

# **GSM PHONE SERVICE MANUAL**

**MODEL : VG207**



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# 1. Introduction

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VG207 is a folder type mobile phone with color LCD, operated in the GSM Digital Cellular Mobile Radio System, which is the Pan-European mobile cellular standard.

VG207 has the operation band of GSM 900 and DCS 1800. GSM Phase II features are fully supported and parts of the GSM Phase II+ features are also supported.

About the SIM Toolkit, VG207 supports up to Class 3 including Class 1, 2. For speech communication, VG207 supports Full Rate(FR), Enhanced Full Rate(EFR) and Half Rate(HR). For easy text, eZi Text is implemented and WAP protocol is adopted for internet connection.

## 2. Specification

### 2.1 HW Features

| Item                           | Description  | Remark   |
|--------------------------------|--|--|
| Supporting standard            | GSM 900/DCS 1800 (Dual Band)<br>E-GSM<br>Phase 2 and Phase 2+<br>SIM Toolkit : Class 1,2,3                             |  |
| Frequency range                | E-GSM TX : 880 - 915 MHz<br>E-GSM RX : 925 - 960 MHz<br>DCS 1800 TX : 1710 - 1785 MHz<br>DCS 1800 RX : 1805 - 1880 MHz |  |
| Battery                        | 1. Capacity<br>Standard : Li-ion, 720 mAh<br>Slim : Li-ion, 620 mAh  |  |
| Display                        | Full graphic type<br>Dual LCD<br>-Main LCD<br>-Ext. LCD  | UFB-65K Color, Pixels : 128 x 96<br>Mono-B/W, Pixels : 80 x 48     |
| 7 Color LED                    | Built-in   | Incoming Indicator x 3 pcs   |
| Antenna                        | Fixed type   |  |
| PC synchronization             | Applied  |  |
| Speech coding                  | FR, EFR, HR  |  |
| Data & Fax                     | Built-in   |  |
| Vibrator                       | Built-in   |  |
| Speaker+Receiver               | Unified Type   | Applied (4pole)  |
| Portable Handsfree (Ear-Phone) | Built-in   |  |
| Travel charger                 | Built-in   |  |
| Options                        | Cigarette Lighter Adapter<br>Data communication kit<br>Battery Charger   | Some optional items may be<br>basic items depending on<br>country. |
| Melody Chip                    | Yamaha   | 40Poly   |
| Flash Memory                   | Flash : 128 Mbits<br>RAM : 32 Mbits  |  |

## 2.2 SW Features

| Function               | Detail Item           | Comments   |
|------------------------|-----------------------|--|
| Normal features        | Last dialed number    | 20 entry   |
|                        | Last received number  | 10 entry   |
|                        | Last missed number    | 10 entry   |
|                        | Scratch pad memory    | 1  |
| Call                   | Call waiting Yes      | (network dependent)  |
| Audio                  | Earpiece volume       | 5 level  |
|                        | Mute on & Mute off    | Yes  |
| Cell broadcast         | CB option             | On / Off   |
| Phone Book             | Read topics           | SIM / Phone  |
| Languages              | S/T Chinese & English | Available other language   |
| Supplementary services | Call barring          | All calls<br>All outgoing calls<br>All outgoing international calls<br>All outgoing int. calls except to home country<br>All incoming calls<br>All incoming calls when roaming |
| Short Message          | Write message         | Send/Store   |
|                        | Output message        | Send/Save/Extract Number/<br>Delete/Delete All   |
|                        | Input message         | Reply/Forward/Extract number/<br>Delete/Delete All   |
|                        | Status report         | Delete/Delete All  |
|                        | Call voicemail        |  |
|                        | Cell broadcast        | CB Option(On/Off)/Read<br>Topics(SIM/Phone)/Languages  |

| Function               | Detail Item  | Comments   |
|------------------------|--|--|
|                        | Memory status  |  |
|                        | Settings   | Status report/Message type<br>Expiry period/SMS center<br>Voice center/Alert |
| Multi-band             | Support of multi-band & mode   | GSM 900<br>EGSM<br>DCS1800   |
| Miscellaneous function | Development & test facility  |  |
|                        | Field test facility  |  |
|                        | Display software version   |  |
| Text input             | Language   | English<br>Simplified Chinese<br>Traditional Chinese                         |
|                        | eZi text   | Predictive word input  |
| Scheduler              | View day   |  |
|                        | Make   | Schedule<br>Call<br>Memo<br>Anniversary                                      |
|                        | Delete   |  |
|                        | View all   |  |
| WAP                    | Built in   | WAP 1.2.1  |
| World time             | Setting local time   |  |
|                        | Number of selectable cities  | 61 Cities  |
| Calculator             | Operator   | Addition<br>Subtraction<br>Multiplication<br>Division                        |
| Unit converter         | Length conversion<br>Weight conversion<br>Volumes conversion<br>Surface conversion |  |

| Function      | Detail Item                                 | Comments                         |
|---------------|---|----------------------------------|
| Pink schedule |   |                                  |
| Bio Rhythm    | View<br>with Friend<br>Special day<br>Input | My Birthday<br>Friend's Birthday |
| Game          | 3EA (minimum)                               |                                  |
| SIM Card      |   | Support 3V / 5V SIM              |



## 3. Disassembly Instruction

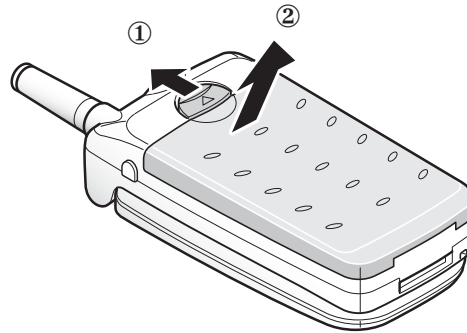
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### 3.1 Before Disassembly

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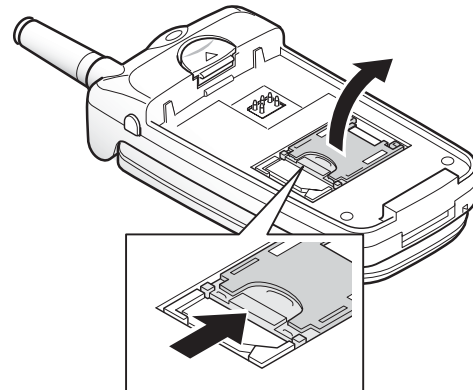
1. Remove the battery. To do so:

- ① Pull the battery lock above the battery toward the top of the phone and hold it in the position.
- ② Lift the battery away.

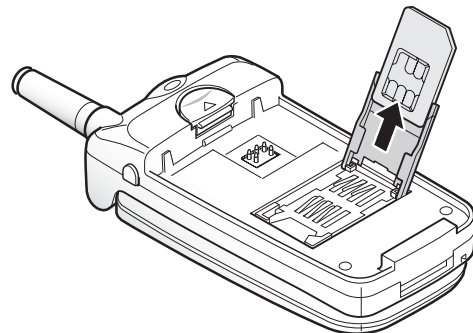


2. Remove the SIM card. To do so:

- ① Slide the ivory lock in the SIM card holder to unlock the SIM card holder and lift it up.



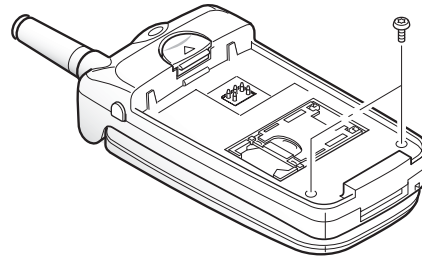
- ② Remove the SIM card, then replace the card holder. Keep the SIM card in a safe place.



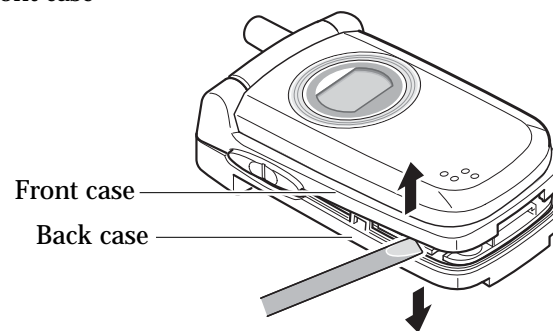
## 3.2 Main Frame

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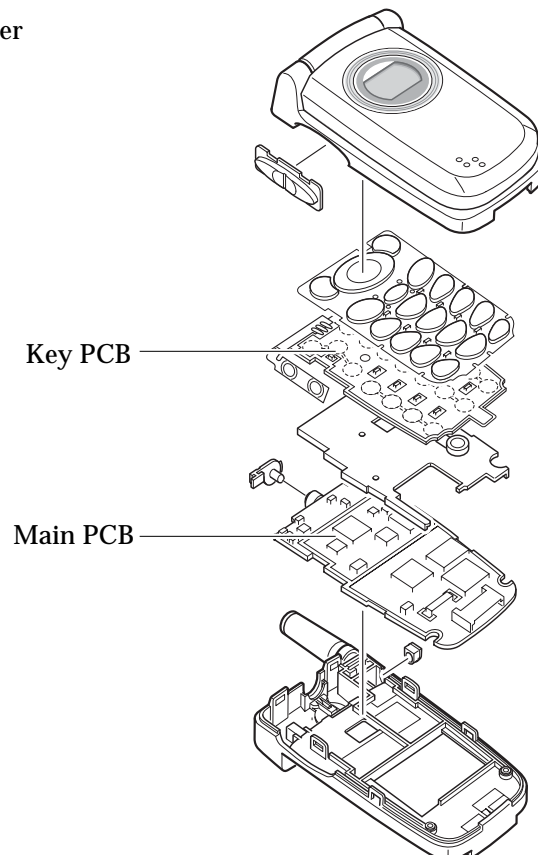
1. Remove the two screws on the back of the phone.



2. Insert a small ' - ' type driver between the front case and the back case, and lift up the front case.



3. Now, you can remove the PCBs and the other components.

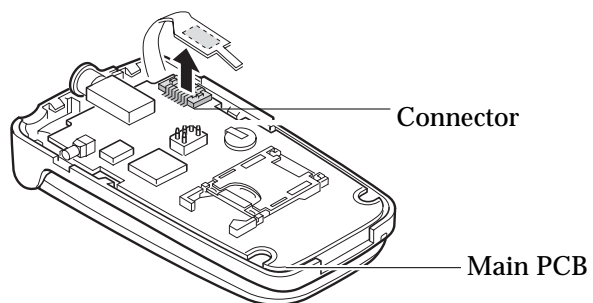


### 3.3 Folder

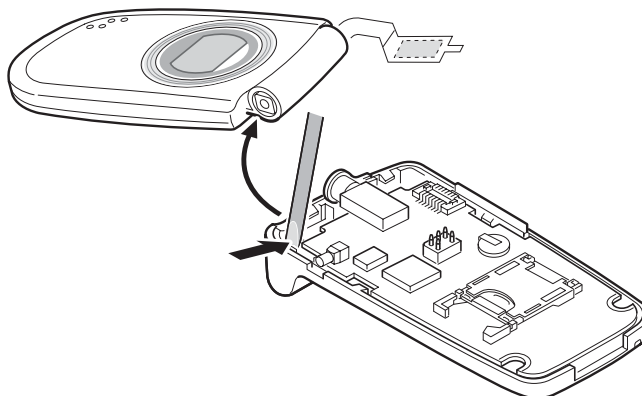
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1. Remove the back case as described at Steps 1 and 2 under Main Frame Disassembly on page 3-2.

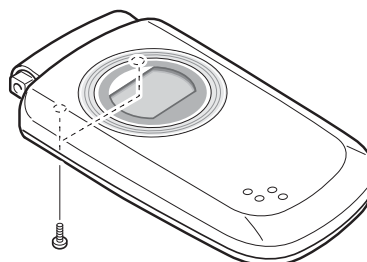
2. Unplug the connector shown at right from the main PCB.



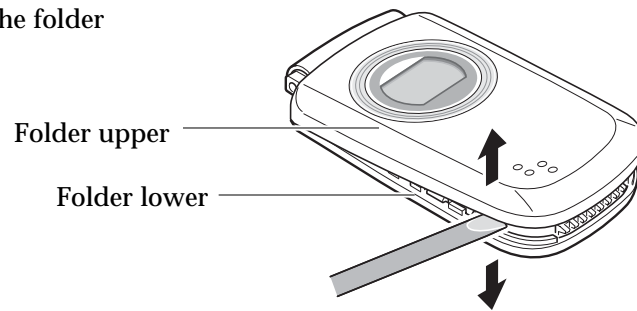
3. Unhook the folder from the main frame.



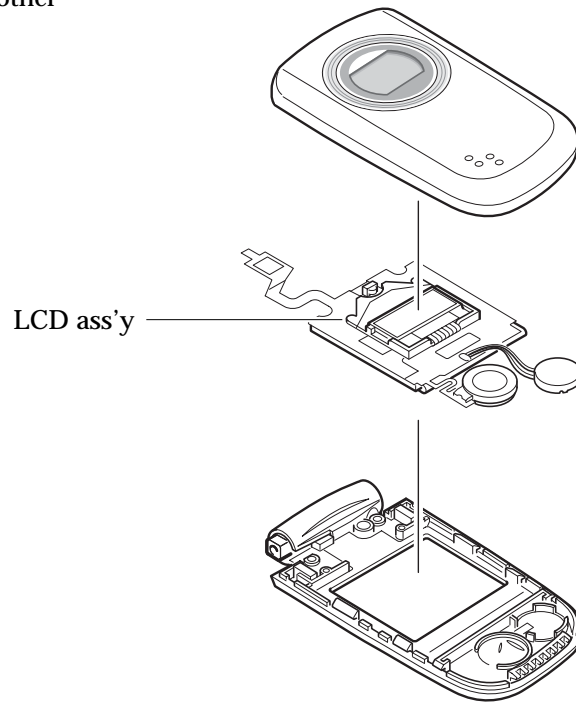
4. Remove the two screws from the folder.



5. Insert a small ' - ' type driver between the folder upper and the folder lower, and lift up the folder upper.

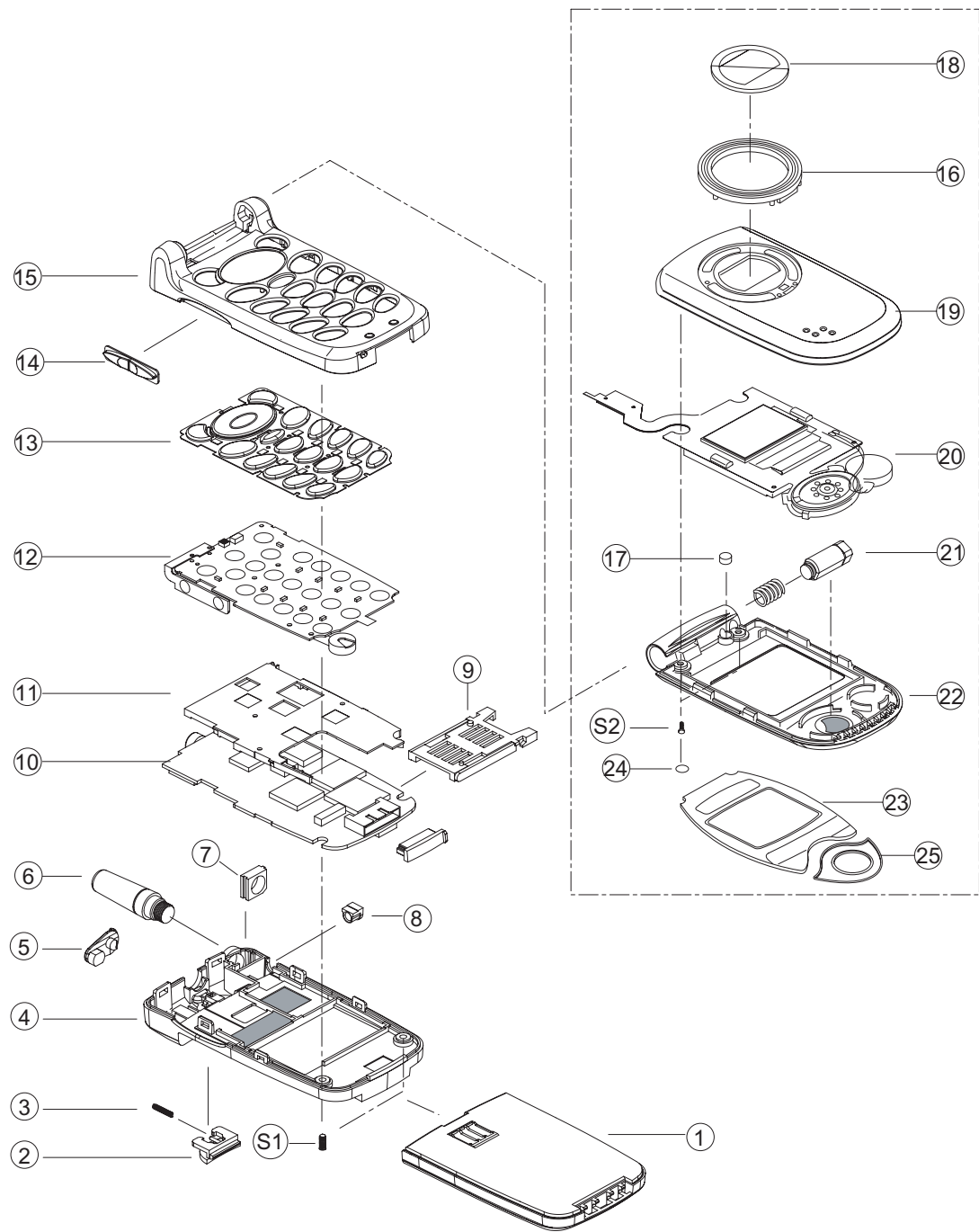


6. Now, you can remove the LCD ass'y and the other components.



### 3.4. Exploded View and Parts List

#### 3.4.1 Exploded View



### 3.4.2 Mechanical Parts List

| NO. | DESCRIPTION                  | Q'TY | CODE NO.     |
|-----|------------------------------|------|--------------|
| 1   | Battery package              | 1    | VKA010007XX1 |
| 2   | Battery Locker               | 1    | VKP050003XX0 |
| 3   | Spring knob                  | 1    | 70200031     |
| 4   | Rear Case                    | 1    | VKP010006XX0 |
| 5   | Rubber (Ear jack)            | 1    | 70300421     |
| 6   | Antenna                      | 1    | VKP460001XX0 |
| 7   | Antenna bracket              | 1    | 70200041     |
| 8   | Rubber (Ant-jack)            | 1    | 70300251     |
| 9   | SIM connector                | 1    | 54100071     |
| 10  | Main PBA                     | 1    | VG200VKMS0XX |
| 11  | Shield Can                   | 1    | 70100091     |
| 12  | Key PBA                      | 1    | VG200VKKS0XX |
| 13  | Key pad                      | 1    | VKP060002000 |
| 14  | Side key                     | 1    | 70100531     |
| 15  | Front case                   | 1    | VKP010005000 |
| 16  | Indicator (7LED)             | 2    | VKP090002000 |
| 17  | Magnetic                     | 1    | STP220001000 |
| 18  | LCD Window (SUB)             | 1    | VKP030004000 |
| 19  | Folder (Upper)               | 1    | VKP02000XX0  |
| 20  | LCD module                   | 1    | 36600041     |
| 21  | Hinge                        | 1    | 70200011     |
| 22  | Folder (Lower)               | 1    | VKP020005000 |
| 23  | LCD Window (MAIN)            | 1    | VKP030004000 |
| 24  | Cover screw                  | 2    | VKP140002000 |
| 25  | Receiver Badge               | 1    | VKP180004000 |
| S1  | Rear Case Screw (M1.6 x 5.8) | 2    | 70400021     |
| S2  | Folder Screw (M1.6 x 4.0)    | 2    | SBTRM160400S |

## 4. Data Kit & Test Method

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### 4.1 Data Kit

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#### 4.1.1 Download Equipment

1. Download Cable
2. Desktop or Notebook PC
3. Download monitor program
4. VG207 Mobile Phone

#### 4.1.2 Download Environment

To download software of VG207, the following working environments should be prepared:

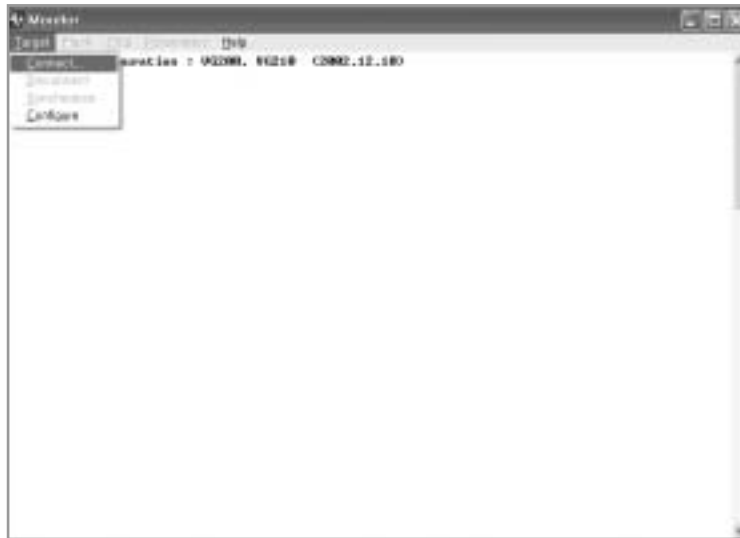
- VG207 download cable, Interface JIG, is connected to only COM1 serial port of the desktop or notebook PC.
- VG207 download monitor program is copied to the desktop PC or notebook PC.
- Target software is downloaded to the VG207 mobile phone.

#### **WARNING**

You MUST use the **download cable kit** (Interface JIG) and UART download **Monitor program**. Otherwise, downloading process won't work properly.

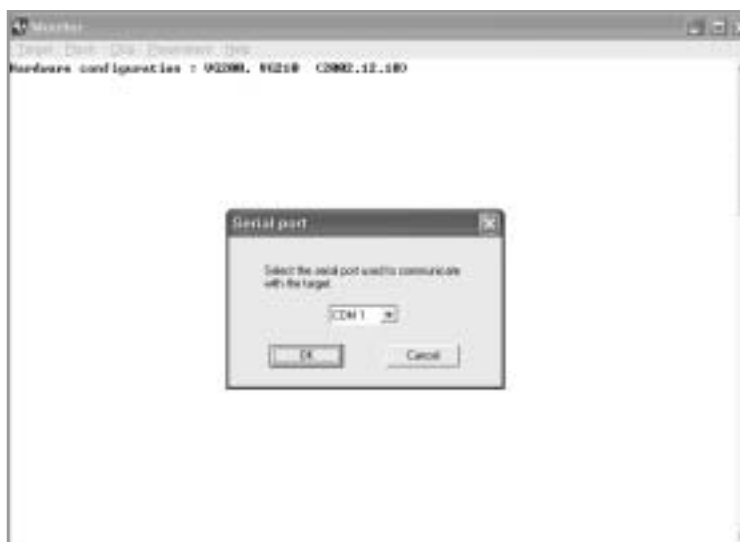
### 4.1.3 Download Procedure

1. Unzip VG207 UART Download monitor program (monitor701.zip) in the PC.
2. Execute **monitor701.exe**. And then select **Target** menu. Then, choose **Connect** from the **Target** menu.



<Figure 1>

3. A table will be displayed as shown in <Figure 2>. Then press the arrow-button and choose a correct serial port. And press OK button.



<Figure 2>



4. As the following window shown in <Figure 3> is displayed, connect VG207 phone to the download cable, (Interface JIG) and press power on key of VG207. If the connection is succeeded, the following screen will show the contents as shown in <Figure 4>.

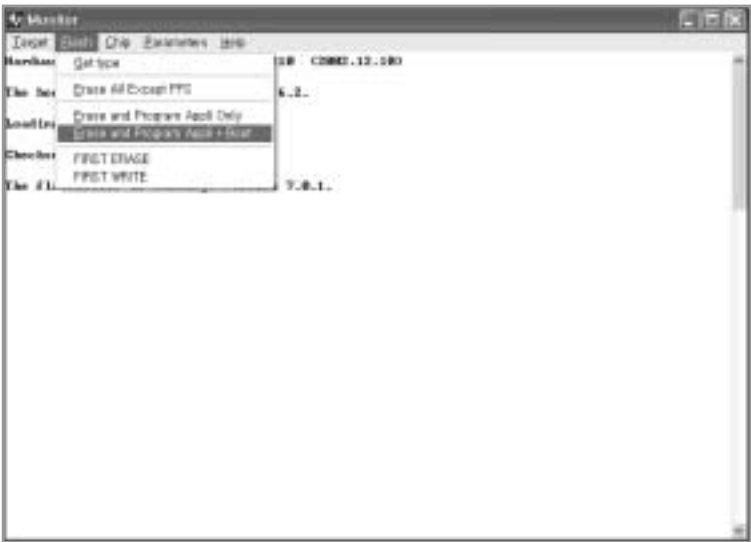


<Figure 3>



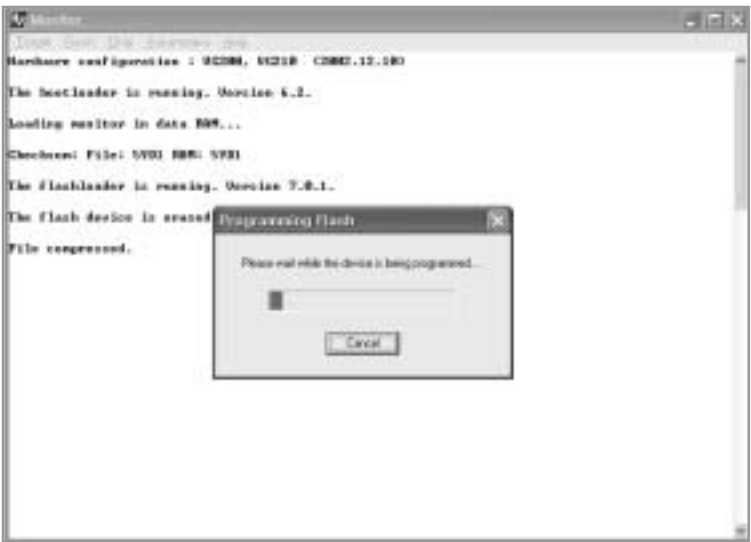
<Figure 4>

5. Click on Flash on the top menu and select **Erase and Program Appli+Boot** item as shown in <Figure 5>.



<Figure 5>

6. Choose the target SW that you want to download. And then you can see the following window in <Figure 6>.



<Figure 6>

7. If the downloading procedure is succeeded, then the following window is shown.



<Figure 7>

8. Press the Disconnect of Target menu, and seperate the phone from Download cable.



<Figure 8>

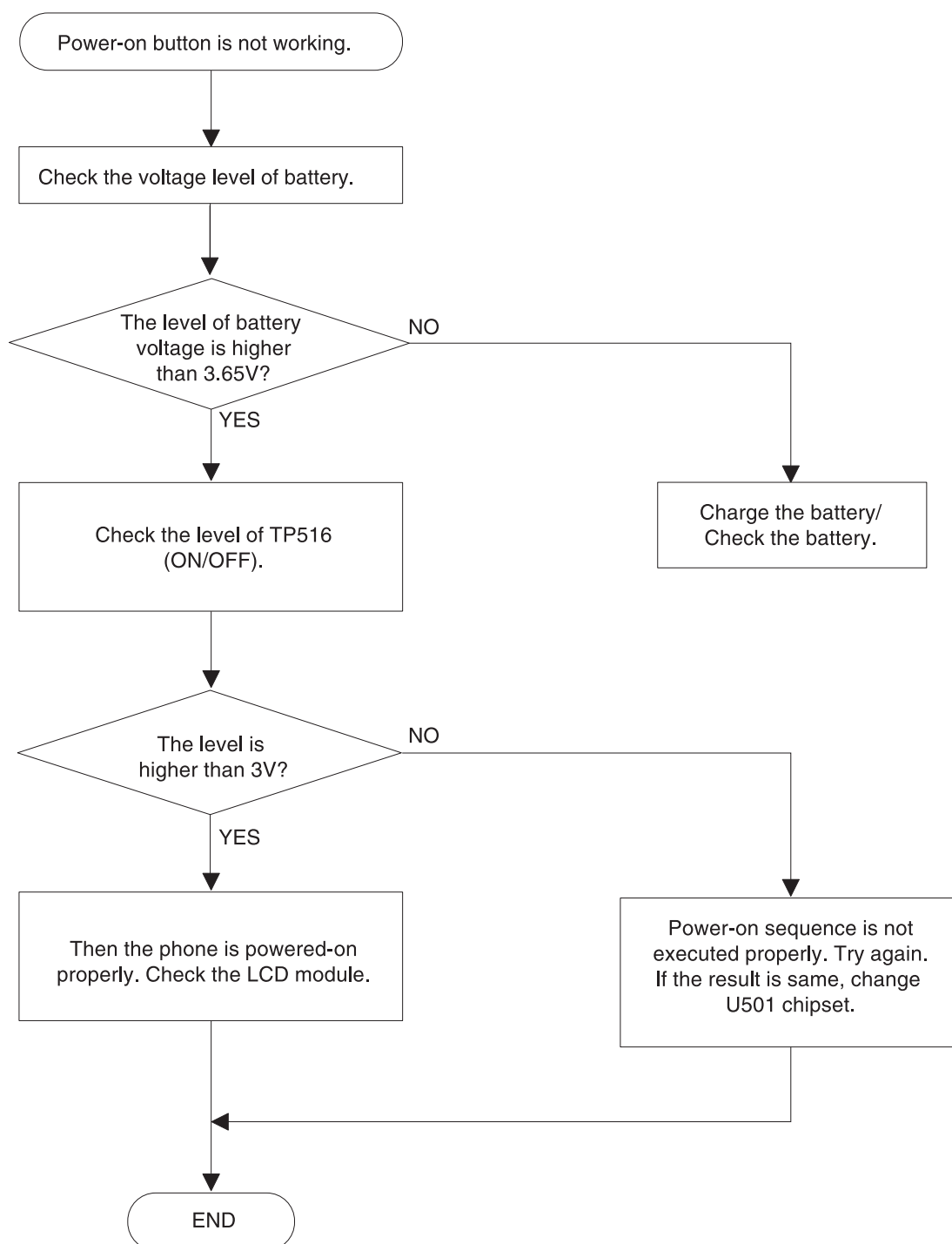
**Memo**

## 5. Trouble Shooting

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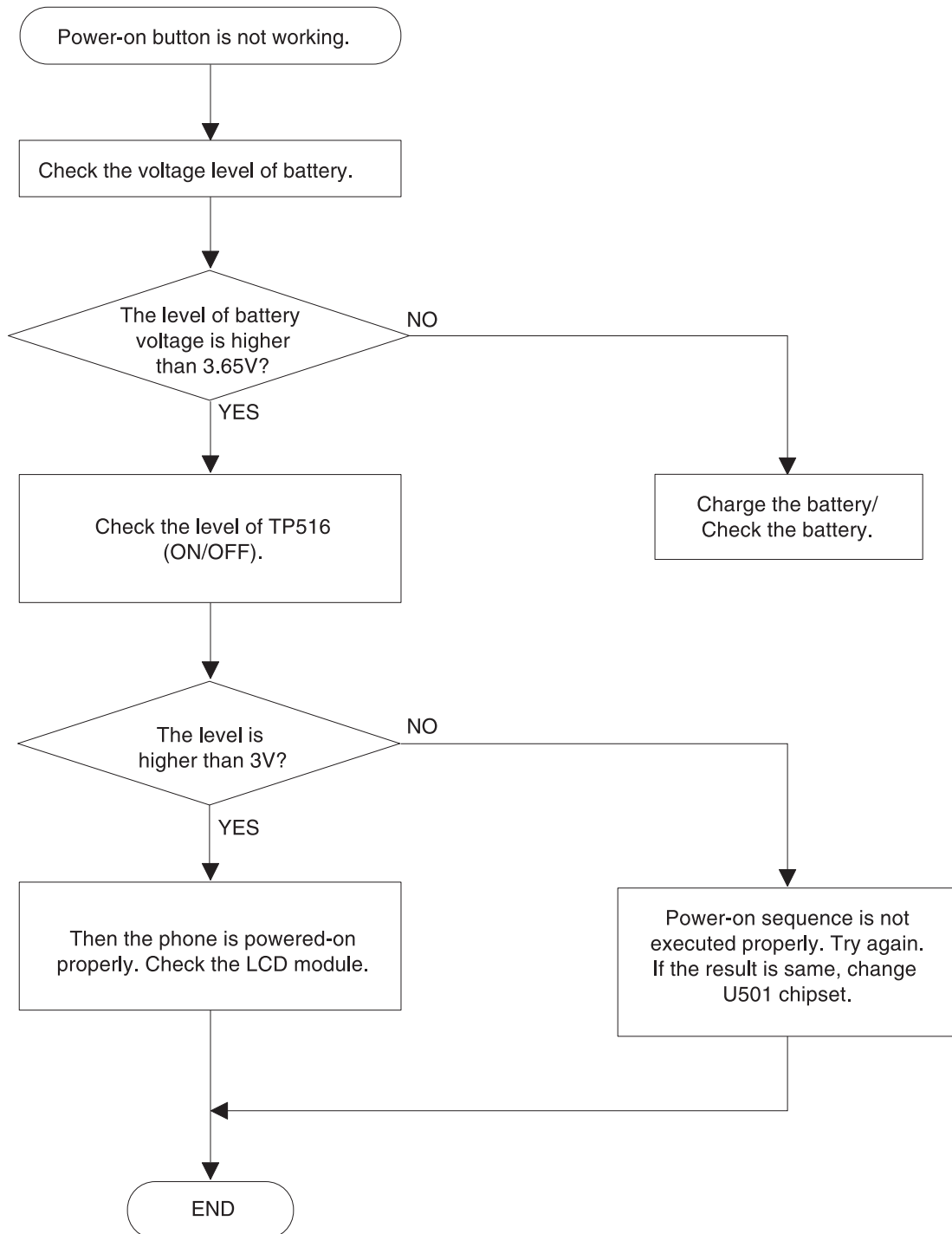
### 5.1 Power-On Trouble

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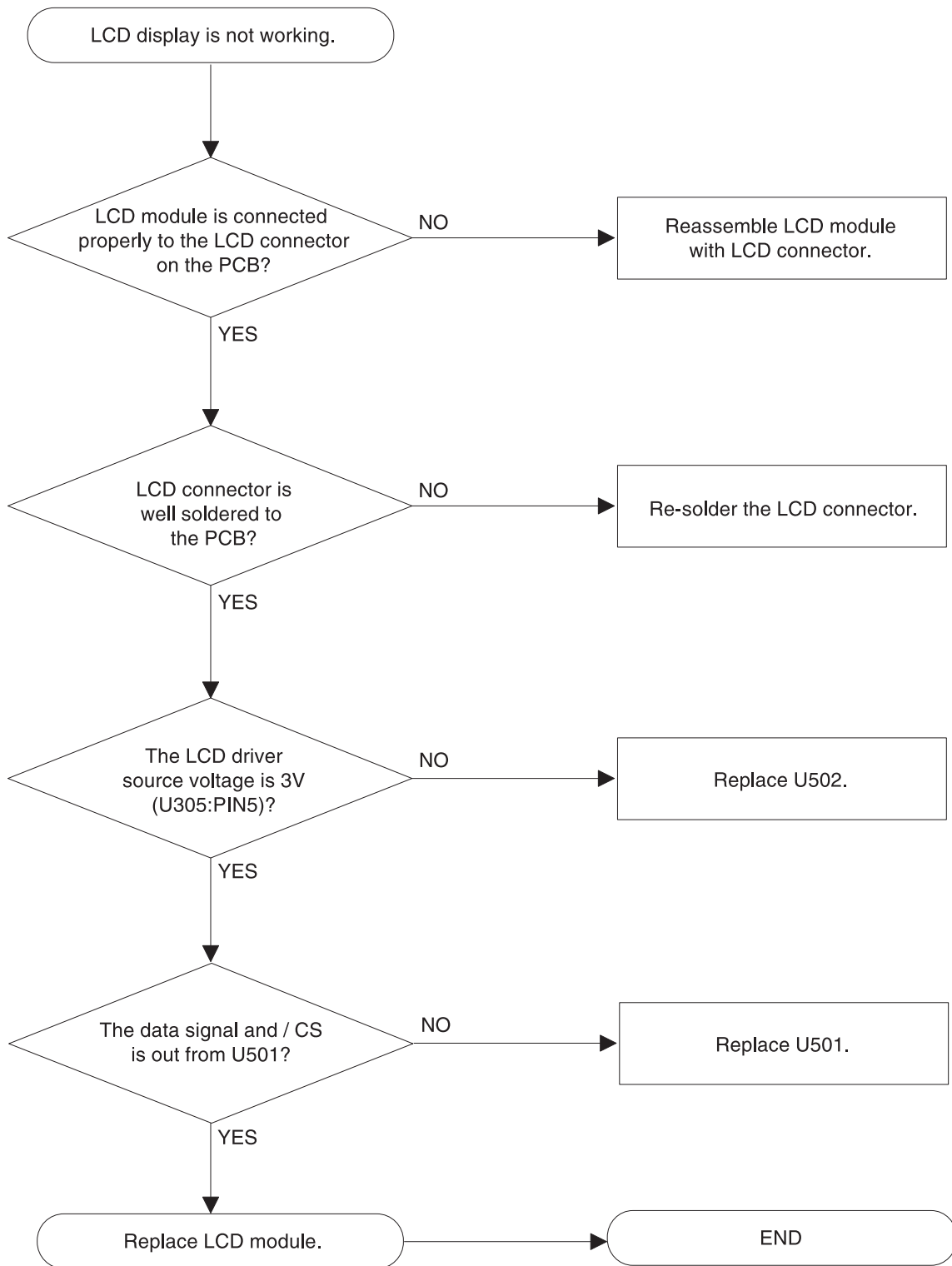


## 5.2 Melody Trouble

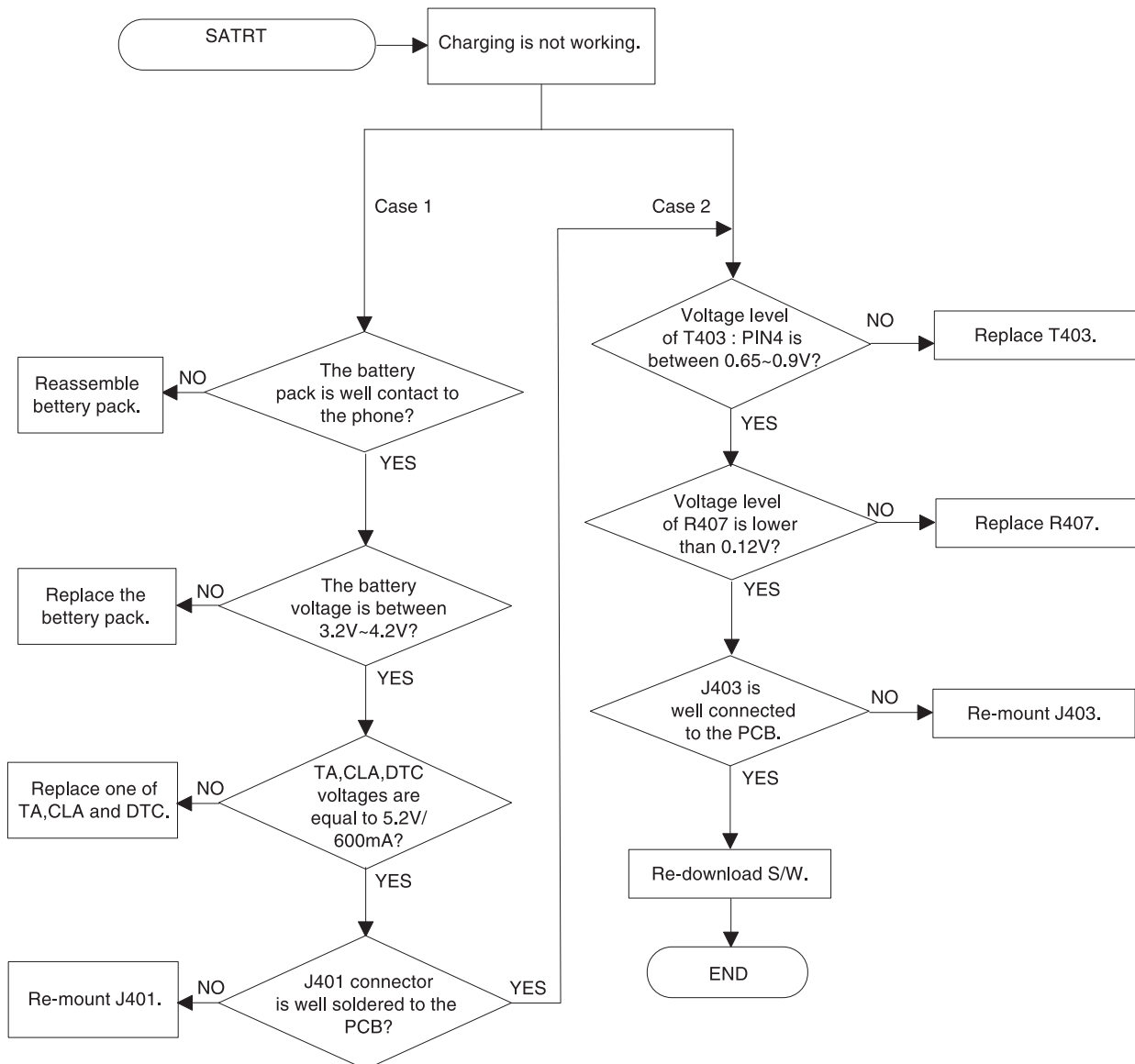
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## 5.3 LCD Trouble

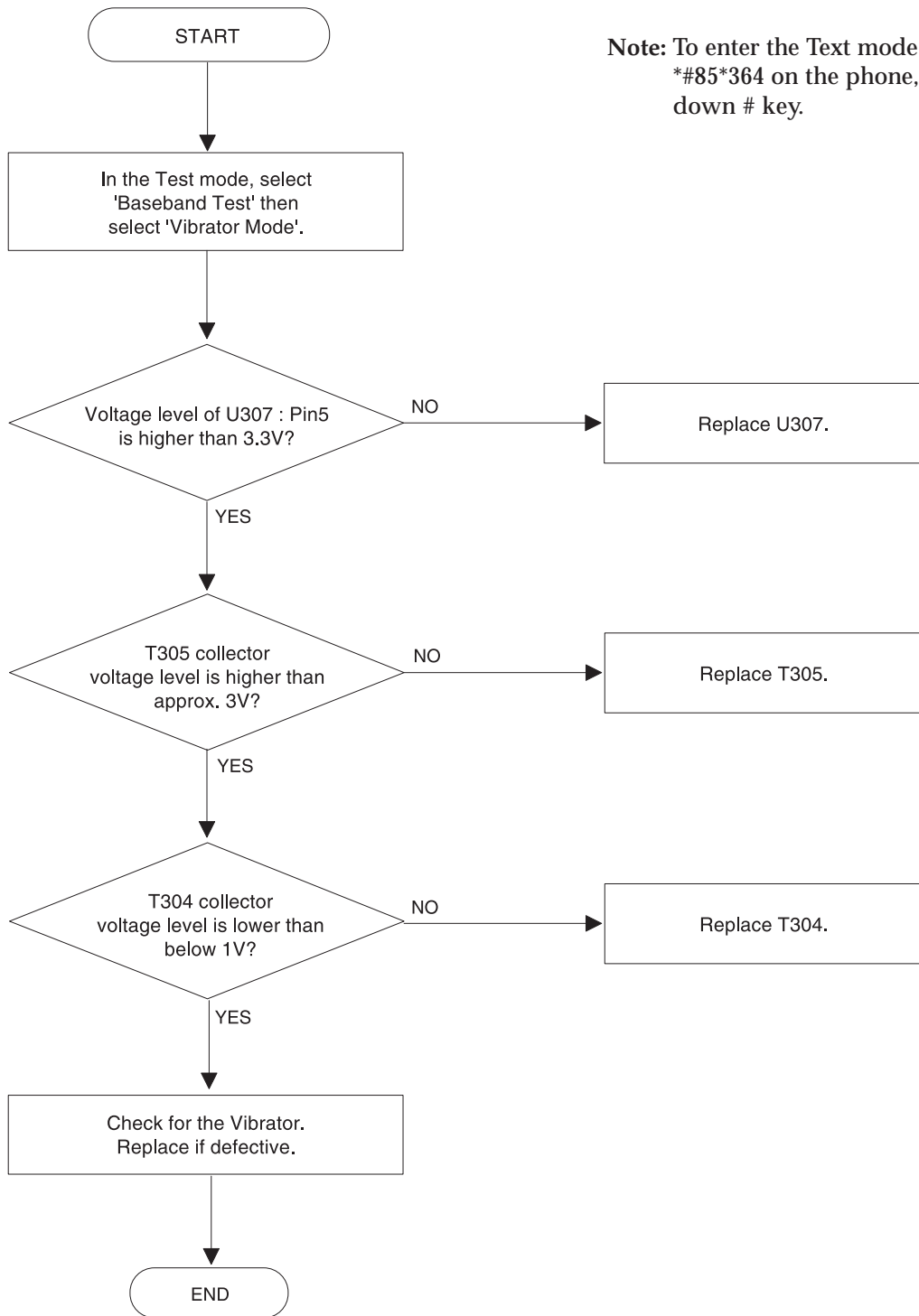


## 5.4 Charging Trouble



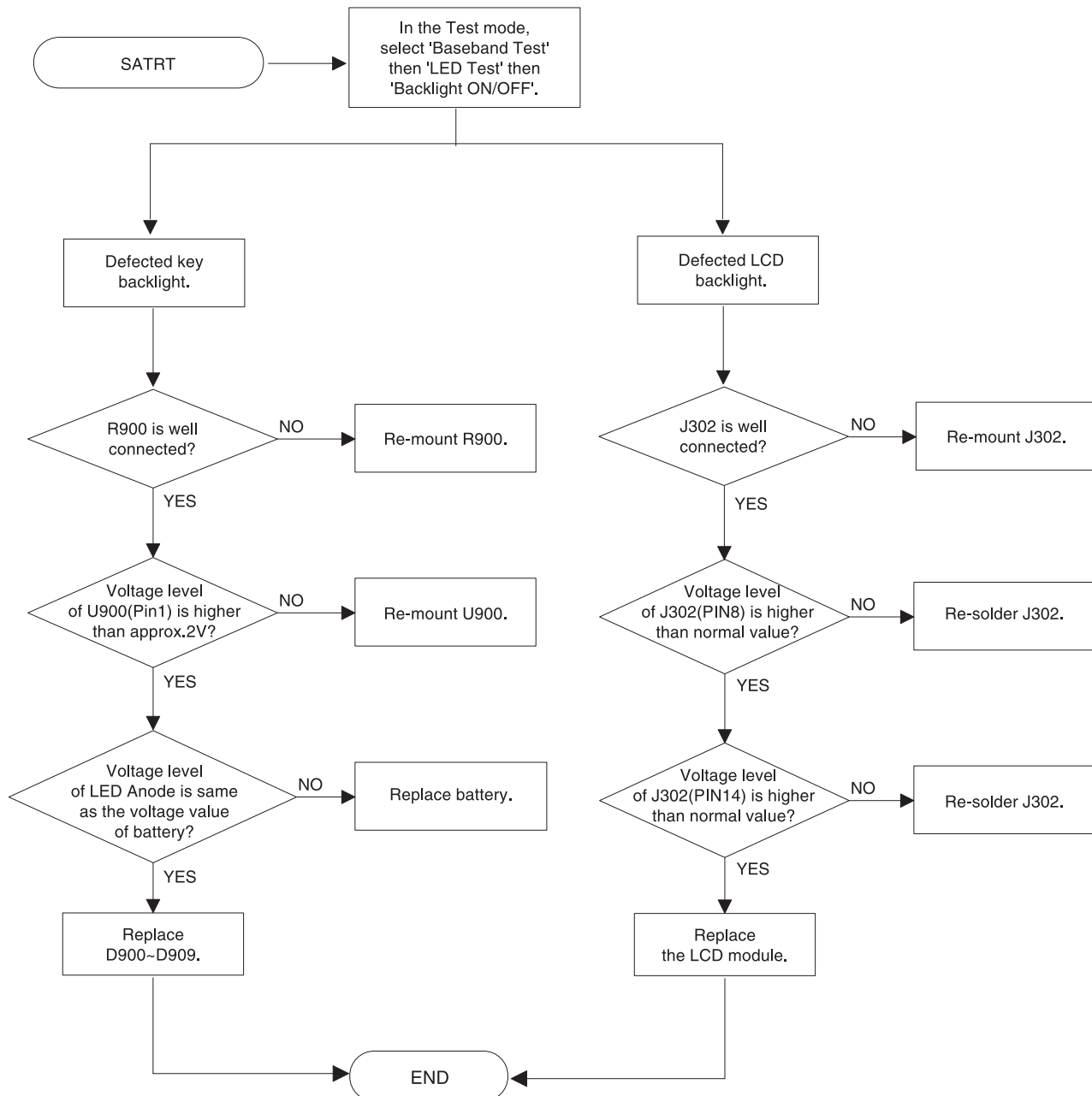


## 5.5 Vibrator Trouble



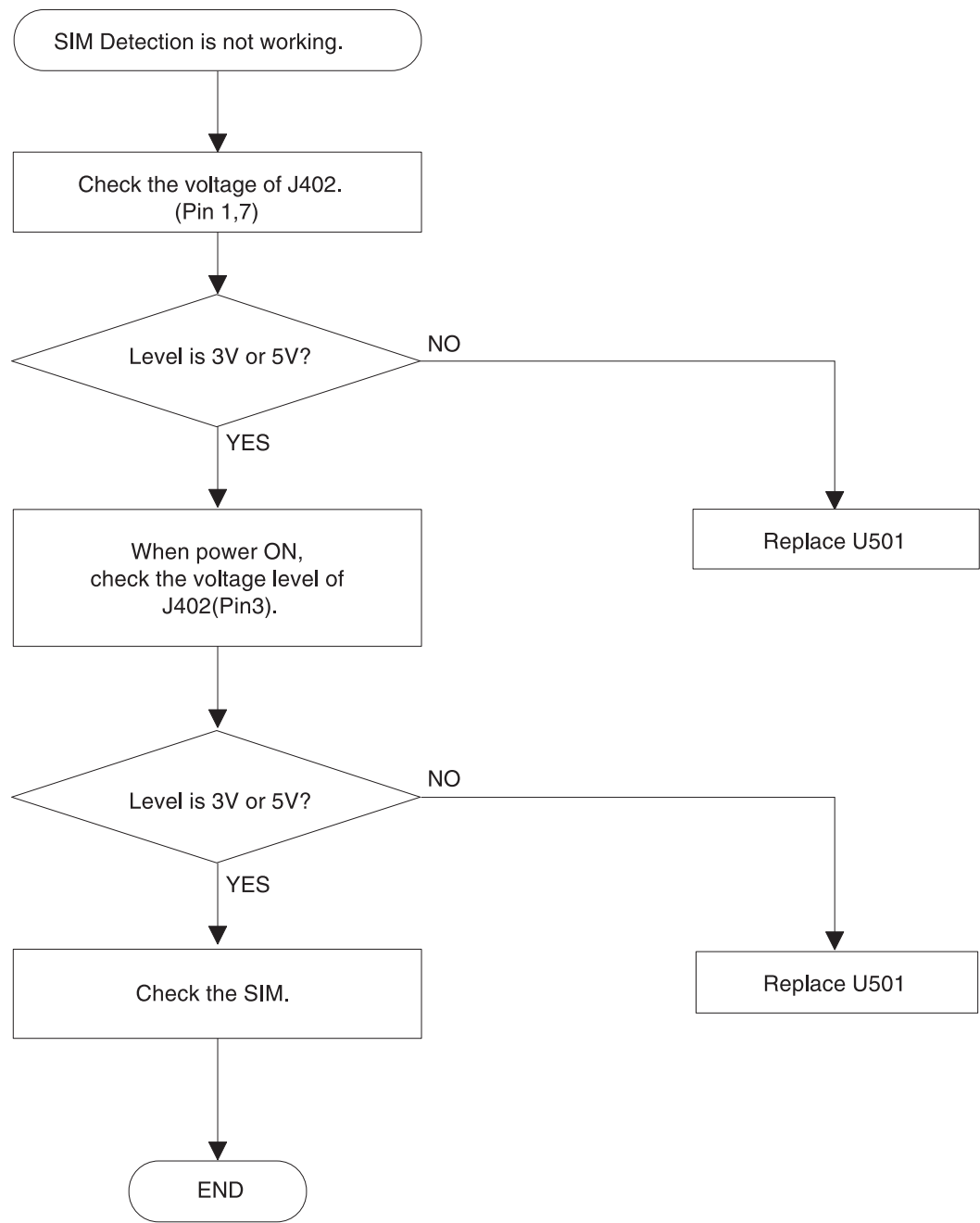
## 5.6 Backlight Trouble

**Note:** To enter the Test mode, press \*#85\*364 on the phone, then hold down # key.



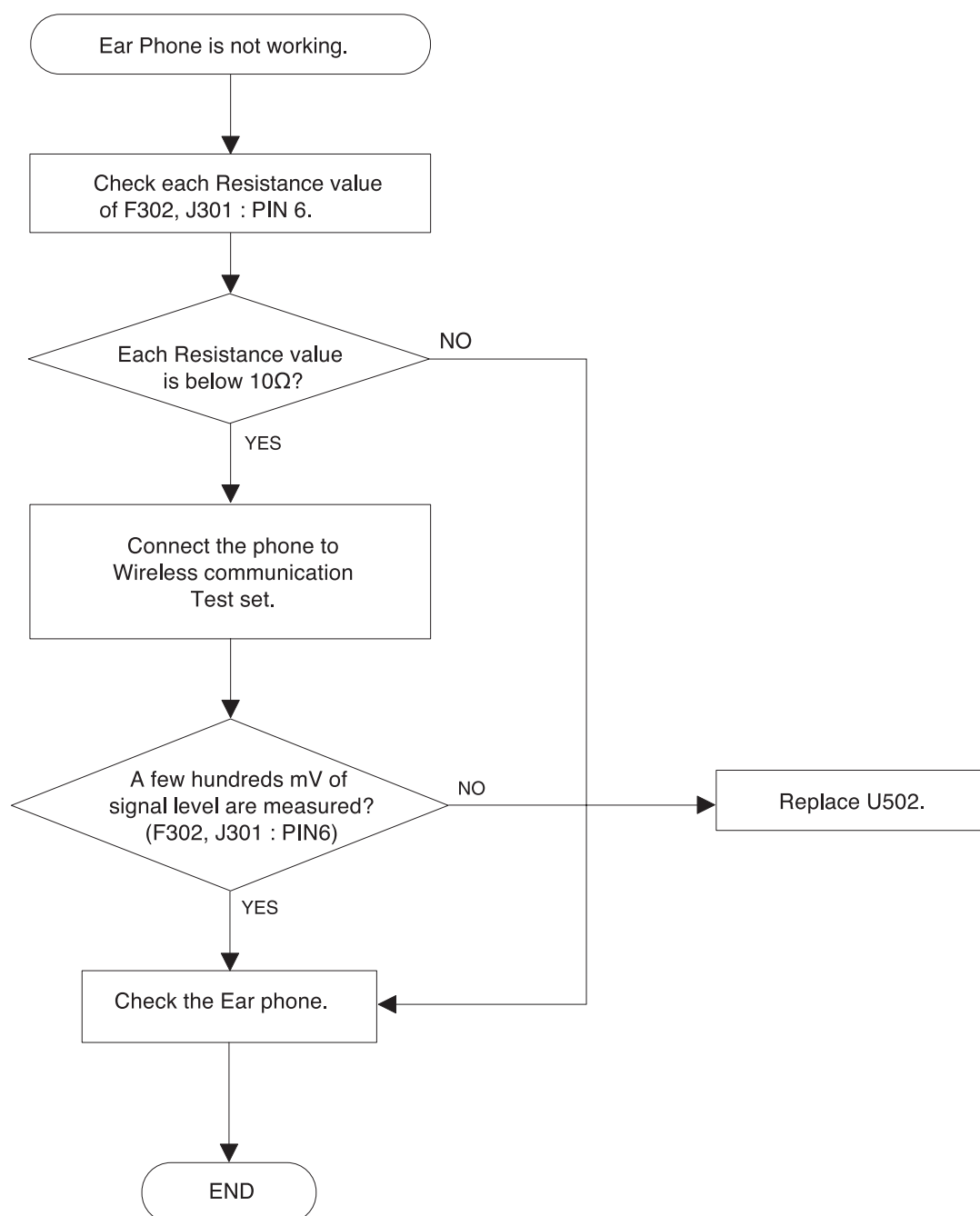
# 5.7 SIM Detection Trouble

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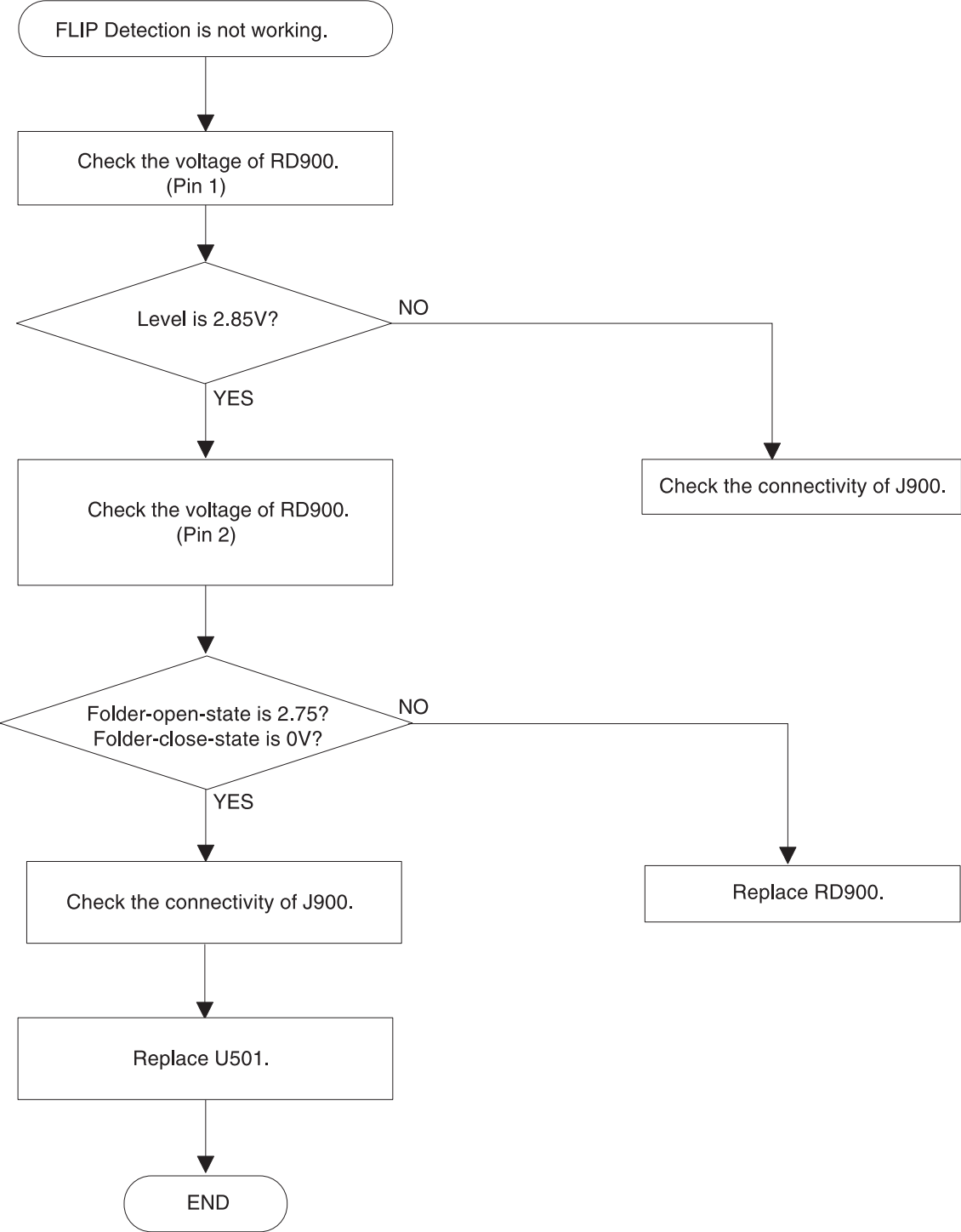
## 5.8 Ear-microphone Trouble

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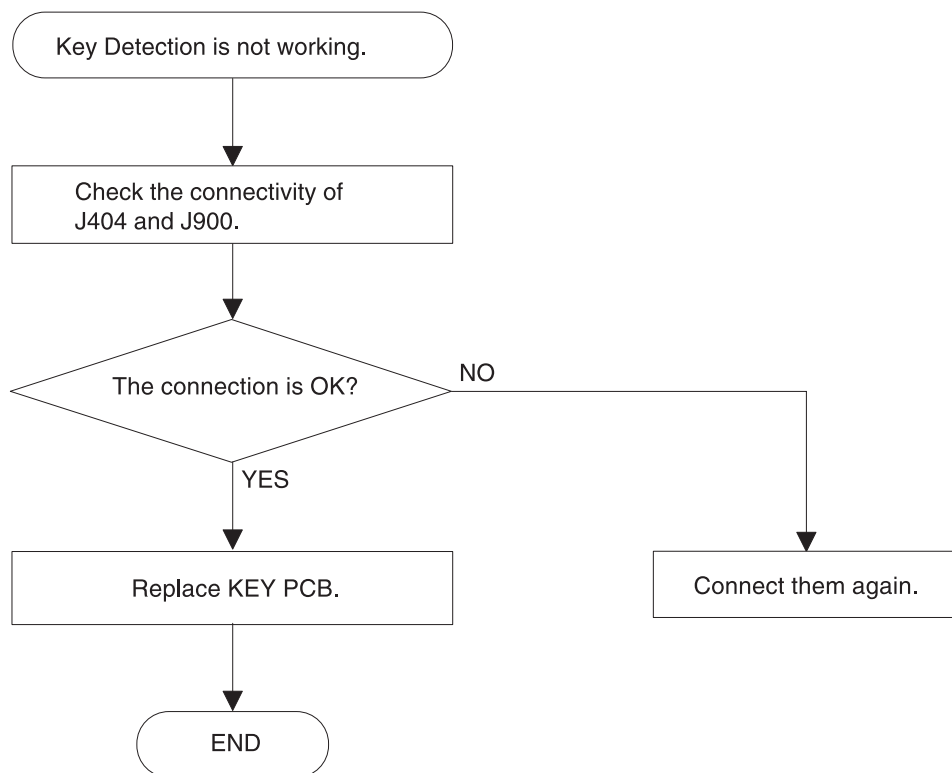
# 5.9 FLIP Detection Trouble

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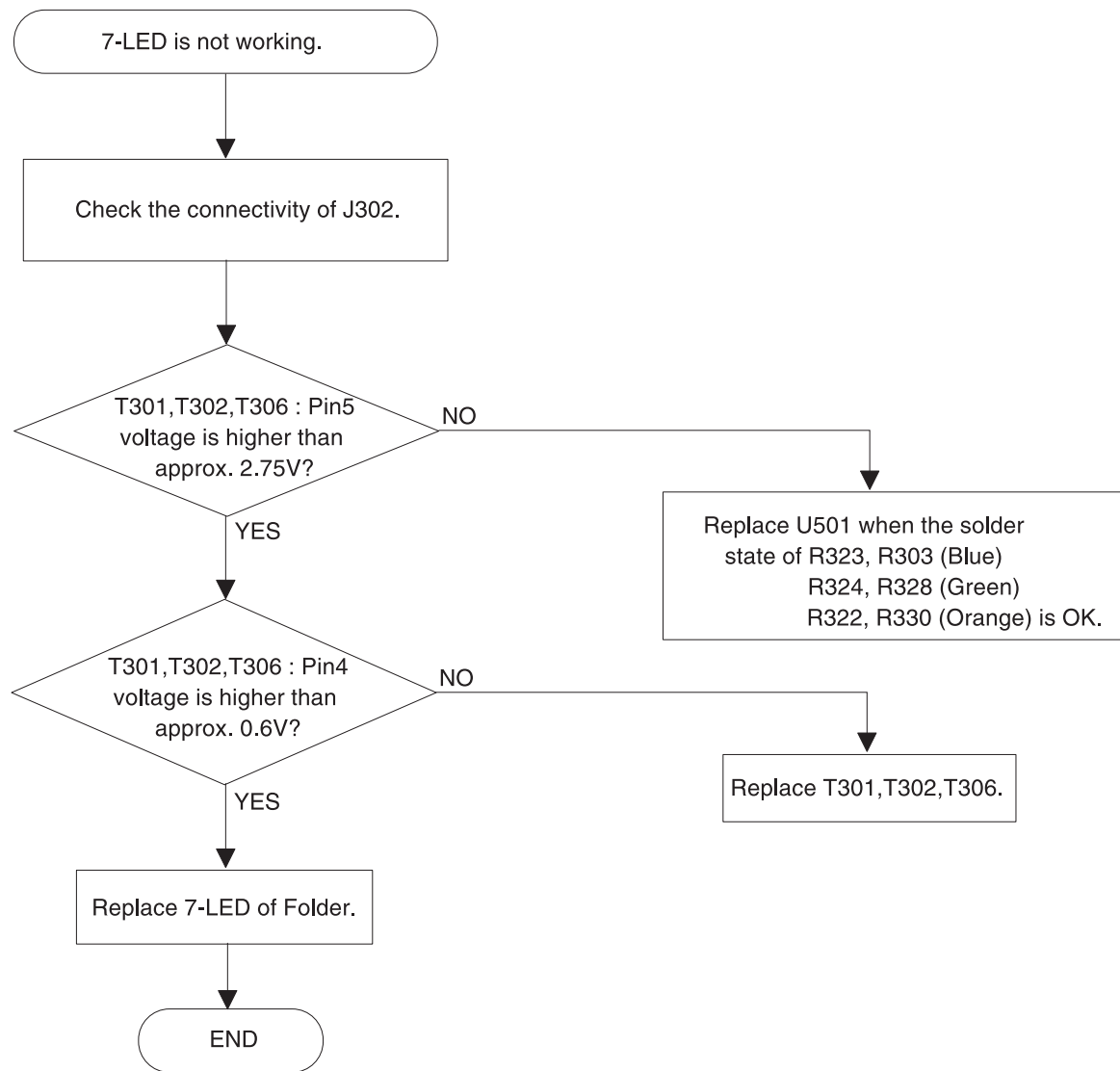


## 5.10 Key Detection Trouble

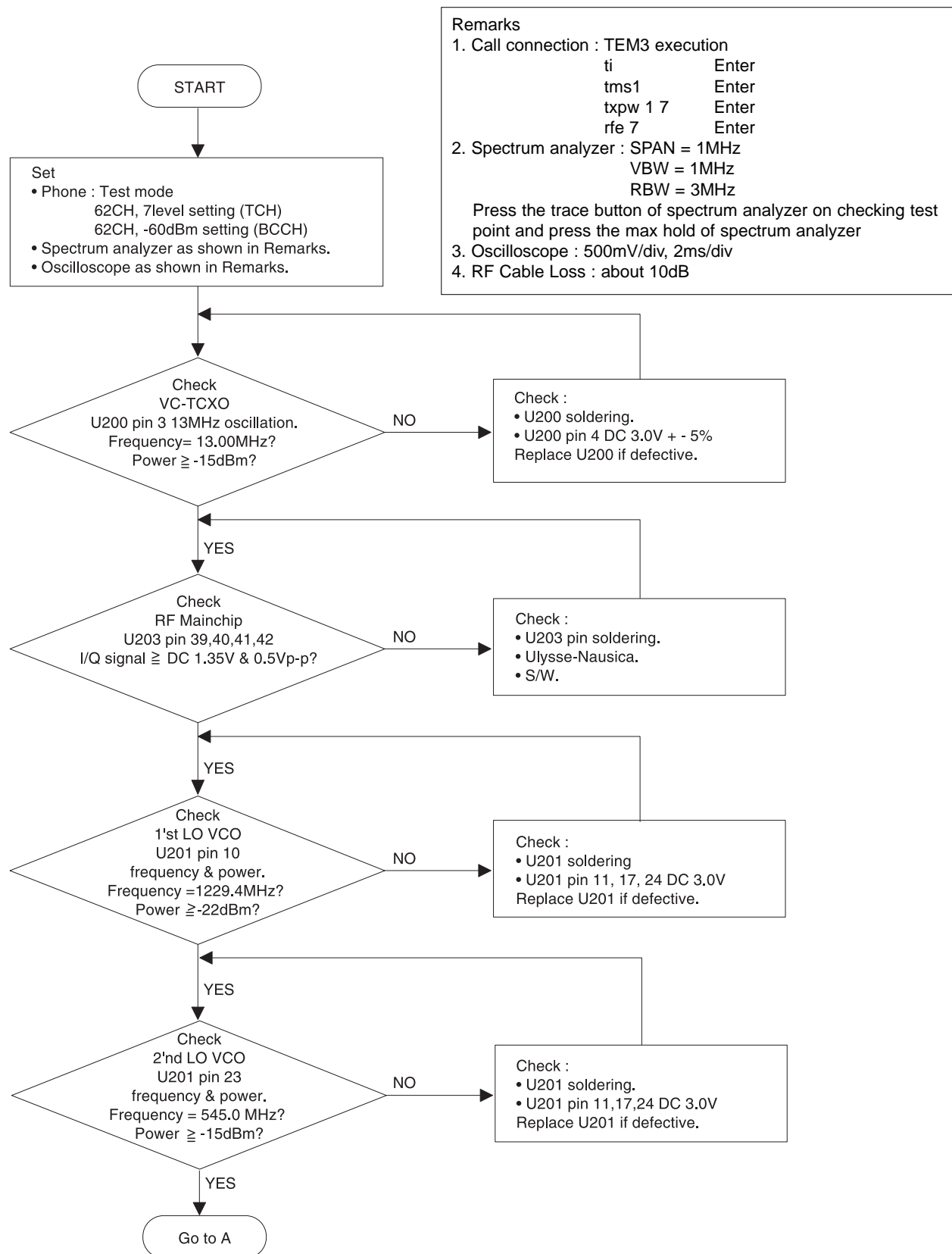
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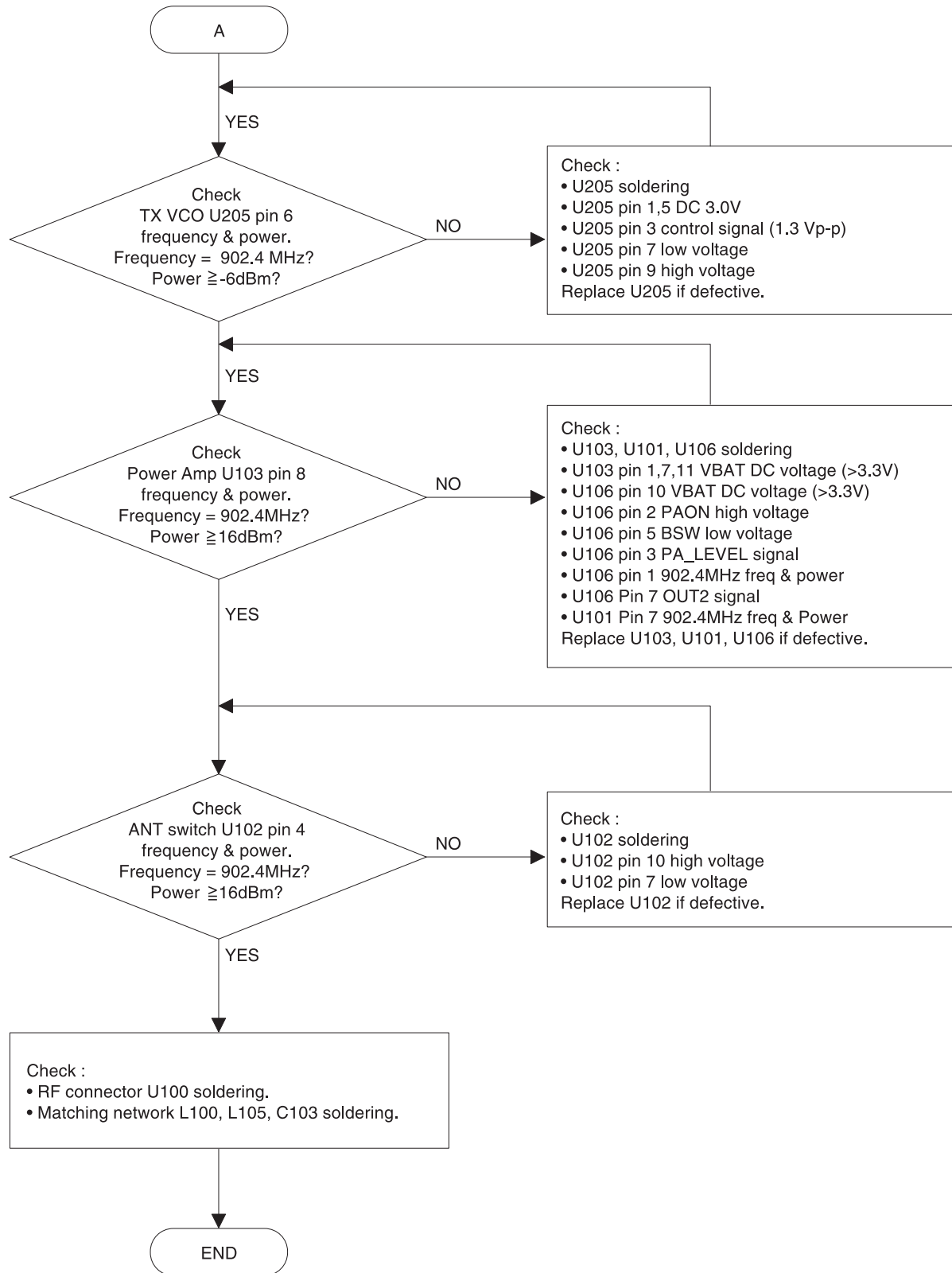
# 5.11 7 LED Trouble



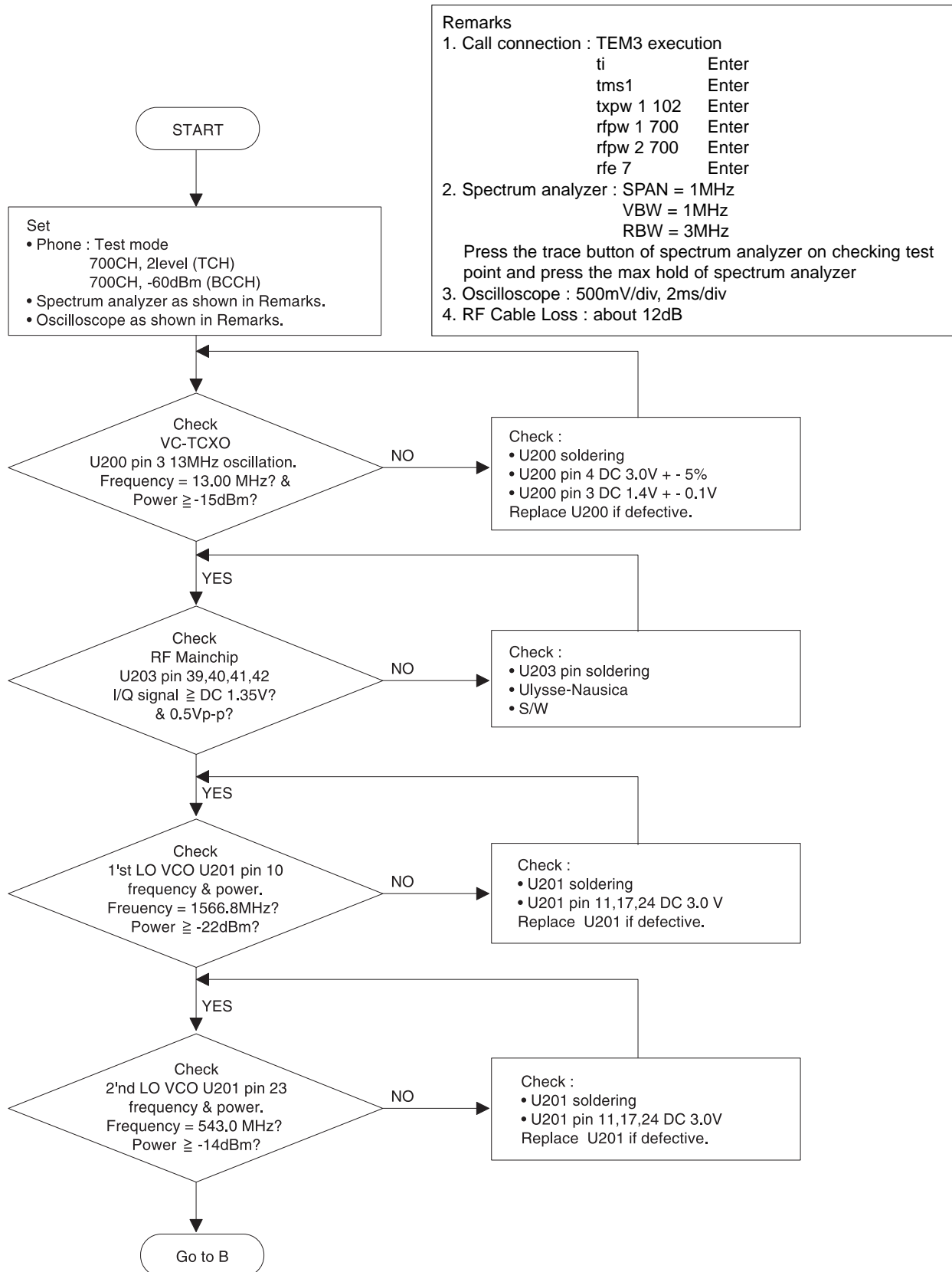
## 5.12 TX Power Trouble (E-GSM)

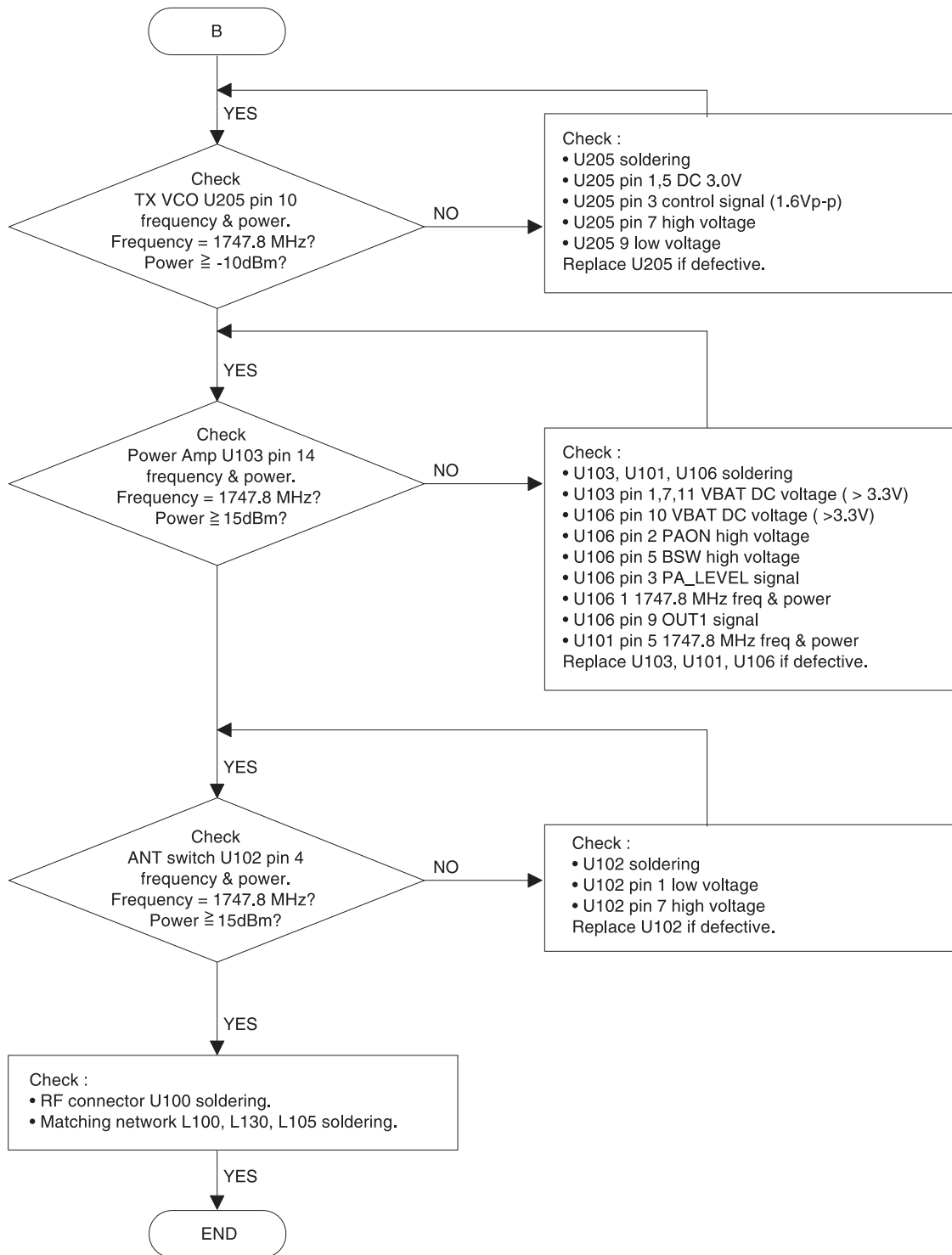




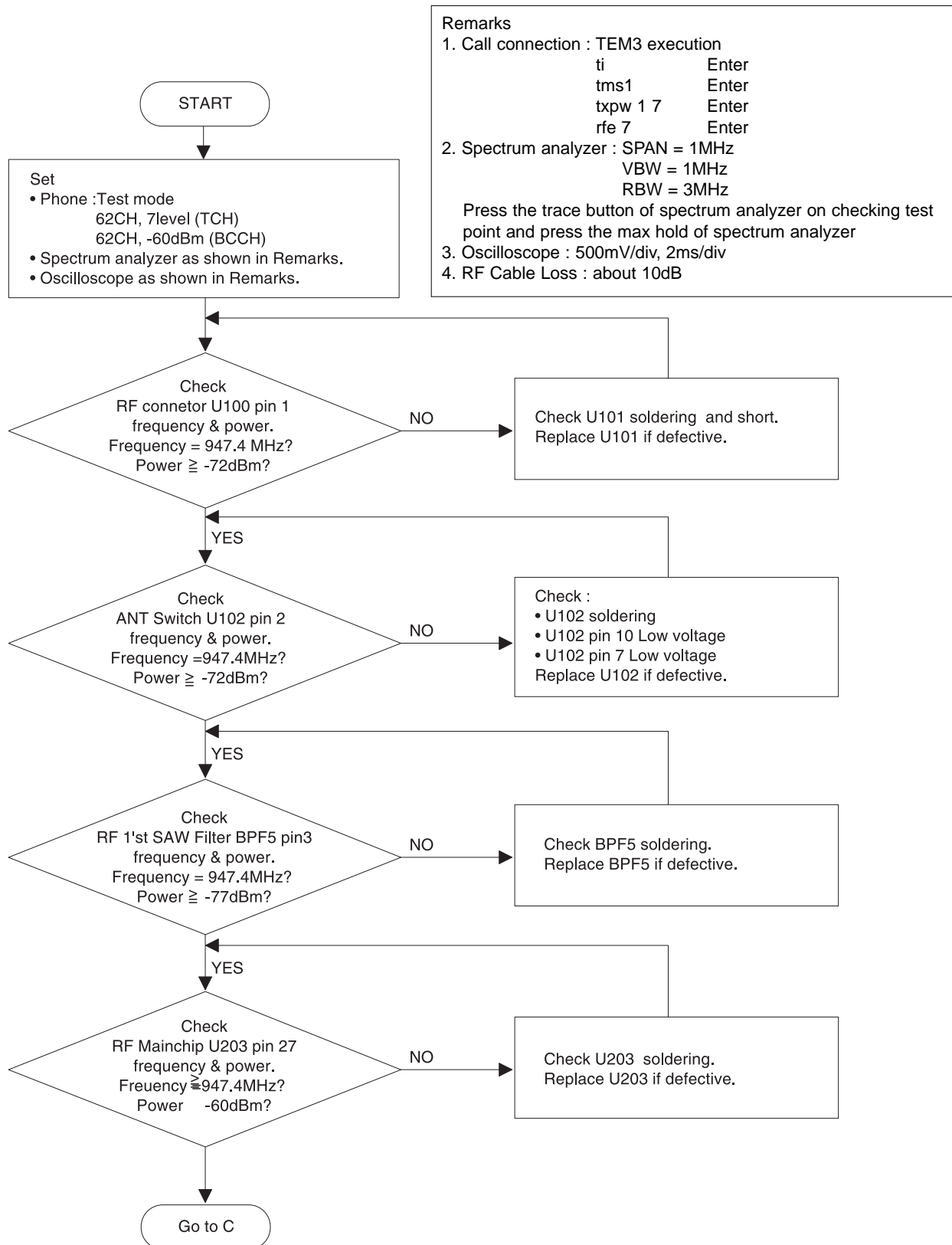


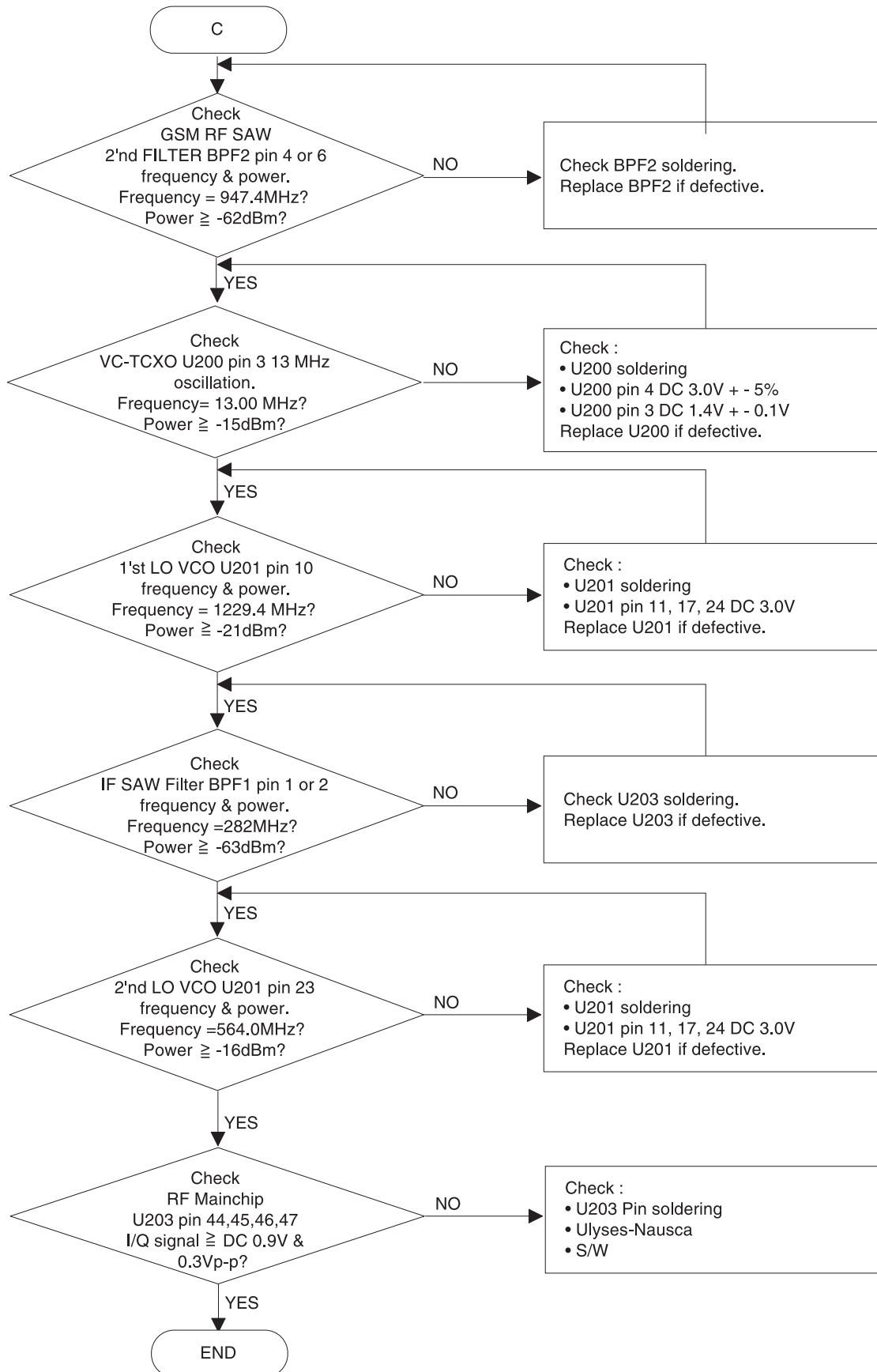
## 5.13 TX Power Trouble (DCS)



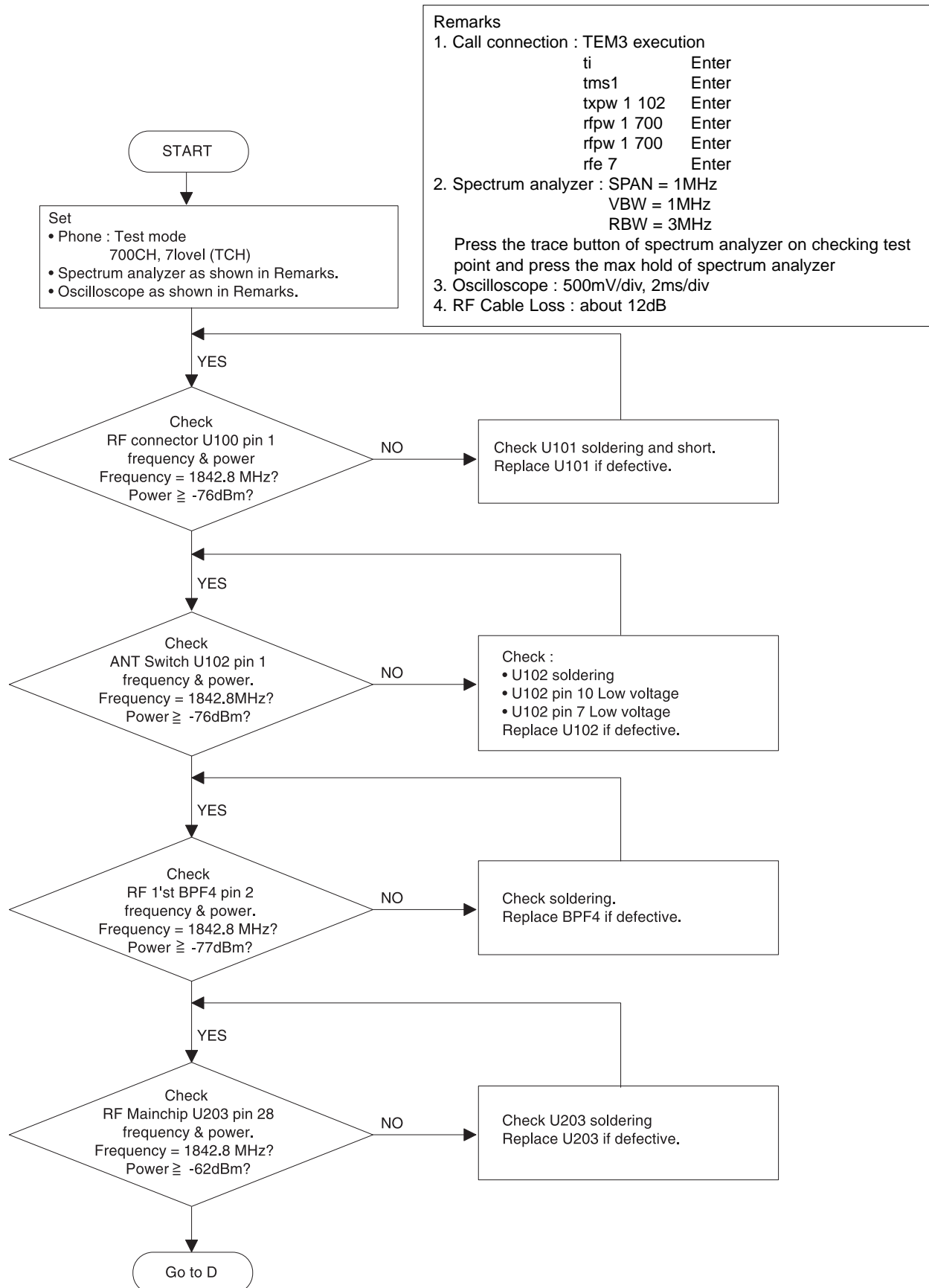


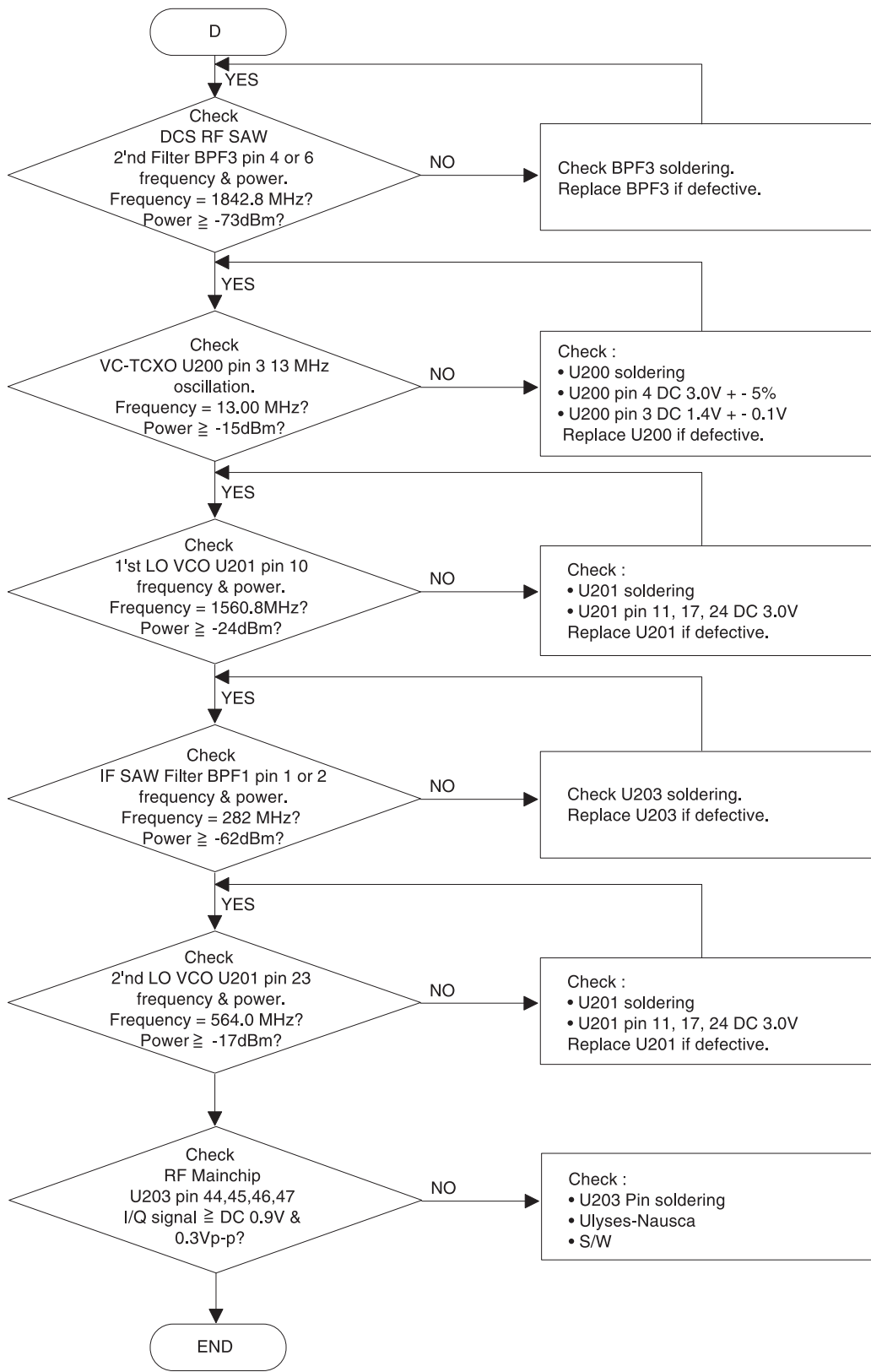
## 5.14 RX Sensitivity Trouble (E-GSM)





## 5.15 RX Sensitivity Trouble (DCS)









**Memo**

## 6.1 Overall

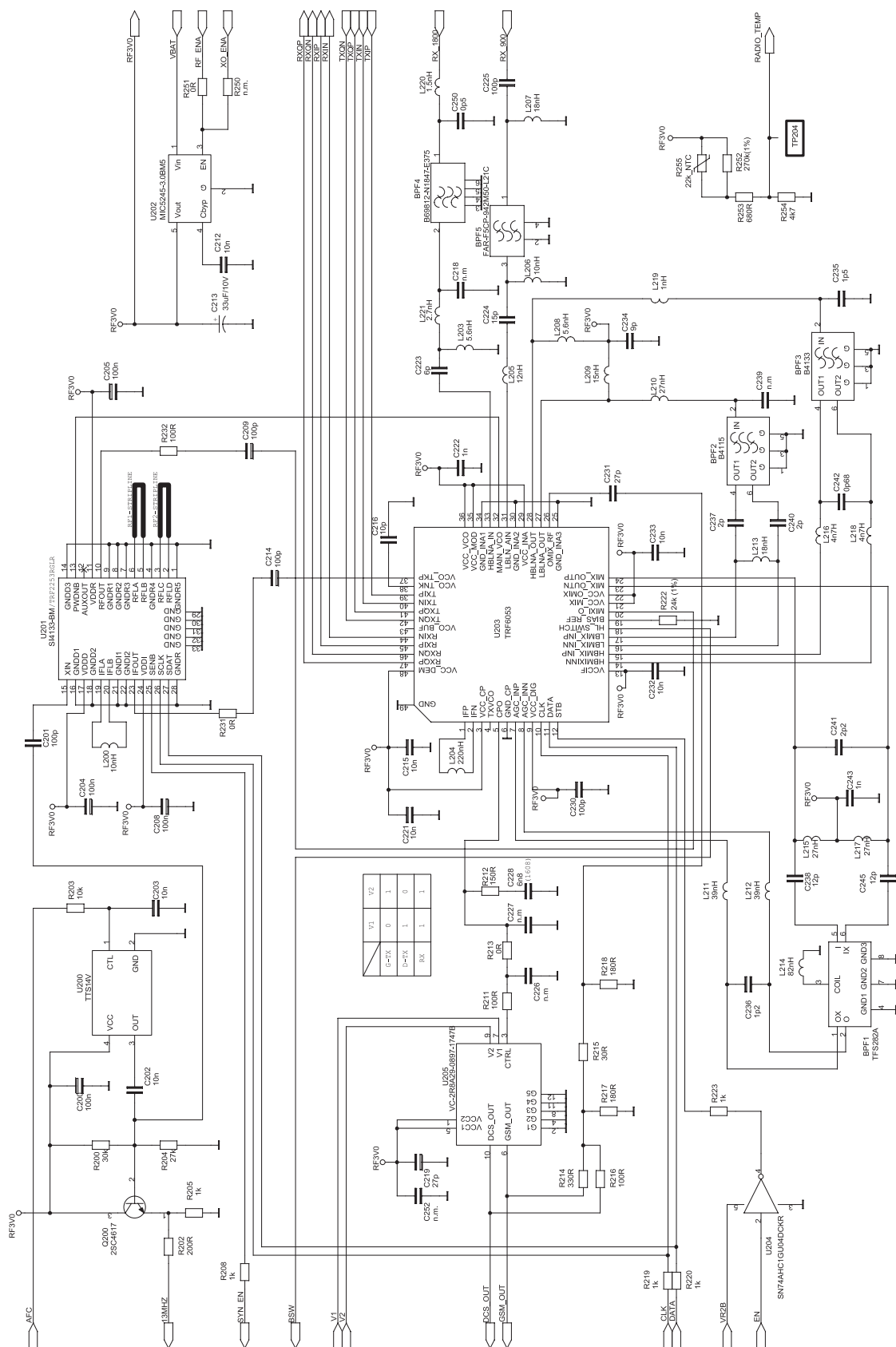


**Memo**

## 7.1 RF PAM Block

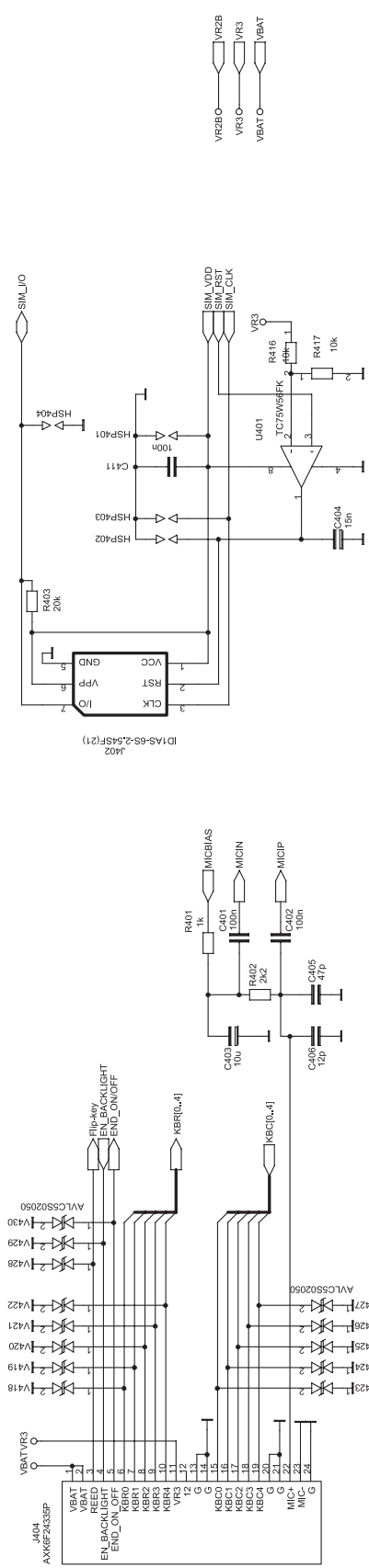
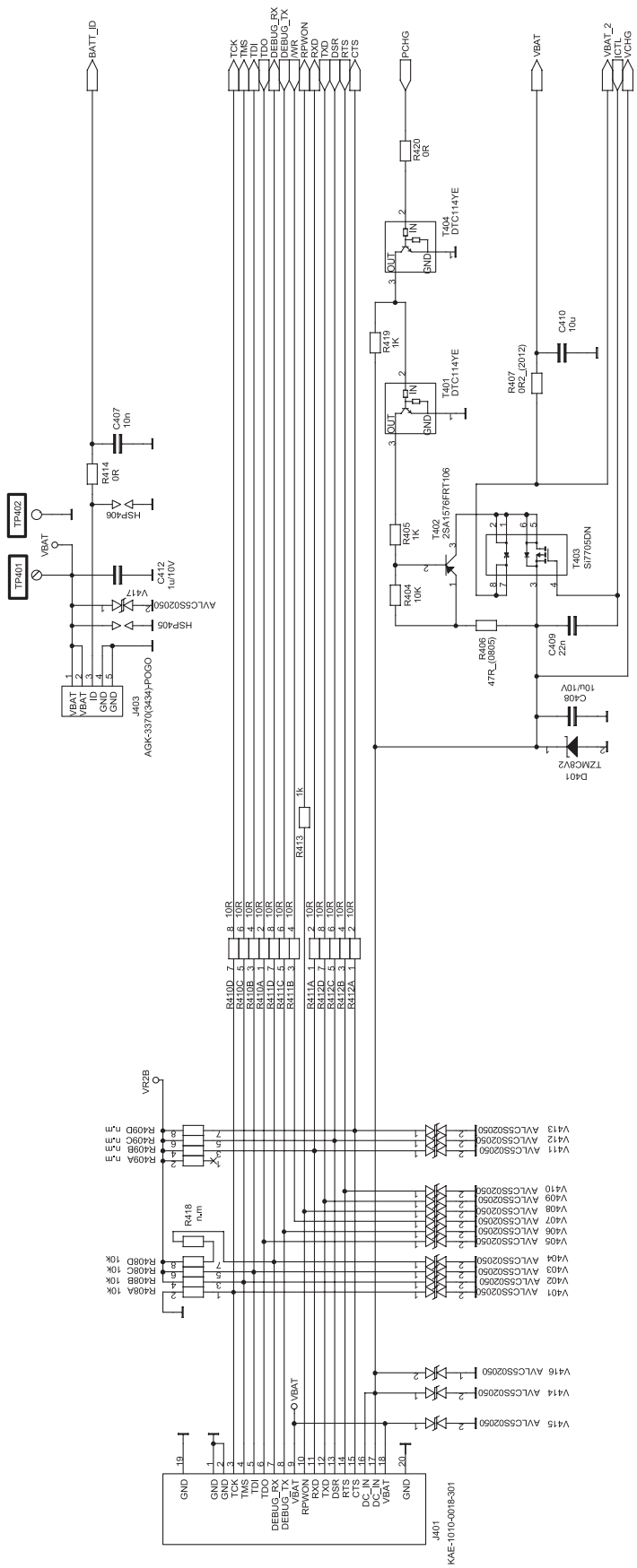


## 7.2 RF Main Block

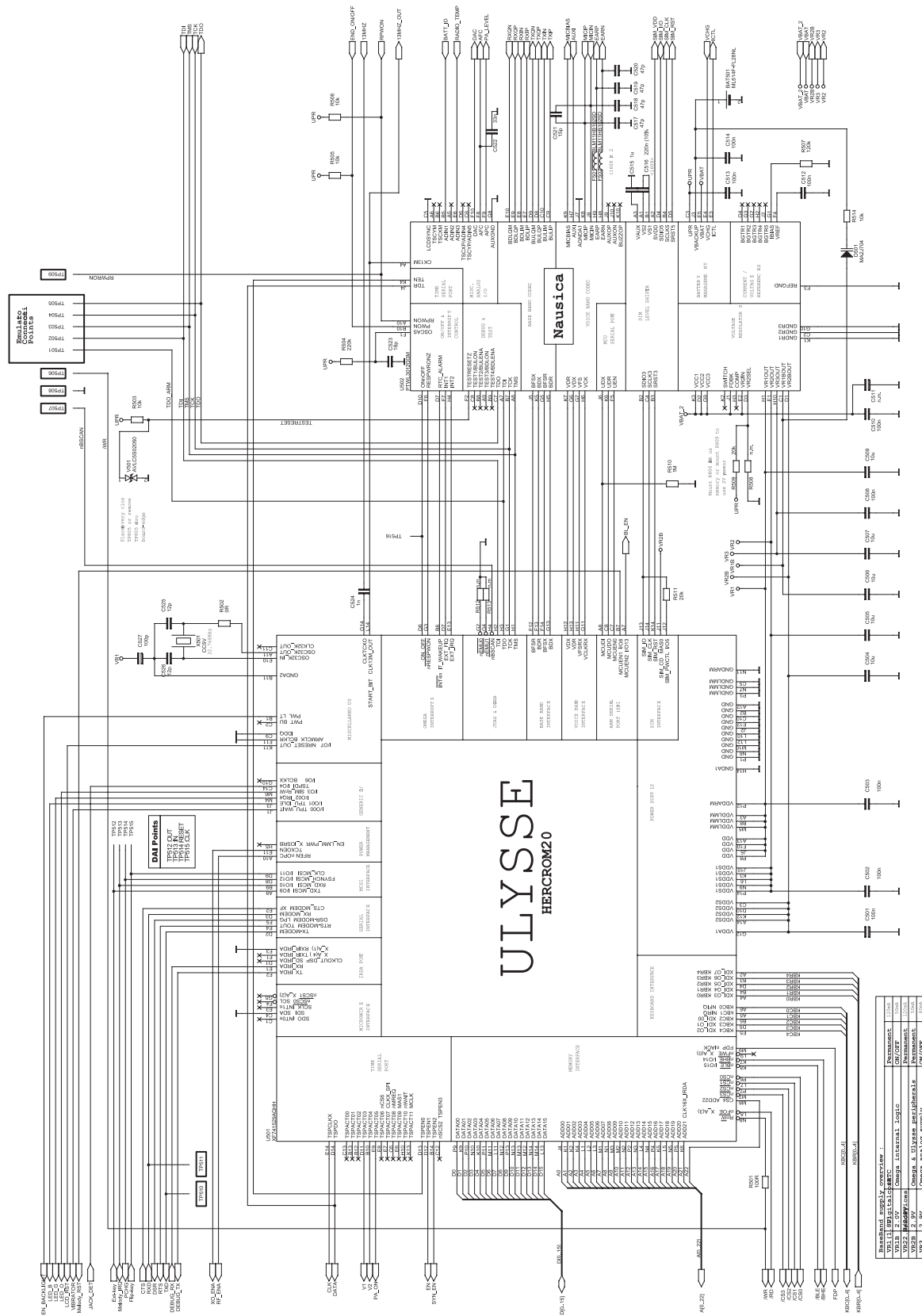




7.4 Peripheral Block

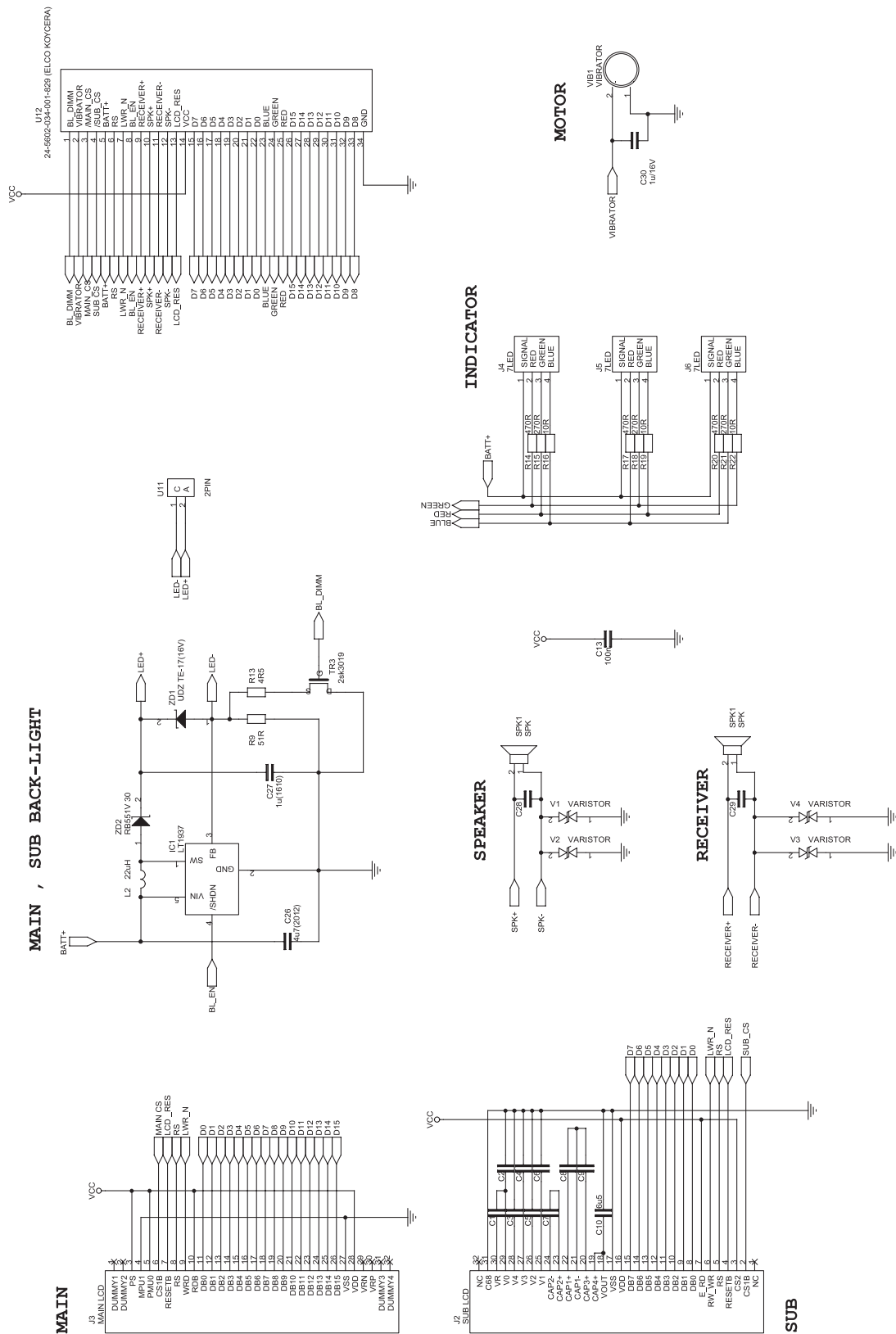


## 7.5 Base Band Block

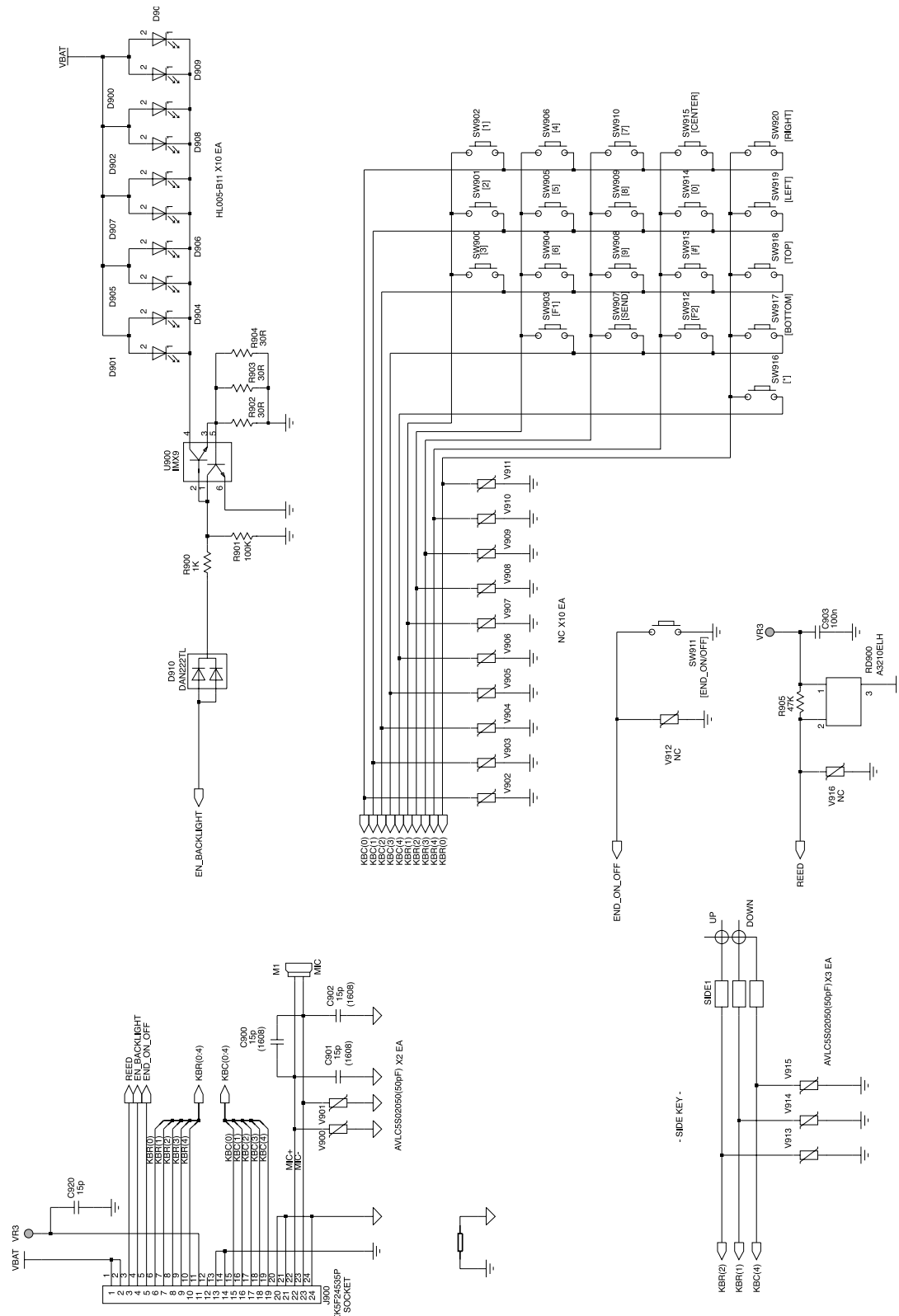




7.6 Folder Block



## 7.7 Key Pad Block

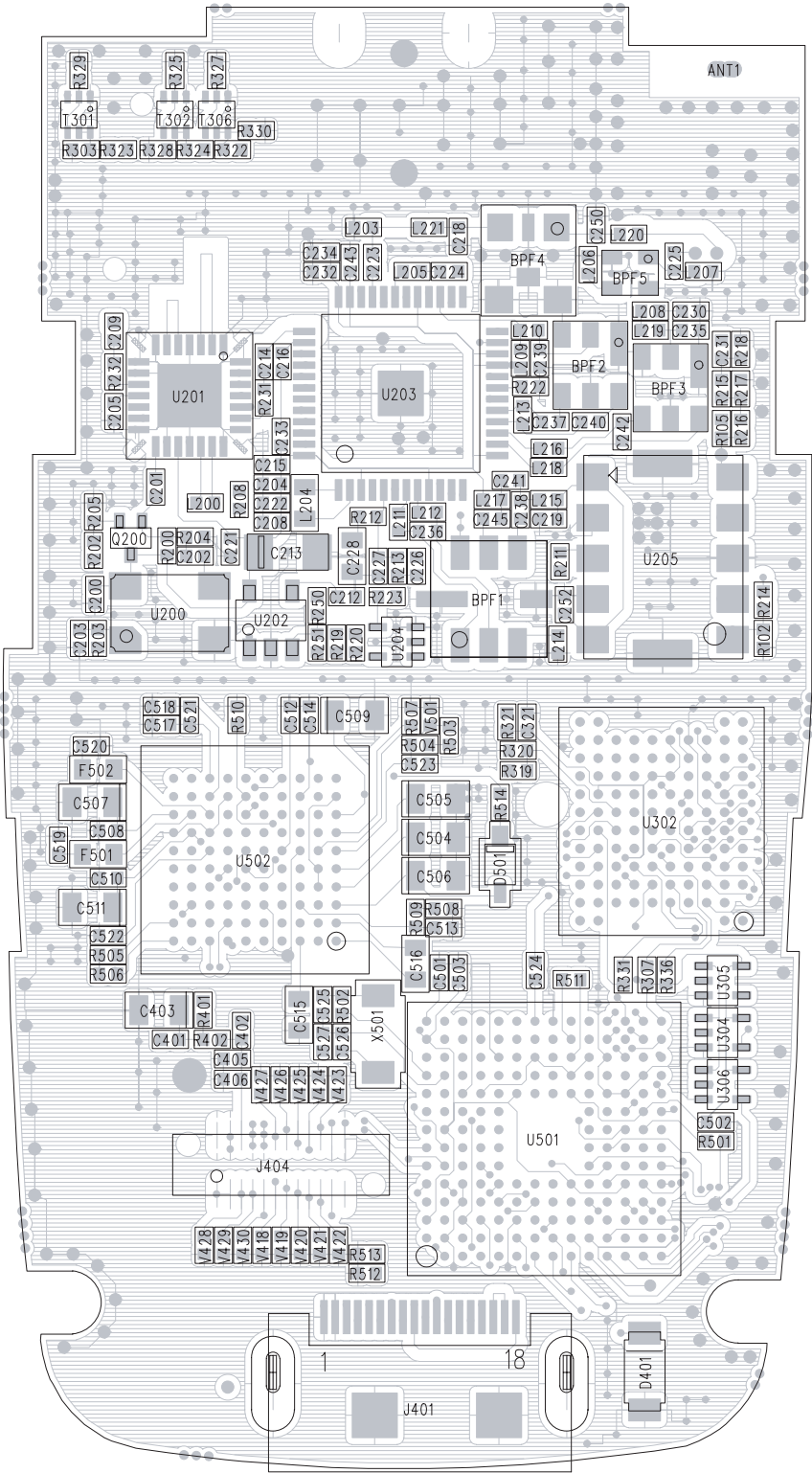


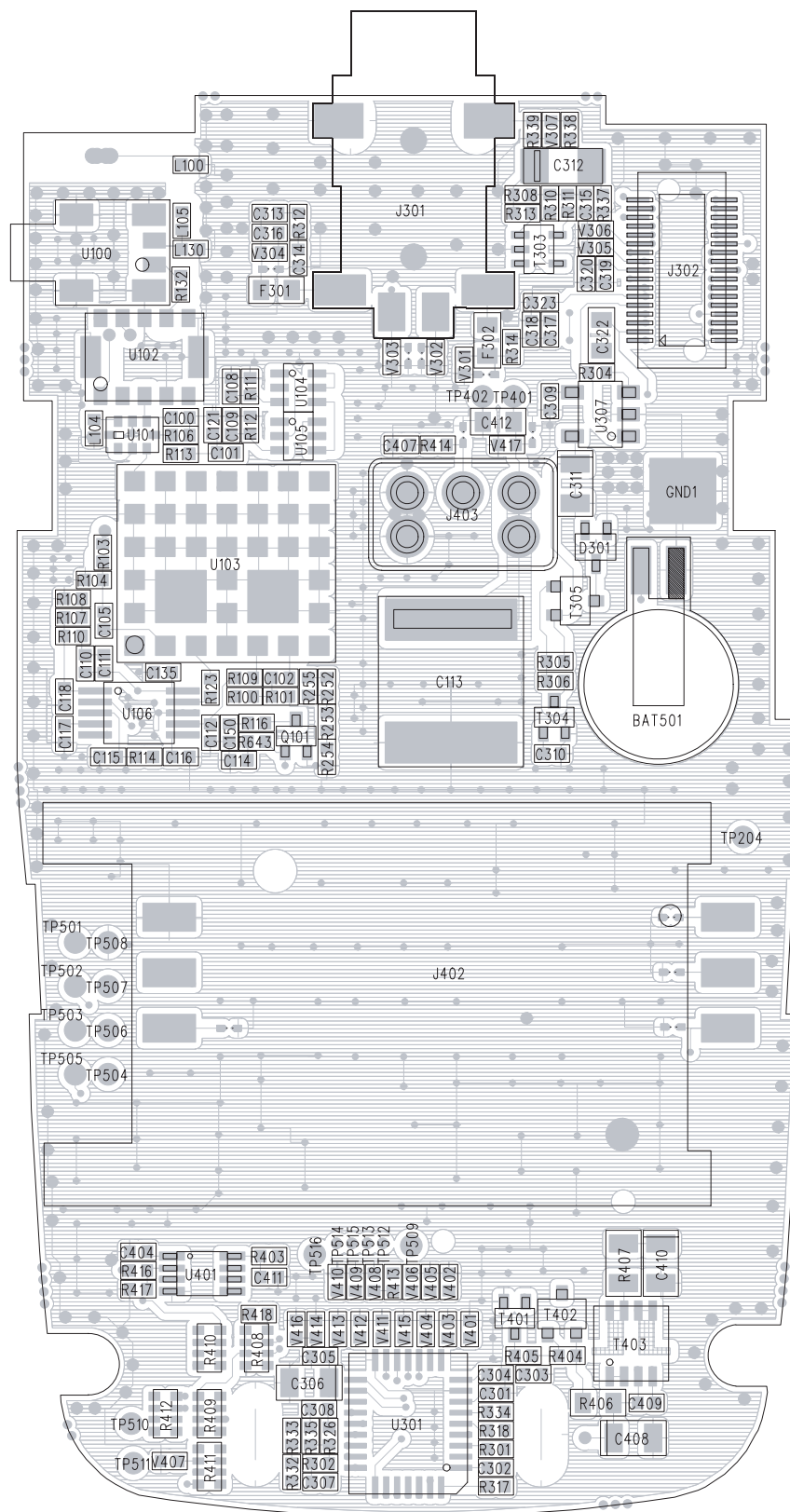


# 8. PCB Diagram

## 8.1 Main PCB

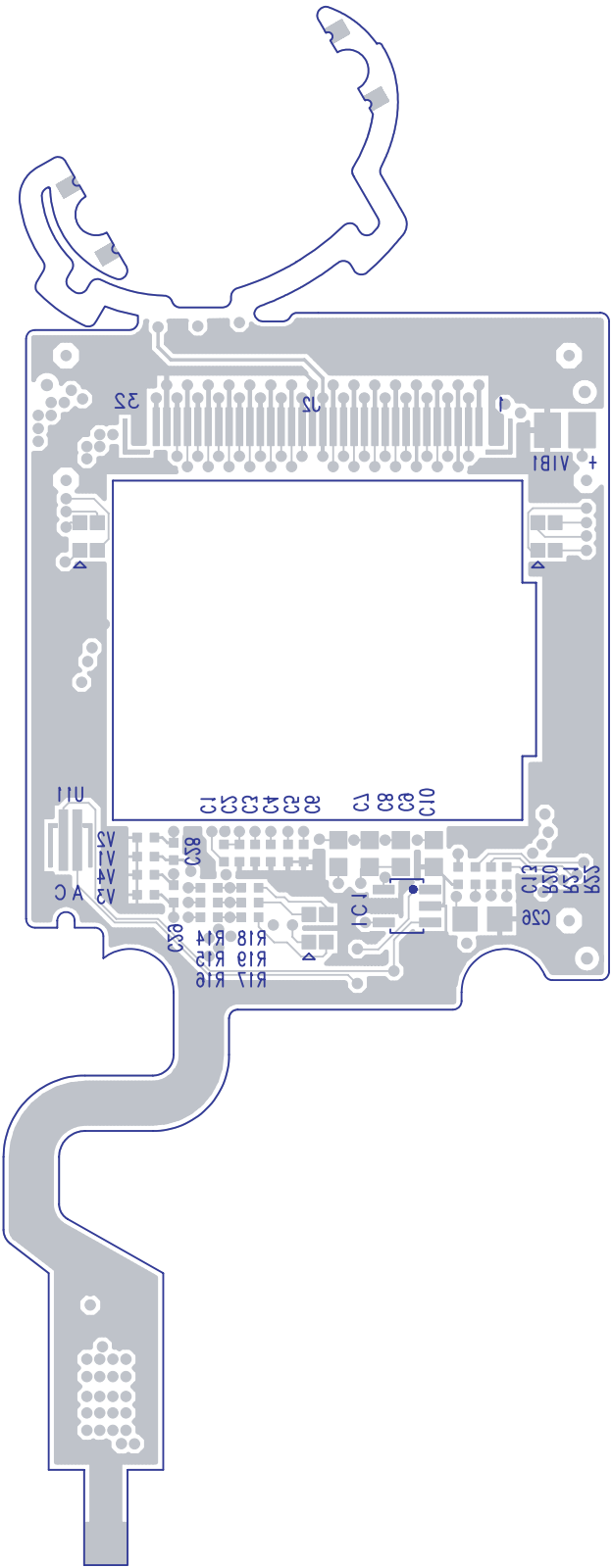
<TOP ViEW - COMP>



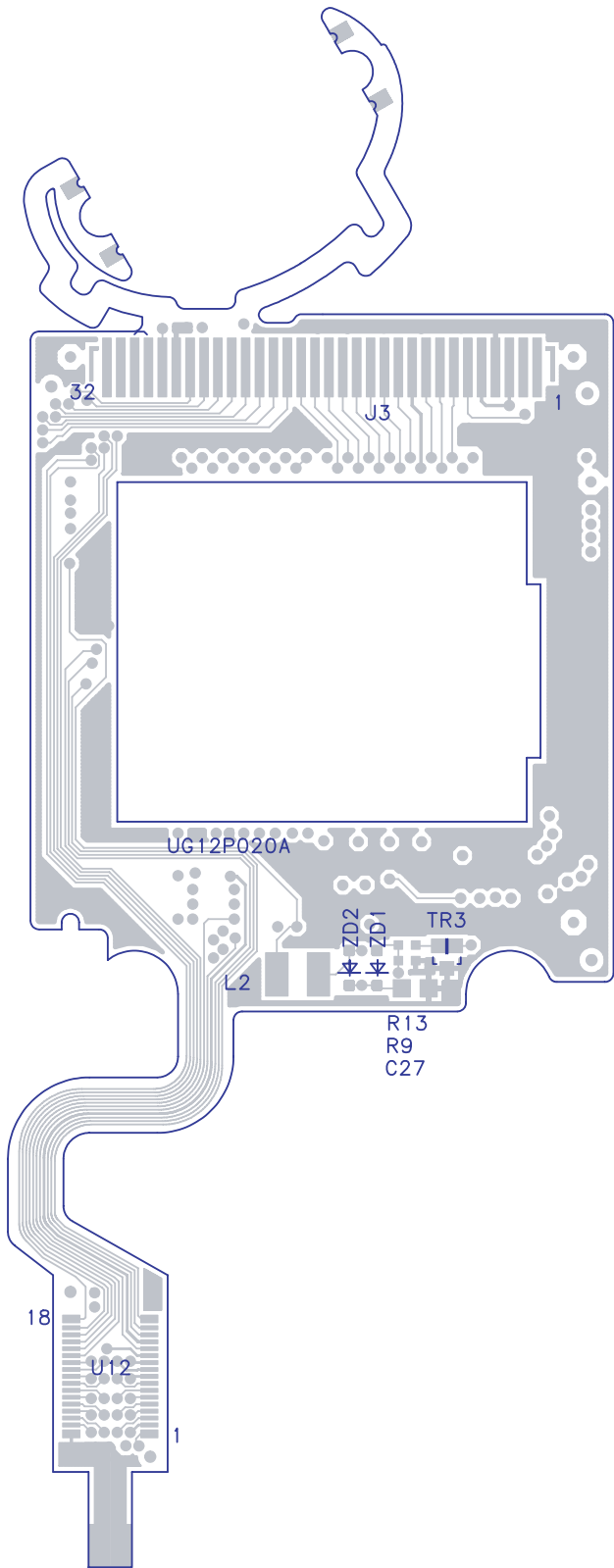


## 8.2 Folder PCB

<TOP VIEW - COMP>

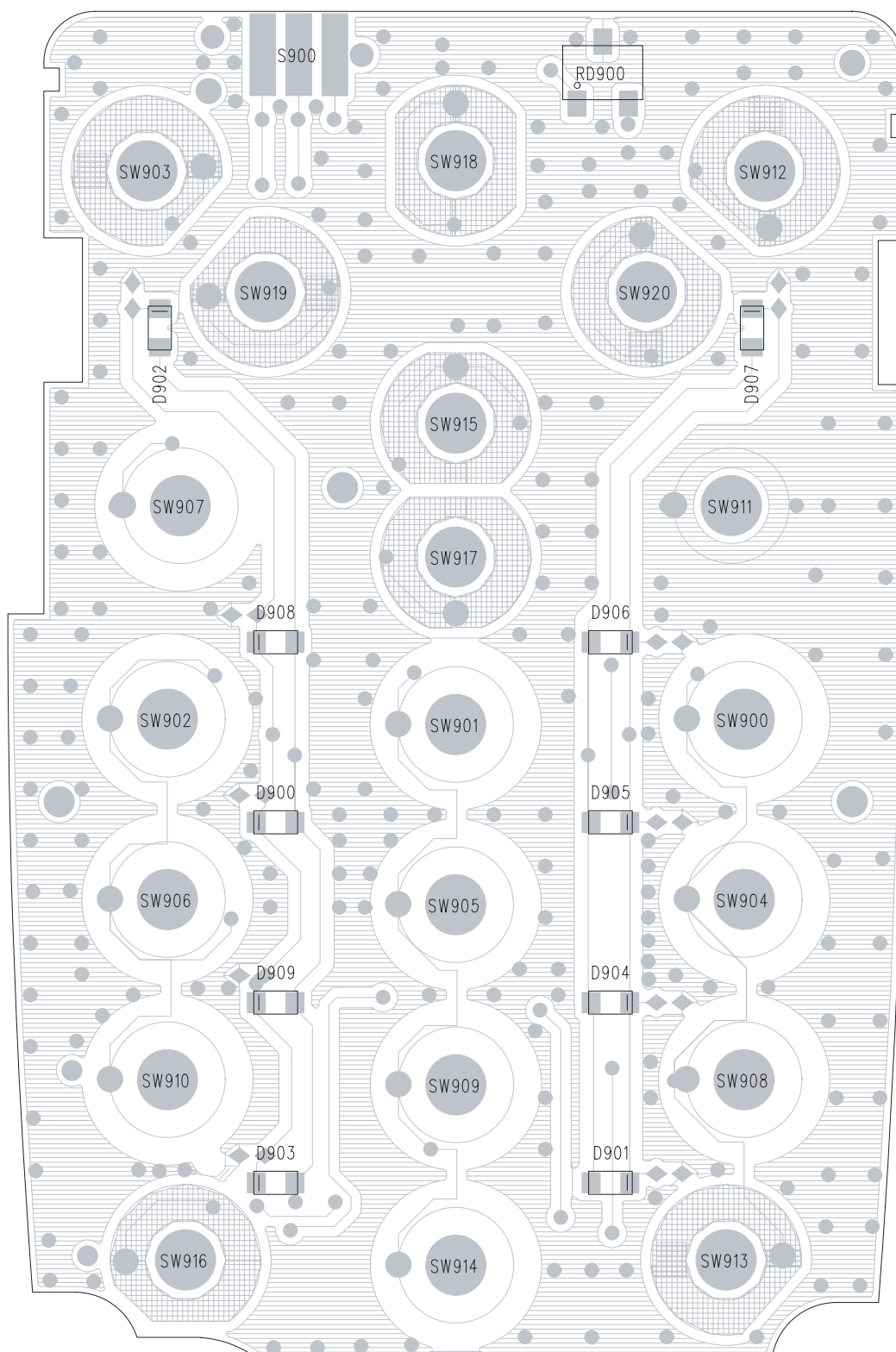


<BOTTOM VIEW - COMP>



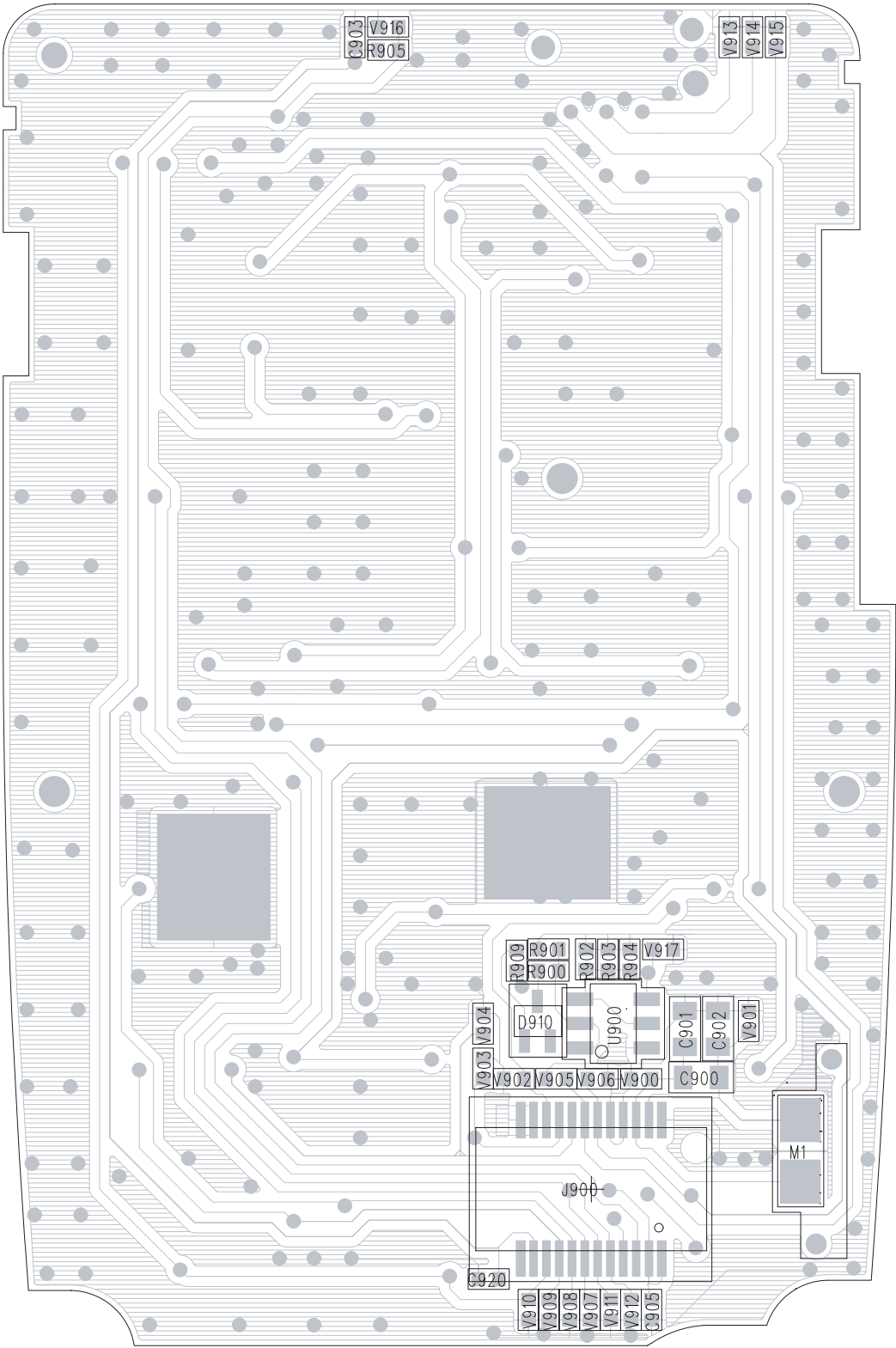
## 8.3 Key Pad PCB

<TOP VIEW - COMP>



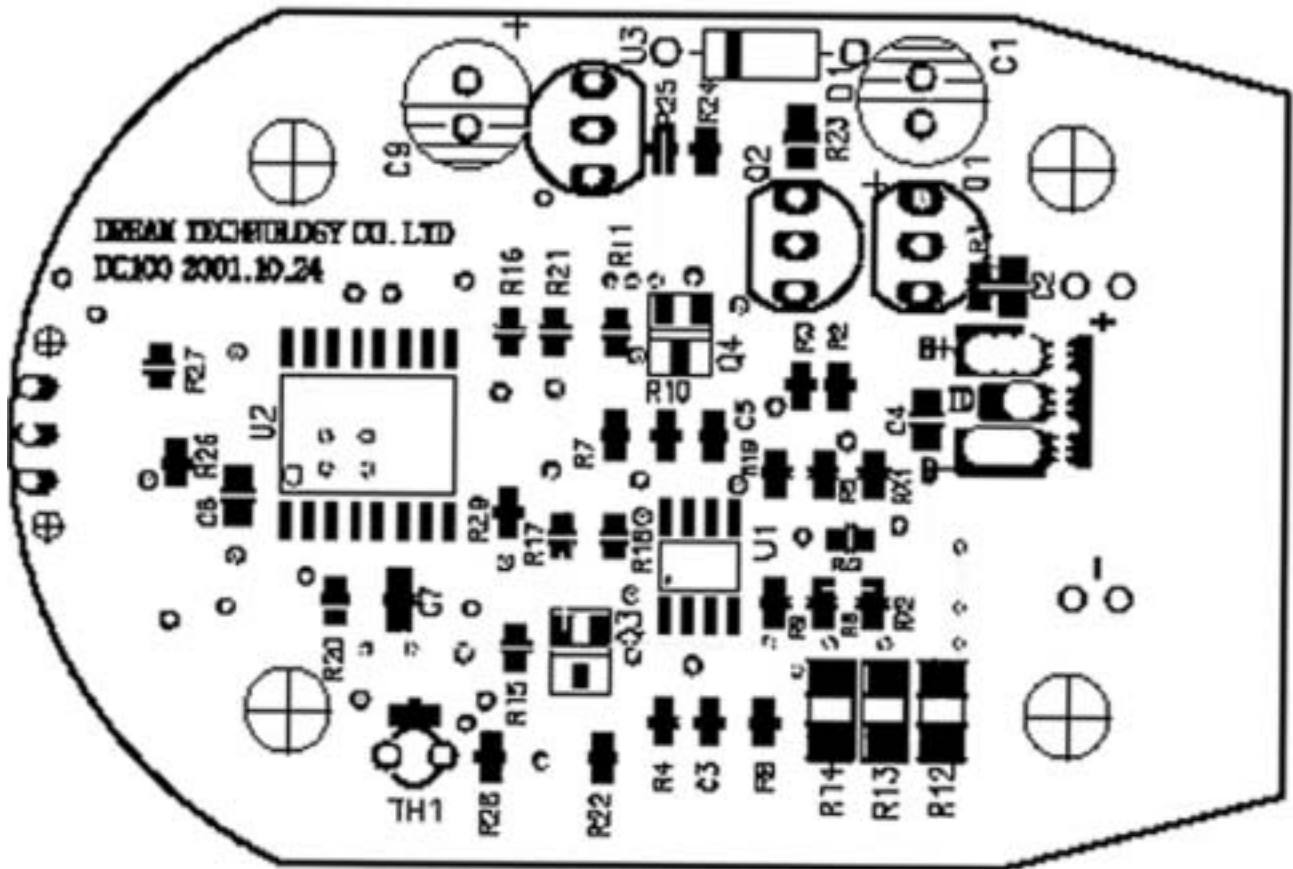


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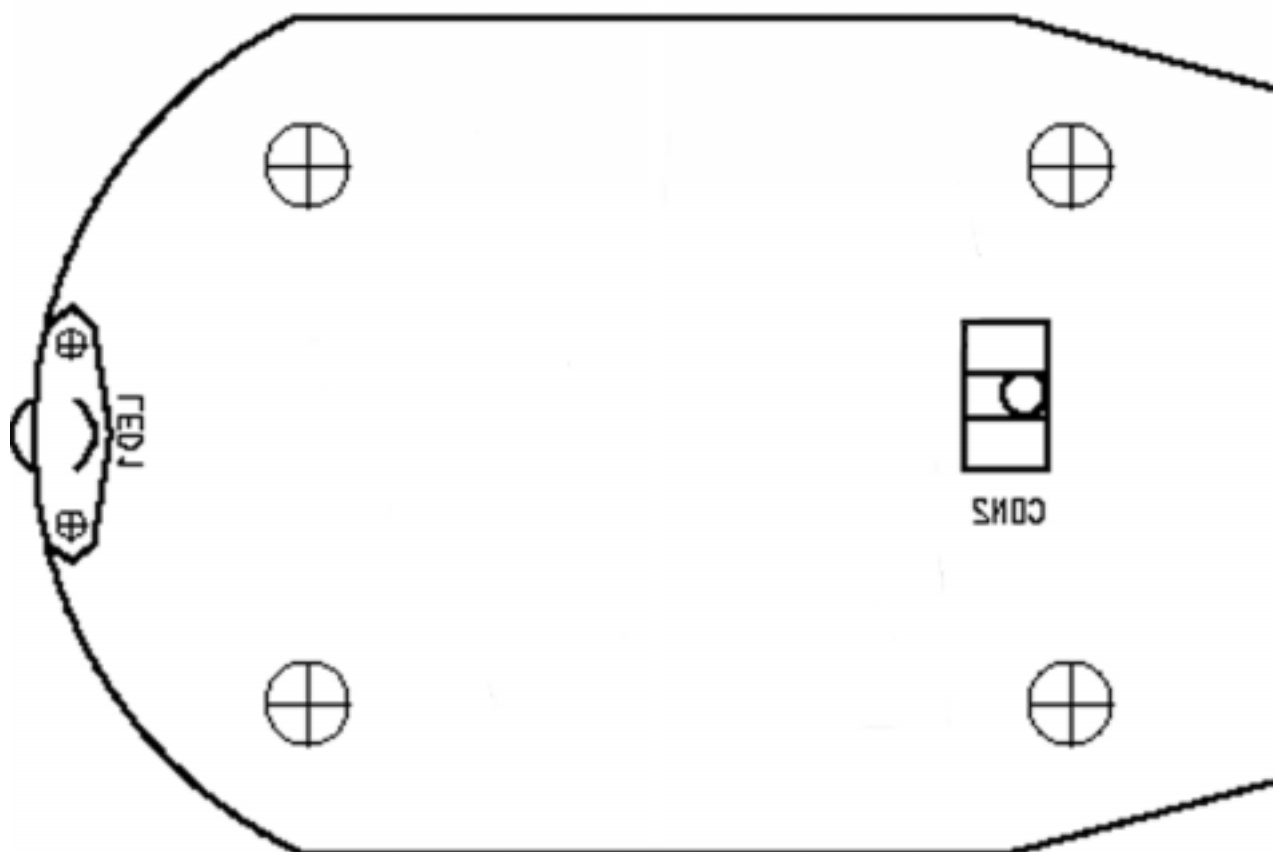


## 8.4 Battery Charger PCB

<TOP VIEW - COMP>



<BOTTOM VIEW - COMP>



## 9. Electrical Parts List

### 9.1 Main Parts List

| REF. NO   | DESCRIPTION          | PART NUMBER          |
|-----------|----------------------|----------------------|
| BAT501    | BACK UP BATTERY      | MS614F-FL28N         |
| BPF1      | IF SAW FILTER 282MHz | TFS282A              |
| BPF2      | RF SAW FILTER SINGLE | B39941-B4115-U510    |
| BPF3      | RF SAW FILTER SINGLE | B39182-B4133-U510    |
| BPF4      | MMC FILTER           | B69812-N1847-E375    |
| BPF5      | RF SAW FILTER        | FAR-F5CP-942M50-L21C |
| C101      | CAP 1005 33pF J      | GRP 1555C1H330JZ01E  |
| C102      | CAP 1005 47pF J      | GRP 1555C1H470JZ01E  |
| C105      | CAP 1005 22pF J      | GRP 1555C1H220JZ01E  |
| C108      | CAP 1005 47pF J      | GRP 1555C1H470JZ01E  |
| C109      | CAP 1005 12pF J      | GRP 1555C1H120JZ01E  |
| C110      | CAP 1005 100pF J     | GRP 1555C1H101JD01E  |
| C111      | CAP 1005 0.1uF K     | GRP 155R61A104KA01E  |
| C113      | TAN R 220uF 6.3V     | 592D227X06R3R2T      |
| C114~C115 | CAP 1005 1N K        | GRP 155R71A102KA01E  |
| C116      | CAP 1005 5.6pF C     | GRP 1555C1H5R6CZ01E  |
| C117      | CAP 1005 56pF J      | GRP 1555C1H560JZ01E  |
| C118      | CAP 1005 1pF C       | GRP 1555C1H1ROCZ01E  |
| C150      | CAP 1005 10N K       | GRP 155R71C103KA01E  |
| C200      | CAP 1005 0.1uF K     | GRP 155R61A104KA01E  |
| C201      | CAP 1005 100pF J     | GRP 1555C1H101JD01E  |
| C202~C203 | CAP 1005 10N K       | GRP 155R71C103KA01E  |
| C204~C205 | CAP 1005 0.1uF K     | GRP 155R61A104KA01E  |
| C208      | CAP 1005 0.1uF K     | GRP 155R61A104KA01E  |
| C209      | CAP 1005 100pF J     | GRP 1555C1H101JD01E  |
| C212      | CAP 1005 10N K       | GRP 155R71C103KA01E  |
| C213      | TAN R 33uF 10V       | F951A336MAAAQ2       |
| C214      | CAP 1005 100pF J     | GRP 1555C1H101JD01E  |
| C215      | CAP 1005 10N K       | GRP 155R71C103KA01E  |
| C216      | CAP 1005 10pF D      | GRP 1555C1H100JZ01E  |
| C219      | CAP 1005 27pF J      | GRP 1555C1H270JZ01E  |
| C221      | CAP 1005 10N K       | GRP 155R71C103KA01E  |
| C222      | CAP 1005 1N K        | GRP 155R71A102KA01E  |
| C223      | CAP 1005 6pF D       | GRP 1555C1H6R0DZ01E  |
| C224      | CAP 1005 15pF J      | GRP 1555C1H150JZ01E  |

| REF. NO   | DESCRIPTION       | PART NUMBER         |
|-----------|-------------------|---------------------|
| C225      | CAP 1005 100pF J  | GRP 1555C1H101JD01E |
| C228      | CAP 1608 6.8N K   | GRM188R71H682KA01D  |
| C230      | CAP 1005 100pF J  | GRP 1555C1H101JD01E |
| C231      | CAP 1005 27pF J   | GRP 1555C1H270JZ01E |
| C232~C233 | CAP 1005 10N K    | GRP 155R71C103KA01E |
| C234      | CAP 1005 9pF D    | GRP 1555C1H9R0DZ01E |
| C235      | CAP 1005 2.7pF C  | GRP 1555C1H2R7CZ01E |
| C236      | CAP 1005 1.2pF C  | GRP 1555C1H1R2CZ01E |
| C237      | CAP 1005 2pF C    | GRP 1555C1H2R0CZ01E |
| C238      | CAP 1005 12pF J   | GRP 1555C1H120JZ01E |
| C240      | CAP 1005 2pF C    | GRP 1555C1H2R0CZ01E |
| C241      | CAP 1005 2.2pF C  | GRP 1555C1H2R2CZ01E |
| C242      | CAP 1005 0.68pF C | GRP 1555C1HR68CZ01E |
| C243      | CAP 1005 1N K     | GRP 155R71A102KA01E |
| C245      | CAP 1005 12pF J   | GRP 1555C1H120JZ01E |
| C250      | CAP 1005 0.5pF C  | GRP 1555C1HR50CZ01E |
| C301      | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C302~C303 | CAP 1005 1N K     | GRP 155R71A102KA01E |
| C304~C305 | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C306      | TAN P 10uF 10V    | F951A106MPAAQ2      |
| C307      | CAP 1005 22N K    | GPR155R71C223KA01E  |
| C308      | CAP 1005 100pF J  | GRP 1555C1H101JD01E |
| C309      | CAP 1005 470pF K  | GRP1555C1H471KA01E  |
| C310      | CAP 1005 39pF J   | GRP 1555C1H390JZ01E |
| C311~C312 | TAN P 10uF 10V    | F951A106MPAAQ2      |
| C313      | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C314      | CAP 1005 47pF J   | GRP 1555C1H470JZ01E |
| C315      | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C316      | CAP 1005 33pF J   | GRP 1555C1H330JZ01E |
| C317      | CAP 1005 12pF J   | GRP 1555C1H120JZ01E |
| C318      | CAP 1005 47pF J   | GRP 1555C1H470JZ01E |
| C319      | CAP 1005 12pF J   | GRP 1555C1H120JZ01E |
| C320      | CAP 1005 47pF J   | GRP 1555C1H470JZ01E |
| C321      | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C401~C402 | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |
| C403      | TAN P 10uF 10V    | F951A106MPAAQ2      |
| C404      | CAP 1005 15 N K   | GRP 155R71C153KA01E |
| C405      | CAP 1005 47pF J   | GRP 1555C1H470JZ01E |
| C406      | CAP 1005 12pF J   | GRP 1555C1H120JZ01E |
| C407      | CAP 1005 0.1uF K  | GRP 155R61A104KA01E |

| REF. NO    | DESCRIPTION          | PART NUMBER         |
|------------|----------------------|---------------------|
| C408       | TAN P 10uF 10V       | F951A106MPAAQ2      |
| C409       | CAP 1005 22N K       | GPR155R71C223KA01E  |
| C410       | TAN P 10uF 10V       | F951A106MPAAQ2      |
| C411       | CAP 1005 0.1uF K     | GRP 155R61A104KA01E |
| C412       | CAP 1608 1uF Z       | GRM188F51A105ZC01D  |
| C501~C503  | CAP 1005 0.1uF K     | GRP 155R61A104KA01E |
| C504~C507  | TAN P 10uF 10V       | F951A106MPAAQ2      |
| C508       | CAP 1005 0.1uF K     | GRP 155R61A104KA01E |
| C509       | TAN P 10uF 10V       | F951A106MPAAQ2      |
| C510       | CAP 1005 0.1uF K     | GRP 155R61A104KA01E |
| C512~ C514 | CAP 1005 0.1uF K     | GRP 155R61A104KA01E |
| C515       | CAP 1608 1uF Z       | GRM188F51A105ZC01D  |
| C516       | CAP 1608 220nF 10V   | LMK107BJ224KA-T     |
| C517 ~C520 | CAP 1005 47pF J      | GRP 1555C1H470JZ01E |
| C522       | CAP 1005 33N K       | GRP155R71A333KA01E  |
| C523       | CAP 1005 18pF J      | GRP1555C1H180JZ01E  |
| C524       | CAP 1005 1N K        | GRP 155R71A102KA01E |
| C525~C526  | CAP 1005 12pF J      | GRP 1555C1H120JZ01E |
| C527       | CAP 1005 100pF J     | GRP 1555C1H101JD01E |
| D301       | DIODE                | DAN222TL            |
| D401       | FET                  | TZMC8V2             |
| D501       | DIODE                | MA2J70400L          |
| F301~F302  | BEADS 1608           | BLM 11HB 102SDPT    |
| F501 F502  | BEADS 1608           | BLM 11HB 102SDPT    |
| J301       | EAR JACK             | 02-828D0-53BKA      |
| J302       | B2B CON 34 PIN       | 14-5602-034-001-829 |
| J401       | I/O CONNECTOR 18 PIN | 1010-0018-301       |
| J402       | SIM CONNECTOR        | ID1AS-6S-2.54SF     |
| J403       | BATTERY CONNECTOR    | AGK3370 / 3434      |
| J404       | B2B CON 24PIN HEADER | AXK6F24335J         |
| L100       | IND 1005 18NH        | AML 1005H18NJT      |
| L104       | IND 1005 22NH        | AML 1005H22NJT      |
| L105       | IND 1005 1.8NH       | AML 1005H1N5ST      |
| L200       | IND 1005 10NH        | AML 1005H10NJT      |
| L203       | IND 1005 5.6NH       | AML 1005H5N6ST      |
| L204       | IND 1608 220NH       | HK1608 R22J-T       |
| L205       | IND 1005 12NH        | AML 1005H12NJT      |
| L206       | IND 1005 10NH        | AML 1005H10NJT      |
| L207       | IND 1005 18NH        | AML 1005H18NJT      |
| L208       | IND 1005 5.6NH       | AML 1005H5N6ST      |
| L209       | IND 1005 15NH        | AML 1005H15NJT      |
| L210       | IND 1005 27NH        | AML 1005H27NJT      |
| L211~L212  | IND 1005 39NH        | AML 1005H39NJT      |

| REF. NO   | DESCRIPTION         | PART NUMBER        |
|-----------|---------------------|--------------------|
| L213      | IND 1005 18NH       | AML 1005H18NJT     |
| L214      | IND 1005 82NH       | AML 1005H82NJT     |
| L215      | IND 1005 27NH       | AML 1005H27NJT     |
| L216      | IND 1005 4.7NH      | AML 1005H4N7ST     |
| L217      | IND 1005 27NH       | AML 1005H27NJT     |
| L218      | IND 1005 4.7NH      | AML 1005H4N7ST     |
| L219      | IND 1005 1NH        | AML 1005H1N0ST     |
| L220      | IND 1005 1.5NH      | AML 1005H1N5ST     |
| L221      | IND 1005 2.7NH      | AML 10052N7ST      |
| P501      | PCB MAIN            | VKPCB200M0X        |
| Q101      | TR                  | DTC114YETL         |
| Q200      | TR, NPN             | 2SC4617TL R        |
| R100      | RES 1005 18 ohm J   | MCR01MZSJ180       |
| R101~R102 | RES 1005 300 ohm J  | MCR01MZSJ301       |
| R103      | RES 1005 18 ohm J   | MCR01MZSJ180       |
| R104~R105 | RES 1005 300 ohm J  | MCR01MZSJ301       |
| R106      | RES 1005 51 ohm J   | MCR01MZSJ510       |
| R107      | RES 1005 240 ohm J  | MCR01MZSJ241       |
| R108      | RES 1005 62 ohm J   | MCR01MZSJ620       |
| R109      | RES 1005 20 ohm J   | MCR01MZSJ200       |
| R110      | RES 1005 62 ohm J   | MCR01MZSJ620       |
| R111~R112 | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R113      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R114      | RES 1005 2K ohm J   | MCR01MZSJ202       |
| R116      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R123      | RES 1005 20 ohm J   | MCR01MZSJ200       |
| R132      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R200      | RES 1005 30K ohm J  | MCR01MZSJ303       |
| R202      | RES 1005 200 ohm J  | MCR01MZSJ201       |
| R203      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R204      | RES 1005 27K ohm J  | MCR01MZSJ273       |
| R205      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R208      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R212      | RES 1005 150K ohm J | MCR01MZSJ151       |
| R213      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R214      | RES 1005 330 ohm J  | MCR01MZSJ331       |
| R215      | RES 1005 30 ohm J   | MCR01MZSJ300       |
| R217      | RES 1005 180 ohm J  | MCR01MZSJ181       |
| R218      | RES 1005 180 ohm J  | MCR01MZSJ181       |
| R219      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R220      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R222      | RES 1005 24K ohm F  | MCR01MZSF2402 (1%) |
| R223      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R231      | RES 1005 0 ohm J    | MCR01MZSJ000       |

| REF. NO   | DESCRIPTION         | PART NUMBER        |
|-----------|---------------------|--------------------|
| R251      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R252      | RES 1005 270K ohm F | MCR01MZSF2703 (1%) |
| R253      | RES 1005 680 ohm J  | MCR01MZSJ681       |
| R254      | RES 1005 4.7K ohm J | MCR01MZSJ472       |
| R255      | THERMISTOR          | NSM4223J380H3R     |
| R302      | RES 1005 20K ohm J  | MCR01MZSJ203       |
| R303      | RES 1005 39K ohm J  | MCR01MZSJ393       |
| R304      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R305      | RES 1005 13K ohm J  | MCR01MZSJ133       |
| R306      | RES 1005 2K ohm J   | MCR01MZSJ202       |
| R307      | RES 1005 100K ohm J | MCR01MZSJ104       |
| R308      | RES 1005 330 ohm J  | MCR01MZSJ331       |
| R310~R311 | RES 1005 270K ohm J | MCR01MZSJ273       |
| R312~R313 | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R314      | RES 1005 4.7K ohm J | MCR01MZSJ4R7       |
| R317      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R319      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R322~R324 | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R325      | RES 1005 20 ohm J   | MCR01MZSJ200       |
| R326      | RES 1005 100K ohm J | MCR01MZSJ104       |
| R327      | RES 1005 20 ohm J   | MCR01MZSJ200       |
| R328      | RES 1005 39K ohm J  | MCR01MZSJ393       |
| R329      | RES 1005 20 ohm J   | MCR01MZSJ200       |
| R330      | RES 1005 39K ohm J  | MCR01MZSJ393       |
| R333      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R334      | RES 1005 3.3K ohm J | MCR01MZSJ332       |
| R335~R336 | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R401      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R402      | RES 1005 2.2K ohm J | MCR01MZSJ222       |
| R403      | RES 1005 20K ohm J  | MCR01MZSJ203       |
| R404      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R405      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R406      | RES 1608 82ohm J    | MVR03EZHJ820       |
| R407      | RES 2012 0.2ohm F   | RLC20R20FTP        |
| R408      | RES ARRAY 10K ohm   | MNR04M0ABJ103      |
| R410~R412 | RES ARRAY 10K ohm   | MNR04M0ABJ100      |
| R416      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R417      | RES 1005 10K ohm J  | MCR01MZSJ103       |
| R509 R511 | RES 1005 20K ohm J  | MCR01MZSJ203       |
| R405      | RES 1005 3.3K ohm J | MCR01MZSJ332       |
| R413      | RES 1005 1K ohm J   | MCR01MZSJ102       |
| R414      | RES 1005 0 ohm J    | MCR01MZSJ000       |
| R416~R417 | RES 1005 1K ohm J   | MCR01MZSJ103       |
| R502      | RES 1005 0 ohm J    | MCR01MZSJ000       |



| REF. NO   | DESCRIPTION         | PART NUMBER         |
|-----------|---------------------|---------------------|
| R503      | RES 1005 10K ohm J  | MCR01MZSJ103        |
| R504      | RES 1005 220K ohm J | MCR01MZSJ224        |
| R505~R506 | RES 1005 10K ohm J  | MCR01MZSJ103        |
| R507      | RES 1005 120K ohm J | MCR01MZSJ124        |
| R509      | RES 1005 20K ohm J  | MCR01MZSJ203        |
| R510      | RES 1005 1M ohm J   | MCR01MZSJ105        |
| R511      | RES 1005 20K ohm J  | MCR01MZSJ203        |
| R505~R506 | RES 1005 1K ohm J   | MCR01MZSJ103        |
| R514      | RES 1005 10K ohm J  | MCR01MZSJ103        |
| R643      | RES 1005 1K ohm J   | MCR01MZSJ102        |
| T301~T302 | TR DUAL TYPE        | EMX1T2R             |
| T303      | TR                  | UMG5NTR             |
| T304      | TR                  | DTC114YELT          |
| T305      | TR, PNP             | 25A1576A T106R      |
| T306      | TR DUAL TYPE        | EMX1T2R             |
| T401      | TR                  | DTC114YELT          |
| T402      | TR, PNP             | 25A1576A T106R      |
| T403      | FET                 | SI7705DN            |
| U100      | RF CONNECTOR        | CRS5001-1702        |
| U101      | COUPLER DUAL        | LMG002S-5008C       |
| U102      | ANT SWITCH          | LMG002S-5008C       |
| U101      | COUPLER DUAL        | LDC15D190A0007A/13A |
| U103      | IC POWER AMP MODULE | RF3108TR13          |
| U104~U105 | TR DUAL TYPE        | UMD9NTR             |
| U106      | IC APC              | AD8316ARMO-REEL     |
| U200      | VCTCXO, 13MHZ       | TTS14V              |
| U201      | IC PLL              | TRF2253RGLR         |
| U202      | LC LDO 3.0V         | MIC5245-3.0BM5 TR   |
| U203      | IC RF MAIN CHIP     | TRF6053PHPR         |
| U204      | IC INVERTER         | SN74AHC1GU04DCKR    |
| U301      | IC MELODY 40POLY    | YMU762              |
| U302      | MCP(128M+32M)       | MB84VF5F5F4J2-70    |
| U304~U306 | IC                  | SN74LVC1G32DCKR     |
| U307      | IC LDO 3.3V         | MIC5219-3.3BM5 TR   |
| U401      | IC COMPARATER       | TC75W56FK           |
| U501      | IC MAIN HERC-ROM-20 | F741529AGHHR        |
| U502      | IC MAIN NAUSICA     | TWL3012GGMR/3012    |
| V501      | VARISTOR 1005 HIGH  | AVLC5S020509(50pF)  |
| X501      | X-TAL 32.768KHz     | CC5V                |
| U200      | VCTCXO, 13MHz       | TTS 14V             |

| REF. NO     | DESCRIPTION         | PART NUMBER          |
|-------------|---------------------|----------------------|
| U204        | IC INVENTER         | SN74AHC1GU04DCKR     |
| U205        | VCO DUAL TX         | VC-2R8A29-0897/1747B |
| U301        | IC MELODY 40POLY    | YMU762               |
| U302        | MCP(128+32M)        | MB84VF5F4J2-70       |
| U304 ~ U306 | IC                  | SN74LVC1G32DCKR      |
| U307        | ICLOD 3.3V          | MIC5219-3.3BM5 TR    |
| U401        | IC CIMPARATER       | TC75W56FK            |
| U501        | IC MAIN HERC-ROM-20 | F741529AGHHR         |
| U502        | IC MAIL NAUSICA     | TWL3012GGMR/3012     |
| V301~ V304  | VARISTOR 1005 HIGH  | AVLC5S02050(50pF)    |
| V306        | VARISTOR 1005 HIGH  | AVLC5S02050(50pF)    |
| V401 ~V430  | VARISTOR 1005 HIGH  | AVLC5S02050(50pF)    |
| X501        | X-TAL 32.768KHz     | CC5V                 |

## 9.2 Folder Parts List

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| REF. NO | DESCRIPTION                                 | PART NUMBER |
|---------|---|-------------|
| C1      | 6.8NF, 10% 50V, X7R, TP, 1005               | 2203-002982 |
| C2~C6   | 220NF, +80~20%, 16V, Y5V, 1005              | 2203-005493 |
| C7~C10  | 1UF, 20%, 16V, X5R, 1610-                   | 2203-006108 |
| C13     | 100NF, +80~20%, 16V, Y5V, TP, 1005          | 2203-005061 |
| C26     | 2.2UF, +80-20%, 50V, Y5V, TP, 2012          | 2203-001596 |
| C27     | 1UF, 20%, 16V, X5R, 1610-                   | 2203-006108 |
| C28~C29 | 100NF, +80~20%, 16V, Y5V, TP, 1005          | 2203-005061 |
| IC1     | LT1937, TSOT -<br>23, 5P, 2.9X1,62MM, PLAST | 1203-002633 |
| J4~J6   |   |             |
| L2      | 22UH, 10%, 3.2X2.5X1.55MM                   | 2703-002339 |
| R9      | 51 OHM, 5%, 1/16W, DA, TP, 1005             | 2007-001298 |
| R13     | 3.3 OHM, 5%, 1/16W, DA, TP, 1005            | 2007-007197 |
| R14     | 560OHM, 1%, 1/16W, DA, TP, 1005             |             |
| R15     | 560OKM, 1%, 1/16W, DA, TP, 1005             | 2007-007305 |
| R16     | 10OHM, 1%, 1/16W, DA, TP, 1005              | 2007-007798 |
| R17     | 560OHM, 1%, 1/16W, DA, TP, 1005             |             |
| R18     | 560OKM, 1%, 1/16W, DA, TP, 1005             | 2007-007305 |
| R19     | 10OHM, 1%, 1/16W, DA, TP, 1005              | 2007-007798 |
| R20     | 560OHM, 1%, 1/16W, DA, TP, 1005             |             |
| R21     | 560OKM, 1%, 1/16W, DA, TP, 1005             | 2007-007305 |
| R22     | 10OHM, 1%, 1/16W, DA, TP, 1005              | 2007-007798 |
| TR3     | 2SK3019. N. 30V. 100MA.130HM. 150W          | 0505-001325 |
| U12     | ELCO 0.4PITCH/34PIN                         |             |
| V1~V4   | 5.6V, 20A, 1X0. 5X0.6MM, TP                 | 1405-001082 |
|         | 4Layer, 0. 1XL94, 585XT0.4, rev02           | LJ-01115A   |
| ZD1     | UDZTE-17(16V)                               | 0403-001446 |
| ZD2     | RB551V-30, 30V, 500MA, SOD-323, TP          | 0404-001089 |

### 9.3 Key Parts List

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| REF. NO     | DESCRIPTION                                 | PART NUMBER                     |
|-------------|---|---------------------------------|
| C900~C902   | CAP, CERAMIC CHIP 15pF(1608)                | GRM36COG 150J 50PN              |
| C903        | CAP, CERAMIC CHIP, 0.1pF(100)N              | GRM36Y5V 104Z 16PN              |
| C920        | CAP, CERAMIC CHIP, 15pF(0402)               | GRM36COG 150J 50PN              |
| D900 ~ D909 | LED KEY, DEEP BLUE, 0.4t                    | HL005-B11<br>( λ : 460~465mmcd) |
| D910        | DIODE                                       | DAN222TL                        |
| J900        | B2B CONNECTOR, B2B, 24Pin, Socket (2.0t)    | AXK5F24535P                     |
| R900        | RES. CHIP 1 Kohm +-5%(J) 1/16W 1005(0402)   | MCR01MZSJ102                    |
| R901        | RES. CHIP 100 Kohm +-5%(J) 1/16W 1005(0402) | MCR01MZSJ104                    |
| R905        | RES. CHIP 47 Kohm +-5%(J) 1/16W 1005(0402)  | MCR01MZSJ473                    |
| R903~R905   | RES. CHIP 30 ohm +-5%(J) 1/16W 1005(0402)   | MCR01MZSJ300                    |
| RD900       | HALL SWITCH                                 | A3210ELH                        |
| U900        | TR, DUAL TYPE                               | IMXP                            |
| V900~V901   | VARISTOR, 1005Size                          | AVLC 5S 02 050(50pF)            |
| V902 ~V912  | N.C   |                                 |
| V913~V915   | VARISTOR, 1005Size                          | AVLC 5S 02 050(50pF)            |
| V916        | N.C   |                                 |

## 9.4 Battery Charger Parts List

| REF. NO    | DESCRIPTION                           | PART NUMBER      |
|------------|---------------------------------------|------------------|
| C1         | ELE-CAP, 4x5x2.5, 16V/47uF, 85°C      | SE16V47uF        |
| C2         | CHIP CAPACITOR, 2012, 104, Z50V       | MCH21 2F 104Z    |
| C3         | CHIP CAPACITOR, 1608, 103, Z, 50V     | MCH18 2F 103Z    |
| C4         | CHIP CAPACITOR, 2012, 104, Z50V       | MCH21 2F 104Z    |
| C5         | CHIP CAPACITOR, 1608,473, Z, 50V      | MCH18 2F 473Z    |
| C6~C7      | CHIP CAPACITOR, 2012, 104, Z50V       | MCH21 2F 104Z    |
| C9         | ELE-CAP, 4x5x2.5, 16V/47uF, 85°C      | SE16V47uF        |
| CON1       | CONNECTOR SOCKET, 18-PIN              | 1005-0018-305    |
| CON2       | CONNECTOR, 5-PIN                      | AGK-3370         |
| D1         | RECTIFIER DIODE, 1N4007, 1000V/1A     | 1N4007           |
| LED1       | LED-DUAL COLOR, Vr 4V/ 85mW/ 1fp 50mA | HDL-51RG         |
| PCB-MAIN   | DOUBLE, FR-4, t=1.2                   | PCB-MAIN         |
| PCB-SUB    | DOUBLE, FR-4, t=1.2                   | PCB-SUB          |
| PIN HEADER | CONNECTION PIN, 2-PIN                 | PII03-115-02A    |
| Q1~Q2      | TR, PNP, TO-92, 500mA, 625mW          | 2SC1277-AT       |
| Q3~Q4      | TR, NPN, SOT-23, 150mA, 150mW         | 2SC5343SF-Y      |
| R1         | CHIP-RESISTOR, 1608, 20Kohm,J         | RC0603JR-07 20K  |
| R2~R3      | CHIP-RESISTOR, 1608, 330Kohm,J        | RC0603JR-07 330R |
| R4         | CHIP-RESISTOR, 1608, 82Kohm,F         | RC0603FR-07 82K  |
| R5         | CHIP-RESISTOR, 1608, 330Kohm,F        | RC0603FR-07 330K |
| R6         | CHIP-RESISTOR, 1608, 510Kohm,F        | RC0603FR-07 510K |
| R7         | CHIP-RESISTOR, 1608, 10Kohm,J         | RC0603JR-07 10K  |
| R8         | CHIP-RESISTOR, 1608, 6.8Kohm,F        | RC0603FR-07 6K8  |
| R9         | CHIP-RESISTOR, 1608, 10Kohm,F         | RC0603FR-07 10K  |
| R10        | CHIP-RESISTOR, 1608, 910Kohm,J        | RC0603JR-07 910R |
| R11        | CHIP-RESISTOR, 1608, 3Kohm,J          | RC0603JR-07 3K   |
| R12~R13    | CHIP-RESISTOR, 3216, 1ohm,F           | RC1206FR-07 1R0  |
| R15        | CHIP-RESISTOR, 1608, 9.1Kohm,J        | RC0603JR-07 9K1  |
| R16        | CHIP-RESISTOR, 1608, 33Kohm,J         | RC0603JR-07 33K  |
| R17        | CHIP-RESISTOR, 1608, 9.1Kohm,J        | RC0603JR-07 9K1  |

| REF. NO | DESCRIPTION                      | PART NUMBER         |
|---------|----------------------------------|---------------------|
| R18     | CHIP-RESISTOR, 1608, 8.2Mohm, J  | RC0603JR-07 8M2     |
| R19     | CHIP-RESISTOR, 1608, 33Kohm, J   | RC0603JR-07 33K     |
| R20     | CHIP-RESISTOR, 1608, 82Kohm, F   | RC0603FR-07 82K     |
| R21     | CHIP-RESISTOR, 1608, 33Kohm, J   | RC0603JR-07 33K     |
| R22     | CHIP-RESISTOR, 1608, 10Kohm, F   | RC1206FR-07 10K     |
| R23     | CHIP-RESISTOR, 2012, 15ohm, J    | RC0603JR-07 15R     |
| R24     | CHIP-RESISTOR, 1608, 1.2Kohm, F  | RC1206FR-07 1K2     |
| R25     | CHIP-RESISTOR, 1608, 1.5Kohm, F  | RC1206FR-07 1K5     |
| R26     | CHIP-RESISTOR, 1608, 220ohm, J   | RC0603JR-07 220R    |
| R27     | CHIP-RESISTOR, 1608, 330Kohm, J  | RC0603JR-07 330R    |
| R28     | CHIP-RESISTOR, 1608, 33Kohm, J   | RC0603JR-07 33K     |
| RX1     | CHIP-RESISTOR, 1608, 10Mohm, J   | RC0603JR-07 10M     |
| TH1     | THERMISTOR, NTC, 10Kohm, 25°C    | ECTH RB 103H 3970GB |
| U1      | SHUNT REGULATOR, LM431 0.5%      | SL431B              |
| U2      | IC-QUAD OP AMP, LM358, 8SOP, 36V | S358                |
| U4      | IC-MCJ, 8BIT, ROM=4K, 28SOP      | ST62T01C6           |
| X2~X3   | CHIP-RESISTOR, 1608, 10Mohm, J   | RC0603JR-07 10M     |