



SINGLE BAND Mobile Cellular Phone STH-N271

SERVICE *Manual*

SINGLE BAND Mobile Cellular Phone



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1. STH-N271 SPECIFICATION (REF TIA/EIA/IS-137-A-1)

1. Confirmation of Power level (Class IV)

Level	Analog(dBm)	Digital(dBm)
0,1,2	26.5	26.5
3	23	23
4	20	20
5	16	16
6	12	12
7	8	8
8	-	3
9	-	-2
10	-	-7

2. Channel Numbering and Frequency

System	Channel Number	Transmitter	Receiver
(Not used)	990 CH	824.01 MHz	869.01 MHz
A''	991 CH ~ 1023 CH	824.04 ~ 825.00 MHz	869.04 ~ 870.00 MHz
A	1 CH ~ 333 CH	825.03 ~ 834.99 MHz	870.03 ~ 879.99 MHz
B	334 CH ~ 666 CH	835.02 ~ 844.98 MHz	880.02 ~ 889.98 MHz
A'	667 CH ~ 716 CH	845.01 ~ 846.48 MHz	890.01 ~ 891.48 MHz
B'	717 CH ~ 799 CH	846.51 ~ 848.97 MHz	891.51 ~ 893.97 MHz
	#. Transmitter : $1 < N < 799 : 0.03N + 825.00 \text{ MHz}$ $990 < N < 1023 : 0.03(N-1023) + 825.00 \text{ MHz}$ #. Receiver : $1 < N < 799 : 0.03N + 870.00 \text{ MHz}$ $990 < N < 1023 : 0.03(N-1023) + 870.00 \text{ MHz}$		

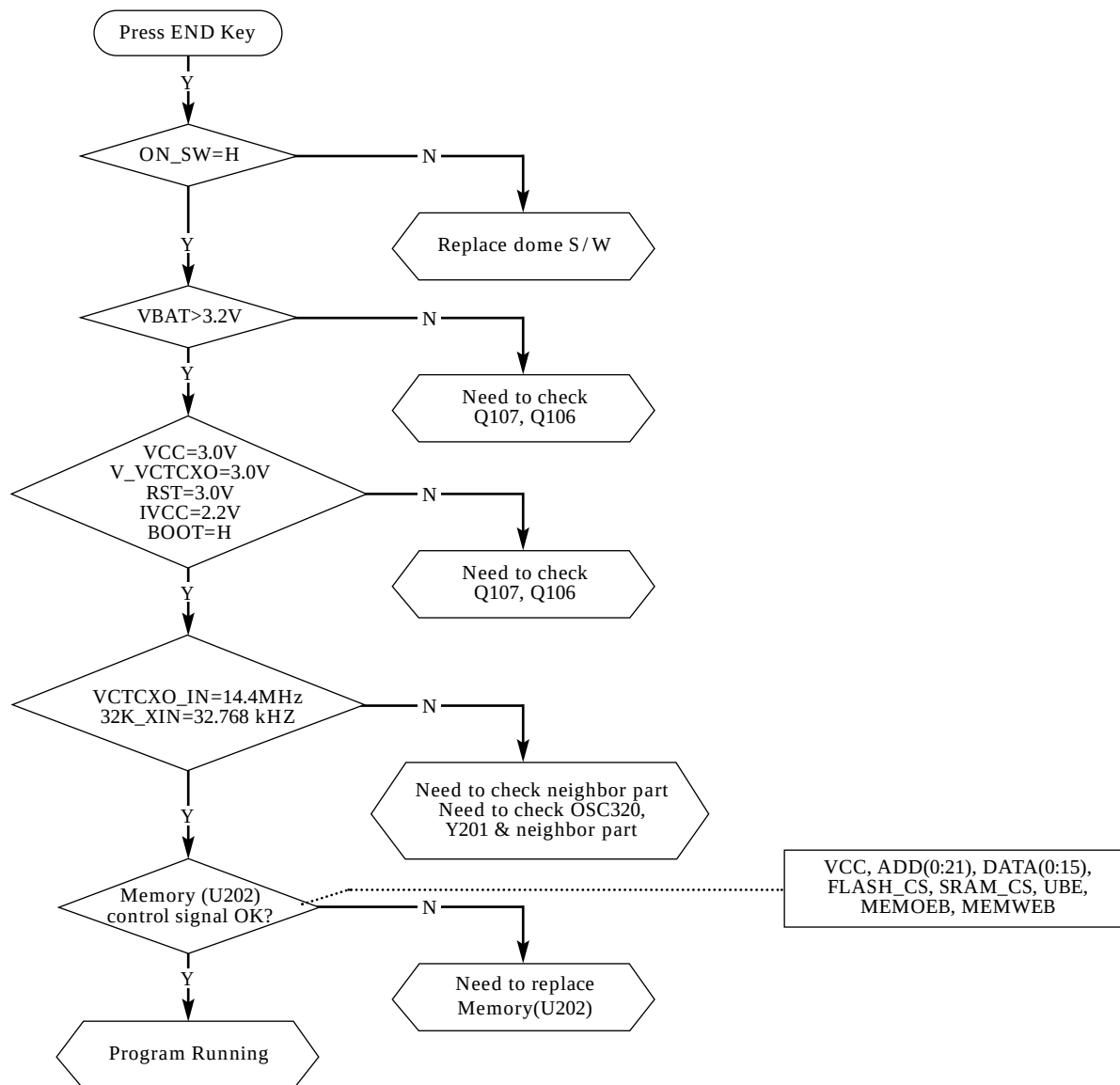
3. General

Item	Analog mode	Digital mode
Frequency Range Transmitter Receiver	824.04 ~ 848.97 MHz 869.04 ~ 893.97 MHz	
Channel Space	30 kHz	
Numbers of Channel	1024	
Duplexer Space	45 MHz	
Frequency Stability	± 2.5 ppm	± 200 Hz
Operating Temperature	- 30 °C ~ +60 °C	
Size and Weight Including 900 mAh battery Including 1200 mAh battery	108 (H) x 42 (W) x 17.2 (D) : 93 g 108 (H) x 42 (W) x 18.7 (D) : 100 g	
Operating Time Standby time Including 900 mAh battery Including 1200 mAh battery Talk time Including 900 mAh battery Including 1200 mAh battery	35 ~ 45 hr 45 ~ 55 hr 60 ~ 90 min 80 ~ 120 min	130 ~ 230 hr 190 ~ 300 hr 2 ~ 3 hr 2.5 ~ 4.5 hr

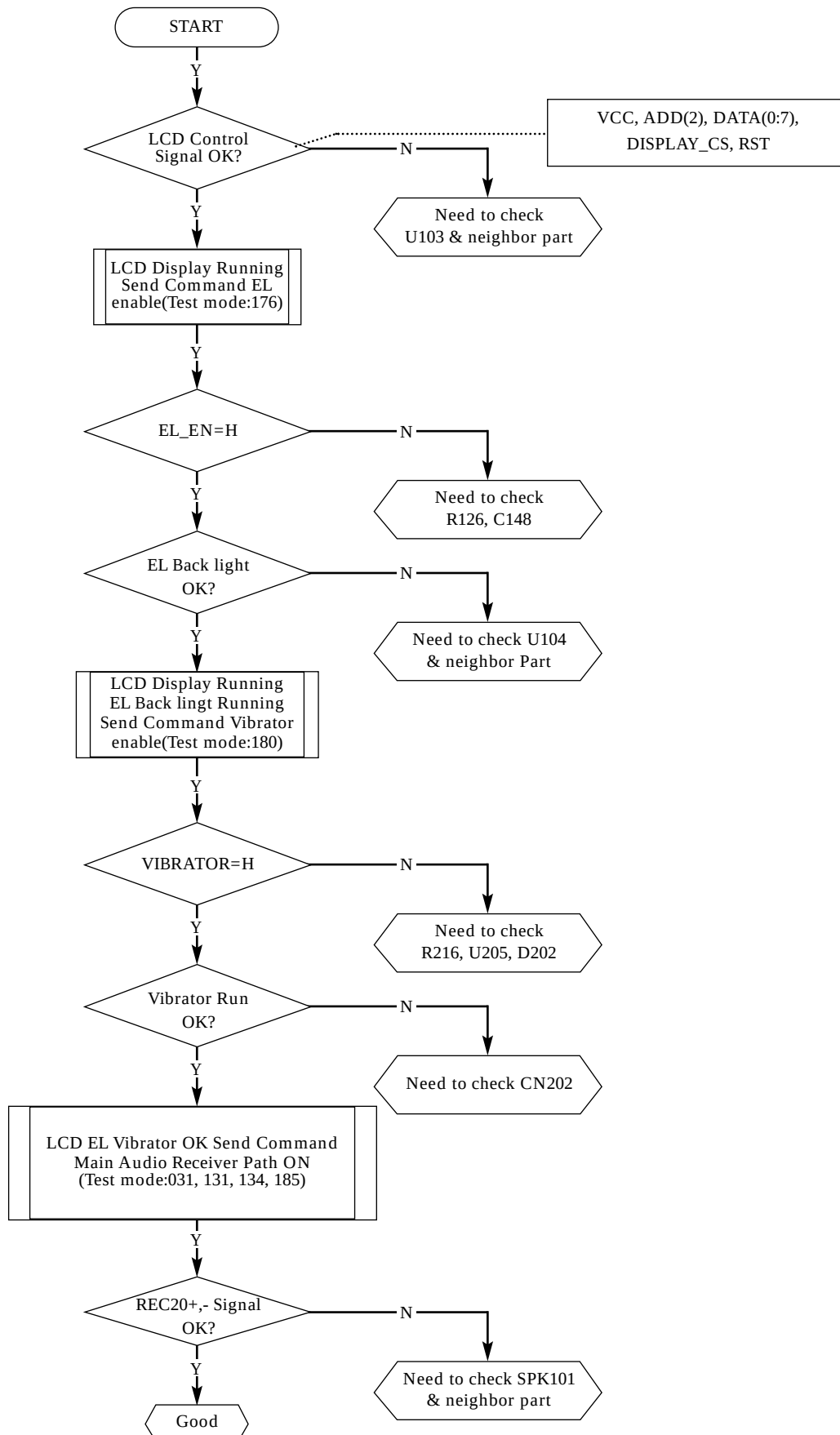
2. STH-N271 Trouble Shooting

1. Baseband Section

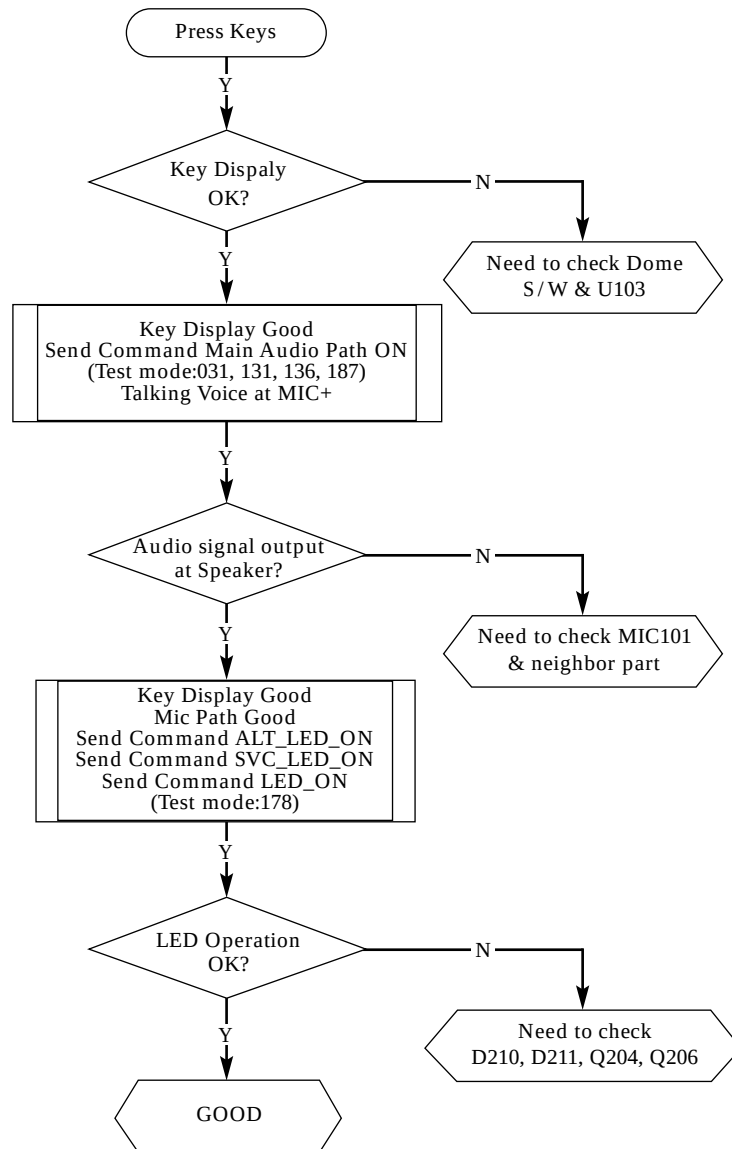
1-1. Program No Running



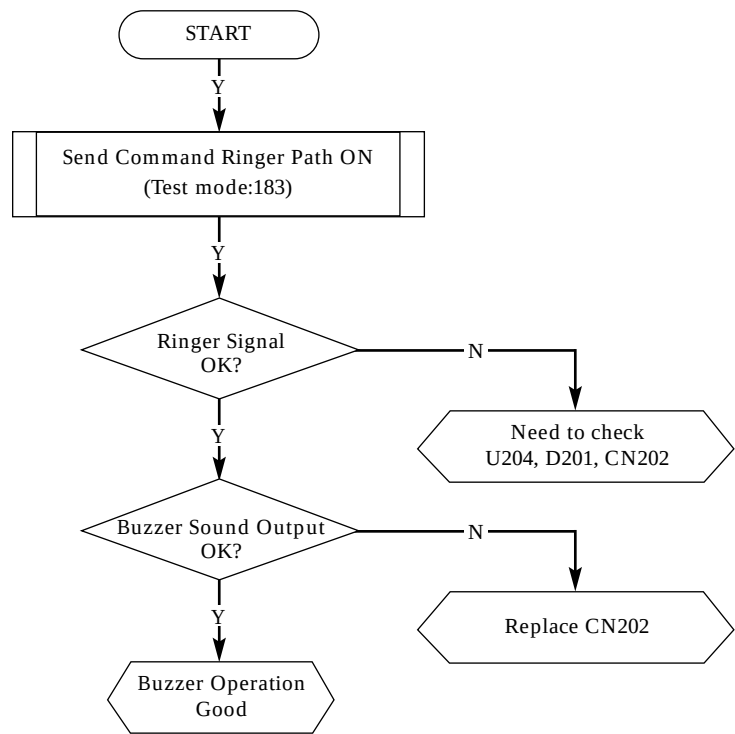
1-2. Abnormal LCD display ,EL Back Light, Vibrator & Speaker Operation



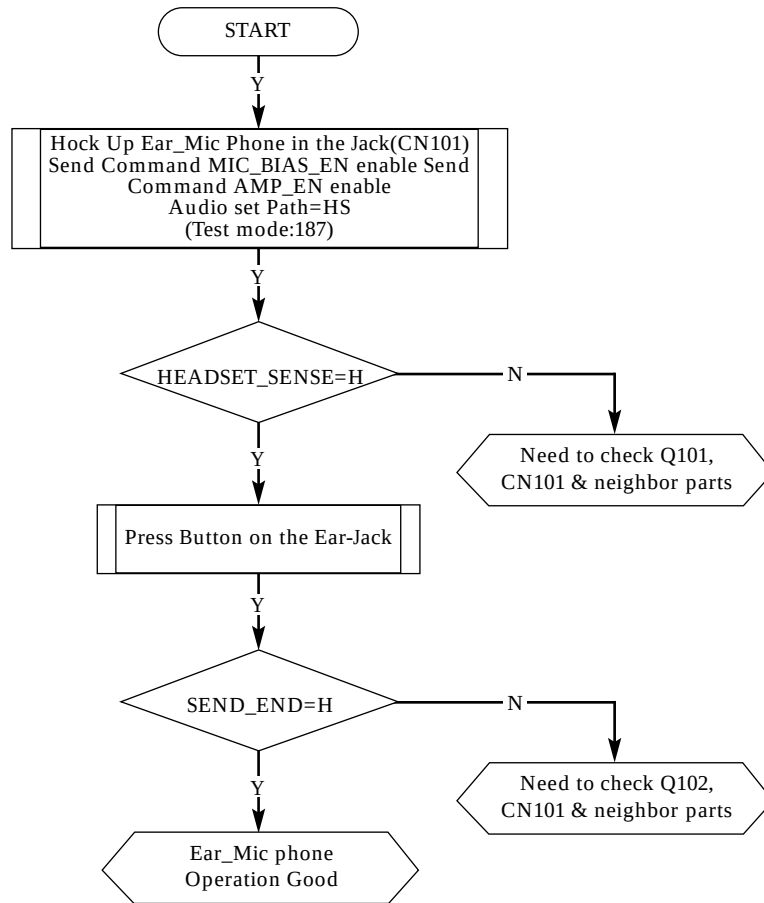
1-3. Abnormal Key, Mic, LED'S operation



1-4. Abnormal Buzzer Operation

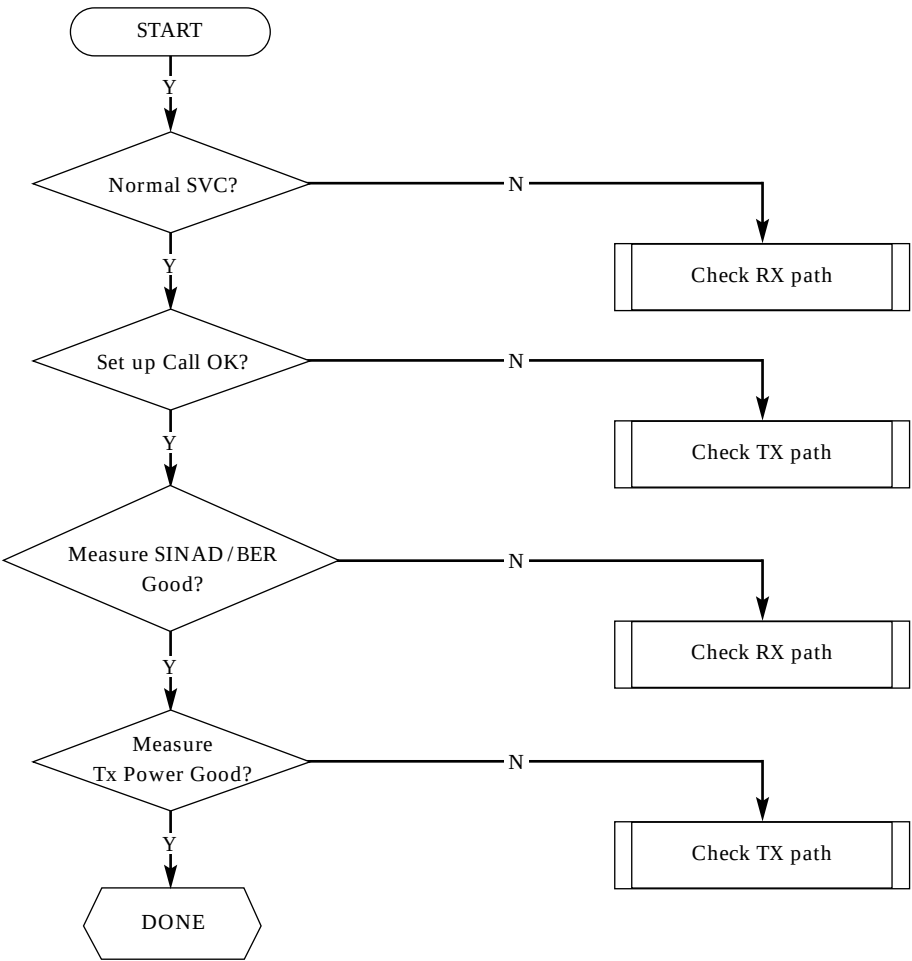


1-5. Abnormal external Ear_Mic Jack operation

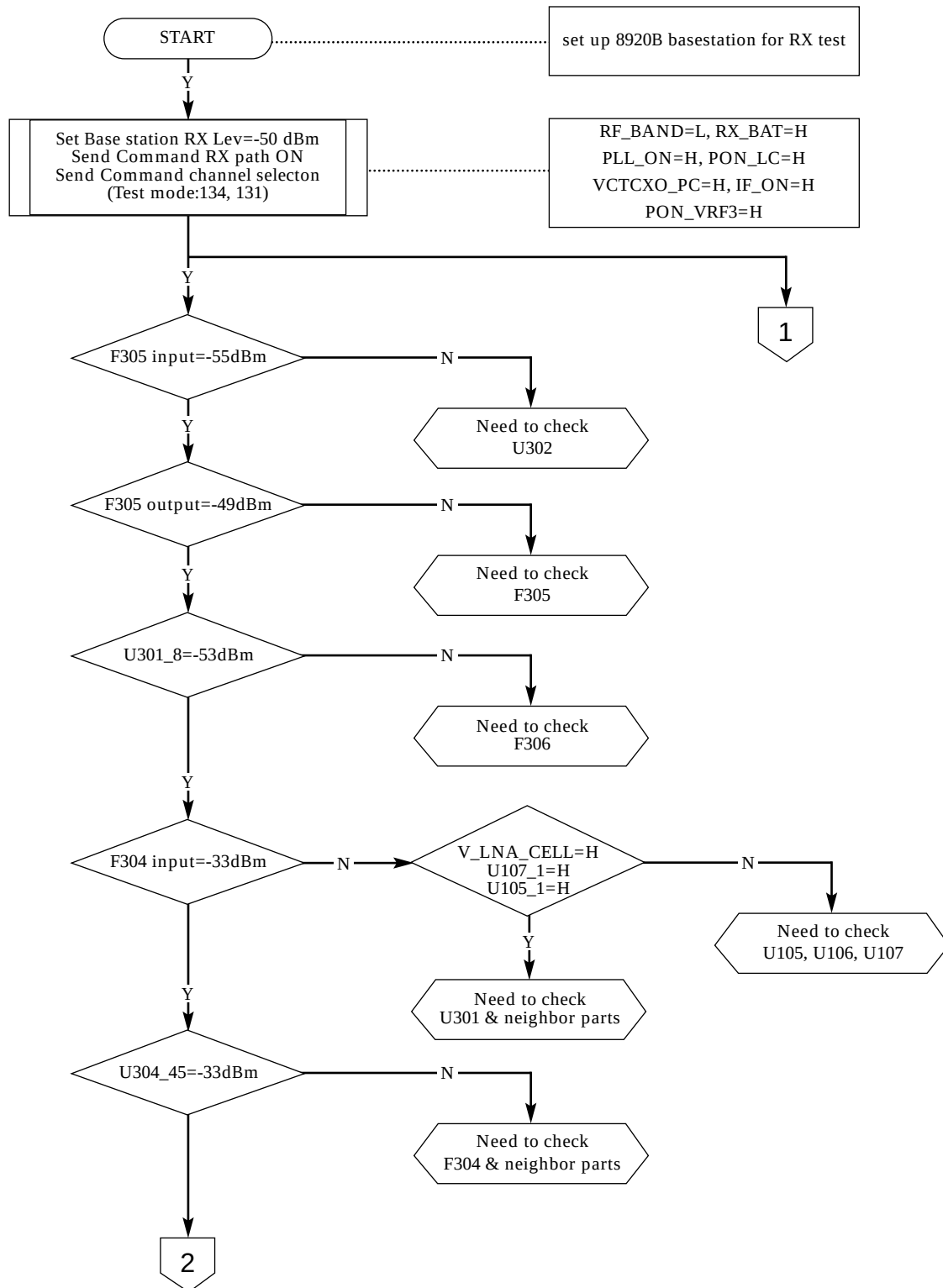


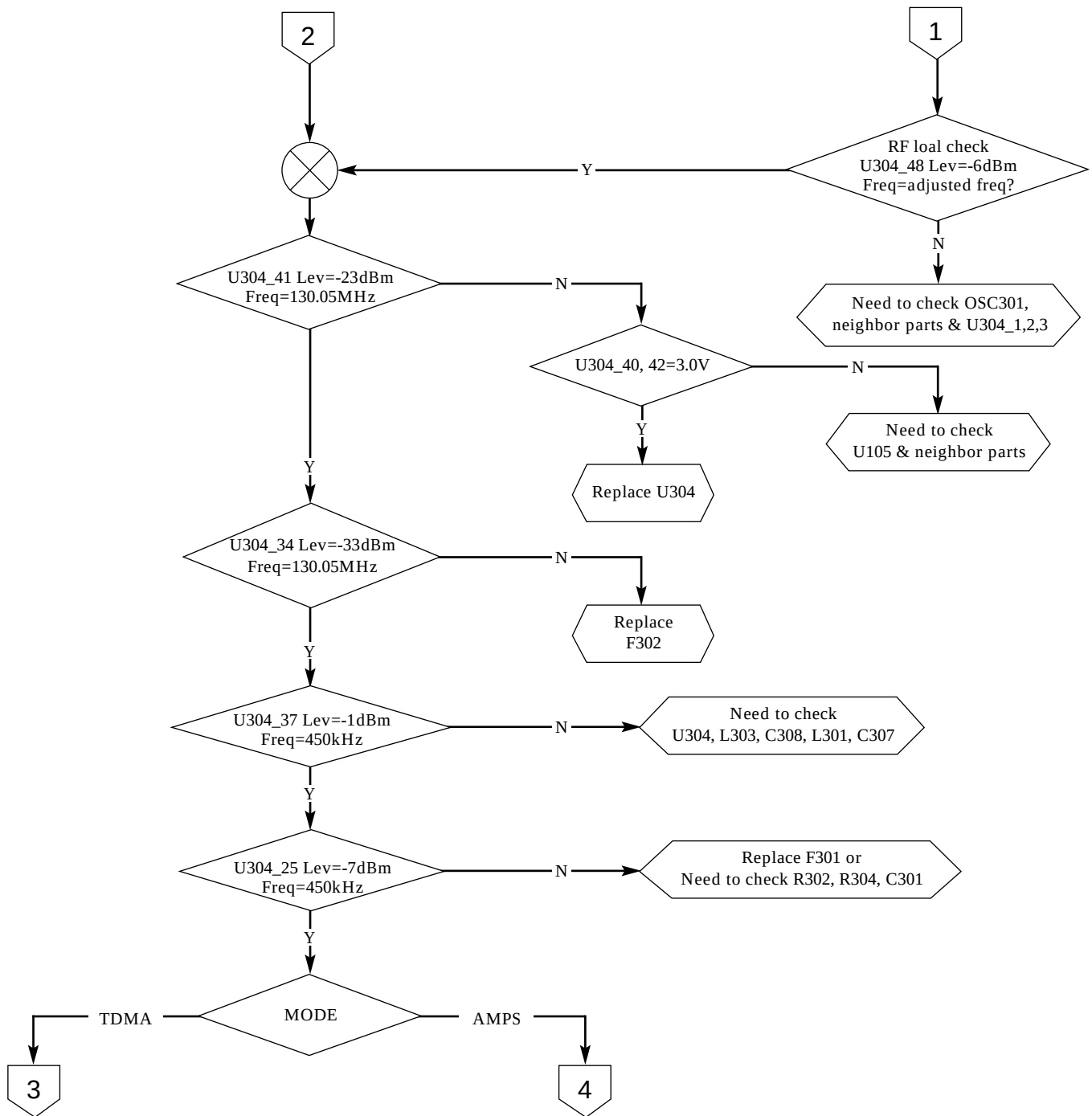
2. RF Section

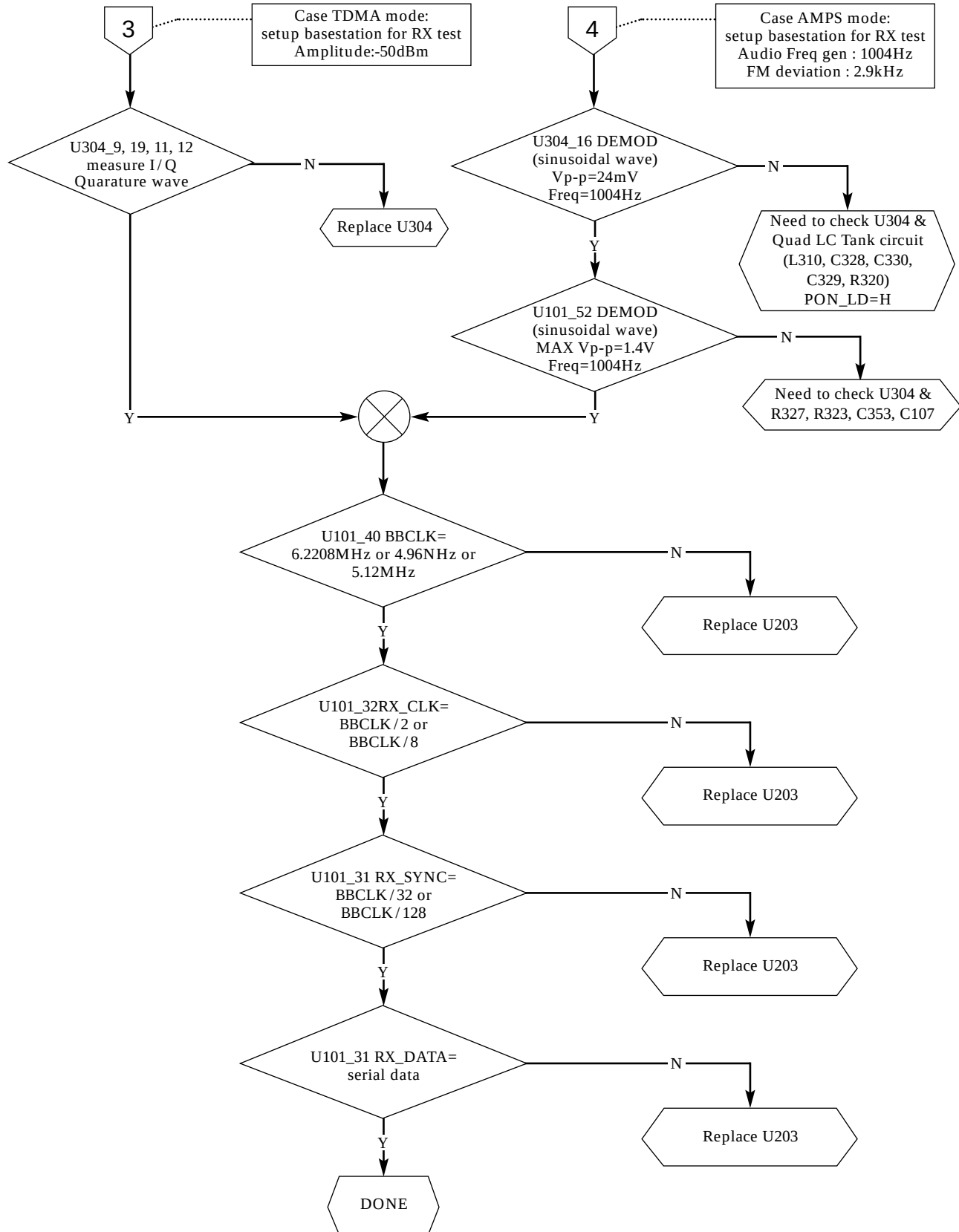
2-1. Call processing and Online Test



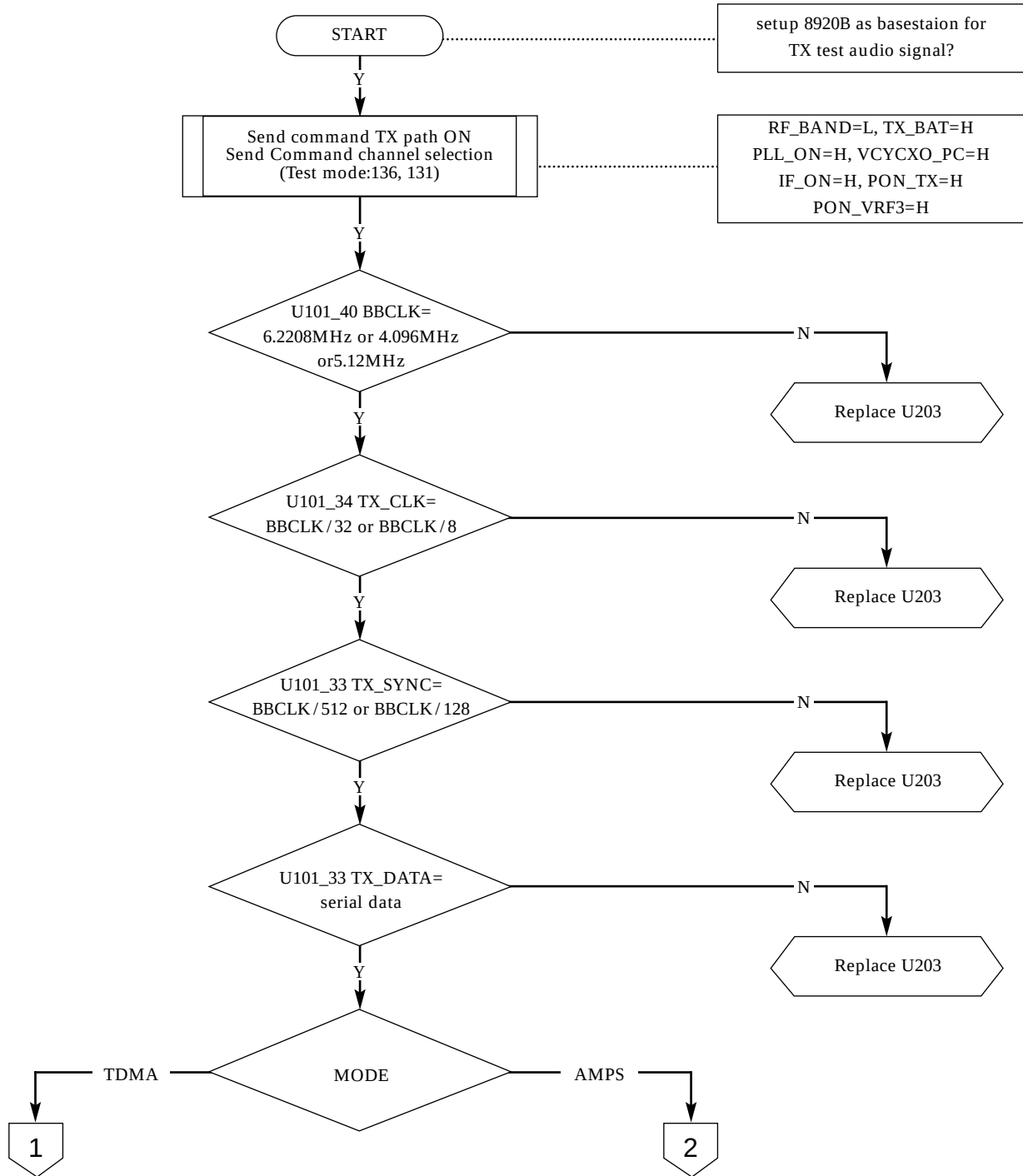
2-2. Receiver Section (Offline test)

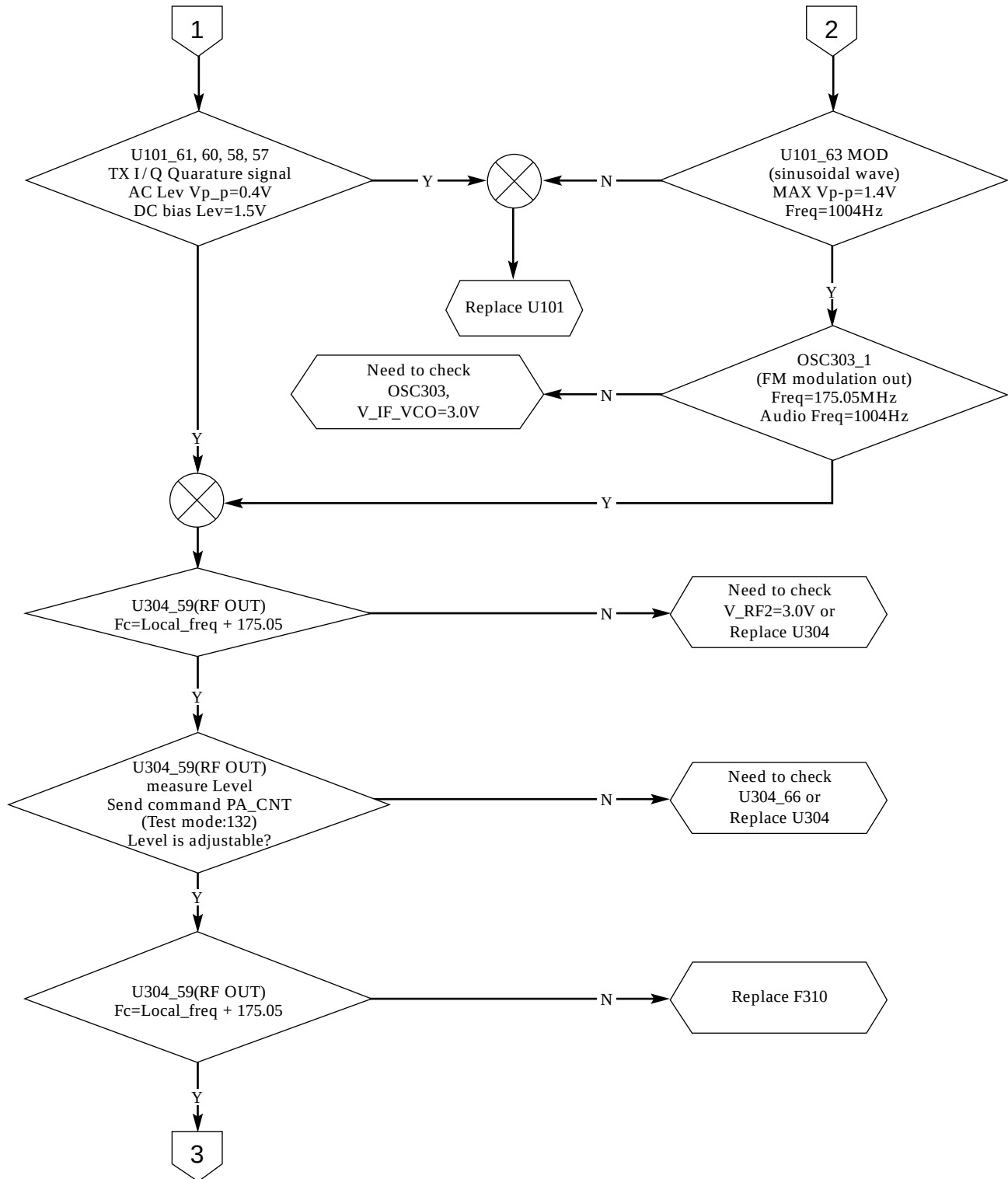


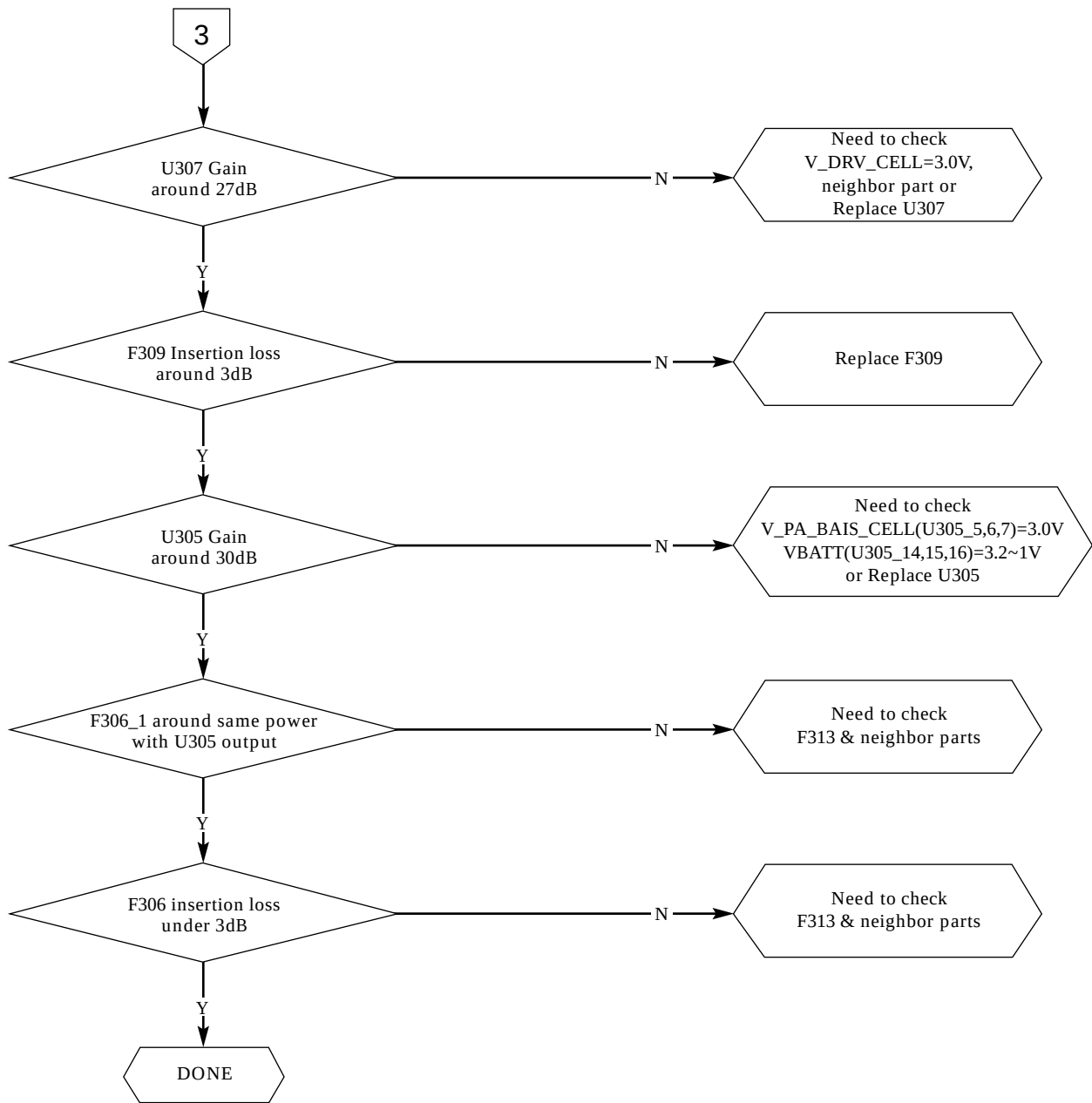




2-3. Transmitter Section (Offline test)







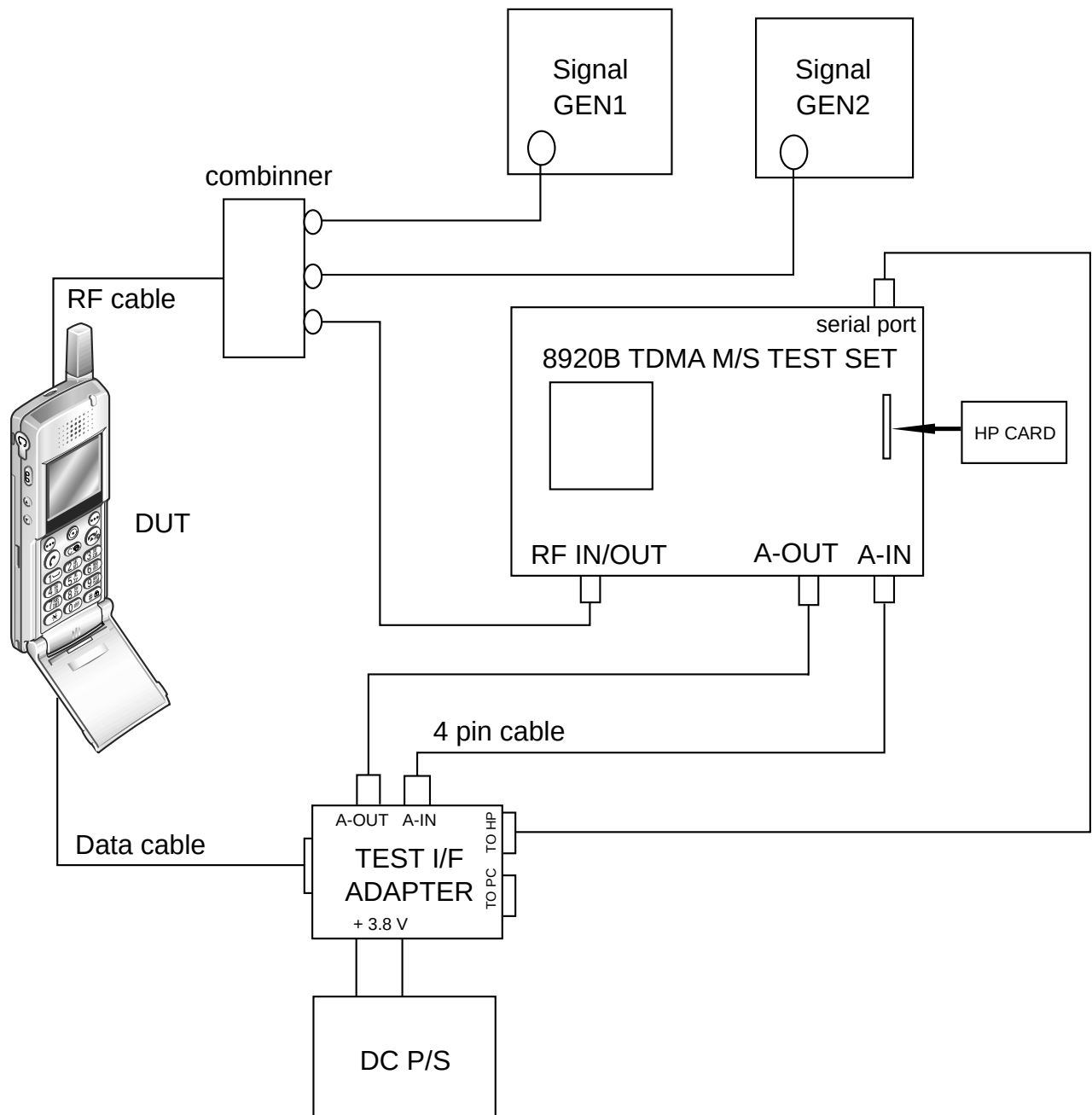
3. STH-N271 TEST PROCEDURE

1. List of Equipment

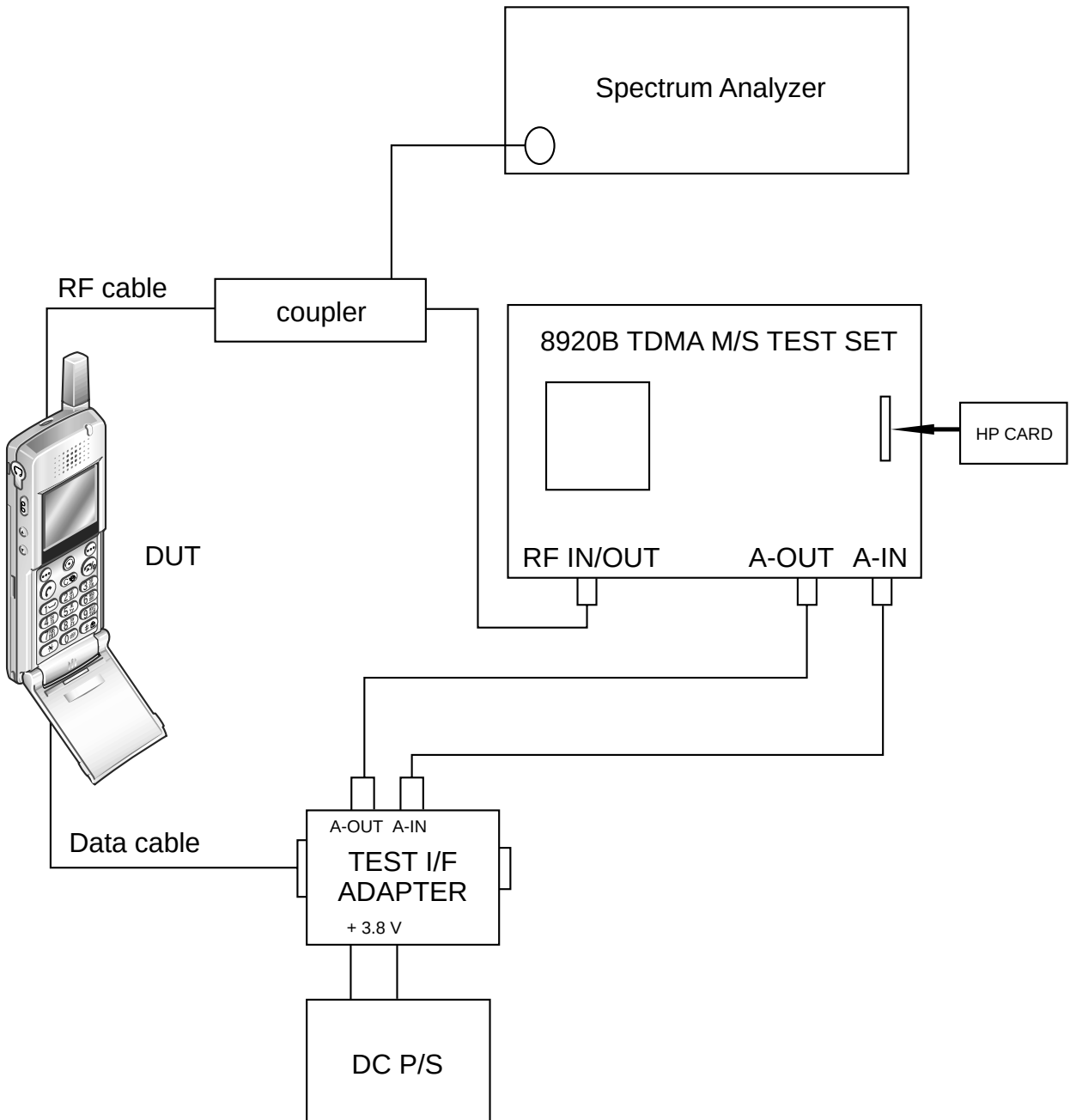
- 8920B TDMA M/S TEST SET (HP CARD, modified by Samsung)
- SIGNAL GENERATOR (2 SETS)
- SPECTRUM ANALZER
- DEVICE UNDER TEST (STH-N271)
- TEST INTERFACE ADAPTER
- COMBINER
- DC POWER SUPPLY
- PC
- Cables (RF CABLE, DATA CABLE, SERIAL CABLE, etc.)

2. Configuration of Test

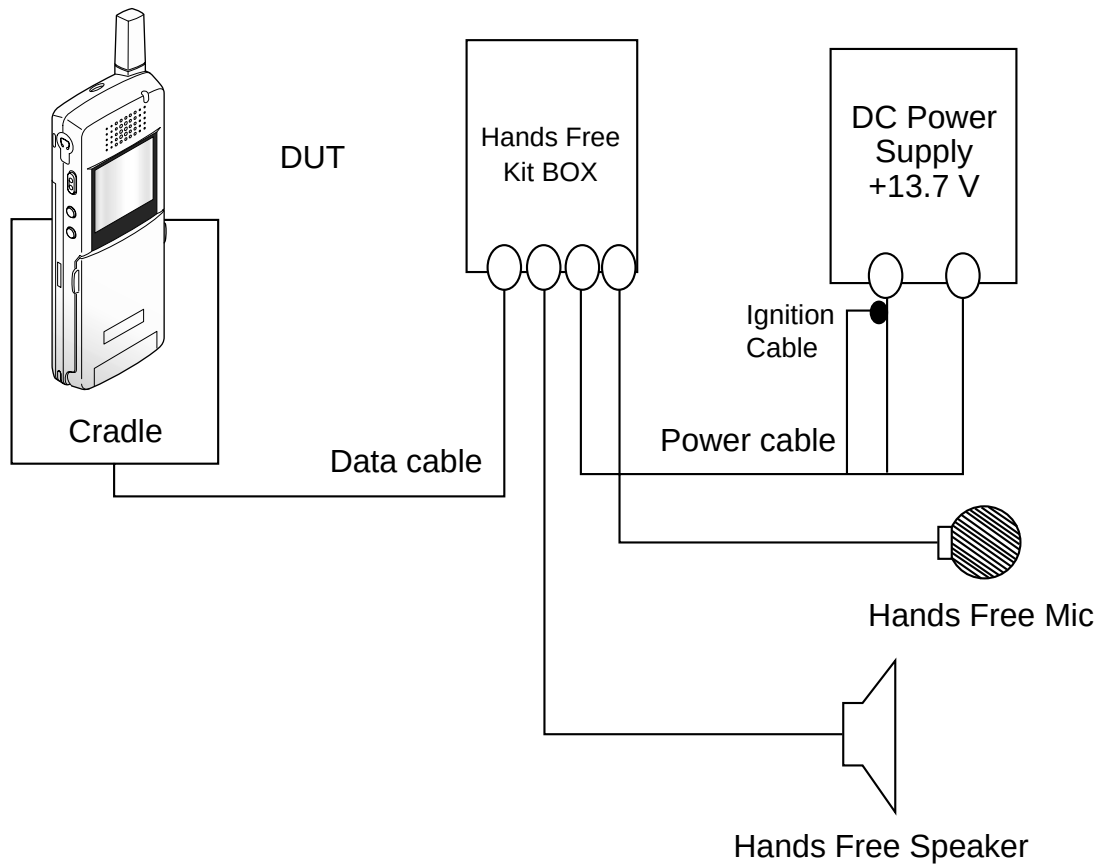
2-1. Test Configuration-1



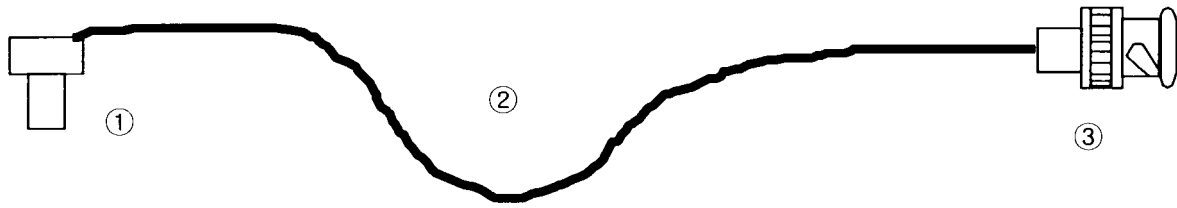
2-2. Test Configuration-2



2-3. Test Configuration-3 (Hands Free Kit)



RF CABLE



DATA CABLE

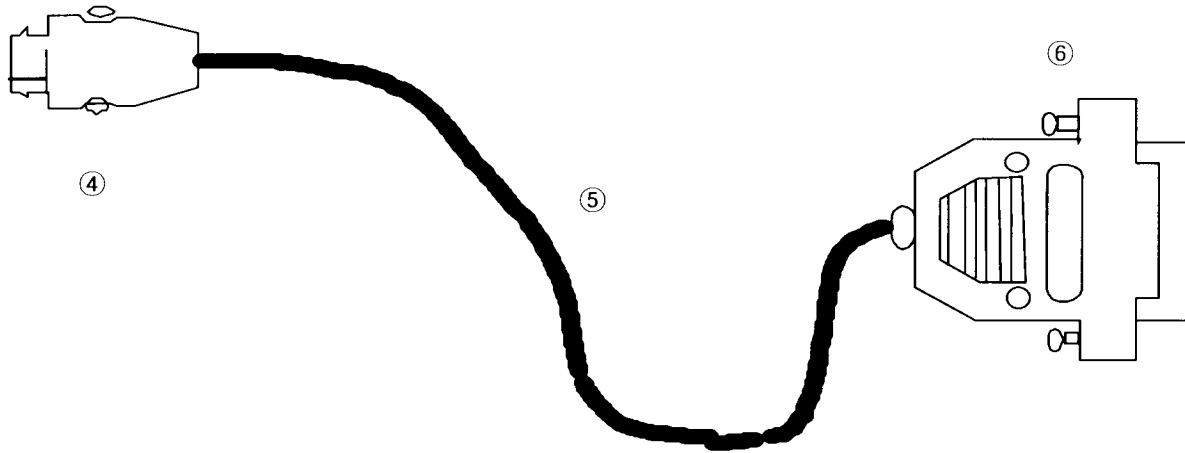


Table 3-Test Cable description

	NAME	DESCRIPTION
1	RF CONNECTOR	Hook up to DUT RF switch
2	RF CABLE	Line loss 1.5dB cable
3	BNC CONNECTOR	Connect to TEST equipment
4	INTERFACE CONNECTOR	Hook up to DUT Button connector (Table 4)
5	DATA CABLE & PST CABLE	Normal data cable, PC Link
6	DSUB 25PIN CONNECTOR	Connect to TEST I/F ADAPTOR (Table 5)

Table 4- Interface Button Connector

CN201 Pin	Signal Name	Comment
1	GBOOT_DI	BOOT & Data IN (serial interface)
2	SCLK	Serial Interface clock
3	DSR	UART1 signal
4	SIN2	UART2 IN signal
5	DO	Data OUT (serial interface)
6	SOUT2	UART2 OUT signal
7	RX_AUDIO	HFK audio receiver signal
8	GND	
9	C_FNSTRB	Battery interface & Strobe (serial interface)
10	GND	
11	TX_AUDIO	HFK audio transmitter signal
12	GND	
13	DP_RX_DATA	UART1 RX data
14	DP_TX_DATA	UART1 TX data
15	HP_PWR	External power on (Test I/F Adapter / HFK)
16	RI	UART1 signal
17	CD	UART1 signal
18	V_F	Battery interface signal
19	GND	
20	RTS	UART1 signal
21	BATT	
22	BATT	
23	CTS	UART1 signal
24	DTR	UART1 signal
25	GND	
26	C_F	Battery interface & Strobe (serial interface)
27	V_F	Battery interface signal
28	BATT	Battery + Voltage

Table 5- DSUB 25pin Connector

DSUB 25Pin	Signal Name	Comment
1	GND	
2	NC	
3	NC	
4	BATT	
5	NC	
6	BATT	
7	HP_PWR	External power (Test I/F Adapter / HFK)
8	NC	
9	NC	
10	TX_AUDIO	HFK audio transmitter signal
11	GND	
12	RX_AUDIO	HFK audio receiver signal
13	GND	
14	NC	
15	GND	
16	NC	
17	NC	
18	SIN2	UART2 OUT signal
19	SOUT2	UART2 IN signal
20	NC	
21	DP_RX_DATA	UART1 RX data
22	DP_TX_DATA	UART1 TX data
23	BOOT	BOOT & Data IN (serial interface)
24	NC	
25	NC	

3. Auto test procedure (with HP CARD, modified by Samsung)

- a). Set up all test equipment like as Test configuration-1
- b). Insert HP Card on the HP8920B Test Set
- c). Power ON phone
- d). Run AUTO Test
- e). Store data if required
- f). TEST items (refer Chapter 1.Specification)

Items	TIA / EIA-137-270
RXA Electrical Audio Response	2.2.2.1
RXA Expander Output	2.2.2.3
RXA Hum and Noise	2.2.2.4
RXA Audio Harmonic Distortion	2.2.2.5
RXA RF Sensitivity	2.3.1.1
TXA RF Power Output	3.2.1.1
TXA Modulation Type & Stability	3.3.1.1
TXA Compressor Output	3.3.1.2.1
TXA Electrical Audio Response	3.3.1.2.2
TXA Modulation Deviation Limiting	3.3.1.2.3
TXA Wideband Data	3.3.1.3
TXA Hum and Noise	3.3.1.6
TXA Modulation Distortion and Noise	3.3.1.8
TXD RF Power Output	3.2.1.2
TXD Modulation Type and Accuracy	3.3.2.1
TXD Adjacent & Spurious Emission	3.4.2.2

4. Manual test procedure

4-1.RXA Audio Muting (Ref 2.2.2.2)

- a). Set up all test equipment like as Test configuration-1
RF amplitude: -50dBm,
Setup channel: 383ch
SAT : 6000Hz
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
"0 3 1" : Suspend.
"1 3 1" : Set_atten '3 8 3' channel.
"1 7 3":Compon
"0 3 2":HFK_on
"1 3 4":RXUNMUTE
- e). Measure AC level of audio in
AFGen: 1004Hz
FM: 8KHz dev
- f). Send command RXMUTE (133)and Measure AC level of audio in
- g). Compare value of e). and f).

4-2.RXA Adjacent and Alternate Channel Desensitization (Ref 2.3.1.2)

- a). Set up all test equipment like as Test configuration-1
Setup channel, RF amplitude based on standard 2.3.1.2.2
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
"0 3 1" : Suspend.
"1 3 1" : Set_atten '3 8 3' channel.
"1 7 3":Compoff
"0 3 2":HFK_on
"1 3 4":RXUNMUTE
- e). Measure Power of Adjacent channel (Signal Generator) to meet 12dB SINAD
based on standard 2.3.1.2.2
- f). Measure Power of Alternate channel (Signal Generator) to meet 12dB SINAD
based on standard 2.3.1.2.2

4-3.RXA Inter-modulation Spurious Response Attenuation (Ref 2.3.1.3)

- a). Set up all test equipment like as Test configuration-1
Setup channel, RF amplitude based on standard 2.3.1.3.2
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
"0 3 1" : Suspend.
"1 3 1" : Set_atten '3 8 3' channel.
"1 7 3":Compoff
"0 3 2":HFK_on
"1 3 4":RXUNMUTE
- e). Measure Power of Intermodulation channel (2-Signal Generator) to meet 12dB SINAD
based on standard 2.3.1.3.2

4-4.RXA Protection Against Spurious Response Interference (Ref 2.3.1.4)

- a). Set up all test equipment like as Test configuration-1
Setup channel, RF amplitude based on standard 2.3.1.4.2
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
 - "0 3 1" : Suspend.
 - "1 3 1" : Set_atten '3 8 3' channel.
 - "1 7 3":Compoff
 - "0 3 2:":HFK_on
 - "1 3 4":RXUNMUTE
- e). Measure Power of undesired input (Signal Generator) to meet 12dB SINAD based on standard 2.3.1.4.2

4-5.RXA RSSI (Ref 2.6.1)

- a). Set up all test equipment like as Test configuration-1
Setup channel, RF amplitude based on standard 2.6.1.2
- b). Power ON the phone and Press the key number “* # 9 9 9 9 * 0 # ”
- c). Make a call
- d). Measure RSSI by test mode in the telephone based on standard 2.6.1.2

4-6.TXA Audio Muting (Ref 3.3.1.2.4)

- a). Set up all test equipment like as Test configuration-1
RF amplitude: -50dBm, Setup channel: 383ch, SAT : 6000Hz
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
 - "0 3 1" : Suspend.
 - "1 3 1" : Set_atten '3 8 3' channel.
 - "1 7 2":Compon
 - "0 3 2:":HFK_on
 - "1 3 6":TXUNMUTE
- e). Measure FM deviation and Set Reference level
- f). Send command TXMUTE (1 3 5)
- g). Measure relative FM deviation based on standard 3.3.1.2.4.3

4-7.TXA Noise Suppression-Broadband (Ref 3.4.1.1)

- a). Set up all test equipment like as Test configuration-2
 Setup channel: 383ch
 RF amplitude: -50dBm
 Power Level: 0
 SAT: 6000Hz
- b). Power ON the phone
- c). For entering the test mode, Press the key number “* # 2 4 2 6 4 # ”
- d). Input the commands.
 "0 3 1" : Suspend.
 "1 3 1" : Set_atten '3 8 3' channel.
 "0 3 2":HFK_on
 "1 2 9":Carrier_ON
 "1 3 6":TXUNMUTE
- e). Setup Voice and SAT tone based on standard 3.4.1.1.2 and 3.4.1.1.3(1 6 1)SATOFF
- f). Send command SATON(1 6 0)SATON
- g). Send disable compressor(1 7 3)COMPOFF
- h). Measure the Spurious based on standard 3.4.1.1.3

4-8.TXD Harmonic & Conducted Spurious Emission (Ref 3.4.2.2)

- a). Set up all test equipment like as Test configuration-2
 Setup channel: 383ch
 RF amplitude: -50dBm
 Power Level: 0
- b). Power ON phone and Make a call
- c). Measure the Spurious based on standard 3.4.2.2.3

5. Test Mode

Command	Purpose	Description	Usage	Note
31	IS-137 SUSPEND			
32	Hands-Free Kit Path On			
33	Hands-Free Kit Path Off			
35	Get/Set DEMOD_AGCR			
36	Get/Set DEMOD_DGCR			
37	Get/Set DSP_RX_GAIN			
38	Get/Set DGGSR			
40	Get/Set TXAG			
41	Get/Set TXDG			
42	Get/Set AUDIO_TxGain			
43	Get/Set MOD_GCR			
44	Get/Set MOD_DGCR			
45	Get/Set WBD_WBTx_GCR			
46	Get/Set ST_WBTx_GCR			
47	Get/Set SAT_Gain			
49	Get/Set DTMF Volume			
63	IS-137 RESTART			
96	SetBand	0: Cell, 1: PCS		
97	SetMode	0: Scan_mode 1: ACC 2: AVC 4: DTC 5: DCCCH 6: TCH_DATA		
98	Get/Set PA_Bias			
99	Get/Set pa_cnt_val			
100	Get/Set TX_I_DOCCR			
101	Get/Set TX_Q_DOCCR			
102	Get/Set TX_I_DGCR			
103	Get/Set TX_Q_DGCR			
128	IS-137 INIT			Analog or Digital
129	IS-137 CARRIER-ON			Analog Only
130	IS-137 CARRIER-OFF			Analog or Digital
131	IS-137 LOAD-SYNTH	Channel Setting		
132	IS-137 SET-ATTN	Set Power Level		
133	IS-137 RXMUTE			
134	IS-137 RXUNMUTE			
135	IS-137 TXMUTE			
136	IS-137 TXUNMUTE			

Command	Purpose	Description	Usage	Note
137	IS-137 DCCH-DGTS	TDMA slot setting		DCCH Digital
138	IS-137 DCCH-ON	Transmitting on		DCCH Digital
139	IS-137 RSSI	RSSI reporting		Digital Only
140	IS-137 DIGITS	—		Analog or Digital
141	IS-137 TDMAON	Loopback	0: Off, 1: On	
142	IS-137-A LOAD- SYNTH-HYPERBAND			
143	IS-137 STON			
144	IS-137 STOFF			
148	IS-137 SEND-NAM			
149	IS-137 VERSION	Software Version		
150	IS-137 SEND-SN	Return the 32-bit serial number (ESN)		
152	IS-137 RCVSI	—		
154	IS-137 WSTS	—		
158	IS-137 TERMINATE			
159	IS-137-A SEND-NAM-MSID			
160	IS-137 SATON			
161	IS-137 SATOFF			
162	IS-137 CDATA			
170	IS-137 DTMFON			
171	IS-137 DTMFOFF			
172	IS-137 COMPON			
173	IS-137 COMPOFF			
176	Backlight On			
177	Backlight Off			
178	Service / Alert LED On			
179	Service / Alert LED Off			
180	Vibrator On			
181	Vibrator Off			
182	LCD contrast			
183	Buzzer On			
184	Buzzer Off			
185	Speaker On			
186	Speaker Off			
187	MIC On			
188	MIC Off			
189	ReadTemp			
223	GetProductNumber			

4. STH-N271 Function of All Active Devices

No	Reference	Vendor Code	Description
1	U203	D5205	Baseband Engine Chip: IS-137 TDMA / AMPS solution
2	U101	D5204-22	Interface Chip
3	U304	uPC8015	RF one chip module: RF/IF Synthesizer, 2-Mixers, AGC, Q-DEMOD, UP converter
4	U305	RF2162	Power Amplifier: Cellular band linear amplifier
5	U307	RF2376TR73	Driver Amp: linear variable amplifier suitable for cellular band
6	OSC301	ENFVF1A2ST4	RF VCO: dual band RF voltage control oscillator (999MHz ~ 1025, 2060 ~2121MHz)
7	OSC303	ENFVH112SA5	IF VCO: dual band IF voltage control oscillator (175.05MHz, 211MHz)
8	OSC302	TCO-9133F	TCXO: 14.4MHz for reference clock
9	U301	RF2363TR7	LNA: dual band Low Noise Amplifier
10	U102	LM4882	Audio Amp: external audio amplifier

5. STH-N271 Frequency Synthesizer Circuit and Spurious Radiation Suppression Circuit

1. Frequency Synthesizer Circuit

The PLL (Phase Lock Loop) block consists of VC-TCXO (OSC302), PLL (belong to RF chip, U304), RF VCO (OSC301), IF VCO (OSC303), and loop filter.

The VC_TCXO is a reference source of the frequency synthesizer. It provides 14.4MHz-reference frequency to PLL part. It is a voltage controlled temperature compensated crystal oscillator having 14.4MHz- $\pm$ 2.0ppm frequency stability over all useful temperature range. The control voltage makes a correct frequency tuning.

The RF VCO generates the RF local signal having 998 ~ 1025MHz frequency range with the voltage control. It has maximum -114dBc/1Hz C/N offset and -3 ± 3 dBm output power.

The IF VCO generates the intermediate frequency having 175.05MHz frequency range with the voltage control. It has maximum -102dBc/1Hz C/N offset and -3 ± 3 dBm output power.

The PLL consist of PLL1 (RF section) and PLL2 (IF section) which interior decorated RF chipset (U304). The reference divider in the PLL part divides the frequency of VC_TCXO. This reference frequency is supplied to one of the inputs of phase detector. The signal generated at VCO goes into another stage of the phase detector through a pre-scaler and a programmable divider. At this point the error proportional to the phase difference of the two inputs occurs. This phase error is applied to the frequency control input stage of VCO through the loop filter, which consists of resistor and capacitor.

2. Spurious Radiation Suppression Circuit

The spurious signal from antenna is suppressed at the duplexer. The duplexer has flat characteristics to the receiving signal and high attenuation characteristics to the harmonic signals of transmission. Therefore, it suppresses the spurious radiation

Item	TX-ANT	RX-ANT
Center Freq.	836.5 MHz	881.5 MHz
Bandwidth (BW)	± 12.5 MHz	± 12.5 MHz
Insertion Loss	2.8 dB Max at 25C 3 dB Max at -30 ~ +85C	4 dB Max
Ripple at BW	1.6 dB Max	2.0 dB Max
VSWR	1.8 Min	1.8 Min
Attenuation	43 dB Min at 869 ~ 894 MHz	56 dB Min at 824 ~ 849 MHz
Input Power	3 W Max	1 W Max
In / Out Impedance	50 Ohms	50 Ohms
Mechanical Size	15.65 (L) X 9.2 (W) X 3.3 (H) mm	

6. STH-N271 Easy NAM Programming

[Function outline]

Inputting #SID#*(SID: System Identity. 5 digits at a maximum(00000 to 32767))in Idle or during a voice call and then pressing SEND key causes Easy NAM Setting Mode1 / Easy NAME Setting Mode2(#SID#2#*).

In NAM Programming Setting Mode, received SMS / MWI / Incoming Call are rejected.

The reference of the set contents is possible during a call, but editing the contents is impossible and a "Fail" is displayed.

About editing not in a call, a display saying "Please Wait" is displayed and then completing the entry to NVM automatically moves to Reboot Mode leading to Power On.

Not Entry but only Reference is available during a call and whether to terminate or not is displayed.

In case of terminating, the display moves to Call Time Display.

In case of Terminating Conversation or Fade timer time Out during reference, Call End is displayed and moves to Idle. In case of receiving Receive Flash with Information Message,

Call Waiting appears and the action of the transition is same as Waiting Section. (See 1.4.7.1)

[Mode]

Public	Private	Residential

[Action condition]

#SID# + SEND Key

[Cancel condition]

press END Key

[Detail]

References or Setting Items are as follows.

- 1). ESN
- 2). Authorization Code
- 3). Phone Number

1). ESN: (Electronic Serial Number)

ESN value is used in the process of certification. In case the value of S information element is set to 1, moving station (mobile side) sends ESN as a series of messages to BMI in System Access.

Reference only is available for ESN. It transits to Phone Number or Exit Save Change (Exit) by Up or Down Scroll Key or *# key.

2). Reference of Authorization Code

Authorization Code is the Network certification access code. It is calculated using ESN, RANDO, MIN, SSD_S by Auth_Signature Algorithm.

3). Reference and Edition of Phone Number.

Phone Number is Moving Station Entry Number like MIN (Mobile ID Number).

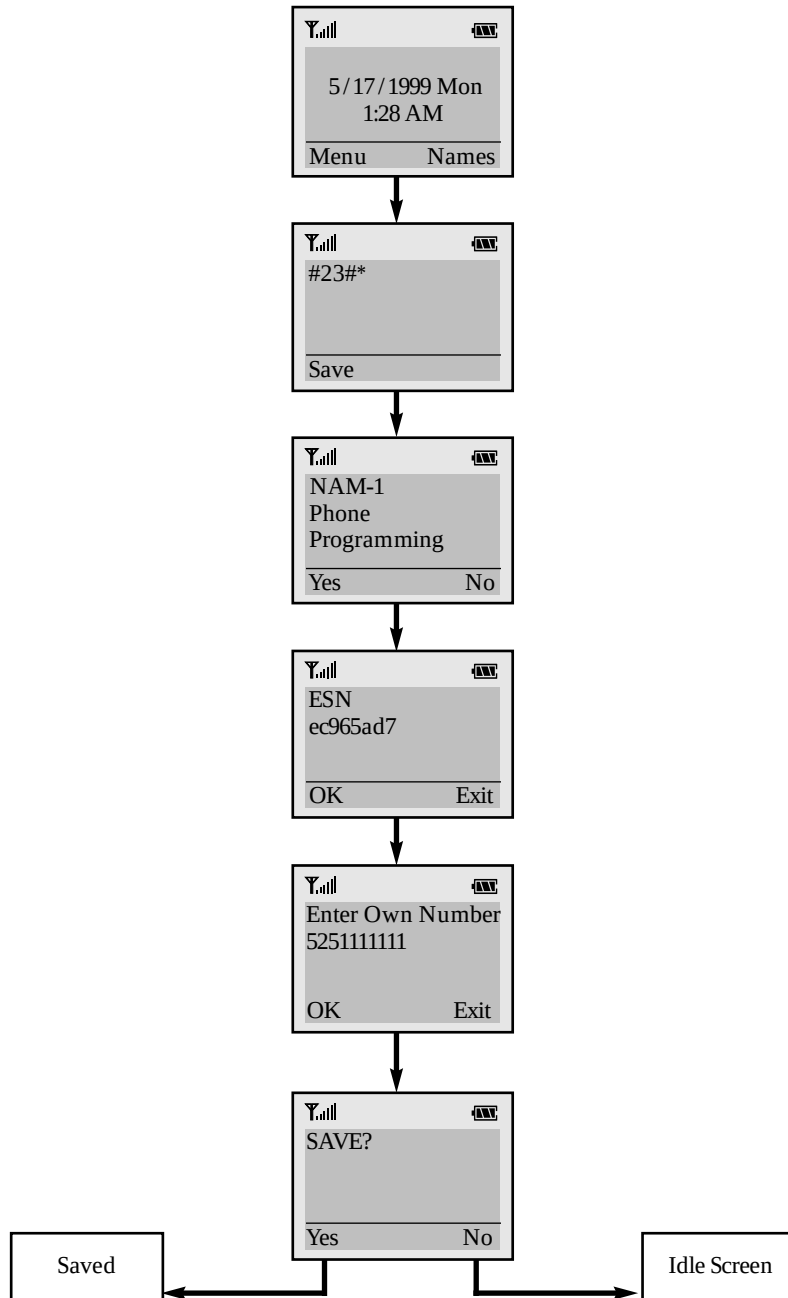
10 digits except *, # and Pause is inputted for editing Phone Number. Other than that, Reinput Display is displayed with the original number, then the Screen moves to Edit Require Screen. In case of normal input, the input number is displayed following the display of Change.

[Screen action]

Easy NAM Programming

(1) To set SID to NAM1 in English

(As an example, in case 23 should be set to HSID)



[Note#0] During Easy NAM Programming Mode, SMS/Incoming Call shall be rejected and MWI is NOT displayed.

[Note#1] The default data of each parameter based on SID&MIN is defines in ATT Req.(4047) Appendix L Section 9.3.

“Primary Paging Channel=333 for odd SIDs otherwise 334 for even SIDs”,

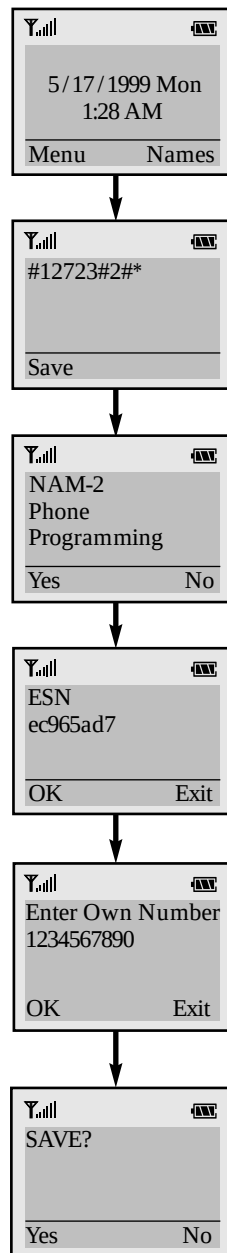
“Secondary Paging Channel=708 for odd SIDs otherwise 737 for even SIDs”, “Access Method=1(active)”,

“Overload Class=0 followed by last digit of MIN”, “SID Alpha Tag Control=disable”.)

[Note#3] During editing Phone#, it is not possible to enter “*”, “#” and “P(Pause)”.

[Note#4] If the seting value for SID is not in the valid range (from 0 to 32767), the normal origination procedure will be executed when hitting SEND Key.

- (2) To set SID to NAM2 in English
(As an example, 12723 should be set to HSID)



- [Note#0] During Easy NAM Programming Mode, SMS/Incoming Call shall be rejected and MWI is NOT displayed.
- [Note#1] The default data of each parameter based on SID&MIN is defines in ATT Req.(4047) Appendix L Section 9.3.
 ("Primary Paging Channel=333 for odd SIDs otherwise 334 for even SIDs",
 "Secondary Paging Channel=708 for odd SIDs otherwise 737 for even SIDs", "Access Method=1(active)", "Overload Class=0 followed by last digit of MIN", "SID Alpha Tag Control=disable", NAM2 Validity=1.)
- [Note#2] If the NAM Number is set to 1, the NAM1 is programmed as same as (1) part.
- [Note#3] During editing Phone#, it is not possible to enter "*", "#" and "P(Pause)".
- [Note#4] If the seting value for SID is not in the valid range (from 0 to 32767), the normal origination procedure will be executed when hitting SEND Key.

7. STH-N271 MAIN Electrical Parts List

Level	SEC CODE	Design LOC	DESCRIPTIONS
0	STH-N271D/COM		
2	4201-000151	AN301	ANTENNA-WHIP 824-894MHZ, -, 1.8, -,
1	4302-001081	BATT.	BATTERY-LI(2ND) -, .25MAH, COIN, 0.03MA, -, -
2	4302-001081	BT201	BATTERY-LI(2ND) -, .25MAH, COIN, 0.03MA, -, -
2	2203-005061	C101	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000330	C102	C-CERAMIC, CHIP 0.012 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C104	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C105	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000679	C106	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2404-001105	C107	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C108	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C109	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C110	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000278	C111	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-005061	C112	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C115	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-001151	C116	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
2	2203-005061	C117	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C118	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C119	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C120	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000679	C121	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005065	C122	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-005061	C124	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005496	C125	C-CERAMIC, CHIP 220 nF, +80-20 %, 10 V, Y5 V, TP, 1005
2	2203-000233	C126	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000885	C127	C-CERAMIC, CHIP 4.7 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2203-005061	C128	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000254	C129	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C130	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000628	C131	C-CERAMIC, CHIP 0.022 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C134	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C136	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C137	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000438	C138	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-001101	C139	C-CERAMIC, CHIP 6.8 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2203-000476	C140	C-CERAMIC, CHIP 1000 nF, +80-20 %, 16 V, Y5 V, TP, 2012
2	2203-005061	C141	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-005061	C142	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C143	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000254	C144	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C145	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000476	C146	C-CERAMIC, CHIP 1000 nF, +80-20 %, 16 V, Y5 V, TP, 2012
2	2203-000476	C147	C-CERAMIC, CHIP 1000 nF, +80-20 %, 16 V, Y5 V, TP, 2012
2	2203-005061	C148	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000476	C149	C-CERAMIC, CHIP 1000 nF, +80-20 %, 16 V, Y5 V, TP, 2012
2	2203-005708	C150	C-CERAMIC, CHIP 100 nF, 10 %, 100 V, Y5P, TP, 3225
2	2203-000476	C151	C-CERAMIC, CHIP 1000 nF, +80-20 %, 16 V, Y5 V, TP, 2012
2	2404-000167	C155	C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216, -
2	2404-001105	C156	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-000167	C157	C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216, -
2	2404-001105	C158	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C159	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C160	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005065	C161	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2404-000167	C162	C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216, -
2	2404-001105	C163	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C164	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C165	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005065	C166	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2404-001105	C167	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C168	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-001105	C169	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C170	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-000167	C171	C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216, -
2	2404-001105	C172	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C173	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C174	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C175	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C176	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C177	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-000167	C178	C-TA, CHIP 2.2 uF, 20 %, 16 V, -, TP, 3216, -
2	2203-005061	C179	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000940	C181	C-CERAMIC, CHIP 470pF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000940	C182	C-CERAMIC, CHIP 470pF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000438	C183	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000233	C184	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-000679	C186	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000278	C187	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000438	C188	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000679	C189	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C201	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000278	C203	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-005061	C205	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C206	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000386	C207	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000386	C208	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C209	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C210	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C211	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C212	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C213	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005065	C214	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-005061	C215	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C216	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C220	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000995	C221	C-CERAMIC, CHIP 0.047 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000995	C222	C-CERAMIC, CHIP 0.047 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C223	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C230	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C233	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C234	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C301	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C302	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C303	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001072	C304	C-CERAMIC, CHIP 0.056 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001201	C305	C-CERAMIC, CHIP 0.007 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000438	C306	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-001153	C307	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001259	C308	C-CERAMIC, CHIP 0.008 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000278	C309	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-005061	C310	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C311	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000870	C312	C-CERAMIC, CHIP 0.003 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000254	C313	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000278	C314	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-005061	C315	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005281	C316	C-CERAMIC, CHIP 0.0015 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-000885	C317	C-CERAMIC, CHIP 4.7 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2203-000885	C318	C-CERAMIC, CHIP 4.7 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2203-000233	C321	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C322	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005393	C323	C-CERAMIC, CHIP 0.005 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-000386	C325	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C326	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C327	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000278	C328	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000812	C329	C-CERAMIC, CHIP 0.033 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000838	C330	C-CERAMIC, CHIP 0.39 nF, 5 %, 50 V, NP0, TP, 1608
2	2203-005061	C331	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C332	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005158	C333	C-CERAMIC, CHIP 0.0022 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-005057	C334	C-CERAMIC, CHIP 0.0082 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000233	C335	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C336	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C337	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C338	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000233	C339	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001259	C340	C-CERAMIC, CHIP 0.008 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000438	C341	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005061	C342	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C343	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C344	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000466	C345	C-CERAMIC, CHIP 0.001 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000530	C346	C-CERAMIC, CHIP 2.7 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005061	C348	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000386	C350	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C352	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000489	C353	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000386	C354	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C355	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005494	C356	C-CERAMIC, CHIP 220 nF, 10 %, 10 V, X7R, TP, 1608, -
2	2203-005061	C357	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000386	C358	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C359	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2404-001105	C360	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-000278	C362	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000254	C363	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2404-001105	C364	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-000233	C365	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000386	C366	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C367	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C368	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C369	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C370	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-001033	C374	C-CERAMIC, CHIP 5.6 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2203-000489	C375	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005480	C376	C-CERAMIC, CHIP 33 nF, 10 %, 10 V, X7R, TP, 1005, -
2	2203-000530	C377	C-CERAMIC, CHIP 2.7 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2404-001105	C380	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-000254	C381	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000254	C383	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000254	C384	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000233	C386	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005393	C387	C-CERAMIC, CHIP 0.005 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-005061	C388	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-001259	C389	C-CERAMIC, CHIP 0.008 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000696	C390	C-CERAMIC, CHIP 0.002 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000696	C392	C-CERAMIC, CHIP 0.002 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000233	C393	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C394	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C395	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C396	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000278	C397	C-CERAMIC, CHIP 0.01 nF, 0.5pF, 50 V, NP0, TP, 1005
2	2203-000233	C398	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C399	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000438	C400	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005393	C401	C-CERAMIC, CHIP 0.005 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-000330	C402	C-CERAMIC, CHIP 0.012 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000438	C403	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000233	C404	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C405	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000696	C406	C-CERAMIC, CHIP 0.002 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-005057	C407	C-CERAMIC, CHIP 0.0082 nF, 0.25pF, 50 V, NP0, TP, 1005

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2	2203-005056	C408	C-CERAMIC, CHIP 0.0068 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-005061	C409	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C410	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000438	C411	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000438	C412	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000438	C413	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005054	C414	C-CERAMIC, CHIP 0.0047 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000233	C415	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000696	C416	C-CERAMIC, CHIP 0.002 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000233	C417	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C418	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C419	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000254	C420	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000233	C421	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C424	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000233	C425	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000438	C427	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2404-001105	C428	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C429	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C430	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000885	C433	C-CERAMIC, CHIP 4.7 nF, 10 %, 25 V, X7R, TP, 1005, -
2	2404-001240	C434	C-TA, CHIP 1 uF, 20 %, 10 V, -, TP, 1608
2	2203-000254	C435	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-001210	C442	C-CERAMIC, CHIP 8.2 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000254	C445	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-000233	C453	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000696	C455	C-CERAMIC, CHIP 0.002 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-000386	C456	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C458	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005393	C460	C-CERAMIC, CHIP 0.005 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-000254	C461	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-001072	C462	C-CERAMIC, CHIP 0.056 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001072	C463	C-CERAMIC, CHIP 0.056 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005281	C464	C-CERAMIC, CHIP 0.0015 nF, 0.1pF, 50 V, NP0, TP, 1005
2	2203-005061	C465	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-001383	C467	C-CERAMIC, CHIP 0.0005 nF, 0.25pF, 50 V, NP0, TP, 1005
2	2203-005065	C468	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000438	C469	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005061	C473	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005

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2	2203-000438	C474	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-001124	C475	C-CERAMIC, CHIP 680pF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000489	C476	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V, X7R, TP, 1005, -
2	3722-001456	CN101	JACK-PHONE 2P, 2.6PI, A uF, BLK, -
2	3710-001634	CN201	CONNECTOR-SOCKET24P, 1R, 0.5mm, SMD-A, A UF
2	0401-001091	D101	DIODE-SWITCHING 1SS376, 250 V, -, SOD-323, TP
2	0407-000115	D201	DIODE-ARRAY DAN202U, 80 V, 100 mA, CA2-3, SC-70,
2	0407-000115	D202	DIODE-ARRAY DAN202U, 80 V, 100 mA, CA2-3, SC-70,
2	0601-000273	D204	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-000273	D205	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-000273	D206	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-000273	D207	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-000273	D208	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-000273	D209	LED CHIP, Y/GRN, 0.8x1.2mm, 570nm
2	0601-001226	D210	LED CHIP, RED, 1.2x0.8mm, 660nm
2	0601-001094	D211	LED CHIP, Y-GRN, 0.8x1.1mm, 570nm
2	0404-001093	D301	DIODE-SCHOTTKY HSMS-282C, 1 V, 30mA, SOT-323, TP
2	2903-001235	F301	FILTER-CERAMIC BP, 0.45MHz, -, 6dB, 0.5dB, TP, -
2	2904-001270	F302	FILTER-SAW 130.05MHz, 0.024MHz, +-10.5KHz/0.5dB, TP, +-
2	2904-001173	F304	FILTER-SAW 881.5MHz, 25MHz, +-12.5MHz/2dB, TP, +-12.5MHz/3.5dB, DC-
2	4709-001216	F305	FREQ-ISOLATOR 824-894/1850-1990MHz, 12dB, 0.5dB, -
2	2909-001119	F306	FILTER-DUPLEXER 881.5MHz, 836.5MHz, 4/3dB, TP, 56dB, 40dB
2	2904-001172	F309	FILTER-SAW 836.5MHz, 25MHz, +-12.5MHz/1.5, TP, +-12.5MHz/2.5dB, DC-
2	2904-001172	F310	FILTER-SAW 836.5MHz, 25MHz, +-12.5MHz/1.5, TP, +-12.5MHz/2.5dB, DC-
2	4709-001226	F313	COUPLER-DIRECTION 800-850MHz, 15.5dB, 24dB, 2x1.25x1mm, TP
2	2703-001293	L101	INDUCTOR-SMD 82nH, 5 %, 1.6x0.8x0.8mm
2	2703-001293	L102	INDUCTOR-SMD 82nH, 5 %, 1.6x0.8x0.8mm
2	2703-002168	L103	INDUCTOR-SMD 220 uH, 10 %, 3.2x2.5x1.8mm
2	2703-001727	L301	INDUCTOR-SMD 22nH, 5 %, 1x0.5x0.5mm
2	2703-001881	L302	INDUCTOR-SMD 220nH, 5 %, 1.6x0.8x0.8mm
2	2703-001860	L303	INDUCTOR-SMD 150 nH, 5 %, 1.6X0.8X0.8MM
2	2703-001954	L304	INDUCTOR-SMD 2.7nH, 0.3nH, 1.0x0.5x0.5mm
2	2703-001860	L305	INDUCTOR-SMD 150 nH, 5 %, 1.6X0.8X0.8MM
2	2703-002112	L306	INDUCTOR-SMD 15 uH, 5 %, 3.2x1.6x1.8mm
2	2007-001298	L307	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2703-001751	L308	INDUCTOR-SMD 3.9nH, 0.3nH, 1.0x0.5x0.5mm
2	2703-002036	L310	INDUCTOR-SMD 330 uH, 5 %, 3.2x2.5x2mm
2	2703-001733	L311	INDUCTOR-SMD 8.2nH, 5 %, 1x0.5x0.5mm
2	2703-001747	L312	INDUCTOR-SMD 4.7nH, 0.3nH, 1.0x0.5x0.5mm

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2	2703-001734	L313	INDUCTOR-SMD 6.8nH, 5 %, 1x0.5x0.5mm
2	2703-001733	L314	INDUCTOR-SMD 8.2nH, 5 %, 1x0.5x0.5mm
2	2703-001786	L315	INDUCTOR-SMD 10 nH, 5 %, 1.0X0.5X0.5MM
2	2703-001708	L317	INDUCTOR-SMD 5.6nH, 10 %, 1.0x0.5x0.5mm
2	2703-001988	L318	INDUCTOR-SMD 82nH, 5 %, 1.0x0.5x0.5mm
2	2703-001708	L321	INDUCTOR-SMD 5.6nH, 10 %, 1.0x0.5x0.5mm
2	2703-001992	L322	INDUCTOR-SMD 1nH, 0.3nH, 1.0x0.5x0.5mm
2	2703-001734	L323	INDUCTOR-SMD 6.8nH, 5 %, 1x0.5x0.5mm
2	2703-001733	L324	INDUCTOR-SMD 8.2nH, 5 %, 1x0.5x0.5mm
2	2703-002039	L325	INDUCTOR-SMD 16 nH, 5 %, 2.29x1.73x1.52mm
2	2703-002028	L326	INDUCTOR-SMD 12nH, 5 %, 1.0x0.5x0.5mm
2	2703-001988	L327	INDUCTOR-SMD 82nH, 5 %, 1.0x0.5x0.5mm
2	2703-001734	L334	INDUCTOR-SMD 6.8nH, 5 %, 1x0.5x0.5mm
2	2703-001786	L336	INDUCTOR-SMD 10 nH, 5 %, 1.0X0.5X0.5MM
2	2703-001242	L338	INDUCTOR-SMD 4.7 uH, 10 %, 1.6x0.8x0.8mm
2	2703-001229	L339	INDUCTOR-SMD 2.2 uH, 10 %, 1.6x0.8x0.8mm
2	2703-001734	L340	INDUCTOR-SMD 6.8nH, 5 %, 1x0.5x0.5mm
2	2007-001298	L502	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2806-001242	OSC301	OSCILLATOR-VCO 998-1025/2059-2121M, -, -, TP, 2.7 V, 10mA
2	2809-001242	OSC302	OSCILLATOR-VCTCXO 14.4MHz, 2ppm, 0.2ppm, TP, 2.8 V, -
2	2806-001243	OSC303	OSCILLATOR-VCO 175.05/210.09MHz, -, -, TP, 2.7 V, 5mA
2	GH41-00118A	PCB	PCB-STHN270 STH-N270, FR-4, 6, -, 0.8T, 118x140, -, -, -, -
2	0504-000172	Q101	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	0501-002318	Q102	TR-SMALL SIGNAL UMW8N, NPN, 150 mW, UMT6, TP, 27-270
2	0504-000172	Q103	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	0505-001464	Q104	FET-SILICON SI1305DL, P, 8 V, 0.86A, 0.28 ohm, 0.26 W, SOT-323
2	0504-000172	Q105	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	0505-001165	Q106	FET-SILICON SI3443D V, P, -20 V, +-3.5mA, 65 Mohm
2	0501-000225	Q107	TR-SMALL SIGNAL 2SC4617, NPN, 200 mW, EM3, TP, 120-5
2	0504-000168	Q108	TR-DIGITAL RN1104, NPN, 100 mW, 47K/47K, SSM, TP
2	0501-000225	Q202	TR-SMALL SIGNAL 2SC4617, NPN, 200 mW, EM3, TP, 120-5
2	0504-000168	Q203	TR-DIGITAL RN1104, NPN, 100 mW, 47K/47K, SSM, TP
2	0504-000167	Q204	TR-DIGITAL RN1102, NPN, 100 mW, 10K/10K, SSM, TP
2	0504-000167	Q206	TR-DIGITAL RN1102, NPN, 100 mW, 10K/10K, SSM, TP
2	0504-000172	Q301	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	2007-000148	R101	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001320	R102	R-CHIP 1.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000141	R103	R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R104	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005

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2	2007-000148	R105	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R106	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001320	R107	R-CHIP 1.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R108	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R109	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R110	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-008037	R111	R-CHIP 57.6 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-001341	R112	R-CHIP 680 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R113	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R114	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007943	R115	R-CHIP 560 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-007771	R116	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R117	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R118	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000636	R119	R-CHIP 270 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007135	R120	R-CHIP 18 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000142	R121	R-CHIP 2.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001335	R122	R-CHIP 36 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000636	R123	R-CHIP 270 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R124	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-008163	R125	R-CHIP 86.6 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000148	R126	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R127	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R128	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R129	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R130	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R131	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R132	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R133	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000167	R134	R-CHIP 390 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R135	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R136	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007573	R138	R-CHIP 330 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000148	R139	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R140	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R141	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R142	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000146	R143	R-CHIP 6.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R144	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005

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2	2007-000162	R145	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R146	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R147	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R148	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R149	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R150	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R151	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000153	R152	R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R153	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001335	R154	R-CHIP 36 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000566	R155	R-CHIP 220 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R156	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R157	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007529	R159	R-CHIP 91 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-007771	R160	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R201	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000636	R204	R-CHIP 270 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000170	R205	R-CHIP 1 Mohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R206	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R207	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R208	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R209	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R211	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R212	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R213	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R214	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R216	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R217	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000152	R218	R-CHIP 20 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R220	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R221	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R223	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R224	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R225	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R226	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R227	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R228	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R229	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001298	R230	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005

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2	2007-001298	R231	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001298	R232	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000141	R233	R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R234	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R235	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R236	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R237	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000982	R238	R-CHIP 5.6 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R239	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000144	R240	R-CHIP 5.1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000144	R241	R-CHIP 5.1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R244	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R245	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R247	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R248	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000932	R301	R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001316	R302	R-CHIP 820 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R303	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003013	R304	R-CHIP 2.4 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-002797	R305	R-CHIP 560 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R306	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R307	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R308	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001311	R309	R-CHIP 270 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-002797	R310	R-CHIP 560 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000932	R312	R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R313	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R314	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R315	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001311	R316	R-CHIP 270 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R318	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R319	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R320	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R321	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000932	R322	R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000242	R323	R-CHIP 1.5 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R324	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R325	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R326	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-000164	R327	R-CHIP 150 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R328	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R329	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R330	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R332	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001325	R333	R-CHIP 3.3 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R334	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000145	R336	R-CHIP 6.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R337	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R338	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R339	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R340	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007200	R341	R-CHIP 2.4 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R342	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R343	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R344	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000144	R345	R-CHIP 5.1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001311	R346	R-CHIP 270 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R347	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R348	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R349	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R350	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R351	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R354	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R356	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R357	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001333	R358	R-CHIP 18 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000159	R359	R-CHIP 56 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R361	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000155	R362	R-CHIP 27 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000141	R363	R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000775	R368	R-CHIP 33 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000141	R369	R-CHIP 2.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R373	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R374	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000168	R375	R-CHIP 470 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000145	R378	R-CHIP 6.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R379	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R380	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-001298	R381	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R382	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R383	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R384	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000137	R387	R-CHIP 2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001305	R388	R-CHIP 120 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007090	R389	R-CHIP 11 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-002797	R391	R-CHIP 560 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R393	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R394	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000145	R395	R-CHIP 6.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000831	R397	R-CHIP 39 kohm, 5 %, 1/16 W, DA, TP, 1005
2	1405-001082	RV201	VARISTOR 5.6 V, 20A, 1x0.5x0.6mm, TP
2	1405-001082	RV202	VARISTOR 5.6 V, 20A, 1x0.5x0.6mm, TP
2	1405-001082	RV203	VARISTOR 5.6 V, 20A, 1x0.5x0.6mm, TP
2	1405-001082	RV204	VARISTOR 5.6 V, 20A, 1x0.5x0.6mm, TP
2	1404-001165	TH101	THERMISTOR-NTC 10 kohm, 3 %, 4100K, 30MW/C, TP
2	1205-001826	U101	IC-TRANSCEIVER D5204-22, TQFP, 80P, 470MIL, PLASTIC, 3.6 V, -, -
2	1201-001639	U102	IC-AUDIO AMP 4882, SOP, 8P, 118MIL, -, -, PLASTIC, 5.5 V, -, -40to+85C, -, -
1	GH07-00055A	U103	LCD-STHA270 LCD UG-12B74-FGHTX-A,
2	1003-001300	U104	IC-DRIVER SM8142BD-EL, SOJ, 8P, 110MIL, -, -, TP, PLASTIC, -, -
2	1203-001979	U105	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V,
2	0505-001462	U106	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	0506-001054	U107	TR-ARRAY IMD10A, NPN/PNP, 2, 300 mW, SMT6, TP, 68-/100-600
2	1203-001302	U108	IC-POS1.ADJUST REG. 5205, SOT-23, 5P, 119MIL, PLASTIC,
2	0505-001462	U109	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	1203-001979	U110	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V,
2	1203-002129	U111	IC-VOLTAGE REGULATOR 71622, SOT-23, 5P, 62MIL, PLASTIC, 2.14/2.26
2	1203-001979	U112	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V,
2	0505-001462	U113	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	1203-002095	U114	IC-VOLTAGE REGULATOR 71628, SOT-23-5, 5P, -, PLASTIC, 2.76/2.84 V,
2	1009-001006	U201	IC-HALL EFFECT S/W A3210ELH, SC-74A, 3P, -, TP, -, -, 5 V, 1mA, -
2	1107-001227	U202	IC-FLASH MEMORY 28F3204, 2Mx16Bit, CSP, 72P, 315MIL, 110ns, 3 V, 10
2	1205-001831	U203	IC-TRANSCEIVER D5205, BGA, 192P, 550MIL, PLASTIC, 3.6 V, -, -
2	0506-001054	U204	TR-ARRAY IMD10A, NPN/PNP, 2, 300 mW, SMT6, TP, 68-/100-600
2	0506-001054	U205	TR-ARRAY IMD10A, NPN/PNP, 2, 300 mW, SMT6, TP, 68-/100-600
2	1203-001835	U206	IC-RESET 3470, SOT23, 5P, -, PLASTIC, 0.99/1.01 V, 300 mW, -
2	1201-001609	U301	IC-RF AMP 2363, SOP, 8P, 62MIL, DUAL, 18dB, PLASTIC, 5 V, -, -40to+85
2	3705-001226	U302	CONNECTOR-COAXIAL -, JACK, 75 Mohm, 50 ohm, 0.45dB

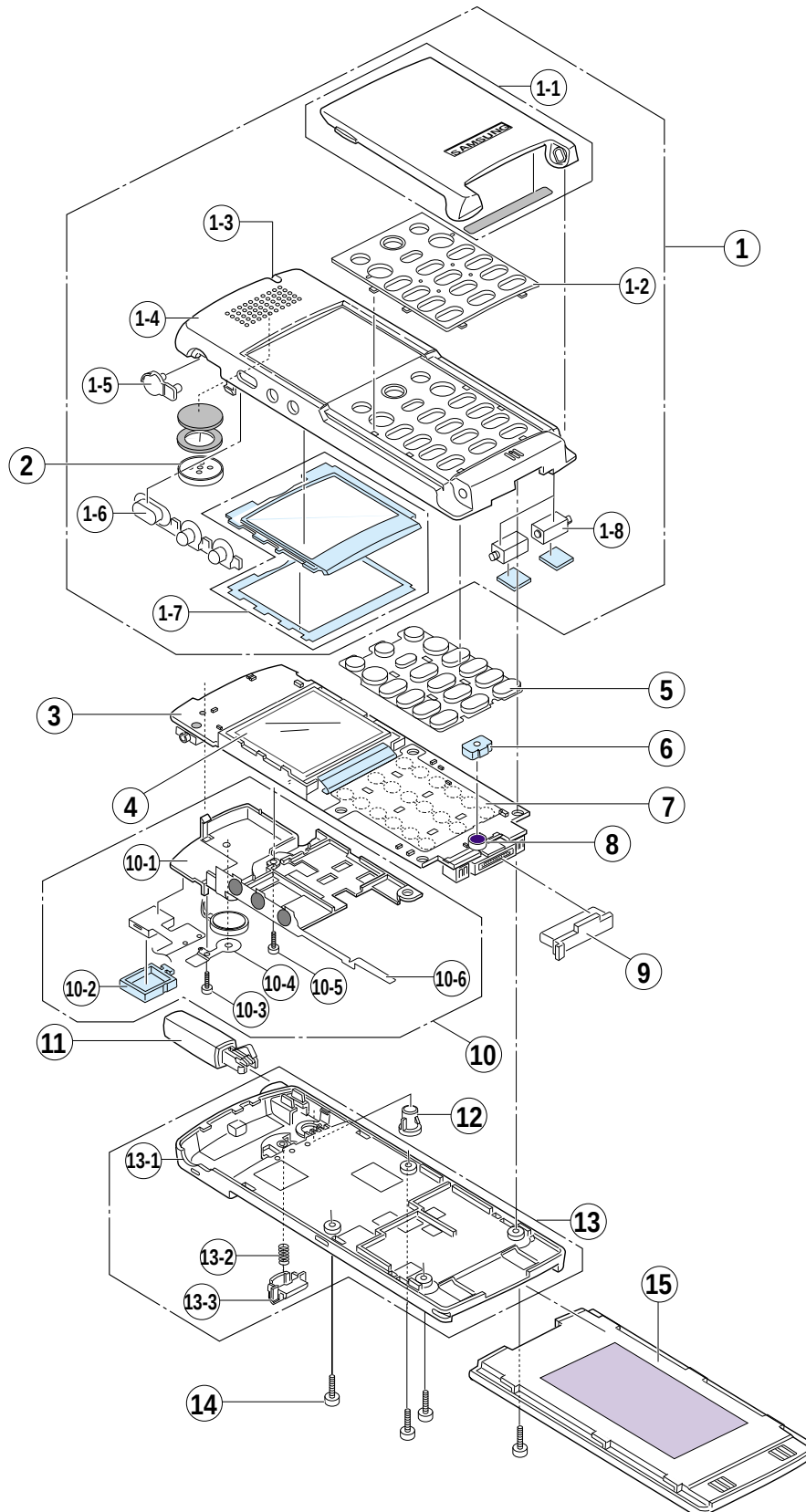
Level	SEC CODE	Design LOC	DESCRIPTIONS
2	1205-001986	U304	IC-MIXER UPC8015GK-9EU, TQFP, 80P, 472MIL, PLASTIC, 3 V, -,
2	1201-001634	U305	IC-POWER AMP 2162, LCC, 16P, 157MIL, -, 29dB, PLASTIC, 5.2 V, -, -
2	1201-001006	U306	IC-OP AMP 7101, SOT-23, 5P, -, SINGLE, -, PLAS
2	1201-001636	U307	IC-RF AMP 2376, SOT-23, 6P, 63MIL, SINGLE, 27dB, PLASTIC, 3.3 V, -, -
2	0505-001469	U310	FET-SILICON SI1902DL, N, 20 V, +-0.66A, 0.63 ohm, 0.27 W, SOT-363
2	2801-004025	Y201	CRYSTAL-UNIT 0.032768MHz, 20ppm, 28-ABK, 1.7fF, 65 kohm, TP
2	0406-001083	ZD101	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD201	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD202	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD203	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD204	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD205	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD206	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD207	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD208	DIODE-TVS -, 6.1/-7.2 V, 150 W, SOT-323-5L
2	0404-001110	ZD209	DIODE-SCHOTTKY RB751S-40, 40 V, 30mA, SOD-523, TP
1	GH92-00863A		PBA MAIN-STHN270 STH-N270, -, BRAZ, MAIN PBA, -, -, -
1	6001-000464		SCREW-MACHINE PH, +, M1.4, L4, BLACK, SM10C, -
1	6001-001460		SCREW-MACHINE CH, +, M1.4, L2.3, BLK, SWRCH18A, FP
1	GH44-00145A		CHARGER-SCHN100 TC TCH020EBE, SCH-N100, AC/DC, -, -, -, 110/220
1	GH71-00325A		NPR-ANT DUMMY PLATE STH-N271, ZN, -, AU, -
1	GH72-01753A		PMO-KEY PAD STH-N271, -, EF TYPE, BLK, -, -, -
1	GH73-00064A		RMO-EAR JACK RUBBER SCH-900, RUBBER, 9X7X0.8, BLK, 70
1	GH73-00490A		RMO-ANT.CAP STH-N271, RUBBER, -, D/GRY, 50, -
1	GH73-00567A		RMO-I/F CONNECTOR STH-N271, RUBBER, -, D/GRY(G4358), 50, -
1	GH73-00715A		RMO-DUPLEX STH-N271, RUBBER, 15X8.5XT0.5, -, -, -
1	GH74-01274A		MPR-CHIP SHORT TAPE STH-N271, TAPE, 4X5XT0.05, -, -
1	GH74-01275A		MPR-FPCB SHORT TAPE STH-N271, TAPE, 4.3X17XT0.05, -, -
1	GH74-01276A		MPR-BATTERY SHORT TAPE STH-N271, TAPE, 7X5XT0.05, -, -
1	GH75-00223G		MEC-HANGER ROPE SGH-2300, -, D/GRY
1	GH75-01062A		MEC-METAR DOME ARRAY STH-N271, -, -, -, IVR, -, -
1	GH75-01105A		MEC-LCD BRACKET STH-N271, -, -, -, NI, -, -
2	GH71-00301A		NPR-LCD BRACKET STH-N271, ZN, -, -, -
2	GH73-00711A		RMO-LCD BRACKET RIGHT STH-N271, RUBBER, T0.3, -, -, -
2	GH73-00712A		RMO-LCD BRACKET LEFT STH-N271, RUBBER, T0.3, -, -, -
1	GH97-01769A		MEA FRONT-STHN270 STH-N271, -, USA, COLM, -, -, -
2	GH75-00773A		MEC-SUA.FRONT STH-N271, -, -, -, D/GRY, -, -
3	GH72-01745A		PMO-FRONT COVER STH-N271, -, PC, D/GRY, -, G4358, -
3	GH72-01748A		PMO-KEY DUMMY STH-N271, -, PC, BLK, -, K2261, -

Level	SEC CODE	Design LOC	DESCRIPTIONS
3	GH72-01752A		PMO-LED CAP STH-N271, -, ACRYL, TR/TRP, -, -, -
3	GH73-00491A		RMO-EAR JACK HOLDER STH-N271, RUBBER, -, BLK, 50, -
3	GH73-00550A		RMO-HINGE RUBBER STH-N271, RUBBER, 6X4XT0.4, GRY, 50, -
3	GH74-00556A		MPR-FLIP BOHO SGH-2400, VINYL(3M 336), 46X48.5, TRP, -
3	GH74-00890A		MPR-KEY DUMMY TAPE STH-N271, TESA TAPE, 30.6X44.3XT0.2, -, -
3	GH74-40107A		MCT-WINDOW BOHO SH800, 3M336, -, -, -
3	GH75-00775A		MEC-SUA.FLIP STH-N271, -, -, -, D/GRY, -, -
4	GH68-01360A		LABEL(M)-LOGO BADGE STH-N271, 3M9448, T0.16, 17.7, 3.8, -, D/GRY, -, -
4	GH68-31000P		LABEL(R)-FLIP SHEET STH-N271, PC SHEET, T0.2, 3, 30, -, D/GRY, -, -, -
4	GH72-01747A		PMO-FLIP COVER STH-N271, -, PC, D/GRY, -, G4358, -
3	GH75-00776A		MEC-SIDE KEY STH-N271, -, -, -, IVR, -, -
4	GH72-01750A		PMO-SIDE KEY TOP STH-N271, -, ABS, -, -, -, -
4	GH73-00488A		RMO-SIDE KEY RUBBER STH-N271, RUBBER, -, BLK, 50, -
3	GH75-00794A		MEC-LCD WINDOW STH-N271, -, -, -, TRP, -, -
4	GH72-01749A		PMO-LCD WINDOW STH-N271, -, ACRYL, TRP, -, -, -
4	GH74-00887A		MPR-LCD SPONGE STH-N271, PORON, 30X34.6XT0.5, BLK, -
4	GH74-00888A		MPR-LCD TAPE STH-N271, TESA TAPE, 34.9X32.7XT0.2, -, -
3	GH75-01030A		MEC-HINGE STH-N271, SEC, -, -, BLK, -, -
1	GH97-01770A		MEA REAR-STHN270 STH-N271, -, USA, COLM, -, -, -
2	GH75-00774A		MEC-SUA.REAR STH-N271, -, -, -, D/GRY, -, -
3	GH68-00973B		LABEL(R)-QUALCOMM SCH-A300, VINYL, T0.12, 10, 4, -, TRP, -, -, -
3	GH70-10633A		IPR-LOCKER SPRING SCH-750, STS304, T0.3, -
3	GH72-01746A		PMO-REAR COVER STH-N271, -, PC, D/GRY, -, G4358, -
3	GH72-01754A		PMO-BATTERY LOCKER STH-N271, -, PC, D/GRY, -, G4358, -
1	GH97-01777A		MEA ETC-SHIELD STH-N271, -, COLM, TRP, -, -, -
2	6001-000464		SCREW-MACHINE PH, +, M1.4, L4, BLACK, SM10C, -
2	GH59-00175A		UNIT-FPC VOL KEY ASS'Y STH-N270, YWTN270BMKF, -, FPC VOLUME
2	GH71-00307A		NPR-MOTOR BRACKET STH-N271, STS, T0.2, -, -
2	GH71-00435A		NDC-SHIELD CAN STH-N271, ZN, -
2	GH73-00492A		RMO-BUZZER HOLDER STH-N271, RUBBER, -, BLK, 50, -
2	GH73-00551A		RMO-MOTOR RUBBER STH-N271, SRS PORON, PI12XT0.8, -, -, -
2	GH73-00714A		RMO-MOTOR BRACKET STH-N271, RUBBER, PI8XT0.7, -, -, -
2	GH74-00973A		MPR-BUZZER SHEET STH-N271, PC SHEET, 8.6X8.6XT0.3, -, -
1	GH97-01925A		MEA ETC-MIC STH-N271, -, COLM, TRP, -, -, -
2	GH59-00176A		UNIT-STHN270 MIC ASS'Y STH-N270, -, -, MIC ASS'Y, -, -, -, -, -, -
2	GH73-00048A		RMO-MIC DUMMY SCH-900, RUBBER, 6X2.5X0.5, BLK, 50
2	GH73-00489A		RMO-MIC HOLDER STH-N271, RUBBER, -, BLK, 50, -
2	GH74-00889A		MPR-MIC TAPE STH-N271, TESA TAPE, 8X5XT0.4, -, -
1	GH99-02406A		PAA MAIN-STHN275 STH-N271, -, BRAZ, -, -, -

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	GG68-10705A		LABEL(P)-SEAL SP-R912, CRP, 65.0x95.0, -, ORG
2	GH68-00518B		LABEL(P)-SEAL SGH-A100, ART, 100G, 46, 34, -, WHT, -, -, -
2	GH68-00662B		LABEL(P)-BAR CODE SCH-3500, WHITE POLYESTER, 67X41, -, WHT
2	GH68-01807A		LABEL(R)-MAIN STH-N271, MAT, T0.05, 41.2, 27.2, -, SIL, -, -, -
2	GH68-11057A		LABEL(P)-MS BAR CODE SCH-1900, ART, 100X155, T0.1, WHT
2	GH69-00800A		BOX(P)-UNIT MAIN STH-N271, SC300G+E(KOL), -, -, -, -, 188X135X72, -
2	GH69-00815A		CUSHION-CASE STH-N271, HIPS(T1), -, -, -, -, -, 180X130X76
2	GH69-11279A		BOX(P)-MASTER(CH) CHINA, SGH-600, SW-3, 530X510X187
2	GH69-30503A		BAG-STD BATT. PE, T0.06, 70X170, SCH-1011
1	3001-001210		SPEAKER
1	GH42-00097A		ANTENNA-STHA271 1538-1LSSUE6, STH-A271, 824~849MHZ
1	GH43-00294A		BATTERY-900M, D/GRY 1LP473465B(STHN270)
1	GH44-00145G		CHARGER-SCHN105 TC TCH020ABN, SCH-N105, AC/DC, -, -, -, -, 110/220
1	GH96-00894A		ELA ETC-SGHA100 EAR-MIC SGH-A100, -, USA, EAR-MIC, -, -, -

8. STH-N271 Exploded View and its Parts List

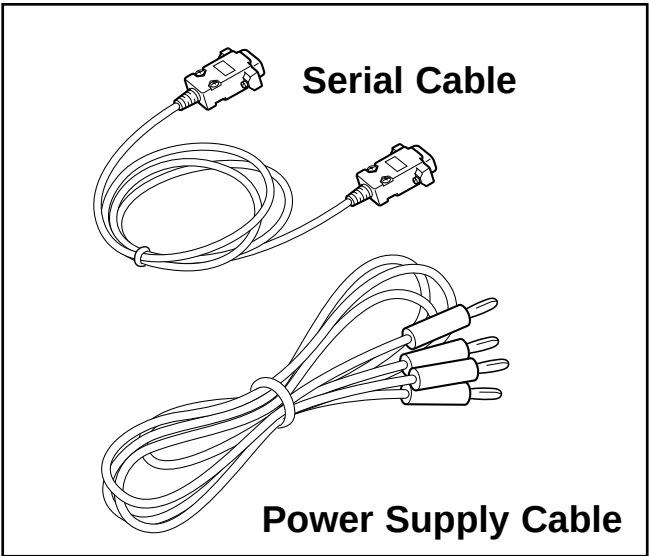
1. STH-N271 Cellular phone Exploded View



2. STH-N271 Cellular phone Parts List

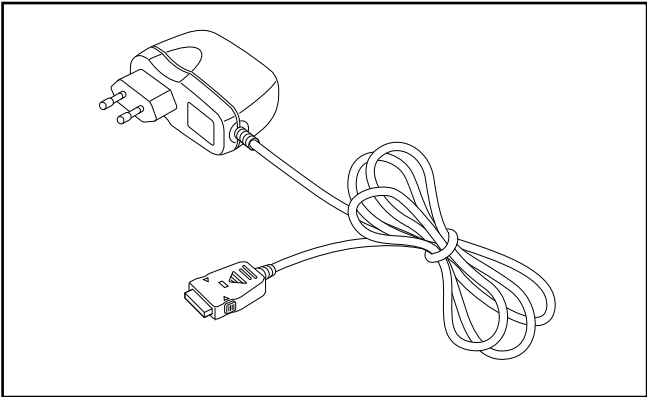
Location No.		Description	SEC CODE			Remark
			Gray	Silver	Gold	
1		FRONT COVER ASS'Y	GH75-01169A	GH75-01169B	GH75-01169C	SA
	1-1	FLIP COVER	GH75-01170A	GH75-01170B	GH75-01170C	SA
	1-2	KEY DUMMY	GH72-01748A	GH72-01748A	GH72-01748A	SNA
	1-3	LED CAP	GH72-01752A	GH72-01752A	GH72-01752A	SNA
	1-4	FRONT COVER	GH72-01745A	GH72-01745A	GH72-01745C	SNA
	1-5	EAR PHONE COVER	GH73-00491A	GH73-00491A	GH73-00491A	SNA
	1-6	SIDE KEY	GH75-00776A	GH75-00776A	GH75-00776A	SNA
	1-7	WINDOW LCD	GH75-00794A	GH75-00794A	GH75-00794A	SA
	1-8	HINGE	GH75-01030A	GH75-01030A	GH75-01030A	SNA
2		SPEAKER	3001-001210	3001-001210	3001-001210	SA
3		MAIN PBA	GH82-00074A	GH82-00074A	GH82-00074A	SA
4		LCD	GH07-00055A	GH07-00055A	GH07-00055A	SA
5		KEY PAD	GH72-01753A	GH72-01753A	GH72-01753B	SA
6		MIC HOLDER	GH73-00489A	GH73-00489A	GH73-00489A	SA
7		METAL DOME	GH75-01062A	GH75-01062A	GH75-01062A	SA
8		MIC	GH59-00176A	GH59-00176A	GH59-00176A	SA
9		INTERFACE COVER	GH73-00567A	GH73-00567A	GH73-00567A	SA
10		SHIELD REAR ASS'Y	GH97-01777A	GH97-01777A	GH97-01777A	SA
	10-1	SHIELD CAN	GH71-00435A	GH71-00435A	GH71-00435A	SA
	10-2	BUZZER HOLDER	GH73-00492A	GH73-00492A	GH73-00492A	SA
	10-3	SCREW (M1.4 x L4)	6001-000464	6001-000464	6001-000464	SA
	10-4	MOTOR BRACKET	GH71-00307A	GH71-00307A	GH71-00307A	SNA
	10-5	SCREW (M1.4 x L2.3)	6001-001460	6001-001460	6001-001460	SA
	10-6	FPCB ASS'Y	GH59-00175A	GH59-00175A	GH59-00175A	SA
11		ANTENNA	GH42-00097A	GH42-00097A	GH42-00097A	SA
12		ANTENNA CAP	GH73-00490A	GH73-00490A	GH73-00490A	SA
13		SUA REAR ASS'Y	GH75-00774A	GH75-00774A	GH75-00774A	SA
	13-1	REAR COVER	GH72-01746A	GH72-01746A	GH72-01746A	SNA
	13-2	BATTERY LOCKER SPRING	GH70-10633A	GH70-10633A	GH70-10633A	SNA
	13-3	BATTERY LOCKER	GH72-01754A	GH72-01754A	GH72-01754A	SNA
14		SCREW (M1.4 x L4)	6001-000464	6001-000464	001-000464	SA
15		BATTERY	GH43-00294A	GH43-00294A	GH43-00294A	SA

3. Test Jig (GH80-00614A)



4. TC (GH44-00145G) 220V

Israel



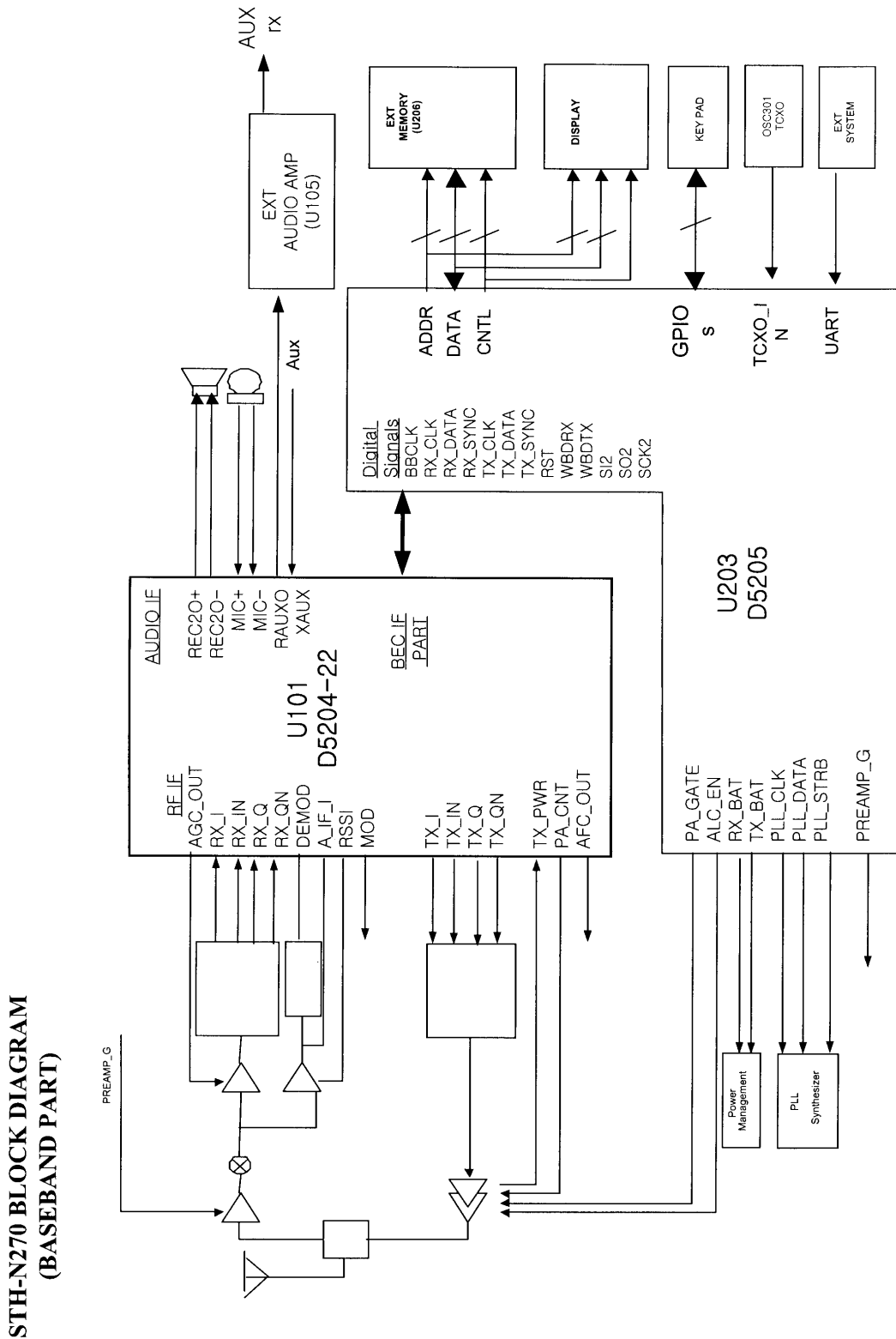
5. RF Test Cable (GH39-00092A)

6. Cigarette Lighter Adaptor
(GH44-00091A)

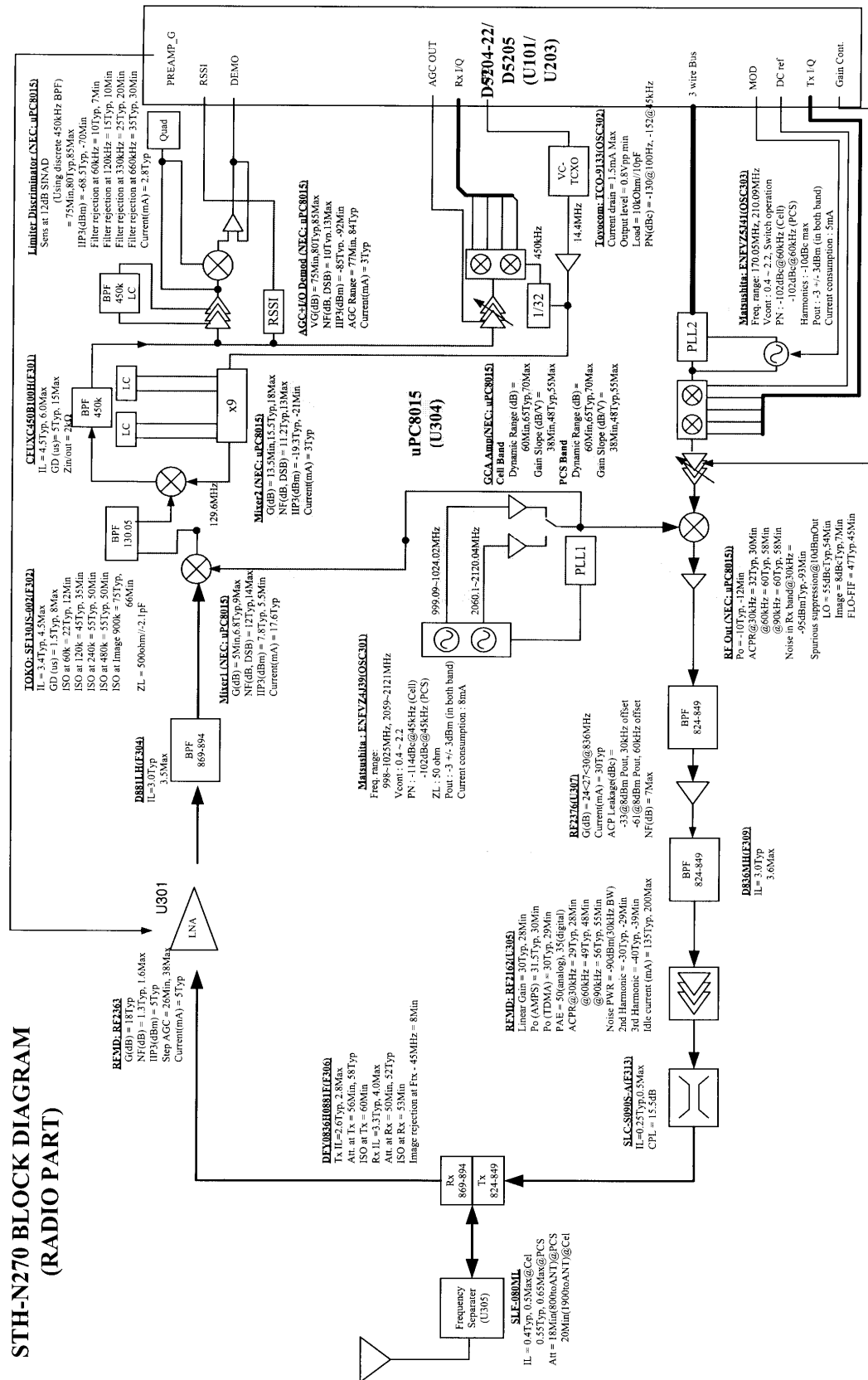
7. Test Cable (GH39-00090A)

9. STH-N271 Block Diagrams

1. STH-N271 Base Band Part



2. STH-N271 Radio Part

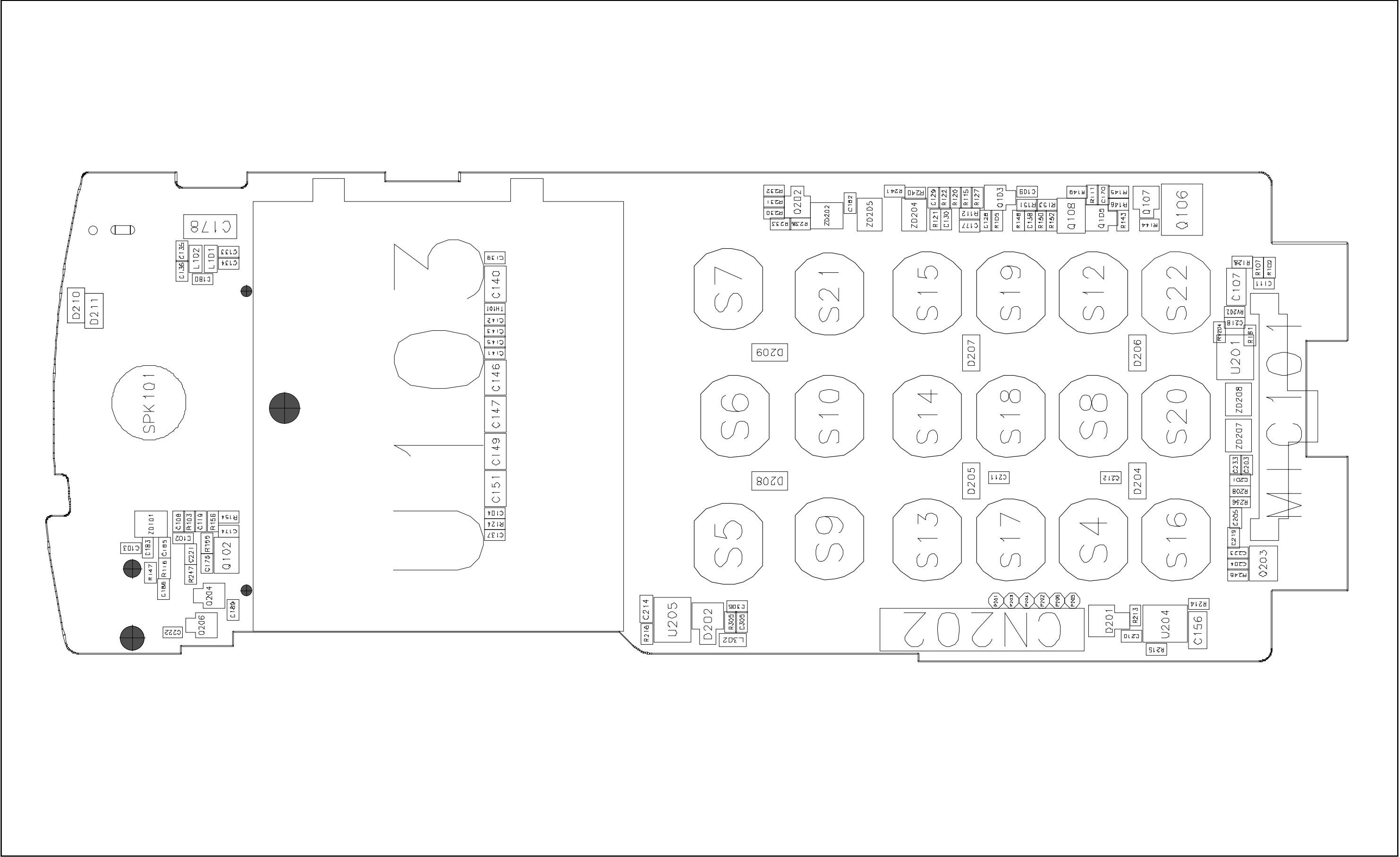


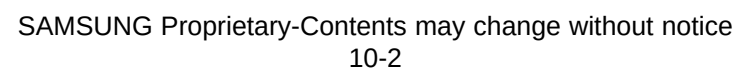
MEMO

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10. STH-N271 PCB Diagrams

1. STH-N271 Main PCB Top Diagram





11. STH-N271 Circuit Description & Circuit Diagrams

STH-N271 provides the AMPS and the Digital TDMA (cellular band only) of compliance with TIA / EIA-137. The radio operation of the STH-N271 has been implemented with the receiver, the transmitter, and the local oscillator controlled by the PLL. The circuit of the STH-N271 is described as followings.

1. Baseband Section

1-1. Power Supply

For the POWER ON, with the battery installed on the telephone and by pressing the END key, the BATT and ON_SW signals will be connected, which it will turn on Q107. In addition, Q106 is turned on by Q107, and thus the BATT is connected to VBAT. Consequently, VBAT is supplied to input of regulators U110 and U111. The regulator U110 supplies all powers of baseband part (VCC, AVCC, V_VCTCXO). The regulator U111 supplies IVCC (2.2 V) to Baseband Engine Chip (U203: BEC). The BEC (U203), which is supplied power from VCC, IVCC and reference clock 14.4 MHz from TCXO (OSC302), will start to run. If BEC will start to run normally, the BEC output POWER_HOLD signal (low active) which is connected to Q105. Moreover, Q105, Q107 and Q106 are turned on in order. In consequence, BATT is connected to VBAT continuously. Although END key is released (ON_SW disconnected BATT). The power from U110 and U111 is used in all baseband part of BEC, IFC (Interface Chip U101).

For the POWER OFF, in this case main application program is running already. The main application program is checking all GPIO inputs periodically. When press the END key during program is running, the BATT and ON_SW signals will be connected. This turns on Q107. Therefore, ON_SW_SENSE that is connected to GPIO_0_5 (U203_ C13) turned logic high to low. The BEC checks this signal, main application program enter to POWER OFF mode.

1-2. BEC (U203) interface

The BEC (U203) is mainly consist of two parts HOST CPU and Baseband Engine (Figure2-1). This is an important component of dual-mode (US-TDMA and AMPS mode) cellular phone. It has 1Kx 32 of internal ROM and 2Kx32 of internal RAM. This is communicate with a lot of peripheral device, memory (Flash ROM, SRAM), Key Pad and LCD. The BEC receives TCXO clock signals from the TCXO and controls the phone during the operation. The BEC communicates with the IFC through several serial links. These include CODEC, wideband data, receiver data, transmitter data, and auxiliary data interface Signals. A master baseband clock (BBCLK: U203_H2) at either 6.2208 MHz or 5.12 MHz or 4.096 MHz, depending on the operating mode, from the BEC drives the IFC. The major components are as follows:

Separate address and data buses provide a data path to external memory and memory mapped peripherals. The 22-bit address bus provides a byte addressing range up to 8 MB in each of 4 spaces decoded by the 4 select signals. The 16-bit data bus in conjunction with the UBE signal allows word or byte transfers. Table2-1 shows the ARM memory map. An Intel 28F3204 Stacked Memory chip supplies 4M Bytes of Flash memory and 512 KBytes of SRAM. Note that in the phone, the SRAM is located at the CS_RES1 block of memory.

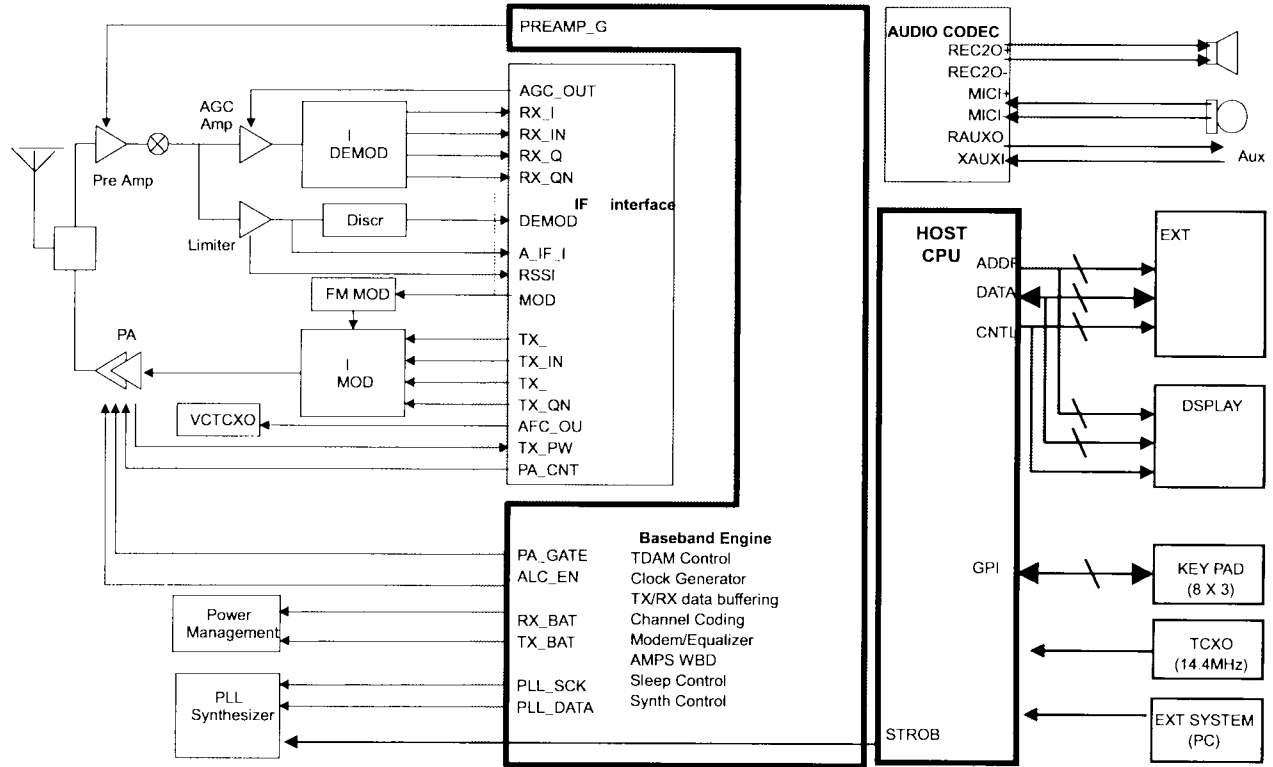


Figure2-1.BEC interface and block diagram

Table2-1. ARM Memory Map

ARM Memory Map					
ARM Address Range		Data	Block Size	Device Name	Remarks
0000 0000	0000 0003	32	4 Byte	Internal ROM	R
0000 0004	0000 1FFF	32	8K Byte	Internal RAM	R / W
0002 0000	0002 0FFF	32	4K Byte	Internal ROM	R
0004 0000	0005 FFFF	32 / 16	NA	Internal Peripherals	R / W
0080 0000	00FF FFFF	8 / 16	Up to 8 M Byte	SRAM_CS	R / W
0100 0000	017F FFFF	8 / 16	Up to 8 M Byte	FLASH_CS	R / W
0180 0000	01FF FFFF	8 / 16	Up to 8 M Byte	CS_RES1	R / W
0200 0000	027F FFFF	8 / 16	Up to 8 M Byte	CS_RES2	R / W

HOST CPU (inside of BEC:U203)

ARM7TDMI 32-bit microprocessor is used for the main call processing. The CPU controls all the circuitry. The reference clock 14.4 MHz, coming from the output of the TCXO (OSC302), is connected to VCTCXO_IN (pin F3). Digital Only, additional crystal oscillator (Y201) of 32.768kHz is connected to pin B2 of the BEC. The interface circuitry consists of reset circuit, address bus (A0-A21), data bus (AD0-AD15), control signals (MEMWEB, MEMOEB, SRAM_CS, FLASH_CS, DISPLAY_CS, UBE etc), GPIOs, and the communication ports. The communication ports includes the UART1 and 2, the JTAG, and the SCI. The UART1 supports HP equipment interface, down loading, and data service. The UART2 and the JTAG are used for the software debugging. The SCI supports the Diagnostic Monitor (DM) function.

FLASH ROM (inside of U202)

The 32Mbit FLASH ROM is used to store code of the application program. Using the down-loader program, this application program can be changed even after the mobile is fully assembled.

SRAM (inside of U202)

The 4Mbit SRAM is used to store the internal flag information, call processing data, and timer data.

Key Pad

The Key Pad is belong to main board. For key-press recognition, the structure of key is consisted of 8 x 3 matrix, which is used GPIO input signal SCAN0-7 and GPIO output signal KEY0-2 of BEC.

LCD

LCD module is connected to main board directly by U103. This contains an LCD controller,. An LCD controller controls the information of displaying from the BEC (parallel 8-bit data) to the LCD.

BASEBAND ENGIN (inside of U203)

This part mainly interface with IFC (U101) and RF part. As for interface of IFC, that will be explained detail in next section. As important signals are PREAMP_G for receiver path, PA-GATE, ALC_EN for transmitter path, PLL_DATA, PLL_CLK, PLL_STRB1 for PLL synthesizer, RX_BAT, TX_BAT for power management.

1-3. IF INTERFACE CHIP (IFC :U101)

The IFC provides the radio IF and audio interfaces (Figure2-2). Differential Rx I/Q and Tx I/Q signal pairs interface directly with the RF interface chip (RFIC : U304) device. MOD, AFC, AGC, RSSI, and PA_CNT signals also directly control the radio circuitry. Three audio paths are implemented. The primary path utilizes the microphone and speaker, located on board. Both microphone and speaker utilize the main differential circuits in the IFC to minimize noise pickup. The speaker output is amplified internally to enable direct connection to the speaker. The second audio path connects to the headset jack. The headset microphone and speaker are passed to the IFC's auxiliary input and output, respectively. The headset jack terminals indicate via the HEADSET_SENSE line when the headset is present as well as when the headset button is pushed via the SEND_END line. The third audio path to the HFK shares the auxiliary output with the headset for its speaker and uses the second auxiliary input for its microphone. Since the auxiliary output is not internally amplified, an external audio amplifier is applied before connection to the two headset and HFK.

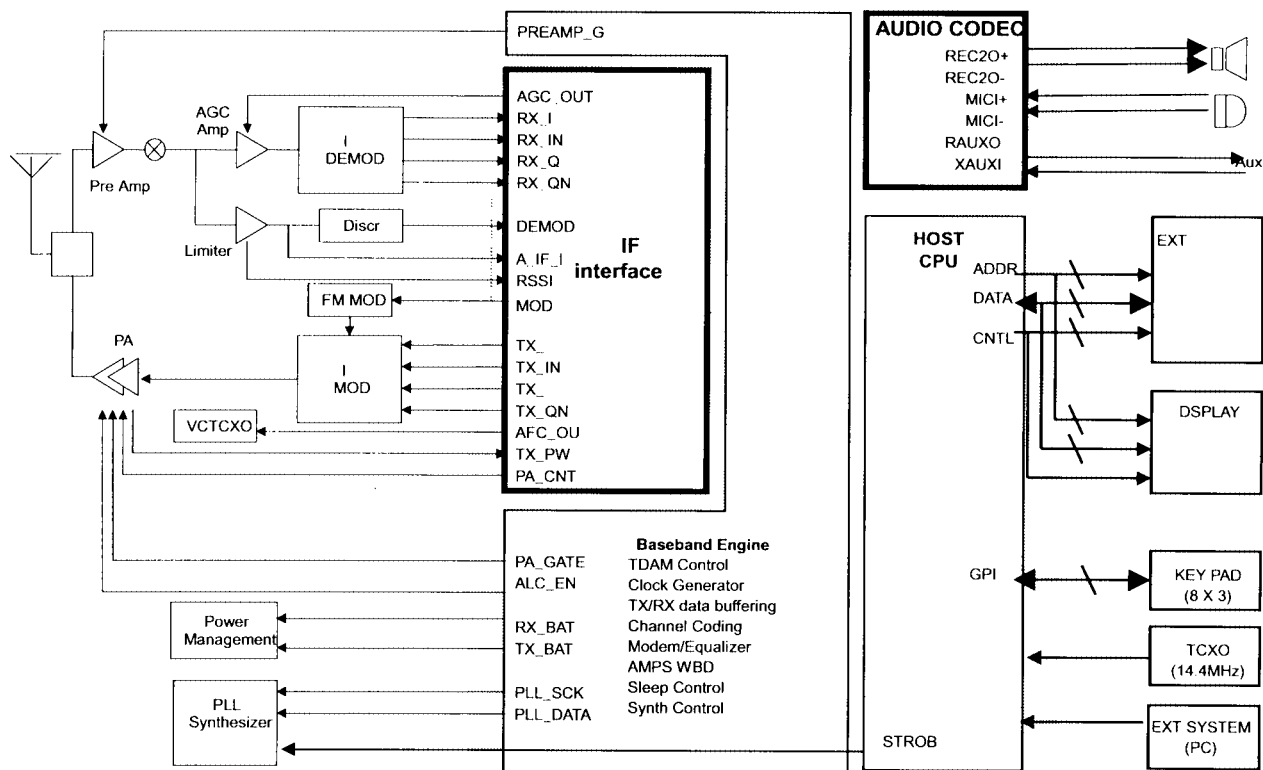


Figure 2-2. IFC interface and block diagram

The IFC (U101) is mainly consist of IF interface part and AUDIO CODEC part. The IF interface part, witch is between RF part (mainly U304) and BEC, translate RF data to baseband data for BEC. Mainly, IF interface part is consist of receiver, transmitter, and some kind of RF control. The IFC also provides several A/D inputs to monitor system parameters. Battery voltage is periodically measured after scaling via a resistor divider (BAT_MON: U101_67). A thermistor located near the PA is monitored to obtain temperature status by TMP_MON (U101_66). Finally, a voltage level from the battery case, identifying the type of battery, is measured by AUX_MON (U101_65).

Receiver Interface

The U101 receive differential I/Q signals (RX_IN, RX_I, RX_QN, RX_Q: U101_48,49,50,51), or DEMOD signal (U101_52) which come from RF demodulator (U304_11,12,9,10,16), and translate as digital data. These data is synchronized by control signals (RX_SYNC, RX_CLK, and BBCLK: U101_31,32,40) is transported to BEC through RX_DATA (pin U101_30). In addition, the U101 uses AGC_OUT (U101_72) for dynamic range of receiver signal strength connected to U304_17, AFC_OUT (U101_71) for adjusting reference frequency exactly connected to TXCO (OSC302_1).

Transmitter Interface

The U101 receives TX_DATA1 (U101_36) synchronized by control signals (TX_SYNC, TX_CLK: U101_33,34), which come from BEC, and translate this data as differential I/Q signals (TX_IN, TX_I, TX_QN, TX_Q : U101_61,60,58,57), or MOD signal (U101_63). It transport this data to RF modulation part. In addition, the U101 uses PA_CNT (U101_73),TX_PWR (U101_68) for controlling power of transmitter.

AUDIO CODEC

Three audio paths are implemented in IFC. The primary path utilizes the microphone (U101_11,12) and speaker (U101_77,79), located on board. Both microphone and speaker utilize the main differential circuits in the IFC to minimize noise pickup. The speaker output is amplified internally to enable direct connection to the speaker. The second audio path connects to the headset jack. The headset microphone and speaker are passed to the IFC's auxiliary input (U101_5) and output (U101_2), respectively. The headset jack terminals indicate via the HS_SENSE (U115_4) to GPIO of BEC (U203_C11) when the headset is present. As well as when the headset button is pushed via the SEND_END (U115_6) to GPIO of BEC (U203_A13). The third audio path to the HFK shares the auxiliary output with the headset for its speaker and uses the second auxiliary input for its microphone. Since the auxiliary output is not internally amplified, an external audio amplifier (U102) is applied before connection to the headset and HFK.

2. RF Section

2-1.Introduction

From the starting point of developing the STH-N271, the cellular and the PCS band operations have been intended. Therefore, the STH-N271 contains many dual-band components and rooms for PCS band components, in order to widen the operating band for the next product. For playing essential role in the radio part, The STH-N271 includes many active components. They are U301 (dual-band LNA), U305 (Cellular band power amplifier), U304 (transceiver including up/down converter, RF and IF PLLs, Rx and Tx AGCs, IQ modulator and demodulator, limiter, and discriminator), OSC301 (dual-band RF VCO), and OSC303 (dual-band IF VCO). In order to obtain good selectivity and sensitivity simultaneously, STH-N271 has dual IF conversion system. The 1st IF and 2nd IF are 130.05 MHz and 450 kHz, respectively.

2-2.Front-End part

RF signal from the air interface passes F305 (diplexer) and F306 (duplexer). The purpose of F305 is the band selection in conjunction with U303 (SPDT switch) according to the band control signal from the baseband chipset. F306 plays the role of Rx and Tx filtering and the isolation between Rx and Tx in the cellular band (AMPS and Digital TDMA).

2-3.Receiver

The Rx signal from F306 goes into U301. U301 amplifies the very weak Rx signal with adding the negligible thermal noise. U301 features 20 dB gain, 1.3 dB NF, and 7 mA current consumption. For the wider dynamic Rx AGC (automatic gain controller) range, the gain of U301 is controlled by PREAMP_G signal coming from U203, resulting in around 30-dB step gain change. By checking the RSSI, U203 decides to whether turn on U301 or not. The amplified signal goes into F304 (RF SAW filter) in order to suppress the unwanted band data.

The signal coming out from F304 inflows to the pin 45 (1st Rx mixer input) of U304, and it is downconverted to the IF of 130.05 MHz. This 1st mixer has around 7 dB conversion gain, 6dB NF, and 5 dBm IIP3. For the downconversion, the local frequency source from OSC301 (dual RF VCO) is used. As for the local frequency, the Rx frequency plus 1st IF (that is, high injection type local frequency) is used, and this frequency is controlled by the RF PLL in U304 in conjunction with U203 (baseband IC).

The 1st mixer output is connected to F302 (130.05 MHz 1st IF SAW filter). The main role of F302 is suppression of undesirable interferers. For the 2nd IF conversion, the output of F302 is connected to the 2nd Rx mixer of U304. The 2nd mixer has the typical characteristics of 13.5 dB gain, 12 dB NF, and -20 dBm IIP3. The local frequency source for making 2nd downconversion is supplied from U304 internally by 9 times multiplying the fundamental frequency of OSC302 (14.4 MHz VC-TCXO). The downconverted signal passes F301 (450 kHz Ceramic filter) in order to suppress the unwanted interferers and the image frequency signals.

Until now, the Rx signal path is common for both of AMPS and Digital TDMA. From the filtered 450 kHz signal output, AMPS path and TDMA path become separate for proper treating of the Rx signal. To begin with, AMPS path will be described.

AMPS (Limiting and Discrimination)

The downconverted signal from the output of F301 enters to the limiter and discriminator of U304. For the better suppression of the unwanted interferers, discrete LC filter is used in the limiter section. The signal through the limiter goes into the discriminator (or quadrature detector) of U304 with incorporation of the quadrature tank circuit (LC resonator) placed outside of U304, and thus the audio signal comes out from the pin 16 of U304. This demodulated signal is connected to U101.

TDMA (Rx AGC and I, Q Demodulator)

The downconverted signal from the output of F301 enters to the Rx AGC and I, Q demodulator of U304. The Rx AGC has the performance of 80-dB dynamic range, 10 dB NF, and -85 dBm IIP3. In the process of I, Q demodulation, 450 kHz local signal, made by dividing 14.4 MHz reference clock, is used.

2-4. Transmitter

In the AMPS mode, Mod signal from U101 (interface IC) is applied to the tuning voltage terminal of OSC303 (175.05 MHz IF VCO) with the internal IF PLL of U304. In the TDMA mode, Tx I, Q signals coming from U101 are applied to the I,Q modulator.

The modulated signal goes into the Tx AGC of U304. The Tx AGC has the 65-dB dynamic range. The output of the Tx AGC enters the upconverter of U304. For the upconversion, the local frequency source from OSC301 (dual RF VCO) is used, as well. The typical output power of the upconverter is -10 dBm at MAC: 0000. The ACPR of the upconverter is 32 dB at adjacent channel and 60 dB at alternate channel.

The upconverted signal passes through F310, U307, and F309. F309 and F310 are same RF Tx SAW filters. U307 (Tx driver) performs the amplification of the input signal by 27 dB, in order to provide enough input power into U305 (power amplifier). The ACPR of U307 is 33 dB at adjacent channel and 61 dB at alternate channel.

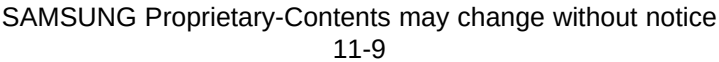
U305 has 30-dB linear gain, and maximum output power of 31 dBm (AMPS) and 30 dBm (TDMA). The ACPR of U305 is 29 dB at adjacent channel and 49 dB at alternate channel. This satisfies the TIA/EIA-136 specification. The output power of U305 is transmitted to F313 (Cellular band coupler) in order to help the Tx power control by using the power detector diode. In result, the Tx power is transmitted to the air interface via an antenna.

2-5. Radio component control

U101 monitors the state of the radio part, and delivers the information to U203. Then, U203 sends the proper control signals to radio relating regulators and AGCs. The radio interface signals are summarized in the Table 2-2

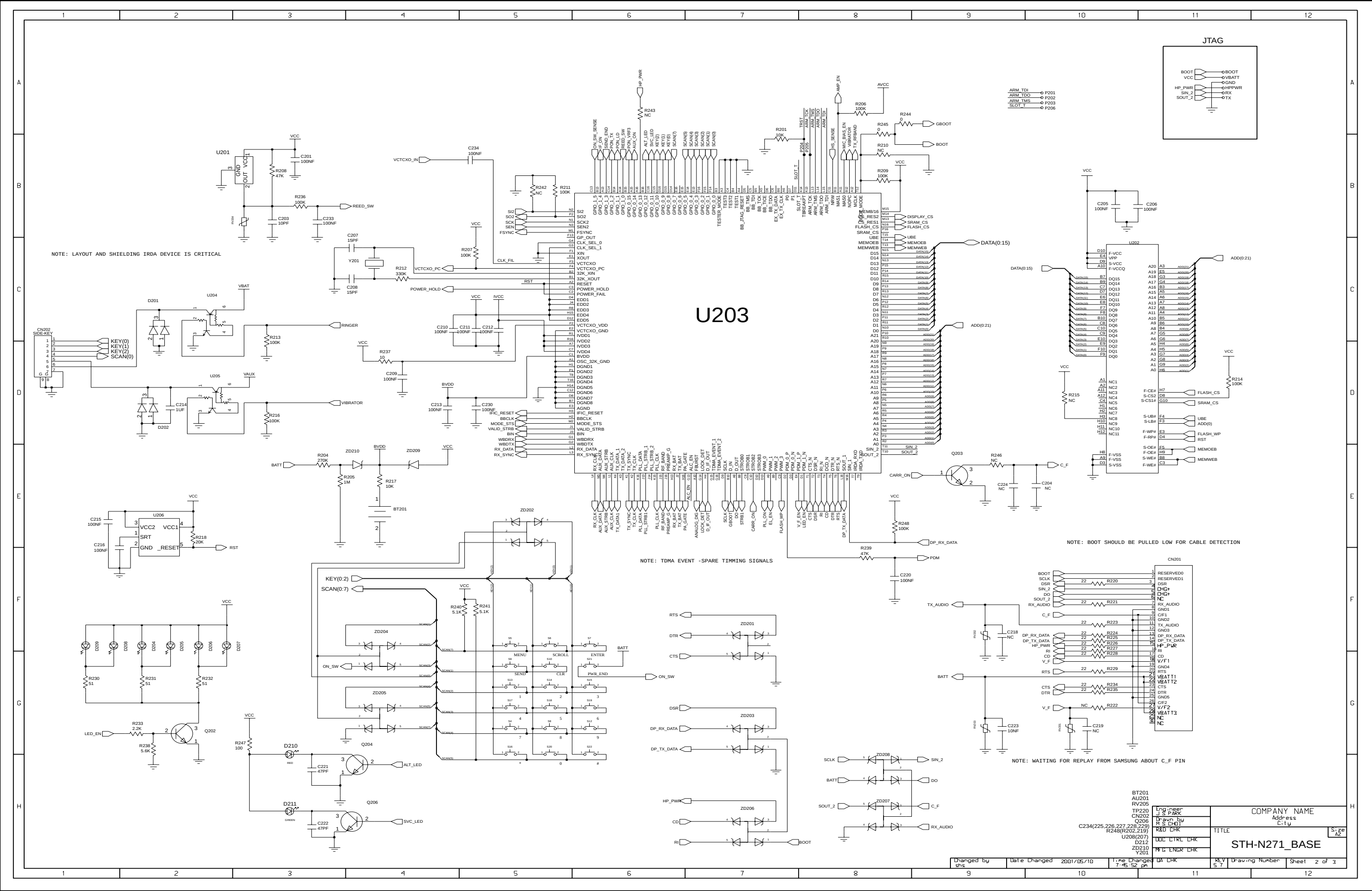
Table 2-2. Radio Interface Signals

Signal Name	Source/Destination	Function
PON_LD	BEC / RFIC	Limiter / Discriminator power control
TX_RFBAND	BEC / IF VCO	Tx band control (0=PCS, 1=Cell)
VCTCXO_IN	TCXO / BEC	14.4 MHz clock
VCTCXO_PC	BEC / TCXO	14.4 MHz clock power control
PLL_DATA	BEC / RFIC	PLL serial data
PLL_CLK	BEC / RFIC	PLL serial clock
PLL_STRB1	BEC / RFIC	PLL serial strobe
RF_BAND	BEC / Various	Cell / PCS band select (0=Cell, 1=PCS)
PREAMP_G	BEC / Regulator	Rx AGC Gain step
RX_BAT	BEC / RFIC	Receiver power control
TX_BAT	BEC / RFIC	Transmitter power control
ANALOG_DIG	BEC / Oscillators	Band control (0=Analog, 1=Digital)
LOCK_DET	RFIC / BEC	PLL lock detect status
PLL_ON	BEC / Regulator	PLL power control(V_RF1:RFIC)
A_IF_IN	RFIC / IFC	IF comparator input
RX_Q, RX_QN	RFIC / IFC	Differential analog receive Q channel
RX_I, RX_IN	RFIC / IFC	Differential analog receive I channel
TX_Q, TX_QN	IFC / RFIC	Differential analog transmit Q channel
TX_I, TX_IN	IFC / RFIC	Differential analog transmit I channel
MOD	IFC / RFIC	Drive to modulator
TX_PWR	Detector / IFC	Tx power detector
RSSI	RFIC / IFC	Rx Signal Strength Indicator
AFC_OUT	IFC / VCTCXO	Auto Frequency Control voltage
AGC_OUT	IFC / RFIC	Auto Gain Control voltage
PA_CNT	IFC / RFIC	Power Amplifier control voltage
DEMOD	RFIC / IFC	Discriminator output
TXDA_REF	RFIC / IFC	Tx section common mode DC bias
PON_TX	BEC / Regulator	TX up converter power (V_RF2:RFIC)
PON_VRF3	BEC / Regulator	Local Amp power(V_RF3:RFIC)



STH-N271 Circuit diagrams

4. STH-N271 BASE Circuit Diagram



5. STH-N271 RF Circuit Diagram

