REFERENCE	DESCRIPTION	SEC CODE
D100,D101,D102,D103	DIODE-VARACTOR;1SV279,15V	0405-001035
ZD200,ZD201,ZD202	DIODE-TVS;-,6.1/-/7.2V,15	0406-001083
ZD203	DIODE-TVS;-,6.1/-/7.2V,15	0406-001083
Q102	TR-SMALL SIGNAL;2SC4617,N	0501-000225
Q200,Q202	TR-SMALL SIGNAL;2SA1774-R	0501-000676
Q201	FET-SILICON;SI3443DV,P,-2	0505-001165
U108	FET-SILICON;FDG6323L,N/P,	0505-001423
Q100	TR-ARRAY;UMT1N,PNP/NPN,1,	0506-000147
Q101	TR-ARRAY;UMH11N,NPN,2,50V	0506-000167
U207	IC-CMOS LOGIC;7S08,AND GA	0801-000794
U208	TC7WHO8FK	0801-002593
U220	IC-ANALOG MULTIPLEX;MAX45	1001-001132
U205	IC-EEPROM;24C256,32Kx8Bit	1103-001184
U206	IC-ETC. MEMORY;84VD22194,	1109-001158
U221	IC-POWER AMP;104968,MSOP,	1201-001500
U100	RM913	1201-001690
U106	MIC5245-3.OB	1203-002054
U107	MAX1798	1203-002119
U103	IC-IF CIRCUIT;IFR3000-48B	1204-001581
U105	IC-IF CIRCUIT;IFT3000-48B	1204-001582
U203	IC-AUDIO PROCESSOR;TWL110	1204-001678
U201	SVR2000	1204-001779
U219	IC-MIXER;MD59-0022,TSSOP,	1205-001781
U204	IC-TRANSCEIVER;MSM3000,FB	1205-001882
U101	MD59-0049	1205-001948
TH101	THERMISTOR-NTC;10KOHM,3%,	1404-001165
R204,R215,R224,R258	R-CHIP;100ohm,5%,1/16W,DA	2007-000138
R246,R259	R-CHIP;100ohm,5%,1/16W,DA	2007-000138
R100,R101,R125,R126	R-CHIP;1Kohm,5%,1/16W,DA,	2007-000140
R145,R147,R229,R237	R-CHIP;1Kohm,5%,1/16W,DA,	2007-000140
R240,R248	R-CHIP;1Kohm,5%,1/16W,DA,	2007-000140
R238,R242	R-CHIP;2.2Kohm,5%,1/16W,D	2007-000141
R102,R141,R241	R-CHIP;2.7Kohm,5%,1/16W,D	2007-000142
R119,R202,R234,R253	R-CHIP;4.7Kohm,5%,1/16W,D	2007-000143
R255	R-CHIP;6.8Kohm,5%,1/16W,D	2007-000146
R131	R-CHIP;8.2Kohm,5%,1/16W,D	2007-000147
R218,R223,R230,R244	R-CHIP;10Kohm,5%,1/16W,DA	2007-000148
R254,R256	R-CHIP;10Kohm,5%,1/16W,DA	2007-000148
R208,R209,R213,R214	R-CHIP;20Kohm,5%,1/16W,DA	2007-000152
R216,R228	R-CHIP;20Kohm,5%,1/16W,DA	2007-000152
R143,R206,R211,R212	R-CHIP;47Kohm,5%,1/16W,DA	2007-000157
R222,R225,R232,R233	R-CHIP;47Kohm,5%,1/16W,DA	2007-000157
R257	R-CHIP;47Kohm,5%,1/16W,DA	2007-000157
R221	R-CHIP;56Kohm,5%,1/16W,DA	2007-000159
R132,R136,R144,R146	R-CHIP;100Kohm,5%,1/16W,D	2007-000162
R207,R226	R-CHIP;100Kohm,5%,1/16W,D	2007-000162
R103	R-CHIP;47OHM,5%,1/16W,DA,	2007-000174
R117	R-CHIP;1.5Kohm,5%,1/16W,D	2007-000242
R138,R200	R-CHIP;33Kohm,5%,1/16W,DA	2007-000775
R220	R-CHIP;560Kohm,5%,1/16W,D	2007-001025

R227	R-CHIP;750ohm,5%,1/16W,DA	2007-001156
R113	R-CHIP;18ohm,5%,1/16W,DA,	2007-001288
R261	R-CHIP;51ohm,5%,1/16W,DA,	2007-001298
R127	R-CHIP;1.8Kohm,5%,1/16W,D	2007-001320
R128	R-CHIP;3.3Kohm,5%,1/16W,D	2007-001325
R142	R-CHIP;7.5Kohm,5%,1/16W,D	2007-001329
R219	R-CHIP;18Kohm,5%,1/16W,DA	2007-001333
R250	R-CHIP;15OHM,5%,1/16W,DA,	2007-002965
R236	R-CHIP;100Kohm,1%,1/16W,D	2007-007107
R260	R-CHIP;27Kohm,1%,1/16W,DA	2007-007138
R121,R122,R235	R-CHIP;10Kohm,1%,1/16W,DA	2007-007142
R123,R124	R-CHIP;6.8Kohm,1%,1/16W,D	2007-007313
R239	R-CHIP;560ohm,1%,1/16W,DA	2007-007405
R139	R-CHIP;130Kohm,1%,1/16W,D	2007-007480
R140	R-CHIP;150Kohm,1%,1/16W,D	2007-007489
R231,R249,R251,R252	R-CHIP;0OHM,5%,1/16W,DA,T	2007-007771
C103,C144,C149,C151,C260	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C152,C153,C165,C167	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C168,C171,C172,C173	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C183,C185,C190,C200	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C202,C203,C204,C205	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C206,C207,C208,C209	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C211,C223,C263,C264	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C272,C273	C-CERAMIC,CHIP;0.1nF,5%,5	2203-000233
C133,C164,C166,C174	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C178,C179,C181,C184	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C187,C192,C201,C210	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C216,C217,C218,C219	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C220,C225,C228,C232	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C237,C240,C248	C-CERAMIC,CHIP;10nF,10%,1	2203-000254
C163	C-CERAMIC,CHIP;0.01nF,0.5	2203-000278
C158,C159	C-CERAMIC,CHIP;0.12nF,5%,	2203-000311
C277	C-CERAMIC,CHIP;0.012nF,5%	2203-000330
C265	C-CERAMIC,CHIP;0.015nF,5%	2203-000386
C150,C160	C-CERAMIC,CHIP;0.018nF,5%	2203-000425
C113,C114,C124,C140	C-CERAMIC,CHIP;1nF,10%,50	2203-000438
C141,C143,C145,C154	C-CERAMIC,CHIP;1nF,10%,50	2203-000438
C177,C222,C235,C253	C-CERAMIC,CHIP;1nF,10%,50	2203-000438
C255,C257,C258	C-CERAMIC,CHIP;1nF,10%,50	2203-000438
C271,C278	C-CERAMIC,CHIP;1nF,10%,50	2203-000438
C146,C251,C259	C-CERAMIC,CHIP;0.001nF,0.	2203-000466
C161,C162	C-CERAMIC,CHIP;0.02nF,5%,	2203-000550
C268	C-CERAMIC,CHIP;220pF,10%,	2203-000585
C233,C234	C-CERAMIC,CHIP;0.027nF,5%	2203-000679
C156	C-CERAMIC,CHIP;0.002nF,0.	2203-000696
C115,C148,C267,	C-CERAMIC,CHIP;0.033nF,5%	2203-000812
C226	C-CERAMIC,CHIP;0.047nF,5%	2203-000995
C247,C274,C275	C-CERAMIC,CHIP;680pF,10%,	2203-001124
C213,C214	C-CERAMIC,CHIP;8.2nF,10%,	2203-001210
C284	C-CERAMIC,CHIP;0.0005nF,0	2203-001383
C112	C-CERAMIC,CHIP;0.0033nF,0.	2203-005052

C169,C186,C224,C229	C-CERAMIC,CHIP;100nF,+80-	2203-005061
C238,C239,C241,C243	C-CERAMIC,CHIP;100nF,+80-	2203-005061
C244,C245,C246,C250	C-CERAMIC,CHIP;100nF,+80-	2203-005061
C270,C285,C286	C-CERAMIC,CHIP;100nF,+80-	2203-005061
C280,C282,C283,C254,C279	C-CERAMIC,CHIP;100nF,5%,	2203-005061
C119,C175,C230,C261	C-CERAMIC,CHIP;1000nF,+80	2203-005065
C266	C-CERAMIC,CHIP;1000nF,+80	2203-005065
C157	C-CERAMIC,CHIP;0.0047nF,0	2203-005395
C252	C-CERAMIC,CHIP;33nF,10%,1	2203-005480
C138,C176,C180,C182	C-CERAMIC,CHIP;10000NF,+8	2203-005571
C188,C189,C191,C193	C-CERAMIC,CHIP;10000NF,+8	2203-005571
C194,C269	C-CERAMIC,CHIP;10000NF,+8	2203-005571
C155	C-TA,CHIP;1uF,20%,10V,GP,	2404-001017
C221	C-TA,CHIP;2.2uF,20%,6.3V,	2404-001088
C139	C-TA,CHIP;220nF,20%,20V,G	2404-001092
C227	C-TA,CHIP;1uF,20%,16V,GP,	2404-001101
C142,C231,C242,C249	C-TA,CHIP;10UF,20%,6.3V,G	2404-001105
L117	INDUCTOR-SMD;270nH,10%,0.	2703-000175
L114,L115	INDUCTOR-SMD;220nH,10%,0.	2703-000295
L116	INDUCTOR-SMD;27nH,5%,1.8x	2703-001512
L104,L121	INDUCTOR-SMD;100nH,5%,1.8	2703-001513
L107	INDUCTOR-SMD;33nH,5%,1.8x	2703-001543
L118	INDUCTOR-SMD;47nH,5%,1.8x	2703-001545
L119	INDUCTOR-SMD;120nH,5%,1.8	2703-001673
L113	INDUCTOR-SMD;22nH,5%,1.8x	2703-001731
L105	INDUCTOR-SMD;56nH,5%,1.8x	2703-001732
L111	INDUCTOR-SMD;180nH,5%,1.6	2703-001880
L120	INDUCTOR-SMD;6.8nH,10%,1.	2703-002144
L122	INDUCTOR-SMD;12nH,5%,1.6	2703-002145
L123	INDUCTOR-SMD;15nH,5%,1.6	2703-002146
OSC200	CRYSTAL-SMD;.032768MHZ,30	2801-003747
OSC201	RESONATOR-CERAMIC;36MHZ,0	2802-001123
OSC101	OSCILLATOR-VCTCXO;19.68MH	2809-001230
F102	FILTER-SAW;210.38MHz,1.26	2904-001191
F108	FILTER-SAW;1.96GHz,60MHz,	2904-001213
F103	FILTER-SAW;1.88GHz,60MHz,	2904-001214
F104	FILTER-SAW;1.88GHz,60MHz,	2904-001248
U104	855769	2904-001277
F101	HPMD-7903	2909-001135
F105,F106,F107,F109	CORE-FERRITE BEAD;AB,1.5K	3301-001342
F110,F111,F112,F113	CORE-FERRITE BEAD;AB,1.5K	3301-001342
F114,F115,F116,F117	CORE-FERRITE BEAD;AB,1.5K	3301-001342
F118	CORE-FERRITE BEAD;AB,1.5K	3301-001342
CN100	U.FL-R-SMT	3705-001236
CN202	2000-9002-302	3711-004642
CN201	AXK6F34335J	3711-004728
CN200	9001-0906-010	3722-001572
OSC100	MODULE;VCO/PLL MODULE,172	4719-001030

11. FUNCTIONS OF ACTIVE DEVICES

NO	NAME	VENDOR CODE	DESCRIPTION
1	U203	TWL1103PBSR	CODEC
2	U204	MSM 3000C176FBGA	Mobile Station Modem
3	F101	HPMD-7903	DUPLEXER
4	OSC100	PO1241NA	VCO+PLL MODULE
5	OSC101	KT16-DCV30L-19.680M-T	VCTCXO
6	U105	IFT3000	IFT
7	U103	IFR3000	IFR
8	U219	MD59-0022TR	UPCONVERTER
9	U101	MD59-0049	DOWNCONVERTER
10	U100	RM913	POWER AMP
11	U107	MAX1798	PMIC
12	U201	SVR2000	VRIC

NAM features can be programmed as follows:

Notes:
- If you enter the NAM program mode, each item shows the currenly stored data. Go to the next item by pressing **OK**.
- You can modify the data by entering a new data.
- If you enter a wrong digit, press **CLR** to delete the last digit. Press and hold **CLR** to delete all digits.
- To scroll items backwards or forwards, press the **VOLUME** button on the left side of the phone.

(1)General Setup

LCD Display	Key in	Function
	MENU,8,4,**OK**	-selects Service Mode using navigation key
Svc Menu 1:Phone# 2.General 3:NAM	2	-Choose General
ESN B0000000	Navigation ▲	-Electronic Serial Number of the phone is displayed
CAI version 1	Navigation ▲	-Common Air Interface version is displayed
VOC8/13/EVRC SO_VOICE_13K	Navigation ▲	-Vocoder mode is displayed
SCM 10101010	Navigation ▲	-Station Class Mark displays the power class, transmission, slotted class, dual mode.
Lock Code 0000	Navigation ▲ 4-digit code **OK**	Lock code, current ststus is displayed -to change, enter new code. -stores it
Slot Mode Yes	Navigation ▲ * or # **OK**	Slot mode. Yes indicates the slot mode. -changes the status. -stores it.
Slot Index 2	Navigation ▲ **0-7** **OK**	Slot mode index. The higher,the longer sleeping time -to change, enter new one. -stores it

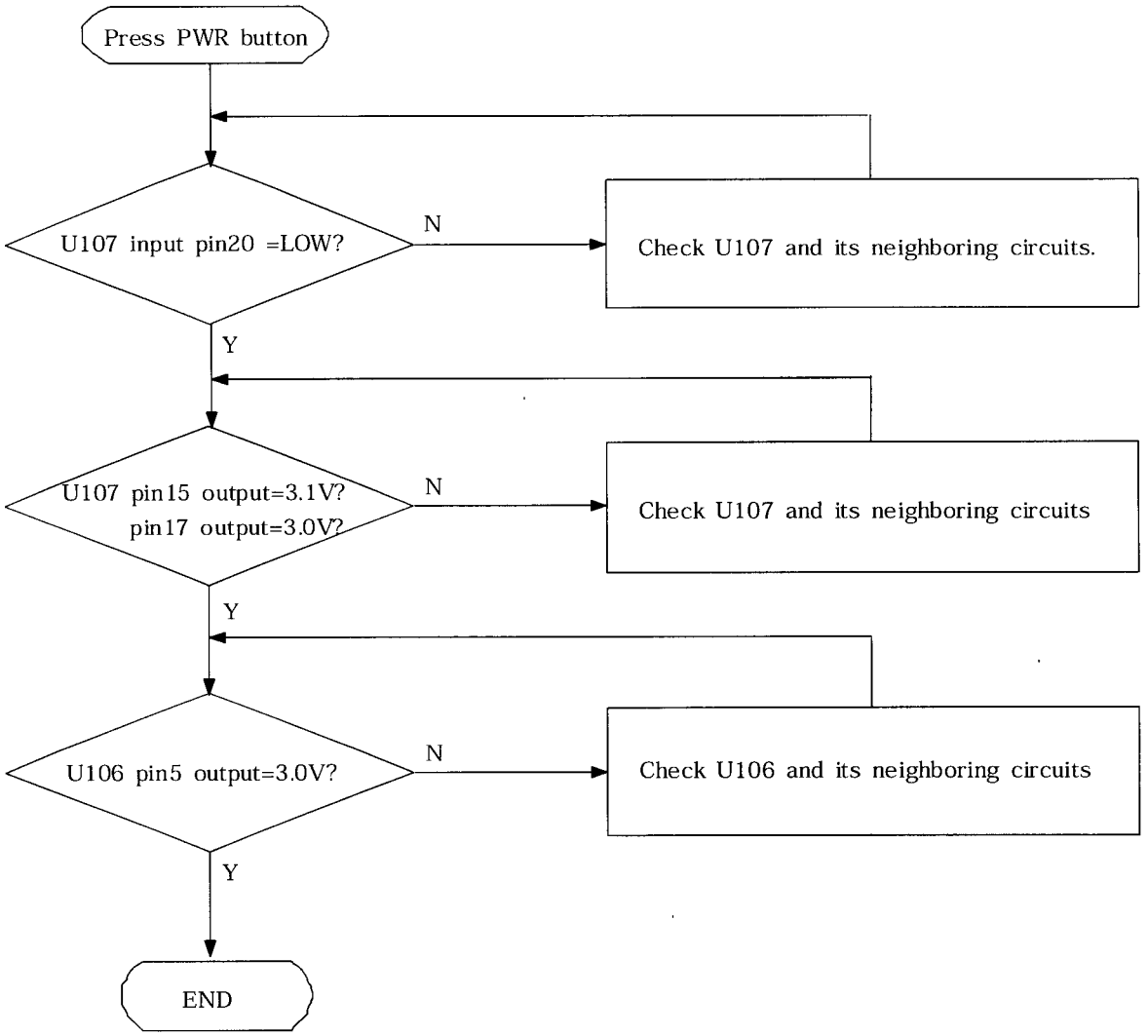
(2)Setting Up NAM

LCD Display	Key in	Function
Svc Menu 1:Phone# 2.General 3:NAM	3	-Choose NAM
IMSI_MCC 310	number **OK**	IMSI Moble Country Code,current code is displayed. -to change, enter new one. -stores it.
IMSI_MNC 00	number **OK**	IMSI Moble Network Code,current code is displayed. -to change, enter new one. -stores it.
CDMA ACCOLC 7	class number **OK**	CDMA Access Overload Class,current status is displayed. -to change,enter new one. -stores it.
CDMA HOME SID Yes	* or # **OK**	CDMA Home system ID, current ststus is displayed. -changes the status. -stores it.
CDMA fSID Yes	* or # **OK**	CDMA foreign SID, current ststus is displayed. -changes the status. -stores it.
CDMA fNID Yes	* or # **OK**	CDMA foreign NID, current ststus is displayed. -changes the status. -stores it.
HOME SID #1 4120	number **OK**	SID written in the list, current ststus is displayed. -to change, enter new one. -stores it.
NID 65535	number **OK**	NID written in the list, current ststus is displayed. -to change, enter new one. -stores it.

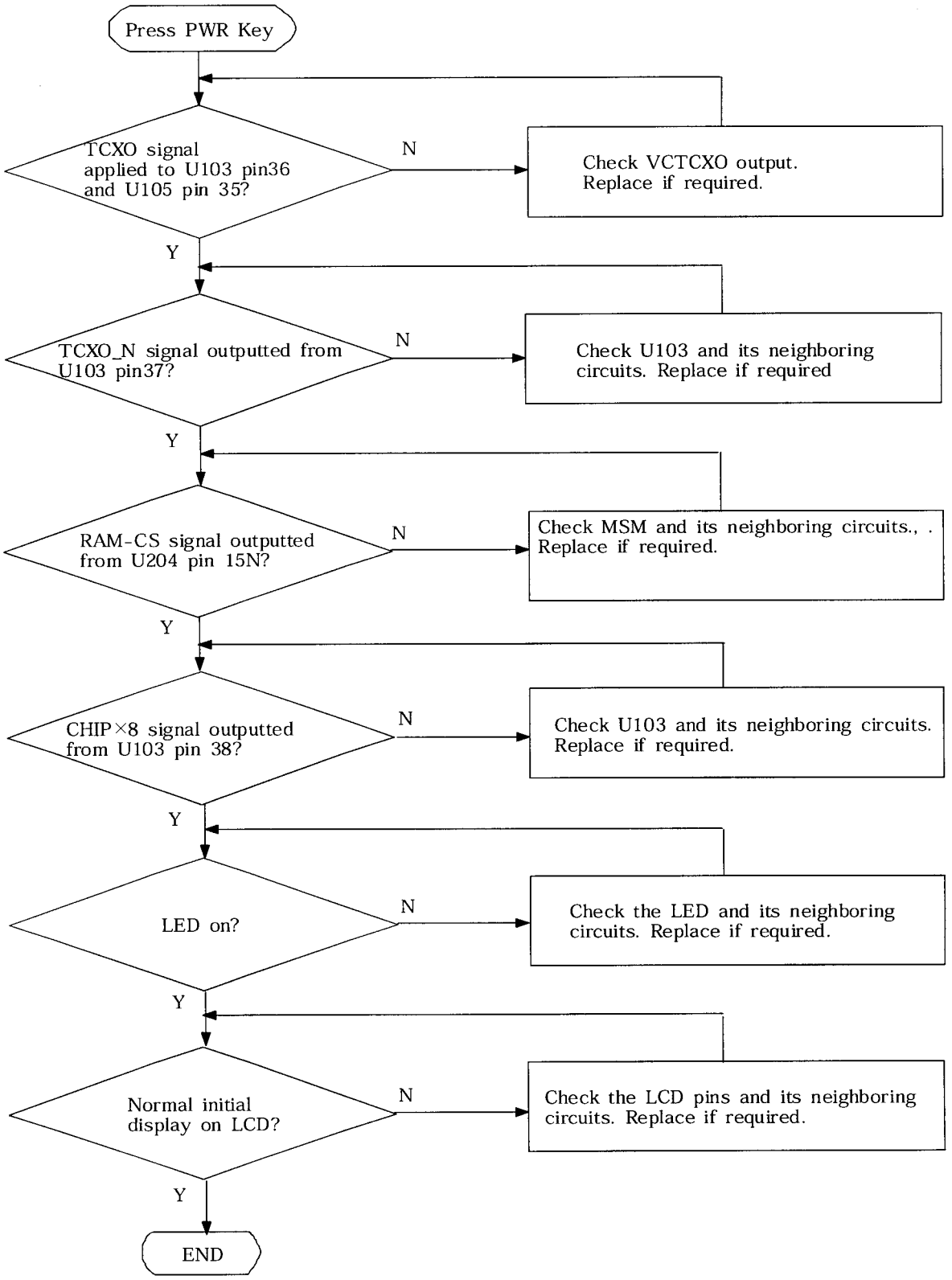
4. TROUBLESHOOTING

Logic Section

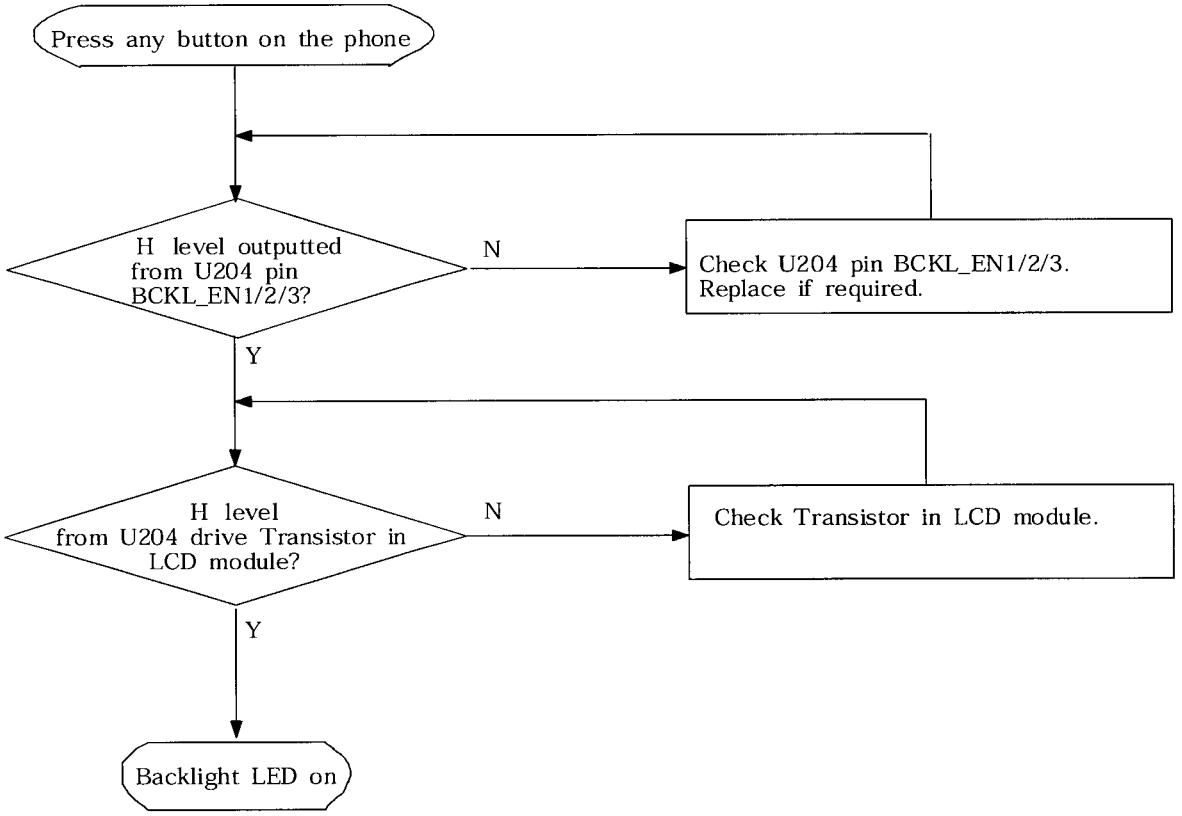
Abnormal Power on



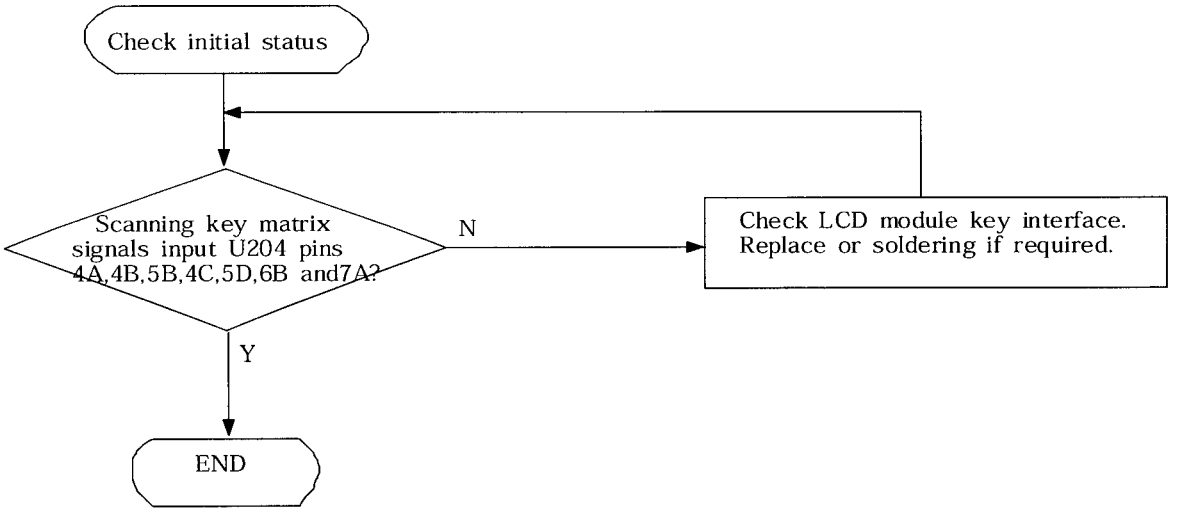
Abnormal initial operation (Normal +3.0V voltage source)



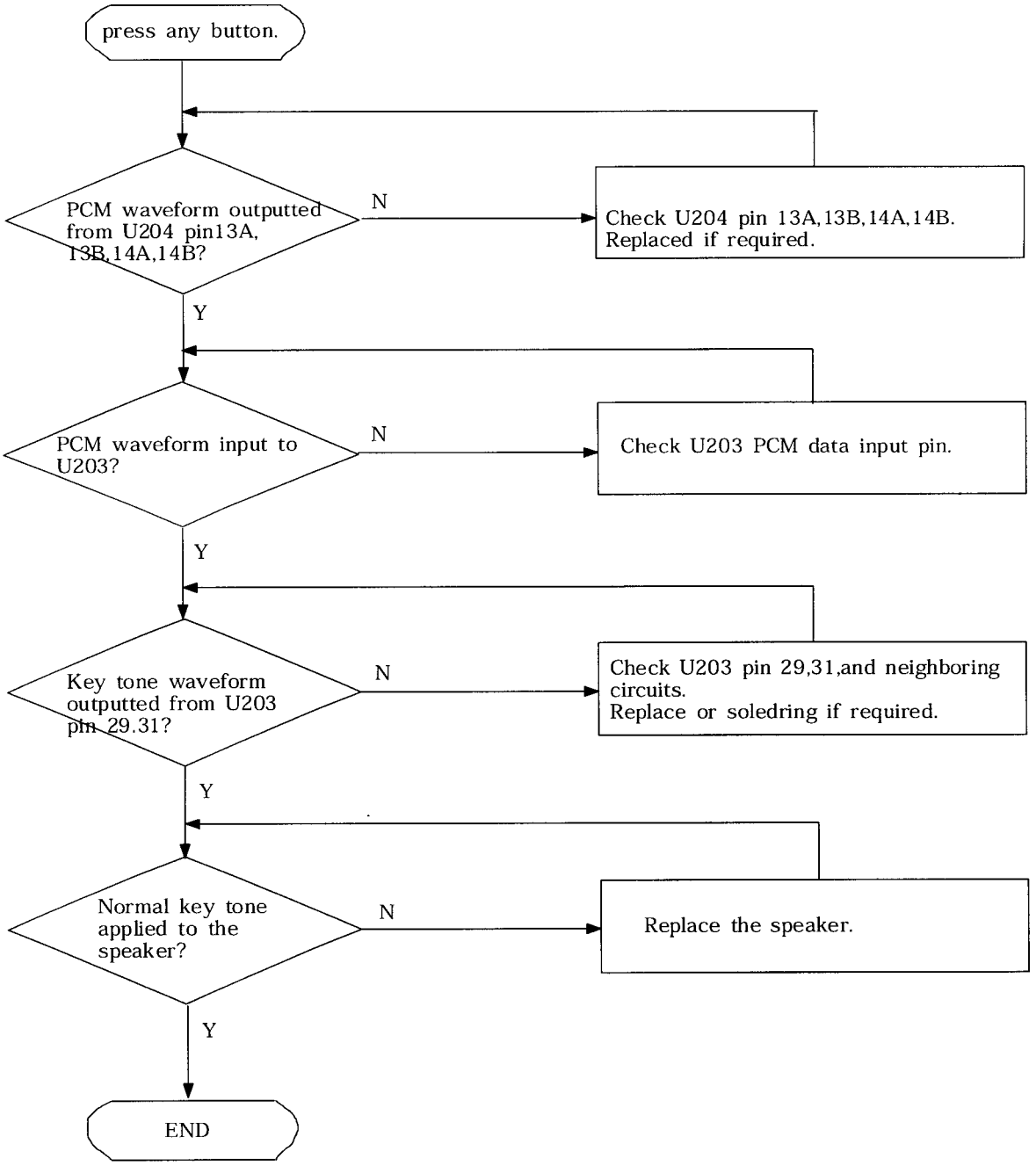
Abnormal Back lighting Operation



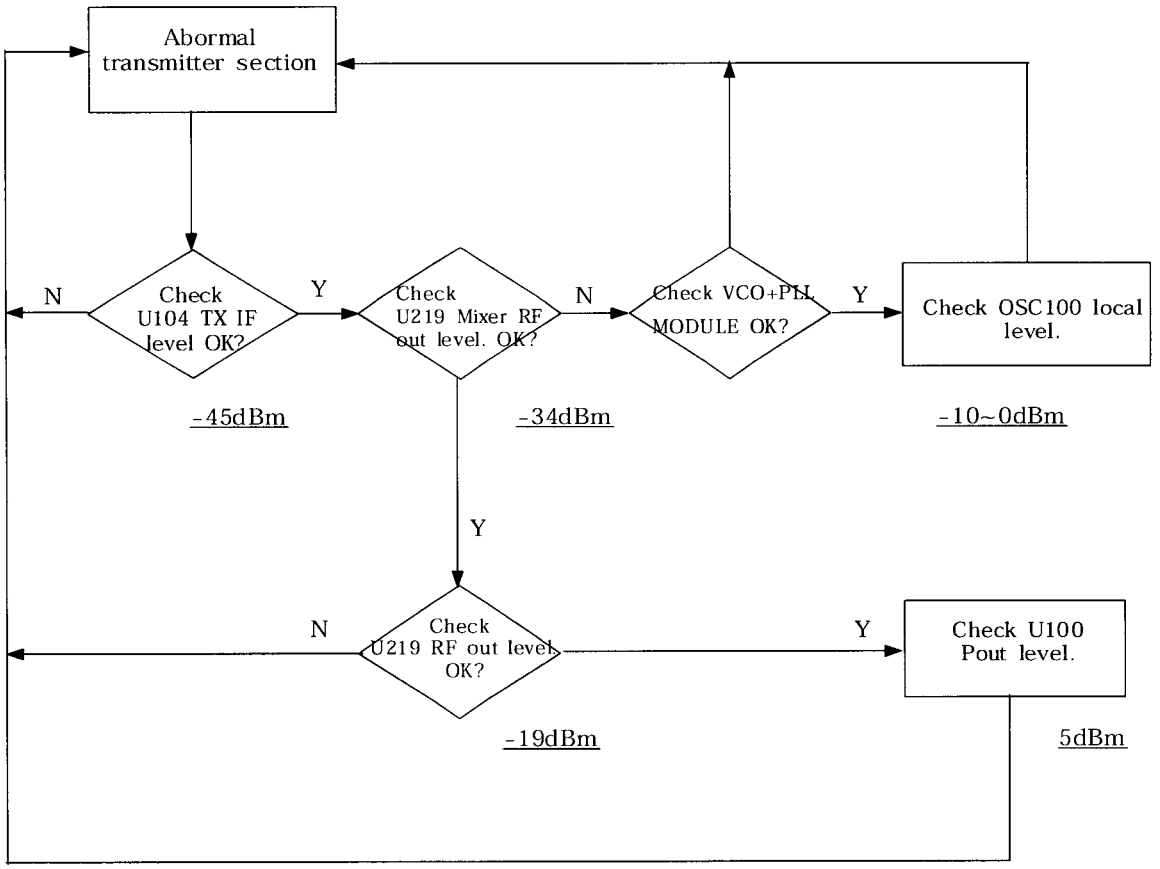
Abnormal Key Data Input



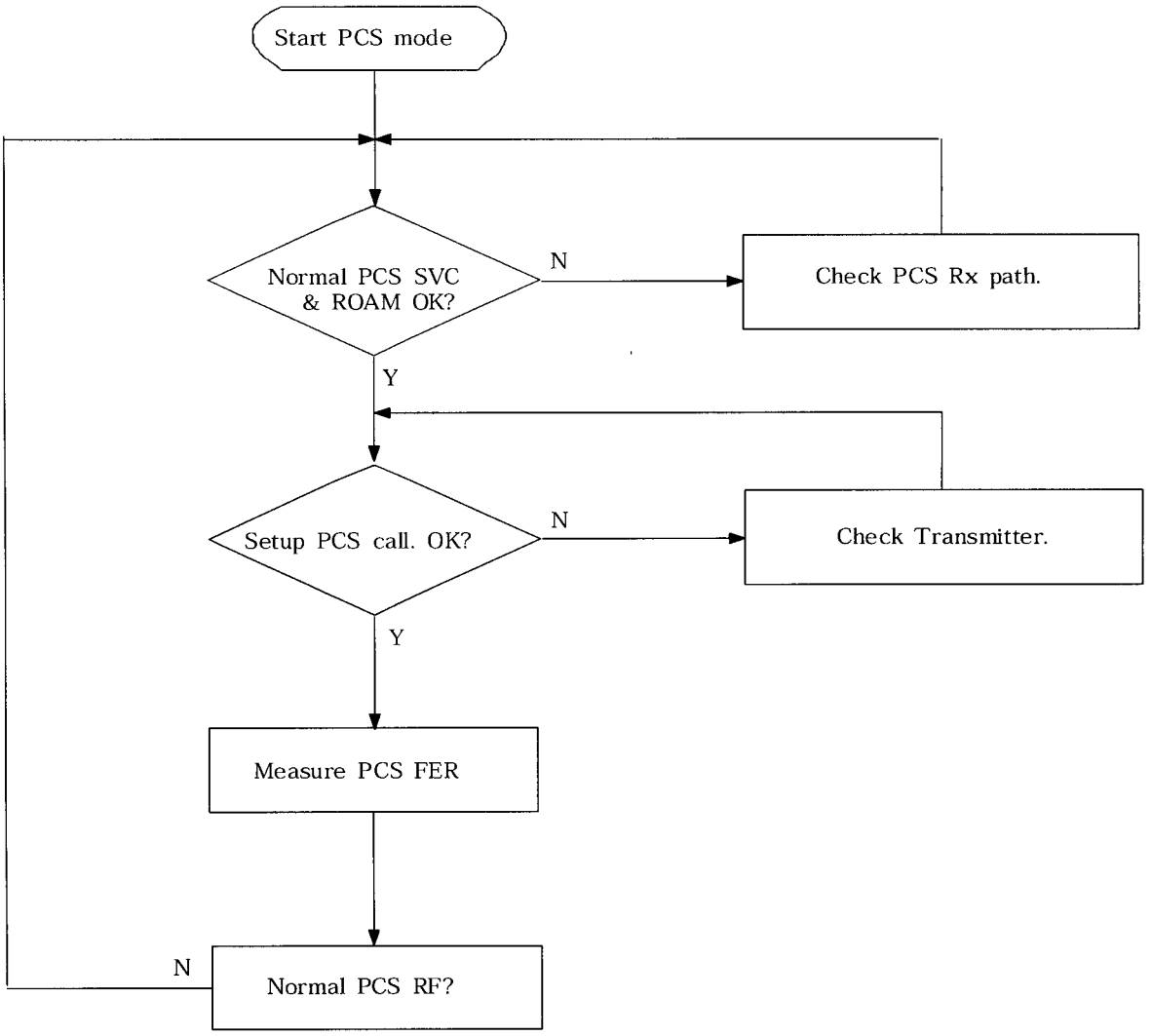
Abnormal Key tone and Alert tone



Transmitter Section



Receiver Section

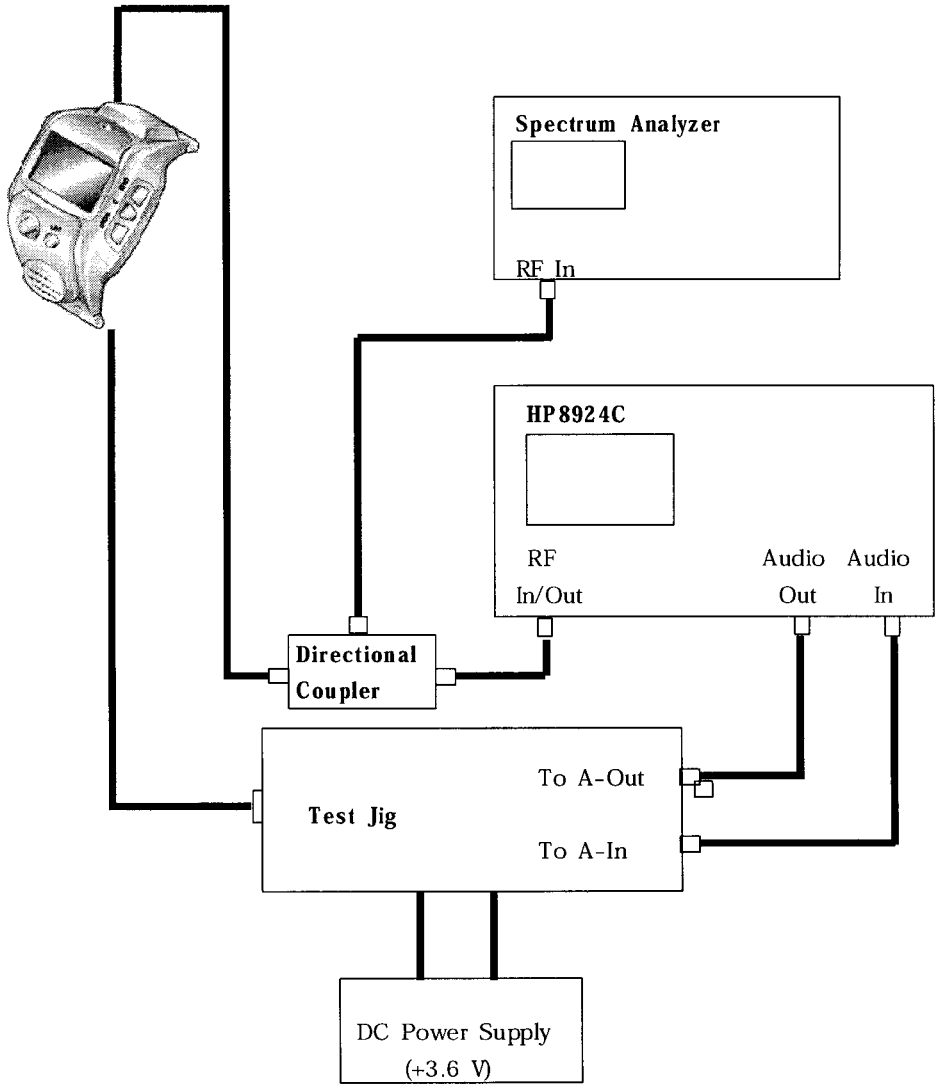


5. TUNE-UP PROCEDURE
TEST PROCEDURE

List of Equipment

- DC Power Supply
- Test Jig
- Test Cable
- CDMA Mobile Station Test Set — HP8924C, HP83236A, CMD-80, etc
- Spectrum Analyzer(include CDMA test mode) — HP8596E

Configuration of Test



Change to Test Mode

A. To change the phone from Normal Mode to test Mode, You should enter the following numbers using navigation key.
"Menu,8,3,OK"

B. The command "0 1"(Suspend) is entered to start test.

C. To finish the Test Mode, You should enter the command "0 2".

Channel Selection and Tx Power Output level Control

A. You should change the phone from Normal Mode to PCS Test mode
" 0 1 , 2 0 3 0 6 0 0 , 0 2 "

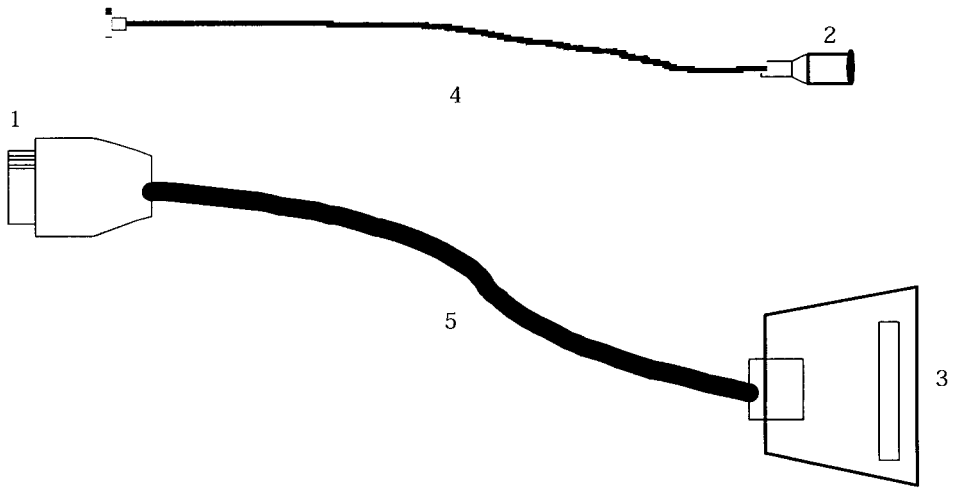
B. The command "0 1"(Suspend) is entered to start test.

C. You should enter the following numbers using navigation key
" 0 9 X X X X #, 0 7, 3 4, 5 5 , 7 1 X X X # "
- If you enter the command "0 9", You can select the channel
  ex) 0 9 0 3 6 3 (under-bar means channel number)
- The command "0 7"means Carrier On (Carrier Off : "0 8")
- If you enter the command "3 4", You can spread the carrier.
- If you enter the command "5 5", You can select high power mode.
- If you enter the command "7 1", You can control the power output level.
  Following under-bar means AGC code. And you can control the power output level using [SEND] or [END] Keys.
  ex) 7 1 4 7 5

D. After enter the command "9 3" and control the Tx Power Output Level to be each power level step (TX RAS) using [SEND] or [END] key , press "OK" key to store Data in EEPROM.

TEST CABLE DESCRIPTION FOR SPH-S100

1. TEST CABLE

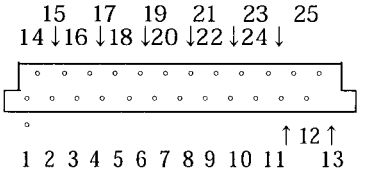


2. TEST CABLE CONNECTIONS

1	PLUG CONNECT TO SPH-S100
2	BNC CONNECTOR (RF)
3	Dsub 25PIN CONNECTOR (DATA)
4	RF CABLE
5	DATA CABLE

3. Dsub 25 PIN CONNECTOR PIN DESCRIPTION (TEST CABLE 1, BACK SIDE)

DATA DESCRIPTION	Dsub CONN. PIN NO.
Vcc	4, 5, 6
GND	13, 23, 24, 25
PW ON/OFF	7
TX AUDIO	10
TX DATA	22
RX AUDIO	12
RX DATA	21
RSSI	8



4. CONVERSION TABLE OF FREQUENCY vs CHANNEL

TYPE	CHANNEL	CONVERSION EQUATION	REMARK
TX FREQUENCY	0 ≤N≤ 1199	F=0.05 × N + 1850.00	N ; CH NUMBER
RX FREQUENCY	0 ≤N≤ 1199	F=0.05 × N + 1930.00	F ; FREQUENCY

TEST MODE

TEST ITEM	STEP	PROCEDURE
1. PREPARE	a	Connect the test equipment
	b	Enter the test mode: Enter [Menu 8 3 OK] using navigation key Select PCS mode: Press in test mode [2 0 3 0 6 0 0]
	c	If you press a wrong key, Enter [#] key and then enter new command.
	d	To exit the test mode at any time : press [0 2]
2. FREQUENCY ACCURACY	a	Set the channel 600 : enter [0 9 0 6 0 0] using navigation key
	b	Turn the carrier on and set the power level. : Enter [0 7, 34, 71] using navigation key
	c	Measure the frequency accuracy (spec: ±300Hz)
	d	To adjust the Frequency Accuracy : Enter [8 9] using navigation key and press [SEND] or [END] key.
	e	Store the Frequency Accuracy in EEPROM: Press [OK]
3. OCCUPIED CDMA BAND WIDTH	a	Set the channel 600: enter [0 9 0 6 0 0] using navigation key
	b	Turn the carrier on and set the power level. : enter [0 7, 3 4, 7 3 0 #, 7 1 X X X] using navigation key
	c	Measure the Band Width. (spec: 1.32MHz)
4. LIMITATIONS ON EMISSIONS	a	Set the channel 600: enter [0 9 0 6 0 0] using navigation key
	b	Turn the carrier on and set the power level. : enter [0 7, 3 4, 7 3 0 #, 7 1 X X X] using navigation key
	c	Measure the spurious at F_c±900kHz, F_c±1.98MHz, $2F_c$, $3F_c$, $1/2F_c$ spec: F_c±900kHz below 42dBc/30kHz F_c±1.98MHz below 54dBc/30kHz Outside Receive Band 43+10log (PY) PY: Mean output power in watts
5. GATED POWER &TIME	a	Set the Service option: 2
	b	Set the Data Rate: Eighth (1200bps)
	c	Registering: HHP --> HP8924C
	d	Call : HP8924C --> HHP
	e	Measure the Gated Power & Time spec: Gated Power at least 20dB Gated Time - Rising Time: below 7us Falling Time: below 7us Burst Time: below 1.247ms

6. FREQUENCY SYNTHESIZER CIRCUIT SPURIOUS RADIATION-SUPPRESSION CIRCUIT

Frequency Synthesizer Circuit

The Frequency synthesizer is an indirect frequency synthesizer PLL(Phased Locked Loop). It consists of a VCTCXO(OSC101), PLL + VCO Module(OSC100), and loop filter.

VCTCXO

The VCTCXO is a reference source of the frequency synthesizer. It provides 19.68MHz reference frequency to PLL + VCO Module(OSC100). The VCTCXO is a Voltage Controlled Temperature Compensated Crystal Oscillator having 19.68MHz±2.5ppm frequency stability over all useful temperature range. A correct frequency tuning is made by the control voltage.

VCO + PLL Module

The PLL + VCO Module(OSC100) generates the signal having 1750±30MHz center frequency with the voltage control. The PLL + VCO Module(OSC100) controls this signal.

The PLL + VCO Module(OSC100) includes prescalers and charge pump. The reference divider in the PLL + VCO Module(OSC100) divides the frequency of VCTCXO into 10kHz. This reference frequency is supplied to one of the input of phase detector. The signal generated at the PLL + VCO Module(OSC100) goes into another input stage of the phase detector through a prescaler and the main divider. At this point, the error proportional to the phase difference of two inputs is occurred. This error signal is supplied to the frequency control input stage of the PLL + VCO Module(OSC100) through the loop filter consisted of RC.

Spurious Radiation Suppression Circuit

The spurious signal from antenna is suppressed at the duplexer. The duplexer has a flat characteristics to the receive signal and a high attenuation characteristics to the harmonic signal of transmission. So it suppress the spurious radiation

Table: The characteristic of PCS duplexer filter(F101)

Parameter	Value
T X	
Center Frequency	1880 MHz (F_T)
Bandwidth	F_T ±30 MHz
Insertion Loss at BW	-30℃ ~ +85℃ 3.8dB Max
VSWR at BW	1.8 Max
Input power	3.0W Max
Attenuation	1930 ~ 1990MHz 37.5dB
Ripple at BW	2.5dB Max
R X	
Center Frequency	1960 MHz (F_R)
Bandwidth	F_R ±30 MHz
Insertion Loss at BW	-30℃ ~ +85℃ 4.7dB Max
VSWR at BW	1.8 Max
Input power	1W Max
Attenuation	1850 ~ 1910 MHz 50dB Min
Ripple at BW	2.5dB Max
TX → RX	
Isolation	1850 ~ 1910 MHz 50dB Max 1930 ~ 1990 MHz 40dB Max