397	Ceramic, 0.1U	2203-000189	
C398	Ceramic, 0.01U	2203-000254	
C399	Ceramic, 0.1U	2203-000189	
C401	Ceramic, 1000P	2203-000438	
C402	Ceramic, 2700P	2203-000530	
C403	Ceramic, 4P	2203-001017	
C405	Ceramic, 100P	2203-000234	
C407	Ceramic, 1000P	2203-000438	
C408,C409	Ceramic, 100P	2203-000234	
C410	Ceramic, 5P	2203-001437	
C411	Ceramic, 3P	2203-000870	

NO	DESCRIPTION	SEC.CODE	REMARK
C413	Ceramic, 100P	2203-000234	
C414	Ceramic, 12P	2203-000330	
C415,C416	Ceramic, 1000P	2203-000438	
C417	Ceramic, 12P	2203-000330	
C418	Ceramic, 1000P	2203-000438	
C419	Ceramic, 12P	2203-000330	
C420	Ceramic, 1000P	2203-000438	
C421	Ceramic, 12P	2203-000330	
C422	OPEN_C	OPEN_C	
C423,C424	Ceramic, 1000P	2203-000438	
C425	Ceramic, 5P	2203-001437	
C426	OPEN_C	OPEN_C	
C428,C429	Ceramic, 1000P	2203-000438	
C431	Ceramic, 0.01U	2203-000254	
C432	Ceramic, 1000P	2203-000438	
C434	Ceramic, 12P	2203-000330	
C435	Ceramic, 1000P	2203-000438	
C436	Ceramic, 12P	2203-000330	
C439	Ceramic, 3P	2203-000870	
C440	Ceramic, 1P	2203-000466	
C441	Ceramic, 5P	2203-001437	
C443	Ceramic, 100P	2203-000234	
C445	Ceramic, 5P	2203-001437	
C446	Ceramic, 100P	2203-000234	
C448	Ceramic, 3900P	2203-000725	
C449	Ceramic, 24P	2203-000643	
C450	Ceramic, 1000P	2203-000438	
C451	Ceramic, 100P	2203-000234	
C453,C454	Ceramic, 1000P	2203-000438	
C455	Ceramic, 0.047UF	2203-001432	
C456	Tantalum, Chip 4.7U/10V	2404-000232	
C457,C459	Ceramic, 1000P	2203-000438	
C462	Ceramic, 0.047UF	2203-001432	
C463	Ceramic, 1000P	2203-000438	
C464	Ceramic, 47P	2203-000995	
C465	Ceramic, 56P	2203-001072	
C467	Ceramic, 3P	2203-000870	
C468	Ceramic, 1000P	2203-000438	
C469,C470	Ceramic, 100P	2203-000234	
C471	Ceramic, 20P	2203-000550	

NO	DESCRIPTION	SEC.CODE	REMARK
C472	Ceramic, 1000P	2203-000438	
C473	Ceramic, 10P	2203-000278	
C474	Ceramic, 15P	2203-000386	
C475	Ceramic, 3900P	2203-000725	
C499	Ceramic, 2P	2203-000696	
C500	Ceramic, 4P	2203-001017	
C501,C502	Ceramic, 1000P	2203-000438	
C503	Ceramic, 220P	2203-000585	
C504,C505	Ceramic, 12P	2203-000330	
C506	Ceramic, 1000P	2203-000438	
C507	Ceramic, 0.1U	2203-000189	
C508,C509,C510	Ceramic, 1000P	2203-000438	
C512	Tantalum, Chip 4.7U/10V	2404-000232	
C513	Ceramic, 100P	2203-000234	
C514	Ceramic, 15P	2203-000386	
C515	Ceramic, 4P	2203-001017	
C516	Ceramic, 1000P	2203-000438	
C519	Ceramic, 15P	2203-000386	
C520	Ceramic, 2P	2203-000696	
C521	Ceramic, 1000P	2203-000438	
C522,C523,C524,C525	Ceramic, 15P	2203-000386	
C526	Ceramic, 100P	2203-000234	
C528	Ceramic, 15P	2203-000386	
C529	Ceramic, 1P	2203-000466	
C530	Ceramic, 1000P	2203-000438	
C531	Ceramic, 15P	2203-000386	
C534	Ceramic, 100P	2203-000234	
C535,C536	Ceramic, 15P	2203-000386	
C537,C538	Ceramic, 1000P	2203-000438	
C547	Ceramic, 100P	2203-000234	
C548	Ceramic, 1000P	2203-000438	
C552	Ceramic, 15P	2203-000386	
C553	Ceramic, 0.1U	2203-000189	
C558	Ceramic, 100P	2203-000234	
C559,C560,C561	Ceramic, 15P	2203-000386	
C562,C563,C564	Ceramic, 100P	2203-000234	
C565	Ceramic, 15P	2203-000386	
C566,C567,C568,C569	Ceramic, 100P	2203-000234	
C570	Ceramic, 1000P	2203-000438	
C571,C572,C573	Tantalum, Chip 3.3U/6.3V	2404-000216	
C574	Ceramic, 1000P	2203-000438	
C576	Ceramic, 100P	2203-000234	

NO	DESCRIPTION	SEC.CODE	REMARK
C577,C578	Tantalum, Chip 4.7U/10V	2404-000232	
C580	Ceramic, 1P	2203-000466	
C581,C582,C583	Ceramic, 0.1U	2203-000189	
C584	Ceramic, 0.01U	2203-000254	
C585	Ceramic, 15P	2203-000386	
C586	Ceramic, 0.047UF	2203-001432	
C587	Ceramic, 100P	2203-000234	
C589	Ceramic, 10P	2203-000278	
C590	Ceramic, 100P	2203-000234	
C591	OPEN_C	OPEN_C	
C600	Ceramic, 1000P	2203-000438	
C601,C602	Ceramic, 0.01U	2203-000254	
C603	Ceramic, 100P	2203-000234	
C604	Ceramic, 0.01U	2203-000254	
C605	Tantalum, Chip 10UF/6.3V	2404-000139	
C606	Ceramic, 1000P	2203-000438	
C607	Ceramic, 0.01U	2203-000254	
C608	Ceramic, 1000P	2203-000438	
C609	Ceramic, 0.01U	2203-000254	
C610,C611	Ceramic, 11P	2203-000300	
C614	Ceramic, 0.01U	2203-000254	
C615,C618	Ceramic, 1000P	2203-000438	
C619	Ceramic, 0.01U	2203-000254	
C620	Ceramic, 150P	2203-000359	
C621	Ceramic, 0.1U	2203-000189	
C622	Ceramic, 100P	2203-000234	
C623,C626	Ceramic, 1000P	2203-000438	
C627	Ceramic, 0.01U	2203-000254	
C628	Ceramic, 1000P	2203-000438	
C629	Ceramic, 0.01U	2203-000254	
C631	Ceramic, 100P	2203-000234	
C632	Ceramic, 6P	2203-001178	
C633	Ceramic, 470P	2203-000941	
C635	Ceramic, 1000P	2203-000438	
C636	Ceramic, 0.047UF	2203-001432	
C637	Tantalum, Chip 2.2U/16V	2404-000167	
C638,C639,C640	Ceramic, 1000P	2203-000438	
C641	Ceramic, 100P	2203-000234	
C642	Ceramic, 0.01U	2203-000254	
C643,C644	Ceramic, 100P	2203-000234	

NO	DESCRIPTION	SEC.CODE	REMARK
C645	Ceramic, 0.01U	2203-000254	
C646,C647	Ceramic, 15P	2203-000386	
C648,C649	Ceramic, 100P	2203-000234	
C650,C651	Ceramic, 10P	2203-000278	
C652	Ceramic, 100P	2203-000234	
C653,C654	Ceramic, 10P	2203-000278	
C656	Ceramic, 0.1U	2203-000189	
C657,C658	Ceramic, 1000P	2203-000438	
C660	Tantalum, Chip 10UF/6.3V	2404-000139	
C661	Ceramic, 0.01U	2203-000254	
C666	Tantalum, Chip 10UF/6.3V	2404-000139	
C667	Ceramic, 0.01U	2203-000254	
C668	Ceramic, 0.1U	2203-000189	
C669	Tantalum, Chip 1U/16V	2404-000151	
C670	Ceramic, 0.01U	2203-000254	
C671	Ceramic, 1P	2203-000466	
C672,C673,C674	Ceramic, 100P	2203-000234	
C681	Ceramic, 0.01U	2203-000254	
C682	Tantalum, Chip 10UF/6.3V	2404-000139	
C683,C690	Ceramic, 0.01U	2203-000254	
C691	Ceramic, 15P	2203-000386	
C692	Ceramic, 0.01U	2203-000254	
C693	Ceramic, 100P	2203-000234	
C694	Ceramic, 0.01U	2203-000254	
C695	Ceramic, 1000P	2203-000438	
C696,C710,C711, C712,C740	Ceramic, 0.01U	2203-000254	
C741	Ceramic, 0.1U	2203-000189	
C742	Tantalum, Chip 10UF/6.3V	2404-000139	
C743	Ceramic, 12P	2203-000330	
C751	Ceramic, 0.01U	2203-000254	
C752	Tantalum, Chip 10UF/6.3V	2404-000139	
C753	Ceramic, 0.1U	2203-000189	
C754,C755	Ceramic, 0.01U	2203-000254	
C756	Tantalum, Chip 4.7U/10V	2404-000232	
C761	Ceramic, 12P	2203-000330	
C762,C763	Ceramic, 15P	2203-000386	
C764	Ceramic, 100P	2203-000234	
C765,C766	Ceramic, 15P	2203-000386	
C767,C768	Ceramic, 100P	2203-000234	
C770	Ceramic, 15P	2203-000386	

NO	DESCRIPTION	SEC.CODE	REMARK
	- Diodes -		
D130	DIODE, RB160L-40TE25	0404-000115	
D140,D320,D340	DIODE, 1SS226	0407-000122	
D350,D351	DIODE, DAN202UT106	0407-000115	
D380	LED, Chip, RED, 2.0	0601-000355	
D383,D384,D386, D387	DIODE, 1SS226	0407-000122	
D390	DIODE, DAN202UT106	0407-000115	
D603,D610,D611, D620,D631	DIODE, 1SV229	0405-000107	
D690	DIODE, 1SS226	0407-000122	
	- Filters -		
F401	Filter, SAW, 1960MHz	2904-001021	
F402	Filter, SAW	2904-001080	
F403	Filter, SAW	2904-001011	
F404	Filter, SAW, 85.38MHz	2904-001074	
F405	Filter,Duplexer	2909-001004	
F406	Filter,Duplexer	2909-001037	
F501	Filter-BPF,SAFC130.4	2904-001082	
F521,F522	Filter, SAW, 1880MHz	2904-001020	
F562	Filter, SAW	2904-001012	
F601	FILTER, SAW	2904-001103	
	- Connectors -		
J100	Connector,Socket	3710-000341	
J200	Connector,Socket	3711-003924	
J300	Connector,Socket	3710-001021	
J390	Connector,Socket	3710-001105	

NO	DESCRIPTION	SEC.CODE	REMARK
	- INDUCTOR -		
L130	Inductor, CHIP, 22UH	2703-001429	
L401	Inductor, SMD, 6.8N	2703-001296	
L402	Inductor, SMD, 8.2N	2703-001080	
L403	OPEN_L	OPEN_L	
L404	Inductor, SMD, 3.3N	2703-001178	
L405	Inductor, SMD, 4.7N	2703-001206	
L406	Inductor, SMD, 3.3N	2703-001291	
L407	Inductor, SMD, 15N	2703-001190	
L408	Inductor, SMD, 33N	2703-001174	
L409	Inductor, SMD, 100N	2703-001172	
L410,L411	Inductor, SMD, 8.2N	2703-001080	
L412	Inductor, SMD, 390N	2703-000203	
L413	Inductor, SMD, 820N	2703-000268	
L414	Inductor, SMD, 2.2N	2703-001205	
L415	Inductor, SMD, 22N	2703-001305	
L416	Inductor, SMD, 8.2N	2703-001080	
L417	Inductor, SMD, 5.6N	2703-001284	
L420	Inductor, SMD, 15N	2703-001190	
L421	Inductor, SMD, 33N	2703-001174	
L422	Inductor, SMD, 22N	2703-001305	
L426,L427	Inductor, SMD, 18N	2703-001189	
L428	Inductor, SMD, 47N	2703-000309	
L429,L430	Inductor, SMD, 2.7U	2703-000301	
L432	Inductor, SMD, 12N	2703-001173	
L433	Inductor, SMD, 120N	2703-000265	
L434	Inductor, SMD, 39N	2703-001285	
L435	Inductor, SMD, 8.2N	2703-001080	
L436	Inductor, SMD, 22N	2703-001305	
L437	Inductor, SMD, 18N	2703-001189	
L498	Inductor, SMD, 22N	2703-001305	
L499	Inductor, SMD, 15N	2703-001190	
L501	Inductor, SMD, 390N	2703-000297	
L502,L503	Inductor, SMD, 2.7U	2703-000301	
L504	Inductor, SMD, 330N	2703-000190	
L521,L523	Inductor, SMD, 3.3N	2703-001291	
L524	Inductor, SMD, 2.2N	2703-001205	
L527	Inductor, SMD, 3.9N	2703-001295	
L528	Inductor, SMD, 2.2N	2703-001205	
L529	Inductor, SMD, 1.8N	2703-001289	
L530	Inductor, SMD, 3.3N	2703-001291	
L531	Inductor, SMD, 2.7U	2703-000301	
L532	Inductor, SMD, 5.6U	2703-001255	

NO	DESCRIPTION	SEC.CODE	REMARK
L533	BID Inductor, SMD	3301-001158	
L535	Inductor, SMD, 330N	2703-000195	
L536	Inductor, SMD, 5.6U	2703-001255	
L544	Inductor, SMD, 2.7U	2703-000301	
L546	Inductor, SMD, 47N	2703-001259	
L561	Inductor, SMD, 33N	2703-001174	
L562	Inductor, SMD, 27N	2703-001306	
L563	Inductor, SMD, 18N	2703-001189	
L564	Inductor, SMD, 12N	2703-001173	
L565	OPEN_L	OPEN_L	
L600	Inductor, SMD, 750N	2703-000237	
L610	Inductor, SMD, 47N	2703-001679	
L620	Inductor, SMD, 22N	2703-001678	
L630	Inductor, SMD, 220N	2703-001680	
L640	Inductor, SMD, 2.7U	2703-000301	
L650	Inductor, SMD, 27N	2703-000304	
L660,L661,L662	Inductor, SMD, 2.7U	2703-000301	
	- Transistor -		
Q110	Small Signal	0501-000218	
Q111	Digital, DTC144EE	0504-000168	
Q130	Digital, DTA144EE	0504-000172	
Q140	Small Signal	0501-000218	
Q141	Small Signal	0501-000457	
Q142	Small Signal	0501-000162	
Q150	Small Signal	0501-000462	
Q340	Digital, DTC114EE	0504-000167	
Q350	Small Signal	0501-000457	
Q351	Digital, DTA144EE	0504-000172	
Q380	Digital, DTC144EE	0504-000168	
Q390	Small Signal	0501-000457	
Q391	Small Signal	0501-000218	
Q581	Small Signal	0501-000162	
Q582	Small Signal	0501-000218	
Q583	Small Signal	0501-000462	
Q690	Digital, DTA114EE	0504-001016	
Q741,Q742,Q751,Q752	Digital, DTC114EE	0504-000167	

NO	DESCRIPTION	SEC.CODE	REMARK
	- Resistor -		
C438,C612,C613,C634	Chip, 0	2007-000171	
R100	Chip, 10K	2007-000148	
R102	Chip, 4.7K	2007-000143	
R106,R107	Chip, 10K	2007-000148	
R108	Chip, 1K	2007-000140	
R109	Chip, 15K	2007-000151	
R110	Chip, 150K	2007-000164	
R111	Chip, 22K	2007-000153	
R112,R113,R114,R115	Chip, 100K	2007-000162	
R116	Chip, 6.8K	2007-000146	
R117	Chip, 47K	2007-000157	
R118	Chip, 100K	2007-000162	
R119	Chip, 4.7K	2007-000143	
R120	Chip, 270K	2007-000636	
R121	Chip, 10K	2007-000148	
R122	Chip, 22K	2007-000153	
R123	Chip, 100K	2007-000162	
R124	Chip, 0	2007-000171	
R125	Chip, 22K	2007-000153	
R126	Chip, 6.8K	2007-000146	
R127	Chip, 3K	2007-001323	
R130	Chip, 1K	2007-000140	
R131	Chip, 0.1(2%)	2007-007063	
R132	Chip, 27K(1%)	2007-007138	
R133	Chip, 100K(1%)	2007-007107	
R134	Chip, 39K(1%)	2007-007134	
R135	Chip, 100K	2007-000162	
R140	Chip, 91K	2007-001244	
R141,R142	Chip, 20	2007-003010	
R143	Chip, 1K	2007-000140	
R144	Chip, 22K	2007-000153	
R145	Chip, 10K	2007-000148	
R146,R147,R148	Chip, 56	2007-002970	
R149,R150	Chip, 10K	2007-000148	
R151	Chip, 0	2007-000171	
R152,R153	Chip, 10K	2007-000148	
R154	Chip, 4.7K	2007-000143	
R155	Chip, 39K	2007-000831	
R156	Chip, 10K	2007-000148	
R157	Chip, 2.2K	2007-000141	
R158,R159	Chip, 10K	2007-000148	
R160	Chip, 100K	2007-000162	

NO	DESCRIPTION	SEC.CODE	REMARK
R161,R162	Chip, 100	2007-000138	
R163	OPEN_R	OPEN_R	
R170,R171	Chip, 100	2007-000138	
R172	Chip, 0	2007-000171	
R310	Chip, 10K	2007-000148	
R311	Chip, 47K	2007-000157	
R312	Chip, 4.7K	2007-000143	
R320	Chip, 2K	2007-000137	
R321	Chip, 180K	2007-001339	
R322	Chip, 10K	2007-000148	
R324	Chip, 180K	2007-001339	
R325	Chip, 6.8K	2007-000146	
R330	Chip, 270K	2007-000636	
R332	Chip, 33K	2007-000775	
R333	Chip, 3.9K	2007-007001	
R334	Chip, 75K	2007-007021	
R335	Chip, 10K	2007-000148	
R336	Chip, 47K	2007-000157	
R340	Chip, 4.7K	2007-000143	
R341	Chip, 1.2K	2007-001319	
R343	Chip, 150K	2007-000164	
R350	Chip, 1K	2007-000140	
R351	Chip, 56K	2007-000159	
R352	Chip, 3.9K	2007-007001	
R360	Chip, 8.2K	2007-000147	
R361	Chip, 10K	2007-000148	
R363,R364	Chip, 47K	2007-000157	
R365	Chip, 470	2007-000932	
R366,R367	Chip, 22K	2007-000153	
R368	Chip, 0	2007-000171	
R370,R371,R372,R373	Chip, 20K	2007-000152	
R374	Chip, 0	2007-000171	
R380	Chip, 150	2007-001306	
R383,R385	Chip, 470	2007-000932	
R386	Chip, 22K	2007-000153	
R387	OPEN_R	OPEN_R	
R388,R389	Chip, 470	2007-000932	
R390	OPEN_R	OPEN_R	
R391	Chip, 2.2K	2007-000141	
R394	Chip, 4.7K	2007-000143	
R395	Chip, 10K	2007-000148	
R396	Chip, 4.7K	2007-000143	
R397	Chip, 10K	2007-000148	

NO	DESCRIPTION	SEC.CODE	REMARK
R398	Chip, 4.7K	2007-000143	
R399	Chip, 10K	2007-000148	
R400	Chip, 3K	2007-001323	
R401	Chip, 1.2K	2007-001319	
R402	Chip, 180	2007-001307	
R403	Chip, 10K	2007-000148	
R404	Chip, 3.9K	2007-007001	
R406	Chip, 3.6K	2007-007148	
R407	Chip, 30	2007-001291	
R408	Chip, 20K	2007-000152	
R409	Chip, 47	2007-000174	
R410	Chip, 3.6K	2007-007148	
R411	Chip, 1.2K	2007-001319	
R412	Chip, 8.2K	2007-000147	
R413	Chip, 30	2007-001291	
R415	Chip, 56	2007-007128	
R416,R417	Chip, 82	2007-001217	
R421	Chip, 47	2007-000174	
R422	Chip, 51	2007-001298	
R423	Chip, 12K	2007-000149	
R424	Chip, 180	2007-001307	
R425,R427	Chip, 1.2K	2007-001319	
R428	Chip, 51	2007-001298	
R430	OPEN_R	OPEN_R	
R501	Chip, 510	2007-002796	
R502,R503	Chip, 3.3K	2007-001325	
R504	Chip, 1.2K	2007-001319	
R505	Chip, 56K	2007-000159	
R506	Chip, 10K	2007-000148	
R507	Chip, 30	2007-001291	
R508,R509	Chip, 510	2007-002796	
R510,R511	Chip, 39	2007-001295	
R512	Chip, 18	2007-001288	
R514	Chip, 100	2007-000138	
R521	Chip, 430	2007-003019	
R523	Chip, 4.7K	2007-000143	
R524	Chip, 18	2007-001288	
R528	Chip, 390	2007-007095	
R529	Chip, 18K	2007-001333	
R561	Chip, 27	2007-003112	
R562	Chip, 130K	2007-001336	
R563	Chip, 100	2007-000138	
R564	Chip, 430	2007-003019	

NO	DESCRIPTION	SEC.CODE	REMARK
R565	Chip, 18	2007-001288	
R566	Chip, 51	2007-001298	
R567	Chip, 47	2007-000174	
R571	Chip, 680	2007-001119	
R572	Chip, 1K	2007-000140	
R581,R582.R583	OPEN_R	OPEN_R	
R584	Chip, 100K	2007-000162	
R585	Chip, 1K	2007-000140	
R586	Chip, 4.7K	2007-000143	
R587	Chip, 47K	2007-000157	
R588	Chip, 82K	2007-000161	
R589	Chip, 4.7K	2007-000143	
R590	Chip, 10K	2007-000148	
R591	Chip, 10K	2007-000148	
R592	Chip, 22K	2007-000153	
R593	Chip, 3.9K	2007-007001	
R594	Chip, 30	2007-001291	
R595	Chip, 10	2007-000172	
R596	Chip, 1K	2007-000140	
R597	Chip, 1.8K	2007-001320	
R603	Chip, 10K	2007-000148	
R604	Chip, 39K(1%)	2007-007134	
R606	Chip, 18	2007-001288	
R610,R611	Chip, 10K	2007-000148	
R612	Chip, 18	2007-001288	
R614	Chip, 33K	2007-000775	
R620	Chip, 1M	2007-000170	
R622	Chip, 18	2007-001288	
R631	Chip, 10K	2007-000148	
R633	Chip, 300(1%)	2007-007133	
R634	Chip, 10K(1%)	2007-007142	
R635	Chip, 1.2K(1%)	2007-007137	
R636,R637	Chip, 10K	2007-000148	
R638	Chip, 1.8K	2007-001320	
R642	Chip, 510	2007-002796	
R644	Chip, 150	2007-001306	
R654	Chip, 1K	2007-000140	
R655	Chip, 75	2007-007009	
R656	Chip, 75	2007-007009	
R665,R667,R669	Chip, 100	2007-000138	
R670	Chip, 510	2007-002796	
R671	Chip, 5.1K	2007-000144	
R680	Chip, 100	2007-000138	
R690	Chip, 3K	2007-001323	

NO	DESCRIPTION	SEC.CODE	REMARK
R691	Chip, 13K(1%)	2007-007131	
R692	Chip, 4.7K(1%)	2007-007136	
R693	Chip, 10K	2007-000148	
R694	Chip, 1.2K	2007-001319	
R695	Chip, 20K	2007-000152	
R710,R711	Chip, 1.2K	2007-001319	
R712,R713	Chip, 56K	2007-000159	
R740	Chip, 100K	2007-000162	
R750	Chip, 100K	2007-000162	
R751,R752	Chip, 1.2K	2007-001319	
R753,R754	Chip, 56K	2007-000159	
	- IC's -		
TH690	IC, Thermistor, NTH5G36B	1404-001040	
U100	IC, Data COMM,. MSM2.3	1205-001383	
U106	IC, Flash Memory	1107-001033	
U107	IC, SRAM, KM68V2000LTGI	1106-001130	
U108	IC, Eeprom, AT24C128W	1103-001062	
U110	IC, Voltage Regulator	1203-001468	
U120	IC, Voltage Regulator	1203-001335	
U130	IC, DC-DC CON, LTC1265	1203-001039	
U140	Display-LCD	GH07-20535A	
U160	IC, CMOS Logic, TC7S04F	0801-002192	
U310	IC, ASP, TLV320AC36IPTR	1204-001106	
U320	IC, TTL, 4W53, MUX	0803-003010	
U330	IC, Audio Amp, KA8602BD	1201-000103	
U331	IC, CMOS Logic, TC4S66F	1001-000133	
U340	IC, OP Amp, LMC7101AIM5	1201-001006	
U401	IC, Drive Amp, BFP420	0501-002096	
U403	IC, AGC Amp, 5500	1201-001075	
U404	IC, Drive Amp, AT31033	0501-000512	
U406	IC, Seperator, SLF080AL	4709-001113	
U407	Freq, Mixer, SLM170AL	4709-001103	
U408	IC, Drive Amp, BFP420	0501-002096	
U409,U411	IC, Drive Amp, AT31033	0501-000512	
U412	Freq, Mixer, GN2018	1201-001247	
U501	IC, AGC Amp, 5505	1201-001076	
U502	IC, SW-395, SWITCH	1001-001048	
U521	Freq, Mixer, MRFIC1813	1205-001267	
U522	IC, Drive Amp, BFP450	0501-002067	
U524	IC, Drive Amp, AT32011	0501-002060	
U542	IC, Freq Isolator	4709-001092	
U550	IC, Power Amp, RI21108U	1201-001329	

NO	DESCRIPTION	SEC.CODE	REMARK
U561	Freq, Mixer, UPC8106T1	1204-001013	
U562	IC, Drive Amp, UPC2771T1	1201-001009	
U563	IC, Drive Amp, AT32011	0501-002060	
U571	IC, Power Amp, UN00403	GH13-10568A	
U572	IC, Invertor, MAX829	1203-001366	
U581,U582	IC, OP Amp, LMC7101AIM5	1201-001006	
U600	IC, Data COMM,. BBA2	1205-001203	
U603	IC, SW-395, SWITCH	1001-001048	
U604	IC, TTL, 4W53, MUX	0803-003010	
U616	Oscillator, VCO(PCS)	2806-001022	
U640	IC, PLL Synthesis	1209-001128	
U660	Oscillator, VCO(FM)	2806-001146	
U680	Oscillator, VCTCXO	2809-001205	
U690	IC,BU4051BCFV, MUX/DEMUX	1001-001019	
U711	IC, CMOS Logic, TC7S04F	0801-002192	
U712,U713	IC, CMOS Logic, TC7S08F	0801-000303	
U741	IC, Voltage Regulator	1203-001501	
U742,U750	FET-S/W, SI9933ADY	0505-001170	
U751	IC, Voltage Regulator	1203-001501	
U752	FET-S/W, SI9933ADY	0505-001170	
U760	IC, PWR Splittor, STH03R	4709-001119	
X100	Resonator Ceramic, 27MHz	2802-001048	

11-1-2 Memory Board Assembly

NO	DESCRIPTION	SEC.CODE	REMARK
	- Capacitor -		
C220	Ceramic 0.1uF	2203-000189	
	- Connector -		
J210	60PIN CONN SOCKET	3710-001340	
	- Resistor -		
R220, R221	Chip, 10K	2007-000148	
	- IC's -		
U220	FLASH MEMORY MBM29LV800T	1107-001033	

11-2 Desk-Top Rapid charger

NO	DESCRIPTION	SPECIFICATION	QTY
	- Capacitors -		
C1	MP	250VAC 0.1UF M “X”	1
C2	Electrolytic	400V22uF 85’C 13X20	1
C3	MY	100V 0.0015uF J	1
C4	CHIP	0.22uF Z, 1206	1
C5	Electrolytic	16V 47uF, 5X7 85’C	2
C6	CHIP IC HYBRID	0.1uF Z, 0805 AH1511A	9 1
C7	CHIP	0.00047uF J, 1206	2
C8	Electrolytic	16V 330uF, 8X11.5 105’C	2
C9	Electrolytic	16V470uF, 10X12.5 105’C	2
C10	CHIP	0.00047uF J, 1206	2
C11	Electrolytic	10V 1000uF 105’C 10X16	1
C12	Electrolytic	16V 330uF, 8X11.5 105’C	2
C13	Ceramic	250VAC 222-Y1	1
C14~18	CHIP IC HYBRID	0.1uF Z, 0805 AH1511A	9 1
C19	Electrolytic	16V470uF, 10X12.5 105’C	2
C21~23	CHIP IC HYBRID	0.1uF Z, 0805 AH1511A	9 1
C24	Electrolytic	16V 47uf, 5X7 85’C	2
C26	CHIP	0.22uF Z, 0805	1
	-Diodes -		
D1	T.V.S DIODE	600W 200V +/-5% SOD-57	1
D2	DIODE UF	1KV 1A	1
D3	DIODE SW	75V 225MA, D0-35	1
D4, 5	DIODE SCHOTKY	5A 60V D0-201AD	2
D6, 7, 8	DIODE SCHOT	40V 1A, D0-41	3
	-Connectors -		
JP1	JUMP WIRE	0.6PHI 10mm	4
JP2	JUMP WIRE	0.6PHI 7.5mm	2
JP4	JUMP WIRE	0.6PHI 10mm	4
JP5	JUMP WIRE	0.6PHI 7.5mm	2

NO	DESCRIPTION	SPECIFICATION	QTY
JP6	JUMP WIRE	0.6PHI 10mm	4
JP7	CHIP	0.0HM F, MCR10	1
JP8, 9	CHIP	0.0HM J, MCR18	8
JP10, 11	JUMP WIRE	0.6PHI 12.5mm	3
JP12	JUMP WIRE	0.6PHI 10mm	4
JP13	CHIP	0.0HM J, MCR18	8
JP16, 17, 18	CHIP	0.0HM J, MCR18	8
JP21	CHIP	0.0HM J, MCR18	8
JP23	CHIP	0.0HM J, MCR18	8
JP24	JUMP WIRE	0.6PHI 12.5mm	3
	- Coils -		
L1	CHOKE ASS'Y	13PHI, 82Ts 0.4 M/M	1
L2, 3	CHOKE ASS'Y	DR6.5, 0.5-17.5TS	1
	- Resistors -		
R1	CHIP	6.2 OHM J, MCR18	1
R5, 6	CHIP	1 OHM F, MCR18	4
R8	CHIP	68 OHM J, MCR18	1
R11, 12	CHIP	1 OHM F, MCR18	4
R13	CHIP	1.5 KOHM F, MCR10	1
R14	CHIP	2.2 KOHM F, MCR10	1
R15, 16	CARBON RESISTOR	1/4W 4.7M OHM	2
R17	CHIP	470 OHM J, MCR18	1
R18	CHIP	10K OHM J, MCR10	1
	- Miscellaneous -		
1CARTON=1/40	CARTON BOX		0.025
1CARTON=1/40	PAD VINYL SACK	3PO-233A, (CP-RC800) 4PO-393, 170X350X. 05	0.020 1
1CARTON=2/40	MAIN BOARD		0.050
1CARTON=6/40	CARD BOARD(B)		0.150
1CARTON=12/40	CARD BOARD(A)		0.300
BD1	DIODE BRDG	600V 1A, DB TYPE	1

NO	DESCRIPTION	SPECIFICATION	QTY
BOTOM & TOP	SCREW	VH, T2. 6X12(2W), BLK	4
	BAT. CONTACT	4P, SMALL (DTC10)	1
	BAT. CONTACT	4P, LARGE (DTC10)	1
	HEAT SINK	4PO-396A	1
	SCREW	BH, M3X5, B/Z	1
CASE BOTTOM	BUMPON	10X1.6T	4
CASE TOP	LABEL	4LO-210A, GATE	1
	LABEL	4PL315A0, (DTC57)	1
CON1	CONN. HEADER	2PIN	1
CON1 (INPUT)	AC POWER CORD	3PH113A0, (DTC58)	1
	BATTERY HOUSING	2PO-096, (DTC57)	1
	CASE BOTTOM	(DTC57)	1
	CASE TOP ASS'Y		1
	HOOK ASY (LEFT)	4PO-374 (RC100)	1
	HOOK ASY (RIGHT)	4PO-375 (RC100)	1
F1	MICRO FUSE	250VAC 1A/TR5-T, TUV	1
HOUSING & TOP	SCREW	VH, T3X8, BLK	3
HOOK & HOUSING	SCREW	VH, T2. 6X6 (2W), BLK	4
IC1	IC PWM P/S	220VAC, 3PIN	1
IC3	IC V. REF	36V 100MA 1%	1
IC7	IC OPTO	32V, 50mA, 4pin 55V, 60mA, 4pin, GB	1
LED1, 2	LED ASS'Y	4PO-371A	2
	LED	RECT, 5X2, (RED/GRN)	1
LF1	LINE FILTER	UU9.8 125Ts	1
MOV1	VARISTOR M.O.V	300V 3KA `VDE' 300V, PHI 12	1
PTF1	DTC58 TRANS	MAIN TRANS ASS'Y	1
Q1, 2, 3	TRANSISTOR	SOT-89	3
SK1	CONN. HEADER	4PIN (5267-04A)	1
SK2	CONN. HEADER	3PIN (5267-03A)	1
TH1	THERMISTOR	10K OHM/25'C	1
U10	MICOM IC	PIC16C72, 28PIN SOP	1
	P.C.B	DTC57 PCB(CEM-1 1.2T)	1
VR1	SEMI-FIXED RES	1K OHM 20% TOP	1

11-3 Hands-Free Kit

NO	DESCRIPTION	SPECIFICATION	QTY
	- Capacitors -		
C1		Ceramic 104 Z	14
C2		Ceramic 332 Z	2
C3		Ceramic 471 Z	2
C4, 5		Ceramic 104 Z	14
C6		Ceramic 332 Z	2
C7		Ceramic 104 Z	14
C8		Ceramic 102 Z	7
C9		Ceramic 224 Z	5
C10		Ceramic 222 Z	1
C11		Ceramic 471 Z	2
C12		Ceramic 224 Z	5
C13		Ceramic 102 Z	7
C14, 15		Ceramic 104 Z	14
C16, 17		Ceramic 473 Z	3
C18		Ceramic 102 Z	7
C19, 20		Ceramic 104 Z	14
C21		Ceramic 472 Z	1
C22		Ceramic 224 Z	5
C23		Ceramic 104 Z	14
C24		Ceramic 100Z	
C25		Ceramic 304 Z	2
C26		Ceramic 223 Z	1
C27		Ceramic 304 Z	2
C28, 29		Ceramic 224 Z	5
C30		Ceramic 473 Z	3
C31, 32, 33		Ceramic 102 Z	7
C34		Ceramic 103 Z	1
C35, 36, 37, 38		Ceramic 100Z	
C39		Ceramic 102 Z	7
C40, 41	2012	Ceramic 470 Z	2
	- Connectors -		
CON1	HIROSE20	HIROSE20	1

NO	DESCRIPTION	SPECIFICATION	QTY
CON2	MJ-25-1	MJ-25-01	1
CON4	HIROSE13	HIROSE13	1
	- Diodes -		
D1	AXIAL	P6KE39A	1
D2	CHIP	IN5819(SS-14)	2
D3, 4	CHIP	LL4004 M4	2
D5	CHIP	IN5819(SS-14)	2
D6	1/2W CHIP	ZENER DIODE 5.1V	3
D7, 8	CHIP	LL4148MELF	2
D9~14	1/2W CHIP	ZENER DIODE 6.2V	6
D15, 16	1/2W CHIP	ZENER DIODE 5.1V	3
	- Transistors -		
Q1	TO-126	KSB1151Y	3
Q2	SOT-23	KSR1101 MTF	1
Q3	SOT-23	KST3906 MTF	1
Q4	TO-126	KSB1151Y	3
Q5	SOT-23	KSR1109MTF(KRC110S)	1
Q6	SOT-23	KSR1102 MTF	1
Q7	TO-126	KSB1151Y	3
Q8	SOT-23	KSR1103 MTF	1
Q9	SOT-23	KSR1110	1
Q11, 12	SOT-23	KSR1104 MTF	4
Q13	DIP	IRFU9024	1
Q14, 15	SOT-23	KSR1104 MTF	4
	- Resistors -		
R1		Chip 200, 1/4W	3
R2	3216	Chip 100, 1/4W	2
R3, 4		Chip 390, 1/4W	4
R5, 6, 7, 8, 9	0805	Chip 1 OHM	11
R10		Chip 300 OHM	1
R11		Chip 6.2K OHM	1
R12		Chip 3.9K OHM	8
R13		Chip 10K OHM	12

NO	DESCRIPTION	SPECIFICATION	QTY
R14		Chip 2.2K OHM	1
R14+		Chip 1K OHM	6
R14++		Chip 15K OHM	3
R15		Chip 200, 1/4W	3
R15+		Chip 5.1K OHM	5
R15+++		Chip 100K OHM	5
R16		Chip 5.1K OHM	5
R17, 18, 18+, R18++, 19	0805	Chip 1 OHM	11
R20		Chip 200, 1/4W	3
R21	3216	Chip 100, 1/4W	2
R22, 23		Chip 390, 1/4W	4
R24		Chip 51K OHM 1%	1
R25		Chip 10K OHM 1%	1
R26		Chip 220 OHM	1
R27, 28		Chip 2K OHM	3
R29		Chip 5.6K OHM	2
R30		Chip 10K OHM	12
R31		Chip 7.5K OHM	2
R32		Chip 100K OHM	5
R33		Chip 3.9K OHM	8
R34		Chip 7.5K OHM	2
R35		Chip 56K OHM	2
R36		Chip 3.9K OHM	8
R37		Chip 8.2K OHM	3
R38		Chip 15K OHM	3
R39		Chip 27K OHM	2
R40		Chip 62K OHM	1
R41		Chip 120K OHM	2
R42		Chip 240K OHM	1
R43		Chip 510K OHM	1
R44		Chip 8.2K OHM	3
R45		Chip 3.9K OHM	8
R46, 47		Chip 150k OHM	4
R48		Chip 56K OHM	2
R49, 50, 51		Chip 20K OHM 1%	4

NO	DESCRIPTION	SPECIFICATION	QTY
R52		Chip 240K OHM	1
R53		Chip 20K OHM 1%	4
R54		Chip 51K OHM	2
R55		Chip 10K OHM	12
R56		Chip 68K OHM	2
R57		Chip 120K OHM	2
R58		Chip 39K OHM	1
R59		Chip 82K OHM	1
R60		Chip 5.6K OHM	2
R61		Chip 3K OHM	4
R62		Chip 8.2K OHM	3
R63		Chip 3K OHM	4
R64		Chip 240K OHM	1
R65		Chip 3K OHM	4
R66		Chip 10K OHM	12
R67		Chip 30K OHM	3
R68		Chip 75K OHM	1
R69		Chip 200K OHM	1
R70		Chip 500K OHM	1
R71		CHIP 1.3M OHM	1
R72		Chip 2K OHM	3
R73		Chip 16K OHM	1
R74		Chip 240K OHM	1
R75		Chip 15K OHM	3
R76		Chip 5.1K OHM	5
R77		Chip 20K OHM	4
R78		Chip 30K OHM	3
R79		Chip 100K OHM	5
R80		Chip 1K OHM	6
R81	0805	Chip 1 OHM	11
R82, 83		Chip 150k OHM	4
R84		Chip 5.1K OHM	5
R85		Chip 100K OHM	5
R86		Chip 240K OHM	1
R87		Chip 3K OHM	4
R88		Chip 51K OHM	2

NO	DESCRIPTION	SPECIFICATION	QTY
R89		Chip 4.3K OHM	1
R90	POTENTIONMETER	4.7K	1
R91, 92		Chip 100K OHM 1%	2
R93, 94, 95		Chip 10K OHM	12
R96		Chip 1K OHM	6
R97		Chip 27K OHM	2
R98		Chip 10K OHM	12
R99		Chip OHM	
R100		Chip 100K OHM	5
R101		Chip 68K OHM	2
R102, 103, 104		Chip 20K OHM	4
R106		Chip OHM	
R107		Chip 30K OHM	3
R108		Chip 5.1K OHM	5
R109, 110		Chip OHM	
R113, 114, 115		Chip 1K OHM	6
	- IC's -		
U1	SOP-8	LM2904	1
U2	SOP-8	LM2903	1
U3	SOP-8	NJM2360M	1
U4, 5	TO-92W	KIA78L05BP	2
U6	SOP-14	LM2902	2
U7	SOP-16	MC14051	2
U8	SOP-14	LM2902	2
U9	DIL-16	TDA1905	1
U10	SOP-16	MC14051	2
U11	DIL-28	PIC16C73	1
	- Miscellaneou -		
CABLE ASS'Y	DATA CABLE ASS'Y CURL CORD ASS'Y 2PIN HARNESS ASS'Y MIC ASS'Y POWER CABLE ASS'Y	SCH-300 DATA CABLE 66dB FUSE(125V 1.5A)	1 1 1 1 1
E1, 2	10X16	CAP 470u/35V	2
E3	8X11.5	CAP 470u/16V	4

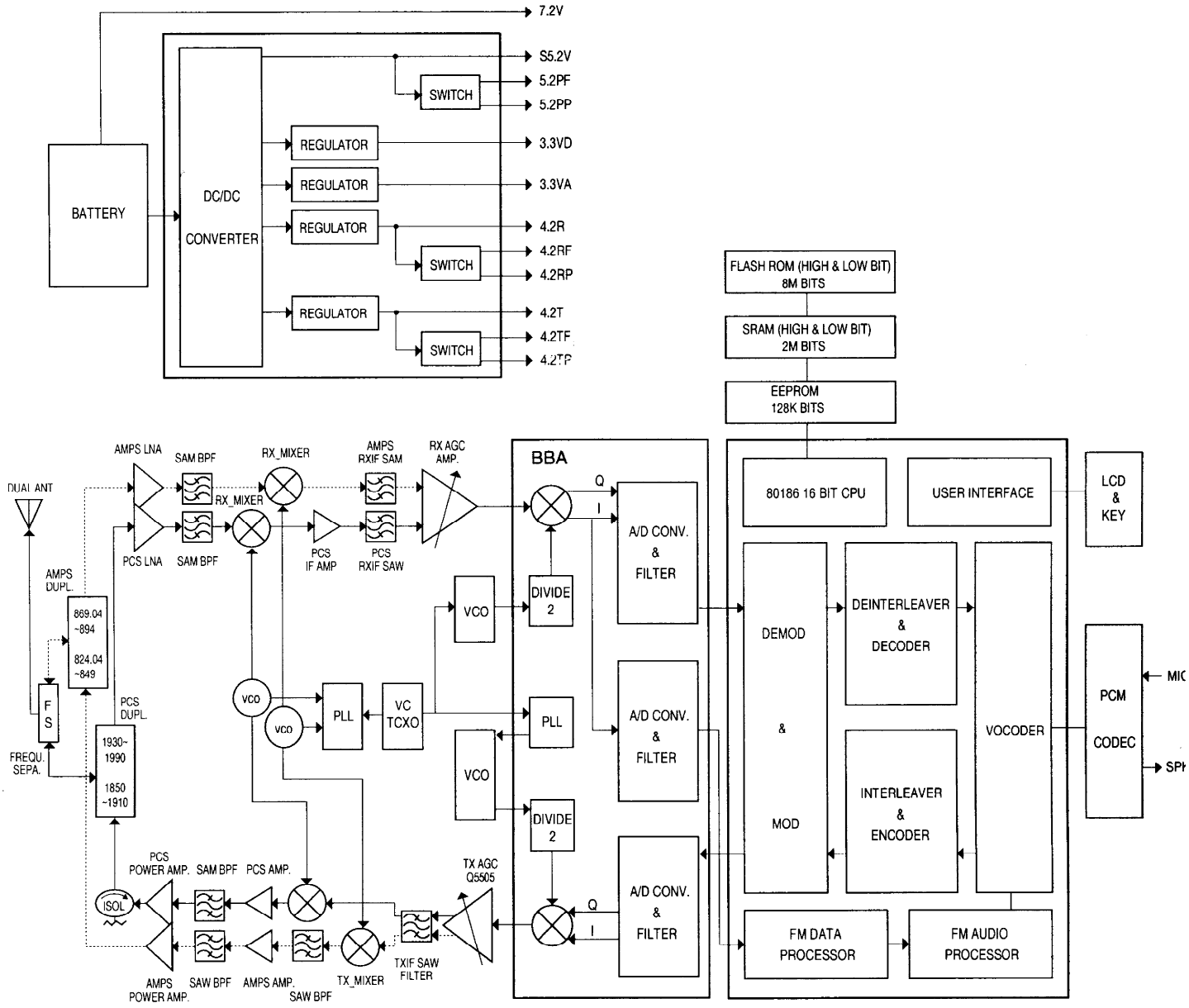
NO	DESCRIPTION	SPECIFICATION	QTY
E4	5X11	CAP 4.7u/50V	1
E5	5X11	CAP 1u/50V	2
E6	5X11	CAP 10u/16V	3
E7	8X11.5	CAP 470u/16V	4
E8	5X11	CAP 1u/50V	2
E9	5X11	CAP 100u/10V	1
E10,11	5X11	CAP 10u/16V	3
E12	5X11	CAP 4u7/8V	1
E13	8X11.5	CAP 470u/16V	4
E14	5X11	CAP 47u/16V	1
E15	8X11.5	CAP 470u/16V	4
E16	5X11	CAP 22u/16V	1
IC SOCKET		28P	1
INTERFACE Ass'y			
	LOGO STICKER		1
	COVER TOP		1
	COVER BOTTOM		1
	GRILL SPEAKER		2
	BRACKET	PC	1
	SCREW	PH2 3 x 12B	4
	SCREW	TH1 4 x 20B	4
	LABEL (HFB21)	PH2 3 x 12B	1
	PLATE SHIELD	AL 0.5T	1
	SPONGE	PI 15 x 5T	2
L3, 4	L TYPE (13PIE)	COIL 400uH	2
PCB	127X86X1.6T FR4		1
SPEAKER		4 ohm/3W	1
	WAFER 2PIN(2.54mm)	STRAIGHT	1
X1	X-TAL	3.6864MHz	1

11-4 Cradle

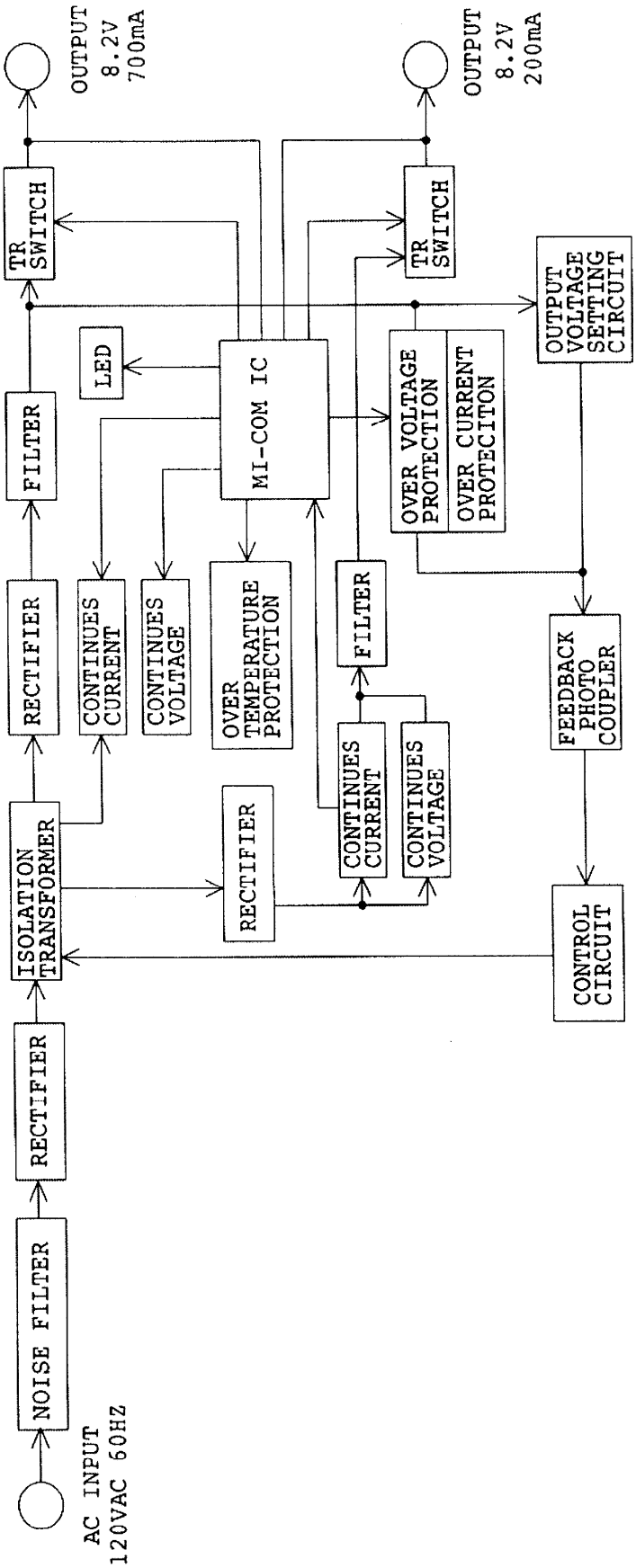
NO	DESCRIPTION	SPECIFICATION	QTY
	- Capacitors -		
C1	0805	Ceramic 221 Z	1
C2, 3, 4, 5		Ceramic 103 Z	4
	-Transistors -		
Q1, 2, 3	SOT-23	KSR1104	3
	- Resistors -		
R1		Chip 1K OHM	3
R2		Chip 12K OHM	1
R4		Chip 1K OHM	3
R5	0805	Chip 1.5K OHM	1
R6		Chip 1K OHM	3
R7		Chip 220 OHM	1
	- Miscellaneou -		
HJ3	LEDCON	SAM5270	1
J1	PHOTO INTERRUPT	SG-215	1
PCB	53.1X1.6T FR4		1
TH1	THERMISTER	10K -J	1
U$3	WAFER R/ANGLE	15p-2mm	1
U$15	WAFER R/ANGLE	12p-2mm	1

12. Block & Circuit Diagrams

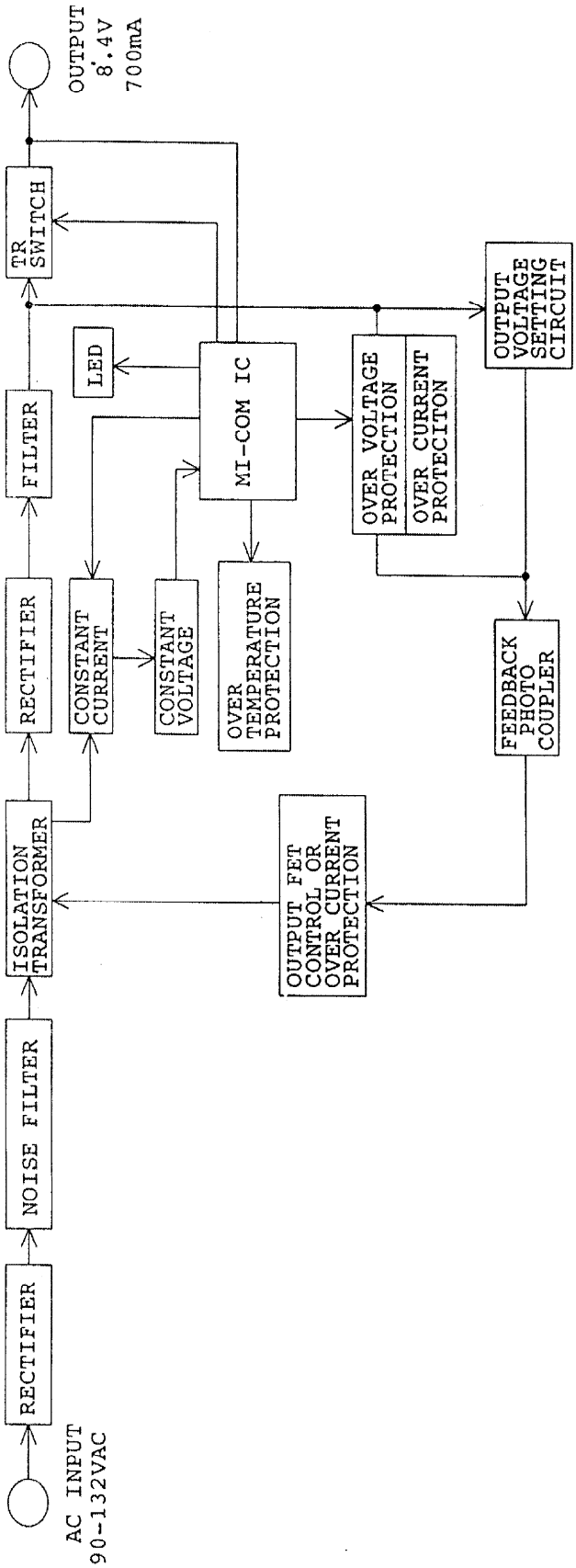
12-1 Main Block Diagram



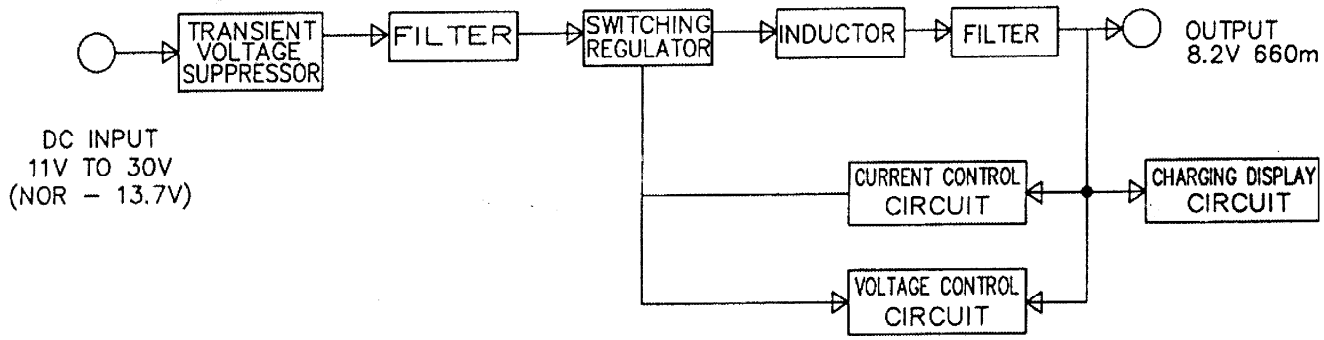
12-2 Desk-Top Rapid Charger Block Diagram



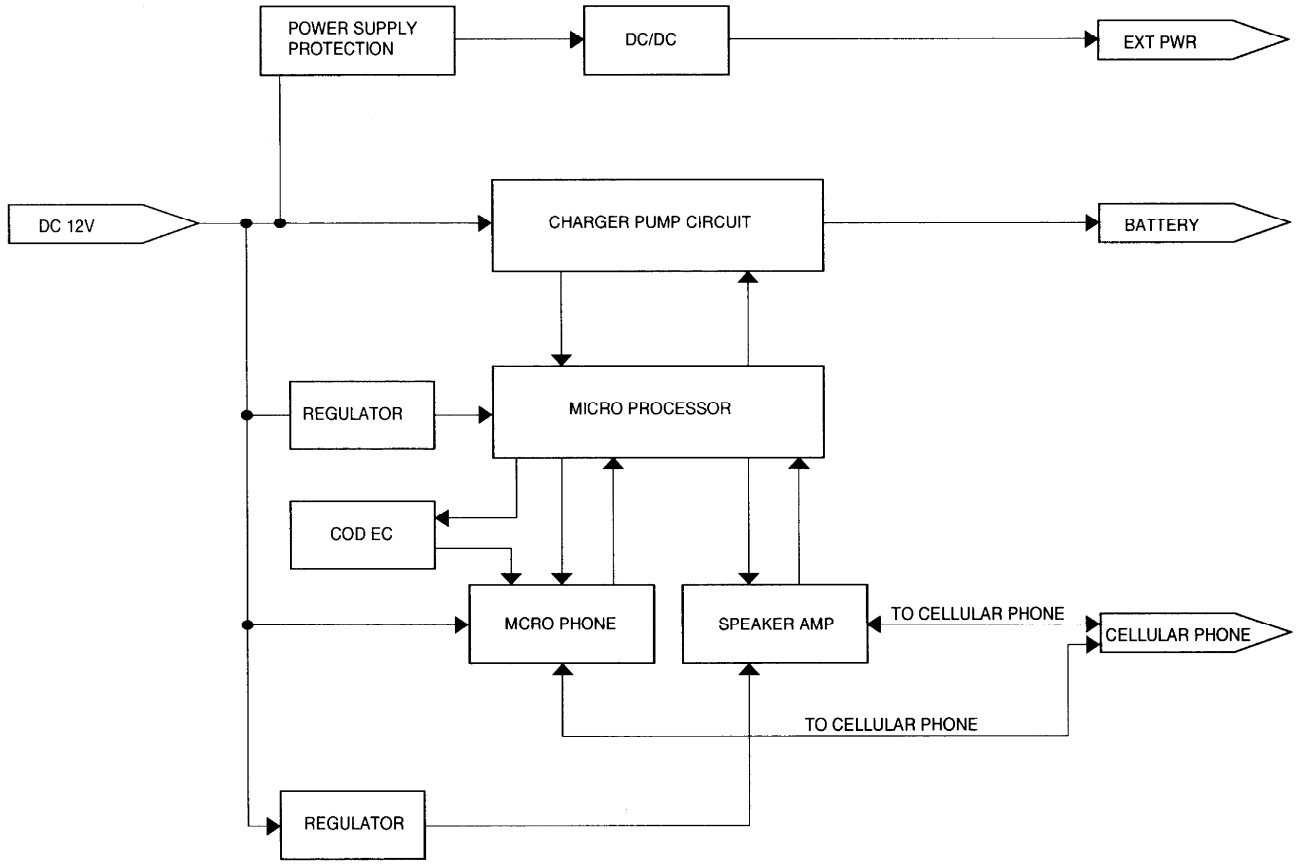
12-3 Travel Charger Block Diagram



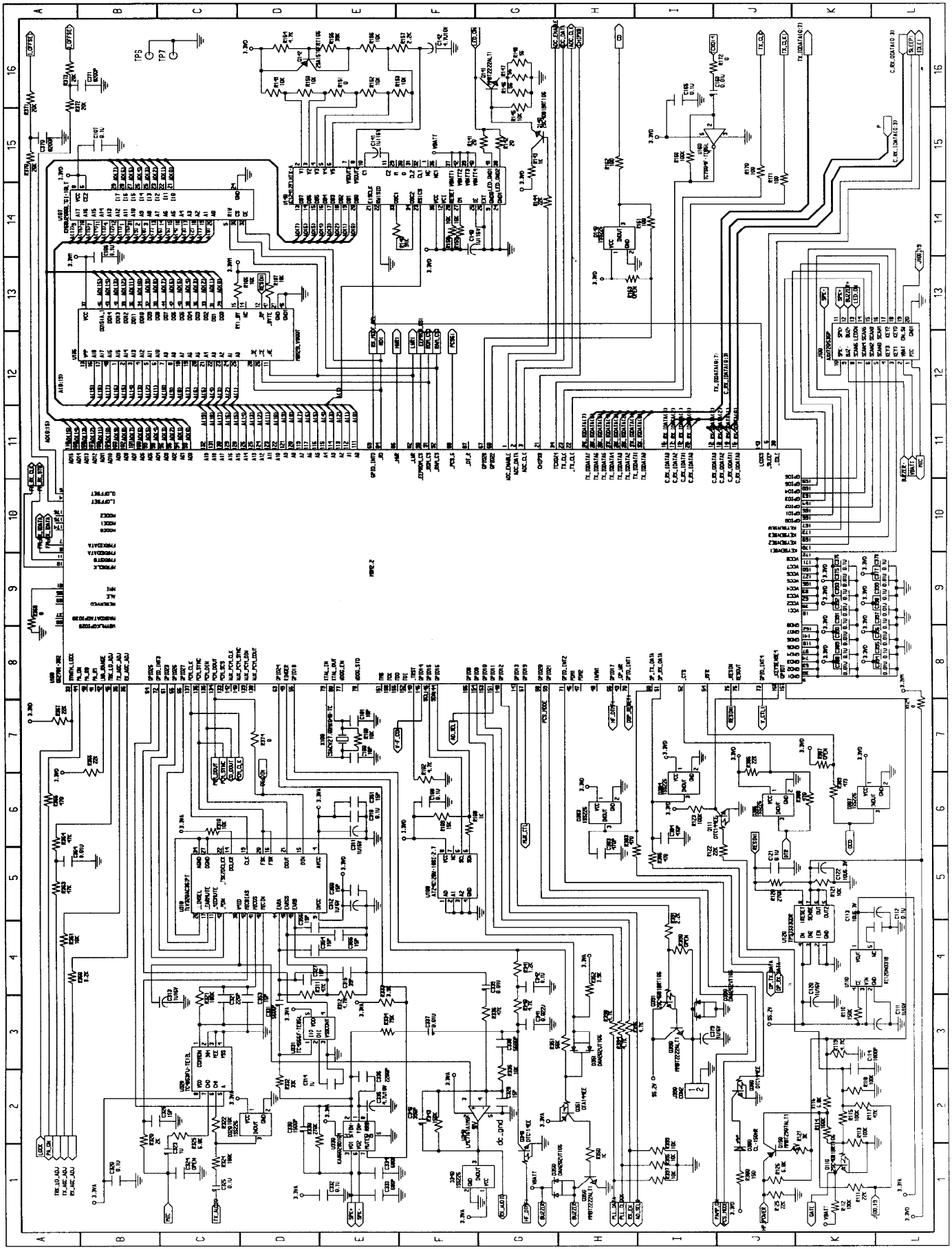
12-4 Cigarette Lighter Adaptor Block Diagram

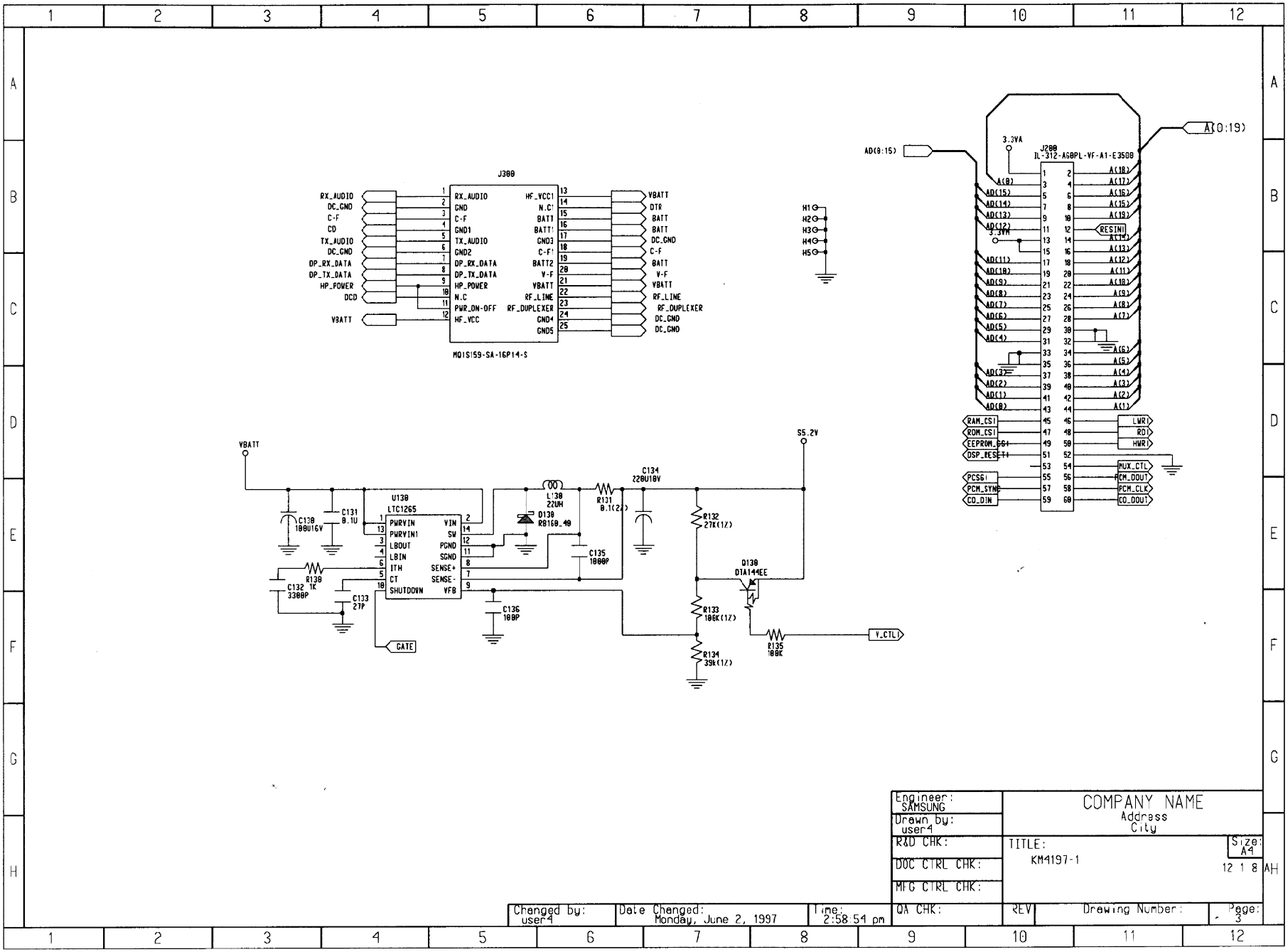


12-5 Hands-Free Kit Block Diagram



12-6 Logic Circuit Diagram (REV : 2.1)



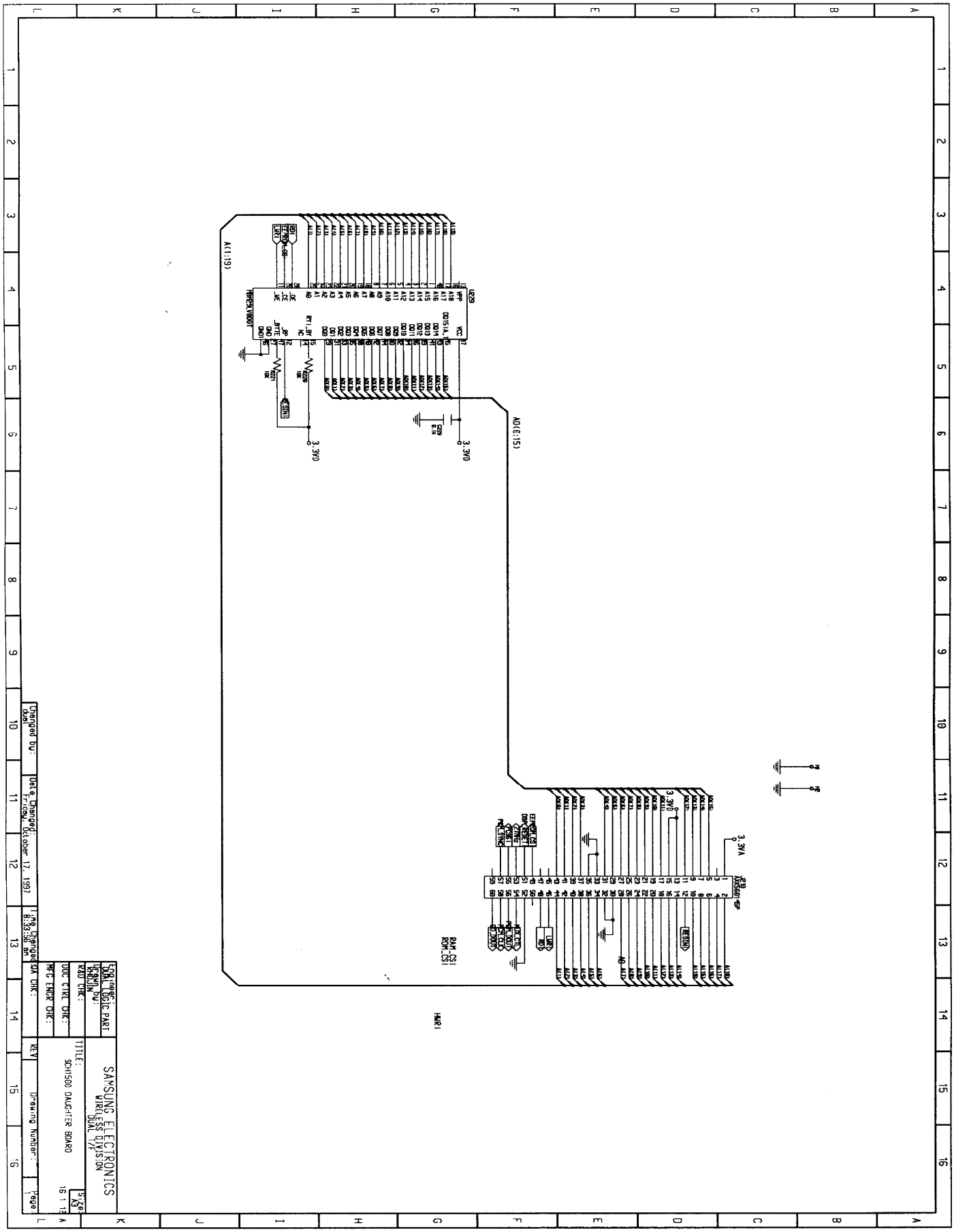


1	2	3	4	5	6	7	8	9	10	11	12

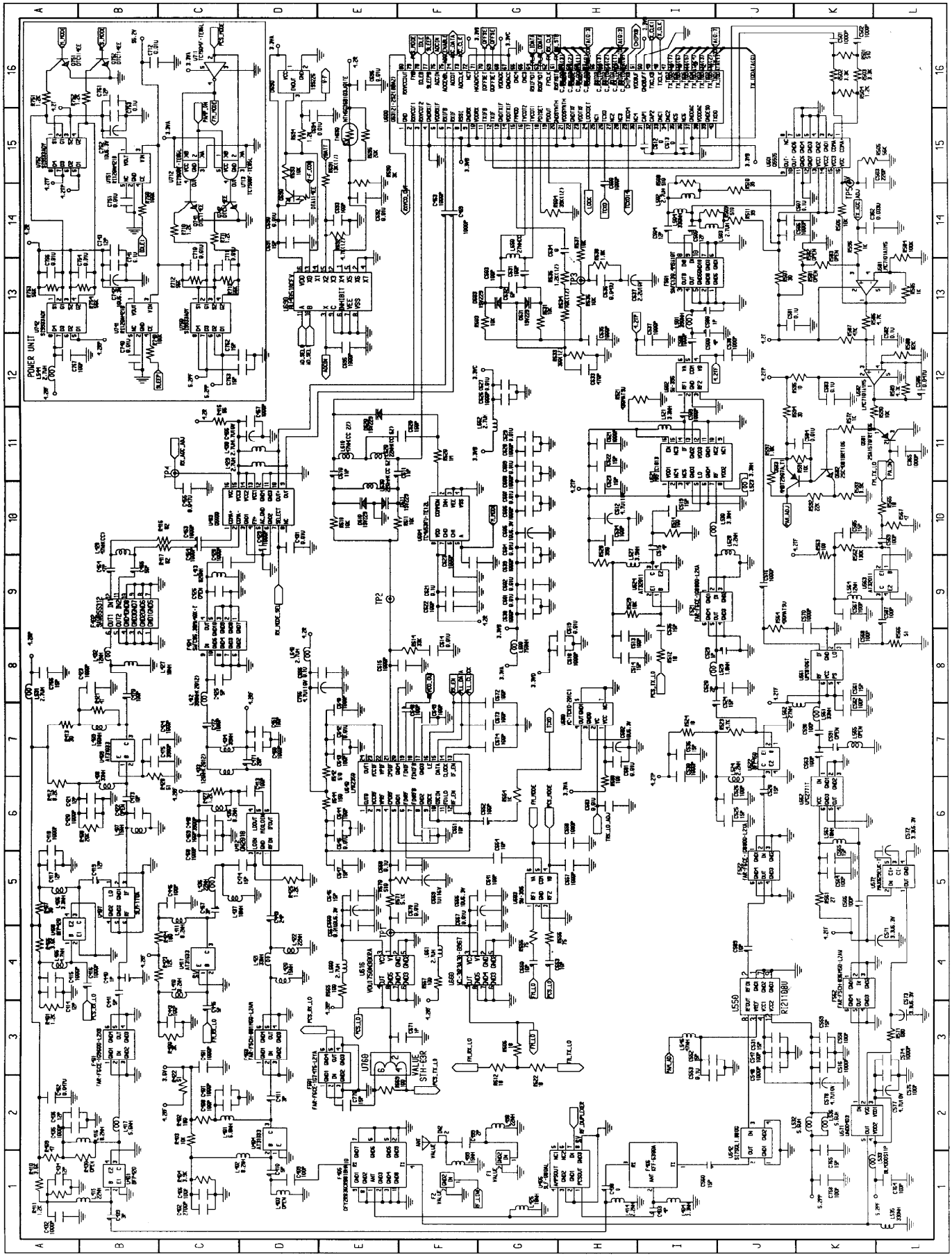
Engineer: SAMSUNG	COMPANY NAME Address City
Drawn by: user4	
R&D CHK:	TITLE: KM4197-1
DOC CTRL CHK:	Size: A4
MFG CTRL CHK:	12 1 8
QA CHK:	REV / Drawing Number: / Page: 3

Changed by:	Date Changed:	Time:
user4	Monday, June 2, 1997	2:58:54 pm

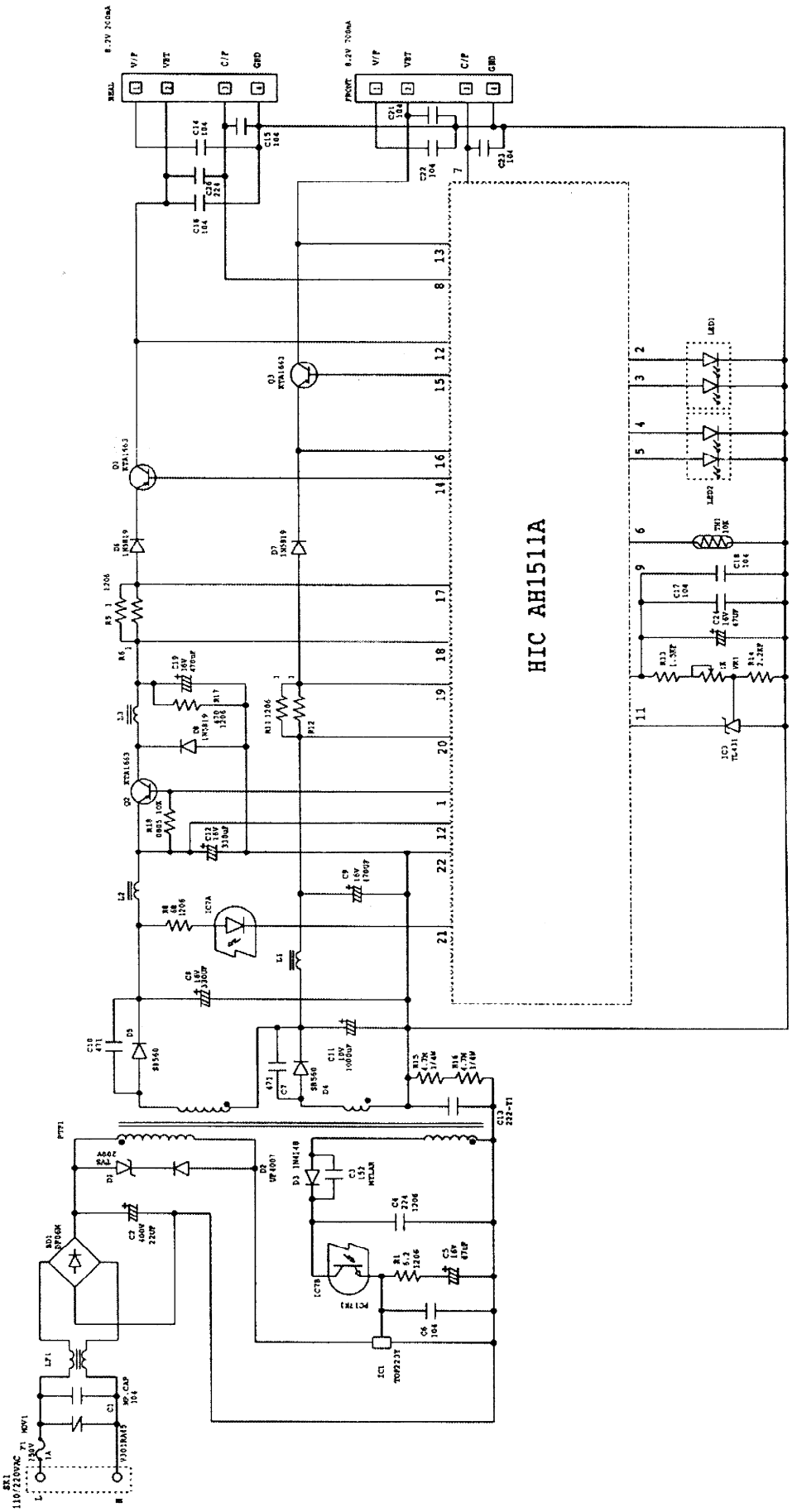
12-7 Memory Board Circuit Diagram (REV : 2.0)



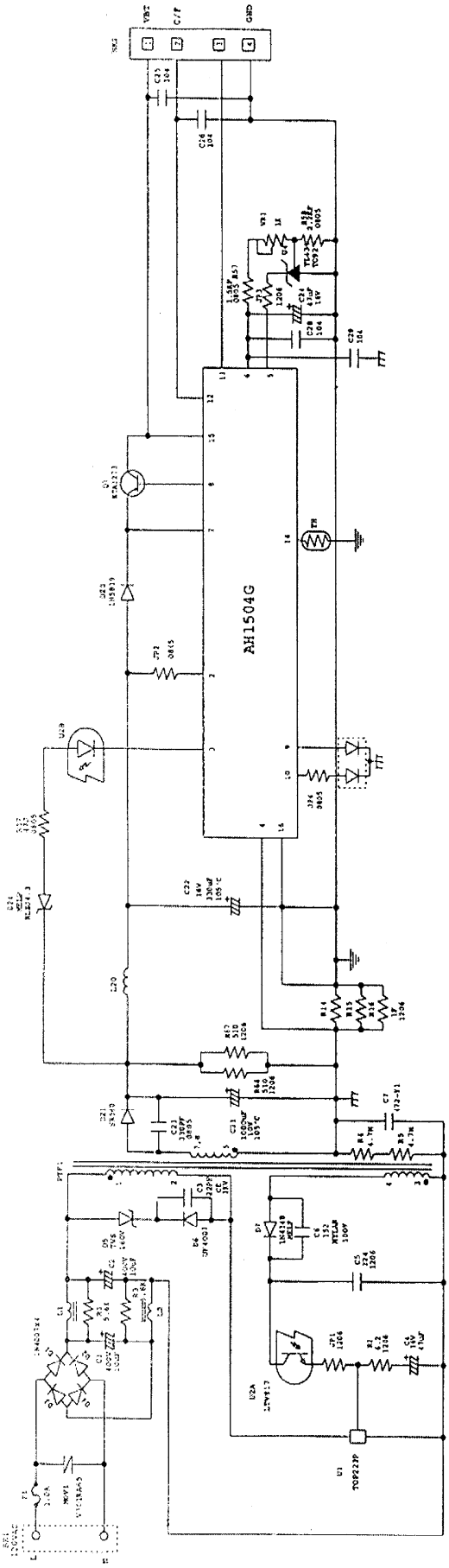
12-8 RF Circuit Diagram (REV : 2.1)



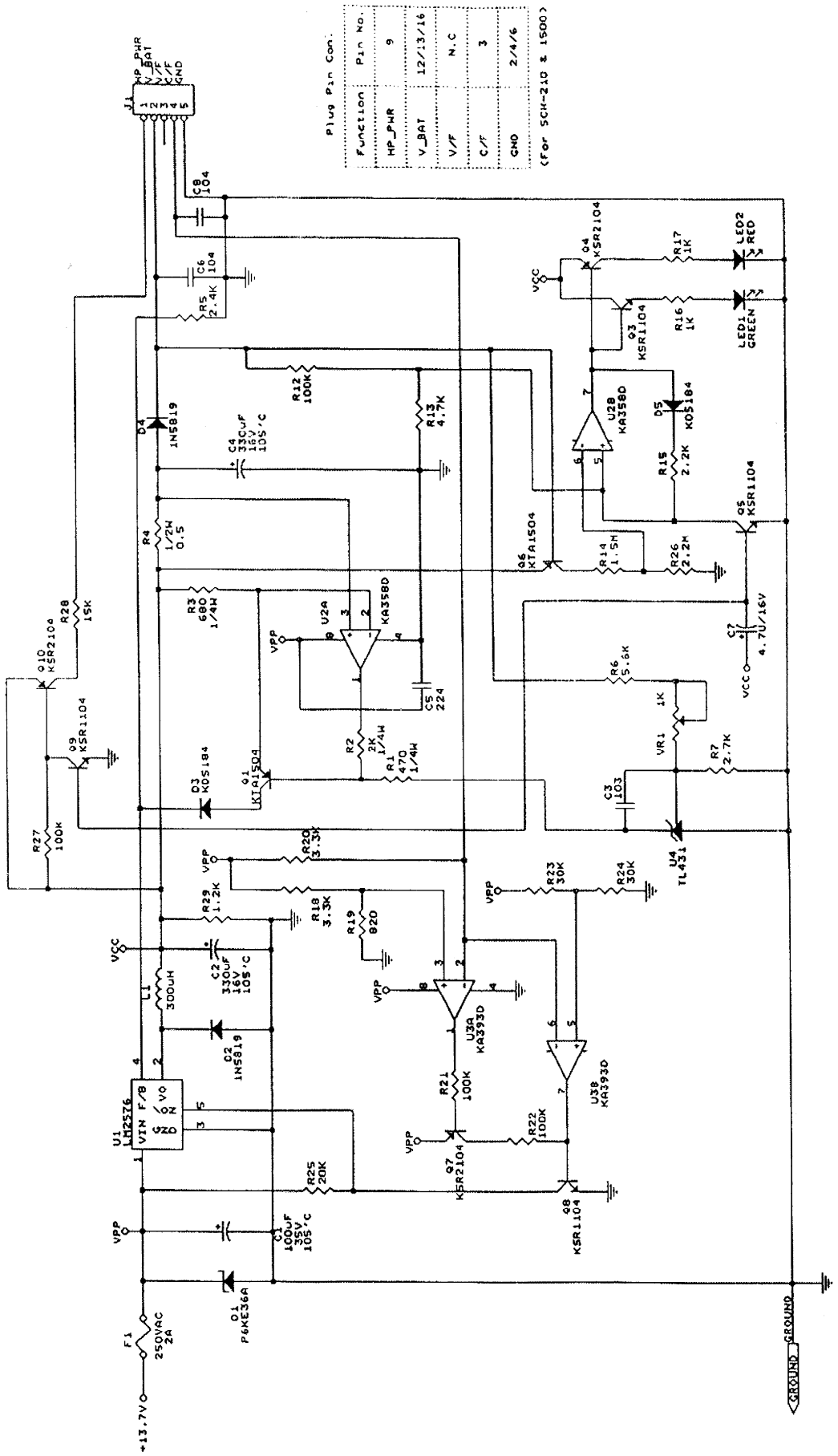
12-9 Desk-Top Rapid Charger Circuit Diagram



12-10 Travel Charger Circuit Diagram

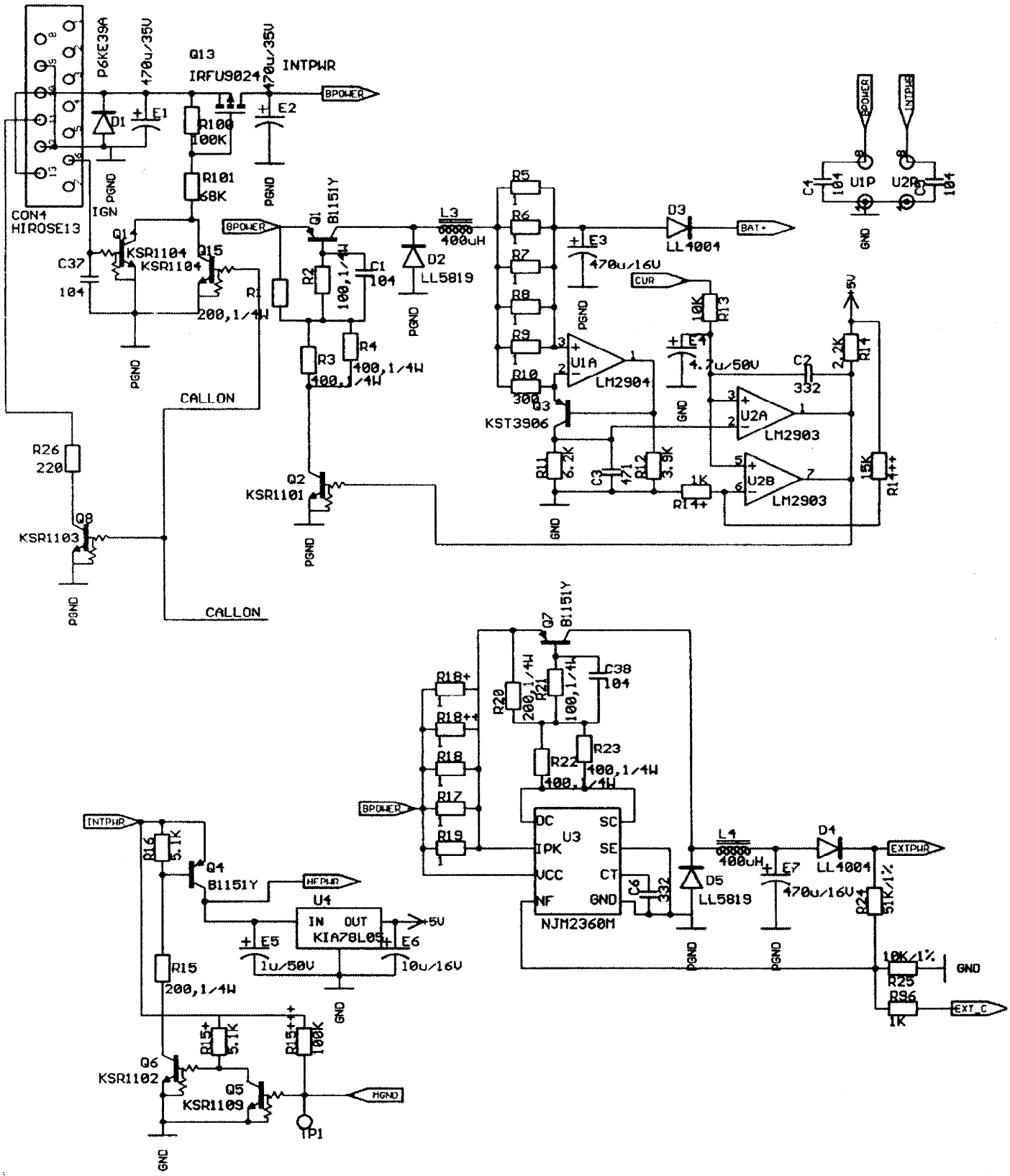


12-11 Cigarette Lighter Adaptor Circuit Diagram

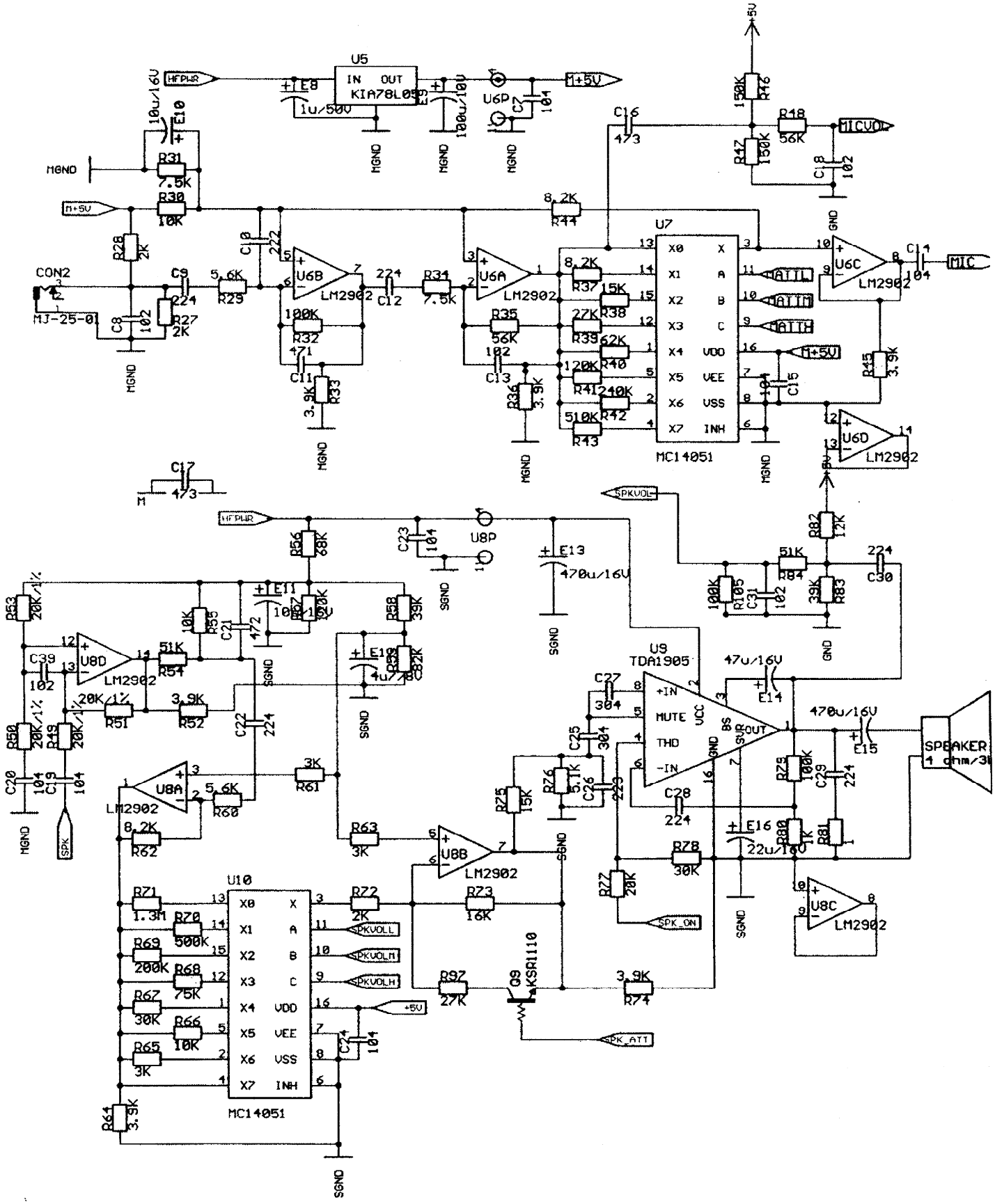


12-12 Hands-Free Circuit Diagram

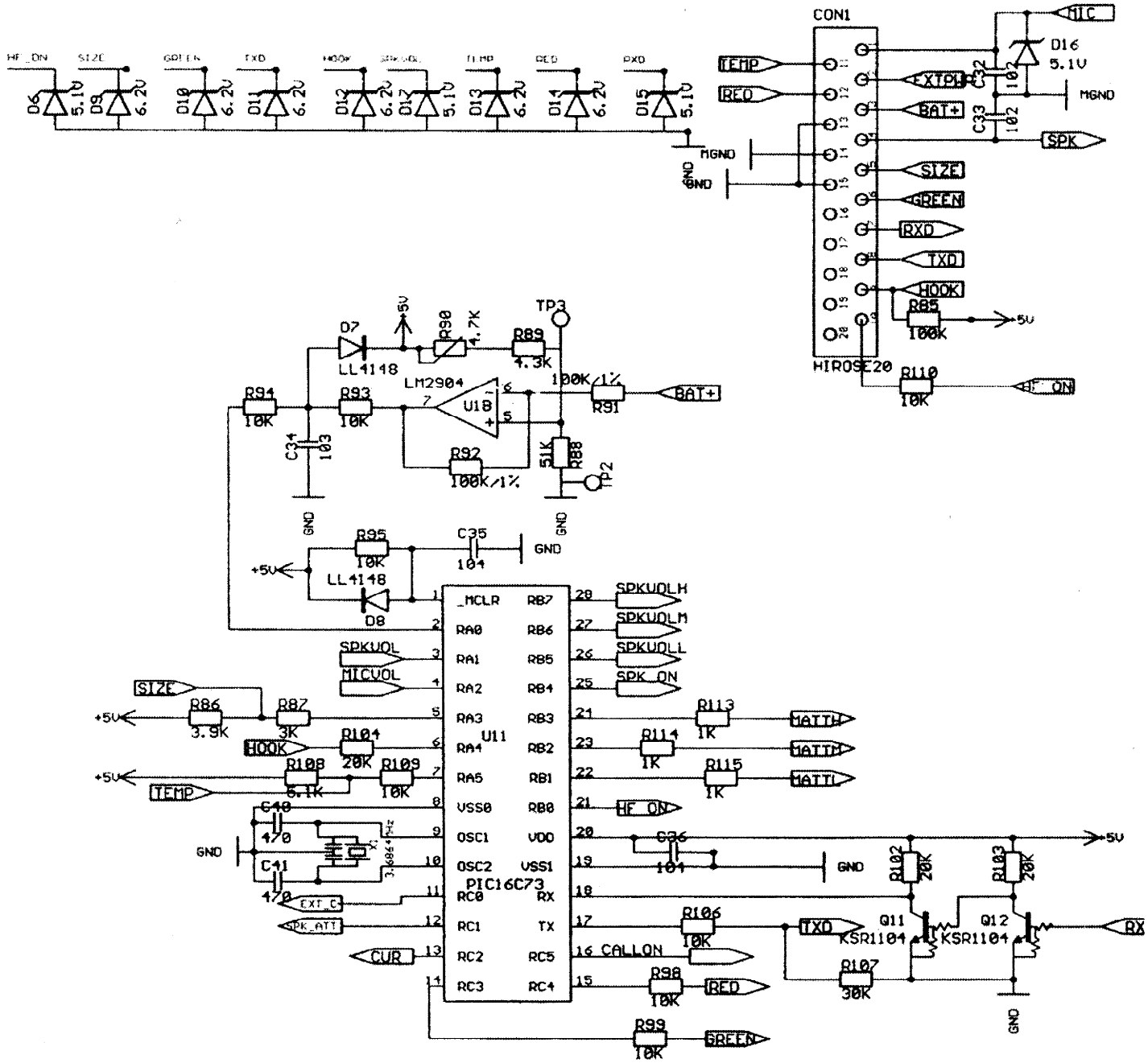
12-12-1 Power Supply



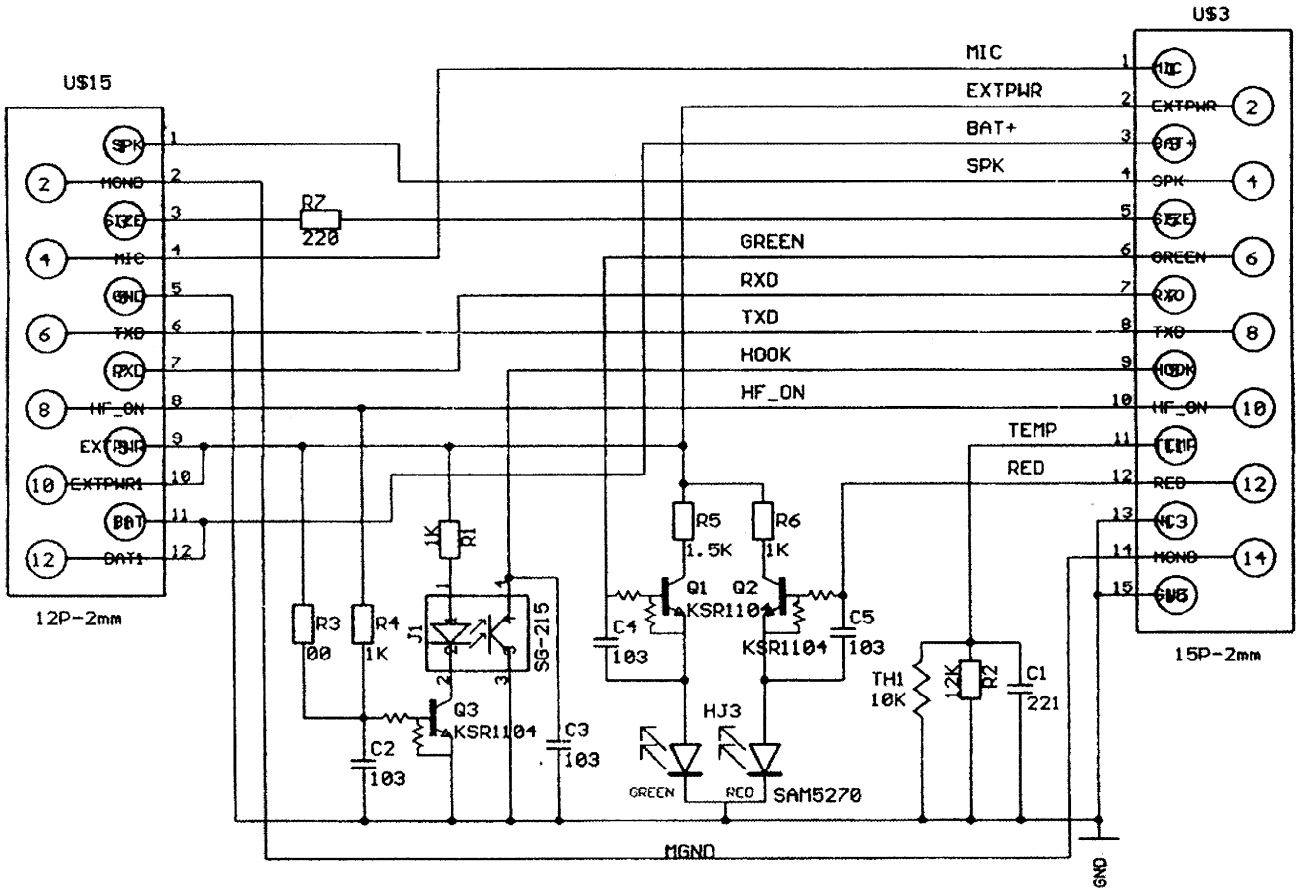
12-12-2 Audio Amp.



12-12-3 Comm. & Cont.



12-13 Cradle Circuit Diagram



Memo