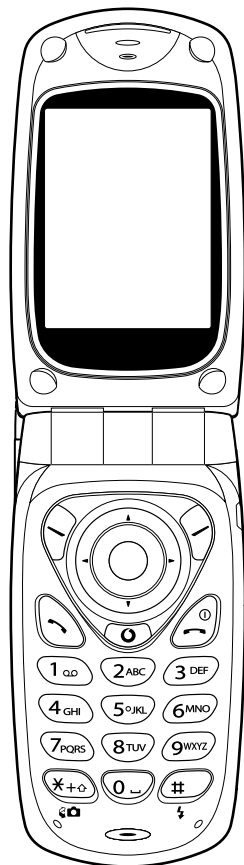


SHARP SERVICE MANUAL

No. S9311TQGX20/B



DIGITAL MOBILE PHONE MODEL **GX20**

(INTERNAL MODEL NAME:
TQ-GX20E/G/R/T/S/H/EP/PP/W/B/D/A/Z/Q/L/F/C)

- | | |
|--------------------------------|------------------------------------|
| E : For U.K. | G : For Germany |
| R : For Ireland | T : For Italy |
| S : For Spain | H : For Netherlands |
| EP : For U.K. (Prepaid) | PP : For Portugal (Prepaid) |
| W : For Sweden | B : For Hungary |
| D : For Greece | A : For Australia |
| Z : For New Zealand | Q : For Egypt |
| L : For Malta | F : For France |
| C : For Switzerland | |

• In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified should be used.

• Caution
Risk of explosion if battery is replaced by an incorrect type, dispose of used batteries according to the instruction.

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Parts Guide

Parts marked with "▲" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

CHAPTER 1. GENERAL DESCRIPTION

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

[1] Specifications

General:	Tri - band (GSM 900 MHz/DCS 1800 MHz/ PCS 1900MHz) GPRS-enabled WAP, MMS, SMS
Dimensions (folded, excluding the aerial)	
(H x W x D):	95 x 49 x 25 mm
Weight:	102 g
Battery operating temperature:	0°C - 40°C
Main display:	Display dimensions: 320 x 240 pixels LCD display: CGS 262,144 colours with backlight LCD backlight: LED backlight white colour LEDs
External display:	Display dimensions: 60 x 80 pixels LCD display: STN 256 colours LCD with backlight
Camera:	CCD 350K pixels built-in camera Zoom: Wide and zoom mode [Supported 4 (when image size is 120 x 160 pixels) x zoom] Lens: F2.8, f = 2.6 mm

Sound:	16-polyphonic ring melodies
Mobile light:	7 colours
External DC supply voltage:	5.2 V
Battery:	3.7 V, 720 mAh, Li-Ion
Standby time:	100 ~ 250 hours
Talk time:	180 ~ 240 min.
Others:	Side key Infrared port 1.2 L/P (maximum distance 20 cm) Connector for AC charger and data cable Standard hands free connector (ø2.5)

Battery running time depends on the battery and SIM card as well as the network conditions and usage

Specifications for this model are subject to change without prior notice.

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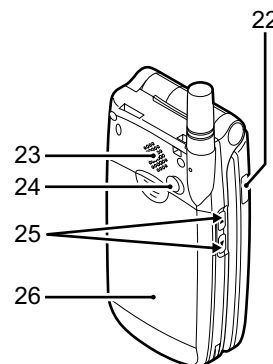
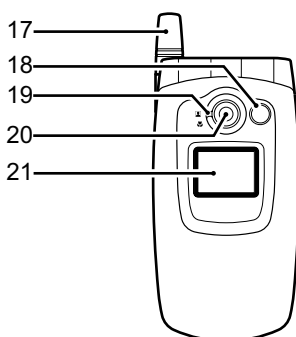
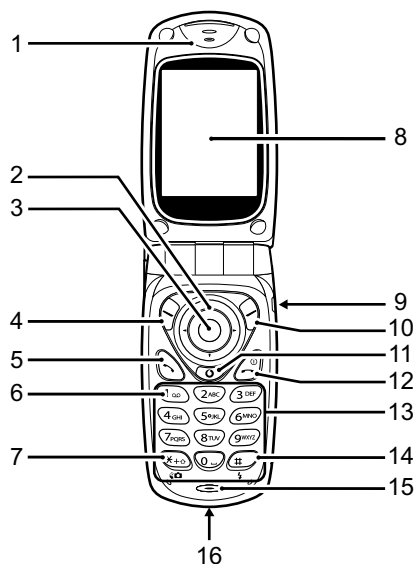
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JBlend[®] is a Java execution environment that Aplix developed for implementing advanced performance and fast operation on small-memory systems. JBlend and JBlend logo are trademarks or registered trademarks of Aplix Corporation in Japan and other countries.

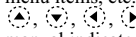







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[2] Names of parts



- 1. Earpiece**
- 2. Navigation Keys (Arrow Keys):**
 Moves cursor to select menu items, etc.
 in this manual indicate these keys.
 Up/Down arrow keys: Displays Contacts List entries in stand-by mode.
 Left arrow key: Displays list of Applications in stand-by mode.
 Right arrow key: Displays list of Saved Pictures in stand-by mode.
- 3. Centre Key:**
 Displays Main menu in stand-by mode and executes functions.
 in this manual indicates this key.
- 4. Left Soft Key:**
 Executes the function at the bottom left of the screen.
 in this manual indicates this key.
- 5. Send Key:**
 Makes or accepts calls, views the call in stand-by mode.
- 6. Voice Mail Key:**
 Press and hold this key to connect to the Voice mail centre automatically.
 (Depends on the SIM card.)
- 7. */Shift Key, Viewfinder Switch Key:**
 Enters *.
 Press and hold this key to switch input method among four modes: Abc, ABC, abc and 123.
 Switches viewfinders between main display and external display in digital camera/video camera mode.
- 8. Main Display**
- 9. Hands Free Connector**
- 10. Right Soft Key:**
 Executes the function at the bottom right of the screen.
 in this manual indicates this key.
- 11. "Vodafone live!" Key:**
 Used to access "Vodafone live!" by opening the browser.
- 12. End/Power Key:**
 Ends a call, turns power on/off.
- 13. Keypad**
- 14. #/Flash light Key:**
 Switches symbol screens.
 Press and hold this key to shift text input method between multi-tap and T9 mode.
 Turns the flash/auxiliary light on or off in digital camera/video camera mode.
- 15. Microphone**
- 16. External Connector:**
 Used to connect either the charger or data cable.
- 17. Aerial**
- 18. Mobile Light:**
 Used as a flash or an auxiliary light in digital camera/video camera mode, as a battery charge indicator, or notification for incoming calls, data/fax calls or messages.
- 19. Macro Dial:**
 (Close-up)
 Turns the dial to normal () or macro () position.
- 20. Camera**
- 21. External Display**
- 22. Infrared Port:**
 Sends and receives data via infrared.
- 23. Speaker**
- 24. RF Connector**
- 25. Side-Up/Side-Down Keys:**
 Moves cursor to select menu items, adjusts earpiece volume, etc.
 In stand-by mode, press and hold this key to turn the mobile light on and off.
 When the mobile light is on, press this key to change the light colour.
- 26. Battery Cover**

[3] Operation manual

(Page numbers refer to the user guide)

[Optional Accessories]

- Li-ion spare battery (XN-1BT11)
- High capacity Li-ion battery (XN-1BT13)
- Cigarette lighter charger (XN-1CL10)
- Data cable (RS232C cable: XN-1DC10)
- AC charger (Except for France: XN-1QC10, XN-1QC11)
(for France: XN-1QC11)

The above accessories may not be available in all regions.
For details, please contact your dealer.

[Quickstart Guide] (Except for France, Swiss)

QUICKSTART GUIDE 1: GETTING STARTED

In just a few minutes this QuickStart Guide will show you how to use some of the main features of your new GX20.

The Sharp GX20 is one of the most advanced mobile handsets available. With it you will be able to use its built-in camera to take pictures and video clips, play arcade quality games, listen to life-like polyphonic ringtones and sounds, send Multimedia messages, and connect to Vodafone live! and the mobile internet.

But before you can do any of this, first you need to make sure your handset is prepared.


1. Inserting your SIM card:

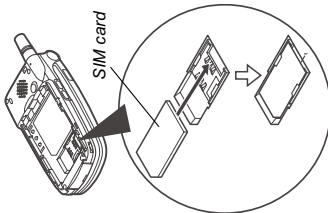
Slide off the battery cover, and remove the battery. Slide your Vodafone SIM card (with the gold contacts facing downwards) into its holder. Replace the battery and cover.

2. Charging the battery:

Before using your handset for the first time, it's important to charge the battery for at least 2 hours (see page 14 of the Manual).

3. Turning it on and off:

Open the handset, then press and hold the red  key. Do the same to turn it off again.



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QUICKSTART GUIDE 2: NAVIGATION

The GX20 has many features, but exploring and using them is simple, thanks to the 5-way central navigation key and the contextual softkeys.

(Centre key): Use to select an icon or menu item.

(In Standby): Takes you to the main Menu (shown in phone).

(In Camera mode): Takes a picture or starts/stops video recording.

(Navigation keys): Use to move between icons in menus and item lists.

(In Standby): Brings up commonly used menus (Contacts List, Applications and Saved Pictures).

The softkey selects whatever icon or command is shown in the bottom left of the screen. The softkey selects the bottom right of the screen (this usually acts as Cancel or Back). The key will select what's in the middle.

(When ringing): Answers a call.

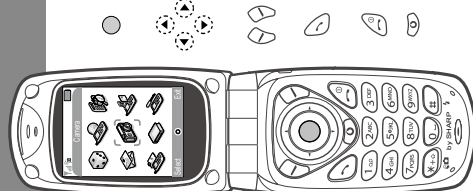
(In Standby): Brings up Last Dialed numbers.

(During call): Ends a call.

(Press and hold): Turns handset on and off.

(In menus): Takes you back to the Standby screen.

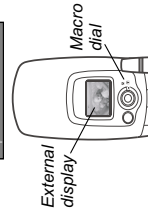
Takes you to the Vodafone live! home page.



ii

QUICKSTART GUIDE 3: THE CAMERA

The GX20's built-in camera now lets you take video clips, as well as having digital zoom and even a flash. Once you've taken your video or picture you can save it, then send it to others at a mobile number or email address (see next page).

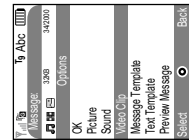


- 1. Video Camera mode:** Go to the main Menu (press **[M]** in Standby mode), select the Camera icon (you'll see the word 'Camera' in the red title bar), then press **[C]**. Select **Video Camera**.
- 2. Recording a video clip:** The screen becomes your viewfinder. You can zoom in (up to 4x) by pressing the **[Z]** key (the **[Z]** key zooms out again). You can also adjust the brightness using the **[+]** and **[-]** keys. Then press **[R]** to start recording. When you've finished, press **[C]** again.
- 3. Saving your video:** Now you'll be offered the choice of **Save** or **Preview**. Choose **Preview** to review your clip, then press **[B]** [Back]. If you're happy with the clip, select **Save** (it will be saved in **My Stuff** in the main Menu). If not, press **[C]** [Cancel], and try again.
- 4. Digital Camera mode:** Choose **Digital Camera** in the Camera menu (or press the **[D]** key in Standby mode). Press **[C]** to take the picture. Press **[S]** [Save] to save it (in **My Stuff**), or press **[C]** [Cancel] and take it again.
Tip: You can change the camera viewfinder to the external display (for taking pictures/videos of yourself) by pressing the **[E]** key. And you can adjust the Macro dial around the lens to take close-up shots (**[M]**).

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QUICKSTART GUIDE 4: MULTIMEDIA MESSAGING

Life is more than just text. With Multimedia Messaging, you can now send video clips, pictures and sounds as well! Your handset is already enabled to send and receive Multimedia Messaging, but if you have any problems call your local Vodafone customer services.



- 1. Create a new Multimedia message:** Select **Messages** in the main Menu (or press the **[M]** key in Standby mode). Select **Multimedia Messages**, then **Create Message**.
- 2. Write your message:** Use the keypad to write your text. To enter punctuation or other characters, press the **[Q]** key, then select the symbol you want. For a space, press **[S]**.
Tip: To turn Predictive Text (T9) off and on while entering text, press and hold the **[E]** key (you'll see the T9 symbol at the top of the screen). Press and hold the **[E]** key to cycle through the Input Method (capitals, numeric, etc.).
- 3. Add your video clip: (V symbol in message menu bar)** Press **[O]** [Options] and select **Video Clip**. Highlight the clip you want to send. Press **[C]**, then press **[B]** [Back].
Tip: To send video you may have to adjust the setting. Select **Multimedia Messages** in the Messages menu, then press **[O]** [Options]. Choose **Settings**. **Slide Show** then make sure that **Off** is selected.
- 4. Add your picture: (P symbol in message menu bar)** Press **[O]** [Options] and select **Picture**. Highlight the picture you want, press **[C]**, then press **[B]** [Back].

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QUICKSTART GUIDE

- 5. Add a sound file: (S symbol in message menu bar)** Press **[O]** [Options] and select **Sound**. To listen to the sounds, press **[O]** [Options], then **Play**. Highlight the sound you want, press **[C]**, then press **[B]** [Back].
- 6. Preview your message:** Then press **[O]** [Options], and select **Preview Message**. If you're happy with the message, press **[C]**, then **[C]** again to go to the **To:** screen.
7. Send to another mobile: Enter the number of the mobile phone you want to send it to. Press **[C]**, then select **Send** and press **[C]** again. If the receiving phone can't display Multimedia messages or video clips, they'll be sent a link to a web page they can view them on.
Tip: Try sending it to yourself to see how it works!
8. Send to an email address: After Step 6, press **[O]** [Options], and select **Input Method**. Choose **abc** and then press **[B]** [Back]. Then write the email address (using the **[E]** key to bring up the symbols menu for the **@** key). Press **[C]**, then select **Send** and press **[C]** again.
Tip: Press **[O]** [Options], then select **Search** in the **To:** screen to bring up your **Contacts** list. Then choose the mobile number or email address for the contact you wish to send it to. It will be entered in the **To:** screen automatically.



v

QUICKSTART GUIDE 5: Vodafone live!

Vodafone live!
Vodafone live! is a mobile internet portal which is your gateway to a new world of information, games, music and services.

Connect to Vodafone live!

Simply press the **[N]** key (under the Navigation key) to connect you to the Vodafone live! main menu. To exit, press the **[B]** key.

Tip: Your GX20 uses GPRS, a fast way of getting mobile information. Also, the connection is 'always on' — which means no wait for dialling up. You only pay for data you send or get, not how long you're connected.

Or link directly to Vodafone live! services:

In the main Menu, select the **Vodafone live!** section, and choose your service:

Games: Online fun and games to download...

Ringtones: Download music, sounds and ringtones.

Pictures: Download images, animations and background wallpaper.

News: Get the latest news as it happens...

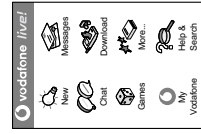
Sport: News, results and latest scores (with pictures).

Find & Seek: Get the local information you need, wherever you are.

Chat: Instant messaging and text chat with all your friends.

Search: Find what you need in Vodafone live!

Tip: Vodafone live! is growing and changing all the time, so these options may vary. Keep checking it out to see what's new.



This works very like an ordinary web browser. Use the navigation keys to highlight the item you want to select, then press **[C]** to open that page. Press **[B]** [Back] to go back a page. Press **[O]** [Options] for the Browser Option menu.

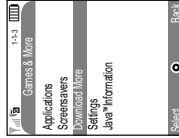
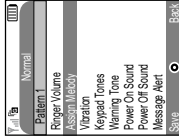
vi

QUICKSTART GUIDE 6: DOWNLOADING

Personalise your new handset by downloading new ringtones, images and background wallpaper from Vodafone live!. All downloads are saved in the *My Stuff* section of the main Menu.

You can download from the Vodafone live! portal or the handset shortcuts (see previous page), or use the **Download More** menus:

- 1. Download a new ringtone:**
Your GX20 uses polyphonic ringtones for a more life-like sound. Go to the **My Stuff** section from the main Menu, choose **Sounds** and then **Download More**. Choose the ringtone you'd like and follow the instructions to download it.
Tip: To activate your ringtone, go to **Profiles** (in the main Menu), then choose **Normal**, then select **Options/Personalise/Assign Melody**. Choose **My Sounds** and select your downloaded ringtone.
- 2. Download new background wallpaper:**
To choose a new background image for your phone, go to **My Stuff/Pictures/Download More**. Choose an image and follow the instructions to download it. Then go to **Settings** (in the main Menu)/**Phone Settings/Main Display/Wallpaper/My Pictures**, and select your downloaded image.
- 3. Download new games:**
To add more arcade quality games to your handset, go to **Fun & Games** (in the main Menu) and choose **Games & More/Download More**. Choose a game to download, and you'll find it in **Fun & Games/Games & More/Applications**.



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QUICKSTART GUIDE 7: TIPS AND TRICKS

Here are a few tips to help you use your new handset. There's much more information in the manual — or you could just explore all the menus and options screens...

1. Silent mode:

To switch your handset to silent mode, press and hold the **⏏** key. Highlight the **Silent** profile and select it. Select the **Normal** profile to go back to your usual setting.

2. International dialling:

Press and hold the **⏏** key for the (+) sign when dialling international numbers.

3. Voice Memo:

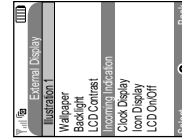
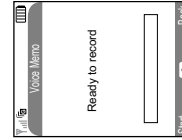
Press **⏏** then **⏏** to bring up the **Voice Memo** application. Press **⏏** to record, and again to stop. You can send voice memos as part of a Multimedia message.

4. Front light:

Press and hold the side key on the left side of the handset (in **Standby** mode) to turn the light on and off (it can be used as a makeshift torch). Press the side key to change the colour (the last selection cycles through them all like a disco light).

5. External display:

You can customise your External display in the same way as your main screen. Go to **Phone Settings** from the main Menu, then choose **External Display**. Now you can change the way the clock looks, the background picture, even the icon displayed when there's a call...



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CHAPTER 2. ADJUSTMENTS

[1] Adjustments SHARP Program Support Tool (SPST)

1. Outline

This document provides user information required to install and use GX20 Program Support Tool (SPST).

2. System requirements

- IBM PC compatible personal computer (standard COM1 serial port (115,200 bps) and USB required)
Supporting OS: Windows 98/98SE/2000/XP (except for Windows 95/ME/NT)
(English, German, Italian, Spanish, French and Chinese versions)

- Data cable
- Full charged battery

<During RF adjustment>

- RF test instrument: CMU200
- GPIB interface: National Instruments USB-GPIB cable
Model No.: NI GPIB-USB-B
- The battery should be fully charged.

3. Introduction

3.1. Functions

SPST offers five key functions:

1. Software download
2. User data transfer (processes all data at once but not individually)
3. RF calibration
4. Default setting
5. Identification

SPST functions as a **launcher for these independent software programs.**

3.2. Installation

The SPST software is distributed in CD-ROM format.

- 1) Use Windows Explorer and copy "UpgradingTool.zip" and "SPST.zip" to the desktop.
- 2) Unzip and install "UpgradingTool.zip" following the procedures below.
- 3) Unzip the "SPST.zip".

Hereinafter, procedures are carried out in the SPST folder.

3.2.1 Starting up

Connect GX20 to an operable serial port of the PC with the supplied data cable. Connect the AC charger to the Data cable. Execute the GX20 SPST.exe program in the SPST folder.

- 1) The SPC input screen appears. Input SPC (2968) and press "OK".
If you do not know SPC, press "Cancel" to close.



Figure 1

2) If SPC is correct, the following screen appears.



Figure 2

The software for each function is independent and thus multi-bootable. However, you can only activate single software at a time. To start another software, exit the current one.

3) Click the "Change Password" button in Step 1. The screen below appears and you can change SPC.



Figure 3

3.3. Functions

3.3.1 Identification

SPST downloads and displays the main data configured in GX20.

<Operation>

1) On the SPST startup screen, press "Identity".

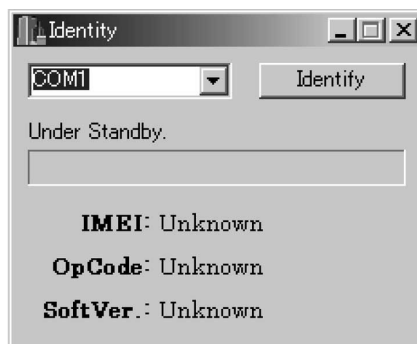


Figure 4

2) Connect PC and MS with a Data cable.

3) Remove the SIM card and turn on the phone. → Regular display.

4) Select the COM port.

5) Press "Get Identity". → The information will be displayed.

6) IMEI will be displayed, and the following dialog box appears.



Figure 5

- 7) Make sure GX20 is turned off and press the power key.
- 8) Press "OK" when **** appears on the GX20 display.
- 9) Make sure "Success!!" appears. Check the data and exit.

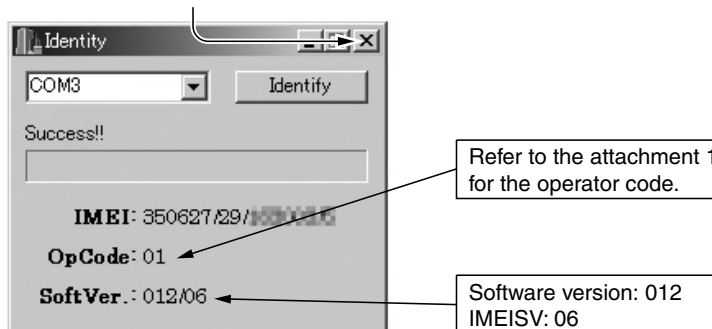


Figure 6

Attachment 1 Operator Code Chart

No.	Operator name		Country	Model name
01	Vodafone UK	Post-Paid	UK	A4TQGX20E
02	Airtel	Post-Paid	Spain	A4TQGX20S
03	SFR	Post-Paid	France	A4TQGX20F
04	Vodafone Omnitel	Post-Paid	Italy	A4TQGX20T
05	D2	Post-Paid	Germany	A4TQGX20G
06	Vodafone NL	Post-Paid	Netherlands(Holland)	A4TQGX20H
08	Vodafone Ireland	Post-Paid	Ireland	A4TQGX20R
10	Vodafone Greece	Post-Paid	Greece	A4TQGX20D
11	Vodafone Hungary	Post-Paid	Hungary	A4TQGX20B
12	Vodafone Australia	Post-Paid	Australia	A4TQGX20A
13	Vodafone New Zealand	Post-Paid	New Zealand	A4TQGX20Z
14	Vodafone Sweden	Post-Paid	Sweden	A4TQGX20W
15	Vodafone Egypt	Post-Paid	Egypt	A4TQGX20Q
16	Vodafone Malta	Post-Paid	Malta	A4TQGX20L
17	Swisscom	Post-Paid	Switzerland	A4TQGX20C
48	Vodafone PT	Pre-Paid	Portugal	A4TQGX20PP
50	Vodafone UK	Pre-Paid	UK	A4TQGX20EP

3.3.2 User data transfer**SPST saves and downloads all the following user data.**

- 1) Connect PC and MS with a Data cable and turn on MS.
- 2) Activate the software.



Figure 7

- a) Select the COM port. You cannot specify the communication protocol. (115 kbps)
- b) Press "Recognition".
Do not press "Recognition" until "InsertSIM" appears.
- 3) Press either "BACKUP", "RESTORE" or "END".

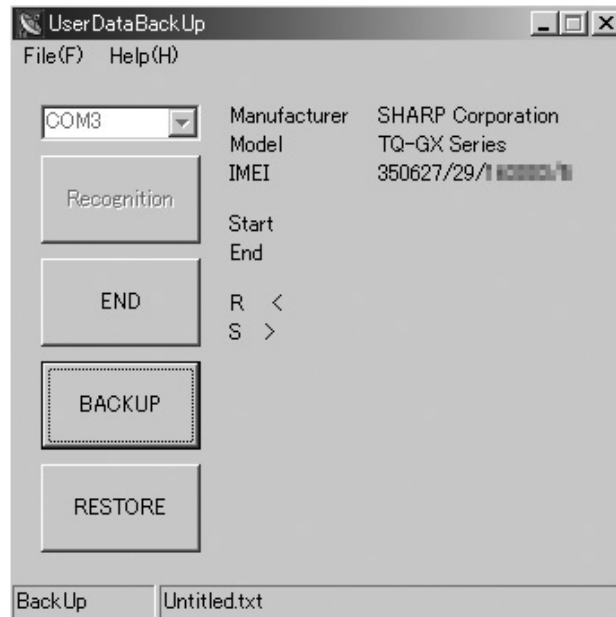


Figure 8

4) If "BACKUP" is pressed, the dialog box for file selection appears. Select the file and press "Save".

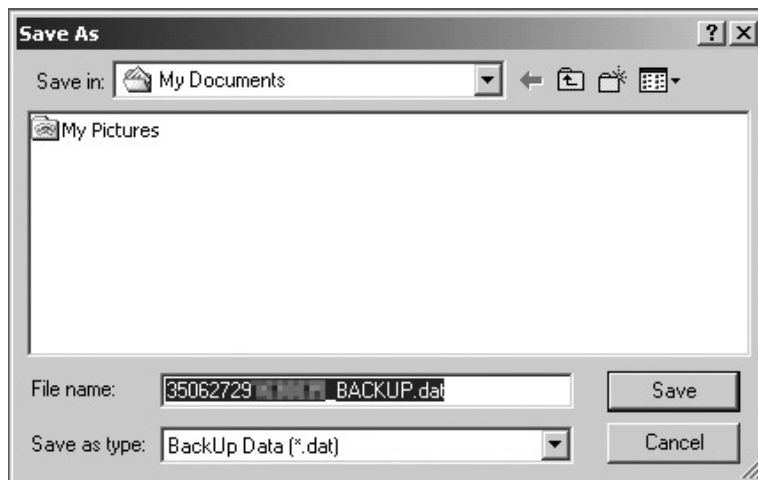


Figure 9

The buttons are grayed out during the process.



Figure 10

When they return to black, the process is complete. Press "END" to exit.



Figure 11

5) If "RESTORE" is pressed, the following confirmation dialog box appears. Press "OK" to confirm.

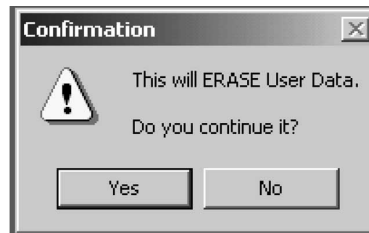


Figure 12

The dialog box for file selection appears. Select the file and press "Open".

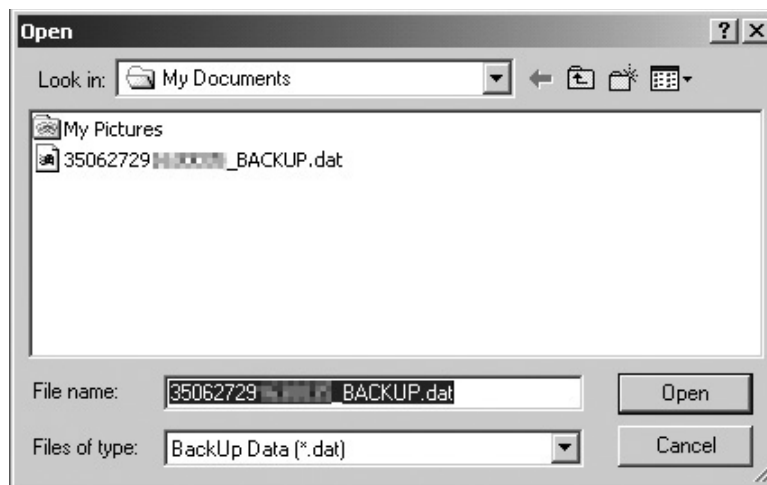


Figure 13

The buttons are grayed out during the process.
 The process is complete when the buttons turn black.

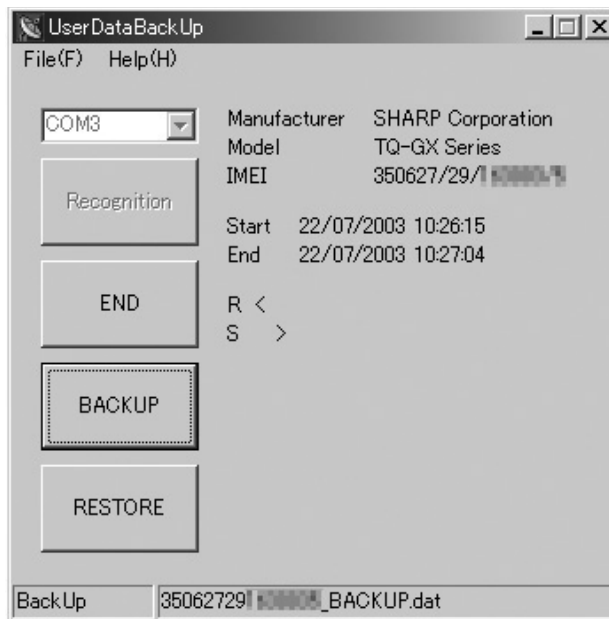


Figure 14

3.3.3 Default setting

You can reset settings to the factory default. The following will be performed:

1. All user data in the file system is deleted.
2. All WAP settings return to the default.
3. All values set by users return to the default.
4. 1) MEPLOCK setting remains unchanged.
 When "MEPLOCK Set Default" is unchecked:
 MEPLOCK remains disabled if canceled after shipment. Check "MEPLOCK Set Default" to activate it.
- 2) MEPLOCK setting returns to the factory default.
 Check "MEPLOCK Set Default". Even if canceled after shipment, MEPLOCK is activated.
 (MEPLOCK is not activated when units are shipped to some countries and remains disabled. Check the country code.)

<Procedure>

- 1) Connect the cable to the phone.
- 2) Press the power button to enter the standby mode.
- 3) Click the "Set to Default" button.

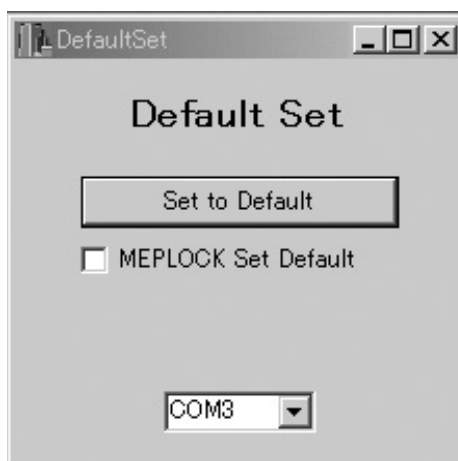


Figure 15

- 4) Click the "OK" button, The display changes as follows:

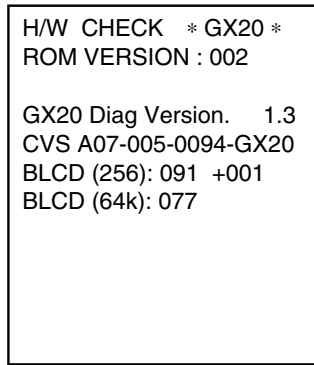


Figure 16

Check the version. It takes approx. 35 seconds for initialization.



Figure 17

- 5) When MEPLOCK data exists, the screen below appears asking if the data should be restored. If there is no data, the screen in 8) appears.

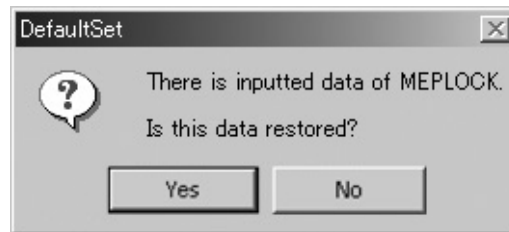


Figure 18

- 6) Select [Yes]. After the following screen, turn on the phone power and click the [Retry] button. To cancel the operation, click the [Cancel] button.



Figure 19

7) The screen below is displayed after initialization and the phone turns off.

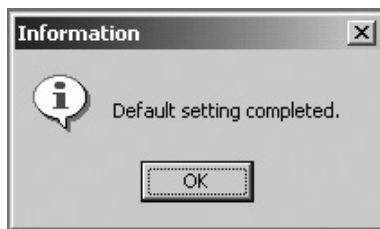


Figure 20

8) Click the [OK] button. After the following screen, disconnect the cable.

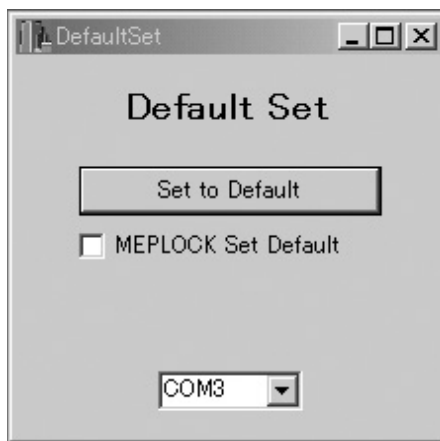


Figure 21

The setting is completed.

3.3.4 RF Adjustment Tool

1) Tool layout

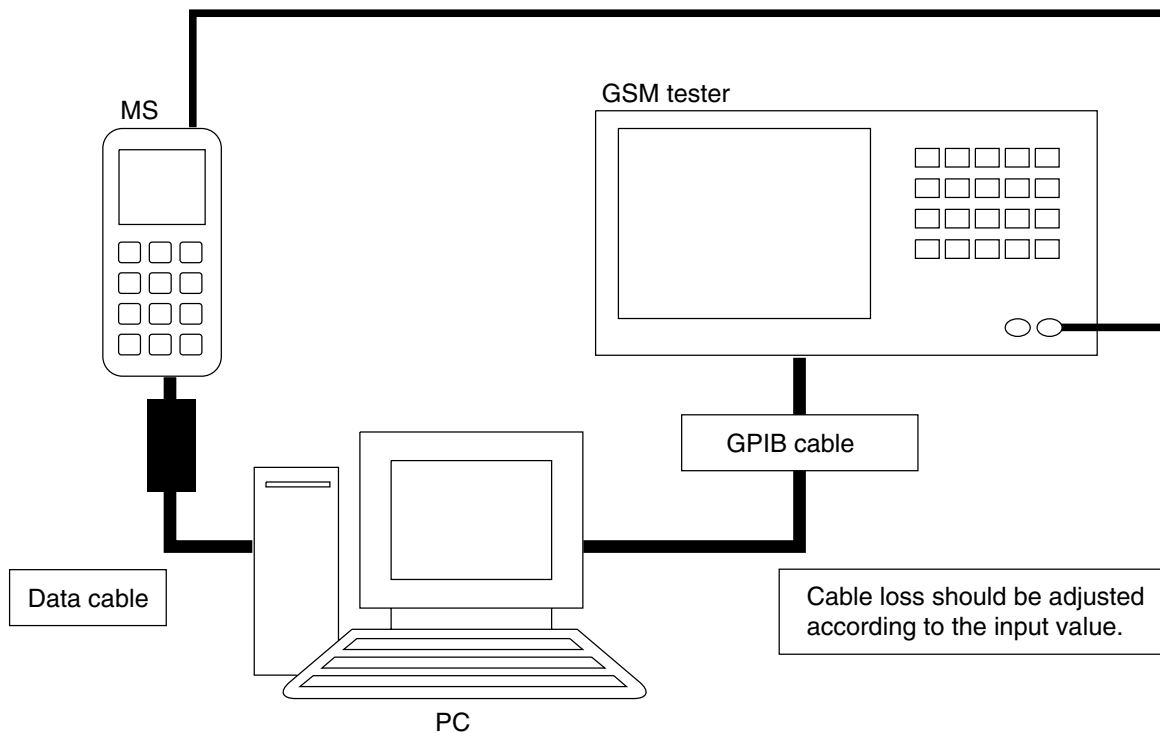


Figure 22

2) Preparation

- Connect PC and GSM tester with a GPIB cable.
- Connect PC and MS with a Data cable. (Use a full charged battery or one close.)
- Connect an antenna input/output cable of GSM tester to MS.

3) Default setting for the program.

- Activate the program and set defaults.

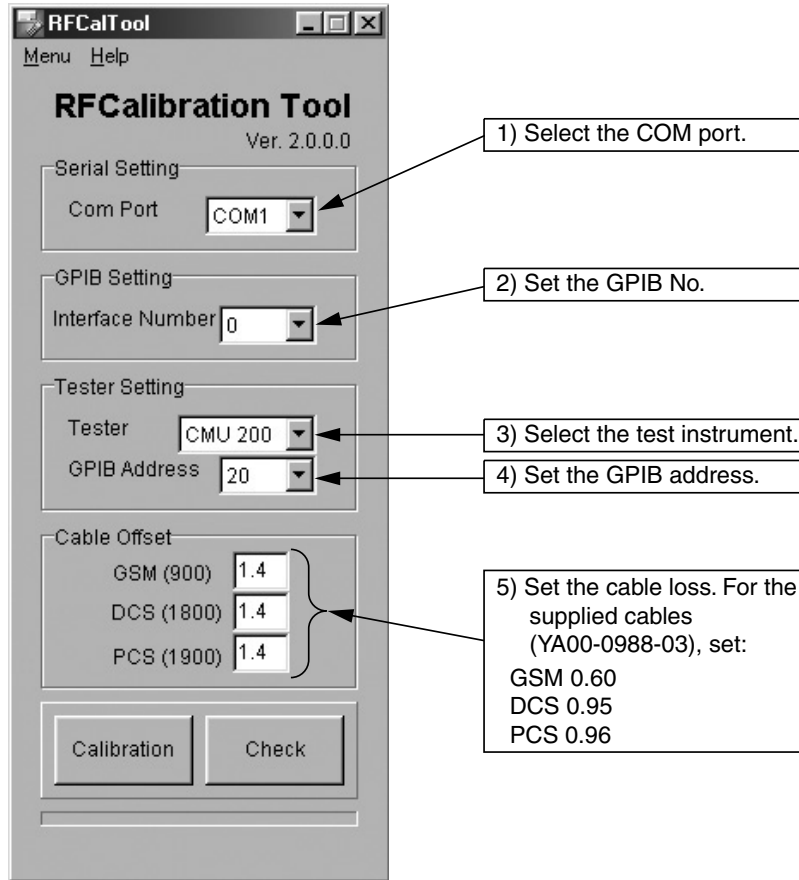


Figure 23

4) RF adjustment

1. Press "Calibration".
2. When initialization is complete, press "OK".



Figure 24

3. Turn on the phone and press "OK".



Figure 25

4. Make sure the phone is turned on and press "OK". (Adjustments start.)



Figure 26

5. Press "OK".



Figure 27

6. The startup screen appears.

5) RF performance check

Press "Check".

1. When initialization is complete, press "OK".



Figure 28

2. Turn on the phone, enter the PIN code and press "OK".

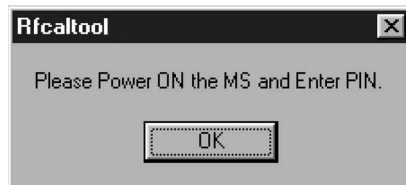


Figure 29

3. Make sure that the phone is in the idle mode and press "OK".

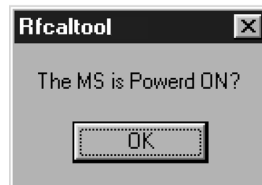


Figure 30

4. Press the keys 1, 2, 3 and Send and press "OK".



Figure 31

5. Make sure the terminal display is "In Call" and press "OK".
(RF performance check starts.)



Figure 32

6. The following message appears during the check. Press the keys 1, 2, 3 and Send again and press "OK".



Figure 33

7. Make sure the terminal display is "In Call" and press "OK".

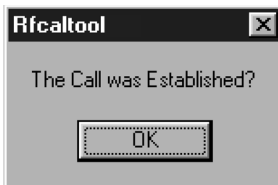


Figure 34

8. RF performance check is complete. Press "Save As..." and name the file to save the result. Press "OK" to exit.

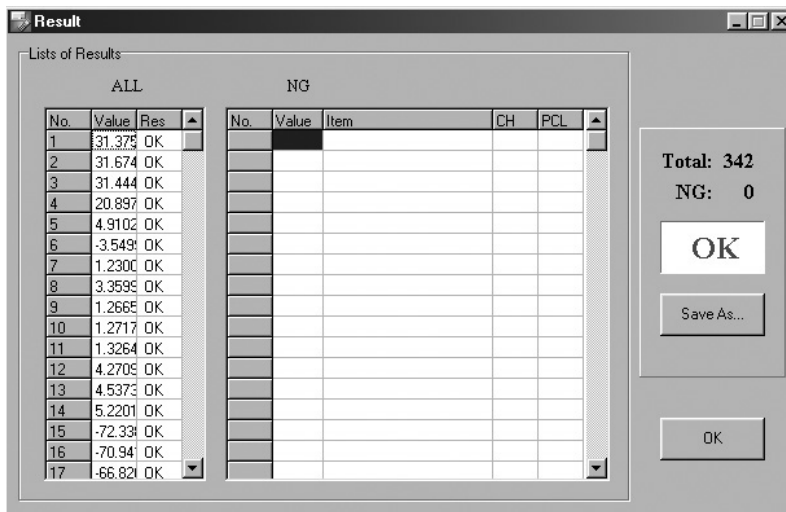


Figure 35

The following will be displayed in case of failure.

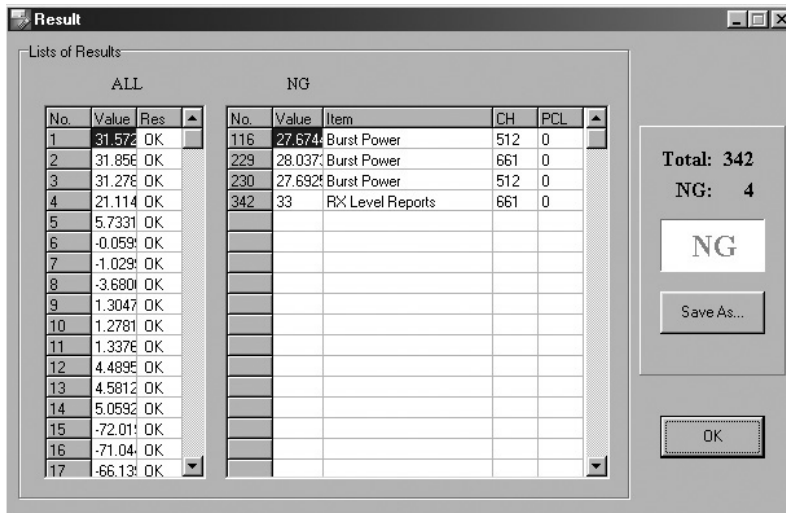


Figure 36

9. Press "OK".

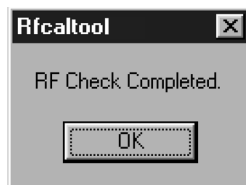


Figure 37

10. The startup screen appears.

Attachment 2

Whole inspection list by RF performance check.

Band	Sending/Receive	No.	Item to be inspected	Channel	PCL
GSM band	Tx	1	Sending output	37CH	PCL5
		2	Sending output	975CH	PCL5
		3	Sending output	124CH	PCL5
		4	Sending output	37CH	PCL11
		5	Sending output	37CH	PCL19
		6	Frequency deviation	37CH	PCL5
		7	Frequency deviation	975CH	PCL5
		8	Frequency deviation	124CH	PCL5
		9	Phase error (RMS)	37CH	PCL5
		10	Phase error (RMS)	975CH	PCL5
		11	Phase error (RMS)	124CH	PCL5
		12	Phase error (Peak)	37CH	PCL5
		13	Phase error (Peak)	975CH	PCL5
		14	Phase error (Peak)	124CH	PCL5
		15	Mod_spectrum -800	37CH	PCL5
		16	Mod_spectrum -600	37CH	PCL5
		17	Mod_spectrum -400	37CH	PCL5
		18	Mod_spectrum -250	37CH	PCL5
		19	Mod_spectrum -200	37CH	PCL5
		20	Mod_spectrum +200	37CH	PCL5
		21	Mod_spectrum +250	37CH	PCL5
		22	Mod_spectrum +400	37CH	PCL5
		23	Mod_spectrum +600	37CH	PCL5
		24	Mod_spectrum +800	37CH	PCL5
		25	Mod_spectrum -800	975CH	PCL5
		26	Mod_spectrum -600	975CH	PCL5
		27	Mod_spectrum -400	975CH	PCL5
		28	Mod_spectrum -250	975CH	PCL5
		29	Mod_spectrum -200	975CH	PCL5
		30	Mod_spectrum +200	975CH	PCL5
		31	Mod_spectrum +250	975CH	PCL5
		32	Mod_spectrum +400	975CH	PCL5
		33	Mod_spectrum +600	975CH	PCL5
		34	Mod_spectrum +800	975CH	PCL5
		35	Mod_spectrum -800	124CH	PCL5
		36	Mod_spectrum -600	124CH	PCL5
		37	Mod_spectrum -400	124CH	PCL5
		38	Mod_spectrum -250	124CH	PCL5
		39	Mod_spectrum -200	124CH	PCL5
		40	Mod_spectrum +200	124CH	PCL5
		41	Mod_spectrum +250	124CH	PCL5
		42	Mod_spectrum +400	124CH	PCL5
		43	Mod_spectrum +600	124CH	PCL5
		44	Mod_spectrum +800	124CH	PCL5
		45	Mod_spectrum -800	37CH	PCL11
		46	Mod_spectrum -600	37CH	PCL11
		47	Mod_spectrum -400	37CH	PCL11
		48	Mod_spectrum -250	37CH	PCL11
		49	Mod_spectrum -200	37CH	PCL11
		50	Mod_spectrum +200	37CH	PCL11
		51	Mod_spectrum +250	37CH	PCL11
		52	Mod_spectrum +400	37CH	PCL11
		53	Mod_spectrum +600	37CH	PCL11
		54	Mod_spectrum +800	37CH	PCL11
		55	Mod_spectrum -800	37CH	PCL19
		56	Mod_spectrum -600	37CH	PCL19
		57	Mod_spectrum -400	37CH	PCL19
		58	Mod_spectrum -250	37CH	PCL19
		59	Mod_spectrum -200	37CH	PCL19
		60	Mod_spectrum +200	37CH	PCL19

Band	Sending/Receive	No.	Item to be inspected	Channel	PCL		
		61	Mod_spectrum +250	37CH	PCL19		
		62	Mod_spectrum +400	37CH	PCL19		
		63	Mod_spectrum +600	37CH	PCL19		
		64	Mod_spectrum +800	37CH	PCL19		
		65	Switch_Spectrum -1800	37CH	PCL5		
		66	Switch_Spectrum -1200	37CH	PCL5		
		67	Switch_Spectrum -600	37CH	PCL5		
		68	Switch_Spectrum -400	37CH	PCL5		
		69	Switch_Spectrum +400	37CH	PCL5		
		70	Switch_Spectrum +600	37CH	PCL5		
		71	Switch_Spectrum +1200	37CH	PCL5		
		72	Switch_Spectrum +1800	37CH	PCL5		
		73	Switch_Spectrum -1800	975CH	PCL5		
		74	Switch_Spectrum -1200	975CH	PCL5		
		75	Switch_Spectrum -600	975CH	PCL5		
		76	Switch_Spectrum -400	975CH	PCL5		
		77	Switch_Spectrum +400	975CH	PCL5		
		78	Switch_Spectrum +600	975CH	PCL5		
		79	Switch_Spectrum +1200	975CH	PCL5		
		80	Switch_Spectrum +1800	975CH	PCL5		
		81	Switch_Spectrum -1800	124CH	PCL5		
		82	Switch_Spectrum -1200	124CH	PCL5		
		83	Switch_Spectrum -600	124CH	PCL5		
		84	Switch_Spectrum -400	124CH	PCL5		
		85	Switch_Spectrum +400	124CH	PCL5		
		86	Switch_Spectrum +600	124CH	PCL5		
		87	Switch_Spectrum +1200	124CH	PCL5		
		88	Switch_Spectrum +1800	124CH	PCL5		
		89	Switch_Spectrum -1800	37CH	PCL11		
		90	Switch_Spectrum -1200	37CH	PCL11		
		91	Switch_Spectrum -600	37CH	PCL11		
		92	Switch_Spectrum -400	37CH	PCL11		
		93	Switch_Spectrum +400	37CH	PCL11		
		94	Switch_Spectrum +600	37CH	PCL11		
		95	Switch_Spectrum +1200	37CH	PCL11		
		96	Switch_Spectrum +1800	37CH	PCL11		
		97	Switch_Spectrum -1800	37CH	PCL19		
		98	Switch_Spectrum -1200	37CH	PCL19		
		99	Switch_Spectrum -600	37CH	PCL19		
		100	Switch_Spectrum -400	37CH	PCL19		
		101	Switch_Spectrum +400	37CH	PCL19		
		102	Switch_Spectrum +600	37CH	PCL19		
		103	Switch_Spectrum +1200	37CH	PCL19		
		104	Switch_Spectrum +1800	37CH	PCL19		
		105	Burst Timing	37CH	PCL5		
		106	Burst Timing	975CH	PCL5		
		107	Burst Timing	124CH	PCL5		
		108	Burst Timing	37CH	PCL11		
		109	Burst Timing	37CH	PCL19		
		DCS band	Tx	110	Reception sensitivity	37CH	PCL5
				111	Reception sensitivity	975CH	PCL5
				112	Reception sensitivity	124CH	PCL5
				113	Floor sensitivity 2	37CH	PCL5
				114	Reception level report	37CH	PCL5
				115	Sending output	699CH	PCL0
				116	Sending output	512CH	PCL0
				117	Sending output	855CH	PCL0
				118	Sending output	699CH	PCL5
				119	Sending output	699CH	PCL15
				120	Frequency deviation	699CH	PCL0
				121	Frequency deviation	512CH	PCL0
				122	Frequency deviation	885CH	PCL0

Band	Sending/Receive	No.	Item to be inspected	Channel	PCL	Band	Sending/Receive	No.	Item to be inspected	Channel	PCL
		123	Phase error (RMS)	699CH	PCL0			185	Switch_Spectrum +1200	699CH	PCL0
		124	Phase error (RMS)	512CH	PCL0			186	Switch_Spectrum +1800	699CH	PCL0
		125	Phase error (RMS)	885CH	PCL0			187	Switch_Spectrum -1800	512CH	PCL0
		126	Phase error (Peak)	699CH	PCL0			188	Switch_Spectrum -1200	512CH	PCL0
		127	Phase error (Peak)	512CH	PCL0			189	Switch_Spectrum -600	512CH	PCL0
		128	Phase error (Peak)	855CH	PCL0			190	Switch_Spectrum -400	512CH	PCL0
		129	Mod_spectrum -800	699CH	PCL0			191	Switch_Spectrum +400	512CH	PCL0
		130	Mod_spectrum -600	699CH	PCL0			192	Switch_Spectrum +600	512CH	PCL0
		131	Mod_spectrum -400	699CH	PCL0			193	Switch_Spectrum +1200	512CH	PCL0
		132	Mod_spectrum -250	699CH	PCL0			194	Switch_Spectrum +1800	512CH	PCL0
		133	Mod_spectrum -200	699CH	PCL0			195	Switch_Spectrum -1800	855CH	PCL0
		134	Mod_spectrum +200	699CH	PCL0			196	Switch_Spectrum -1200	855CH	PCL0
		135	Mod_spectrum +250	699CH	PCL0			197	Switch_Spectrum -600	855CH	PCL0
		136	Mod_spectrum +400	699CH	PCL0			198	Switch_Spectrum -400	855CH	PCL0
		137	Mod_spectrum +600	699CH	PCL0			199	Switch_Spectrum +400	855CH	PCL0
		138	Mod_spectrum +800	699CH	PCL0			200	Switch_Spectrum +600	855CH	PCL0
		139	Mod_spectrum -800	512CH	PCL0			201	Switch_Spectrum +1200	855CH	PCL0
		140	Mod_spectrum -600	512CH	PCL0			202	Switch_Spectrum +1800	855CH	PCL0
		141	Mod_spectrum -400	512CH	PCL0			203	Switch_Spectrum -1800	699CH	PCL5
		142	Mod_spectrum -250	512CH	PCL0			204	Switch_Spectrum -1200	699CH	PCL5
		143	Mod_spectrum -200	512CH	PCL0			205	Switch_Spectrum -600	699CH	PCL5
		144	Mod_spectrum +200	512CH	PCL0			206	Switch_Spectrum -400	699CH	PCL5
		145	Mod_spectrum +250	512CH	PCL0			207	Switch_Spectrum +400	699CH	PCL5
		146	Mod_spectrum +400	512CH	PCL0			208	Switch_Spectrum +600	699CH	PCL5
		147	Mod_spectrum +600	512CH	PCL0			209	Switch_Spectrum +1200	699CH	PCL5
		148	Mod_spectrum +800	512CH	PCL0			210	Switch_Spectrum +1800	699CH	PCL5
		149	Mod_spectrum -800	855CH	PCL0			211	Switch_Spectrum -1800	699CH	PCL15
		150	Mod_spectrum -600	855CH	PCL0			212	Switch_Spectrum -1200	699CH	PCL15
		151	Mod_spectrum -400	855CH	PCL0			213	Switch_Spectrum -600	699CH	PCL15
		152	Mod_spectrum -250	855CH	PCL0			214	Switch_Spectrum -400	699CH	PCL15
		153	Mod_spectrum -200	855CH	PCL0			215	Switch_Spectrum +400	699CH	PCL15
		154	Mod_spectrum +200	855CH	PCL0			216	Switch_Spectrum +600	699CH	PCL15
		155	Mod_spectrum +250	855CH	PCL0			217	Switch_Spectrum +1200	699CH	PCL15
		156	Mod_spectrum +400	855CH	PCL0			218	Switch_Spectrum +1800	699CH	PCL15
		157	Mod_spectrum +600	855CH	PCL0			219	Burst Timing	699CH	PCL0
		158	Mod_spectrum +800	855CH	PCL0			220	Burst Timing	512CH	PCL0
		159	Mod_spectrum -800	699CH	PCL5			221	Burst Timing	855CH	PCL0
		160	Mod_spectrum -600	699CH	PCL5			222	Burst Timing	699CH	PCL5
		161	Mod_spectrum -400	699CH	PCL5			223	Burst Timing	699CH	PCL15
		162	Mod_spectrum -250	699CH	PCL5		Rx	224	Reception sensitivity	699CH	PCL0
		163	Mod_spectrum -200	699CH	PCL5			225	Reception sensitivity	512CH	PCL0
		164	Mod_spectrum +200	699CH	PCL5			226	Reception sensitivity	855CH	PCL0
		165	Mod_spectrum +250	699CH	PCL5			227	Floor sensitivity 2	699CH	PCL0
		166	Mod_spectrum +400	699CH	PCL5			228	Reception level report	699CH	PCL0
		167	Mod_spectrum +600	699CH	PCL5	PCS band (CMU 200 only)	Tx	229	Sending output	661CH	PCL0
		168	Mod_spectrum +800	699CH	PCL5			230	Sending output	512CH	PCL0
		169	Mod_spectrum -800	699CH	PCL15			231	Sending output	810CH	PCL0
		170	Mod_spectrum -600	699CH	PCL15			232	Sending output	661CH	PCL5
		171	Mod_spectrum -400	699CH	PCL15			233	Sending output	661CH	PCL15
		172	Mod_spectrum -250	699CH	PCL15			234	Frequency deviation	661CH	PCL0
		173	Mod_spectrum -200	699CH	PCL15			235	Frequency deviation	512CH	PCL0
		174	Mod_spectrum +200	699CH	PCL15			236	Frequency deviation	810CH	PCL0
		175	Mod_spectrum +250	699CH	PCL15			237	Phase error (RMS)	661CH	PCL0
		176	Mod_spectrum +400	699CH	PCL15			238	Phase error (RMS)	512CH	PCL0
		177	Mod_spectrum +600	699CH	PCL15			239	Phase error (RMS)	810CH	PCL0
		178	Mod_spectrum +800	699CH	PCL15			240	Phase error (Peak)	661CH	PCL0
		179	Switch_Spectrum -1800	699CH	PCL0			241	Phase error (Peak)	512CH	PCL0
		180	Switch_Spectrum -1200	699CH	PCL0			242	Phase error (Peak)	810CH	PCL0
		181	Switch_Spectrum -600	699CH	PCL0			243	Mod_spectrum -800	661CH	PCL0
		182	Switch_Spectrum -400	699CH	PCL0			244	Mod_spectrum -600	661CH	PCL0
		183	Switch_Spectrum +400	699CH	PCL0			245	Mod_spectrum -400	661CH	PCL0
		184	Switch_Spectrum +600	699CH	PCL0			246	Mod_spectrum -250	661CH	PCL0

Band	Sending/Receiving	No.	Item to be inspected	Channel	PCL	Band	Sending/Receiving	No.	Item to be inspected	Channel	PCL
		247	Mod_spectrum -200	661CH	PCL0			296	Switch_Spectrum -400	661CH	PCL0
		248	Mod_spectrum +200	661CH	PCL0			297	Switch_Spectrum +400	661CH	PCL0
		249	Mod_spectrum +250	661CH	PCL0			298	Switch_Spectrum +600	661CH	PCL0
		250	Mod_spectrum +400	661CH	PCL0			299	Switch_Spectrum +1200	661CH	PCL0
		251	Mod_spectrum +600	661CH	PCL0			300	Switch_Spectrum +1800	661CH	PCL0
		252	Mod_spectrum +800	661CH	PCL0			301	Switch_Spectrum -1800	512CH	PCL0
		253	Mod_spectrum -800	512CH	PCL0			302	Switch_Spectrum -1200	512CH	PCL0
		254	Mod_spectrum -600	512CH	PCL0			303	Switch_Spectrum -600	512CH	PCL0
		255	Mod_spectrum -400	512CH	PCL0			304	Switch_Spectrum -400	512CH	PCL0
		256	Mod_spectrum -250	512CH	PCL0			305	Switch_Spectrum +400	512CH	PCL0
		257	Mod_spectrum -200	512CH	PCL0			306	Switch_Spectrum +600	512CH	PCL0
		258	Mod_spectrum +200	512CH	PCL0			307	Switch_Spectrum +1200	512CH	PCL0
		259	Mod_spectrum +250	512CH	PCL0			308	Switch_Spectrum +1800	512CH	PCL0
		260	Mod_spectrum +400	512CH	PCL0			309	Switch_Spectrum -1800	810CH	PCL0
		261	Mod_spectrum +600	512CH	PCL0			310	Switch_Spectrum -1200	810CH	PCL0
		262	Mod_spectrum +800	512CH	PCL0			311	Switch_Spectrum -600	810CH	PCL0
		263	Mod_spectrum -800	810CH	PCL0			312	Switch_Spectrum -400	810CH	PCL0
		264	Mod_spectrum -600	810CH	PCL0			313	Switch_Spectrum +400	810CH	PCL0
		265	Mod_spectrum -400	810CH	PCL0			314	Switch_Spectrum +600	810CH	PCL0
		266	Mod_spectrum -250	810CH	PCL0			315	Switch_Spectrum +1200	810CH	PCL0
		267	Mod_spectrum -200	810CH	PCL0			316	Switch_Spectrum +1800	810CH	PCL0
		268	Mod_spectrum +200	810CH	PCL0			317	Switch_Spectrum -1800	661CH	PCL5
		269	Mod_spectrum +250	810CH	PCL0			318	Switch_Spectrum -1200	661CH	PCL5
		270	Mod_spectrum +400	810CH	PCL0			319	Switch_Spectrum -600	661CH	PCL5
		271	Mod_spectrum +600	810CH	PCL0			320	Switch_Spectrum -400	661CH	PCL5
		272	Mod_spectrum +800	810CH	PCL0			321	Switch_Spectrum +400	661CH	PCL5
		273	Mod_spectrum -800	661CH	PCL5			322	Switch_Spectrum +600	661CH	PCL5
		274	Mod_spectrum -600	661CH	PCL5			323	Switch_Spectrum +1200	661CH	PCL5
		275	Mod_spectrum -400	661CH	PCL5			324	Switch_Spectrum +1800	661CH	PCL5
		276	Mod_spectrum -250	661CH	PCL5			325	Switch_Spectrum -1800	661CH	PCL15
		277	Mod_spectrum -200	661CH	PCL5			326	Switch_Spectrum -1200	661CH	PCL15
		278	Mod_spectrum +200	661CH	PCL5			327	Switch_Spectrum -600	661CH	PCL15
		279	Mod_spectrum +250	661CH	PCL5			328	Switch_Spectrum -400	661CH	PCL15
		280	Mod_spectrum +400	661CH	PCL5			329	Switch_Spectrum +400	661CH	PCL15
		281	Mod_spectrum +600	661CH	PCL5			330	Switch_Spectrum +600	661CH	PCL15
		282	Mod_spectrum +800	661CH	PCL5			331	Switch_Spectrum +1200	661CH	PCL15
		283	Mod_spectrum -800	661CH	PCL15			332	Switch_Spectrum +1800	661CH	PCL15
		284	Mod_spectrum -600	661CH	PCL15			333	Burst Timing	661CH	PCL0
		285	Mod_spectrum -400	661CH	PCL15			334	Burst Timing	512CH	PCL0
		286	Mod_spectrum -250	661CH	PCL15			335	Burst Timing	810CH	PCL0
		287	Mod_spectrum -200	661CH	PCL15			336	Burst Timing	661CH	PCL5
		288	Mod_spectrum +200	661CH	PCL15			337	Burst Timing	661CH	PCL15
		289	Mod_spectrum +250	661CH	PCL15		Rx	338	Reception sensitivity	661CH	PCL0
		290	Mod_spectrum +400	661CH	PCL15			339	Reception sensitivity	512CH	PCL0
		291	Mod_spectrum +600	661CH	PCL15			340	Reception sensitivity	810CH	PCL0
		292	Mod_spectrum +800	661CH	PCL15			341	Floor sensitivity 2	661CH	PCL0
		293	Switch_Spectrum -1800	661CH	PCL0			342	Reception level report	661CH	PCL0
		294	Switch_Spectrum -1200	661CH	PCL0						
		295	Switch_Spectrum -600	661CH	PCL0						

Troubleshooting list according to the results of RF performance check.

Test item		Check parts for GSM	Check parts for DCS	Check parts for PCS
Tx	Sending output	IC831, IC881, FL811, FL801	IC831, IC881, FL816, FL801	IC831, IC881, FL816, FL801
	Frequency deviation	TCX951	TCX951	TCX951
	Phase error	VCO971, IC901, VCO851	VCO971, IC901, VCO851	VCO971, IC901, VCO851
	Mod_spectrum	VCO971, IC901, VCO851	VCO971, IC901, VCO851	VCO971, IC901, VCO851
	Switch_spectrum	VCO971, IC901, VCO851	VCO971, IC901, VCO851	VCO971, IC901, VCO851
	Burst Timing	IC881	IC881	IC881
Rx	Reception sensitivity	FL801, FL901	FL801, FL902	FL801, FL903
	Floor sensitivity	FL801, FL901	FL801, FL902	FL801, FL903
	Reception level report	FL801, FL901	FL801, FL902	FL801, FL903

3.3.5 Software download

- 1) Overview
This document describes the specification of the Flash-downloading tool (Upgrading Tool) used for the user service.
- 2) Purpose of this document
The aim of this document is to provide a sufficient description of the GX20 Upgrading Tool for readers.
- 3) Scope
This document covers the description of the Flash-downloading tool specification for the user service.
- 4) Operating environment

Operating environment for the Upgrading Tool

OS: Windows 98, 98SE, 2000 or XP
 Downloadable file: Only Motorola format is available for downloading.
 Communication mode: Asynchronous mode
 Data length: 8 bit
 Parity bit: None
 Stop bit length: 1 bit

Operating environment for the loading loader

Phone: GX20
 Communication mode: Asynchronous mode
 Data length: 8 bit
 Parity bit: None
 Stop bit length: 1 bit

1) Description of the screens.

- 1) Activation
You can start the application either from the short cut on your desktop or Start menu.
- 2) The Upgrading Tool (on the PC)

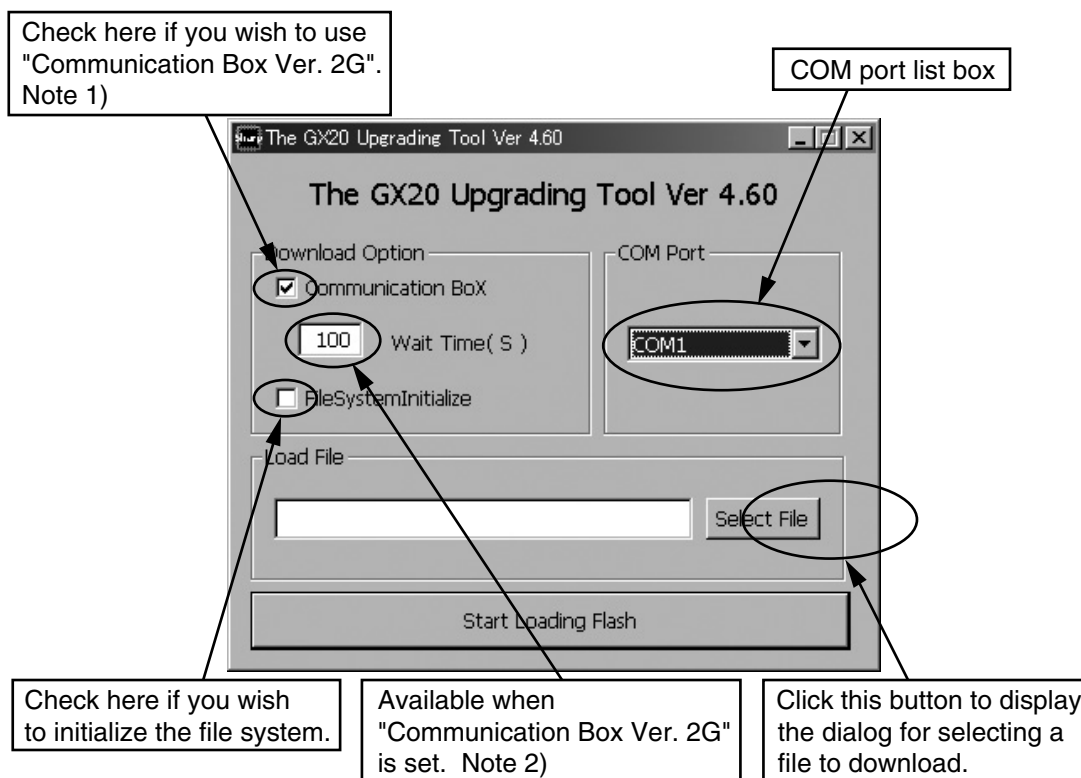


Figure 38

Note 1)

If using "Communication Box Ver. 2G", the only the phone connected to No.1 cable is controlled on your PC.

Note2)

The time displayed in this dialog indicates a margin of processing time taken for data to be downloaded to the phones that are connected to cable No.2 to No.10 of the "Communication Box Ver. 2G". If an error occurs, increase this margin time. See the section 3.3.5.2 (3) "Using the Communication Box Ver. 2G" on page 2-20 for details.

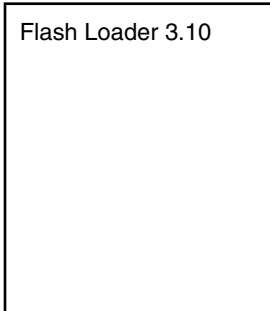
[Caution!]

- If you wish to download using "Communication Box Ver. 2G", power on from No.10 to No.1 after "Sending Sync Byte.../Press Power Button" message has appeared.
- Use a fully charged battery and remove the check from "Communication Box" if using a Data cable for the downloading operation.
- Start downloading after the phone has been properly turned off in order to clear the Backup RAM.
- If you select "FileSystem Initialize" for the download, user's data stored in the phone will be deleted. Care should be taken for this performance.

3) The loading loader (on the phone side)

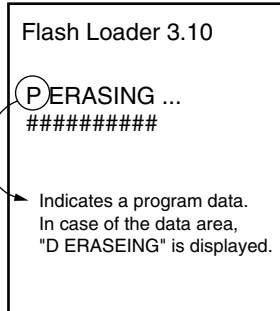
The progress indication of the operation and error status are displayed on the phone.
The following are example screens.

1. Initial screen



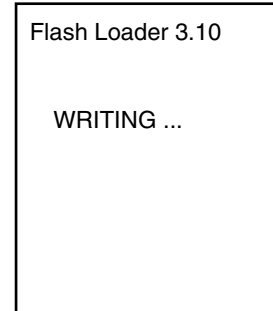
Appears if the loading loader is successfully expanded. (the version of the loading loader software is displayed). The mobile light will be turned on to red until the write operation is complete.

2. Deleting the Flash



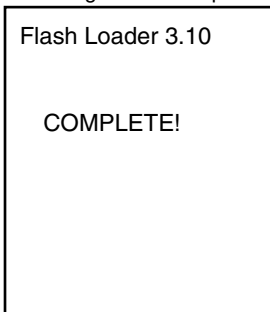
Indicates that the Flash is being erased. "#" disappears as the erasing operation proceeded.

3. Writing the data



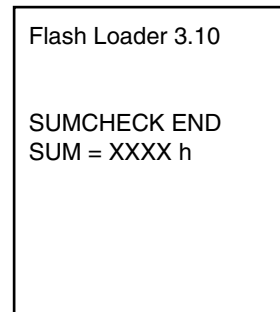
Indicates that data is being written into the phone. During this operation, the mobile light stays purple.

4. Writing data is completed



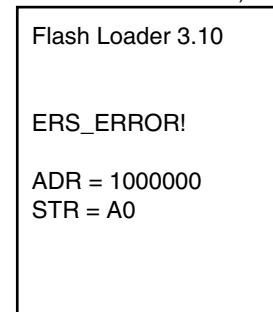
Indicates that the program data is successfully loaded and the mobile light will blink green light.

5. SUM value is indicated Note 1)



SUM value is displayed few seconds after the program data has been successfully loaded. The value is displayed at "XXXX".

6. Error screen Note 2)



This screen appears when an error occurs and the mobile light will blink yellow.
ADR: Address where the error occurs.
STR: Flash Status information.

Note 1)

You can check if the loaded program data is correct or not by comparing the SUM values displayed on the PC side and the phone as shown on the screen 5. If both SUM values are the same, it means the correct program data has been loaded. Please check the SUM value quickly since this display will disappear very soon if using the Data cable.

Note 2)

The screen 6 shows an example of one error occurred while in Flash erasing operation.

"ADR" and "STR" only appear for Flash-oriented errors. Other errors are described latter in section 3. (see pages 2-22, 2-23)

2) Operational specification

1) Selecting a file.

Press "Select File" button to open the dialog. Select a file you wish to download.
You can only select the file with Motorola format.

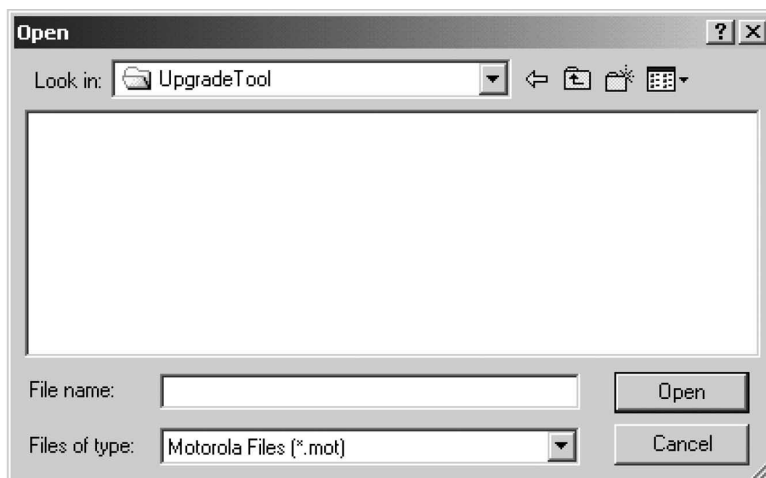


Figure 39 The dialog screen to select the file

2) Selecting a COM Port.

Select the COM Port that connects the PC and the phone (or "Communication Box Ver. 2G") from COM Port box on the screen. You can choose from COM1 to 9.



Figure 40 COM Port selecting screen

3) Using the Communication Box.

Check the dialog box "Use Communication Box Ver. 2G" displayed on your PC if using "Communication Box Ver. 2G".

You can specify the wait time from 0 to 999 seconds since the access latency differs depending on the phone if using "Communication Box Ver. 2G". (Default value is set to 100 seconds).

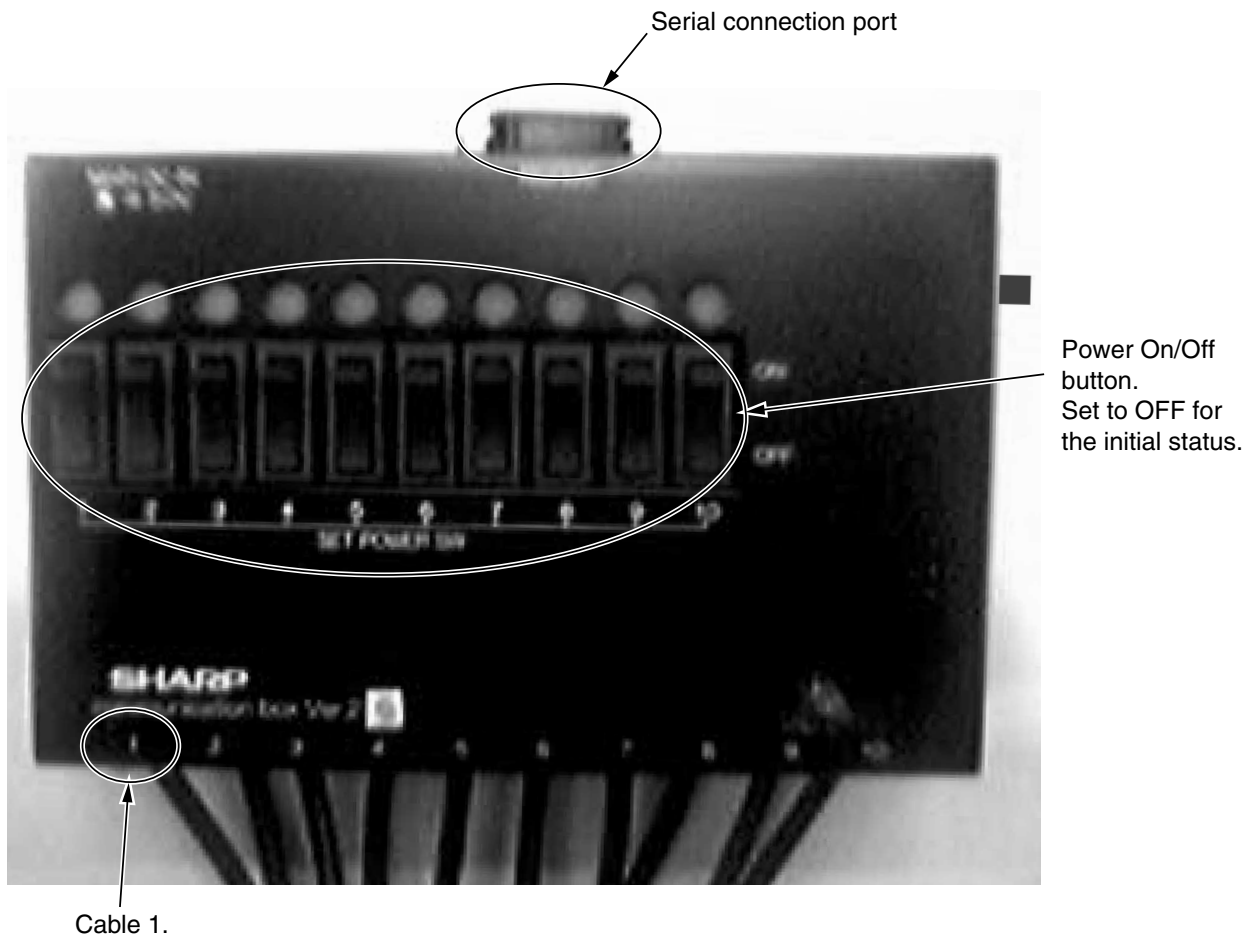


Figure 41 Image of Communication Box Ver. 2G

[Caution]

Cable 1 is used for the handshaking between the PC and the phone. Make sure that cable is properly connected to the phone while the handshaking if using "Communication Box Ver. 2G".

Switch on the power buttons from No.10 to No.1 when "Sending Sync Byte.../Press Power Button" message appears. You may turn on the power switch as necessary.

4) Starting the download.

Press [Start Loading Flash] button after you finish selecting the file to download. Downloading operation starts. The message as below appears if no file is selected.

- Select "File System Initialize" if you wish to initialize the file system only. In this case, you can download the program by pressing the [Start Loading Flash] button without selecting a downloading file.



Figure 42

[Using a Data cable]

If using a Data cable for the downloading operation, press Power button of the phone after [Please remove AC charger, when you use PCcable-Sending Sync Byte.../Press Power Button!] information message has appeared. The loading loader starts being expanded.

[Using "Communication Box Ver. 2G"]

If using "Communication Box Ver. 2G", switch on the power button of the Box from No.10 to No.1 after [Please remove AC charger, when you use PCcableSending Sync Byte.../Press Power Button!] information message has appeared. The loading loader starts expanding.

[Caution]

If using a Data cable, [Keep Power Button!] message will appear after the power button of the phone is pressed. Keep pressing the button until this message disappears. The above-mentioned message disappears and the following screen will appear after the expansion of the loading loader has been completed.

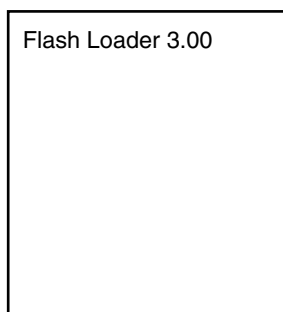


Figure 43

5) Completing the download

If the program data is successfully downloaded, [Download completed] message appears and then, the SUM value of the data loaded into the Flash is displayed. If the operation is not properly completed, the error message will appear. Refer to pages 2-22, 2-23 [Table of Error messages] for details of error messages.

[Caution!]

After the downloading operation is ended, SUM value is displayed on the phone.

You can check if the program data is successfully downloaded or not by comparing the SUM values displayed on the phone and the PC. Please check the SUM value quickly since this display will disappear very soon if using the Data cable (it will disappear in about 7 seconds).

If both values are not the same, the program data may not be successfully downloaded. Please start downloading all over again.

6) Matters to be attended to the downloading operation.

[If using a Data cable:]

1. Make sure to remove the AC charger from the Data cable. Otherwise it may cause the charging application to be activated and downloading operation cannot be operated properly.
2. Use a fully charged battery for the downloading operation.
3. If the battery is not charged enough, the downloading operation may not be completed. Make sure to charge the battery fully before downloading.
4. If the downloading operation is cancelled or interrupted due to an error condition, remove the battery once and then, start over the operation.
5. Start downloading after the phone has been properly turned off in order to clear the back-up RAM.
6. If you select "FileSystem Initialize" for the download, user's data stored in the phone will be deleted. Care should be taken for this performance.
7. If the power saving mode is set on your PC, the download may fail depending on PCs. Please cancel the power saving mode when performing the download.

[If using "Communication Box Ver. 2G":]

1. Switch on the Power button of the Box starting from No.10 to No.1 when "Sending Sync Byte.../Press Power Button" message appears. If the button 1 is switched on first, it results in failure of the downloading operation on phones that are connected to the cable 2 to 10.
2. The time to be taken for erasing the program data differs depending on the phones. If failed for the erasing operation at 100 seconds wait time, increase "Wait Time". However it takes more time to finish downloading.
3. Start downloading after turning off the phone in order to clear the back-up RAM.
4. If you select "FileSystem Initialize" for the download, user's data stored in the phone will be deleted. Care should be taken for this performance.
5. If the power saving mode is set on your PC, the download may fail depending on PCs. Please cancel the power saving mode when performing the download.

3) Table of Error messages

1) Error messages for the Upgrading Tool (on PC side)

No.	Displayed Message	Description
1	Unable to open file	File open error Failed to open MOT file to download.
2	Unable to receive Sync Byte	Communication error Could not be synchronized with Boot ROM
3	Cannot communicate to port	Serial setting error Wrong serial port was selected.
4	RAM Loader not responding to commands	Communication error No response from the downloaded loading loader.
5	RAM Loader cannot understand commands	Communication error Received undefined response from the loading loader.
6	Unable to program flash	Flash operation error Failed to write or erase the Flash ROM.
7	Unable to reconfigure port	Serial setting error Selected COM Port is still in use.
8	Select File Error	Wrong file is selected. The file you select is not applicable for the upgrading. Choose another file to download.

2) Table of the Loading loader error messages (on the phone side)

No.	Display Message	Description
1	COMPLETE!	Indicates that the downloading operation is completed.
2	ERASE READY	Appears while waiting for the erase operation to be ready.
3	WRITE READY	Appears while waiting for the program data to be ready.
4	BRT CHANGING	Appears while changing the baud rate.
5	P ERASING ...	Appears while erasing the program data.
6	WRITING ...	Appears while loading the program data.
7	FLASH ERS OK!	Indicates that the program data is successfully erased.
8	SUMCHECK ...	Appears while calculating the written data of SUM value.
9	SUMCHECK END	Indicates that the calculation of the SUM value of the written data is completed.
10	SUM = XXXX h	Indicates the SUM value of the written data.
11	SUM ERROR!	Serial communication error (Check SUM error).
12	PARITYERR!	Serial communication error (Parity bit error).
13	FRAMINGERR!	Serial communication error (Framing error).
14	OVERFLOW!	Serial communication error (Buffer overflow error).
15	ERS_REC_ERROR	Serial communication error (Failed to receive the erase record).
16	BRT_REC_ERROR	Serial communication error (Failed to receive the change record of baud rate).
17	DAT_REC_ERROR	Serial communication error (Failed to receive the data record).
18	ADR_REC_ERROR	Serial communication error (Failed to receive the address record).
19	END_REC_ERROR	Serial communication error (Failed to receive the end record).
20	HDR_ERROR!	Serial communication error (Received the undefined record).
21	ODD_ERROR!	Serial communication error (Odd error).
22	SEQ_ERROR!	Indicates that the Flash operation was failed (Sequence error).
23	VPP_ERROR!	Indicates that the Flash operation was failed (VppLow error).
24	PRT_ERROR!	Indicates that the Flash operation was failed (Protect error).
25	ERS_ERROR!	Indicates that the Flash operation was failed (Erase error).
26	WRT_ERROR!	Indicates that the Flash operation was failed (Write error).
27	ERASE CHK ERR	Indicates that an error occurred while verifying the erase.
28	WRITE CHK ERR	Indicates that error occurred while writing data.
29	ADR = XXXXXXXX	Indicates the Flash address where the error occurred.
30	STR =XX	Indicates the Flash status when the error occurred.

- From No.1 to No.10 are information messages. These messages are displayed in the normal operation.
From No.11 to 33 are error messages. Regarding to the messages from No.22 to 28, they indicate the errors that have occurred on Flash.
Address (No.29) and status information (No.30) are also displayed at the same time.

4) Installation / Un-installation

1) Installation

Execute "setup.exe" and activate the setup wizard.

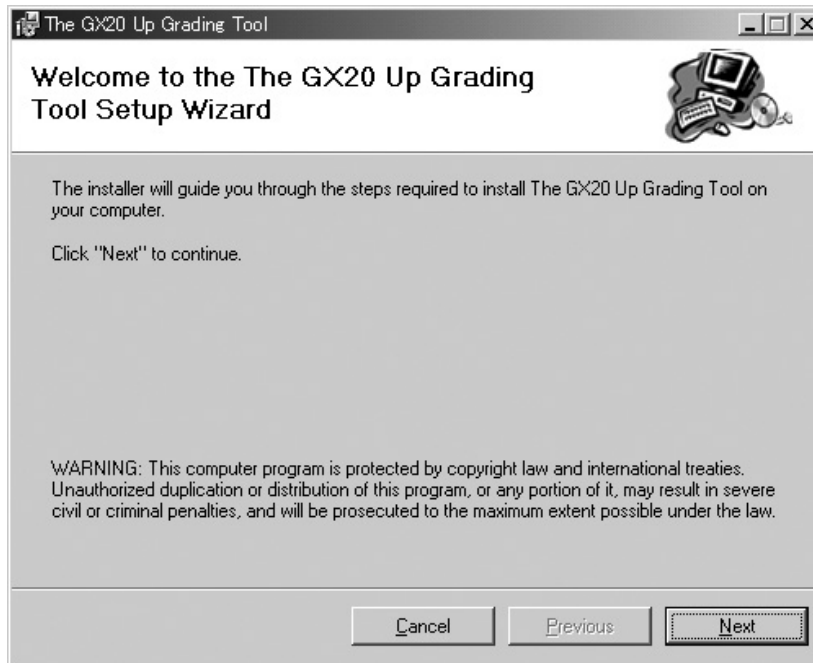


Figure 44

Select a folder you wish to install to.

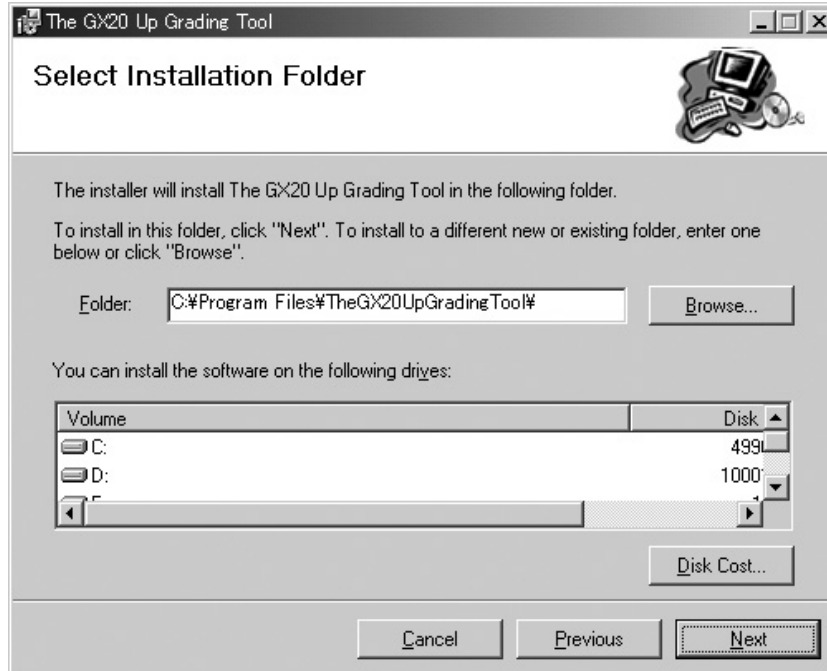


Figure 45

The confirmation screen appears. Select [Next].

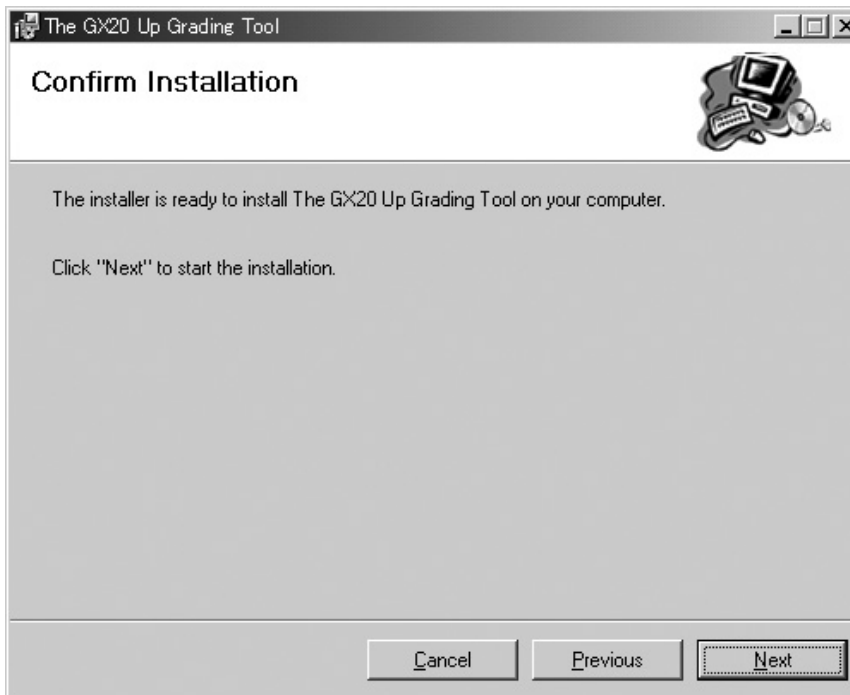


Figure 46

The Up Grading Tool is being installed.

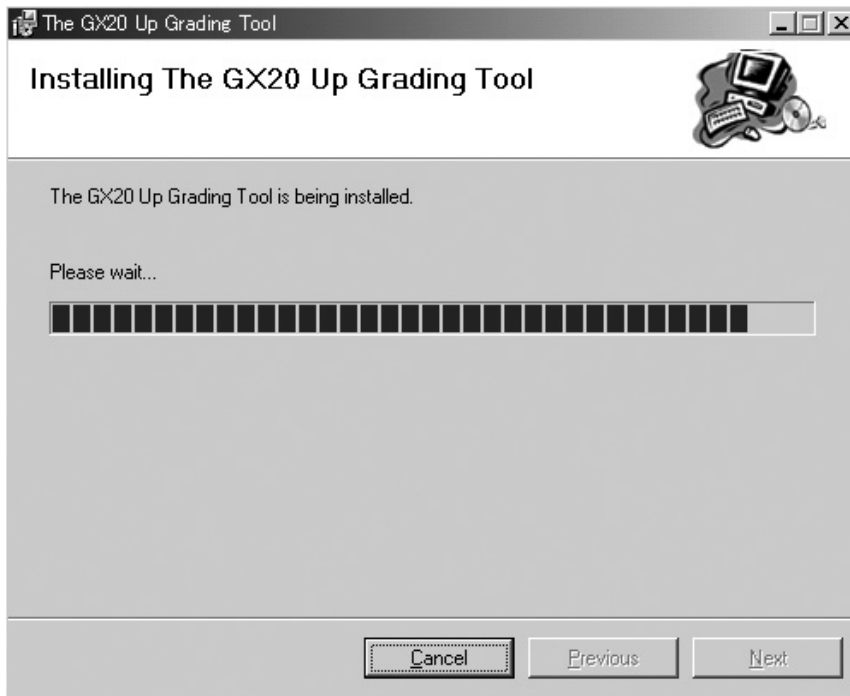


Figure 47

The installation is complete.

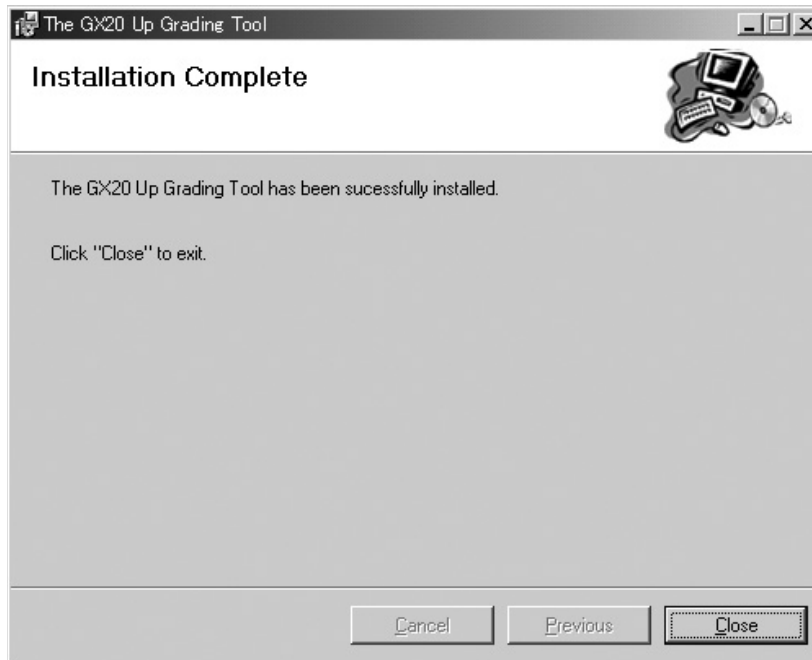


Figure 48

The icon of the Up Grading Tool as shown below is configured on your desktop. You can also activate this application selecting "The GX20 Up Ggrading Tool" from Start menu.

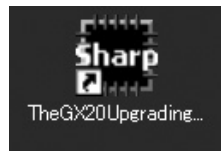


Figure 49 The icon of theUp Grading Tool icon

2) Un-installation

Execute "setup.exe" and activate the setup wizard.
Running "setup.exe" on the PC un-installs the preloaded program.



Figure 50

The preloaded program is being un-installed.

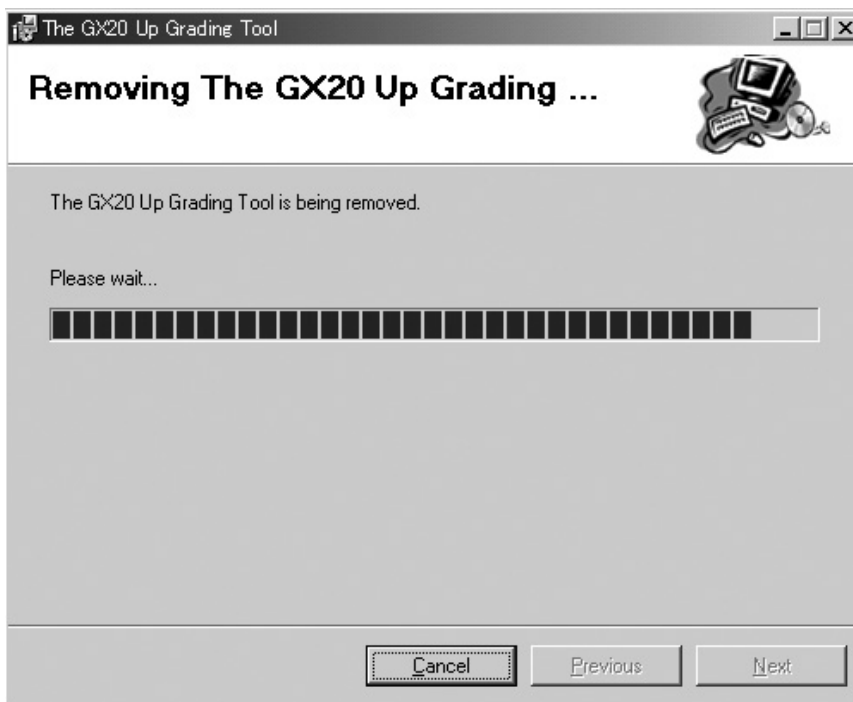


Figure 51

The un-installation is complete.

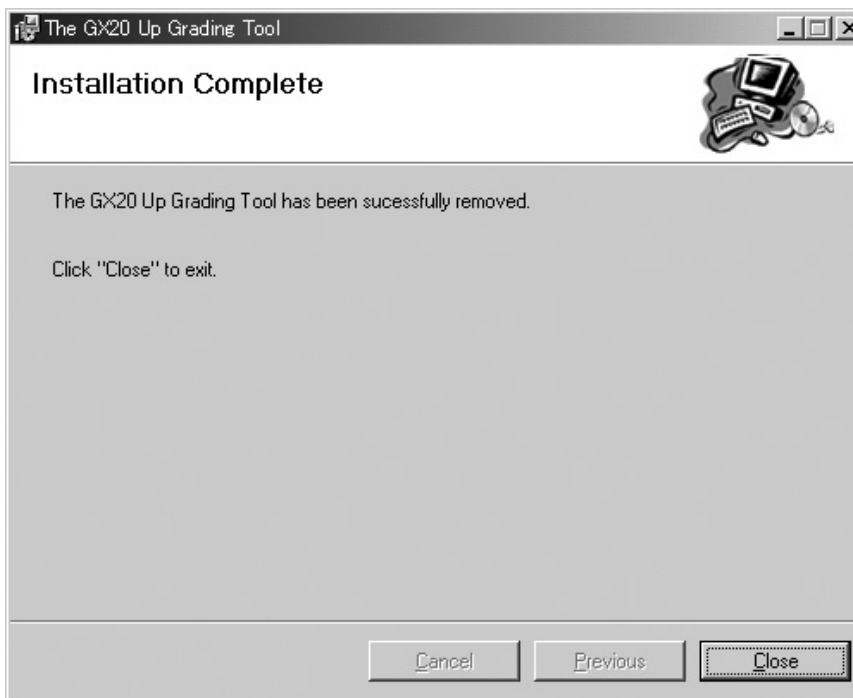


Figure 52

3.3.6 Matters to be attended to the Installation /Uninstallation

- If installing the Up Ggrading Tool to the PC that the tool has been already installed, uninstall the preloaded tool first then start installing the program again.
- If you are performing the Up Ggrading Tool on Windows 98, 98SE and Me operation system, a message may appear asking you to restart up the operation system during the installation. In this case, please restart your operation system according to the instruction. Even if such messages do not appear, restart your operation system after the installation has been completed.

Note)

If you are using Windows 98 and trying to activate the Up Grading Tool without restarting the operation system, the following message may appear. In this case, you need to restart your operation system for the proper operation of the Up Grading Tool.



Figure 53

Attachment 3 Reset Tool for the phone code

<Description>

Reset the phone code to "0000".

<Operation>

- 1) Connect the Reset tool to the cable.
- 2) Execute "PWDinit.exe".
- 3) Press the power key to access the idle mode. ("InsertSIM" is displayed.)
- 4) Press "Set to Default".

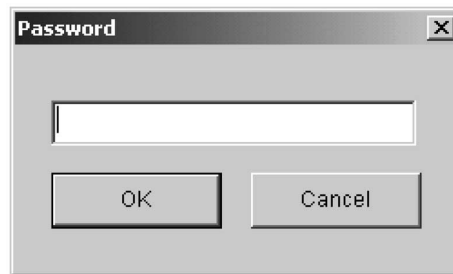


Figure 54

- 5) Enter "2968" and press "OK".



Figure 55

6) Press "Reset". The following confirmation message appears.



Figure 56

7) Press "Yes".

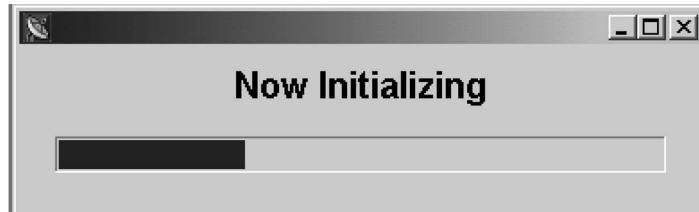


Figure 57

8) When initialization is complete, the dialog box below appears. Press "OK" to turn off the phone.



Figure 58

[2] SHARP RF Test tool manual**1. Requirements**

- PC with COM port
- Mouse
- GX20 Data Cable
- PWB repair jig

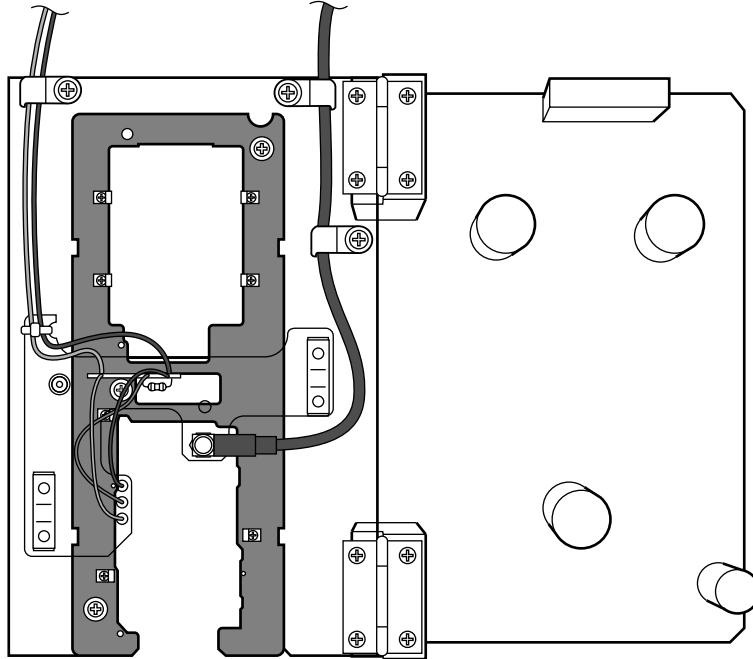


Figure 59 PWB repair jig

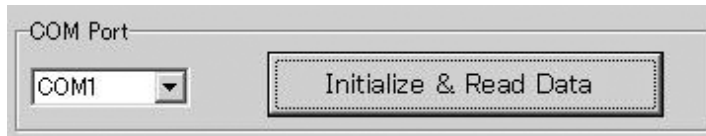
2. Setup

Figure 60

1. Set PWB and make connections as shown in Figures 62 and 63.
Make sure connections are correct at the points shown in Figure 64.
2. Connect PC and GX20 with Data Cable.
3. Turn on the phone.
4. Start RF Test Tool.
5. Select a COM port to which Data Cable is connected.
6. Press the "Initialize & Read Data" Button.
7. Figure 61 appears.
8. Click OK to proceed.



Figure 61

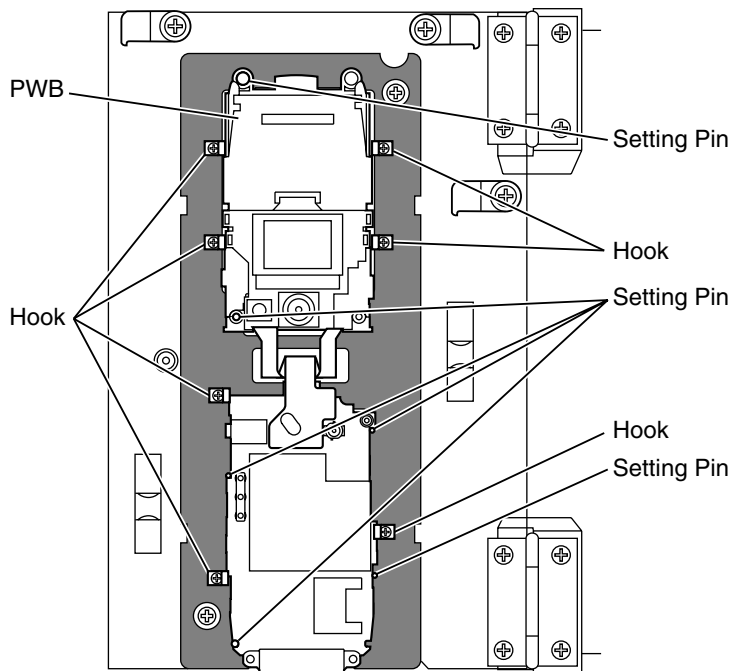


Figure 62 PWB installation

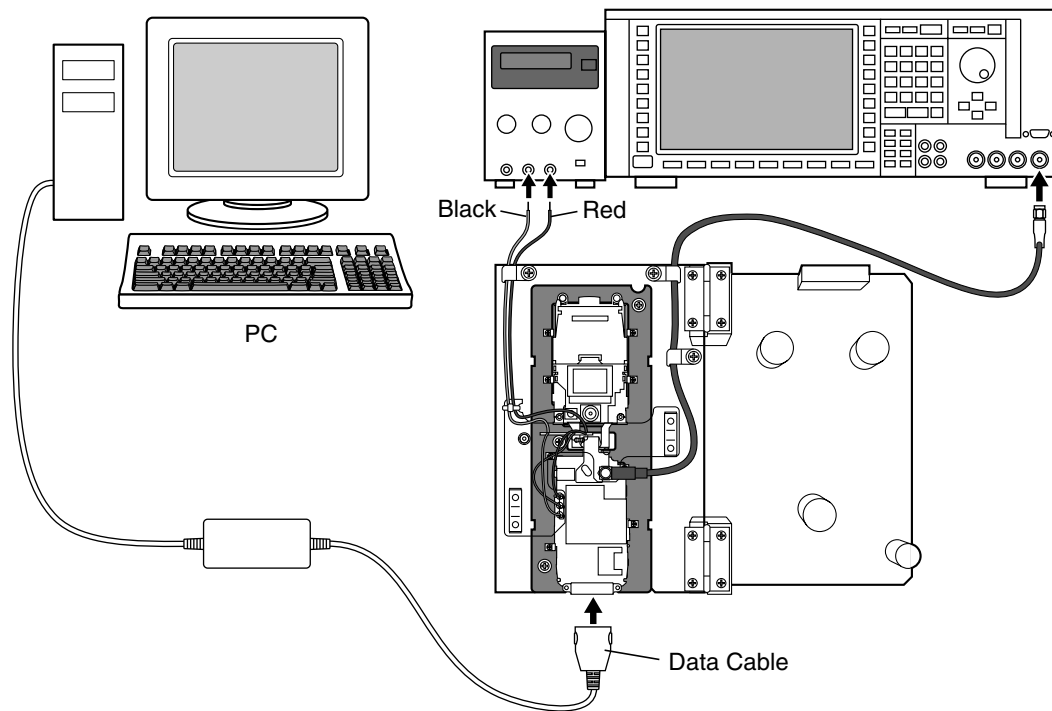


Figure 63 Connections

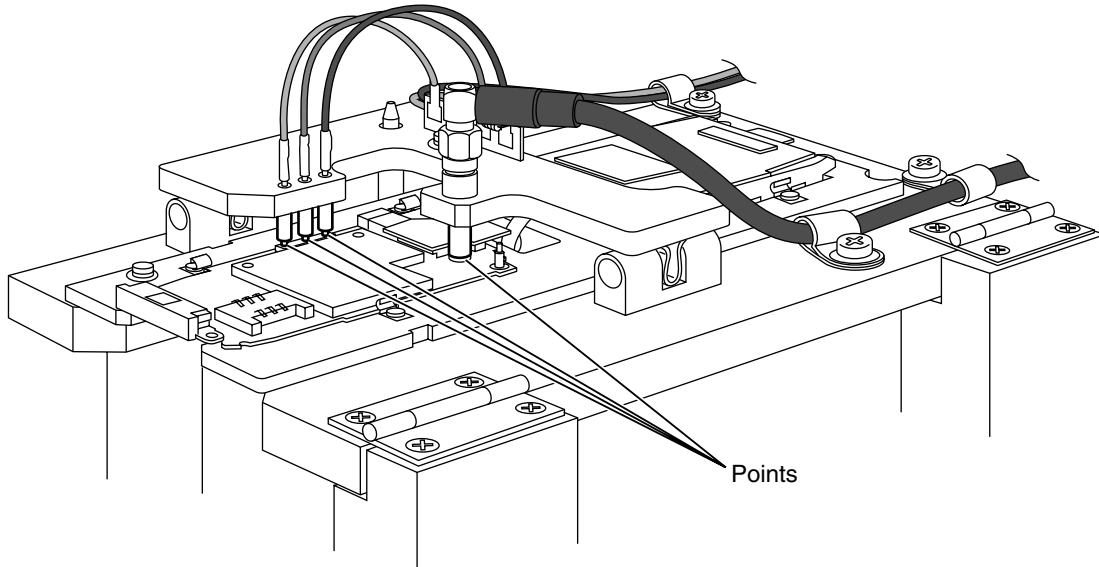


Figure 64 Contact points

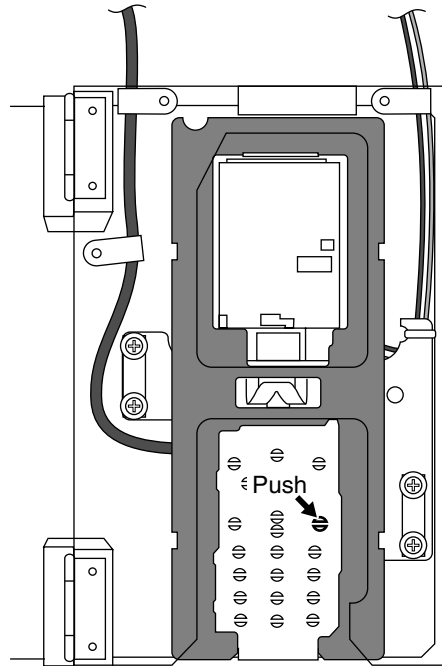


Figure 65 Turning power on

3. Tests

3.1. BAND Select & Channel

Select a band and a channel to test. Settings are applied to all tests.

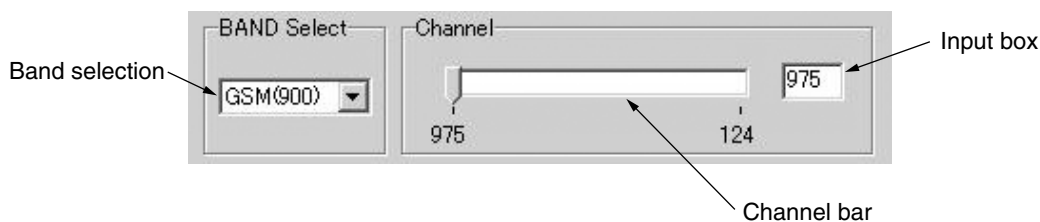


Figure 66

[Procedure]

1. Select a band. (GSM, DCS or PCS)
2. Select or enter a channel using Channel bar or Input box.

3.2. TX test

Test burst transmission.

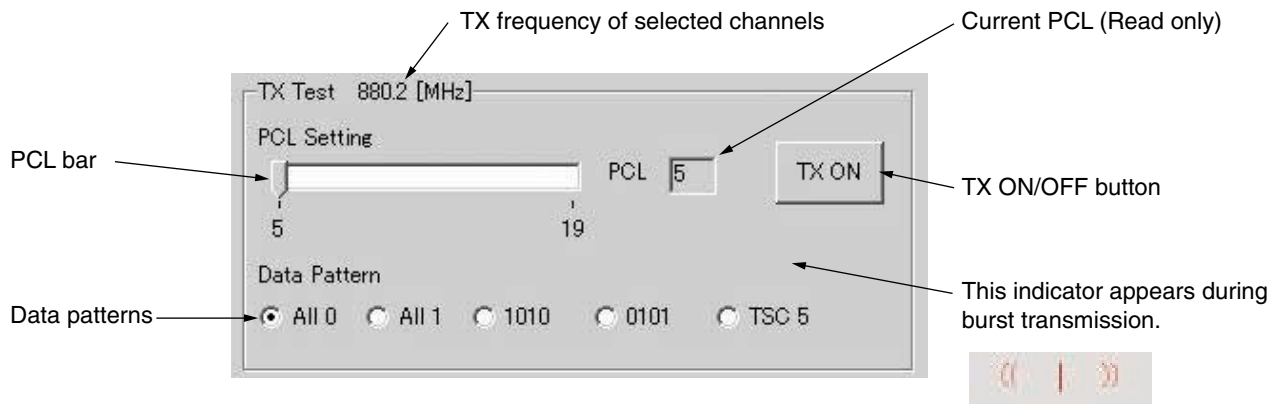


Figure 67

[Procedure]

1. Select a band and channel. (see 3.1)
2. Select PCL (Power Control Level) using PCL bar.
3. Select Data pattern.
4. Click TX ON to start burst transmission.
(You can check each part in this state.)
5. Click TX OFF to end burst transmission.

* Data pattern (TSC 5) includes Training Sequence GSM 5, and other part is pseudo random data.

GX20 TX power Table (Target power during calibration, supply voltage: 3.7[V])

GSM	
PCL	TX Power [dBm]
5	31.6
6	30.0
7	29.0
8	27.0
9	25.0
10	23.0
11	21.0
12	19.0
13	17.0
14	15.0
15	13.0
16	11.0
17	9.0
18	7.0
19	5.0

DCS/PCS	
PCL	TX Power [dBm]
0	28.6
1	27.0
2	26.0
3	24.0
4	22.0
5	20.0
6	18.0
7	16.0
8	14.0
9	12.0
10	10.0
11	8.0
12	6.0
13	4.0
14	2.0
15	0.0

3.3. RX test

The phone receives burst signals in this test.

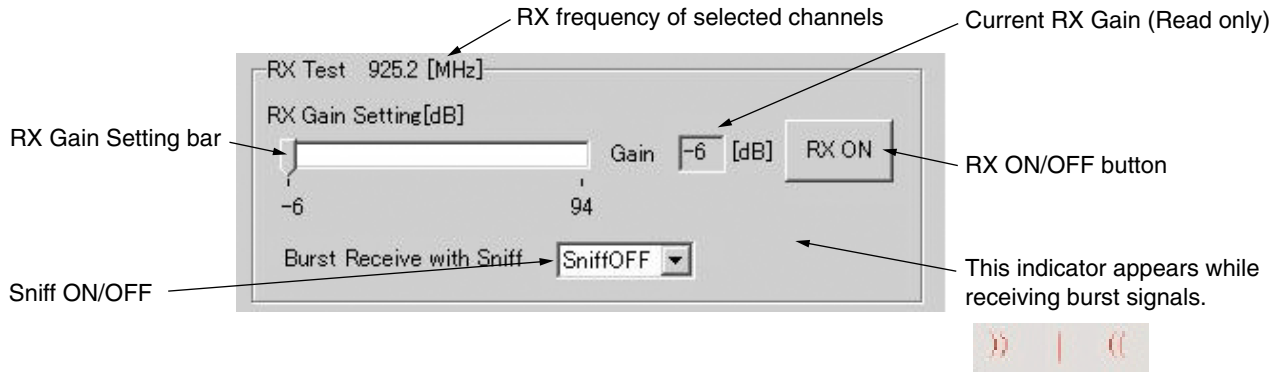


Figure 68

[Procedure]

1. Select a channel and band. (see 3.1)
2. Select RX Gain using RX Gain Setting bar.
3. Choose Sniff ON or OFF.
4. Click RX ON to start receiving burst signals.
5. From GSM tester, send burst signals in the specified channel.

(You can check each part in this state.)

6. Click RX OFF to end receiving burst signals.

* In this test, the reception timing cannot be synchronized with burst signals from Signal Generator or GSM tester.

* The standard RX Gain Setting is:
 (Input power at the antenna connector of the phone) + (RX Gain) = -16 dBm
 Excessive Input power or RX Gain may cause damage to the phone.

3.4. RSSI Measure

The phone notifies you of input power value at the antenna connector.

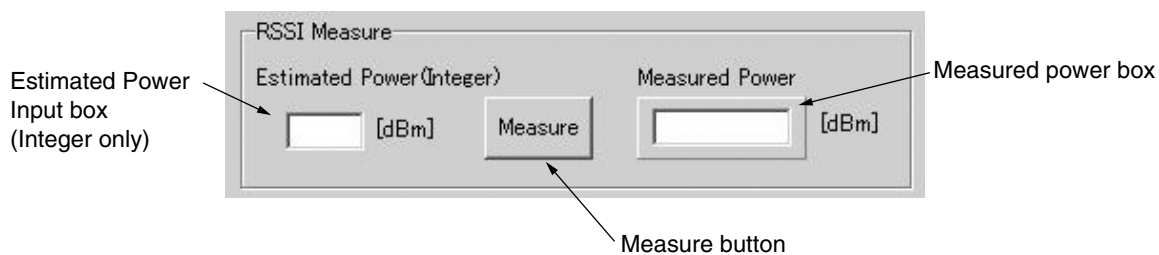


Figure 69

[Procedure]

1. Connect the phone and GSM tester (or Signal Generator) with RF cable.
2. Select a band and channel. (see 3.1)
3. Send signals (*) from GSM tester.
4. Enter the value of input power from GSM tester in integers (from -10 to -110) considering RF cable loss.
5. Press the Measure button.
6. The result appears in Measured Power box.

- * The signal type from GSM tester must be either of two:
1. Continuous sine wave (without modulation) with the frequency as follows:
 (Frequency of the measured channel) + 67.708kHz.
 (Ex. channel: GSM 37ch → the result: 942.467708 MHz)
 Power: -110 to -10 dBm
 2. BCCH signal of the measured channel
 Power: -110 to -10 dBm

Result

When the phone is properly calibrated, the error between "Estimated Power" and "Measured Power" is less than 2dB.

4. Termination

Turn off the phone to ensure proper operations.

5. Trouble information

When switching DCS and PCS, change the channel number as well. Or the band does not change properly.

Example: If you change DCS 512 CH to PCS 512 CH, the band remains DCS.

[3] Adjustment procedures after replacement of the parts

Be sure to make adjustments to the parts as shown in the table below.

	1. Adjustment to camera temperature	2. Adjustment to battery temperature	3. Main display flicker adjustment	4. External display contrast adjustment	5. White defect correction
IC105	○	×	×	×	×
IC307	×	○	×	×	×
Camera FPC a'ssy	×	×	×	×	○
Main display	×	×	○	×	×
External display	×	×	×	○	×

1. Adjustment procedures of camera temperature

- Place a thermometer near the unit to be adjusted. Make sure the room temperature is over 0°C.
- Attach the battery pack and then connect the Data cable.
- Access the normal mode by holding down the "End/Power" key.
- Send the [AT+XDIAG] command to receive the response [DIAGREADY].
- Send the [PWRFON] command to receive the response [OK].
- Send the [PWRDOWN] command to power off.
- Hold down the "End/Power" key to display "*****".
- Press the "3" key to display "H/W CHECK *GX20*"
Then the test mode is started.
- Access the TEMP ADJ mode by pressing the "✕" key, and push the "1" (1. CAM TEMP) key.
- Temperature detected by the sensor is displayed after "Temp:". Compare the displayed value to the room temperature.
Enter the difference as a corrected value with the "▼" key if the displayed value is higher, and use the "▲" key if it is lower.
The corrected value is displayed after "Correct:".
- Press the "#" key. The corrected value is registered.
- Press the "0" key to access the initial screen of the function test mode.
- Press the "End/Power" key to power off.
- Connect the Data cable and then hold down the "End/Power" key to display "*****".
- Press the "2" key to display "Function Mode *GX20*"
- Send the [PWRFOFF] command to receive the response [OK].
- Send the [PWRDOWN] command to power off.
- Hold down the "End/Power" key to check for the startup in the normal mode.
- Hold down the "End/Power" key to power off.

2. Adjustment procedures of battery temperature

- Perform steps 1 – 8 of "Camera temperature adjustment procedure".
- Access the TEMP ADJ mode by pressing the "✕" key, and push the "2" (2.BAT TEMP) key.
- Perform steps 10 – 19 of "Camera temperature adjustment procedure".

3. Main display flicker adjustment procedure

1. Attach the battery pack.
2. Access the manual testmode.
3. Access the manual testmodeF81 (LCD Setting) by pressing the “8”, “1” and “Right Soft” keys in this order.
4. Press the “2” (2. VCOM Adjust) key.
5. Adjust the flickers on the screen to the minimum by pressing the “ ▲ ” and the “ ▼ ” keys. Make sure visually they are minimized at a distance of about 20 cm from the inverter fluorescent lamp. (Fine adjustments to the DC voltage between display electrodes)

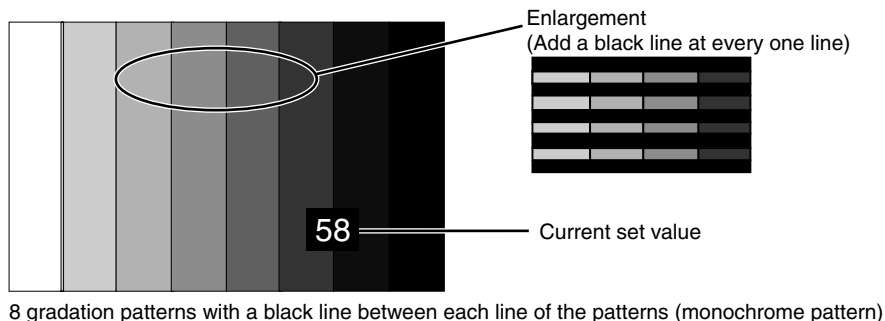


Figure 70

6. Press the “Centre” key twice. The corrected value is registered.
7. Press the “End/Power” key to exit this mode.

4. External display contrast adjustment

1. Attach the battery pack and then connect the Data cable.
2. Hold down the "End/Power" key for startup in the normal mode.
3. Send the [AT+XDIAG] command to receive the response [DIAGREADY].
4. Send the [PWRFON] command to receive the response [OK].
5. Send the [PWRDOWN] command to power off.
6. Hold down the "End/Power" key to display "*****".
7. Press the "3" key to display "H/W CHECK *GX20*" and then to access the test mode.
8. Press the "8" key to show the following pattern on the external display.

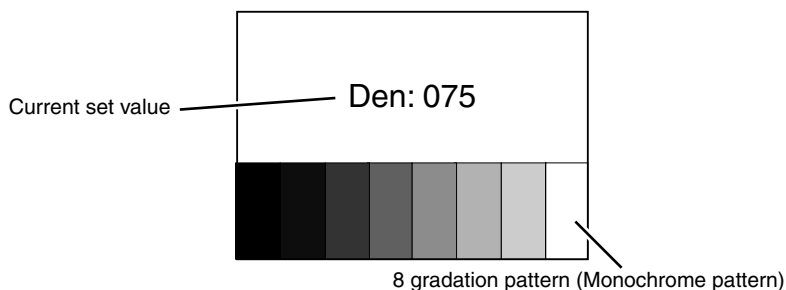


Figure 71

9. Use “ ▲ ” or “ ▼ ” key to adjust the gradation pattern by comparing it with the other one already adjusted at the plant.
10. Press the “Centre” key to show [Save OK.] on the external display. Then the adjusted value is entered.
11. Press the "0" key to access the initial screen of the function test mode.
12. Press the "End/Power" key to power off.
13. Connect the Data cable and then hold down the "End/Power" key to display "*****".
14. Press the "2" key to display "Function Mode *GX20*".
15. Send the [PWRFOFF] command to receive the response [OK].
16. Send the [PWRDOWN] command to power off.
17. Hold down the "End/Power" key to check for startup in the normal mode.
18. Hold down the "End/Power" key to power off.

5. Procedures of white defect correction

1. Attach the battery pack and then connect the Data cable.
2. Access the normal mode by holding down the "End/Power" key.
3. Send the [AT+XDIAG] command to receive the response [DIAGREADY].
4. "Function Mode *GX20*" is shown on the display.
5. Cover the camera front to block off light completely.
6. Transmit the [WHC00840120000000] command.
7. Response will be received if the transmission is completed after 20 to 30 seconds. Be sure to continue to block off light during this process.

<Response to be received>

- In case of [LDDEVPRMOK]: aaaabbb will be received.
aaaa: the number of white defects
bbb: the maximum level of dark current
 - In case of [LDDEVPRMNG]: 000000 will be received.
This indicates light was not blocked completely. Go back to step 6.
8. Send the [WH] command.
 9. After receiving the response [OK], send the [POWDOWN] command.
 10. Power off and then remove the Data cable.

* White defect correction

White defects indicate pixel defects in the image detected by the light sensor. These appear as white spots even when light is completely blocked off (even on a black background). White defect correction solves this problem.

[4] Test points

MAIN PWB-A (REAR SIDE)

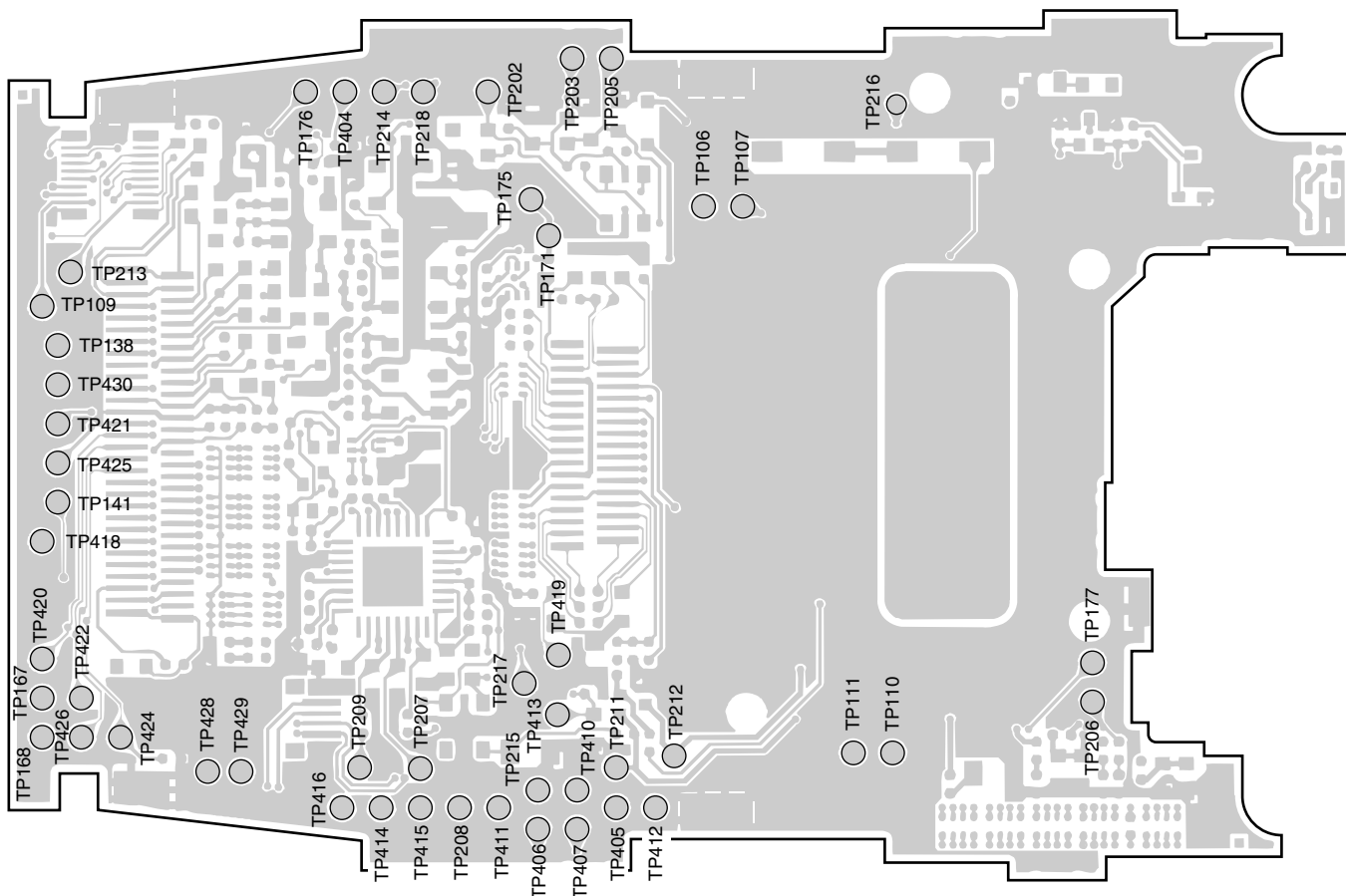


Figure 72 TEST POINT

TP No.	Signal name	TP No.	Signal name	TP No.	Signal name
TP106	JAKMIC	TP207	VCORE (1.8V)	TP412	Power supply for camera (+13V)
TP107	JAKEAR	TP208	VANA (2.45V)	TP413	Power supply for camera (-7V)
TP109	CONT2	TP209	VMEM(2.8V)	TP414	13MHzCLK
TP110	SP1	TP211	VCCD (2.5V)	TP415	CAMCLK
TP111	SP2	TP212	VEXT_CN (2.5V)	TP416	Terminal for LCDC adhesion check 1
TP138	Terminal for STACK MEMORY adhesion check 1	TP213	VINT (3V)	TP418	Terminal for LCDC adhesion check 2
TP141	Terminal for STACK MEMORY adhesion check 2	TP214	VAMP (3V)	TP419	VOUT (External display)
TP167	RECIVER_OUTP	TP215	VT (2.715V)	TP420	CS
TP168	RECIVER_OUTN	TP216	VIR (2.8V)	TP421	SCLK
TP171	AUXADC6	TP217	POWONKEY	TP422	SI
TP175	AUXADC6	TP218	VLCD (1.8V)	TP424	DCLK
TP176	VPP	TP404	/LCD_RESET	TP425	HSYNC
TP177	CINT	TP405	VPLUS2	TP426	VSYNC
TP202	3V	TP406	LEDR	TP428	Back light (LED+)
TP203	VBACK (3V)	TP407	LEDG	TP429	Back light (LED-)
TP205	VRTC (1.8V)	TP410	Terminal for APPLICATION POWER adhesion check 1	TP430	VDD2
TP206	VCAM (3.1V)	TP411	Terminal for APPLICATION POWER adhesion check 2		

KEY PWB-B (FRONT SIDE)

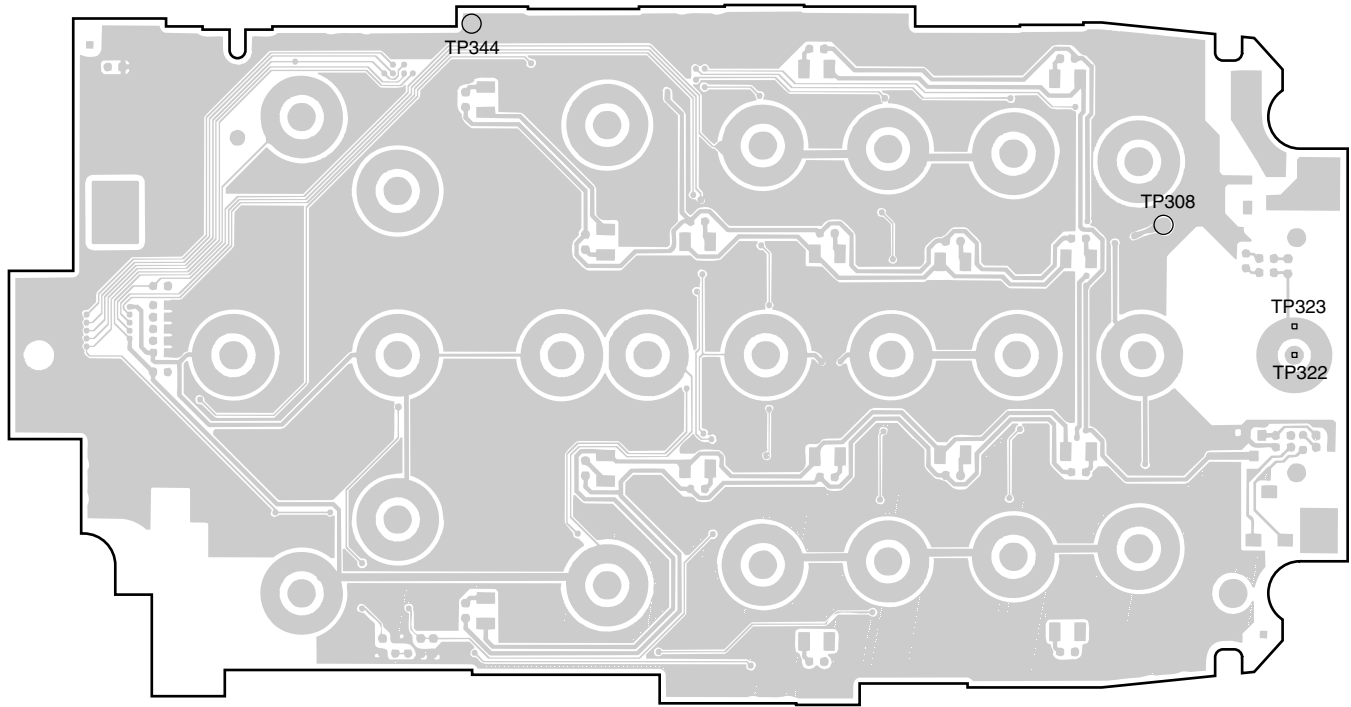


Figure 73 TEST POINT

TP No.	Signal name
TP308	VEXT_CN
TP344	DGND

KEY PWB-B (REAR SIDE)

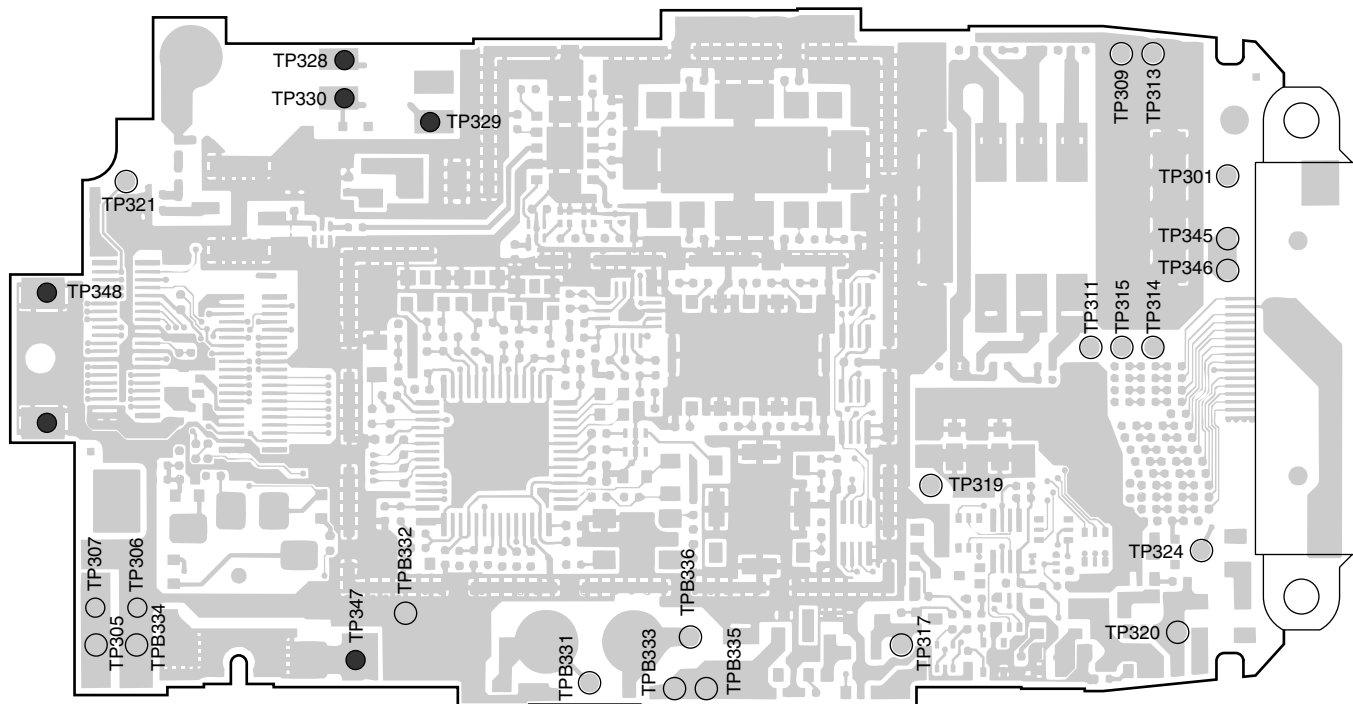


Figure 74 TEST POINT

TP No.	Signal name	TP No.	Signal name
TP301	VSIM (2.85V)	TP328	KEYPADCOL [1]
TP305	VVIB	TP329	KEYPADCOL [2]
TP306	DGND	TP330	KEYPADROW [0]
TP307	VVIB	TP345	KEY_BL_ON
TP309	TXD	TP346	KEY_BL_ON
TP311	ADPDET	TP347	JACK_GND
TP313	RXD	TP348	DGND
TP314	RTS	TPB331	BATT_SENSE
TP315	CTS	TPB332	DGND
TP317	VTCXO (2.9V)	TPB333	BATT
TP319	VRF (2.9V)	TPB334	DGND
TP320	CHGIN	TPB335	BATT
TP321	CHGIN	TPB336	BATT
TP324	MIC		

[5] Troubleshooting

1. Power does not turn on.

Connect a battery with voltage of more than 4.0 V.



Manual test mode gained?

NO → (A) (To page 2-43)



Can initialization of only user area (File System) be conducted by Flash Loader?

NO → 4-level stack memory (IC106), and IC104 defective.



Does the normal mode start?

YES → 4-level stack memory (IC106) data damaged.



Is the program rewritable?

NO → 4-level stack memory (IC106), and IC104 defective.



After restart, the normal mode gained?

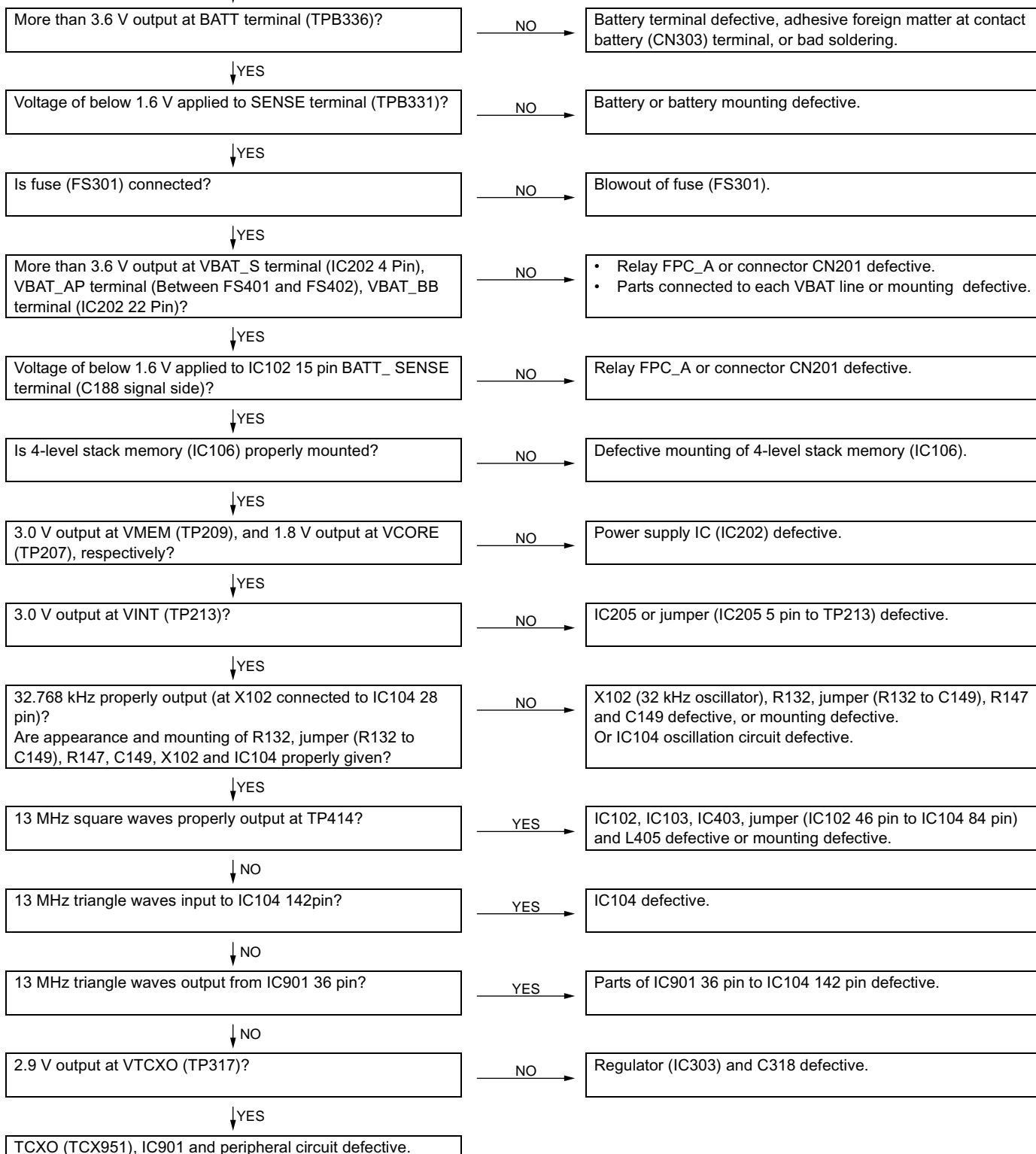
YES → Program of 4-level stack memory (IC106) transformed.



4-level stack memory (IC106), and IC104 defective.

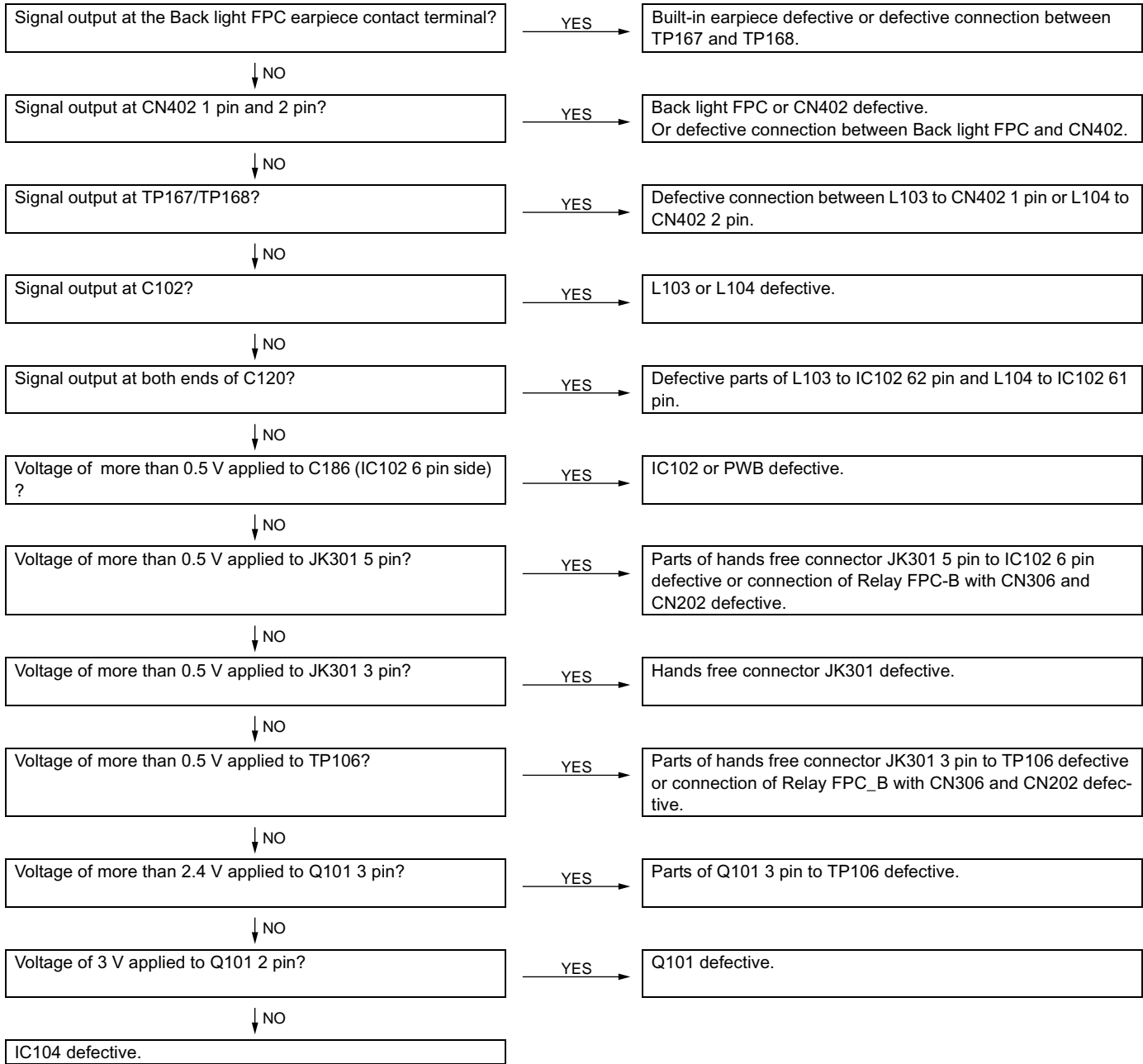
NOTE: If the cause is damage to 4-level memory (IC106), ensure to upload flash data before operation as initializing user area may prevent detecting the damaged data.

Ⓐ (From page 2-42)

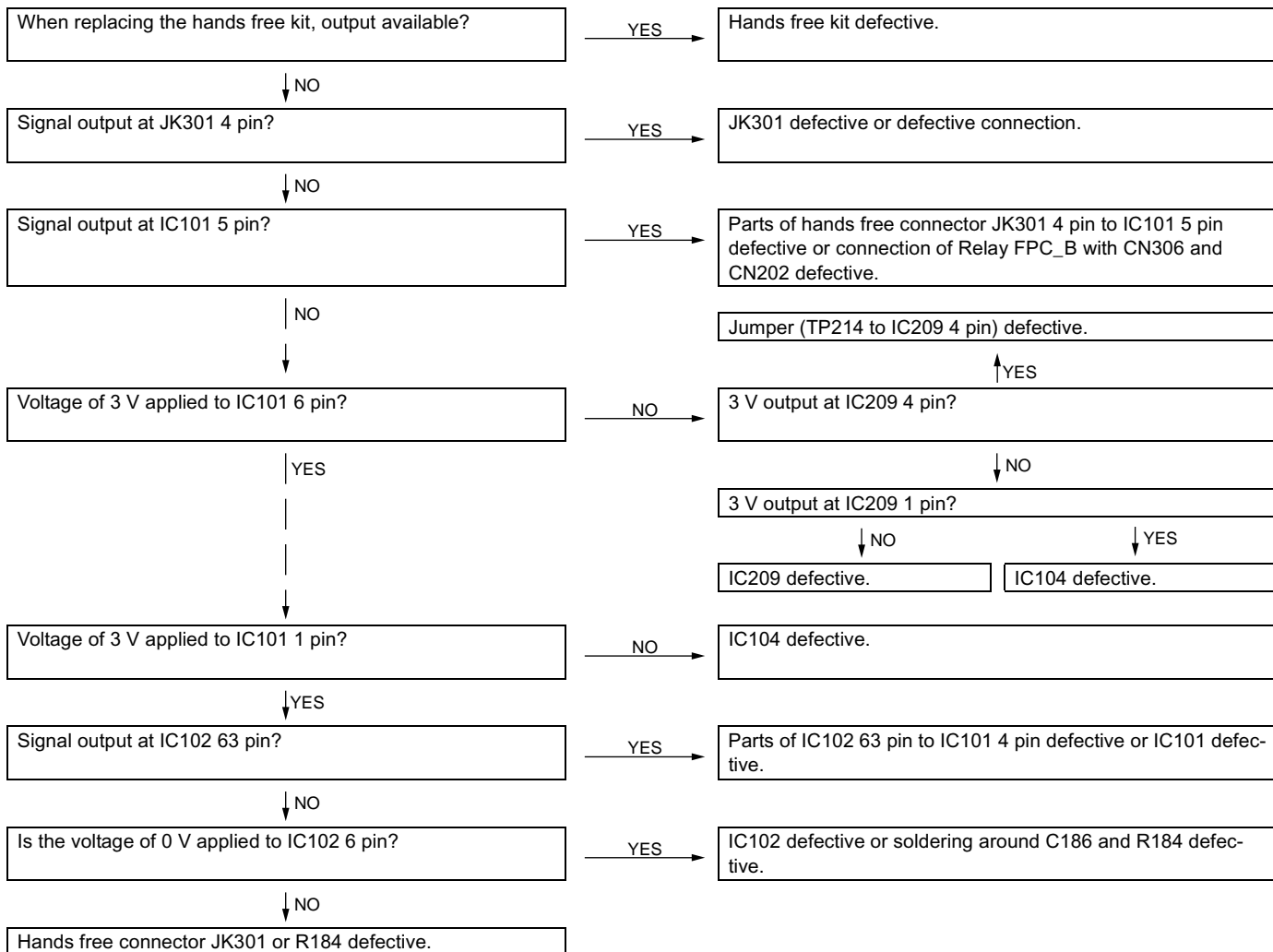


2. Incoming audio cannot be heard.

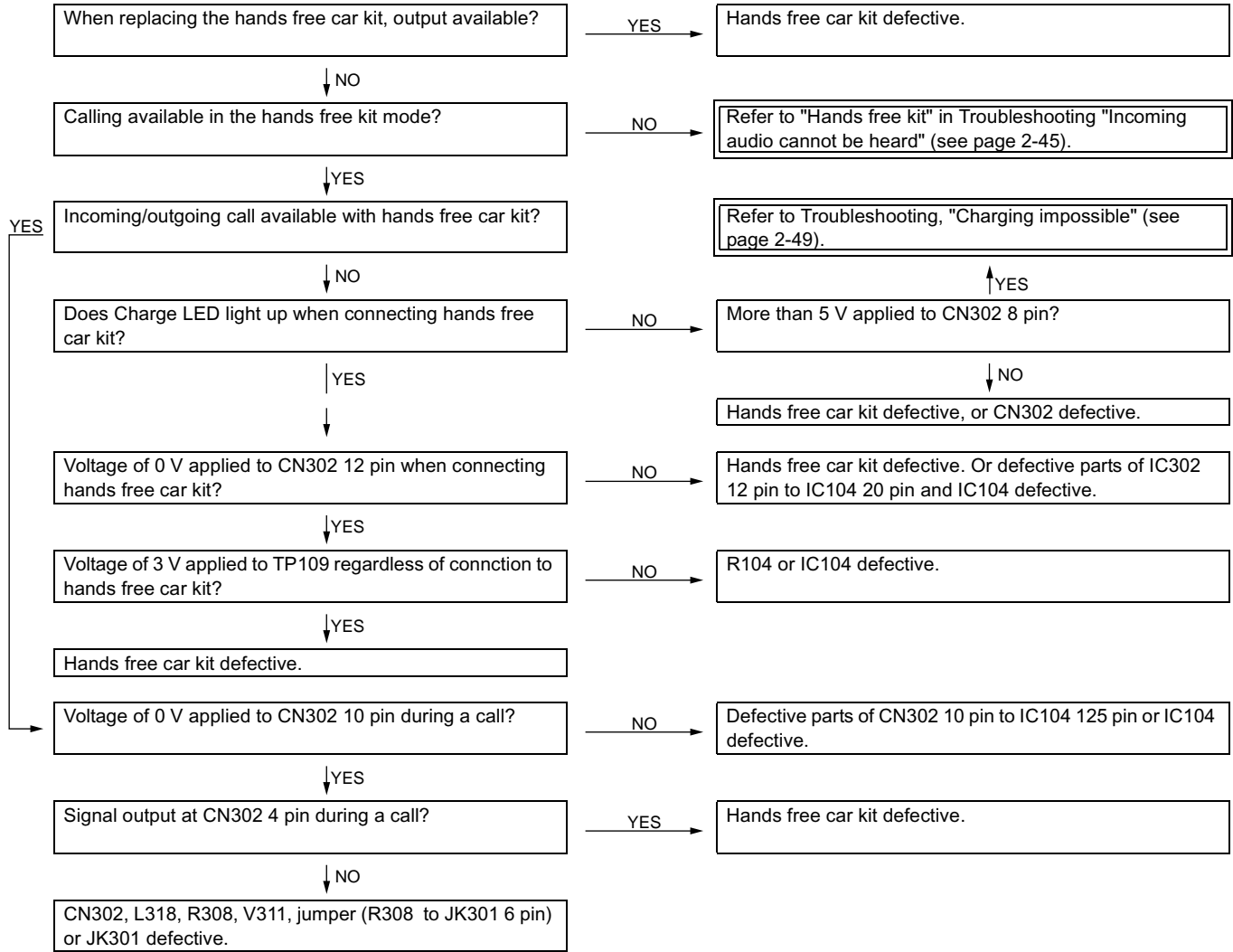
Phone



Hands free kit (Headset)

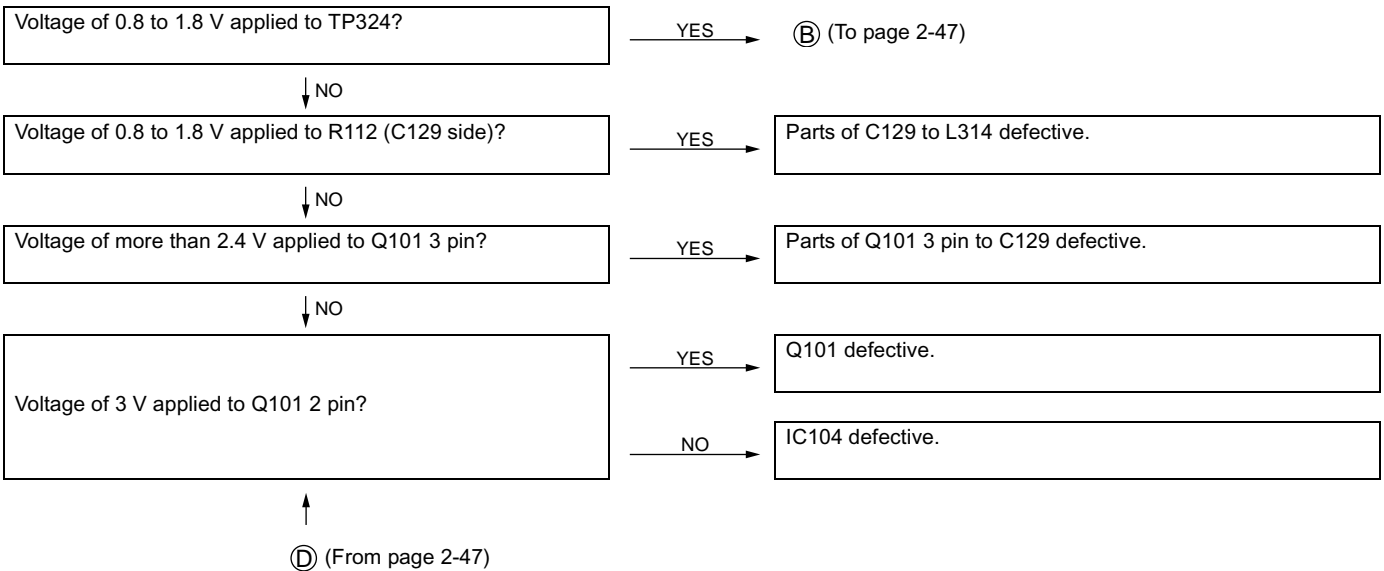


Hands free car kit



3. Audio cannot be sent/recorded.

Phone



Ⓑ (From page 2-46)

Voltage of approx. 1 V applied to IC102 54 pin?

→ YES → Ⓒ

↓ NO

Voltage of approx. 1 V applied to IC102 64 pin?

→ YES → IC102 defective.

↓ NO

Voltage of more than 2.4 V applied to Q101 3 pin?

→ NO → Ⓓ (To page 2-46)

↓ YES

Parts of R110, R111, C126 and jumper (IC102 64 pin to R111) defective or soldering defective.

Ⓒ

Voltage of more than 0.5 V applied to C186 (IC102 6 pin side)?

→ YES → Attach the PC board on the microphone side again or replace the microphone. Then improvement observed?

Built-in microphone defective.
defective connection between microphone and PWB.

↑ YES

↓ NO

Voltage of more than 0.5 V applied to JK301 5 pin?

→ YES → Parts of hands free connector JK301 5 pin to IC102 6 pin defective or defective connection between Relay FPC_B and CN306, CN202.

↓ NO

IC102 defective.

↓ NO

Voltage of more than 0.5 V applied to JK301 3 pin?

→ YES → Hands free connector JK301 defective.

↓ NO

Voltage of more than 0.5 V applied to TP106?

→ YES → Parts of JK301 3 pin to TP106 defective or defective connection between Relay FPC_B and CN306, CN202.

↓ NO

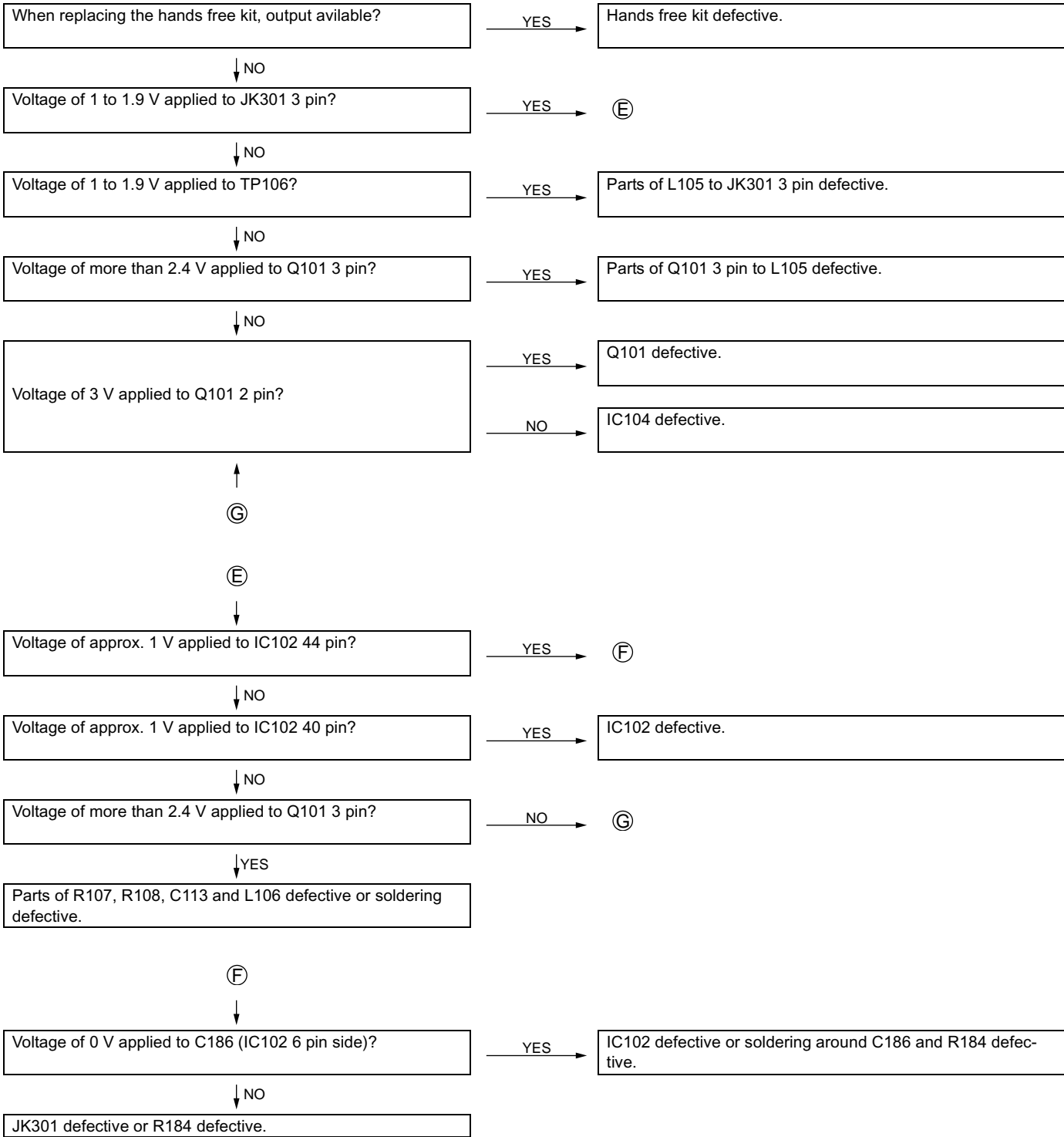
Voltage of more than 2.4 V applied to Q101 3 pin?

→ NO → Ⓓ (To page 2-46)

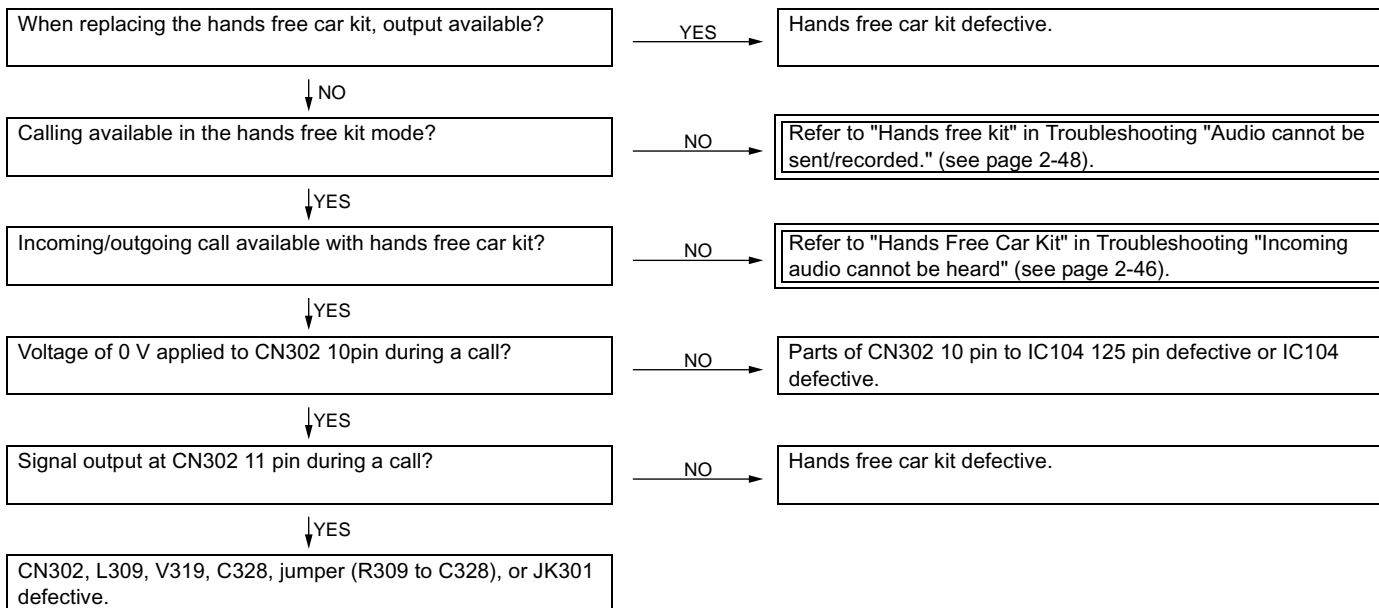
↓ YES

Parts of Q101 3 pin to TP106 defective.

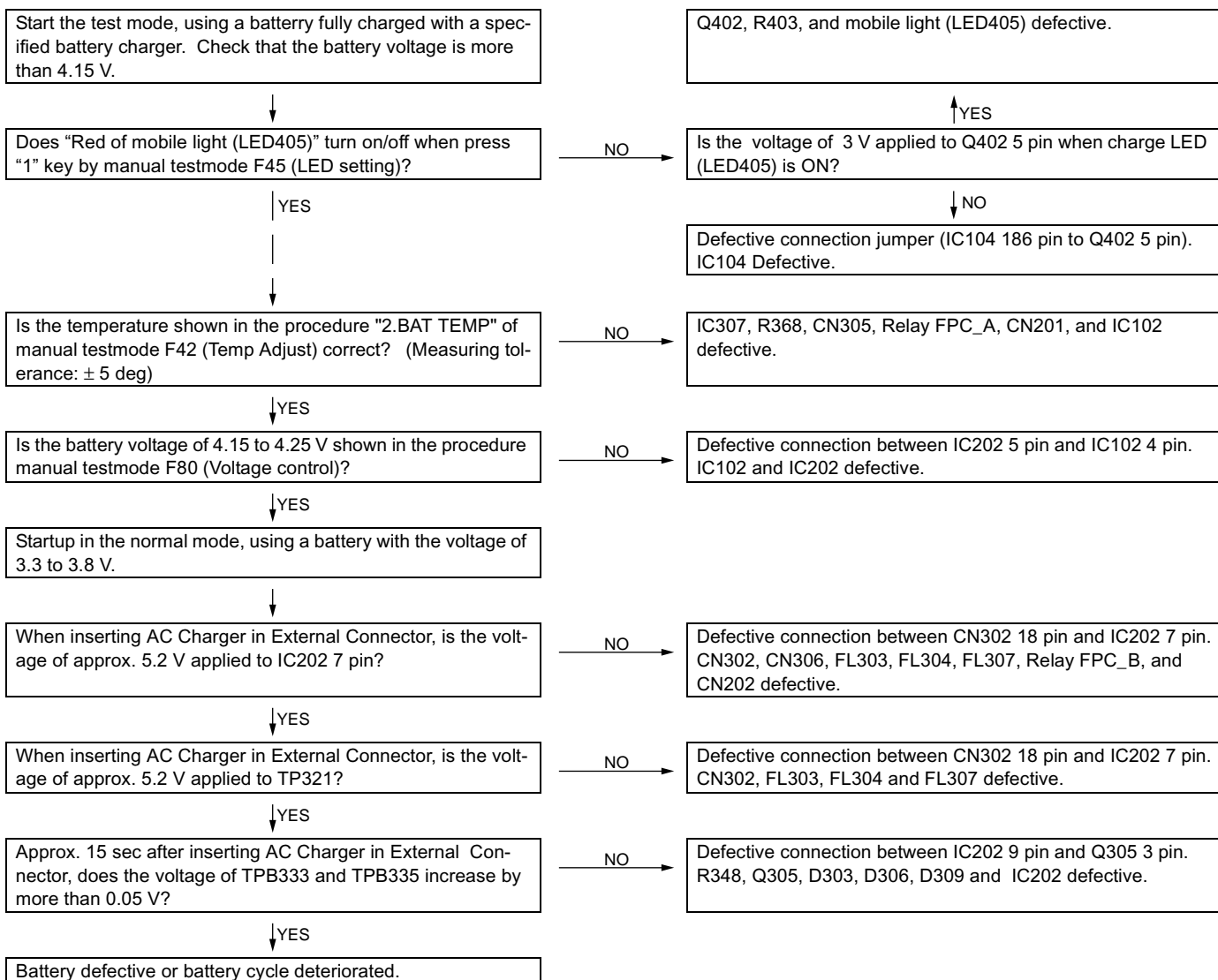
Hands free kit (Headset)



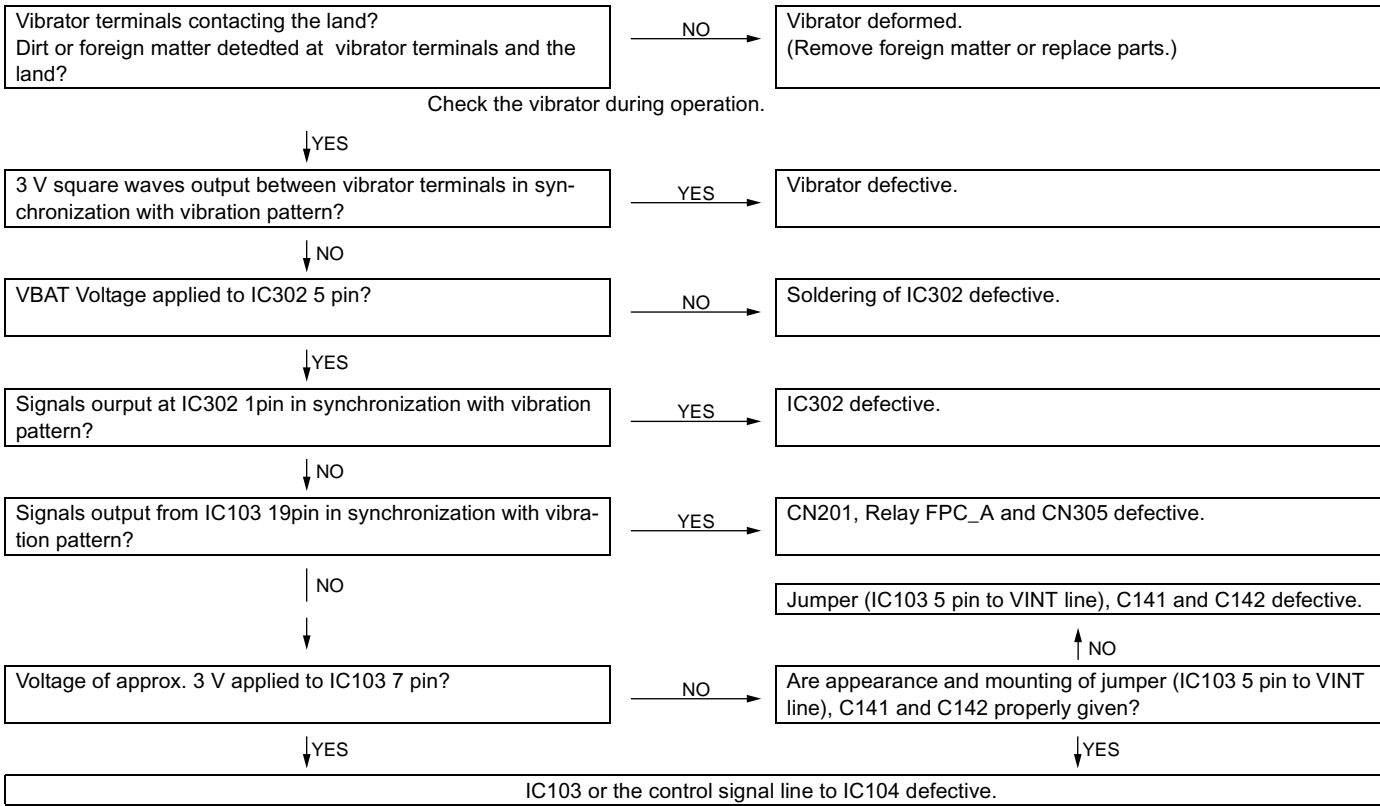
Hands free car kit



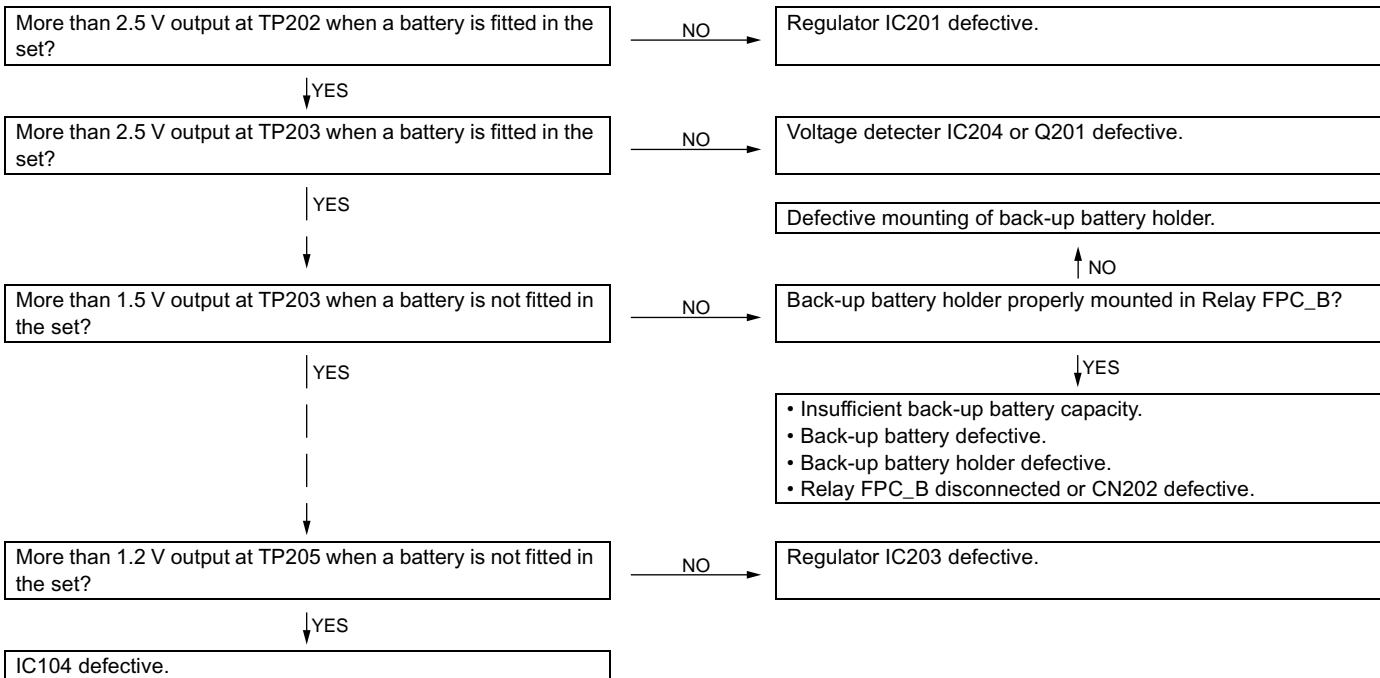
4. Charging impossible.



5. Vibrator does not operate.

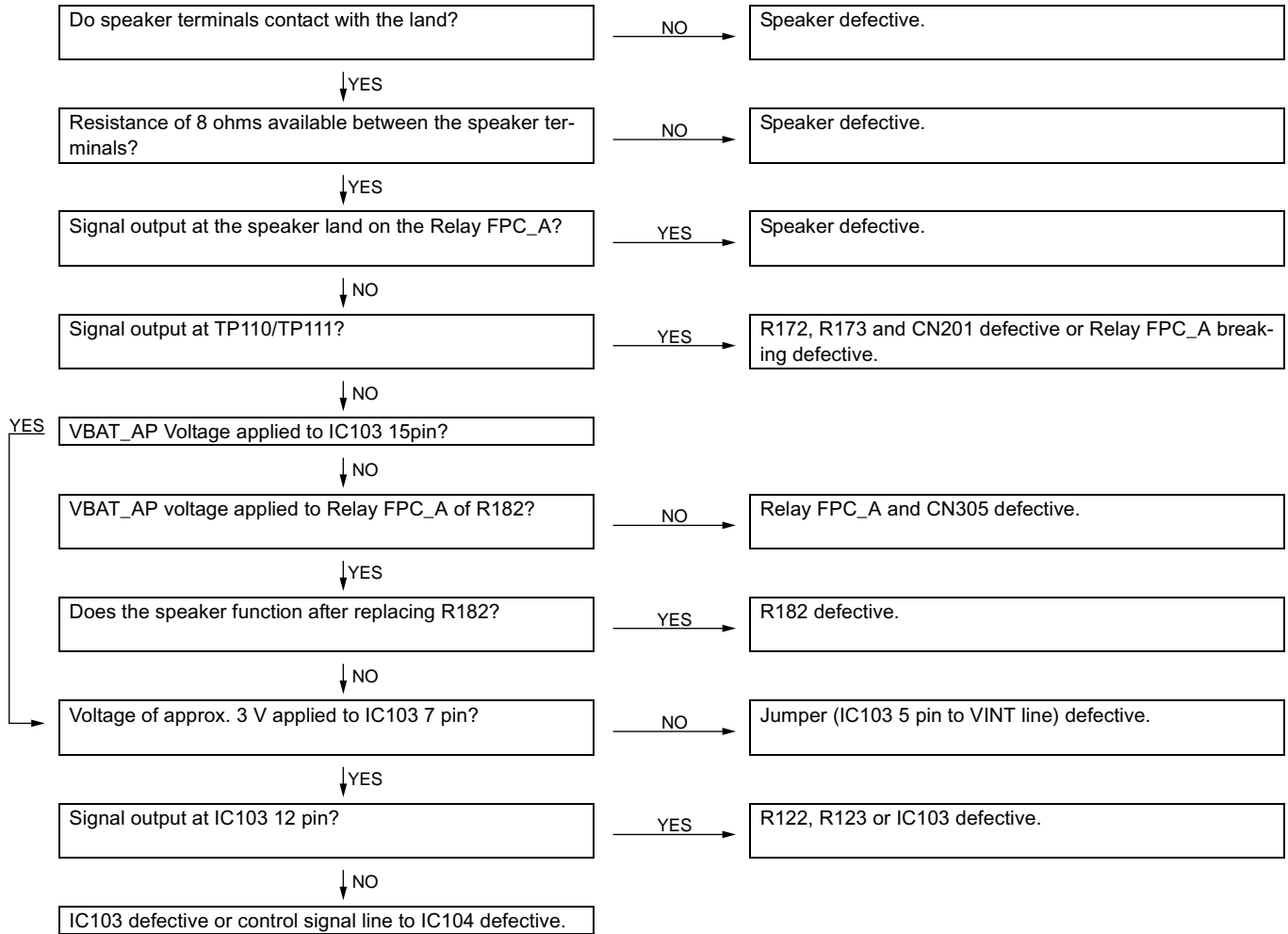


6. Clock is reset.



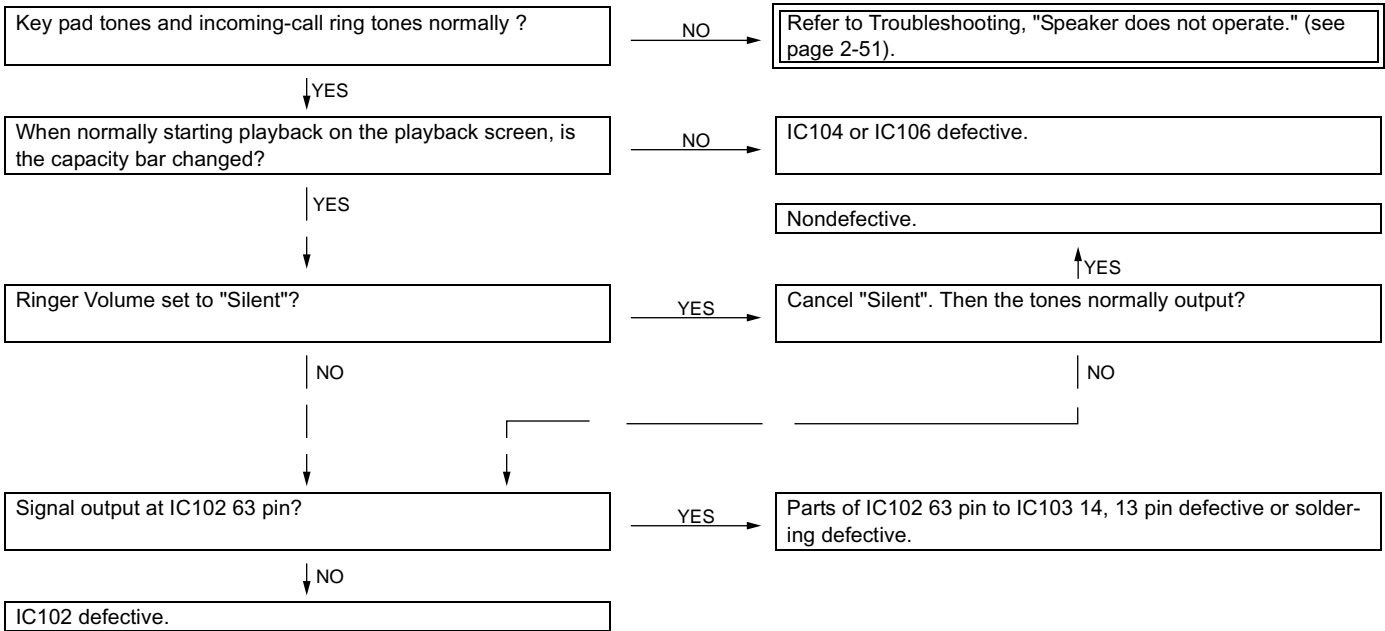
7. Speaker does not operate.

- * When ring tones sound but only key touch tones do not, "Keypad Tones" are set to OFF.
- * When the ring tone volume is set to "Silent", Voice Memo is not played back.

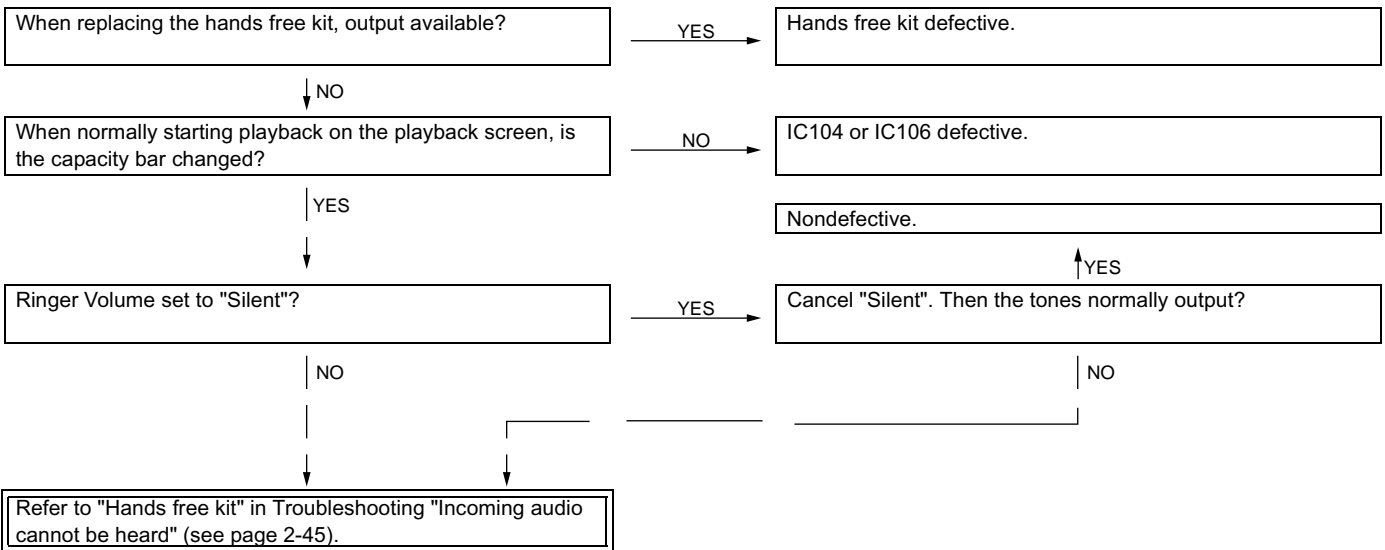


8. Movie, Voice Memo cannot be played back.

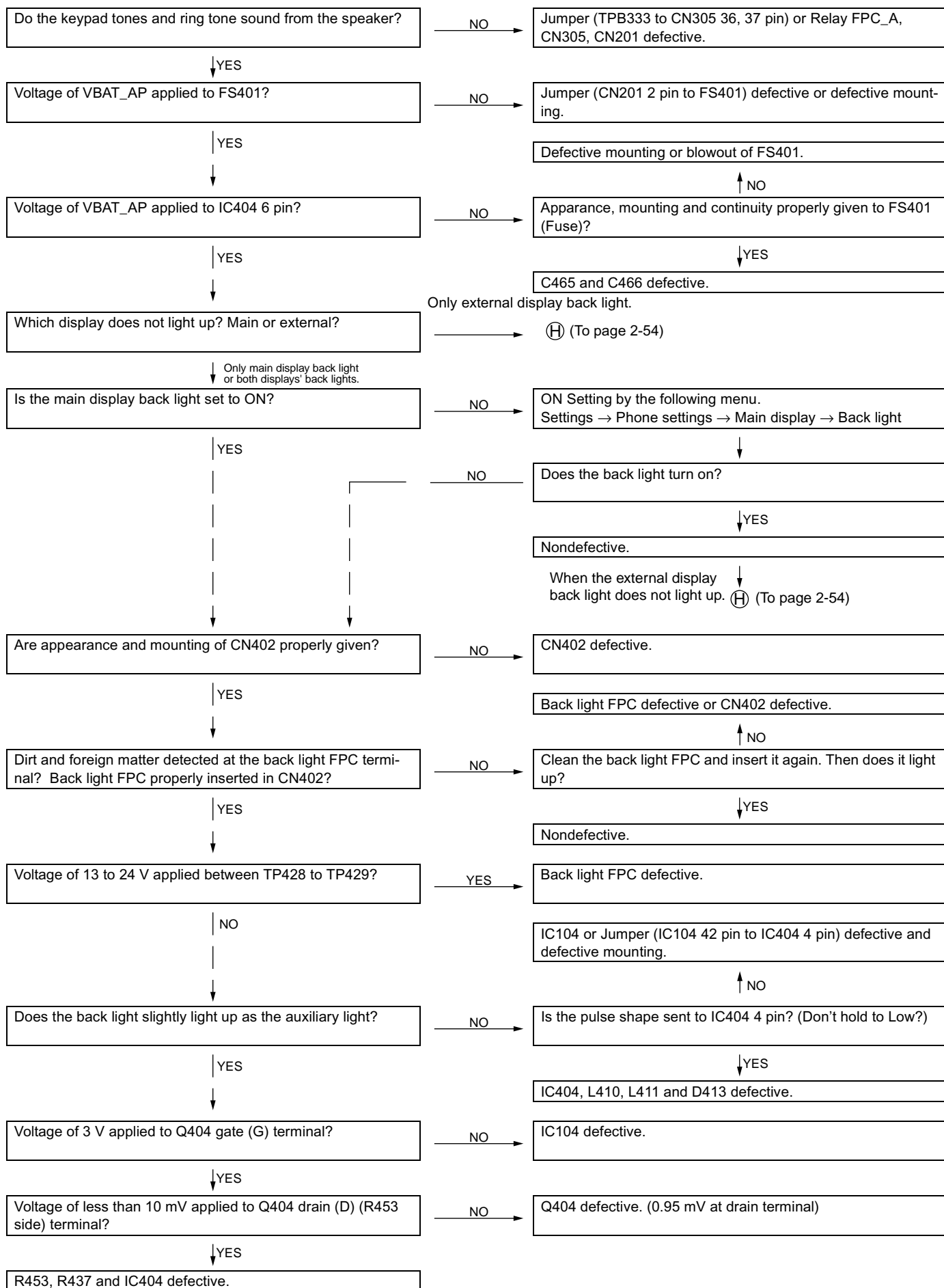
Speaker



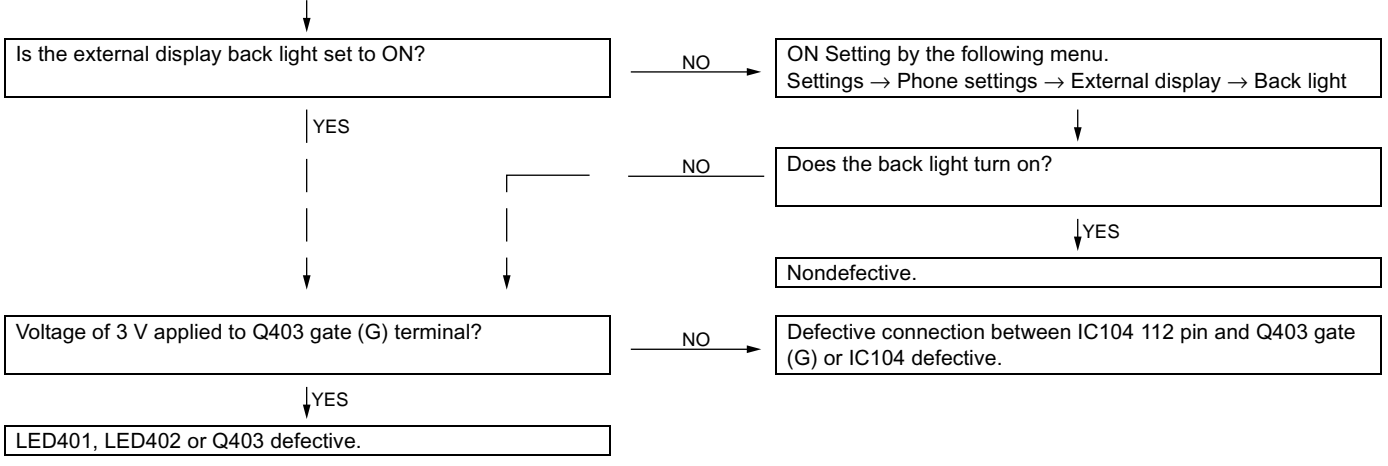
Hands free kit (Headset)



9. Back light does not turn on.

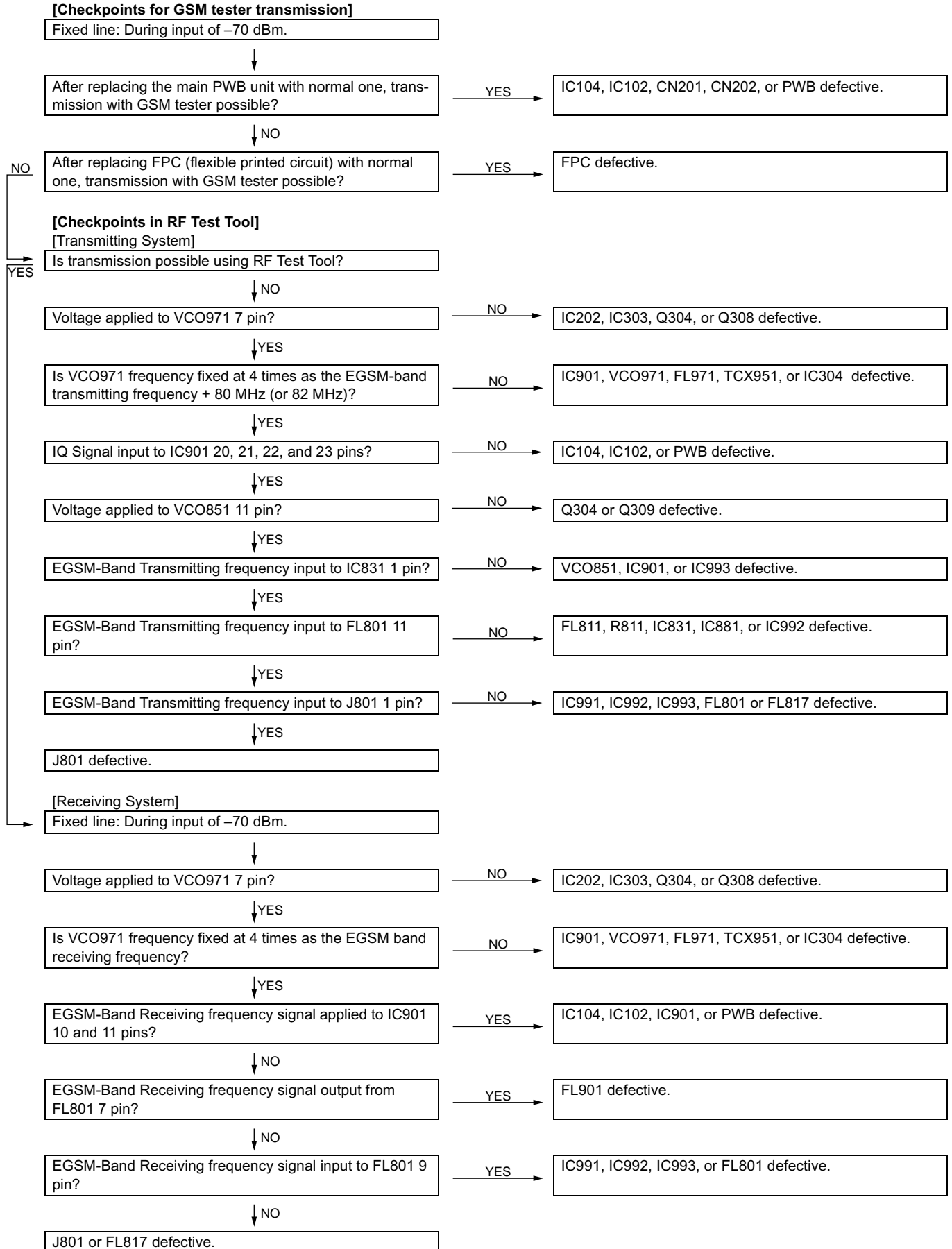


Ⓜ (From page 2-53)

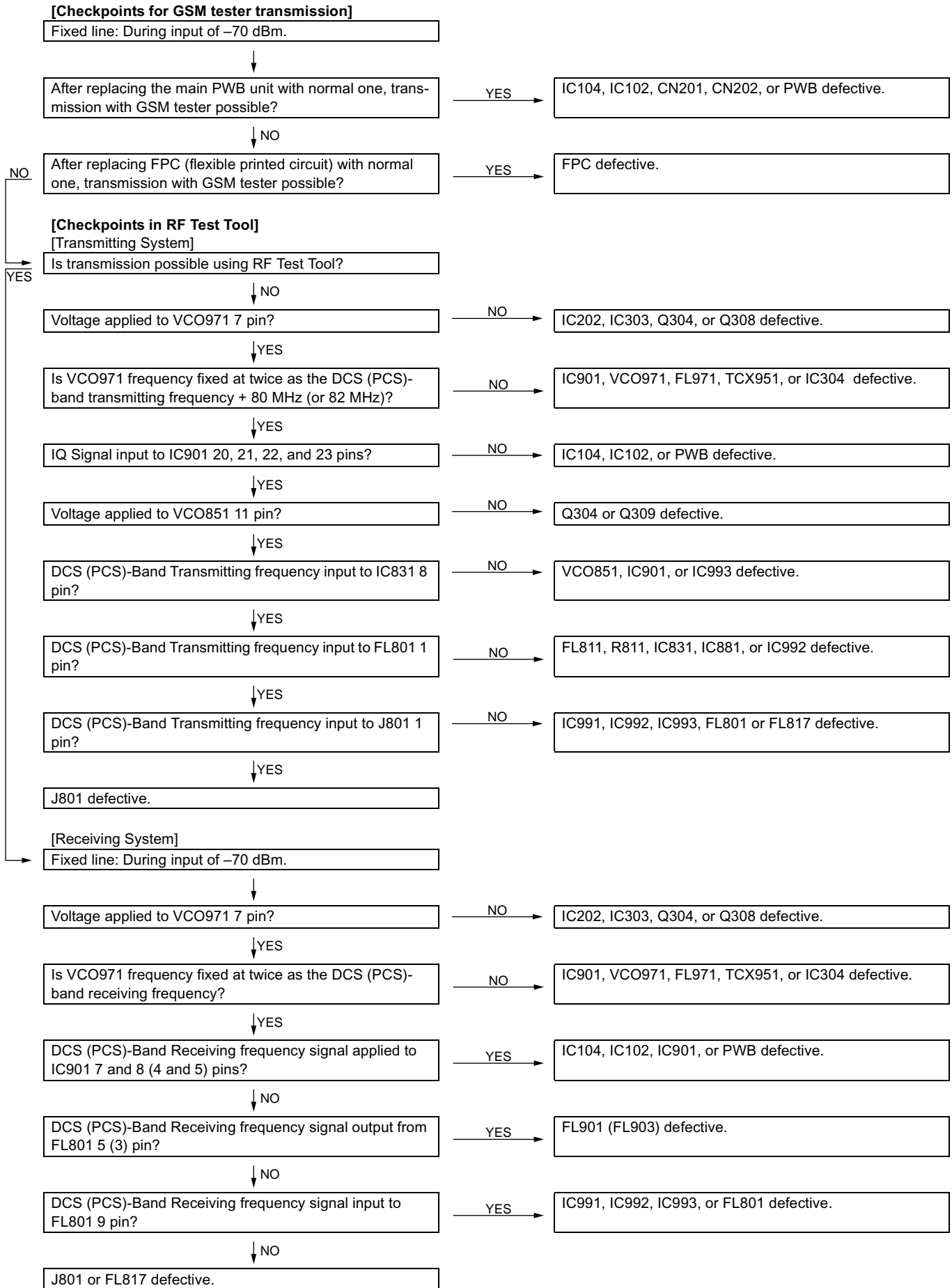


10. "No Service" display and receiving/transmitting do not function.

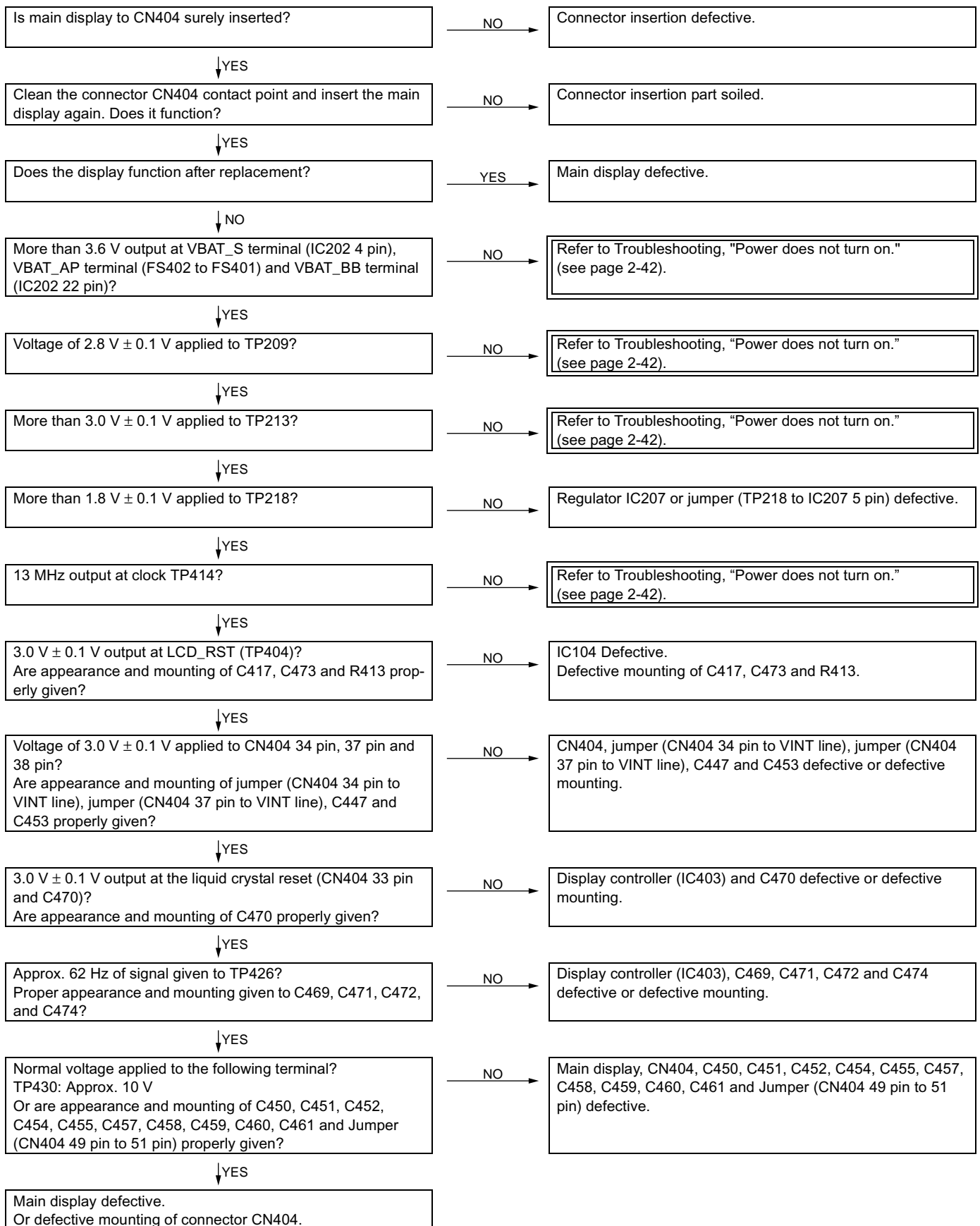
10.1. "No Service" display and receiving/transmitting do not function in the EGSM band.



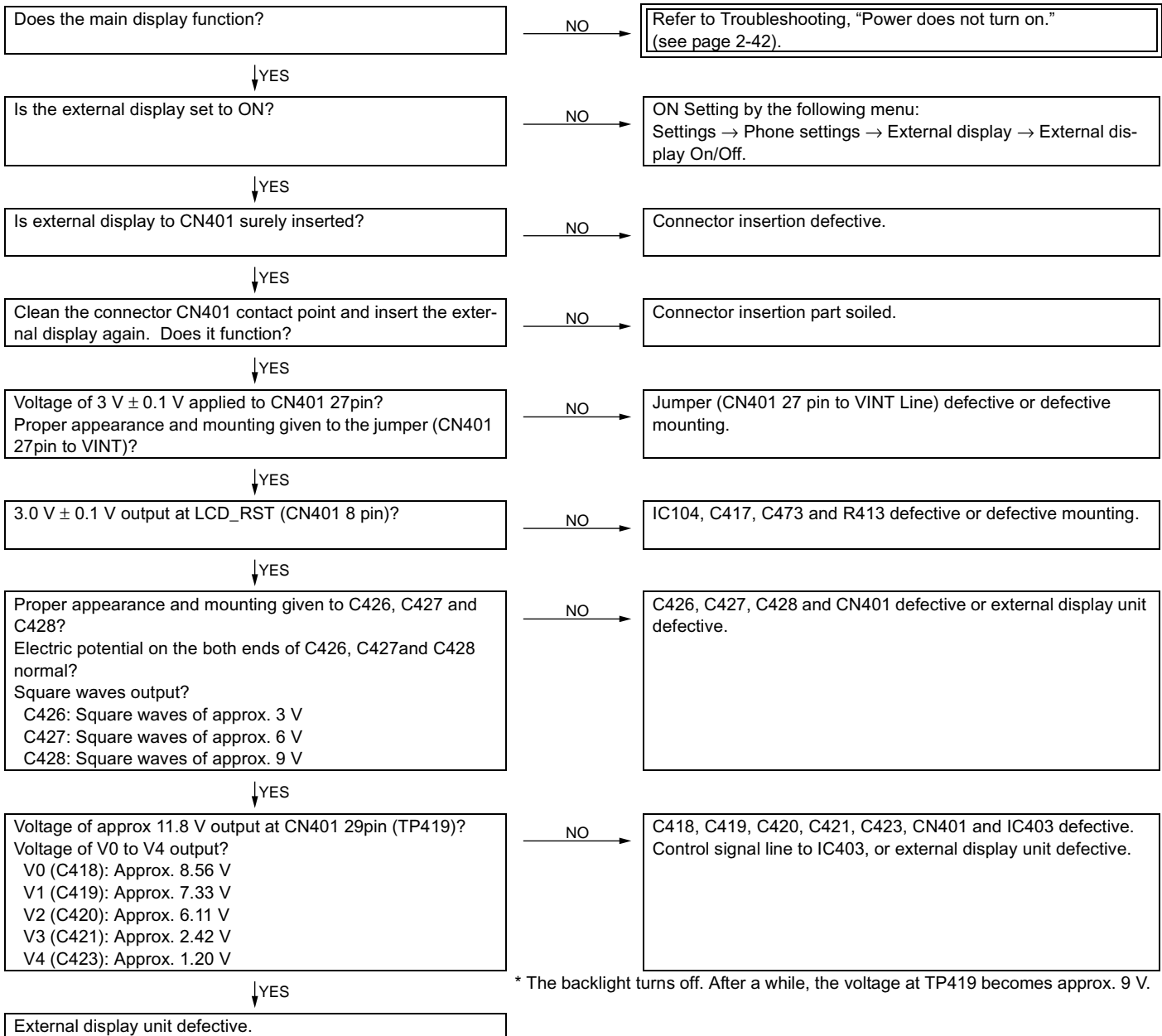
10.2. "No Service" display and receiving/transmitting do not function in the DCS/PCS band.



11. Main display does not function.

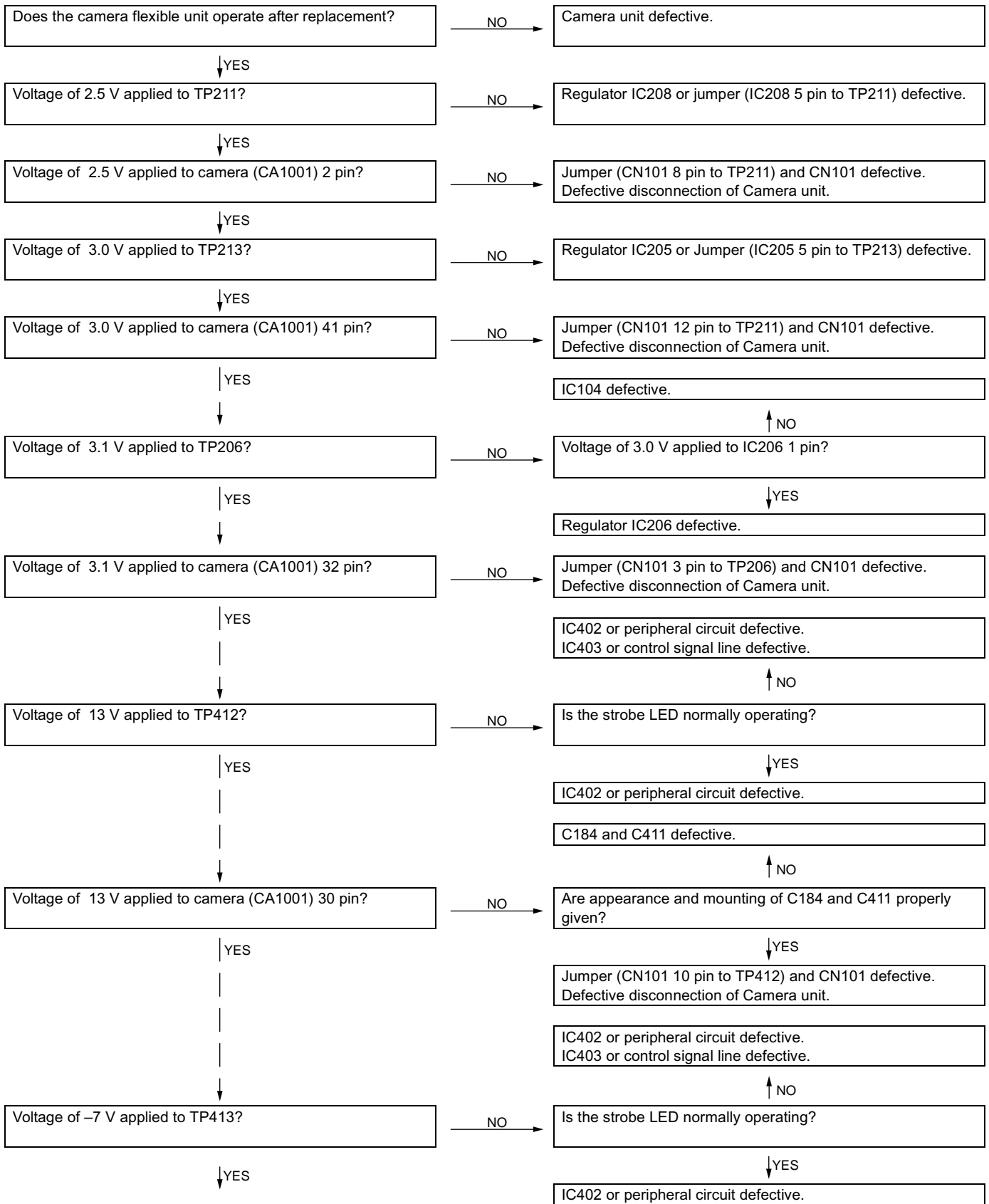


12. External display does not function.



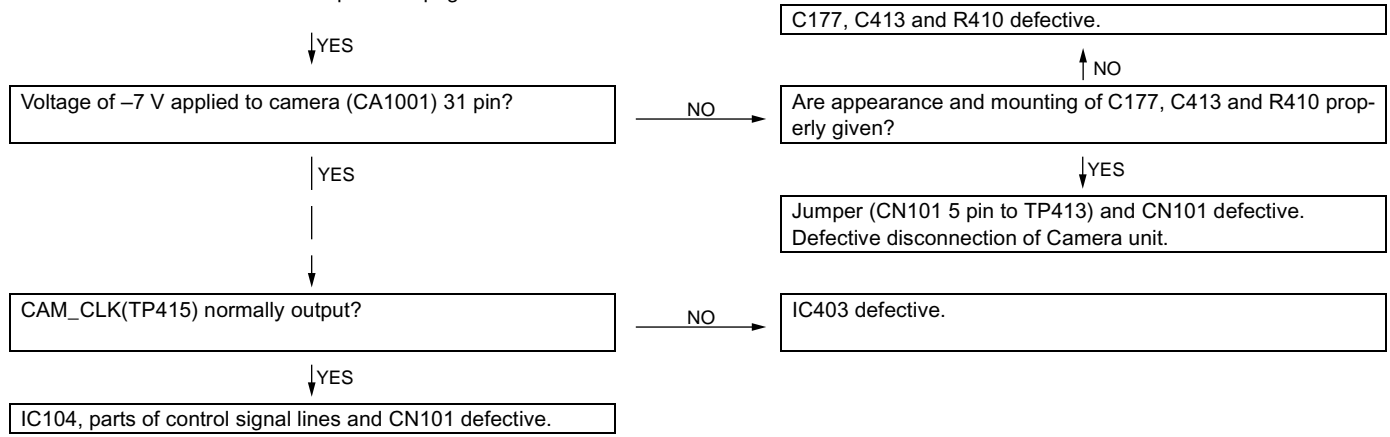
* The backlight turns off. After a while, the voltage at TP419 becomes approx. 9 V.

13. Camera does not function.

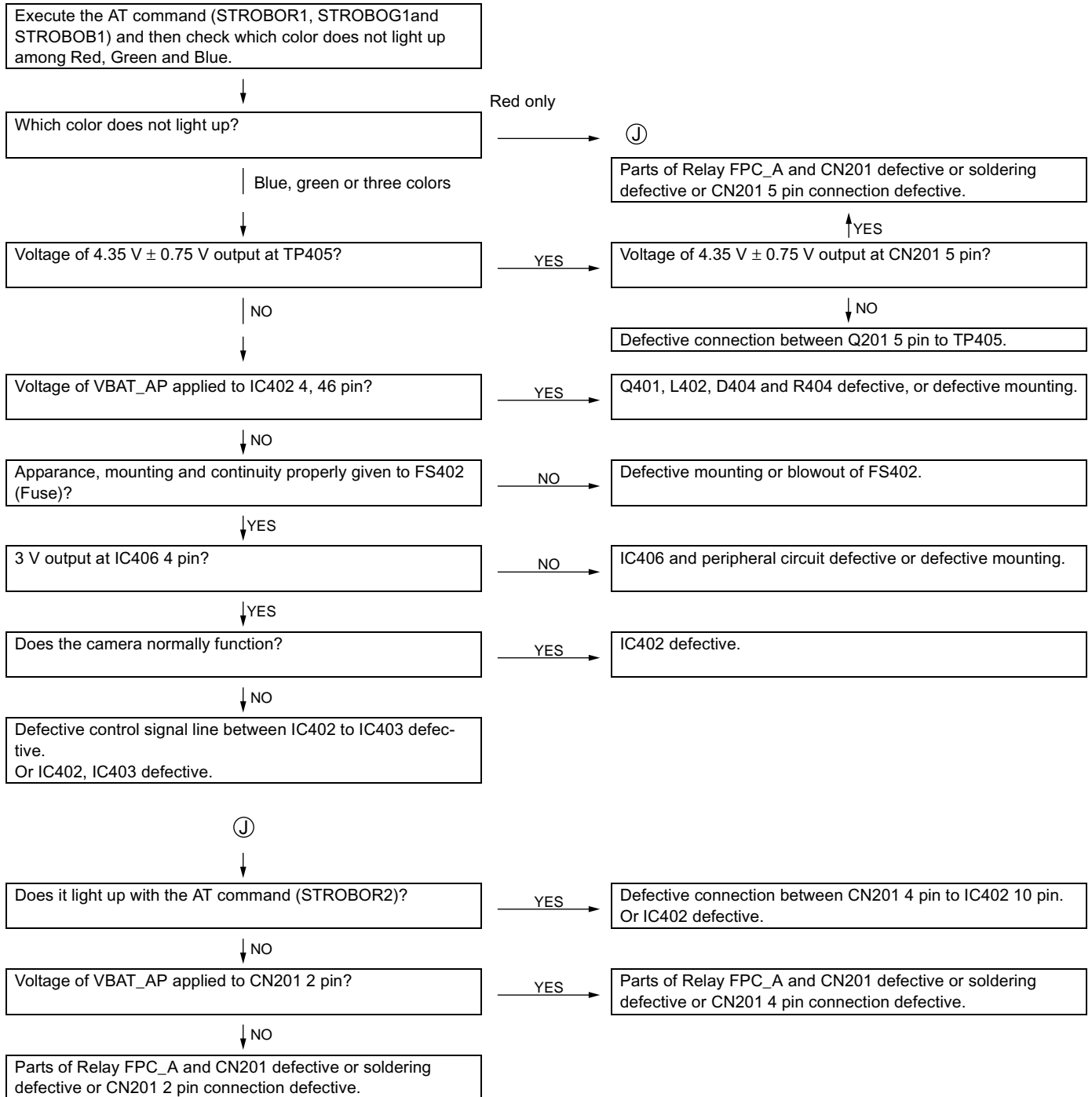


To the next page

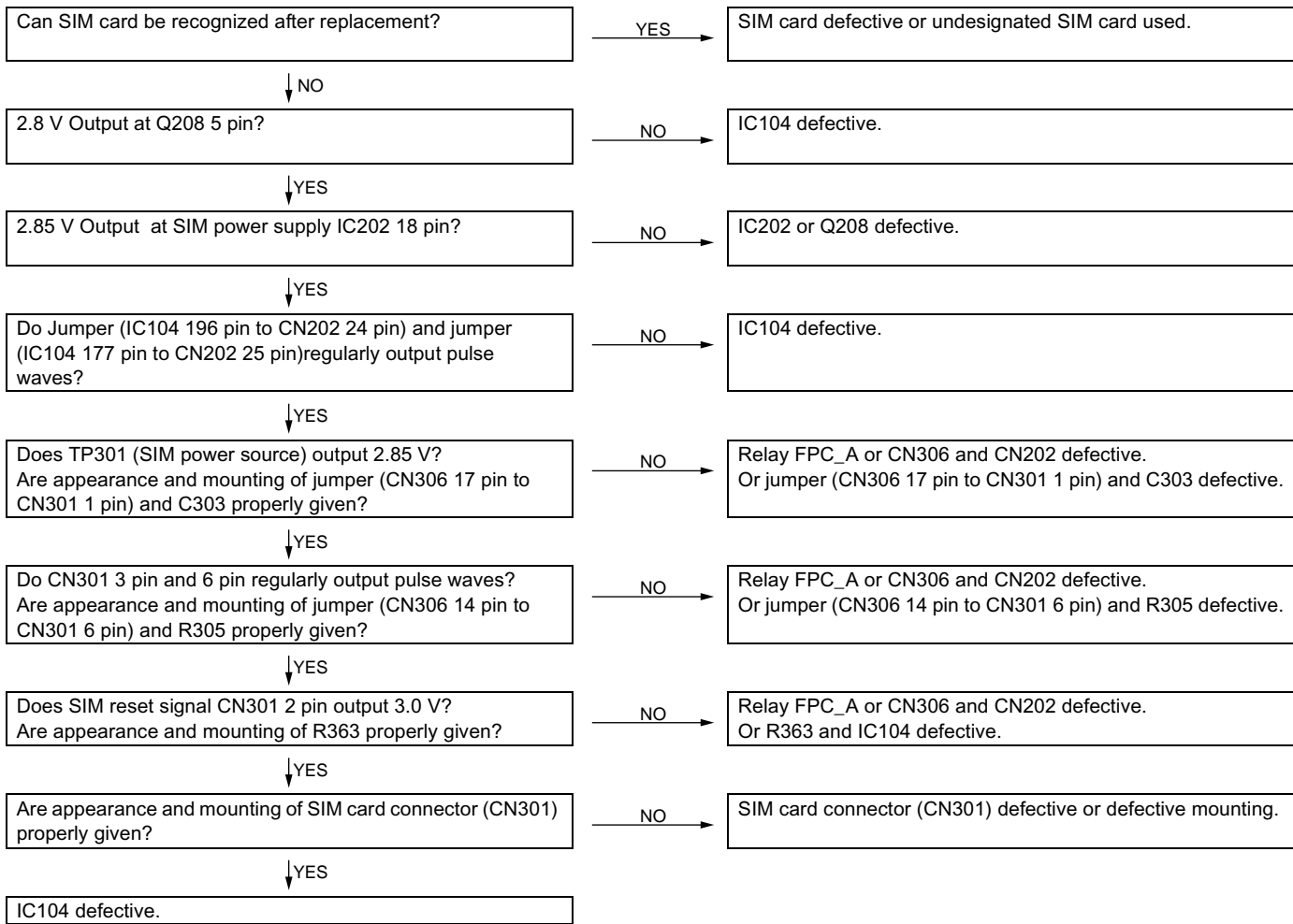
From the previous page



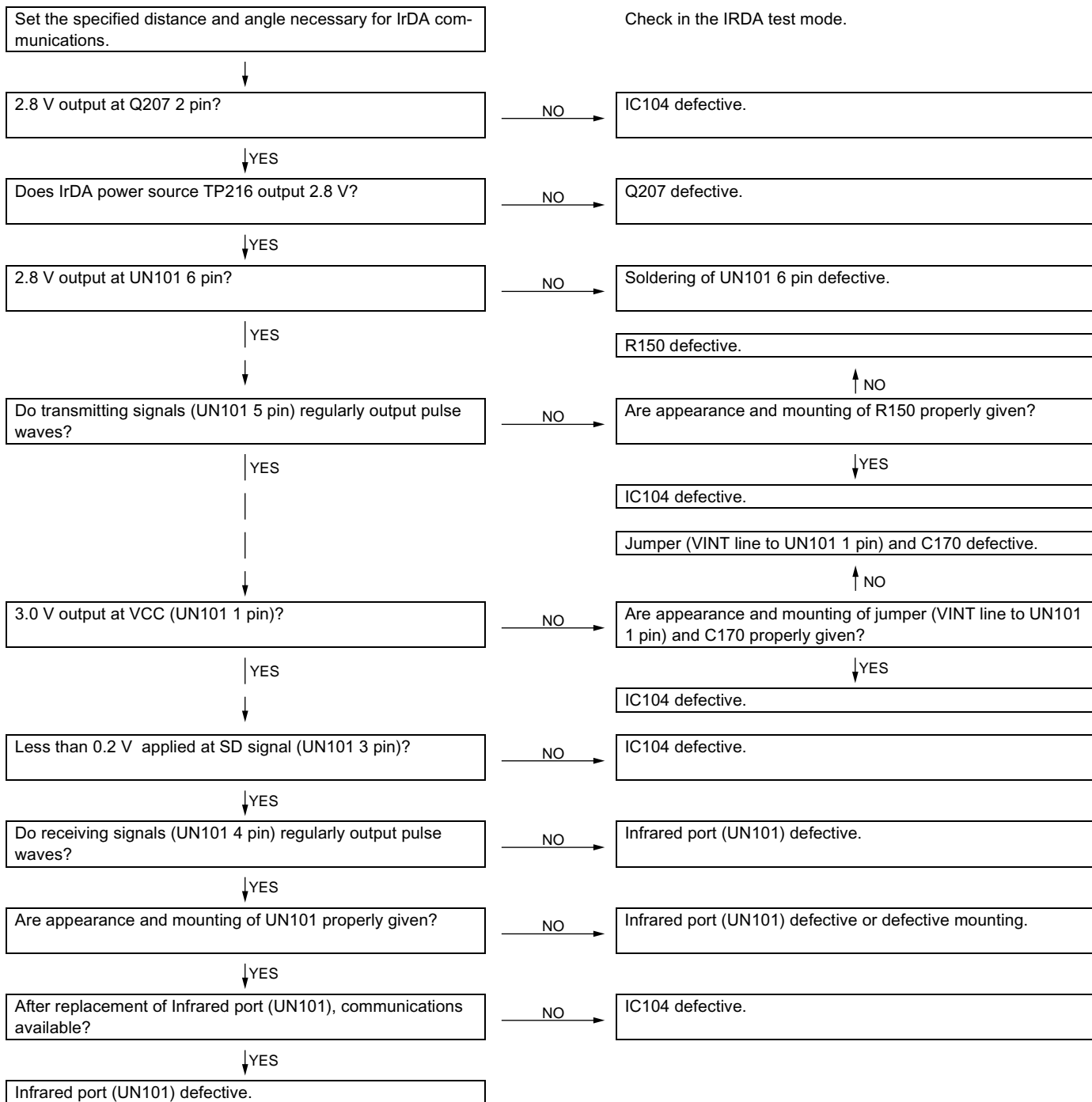
14. Strobe light does not light up.



15. SIM Card is not recognized.



16. IrDA Communications unavailable



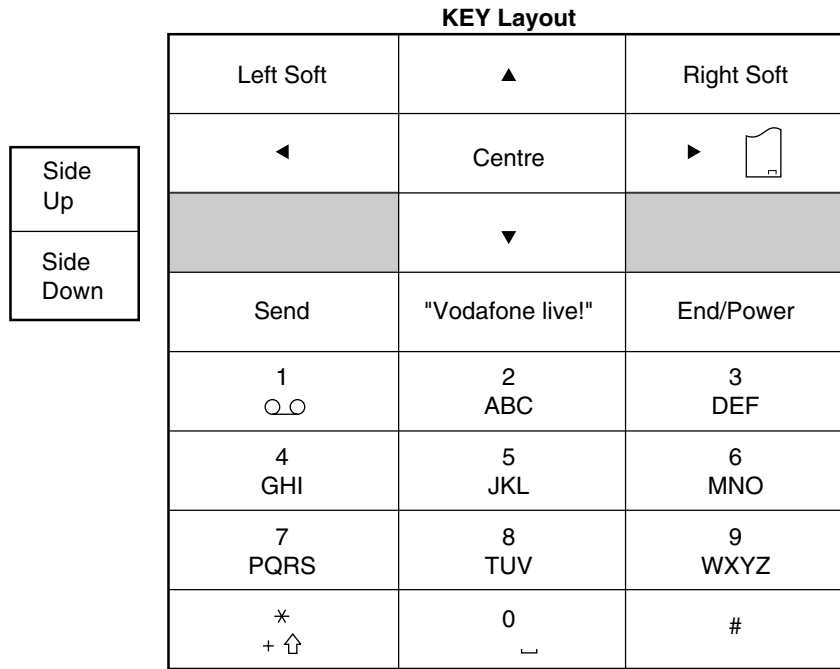
[6] Specification for function test

• **Outline**

AT commands are used for the function test mode.

To enter the general mode, send the command "AT+XDIAG".

Then the machine can accept all key test functions (see "All Key Test and Others" on page 2-76) and further commands from the computer.



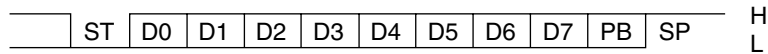
• **Logic of signals**

1)Setting function (AT Command: AT+XDIAG)

Asynchronous (Consisting of 115200bps, data length 8, start 1, stop 1, and Parity None).

2)After shifting to Function Test

Incoming/Outgoing serial signals should be as follows.



- ST: Start bit
- D0-D7:Data bit
- PB: Parity bit
- SP: Stop bit

After AT+XDIAG

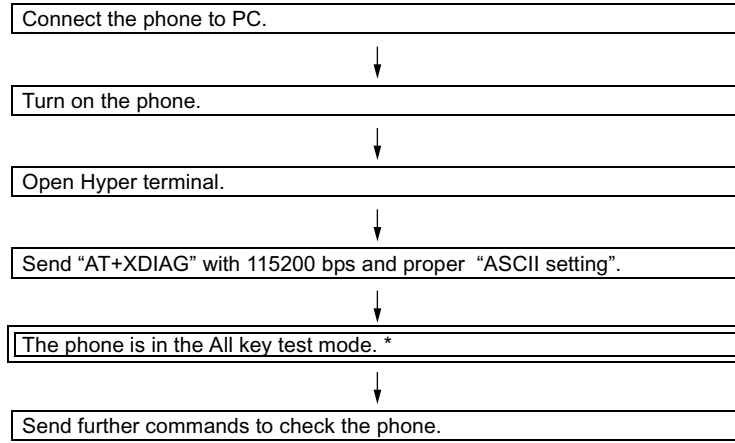
1. Synchro systemAsynchronous (Consisting of data length 8, start 1, stop 1, and Parity None)

• **Signal protocol**

1. The personal computer requests a response from a mobile machine to establish communications.
2. When keys are pressed, appropriate key codes are transmitted serially.
3. ASCII Characters (only capitals in the case of alphabet) are used for incoming/outgoing serial signals. At the end, return codes (0Dh, 0Ah) are added.
4. Once making a request, the personal computer cannot make another request until the mobile machine returns a certain response. Time-out does not occur.

• **Basic procedure (when using Hyper terminal)**

Flow chart



* : Keys are disabled if you enter the All Key test mode by AT command. To avoid this, perform steps on page 2-76.

(Details)

1. Connect the phone to the computer via a data cable.
2. Turn on the phone.
3. Open Hyper terminal. (Start → Program → Accessory → Communication → Hyper terminal)
4. Enter the name and choose the desired icon. Then click “OK”.

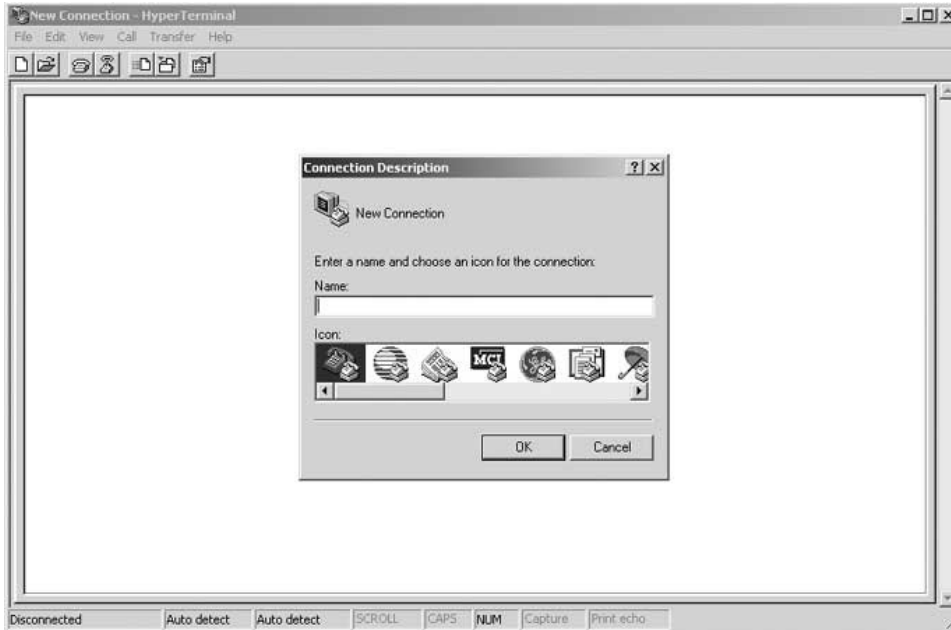


Figure 75

5. Choose the appropriate COM port for network and click “OK”.

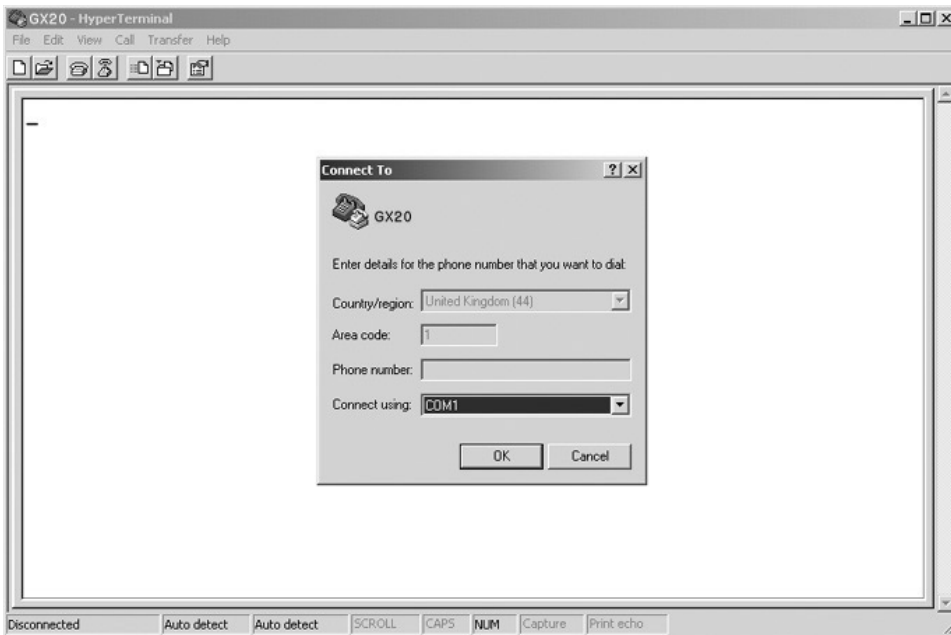


Figure 76

6. Adjust the port settings and click “OK”.

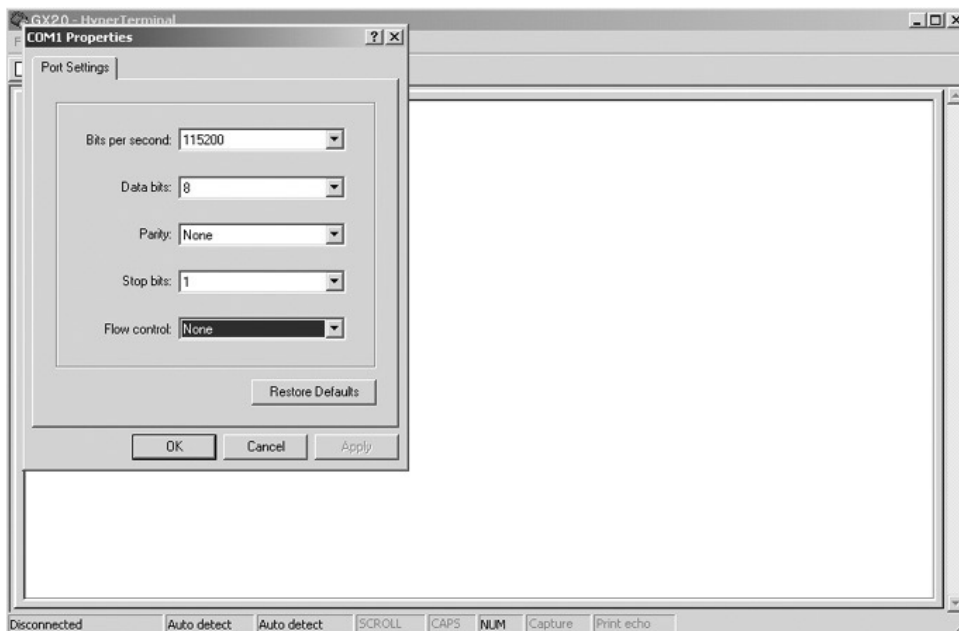


Figure 77

7. From the file menu, select “Properties” and click the Settings tab.

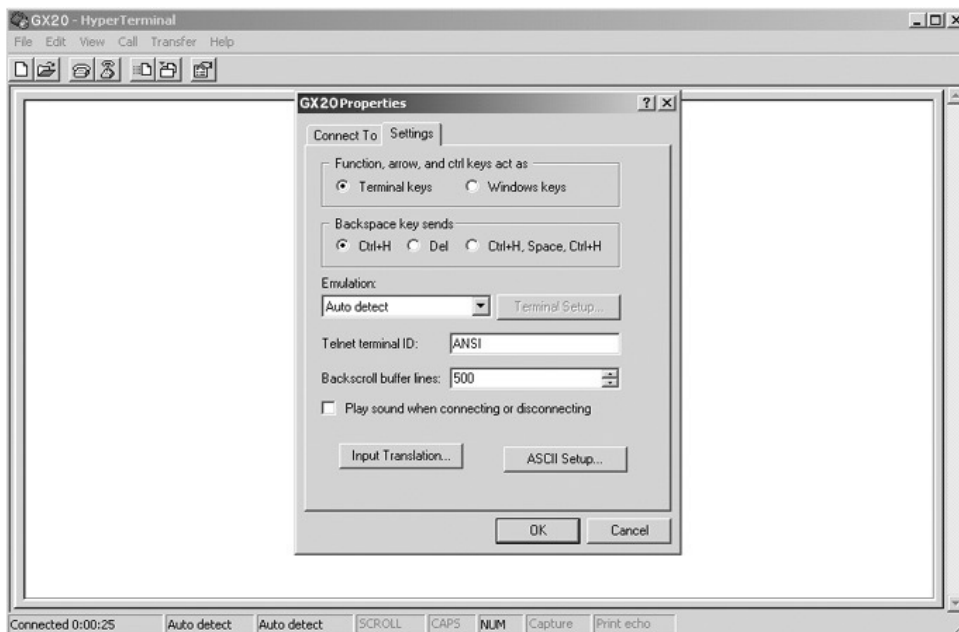


Figure 78

8. Click "ASCII setting" and check "Send line ends with line feeds" and "Echo typed characters locally".

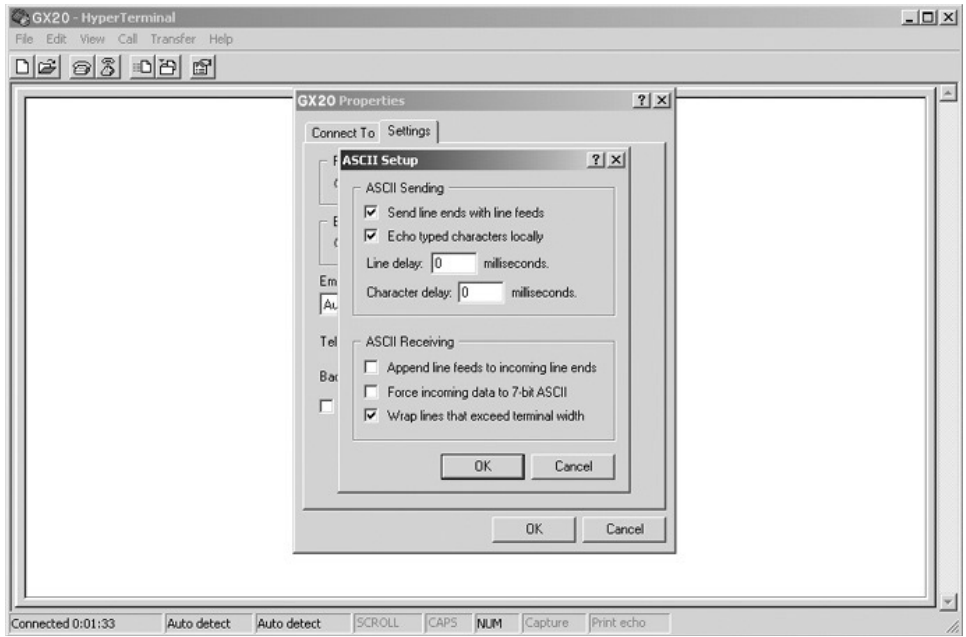


Figure 79

9. Click "OK" for "ASCII setting" and "Properties" to exit.

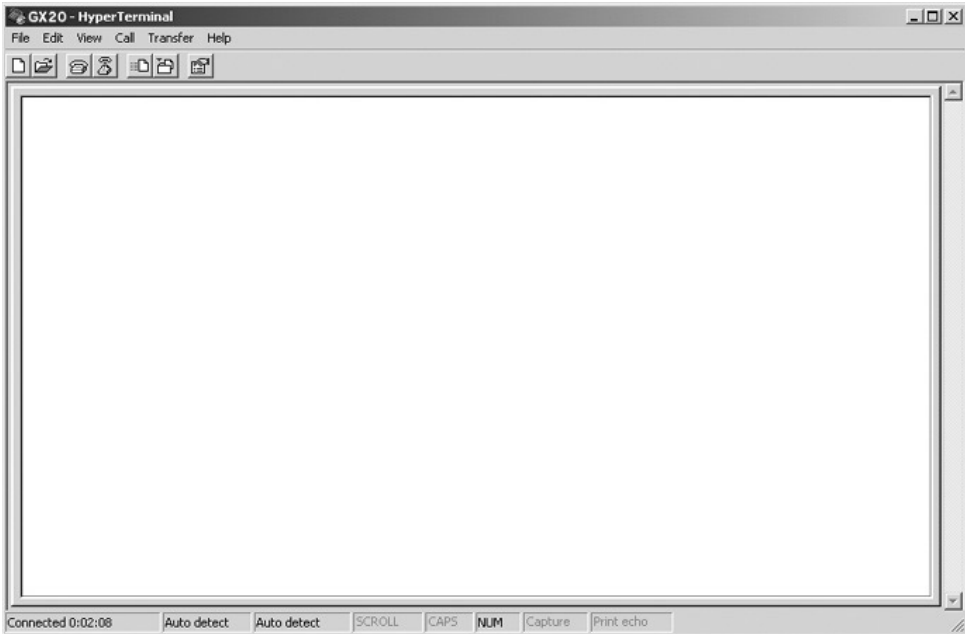


Figure 80

10. Send "AT+XDIAG"

- You will see AATT++XXDDIIAAGG instead of AT+XDIAG as shown below by the Local echo mode, although you input AT+XDIAG.
- After sending you will receive "OK", and the machine should enter the All key test mode (see "All Key Test and Others" on page 2-76).

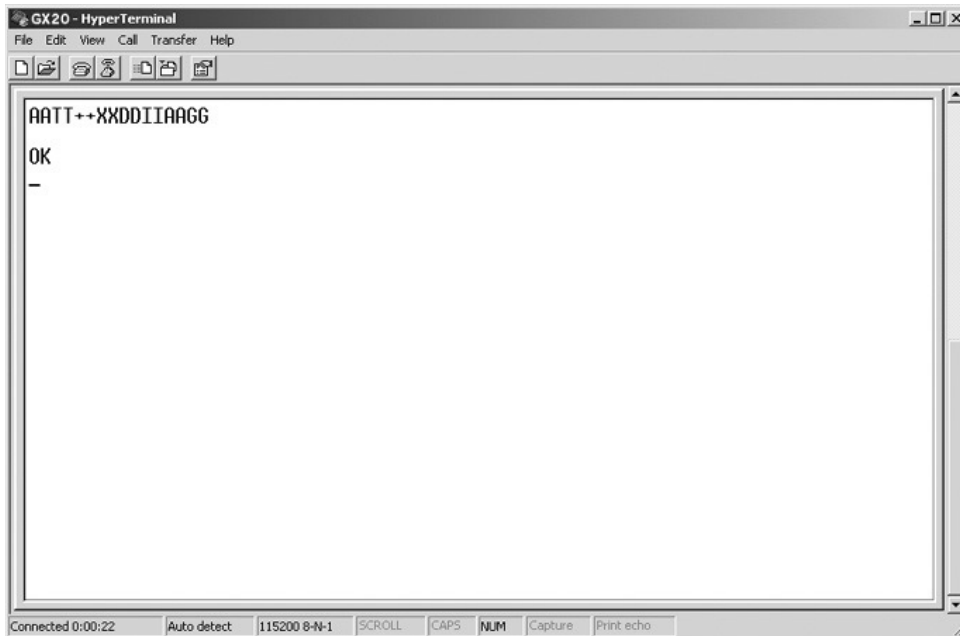


Figure 81

11. You can now send commands. (See example below for the "BATVAL" command.)

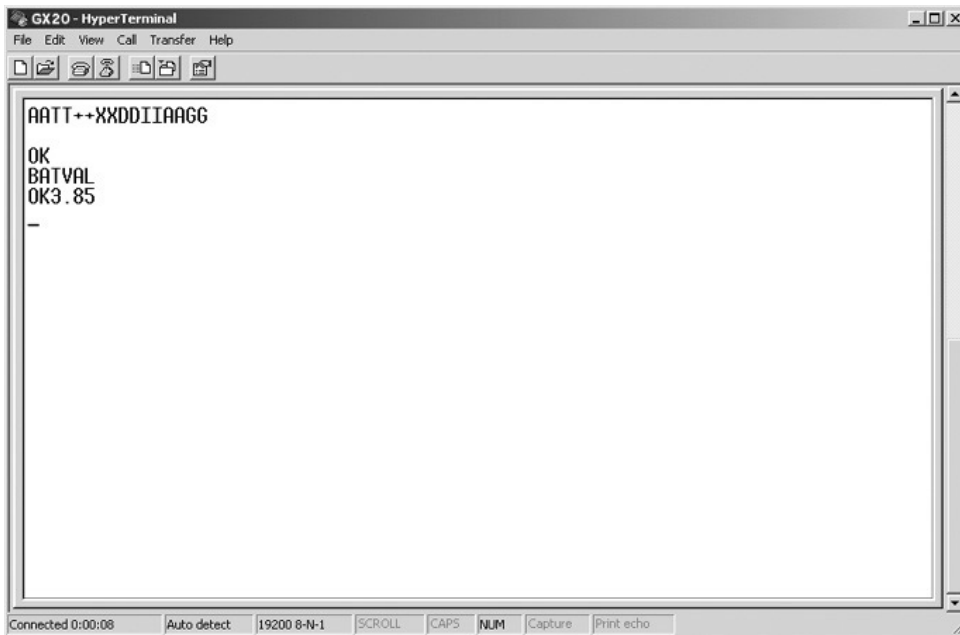


Figure 82

1. Basic Operation Test

<Startup and initial condition>

Fit a battery or a dummy battery in the set. Hold down the "End/Power" key to start up in the general mode.
Then enter AT+XDIAG without pressing any key. → Start up in the general function test mode. (3 sec. until startup)

- Back light lights up in the standby mode.
- After startup, "Function Mode * GX20 *" is displayed.

Serial Signal Format for Basic Operation Test

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Main display Back light	LED	0 1 2	OFF Main display back light (Brightness 4) ON Main display standby ON	OFF Main display back light (Brightness 4) ON. Main display standby ON.	Checking for the main display back light *1 LED0: Display back light OFF LED1: ON (Brightness 4) LED2: Standby ON
Red LED	STROBOR	0 1 2	STROBORn	Red OFF Red strobe light ON (IC402 control). Red strobe light ON (IC104 control).	Checking for the red strobe light *1 STROBOR0: OFF STROBOR1: Strobe light ON STROBOR2: Charge LED ON
Green LED	STROBOG	0 1 2	STROBOGn	Green OFF Green strobe light ON (IC402 control). Green strobe light ON (IC 103 control).	Checking for the green strobe light *1 STROBOG0: OFF STROBOG1: Strobe light ON STROBOG2: Incoming LED ON
Blue LED	STROBOB	0 1	STROBOBn	Blue OFF Blue strobe light ON (IC402 control).	Checking for the blue strobe light *1 STROBOB0: OFF STROBOB1: Strobe light ON
External display back light	BKLED	0 1	BKLEDn	External display back light OFF. External display back light ON.	Checking for the external display back light *1 BKLED0: OFF BKLED1: LED ON
Key back light LED	KLED	0 1	KLEDn	OFF ON	Checking for the key back light *1 KLED0: OFF KLED1: LED ON
Measuring RTC clock	OUT32K	1 0	OUT32Kn	32 kHz Output (MON Output) 32 kHz Stop (Returned to ALT1)	Checking frequency of the real time clock. Normal: When OUT32K1 is transmitted, TP109 frequency is 32.768 kHz \pm 1.11 kHz.
Battery voltage check	BATVAL	None	Okn.nn	Reading down to the last two digits of voltage.	Reading the voltage of the battery power line. BATVAL is transmitted, "OK" and the voltage value are returned.
RTC Test (Writing)	RTCWR	yymm ddhh mmss	OK	Writing time of day "yymmddhhmmss" to RTC.	Writing time to the clock. When RTCWR yymmddhhmmss is transmitted, yy (year), mm (month), mm (hour), and ss (minute) are written. (Writing yy=03 for 2003)
RTC Test (Reading)	RTC RD	None	RTC yymmddhhmmss	Reading time of day "yymmddhhmmss" from RTC.	Reading time of the clock. When RTCRD is transmitted, time of day is read out.
Temperature A/D Adjustment	TMPAD	4 3 2 1	ADSETOK TMPADH <Readout AD value> TMPADL <Readout AD value> TMPADRDY	Adjustment mode ended. *2 2.2 V Measurement started. 0.4 V Measurement started. Adjustment mode started.	Refer to the "Adjustment procedures after replacement of parts" on pages 2 – 36 to 2 – 38.
Temperature check	TMP	n	TMPnxx: Temperature NG: Except 0 – 50 °C	Temperature readout. (0 °C min.) n=1: Camera n=2: Battery	Reading temperature measured by the temperature sensor. When TMP is transmitted, TM and temperature are returned. In case of other than 0 – 50 °C, "NG" is returned.

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Temperature correction	TMPADJ	4nn 3nn 2nn 1nn	TMPADJ4nn TMPADJ3nn TMPADJ2nn TMPADJ1nn	Battery side -nn °C. (Not cumulative subtraction) Battery side +nn °C. (Not cumulative addition) Camera side -nn °C. (Not cumulative subtraction) Camera side +nn °C. (Not cumulative addition) "nn": To input difference from the present temperature. Cumulative addition is unavailable for more than one transmission.	Correcting difference between the ambient temperature and the temperature read by the sensor. Comparing the ambient temperature and the temperature read by the sensor to transmit the corrected value. TMPADJ15: To raise temperature by 5 °C. TMPADJ25: To reduce temperature by 5 °C. * When the same commands are transmitted several times, corrected values are not added.
IrDA Test	IRDA	1 2 3 4 5 6	OK NG aa NG NODATA	1: 2.4 kbps 2: 9.6 kbps 3: 19.2 kbps 4: 38.4 kbps 5: 57.6 kbps 6: 115.2 kbps "OK" if "5A" is detected. If values other than "5A" are detected, they are returned. Data cannot be received.	Provide the set in the IrDA jig mode to the other end of the line to perform the transmitting/receiving test. When IRDA is transmitted, the set in the IrDA jig mode receives signals and returns "5A". Detecting "5A", the tested set returns "OK" to the personal computer. When values are other than "5A", "NG aa" is returned. If data cannot be received, NG NODATA is returned. *3
IrDA Jig Mode	IRDACH	1 2 3 4 5 6	OK	1: 2.4 kbps 2: 9.6 kbps 3: 19.2 kbps 4: 38.4 kbps 5: 57.6 kbps 6: 115.2 kbps IrDA Jig mode entered. After that commands are rejected.	When IRDACH5 is transmitted, using the command to set the IrDA jig mode, the jig mode starts. Reset, or disconnect the power from the set, to release the jig mode. *3
Vibrator Test	VIB	1 0	VIBn	Asynchronous drive. (Always ON) Stop.	Checking vibrator operation. When VIB1 is transmitted, the vibrator operates continuously; when VIB2 is transmitted, it stops operation.
Melody Test	MELO	2 1 0	MELOn	1 kHz playback from Jack. 1 kHz playback from SP. Stop.	Checking melody playback. *4
Memory test (SRAM)	MEMCHK1	00000 00000 07FF FE5	MEMCHK1 OK MEMCHK1 NG 0000 0000dddd	Addresses (00000000 to 0007FFFE) are checked. For NG, the address "00000000" and the readout data "dddd" are returned. (dddd: Production Process No)	Checking read/write of 4Mbit SRAM.
Memory test (PSRAM)	MEMCHK2	00370 00000 3703 FE5	MEMCHK2 OK MEMCHK2 NG 0037 0000dddd	Addresses (00370000 to 003703FE) are checked. For NG, the address "00370000" and the readout data "dddd" are returned. (dddd: Production Process No)	Checking read/write of 16 Mbit. Smartcombo RAM.
POWER OFF	PWRDOWN	None	OK	POWER OFF	POWER OFF when PWRDOWN is transmitted.

[Note]

In the test mode clock setting is reset; after finishing the test, if necessary, reset the current time by selecting [Date&Time] in [Settings] in the normal mode.

- * 1: The LED test is also available in the manual test mode F45.

<Startup>

1. Fit a battery in the set to start the manual test mode.
2. Press the keys "4" → "5" → "Right Soft" to start the manual test mode F45 (LED Setting).
3. Press the following keys for ON/OFF operation.

Key	Description	Contents
"0"	OFF	All LEDs OFF
"1"	Charge LED ON/OFF	Charge LED (Also used as the strobe light: RED)
"2"	Incoming call LED ON/OFF	MA2 LED (Also used as the strobe light: GREEN)
"3"	Key LED ON/OFF	Key LED (LED301 to LED316: GREEN)
"4"	Main display back light ON/OFF	Main display back light (Back light FPC: WHITE) *a
"5"	External display back light ON/OFF	External display back light (LED401, 402: WHITE)
"6"	Changing the strobe light color	Changing the strobe LED color (7 colors) *b
"7"	Changing full output time of strobe light	Changing full output time of strobe LED *c
" * "	Strobe light ON with full output	Lighting the strobe LED with full output for the setting time as specified in "7" above.
"##"	Changing flash mode	Changing brightness according to flash modes *d
"Centre"	End	Shifting from this mode to the initial screen

* a : Every time a key is pressed, the operation, "Stand-by → Brightness 1 → 2 → 3 → 4 → OFF", is repeated.

* b : With every pressing of the key, color changes repeatedly in the order of "Blue → Green → Light Blue → Red → Purple → Yellow → White"

* c : With every pressing of the key, setting time changes repeatedly in the order of "400ms → 800ms → 300ms".

* d : With every pressing of the key, flash mode changes repeatedly in the order of "Macro pre-flash → Normal pre-flash → Spot light → OFF".

4. Press the "Centre" key twice to return to the initial screen of the manual test mode.
5. Press the "End/Power" key to finish operation.

- * 2: Only when performing the TMPAD4 command or turning power OFF/ON, A/D adjusted values are reflected in temperature.

- * 3: The IrDA test is also available in the manual test mode F13.

<Startup in the jig mode>

Provide a set other than the tested set, which has been confirmed to operate normally. Use this set as the IrDA receiver.

1. Fit a battery in the set to start the manual test mode.
2. Press the keys, "1" → "3" → "Right Soft" to start the manual test mode F13 (IrDA Test).
3. Press the key "Left Soft" (S1: Test Device Mode).

* The infinite loop mode for the IrDA data stand-by is started. After finishing the test, remove the battery.

<Startup in the test mode>

Data are transmitted/received by using the tested set.

1. Fit a battery in the set to start the manual test mode.
2. Press the keys, "1" → "3" → "Right Soft", to start the manual test mode F13 (IrDA Test).
3. Direct the IrDA window of the tested set to that of the jig set.
4. Press the key "0" (0: Check IrDA) to transmit data automatically.
5. When "OK" is displayed, transmitting/receiving is normally completed. When "NG No Data" is displayed, transmitting/receiving is abnormally ended.
6. Press the "Centre" key twice to return to the initial screen of the manual test mode.
7. Press the "End/Power" key to finish operation.

- * 4: The melody playback test is also available in the manual test mode F51.

<Startup>

1. Fit a battery in the set to start the manual test mode.
2. Press the keys, "5" → "1" → "Right Soft", to start the manual test mode F51 (Melody Test).
3. Press the following keys to switch operations.

Key	Description	Contents
" ◀ "	Selecting melody tone.	Select the next melody by toggling. If the final melody is selected, further selection is unavailable.
" ▶ "	Selecting melody tone.	Select the preceding melody by toggling. If the default melody is selected, further selection is unavailable.
"0"	Ring tone playback. Playback/Stop.	Toggle the selected ring tone between playback and stop. Default: -16 dB 0: Stop 1: Playback
"Right Soft"	Key touch tone output.	Toggle the key touch tone between ON and OFF. 0: Stop 1: Output (DTMF: -16dB)

Key	Description	Contents
“ ▲ ”	Volume control.	Turn up the volume by 1 level. During playback of ring tone: Ring tone is changed. During key touch tone output: Incoming audio volume is changed.
“ ▼ ”	Volume control.	Turn down the volume by 1 level. During playback of ring tone: Ring tone is changed. During key touch tone output: Incoming audio volume is changed.
“Centre”	End	Shifting from this mode to the initial screen.

4. Press the key “Centre” to return to the initial screen with the display, “Diag Param Saving”.
5. Press the “End/Power” key to finish operation.

2. Camera Adjustment/Test

Serial Signal Format for Camera Adjustment/Test

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Dark current correction and white flaw check.	WHC (Including initialization)	Swwx yyzaaa bbb Recommended value: 00840 12000 0000	In the case of OK. AAAA, BBB AAAA: Number of white flaws BBB: Max. level In the case of NG. COUNT NG (More than 2000 white flaws) 000000: Insufficient light shielding	S: Mode (0 to 3) Recommended value: 0 ww: Dividing ratio (00 to 16) Recommended value: 08 x: Average number (0 to 4) Recommended value: 4 yyy: Threshold detection frequency (000 to 255) Recommended value: 012 z: G Data mode (0 to 3) *1 Recommended value: 0 aaa: Stabilized frame number immediately after startup Recommended value: 000 bbb: Frame rate to be corrected Recommended value: 000	Refer to the “Adjustment procedures after replacement of parts” on pages 2 – 36 to 2 – 38.
White flaw correction *1	WH (Including initialization)	None	OK	White flaw correction.	Refer to the “Adjustment procedures after replacement of parts” on pages 2 – 36 to 2 – 38.
Camera ON/OFF	CAM	6 5 4 3 2 1 0	CAMn	ON (QQVGA Macro pre-flash [White])*3 ON (QQVGA full output [White])*2 ON (QQVGA Normal pre-flash [White]) *3 D'ont support ON (VGA) ON (QQVGA) OFF	Checking photography. To switch to the other mode, power off and then send the command again.
Shutter ON/OFF	SHT	2 1 0	SHT n	Shutter ON (Full output [White] 400 mS) *4 Shutter ON Shutter OFF	Shutter ON/OFF operation. When SHT 1 or 2 is transmitted, the shutter turns ON; when SHT0 (to fix the screen) is transmitted, the shutter is released.
Zoom ON/OFF	ZOOM	2 1 0	ZOOM n	ZOOM ON (4 x Zoom) ZOOM ON (2 x Zoom) ZOOM OFF *ZOOM only available for CAM, CAM4, or CAM5	Changing zoom. When ZOOM 1 is transmitted, the double size image is displayed; when ZOOM 2 is transmitted, the original state is returned.

- * 1: Be sure to check white flaw (WHC command) before performing white flaw correction (WH command).
- * 2: CAM5 Full output of flash is given 0.5 sec after the camera startup and then lights out.
- * 3: CAM4,6 Pre-flash 0.5 sec after the camera startup.
- * 4: SHT2 After full output, pre-flash also lights out.

3. Display Test**Serial Signal Format for Main Display Test**

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Checking main display	LCDDISP	3 2 1 0	LCDDISPn	VCOM adjustment pattern. Color gradation. Black display. White display.	Checking for the main display. LCDDISP3: VCOM adjustment pattern. LCDDISP2: Color gradation display. LCDDISP1: All black display. LCDDISP0: All white display.
Gradation display	SGRA	1 0	OK	VCOM adjustment pattern displayed on the main display. White display.	8-gradation pattern displayed. Send the signal for flicker adjustment.

* For VCOM adjustment (flicker adjustment), refer to "the Adjustment Procedures for Replacement of Parts".

Serial Signal Format for External Display Test

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Checking the rear liquid crystal display	SUBLCD	1 0	OK	RGB display: Vertical tripartition (RGB from the left). RGB display: Horizontal tripartition (RGB from the top). * 256-color mode display.	Checking RGB display available.

* For contrast adjustment of the external display, refer to "the Adjustment procedures after replacement of parts" on pages 2-36 to 2-38.

4. Audio Test

Serial Signal Format for Audio Test

Item	Incoming Serial Signal		Outgoing Serial Signal	Contents	Test Method
	Command	n	Response		
Audio system power source and codec loop-back test.	PCMLP	4xx 3xx 2xx 1xx 0	PCMLPnxx (xx: Volume level)	Mic to JackEar path check. JackMic to Earpiece check. Jack to Jack path check. Mic to Earpiece path check. Path release (Finished)	Loop-back test for codec IC. Ex.: xx=20 (when the volume level is 5) PCMLP120: Checking that signals from the main unit microphone (TP324) are transmitted to the main unit earpiece (between TP167 and TP168). (In case that the volume level is 20) (Other cases.) PCMLP220: Inputting the signal from headset microphone (TP106) to check that it is output at the headset earpiece (TP107). PCMLP320: Between the hands free microphone and the main unit earpiece. PCMLP420: Between the main unit microphone and the hands free earpiece. PCMLP000: Exiting from the loop-back.
H/S Detection	EAR	None	EARON•EAROFF	Detection of hands free insertion.	Detecting that the hands free is connected to the hands free connector. When "EAR" is transmitted: "EARON" is returned if the hands free is connected, and "EAROFF" returned if not connected.

Gain Table during "Mic to Earpiece" and "JackMic to Earpiece" Path Check.

xx	Table Value of Audio Volume	DAC Output Gain (dB)	Equivalent to Volume Position for User Setting
00	0x1F	Mute	Mute
03	0x12	-18.0 dB	VOLUME 1
07	0x10	-15.0 dB	VOLUME 2
11	0x0D	-10.5 dB	VOLUME 3
15	0x08	-3.0 dB	VOLUME 4
20	0x03	+4.5 dB	VOLUME 5

Gain Table during "Jack to Jack" and "Mic to JackEar" Path Check.

xx	Table Value of Audio Volume	DAC Output Gain (dB)	Equivalent to Volume Position for User Setting
00	0x1F	Mute	Mute
03	0x0F	-13.5 dB	VOLUME 1
07	0x0C	-9.0 dB	VOLUME 2
11	0x09	-4.5 dB	VOLUME 3
15	0x06	0 dB	VOLUME 4
20	0x03	+4.5 dB	VOLUME 5

5. All Key Test and Others

<Startup and initial condition>

- 1) Fit a battery or a dummy battery in the set. Hold down the “End/Power” key to start up in the general mode.
- 2) Connect the Data cable and send the [AT+XDIAG] command to receive the response [DIAGREADY].
- 3) Send the [PWRFON] command to receive the response [OK].
- 4) Send the [PWRDOWN] command to power off.
- 5) Hold down the “End/Power” key to display “*****”.
- 6) Press the “3” key to display “H/W CHECK *GX20*” and then to access the test mode.
 - After the test mode is started, the Data cable can be removed.
 - The back light is on for standby.

<Ending the test>

The [PWRFON] command is executed to enter the special mode; in the case of restart, the test mode is started with the display “*****”. Startup is unavailable in the normal mode. After ending the test, follow the procedures below.

- 1) Press the “End/Power” key with the all key test initial screen displayed to power off.
- 2) Connect the Data cable and hold down the “End/Power” key to display “*****”.
- 3) Press the “2” key to display “Function Mode *GX20*”.
- 4) Send the [PWRFOFF] command to receive the response [OK].
- 5) Send the [PWRDOWN] command to power off.
- 6) Hold down the “End/Power” key and check for the startup in the normal mode.
- 7) Hold down the “End/Power” key to power off.

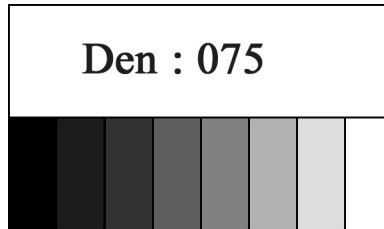
Key	Contents
“Send”	Vibrator operation. “VIBRATOR” Displayed. Stop the vibrator with the key “0” to return to the all key test mode initial screen.
“▶”	Playback melody at max. volume (MERODY1 in the normal condition). “MELODY” displayed. Press the key “×” to set the volume to the minimum, and the key “#”, to the maximum, respectively. Stop melody with the key “0” to return to the all key test mode initial screen.
“◀”	Playback the ringer at max. volume (Ringer1 in the normal condition). “RINGER” displayed. Press the key “×” to set the volume to the minimum, and the key “#”, to the maximum, respectively. Stop melody with the key “0” to return to the all key test mode initial screen.
“Centre”	Full-rate codec loop-back. “CODEC INT” displayed. Stop loop-back with the key “0” to return to the all key test mode initial screen.
“0”	Return to the all key test initial screen.
“1”	Display check mode. Display is as shown below. (The main display back light MAX; the external display back light Off; the key back light On; the mobile light Off.) <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <pre style="font-family: monospace; font-size: 0.9em;"> LCD CHECK * GX-20 * ROM VERSION : *** GX20 Diag Version *** CVS Ver. A** *** ****_GX20 BLCD (256) : 089+004 BLCD (64K) : 075 </pre> </div>
	“1”: All White → All Red → All Green → All Blue → All Black → Color gradation → (Returning to white.)
	“2”: First pressing of the key for white pre-flash of the strobe light. 400 ms full output given after the second pressing (Back to pre-flash).
	“3”: Press this key for white pre-flash of the mobile light. The same state is remained until the “0” key is pressed. Press the key furthermore to change flash colors in the order of “White → Red → Green → Blue → Light blue → Purple → Yellow → (Back to white).
	“0”: Press this key to turn off the mobile light and the key back light and then to access the all key test initial screen.
	“8”: Press this key to turn on the external display back light with “H/W CHECK Den: 075” displayed. Every pressing of the “Side-Up” changes the screen in the order of “All white → All red → All green → All blue → All black → Color gradation → VCOM adjustment pattern → (Back to all white)”. Press the “Side-Down” to reverse the order.
“2”	IrDA Check (115 kbps). Press the key “0” to return to the initial screen. Time out: 1 sec.
“3”	Display changed to CHG CHECK. Press the key “0” to return to the initial screen. AC Charger is inserted to turn on the red LED.
“4”	Press this key to change the main display to the flickering check pattern. Press the “0” key to return to the all key test initial screen.

Key	Contents								
"8"	<p>External display contrast check. Press the key "0" to return to the initial screen. To thickness is reflected in the general mode. *</p> <table border="1" data-bbox="310 170 1481 338"> <tr> <td data-bbox="310 170 407 226">" ▲ "</td> <td data-bbox="407 170 1481 226">To increase the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)</td> </tr> <tr> <td data-bbox="310 226 407 283">" ▼ "</td> <td data-bbox="407 226 1481 283">To decrease the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)</td> </tr> <tr> <td data-bbox="310 283 407 310">"0"</td> <td data-bbox="407 283 1481 310">To return to the all key test initial screen.</td> </tr> <tr> <td data-bbox="310 310 407 338">"Centre"</td> <td data-bbox="407 310 1481 338">To write in the contrast SRAM. ("SaveOK" displayed on the external display.)</td> </tr> </table>	" ▲ "	To increase the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)	" ▼ "	To decrease the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)	"0"	To return to the all key test initial screen.	"Centre"	To write in the contrast SRAM. ("SaveOK" displayed on the external display.)
" ▲ "	To increase the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)								
" ▼ "	To decrease the contrast by one level. (Write operation not performed) (Other set value is changed to obtain the equation, "256-color setting= 65 k-color setting +14".)								
"0"	To return to the all key test initial screen.								
"Centre"	To write in the contrast SRAM. ("SaveOK" displayed on the external display.)								
"6"	<p>Camera turns ON to display camera image. (Optical axis at the left end) Press the key "Left Soft" to repeat the operation of "2 x ZOOM → 4 x ZOOM → Standard". Press the key "Centre" to repeat the operation of the shutter ON/OFF. Press the key "0" to return to the all key test initial screen.</p>								
"9"	<p>Red LED ON. Display is shown below. Back light remains ON. Key back light ON. RTC contents are displayed at the time the key "9" is pressed. Clock does not tick.</p> <div data-bbox="743 552 1060 835" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <pre> KEY CHECK * GX-20 * ROM VERSION : *** GX20 Diag Version *** CVS Ver. A**_***_****_GX20 BLCD (256) : 089+004 BLCD (64K) : 075 2003/**/** **.*. ** </pre> </div> <p>Press all keys except the key "0" in random order. The first pressing of the key brings white display and red LED OFF. Every pressing makes a bleep. Opening/closing flip also makes a bleep. With flip closed, green LED ON.</p> <p>Press the key " ► " to sound melody. (When pressing the next key, melody stops.)</p> <p>Press the key " ◀ " so sound ringer at max volume. (When pressing the next key, ringer stops.)</p> <p>Press the key "0" before pressing all keys to return to the all key test initial screen.</p> <p>When pressing all keys except the key "0", ringer sounds at max. volume. Green LED for incoming call blinks and the screen display becomes black.</p> <p>When closing the flip, the ringer stops sounding. (Thereafter the ringer does not sound.) After that open/close the flip to make a bleep. Close it to turn on green LED.</p> <p>Press the key "0" to stop ringer, to turn off green LED for incoming call, and to return to the all key test initial screen.</p>								
"#"	<p>Sum check.</p> <div data-bbox="743 1220 1060 1507" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <pre> SUM CHECK * GX-20 * ROM VERSION : *** GX20 Diag Version *** CVS Ver. A**_***_****_GX20 BLCD (256) : 089+004 BLCD (64K) : 075 SUM : **** </pre> </div> <p>Press the key "0" to return to the all key test initial screen.</p>								

Key	Contents
" ✕ "	<p>Shifting to the mode for temperature correction.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>TEMP ADJ</p> <p>1. CAM TEMP</p> <p>2. BAT TEMP</p> <p>0. EXIT</p> </div> <p>"1" (Selecting the camera side) or "2" (Selecting the battery side) "0" Exit</p> <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p>TEMP ADJ (BAT)</p> <p>Temp. : +23 Deg..</p> <p>Correct : -05 Deg.</p> <p>"▲" KEY : +1 Deg..</p> <p>"▼" KEY : -1 Deg..</p> </div> <p>" ▲ ": +1 °C Correction in the correction mode.</p> <p>" ▼ ": -1 °C Correction in the correction mode.</p> <p>"#": Determination of corrected value.</p> <p>TEMP is not updated automatically.</p> <p>Press the key "0" to return to the all key test initial screen.</p>

Note) Display: No temperature correction during the all key test; Display in the user contrast setting default condition.

* : Display in the external display contrast adjustment mode



6. Initializing Flash User Domain (Manual Test Mode F99)

Only use the troubleshooting procedure, "Power does not turn on" (page 2 - 42).

Take care that the user setting data will be lost in this operation.

Before starting this mode, be sure to backup the user data, referring to "SOFTWARE DOWNLOAD."

<Startup>

1. Fit a battery in the set to start the manual test mode.
2. Press the keys, "9" → "9" → "Right Soft", to start the manual test mode F99 (User Function).
3. When "Select Init Area: " is displayed on the screen, enter "1" and press the key "Right Soft".
4. "EE_FORMAT START" is displayed on the screen.
5. When initialization ended, [FINISHED PLEASE ANY KEY] is displayed on the lower part of the screen.
6. Press any key to return to the F99 initial screen.
7. Press the "Centre" key.
8. Press the "End/Power" key to finish operation.

After initialization, start up in the general mode.

CHAPTER 3. DISASSEMBLY AND REASSEMBLY

[1] Servicing Concerns

1. General

1. Before servicing, you must warn the user that the repair may clear the information stored in the memory.
2. Before storing or transporting the circuit board, put it into the conductive bag or wrap it in aluminium foil.
(C-MOS IC may be damaged by electrostatic charges.)
3. In order not to stain cosmetic parts such as a cabinet, especially clear window parts for main and external display panels by finger print or whatever, please cover your finger by finger sack.
Also, please take care about surface of main and external display panels not to stamp finger print.
4. To prevent oxidation which cause connection problem, please do not touch any terminal on electric board, microphone, vibrator, ear-piece and speaker.
If you have to touch there, please cover your finger by finger sack.
If you touch those parts, please clean by soft dry cloth.
Also, please do not touch shield case on electric board directly without finger sack, otherwise performance of the phone may decline because of oxidation.
5. Since FPC is sensitive, please handle FPC careful so that you will not make any damage.
6. Please do not wet the moisture sensor.
Once the sheet is wet, red ink is supposed to run. In this case, please replace the sheet with new one.
Please take care about your sweat.
7. Be sure to remove the Li-Ion battery from mobilephone.
8. Take sufficient care on static electricity of integrated circuits and other circuits by using static electricity prevention bands when servicing.

2. For disassembling

1. Please do not remove the board of base band section by pulling external interface connector, otherwise you will make damage to the board.
2. Shield case is attached on shield case holder without clearance. When you remove it, please take care not to remove together with shield case holder. If you remove shield case holder together, you can not attach it again because it is attached by solder and in such a case, you should have taken electric pattern on the board as well.

3. For reassembling

1. Please make sure that all cosmetic parts have no scratch and clean.
2. Please make sure that you can open and close handset smoothly and hear tick sound of hinges.
3. Please make sure that external display cushion can not be seen from the window.
4. Please make sure that main screen display panel is placed in proper position without inclination.
5. Please make sure that all three battery terminals protrude evenly.
6. Please make sure that the pawl of aerial is upside.

• FASTENING TORQUE (Referential Value)

• Back Cabinet (Key)/ Front Cabinet (Key)	14.7 ± 2.0 N • cm (1.5 ± 0.2 Kgf • cm)
• Back Cabinet (Display)/ Front Cabinet (Display)	

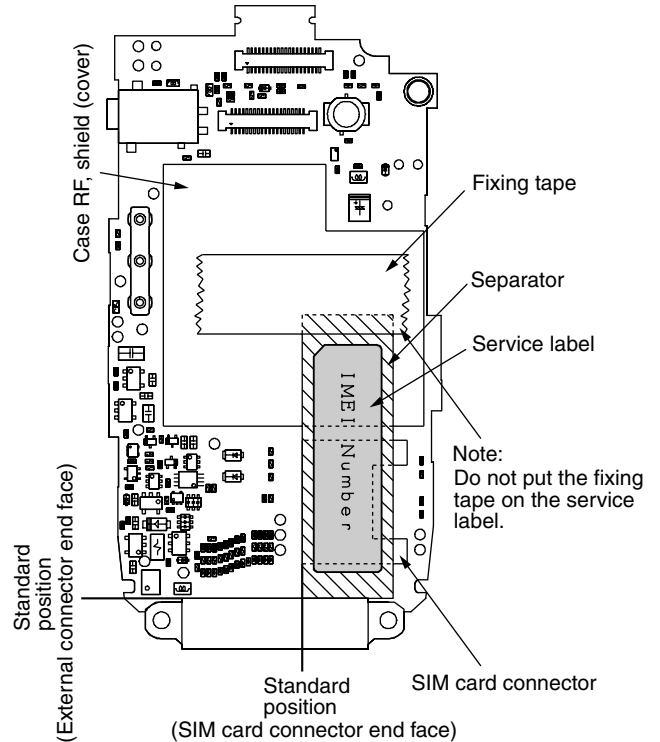
The value is for reference when an electric screwdriver (HIOS CL4000) is used.

• SOLDERING SPECIFICATION

Soldering iron must be set to 350° C for 5 seconds.

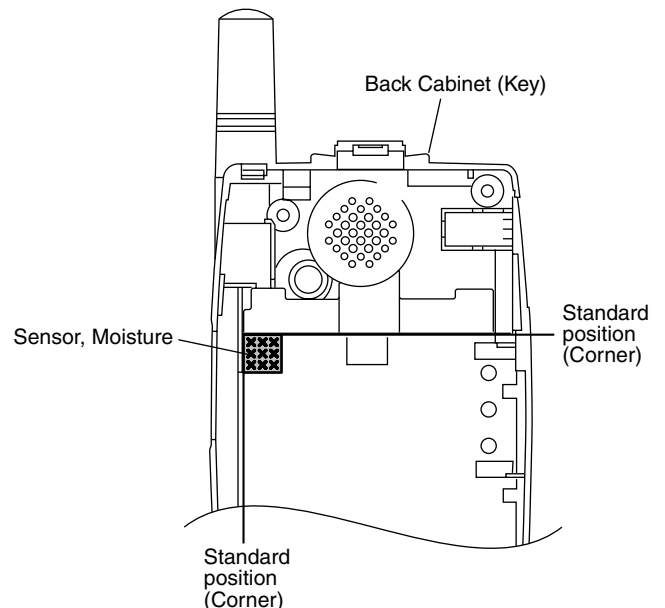
• Diagram for Service Label Position

Before attaching the cabinet, remove and throw out the service label with IMEI Number written on it as shown in the illustration. If it is not removed or it is put on the other position, the handset may be damaged.

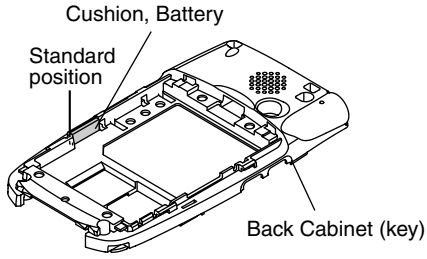


• STANDARD POSITION OF ATTACHMENT

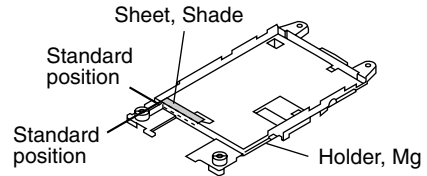
When replacing the following labels (marked with), be sure to put new ones on the specified positions.



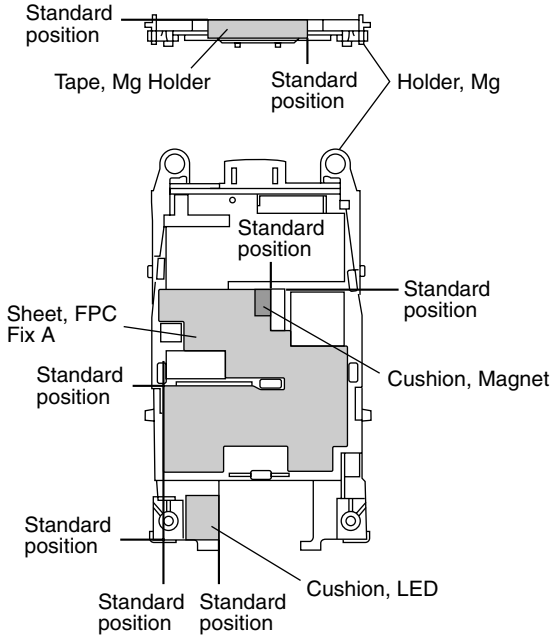
[Sensor, Moisture]



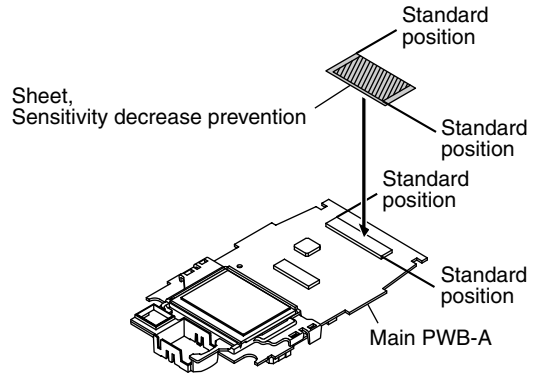
[Cushion, Battery]



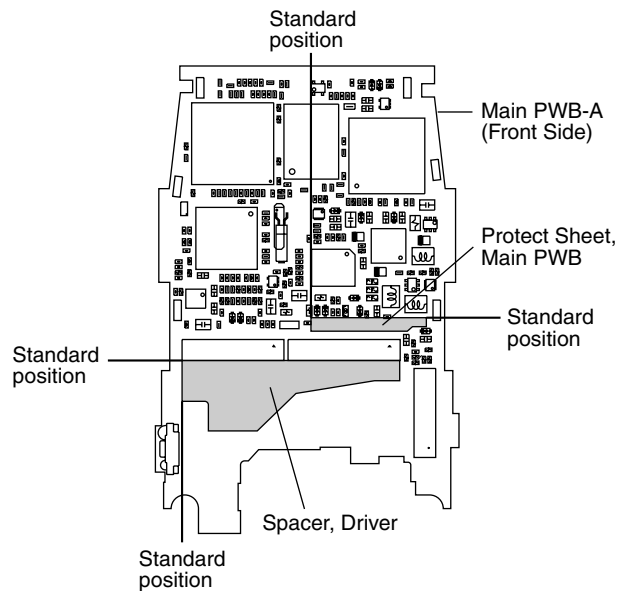
[Sheet, Shade]



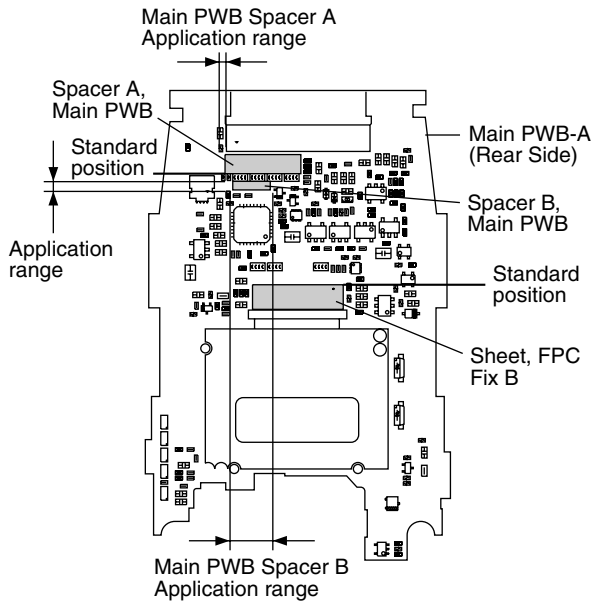
[Tape, Mg Holder/Cushion, Magnet/Sheet, FPC Fix A/Cushion, LED]



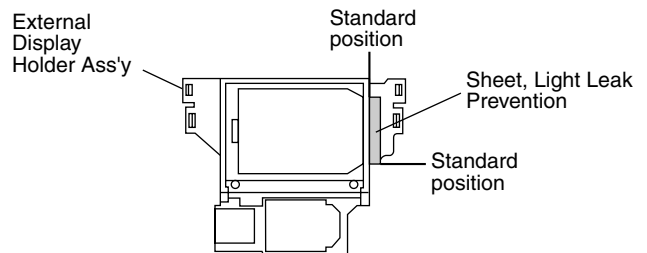
[Sheet, Sensitivity decrease prevention]



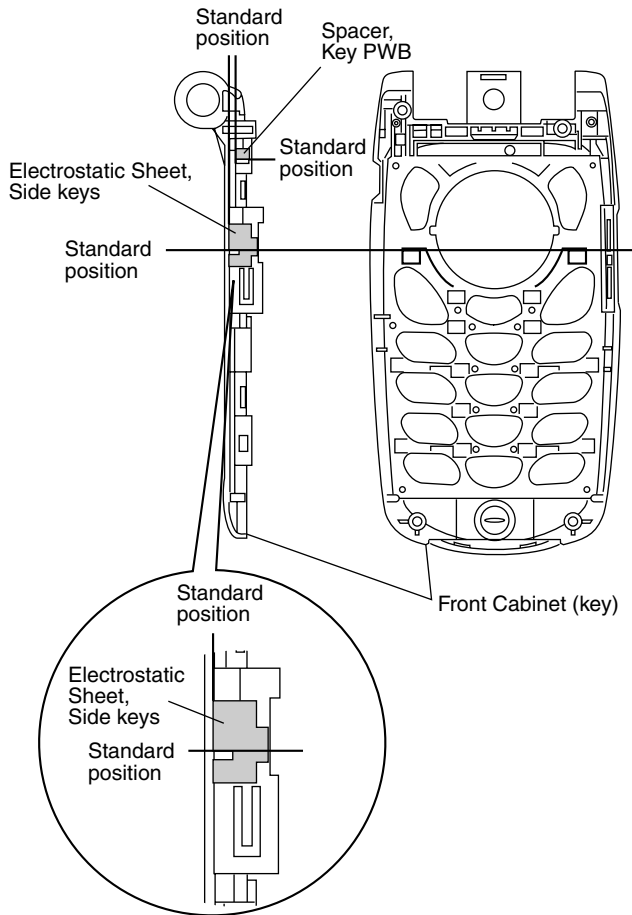
[Protect Sheet, Main PWB/Spacer, Driver]



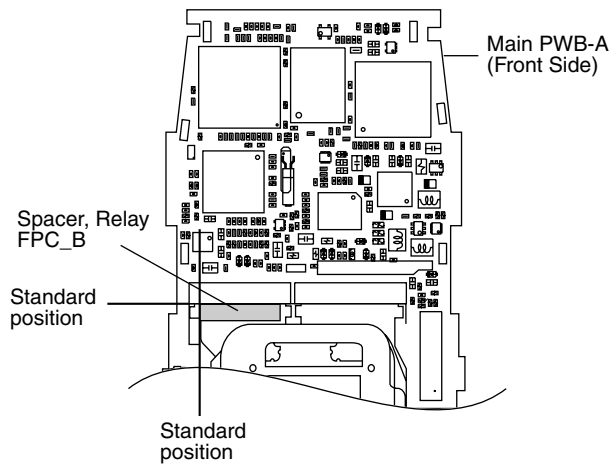
[Spacer A, Main PWB/Spacer B, Main PWB/Sheet, FPC Fix B]



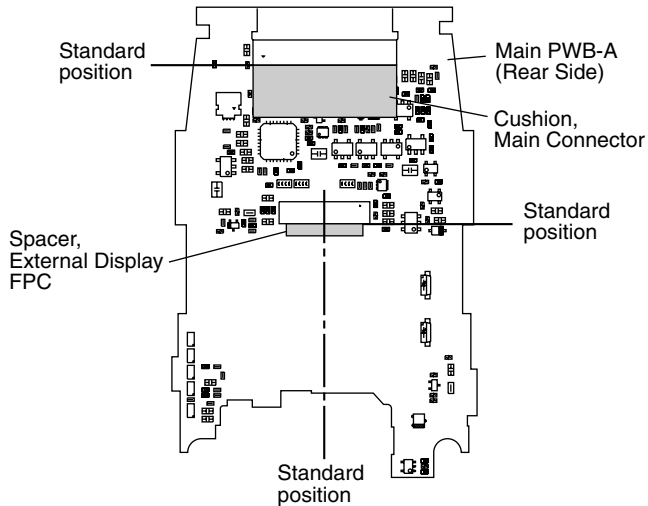
[Sheet, Light Leak Prevention]



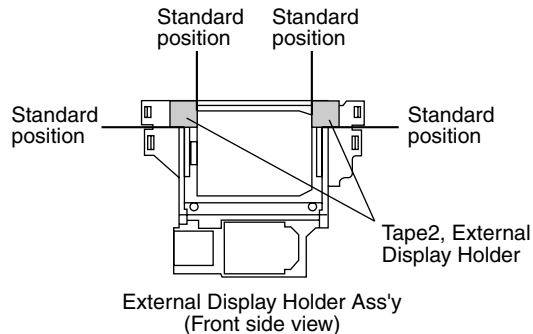
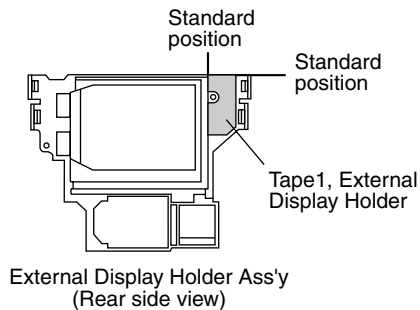
[Spacer, Key PWB/Electrostatic Sheet, Side keys]



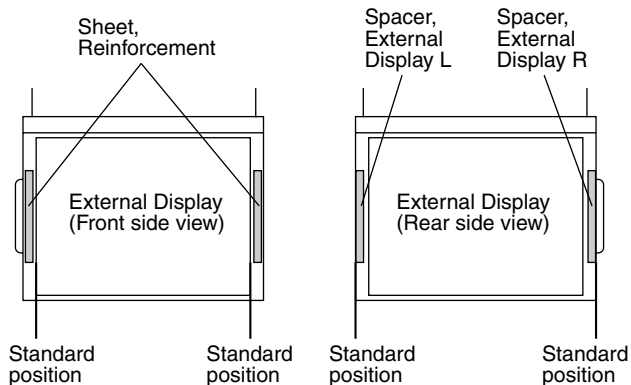
[Spacer, Relay FPC_B]



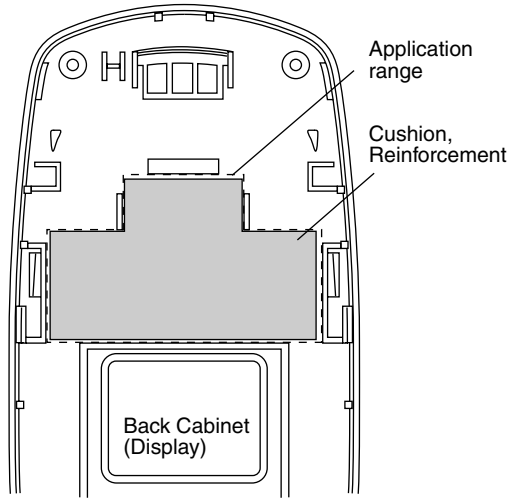
[Cushion, Main Connector/Spacer, External Display FPC]



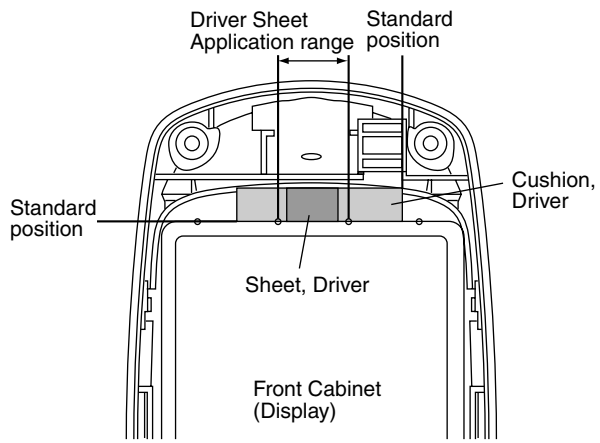
[Tape1, External Display Holder/Tape2, External Display Holder]



[Sheet, Reinforcement/Spacer, External Display L/Spacer, External Display R]



[Cushion, Reinforcement]



[Cushion, Driver/Sheet, Driver]

[2] Disassembly and reassembly

- To reassemble, follow the reverse procedure.

STEP	REMOVAL	PROCEDURE	FIGURE
1	Back Cabinet (Key) Ass'y	1. Battery Cover..... (A1)x1 2. Li-Ion Battery..... (A2)x1 3. Screw Cover..... (A3)x2 4. Screw..... (A4)x4 5. Hook..... (A5)x5	1
2	Key PWB-B	1. Socket..... (B1)x2 2. Solder..... (B2)x7 3. Hook..... (B3)x4	2

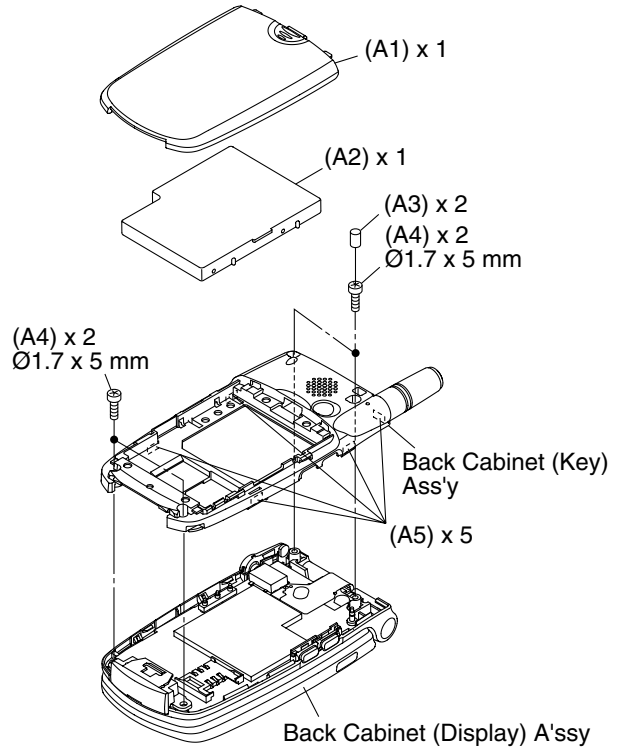


Figure 1

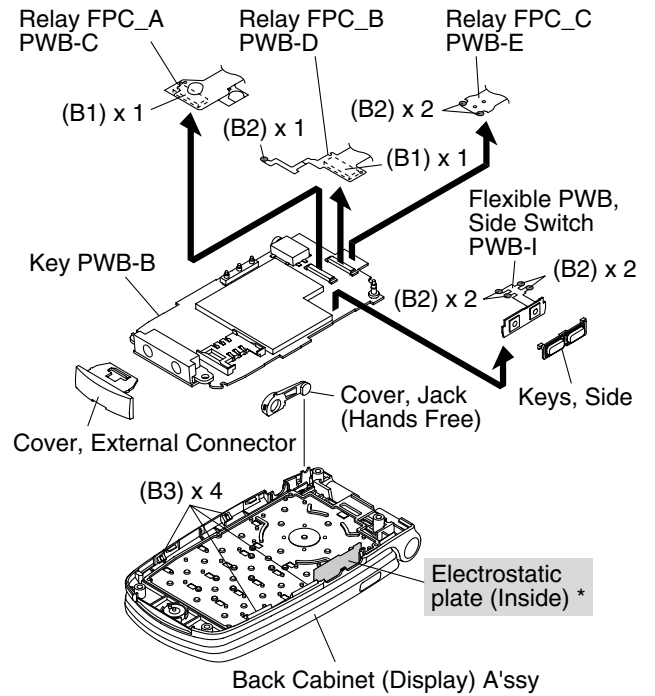


Figure 2

* Be careful not to deform the electrostatic plate (PSLDC3348AFZZ) used to eliminate static electricity when installing/removing the key PWB.

STEP	REMOVAL	PROCEDURE	FIGURE
3	Back Cabinet (Display) Ass'y	1.Screw Cover..... (C1)x4 2.Screw..... (C2)x4 3.Hook..... (C3)x11	3
4	Main PWB-A	1.Solder..... (D1)x3 2.Sheet..... (D2)x2 3.Socket..... (D3)x6 4.Hook..... (D4)x2	4

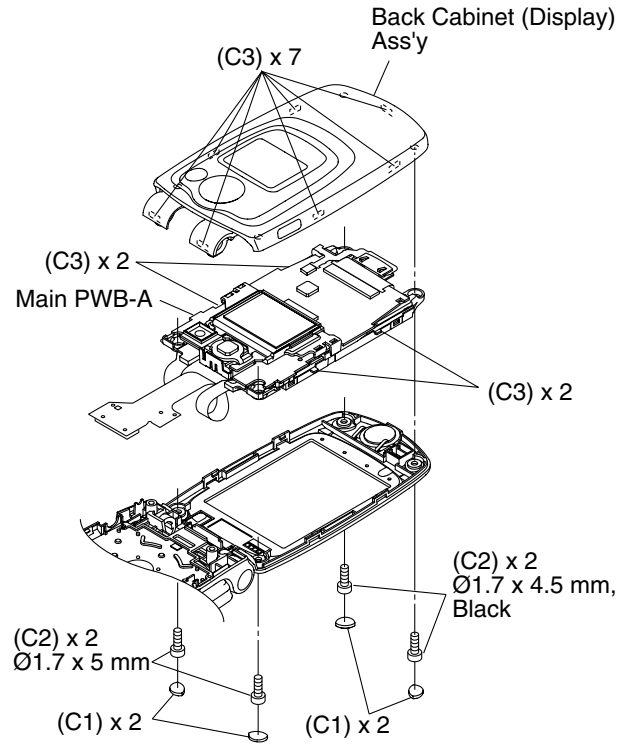


Figure 3

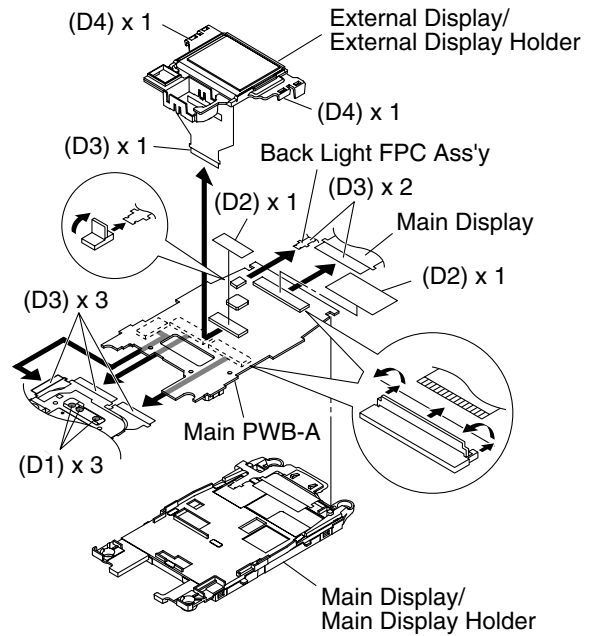


Figure 4

- MEMO -

CHAPTER 4. DIAGRAMS

[1] Block diagram

[Main]

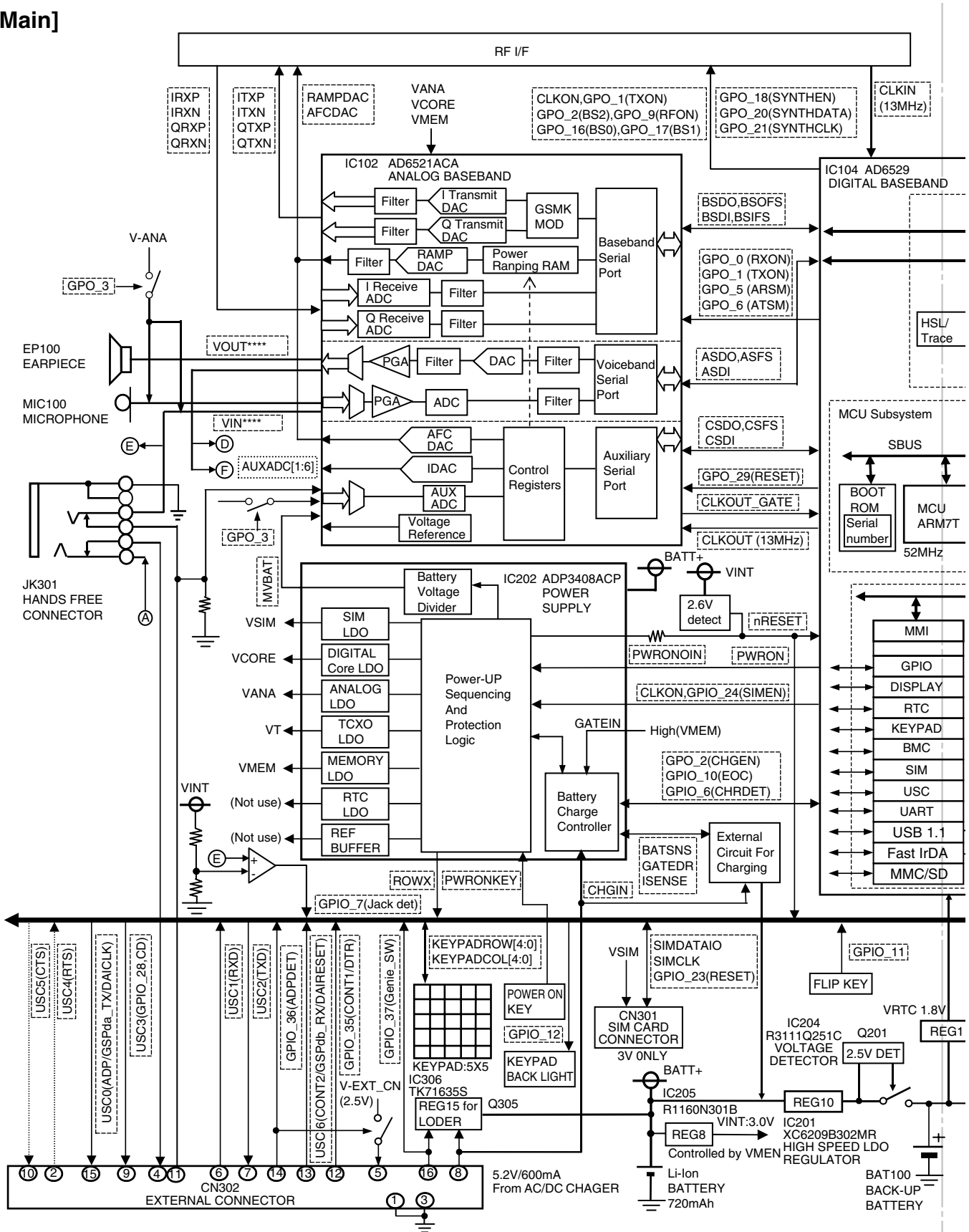


Figure 1 MAIN BLOCK DIAGRAM (1/2)

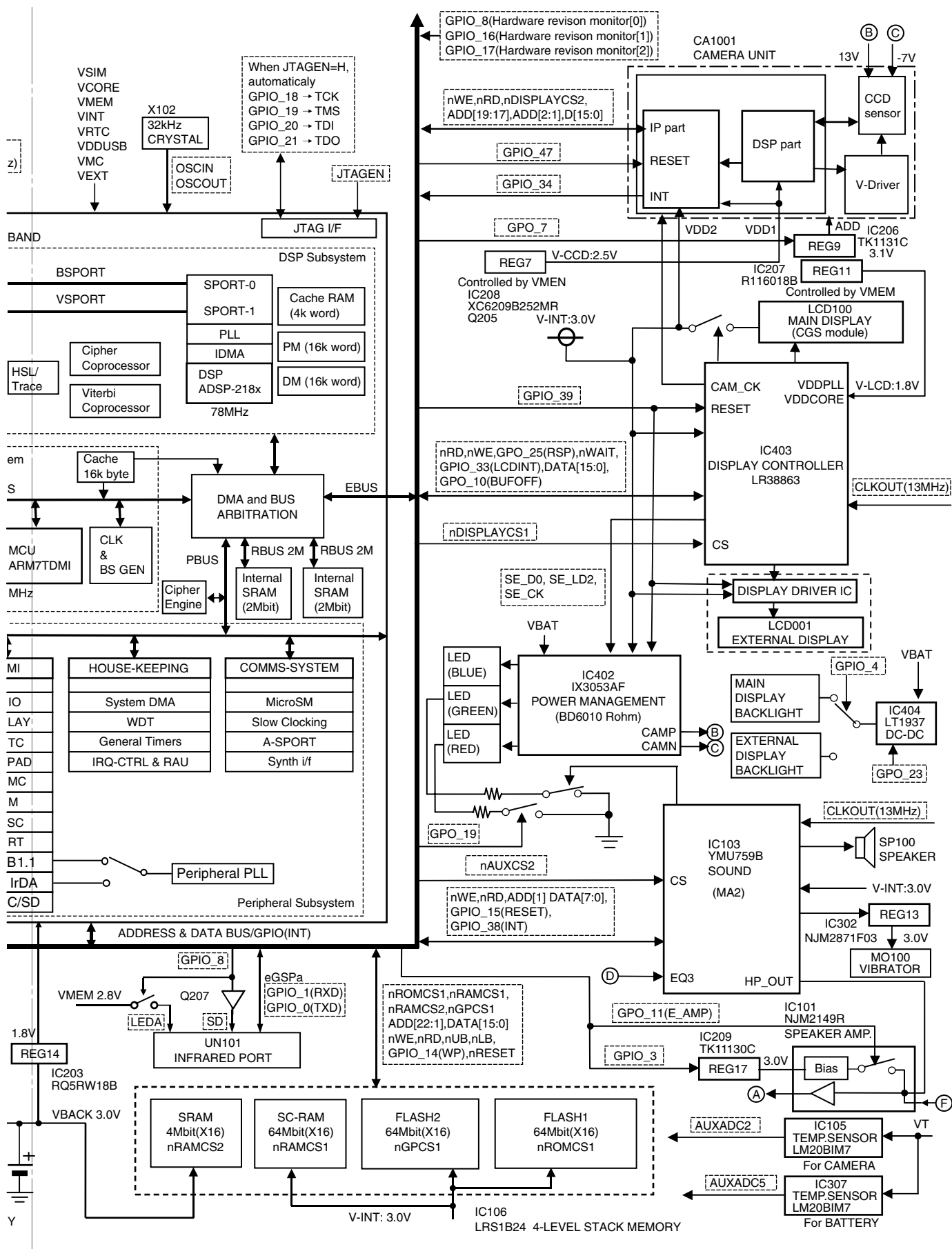


Figure 2 MAIN BLOCK DIAGRAM (2/2)

[RF]

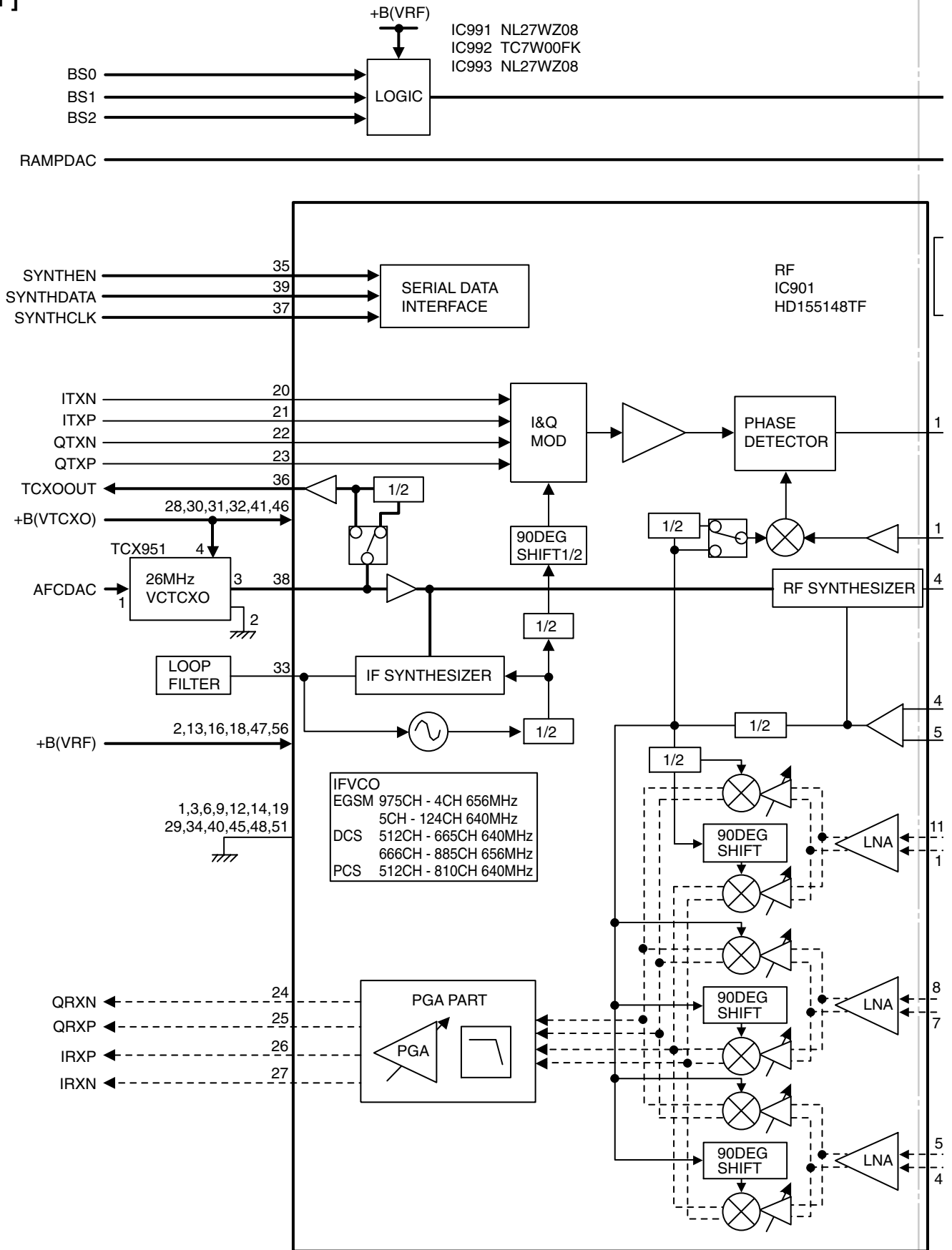


Figure 3 RF BLOCK DIAGRAM (1/2)

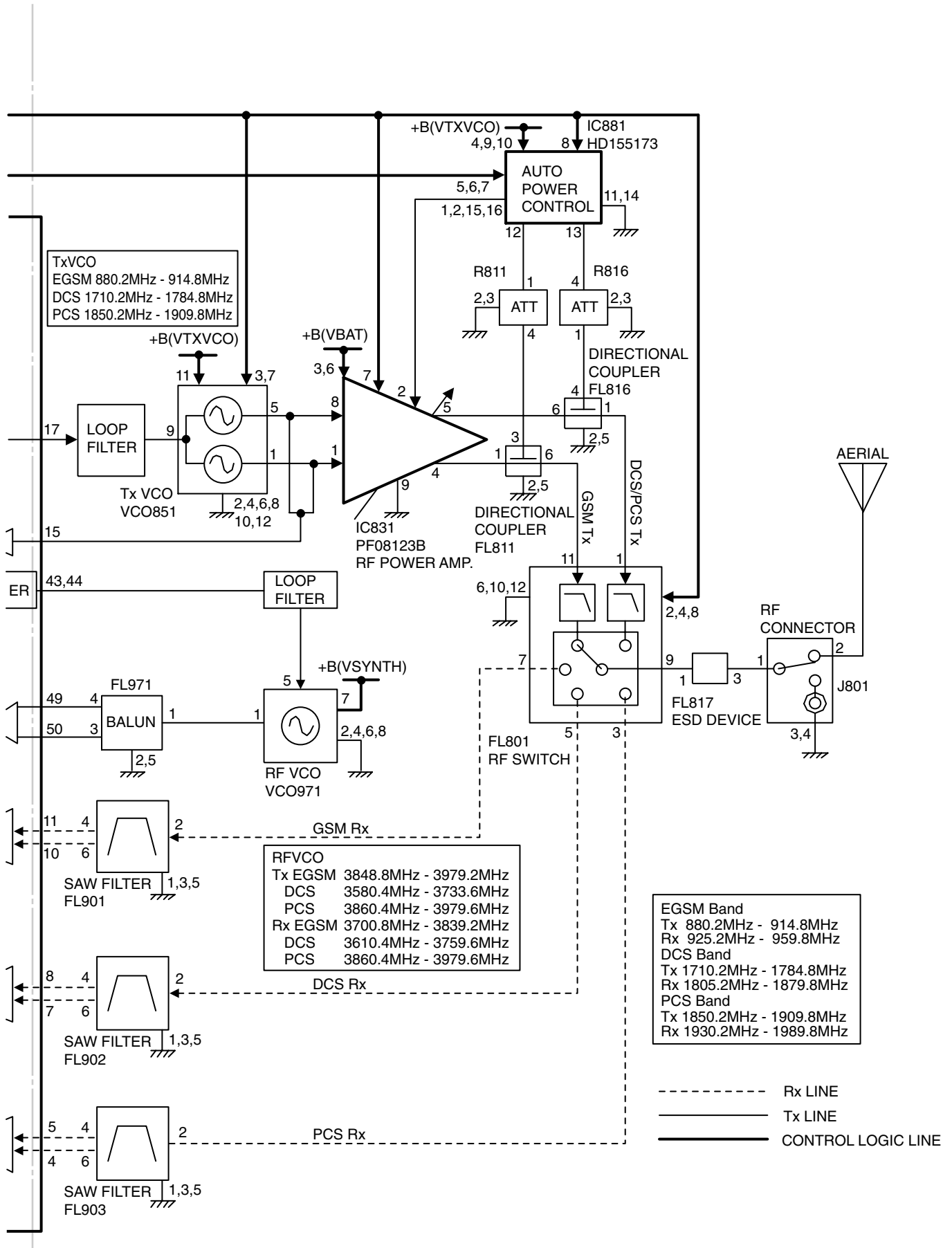


Figure 4 RF BLOCK DIAGRAM (2/2)

CHAPTER 5. SCHEMATIC DIAGRAM AND WIRING SIDE OF P.W.BOARD

[1] Notes on schematic diagram

• Resistor:

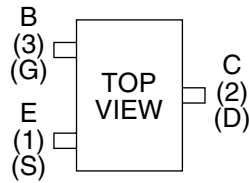
To differentiate the units of resistors, the symbols K and M are used. The symbol K means 1000 ohm and the symbol M means 1000 kohm. The resistor without any symbol is an ohm resistor.

• Capacitor:

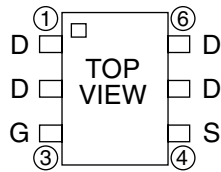
To indicate the unit of capacitor, the symbol is used. The symbol P means pico-farad and the unit of the capacitor without such a symbol is microfarad. As to electrolytic capacitor, the expression "capacitance/withstand voltage" is used. (CH), (RH), (UJ): Temperature compensation (ML): Mylar type (S): Styrol type (PP): Polypropylene type

- The indicated voltage in each section is the one measured by Digital Multimeter between such a section and the chassis with no signal given.
- Conditions: SIM card inserted, power on, in stand-by mode (opened)
- Schematic diagram and Wiring Side of P.W. Board for this model are subject to change for improvement without prior notice.
- Parts marked with "△" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

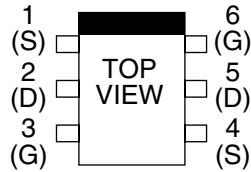
[2] Types of transistor and LED



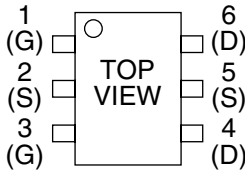
2SA1955 A
2SA1989 SR
2SC4617 R
2SK3019
MCH3443
RT1N144 U



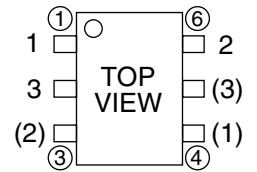
CPH6311
FDG311 N



EMD6
EMD9
EMD12
EMG9
UM6K1

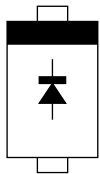


FDC6322 C



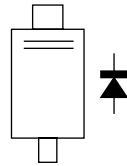
EMH11

TOP VIEW



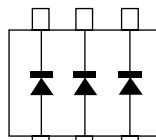
1SS388
1SS405
RB160M30
RB520S30
RB521S30
RB551V30

TOP VIEW



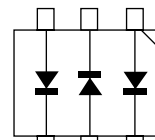
CUS01

TOP VIEW



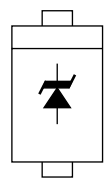
HN2S01FU

TOP VIEW



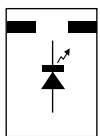
GM56271A

TOP VIEW



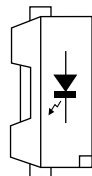
RD22SL
RSB6.8S

TOP VIEW



YPY1105C

TOP VIEW

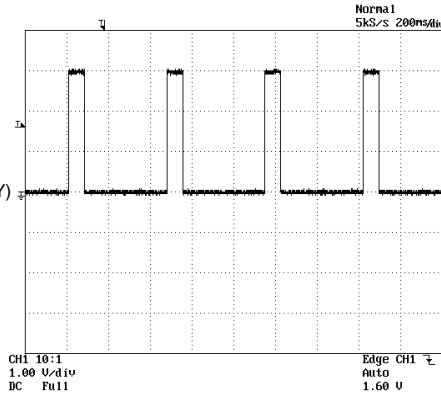


NSCW335T

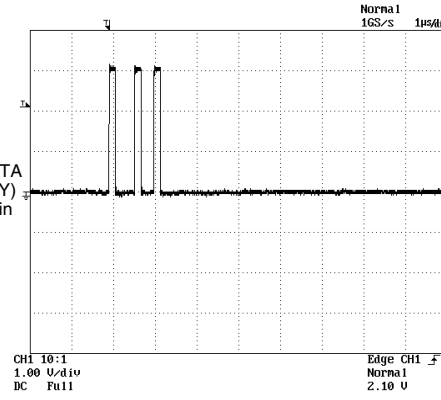
[3] Waveforms of circuit

RF UNIT PLL_IC SERIAL COMMUNICATION

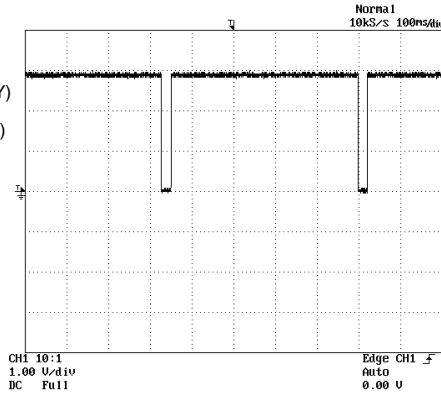
1
TCXOEN
(STAND-BY)
IC304 1Pin



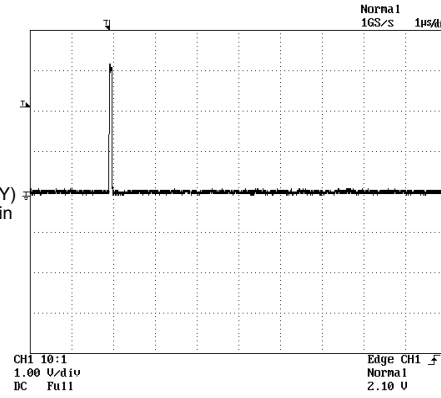
5
SYNTHDATA
(STAND-BY)
IC901 39Pin



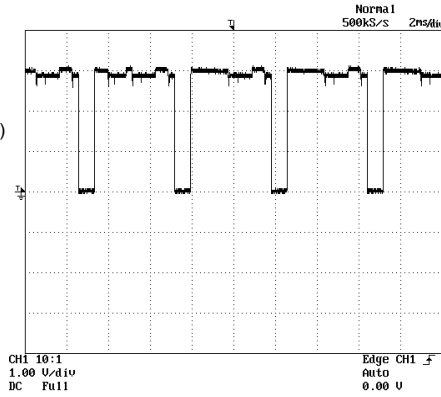
2
RFON_B
(STAND-BY)
R351
(Q304 5Pin)



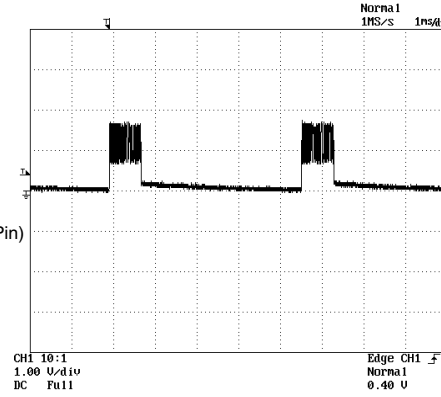
6
SYNTHEN
(STAND-BY)
IC901 35Pin



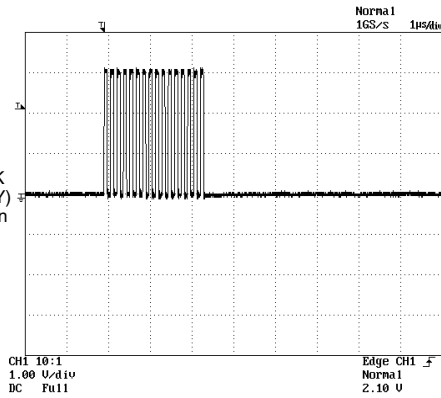
3
TXON_B
(Talking)
R352
(Q304 4Pin)



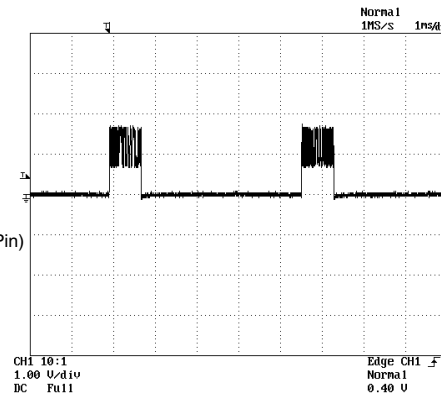
7
QTXN
(Talking)
C924
(IC901 22Pin)



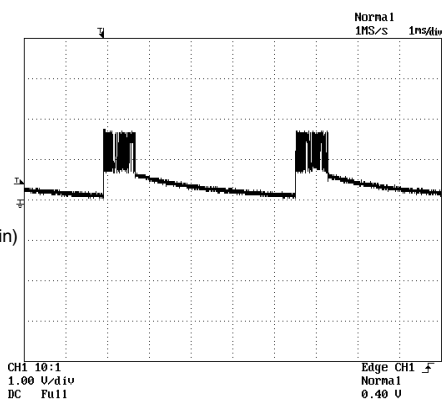
4
SYNTHCLK
(STAND-BY)
IC901 37Pin



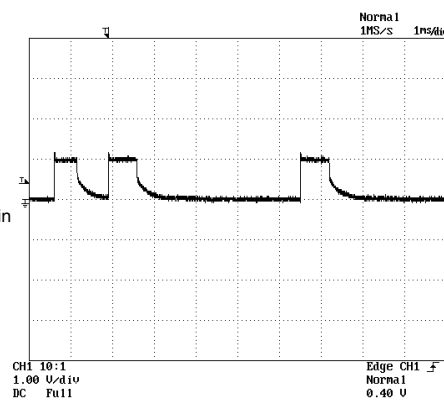
8
QTXP
(Talking)
C924
(IC901 23Pin)



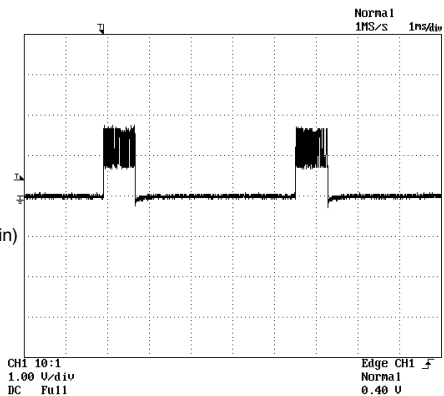
9
ITXN
(Talking)
C923
(IC901 20Pin)



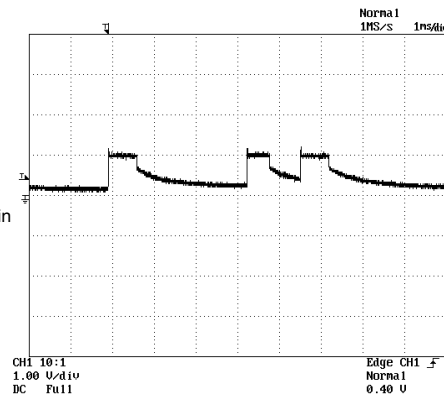
13
IRXN
(Talking)
IC901 27Pin



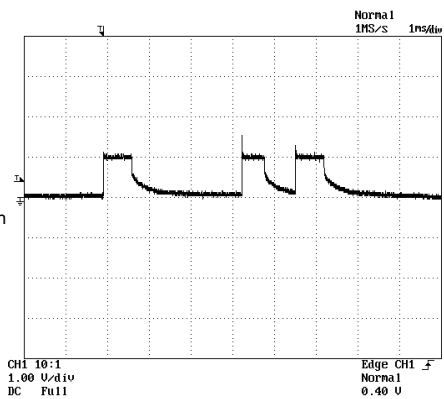
10
ITXP
(Talking)
C923
(IC901 21Pin)



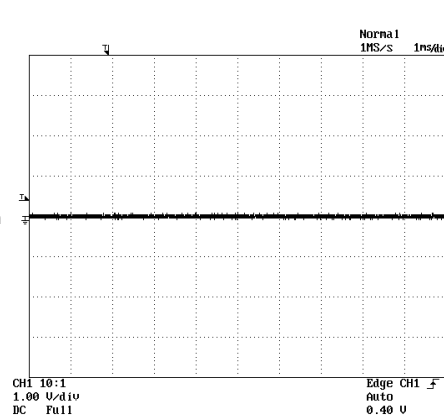
14
IRXP
(Talking)
IC901 26Pin



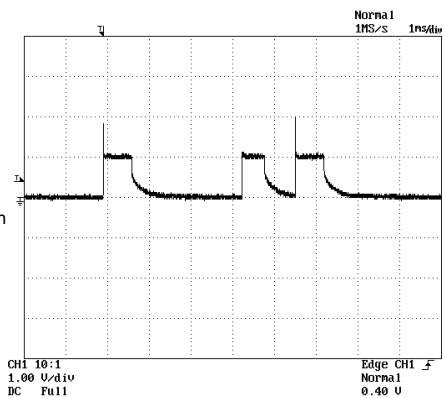
11
QRXN
(Talking)
IC901 24Pin



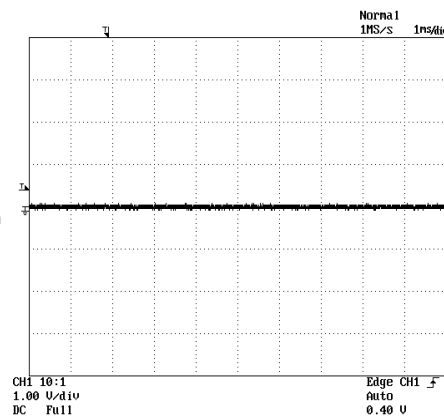
15
BS0(GSM)
(Talking)
IC993 1Pin



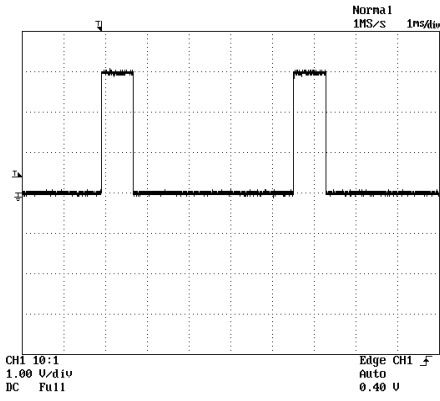
12
QRXP
(Talking)
IC901 25Pin



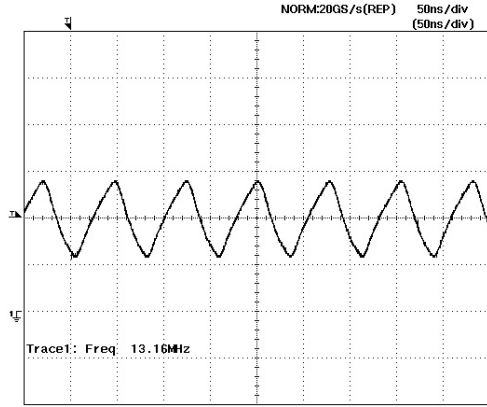
16
BS1(GSM)
(Talking)
IC993 2Pin



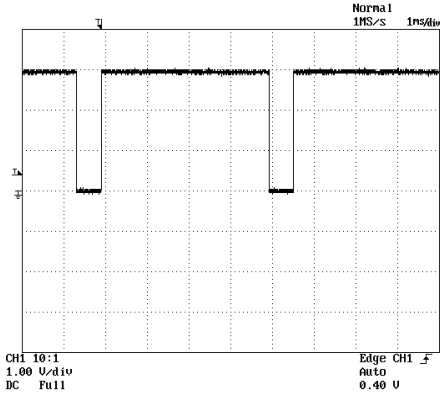
17
BS2(GSM)
(Talking)
IC992 1Pin



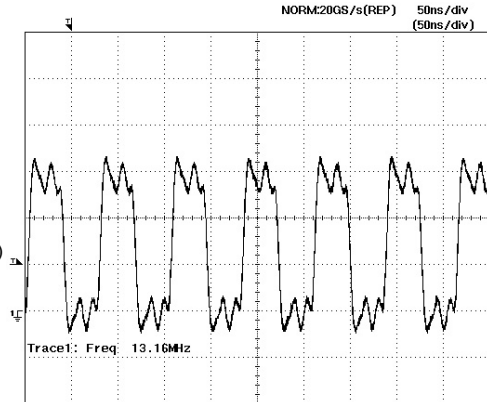
21
CLKIN
(Stand-by)
C148
(IC104 142Pin)



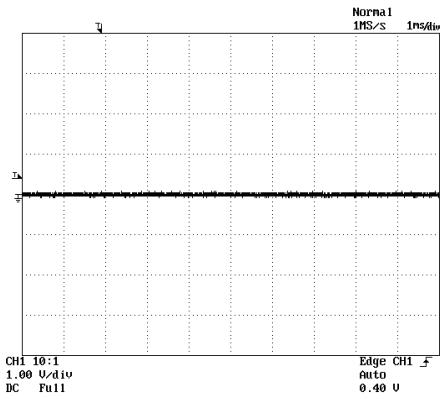
18
BS0(DCS)
(Talking)
IC993 1Pin



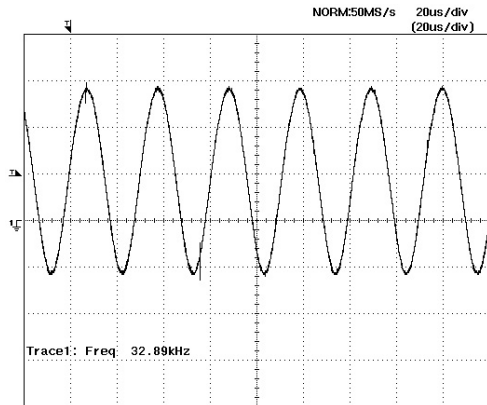
22
CLKOUT
(Stand-by)
Jumper
(IC104 84Pin
-IC102 46Pin)



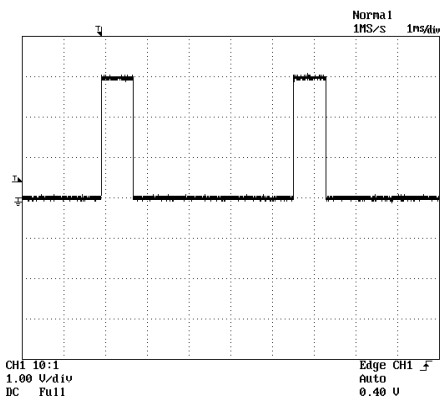
19
BS1(DCS)
(Talking)
IC993 2Pin



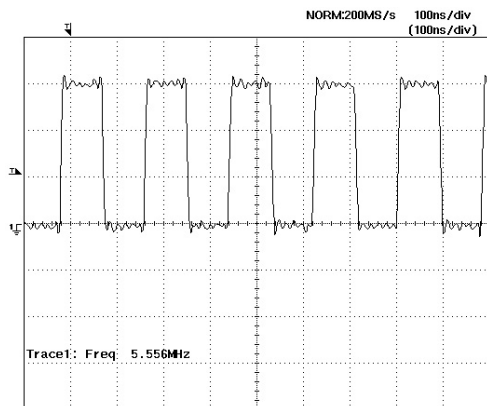
23
OSCIN
(32 kHz)
(Stand-by)
R147
(IC104 49Pin)



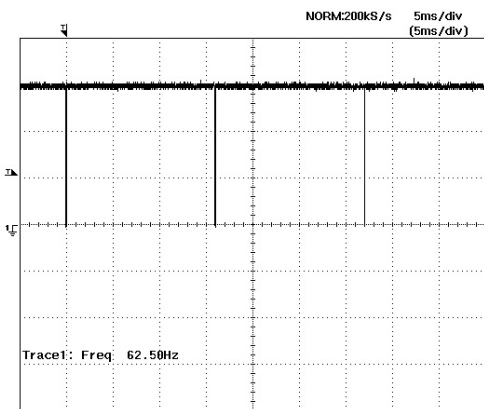
20
BS2(DCS)
(Talking)
IC992 1Pin



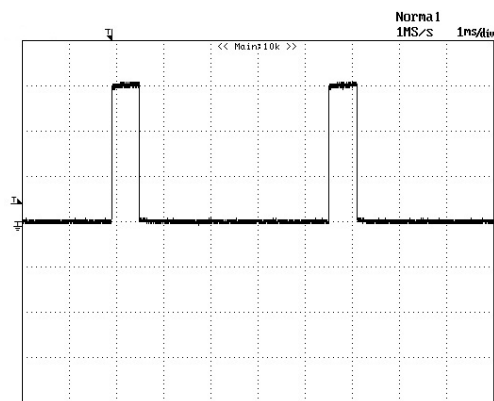
24
DCLK
(Stand-by)
TP424



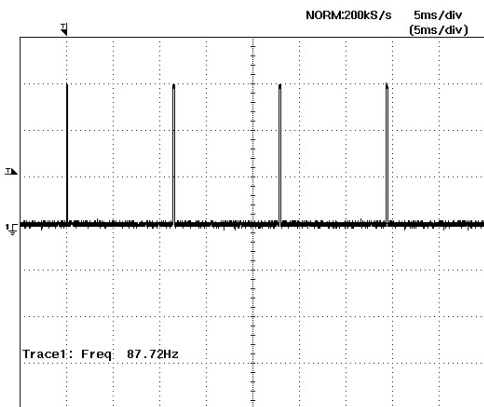
25
VSYNC
(Stand-by)
TP426



29
BS2 (PCS)
(Talking)
IC992 1Pin

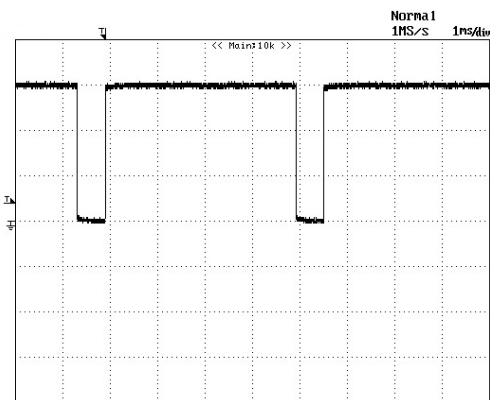


26
SUBFLM
(Stand-by)
L445 7Pin

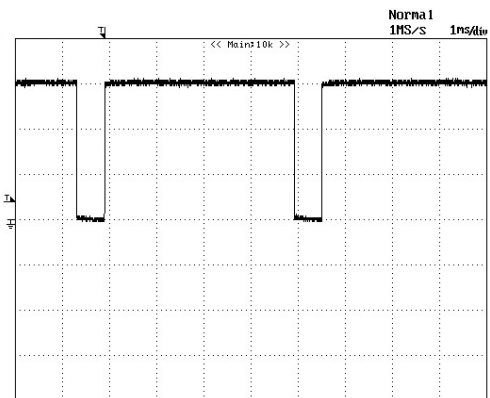


In this case, the external display is in 256-color mode with the handset closed.

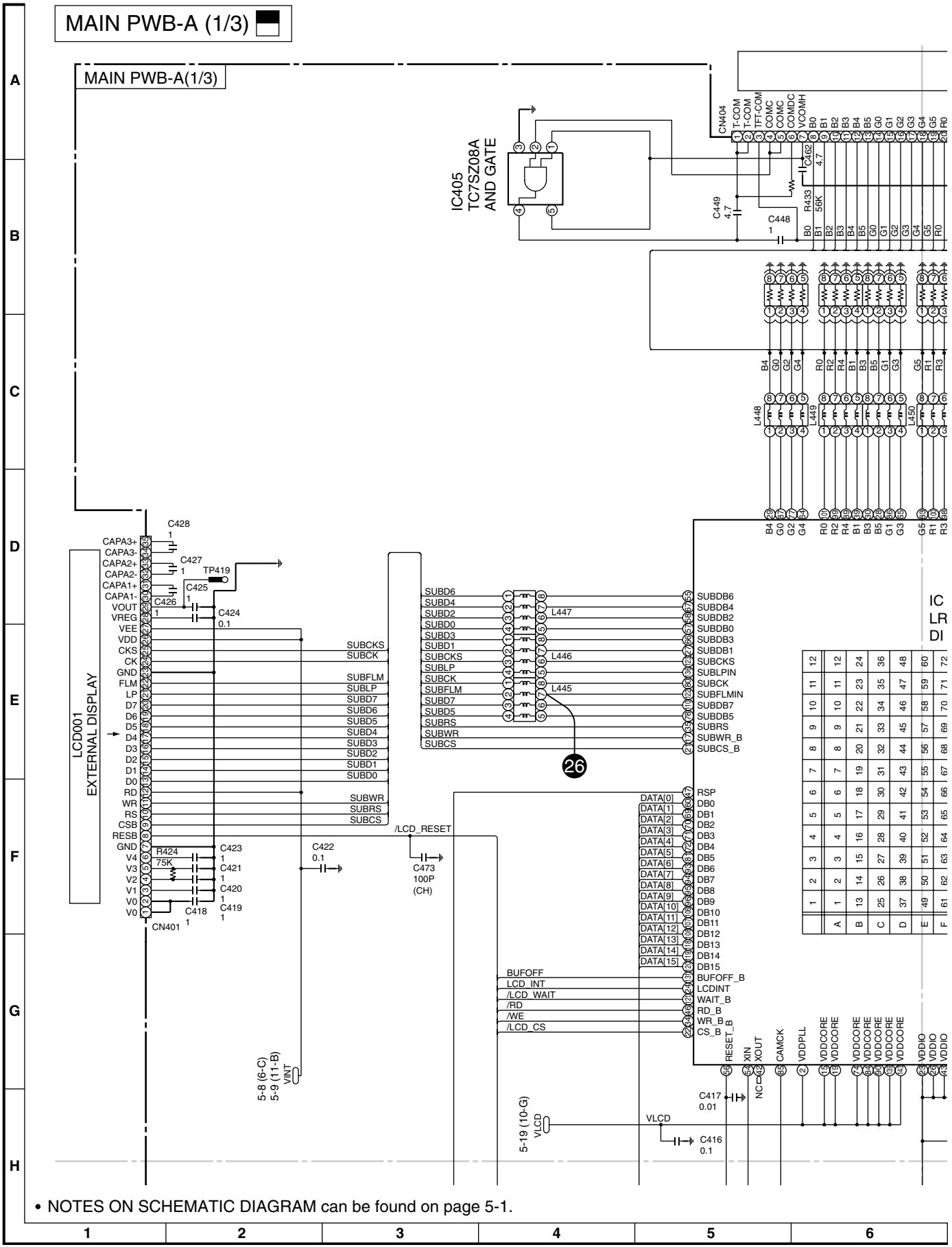
27
BS0 (PCS)
(Talking)
IC993 1Pin



28
BS1 (PCS)
(Talking)
IC993 2Pin

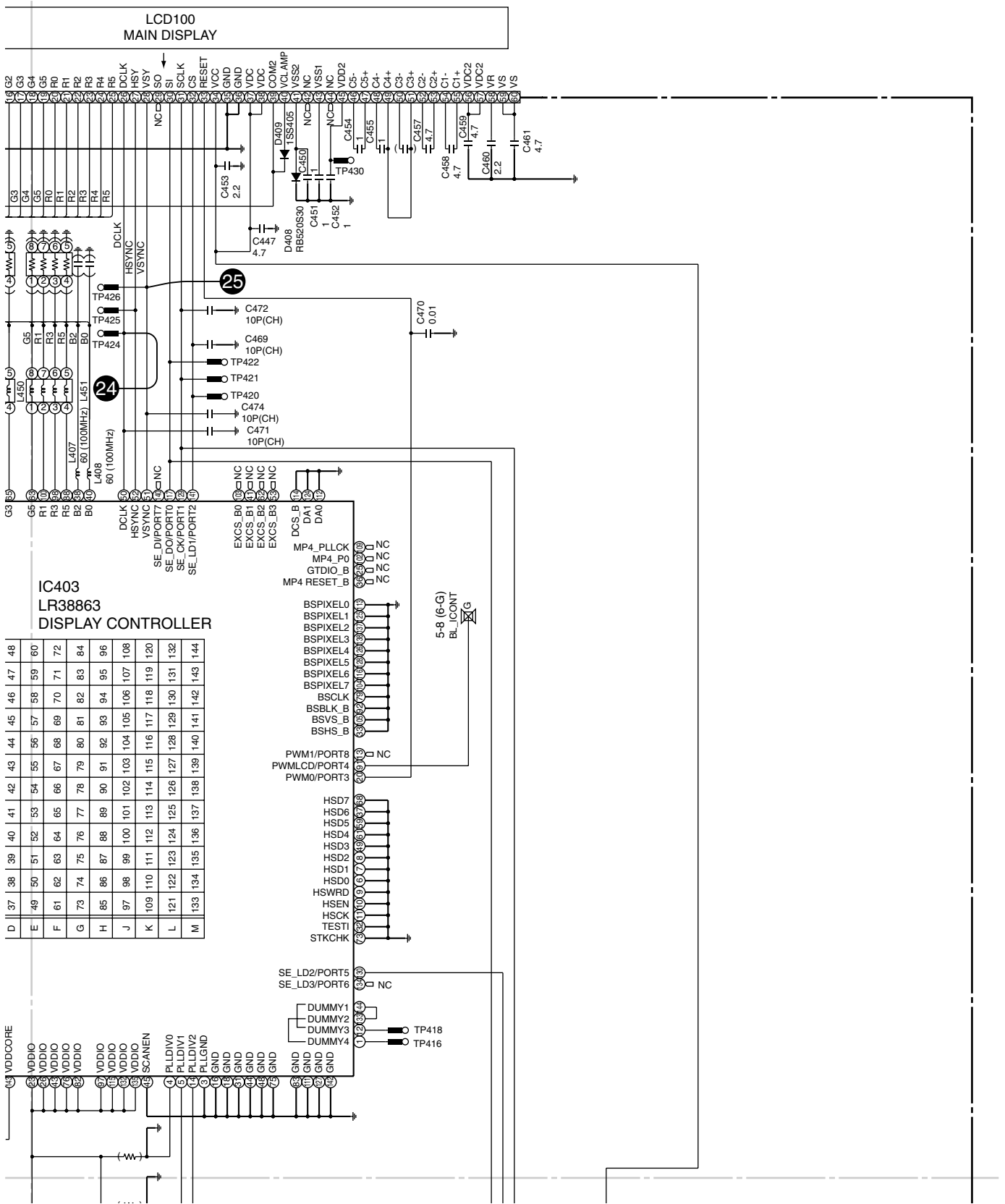


[4] Schematic diagram/wiring side of P.W.Board



• NOTES ON SCHEMATIC DIAGRAM can be found on page 5-1.

Figure 1 SCHEMATIC DIAGRAM (1/24)



• () : Not Mount

• The numbers 24 to 26 are waveform numbers shown in pages 5-4, 5-5.

7	8	9	10	11	12
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Figure 2 SCHEMATIC DIAGRAM (2/24)

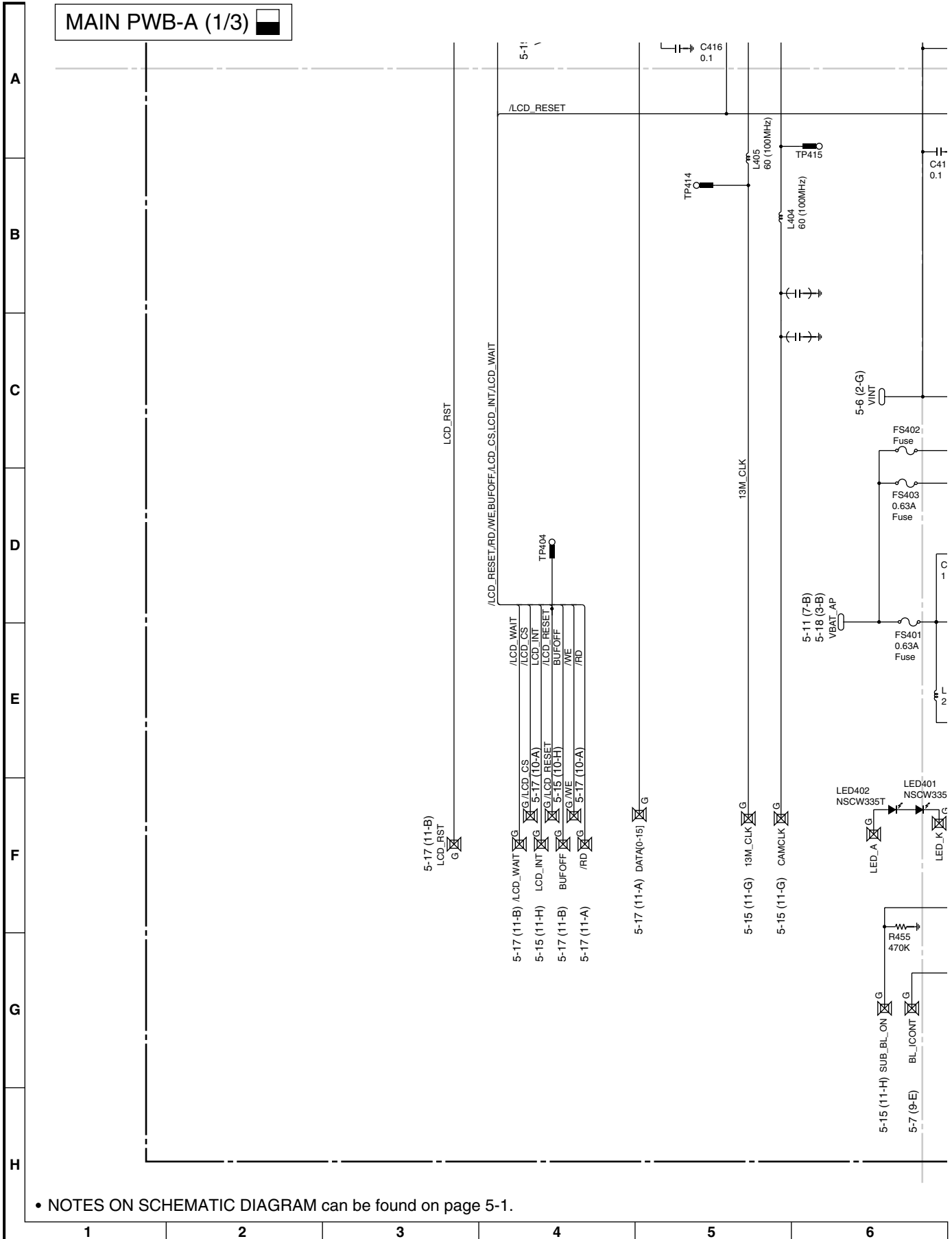
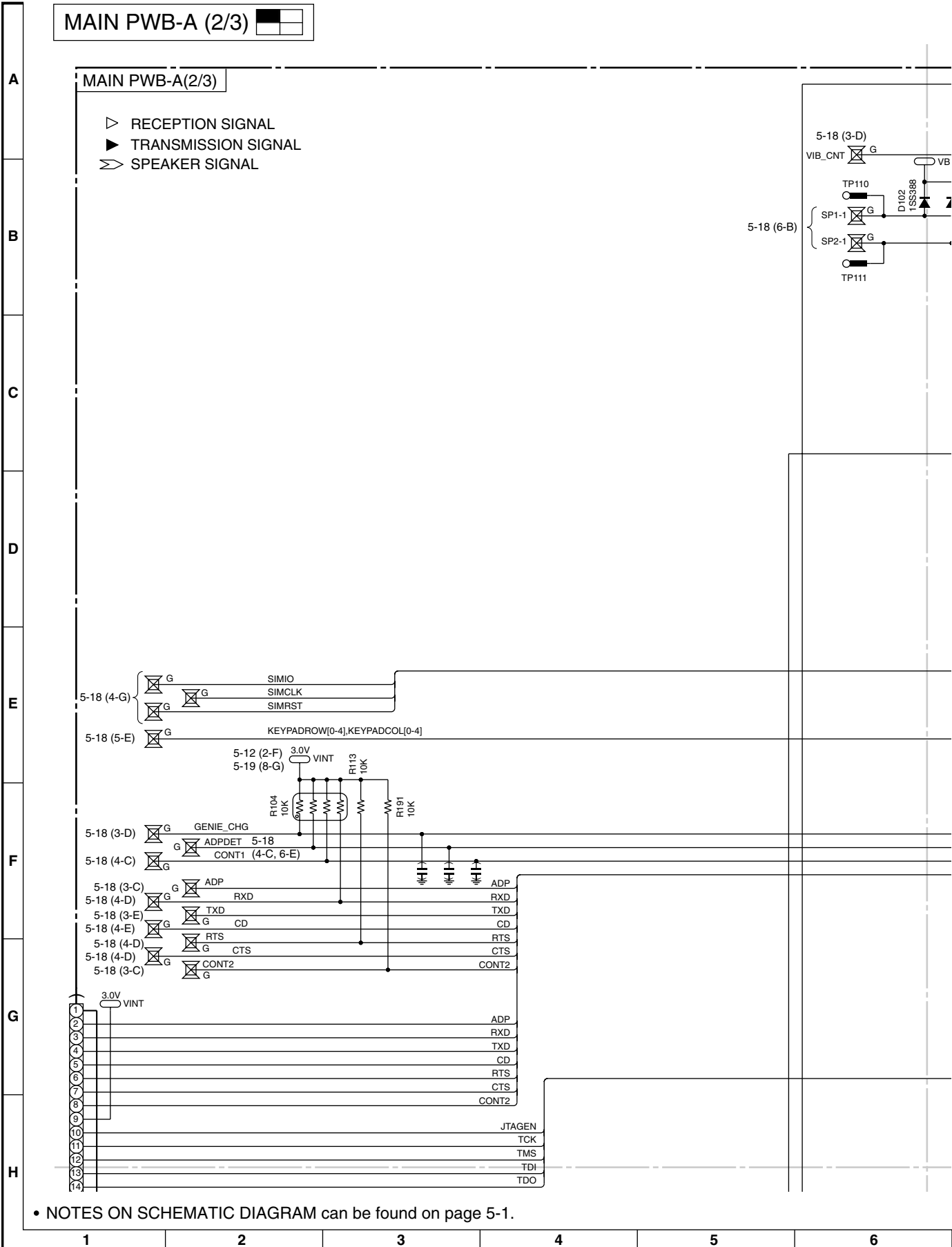


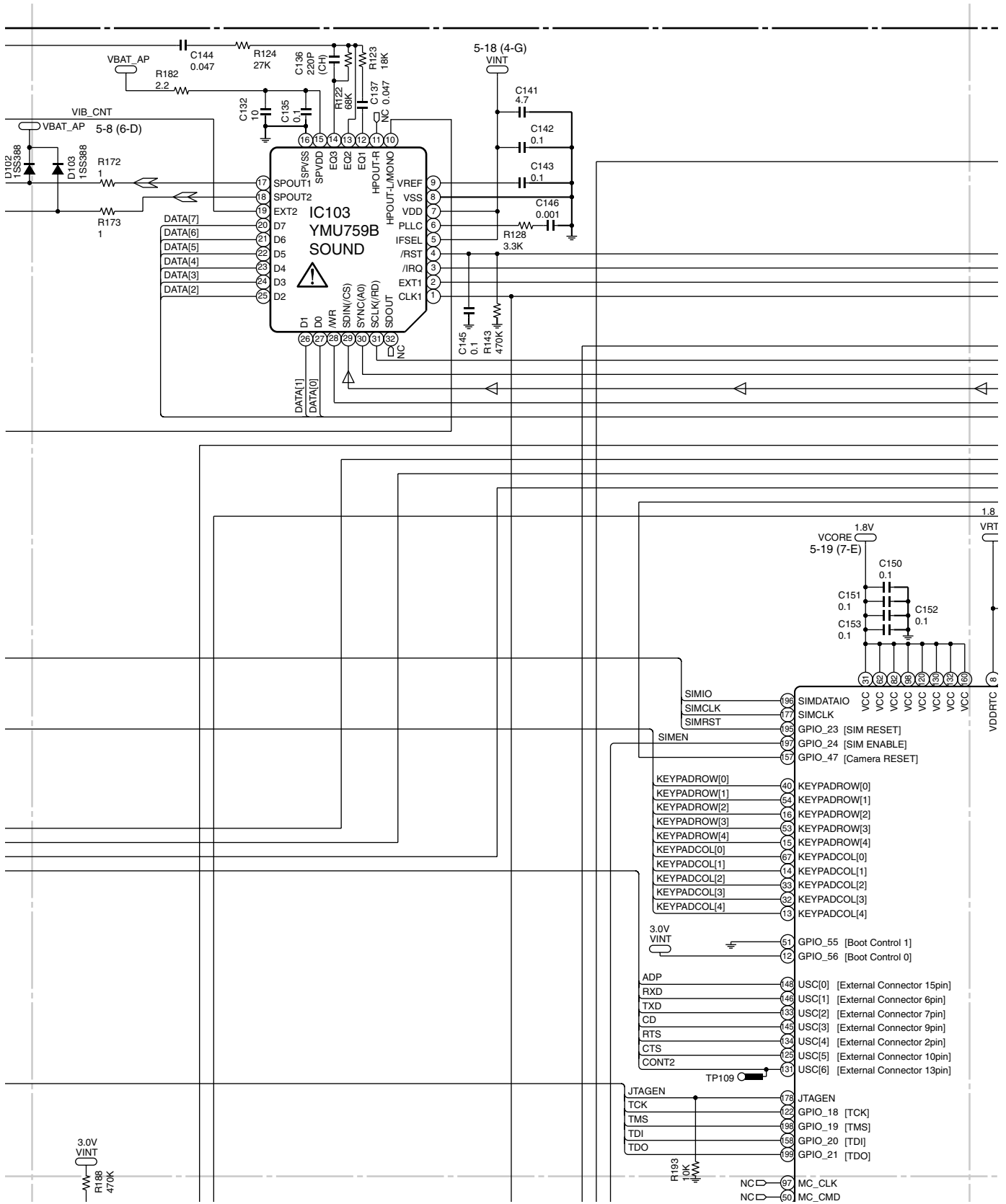
Figure 3 SCHEMATIC DIAGRAM (3/24)

MAIN PWB-A (2/3)



• NOTES ON SCHEMATIC DIAGRAM can be found on page 5-1.

Figure 5 SCHEMATIC DIAGRAM (5/24)



• () : Not Mount

7	8	9	10	11	12
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Figure 6 SCHEMATIC DIAGRAM (6/24)

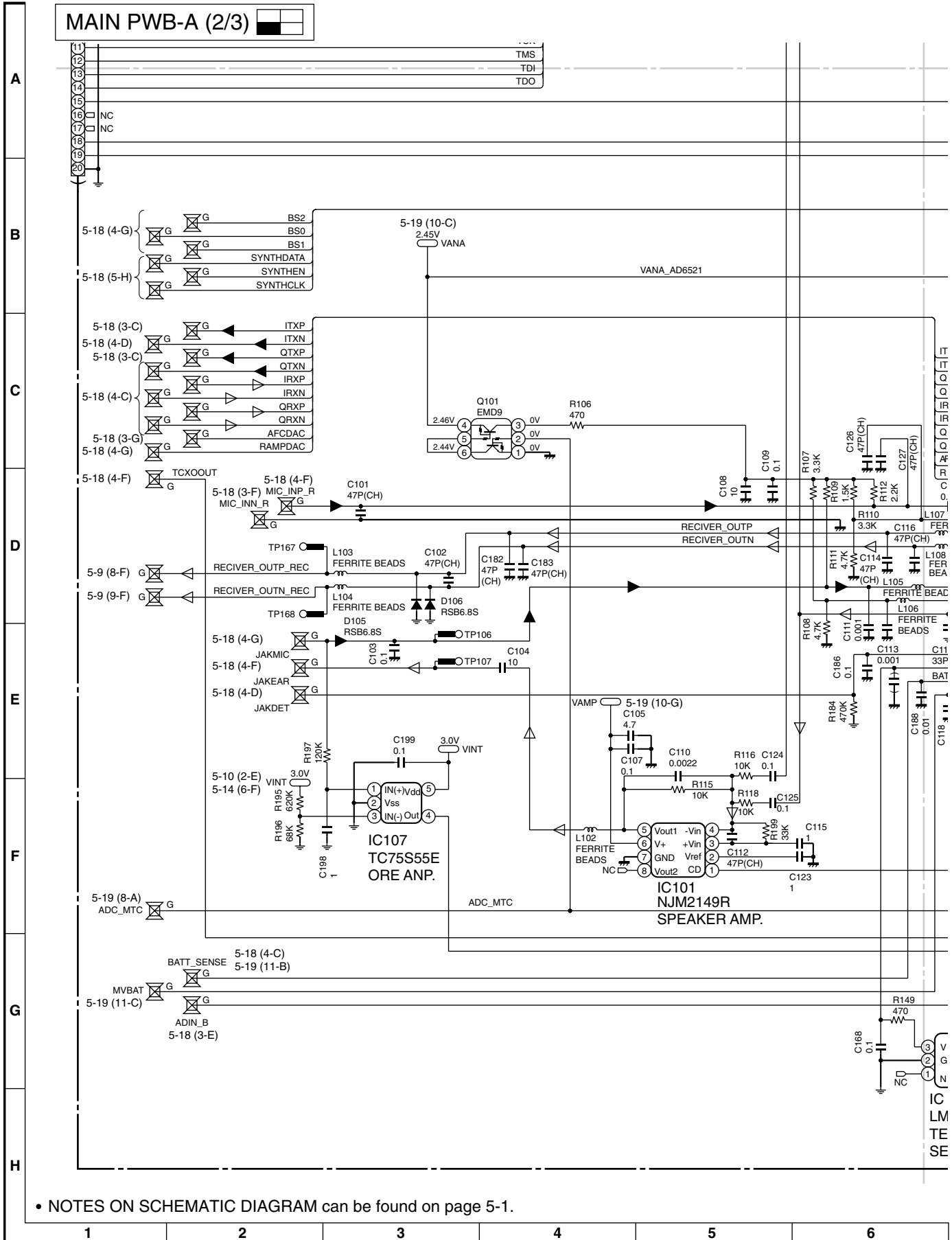
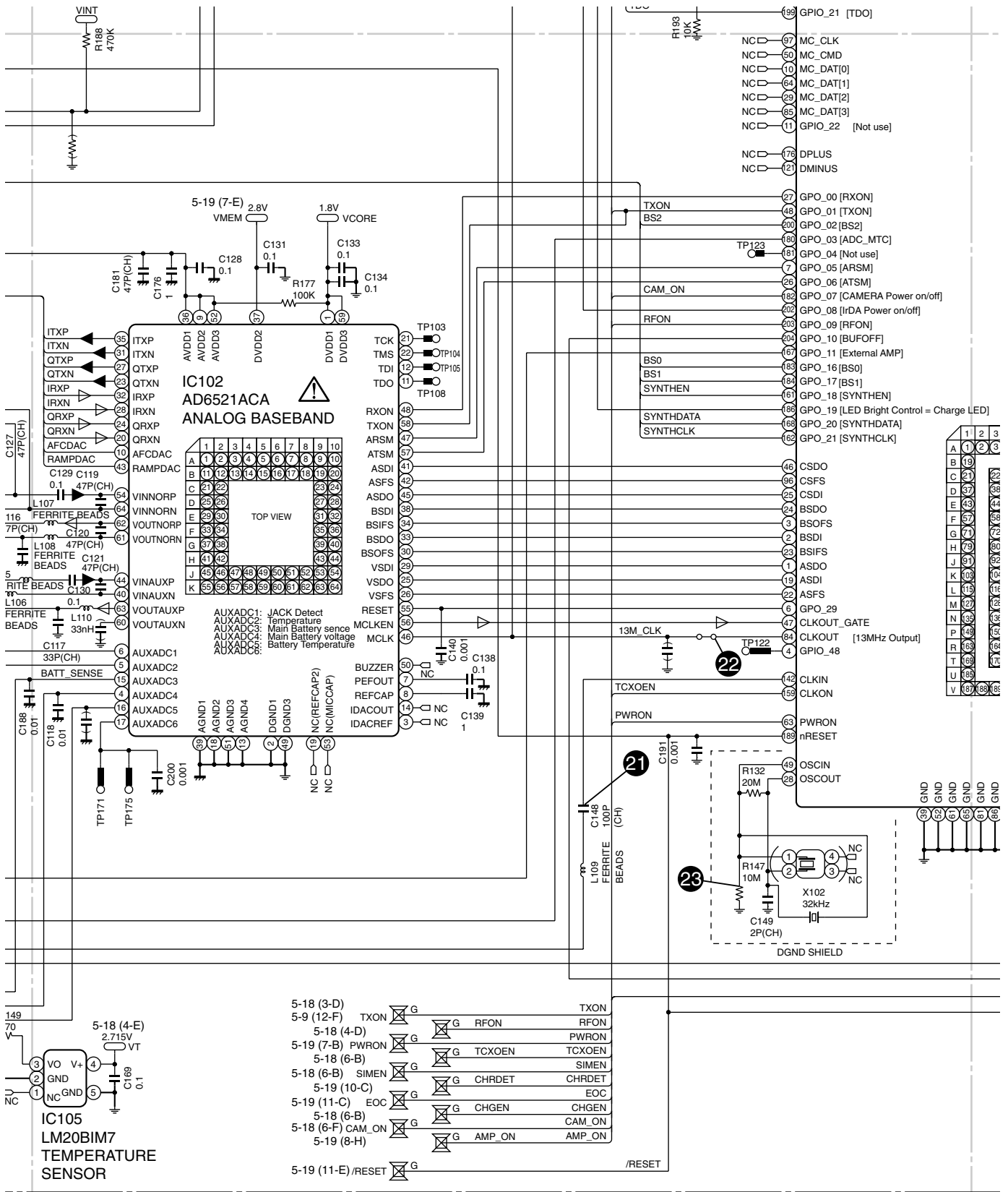


Figure 7 SCHEMATIC DIAGRAM (7/24)



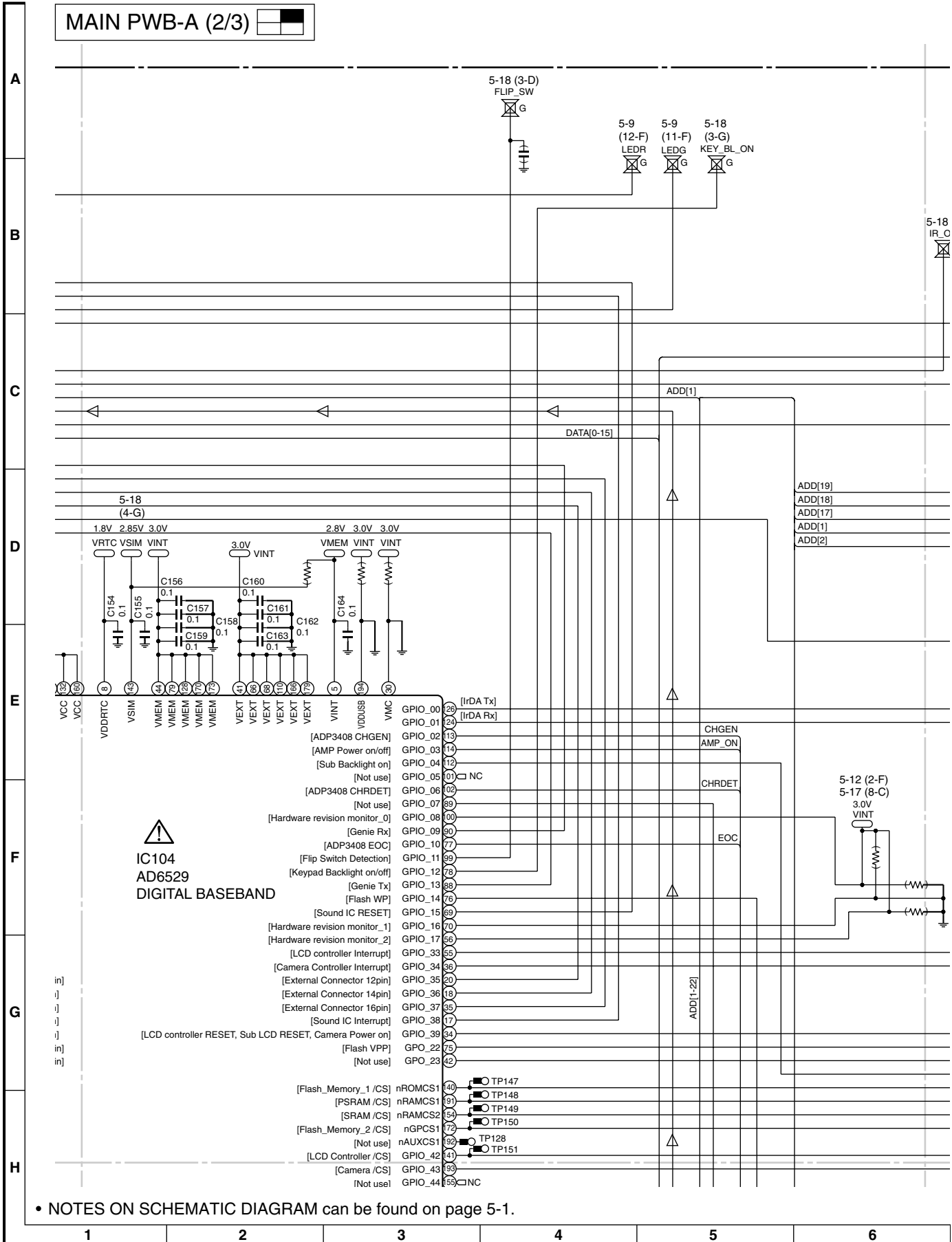
• () : Not Mount

• The numbers 21 to 23 are waveform numbers shown in page 5-4.

7	8	9	10	11	12
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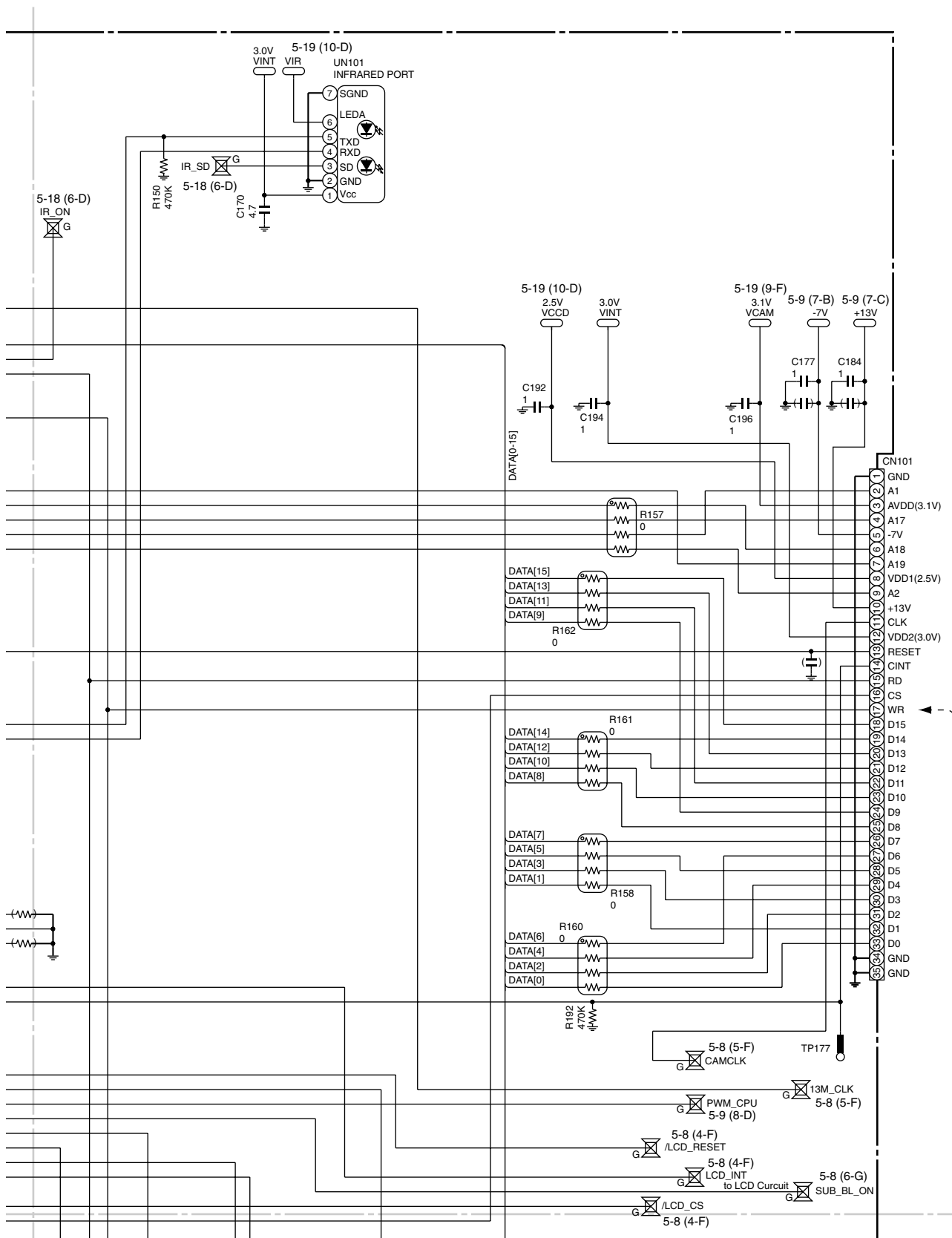
Figure 8 SCHEMATIC DIAGRAM (8/24)

MAIN PWB-A (2/3)



• NOTES ON SCHEMATIC DIAGRAM can be found on page 5-1.

Figure 9 SCHEMATIC DIAGRAM (9/24)



• () : Not Mount

7	8	9	10	11	12
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Figure 10 SCHEMATIC DIAGRAM (10/24)

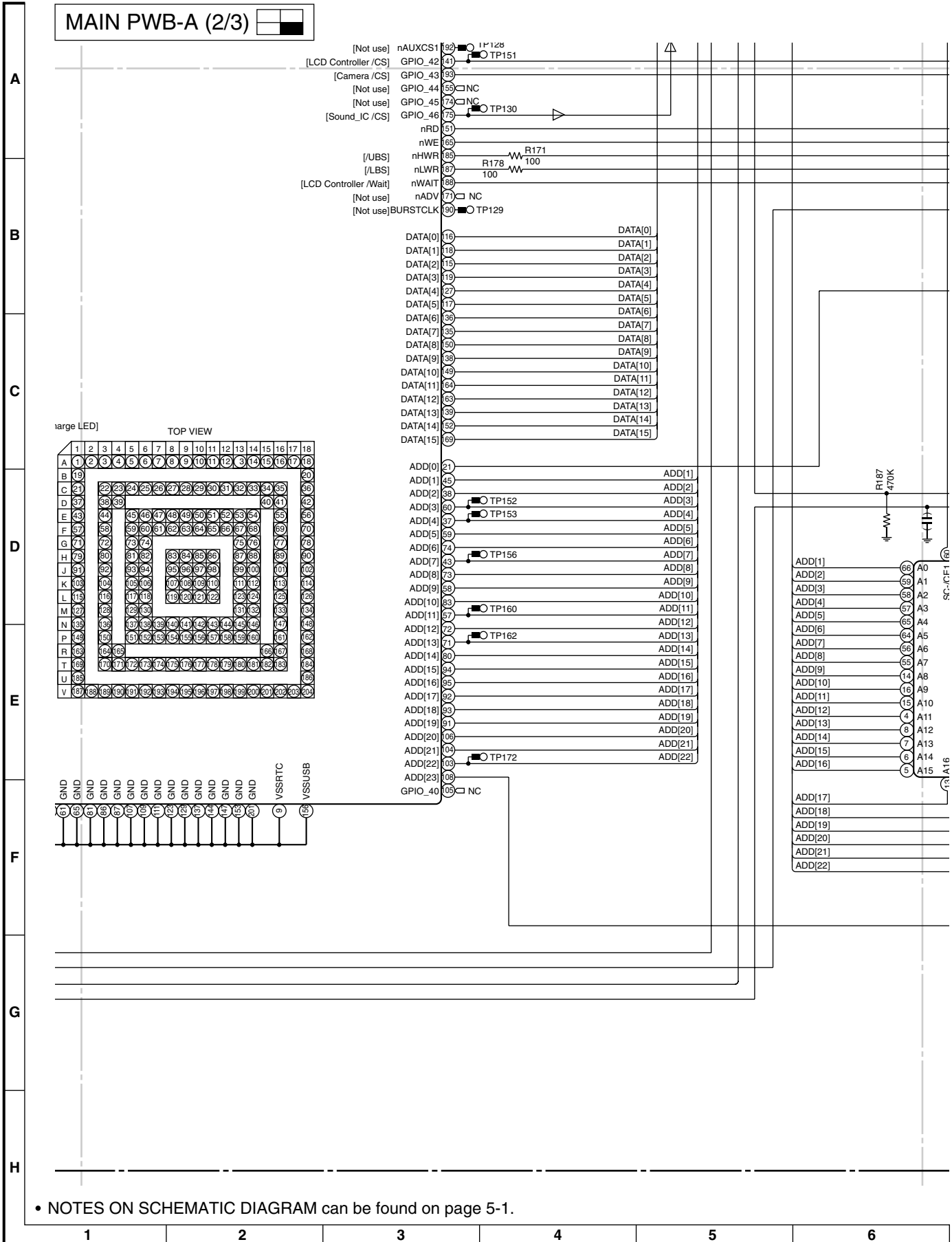
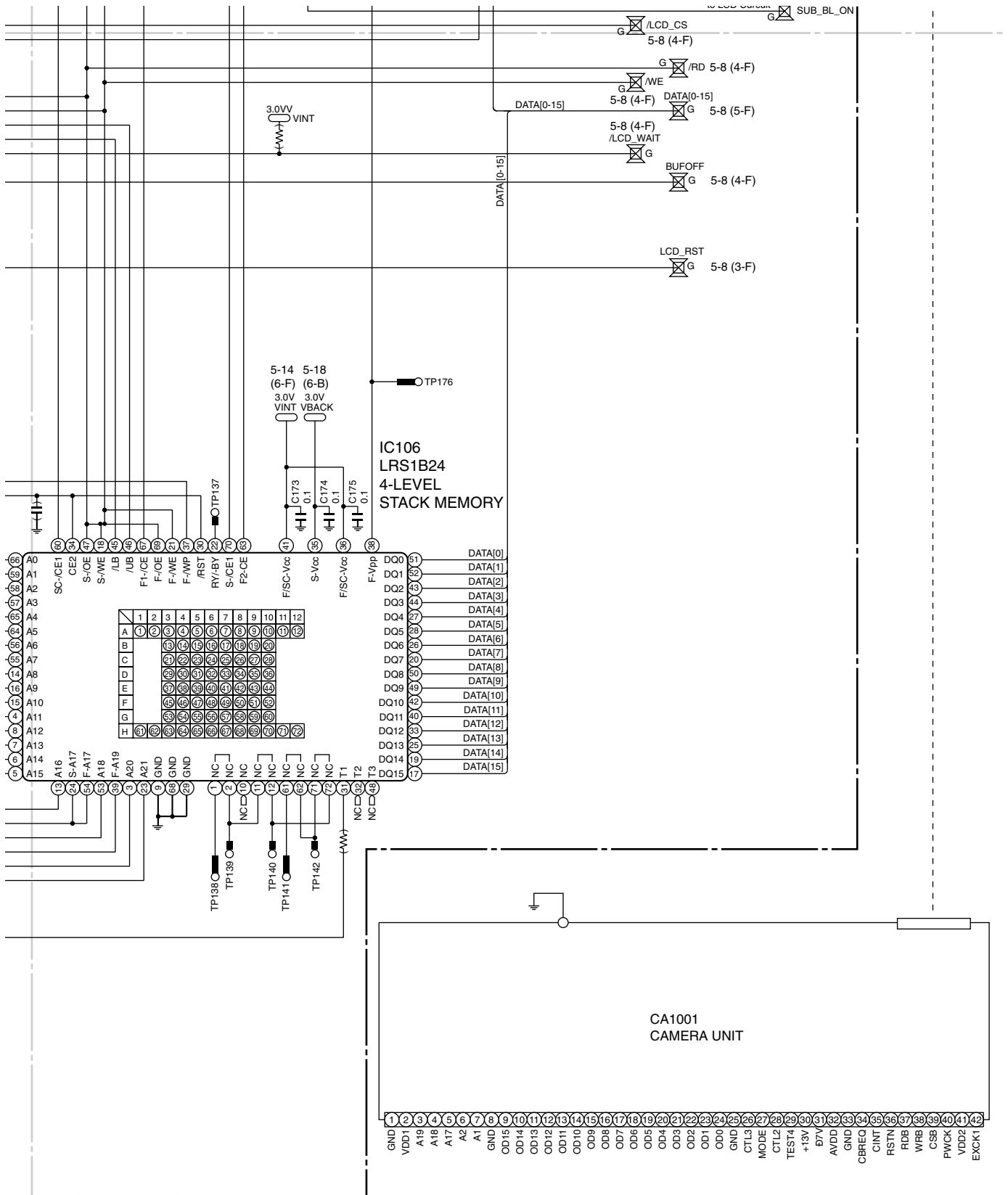


Figure 11 SCHEMATIC DIAGRAM (11/24)



• () : Not Mount

7	8	9	10	11	12
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Figure 12 SCHEMATIC DIAGRAM (12/24)

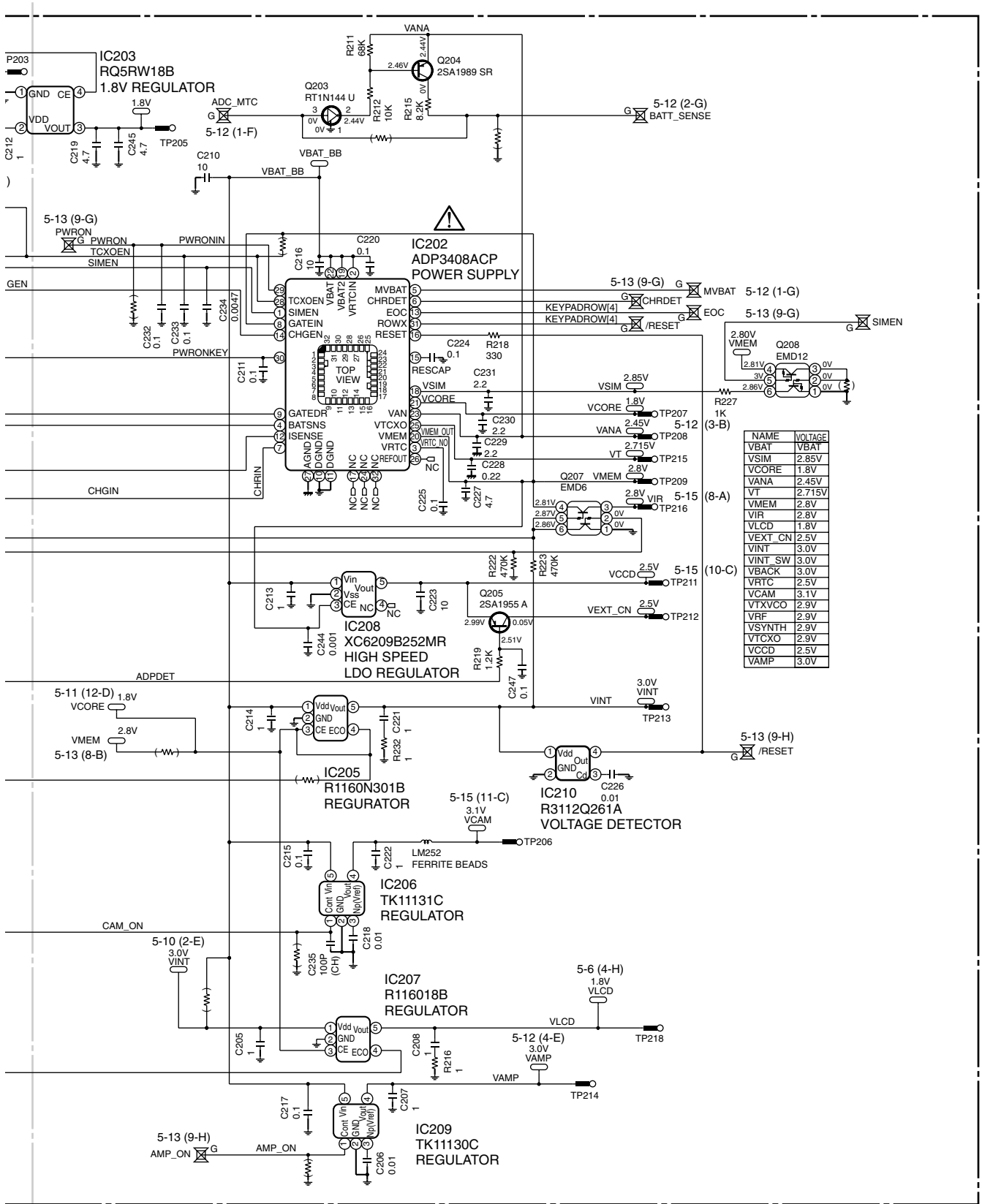


Figure 14 SCHEMATIC DIAGRAM (14/24)

MAIN PWB-A (FRONT SIDE)

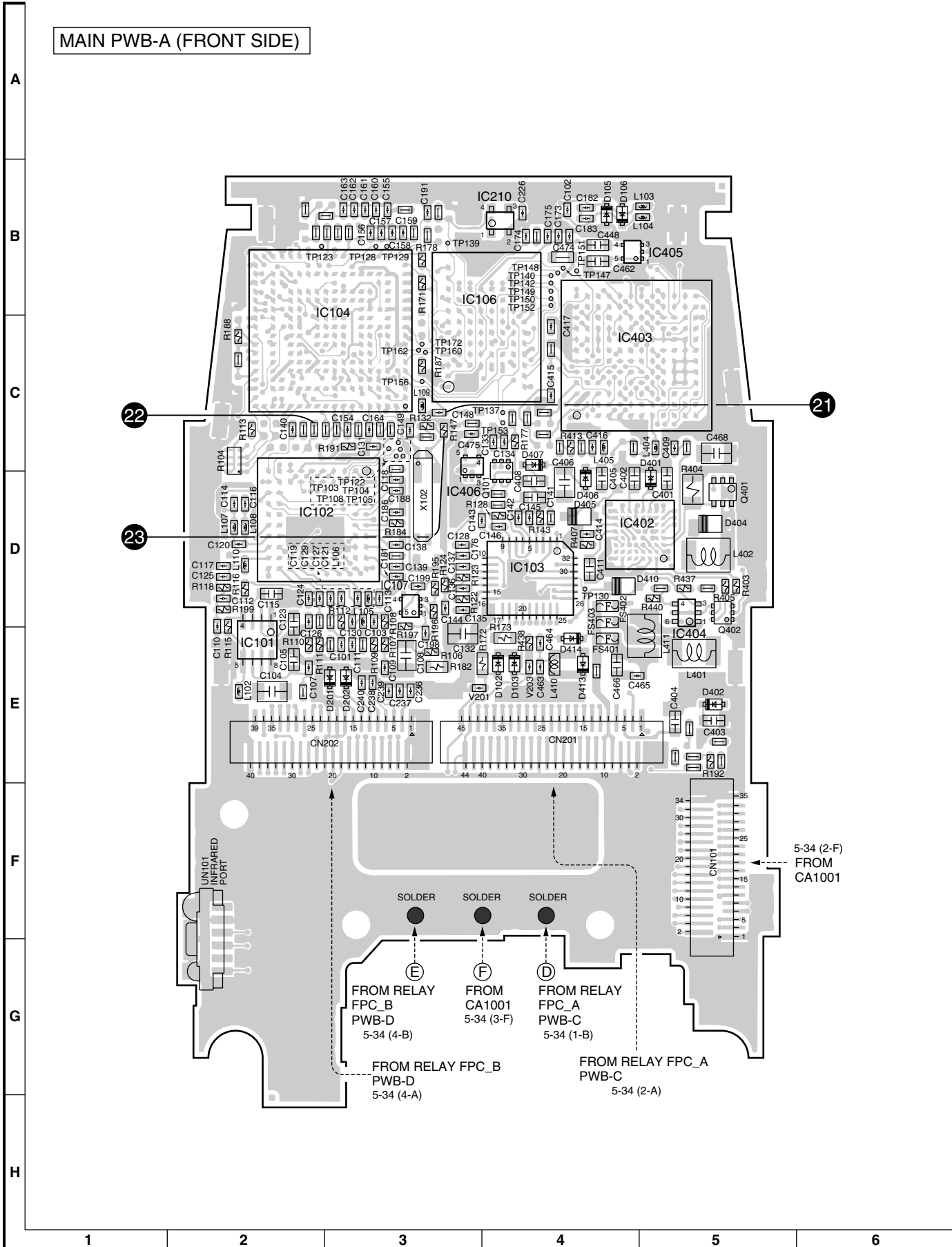
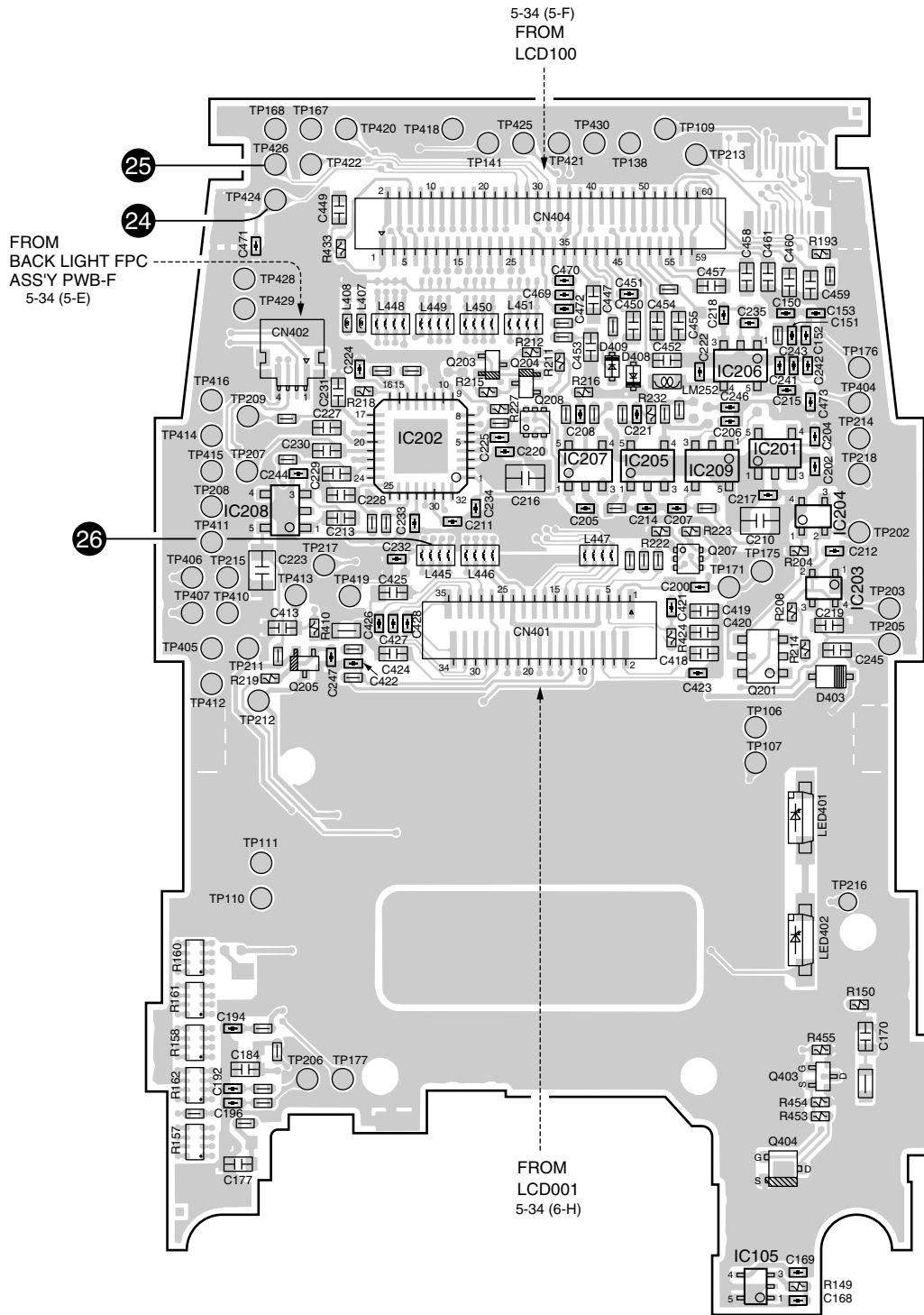


Figure 15 WIRING SIDE OF P.W.BOARD (1/5)

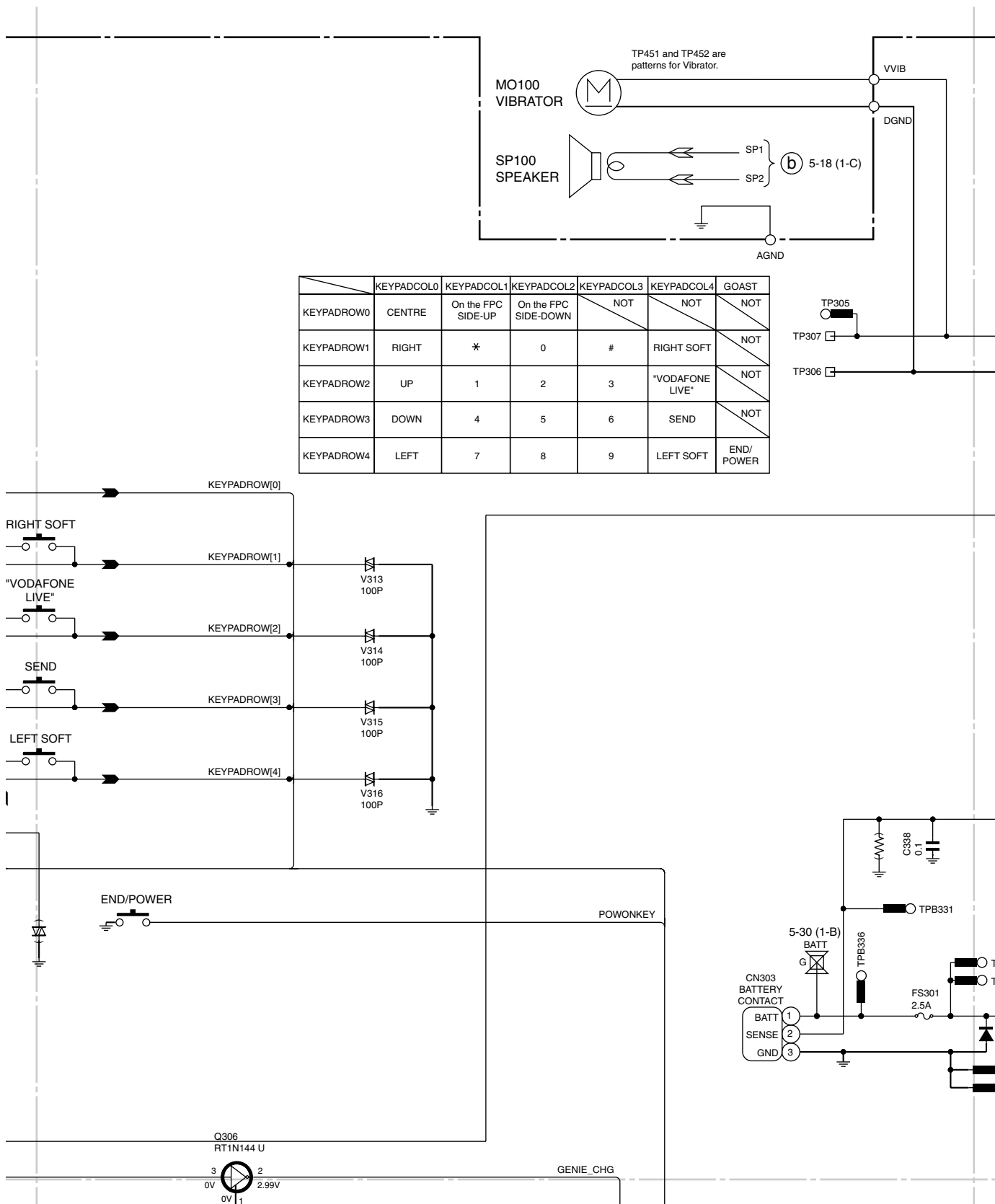
MAIN PWB-A (REAR SIDE)



• The numbers 21 to 26 are waveform numbers shown in pages 5-4 ,5-5.

7	8	9	10	11	12
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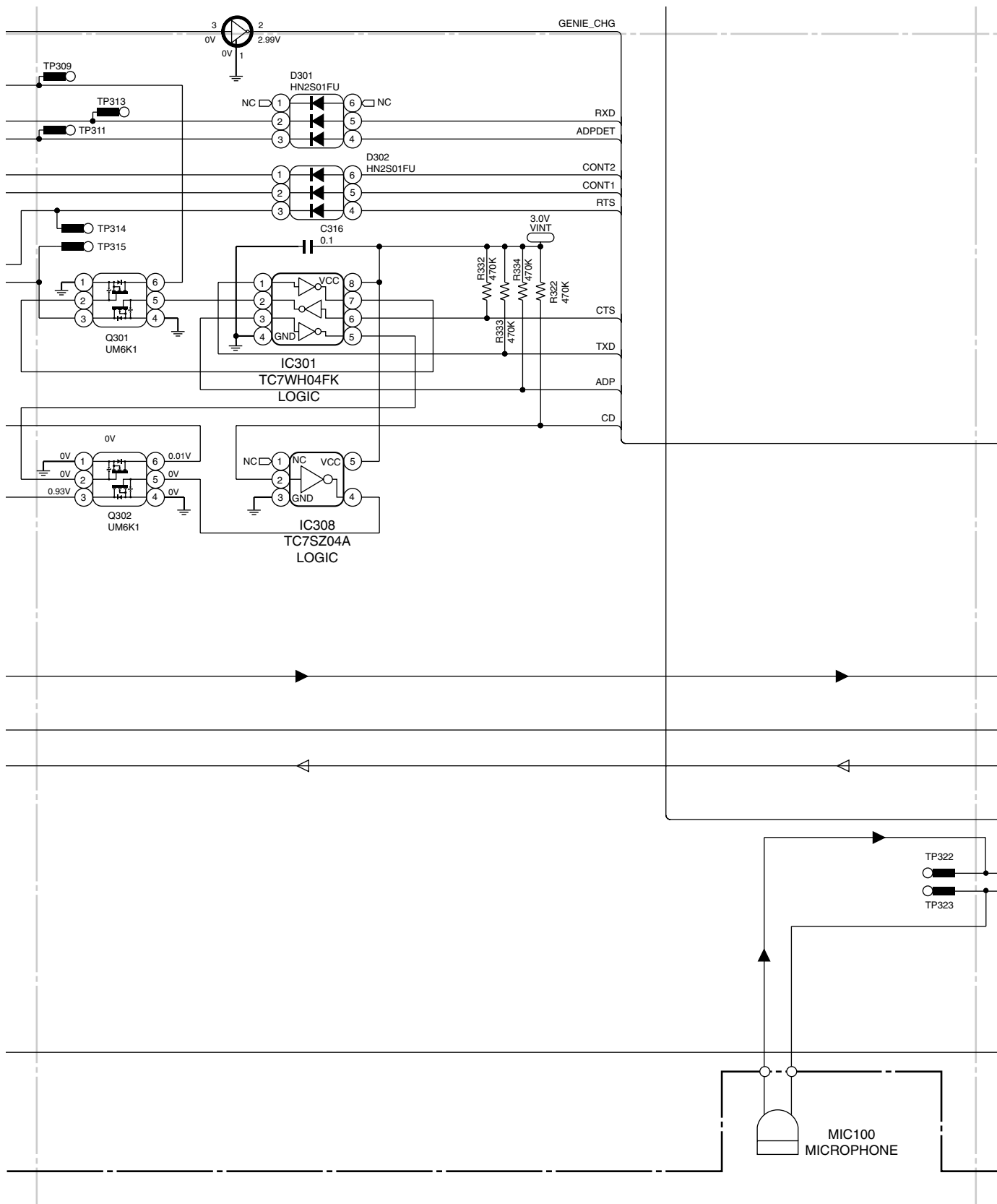
Figure 16 WIRING SIDE OF P.W.BOARD (2/5)



• () : Not Mount

7	8	9	10	11	12
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Figure 18 SCHEMATIC DIAGRAM (16/24)

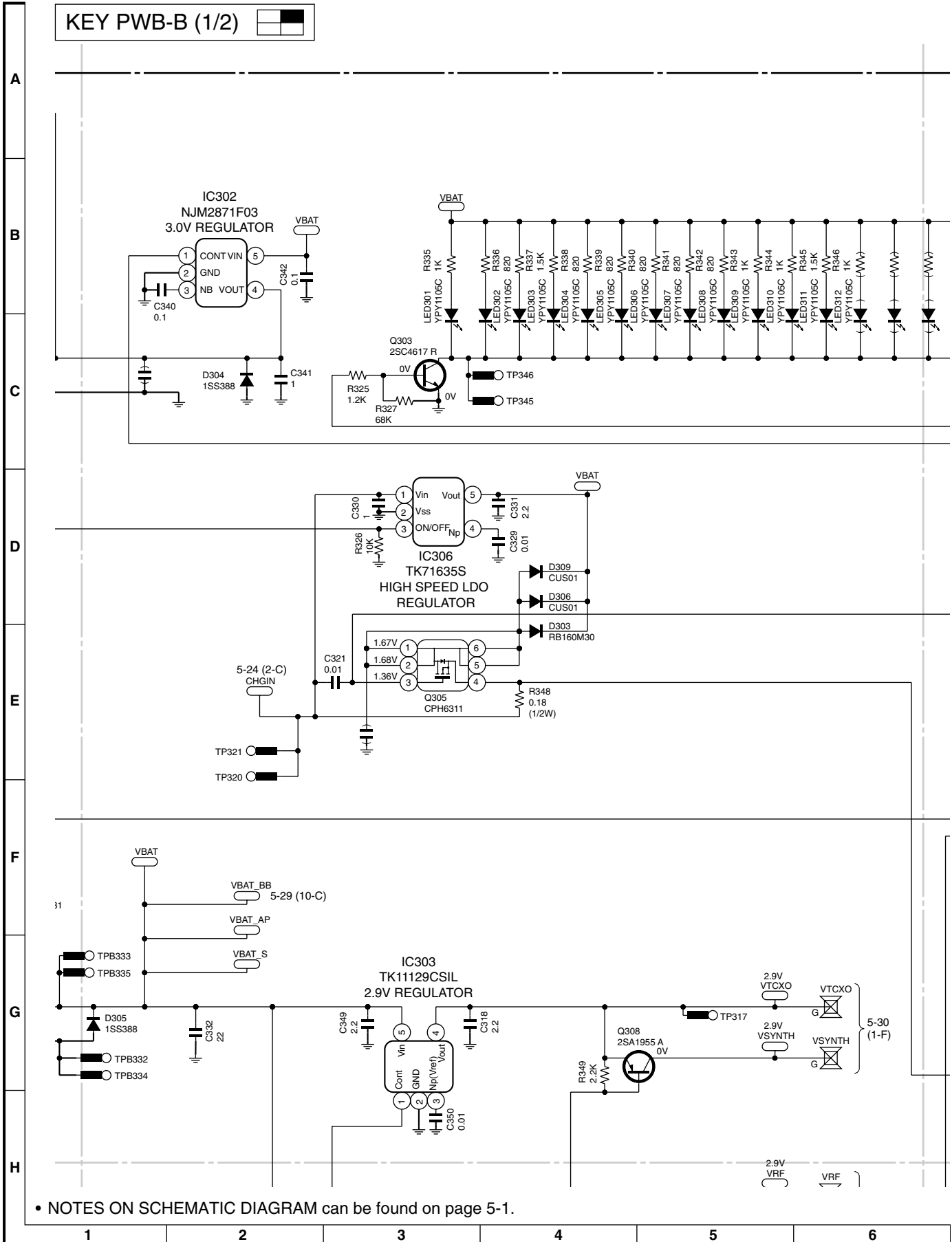


• () : Not Mount

7	8	9	10	11	12
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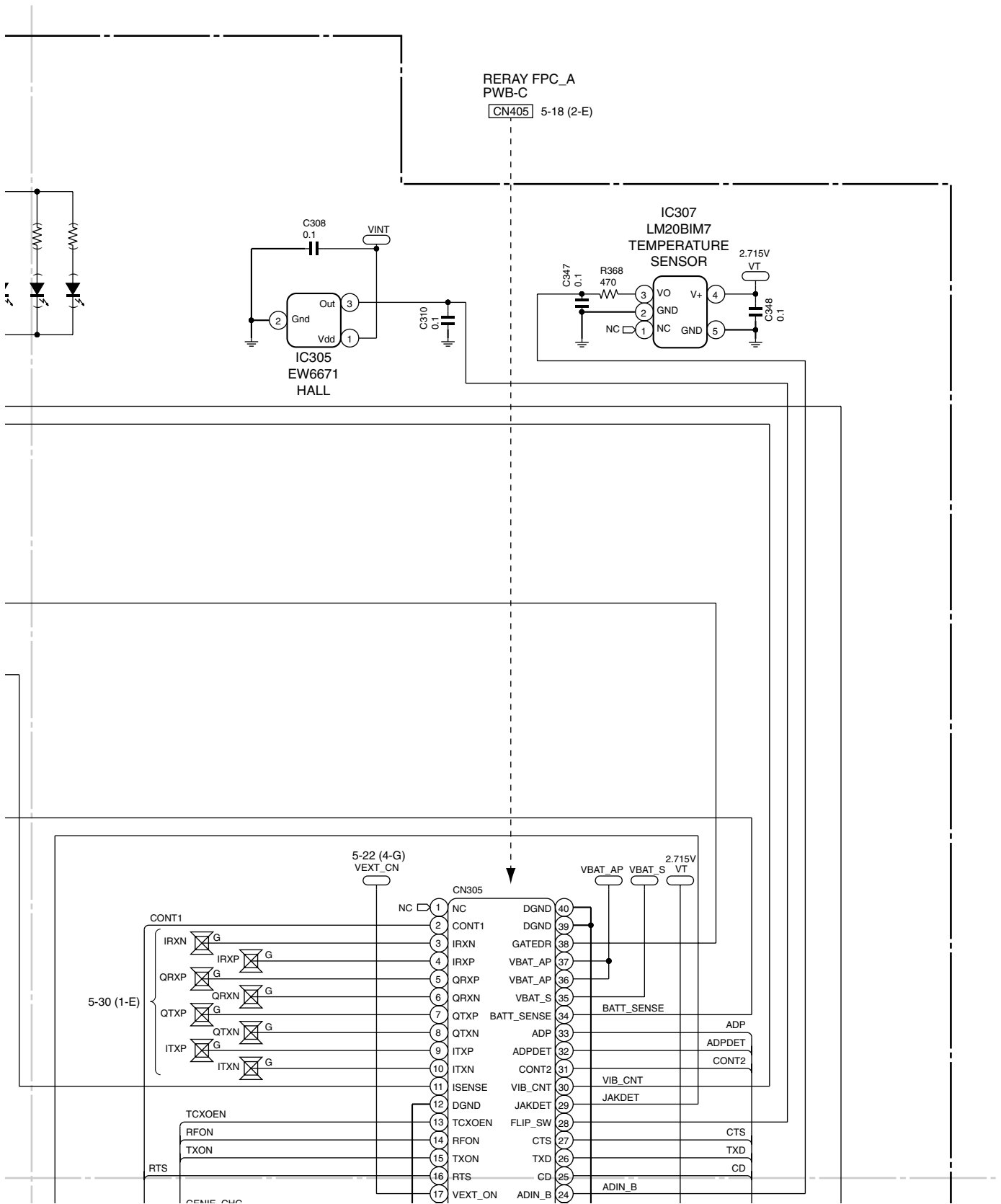
Figure 20 SCHEMATIC DIAGRAM (18/24)

KEY PWB-B (1/2)



• NOTES ON SCHEMATIC DIAGRAM can be found on page 5-1.

Figure 21 SCHEMATIC DIAGRAM (19/24)



• () : Not Mount

7	8	9	10	11	12
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Figure 22 SCHEMATIC DIAGRAM (20/24)

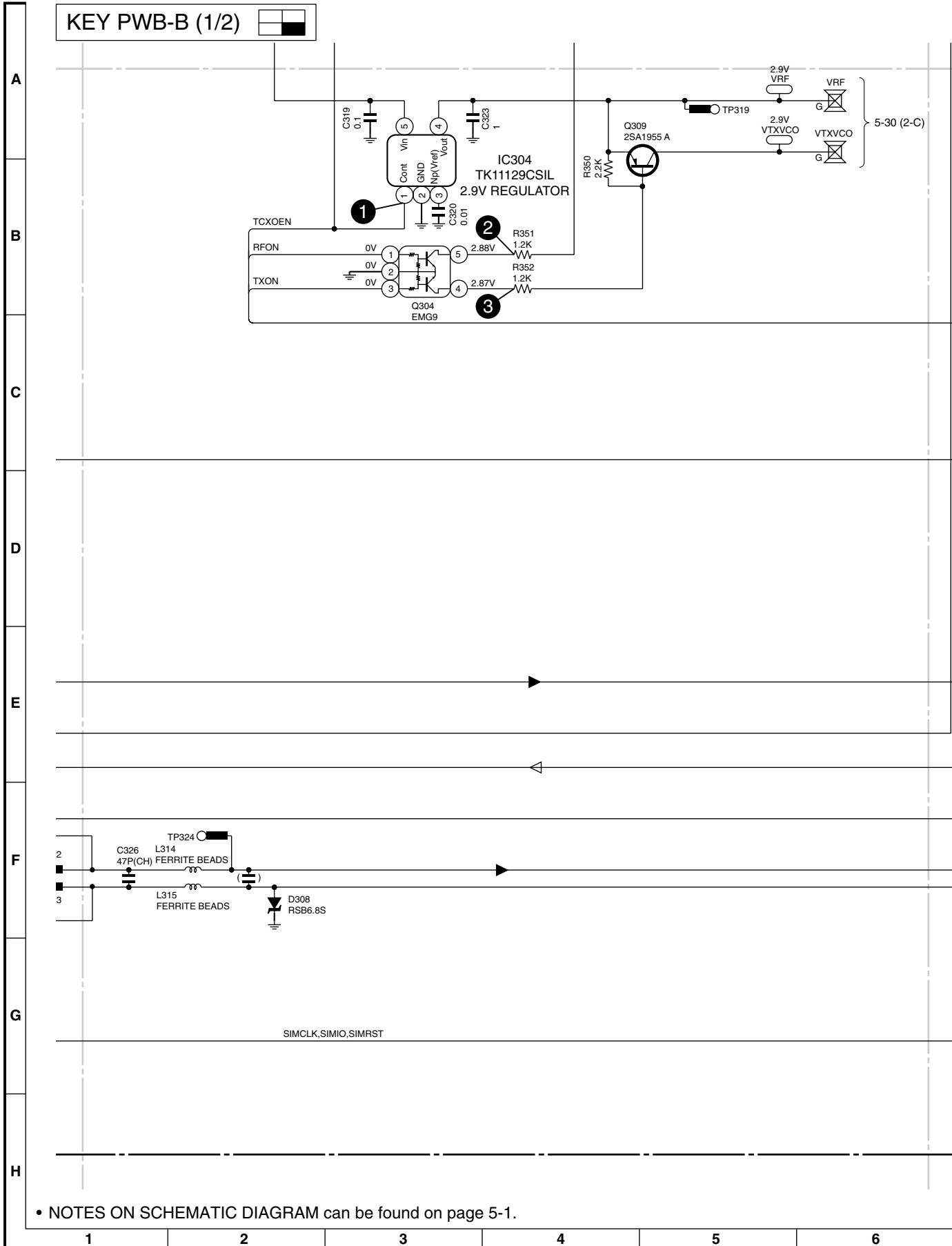
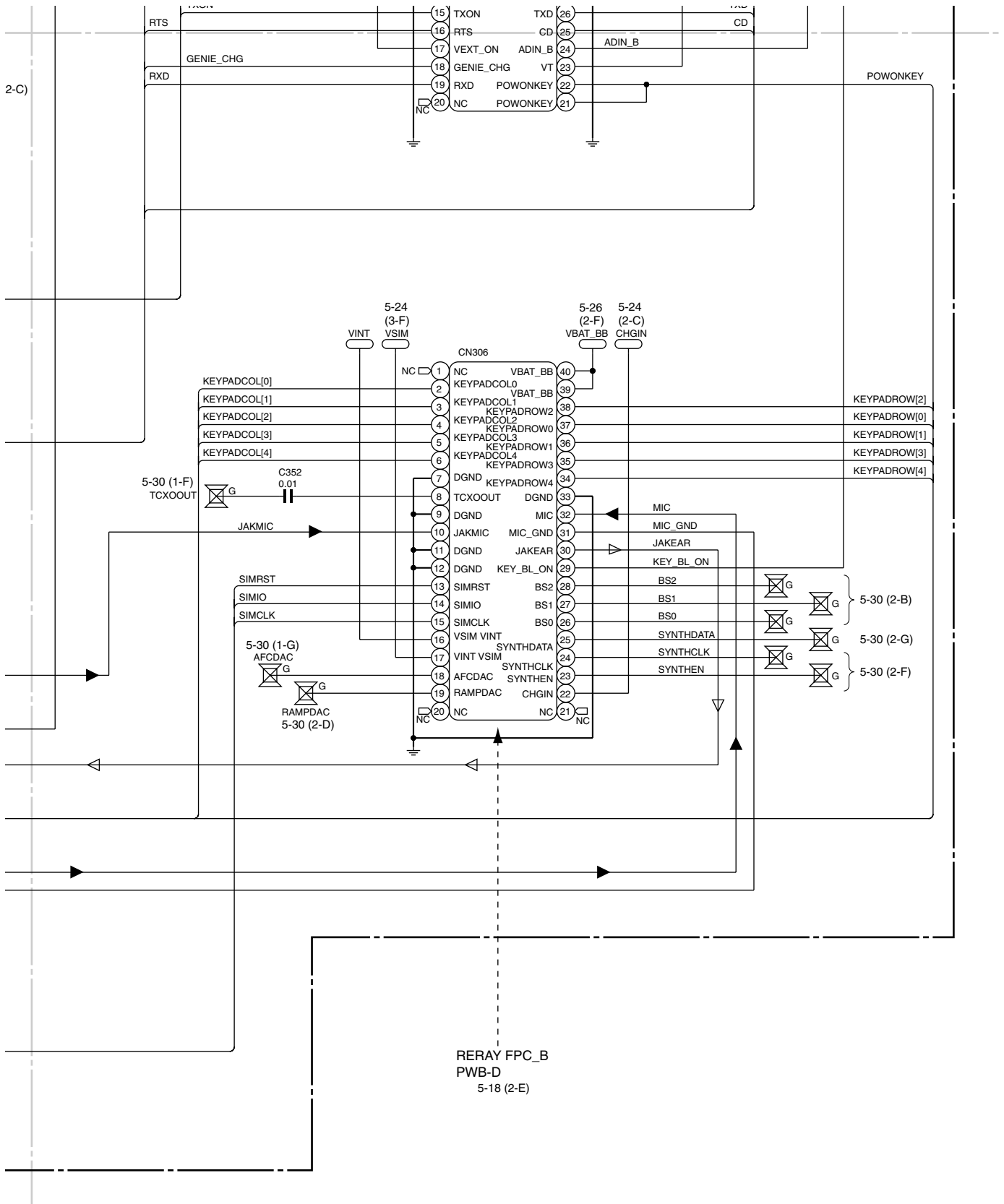


Figure 23 SCHEMATIC DIAGRAM (21/24)



• () : Not Mount

• The numbers 1 to 3 are waveform numbers shown in page 5-2.

7	8	9	10	11	12
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Figure 24 SCHEMATIC DIAGRAM (22/24)

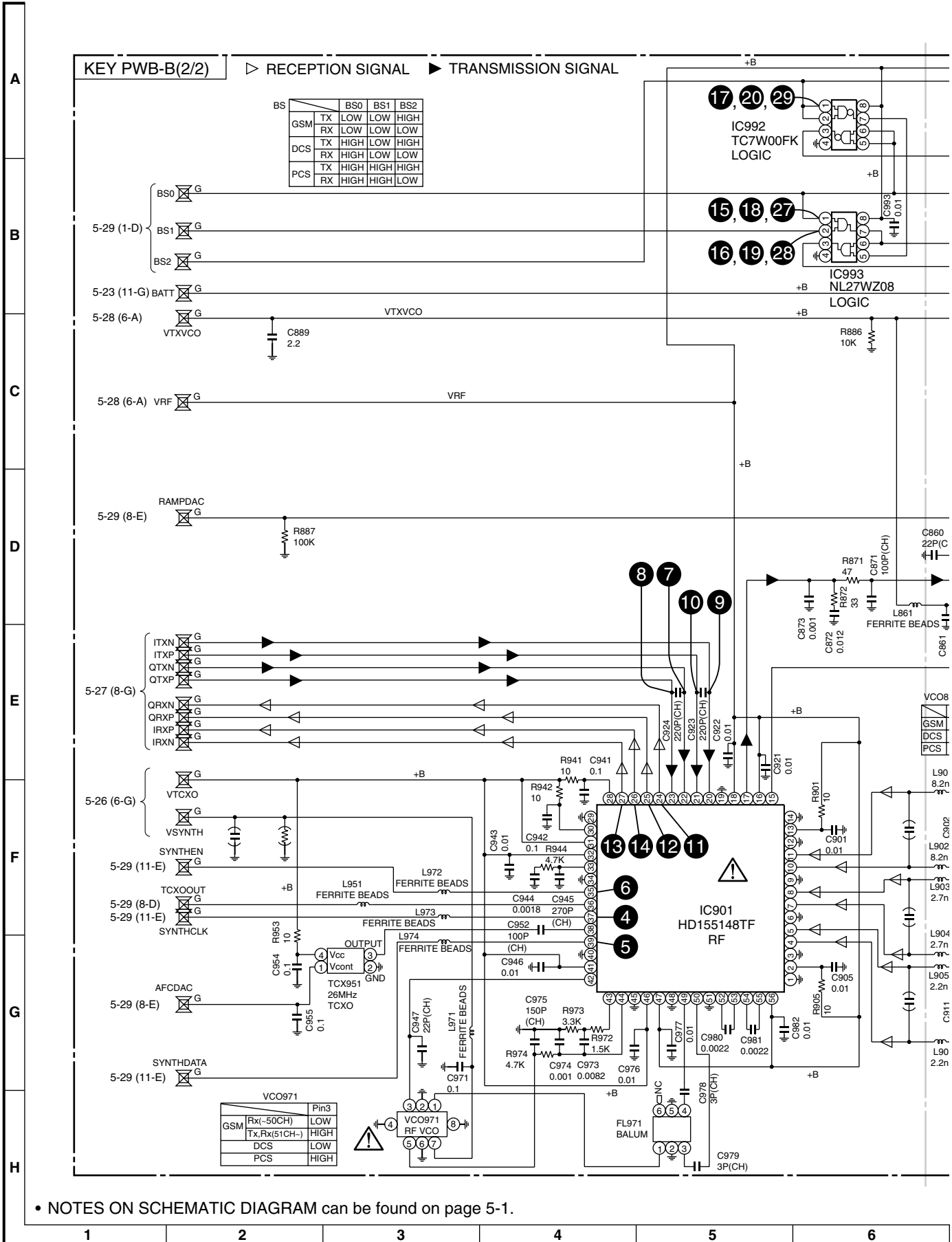
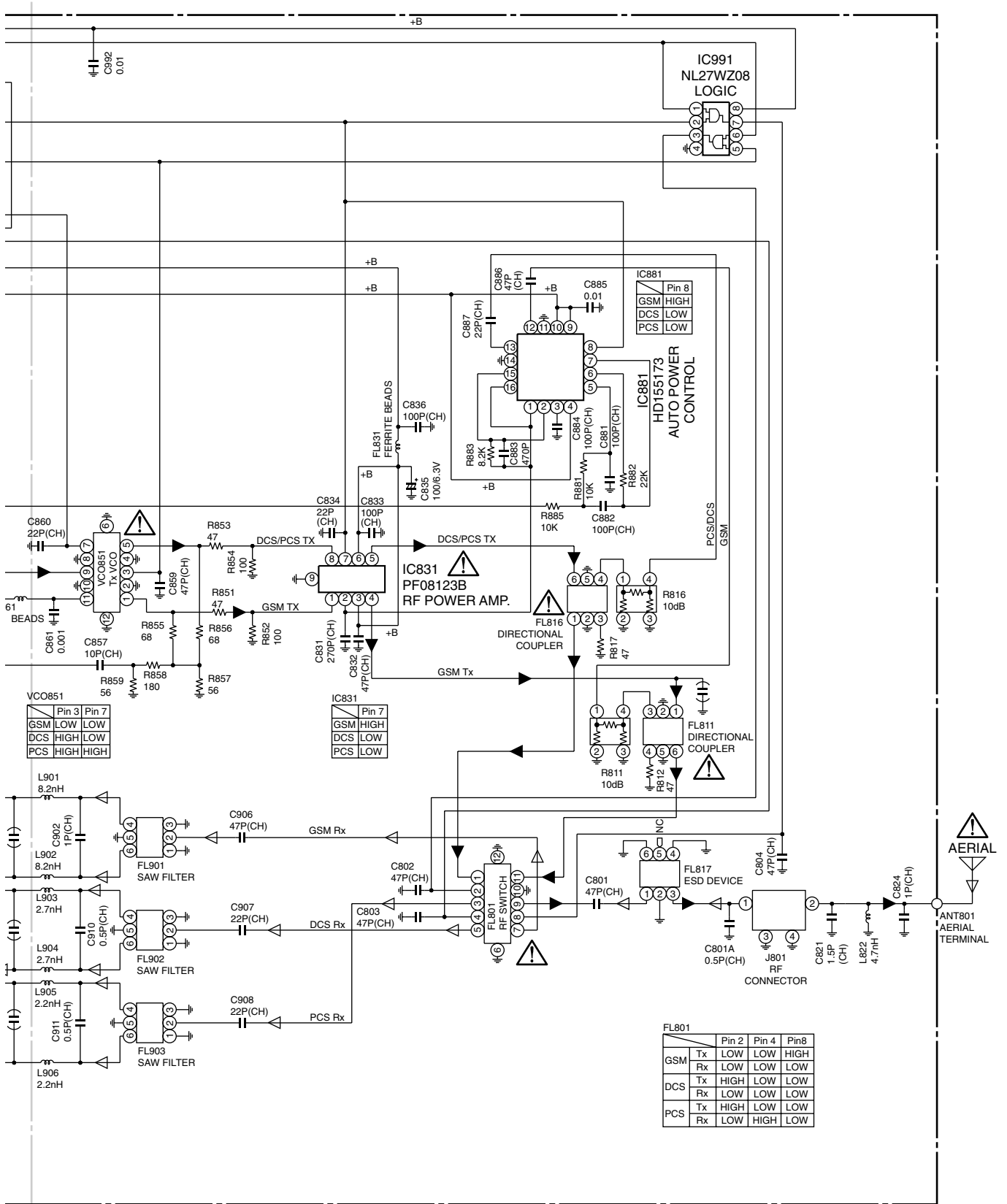


Figure 25 SCHEMATIC DIAGRAM (23/24)



• () : Not Mount

• The numbers 4 to 20 are waveform numbers shown in pages 5-2, 5-3, 5-4.

7	8	9	10	11	12
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Figure 26 SCHEMATIC DIAGRAM (24/24)

KEY PWB-B (FRONT SIDE)

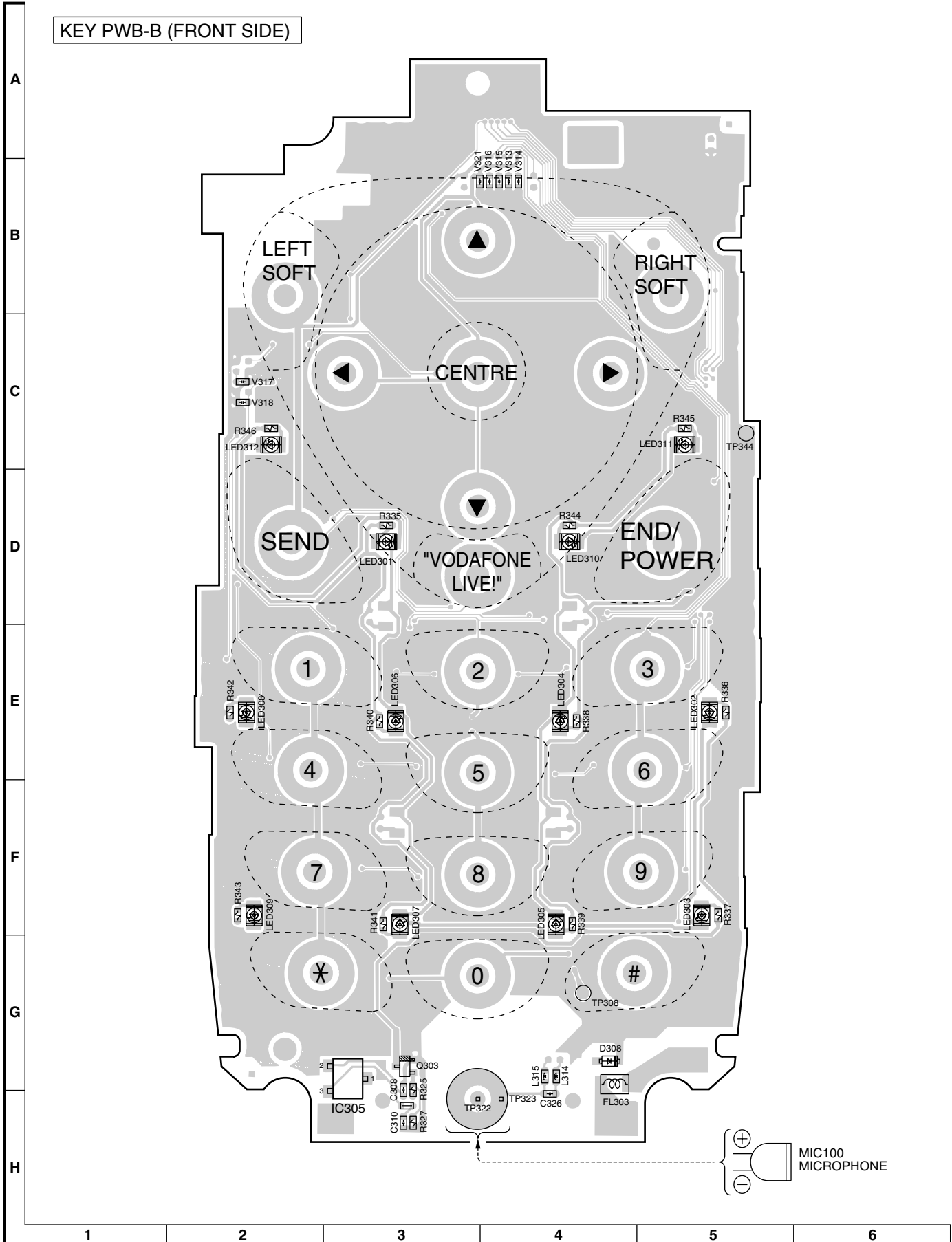


Figure 27 WIRING SIDE OF P.W.BOARD (3/5)

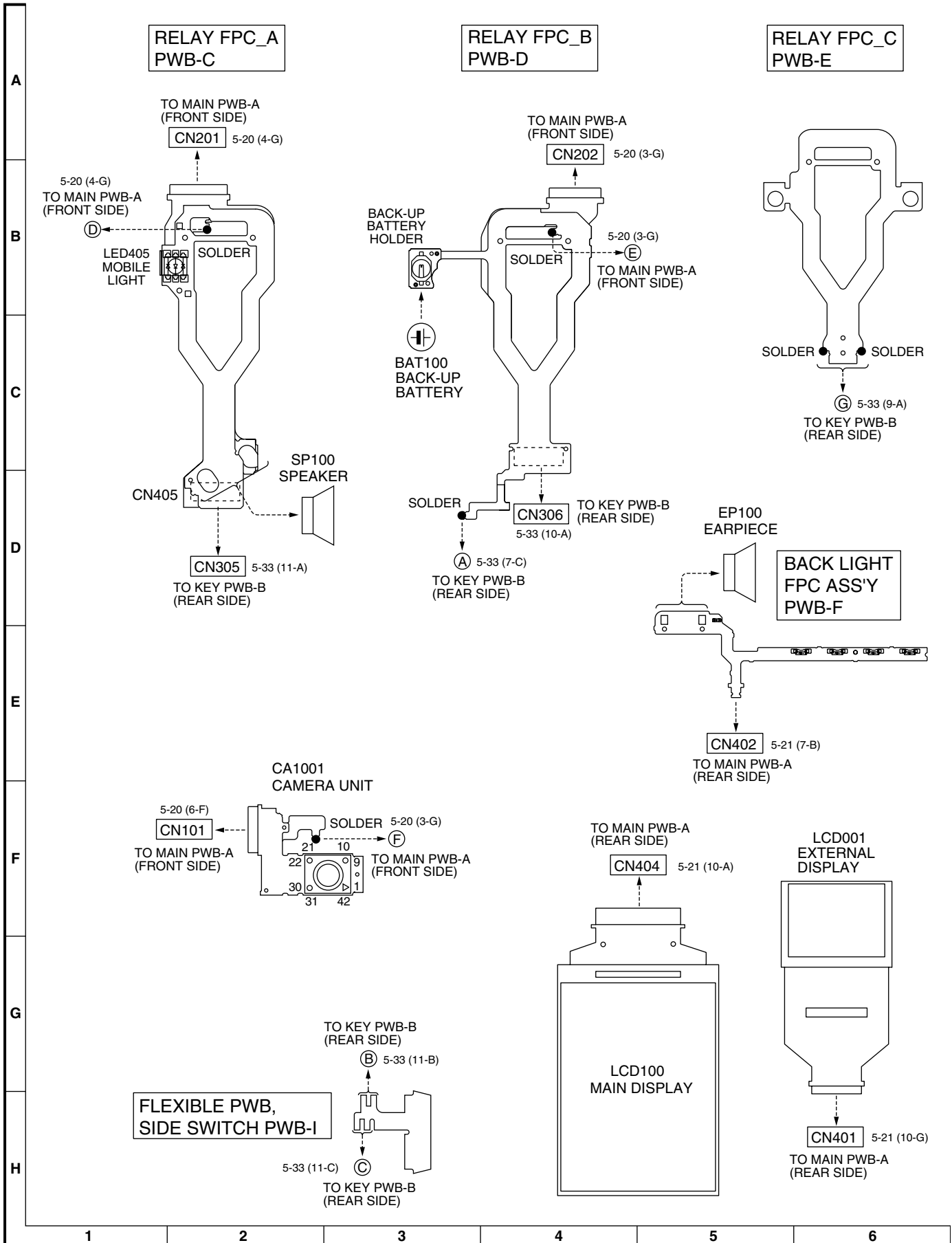


Figure 29 WIRING SIDE OF P.W.BOARD (5/5)

A	IC831		IC901		IC991	
	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
	1	0V	1	0V	1	0V
	2	0.19V	2	2.94V	2	0V
	3	3.89V	3	0V	3	2.94V
	4	0V	4	0V	4	0V
	5	0V	5	0V	5	0V
	6	3.89V	6	0V	6	0V
	7	2.95V	7	0V	7	2.94V
B	8	0V	8	0V	8	2.94V
	9	0V	9	0V		
	IC881		10	0.14V	IC992	
	PIN NO.	VOLTAGE	11	0.14V	PIN NO.	VOLTAGE
	1	0.19V	12	0V	1	0V
	2	0.24V	13	2.94V	2	0V
	3	0.24V	14	0V	3	0V
	4	1.3V	15	0.41V	4	0V
	5	0.24V	16	2.95V	5	2.94V
C	6	0.24V	17	0.21V	6	0V
	7	0.24V	18	2.95V	7	0V
	8	2.95V	19	0V	8	2.94V
	9	1.3V	20	0.5V		
	10	1.3V	21	0.5V	IC993	
	11	0V	22	0.5V	PIN NO.	VOLTAGE
	12	1.23V	23	0.5V	1	0V
	13	1.3V	24	0.5V	2	2.94V
	14	0V	25	0.5V	3	0V
D	15	0.24V	26	0.5V	4	0V
	16	0.19V	27	0.5V	5	0V
			28	2.89V	6	0V
			29	0V	7	0V
			30	2.89V	8	2.94V
			31	2.89V		
			32	2.89V		
			33	1.57V		
			34	0V		
E			35	0V		
			36	0V		
			37	0V		
			38	0V		
			39	0V		
			40	0V		
			41	2.9V		
			42	2.75V		
			43	0V		
F			44	1.25V		
			45	0V		
			46	2.9V		
			47	2.95V		
			48	0V		
			49	0.73V		
			50	0.73V		
			51	0V		
			52	2.74V		
G			53	2.74V		
			54	2.74V		
			55	2.74V		
			56	2.95V		
H						

• NOTES ON SCHEMATIC DIAGRAM can be found on page 5-1.

1

2

3

4

5

6

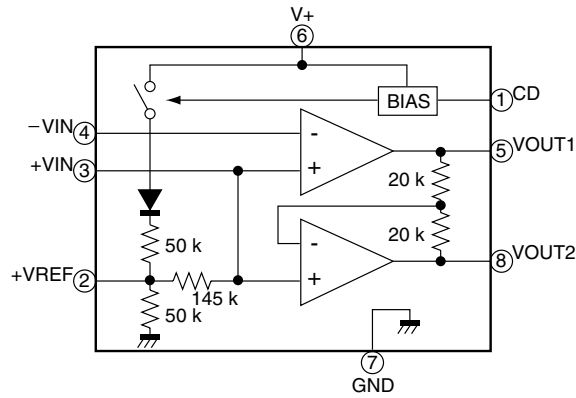
CHAPTER 6. OTHERS

[1] Function table of IC

IC101 VHINJM2149R-1+ (NJM2149R): SPEAKER AMP.

Pin No.	Terminal name	Input/Output	Description of terminal
1	CD	Input	Chip disable control terminal
2	VREF	Input	Reference voltage terminal
3	+VIN	Input	Analog input terminal
4	-VIN	Input	Analog input terminal
5	Vout1	Output	Analog output terminal
6	V+	Input	Power supply +3V
7	GND	-	Ground
8*	VOUT2	-	Not used

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



IC102 (AD6521ACA): ANALOG BASEBAND

Pin No.	Terminal name	Input/Output	Description of terminal
1	DVDD1	–	Digital core power supply (1.6V AVDD1/2)
2	DGND1	–	Digital ground
3*	IDACREF	Output	Current DAC bias resistor connection, rset
4	AUXADC4	Input	Auxiliary A/D converter input 4 (MVBAT)
5	AUXADC2	Input	Auxiliary A/D converter input 2 (Camera thermal sensor)
6	AUXADC1	Input	Auxiliary A/D converter input 1 (Jack detection)
7	REFOUT	Input/Output	Buffered reference output/external bias voltage input
8	REFCAP	Output	Reference filter capacitor connection
9	AVDD2	–	Auxiliary analog power supply (2.4V to 2.6V)
10	AFCDAC	Output	Automatic frequency control signal output
11	TDO	Output	Test data output
12	TDI	Input	Test data input
13	AGND4	–	Analog substrate ground
14*	IDACOUT	Output	Current DAC output for battery charging
15	AUXADC3	Input	Auxiliary A/D converter Input 3 (Battery sense)
16	AUXADC5	Input	Auxiliary A/D converter Input 5 (Battery thermal sensor)
17	AUXADC6	Input	Auxiliary A/D converter Input 6
18	AGND2	–	Auxiliary analog ground
19*	NC (REFCAP2)	Output	Reserved for reference filter capacitor
20	QRXN	Input	Differential analog input for quadrature receive signal
21	TCK	Input	Test clock
22	TMS	Input	Test mode select
23	QTXN	Output	Differential analog output for quadrature transmit signal
24	QRXP	Input	Differential analog input for quadrature receive signal
25	VSDO	Output	Voiceband serial port data output
26	VSFS	Output	Voiceband serial port input/output framing signal
27	QTXP	Output	Differential analog output for quadrature transmit signal
28	IRXN	Input	Differential analog input for in-phase receive signal
29	VSDI	Input	Voiceband serial port data input
30	BSOFS	Output	Baseband serial port output framing signal
31	ITXN	Output	Differential analog output for in-phase transmit signal
32	IRXP	Input	Differential analog input for in-phase receive signal
33	BSDO	Output	Baseband serial port data output
34	BSIFS	Output	Baseband serial port input framing signal
35	ITXP	Output	Differential analog output for in-phase transmit signal
36	AVDD1	–	Baseband Analog Power Supply (2.4V to 2.6V)
37	DVDD2	–	Digital Interface Power Supply (The greater of DVDD1 or DVDD3 or AVDD3-0.2V, to maximum 3.3V)
38	BSDI	Input	Baseband serial port data input
39	AGND1	–	Baseband analog ground
40	VINAUXN	Input	Differential voiceband auxiliary input
41	ASDI	Input	Auxiliary serial port data input
42	ASFS	Input	Auxiliary serial port input/output framing signal
43	RAMPDAC	Output	Power ramping control signal output
44	VINAUXP	Input	Differential voiceband auxiliary input (Jack mic audio input)
45	ASDO	Output	Auxiliary serial port data output
46	MCLK	Input	Master clock input
47	ARSM	Input	Advance baseband receive state machine
48	RXON	Input	Baseband receive section power-on input
49	DGND3	–	Digital ground
50*	BUZZER	Output	Buzzer output
51	AGND3	–	Voiceband analog ground
52	AVDD3	–	Voiceband analog power supply (2.4 V to 2.7 V)
53*	NC (MICCAP)	Output	Reserved for microphone
54	VINNORP	Input	Differential voiceband normal input (Mic audio input)
55	RESET	Input	Active low reset signal input
56	MCLKEN	Output	Master clock enable
57	ATSM	Input	Advance baseband transmit state machine
58	TXON	Input	Baseband transmit section power-on input
59	DVDD3	–	Digital core power supply (1.6 V to AVDD1/2)
60	VOUTAUXN	Output	Differential voiceband auxiliary output
61	VOUYNORN	Output	Differential voiceband normal output (Earpiece audio output)
62	VOUYNORP	Output	Differential voiceband normal output (Earpiece audio output)

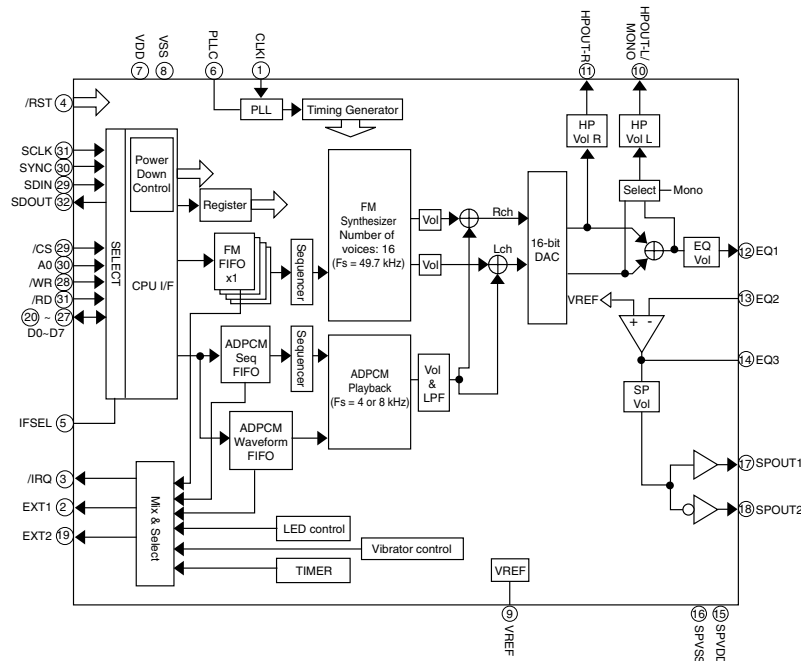
Pin No.	Terminal name	Input/Output	Description of terminal
63	VOUTAUXP	Output	Differential voiceband auxiliary output (Jack Earpiece audio output)
64	VINNORN	Input	Differential voiceband normal input

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

IC103 VHIYMU759B+1FL (YMU759B): SOUND

Pin No.	Terminal name	Input/Output	Description of terminal
1	CLKI	Input	Clock input terminal (2 – 20 MHz)
2	EXT1	Output	External control terminal 1
3	/IRQ	Output	Interrupt output terminal
4	/RST	Input	Hardware reset input terminal
5	IFSEL	Input	CPU I/F select; L: serial I/F, H: parallel I/F
6	PLLC	–	Built-in PLL capacitor terminal
7	VDD	–	Power supply
8	VSS	–	Ground
9	VREF	–	Analog reference voltage terminal
10	HPOUT-L/MONO	Output	Headphone output Lch
11*	HPOUT-R	Output	Headphone output Rch
12	EQ1	–	Equalizer terminal 1
13	EQ2	–	Equalizer terminal 2
14	EQ3	–	Equalizer terminal 3
15	SPVDD	–	Analog power supply for speaker amplifier (Typ + 3.6 V)
16	SPVSS	–	Analog ground for speaker amplifier
17	SPOUT1	Output	Speaker terminal 1
18	SPOUT2	Output	Speaker terminal 2
19	EXT2	Output	External control terminal 2
20	D7	Input/Output	Parallel I/F data bus 7
21	D6	Input/Output	Parallel I/F data bus 6
22	D5	Input/Output	Parallel I/F data bus 5
23	D4	Input/Output	Parallel I/F data bus 4 (Not connected when IFSEL terminal at L)
24	D3	Input/Output	Parallel I/F data bus 3 (Not connected when IFSEL terminal at L)
25	D2	Input/Output	Parallel I/F data bus 2 (Not connected when IFSEL terminal at L)
26	D1	Input/Output	Parallel I/F data bus 1 (Not connected when IFSEL terminal at L)
27	D0	Input/Output	Parallel I/F data bus 0 (Not connected when IFSEL terminal at L)
28	/WR	Input	Parallel I/F write pulse (Not connected when IFSEL terminal at L)
29	SDIN (/CS)	Input	IFSEL terminal = L serial I/F data input IFSEL terminal = H parallel I/F chip select input
30	SYNC (A0)	Input	IFSEL terminal = L serial I/F data read signal IFSEL terminal = H parallel I/F address signal
31	SCLK (/RD)	Input	IFSEL terminal = L serial I/F bit clock input IFSEL terminal = H parallel I/F read pulse
32*	SDOUT	Output	Serial I/F data output (external pull-up resistor required)

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



IC104 (AD6529): DIGITAL BASEBAND

Pin No.	Terminal name	Input/Output	Description of terminal
1	ASDO	Output	Audio serial port data output
2	BSDI	Input	Baseband serial port data input
3	BSOFS	Input	Baseband serial port output framing signal
4	GPIO_48	Input/Output	ABB_IRQ
5	VINT	–	AD6535 interface power supply 1.7V to 3.3V
6	GPO_29	Output	ABB_RESET
7	GPO_05	Output	ASM (Typhoon)
8	VDDRTC	–	RTC power supply 1.2V to 2.0V
9	VSSRTC	–	RTC power supply return
10*	MC_DAT[0]	Input/Output	MC_DAT[0]
11*	GPIO_22	Input/Output	MC_WR_Protect
12	GPIO_56	Input	Boot control [0]
13	KEYPADCOL[4]	Input/Output	KEYPADCOL [4]
14	KEYPADCOL[1]	Input/Output	KEYPADCOL [1]
15	KEYPADROW[4]	Input	KEYPADROW [4]
16	KEYPADROW[2]	Input	KEYPADROW [2]
17	GPIO_38	Input/Output	Camera IRQ
18	GPIO_36	Input/Output	GPIO_36 Serial display
19	ASDI	Input	Audio serial port data input
20	GPIO_35	Input/Output	SD card detect
21	ADD[0]	Output	Display_A0
22	ASFS	Input	Audio serial port framing signal (Optional)
23	BSIFS	Input/Output	Baseband serial port input framing signal
24	BSDO	Output	Baseband serial port data output
25	CSDI	Input	Control serial port data input
26	GPO_06	Output	ATSM
27	GPO_00	Output	Rx_On
28	OSCOUT	Output	32.768 kHz oscillator output and feedback to crystal
29*	MC_DAT[2]	Input/Output	MC_DAT [2]
30	VMC	–	Multimedia card interface supply 1.7V to 3.3V
31	VCC	–	Core power supply voltage 1.7V to 1.9V
32	KEYPADCOL[3]	Input/Output	KEYPADCOL [3]
33	KEYPADCOL[2]	Input/Output	KEYPADCOL [2]
34	GPIO_39	Input/Output	Buzzer
35	GPIO_37	Input/Output	Sound IC IRQ
36	GPIO_34	Input/Output	Bluetooth Tx
37	ADD[4]	Output	Processor address bus
38	ADD[2]	Output	Processor address bus
39	GND	–	Ground
40	KEYPADROW[0]	Input	KEYPADROW [0]
41	VEXT	–	External device power supply 2.4V to 3.3V
42	GPO_23	Input/Output	Display back light 1
43	ADD[7]	Output	Processor address bus
44	VMEM	–	Memory power supply 2.7V to 3.3V memory support
45	ADD[1]	Output	Processor address bus
46	CSDO	Output	Control serial port data output
47	CLKOUT_GATE	Input	Hardware CLKOUT on/off switching
48	GPO_01	Output	Tx_On
49	OSCIN	Input	32.768 kHz crystal input inverted (GND if no crystal)
50*	MC_CMD	Input/Output	MC_CMD
51	GPIO_55	Input	Boot control [1]
52	GND	–	Ground
53	KEYPADROW[3]	Input	KEYPADROW [3]
54	KEYPADROW[1]	Input	KEYPADROW [1]
55	GPIO_33	Input/Output	Bluetooth Rx
56	GPIO_17	Input/Output	Serial display DI/DO
57	ADD[11]	Output	Processor address bus
58	ADD[9]	Output	Processor address bus
59	ADD[5]	Output	Processor address bus
60	ADD[3]	Output	Processor address bus
61	GND	–	Ground
62	VCC	–	Core power supply voltage 1.7V to 1.9V
63	PWRON	Output	Power on/off control

Pin No.	Terminal name	Input/Output	Description of terminal
64*	MC_DAT[1]	Input/Output	MC_DAT [1]
65	GND	–	Ground
66	VEXT	–	External device power supply 2.4V to 3.3V
67	KEYPADCOL[0]	Input/Output	KEYPADCOL [0]
68	VEXT	–	External device power supply 2.4V to 3.3V
69	GPIO_15	Input/Output	Serial display A0
70	GPIO_16	Input/Output	Serial display EN
71	ADD[13]	Output	Processor address bus
72	ADD[12]	Output	Processor address bus
73	ADD[8]	Output	Processor address bus
74	ADD[6]	Output	Processor address bus
75	GPO_22	Input/Output	Keypad back light
76	GPIO_14	Input/Output	Serial display CLK
77	GPIO_10	Input/Output	Flip-switch detect
78	GPIO_12	Input/Output	Display back light 2
79	VMEM	–	Memory power supply 2.7V to 3.3V memory support
80	ADD[14]	Output	Processor address bus
81	GND	–	Ground
82	VCC	–	Core power supply voltage 1.7V to 1.9V
83	ADD[10]	Output	Processor address bus
84	CLKOUT	Input/Output	Clock output to ABB
85*	MC_DAT[3]	Input/Output	MC_DAT [3]
86	GND	–	Ground
87	GND	–	Ground
88	GPIO_13	Input/Output	Service light
89	GPIO_07	Input/Output	SPI SCK/12 C Clk
90	GPIO_09	Input/Output	SPI MOSI/12 C_Tx
91	ADD[19]	Output	Processor address bus
92	ADD[17]	Output	Processor address bus
93	ADD[18]	Output	Processor address bus
94	ADD[15]	Output	Processor address bus
95	ADD[16]	Output	Processor address bus
96	CSFS	Output	Control serial port framing signal
97*	MC_CLK	Output	MC_CLK
98	VCC	–	Core power supply voltage 1.7V to 1.9V
99	GPIO_11	Input/Output	Flip WP
100	GPIO_08	Input/Output	SPI Sel/12 C En
101*	GPIO_05	Input/Output	Bluetooth enable
102	GPIO_06	Input/Output	SPI MISO/12 C data
103	ADD[22]	Output	Processor address bus
104	ADD[21]	Output	Processor address bus
105*	GPIO_40	Input/Output	Processor address 16 M words
106	ADD[20]	Output	Processor address bus
107	GND	–	Ground
108	ADD[23]	Output	Processor address 8 M words
109	GND	–	Ground
110	VEXT	–	External device power supply 2.4V to 3.3V
111	GND	–	Ground
112	GPIO_04	Input/Output	Display back light 3
113	GPIO_02	Input/Output	IrDA_EN
114	GPIO_03	Input/Output	Vibrator
115	DATA[2]	Input/Output	Processor data bus
116	DATA[0]	Input/Output	Processor data bus
117	DATA[5]	Input/Output	Processor data bus
118	DATA[1]	Input/Output	Processor data bus
119	DATA[3]	Input/Output	Processor data bus
120	VCC	–	Core power supply voltage 1.7V to 1.9V
121*	DMINUS	Input/Output	USB D-
122	GPIO_18	Input/Output	JTAG Test clock (TCK [!])
123	GND	–	Ground
124	GPIO_01	Input/Output	IrDA_Rx
125	USC[5]	Output	USC pin (CTS)
126	GPIO_00	Input/Output	IrDA_Tx
127	DATA[4]	Input/Output	Processor data bus

Pin No.	Terminal name	Input/Output	Description of terminal
128	VMEM	–	Memory power supply 2.7V to 3.3V memory support
129	GND	–	Ground
130	VCC	–	Core power supply voltage 1.7V to 1.9V
131	USC[6]	Input	USC pin (CONT2)
132	VCC	–	Core power supply voltage 1.7V to 1.9V
133	USC[2]	Output	USC pin (TXD)
134	USC[4]	Input	USC pin (RTS)
135	DATA[7]	Input/Output	Processor data bus
136	DATA[6]	Input/Output	Processor data bus
137	GND	–	Ground
138	DATA[9]	Input/Output	Processor data bus
139	DATA[13]	Input/Output	Processor data bus
140	nROMCS1	Output	External ROM chip select
141	GPIO_42	Input/Output	Display 1 chip select
142	CLKIN	Input	13 MHz or 26 MHz crystal system clock input (Auto detect)
143	VSIM	–	SIM power supply 1.7V to 3.3V
144	GND	–	Ground
145	USC[3]	Input	USC pin (CD)
146	USC[1]	Input	USC pin (RXD)
147	GND	–	Ground
148	USC[0]	Output	USC pin (ADP)
149	DATA[10]	Input/Output	Processor data bus
150	DATA[8]	Input/Output	Processor data bus
151	nRD	Output	Processor read strobe
152	DATA[14]	Input/Output	Processor data bus
153	GND	–	Ground
154	nRAMCS2	Output	Pseudo SRAM chip select
155*	GPIO_44	Input/Output	Flash 2 chip select
156	VSSUSB	–	USB ground
157	GPIO_47	Input/Output	SIM Volt (SIM voltage select)
158	GPIO_20	Input/Output	JTAG Test data input (TDI [I] DAI [1])
159	CLKON	Output	Oscillator power control signal (On/off)
160	VCC	–	Core power supply voltage 1.7V to 1.9V
161	GPO_18	Output	TCK
162	GPO_21	Output	SYNTHCLK
163	DATA[12]	Input/Output	Processor data bus
164	DATA[11]	Input/Output	Processor data bus
165	nWE	Output	Processor write strobe
166	VEXT	–	External device power supply 2.4V to 3.3V
167	GPO_11	Output	TR_SW 4
168	GPO_20	Output	SYNTHDATA
169	DATA[15]	Input/Output	Processor data bus
170	VMEM	–	Memory power supply 2.7V to 3.3V memory support
171*	nADV	Output	nADV (Burst)
172	nGPCS1	Output	Camera chip select
173	VMEM	–	Memory power supply 2.7V to 3.3V memory support
174*	GPIO_45	Input/Output	Flash 3 chip select
175	GPIO_46	Input/Output	Extra chip select
176*	DPLUS	Input/Output	USB D+
177	SIMCLK	Output	SIM Clock
178	JTAGEN	Input	JTAG Enable pull down
179	VEXT	–	External device power supply 2.4V to 3.3V
180	GPO_03	Output	RXON1
181	GPO_04	Output	OTH_PA_ Negblas
182	GPO_07	Output	Camera power ON/OFF
183	GPO_16	Output	GSM_On
184	GPO_17	Output	DCS_On
185	nHWR/nUBS	Output	Processor high write strobe
186	GPO_19	Output	SYNTHEN
187	nLWR/nLBS	Output	Processor low write strobe
188	nWAIT	Input	nWAIT (Burst/page)
189	nRESET	Input	System reset input
190	BURSTCLK	Output	Burst clock
191	nRAMCS1	Output	External RAM chip select

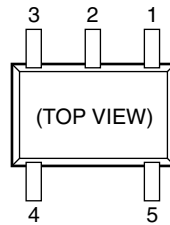
Pin No.	Terminal name	Input/Output	Description of terminal
192	nAUXCS1	Output	Sound IC chip select
193	GPIO_43	Input/Output	Display 2 chip select
194	VDDUSB	–	USB power supply 2.8V to 3.3V
195	GPIO_23	Input/Output	SIM Reset
196	SIMDATAIO	Input/Output	SIM Data input/output
197	GPIO_24	Input/Output	SIM Enable
198	GPIO_19	Input/Output	JTAG Test mode select (TMS [I] DAIRESET)
199	GPIO_21	Input/Output	JTAG Test data output (TDO [O] DAI [0])
200	GPO_02	Output	OTH_Tx_PA
201	GND	–	Ground
202	GPO_08	Output	TR_SW 2
203	GPO_09	Output	TR_SW 1
204	GPO_10	Output	TR_SW 3

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

IC105, IC307 VHILM20BIM7-1L (LM20BIM7): TEMPERATURE SENSOR

Pin No.	Terminal name	Input/Output	Description of terminal
1*	NC	–	Not used
2	GND	–	Ground
3	VO	Output	Output
4	V+	Input	Input
5	GND	–	Ground

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

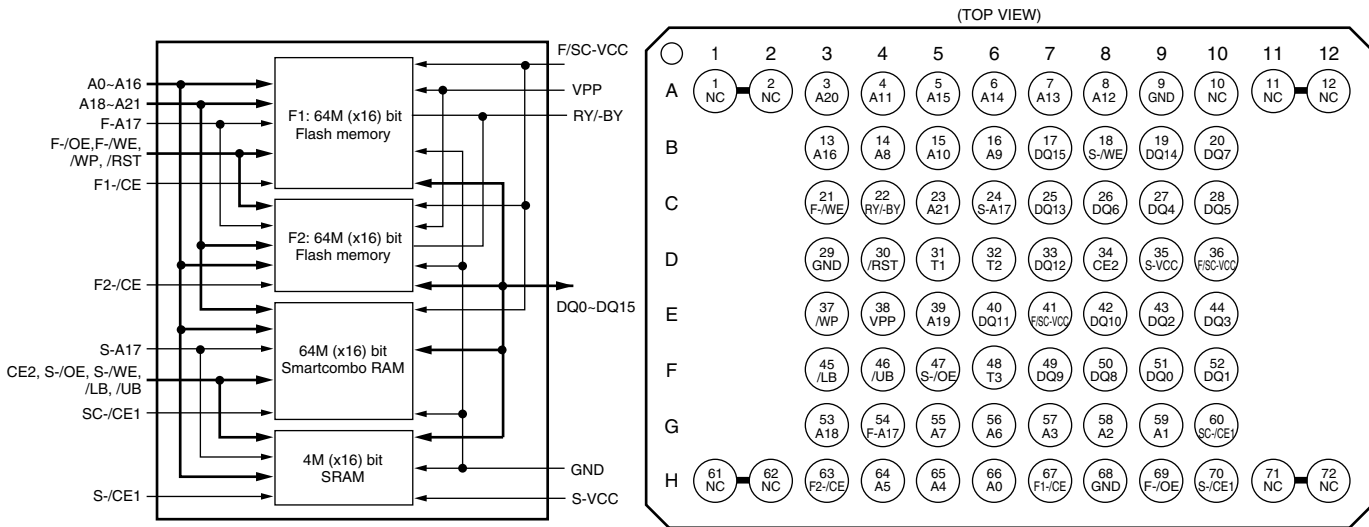


IC106 (LRS1B24): 4-LEVEL STACK MEMORY

Pin No.	Terminal name	Input/Output	Description of terminal
1	NC	–	Not used
2	NC	–	Not used
3	A20	Input	Address input (Flash, Smartcombo RAM)
4	A11	Input	Address input (common)
5	A15	Input	Address input (common)
6	A14	Input	Address input (common)
7	A13	Input	Address input (common)
8	A12	Input	Address input (common)
9	GND	–	Ground
10*	NC	–	Not used
11	NC	–	Not used
12	NC	–	Not used
13	A16	Input	Address input (common)
14	A8	Input	Address input (common)
15	A10	Input	Address input (common)
16	A9	Input	Address input (common)
17	DQ15	Input/Output	Data input/output (common)
18	S-/WE	Input	Write enable input (SRAM, Smartcombo RAM)
19	DQ14	Input/Output	Data input/output (common)
20	DQ7	Input/Output	Data input/output (common)
21	F-/WE	Input	Write enable input (Flash)
22	RY/-BY	Output	Ready busy output (Flash) When deleting/writing: VOL When interrupting block delete/write: High-Z (High impedance)
23	A21	Input	Address input (Flash, Smartcombo RAM)
24	S-A17	Input	Address input (SRAM, Smartcombo RAM)
25	DQ13	Input/Output	Data input/output (common)
26	DQ6	Input/Output	Data input/output (common)
27	DQ4	Input/Output	Data input/output (common)
28	DQ5	Input/Output	Data input/output (common)
29	GND	–	Ground
30	/RST	Input	Reset power down input (Flash) When deleting/writing block: VIH When reading: VIH Reset power down: VIL
31	T1	–	Test pin (all open)
32*	T2 (NC)	–	Test pin (all open)
33	DQ12	Input/Output	Data input/output (common)
34	CE2	Input	Chip enable input (SRAM), sleep state input (Smartcombo RAM)
35	S-VCC	–	Power (SRAM)
36	F/SC-VCC	–	Power (Flash, Smartcombo RAM)
37	/WP (F-/WP)	Input	Write protect input (Flash) When WP is set to VIL, it is prohibited to cancel lock bit of the block that has lock bit down set. Deletion and program operation are executable for the block that has neither lock bit nor lock down bit set. Disable lock down bit by setting WP to VIH.
38	VPP (F-VPP)	Input/–	Power voltage detect terminal (Flash) When deleting/writing: VPP = VPPH When deleting/writing is prohibited: VPP < VPPLK
39	A19 (F-A19)	Input	Address input (Flash, Smartcombo RAM)
40	DQ11	Input/Output	Data input/output (common)
41	F/SC-VCC	–	Power (Flash, Smartcombo RAM)
42	DQ10	Input/Output	Data input/output (common)
43	DQ2	Input/Output	Data input/output (common)
44	DQ3	Input/Output	Data input/output (common)
45	/LB	Input	SRAM, Smartcombo RAM byte enable input (DQ0 – DQ7)
46	/UB	Input	SRAM, Smartcombo RAM byte enable input (DQ8 – DQ15)
47	S-/OE	Input	Output enable input (SRAM, Smartcombo RAM)
48*	T3(NC)	–	Test pin (all open)
49	DQ9	Input/Output	Data input/output (common)
50	DQ8	Input/Output	Data input/output (common)
51	DQ0	Input/Output	Data input/output (common)
52	DQ1	Input/Output	Data input/output (common)
53	A18	Input	Address input (Flash, Smartcombo RAM)
54	F-A17	Input	Address input (Flash)

Pin No.	Terminal name	Input/Output	Description of terminal
55	A7	Input	Address input (common)
56	A6	Input	Address input (common)
57	A3	Input	Address input (common)
58	A2	Input	Address input (common)
59	A1	Input	Address input (common)
60	SC-/CE1	Input	Chip enable input (Smartcombo RAM)
61	NC	–	Not used
62	NC	–	Not used
63	F2-/CE	Input	Chip enable input (Flash – when selecting F2)
64	A5	Input	Address input (common)
65	A4	Input	Address input (common)
66	A0	Input	Address input (common)
67	F1-/CE	Input	Chip enable input (Flash – when selecting F1)
68	GND	–	Ground
69	F1-/OE	Input	Output enable input (Flash)
70	S-/CE1	Input	Chip enable input (SRAM)
71	NC	–	Not used
72	NC	–	Not used

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



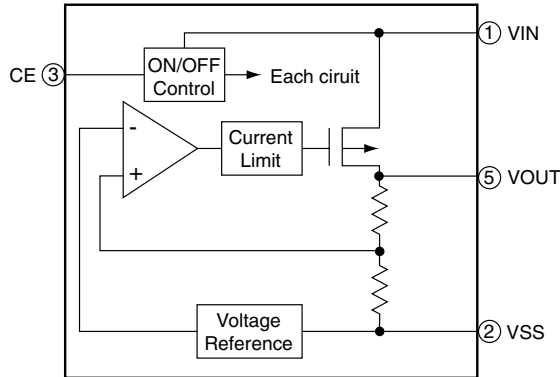
IC107 VHITC75S55E-1L (TC75S55E): OPE AMP.

Pin No.	Terminal name	Input/Output	Description of terminal
1	IN (+)	Input	Input (+)
2	VSS	–	Ground
3	IN (-)	Input	Input (-)
4	OUT	Output	Output
5	VDD	–	Power supply

IC201 VHXC620930-1L (XC6209B302MR): HIGH SPEED LDO REGULATOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	VIN	Input	Input
2	VSS	–	Ground
3	CE	Input	ON/OFF Control
4*	NC	–	Not used
5	VOUT	Output	Output

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



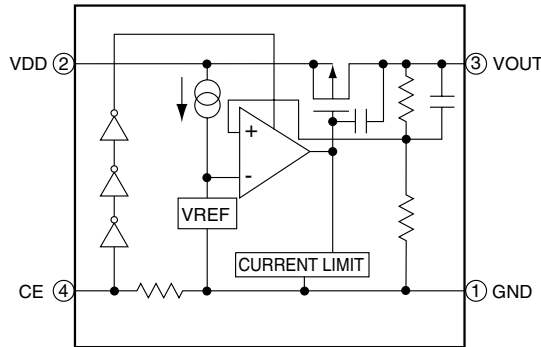
IC202 VHAD340818-1L (ADP3408ACP) POWER SUPPLY

Pin No.	Terminal name	Input/Output	Description of terminal
1	SIMEN	Input	SIM LDO enable
2	VRTCIN	Input	RTC LDO input voltage
3	VRTC	Output	Real time clock supply/coin cell battery charger
4	BATSNS	Input	Battery voltage sense input
5	MVBAT	Output	Divided battery voltage output
6	CHRDET	Output	Charge detect output
7	CHRIN	Input	Charger input voltage
8	GATEIN	Input	Microprocessor gate input signal
9	GATEDR	Output	Gate drive output
10	DGND	–	Digital ground
11	DGND	–	Digital ground
12	ISENSE	Input	Charge current sense input
13	EOC	Input	End of charge signal
14	CHGEN	Input	Charge enable for GATEIN, NiMH pulse charging
15	RESCAP	Input	Reset delay time
16	RESET	Output	Main reset
17*	NC	–	Not used
18	VSIM	Output	SIM LDO output
19	VBAT2	Input	Battery input voltage 2
20	VMEM	Output	Memory LDO output
21	VCORE	Output	Digital core LDO output
22	VBAT	Input	Battery input voltage
23	VAN	Output	Analog LDO output
24*	NC	–	Not used
25	VTCXO	Output	TCXO LDO output
26*	REFOUT	Output	Output reference
27	AGND	–	Analog ground
28	TCXOEN	Input	TCXO LDO enable and MVBATenable
29	PWRONIN	Input	Power on/off signal from microprocessor
30	PWRONKEY	Input	Power on/off key
31	ROWX	Output	Power key interface output
32*	NC	–	Not used

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

IC203 VHIRQ5RW18B-1L (RQ5RW18B): 1.8 V REGULATOR

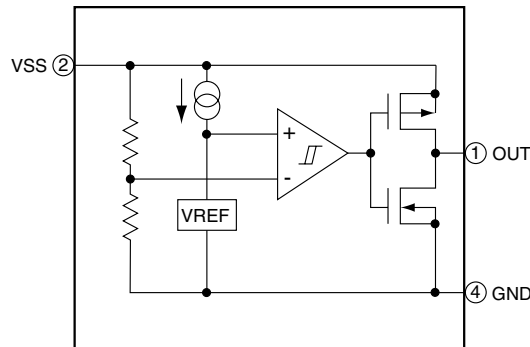
Pin No.	Terminal name	Input/Output	Description of terminal
1	GND	–	Ground
2	VDD	–	Power supply
3	VOUT	Output	Output
4	CE	Input	Chip enable



IC204 VHIR3111Q25-1L (R3111Q251C): VOLTAGE DETECTOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	OUT	Output	Output
2	VDD	–	Power supply
3*	NC	–	Not used
4	VSS	–	Ground

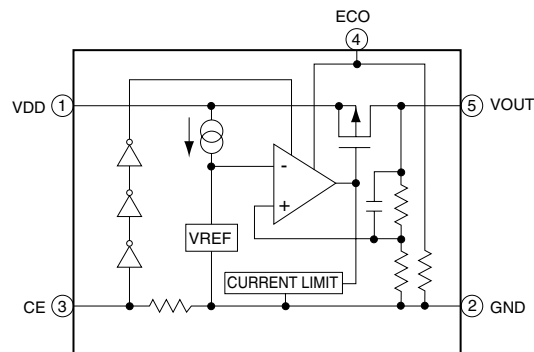
In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



IC205 VHIR116030B-1L (R1160N301B): REGULATOR

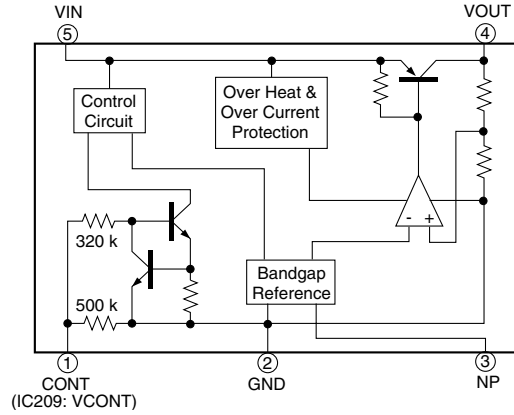
IC207 VHIR116018B-1L (R116018B): REGULATOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	VDD	Input	Input
2	GND	–	Ground
3	CE	Input	Chip enable
4	ECO	Input	High speed/low consumption selector switch
5	VOUT	Output	Output



IC206 VHITK11131C-1R (TK11131C): REGULATOR
IC209 VHITK11130C-1R (TK11130C): REGULATOR

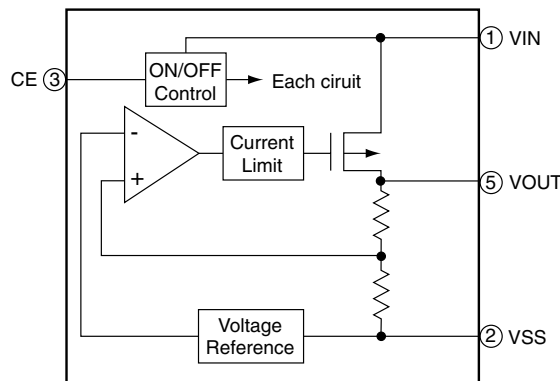
Pin No.	Terminal name	Input/Output	Description of terminal
1	CONT (IC209: VCONT)	Input	Control
2	GND	–	Ground
3	NP	–	Capacitor
4	VOUT	Output	Output
5	VIN	Input	Input



IC208 VHIXC620925-1L (XC6209B252MR): HIGH SPEED LDO REGULATOR

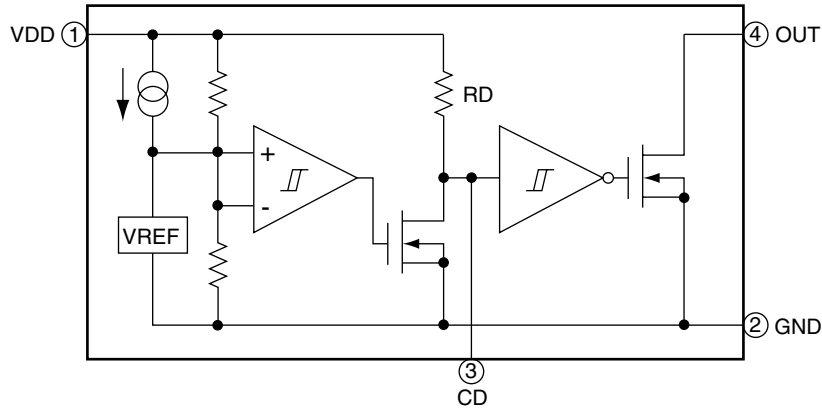
Pin No.	Terminal name	Input/Output	Description of terminal
1	VIN	Input	Input
2	VSS	–	Ground
3	CE	Input	Chip enable
4*	NC	–	Not used
5	VOUT	Output	Output

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



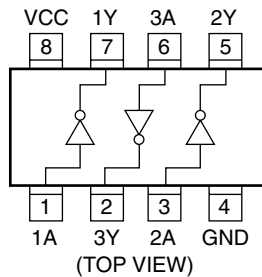
IC210 VHIR3112Q26-1L (R3112Q261A): VOLTAGE DETECTOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	VDD	–	Power supply
2	GND	–	Ground
3	CD	Input	External condenser connection terminal for delay
4	OUT	Output	Output terminal (L: when output is detected, H: when output is cancelled)



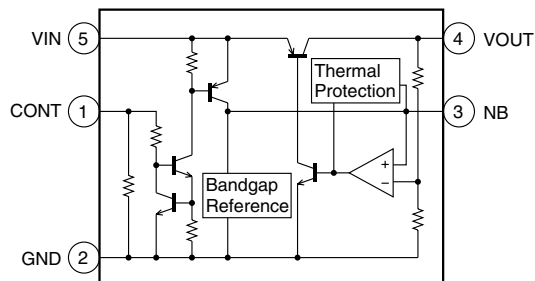
IC301 VHITC7WH04K-1R (TC7WH04FK): LOGIC

Pin No.	Terminal name	Input/Output	Description of terminal
1	1A	Input	Input 1
2	3Y	Output	Output 3
3	2A	Input	Input 2
4	GND	–	Ground
5	2Y	Output	Output 2
6	3A	Input	Input 3
7	1Y	Output	Output 1
8	VCC	–	Power supply



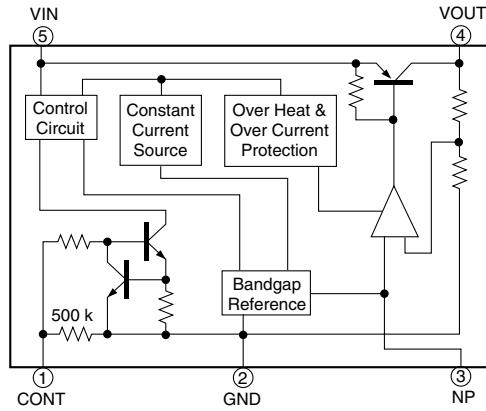
IC302 VHINJ287130-1L (NJM2871F03): 3.0 V REGULATOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	CONT	Input	Control
2	GND	–	Ground
3	NB	–	Noise bypass
4	VOUT	Output	Output
5	VIN	Input	Input



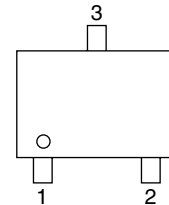
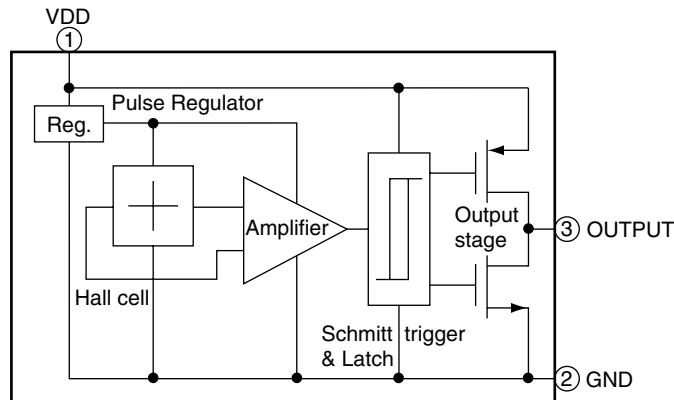
IC303, IC304 VHITK11129C-1R (TK11129CSIL): 2.9 V REGULATOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	CONT	Input	Control
2	GND	-	Ground
3	NP	-	Capacitor
4	VOUT	Output	Output
5	VIN	Input	Input



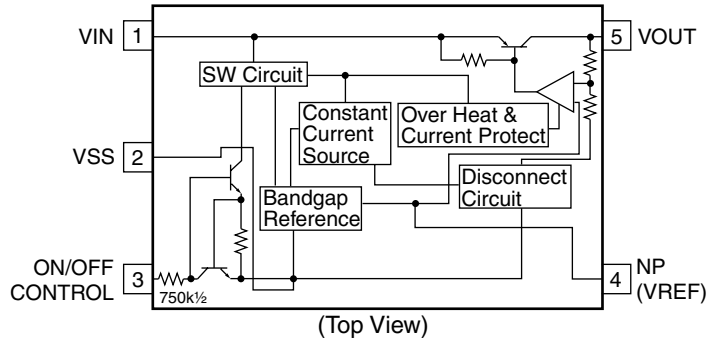
IC305 VHIEW6671+-1R (EW6671): HALL

Pin No.	Terminal name	Input/Output	Description of terminal
1	VDD	Input	Input
2	GND	-	Ground
3	OUT	Output	Output



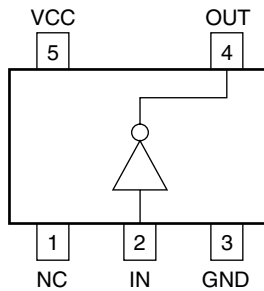
IC306 VHITK71635S-1R (TK71635S): HIGH SPEED LDO REGULATOR

Pin No.	Terminal name	Input/Output	Description of terminal
1	VIN	–	Power supply
2	VSS	–	Ground
3	ON/OFF	Input	ON/OFF control
4	NP	Input	VREF (NP)
5	VOUT	Output	Output

**IC308, IC406 VHITC7SZ04A-1L (TC7SZ04A): LOGIC**

Pin No.	Terminal name	Input/Output	Description of terminal
1*	NC	–	Not used
2	IN	Input	Input
3	GND	–	Ground
4	OUT	Output	Output
5	VCC	–	Power supply

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.



IC402 (IX3053AF): POWER MANAGEMENT

Pin No.	Terminal name	Input/Output	Description of terminal
1	T1	–	Dummy terminal (connected with T2 internally.)
2	LEDG	Output	G LED drive output terminal (Constant current drive)
3	GND1	–	Ground power supply terminal
4	VBAT1	–	VBAT power supply terminal
5*	LSO11	Output	Level shift output 1
6*	LSO12	Output	Level shift output 1
7	WVOUT	Output	Triple pressure rise charge pump output
8	T2	–	Dummy terminal (connected with T1 internally.)
9	TEST	Input	Test terminal (Internal pull down processing with IC)
10	LEDR	Output	R LED drive output terminal (Constant current drive)
11	LEDB	Output	B LED drive output terminal (Constant current drive)
12	TRSW	Output	DC-DC switching Tr drive terminal for R/G/B LED
13*	LSO21	Output	Level shift output 2
14*	LSO22	Output	Level shift output 2
15*	CAPP1	Output	Triple pressure rise charge pump C1 connection output
16*	CAPN1	Output	Triple pressure rise charge pump C1 connection output
17	SENSP	Input	DC-DC switching current sense terminal for R/G/B LED
18	SENSN	Input	DC-DC switching current sense terminal for R/G/B LED
19	CPIN	Input	Triple pressure rise charge pump input terminal
20*	CAPP2	Output	Triple pressure rise charge pump C2 connection terminal
21	VIO	–	Logic system power supply terminal
22	VPLUS2	Input	DC-DC pressure rise voltage feedback input for R/G/B LED
23*	CAPN2	Output	Triple pressure rise charge pump C2 connection terminal
24	GND3	–	Ground power supply terminal
25	STRB	Input	3-wire serial strobe input
26	CLK	Input	3-wire serial clock input
27	VPLUS12	Input	DC-DC pressure rise voltage feedback input for back light LED (main/external)
28	CAMP	Output	+13V voltage output terminal for cameras
29	DATA	Input	3-wire serial data input
30	FRP	Input	Level shift circuit and square wave input terminal
31	IREF	Output	Resistance connection terminal for current reference
32	VREF	Output	Voltage reference terminal C is connected
33	LEDCTL	Input	On/Off control terminal for R/G/B LED
34	CUR2	Output	Constant current drive output 2
35	CUR1	Output	Constant current drive output 1
36	FLED	Output	White backlight LED drive terminal (main)
37	GND2	–	Ground power supply terminal
38	SBD	Input	SBD input terminal
39	VNEG	Input	Negative power supply terminal for cameras
40	CAMN	Output	–7V voltage output terminal for cameras
41	T4	–	Dummy terminal (connected with T3 internally.)
42	RSTB	Input	Reset input (when Low is input)
43	BLED	Output	White backlight LED drive terminal (external)
44	SW1	Output	DC-DC coil switching terminal for backlight (main/external)
45	GND	Output	Ground power supply terminal
46	VBAT2	–	VBAT power supply terminal
47	VPLUS11	Input	DC-DC pressure rise voltage feedback input for backlight (main/external)
48	T3	–	Dummy terminal (connected with T4 internally.)

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

A	T1	LEDG	GND1	VBAT1	LSO11	LSO12	WVOUT	T2
B	TEST	LEDR	LEDB	TRSW	LSO21	LSO22	CAPP1	CAPN1
C	SENSP	SENSN	○				CPIN	CAPP2
D	VIO	VPLUS2					CAPN2	GND3
E	STRB	CLK					VPLUS12	CAMP
F	DATA	FRP					IREF	VREF
G	LEDCTL	CUR2	CUR1	FLED	GND2	SBD	VNEG	CAMN
H	T4	RSTB	BLED	SW	GNDP	VBAT2	VPLUS11	T3
	1	2	3	4	5	6	7	8

IC403 (LR38863): DISPLAY CONTROLLER

Pin No.	Terminal name	Input/Output	Description of terminal
1	DUMMY4	–	Dummy 4
2	VDDPLL	–	PLL Power supply 1.8 V (1.6 V~ 2.0 V)
3	PLLGND	–	PLL Ground
4	PLLDIV0	Input	PLL multiply switching signal
5	PLLDIV1	Input	PLL multiply switching signal
6	HSD0	Input/Output	Data bus for high-speed serial transfer
7	HSD1	Input/Output	Data bus for high-speed serial transfer
8	HSD2	Input/Output	Data bus for high-speed serial transfer
9	HSWRD	Input/Output	Read/Write determination signal for high-speed serial transfer
10	HSEN	Input/Output	High-speed serial data effective signal High is active
11	HCLK	Input/Output	Standard clock for high-speed serial transfer (5 to 33 MHz)
12	DUMMY3	–	Dummy 3
13*	PWM1/PORT8	Output	PWM output 1 General-purpose PORT output (default)
14	PLLDIV2	Input	PLL multiply switching signal
15	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
16	GND	–	Logic ground
17	SUBWR_B	Input/Output	Light signal for External display
18	GND	–	Logic ground
19	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
20	PWM0/PORT3	Output	PWM output 0 General-purpose PORT output (default)
21	SUBCS_B	Input/Output	Chip select signal for External display
22	CS_B	Input/Output	Device select signal (Display is active when CS_B is "Low")
23	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
24	LCDINT	Output	External interrupt signal (Starting varies when interruption occurs.)
25*	GTIO_B	Output	MPEG4ASIC internal core power-cut signal ("Low" is active.)
26	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
27	SUBDB1	Input/Output	Data bus for External display
28	BDATA[5] (B5)	Output	Display panel B output signa
29	BDATA[5] (B4)	Output	Display panel B output signa
30	BDATA[5] (B3)	Output	Display panel B output signa
31	GND	–	Logic ground
32	TESTI	Input	Test terminal (Connected to GND normally)
33	BSHS_B	Input/Output	External Bit Stream horizontal synchronization signal ("Low" is active)
34	WR_B	Input/Output	Host write strobe signal
35	SUBRS	Input/Output	Data determination signal for External display
36*	MP4 RESET_B	Output	MPEG4ASIC reset control signal ("Low" is active)
37	HSD6	Input/Output	Data bus for high-speed serial transfer
38	BDATA[2] (B2)	Output	Display panel B output signal
39	BDATA[2] (B1)	Output	Display panel B output signal
40	BDATA[2] (B0)	Output	Display panel B output signal
41*	EXCS_B1	Input/Output	Chip select output 1 (internal decode output)
42*	XOUT	Output	Oscillation circuit output
43	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
44	GND	–	Logic ground
45	SCANEN	Input	Full scan effective signal "High" is active (Connected to GND normally)
46	RD_B	Input/Output	Host read strobe signal
47	RSP	Input/Output	Register selection signal HOST_IF section : RSP = Low...Display access RSP = High...Control access Hyper_Serial section : RSP = Low...Control acces RSP = High...Display access
48	GND	–	Logic ground
49	HSD3	Input/Output	Data bus for high-speed serial transfer
50	DCLK	Input/Output	Data sampling clock (display clock)
51	VSYNC	Input/Output	Vertical synchronization signal
52	HSYNC	Input/Output	Horizontal synchronization signal
53*	EXCS_B3	Input/Output	Chip select output 3 (internal decode output)
54	XIN	Input	Oscillation circuit input/External clock input signal Clock input for full scan
55	SUBDB6	Input/Output	Data bus for External display
56	RESET_B	Input	Master reset (All registers are initialized when Low is activated)

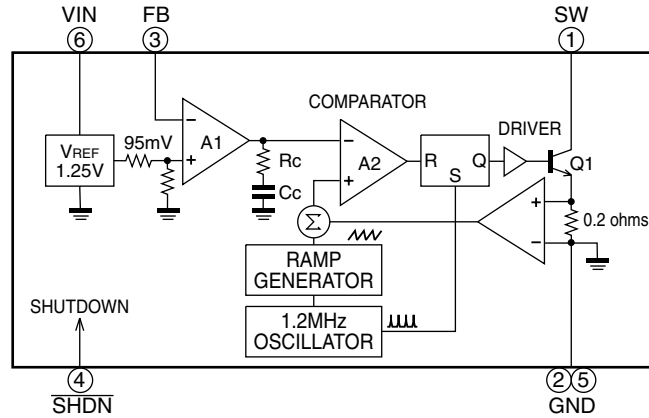
Pin No.	Terminal name	Input/Output	Description of terminal
57	SUBDB0	Input/Output	Data bus for External display
58	SUBDB2	Input/Output	Data bus for External display
59	HSD5	Input/Output	Data bus for high-speed serial transfer
60	DB0	Input/Output	Data bus
61	HSD4	Input/Output	Data bus for high-speed serial transfer
62*	EXCS_B2	Input/Output	Chip select output 2 (internal decode output)
63	GDATA[5] (G5)	Output	Display panel G output signal
64	GDATA[4] (G4)	Output	Display panel G output signal
65	GDATA[3] (G3)	Output	Display panel G output signal
66	SUBDB3	Input/Output	Data bus for External display
67	SUBDB4	Input/Output	Data bus for External display
68	HSD7	Input/Output	Data bus for high-speed serial transfer
69	DB1	Input/Output	Data bus
70	DB2	Input/Output	Data bus
71	DB3	Input/Output	Data bus
72	DB4	Input/Output	Data bus
73	STKCHK	Input	Setting BS-related output terminal to Hi-z when a stack is installed (Connected to GND normally)
74	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
75	GND	–	Logic ground
76	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
77	GDATA[2] (G2)	Output	Display panel G output signal
78	SUBDB5	Input/Output	Data bus for External display
79	BSCLK	Input/Output	External Bit Stream data clock
80	SUBCK	Output	Clock for External display
81	DB5	Input/Output	Data bus
82	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
83	GND	–	Logic ground
84	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
85	CAMCK	Output	Clock for camera operation
86	GDATA[1] (G1)	Output	Display panel G output signal
87	GDATA[0] (G0)	Output	Display panel G output signal
88	RDATA[5] (R5)	Output	Display panel R output signal
89	RDATA[4] (R4)	Output	Display panel R output signal
90	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
91	PWMLCD/ PORT4	Output	PWM LCD output General-purpose PORT output (default)
92	BSBLK_B	Input/Output	External Bit Stream data effective signal (“High” is active when transferring the data)
93	DB6	Input/Output	Data bus
94	DB7	Input/Output	Data bus
95	DB8	Input/Output	Data bus
96	DB9	Input/Output	Data bus
97	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
98	RDATA[3] (R3)	Output	Display panel R output signal
99	RDATA[2] (R2)	Output	Display panel R output signal
100	RDATA[1] (R1)	Output	Display panel R output signal
101	RDATA[0] (R0)	Output	Display panel R output signal
102*	MP4_P0	Output	MPEG4 control
103*	EXCS_B0	Input/Output	Chip select output 0 (internal decode output)
104	BSPIXEL7	Input/Output	External Bit Stream data bus
105	BSVS_B	Input/Output	External Bit Stream vertical synchronization signal (“Low” is active)
106	DB10	Input/Output	Data bus
107	DB11	Input/Output	Data bus
108	DB12	Input/Output	Data bus
109*	MP4_PLLCK	Output	MPEG4ASIC clock 15.36 MHz/CPU supply XIN clock
110	SUBDB7	Input/Output	Data bus for External display
111	GND	–	Logic ground
112	DA0	Input/Output	Address input for chip select decode
113	BSPIXEL0	Input/Output	External Bit Stream data bus
114	DCS_B	Input	Chip select input dedicated for chip select decode
115	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
116	BSPIXEL6	Input/Output	External Bit Stream data bus
117	SE_DO/PORT0	Output	Data output for 4-wire serial IF (default) General-purpose PORT output
118	DB13	Input/Output	Data bus

Pin No.	Terminal name	Input/Output	Description of terminal
119	DB14	Input/Output	Data bus
120	DB15	Input/Output	Data bus
121	WAIT_B	Output	External wait signal ("Low" is active)
122	SUBFLMIN	Input	Driver FLM signal input for External display
123	SUBCKS	Output	Clock switching signal for External display
124	DA1	Input/Output	Address input for chip select decode
125	BSPIXEL1	Input/Output	External Bit Stream data bus
126	BSPIXEL4	Input/Output	External Bit Stream data bus
127	GND	–	Logic ground
128	BSPIXEL5	Input/Output	External Bit Stream data bus
129	SE_CK/PORT1	Output	Control clock for 4-wire serial IF (default) General-purpose PORT output
130	SE_LD2/PORT5	Output	Load signal 2 for 4-wire serial IF General-purpose PORT output (default)
131	BUFOFF_B	Input	Buffer Gated switching signal for I/O through current prevention (High when Host_IF signal is activated)
132	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
133	DUMMY2	–	Dummy 2
134*	SE_LD3/PORT6	Output	Load signal 3 for 4-wire serial IF General-purpose PORT output (default)
135	VDDIO	–	IO Power supply 3.0 V (2.7 V~ 3.3 V)
136	SUBLPIN	Input	Driver LP input External display
137	BSPIXEL2	Input/Output	External Bit Stream data bus
138	BSPIXEL3	Input/Output	External Bit Stream data bus
139	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
140*	SE_DI/PORT7	Input/Output	4-wire serial input (default) General-purpose PORT output
141	SE_LD1/PORT2	Output	Load signal 1 for 4-wire serial IF (default) General-purpose PORT output
142	GND	–	Logic ground
143	VDDCORE	–	CORE Power supply 1.8 V (1.6 V~ 2.0 V)
144	DUMMY1	–	Dummy 1 Dummy 4

In this unit, the terminal with asterisk mark (*) is (open) terminal which is not connected to the outside.

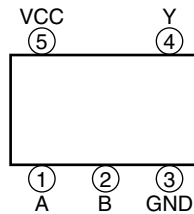
IC404 VHILT1937+-1R (LT1937): DC - DC

Pin No.	Terminal name	Input/Output	Description of terminal
1	SW	Output	LED voltage output
2	GND	-	Ground
3	FB	Input	LED ground
4	SHDN#	Input	Chip enable
5	GND	-	Ground
6	VIN	Input	Input



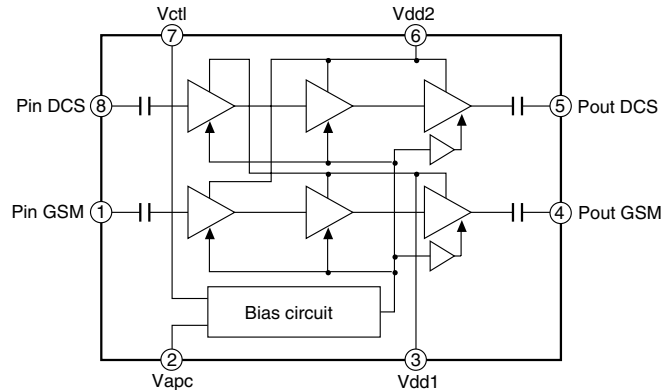
IC405 VHITC7SZ08A-1L (TC7SZ08A): AND GATE

Pin No.	Terminal name	Input/Output	Description of terminal
1	A	Input	Signal input
2	B	Input	Signal input
3	GND	-	Ground
4	Y	Output	Logic value output
5	VCC	Input	Power supply



IC831 VHIPF08123B-1L (PF08123B): RF POWER AMP.

Pin No.	Terminal name	Input/Output	Description of terminal
1	Pin GSM	Input	Input power from TXVCO (GSM)
2	Vapc	Input	Power control voltage from APCIC
3	Vdd1	–	Power supply
4	Pout GSM	Output	Output power (GSM)
5	Pout DCS	Output	Output power (DCS/PCS)
6	Vdd2	–	Power supply
7	Vctl	Input	Band select switch
8	Pin DCS	Input	Input power from TXVCO (DCS/PCS)
9	GND	–	Ground

**IC881 VHHD155173-1L (HD155173): AUTO POWER CONTROL**

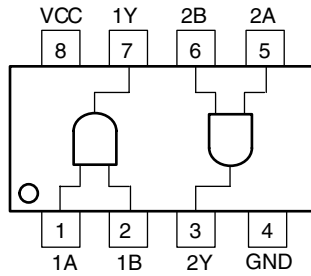
Pin No.	Terminal name	Input/Output	Description of terminal
1	VAPC1	Output	APC voltage output terminal (GSM900)
2	IN1(-)	Input	Output amp negative terminal (GSM900)
3	IN(+)	Input	Output amp positive terminal
4	VCC1	Input	Power supply
5	DACin	Input	DAC voltage input terminal
6	AMPIB	Input	DAC amp input terminal
7	AMPO	Output	DAC amp output terminal
8	Mode SW	Input	Mode switch
9	VCC2	Input	Power supply
10	PS	Input	Power save switch
11	GND2	–	Ground
12	RFin1	Input	GSM900 signal input terminal
13	RFin2	Input	DCS/PCS signal input terminal
14	GND1	–	Ground
15	IN2(-)	Input	Output amp negative terminal (DCS/PCS)
16	VAPC2	Output	APC voltage output terminal (DCS/PCS)

IC901 VHIHD155148-1L (HD155148TF): RF

Pin No.	Terminal name	Input/Output	Description of terminal
1	GNDLNA	–	Ground for LNA bias
2	VCCLNA	Input	VCC for LNA transistor and LNA bias
3	GNDDUM,GNDPCS	–	Ground for emitter of LNA transistor (PCS)
4	PCSLNAI	Input	Positive input for LNA transistor (PCS)
5	PCSLNAIB	Input	Negative input for LNA transistor (PCS)
6	GNDPCSB,GNDDCS	–	Ground for emitter of LNA transistor (PCS,DCS)
7	DCSLNAI	Input	Positive input for LNA transistor (DCS)
8	DCSLNAIB	Input	Negative input for LNA transistor (DCS)
9	GNDDCSB,GNDGSM	–	Ground for emitter of LNA transistor (DCS,GSM)
10	GSMLNAI	Input	Positive input for LNA transistor (GSM)
11	GSMLNAIB	Input	Negative input for LNA transistor (GSM)
12	GNDGSMB,GNDDUM	–	Ground for emitter of LNA transistor (GSM)
13	VCCLNA	Input	VCC for LNA transistor and LNA bias
14	GNDOPLL	–	Ground for OPLL
15	VCOIN	Input	TXVCO signal input
16	VCCOPLL	Input	VCC for OPLL and phase comparator
17	PLLOUT	Output	Current output to control and modulate TXVCO
18	VCCIQ/ADDAC	Input	VCC for IQ modulator and offset canceling AD/DAC
19	GNDIQ/ADDAC	–	Ground for IQ modulator and offset canceling AD/DAC
20	IINB	Input	Negative input of I signal for modulator
21	IIN	Input	Positive input of I signal for modulator
22	QINB	Input	Negative input of Q signal for modulator
23	QIN	Input	Positive input of Q signal for modulator
24	QOUTB	Output	Negative output of Q channel
25	QOUT	Output	Positive output of Q channel
26	IOUTB	Output	Negative output of I channel
27	IOUT	Output	Positive output of I channel
28	VCCIFVCO	Input	VCC for IFVCO and IFVCO buffer and divider
29	GNDIFVCO	–	Ground for IFVCO buffer and divider
30	VCCOSC	Input	VCC for IFVCO
31	TCXOCONT	–	TCXOOUT frequency (GND: 26 MHz/VCC: 13 MHz)
32	VCCIFSYN	Input	VCC for IF synthesizer and TCXOOUT buffer (13 MHz/26 MHz)
33	CPIFSYN	Output	Charge pump output of IF synthesizer
34	GNDIFSYN	–	Ground for IFsynthesizer and TCXOOUT buffer (13 MHz/26 MHz)
35	LE	Input	Load enable for serial data
36	TCXOOUT	Output	TCXO output for base band
37	CLK	Input	Clock for serial data
38	TCXOIN	Input	TCXO input for IF and RF synthesizer
39	SDATA	Input	Serial data
40	GNDRFSYN	–	Ground for RF synthesizer and TCXO input buffer (26 MHz)
41	VCCRFSYN	Input	VCC for RF synthesizer and TCXO input buffer (26 MHz)
42	BANDSW	Output	Band select or frequency select switch for RFVCO
43	FLOCK	Output	Fast lock control for RF synthesizer
44	CPRFSYN	Output	Charge pump output of RF synthesizer
45	GNDBB	–	Ground for base band
46	VCCBB	Input	VCC for base band
47	VCCRFL0	Input	VCC for RF local buffer and divider
48	GNDRFLO	–	Ground for RF local buffer and divider
49	RFLOINB	Input	Negative input for RF local
50	RFLOIN	Input	Positive input for RF local
51	GNDMIX	–	Ground for direct conversion mixer
52	CAPQB	Output	Capacitor for Q channel LPF (Negative output)
53	CAPQ	Output	Capacitor for Q channel LPF (Positive output)
54	CAPIB	Output	Capacitor for I channel LPF (Negative output)
55	CAP I	Output	Capacitor for I channel LPF (Positive output)
56	VCCMIX	Input	VCC for direct conversion mixer

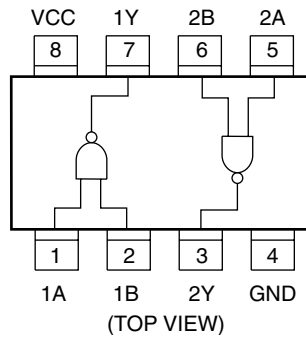
IC991, IC993 VHINL27WZ08-1R (NL27WZ08): LOGIC

Pin No.	Terminal name	Input/Output	Description of terminal
1	1A	Input	Input 1
2	1B	Input	Input 1
3	2Y	Output	Output 2
4	GND	–	Ground
5	2A	Input	Input 2
6	2B	Input	Input 2
7	1Y	Output	Output 1
8	VCC	–	Power supply



IC992 VHITC7W00FK-1R (TC7W00FK): LOGIC

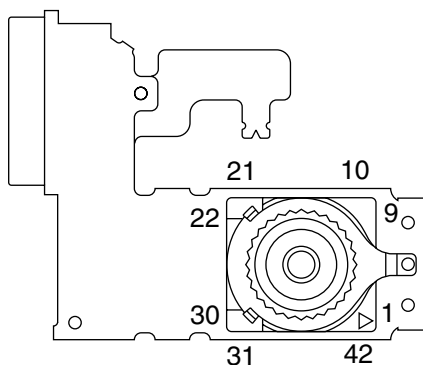
Pin No.	Terminal name	Input/Output	Description of terminal
1	1A	Input	Input 1
2	1B	Input	Input 1
3	2Y	Output	Output 2
4	GND	–	Ground
5	2A	Input	Input 2
6	2B	Input	Input 2
7	1Y	Output	Output 1
8	VCC	–	Power supply



[2] Function table of Camera

CA1001 (DKENDW025AFSI): CAMERA UNIT

Pin No.	Terminal name	Input/Output	Description of terminal
1	GND	–	Digital ground
2	VDD1	–	Power supply input (2.5 V/DSP core)
3	A19	Input	Address bus 19
4	A18	Input	Address bus 18
5	A17	Input	Address bus 17
6	A2	Input	Address bus 2
7	A1	Input	Address bus 1
8	GND	–	Digital ground
9	OD15	Input/Output	Data bus 15
10	OD14	Input/Output	Data bus 14
11	OD13	Input/Output	Data bus 13
12	OD12	Input/Output	Data bus 12
13	OD11	Input/Output	Data bus 11
14	OD10	Input/Output	Data bus 10
15	OD9	Input/Output	Data bus 9
16	OD8	Input/Output	Data bus 8
17	OD7	Input/Output	Data bus 7
18	OD6	Input/Output	Data bus 6
19	OD5	Input/Output	Data bus 5
20	OD4	Input/Output	Data bus 4
21	OD3	Input/Output	Data bus 3
22	OD2	Input/Output	Data bus 2
23	OD1	Input/Output	Data bus 1
24	OD0	Input/Output	Data bus 0
25	GND	–	Digital ground
26	CTL3	Output	Power circuit standby output (3)
27	MODE	Input	Moving image mode switching
28	CTL2	Output	Power circuit standby output (2)
29	TEST4	Input	Test terminal
30	+13V	–	Power supply input (+13 V/sensor)
31	–7V	–	Power supply input (–7 V/sensor)
32	AVDD	–	Power supply input (+3.1 V/V-Driver)
33	GND	–	Analog ground
34	CBREQ	Output	DMA request
35	CINT	Output	Interruption signal
36	RSTN	Input	Reset signal
37	RDB	Input	IP parameter read signal
38	WRB	Input	IP parameter write signal
39	CSB	Input	Chip select input
40	PWCK	Output	Clock output for power supply
41	VDD2	–	Power supply input (3.0 V/I/O)
42	EXCKI	Input	External clock input



SHARP PARTS GUIDE

DIGITAL MOBILE PHONE

MODEL GX20

(INTERNAL MODEL NAME:

TQ-GX20E/G/R/T/S/H/EP/PP/W/B/D/A/Z/Q/L/F/C)

E : For U.K.	G : For Germany
R : For Ireland	T : For Italy
S : For Spain	H : For Netherlands
EP : For U.K. (Prepaid)	PP: For Portugal (Prepaid)
W : For Sweden	B : For Hungary
D : For Greece	A : For Australia
Z : For New Zealand	Q : For Egypt
L : For Malta	F : For France
C : For Switzerland	

“HOW TO ORDER REPLACEMENT PARTS”

To have your order filled promptly and correctly, please furnish the following information.

- | | |
|-----------------|----------------|
| 1. MODEL NUMBER | 2. REF. No. |
| 3. PART NO. | 4. DESCRIPTION |

Explanation of capacitors/resistors parts codes

Capacitors

VCC	Ceramic type
VCK	Ceramic type
VCT	Semiconductor type
VC •• MF	Cylindrical type (without lead wire)
VC •• MN	Cylindrical type (without lead wire)
VC •• TV	Square type (without lead wire)
VC •• TQ	Square type (without lead wire)
VC •• CY	Square type (without lead wire)
VC •• CZ	Square type (without lead wire)
VC •••••••• J ..	The 13th character represents capacity difference. ("J" ±5%, "K" ±10%, "M" ±20%, "N" ±30%, "C" ±0.25 pF, "D" ±0.5 pF, "Z" +80-20%.)


If there are no indications for the electrolytic capacitors, error is ±20%.

Resistors

VRD	Carbon-film type
VRS	Carbon-film type
VRN	Metal-film type
VR •• MF	Cylindrical type (without lead wire)
VR •• MN	Cylindrical type (without lead wire)
VR •• TV	Square type (without lead wire)
VR •• TQ	Square type (without lead wire)
VR •• CY	Square type (without lead wire)
VR •• CZ	Square type (without lead wire)
VR •••••••• J ..	The 13th character represents error. ("J" ±5%, "F" ±1%, "D" ±0.5%.)

If there are no indications for other parts, the resistors are ±5% carbon-film type.

NOTE:

Parts marked with “” are important for maintaining the safety of the set.

Be sure to replace parts with specified ones for maintaining the safety and performance of the set.

NO.	PART CODE	PRICE RANK	DESCRIPTION	NO.	PARTS CODE	PRICE RANK	DESCRIPTION
ARRAY PARTS							
L445-451	RCILZ0390AFZZN	AC	Array,120 ohms	C226	VCKYCZ1CB103KT	AB	0.01 μ F,16V
R104	RMPTR4103ACZZN	AA	Array,10 kohm	C227	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
R157,158	RR-DZ1133AFZZN	AB	Array,0 ohm	C228	VCKYCY1AB224KT	AA	0.22 μ F,10V
R160-162	RR-DZ1133AFZZN	AB	Array,0 ohm	C229-231	VCKYCY0JB225KT	AC	2.2 μ F,6.3V
R811	RR-TZ1118AFZZR	AB	Array,10 dB	C232,233	VCKYCZ1AB104KT	AA	0.1 μ F,10V
R816	RR-TZ1118AFZZR	AB	Array,10 dB	C234	VCKYCZ1EB472KT	AB	0.0047 μ F,25V
CAPACITORS							
C101,102	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C235	VCCCCZ1EH101JT	AB	100 pF (CH),25V
C103	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C236-240	VCCCCZ1EH101JT	AB	100 pF (CH),25V
C104	RC-KZ1315AFZZN	AC	10 μ F,6.3V	C241	VCCCCZ1EH470JT	AB	47 pF (CH),25V
C105	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V	C242	VCCCCZ1EH330JT	AB	33 pF (CH),25V
C107	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C243	VCCCCZ1EH470JT	AB	47 pF (CH),25V
C108	RC-KZ1315AFZZN	AC	10 μ F,6.3V	C244	VCKYCZ1EB102KT	AB	0.001 μ F,25V
C109	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C245	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C110	VCKYCZ1EB222KT	AA	0.0022 μ F,25V	C246	VCCCCZ1EH101JT	AB	100 pF (CH),25V
C111	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C247	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C112	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C303	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C113	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C304	VCCCCZ1EH470JT	AB	47 pF (CH),25V
C114	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C308	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C115	VCKYCY1AB105KT	AB	1 μ F,10V	C310	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C116	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C316	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C117	VCCCCZ1EH330JT	AB	33 pF (CH),25V	C318	VCKYTV0JB225KT	AD	2.2 μ F,6.3V
C118	VCKYCZ1CB103KT	AB	0.01 μ F,16V	C319	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C119-121	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C320,321	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C123	VCKYCY1AB105KT	AB	1 μ F,10V	C323	VCKYCY1AB105KT	AB	1 μ F,10V
C124,125	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C326	VCCCCZ1EH470JT	AB	47 pF (CH),25V
C126,127	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C328	VCKYCY1AB105KT	AB	1 μ F,10V
C128-131	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C329	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C132	RC-KZ1315AFZZN	AC	10 μ F,6.3V	C330	VCKYCY1AB105KT	AB	1 μ F,10V
C133-135	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C331	VCKYCY1AB225KT	AB	2.2 μ F,10V
C136	VCCCCZ1EH221JT	AA	220 pF (CH),25V	C332	RC-KZ1321AFZZN	AD	22 μ F,6.3V
C137	VCKYCZ1AB473KT	AB	0.047 μ F,10V	C334	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C138	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C335	VCKYCZ1EB102KT	AB	0.001 μ F,25V
C139	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C337,338	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C140	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C340	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C141	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V	C341	VCKYCY1AB105KT	AB	1 μ F,10V
C142,143	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C342	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C144	VCKYCZ1AB473KT	AB	0.047 μ F,10V	C347,348	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C145	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C349	VCKYCY0JB225KT	AC	2.2 μ F,6.3V
C146	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C350	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C148	VCCCCZ1EH101JT	AB	100 pF (CH),25V	C352	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C149	VCCCCZ1EH2R0CT	AB	2 pF (CH),25V	C353	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C150-153	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C401	VCKYCY1CB104KT	AA	0.1 μ F,16V
C154-164	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C402	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C168,169	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C403	VCKYCY1EB104KT	AA	0.1 μ F,25V
C170	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V	C404,405	RC-KZ1300AFZZN	AC	1 μ F,16V
C173-175	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C406	RC-KZ1311AFZZN	AC	1 μ F,25V
C176	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C408	RC-KZ1300AFZZN	AC	1 μ F,16V
C177	RC-KZ1317AFZZN	AB	1 μ F,16V	C409	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C181-183	VCCCCZ1EH470JT	AB	47 pF (CH),25V	C411	RC-KZ1300AFZZN	AC	1 μ F,16V
C184	RC-KZ1317AFZZN	AB	1 μ F,16V	C413	VCKYCY1AB105KT	AB	1 μ F,10V
C186	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C414-416	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C188	VCKYCZ1CB103KT	AB	0.01 μ F,16V	C417	VCKYCZ1CB103KT	AB	0.01 μ F,16V
C191	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C418-420	RC-KZ1317AFZZN	AB	1 μ F,16V
C192	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C421	VCKYCZ0JB105KT	AB	1 μ F,6.3V
C194	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C422	VCKYCZ1AB104KT	AA	0.1 μ F,10V
C196	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C423	VCKYCZ0JB105KT	AB	1 μ F,6.3V
C198	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C424	VCKYCY1CB104KT	AA	0.1 μ F,16V
C199	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C425	RC-KZ1317AFZZN	AB	1 μ F,16V
C200	VCKYCZ1EB102KT	AB	0.001 μ F,25V	C426-428	VCKYCZ0JB105KT	AB	1 μ F,6.3V
C202	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C447	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C204,205	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C448	RC-KZ1317AFZZN	AB	1 μ F,16V
C206	VCKYCZ1CB103KT	AB	0.01 μ F,16V	C449	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C207,208	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C450	RC-KZ1317AFZZN	AB	1 μ F,16V
C210	RC-KZ1315AFZZN	AC	10 μ F,6.3V	C451	VCKYCZ0JB105KT	AB	1 μ F,6.3V
C211	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C452	RC-KZ1317AFZZN	AB	1 μ F,16V
C212	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C453	VCKYCY0JB225KT	AC	2.2 μ F,6.3V
C213	VCKYCY1AB105KT	AB	1 μ F,10V	C454,455	VCKYCY1AB105KT	AB	1 μ F,10V
C214	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C457-459	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C215	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C460	VCKYCY0JB225KT	AC	2.2 μ F,6.3V
C216	VCKYTV0JB106MT	AF	10 μ F,6.3V	C461,462	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V
C217	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C463	VCCCCZ1EH101JT	AB	100 pF (CH),25V
C218	VCKYCZ1CB103KT	AB	0.01 μ F,16V	C464	VCKYCZ1EB222KT	AA	0.0022 μ F,25V
C219	RC-KZ1308AFZZT	AD	4.7 μ F,6.3V	C465	VCCCCZ1EH101JT	AB	100 pF (CH),25V
C220	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C466	VCKYCY1AB105KT	AB	1 μ F,10V
C221,222	VCKYCZ0JB105KT	AB	1 μ F,6.3V	C468	VCKYTV1EB224KT	AB	0.22 μ F,25V
C223	RC-KZ1315AFZZN	AC	10 μ F,6.3V	C469	VCCCCZ1EH100DT	AB	10 pF (CH),25V
C224,225	VCKYCZ1AB104KT	AA	0.1 μ F,10V	C470	VCKYCZ1CB103KT	AB	0.01 μ F,16V
				C471,472	VCCCCZ1EH100DT	AB	10 pF (CH),25V
				C473	VCCCCZ1EH101JT	AB	100 pF (CH),25V
				C474	VCCCCZ1EH100DT	AB	10 pF (CH),25V
				C475	VCKYCZ1AB104KT	AA	0.1 μ F,10V
				C801-804	VCCCCZ1EH470JT	AB	47 pF (CH),25V
				C801A	VCCCCZ1EH0R5CT	AB	0.5 pF (CH),25V

NO.	PART CODE	PRICE RANK	DESCRIPTION	NO.	PARTS CODE	PRICE RANK	DESCRIPTION
C821	VCCCCZ1EH1R5CT	AB	1.5 pF (CH),25V	R197	VRS-CZ1JB124JT	AB	120 kohms,1/16W
C824	VCCCCZ1EH1R0CT	AA	1 pF (CH),25V	R199	VRS-CZ1JB333JT	AB	33 kohms,1/16W
C831	VCCCCZ1EH271JT	AA	270 pF (CH),25V	R204	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C832	VCCCCZ1EH470JT	AB	47 pF (CH),25V	R208	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C833	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R211	VRS-CZ1JB683JT	AA	68 kohms,1/16W
C834	VCCCCZ1EH220JT	AA	22 pF (CH),25V	R212	VRS-CZ1JB103JT	AA	10 kohm,1/16W
C835	RC-SZ1158AFZZL	AF	100 µF,6.3V,Tantalum,Electrolytic	R214	VRS-CZ1JB752JT	AA	7.5 kohms,1/16W
C836	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R215	VRS-CZ1JB822JT	AA	8.2 kohms,1/16W
C857	VCCCCZ1EH100DT	AB	10 pF (CH),25V	R216	VRS-CZ1JB1R0JT	AA	1 ohm,1/16W
C859	VCCCCZ1EH470JT	AB	47 pF (CH),25V	R218	VRS-CZ1JB331JT	AB	330 ohms,1/16W
C860	VCCCCZ1EH220JT	AA	22 pF (CH),25V	R219	VRS-CZ1JB122JT	AA	1.2 kohms,1/16W
C861	VCKYCZ1EB102KT	AB	0.001 µF,25V	R222,223	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C871	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R227	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C872	VCKYTV1EB123KT	AB	0.012 µF,25V	R232	VRS-CZ1JB1R0JT	AA	1 ohm,1/16W
C873	VCKYCZ1EB102KT	AB	0.001 µF,25V	R305	VRS-CZ1JB203JT	AA	20 kohms,1/16W
C881,882	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R308-310	VRS-CZ1JB101JT	AB	100 ohm,1/16W
C883	VCKYCZ1EB471KT	AA	470 pF,25V	R312-317	VRS-CZ1JB101JT	AB	100 ohm,1/16W
C884	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R319-321	VRS-CZ1JB101JT	AB	100 ohm,1/16W
C885	VCKYCZ1CB103KT	AB	0.01 µF,16V	R322	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C886	VCCCCZ1EH470JT	AB	47 pF (CH),25V	R325	VRS-CZ1JB122JT	AA	1.2 kohms,1/16W
C887	VCCCCZ1EH220JT	AA	22 pF (CH),25V	R326	VRS-CZ1JB103JT	AA	10 kohm,1/16W
C889	VCKYCY0JB225KT	AC	2.2 µF,6.3V	R327	VRS-CZ1JB683JT	AA	68 kohms,1/16W
C901	VCKYCZ1CB103KT	AB	0.01 µF,16V	R332-334	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C902	VCCCCZ1EH1R0CT	AA	1 pF (CH),25V	R335	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C905	VCKYCZ1CB103KT	AB	0.01 µF,16V	R336	VRS-CZ1JB821JT	AA	820 ohms,1/16W
C906	VCCCCZ1EH470JT	AB	47 pF (CH),25V	R337	VRS-CZ1JB152JT	AA	1.5 kohms,1/16W
C907,908	VCCCCZ1EH220JT	AA	22 pF (CH),25V	R338-342	VRS-CZ1JB821JT	AA	820 ohms,1/16W
C910,911	VCCCCZ1EH0R5CT	AB	0.5 pF (CH),25V	R343,344	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C921,922	VCKYCZ1CB103KT	AB	0.01 µF,16V	R345	VRS-CZ1JB152JT	AA	1.5 kohms,1/16W
C923,924	VCCCCZ1EH221JT	AA	220 pF (CH),25V	R346	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C941,942	VCKYCZ1AB104KT	AA	0.1 µF,10V	R348	RR-NZ1103AFZZN	AC	0.18 ohms,1/2W
C943	VCKYCZ1CB103KT	AB	0.01 µF,16V	R349,350	VRS-CZ1JB222JT	AB	2.2 kohms,1/16W
C944	VCKYCY1HB182KT	AA	0.0018 µF,50V	R351,352	VRS-CZ1JB122JT	AA	1.2 kohms,1/16W
C945	VCCCCZ1EH271JT	AA	270 pF (CH),25V	R363	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C946	VCKYCZ1CB103KT	AB	0.01 µF,16V	R368	VRS-CZ1JB471JT	AA	470 ohms,1/16W
C947	VCCCCZ1EH220JT	AA	22 pF (CH),25V	R403	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W
C952	VCCCCZ1EH101JT	AB	100 pF (CH),25V	R404	VRS-TV2ABR10JT	AA	0.1 ohm,1/10W
C954,955	VCKYCZ1AB104KT	AA	0.1 µF,10V	R405	VRS-CZ1JB221JT	AA	220 ohms,1/16W
C971	VCKYCZ1AB104KT	AA	0.1 µF,10V	R407	VRS-CZ1JB124DT	AB	120 kohms,1/16W
C973	RC-KZ1305AFZZN	AC	0.0082 µF,25V	R410	VRS-CZ1JB122JT	AA	1.2 kohms,1/16W
C974	RC-KZ1304AFZZN	AC	0.001 µF,25V	R413	VRS-CZ1JB104JT	AA	100 kohm,1/16W
C975	VCCCCZ1EH151JT	AB	150 pF (CH),50V	R424	VRS-CZ1JB753JT	AA	75 kohms,1/16W
C976,977	VCKYCZ1CB103KT	AB	0.01 µF,16V	R433	VRS-CZ1JB563JT	AA	56 kohms,1/16W
C978,979	VCCCCZ1EH3R0CT	AA	3 pF (CH),25V	R437	VRS-CZ1JB102JT	AA	1 kohm,1/16W
C980,981	VCKYCY1HB222JT	AA	0.0022 µF,50V	R438	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W
C982	VCKYCZ1CB103KT	AB	0.01 µF,16V	R440	VRS-CZ1JB474JT	AB	470 kohms,1/16W
C992,993	VCKYCZ1CB103KT	AB	0.01 µF,16V	R453	VRS-CZ1JB4R7JT	AA	4.7 ohms,1/16W
				R454	VRS-CZ1JB221JT	AA	220 ohms,1/16W
				R455	VRS-CZ1JB474JT	AB	470 kohms,1/16W
				R812	VRS-CZ1JB470JT	AA	47 ohms,1/16W
				R817	VRS-CZ1JB470JT	AA	47 ohms,1/16W
				R851	VRS-CZ1JB470JT	AA	47 ohms,1/16W
				R852	VRS-CZ1JB101JT	AB	100 ohm,1/16W
				R853	VRS-CZ1JB470JT	AA	47 ohms,1/16W
				R854	VRS-CZ1JB101JT	AB	100 ohm,1/16W
				R855,856	VRS-CZ1JB680JT	AA	68 ohms,1/16W
				R857	VRS-CZ1JB560JT	AA	56 ohms,1/16W
				R858	VRS-CZ1JB181JT	AA	180 ohms,1/16W
				R859	VRS-CZ1JB560JT	AA	56 ohms,1/16W
				R871	VRS-CZ1JB470JT	AA	47 ohms,1/16W
				R872	VRS-CZ1JB330JT	AA	33 ohms,1/16W
				R881	VRS-CZ1JB103JT	AA	10 kohm,1/16W
				R882	VRS-CZ1JB223JT	AA	22 kohms,1/16W
				R883	VRS-CZ1JB822JT	AA	8.2 kohms,1/16W
				R885,886	VRS-CZ1JB103JT	AA	10 kohm,1/16W
				R887	VRS-CZ1JB104JT	AA	100 kohm,1/16W
				R901	VRS-CZ1JB100JT	AA	10 ohm,1/16W
				R905	VRS-CZ1JB100JT	AA	10 ohm,1/16W
				R941,942	VRS-CZ1JB100JT	AA	10 ohm,1/16W
				R944	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W
				R953	VRS-CZ1JB100JT	AA	10 ohm,1/16W
				R972	VRS-CZ1JB152JT	AA	1.5 kohms,1/16W
				R973	VRS-CZ1JB332JT	AA	3.3 kohms,1/16W
				R974	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W

RESISTORS

	VRS-CY1JB000JT	AA	0 ohm,Jumper,0.8x1.55mm,Green
	VRS-CZ1JB000JT	AB	0 ohm,Jumper,0.5x1.0mm
R106	VRS-CZ1JB471JT	AA	470 ohms,1/16W
R107	VRS-CZ1JB332JT	AA	3.3 kohms,1/16W
R108	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W
R109	VRS-CZ1JB152JT	AA	1.5 kohms,1/16W
R110	VRS-CZ1JB332JT	AA	3.3 kohms,1/16W
R111	VRS-CZ1JB472JT	AB	4.7 kohms,1/16W
R112	VRS-CZ1JB222JT	AB	2.2 kohms,1/16W
R113	VRS-CZ1JB103JT	AA	10 kohm,1/16W
R115,116	VRS-CZ1JB103JT	AA	10 kohm,1/16W
R118	VRS-CZ1JB103JT	AA	10 kohm,1/16W
R122	VRS-CZ1JB683JT	AA	68 kohms,1/16W
R123	VRS-CZ1JB183JT	AB	18 kohms,1/16W
R124	VRS-CZ1JB273JT	AA	27 kohms,1/16W
R128	VRS-CZ1JB332JT	AA	3.3 kohms,1/16W
R132	VRS-CZ1JB206JT	AA	20 Mohms,1/16W
R143	VRS-CZ1JB474JT	AB	470 kohms,1/16W
R147	VRS-CZ1JB106JT	AA	10 Mohm,1/16W
R149	VRS-CZ1JB471JT	AA	470 ohms,1/16W
R150	VRS-CZ1JB474JT	AB	470 kohms,1/16W
R171	VRS-CZ1JB101JT	AB	100 ohm,1/16W
R172,173	VRS-CY1JB1R0JT	AA	1 ohm,1/16W
R177	VRS-CZ1JB104JT	AA	100 kohm,1/16W
R178	VRS-CZ1JB101JT	AB	100 ohm,1/16W
R182	VRS-CY1JB2R2JT	AA	2.2 ohms,1/16W
R184	VRS-CZ1JB474JT	AB	470 kohms,1/16W
R187,188	VRS-CZ1JB474JT	AB	470 kohms,1/16W
R191	VRS-CZ1JB103JT	AA	10 kohm,1/16W
R192	VRS-CZ1JB474JT	AB	470 kohms,1/16W
R193	VRS-CZ1JB103JT	AA	10 kohm,1/16W
R195	VRS-CZ1JB624DT	AA	620 kohms,1/16W
R196	VRS-CZ1JB683DT	AA	68 kohms,1/16W

OTHER CIRCUITRY PARTS

ANT801	QCNTA0132AFZZN	AE	Terminal,Aerial
BAT100	RDNTL0015AFZZ	BQ	Battery,Back-up
CA1001	DKENDW025AFSI	AG	Camera Unit
CN101	QCNCWTL35AFZZL	AL	Socket,35Pin
CN201	QCNCWTL45AFZZL	AL	Socket,45Pin
CN202	QCNCWTL40AFZZL	AL	Socket,40Pin

NO.	PART CODE	PRICE RANK	DESCRIPTION	NO.	PARTS CODE	PRICE RANK	DESCRIPTION
CN301	QSOCZ9171AFZZL	AH	SIM Card Connector	104	DKENDW025AFS3	CV	Board Unit [A]
CN302	QSOCN1801AFZZL	AM	External Connector	104	DKENDW025AFS4	CV	Board Unit [EP]
CN303	QCNTA0128AFZZN	AG	Contact,Battery	104	DKENDW025AFS5	CV	Board Unit [R]
CN305	QCNCMXM40AFZZN	AH	Plug,40Pin	104	DKENDW025AFS6	CV	Board Unit [T]
CN306	QCNCMXN40AFZZN	AH	Plug,40Pin	104	DKENDW025AFS7	CV	Board Unit [PP]
CN401	QCNCWUF35AFZZL	AK	Socket,35Pin	104	DKENDW025AFS8	CV	Board Unit [S]
CN402	QCNCW950DAFZZL	AE	Socket,4Pin	104	DKENDW025AFS9	CV	Board Unit [H]
CN404	QCNCWTL60AFZZL	AN	Socket,60Pin	104- 1(PWB-A)	---	---	Main (Not Replacement Item)
CN405	QCNCWTF40AFZZN	AH	Socket,40Pin	104- 2(PWB-B)	---	---	Key (Not Replacement Item)
EP100	RPHOD0043AFZZ	AK	Earpiece	104- 3(PWB-C)	DUNTZW025AF01	BB	Relay FPC_A
FS301	QFS-L252EAFNZN	AC	Fuse,2.5A	104- 4	LHLDZ1928AF01	AS	Main Display Holder Assembly
FS401	QFS-L631AAFNZN	AC	Fuse,0.63A	104- 5	LHLDZ1929AF01	AP	External Display Holder Assembly (Except for [F], [C] to Serial No. 307XXXXX)
FS402	QFS-L631EAFNZN	AC	Fuse,0.63A	104- 5	LHLDZ1929AF02	AP	External Display Holder Assembly ([F], [C] and Except for [F], [C] from Serial No. 308XXXXX)
FS403	QFS-L0004QCZZN	AC	Fuse,1A	104- 6	LHLDZ3220AFZZ	AP	Holder,Mg
	QFS-L102EAFNZN	AC	Fuse,1A	104- 7	PCUSG0783AFZZ	AB	Cushion,LED
	QFS-L631AAFNZN	AC	Fuse,0.63A	104- 8	PCUSS0994AFZZ	AC	Cushion,Camera
	QFS-L631EAFNZN	AC	Fuse,0.63A	104- 9	PSHEZ1702AFZZ	AC	Sheet,FPC Fix A
J801	QCNCW927AAFZZR	AG	Connector,RF	104-10	PSHEZ1703AFZZ	AC	Sheet,FPC Fix B
JK301	QJAKM0223AFZZL	AE	Hands Free Connector	104-11	PSHEZ1707AFZZ	AC	Sheet,Protect
LCD001	RLCUB0042AFZZ	BD	External Display	104-12	PSHEZ1730AFZZ	AC	Protect Sheet,Main PWB
LCD100	RLCUB0041AFZZ	BS	Main Display	104-13	PSHEZ1738AFZZ	AC	Sheet,Shade
MIC100	RMICC0213AFZZ	AL	Microphone	104-14	PSHEZ1757AFZZ	AH	Sheet,Sensitivity Decrease Prevention
MO100	RMOTV0553AFZZ	AL	Vibrator	104-15	PSHEZA003AFZZ	AB	Tape,Mg Holder
SP100	RSPA00021AF8P	AK	Speaker	104-16	PSHEZ1777AFZZ	AA	Sheet,Light Leak Prevention
△ VCO851	RUNTZ0831AFZZR	AQ	Tx VCO	104-17	PSHEZ1788AFZZ	AC	Sheet,Relay FPC ([F], [C] and Except for [F], [C] from Serial No. 309XXXXX is not used)
△ VCO971	RUNTZ0832AFZZR	AP	RF VCO	104-18	PSHEZ1801AFZZ	AB	Sheet,Reinforcement (External Display)
CABINET PARTS				104-19	PCUSS1068AFZZ	AC	Cushion,Aerial
101	DCABAW025AFSG	BD	Front Cabinet Assembly [F]	△ 104-20	PSLDM3809AFZZN	AG	Case RF,Shield (Frame)
101	DCABAW025AFSH	BD	Front Cabinet Assembly [C]	△ 104-21	PSLDM3857AFZZ	AE	Case RF,Shield (Cover)
101	DCABAW025AFS1	BD	Front Cabinet Assembly (Except for [F], [C])	104-22	PSPAP0160AFZZ	AB	Spacer,External Display FPC
101- 1	---	---	Front Cabinet (Display),Display (Not Replacement Item)	104-23	PSPAP0161AFZZ	AD	Spacer,Driver
101- 2	GCABC7011AFSA	AS	Front Cabinet (Key),Display	104-24(CA1001)	DKENDW025AFSI	BQ	Camera Unit
101- 5	PCUSS0993AFZZ	AB	Protect Cushion,Camera	104-25	QTANZ9190AFZZL	AB	Contact,Spring
101- 6	PMAGZ0074AFZZ	AD	Magnet	104-26(LCD100)	RLCUB0041AFZZ	BS	Main Display
101- 8	PSHEZ1733AFZZ	AB	Electrostatic Sheet,Side Keys	104-27(LCD001)	RLCUB0042AFZZ	BD	External Display
101- 9	PCUSSA001AFZZ	AD	Cushion,Driver ([F], [C] and Except for [F], [C] from Serial No. 308XXXXX)	104-29(PWB-I)	RUNTK0702AFZZ	AK	Flexible PWB,Side Switch
101-10	PSLDC3348AFZZ	AC	Electrostatic Plate,Side Keys	104-31(PWB-D)	RUNTK0706AFZZ	AY	Relay FPC_B
101-11	RUNTZ0884AFZZ	AG	Hinge	104-32(PWB-E)	RUNTK0707AFZZ	AN	Relay FPC_C
101-12	PCUSS1070AFZZ	AB	Cushion,Driver (Except for [F], [C] to Serial No. 307XXXXX)	104-33(PWB-F)	RUNTK0708AFZZ	AY	Back Light FPC Assembly
101-13	PSHEZ1839AFZZ	AB	Spacer,Key PWB	104-34	TLABZ2595AFZZ	AA	Sensor,Moisture
101-14	PSHEZ1844AFZZ	AB	Sheet,Driver (Except for [F], [C] to Serial No. 307XXXXX)	104-35	PCUSG0788AFZZ	AB	Cushion,Magnet
102	DCABBW025AFSG	BC	Back Cabinet (Display) Assembly [F]	104-36	PCUSS1069AFZZ	AC	Cushion,Main Connector
102	DCABBW025AFSH	BC	Back Cabinet (Display) Assembly [C]	104-37	PSHEZ1820AFZZ	AB	Spacer,External Display R ([F], [C] and Except for [F], [C] from Serial No. 308XXXXX is not used)
102	DCABBW025AFS1	BC	Back Cabinet (Display) Assembly (Except for [F], [C])	104-38	PSHEZ1821AFZZ	AB	Spacer,External Display L ([F], [C] and Except for [F], [C] from Serial No. 308XXXXX is not used)
102- 1	---	---	Back Cabinet (Display),Display (Not Replacement Item)	104-39	PSHEZ1822AFZZ	AB	Spacer,Relay FPC-B
102- 2	PCUSG0776AFZZ	AB	Cushion,Reinforcement	104-40	PSHEZ1840AFZZ	AB	Spacer A,Main PWB
102- 3	PFILW0122AFZZ	AC	Filter,Ir	104-41	PSHEZ1841AFZZ	AB	Spacer B,Main PWB
102- 5	TLABZ2595AFZZ	AA	Sensor,Moisture	104-42	PSHEZ1842AFZZ	AC	Tape1,External Display Holder
103	DCABDW025AFS1	AY	Back Cabinet (Key) Assembly	104-43	PSHEZ1791AFZZ	AB	Tape2,External Display Holder
103- 1	---	---	Back Cabinet (Key),Display (Not Replacement Item)	105	GCOVA2528AFSA	AC	Screw Cover,Display
103- 2	GCOVH1337AFZZ	AC	Cover,Aerial A	106	GCOVA2546AFSA	AC	Cap,Aerial
103- 3	GCOVH1346AFSA	AC	Cover,Jack (Hands Free)	107	GCOVD1119AFSP	AB	Screw Cover,Key
103- 4	PCUSS0902AFZZ	AB	Cushion,Battery	108	GCOVH1345AFZZ	AC	Cover,Hinge
103- 5	PSHEZ1717AFZZ	AC	Electrostatic Sheet,Speaker	109	GCOVH1347AFSA	AD	Cover,External Connector
103- 6	QANTH0206AFSA	AL	Aerial	110	JKNBZ2352AFSA	AT	Button,10 Key
103- 7	TLABZ2595AFZZ	AA	Sensor,Moisture	111	JKNBZ2359AFSA	AG	Keys,Side
103- 8	GCOVH8125AFZZ	AC	Cover,Aerial B	112(BAT100)	RDNTL0015AFZZ	AG	Battery,Back-up
104	DKENDW025AFSA	CV	Board Unit [W]	113(MIC100)	RMICC0213AFZZ	AL	Microphone
104	DKENDW025AFSB	CV	Board Unit [B]	114(MO100)	RMOTV0553AFZZ	AL	Vibrator
104	DKENDW025AFSC	CV	Board Unit [Z]	115(EP100)	RPHOD0043AFZZ	AK	Earpiece
104	DKENDW025AFSD	CV	Board Unit [D]	116(SP100)	RSPA00021AF8P	AK	Speaker
104	DKENDW025AFSE	CV	Board Unit [Q]	117	TSPC-A081AFZZ	DF	Label,Specifications [F]
104	DKENDW025AFSF	CV	Board Unit [L]	117	TSPC-A079AFZZ	DH	Label,Specifications (Except for [A], [Z], [F])
104	DKENDW025AFSG	CV	Board Unit [J]	117	TSPC-A080AFZZ	DH	Label,Specifications [A], [Z]
104	DKENDW025AFSH	CV	Board Unit [C]	601	LX-EZ0193AFZZ	AB	Screw,ø1.7×4.5mm,Black
104	DKENDW025AFS1	CV	Board Unit [E]	602	LX-EZ0195AFZZ	AB	Screw,ø1.7×5mm
104	DKENDW025AFS2	CV	Board Unit [G]				

NO.	PART CODE	PRICE RANK	DESCRIPTION
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ACCESSORIES/PACKING PARTS

1	GFTAB1404AFSA	AH	Cover,Battery
△ 2	RADPT6214AF01	**	AC Charger [A] [Z]
△ 2	RADPT7203AF01	**	AC Charger [B] [D] [G] [H] [PP] [S] [T] [W] [Q] [F] [C]
△ 2	RADPT8201AF01	**	AC Charger [E] [EP] [R] [L]
3	RUNTZ0893AFZZ	AS	Hands Free Kit
4	SPAKA2823AFZZ	AG	Packing Add.
5	SPAKC7719AFZZ	AN	Packing Case [E] [B] [D] [PP] [R] [T] [S] [W] [L]
5	SPAKC7730AFZZ	AK	Packing Case [EP] [G] [H] [Q] [F] [C]
5	SPAKC7731AFZZ	AN	Packing Case [A] [Z]
6	SPAKP1252AFZZ	AC	Polyethylene Bag,AC Charger
7	SPAKP1284AFZZ	AC	Polyethylene Bag,Unit
8	SPAKX3534AFZZ	AE	Spacer
9	SSAKH0329AFZZ	AA	Polyethylene Bag,Battery Cover
10	SSAKH0337AFZZ	AB	Polyethylene Bag,User Guide
11	TCADZ0263AFZZ	AC	Card,Free Service ([T] Only)
12	TGANZA001AFZZ	AD	Guarantee [C]
12	TGANE1239AFZZ	AB	Guarantee [Q] [L]
12	TGANE1243AFZZ	AC	Guarantee [A] [Z]
12	TGANE1245AFZZ	AC	Guarantee [E] [EP]
12	TGANE1246AFZZ	AC	Guarantee [R]
12	TGANI1072AFZZ	AC	Guarantee [T]
12	TGANZ1099AFZZ	AD	Guarantee [H]
12	TGANZ1109AFZZ	AC	Guarantee [S]
12	TGANZ1111AFZZ	AE	Guarantee [PP]
12	TGANZ1112AFZZ	AE	Guarantee [W]
12	TGANZ1113AFZZ	AE	Guarantee [B]
12	TGANZ1114AFZZ	AC	Guarantee [D]
13	TINSEA001AFZZ	AL	User Guide [L]
13	TINSE1682AFZZ	AK	User Guide [E] [EP] [R] [Q]
13	TINSE1689AFZZ	AL	User Guide [A] [Z]
13	TINSFA001AFZZ	AL	User Guide [F]
13	TINSGA001AFZZ	AL	User Guide [C]
13	TINSG0110AFZZ	AK	User Guide [G]
13	TINSI0037AFZZ	AL	User Guide [T]
13	TINSP0257AFZZ	AP	User Guide [PP]
13	TINSZ1435AFZZ	AL	User Guide [S]
13	TINSZ1436AFZZ	AN	User Guide [H]
13	TINSZ1437AFZZ	AP	User Guide [W]
13	TINSZ1438AFZZ	AP	User Guide [B]
13	TINSZ1439AFZZ	AN	User Guide [D]
14	TLABZ2793AFZZ	AA	Sheet,Security ([E] [L] Only)
△ 15	UBATI0147AF02	**	Rechargeable Li-ion Battery
16	_____	—	Label,Case
17	UDSKAA001AF01	AK	CD-ROM
18	SSAKA0233AFZZ	AD	Polyethylene Bag,CD-ROM
19	TCADHA003AFZZ		Card,"How to" ([E] Only from Serial No. 309XXXXX)

P.W.B. ASSEMBLY

PWB-A	_____	—	Main (Not Replacement Item)
PWB-B	_____	—	Key (Not Replacement Item)
PWB-C	DUNTZW025AF01	BB	Relay FPC_A
PWB-D	RUNTK0706AFZZ	AY	Relay FPC_B
PWB-E	RUNTK0707AFZZ	AN	Relay FPC_C
PWB-F	RUNTK0708AFZZ	AY	Back Light FPC Assembly
PWB-I	RUNTK0702AFZZ	AK	Flexible PWB,Side Switch

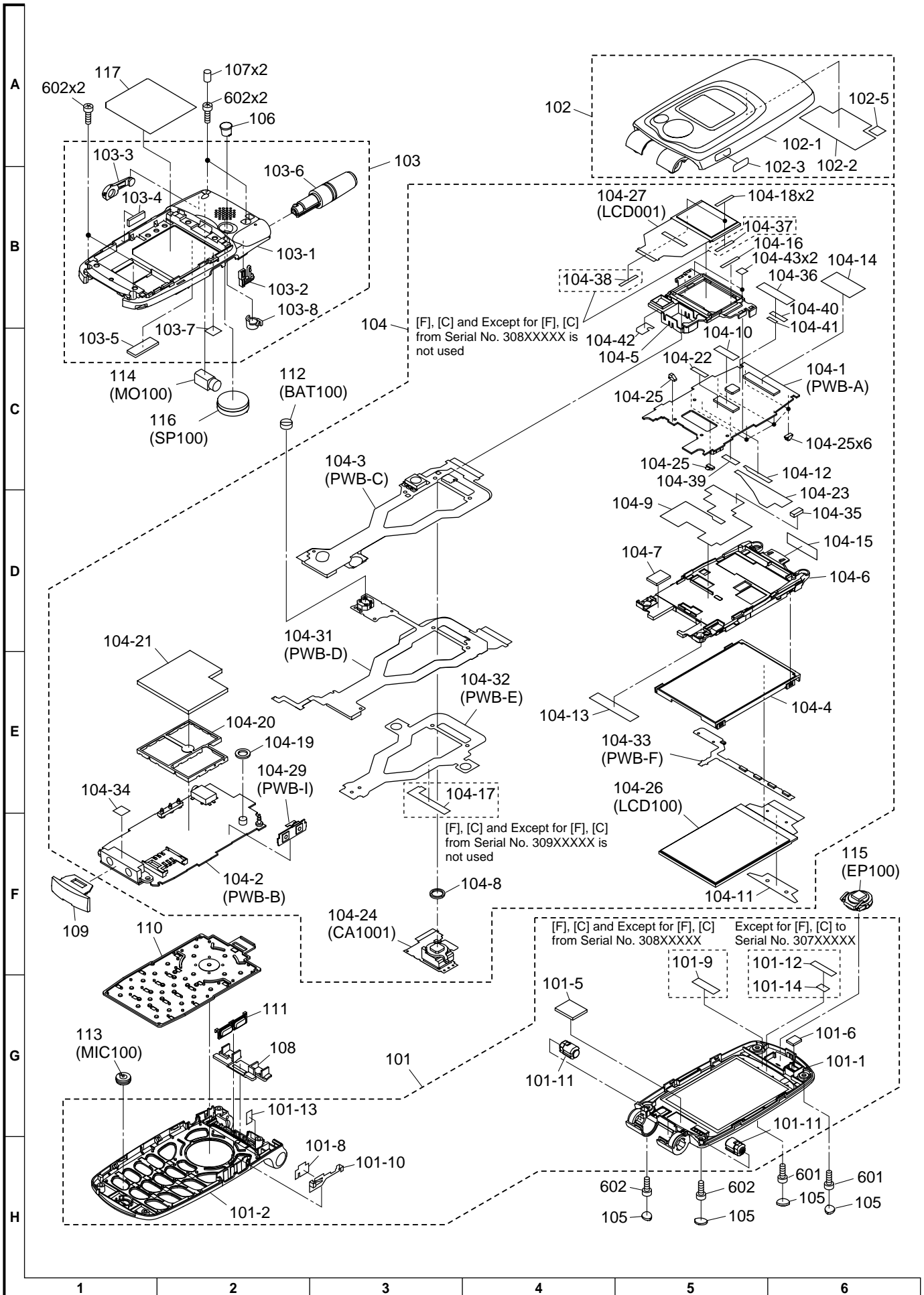
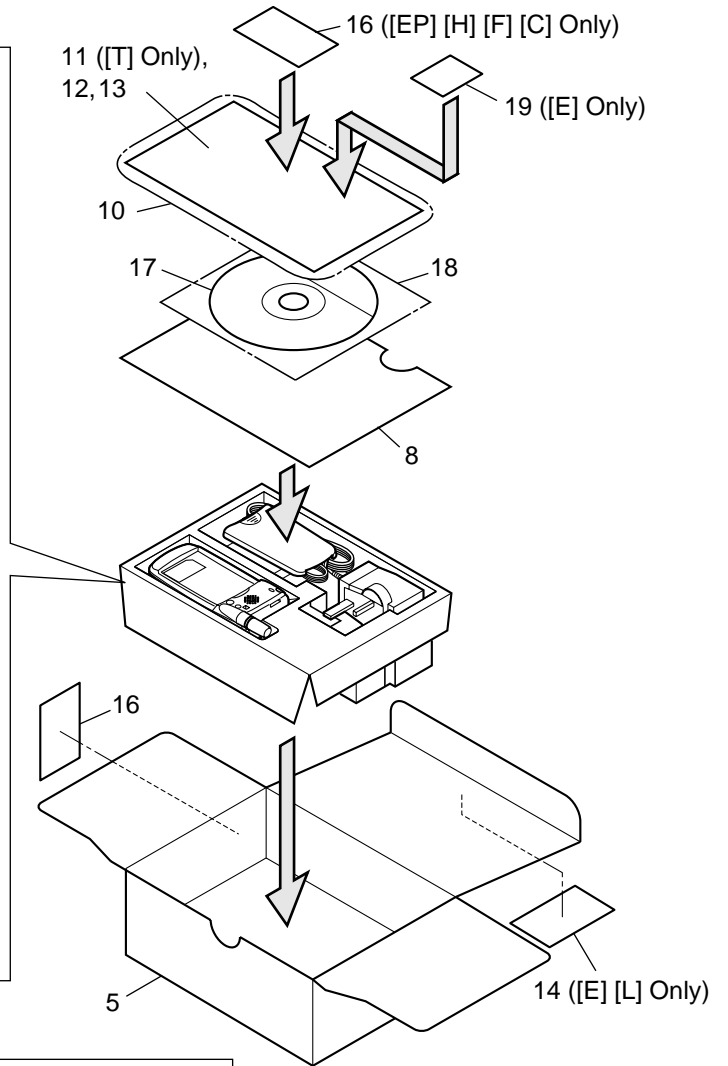
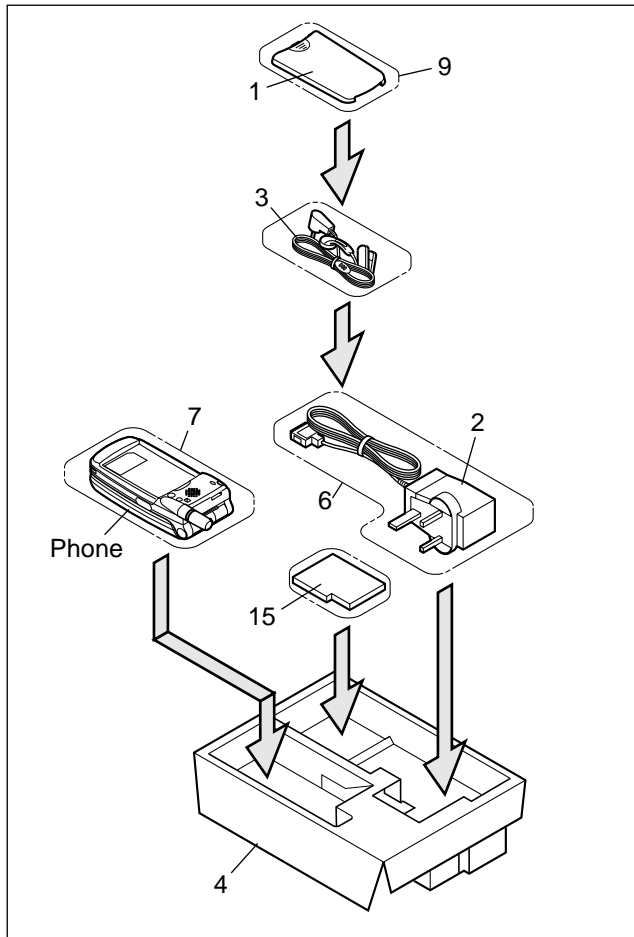


Figure 1 CABINET EXPLODED VIEW

Packing method

- | | | | |
|--------------------|---------------------------------------------------|---------------------|-------------------------------|
| 1. GFTAB1404AFSA | Cover,Battery | 12. TGANZ1111AFZZ | Guarantee [PP] |
| △ 2. RADPT6214AF01 | AC Charger [A] [Z] | 12. TGANZ1112AFZZ | Guarantee [W] |
| △ 2. RADPT7203AF01 | AC Charger [B] [D] [G] [H] [PP] [S] [T] [W] [Q] | 12. TGANZ1113AFZZ | Guarantee [B] |
| | [F] [C] | 12. TGANZ1114AFZZ | Guarantee [D] |
| △ 2. RADPT8201AF01 | AC Charger [E] [EP] [R] [L] | 13. TINSEA001AFZZ | User Guide [L] |
| 3. RUNTZ0893AFZZ | Hands Free Kit | 13. TINSE1682AFZZ | User Guide [E] [EP] [R] [Q] |
| 4. SPAKA2823AFZZ | Packing Add. | 13. TINSE1689AFZZ | User Guide [A] [Z] |
| 5. SPAKC7719AFZZ | Packing Case [E] [B] [D] [PP] [R] [T] [S] [W] [L] | 13. TINSFA001AFZZ | User Guide [F] |
| 5. SPAKC7730AFZZ | Packing Case [EP] [G] [H] [Q] [F] [C] | 13. TINSGA001AFZZ | User Guide [C] |
| 5. SPAKC7731AFZZ | Packing Case [A] [Z] | 13. TINSG0110AFZZ | User Guide [G] |
| 6. SPAKP1252AFZZ | Polyethylene Bag,AC Charger | 13. TINSI0037AFZZ | User Guide [T] |
| 7. SPAKP1284AFZZ | Polyethylene Bag,Unit | 13. TINSPO257AFZZ | User Guide [PP] |
| 8. SPAKX3534AFZZ | Spacer | 13. TINSZ1435AFZZ | User Guide [S] |
| 9. SSAKH0329AFZZ | Polyethylene Bag,Battery Cover | 13. TINSZ1436AFZZ | User Guide [H] |
| 10. SSAKH0337AFZZ | Polyethylene Bag,User Guide | 13. TINSZ1437AFZZ | User Guide [W] |
| 11. TCADZ0263AFZZ | Card,Free Service ([T] Only) | 13. TINSZ1438AFZZ | User Guide [B] |
| 12. TGANZA001AFZZ | Guarantee [C] | 13. TINSZ1439AFZZ | User Guide [D] |
| 12. TGANE1239AFZZ | Guarantee [Q] [L] | 14. TLABZ2793AFZZ | Sheet,Security ([E] [L] Only) |
| 12. TGANE1243AFZZ | Guarantee [A] [Z] | △ 15. UBATI0147AF02 | Rechargeable Li-ion Battery |
| 12. TGANE1245AFZZ | Guarantee [E] [EP] | 16. _____ | Label,Case |
| 12. TGANE1246AFZZ | Guarantee [R] | 17. UDSKAA001AF01 | CD-ROM |
| 12. TGANI1072AFZZ | Guarantee [T] | 18. SSAKA0233AFZZ | Polyethylene Bag,CD-ROM |
| 12. TGANZ1099AFZZ | Guarantee [H] | 19. TCADHA003AFZZ | Card,"How to" ([E] Only from |
| 12. TGANZ1109AFZZ | Guarantee [S] | | Serial No.309XXXXX) |



AC Charger

RADPT6214AF01	RADPT7203AF01	RADPT8201AF01

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