

# RADIO TEST REPORT

**No. 405669**

## EQUIPMENT UNDER TEST

Equipment: FCT Fixed cellular terminal  
Type / model: 0130101-BV R4E  
0130102-BV R4E  
Manufacturer: Ericsson AB  
Tested by request of: Ericsson AB

## SUMMARY

The equipment complies with the requirements of the following standards:

FCC, Part 24, Subpart E (2003);  
FCC, Part 15, Subpart B, class B (2003)  
RSS-133, Issue 2 (September 1999)

Industry Canada listed test facility No. IC 3481



Date of issue: May 18, 2004

Tested by:

*Linda Heikurainen*

Linda Heikurainen

Approved by:

*Björn Rosenquist*

Björn Rosenquist



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**Intertek Semko AB**

Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, [www.sweden.intertek-etlsemko.com](http://www.sweden.intertek-etlsemko.com)

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**1. CLIENT INFORMATION**

The EUT has been tested by request of

Company: Ericsson AB  
Department EAB/AZ/Y  
S-164 80 Stockholm  
Sweden

Name of contact: Mikael Ohlsson  
+46 733 60 40 44

**2. EQUIPMENT UNDER TEST (EUT)****2.1 Identification of the EUT according to the manufacturer/client declaration**

Equipment: FCT Fixed cellular terminal  
Type/Model: 0130101-BV R4E  
0130102-BV R4E  
Brand name: Ericsson  
Serial number: 0130101-BV; 369001K3KX  
0130102-BV; S69001K3LD  
Manufacturer: Ericsson AB  
Rating/Supplying voltage: 100-240 V AC, 0,33-0,19 A, 50-60 Hz  
Rating RF output power: Max +30 dBm (Power class 1/ PCS 1900)  
Antenna gain: Indoor antenna; +2 dBi  
Outdoor antenna; +3 dBi  
External antenna connector: YES  
Operating temperature range: -10 to +55 °C  
Frequency range: 1850,2 – 1909,8 MHz  
Number of channels: 299  
Modulation characteristics: GFSK  
Stand by mode supported: Yes



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**2.2 Additional hardware information about the EUT**

The EUT consists of the following units:

**0130101-BV**

| Unit                                      | Type and version | Serial number |
|---|------------------|---------------|
| Fixed cellular terminal (FCT)             | 0130101-BV R4E   | S69001K3KX    |
| AD/DC-adaptor                             | 4020051-BV R1A   | 0405005084    |
| Indoor antenna                            | KRE 101 1447     | Unmarked      |
| Outdoor antenna including 3 m RG 58-cable | KRE 101 446      | Unmarked      |

**0130102-BV**

| Unit                                      | Type and version | Serial number |
|---|------------------|---------------|
| Fixed cellular terminal (FCT)             | 0130102-BV R4E   | S69001K3LD    |
| AD/DC-adaptor                             | 4020051-BV R1A   | 0405005084    |
| Indoor antenna                            | KRE 101 1447     | Unmarked      |
| Outdoor antenna including 3 m RG 58-cable | KRE 101 446      | Unmarked      |

The difference between 0130101-BV and 0130102-BV is that 0130101-BV supports voice and data transmission, 0130102-BV supports data transmission only. There are no hardware differences between the two models.

**2.3 Additional software information about the EUT**

During the tests the EUT supported the following software:

| Software    | Version  |
|-------------|----------|
| RapidTest32 | 0.0.0.80 |

**2.4 Peripheral equipment**

Peripheral equipment is defined as equipment needed for correct operation of the EUT, but not included as a part of the testing and evaluation of the EUT.

| Equipment | Manufacturer / Type     | Serial number |
|-----------|-------------------------|---------------|
| Computer  | IBM ThinkPad / 2645-8PG | 552V18T       |

**2.5 Modifications during the test**

No modifications have been made during the tests.



### 3. TEST SPECIFICATIONS

#### 3.1 Standards

FCC 47 CFR part 24 (2003): Subpart E – Broadband PCS  
FCC 47 CFR part 15 (2003): Subpart B – Unintentional radiators

Measurements methods according to ANSI C63.4-2001

RSS-133, Issue 2 (September 1999): 2 GHz Personal Communications Services.

#### 3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

#### 3.3 Test set-up

Measurement set-ups for the test of conducted disturbance voltage in the frequency range 0,45-30 MHz, output power and out-of-band spurious emissions test are described in the sections for respective test. During other tests the EUT was connected to the spectrum/communication analyzer by cable.

#### 3.4 Operating environment

If not additionally specified, the tests were performed under the following environmental conditions:

|                    |          |
|--------------------|----------|
| Air temperature:   | 19-23° C |
| Relative humidity: | 19-44 %  |



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**4. TEST SUMMARY**

The results in this report apply only to the sample tested.

**0130101-BV**

| FCC reference | Test  | Result | Note |
|---------------|---|--------|------|
| 24.232        | RF output power                                 | Pass   |      |
| 24.238 (a-d)  | 26 dB bandwidth                                 | Pass   | 1.   |
| 24.235        | Frequency stability with temperature variations | Pass   |      |
| 24.235        | Frequency stability with voltage variations     | Pass   |      |
| 24.238 (a-d)  | Out of band spurious emissions, radiated        | Pass   |      |
| 24.238 (a-d)  | Out of band spurious emissions, conducted       | Pass   |      |
| 15B           | Out of band spurious emissions, radiated        | Pass   |      |
| 15B           | Conducted emission at AC port                   | Pass   |      |
| 24.238 (b)    | Band edge compliance                            | Pass   |      |

**0130102-BV**

| FCC reference | Test                                     | Result | Note |
|---------------|--|--------|------|
| 24.232        | RF output power                          | Pass   |      |
| 24.238 (a-d)  | Out of band spurious emissions, radiated | Pass   |      |
| 15B           | Out of band spurious emissions, radiated | Pass   |      |

Note 1: No limits apply for the test; the result is used to calculate the resolution bandwidth for Band edge compliance.



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**RF OUTPUT POWER**

**5.1 Test protocol**

Date of test: 2004-05-11

EUT mode of operation: Modulated TX.

**0130101-BV; Highest power level**

| Channel<br>(MHz) | Indoor antenna<br>Peak Output<br>Power<br>(dBm) | Outdoor antenna<br>Peak Output<br>Power<br>(dBm) | Limit value<br>(dBm) |
|------------------|---|--|----------------------|
| 1851,4           | 30,1  | 28,7   | < 33                 |
| 1880             | 30,8  | 29,4   |                      |
| 1908,6           | 31,6  | 30,2   |                      |

**0130101-BV; Lowest power level**

| Channel<br>(MHz) | Indoor antenna<br>Peak Output<br>Power<br>(dBm) | Outdoor antenna<br>Peak Output<br>Power<br>(dBm) | Limit value<br>(dBm) |
|------------------|---|--|----------------------|
| 1851,4           | 3,1   | 1,7  | < 33                 |
| 1880             | 2,9   | 1,5  |                      |
| 1908,6           | 2,6   | 1,2  |                      |

**0130102-BV; Highest power level**

| Channel<br>(MHz) | Indoor antenna<br>Peak Output<br>Power<br>(dBm) | Outdoor antenna<br>Peak Output<br>Power<br>(dBm) | Limit value<br>(dBm) |
|------------------|---|--|----------------------|
| 1851,4           | 30,3  | 28,9   | < 33                 |
| 1880             | 30,8  | 29,4   |                      |
| 1908,6           | 31,4  | 30,0   |                      |

**0130102-BV; Lowest power level**

| Channel<br>(MHz) | Indoor antenna<br>Peak Output<br>Power<br>(dBm) | Outdoor antenna<br>Peak Output<br>Power<br>(dBm) | Limit value<br>(dBm) |
|------------------|---|--|----------------------|
| 1851,4           | 3,0   | 1,6  | < 33                 |
| 1880             | 3,3   | 1,9  |                      |
| 1908,6           | 2,3   | 0,9  |                      |

The measurement was made using a power meter with a peak power sensor measuring the peak output power.

Measurement results are corrected for attenuation in the set-up configuration and antenna gain declared by the manufacturer.

Example calculation:

$$\text{Peak output power [dBm]} = \text{Analyser reading [dBm]} + \text{cable loss [dB]} + \text{EUT antenna gain [dBi]}$$



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0130101-BV; Highest power level

**5. 26 DB BANDWIDTH**

**6.1 Test protocol**

Date of test: 2004-05-12

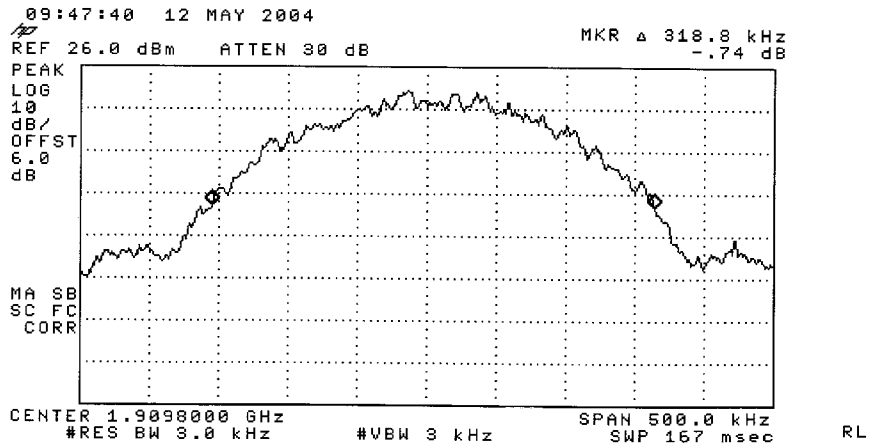
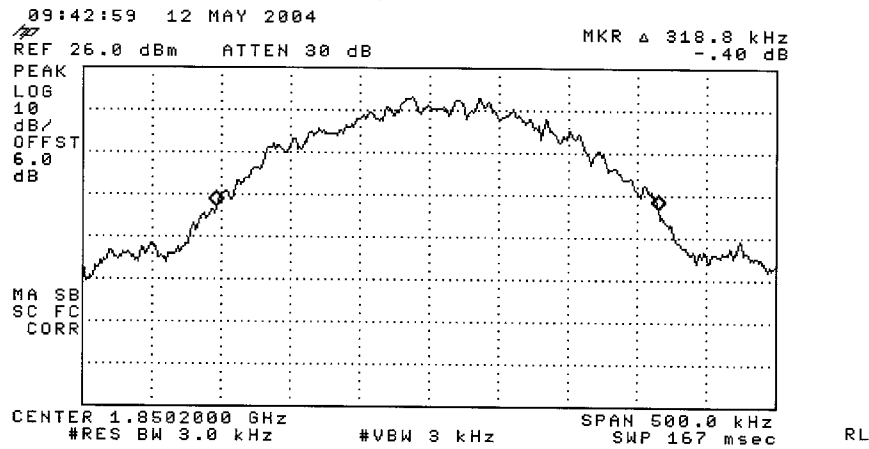
EUT mode of operation: Modulated TX.

Spectrum analyzer settings:

Span: 0,5 MHz  
 RBW: 3 kHz  
 VBW: 3 kHz  
 Sweep time: Auto  
 Detector: Peak  
 Trace: Max Hold

**0130101-BV<sup>1</sup>**

| Channel | 26 dB bandwidth |
|---------|-----------------|
| (MHz)   | (kHz)           |
| 1850,2  | 318             |
| 1909,8  | 318             |



<sup>1</sup> The measurement result also applies for 0130102-BV.



**6. FREQUENCY STABILITY WITH TEMPERATURE VARIATIONS**

**7.1 Test protocol**

Date of test: 2004-05-12 to 2004-05-13

EUT mode of operation: Modulated TX.

Communication analyzer settings:

MS Power level: 0

BS TCH level: -80 dBm

Detector: Max hold

Channel numbers: 512, 660 and 810

**0130101-BV<sup>2</sup>**

| Test conditions          | Frequency                |                        |                          |
|--------------------------|--------------------------|------------------------|--------------------------|
|                          | 1850,2 MHz<br>Error (Hz) | 1880 MHz<br>Error (Hz) | 1909,8 MHz<br>Error (Hz) |
| T <sub>min</sub> (-10)°C | 182                      | 142                    | 165                      |
| T (0)°C                  | 185                      | 168                    | 118                      |
| T (10)°C                 | 167                      | 175                    | 67                       |
| T <sub>nom</sub> (20)°C  | 142                      | 131                    | 136                      |
| T (30)°C                 | 170                      | 116                    | 110                      |
| T (40)°C                 | 138                      | 108                    | -71                      |
| T <sub>max</sub> (50)°C  | 121                      | 81                     | -93                      |

Limit = Stay within the authorized frequency block, the RF carrier frequency shall not depart more than ±2,5 ppm (4625 Hz) from the reference frequency.  
(2,5 ppm of 1850-1910 MHz is = 4625 - 4775 Hz)



<sup>2</sup> The measurement result also applies for 0130102-BV.

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**7. FREQUENCY STABILITY WITH VOLTAGE VARIATIONS**

**8.1 Test protocol**

Date of test: 2004-05-12

EUT mode of operation: Modulated TX.

Communication analyzer settings:

MS Power level: 0

BS TCH level: -80 dBm

Detector: Max hold

Channel numbers: 512, 660 and 810

**0130101-BV<sup>3</sup>**

| Test conditions             | Frequency                |                        |                          |
|-----------------------------|--------------------------|------------------------|--------------------------|
|                             | 1850,2 MHz<br>Error (Hz) | 1880 MHz<br>Error (Hz) | 1909,8 MHz<br>Error (Hz) |
| V <sub>min</sub> ( 120 )VAC | 153                      | 134                    | 95                       |
| V <sub>nom</sub> ( 102 )VAC | 105                      | 130                    | 98                       |
| V <sub>max</sub> ( 138 )VAC | 136                      | 91                     | 55                       |

Limit = Stay within the authorized frequency block, the RF carrier frequency shall not depart more than ±2,5 ppm (4625 Hz) from the reference frequency.  
(2,5 ppm of 1850-1910 MHz is = 4625 - 4775 Hz)



<sup>3</sup> The measurement result also applies for 0130102-BV.

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**9. RADIATED SPURIOUS EMISSIONS**

**9.1 Operating environment**

Temperature: 19 °C (10 – 40 °C)  
 Relative Humidity: 44 % (10 - 90 %)

**9.2 Measurement uncertainty**

Radiated disturbance electric field intensity, 30 – 1000 MHz: ± 4,6 dB  
 Radiated disturbance electric field intensity, 1000 – 18000 MHz: ± 6,0 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997.  
 The measurement uncertainty is given with a confidence of 95%.

**9.3 Test equipment**

| Equipment  | Manufacturer    | Type         | SEMKO No. |
|--|-----------------|--------------|-----------|
| <i>Test site: Semi-anechoic shielded chamber, 10 x 20 x 8,5 m (W x L x H)</i>        |                 |              | 30300     |
| Software:  | Rohde & Schwarz | ES-K1, V1.60 |           |
| Measurement receiver:  | Rohde & Schwarz | ESAI         | 2973/2974 |
| Antenna amplifier:   | SEMKO           |              | 7992/7993 |
| Antenna, bilog:  | Chase           | CBL6111B     | 8578      |
| <i>Test site: Bluetooth anechoic shielded chamber, 3,7 x 7,0 x 2,4 m (W x L x H)</i> |                 |              | 12285     |
| Software:  | Rohde & Schwarz | ES-K1, V1.70 |           |
| Signal analyser:   | Rohde & Schwarz | FSIQ 40      | 40023     |
| Preamplifier:  | MITEQ           | AFS6/AFS44   | 12335     |
| <b>Antennas:</b>   |                 |              |           |
| Double Ridge Guide Horn:   | EMCO            | 3115         | 4936      |
| Horn antenna:  | EMCO            | 3160-08      | 30099     |
| Horn antenna:  | EMCO            | 3160-09      | 30101     |



**9.4 Measurement set-up**

Test site: Semi-anechoic shielded chamber (30 – 1000 MHz)

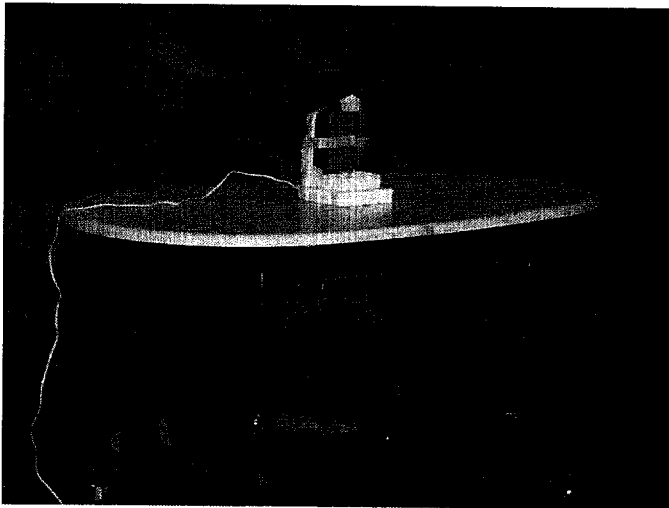
The radiated disturbance electric field intensity was measured in a semi-anechoic chamber at a distance of 10 m and the EUT was placed on a non-metallic table, 0,8 m above the reference ground plane. The specified test mode was enabled. Test set-up photo is given below.

An overview sweep with peak detection of the electric field intensity was performed with the measurement receiver in max-hold and with the antenna placed 1,5 m, 2,5 m and 3,5 m above the floor. The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps.

At the frequencies where high disturbance levels were found a search for max disturbance level was performed. With the EUT and antenna in the worst-case configuration new measurements were carried out.

The EUT was supplied by 120 VAC (50 Hz) during the test.

Test set-up photo:



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Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, [www.sweden.intertek-etlsemko.com](http://www.sweden.intertek-etlsemko.com)

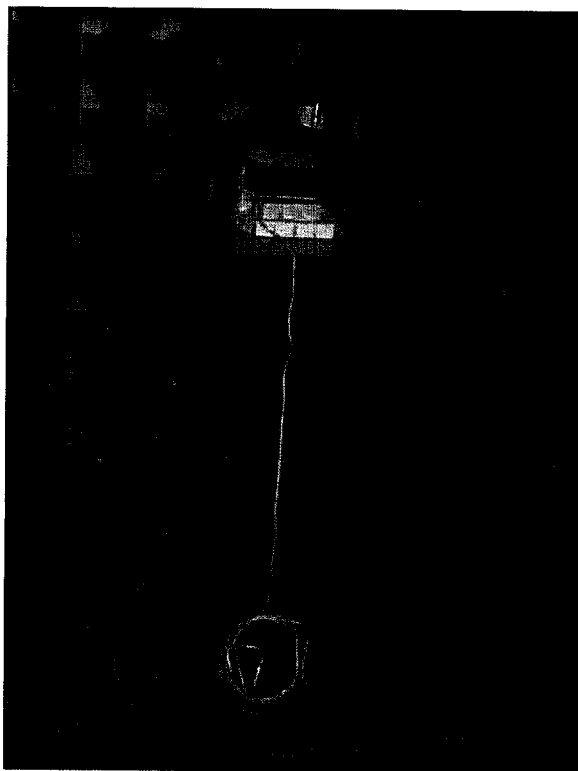
Registered in Sweden: No SE556024059901, Registered office: As address

Test site: Bluetooth anechoic shielded chamber (1 – 26 GHz)

In the Bluetooth anechoic chamber the EUT was placed on a non-metallic table, 1,4 m above the floor. The radiated disturbance electric field intensity was measured at a distance of 3 m. The specified test mode was enabled.

An overview sweep with peak detection of the electric field intensity was performed with the spectrum analyser in max-hold and with the antenna placed 1,4 m above the floor. The polarisation was horizontal and vertical. The measurements were repeated with the EUT rotated in 90-degree steps. If necessary, the sweep was repeated with average detection. Test set-up photo is shown below.

The EUT was supplied by 120 VAC (50 Hz) during the test.



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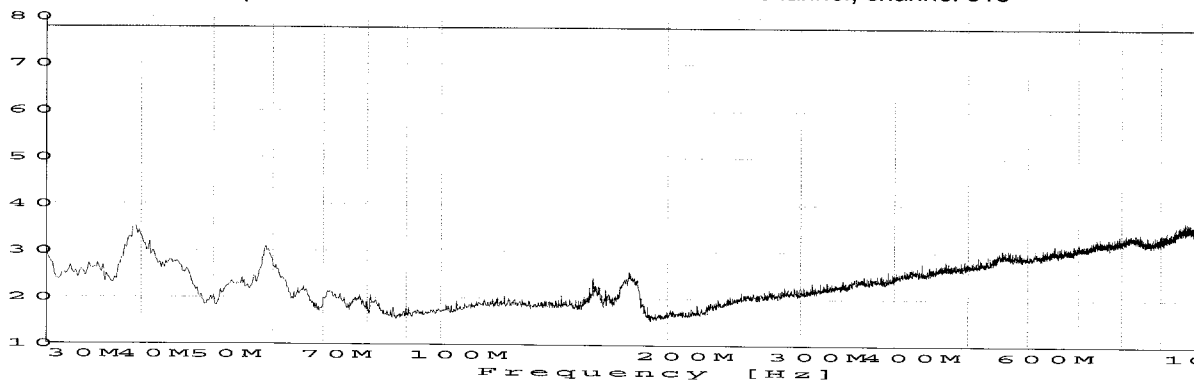
**9.5 Test protocol**

**9.5.1 0130101-BV**

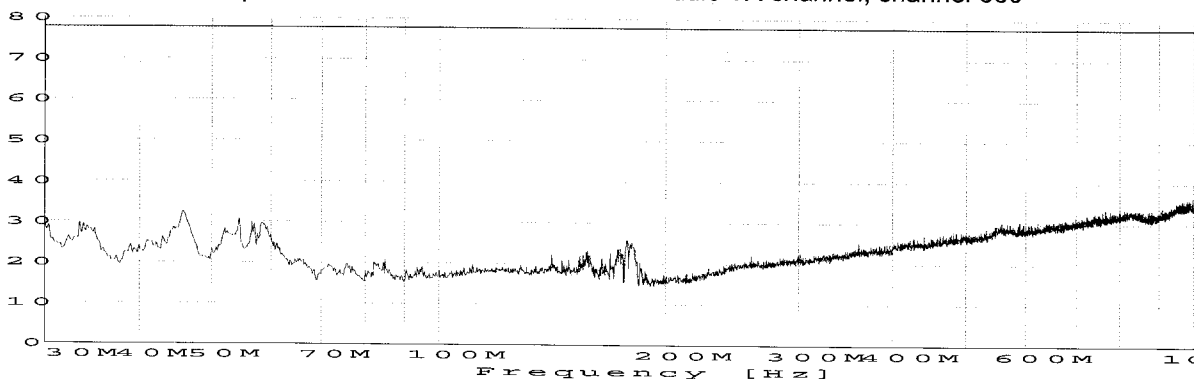
Semi-anechoic shielded chamber

Date of test: 2004-05-07

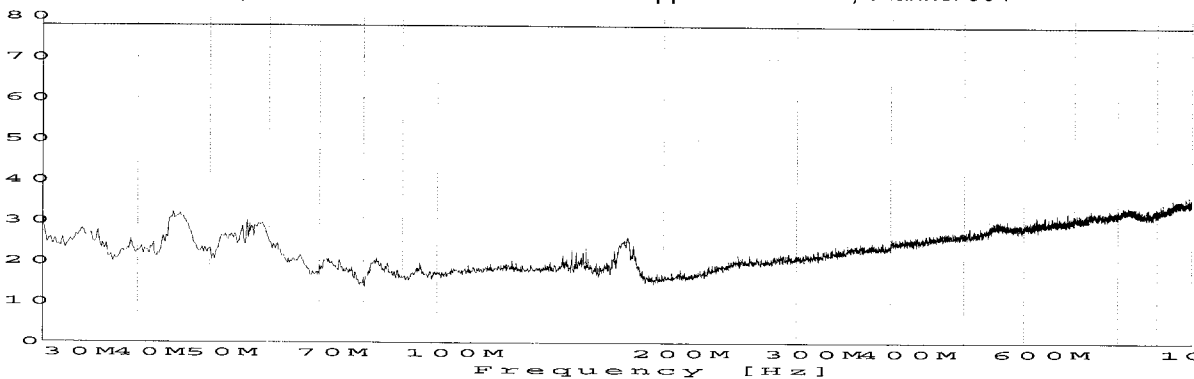
30 – 1000 MHz, max peak at a distance of 10 m on the lower TX channel, channel 518



30 – 1000 MHz, max peak at a distance of 10 m on the middle TX channel, channel 660



30 – 1000 MHz, max peak at a distance of 10 m on the upper TX channel, channel 804



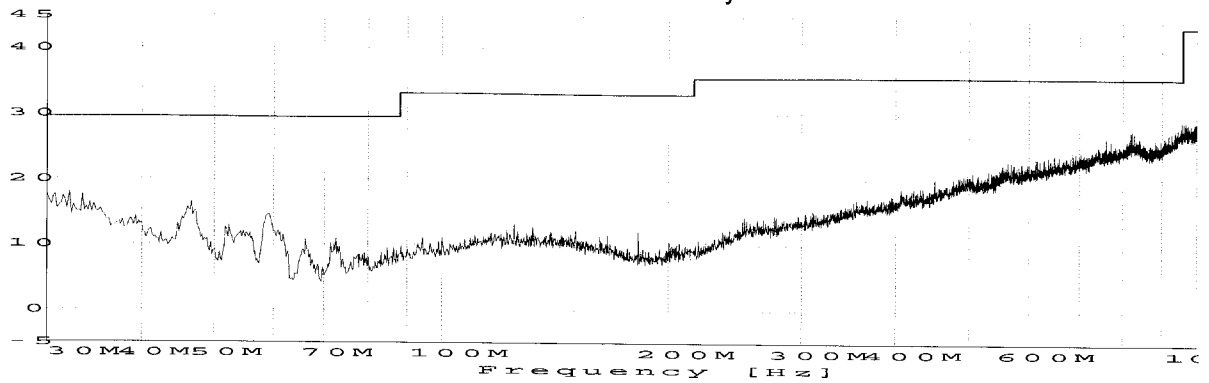
Intertek Semko AB

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Telephone +46 8 750 00 00, Fax +46 8 750 60 30, [www.sweden.intertek-etlsemko.com](http://www.sweden.intertek-etlsemko.com)

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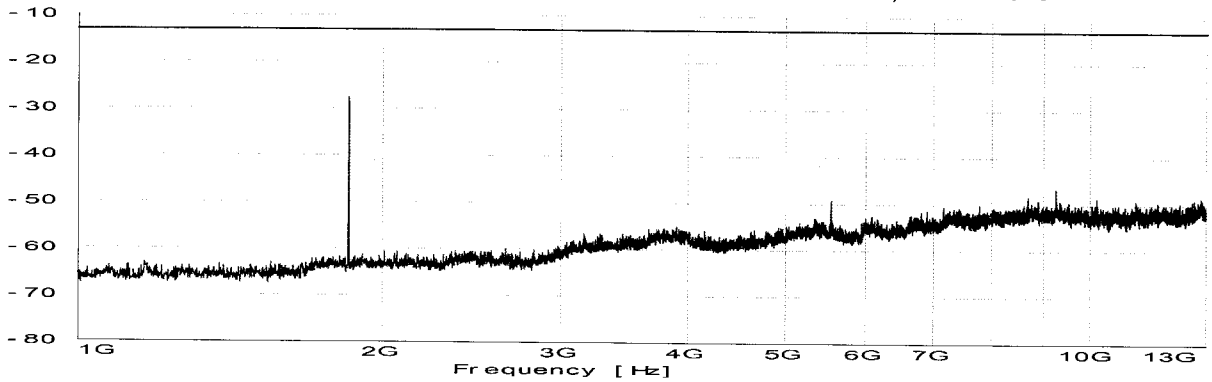
30 – 1000 MHz, max peak at a distance of 10 m in the stand by mode



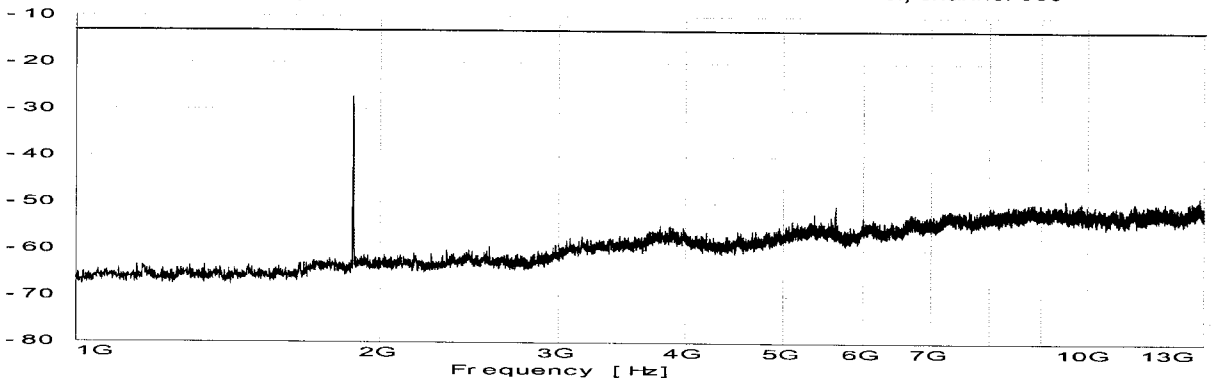
Bluetooth anechoic shielded chamber

Date of test: 2004-05-10

1000 – 13000 MHz, max peak at a distance of 3 m on the lower TX channel; channel 518



1000 – 13000 MHz, max peak at a distance of 3 m on the middle TX channel; channel 660



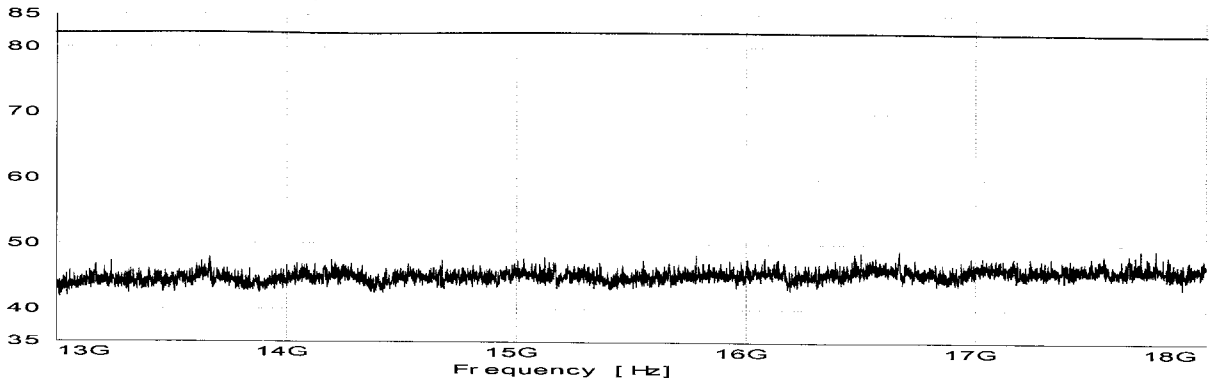
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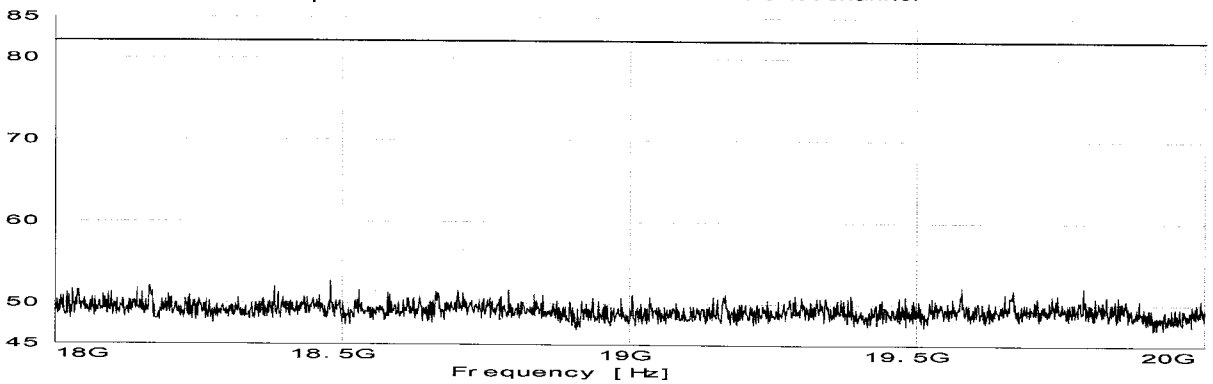
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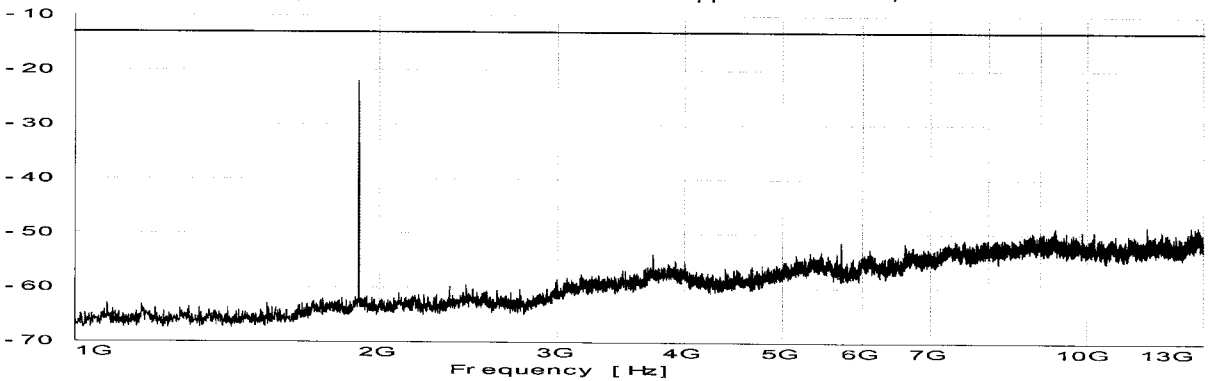
13000 – 18000 MHz, max peak at a distance of 3 m on the middle TX channel<sup>4</sup>



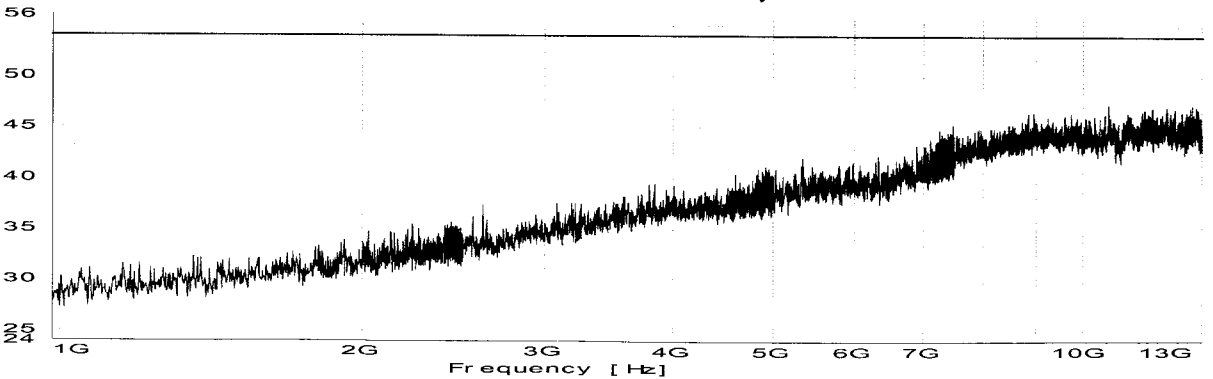
18000 – 20000 MHz, max peak at a distance of 3 m on the middle TX channel<sup>4</sup>



1000 – 13000 MHz, max peak at a distance of 3 m on the upper TX channel; channel 804



1000 – 13000 MHz, max peak at a distance of 3 m in the stand by mode



<sup>4</sup> This graph also applies to the low and high channel.



Data summary; Stand by mode

| Field strength of spurious emissions |              |                    |                     |                    |                     |               |
|--------------------------------------|--------------|--------------------|---------------------|--------------------|---------------------|---------------|
| Frequency<br>[MHz]                   | RBW<br>[kHz] | Measured level     |                     | Limit              |                     | Note          |
|                                      |              | Peak<br>[dB(μV/m)] | QP/AV<br>[dB(μV/m)] | Peak<br>[dB(μV/m)] | QP/AV<br>[dB(μV/m)] |               |
| 46,1                                 | 120          | < 20               | 14                  | -                  | 29,5                | 10 m distance |
| 88 – 216                             | 120          | < 13               | -                   | -                  | 33                  | "             |
| 957,8                                | 120          | < 30               | 20                  | -                  | 35,6                | "             |
| 960 – 1000                           | 120          | < 30               | -                   | -                  | 43,5                | "             |
| 8950,9                               | 1000         | < 47               | 35                  | 74                 | 54                  | 3 m distance  |
| 9724,4                               | 1000         | < 46               | 37                  | 74                 | 54                  | "             |
| 10580,1                              | 1000         | < 47               | 37                  | 74                 | 54                  | "             |
| 12039                                | 1000         | < 47               | 38                  | 74                 | 54                  | "             |
| 12721,4                              | 1000         | < 47               | 38                  | 74                 | 54                  | "             |

At 10 m test distance is the limit extrapolated to 3 m by 20 dB/ decade.

Example calculation:

Measured level [dBuV/m] = Analyser reading [dBuV] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]

TX-mode:

| Field strength of spurious emissions |              |                |             |               |             |                          |
|--------------------------------------|--------------|----------------|-------------|---------------|-------------|--------------------------|
| Frequency<br>[MHz]                   | RBW<br>[kHz] | Measured level |             | Limit         |             | Note                     |
|                                      |              | Peak<br>[dBm]  | AV<br>[dBm] | Peak<br>[dBm] | AV<br>[dBm] |                          |
| 39                                   | 1000         | -44            | -           | -13           | -           | Note 1,<br>10 m distance |
| 45,5                                 | 1000         | -47            | -           | -13           | -           | "                        |
| 960,5                                | 1000         | -43            | -           | -13           | -           | "                        |
| 987,5                                | 1000         | -43            | -           | -13           | -           | "                        |
| 3725,4                               | 1000         | -55            | -           | -13           | -           | 3 m distance             |
| 5554,1                               | 1000         | -44            | -           | -13           | -           | "                        |
| 5726,4                               | 1000         | -47            | -           | -13           | -           | "                        |
| 9257,5                               | 1000         | -45            | -           | -13           | -           | "                        |
| 16668,8                              | 1000         | -46            | -           | -13           | -           | Note 2,<br>3 m distance  |
| 18479,9                              | 1000         | -42            | -           | -13           | -           | "                        |

The radiated spurious emissions below 1 GHz have been measured as field strength. The corresponding radiated power for 10 m antenna distance has been calculated:  
 34 dBμV/m is the calculated field strength at 10 m when -57 dBm is radiated  
 37 dBμV/m is the calculated field strength at 10 m when -54 dBm is radiated  
 49 dBμV/m is the calculated field strength at 10 m when -36 dBm is radiated

Note 2: The radiated spurious emissions above 13 GHz have been measured as field strength. The corresponding radiated power for 3 m antenna distance has been calculated:  
 38 dBμV/m is the calculated field strength at 3 m when -57 dBm is radiated  
 41 dBμV/m is the calculated field strength at 3 m when -54 dBm is radiated  
 59 dBμV/m is the calculated field strength at 3 m when -36 dBm is radiated

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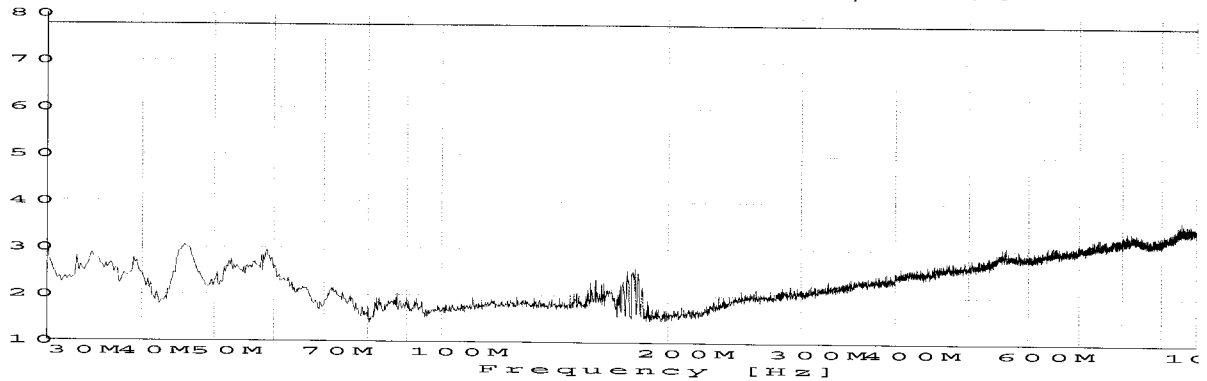


**9.5.2. 0130102-BV**

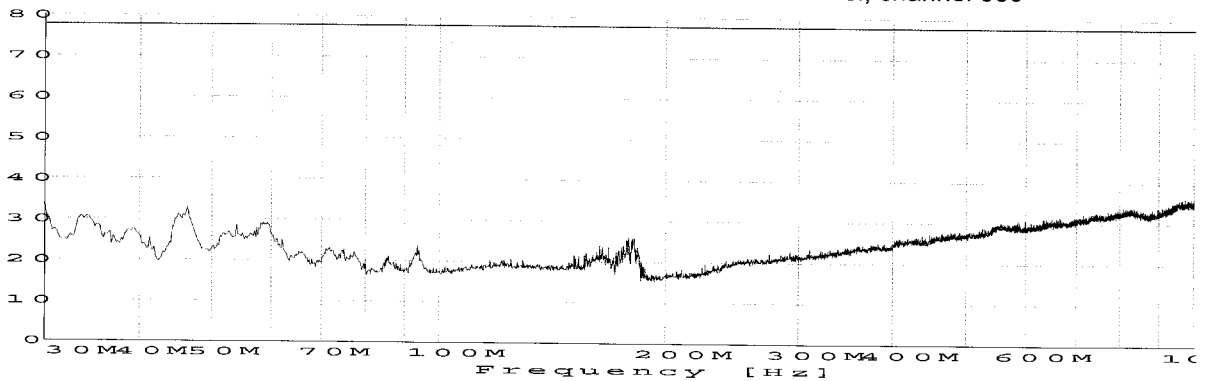
Semi-anechoic shielded chamber

Date of test: 2004-05-07

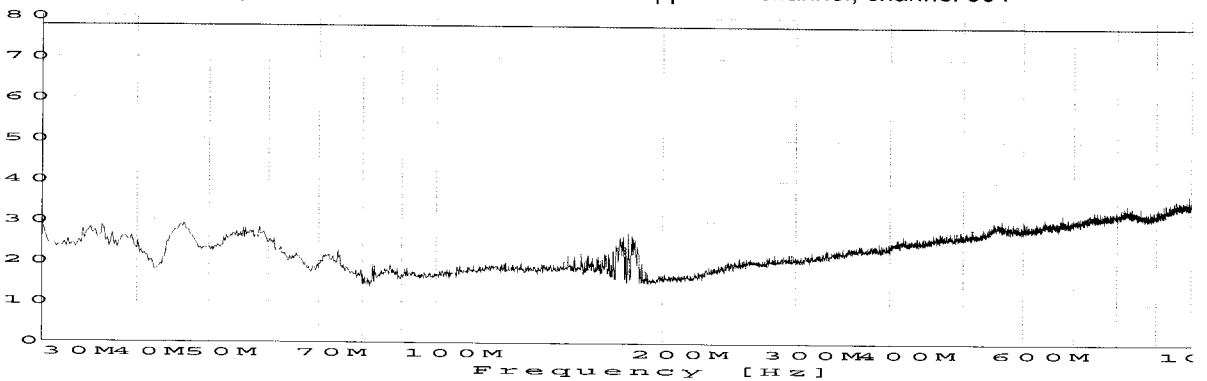
30 – 1000 MHz, max peak at a distance of 10 m on the lower TX channel, channel 518



30 – 1000 MHz, max peak at a distance of 10 m on the middle TX channel, channel 660



30 – 1000 MHz, max peak at a distance of 10 m on the upper TX channel, channel 804



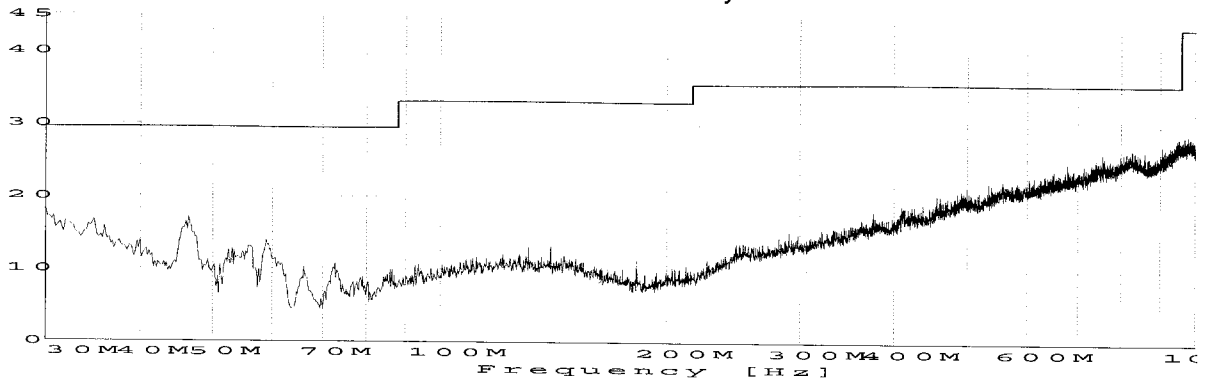
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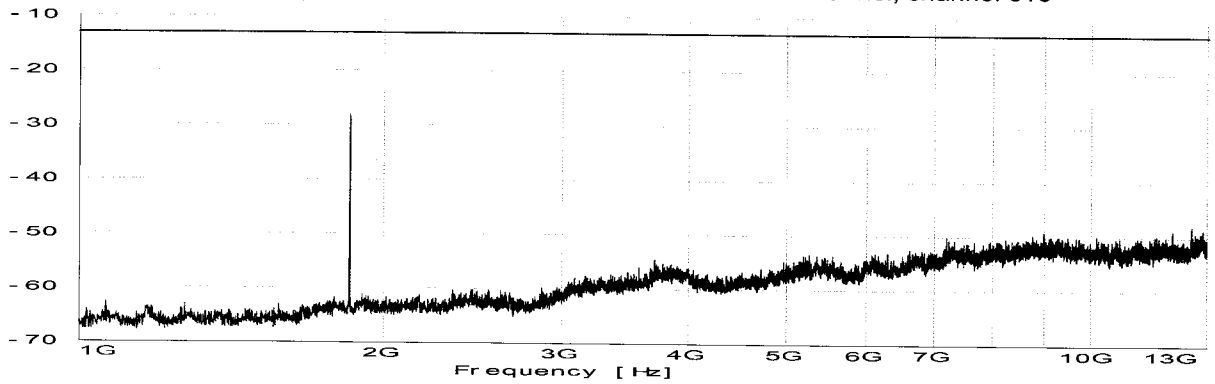
30 – 1000 MHz, max peak at a distance of 10 m in the stand by mode



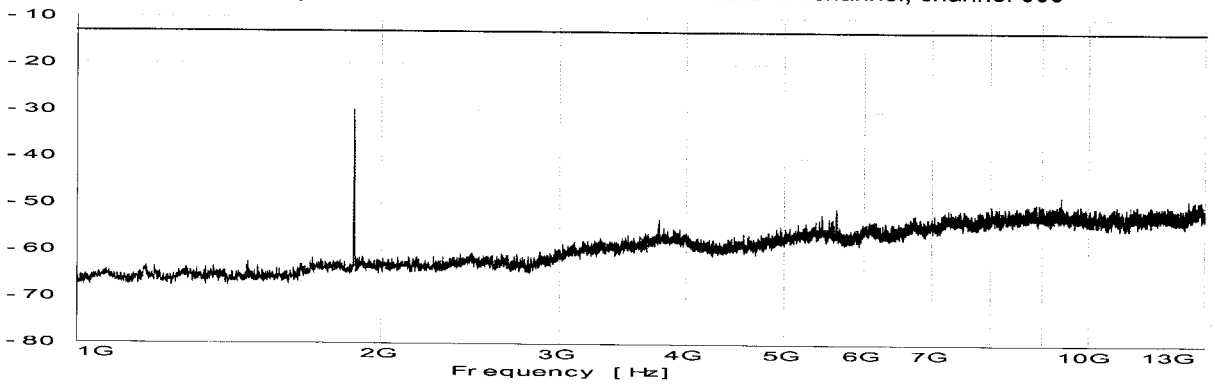
Bluetooth anechoic shielded chamber

Date of test: 2004-05-10

1000 – 13000 MHz, max peak at a distance of 3 m on the lower TX channel; channel 518



1000 – 13000 MHz, max peak at a distance of 3 m on the middle TX channel; channel 660



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Data summary; Stand by mode

| Field strength of spurious emissions |              |                    |                     |                    |                     |               |
|--------------------------------------|--------------|--------------------|---------------------|--------------------|---------------------|---------------|
| Frequency<br>[MHz]                   | RBW<br>[kHz] | Measured level     |                     | Limit              |                     | Note          |
|                                      |              | Peak<br>[dB(μV/m)] | QP/AV<br>[dB(μV/m)] | Peak<br>[dB(μV/m)] | QP/AV<br>[dB(μV/m)] |               |
| 46,0                                 | 120          | < 20               | 14                  | -                  | 29,5                | 10 m distance |
| 88 – 216                             | 120          | < 13               | -                   | -                  | 33                  | "             |
| 958,5                                | 120          | < 30               | 20                  | -                  | 35,6                | "             |
| 960 – 1000                           | 120          | < 30               | -                   | -                  | 43,5                | "             |
| 8297,5                               | 1000         | < 46               | 34                  | 74                 | 54                  | 3 m distance  |
| 9219,4                               | 1000         | < 47               | 36                  | 74                 | 54                  | "             |
| 9800,6                               | 1000         | < 47               | 37                  | 74                 | 54                  | "             |
| 12147,2                              | 1000         | < 47               | 37                  | 74                 | 54                  | "             |
| 12696,3                              | 1000         | < 47               | 38                  | 74                 | 54                  | "             |

At 10 m test distance is the limit extrapolated to 3 m by 20 dB/ decade.

Example calculation:

Measured level [dBμV/m] = Analyser reading [dBμV] + cable loss [dB] – preamplifier gain [dB] + antenna factor [1/m]

TX-mode:

| Field strength of spurious emissions |              |                |             |               |             |                          |
|--------------------------------------|--------------|----------------|-------------|---------------|-------------|--------------------------|
| Frequency<br>[MHz]                   | RBW<br>[kHz] | Measured level |             | Limit         |             | Note                     |
|                                      |              | Peak<br>[dBm]  | AV<br>[dBm] | Peak<br>[dBm] | AV<br>[dBm] |                          |
| 45,5                                 | 1000         | -49            | -           | -13           | -           | Note 1,<br>10 m distance |
| 46                                   | 1000         | -48            | -           | -13           | -           | "                        |
| 960,5                                | 1000         | -44            | -           | -13           | -           | "                        |
| 975,5                                | 1000         | -44            | -           | -13           | -           | "                        |
| 3713,4                               | 1000         | -55            | -           | -13           | -           | 3 m distance             |
| 5640,2                               | 1000         | -48            | -           | -13           | -           | "                        |
| 5726,4                               | 1000         | -48            | -           | -13           | -           | "                        |
| 9399,7                               | 1000         | -44            | -           | -13           | -           | "                        |
| 16918,8                              | 1000         | -47            | -           | -13           | -           | Note 2,<br>3 m distance  |
| 18063,1                              | 1000         | -43            | -           | -13           | -           | "                        |

Note 1: The radiated spurious emissions below 1 GHz have been measured as field strength. The corresponding radiated power for 10 m antenna distance has been calculated:  
 34 dBμV/m is the calculated field strength at 10 m when -57 dBm is radiated  
 37 dBμV/m is the calculated field strength at 10 m when -54 dBm is radiated  
 49 dBμV/m is the calculated field strength at 10 m when -36 dBm is radiated

Note 2: The radiated spurious emissions above 13 GHz have been measured as field strength. The corresponding radiated power for 3 m antenna distance has been calculated:  
 38 dBμV/m is the calculated field strength at 3 m when -57 dBm is radiated  
 41 dBμV/m is the calculated field strength at 3 m when -54 dBm is radiated  
 59 dBμV/m is the calculated field strength at 3 m when -36 dBm is radiated



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Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

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**10. CONDUCTED DISTURBANCE VOLTAGE IN THE FREQUENCY RANGE 0,15 - 30 MHZ**

**10.1 Operating environment**

Temperature: 23°C (10 – 40 °C)  
 Relative Humidity: 22% (10 - 90 %)

**10.2 Measurement uncertainty**

Conducted disturbance voltage, quasi-peak detection: ±2,0 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during operation of the EUT.

Measurement uncertainty is calculated in accordance with EA-4/02-1997. The measurement uncertainty is given with a confidence of 95%.

**10.3 Test equipment**

|                           |                 |             |           |
|---------------------------|-----------------|-------------|-----------|
| Test site:                | FCC             |             |           |
| Equipment                 | Manufacturer    | Type        | SEMKO No. |
| Software:                 | Rohde & Schwarz | ES-K1 V1.60 |           |
| Measurement receiver:     | Rohde & Schwarz | ESHS 30     | 4946      |
| Artificial mains network: | Rohde & Schwarz | ESH3-Z5     | 2727      |
| Transformer:              | TUFVASSONS      | AFM-1500    | 375       |

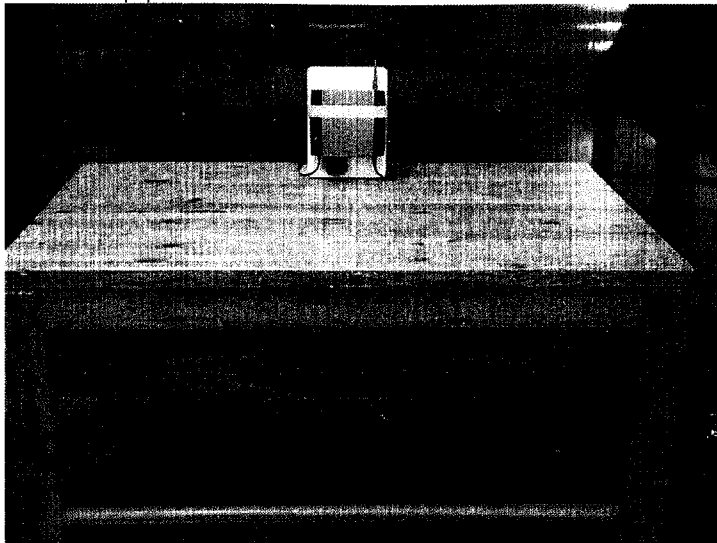
**10.4 Measurement set-up**

The mains terminal disturbance voltage was measured with the EUT located 0,8 m above the ground plane and 0,4 m from the vertical ground plane. The EUT was connected to an artificial mains network (AMN). The AMN was placed on a metallic, grounded floor. Amplitude measurements were performed with a quasi-peak detector. The test set-up photo is given below.

The EUT was supplied by 120 VAC (60 Hz) during the test.



Test set-up photo:



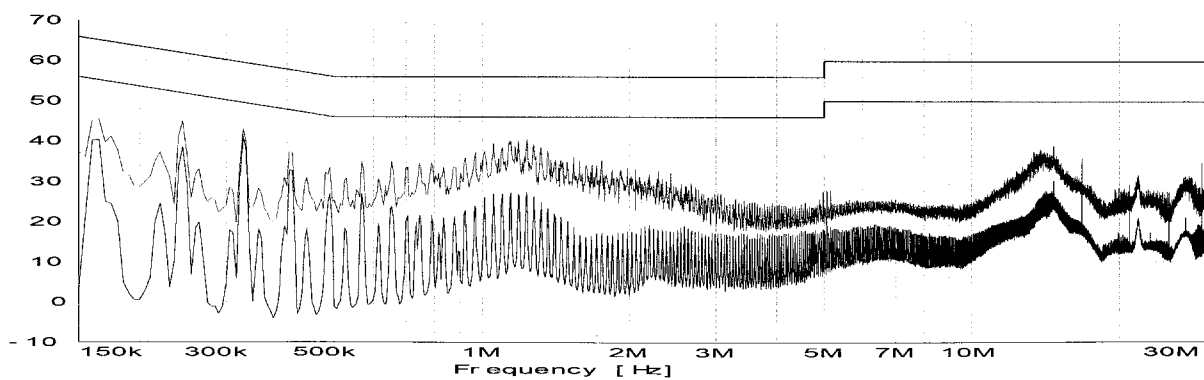
**10.5 Test protocol**

Date of test: 2004-05-17

**0130101-BV<sup>7</sup>**

| Frequency<br>/MHz | Quasi-Peak                      |                               |
|-------------------|---------------------------------|-------------------------------|
|                   | Disturbance<br>Level<br>/dB(μV) | Permitted<br>limit<br>/dB(μV) |
| 0,245             | 44                              | 62                            |
| 0,325             | 42                              | 60                            |
| 1,055             | 36                              | 56                            |
| 1,10              | 36                              | 56                            |
| 1,23              | 36                              | 56                            |
| 1,275             | 36                              | 56                            |

An overview sweep performed with a peak detector is shown below.



<sup>7</sup> The measurement result also applies for 0130102-BV.

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**11. OUT OF BAND SPURIOUS EMISSIONS, CONDUCTED AT ANTENNA PORT**

**11.1 Test equipment**

| Equipment          | Manufacturer | Type               | SEMKO No. |
|--------------------|--------------|--------------------|-----------|
| Spectrum analyzer: | HP           | 8593E              | 6661      |
| Attenuator 6 dB    | Spinner      | BN534352           | 7761      |
| Cable              | Midwest      | CSY-NMNM-80-350-CS | 8002      |

HP = Hewlett & Packard

**11.2 Measurement set-up**

The EUT was connected to a spectrum analyzer through a 6 dB power attenuator.

**11.3 Test protocol**

0130101-BV<sup>8</sup>

| Strength of conducted spurious emissions |              |                |                |               |                |             |
|--|--------------|----------------|----------------|---------------|----------------|-------------|
| Frequency<br>[MHz]                       | RBW<br>[kHz] | Measured level |                | Limit         |                | Note        |
|  |              | Peak<br>[dBm]  | QP/AV<br>[dBm] | Peak<br>[dBm] | QP/AV<br>[dBm] |             |
| 30 -1000                                 | 1000         | < -34          | -              | -13           | -              | Noise floor |
| 1000 - 3000                              | 1000         | < -39          | -              | -13           | -              | "           |
| 3706                                     | 1000         | -46            | -              | -13           | -              |             |
| 5650                                     | 1000         | -52            | -              | -13           | -              |             |
| 6000 - 8000                              | 1000         | < -50          | -              | -13           | -              | Noise floor |
| 9405                                     | 1000         | -44            | -              | -13           | -              |             |
| 10000 - 12000                            | 1000         | < -50          | -              | -13           | -              | Noise floor |
| 12000 - 16000                            | 1000         | < -47          | -              | -13           | -              | "           |
| 16000 - 20000                            | 1000         | < -42          | -              | -             | -              | "           |

Limit: In any 1 MHz bandwidth outside the operating frequency band (1850-1910 MHz), the radio frequency power that is produced by the intentional radiator shall be attenuated below -13 dBm<sup>9</sup>.



<sup>8</sup> The measurement result also applies to 0130102-BV.

<sup>9</sup> Calculated with the formula: 43+10log(P) dB below the measured transmitter output power. Output power, see section 5.

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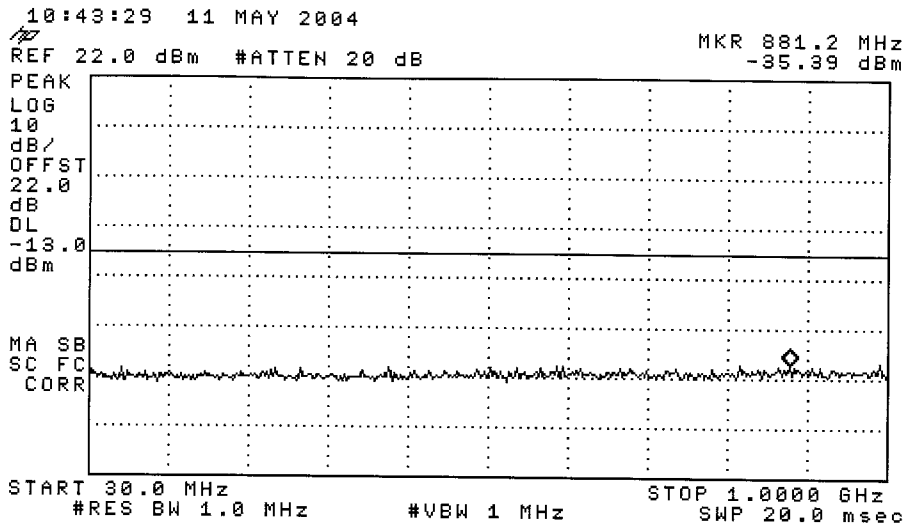
Registered in Sweden: No SE556024059901, Registered office: As address



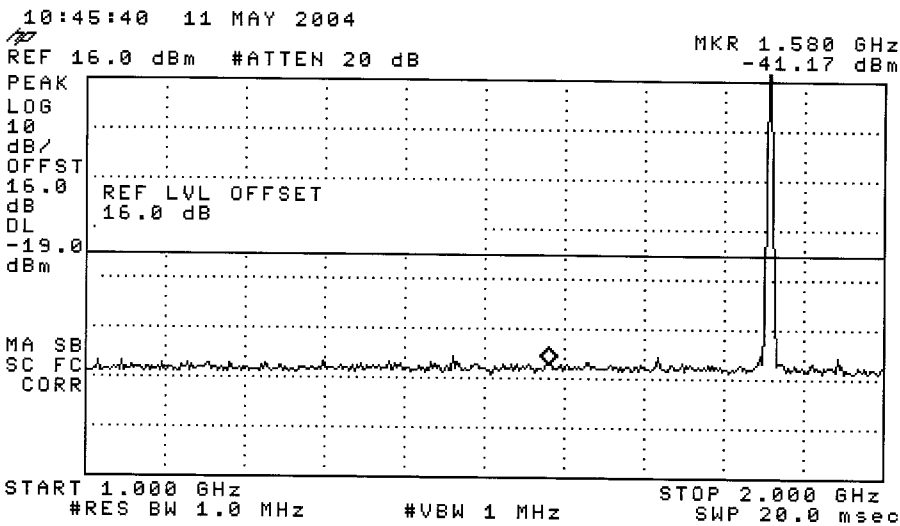
CLASS OF MEASUREMENT: STANDARD



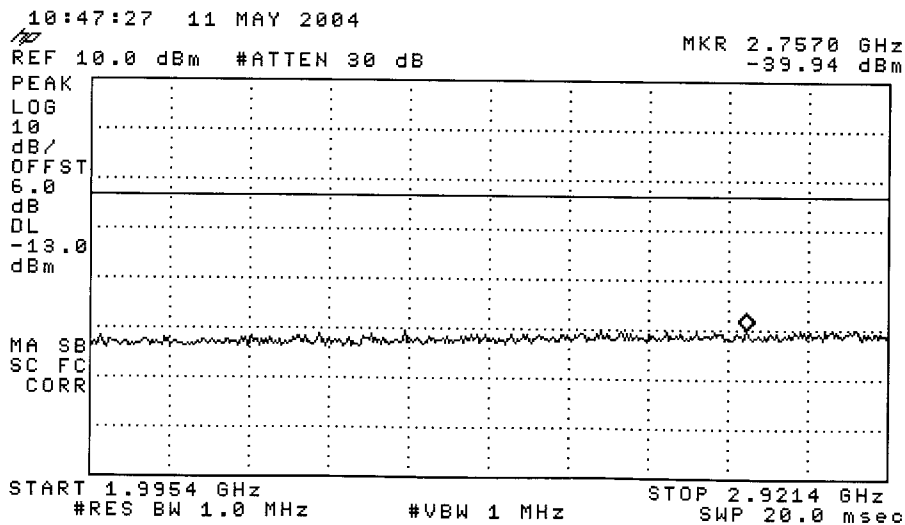
**Conducted emissions at the antenna port, channel 518, power level +30 dBm**



RT



RL



RT

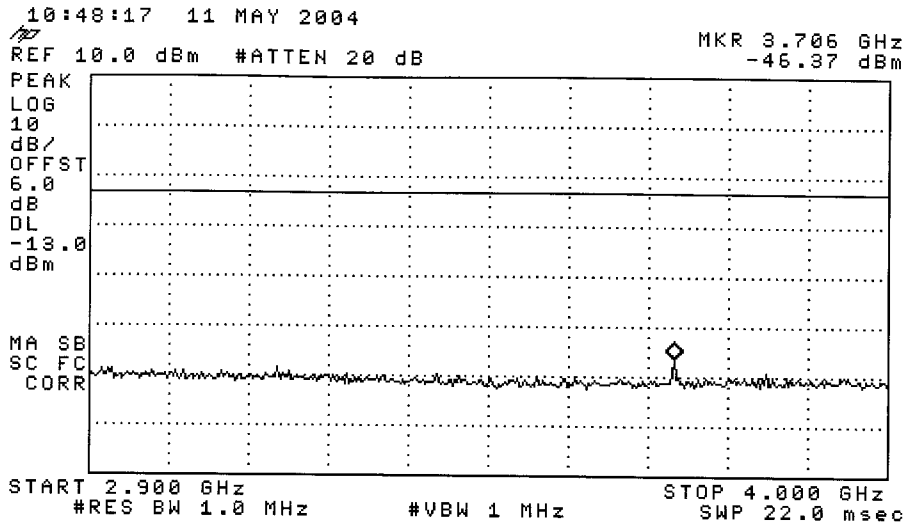


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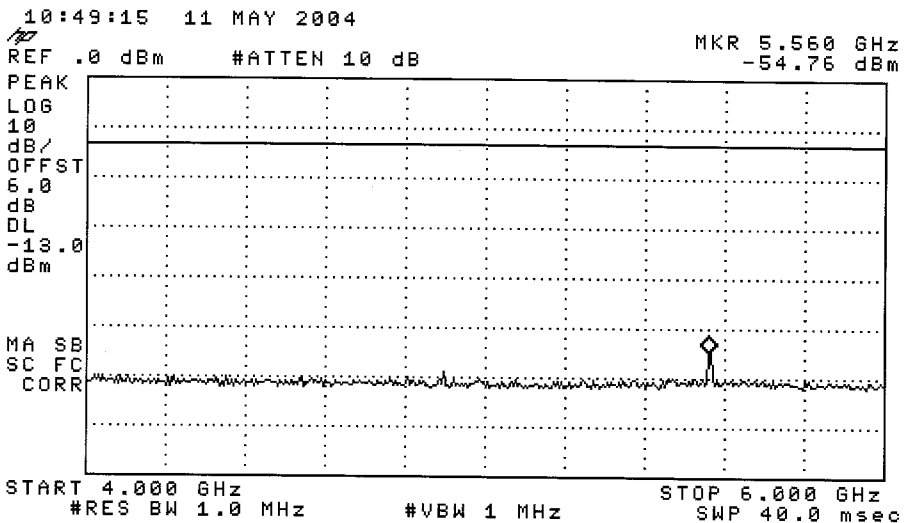
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, www.sweden.intertek-etlsemko.com

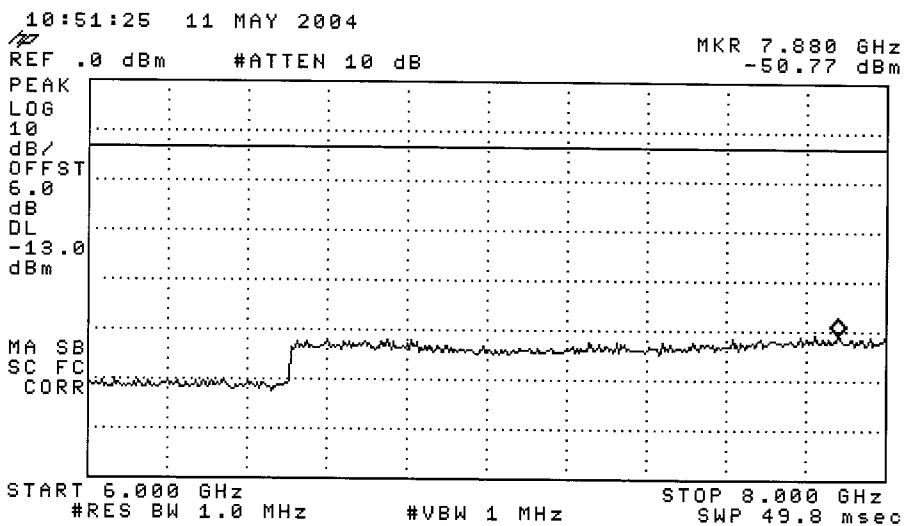
Registered in Sweden: No SE556024059901, Registered office: As address



RT



RT



L

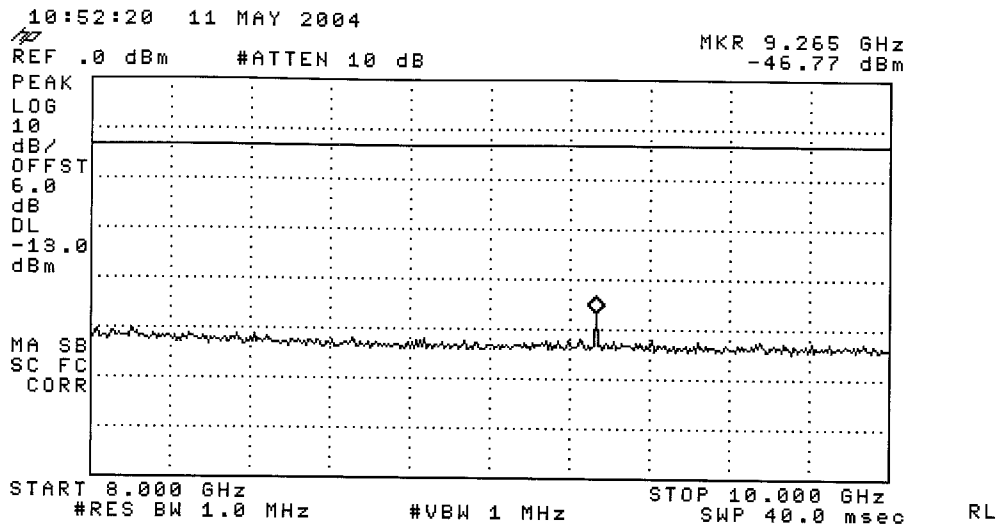


Intertek Semko AB

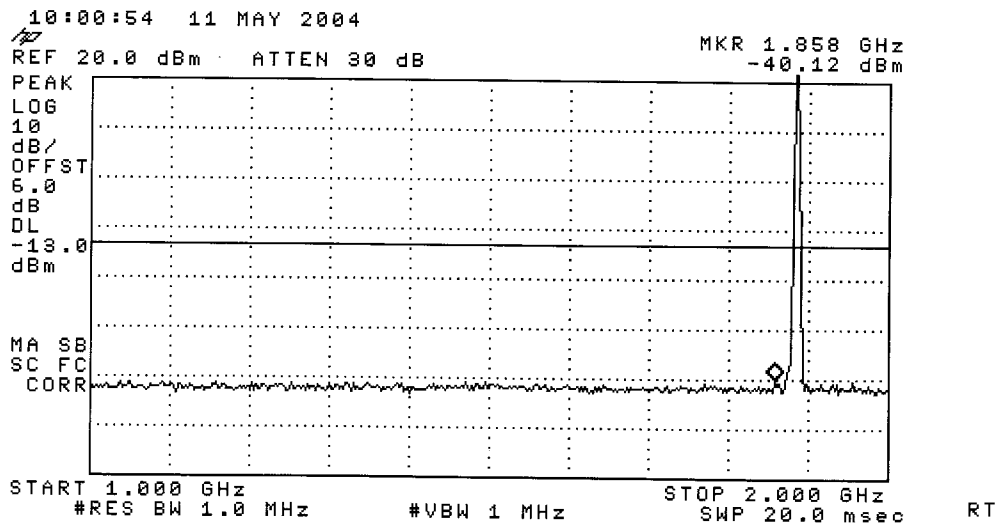
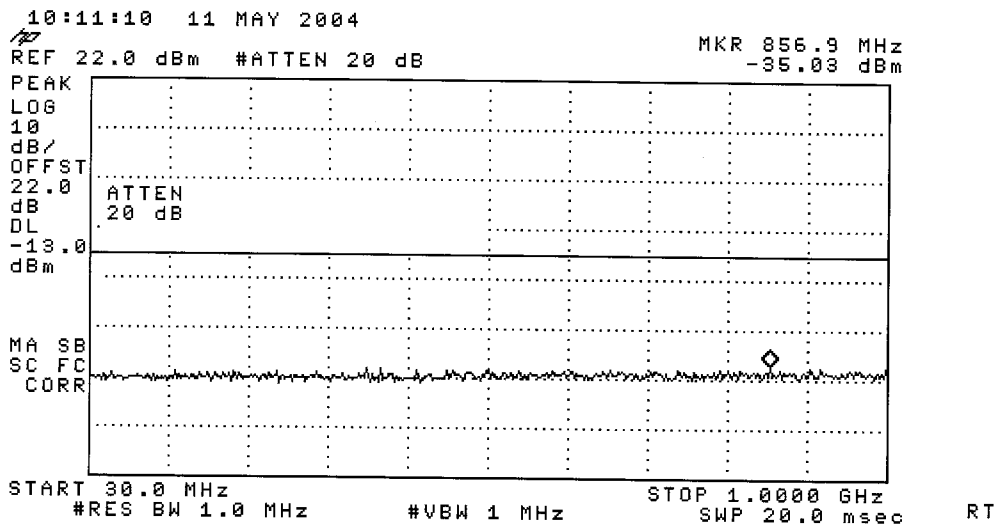
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**Conducted emissions at the antenna port, channel 660, power level +30 dBm<sup>10</sup>**



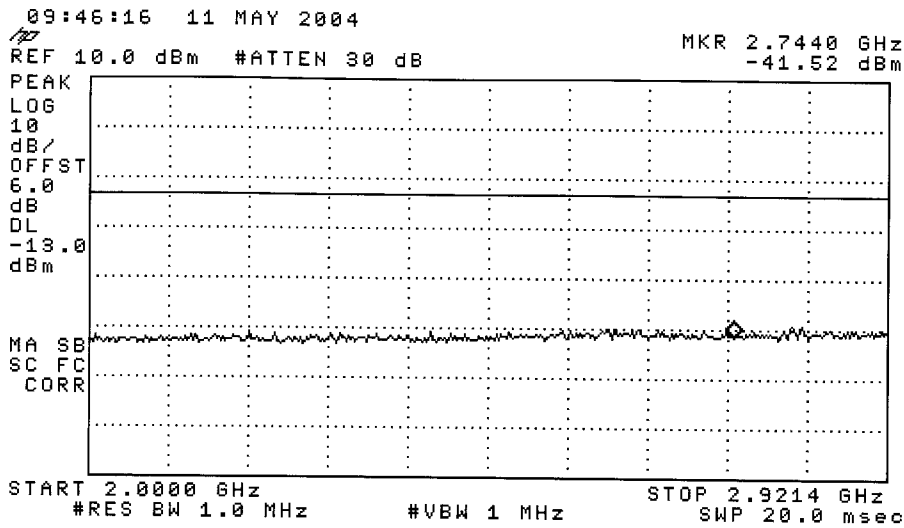
<sup>10</sup> Measurements between 10 GHz to 20 GHz applies also for all channels.

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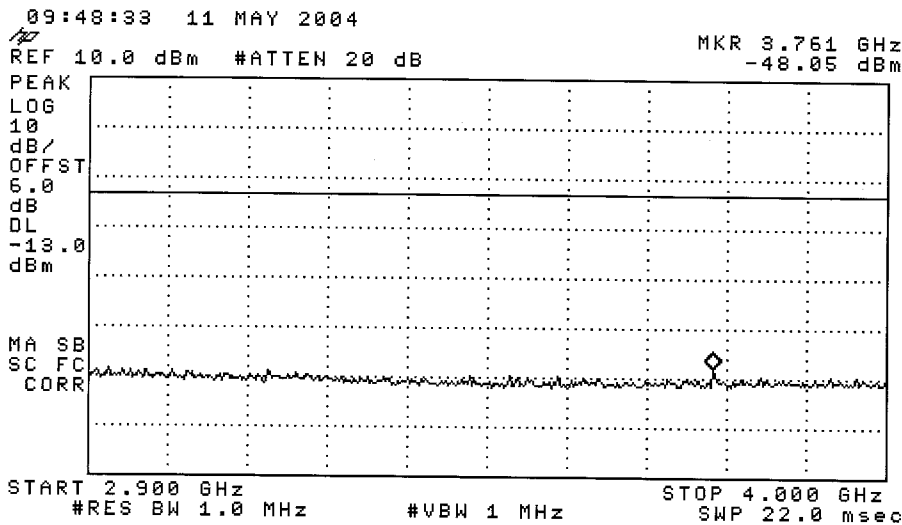
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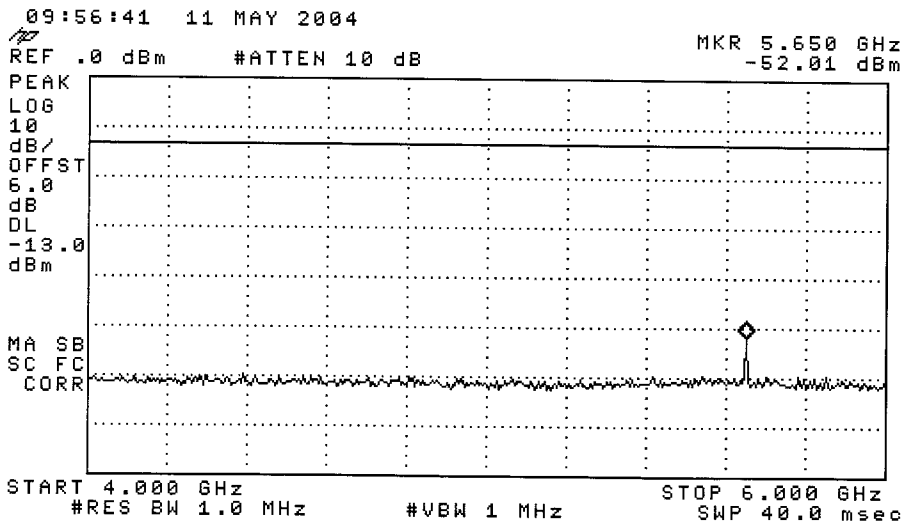
Registered in Sweden: No SE556024059901, Registered office: As address



RT



RT



RT

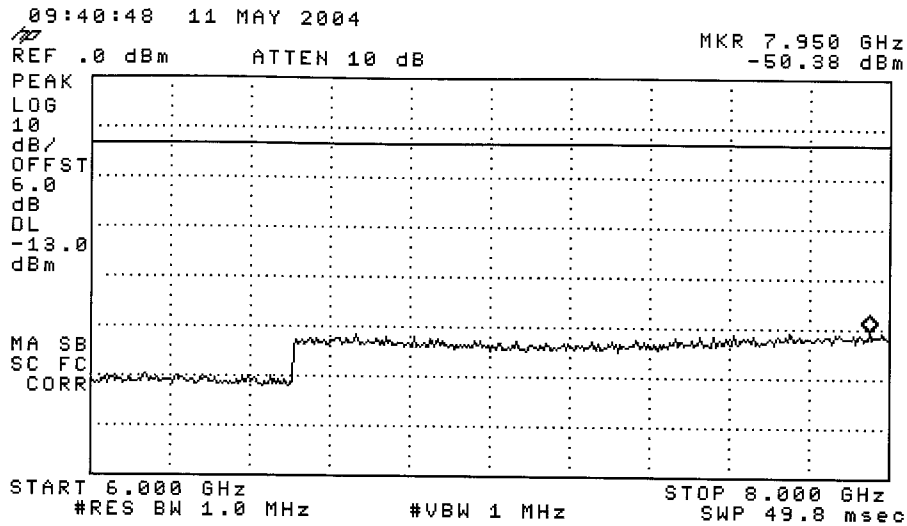


Intertek Semko AB

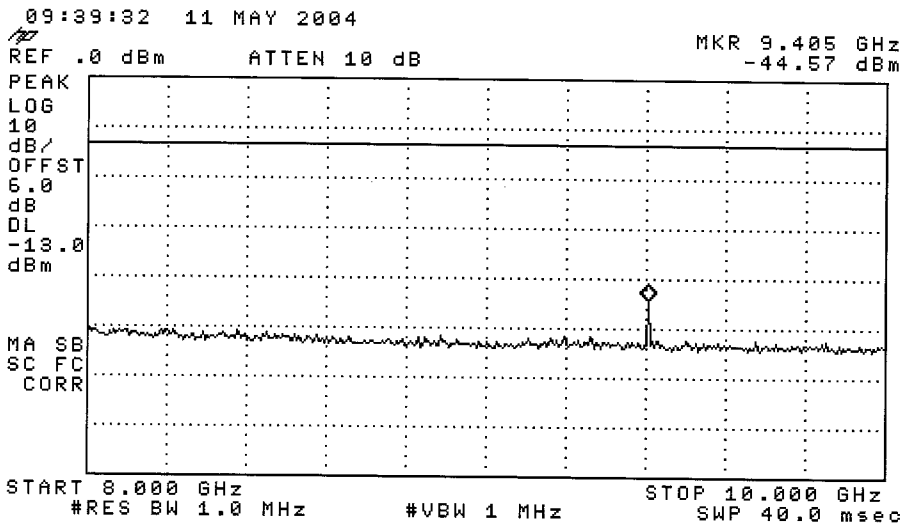
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, www.sweden.intertek-etlsemko.com

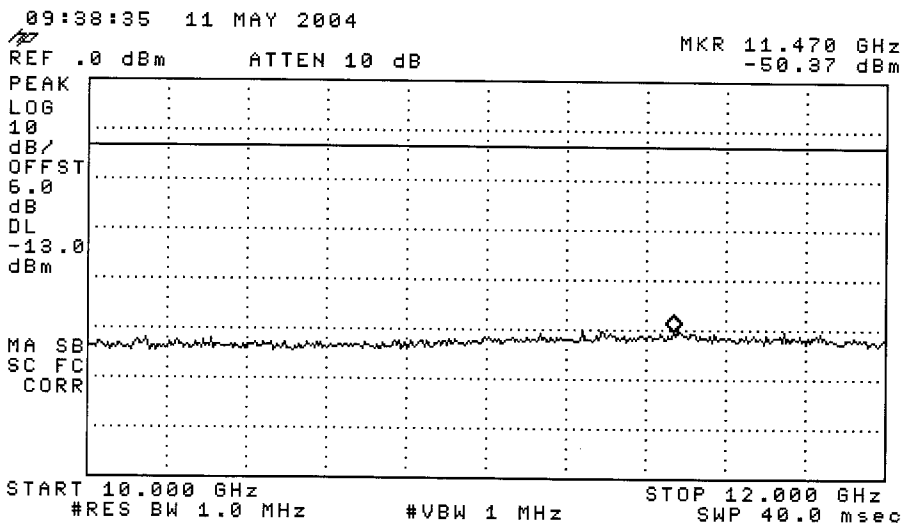
Registered in Sweden: No SE556024059901, Registered office: As address



RL



RL



RT



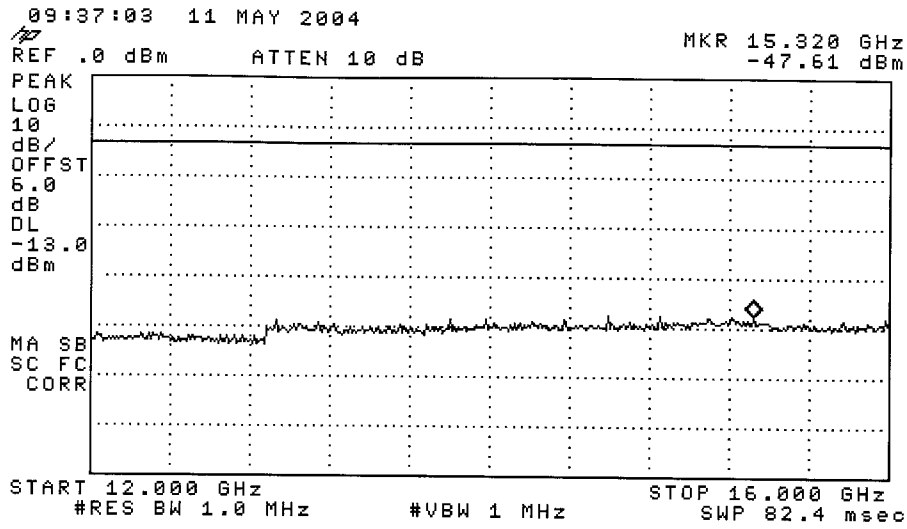
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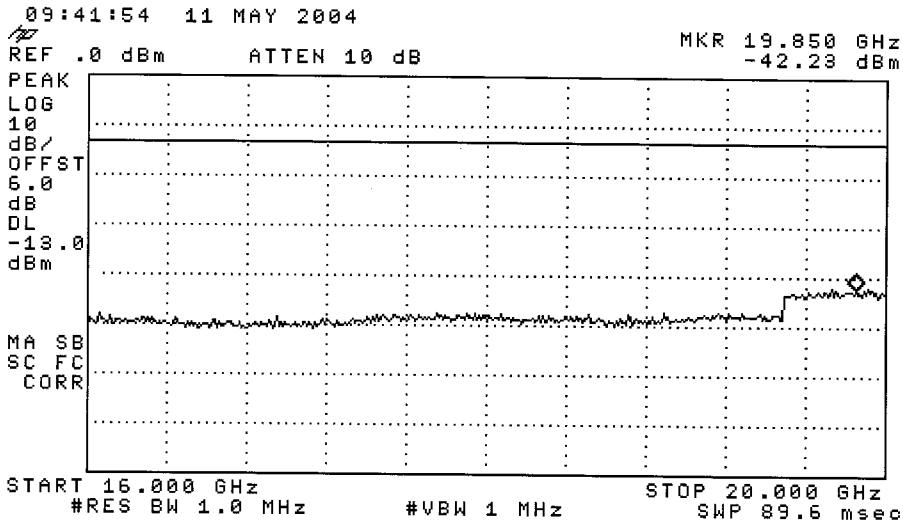
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PAGE 02 OF 04 NUMBER: 07140847

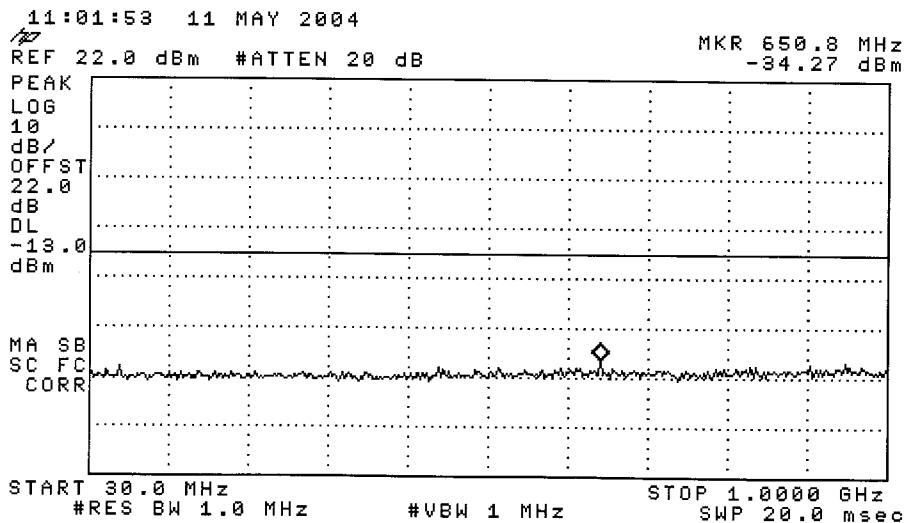


RT



RL

**Conducted emissions at the antenna port, channel 804, power level +30 dBm**



RT

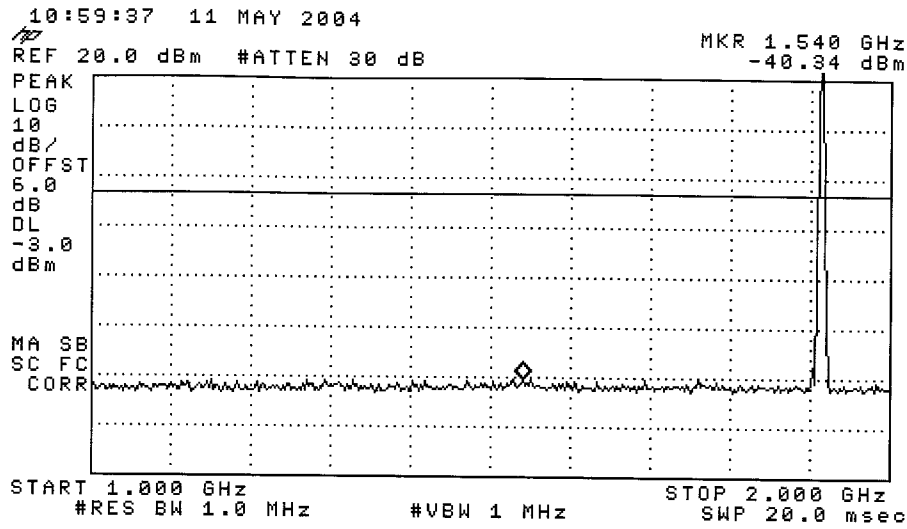


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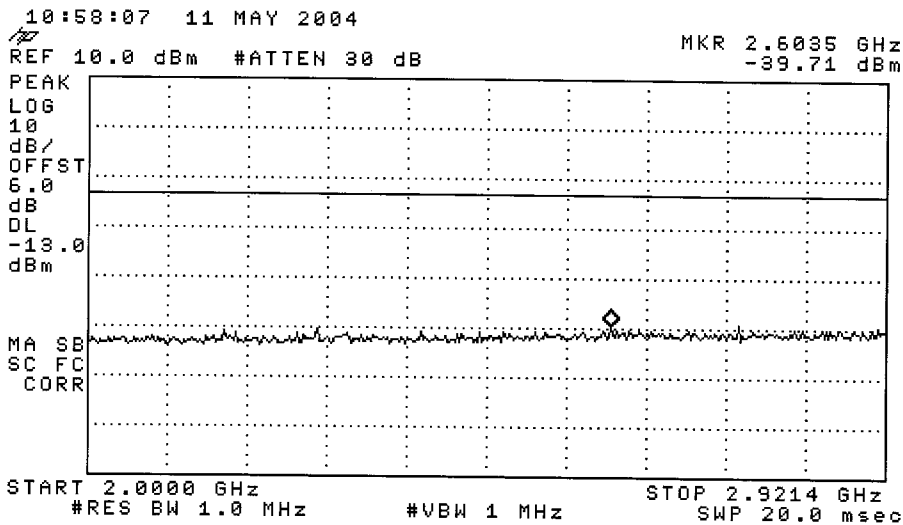
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

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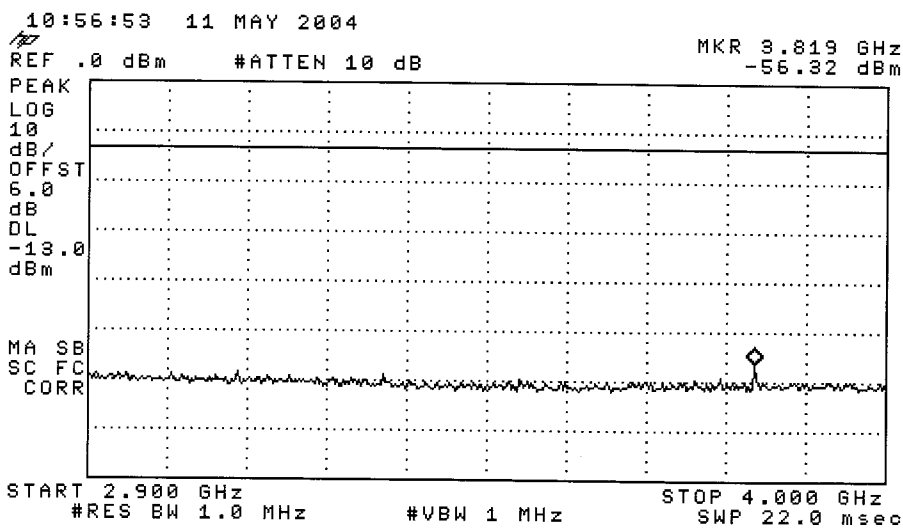
Registered in Sweden: No SE556024059901, Registered office: As address



RT



RT



RT

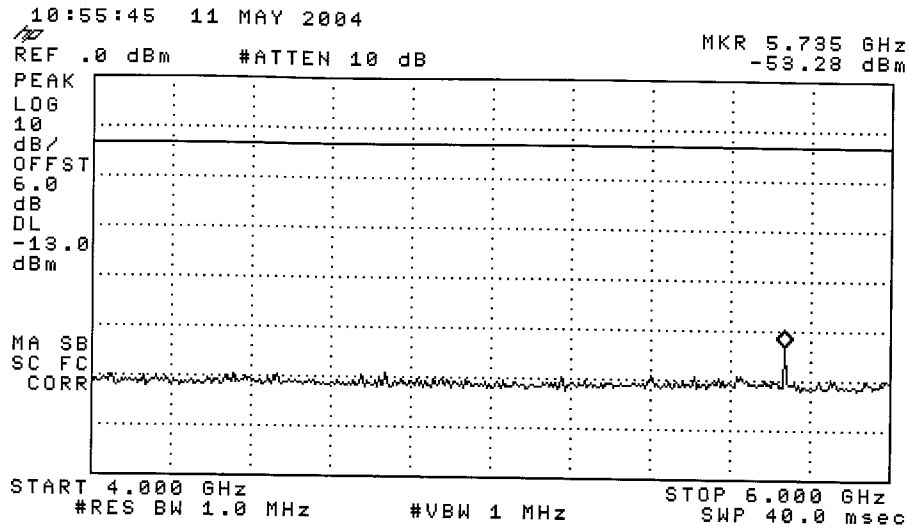


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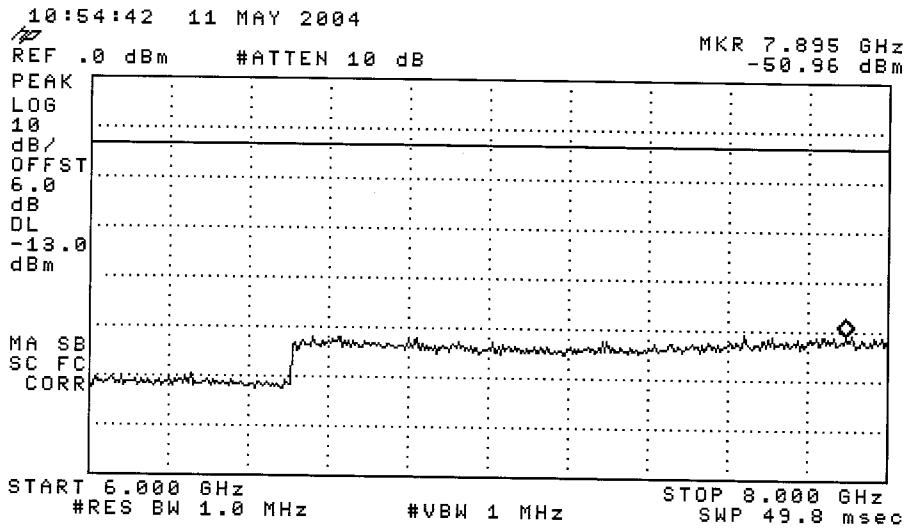
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, www.sweden.intertek-etlsemko.com

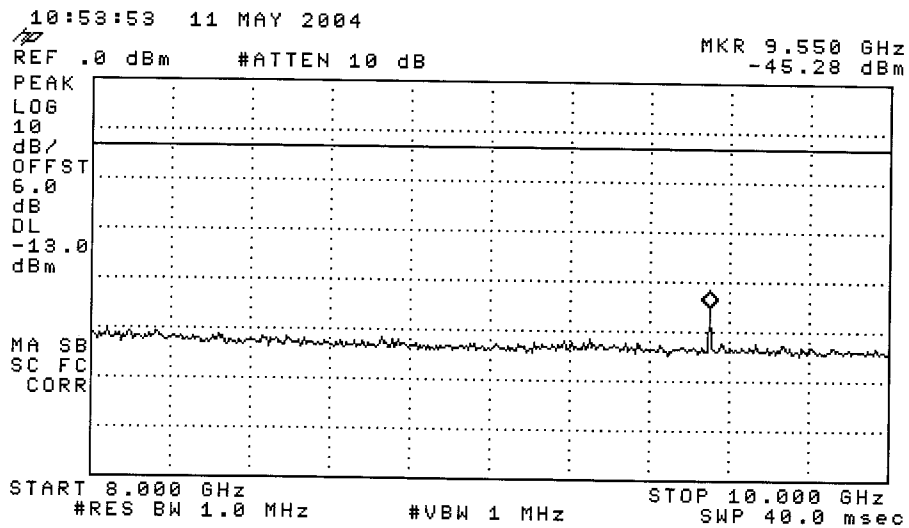
Registered in Sweden: No SE556024059901, Registered office: As address



RT



RL



RL



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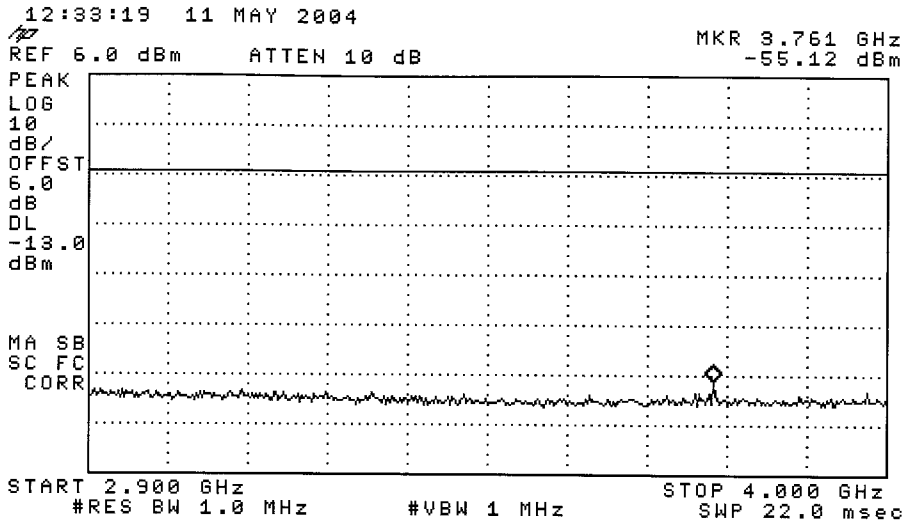
Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, www.sweden.intertek-etlsemko.com

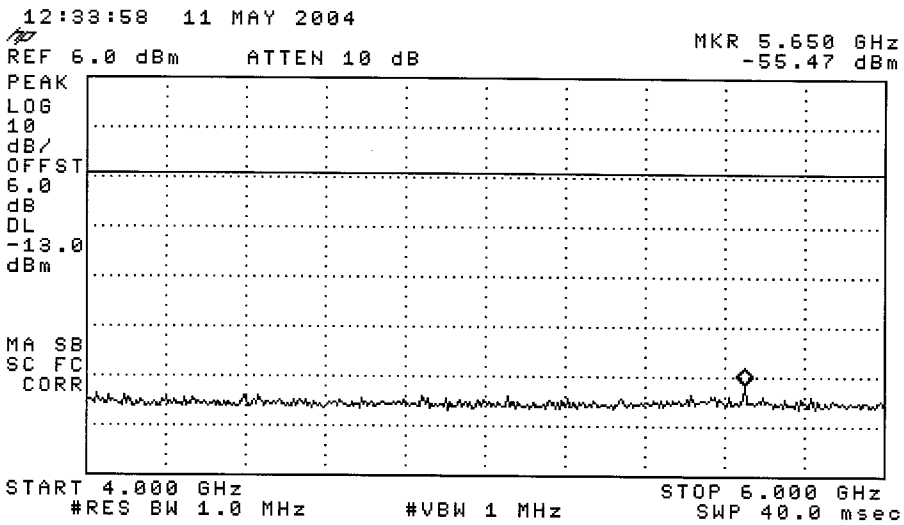
Registered in Sweden: No SE556024059901, Registered office: As address



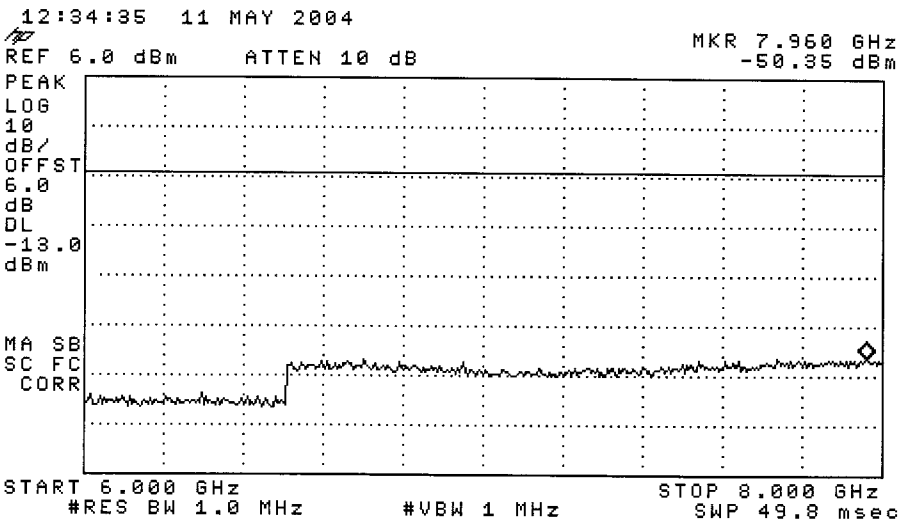




RT



RT



RT

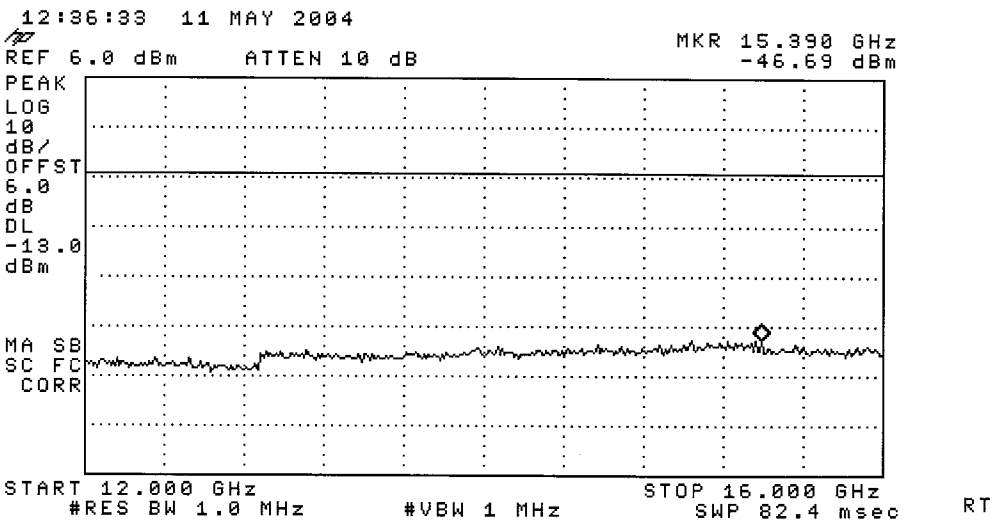
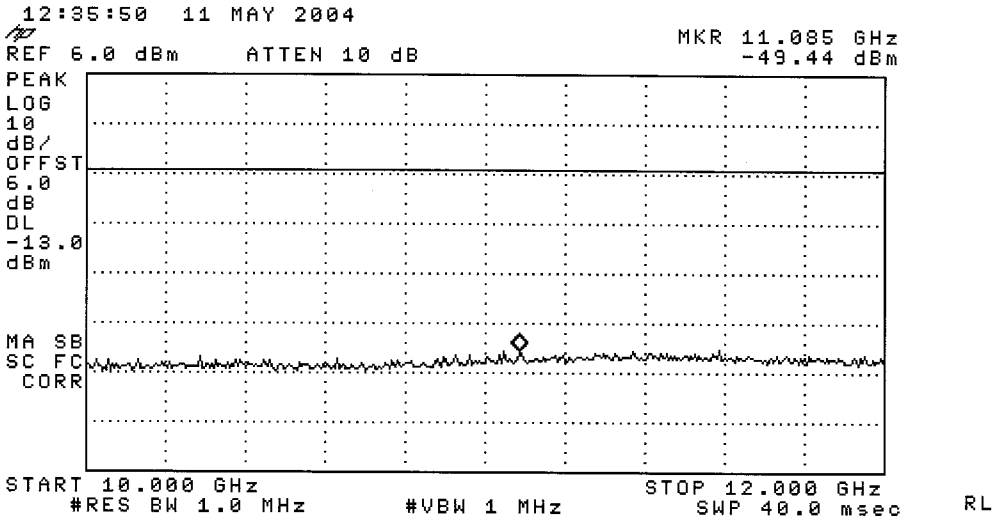
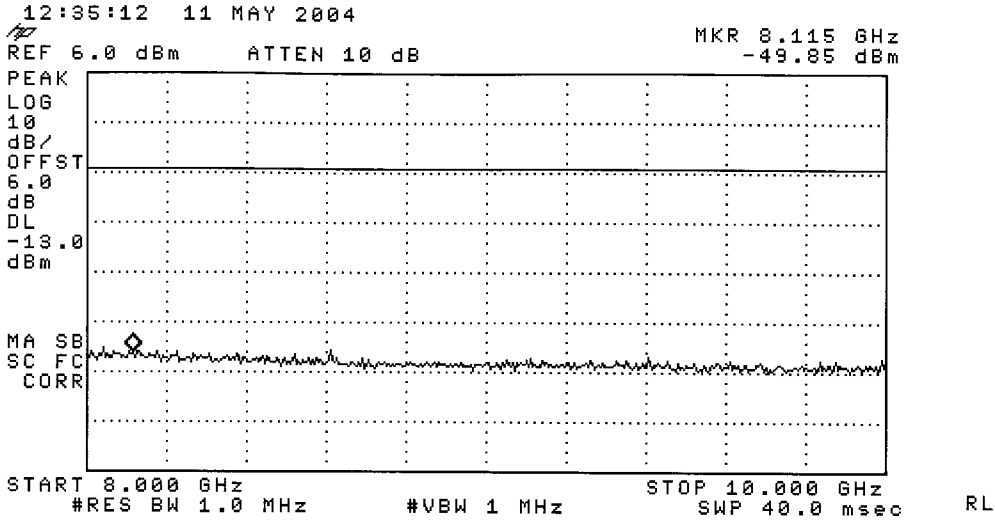


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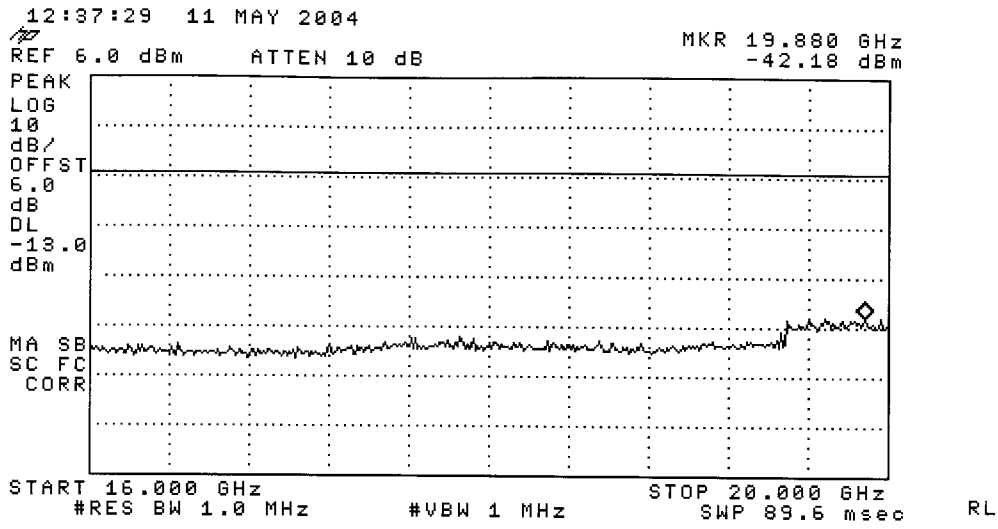


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Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

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**12. BAND EDGE COMPLIANCE**

**12.1 Test protocol**

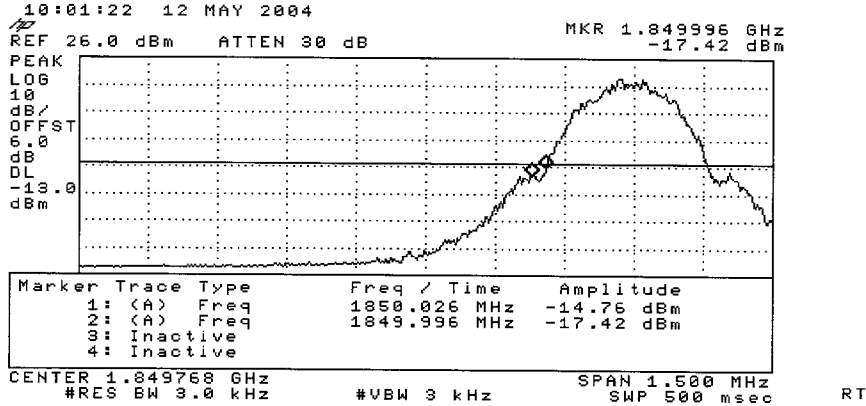
Date of test: 2004-05-12

EUT mode of operation: Modulated TX.

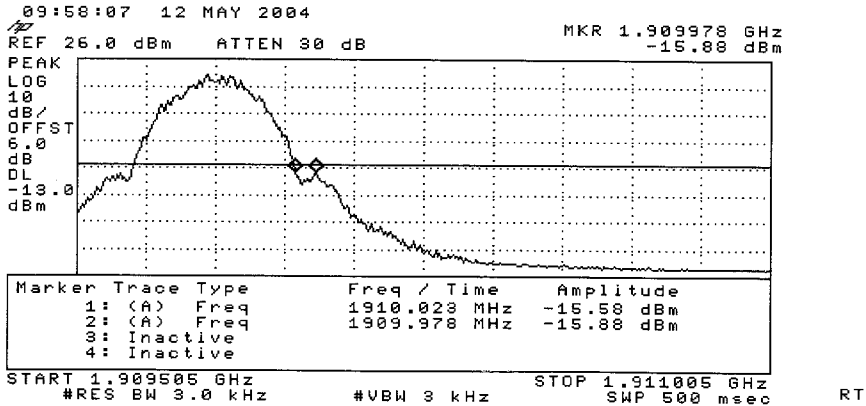
| Parameter settings     | Compliance at 1850 MHz | Compliance at 1910 MHz |
|------------------------|------------------------|------------------------|
| Start frequency (MHz): | 1849                   | 1909,5                 |
| Stop frequency (MHz):  | 1850,5                 | 1911                   |
| RBW (kHz):             | 3                      | 3                      |
| VBW (kHz):             | 3                      | 3                      |
| Sweep time (ms):       | 500                    | 500                    |
| Detector:              | Peak                   | Peak                   |
| Trace:                 | Max Hold               | Max Hold               |

In the 1 MHz band immediately outside and adjacent to the frequency block a bandwidth <1% of the emission bandwidth (26 dB bandwidth), which is 3 kHz, see section 6.

Band edge compliance at 1850 MHz, ch 512 (freq. 1850,2 MHz)<sup>11</sup>



Band edge compliance at 1910 MHz, ch 810 (freq. 1909,8 MHz)<sup>11</sup>



<sup>11</sup> The measurement also applies to 0130102-BV.







Identification photo



Intertek Semko AB

Torshamnsgatan 43, Box 1103, SE-164 22 Kista, Sweden

Telephone +46 8 750 00 00, Fax +46 8 750 60 30, [www.sweden.intertek-etlsemko.com](http://www.sweden.intertek-etlsemko.com)

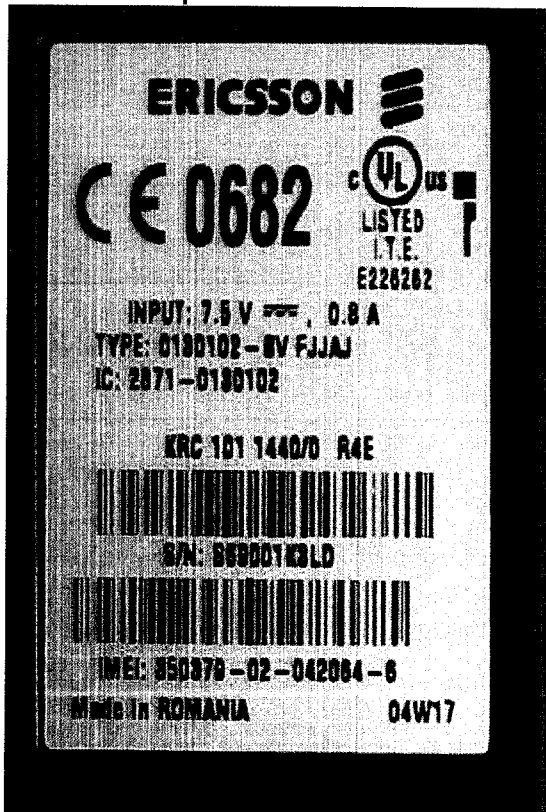
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