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## Class II permissive change on RUS 01 B2 1900 MHz radio equipment with FCC ID: TA8AKRC11866-2 and IC: 287AB-AS118662 (5 appendices)

### Test object

Product name: RUS 01 B2  
Product number: KRC 118 66/2, R1G

### Summary

See appendix 1 for general information and appendix 5 for external photos.

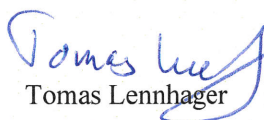
| Standard                                                    | Compliant | Appendix |
|-------------------------------------------------------------|-----------|----------|
| <b>FCC CFR 47 / IC RSS-133 ISSUE 6</b>                      |           |          |
| 2.1046 / RSS-133 6.4 RF power output                        | Yes       | 2        |
| 2.1051 / RSS-136 6.5 Spurious emission at antenna terminals | Yes       | 3        |
| 2.1053 / RSS-136 6.5 Field strength of spurious radiation   | Yes       | 4        |

Note: Above RSS-133 items are given as cross-reference only. Measurements were performed according to ANSI procedures referenced by FCC and covered by SP's accreditation.

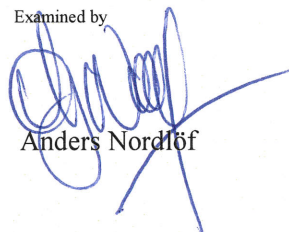
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#### Electronics – EMC

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## Appendix 1

**Description of the test object**

|                                        |                                                                                                                                                     |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment:                             | Radio equipment RUS 01 B2 (MSR) WCDMA + LTE<br>Product number KRC 118 66/2<br>FCC ID: TA8AKRC11866-2<br>IC: 287AB-AS118662<br>IC MODEL NO: AS118662 |
| Operating bands:                       | TX: 1930 – 1990 MHz<br>RX: 1850 – 1910 MHz                                                                                                          |
| Antenna ports:                         | 1 TX/RX port<br>1 RX port                                                                                                                           |
| RF configurations:                     | MSR WCDMA + LTE, TX diversity and MIMO 2x2<br>(TX diversity only LTE)                                                                               |
| Nominal output power per antenna port: | 1-2 LTE + 1-3 WCDMA (Total power 49 dBm, 80W)<br>Total number of carriers 4                                                                         |
| Antenna:                               | No dedicated antenna, handled during licensing                                                                                                      |
| LTE<br>Modulations:                    | QPSK, 16QAM and 64QAM                                                                                                                               |
| Channel bandwidth:                     | 5 MHz, 10 MHz and 15 MHz                                                                                                                            |
| WCDMA<br>Modulations:                  | QPSK, 16QAM and 64QAM                                                                                                                               |
| Channel bandwidth:                     | 4.2 to 5 MHz (configurable in steps of 100/200 kHz)                                                                                                 |
| Channel spacing:                       | 4.4 to 5 MHz (configurable in steps of 100/200kHz)                                                                                                  |
| Nominal supply voltage:                | -48VDC                                                                                                                                              |

**Purpose of test**

The purpose of this test is to justify a Class II Permissive Change of the test object to include the use of MSR with LTE+WCDMA access technologies, by verifying compliance to the performance characteristics specified in applicable items of FCC CFR 47 and Industry Canada RSS-133 and RSS-Gen.

## Appendix 1

**Operation modes during measurements**

MSR, WCDMA + LTE

WCDMA measurements were performed with the test object transmitting test models as defined in 3GPP TS 25.141. Test model 1 (TM1) represent QPSK modulation, Test model 5 (TM5) represent 16QAM modulation and Test model 6 (TM6) represent 64QAM modulation.

LTE measurements were performed with the test object transmitting test models as defined in 3GPP TS 36.141. Test model E-TM1.1 represent QPSK modulation, test model E-TM3.2 represent 16QAM modulation and test model E-TM3.1 represent 64QAM modulation.

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting. The settings below were used for all measurements if not otherwise noted.

WCDMA MIMO mode

TM5:8 HS-PDSCH at 240ksps + 30 DPCH:s at 30 ksps (SF=128)

Channel bandwidth 5 MHz

LTE MIMO mode

E-TM1.1

Channel bandwidth 5 MHz.

Measurements were performed with the test object configured for the maximum transmit power applicable for the tested configuration.

**Conducted measurements**

The test object was hosted in a RBS 6201 powered with -48 VDC. Additional connections are documented in the set-up drawings below.

All measurements were performed on test object 1 (described in the Test set-up diagram), running in primary mode.

**Radiated measurements**

The test object was tested stand-alone. It was powered with -48 VDC. All measurements were performed with the test object configured for maximum transmit power.

**References**

Measurements were done according to relevant parts of the following standards:

ANSI 63.4-2009

ANSI/TIA/EIA-603-C-2004

CFR 47 part 2, October 1<sup>st</sup>, 2012

CFR 47 part 24, October 1<sup>st</sup>, 2012

3GPP TS 25.141, version 11.4.0

3GPP TS 36.141, version 11.4.0

3GPP TS 37.141, version 11.3.0

RSS-Gen Issue 3

RSS-133 Issue 6

## Appendix 1

### Measurement equipment

|                                                            | Calibration Due | SP number |
|------------------------------------------------------------|-----------------|-----------|
| Test site Tesla                                            | 2014-01         | 503 881   |
| R&S ESU 26                                                 | 2014-05         | 901 553   |
| R&S FSQ 40                                                 | 2014-03         | 504 143   |
| R&S FSW 43                                                 | 2014-03         | 902 073   |
| Control computer with<br>R&S software EMC32 version 8.52.0 | -               | 503 899   |
| High pass filter                                           | 2014-07         | 901 501   |
| High pass filter                                           | 2014-07         | 901 502   |
| High pass filter                                           | 2014-07         | 504 199   |
| High pass filter                                           | 2014-09         | 901 373   |
| High pass filter                                           | 2014-08         | 503 739   |
| High pass filter                                           | 2014-07         | 503 740   |
| RF attenuator                                              | 2014-09         | 503 248   |
| RF attenuator                                              | 2014-09         | 503 249   |
| RF attenuator                                              | 2014-07         | 504 159   |
| RF attenuator                                              | 2014-07         | 900 233   |
| RF attenuator                                              | 2014-07         | 901 384   |
| RF attenuator                                              | 2013-12         | 901 508   |
| Chase Bilog Antenna CBL 6111A                              | 2014-10         | 503 182   |
| EMCO Horn Antenna 3115                                     | 2014-01         | 502 175   |
| µComp Nordic, Low Noise Amplifier                          | 2014-04         | 901 545   |
| Temperature and humidity meter, Testo 635                  | 2014-06         | 504 203   |
| Temperature and humidity meter, Testo 625                  | 2014-06         | 504 188   |
| Temperature Chamber                                        | -               | 503 360   |
| Multimeter Fluke 87                                        | 2014-08         | 502 190   |

## Appendix 1

**Uncertainties**

Measurement and test instrument uncertainties are described in the quality assurance documentation "SP-QD 10885". The uncertainties are calculated with a coverage factor  $k=2$  (95% level of confidence).

Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

**Reservation**

The test results in this report apply only to the particular test object as declared in the report.

**Delivery of test object**

The test object was delivered 2013-09-27.

**Manufacturer's representative**

Christer Gustavsson, Ericsson AB.

**Test engineers**

Andreas Johnson, Tomas Lennhager, Kexin Chen, Tomas Isbring, Jörgen Wassholm and Hyder Khalaf, SP.

**Test participant**

None.

## Appendix 1

### Test frequencies used for radiated and conducted measurements

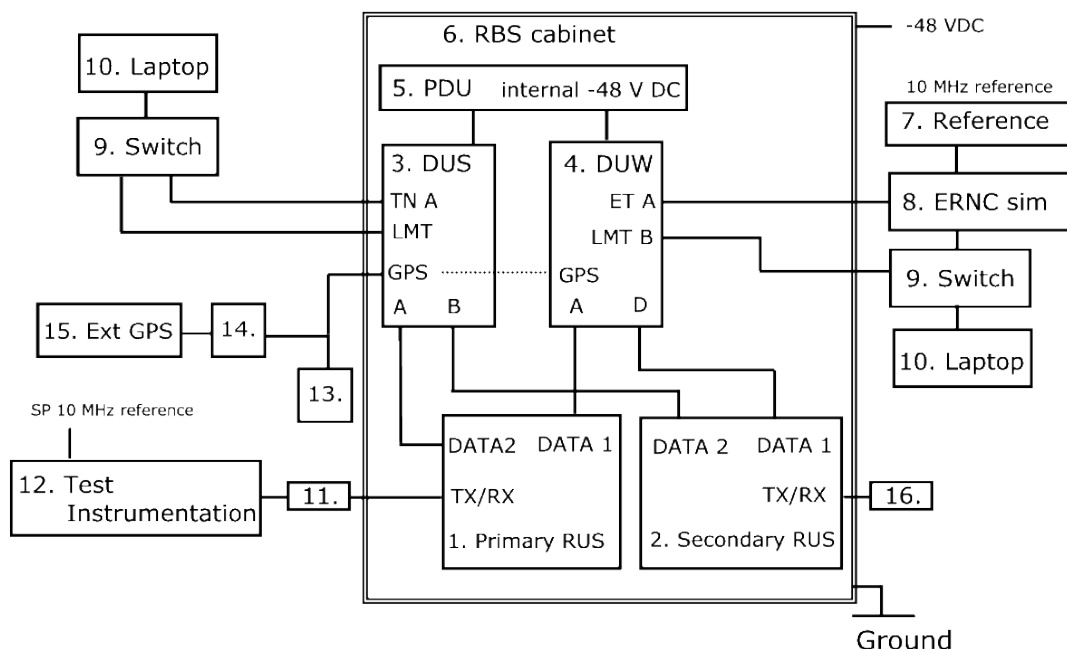
#### WCDMA & LTE MSR TX test frequencies

| WCDMA              |                    |             | LTE                |                    |             |                  |                                            |
|--------------------|--------------------|-------------|--------------------|--------------------|-------------|------------------|--------------------------------------------|
| UARFCN<br>Downlink | Frequency<br>[MHz] | BW<br>[MHz] | EARFCN<br>Downlink | Frequency<br>[MHz] | BW<br>[MHz] | Symbolic<br>name | Comment                                    |
| 9662               | 1932.4             | 5           | 775                | 1947.5             | 5           | B                | TX bottom<br>constellation per<br>LTE BW   |
| 9763               | 1952.6             | 5           | 975                | 1967.5             | 5           | M                | TX mid<br>constellation per<br>LTE BW      |
| 9763               | 1952.6             | 5           | 950                | 1965.0             | 10          | M                |                                            |
| 9763               | 1952.6             | 5           | 925                | 1962.5             | 15          | M                |                                            |
| 9863               | 1972.6             | 5           | 1175               | 1987.5             | 5           | T                | TX top constellation<br>per LTE BW         |
| 9690               | 1938.0             | 5           | 775                | 1947.5             | 5           | B <sub>IM</sub>  | TX constellation for<br>bottom spurious IM |
| 9862               | 1972.8             | 5           | 1120               | 1982.0             | 5           | T <sub>IM</sub>  | TX constellation top<br>for spurious IM    |

All RX frequencies were configured 80 MHz below the corresponding TX frequency according the applicable duplex offset for the operating band.

## Appendix 1

### Test set-up conducted measurements for MSR LTE+WCDMA



Note: Unconnected interfaces were omitted in the picture for simplicity, but are listed in the interface table on page 7.

#### Test object:

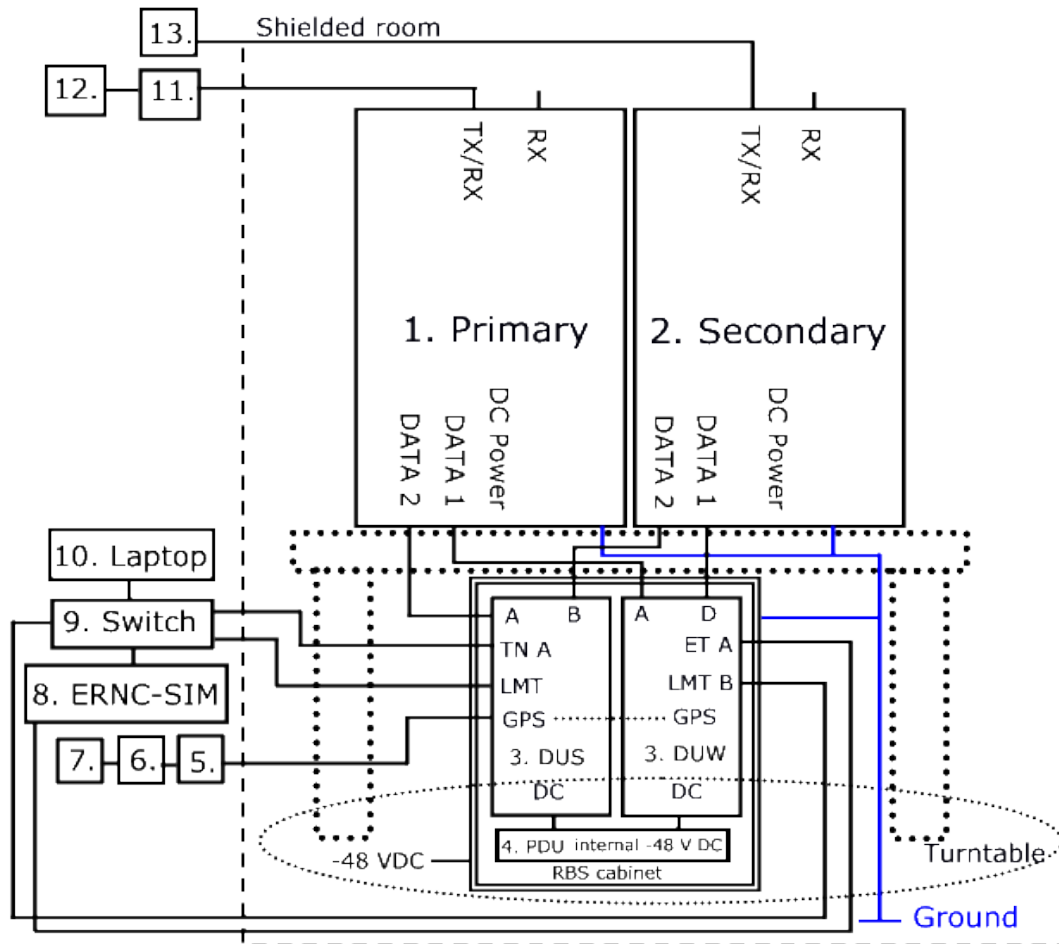
|    |                                                                                                                                                                               |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | RUS 01 B2, KRC 118 66/2, rev. R1G, s/n: D169299399 ,Test object: primary/ secondary                                                                                           |
| 2. | RUS 01 B2, KRC 118 66/2, rev. R1G, s/n: D169299373, Dummy (secondary/ primary) working software CXP 901 3268/6, rev. R49FH with FCC ID: TA8AKRC11866-2 and IC: 287AB-AS118662 |

#### Functional test equipment:

|     |                                                         |
|-----|---------------------------------------------------------|
| 3.  | DUS 41 01, KDU 137 624/1, rev:R5A, s/n: D165724695      |
| 4.  | DUW 41 01, KDU 127 174/4, rev:R2C, s/n: A401998222      |
| 5.  | PDU 02 02, BMG 980 336/5, rev: R1F, s/n: X051445683     |
| 6.  | RBS 6201 cabinet, BAMS – 1000778792                     |
| 7.  | Symmetricon 8040 reference, BAMS – 1000714189           |
| 8.  | ERNC Sim 130, BAMS – 100066091                          |
| 9.  | Fast Ethernet switch, Netgear FS726T                    |
| 10. | Laptop, EliteBook 8560w, BAMS – 1001236856              |
| 11. | Attenuator, filter, according respective appendix       |
| 12. | SP test instrument according measurement equipment list |
| 13. | Power supply, Mascot Type 719                           |
| 14. | GPS 02 01, NCD 901 41/1, rev. R1D, s/n: TU8K474887      |
| 15. | GPS Active Antenna, KRE 101 2082/1                      |
| 16. | Terminator                                              |

## Appendix 1

### Test setup radiated measurements for MSR LTE+WCDMA



#### Test object:

1. RUS 01 B2, KRC 118 66/2, rev. R1G, s/n: D169299399 primary
2. RUS 01 B2, KRC 118 66/2, rev. R1G, s/n: D169299373 secondary  
working software CXP 901 3268/6, rev. R49FH with  
FCC ID: TA8AKRC11866-2 and IC: 287AB-AS118662

## Appendix 1

### Functional test equipment:

|     |                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------|
| 3.  | DUS 41 01, KDU 137 624/1, rev:R5A, s/n: D165724695<br>DUW 41 01, KDU 127 174/4, rev:R2C, s/n: A401998222 |
| 4.  | RBS 6202:<br>PDU 02 02, BMG 980 336/5, rev: R1F, s/n: X051445683                                         |
| 5.  | Power supply, Mascot Type 719                                                                            |
| 6.  | GPS 02 01, NCD 901 41/1, rev. R1D, s/n: TU8K356428                                                       |
| 7.  | GPS Active Antenna, KRE 101 2082/1                                                                       |
| 8.  | ERNC-SIM 131, BAMS – 1000660992                                                                          |
| 9.  | Switch Netgear FS726T                                                                                    |
| 10. | Laptop, EliteBook 8560w, BAMS – 1001236856                                                               |
| 11. | Attenuator                                                                                               |
| 12. | ESI 26, SP number: 503 292, for supervision purpose only                                                 |
| 13. | Terminator                                                                                               |

### Interfaces:

### Type of port:

|                                                  |          |
|--------------------------------------------------|----------|
| Power: -48 VDC                                   | DC Power |
| Antenna port (A), 7/16 connector, combined TX/RX | Antenna  |
| Antenna port (B), 7/16 connector, only RX        | Antenna  |
| Data 1, electrical interface                     | Signal   |
| Data 2, electrical interface                     | Signal   |
| RX A Out, no cable attached                      | RF       |
| RX A I/O, no cable attached                      | RF       |
| RX B I/O, no cable attached                      | RF       |
| Ground wire                                      | Ground   |

### RBS software:

| RAT   | Software       | Revision |
|-------|----------------|----------|
| WCDMA | CXP 902 1719   | R1DG07   |
| LTE   | CXP 102 051/18 | R32AV    |

## Appendix 2

### RF power output measurements according to CFR 47 §2.1046 / IC RSS-133 6.4

|            |              |            |
|------------|--------------|------------|
| Date       | Temperature  | Humidity   |
| 2013-10-02 | 22 °C ± 3 °C | 23 % ± 5 % |

#### Test set-up and procedure

The test object was connected to a signal analyzer measuring peak and RMS output power in CDF mode. A resolution bandwidth of 50 MHz was used.

| Measurement equipment                    | SP number |
|------------------------------------------|-----------|
| Rohde & Schwarz signal analyzer FSQ40    | 504 143   |
| RF attenuator                            | 901 508   |
| Testo 635 temperature and humidity meter | 504 203   |

**Measurement uncertainty:** 1.1 dB

#### Results

Rated output power at RF connector 49 dBm.

| Tested configuration | Port RFA primary<br>[RMS dBm/ dB PAR <sup>3)</sup> ] | Port RFA secondary <sup>2)</sup><br>[RMS dBm/ dB PAR <sup>3)</sup> ] | Total power <sup>1)</sup><br>[RMS dBm] |
|----------------------|------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------|
| B<br>LTE BW 5 MHz    | 48.45/ 6.83                                          | Not tested <sup>2)</sup>                                             | 51.45                                  |
| M<br>LTE BW 5 MHz    | 48.46/ 6.63                                          | Not tested <sup>2)</sup>                                             | 51.46                                  |
| M<br>LTE BW 10 MHz   | 48.38/ 6.61                                          | Not tested <sup>2)</sup>                                             | 51.38                                  |
| M<br>LTE BW 15 MHz   | 48.36/ 6.54                                          | Not tested <sup>2)</sup>                                             | 51.36                                  |
| T<br>LTE BW 5 MHz    | 48.31/ 6.71                                          | Not tested <sup>2)</sup>                                             | 51.31                                  |

<sup>1)</sup>: Since port A secondary isn't measured 3dB has been added to the result on port RFA primary.

<sup>2)</sup>: Measurements were limited to port RF A in primary mode due to the measurement result in LTE and WCDMA single carrier MIMO mode that shows that the ports are identical.

<sup>3)</sup>: The PAR value is the 0.1 % Peak to Average Ratio.

## Appendix 2

### Remark

This unit is tested without antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensee's are required to take into account maximum allowed antenna gain used in combination with above power settings to prevent the radiated output power to exceed the limits.

### Limits

§24.232: The maximum equivalent isotropically radiated power (e.i.r.p.) may not exceed 3280 W (EIRP) / MHz.  
The Peak to Average Ratio (PAR) may not exceed 13 dB.

RSS-133 6.4: The average equivalent isotropically radiated power (e.i.r.p.) limits in SRSP-510 apply. Base station transmitters operating in the band 1930 – 1995 MHz shall not have output power exceeding 100 Watts.  
The Peak to Average Ratio (PAR) may not exceed 13 dB.

|           |     |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

## Appendix 3

### Conducted spurious emission measurements according to CFR 47 §2.1051 / IC RSS-133 6.5

|            |              |            |
|------------|--------------|------------|
| Date       | Temperature  | Humidity   |
| 2013-10-02 | 22 °C ± 3 °C | 23 % ± 5 % |

#### Test set-up and procedure

The measurements were made per definition in §24.238. The output was connected to a spectrum analyzer with a RBW setting of 1 MHz and RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Before comparing the results to the limit, 3 dB [10 log (2)] should be added according to method E), 3), (iii) “measure and add 10 log(N<sub>ANT</sub>)” of FCC KDB662911 D01 Multiple Transmitter Output v02r01

| Measurement equipment                    | SP number |
|------------------------------------------|-----------|
| Rohde & Schwarz signal analyzer FSQ40    | 504 143   |
| RF attenuator                            | 901 508   |
| High pass filter                         | 901 502   |
| Testo 635 temperature and humidity meter | 504 203   |

Measurement uncertainty: 3.7 dB

## Appendix 3

### Results

#### WCDMA + LTE MSR

| Diagrams | WCDMA<br>BW/[MHz] | LTE<br>BW/[MHz] | Symbolic<br>frequency | Tested<br>Port |
|----------|-------------------|-----------------|-----------------------|----------------|
| 1 a-e    | 5                 | 5               | B                     | RF A           |
| 2 a-e    | 5                 | 5               | M                     | RF A           |
| 3 a-e    | 5                 | 10              | M                     | RF A           |
| 4 a-e    | 5                 | 15              | M                     | RF A           |
| 5 a-e    | 5                 | 5               | T                     | RF A           |
| 6 a-e    | 5                 | 5               | B <sub>IM</sub>       | RF A           |
| 7 a-e    | 5                 | 5               | T <sub>IM</sub>       | RF A           |

The diagrams are shown on the following pages.

### Remarks

The emission at 9 kHz on some of the plots was not generated by the test object. A complementary measurement with a smaller RBW showed that it was related to the LO feed-through. The upper frequency boundary was chosen to cover 10x the highest TX fundamental frequency.

### Limits

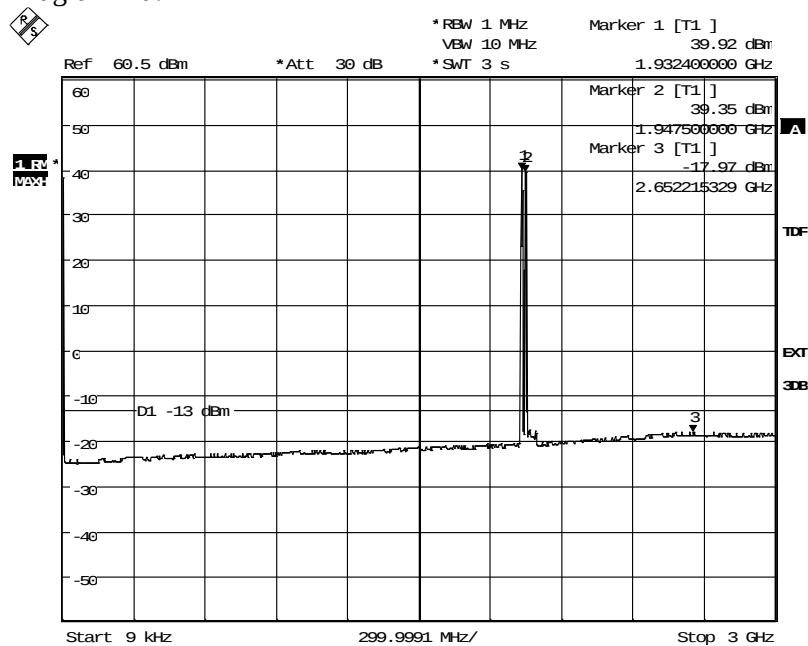
CFR 47 §24.238 and IC RSS-133 6.5

Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, resulting in a limit of -13 dBm.

|           |     |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

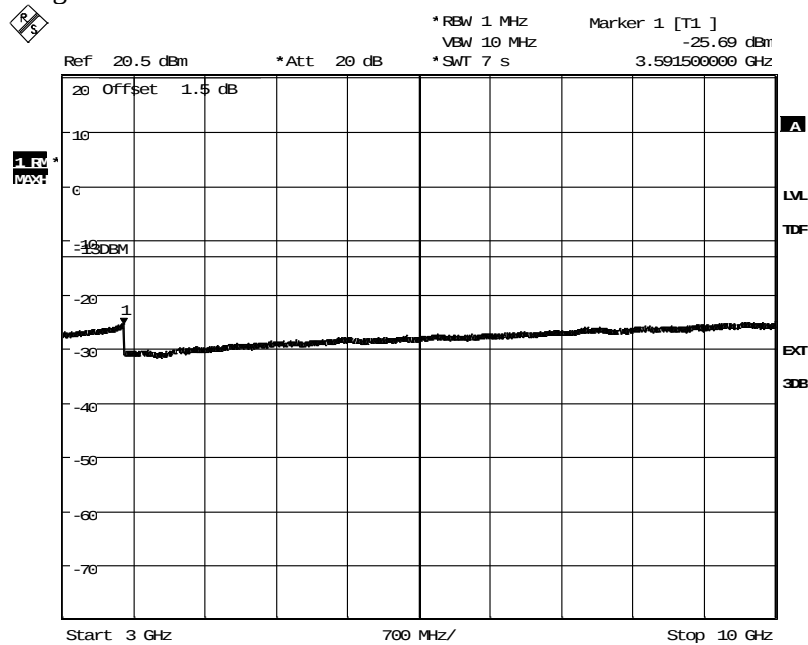
## Appendix 3

Diagram 1 a:



Date: 2.OCT.2013 10:07:38

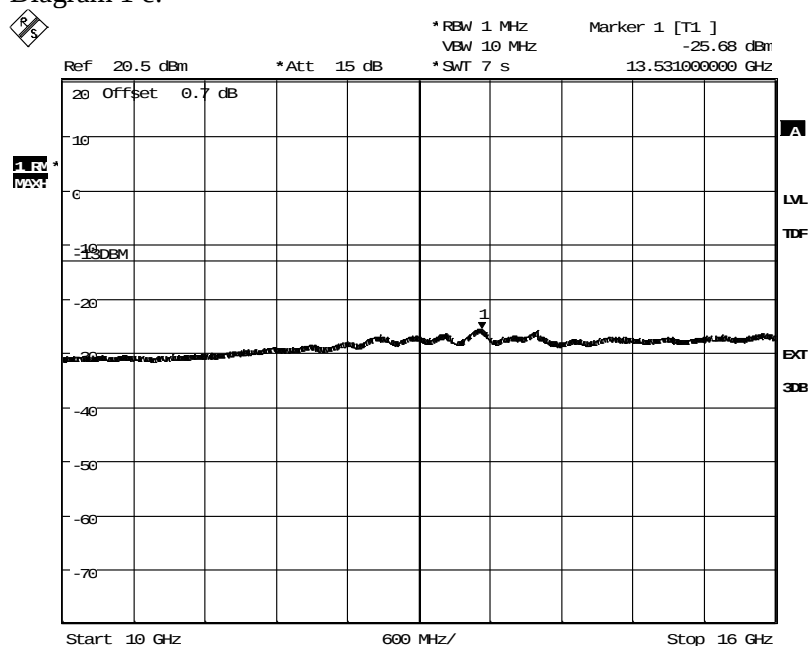
Diagram 1 b:



Date: 2.OCT.2013 10:05:57

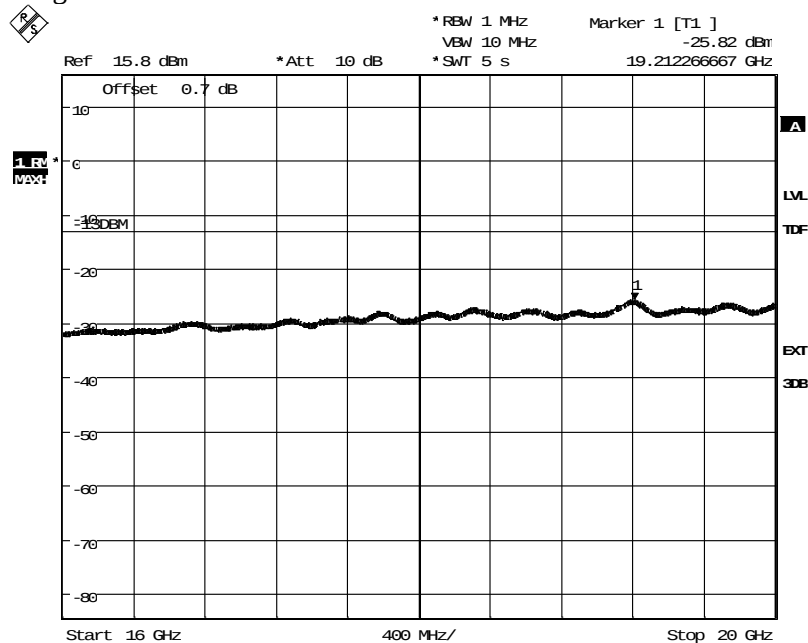
## Appendix 3

Diagram 1 c:



Date: 2.OCT.2013 10:04:59

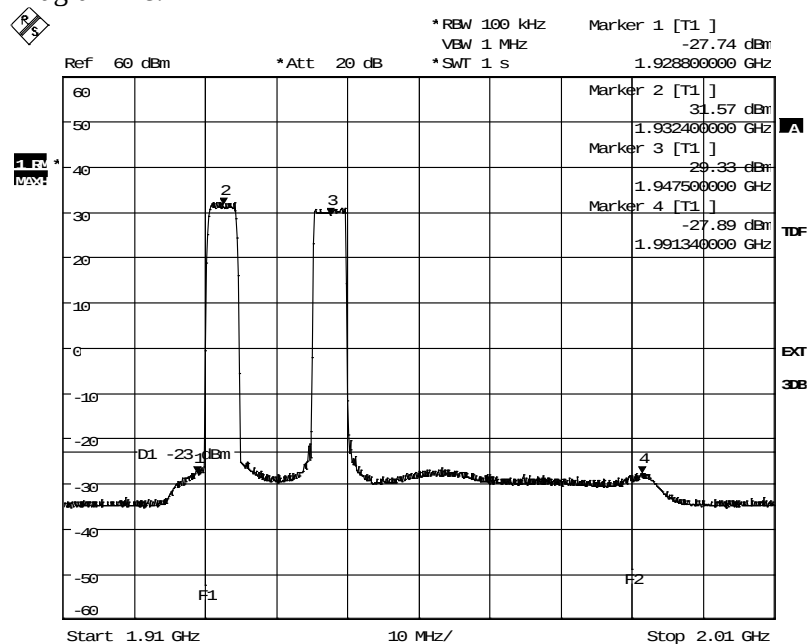
Diagram 1 d:



Date: 2.OCT.2013 10:03:40

## Appendix 3

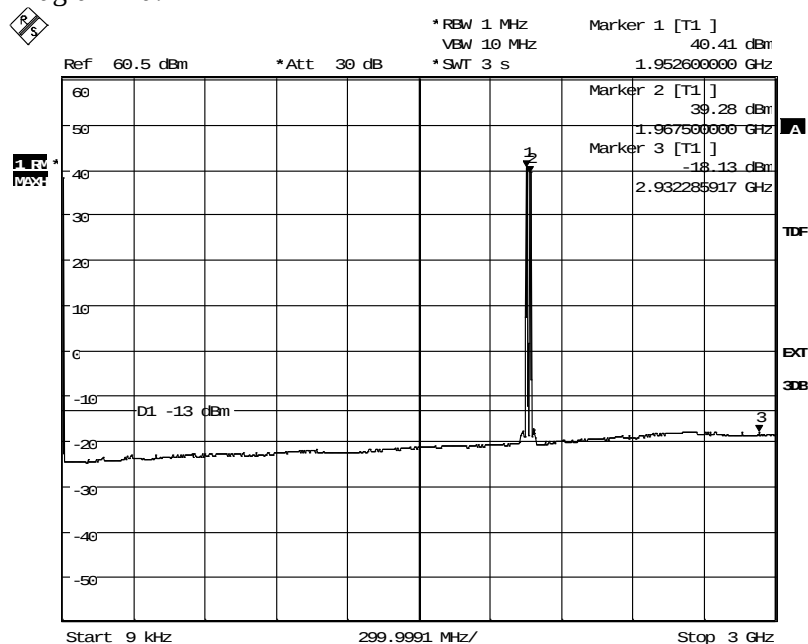
Diagram 1 e:



Date: 2.OCT.2013 15:14:54

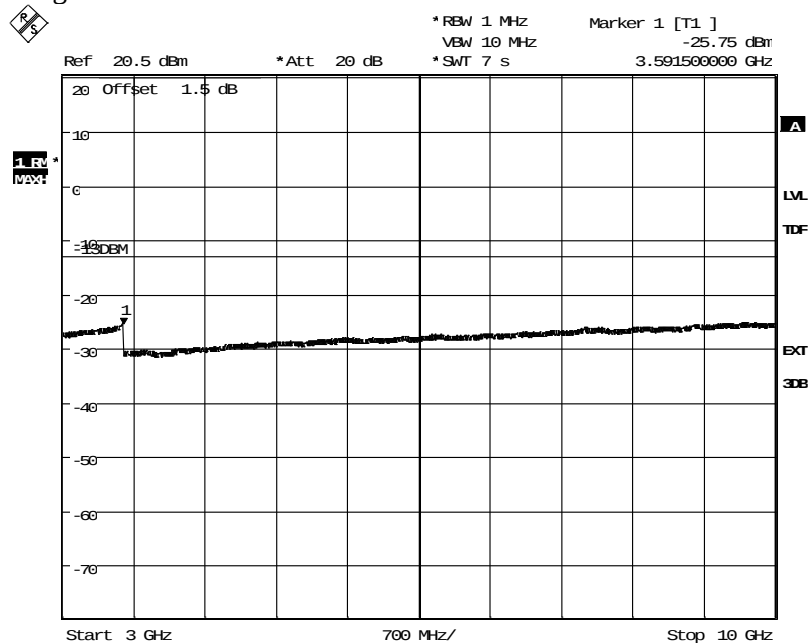
## Appendix 3

Diagram 2 a:



Date: 2.OCT.2013 10:25:01

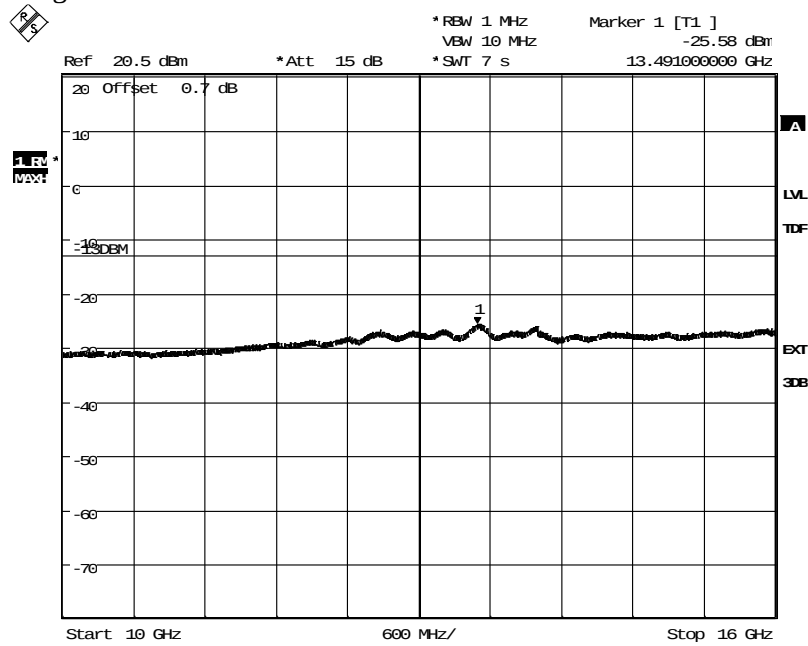
Diagram 2 b:



Date: 2.OCT.2013 10:27:46

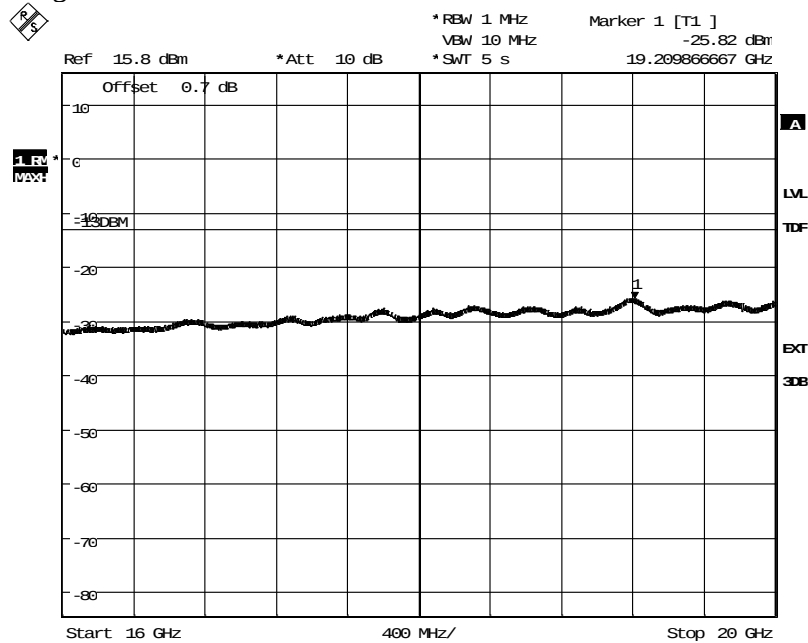
## Appendix 3

Diagram 2 c



Date: 2.OCT.2013 10:28:55

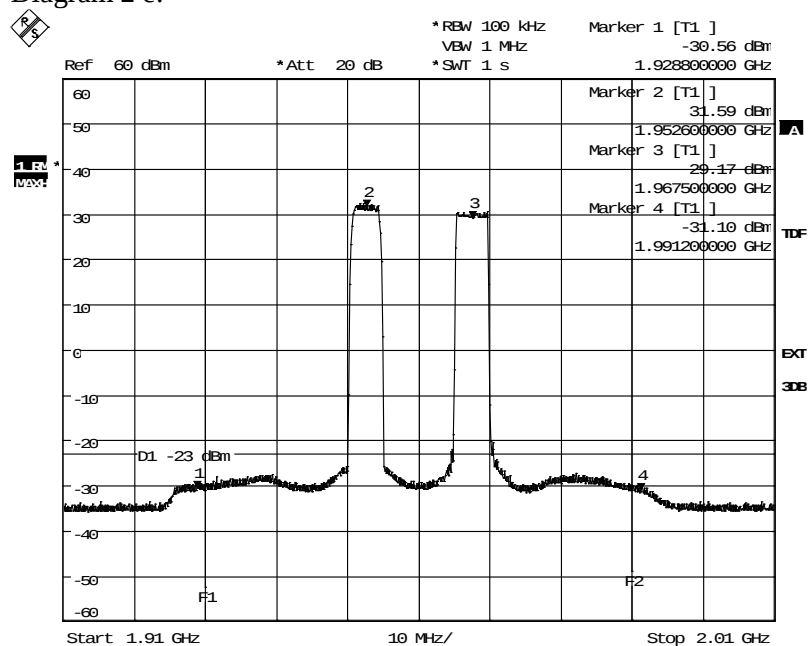
Diagram 2 d:



Date: 2.OCT.2013 10:30:13

## Appendix 3

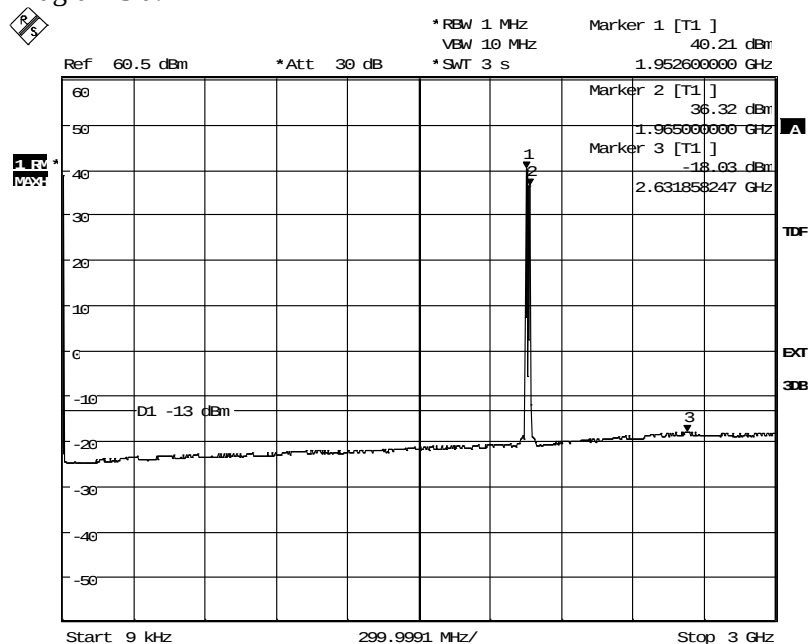
Diagram 2 e:



Date: 2.OCT.2013 15:33:39

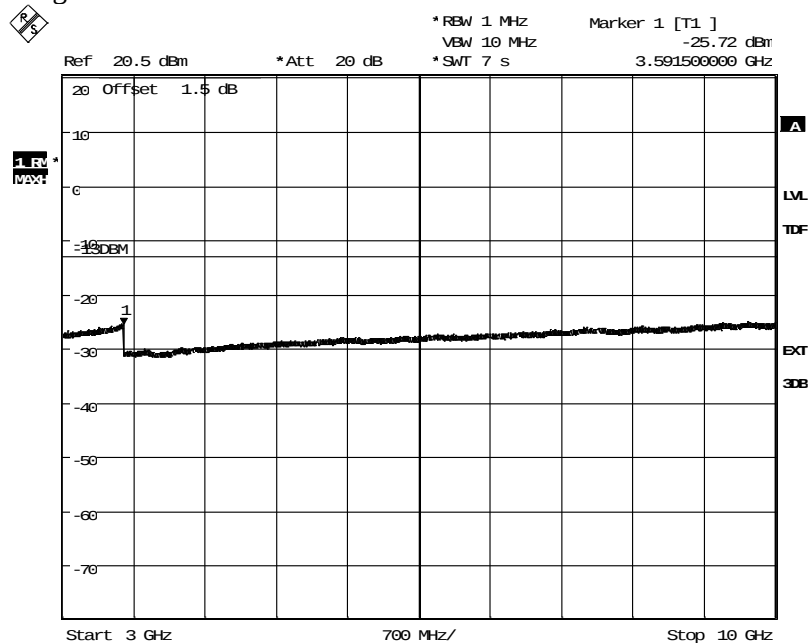
## Appendix 3

Diagram 3 a:



Date: 2.OCT.2013 10:35:19

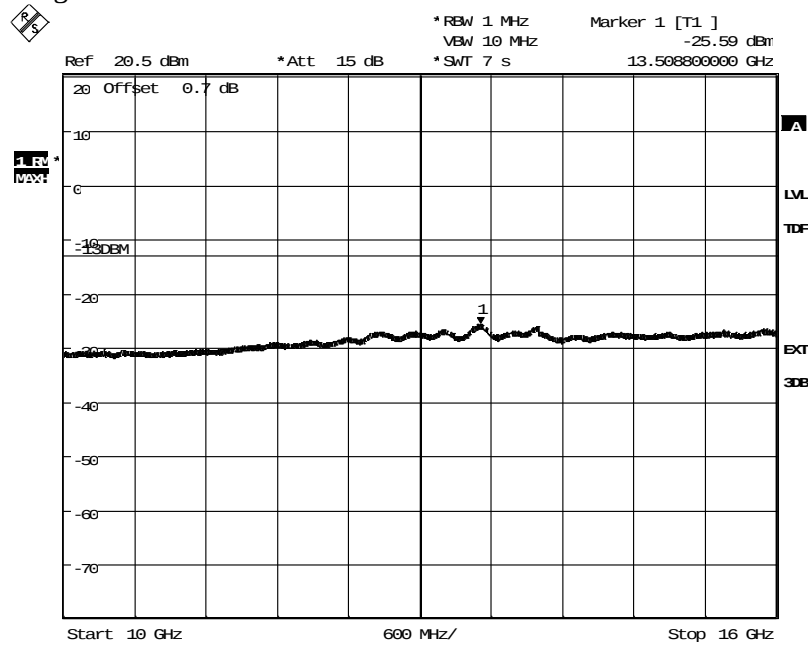
Diagram 3 b:



Date: 2.OCT.2013 10:33:50

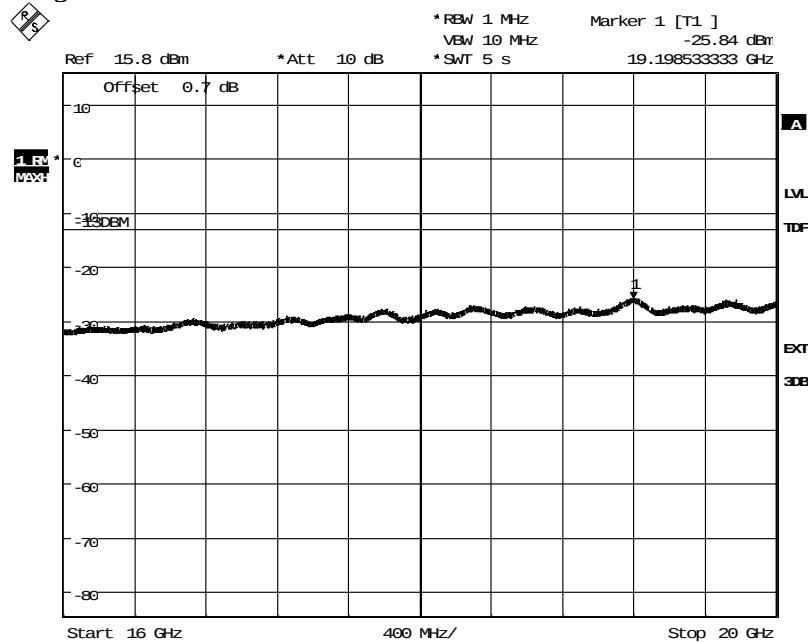
## Appendix 3

Diagram 3 c:



Date: 2.OCT.2013 10:32:56

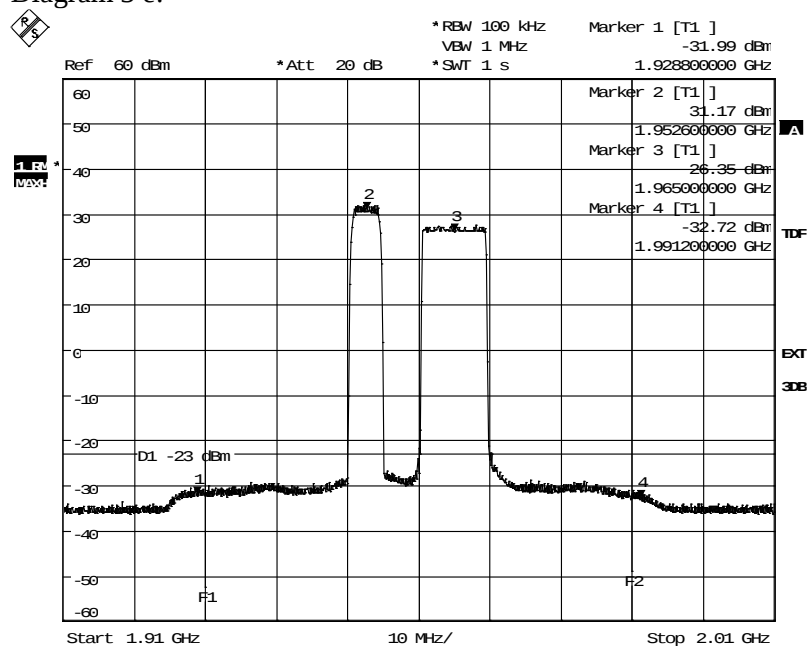
Diagram 3 d:



Date: 2.OCT.2013 10:31:55

## Appendix 3

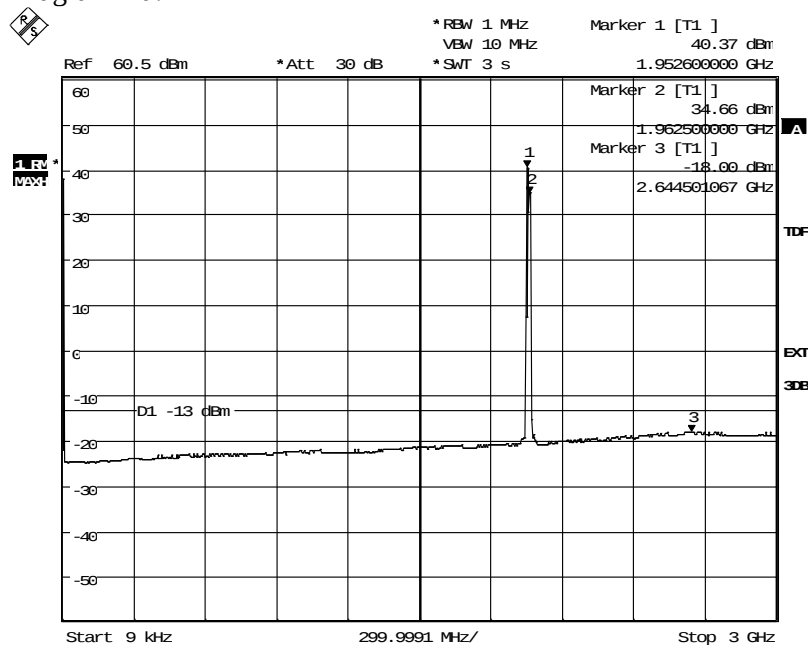
Diagram 3 e:



Date: 2.OCT.2013 15:35:18

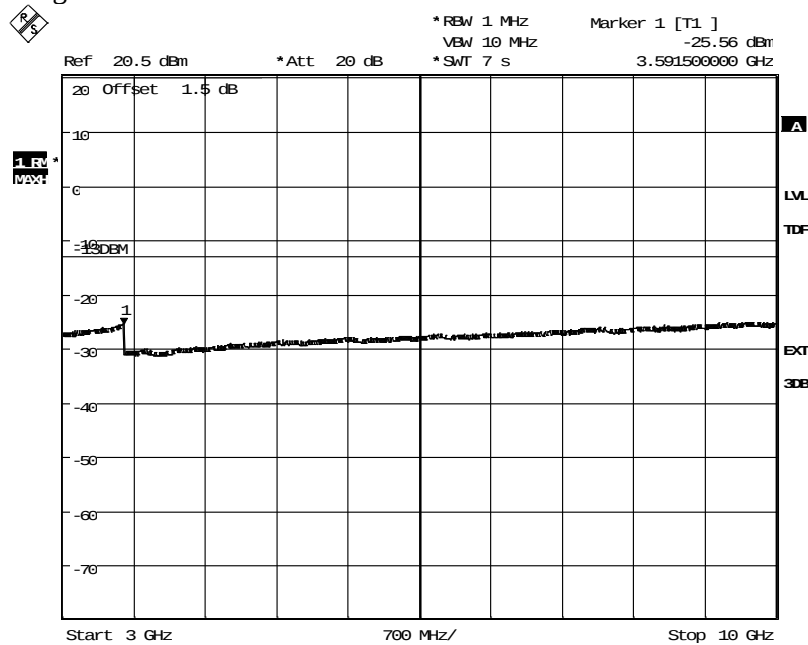
## Appendix 3

Diagram 4 a:



Date: 2.OCT.2013 12:18:06

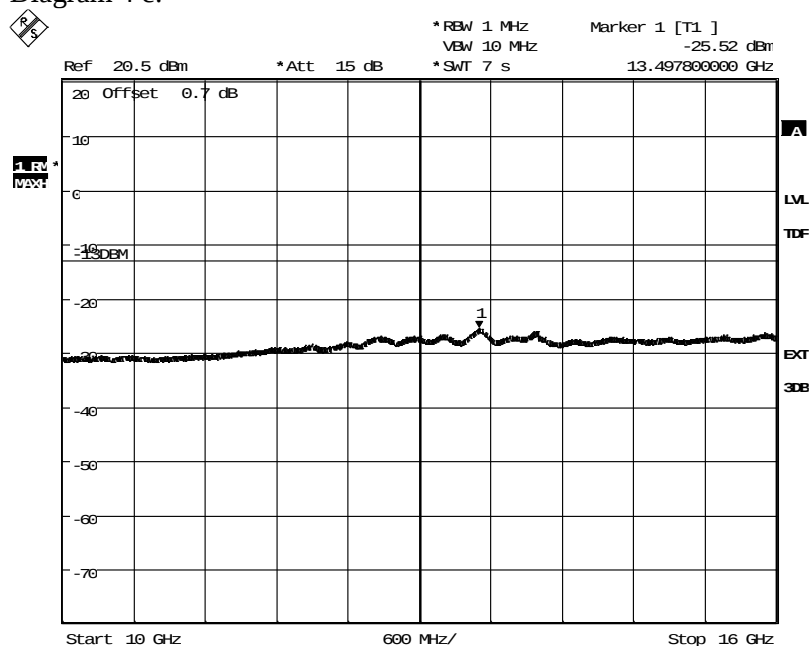
Diagram 4 b:



Date: 2.OCT.2013 12:32:03

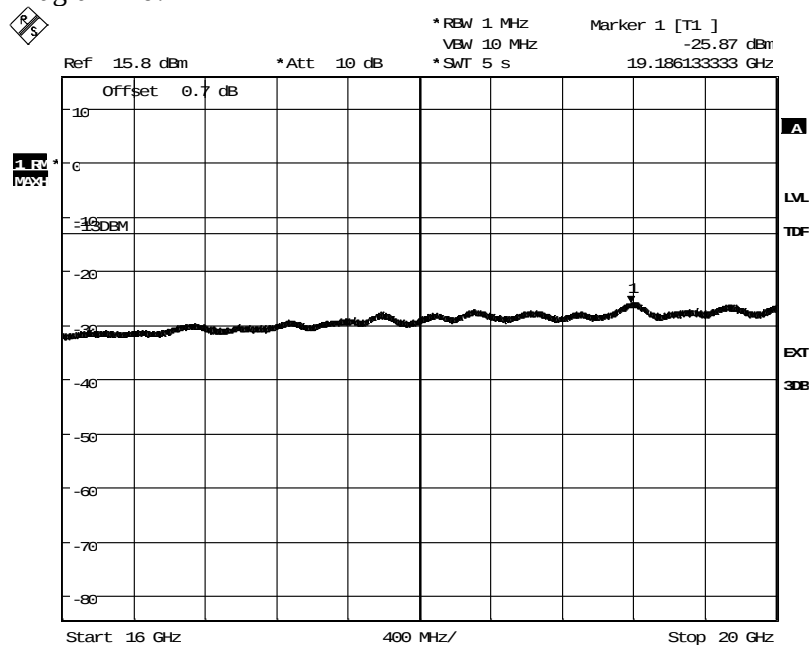
## Appendix 3

Diagram 4 c:



Date: 2.OCT.2013 12:32:59

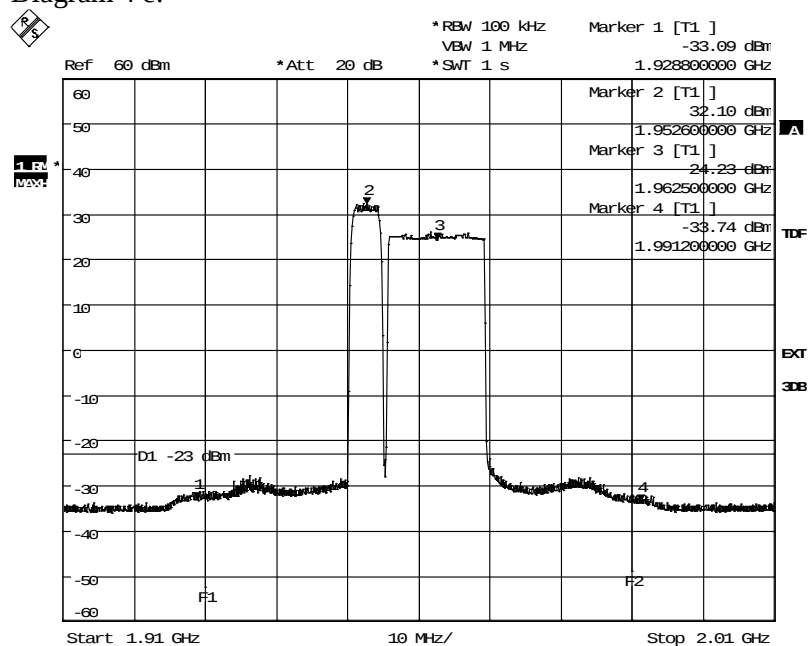
Diagram 4 d:



Date: 2.OCT.2013 12:33:53

## Appendix 3

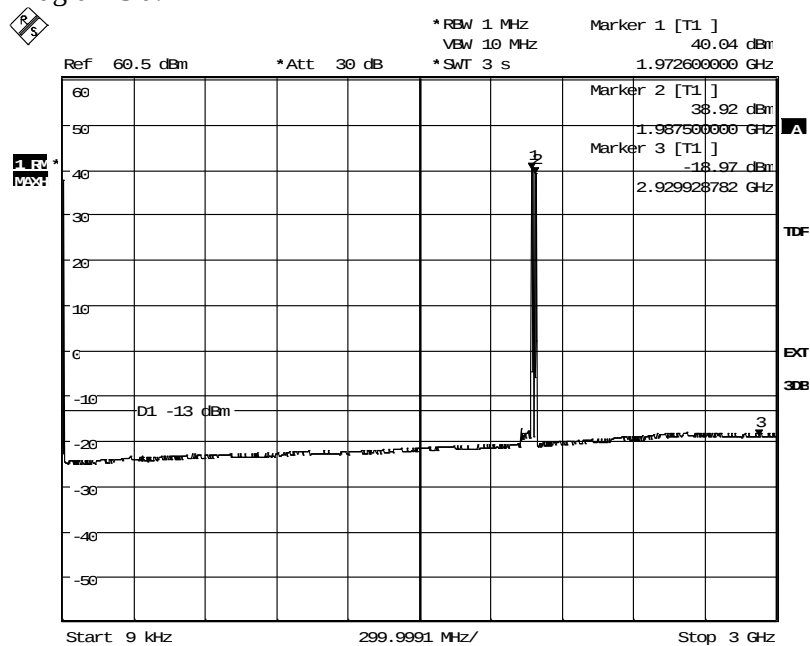
Diagram 4 e:



Date: 2.OCT.2013 15:37:44

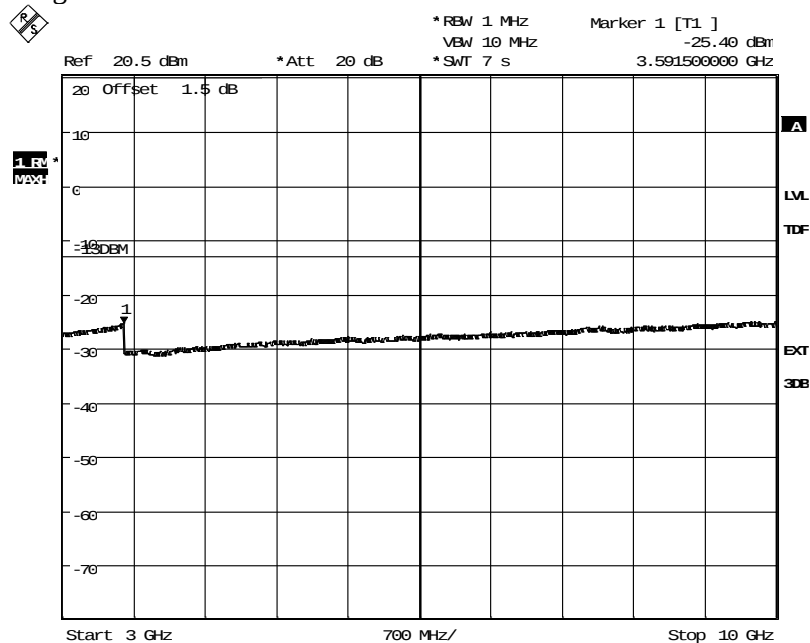
## Appendix 3

Diagram 5 a:



Date: 2.OCT.2013 09:46:26

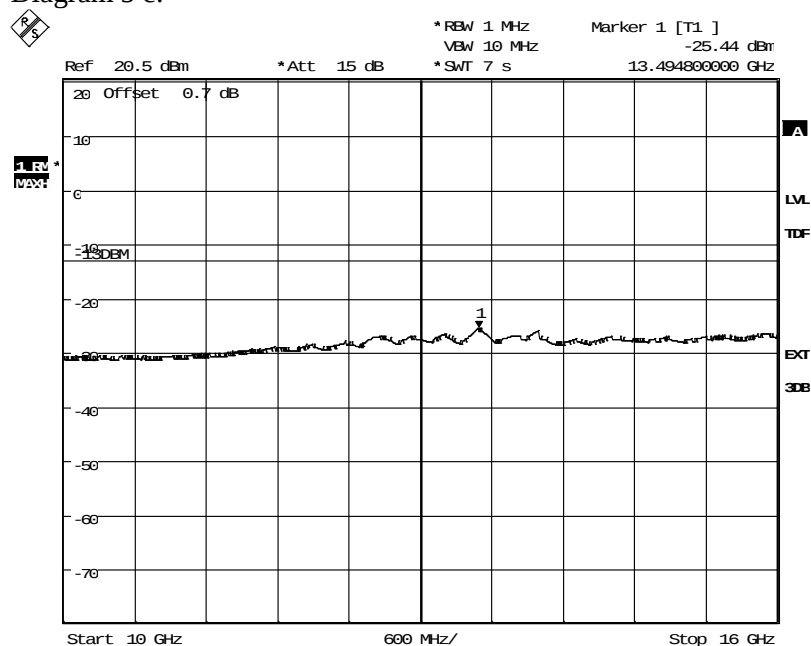
Diagram 5 b:



Date: 2.OCT.2013 09:53:23

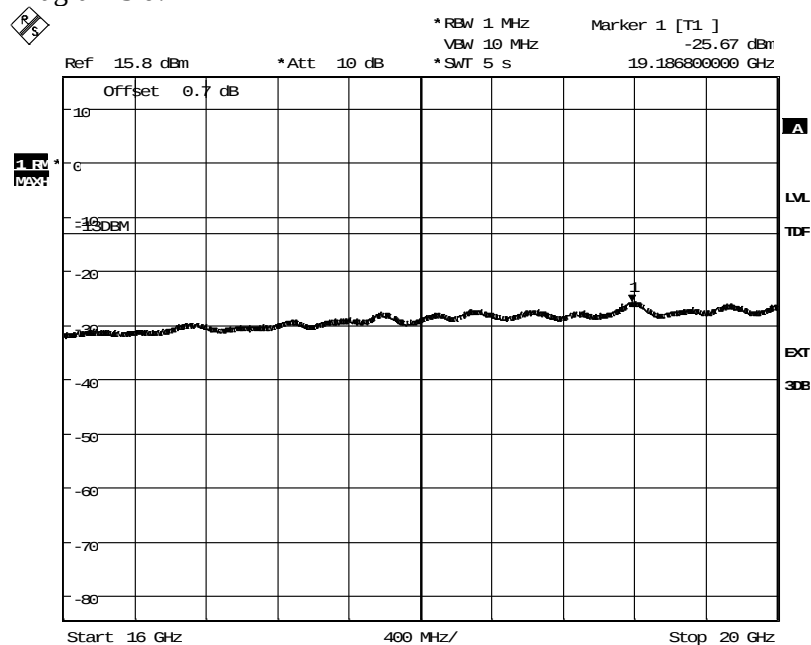
## Appendix 3

Diagram 5 c:



Date: 2.OCT.2013 09:56:32

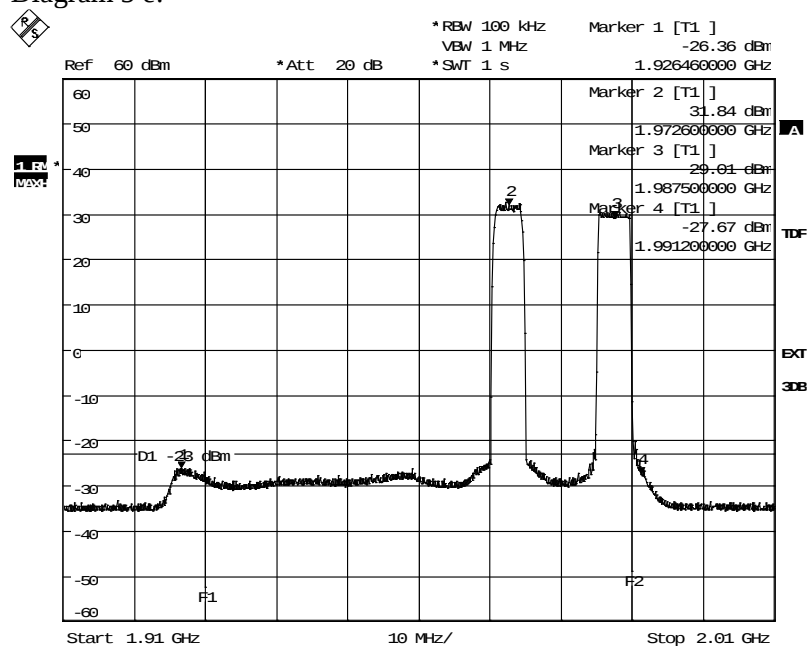
Diagram 5 d:



Date: 2.OCT.2013 09:58:20

## Appendix 3

Diagram 5 e:

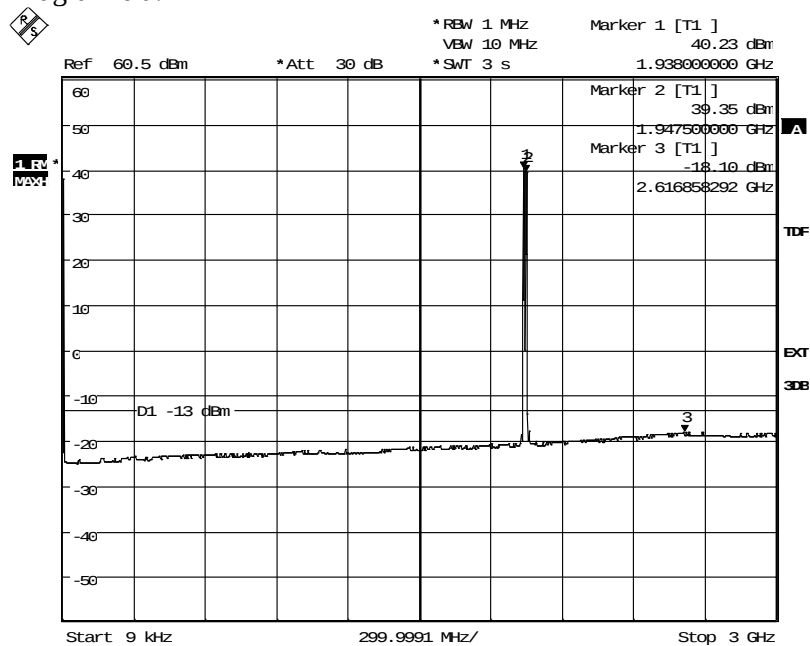


Date: 2.OCT.2013 14:59:31

The emission at 1926.46 MHz was -21.63 dBm measured with the channel power method with 1 MHz channel bandwidth.

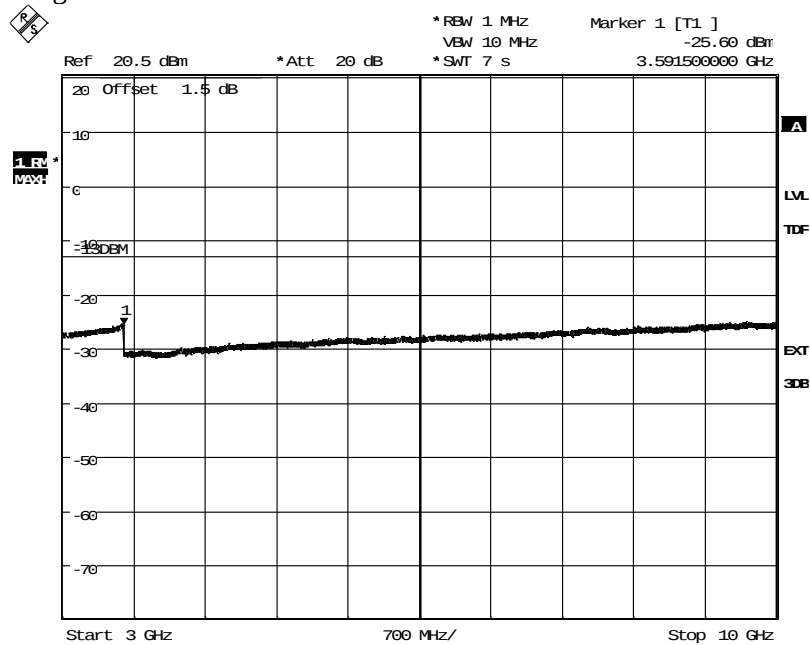
## Appendix 3

Diagram 6 a:



Date: 2.OCT.2013 13:28:15

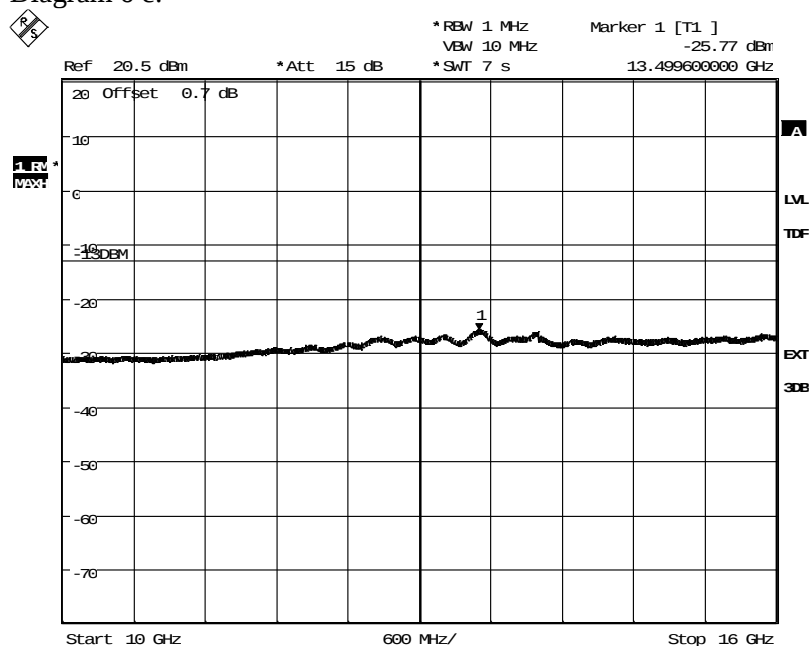
Diagram 6 b:



Date: 2.OCT.2013 13:29:43

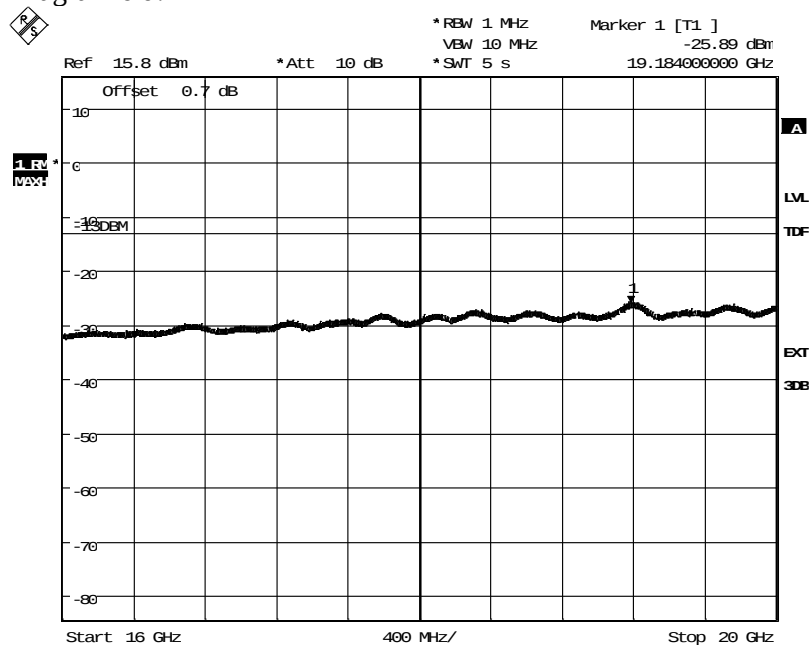
## Appendix 3

Diagram 6 c:



Date: 2.OCT.2013 13:30:39

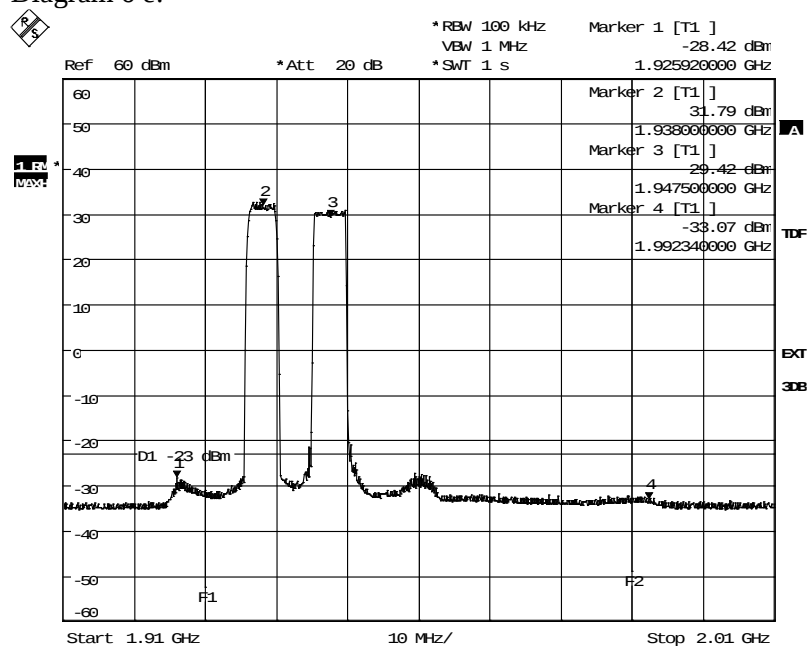
Diagram 6 d:



Date: 2.OCT.2013 13:31:41

## Appendix 3

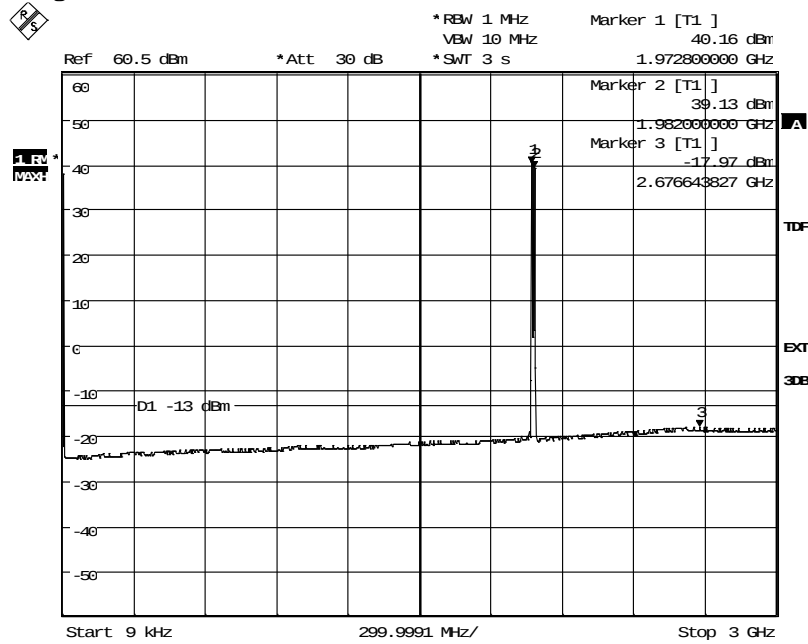
Diagram 6 e:



Date: 2.OCT.2013 14:50:56

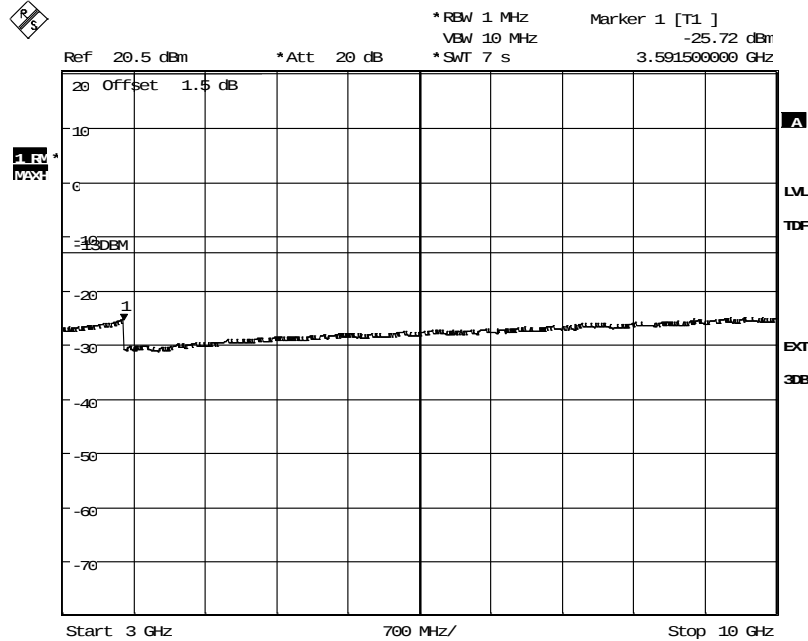
## Appendix 3

Diagram 7 a:



Date: 2.OCT.2013 13:44:35

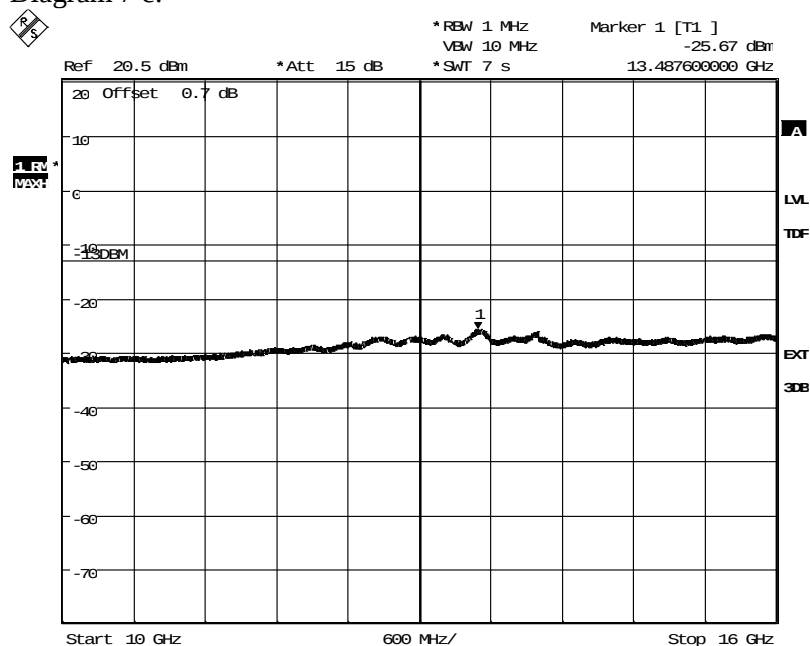
Diagram 7 b:



Date: 2.OCT.2013 13:40:03

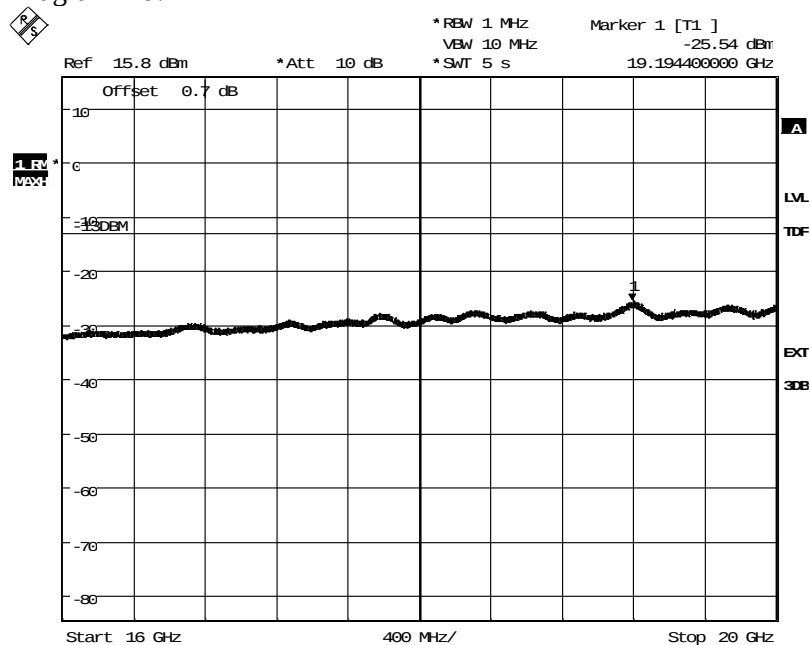
## Appendix 3

Diagram 7 c:



Date: 2.OCT.2013 13:37:21

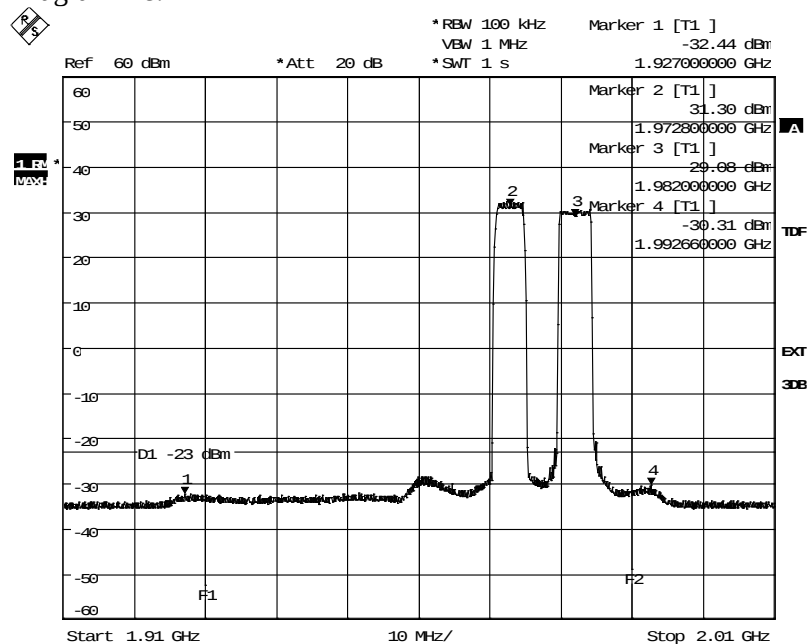
Diagram 7 d:



Date: 2.OCT.2013 13:36:09

## Appendix 3

Diagram 7 e:



Date: 2.OCT.2013 14:35:35

## Appendix 4

**Field strength of spurious radiation measurements according to 47 CFR 2.1053 / IC RSS-139 6.5**

| Date       | Temperature | Humidity   |
|------------|-------------|------------|
| 2013-09-30 | 22 °C ± 3°C | 27 % ± 5 % |
| 2013-10-01 | 23 °C ± 3°C | 24 % ± 5 % |

**Test set-up and procedure**

The test sites are listed at FCC, Columbia with registration number: 93866. The test site complies with RSS-Gen, Industry Canada file no. 3482A-1.

The measurements were performed with both horizontal and vertical polarization of the antenna. The antenna distance was 3 m in the frequency range 30 MHz – 18 GHz and 1m in the frequency range 18 - 20 GHz.

In the frequency range 30 MHz - 20 GHz the measurement was performed in power with a RBW of 1 MHz. A propagation loss in free space was calculated. The used formula was

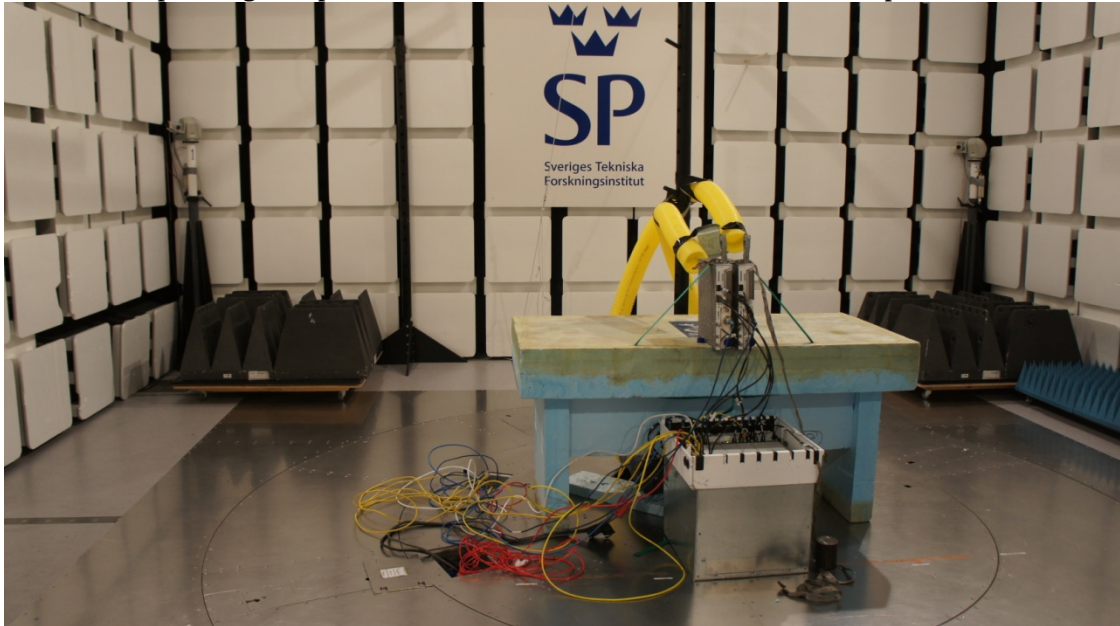
$$\gamma = 20 \log \left( \frac{4\pi D}{\lambda} \right), \gamma \text{ is the propagation loss and } D \text{ is the antenna distance.}$$

The measurement procedure was as the following:

1. The pre-measurement was first performed with peak detector. The EUT was measured in eight directions and with the antenna at three heights, 1.0 m, 1.5 m and 2.0 m.
2. Spurious radiation on frequencies closer than 20 dB to the limit in the pre-measurement is scanned 0-360 degrees and the antenna is scanned 1- 4 m for maximum response. The emission is then measured with the RMS detector and the RMS value is reported. Frequencies closer than 10 dB to the limit when measured with the RMS detector were measured with the substitution method according to the standard.

## Appendix 4

The test set-up during the spurious radiation measurements is shown in the picture below:



### Measurement equipment

| Measurement equipment                     | SP number |
|-------------------------------------------|-----------|
| Semi anechoic chamber                     | 503 881   |
| R&S ESU 26                                | 901 553   |
| R&S FSIQ 40                               | 503 738   |
| EMC 32 ver. 8.52.0                        | 503 899   |
| Chase Bilog Antenna CBL 6111A             | 503 182   |
| EMCO Horn Antenna 3115                    | 502 175   |
| High pass filter, RLC Electronics         | 503 739   |
| Miteq, Low Noise Amplifier                | 503 285   |
| Schwarzbeck preamplifier BBV 9742         | 504 085   |
| µComp Nordic, Low Noise Amplifier         | 901 545   |
| Temperature and humidity meter, Testo 625 | 504 188   |

### Tested configurations

#### MSR WCDMA + LTE

| WCDMA<br>BW/[MHz] | LTE<br>BW/[MHz] | Symbolic<br>frequency |
|-------------------|-----------------|-----------------------|
| 5                 | 5               | B                     |
| 5                 | 5               | M                     |
| 5                 | 10              | M                     |
| 5                 | 15              | M                     |
| 5                 | 5               | T                     |

## Appendix 4

### Results for worst emissions found

| Diagram | LTE/<br>WCDMA<br>BW [MHz] | Symbolic name |
|---------|---------------------------|---------------|
| 1 a-d   | 5                         | T             |

| Frequency<br>(MHz) | Spurious emission level (dBm)    |                                  |
|--------------------|----------------------------------|----------------------------------|
|                    | Vertical                         | Horizontal                       |
| 30-20000           | All emission > 20 dB below limit | All emission > 20 dB below limit |

### Measurement uncertainty:

3.2 dB up to 18 GHz, 3.6 dB above 18 GHz

### Limits

CFR 47 §24.238 and IC RSS-133 6.5

Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB, resulting in a limit of -13 dBm.

|           |     |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

## Appendix 4

Diagram 1 a:

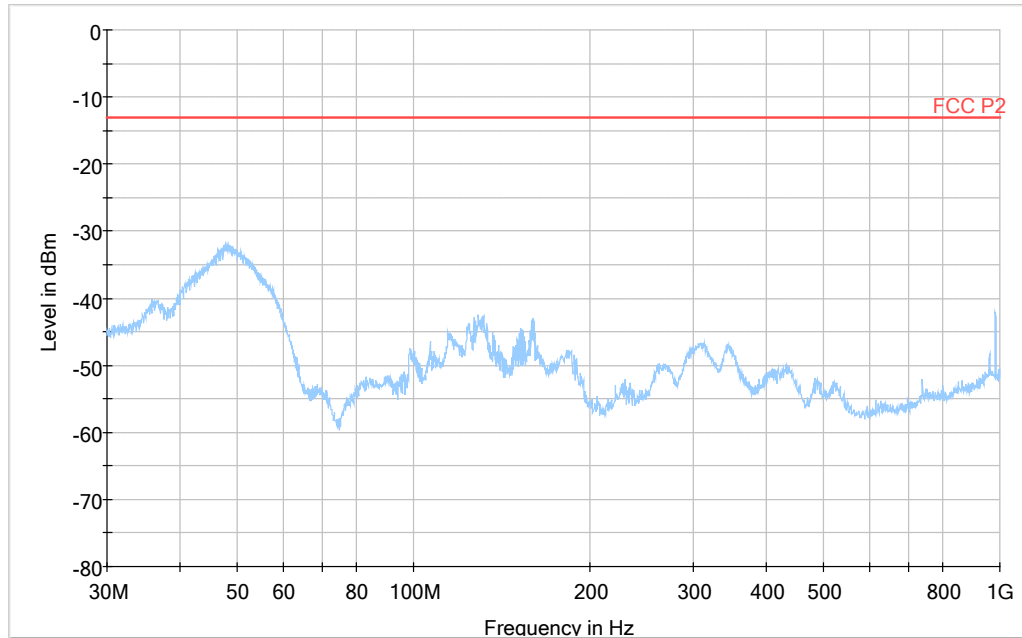
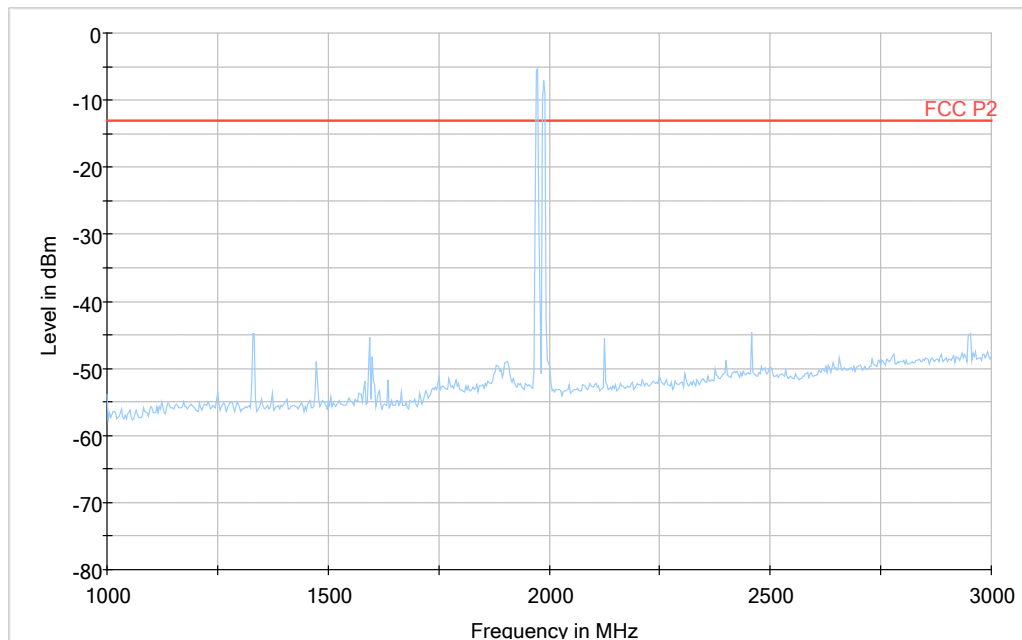


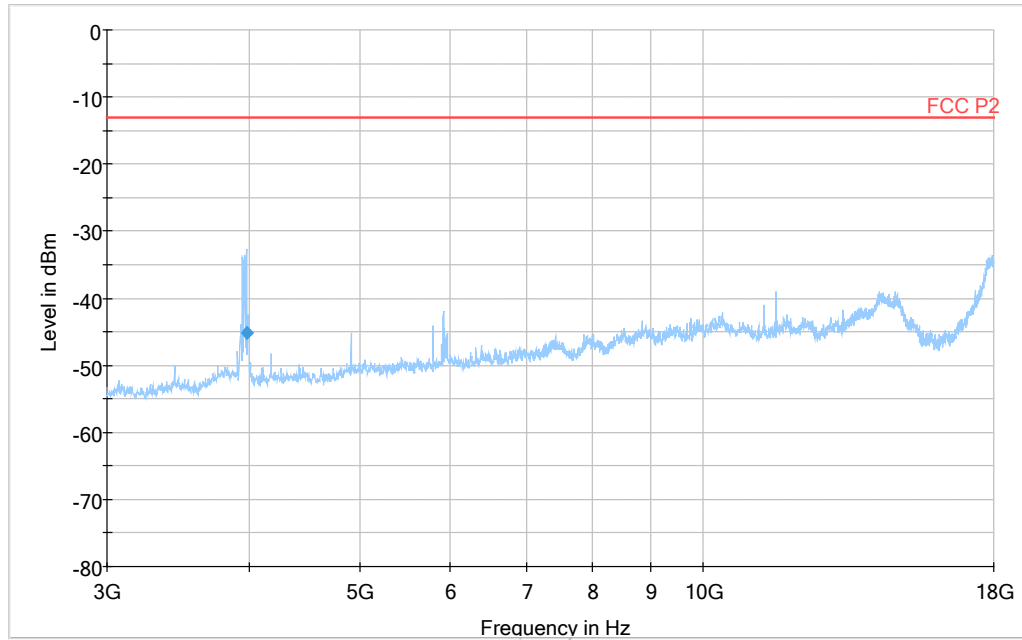
Diagram 1 b:



Note: The emission between 1972.6 MHz and 1982.5 MHz are the carrier frequencies and shall be ignored in the context.

## Appendix 4

Diagram 1 c:

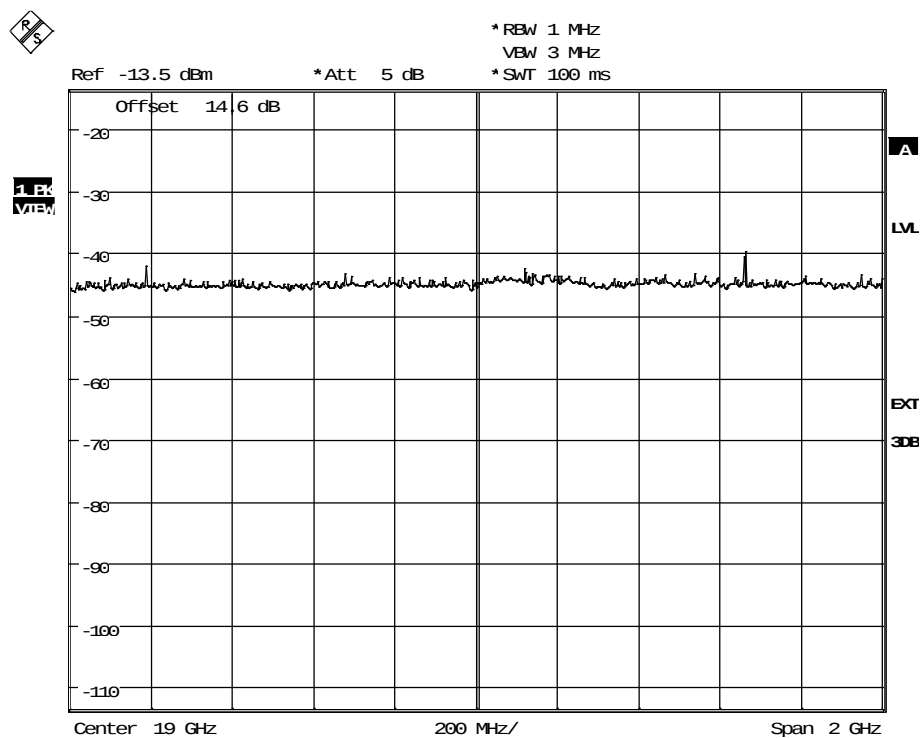


### Final RMS Result

| Frequency (MHz) | RMS (dBm) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dBm) |
|-----------------|-----------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|-------------|
| 3975.897        | -45.1     | 5000.0          | 1000.000        | 169.0       | V            | 90.0          | -103.7     | 32.1        | -13.0       |

## Appendix 4

Diagram 1 d:



Date: 1.OCT.2013 12:29:57

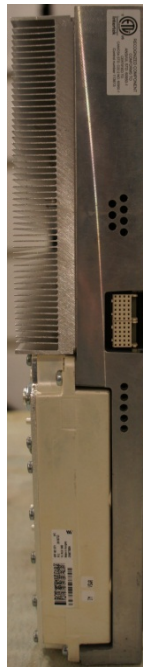
## Appendix 5

### External photos

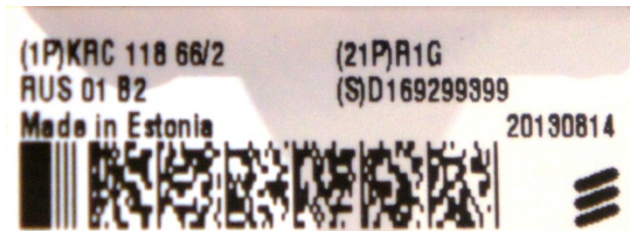
Front side:



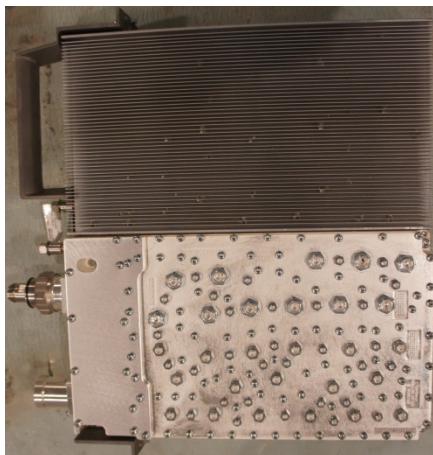
Back side:



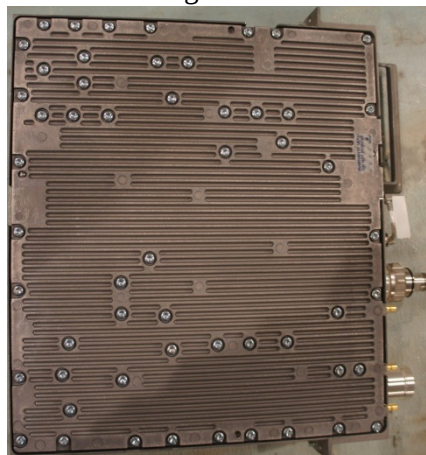
Product Label:



Left side:



Right side:



## Appendix 5

Top side:



Bottom side:

