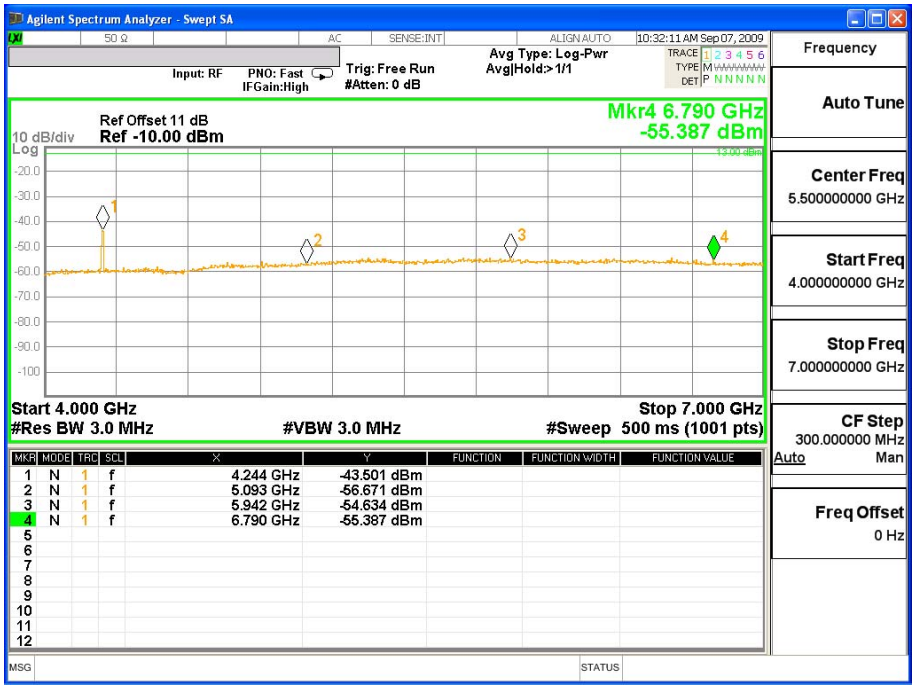
5.6. Test Result of Spurious Emission

Product	GPS TRACKER		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/09/07	Test Site	CTR
Test Condition	GSM 850 Voice	Test Range	30MHz~10GHz

GSM 850 Voice Middle-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1697.6	-45.691	0.58	-45.111	-13
2546.4	-26.175	0.7	-25.475	-13
3395.2	-56.208	1.01	-55.198	-13
4244	-43.501	1.18	-42.321	-13
5092.8	-56.671	1.23	-55.441	-13
5941.6	-54.634	1.45	-53.184	-13
6790.4	-55.387	1.56	-53.827	-13
7639.2	-54.102	1.59	-52.512	-13
8488	-52.194	1.82	-50.374	-13


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:31:25 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.395 GHz
-56.208 dBm
Start 1.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 1.698 GHz -45.691 dBm
2 N 1 f 2.546 GHz -26.175 dBm
3 N 1 f 3.395 GHz -56.208 dBm
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

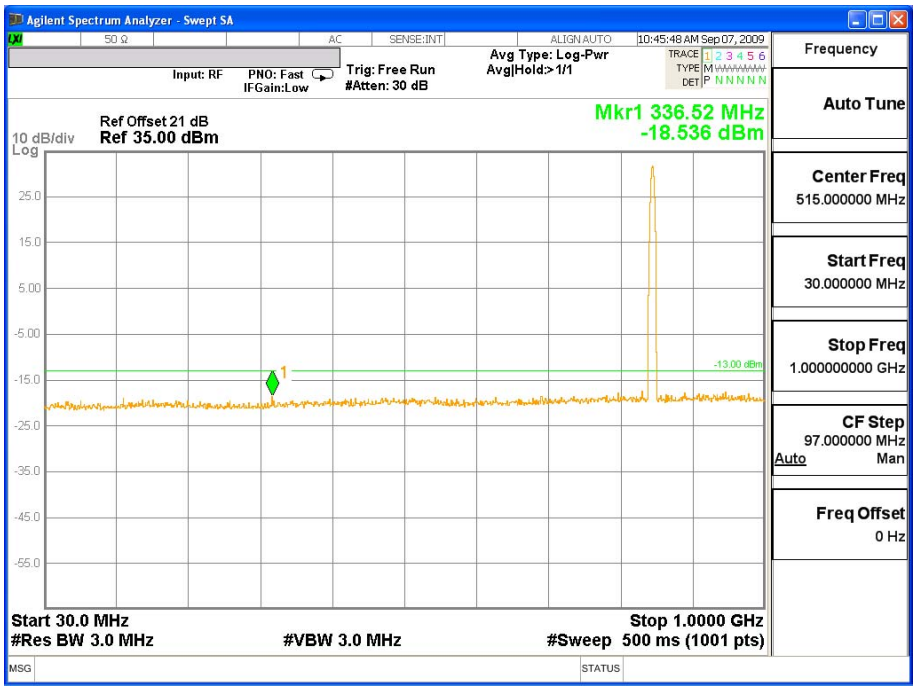

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:32:11 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.790 GHz
-55.387 dBm
Start 4.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 4.244 GHz -43.501 dBm
2 N 1 f 5.093 GHz -56.671 dBm
3 N 1 f 5.942 GHz -54.634 dBm
4 N 1 f 6.790 GHz -55.387 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:32:37 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 8.488 GHz
-52.194 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 7.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.639 GHz -54.102 dBm
2 N 1 f 8.488 GHz -52.194 dBm
3
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

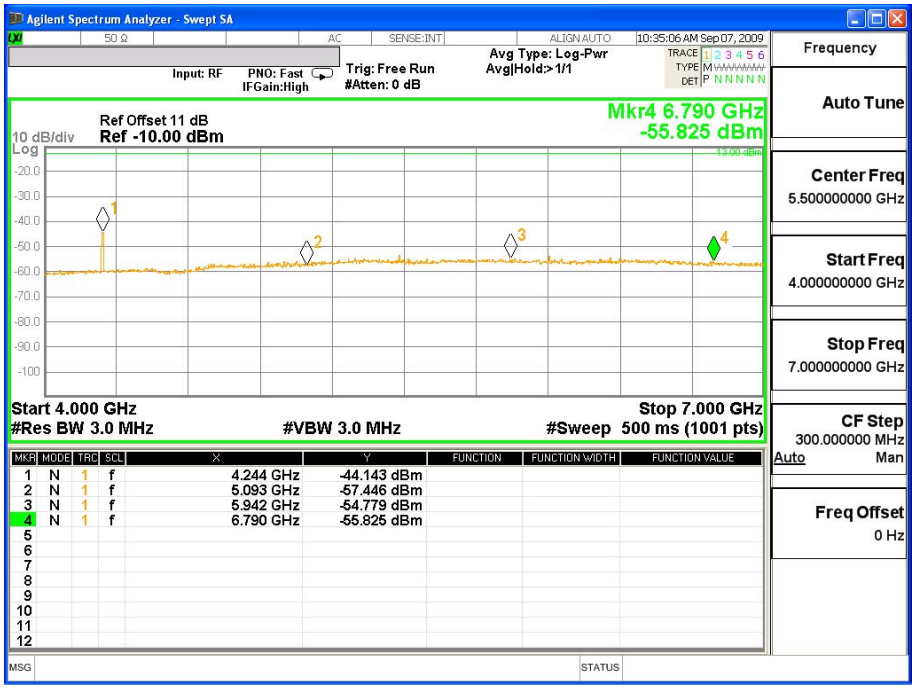
Product	GPS TRACKER		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/09/07	Test Site	CTR
Test Condition	GSM 850 GPRS	Test Range	30MHz~10GHz

GSM 850 GPRS Middle-Channel 251

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
1697.6	-46.575	0.58	-45.995	-13
2546.4	-27.361	0.7	-26.661	-13
3395.2	-56.908	1.01	-55.898	-13
4244	-44.143	1.18	-42.963	-13
5092.8	-57.446	1.23	-56.216	-13
5941.6	-54.779	1.45	-53.329	-13
6790.4	-55.825	1.56	-54.265	-13
7639.2	-55.655	1.59	-54.065	-13
8488	-52.071	1.82	-50.251	-13




Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:34:26 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 3.395 GHz
-56.908 dBm
Start 1.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 4.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 1.698 GHz -46.575 dBm
2 N 1 f 2.546 GHz -27.361 dBm
3 N 1 f 3.395 GHz -56.908 dBm
Frequency
Auto Tune
Center Freq
2.500000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
4.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

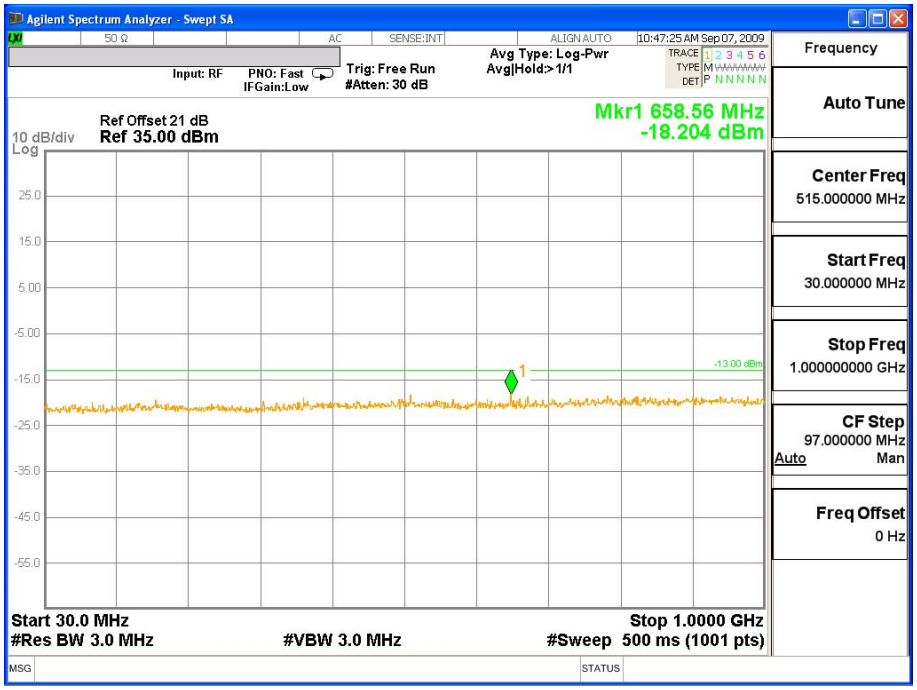

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:35:06 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr4 6.790 GHz
-55.825 dBm
Start 4.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 7.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 4.244 GHz -44.143 dBm
2 N 1 f 5.093 GHz -57.446 dBm
3 N 1 f 5.942 GHz -54.779 dBm
4 N 1 f 6.790 GHz -55.825 dBm
Frequency
Auto Tune
Center Freq
5.500000000 GHz
Start Freq
4.000000000 GHz
Stop Freq
7.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:33:53 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 8.488 GHz
-52.071 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 7.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 7.639 GHz -55.655 dBm
2 N 1 f 8.488 GHz -52.071 dBm
3
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
8.500000000 GHz
Start Freq
7.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
300.000000 MHz
Auto
Man
Freq Offset
0 Hz

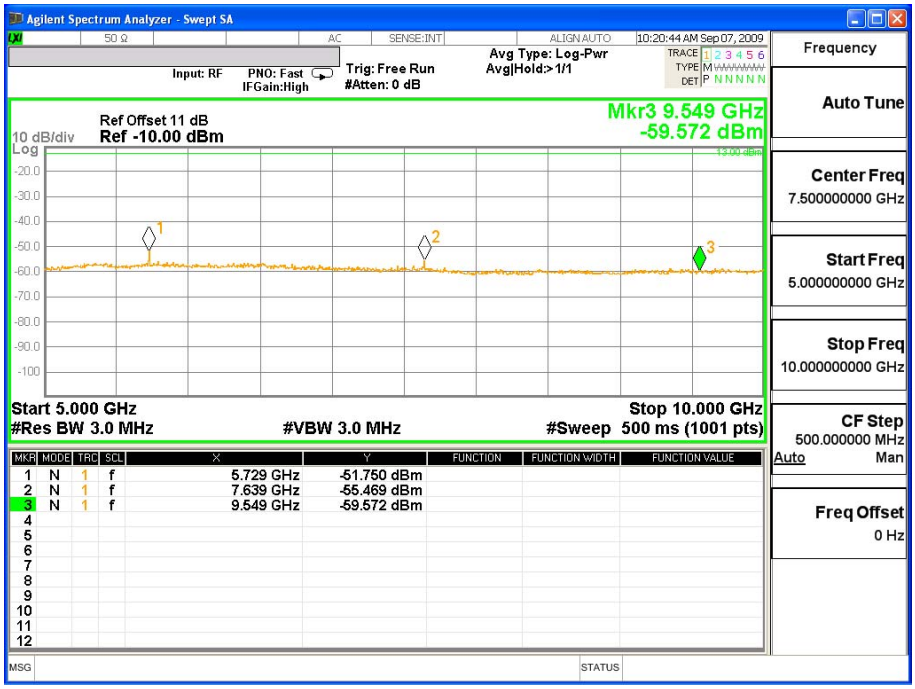
Product	GPS TRACKER		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/09/07	Test Site	CTR
Test Condition	PCS 1900 Voice	Test Range	30MHz~20GHz

PCS 1900 Voice Mid-Channel 810

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3819.6	-45.047	1.1	-43.947	-13
5729.4	-51.750	1.23	-50.520	-13
7639.2	-55.469	1.59	-53.879	-13
9549	-59.572	1.89	-57.682	-13
11458.8	-59.626	2.07	-57.556	-13
13368.6	-58.729	2.26	-56.469	-13
15278.4	-55.328	2.64	-52.688	-13
17188.2	-55.371	3.5	-51.871	-13
19098	-54.860	3.7	-51.160	-13




Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:20:09 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr1 3.820 GHz
-45.047 dBm
Start 1.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 5.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 3.820 GHz -45.047 dBm
Frequency
Auto Tune
Center Freq
3.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
5.000000000 GHz
CF Step
400.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:20:44 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Mkr3 9.549 GHz
-59.572 dBm
Start 5.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 5.729 GHz -51.750 dBm
2 N 1 f 7.639 GHz -55.469 dBm
3 N 1 f 9.549 GHz -59.572 dBm
Frequency
Auto Tune
Center Freq
7.500000000 GHz
Start Freq
5.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

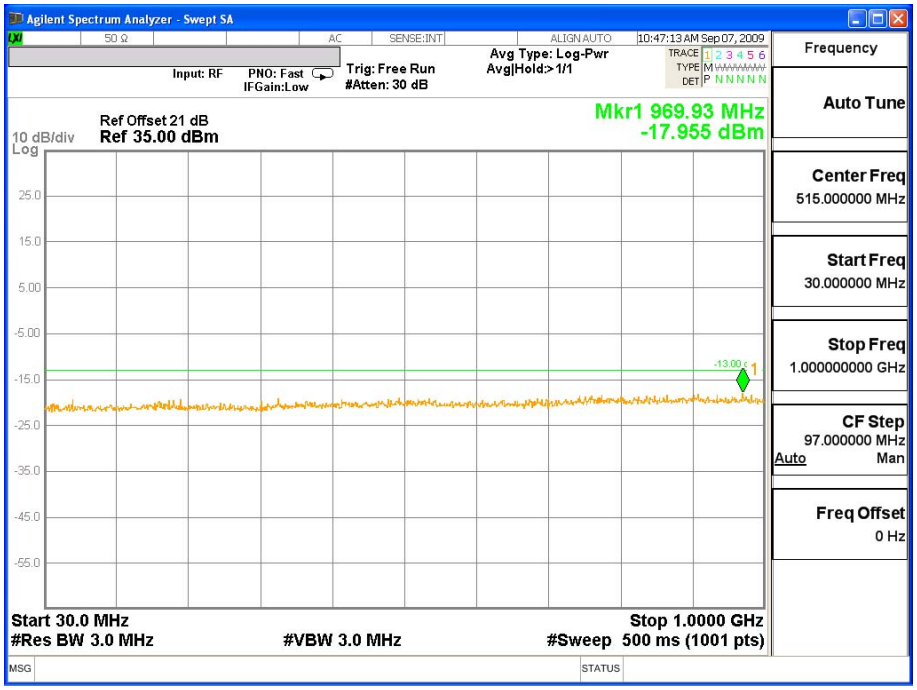

Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:21:45 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 13.369 GHz
-58.729 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 10.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 15.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 11.459 GHz -59.626 dBm
2 N 1 f 13.369 GHz -58.729 dBm
3
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
12.500000000 GHz
Start Freq
10.000000000 GHz
Stop Freq
15.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:22:38 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr3 19.098 GHz
-54.860 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 15.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 20.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 15.278 GHz -55.328 dBm
2 N 1 f 17.188 GHz -55.371 dBm
3 N 1 f 19.098 GHz -54.860 dBm
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
17.500000000 GHz
Start Freq
15.000000000 GHz
Stop Freq
20.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

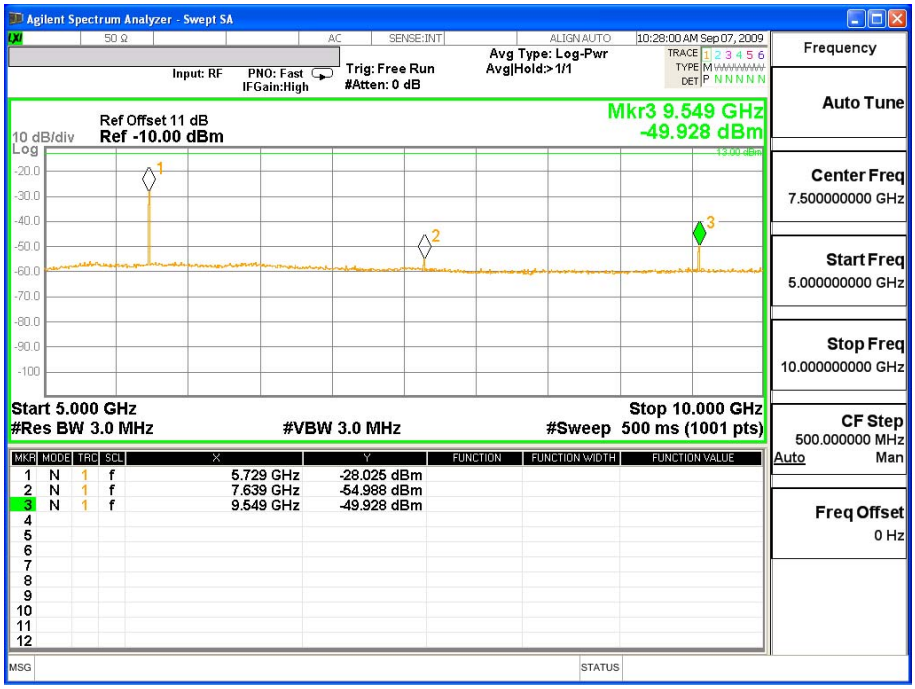
Product	GPS TRACKER		
Test Mode	Spurious Emission (Conducted)		
Date of Test	2009/09/07	Test Site	CTR
Test Condition	PCS 1900 GPRS	Test Range	30MHz~20GHz

PCS 1900 GPRS Mid-Channel 810

Frequency (MHz)	Reading Level (dBm)	Path Loss (dB)	Emission Level (dBm)	Limit (dBm)
3819.6	-44.965	1.1	-43.865	-13
5729.4	-28.025	1.23	-26.795	-13
7639.2	-54.988	1.59	-53.398	-13
9549	-49.928	1.89	-48.038	-13
11458.8	-58.729	2.07	-56.659	-13
13368.6	-56.308	2.26	-54.048	-13
15278.4	-56.229	2.64	-53.589	-13
17188.2	-55.825	3.5	-52.325	-13
19098	-54.071	3.7	-50.371	-13




Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:27:02 AM Sep 07, 2009
Avg Type: Log-Pwr
Avg|Hold:>1/1
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Mkr1 3.820 GHz
-44.965 dBm
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Start 1.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 5.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 3.820 GHz -44.965 dBm
Frequency
Auto Tune
Center Freq
3.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
5.000000000 GHz
CF Step
400.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:28:00 AM Sep 07, 2009
Avg Type: Log-Pwr
Avg|Hold:>1/1
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Mkr3 9.549 GHz
-49.928 dBm
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Start 5.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 10.000 GHz
#Sweep 500 ms (1001 pts)
1 N 1 f 5.729 GHz -28.025 dBm
2 N 1 f 7.639 GHz -54.988 dBm
3 N 1 f 9.549 GHz -49.928 dBm
Frequency
Auto Tune
Center Freq
7.500000000 GHz
Start Freq
5.000000000 GHz
Stop Freq
10.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:28:29 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr2 13.369 GHz
-56.308 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 10.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 15.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 11.459 GHz -58.729 dBm
2 N 1 f 13.369 GHz -56.308 dBm
3
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
12.500000000 GHz
Start Freq
10.000000000 GHz
Stop Freq
15.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
50 Ω
AC
SENSE:INT
ALIGN AUTO
10:26:29 AM Sep 07, 2009
Input: RF
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>1/1
TRACE 1 2 3 4 5 6
TYPE M
DET P N N N N N
Ref Offset 11 dB
10 dB/div
Ref -10.00 dBm
Log
Mkr3 19.098 GHz
-54.071 dBm
13.00 dBm
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0
-100
Start 15.000 GHz
#Res BW 3.0 MHz
#VBW 3.0 MHz
Stop 20.000 GHz
#Sweep 500 ms (1001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 15.278 GHz -56.229 dBm
2 N 1 f 17.188 GHz -55.825 dBm
3 N 1 f 19.098 GHz -54.071 dBm
4
5
6
7
8
9
10
11
12
MSG
STATUS
Frequency
Auto Tune
Center Freq
17.500000000 GHz
Start Freq
15.000000000 GHz
Stop Freq
20.000000000 GHz
CF Step
500.000000 MHz
Auto
Man
Freq Offset
0 Hz

Product	GPS TRACKER		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/09/03	Test Site	OATS 1
Test Condition	Channel 251 (GSM 850 Voice)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

1697.6	-47.34	-47.64	1.630	9.800	-39.47	-13
2546.4	-42.95	-38.94	2.100	10.600	-30.44	-13
3395.2	-52.81	-49.81	2.350	12.300	-39.86	-13
4244	-54.76	-49.38	2.700	12.600	-39.48	-13
5092.8	-53.56	-44.10	2.830	12.700	-34.23	-13
5941.6	-55.67	-45.90	3.200	13.000	-36.10	-13

Vertical Emissions

1697.6	-45.11	-45.26	1.630	9.800	-37.09	-13
2546.4	-48.36	-45.62	2.100	10.600	-37.12	-13
3395.2	-51.49	-48.57	2.350	12.300	-38.62	-13
4244	-53.75	-48.83	2.700	12.600	-38.93	-13
5092.8	-51.95	-41.96	2.830	12.700	-32.09	-13
5941.6	-55.47	-45.83	3.200	13.000	-36.03	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	GPS TRACKER		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/09/03	Test Site	OATS 1
Test Condition	Channel 251 (GSM 850 GPRS)	Test Range	30MHz~10GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)
Horizontal Emissions						
1697.6	-40.89	-39.96	1.630	9.800	-31.79	-13
2546.4	-43.86	-39.92	2.100	10.600	-31.42	-13
3395.2	-52.37	-49.23	2.350	12.300	-39.28	-13
4244	-50.59	-43.87	2.700	12.600	-33.97	-13
5092.8	-51.56	-41.19	2.830	12.700	-31.32	-13
5941.6	-55.59	-45.78	3.200	13.000	-35.98	-13
Vertical Emissions						
1697.6	-43.22	-43.04	1.630	9.800	-34.87	-13
2546.4	-42.97	-39.26	2.100	10.600	-30.76	-13
3395.2	-52.83	-50.30	2.350	12.300	-40.35	-13
4244	-49.73	-43.31	2.700	12.600	-33.41	-13
5092.8	-52.07	-42.13	2.830	12.700	-32.26	-13
5941.6	-52.83	-42.06	3.200	13.000	-32.26	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 6 GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	GPS TRACKER		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/09/03	Test Site	OATS 1
Test Condition	Channel 810 (PCS1900 Voice)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)
Horizontal Emissions						
3819.6	-45.160	-55.134	2.530	12.600	-45.064	-13
5729.4	-55.750	-60.450	3.050	13.100	-50.400	-13
7639.2	-54.820	-54.090	3.650	11.500	-46.240	-13
9549	-54.600	-49.047	3.850	12.000	-40.897	-13
11458.8	-55.530	-51.491	4.580	12.000	-44.071	-13
Vertical Emissions						
3819.6	-42.730	-52.485	2.530	12.600	-42.415	-13
5729.4	-55.140	-58.908	3.050	13.100	-48.858	-13
7639.2	-54.100	-53.553	3.650	11.500	-45.703	-13
9549	-54.420	-48.261	3.850	12.000	-40.111	-13
11458.8	-55.410	-51.375	4.580	12.000	-43.955	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

Product	GPS TRACKER		
Test Mode	Spurious Emission (Radiated)		
Date of Test	2009/09/03	Test Site	OATS 1
Test Condition	Channel 810 (PCS1900 GPRS)	Test Range	30MHz~20GHz

Frequency	Reading Level	Signal Generator Level	Cable Loss	Antenna Gain	EIRP Value	Limit
(GHz)	(dBm)	(dBm)	(dB)	(dBi)	(dBm)	(dBm)

Horizontal Emissions

3819.6	-46.030	-56.004	2.530	12.600	-45.934	-13
5729.4	-55.280	-59.980	3.050	13.100	-49.930	-13
7639.2	-54.740	-54.010	3.650	11.500	-46.160	-13
9549	-53.620	-48.067	3.850	12.000	-39.917	-13
11458.8	-55.540	-51.501	4.580	12.000	-44.081	-13

Vertical Emissions

3819.6	-42.510	-52.265	2.530	12.600	-42.195	-13
5729.4	-54.400	-58.168	3.050	13.100	-48.118	-13
7639.2	-54.000	-53.453	3.650	11.500	-45.603	-13
9549	-54.660	-48.501	3.850	12.000	-40.351	-13
11458.8	-55.500	-51.465	4.580	12.000	-44.045	-13

Note:

1. Receiver setting (Peak Detector) : RBW:3MHz; VBW:3MHz
2. EIRP Value = Signal Generator Level + Antenna Gain - Cable Loss
3. Spurious emissions past 12GHz are not shown, due to the magnitude of spurious emissions attenuated more than 20 dB below the limit.

6. Frequency Stability Under Temperature & Voltage Variations

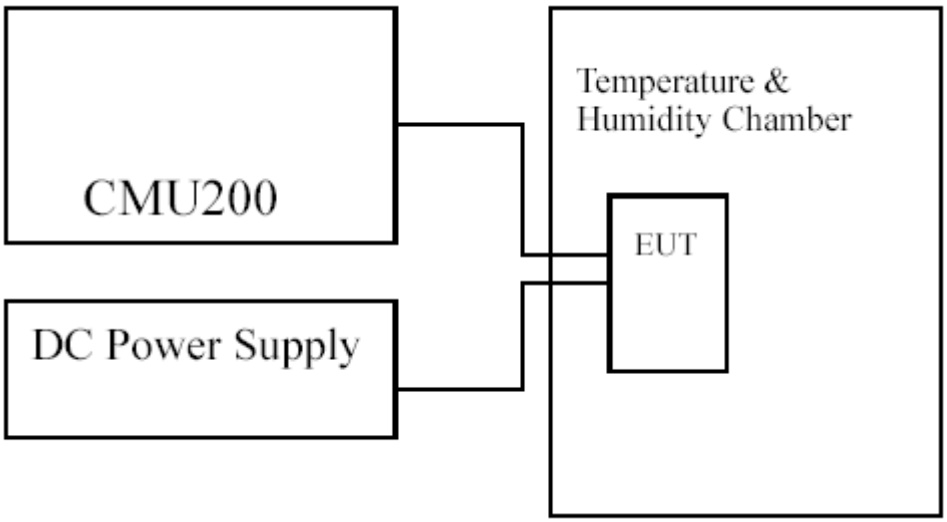
6.1. Test Equipment

The following test equipments are used during the frequency stability test:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Universal Radio Communication Tester	R & S	CMU200 / 104846	May., 2009
Standard Temperature & Humidity Chamber	WIT	TH-1S-B / 108210	Aug., 2009
DC Power Supply	Agilent	87421A / MY44350304	Apr., 2009

Note: All equipments upon which need to be calibrated are with calibration period of 1 year

6.2. Test Setup



6.3. Limits

Limit	**<±2.5ppm**

6.4. Test Procedure

The frequency stability of transmitter is measured by:

(a) Temperature: The temperature is varied from -30°C to 50°C in 10°C increament using a standard temperature & Humidity chamber.

(b) Primary Supply Voltage: The primary supply voltage is varied 85% to 115% of the nominal value for non hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, (CMU200), was used to measure The Frequency Error. The maximum result of measurements was recorded.

6.5. Test Specification

According to Part 2.1055,22.355,24.235

6.6. Test Result of Frequency Stability Under Temperature Variations

Product	GPS TRACKER		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/09/03	Test Site	CTR
Test Condition	GSM 850 Voice/ Channel 189	Test Range	-30℃~+50℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	65	±2.09
-20	0.836	53	±2.09
-10	0.836	-52	±2.09
0	0.836	52	±2.09
10	0.836	71	±2.09
20	0.836	37	±2.09
30	0.836	61	±2.09
40	0.836	63	±2.09
50	0.836	75	±2.09

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	31	±2.09
3.7	0.836	37	±2.09
3.4	0.836	39	±2.09

Product	GPS TRACKER		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/09/03	Test Site	CTR
Test Condition	GSM 850 GPRS / Channel 189	Test Range	-30℃~+50℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	0.836	61	±2.09
-20	0.836	56	±2.09
-10	0.836	-46	±2.09
0	0.836	-49	±2.09
10	0.836	62	±2.09
20	0.836	36	±2.09
30	0.836	64	±2.09
40	0.836	67	±2.09
50	0.836	73	±2.09

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	0.836	35	±2.09
3.7	0.836	36	±2.09
3.4	0.836	33	±2.09

Product	GPS TRACKER		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/09/03	Test Site	CTR
Test Condition	PCS 1900 Voice/ Channel 661	Test Range	-30℃~+50℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	36	±4.7
-20	1.88	57	±4.7
-10	1.88	89	±4.7
0	1.88	94	±4.7
10	1.88	107	±4.7
20	1.88	106	±4.7
30	1.88	99	±4.7
40	1.88	82	±4.7
50	1.88	101	±4.7

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	94	±4.7
3.7	1.88	106	±4.7
3.4	1.88	109	±4.7

Product	GPS TRACKER		
Test Mode	Frequency Stability Under Temperature Variations & Voltage Variations		
Date of Test	2009/09/03	Test Site	CTR
Test Condition	PCS 1900 GPRS / Channel 661	Test Range	-30℃~+50℃

Frequency Stability Under Temperature Variations

Temperature Interval(℃)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
-30	1.88	43	±4.7
-20	1.88	59	±4.7
-10	1.88	92	±4.7
0	1.88	97	±4.7
10	1.88	109	±4.7
20	1.88	106	±4.7
30	1.88	104	±4.7
40	1.88	89	±4.7
50	1.88	97	±4.7

Voltage Variations

DC Voltage (V)	Test Frequency (GHz)	Deviation (Hz)	Limit (KHz)
4.2	1.88	98	±4.7
3.7	1.88	106	±4.7
3.4	1.88	112	±4.7

7. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test

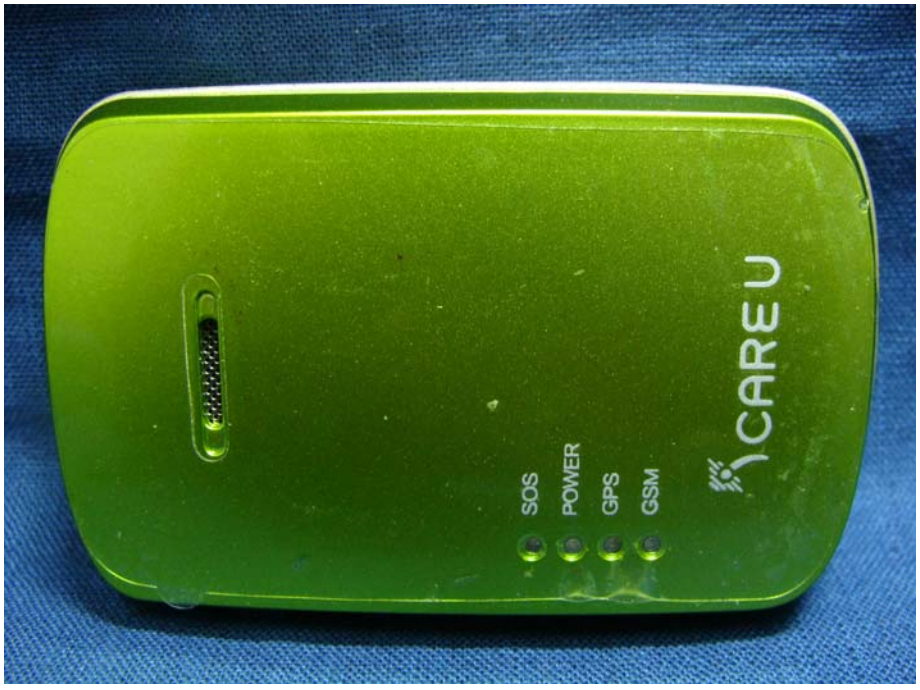
Back View of Radiated Test

Front View of Radiated Test (Horn)

Back View of Radiated Test (Horn)

Attachment 2 : EUT Detailed Photographs

(1) EUT Photo



(2) EUT Photo

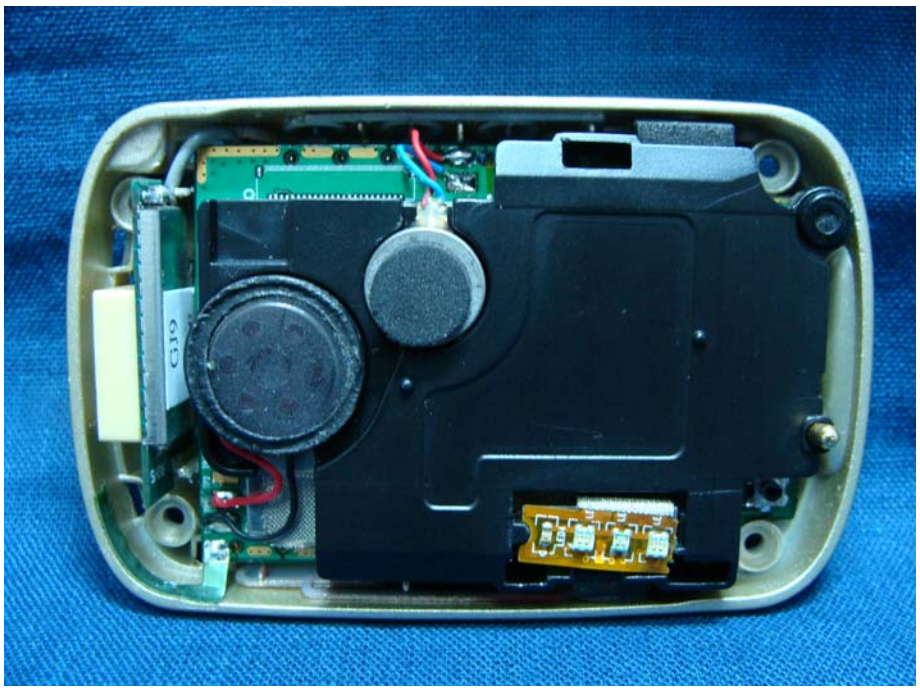
(3) EUT Photo

(4) EUT Photo

(5) EUT Photo

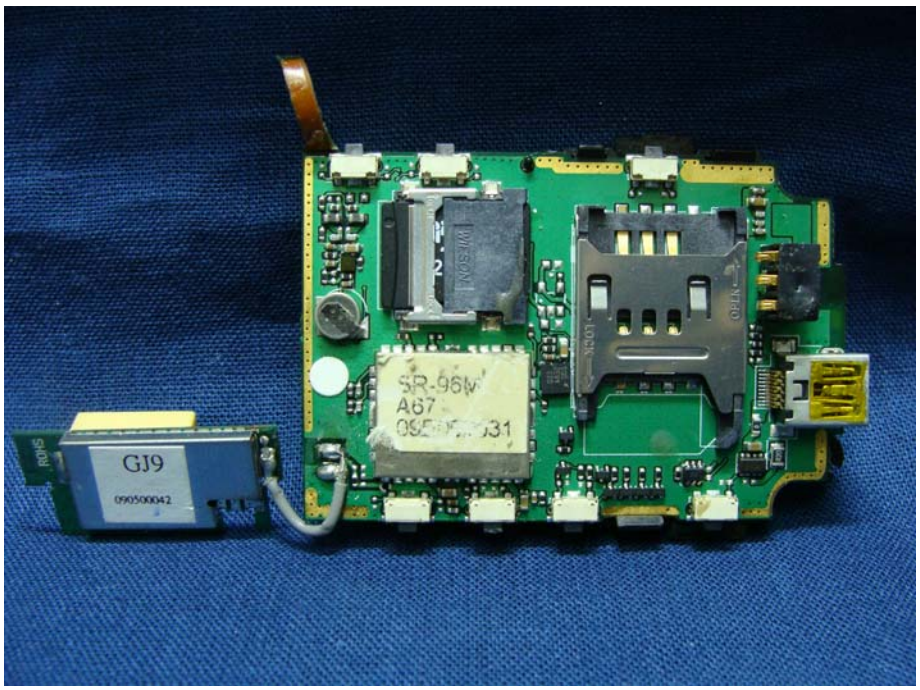
(6) EUT Photo

(7) EUT Photo

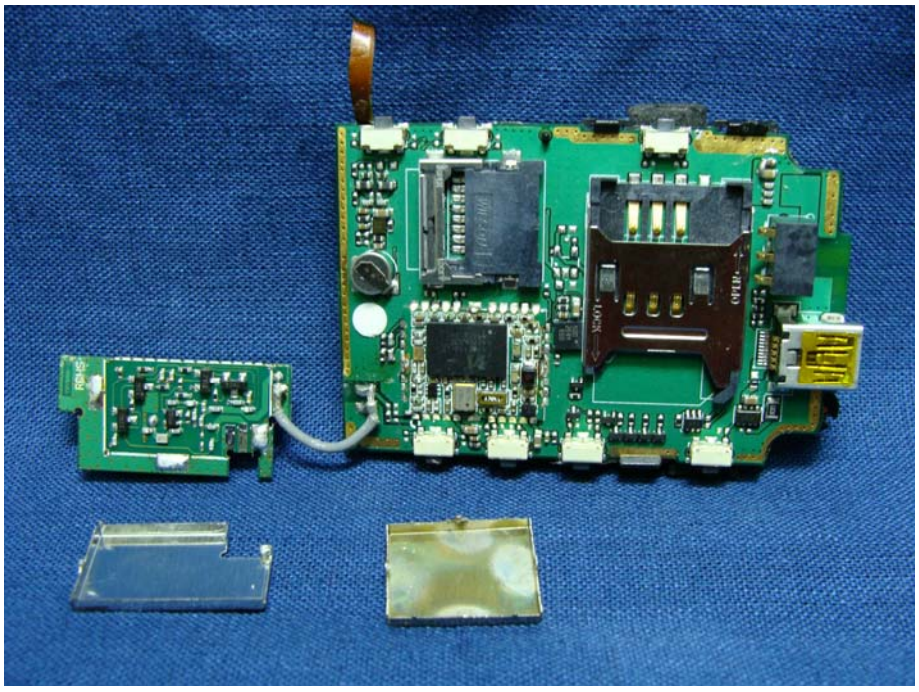


(8) EUT Photo

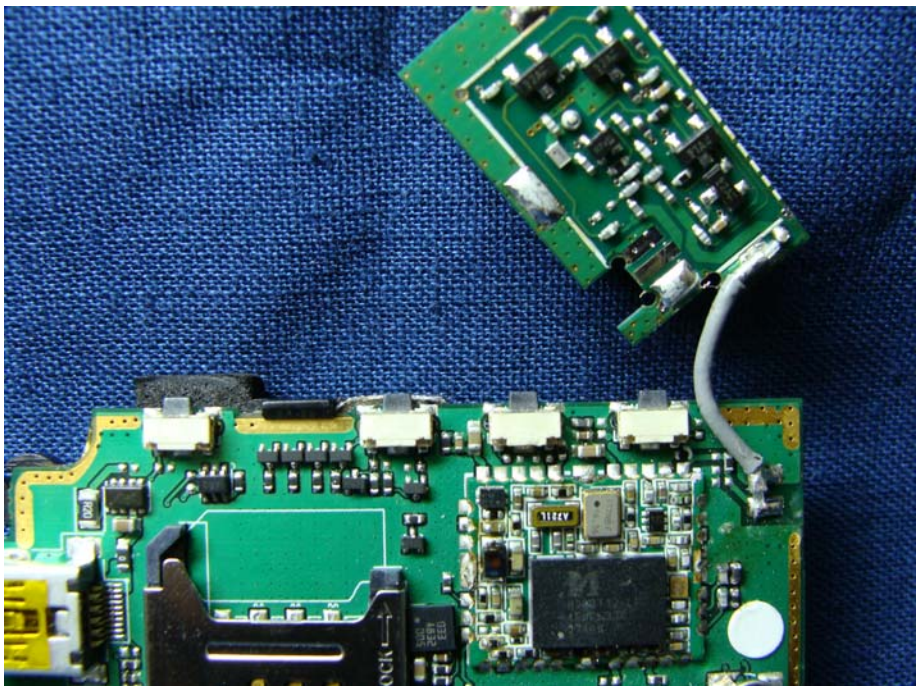
(9) EUT Photo



(10) EUT Photo

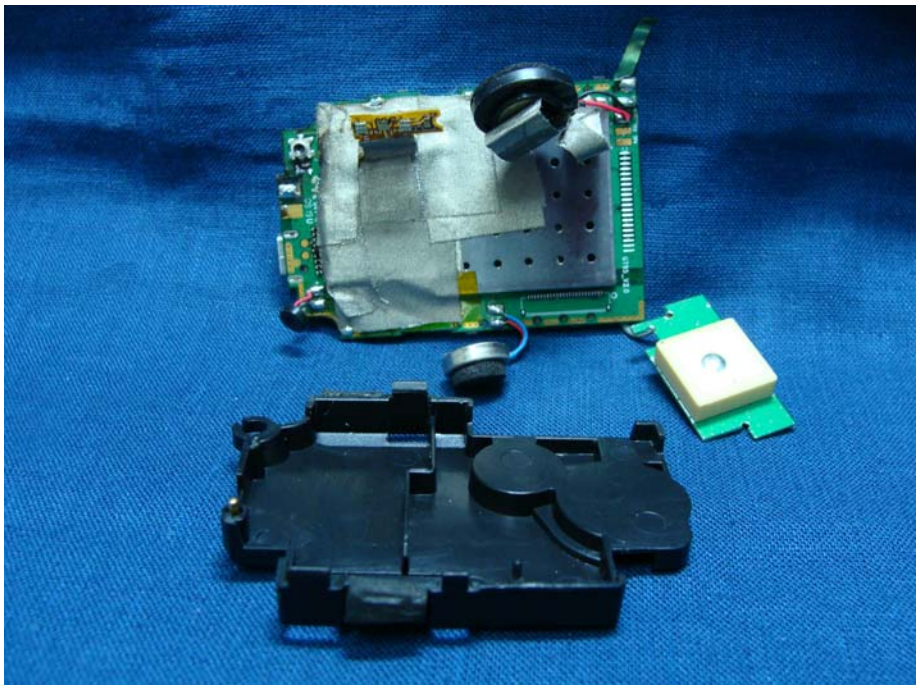


(11) EUT Photo

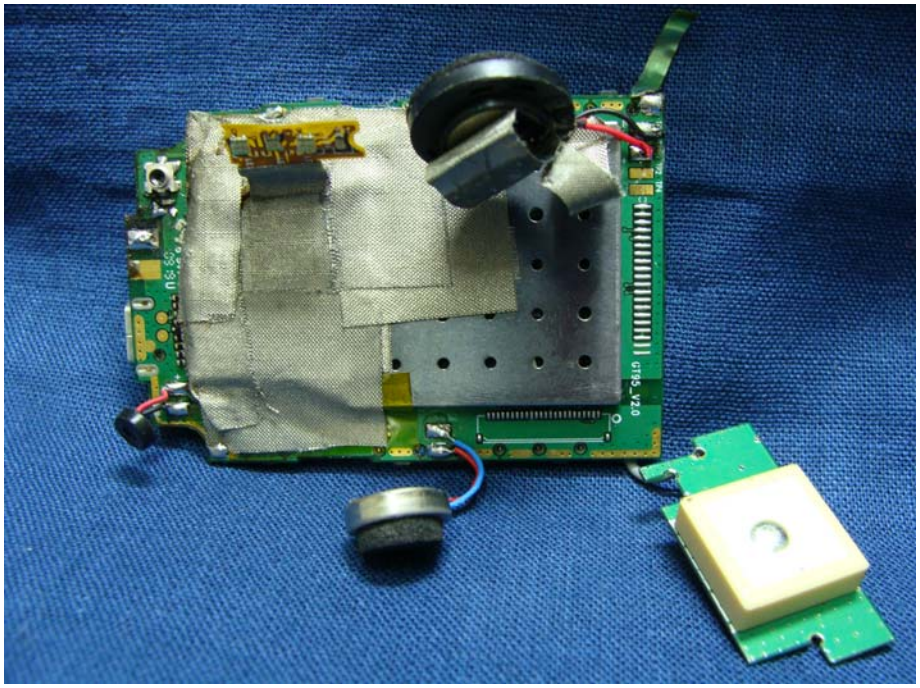


(12) EUT Photo

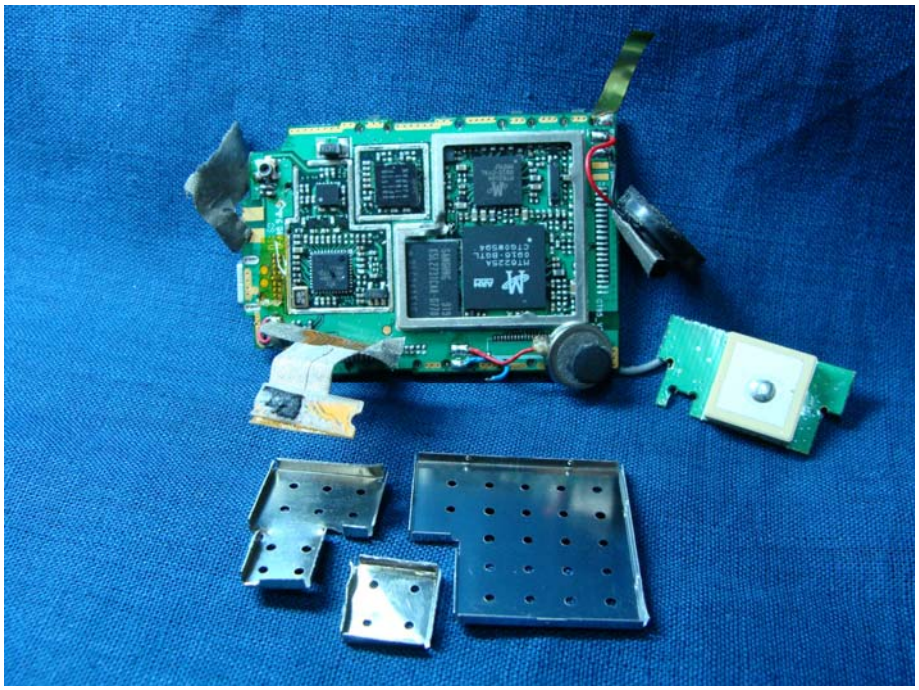
(13) EUT Photo



(14) EUT Photo



(15) EUT Photo



(16) EUT Photo