



TDMA MOBILE TELEPHONE STH-A225

SERVICE *Manual*

TDMA MOBILE TELEPHONE



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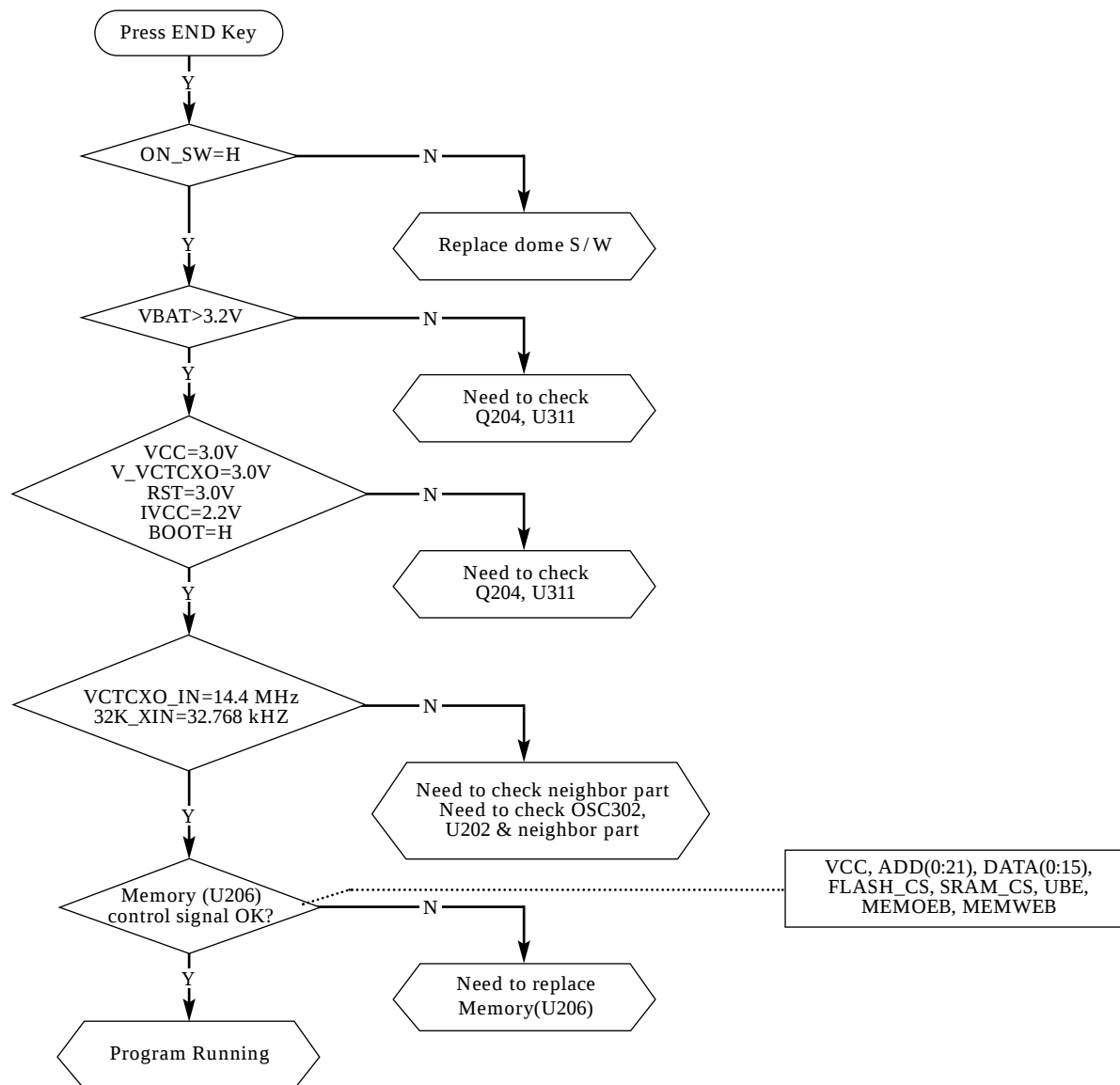
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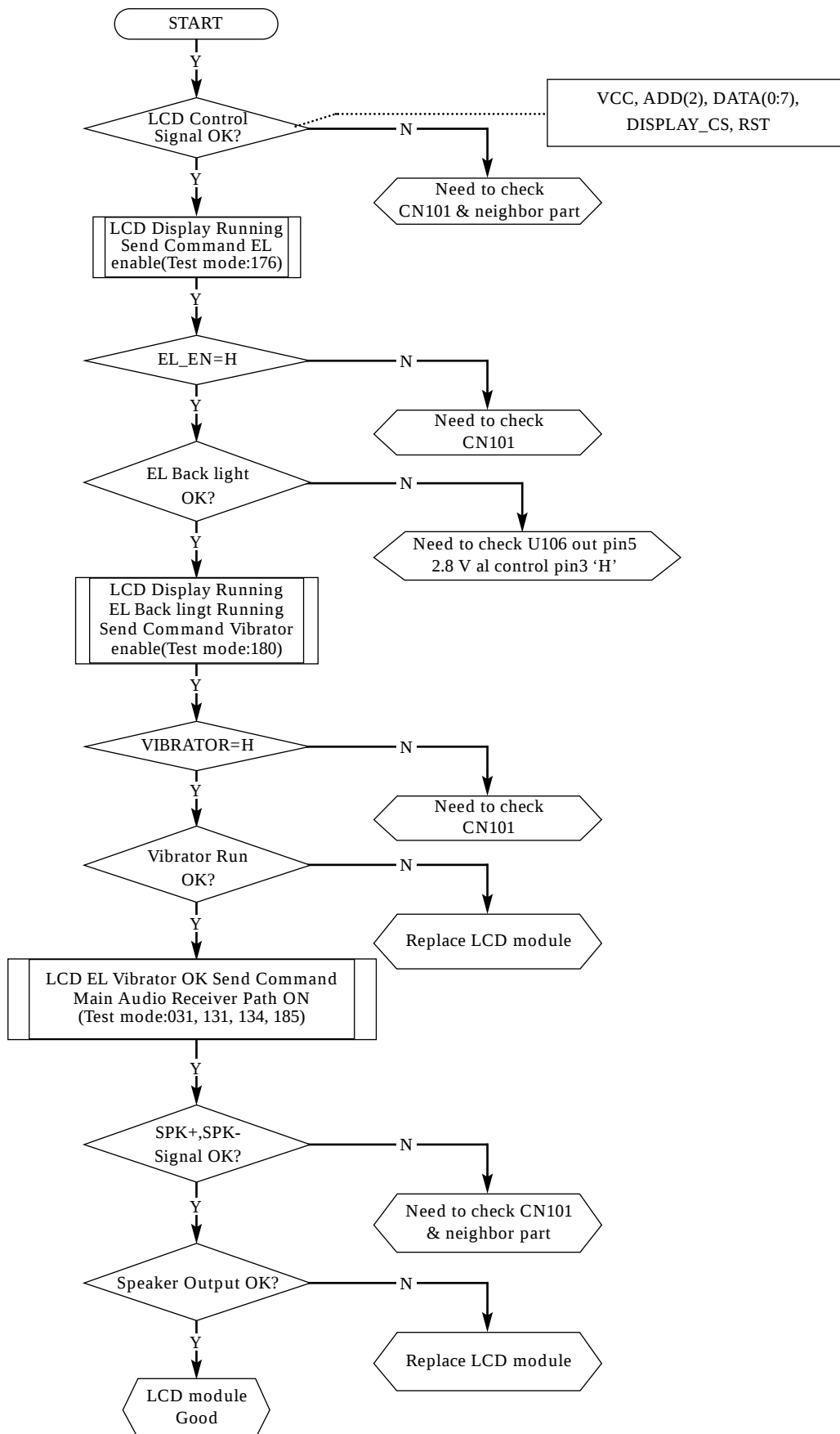
1. STH-A225 Trouble Shooting

1. Baseband Section

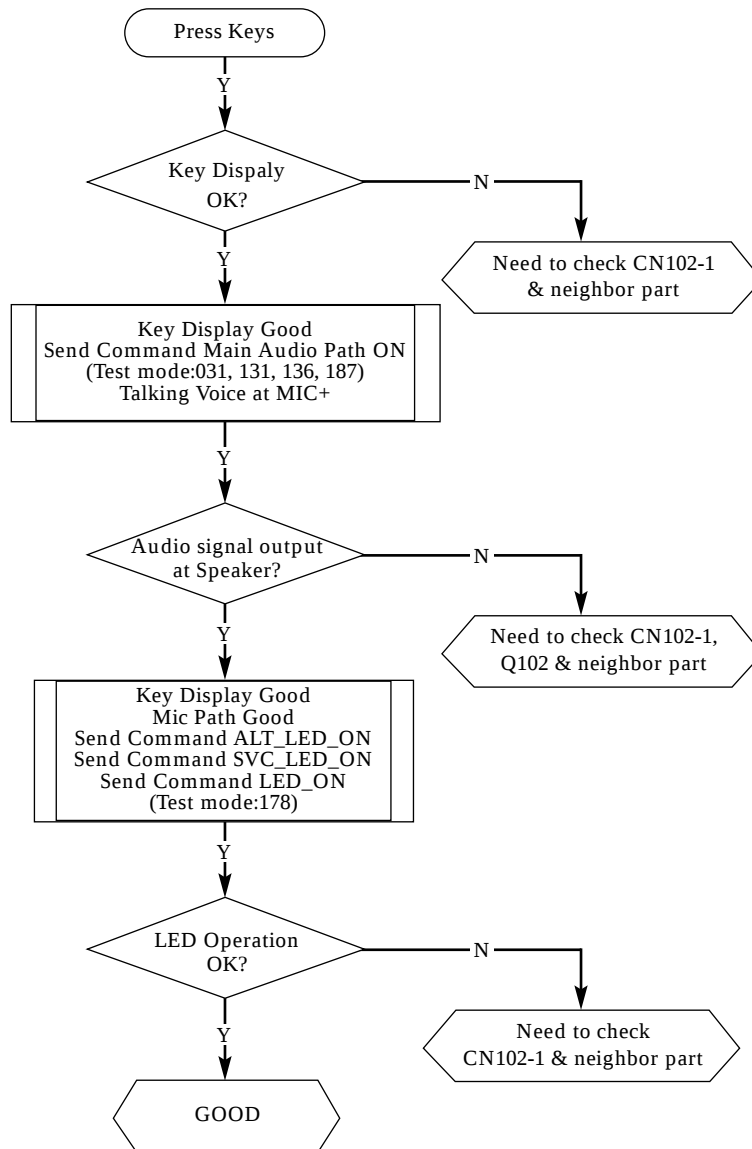
1-1. Program No Running



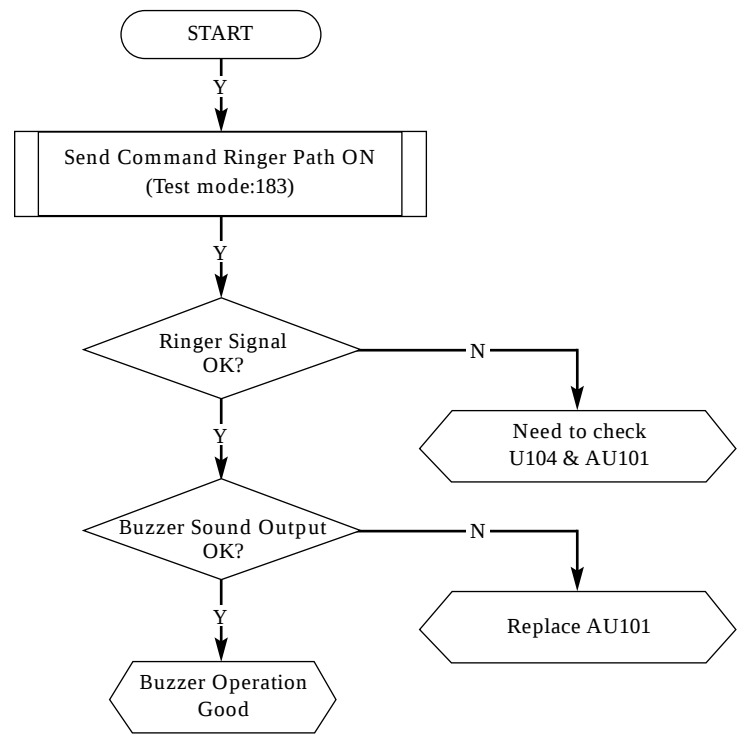
1-2. Abnormal LCD display ,EL Baob Light, Vibrator & Speaker Operation



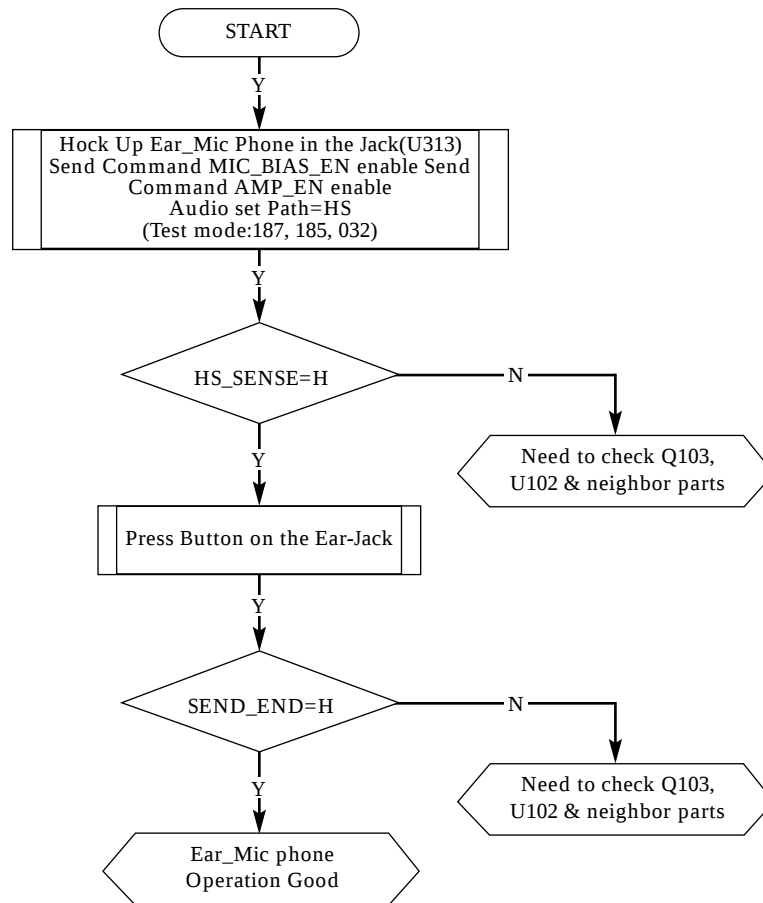
1-3. Abnormal Key, Mic, LED'S operation



1-4. Abnormal Buzzer Operation

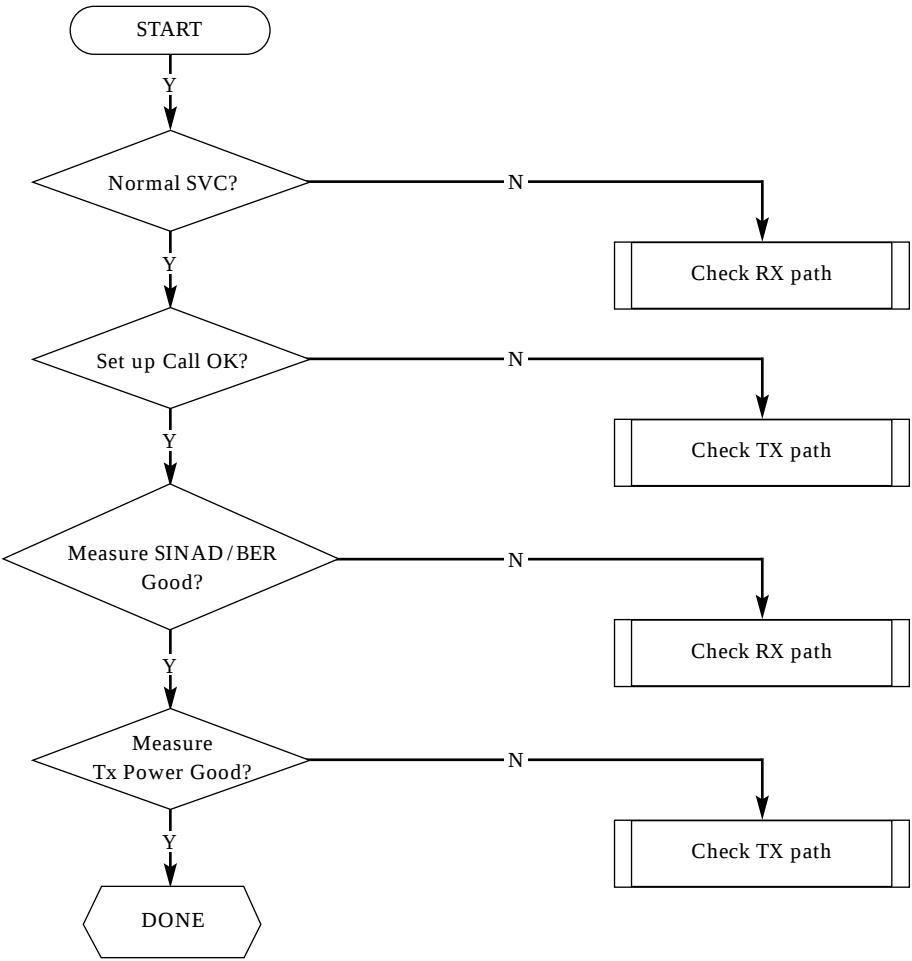


1-5. Abnormal external Ear_Mic Jack operation

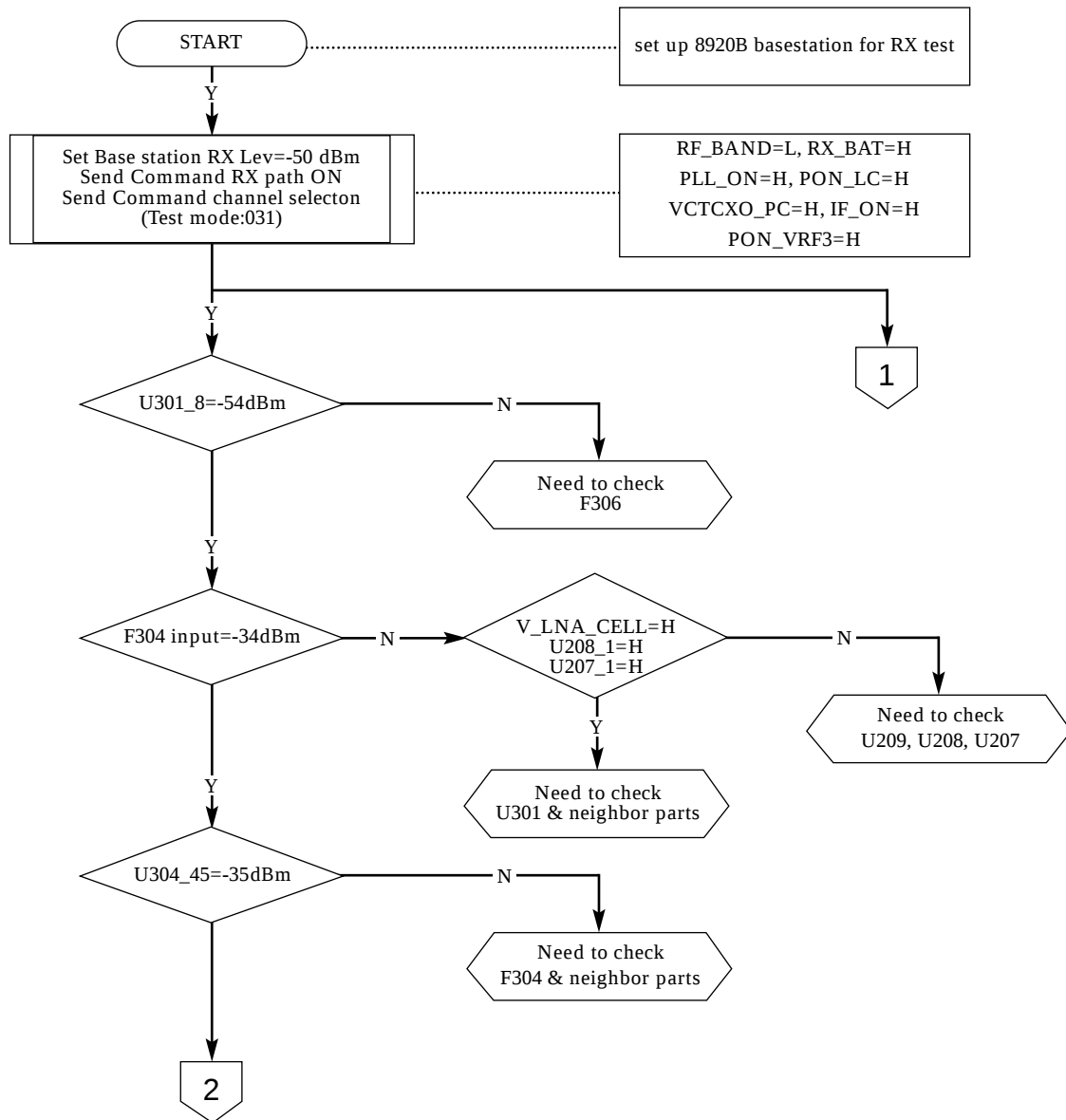


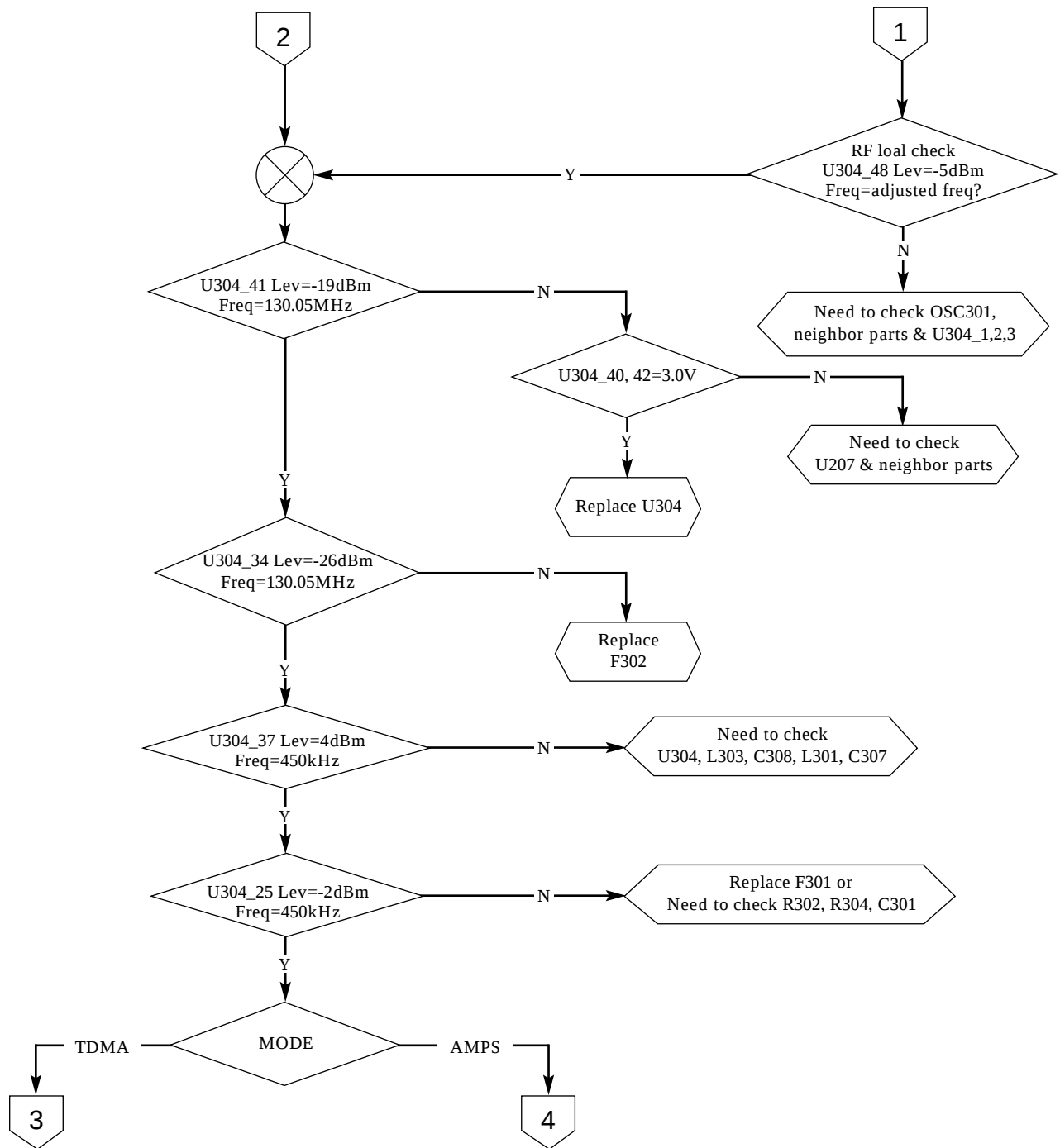
2. RF Section

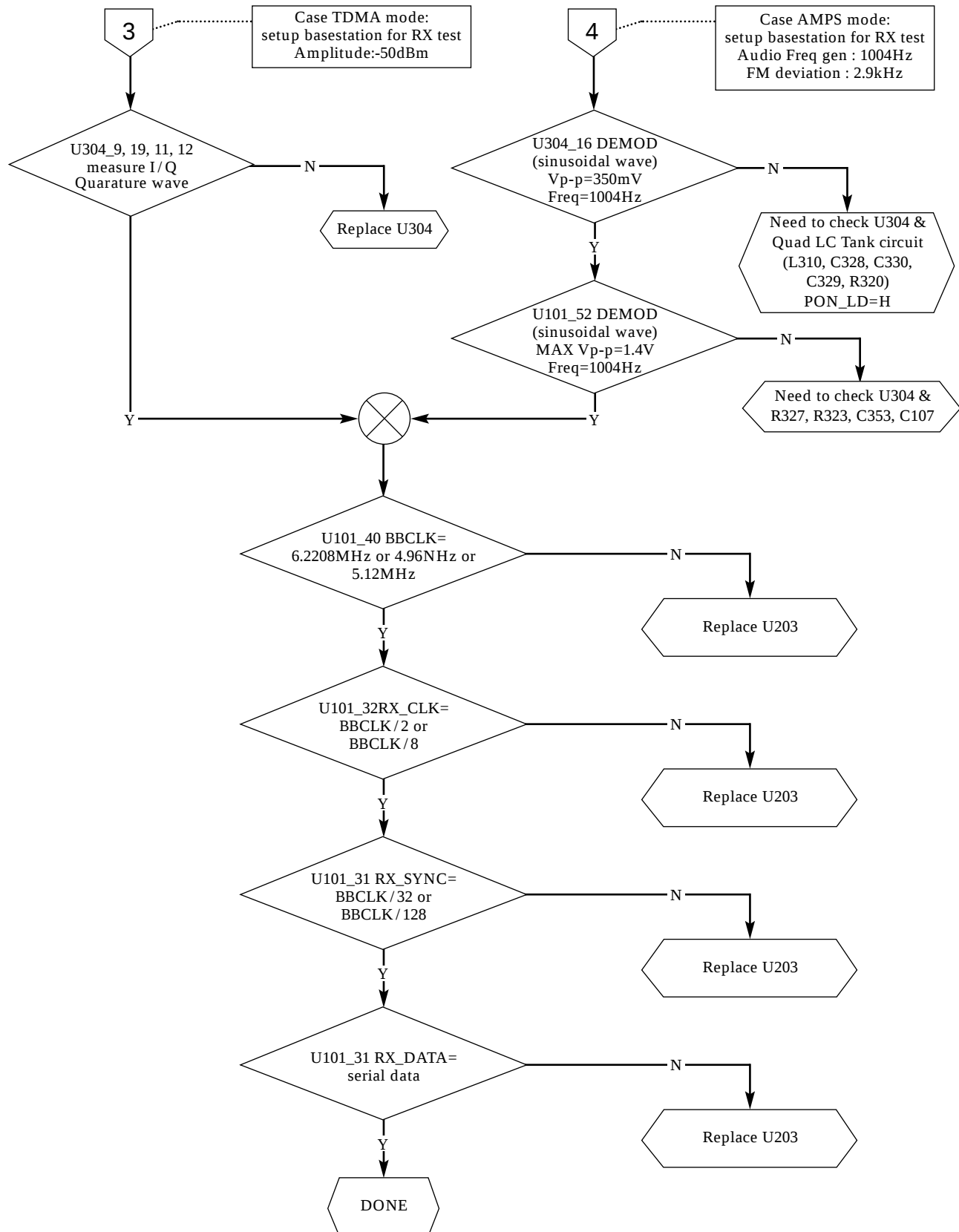
2-1. Call processing and Online Test



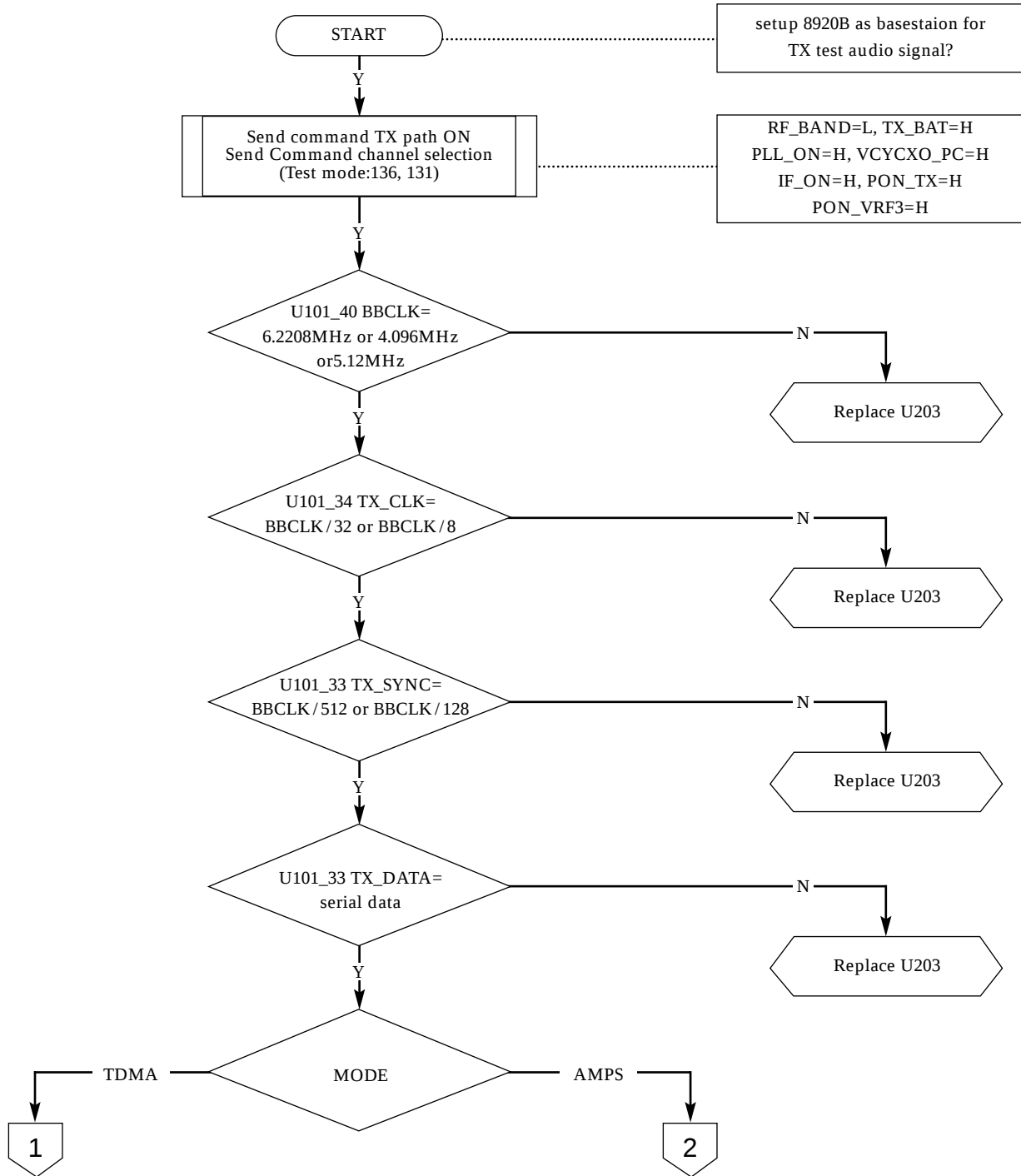
2-2. Receiver Section (Offline test)

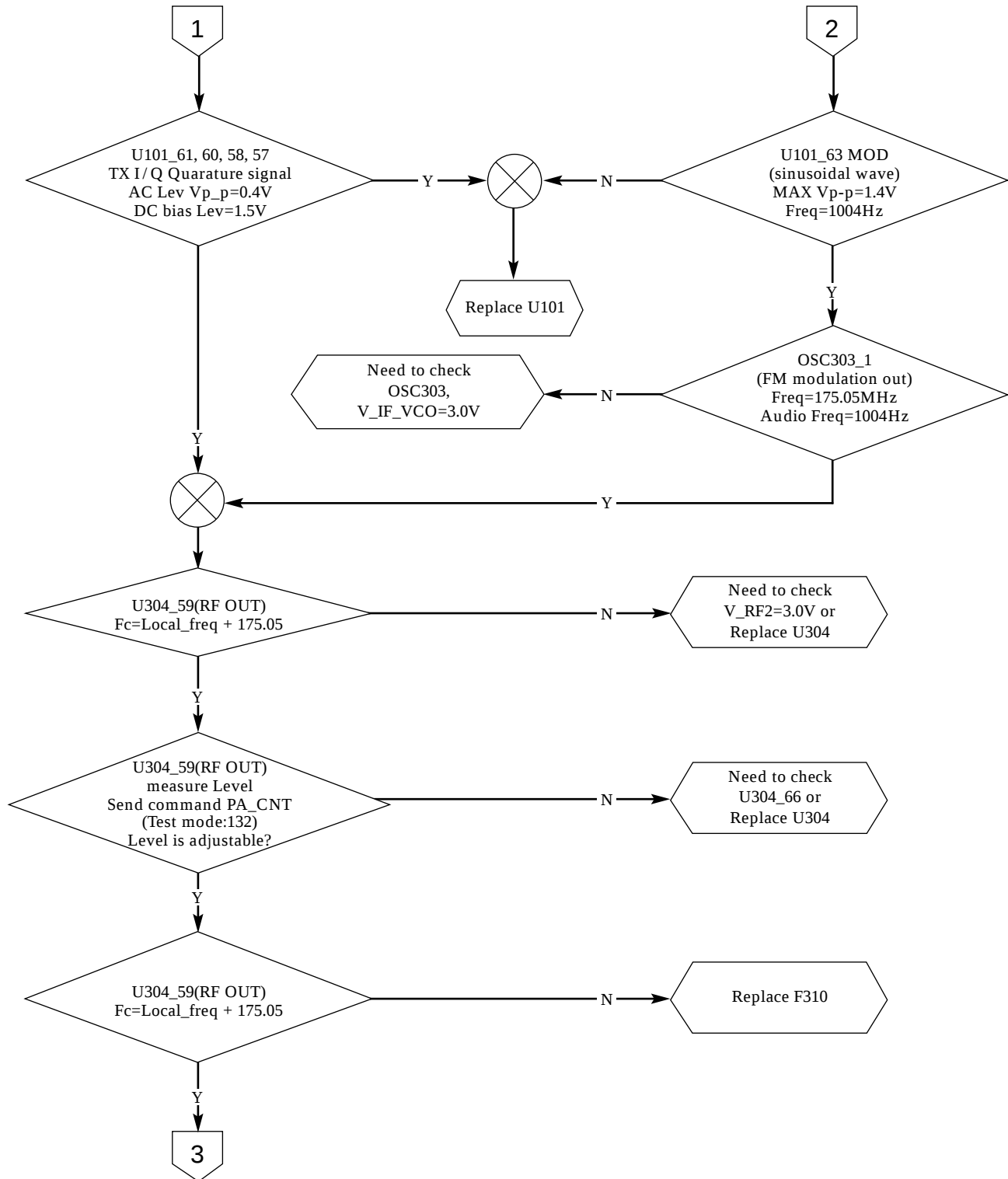


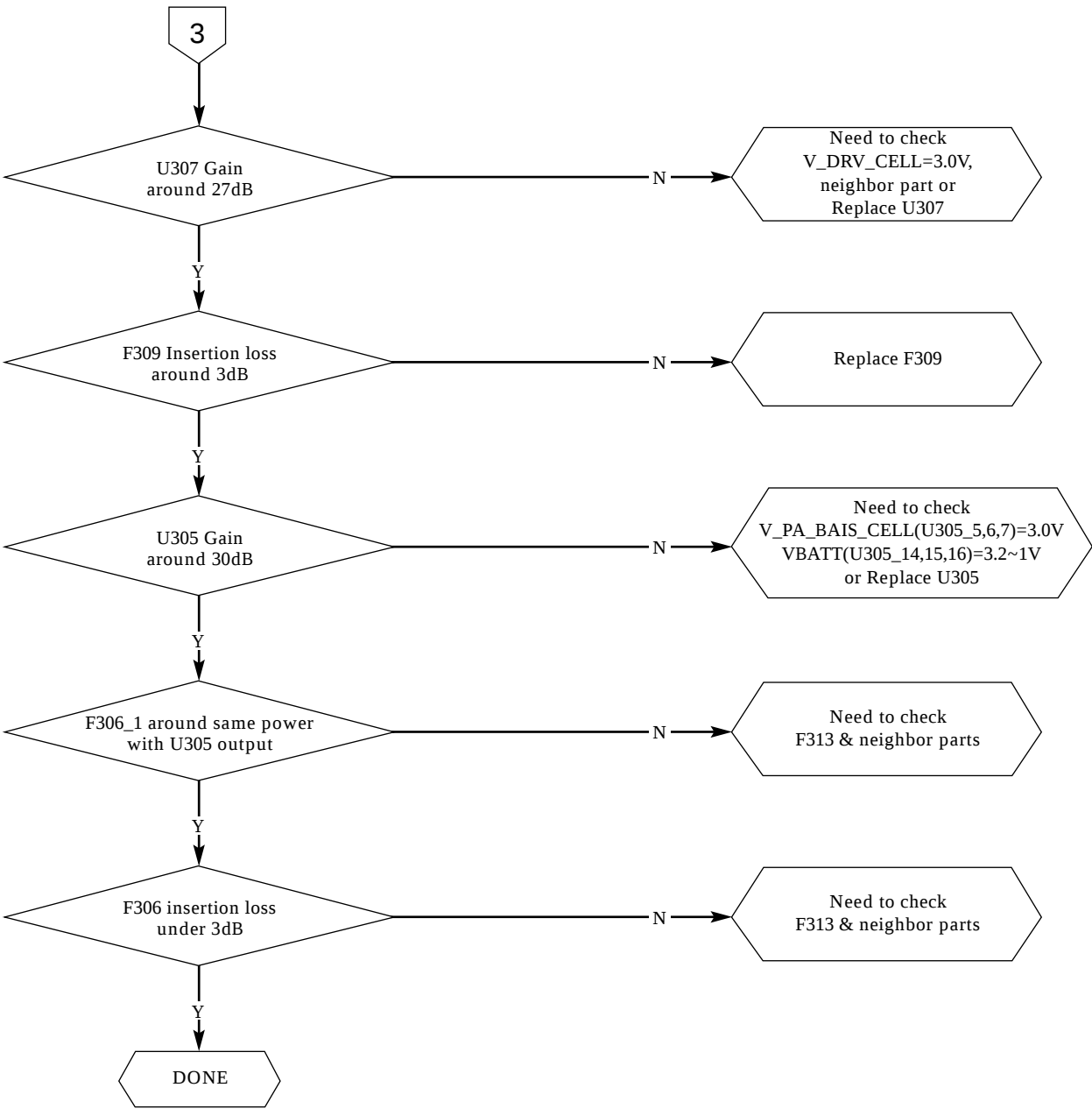




2-3. Transmitter Section (Offline test)







2. STH-A225 MAIN Electrical Parts List

Level	SEC CODE	Design LOC	DESCRIPTIONS
0	STH-A225G/TCE		
1	GH07-00092A		LCD-STHA225 MOTOR, SPK UG-18B75-FGHTX-A, STH-A225, -, 34.6 x
1	GH43-00360A		BATTERY-STHA205 LP473465B, STH-A205, LI-ION , 900 mAh, -, 4.2 V, -
1	GH44-00145G		CHARGER-SCHN105 TC TCH020ABN, SCH-N105, AC/DC, -, -, -, -,
1	GH59-00174A		UNIT-KEY PAD ASS'Y STH-A205, HUW9518-010010, -, KEY PAD ASS'Y, -,
1	GH92-00829A		PBA MAIN-STHA225 STH-A225, -, BRAZ, MAIN PBA, -, -, -, -, -
2	3002-001062	AU101	BUZZER-MAGNETIC 88dB, 3.6 V, 90 mA, 2.731KHz, TP
2	2203-005061	C101	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C102	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000254	C103	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, 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	2203-005061	C106	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C107	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
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	2203-005061	C111	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C112	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C114	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	2203-000233	C116	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000628	C117	C-CERAMIC, CHIP 0.022 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C118	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-001153	C119	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C120	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C121	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C122	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C123	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C124	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C125	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C126	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C127	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000278	C128	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-001153	C130	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C131	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C132	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C133	C-CERAMIC, CHIP 0.068 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	C135	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	2404-001105	C141	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
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	2203-000278	C144	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-005061	C145	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005065	C148	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2404-001088	C149	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001105	C150	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C151	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-000278	C152	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000330	C153	C-CERAMIC, CHIP 0.012 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000278	C154	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000330	C155	C-CERAMIC, CHIP 0.012 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000679	C156	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005061	C160	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C161	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005065	C162	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-005061	C163	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-001151	C164	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
2	2203-005061	C165	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-001153	C166	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C167	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C168	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C169	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-001153	C170	C-CERAMIC, CHIP 0.068 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C172	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C173	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-005061	C174	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000278	C175	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-005065	C176	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000278	C177	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000233	C178	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C179	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000679	C180	C-CERAMIC, CHIP 0.027 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005065	C181	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000233	C201	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C202	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000386	C203	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000386	C204	C-CERAMIC, CHIP 0.015 nF, 5 %, 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	2203-005061	C207	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C208	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C209	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005065	C210	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-005061	C211	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C218	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005061	C219	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-001088	C220	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001105	C221	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001105	C222	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005065	C223	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-005065	C224	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000940	C225	C-CERAMIC, CHIP 470 pF, 10 %, 50 V, X7R, TP, 1005, -
2	2404-001105	C226	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2404-001088	C227	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001088	C228	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001105	C229	C-TA, CHIP 10 uF, 20 %, 6.3 V, GP, TP, 2012
2	2203-005061	C230	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000438	C231	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005061	C232	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-005061	C233	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2404-001088	C234	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001151	C235	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
2	2404-001088	C236	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001088	C237	C-TA, CHIP 2.2 uF, 20 %, 6.3 V, GP, TP, 2012, -
2	2404-001151	C239	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
2	2203-005061	C240	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000628	C241	C-CERAMIC, CHIP 0.022 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C242	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2404-001151	C243	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
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	2203-000438	C304	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-001259	C305	C-CERAMIC, CHIP 0.008 nF, 0.5 pF, 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	2203-000278	C308	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000278	C309	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 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	2203-000438	C313	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000278	C314	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-005061	C315	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005053	C316	C-CERAMIC, CHIP 0.0039 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-000233	C318	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000233	C321	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005393	C322	C-CERAMIC, CHIP 0.005 nF, 0.1 pF, 50 V, NP0, TP, 1005
2	2203-000438	C323	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000489	C324	C-CERAMIC, CHIP 2.2 nF, 10 %, 50 V, X7R, 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, 0.5 pF, 50 V, NP0, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2203-000783	C329	C-CERAMIC, CHIP 0.33 nF, 5 %, 50 V, NP0, TP, 1608
2	2203-000233	C330	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
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	2203-005281	C333	C-CERAMIC, CHIP 0.0015 nF, 0.1 pF, 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	C340	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, 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	2203-005054	C345	C-CERAMIC, CHIP 0.0047 nF, 0.25 pF, 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	2203-005061	C358	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
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, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-001072	C363	C-CERAMIC, CHIP 0.056 nF, 5 %, 50 V, NP0, 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	2203-005061	C366	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005065	C367	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000233	C368	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000254	C369	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C370	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000425	C373	C-CERAMIC, CHIP 0.018 nF, 5 %, 50 V, NP0, TP, 1005

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2	2203-000278	C374	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000940	C375	C-CERAMIC, CHIP 470 pF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-005480	C376	C-CERAMIC, CHIP 33 nF, 10 %, 10 V, X7R, TP, 1005, -
2	2203-000138	C377	C-CERAMIC, CHIP 1.5 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000254	C378	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005061	C379	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, 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	2203-000440	C382	C-CERAMIC, CHIP 1 nF, 10 %, 50 V, X7R, TP, 1608, -
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	2203-005050	C387	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-005061	C388	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-005552	C390	C-CERAMIC, CHIP 0.0022 nF, 0.1 pF, 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	2203-000628	C396	C-CERAMIC, CHIP 0.022 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000278	C397	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000628	C398	C-CERAMIC, CHIP 0.022 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, 0.1 pF, 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	2203-001259	C407	C-CERAMIC, CHIP 0.008 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-005053	C408	C-CERAMIC, CHIP 0.0039 nF, 0.25 pF, 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, -

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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, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-000254	C417	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-001072	C418	C-CERAMIC, CHIP 0.056 nF, 5 %, 50 V, NP0, 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	2203-000438	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	2203-005481	C430	C-CERAMIC, CHIP 47 nF, 10 %, 10 V, X7R, 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	2203-005050	C441	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, 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	2404-001151	C449	C-TA, CHIP 33 uF, 20 %, 6.3 V, LZ, TP, 3216
2	2203-000696	C453	C-CERAMIC, CHIP 0.002 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-005061	C454	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000233	C455	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-000696	C456	C-CERAMIC, CHIP 0.002 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-000233	C463	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005481	C465	C-CERAMIC, CHIP 47 nF, 10 %, 10 V, X7R, TP, 1005, -
2	2203-005061	C466	C-CERAMIC, CHIP 100 nF, +80-20 %, 16 V, Y5 V, TP, 1005
2	2203-000254	C470	C-CERAMIC, CHIP 10 nF, 10 %, 16 V, X7R, TP, 1005, -
2	2203-005050	C471	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-005393	C472	C-CERAMIC, CHIP 0.005 nF, 0.1 pF, 50 V, NP0, TP, 1005
2	2203-005050	C473	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-001259	C474	C-CERAMIC, CHIP 0.008 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000233	C475	C-CERAMIC, CHIP 0.1 nF, 5 %, 50 V, NP0, TP, 1005
2	2203-005065	C476	C-CERAMIC, CHIP 1000 nF, +80-20 %, 10 V, Y5 V, TP, 1608
2	2203-000278	C477	C-CERAMIC, CHIP 0.01 nF, 0.5 pF, 50 V, NP0, TP, 1005
2	2203-000425	C478	C-CERAMIC, CHIP 0.018 nF, 5 %, 50 V, NP0, TP, 1005

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2	2203-005050	C479	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-005050	C480	C-CERAMIC, CHIP 0.0018 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	2203-000138	C482	C-CERAMIC, CHIP 1.5 nF, 10 %, 50 V, X7R, TP, 1005, -
2	2203-000696	C483	C-CERAMIC, CHIP 0.002 nF, 0.25 pF, 50 V, NP0, TP, 1005
2	3708-001396	CN101	CONNECTOR-FPC/FC/PIC 22P, 0.5 mm, SMD-A, SN
2	3711-004289	CN102	CONNECTOR-HEADER BOX, 30P, 2R, 0.5 mm, SMD-S, AUF
2	3710-001634	CN201	CONNECTOR-SOCKET 24P, 1R, 0.5 mm, SMD-A, AUF
2	1405-001082	D101	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D102	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	0407-000115	D103	DIODE-ARRAY DAN202U, 80 V, 100 mA, CA2-3, SC-70,
2	1405-001082	D104	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D105	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D202	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D203	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D204	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	1405-001082	D205	VARISTOR 5.6 V, 20A, 1 x 0.5 x 0.6 mm, TP
2	0404-001093	D302	DIODE-SCHOTTKY HSMS-282C, 1 V, 30 mA, SOT-323, TP
2	2903-001235	F301	FILTER-CERAMIC BP, 0.45 MHz, -, 6dB, 0.5dB, TP, -
2	2904-001270	F302	FILTER-SAW 130.05 MHz, 0.024 MHz, +-10.5KHz/0.5dB, TP, +-
2	2904-001173	F304	FILTER-SAW 881.5 MHz, 25 MHz, +-12.5MHz/2dB, TP, +-12.5MHz/3.5dB,
2	2909-001119	F306	FILTER-DUPLEXER 881.5 MHz, 836.5 MHz, 4/3dB, TP, 56dB, 40dB
2	2904-001172	F309	FILTER-SAW 836.5 MHz, 25 MHz, +-12.5MHz/1.5, TP, +-12.5MHz/2.5dB,
2	2904-001172	F310	FILTER-SAW 836.5 MHz, 25 MHz, +-12.5MHz/1.5, TP, +-12.5MHz/2.5dB,
2	4709-001226	F313	COUPLER-DIRECTION 800-850 MHz, 15.5dB, 24dB, 2 x 1.25 x 1 mm, TP
2	2903-001235	F314	FILTER-CERAMIC BP, 0.45 MHz, -, 6dB, 0.5dB, TP, -
2	3301-001438	L101	CORE-FERRITE BEAD AB, 75 ohm, 1 x 0.5 x 0.5 mm, 100 mA, TP,
2	3301-001438	L102	CORE-FERRITE BEAD AB, 75 ohm, 1 x 0.5 x 0.5 mm, 100 mA, TP,
2	2703-001868	L103	INDUCTOR-SMD 82 nH, 5 %, 1005
2	2703-001868	L104	INDUCTOR-SMD 82 nH, 5 %, 1005
2	3301-001438	L105	CORE-FERRITE BEAD AB, 75 ohm, 1 x 0.5 x 0.5 mm, 100 mA, TP,
2	2703-001727	L301	INDUCTOR-SMD 22 nH, 5 %, 1 x 0.5 x 0.5 mm
2	2703-000190	L302	INDUCTOR-SMD 330 nH, 10 %, 0.8 x 1.6 x 0.8 mm
2	2703-001860	L303	INDUCTOR-SMD 150 nH, 5 %, 1.6 x 0.8 x 0.8 mm
2	2703-001752	L304	INDUCTOR-SMD 39 nH, 5 %, 1.0 x 0.5 x 0.5 mm

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2	2703-000143	L305	INDUCTOR-SMD 180 nH, 10 %, 0.8 x 1.6 x 0.8 mm
2	2703-001790	L306	INDUCTOR-SMD 3.3 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2007-001298	L307	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2703-001751	L308	INDUCTOR-SMD 3.9 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2703-001242	L309	INDUCTOR-SMD 4.7 uH, 10 %, 1.6 x 0.8 x 0.8 mm
2	2703-002036	L310	INDUCTOR-SMD 330 uH, 5 %, 3.2 x 2.5 x 2 mm
2	2703-001730	L311	INDUCTOR-SMD 15 nH, 5 %, 1 x 0.5 x 0.5 mm
2	2703-001734	L312	INDUCTOR-SMD 6.8 nH, 5 %, 1 x 0.5 x 0.5 mm
2	2703-001242	L313	INDUCTOR-SMD 4.7 uH, 10 %, 1.6 x 0.8 x 0.8 mm
2	2703-001790	L314	INDUCTOR-SMD 3.3 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2203-000386	L316	C-CERAMIC, CHIP 0.015 nF, 5 %, 50 V, NP0, TP, 1005
2	2703-001747	L317	INDUCTOR-SMD 4.7 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2703-001747	L318	INDUCTOR-SMD 4.7 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2703-001728	L322	INDUCTOR-SMD 1.5 nH, 0.3 nH, 1 x 0.5 x 0.5 mm
2	2703-001733	L323	INDUCTOR-SMD 8.2 nH, 5 %, 1 x 0.5 x 0.5 mm
2	2703-002028	L324	INDUCTOR-SMD 12 nH, 5 %, 1.0 x 0.5 x 0.5 mm
2	2703-002039	L325	INDUCTOR-SMD 16 nH, 5 %, 2.29 x 1.73 x 1.52 mm
2	2703-001722	L326	INDUCTOR-SMD 18 nH, 5 %, 1.0 x 0.5 x 0.5 mm
2	2703-001747	L327	INDUCTOR-SMD 4.7 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2703-001733	L334	INDUCTOR-SMD 8.2 nH, 5 %, 1 x 0.5 x 0.5 mm
2	2703-001786	L335	INDUCTOR-SMD 10 nH, 5 %, 1.0 x 0.5 x 0.5 mm
2	2703-001729	L338	INDUCTOR-SMD 1.8 nH, 0.3 nH, 1 x 0.5 x 0.5 mm
2	2703-001181	L339	INDUCTOR-SMD 27 nH, 10 %, 1 x 0.5 x 0.5 mm
2	2007-001298	L341	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2703-001790	L343	INDUCTOR-SMD 3.3 nH, 0.3 nH, 1.0 x 0.5 x 0.5 mm
2	2703-000175	L344	INDUCTOR-SMD 270 nH, 10 %, 0.8 x 1.6 x 0.8 mm
2	2806-001242	OSC301	OSCILLATOR-VCO 998-1025/2059-2121M, -, -, TP, 2.7 V, 10mA
2	2809-001242	OSC302	OSCILLATOR-VCTCXO 14.4 MHz, 2ppm, 0.2ppm, TP, 2.8 V, -
2	2806-001243	OSC303	OSCILLATOR-VCO 175.05/210.09 MHz, -, -, TP, 2.7 V, 5mA
2	0504-000172	Q101	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	0504-000172	Q102	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP
2	0501-002318	Q103	TR-SMALL SIGNAL UMW8N, NPN, 150 mW, UMT6, TP, 27-270
2	0504-000168	Q201	TR-DIGITAL RN1104, NPN, 100 mW, 47K/47K, SSM, TP
2	0504-000172	Q202	TR-DIGITAL RN2104, PNP, 100 mW, 47K/47K, SSM, TP

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2	0501-000225	Q203	TR-SMALL SIGNAL 2SC4617, NPN, 200 mW, EM3, TP, 120-5
2	0501-000225	Q204	TR-SMALL SIGNAL 2SC4617, NPN, 200 mW, EM3, TP, 120-5
2	0504-000168	Q205	TR-DIGITAL RN1104, NPN, 100 mW, 47K/47K, SSM, TP
2	0505-001464	Q206	FET-SILICON SI1305DL, P, 8 V, 0.86A, 0.28 ohm, 0.26 W, SOT-323
2	0505-001469	Q301	FET-SILICON SI1902DL, N, 20 V, +-0.66A, 0.63 ohm, 0.27 W, SOT-363
2	2007-000148	R101	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R102	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007135	R103	R-CHIP 18 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000142	R104	R-CHIP 2.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001335	R105	R-CHIP 36 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001341	R106	R-CHIP 680 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007943	R107	R-CHIP 560 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000148	R108	R-CHIP 10 kohm, 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	2007-007771	R111	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-008037	R112	R-CHIP 57.6 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-007771	R113	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R114	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R115	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R116	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R117	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R118	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R119	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R120	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R121	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R122	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R123	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R124	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R125	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R126	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R127	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001320	R128	R-CHIP 1.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000151	R129	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005

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2	2007-000151	R130	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001320	R131	R-CHIP 1.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R132	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001298	R133	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001298	R134	R-CHIP 51 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001295	R135	R-CHIP 39 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000566	R136	R-CHIP 220 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000566	R137	R-CHIP 220 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R138	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R139	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R140	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000152	R141	R-CHIP 20 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000157	R142	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R143	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R144	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
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	2007-000029	R202	R-CHIP 0 ohm, 5 %, 1/10 W, DA, TP, 2012
2	2007-000170	R203	R-CHIP 1 Mohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R206	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000636	R207	R-CHIP 270 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	2007-000138	R210	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R211	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R213	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R214	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R215	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R216	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R217	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R218	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R219	R-CHIP 22 ohm, 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

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-000173	R222	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	2007-000162	R230	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R232	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R233	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R234	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R235	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000167	R236	R-CHIP 390 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007573	R238	R-CHIP 330 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000157	R239	R-CHIP 47 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000758	R240	R-CHIP 330 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R241	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R242	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R243	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R244	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R245	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R246	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000146	R247	R-CHIP 6.8 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R249	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R250	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R251	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R252	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000153	R253	R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R254	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000152	R255	R-CHIP 20 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007573	R256	R-CHIP 330 kohm, 1 %, 1/16 W, DA, TP, 1005
2	2007-000172	R258	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001319	R259	R-CHIP 1.2 kohm, 5 %, 1/16 W, DA, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-000140	R260	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000153	R261	R-CHIP 22 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001325	R262	R-CHIP 3.3 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R264	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R265	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R266	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R267	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R268	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R269	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R270	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R271	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R273	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R274	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R275	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R276	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R278	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000173	R279	R-CHIP 22 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R280	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R281	R-CHIP 10 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R282	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001319	R301	R-CHIP 1.2 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R302	R-CHIP 0 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	2007-000172	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	2007-003112	R310	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R311	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R312	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R313	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000174	R314	R-CHIP 47 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001323	R315	R-CHIP 3 kohm, 5 %, 1/16 W, DA, TP, 1005

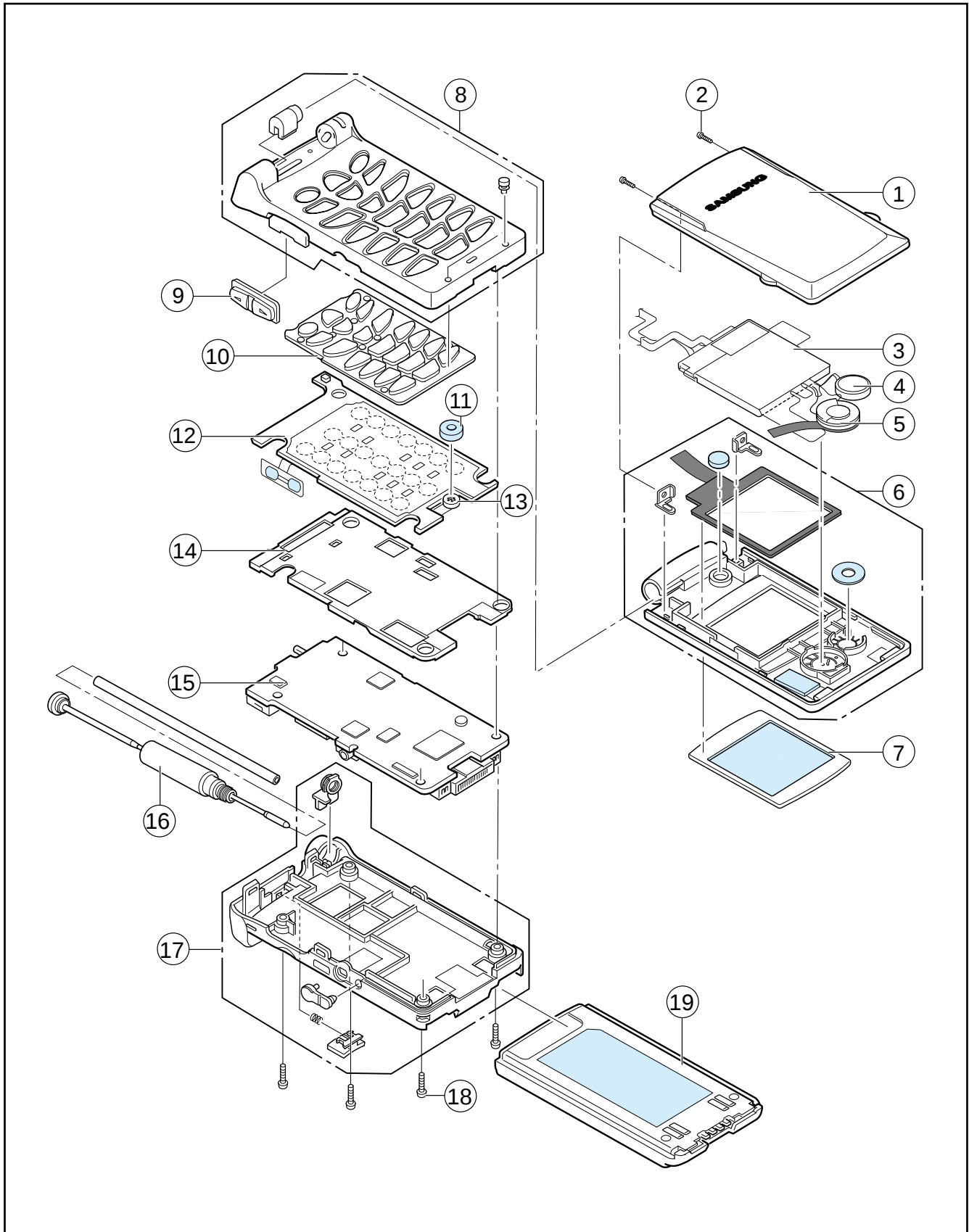
Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-000932	R316	R-CHIP 470 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R318	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-003112	R319	R-CHIP 27 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R320	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000148	R321	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	2007-000143	R324	R-CHIP 4.7 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
2	2007-001339	R327	R-CHIP 180 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	2007-000138	R330	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R331	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R332	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000143	R333	R-CHIP 4.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R334	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000566	R336	R-CHIP 220 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	2007-007771	R340	R-CHIP 0 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	2007-001316	R346	R-CHIP 820ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R347	R-CHIP 0 ohm, 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	2007-000138	R354	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R355	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	2007-000172	R356	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R357	R-CHIP 0 ohm, 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	2007-001298	R371	R-CHIP 51 ohm, 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
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	2007-000151	R385	R-CHIP 15 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001333	R386	R-CHIP 18 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000162	R387	R-CHIP 100 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R389	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000172	R390	R-CHIP 10 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000142	R391	R-CHIP 2.7 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000140	R392	R-CHIP 1 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-001323	R393	R-CHIP 3 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R405	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007090	R406	R-CHIP 11 kohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R407	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-000138	R409	R-CHIP 100 ohm, 5 %, 1/16 W, DA, TP, 1005
2	2007-007771	R410	R-CHIP 0 ohm, 5 %, 1/16 W, DA, TP, 1005
2	1404-001165	TH101	THERMISTOR-NTC 10 kohm, 3 %, 4100 K, 30 mW/C, TP
2	1205-001826	U101	IC-TRANSCIEVER D5204-22, TQFP, 80P, 470MIL, PLASTIC, 3.6 V, -, -
2	1203-001979	U103	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V, 300

Level	SEC CODE	Design LOC	DESCRIPTIONS
2	0506-001054	U104	TR-ARRAY IMD10A, NPN/PNP, 2, 300 mW, SMT6, TP, 68-/100-600
2	1201-001639	U105	IC-AUDIO AMP 4882, SOP, 8P, 118MIL, -, -, PLASTIC, 5.5 V, -, -40to+85C,
2	1203-001917	U106	IC-VOLTAGE REGULATOR 5213, SOT-23, 5P, 50MIL, PLASTIC, 3.3, 222
2	2801-004025	U202	CRYSTAL-UNIT 0.032768 MHz, 20ppm, 28-ABK, 1.7fF, 65 kohm, TP
2	1205-001831	U203	IC-TRANSCEIVER D5205, BGA, 192P, 550MIL, PLASTIC, 3.6 V, -, -
2	4302-001119	U204	BATTERY-LI(2ND) 3 V, 0.1 mAh, -, -, 3.1 V, -
2	1107-001227	U206	IC-FLASH MEMORY 28F3204, 2M x 16Bit, CSP, 72P, 315MIL, 110nS, 3 V,
2	1203-001979	U207	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V,
2	0506-001054	U208	TR-ARRAY IMD10A, NPN/PNP, 2, 300 mW, SMT6, TP, 68-/100-600
2	0505-001462	U209	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	1203-001302	U210	IC-POS1.ADJUST REG. 5205, SOT-23, 5P, 119MIL, PLASTIC,
2	0505-001462	U211	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	1203-001979	U212	IC-VOLTAGE REGULATOR 5320, SSOP, 8P, 110MIL, PLASTIC, 6.12 V, 300
2	0505-001462	U213	FET-SILICON 1905, P, -8 V, 0.6A, 0.51 ohm, 0.3 W, SOT-363
2	1203-001835	U214	IC-RESET 3470, SOT23, 5P, -, PLASTIC, 0.99/1.01 V, 300 mW, -
2	1203-002129	U215	IC-VOLTAGE REGULATOR 71622, SOT-23, 5P, 62MIL, PLASTIC, 2.14/2.26
2	1201-001609	U301	IC-RF AMP 2363, SOP, 8P, 62MIL, DUAL, 18dB, PLASTIC, 5 V, -, -
2	3705-001178	U302	CONNECTOR-COAXIAL SMC, JACK, 100 Mohm, 50 ohm, .5DB
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	0801-000022	U310	IC-CMOS LOGIC 7S00, NAND GATE, SOP, 5P, 49MIL, SINGLE, TP,
2	0505-001165	U311	FET-SILICON SI3443D V, P, -20 V, +-3.5 mA, 65 Mohm
2	3722-001456	U313	JACK-PHONE 2P, 2.6PI, A uF, BLK, -
2	0406-001083	ZD101	DIODE-TVS -, 6.1/-/7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD102	DIODE-TVS -, 6.1/-/7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD103	DIODE-TVS -, 6.1/-/7.2 V, 150 W, SOT-323-5L
2	0406-001083	ZD104	DIODE-TVS -, 6.1/-/7.2 V, 150 W, SOT-323-5L
2	0406-001113	ZD201	DIODE-TVS ESDA5V3L, 5.3/-/5.9 V, 300 W, SOT-23
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	0404-001110	ZD206	DIODE-SCHOTTKY RB751S-40, 40 V, 30 mA, SOD-523, TP
2	0404-001110	ZD207	DIODE-SCHOTTKY RB751S-40, 40 V, 30 mA, SOD-523, TP

3. STH-A225 Exploded View and its Parts List

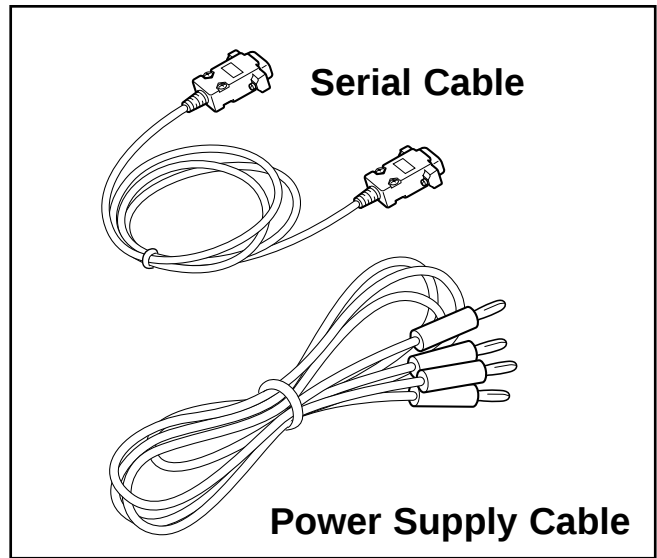
1. Cellular phone Exploded View



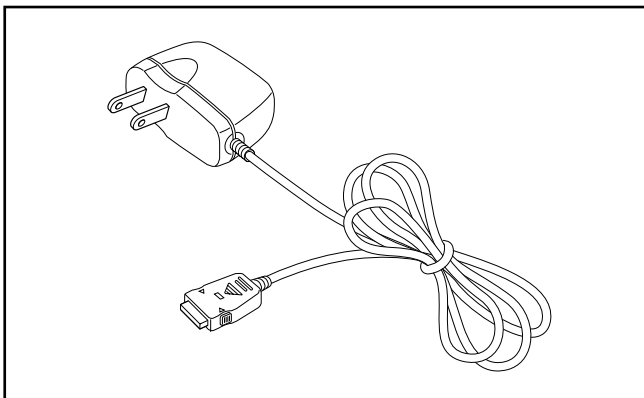
2. Cellular phone Parts List

Location No.	Description	SEC CODE		Remark	
		Gold	Silver		
1	FOLDER UPPER	GH72-01977A	GH72-01977B		SA
		GH72-01977E	GH72-01977F	colombia	SA
2	SCREW MACHINE	6001-000876	6001-000876		SA
3	LCD	GH07-00092A	GH07-00092A		SA
4	MOTOR	3101-001239	3101-001239		SA
5	SPEAKER	3001-001220	3001-001220		SA
6	SUA, FOLDER LOWER	GH75-00851A	GH75-00851B		SA
7	LCD WINDOW	GH72-00515J	GH72-00515J		SA
8	SUA, FRONT COVER ASS'Y	GH75-00848A	GH75-00848B		SA
9	VOLUME EKY ASS'Y	GH75-00852A	GH75-00852B		SA
10	KEY PAD	GH73-00156G	GH73-00156G		SA
11	MIC HOLDER	GH73-00547A	GH73-00547A		SA
12	KEY PCB	GH59-00174A	GH59-00174A		SA
13	MIC	GH59-00299A	GH59-00299A		SA
14	SHIELD COVER	GH72-01980A	GH72-01980A		SA
15	MAIN PBA	GH92-00829A	GH92-00829A		SA
16	ANTENNA	GH42-00160A	GH42-00160B		SA
17	SUA, REAR COVER	GH75-00849A	GH75-00849B		SA
18	SCREW MACHINE	6001-001057	6001-001057		SA
19	BATTERY	GH43-00360B	GH43-00360B	900mAh	SA

3. Test Jig (GH80-00614A)



4. TC (GH44-00145G) 110V Mexico, Colombia, Brazil



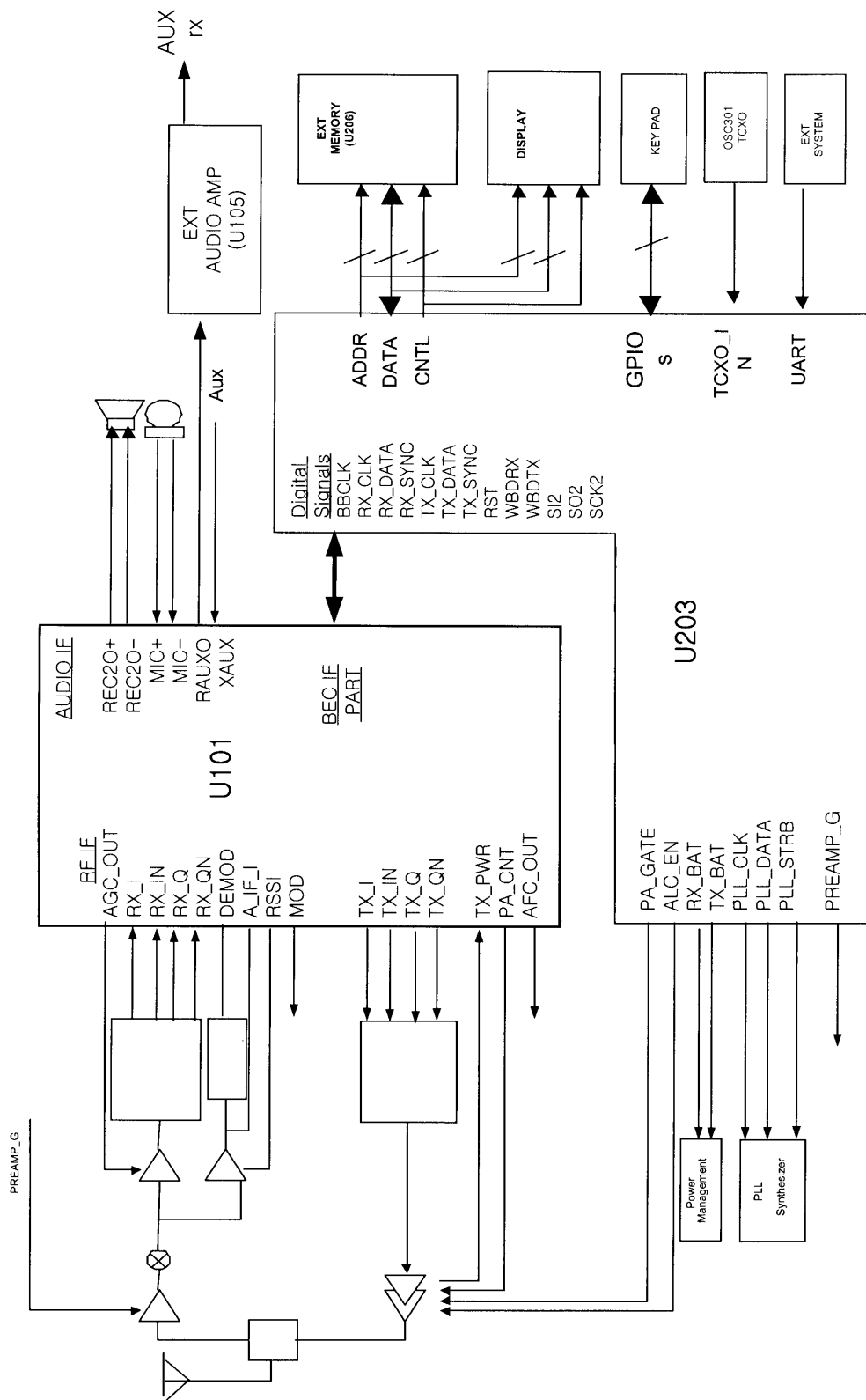
5. RF Test Cable (GH39-00093A)

6. Cigarette Lighter Adaptor (GH44-00091A)

7. Test Cable (GH39-00092A)

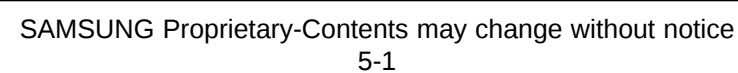
4. STH-A225 Block Diagrams

1. Base Band Part Block Diagram

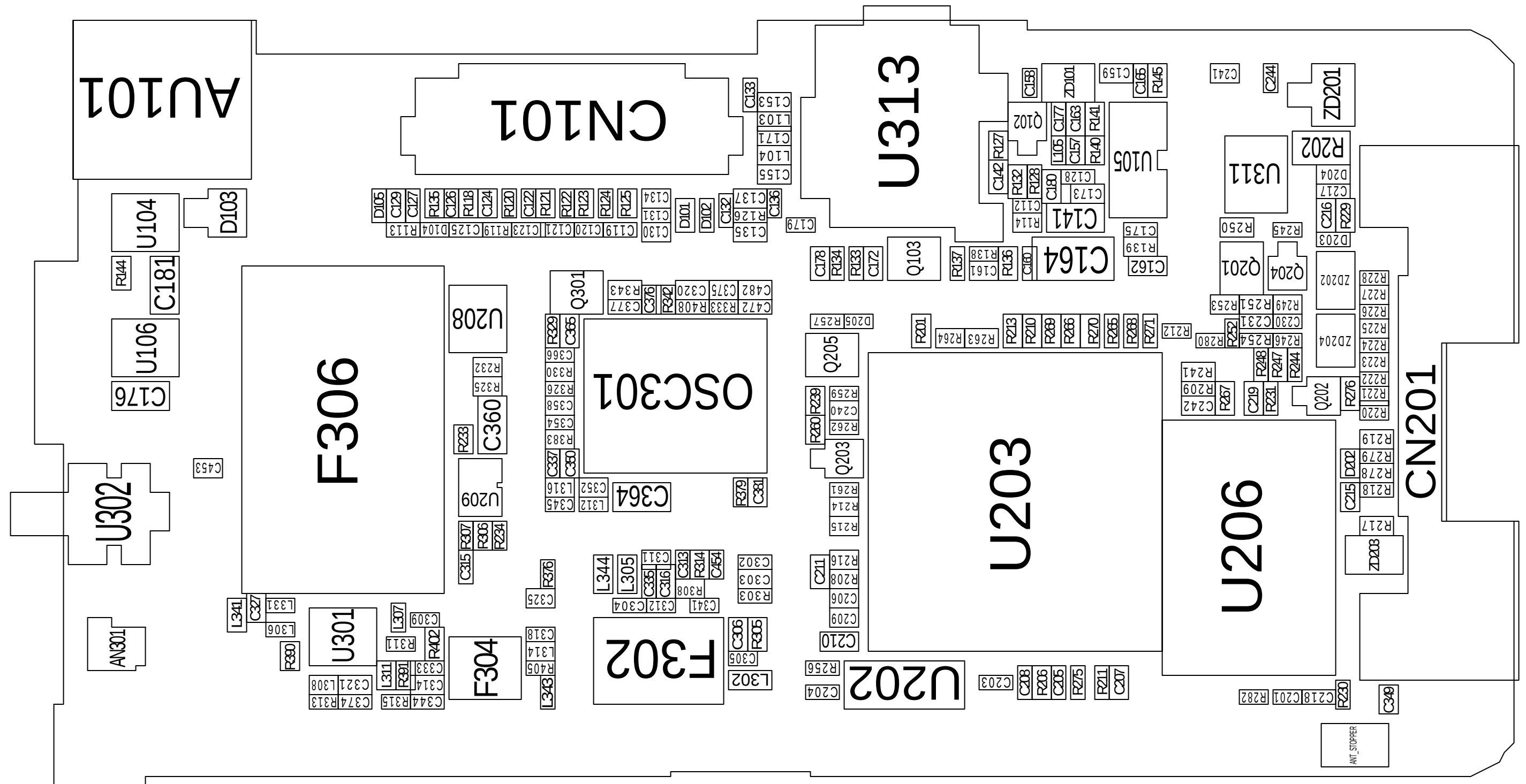




1. Main PCB Top Diagram



2. Main PCB Bottom Diagram



10. STH-A225 Circuit Description & Circuit Diagrams

STH-A225 provides the AMPS and the Digital TDMA (cellular band only) of compliance with TIA / EIA-137. The radio operation of the STH-A225 has been implemented with the receiver, the transmitter, and the local oscillator controlled by the PLL. The circuit of the STH-A225 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 Q204. In addition, U311 is turned on by Q204, and thus the BATT is connected to VBAT. Consequently, VBAT is supplied to input of regulators U103 and U215. The regulator U103 supplies all powers of baseband part (VCC, AVCC, V_VCTCXO). The regulator U215 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 Q202. Moreover, Q202, Q204 and U311 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 U103 and U215 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 Q204. 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 (Figure1). 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 (SRAM, ROM), Key Pad and LCD module. 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. Table1 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.

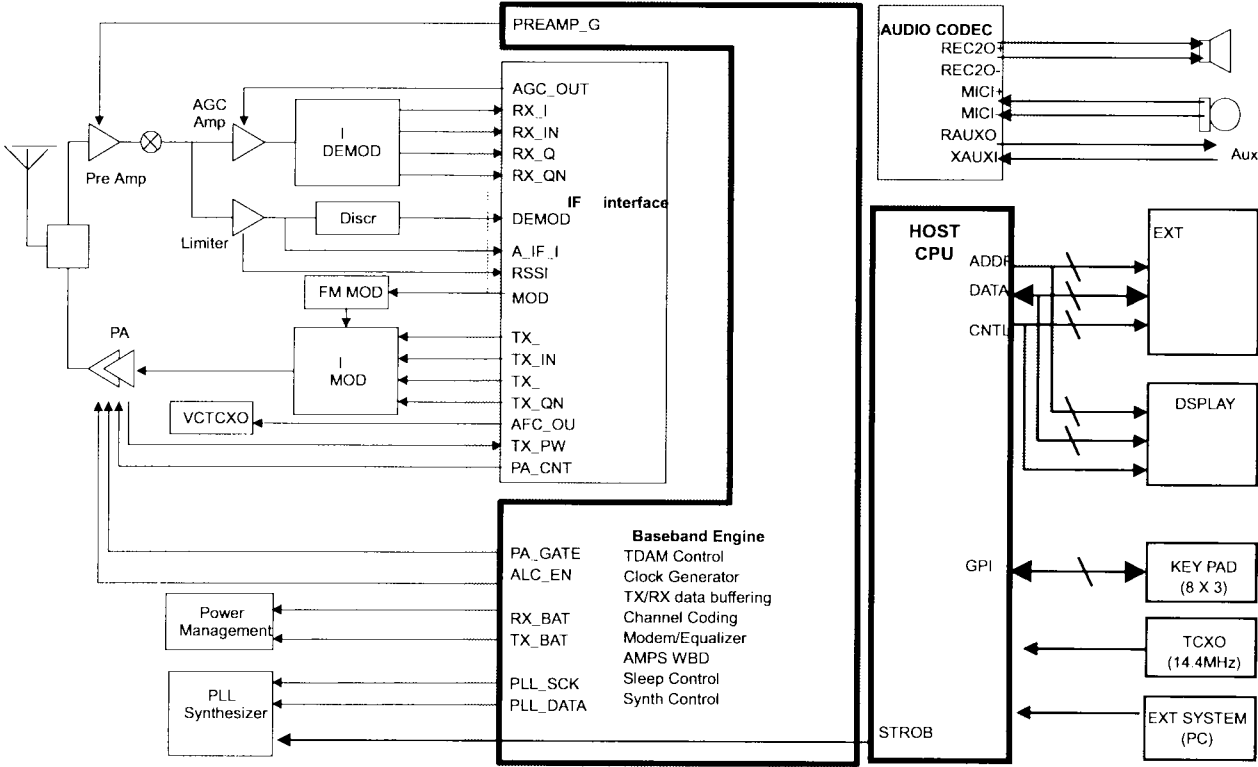


Figure1. BEC interface and block diagram

Table1. 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). For the power fail mode and the sleep mode, additional crystal oscillator (U202) 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 U206)

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 U206)

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

Key Pad Module

The Key Pad module is connected to main board by connector, CN201-1. 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. In addition, this module contains Micro-phone and six backlight LEDs that will help to operate phone in the dark.

LCD Module

LCD module is connected to main board by connector, CN101. This contains an LCD controller, an EL (Electro-Luminescent) driver, a speaker, and a vibrator. An LCD controller controls the information of displaying from the BEC (parallel 8-bit data) to the LCD. The EL driver IC turns on and off the EL backlight.

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). 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 the keypad and display board respectively. 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.

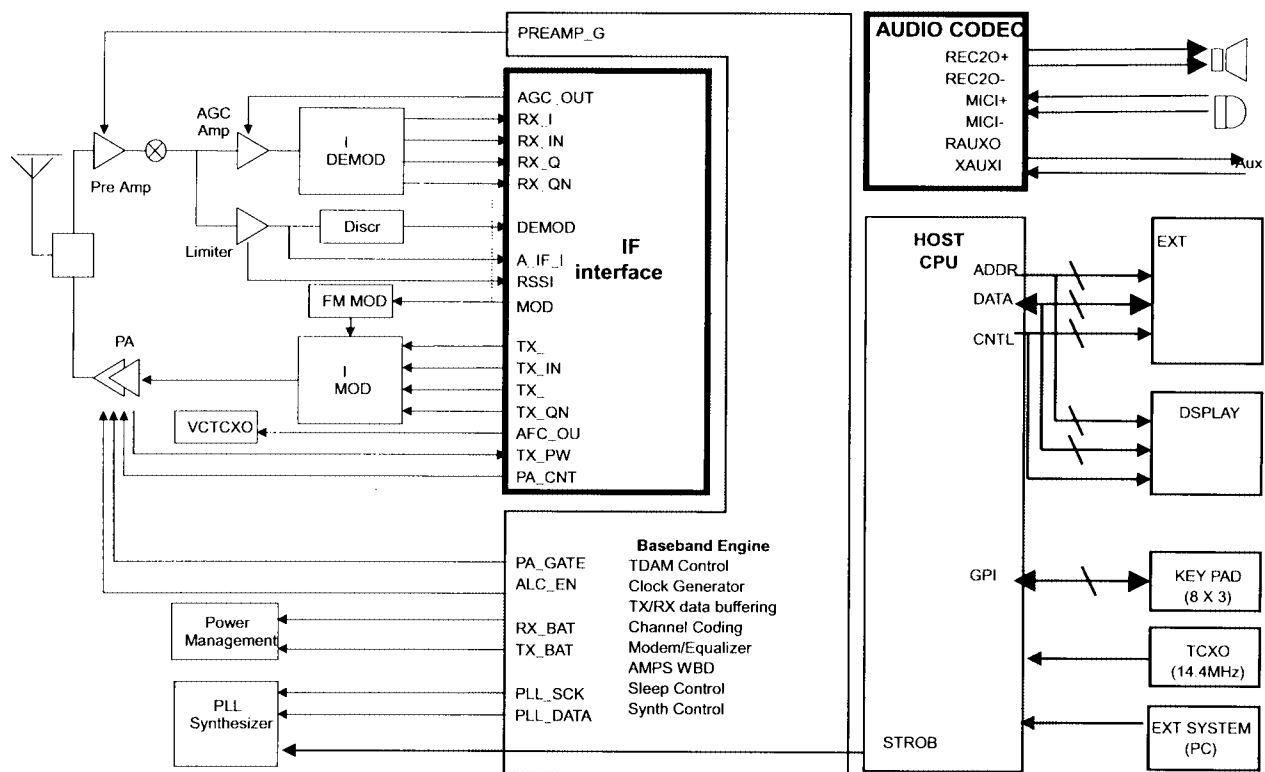


Figure 2. IFC interface and block diagram

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 the keypad module and LCD module boards, respectively. 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 (Q103_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 (Q103_5) 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 (U105) is applied before connection to the headset and HFK.

2. RF Section

2-1.Introduction

From the starting point of developing the STH-A225, the cellular and the PCS band operations have been intended. Therefore, the STH-A225 contains many dual-band components and rooms for PCS band components, in order to widen the operating band for the next product. The active components is playing essential role in the radio part 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-A225 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.

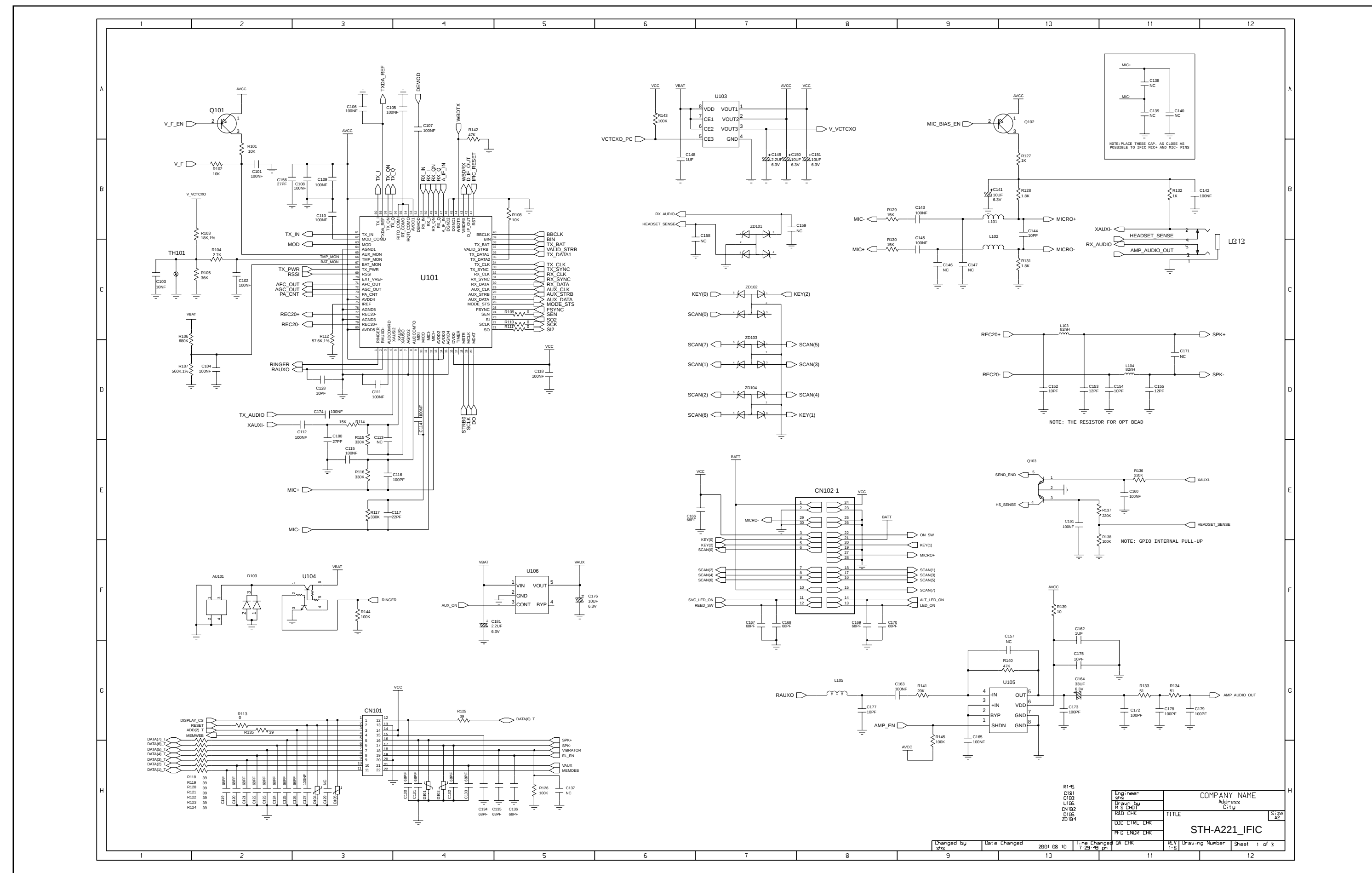
2-5. Radio component control

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.

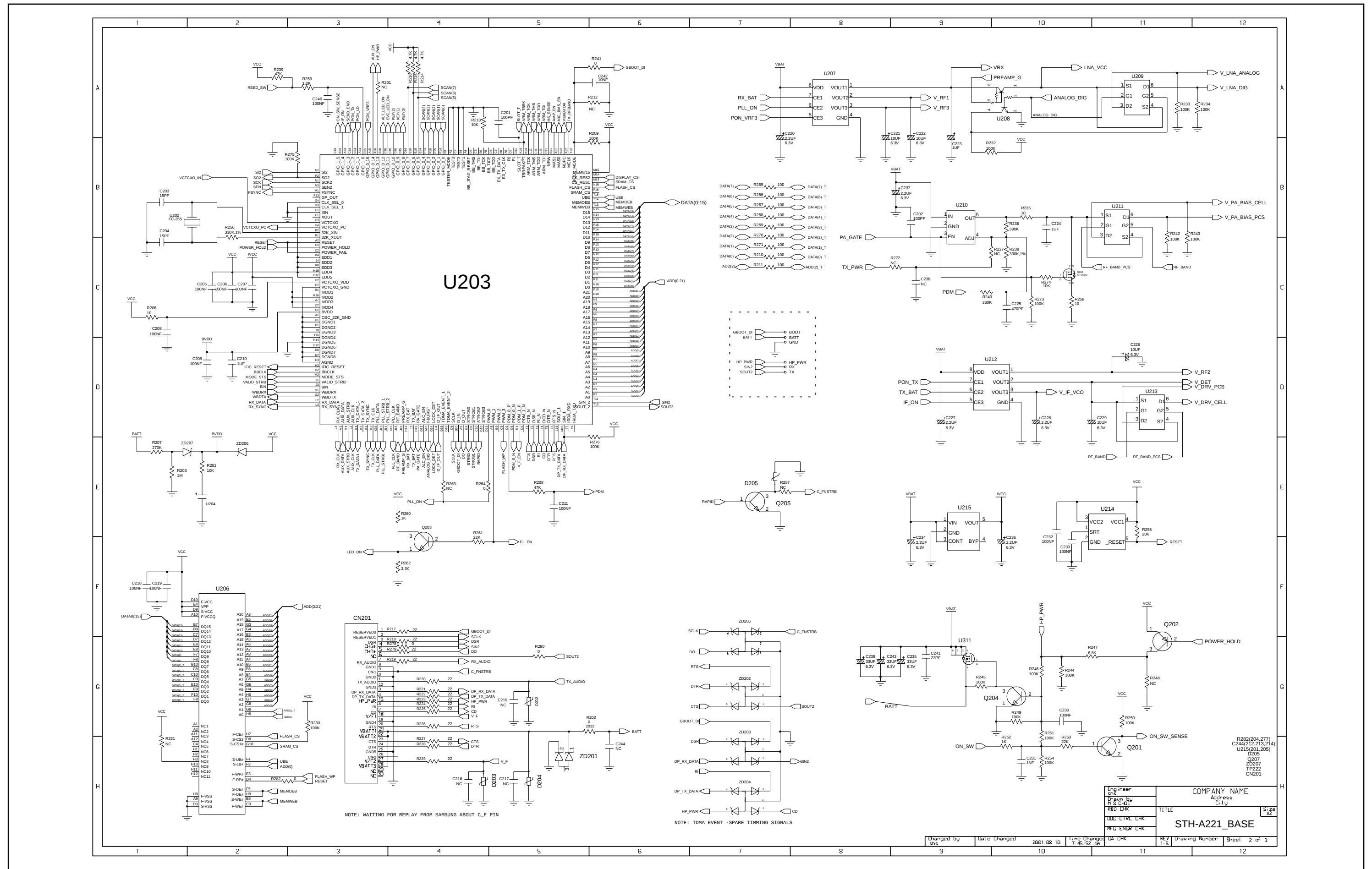
Table 2. Radio Interface Signals

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)

3. IFIC Circuit Diagram



4. BASE Circuit Diagram



5. RF Circuit Diagram

