



Hong Kong

FCC – Test report

Report Number : **60/790.13.004.01** Date of Issue: 05th March 2013

Model : **N2C**

Product Type : **GPS Bike computer**

Applicant : **Dayton Industrial Co., Ltd.**

Address : **2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong**

Production Facility : **Kendy Enterprise Ltd.**

Address : **2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong Kong**

Test Result : **Positive** **Negative**

Total pages including Appendices : 34

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Report Number: **60/790.13.004.01**

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2. Details about the Test Laboratory

Details about the Test Laboratory

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323

Fax: 852 2776 1372

Company name: TMC-Telecommunication Metrology Center of M.I.T
No 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China



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3. Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	GPS Bike computer
Model no.:	N2C
Serial number:	NIL
Options and accessories:	USB cable
Rated Voltage:	3.7 VDC
Rated Current:	NIL
Rated Power:	NIL
Frequency:	NIL
RF Transmission Frequency:	2457MHz
Antenna gain:	0 dBi
No. of Operated Channel:	1
Modulation:	GFSK
Description of the EUT:	Battery operated – 1 x3.7V rechargeable battery Model – N2C BL-5B



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4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators
FCC Part 15 Subpart B, Unintentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart B – Unintentional Radiators

5. Summary of Test Standards and Results

Emission Tests				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
Radiated Emission (47 CFR 15.249, 15.209, 15.109)	8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emission (47 CFR 15.107)	13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20dB Bandwidth (47 CFR 15.215)	16	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bandedge Emission (47 CFR 15.249)	18	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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6. General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: O4GN2COH complies with the FCC Part 15, Subpart B and Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed
- **Not** Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.
- **Does not** fulfill the general approval requirements.

Sample Received Date: 14th January 2013

Testing Start Date: 14th January 2013

Testing End Date: 30th January 2013

- TÜV SÜD HONG KONG LTD. -

Reviewed by:

Edmond FUNG
EMC Test Engineer

Prepared by:



CHAN Kwong Ngai
EMC Test Engineer

Report Number: **60/790.13.004.01**

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7. Emission Test Results

6.1 Radiated Emission Test (Fundamental)

Date of test : 25th January 2013
 Test requirement : FCC Part 15
 Test method : ANSI C63.4:2009
 Operating mode : Transmit mode
 Frequency channel : 2457MHz
 Remarks : NIL

Test Result
<input checked="" type="checkbox"/> Passed
<input type="checkbox"/> Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dB μ V)	Corr. (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
2456.100	V	100.5	0.9	101.4	114.0	-12.6	Peak
2456.100	V	85.4	0.9	86.3	94.0	-7.7	Average

Remark: The EUT was placed on the top of the turntable in test site area.
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable. The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.



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Radiated Emission Test (Spurious Emission)

Date of test : 25th January 2013

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Antenna polarity : Horizontal

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result
<input checked="" type="checkbox"/> Passed
<input type="checkbox"/> Not Passed

Frequency (MHz)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
234.170	35.24	-15.00	20.24	46.00	-25.76	Quasi-Peak
312.180	41.73	-13.29	28.44	46.00	-17.56	Quasi-Peak
468.880	48.10	-11.33	36.77	46.00	-9.23	Quasi-Peak
547.100	37.33	-9.16	28.17	46.00	-17.83	Quasi-Peak
782.350	34.62	-6.27	28.35	46.00	-17.65	Quasi-Peak
1192.010	42.99	8.82	51.81	74.00	-22.19	Peak
1192.010	28.45	8.82	37.27	54.00	-16.73	Average
*1388.700	46.55	6.97	53.52	74.00	-20.48	Peak
*1388.700	29.63	6.97	36.60	54.00	-17.40	Average
3507.650	49.82	5.96	55.78	74.00	-18.22	Peak
3507.650	28.26	5.96	34.22	54.00	-19.78	Average
*4920.960	56.25	13.58	69.83	74.00	-4.17	Peak
*4920.960	37.04	13.58	50.62	54.00	-3.38	Average
7781.250	51.01	16.24	67.25	74.00	-6.75	Peak
7781.250	29.47	16.24	45.71	54.00	-8.29	Average

Remark: ** means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205. The EUT was placed on the top of the turntable in test site area. The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation. For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable. The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Adjust the emission and slightly rotate the turntable to locate the position with maximum reading. Adjust the emission and slightly height of the antenna to locate the position with maximum reading.

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Radiated Emission Test (Spurious Emission)

Date of test : 25th January 2013

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Antenna polarity : Vertical

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency (MHz)	Read Level (dBμV)	Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
36.010	39.07	-13.24	25.83	40.00	-14.17	Quasi-Peak
*135.980	39.80	-18.64	21.16	43.50	-22.34	Quasi-Peak
468.880	37.42	-11.33	26.09	46.00	-19.91	Quasi-Peak
547.100	38.77	-9.16	29.61	46.00	-16.39	Quasi-Peak
860.040	40.08	-5.45	34.63	46.00	-11.37	Quasi-Peak
1188.980	43.51	8.82	52.33	74.00	-21.67	Peak
1188.980	26.95	8.82	35.77	54.00	-18.23	Average
*1399.350	47.58	6.88	54.46	74.00	-19.54	Peak
*1399.350	28.13	6.88	35.01	54.00	-18.99	Average
3598.090	50.3	6.39	56.69	74.00	-17.31	Peak
3598.090	27.47	6.39	33.86	54.00	-20.14	Average
*4920.960	56.44	13.58	70.02	74.00	-3.98	Peak
*4920.960	37.05	13.58	50.63	54.00	-3.37	Average
7941.190	51.62	16.52	68.14	74.00	-5.86	Peak
7941.190	29.06	16.52	45.58	54.00	-8.42	Average

Remark: ** means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.
 The EUT was placed on the top of the turntable in test site area.
 The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
 For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.
 The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.
 Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.
 Adjust the emission and slightly height of the antenna to locate the position with maximum reading.



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Radiated Emission Test

Date of test : 25th January 2013

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : PC Data transfer

Remarks : NIL

Test Result

Passed

Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBμV)	Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
132.510	H	50.28	-18.64	31.64	43.50	-11.86	Quasi-Peak
221.780	H	47.81	-15.75	32.06	46.00	-13.94	Quasi-Peak
233.130	H	51.20	-16.2	35.00	46.00	-11.00	Quasi-Peak

Frequency (MHz)	Polarity (H/V)	Read Level (dBμV)	Corr. (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
62.890	V	37.45	-14.35	23.10	40.00	-16.90	Quasi-Peak
175.620	V	46.63	-16.81	29.82	43.50	-13.68	Quasi-Peak
441.370	V	43.89	-11.33	32.56	46.00	-13.44	Quasi-Peak
510.910	V	42.96	-9.16	33.80	46.00	-12.20	Quasi-Peak

Remark: The EUT was placed on the top of the turntable in test site area.
The test shall be made in the operation mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
For emissions measurement, the receiving antenna was placed 3 meters far away from the turntable.
The antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization.
Adjust the emission and slightly rotate the turntable to locate the position with maximum reading.
Adjust the emission and slightly height of the antenna to locate the position with maximum reading.



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Test Equipment List

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.21

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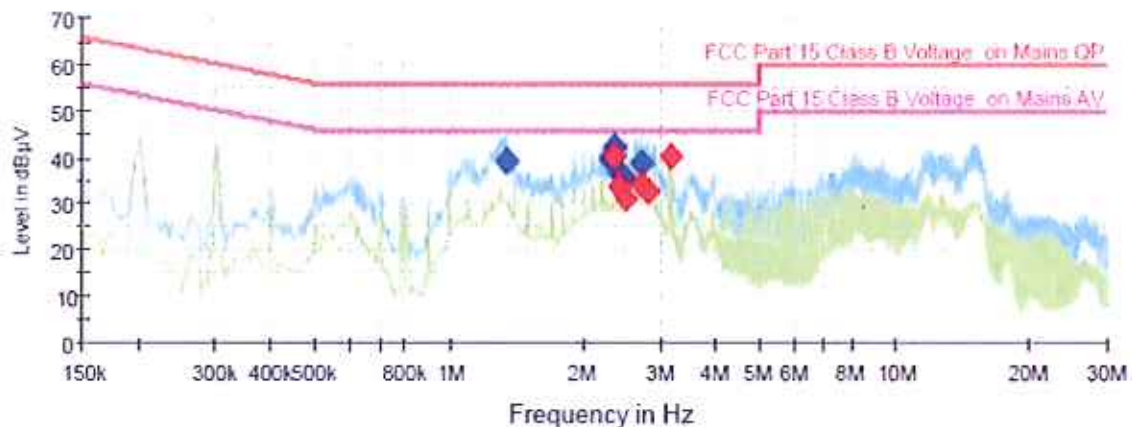
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6.2 Conducted Emission Test 150kHz – 30MHz

Date of test : 25th January 2013
 Test requirement : FCC Part 15
 Test method : ANSI C63.4:2009
 Operating mode : PC data transfer
 Tested on : PC AC Mains, Live
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



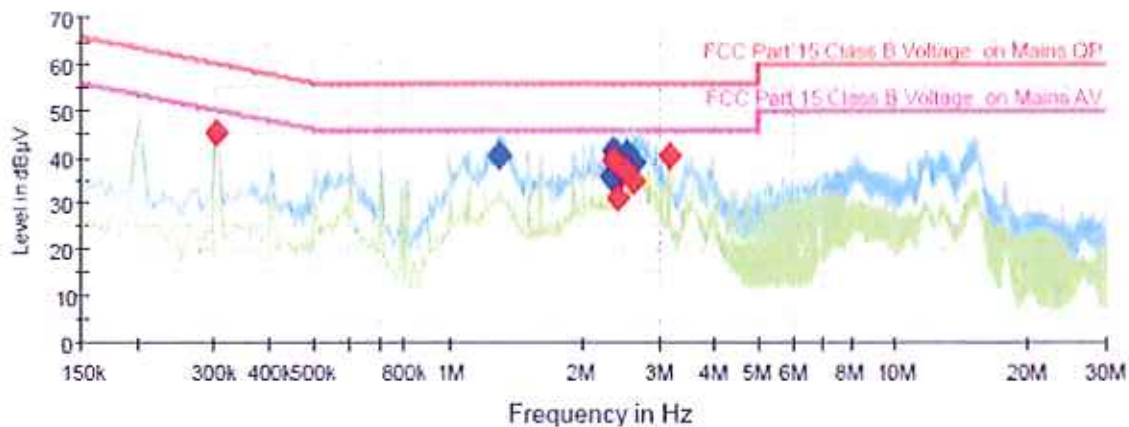
Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)
1.350000	39.2	56.0	-16.8
2.310000	39.7	56.0	-16.3
2.354000	42.2	56.0	-13.8
2.410000	36.7	56.0	-19.3
2.510000	35.5	56.0	-20.5
2.710000	38.8	56.0	-17.2

Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)
2.354000	40.2	46.0	-5.8
2.410000	33.5	46.0	-12.5
2.510000	31.4	46.0	-14.6
2.710000	34.2	46.0	-11.8
2.810000	32.9	46.0	-13.1
3.138000	40.2	46.0	-5.8

Conducted Emission Test 150kHz – 30MHz

Date of test : 25th January 2013
 Test requirement : FCC Part 15
 Test method : ANSI C63.4:2009
 Operating mode : PC data transfer
 Tested on : PC AC Mains, Neutral
 Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Frequency (MHz)	Average (dBµV)	Limit (dBµV)	Margin (dB)
1.294000	40.3	56.0	-15.7	0.302000	45.5	50.2	-4.7
2.322000	35.7	56.0	-20.3	2.354000	39.1	46.0	-6.9
2.354000	41.3	56.0	-14.7	2.422000	31.0	46.0	-15.0
2.422000	35.4	56.0	-20.6	2.526000	36.7	46.0	-9.3
2.526000	41.0	56.0	-15.0	2.626000	34.5	46.0	-11.5
2.626000	38.9	56.0	-17.1	3.138000	40.1	46.0	-5.9



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Test Equipment List

Conducted Emission Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Aug. 05, 2013
2	LISN	R&S	ENV216	101113	Aug. 05, 2013
4	50Ω Terminator	N/A	N/A	N/A	Jul. 01, 2013
5	Test Cable	N/A	C01	N/A	Jul. 01, 2013
6	EMI Test Receiver	R&S	ESCI	100920	Aug. 04, 2013

6.3 20dB Bandwidth measurement

Date of test : 25th January 2013

Test requirement : FCC Part 15

Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



20dB bandwidth (MHz)	Limit
0.324	-

Remark: Use the following spectrum analyzer settings:
 Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
 RBW ≥ 1% of the 20 dB bandwidth
 VBW ≥ RBW Sweep = auto
 Detector function = peak
 Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation.



Hong Kong

Test Equipment List

20dB Bandwidth measurement

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.21

6.4 Bandedge measurement

Date of test : 25th January 2013

Test requirement : FCC Part 15

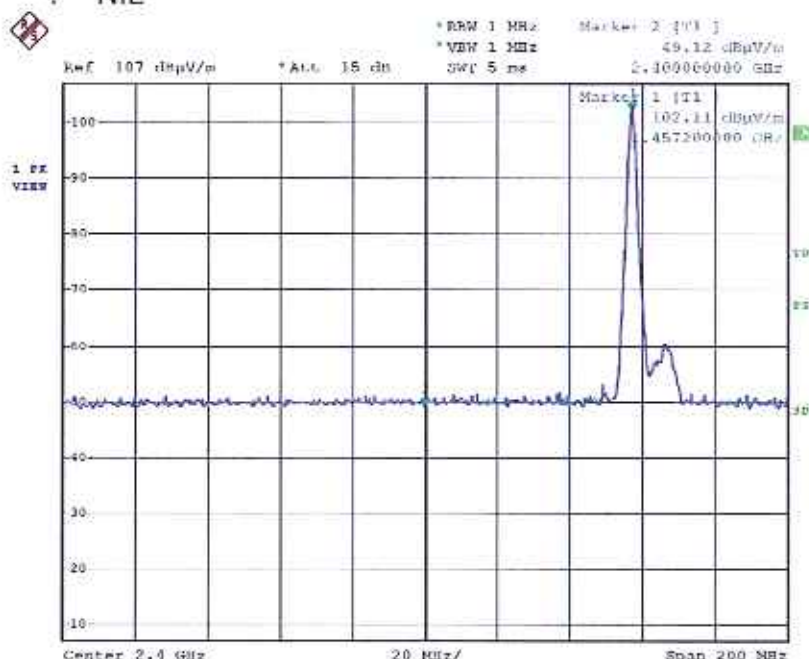
Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Frequency (MHz)	Test result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2400.000	49.1	74.0	-24.9	Peak
2400.000	34.1	54.0	-19.9	Average

Remark: Use the following spectrum analyzer settings:
 Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
 RBW ≥ 1% of the span
 VBW ≥ RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold

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Bandedge measurement

Date of test : 25th January 2013

Test requirement : FCC Part 15

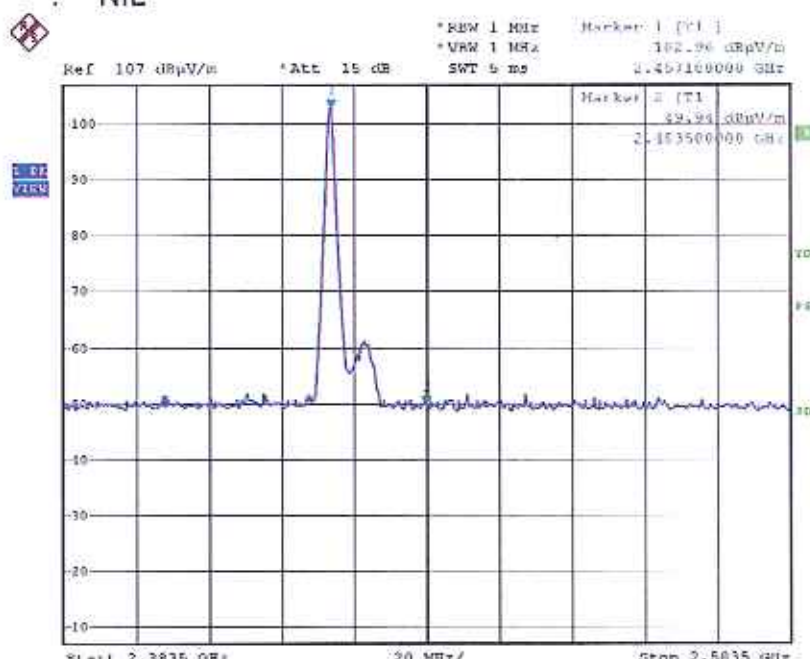
Test method : ANSI C63.4:2009

Operating mode : Transmit mode

Frequency channel : 2457MHz

Remarks : NIL

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Frequency (MHz)	Test result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2483.500	49.9	74.0	-24.1	Peak
2483.500	35.6	54.0	-18.4	Average

Remark: Use the following spectrum analyzer settings:
 Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
 RDW ≥ 1% of the span
 VBW ≥ RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold



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Test Equipment List

Bandedge measurement

DESCRIPTION	Type No.	Serial No.	Calibrated until
Antenna	VULB9163	9163 330	2014.02.24
Antenna	3164-05	85724	2014.02.17
Loop Antenna	6512	29604	2013.09.24
Spectrum Analyzer	FSP 40	100378	2013.12.22
EMI Test Receiver	ESCI	100701	2013.08.03
Spectrum Analyzer	FSV40	100903	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2014.02.17
Amplifier	150A250	326446	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.21



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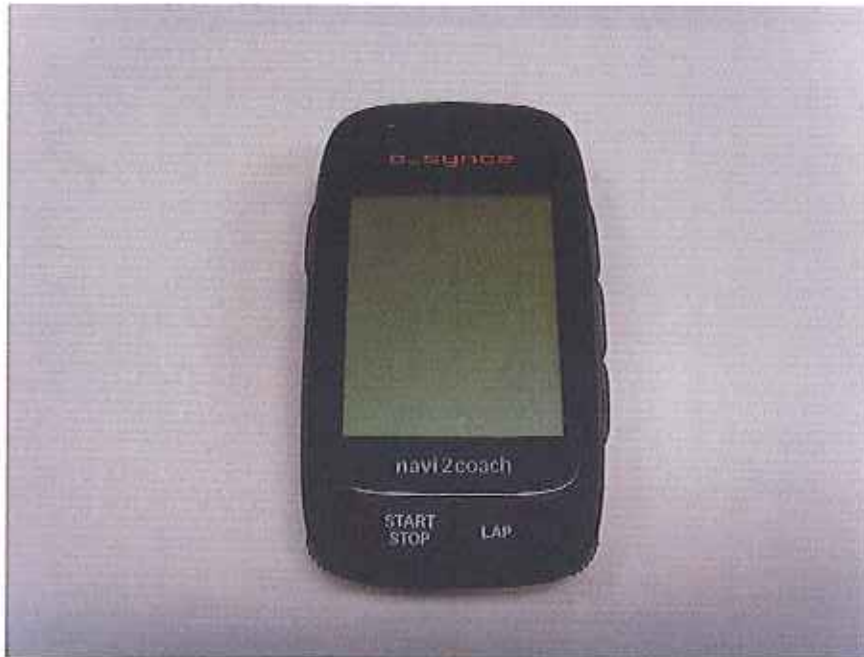
8. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

	Items	Extended Uncertainty
RE	Field strength (dB μ V/m)	U=5.08dB (30MHz-1GHz) U=4.56dB (1GHz-6GHz)
CE	Disturbance Voltage (dB μ V)	U=2.7dB

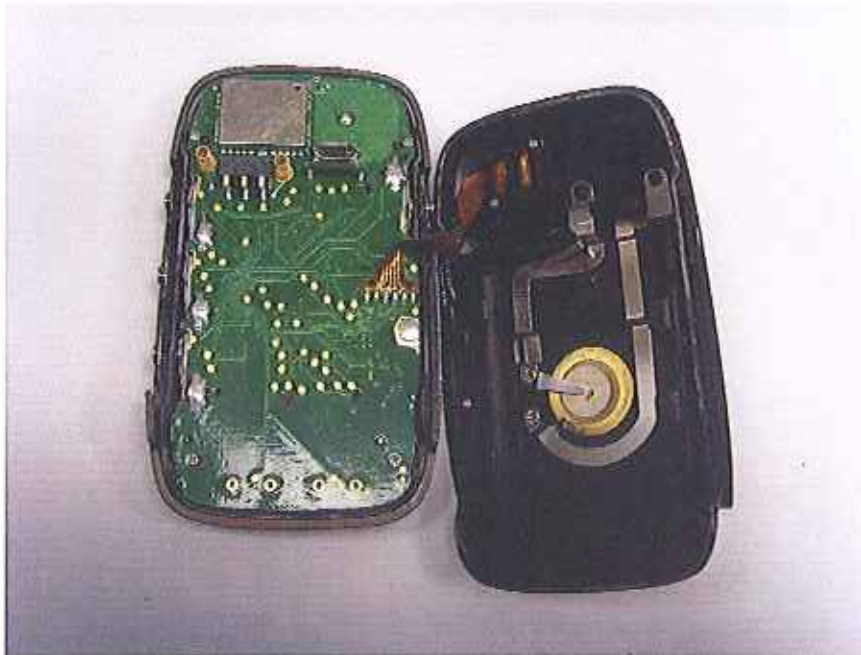
9. Appendix A



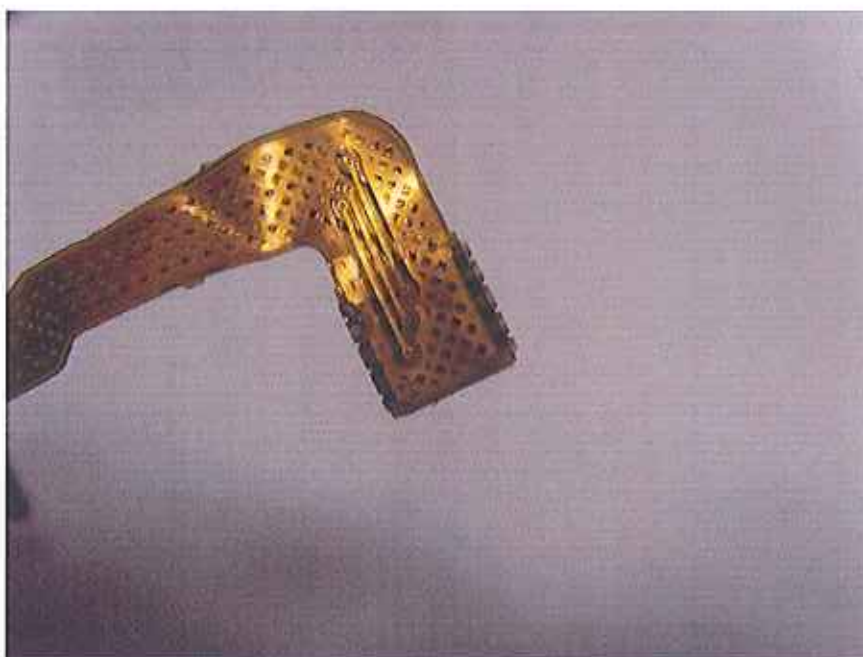
Appendix A



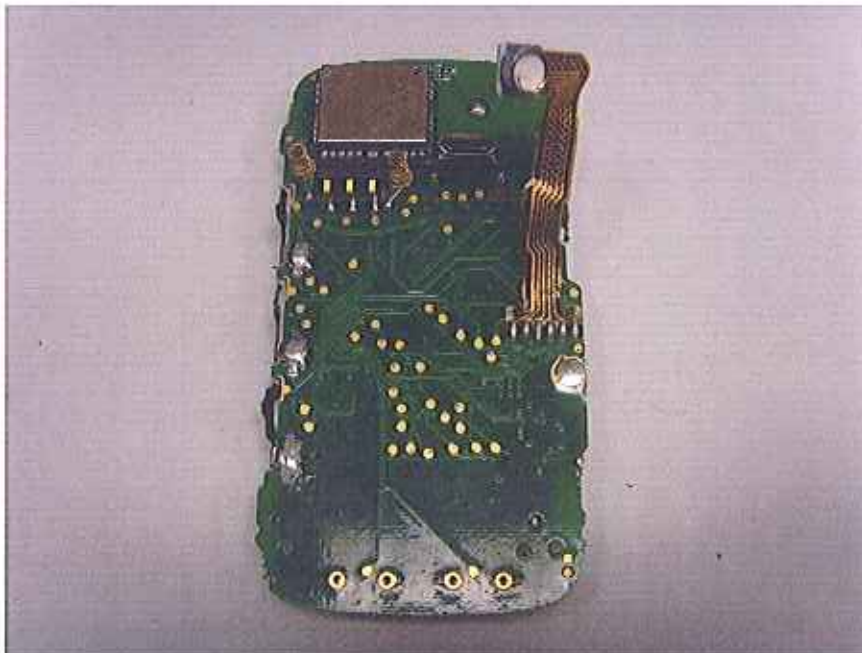
Appendix A



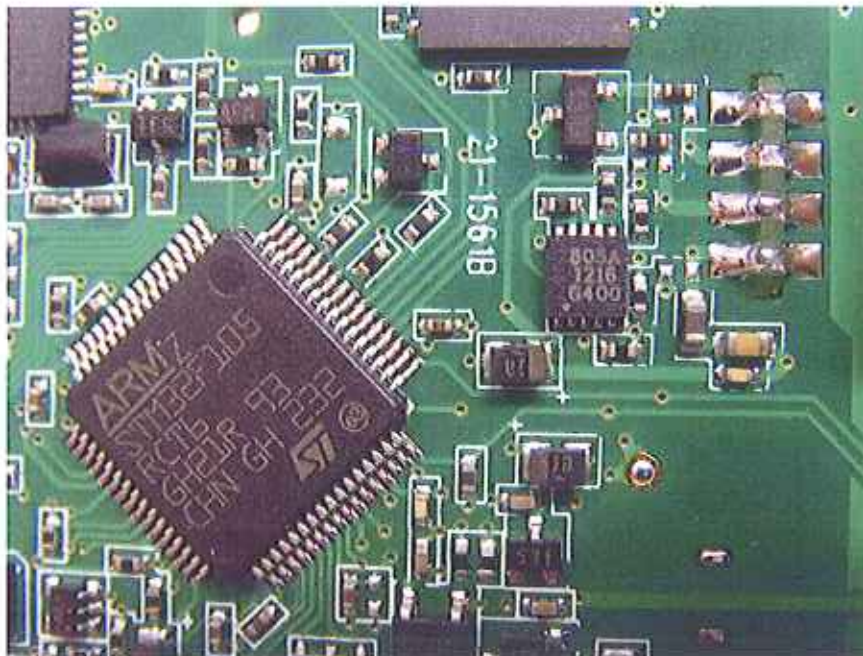
Appendix A



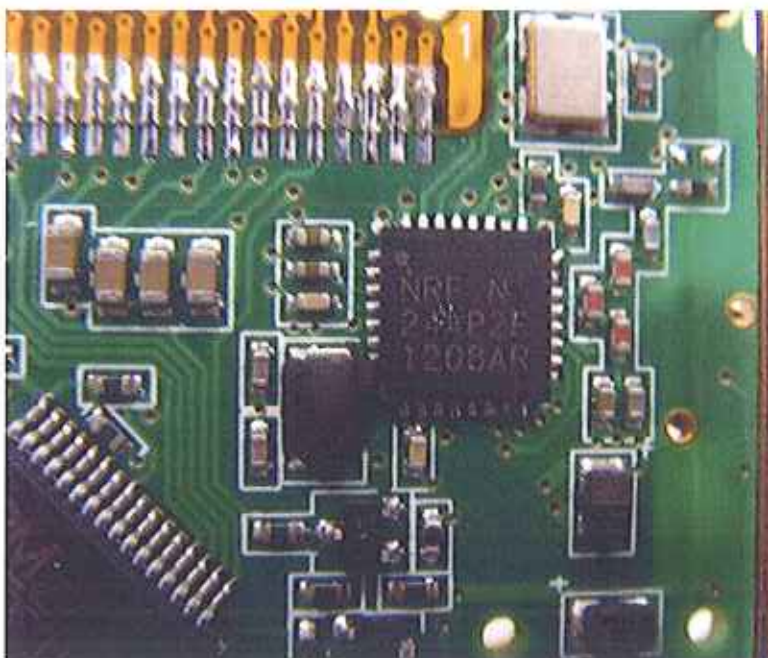
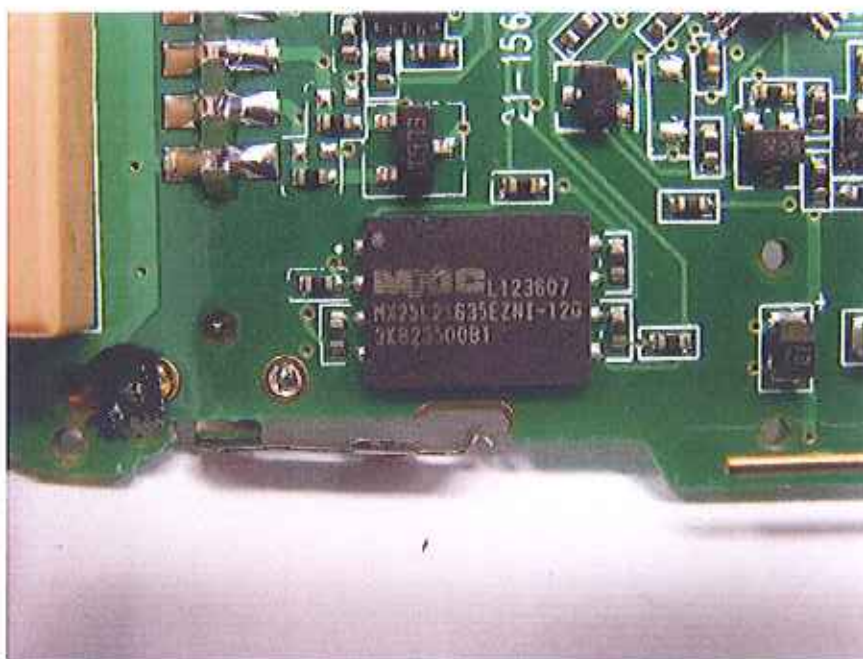
Appendix A



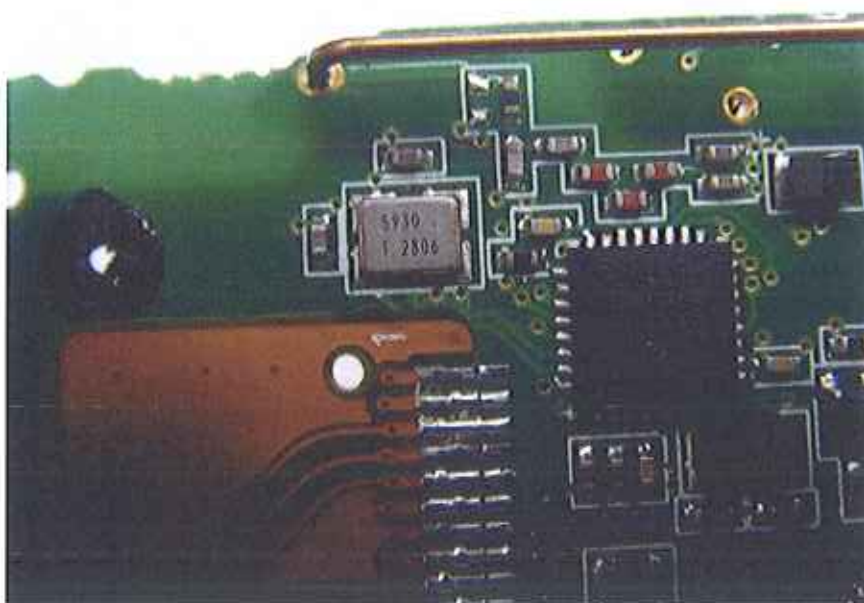
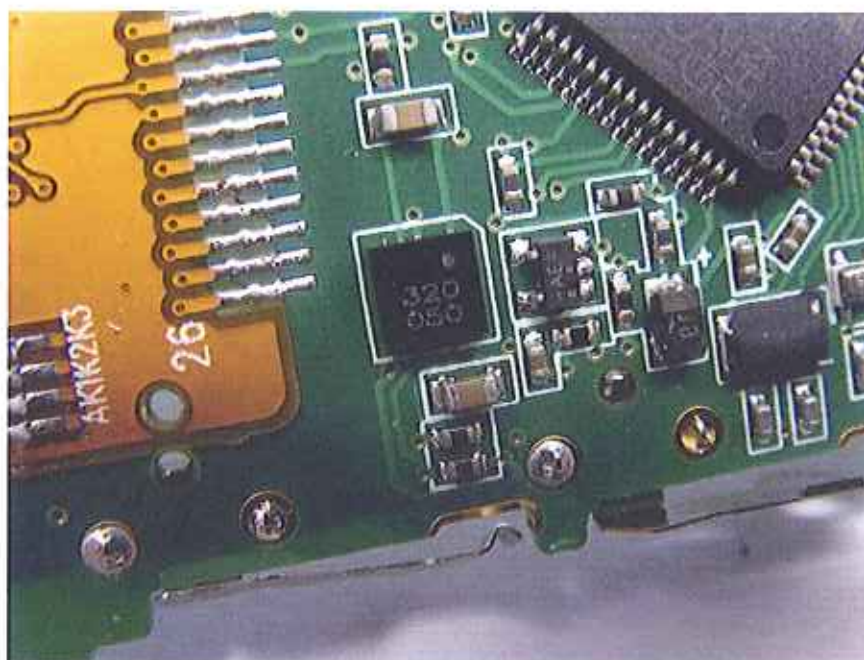
Appendix A



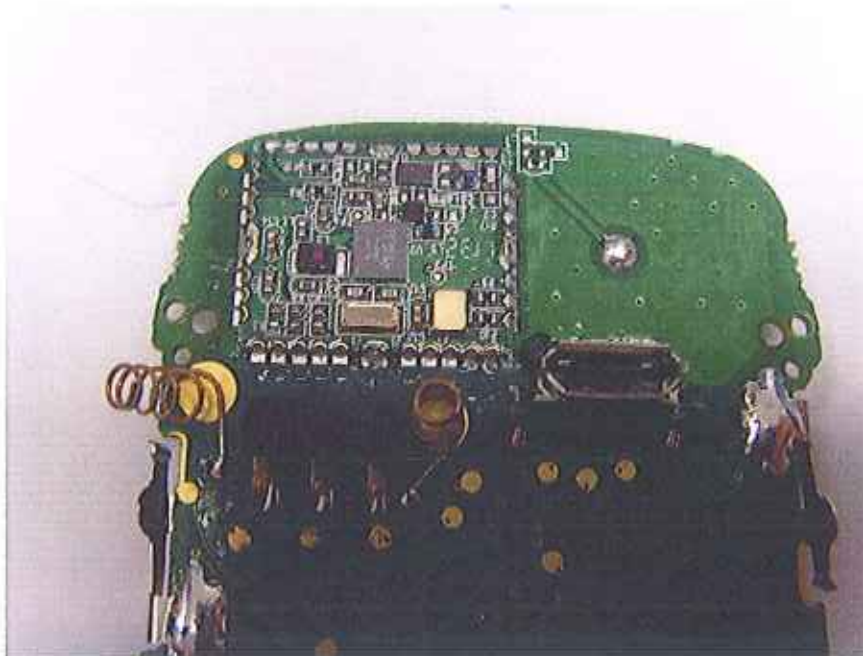
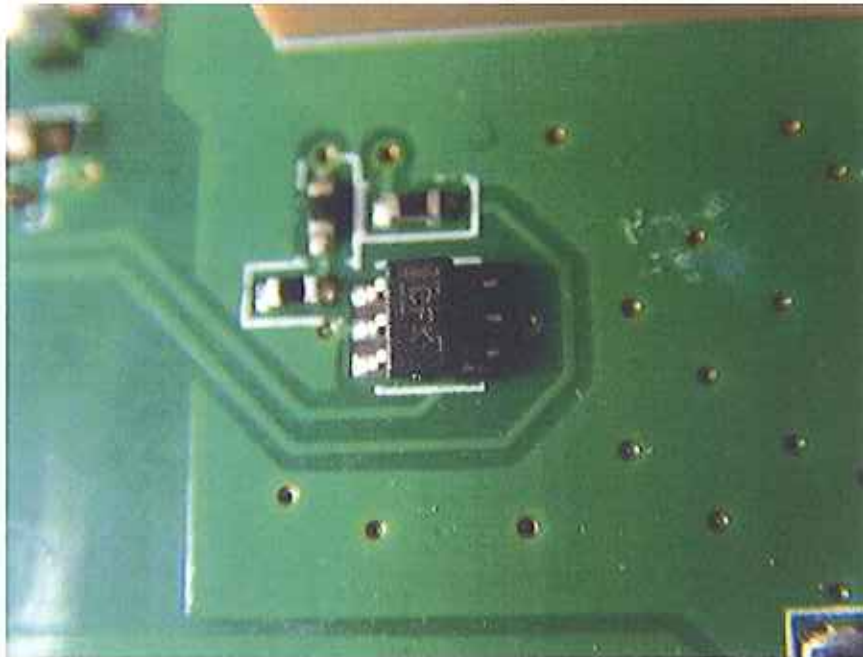
Appendix A



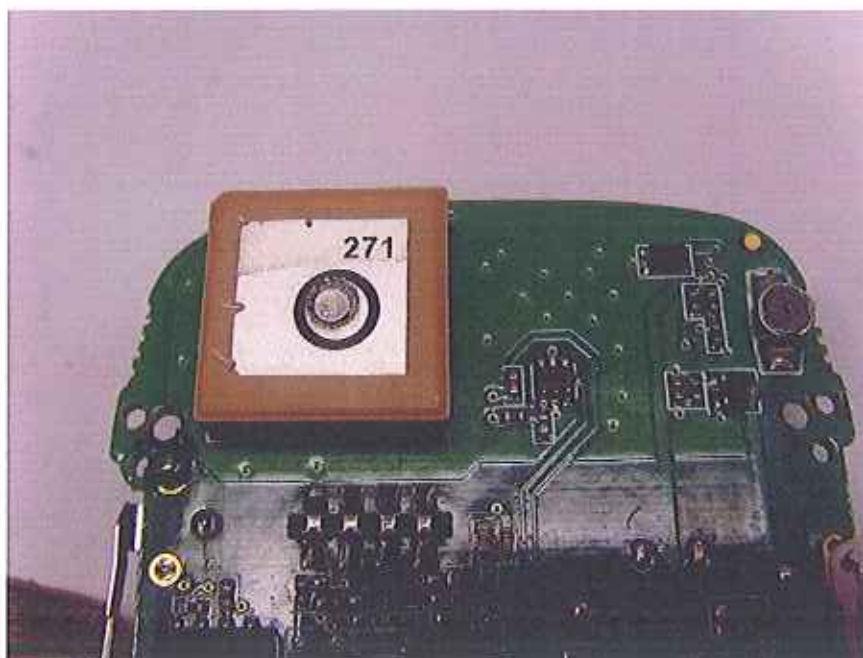
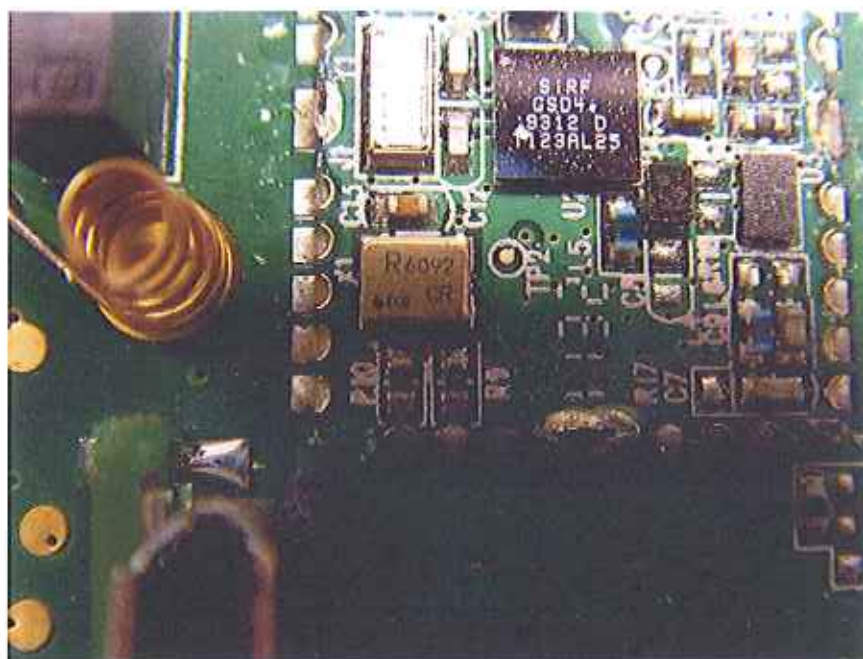
Appendix A



Appendix A



Appendix A



10. Appendix B



Radiated Emission Test



Radiated Emission Test

Appendix B



Radiated Emission Test



Conducted Emission Test

Appendix B



Conducted Emission Test