Acorn Projects ApS

Leikr Watch

Main Model: LKR1
Serial Model: LKR2,LKR3,LKR4,LKR5,LKR6,LKR7, LKR8,LKR9,LKR10,LKR11,LKR12

September 06, 2013

Report No.: 13070285-FCC IC-R2
(This report supersedes NONE)

Modifications made to the product : None

This Test Report is Issued Under the Authority of:		
Back Huang	Alex Liu	
Back Huang **Compliance Engineer**	**Alex Liu** **Technical Manager**	

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Test result presented in this test report is applicable to the representative sample only.

RF Test Report

To: FCC 15.249: 2012, IC RSS-210: Issue 8, RSS-102: Issue 4, RSS-Gen: Issue 3

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Laboratory Introduction

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Hong Kong	OFTA (US002)	RF , Telecom

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CONTENTS

1 EXECUTIVE SUMMARY & EUT INFORMATION

The purpose of this test programme was to demonstrate compliance of the Acorn Projects ApS, Leikr Watch and model: LKR1 against the current Stipulated Standards. The Leikr Watch has demonstrated compliance with the FCC 15.249: 2012, IC RSS-210: Issue 8, RSS-102: Issue 4, RSS-Gen: Issue 3.

EUT Information

EUT Description	:	**Leikr Watch**
Main Model	:	**LKR1**
Serial Model	:	**LKR2,LKR3,LKR4,LKR5,LKR6,LKR7,LKR8,LKR9,LKR10,LKR11, LKR12**
Antenna Gain	:	**WIFI: 3 dBi** **ANT+: 3 dBi**
Input Power	:	**Battery:** **Model: GEB303242** **Li-ion Battery: 3.7V 330mAh**
Classification Per Stipulated Test Standard	:	**FCC 15.249: 2012, IC RSS-210: Issue 8, RSS-102: Issue 4, RSS-Gen: Issue 3**

2 TECHNICAL DETAILS

Purpose	**Compliance testing of Leikr Watch with stipulated standard**
Applicant / Client	**Acorn Projects ApS Smedeland 2, DK-2600 Glostrup, Denmark**
Manufacturer	**Acorn Projects ApS Smedeland 2, DK-2600 Glostrup, Denmark**
Laboratory performing the tests	**SIEMIC (Shenzhen-China) Laboratories Zone A, Floor 1, Building 2, Wan Ye Long Technology Park, South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong, China Tel: +86-0755-2601 4629 / 2601 4953 Fax: +86-0755-2601 4953-810 Email: China@siemic.com.cn**
Test report reference number	**13070285-FCC IC-R2**
Date EUT received	**July 25, 2013**
Standard applied	**FCC 15.249: 2012, IC RSS-210: Issue 8, RSS-102: Issue 4, RSS-Gen: Issue 3**
Dates of test (from – to)	**September 04, 2013 to September 05, 2013**
No of Units	**#1**
Equipment Category	**DXT**
Trade Name	**Leikr**
RF Operating Frequency (ies)	**WIFI: 802.11b/g/n(20) : 2412-2462 MHz ANT+: 2403-2480 MHz GPS: 1575.42 MHz**
Number of Channels	**WIFI: 11CH ANT+: 78CH GPS: 1CH**
Modulation	**WIFI: DSSS/OFDM ANT+: GFSK GPS: BPSK**
FCC ID	**2AAPI-LKR**
IC ID	**11342A-LKR**

3 MODIFICATION

NONE

4 TEST SUMMARY

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

Spread Spectrum System/Device

Test Results Summary

Test Standard		Description	Pass / Fail
/	RSS-102 [2.5.1]	RF Exposure	Pass
§15.215(c)	RSS-210 [A8.1]	20 dB Bandwidth&99% Occupied Bandwidth	Pass
§15.249(a)	/	Field Strength Measurement	Pass
§15.205(a), §15.209(a), §15.249, §15.35.	RSS-210 [A2.9]	Radiated Emissions(Tx)	Pass
/	RSS-Gen [6.1]	Radiated Emissions(Rx)	Pass
/	RSS-210 [A8.5]	Band-Edge	Pass

5 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS

5.1 RF Exposure

Standard Requirement:

According to RSS-102 [2.5] Exemption from Routine Evaluation Limits.

All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance (see Annex C). The information contained in the RF exposure technical brief may be limited to information that demonstrates how the output power of the transmitter was derived.

If the EUT does not meet the appropriate exemption limit, a complete SAR or RF exposure evaluation shall be performed.

It must be emphasized that the above exemption from routine evaluation is not an exemption from compliance.

2.5.1 Exemption from Routine Evaluation Limits – SAR Evaluation

SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- from 3 kHz up to 1 GHz inclusively, and with output power (i.e. the higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 200 mW for general public use and 1000 mW for controlled use;
- above 1 GHz and up to 2.2 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 100 mW for general public use and 500 mW for controlled use;
- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use;
- above 3 GHz and up to 6 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 10 mW for general public use and 50 mW for controlled use.

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the output power of the device was derived.

The maximum e.i.r.p. of ANT+ is 8.812 dBm=7.61 mW＜20 mW.

Note:The maximun e.i.r.p.= the maximum output power+the antenna gain.

Test Result: Pass

5.2 20 dB Bandwidth&99% Occupied Bandwidth

1. Conducted Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
   The spectrum analyzer was connected to the antenna terminal.
2. Environmental Conditions

Temperature	26°C
Relative Humidity	58%
Atmospheric Pressure	1017mbar

3. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
4. Test date : September 04, 2013
   Tested By : Back Huang

Standard Requirement:

The bandwidth of a frequency hopping channel is the 20 dB emission bandwidth, measured with the hopping stopped. The system RF bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset while the long-term distribution appears evenly distributed.

Procedures:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as 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.
4. Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

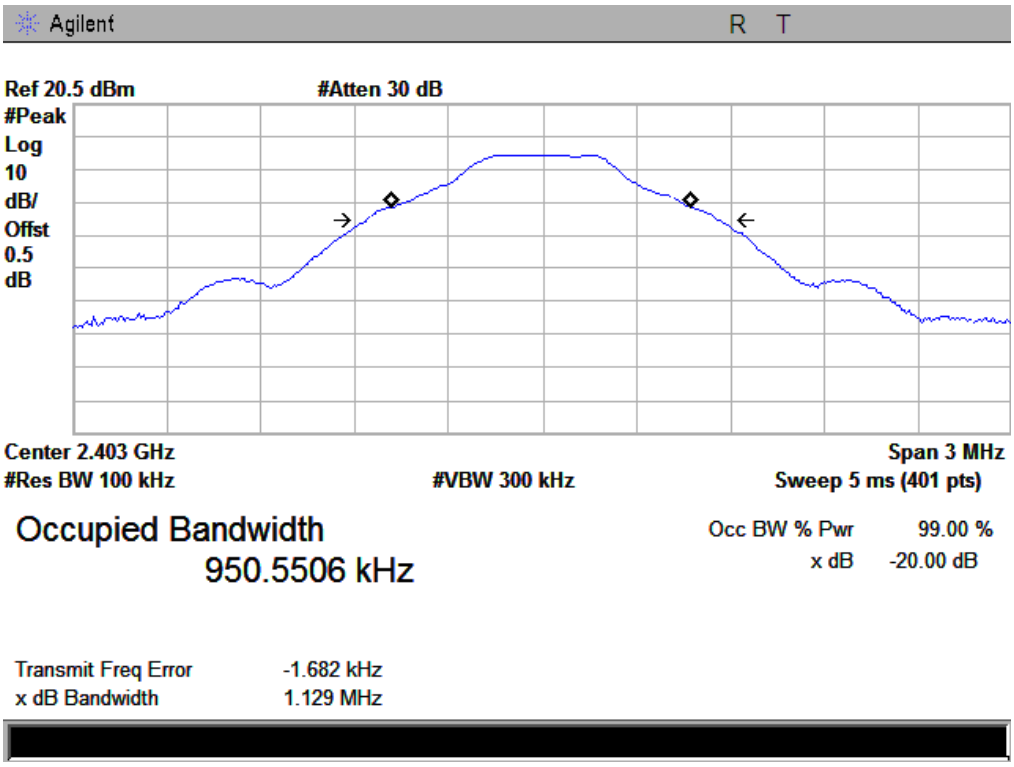
Test Result: Pass

Test Mode:	GFSK Transmitting

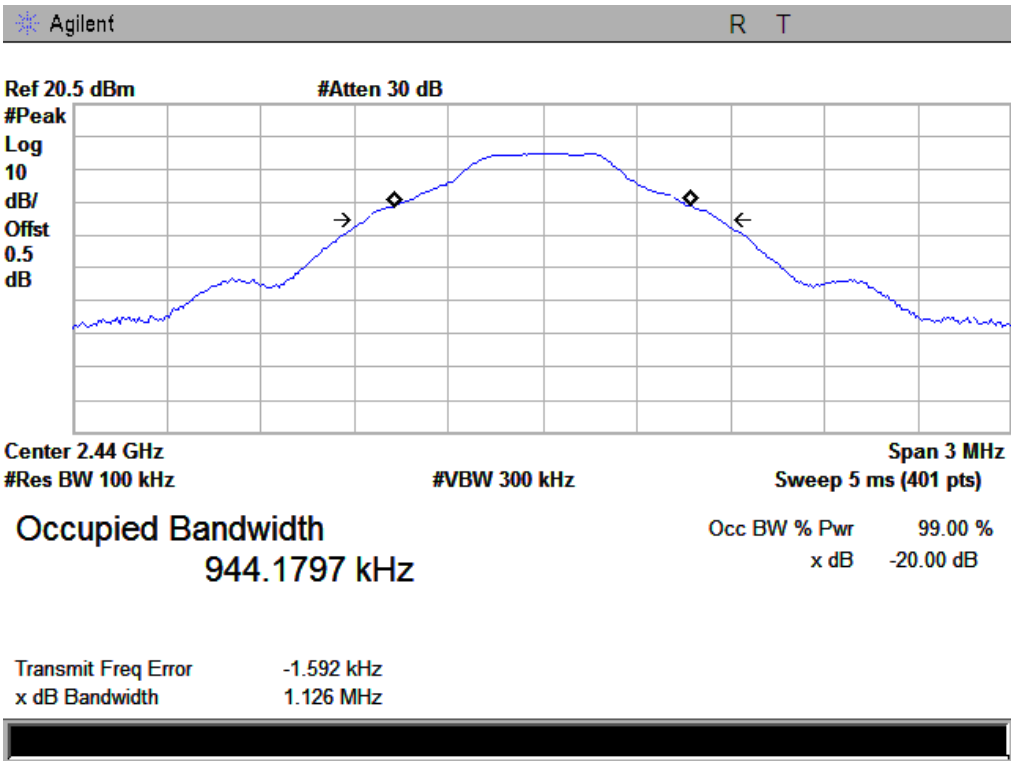
Channel	Frequency (MHz)	20dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)
Low	2403	1129	950.6
Middle	2440	1126	944.2
High	2480	1125	945.0

The 20dB&99% bandwidth:

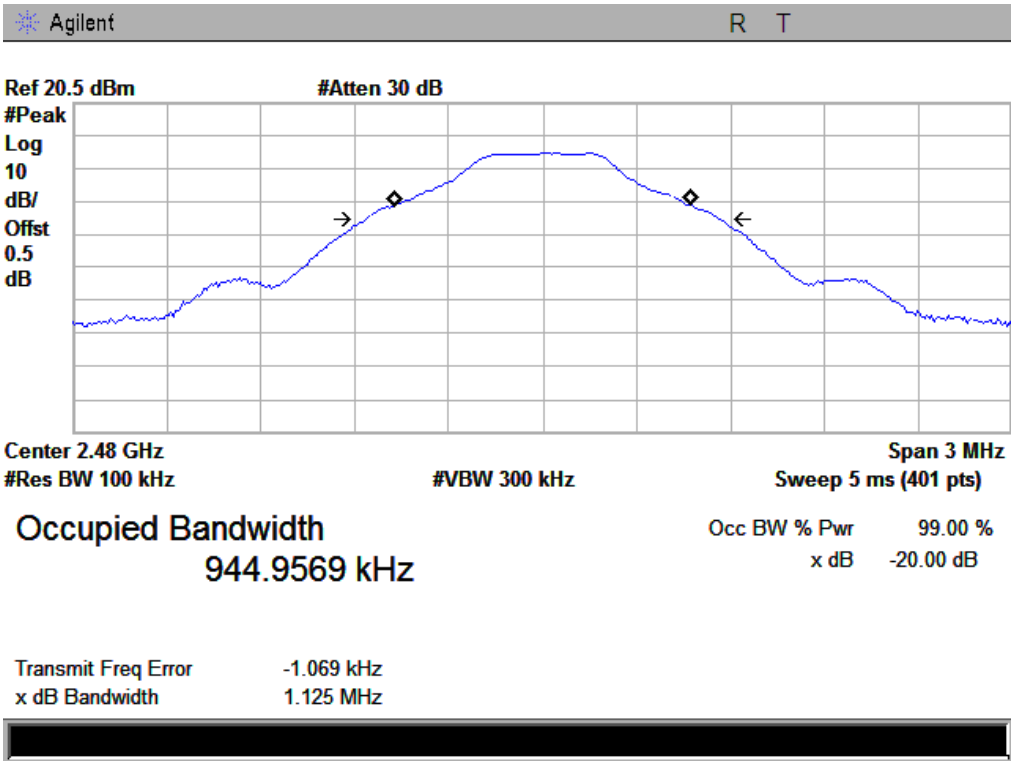
Low Channel



Middle Channel



High Channel



5.3 Field Strength Measurement

1. Radiated Measurement
   EUT was set for low, mid, high channel with modulated mode and highest RF output power.
2. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 40GHz is ±1.5dB.
3. Environmental Conditions

Temperature	26°C
Relative Humidity	58%
Atmospheric Pressure	1017mbar

4. Test date : September 04, 2013
   Tested By : Back Huang

Standard Requirement:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

Procedures:

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

Test Result: Pass

Test Mode:	**GFSK Transmitting**

Fundamental Field Strength:

Frequency (MHz)	S.A. Reading (dBµV)	Detector (PK/AV)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
2403	91.28	PK	V	29.08	2.4	24	98.76	114	-15.24
2403	84.65	AV	V	29.08	2.4	24	92.13	94	-1.87
2440	91.35	PK	V	29.14	2.4	24	98.89	114	-15.11
2440	84.58	AV	V	29.14	2.4	24	92.12	94	-1.88
2480	91.22	PK	V	29.21	2.4	24	98.83	114	-15.17
2480	84.74	AV	V	29.21	2.4	24	92.35	94	-1.65

5.4 Radiated Emissions(Tx)

1. All possible modes of operation were investigated. Only the 6 worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2, in the range 30MHz – 1GHz (3m & 10m) & 1GHz above (3m) is +5.6/-4.5dB.
4. Environmental Conditions

Temperature	27°C
Relative Humidity	62%
Atmospheric Pressure	1018mbar

5. Test date : September 05, 2013
   Tested By : Back Huang

Standard Requirement:

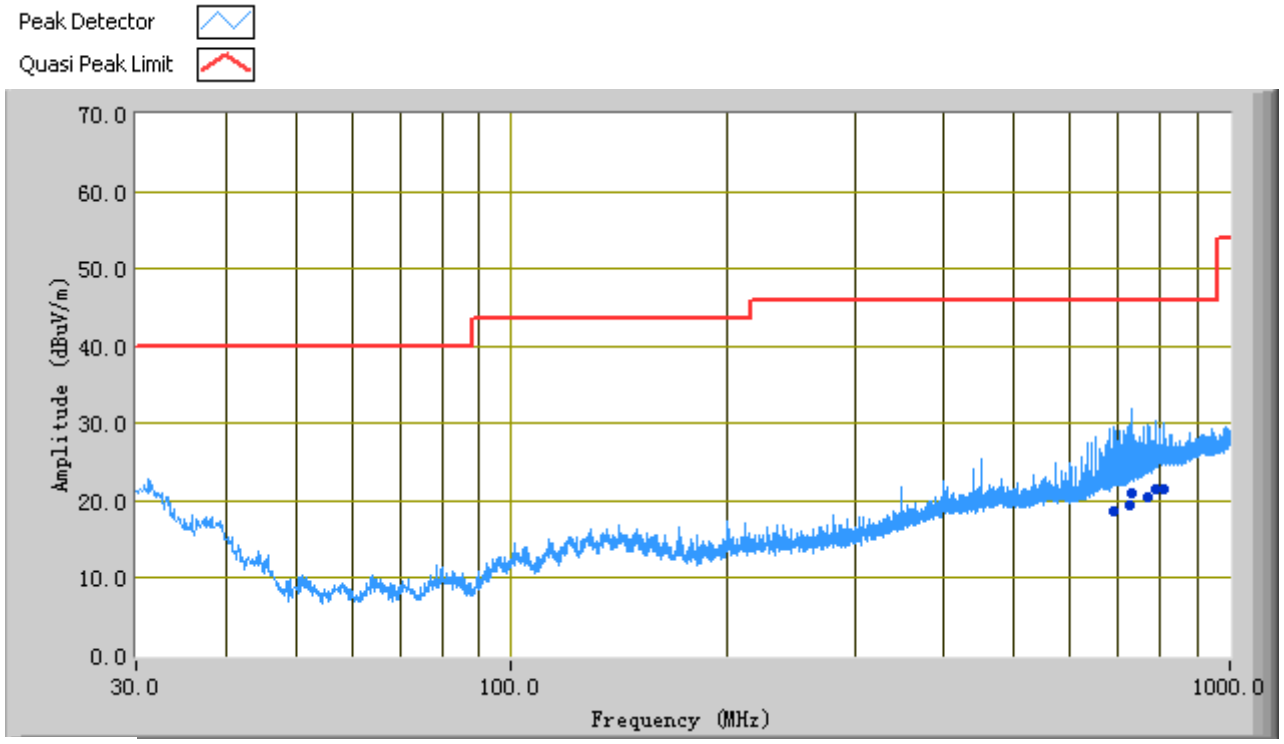
The emissions from the Low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges.

The spurious emission scanned frequency range is 30MHz – 25GHz.

Test Result: Pass

Test Mode:	GFSK Transmitting

Below 1GHz



Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H/V)	Height (cm)	Factors (dB)	Limit (dBuV)	Margin (dB)
730.88	21.06	273.00	H	383.00	1.42	46.00	-24.94
789.58	21.44	126.00	H	162.00	3.17	46.00	-24.56
810.56	21.58	89.00	V	380.00	3.62	46.00	-24.42
771.01	20.54	285.00	H	105.00	2.61	46.00	-25.46
725.78	19.33	334.00	H	398.00	1.26	46.00	-26.67
690.98	18.55	306.00	V	278.00	0.33	46.00	-27.45

Test Mode:	GFSK Transmitting

Above 1 GHz

Low Channel (2403 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4806	35.14	AV	228	1.1	V	33.83	3.3	24	48.27	54	-5.73
4806	35.64	AV	162	1.1	H	33.83	3.3	24	48.77	54	-5.23
4806	42.16	PK	228	1.1	V	33.83	3.3	24	55.29	74	-18.71
4806	42.55	PK	162	1.1	H	33.83	3.3	24	55.68	74	-18.32
5406	37.86	AV	315	1.2	V	34.18	3.8	24	51.84	54	-2.16
5406	37.83	AV	76	1.0	H	34.18	3.8	24	51.81	54	-2.19
5406	44.36	PK	315	1.2	V	34.18	3.8	24	58.34	74	-15.66
5406	44.68	PK	76	1.0	H	34.18	3.8	24	58.66	74	-15.34

Middle Channel (2440 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4880	36.12	AV	221	1.0	V	33.86	3.3	24	49.28	54	-4.72
4880	36.23	AV	176	1.0	H	33.86	3.3	24	49.39	54	-4.61
4880	42.78	PK	221	1.0	V	33.86	3.3	24	55.94	74	-18.06
4880	43.24	PK	176	1.0	H	33.86	3.3	24	56.4	74	-17.6
5177	37.6	AV	211	1.2	V	34.06	3.5	24	51.16	54	-2.84
5177	37.52	AV	225	1.1	H	34.06	3.5	24	51.08	54	-2.92
5177	44.74	PK	211	1.2	V	34.06	3.5	24	58.3	74	-15.7
5177	44.53	PK	225	1.1	H	34.06	3.5	24	58.09	74	-15.91

High Channel (2480 MHz)

Frequency (MHz)	S.A. Reading (dBμV)	Detector (PK/AV)	Direction (degree)	Height (m)	Polarity (H/V)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Amp. (dBμV/m)	Limit (dBμV/m)	Margin (dB)
4960	36.48	AV	238	1.1	V	33.9	3.3	24	49.68	54	-4.32
4960	36.61	AV	196	1.1	H	33.9	3.3	24	49.81	54	-4.19
4960	42.83	PK	238	1.1	V	33.9	3.3	24	56.03	74	-17.97
4960	43.66	PK	196	1.1	H	33.9	3.3	24	56.86	74	-17.14
5476	37.33	AV	154	1.0	V	34.29	3.8	24	51.42	54	-2.58
5476	37.58	AV	89	1.2	H	34.29	3.8	24	51.67	54	-2.33
5476	44.27	PK	154	1.0	V	34.29	3.8	24	58.36	74	-15.64
5476	44.78	PK	89	1.2	H	34.29	3.8	24	58.87	74	-15.13

Spurious emissions in restricted band for FCC/IC:

The Spurious Emission was checked in restricted band. No emissions were found and only noise floor.

5.5 Radiated Emissions(Rx)

1. The receiver shall be operated in the normal receive mode near the mid-point of the band in which the receiver is designed to operate.
2. Radiated emission measurements are to be performed on a test site registered with Industry Canada. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.
4. Environmental Conditions

Temperature	27°C
Relative Humidity	62%
Atmospheric Pressure	1018mbar

5. Test date : September 05, 2013
   Tested By : Back Huang

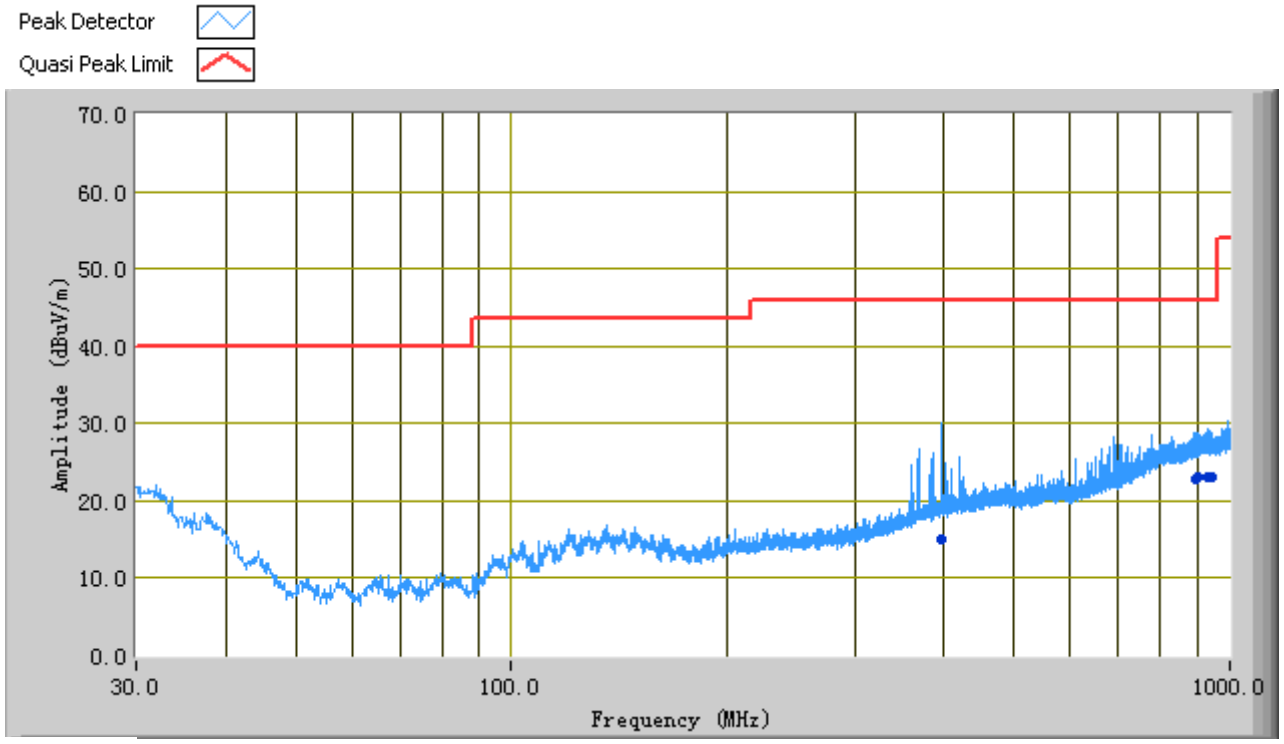
Standard Requirement:

For emissions below 1000 MHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.
Above 1000 MHz, measurements shall be performed using an average detector with a minimum resolution bandwidth of 1 MHz.

Test Result: Pass

Test Mode:	GFSK Receiving

Below 1GHz

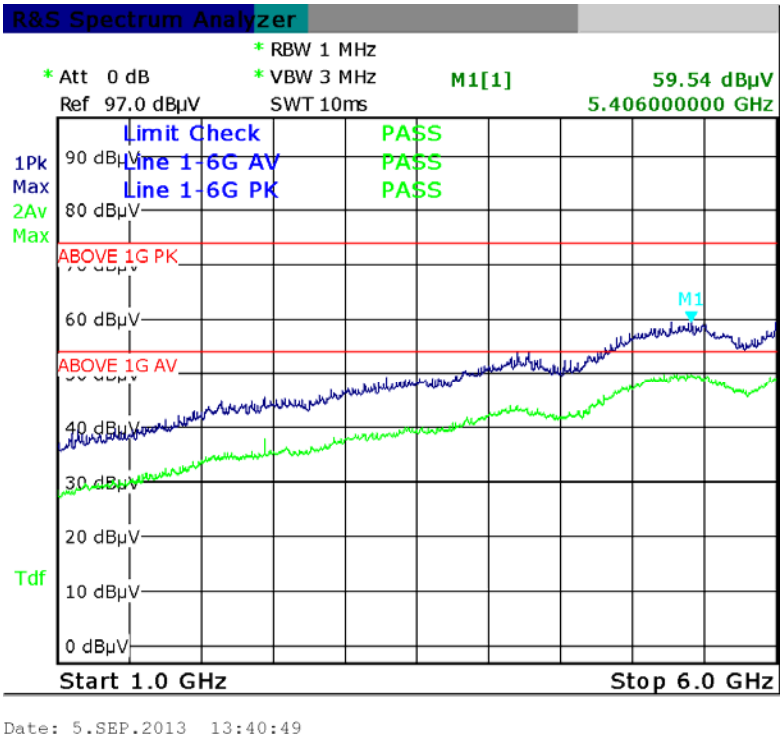


Test Data

Frequency (MHz)	Quasi Peak (dBuV/m)	Azimuth	Polarity(H/V)	Height (cm)	Factors (dB)	Limit (dBuV)	Margin (dB)
397.11	15.09	0.00	V	203.00	-3.11	46.00	-30.91
928.92	23.07	2.00	H	367.00	5.23	46.00	-22.93
938.41	22.97	187.00	V	132.00	5.37	46.00	-23.03
897.19	22.79	196.00	H	211.00	4.73	46.00	-23.21
942.62	23.08	45.00	V	148.00	5.44	46.00	-22.92
903.90	23.00	288.00	V	378.00	4.83	46.00	-23.00

Test Mode:	GFSK Receiving(Worse Case)

Above 1 GHz



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5.6 Band-Edge

1. In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.
2. Environmental Conditions

Temperature	27°C
Relative Humidity	62%
Atmospheric Pressure	1018mbar

3. Test date : September 05, 2013
   Tested By : Back Huang

Procedures: (Radiated Method Only)

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the rotated table inside the anechoic chamber without connection to measurement instrument. Turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range. Repeat above procedures until all measured frequencies were complete.
3. Set band RBW=1MHz, VBW=3MHz with a convenient frequency span from band edge.
4. Find the highest point in edge frequency,and then calculated results.
5. Repeat above procedures until all measured frequencies were complete.

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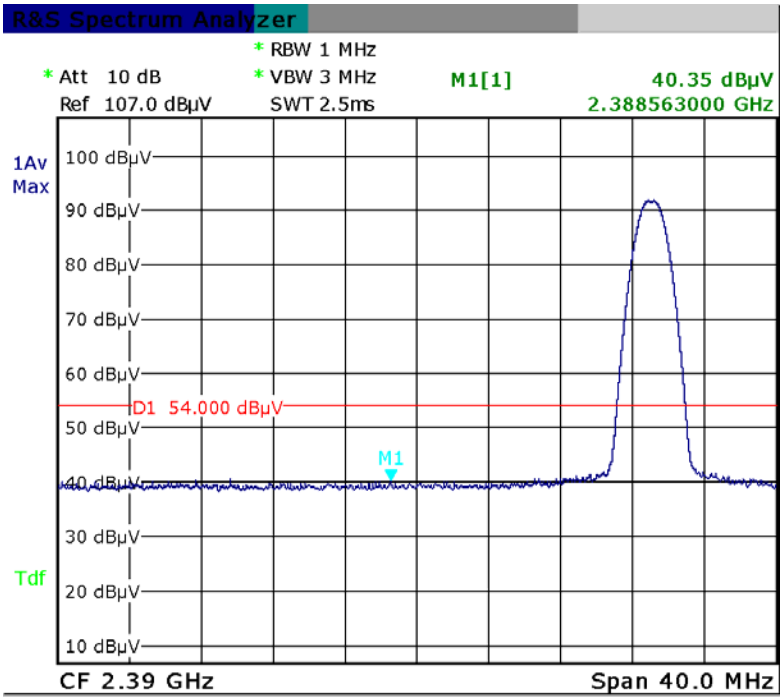
Test Result: Pass

Please refer to the following tables and plots.

Band Edge, Left Side (Average)



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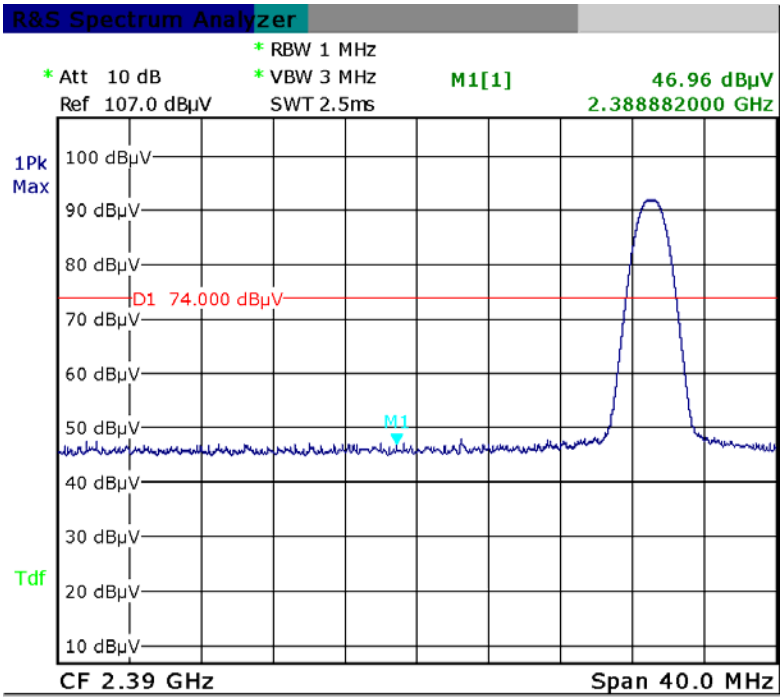
Band Edge, Left Side (Peak)



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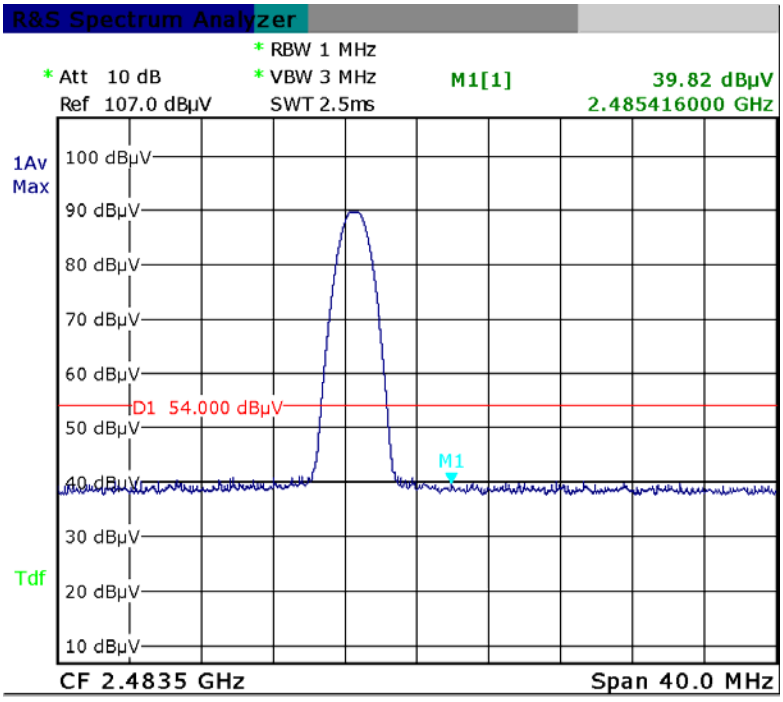
Band Edge, Right Side (Average)



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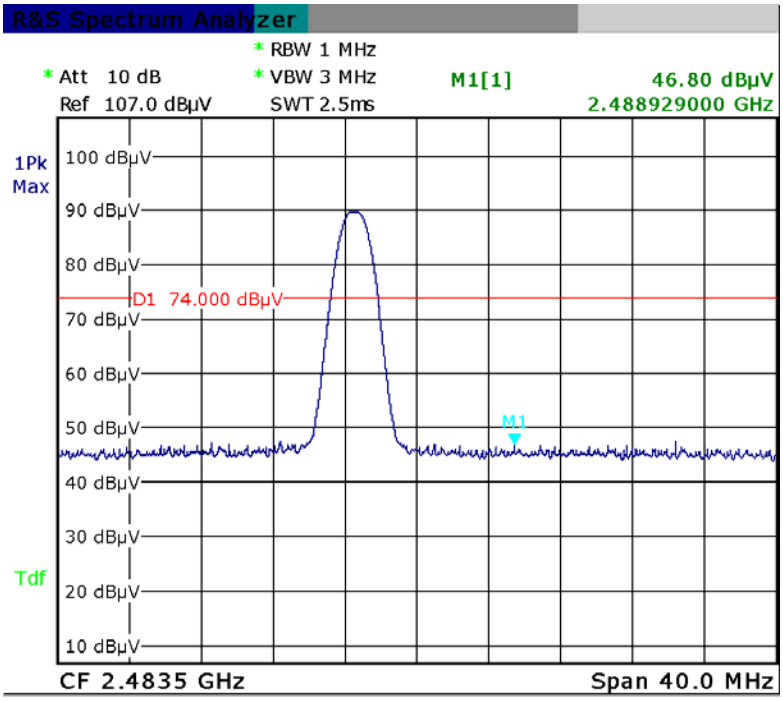
Band Edge, Right Side (Peak)



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Annex A. TEST INSTRUMENT & METHOD

Annex A.i. TEST INSTRUMENTATION & GENERAL PROCEDURES

Instrument	Model	Serial #	Calibration Date	Calibration Due Date
RF conducted test				
Agilent ESA-E SERIES SPECTRUM ANALYZER	E4407B	CFG038	10/25/2012	10/24/2013
Power Splitter	1#	1#	02/02/2013	02/01/2014
Temperature/Humidity Chamber	1007H	N/A	01/07/2013	01/06/2014
DC Power Supply	E3640A	MY40004013	03/22/2013	03/21/2014
Radiated Emissions				
EMI test receiver	ESL6	100262	11/19/2012	11/18/2013
Positioning Controller	UC3000	MF780208282	11/19/2012	11/18/2013
OPT 010 AMPLIFIER(0.1-1300MHz)	8447E	2727A02430	11/19/2012	11/18/2013
Microwave Preamplifier(0.5～18GHz)	PAM-118	443008	11/08/2012	11/07/2013
Bilog Antenna (30MHz~6GHz)	JB6	A110712	01/27/2013	01/26/2014
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	071283	11/20/2012	11/19/2013

Annex A. ii. RADIATED EMISSIONS TEST DESCRIPTION

Limit

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2. In the above emission table, the tighter limit applies at the band edges.

Frequency (Hz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

EUT Characterisation

EUT characterisation, over the frequency range from 30MHz to 10th Harmonic, was done in order to minimise radiated emissions testing time while still maintaining high confidence in the test results.

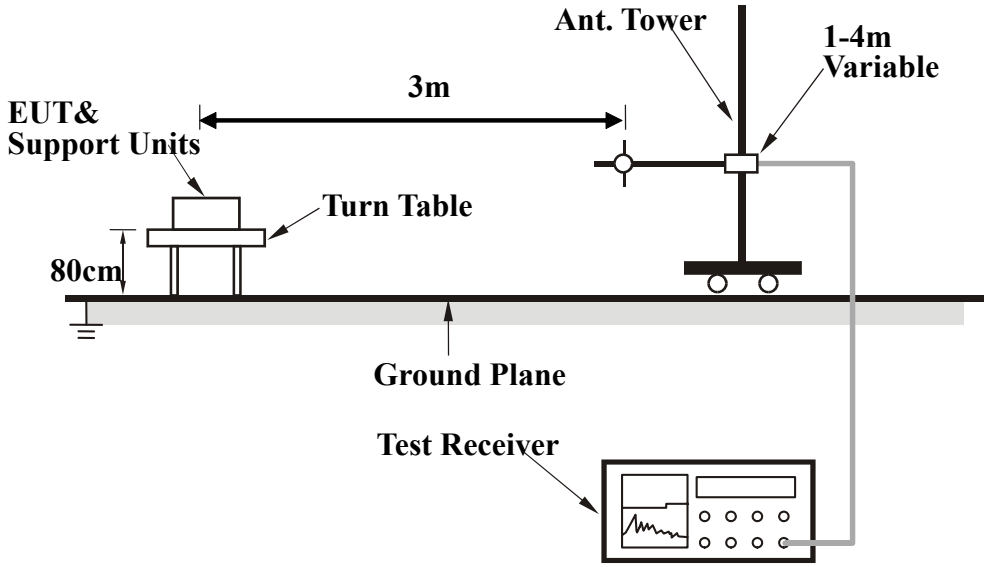
The EUT was placed in the chamber, at a height of about 0.8m on a turntable. Its radiated emissions frequency profile was observed, using a spectrum analyzer /receiver with the appropriate broadband antenna placed 3m away from the EUT. Radiated emissions from the EUT were maximised by rotating the turntable manually, changing the antenna polarisation and manipulating the EUT cables while observing the frequency profile on the spectrum analyzer / receiver. Frequency points at which maximum emissions occurred, clock frequencies and operating frequencies were then noted for the formal radiated emissions test at the Open Area Test Site (OATS) or 3m EMC chamber.

Test Set-up

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.

2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.

3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.



Test Method

The following procedure was performed to determine the maximum emission axis of EUT:
1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antenna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. So, the axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.

Final Radiated Emission Measurement
1. Setup the configuration according to figure 1. Turn on EUT and make sure that it is in normal function.

2. For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 100 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.

4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ◦ to 360 ◦ with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading.

5. Repeat step 4 until all frequencies need to be measured was complete.

6. Repeat step 5 with search antenna in vertical polarized orientations.

During the radiated emission test, the Spectrum Analyzer was set with the following configurations:

Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth
30 to 1000	Peak	100 kHz	100 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Description of Radiated Emissions Program

This EMC Measurement software run LabView automation software and offers a common user interface for electromagnetic interference (EMI) measurements. This software is a modern and powerful tool for controlling and monitoring EMI test receivers and EMC test systems. It guarantees reliable collection, evaluation, and documentation of measurement results. Basically, this program will run a pre-scan measurement before it proceeds with the final measurement. The pre-scan routine will run the scan on four different antenna heights, 2 antenna polarity, and 360 degrees table rotation. For example, the program was set to run 30 MHz to 1 GHz scan; the program will first start from a meter antenna height and divide the 30 MHz to 1 GHz into 10 separate parts of maximum hold sweeps. Each parts of maximum hold sweep, the program will collect the data from 0 degree to 360 degrees table rotation. After the program complete the 1m scan, the antenna continues to rise to 2m and continue the scan. The step will repeated for all specified antenna height and polarity. This program will perform the Quasi Peak measurement after the signal maximization process and pre-scan routine. The final measurement will be base on the pre-scan data reduction result.

Sample Calculation Example

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. For the limit is employed average value, therefore the peak value can be transferred to average value by subtracting the duty factor. The basic equation with a sample calculation is as follows:

Peak = Reading + Corrected Factor

where

Corr. Factor = Antenna Factor + Cable Factor - Amplifier Gain (if any)

And the average value is

Average = Peak Value + Duty Factor or

Set RBW = 1MHz, VBW = 10Hz.

Note:

If the measured frequencies are fall in the restricted frequency band, the limit employed must be quasi peak value when frequencies are below or equal to 1 GHz. And the measuring instrument is set to quasi peak detector function.

Annex B. EUT AND TEST SETUP PHOTOGRAPHS

Annex B.i. Photograph 1: EUT External Photo

EUT - Front View

EUT - Rear View

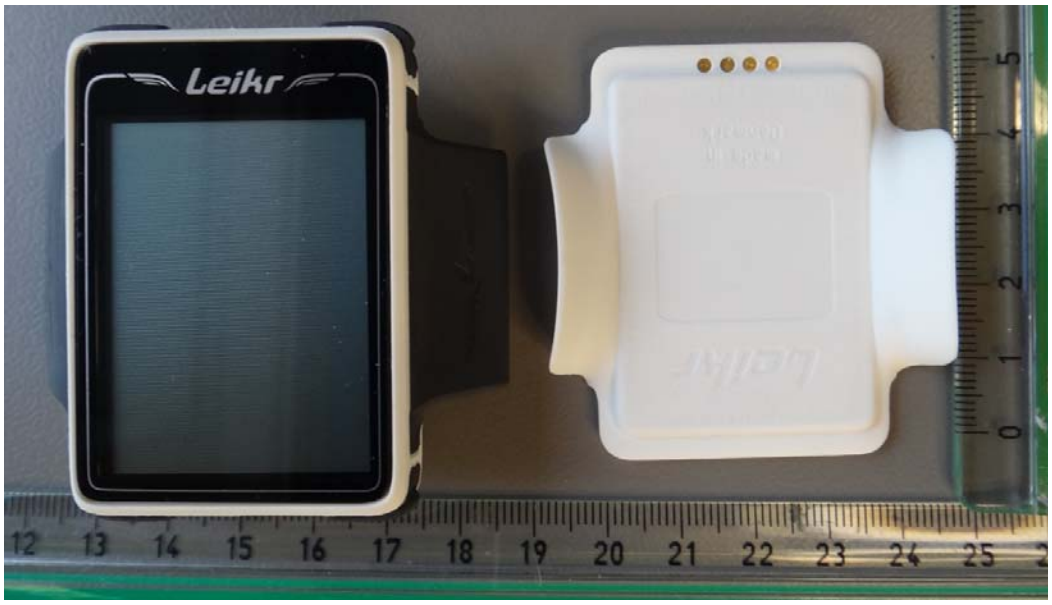
EUT - Top View

EUT - Bottom View

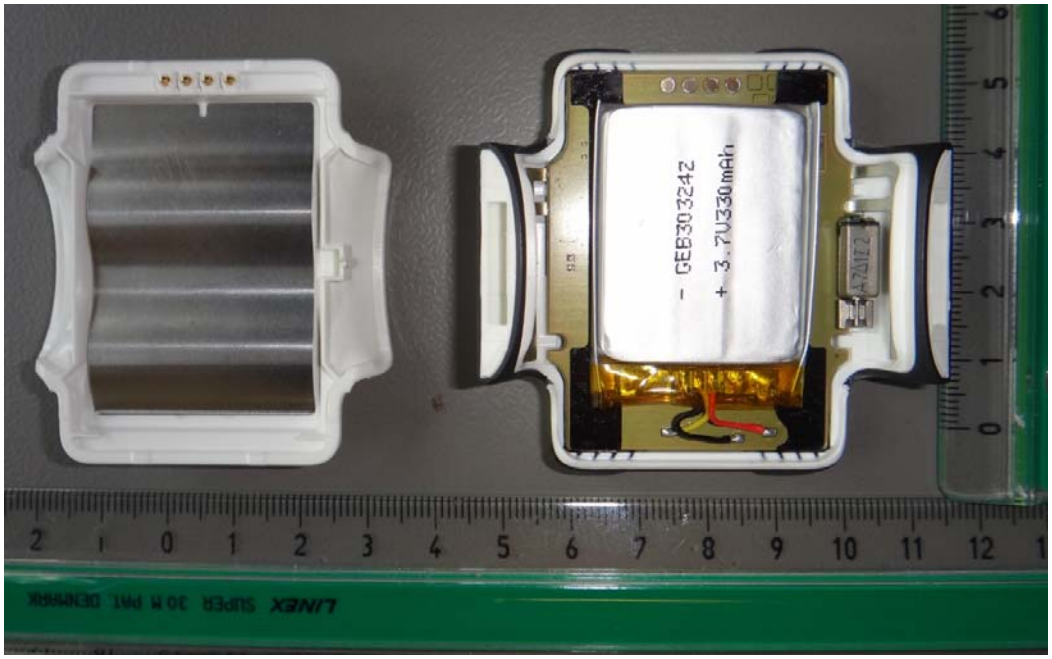
EUT - Left View

EUT - Right View

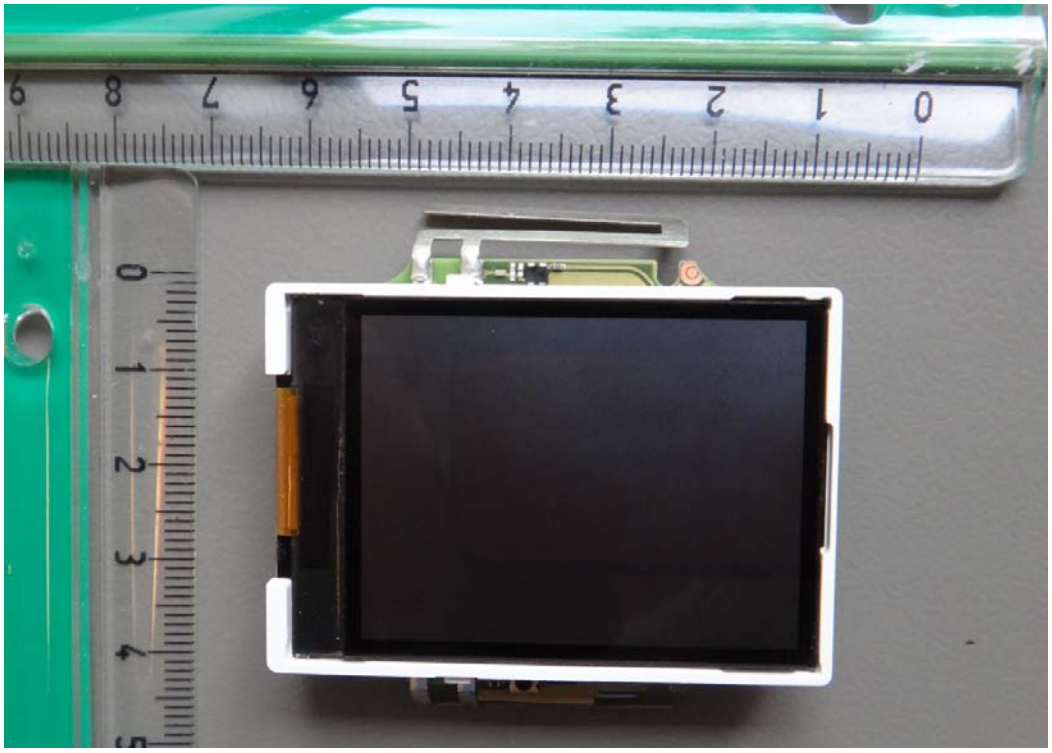
Annex B.ii. Photograph 2: EUT Internal Photo



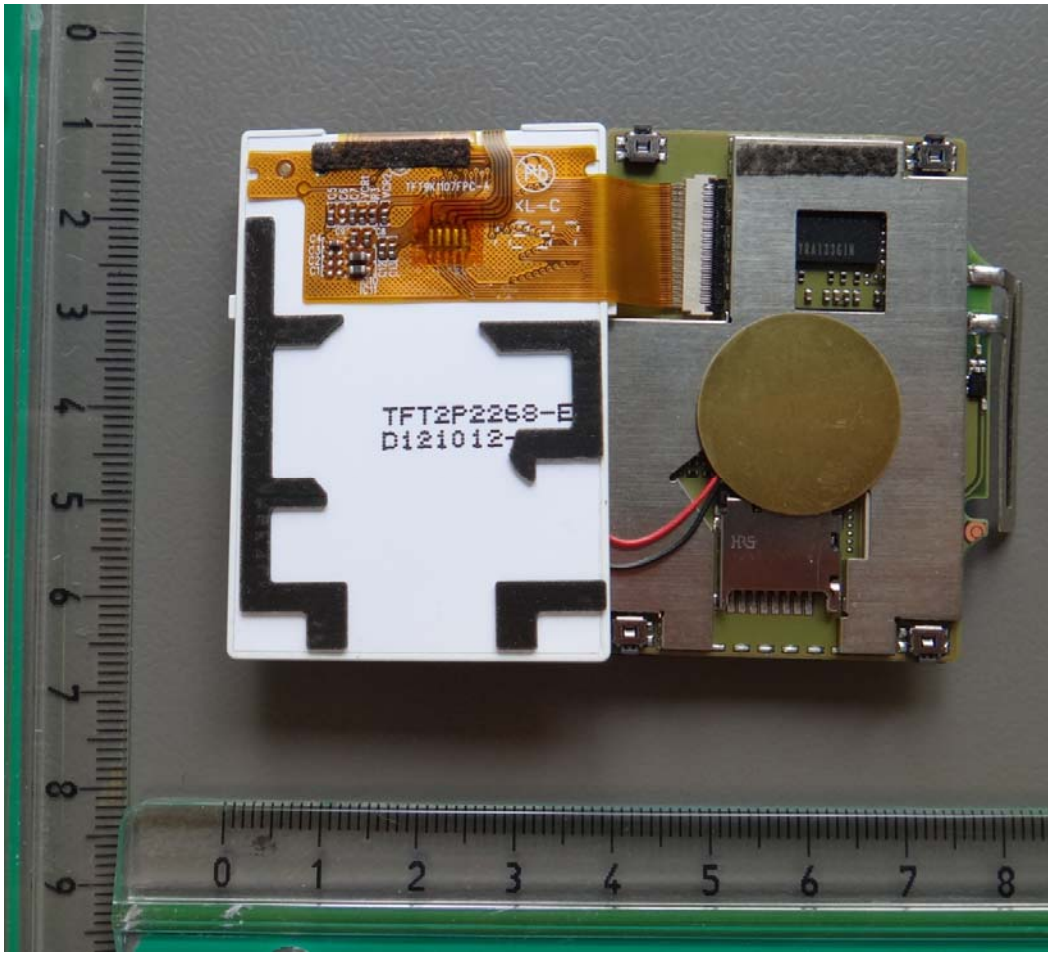
Cover Off - Top View



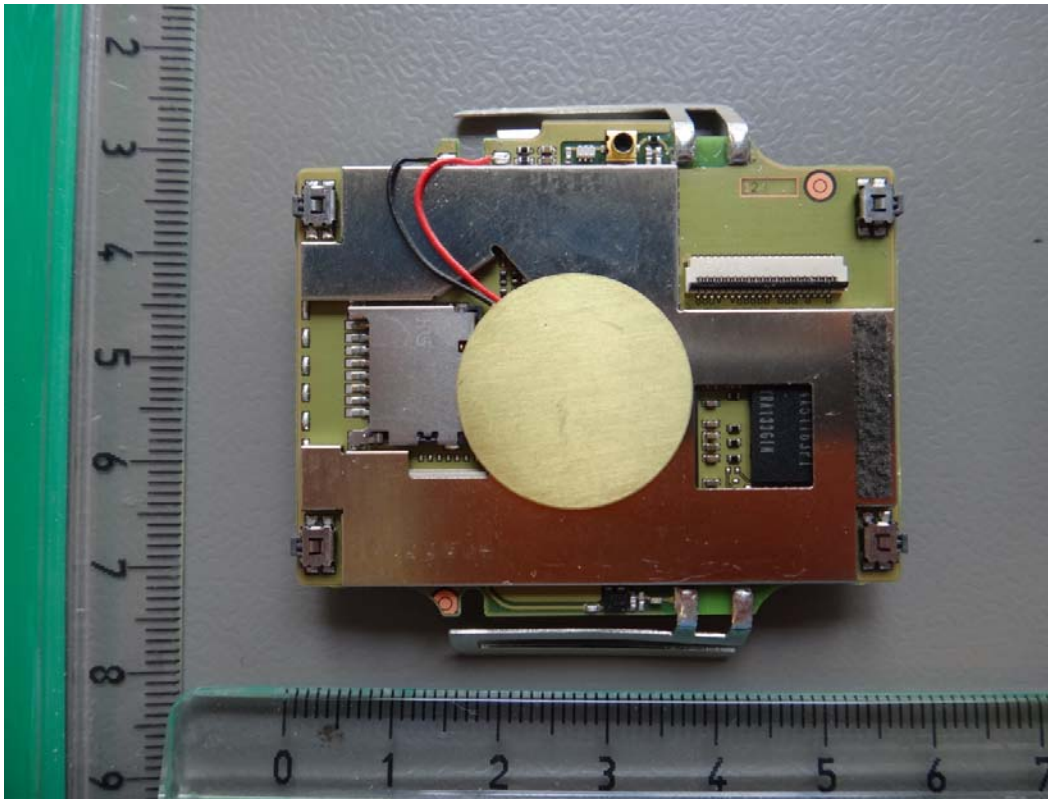
Cover Off - Rear View



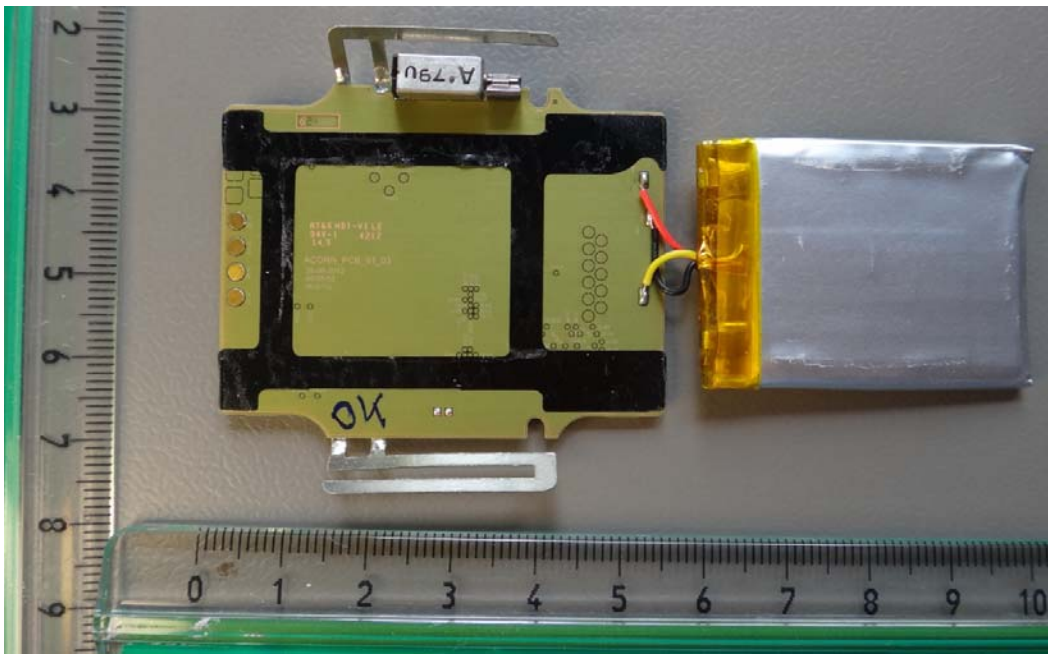
Mainboard With Display – Top view



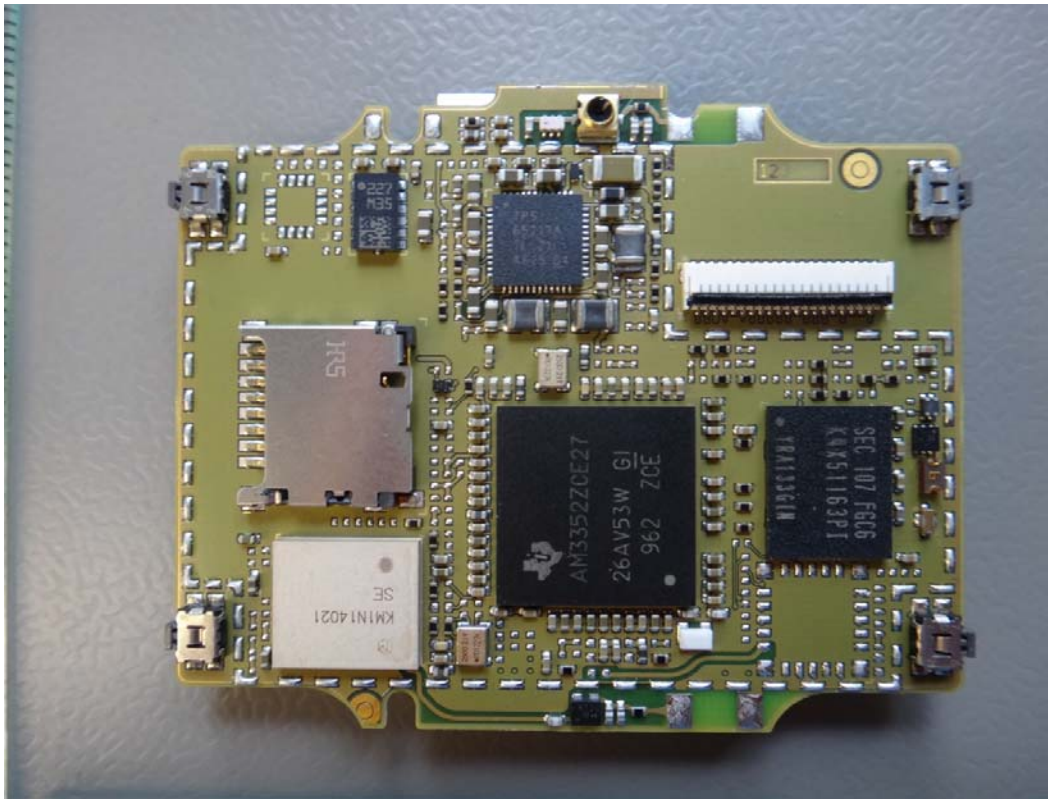
Mainboard With Display Off – Top view



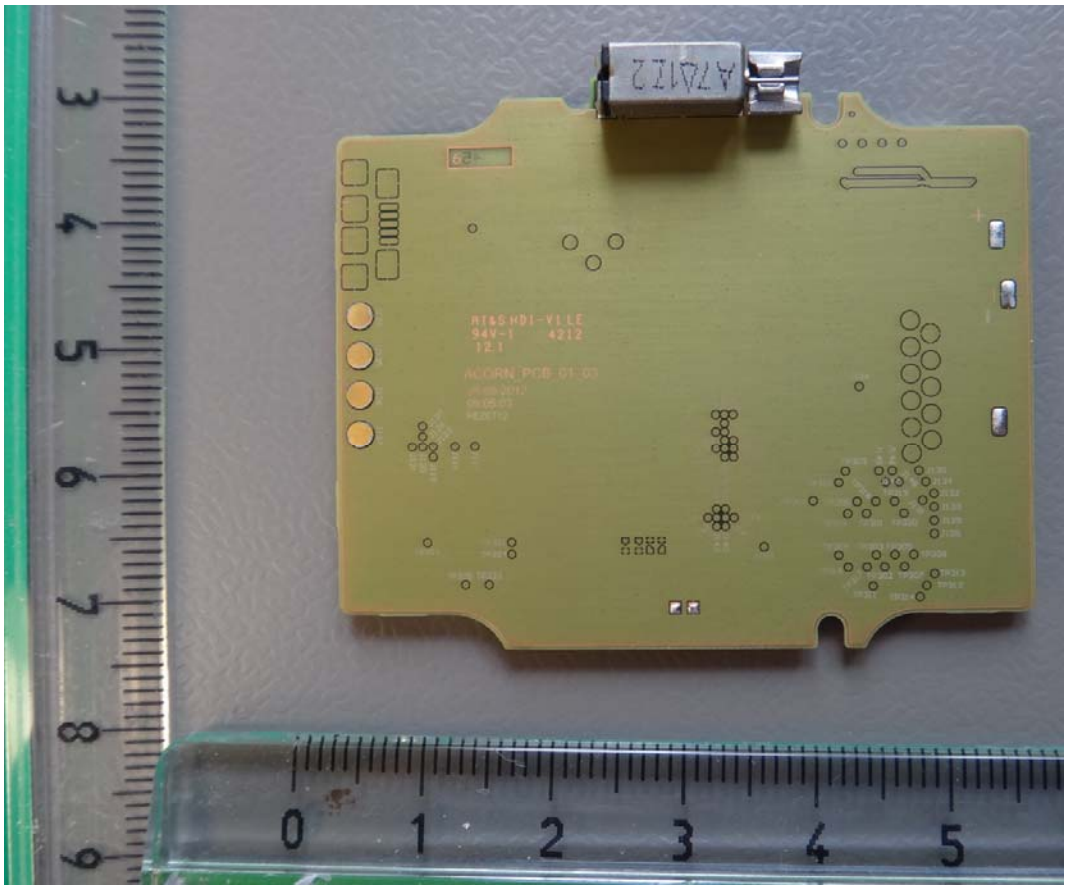
Mainboard With Shielding Can – Top view



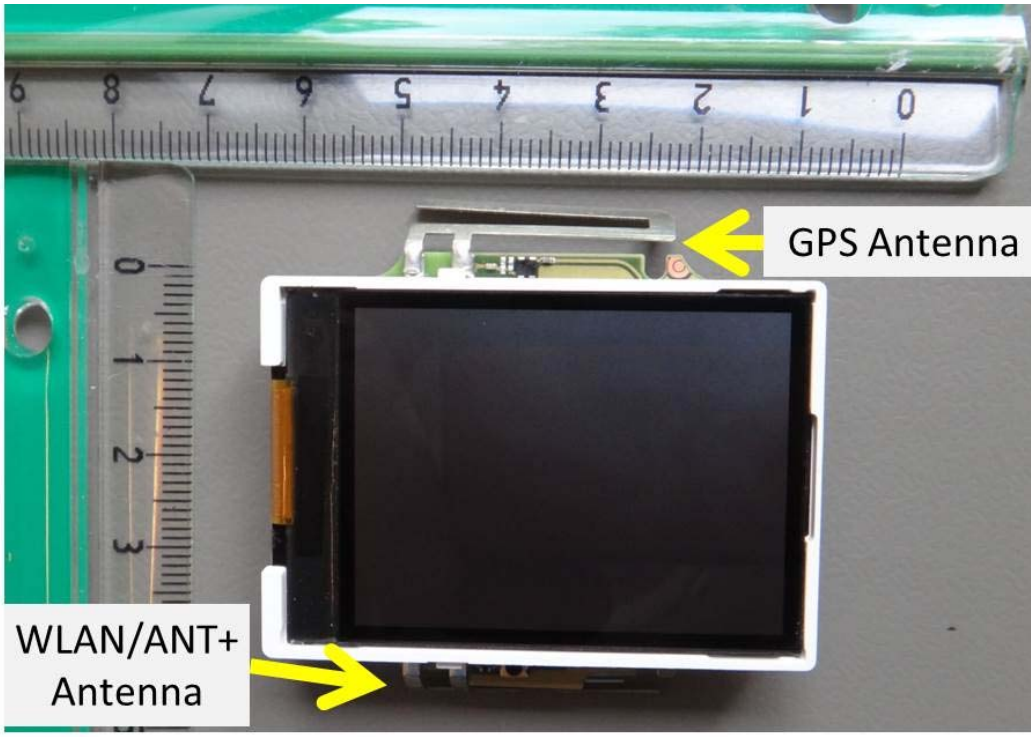
Mainboard Battery Off – Bottom view



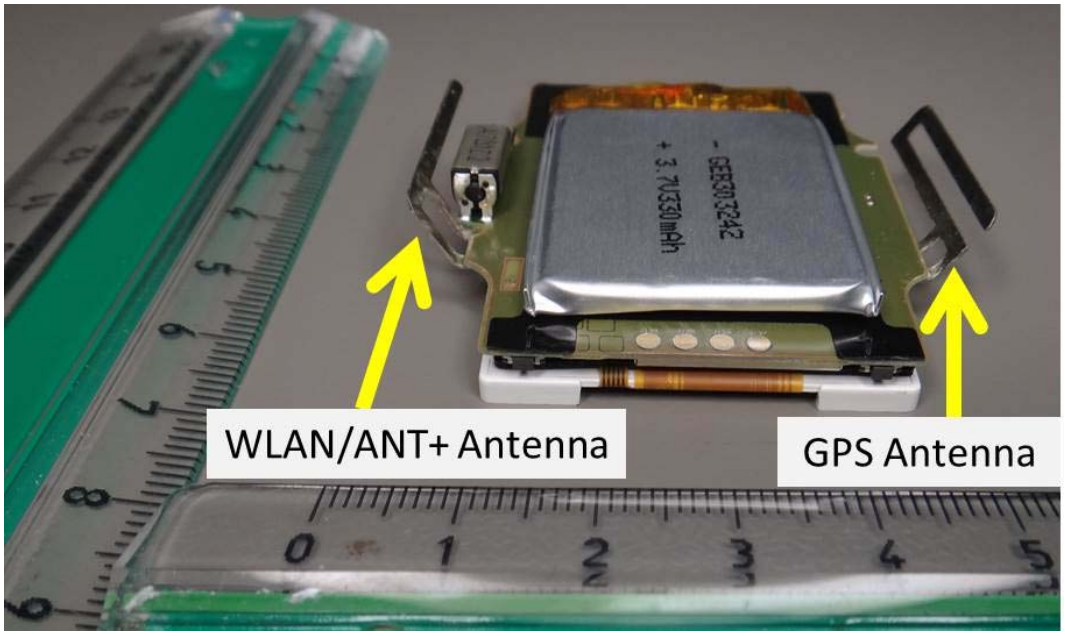
Mainboard Without Shielding Can – Top view



Mainboard Battery & Adhesive Off – Bottom view

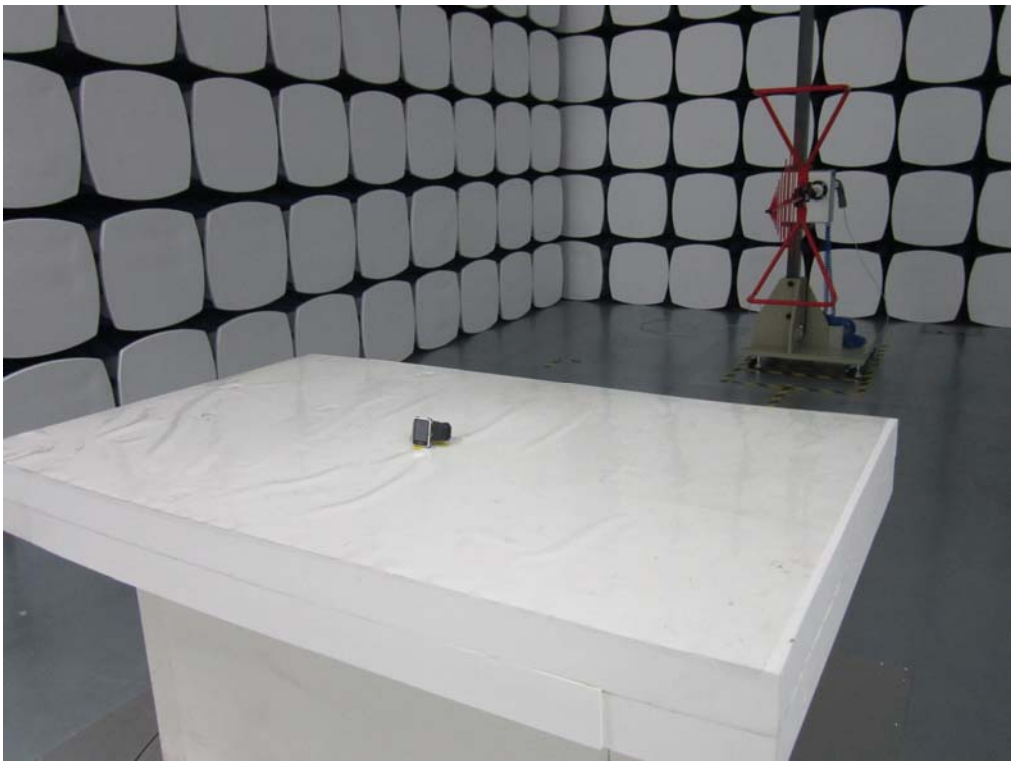


Antenna view – Top view

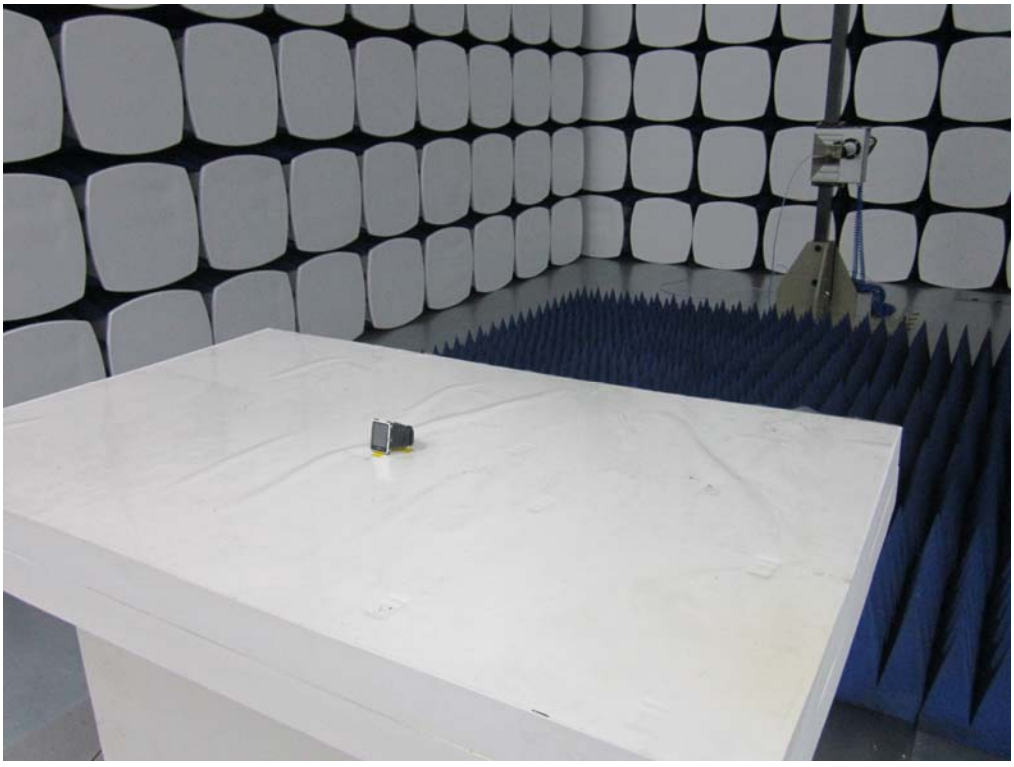


Antenna view – Bottom view

Annex B.iii. Photograph 3: Test Setup Photo



Radiated Spurious Emissions Test Setup Below 1GHz - Front View



Radiated Spurious Emissions Test Setup Above 1GHz –Front View

Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

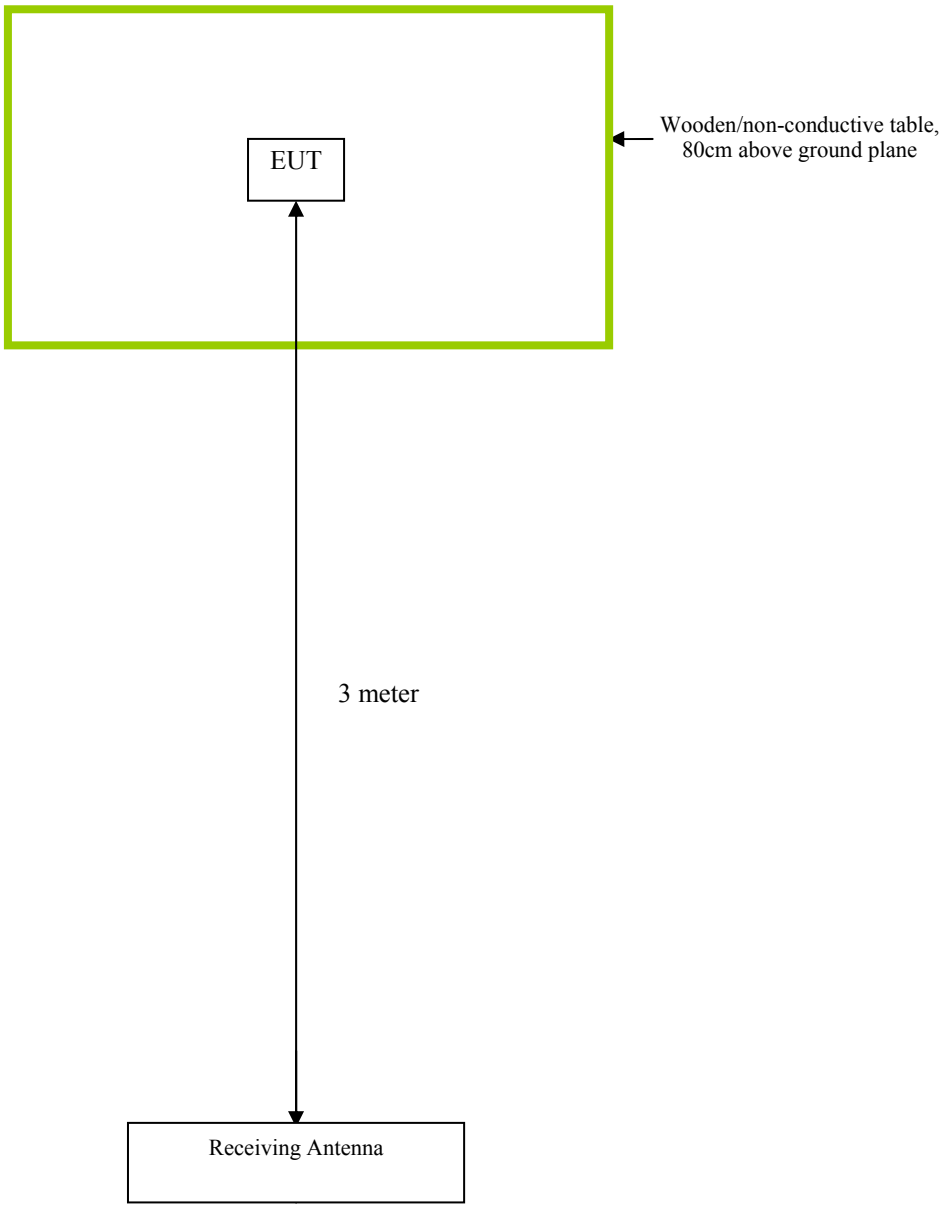
EUT TEST CONDITIONS

Annex C. i. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Model & Serial Number	Cable Description (List Length, Type & Purpose)
lenovo Laptop	E40& 0579A52	N/A

Block Configuration Diagram for Radiated Emissions



Annex C.ii. EUT OPERATING CONDITIONS

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
Emissions Testing	The EUT was continuously transmitting to stimulate the worst case.

Annex D. USER MANUAL / BLOCK DIAGRAM / SCHEMATICS / PART LIST

Please see attachment

Annex E. DECLARATION OF SIMILARITY

NONE