GSM PHONE
SERVICE MANUAL

MODEL : VK300

ISSUED DATE : 2003-07-18

Rev. 1.00

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1. Introduction

VK300 is a folder type mobile phone with color LCD, operated in the GSM and Digital Cellular Mobile Radio System, which is the Pan-European mobile cellular standard.

VK300 has the operation band of GSM 900 and DCS 1800. GSM PhaseII features are fully supported and parts of the GSM Phase II+ features are also supported.

About the SIM Toolkit, VK300 supports up to Class 3 including Class 1, 2. For speech communication, VK300 supports Full Rate(FR), Enhanced Full Rate(EFR) and Half Rate(HR). For easy text, eZi Text is implemented and WAP protocol is adopted for internet connection.

VK300 supports GPRS up to Class 10.

2. Specification

2.1 HW Features

Item	Description	Remark
Supporting standard	GSM 900/DCS 1800 (Dual Band)	
	E-GSM	
	Phase 2 and Phase 2+	
	SIM Toolkit : Class 1,2,3	
	GPRS : Class 10	
Frequency range	E-GSM TX : 880 - 915 MHz	
	E-GSM RX : 925 - 960 MHz	
	DCS 1800 TX : 1710 - 1785 MHz	
	DCS 1800 RX : 1805 - 1880 MHz	
Battery	Standard : ADLB, 850 mAh	
	Slim : ADLB, 620mAh	
Display	Full graphic type	
	Dual LCD	
	- Main LCD	TFT-65K Color, Pixels : 128 x 160
	- Ext. LCD	STN 256 Color, Pixels : 80 x 80
Antenna	Fixed type	
Speech coding	FR, EFR, HR	
Data & Fax	Built-in	
Vibrator	Built-in	
Speaker+Receiver	Unified Type	Applied (4 pole)
Portable Handsfree (Ear-Phone)	Built-in	
Travel charger	Built-in	
Options	Battery Charger	country.
Melody Chip	Yamaha	40 Poly
Flash Memory	Flash : 128 Mbytes	
	RAM : 32 Mbytes	

2.2 SW Features

Function	Detail Item	Comments
Normal features	Last dialed number	20 entry
	Last received number	20 entry
	Last missed number	20 entry
	Scratch pad memory	1
Call	Call waiting Yes	(network dependent)
Audio	Earpiece volume	5 level
	Mute on& Mute off	Yes
Cell broadcast	CB option	Manual/Auto/Off
Phone Book	Read topics	SIM / Phone
Languages	S/T Chinese & English	Available other language
Supplementary services	Call barring	All calls
		All outgoing calls
		All outgoing international calls
		All outgoing int. calls except to home country
		All incoming calls
		All incoming calls when roaming
		Cancel all
Short Message	Write message	Send/Save
	Output message	Send/Save/Extract Number/
		Delete/Delete All
	Input message	Reply/Forward/Extract number/
		Delete/Delete All
	Status report	Delete/Delete All
	Call voicemail	
	Cell broadcast	CB Option(Manual/Auto/Off)/Read/
		Topics(SIM/Phone)/Languages
	Memory status	
	Settings	Status report/Message type
		Expiry period/SMS center
		Voice center/Alert
Multi-band	Support of multi-band & mode	GSM 900
		EGSM
		DCS1800

Function	Detail Item	Comments
Miscellaneous function	Development & test facility	
	Field test facility	
	Display software version	
Text input	Language	English
		Simplified chinese
		Traditional chinese
	eZi text	Predictive word input
Scheduler	View day	
	Make	Schedule
		Call
		Memo
		Anniversary
	Delete	
	View all	
WAP	Built in	WAP 1.2.1
EMS	Built in	
GPRS	Built in	Class 10
World time	Setting local time	
	Number of selectable cities	61 Cities
Calculator	Operator	Addition
		Subtraction
		Multiplication
		Division
Unit converter	Length conversion	
	Weight conversion	
	Volume conversion	
	Surface conversion	
Pink schedule		
Bio Rhythm	My rhythm	
	With Friend	
	Special day	
	Setup	My Birthday
		Friend’s Birthday
Game	3EA (minimum)	
SIM Card		Support 1.8V / 3V SIM

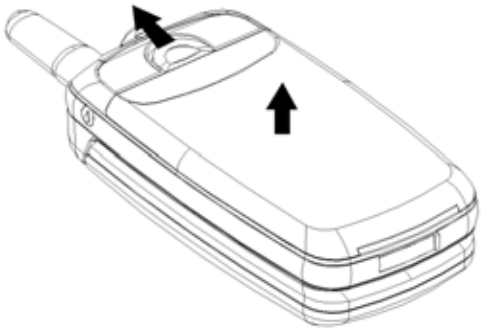
3. Disassembly Instruction

3.1 Before Disassembly

1. Remove the battery. To do so:

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

   ② Lift the battery away.



2. Remove the SIM card. To do so:

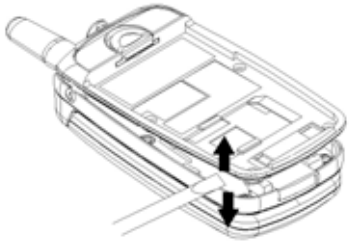
   ① Remove the SIM card.

   Keep the SIM card in a safe place.

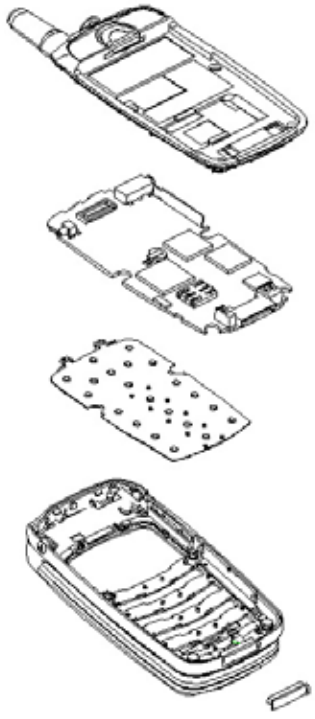
3.2 Main Frame

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

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

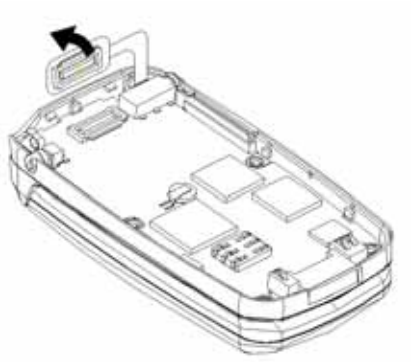


3. Now, you can replace the PCBs and the other components.



3.3 Folder

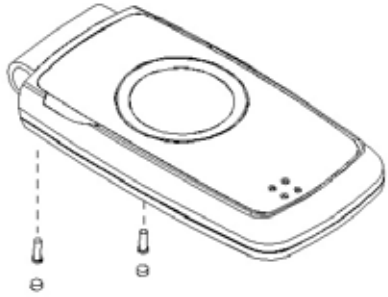
1. Remove the back case as described at Steps 1 and 2 under Main Frame Disassembly on page 3-2.



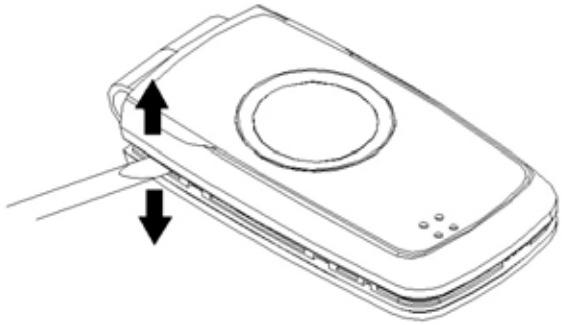
2. Unplug the connector shown at right from the main PCB.

3. Unhook the folder from the main frame.

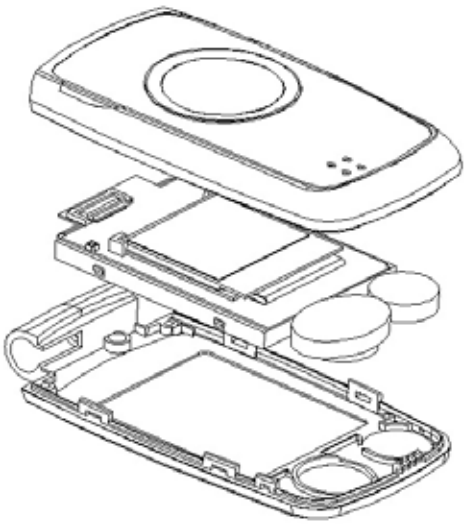
4. Remove the two screws from the folder.



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

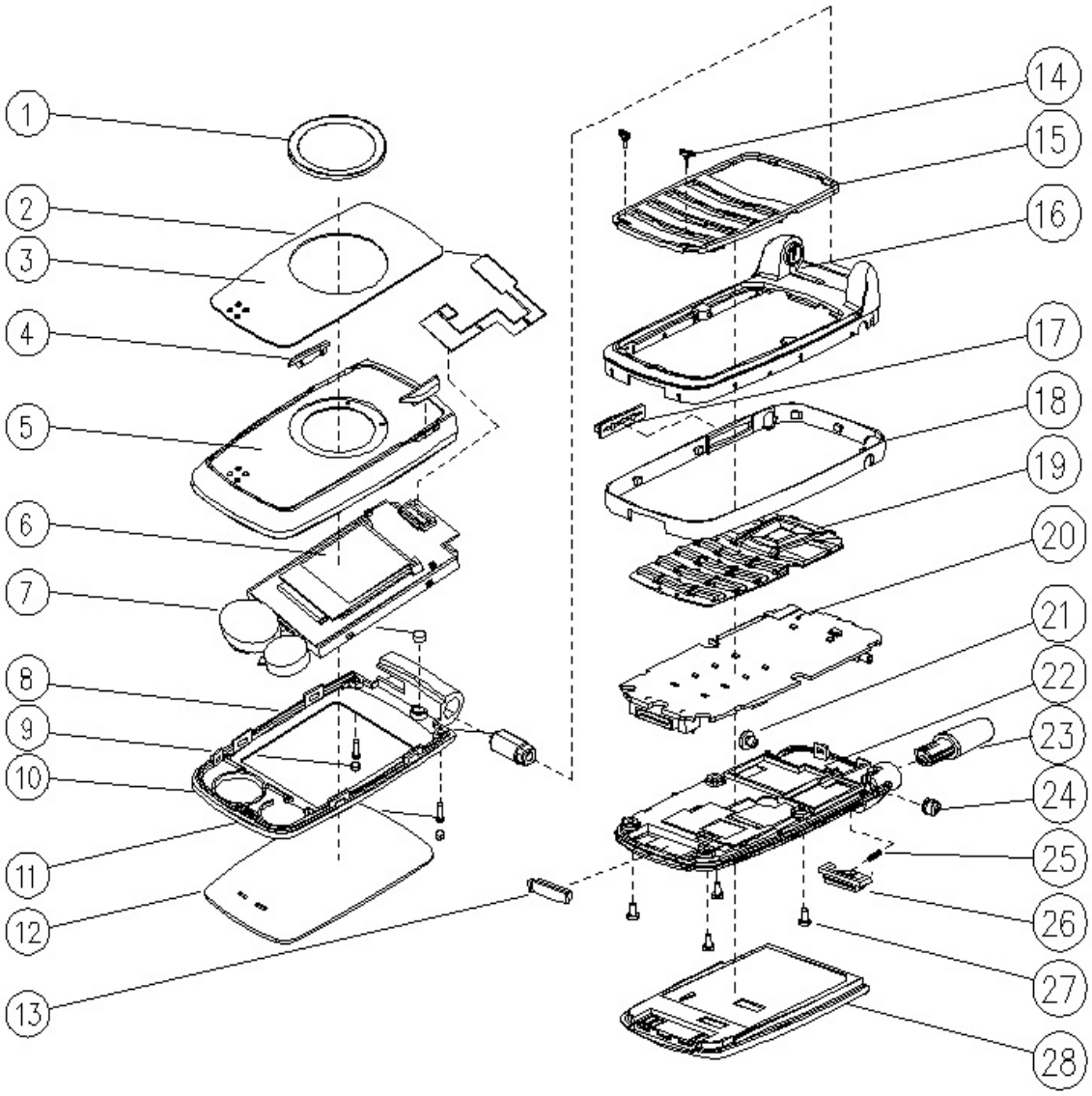


6. Now, you can remove the LCD ass’y and the other components.



3.4. Exploded View and Parts List

3.4.1 Exploded View



3.4.2 Mechanical Parts List

NO.	DESCRIPTION	Q'TY
1	Window Sub Lcd	1
2	F-pcb Folder	1
3	Deco Panel	1
4	Indicator Led	2
5	Folder Upper	1
6	Lcd Module	1
7	Magnet	1
8	Hinge	1
9	Rubber Screw	2
10	Screw Torx(+)	2
11	Folder Lower	1
12	Window Main Lcd	1
13	Rubber Carkit	1
14	Bushing Deco Front	2
15	Deco Front	1
16	Case Front	1
17	Knob Side	1
18	Deco Side Front	1
19	Keypad	1
20	Main Pcb	1
21	Rubber Ear Jack	1
22	Case Rear	1
23	Antenna	1
24	Rubber RF	1
25	Spring	1
26	Knob Lock	1
27	Screw Torx(*)	4
28	Battery Package	1

4. Data Kit & Test Method

4.1 Data Kit

4.1.1 Download Equipment

1. Download Cable
2. Desktop or Notebook PC
3. Fluid program
4. VK300 Mobile Phone

4.1.2 Download Environment.

To download software of VK300, the following working environments should be prepared:

• VK300 download cable, Interface JIG, is connected to serial port of the desktop or notebook PC.

• VK300 fluid program is copied to the desktop PC or notebook PC.

Warning

You MUST use the **download cable kit** (Interface JIG) and UART download **Fluid program**.

Otherwise,downloading process won't work properly.

4.1.3 Download Procedure

1. Unzip Fluid program (FluidVK1_1.zip) in the PC.

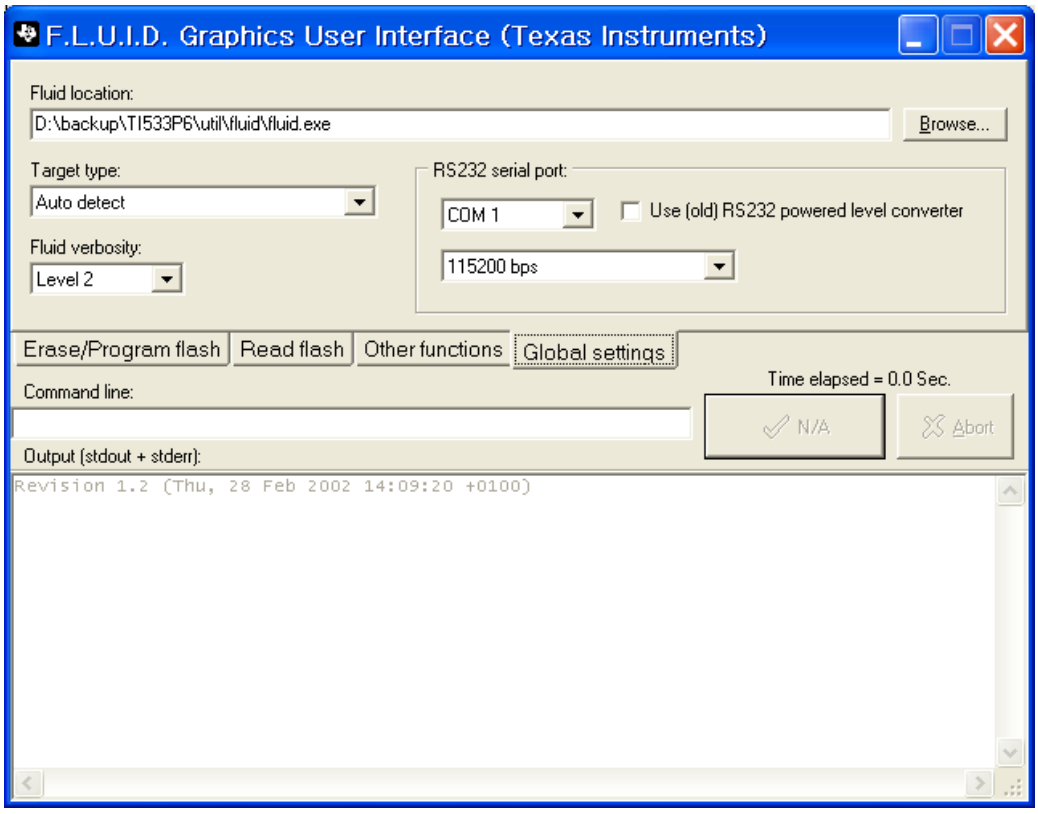
2. Execute **fluid_gui.exe**. And then select **Global setings** tap. Then check settings.

Fluid location: should be selected fluid.exe

Target type: Auto detect or HERCROM400/Calipso/C-sample

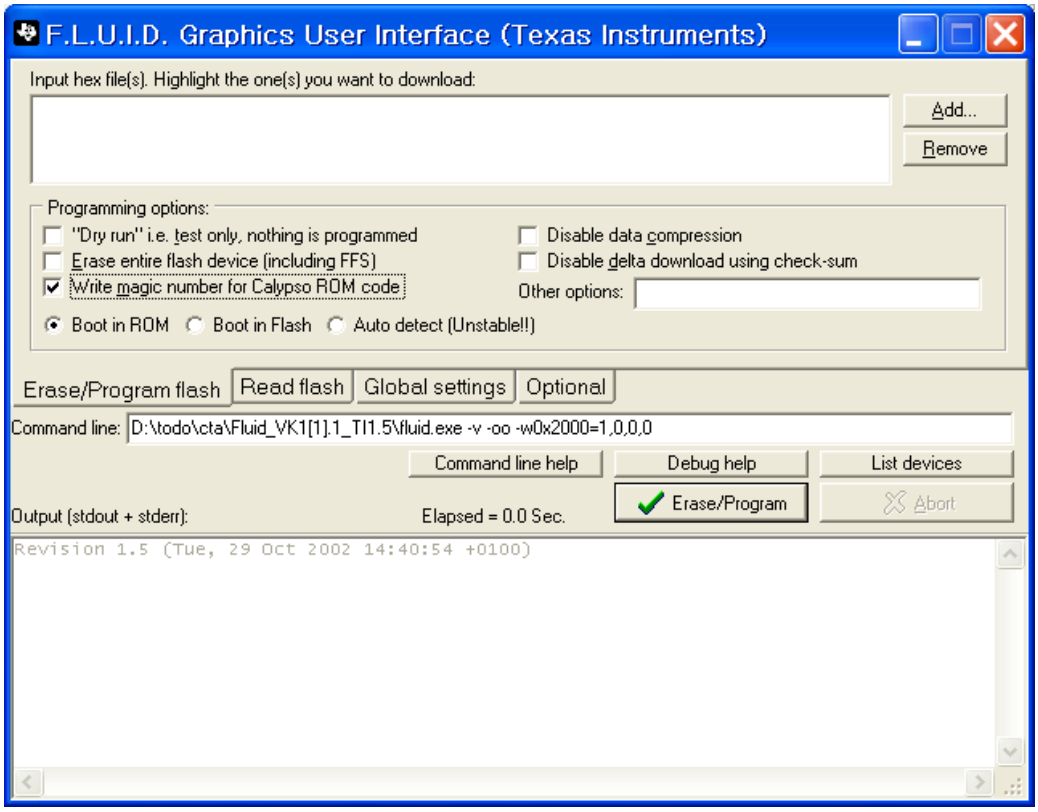
Fluid verbosity: Level 2

RS232 serial port: connected COM port, 115200 bps. Must not check Use(old)RS232 powered level converter



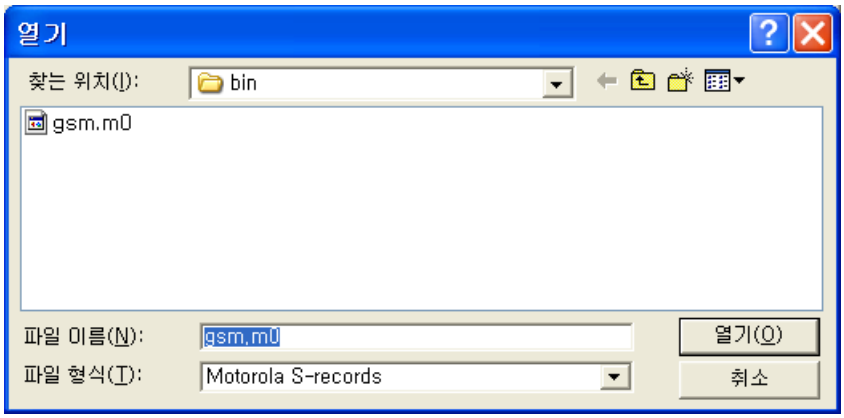
< Figure 1 >

3. Select **Erase/Program flash** tap. Than **check Write magic number for Calypso ROM code** and **Boot in Rom** as shown in Figure 2.



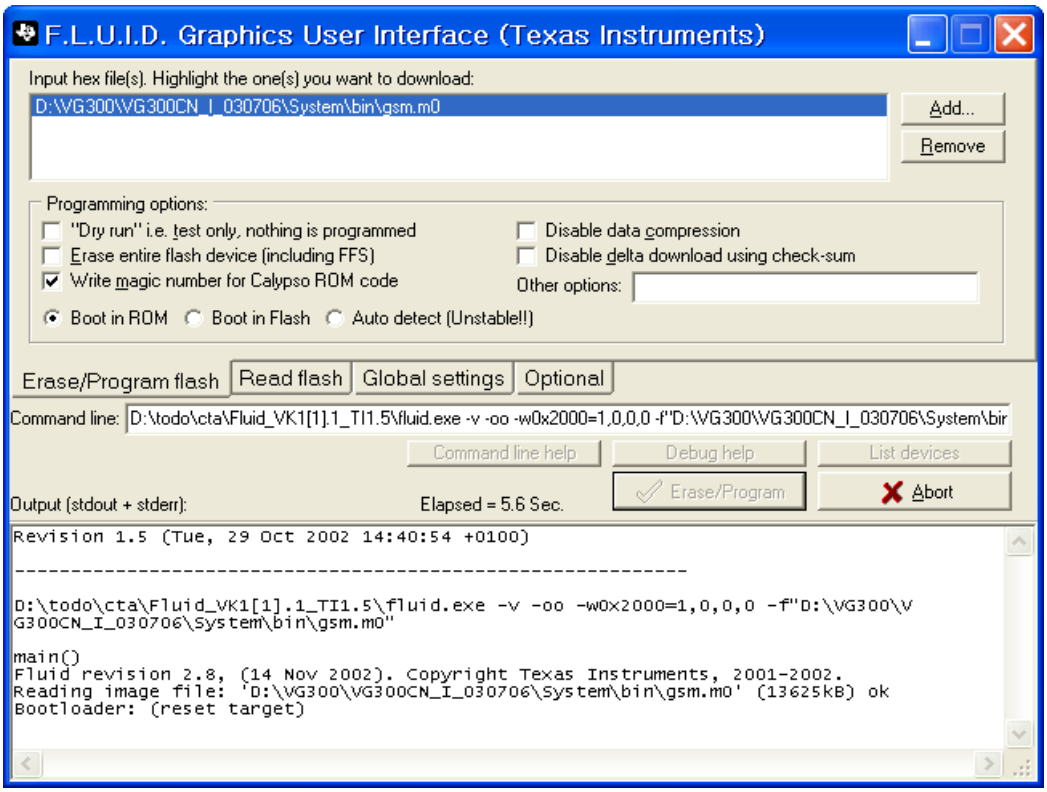
< Figure 2 >

4. Press **Add** button and select M0 file to update.



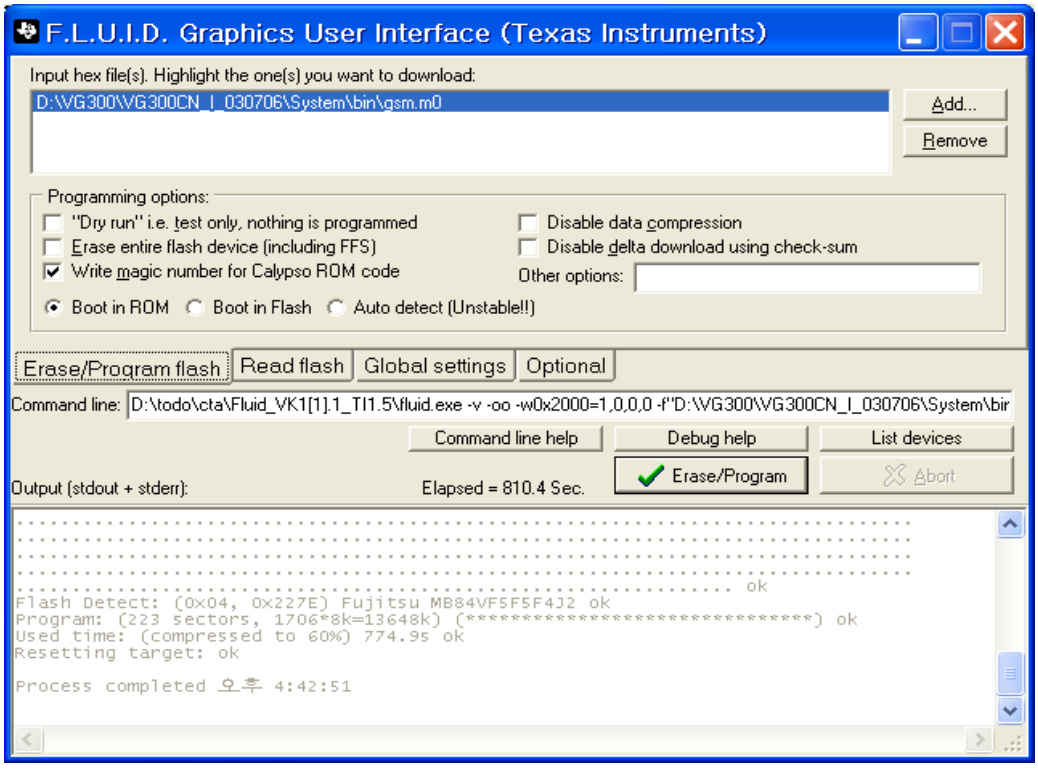
< Figure 3 >

5. Connect VK300 phone. And **Press Erase/Program** button



< Figure4 >

6. When 'Bootloader: (rest target)' message is display, Reset VK300 phone.

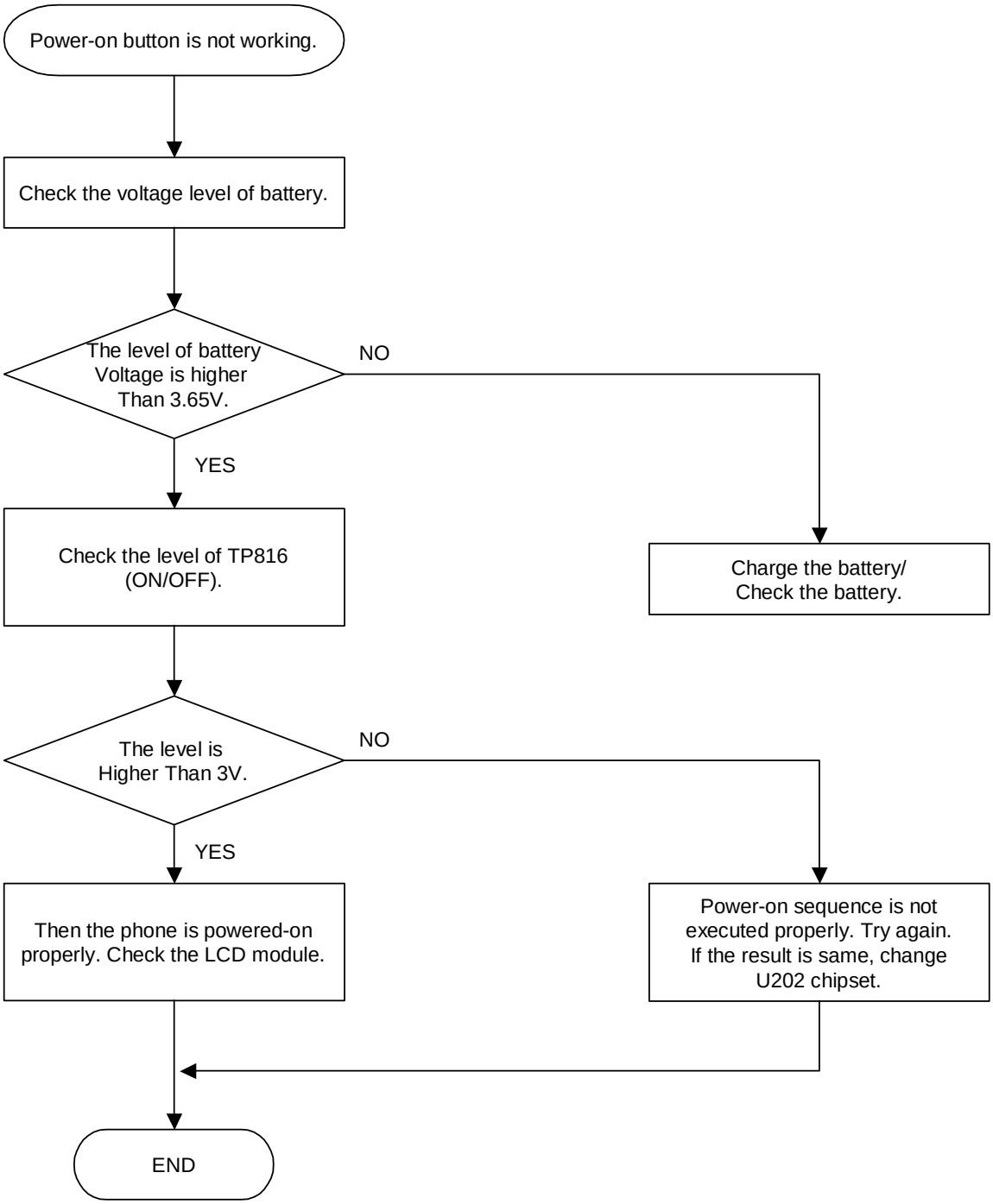


< Figure 5 >

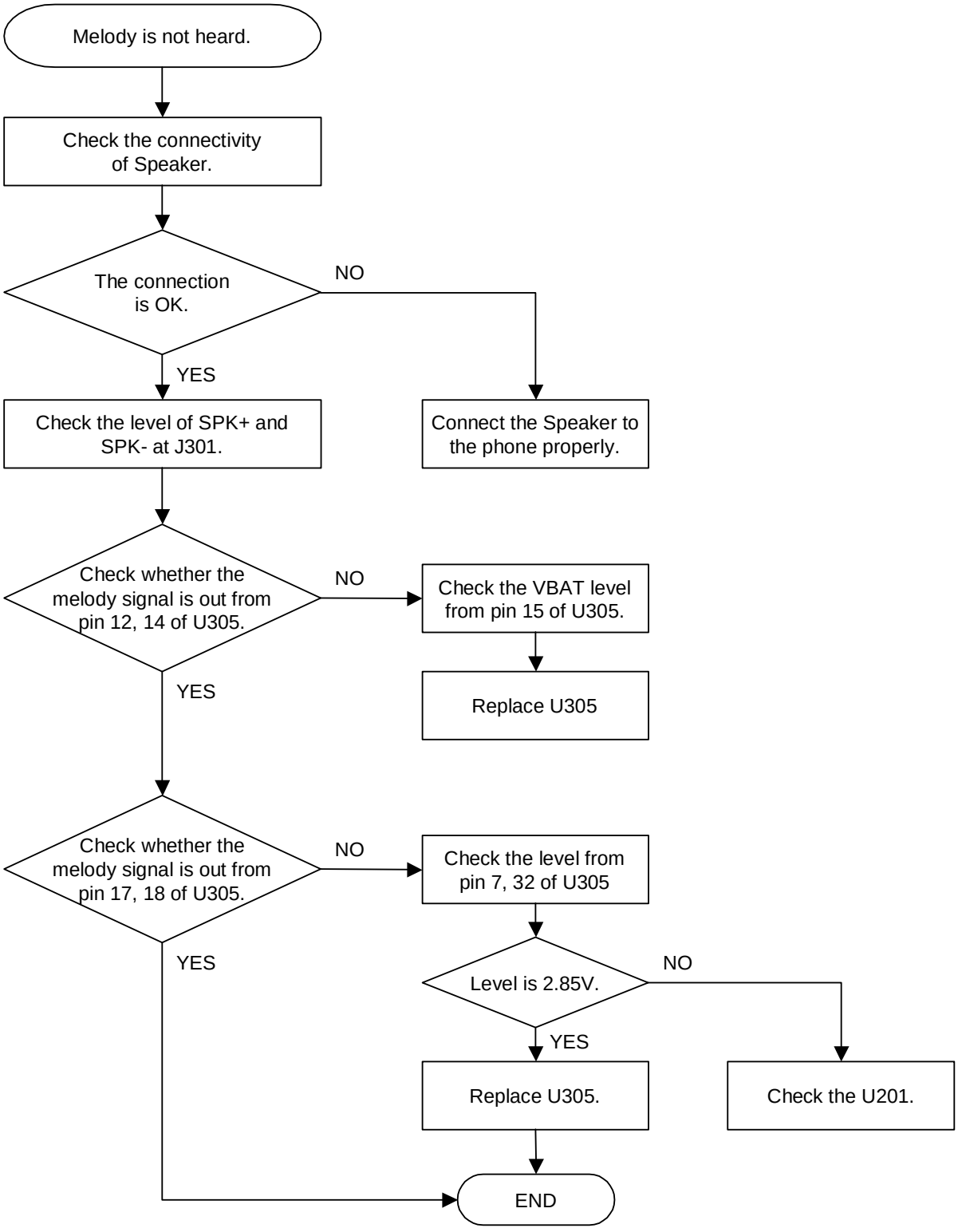
If m0 file was already loaded to VK300 phone, Fluid just check and end download process. It's not error.

5. Trouble Shooting

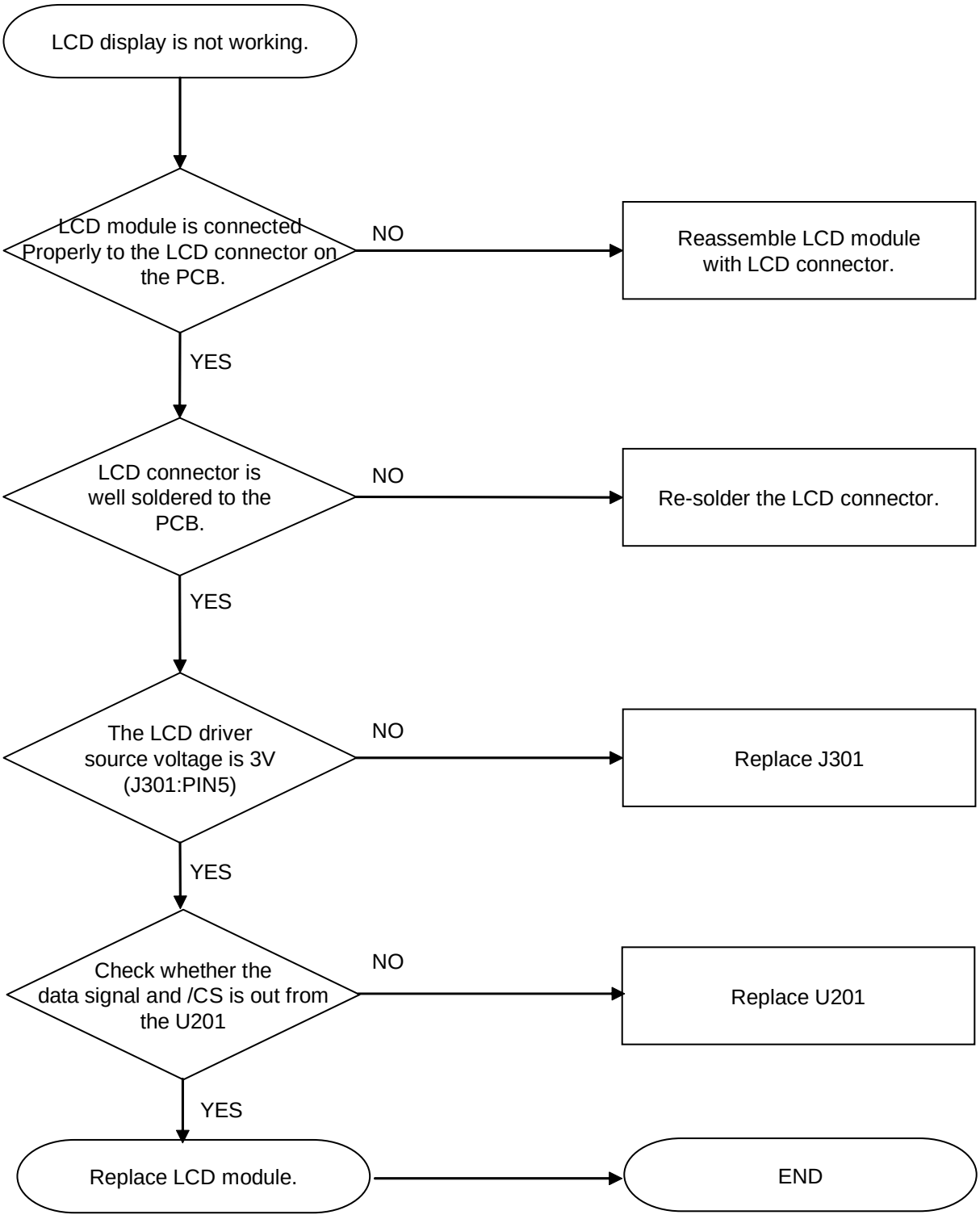
5.1 Power-On Trouble



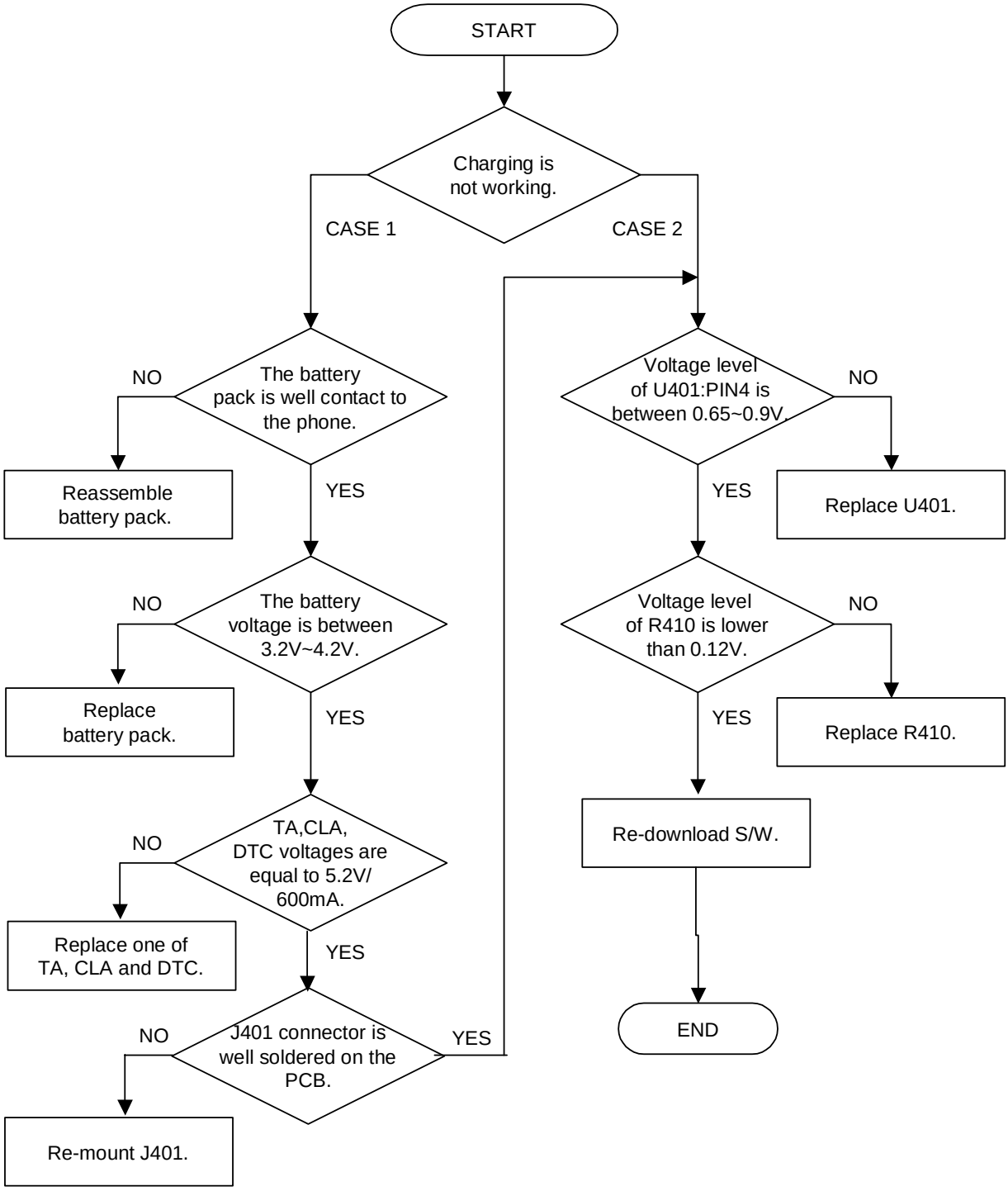
5.2 Melody Trouble



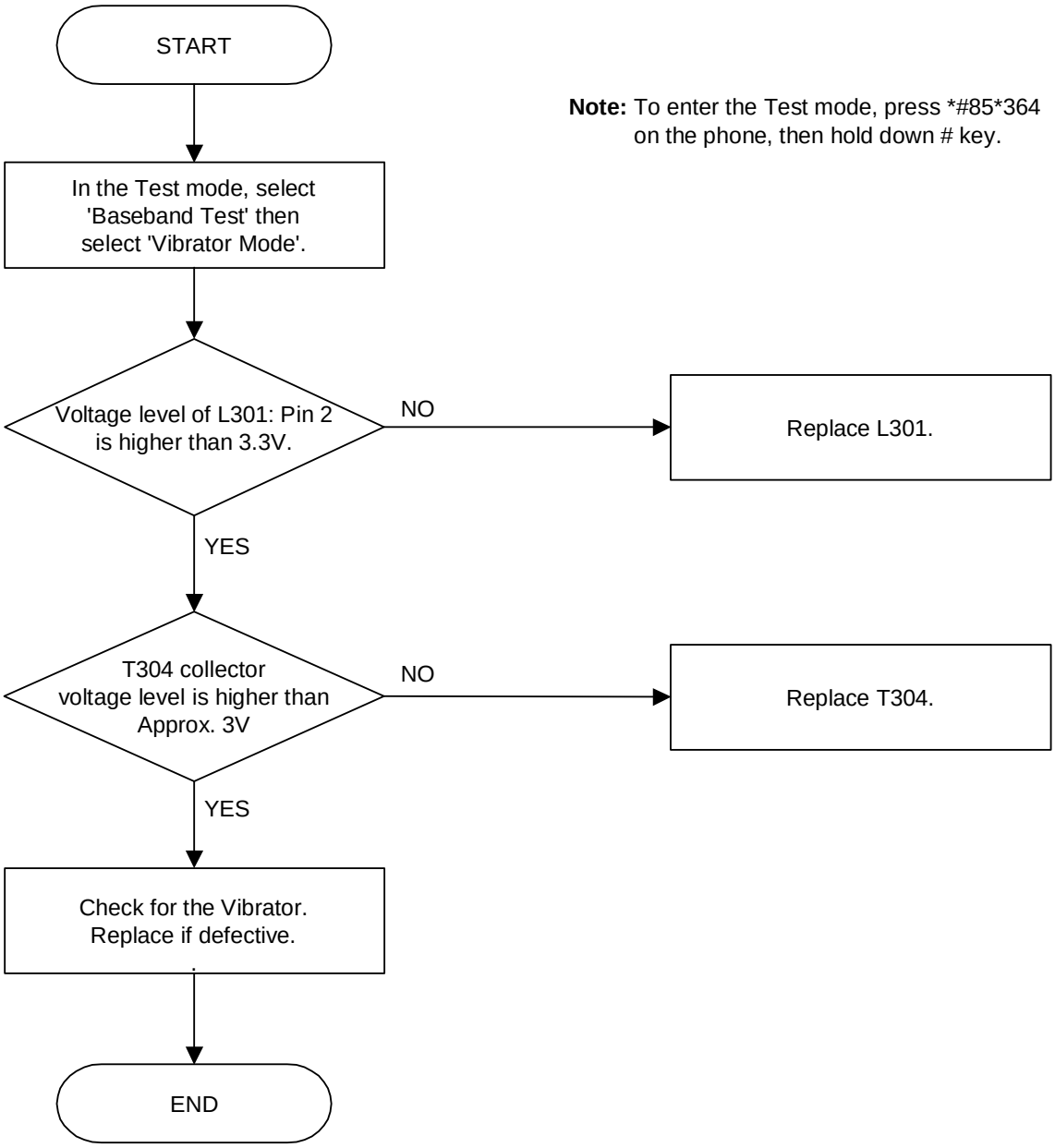
5.3 LCD Trouble



5.4 Charging Trouble

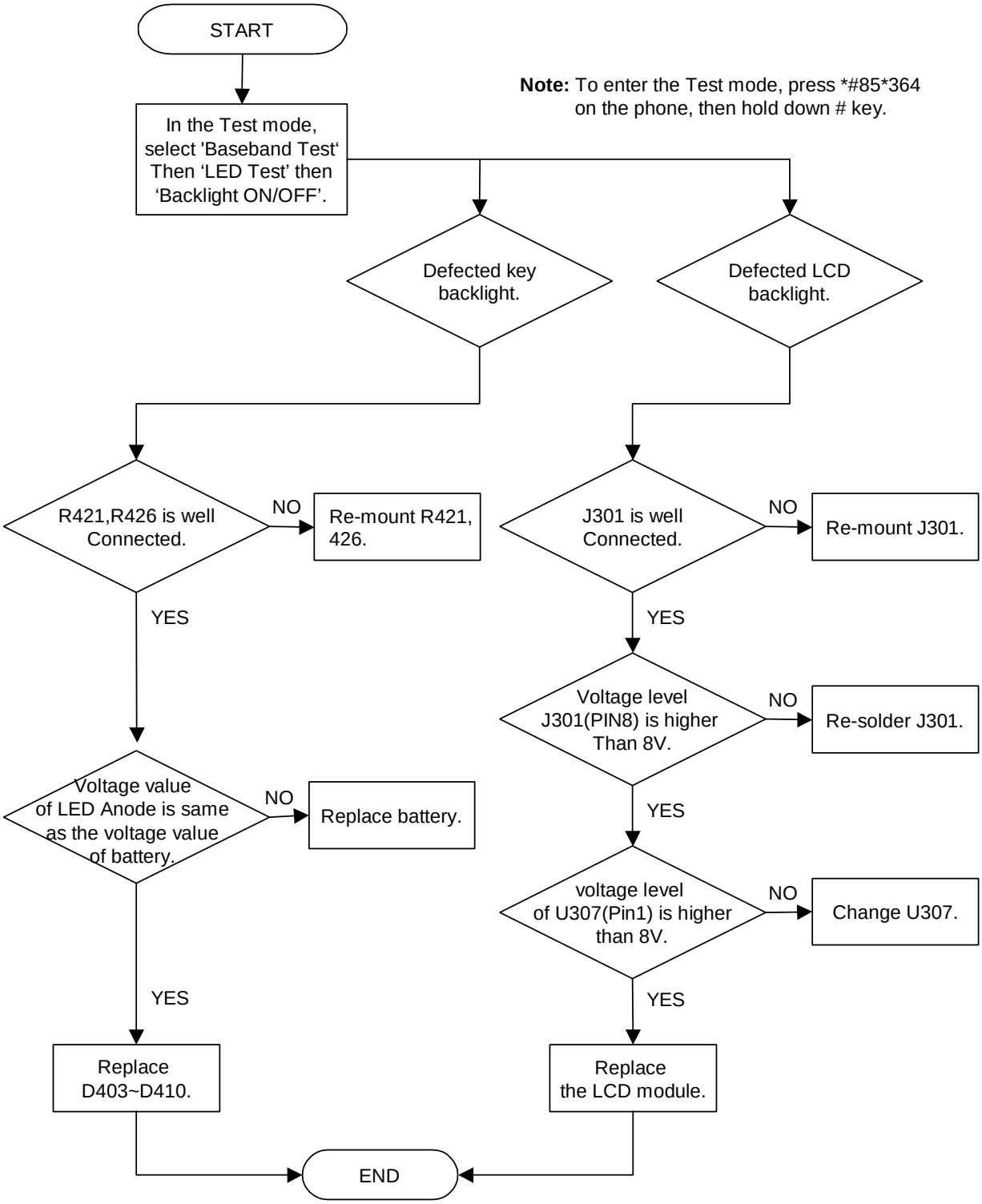


5.5 Vibrator Trouble

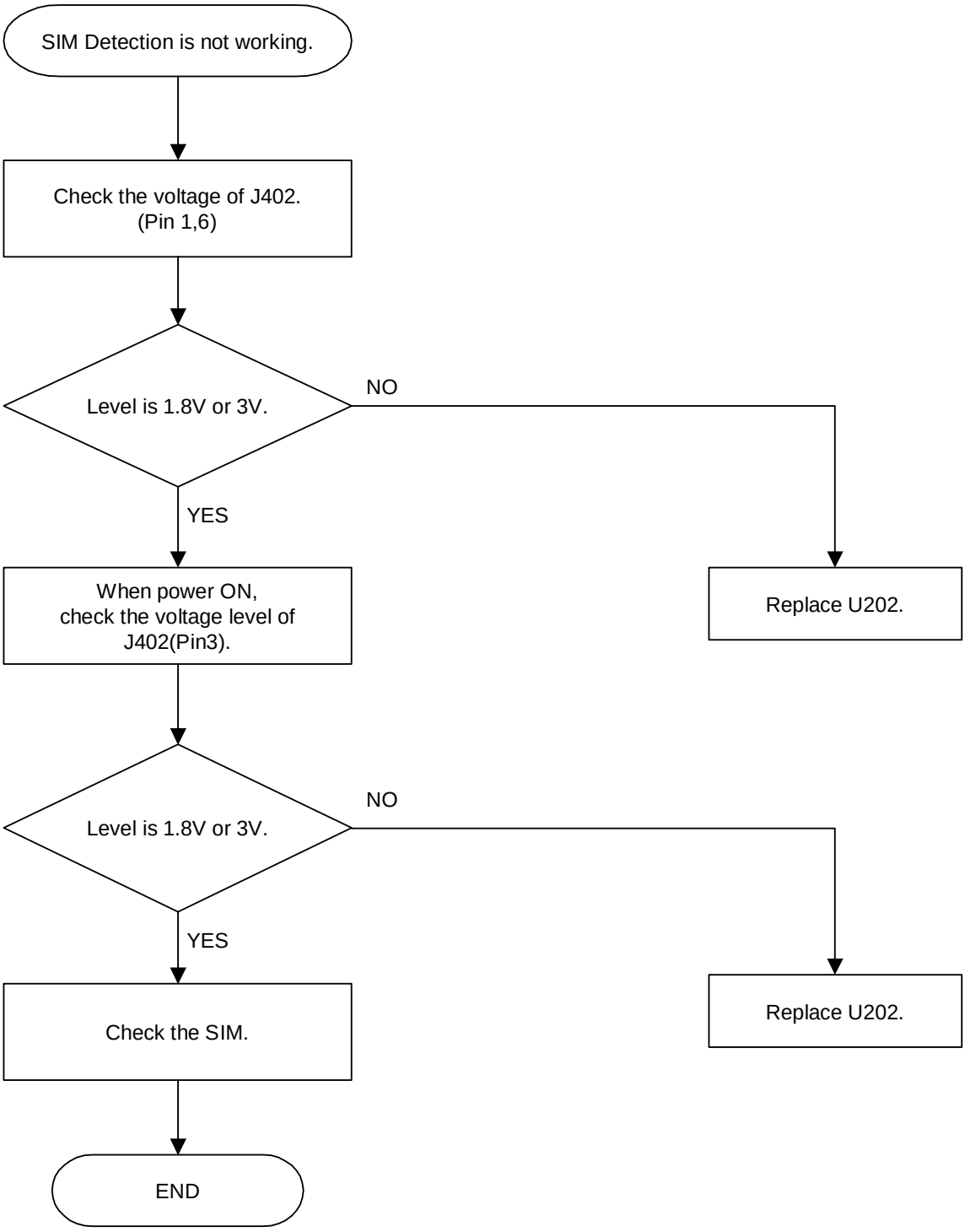


Note: To enter the Test mode, press *#85*364 on the phone, then hold down # key.

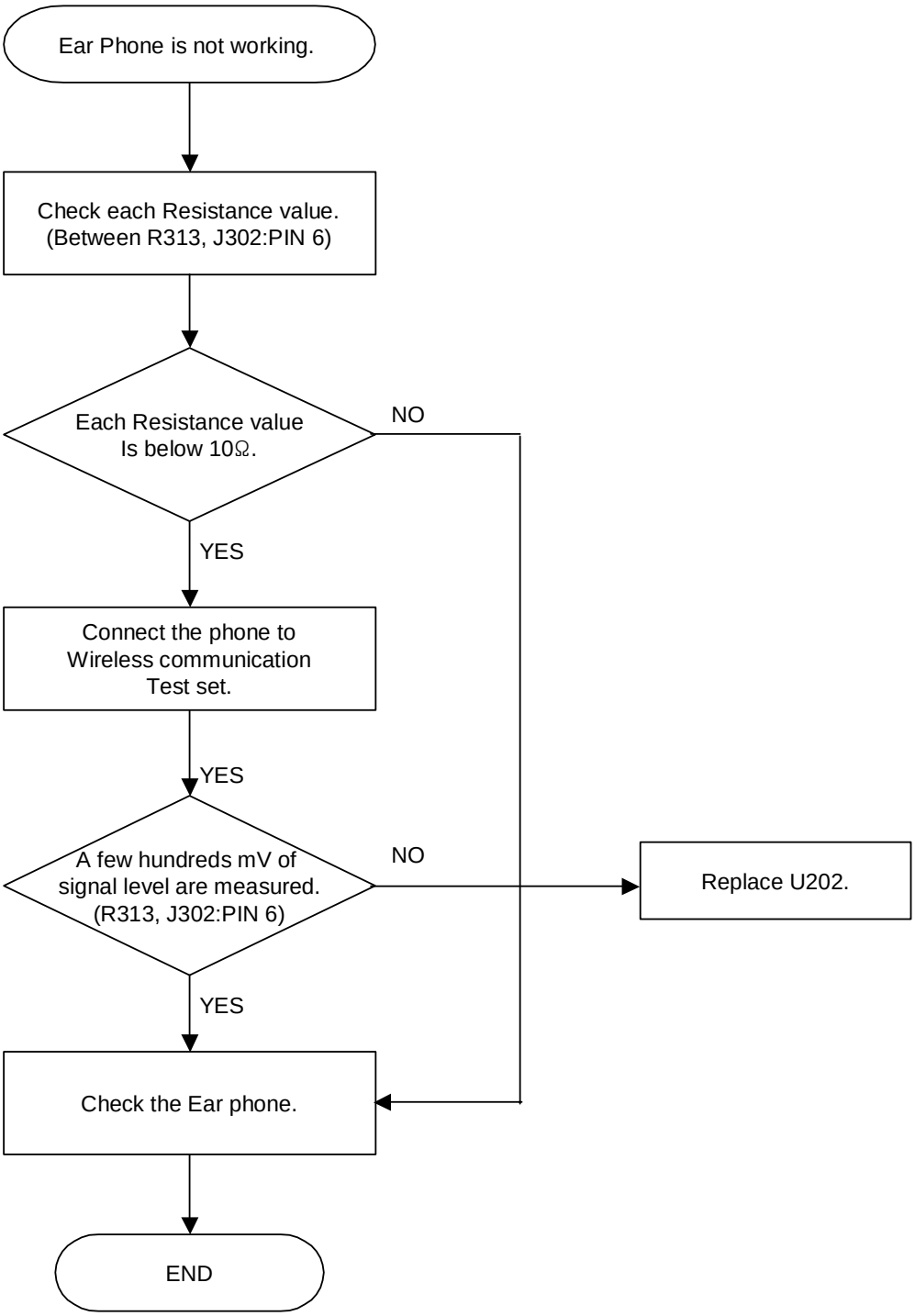
5.6 Backlight Trouble



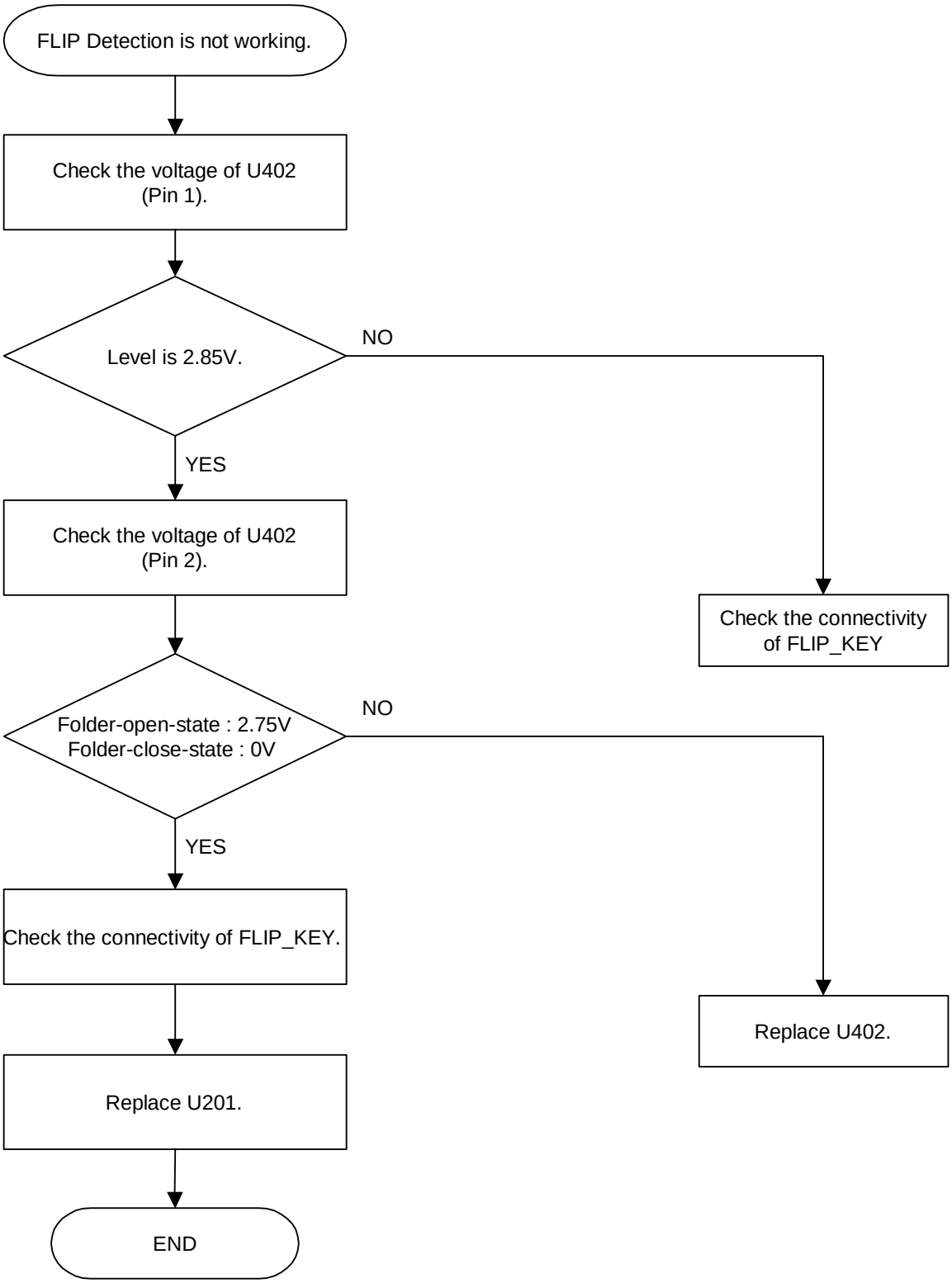
5.7 SIM Detection Trouble



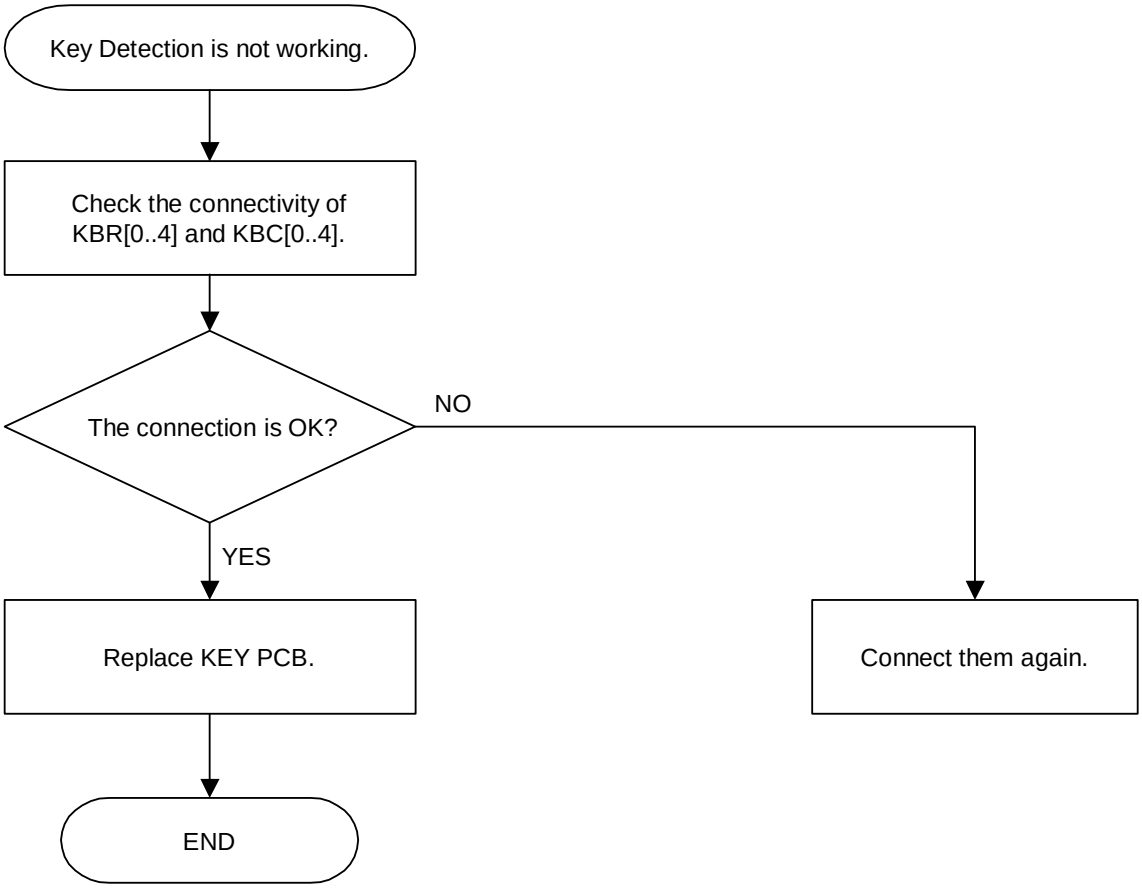
5.8 Ear-Phone Trouble



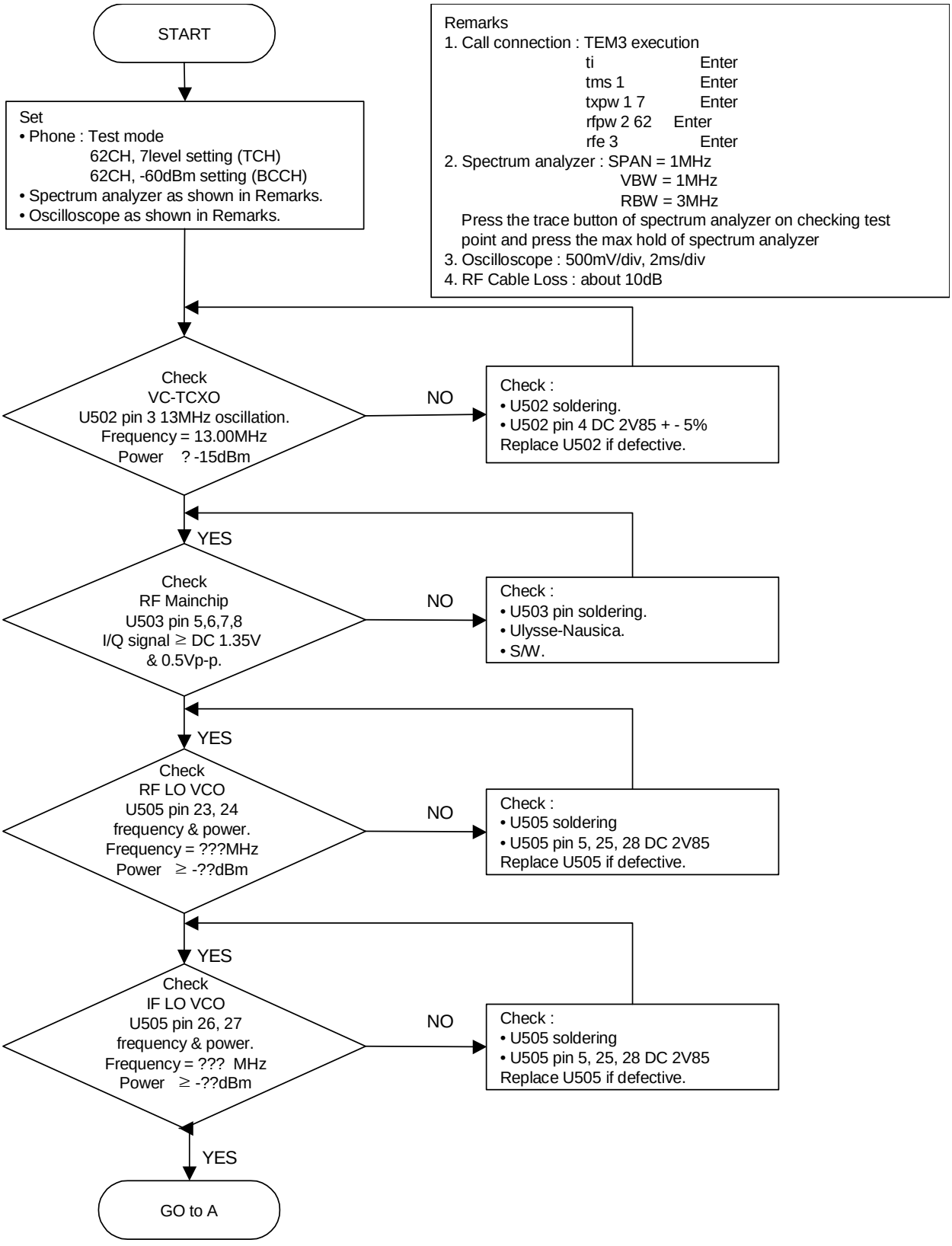
5.9 FLIP Detection Trouble

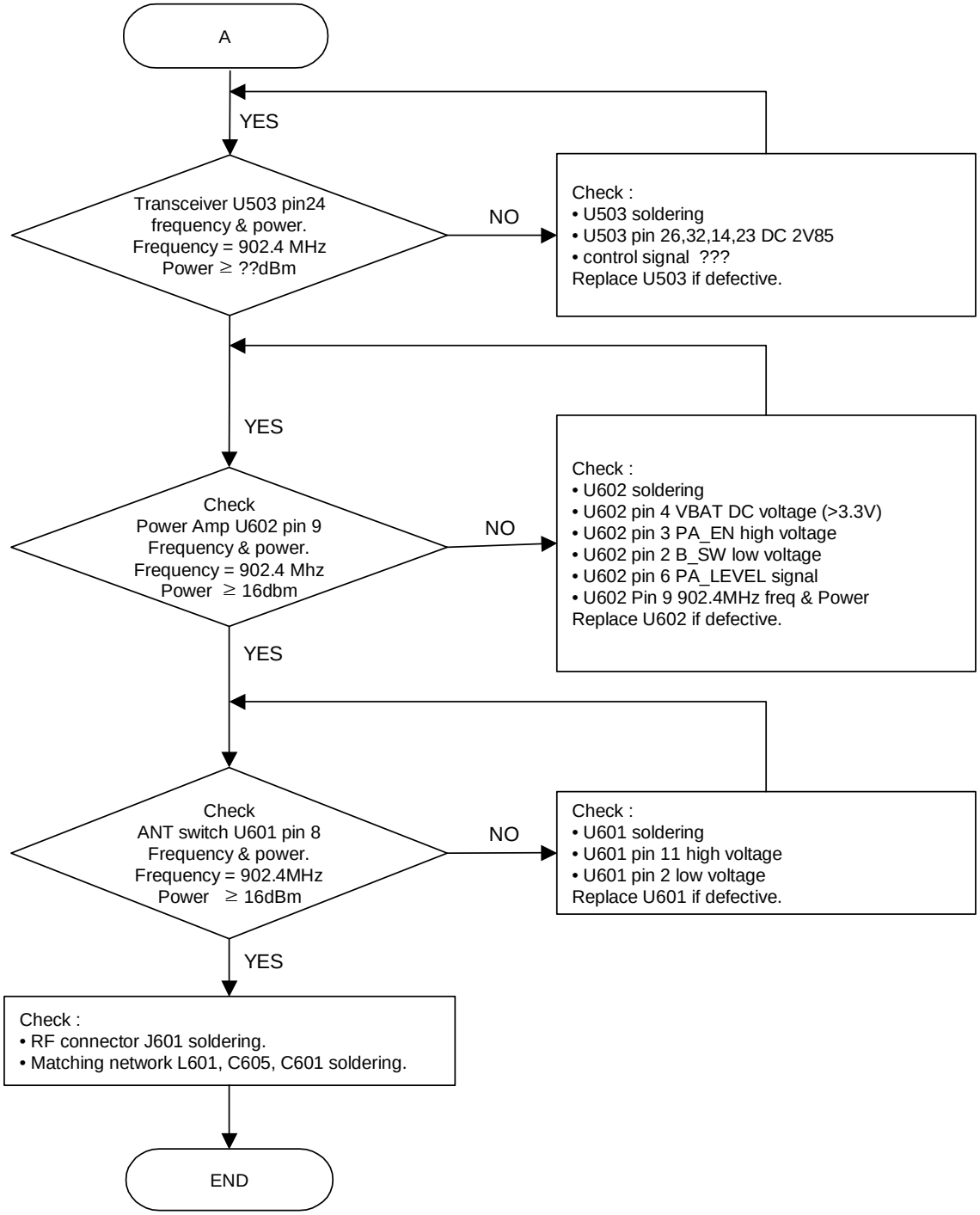


5.10 KEY Detection Trouble

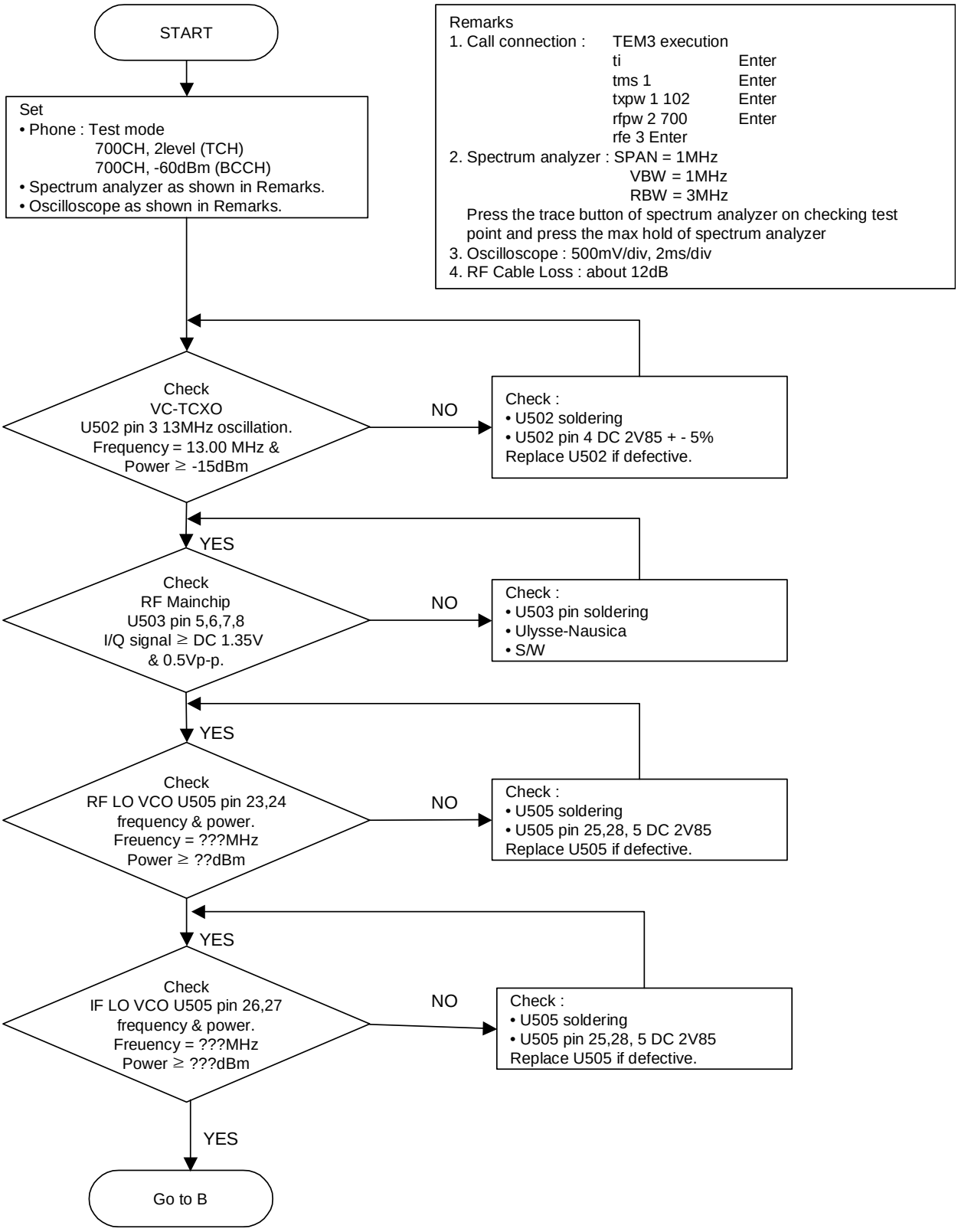


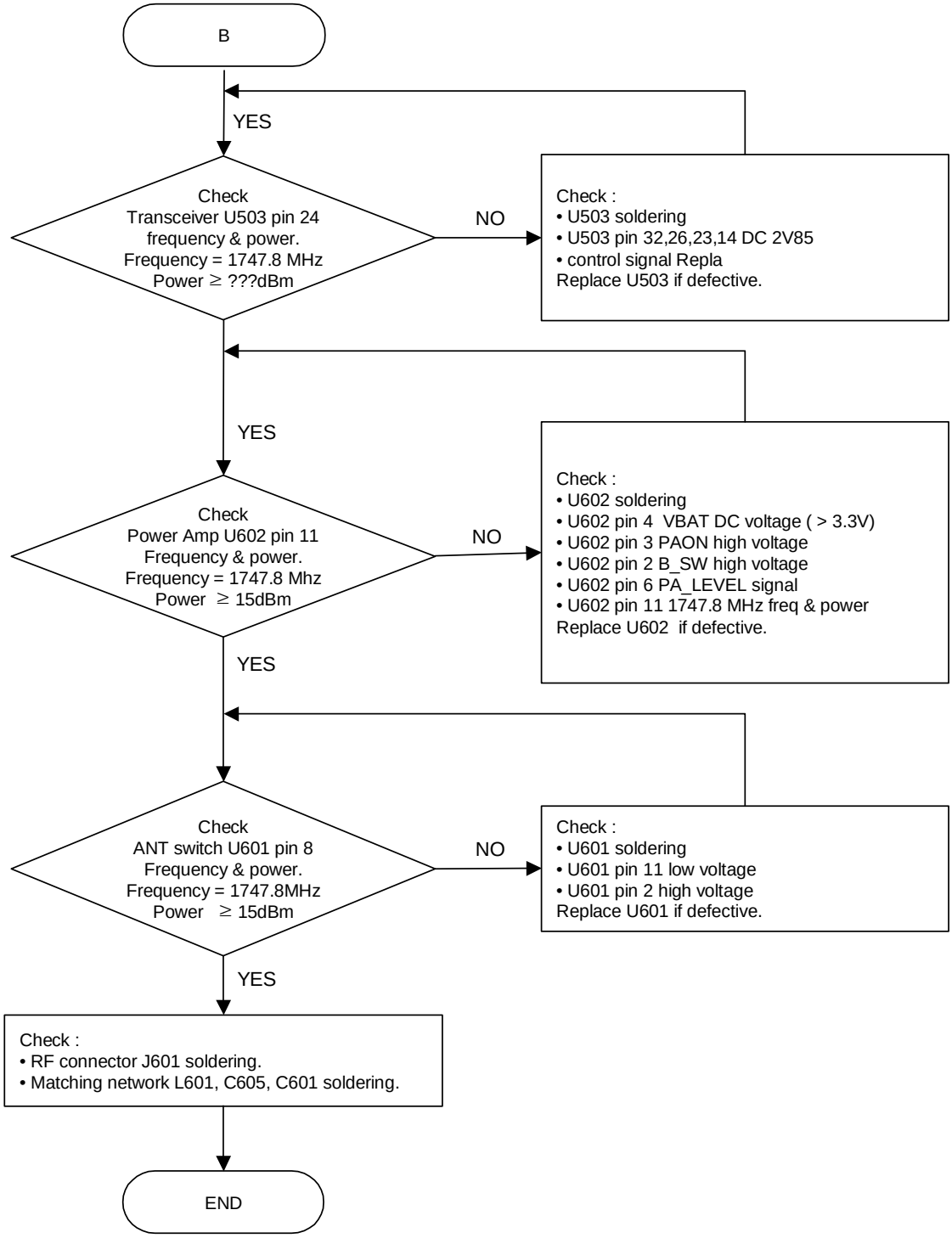
5.11 TX Power Trouble (E-GSM)



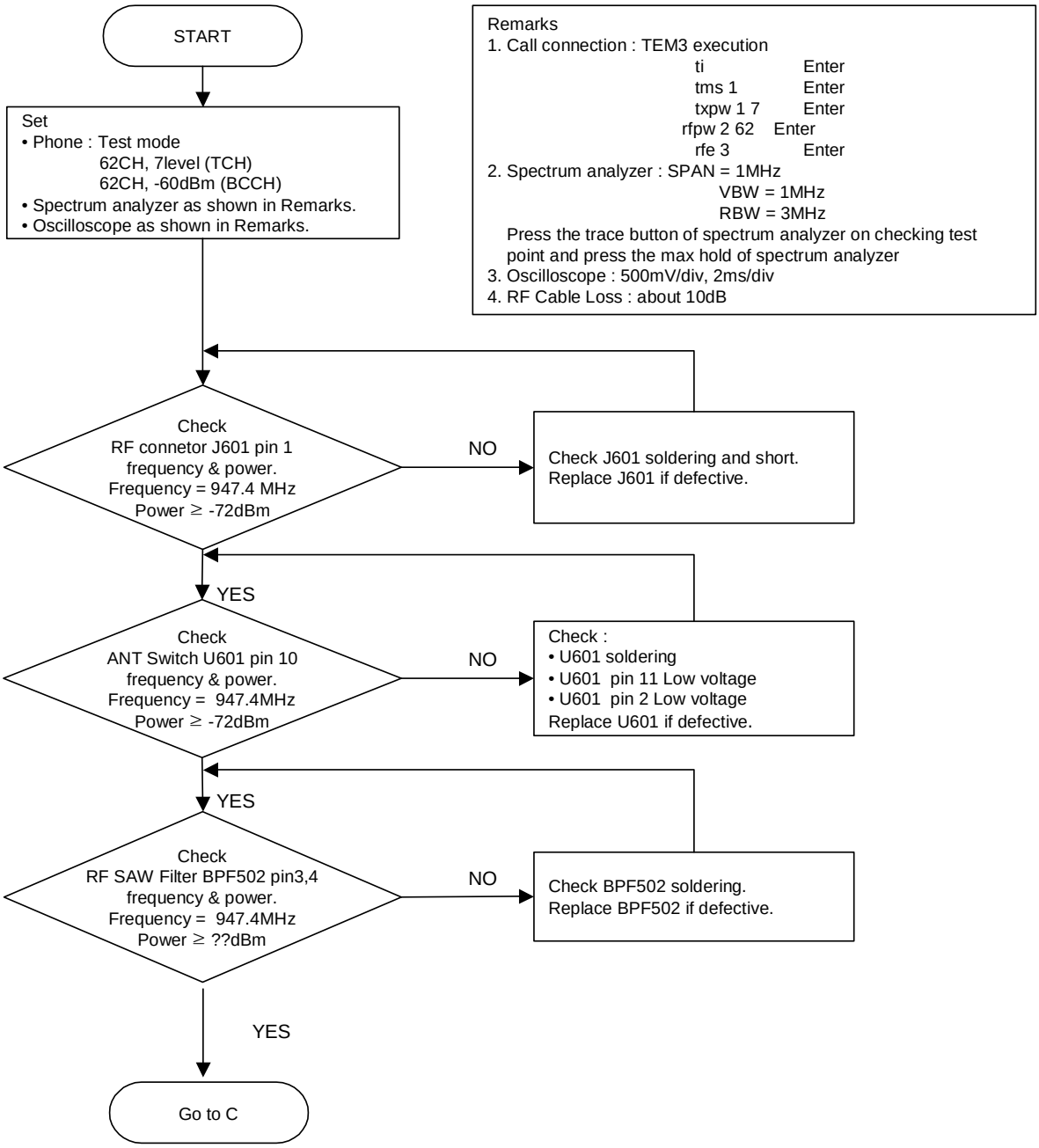

A
YES
Transceiver U503 pin24
frequency & power.
Frequency = 902.4 MHz
Power ≥ ??dBm
NO
Check :
• U503 soldering
• U503 pin 26,32,14,23 DC 2V85
• control signal ???
Replace U503 if defective.
YES
Check
Power Amp U602 pin 9
Frequency & power.
Frequency = 902.4 Mhz
Power ≥ 16dbm
NO
Check :
• U602 soldering
• U602 pin 4 VBAT DC voltage (>3.3V)
• U602 pin 3 PA_EN high voltage
• U602 pin 2 B_SW low voltage
• U602 pin 6 PA_LEVEL signal
• U602 Pin 9 902.4MHz freq & Power
Replace U602 if defective.
YES
Check
ANT switch U601 pin 8
Frequency & power.
Frequency = 902.4MHz
Power ≥ 16dBm
NO
Check :
• U601 soldering
• U601 pin 11 high voltage
• U601 pin 2 low voltage
Replace U601 if defective.
YES
Check :
• RF connector J601 soldering.
• Matching network L601, C605, C601 soldering.
END

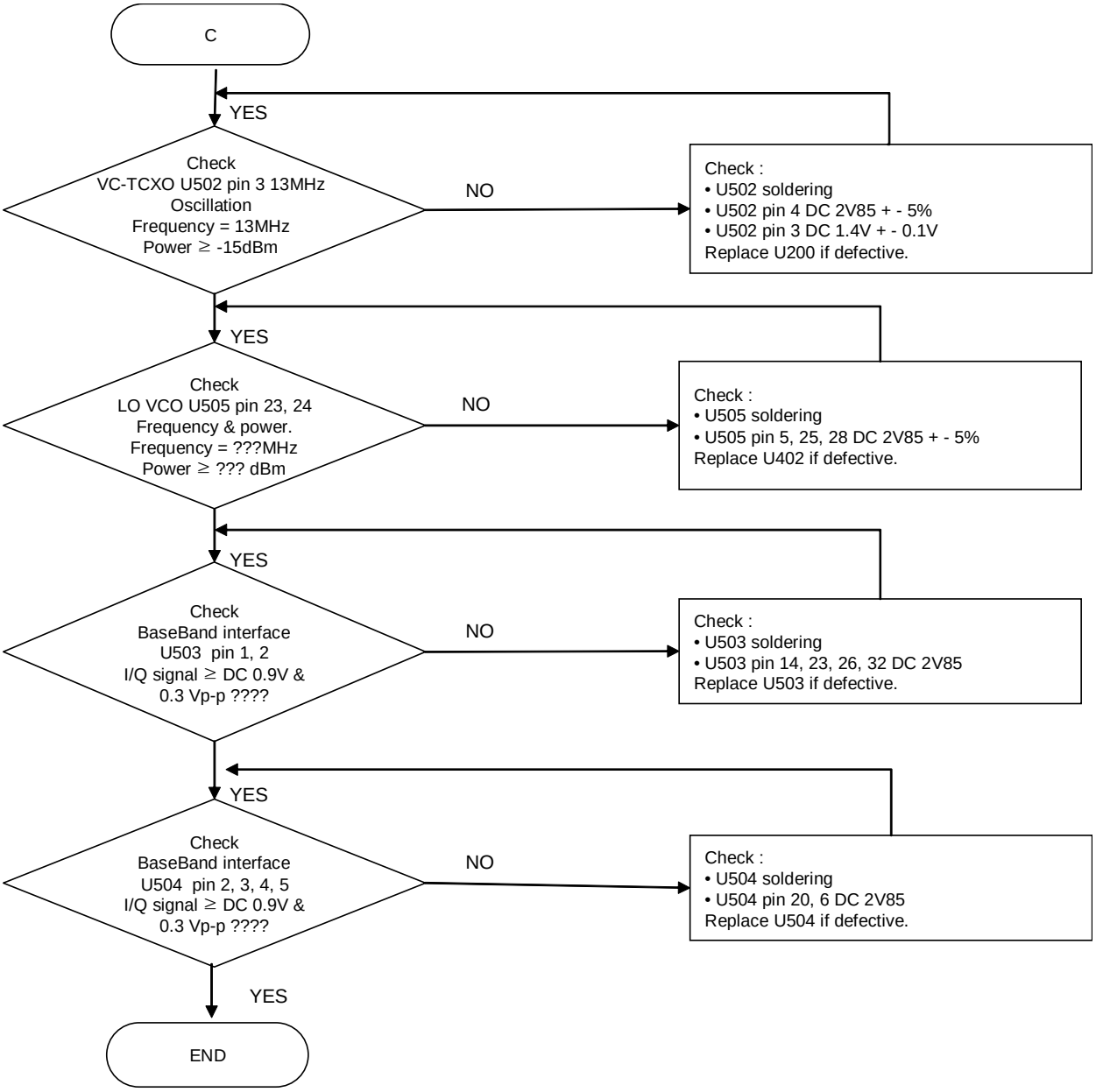
5.12 TX Power Trouble (DCS)



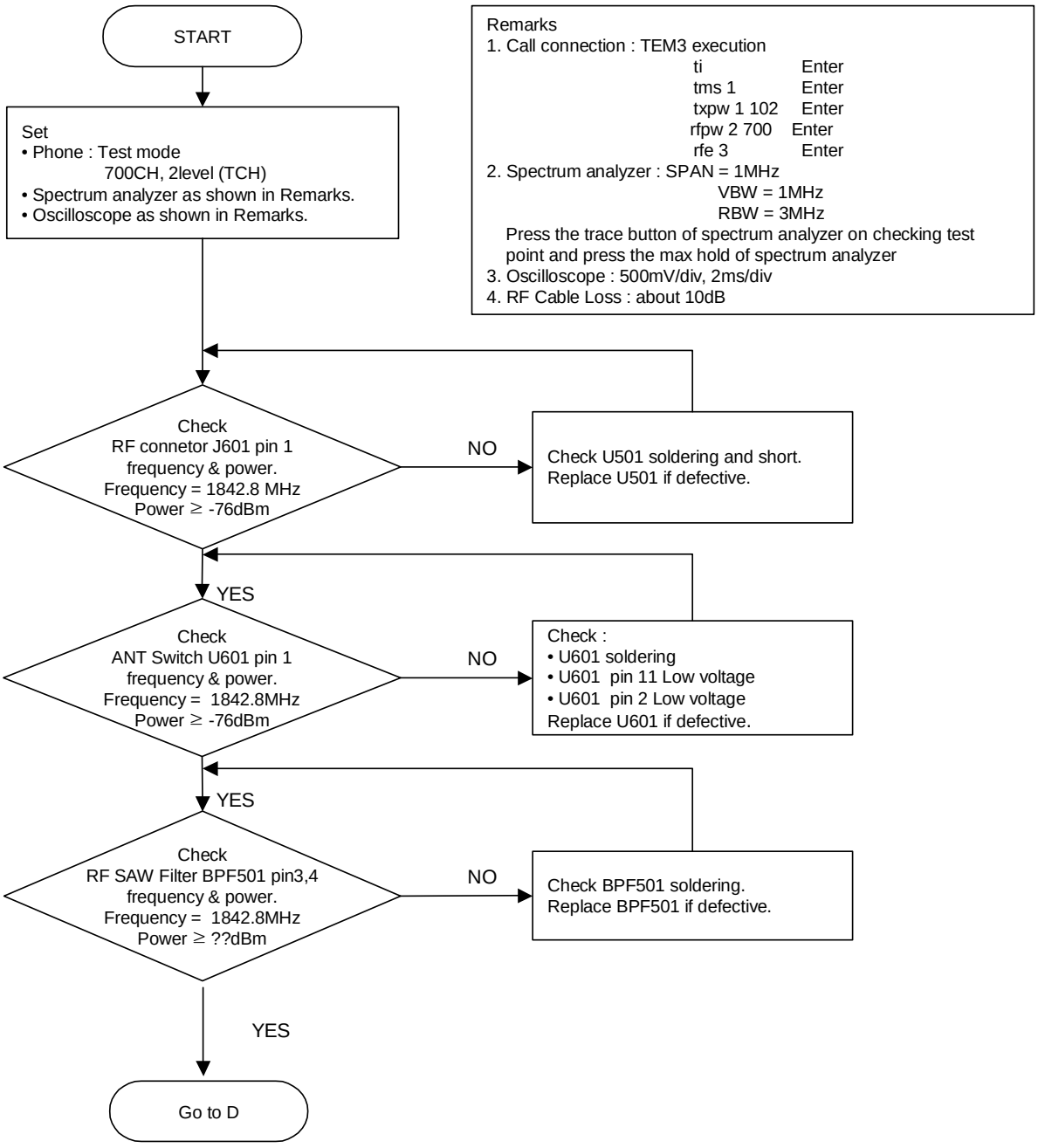

B
YES
Check
Transceiver U503 pin 24
frequency & power.
Frequency = 1747.8 MHz
Power ≥ ???dBm
NO
Check :
• U503 soldering
• U503 pin 32,26,23,14 DC 2V85
• control signal Repla
Replace U503 if defective.
YES
Check
Power Amp U602 pin 11
Frequency & power.
Frequency = 1747.8 Mhz
Power ≥ 15dBm
NO
Check :
• U602 soldering
• U602 pin 4 VBAT DC voltage (> 3.3V)
• U602 pin 3 PAON high voltage
• U602 pin 2 B_SW high voltage
• U602 pin 6 PA_LEVEL signal
• U602 pin 11 1747.8 MHz freq & power
Replace U602 if defective.
YES
Check
ANT switch U601 pin 8
Frequency & power.
Frequency = 1747.8MHz
Power ≥ 15dBm
NO
Check :
• U601 soldering
• U601 pin 11 low voltage
• U601 pin 2 high voltage
Replace U601 if defective.
YES
Check :
• RF connector J601 soldering.
• Matching network L601, C605, C601 soldering.
END

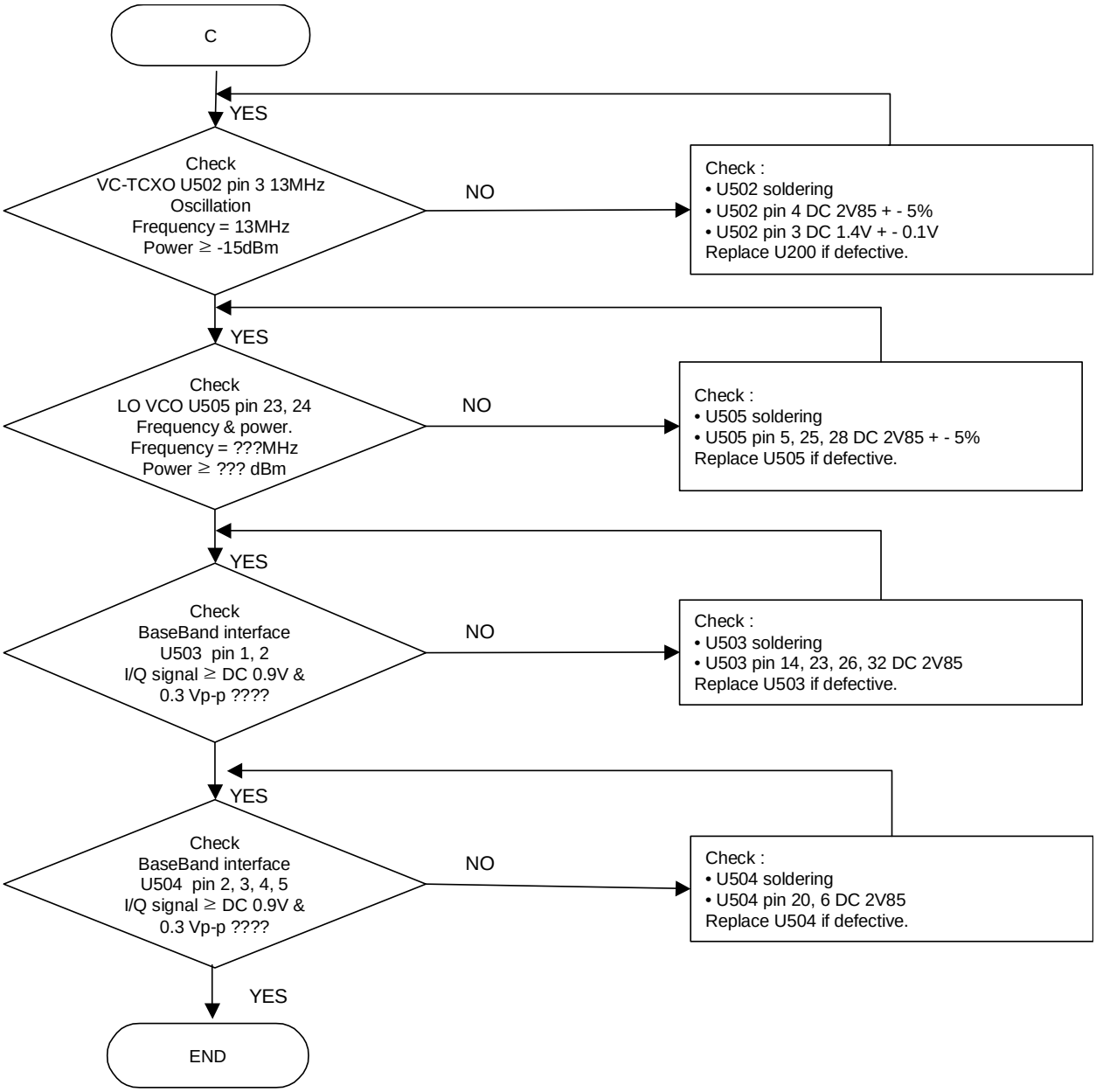
5.13 RX Sensitivity Trouble (E-GSM)



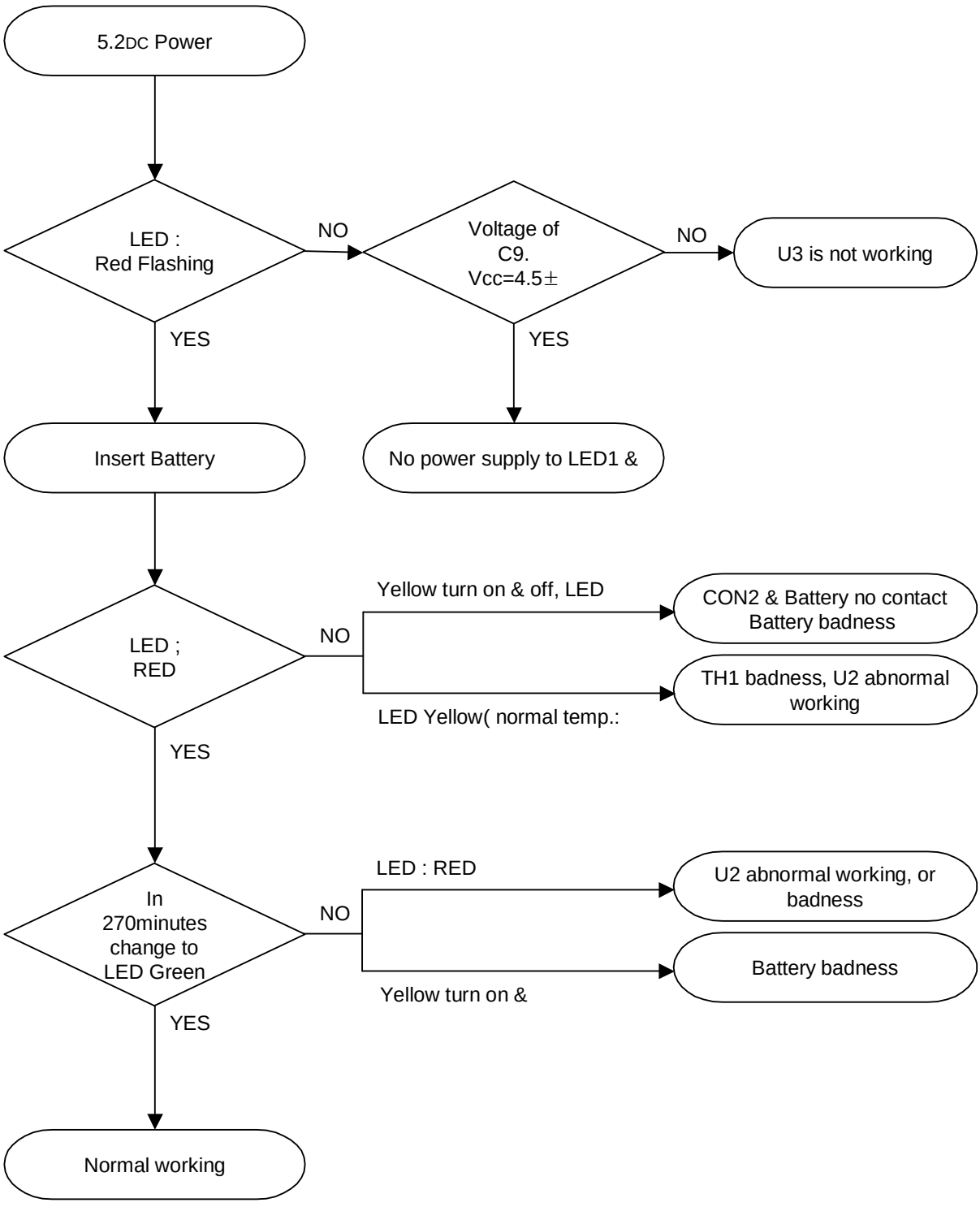

C
YES
Check
VC-TCXO U502 pin 3 13MHz
Oscillation
Frequency = 13MHz
Power ≥ -15dBm
NO
Check :
• U502 soldering
• U502 pin 4 DC 2V85 + - 5%
• U502 pin 3 DC 1.4V + - 0.1V
Replace U200 if defective.
YES
Check
LO VCO U505 pin 23, 24
Frequency & power.
Frequency = ???MHz
Power ≥ ??? dBm
NO
Check :
• U505 soldering
• U505 pin 5, 25, 28 DC 2V85 + - 5%
Replace U402 if defective.
YES
Check
BaseBand interface
U503 pin 1, 2
I/Q signal ≥ DC 0.9V &
0.3 Vp-p ????
NO
Check :
• U503 soldering
• U503 pin 14, 23, 26, 32 DC 2V85
Replace U503 if defective.
YES
Check
BaseBand interface
U504 pin 2, 3, 4, 5
I/Q signal ≥ DC 0.9V &
0.3 Vp-p ????
NO
Check :
• U504 soldering
• U504 pin 20, 6 DC 2V85
Replace U504 if defective.
YES
END

5.14 RX Sensitivity Trouble (DCS)



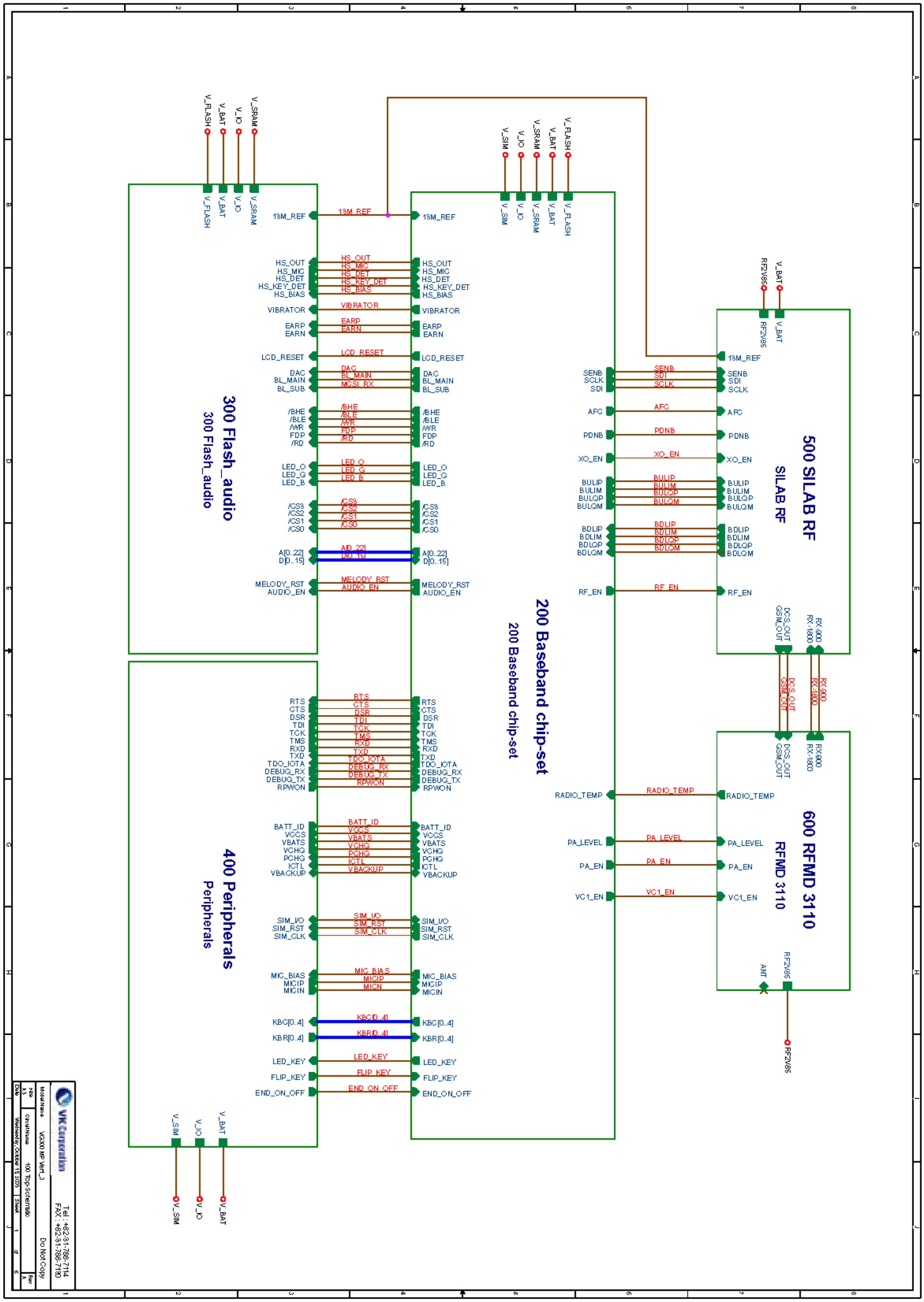

C
YES
Check
VC-TCXO U502 pin 3 13MHz
Oscillation
Frequency = 13MHz
Power ≥ -15dBm
NO
Check :
• U502 soldering
• U502 pin 4 DC 2V85 + - 5%
• U502 pin 3 DC 1.4V + - 0.1V
Replace U200 if defective.
YES
Check
LO VCO U505 pin 23, 24
Frequency & power.
Frequency = ???MHz
Power ≥ ??? dBm
NO
Check :
• U505 soldering
• U505 pin 5, 25, 28 DC 2V85 + - 5%
Replace U505 if defective.
YES
Check
BaseBand interface
U503 pin 1, 2
I/Q signal ≥ DC 0.9V &
0.3 Vp-p ????
NO
Check :
• U503 soldering
• U503 pin 14, 23, 26, 32 DC 2V85
Replace U503 if defective.
YES
Check
BaseBand interface
U504 pin 2, 3, 4, 5
I/Q signal ≥ DC 0.9V &
0.3 Vp-p ????
NO
Check :
• U504 soldering
• U504 pin 20, 6 DC 2V85
Replace U504 if defective.
YES
END

5.15 Battery Charger Trouble



6. Block Diagram

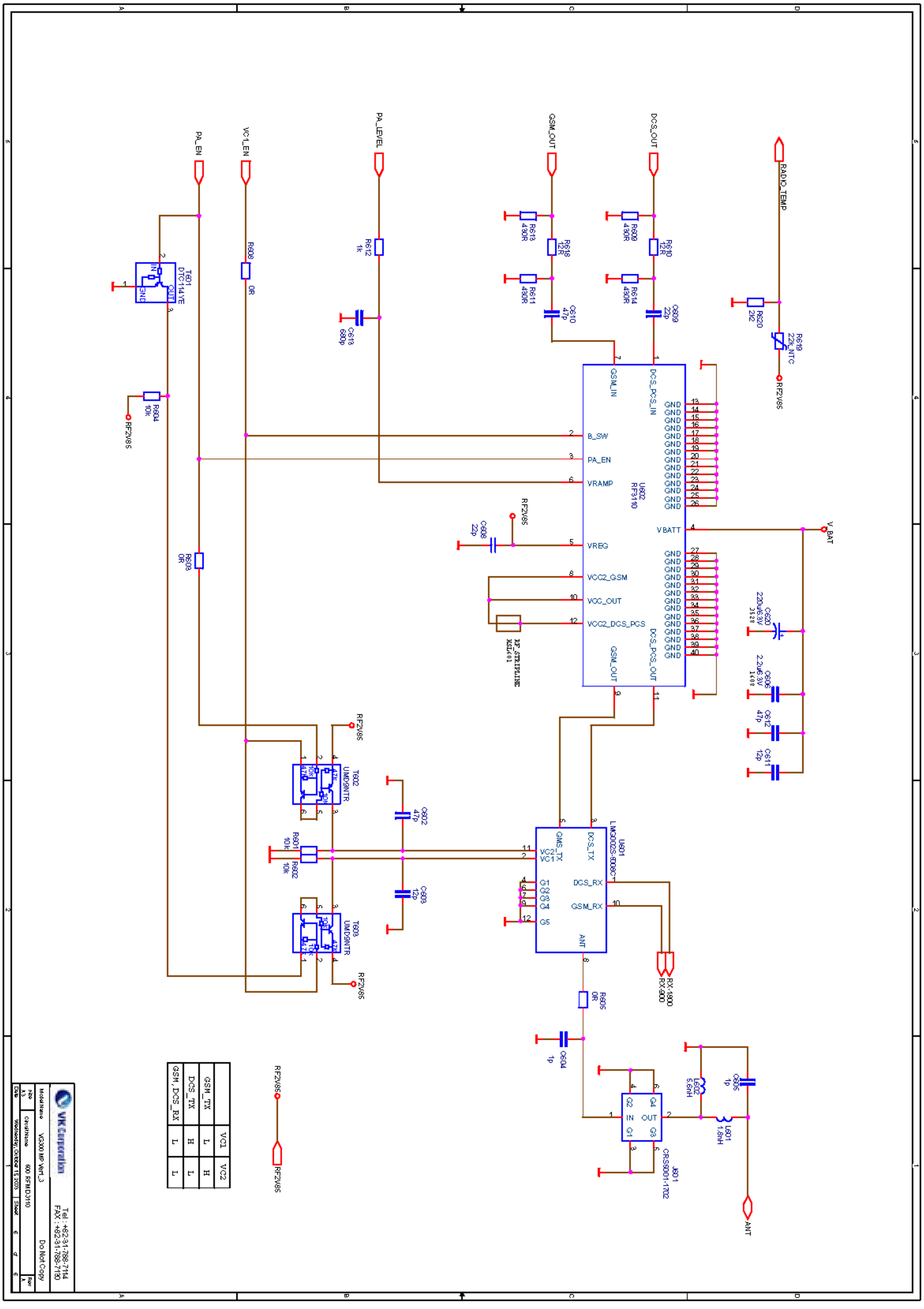
6.1 Overall



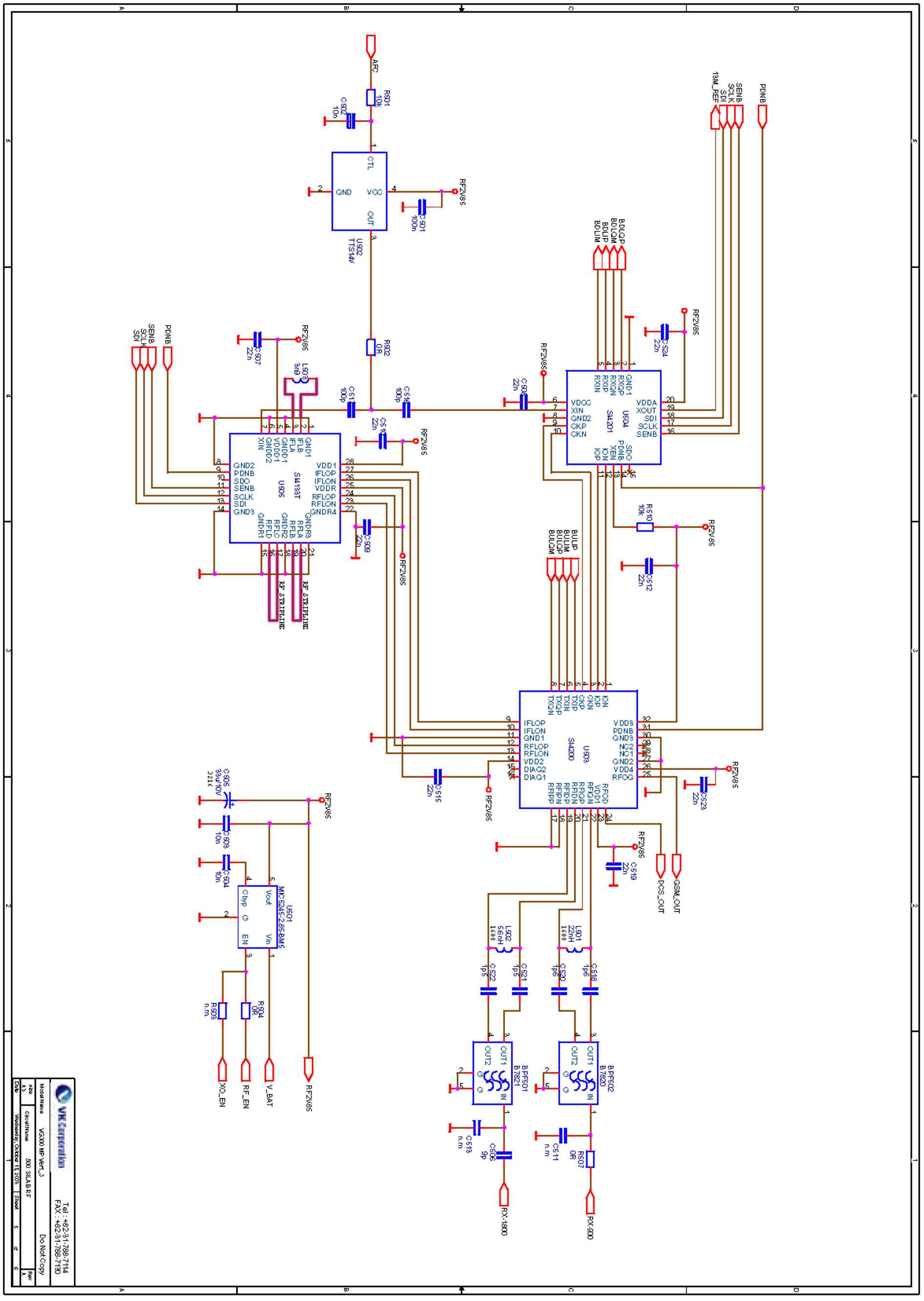
Memo

7. Schematic

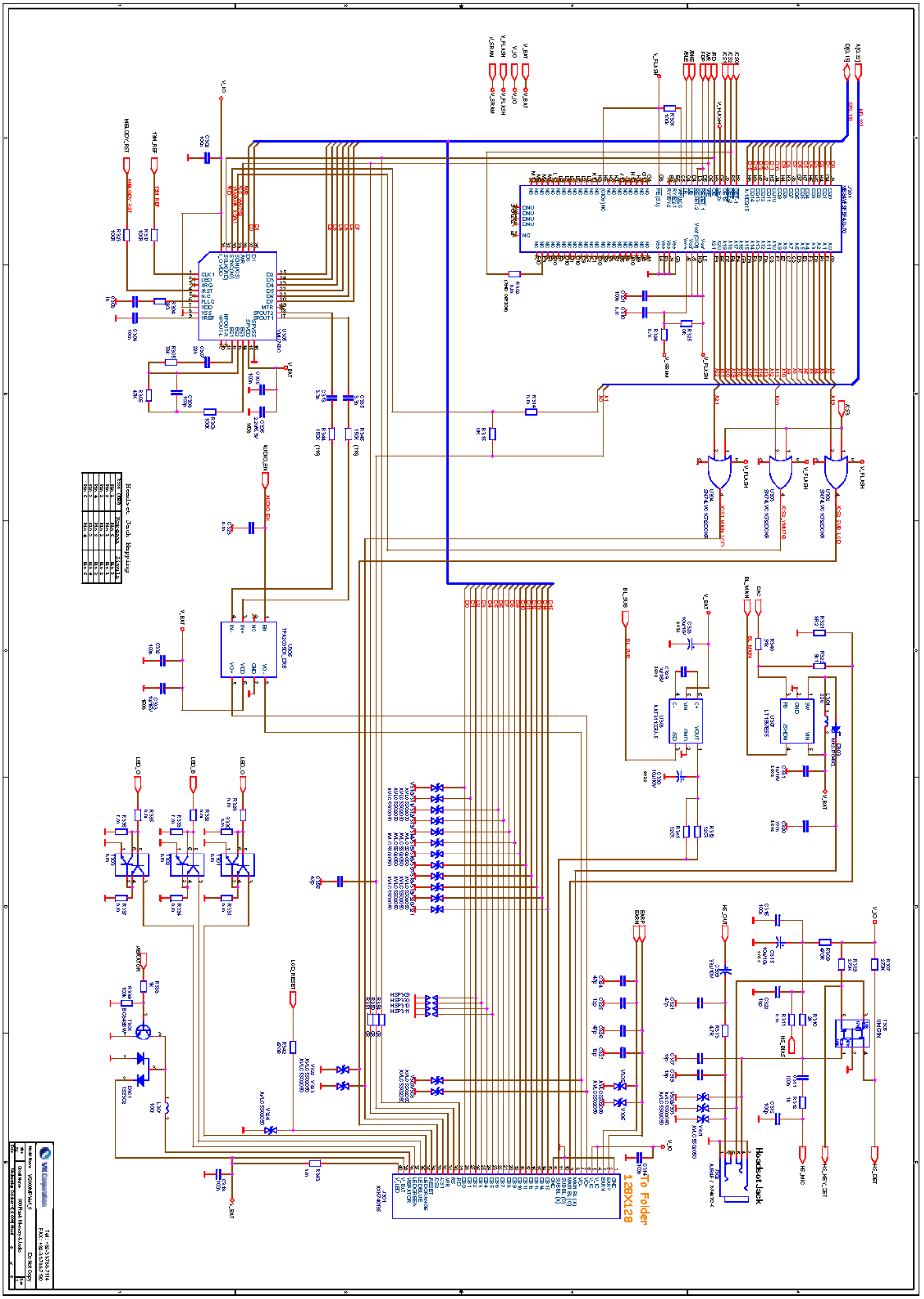
7.1 RF PAM Block



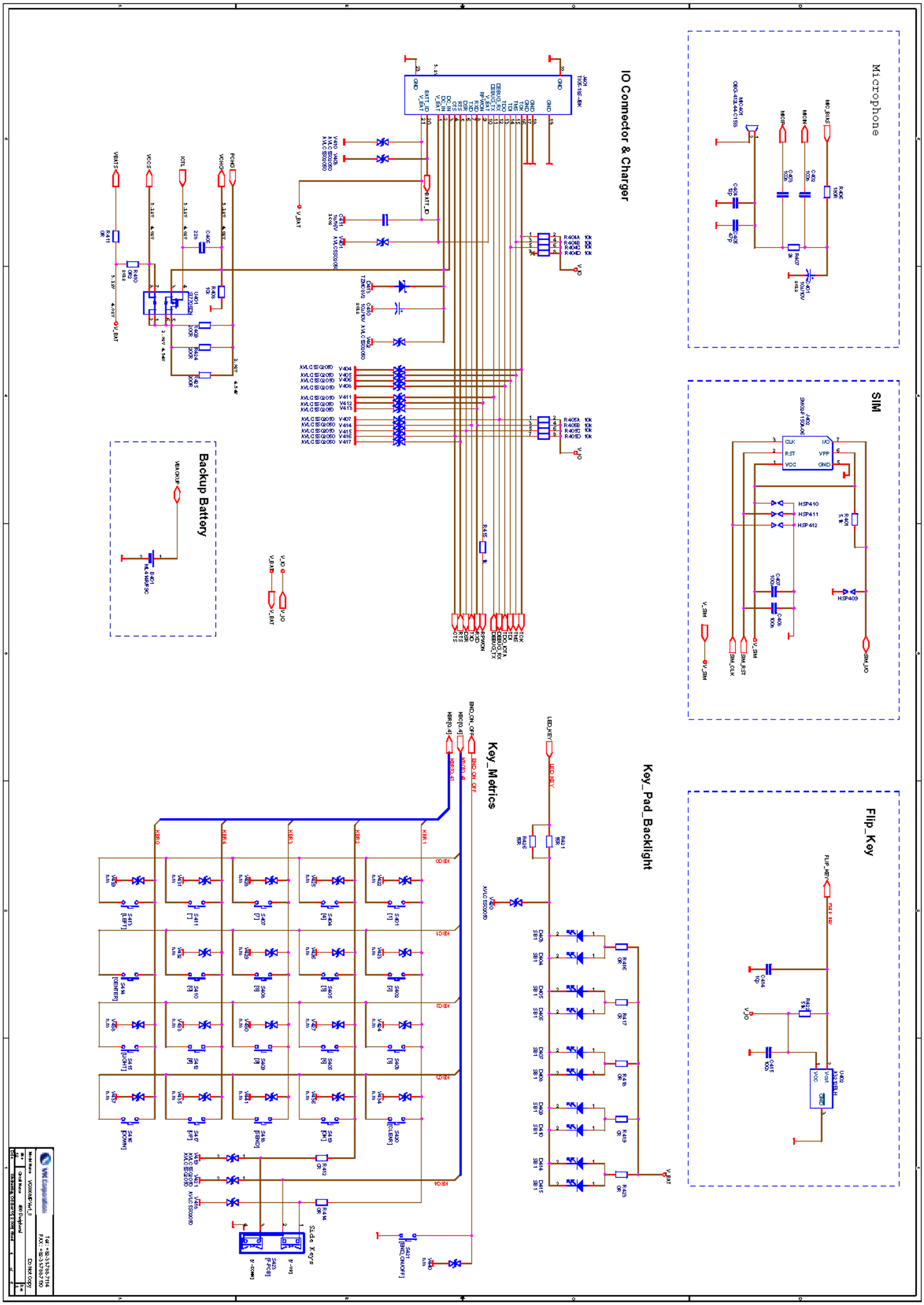
7.2 RF Main Block



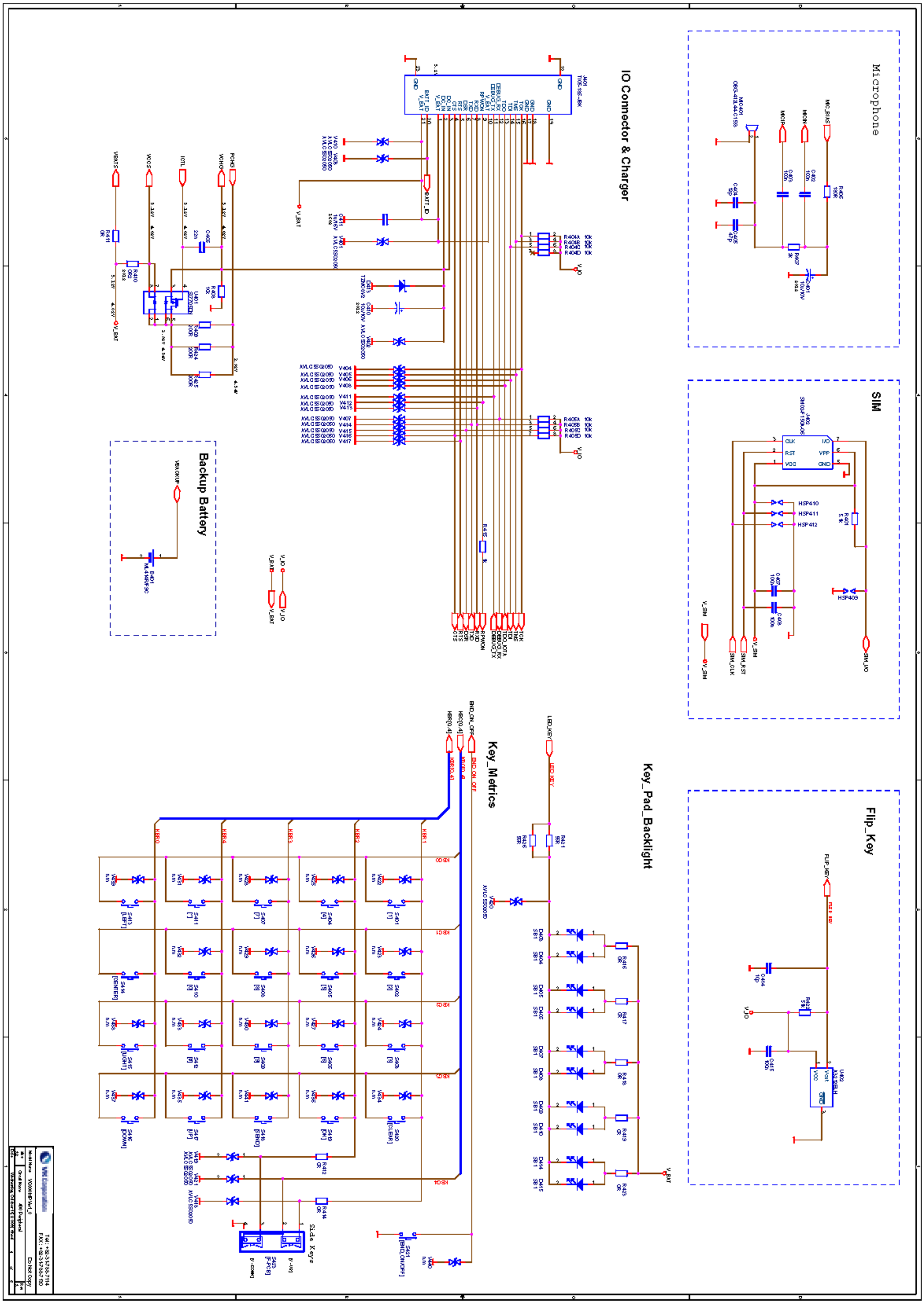
7.3 Flash & Audio Block



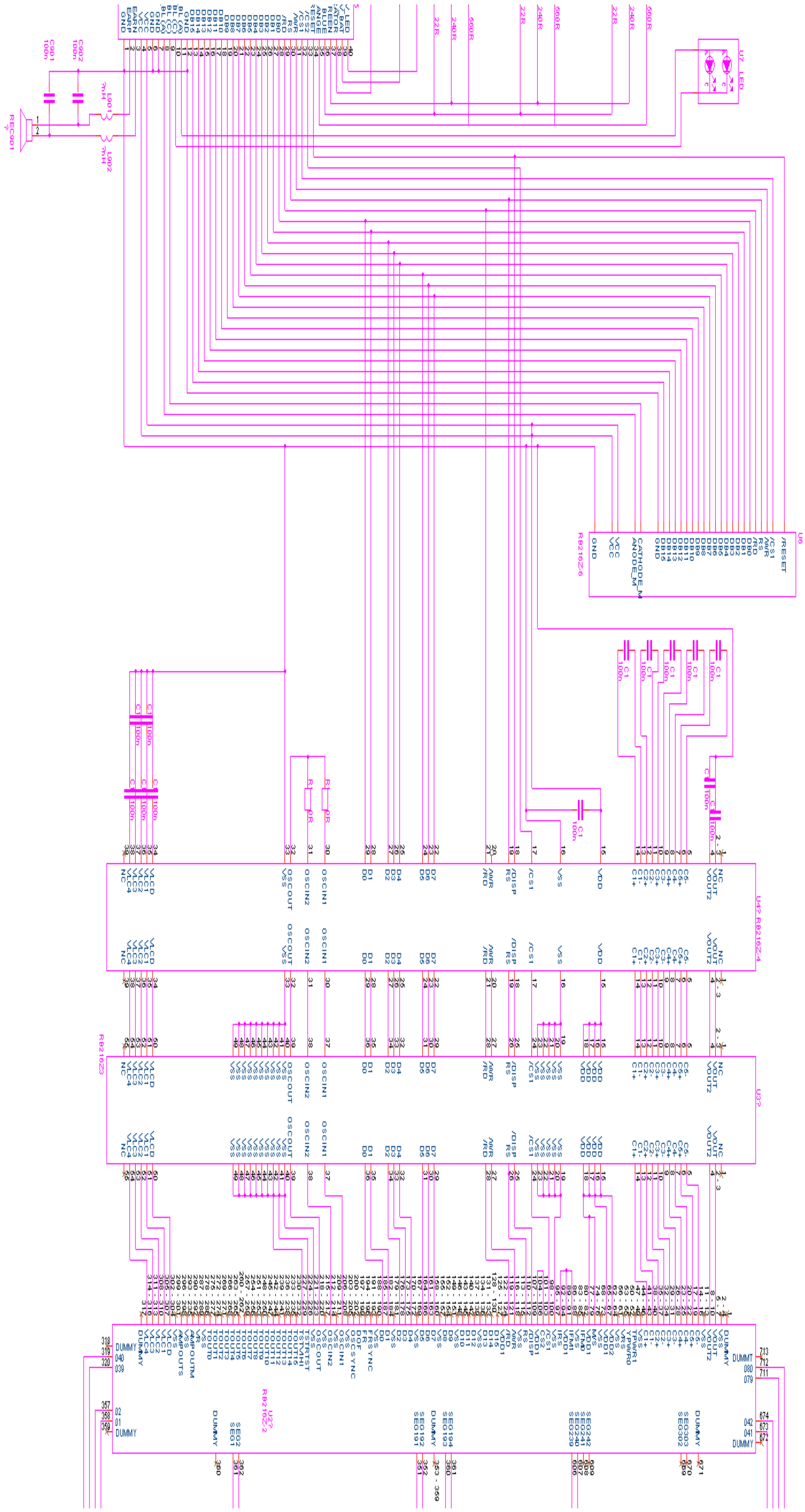
7.4 Peripheral Block



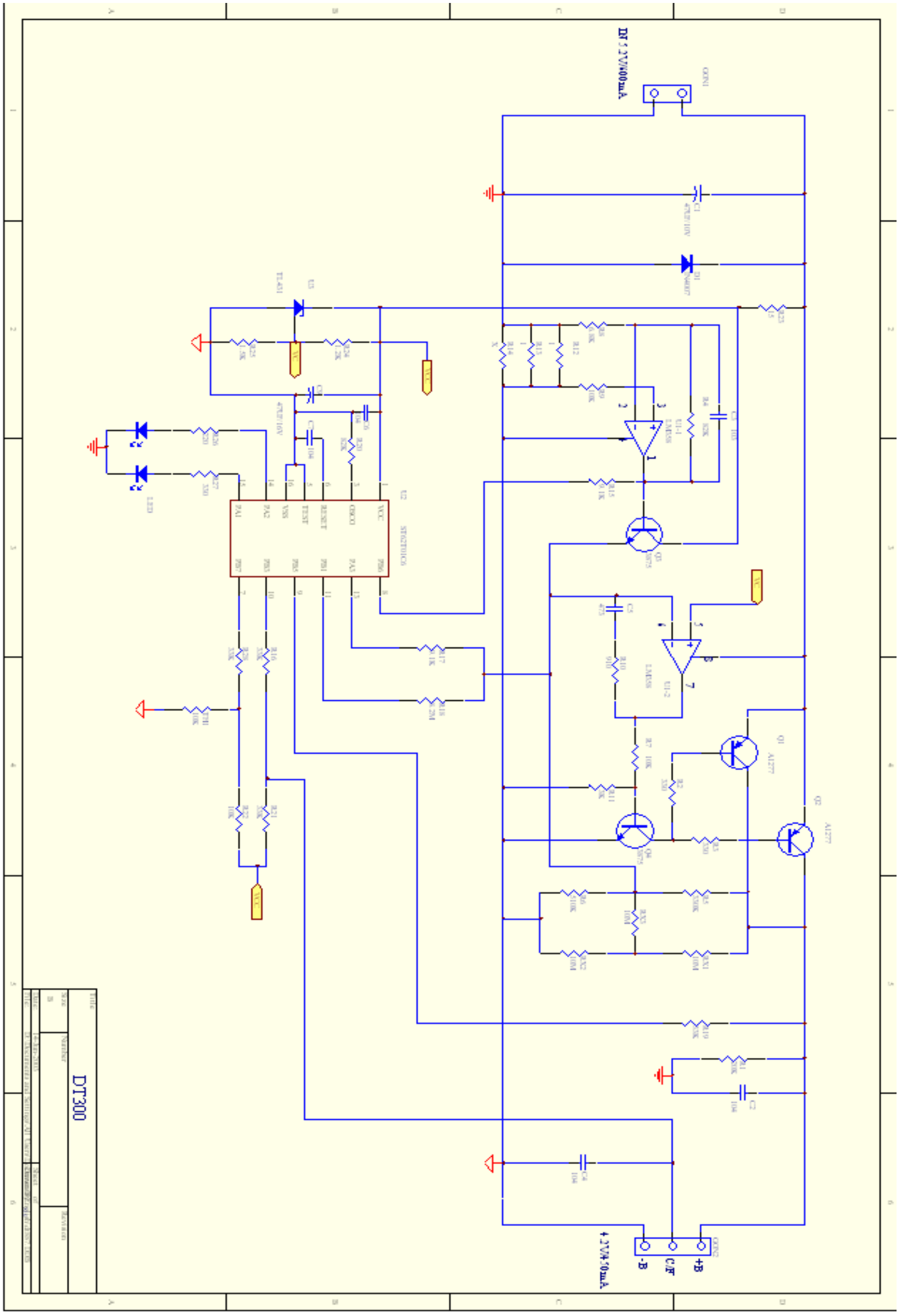
7.5 Base Band Block



7.6 Folder Block



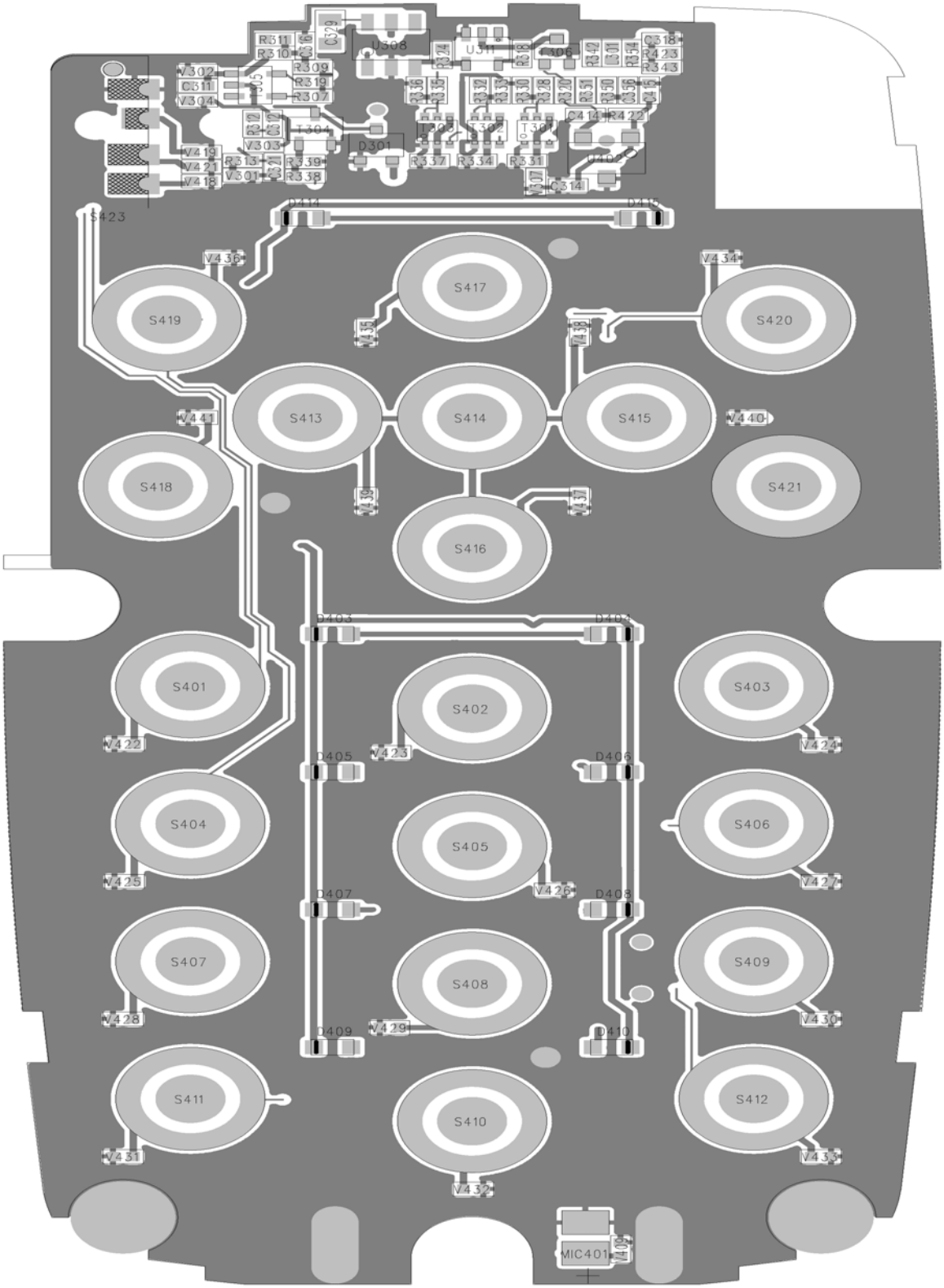
7.7 Battery Charger Block



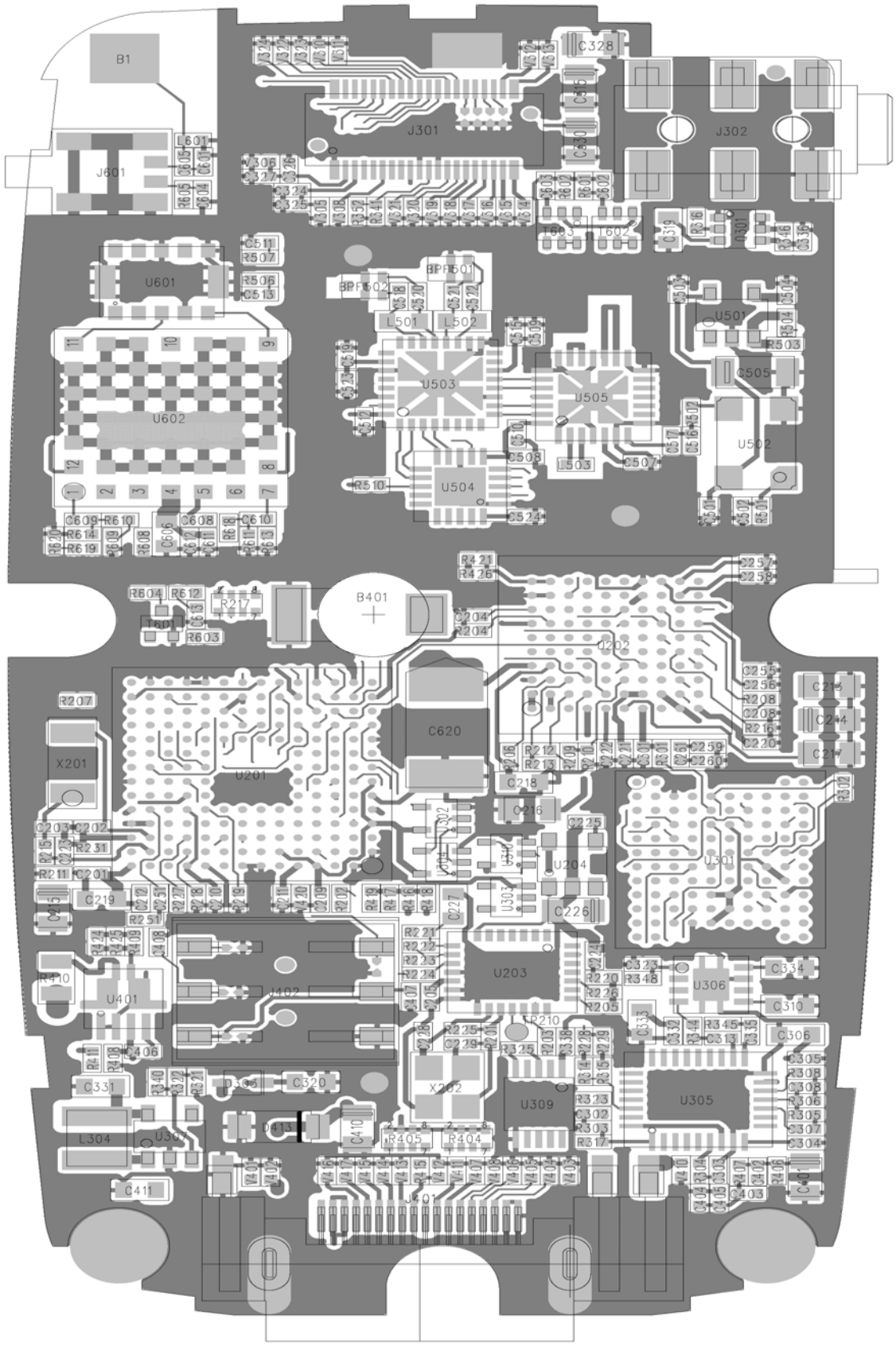
8. PCB Diagram

8.1 Main PCB

< TOP VIEW >

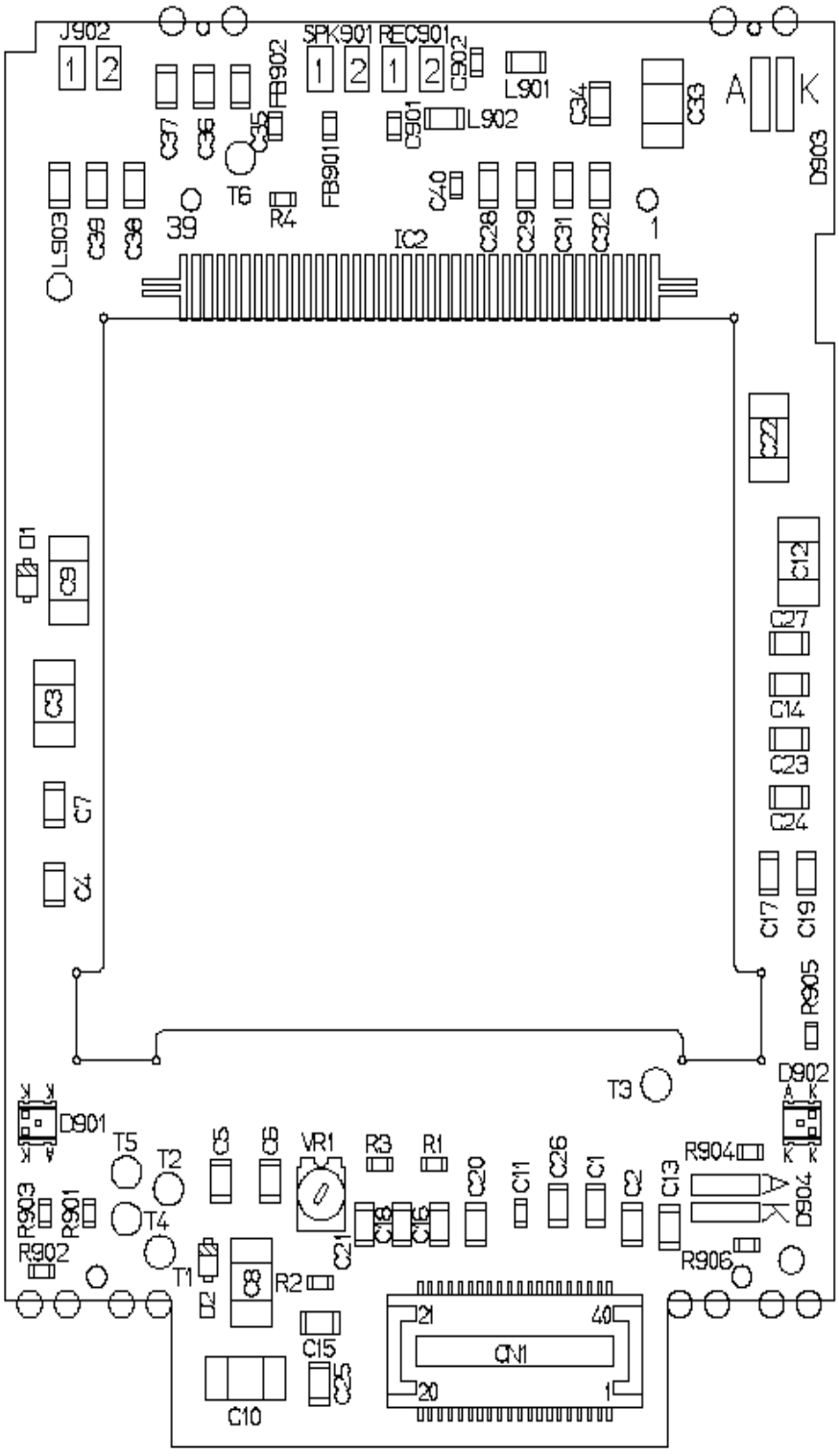


< BOTTOM VIEW >


B1
J601
J301
J302
U601
U602
U503
U505
U504
U501
U502
B401
U202
U201
C620
X201
U204
U203
U301
U306
U401
U402
U309
U305
X202
L304
U307
J401

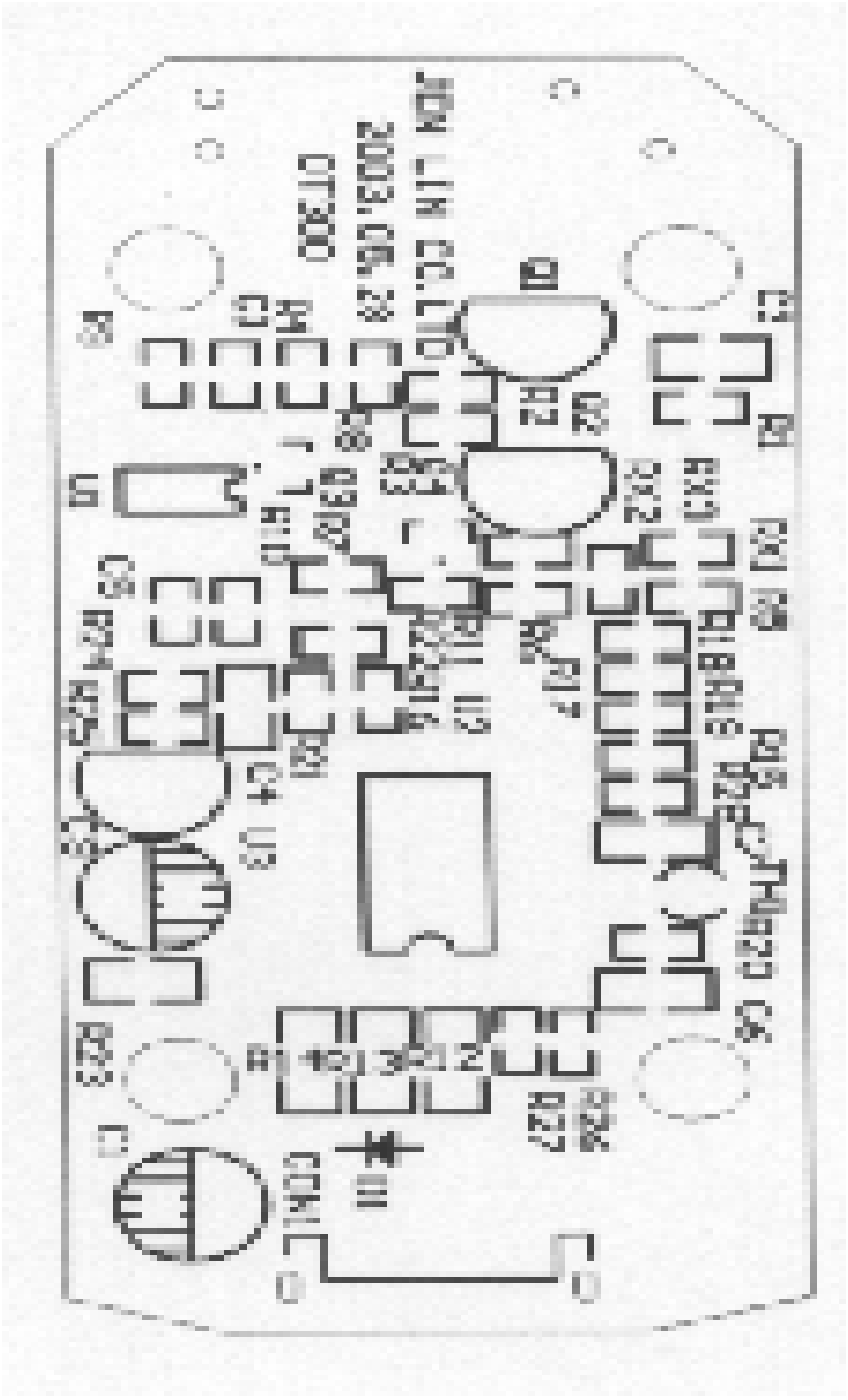
8.2 Folder PCB

< TOP VIEW - COMP >

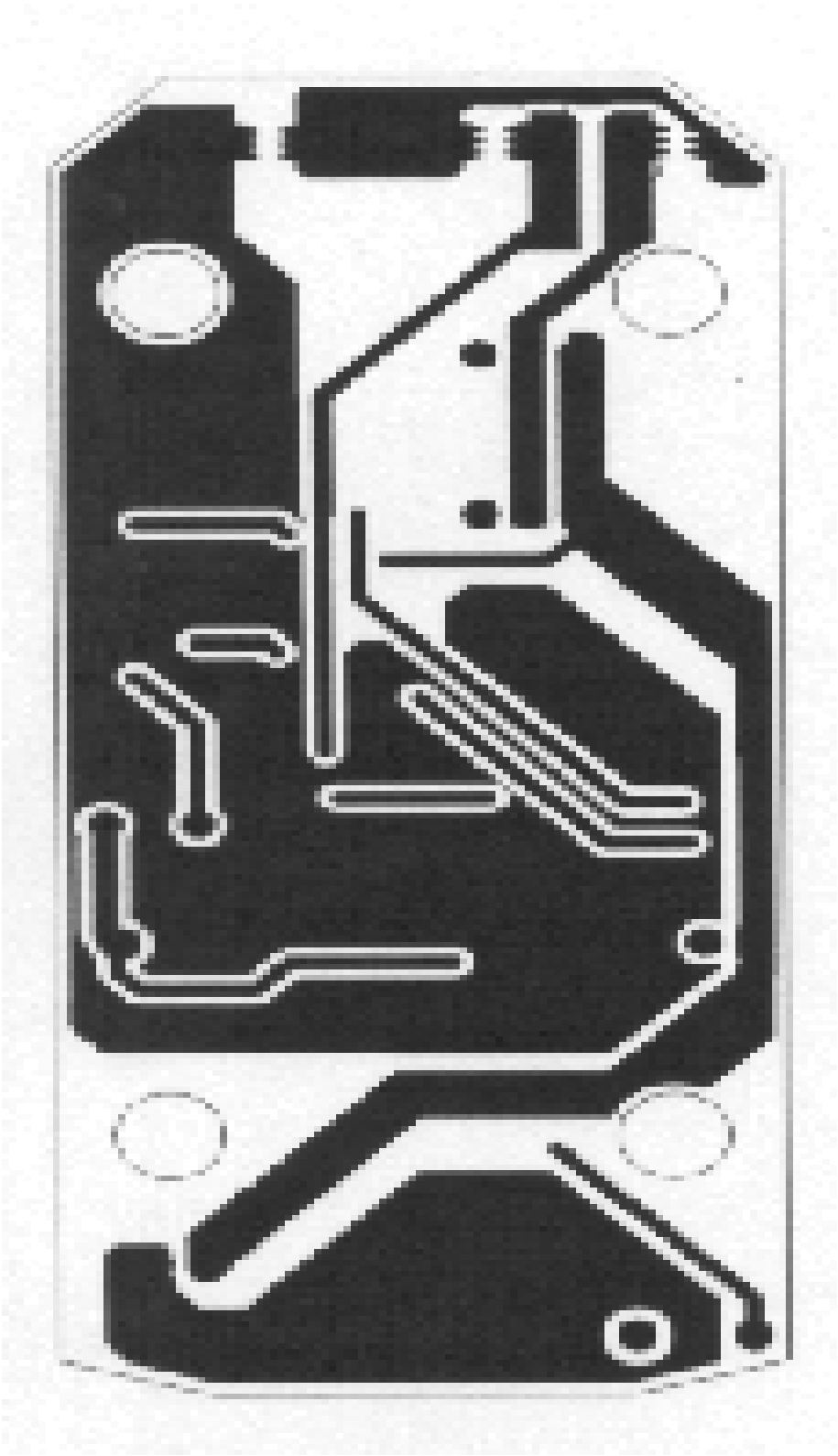


8.3 Battery Charger PCB

< TOP VIEW - COMP >



< BOTTOM VIEW - Pattern >



9. Electrical Parts List

9.1 Main Parts List

REF. NO	DESCRIPTION	PARTS NUMBER
R410	RES 2012 0.2 ohm +-1%	RLC20R20FTP
R228,R231,R313,R315,R325,R343,R348,R350, R351,R354,R411,R416,R417,R418,R419,R502, R504,R506,R507,R603,R605,R608	RES 1005 0 ohm +-5%	MCR01MZSJ000
R317,R323,R324	RES 1005 100 ohm +-5%	MCR01MZSJ101
R312,R328,R332,R335,R338 R415,R612	RES 1005 1K ohm +-5%	MCR01MZSJ102
R206,R207,R209,R212,R408 R501,R510,R601,R602,R604	RES 1005 10K ohm +-5%	MCR01MZSJ103
R208,R216,R301,R308,R339	RES 1005 100K ohm +-5%	MCR01MZSJ104
R204	RES 1005 100K ohm +-1%	MCR01MZSF1003(1%)
R610,R618	RES 1005 12 ohm +-5%	MCR01MZSJ120
R341,R352	RES 1005 120 ohm +-5%	MCR01MZSJ121
R344,R345	RES 1005 150K ohm +-1%	MCR01MZSF1503(1%)
R331,R334,R337	RES 1005 20 ohm +-5%	MCR01MZSJ200
R409,R424,R425	RES 1005 200 ohm +-5%	MCR01MZSJ201
R407	RES 1005 2K ohm +-5%	MCR01MZSJ202
R310,R620	RES 1005 2.2K ohm +-5%	MCR01MZSJ222
R215	RES 1005 220K ohm +-5%	MCR01MZSJ224
R307,R319	RES 1005 270K ohm +-5%	MCR01MZSJ274
R309,R406	RES 1005 330 ohm +-5%	MCR01MZSJ331
R304	RES 1005 3.3K ohm +-5%	MCR01MZSJ332
R305	RES 1005 33K ohm +-5%	MCR01MZSJ333
R330,R333,R336	RES 1005 39K ohm +-5%	MCR01MZSJ393
R609,R611,R613,R614	RES 1005 430 ohm +-5%	MCR01MZSJ431
R251,R342	RES 1005 470 ohm +-5%	MCR01MZSJ471
R306	RES 1005 47K ohm +-5%	MCR01MZSJ473
R322	RES 1005 5.1K ohm +-5%	MCR01MZSJ512
R422	RES 1005 51K ohm +-5%	MCR01MZSJ513
R421,R426	RES 1005 56 ohm +-5%	MCR01MZSJ560
R321	RES 1005 8.2 ohm +-5%	MCR01MZSJ8R2
R340	RES 1005 91K ohm +-5%	MCR01MZSJ913
R217	4-RES ARRAY 1k ohm	MNR04MOABJ102
R404,R405	4-RES ARRAY 10K ohm	MNR04MOABJ103
L301	CHIP INDUCTOR(1005), 100NH	AML1005HR10JT
L501	CHIP INDUCTOR(1608), 24NH	0603CS-24NXGBW
L503	CHIP INDUCTOR(1005), 3.9NH	AML1005Q3N9JT
L502	CHIP INDUCTOR(1608), 6.2NH	0603CS-6N2XGBW
L601	CHIP INDUCTOR(1005), 8.2NH	AML1005H6N8ST
L304	CHIP INDUCTOR, 22uH	LQH32CN220K23L
C214,C215,C315,C328,C330 C401,C410	TAN_CAP, 10uF/10V (P)	F951A106MPAAQ2
C620	TAN_CAP, 220uF/6.3V (U)	F750J227MUCGZT
C505	TAN_CAP, 33uF/10V (A)	F951A336MAAAQ2
C218,C219,C329,C331,C333 C411	CAP 1608 1uF X5R K 16V	GRM188R61C105KA12D

REF. NO	DESCRIPTION	PARTS NUMBER
C306,C606	CAP.CERAMIC CHIP1608 2.2uF/6.3V	JMK107BJ225MA
C213,C216,C217	CAP 2012 4.7UF X5R 6.3V +-10%	GRM21BR60J475KA11L
C604	CAP.CERAMIC CHIP 1 pF	GRP1555C1H1R0CZ01E
C521,C522	CAP.CERAMIC CHIP 1.5 pF	GRP1555C1H1R5CZ01E
C518,C520	CAP.CERAMIC CHIP 1.6 pF	GRP1555C1H1R6BZ01E
C202,C203,C223,C414	CAP.CERAMIC CHIP 10 pF	GRP1555C1H100JZ01E
C308,C516,C517	CAP.CERAMIC CHIP 100 pF	GRP1555C1H101JD01E
C325,C327,C404,C603,C611	CAP.CERAMIC CHIP 12 pF	GRP1555C1H120JZ01E
C261	CAP.CERAMIC CHIP 15 pF	GRP1555C1H150JZ01E
C608,C609	CAP.CERAMIC CHIP 22 pF	GRP1555C1H220JZ01E
C605	CAP.CERAMIC CHIP 3 pF	GRP1555C1H4R0CZ01E
C255,C256,C257,C258,C259 C260,C312,C321,C324,C326 C356,C405,C602,C610,C612	CAP.CERAMIC CHIP 47 pF	GRP1555C1H470JZ01E
C613	CAP.CERAMIC CHIP 680 pF	GRP155R71H681KA01E
C251,C303	CAP.CERAMIC CHIP 1000 pF(1N)	GRP155R71H102KA01E
C502,C503,C504	CAP.CERAMIC CHIP 0.01 uF(10N)	GRP155R71C103KA01E
C201,C204,C208,C209,C210 C211,C212,C220,C221,C222 C301,C302,C304,C305,C311 C314,C316,C318,C332,C402 C403,C407,C408,C415,C501	CAP.CERAMIC CHIP 0.1 uF(100N)	GRP155F51C104ZA01E
C307,C406,C507,C508,C509 C510,C512,C515,C519,C523 C524	CAP.CERAMIC CHIP 22N	GRP155R71C223KA01E
C320	CAP.CERAMIC CHIP 220N(1608)	GRM188R71A224KA01D
C313,C335	CAP.CERAMIC CHIP 3.3N	GRP155R71H332KA01E
B401	BACK UP BATTERY	ML414R/F9CE
U307	CHARGE PUMP 10V	LT1937ES5
U308	CHARGE PUMP 5V	AAT3110GU-5
J601	CONNECTOR RF	CRS5001-1702
J301	CONNECTOR B2B 40Pin	AXK740135
J401	CONNECTOR I/O , 18Pin (BATTERY)	TI05-18S-JBK
J402	CONNECTOR SIM	SM02-F150A-06
D301	DIODE	1SS302
D303	DIODE	MA2J70400L
D413	DIODE ZENER	TZMC8V2
U401	FET WITH SCHOTTKY DIODE	SI7705DN
BPF502	FILTER RF SAW BALANCED	B7820
BPF501	FILTER RF SAW BALANCED	B7821
S423	FPCB (SIDE_KEY)	VK300
U306	IC AUDIO AMP	TPA2005D1_DRB
U201	IC BASEBAND CALYPSO	XF741979BGHH
U202	IC BASEBAND IOTA	PTWL3014CGGM
U402	IC HALL	A3210ELH
U501	IC LDO 2.85V	MIC5245-2.85BM5
U301	IC MCP 128M FLASH MEMORY+32M SRAM	MB84VF5F5F4J2-70
U305	IC MELODY 40POLY	YMU762
U302,U303,U304	IC OR GATE	SN74LVC1G32DCKR
U505	IC PLL	SI4133T
U503	IC RF LNA	SI4200

REF. NO	DESCRIPTION	PARTS NUMBER
U504	IC RF TRANCIEVER	SI4201
U602	IC POWER AMP MODULE	RF3110TR13
J302	JACK EAR	AJR4F-6K2001
D403,D404,D405,D406,D407 D408,D409,D410	LED 1608 BLUE 0.4t	SLSNNBL103TS
MIC401	MIC C	OBG-412L44-C1533
	PCB MAIN	VK300 PCB
U601	ANT SWITCH	LMG002S-5008C
R619	THERMISTOR	22k_NTC, NSM4223J380H3R
T305	TR	UMG5NTR
T601	TR	DTC114YE
T602,T603	TR DUAL TYPE	UMD9NTR
T301,T302,T303	TR, DUAL TYPE	EMX1T2R
T304	TR, DUAL TYPE	BC848BW
V301,V302,V303,V304,V305,V306,V307,V308,V310, V311,V312,V313,V314,V315,V316,V317,V318,V319, V320,V321,V322,V323,V324,V401,V402,V403,V404, V405,V406,V407,V408,V410,V411,V412,V413,V414, V415,V416,V417 V418,V419,V420,V421,V422,V423, V424,V425,V426,V427,V428,V429,V430,V431,V433	VARISTOR, 1005Size (HIGH SPEED)	AVLC5S02050(50PF)
U502	VCTCXO, 13MHz	TTS14V
X201	X-TAL, 32.768KHz,	CC5V (32.768KHz)

9.2 Folder Parts List

REF No.	DESCRIPTION	PARTS NUMBER
C11,C40	0.1uF/10V/B, TDK	C1005JB1A104K
C13,C16,C17,C18,C19,C23,C24,C25	0.1uF/25V/B, TDK	C1608JB1E104K
C1,C2,C4,C5,C6,C7,C14,C15,C20,C21,C26,C27, C28,C29,C31,C32,C34,C38,C39	1uF/10V/B,TDK	C1608JB1A105K
C35,C36,C37	1uF/16V/B, TDK	C1608JB1C105K
C3,C8,C9,C10,C12,C22,C33	1uF/25V/B,TDK	C3216JB1E105KH
CN1	AXK740145J, Matsushita	AXK740145J
F901,F902	Bead, TDK	MMZ1005S601A
D1,D2	Shotkey Diode, RB520S-30, Rohm	RB520S-30
IC1	HD66773R, Hitachi	HD66773R
IC2	S-43200A, SII	S-43200A
L901,L902	1.5uH, TDK	MLF1608A1R5J
L903	100nH, TDK	MLG1608BR10J
R1	150K ,5%, 1/16W, 1005 ,Kamaya	RMC1/16SK154F
R2	560K ,5%, 1/16W, 1005 ,Kamaya	RMC1/16SK564F
R3	82K ,5%, 1/16W, 1005 ,Kamaya	RMC1/16SK823F
R4	360K ,5%, 1/16W, 1005 ,Kamaya	RMC1/16SK364F
VR1	200K, Murata	PVZ2A204A01

9.3 Battery Charger Parts List

REF.NO	DESCRIPTION	PART NUMBER
C1, C9	ELE-CAP, 16V/47uF, 85℃	82E-47602-0161
C2, C4, C6, C7	CHIP CAPACITOR, 0805,104Z	82C-10422-0500
C3	CHIP CAPACITOR, 0805,103Z	82C-10321-0500
C5	CHIP CAPACITOR, 0805,473Z	82C-47321-0500
CON1	CONNECTOR SOCKET, 18-PIN	640-BC018-0010
CON2	CONNECTOR, 2-PIN, 2.54mm	900-DT887-0011
CON3	CONNECTOR, 1-PIN	900-DT887-0020
D1	RECTIFIER DIODE, 1N4007,1000V/1A	230-04007-IN00
LED1	LED-DUAL COLOR, Vr 4V/85mW/ 1fp 50mA	23L-03002-RG01
PCB MAIN	DOUBLE, FR-4, t=1.2	200-DT300-0010
Q1, Q2	STB1277, TR, PNP, TO-92, 500mA, 625mW	220-01277-STBO
Q3, Q4	2SC5343SF, TR, NPN, SOT-23, 150mA, 150mW	221-05343-2SCO
R2, R3, R26, R27	CHIP-RESISTOR, 0603, 330 ohm, J	241-00331-5160
R10	CHIP-RESISTOR, 0603, 910 ohm, J	241-00911-5160
R11	CHIP-RESISTOR, 0603, 3K ohm, J	241-00302-5160
R15, R17	CHIP-RESISTOR, 0603, 9.1K ohm, J	241-00912-5160
R7	CHIP-RESISTOR, 0603, 10K ohm, J	241-00103-5160
R1	CHIP-RESISTOR, 0603, 20K ohm, J	241-00203-5160
R16, R19, R21, R28	CHIP-RESISTOR, 0603, 33K ohm, J	241-00333-5160
R18	CHIP-RESISTOR, 0603, 8.2M ohm, J	241-00825-5160
R*1, R*2, R*3	CHIP-RESISTOR, 0603, 10M ohm, J	241-00106-5160
R24	CHIP-RESISTOR, 0603, 1.2K ohm, F	241-01201-1160
R25	CHIP-RESISTOR, 0603, 1.5K ohm, F	241-01501-1160
R8	CHIP-RESISTOR, 0603, 6.8K ohm, F	241-06801-1160
R9, R22	CHIP-RESISTOR, 0603, 10K ohm, F	241-01002-1160
R4, R20	CHIP-RESISTOR, 0603, 82K ohm, F	241-08202-1160
R5	CHIP-RESISTOR, 0603, 330K ohm, F	241-03303-1160
R6	CHIP-RESISTOR, 0603, 510K ohm, F	241-05103-1160
R23	CHIP-RESISTOR, 0805 15 ohm, J	241-00150-5080
R12, R13	CHIP-RESISTOR, 1206, 1 ohm, F	241-0010A-1040

REF.NO	DESCRIPTION	PART NUMBER
TH1	THERMSTOR, NTC, 10Kohm, 25℃	24N-00103-5040
U1	IC-QUAD OP AMP, LM358, 8SOP, 36V	211-00358-LM00
U2	IC-MCJ, 8BIT, ROM=4K, 28SOP	211-6201C-ST00
U3	SHUNT REGULATOR, TL431C 0.5%	230-0431C-TL00

Memo