

TEST REPORT

| | | |
|------------------------|----------------------------------|---|
| Report Number | RAPA13-O-494 | |
| Type of Equipment | Keyless Entry System | |
| Model Name | 2W901R-SS PTS | |
| FCC ID | VA5R901-2WSS | |
| IC Number | 7087A-2WR901WSS | |
| Applicant | Name | SEGI LIMITED |
| | Logo | SEGI |
| | Address | Unit F, 7/F, Century Industrial Center, 33-35 AU PUI WAN Street, Shatin NT, Hong Kong |
| Manufacturer | Name | SEGI ELECTRONICS CO., LTD |
| | Address | Chenjiapucun, Liaobu Town Dongguan City, Guangdong Province, 523-408, P.R. China |
| Test period | June 24, 2013 to August 02, 2013 | |
| Issuing date of report | August 02, 2013 | |
| Total page | 36 pages (including this page) | |

SUMMARY

The equipment complies with FCC Part 15.247: Operation within the bands 902 MHz to 928 MHz, 2 400 MHz to 2 483.5 MHz, and 5 725 MHz to 5 850 MHz.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Date : August 02, 2013

Date : August 02, 2013



Prepared and tested by Chang Young Choi
Deputy General Manager / TCL of RAPA



Reviewed by Sukil Park
Executive Managing Director / TCL of RAPA

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1. GENERAL DESCRIPTION

1.1 Applicant

- Company name : SEGI LIMITED
- Address : Unit F, 7/F, Century Industrial Center, 33-35 AU PUI WAN Street, Shatin NT, Hong Kong
- Contact person : Eui Seok Chung
- Phone/Fax : +82-32-623-5550 / +82-32-623-6667

1.2 Manufacturer

- Company name : SEGI ELECTRONICS CO., LTD
- Address : Chenjiapucun, Liaoibu Town Dongguan City, Guangdong Province, 523-408, P.R. China
- Contact person : Eui Seok Chung
- Phone/Fax : +82-32-623-5550 / +82-32-623-6667

1.3 Basic description of EUT

- Product name : Keyless Entry System
- Model name : 2W901R-SS PTS
- Serial number : N/A
- Frequency : 910.92 MHz ~ 919.08 MHz
- Number of channel(s) : 25 Channels
- Modulation method : FHSS
- FCC Rule Part(s) : FCC CFR47 Part 15 Subpart C Section 15.247
- IC Rule Part(s) : IC RSS-210 Issue8 Annex 8-2010
- FCC classification : DSS / Part 15 Spread Spectrum Transmitter (FHSS)
- IC classification : Annex 8 / Frequency Hopping and Digital Modulation Systems Operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz
- Test period : June 24, 2013 to August 02, 2013
- Issuing date of report : August 02, 2013
- Place of test : Head office
824, B104, Anyang Megavalley, 799, Gwanyang-dong, Dongan-gu, Anyang-si, Gyeonggi-do, 431-767, Korea

Open Area Test Site

80, Jeil-ri, Yangji-myun, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-825, Korea

(FCC Registration Number : 337229)

(IC Submission Number : 143881)

(KCC Designation Number : KR0027)

1.4 Electrical specification

| Item | Specifications |
|--------------------|--|
| Type of Equipment | Keyless Entry System |
| Model Name | 2W901R-SS PTS |
| Transmit Frequency | 910.92 MHz ~ 919.08 MHz (25 CH / 340 kHz Step) |
| Receive Frequency | 20 kHz / 1 CH |
| Modulation Method | FHSS |
| Power Source | DC 3.7 V Li-Polymer Rechargeable battery |
| Size (mm) | 40.0 x 64.7 x 13.9 (L x H x W) |
| Weight (g) | 29.7 |

2. General information of test

2.1 Standard for measurement methods

| Applied Standard : FCC CFR47 Part 15 Subpart C, IC RSS-210 Issue8 Annex 8-2010 | | | | |
|---|----------------|--------------------------------------|--------------------------|--------|
| FCC | IC | Description of Test | Limit | Result |
| 15.209 | RSS-210_2.2 | Radiated Emission in Restricted Band | See 15.207 | Pass |
| 15.247(a)(1) | RSS-210_A8.1_B | Frequency Separation | ≥ 20 dB Bandwidth | Pass |
| 15.247(a)(1)(i) | RSS-210_A8.1_C | Number of Hopping Channels | ≥ 25 CH | Pass |
| 15.247(a)(1)(i) | RSS-210_A8.1_C | Occupied Bandwidth | ≤ 500 kHz | Pass |
| 15.247(a)(1)(i) | RSS-210_A8.1_C | Average Time of Occupancy | ≤ 0.4 s within 10 s | Pass |
| 15.247(b)(2) | RSS-210_A8.4_1 | Maximum Peak Output Power | ≤ 0.25 Watt | Pass |
| 15.247(d) | RSS-210_A8.5 | Conducted Emission & Band Edge | ≥ 20 dBc | Pass |

2.2 Description of EUT modification

During the test, there was no mechanical or circuitry modification to improve any RF specification including spurious characteristic, and any RF and spurious suppression device(s) were not added against the device tested.

2.3 Description of test system configuration

- Peripheral equipment used;

| Description | Model name | Serial No. | Manufacturer | FCC ID | IC Number |
|-------------|---------------|------------|--------------|--------------|-----------------|
| EUT | 2W901R-SS PTS | N/A | SEGI | VA5R901-2WSS | 7087A-2WR901WSS |

- Cables used

| Device from | Device to | Type of cable | Type of connector | Length |
|-------------|-----------|---------------|-------------------|--------|
| - | - | - | - | - |

3. Measurement data

3.1 Radiated emission in restricted band

3.1.1 Definitions

A radiated emission is a emission from the equipment when transmitting into a non-radiating load on frequencies that are restricted band sufficient to ensure transmission of information of required quality for the class of communications desired.

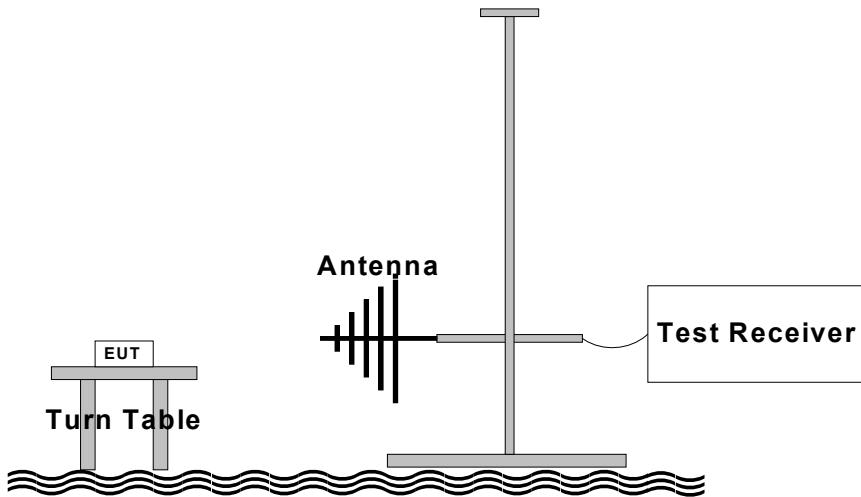
3.1.2 Specification

- FCC Rules Part 15 Subpart C Section 15.209
- IC Rules RSS-210 Section 2.2

3.1.3 Measurement method

- ANSI Standard C63.4-2003 8.3

3.1.4 Set-up



3.1.5 Test equipment list

| Equipment | Model name | Manufacturer |
|----------------------|--------------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI |
| Test Receiver | ESCI 7 | Rohde & Schwarz |
| Loop antenna | EMCO 6502 | EMCO |
| Bi-conical antenna | VHA9103 | Schwarzbeck |
| Log periodic antenna | VULP9118A | Schwarzbeck |
| Horn Antenna | BBHA-9120D | Schwarzbeck |
| Pre-amplifier | SCU01 | Rohde & Schwarz |
| Pre-amplifier | JS4-00102600-26-5P | MITEQ |

3.1.6 Test procedure

The EUT is placed on a turntable, which is 0.8 meter high above ground.

The turntable rotates 360 degrees to determine the position of the maximum emission level.

EUT is set 3.0 meters away from the receiving antenna, broadband antenna, which is mounted on an antenna mast. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level from the EUT. Both horizontal and vertical polarizations of the antenna are set on measurement.

In order to find out the maximum emission levels, all of the EUT location were manipulated according to ANSI 63.4 during the radiated emission measurement. The EUT was tested to 3 orthogonal planes.

The RBW of test receiver is 120 kHz between 30 to 1 000 MHz, and 1 MHz above 1 GHz.

3.1.7 Test condition

- Test place : Open area test site
- Test environment : 26.2 °C, 56 % R.H.
- Test mode : Operation at single channel

3.1.8 Limit

| Frequency [MHz] | Field Strength [μ V/m] | Field Strength [dB μ V/m] | Measurement Distance [m] |
|--------------------|--------------------------------|----------------------------------|-----------------------------|
| 0.009 – 0.490 | 2 400 / F(kHz) | 48.52 to 13.80 | 300 |
| 0.490 – 1.705 | 2 4000 / F(kHz) | 33.80 to 22.97 | 30 |
| 1.705 – 30.0 | 30 | 29.54 | 30 |
| 30 – 88 | 100 | 40.00 | 3 |
| 88 – 216 | 150 | 43.52 | 3 |
| 216 – 960 | 200 | 46.02 | 3 |
| Above 470 | 500 | 53.98 | 3 |

Remark: Radiated emissions which fall in the restricted bands must also comply with the limits as this table.

3.1.9 Test result

- Operation frequency: 910.92 MHz

| Frequency [MHz] | Pol. [H/V] | Plane [X/Y/Z] | Detect mode [Peak/AVG] | Reading [dB μ V] | Antenna factor [dB/m] | Cable loss [dB] | Pre-amp gain [dB] | Emission level [dB μ V] | Limit [dB μ V] | Margin [dB] |
|-----------------|------------|---------------|------------------------|----------------------|-----------------------|-----------------|-------------------|-----------------------------|--------------------|-------------|
| 902.92 | H | Y | Peak | 88.2 | 22.6 | 4.1 | 0 | 108.9 | - | - |
| 902.92 | H | Y | AVG | 46.9 | 22.6 | 4.1 | 0 | 103.6 | - | - |
| 1 821.84 | V | Y | Peak | 36.6 | 25.8 | 5.8 | 0 | 68.2 | 88.9 | 20.7 |
| 1 821.84 | V | Y | AVG | 26.0 | 25.8 | 5.8 | 0 | 57.6 | 68.9 | 11.3 |
| 2 732.76 | V | Y | Peak | 25.0 | 28.1 | 7.2 | 0 | 60.3 | 74.0 | 13.7 |
| 2 732.76 | V | Y | AVG | 14.3 | 28.1 | 7.2 | 0 | 49.6 | 54.0 | 4.4 |
| 3 643.68 | V | Y | Peak | 23.8 | 29.3 | 8.4 | 0 | 61.5 | 74.0 | 12.5 |
| 3 643.68 | V | Y | AVG | 12.9 | 29.3 | 8.4 | 0 | 50.6 | 54.0 | 3.4 |

- Operation frequency: 915.00 MHz

| Frequency [MHz] | Pol. [H/V] | Plane [X/Y/Z] | Detect mode [Peak/AVG] | Reading [dB μ V] | Antenna factor [dB/m] | Cable loss [dB] | Pre-amp gain [dB] | Emission level [dB μ V] | Limit [dB μ V] | Margin [dB] |
|-----------------|------------|---------------|------------------------|----------------------|-----------------------|-----------------|-------------------|-----------------------------|--------------------|-------------|
| 915.00 | H | Y | Peak | 82.7 | 22.6 | 4.1 | 0 | 109.4 | - | - |
| 915.00 | H | Y | AVG | 77.8 | 22.6 | 4.1 | 0 | 104.5 | - | - |
| 1 830.00 | V | Y | Peak | 35.8 | 25.9 | 5.8 | 0 | 67.5 | 89.4 | 21.9 |
| 1 830.00 | V | Y | AVG | 23.6 | 25.9 | 5.8 | 0 | 55.3 | 69.4 | 14.1 |
| 2 745.00 | V | Y | Peak | 25.4 | 28.1 | 7.2 | 0 | 60.7 | 74.0 | 13.3 |
| 2 745.00 | V | Y | AVG | 14.9 | 28.1 | 7.2 | 0 | 50.2 | 54.0 | 3.8 |
| 3 660.00 | V | Y | Peak | 23.4 | 29.4 | 8.5 | 0 | 61.3 | 74.0 | 12.7 |
| 3 660.00 | V | Y | AVG | 12.2 | 29.4 | 8.5 | 0 | 50.1 | 54.0 | 3.9 |

- Operation frequency: 919.08 MHz

| Frequency [MHz] | Pol. [H/V] | Plane [X/Y/Z] | Detect mode [Peak/AVG] | Reading [dB μ V] | Antenna factor [dB/m] | Cable loss [dB] | Pre-amp gain [dB] | Emission level [dB μ V] | Limit [dB μ V] | Margin [dB] |
|-----------------|------------|---------------|------------------------|----------------------|-----------------------|-----------------|-------------------|-----------------------------|--------------------|-------------|
| 919.08 | H | Y | Peak | 83.8 | 22.6 | 4.1 | 0 | 110.5 | - | - |
| 919.08 | H | Y | AVG | 77.1 | 22.6 | 4.1 | 0 | 103.8 | - | - |
| 1 838.16 | V | Y | Peak | 33.6 | 25.9 | 5.8 | 0 | 65.3 | 90.5 | 25.2 |
| 1 838.16 | V | Y | AVG | 19.7 | 25.9 | 5.8 | 0 | 51.4 | 70.5 | 19.1 |
| 2 757.24 | V | Y | Peak | 27.4 | 28.1 | 7.2 | 0 | 62.7 | 74.0 | 11.3 |
| 2 757.24 | V | Y | AVG | 15.1 | 28.1 | 7.2 | 0 | 50.4 | 54.0 | 3.6 |
| 3 676.32 | V | Y | Peak | 22.9 | 29.4 | 8.5 | 0 | 60.8 | 74.0 | 13.2 |
| 3 676.32 | V | Y | AVG | 11.0 | 29.4 | 8.5 | 0 | 48.9 | 54.0 | 5.1 |

Remark: The other emissions were not detected.

3.2 Frequency separation

3.2.1 Definitions

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

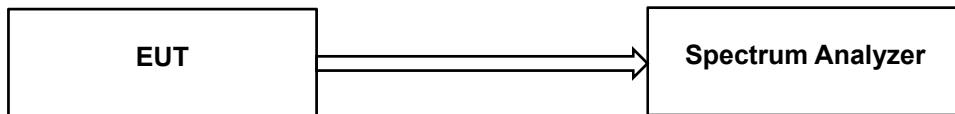
3.2.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(a)(1)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.1 B

3.2.3 Measurement method

- Public Notice "DA 00-705"

3.2.4 Set-up



3.2.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.2.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- The Hopping channel separation is defined as the channel is separated with next channel.

3.2.7 Test condition

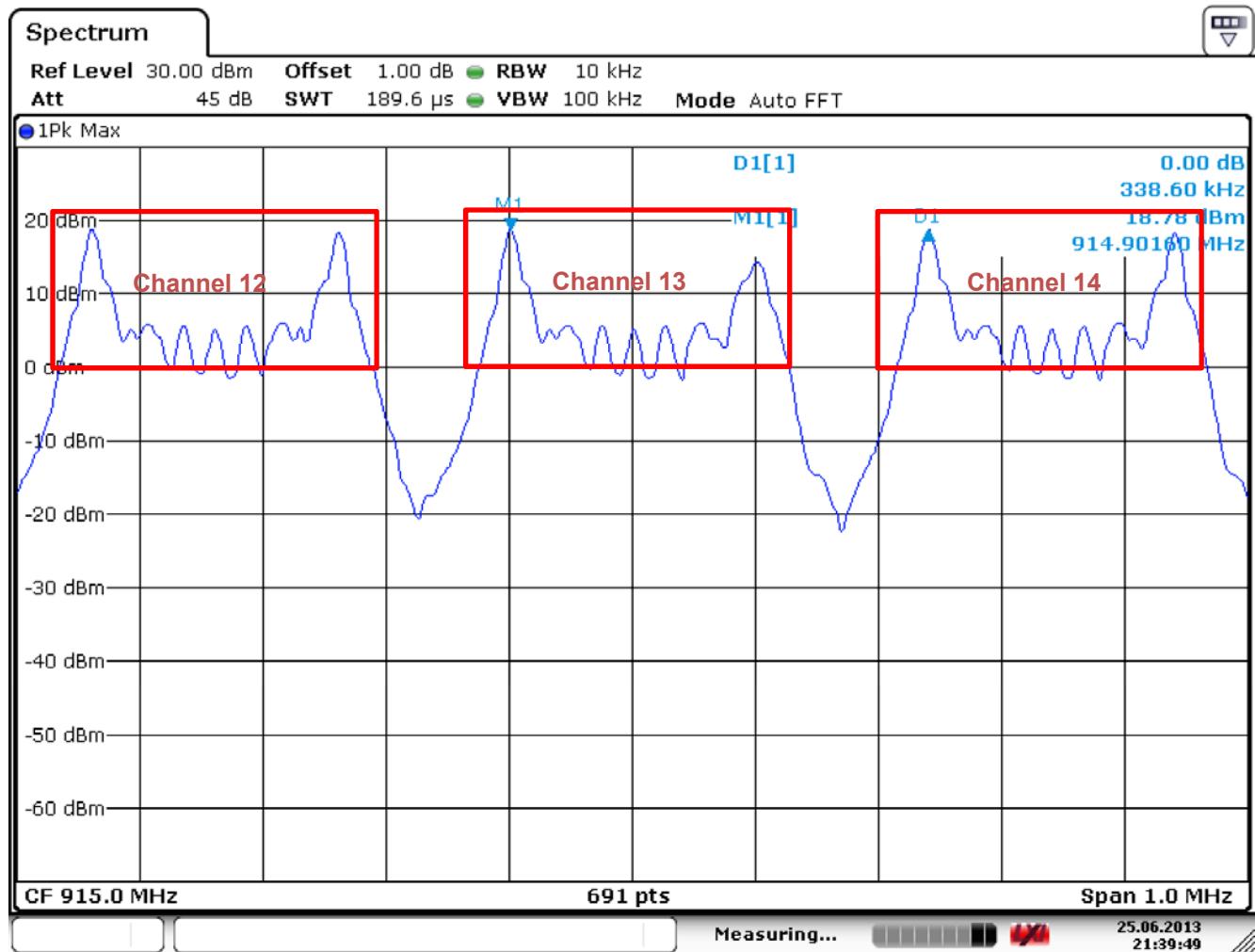
- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at full hopping

3.2.8 Test result

| Channel | Frequency separation [kHz] | Limit [kHz] |
|--------------|-------------------------------|----------------|
| Full hopping | 338.6 | ≥ 270.6 |

Remark: For the limit value, please refer to the maximum 20 dB Bandwidth value of section 3.4.8 in this report.

3.2.10 Plots of frequency separation



Operating frequency : Full hopping

RBW : 10 kHz

VBW : 100 kHz

Detector mode : Peak

Trace mode : Max hold

Sweep time : Auto

Frequency separation : 338.6 kHz

3.3 Number of hopping channels

3.3.1 Definitions

Frequency hopping systems operating in the 902 MHz - 928 MHz should employ at least 25 hopping channels.

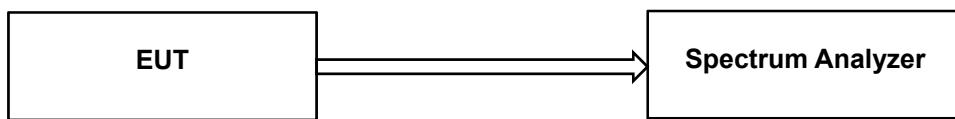
3.3.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(a)(1)(i)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.1 C

3.3.3 Measurement method

- Public Notice “DA 00-705”

3.3.4 Set-up



3.3.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.3.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- Measure the hopping channels of EUT using spectrum analyzer.
- With the analyzer set to max hold readings were taken for 1 ~ 2 minutes in each band.

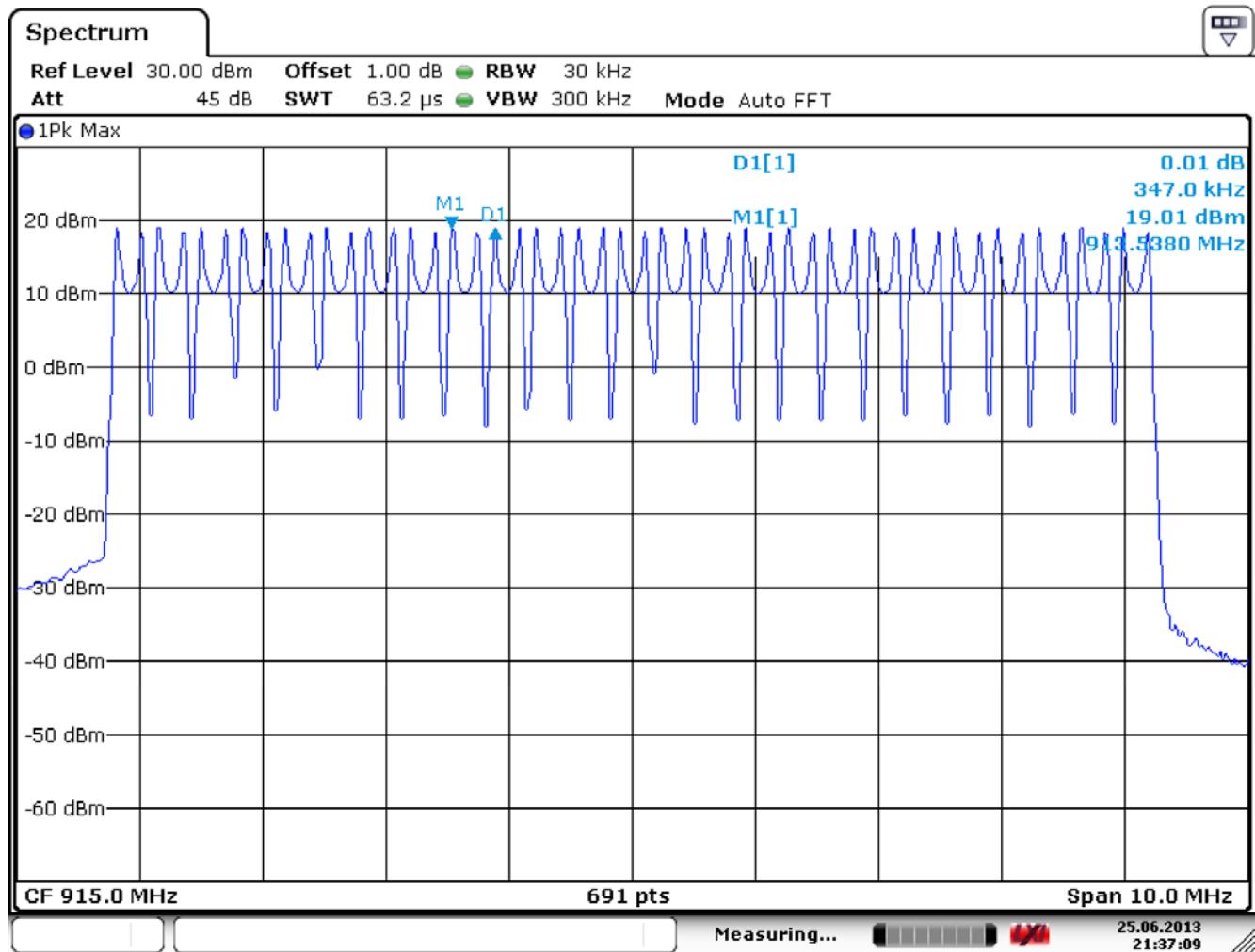
3.3.7 Test condition

- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at full hopping

3.3.8 Test result

| Channel | Number of hopping channels | Limit |
|--------------|----------------------------|---------------|
| Full hopping | 25 | ≥ 25 Channels |

3.3.10 Plots of number of hopping channels



Date: 25.JUN.2013 21:37:08

Operating frequency : Full hopping
RBW : 30 kHz
VBW : 300 kHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Number of hopping channels : 25

3.4 Occupied bandwidth

3.4.1 Definitions

A occupied bandwidth is width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each lower 20 dB of the total mean power of a given emission.

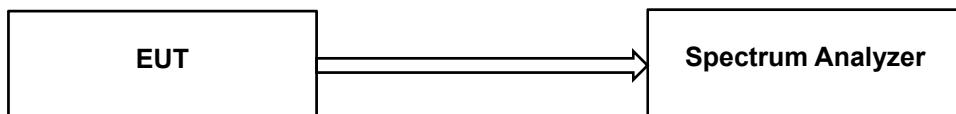
3.4.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(a)(1)(i)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.1 C

3.4.3 Measurement method

- Public Notice "DA 00-705"

3.4.4 Set-up



3.4.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.4.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level.

3.4.7 Test condition

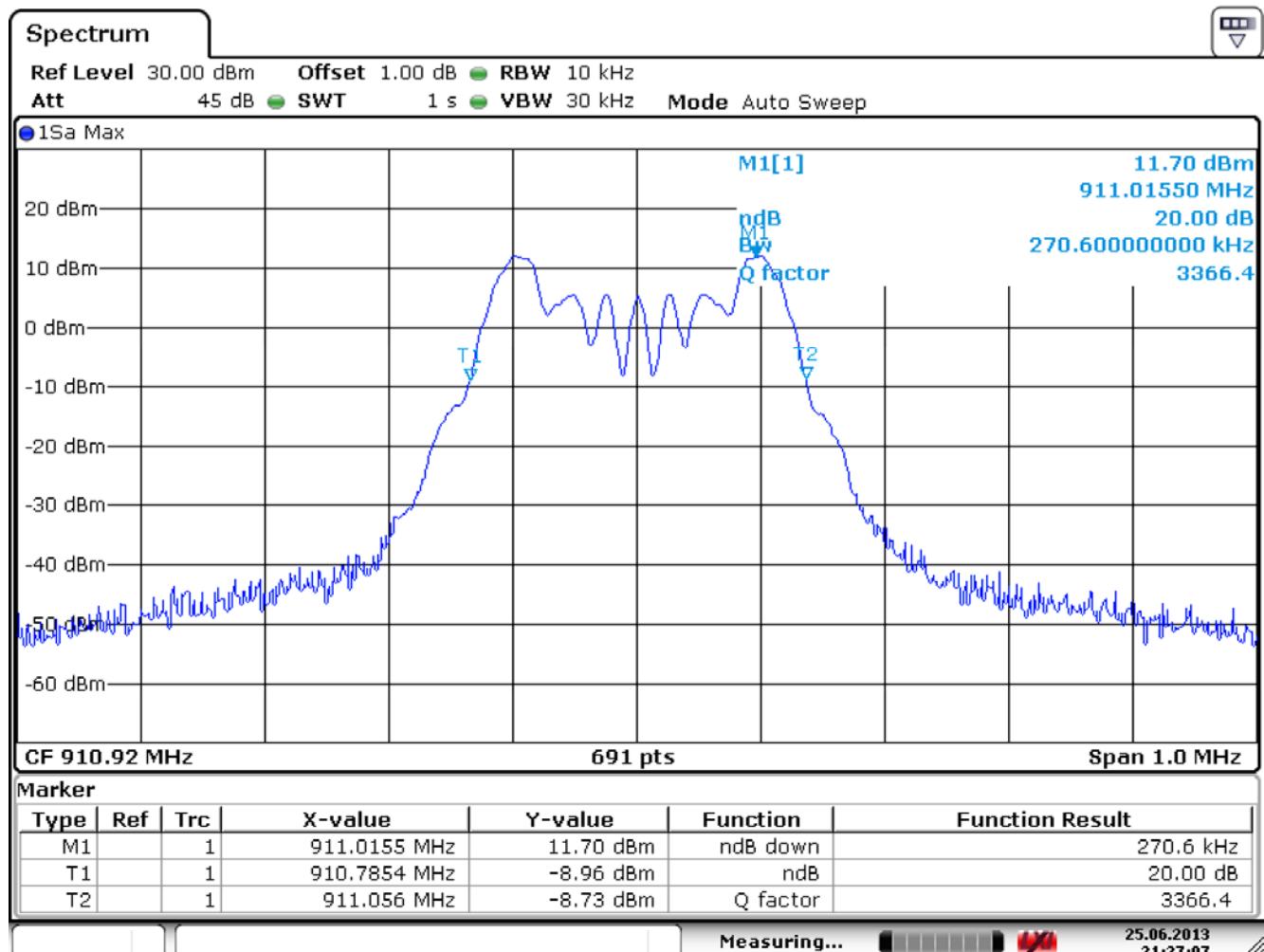
- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at single channel

3.4.8 Test result

| Frequency [MHz] | 20 dB Bandwidth [kHz] | 99 % Bandwidth [kHz] |
|--------------------|--------------------------|-------------------------|
| 910.92 | 270.6 | 251.8 |
| 915.00 | 270.6 | 250.4 |
| 919.08 | 269.2 | 250.4 |

3.4.9 Plots of 20 dB bandwidth

3.4.9.1 Channel 1

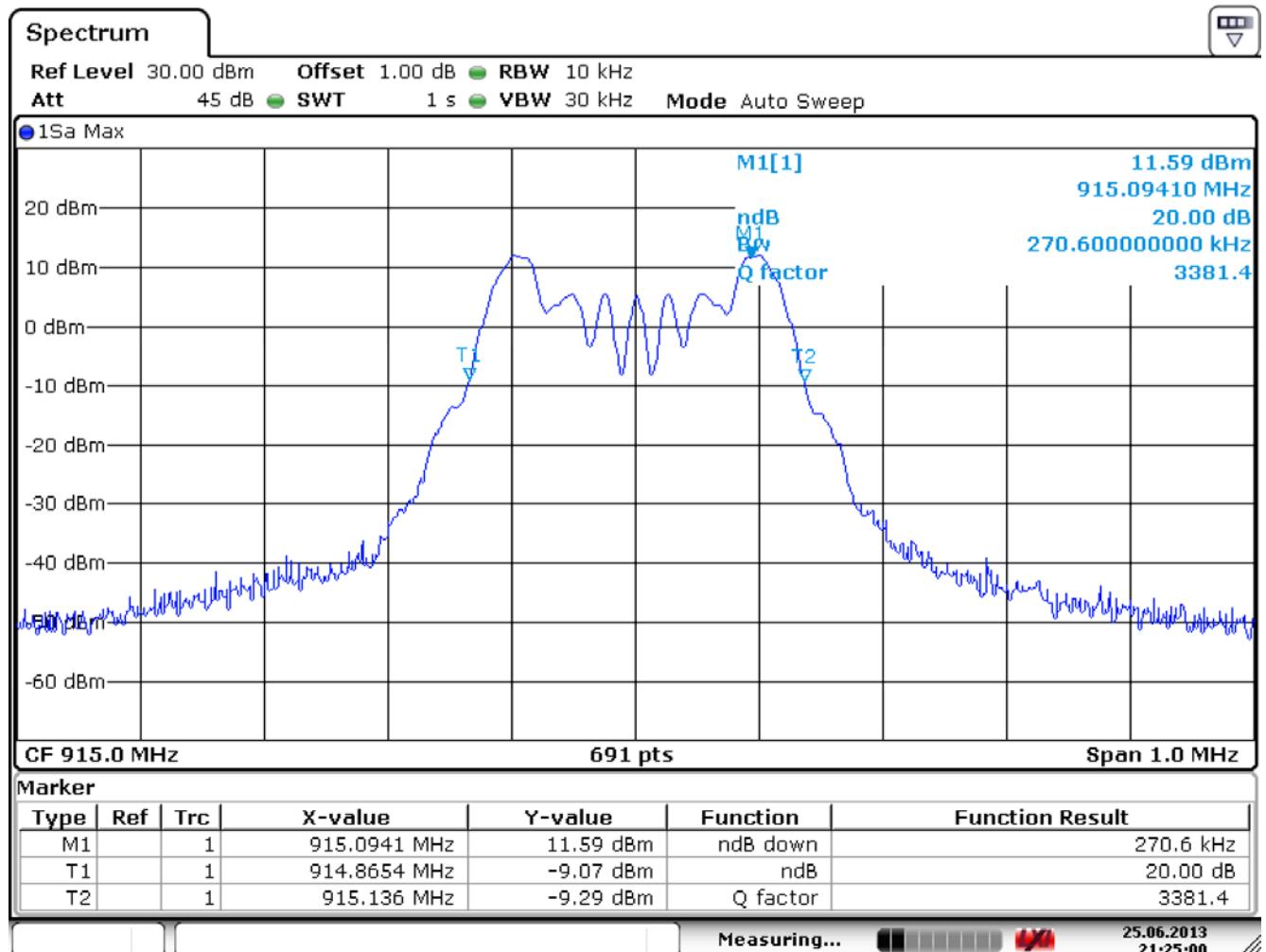


Date: 25.JUN.2013 21:27:07

Operating frequency : 910.92 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

20 dB bandwidth : 270.6 kHz

3.4.9.2 Channel 13

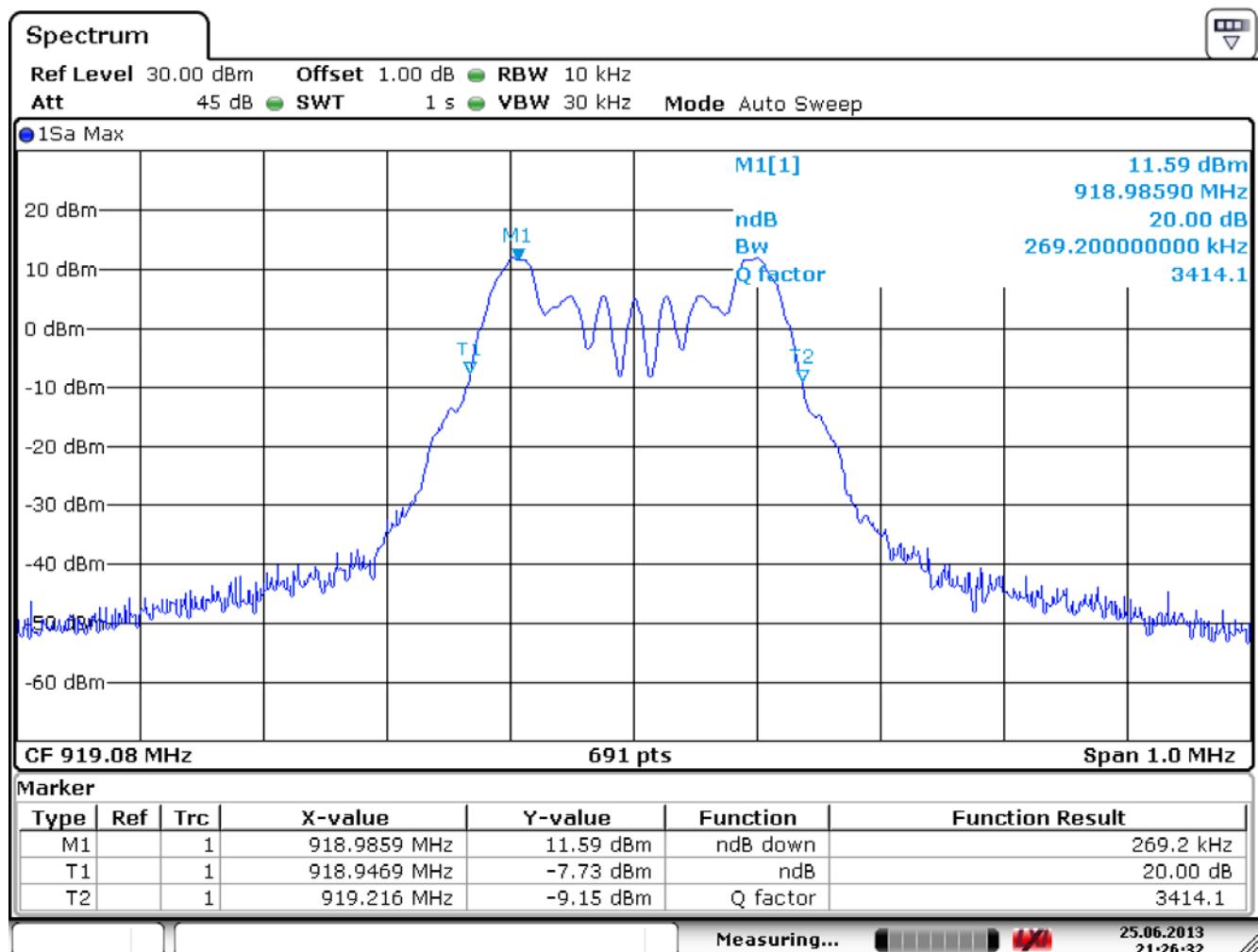


Date: 25.JUN.2013 21:24:59

Operating frequency : 915.00 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

20 dB bandwidth : 270.6 kHz

3.4.9.3 Channel 25



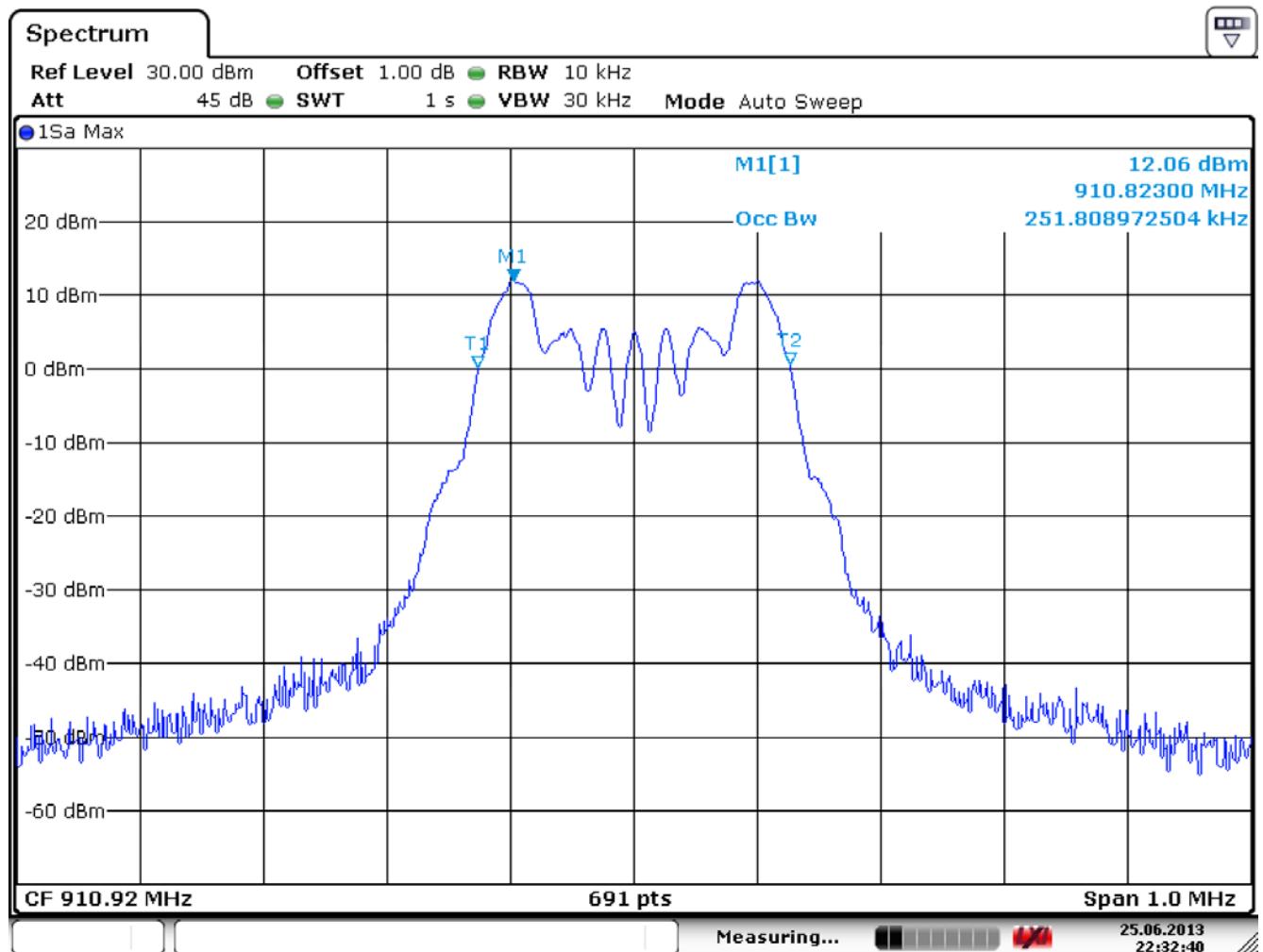
Date: 25.JUN.2013 21:26:32

Operating frequency : 919.08 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

20 dB bandwidth : 269.2 MHz

3.4.10 Plots of 99 % bandwidth

3.4.10.1 Channel 1

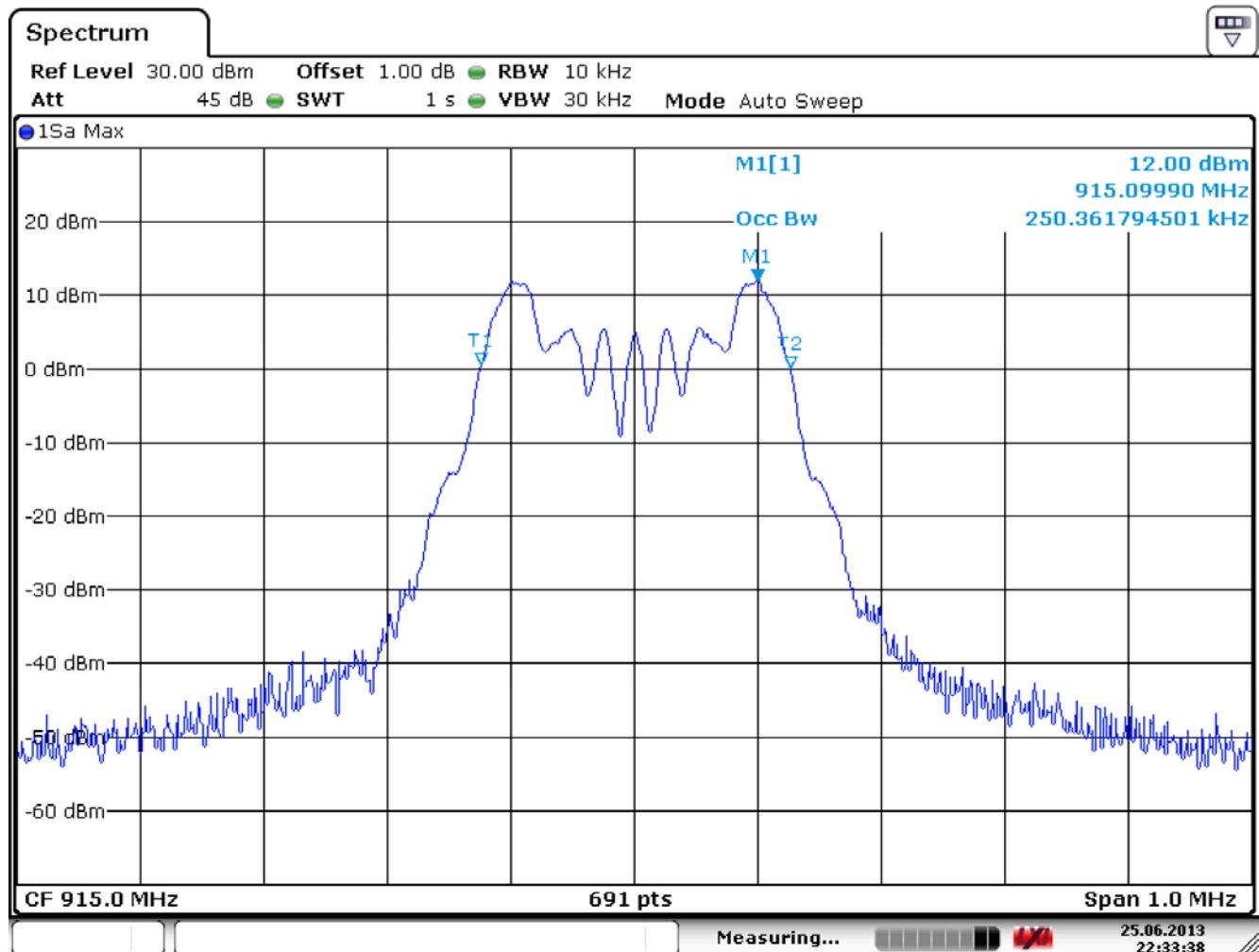


Date: 25.JUN.2013 22:32:40

Operating frequency : 910.92 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

99 % bandwidth : 251.8 kHz

3.4.10.2 Channel 13

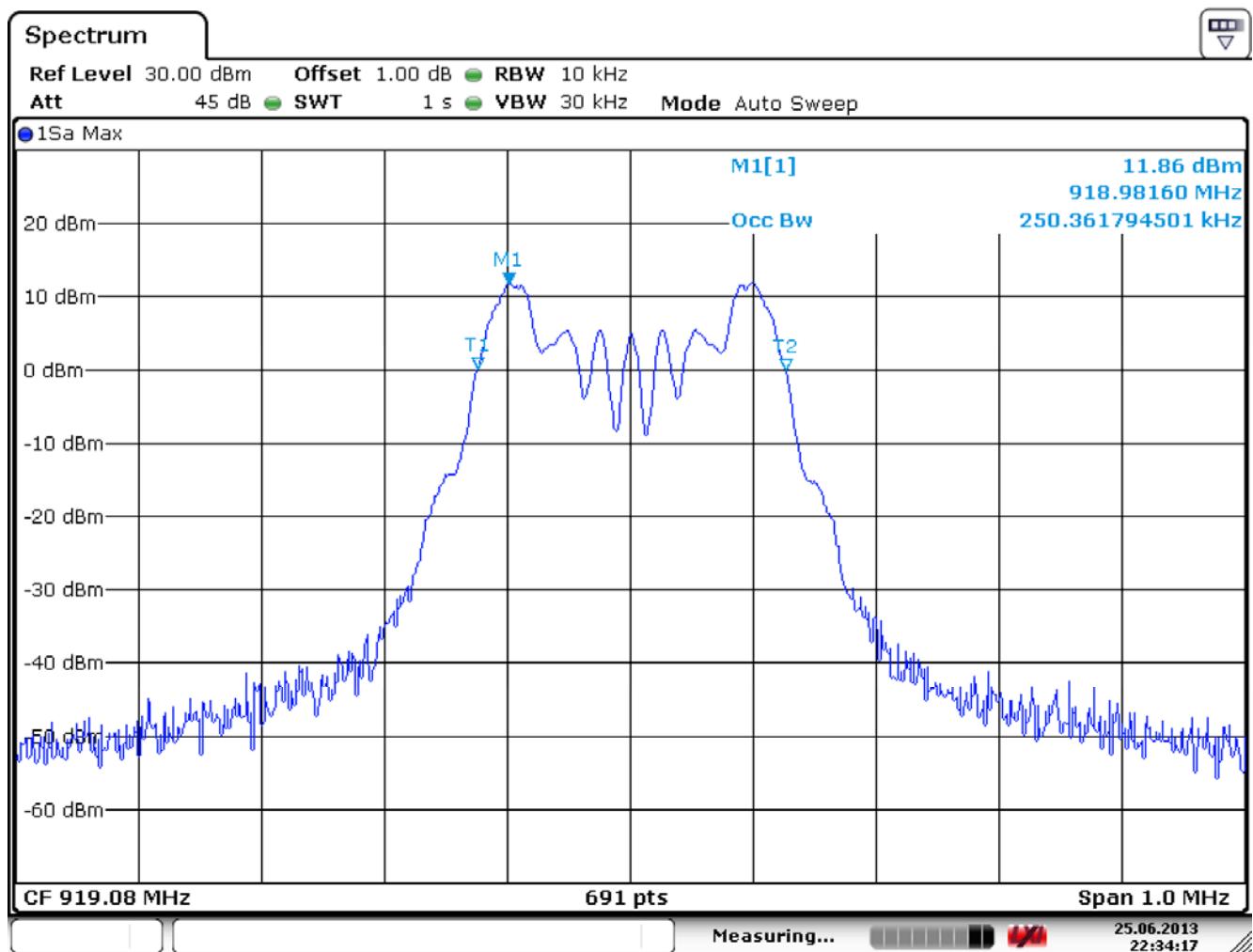


Date: 25.JUN.2013 22:33:38

Operating frequency : 915.00 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

99 % bandwidth : 250.4 kHz

3.4.10.3 Channel 25



Date: 25.JUN.2013 22:34:16

Operating frequency : 919.08 MHz
RBW : 10 kHz
VBW : 30 kHz
Detector mode : Sample
Trace mode : Max hold
Sweep time : 1 s

99 % bandwidth : 250.4 kHz

3.5 Average time of occupancy

3.5.1 Definitions

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a 10 second period.

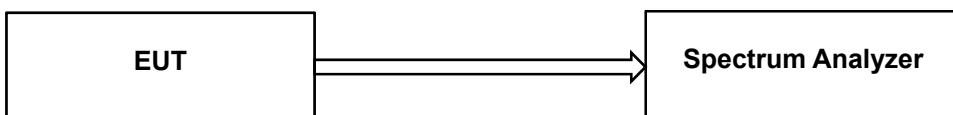
3.5.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(a)(1)(i)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.1 C

3.5.3 Measurement method

- Public Notice “DA 00-705”

3.5.4 Set-up



3.5.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.5.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- Sets RBW 1 MHz, VBW 1 MHz, Max hold

3.5.7 Test condition

- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at full hopping

3.5.8 Test result

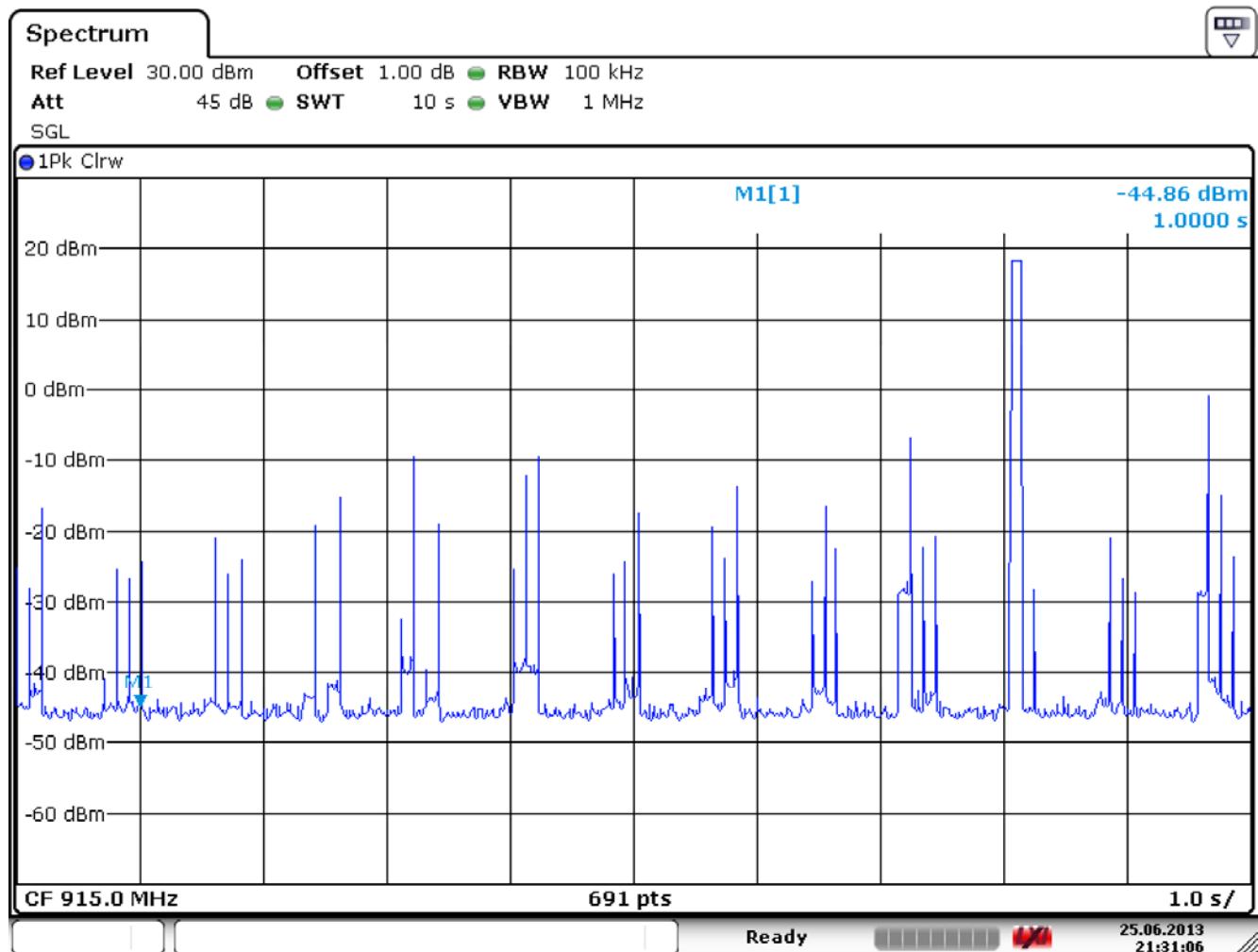
| Dwell time [ms] | Limit [ms] |
|--------------------|---------------|
| 97.1 | 400 |

3.5.9 Limit

Less than 0.4 seconds within 10 seconds period.

3.5.10 Plots of channel occupation

3.5.10.1 Within 10 seconds period

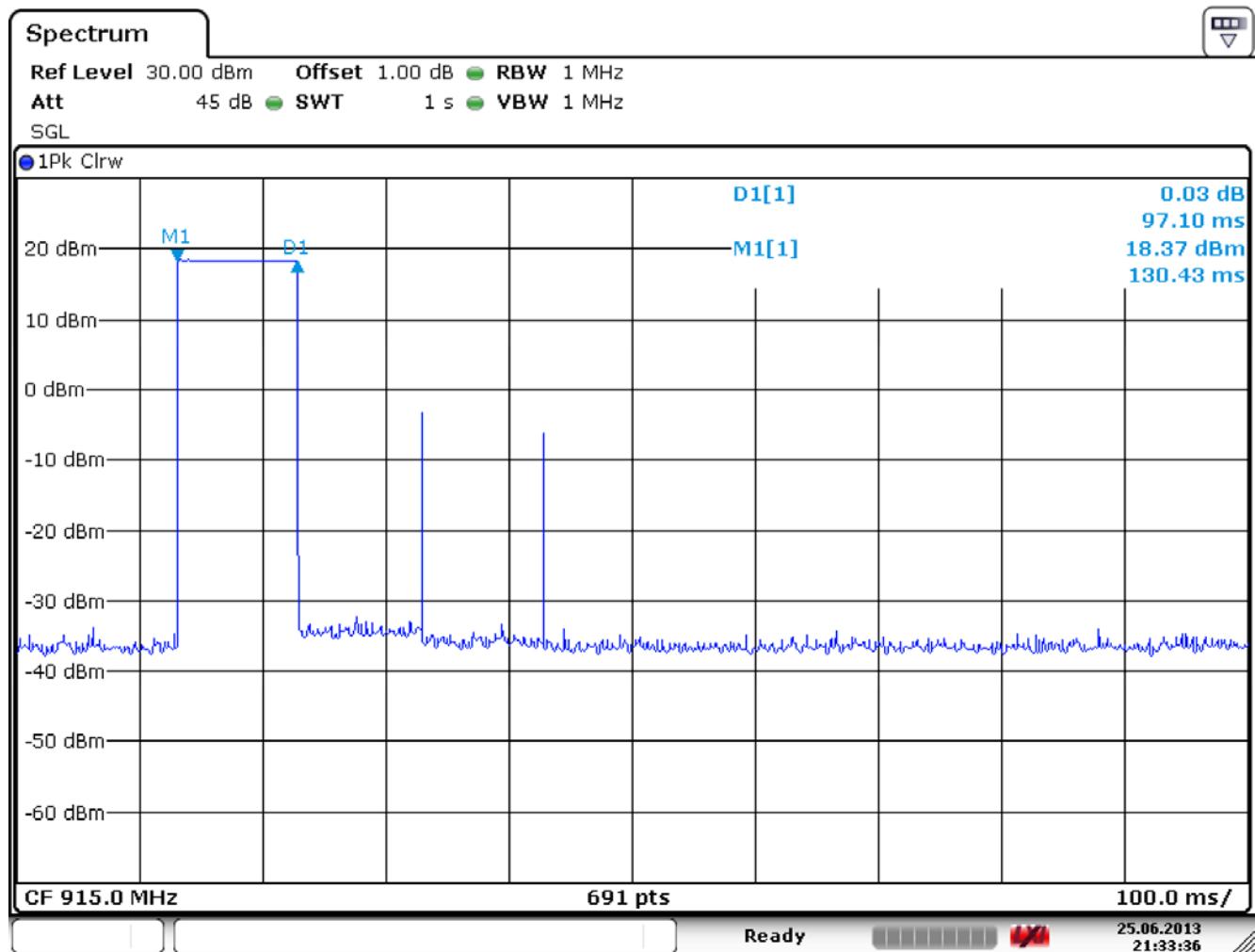


Date: 25.JUN.2013 21:31:05

Operating frequency : Full hopping
RBW : 100 kHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : View
Sweep time : 10 s

Number of channel within 10 s : 1

3.5.10.2 Dwell time



Date: 25.JUN.2013 21:33:36

Operating frequency : Full hopping
RBW : 1 MHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : View
Sweep time : 1 s

Dwell time : 97.1 ms

3.6 Maximum peak output power

3.6.1 Definitions

Maximum conducted output power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level.

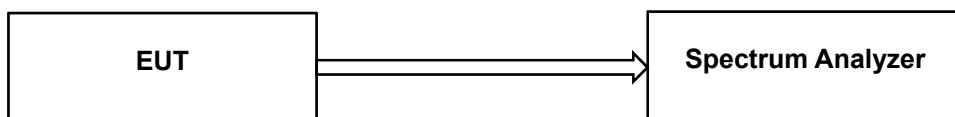
3.6.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(b)(2)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.4

3.6.3 Measurement method

- Public Notice “DA 00-705”

3.6.4 Set-up



3.6.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.6.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- Sets RBW 1 MHz, VBW 20 MHz, Max hold

3.6.7 Test condition

- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at full hopping

3.6.8 Test result

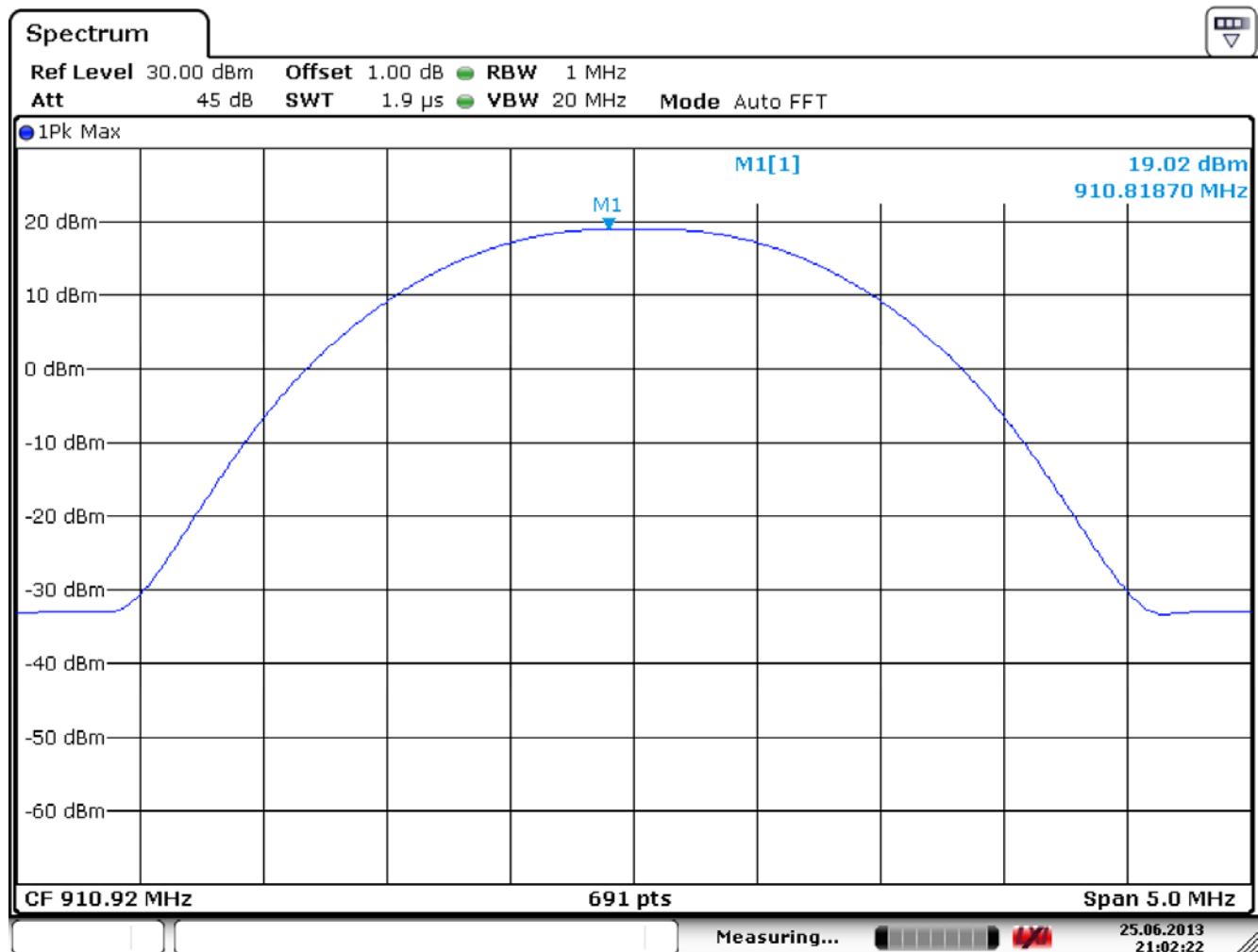
| Frequency [MHz] | Peak Output Power [mW] | | Limit [mW] |
|--------------------|---------------------------|-----------|---------------|
| | High power | Low power | |
| 910.92 | 79.8 | 0.120 | 250.0 |
| 915.00 | 77.3 | 0.118 | 250.0 |
| 919.08 | 77.6 | 0.120 | 250.0 |

3.6.9 Limit

Less than 0.25 Watts.

3.6.10 Plots of peak output power at high power

3.6.10.1 Channel 1

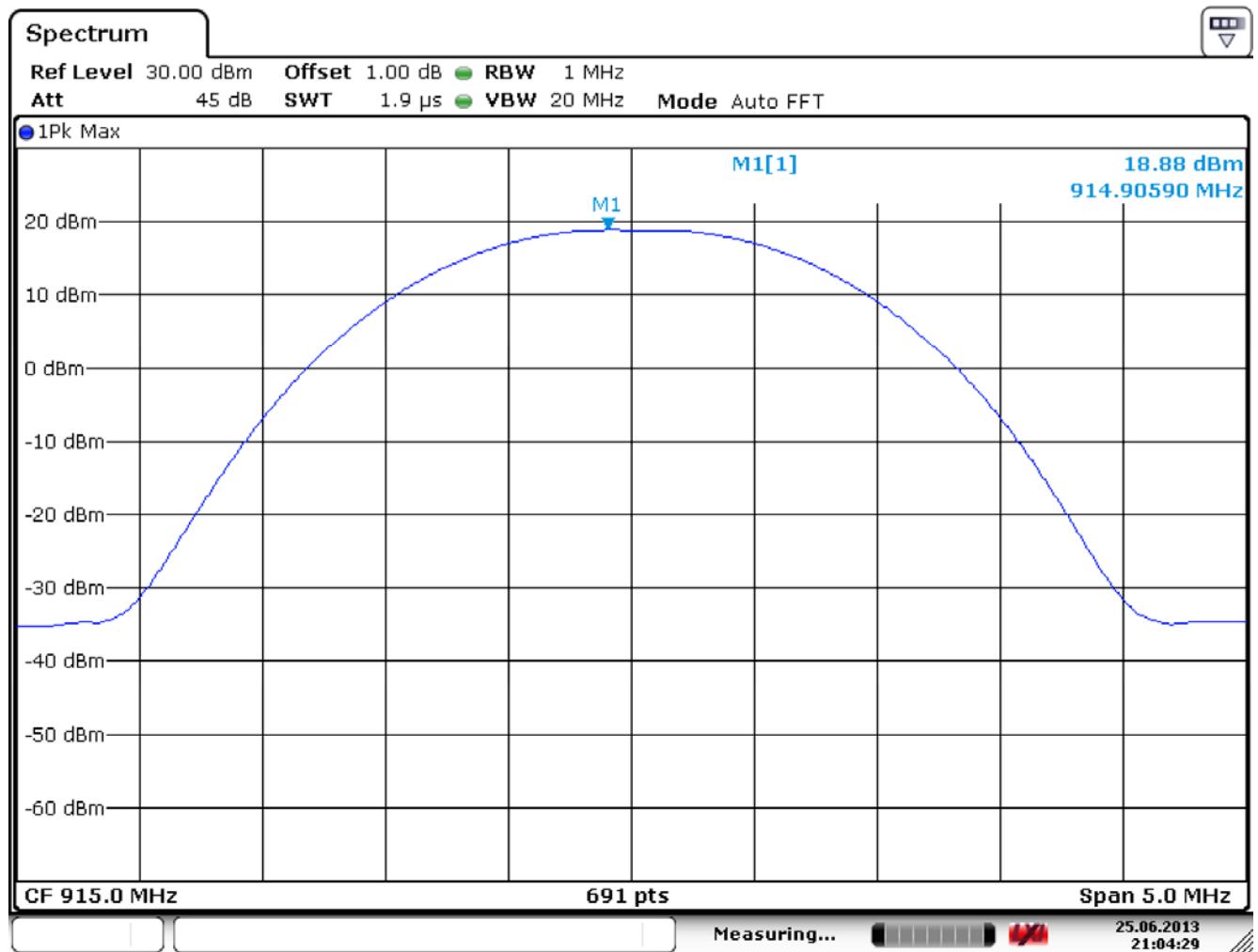


Date: 25.JUN.2013 21:02:22

Operating frequency : 910.92 MHz
RBW : 1 MHz
VBW : 20 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Output power : 19.02 dBm (=79.8 mW)

3.6.10.2 Channel 13



Date: 25.JUN.2013 21:04:29

Operating frequency : 915.00 MHz

RBW : 1 MHz

VBW : 20 MHz

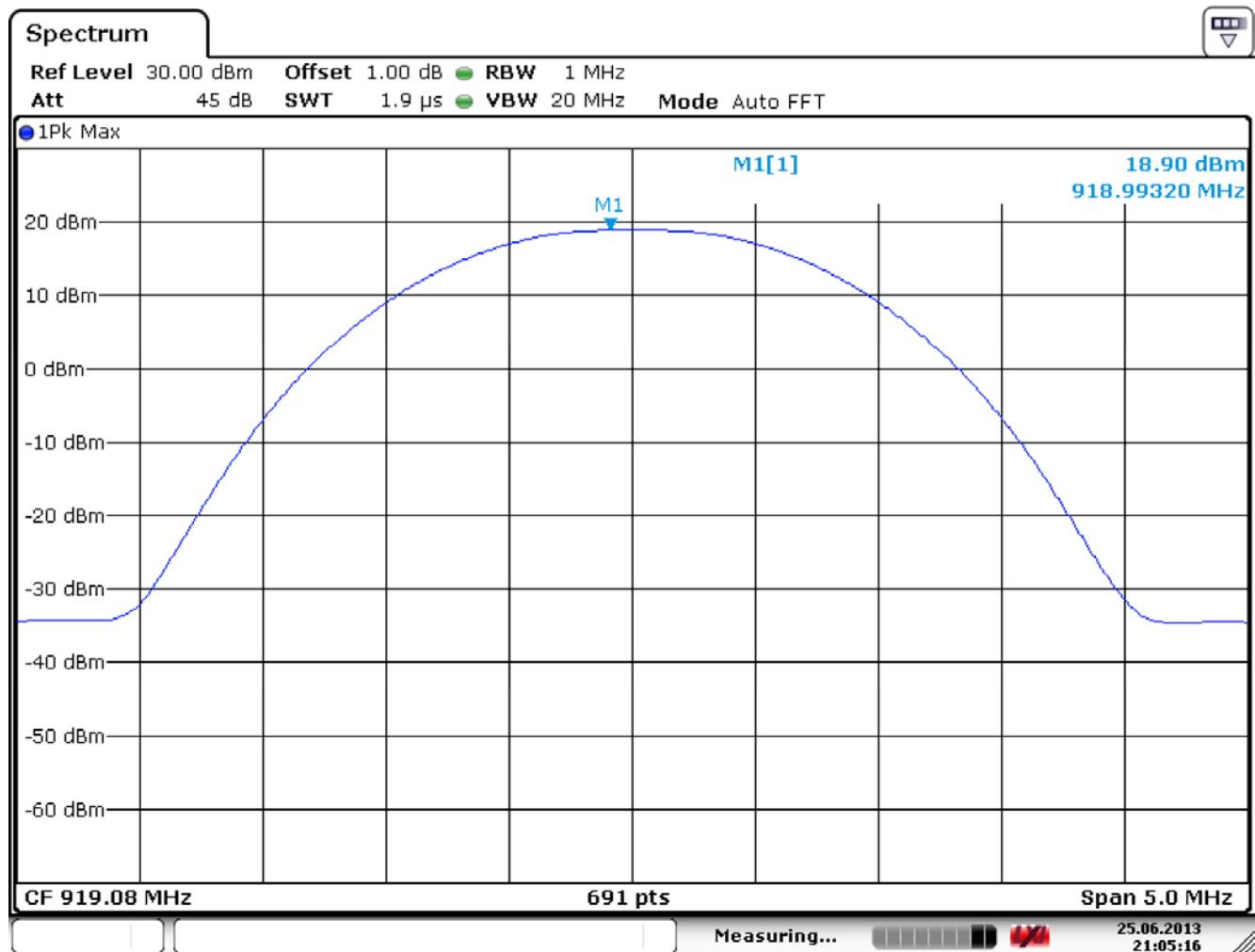
Detector mode : Peak

Trace mode : Max hold

Sweep time : Auto

Output power : 18.88 dBm (=77.3 mW)

3.6.10.3 Channel 25



Date: 25.JUN.2013 21:05:16

Operating frequency : 919.08 MHz

RBW : 1 MHz

VBW : 20 MHz

Detector mode : Peak

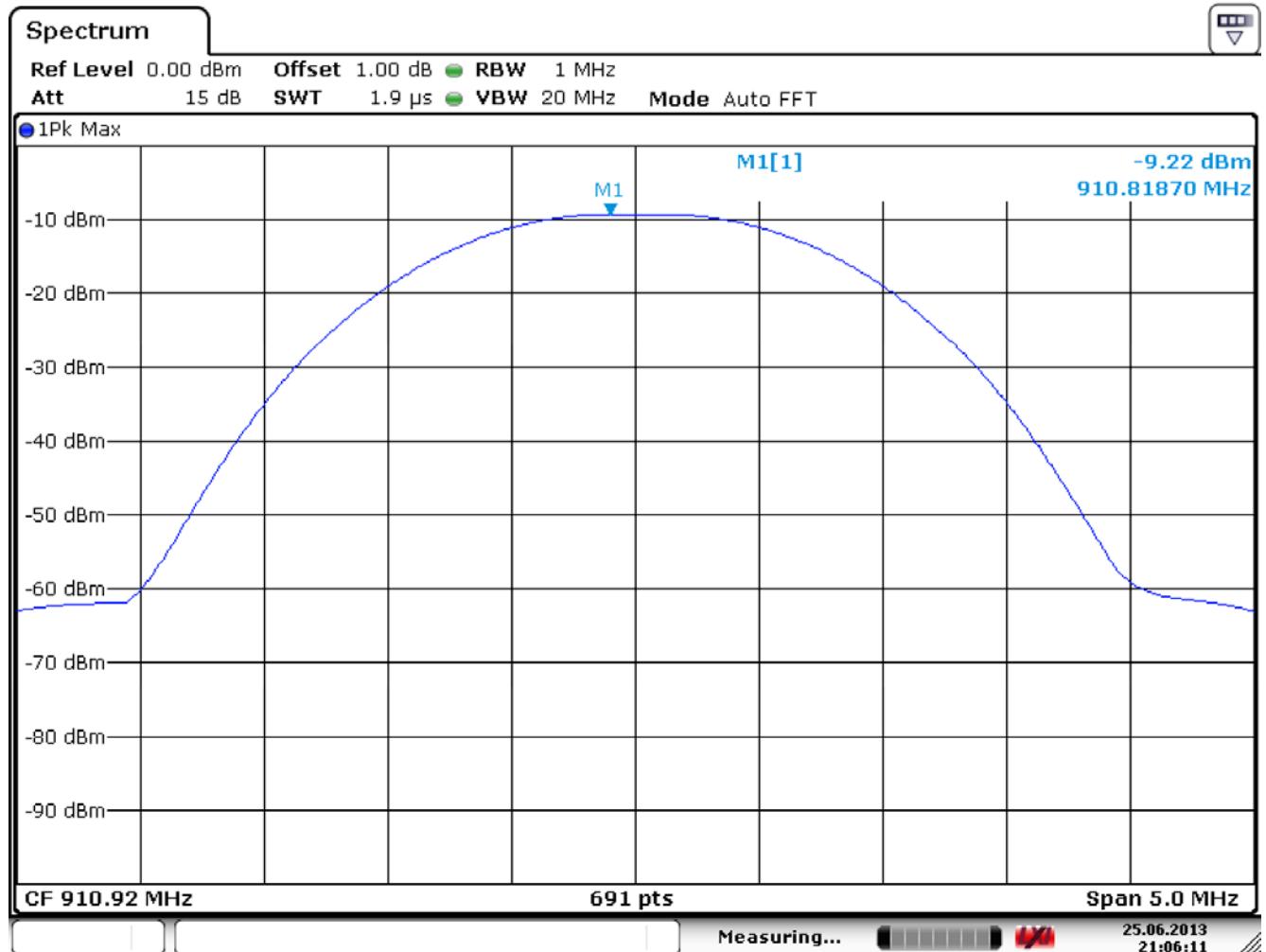
Trace mode : Max hold

Sweep time : Auto

Output power : 18.90 dBm (=77.6 mW)

3.6.11 Plots of peak output power at low power

3.6.11.1 Channel 1

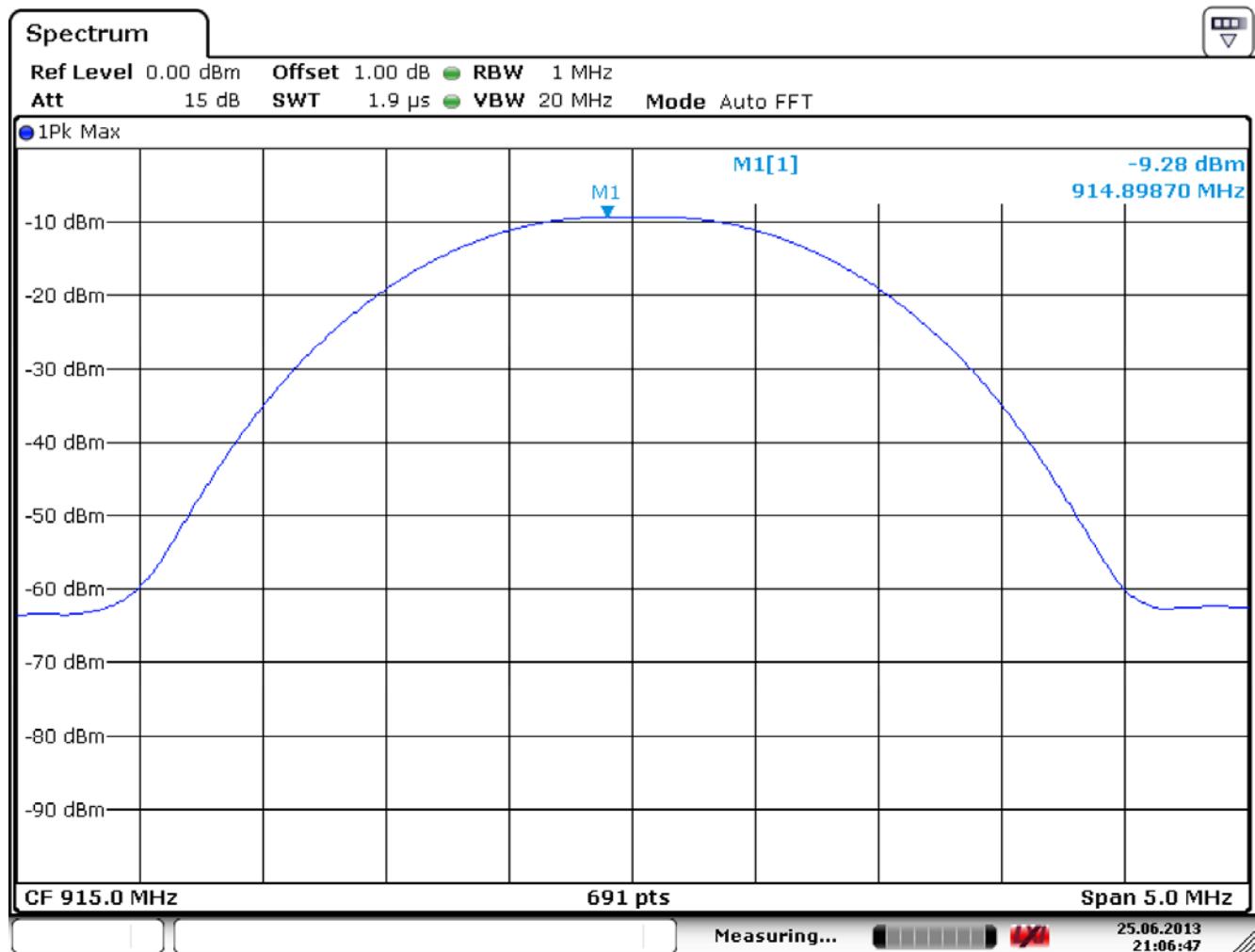


Date: 25.JUN.2013 21:06:10

Operating frequency : 910.92 MHz
RBW : 1 MHz
VBW : 20 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Output power : -9.22 dBm (=0.120 mW)

3.6.11.2 Channel 13



Date: 25.JUN.2013 21:06:47

Operating frequency : 915.00 MHz

RBW : 1 MHz

VBW : 20 MHz

Detector mode :

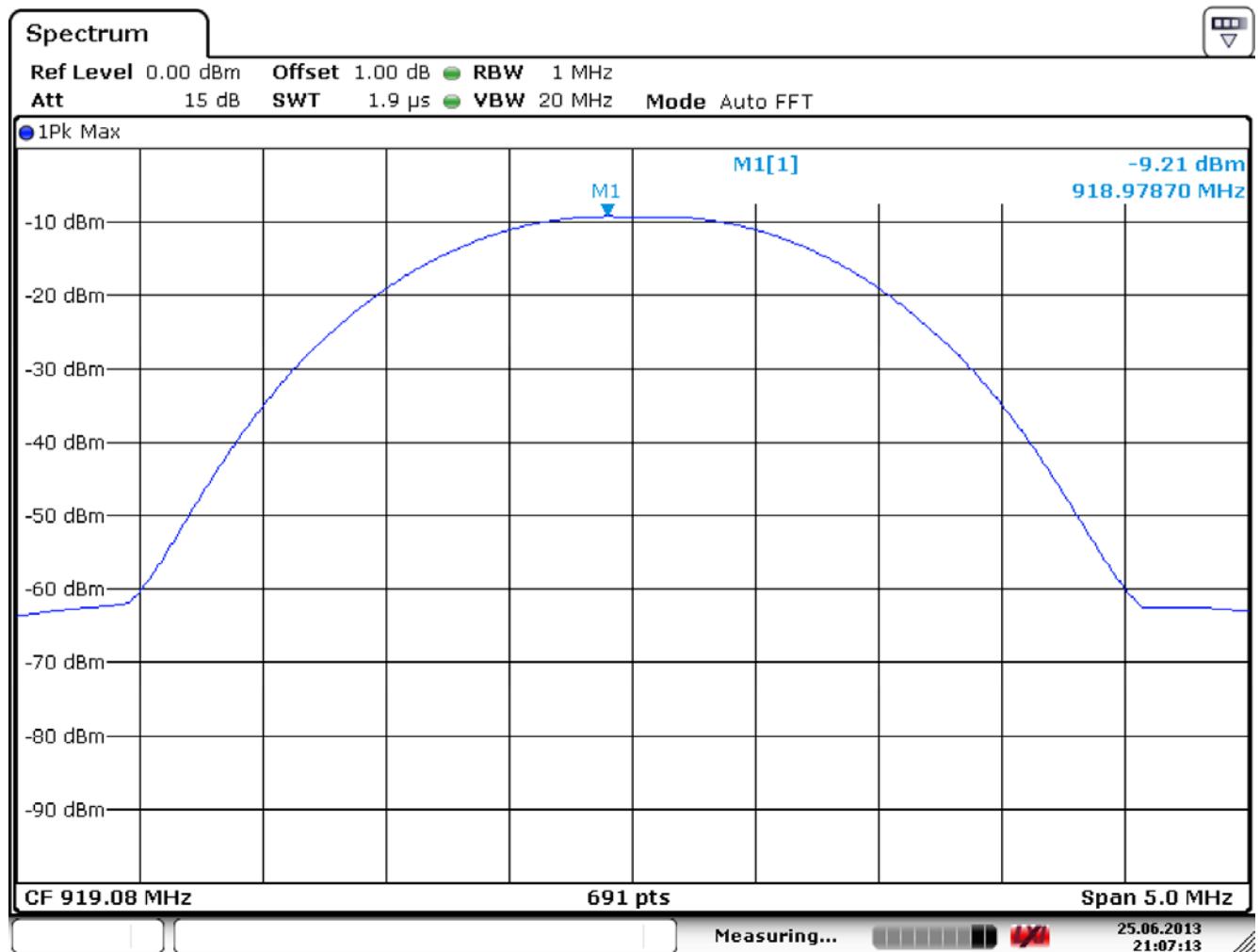
Peak

Trace mode : Max hold

Sweep time : Auto

Output power : -9.28 dBm (=0.118 mW)

3.6.11.3 Channel 25



Date: 25.JUN.2013 21:07:13

Operating frequency : 919.08 MHz

RBW : 1 MHz

VBW : 20 MHz

Detector mode : Peak

Trace mode : Max hold

Sweep time : Auto

Output power : -9.21 dBm (=0.120 mW)

3.7 Conducted emission and band edge

3.7.1 Definitions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on RF conducted measurement.

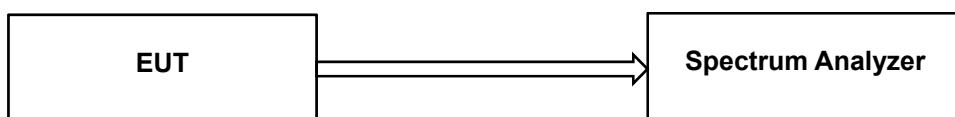
3.7.2 Specification

- FCC Rules Part 15 Subpart C Section 15.247(d)
- IC Rules RSS-210 Issue8 Annex 8-2010 A8.5

3.7.3 Measurement method

- Public Notice “DA 00-705”

3.7.4 Set-up



3.7.5 Test equipment list

| Equipment | Model name | Manufacturer |
|-------------------|---------------|-----------------|
| EUT | 2W901R-SS PTS | SEGI LIMITED |
| Spectrum analyzer | FSV | Rohde & Schwarz |

3.7.6 Test procedure

- The output of EUT was connected to the spectrum analyzer.
- Sets RBW 100 kHz, VBW 1 MHz, Max hold

3.7.7 Test condition

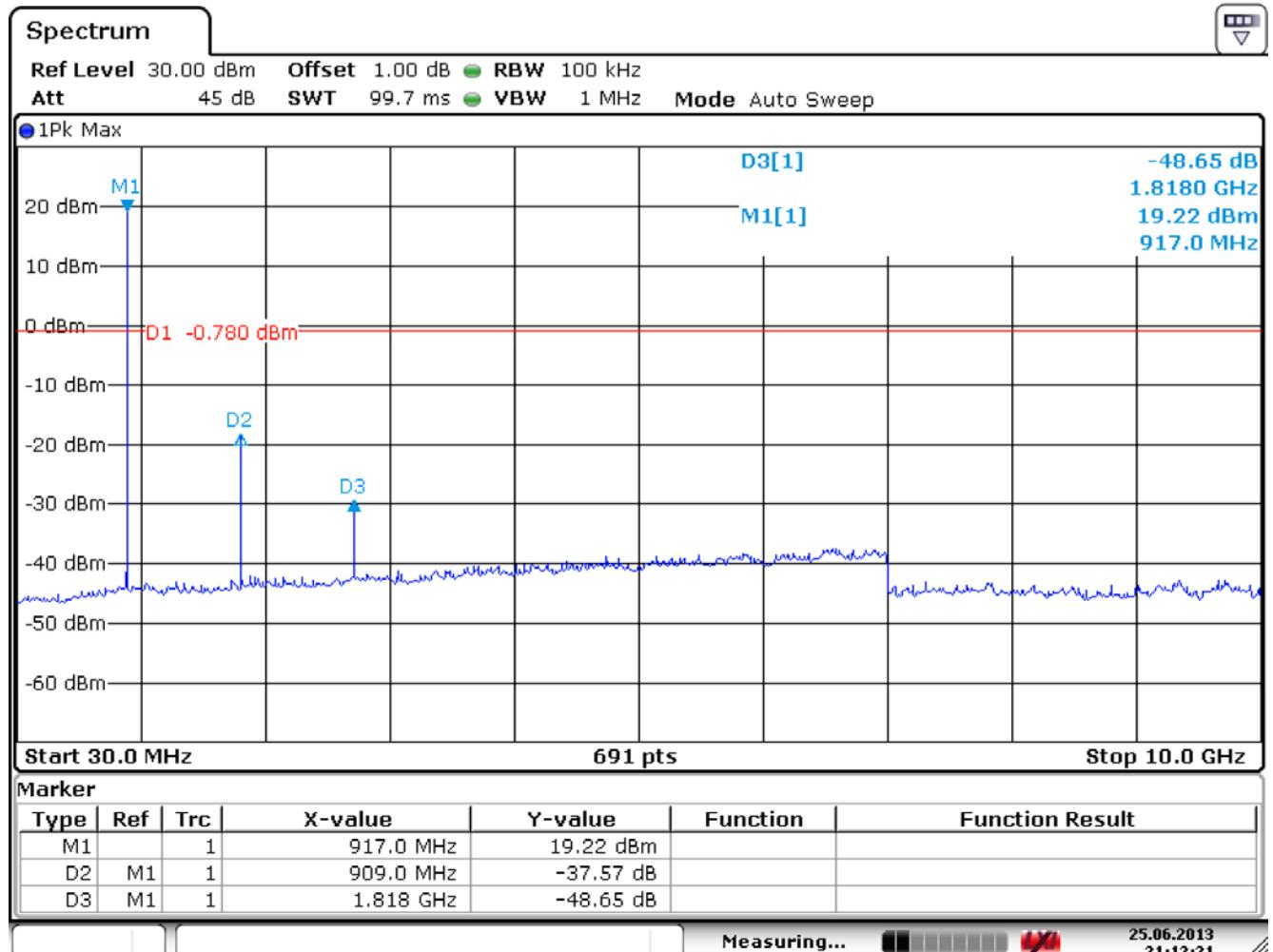
- Test place : Test room
- Test environment : 22 °C, 47 % R.H.
- Test mode : Operation at full hopping

3.7.8 Limit

Less than 20 dBc.

3.7.9 Plots of conducted emission & band edge

3.7.10.1 Channel 1

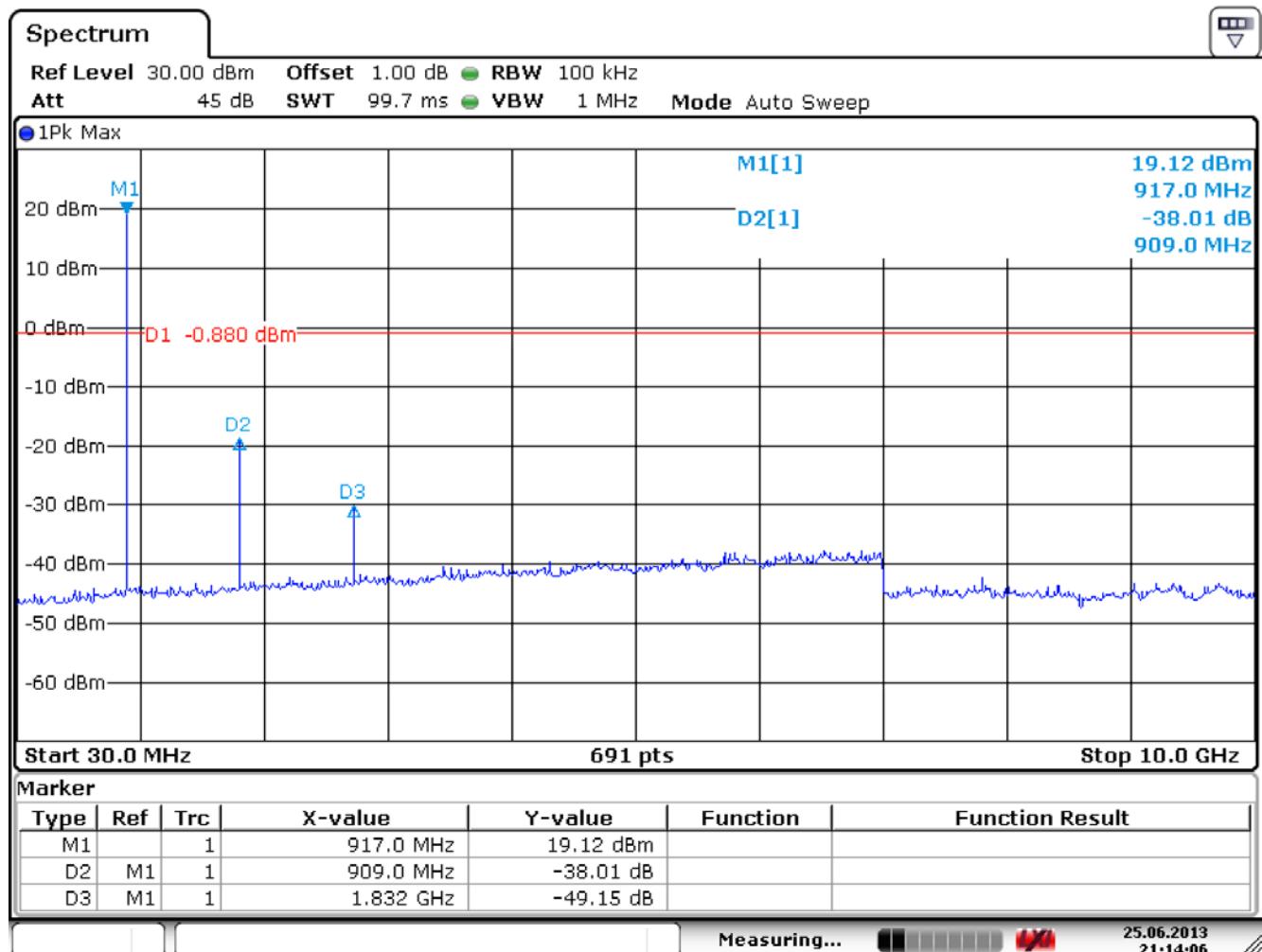


Date: 25.JUN.2013 21:12:20

Operating frequency : 910.92 MHz
RBW : 100 kHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Spurious emission (2nd harmonic) : 37.6 dBc
Spurious emission (3rd harmonic) : 48.7 dBc

3.7.10.2 Channel 13

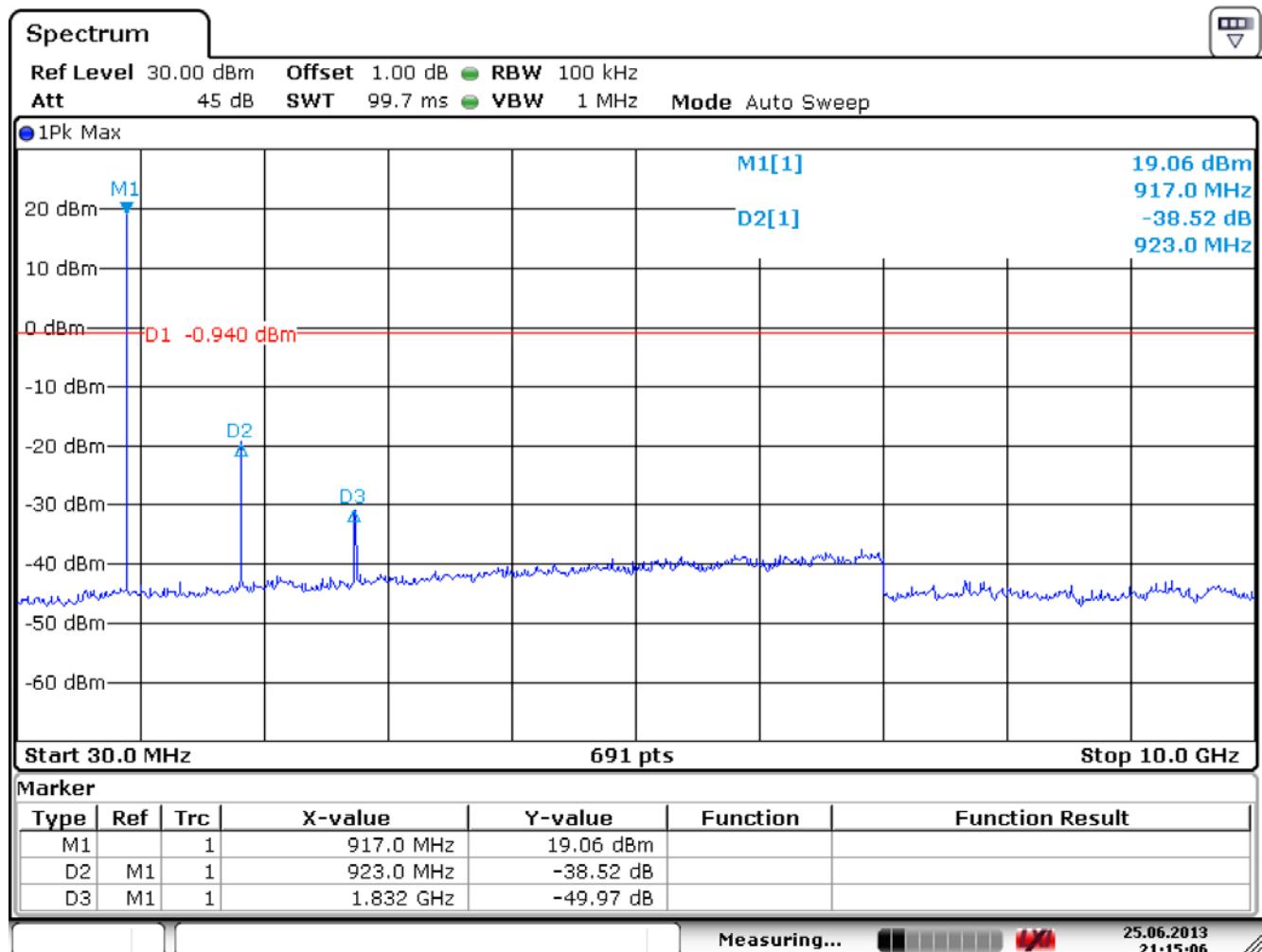


Date: 25.JUN.2013 21:14:05

Operating frequency : 915.00 MHz
RBW : 100 kHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Spurious emission (2nd harmonic) : 38.0 dBc
Spurious emission (3rd harmonic) : 49.2 dBc

3.7.10.3 Channel 25

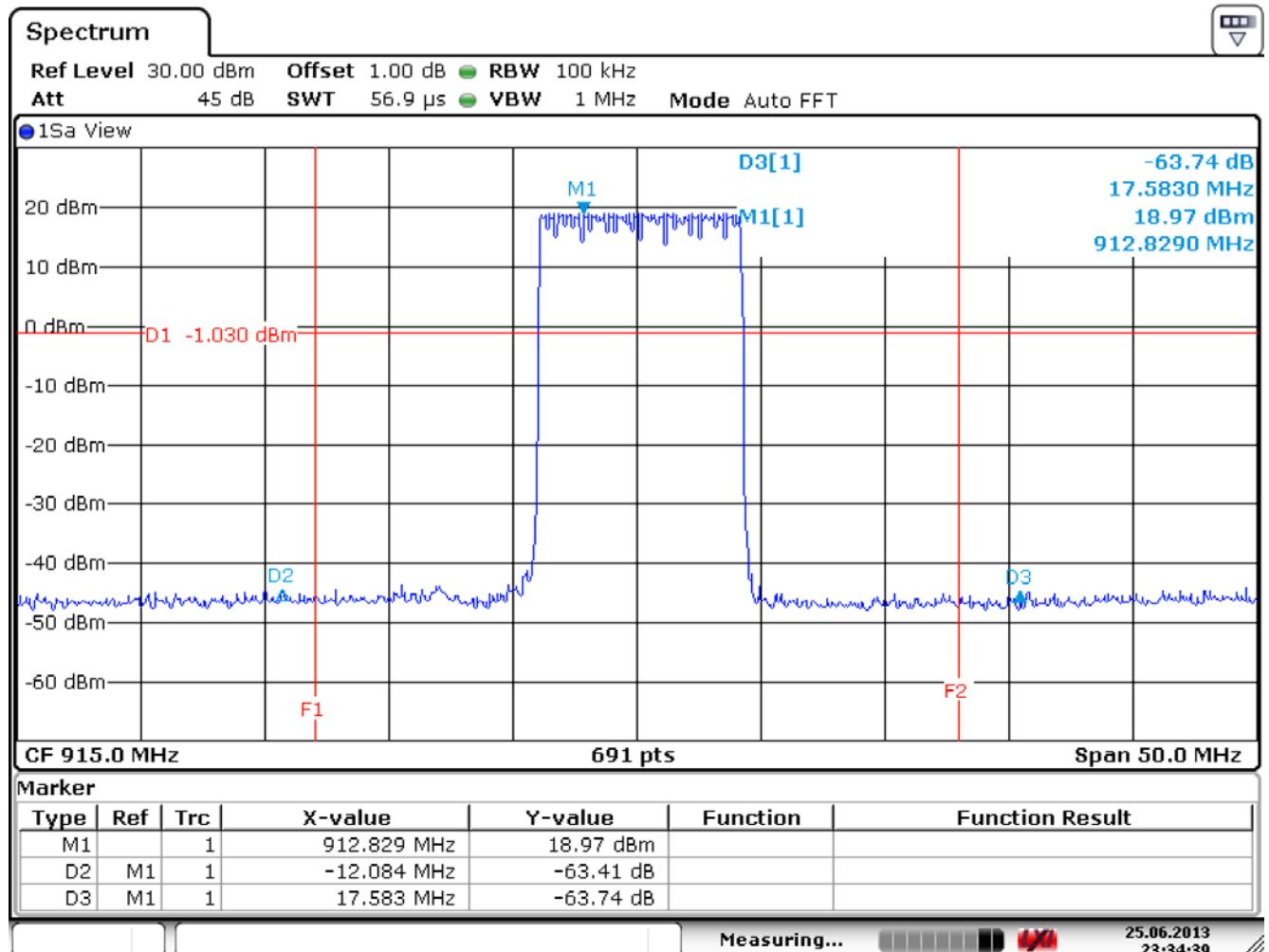


Date: 25.JUN.2013 21:15:06

Operating frequency : 919.08 MHz
RBW : 100 kHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Spurious emission (2nd harmonic) : 38.5 dBc
Spurious emission (3rd harmonic) : 50.0 dBc

3.7.10.4 Band edge at full hopping mode



Date: 25.JUN.2013 23:34:38

Operating frequency : Full hopping
RBW : 100 kHz
VBW : 1 MHz
Detector mode : Peak
Trace mode : Max hold
Sweep time : Auto

Lower band edge : 63.4 dBc
Upper band edge : 63.7 dBc

4. RF Exposure Compliance Requirement

According to KDB447498 D01 General RF Exposure Guidance v05r01

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances \leq 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

| Channel Number | Frequency [MHz] | Field strength at 3 meter by average [dB μ V/m] | Output power at ERP [mW] | Separation distance [mm] | 1-g SAR value | Test exclusion thresholds |
|----------------|-----------------|---|--------------------------|--------------------------|---------------|---------------------------|
| 1 | 910.92 | 103.6 | 6.9 | 5 | 1.3 | 3.0 |
| 13 | 915.00 | 104.5 | 8.5 | 5 | 1.6 | 3.0 |
| 25 | 919.08 | 103.8 | 7.2 | 5 | 1.4 | 3.0 |

Result:

SAR is not required.

5. Test equipment list

The listing below denotes the test equipment for the test(s).

| No. | Equipment | Model | Manufacturer | Serial Number | Calibration Due date |
|-----|----------------------|--------------|-----------------|---------------|----------------------|
| 1 | Spectrum analyzer | FSV | Rohde & Schwarz | 101673 | 02/04/14 |
| 2 | Test receiver | ESCI 7 | Rohde & Schwarz | 1166.5950.07 | 01/30/14 |
| 3 | Power supply | E3633A | Agilent | SG40002272 | 01/28/14 |
| 4 | Loop antenna | 6502 | EMCO | 9609-9087 | 02/26/14 |
| 5 | Biconical antenna | VHA9103 | Schwarzbeck | 2217 | 11/29/13 |
| 6 | Log-Periodic antenna | VULP9118A | Schwarzbeck | 382 | 11/29/13 |
| 7 | Horn antenna | BBHA 9120 D | Schwarzbeck | 395 | 08/07/14 |
| 8 | Pre-amplifier | SCU-01 | R&S | 10020 | 09/28/13 |
| 9 | Pre-amplifier | JS4-00102600 | MITEQ | 383521 | 01/31/14 |
| 10 | Turn table | N/A | Daeil EMC | N/A | N/A |
| 11 | Antenna mast | EAM4.5 | Daeil EMC | N/A | N/A |
| 12 | Controller | DE200 | Daeil EMC | AAA69813111 | N/A |