

**CETECOM™****CETECOM ICT Services**  
consulting - testing - certification >>>

## TEST REPORT

Test Report No.: 1-4722/12-07-02

### Testing Laboratory

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The testing laboratory (FCC part 15 D) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

### Applicant

**Aastra Deutschland GmbH**Zeughofstr. 1  
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Germany  
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Fax: + 49 30 6104-5157  
Contact: Mr. Gerhard Hofmann  
e-mail: [gerhard.hofmann@astra.com](mailto:gerhard.hofmann@astra.com)  
Phone: + 49 30 6104-5329

### Manufacturer

**Aastra Deutschland GmbH**Zeughofstr. 1  
10997 Berlin, Germany

### Test Standard/s

FCC Part 15, subpart D Isochronous UPCS Device 1920 – 1930 MHz

Industry Canada 2 GHz Licence-exempt Personal Communication Service Devices (LE-PCS)  
RSS-213, Issue 2

### Test Item

|                           |   |
|---------------------------|---|
| <b>Kind of test item:</b> | <b>DECT Portable Part</b>                     |
| <b>Model name:</b>        | <b>622d</b>                                   |
| FCC ID:                   | UOUE80E00009622                               |
| IC:                       | 1884E-80E00009622                             |
| S/N serial number:        | /   |
| HW hardware status:       | 63-001543-82                                  |
| SW software status:       | 1.01  |
| Frequency [MHz]:          | 1920 -1930                                    |
| Type of Modulation:       | Digital (Gaussian Frequency Shift Keying)     |
| Number of channels:       | 5 RF Channels, 5x12 = 60 TDMA Duplex Channels |
| Antenna:                  | 1 permanently attached λ/4 antenna            |
| Power Supply:             | 3.7 V DC                                      |
| Temperature Range:        | -20°C to 50°C                                 |

**Test Report authorised:****Test performed:**2012-06-13      Lenjoint, Marco  
                  Testing Manager2012-06-13      Wolf, Joachim  
                  Senior Consultant

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## 2 General information

### 2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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In no case this test report can be considered as a Letter of Approval.

This test report is electronically signed and valid without handwriting signature. For verification of the electronical signatures, the public keys can be requested at the testing laboratory.

### 2.2 Application details

|                                    |            |
|------------------------------------|------------|
| Date of receipt of order:          | 2012-05-29 |
| Date of receipt of test item:      | 2012-06-11 |
| Start of test:                     | 2012-06-11 |
| End of test:                       | 2012-06-13 |
| Person(s) present during the test: | /          |

## 3 Test standard/s:

| Test Standard                    | Version    | Test Standard Description  |
|----------------------------------|------------|--|
| FCC Part 15, subpart D           | 2009-10    | Isochronous UPCS Device 1920 – 1930 MHz                              |
| Industry Canada RSS-213, Issue 2 | 1999-04-24 | 2 GHz Licence-exempt Personal Communication Service Devices (LE-PCS) |

## 4 Test Environment

Temperature: + 22 °C during room temperature tests  
+ 50 °C during high temperature test  
- 20 °C during low temperature test

Relative humidity content: 38 %

Air pressure: not relevant for this kind of testing

Power supply: 3.7V DC, Li-ion battery

## 5 Test Item

|                     |   |                                |
|---------------------|---|--------------------------------|
| Kind of test item   | : | <b>UPCS Portable station</b>   |
| Type identification | : | <b>622d</b>                    |
| S/N serial number   | : | /                              |
| HW hardware status  | : | <b>63-001543-82</b>            |
| SW software status  | : | <b>1.01</b>                    |
| Power Supply        | : | <b>3.7V DC, Li-ion battery</b> |
| Temperature Range   | : | <b>-20°C to 50°C</b>           |

## 6 RSP100 Test report Cover Sheet/Performance Test Data

|   |   |  |
|---|---|--|
| Test Report Number                                | : | <b>1-4722/12-07-02</b>   |
| Equipment Model Number                            | : | <b>622d</b>  |
| Certification Number                              | : | <b>1884E-80E00009622</b>   |
| Manufacturer                                      | : | <b>Aastra Deutschland GmbH</b>                                       |
| Tested to Radio Standards Specification (RSS) No. | : | <b>RSS-213 Issue 2</b>   |
| Open Area Test Site Industry Canada Number        | : | <b>IC 3462C-1</b>  |
| Frequency Range (or fixed frequency)              | : | <b>1921.536 – 1928.448 MHz</b>                                       |
| RF Power [W] (max)                                | : | <b>Conducted: 19.7 dBm, 93.3 mW<br/>Rad. EIRP: 19.0 dBm, 79.4 mW</b> |
| Occupied Bandwidth (99% BW)                       | : | <b>1.31MHz</b>   |
| Type of Modulation                                | : | <b>Digital (Gaussian Frequency Shift Keying)</b>                     |
| Emission Designator (TRC-43)                      | : | <b>1M31F1D</b>   |
| Antenna information                               | : | <b>1 permanently attached antenna, no ext. connector</b>             |
| Transmitter Spurious (worst case)                 | : | <b>-32.9 dBm</b>   |
| Receiver Spurious (worst case)                    | : | <b>-66.8 dBm</b>   |

### ATTESTATION:

**DECLARATION OF COMPLIANCE:** I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Signature:

Date: 2012-06-13

Test engineer: Joachim Wolf

CETECOM ICT Services GmbH  
Untertürkheimerstr. 6-10  
66117 Saarbrücken  
Germany

## 7 Summary of Measurement Results

|                                     |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | No deviations from the technical specifications were ascertained    |
| <input type="checkbox"/>            | There were deviations from the technical specifications ascertained |

## CFR 47 Part 15 UPCS

| Name of test   | FCC CFR 47 Paragraph                  | IC RSS-213 Paragraph   | Verdict               |
|--|---------------------------------------|------------------------|-----------------------|
| Coordination with fixed microwave                                | 15.307(b)                             | N/A                    | Complies              |
| Digital Modulation Techniques                                    | 15.319(b)                             | 6.1                    | Complies              |
| Labeling requirements  | 15.19(a)(3)                           | RSS-GEN 5.2            | Complies              |
| Antenna requirements   | 15.317, 15.203                        | 4.1(e)                 | Complies              |
| Power Line Conducted Emission                                    | 15.107(a),<br>15.207(a)               | 6.3<br>RSS_GEN 7.2.2   | Complies              |
| Emission Bandwidth   | 15.323(a)                             | 6.4                    | Complies              |
| In-band Emission   | 15.323(d)                             | 6.7.2                  | Complies              |
| Out-of-band Emissions  | 15.323(d)                             | 6.7.1                  | Complies              |
| Peak Transmit Power  | 15.319(c)(e),<br>15.31(e)             | 6.5                    | Complies              |
| Power Spectral Density   | 15.319(d)                             | 4.3.2.1                | Complies              |
| Automatic discontinuation of transmission                        | 15.319(f)                             | 4.3.4(a)               | Complies              |
| Carrier frequency stability                                      | 15.323(f)                             | 6.2                    | Complies              |
| Frame repetition stability                                       | 15.323(e)                             | 4.3.4(c)               | Complies              |
| Frame period and jitter  | 15.323(e)                             | 4.3.4(c)               | Complies              |
| Monitoring threshold, Least interfered channel                   | 15.323(c)(2);(5);<br>(9)              | 4.3.4(b)               | Complies              |
| Monitoring of intended transmit window and maximum reaction time | 15.323(c)(1)                          | 4.3.4                  | Complies              |
| Threshold monitoring bandwidth                                   | 15.323(c)(7)                          | 4.3.4                  | Complies              |
| Reaction time and monitoring interval                            | 15.323(c)(1);(5);<br>(7)              | 4.3.4                  | Complies              |
| Access criteria test interval                                    | 15.323(c)(4);(6)                      | 4.3.4                  | N/A <sup>1</sup>      |
| Access criteria functional test                                  | 15.323(c)(4);(6)                      | 4.3.4                  | N/A <sup>1</sup>      |
| Acknowledgments  | 15.323(c)(4)                          | 4.3.4                  | Complies              |
| Transmission duration  | 15.323(c)(3)                          | 4.3.4                  | Complies              |
| Dual access criteria   | 15.323(c)(10)                         | 4.3.4                  | Complies              |
| Alternative monitoring interval                                  | 15.323(c)(10);(11)                    | 4.3.4                  | N/A <sup>2</sup>      |
| Spurious Emissions (Antenna Conducted)                           | 15.323(d)                             | 6.7.1                  | Complies <sup>3</sup> |
| Spurious Emissions (Radiated)                                    | 15.319(g),<br>15.109(a),<br>15.209(a) | 4.3.3<br>RSS-GEN 7.2.3 | Complies <sup>4</sup> |
| Receiver Spurious Emissions                                      | N/A                                   | 6.8                    | Complies              |

<sup>1</sup> Only applicable for EUT that can initiate a communication link<sup>2</sup> The client declares that the tested equipment does not implement this provision<sup>3</sup> The tested equipment has integrated antennas only<sup>4</sup> Only requirement FCC 15.109 for unintentional radiators was tested radiated

## 8 Test Set-up

### 8.1 Frequency Measurements

**Test Set-up 1:**



This setup is used for measuring Carrier Frequency Stability at nominal and extreme temperatures.

For long term Frequency Stability, the EUT was in loopback-mode and was controlled with the CMD65, the modulation pattern was set to 01010101....

### 8.2 Timing Measurements

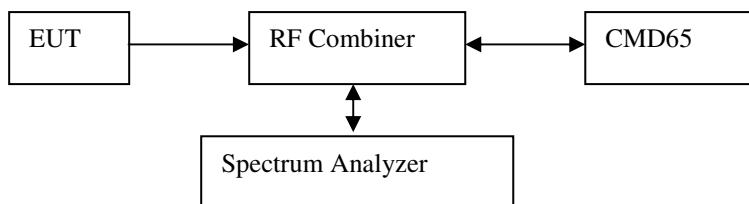
**Test Set-up 2:**



This setup is used for measuring Frame Repetition Stability, Frame Period and Jitter.

### 8.3 Conducted Emission Test

**Test Set-up 3:**



This setup is used for all conducted emission tests.

The EUT was in loopback-mode and was controlled with the CMD65, the modulation pattern was set to Pseudo-Random bit sequence to simulate normal speech.

## 8.4 Radiated Emission Test

### Test Set-up 4:

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform with specifications ANSI C63.2-1987 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.4-2003 clause 4.2.

Antennas are conform with ANSI C63.2-1996 item 15.

9 kHz - 150 MHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.

150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, passive loop antenna.

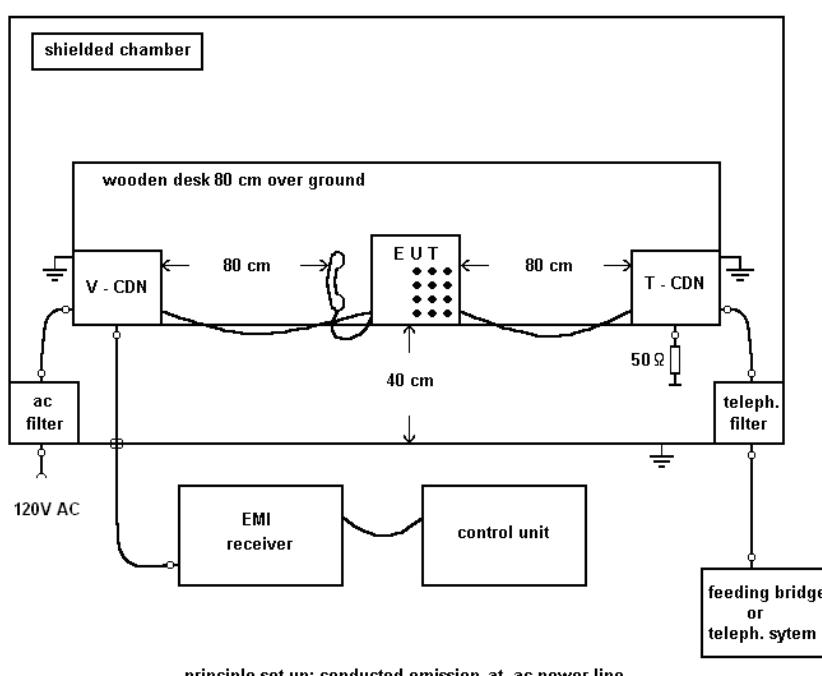
30 MHz - 200 MHz: Quasi Peak measurement, 120 KHz Bandwidth, bilog antenna

200MHz - 1GHz: Quasi Peak measurement, 120 KHz Bandwidth, bilog antenna

1GHz: Average, RBW 1MHz, VBW 10 MHz, waveguide horn

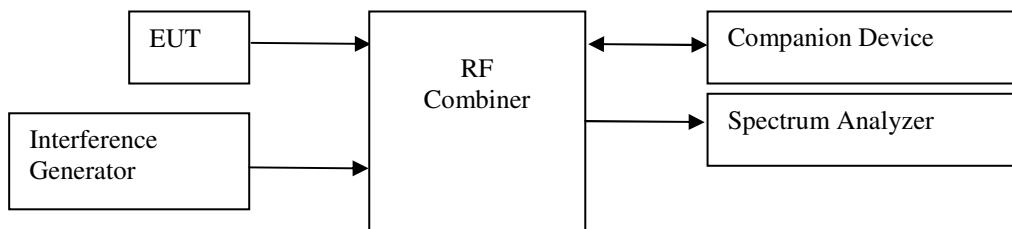
## 8.5 Power Line Conducted Emissions Test

### Test Set-up 5:



## 8.6 Monitoring Tests

### Test Set-up 6:

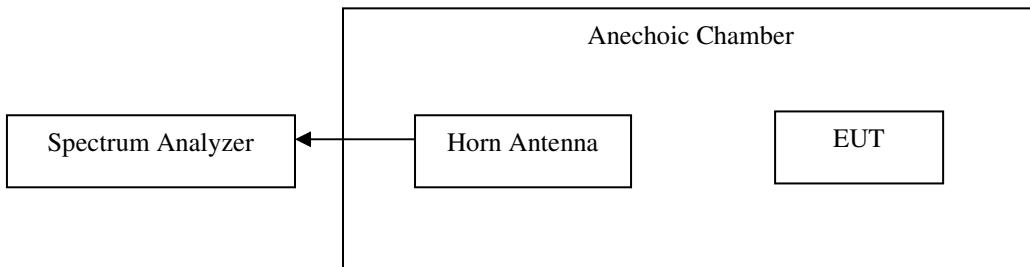


This test setup is used for all Monitoring and Time and Spectrum Access Procedure tests. The path loss from the signal generator to the EUT is measured with a power meter before the testing is started.

A clock signal is used to synchronize the Interference Generator to the start of the DECT frame, this signal always comes from the base station. If the EUT is a DECT Portable Part (i.e. a handset) the clock signal will come from the Companion Device.

## 8.7 Radiated Output Power Test

### Test Set-up 7:



This setup is used for measuring the radiated output power in a fully anechoic chamber with a measurement distance of 1m.

## 9 Detailed Test Results

### 9.1 Power Line Conducted Emissions

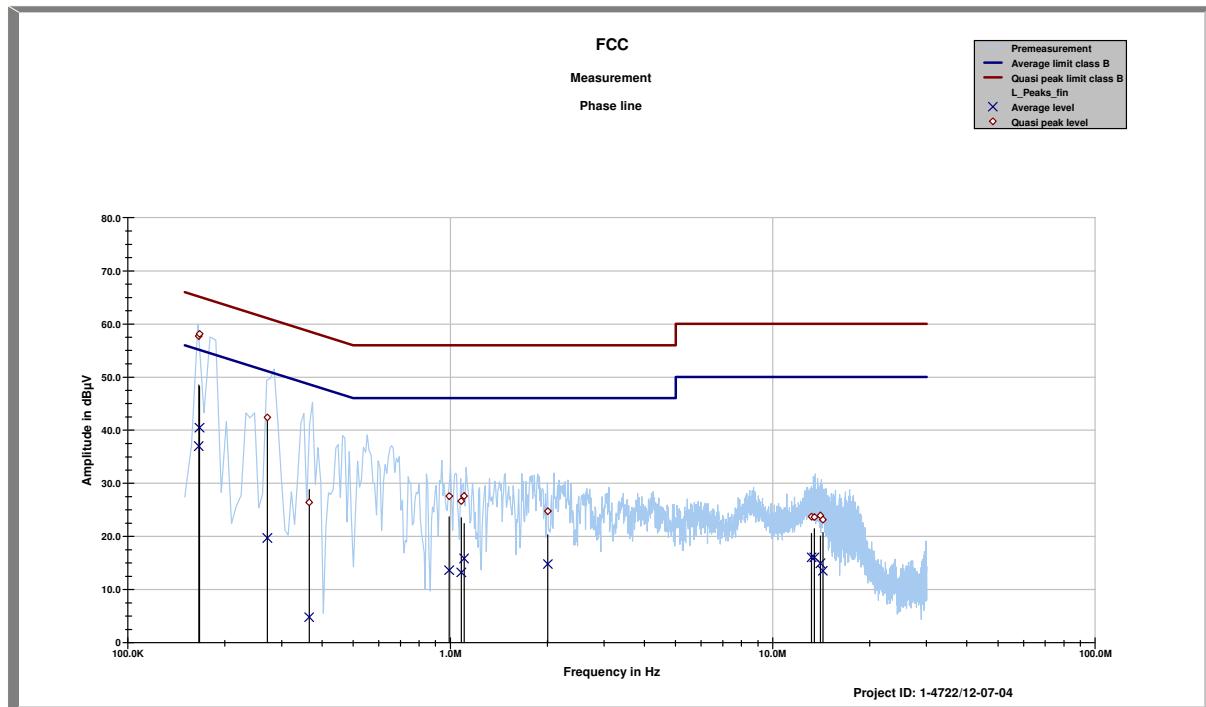
**Measurement Procedure:**

ANSI C63.4-2003 using 50 $\mu$ H/50 ohms LISN.

**Test Result:** Pass

**Measurement Data:** See attached graph and tables.

**Requirement:** FCC 15.207 (a)

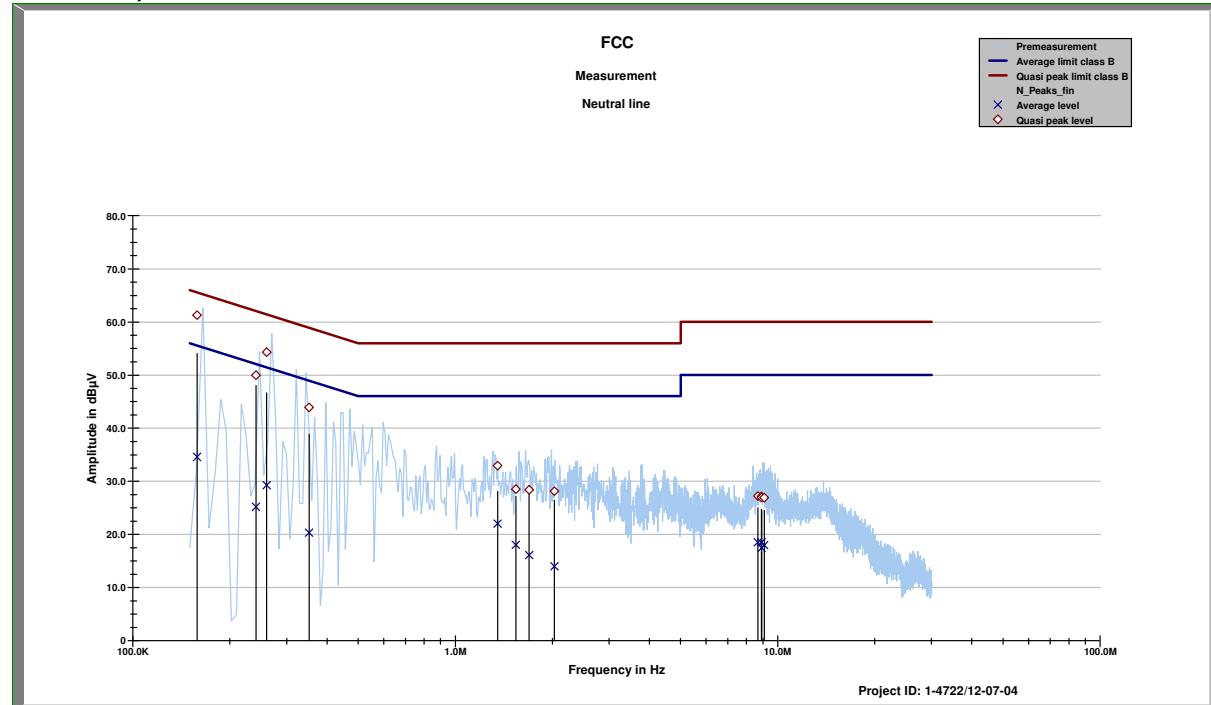
**Idle mode, phase line**

FCC  
Phase line tbl  
Project ID: 1-4722/12-07-04

02:11:47 PM, Wednesday, June 13, 2012

| Frequency | Quasi peak level | Margin quasi peak | Average level | Margin average |
|-----------|------------------|-------------------|---------------|----------------|
| MHz       | dB $\mu$ V       | dB $\mu$ V        | dB $\mu$ V    | dB $\mu$ V     |
| 0.16594   | 57.72            | 7.44              | 37.00         | 18.54          |
| 0.16682   | 58.14            | 6.98              | 40.48         | 15.04          |
| 0.27079   | 42.40            | 18.69             | 19.71         | 32.84          |
| 0.36512   | 26.41            | 32.20             | 4.79          | 45.07          |
| 0.99221   | 27.57            | 28.43             | 13.62         | 32.38          |
| 1.08145   | 26.64            | 29.36             | 13.21         | 32.79          |
| 1.10315   | 27.61            | 28.39             | 15.85         | 30.15          |
| 2.0075    | 24.75            | 31.25             | 14.80         | 31.20          |
| 13.195    | 23.71            | 36.29             | 16.07         | 33.93          |
| 13.46     | 23.63            | 36.37             | 16.04         | 33.96          |
| 14.056    | 23.92            | 36.08             | 14.95         | 35.05          |
| 14.302    | 23.16            | 36.84             | 13.51         | 36.49          |

Project ID - 1-4722/12-07-04  
EUT - 622d  
Serial Number - C5810002002F  
Operating mode - charging + DECT idle

**Idle mode, neutral line**

FCC  
Neutral line tbl  
Project ID: 1-4722/12-07-04

02:11:47 PM, Wednesday, June 13, 2012

| Frequency<br>MHz | Quasi peak<br>level<br>dB $\mu$ V | Margin quasi<br>peak<br>dB $\mu$ V | Average level<br>dB $\mu$ V | Margin<br>average<br>dB $\mu$ V |
|------------------|-----------------------------------|------------------------------------|-----------------------------|---------------------------------|
| 0.15822          | 61.27                             | 4.29                               | 34.59                       | 21.18                           |
| 0.24071          | 49.97                             | 12.10                              | 25.18                       | 28.23                           |
| 0.26003          | 54.30                             | 7.13                               | 29.26                       | 23.59                           |
| 0.35205          | 43.91                             | 15.01                              | 20.31                       | 29.91                           |
| 1.3524           | 32.95                             | 23.05                              | 22.04                       | 23.96                           |
| 1.5412           | 28.52                             | 27.48                              | 18.04                       | 27.96                           |
| 1.6939           | 28.40                             | 27.60                              | 16.09                       | 29.91                           |
| 2.0297           | 28.14                             | 27.86                              | 13.99                       | 32.01                           |
| 8.6788           | 27.22                             | 32.78                              | 18.51                       | 31.49                           |
| 8.9001           | 27.16                             | 32.84                              | 18.51                       | 31.49                           |
| 8.9116           | 26.96                             | 33.04                              | 17.46                       | 32.54                           |
| 9.076            | 26.92                             | 33.08                              | 17.98                       | 32.02                           |

Project ID - 1-4722/12-07-04  
EUT - 622d  
Serial Number - C5810002002F  
Operating mode - charging + DECT idle

## 9.2 Coordination with fixed microwave

The affidavit from UTAM, Inc. is included in the documentation supplied by the applicant:

Yes       No

### Requirement: FCC 15.307 (b):

Each application for certification of equipment operating under the provisions of this Subpart must be accompanied by an affidavit from UTAM, Inc. certifying that the applicant is a participating member of UTAM, Inc. In the event a grantee fails to fulfill the obligations attendant to participation in UTAM, Inc., the commission may invoke administrative sanctions as necessary to preclude continued marketing and installation of devices covered by the grant of certification, including but not limited to revoking certification.

## 9.3 Digital Modulation Techniques

The tested equipment is based on DECT technology, the only difference is that the channel allocation is modified to operate in the 1920-1930 MHz band.

The EUT use Multi Carrier / Time Division Multiple Access / Time division duplex and Digital GFSK modulation.

For further details see the operational description provided by the applicant.

### Requirement: FCC 15.319(b)

All transmissions must use only digital modulation techniques.

## 9.4 Labeling Requirements

See separate documents showing the label design and the placement of the label on the EUT.

### Requirement: FCC 15.19

The FCC identifier shall be displayed on the label, and the device(s) shall bear the following statement in a conspicuous location on the device or in the user manual if the device is to small:

*This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

The label itself shall be of a permanent type, not a paper label, and shall last the lifetime of the equipment.

## 9.5 Antenna Requirements

Does the EUT have detachable antenna(s)?  Yes  No

If detachable, is the antenna connector(s) non-standard?  Yes  No

The tested equipment has only integral antennas. The conducted tests were performed on a sample with a temporary antenna connector.

**Requirements:** FCC 15.203, 14.204. 15.317

## 9.6 Channel Frequencies

| UPCS CHANNEL    | FREQUENCY (MHz) |
|-----------------|-----------------|
| Upper Band Edge | 1930.000        |
| 0 (Highest)     | 1928.448        |
| 1               | 1926.720        |
| 2               | 1924.992        |
| 3               | 1923.264        |
| 4 (Lowest)      | 1921.536        |
| Lower Band Edge | 1920.000        |

**Requirement:** FCC 15.303(d), (g)

Within 1920-1930 MHz band for isochronous devices.

## 9.7 Automatic Discontinuation of Transmission

|   |   |  |
|---|---|--|
| <b>Does the EUT transmit control and Signaling Information?</b> | <input type="checkbox"/> Yes                          | <input checked="" type="checkbox"/> No     |
| Type of EUT:  | <input checked="" type="checkbox"/> Initiating device | <input type="checkbox"/> Responding device |

The following tests simulate the reaction of the EUT in case of either absence of information to transmit or operational failure after a connection with the companion device is established.

| Number | Test                                | EUT Reaction | Verdict     |
|--------|-------------------------------------|--------------|-------------|
| 1      | Power removed from EUT              | C            | <b>Pass</b> |
| 2      | EUT switched Off                    | C            | <b>Pass</b> |
| 3      | Hook-On by companion device         | N/A          | <b>N/A</b>  |
| 4      | Hook-On by EUT                      | C            | <b>Pass</b> |
| 5      | Power removed from companion device | A            | <b>Pass</b> |
| 6      | Companion device switched Off       | N/A          | <b>N/A</b>  |

- A – Connection breakdown, Cease of all transmissions
- B – Connection breakdown, EUT transmits control and signaling information
- C – Connection breakdown, companion device transmits control and signaling information
- N/A – Not applicable (the EUT does not have an on/off switch and can not perform Hook-On)

### Requirement: FCC 15.319(f)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. This provision is not intended to preclude transmission of control and signaling information or use of repetitive code used by certain digital modulation technologies to complete frame or burst intervals.

## 9.8 Peak Power Output

### Measurement Procedure:

ANSI C63.17, clause 6.1.2.

### Test Results: Pass

### Measurement Data:

#### Maximum Conducted Output Power

| Channel No. | Frequency (MHz) | Maximum Conducted Output Power (dBm) | Maximum Radiated Output Power (dBm) | Maximum Antenna Gain (dBi) |
|-------------|-----------------|--------------------------------------|-------------------------------------|----------------------------|
| 4           | 1921.536        | 19.7                                 | 19.0                                | -0.7                       |
| 2           | 1924.992        | 19.6                                 | 18.9                                | -0.7                       |
| 0           | 1928.448        | 19.7                                 | 18.0                                | -1.7                       |

<sup>1</sup> calculated on basis of the antenna gain

For this test it was also checked that the input voltage variation of 85 and 115% of nominal value did not have any effect on the measured output power, neither radiated nor conducted.

### Limit:

Conducted:  $100 \mu\text{W} \times \text{SQRT}(B)$  where B is the measured Emission Bandwidth in Hz

FCC 15.319(c)(e): 21.8 dBm (152 mW)

RSS-213, Issue 2: 20.6 dBm (115 mW)

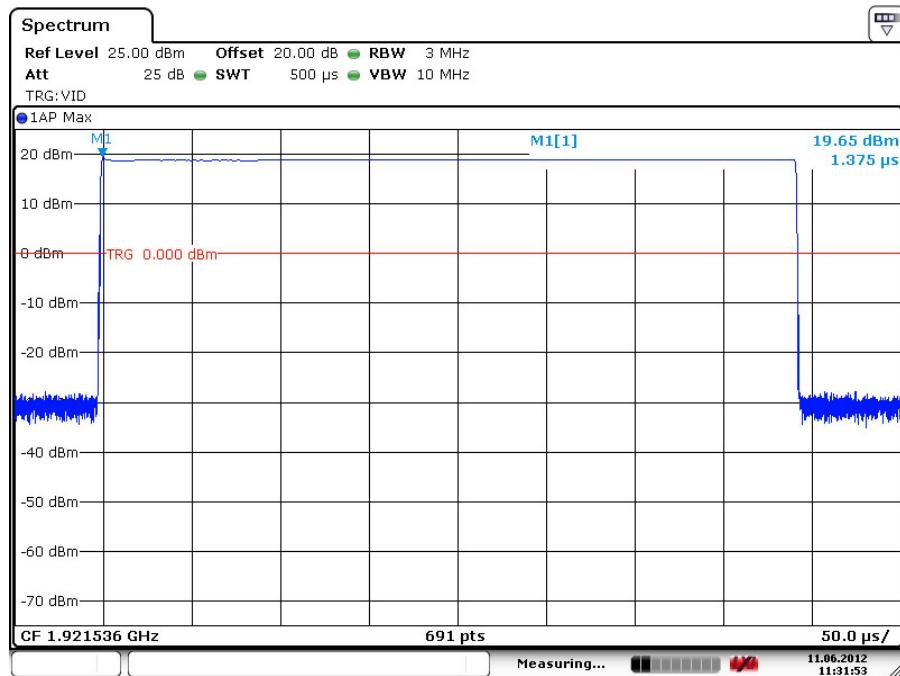
The antenna gain is below 3 dBi.

### Requirements: FCC 15.319(f). RSS-213, Issue 2

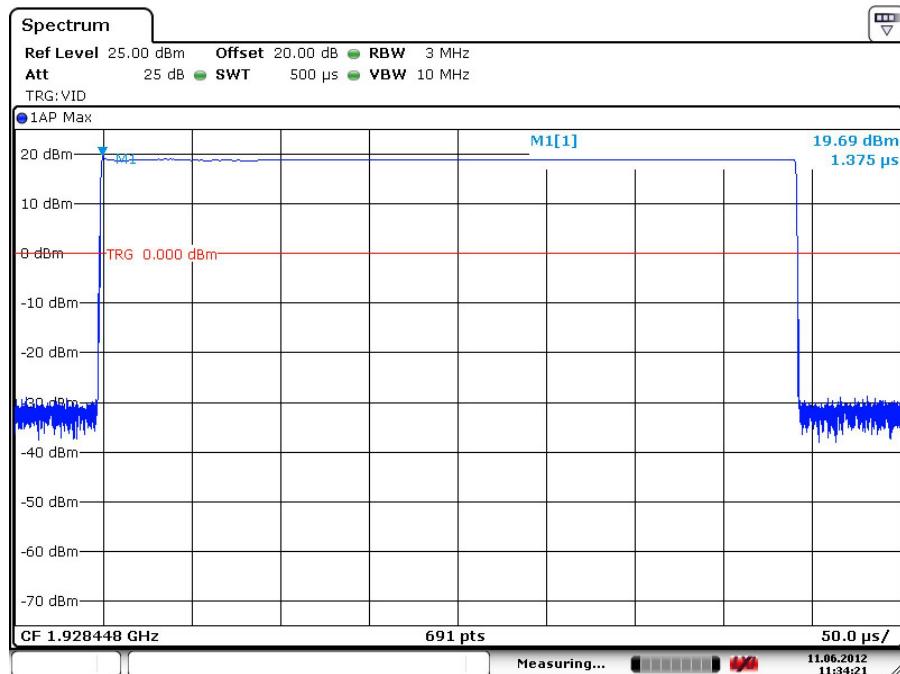
Peak transmit power shall not exceed 100 microwatts multiplied by the square root of the emission bandwidth in Hertz.

The peak transmit power shall be reduced by the amount in decibels that the maximum directional gain of the antenna exceeds 3 dBi.

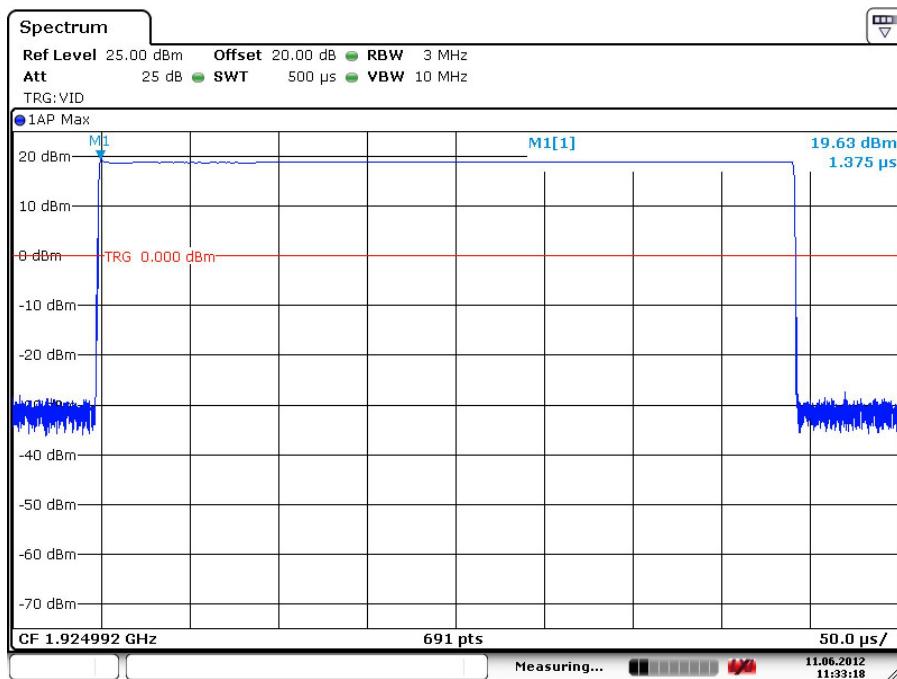
## Conducted Peak Output Power



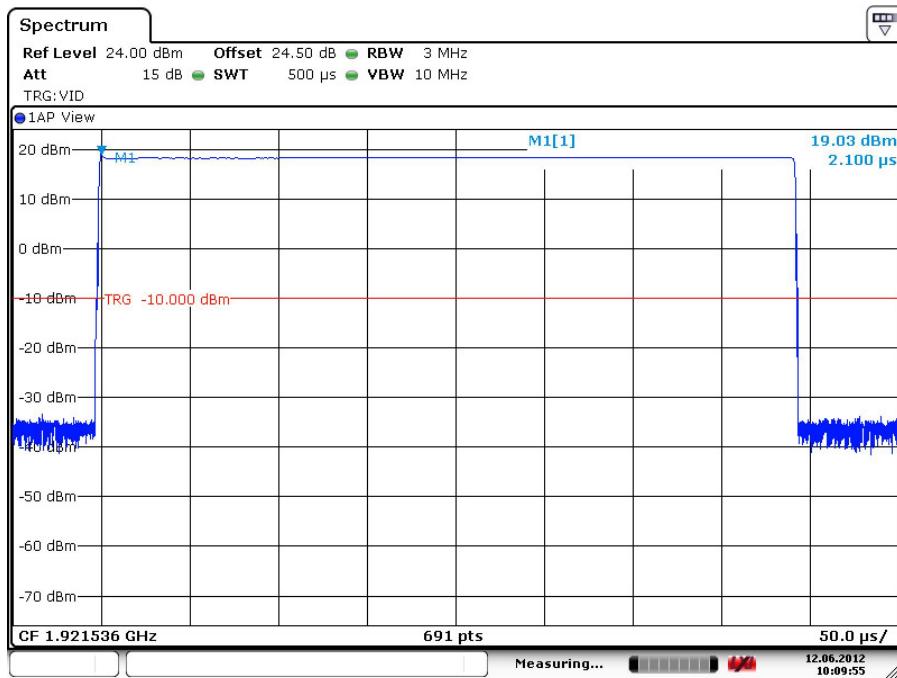
## Lower Channel



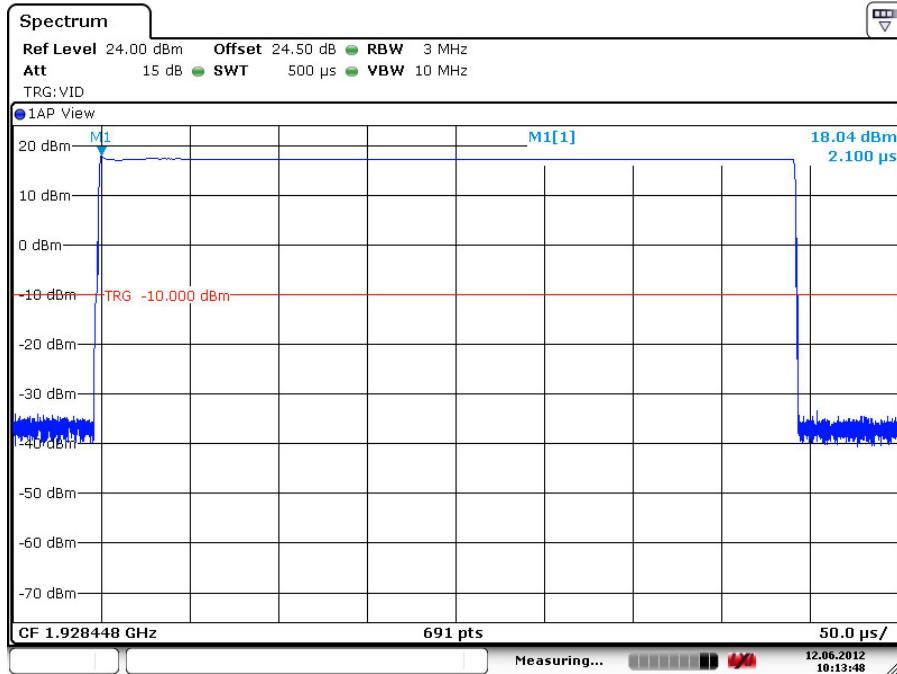
## Upper Channel

**Middle Channel**

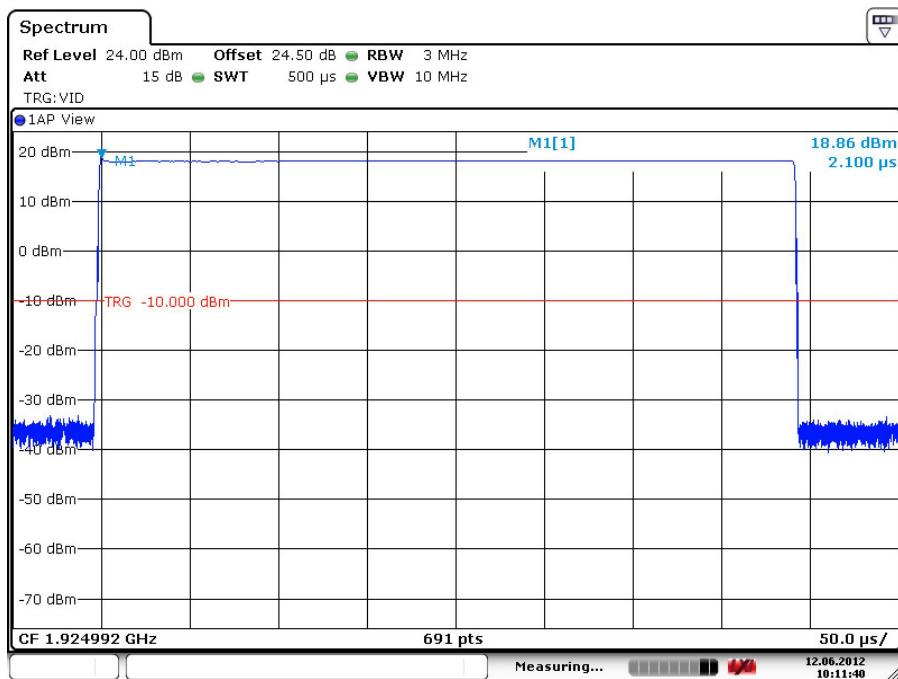
## Radiated Peak Output Power



## Lower Channel



## Upper Channel

**Middle Channel**

## 9.9 Emission Bandwidth B

### Measurement Procedure:

ANSI C63.17, clause 6.1.3.

**Test Results: Pass**

### Measurement Data:

| Channel No. | Frequency<br>(MHz) | 26 dB Bandwidth B<br>(kHz) |
|-------------|--------------------|----------------------------|
| 4           | 1921.536           | 2308                       |
| 0           | 1928.448           | 2312                       |

| Channel No. | Frequency<br>(MHz) | 20 dB Bandwidth B<br>(kHz) |
|-------------|--------------------|----------------------------|
| 2           | 1924.992           | 1314                       |

| Channel No. | Frequency<br>(MHz) | 6 dB Bandwidth B<br>(kHz)  |
|-------------|--------------------|----------------------------|
| 4           | 1921.536           | N/A                        |
| 0           | 1928.448           | N/A                        |
| Channel No. | Frequency<br>(MHz) | 12 dB Bandwidth B<br>(kHz) |
| 4           | 1921.536           | N/A                        |
| 0           | 1928.448           | N/A                        |

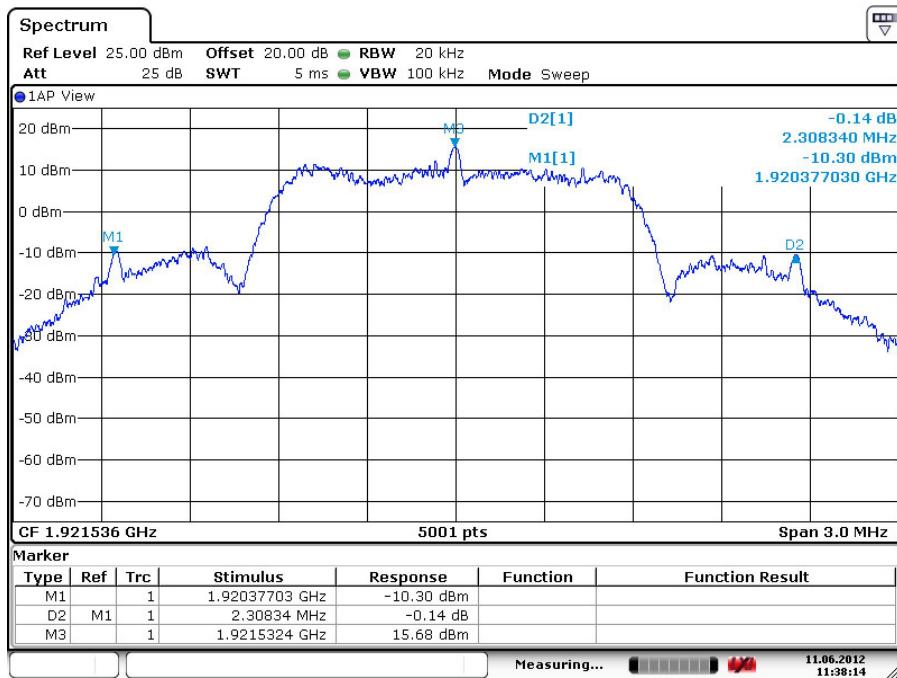
### Requirement: FCC 15.323(a)

The 26 dB Bandwidth B shall be larger than 50 kHz and less than 2.5 MHz.

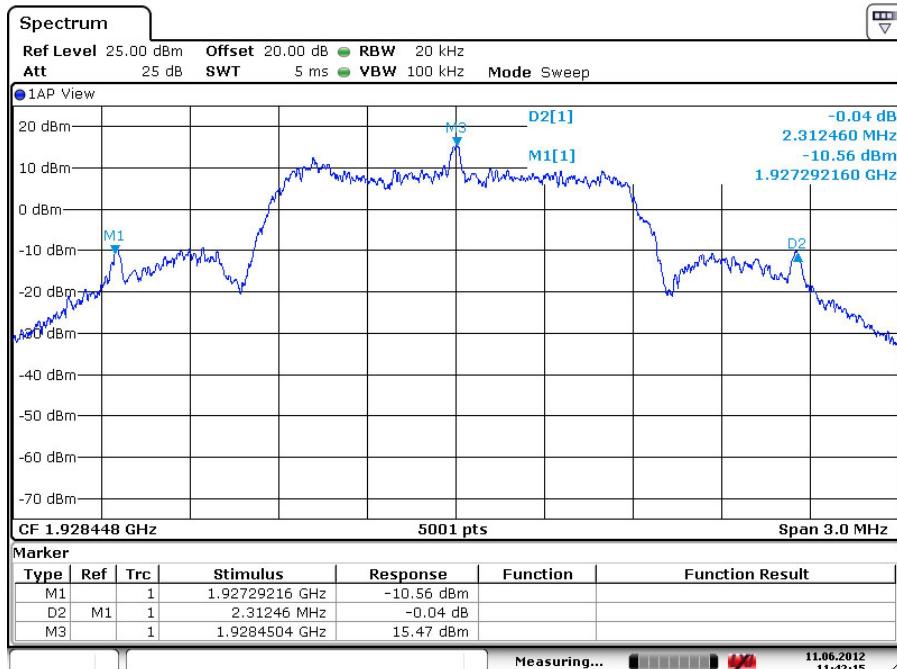
### Requirement: RSS-213 Issue 2, clause 6.4

The 20 dB Bandwidth B shall be larger than 50 kHz and less than 2.5 MHz.

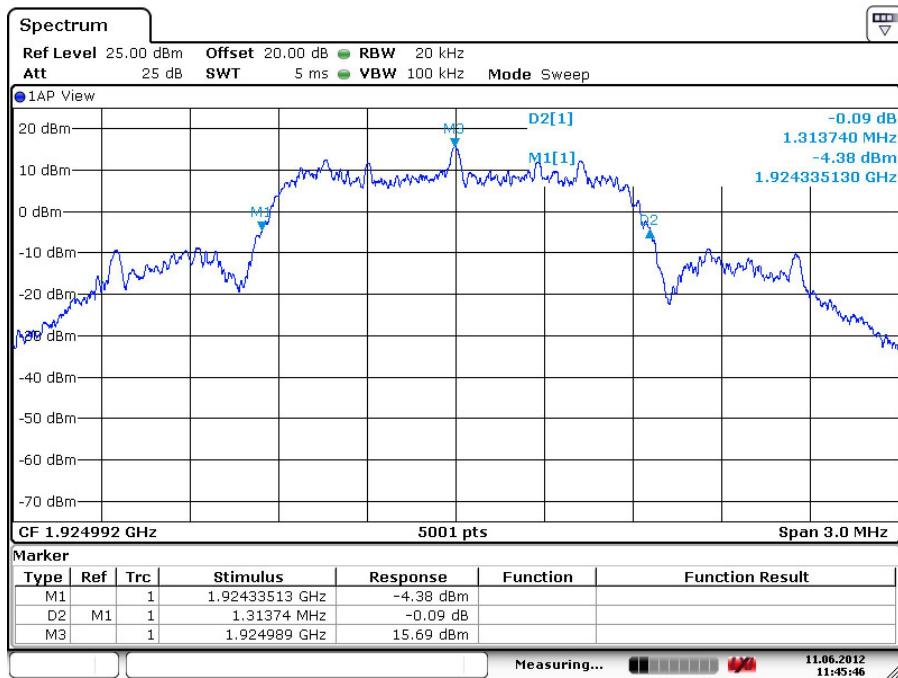
No requirement for 6 dB and 12 dB Bandwidth. These values are only used for testing Monitoring Bandwidth if the Simple Compliance test fails (ANSI C63.17, clause 7.4).



### Emission Bandwidth B, Lower Channel



### Emission Bandwidth B, Upper Channel



## 20 dB Bandwidth B, Middle Channel

## 9.10 Power Spectral Density

**Measurement Procedure:**

ANSI C63.17, clause 6.1.5.

**Test Results: Pass****Measurement Data:**

| Channel No. | Frequency<br>(MHz) | Power Spectral Density (mW/3kHz) |
|-------------|--------------------|----------------------------------|
| 4           | 1921.541           | 1.27                             |
| 0           | 1928.452           | 2.01                             |

Averaged over 100 sweeps.

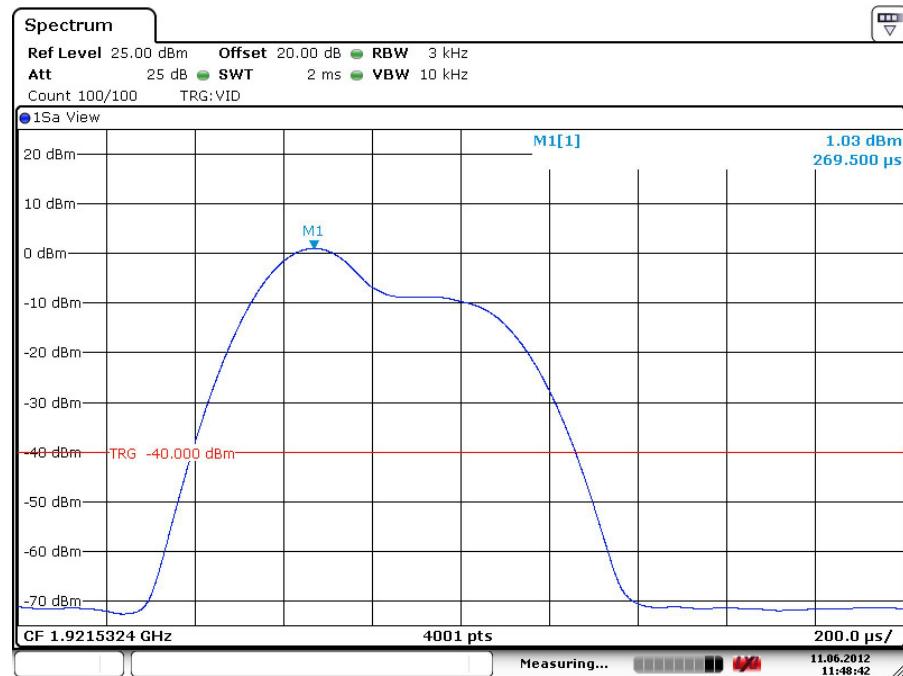
**Requirement: FCC 15.319(d)**

The Power Spectral Density shall be less than 3 mW (4.77 dBm) when averaged over at least 100 sweeps.

## Power Spectral Density

Lower Channel:

Frequency of the maximum level was recorded under chapter 5.9.



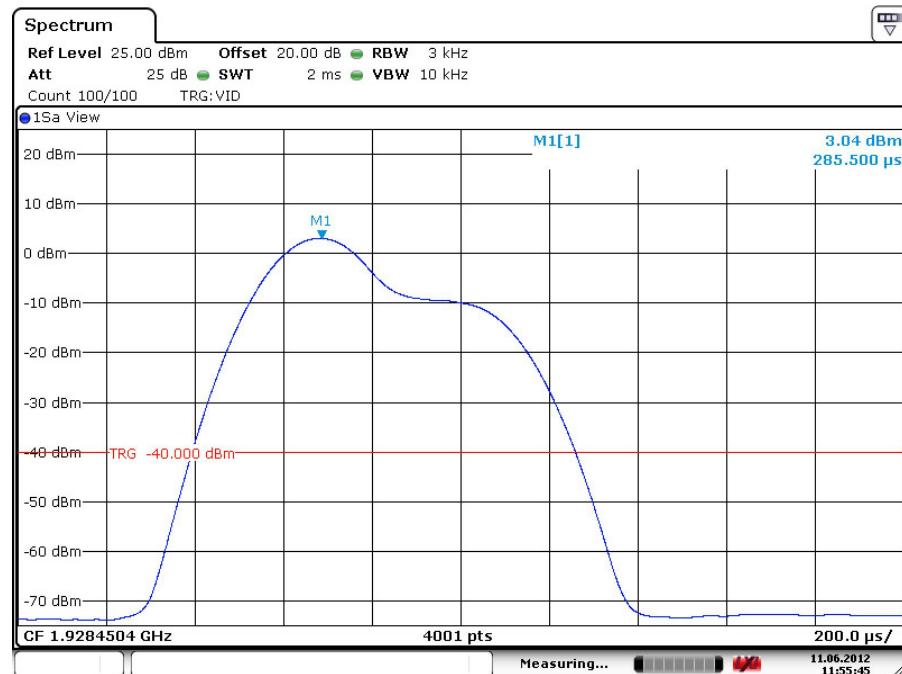
Averaged, 100 Sweeps

|                   |      |
|-------------------|------|
| Pulse power [dBm] | 1.03 |
| Pulse power [mW]  | 1.27 |

## Power Spectral Density

Upper Channel:

Frequency of the maximum level was recorded under chapter 5.9.



Averaged, 100 Sweeps

|                   |      |
|-------------------|------|
| Pulse power [dBm] | 3.04 |
| Pulse power [mW]  | 2.01 |

## 9.11 In-Band Unwanted Emissions, Conducted

### Measurement Procedure:

ANSI C63.17, clause 6.1.6.1.

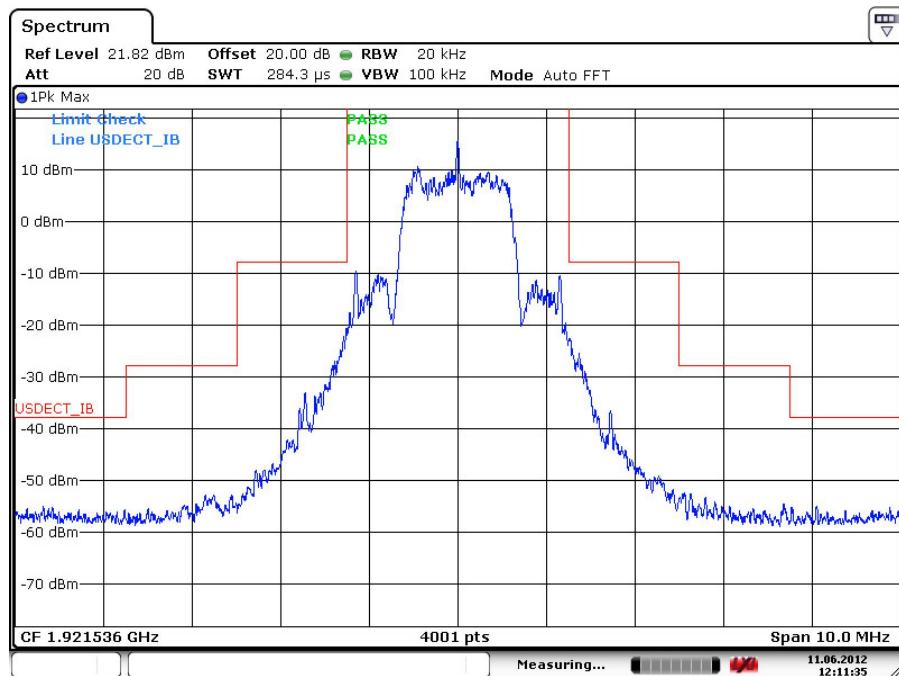
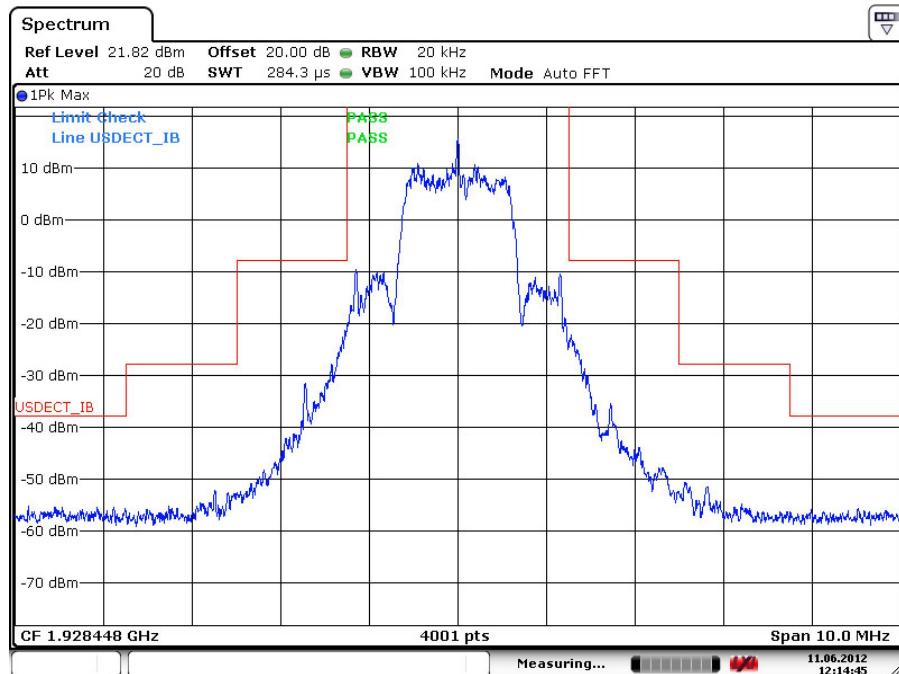
### Test Results: Pass

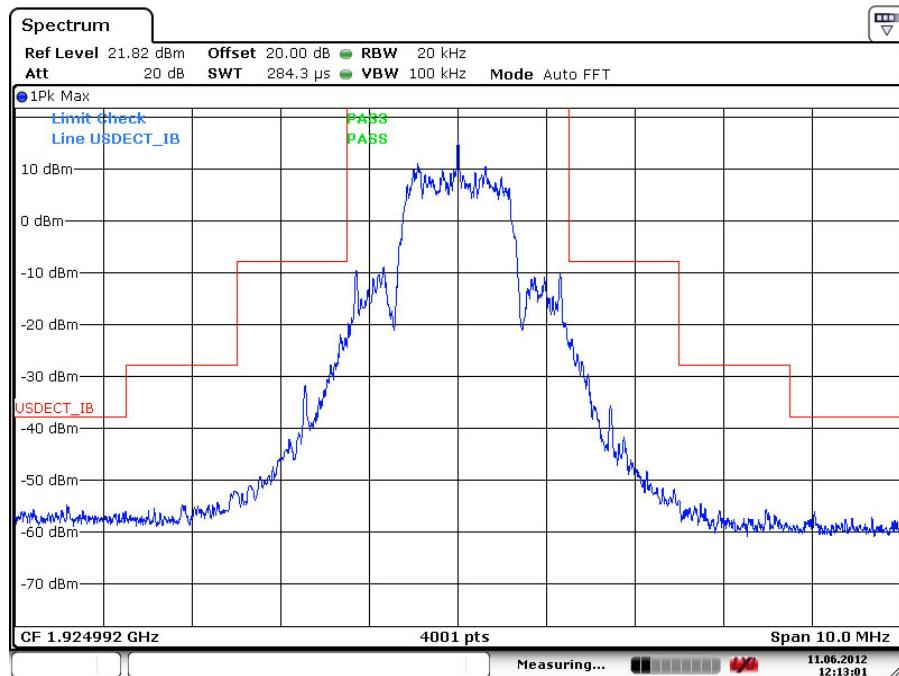
### Measurement Data:

See plots.

### Requirement: FCC 15.323(d)

|   |   |
|---|---|
| $B < f_2 \leq 2B$ :                     | less than or equal to 30 dB below max. permitted peak power level |
| $2B < f_2 \leq 3B$ :                    | less than or equal to 50 dB below max. permitted peak power level |
| $3B < f_2 \leq \text{UPCS Band Edge}$ : | less than or equal to 60 dB below max. permitted peak power level |

**In-Band Unwanted Emissions, Conducted****Lower Channel****Upper Channel**



### Middle Channel

The BS spurious in-band transmission level is below the indicated limit.

## 9.12 Out-of-Band Emissions, Conducted

### Measurement Procedure:

ANSI C63.17, clause 6.1.6.2.

### Test Results: Pass

### Measurement Data:

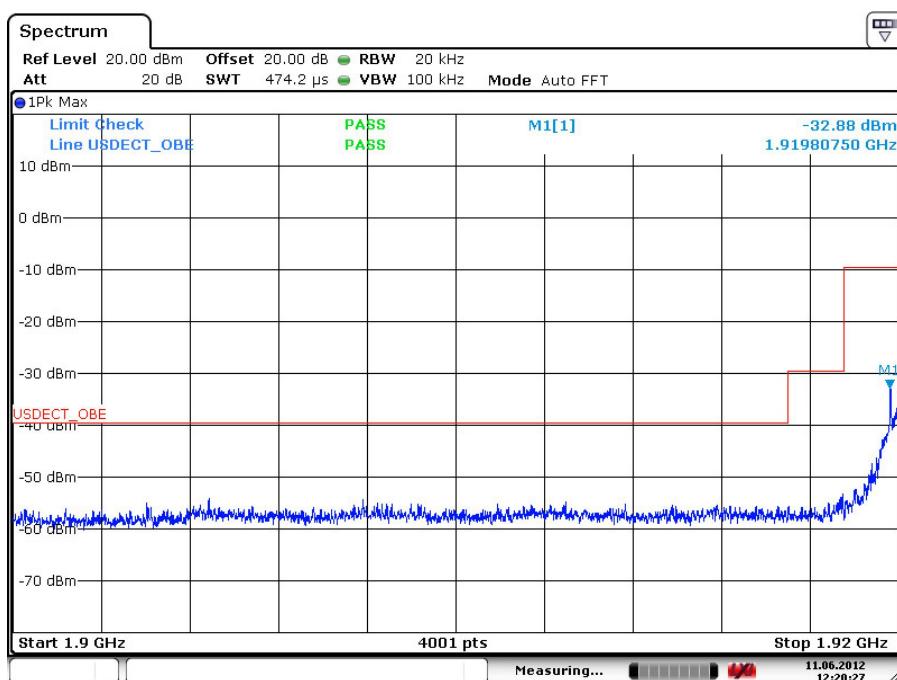
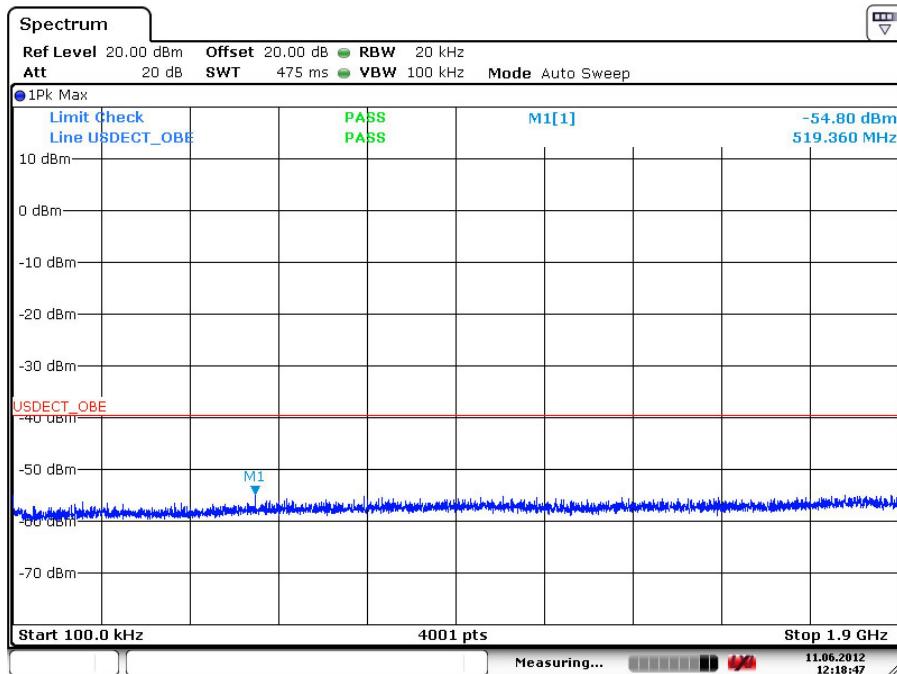
See plots.

### Requirement: FCC 15.323(d)

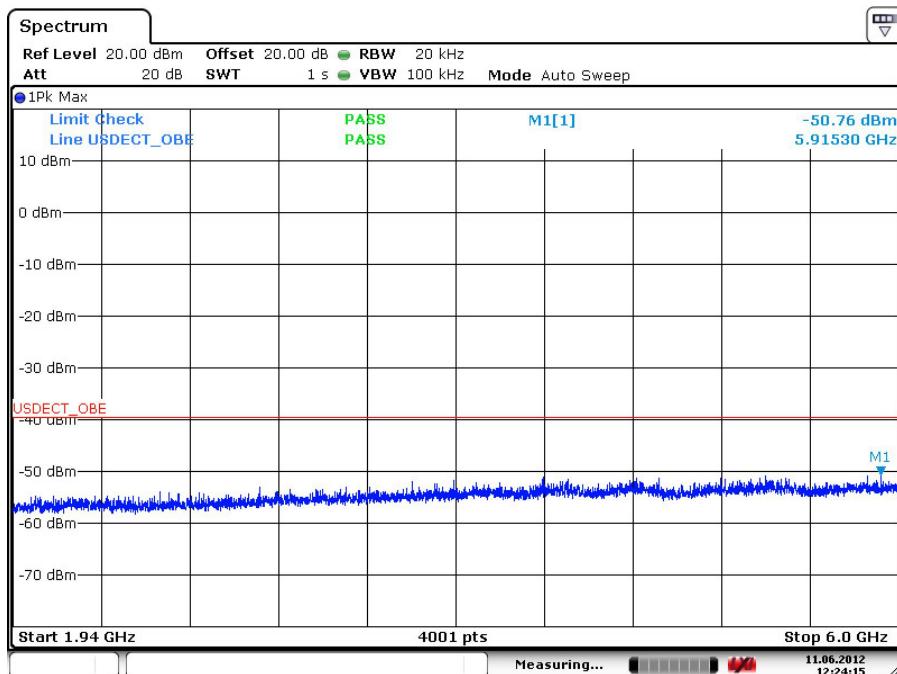
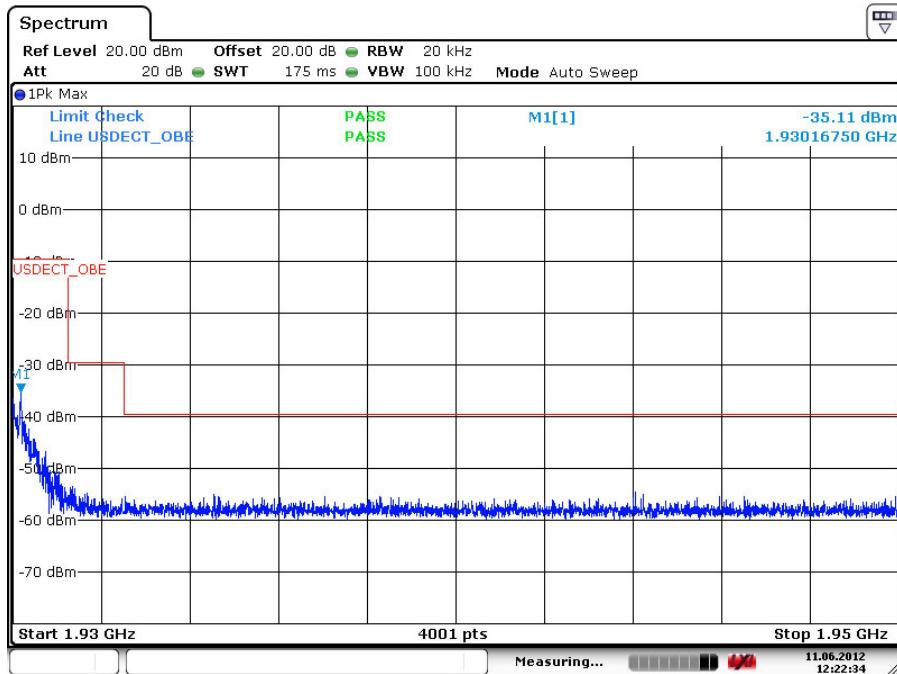
|  |                  |
|--|------------------|
| $f \leq 1.25$ MHz outside UPSCS band:                      | $\leq -9.5$ dBm  |
| $1.25 \text{ MHz} \leq f \leq 2.5$ MHz outside UPSCS band: | $\leq -29.5$ dBm |
| $f \geq 2.5$ MHz outside UPSCS band:                       | $\leq -39.5$ dBm |

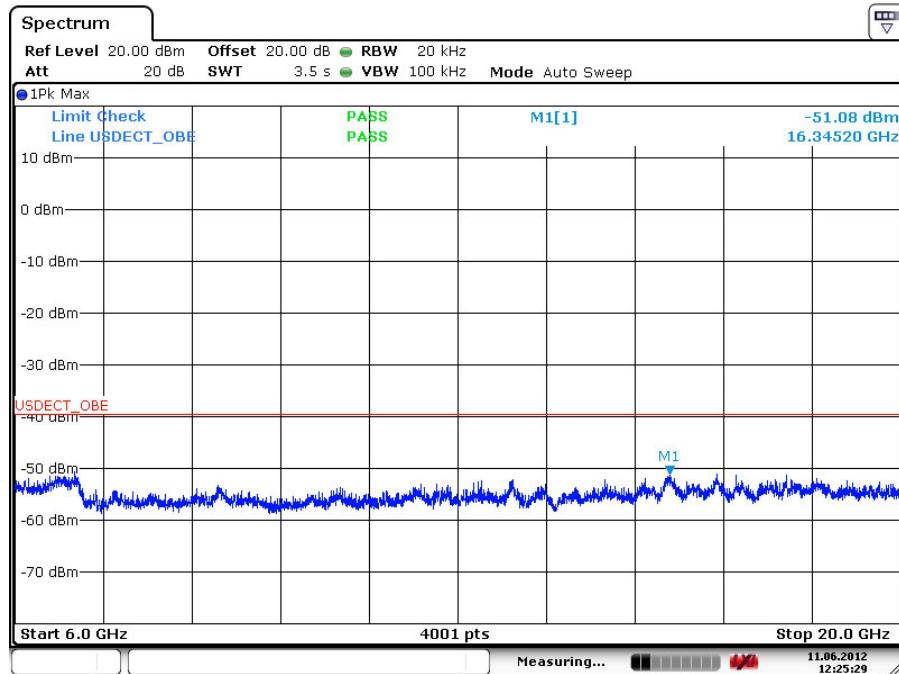
## Out-of-Band Unwanted Emissions, Conducted

### Upper and Lower Channel:



## Out-of-Band Unwanted Emissions, Conducted



**Out-of-Band Unwanted Emissions, Conducted**

The BS spurious out-of-band transmission level is below the indicated limit.

## 9.13 Carrier Frequency Stability

### Measurement Procedure:

ANSI C63.17, clause 6.2.1.

**Test Results: Pass**

### Measurement Data:

The Frequency Stability is measured with the CMD65. The CMD65 was logged by a computer programmed to get the new readings as fast as possible (about 3 readings per second) over the noted time period or number of readings. The peak-to-peak difference was recorded and the mean value and deviation in ppm was calculated.

The Carrier Frequency Stability over power Supply Voltage and over Temperature is measured also with the CMD65.

#### Carrier Frequency Stability over Time at Nominal Temperature

| Average Mean Carrier Frequency (MHz) | Max. Diff. (kHz) | Min. Diff. (kHz) | Max Dev. (ppm) | Limit (ppm) |
|--------------------------------------|------------------|------------------|----------------|-------------|
| 1924.979626                          | -4.90            | -14.17           | 3.88           | ±10         |

Deviation ppm = ((Max.Diff. – Mean.Diff.) / Mean Carrier Freq.) x 10<sup>6</sup>

Deviation (ppm) is calculated from 3000 readings with the CMD65.

#### Carrier Frequency Stability over Power Supply at Nominal Temperature

| Voltage  | Measured Carrier Frequency (MHz) | Difference (kHz) | Deviation (ppm) | Limit (ppm) |
|----------|----------------------------------|------------------|-----------------|-------------|
| 115 V AC | 1924.992                         | N/A              | N/A             | ±10         |
| 98 V AC  | 1924.992                         | N/A              | N/A             |             |
| 132 V AC | 1924.992                         | N/A              | N/A             |             |

Deviation ppm = ((Mean – Measured frequency) / Mean) x 10<sup>6</sup>

#### Carrier Frequency Stability over Temperature

| Temperature | Measured Carrier Frequency (MHz) | Difference (kHz) | Deviation (ppm) | Limit (ppm) |
|-------------|----------------------------------|------------------|-----------------|-------------|
| T = +20 °C  | 1924.986                         | Ref.             | Ref.            | ±10         |
| T = -20 °C  | 1924.989                         | +3.0             | +1.6            |             |
| T = +50 °C  | 1924.983                         | -3.0             | -1.6            |             |

Deviation ppm = ((Mean – Measured frequency) / Mean) x 10<sup>6</sup>

## 9.14 Frame Repetition Stability

**Measurement Procedure:**

ANSI C63.17, clause 6.2.2.

**Test Results: Pass**

**Measurement Data:**

The Frame Repetition Stability is measured with the CMD65. The Frame Repetition Stability is 3 times the standard deviation.

| Carrier Frequency<br>(MHz) | Mean<br>(Hz) | Standard Deviation<br>(ppm) | Frame Repetition<br>Stability (ppm) |
|----------------------------|--------------|-----------------------------|-------------------------------------|
| 1924.992                   | 100.0        | 0.01                        | 0.04                                |

**Limit:**

|                            |                |
|----------------------------|----------------|
| Frame Repetition Stability | ±10 ppm (TDMA) |
|----------------------------|----------------|

Ref. FCC 15.323(e). ANSI C63.17, clause 6.2.2.

## 9.15 Frame Period and Jitter

**Measurement Procedure:**

ANSI C63.17, clause 6.2.3.

**Test Results: Pass**

**Measurement Data:**

The Frame Repetition Stability is measured with the CMD65

| Carrier Frequency<br>(MHz) | Frame Period<br>(ms) | Max Jitter<br>(μs) | 3xStandard Deviation of<br>Jitter (μs) |
|----------------------------|----------------------|--------------------|--|
| 1924.992                   | 10.000               | 0.006              | 0.004                                  |

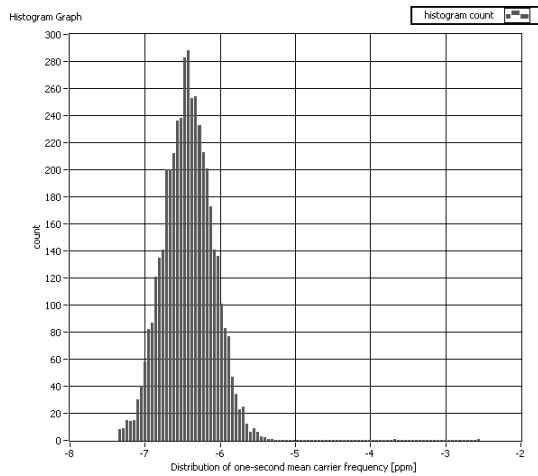
Max Jitter =  $(1/\text{Frame Period} + \text{Pk-Pk})/2 - (1/\text{Frame Period})$ , when Pk-Pk and Frame Period are in Hz.

$3 \times \text{St.Dev.Jitter} = 3 \times (1/\text{Frame Period} + \text{St.Dev}) - (1/\text{St.Dev}) \times 10^6$

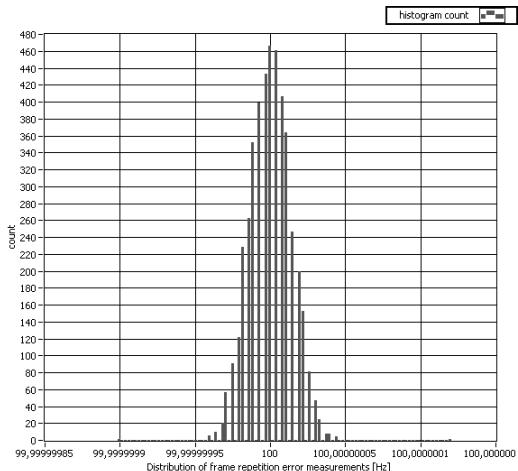
**Limit:**

|                           |             |
|---------------------------|-------------|
| Frame Period              | 20 or 10 ms |
| Max Jitter                | 25 μs       |
| 3 times St.Dev. of Jitter | 12.5 μs     |

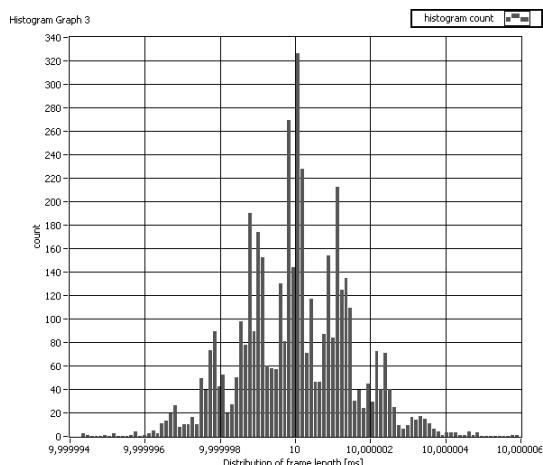
Ref. FCC 15.323(e). ANSI C63.17, clause 6.2.3.



## Histogram of Carrier Frequency Stability



# Histogram of Frame Repetition Stability



# Histogram of Frame Period and Jitter

## 9.16 Monitoring Threshold, Least Interfered Channel

### Monitoring Threshold limits:

Lower Threshold:

$$T_L = 15 \log B - 184 + 30 - P_{EUT} \text{ (dBm)}$$

Upper Threshold:

$$T_U = 15 \log B - 184 + 50 - P_{EUT} \text{ (dBm)}$$

B is measured Emission Bandwidth in Hz

$P_{EUT}$  is measured Transmitter Power in dBm

### Calculated values:

|                 |           |
|-----------------|-----------|
| Lower Threshold | -78.2 dBm |
| Upper Threshold | -58.2 dBm |

The Lower Threshold is applicable for systems which have defined less than 40 duplex system access channels. The Upper Threshold is applicable for systems with more than 40 duplex systems access channels and that implements the Least Interfered Channel Procedure (LIC).

### Measurement Procedure:

The Upper Threshold is found by the procedure defined in ANSI C63.17 clause 7.3.1 or 7.3.2.

| <b>Least Interfered Channel Procedure NOT used:</b> |           |
|---|-----------|
| Lower Threshold                                     | N/A       |
| <b>Least Interfered Channel Procedure used:</b>     |           |
| Upper Threshold                                     | -62.7 dBm |

### Least Interfered Channel (LIC) Procedure Test, FCC 15.323(b), (c)(2) and (c)(5)

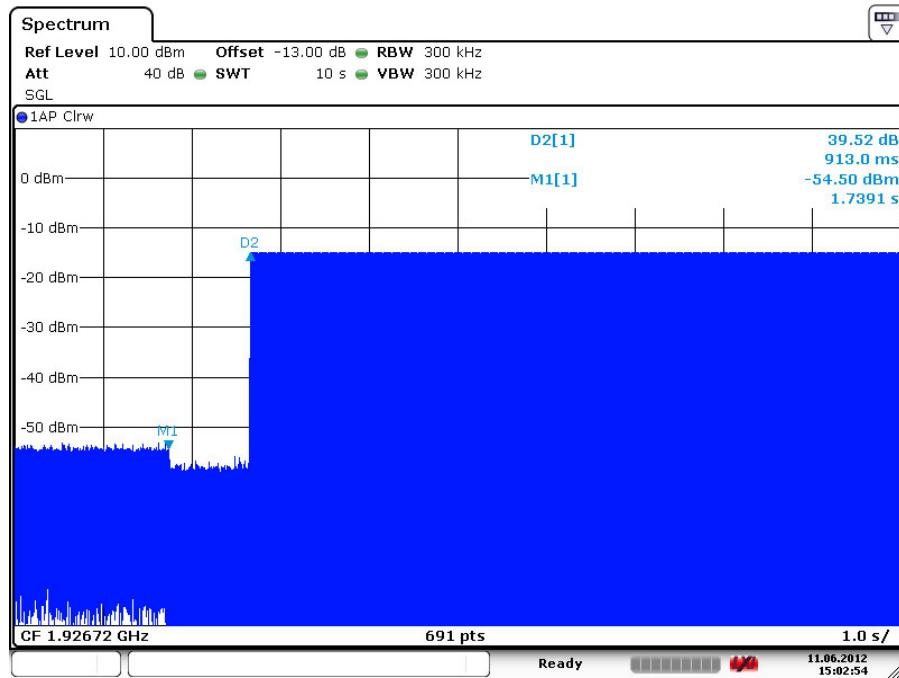
| ANSI C63.17 clause 7.3.3 ref.                        | Observation                  | Verdict     |
|--|------------------------------|-------------|
| b) $f_1 T_L + 13 \text{ dB}, f_2 T_L + 6 \text{ dB}$ | Transmission always on $f_2$ | <b>Pass</b> |
| c) $f_1 T_L + 6 \text{ dB}, f_2 T_L + 13 \text{ dB}$ | Transmission always on $f_1$ | <b>Pass</b> |
| d) $f_1 T_L + 7 \text{ dB}, f_2 T_L$                 | Transmission always on $f_2$ | <b>Pass</b> |
| e) $f_1 T_L, f_2 \text{ at } T_L + 7 \text{ dB}$     | Transmission always on $f_1$ | <b>Pass</b> |

### Selected Channel Confirmation, FCC 15.323(c)(1) and (5)

| ANSI C63.17 clause 7.3.4 ref.         | Observation            | Verdict     |
|---------------------------------------|------------------------|-------------|
| b) Shall <b>not</b> transmit on $f_1$ | EUT transmits on $f_2$ | <b>Pass</b> |
| d) Shall <b>not</b> transmit on $f_2$ | EUT transmits on $f_1$ | <b>Pass</b> |

#### Limits:

|                               |           |
|-------------------------------|-----------|
| Lower Threshold + 6 dB margin | -72.2 dBm |
| Upper Threshold + 6 dB margin | -52.2 dBm |



#### 7.3.4 Selected Channel Confirmation, connection 0.9 s after interferer removed

## 9.17 Threshold Monitoring Bandwidth

This test is only required if a dedicated monitoring receiver is used. If the test is not carried out the manufacturer shall declare and provide evidence that the monitoring is made through the radio receiver used for communication.

### Measurement Procedure:

Simple Compliance Test, ANSI C63.17, clause 7.4.1

More Detailed Test, ANSI C63.17, clause 7.4.2

The test is passed if **either** the Simple Compliance Test or the More Detailed Test is passed.

During this test the spectrum analyzer is observed visually to see if the EUT transmits or not.

### Test Results:

| Test performed                             | Observation      | Verdict     |
|--|------------------|-------------|
| Simple Compliance Test, at $\pm 30\%$ of B | No transmissions | <b>Pass</b> |
| More Detailed Test, at -6 dB points        | N/A              | <b>N/A</b>  |
| More Detailed Test, at -12 dB points       | N/A              | <b>N/A</b>  |

The More Detailed Test must be pass at both the -6dB and -12 dB points if the Simple Compliance Test fails.

**Comment:** The Simple Compliance Test was performed with the level  $T_U + U_M + 10$  dB to check that the EUT did not transmit at all.

The tested EUT uses the same receiver for monitoring and communication, this test is therefore not required. However the test was performed nonetheless and the test is passed.

### Limits: FCC 15.323(c)(7):

The monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission.

## 9.18 Reaction Time and Monitoring Interval

### Measurement Procedure:

ANSI C63.17, clause 7.5

### Test Results:

By administrative commands and out-of-operating region interference, the EUT is restricted to operate on a single carrier frequency.

Time-synchronized pulsed interference was then applied on the carrier at pulsed levels TU + UM to check that the EUT does not transmit. The level was raised 6 dB for part d) with 35 µs pulses.

The pulses are synchronized with the EUT timeslots and applied centered within all timeslots.

| Pulse Width, ref. to ANSI C63.17 clause 7.5  | Observation     | Verdict     |
|--|-----------------|-------------|
| c) > largest of 50 µs and 50*SQRT(1.25/B)  | No transmission | <b>Pass</b> |
| d) > largest of 35 µs and 35*SQRT(1.25/B)<br>and with interference level raised 6 dB | No transmission | <b>Pass</b> |

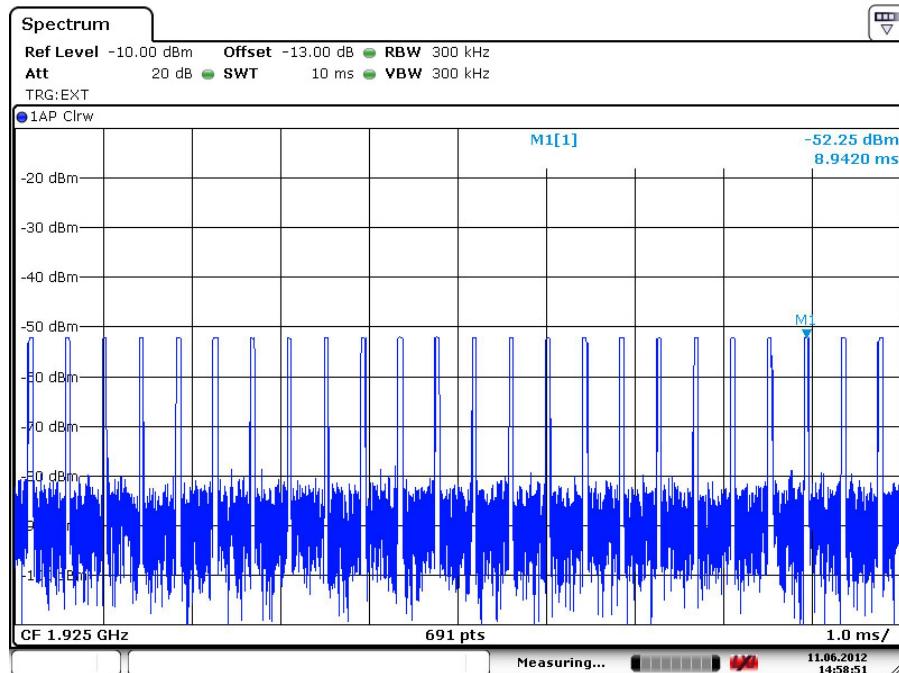
**Comment:** Since B is larger than 1.25 MHz, the test was performed with pulse lengths of 50 µs and 35 µs.

### Limits: FCC 15.323(c)(1), (5) and (7)

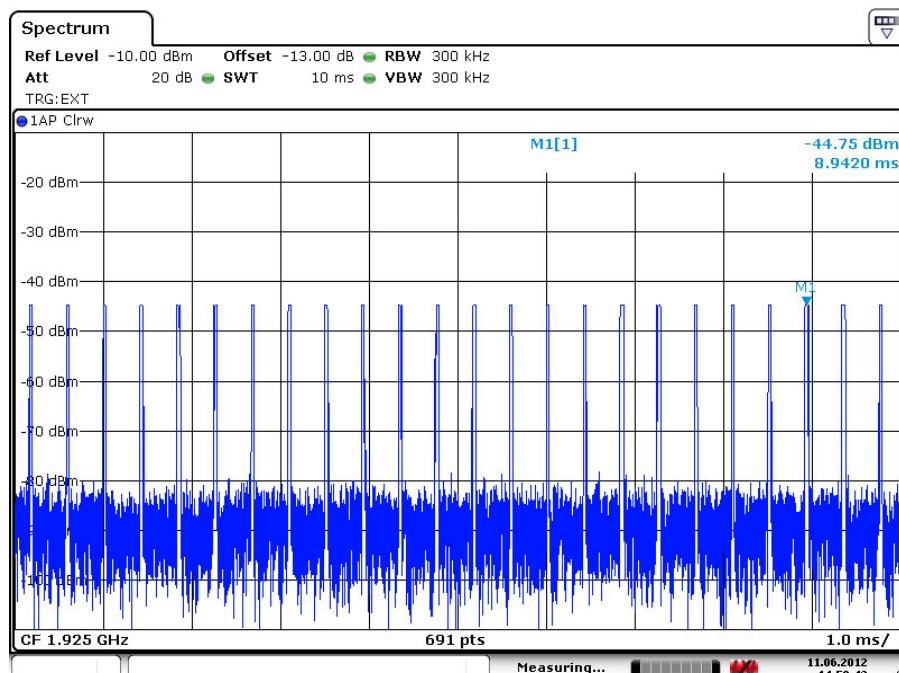
The maximum reaction time must be less than  $50 \times \text{SQRT}(1.25/\text{emission bandwidth in MHz})$  microseconds for signals at the applicable threshold level but shall not be required to be less than 50 microseconds.

If a signal is detected that is 6 dB or more above the applicable threshold level, the maximum reaction time shall be  $35 \times \text{SQRT}(1.25/\text{emission bandwidth in MHz})$  microseconds but shall not be required to be less than 35 microseconds.

Comment: This test is only applicable for EUTs that can be an initiating device.



### 50 µs Pulses



### 35 µs Pulses

## 9.19 Time and Spectrum Window Access Procedure

This requirement is only for EUTs which transmit unacknowledged control and signaling information

### Measurement Procedure:

Timing for EUTs using control and signaling channel type transmissions: ANSI C63.17, clause 8.1

Test results:

| <b>Access Criteria, ref. to ANSI C63.17 clause 8.1.1</b>   | <b>Observation</b> | <b>Verdict</b> |
|--|--------------------|----------------|
| b) Check that the EUT transmits on the interference free time slot   | N/A                | <b>N/A</b>     |
| b) The EUT must terminate or pause in its repetitive transmission of the control and signaling channel on the open channel to repeat the access criteria not less frequently than every 30 s | N/A                | <b>N/A</b>     |

If FCC 15.323(c)(6) option Random Waiting Interval is NOT implemented

| <b>Access Criteria, ref. to ANSI C63.17 clause 8.1.2</b>   | <b>Observation</b> | <b>Verdict</b> |
|--|--------------------|----------------|
| b) Check that the EUT changes to interference free time slot when interference is introduced on the time slot in use | N/A                | <b>N/A</b>     |

If FCC 15.323(c)(6) option Random Waiting Interval is implemented

| <b>Access Criteria, ref. to ANSI C63.17 clause 8.1.3</b>   | <b>Observation</b> | <b>Verdict</b> |
|--|--------------------|----------------|
| b-d) Check that the EUT uses random waiting interval before continuing transmission on an interfered time slot | N/A                | <b>N/A</b>     |

Comment: The tested EUT does not transmit unacknowledged control and signaling information.

### Limits:

#### FCC 15.323(c)(4):

Once access to specific combined time and spectrum windows is obtained an acknowledgement from a system participant must be received by the initiating transmitter within one second or transmission must cease. Periodic acknowledgments must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which the time access criteria must be repeated.

#### FCC 15.323(c)(6):

If the selected combined time and spectrum windows are unavailable, the device may either monitor and select different windows or seek to use the same windows after waiting an amount of time, randomly chosen from a uniform random distribution between 10 and 150 milliseconds, commencing when the channel becomes available.

## 9.20 Acknowledgments and Transmission duration

### Measurement Procedure:

Acknowledgments: ANSI C63.17, clause 8.2.1

Transmission Duration: ANSI C63.17, clause 8.2.2

During the test **Initial transmission without acknowledgments** the signal from the EUT to the companion device is blocked by circulators in addition to the tunable attenuator.

The test **Transmission time after loss of acknowledgments** is performed by cutting-off the signal from the companion device by a RF switch the time until the EUT stops transmitting.

The **Transmission Duration** test is performed by monitoring the slot in use and measuring the time until the EUT changes to a different slot.

### Test Results:

#### Acknowledgments

| Test ref. to ANSI C63.17 clause 8.2.1              | Observation | Verdict     |
|--|-------------|-------------|
| a) Initial transmission without acknowledgments    | 0.4 s       | <b>Pass</b> |
| c) Transmission time after loss of acknowledgments | 5.1 s       | <b>Pass</b> |

#### Transmission Duration

| Test ref. to ANSI C63.17 clause 8.2.2                      | Observation | Verdict     |
|--|-------------|-------------|
| b) Transmission duration on same time and frequency window | Approx. 1 s | <b>Pass</b> |

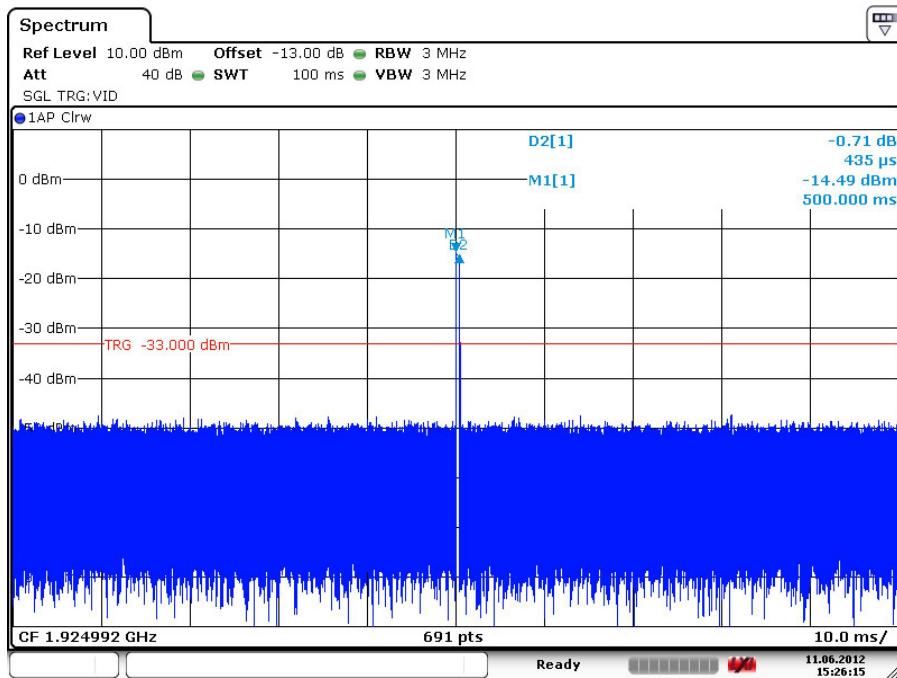
Comment: /

#### Limits: FCC 15.323(c)(3) and (4)

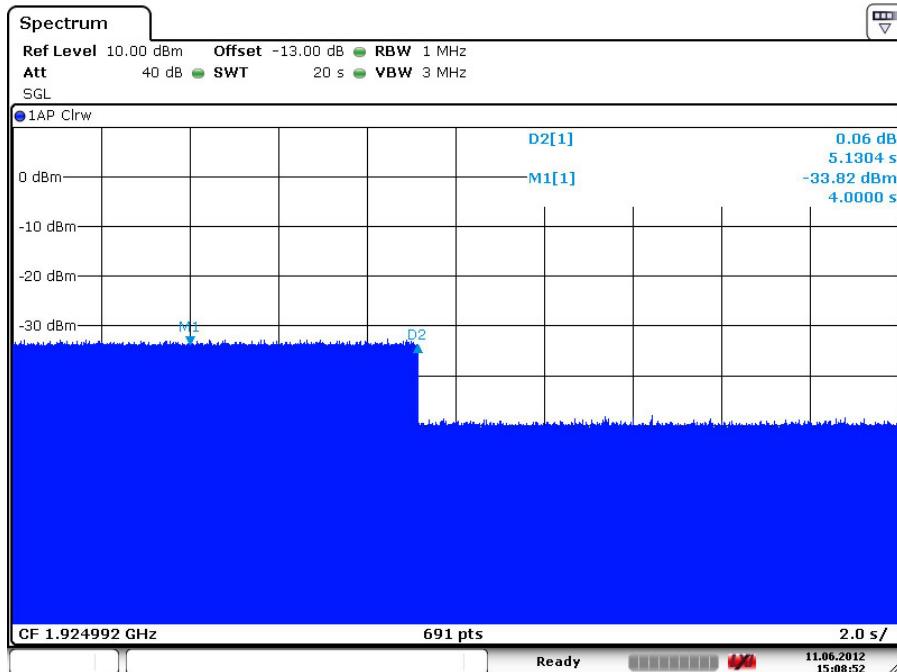
Occupation of the same combined time and spectrum windows by a device or group of cooperating devices continuously over a period of time longer than 8 hours is not permitted without repeating the access criteria.

Once access to specific combined time and spectrum windows is obtained an acknowledgment from a system participant must be received by the initiating transmitter within one second or transmission must cease.

Periodic acknowledgments must be received at least every 30 seconds or transmission must cease. Channels used exclusively for control and signaling information may transmit continuously for 30 seconds without receiving an acknowledgement, at which the time access criteria must be repeated.



### 8.2.1a) Initial Transmission Time without Acknowledgments



### 8.2.1c) Transmission Time after Loss of Acknowledgments

## 9.21 Dual Access Criteria Check

### Measurement Procedure:

EUTs that do not implement the Upper Threshold: ANSI C62.17, clause 8.3.1

EUTs that implement the Upper Threshold: ANSI C62.17, clause 8.3.2

This test is required for equipment that uses the access criteria in FCC 15.323(c)(10).

### Test Results:

#### EUTs that do NOT implement the Upper Threshold:

| Test ref. to ANSI C63.17 clause 8.3.1   | Observation | Verdict |
|---|-------------|---------|
| b) EUT is restricted to a single carrier $f_t$ for TDMA systems. The test is pass if the EUT can set up a communication link. | N/A         | N/A     |
| c) d) No transmission on interference-free <b>receive</b> time/spectrum window. All transmit slots blocked                    | N/A         | N/A     |
| e) f) No transmission on interference-free <b>transmit</b> time/spectrum window. All transmit slots blocked                   | N/A         | N/A     |

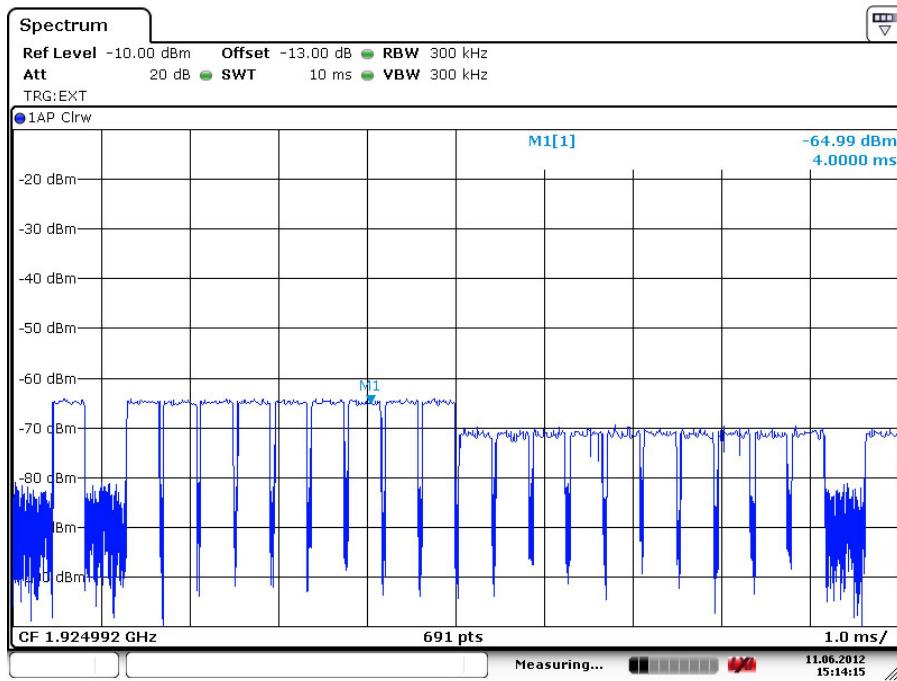
#### EUTs that implement the Upper Threshold:

| Test ref. to ANSI C63.17 clause 8.3.2   | Observation   | Verdict |
|---|---|---------|
| b) EUT is restricted to a single carrier $f_t$ for TDMA systems. The test is pass if the EUT can set up a communication link. | EUT can transmit  | Pass    |
| c) d) Transmission on interference-free <b>receive</b> time/spectrum window.  | EUT transmits on interference free <b>receive</b> slot  | Pass    |
| e) f) Transmission on interference-free <b>transmit</b> time/spectrum window.   | EUT transmits on interference free <b>transmit</b> slot | Pass    |
| g) Transmission not possible on any time/spectrum window.   | No connection possible                                  | Pass    |

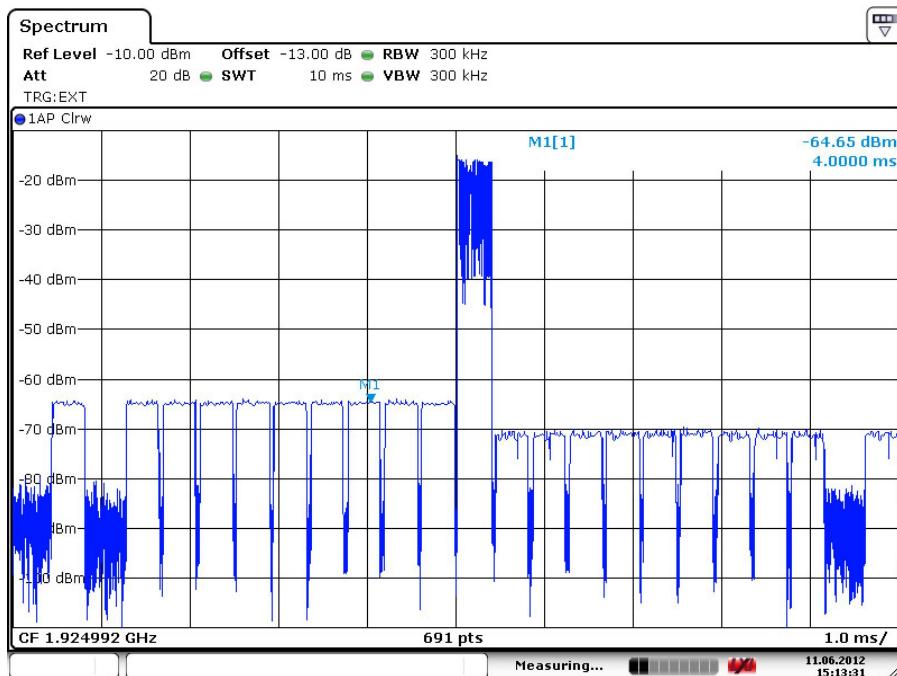
Comment: This test is only applicable for EUTs that can be an initiating device.

### Limits: FCC 15.323(c)(10)

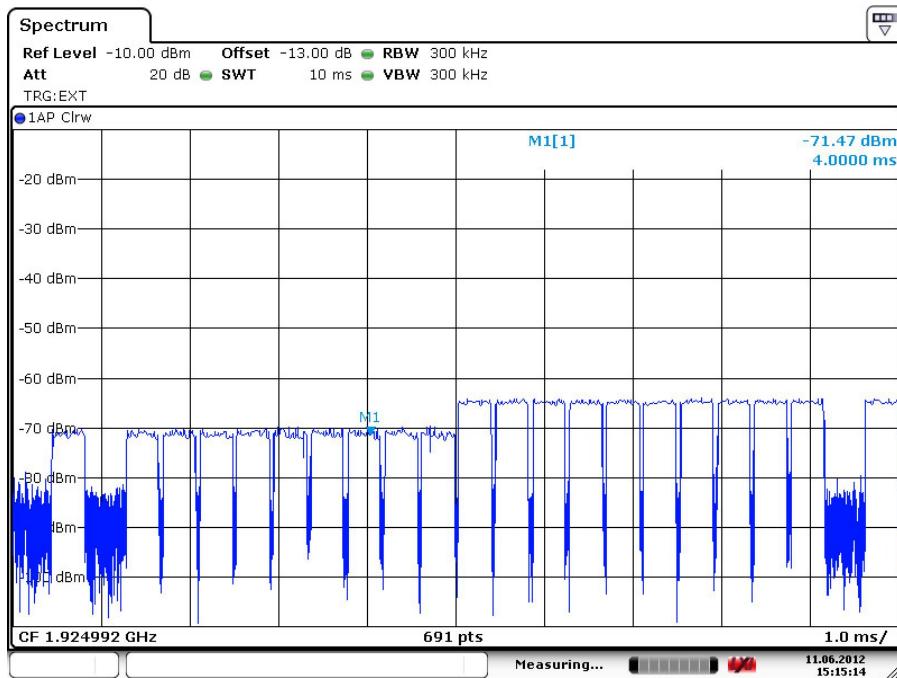
An initiating device may attempt to establish a duplex connection by monitoring both, its intended transmit and receive time and spectrum windows. If both the intended transmit and receive time and spectrum windows meet the access criteria, then the initiating device can initiate a transmission in the intended transmit time and spectrum window. If the power detected by the responding device can be decoded as a duplex connection signal from the initiating device, then the responding device may immediately begin transmitting on the receive time and spectrum window monitored by the initiating device.



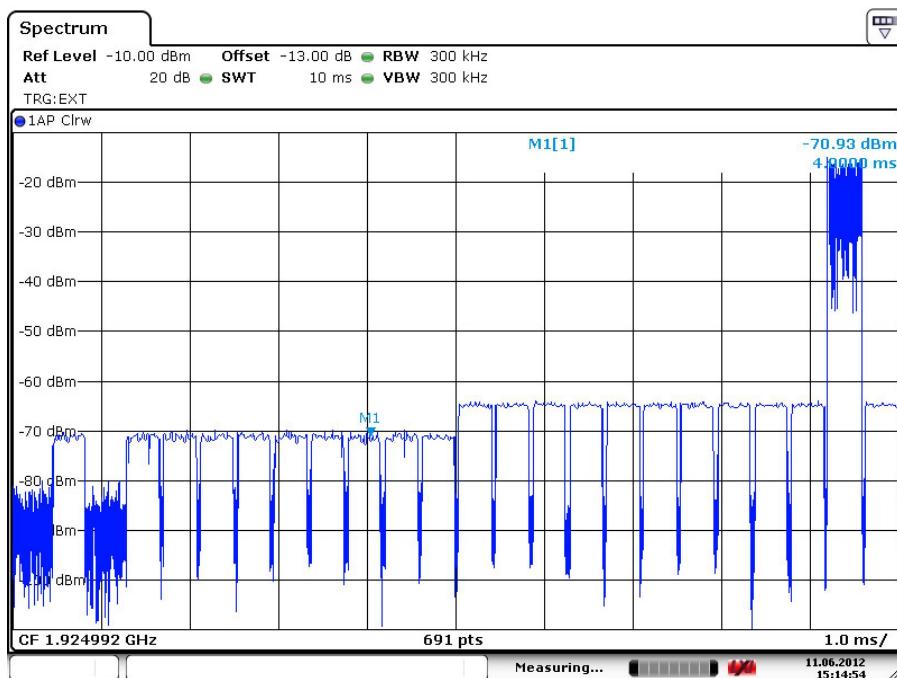
### 8.3.2c) EUT Transmits on Interference Free RECEIVE Slot, BEFORE



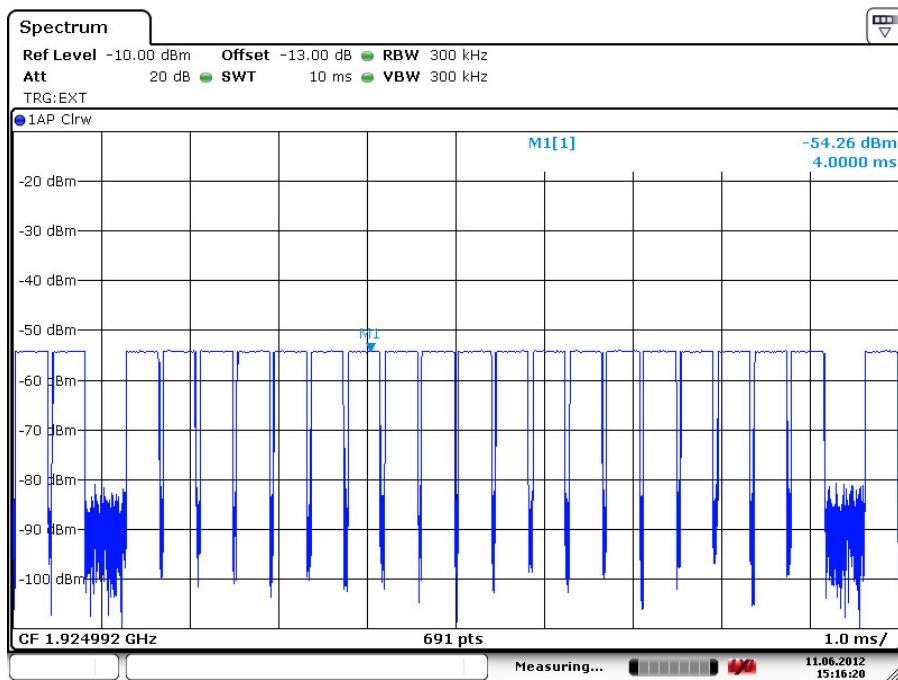
### 8.3.2c) EUT Transmits on Interference Free RECEIVE Slot, AFTER



### 8.3.2e) EUT Transmits on Interference Free TRANSMIT Slot, BEFORE



### 8.3.2e) EUT Transmits on Interference Free TRANSMIT Slot, AFTER



### 8.3.2g) No Connection

## 9.22 Alternative monitoring interval

Test procedure described in ANSI C63.17, clause 8.4.

This test is required if the EUT implements the provision of FCC 15.323(c)(11).

### Test Result:

Not tested. The tested EUT does not implement this provision. See manufacturer's declaration.

## 9.23 Spurious Emissions (Radiated)

### Measurement Procedure:

FCC 15.209, FCC 15.109

### Test Result:

Tests for intentional radiators according to FCC 15.209 are not required when Out-of-Band Emission was tested conducted with a pass result.

### Measurement Data:

See plots.

### Requirement: FCC 15.109(b)

|                 |          |
|-----------------|----------|
| 30 – 88 MHz:    | 90 µV/m  |
| 88 – 216 MHz:   | 150 µV/m |
| 216 – 960 MHz:  | 210 µV/m |
| 960 – 1000 MHz: | 300 µV/m |

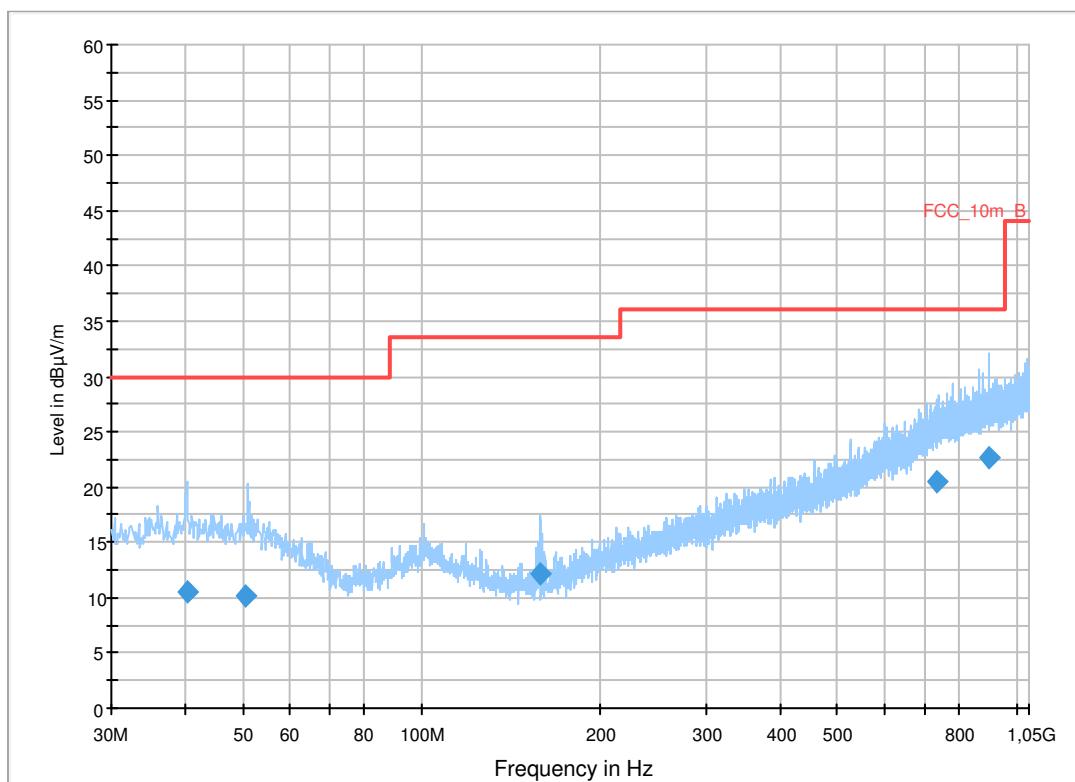
**Common Information**

EUT: 622d + KSAS0100500200D5  
 Serial Number: C5810002002F  
 Test Description: FCC part 15 B class B @ 10m  
 Operating Conditions: charging + DECT idle  
 Operator Name: Hennemann  
 Comment: AC: 115 V / 60 Hz

**Scan Setup: STAN\_Fin [EMI radiated]**

| Hardware Setup: | Electric Field (NOS) |           |         |            |        |
|-----------------|----------------------|-----------|---------|------------|--------|
| Receiver:       | [ESCI 3]             |           |         |            |        |
| Level Unit:     | dB $\mu$ V/m         |           |         |            |        |
| Subrange        | Step Size            | Detectors | IF BW   | Meas. Time | Preamp |
| 30 MHz - 2 GHz  | 60 kHz               | QPK       | 120 kHz | 1 s        | 20 dB  |

FCC\_10m(B)

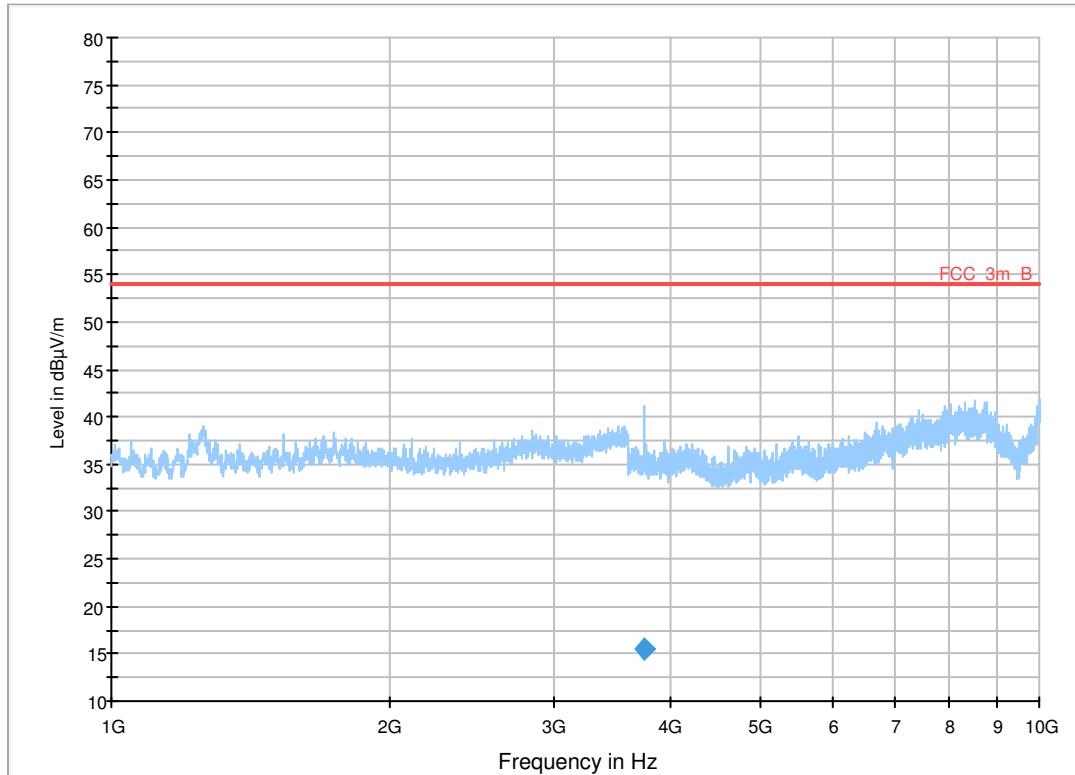
**Final Result 1**

| Frequency (MHz) | QuasiPeak (dB $\mu$ V/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB $\mu$ V/m) | Comment |
|-----------------|--------------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------------|---------|
| 40.344300       | 10.5                     | 1000.0          | 120.000         | 122.0       | H            | 267.0         | 13.4       | 19.5        | 30.0                 |         |
| 50.523450       | 10.2                     | 1000.0          | 120.000         | 394.0       | V            | 9.0           | 13.3       | 19.8        | 30.0                 |         |
| 157.789500      | 12.2                     | 1000.0          | 120.000         | 121.0       | V            | 348.0         | 9.1        | 21.3        | 33.5                 |         |
| 735.860100      | 20.5                     | 1000.0          | 120.000         | 200.0       | V            | 220.0         | 23.3       | 15.5        | 36.0                 |         |
| 897.357450      | 22.7                     | 1000.0          | 120.000         | 100.0       | V            | 95.0          | 25.2       | 13.3        | 36.0                 |         |

**Common Information**

EUT: 622d + KSAS0100500200D5  
 Serial Number: C5810002002F  
 Test Description: FCC part 15 B class B  
 Operating Conditions: charging + DECT idle  
 Operator Name: Hennemann  
 Comment: AC: 115 V / 60 Hz

FCC\_1\_10\_B\_5m

**Final Result 1**

| Frequency (MHz) | Average (dB $\mu$ V/m) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Polarization | Azimuth (deg) | Corr. (dB) | Margin (dB) | Limit (dB $\mu$ V/m) | Comment |
|-----------------|------------------------|-----------------|-----------------|-------------|--------------|---------------|------------|-------------|----------------------|---------|
| 3759.935241     | 15.5                   | 100.0           | 100.000         | 100.0       | H            | 280.0         | -1.7       | 38.5        | 54.0                 |         |

The radiated spurious emission of the unintentional radiator is below the indicated limit.

## 9.24 Receiver Spurious Emissions

### Measurement Procedure:

Industry Canada RSS-213 paragraph 6.8 and RSS-GEN paragraphs 4.8 and 6.

### Test results:

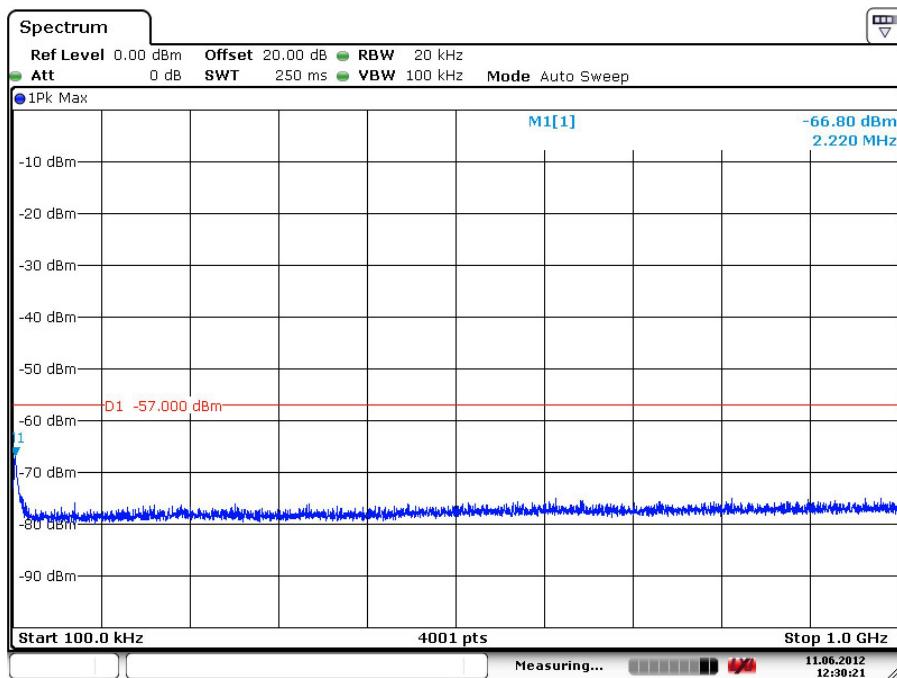
| Frequency<br>MHz | Carrier No. | Measured Value<br>Conducted dBm | Conducted Limit<br>dBm | Margin<br>dB |
|------------------|-------------|---------------------------------|------------------------|--------------|
| 30 - 1000        | all         | -66.8                           | -57                    | 9.8          |
| > 1000           | all         | -70.0                           | -53                    | 17.0         |

### Requirements: RSS-GEN Issue 2, clause 6

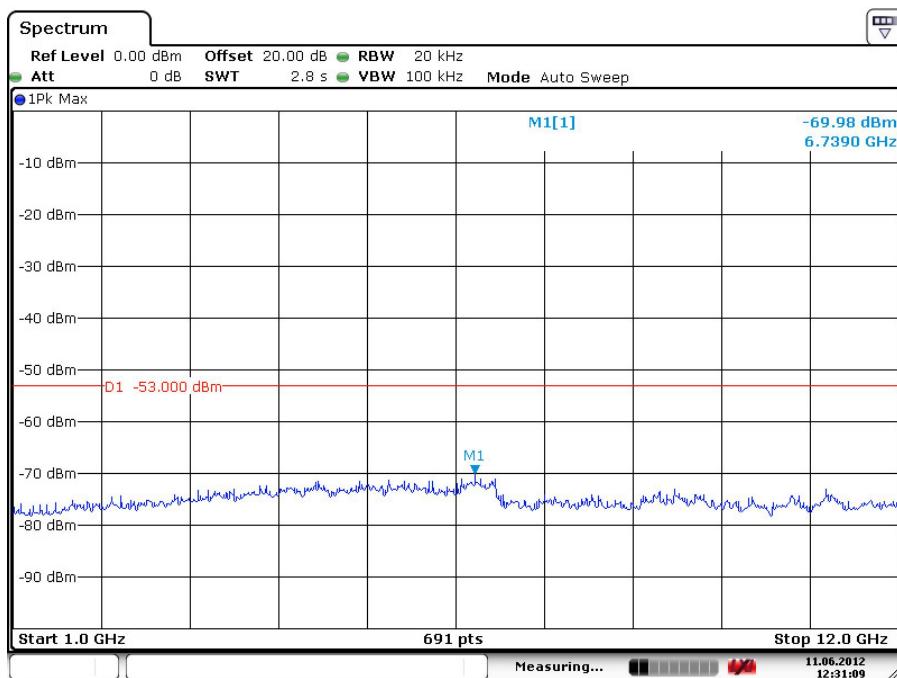
The measurement can be performed either radiated or conducted.

**When measured conducted:** No spurious signals appearing at the antenna terminals shall exceed 2 nW per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nW above 1 GHz.

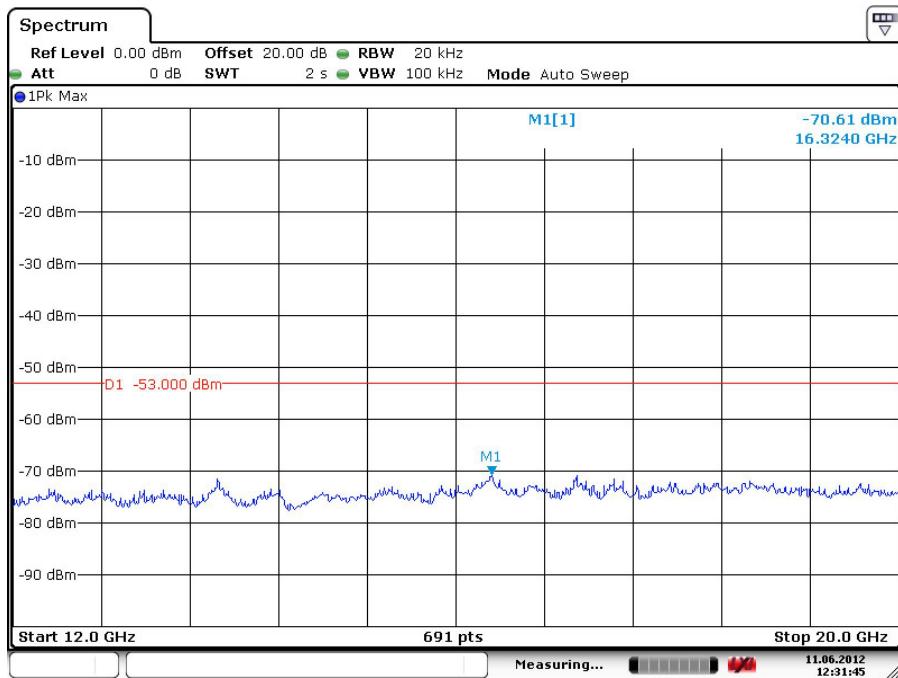
**When measured radiated:** See table 1 in RSS-GEN Issue2, clause 6.



### Receiver Spurious Emissions, Conducted, 100 kHz – 1 GHz



### Receiver Spurious Emissions, Conducted, 1 GHz – 12 GHz

**Receiver Spurious Emissions, Conducted, 12 GHz – 20 GHz**

## 10 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

| No.                                  | Instrument/Ancillary  | Manufacturer            | Type            | Serial-No.  | Internal identification |
|--------------------------------------|-----------------------|-------------------------|-----------------|-------------|-------------------------|
| <b>Radiated Emission</b>             |                       |                         |                 |             |                         |
| F-1                                  | Control Computer      | F+W                     |                 | FW0502032   | 300003303               |
| F-2                                  | Trilog antenna        | Schwarzbeck             | VULB 9163       | 9163-295    | - / -                   |
| F-3a                                 | Amplifier             | Veritech Microwave Inc. | 0518C-138       | - / -       | - / -                   |
| F-4b                                 | Switch                | HP                      | 3488A           | - / -       | 300000368               |
| F-5                                  | EMI Test receiver     | R&S                     | ESCI            | 100083      | 300003312               |
| F-6                                  | Turntable Controller  | EMCO                    | 1061 3M         | 1218        | 300000661               |
| F-7                                  | Tower Controller      | EMCO                    | 1051 Controller | 1262        | 300000625               |
| F-8                                  | Tower                 | EMCO                    | 1051 Tower      | 1262        | 300000625               |
| F-9                                  | EMI Test receiver     | R&S                     | ESU             | - / -       | 300003555               |
| <b>Power Line Conducted Emission</b> |                       |                         |                 |             |                         |
| G-1                                  | EMI Receiver          | Hewlett Packard         | 8542 E          | 3617A0017 0 | 300000568               |
| G-2                                  | V-ISN                 | Rohde & Schwarz         | ESH 3-Z5        | 892475/017  | 300002209               |
| G-2a                                 | V-ISN                 | Rohde & Schwarz         | ESH 2-Z5        | 892602/024  | 300000587               |
| G-3                                  | 2-Wire ISN            | Schaffner               | ISN T200        | 19075       | 300003422               |
| G-4                                  | 4-Wire ISN            | Schaffner               | ISN T400        | 22325       | 300003423               |
| G-5                                  | Shielded wire ISN     | Schaffner               | ISN ST08        | 22583       | 300003433               |
| G-6                                  | Unshielded 8 wire ISN | Teseq                   | ISN T800        | 26113       | 300003833               |
| G-7                                  | Unshielded 8 wire ISN | Teseq                   | ISN T8-Cat. 6   | 26374       | 300003851               |
| G-8                                  | RF Current probe      | FCC                     | F-33-4          | 46          | 300003257               |
| G-9                                  | V-ISN                 | Schaffner               | ISN PLC-150     | 21579       | 300003318               |
| G-10                                 | V-ISN                 | Schaffner               | ISN PLC-25-30   | 21584       | 300003319               |
| G 10a                                | PLC Filter            | TESEQ                   | Filter PLC      | 23436       | 300003598               |
| G 10b                                | Coupling unit 75 Ohm  | Fiedler                 | AC              | - / -       | 300003272.0 4           |
| <b>Conducted</b>                     |                       |                         |                 |             |                         |
| L-1                                  | Spectrum Analyzer     | R&S                     | FSV30           | 100763      | 300003950               |
| L-2                                  | Signal Generator      | R&S                     | SMU200A         | 101633      | 300003496               |
| L-3                                  | Oscilloscope          | Tektronix               | DPO 7254        | B022702     | 300003573               |
| L-4                                  | Signaling Unit        | R&S                     | CMD 65          | 847527/005  | 300003611               |
| L-5                                  | Combiner              | R&S                     | 1025.3400.02    | - / -       | - / -                   |
| L-6                                  | Combiner              | Suhner                  | 4901.19A        | - / -       | - / -                   |
| L-7                                  | Combiner              | Weinschel               | 1515            | KW438       | - / -                   |
| L-8                                  | Detector              | Hewlett Packard         | HP 8473C        | 03690       | - / -                   |
| L-9                                  | Attenuator            | Narda                   | 4779-50         | 9101        | - / -                   |
| L-10                                 | Attenuator            | Narda                   | 4779-30         | 9305        | - / -                   |
| L-11                                 | Attenuator            | Narda                   | 4779-20         | 9310        | - / -                   |
| L-12                                 | Control PC            | F+W                     | - / -           | FW0712052   | 300003735               |

## 11 Observations

No observations exceeding those reported with the single test cases have been made.