



Service Manual

B2150



Model : B2150



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1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it.

The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

1. INTRODUCTION

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated  by the sign. Following information is ESD handling:

- U Service personnel should ground themselves by using a wrist strap when exchange system boards.
- U When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- U Use a suitable, grounded soldering iron.
- U Keep sensitive parts in these protective packages until these are used.
- U When returning system boards or parts like EEPROM to the factory, use the protective package as described.

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current - Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop
PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex

1. INTRODUCTION

TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion, 780mAh Battery Size : 104.5 (W) 44(H) 15.8(T) [mm] Battery Weight : 20kg	
Stand by Current	Under the minimum current consumption environmenth (such as paging period 9), the level of standby current is below 4mA.	
Talk time	Up to 2 hours (GSM TX Level 5)	
Stand by time	Up to 200 hours (Paging Period: 9, RSSI: -85 dBm)	
Charging time	Approx. Under 3.75 hours	
RX Sensitivity	GSM, EGSM: -104dBm, DCS: -104dBm	
TX output power	GSM, EGSM : 33dBm(Level 5), DCS, PCS : 30dBm(Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small Only	
Display	Main LCD : CSTN 128 128 pixel 65K Color	
Status Indicator	Hard icons. Key Pad 0 ~ 9, #, *, Menu Key, Clear Key, Camera Key Send Key, END/PWR Key Soft Key(Left/Right)	
ANT	Internal	
EAR Phone Jack	Yes (Mono)	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax		
Vibrator	Yes	
Loud Speaker	No	
Voice Recoding	Yes	
Microphone	Yes	
Speaker/Receiver	One way dual speaker	
Travel Adapter	Yes	
MIDI	40 Poly (Mono SPK)	
MP3/AAC	No	
Options Data	Cable	

2. PERFORMANCE

2.2 Technical Specification

Item	Description	Specification					
1	Frequency Band	EGSM TX: 890 + (n-1024) 0.2 MHz RX: 935 + (n-1024) 0.2 MHz (n=975~1024) DCS TX: 1710 + (n-512) 0.2 MHz RX: 1805 + (n-512) 0.2 MHz (n=512~885) PCS TX: 1810 + (n-512) 0.2 MHz RX: 1905 + (n-512) 0.2 MHz (n=512~885)					
2	Phase Error	RMS < 5 degrees Peak < 20 degrees					
3	Frequency Error	< 0.1 ppm					
4	Power Level	GSM, EGSM					
		Level	Power	Toler.	Level	Power	Toler.
		5	33dBm	±2dB	13	17dBm	±3dB
		6	31dBm	±3dB	14	15dBm	±3dB
		7	29dBm	±3dB	15	13dBm	±3dB
		8	27dBm	±3dB	16	11dBm	±5dB
		9	25dBm	±3dB	17	9dBm	±5dB
		10	23dBm	±3dB	18	7dBm	±5dB
		11	21dBm	±3dB	19	5dBm	±5dB
		12	19dBm	±3dB			
		DCS, PCS					
		Level	Power	Toler.	Level	Power	Toler.
		0	30dBm	±2dB	8	14dBm	±3dB
		1	28dBm	±3dB	9	12dBm	±4dB
		2	26dBm	±3dB	10	10dBm	±4dB
		3	24dBm	±3dB	11	8dBm	±4dB
		4	22dBm	±3dB	12	6dBm	±4dB
		5	20dBm	±3dB	13	4dBm	±4dB
		6	18dBm	±3dB	14	2dBm	±5dB
		7	16dBm	±3dB	15	0dBm	±5dB

2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	GSM, EGSM	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-63
		3,000~ <6,000	-65
		6,000	-71
		GSM, EGSM	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-65
		3,000~ <6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	GSM, EGSM	
		Offset from Carrier (kHz).	Max. dBc
		400	-19
		600	-21
		1,200	-21
		1,800	-24
		GSM, EGSM	
		Offset from Carrier (kHz).	Max. dBc
		400	-19
		600	-21

2. PERFORMANCE

Item	Description	Specification		
		DCS,PCS		
		Offset from Carrier (kHz).		Max. dBc
		1,200		-24
		1,800		-27
7	Spurious Emissions	Conduction, Emission Status		
8	Bit Error Ratio	GSM, EGSM BER (Class II) < 2.439% @-102 dBm DCS, PCS BER (Class II) < 2.439% @-100 dBm		
9	RX Level Report Accuracy	Conduction, Emission Status		
10	SLR	8±3 dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
	4,000	0	-	
12	RLR	2±3 dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	2	-
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		

2. PERFORMANCE

Item	Description	Specification	
14	STMR	13±5 dB	
15	Stability Margin	> 6 dB	
16	Distortion	dB to ARL (dB)	Level Ratio (dB)
		-35	17.5
		-30	22.5
		-20	30.7
		-10	33.3
		0	33.7
		7	31.7
		10	25.5
		3,400	4 -9
		4,000	0 -
17	Side Tone Distortion	Three stage distortion < 10%	
18	System frequency (13 MHz) tolerance	2.5 ppm	
19	32.768KHz tolerance	30 ppm	
20	Ringer Volume	At least 65 dBspl under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
21	Charge Current	Fast Charge : < 430 mA Slow Charge : < 160 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-95 dBm ~ -91 dBm
		3	30.7
		2	33.3
		1	33.7
		0	31.7
		10	25.5
23	Battery Indicator	Battery Bar Number	Voltage
		0	3.50 ~ 3.59 V
		1	3.60 ~ 3.69 V
		2	3.70 ~ 3.75V

2. PERFORMANCE

Item	Description	Specification	
23	Battery Indicator	Battery Bar Number	Voltage
		3	3.76 ~ 3.89 V
		4	3.90 V ~
24	Low Voltage Warning	3.59 0.03V (Call)	
		3.50 0.03V (Standby)	
25	Forced shut down Voltage	3.35 0.03V	
26	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 780mAh	
27	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60 Hz Output: 5.2 V, 800 mA	

3. TECHNICAL BRIEF

3.1 Transceiver (SI4205-BM, U500)

The RF parts consist of a transmitter part, a receiver part, a frequency synthesizer part, a voltage supply part, The Aero I transceiver is the integrated RF front end for multi-band GSM/GPRS digital cellular and a VCTCXO part.

handsets and wireless data modems. The integrated solution eliminates the IF SAW filter, external low noise amplifier (LNAs) for three bands, transmit and RF voltage controlled oscillator (VCO modules, and other discrete components found in conventional designs.

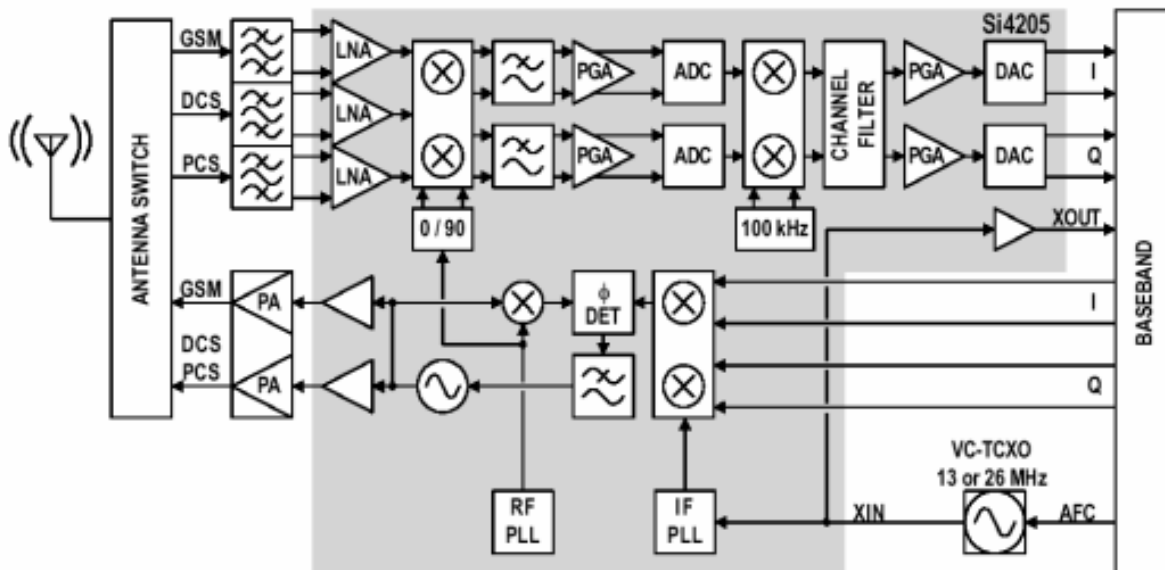


Figure. 3-1 RECEIVER FUNCTIONAL BLOCK DIAGRAM

3. TECHNICAL BRIEF

(1) Receiver Part

The Aero I transceiver uses a low-IF receiver architecture which allows for the on chip integration of the channel selection filters, eliminating the external RF image reject filters and the IF SAW filter required in conventional super-heterodyne architectures.

A. RF front end

RF front end consists of Front End Module(FL500) and Tri band LNAs integrated in transceiver (U500).

The Received RF signals(GSM 925MHz ~ 960MHz, DCS 1805MHz ~ 1880MHz PCS 1905MHz ~ 1980MHz) are fed into the antenna or Mobile switch.

The Front End Module(FL500) is used to control the Rx and Tx paths. And, the input signals VC1, VC2, VC3 of a FL500 are directly connected to baseband controller to switch either Tx or Rx path on.

The logic and current is given below Table 3-1.

	VC3	VC2	VC1
GSM Tx	0 V	0V	2.5 ~ 3.0 V
DCS, PCS Tx	0V	2.5 ~ 3.0 V	0V
GSM / DCS Rx	0 V	0 V	0 V
GSM / DCS Rx	2.5 ~ 3.0 V	0 V	0 V

Table 3-1 THE LOGIC AND CURRENT

Three differential-input LNAs are integrated in SI4205. The GSM input supports the GSM 850 (864-894 MHz) or E-GSM 900 (925-960MHz) bands. The DCS input supports the DCS 1800 (1805-1880 MHz) band. The PCS input supports the PCS 1900 (1930-1990 MHz) band.

The LNA inputs are matched to the 150 Ω balanced output SAW filters through external LC matching networks. The LNA gain is controlled with the LNAG[1:0] and LNAC[1:0] bits in register 05h (Figure 3-2).

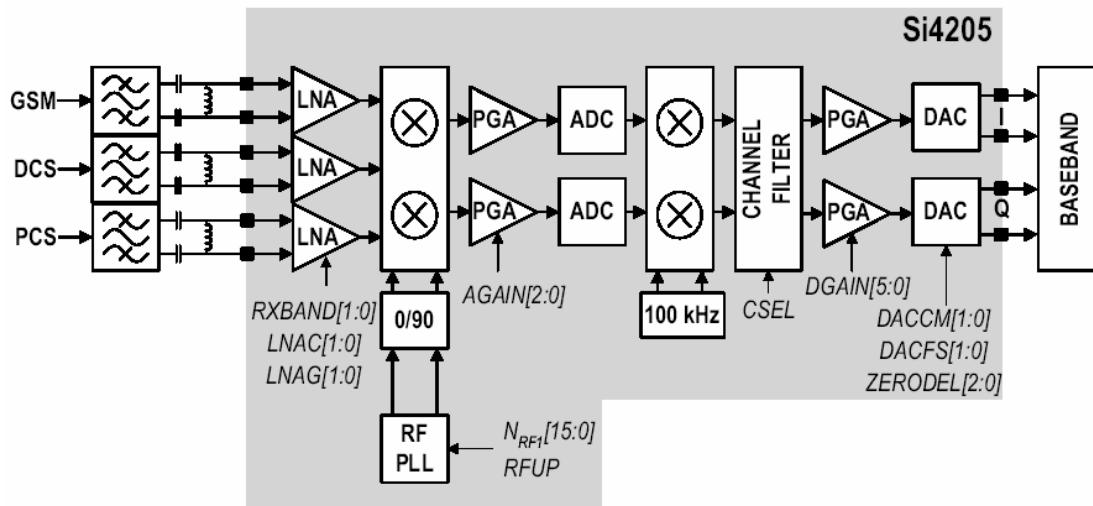


Figure. 3-2 SI4205 RECEIVER PARTIAGRAM

B. Intermediate frequency (IF) and Demodulation

A quadrature image-reject mixer downconverts the RF signal to a 100KHz intermediate frequency (IF) with the RFLO from the frequency synthesizer. The RFLO frequency is between 1737.8 to 1989.9 MHz, and is internally divided by 2 for GSM 850 and E-GSM 900 modes. The mixer output is amplified with an analog programmable gain amplifier (PGA), which is controlled with the AGAIN[2:0] bits in register 05h (Figure3-2). The quadrature IF signal is digitized with high resolution A/D converters(ADCs).

The ADC output is downconverted to baseband with a digital 100KHz quadrature LO signal. Digital decimation and IIR filters perform channel selection to remove blocking and reference interference signals. The selectivity setting (CSEL=0) or a low selectivity setting (CSEL=1). The low selectivity filter has a flatter group channelization filter is in the baseband chip. After channel selection, the digital output is scaled with a digital PGA, which is controlled with the DGAIN [5:0] bits in register 05h.

The amplified digital output signal go through with DACs that drive a differential analog signal onto the RXIP,RXIN,RXQP and RXQN pins to interface to standard analog ADC input baseband ICs. No special processing is required in the baseband for offset compensation or extended dynamic range.

Compared to a direct-conversion architecture, the low-IF architecture has a much greater degree of immunity to dc offsets that can arise from RF local oscillator(RFLO) self-mixing, 2nd order distortion of blockers, and device 1/f noise.

3. TECHNICAL BRIEF

(2) Transmitter Part

The transmit (Tx) section consists of an I/Q baseband upconverter, and offset phase-locked loop (OPLL) and two output buffers that can drive external power amplifiers (PA), one for the GSM 850 (824-849 MHz) and E-GSM 900 (880-915 MHz) bands and one for the DCS 1800 (1710-1785 MHz) and PCS 1900 (1850-1910MHz) bands.

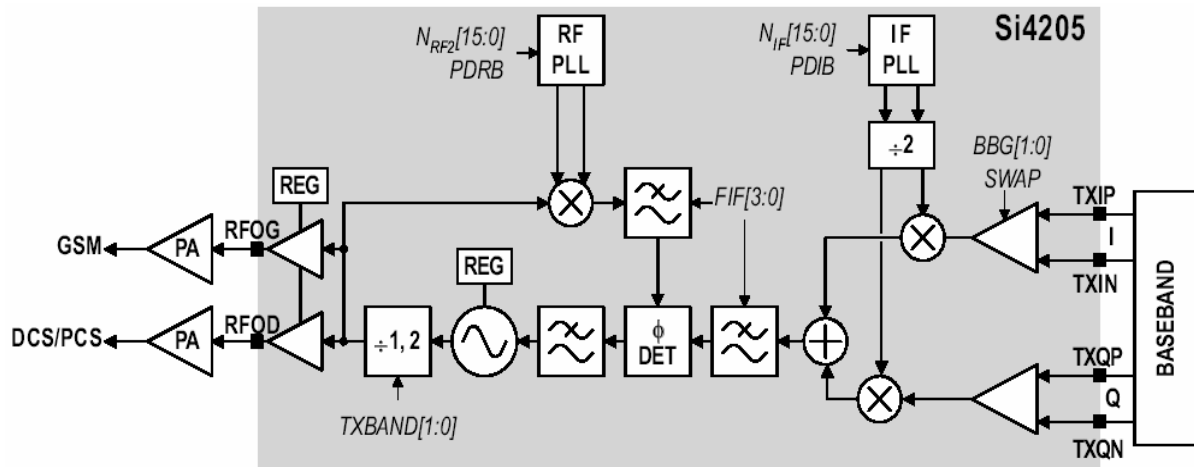


Figure. 3-3 SI4205 TRANSMITTER PART

A. IF Modulator

The baseband converter(BBC) within the GSM chipset generates I and Q baseband signals for the Transmit vector modulator. The modulator provides more than 40dBc of carrier and unwanted sideband rejection and produces a GMSK modulated signal.

The baseband software is able to cancel out differential DC offsets in the I/Q baseband signals caused by imperfections in the D/A converters.

The Tx-Modulator implements a quadrature modulator. A quadrature mixer upconverts the differential in-phase (TXIP, TXIN) and quadrature (TXQP, TXQN) signals with the IFLO to generate a SSB IF signal that is filtered and used as the reference input to the OPLL.

The IFLO frequency is generated between 766 and 896 MHz and internally divided by 2 to generate the quadrature LO signals for the quadrature modulator, resulting in an IF between 383 and 448 MHz. For the E-GSM 900 band, two different IFLO frequencies are required for spur management. Therefore, the IF PLL must be programmed per channel in the E-GSM 900 band.

B. OPLL

The OPLL consists of a feedback mixer, a phase detector, a loop filter, and a fully integrated TXVCO. The TXVCO is centered between the DCS 1800 and PCS 1900 bands, and its output is divided by 2 for the GSM 850 and E-GSM 900 bands. The RFLO frequency is generated between 1272 and 1483 MHz. To allow a single VCO to be used for the RFLO, high-side injection is used for the GSM 850 and E-GSM 900 bands, and low-side injection is used for the DCS 1800 and PCS 1900 bands. The I and Q signals are automatically swapped when switching bands. Additionally, the SWAP bit in register 03h can be used to manually exchange the I and Q signals.

Low-pass filters before the OPLL phase detector reduce the harmonic content of the quadrature modulator and feedback mixer outputs. The cutoff frequency of the filters is programmable with the FIF[3:0] bits in register 04h (Figure 3-3), and should be set to the recommended settings detailed in the register description.

3. TECHNICAL BRIEF

(3) Frequency Synthesizer

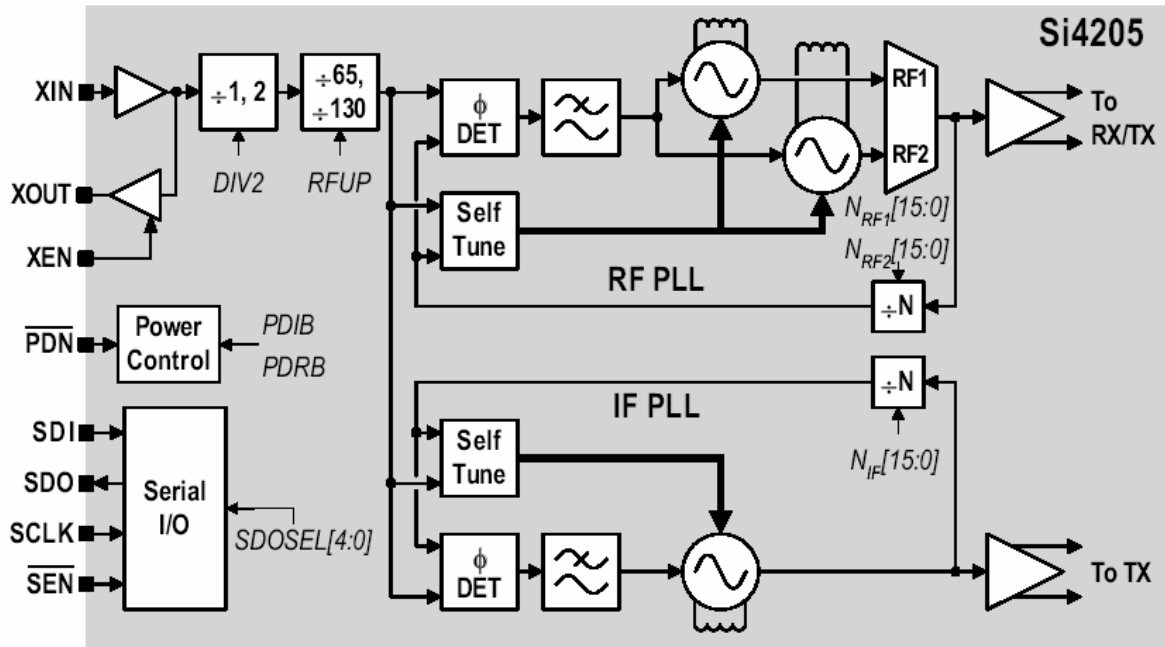


Figure. 3-4 SI4205 FREQUENCY SYNTHESIZER PART

The Aero I transceiver integrates two complete PLLs including VCOs, varactors, resonators, loop filters, reference and VCO dividers, and phase detectors. The RF PLL uses two multiplexed VCOs. The RF1 VCO is used for receive mode, and the RF2 VCO is used for transmit mode. The IF PLL is used only during transmit mode. All VCO tuning inductors are also integrated. The IF and RF output frequencies are set by programming the N-Divider registers, NRF1, NRF2 and NIF. Programming the N-Divider register for either RF1 or RF2 automatically selects the proper VCO. The output frequency of each PLL is as follows:

$$f_{out} = N \times f_o$$

The DIV2 bit in register 31h controls a programmable divider at the XIN pin to allow either a 13 or 26 MHz reference frequency. For receive mode, the RF1 PLL phase detector update rate (f) should be programmed $f = 100$ kHz for DCS 1800 or PCS 1900 bands, and $f = 200$ kHz for GSM 850 and E-GSM900 bands. For transmit mode, the RF2 and IF PLL phase detector update rates are always $f = 200$ kHz.

3.2 Power Amplifier Module (RF3166, U501)

The RF3166 is a high-power, high-efficiency power amplifier module with integrated power control that provides over 50dB of control range. The device is a self-contained 6mmx6mm module with 50 input and output terminals.

The device is designed for use as the final RF amplifier in GSM850, EGSM900, DCS and PCS handheld digital cellular equipment and other applications in the 824MHz to 849MHz, 880MHz to 915MHz, 1710MHz to 1785MHz and 1850MHz to 1910MHz bands. The RF3166 incorporates RFMD's latest VBATT tracking circuit, which monitors battery voltage and prevents the power control loop from reaching saturation. The VBATT tracking circuit eliminates the need to monitor battery voltage, thereby minimizing switching transients. The RF3166 requires no external routing or external components, simplifying layout and reducing board space.

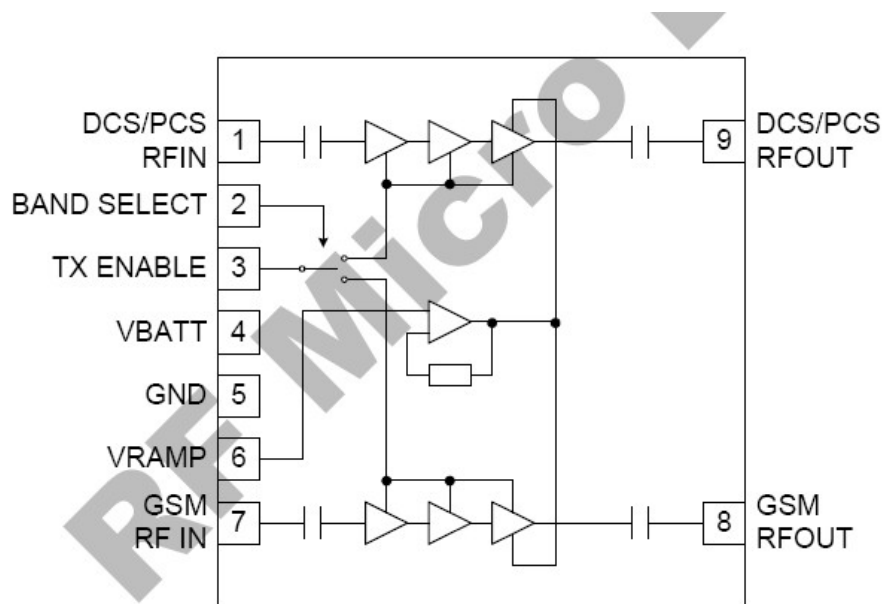


Figure. 3-5 Functional Block Diagram

3. TECHNICAL BRIEF

3.3 13 MHz Clock (VCTCXO, X500)

The 13 MHz clock(X500) consists of a TCXO(Temperature Compensated Crystal Oscillator) which oscillates at a frequency of 13 MHz. It is used within the Si4205, analog base band chipset (U101, AD6537BABC), digital base band chipset (U100, AD6527B). MIDI Chip (U203, ML287HB), Camera Chip (U601, CL761s)

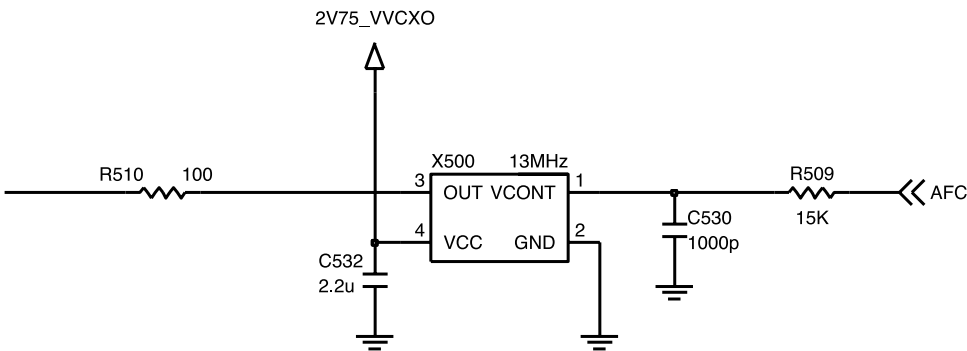


Figure 3-6 VCTCXO CIRCUIT DIAGRAM

3.4 Power Supplies for RF Circuits (RF LDO, U502)

Two regulators are used for RF circuits. One is MIC5255 (U502), and the other is one port of AD6537 (U101). MIC5255 (U502) supplies power to transceiver (SI4205, U500). One port of AD6537 supplies power to VCTCXO (X500). Main power (VBAT) from battery is used for PAM (RF3166, U501) because PAM requires high power.

Supplier	Voltage	Powers	enabled signal
U502(VRF)	2.85 V	U500	CLKON
U101(VVCXO)	2.75 V	X500	
Battery(VBAT)	3.4 ~ 4.2 V	U501	

Table 3-2 RF POWER SUPPLIERS

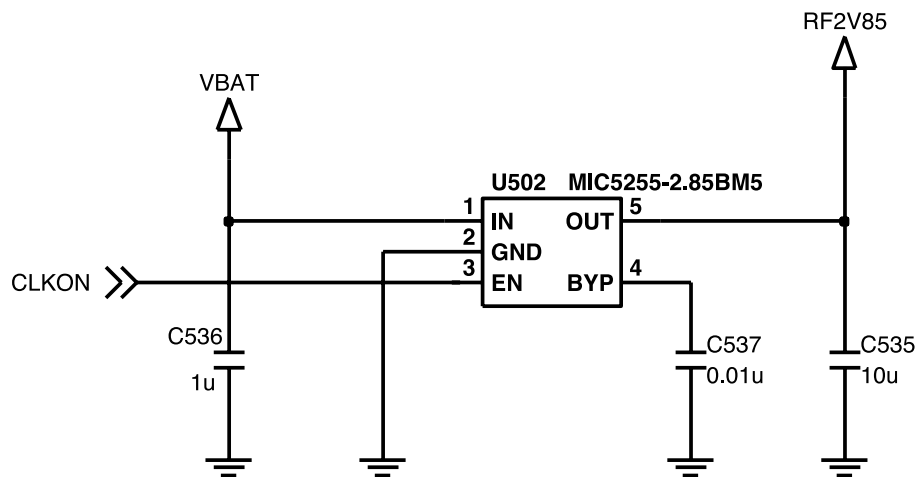


Figure 3-7 RF LDO CIRCUIT DIAGRAM

3. TECHNICAL BRIEF

3.5 Digital Main Processor (AD6527B, U100)

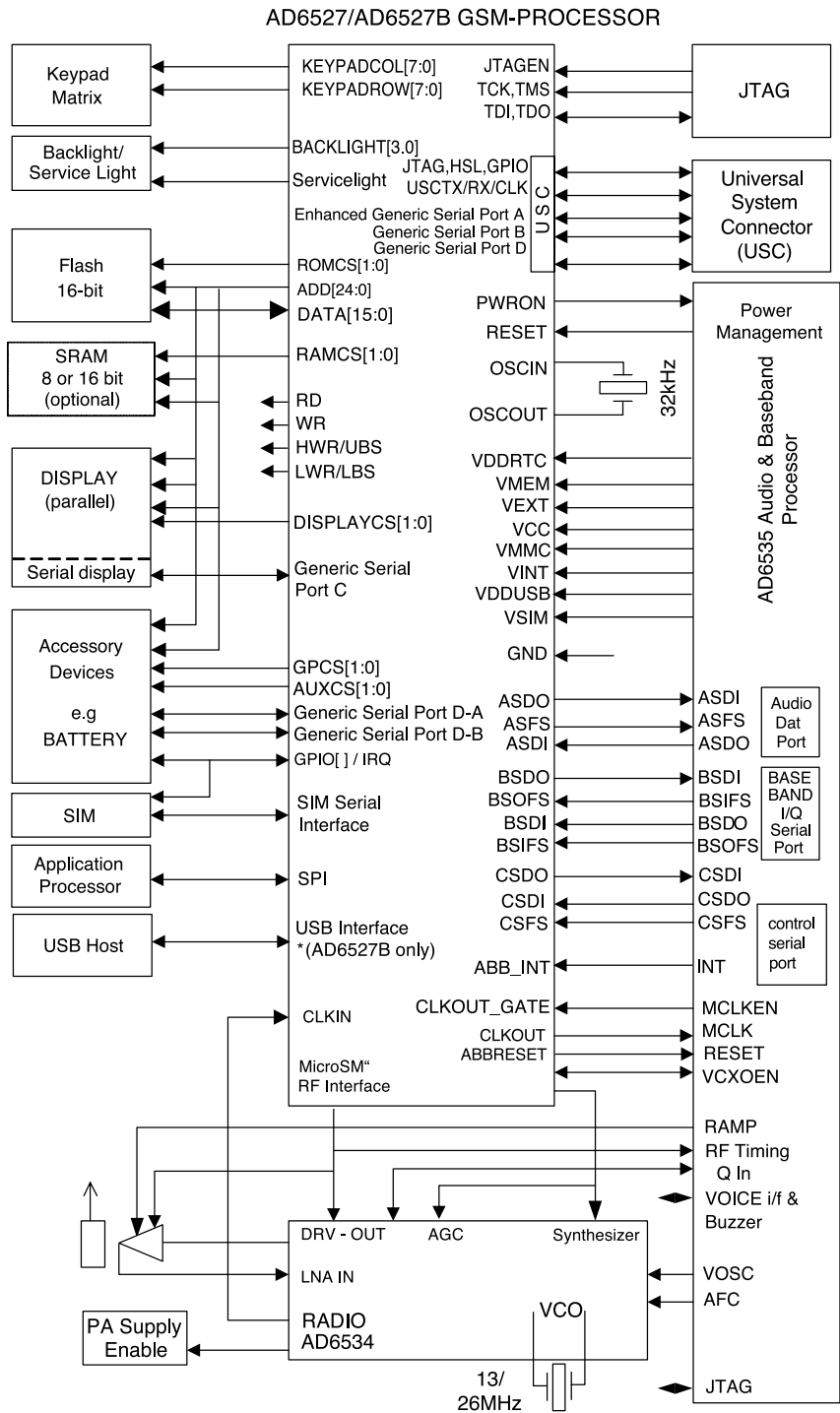


Figure 3-8. SYSTEM INTERCONNECTION OF AD6527B EXTERNAL INTERFACE

- AD6527 is an ADI designed processor.
- AD6527 consists of
 1. **Control Processor Subsystem**
 - 32-bit ARM7TDMI Control Processor
 - 58.5 MHz operation at 1.7V
 - On-board 16KB instruction/Data Cache
 - 1 Mbits of on-chip System SRAM
 2. **DSP Subsystem**
 - 16-bit Fixed Point DSP Processor
 - 91 MIPS at 1.7V
 - 16K word Data and 16K word Program SRAM
 - 4K word Program Instruction Cache
 - Architecture supports Full Rate, Enhanced Full Rate, Half Rate, and AMR Speech Encoding/Decoding Algorithms
 3. **Peripheral Subsystem**
 - Shared on-chip peripheral and off-chip interface:
 - Support for Burst and Page Mode Flash
 - Support for Pseudo SRAM
 - Ciphering module for GPRS supporting GAE1 and GAE2 encryption algorithms
 - Parallel and Serial Display Interface
 - 8 x 8 Keypad Interface
 - Four independent programmable backlight plus One Service Light
 - 1.8V and 3.0V, 64 kbps SIM interface
 - Universal System Connector Interface
 - Slow, Medium and Fast IrDA transceiver interface
 - Enhanced Generic Serial Port
 - Dedicated SPI interface
 - Thumbwheel Interface
 - JTAG Interface for Test and In-Circuit Emulation
 4. **Other**
 - Supports 13 MHz and 26 MHz Input Clocks
 - 1.8V Typical Core Operating Voltages
 - 204-Ball LFBGA(mini-BGA) Package
 5. **Applications**
 - GSM900/DCS1800/PCS1900/PCS850 Wireless Terminals
 - GSM Phase 2 + Compliant
 - GPRS Class 12 Compliant
 - Multimedia Services(MMS)
 - Extended Messaging System(EMS)

3. TECHNICAL BRIEF

3.5.1 Interconnection with external devices

A. RTC block interface

Countered by external X-TAL
The X-TAL oscillates 32.768KHz

B. LCD module interface

The LCD module is controlled by CAMERA IC, CL761S. If CL761S is in the state of by-pass mode, the LCD control signals from AD6527 are by-passed through CL761S.
In operating mode, the CL761S controls the LCD module through L_MAIN_LCD_CS, L_SUB_LCD_CS, LCD_RESET, LCD_RS, LCD_WR, LCD_RD, L_DATA[15-00], 2V8_VEXT, IF_MODE, LCD_ID[0:2].

Signals	Description
_LCD_CS	MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
LCD_DIM_CTRL	It controls dimming mode of LCD module.(GPIO_5)
LCD_RESET (GPIO 15)	This pin resets LCD module. This signal comes from DBB directly.
_WR	Enable writing to LCD Driver.
2V8_VMEM	2.8V voltage is supplied to LCD driver IC.
LCD_ID(GPIO_16)	It determines the maker of LCD module.
LCD_BL_EN	It controls back-light of LCD module.(GPO_23)

Table 3-3. LCD CONTRON SIGNALS DISCRIPTION

3. TECHNICAL BRIEF

The backlight of LCD module is controlled by DBB via TPS60230RGTR , U400. The control signals related to Backlight LED are given below.

Signals	Description
LCD-BL-EN (GPO-23)	LCD Backlight IC En / Disable
LCD-DIM-CTL (GPIO-5)	Control LCD backlight level in 16 steps
LCD-LED-CTR	Voltage source for LCD Backlight LED

Table 3-4. DESCRIPTION OF LCD BACKLIGHT LED CONTROL

C. RF interface

The AD6527B control RF parts through PA-BAND, ANT-SW1, ANT-SW2, ANT-SW2, CLKON, PA-EN, SEN, SDATA, SCLK, RF-PWR-DWN.

Signals	Description
PA-BAND (GPO 17)	PAM Band Select
ANT-SW1 (GPO 9)	Antenna switch Band Select
ANT-SW2 (GPO 11)	Antenna switch Band Select
ANT-SW3 (GPO 10)	Antenna switch Band Select
CLKON	RF LDO Enable/Disable
PA-EN (GPO 16)	PAM Enable/Disable
SEN (GPO 19)	PLL Enable/Disable
SDATA (GPO 20)	Serial Data to PLL
SCLK (GPO 21)	Clock to PLL
RF-EN (GPO 4)	Power down Input

Table 3-5. RF CONTRON SIGNALS DISCRIPTION

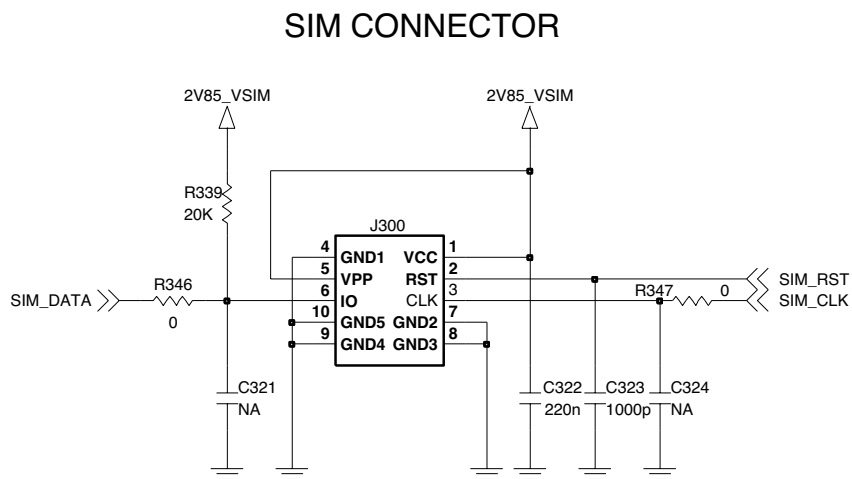
3. TECHNICAL BRIEF

D. SIM interface

The AD6527 provides SIM Interface Module. The AD6527 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM-DATA, SIM-CLK, SIM-RST(GPIO-23) are required. The descriptions about the signals are given by bellow Table 3-6 in detail.

Signals	Description
SIM-DATA	This pin receives and sends data to SIM card. This model can support 1.8volt and 3.0 volt interface SIM card.
SIM-CLK	Clock 3.25MHz frequency.
SIM-RST (GPIO-23)	Reset SIM block

Table 3-6. SIM CONTRON SIGNALS DISCRIPTION



E. Key interface

Include 5 column , 5 row and additional GPIO 35 for KEY-ROW5. The AD6527 detects whether key is pressed or not by using interrupt method.

F. AD6537B Interrupt

AD6537B provides an active-high interrupt output signal. Interrupt signals are generated by the Auxiliary ADC, audio, and charger modules.

3.5.2 AD6527B Architecture

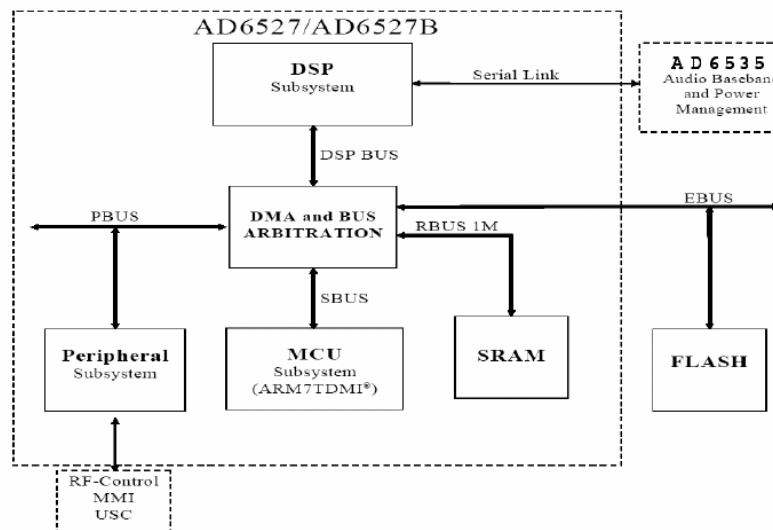


Figure 3-10. AD6527 Architecture

The internal architecture of AD6527 is shown above Figure 3-10. AD6527 regroups three main subsystems connected together through a dynamic and flexible communication bus network. It also includes onboard system RAM (SRAM) and interfaces with external Flash Memory, Baseband converter functions, and terminal functions like MMI, SIM and Universal System Connector (USC).

The Digital Signal Processing (DSP) subsystem primarily hosts all the speech processing, channel equalization and channel codec functions.

The code used to implement such functions can be stored in external Flash Memory and dynamically downloaded on demand into the DSP's program RAM and Instruction Cache.

The micro-controller subsystem supports all the GSM terminal software, including the layer 1, 2 and 3 of the GSM protocol stack, the MMI, and applications software such as data services, test and maintenance. It is tightly associated with on-chip system SRAM and also includes boot ROM memory with a small dedicated routine to facilitate the initialization of the external Flash Memory via code download using the on-chip serial interface to the external Flash Memory interface.

The peripheral subsystem is composed of system peripherals such as interrupt controller, real time clock, watch dog timer, power management and a timing and control module. It also includes peripheral interfaces to the terminal functions: keyboard, battery supervision, radio and display. Both the DSP and the MCU can access the peripheral subsystem via the peripheral bus (PBUS).

For program and data storage, both the MCU subsystem and the DSP subsystem can access the on chip system SRAM and external memory such Flash Memory.

The access to the SRAM module is made through the RAM Bus (RBUS) under the control of the bus arbitration logic. Similarly, access to the Flash Memory is through the parallel External Bus (EBUS).

3. TECHNICAL BRIEF

3.6 Analog Main & Power Management Processor (AD6537B, U101)

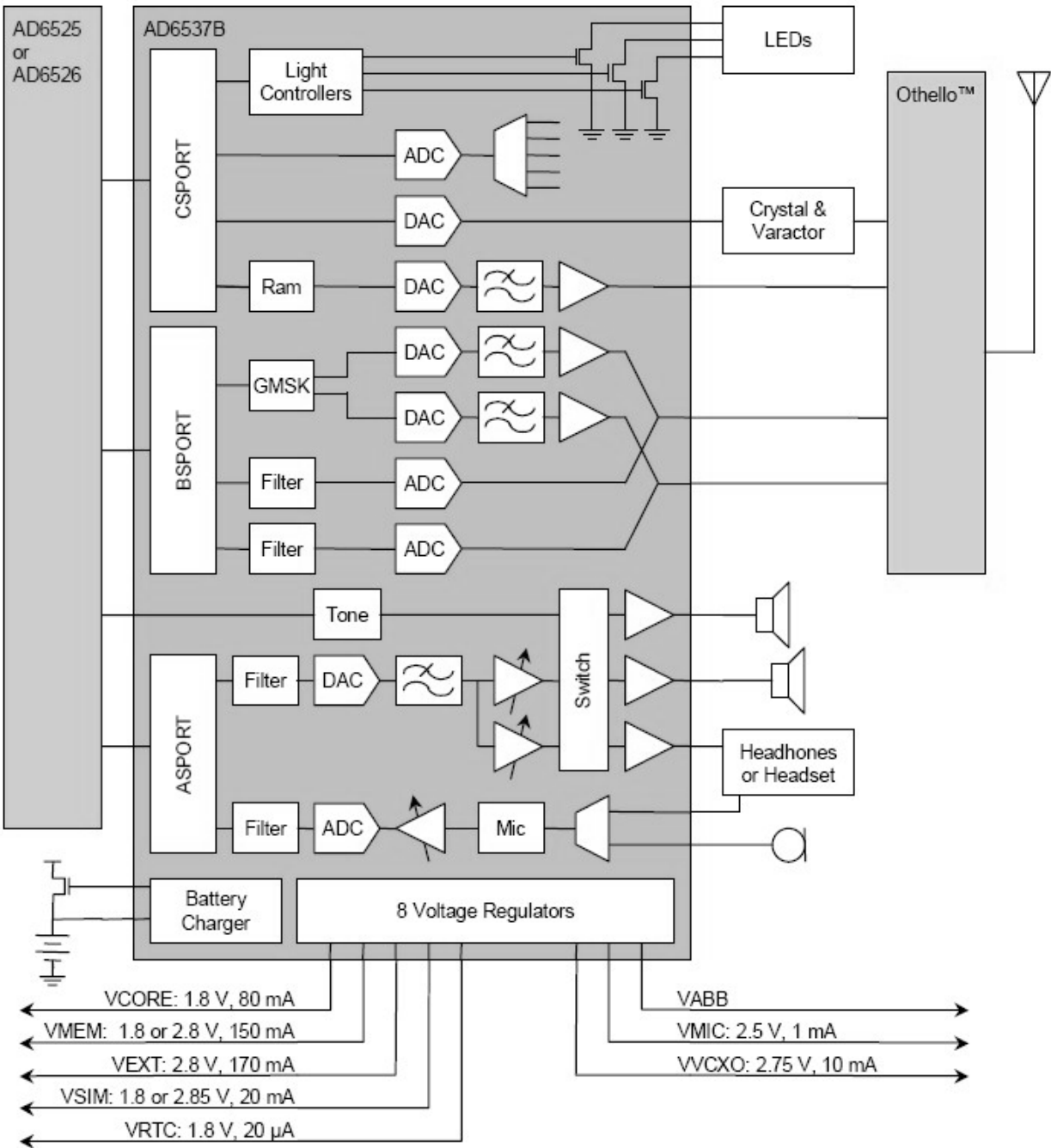


Figure 3-11. AD6537B FUNCTIONAL BLOCK DIAGRAM

- AD6537B is an ADI designed Analog Baseband processor. AD6537B covers the processing GMSK modulation interface, Aux ADC, Voice signal processing and Power Management.
- AD6527 consists of
 1. BB Transmit section
 - GMSK Modulation
 - I-channel & Q-channel Transmit DACs and Filters
 - Power Ramping DAC
 2. BB Receive section
 - I-channel & Q-channel Receive ADCs and Filters
 3. Auxiliary section
 - Voltage Reference
 - Automatic Frequency Control DAC
 - Auxiliary ADC
 - Light Controllers
 4. Audio Section
 - 8 kHz & 16 kHz Voiceband Codec
 - 48 kHz Monophonic DAC
 - Power Amplifiers
 5. Power Management section
 - Voltage Regulators
 - Battery Charger
 - Battery Protection
 6. Digital Processor section
 - Control, Baseband, and Audio Serial Ports
 - Interrupt Logic

3. TECHNICAL BRIEF

3.6.1 Analog Main & Power Management Processor (AD6537B, U101)

1. The AD6537B Baseband Transmit Section is designed to support GMSK for both single-slot and multi-slot application.
2. The transmit channel consists of a digital GMSK modulator, a matched pair of 10-bit DACs and a matched pair of reconstruction filter

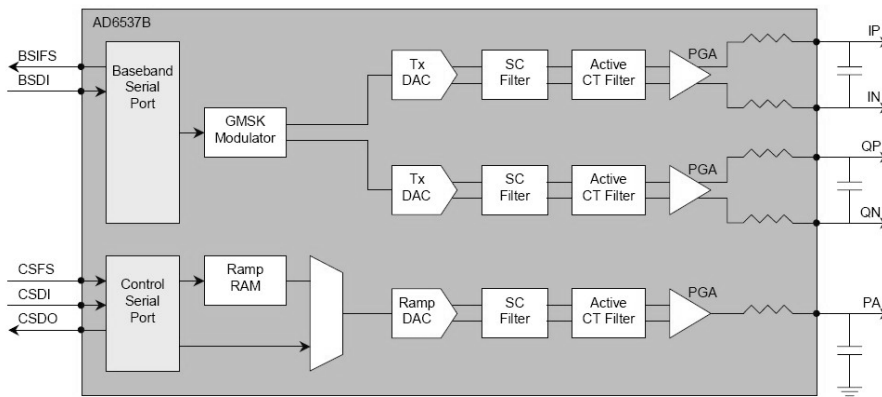


Figure 3-12. AD6537B BASEBAND TRANSMIT SECTION

3.6.2 Baseband Transmit Section

1. This section consists of two identical ADC channels that process baseband in-phase(I) and quadrature(Q) input signals.

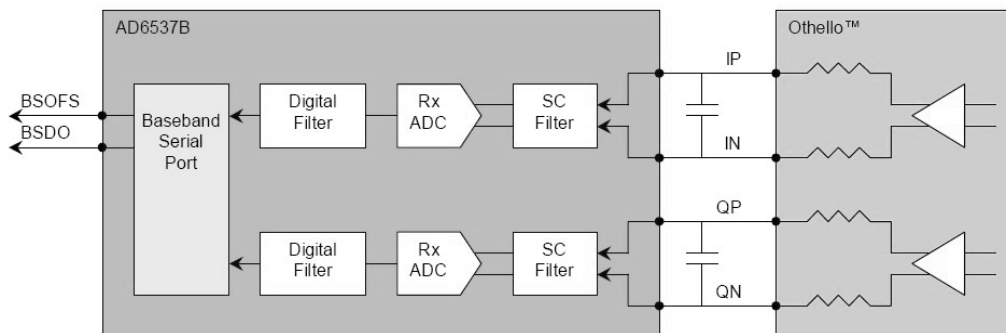


Figure 3-13. AD6537B BASEBAND RECEIVER SECTION

3.6.3 Auxiliary Section

1. This section includes an Automatic Frequency Control(AFC) DAC, voltage reference buffers, an Auxiliary ADC, and light controllers.
 - AFC DAC: 13 bits
2. This section also contains AUX ADC and Voltage Reference
 - IDAC: 10 bits
 - The Auxiliary ADC provides :
 - Two differential inputs for temperature sensing.
 - A differential input for the battery charger current sensor

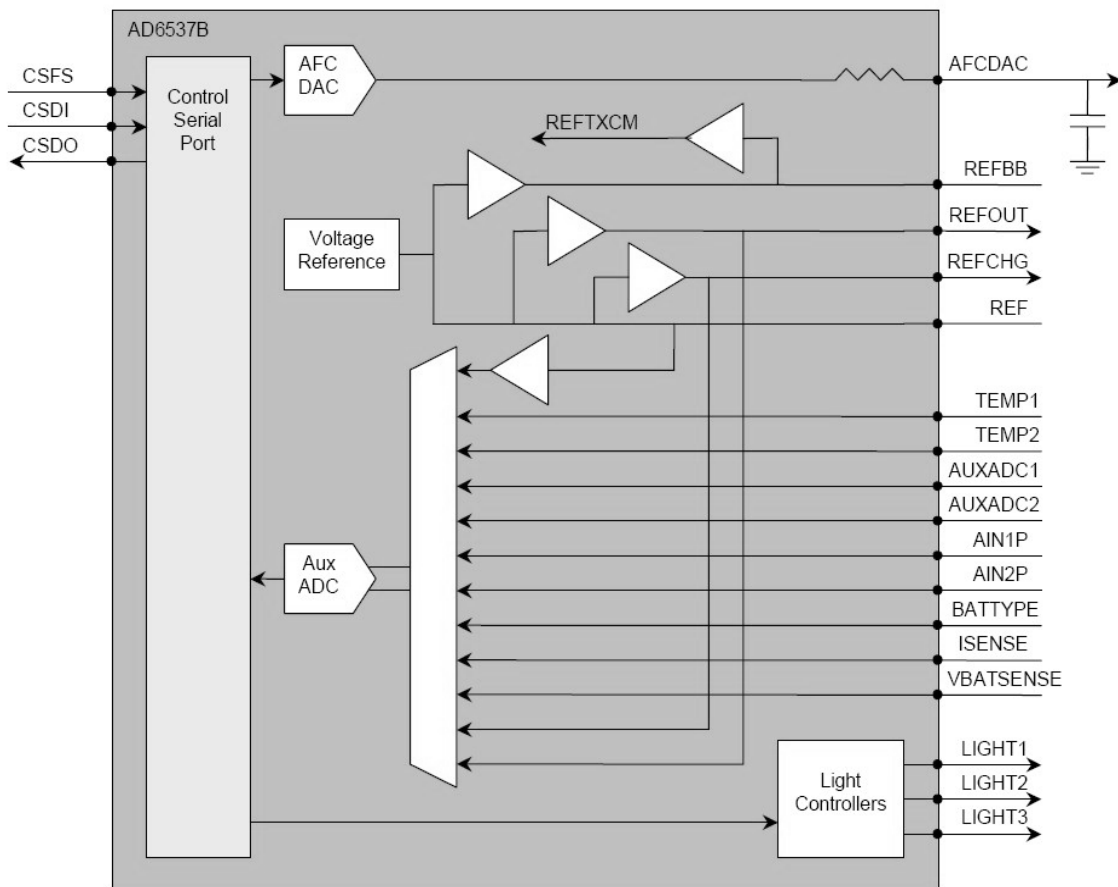


Figure 3-14. AD6537B AUXILIARY SECTION

3. TECHNICAL BRIEF

3.6.4 Audio Section

1. Receive audio signal from microphone. B2150 uses differential configuration.
2. Send audio signal to speaker. B2150 uses differential configuration.
3. This section provides an audio codec with a digital-to-analog converter and an analog-to-digital converter, a ring tone volume controller, a microphone interface, and multiple analog input and output channels.
4. It interconnects with external devices like main microphone, main receiver, and headset. The descriptions of audio port used in B2150 are given below in detail.

<Up Link>

- AIN1P,AIN1N : Main microphone positive/negative terminal
- AIN2P,AIN2N : Headset microphone positive/negative terminal
- AIN3P,AIN3N : External Analog Input terminal

<Down Link>

- AOUT1P,AOUT1N : Main Speaker positive/negative terminal
- AOUT3P : Headset speaker terminal

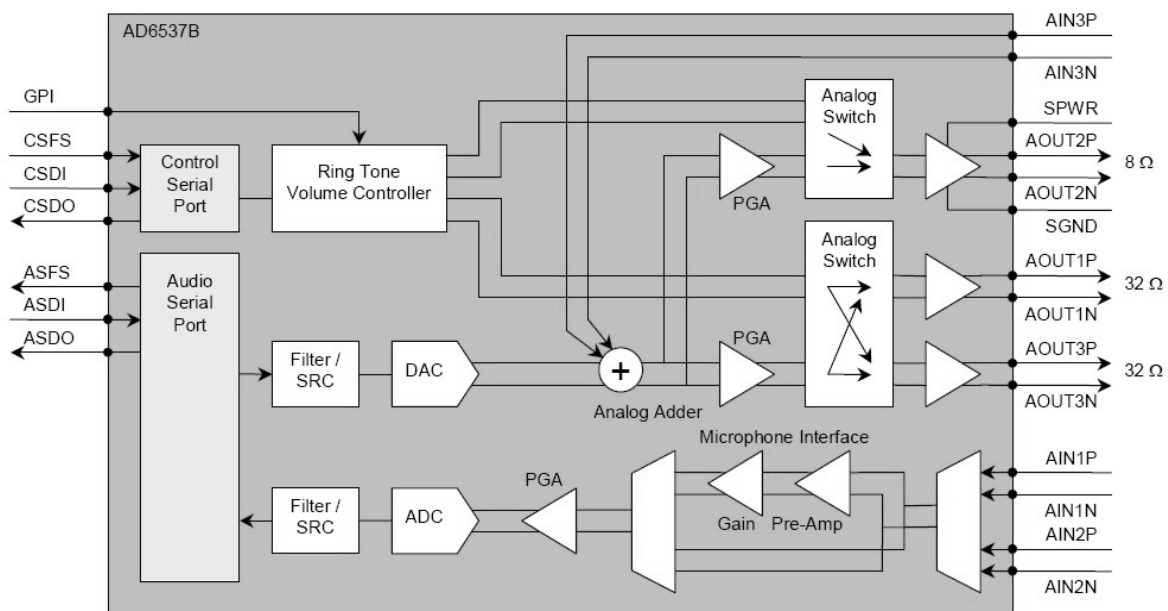


Figure 3-15. AD6537B AUDIO SECTION

3.6.5 Power Management

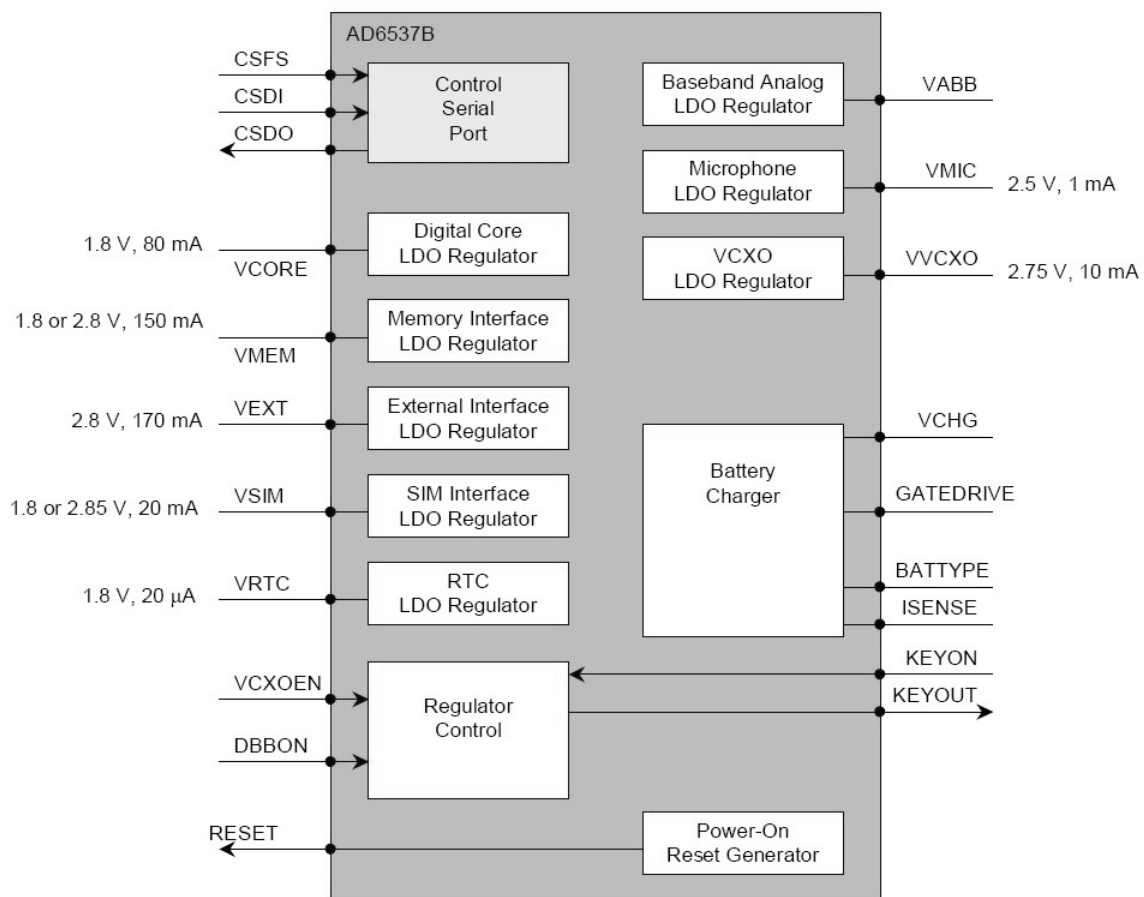


Figure 3-16. AD6537B POWER MANAGEMENT SECTION

1. Power up sequence logic

1. The AD6537B controls power on sequence
2. Power on sequence
 - If a battery is inserted, the battery powers the 8 LDOs.
 - Then if PWRONKEY is detected, the LDOs output turn on.
 - REFOUT is also enabled
 - Reset is generated and send to the AD6527

3. TECHNICAL BRIEF

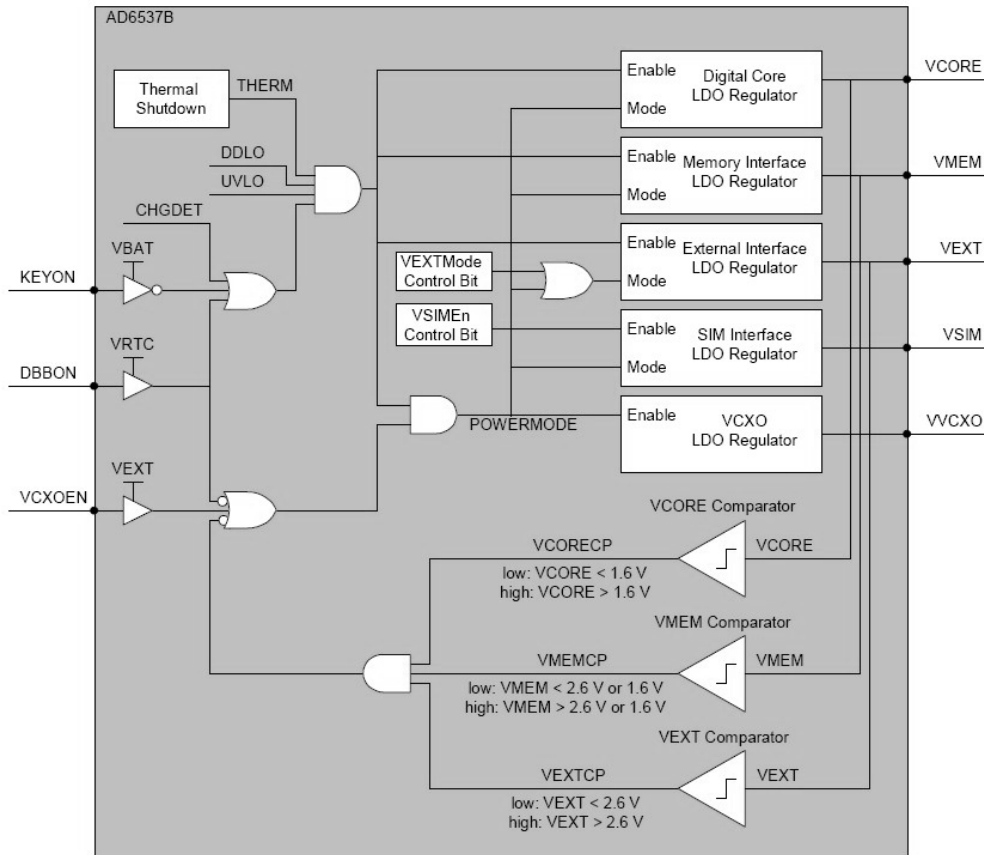


Figure 3-17. AD6537B POWER MODE LOGIC

2. LDO Block

1. There are 8 LDOs in the AD6537B.

- V C O R E : supplies Digital baseband Processor core and AD6537B digital core (1.8V, 80mA)
- V M E M : supplies external memory and the interface to the external memory on the digital baseband processor (1.8V or 2.8V, 150mA)
- V E X T : supplies Radio digital interface and high voltage interface (2.8V, 170mA)
- V S I M : supplies the SIM interface circuitry on the digital processor and SIM card (1.8V or 2.85V, 20mA)
- V R T C : supplies the Real-Time Clock module (1.8 V, 20 A)
- V A B B : supplies the analog portions of the AD6537B
- V M I C : supplies the microphone interface circuitry (2.5 V, 1 mA)
- V V C X O : supplies the voltage controlled crystal oscillator (2.75 V, 10 mA)

3. Battery Charging Block

1. It can be used to charge Lithium Ion and/or Nickel Metal Hydride batteries. Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.
2. Charging Process
 - Check charger is inserted or not
 - If AD6537B detects that Charger is inserted, the CC-CV charging starts.
 - Exception : When battery voltage is lower than 3.2V, the precharge (low current charge mode) starts firstly.
 - And the battery voltage reach to 3.2V the CC-CV charging starts.
3. Pins used for charging
 - VCHG : charger supply.
 - GATEDRIVE : charge DAC output
 - ISENSE : charge current sense input
 - VBATSENSE : battery voltage sense input.
 - BATTYPE : battery type identification input
 - REFCHG : voltage reference output
4. TA (Travel Adaptor)
 - Input voltage: AC 85V ~ 260V, 50~60Hz
 - Output voltage: DC 5.2V (0.2 V)
 - Output current: Max 800mA (50mA)
5. Battery
 - Input voltage: AC 85V ~ 260V, 50~60Hz
 - Standard battery: Capacity - 830mAh

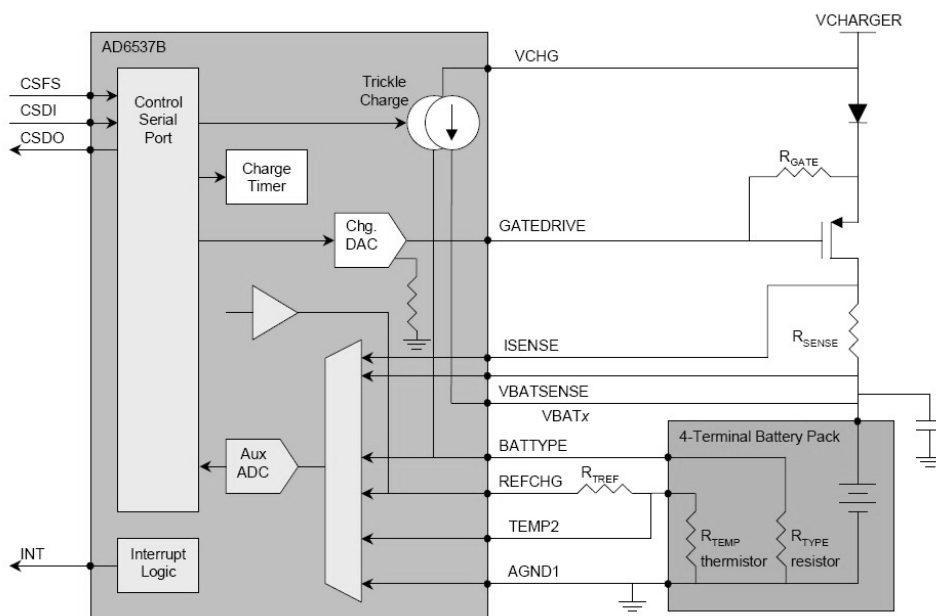


Figure 3-18. AD6537B BATTERY CHARGING BLOCK

3. TECHNICAL BRIEF

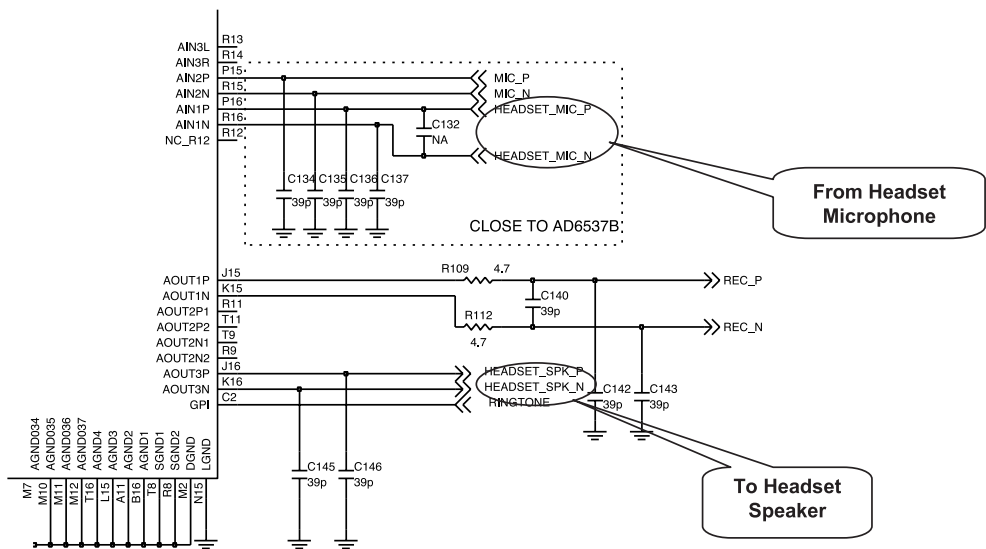


Figure 3-19. B2150 HEADSET SPEAKER CIRCUIT (AD6537B)

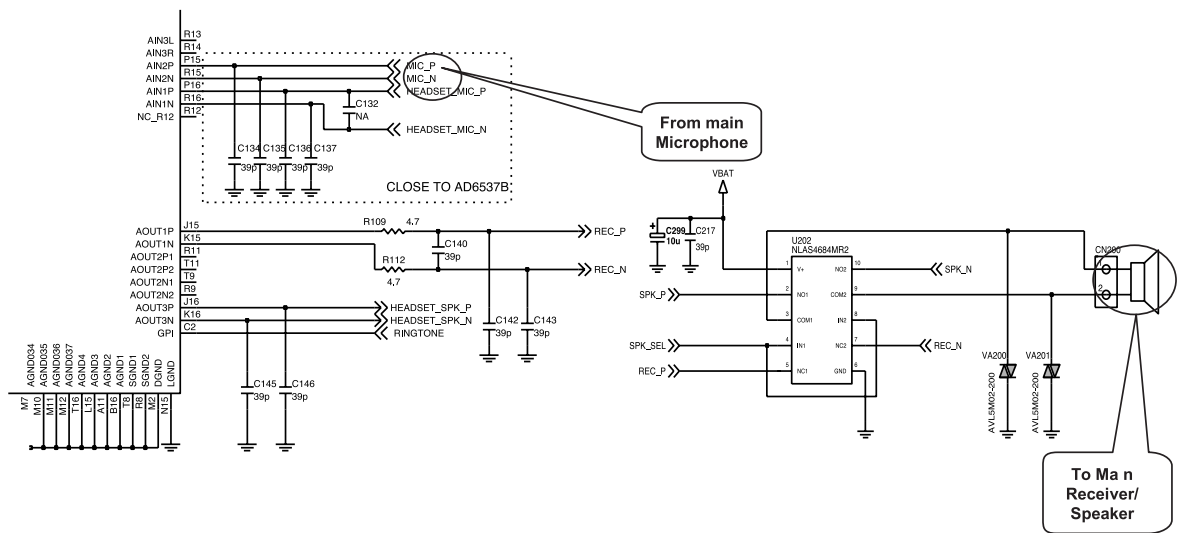


Figure 3-20. B2150 HEADSET SPEAKER CIRCUIT (AD6537B)

3. TECHNICAL BRIEF

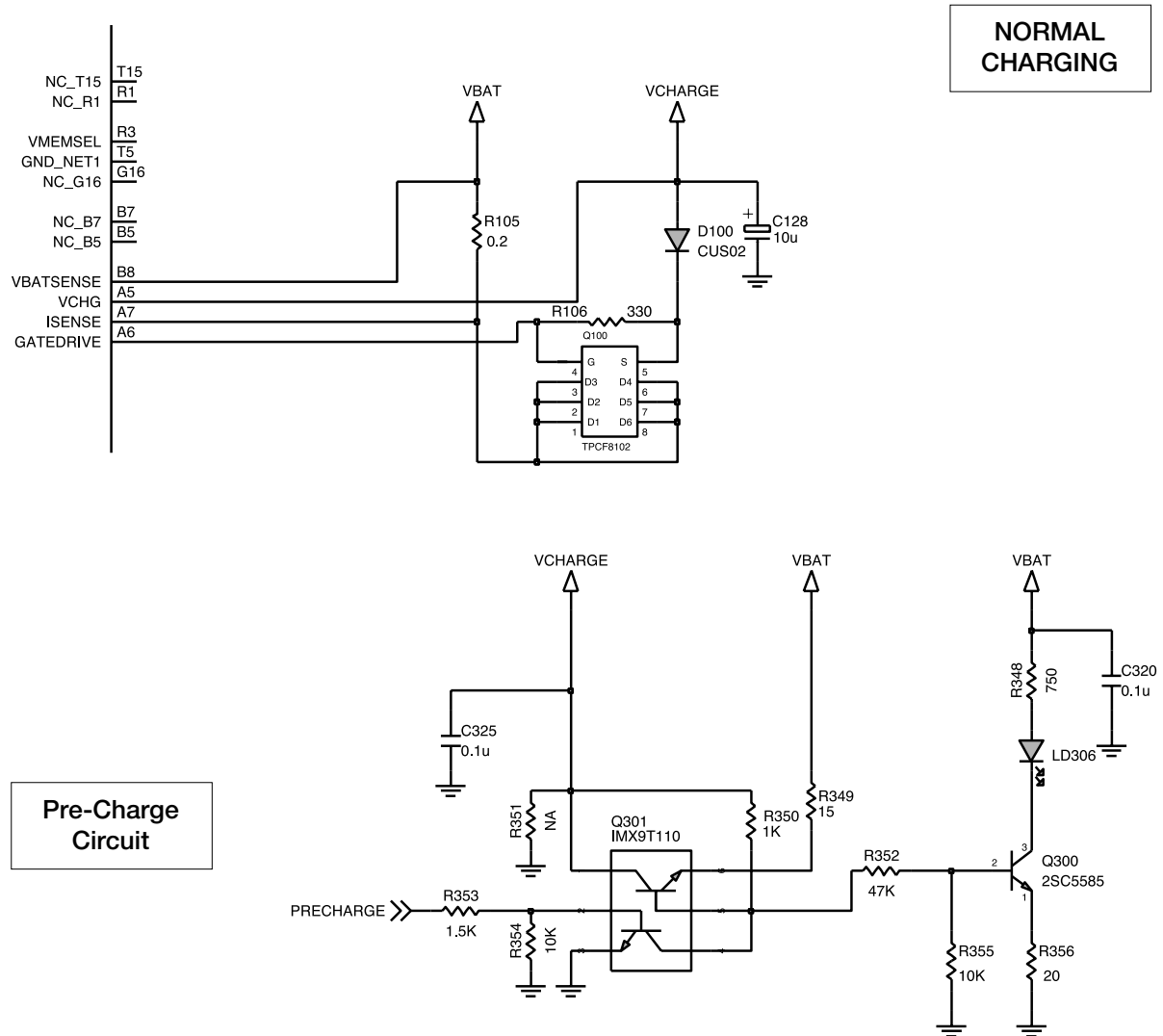


Figure 3-21. CIRCUIT FOR BATTERY CHARGING AT AD6537B

In order to reduce time for trickle charging, additional circuit (Pre-charge circuit) was included. This circuit has supplied Max 160mA current into the battery additionally. So call it, it reduce trickle charging time

3. TECHNICAL BRIEF

3.7 Display and Interface

• Main LCD

Properties	Spec.	Unit
Active Screen Size	28.022(H) X 28.022(V)	mm
Color Depth	65,000	colors
Resolution	128 X RGB X 128	dots
Pixel Size	0.063(H) X 0.209(V)	mm

Controlled by _LCD_CS, LCD_RESET, _WR, DATA[00:15], LCD_ID,

- _LCD_CS : MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
- LCD_RESET : This pin resets LCD module. This signal comes from DBB directly.
- _WR : Write control Signal
- _DATA[00:15] : Parallel data lines.
- LCD_ID[1:2] : LCD type selection signals
 - LCD_ID1 : LCD maker(2.4V is SII, 0V is HyeLCD)
 - LCD_ID[2:3] : for the future using
- For using 65K color, data buses should be 16 bits.



3. TECHNICAL BRIEF

3.8 Keypad Switches and Scanning

The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are 22 switches (Normal Key 21EA, Camera side key), connected in a matrix of 5 rows by 5 columns and additional GPIO 35 for KEY_ROW5, as shown in Figure 3-24, except for the power switch (KB1), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6527. The columns are outputs, while the rows are inputs and have pull-up resistors built in.

When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6527 to identify the pressed key.

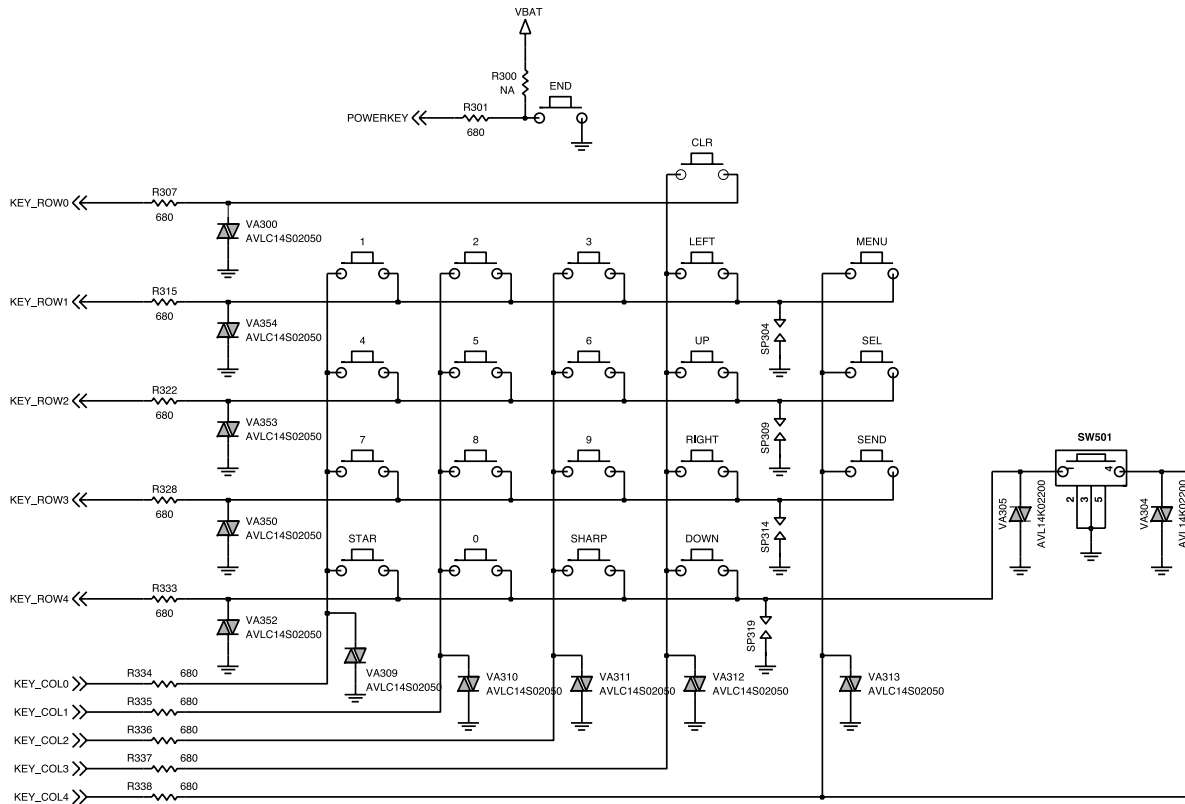


Figure 3-27. Keypad Switches and Scanning

3.9 Microphone

The microphone is placed to the front cover and contacted to main PCB. The audio signal is passed to AIN2P and AIN2N pins of AD6537. The voltage supply VMIC is output from AD6537B, and is a biased voltage for the AIN2P.

The AIN2P and AIN2N signals are then A/D converted by the voiceband ADC part of AD6537B. The digitized speech (PCM 8KHz, 16KHz) is then passed to the DSP section of AD6527 for processing (coding, interleaving etc).

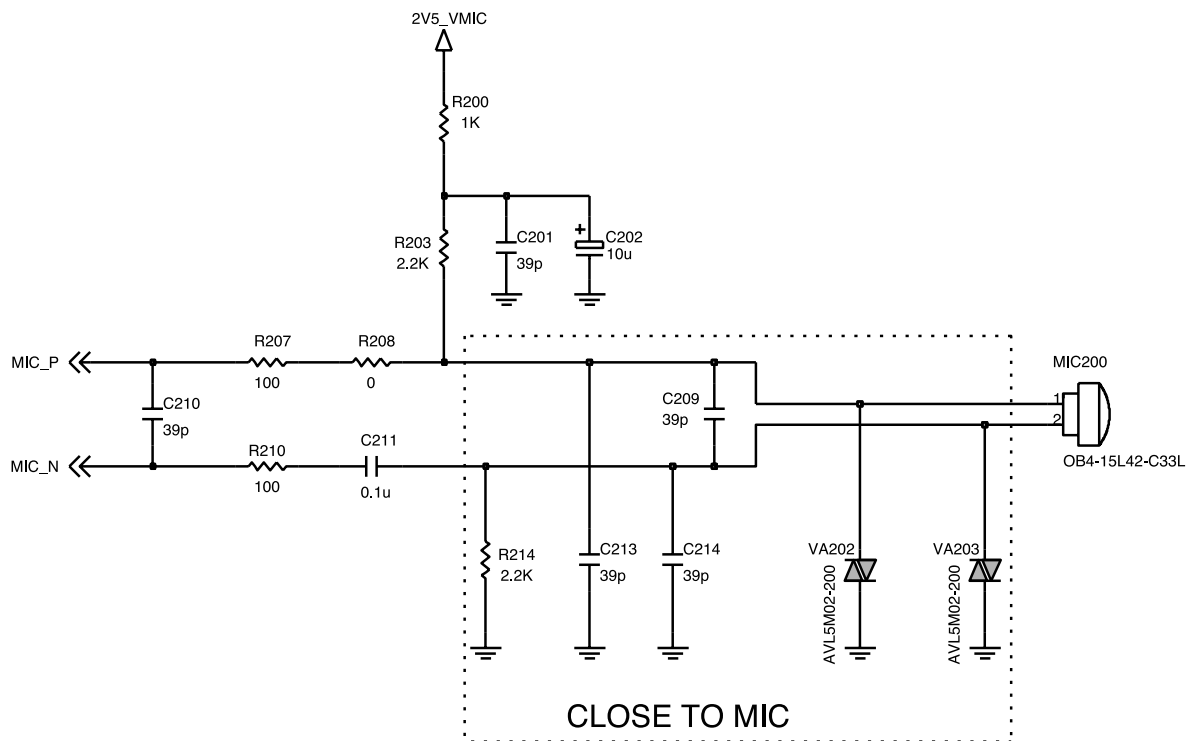


Figure 3-28. Connection between Microphone and AD6537B

3.10 Main Speaker

In the case of B2150, there are 2 different speakers. One is main speaker for the received voice, key tone and other MIDI sounds and the other is headset speaker.

The main speaker is driven directly from AD6537B AOUT1P and AOUT1N pins and the gain is controlled by the PGA in an AD6537B.

3. TECHNICAL BRIEF

3.11 Headset Interface

This phone chooses a 5 pin type headset which has 6 electrodes such as GND, Headset_Mic_N, Headset_Mic_P, Headset_SPK_N, JACK_DETECT, HOOK_DETECT. This type supports stereo sound.

Switching from Receiver to Headset Jack

If jack is inserted, JACK_DETECT goes from low to high.

Audio path is switched from receiver to earphone by JACK_DETECT interrupt.

Switching from Headset Jack to Receiver

If jack is removed, JACK_DETECT goes from high to low.

Audio path is switched from earphone to receiver by JACK_DETECT interrupt.

Hook detection

If hook-button is pressed, HOOK_DETECT is changed from high to low.

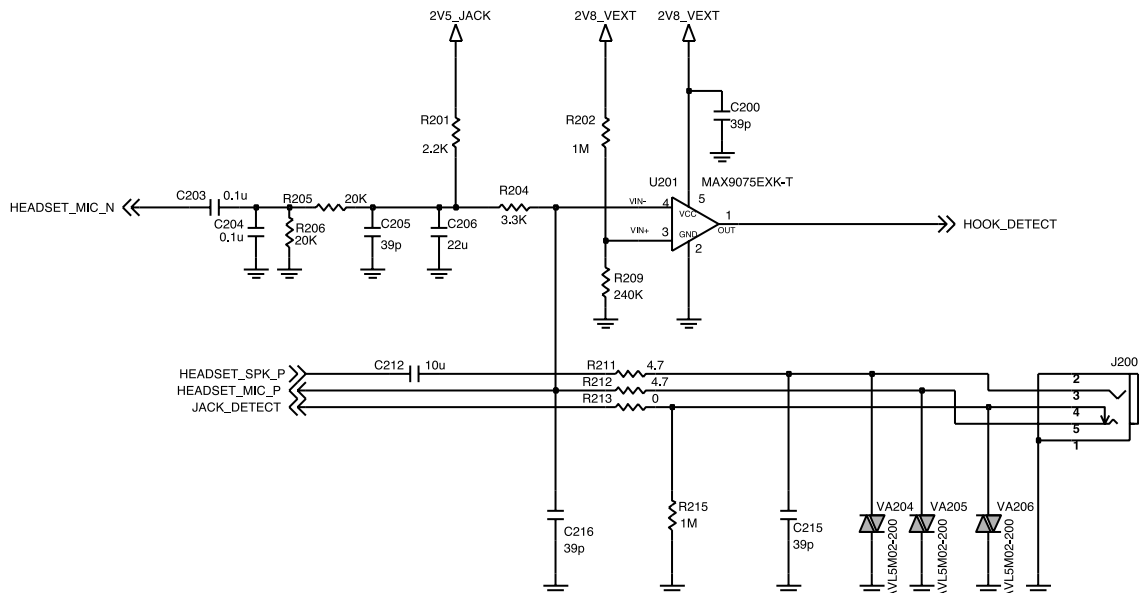


Figure 3-29. HEADSET JACK INTERFACE

3.12 Key Back-light Illumination

In key back-light illumination, there are 6 Blue LEDs in Main Board, which are driven by MIDI-KEY-BL1 and MIDI-KEY-BL2 signal from ML2871.

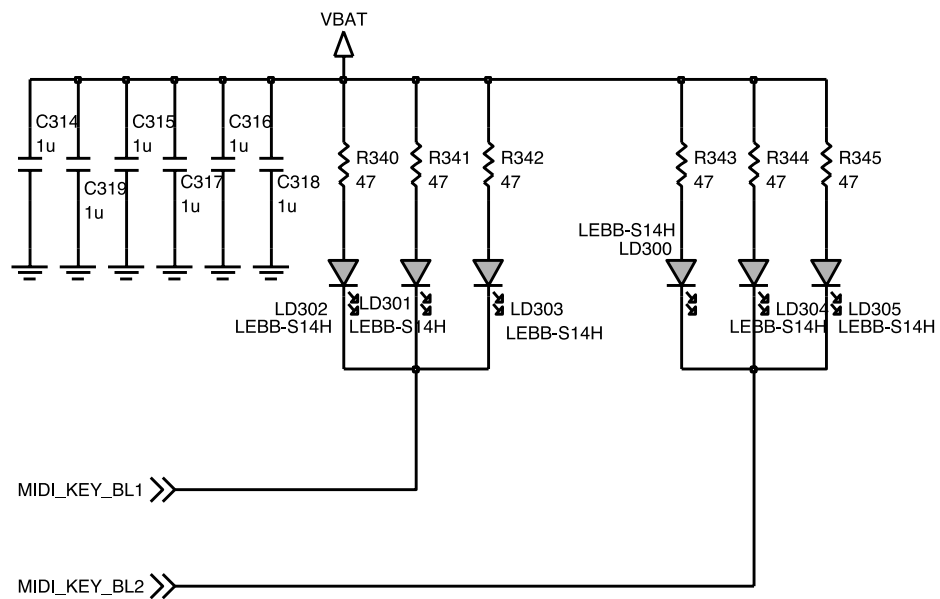


Figure 3-30. KEY BACK-LIGHT ILLUMINTION

3. TECHNICAL BRIEF

3.13 VIBRATOR

The vibrator is placed in the Bar Rear and contacted to LCD MODULE. The vibrator is driven from MIDI_VIBRATOR from ML2871.

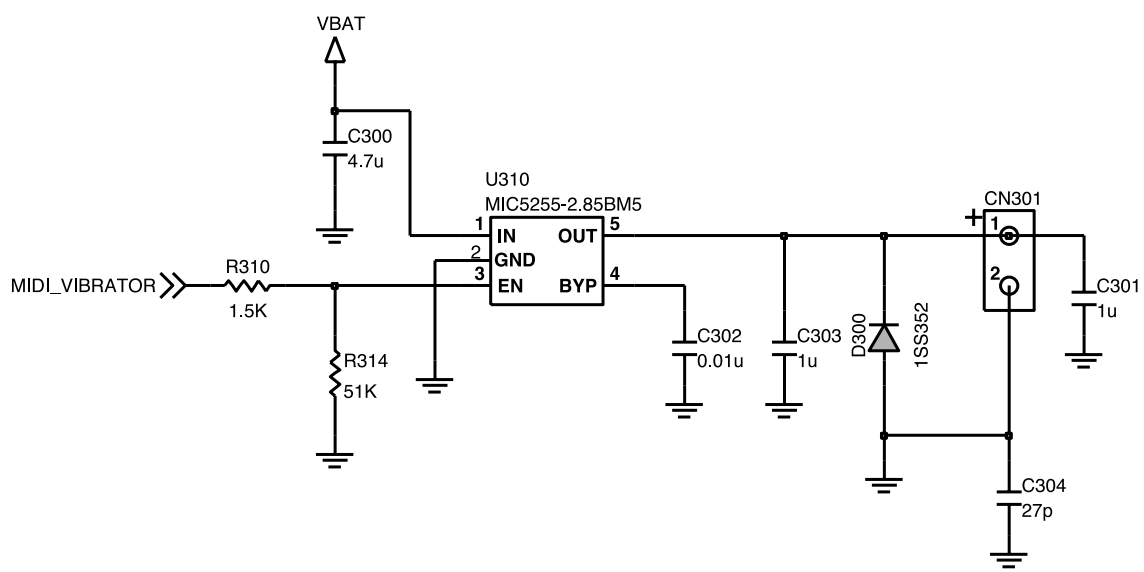


Figure 3-32. MOTOR

4. TROUBLE SHOOTING

4.1 RX Trouble

TEST POINT

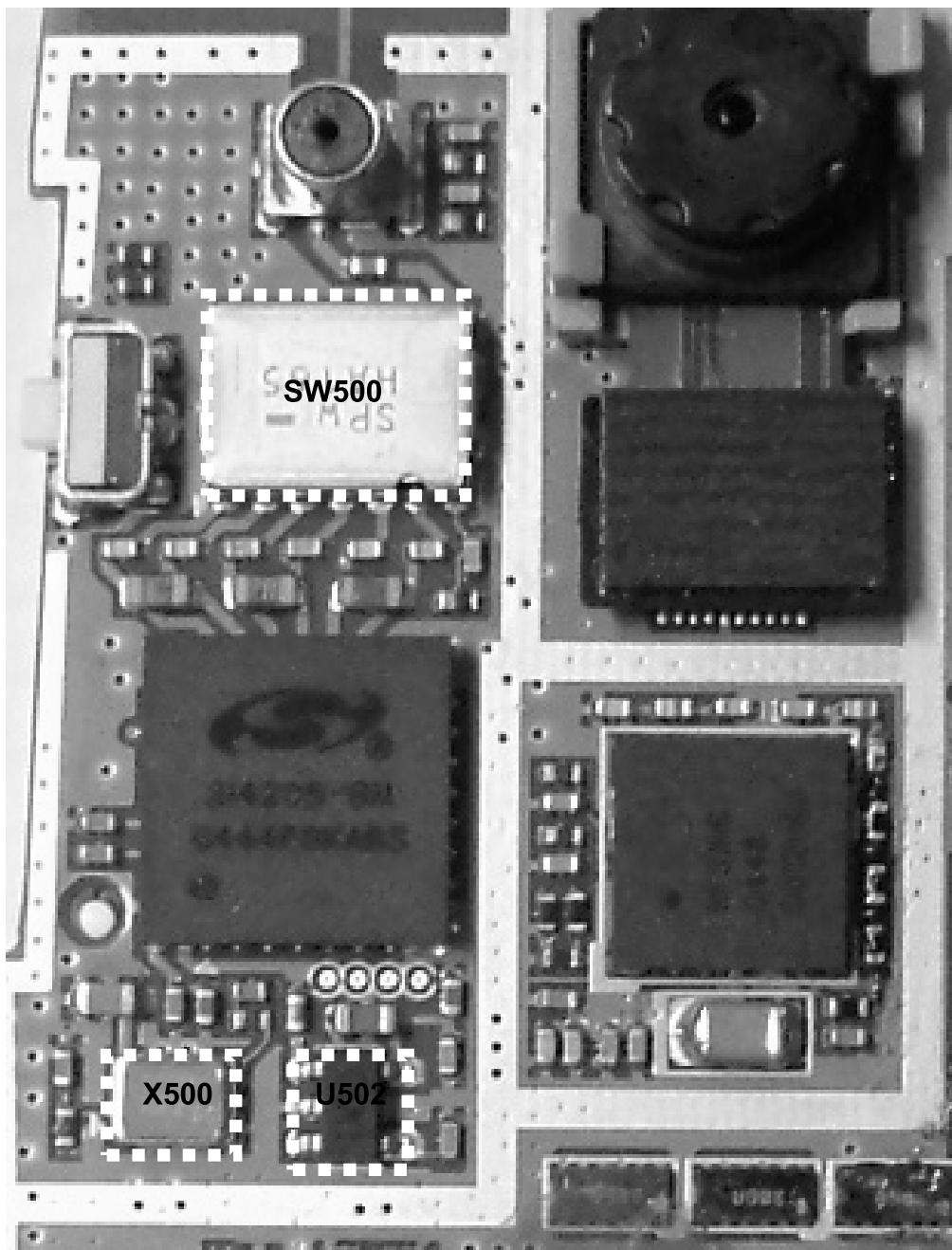


Figure 4-1(a)

4. TROUBLE SHOOTING

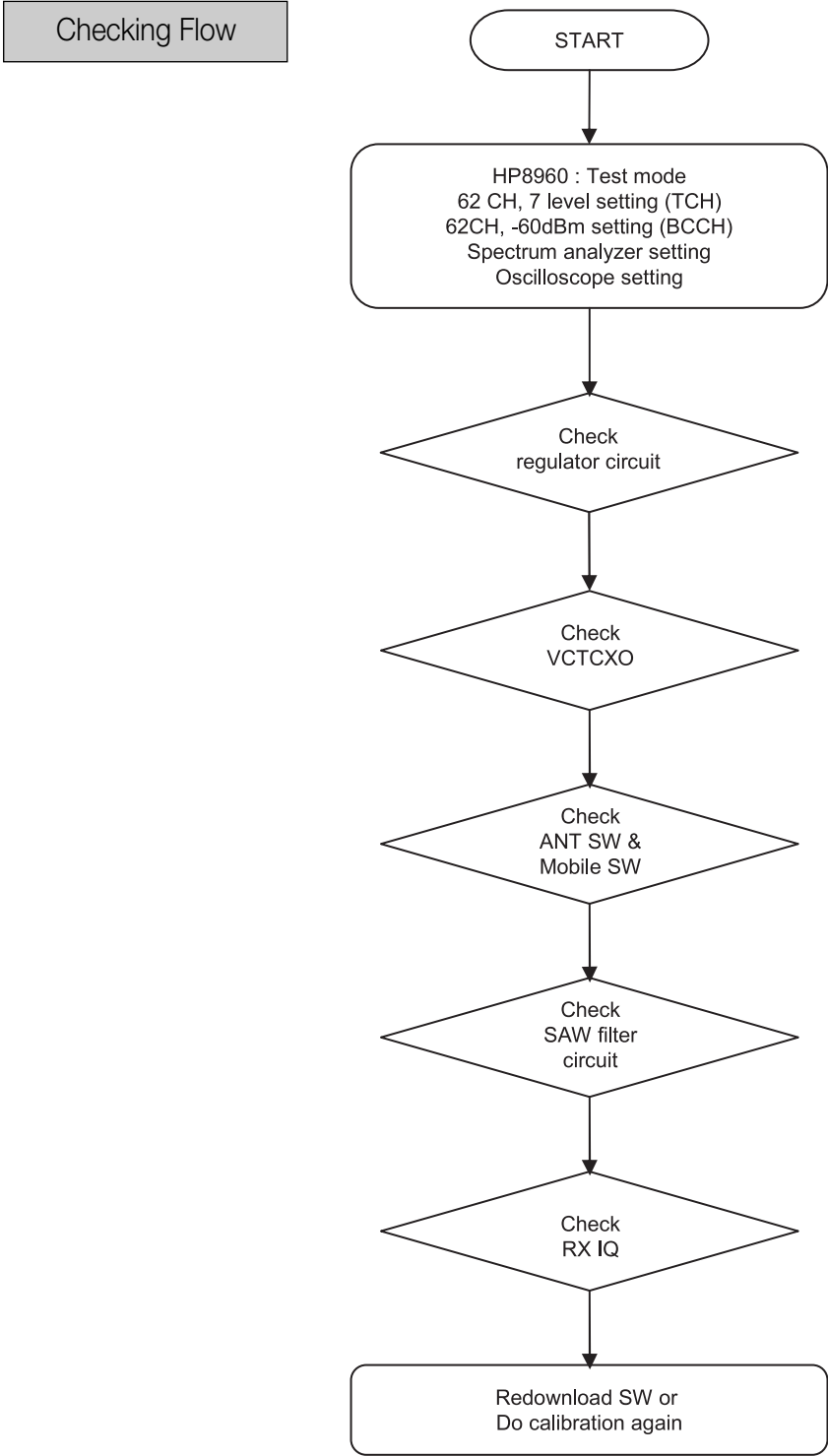


Figure 4-1(a)

(1) Checking Regulator Circuit

TEST POINT

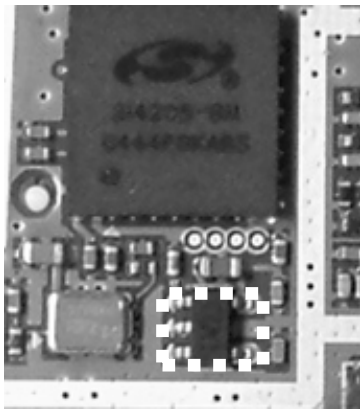
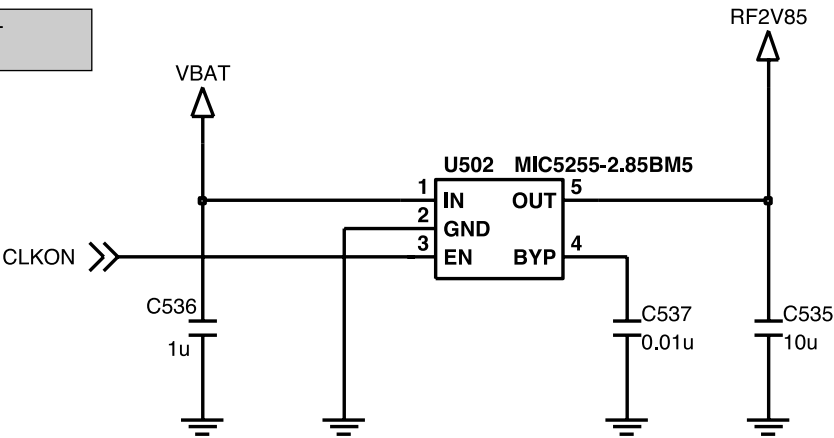
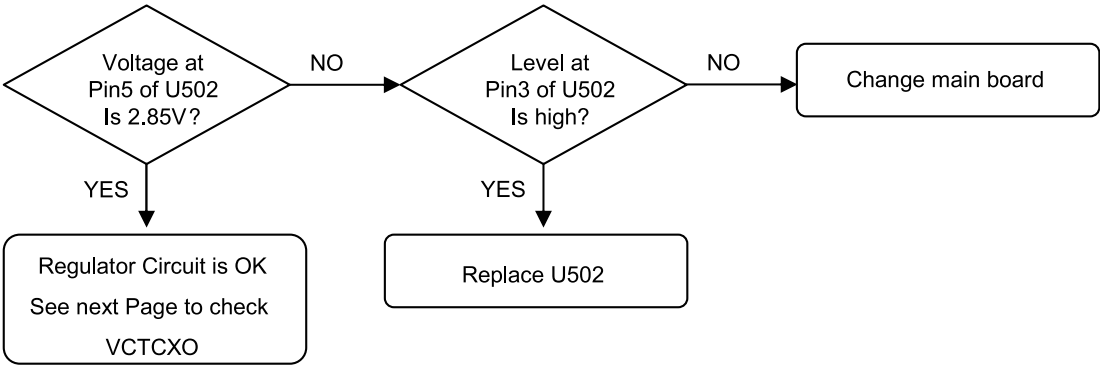


Figure 4-2

CIRCUIT



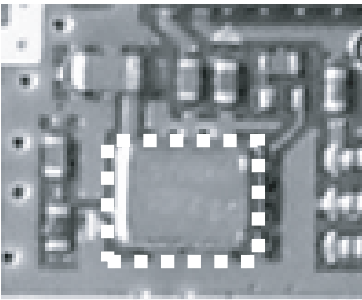
Checking Flow



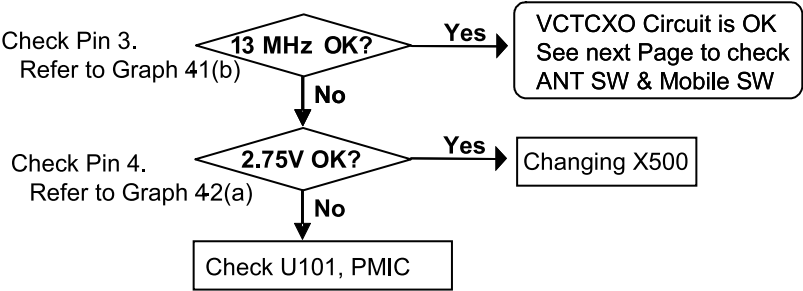
4. TROUBLE SHOOTING

(2) Checking VCTCXO Circuit

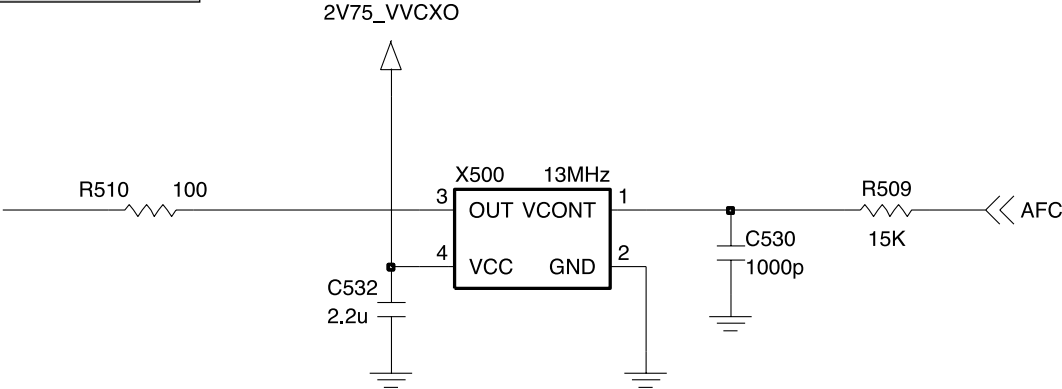
TEST POINT



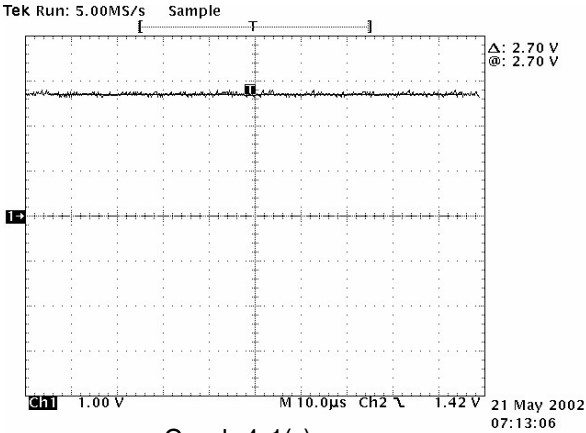
Checking Flow



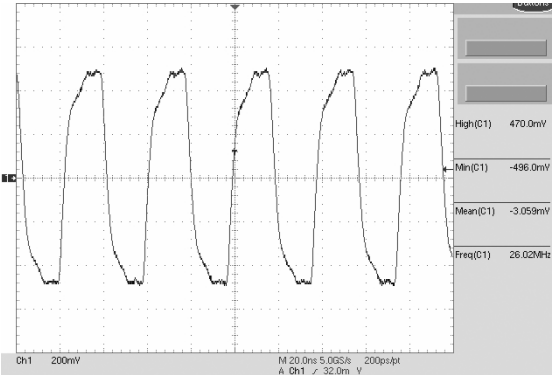
CIRCUIT



Waveform



Graph 4-1(a)

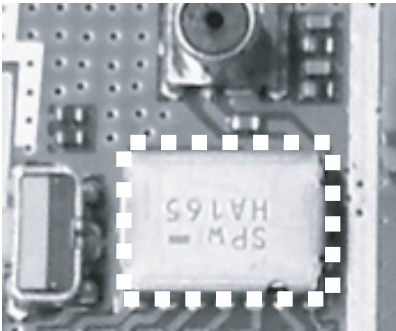


Graph 4-1(b)

4. TROUBLE SHOOTING

(3) Checking Ant SW & Mobile SW

TEST POINT



CIRCUIT

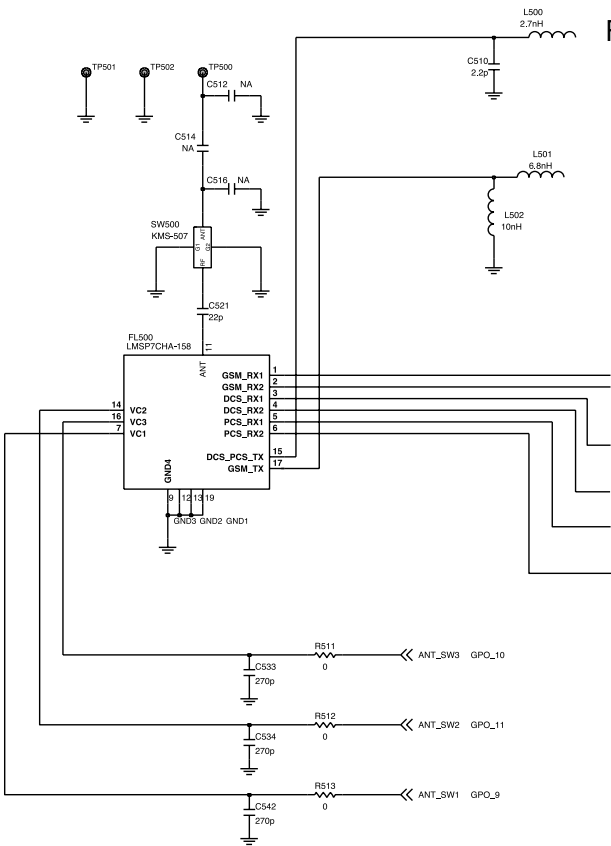
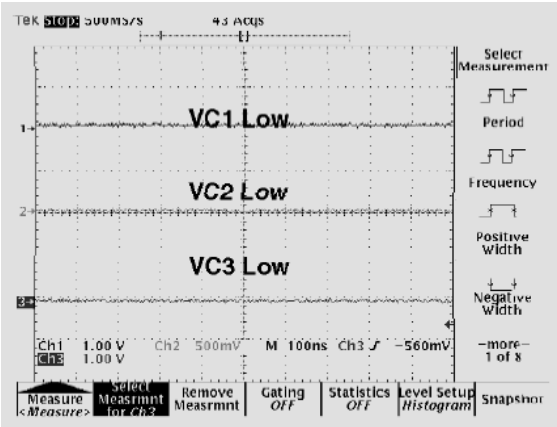


Figure 4-5

Waveform



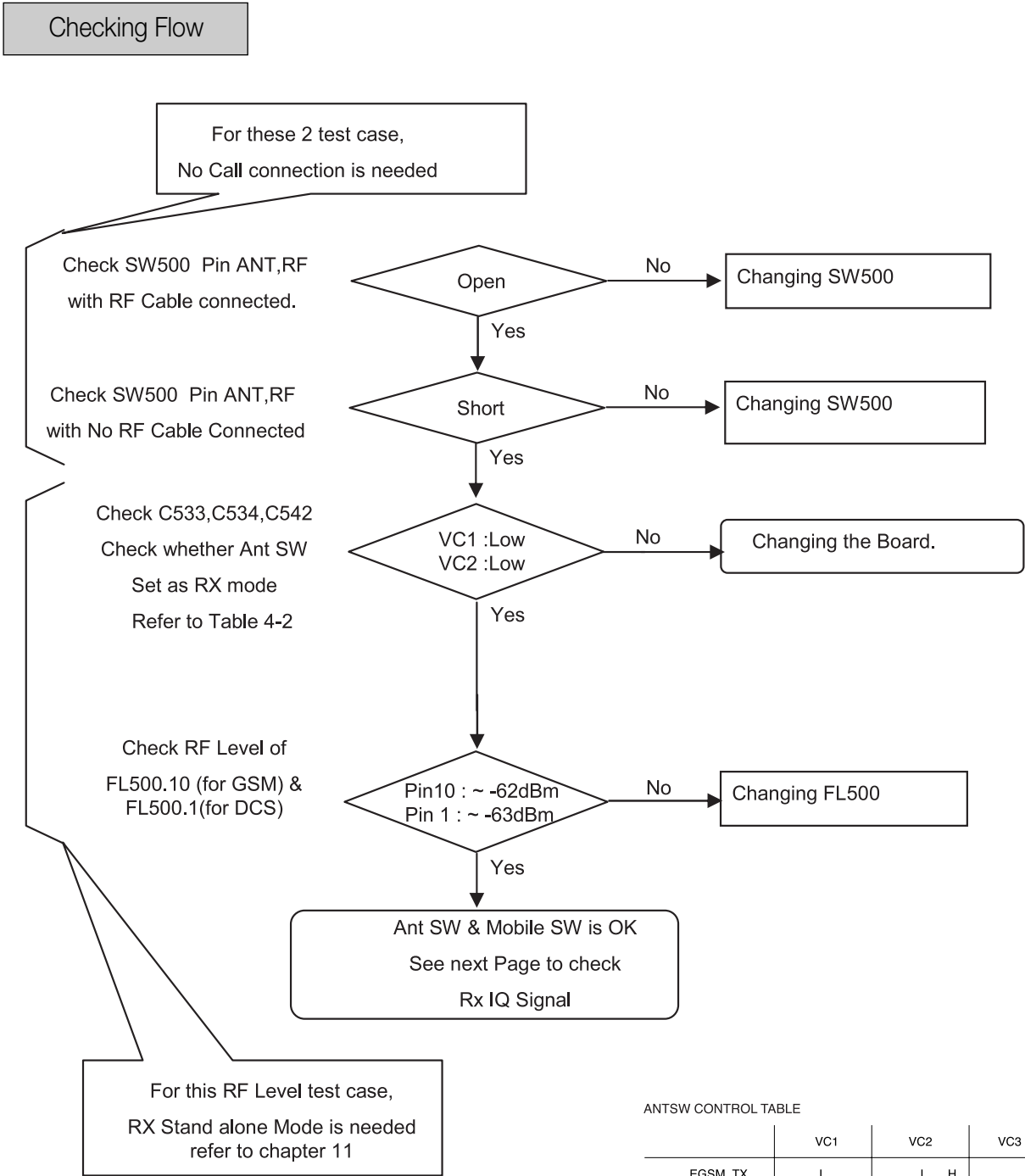
ANT SW Control GSM& DCS RX Mode
Graph 4-3

ANTSW CONTROL TABLE

	VC1	VC2	VC3
EGSM_TX	L	L H	
DCS/PCS_TX	L	H	L
EGSM/DCS_RX	L	L	L
PCS_Rx	H	L	L

Table 4-2

4. TROUBLE SHOOTING



ANTSW CONTROL TABLE

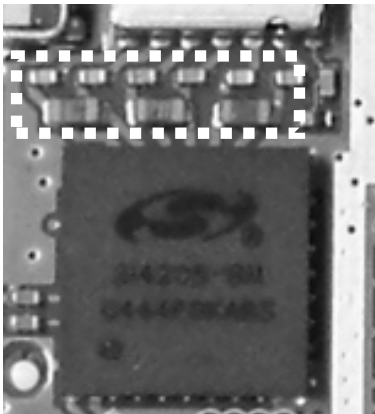
	VC1	VC2	VC3
EGSM_TX	L	L H	
DCS/PCS_TX	L	H	L
EGSM/DCS_RX	L	L	L
PCS_Rx	H	L	L

Table 4-2

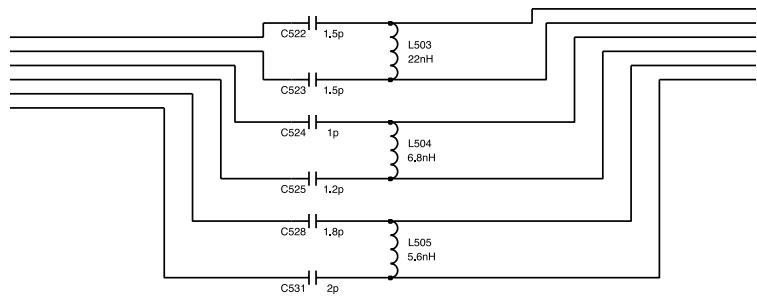
4. TROUBLE SHOOTING

(4) Checking RX path Circuit

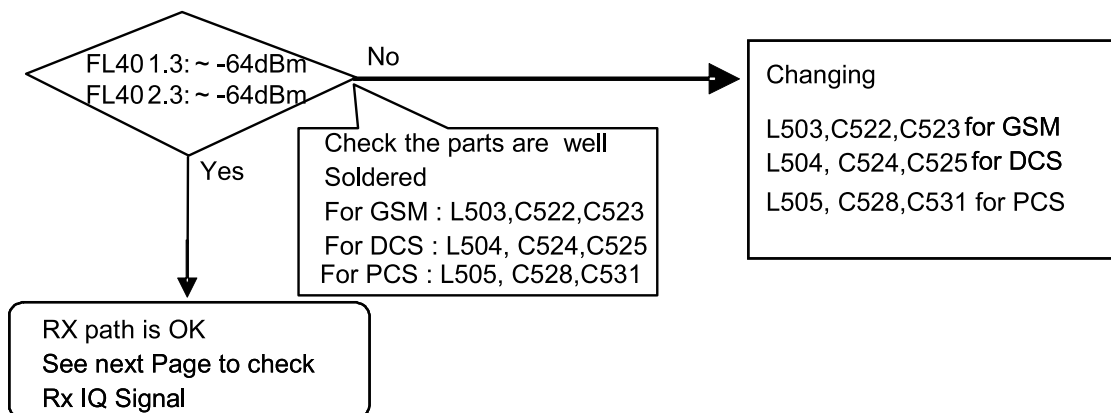
TEST POINT



CIRCUIT



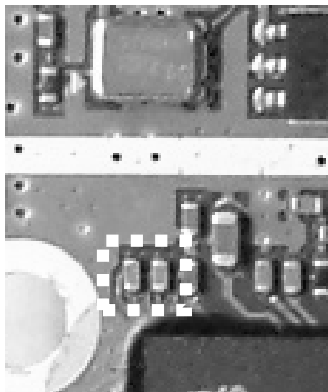
Checking Flow



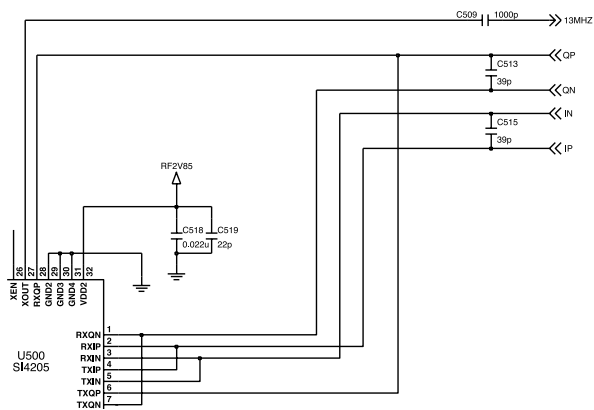
4. TROUBLE SHOOTING

(5) Checking RX IQ

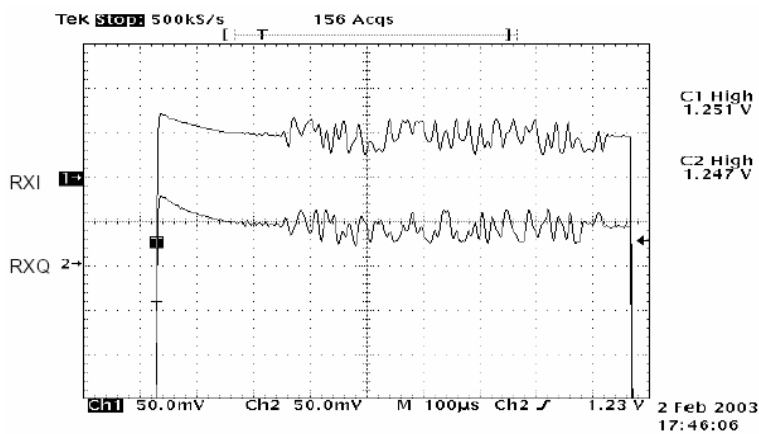
TEST POINT



CIRCUIT



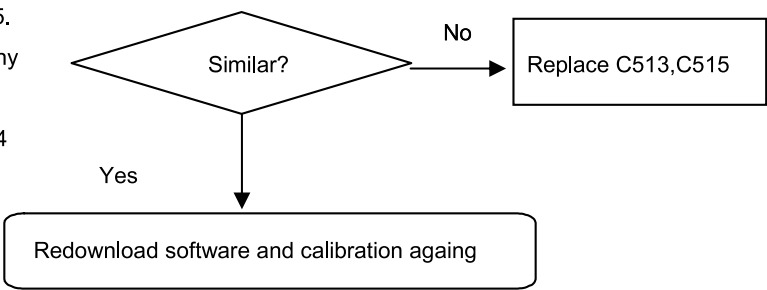
Waveform



Graph 4-4

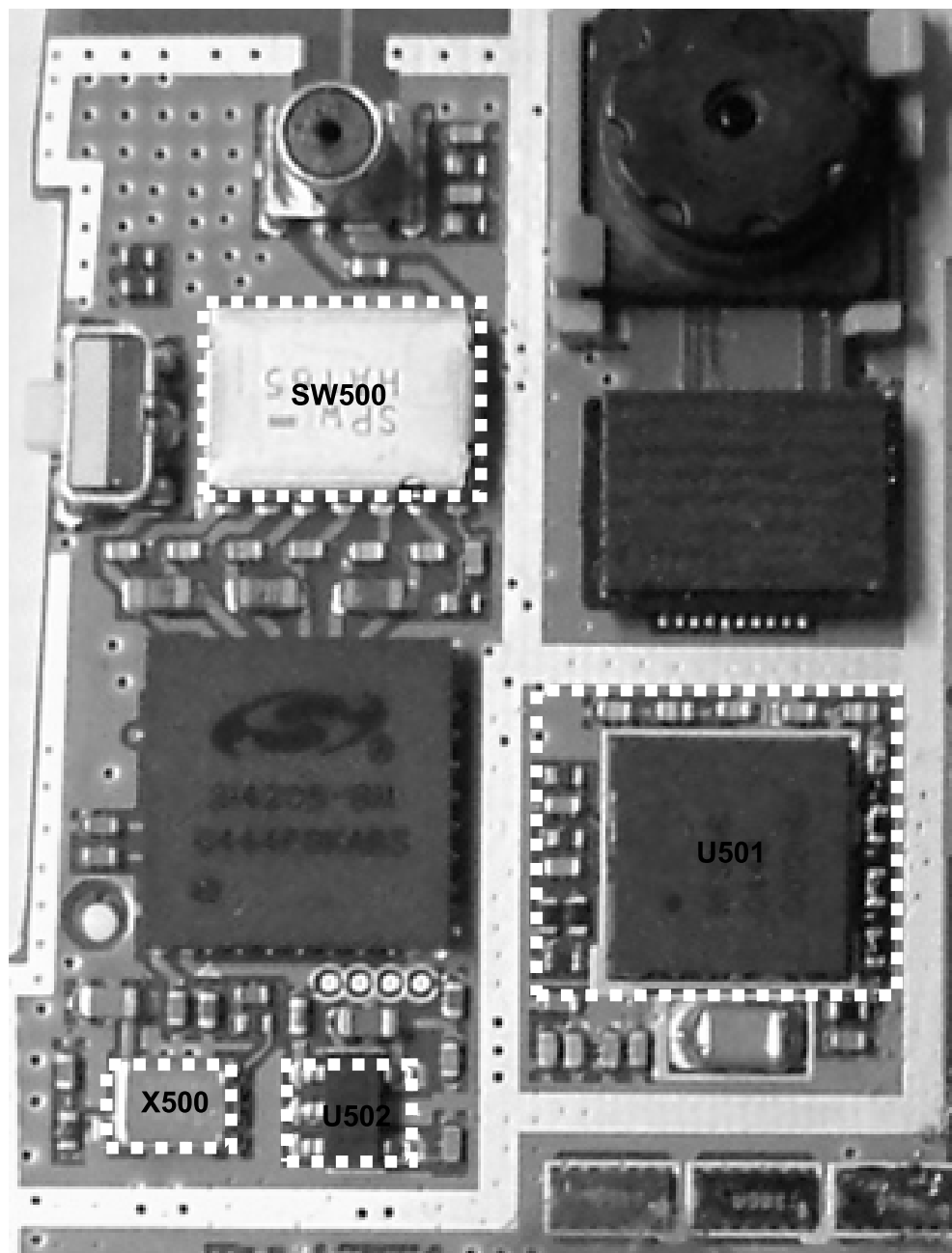
Checking Flow

Check C513,C515.
Check if there is any
Major difference
Refer to graph 4-4

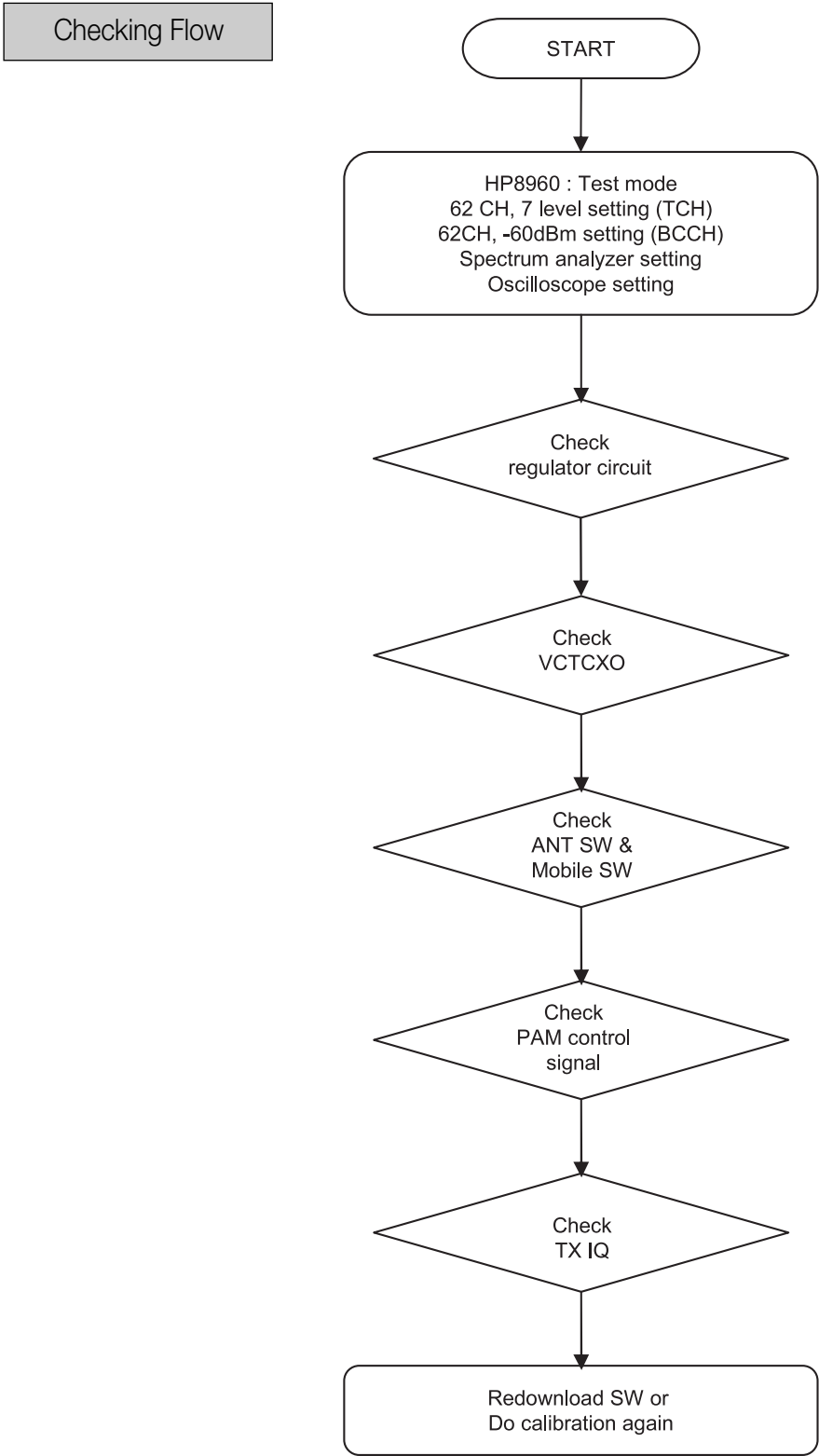


4.2 TX Trouble

TEST POINT

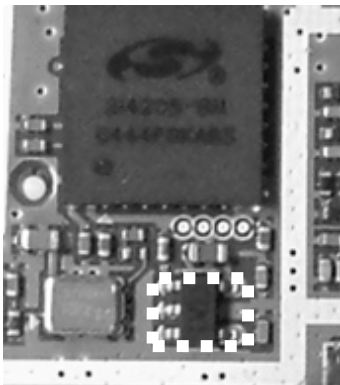


4. TROUBLE SHOOTING

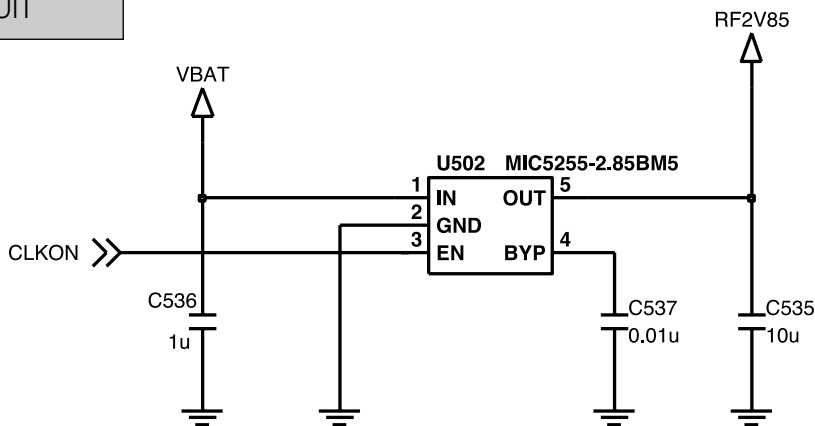


(1) Checking Regulator Circuit

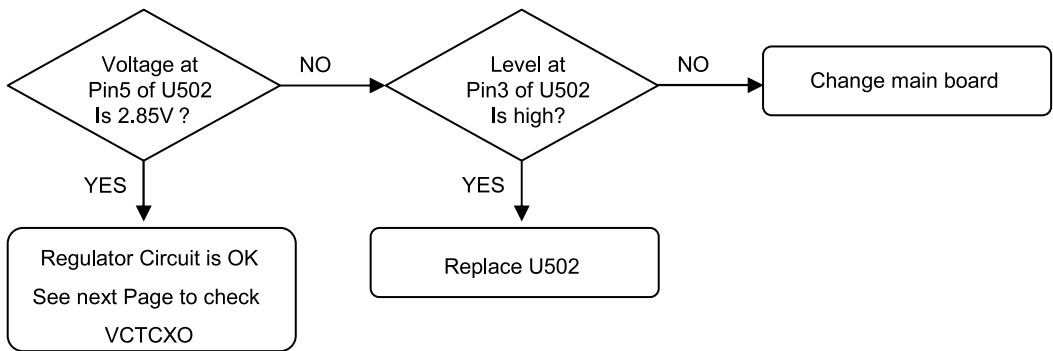
TEST POINT



CIRCUIT



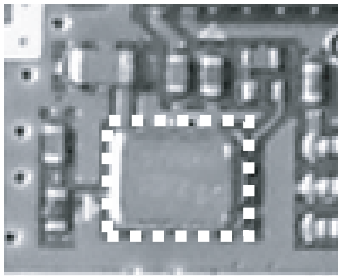
Checking Flow



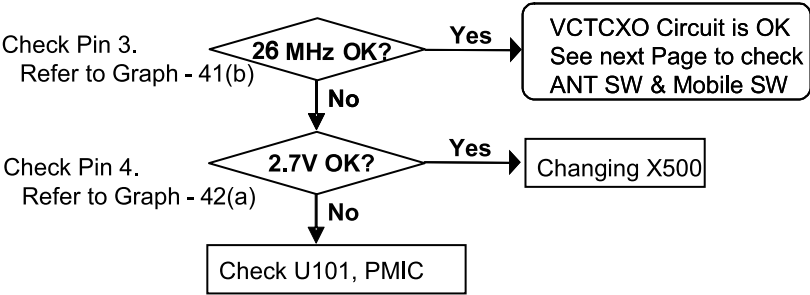
4. TROUBLE SHOOTING

(2) Checking VCTCXO Circuit

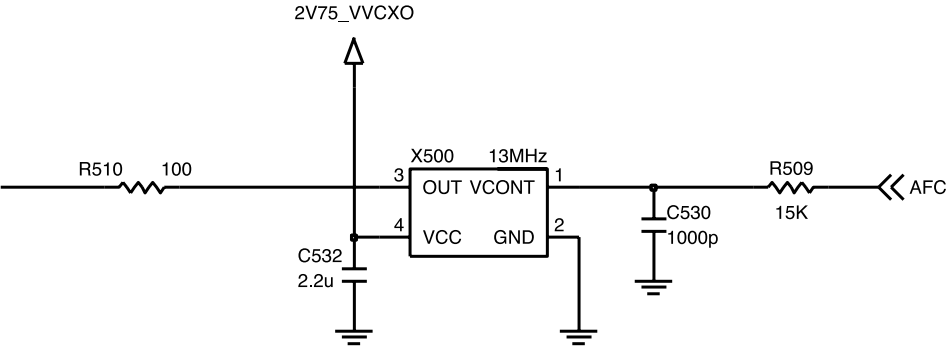
TEST POINT



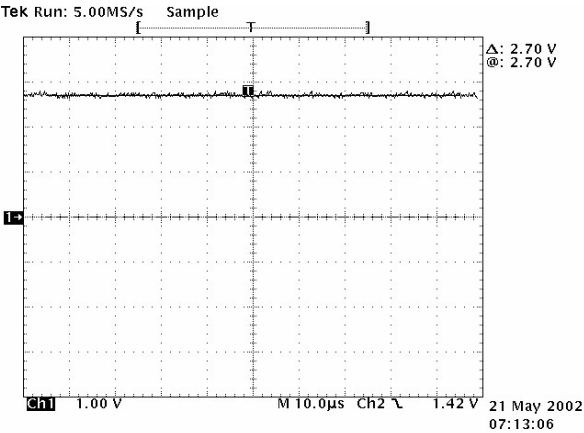
Checking Flow



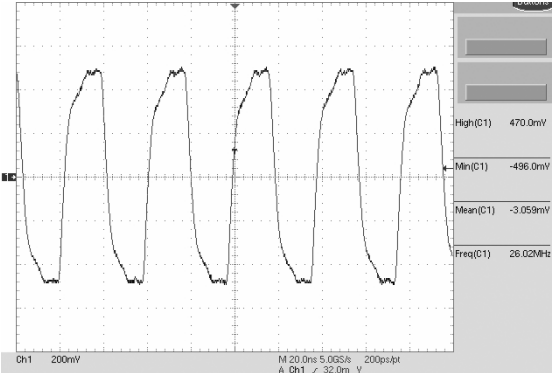
CIRCUIT



Waveform



Graph 4-1(a)

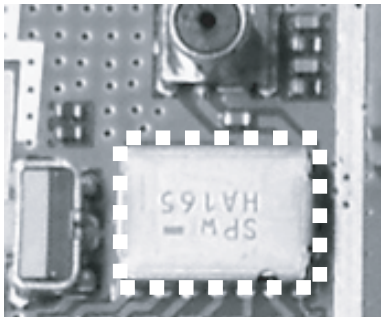


Graph 4-1(b)

4. TROUBLE SHOOTING

(3) Checking Ant SW & Mobile SW

TEST POINT



CIRCUIT

Waveform

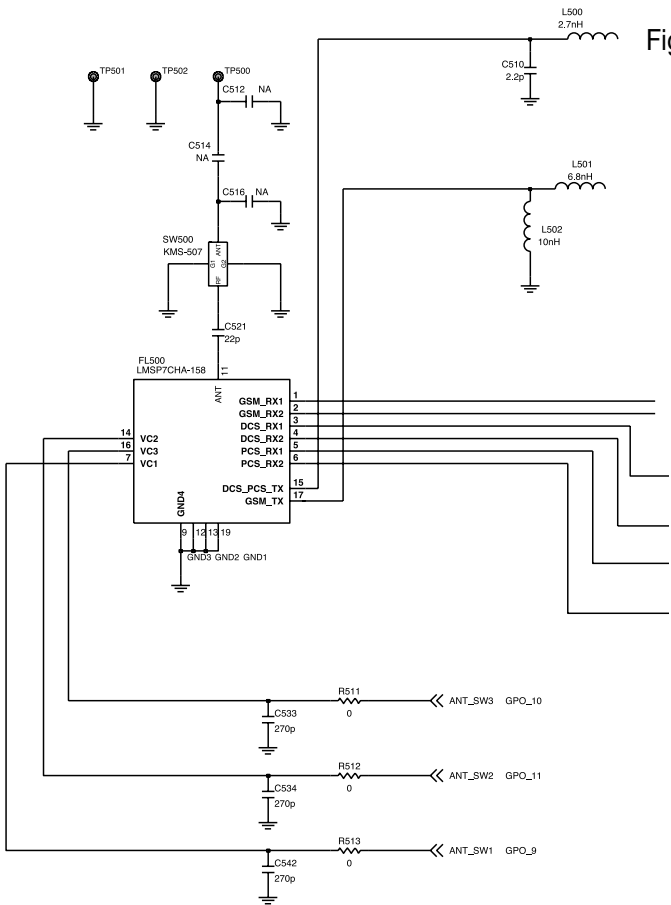
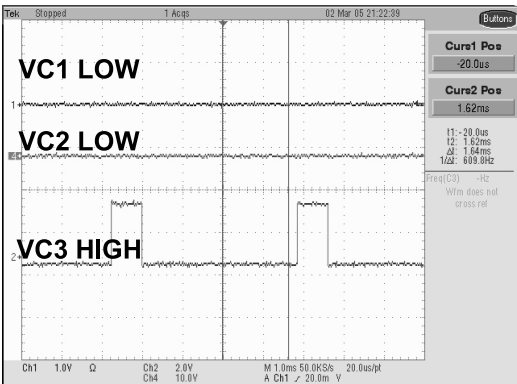
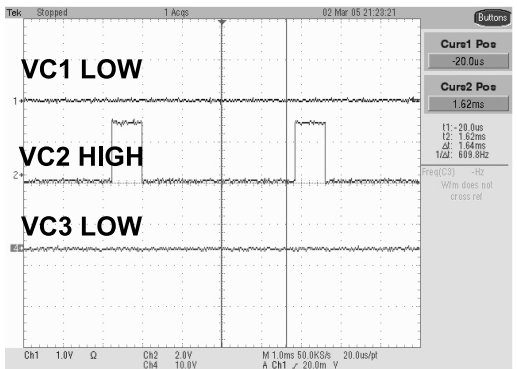


Figure 4-5



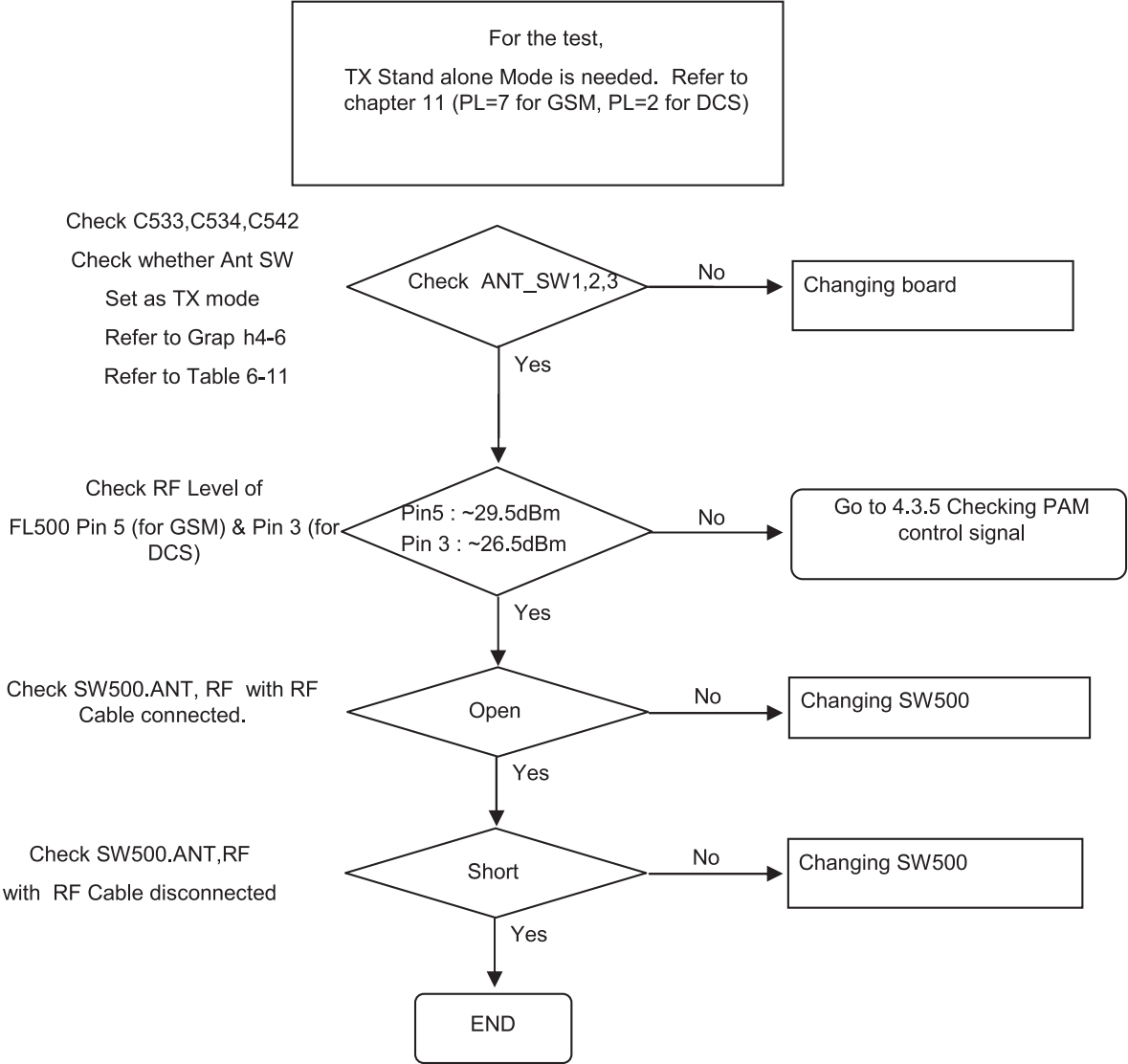
Graph 4-6(a)



Graph 4-6(b)

4. TROUBLE SHOOTING

Checking Flow



ANTSW CONTROL TABLE

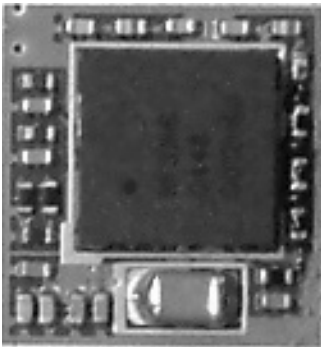
	VC1	VC2	VC3
EGSM_TX	L	L H	
DCS/PCS_TX	L	H	L
EGSM/DCS_RX	L	L	L
PCS_Rx	H	L	L

Table 4-3

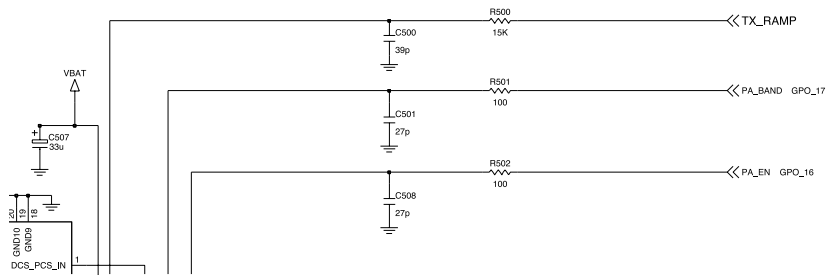
4. TROUBLE SHOOTING

(4) Checking PAM Control Signal

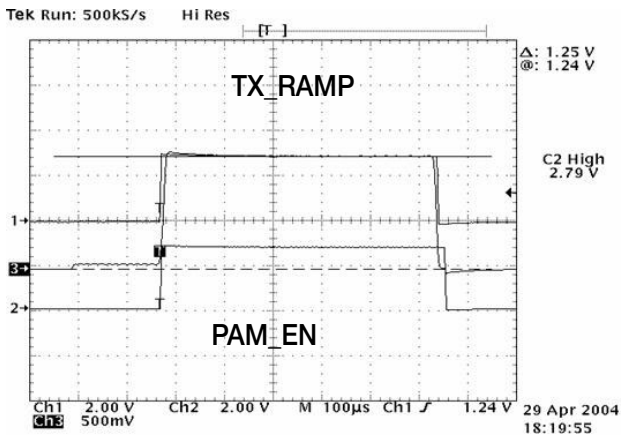
TEST POINT



Checking Flow



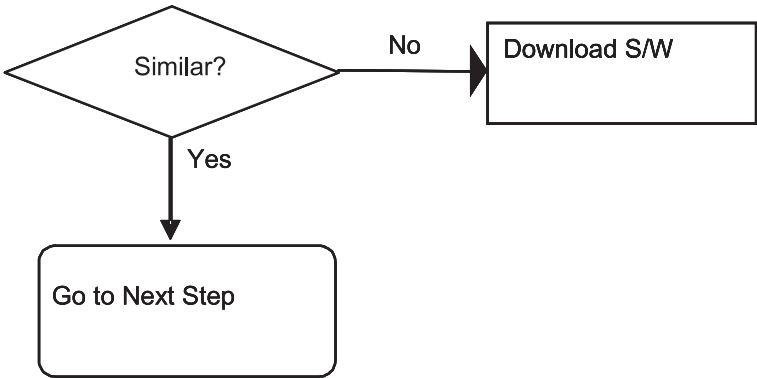
Waveform



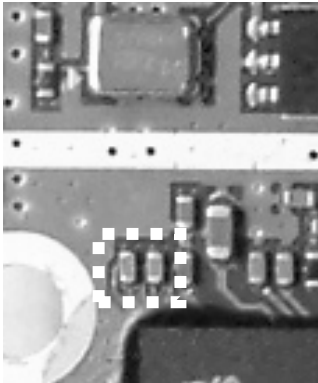
Graph 4-7

Checking Flow

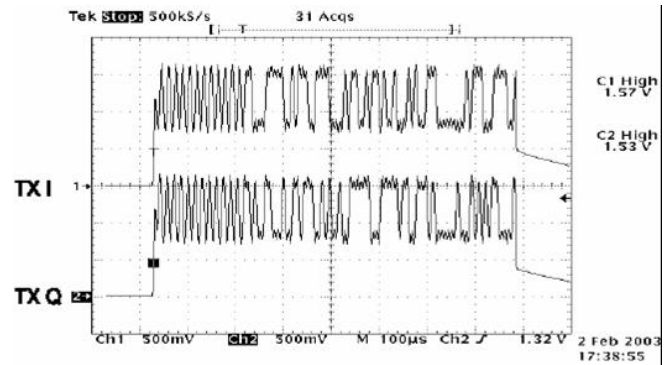
Check TX-RAMP and PA-EN
Check if there is
Any Major Difference or not
Refer to Graph 4 - 7



TEST POINT

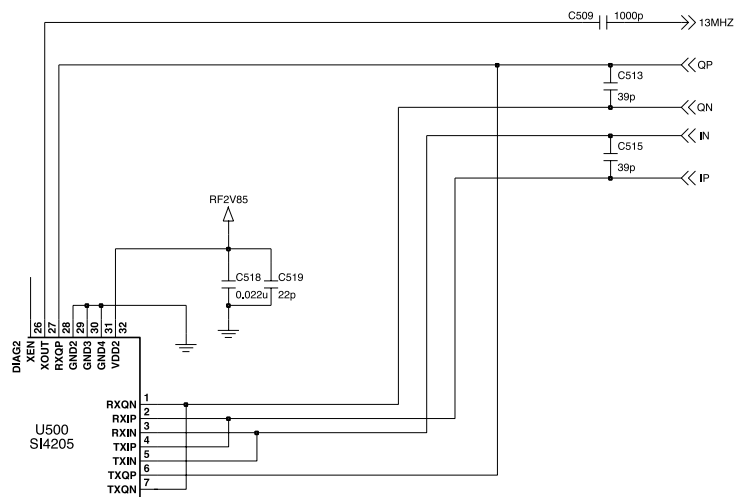


Waveform



Graph 4-8

CIRCUIT



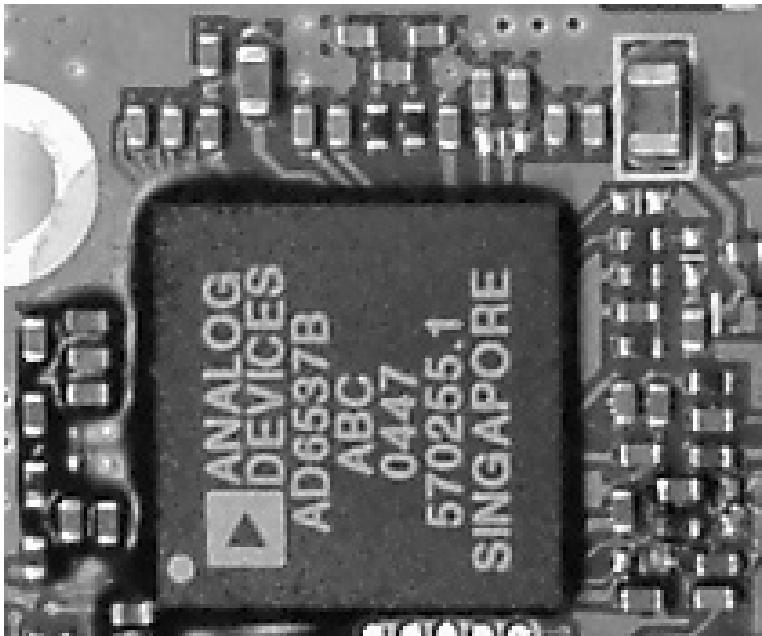
Checking Flow

```

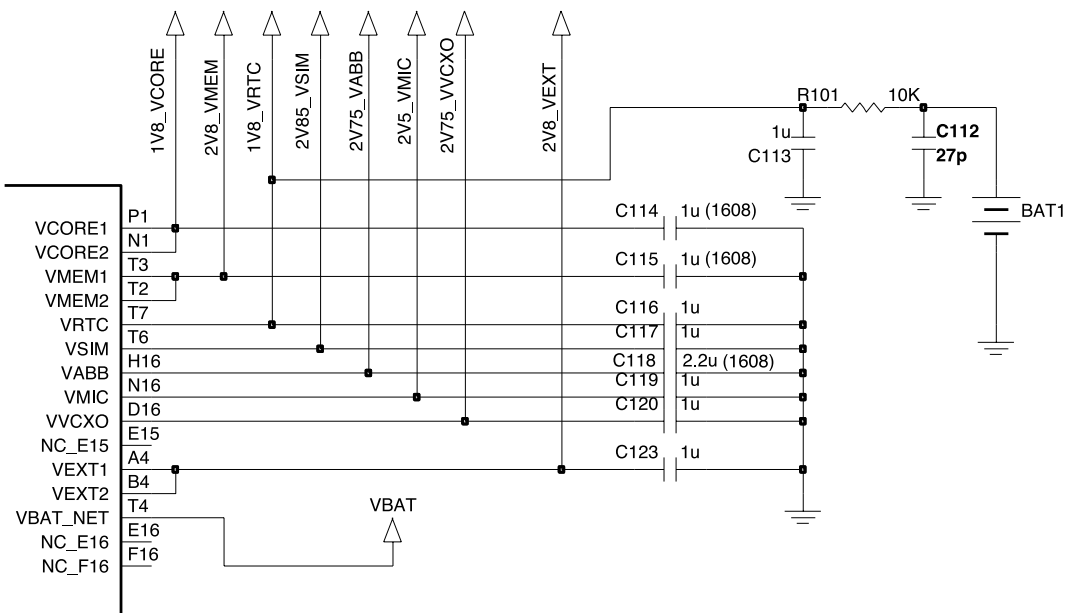
graph TD
    A{Similar?} -- No --> B[Replace U101]
    A -- Yes --> C[Redownload the Software  
And calibrate]
  
```

4.3 Power On Trouble

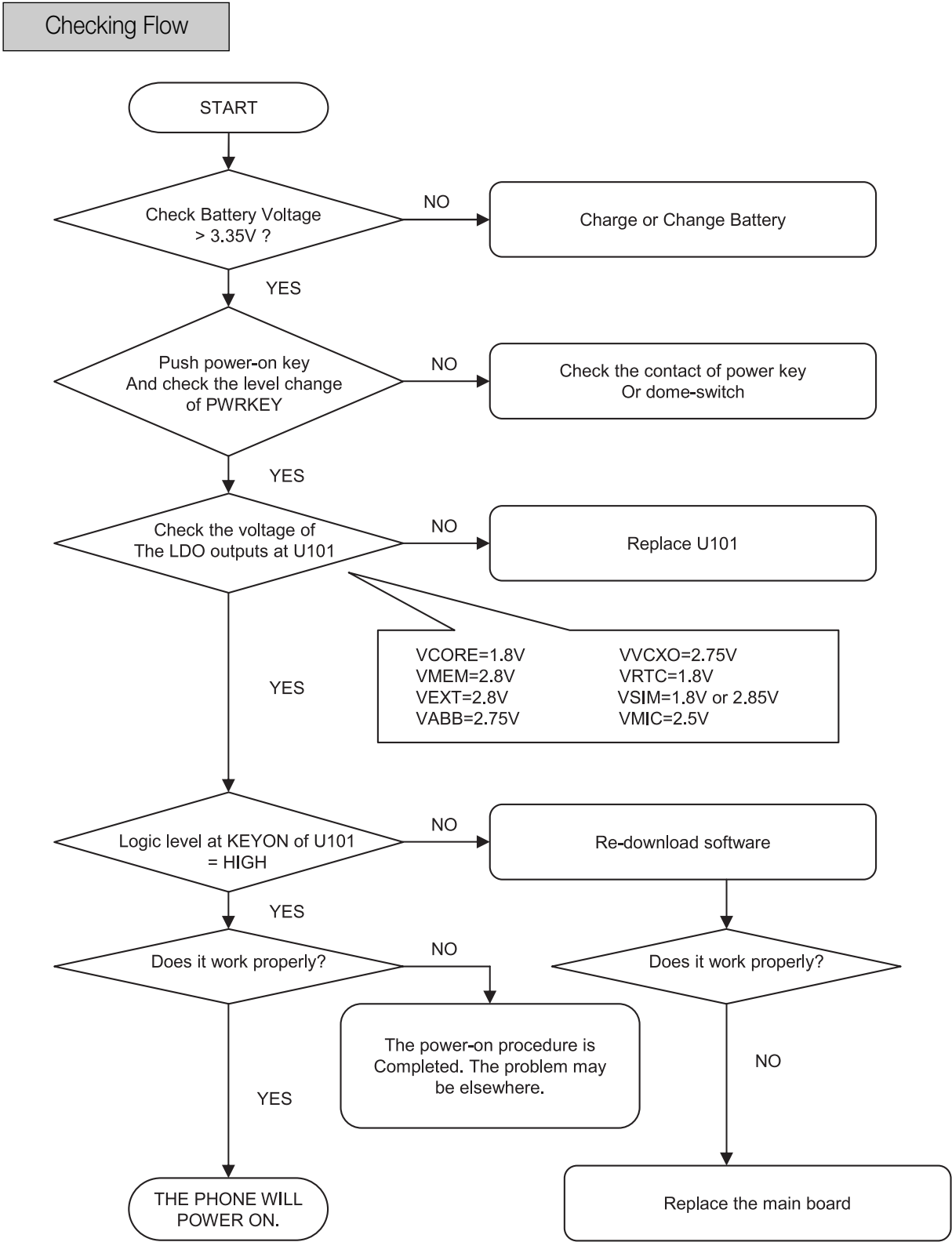
TEST POINT



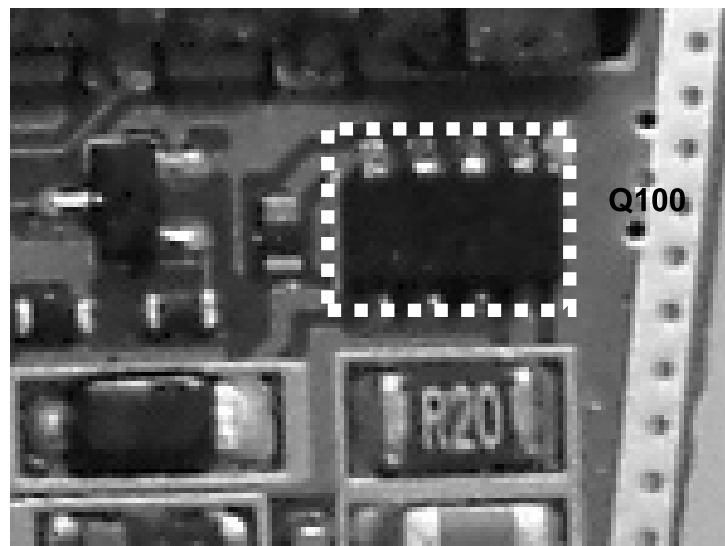
CIRCUIT



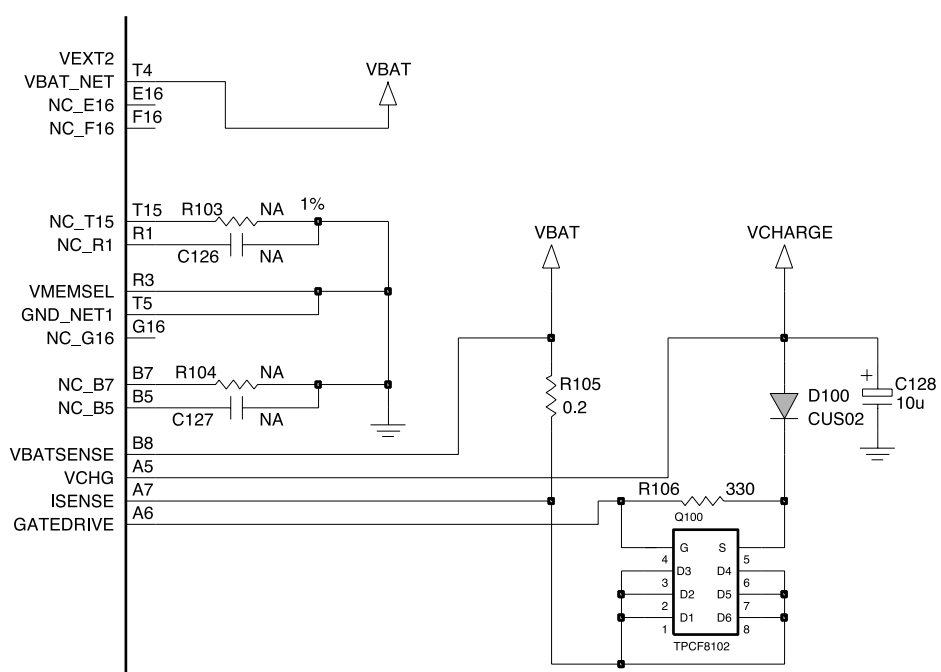
4. TROUBLE SHOOTING



TEST POINT

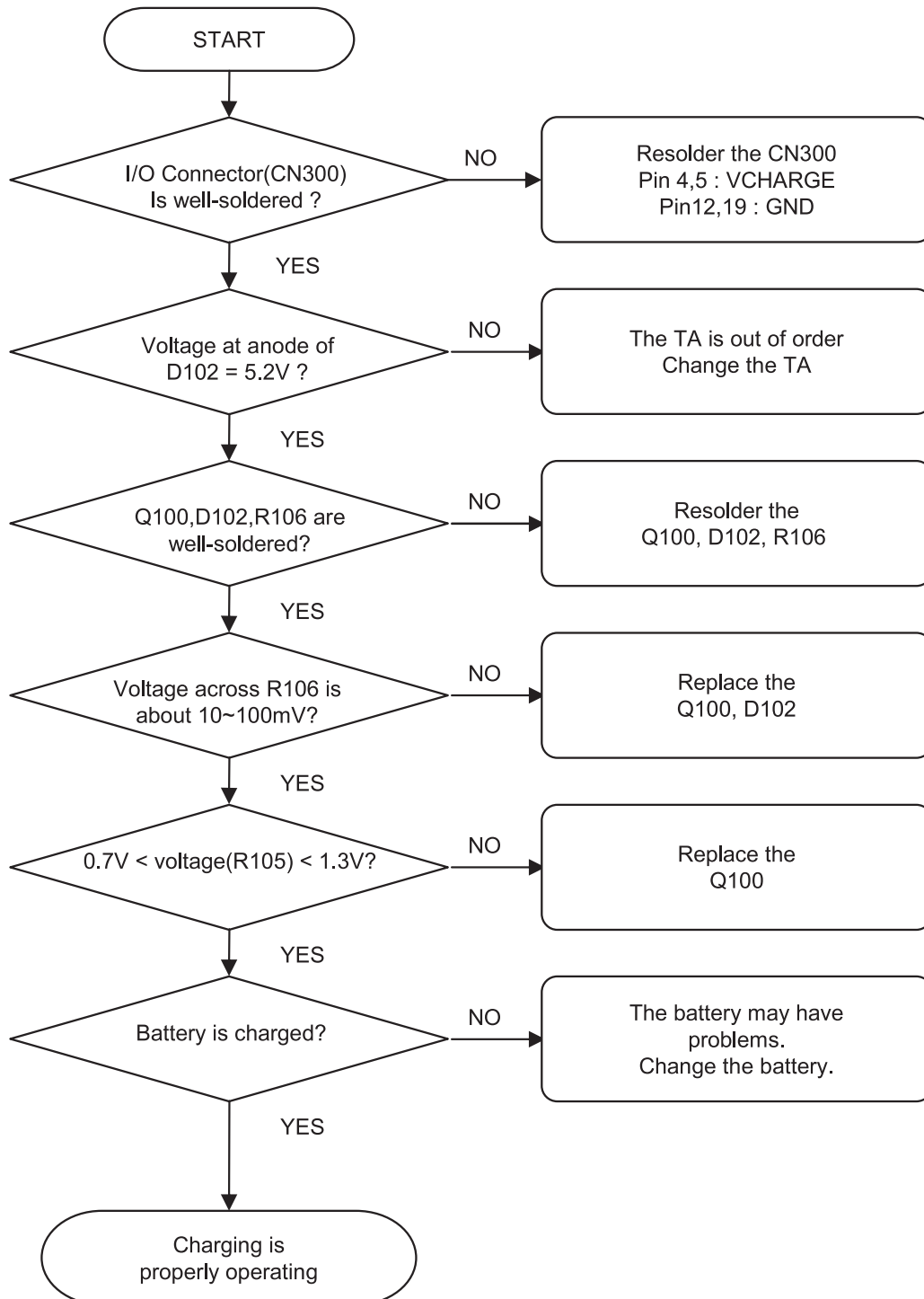


CIRCUIT



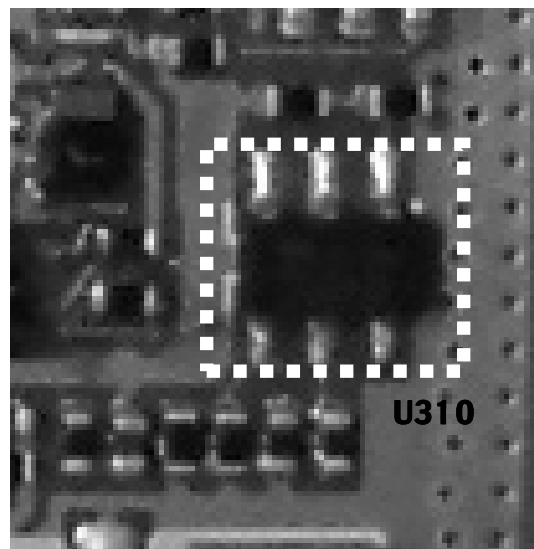
4. TROUBLE SHOOTING

Checking Flow

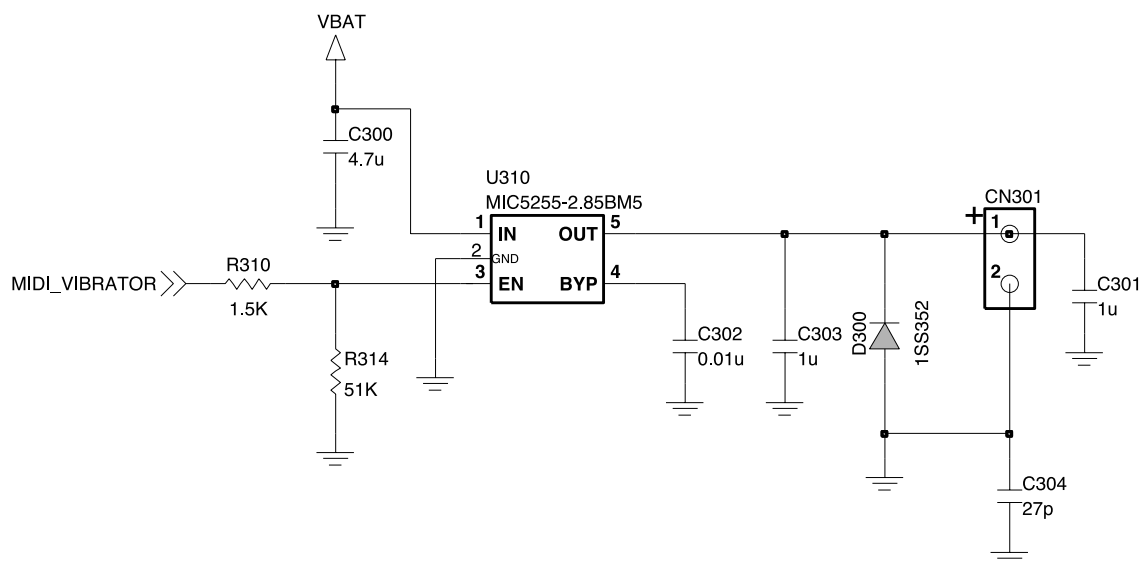


4.5 Vibrator Trouble

TEST POINT



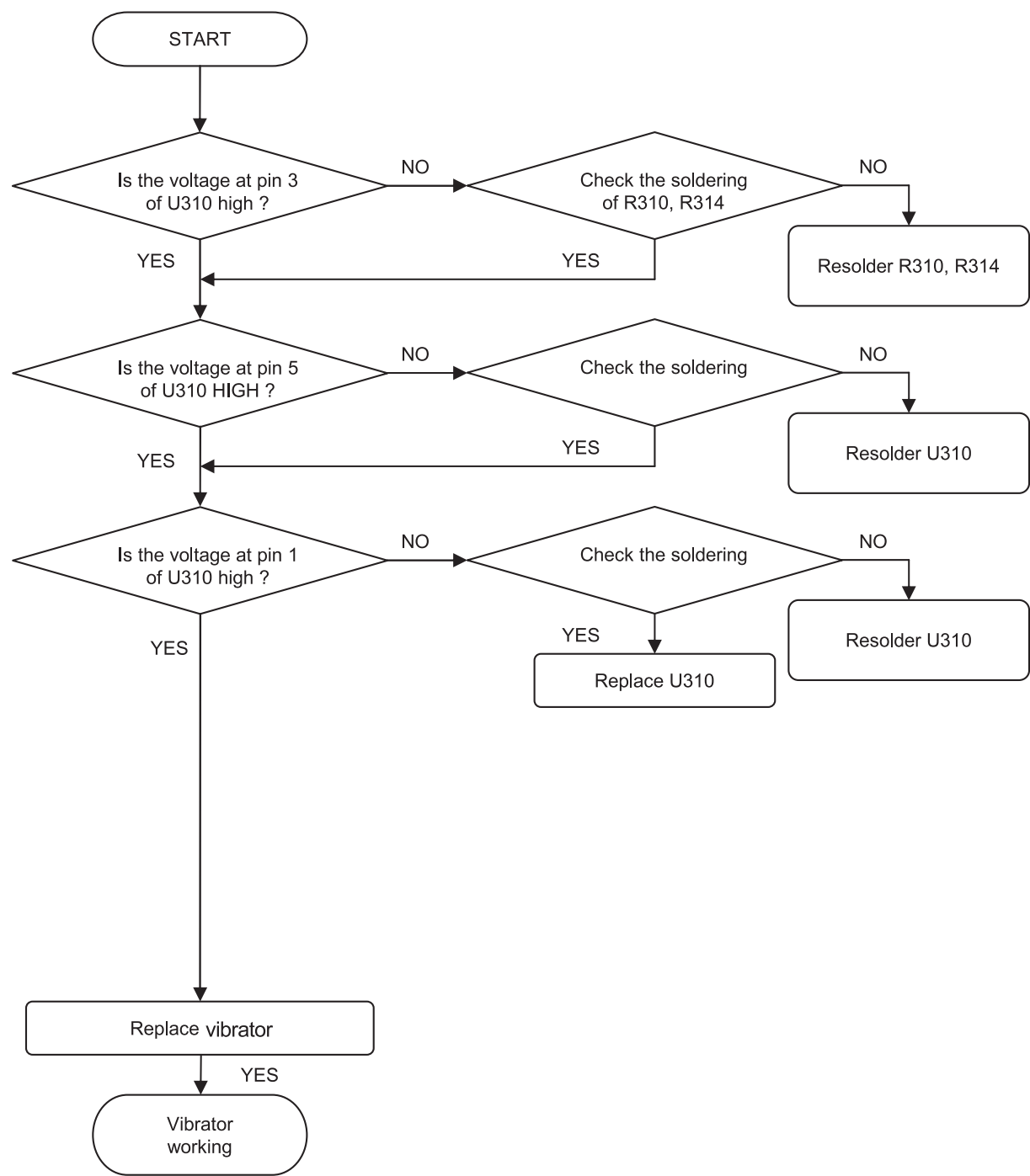
CIRCUIT



4. TROUBLE SHOOTING

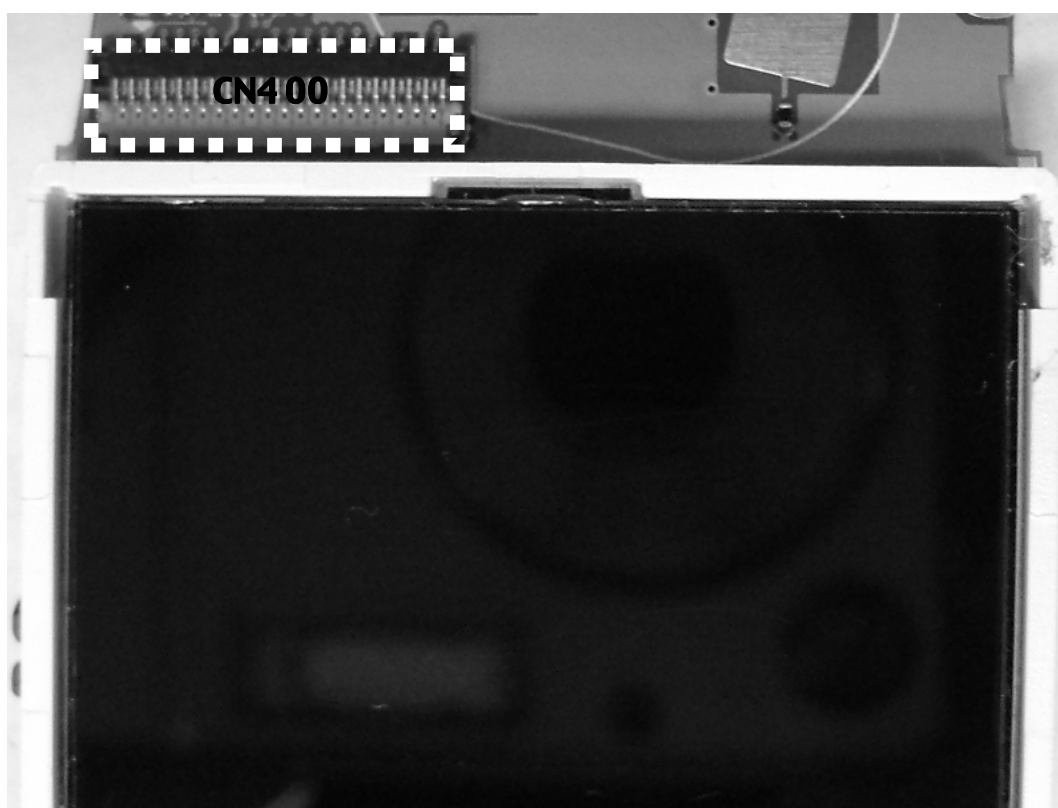
Checking Flow

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu

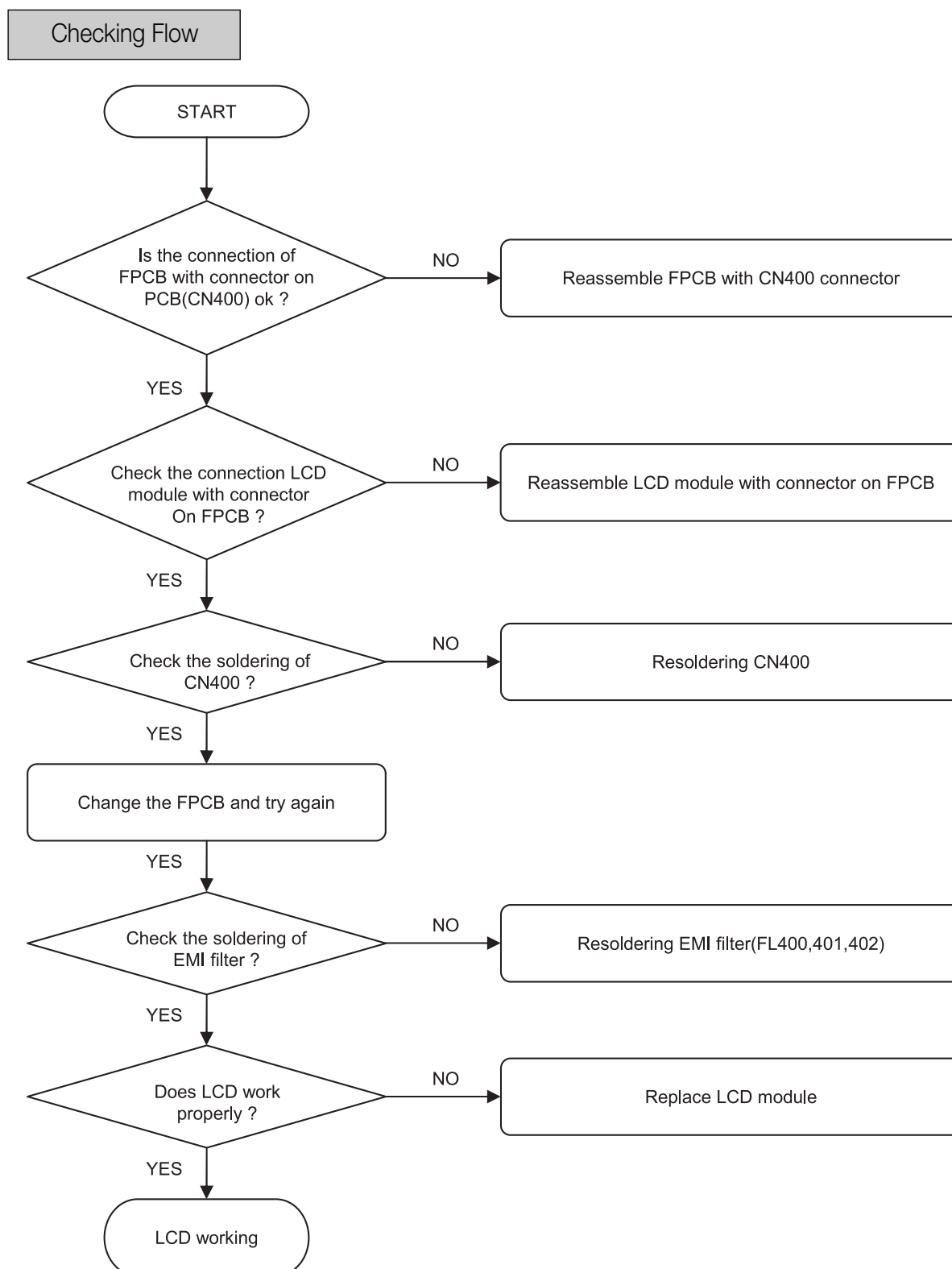


4.6 LCD Trouble

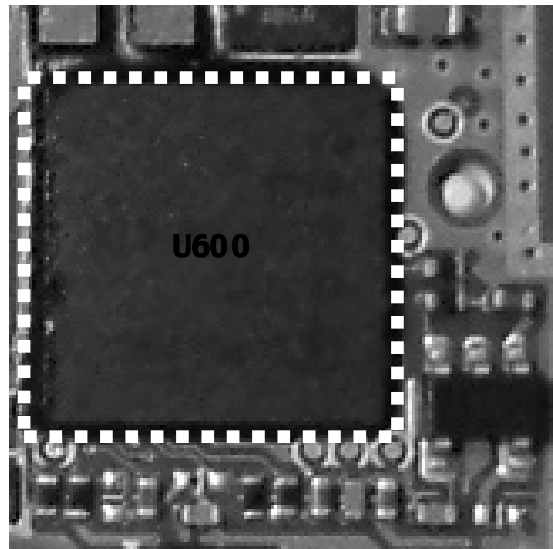
TEST POINT



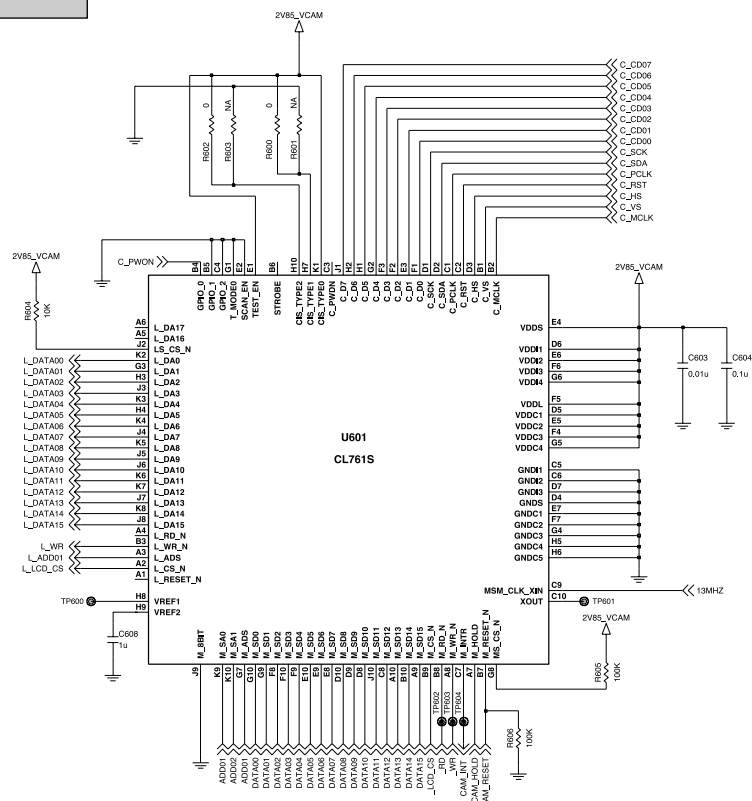
4. TROUBLE SHOOTING



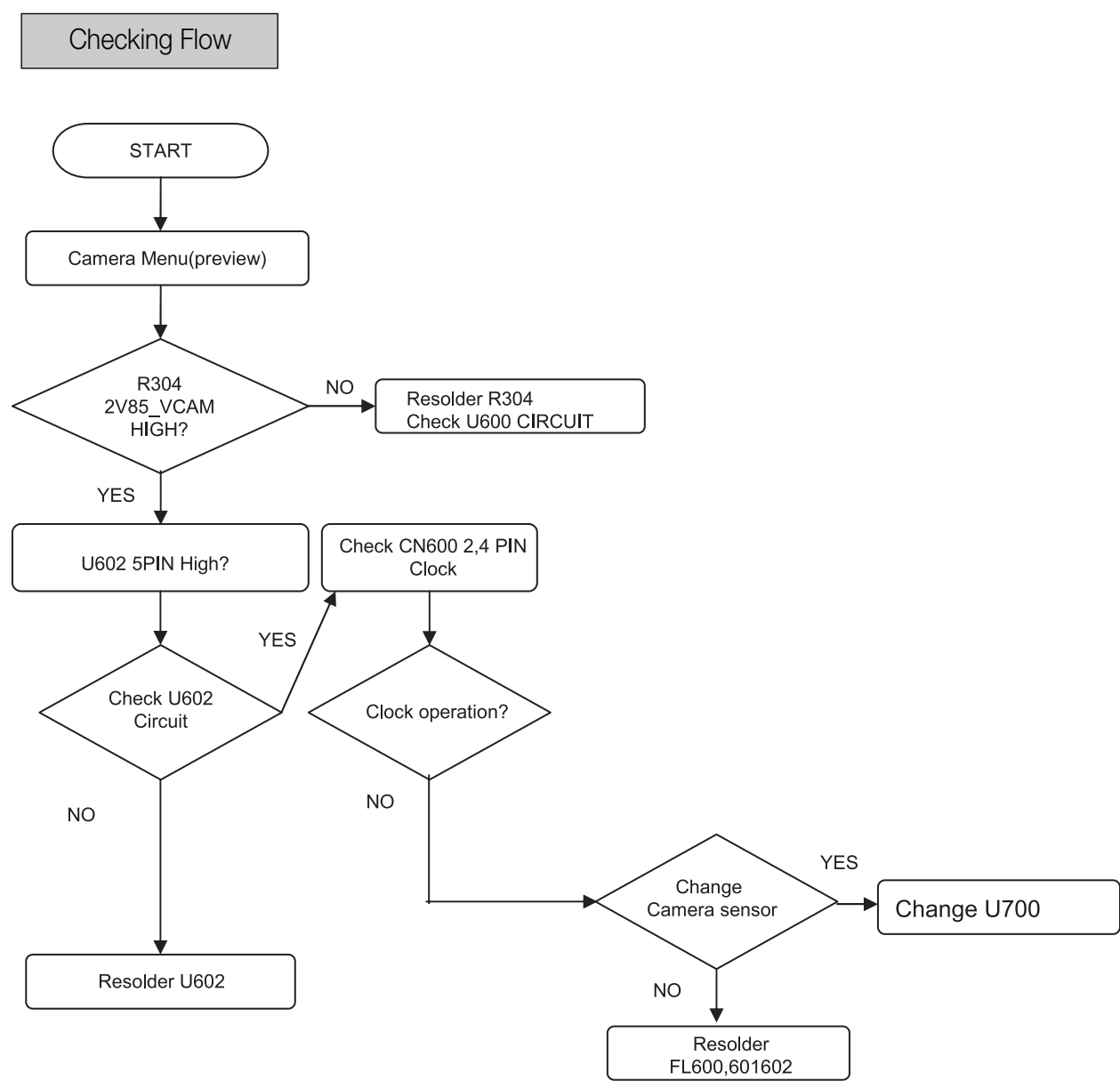
TEST POINT



CIRCUIT DIAGRAM

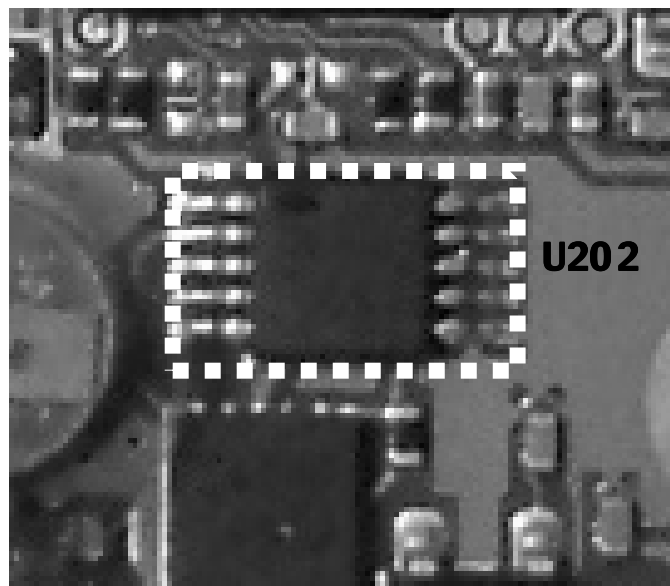


4. TROUBLE SHOOTING

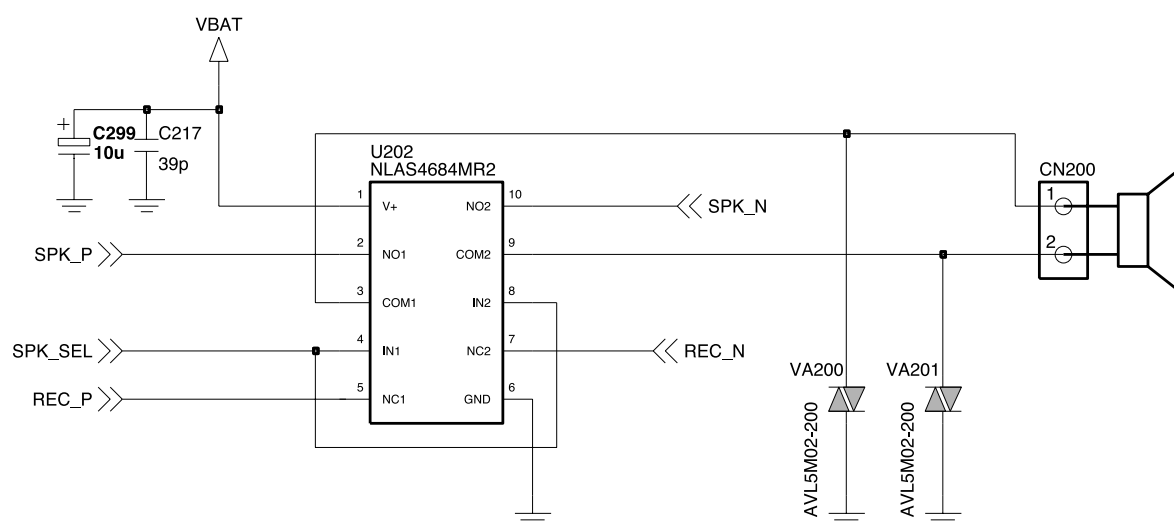


4.8 Speaker Trouble

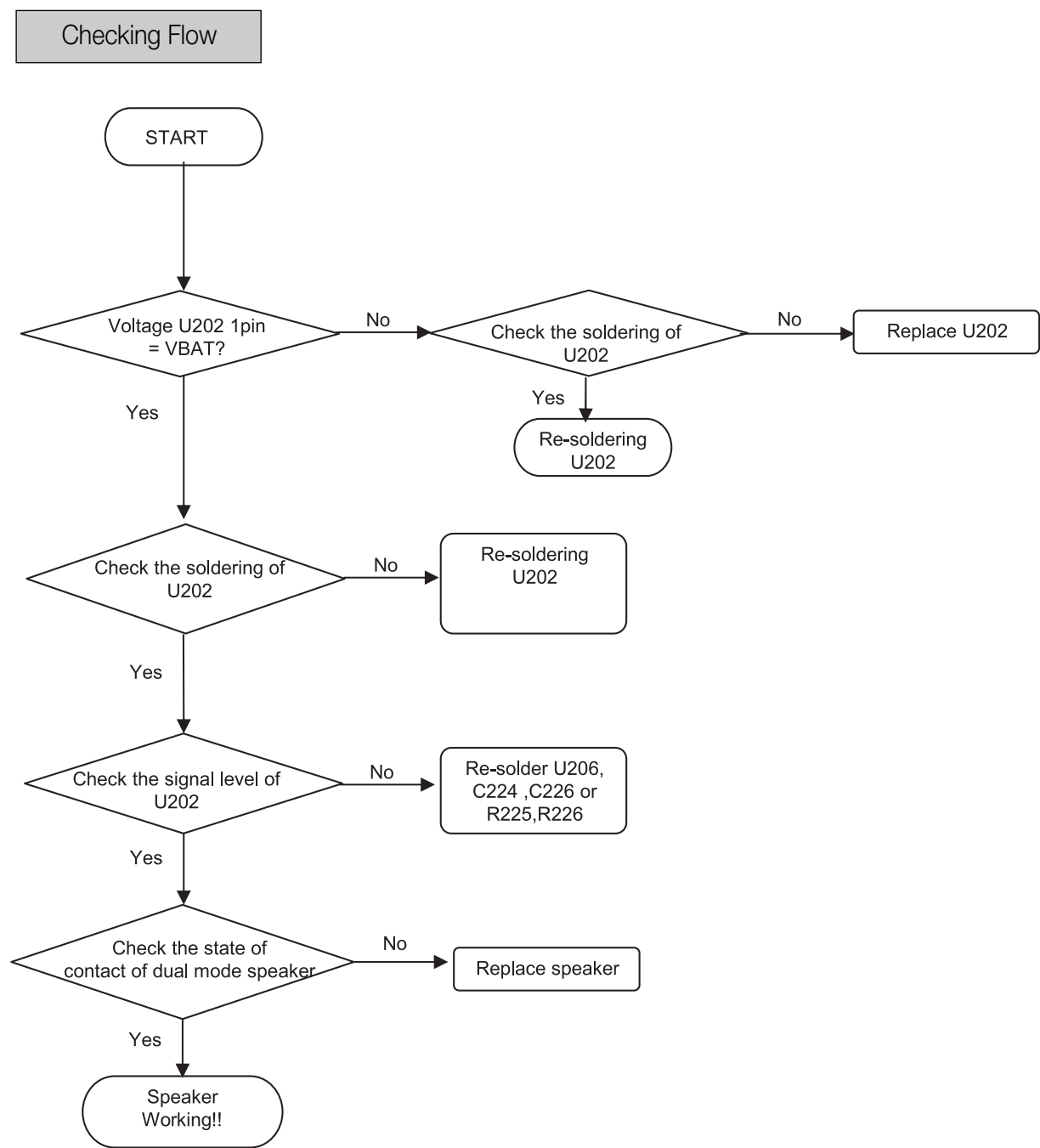
TEST POINT



CIRCUIT DIAGRAM

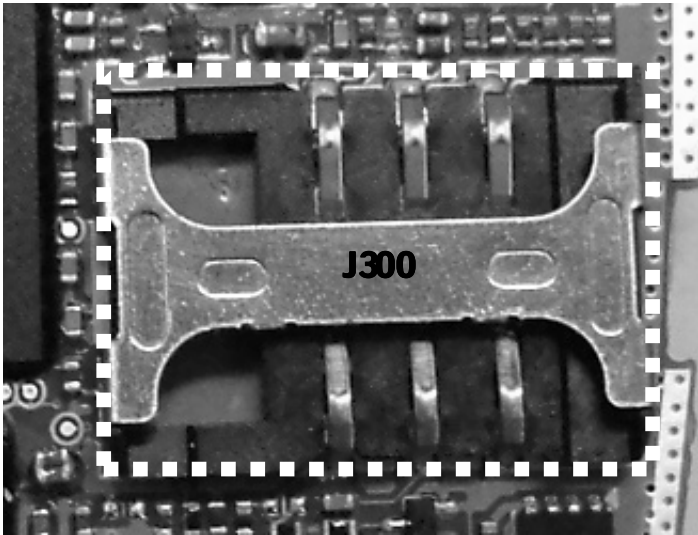


4. TROUBLE SHOOTING



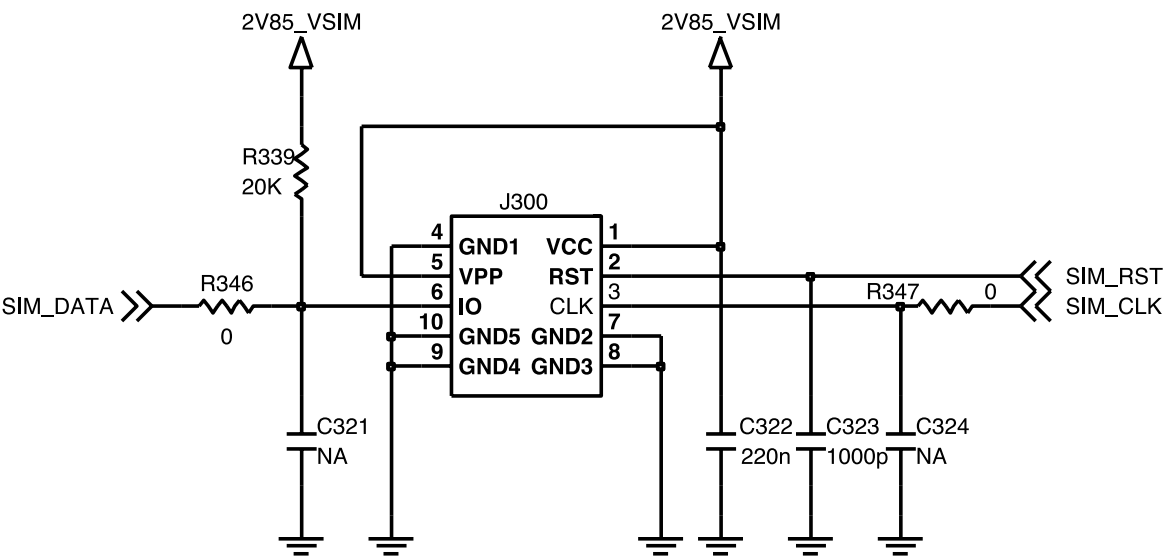
4.9 SIM Card Interface Trouble

TEST POINT

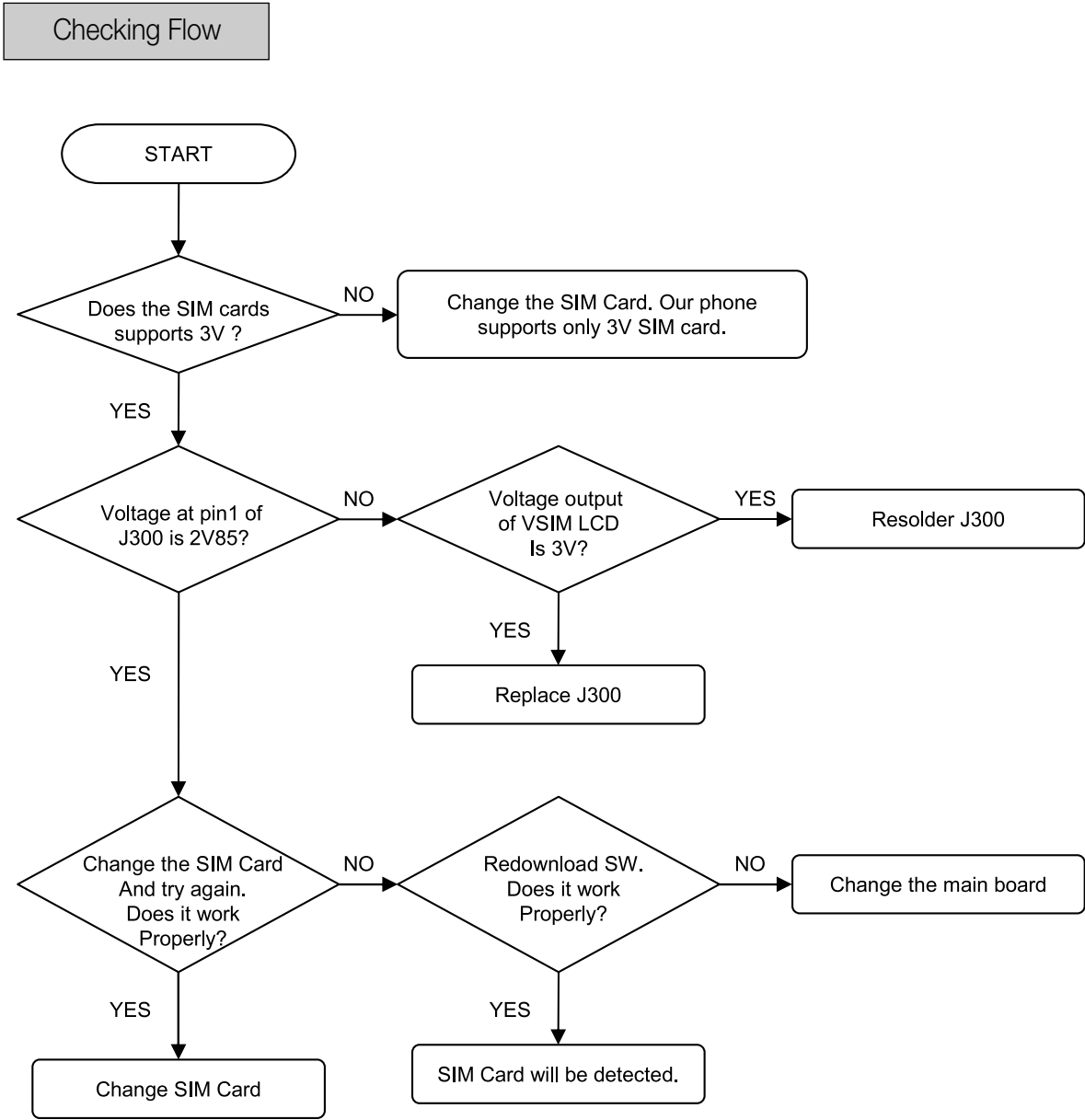


CIRCUIT DIAGRAM

SIM CONNECTOR



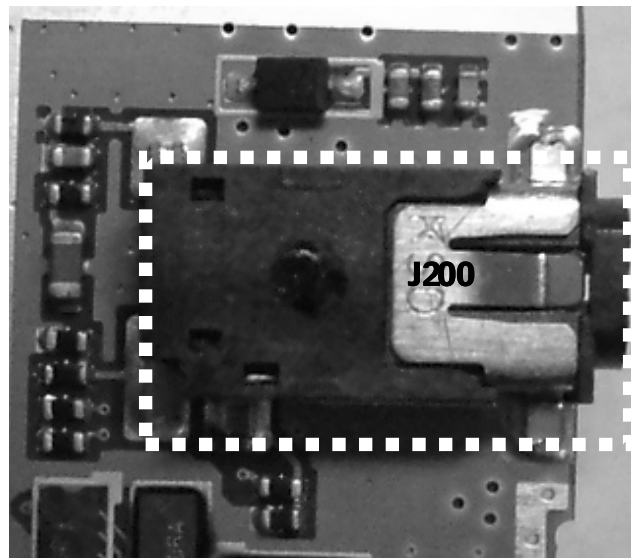
4. TROUBLE SHOOTING



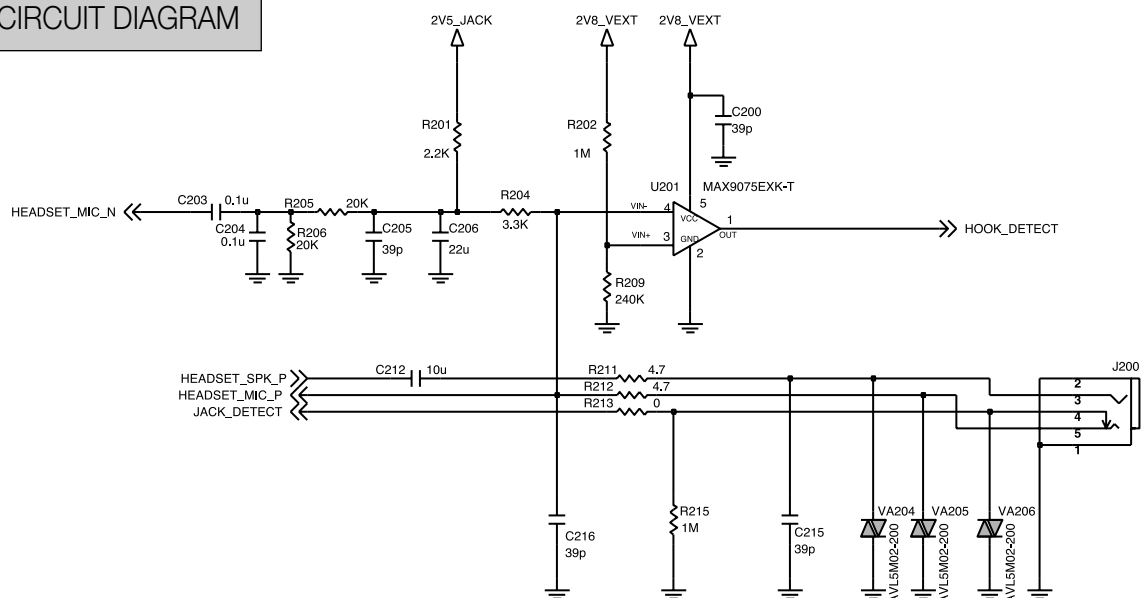
4. TROUBLE SHOOTING

4.10 Earphone Trouble

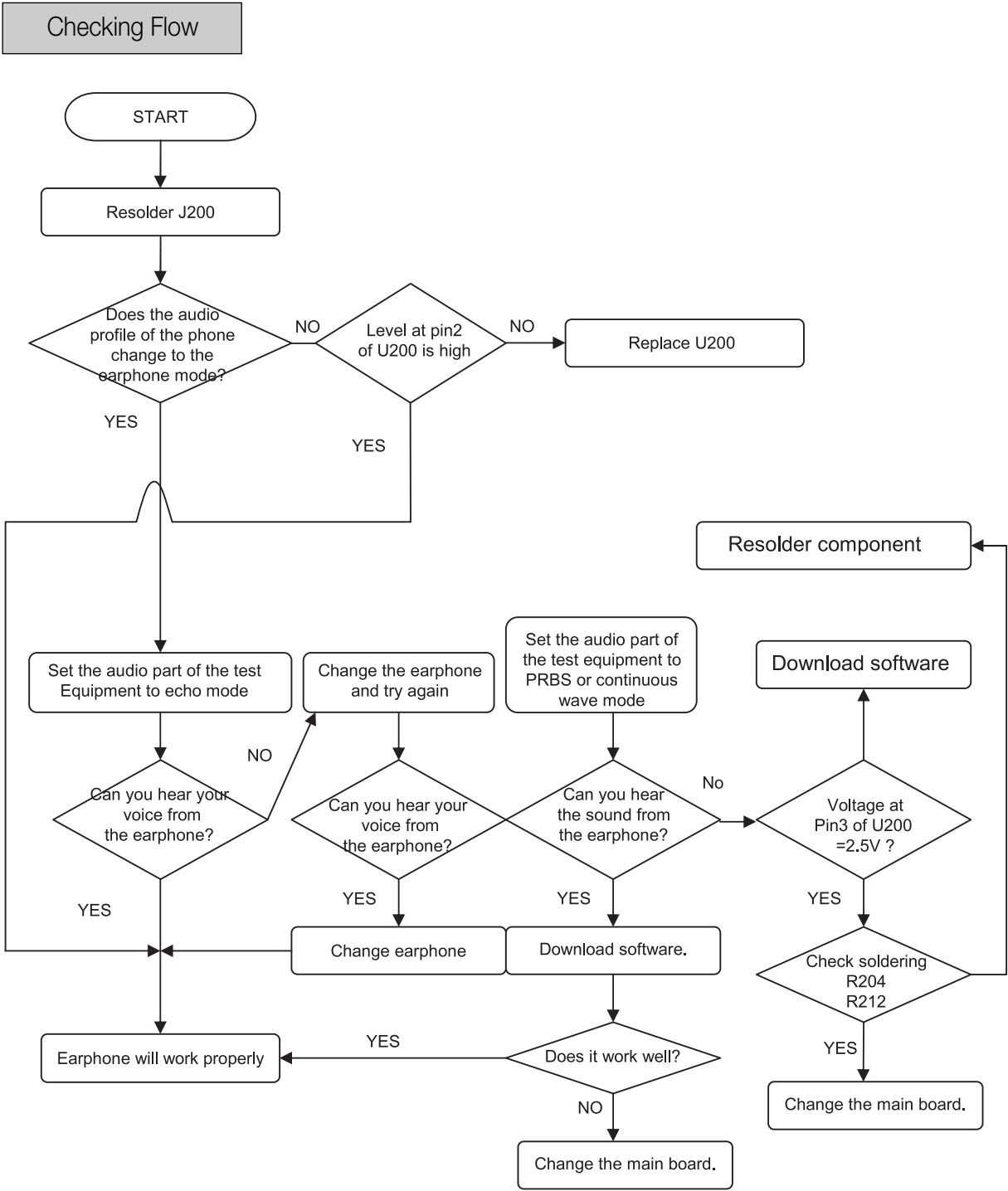
TEST POINT



CIRCUIT DIAGRAM

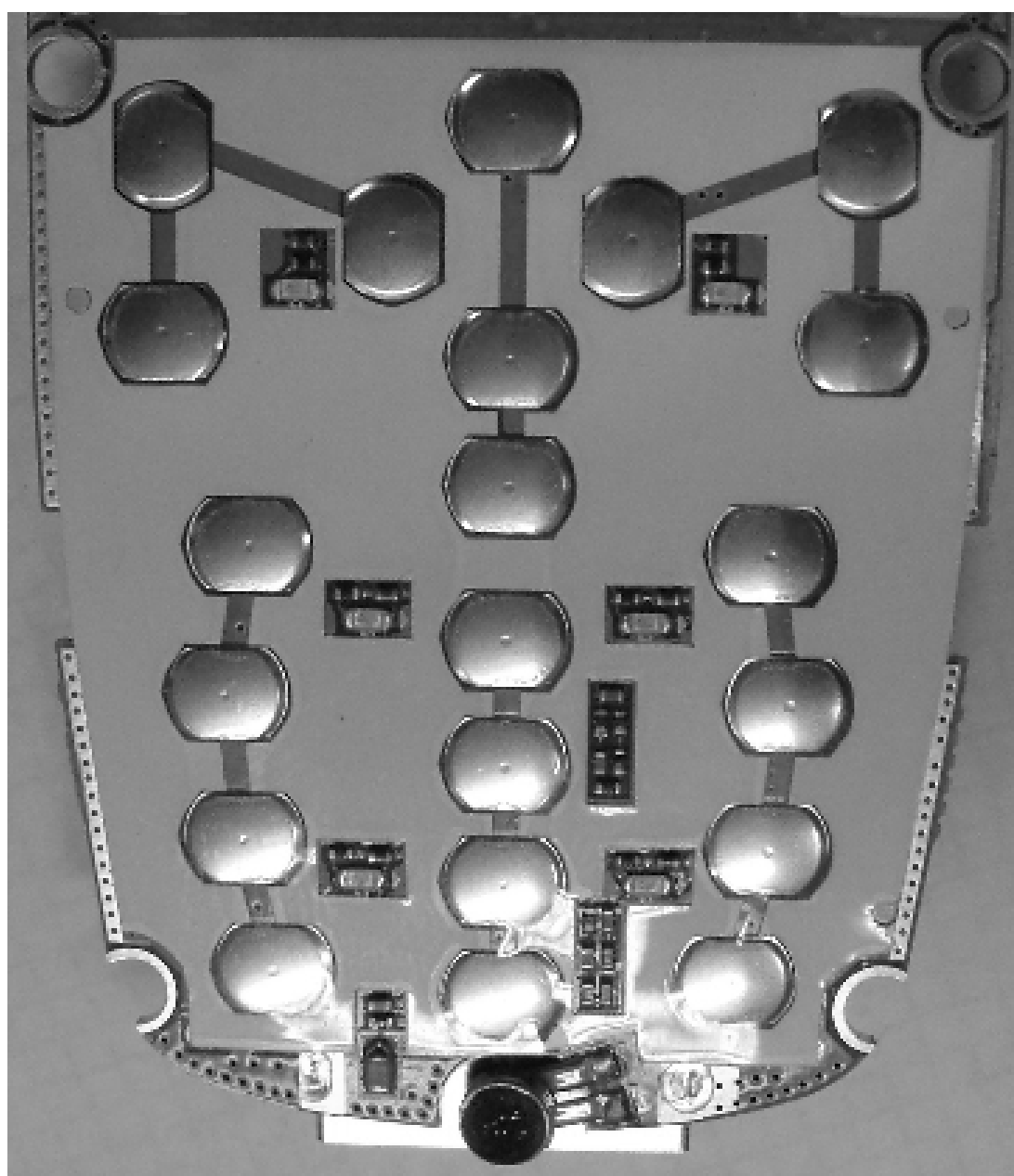


4. TROUBLE SHOOTING



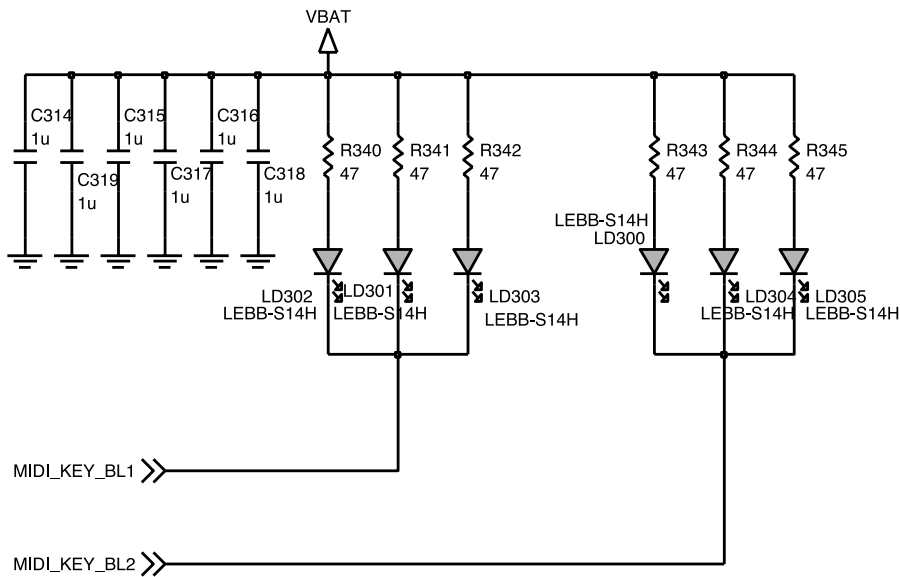
4.11 KEY backlight Trouble

TEST POINT

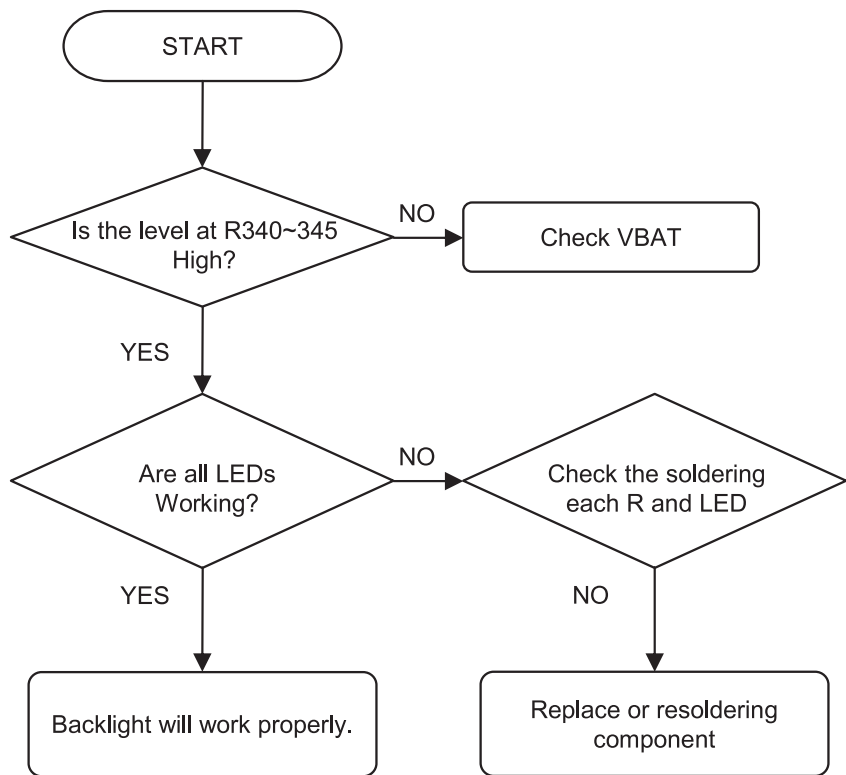


4. TROUBLE SHOOTING

CIRCUIT DIAGRAM

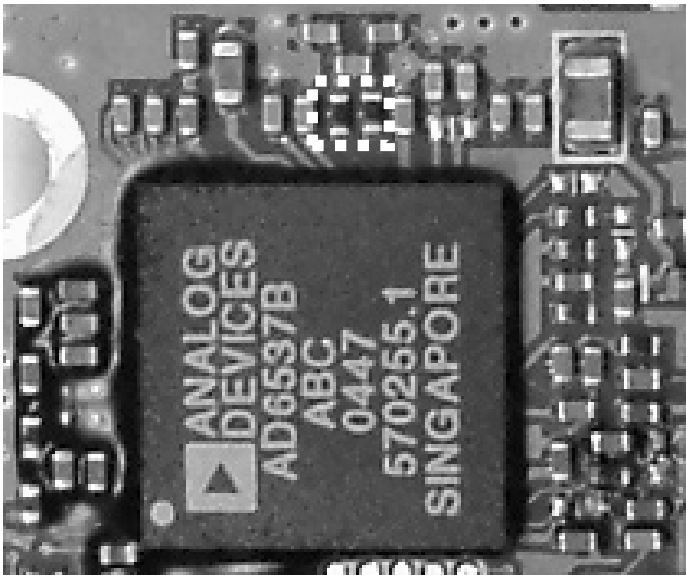


Checking Flow

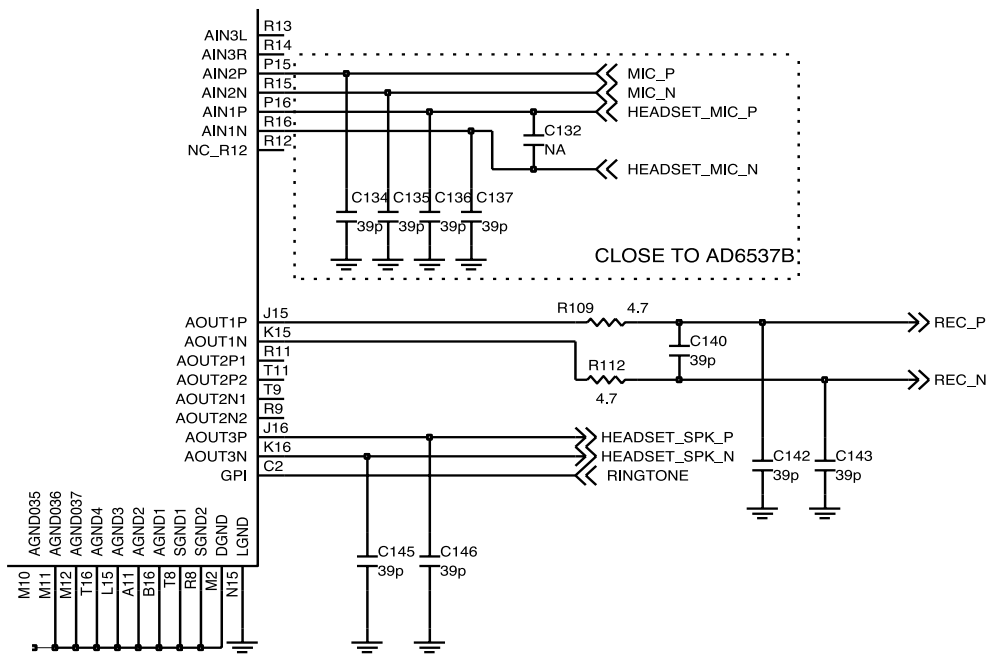


4.12 Receiver Trouble

TEST POINT



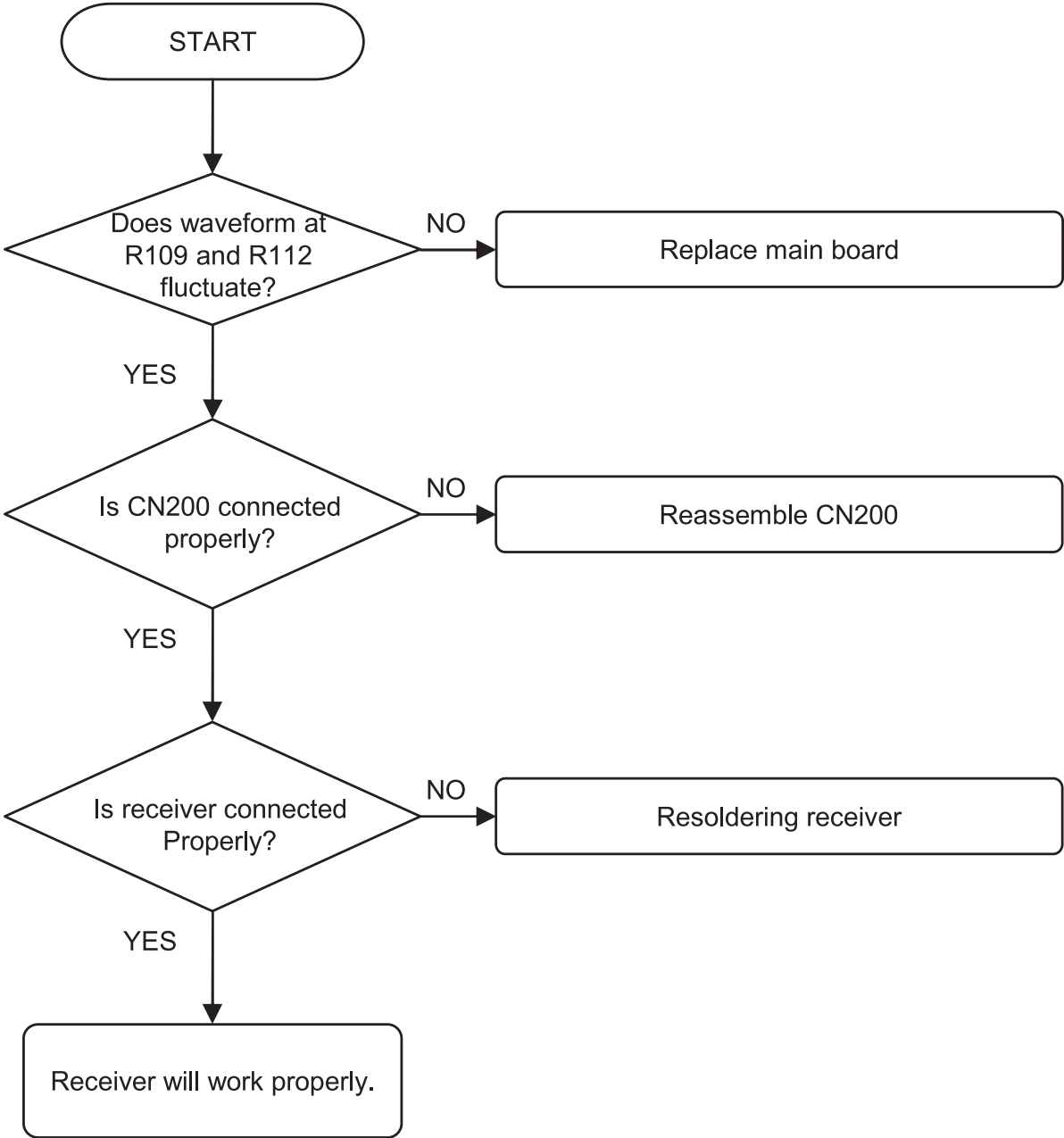
CIRCUIT DIAGRAM



4. TROUBLE SHOOTING

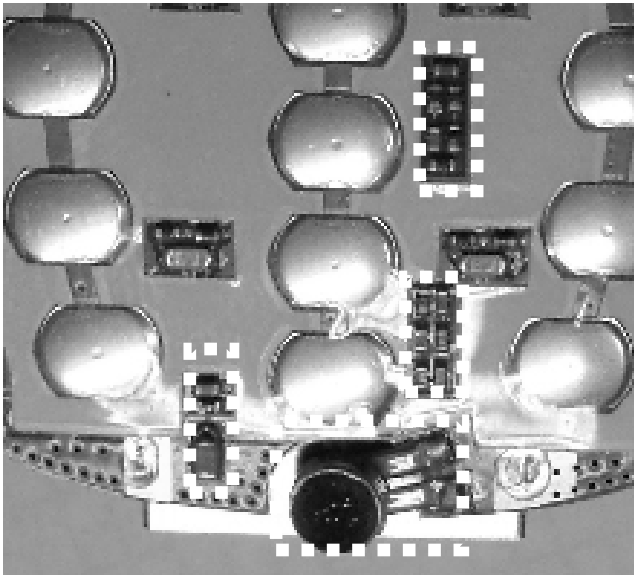
Checking Flow

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode
Set the property of audio as PRBS or continuous wave. Set the receiving volume of mobile as Max.

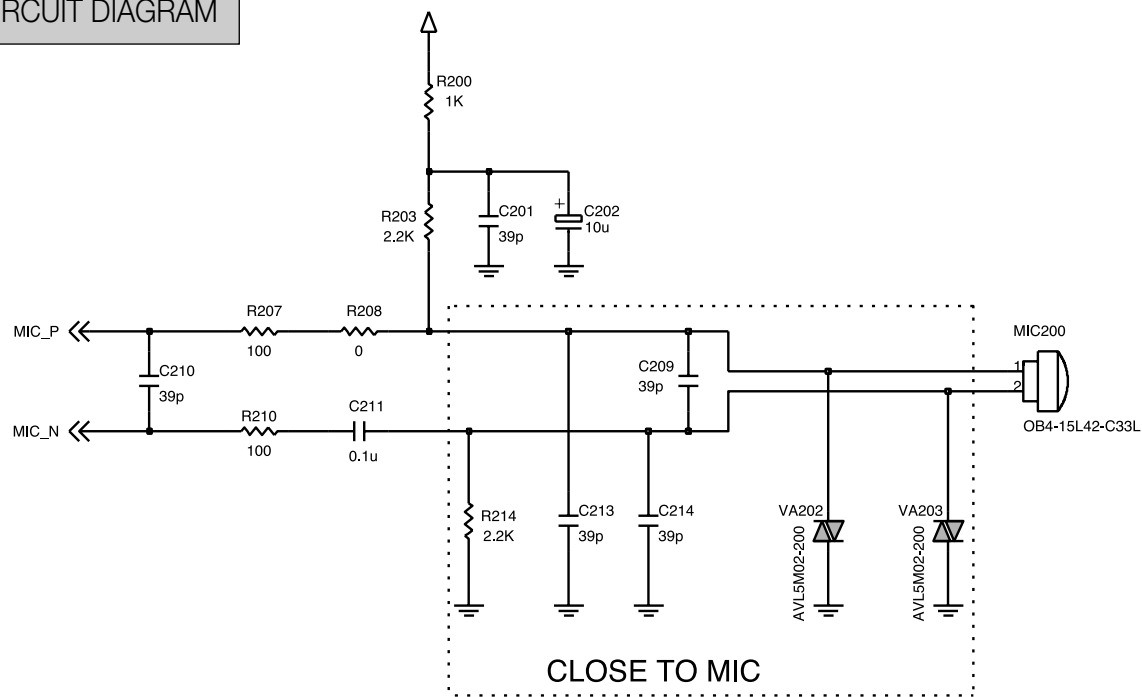


4.13 Microphone Trouble

TEST POINT



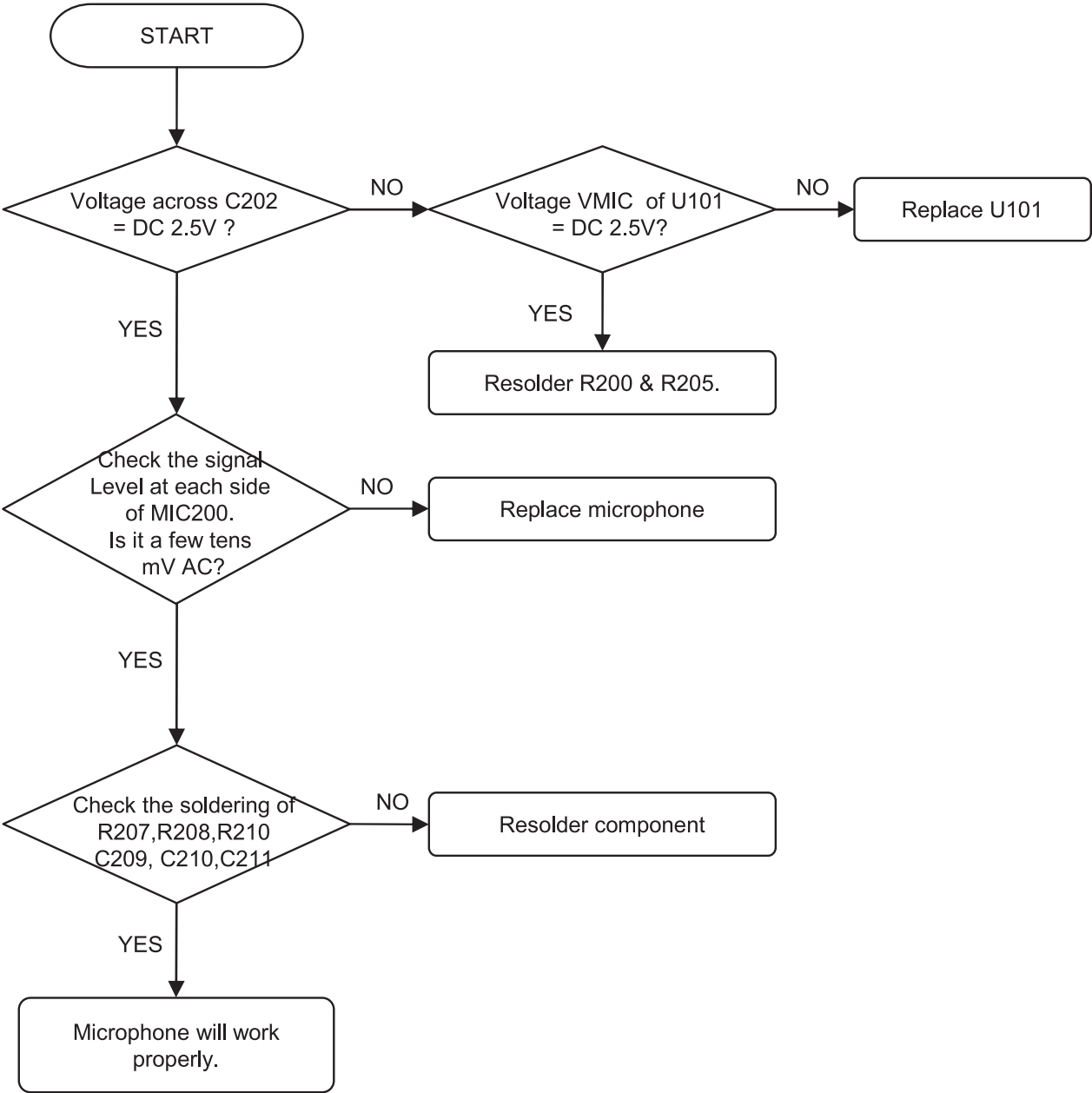
CIRCUIT DIAGRAM



4. TROUBLE SHOOTING

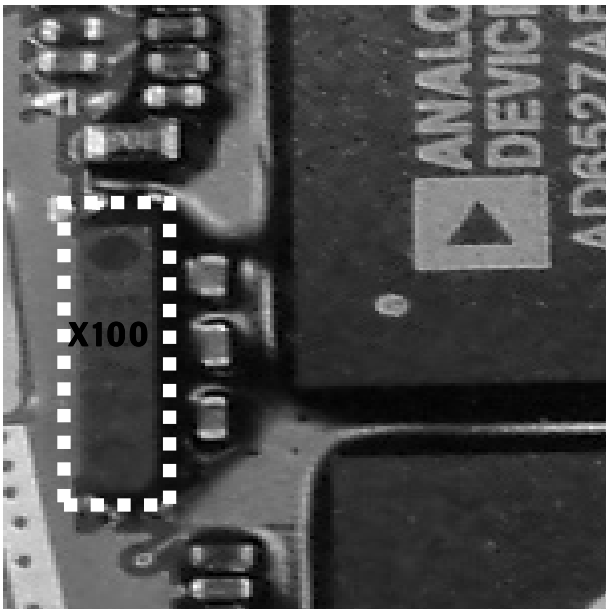
Checking Flow

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode

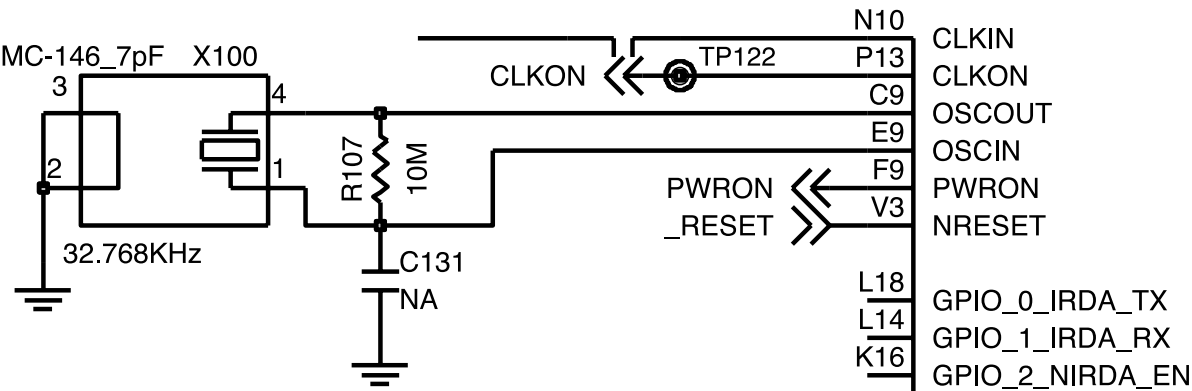


4.14 RTC Trouble

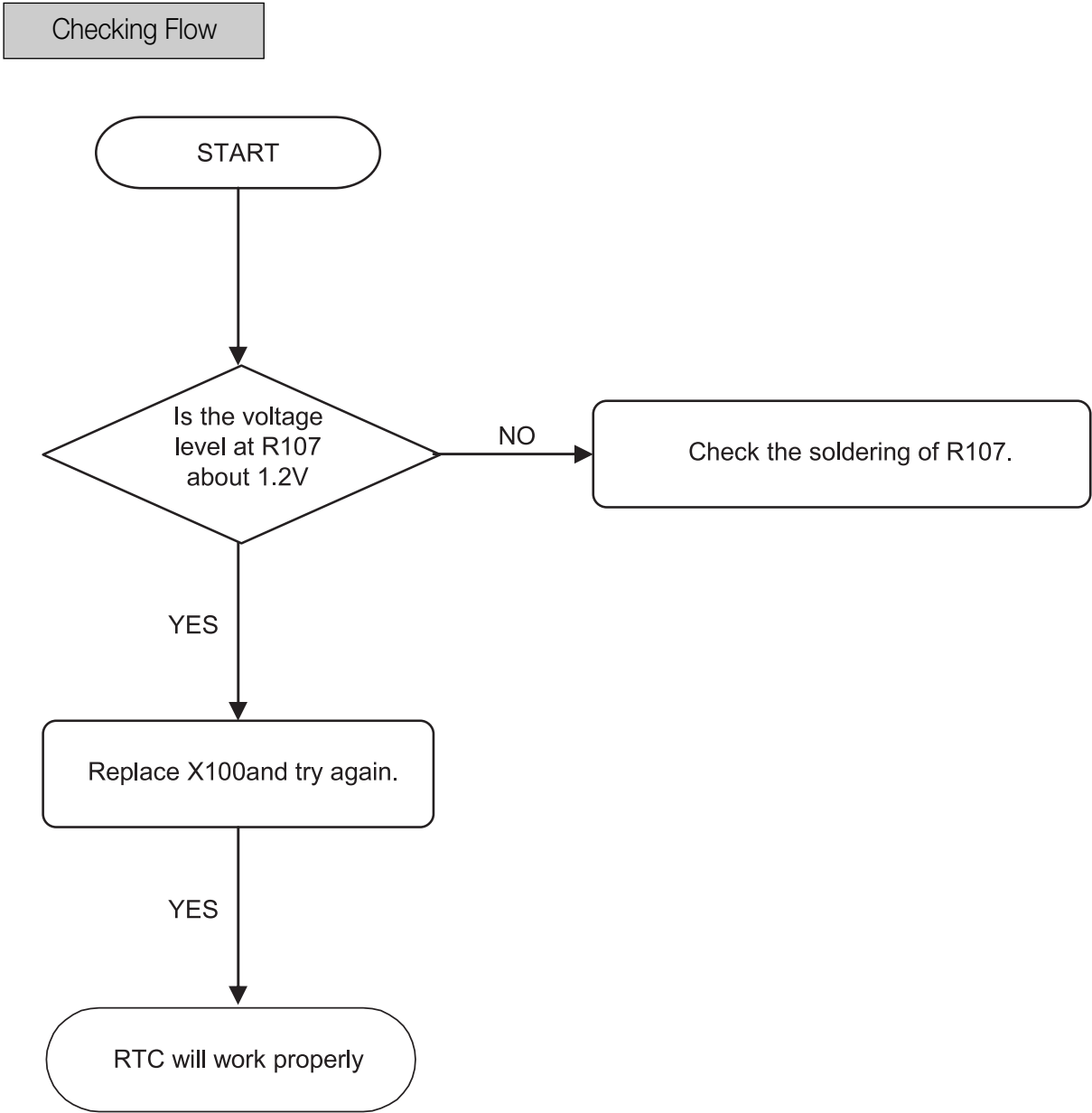
TEST POINT



CIRCUIT DIAGRAM



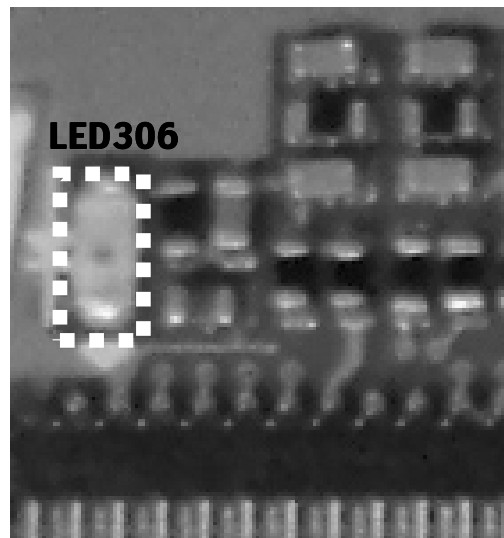
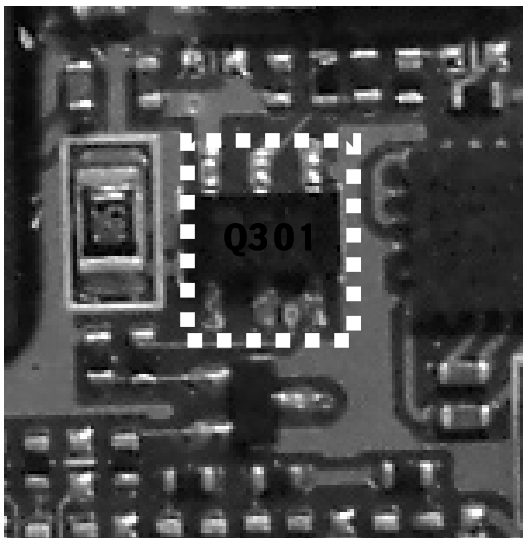
4. TROUBLE SHOOTING



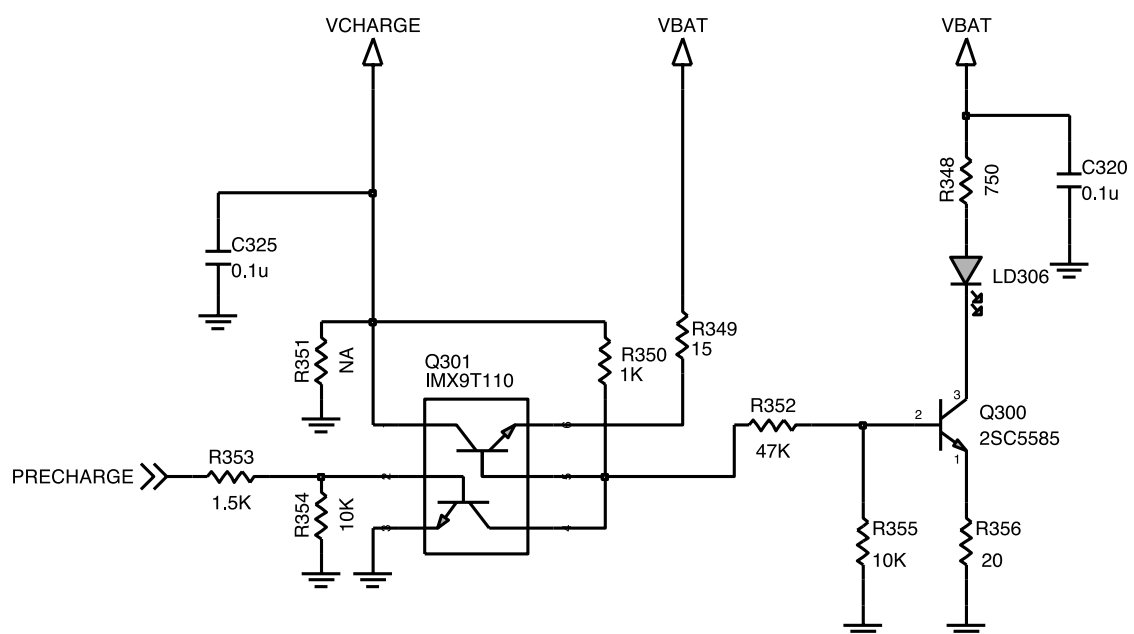
4. TROUBLE SHOOTING

4.15 Indication LED Trouble

TEST POINT



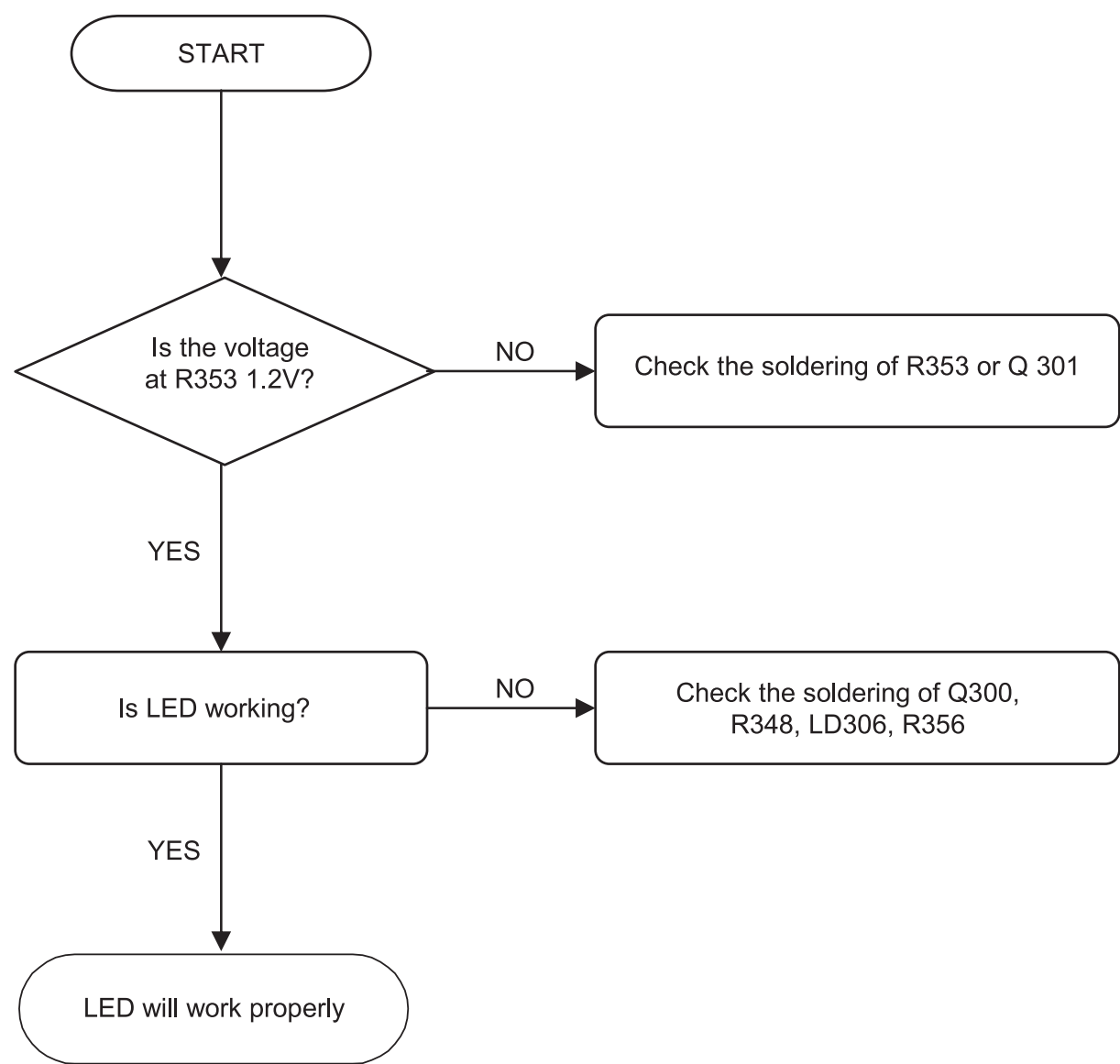
CIRCUIT DIAGRAM



4. TROUBLE SHOOTING

Checking Flow

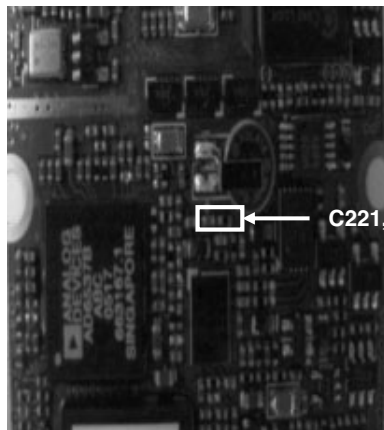
Indication LED only operates in trickle charging mode.



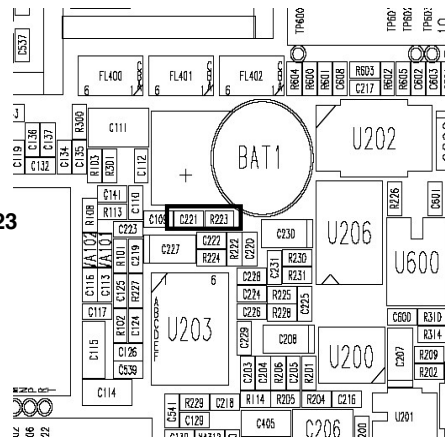
4. TROUBLE SHOOTING

4.16 Speakerphone Trouble

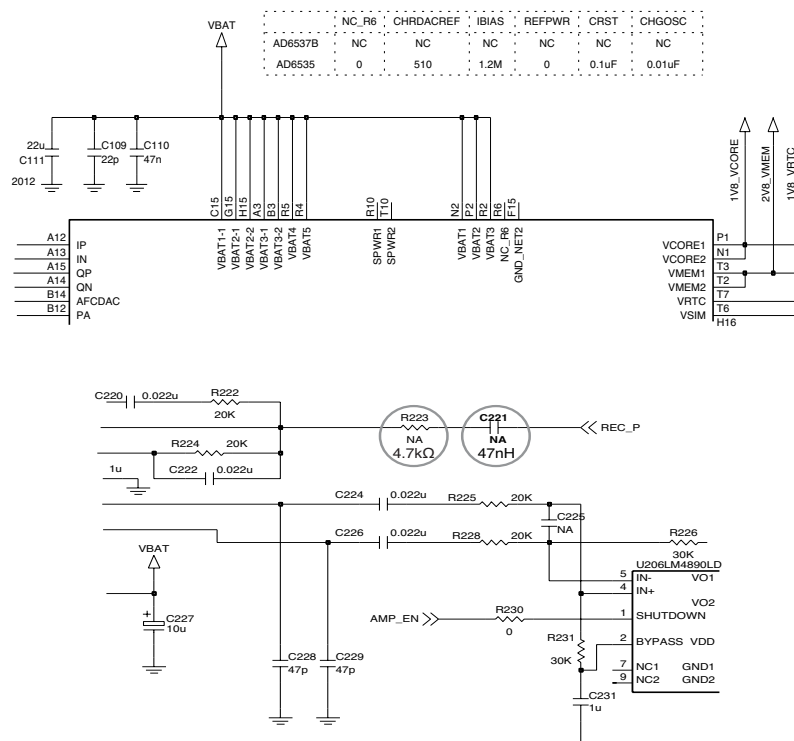
TEST POINT



C221, R223



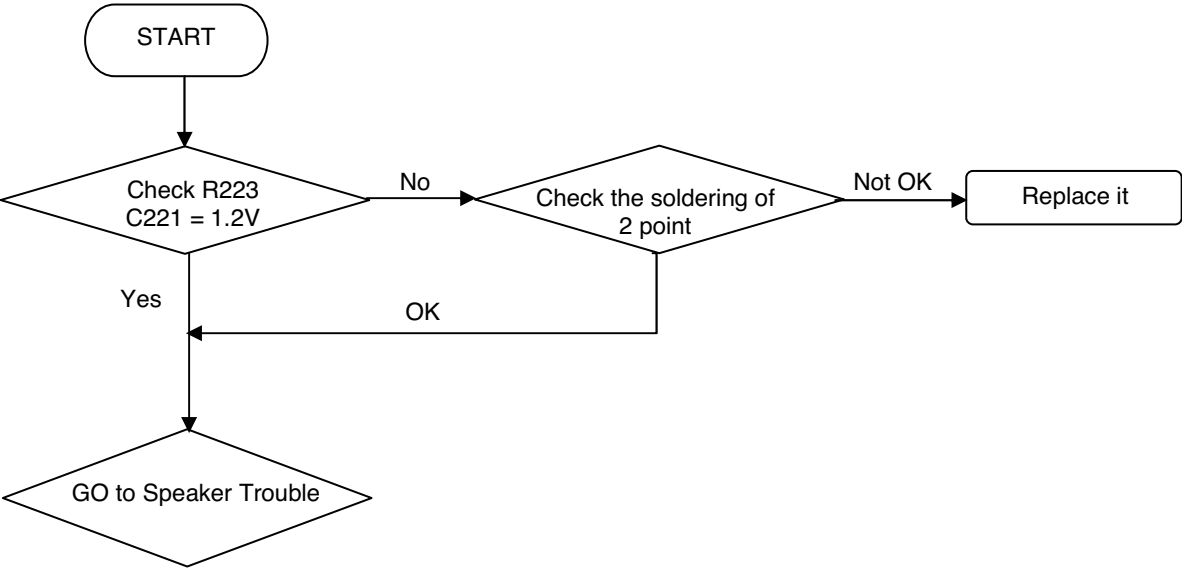
CIRCUIT DIAGRAM



4. TROUBLE SHOOTING

Checking Flow

SETTING: Connect PIF to the phone, and Power on. Call and enter speakerphone mode.



5. DOWNLOAD AND CALIBRATION

5.1 Download

A. Download Setup

Figure 5-1 describes Download setup

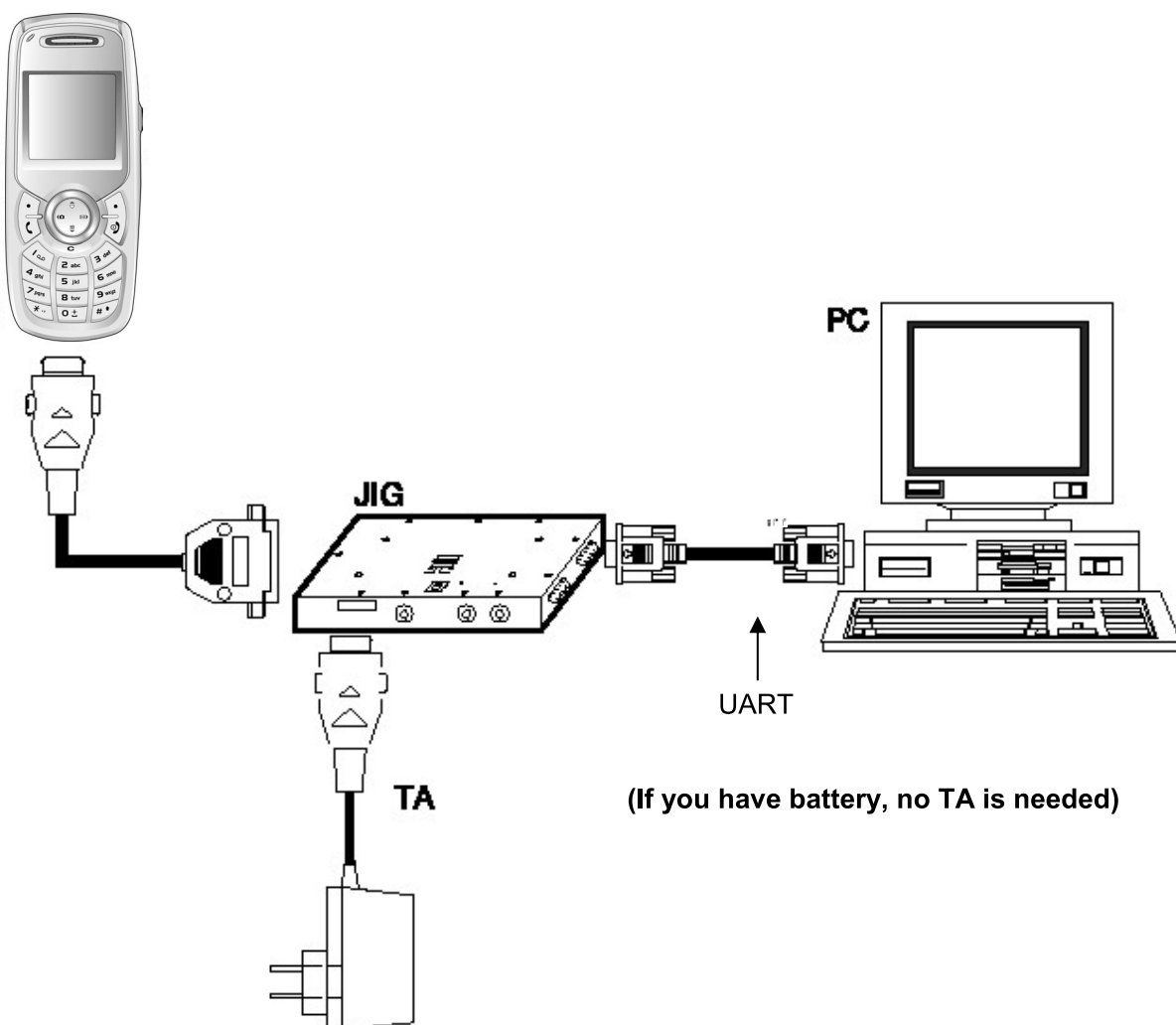
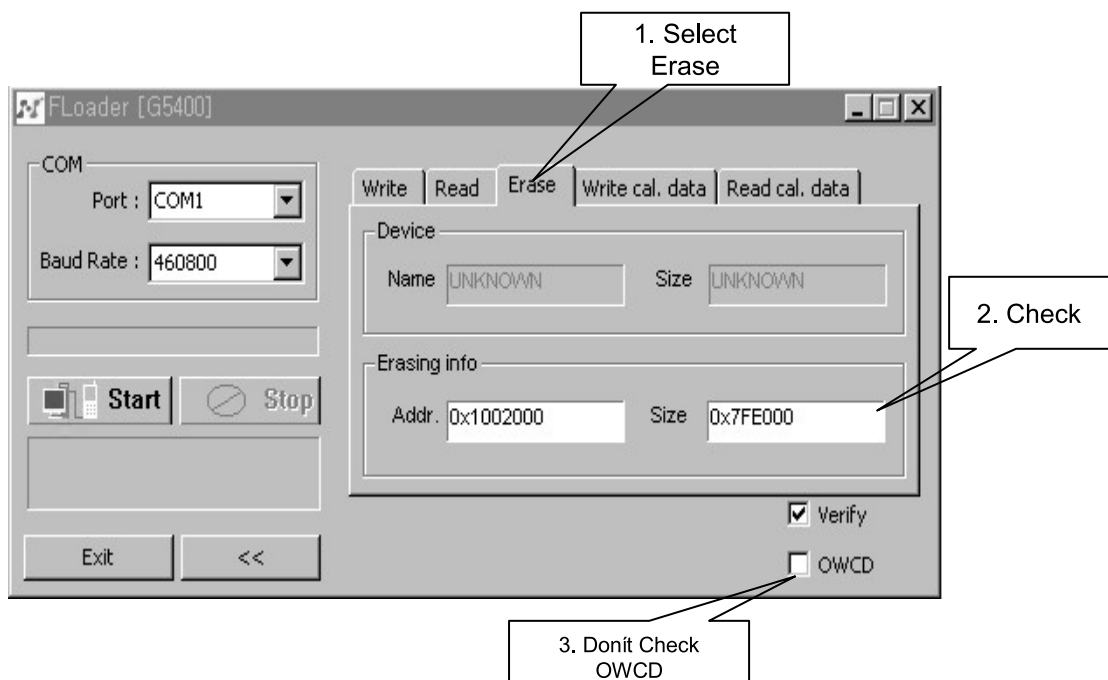


Figure. 5-1 Download setup

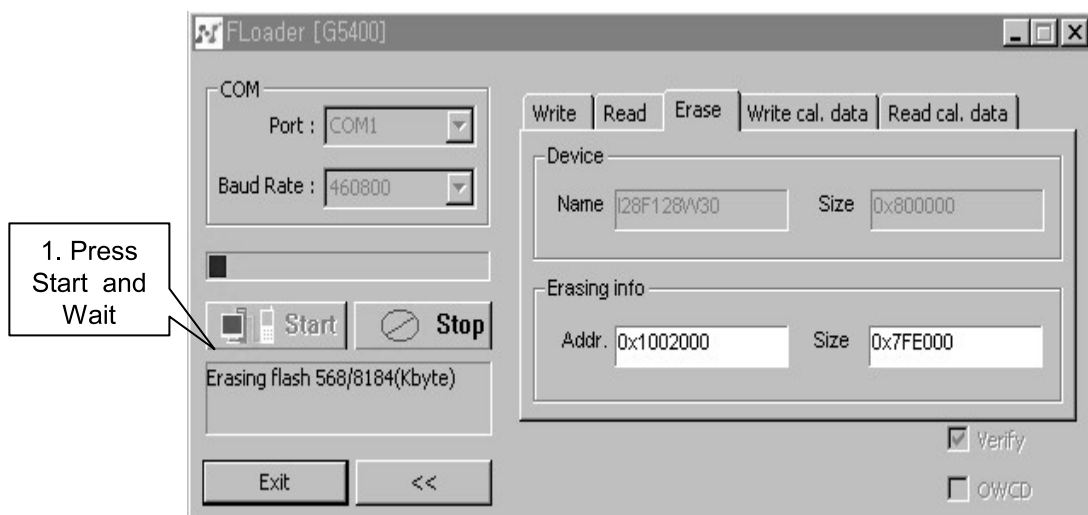
5. DOWNLOAD AND CALIBRATION

B. Download Procedure

1. Access Flash loader program in PC and select Erase.(Don't check OWCD)

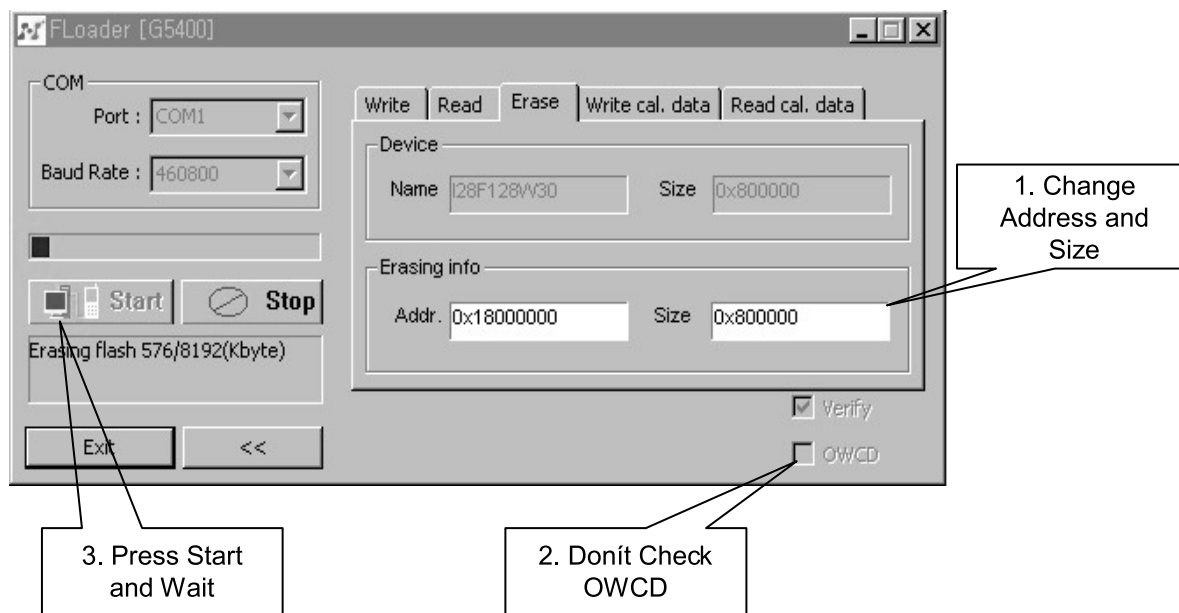


2. Press Start and Wait until Erase is completed.

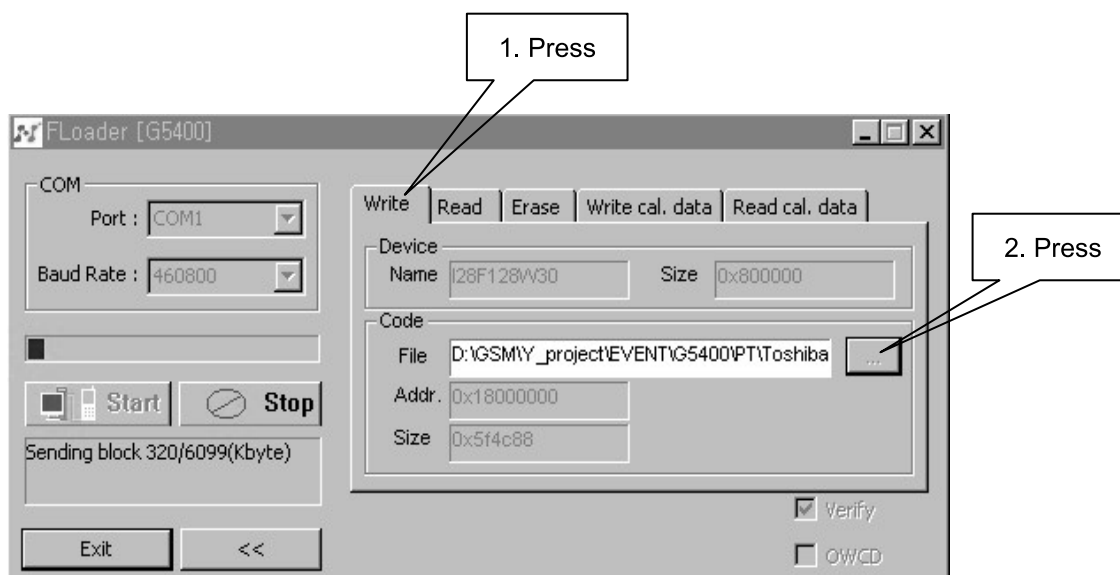


5. DOWNLOAD AND CALIBRATION

3. Change Address and Size(Address : 18000000, Size : 0x800000), and Press Start and Wait until Erase is completed again.

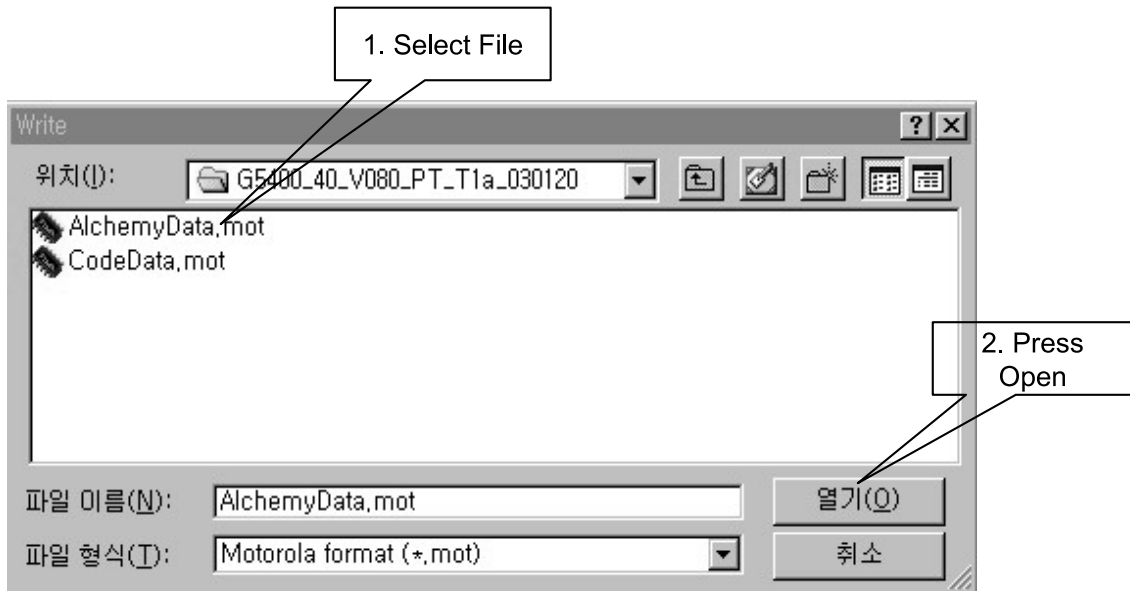


4. Press Write to start Download and press [...] Key to choose software (AlchemyData.mot)

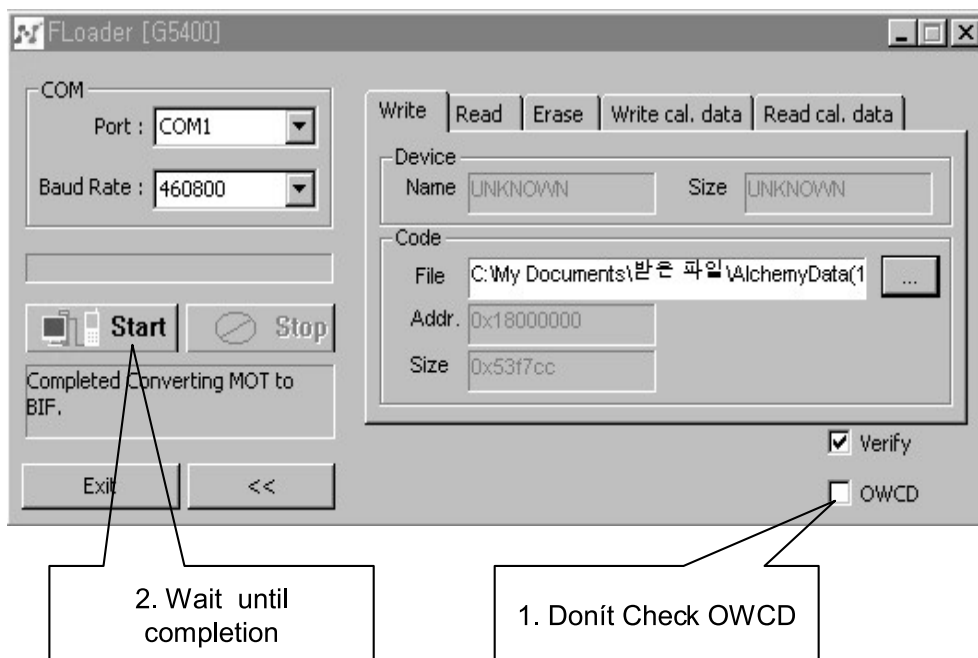


5. DOWNLOAD AND CALIBRATION

5. Choose software

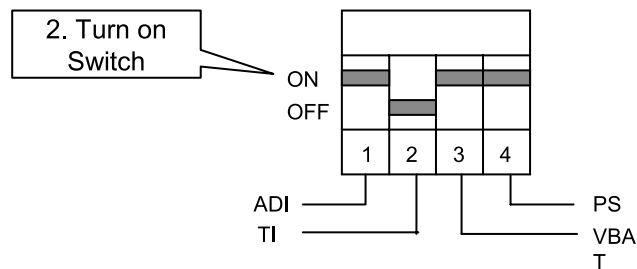
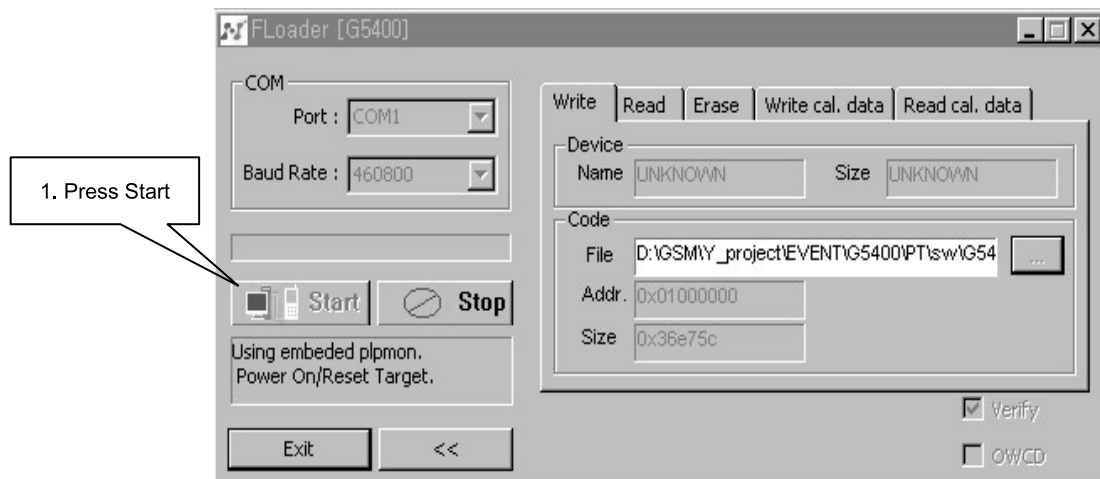


6. Wait until converting from MOT to BIF is completed(Don't check OWCD)

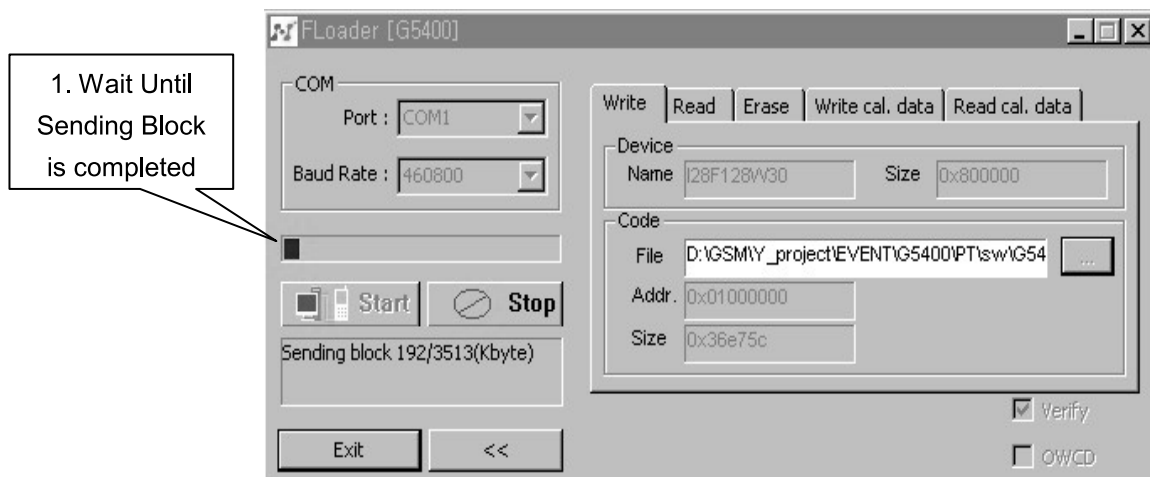


5. DOWNLOAD AND CALIBRATION

7. Press Start and Power on the phone using JIG remote Power on(Switch 1)

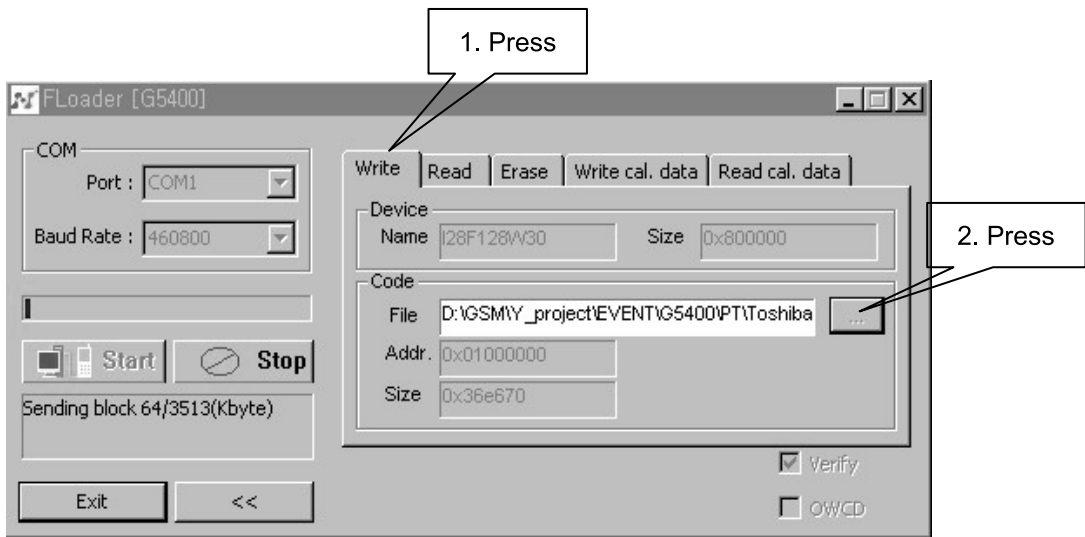


8. Wait until Sending Block is completed

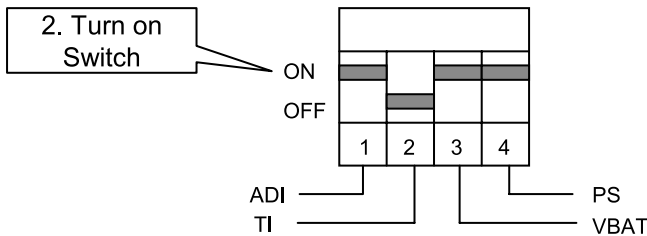
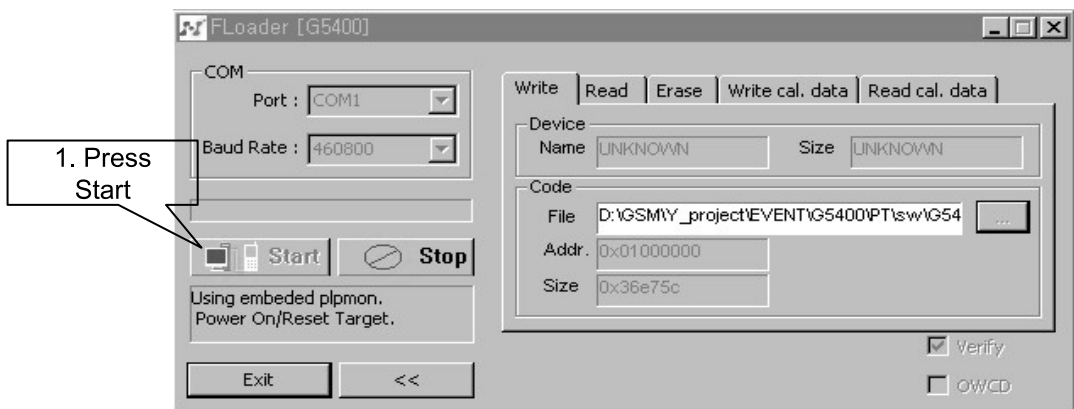


5. DOWNLOAD AND CALIBRATION

9. Press Write to start Download and press  Key to choose software(CodeData.mot)

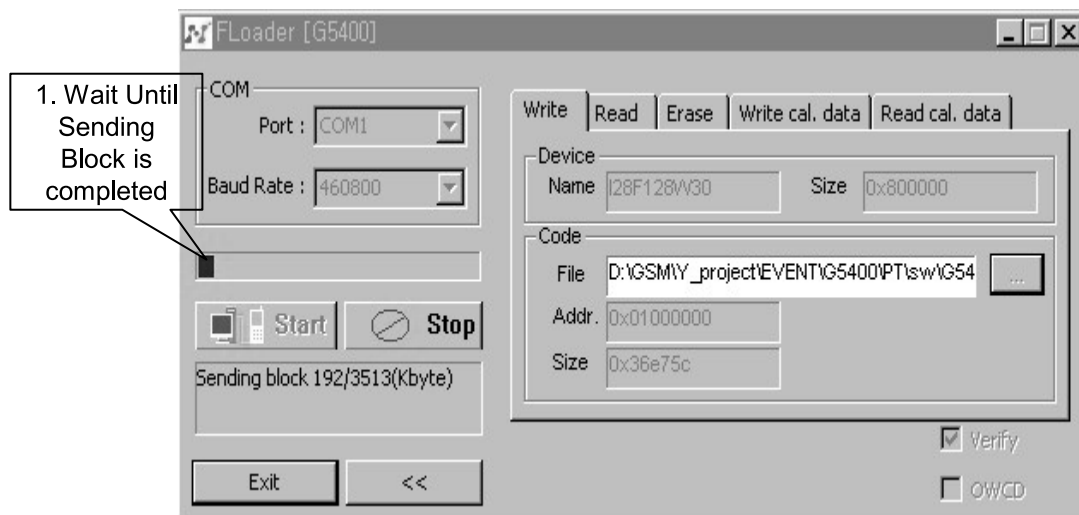


10. Choose software



5. DOWNLOAD AND CALIBRATION

11. Wait until Sending Block is completed



5. DOWNLOAD AND CALIBRATION

5.2 Calibration

A. Equipment List

Equipment for Calibration	Type / Model	Band
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	HP-66311B	Agilent
GPIO interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium class above 300MHz	

B. Equipment Setup

GSM Test Set(8960)

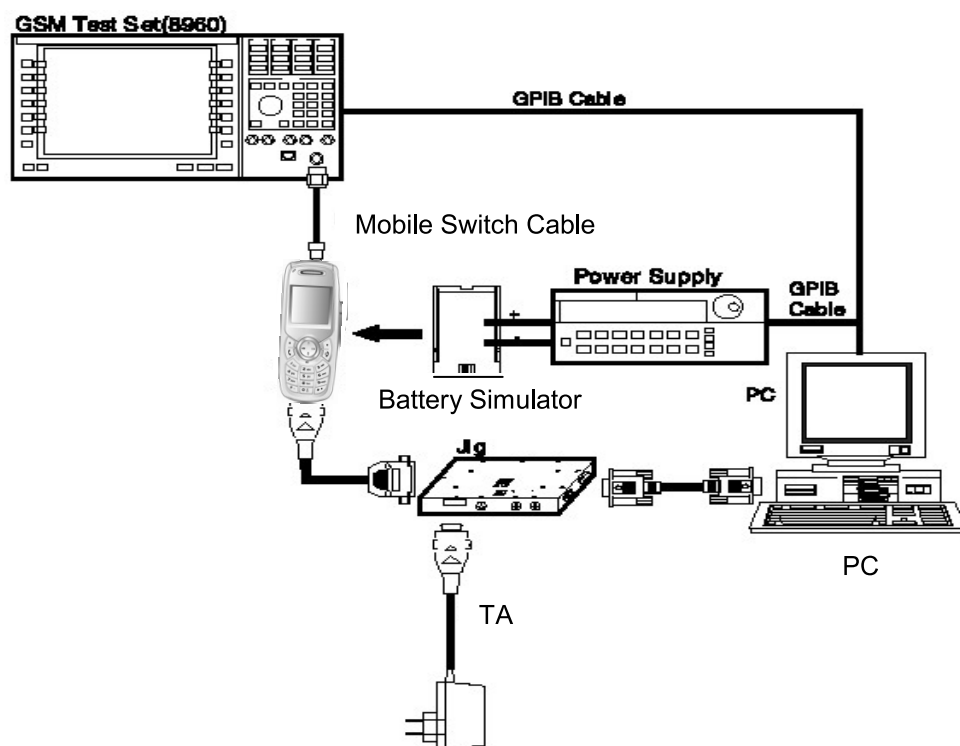


Figure 5-2. Equipment Setup

5. DOWNLOAD AND CALIBRATION

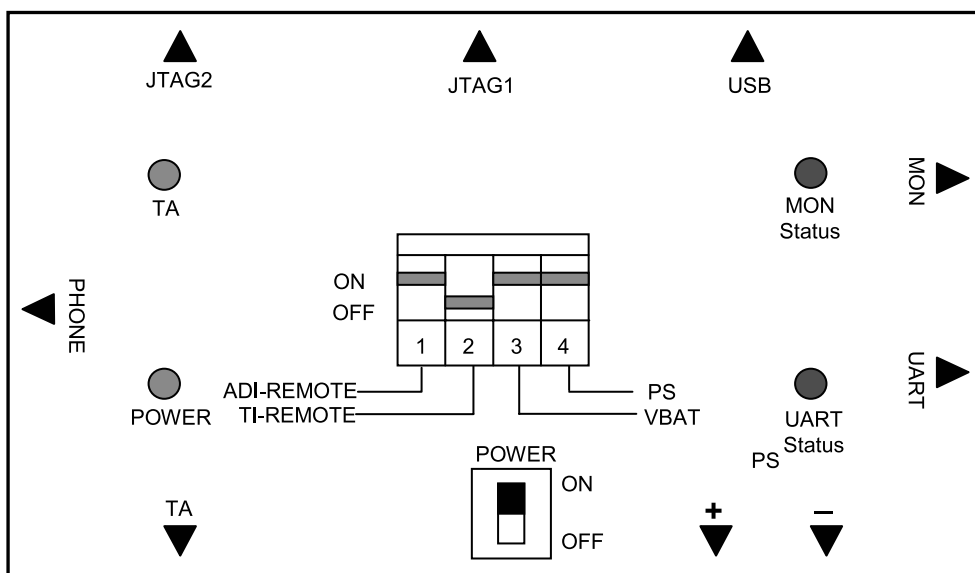


Figure 5-3 The top of Test JIG

Power Source	Description
Power Source	Usually 4.0V
Travel Adaptor	Use TA, name is TA-20G(24pin)

Table 5-2 jig Power

Switch Number	Name	Description
Switch1	ADI-REMOTE	In ON state, phone is awaked. It is used ADI chipset.
Switch2	TI-REMOTE	In ON state, phone is awaked. It is used TI chipset.
Switch3	VBAT	Power is provided for phone from battery
Switch4	PS	Power is provided for phone from Power supply

Table 5-3 Jig DIP Switch

LED Number	Name	Description
LED1	POWER	Power is provided for Test Jig
LED2	TA	Indicate charging state of the phone battery
LED3	VART	Indicate data transfer state through the UART port
LED4	MON	Indicate data transfer state through the MON port

Table 5-4 LED Description

5. DOWNLOAD AND CALIBRATION

1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Set the Power Supply 4.0V
3. Set the 3rd, 4th of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1st ON state

D. Procedure

1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Power ON PC then enter into Windows 98(Remark : Windows 2000 system could be feasible)
3. Run AUTOCAL.exe, the AUTOCAL application window will be appeared.

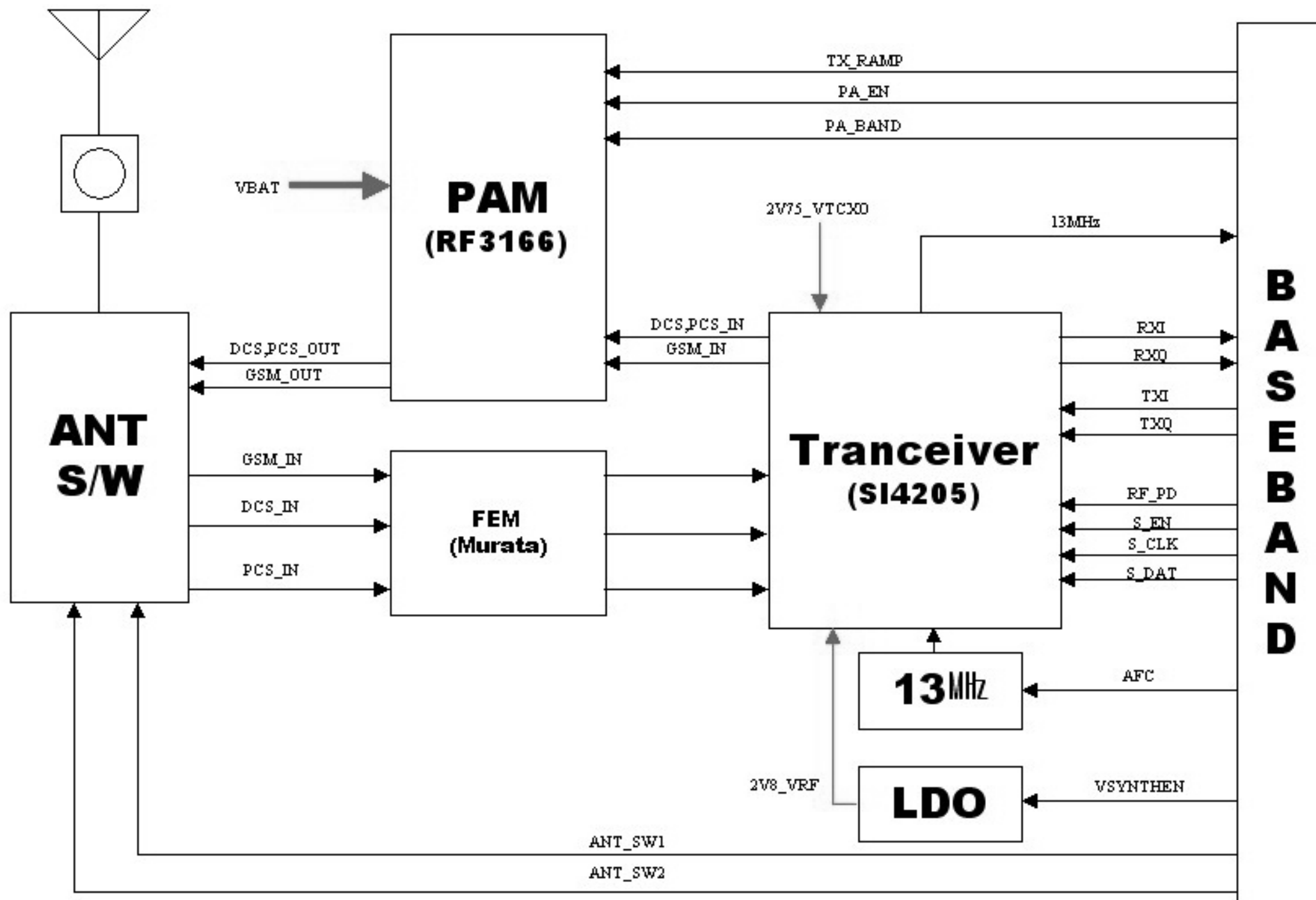
6. BLOCK DIAGRAM-Base Band



6. BLOCK DIAGRAM

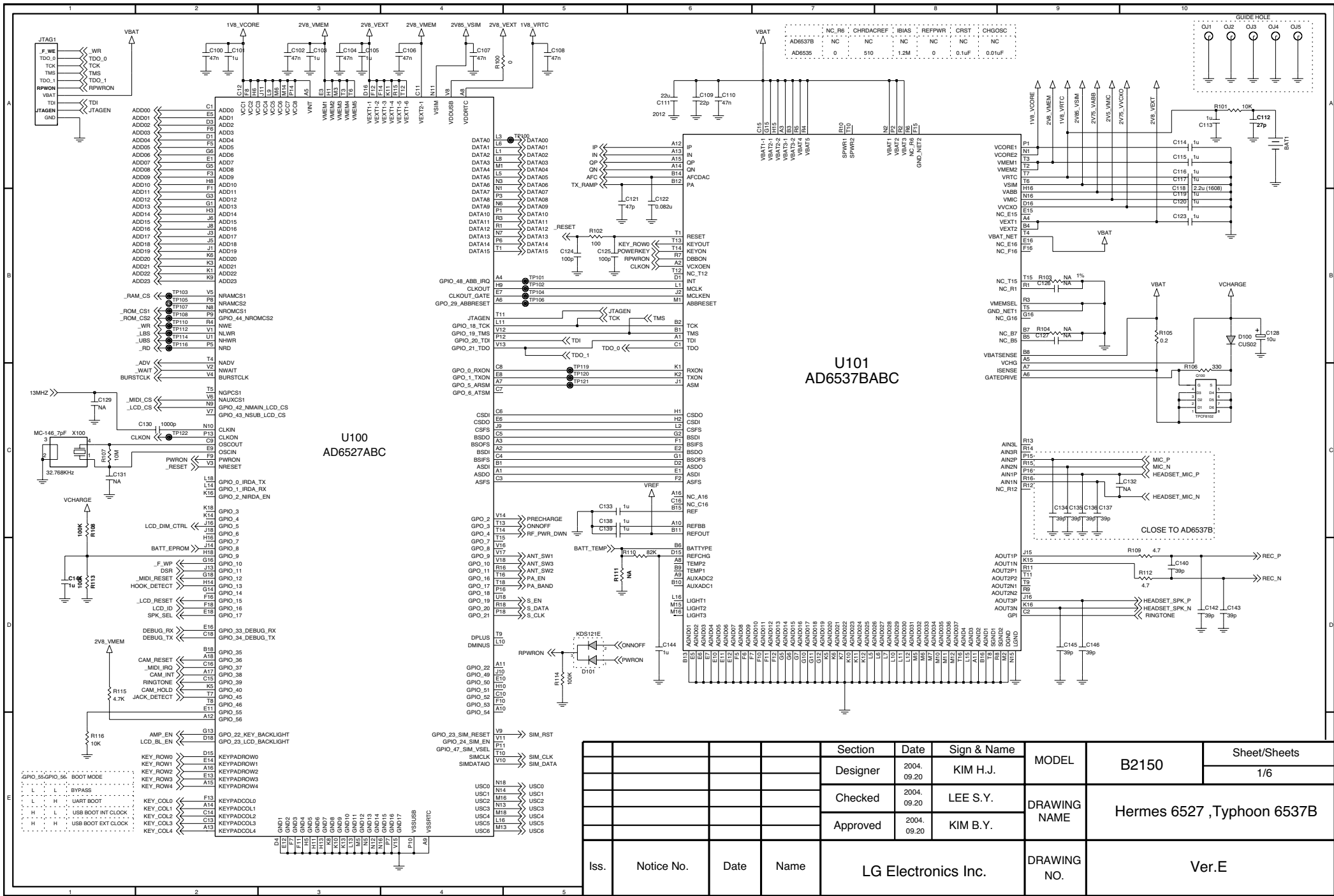
6. BLOCK DIAGRAM-RF

BEE Project RF Block Diagram



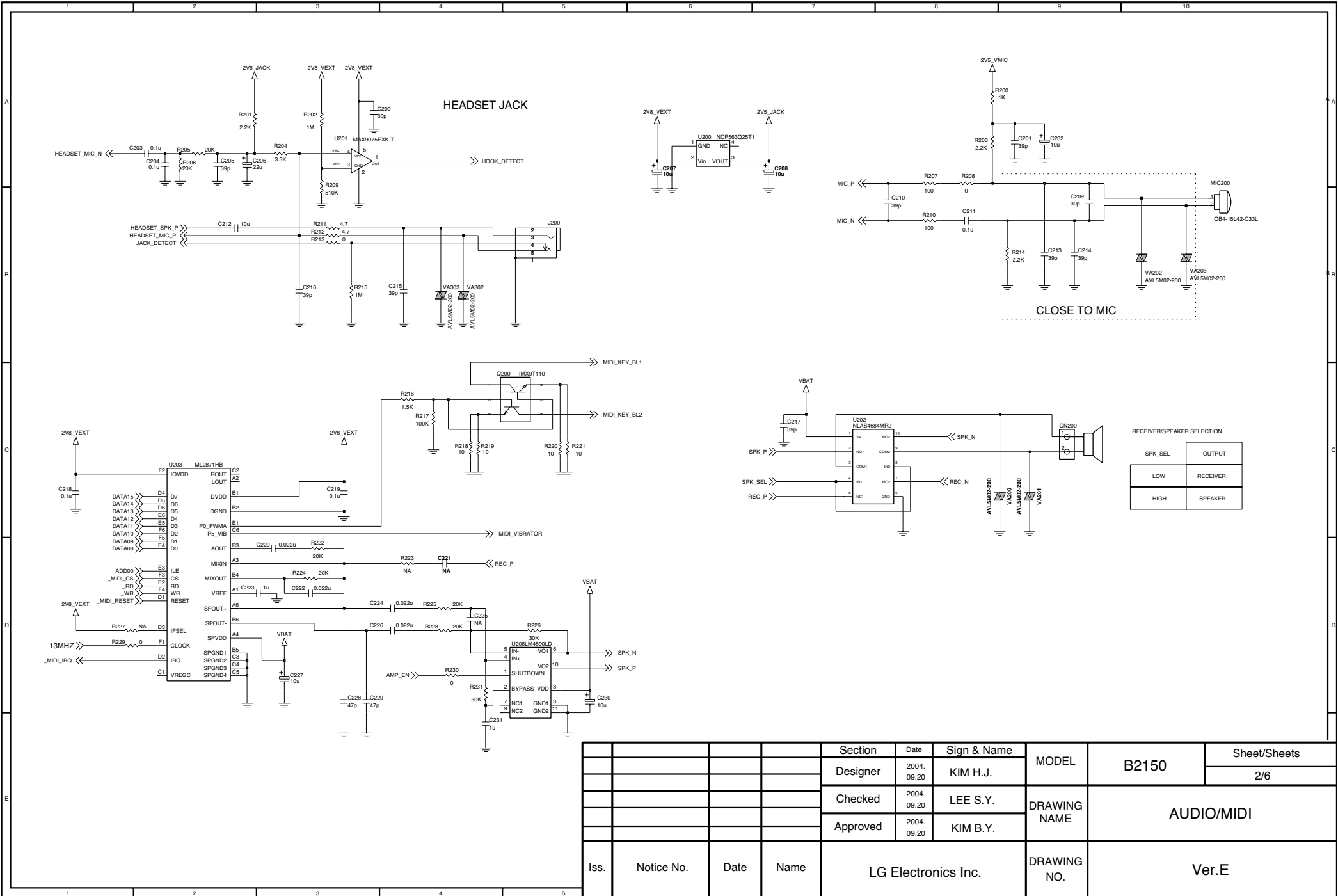
7. CIRCUIT DIAGRAM

7.1 MANI



7. CIRCUIT DIAGRAM

7.2 AUDIO&MIDI



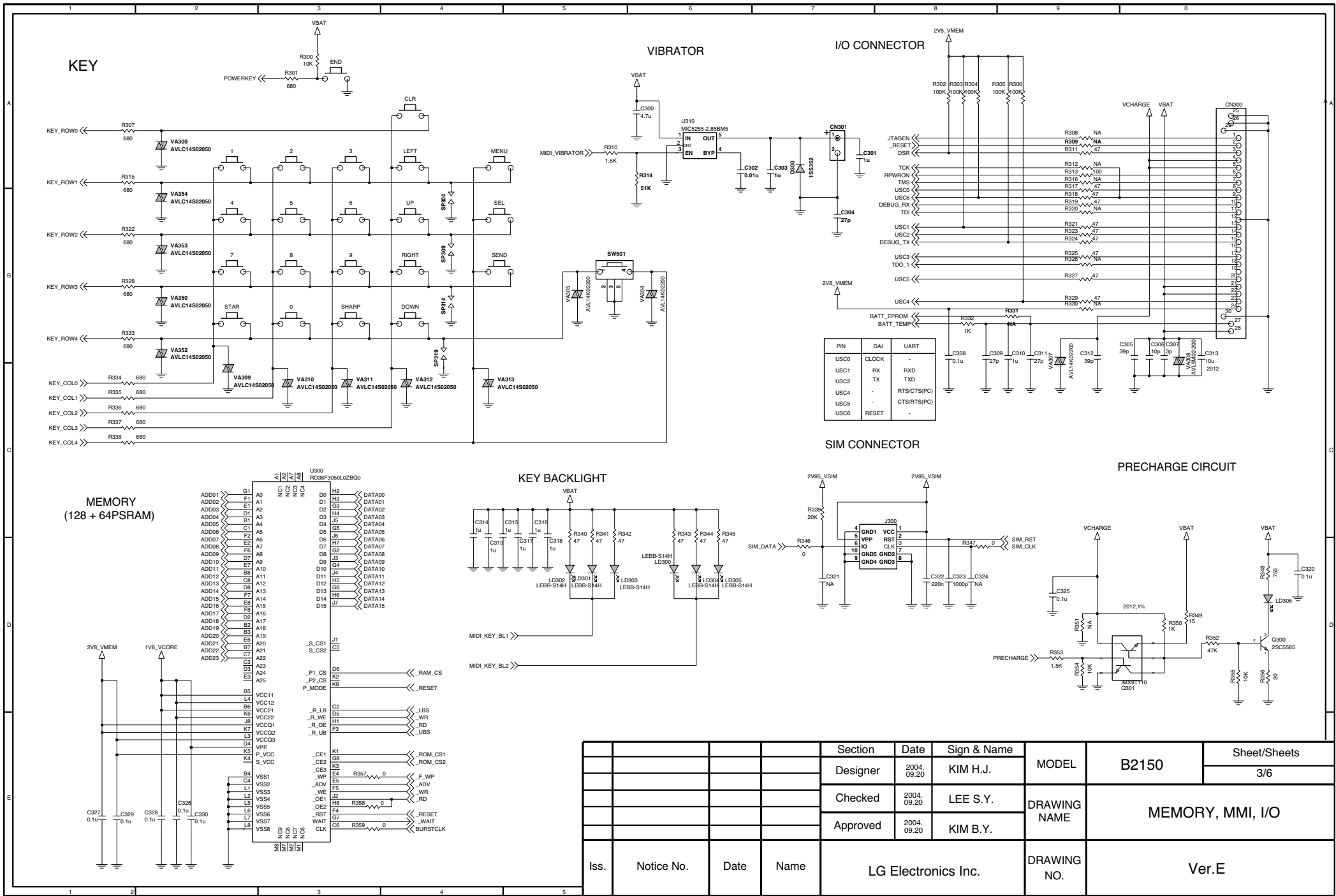
				Section	Date	Sign & Name	MODEL	B2150	Sheet/Sheets
				Designer	2004.09.20	KIM H.J.			2/6
				Checked	2004.09.20	LEE S.Y.	DRAWING NAME	AUDIO/MIDI	
				Approved	2004.09.20	KIM B.Y.			
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	Ver.E	

LGIC(42)-A-5505-10-01

LG Electronics Inc.

7. CIRCUIT DIAGRAM

7.3 MEMORY&MMI&IO

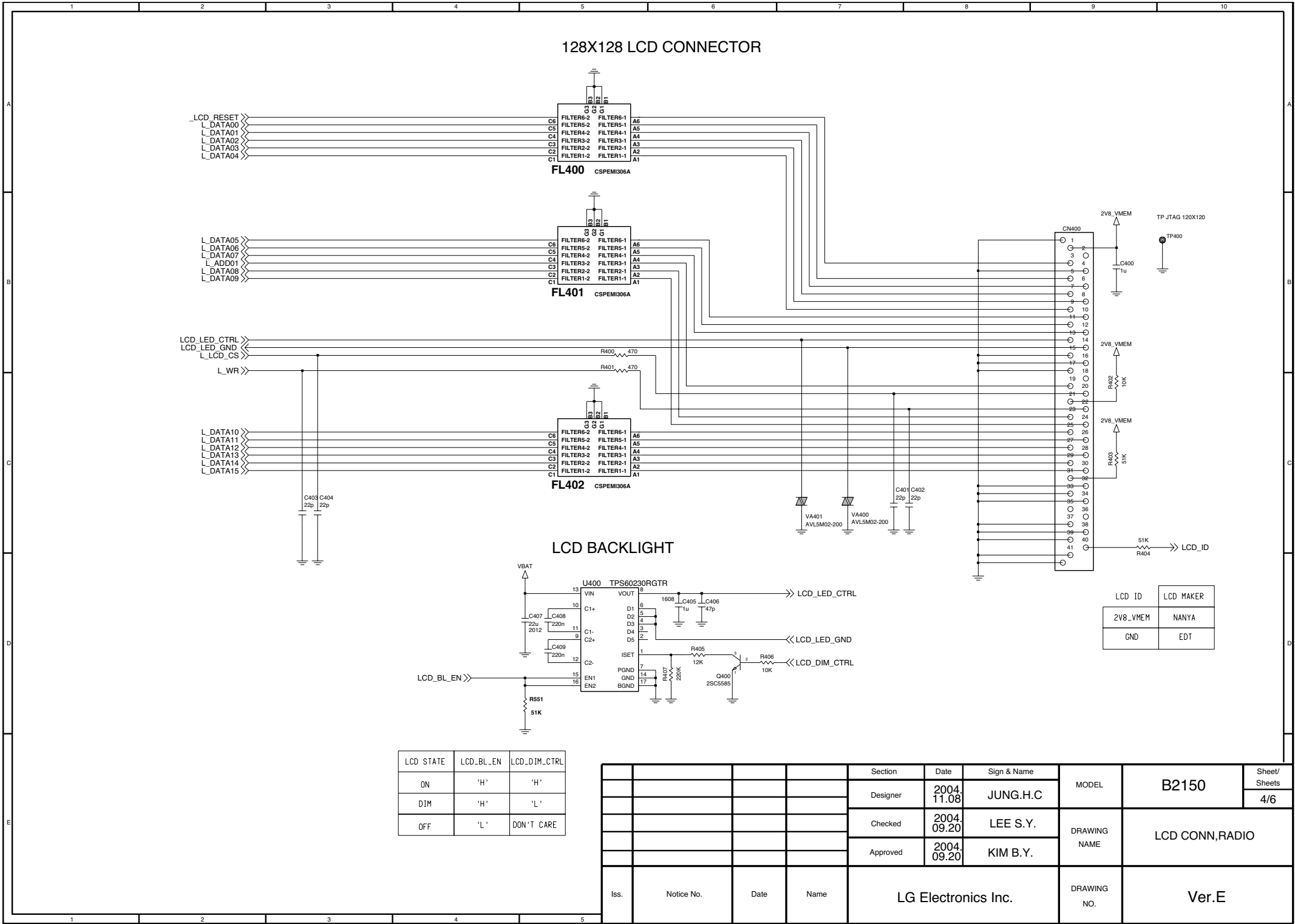


LGIC(42)-A-5505-10:01

LG Electronics Inc.

7. CIRCUIT DIAGRAM

7.4 LCD CONN

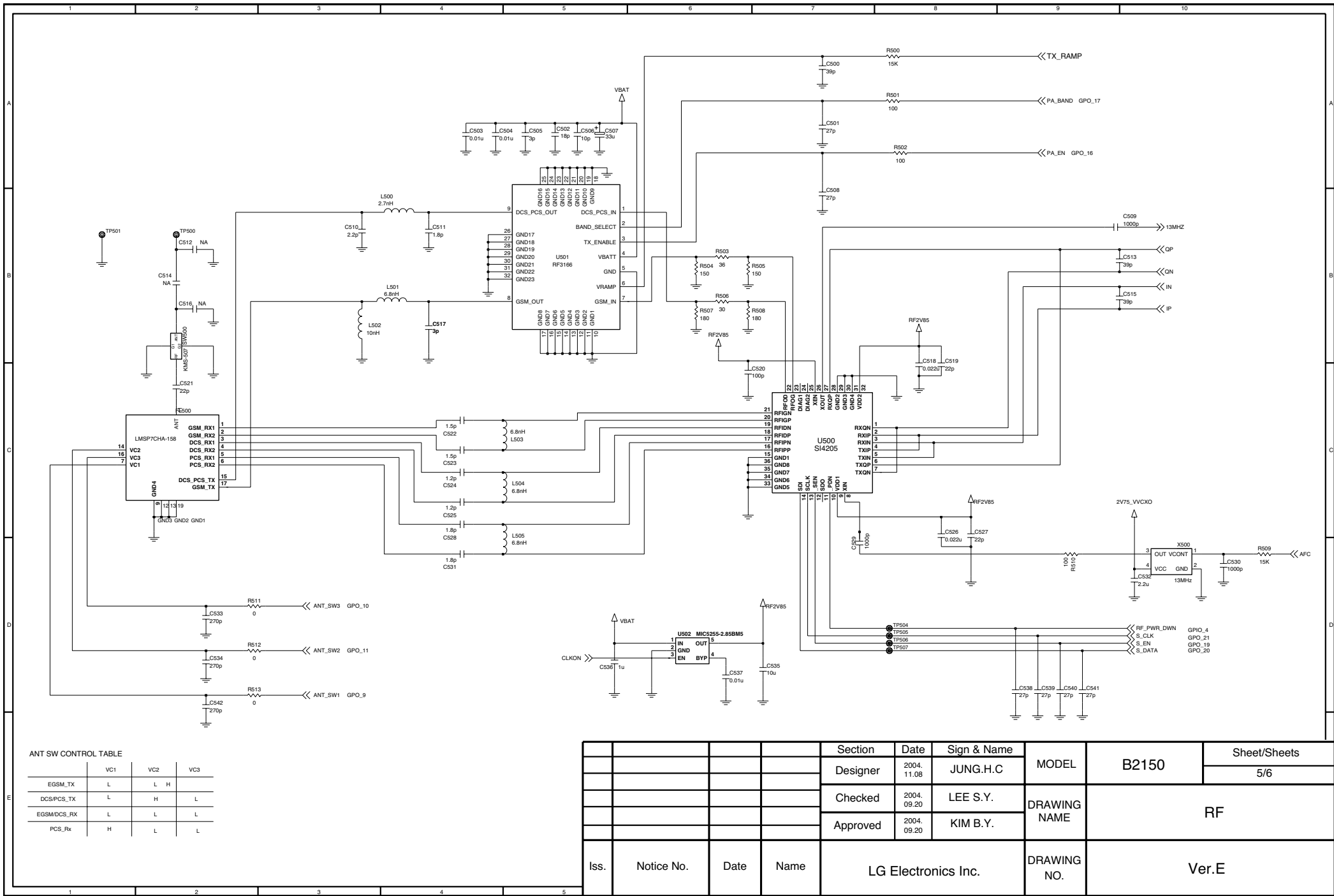


LGIC(42)-A-5505-10:01

LG Electronics Inc.

7. CIRCUIT DIAGRAM

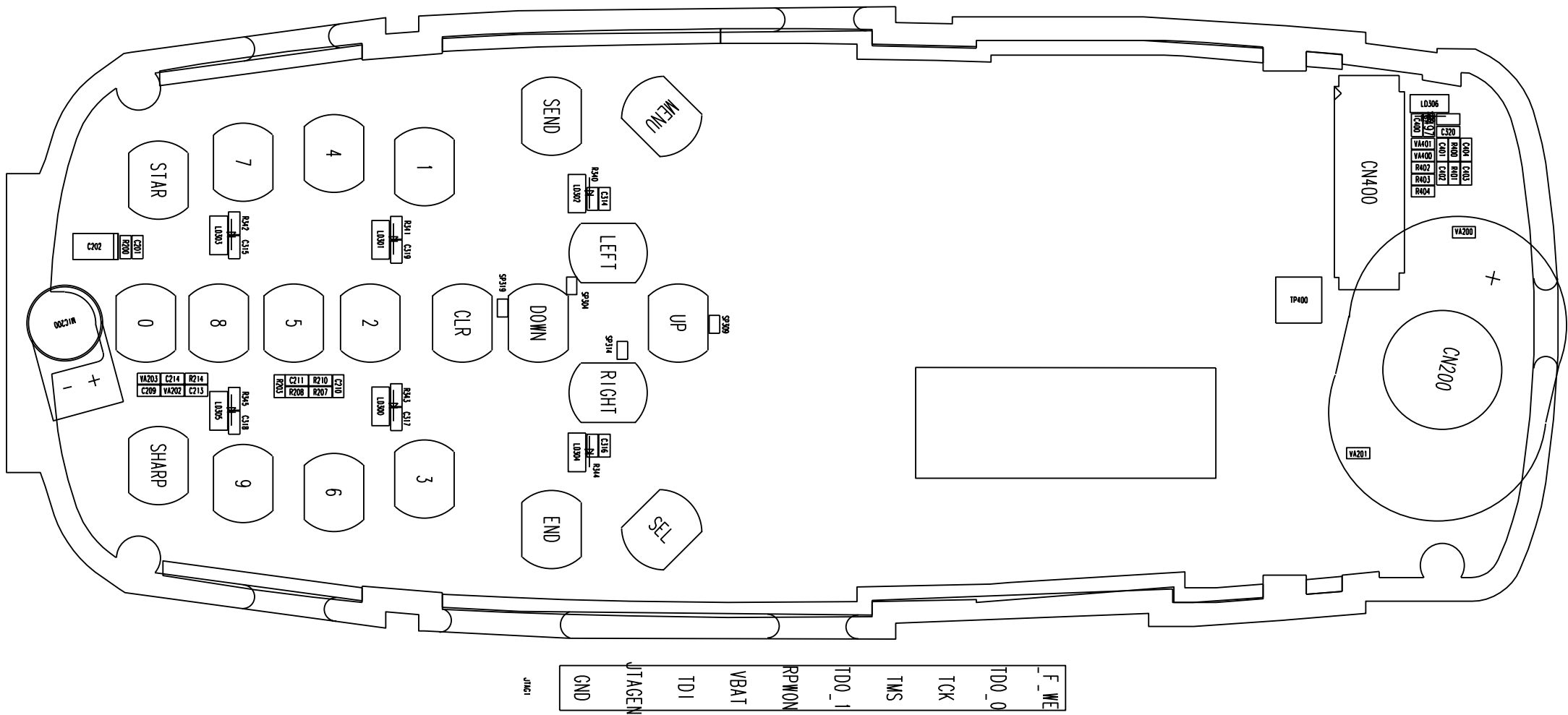
7.5 RF Circuit



LGIC(42)-A-5505-10:01

LG Electronics Inc.

8. PCB LAYOUT



9. ENGINEERING MODE

A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

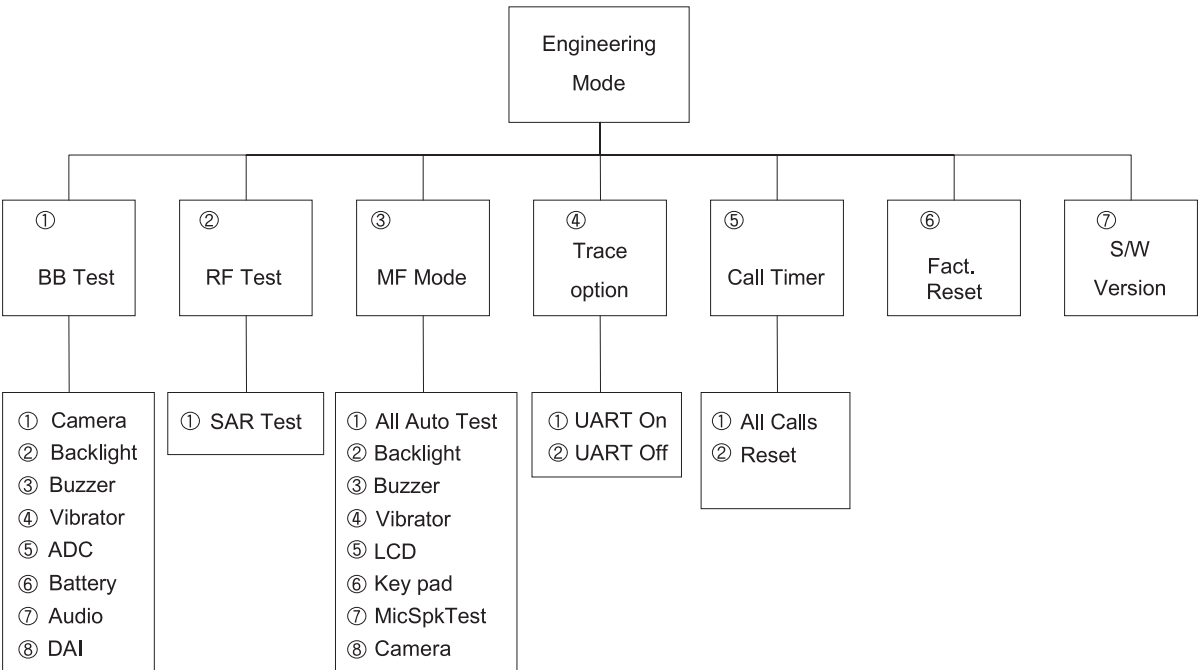
B. Access Codes

The key sequence for switching the engineering mode on is 2945# *#. Pressing END will switch back to non-engineering mode operation.

C. Key Operation

Use Up and Down key to select a menu and press ‘select’ key to progress the test. Pressing ‘back’ key will switch back to the original test menu.

D. Engineering Mode Menu Tree



9. ENGINEERING MODE

9.1 BB Test [MENU 1]

9.1.1 Camera

- 1) Preview : This menu is to test Camera preview on LCD screen.

9.1.2 LCD

- 1) Contrast value : This menu is to change contrast value of LCD screen.

9.1.3 Backlight

This menu is to test the LCD Backlight and Keypad Backlight.

- 1) Backlight on : LCD Backlight and Keypad Backlight light on at the same time.
- 2) Backlight off : LCD Backlight and Keypad Backlight light off at the same time.
- 3) Backlight value : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

9.1.4 Buzzer

This menu is to test the melody sound.

- 1) Melody on : Melody sound is played through the speaker.
- 2) Melody off : Melody sound is off.

9.1.4 Vibrator

This menu is to test the LCD Backlight and Keypad Backlight.

- 1) **Vibrator on** : Vibration mode is on.
- 2) **Vibrator off** : Vibration mode is off.

9.1.5 ADC (Analog to Digital Converter)

This displays the value of each ADC.

- 1) **MVBAT ADC** : Main Voltage Battery ADC
- 2) **AUX ADC** : Auxiliary ADC
- 3) **TEMPER ADC** : Temperature ADC

9.1.6 BATTERY

- 1) **Bat Cal** : This displays the value of Battery Calibration. The following menus are displayed in order :
BAT-LEV-4V, BAT-LEV-3-LIMIT, BAT-LEV-2-LIMIT, BAT-LEV-1-LIMIT, BAT-IDLE-LIMIT, BAT-INCALL-LIMIT, SHUT-DOWN-VOLTAGE, BAT-RECHARGE-LMT
- 2) **TEMP Cal** : This displays the value of Temperature Calibration. The following menus are displayed in order:TEMP-HIGH-LIMIT, TEMP-HIGH-RECHARGE-LMT, TEMP-LOW-RECHARGE-LMT, TEMP-LOW-LIMIT

9. ENGINEERING MODE

9.1.7 Audio

This is a menu for setting the control register of Voiceband Baseband Codec chip. Although the actual value can be written over, it returns to default value after switching off and on the phone.

- 1) VbControl1 : VbControl1 bit Register Value Setting
- 2) VbControl2 : VbControl2 bit Register Value Setting
- 3) VbControl3 : VbControl3 bit Register Value Setting
- 4) VbControl4 : VbControl4 bit Register Value Setting
- 5) VbControl5 : VbControl5 bit Register Value Setting
- 6) VbControl6 : VbControl6 bit Register Value Setting

9.1.8 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) DAI AUDIO : DAI audio mode
- 2) DAI UPLINK : Speech encoder test
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off

9.2 RF Test [MENU 2]

9.2.1 SAR test

This menu is to test the Specific Absorption Rate.

- 1) SAR test on : Phone continuously process TX only. Call-setup equipment is not required.
- 2) SAR test off : TX process off

9.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

9.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic&Speaker,

9.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

9.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

9.3.4 Vibratort

Vibrator is on for about 1.5 seconds.

9.3.5 LCD

1)LCD

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

2)SubLCD

Sub LCD screen resolution tests horizontally and vertically one by one and fills the screen.

9.3.6 Key pad

When a pop-up message shows 'Press Any Key', you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

9.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

9. ENGINEERING MODE

9.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

9.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) All calls : This displays total conversation time. User cannot reset this value.
- 2) Reset settings : This resets total conversation time to this, [00:00:00].
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off

9.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

Attention

- ① Fact. Reset (i.e.Factory Reset) should be only used during the Manufacturing process.
- ② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

9.7 S/W version

This displays software version stored in the phone.

10. STAND ALONE TEST

10.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

10.2 Setting Method

A. COM port

- a. Move your mouse on the "Connect" button, then click the right button of the mouse and select "Com setting".
- b. In the "Dialog Menu", select the values as explained below.
 - Port : select a correct COM port
 - Baud rate : 38400
 - Leave the rest as default values

B. Tx

1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

2. Selecting APC

- a. Select either Power level or Scaling Factor.
- b. Power level
 - Input appropriate value GSM (between 5~19) or DCS (between 0~15)
- c. Scaling Factor
 - A 'Ramp Factor' appears on the screen.
 - You may adjust the shape of the Ramp or directly input the values.

C. Rx

1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

2. Gain Control Index (0~26) and RSSI level

- See if the value of RSSI is close to -16dBm when setting the value between 0~26 in Gain Control Index.
- Normal phone should indicate the value of RSSI close to -16dBm.

10. STAND ALONE TEST

10.3 Means of Test

- Select a COM port
- Set the values in Tx or Rx
- Select band and channel
- After setting them all above, press connect button.
- Press the start button

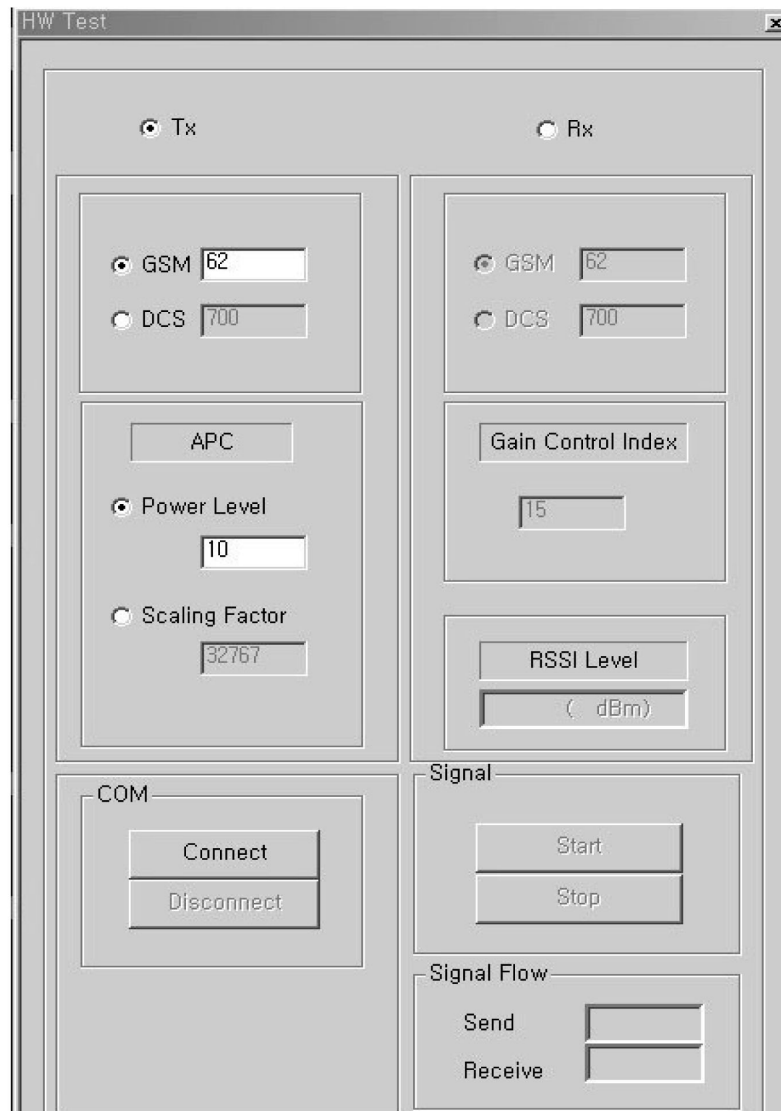


Figure. 11-1. HW test program

10. STAND ALONE TEST

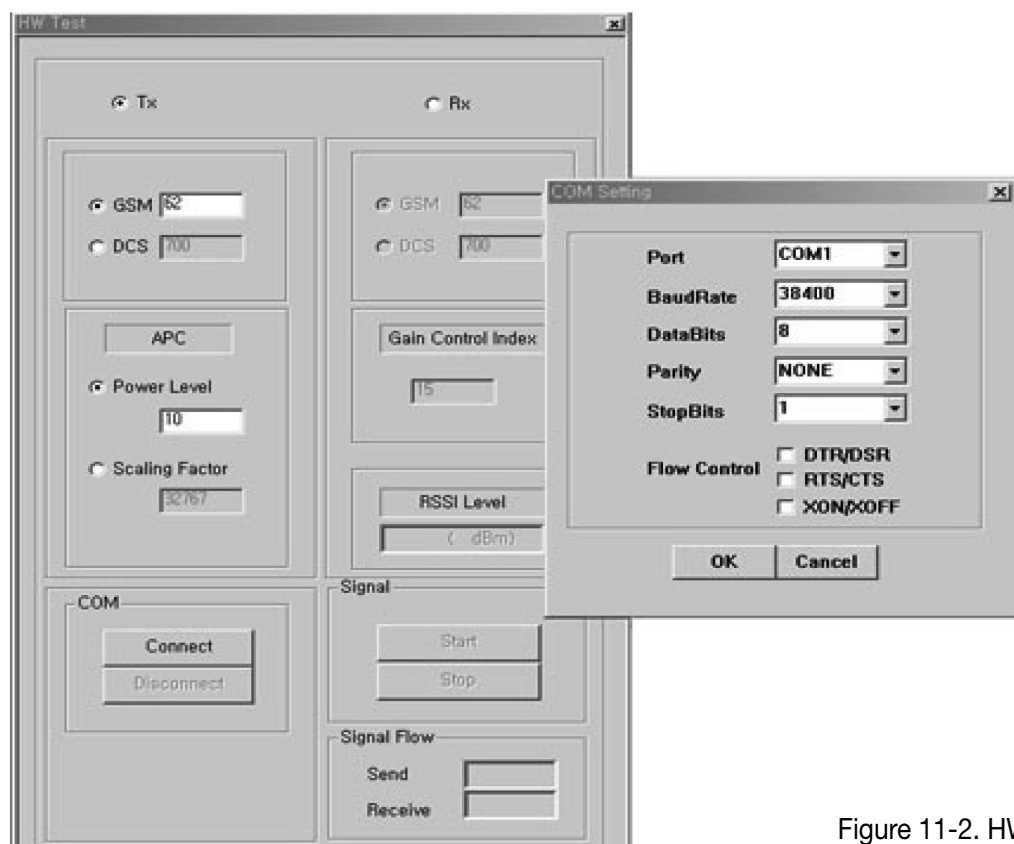


Figure 11-2. HW test setting

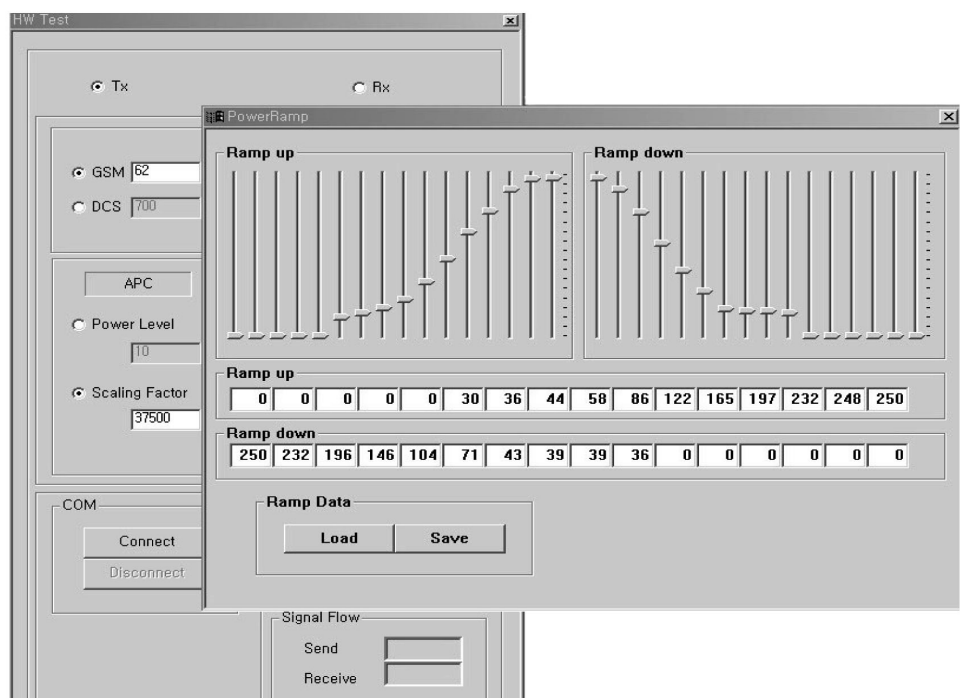


Figure 11-3. Ramping profile

11.AUTO CALIBRATION

11. AUTO CALIBRATION

11.1 Overview

Autocal (Auto Calibration) is the PC side Calibration tool that perform Tx ,Rx and Battery Calibration with Agilent 8960(GSM call setting instrument) and Tektronix PS2521G(Programmable Power supply). Autocal generate calibration data by communicating with phone and measuring equipment then write it into calibration data block of flash memory in GSM phone.

11.2 Requirements

- PC or Notebook installed with Microsoft Windows 98/ME/2000/XP
- Auto Calibration program(Autocal.exe)
- GSM Phone
- LGE PIF JIG, Serial Cable, Data Cable
- Agilent 8960(Call Setting Instrument)
- Tektronix PS2521G(Programmable Power Supply)

11.3 Menu and Settings

- File(F) Clear View : Clear Calibration Status window texts
- File(F) Save View : Save Calibration Status window texts
- File(F) Save Setting : Save Current Calibration settings to setting file(*.cal)
- File(F) Load Setting : Load saved Calibration setting
- File(F) Make BIN ALL : Make binary file after calibration finished
- File(F) Make BIN BAT.Cal only : Make binary file of battery cal data only after calibration finished
- File(F) Make & Write BIN : Make binary file after calibration finished then download it to the Flash Memory
- View(V) Tools : Enable or disable Tool bar
- View(V) Status : Enable or disable status bar
- Connection(C) Connect : Connect the phone with PC. This procedure checks whether the PC is connected "ag8960" or not. After that it performs sync. procedure with phone. If the sync. procedure is successful state column on status bar changed to SETUP, else you should disconnect phone and try again from the beginning and also check the whole connection. All measurement is performed at state SETUP.
- Connection(C) Port Setting : Show COM port setting dialog and Baudrate you can change,etc.
- GPIB(G) Connect : Connect the Ag8960 GPIB card with PC.

11.AUTO CALIBRATION

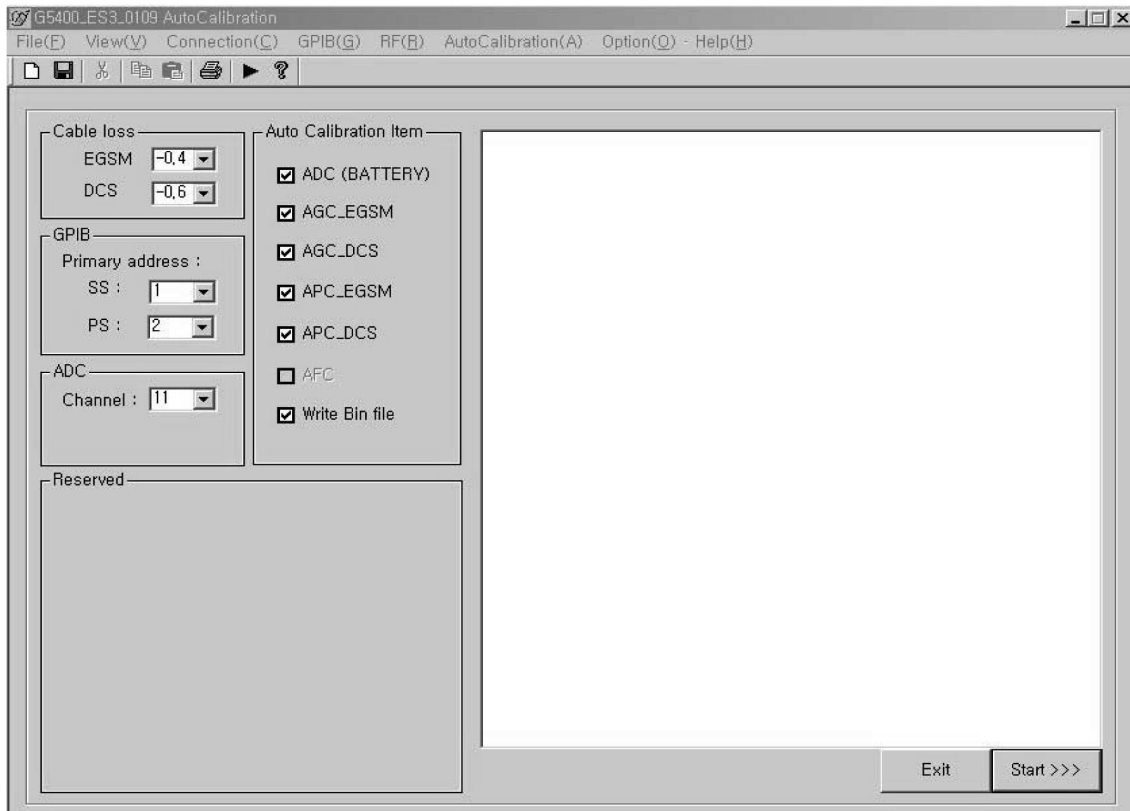


Figure 11-1. Auto Calibration Program

Screen → Cable loss : Enter the RF cable loss GSM and DCS

Screen → GPIB(Primary address) : Enter the SS(Ag8960) and PS(Tektronix PS2521G) GPIB address

Screen → ADC Channel : Default ADC Calibration Channel

Screen → Auto Calibration Item : Default Calibration Settings about Tx, Rx, ADC and write BIN file

11.AUTO CALIBRATION

11.4 AGC

This procedure is for Rx calibration.

In this procedure, We can get RSSI correction value. Set band EGSM and press Start button the result window will show correction values per every power level and gain code and the same measure is performed per every frequency.

11.5 APC

This procedure is for Tx calibration.

In this procedure you can get proper scale factor value and measured power level.

11.6 ADC

This procedure is for battery calibration.

You can get main Battery Config Table and temperature Config Table

11.7 Setting

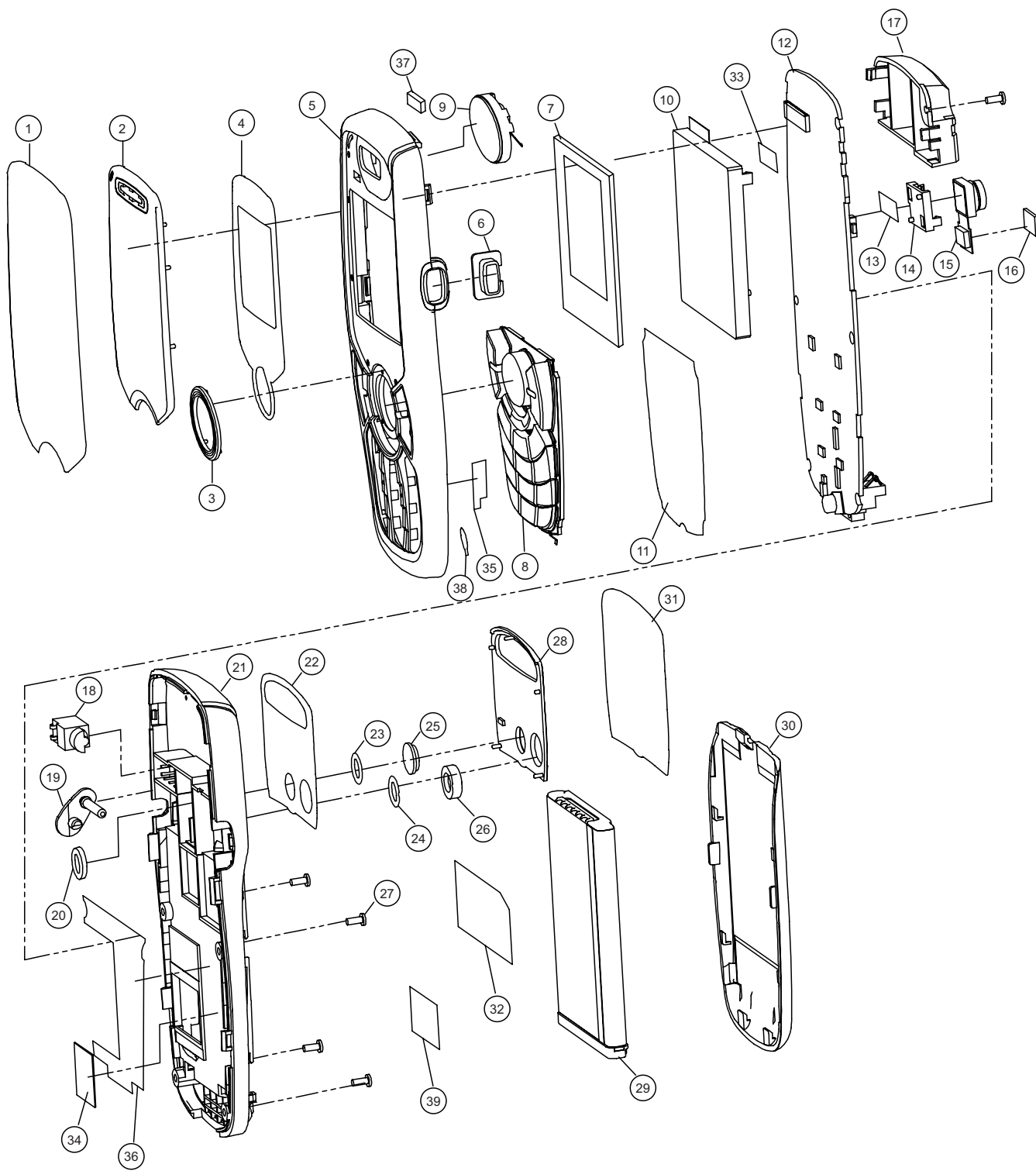
check com port and cable loss. Select automatic calibration item. If you uncheck one item calibration will stop from the unchecked item. This is useful when you want to process only one item.

11.8 How to do calibration

- A. Connect cable between phone and serial port of PC.
- B. Connect Ag8960 equipment and Power Supply and phone.
- C. Set correct port and baud rate.
- D. Press Start button. AutoCal process all calibration procedure
 - i. AGC EGSM
 - ii. AGC DCS
 - iii. APC EGSM
 - iv. APC DCS
 - v. ADC
- E. After finished all measurement. The state is return to SETUP.
- F. The Cal file will be generated and then the calibration data will be written into phone and then will be reset.

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 Exploded View



38	GAUZE [MIC]	1	MGBY0003201	
37	PAD[ZIP CONNECTOR]	1	MPBZ0083501	
36	TAPE SHIELD REAR	1	MTAC0023501	
35	TAPE[JACK]	1	MTAZ0067901	
34	TAPE[REAR]	1	MTAZ0063701	
33	TAPE[LCD-FPCB]	1	MTAZ0065101	
32	LABEL,MODEL	1	MLAK0013601	
31	TAPE-PROTECTION[REAR]	1	MTAB0065101	
30	COVER-BATTERY	1	MCJA0017701	
29	BATTERY-MODULE	1	SBCL0001303	
28	WINDOW-ASSY-CAMERA	1	AWAZ0006501	
27	SCREW M1.4_H3	5	GMZZ0015101	
26	CAP-MOBILE-SWITCH	1	MCCF0021801	
25	CAMERA LENS	1	MLCD0003801	
24	TAPE-RF MIRROR	1	MTAZ0053901	
23	TAPE-CAMERA-LENS	1	MTAZ0053801	
22	TAPE-WINDOW [CAMERA]	1	MTAD0032001	
21	COVER-REAR	1	MCJN0031401	
20	PAD-CAMERA	1	MPBT0012601	
19	CAP-EARJACK-COVER	1	MCCC0021101	
18	VIBRATOR	1	SJMY0007001	
17	INTTENNA	1	SNGF0006402	
16	CUSHION-CAMERA-CONECTOR	1	MPBT0012701	
15	CAMERA-MODULE	1	SVCY0005801	
14	CAMERA-BRKT	1	MBFP0002201	
13	TAPE-CAMERA-BRKT	1	MTAZ0054001	
12	PCB-ASSY,MAIN	1	SAFY0125001	
11	DOME ASSY,METAL	1	ADCA0028801	
10	LCD-MODULE	1	SVLY0025501	
9	SPEAKER	1	SUSY0014801	
8	KEY-PAD ASS'Y	1	AKAZ0008101	
7	PAD-LCD	1	MPBG0029801	
6	BUTTON-SIDE[CAMERA]	1	MBJL0017501	
5	COVER-FRONT	1	MCJK0035301	
4	TAPE-WINDOW-LCD	1	MTAD0031901	
3	DECO-FRONT	1	MDAG0009201	
2	WINDOW-ASSY-LCD	1	AWAB0016801	
1	TAPE-PROTECTION[FRONT]	1	MTAB0065001	
NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK

12.EXPLODED VIEW & REPLACEMENT PART LIST

12.2 Replacement Parts <Mechanical Component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		GSM,BAR/FILP	TGSM0039336		PEARL GRAY	
2	AAAY00	ADDITION	AAAY0128008		PEARL GRAY	
3	MCJA00	COVER,BATTERY	MCJA0017707		PEARL GRAY	
2	APEY00	PHONE	APEY0255407		PEARL GRAY	
3	ACGK00	COVER ASSY,FRONT	ACGK0047214		Gray	
4	AWAB00	WINDOW ASSY,LCD	AWAB0016601		Silver	2
5	BFAA	FILM,INMOLD	BFAA0024801	RUSSIA		
5	MWAC	WINDOW,LCD	MWAC0047901		Without Color	
4	MBJL00	BUTTON,SIDE	MBJL0017504		Gray	6
4	MCJK00	COVER,FRONT	MCJK0035304		Gray	5
4	MDAG00	DECO,FRONT	MDAG0009201		Silver	3
4	MGBY00	GAUZE	MGBY0003201		Black	38
4	MICD	INSERT,BAR	MICD0000801	[1.4X2.5pieX4mm]	Without Color	
4	MICD00	INSERT,BAR	MICD0000601	M1.4X2.5pieX2mm	Without Color	
4	MPBG00	PAD,LCD	MPBG0029801		Black	7
4	MPBZ00	PAD	MPBZ0083501		Black	37
4	MTAB00	TAPE,PROTECTION	MTAB0065001		Without Color	1
4	MTAD00	TAPE,WINDOW	MTAD0031901		Without Color	4
4	MTAZ00	TAPE	MTAZ0067901		Without Color	35
3	ACGM00	COVER ASSY,REAR	ACGM0046613		Gray	
4	AWAZ00	WINDOW ASSY	AWAZ0006501		Black	28
5	BFAA	FILM,INMOLD	BFAA0024701	RUSSIA		
5	MWAE	WINDOW,CAMERA	MWAE0006401		Without Color	
4	MCCC00	CAP,EARPHONE JACK	MCCC0021104		Gray	19
4	MCJN00	COVER,REAR	MCJN0031405		Gray	21
4	MLCD00	LENS,CAMERA	MLCD0003801		Without Color	25

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	MPBT00	PAD,CAMERA	MPBT0012601		Black	20
4	MTAB00	TAPE,PROTECTION	MTAB0065101		Without Color	31
4	MTAC00	TAPE,SHIELD	MTAC0023501		Without Color	36
4	MTAD00	TAPE,WINDOW	MTAD0032001		Without Color	22
4	MTAZ00	TAPE	MTAZ0053801		Without Color	23
4	MTAZ01	TAPE	MTAZ0053901		Without Color	24
4	MTAZ02	TAPE	MTAZ0063701		Black	34
3	AKAZ00	KEYPAD ASSY	AKAZ0008114		PEARL GRAY	8
3	GMZZ01	SCREW MACHINE	GMZZ0015101	1.4 mm,3.0 mm,MSWR3(FN) ,N ,+ , - ,	Silver	27
3	MCCF00	CAP,MOBILE SWITCH	MCCF0021801		Silver	26
4	MTAZ	TAPE	MTAZ0053901		Without Color	
3	MLAK00	LABEL,MODEL	MLAK0013601		Without Color	32
5	ACMY	CAMERA ASSY	ACMY0002601			
6	MBFP	BRACKET,CAMERA	MBFP0002201		Without Color	14
6	MPBZ	PAD	MPBZ0080601		Blue	
6	MTAZ	TAPE	MTAZ0054001		Without Color	13
6	SVCY00	CAMERA	SVCY0005801	CMOS ,VGA ,		15
5	ADCA00	DOME ASSY,METAL	ADCA0028801		Without Color	11
5	MPBZ00	PAD	MPBZ0080901		Black	
5	MTAC00	TAPE,SHIELD	MTAC0022101		Gold	
5	MTAZ	TAPE	MTAZ0065101		Without Color	33
5	MLAB00	LABEL,A/S	MLAB0000601	HUMIDITY STICKER	Without Color	
5	MLAC00	LABEL,BARCODE	MLAC0003301	EZ LOOKS(use for PCB ASSY MAIN(hardware))	Without Color	

12.EXPLODED VIEW & REPLACEMENT PART LIST

12.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SUSY00	SPEAKER	SUSY0014801	PIN ,8 ohm,88 dB,20 mm,*14mm		9
4	SJMY00	VIBRATOR,MOTOR	SJMY0007001	3 V,0.085 A,4*12.5 ,6.6T,L3100,SILINDER		18
3	SAFY00	PCB ASSY,MAIN	SAFY0125045			12
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0041302			
5	SBCL00	BATTERY,CELL,LITHIUM	SBCL0001303	2 V,1 mAh,COIN ,SOLDER TYPE BACKUP BATTERY		29
5	SNGF00	ANTENNA,GSM,FIXED	SNGF0006402	3.0 ,-2.0 dBd, ,EGSM+DCS+PCS, Intenna		17
5	SUMY00	MICROPHONE	SUMY0003802	FPCB ,-42 dB,4*1.5 ,		
5	SVLY00	LCD	SVLY0025501	MAIN ,128*128 ,35.78*39.7 ,65k ,CSTN ,TM ,ST7636 (Sitronix) ,		10
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0054643			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0048002			
6	C100	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C101	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C102	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C105	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C108	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C110	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C111	CAP,TANTAL,CHIP,MAKER	ECTZ0002602	22 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C112	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C113	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C114	CAP,CERAMIC,CHIP	ECCH0000276	1 uF,10V,Z,Y5V,HD,1608,R/TP		
6	C115	CAP,CERAMIC,CHIP	ECCH0000276	1 uF,10V,Z,Y5V,HD,1608,R/TP		
6	C116	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C119	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C120	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C122	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C124	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN , ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	C125	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN , ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	C128	CAP,TANTAL,CHIP	ECTH0001701	10 uF,6.3V ,M ,L_ ESR ,2012 ,R/TP		
6	C130	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C131	CAP,CERAMIC,CHIP	ECCH0000113	18 pF,50V,J,NP0,TC,1005,R/TP		
6	C133	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C134	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C135	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C136	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C137	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C138	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C141	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C142	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C143	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C144	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C145	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C146	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C200	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C203	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C204	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C205	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C206	CAP,TANTAL,CHIP,MAKER	ECTZ0002602	22 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C207	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ ESR ,1608 ,R/TP		
6	C208	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L_ ESR ,1608 ,R/TP		
6	C212	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C217	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C219	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C224	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C226	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C227	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C228	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C230	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C231	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C299	CAP,TANTAL,CHIP,MAKER	ECTZ0005201	10 uF,6.3V ,M ,L _ESR ,1608 ,R/TP		
6	C300	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C302	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C313	CAP,TANTAL,CHIP,MAKER	ECTZ0002602	22 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C323	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C325	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C327	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C328	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C405	CAP,CERAMIC,CHIP	ECCH0000276	1 uF,10V,Z,Y5V,HD,1608,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C407	CAP,TANTAL,CHIP,MAKER	ECTZ0002602	22 uF,6.3V ,M ,STD ,2012 ,R/TP		
6	C408	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C409	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C498	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C500	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C502	CAP,CERAMIC,CHIP	ECCH0000113	18 pF,50V,J,NP0,TC,1005,R/TP		
6	C503	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C504	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C505	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C507	CAP,TANTAL,CHIP,MAKER	ECTZ0003101	33 uF,10V ,M ,STD ,ETC ,R/TP		
6	C508	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C509	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C510	CAP,CERAMIC,CHIP	ECCH0000901	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C511	CAP,CERAMIC,CHIP	ECCH0000178	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP		
6	C513	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0000181	4.7 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C515	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C516	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C517	CAP,CERAMIC,CHIP	ECCH0000104	3 pF,50V,C,NP0,TC,1005,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C519	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C520	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP		
6	C521	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C522	CAP,CERAMIC,CHIP	ECCH0000103	1.5 pF,50V,C,NP0,TC,1005,R/TP		
6	C523	CAP,CERAMIC,CHIP	ECCH0000103	1.5 pF,50V,C,NP0,TC,1005,R/TP		
6	C524	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C525	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C526	CAP,CERAMIC,CHIP	ECCH0000159	22 nF,16V,K,X7R,HD,1005,R/TP		
6	C527	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C528	CAP,CERAMIC,CHIP	ECCH0000178	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C529	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C530	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C531	CAP,CERAMIC,CHIP	ECCH0000178	1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP		
6	C532	CAP,CERAMIC,CHIP	ECCH0005801	2.2 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C533	CAP,CERAMIC,CHIP	ECCH0000135	270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C534	CAP,CERAMIC,CHIP	ECCH0000135	270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C535	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C536	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C537	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C538	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C539	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C540	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C541	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP		
6	C542	CAP,CERAMIC,CHIP	ECCH0000135	270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP		
6	C600	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C601	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C602	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C603	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C604	CAP,CERAMIC,CHIP	ECCH0000167	0.1 uF,6.3V,K,X5R,HD,1005,R/TP		
6	C605	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C606	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C607	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C608	CAP,CERAMIC,CHIP	ECCH0004903	1 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	CN300	CONNECTOR,I/O	ENRY0003501	24 PIN,0.5 mm,ANGLE , ,		
6	CN600	CONNECTOR,BOARD TO BOARD	ENBY0019501	20 PIN,4 mm,ETC , ,H=1.5, Socket		
6	D100	DIODE,SWITCHING	EDSY0012101	US-FLAT ,30 V,1 A,R/TP ,2.5*1.25*0.6(t)		
6	D101	DIODE,SWITCHING	EDSY0005701	EMT3 ,80 V,4 A,R/TP ,		
6	D300	DIODE,SWITCHING	EDSY0012301	1-1E1A ,85 V,1 A,R/TP ,P=200mW, IFM=200mA		
6	FL400	FILTER,EMI/POWER	SFEY0006401	SMD ,6 Channel, EMI+ESD, CSP,Pb-free		
6	FL401	FILTER,EMI/POWER	SFEY0006401	SMD ,6 Channel, EMI+ESD, CSP,Pb-free		
6	FL402	FILTER,EMI/POWER	SFEY0006401	SMD ,6 Channel, EMI+ESD, CSP,Pb-free		
6	FL500	FILTER,SEPERATOR	SFAY0003802	900.1800 ,1900 ,3.0 dB,3.8 dB,25 dB,23 dB,ETC ,7.2*5.0*1.8mm		
6	FL600	FILTER,EMI/POWER	SFEY0009301	SMD ,		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	FL601	FILTER,EMI/POWER	SFEY0009301	SMD ,		
6	FL602	FILTER,EMI/POWER	SFEY0009301	SMD ,		
6	J200	CONN,JACK/PLUG, EARPHONE	ENJE0002301	3,5 PIN,G7000 EAR JACK 3 pole, 5 pin KSD		
6	J300	CONN,SOCKET	ENSY0007608	6 PIN,ETC ,BRIDGE NON PROTECTOR TYPE ,2.54 mm,2.7T		
6	L500	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,		
6	L501	INDUCTOR,CHIP	ELCH0001003	6.8 nH,J ,1005 ,R/TP ,chip inductor PBFREE		
6	L502	INDUCTOR,CHIP	ELCH0001001	10 nH,J ,1005 ,R/TP ,Pb Free		
6	L503	INDUCTOR,CHIP	ELCH0002702	22 nH,G ,1608 ,R/TP ,		
6	L504	INDUCTOR,CHIP	ELCH0002717	6.8 nH,J ,1608 ,R/TP ,coil inductor		
6	L505	INDUCTOR,CHIP	ELCH0002716	5.1 nH,J ,1608 ,R/TP ,coil inductor		
6	Q100	TR,FET,P-CHANNEL	EQFP0004201	2.9*1.9*0.8(t) ,.7 W,20 V,-6 A,R/TP ,NDC652P upgrade(substitution) item, Pb free		
6	Q200	TR,BJT,NPN	EQBN0004801	SMT6 ,0.2 W,R/TP ,		
6	Q300	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY		
6	Q301	TR,BJT,NPN	EQBN0004801	SMT6 ,0.2 W,R/TP ,		
6	Q400	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY		
6	R101	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R102	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R105	RES,CHIP	ERHY0001102	0.2 ohm,1/4W ,F ,2012 ,R/TP		
6	R106	RES,CHIP	ERHY0000230	330 ohm,1/16W,J,1005,R/TP		
6	R107	RES,CHIP	ERHY0000512	10M ohm,1/16W,J,1608,R/TP		
6	R108	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R109	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R110	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP		
6	R112	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R113	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R114	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R115	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R116	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R201	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R202	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
6	R204	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP		
6	R205	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R206	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R209	RES,CHIP	ERHY0000288	240K ohm,1/16W,J,1005,R/TP		
6	R211	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R212	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP		
6	R213	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R215	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP		
6	R216	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
6	R217	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R218	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R219	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R220	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R221	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP		
6	R222	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R223	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R224	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R225	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R226	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R228	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R229	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R230	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R231	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R301	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R302	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R303	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R304	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R305	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R306	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R307	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R310	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP		
6	R311	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R313	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R314	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R315	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R317	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R318	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R319	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R321	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R322	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R323	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R324	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R325	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R327	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R328	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R329	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R332	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R333	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R334	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R335	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R336	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R337	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R338	RES,CHIP	ERHY0000237	680 ohm,1/16W,J,1005,R/TP		
6	R339	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP		
6	R346	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R347	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R349	RES,CHIP	ERHY0007007	15 ohm,1/8W ,F ,2012 ,R/TP		
6	R350	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R352	RES,CHIP	ERHY0000273	47K ohm,1/16W,J,1005,R/TP		
6	R353	RES,CHIP	ERHY0000116	1.5K ohm,1/16W,F,1005,R/TP		
6	R354	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R355	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R356	RES,CHIP	ERHY0000207	20 ohm,1/16W,J,1005,R/TP		
6	R357	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R358	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R359	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R405	RES,CHIP	ERHY0000262	12K ohm,1/16W,J,1005,R/TP		
6	R406	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R407	RES,CHIP	ERHY0000287	220K ohm,1/16W,J,1005,R/TP		
6	R498	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R500	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R501	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R502	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R503	RES,CHIP	ERHY0006603	36 ohm,1/16W ,J ,1005 ,R/TP		
6	R504	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
6	R505	RES,CHIP	ERHY0000223	150 ohm,1/16W,J,1005,R/TP		
6	R506	RES,CHIP	ERHY0000210	30 ohm,1/16W,J,1005,R/TP		
6	R507	RES,CHIP	ERHY0000224	180 ohm,1/16W,J,1005,R/TP		
6	R508	RES,CHIP	ERHY0000224	180 ohm,1/16W,J,1005,R/TP		
6	R509	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP		
6	R510	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R511	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R512	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R513	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R600	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R602	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R604	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R605	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R606	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	R608	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R609	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP		
6	R610	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R611	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP		
6	SW500	CONN,RF SWITCH	ENWY0003001	STRAIGHT ,SMD ,0.6 dB,3.8X3.0X3.6T		
6	SW501	SWITCH,TACT	ESCY0002501	12 V,0.05 A,HORIZONTAL ,220 G,G5200 TACK S/W		
6	U100	IC	EUSY0181502	CSP BGA ,204 PIN,R/TP ,GSM/GPRS DIGITAL BASEBAND PROCESSOR / ART7TDMI DSP, Pb Free		
6	U101	IC	EUSY0169301	148-TERMINAL BGA ,148 PIN,R/TP ,GSM ANALOG BASEBAND / TYPHOON B, Pb Free		
6	U200	IC	EUSY0204801	SC82-AB (SC70-4) ,4 PIN,R/TP ,80mA CMOS LOW IQ LDO VOLTAGE REGULATOR / 2.5V		
6	U201	IC	EUSY0250501	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0077701		
6	U202	IC	EUSY0119001	10 uMAX ,10 PIN,R/TP ,DUAL SPDT ANALOG SWITCH, Pb Free		
6	U203	IC	EUSY0212401	BGA ,35 PIN,R/TP ,		
6	U206	IC	EUSY0149701	LLP ,10 PIN,R/TP ,1 Watt Audio Power Amplifier / Leadless Type		
6	U300	IC	EUSY0250201	BGA ,88 PIN,R/TP ,128T+32ps(MLC) 8X10		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	U310	IC	EUSY0118602	SOT23 ,5 PIN,R/TP ,2.85V/150mA Low Noise uCap LDO Regulator, PBFREE		
6	U400	IC	EUSY0238201	QFN ,16 PIN,R/TP ,3 LEDs, WHITE LED CHARGE PUMP		
6	U500	IC	EUSY0161301	8x8 LGA ,28 PIN,R/TP ,		
6	U501	PAM	SMPY0008901	35 dBm,55 %,2 A,-50 dBc,25 dB,6.0 * 6.0 * 1.4 ,SMD ,GSM QUAD PAM		
6	U502	IC	EUSY0118602	SOT23 ,5 PIN,R/TP ,2.85V/150mA Low Noise uCap LDO Regulator, PBFREE		
6	U600	IC	EUSY0118602	SOT23 ,5 PIN,R/TP ,2.85V/150mA Low Noise uCap LDO Regulator, PBFREE		
6	U601	IC	EUSY0232601			
6	U602	IC	EUSY0118802	SOT-23 ,5 PIN,R/TP ,150mA Low Noise uCap CMOS LDO,PBFREE		
6	VA101	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA102	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA204	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA205	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA206	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA300	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA304	VARISTOR	SEVY0000702	14 V ,10% ,SMD ,		
6	VA305	VARISTOR	SEVY0000702	14 V ,10% ,SMD ,		
6	VA307	VARISTOR	SEVY0000702	14 V ,10% ,SMD ,		
6	VA308	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA309	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA310	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA311	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA312	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA313	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA314	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA350	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA352	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA353	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	VA354	VARISTOR	SEVY0001001	14 V , ,SMD ,50pF, 1005		
6	X100	X-TAL	EXXY0015601	.032768 MHz,20 PPM,7 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	X500	VCTCXO	EXSK0006501	13 MHz,2 PPM,10 pF,SMD ,3.2*2.5*1.2 ,SV 2.85V , AFC 0.8V		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0046902			
6	C201	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C202	CAP,TANTAL,CHIP,MAKER	ECTZ0002601	10 uF,10V ,M ,STD ,2125 ,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C214	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C319	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C320	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C400	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C497	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	CN400	CONNECTOR,BOARD TO BOARD	ENBY0018701	41 PIN,0.3 mm,STRAIGHT , ,0.9t stacking height		
6	LD300	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD301	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD302	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD303	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD304	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD305	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T		
6	LD306	DIODE,LED,CHIP	EDLH0007901	RED ,1608 ,R/TP ,Indicator,0.4T Red LED		
6	R200	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP		
6	R203	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R207	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		

12.EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R208	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP		
6	R210	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP		
6	R214	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP		
6	R340	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R341	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R342	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R343	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R344	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R345	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP		
6	R348	RES,CHIP	ERHY0000239	820 ohm,1/16W,J,1005,R/TP		
6	R400	RES,CHIP	ERHY0000233	470 ohm,1/16W,J,1005,R/TP		
6	R401	RES,CHIP	ERHY0000233	470 ohm,1/16W,J,1005,R/TP		
6	R402	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP		
6	R403	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	R404	RES,CHIP	ERHY0000274	51K ohm,1/16W,J,1005,R/TP		
6	VA200	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA201	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA202	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA203	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA400	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
6	VA401	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR, Pb Free		
5	SPFY00	PCB,MAIN	SPFY0097501	FR-4 ,1.0 mm,BUILD-UP 8 ,B2100 MAIN PCB		

12.EXPLODED VIEW & REPLACEMENT PART LIST

12.3 Accessory

Note: This Chapter is used for reference, Part order by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0077901	3.7 V,830 mAh,1 CELL,PRISMATIC ,FG101 RUSSV423450, Innerpack	Without Color	
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0003203	G4050 G4010 For USA ,3 POLE Design change		
3	SSAD00	ADAPTOR,AC-DC	SSAD0007837	FREE ,50 Hz,5.2 V,800 mA,CE,CB ,		

Note
