

SAMSUNG

GSM Mobile Cellular Phone SGH-500

SERVICE *Manual*

GSM Mobile Cellular Phone



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1. General Description

1-1 GSM System

1-1-1 Calls

GSM® is an acronym for Global System for Mobile communications®, using TDMA for wide-area cellular operation. The GSM system consists of the sub-systems shown;

The Mobile Station (MS) talks to the Base Station System (BSS) via an RF air interface. The Base Station System (BSS) consists of Base Transceiver Station (BTS) and a Base Station Controller (BSC). The microwave link between BTS and BSC is called an Abis interface. Generally one BSC controls 20 to 30 BTSs, and a Mobile Switching Center (MSC) controlling the traffic among different cells would be reported back from a number of BSSs. A Visitor Location Register (VLR) will be allocated to one MSC to find the mobiles out of their home cell by listing them to VLR. The MSC would also be connected to the Home Location Register (HLR), the Authentication Center (AC) and the Equipment Identity Register (EIR) So the system verify that the users and equipment are legal subscriber.

1-1-2 Channels

Channels used in the GSM system can be divided into two classes - Logical and Physical channel. Physical channels can be described in terms of their frequency and time domain characteristics. They are the actual frequencies and timeslots the MS and BS transmits or receives on. The logical channels are mapped onto these physical channels logically. Any particular and instant, physical channels may be control or traffic channels, which determines the function of a physical channel at a particular point in time.

1-1-3 Airinterface of ARFCN (Absolute Radio Frequency Channel Number)

1	2	3	...	...	...	...	...	123	124
890.2 MHz								914.8 MHz	

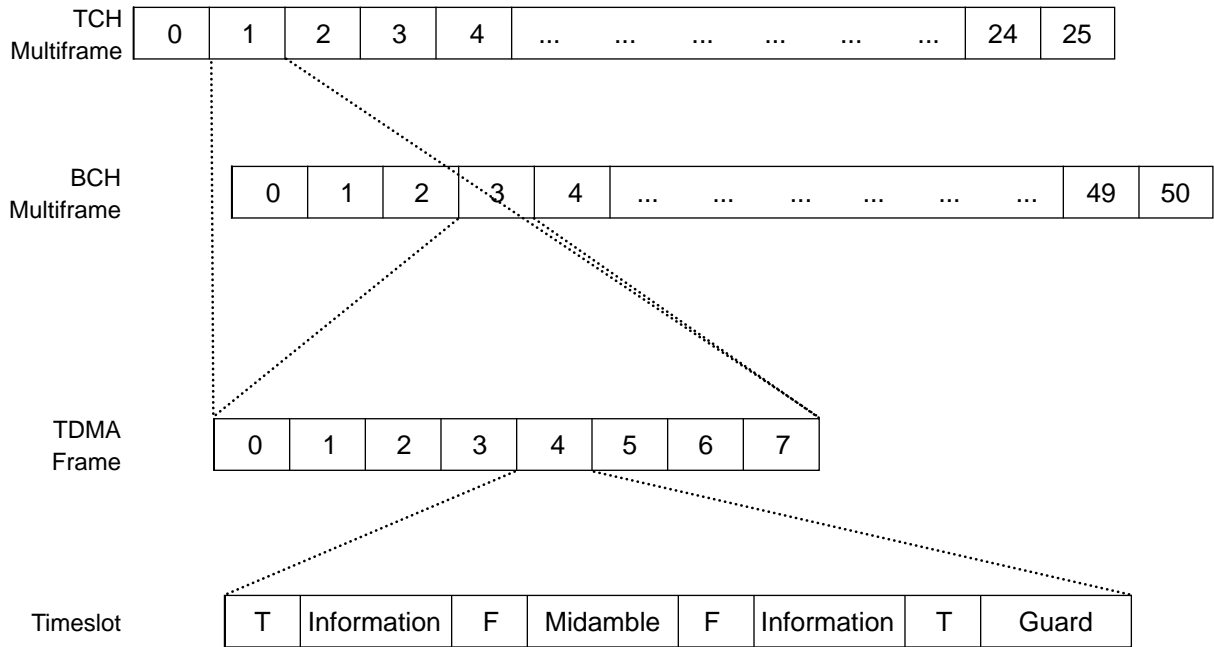
1	2	3	...	...	...	...	...	123	124
935.2 MHz								959.8 MHz	

$$\text{P-GSM: TX: } F_l(n) = 890 + 0.2 * n \quad (1 \leq n \leq 124)$$

$$\text{RX: } F_u(n) = F_l(n) + 45$$

< Fig. 1 ARFCN Diagram >

1-1-4 GSM TDMA Timeslots, Frames, and Multiframe



< Fig. 2 Concept of Frames and Timeslots >

1-1-5 Logical Channel

TCH (Traffic CH) is used mainly for transferring the speech information, and the BCH (Broadcast CH) is related to control information. The major function of BCH is transferring information on the downlink for MS synchronization, identification, paging, and control. BCH is always radiated from every cell and the MS tries to find the BCH which has highest level soon after turned on. The organization of BCH is shown below; FCCH (Frequency Correction Channel), SCH (Synchronization Channel), and BCCH (Broadcast Control Channel). CCCH (Common Control Channel) will play a role like a message board, and is divided into two control channels - PCH (Paging Channel) and AGCH (Access Grant Channel). SACCH (Slow Associated Control Channel) exists every 12 frames, controlling and controlling the TX power level and timing advance of MS, transferring cell information to MS on downlink, transferring the information about RX level, Quality, and RX level of adjacent cell on uplink. FACCH (Fast Associated Control Channel) steals and changes the TCH when needing a Handover. SDCCH (Stand-alone Dedicated Control Channel) and RACH (Random Access Channel) operate during the call setup procedure.

1-2 GSM HHP Feature

1-2-1 Main Set (HHP)

The main set is a microprocessor (KERNEL5)-controlled, full duplex radiotelephone system that provides the user with GSM cellular service through cell sites linked to control centers. It also provides functions related to frequency control, power control, and many user-convenience features.

1-2-2 Desktop Charger

The DTC is designed to charge batteries from commercial mains. The charger has two battery receptacles. The forward one is for rapid charging, and the rear for normal charging.

1-2-3 Travel Adaptor

The travel adaptor is designed to operate the main set by supplying power to directly, while charging batteries from commercial mains.

1-2-4 Cigar Lighter Adaptor

A cigar lighter adaptor is used to operate the main set and charge the battery from a 12 volt vehicular electrical system.

1-2-5 Hands Free Car Kit

The Hands Free kit provides unlimited talk time, as power is supplied by the vehicular electrical system, and improved receiving and transmitting due to the external antenna. The Hands Free car kit adapts an external speaker, a hands-free microphone, a bracket, and a cradle for mounting the main set. ®Hands Free® means user can have a conversation without holding the phone by hand.

MEMO

3. Specification

3-1 General Specification

3-1-1 Frequency Range

- Transmit (Uplink): 890 ~ 915 MHz
- Receive (Downlink): 935 ~ 960 MHz

3-1-2 Channel Spacing : 200 kHz

3-1-3 Number of Channels: 124

3-1-4 Frequency Spacing: 45 MHz

3-1-5 Modulation Data Rate

- 270.833 kbits/sec

3-1-6 Frame Period: 4.615 msec

3-1-7 Timeslot Period: 576.9 μ sec

3-1-8 Modulation Type: 0.3 GMSK

3-1-9 MS Max Power: 2 W (33 dBm)

3-1-10 MS Min Power: 0.3 W (5 dBm)

3-1-11 Voice Coder Bit Rate: 13 kbits/sec

3-1-12 Input / Output Impedance : 50 Ω

3-1-13 VCO Frequency

- TX VCO : 890 ~ 915 MHz,
- UHF VCO : 1160 ~ 1185 MHz
- VHF VCO : 540 MHz

3-1-14 IF

- 1st RX IF: 225 MHz
- 2nd RX IF: 45 MHz
- 1st TX IF: 270 MHz

3-1-15 VCTCXO Frequency

- 13 MHz (± 5 PPM)

3-1-16 Operating Temperature

- Main : Nominal: +15 $^{\circ}$ C ~ +35 $^{\circ}$ C
Extreme: -10 $^{\circ}$ C (spec) ~ +55 $^{\circ}$ C
- TA : Nominal: +15 $^{\circ}$ C ~ +35 $^{\circ}$ C
Extreme: -20 $^{\circ}$ C ~ +55 $^{\circ}$ C

3-1-17 Operating Voltage

- High Voltage: 4.1 V
- Nominal Voltage: 3.7 V
- Low Voltage: 3.4 V

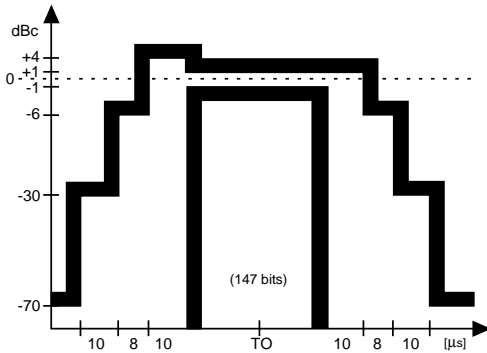
3-2 Transmitter Specification

3-2-1 Power

Power Control Level	Peak Power (dBm)	Norminal (dB)	Extreme (dB)
5	33	±2 dB	±2.5 dB
6	31	±3 dB	±4 dB
7	29	±3 dB	±4 dB
8	27	±3 dB	±4 dB
9	25	±3 dB	±4 dB
10	23	±3 dB	±4 dB
11	21	±3 dB	±4 dB
12	19	±3 dB	±4 dB
13	17	±3 dB	±4 dB
14	15	±3 dB	±4 dB
15	13	±3 dB	±4 dB
16	11	±5 dB	±6 dB
17	9	±5 dB	±6 dB
18	7	±5 dB	±6 dB
19	5	±5 dB	±6 dB

The power-time template requirements for mobile stations also apply to base stations. The only difference is that, in the base station case, no short burst (random access) exists. To measure the template, the base station has to be operated in its *bursting mode*. This test cannot be performed on the base channel, since a base station has to transmit continuously in all time slots. In most cases, an additional channel besides the base channel has to be activated or the transmitter under test is not considered to be configured as a base channel transmitter. The average peak power from the previous part of the test is used as a reference. The time reference is provided by the training sequence in the middle of the burst. The template has to meet the requirements of Fig. 6. Again, the noise level of -70 dBc is dependent on the actual transmitted power level. If this level is below -36 dBm, the absolute level applies. The template is usually evaluated along with the peak power level.

3-2-2 Power Ramping Time Level



< Fig. 6 Power-Time Template >

3-2-3 IF Filter

- 270 MHz LC Filter

3-2-4 TX SAW Filter

- Spurious signal attenuating : ≤-70 dBc
 - Wide Bandwidth to make plane Group delay characteristic

3-2-5 Power Amplifier

- Total Efficiency: 40~45 % at Pin=1mW,
 V_{DD}=3.6 V, P_{out}=3.2 W

3-3 Synthesizer Specification

3-3-1 General Specification

- Frequency Hopping : 1 Channel to $< 3^\circ$ rms in < 500 mS
- Phase Noise: $< 3^\circ$ RMS

3-3-2 IF Synthesiser

- Synthesizer Frequency: 540 MHz
- Output Signal Drive Level: -10 dB
- 2nd IF LO Output Frequency FIR: 45 MHz

3-3-3 FIR Output

- 1st IF: 225 MHz
- 2nd IF: 45 MHz
- FIR Frequency: 45 MHz
- FIR Level: -17 dBm

3-3-4 Phase Noise Specification

Offset (kHz)	Phase Noise (dBc/Hz)
± 200	< -75
± 250	< -78
± 400	< -105
> 600	< -105
> 1200	< -105
> 1800	< -113
> 3000	< -115
> 6000	< -121
> 10.0 MHz	< -124
> 20.0 MHz	< -129
> 30.0 MHz	< -134

3-4 Receiver Specification

3-4-1 Front-end Specification

- Input Frequency range: 935 MHz ~ 960 MHz
- Gain: 18 dB
- If Frequency range: 540 MHz
- Input Impedance: 150 Ω
- Output Load: 1 k Ω
- Overall Sensitivity: -106 dBm for 9 dB S/N in 180 kHz

3-4-2 Sensitivity

- Reference Sensitivity Level: -102 dBm
- Channel Width : 180 kHz
- Input Thermal Noise: -121.4 dBm/Hz
- Output S/N: > 9 dB
- Noise Figure: < 7 dB

3-4-3 Intermodulation

- Input Useful Signal: -99 dBm
- Interferer: -49 dBm at ± 800 kHz and 1600 kHz

3-4-4 Selectivity

Signal	Type	Level
Useful Signal	GMSK	- 82 dBm
Cochannel	GMSK	- 9 dBc
± 200 kHz	GMSK	+ 9 dBc
± 400 kHz	GMSK	+ 41 dBc
± 600 kHz	GMSK	+ 49 dBc

MEMO

2. Circuit Description

2-1 RF Part

2-1-1 Frequency Generator

The 13MHz reference clock (VCTCXO) drives the logic and RF part. The 13 MHz reference is controlled by the logic (10bits DAC minimum) and is kept to a frequency error less than ± 0.1 ppm after synchronization with the GSM network.

A 540 MHz oscillator is divided by 2 to generate a fixed 270 MHz VHF LO used in the TX I,Q modulator and mixed by 270 MHz. The UHF LO for the first RX down conversion and the TX offset mixing works in superheterodyne mode to reduce the relative bandwidth and to be able to work at a frequency greater than 1 GHz.

2-1-2 Transmitter

The baseband GSM chipset (Kernel5) generates I and Q baseband signals for the transmit vector modulator. The modulator provides more than 40dBc of carrier and unwanted side-band rejection and produces GMSK modulated signal, the 'reference' signal at 270 MHz which passes to the offset phase-locked loop block (OPLL). The OPLL consists of a down-converter, phase detector, loop filter and transmit VCO operating at the final RF output frequency. The down converter mixes the UHF LO (eg. 1172 MHz) with the transmit VCO signal to generate a 'feedback' signal at 270 MHz. The 'feedback' signal passes via a limiter to one port of the phase detector. The GMSK 'reference' signal from the vector modulator passes via a second limiter to the other input port of the phase detector. The phase detector generates an error current proportional to the phase difference between the 'feedback' signal from the down-converter and the 'reference' signal from the vector modulator. This error current is filtered by a second order low-pass filter to generate an output voltage which depends on the GMSK modulation and the desired channel frequency. This voltage controls the transmit VCO such that the VCO output signal, centered on the correct RF channel, is frequency modulated with the original GMSK data. The centre frequency of the transmit VCO is offset from the UHF LO frequency by 270 MHz. The OPLL acts as a tracking narrowband band pass filter tuned to the desired channel frequency. This reduces the wideband noise floor of the modulation and up-conversion process and provides significant filtering of spurious products. The OPLL architecture results in a low-noise GMSK modulated signal at 902 MHz with very low spurious content.

The RF GMSK output from the transmit VCO is fed via TX SAW filter to the RF power amplifier. The peak output power and the profile of the transmitted burst are controlled by means of a closed feedback loop. The RF output from the PA is sampled with a directional coupler. The sampled signal passes to an RF detector diode whose output voltage is dependent on the incident RF level. This 'feedback' voltage passes to the inverting input of the loop integrator. A 'reference' signal is generated within the baseband section under control of the layer 1 software. The loop maintains zero difference between the 'feedback' signal and the 'reference' signal. In this way, the amplitude and shape of the transmitted RF burst may be controlled by the baseband processor. In particular, the rise and fall profiles can be controlled to meet the stringent power/time templates and switching transient requirements of GSM 05.05.

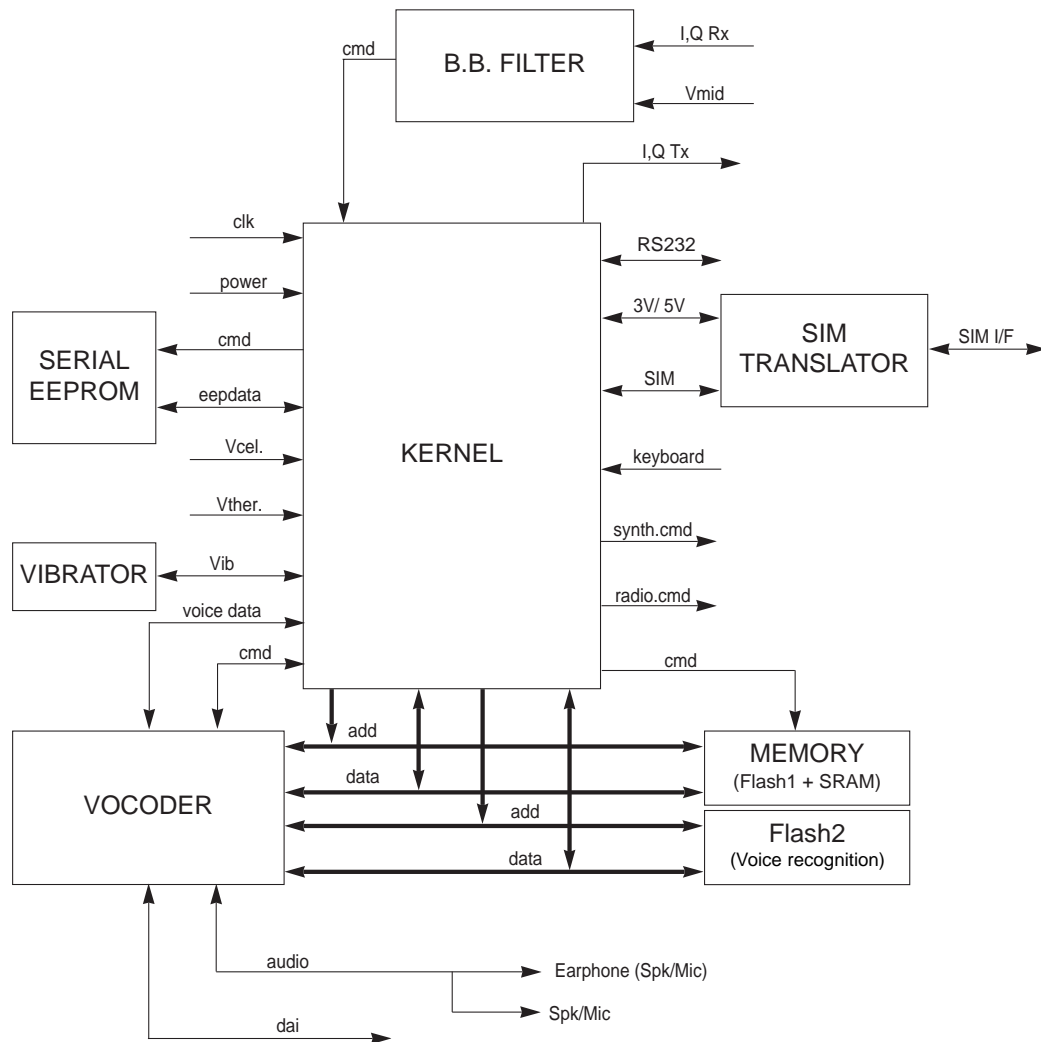
The RF output passes to the antenna connector via an integrated TX/RX switch and lowpass filter to attenuate the harmonics generated by the power amplifier.

2-1-3 Receiver

The incoming RF signal passes through the integrated lowpass filter and TX/RX switch. This is followed by a 947 MHz SAW Band Pass Filter and a bipolar low-noise amplifier (LNA). The HD155101BF includes an active bias circuit which stabilizes the DC operating point of the LNA. The RF signal passes via a second RF SAW filter to the first receive mixer. This mixer is implemented as a Gilbert cell within the HD155101BF. The incoming signal at 947 MHz mixes with the UHF LO at 1172 MHz to generate a 225 MHz IF signal. The IF signal passes from the mixer output via a 225 MHz IF SAW filter to the first IF amplifier. A further internal Gilbert cell mixes the 225 MHz IF signal down to the 45 MHz second IF. The 45 MHz output from the second mixer is filtered and passes to the AGC amplifier. The gain of the AGC amplifier is set by a DC control voltage supplied by the baseband. The usable control range is in excess of 80dB. Finally, the AGC output signal at 45 MHz passes to the demodulator and is mixed down to DC to generate I and Q baseband signals. The baseband signals pass via baseband filter to the baseband A/D converters. The remainder of the channel filtering is performed by the baseband chipset.

2-2 Baseband Part

2-2-1 General Block Diagram



< Fig. 3 Baseband Block Diagram >

2-2-2 ROM1 & SRAM

8M (X16) Flash ROM and 2M (X8) bit SRAM are used. Two devices are merged in one package. This device is a combination memory organized as 524, 288 x 16 bit flash memory and 262, 144 x 8 bit static RAM in one package.

2-2-3 ROM2

A 8M (X16) bit Flash Memory is used for the voice recognition and voice memory. This device is an 8, 388, 608 bit flash memory with batch chip erasing, sector erasing, and byte and word writing using a single 3V power supply.

2-2-4 EEPROM

The kernel requires some external non-volatile memory to store various system parameters, such as RF control calibrations, extra dial stores etc. A 64 K (65, 536) bit device is used. This device is internally organized 8192 x 8. This device features a serial interface and software protocol allowing, operation on a simple, two wire bus.

2-3 SIM

2-3-1 SIM Interface

An interface is provided to a serial port controlling the SIM interface. It can support 5V and 3V SIM interface. The hardware interface consists of SIMVCC, SIMdata I/O, SIMclk output, SIMRST output, and SIMPRES input. The interface is controlled through TX Data, RX Data, control, and status registers. Transmit and receive data may use a 256 byte buffer or be exchanged through single byte registers. SIMVCC may be used to control the power supply to the SIM card.

2-4 POWER MANAGEMENT

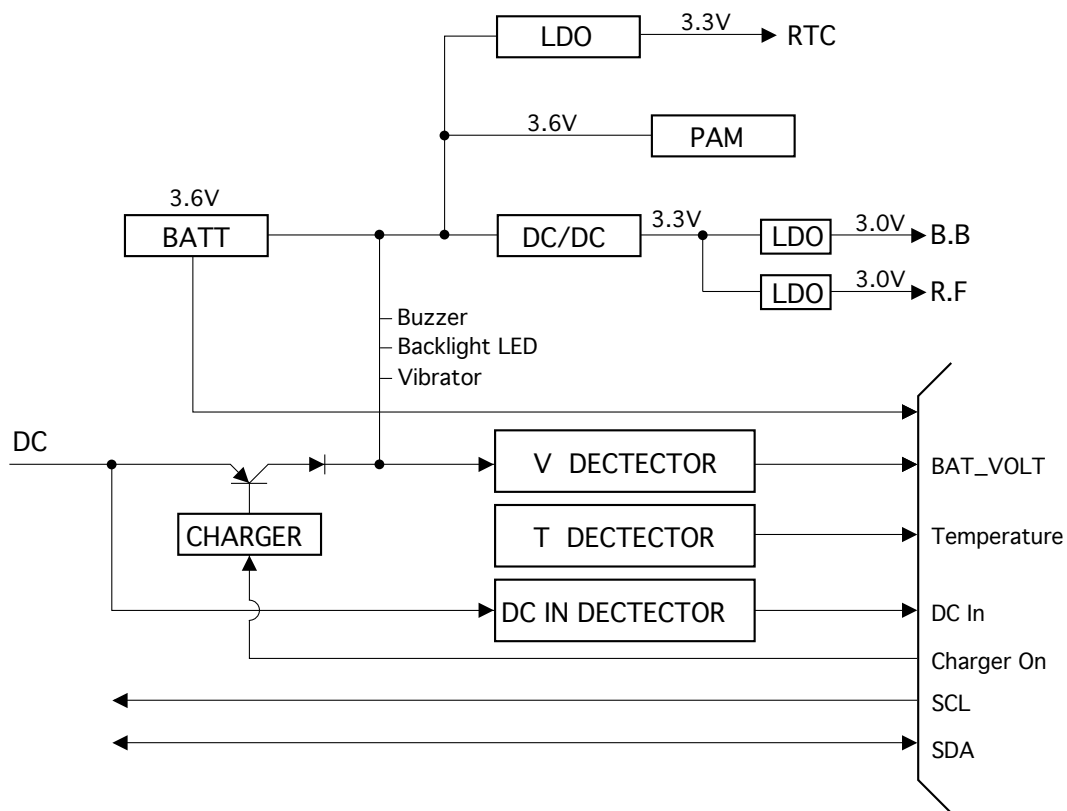
2-4-1 DC/DC Converter

Our 1 cell Li-ion battery solution requires a up-converting DC/DC conversion circuit for efficiency improvement. The device is a PWM Step-up DC/DC converter IC. Specification is as below;

- V_{in} : 2.75 V ~ 4.2 V
- V_{out} : 3.3 V ~ 4.1 V
- Ripple: less than 50 mVpp
- Efficiency: typ. 85 % (up to 96%)

2-4-2 Charger Circuitry

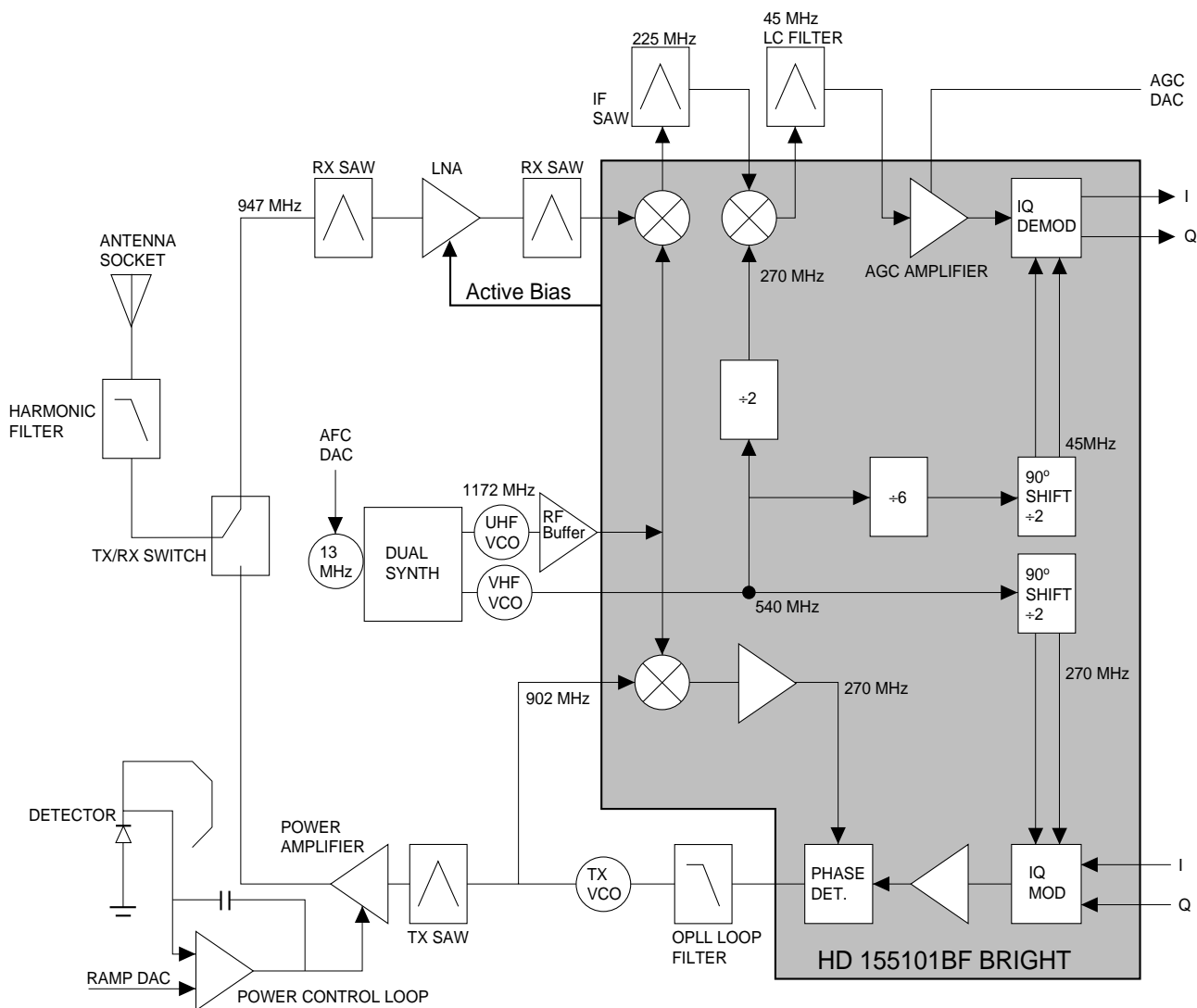
The simplified built-in charger circuit diagram is as below ;



< Fig. 4 Built-in Charger Circuitry >

2-5 RADIO INTERFACE

2-5-1 RF Block Diagram



< Fig. 5 RF Block Diagram >

2-5-2 Baseband Filter

To control the spectral splatter and thus the intersymbol interference (ISI), filtering is applied to the baseband pulses. The required filtering is achieved very simply using a small, low cost discrete LC structure, which has the great advantage of not consuming current.

2-6 AUDIO

2-6-1 Audio Inputs

The Handset provides two audio inputs:

- Built in microphone
- Connection for external microphone

A microphone biasing amplifier reduces component count in the overall system design:

- Supply: 2.2 V regulated to $\pm 20\%$
- Different output to eliminate possible coupling noise problems, MICBIASP and MICBIASN
- Maximum current: 500 μ A
- Maximum load: 200 pF

2-7 EXTERNAL INTERFACE

A 18 pin connector is mounted on the bottom corner of the PCB. The antenna external connection is on the right hand side of this connector.

2-8 KERNEL SPECIFICATION

2-8-1 FEATURES

- Complete Layer 1 support
- TDMA burst building (ETSI Rec.5-02)
- Coding and interleaving (Rec. 5-03)
- GMSK with differential coding (Rec. 5-04)
- Programmable power template for Tx burst control
- AGC in Receive mode
- I,Q inputs or single intermediate frequency (IF) input
- Detection of FCCH, SCH, Normal and Dummy Bursts
- Flash ROM programming abilities
- Auxiliary ADC for battery voltage and temperature monitoring

2-8-2 Equalizer

MAJOR FEATURES

- Frequency Correction Burst Correction
- Frequency Correction Burst Frequency Measurement
- Synchronization Burst Long Preamble Correlation
- Normal Burst Short Preamble Correlation
- Channel Impulse Response Generation
- Possible Received Value Generation
- Data Equalization
- Carrier Power Measurement
- Doppler Shift Measurement and Correction
- Scaled 7-Bit Soft Decision
- I and Q component recovered from Received Data

2-9 VOCODER SPECIFICATION

2-9-1 FEATURE

- Complete GSM voice encoding and decoding functions
- DTX function
- Voice Activity Detection (VAD) output
- Fully asynchronous coding and decoding
- A-law PCM conversion
- DTMF generation
- Sidetone level control
- Programmable microphone amplifier with two differential input ports
- Two programmable audio output amplifiers
- 13 MHz master clock

2-10 Desk Top Charger

2-10-1 Charging

The desk-top charger contains switching regulator to charge a lithium battery from an DC/DC adaptor. The battery type is detected at pin 15 (MPU) through U5 (front port) and U26 (rear port). Battery charging current is turned into V_i . V_i is measured at pin 12 (MPU) after R32 and C23 to cancel the noise. When the battery voltage is too low, the charging circuit turns to trickle mode using Q9 and Q11.

2-10-2 Control Part

This circuit contains 4-bit micro controller (U21), including an I/O port, timer, A/D converter to control battery charging. This circuit uses a 4 MHz main clock and +5V power.

BATTERY VOLTAGE DETECTION

Battery voltage from the front port is detected at R20, R18 and measured at pin 13 (MPU).
Battery voltage from the rear port is detected at R14, R13 and measured at pin 14 (MPU).

BATTERY TEMPERATURE DETECTION

The charger always detects the battery temperature via NTC thermistor to prevent battery thermal problems. This circuit is composed of parallel resistors because NTC thermistor has log-scale thermal characteristics. If the battery temperature exceeds 55 degrees C, charging stops.

AUTONOMOUS TIMER

If MPU has stopped charging and the timer goes to the 'on' state by an external shock, overcharging may occur. A timer (U7-4) prevents the battery from being overcharged by any unexpected external influence.

2-11 Cigar Lighter Adaptor (CLA)

2-11-1 General Description

The CLA is a regulated switched-mode power supply designed for use with a portable HHP. The power supply is connected directly to the phone and provides a voltage path for charging a battery installed in the hand-held portable phone.

2-11-2 Circuit Description

The input voltage range of CLA is from 12 Vdc to 30 Vdc, and the nominal voltage is 13.7 Vdc. The output current is 600 mA. The ripple and noise amplitude is less than 50 mV at the input (12 V ~ 30 Vdc). And the limit settings are shown below;

- Current limit : 600 mA \pm 50 mA at nominal input 13.7 V
- Output voltage : 9.0 V (+/- 0.8 V) Vdc at no load.

In addition, the temperature limit is -20 upto +85 °C for storage, and 0 to +40 °C for operating. The CLA size of SGH-600 is 89.3 x 43 x 27 mm, and the weight is 110 g.

2-12 Travel Adaptor (TA)

2-12-1 General Description

This adaptor is designed for use with a portable hand held phone (HHP). It is a switching-mode power supply connected directly to the phone with a cable, and it provides a voltage for charging a battery installed in the hand held portable phone.

2-12-2 Circuit Description

The input voltage range is 85 ~ 264 Vac, and input frequency is 47 ~ 63 Hz. At an input voltage of 230 Vac (standard input voltage), AC input current is 0.1 A(rms). The output voltage range is 9.0 V \pm 10% and the unit maintains current 600 mA \pm 30 mA. The operating temperature is 0 ~ 55 °C, and for storage -20 ~ 85°C. Power ON/OFF cycle is 1.0sec min. The overall size is 74.1 x 28.4 x 79.8 mm and the weight is 65 g without the output DC cable. The charger is an AC/DC switch mode flyback converter featuring constant current and voltage limit. Output cable is two-way DC cable. Maximum output power is 6.4 W.

2-13 Hands Free Car kit

2-13-1 General Description

Many states and countries are considering legislation requiring mobile phone users to operate in Hands-Free mode while driving.

Feature of the hands free kit are:

- Power adaptor (600 mA) from vehicle battery to GSM battery pack.
- Ignition sensor for automatic power ON/OFF.
- Car stereo mute function in Hands-Free mode, with programmable output level.
- External microphone input.
- Loudspeaker output.
- Hands-Free operation.

2-13-2 Circuit Description

The input voltage range is from 12V dc to 28V dc, (battery) and input current is 10mA(stanby). The operating temperature is -10 ~ 60 °C, and for storage temperature is - 30 ~ 85 °C(± 5 °C). The charging voltage is DC9V and charging current is MAX 600mA.

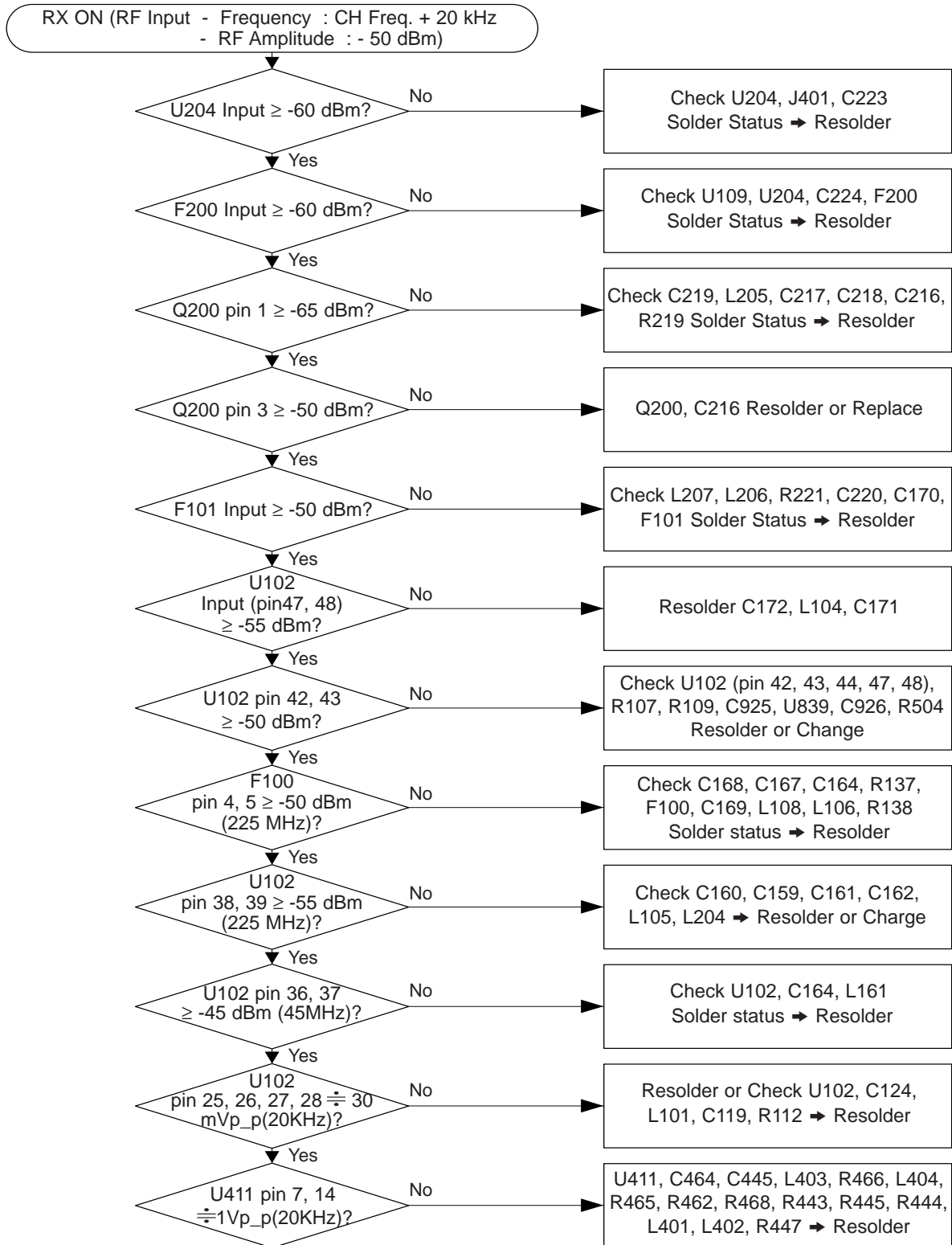
2-13-3 Audio Features

- Microphone Sensitivity: -60 dB ± 3 dB
- Speaker S/N: -45 dB ± 3 dB (1W Output)
- Speaker Distortion: 20% below (3W Output)
- Speaker Feature: Impedance 4Ω, Max 5W Output
- Echo Cancellation: 50 dB (Min)
- Noise Suppression: 15 dB (Min)

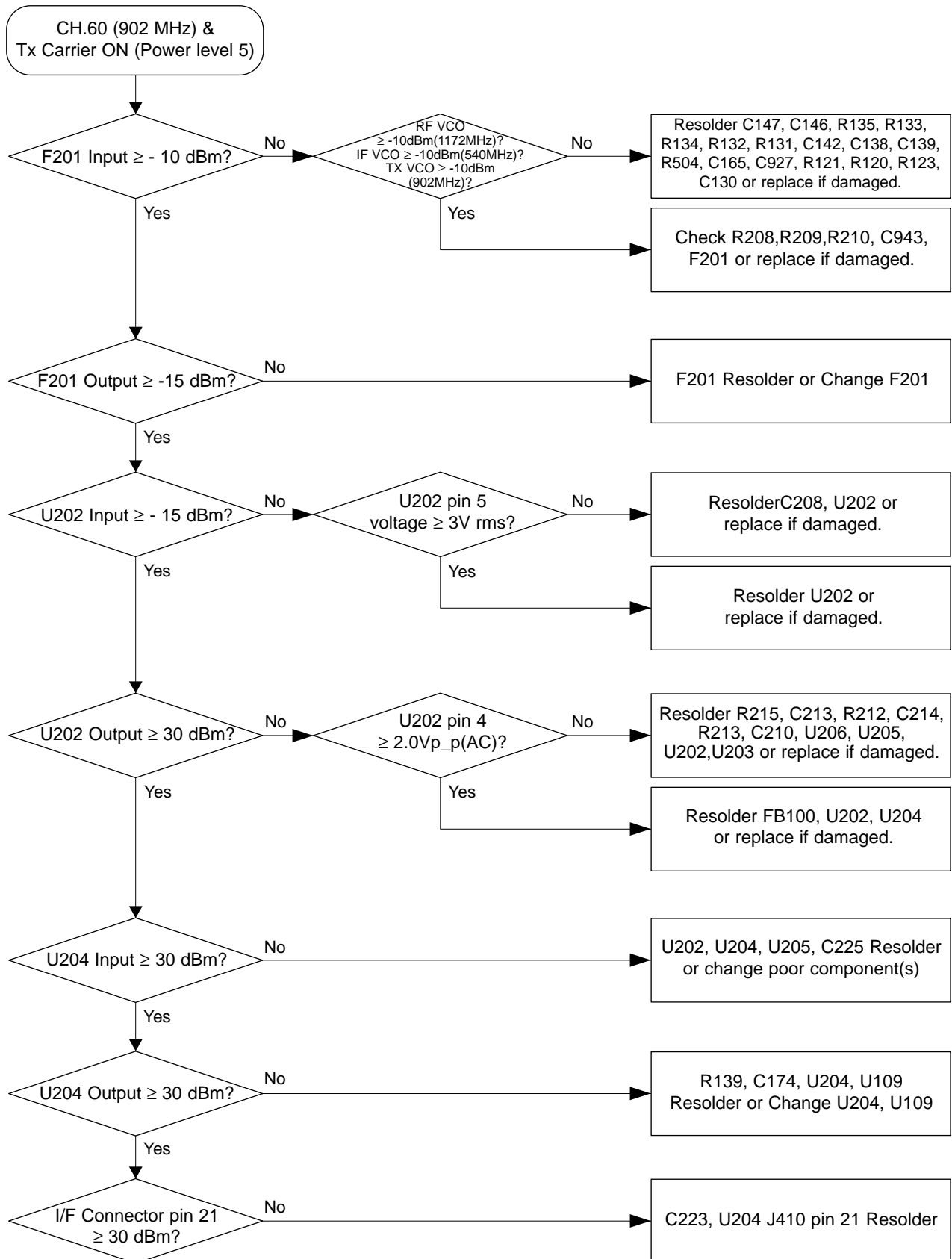
5. Troubleshooting

5-1 Main Set

5-1-1 RX Sensitivity Problem

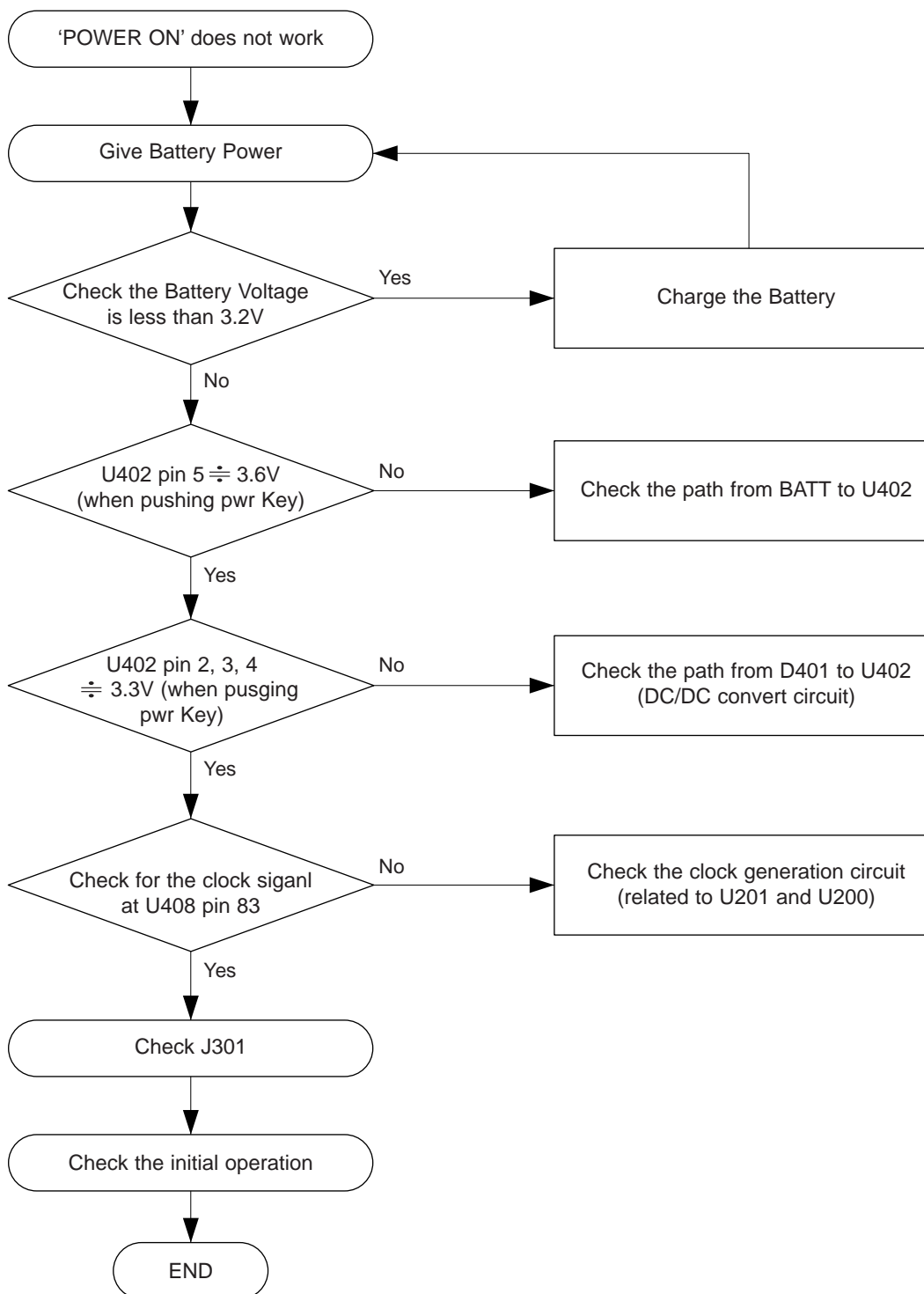


5-1-2 TX Power Problem

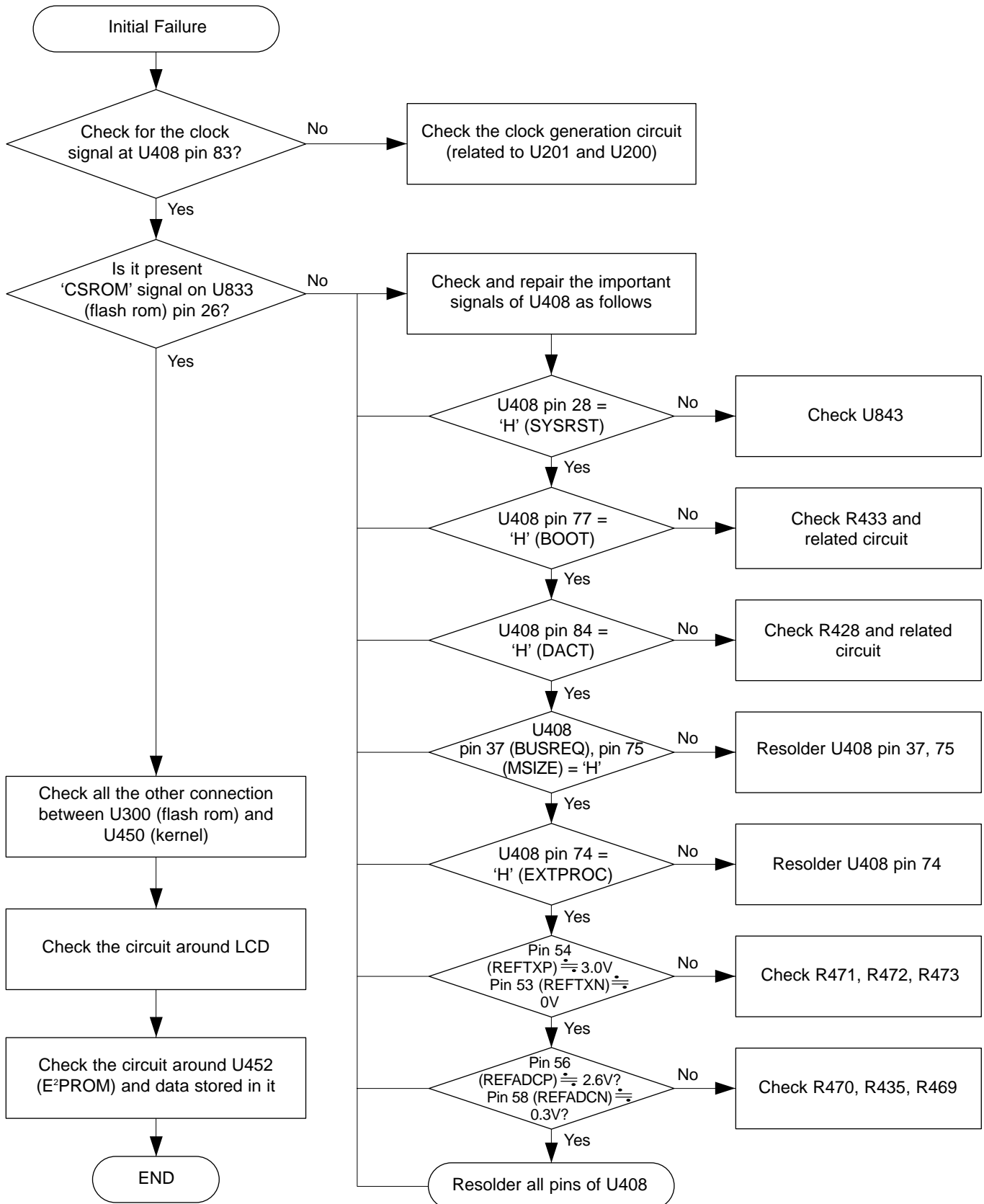


5-1-3 Base Band

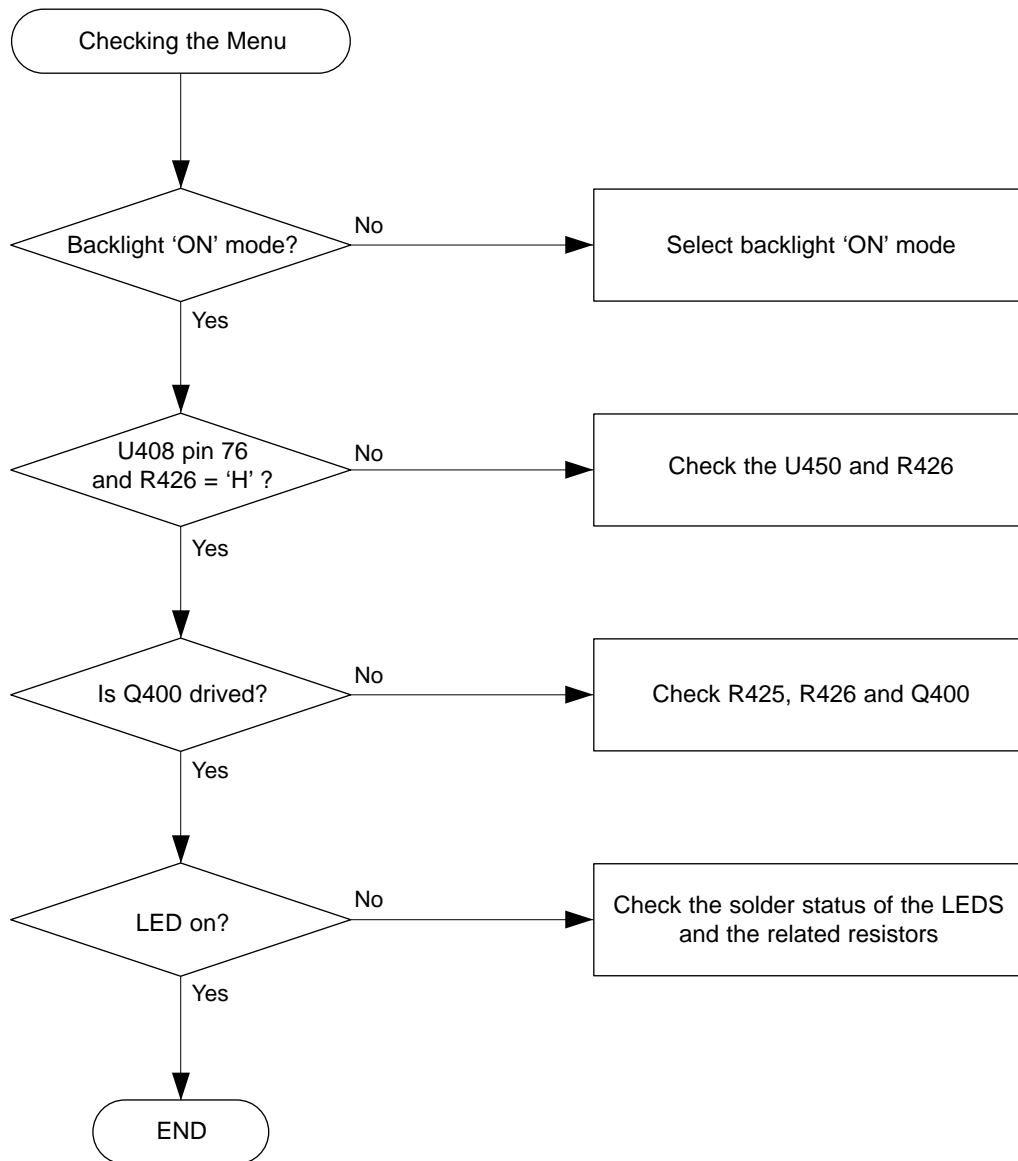
POWER ON



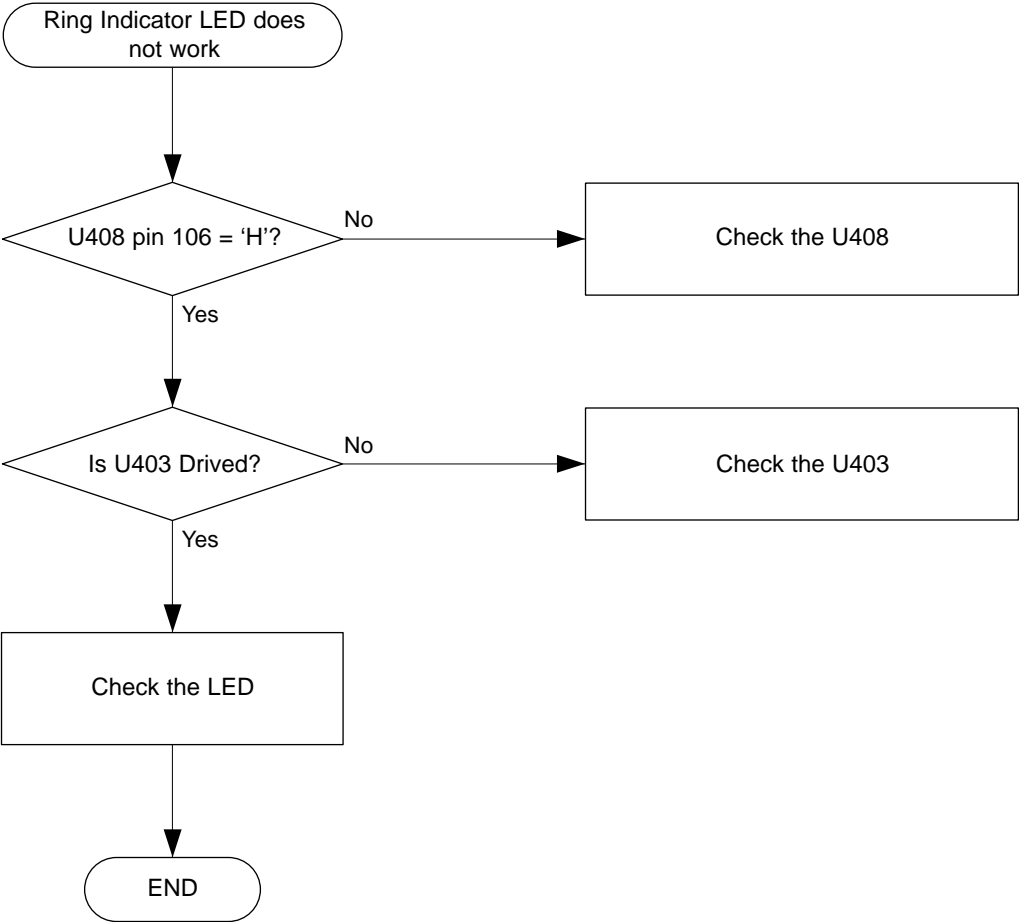
INITIAL OPERATION



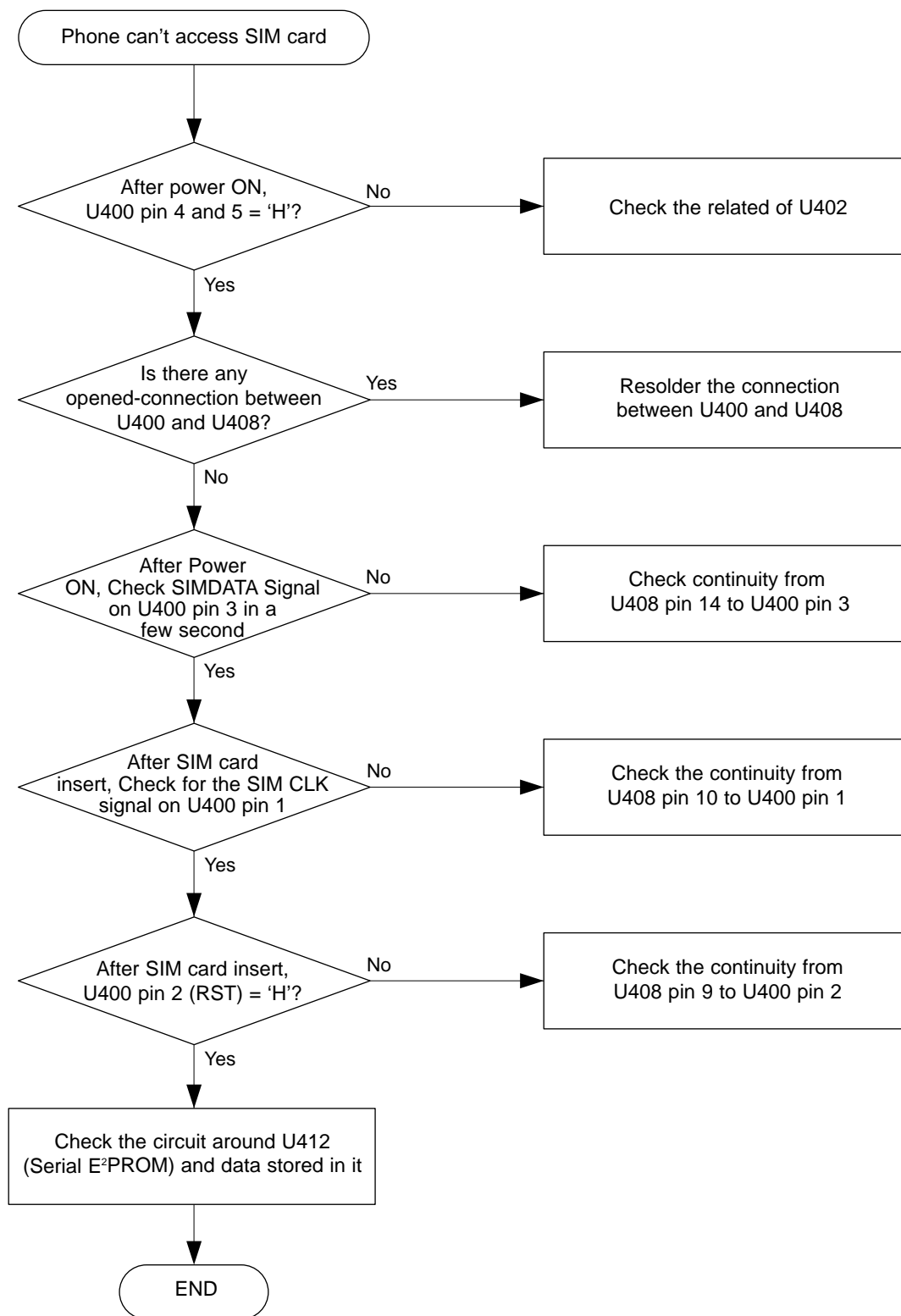
BACKLIGHT



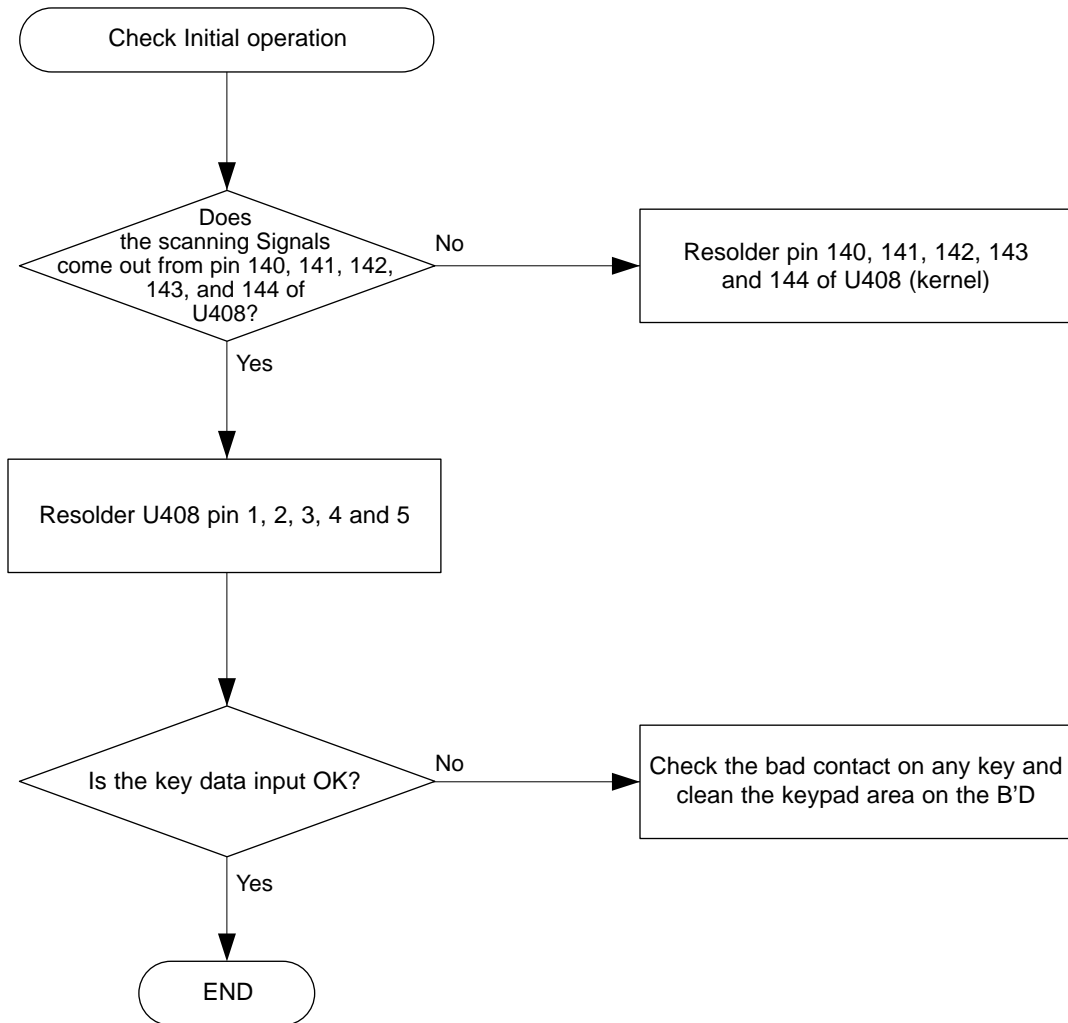
RING INDICATOR LED



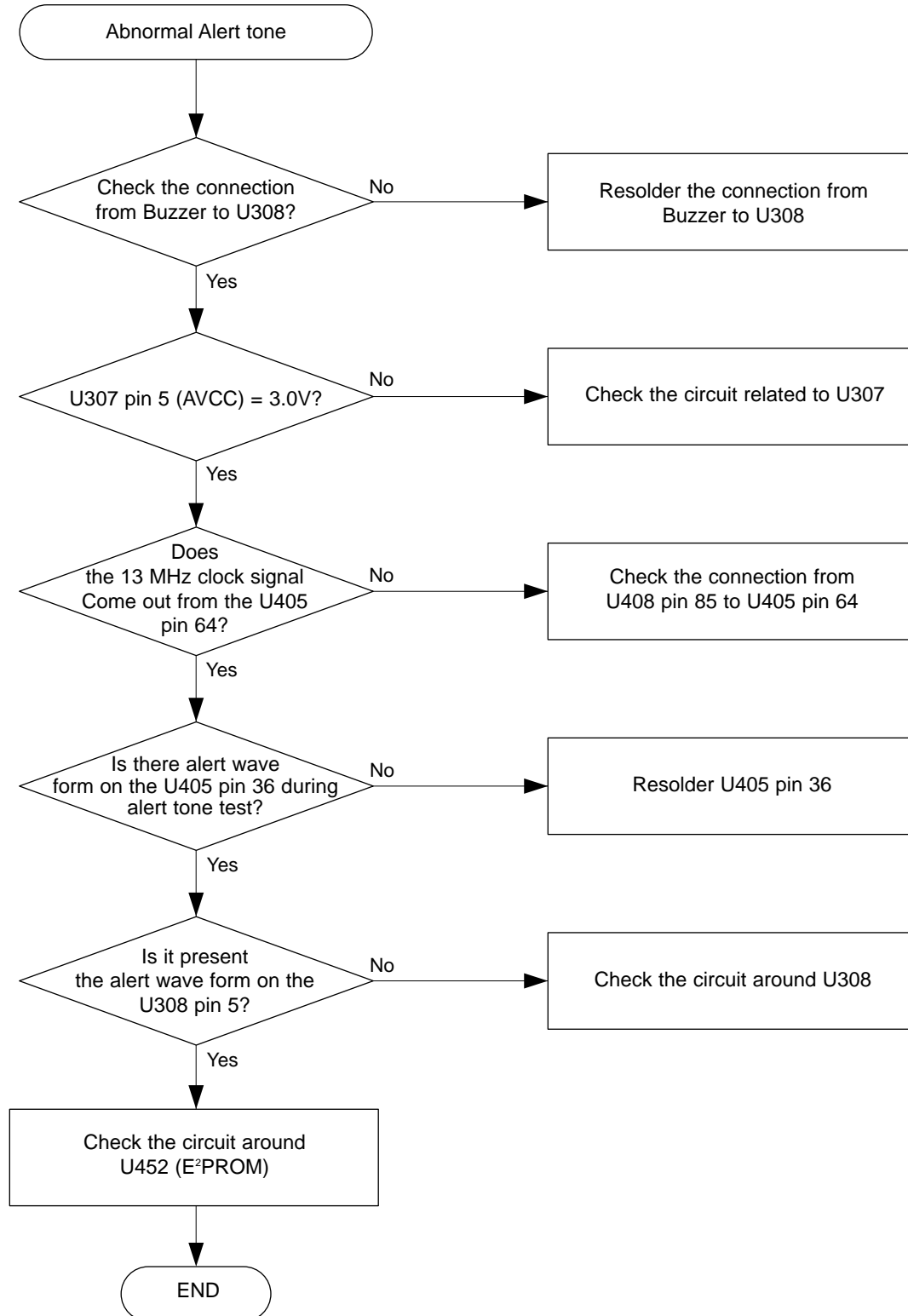
SIM CARD PART



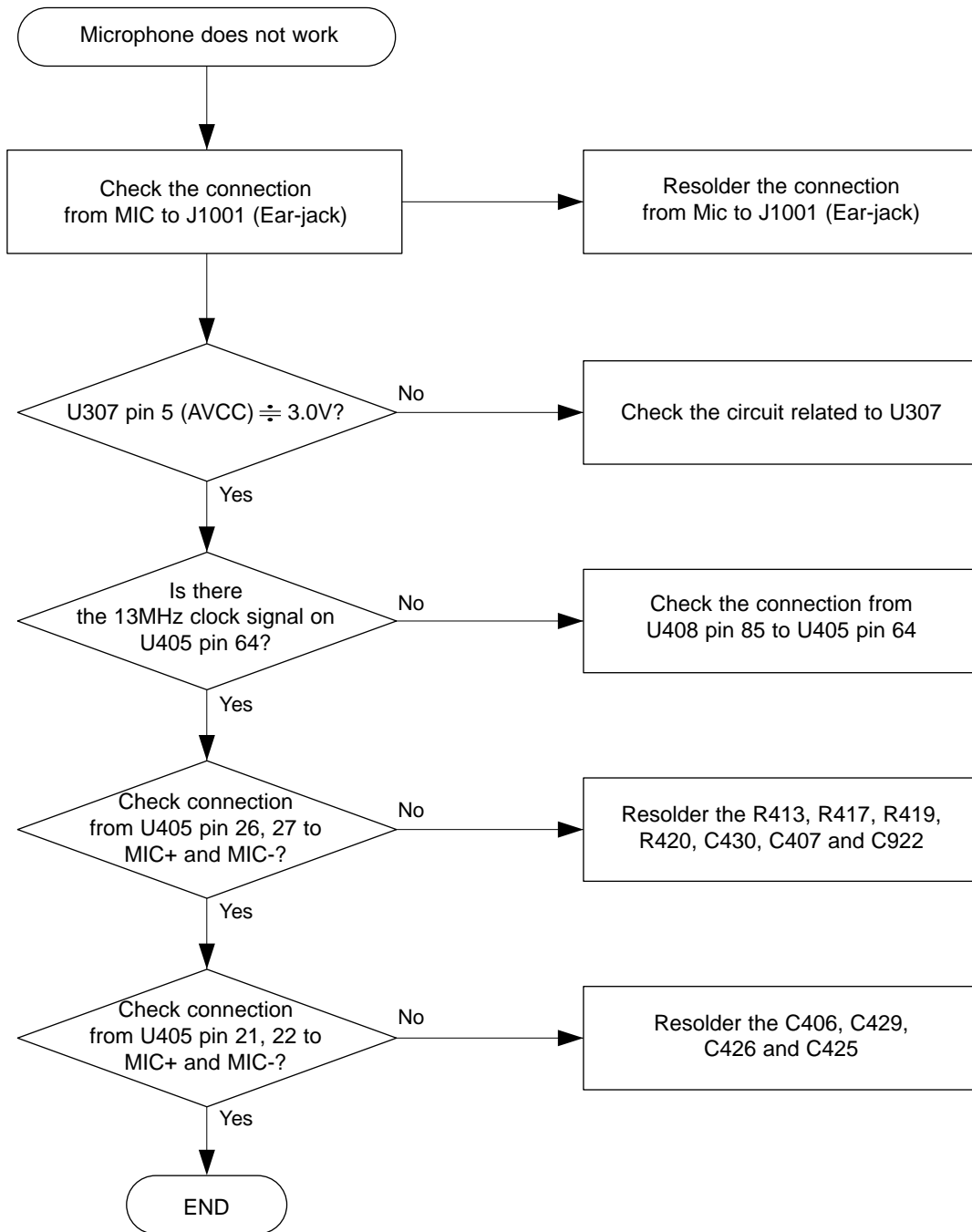
KEY DATA INPUT



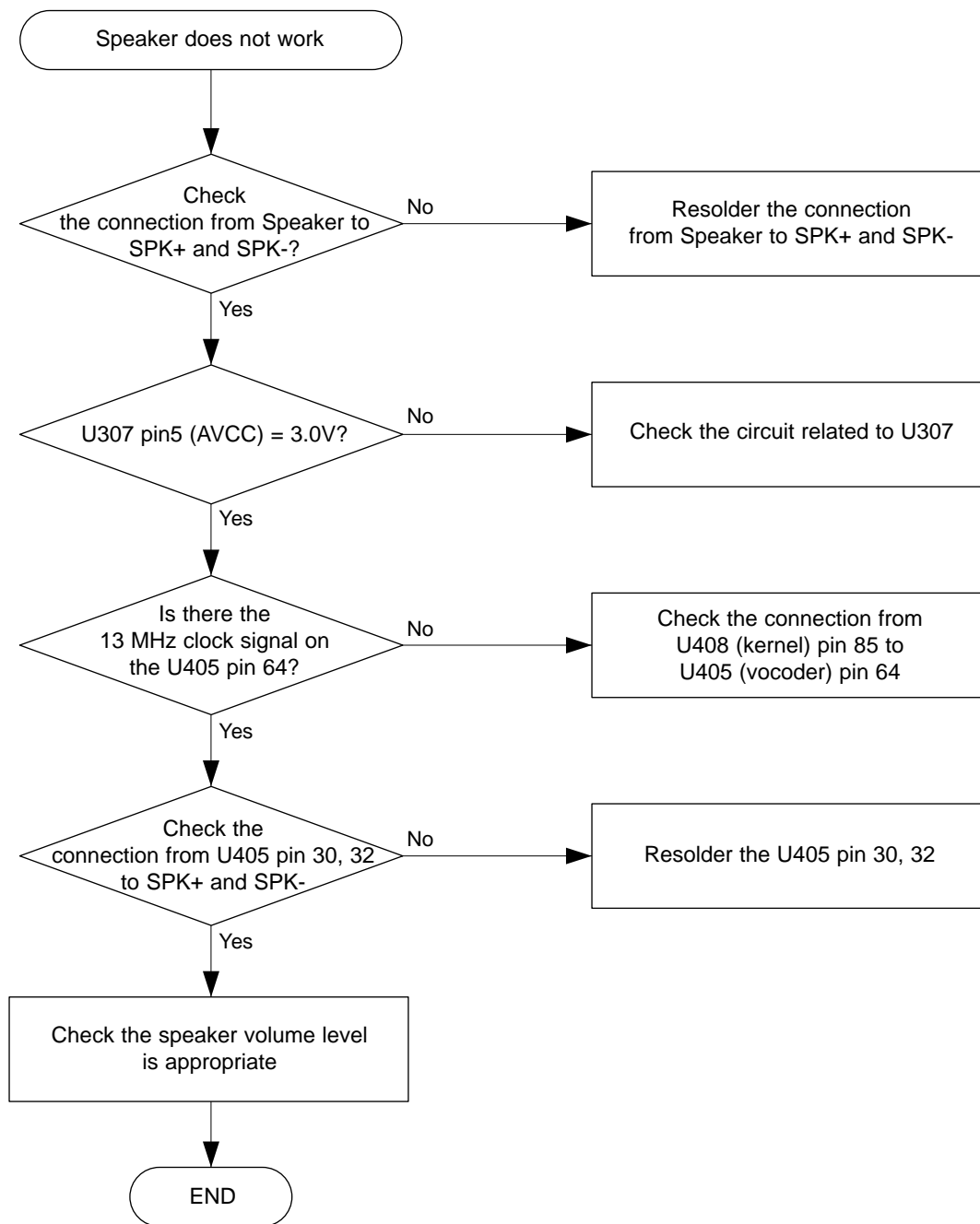
ALERT TONE



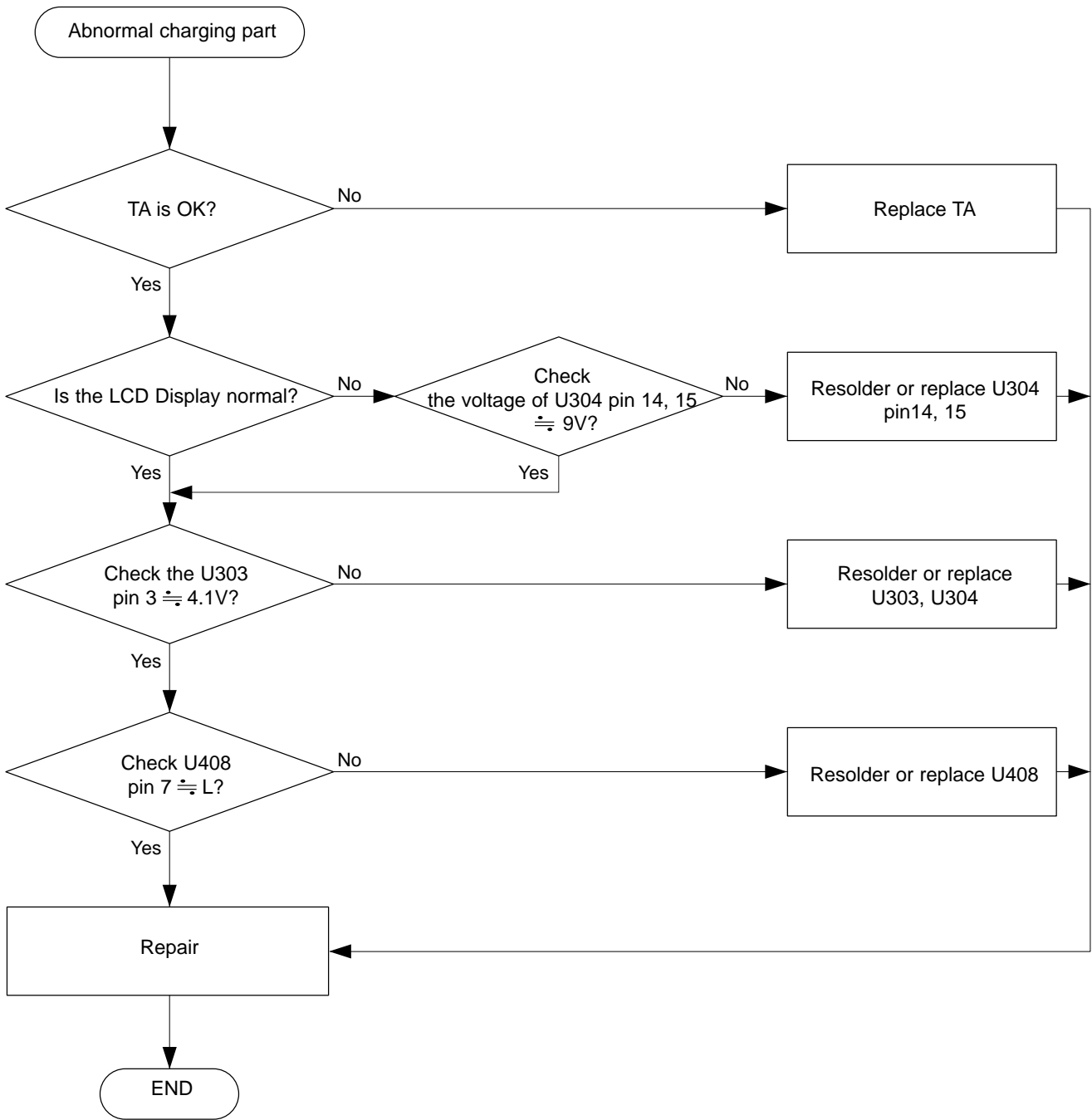
MICROPHONE PART



SPEAKER PART

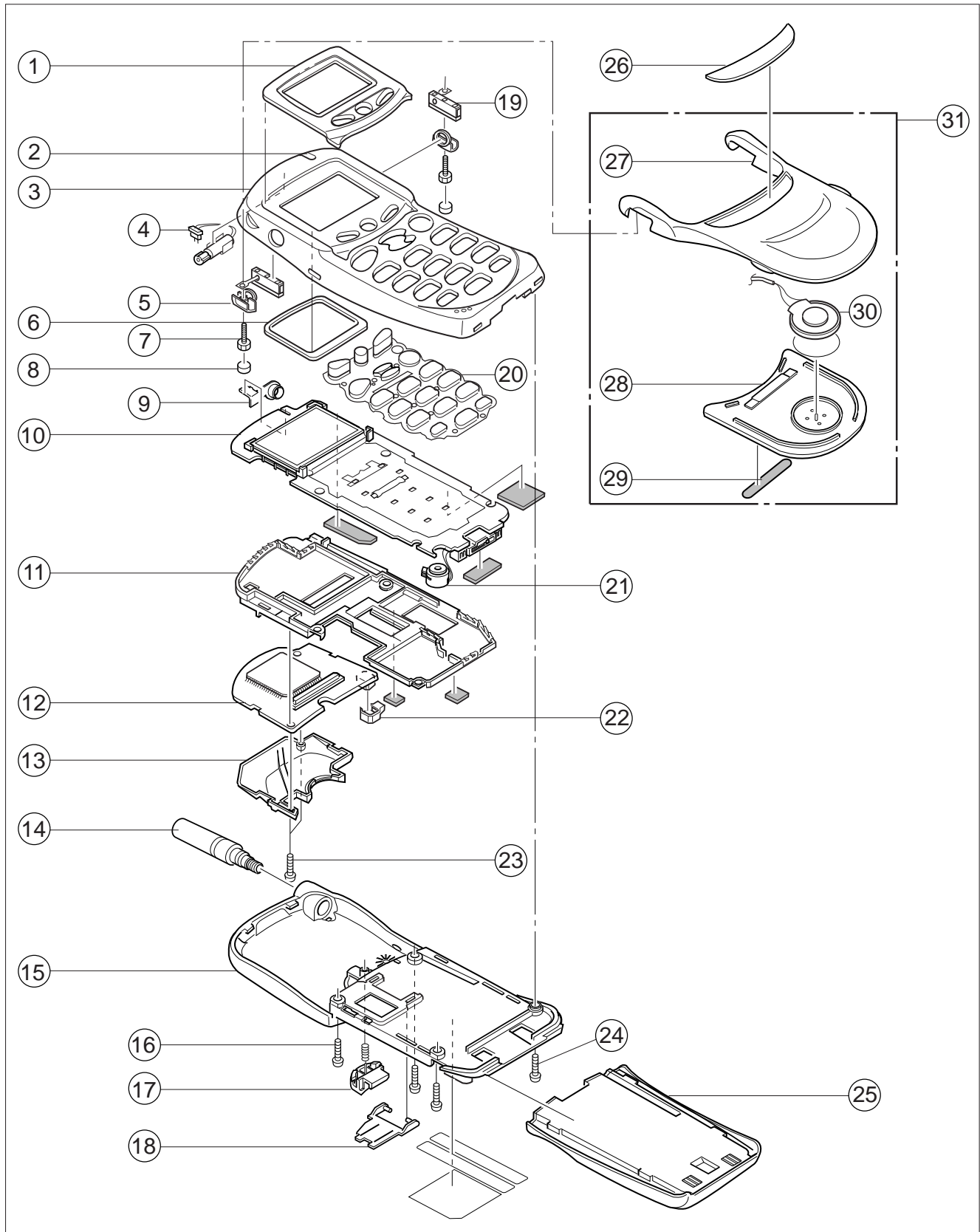


CHARGING PART



1. Exploded View and Parts List

1-1 Main Exploded View



1-2 Main Exploded View Parts List

No.	Description	SEC Code			Remark
		Dark Gray	Deep Blue	Stone Gray	
1	WINDOW	GH72-41659A	GH72-41659C	GH72-41659B	CHINA
		GH72-41659D	GH72-41659F	GH72-41659Z	
2	REFLECTOR-LED	GH72-41653A	GH72-41653A	GH72-41653A	
3	FRONT COVER	GH75-11254A	GH75-11254B	GH75-11254C	
4	VIBRATOR	GH59-10069A	GH59-10069A	GH59-10069A	
5	FLIP DUMMY-L/R	GH72-41455G/H	GH72-41455J/K	GH72-41455E/F	
6	SPONGE BUMPER	GH74-10717A	GH74-10717A	GH74-10717A	
7	SCREW-MACHINE(M1.4/L3.5)	6001-001155	6001-001155	6001-001155	
8	FLIP DUMMY(RUBBER)	GH73-40658A	GH73-40658E	GH73-40658F	
9	ANTENNA BRACKET	GH71-10713A	GH71-10713A	GH71-10713A	
10	MAIN B'D	GH94-00809A	GH94-00809A	GH94-00809A	CHINA
		GH92-00737A	GH92-00737A	GH92-00737A	
11	SHIELD-MAIN	GH72-41657A	GH72-41657A	GH72-41657A	
12	MEMORY B'D	GH94-00854A	GH94-00854A	GH94-00854A	CHINA
		GH92-00738A	GH92-00738A	GH92-00738A	
13	SHIELD-LOGIC	GH72-41658A	GH72-41658A	GH72-41658A	
14	ANTENNA	GH42-00001A	GH42-00001A	GH42-00001A	CHINA
		GH42-00011A	GH42-00011A	GH42-00011A	
15	REAR COVER	GH72-41662A	GH72-41662A	GH72-41662A	
16	SCREW-MACHINE(L2/L3.5)	6001-001149	6001-001149	6001-001149	
17	BATTERY LOCKER	GH72-41663A	GH72-41663A	GH72-41663A	
18	CARD HOLDER	GH72-41664A	GH72-41664A	GH72-41664A	
19	FLIP BRACKET-L/R	GH75-11146A/B	GH75-11146A/B	GH75-11146A/B	
20	KEYPAD	GH72-41661A	GH72-41661A	GH72-41661A	
21	MIC HOLDER	GH72-41656A	GH72-41656A	GH72-41656A	
22	BUZZER HOLDER	GH73-40694A	GH73-40694A	GH73-40694A	
23	SCREW-TAPTIGHT(M1.4x4)	6003-001049	6003-001049	6003-001049	
24	SCREW-MACHINE(M2/L5)	6001-001148	6001-001148	6001-001148	
25	BATTERY	GH43-10091A	GH43-10089A	GH43-10101A	Slim(600 mA)
		GH43-10093A	GH43-10090A	GH43-10097A	Middle(900 mA)
		GH43-10328A	GH43-10327A	GH43-10329A	Long(1600 mA)
26	FLIP WINDOW	GH72-41660A	GH72-41660C	GH72-41660B	CHINA
		GH72-41660D	GH72-41660F	GH72-41660E	
27	FLIP UPPER	GH72-41654A	GH72-41654B	GH72-41654C	
28	FLIP LOWER	GH72-41655A	GH72-41655B	GH72-41655C	
29	FLIP LABEL	GH68-31050D	GH68-31050E	GH68-31050F	
30	SPEAKER	3009-001024	3009-001024	3009-001024	
31	FLIP ASS'Y	GH97-00838A	GH97-00838B	GH97-00838C	

2. Electrical Parts LIST

2-1 Main Parts List (Europe)

Location No.	Description	SEC Code	Remark
RDS161	SWITCH-REED 200 V, 0.5A, -, -	3409-001002	
BAT201	BATTERY-POLYMER 3.3 V, 0.065 mAH	4302-001026	
J161	DISPLAY LCD SGH-500, UG-09A12-FLHTX-B	GH07-20533A	
SEMI-CABLE	CBF SIG NAL- SGH-500, COAXIAL	GH39-20017A	
METALDOM	UNIT-KEY ARRAY SGH-500, YOU07d	GH59-10168A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE SPONGE	GH63-20056A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE SPONGE	GH63-20058A	
-	NPR-ANT.BRACKET SGH-500, CUZN, T0.5, AU	GH71-10713A	
BACKUP-TAPE	MCT-BACKUP TAPE SGH-600, TAPE	GH74-40518A	
-	PRA AUTO SMD-SGH-500, SEUK, UK	GH94-00809A	
D202	DIODE-ZENER UDZ3.0B, 3.0 V, 3.01-3.22 V	0403-001166	
D241, D242	DIODE-SCHOTTKY PRL5819, 40 V, 1A	0404-001005	
D200	DIODE-SCHOTTKY UPS5817, 20 V, 1A	0404-001044	
D701	DIODE-SCHOTTKY HSMS-2805, 70 V	0404-001054	
U205	DIODE-SCHOTTKY RB425D, 20 V, 100 mA	0404-001074	
D402, D602	DIODE-VARACTOR BB149, 30 V, 10 nA	0405-001004	
D401, D601	DIODE-VARACTOR SMV1104-34, 15 V	0405-001005	
D151	DIODE-TVS SM05, 6V/1 mA, 300, SOT-23	0406-001005	
D201	DIODE-ARRAY UMN1, 80 V, 25 mA	0407-001007	
D155	DIODE-ARRAY SMS05, 5 V	0407-001030	
D181, D152	DIODE-ARRAY SMS05, 5 V	0407-001030	
D153, D154	DIODE-ARRAY SMS05, 5 V	0407-001030	
Q164	TR-S MALL SIG NAL KSA812, PNP, 150 mW	0501-000002	
Q401	TR-S MALL SIG NAL NPN, 8 V, 5 V, 6.5 mA	0501-002005	
Q163	TR-S MALL SIG NAL 2SD2114K, NPN	0501-002011	
Q702	TR-S MALL SIG NAL AT32033, NPN	0501-002110	
Q161, Q162	TR-DIGITAL RN1102, NPN, 100 mW	0504-000167	
Q221, Q241	TR-DIGITAL RN1102, NPN, 100 mW	0504-000167	
Q242	FET-SILICON TP0202T, P, -20 V, -0.75A	0505-001007	
U405	TR-ARRAY uPA800T-T1, NPN, 2, 20 V	0506-001002	
U201, U403	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U404, U604	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U605	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U503, U795	TR-ARRAY UMC5N, NPN/PNP, 2, 50 V	0506-001004	

Location No.	Description	SEC Code	Remark
D161, D162	LED CHIP, Y/GRN, 0.8x1.2 mm, 570nm	0601-000273	
D163, D164	LED CHIP, Y/GRN, 0.8x1.2 mm, 570nm	0601-000273	
D165, D166	LED CHIP, Y/GRN, 0.8x1.2 mm, 570nm	0601-000273	
D167, D168	LED CHIP, Y/GRN, 0.8x1.2 mm, 570nm	0601-000273	
D169, D170	LED CHIP, Y/GRN, 0.8x1.2 mm, 570nm	0601-000273	
D171	LED CHIP, Y/GRN, 1.6x2.0 mm, 570nm	0601-000276	
U602, U603, U606	IC-CMOS LOGIC 7SET08, AND GATE	0801-002272	
U504	IC-OP AMP 2274, SOP, 14P, -, DUAL	1201-001007	
U702	IC-PREAMP 2771, SOP, 6P, 150 MIL, SINGLE	1201-001009	
U701	IC- MMIC AMP 2748, SOP, 6P, -, SINGLE	1201-001010	
U705	IC-OP AMP 7131, SOT-23, 5P, -, SINGLE	1201-001018	
U791	IC-RF AMP 240, SOT-388C, 4P, -, TRIPLE	1201-001282	
U401, U402	IC-SWITCH VOL. REG. 5205, SOP, 8P	1203-001207	
U181	IC-DC/DC CONVERTER 1555, SOP, 16P	1203-001289	
U241	IC-DC/DC CONVERTER 1705, SOP, 16P	1203-001386	
U242	IC-DC/DC CONVERTER 1308, SOP, 8P	1203-001557	
U204	IC-VOLTAGE REGULATOR 1015	1203-001592	
U406	IC-SWITCH VOL. REG. 1015, SOT-23A	1203-001593	
U501	IC-IF SYSTEM AD607, SOP, 20P	1204-001006	
U601	IC-TELE. WARM G1, QFP, 48P	1205-001006	
U104	IC-TIMER RS5C372A, SOP, 8P	1206-001009	
RTH161	THERMISTOR-NTC 15 kohm, 5, 3950K	1404-001103	
R183	R-CHIP 100 ohm, 5, 1/16 W	2007-000138	
R202, R527	R-CHIP 100 ohm, 5, 1/16 W	2007-000138	
R707	R-CHIP 220 ohm, 5, 1/16 W	2007-000139	
R169, R512, R515	R-CHIP 1 kohm, 5, 1/16 W	2007-000140	
R611, R724, R719	R-CHIP 1 kohm, 5, 1/16 W	2007-000140	
R403, R607	R-CHIP 2.7 kohm, 5, 1/16 W	2007-000142	
R170, R201	R-CHIP 4.7 kohm, 5, 1/16 W	2007-000143	
R526, R528	R-CHIP 4.7 kohm, 5, 1/16 W	2007-000143	
R723	R-CHIP 8.2 kohm, 5, 1/16 W	2007-000147	
R161, R203, R211	R-CHIP 10 kohm, 5, 1/16 W	2007-000148	
R221, R410	R-CHIP 10 kohm, 5, 1/16 W	2007-000148	
R411, R412	R-CHIP 10 kohm, 5, 1/16 W	2007-000148	
R413, R505, R701	R-CHIP 10 kohm, 5, 1/16 W	2007-000148	
R702	R-CHIP 10 kohm, 5, 1/16 W	2007-000148	
R609, R615	R-CHIP 12 kohm, 5, 1/16 W	2007-000149	

Location No.	Description	SEC Code	Remark
R171	R-CHIP 15 kohm, 5, 1/16 W	2007-000151	
R246, R213	R-CHIP 47 kohm, 5, 1/16 W	2007-000157	
R602	R-CHIP 56 kohm, 5, 1/16 W	2007-000159	
R172	R-CHIP 82 kohm, 5, 1/16 W	2007-000161	
R181, R182	R-CHIP 100 kohm, 5, 1/16 W	2007-000162	
R167, R204	R-CHIP 100 kohm, 5, 1/16 W	2007-000162	
R243, R621	R-CHIP 100 kohm, 5, 1/16 W	2007-000162	
R248, R622	R-CHIP 100 kohm, 5, 1/16 W	2007-000162	
R603	R-CHIP 120 kohm, 5, 1/16 W	2007-000163	
R525	R-CHIP 1Mohm, 5, 1/16 W	2007-000170	
R619	R-CHIP 0 ohm, 5, 1/16 W	2007-000171	
R617	R-CHIP 10 ohm, 5, 1/16 W	2007-000172	
R623, R725	R-CHIP 47 ohm, 5, 1/16 W	2007-000174	
R518, R519	R-CHIP 1.5 kohm, 5, 1/16 W	2007-000242	
R601, R604	R-CHIP 220 kohm, 5, 1/16 W	2007-000566	
R511, R520	R-CHIP 330 kohm, 5, 1/16 W	2007-000758	
R405, R510	R-CHIP 33 kohm, 5, 1/16 W	2007-000775	
R168, R517, R706	R-CHIP 470 ohm, 5, 1/16 W	2007-000932	
R513, R514, R516	R-CHIP 470 ohm, 5, 1/16 W	2007-000932	
R605	R-CHIP 5.6 kohm, 5, 1/16 W	2007-000982	
R612, R416	R-CHIP 680 ohm, 5, 1/16 W	2007-001119	
R712	R-CHIP 18 ohm, 5, 1/16 W	2007-001288	
R708	R-CHIP 39 ohm, 5, 1/16 W	2007-001295	
R705	R-CHIP 51 ohm, 5, 1/16 W	2007-001298	
R710, R166	R-CHIP 68 ohm, 5, 1/16 W	2007-001301	
R175, R176	R-CHIP 68 ohm, 5, 1/16 W	2007-001301	
R162, R163	R-CHIP 120 ohm, 5, 1/16 W	2007-001305	
R507, R508, R509	R-CHIP 330 ohm, 5, 1/16 W	2007-001313	
R408, R703	R-CHIP 820 ohm, 5, 1/16 W	2007-001316	
R606	R-CHIP 1.8 kohm, 5, 1/16 W	2007-001320	
R506, R608	R-CHIP 3.3 kohm, 5, 1/16 W	2007-001325	
R610, R613	R-CHIP 3.3 kohm, 5, 1/16 W	2007-001325	
R614	R-CHIP 3.3 kohm, 5, 1/16 W	2007-001325	
R722	R-CHIP 560 ohm, 5, 1/16 W	2007-002797	
R164, R165	R-CHIP 75 ohm, 5, 1/16 W	2007-007009	
R245	R-CHIP 100 kohm, 1, 1/16 W	2007-007107	
R174, R718	R-CHIP 15 kohm, 1, 1/16 W	2007-007132	

Location No.	Description	SEC Code	Remark
R721	R-CHIP 1.2 kohm, 1, 1/16 W	2007-007137	
R249	R-CHIP 10 kohm, 1, 1/16 W	2007-007142	
R715	R-CHIP 12 kohm, 1, 1/16 W	2007-007309	
R717	R-CHIP 8.2 kohm, 1, 1/16 W	2007-007310	
R704	R-CHIP 22 kohm, 1, 1/16 W	2007-007311	
R716, R404	R-CHIP 3.3 kohm, 1, 1/16 W	2007-007316	
R409	R-CHIP 1 kohm, 1, 1/16 W	2007-007318	
R402	R-CHIP 390 ohm, 1, 1/16 W	2007-007319	
R242	R-CHIP 200 kohm, 1, 1/16 W	2007-007334	
R713, R714	R-CHIP 240 ohm, 1, 1/16 W	2007-007517	
R241	R-CHIP 56 kohm, 1, 1/16 W	2007-007538	
R244, R250	R-CHIP 330 kohm, 1, 1/16 W	2007-007573	
R406, R401	R-CHIP 470 ohm, 1, 1/16 W	2007-007586	
R720	R-CHIP1.8 kohm, 1, 1/16 W	2007-007588	
C221, C224, C405	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C225, C226	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C227, C228	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C229, C230	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C516, C623	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C534, C713, C724	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C703, C704, C728	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C709, C712	C-CERAMIC, CHIP 100 pF, 5, 50 V	2203-000233	
C402, C411, C413	C-CERAMIC, CHIP 10 nF, 10, 16 V	2203-000254	
C418, C424, C720	C-CERAMIC, CHIP 10 nF, 10, 16 V	2203-000254	
C506	C-CERAMIC, CHIP 10 nF, 10, 16 V	2203-000254	
C619, C428	C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V	2203-000278	
C701, C705, C637	C-CERAMIC, CHIP 12 pF, 5, 50 V	2203-000330	
C410, C615	C-CERAMIC, CHIP 150 pF, 5, 50 V	2203-000359	
C632, C633	C-CERAMIC, CHIP 150 pF, 5, 50 V	2203-000359	
C702	C-CERAMIC, CHIP 15 pF, 5, 50 V	2203-000386	
C727	C-CERAMIC, CHIP 18 pF, 5, 50 V	2203-000425	
C150, C510	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	
C511, C604	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	
C151, C152	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	
C251, C252	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	
C512, C606, C620	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	
C621, C721, C508	C-CERAMIC, CHIP 1 nF, 10, 50 V	2203-000438	

Location No.	Description	SEC Code	Remark
C613	C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V	2203-000466	
C523, C528, C616	C-CERAMIC, CHIP 2.2 nF, 10, 50 V	2203-000489	
C717, C611	C-CERAMIC, CHIP 220 pF, 10, 50 V	2203-000585	
C520, C525	C-CERAMIC, CHIP 3.3 nF, 10, 50 V	2203-000714	
C521, C526	C-CERAMIC, CHIP 3.9 nF, 10, 50 V	2203-000725	
C617	C-CERAMIC, CHIP 33 pF, 5, 50 V	2203-000812	
C403	C-CERAMIC, CHIP 470 pF, 10, 50 V	2203-000940	
C419, C423	C-CERAMIC, CHIP 470 pF, 10, 50 V	2203-000940	
C505, C718, C212	C-CERAMIC, CHIP 470 pF, 10, 50 V	2203-000940	
C535, C417	C-CERAMIC, CHIP 47 pF, 5, 50 V	2203-000995	
C522, C527	C-CERAMIC, CHIP 5.6 nF, 10, 25 V	2203-001033	
C610	C-CERAMIC, CHIP 6.8 nF, 10, 25 V	2203-001101	
C707	C-CERAMIC, CHIP 680 pF, 10, 50 V	2203-001124	
C618, C601, C607	C-CERAMIC, CHIP 68 pF, 5, 50 V	2203-001153	
C626	C-CERAMIC, CHIP 6 pF, 0.5 pF, 50 V	2203-001178	
C427	C-CERAMIC, CHIP 8.2 nF, 10, 16 V	2203-001210	
C714, C609, C536	C-CERAMIC, CHIP 820 pF, 10, 50 V	2203-001221	
C501	C-CERAMIC, CHIP 82 pF, 5, 50 V	2203-001239	
C723, C530	C-CERAMIC, CHIP 0.5 pF, 0.25 pF, 50 V	2203-001383	
C614	C-CERAMIC, CHIP 1.5 pF, 0.25 pF, 50 V	2203-001385	
C246, C631	C-CERAMIC, CHIP 22 nF, 20, 25 V1.0 mm	2203-001405	
C710	C-CERAMIC, CHIP 30 pF, 5, 50 V, X7R	2203-001412	
C209	C-CERAMIC, CHIP 33 nF, 10, 16 V1.0 mm	2203-001416	
C161, C163, C164	C-CERAMIC, CHIP 2.2 uF, +80-20, 16 V	2203-001598	
C242, C243	C-CERAMIC, CHIP 330 nF, +80-20, 16 V	2203-001630	
C519, C524	C-CERAMIC, CHIP 330 pF, 10, 50 V	2203-002443	
C719	C-CERAMIC, CHIP 1.2 nF, 10, 50 V	2203-002687	
C630	C-CERAMIC, CHIP 1.8 pF, 0.25 pF, 50 V	2203-005050	
C409, C414	C-CERAMIC, CHIP 3.3 pF, 0.25 pF, 50 V	2203-005052	
C629, C624	C-CERAMIC, CHIP 3.3 pF, 0.25 pF, 50 V	2203-005052	
C627, C628	C-CERAMIC, CHIP 3.9 pF, 0.25 pF, 50 V	2203-005053	
C415	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 50 V	2203-005056	
C181, C185	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C186, C214	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C244, C249	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C406, C416	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C503, C507, C513	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	

Location No.	Description	SEC Code	Remark
C514, C517	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C518, C529	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C532, C157, C156	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C603, C153	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C154, C155	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C605, C408	C-CERAMIC, CHIP 100 nF, +80-20, 16 V	2203-005061	
C250, C401, C634	C-CERAMIC, CHIP 1 uF, +80-20, 10 V, Y5 V	2203-005065	
C407, C504, C515	C-CERAMIC, CHIP 1 uF, +80-20, 10 V, Y5 V	2203-005065	
C165, C166	C-CERAMIC, CHIP 100 nF, 10, 16 V, X7R	2203-005148	
C167, C168	C-CERAMIC, CHIP 100 nF, 10, 16 V, X7R	2203-005148	
C169	C-CERAMIC, CHIP 100 nF, 10, 16 V, X7R	2203-005148	
C708, C509	C-CERAMIC, CHIP 2.2 pF, 0.25 pF, 50 V	2203-005158	
C612	C-CERAMIC, CHIP 4.7 pF, 0.1 pF, 50 V	2203-005395	
C711	C-CERAMIC, CHIP 180 pF, 5, 25 V	2203-005503	
C404, C420, C726	C-TA, CHIP 10 uF, 20, 10 V	2404-001020	
C241	C-TA, CHIP 33 uF, 20, 6.3 V	2404-001032	
C182, C213, C426	C-TA, CHIP 10 uF, 20, 6.3 V	2404-001064	
C245, C248	C-TA, CHIP 220 uF, 20, 6.3 V	2404-001083	
C775, C183	C-TA, CHIP 33 uF, 20, 6.3 V	2404-001100	
C247	C-TA, CHIP 100 uF, 20, 16 V	2404-001107	
L241	INDUCTOR-SMD 10 uH	2703-000001	
L504, L506	INDUCTOR-SMD 1 mH	2703-000153	
L242	INDUCTOR-SMD 22 uH	2703-000172	
L606	INDUCTOR-SMD 18 nH	2703-001028	
L605	INDUCTOR-SMD 180 nH	2703-001043	
L604	INDUCTOR-SMD 2.7 uH	2703-001047	
L602	INDUCTOR-SMD 8.2 nH	2703-001063	
L609	INDUCTOR-SMD 8.8 nH	2703-001078	
L501, L507	INDUCTOR-SMD 220 nH	2703-001079	
L707	INDUCTOR-SMD 1.2 nH	2703-001204	
L705	INDUCTOR-SMD 3.3 nH	2703-001258	
L503, L505	INDUCTOR-SMD 680 uH	2703-001417	
L709	INDUCTOR-SMD 100 nH	2703-001513	
L704	INDUCTOR-SMD 33 nH	2703-001543	
L706	INDUCTOR-SMD 47 nH	2703-001545	
L607, L608, L610	INDUCTOR-SMD 120 nH	2703-001546	
L710, L708	INDUCTOR-SMD 10 nH	2703-001547	

Location No.	Description	SEC Code	Remark
L502	INDUCTOR-SMD 82 nH	2703-001685	
L711	INDUCTOR-SMD 5.6 nH, 0.3 nH	2703-001748	
X101	CRYSTAL-UNIT 32.768KHz, 20 ppm	2801-003602	
X401	CRYSTAL-SMD 13 MHz, 10 ppm	2801-003603	
F501	FILTER-CERAMIC IF, 13.0 MHz	2903-001002	
F701, F702	FILTER-SAW 890-915 MHz	2904-001003	
F703	FILTER-SAW 947.5 MHz, 25 MHz	2904-001042	
U502	FILTER-SAW 83 MHz, 160KHz, -, TP, 10 dB, -	2904-001078	
U707	FILTER-DUPLEXER 947 MHz, 902 MHz	2909-001059	
J181	CONNECTOR-CARD EDGE 6P, 2.54 mm	3709-001086	
J151	CONNECTOR-SOCKET 18P, 1R, 0.5 mm	3710-001309	
J221	CONNECTOR-SOCKET 80P, 2R, 0.5 mm	3710-001312	
U706	COUPLER-DIRECTION 902.5+-12.5 MHz	4709-001008	
U607	RF-MODULE 900+-100 MHz, 50 ohm	4709-001063	
PCB	PCB- MAIN , EPOXY, 6L, T0.8, 118.25*13	GH41-10632A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-00001A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20057A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20059A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20060A	
-	NPR-SHIELD STRIP(A) SCH-1100	GH71-10639A	
-	NPR-SHIELD STRIP(B) SCH-1100	GH71-10640A	
-	NPR-SHIELD STRIP(C) SCH-1100	GH71-10641A	
-	NPR-SHIELD STRIP(D) SCH-1100	GH71-10643A	
-	NPR-SHIELD STRIP SCH-1900, C5210S-3/4H	GH71-10644A	
-	MIC-CONDENSOR 2 V, 130 uA, 48 dB	3003-001026	
-	RMO-MIC ADAPTOR SPH-5000, RUBBER	GH73-40657A	

2-2 Main Parts List (China)

Location No.	Description	SEC Code	Remark
D202	DIODE-ZENER UDZ3.0B, 3.0 V, 3.01-3.22 V	0403-001166	
D241, D242	DIODE-SCHOTTKY PRL5819, 40 V, 1A	0404-001005	
D200	DIODE-SCHOTTKY UPS5817, 20 V, 1A	0404-001044	
D701	DIODE-SCHOTTKY HSMS-2805, 70 V	0404-001054	
U205	DIODE-SCHOTTKY RB425D, 20 V, 100 mA	0404-001074	
D402, D602	DIODE-VARACTOR BB149, 30 V, 10 nA	0405-001004	
D401, D601	DIODE-VARACTOR SMV1104-34, 15 V, 50 nA,	0405-001005	
D151	DIODE-TVS SM05, 6V/1 mA, 300, SOT-23	0406-001005	
D201	DIODE-ARRAY UMN1, 80 V, 25 mA	0407-001007	
D155	DIODE-ARRAY SMS05, 5 V, -, CK5-2	0407-001030	
D181, D152	DIODE-ARRAY SMS05, 5 V, -, CK5-2	0407-001030	
D153, D154	DIODE-ARRAY SMS05, 5 V, -, CK5-2	0407-001030	
Q401	TR-S MALL SIGNAL NPN, 8 V, 5 V, 6.5 mA	0501-002005	
Q163	TR-S MALL SIGNAL 2SD2114K, NPN	0501-002011	
Q702	TR-S MALL SIGNAL AT32033, NPN	0501-002110	
Q161, Q162	TR-DIGITAL RN1102, NPN, 100 mW	0504-000167	
Q221, Q241	TR-DIGITAL RN1102, NPN, 100 mW	0504-000167	
Q242	FET-SILICON TP0202T, P, -20 V	0505-001007	
U405	TR-ARRAY uPA800T-T1, NPN	0506-001002	
U201, U403	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U404, U604	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U605	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U503, U795	TR-ARRAY UMC5N, NPN/PNP, 2, 50 V	0506-001004	
D161, D162	LED CHIP, Y/GRN, 0.8 x 1.2 mm, 570 nm	0601-000273	
D163, D164	LED CHIP, Y/GRN, 0.8 x 1.2 mm, 570 nm	0601-000273	
D165, D166	LED CHIP, Y/GRN, 0.8 x 1.2 mm, 570 nm	0601-000273	
D167, D168	LED CHIP, Y/GRN, 0.8 x 1.2 mm, 570 nm	0601-000273	
D169, D170	LED CHIP, Y/GRN, 0.8 x 1.2 mm, 570 nm	0601-000273	
D171	LED CHIP, Y/GRN, 1.6 x 2.0 mm, 570 nm	0601-000276	
U602, U603, U606	IC-CMOS LOGIC 7SET08, AND GATE	0801-002272	
U504	IC-OP AMP 2274, SOP, 14P, -, DUAL	1201-001007	
U702	IC-PREAMP 2771, SOP, 6P, 150 MIL	1201-001009	
U701	IC- MMIC AMP 2748, SOP, 6P, -, SINGLE	1201-001010	
U705	IC-OP AMP 7131, SOT-23, 5P, -, SINGLE	1201-001018	
U791	IC-RF AMP 240, SOT-388C, 4P, -, TRIPLE	1201-001282	
U401, U402	IC-SWITCH VOL. REG. 5205, SOP, 8P	1203-001207	

Location No.	Description	SEC Code	Remark
U181	IC-DC/DC CONVERTER 1555, SOP, 16P	1203-001289	
U241	IC-DC/DC CONVERTER 1705, SOP, 16P	1203-001386	
U242	IC-DC/DC CONVERTER 1308, SOP, 8P	1203-001557	
U204	IC-VOLTAGE REGULATOR 1015	1203-001592	
U406	IC-SWITCH VOL. REG. 1015, SOT-23A	1203-001593	
U501	IC-IF SYSTEM AD607, SOP, 20P	1204-001006	
U601	IC-TELE. WARM G1, QFP, 48P	1205-001006	
U104	IC-TIMER RS5C372A, SOP, 8P	1206-001009	
R172	R-CHIP 150 kohm, 5 %, 1/16 W	2007-000104	
R171	R-CHIP 1 Mohm, 5 %, 1/16 W	2007-000109	
R183	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R202, R527	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R707	R-CHIP 220 ohm, 5 %, 1/16 W	2007-000139	
R169, R512, R515	R-CHIP 1 kohm, 5 %, 1/16 W	2007-000140	
R611, R724, R719	R-CHIP 1 kohm, 5 %, 1/16 W	2007-000140	
R403, R607	R-CHIP 2.7 kohm, 5 %, 1/16 W	2007-000142	
R170, R201	R-CHIP 4.7 kohm, 5 %, 1/16 W	2007-000143	
R526, R528	R-CHIP 4.7 kohm, 5 %, 1/16 W	2007-000143	
R723	R-CHIP 8.2 kohm, 5 %, 1/16 W	2007-000147	
R161, R203	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R211, R212	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R221, R410	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R411, R412	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R413, R505, R701	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R702	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R609, R615	R-CHIP 12 kohm, 5 %, 1/16 W	2007-000149	
R246, R213	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000157	
R602	R-CHIP 56 kohm, 5 %, 1/16 W	2007-000159	
R181, R182	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R167, R204	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R243, R621	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R248, R622	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R603	R-CHIP 120 kohm, 5 %, 1/16 W	2007-000163	
R525	R-CHIP 1 Mohm, 5 %, 1/16 W	2007-000170	
R619	R-CHIP 0 ohm, 5 %, 1/16 W	2007-000171	
R617	R-CHIP 10 ohm, 5 %, 1/16 W	2007-000172	

Location No.	Description	SEC Code	Remark
R623, R725	R-CHIP 47 ohm, 5 %, 1/16 W	2007-000174	
R518, R519	R-CHIP 1.5 kohm, 5 %, 1/16 W	2007-000242	
R173	R-CHIP 110 kohm, 5 %, 1/16 W	2007-000317	
R601, R604	R-CHIP 220 kohm, 5 %, 1/16 W	2007-000566	
R511, R520	R-CHIP 330 kohm, 5 %, 1/16 W	2007-000758	
R405, R510	R-CHIP 33 kohm, 5 %, 1/16 W	2007-000775	
R168, R517, R706	R-CHIP 470 ohm, 5 %, 1/16 W	2007-000932	
R513, R514, R516	R-CHIP 470 ohm, 5 %, 1/16 W	2007-000932	
R605	R-CHIP 5.6 kohm, 5 %, 1/16 W	2007-000982	
R612, R416	R-CHIP 680 ohm, 5 %, 1/16 W	2007-001119	
R712	R-CHIP 18 ohm, 5 %, 1/16 W	2007-001288	
R708	R-CHIP 39 ohm, 5 %, 1/16 W	2007-001295	
R705	R-CHIP 51 ohm, 5 %, 1/16 W	2007-001298	
R710, R166	R-CHIP 68 ohm, 5 %, 1/16 W	2007-001301	
R175, R176	R-CHIP 68 ohm, 5 %, 1/16 W	2007-001301	
R162, R163	R-CHIP 120 ohm, 5 %, 1/16 W	2007-001305	
R507, R508, R509	R-CHIP 330 ohm, 5 %, 1/16 W	2007-001313	
R408, R703	R-CHIP 820 ohm, 5 %, 1/16 W	2007-001316	
R606	R-CHIP 1.8 kohm, 5 %, 1/16 W	2007-001320	
R506, R608	R-CHIP 3.3 kohm, 5 %, 1/16 W	2007-001325	
R610, R613	R-CHIP 3.3 kohm, 5 %, 1/16 W	2007-001325	
R614	R-CHIP 3.3 kohm, 5 %, 1/16 W	2007-001325	
R722	R-CHIP 560 ohm, 5 %, 1/16 W	2007-002797	
R164, R165	R-CHIP 75 ohm, 5 %, 1/16 W	2007-007009	
R245	R-CHIP 100 kohm, 1 %, 1/16 W	2007-007107	
R718	R-CHIP 15 kohm, 1 %, 1/16 W	2007-007132	
R721	R-CHIP 1.2 kohm, 1 %, 1/16 W	2007-007137	
R249	R-CHIP 10 kohm, 1 %, 1/16 W	2007-007142	
R715	R-CHIP 12 kohm, 1 %, 1/16 W	2007-007309	
R717	R-CHIP 8.2 kohm, 1 %, 1/16 W	2007-007310	
R704	R-CHIP 22 kohm, 1 %, 1/16 W	2007-007311	
R716, R404	R-CHIP 3.3 kohm, 1 %, 1/16 W	2007-007316	
R409	R-CHIP 1 kohm, 1 %, 1/16 W	2007-007318	
R402	R-CHIP 390 ohm, 1 %, 1/16 W	2007-007319	
R242	R-CHIP 200 kohm, 1 %, 1/16 W	2007-007334	
R713, R714	R-CHIP 240 ohm, 1 %, 1/16 W	2007-007517	
R241	R-CHIP 56 kohm, 1 %, 1/16 W	2007-007538	

Location No.	Description	SEC Code	Remark
R244, R250	R-CHIP 330 kohm, 1 %, 1/16 W	2007-007573	
R406, R401	R-CHIP 470 ohm, 1 %, 1/16 W	2007-007586	
R720	R-CHIP 1.8 kohm, 1 %, 1/16 W	2007-007588	
C221, C224, C405	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C225, C226	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C227, C228	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C229, C230	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C516, C623	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C534, C713, C724	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C703, C704, C728	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C709, C712	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C402, C411, C413	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C418, C424, C720	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C506	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C619, C428	C-CERAMIC, CHIP 10 pF, 0.5 pF, 50 V	2203-000278	
C701, C705, C637	C-CERAMIC, CHIP 12 pF, 5 %, 50 V	2203-000330	
C410, C615	C-CERAMIC, CHIP 150 pF, 5 %, 50 V	2203-000359	
C632, C633	C-CERAMIC, CHIP 150 pF, 5 %, 50 V	2203-000359	
C702	C-CERAMIC, CHIP 15 pF, 5 %, 50 V	2203-000386	
C727	C-CERAMIC, CHIP 18 pF, 5 %, 50 V	2203-000425	
C150, C510	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C511, C604	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C151, C152	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C251, C252	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C512, C606, C620	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C621, C721, C508	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C613	C-CERAMIC, CHIP 1 pF, 0.25 pF, 50 V	2203-000466	
C523, C528, C616	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V	2203-000489	
C717, C611	C-CERAMIC, CHIP 220 pF, 10 %, 50 V	2203-000585	
C520, C525	C-CERAMIC, CHIP 3.3 nF, 10 %, 50 V	2203-000714	
C521, C526	C-CERAMIC, CHIP 3.9 nF, 10 %, 50 V	2203-000725	
C617	C-CERAMIC, CHIP 33 pF, 5 %, 50 V	2203-000812	
C403	C-CERAMIC, CHIP 470 pF, 10 %, 50 V	2203-000940	
C419, C423	C-CERAMIC, CHIP 470 pF, 10 %, 50 V	2203-000940	
C505, C718, C212	C-CERAMIC, CHIP 470 pF, 10 %, 50 V	2203-000940	
C535, C417	C-CERAMIC, CHIP 47 pF, 5 %, 50 V	2203-000995	
C522, C527	C-CERAMIC, CHIP 5.6 nF, 10 %, 25 V	2203-001033	

Location No.	Description	SEC Code	Remark
C610	C-CERAMIC, CHIP 6.8 nF, 10 %, 25 V	2203-001101	
C707	C-CERAMIC, CHIP 680 pF, 10 %, 50 V	2203-001124	
C618, C601, C607	C-CERAMIC, CHIP 68 pF, 5 %, 50 V	2203-001153	
C626	C-CERAMIC, CHIP 6 pF, 0.5 pF, 50 V	2203-001178	
C427	C-CERAMIC, CHIP 8.2 nF, 10 %, 16 V	2203-001210	
C714, C609, C536	C-CERAMIC, CHIP 820 pF, 10 %, 50 V	2203-001221	
C501	C-CERAMIC, CHIP 82 pF, 5 %, 50 V	2203-001239	
C723, C530	C-CERAMIC, CHIP 0.5 pF, 0.25 pF, 50 V	2203-001383	
C614	C-CERAMIC, CHIP 1.5 pF, 0.25 pF, 50 V	2203-001385	
C246, C631	C-CERAMIC, CHIP 22 nF, 20 %, 25 V	2203-001405	
C710	C-CERAMIC, CHIP 30 pF, 5 %, 50 V	2203-001412	
C209	C-CERAMIC, CHIP 33 nF, 10 %, 16 V	2203-001416	
C166, C167	C-CERAMIC, CHIP 2.2 uF, +80-20 %	2203-001598	
C168, C169	C-CERAMIC, CHIP 2.2 uF, +80-20 %	2203-001598	
C242, C243	C-CERAMIC, CHIP 330 nF, +80-20 %	2203-001630	
C519, C524	C-CERAMIC, CHIP 330 pF, 10 %, 50 V	2203-002443	
C719	C-CERAMIC, CHIP 1.2 nF, 10 %, 50 V	2203-002687	
C630	C-CERAMIC, CHIP 1.8 pF, 0.25 pF, 50 V	2203-005050	
C409, C414	C-CERAMIC, CHIP 3.3 pF, 0.25 pF, 50 V	2203-005052	
C629, C624	C-CERAMIC, CHIP 3.3 pF, 0.25 pF, 50 V	2203-005052	
C627, C628	C-CERAMIC, CHIP 3.9 pF, 0.25 pF, 50 V	2203-005053	
C415	C-CERAMIC, CHIP 6.8 pF, 0.25 pF, 50 V	2203-005056	
C181, C185	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C186, C214	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C244, C249	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C406, C416	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C503, C507, C513	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C514, C517	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C518, C529	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C532, C157, C156	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C603, C153	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C154, C155	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C605, C408	C-CERAMIC, CHIP 100 nF, +80-20 %	2203-005061	
C250, C401, C634	C-CERAMIC, CHIP 1 uF, +80-20 %	2203-005065	
C407, C504, C515	C-CERAMIC, CHIP 1 uF, +80-20 %	2203-005065	
C170, C171	C-CERAMIC, CHIP 100 nF, 10 %	2203-005148	
C172, C173	C-CERAMIC, CHIP 100 nF, 10 %	2203-005148	

Location No.	Description	SEC Code	Remark
C174	C-CERAMIC, CHIP 100 nF, 10 %	2203-005148	
C509, C708	C-CERAMIC, CHIP 2.2 pF, 0.25 pF, 50 V	2203-005158	
C612	C-CERAMIC, CHIP 4.7 pF, 0.1 pF, 50 V	2203-005395	
C711	C-CERAMIC, CHIP 180 pF, 5 %, 25 V	2203-005503	
C404, C420, C726	C-TA, CHIP 10 uF, 20 %, 10 V	2404-001020	
C241	C-TA, CHIP 33 uF, 20 %, 6.3 V	2404-001032	
C182, C213, C426	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012, -	2404-001064	
C245, C248	C-TA, CHIP 220 uF, 20 %, 6.3 V, LZ, TP, 7125, -	2404-001083	
C775, C183	C-TA, CHIP 33 uF, 20 %, 6.3 V, GP, TP, 3719, -	2404-001100	
C247	C-TA, CHIP 100 uF, 20 %, 16 V, LZ, TP, 7132	2404-001107	
L241	INDUCTOR-SMD 10 uH, 10 %	2703-000001	
L504, L506	INDUCTOR-SMD 1 mH, 20 %	2703-000153	
L242	INDUCTOR-SMD 22 uH, 10 %	2703-000172	
L606	INDUCTOR-SMD 18 nH, 5 %	2703-001028	
L605	INDUCTOR-SMD 180 nH, 5 %	2703-001043	
L604	INDUCTOR-SMD 2.7 uH, 10 %	2703-001047	
L602	INDUCTOR-SMD 8.2 nH, 0.5 nH	2703-001063	
L609	INDUCTOR-SMD 8.8 nH, 2 %	2703-001078	
L501, L507	INDUCTOR-SMD 220 nH, 5 %	2703-001079	
L707	INDUCTOR-SMD 1.2 nH, 0.3 nH	2703-001204	
L705	INDUCTOR-SMD 3.3 nH, 0.3 nH	2703-001258	
L503, L505	INDUCTOR-SMD 680 uH, 20 %	2703-001417	
L709	INDUCTOR-SMD 100 nH, 5 %	2703-001513	
L704	INDUCTOR-SMD 33 nH, 5 %	2703-001543	
L706	INDUCTOR-SMD 47 nH, 5 %	2703-001545	
L607, L608, L610	INDUCTOR-SMD 120 nH, 5 %	2703-001546	
L710, L708	INDUCTOR-SMD 10 nH, 5 %	2703-001547	
L502	INDUCTOR-SMD 82 nH, 5 %	2703-001685	
L711	INDUCTOR-SMD 5.6 nH, 0.3 nH	2703-001748	
X101	CRYSTAL-UNIT 32.768 kHz, 20 ppm	2801-003602	
X401	CRYSTAL-SMD 13 MHz, 10 ppm, 28-ACF	2801-003603	
F501	FILTER-CERAMIC IF, 13.0 MHz	2903-001002	
F701, F702	FILTER-SAW 890-915 MHz	2904-001003	
F703	FILTER-SAW 947.5 MHz, 25 MHz	2904-001042	
U502	FILTER-SAW 83 MHz, 160KHz, -, TP, 10dB, -	2904-001078	
U707	FILTER-DUPLEXER 947 MHz, 902 MHz	2909-001059	
RDS161	SWITCH-REED 200 V, 0.5A, -, -	3409-001002	

Location No.	Description	SEC Code	Remark
J181	CONNECTOR-CARD EDGE 6P, 2.54 mm		
J151	CONNECTOR-SOCKET 18P, 1R, 0.5 mm	3710-001309	
J221	CONNECTOR-SOCKET 80P, 2R, 0.5 mm	3710-001312	
BAT201	BATTERY-POLYMER 3.3 V, 0.065 mAH	4302-001026	
U706	COUPLER-DIRECTION 902.5+-12.5 MHz	4709-001008	
U607	RF-MOLULE 900+-100 MHz, 50 ohm	4709-001063	
J161	DISPLAY LCD- CHINA SGH-500	GH07-00003A	
SEMI-CABLE	CBF SIGNAL- SGH-500, COAXIAL	GH39-20017A	
PCB- MAIN	PCB- MAIN C C, EPOXY	GH41-00008A	
METALDOM	UNIT-KEY ARRAY, YOU07d	GH59-10168A	
SHIELD SPONGE	GASKET-SGH-500, POLYURETHANE	GH63-20056A	
SHIELD SPONGE	GASKET-SGH-500, POLYURETHANE	GH63-20058A	
BACKUP-TAPE	MCT-BACKUP TAPE SGH-600, TAPE	GH74-40518A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-00001A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20057A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20059A	
SHIELD SPONGE	GASKET- SGH-500, POLYURETHANE	GH63-20060A	
-	MIC-CONDENSOR 2 V, 130 uA, 48 dB	3003-001026	
-	RMO-MIC ADAPTOR SPH-5000, RUBBER	GH73-40657A	

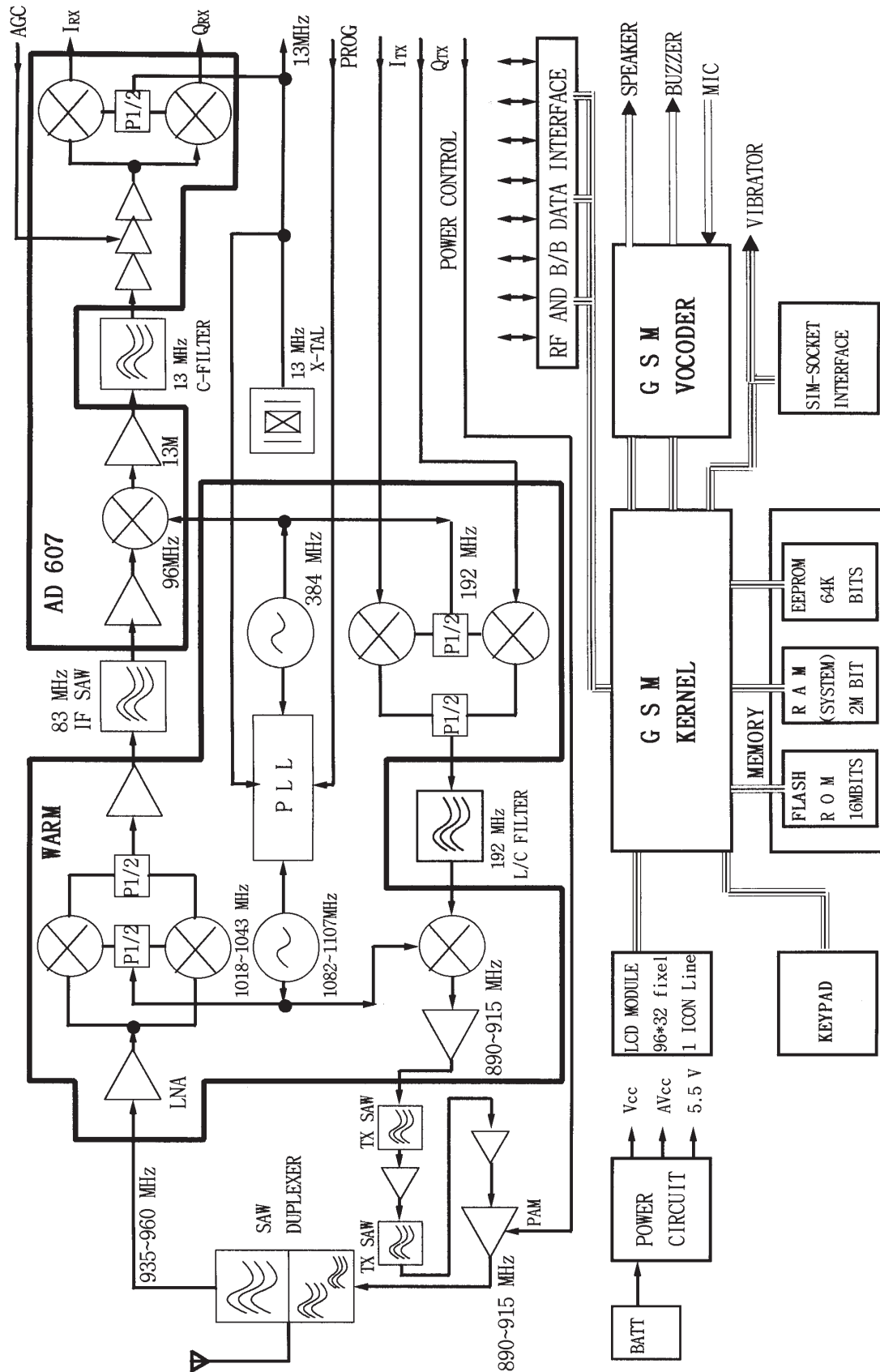
2-3 Memory Parts List

Location No.	Description	SEC Code	Remark
-	PRA AUTO SMD- SGH-500, SEUK	GH94-00854A	
D302	DIODE-TVS SM05, 6V/1 mA, 300, SOT-23	0406-001005	
D101	DIODE-ARRAY DAN202U, 80 V, 100 mA	0407-000115	
Q101	TR-SMALL SIGNAL 2SC4081, NPN, 200 mW	0501-000218	
Q102	TR-SMALL SIGNAL MMBT2222A, NPN	0501-000457	
U303	TR-ARRAY UMD3N, NPN/PNP, 2, 300 mW	0506-001003	
U195	IC-CMOS LOGIC TC7W32FU, OR GATE	0801-002339	
U194	IC-CMOS LOGIC 7S04FU, INVERTER	0801-002345	
U103	IC-EEPROM 24645, 8192x8BIT, SOP	1103-001084	
U192	IC-SRAM 68V2000, 256Kx8BIT	1106-001130	
U191, U193	IC-FLASH MEMORY 29LV800, 1Mx8BIT	1107-001062	
U302	IC-AUDIO AMP 34119, SOP, 8P, 150 MIL	1201-000105	
U102	IC-RESET 809, SOP, 3P, -, PLASTIC	1203-000392	
U202, U203	IC-VOLTAGE REGULATOR 1015, SOT-23A-5	1203-001592	
U101	IC-COMM. CONTROLLER VP40524A2	1205-001327	
U301	IC-CODEC VP40506B4, QFP, 80P	1205-001328	
R144	THERMISTOR-NTC 15 kohm, 5 %	1404-001103	
R113, R114	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R115, R116	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R117, R125	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R126, R306	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R307	R-CHIP 100 ohm, 5 %, 1/16 W	2007-000138	
R304, R305, R315	R-CHIP 1 kohm, 5 %, 1/16 W	2007-000140	
R101, R102	R-CHIP 2.2 kohm, 5 %, 1/16 W	2007-000141	
R103, R104	R-CHIP 2.2 kohm, 5 %, 1/16 W	2007-000141	
R141, R320	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R193	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R301, R308	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R309, R310	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R316	R-CHIP 10 kohm, 5 %, 1/16 W	2007-000148	
R140, R122	R-CHIP 15 kohm, 5 %, 1/16 W	2007-000151	
C132, R143	R-CHIP 15 kohm, 5 %, 1/16 W	2007-000151	
R133	R-CHIP 22 kohm, 5 %, 1/16 W	2007-000153	
R105, R120	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000157	
R121	R-CHIP 47 kohm, 5 %, 1/16 W	2007-000157	
R106, R111	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	

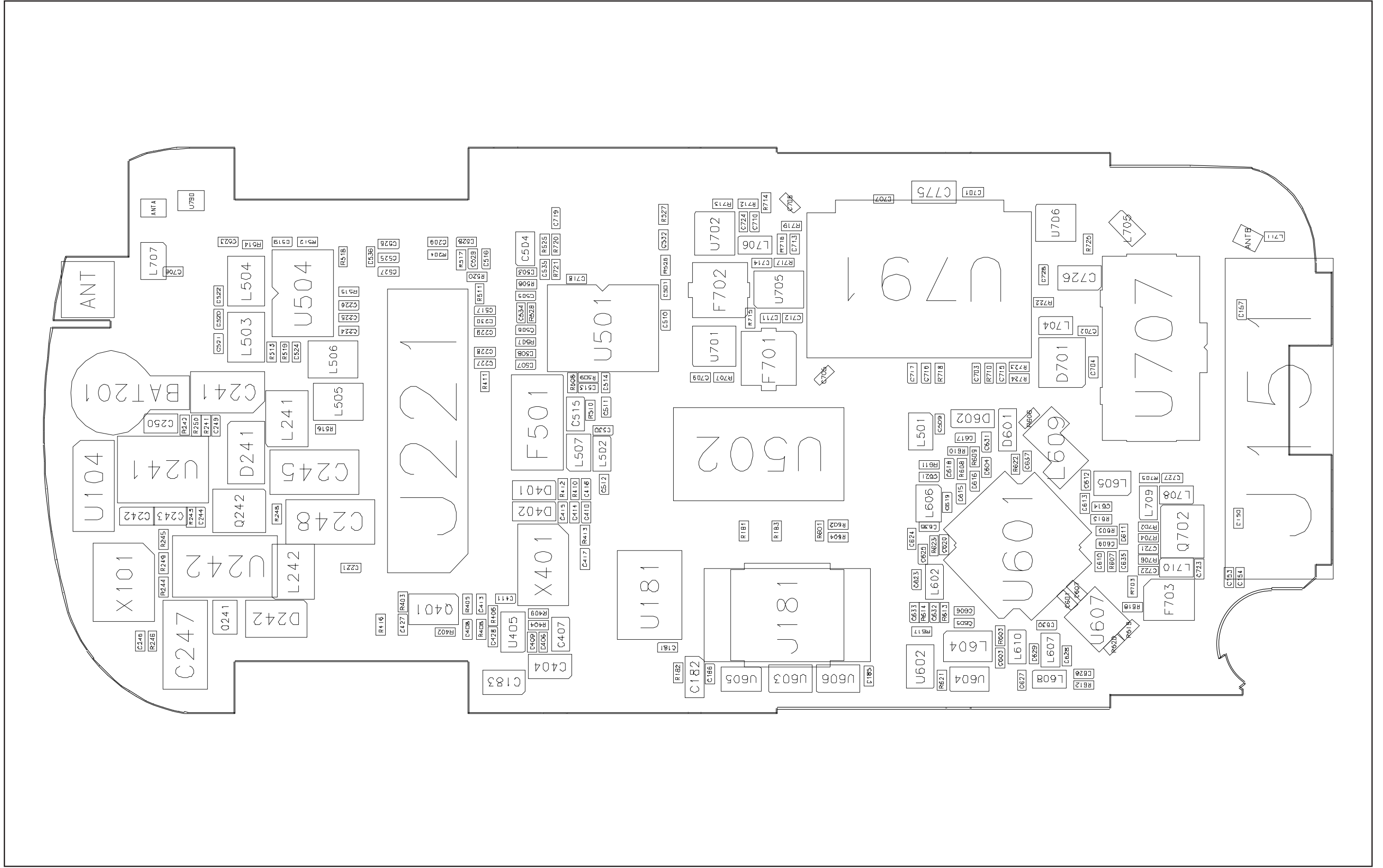
Location No.	Description	SEC Code	Remark
R112, R119	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R130, R131	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R132, R134	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R191, R192, R321	R-CHIP 100 kohm, 5 %, 1/16 W	2007-000162	
R322, R324, R142	R-CHIP 0 ohm, 5 %, 1/16 W	2007-000171	
R311, R314	R-CHIP 10 ohm, 5 %, 1/16 W	2007-000172	
R318, R319	R-CHIP 10 ohm, 5 %, 1/16 W	2007-000172	
R312, R313	R-CHIP 22 ohm, 5 %, 1/16 W	2007-000173	
R208, R210	R-CHIP 1.2 kohm, 1 %, 1/16 W, DA, TP, 1608	2007-000219	
R109	R-CHIP 33 kohm, 1 %, 1/16 W, DA, TP, 1608	2007-000772	
R110	R-CHIP 39 kohm, 1 %, 1/16 W, DA, TP, 1608	2007-000828	
R123, R124	R-CHIP 5.6 kohm, 5 %, 1/16 W	2007-000982	
R205, R207	R-CHIP 330 ohm, 5 %, 1/16 W	2007-001313	
R302, R303	R-CHIP 330 ohm, 5 %, 1/16 W	2007-001313	
R107	R-CHIP 9.1 kohm, 5 %, 1/16 W	2007-007013	
R317	R-CHIP 51 kohm, 5 %, 1/16 W	2007-007014	
R209, R129	R-CHIP 10 kohm, 1 %, 1/16 W	2007-007142	
C109, C115	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C116, C117	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C118, C119	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C120, C121	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C122, C123	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C124, C126	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C127, C128	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C129, C313	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C314	C-CERAMIC, CHIP 100 pF, 5 %, 50 V	2203-000233	
C315, C316	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C326, C194	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C130, C131	C-CERAMIC, CHIP 10 nF, 10 %, 16 V	2203-000254	
C309, C310, C312	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C327	C-CERAMIC, CHIP 1 nF, 10 %, 50 V	2203-000438	
C207, C210, C323	C-CERAMIC, CHIP 470 pF, 10 %, 50 V	2203-000940	
C322, C324, C325	C-CERAMIC, CHIP 220 nF, +80-20 %, 16 V	2203-001402	
C317, C318	C-CERAMIC, CHIP 47 nF, 10 %, 16 V	2203-001432	
C319, C321	C-CERAMIC, CHIP 47 nF, 10 %, 16 V	2203-001432	
C101, C205	C-CERAMIC, CHIP 2.2 uF, +80-20 %, 16 V	2203-001598	
C307, C311	C-CERAMIC, CHIP 150 nF, +80-20 %, 16 V	2203-005015	

Location No.	Description	SEC Code	Remark
C102, C103	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C104, C105	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C108, C112	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C113, C191	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C192, C193	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C201, C202	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C203, C204	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C206, C301	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C302, C303	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C304, C305	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C306	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V	2203-005061	
C114	C-CERAMIC, CHIP 1uF, +80-20 %, 10 V	2203-005065	
C308	C-TA, CHIP 33uF, 20 %, 6.3 V, GP, TP, 3528, -	2404-001032	
C208, C211	C-TA, CHIP 10uF, 20 %, 6.3 V, GP, TP, 2012, -	2404-001064	
J303	BUZZER-MAGNETIC 87DB, 3.6 V, 95 mA	3002-001070	
J102, J302	CONNECTOR-SOCKET 2P, 1R, 1.27 mm	3710-001105	
J101	CONNECTOR-HEADER NOWALL, 80P	3711-003826	
PCB	PCB-B/B B/B, EPOXY, 6L, T0.8, 138*11	GH41-10633A	

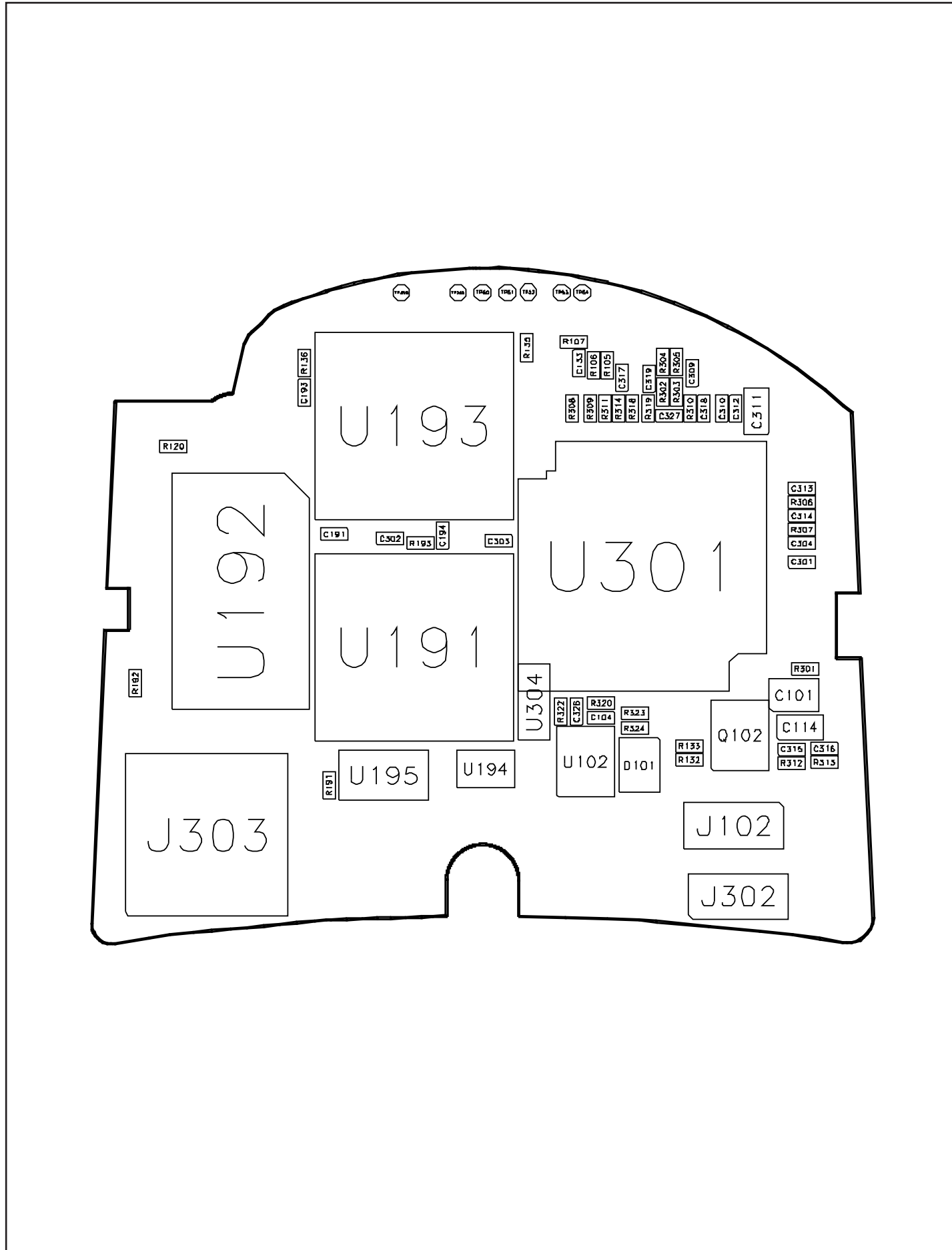
3. Block Diagrams



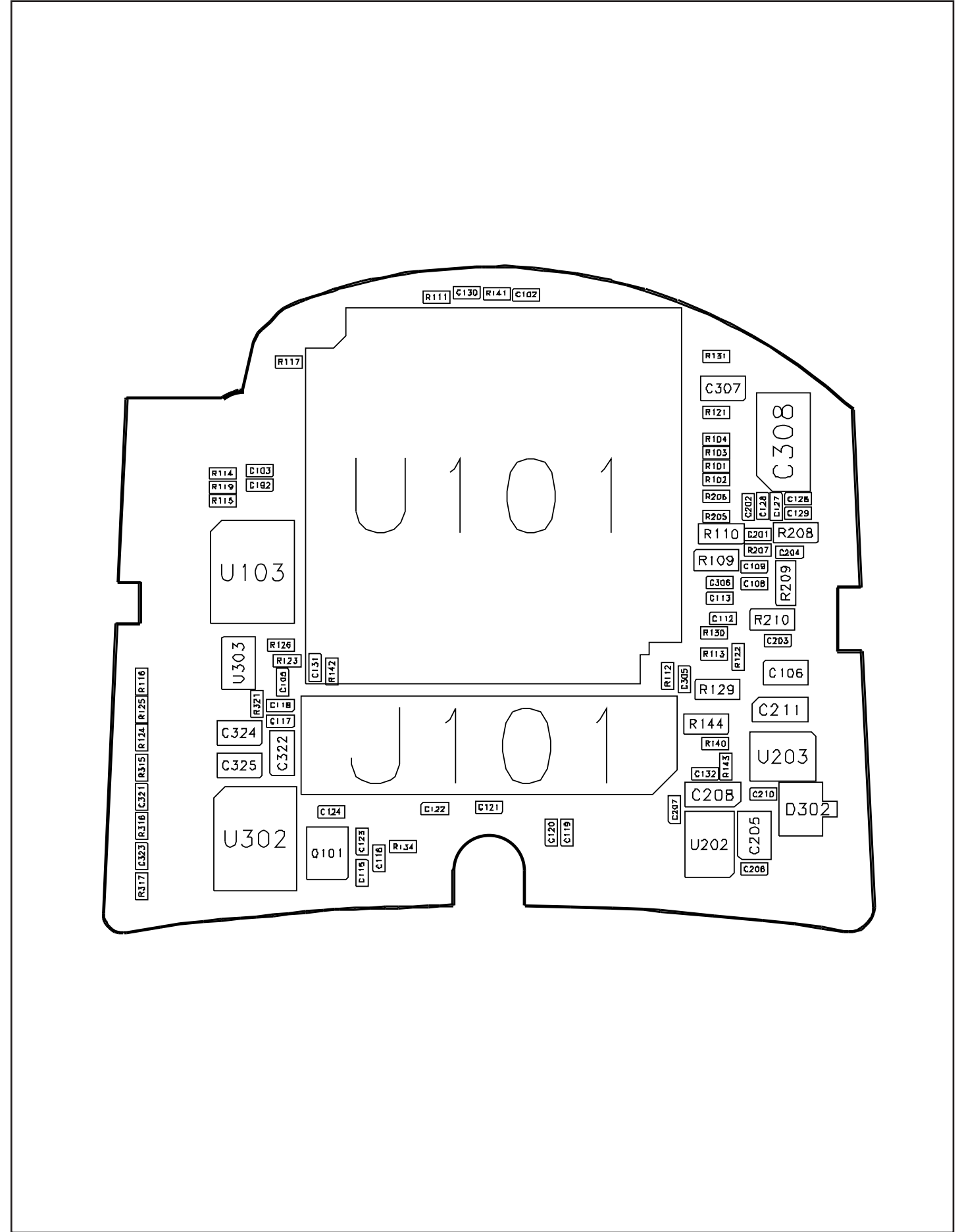
4-3 Main PCB Bottom Diagram



4-4 Memory PCB Top Diagram

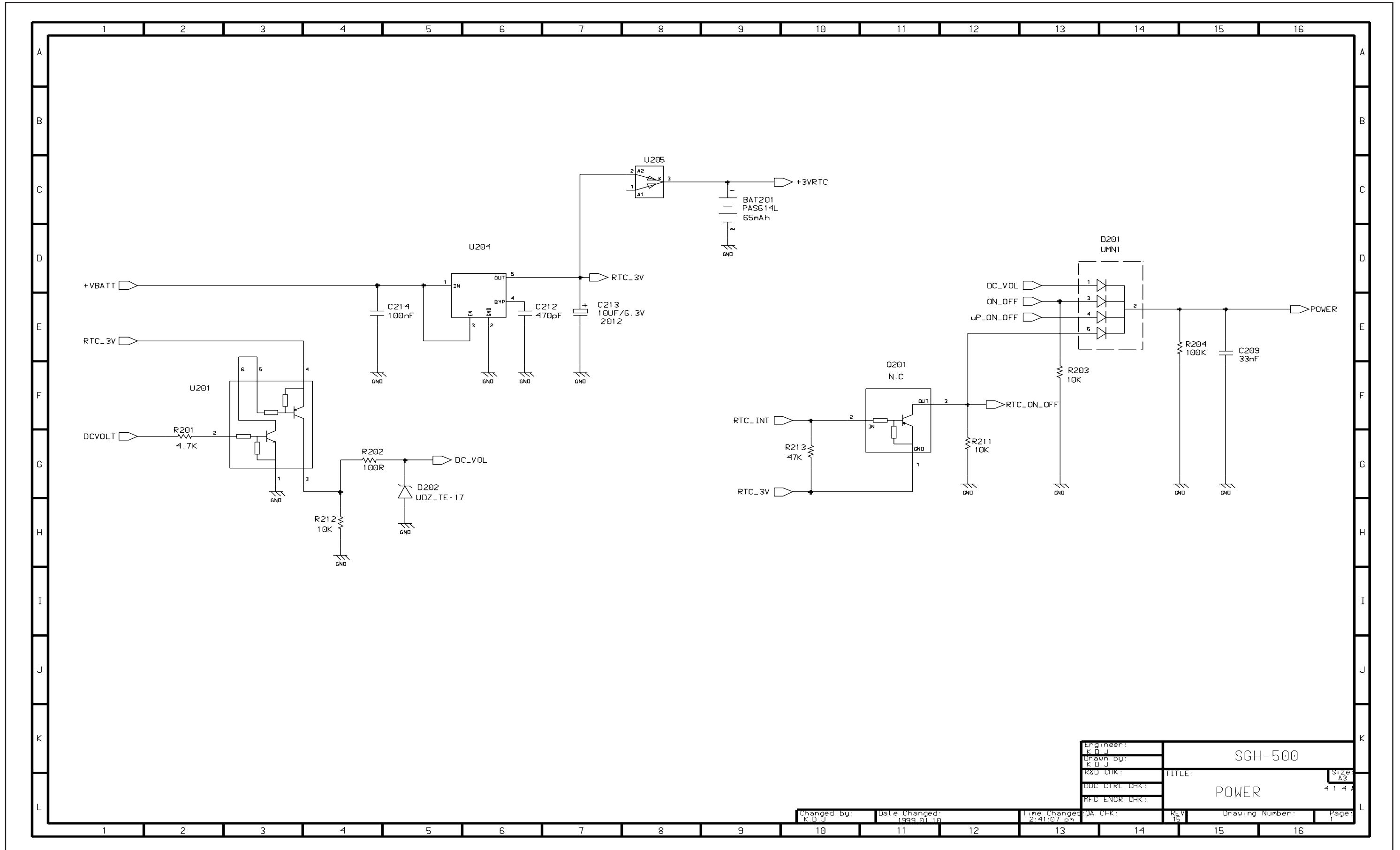


4-5 Memory PCB Bottom Diagram



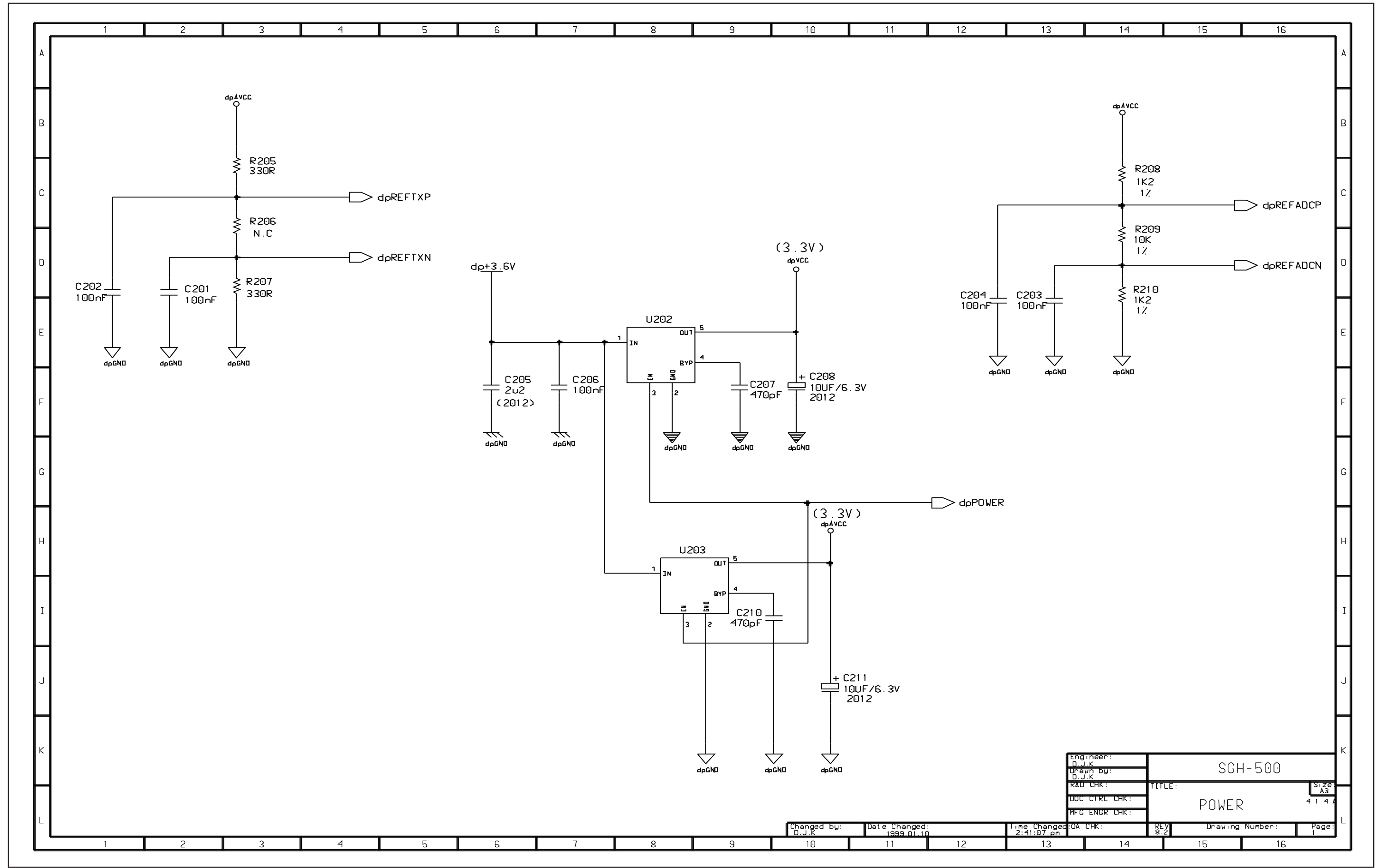
5. Schematic Diagrams

5-1 Main Power



Engineer:	K.D.J.	SGH-500	Size A3
Drawn by:	K.D.J.		
R&D CHK:		TITLE:	4.1.4.4
DDC CTRL CHK:		POWER	
MFG ENGR CHK:		REV:	15
Changed by:	Date Changed:	Time Changed:	Page:
K.D.J.	1999.01.10	2:41:07 pm	1
QA CHK:		Drawing Number:	

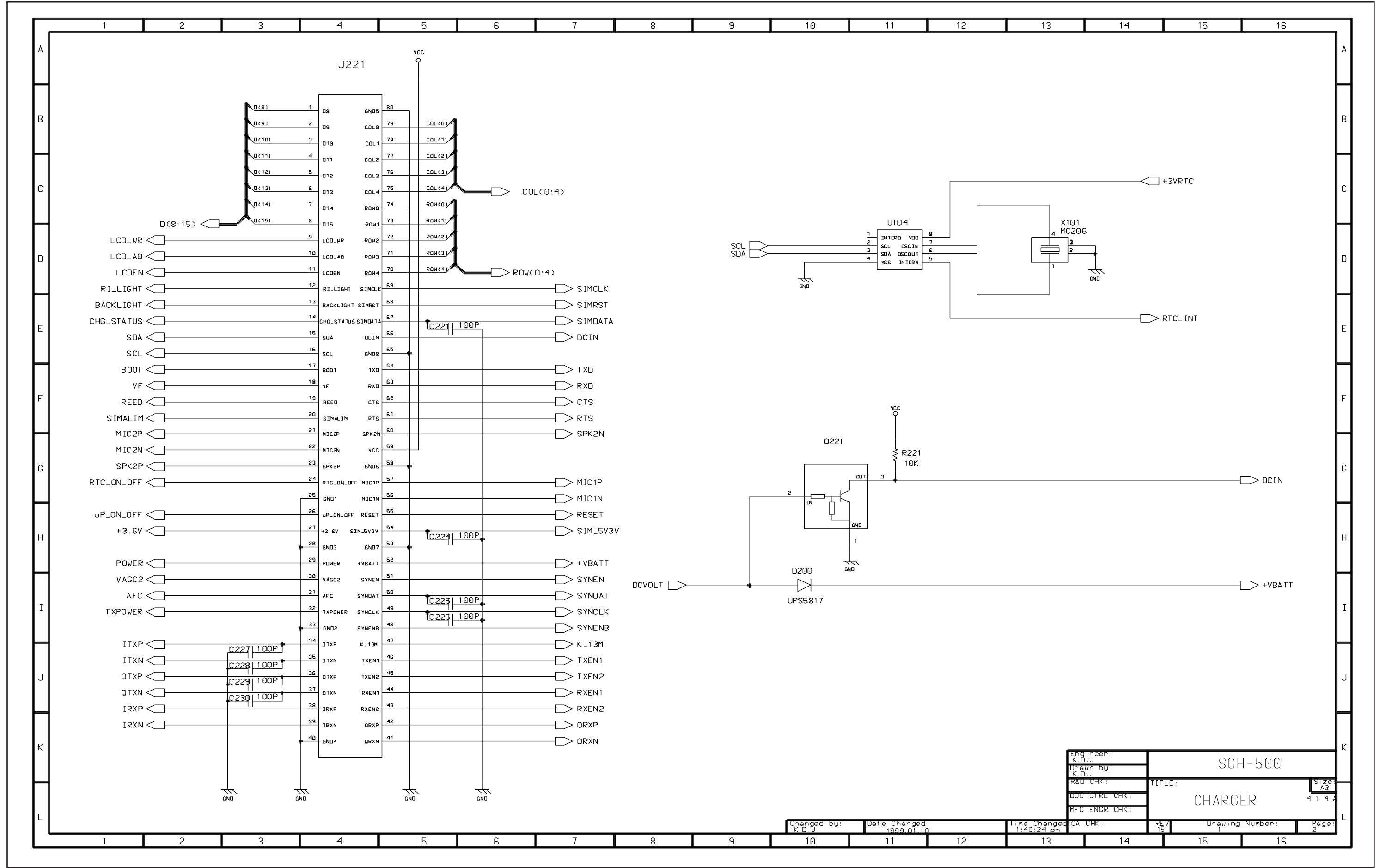
5-2 Memory Power



Engineer: D.J.K	SGH-500	Size: A3 4147
Drawn by: D.J.K		
R&D CHK:		
DOC CTRL CHK:		
MFG ENGR CHK:	TITLE: POWER	Page: 1

Changed by: D.J.K	Date Changed: 1999.01.10	Time Changed: 2:41:07 pm	QA CHK:	REV: 8.2	Drawing Number:	Page:
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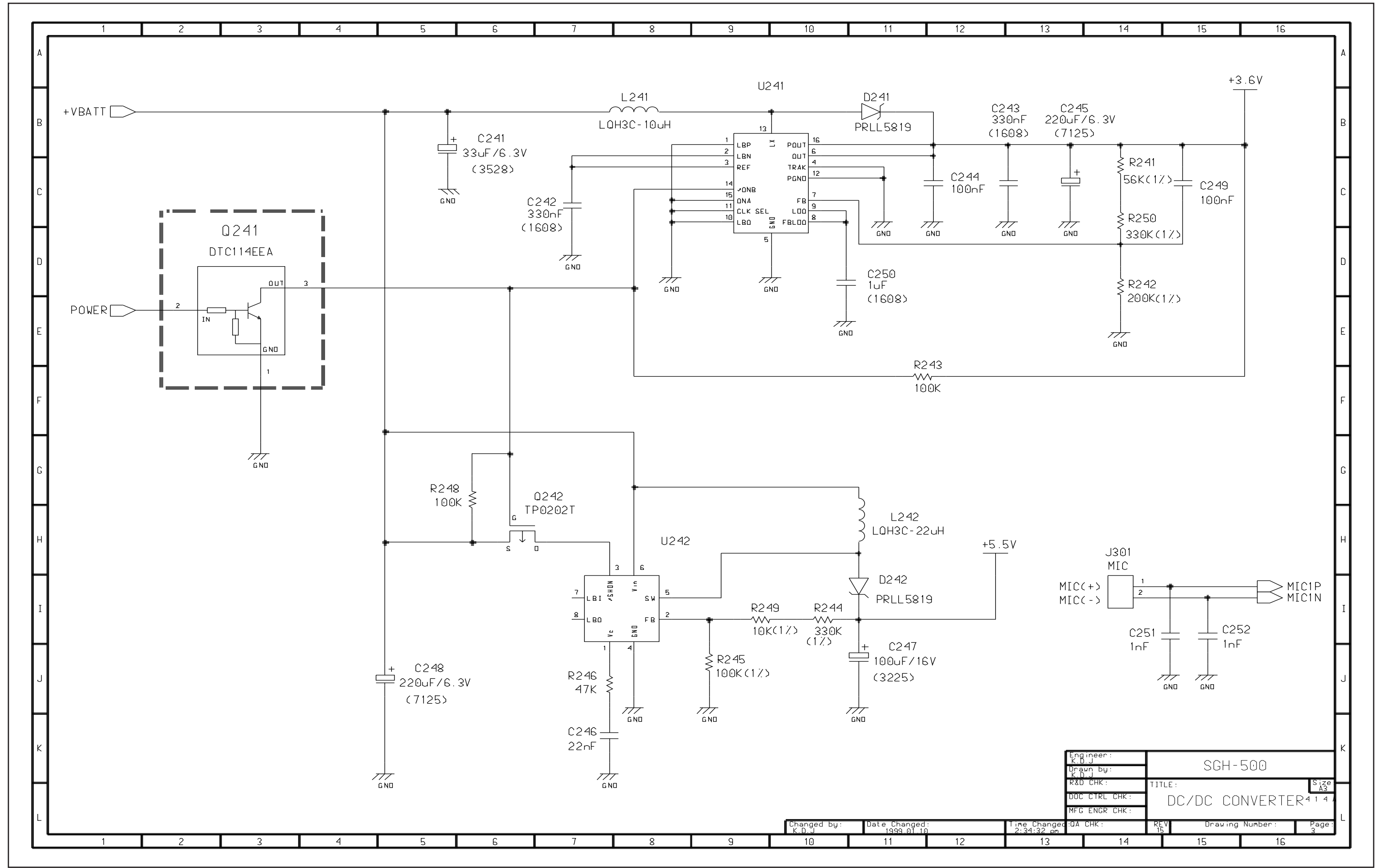
5-3 Charger



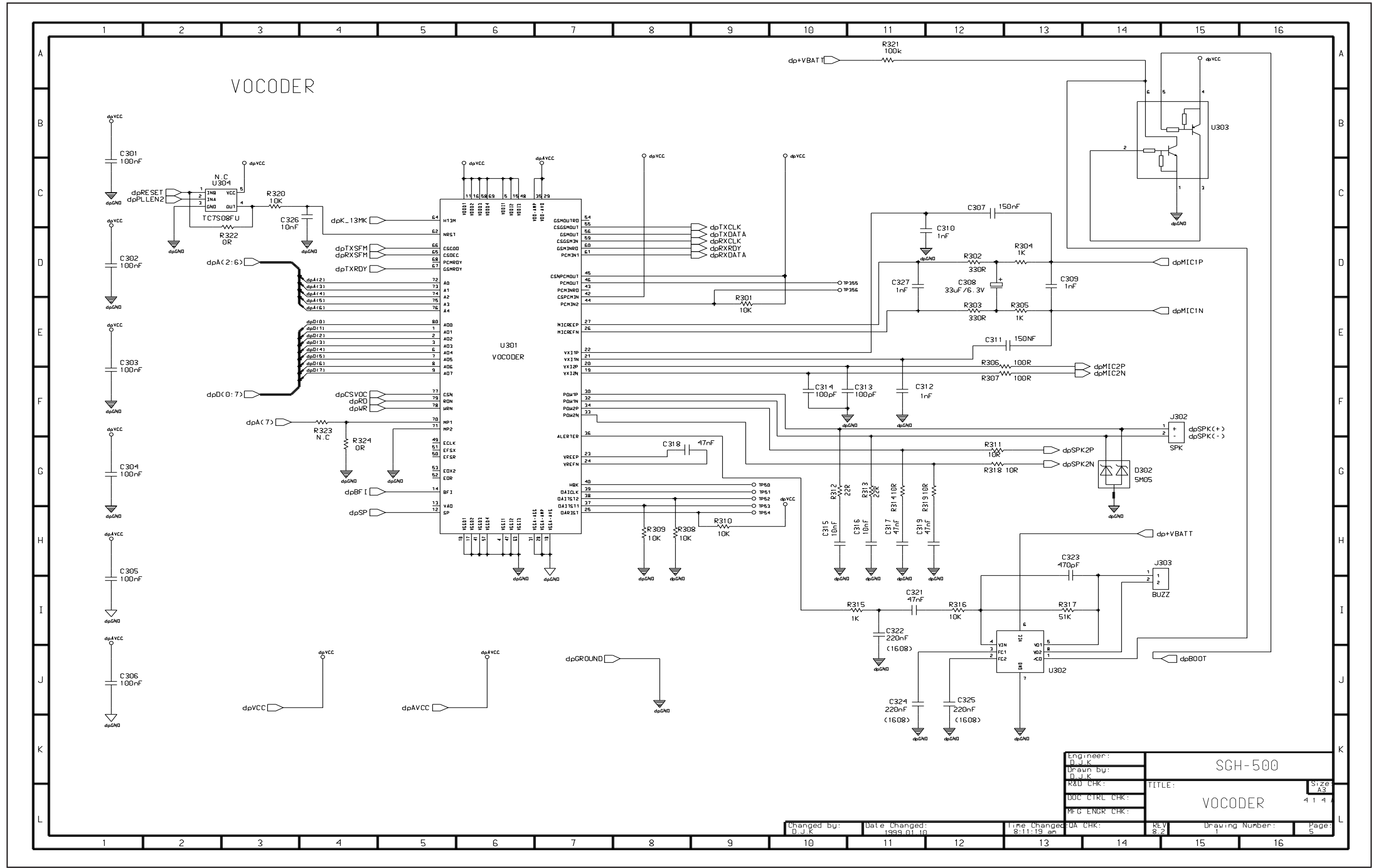
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Drawn by: K.D.J	
R&D CHK:	
DOC CTRL CHK:	
MFG ENGR CHK:	

Changed by: K.D.J	Date Changed: 1999.01.10	Time Changed: 1:40:24 pm	REV 15	Drawing Number: 1	Page: 2
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5-4 DC/DC Converter

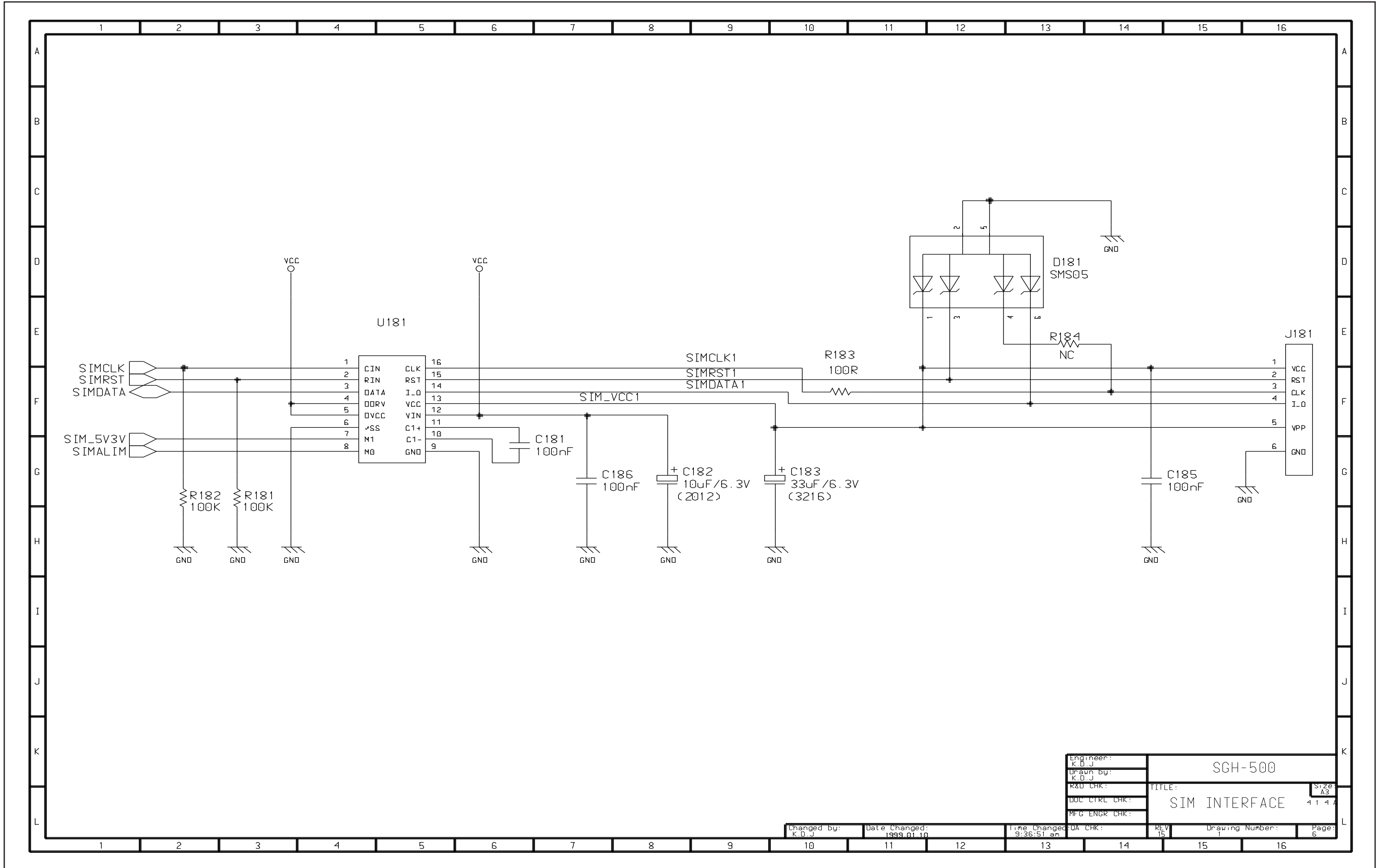


5-6 Vocoder



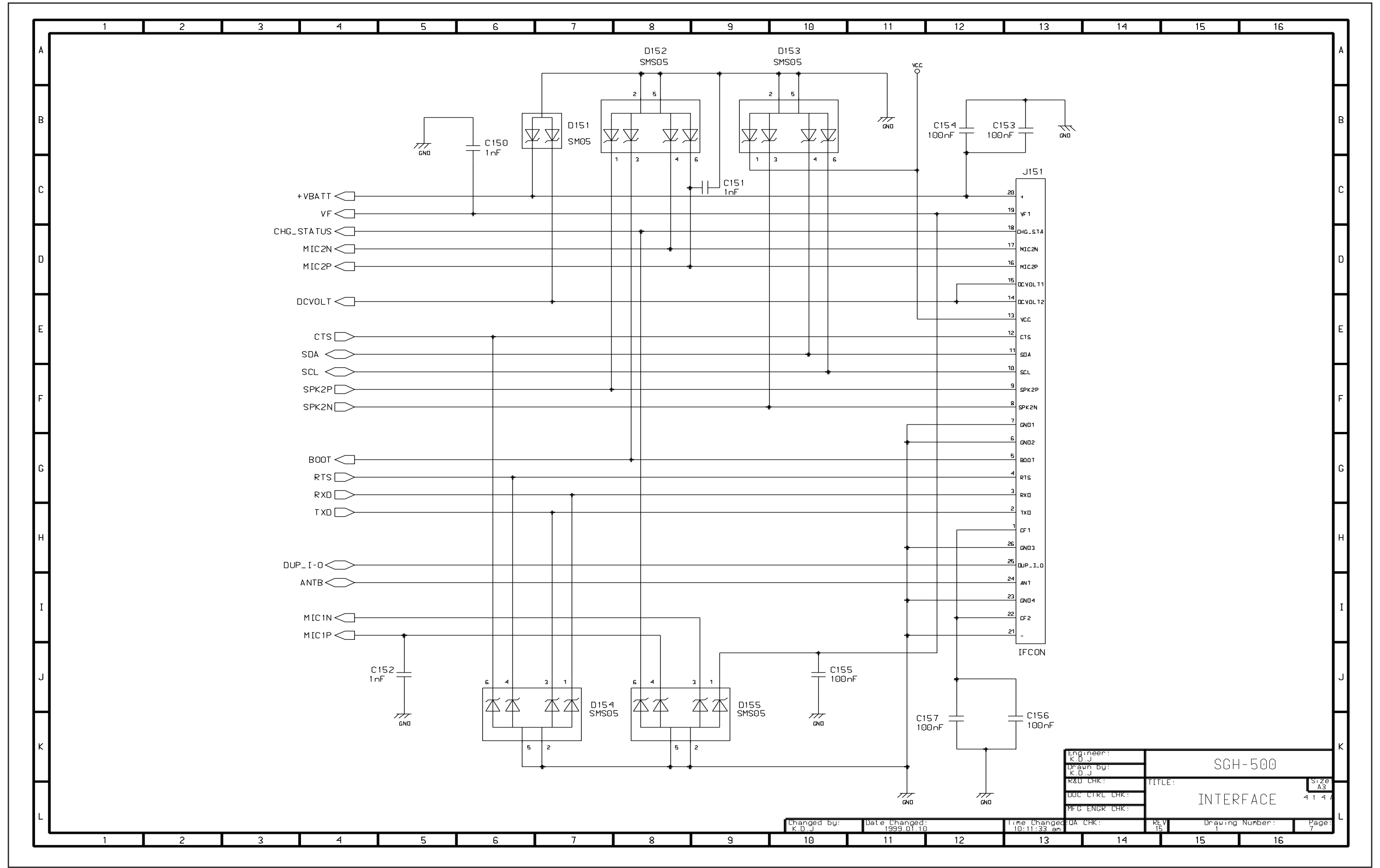
Engineer:	D.J.K.	SGH-500	Size A3
Drawn by:	D.J.K.		
R&D CHK:		TITLE:	VOCODER
DOC CTRL CHK:		REV:	8.2
MFG ENGR CHK:		Drawing Number:	1
Changed by:	D.J.K.	Date Changed:	1999.01.10
		Time Changed:	8:11:19 am
		FOA CHK:	
		Page:	5

5-7 SIM Interface



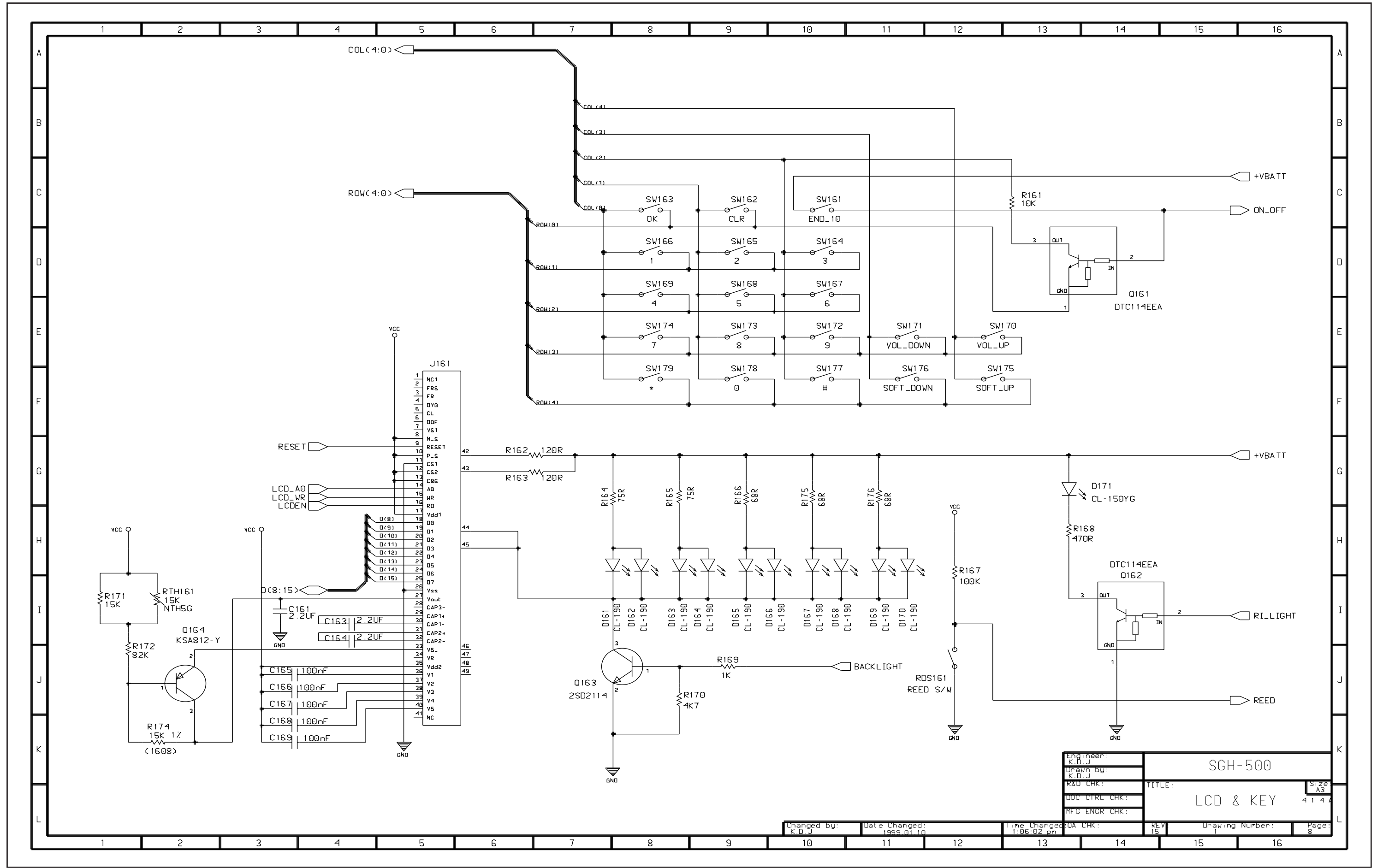
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Drawn by: K.D.J		4 1 4 A
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DOC CTRL CHK:		
MFG ENGR CHK:		
Changed by: K.D.J	Date Changed: 1999.01.10	Time Changed: 9:36:51 am
REV 15	Drawing Number: 1	Page: 6

5-8 Interface



Engineer:	K.D.J		SGH-500	Size A3
Drawn by:	K.D.J			
R&D CHK:			TITLE:	41 4 4
DOC CTRL CHK:			INTERFACE	
MFG ENGR CHK:			REV	Page:
QA CHK:			15	7
Changed by:	Date Changed:	Time Changed:	Drawing Number:	
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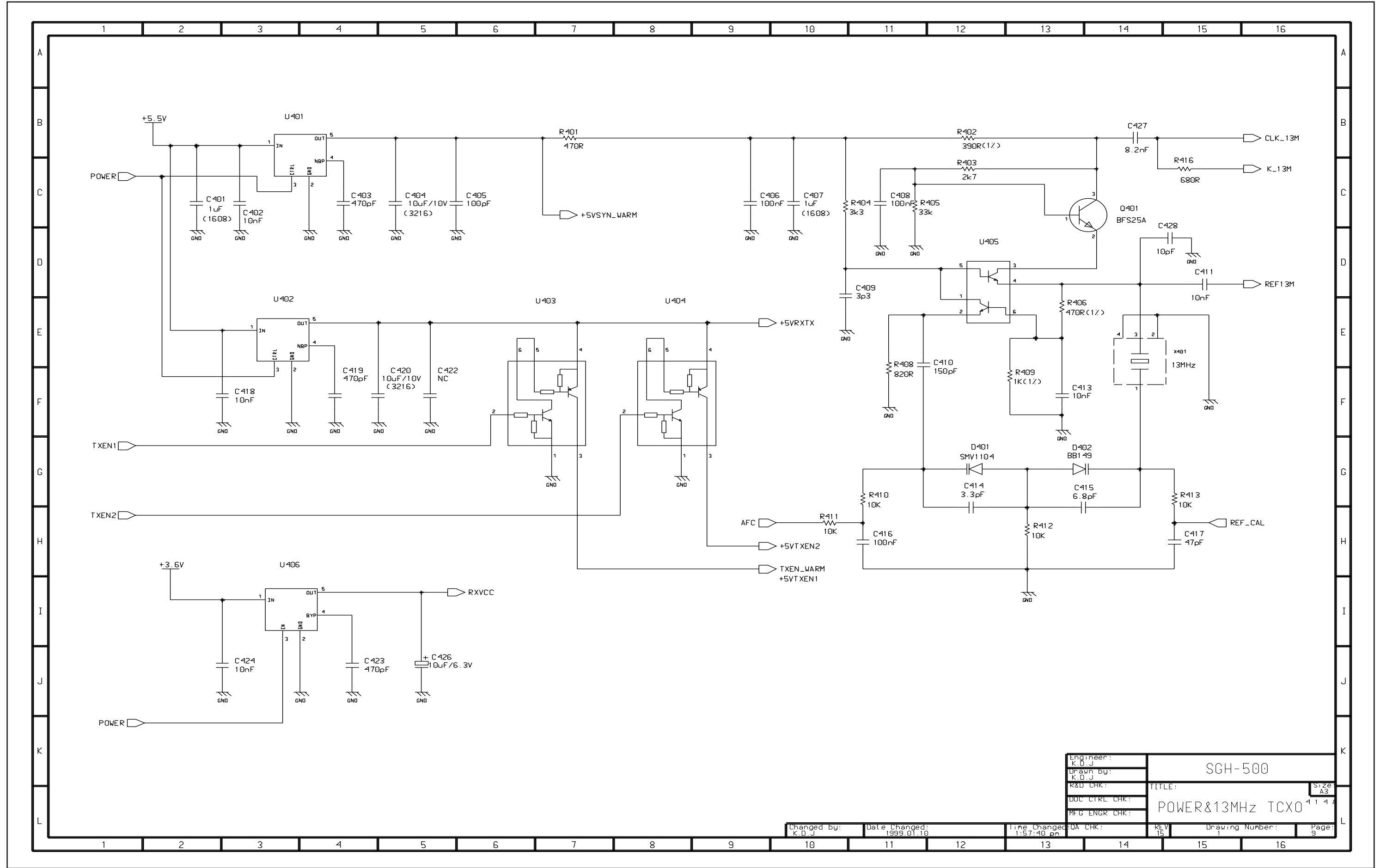
5-10 LCD & Key (Europe)



Engineer:	K.D.J.	SGH-500 LCD & KEY Size A3 4147
Drawn by:	K.D.J.	
R&D CHK:		
DOC CTRL CHK:		
MFG ENGR CHK:		

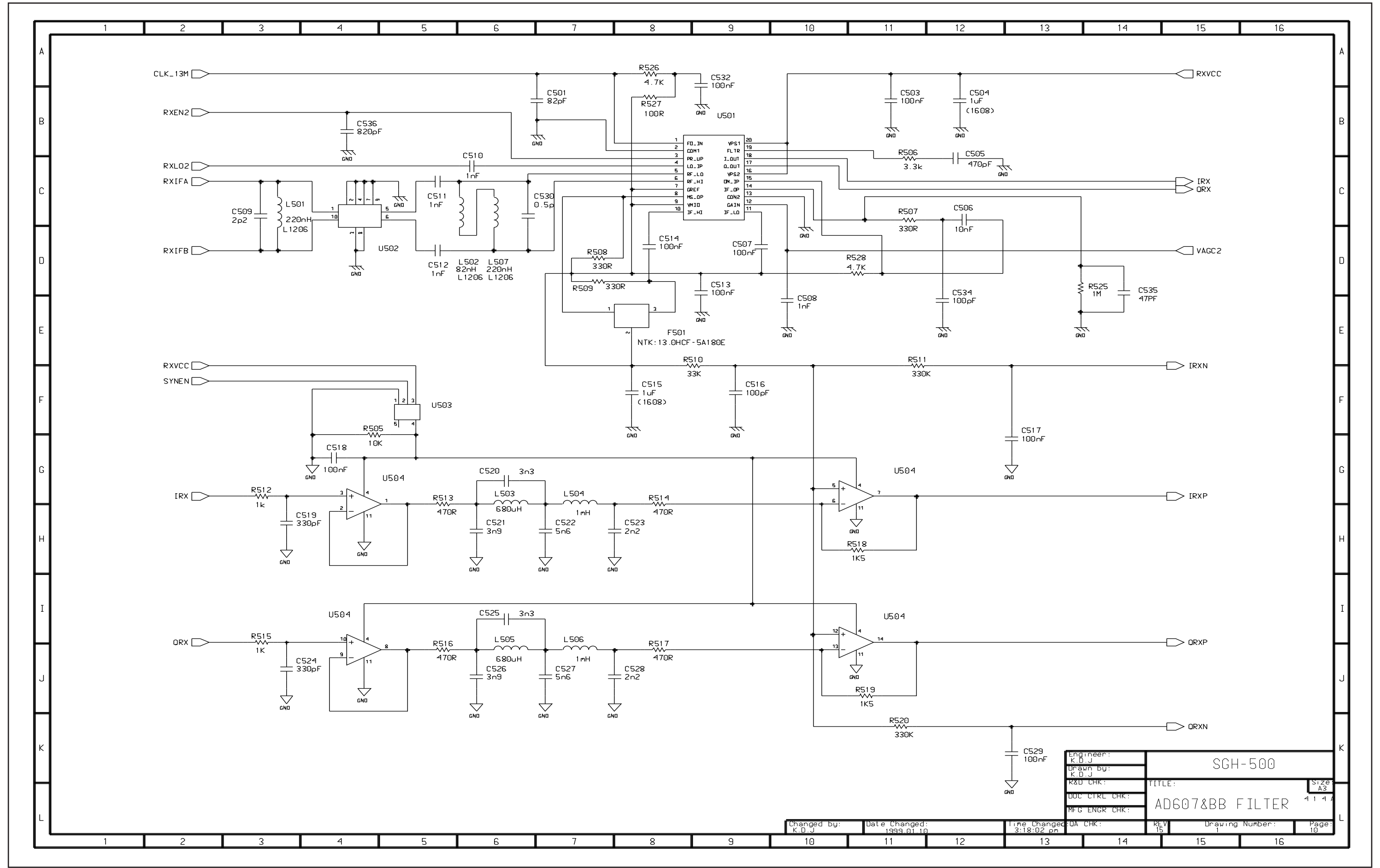
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5-11 Power & 13 MHz TCXO

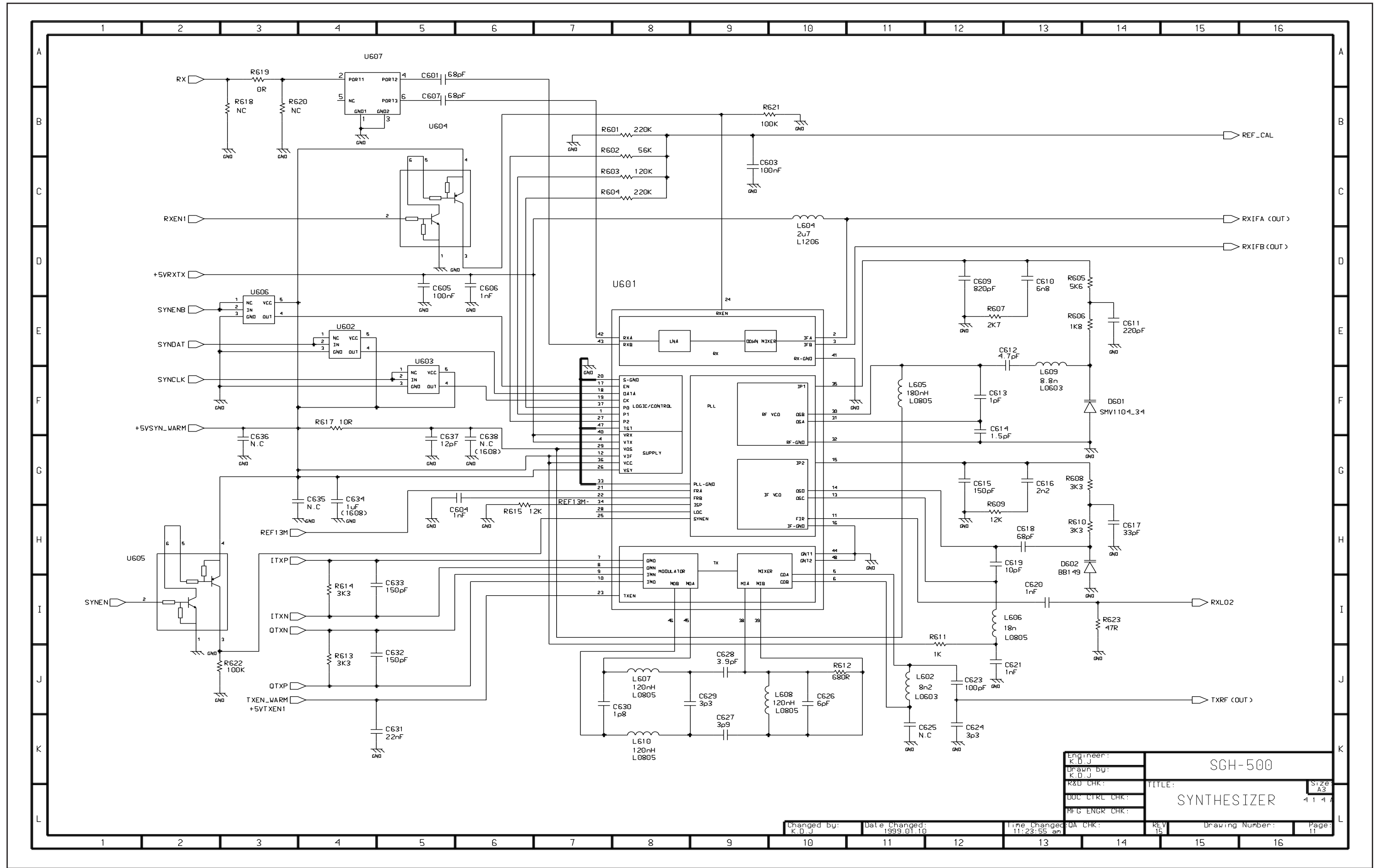


Engineer:	K.D.J	TITLE: SGH-500 POWER&13MHz TCXO Size: A3 4144										
Drawn by:	K.D.J											
R&D CHK:												
DOC CTRL CHK:												
MFG ENGR CHK:												
Changed by:	K.D.J	Date Changed:	1999.01.10	Time Changed:	1:57:40 pm	FOA CHK:	REV	15	Drawing Number:	1	Page:	9

5-12 AD607 & BB Filter



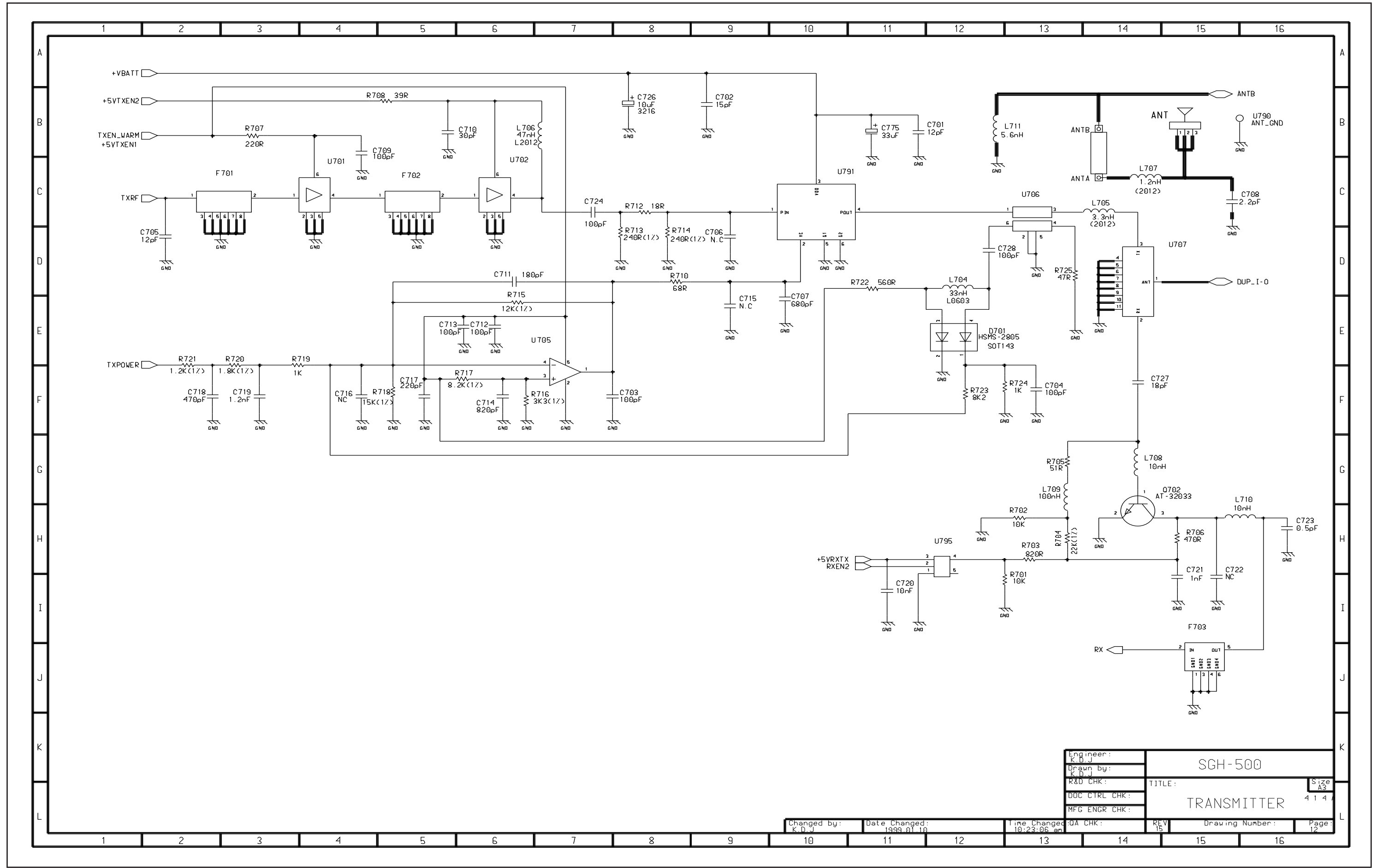
5-13 Synthesizer



Engineer:	K.D.J.	SGH-500	Size A3
Drawn by:	K.D.J.		
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DOC CTRL CHK:		SYNTHESIZER	
MEG ENGR CHK:			

Changed by:	Date Changed:	Time Changed:	DA CHK:	REV:	Drawing Number:	Page:
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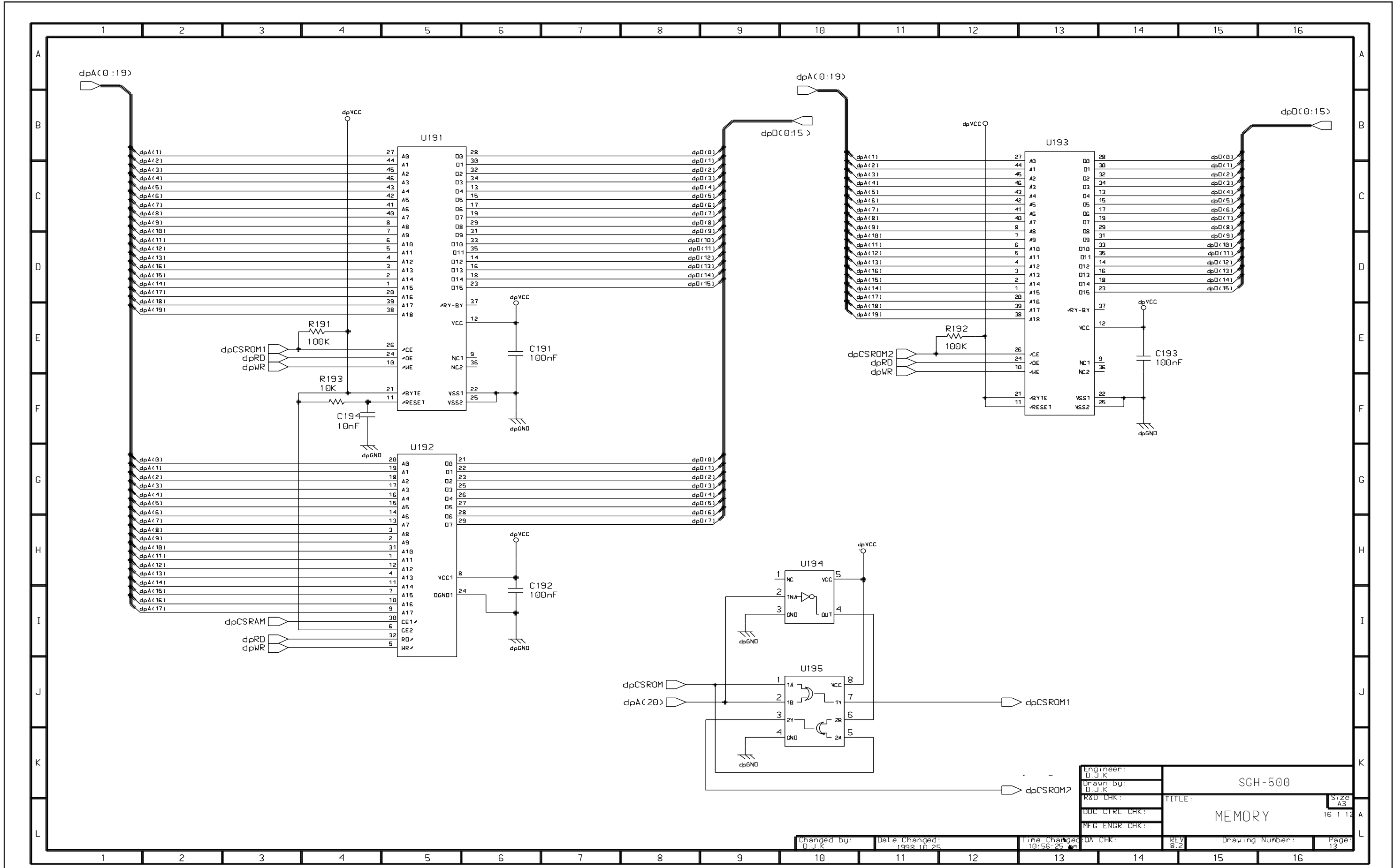
5-14 Transmitter



Engineer:	K.D.J	
Drawn by:	K.D.J	
R&D CHK:		
DOC CTRL CHK:		
MFG ENGR CHK:		
SGH-500		
TITLE:		
TRANSMITTER		
Size:	A3	
4 1 4		

Changed by:	Date Changed:	Time Changed:	QA CHK:	REV:	Drawing Number:	Page:
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5-15 Memory



Engineer: D.J.K.	SGH-500	Size: A3
Drawn by: D.J.K.		TITLE: MEMORY
R&D CHK:		16 1 12 A
DOC CTRL CHK:		
MFG ENGR CHK:		

Changed by: D.J.K.	Date Changed: 1998.10.25	Time Changed: 10:55:25 AM	REV 8.2	Drawing Number:	Page: 13
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ELECTRONICS