

Service Manual

Telephone Equipment

Model No. **KX-TG6451BX**
KX-TGA641BX

(for Asia, Middle Near East and other areas)

1.2. Circuit Operation (Base Unit)

1.2.1. Outline

Base unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.2).

- DECT BBIC (**B**ase **B**and IC): IC501
 - Handling all the audio, signal and data processing needed in a US DECT base unit
 - Controlling the US DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)
 - ADPCM code filter for speech encoding and speech decoding (DSP section)
 - Echo-cancellation and Echo-suppression (DSP section)
 - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
 - DTMF receiver (DSP section)
 - Clock Generation for RF Module
 - ADC, DAC, timer, and power control circuitry
 - All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)
 - RF Tranceiver (LNA Mixer IF Filter, Modulator/Demodulator, PLL, Vco)
- EEPROM: IC561
 - Temporary operating parameters (for RF, etc.)
- FLASH MEMORY: IC541
 - Voice Prompt (TAM) D/L Area
 - ICM/OGM/MEMO Recording Area
- TAM Companion: IC201
 - Voice data compression and decompression
 - Speaker Amp
- Additionally,
 - Power Supply Circuit (+4.0 V, +3.3 V, +2.5 V, +1.8 V output)
 - Crystal Circuit (10.368 MHz)
 - Telephone Line Interface Circuit

1.2.2. Power Supply Circuit

The power is supplied to the BBIC, TAM Companion, Power AMP, LCD module, EEPROM, Flash Memory, LED, LCD backlight from AC Adaptor(+6.5V) as shown in Fig 1.

When power line failure, the power is supplied to BBIC, TAM companion, EEPROM from telephone line instead of AC Adaptor through D138 and Q341.

- BBIC (IC501)

AC adaptor → F301 → D301 → IC301 → D311 → Q351 → IC501 (VDD 1.8V)
 (When power fail) → IC501 (BAT 3.2V)
 Telephone line → line interface → D138 → Q341 → IC303 → IC501 (RF_SUPPLY)

- TAM Companion (IC201)

AC adaptor → F301 → D301 → D311 → Q351 → IC201 (VDD 1.8V)
 (When power fail) → IC201 (BAT 3.2V)
 Telephone line → line interface → D138 → Q341 → IC303 → IC501 (RF_SUPPLY)

AC adaptor → F301 → D301 → IC301 → D353 → IC201 (VDDPA 3.2V)

- RF Power AMP (IC801)

AC adaptor → F301 → D301 → IC304 → Q608 → IC801 (VCC)

- EEPROM (IC561)

AC adaptor → F301 → D301 → IC301 → D311 → IC303 → IC561 (VCC 2.5V)
 (When power fail) → IC303 → IC561 (VCC 2.5V)
 Telephone line → line interface → D138 → Q341 → IC303 → IC561 (VCC 2.5V)

- Flash memory (IC541)

AC adaptor → F301 → D301 → IC301 → D311 → IC501 (BAT:CP_VOUT1) → IC541 (VDD 3.0V)

- LCD module

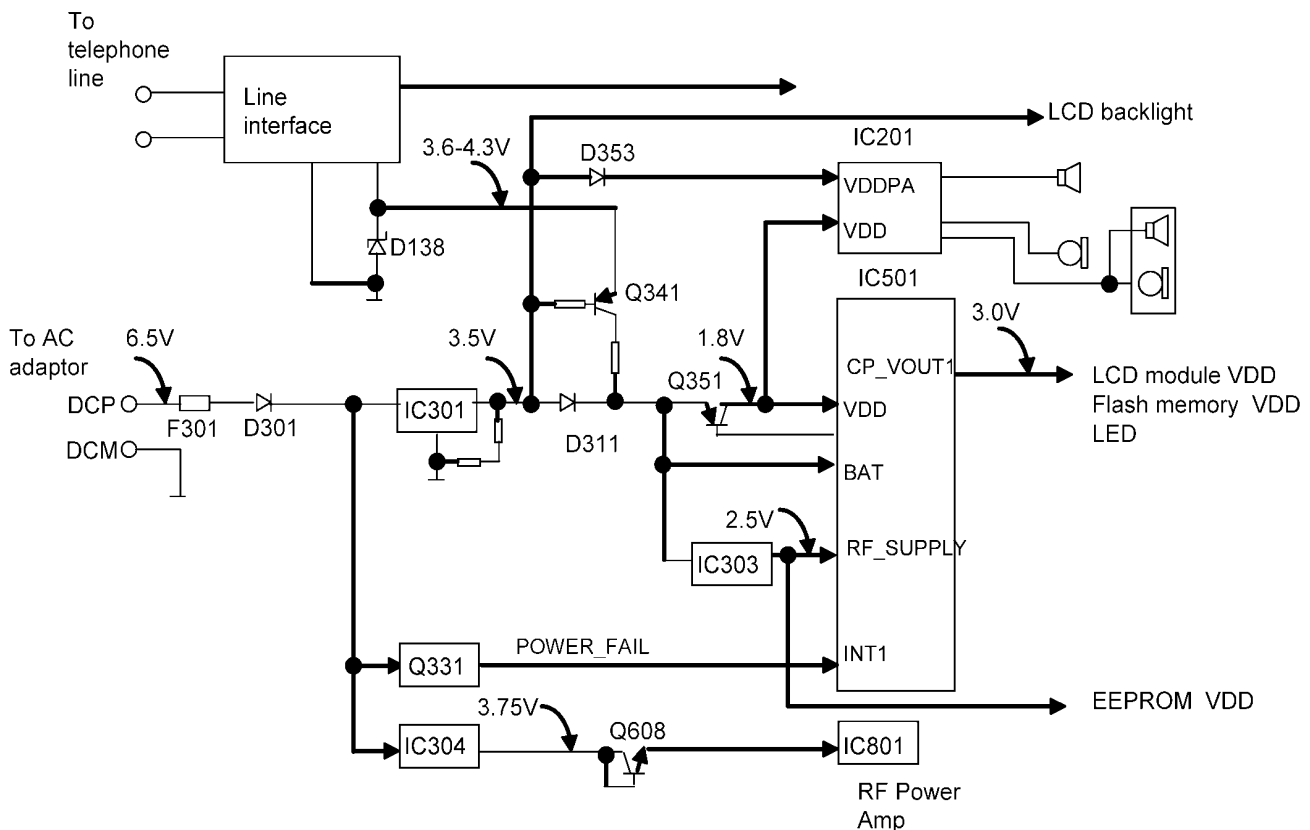
AC adaptor → F301 → D301 → IC301 → D311 → IC501 (BAT:CP_VOUT1) → CN1 → LCD module (VDD 3.0V)

- LED

AC adaptor → F301 → D301 → IC301 → D311 → IC501 (BAT:CP_VOUT1) → CN1 → LED (3.0V)

- LCD backlight

AC adaptor → F301 → D301 → IC301 → CN2 → LCD backlight (3.5V)



<Fig.1>

1.2.3. Telephone Line Interface

Function

- Bell signal detection
- CLIP signal detection
- ON/OFF hook and pulse dial circuit

Bell & CLIP (Calling Line Identification Presentation: Caller ID) signal detection:

In standby mode, Q111/Q115 is open to cut the DC Loop current and decrease the ring load.

When ringing voltage appears at the TIP and RING, AC ring voltages transferred as followings;

CLIP signal detection

TIP → C181 → R182 → R185 → IC501(26)(BBIC-CIDINn)

RING → C191 → R192 → R195 → IC501(27)(BBIC-CIDINp)

Bell signal detection

TIP → C181 → R182 → C184 → R186 → C187 → IC501(30)(BBIC-RINGING)

When power line failure (Because this case is no power to IC501)

TIP → C164 → D161(2) → D161(1) → IC101(1:5) → R167 → RINGERP

RING ← D161(3) ← D161(4) ← Q162(c:e) ← IC101(2:8) ← RINGERM

ON/OFF hook circuit

ON hook:

Q111/Q115 is open to cut the DC loop current and voice signal, caused by the following control:

Hook switch (between hook2-4 and hook2-6) is opened and IC501(29)(Hook CTRL) is Low, (and Q114 is open), then Q112 is OFF, so Q111/Q115 is OPEN

OFF hook:

Q111/Q115 is ON to make the DC loop current and be possible to transfer voice signal, caused by the following control:

Hook switch (between hook2-4 and hook2-6) make and IC501(29)(Hook CTRL) is High. (and Q114 is open), then Q112 is ON.

1.2.4. Audio signal Flow (Out line)

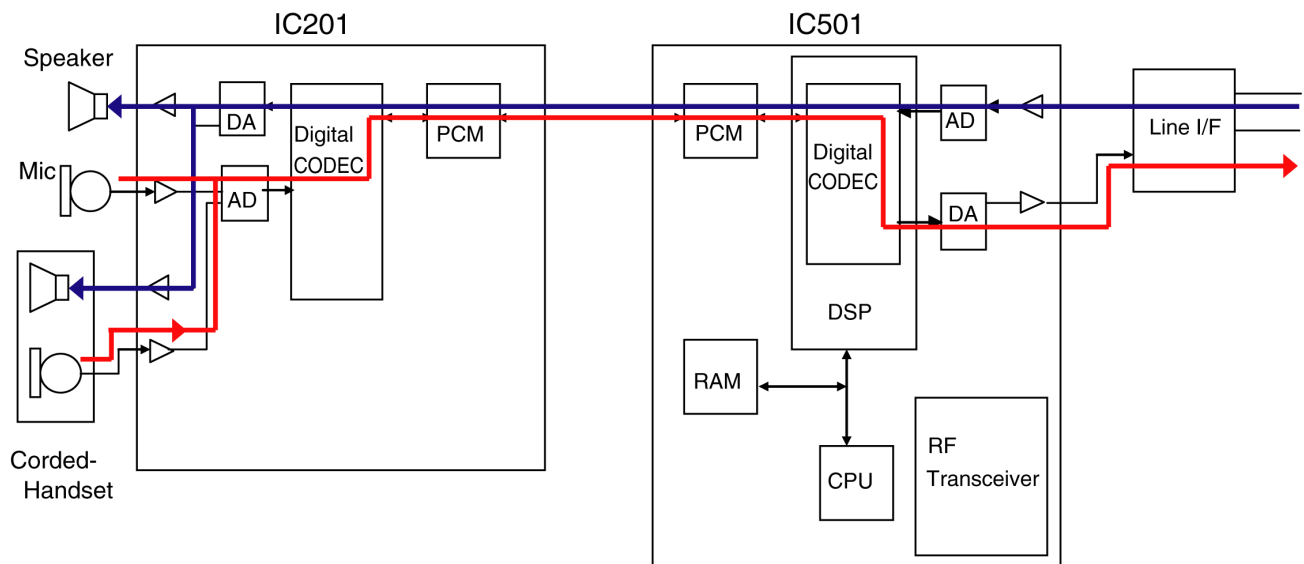
The audio signal from Mic (for SP-phone and Corded Handset) is converted from Analog to digital in TAM companion IC(IC201), then is transferred to BBIC(IC501) through PCM interface.

In BBIC(IC501), these data is converted to Analog, then send out tel line through tel line interface.

On the other hand, the audio signal from tel line is converted from Analog to digital in BBIC(IC501), then is transferred to TAM companion IC(IC201) through PCM interface.

In TAM companion IC(IC201), these data is converted to Analog, then sound out from speaker.

Refer to the fig.2.



<Fig.2>

1.2.5. RF cuircuit

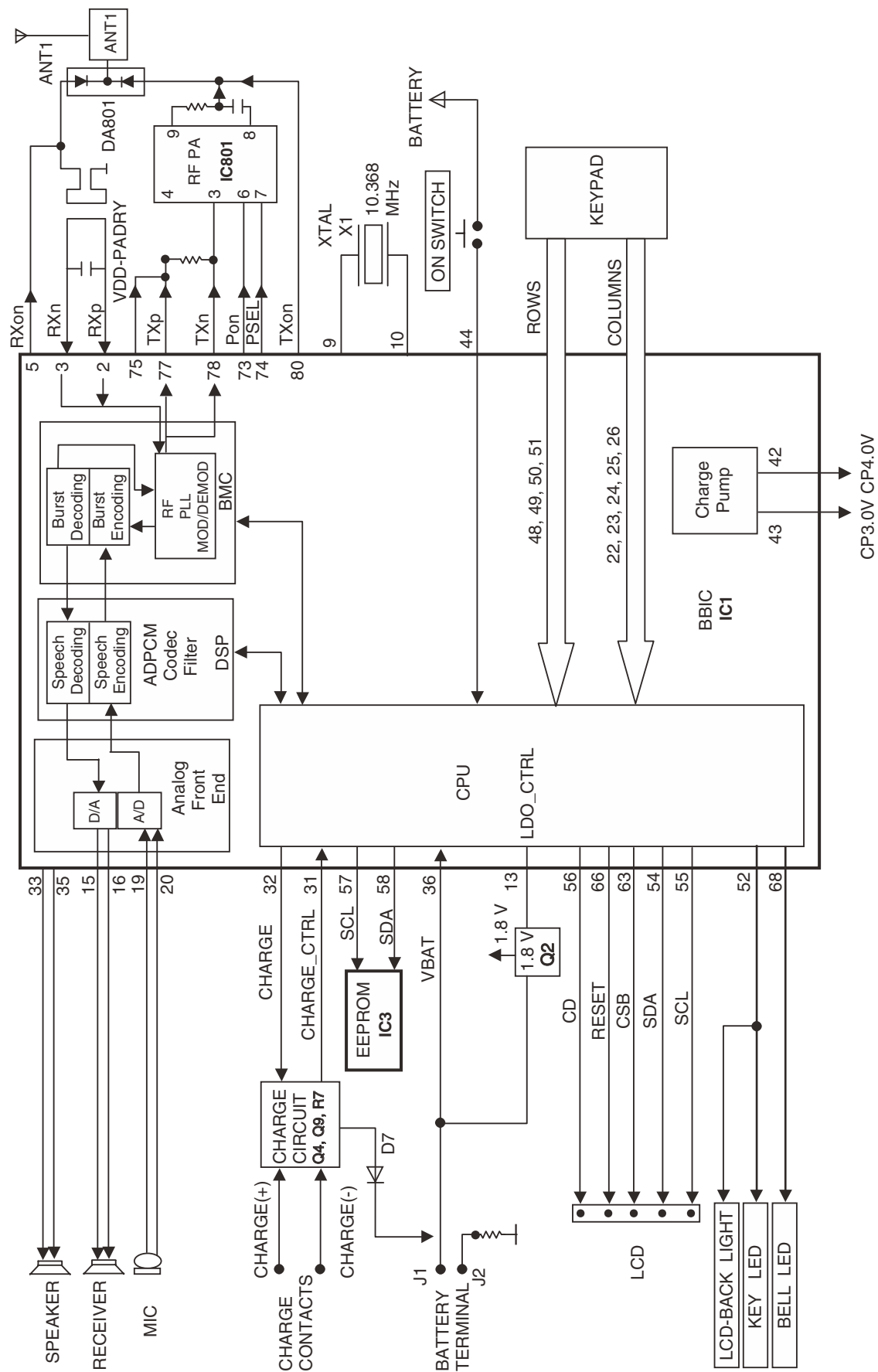
BBIC(IC501) includes the RF transceiver circuit. (LNA,Mixer, IF filter, modulator/Demodulator,PLL, VCO etc).

This RF transceiver is interfaced with Power-AMP(IC801) and Antenna circuit.

1.2.6. Pulse Dialling

During pulse dialling the hookswitch (Q3, Q4) is used to generate the pulses using the HOOK control signal, which is set high during pulses. To force the line impedance low during the "pause" intervals between dial pulses, the PULSE_DIAL signal turns on Q2.

1.3. Block Diagram (Cordless Handset)



1.4. Circuit Operation (Cordless Handset)

1.4.1. Outline

Cordless Handset consists of the following ICs as shown in **Block Diagram (Cordless Handset)** (P.6).

- DECT BBIC (**B**ase **B**and IC): IC1
 - All data signals (forming/analyzing ACK or CMD signal)
 - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD, RF Power Amp.)
 - PLL Oscillator
 - Detector
 - Compress/Expander
 - Reception
- RF Power Amp: IC801
 - Amplifier for transmission
- EEPROM: IC3
 - Temporary operating parameters (for RF, etc.)

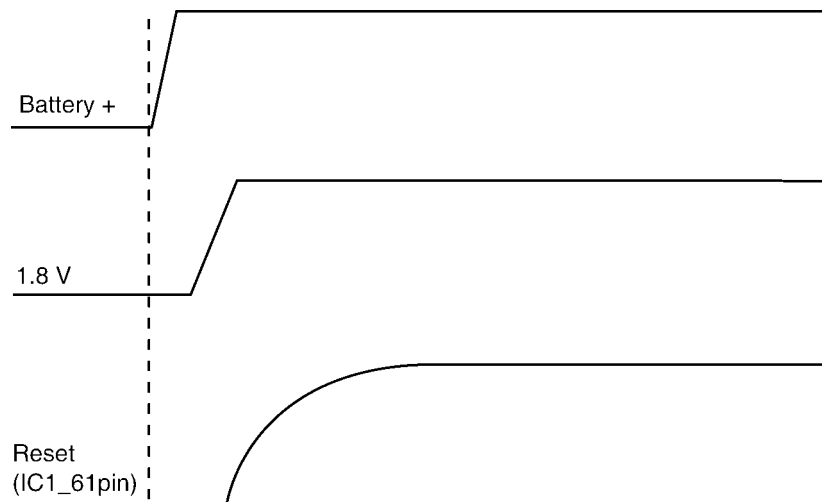
1.4.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

When power on the Cordless Handset, the voltage is as follows;

BATTERY(2.2 V ~ 2.6 V: BATT+) → F1 → Q2 (1.8 V), IC1-43pin (2.5V)

The Reset signal generates IC1 (61 pin) and 1.8 V.



1.4.3. Charge Circuit

Circuit Operation:

When charging the Cordless Handset on the Charger Unit, the charge current is as follows;

DC+(6.5 V) → F1 → R1 → CHARGE+(Charger) → CHARGE+(Cordless Handset) → L4 → Q4 → D7 → F1 → BATTERY+... Battery...

BATTERY- → L8 → R45 → GND → L5 → CHARGE-(Cordless Handset) → CHARGE-(Charger) → GND → DC-(GND)

In this way, the BBIC on Cordless Handset detects the fact that the battery is charged.

The charge current is controlled by switching Q9 of Cordless Handset.

1.4.4. Battery Low/Power Down Detector

Circuit Operation:

"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery.

The detected voltage is as follows;

- Battery Low

Battery voltage: $V(\text{Batt}) \leq 2.25 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and "■" starts flashing.

- Power Down

Battery voltage: $V(\text{Batt}) \leq 2.0 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and power down.

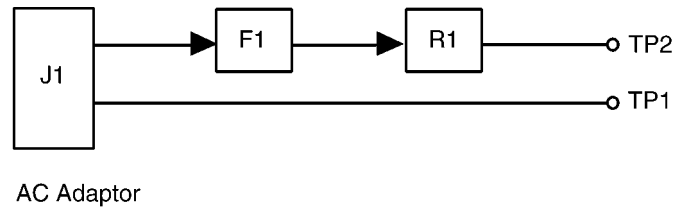
1.4.5. Speakerphone

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm.

1.5. Circuit Operation (Charger Unit)

1.5.1. Power Supply Circuit

The power supply is as shown.



2 Schematic Diagram

2.1. For Schematic Diagram

2.1.1. Base Unit (Schematic Diagram (Base Unit_Main))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. The schematic diagrams may be modified at any time with the development of new technology.

2.1.2. Cordless Handset (Schematic Diagram (Cordless Handset))

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams may be modified at any time with the development of new technology.

2.1.3. Charger Unit (Schematic Diagram (Charger Unit))

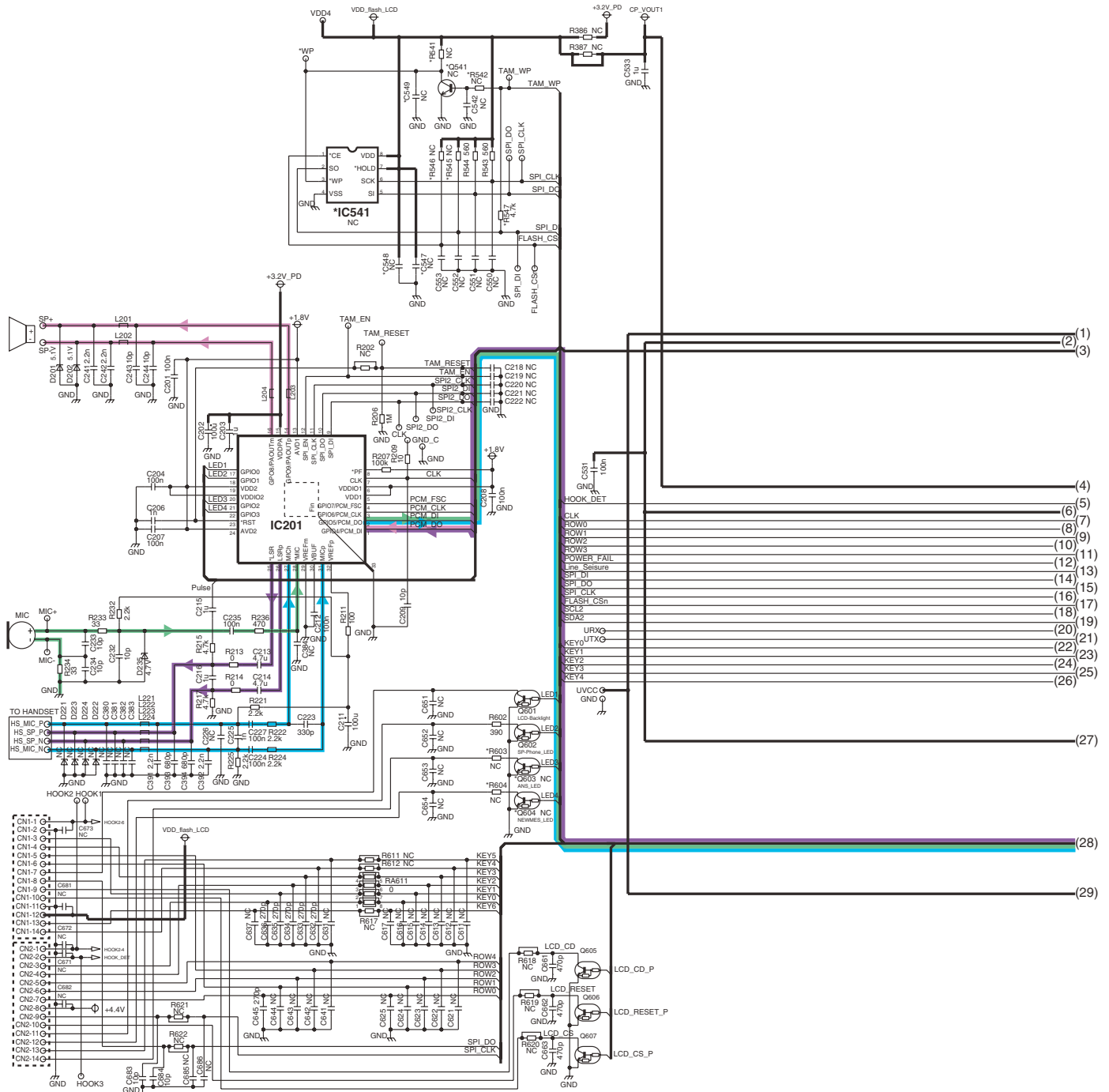
Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

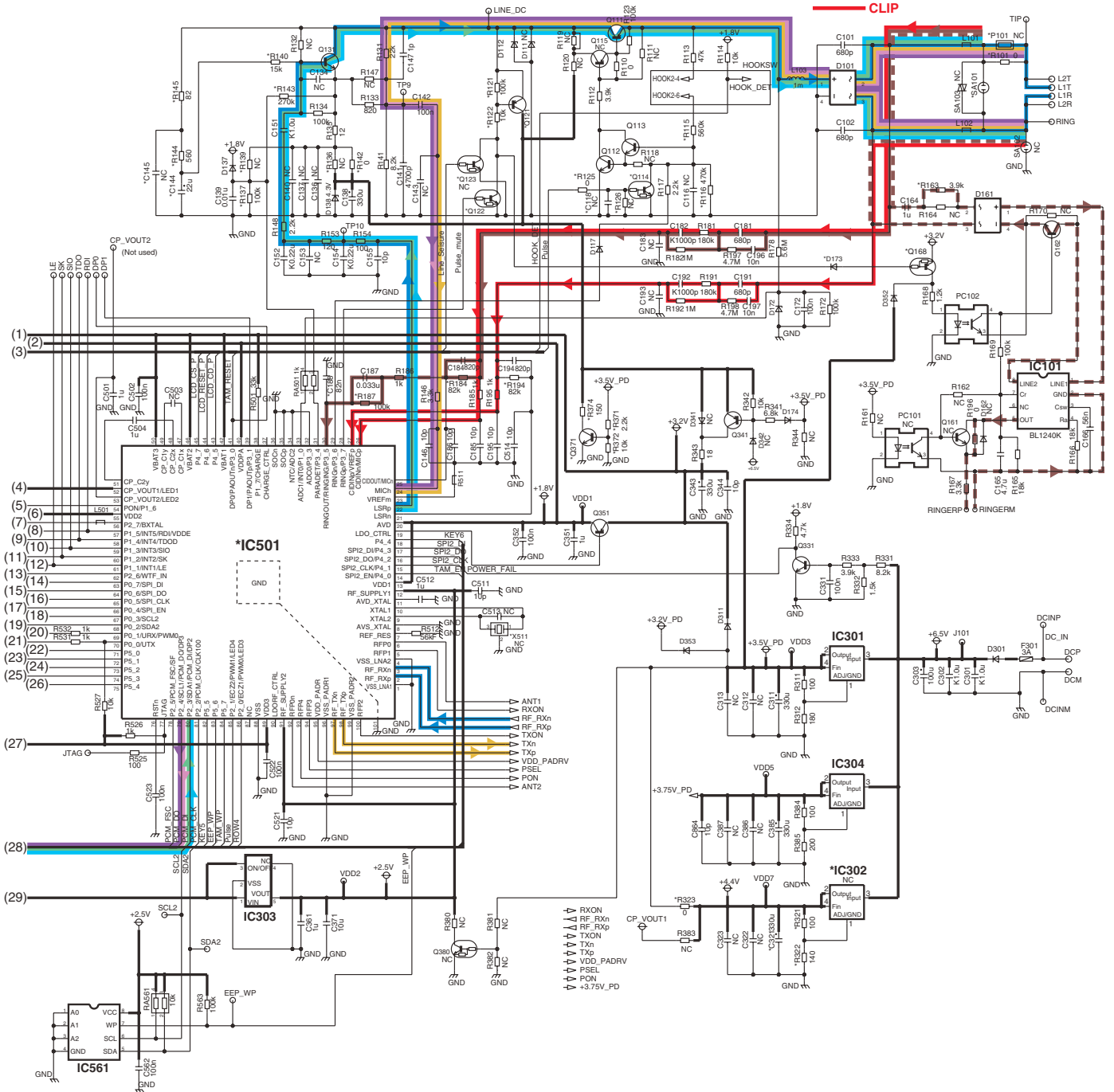
2. This schematic diagram may be modified at any time with the development of new technology.

2.2. Schematic Diagram (Base Unit_Main)



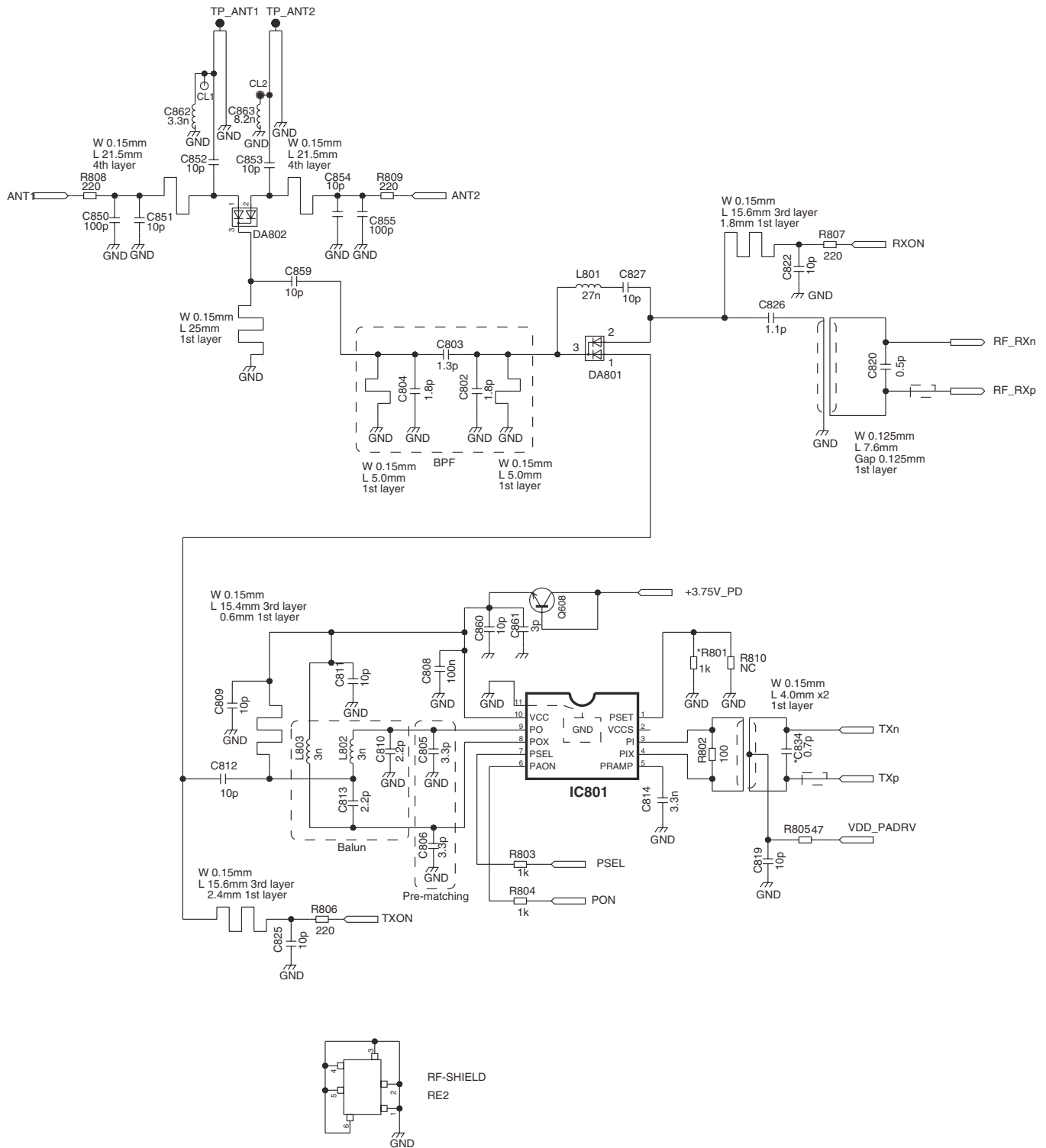
NC: No Components

- CDL Tx (to Tel line)
- CDL Rx (from Tel line)
- SP_Phone Tx (to Tel line)
- SP_Phone Rx (from Tel line)
- (Corded) Handset Tx (to Tel line)
- (Corded) Handset Rx (from Tel line)
- Bell
- Bell (Power fail)
- CLIP



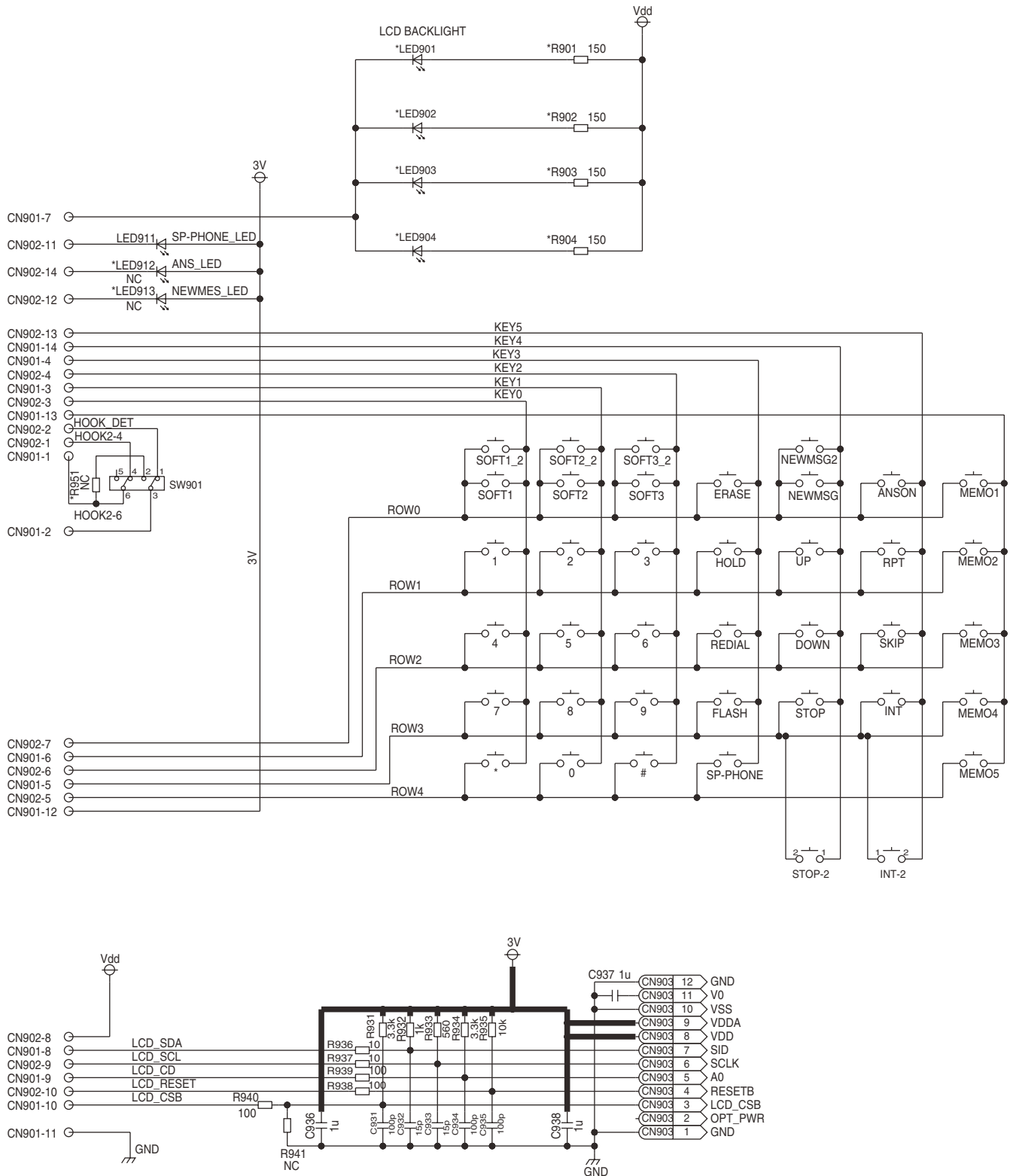
NC: No Components

2.3. Schematic Diagram (Base Unit_RF Part)



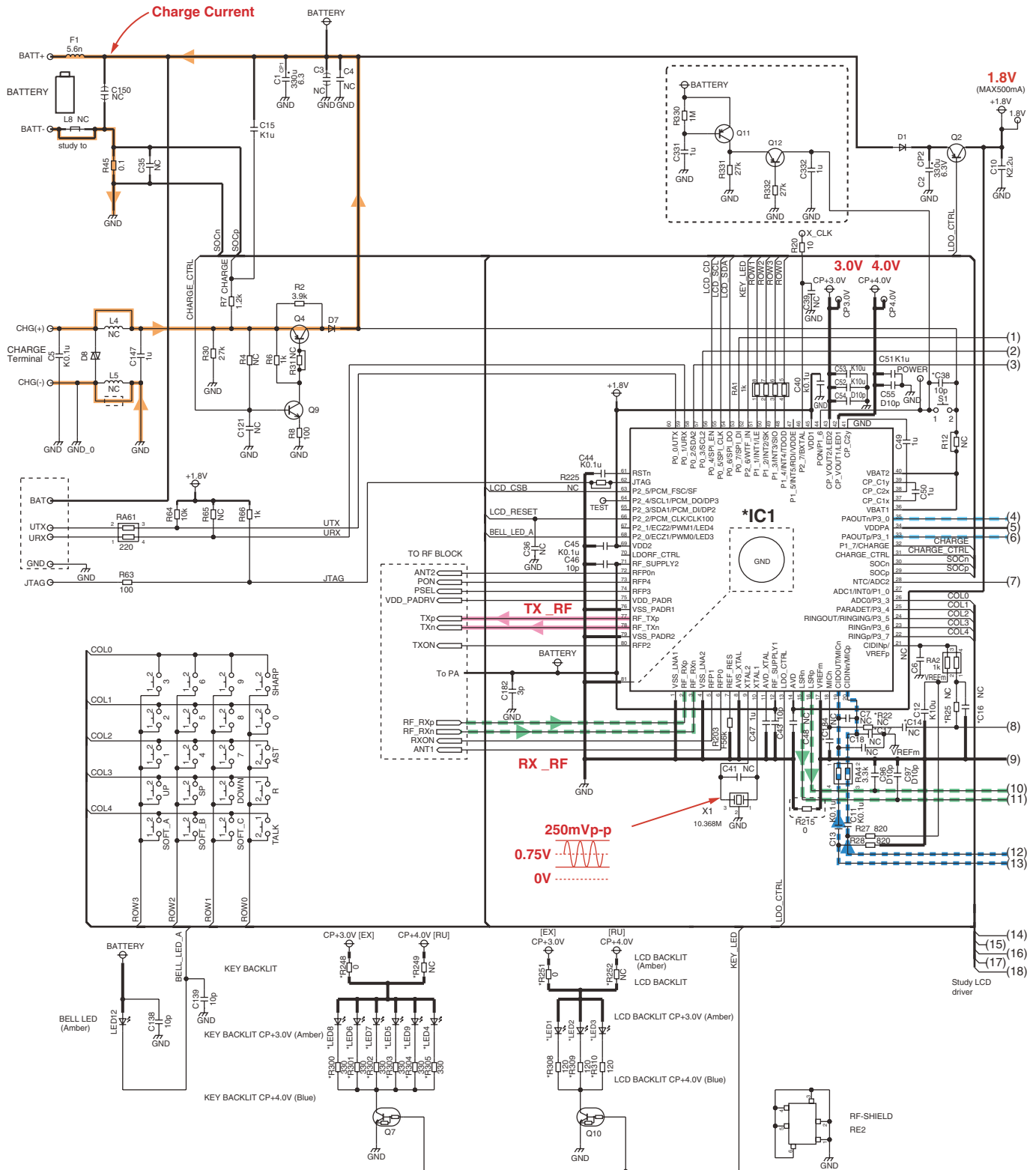
NC: No Components

2.4. Schematic Diagram (Base Unit_Operation)

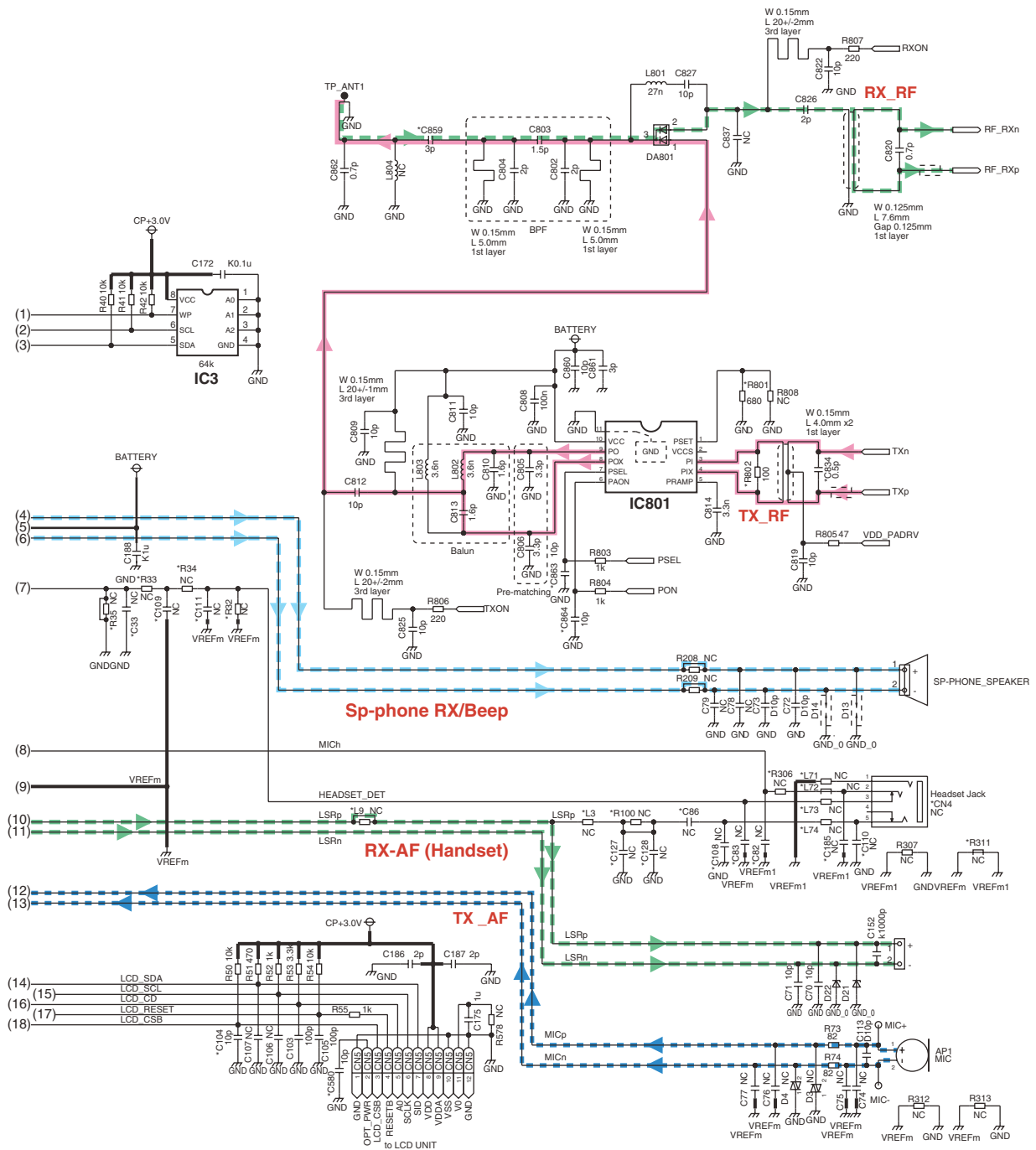


NC: No Components

2.5. Schematic Diagram (Cordless Handset)

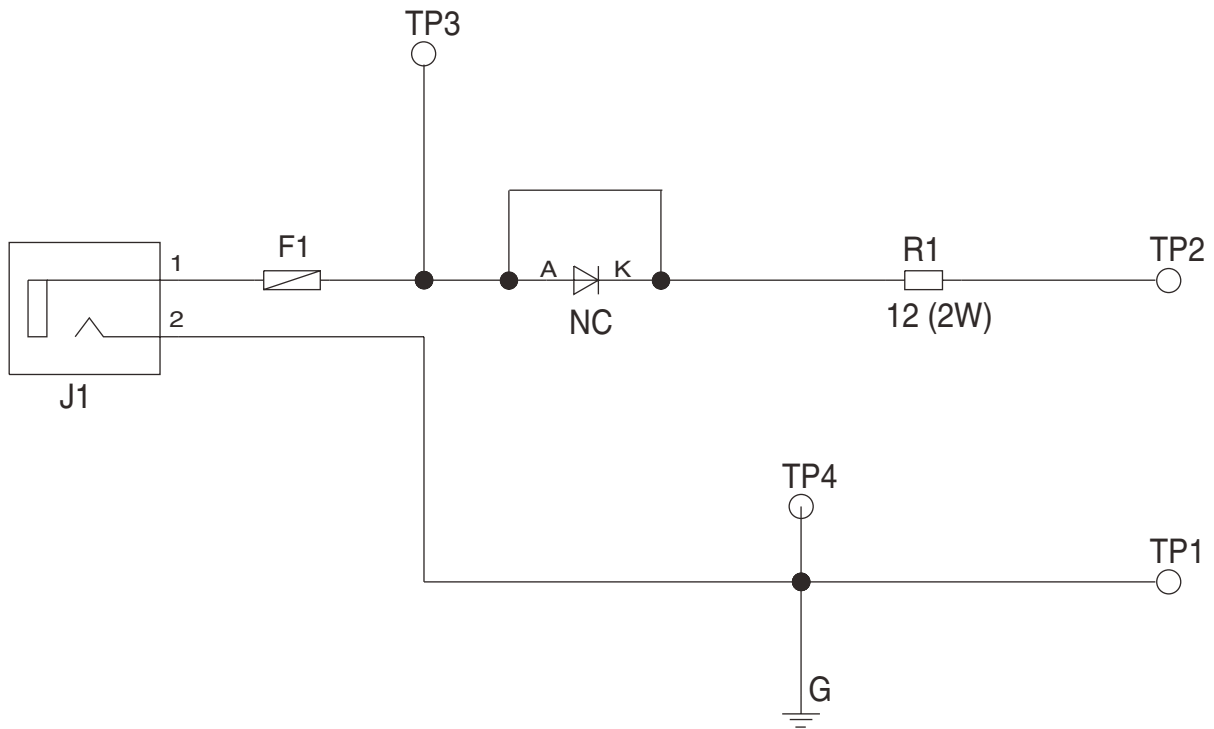


NC: No Components



NC: No Components

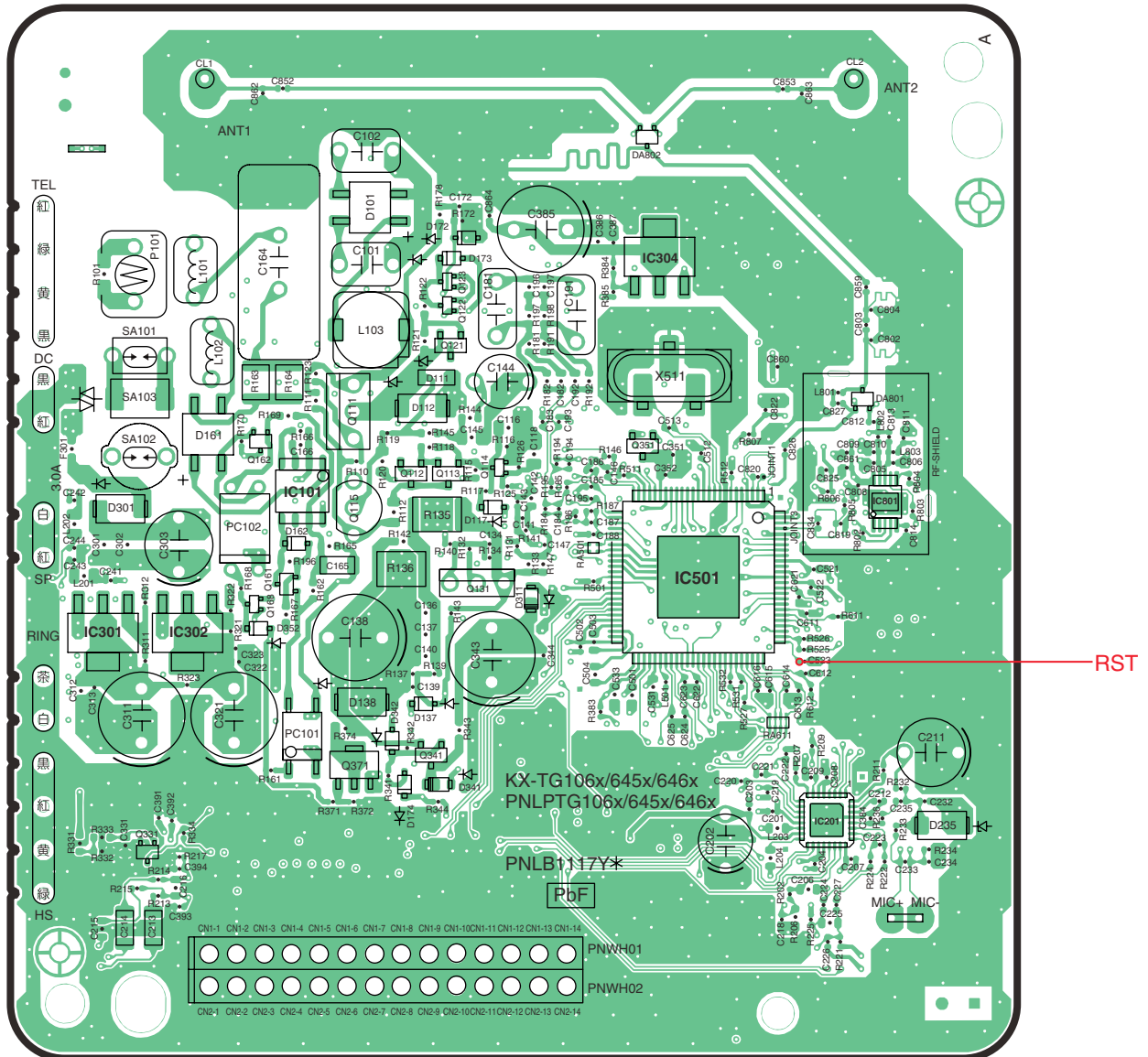
2.6. Schematic Diagram (Charger Unit)



3 Printed Circuit Board

3.1. Circuit Board (Base Unit_Main)

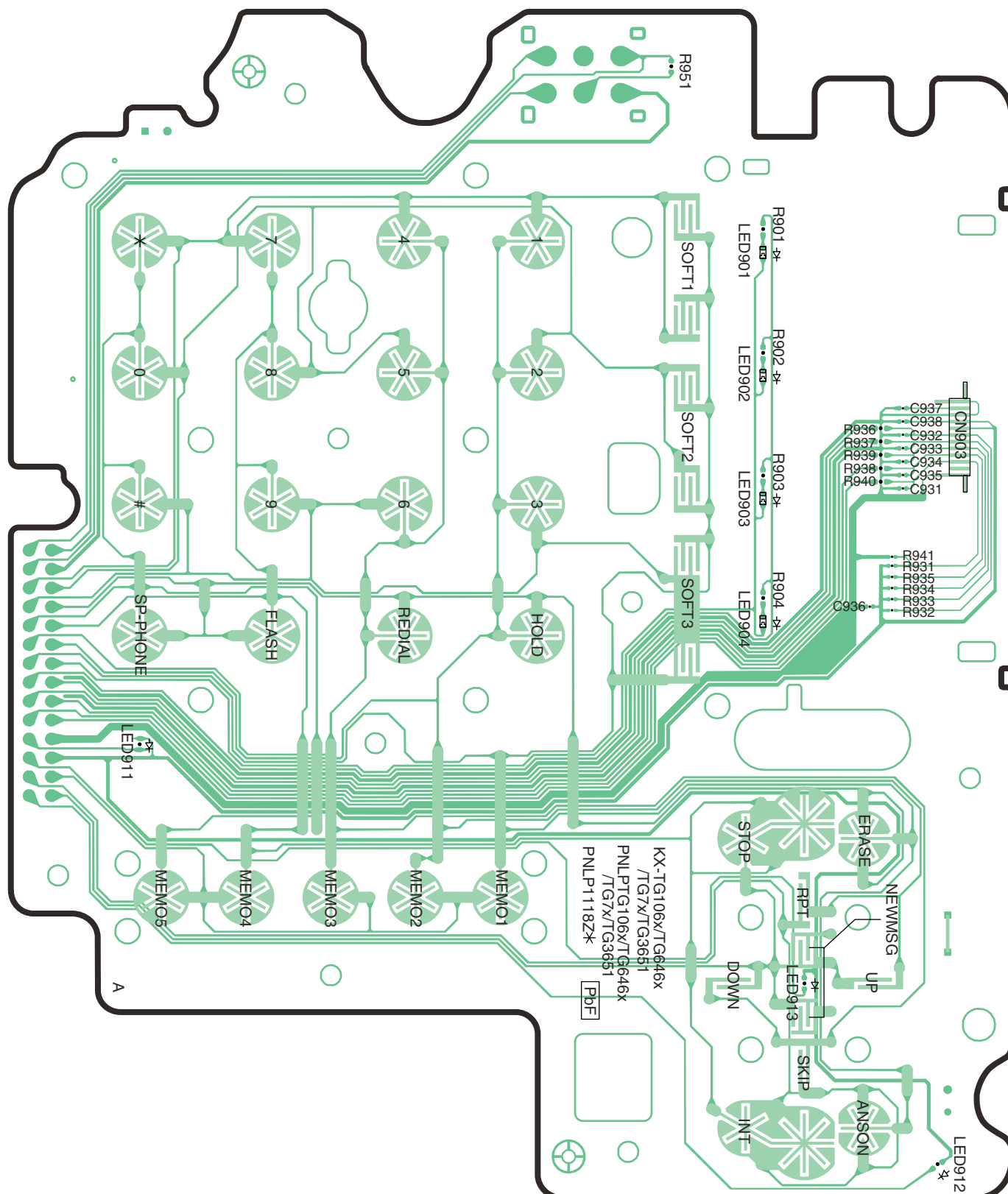
3.1.1. Component View



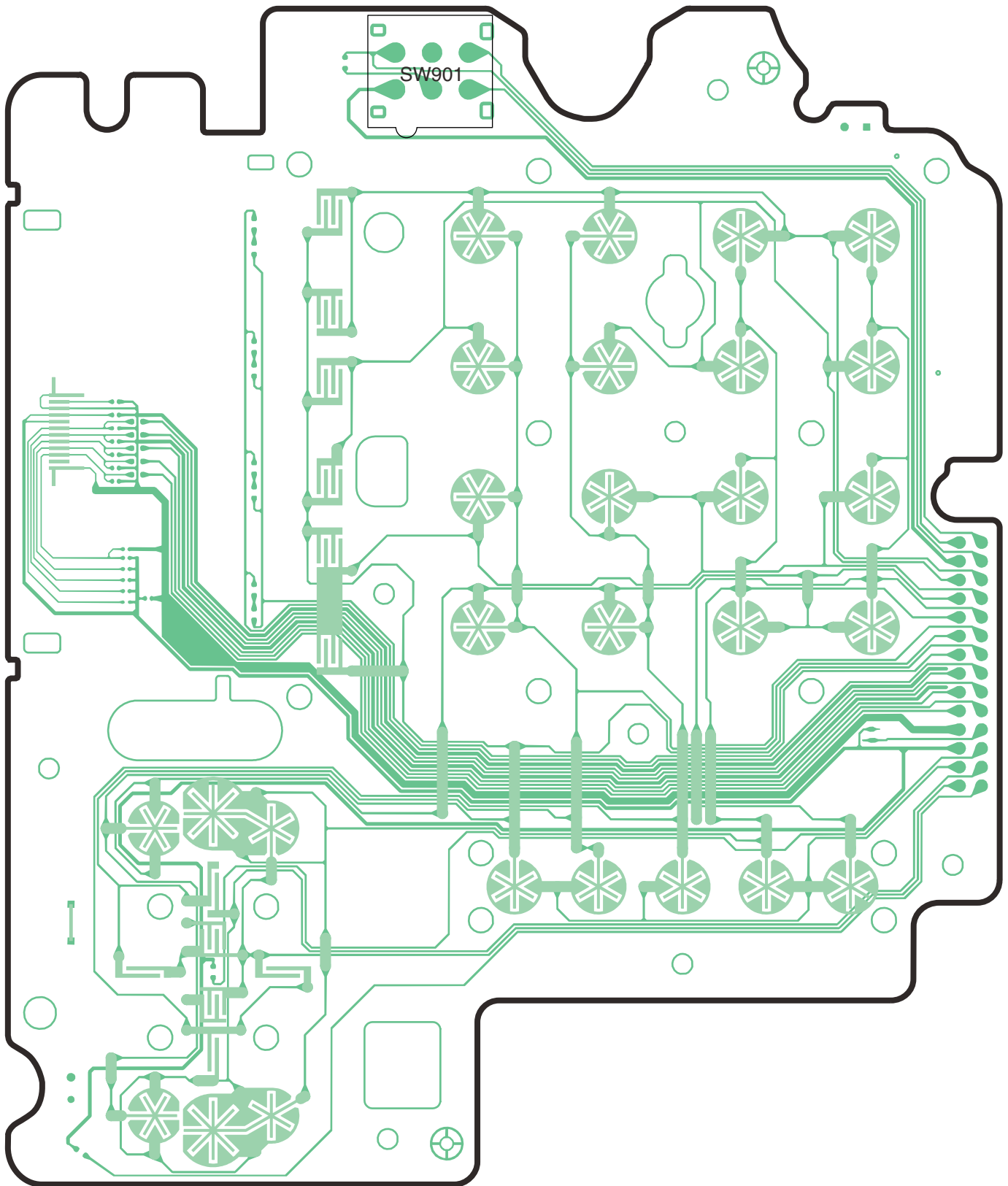


3.2. Circuit Board (Base Unit_Operation)

3.2.1. Component View

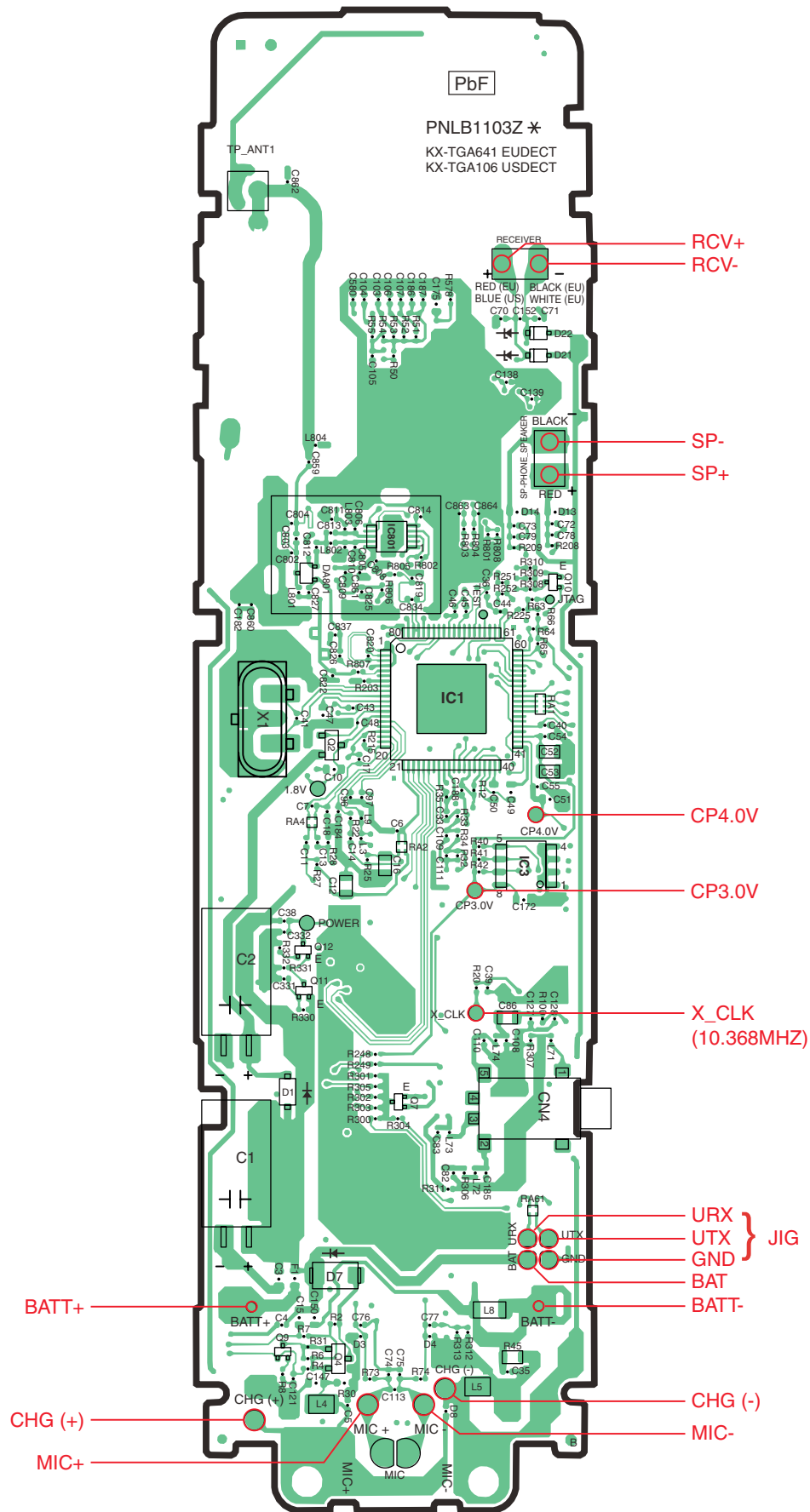


3.2.2. Bottom View

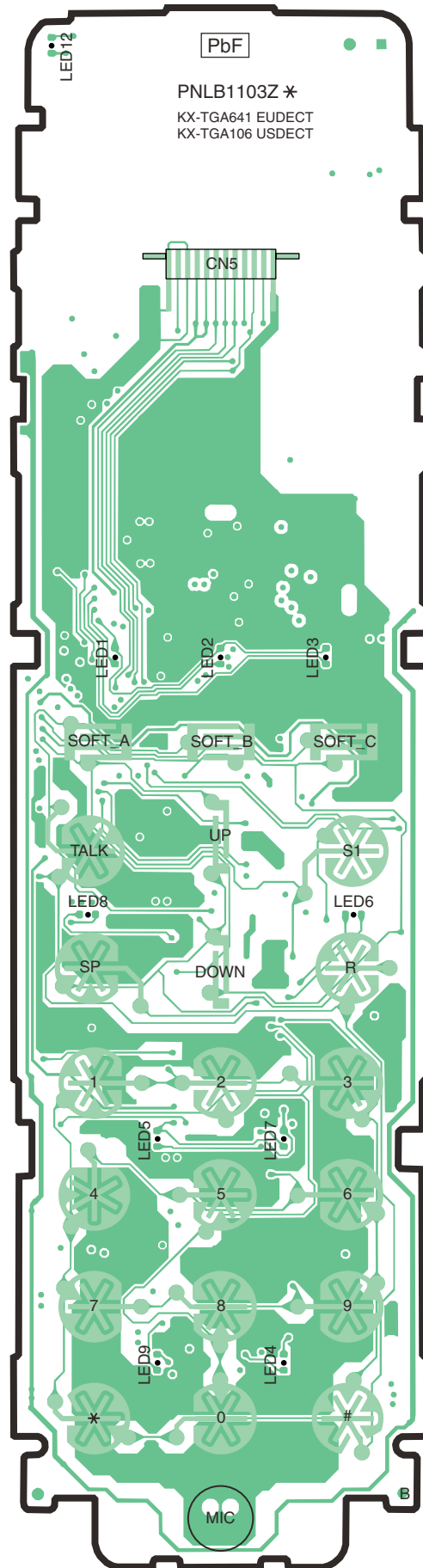


3.3. Circuit Board (Cordless Handset)

3.3.1. Component View

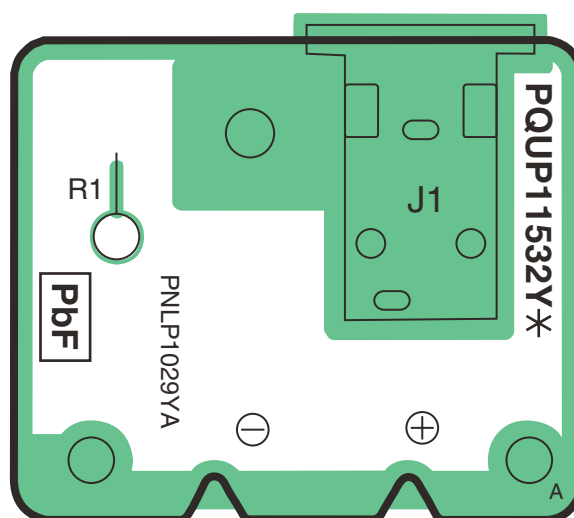


3.3.2. Bottom View

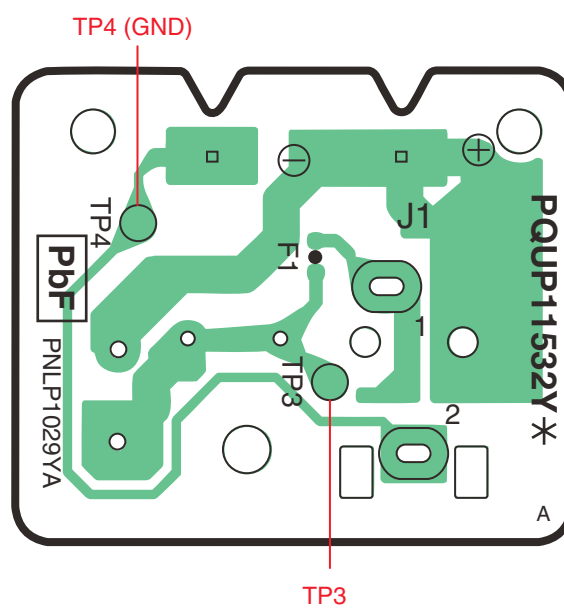


3.4. Circuit Board (Charger Unit)

3.4.1. Component View



3.4.2. Bottom View



4 Exploded View and Replacement Parts List

4.1. Replacement Parts List

1. RTL (Retention Time Limited)

Note:

The "RTL" marking indicates that its Retention Time is Limited.

When production is discontinued, this item will continue to be available only for a specific period of time.

This period of time depends on the type of item, and the local laws governing parts and product retention.

At the end of this period, the item will no longer be available.

2. Important safety notice

Components identified by the Δ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) k=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) p= μ μ F

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Chip
ERDS:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
ERJ:Chip	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W
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*Type & Voltage Of Capacitor

Type

ECFD:Semi-Conductor	ECED,ECKD,ECBT,F1K,ECUV: Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG: Polyester
ECUV,PQCUV,ECUE:Chip	ECEA,ECST,EEE: Electlytic
ECQMS:Mica	ECQP: Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V	05:50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1A:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :16V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

4.1.1. Base Unit

4.1.1.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP16451BXH	MAIN P.C.BOARD	
	C101	F1B2H681A070	680p	
	C102	F1B2H681A070	680p	
	C138	ECEA0JKA331	330	
	C139	ECUE1C103KBQ	0.01	
	C141	ECUE1E472KBQ	0.0047	
	C142	ECUV1H104KBV	0.1	
	C144	F2A1H2200014	22	
	C146	ECUE1H100DCQ	10p	
	C147	ECUE1H102KBQ	0.001	
	C151	PQCUV1C105KB	1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C152	ECJ0EB0J224K	0.22	S
	C154	ECJ0EB0J224K	0.22	S
	C155	ECUE1H100DCQ	10p	
	C164	F0C2E1050005	1	
	C165	F1K1H475A199	4.7	S
	C166	ECUV1C563KBV	0.056	
	C172	ECUE1A104KBQ	0.1	
	C181	F1B2H681A070	680p	
	C182	ECUV1H102KBV	0.001	
	C184	ECUE1H821KBQ	820p	
	C185	ECUE1H100DCQ	10p	
	C186	ECUE1H100DCQ	10p	
	C187	ECUE1C333KBQ	0.033	
	C188	ECUE1A823KBQ	0.082	
	C191	F1B2H681A070	680p	
	C192	ECUV1H102KBV	0.001	
	C194	ECUE1H821KBQ	820p	
	C195	ECUE1H100DCQ	10p	
	C196	ECUV1C103KBV	0.01	
	C197	ECUV1C103KBV	0.01	
	C201	ECUE1A104KBQ	0.1	
	C202	ECEA0JKA101	100	
	C203	ECUE0J105KBQ	1	
	C204	ECUE1A104KBQ	0.1	
	C206	ECUV1H102KBV	0.001	
	C207	ECUE1A104KBQ	0.1	
	C208	ECUE1A104KBQ	0.1	
	C209	ECUE1H100DCQ	10p	
	C211	ECEA1CK101	100	S
	C212	ECUE1A104KBQ	0.1	
	C213	F1K1C4750023	4.7	
	C214	F1K1C4750023	4.7	
	C215	ECUV1A105KBV	1	
	C216	ECUV1A105KBV	1	
	C223	ECUE1H331KBQ	330p	
	C224	ECUE1A104KBQ	0.1	
	C225	ECUV1H102KBV	0.001	
	C227	ECUE1A104KBQ	0.1	
	C232	ECUE1H100DCQ	10p	
	C235	ECUE1A104KBQ	0.1	
	C241	ECUE1H222KBQ	0.0022	
	C242	ECUE1H222KBQ	0.0022	
	C243	ECUE1H100DCQ	10p	
	C244	ECUE1H100DCQ	10p	
	C301	PQCUV1C105KB	1	
	C302	PQCUV1C105KB	1	
	C303	ECEA1CK101	100	S
	C311	ECEA0JKA331	330	
	C331	ECUV1H104KBV	0.1	
	C343	ECEA0JKA331	330	
	C344	ECUE1H100DCQ	10p	
	C351	ECUV1A105KBV	1	
	C352	ECUE1A104KBQ	0.1	
	C361	ECUV1A105KBV	1	
	C371	F1J1A106A024	10	
	C385	ECEA0JKA331	330	
	C391	ECUE1H222KBQ	0.0022	
	C392	ECUE1H222KBQ	0.0022	
	C393	ECUE1H681KBQ	680p	
	C394	ECUE1H681KBQ	680p	
	C501	ECUV1A105KBV	1	
	C502	ECUE1A104KBQ	0.1	
	C504	ECUV1A105KBV	1	
	C511	ECUE1H100DCQ	10p	
	C512	ECUE0J105KBQ	1	
	C514	ECUE1H100DCQ	10p	
	C521	ECUE1H100DCQ	10p	
	C522	ECUE1A104KBQ	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C523	ECUE1A104KBQ	0.1	
	C531	ECUV1H104KBV	0.1	
	C533	ECUV1A105KBV	1	
	C562	ECUE1A104KBQ	0.1	
	C632	ECUE1H271KBQ	270p	
	C633	ECUE1H271KBQ	270p	
	C634	ECUE1H271KBQ	270p	
	C635	ECUE1H271KBQ	270p	
	C636	ECUE1H271KBQ	270p	
	C645	ECUE1H271KBQ	270p	
	C661	F1G1H471A541	470p	S
	C662	F1G1H471A541	470p	S
	C663	F1G1H471A541	470p	S
	C683	ECUE1H100DCQ	10p	
	C684	ECUE1H100DCQ	10p	
	C802	F1G1H1R8A480	1.8p	
	C803	F1G1H1R3A480	1.3p	
	C804	F1G1H1R8A480	1.8p	
	C805	F1G1H3R3A480	3.3p	
	C806	F1G1H3R3A480	3.3p	
	C808	ECUE1A104KBQ	0.1	S
	C809	F1G1H100A420	10p	
	C810	F1G1H2R2A480	2.2p	
	C811	F1G1H100A420	10p	
	C812	F1G1H100A420	10p	
	C813	F1G1H2R2A480	2.2p	
	C814	ECUE1H332KBQ	0.0033	S
	C819	F1G1H100A420	10p	
	C820	F1G1HR50A480	0.5p	
	C822	F1G1H100A420	10p	
	C825	F1G1H100A420	10p	
	C826	F1G1H1R1A480	1.1p	
	C827	F1G1H100A420	10p	
	C834	F1G1HR50A480	0.5p	
	C850	F1G1H101A557	100p	
	C851	F1G1H100A420	10p	
	C852	F1G1H100A420	10p	
	C853	F1G1H100A420	10p	
	C854	F1G1H100A420	10p	
	C855	F1G1H101A557	100p	
	C859	F1G1H100A420	10p	
	C860	F1G1H100A420	10p	
	C861	F1G1H3R0A480	3p	
	C862	G1C3N3Z00007	COIL	
	C863	PQLQR4C8N2J	COIL	S
	C864	F1G1H100A420	10p	
	D101	B0EDER000009	DIODE (SI)	
	D112	MA1Z300	DIODE (SI)	S
	D117	MA111	DIODE (SI)	S
	D137	MA111	DIODE (SI)	S
	D138	B0BC4R500012	DIODE (SI)	
	D161	B0EDER000009	DIODE (SI)	
	D173	MA111	DIODE (SI)	S
	D174	MA111	DIODE (SI)	S
	D201	MAZ805100L	DIODE (SI)	
	D202	MAZ805100L	DIODE (SI)	
	D301	B0JCME000035	DIODE (SI)	
	D311	MA21D3400L	DIODE (SI)	
	D352	MA111	DIODE (SI)	S
	D353	MA21D3400L	DIODE (SI)	
	DA801	B0DDCD000001	DIODE (SI)	
	DA802	B0DDCD000001	DIODE (SI)	
	F301	K5H302Y00003	FUSE	
	IC101	C1CB00002903	IC	S
	IC201	C1CB00002427	IC	
	IC301	C0CBAYG00016	IC	S
	IC303	C0CBCAC00250	IC	
	IC304	C0CBAYG00016	IC	S
	IC501	C1CB00003153	IC (BBIC (FLASH))	
	IC561	C3EBJC000083	IC (EEPROM)	
	IC801	C1CB00001842	IC	
	L101	PQLQXF330K	COIL	S
	L102	PQLQXF330K	COIL	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L103	G1A102BA0002	COIL	
	L201	PQLQR1WT	COIL	S
	L202	PQLQR1WT	COIL	S
	L203	PQLQR1RS241	COIL	S
	L204	PQLQR1RS241	COIL	S
	L221	PQLQR2KA20T	COIL	S
	L222	PQLQR2KA20T	COIL	S
	L223	PQLQR2KA20T	COIL	S
	L224	PQLQR2KA20T	COIL	S
	L501	ERJ2GE0R00	0	
	L801	G1C27NJ00010	COIL	
	L802	G1C3N0ZA0063	COIL	
	L803	G1C3N0ZA0063	COIL	
	MIC1	L0CBAY000016	MICROPHONE	
	PC102	B3PAA0000531	PHOTO ELECTRIC TRANS-DUCER	
	Q111	B1CCBR000001	TRANSISTOR (SI)	
	Q112	PQVTBF822T7	TRANSISTOR (SI)	
	Q113	PQVTBF822T7	TRANSISTOR (SI)	
	Q114	PSVTDTC144E	TRANSISTOR (SI)	S
	Q121	B1ADGE000004	TRANSISTOR (SI)	
	Q122	PSVTDTC144E	TRANSISTOR (SI)	S
	Q131	2SD1994A	TRANSISTOR (SI)	
	Q162	2SD1819A-TX	TRANSISTOR (SI)	S
	Q168	UNR9113J0L	TRANSISTOR (SI)	
	Q331	2SD1819A-TX	TRANSISTOR (SI)	S
	Q341	B1ADGE000004	TRANSISTOR (SI)	
	Q351	B1ADGE000004	TRANSISTOR (SI)	
	Q371	B1BBAP000021	TRANSISTOR (SI)	
	Q601	UN9219J	TRANSISTOR (SI)	S
	Q602	UN9219J	TRANSISTOR (SI)	S
	Q605	PSVTDTC144E	TRANSISTOR (SI)	S
	Q606	PSVTDTC144E	TRANSISTOR (SI)	S
	Q607	PSVTDTC144E	TRANSISTOR (SI)	S
	Q608	2SD0874AS	TRANSISTOR (SI)	
	R101	ERJ6GEY0R00	0	
	R110	ERJ2GE0R00	0	
	R112	PQ4R10XJ392	3.9k	S
	R113	ERJ3GEYJ473	47k	
	R114	ERJ2GEJ103	10k	
	R115	ERJ3GEYJ564	560k	
	R116	ERJ3GEYJ474	470k	
	R117	ERJ2GEJ222	2.2k	
	R121	ERJ3GEYJ104	100k	
	R122	ERJ3GEYJ103	10k	
	R123	ERJ3GEYJ104	100k	
	R125	ERJ2GE0R00	0	
	R131	ERJ2GEJ223	22k	
	R133	ERJ3GEYJ821	820	
	R134	ERJ2GEJ104	100k	
	R135	ERJ12YJ120	12	
	R137	ERJ2GEJ104	100k	
	R140	ERJ2GEJ153	15k	
	R141	ERJ3GEYJ822	8.2k	
	R142	ERJ3GEY0R00	0	
	R143	ERJ2GEJ274	270k	
	R144	ERJ3GEYJ561	560	
	R145	ERJ3GEYJ820	82	
	R146	ERJ2GEJ332	3.3k	
	R148	ERJ2GEJ222	2.2k	
	R153	ERJ2GEJ121	120	
	R154	ERJ2GEJ101	100	
	R163	ERJ14YJ392	3.9k	
	R165	ERJ3GEYJ183	18k	
	R166	ERJ3GEYJ183	18k	
	R167	ERJ3GEYJ332	3.3k	
	R168	ERJ2GEJ122	1.2k	
	R169	ERJ3GEYJ104	100k	
	R172	ERJ3GEYJ823	82k	
	R178	ERJ3GEYJ565	5.6M	
	R181	ERJ3GEYJ184	180k	
	R182	ERJ3GEYJ105	1M	
	R184	ERJ2GEJ823	82k	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R185	ERJ2GEJ102	1k	
	R186	ERJ2GEJ102	1k	
	R187	ERJ2GEJ104	100k	
	R191	ERJ3GEYJ184	180k	
	R192	ERJ3GEYJ105	1M	
	R194	ERJ2GEJ823	82k	
	R195	ERJ2GEJ102	1k	
	R196	ERJ3GEY0R00	0	
	R197	ERJ3GEYJ475	4.7M	
	R198	ERJ3GEYJ475	4.7M	
	R206	ERJ3GEYJ105	1M	
	R207	ERJ2GEJ104	100k	
	R209	ERJ2GEJ100	10	
	R211	ERJ2GEJ101	100	
	R213	ERJ2GEOR00	0	
	R214	ERJ2GEOR00	0	
	R215	ERJ2GEJ472X	4.7k	
	R217	ERJ2GEJ472X	4.7k	
	R221	ERJ2GEJ222	2.2k	
	R222	ERJ2GEJ222	2.2k	
	R224	ERJ2GEJ222	2.2k	
	R225	ERJ2GEJ222	2.2k	
	R232	ERJ2GEJ222	2.2k	
	R233	ERJ2GEJ330	33	
	R234	ERJ2GEJ330	33	
	R236	ERJ2GEJ471	470	
	R311	ERJ2RKF1000	100	
	R312	ERJ2RKF1800	180	
	R323	ERJ2GEOR00	0	
	R331	ERJ3GEYJ822	8.2k	
	R332	ERJ3GEYJ152	1.5k	
	R333	ERJ3GEYJ392	3.9k	
	R334	ERJ2GEJ472X	4.7k	
	R341	ERJ2GEJ682	6.8k	
	R342	ERJ2GEJ103	10k	
	R343	ERJ3GEYJ180	18	
	R371	ERJ2GEJ222	2.2k	
	R372	ERJ2GEJ103	10k	
	R374	PQ4R10XJ151	150	S
	R384	ERJ2RKF1000	100	
	R385	ERJ2RKF2000	200	
	R501	ERJ2GEJ333	33k	
	R511	J0JCC00000275	IC FILTER	
	R512	D0GA563ZA006	56k	
	R525	ERJ2GEJ101	100	
	R526	ERJ2GEJ102	1k	
	R527	ERJ2GEJ103	10k	
	R531	ERJ2GEJ102	1k	
	R532	ERJ2GEJ102	1k	
	R543	ERJ2GEJ561	560	
	R544	ERJ2GEJ561	560	
	R547	ERJ2GEOR00	0	
	R563	ERJ2GEJ104	100k	
	R602	ERJ3GEYJ391	390	
	R801	ERJ2GEJ821	820	
	R802	ERJ2GEJ101	100	
	R803	ERJ2GEJ102	1k	
	R804	ERJ2GEJ102	1k	
	R805	ERJ2GEJ470	47	
	R806	ERJ2GEJ221	220	
	R807	ERJ2GEJ221	220	
	R808	ERJ2GEJ221	220	
	R809	ERJ2GEJ221	220	
	R810	ERJ2GEJ102	1k	
	RA501	D1H410220001	RESISTOR ARRAY	
	RA561	D1H410320002	RESISTOR ARRAY	
	E1	PNMC1013Z	MAGNETIC SHIELD	
	SA101	J0LF000000026	VARISTOR	
	X511	H0J103500027	CRYSTAL OSCILLATOR	

4.1.1.2. Operational P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWP26451FXH	OPERATIONAL P.C.BOARD ASS'Y (RTL)	
	C931	ECUE1H101JCQ	100p	
	C932	ECUE1H150JCQ	15p	
	C933	ECUE1H150JCQ	15p	
	C934	ECUE1H101JCQ	100p	
	C935	ECUE1H101JCQ	100p	
	C936	ECUE0J105KBQ	1	
	C937	ECUE0J105KBQ	1	
	C938	ECUE0J105KBQ	1	
	E3	L5DYAYY00004	LIQUID CRYSTAL DISPLAY (*1)	
	E4	PNHX1156Z	COVER, LCD	
	E5	PNHR1129Z	TRANSPARENT PLATE, LCD PLATE	PMMA-HB
	E6	PNHR1128Z	GUIDE, LCD	ABS-HB
	LED901	B3ACB0000190	DIODE (SI)	
	LED902	B3ACB0000190	DIODE (SI)	
	LED903	B3ACB0000190	DIODE (SI)	
	LED904	B3ACB0000190	DIODE (SI)	
	LED911	PQVDBR1111C	DIODE (SI)	S
	R901	ERJ3GEYJ151	150	
	R902	ERJ3GEYJ151	150	
	R903	ERJ3GEYJ151	150	
	R904	ERJ3GEYJ151	150	
	R931	ERJ2GEJ332	3.3k	
	R932	ERJ2GEJ102	1k	
	R933	ERJ2GEJ561	560	
	R934	ERJ2GEJ332	3.3k	
	R935	ERJ2GEJ103	10k	
	R936	ERJ3GEYJ100	10	
	R937	ERJ3GEYJ100	10	
	R938	ERJ3GEYJ101	100	
	R939	ERJ3GEYJ101	100	
	R940	ERJ3GEYJ101	100	
	SW901	K01LB000021	SPECIAL SWITCH	

4.1.2. Cordless Handset

4.1.2.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA641BXR	MAIN P.C.BOARD ASS'Y (RTL) (*1)	
	C1	F2A0J3310067	330	
	C10	ECUV1A225KB	2.2	
	C103	ECUE1H101JCQ	100p	
	C104	ECUE1H100DCQ	10p	
	C105	ECUE1H101JCQ	100p	
	C11	ECUE1A104KBQ	0.1	
	C113	ECUE1H100DCQ	10p	
	C12	PQCUV0J106KB	10	
	C13	ECUE1A104KBQ	0.1	
	C138	ECUE1H100DCQ	10p	
	C139	ECUE1H100DCQ	10p	
	C147	ECUV1C105KBV	1	
	C15	ECUV1A105KBV	1	
	C152	ECUE1H102KBQ	0.001	
	C172	ECUV1C104KBV	0.1	
	C175	ECUV1C105KBV	1	
	C182	F1G1H3R0A480	3p	
	C186	F1G1H2R0A480	2.0p	
	C187	F1G1H2R0A480	2.0p	
	C188	ECUE0J105KBQ	1	
	C2	F2A0J3310067	330	
	C331	ECUE0J105KBQ	1	
	C332	ECUE0J105KBQ	1	
	C38	ECUE1H100DCQ	10p	
	C40	ECUE1A104KBQ	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C43	ECUE1H100DCQ	10p	
	C44	ECUE1A104KBQ	0.1	
	C45	ECUE1A104KBQ	0.1	
	C46	ECUE1H100DCQ	10p	
	C47	ECUV1A105KBV	1	
	C49	ECUV1A105KBV	1	
	C5	ECUE1A104KBQ	0.1	
	C50	ECUV1A105KBV	1	
	C51	ECUV1A105KBV	1	
	C52	PQCUV0J106KB	10	
	C53	PQCUV0J106KB	10	
	C54	ECUE1H100DCQ	10p	
	C55	ECUE1H100DCQ	10p	
	C580	ECUE1H100DCQ	10p	
	C70	ECUE1H100DCQ	10p	
	C71	ECUE1H100DCQ	10p	
	C72	ECUE1H100DCQ	10p	
	C73	ECUE1H100DCQ	10p	
	C802	F1G1H2R0A480	2.0p	
	C803	F1G1H1R5A480	1.5p	
	C804	F1G1H2R0A480	2.0p	
	C805	F1G1H3R3A480	3.3p	
	C806	F1G1H3R3A480	3.3p	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	
	C810	F1G1H1R6A480	1.6p	
	C811	ECUE1H100DCQ	10p	
	C812	ECUE1H100DCQ	10p	
	C813	F1G1H1R6A480	1.6p	
	C814	ECUE1H332KBQ	0.0033	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR70A480	0.7p	
	C822	ECUE1H100DCQ	10p	
	C825	ECUE1H100DCQ	10p	
	C826	F1G1H2R0A480	2.0p	
	C827	ECUE1H100DCQ	10p	
	C834	F1G1HR50A480	0.5p	
	C859	F1G1H3R0A480	3p	
	C860	ECUE1H100DCQ	10p	
	C861	F1G1H3R0A480	3p	
	C862	F1G1HR70A480	0.7p	
	C863	ECUE1H100DCQ	10p	
	C864	ECUE1H100DCQ	10p	
	C96	ECUE1H100DCQ	10p	
	C97	ECUE1H100DCQ	10p	
	D1	MA2YD2120L	DIODE (SI)	
	D13	D4ZZ00000024	VARISTOR	
	D14	D4ZZ00000024	VARISTOR	
	D21	MA8043M	DIODE (SI)	S
	D22	MA8043M	DIODE (SI)	S
	D7	B0JCME000035	DIODE (SI)	
	D8	D4ED1270A014	VARISTOR	
	DA801	B0DDCD000001	DIODE (SI)	
	E101	L5DYBY000001	LIQUID CRYSTAL DISPLAY (*4)	
	E102	PNHR1114Z	TRANSPARENT PLATE, LCD PLATE	PMMA-HB
	E103	PNHR1113Z	GUIDE, LCD HOLDER	ABS-HB
	E104	PNHX1136Z	COVER, LCD COVER SHEET	
	E105	PNMC1013Z	CASE, MAGNETIC SHIELD (*3)	
	E106	PNLA1020Z	ANTENNA	
	E107	PNVE1002Z	BATTERY TERMINAL	ABS-HB
	IC1	C1CB00002906	IC (BBIC (FLASH)) (*2) (*5) (*6)	
	IC3	PQWIA130EXRR	IC (EEPROM) (*2)	
	IC801	C1CB00001842	IC (*5)	
	L801	G1C27NJ00010	COIL	
	L802	G1C3N6ZA0063	COIL	
	L803	G1C3N6ZA0063	COIL	
	LED1	B3ACB0000216	LED	
	LED12	B3ACB0000216	LED	
	LED2	B3ACB0000216	LED	
	LED3	B3ACB0000216	LED	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	LED4	B3ACB0000216	LED	
	LED5	B3ACB0000216	LED	
	LED6	B3ACB0000216	LED	
	LED7	B3ACB0000216	LED	
	LED8	B3ACB0000216	LED	
	LED9	B3ACB0000216	LED	
	MIC100	L0CBAY000032	MICROPHONE	
	Q10	UN9219J	TRANSISTOR (SI)	S
	Q11	B1ADCF000161	TRANSISTOR (SI)	
	Q12	B1ADCF000161	TRANSISTOR (SI)	
	Q2	B1ADGE000004	TRANSISTOR (SI)	
	Q4	B1ADGE000004	TRANSISTOR (SI)	
	Q7	UN9219J	TRANSISTOR (SI)	S
	Q9	2SC6054JSL	TRANSISTOR (SI)	
	R2	ERJ2GEJ392	3.9k	
	R20	ERJ2GEJ100	10	
	R203	D0GA563ZA006	56k	
	R215	ERJ2GE0R00	0	
	R248	ERJ2GE0R00	0	
	R251	ERJ2GE0R00	0	
	R27	ERJ2GEJ821	820	
	R28	ERJ2GEJ821	820	
	R30	ERJ3GEYJ273	27k	
	R300	ERJ2GEJ331	330	
	R301	ERJ2GEJ331	330	
	R302	ERJ2GEJ331	330	
	R303	ERJ2GEJ331	330	
	R304	ERJ2GEJ331	330	
	R305	ERJ2GEJ331	330	
	R308	ERJ2GEJ121	120	
	R309	ERJ2GEJ121	120	
	R310	ERJ2GEJ121	120	
	R330	ERJ2GEJ105X	1M	
	R331	ERJ2GEJ273X	27k	
	R332	ERJ2GEJ273X	27k	
	R40	ERJ2GEJ103	10k	
	R41	ERJ2GEJ103	10k	
	R42	ERJ2GEJ103	10k	
	R45	ERJ6RSJR10V	0.1	
	R50	ERJ2GEJ103	10k	
	R51	ERJ2GEJ471	470	
	R52	ERJ2GEJ102	1k	
	R53	ERJ2GEJ332	3.3k	
	R54	ERJ2GEJ103	10k	
	R55	ERJ2GEJ102	1k	
	R6	ERJ2GEJ102	1k	
	R63	ERJ2GEJ101	100	
	R64	ERJ2GEJ103	10k	
	R66	ERJ2GEJ102	1k	
	R7	ERJ2GEJ122	1.2k	
	R73	ERJ2GEJ820	82	
	R74	ERJ2GEJ820	82	
	R8	ERJ2GEJ101	100	
	R801	ERJ2GEJ681	680	
	R802	ERJ2GEJ101	100	
	R803	ERJ2GEJ102	1k	
	R804	ERJ2GEJ102	1k	
	R805	ERJ2GEJ470	47	
	R806	ERJ2GEJ221	220	
	R807	ERJ2GEJ221	220	
	RA1	D1H810240004	RESISTOR ARRAY	S
	RA2	D1H410220001	RESISTOR ARRAY	
	RA4	D1H433220001	RESISTOR ARRAY	
	RA61	D1H422120001	RESISTOR ARRAY	
	X1	H0J103500034	CRYSTAL OSCILLATOR (*2)	

4.1.3. Charger Unit

4.1.3.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB200	PQWPTGA641CH	MAIN P.C.BOARD ASS'Y (RTL)	
	J1	K2ECYB000001	JACK	S
	R1	ERG2SJ120	12	
	F1	K5H302Y00003	FUSE	