

FCC ID: NXW-RF600R

# EMI - TEST REPORT

- FCC Part 15.247 -



<b>Test Report No. :</b> <b>T35099-00-00HU</b>	04. June 2012
	Date of issue

Type / Model Name : RF620R-2, RF630R-2, RF640R, RF670R-2

Product Description : RFID UHF Reader

**Applicant** : Siemens Aktiengesellschaft

Address : I IA SC Cl, Gleiwitzer Str. 555  
D-90475 Nuremberg

**Manufacturer** : Kathrein Sachsen GmbH

Address : Lindenstraße 3, Gewerbegebiet  
D-09241 Mühlau

**Licence holder** : Siemens Aktiengesellschaft

Address : I IA SC Cl, Gleiwitzer Str. 555  
D-90475 Nuremberg

<b>Test Result</b> according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

FCC ID: NXW-RF600R

# Contents

<b>1</b>	<b><u>TEST STANDARDS</u></b>	<b>3</b>
<b>2</b>	<b><u>SUMMARY</u></b>	<b>4</b>
<b>3</b>	<b><u>EQUIPMENT UNDER TEST</u></b>	<b>6</b>
3.1	Photo documentation of the EUT – Detailed photos see Attachment A	6
3.2	Test setup	6
3.3	Power supply system utilised	6
3.4	Short description of the EUT	6
<b>4</b>	<b><u>TEST ENVIRONMENT</u></b>	<b>8</b>
4.1	Address of the test laboratory	8
4.2	Environmental conditions	8
4.3	Statement of the measurement uncertainty	8
4.4	Measurement Protocol for FCC, VCCI and AUSTEL	9
4.5	Determination of worst case measurement conditions	9
<b>5</b>	<b><u>TEST CONDITIONS AND RESULTS</u></b>	<b>10</b>
5.1	Conducted emissions	10
5.2	20 dB bandwidth	20
5.3	Maximum peak conducted output power	28
5.4	Spurious RF conducted emissions	30
5.5	Spurious radiated emissions	36
5.6	Hopping sequence	40
5.7	Equal hopping frequency use	41
5.8	Receiver input bandwidth	41
5.9	Dwell time	42
5.10	Channel separation	45
5.11	Quantity of hopping channels	48
5.12	Antenna application - Detailed photos see Attachment A	51
5.13	Maximum permissible exposure (MPE) – See Attachment B	52
<b>6</b>	<b><u>USED TEST EQUIPMENT AND ACCESSORIES</u></b>	<b>53</b>

**FCC ID: NXW-RF600R****1 TEST STANDARDS**

The tests were performed according to following standards:

**FCC Rules and Regulations Part 15, Subpart A - General (October, 2011)**

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

**FCC Rules and Regulations Part 15, Subpart B - Unintentional Radiators (October, 2011)**

Part 15, Subpart B, Section 15.107	AC Line conducted emissions,
Part 15, Subpart B, Section 15.109	Radiated emissions, general requirements

**FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (October, 2011)**

Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.205	Restricted bands of operation
Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.247	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz

**FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969**

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart 2, Section 2.1093	Radiofrequency radiation exposure evaluation: portable device

**OET Bulletin 65, 65A, 65B, 65C Edition 97-01, August 1997 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.**

ANSI C63.10: 2009	Testing Unlicensed Wireless Devices
ANSI C95.1:1992	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
CISPR 16-4-2: 2003	Uncertainty in EMC measurement
CISPR 22: 2005 EN 55022: 2006	Information technology equipment

**FCC ID: NXW-RF600R****2 SUMMARY****GENERAL REMARKS:**

The frequency range was scanned from 9 kHz to 10 GHz.

All emissions not reported in this test report were more than 10 dB below the specified limit.

The EuT is a frequency hopping system using 52 channels in the frequency band from 902 to 928 MHz.

The reader family RF600R consist of following models:

- RF620R-2
- RF630R-2
- RF640R
- RF670R-2

The manufacturer declared that the models are technical identical expect the following items:

- RF620R-2:
  - 1 ext. antenna connector
  - 1 int. antenna (4.0 dBi)
  - RS422 connector
  - max. connected output power 27.0 dBm
- RF630R-2:
  - 2 ext. antenna connectors
  - RS422 connector
  - max. connected output power 27.0 dBm
- RF640R:
  - 1 ext. antenna connector
  - 1 int. antenna (4.0 dBi)
  - DI/DO connector
  - 1 ethernet connector RJ45
  - 1 DC power supply input port
  - max. connected output power 30.0 dBm
- RF670R-2:
  - 4 ext. antenna connectors
  - DI/DO connector
  - 1 ethernet connector RJ45
  - 1 DC power supply input port
  - max. connected output power 30.0 dBm

Following antennas are provided with the RF620R-2, RF630R-2, RF640R, RF670R-2:

- RF660A antenna: Type 60° - 75° CP (6.0 dBi)
- RF620A antenna: Horizontal plane: 130° and Vertical plane: 105° (-10 - -5 dBi)
- RF640A antenna: Horizontal plane: 75° and Vertical plane: 85° (4.3 dBi)
- RF642A antenna: Horizontal plane: 80° and Vertical plane: 70° (7.0 dBi)

For detailed information about the different models and the antennas please refer to the user manual.

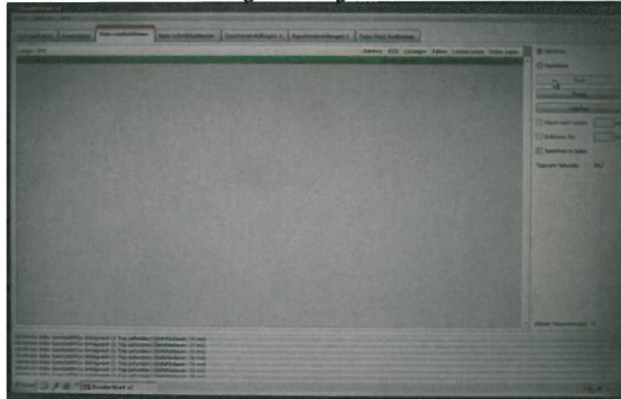
The EuT is declared as Class B digital device.

It is not possible to set the EuT only in receiving mode.

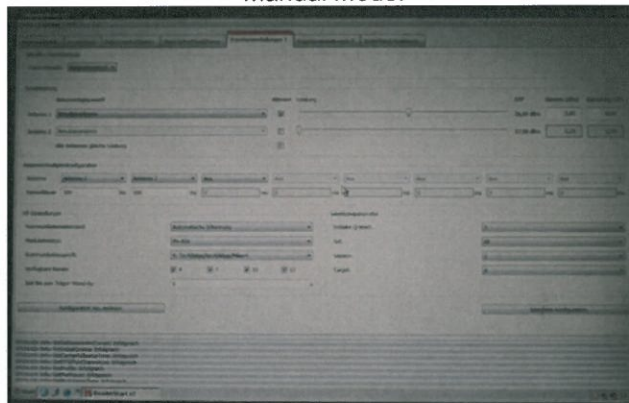
## FCC ID: NXW-RF600R

Screenshot of the supportet test software:

Tag reading mode:



Manual mode:



### FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 07. February 2012

Testing concluded on : 14. February 2012

Checked by:



Klaus Gegenfurtner  
I confirm the correctness  
and integrity of this  
documents  
2012.05.31 15:56:47  
+02'00'

Klaus Gegenfurtner  
Dipl.-Ing.(FH)  
Manager: Radio Group

Tested by:



Markus Huber  
I'm the author of  
this document  
2012.05.31  
15:50:53 +02'00'

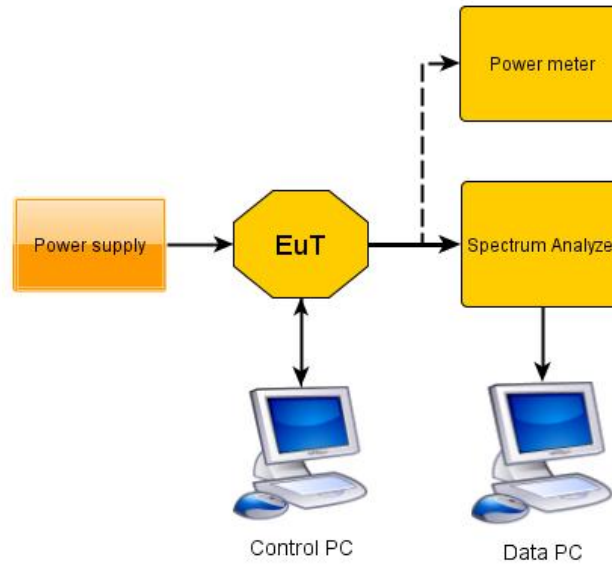
Markus Huber

FCC ID: NXW-RF600R

### 3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EUT – Detailed photos see Attachment A

### 3.2 Test setup



### 3.3 Power supply system utilised

Power supply voltage: : 100-240 V / 50-60 Hz / 1 $\phi$ , 24 V DC

### 3.4 Short description of the EUT

The EUT's are UHF RFID reader systems. They can read active and passive Tags in the frequency range from 902 to 928 MHz.

Number of tested samples: 1  
 Serial number: Prototype

#### EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- TAG reading mode supplying 30.0 dBm and 29.0 dBm (RF640R)

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- TAG reading mode supplying 27.0 dBm (RF630R-2)

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- Standby mode (RF640R)

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**FCC ID: NXW-RF600R****EUT configuration:**

The following peripheral devices and interface cables were connected during the measurements:

- |                                   |  |
|-----------------------------------|--|
| - <u>Test software</u>            | Model : <u>Supplied by manufacturer Kathrein</u> |
| - <u>Lap Top</u>                  | Model : <u>Fa. mikes-testingpartners gmbh</u>    |
| - <u>Antenna</u>                  | Model : <u>RF660A</u>                            |
| - <u>Antenna</u>                  | Model : <u>RF620A</u>                            |
| - <u>Antenna</u>                  | Model : <u>RF640A</u>                            |
| - <u>Antenna</u>                  | Model : <u>RF642A</u>                            |
| - <u>Power supply – DEUTRONIC</u> | Model : <u>ETC45-24, #9443010049, #0844</u>      |
| - _____                           | Model : _____                                    |
| - customer specific cables        |  |

mikes

FCC ID: NXW-RF600R

## 4 TEST ENVIRONMENT

### 4.1 Address of the test laboratory

mikes-testingpartners gmbh  
Ohmstrasse 2-4  
94342 Strasskirchen  
Germany

### 4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

### 4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader may notice that tolerances within the calibration of the equipment and facilities may cause additional uncertainty. The measurement uncertainty is calculated for all measurements listed in this test report acc. to CISPR 16-4-2 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurement“ and documented in the mikes-testingpartners gmbh quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, mikes-testingpartners gmbh, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component diversity and modifications in production process of devices may result in additional deviation. If necessary, refer to the test lab for the actual measurement uncertainty for the specific test. The manufacturer has the sole responsibility of continued compliance of the EUT.



## FCC ID: NXW-RF600R

### 4.4 Measurement Protocol for FCC, VCCI and AUSTEL

#### 4.4.1 GENERAL INFORMATION

##### 4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.10: 2009, Testing Unlicensed Wireless Devices."

In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

##### 4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

### 4.5 Determination of worst case measurement conditions

Pre measurements shows that the RF640R is the worst case model. So the complete testing were performed with this model and with max. Tx power setting 30 dBm.

Following measurements have been made with following samples, settings and antennas:

- RF630R-2 – Partly testing:
  - o Conducted emissions, power setting 27.0 dBm (antenna RF660A)
  - o 20 dB bandwidth, power setting 27.0 dBm
  - o Maximum peak conducted output power, power setting 27.0 dBm
  - o Channel separation, power setting 27.0 dBm
  
- RF640R – Complete testing:
  - o Conducted emissions, power setting 30.0 dBm (antenna RF660A)
  - o 20 dB bandwidth, power setting 30.0 dBm
  - o Maximum peak conducted output power, power setting 30.0 dBm
  - o Spurious RF conducted emissions, power setting 30.0 dBm
  - o Spurious radiated emissions in the restricted bands, power setting 30.0 dBm (antenna RF660A)
  - o Hopping sequence, power setting 30.0 dBm
  - o Dwell time, power setting 30.0 dBm
  - o Channel separation, power setting 30.0 dBm
  - o Quantity of hopping channels, power setting 30.0 dBm
  - o Maximum permissible exposure (MPE), power setting 30.0 dBm (antenna RF660A) and 29.0 dBm (antenna RF642A)

FCC ID: NXW-RF600R

## 5 TEST CONDITIONS AND RESULTS

### 5.1 Conducted emissions

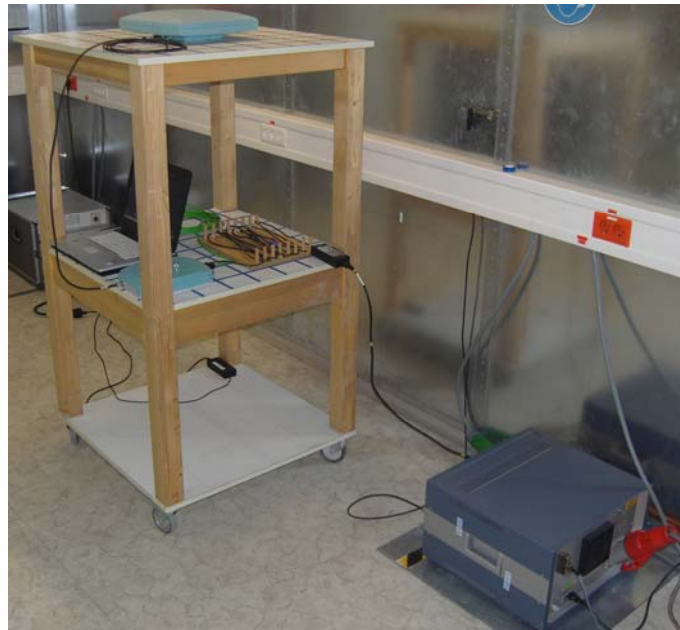
For test instruments and accessories used see section 6 Part A 4.

#### 5.1.1 Description of the test location

Test location:                   Shielded Room S2

#### 5.1.2 Photo documentation of the test set-up

RF640R:



RF620R-2:



**FCC ID: NXW-RF600R**

**5.1.3 Applicable standard**

According to FCC Part 15C, Section 15.207(a):

Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency

**5.1.4 Description of Measurement**

The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a line impedance stabilization network (LISN) with 50 Ω/50 µH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimetres above the floor and is positioned 40 centimetres from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded.

To convert between dBµV and µV, the following conversions apply:

$$\text{dB}\mu\text{V} = 20 \log \mu\text{V}$$

$$\mu\text{V} = 10^{(\text{dB}\mu\text{V}/20)}$$

**5.1.5 Test result**

Frequency range: 0.15 MHz - 30 MHz  
 Min. limit margin: 3.3 dB at 0.56 MHz  
 (RF630R-2, Test point N, Tag reading mode, 27.0 dBm)

The requirements are **FULFILLED**.

**Remarks:** For detailed test result please refer to following test protocols.  
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 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

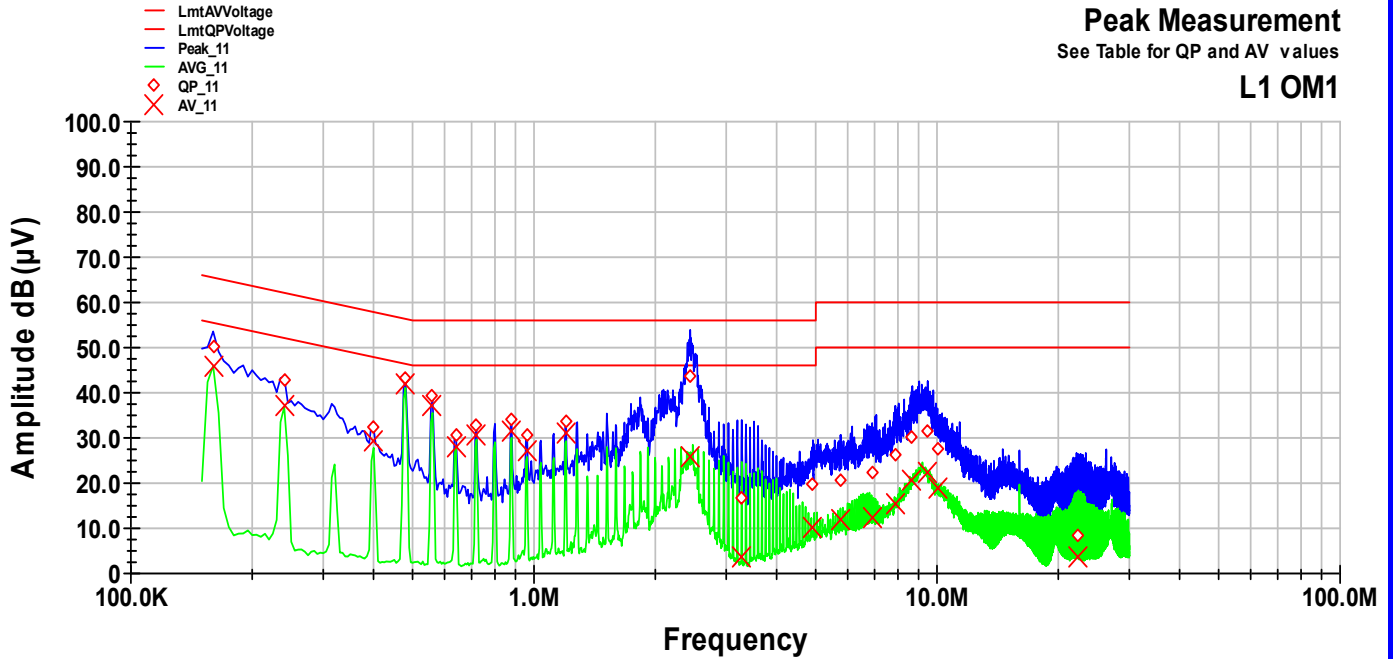
### FCC ID: NXW-RF600R

#### 5.1.6 Test protocol

Test point: L1  
 Operation mode: Tag reading mode supplying 30.0 dBm  
 Remarks: RF640R

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**L1 OM1**



Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	50.3	-15.1	65.5	46.1	-9.4	55.5
0.24	42.9	-19.2	62.1	37.3	-14.8	52.1
0.4	32.3	-25.5	57.9	29.3	-18.6	47.9
0.48	43.1	-13.2	56.3	41.8	-4.5	46.3
0.56	39.4	-16.6	56.0	37.0	-9.0	46.0
0.64	30.7	-25.3	56.0	28.0	-18.0	46.0
0.72	32.6	-23.4	56.0	30.8	-15.2	46.0
0.88	34.2	-21.8	56.0	31.7	-14.3	46.0
0.96	30.5	-25.5	56.0	27.3	-18.7	46.0
1.2	33.7	-22.3	56.0	30.9	-15.1	46.0
2.44	43.5	-12.5	56.0	25.9	-20.1	46.0
3.275	16.6	-39.4	56.0	3.6	-42.4	46.0
4.92	19.7	-36.3	56.0	10.3	-35.7	46.0
5.775	20.7	-39.3	60.0	12.1	-37.9	50.0
6.9	22.5	-37.5	60.0	12.2	-37.8	50.0
7.875	26.2	-33.8	60.0	15.2	-34.8	50.0
8.675	30.4	-29.6	60.0	20.4	-29.6	50.0
9.475	31.5	-28.5	60.0	22.4	-27.6	50.0
10.015	27.5	-32.5	60.0	19.0	-31.0	50.0
22.41	8.4	-51.7	60.0	3.6	-46.4	50.0

FCC ID: NXW-RF600R

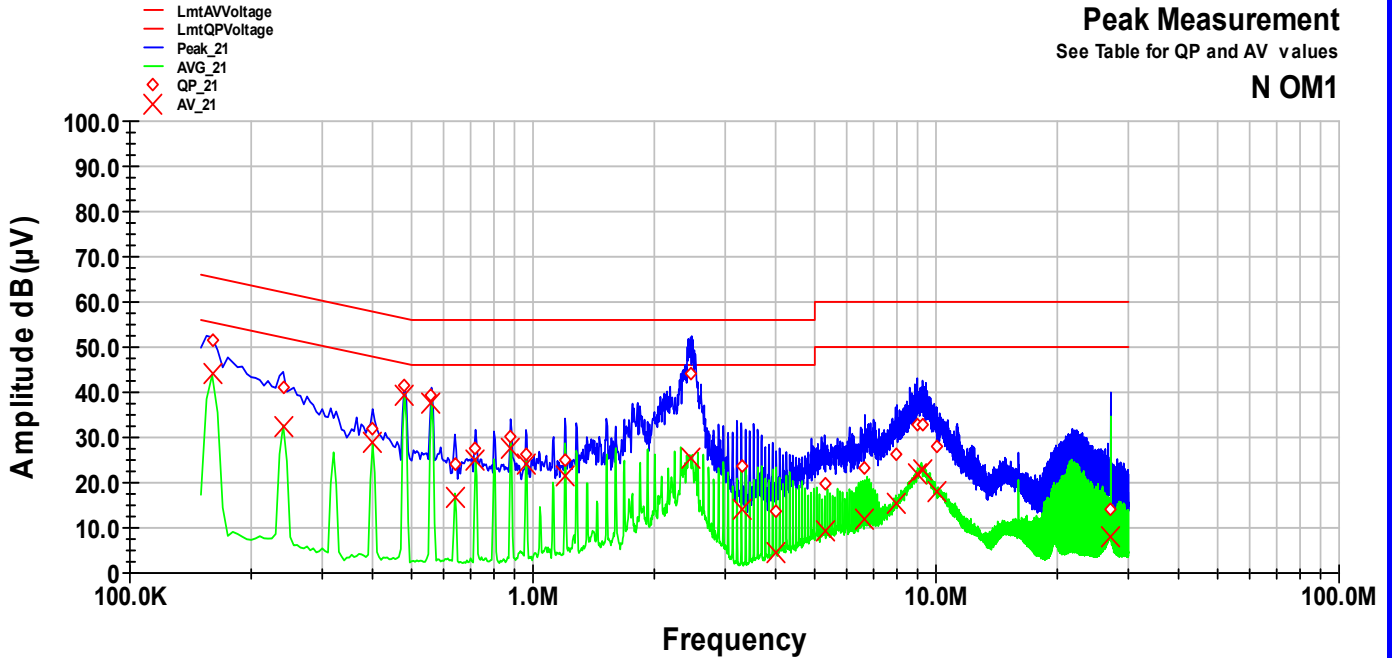
Test point: N  
 Operation mode: Tag reading mode supplying 30.0 dBm  
 Remarks: RF640R

Result: Passed

Peak Measurement

See Table for QP and AV values

N OM1



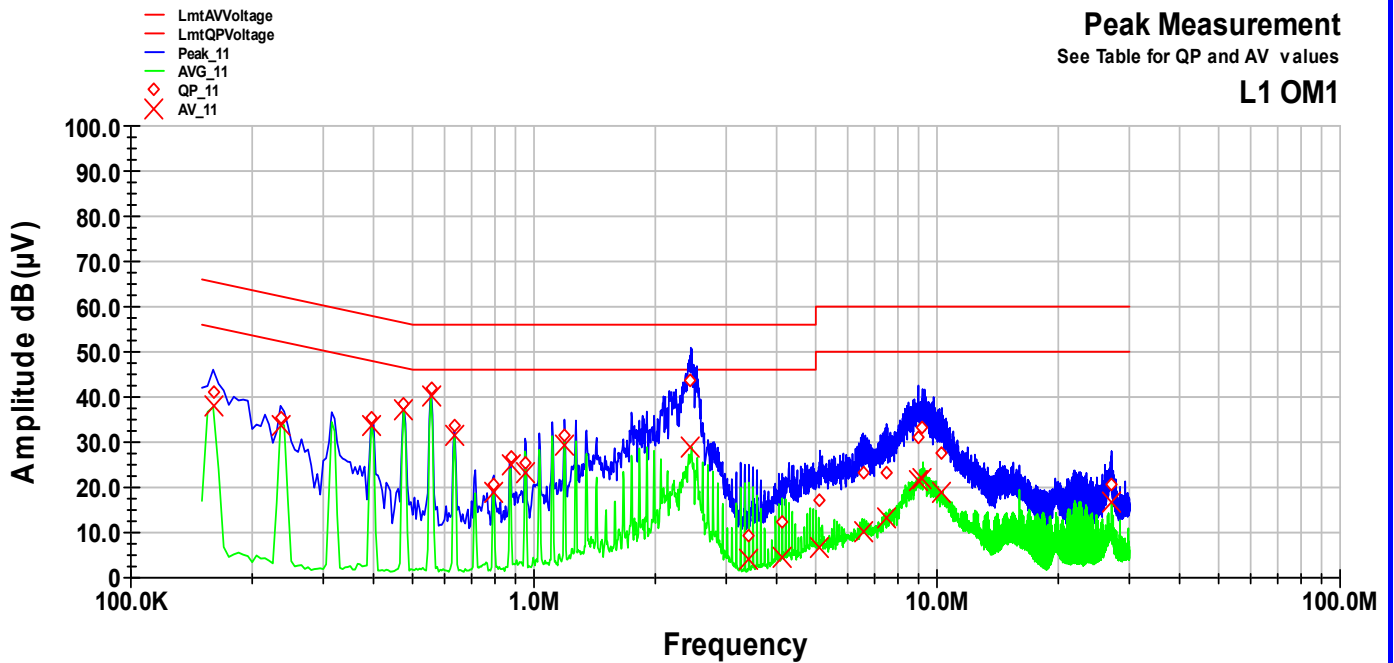
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	51.6	-13.9	65.5	44.1	-11.3	55.5
0.24	41.0	-21.1	62.1	32.5	-19.6	52.1
0.4	32.0	-25.8	57.9	28.7	-19.1	47.9
0.48	41.5	-14.9	56.3	39.5	-6.9	46.3
0.56	39.5	-16.5	56.0	37.6	-8.4	46.0
0.64	24.0	-32.0	56.0	16.7	-29.3	46.0
0.72	27.6	-28.4	56.0	24.8	-21.2	46.0
0.88	30.3	-25.8	56.0	27.6	-18.4	46.0
0.96	26.3	-29.7	56.0	24.1	-21.9	46.0
1.2	24.8	-31.2	56.0	21.4	-24.6	46.0
2.475	44.1	-11.9	56.0	25.5	-20.5	46.0
3.29	23.5	-32.5	56.0	14.3	-31.7	46.0
4.01	13.6	-42.4	56.0	4.6	-41.4	46.0
5.29	19.9	-40.1	60.0	9.3	-40.7	50.0
6.66	23.1	-36.9	60.0	11.7	-38.3	50.0
7.995	26.2	-33.8	60.0	15.4	-34.6	50.0
8.975	32.7	-27.3	60.0	22.0	-28.0	50.0
9.255	32.7	-27.3	60.0	22.9	-27.1	50.0
10.02	28.0	-32.0	60.0	18.2	-31.8	50.0
27.115	14.1	-45.9	60.0	8.0	-42.0	50.0

### FCC ID: NXW-RF600R

Test point: L1  
 Operation mode: Standby mode  
 Remarks: RF640R

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**L1 OM1**



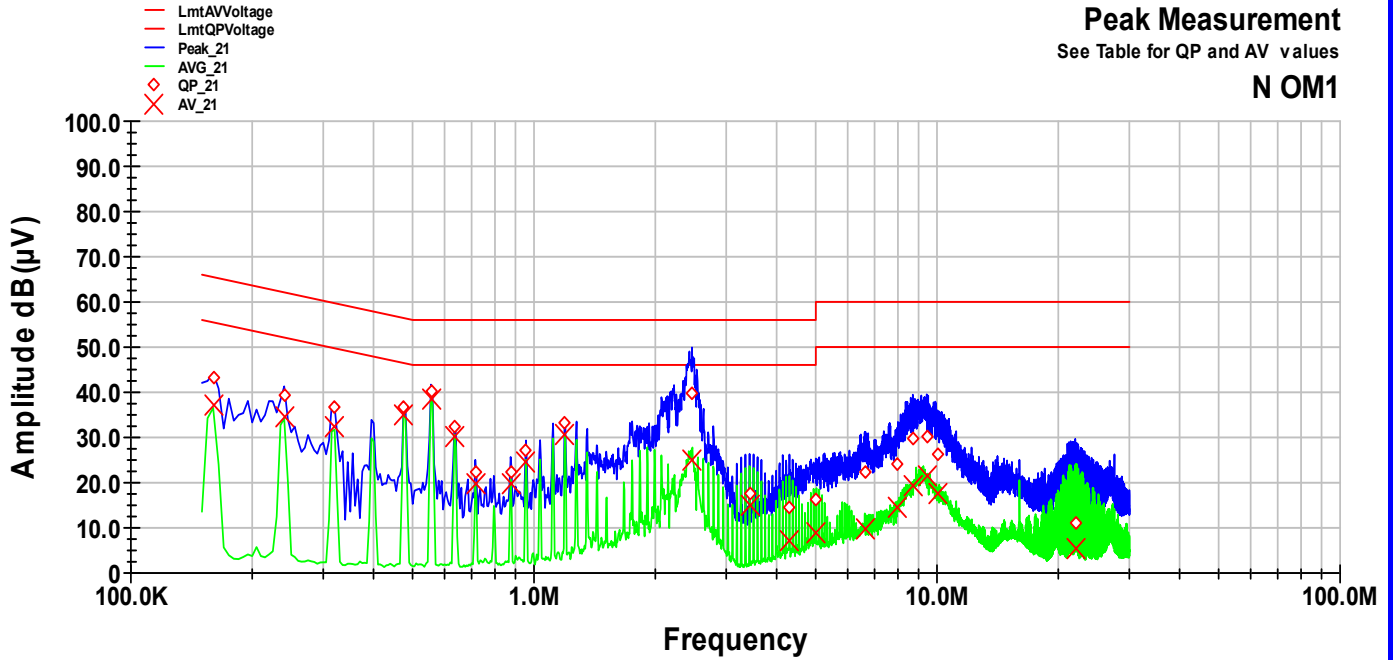
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	40.9	-24.6	65.5	37.8	-17.7	55.5
0.235	35.4	-26.9	62.3	33.7	-18.6	52.3
0.395	35.3	-22.7	58.0	33.7	-14.2	48.0
0.475	38.3	-18.1	56.4	36.9	-9.5	46.4
0.555	42.0	-14.0	56.0	40.3	-5.7	46.0
0.635	33.5	-22.5	56.0	31.5	-14.5	46.0
0.795	20.8	-35.2	56.0	19.0	-27.0	46.0
0.875	26.8	-29.2	56.0	24.9	-21.1	46.0
0.95	25.2	-30.8	56.0	23.2	-22.8	46.0
1.19	31.7	-24.3	56.0	29.3	-16.7	46.0
2.45	43.7	-12.3	56.0	28.9	-17.1	46.0
3.415	9.4	-46.6	56.0	4.2	-41.8	46.0
4.13	12.5	-43.5	56.0	4.4	-41.6	46.0
5.125	17.0	-43.0	60.0	6.9	-43.1	50.0
6.545	23.2	-36.8	60.0	10.2	-39.8	50.0
7.49	23.1	-36.9	60.0	13.4	-36.6	50.0
8.985	31.2	-28.8	60.0	21.7	-28.3	50.0
9.2	33.0	-27.0	60.0	22.0	-28.0	50.0
10.275	27.4	-32.6	60.0	18.7	-31.3	50.0
27.085	20.5	-39.5	60.0	16.5	-33.5	50.0

FCC ID: NXW-RF600R

Test point: N  
 Operation mode: Standby mode  
 Remarks: RF640R

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**N OM1**



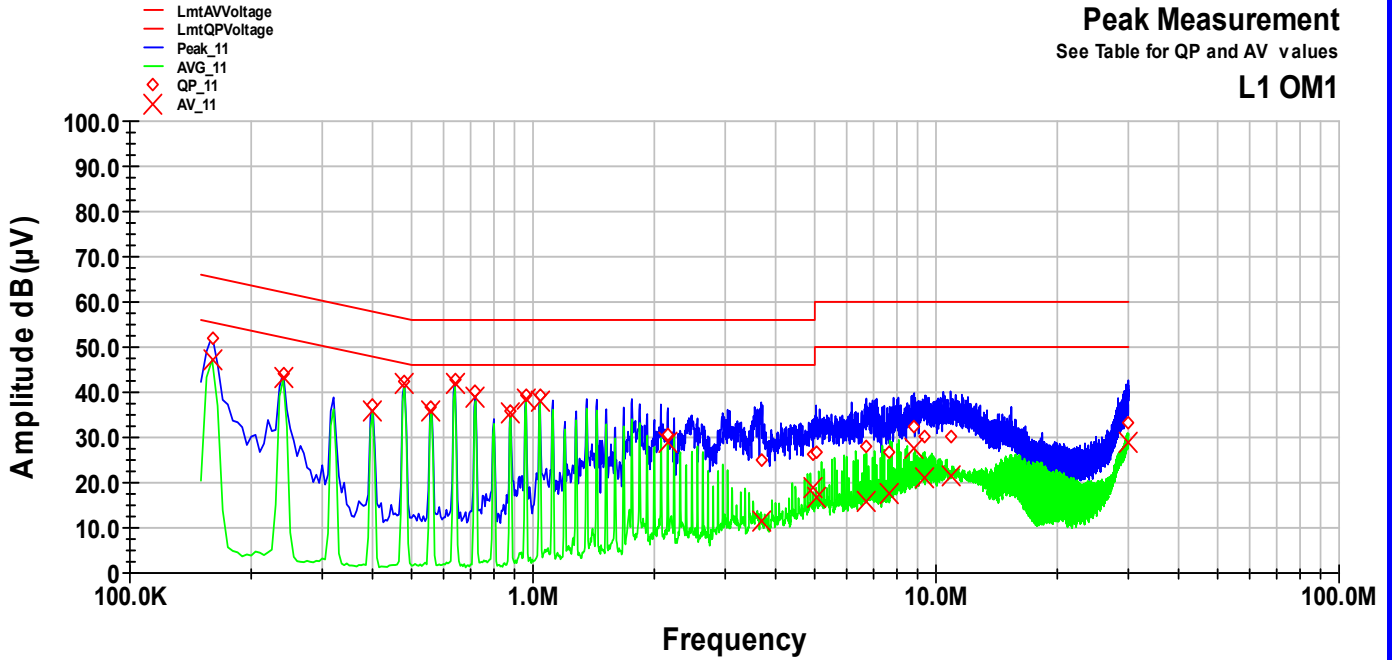
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	43.1	-22.4	65.5	37.0	-18.5	55.5
0.24	39.1	-23.0	62.1	34.6	-17.5	52.1
0.32	36.9	-22.8	59.7	32.4	-17.3	49.7
0.475	36.5	-19.9	56.4	34.8	-11.6	46.4
0.555	40.2	-15.8	56.0	38.3	-7.7	46.0
0.635	32.2	-23.8	56.0	30.1	-15.9	46.0
0.715	22.3	-33.7	56.0	19.6	-26.4	46.0
0.875	22.5	-33.5	56.0	19.9	-26.1	46.0
0.955	27.3	-28.7	56.0	24.5	-21.5	46.0
1.195	33.2	-22.8	56.0	30.8	-15.2	46.0
2.465	39.7	-16.3	56.0	24.9	-21.1	46.0
3.425	17.5	-38.5	56.0	14.9	-31.1	46.0
4.3	14.7	-41.3	56.0	7.0	-39.0	46.0
5.02	16.0	-44.0	60.0	8.7	-41.3	50.0
6.64	22.1	-37.8	60.0	9.7	-40.3	50.0
7.99	24.1	-35.9	60.0	14.5	-35.5	50.0
8.705	29.8	-30.2	60.0	19.5	-30.5	50.0
9.42	30.0	-30.0	60.0	21.7	-28.3	50.0
10.025	26.4	-33.7	60.0	17.7	-32.3	50.0
22.165	11.0	-49.0	60.0	5.5	-44.5	50.0

### FCC ID: NXW-RF600R

Test point: L1  
 Operation mode: Tag reading mode supplying 27.0 dBm  
 Remarks: RF630R-2

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**L1 OM1**



Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	51.8	-13.7	65.5	47.3	-8.2	55.5
0.24	44.1	-18.0	62.1	43.2	-8.9	52.1
0.4	37.2	-20.7	57.9	35.8	-12.0	47.9
0.48	42.5	-13.8	56.3	42.1	-4.3	46.3
0.56	36.9	-19.1	56.0	35.8	-10.2	46.0
0.64	42.9	-13.1	56.0	41.8	-4.2	46.0
0.72	40.0	-16.0	56.0	38.7	-7.3	46.0
0.88	35.7	-20.3	56.0	35.2	-10.8	46.0
0.96	39.2	-16.8	56.0	38.3	-7.7	46.0
1.04	39.4	-16.6	56.0	38.1	-7.9	46.0
2.16	30.7	-25.3	56.0	29.0	-17.0	46.0
3.68	25.0	-31.0	56.0	11.6	-34.4	46.0
4.97	26.2	-29.8	56.0	19.0	-27.0	46.0
5.04	26.9	-33.1	60.0	16.7	-33.3	50.0
6.715	28.0	-32.0	60.0	16.0	-34.0	50.0
7.68	26.8	-33.2	60.0	17.6	-32.4	50.0
8.82	32.5	-27.5	60.0	27.7	-22.3	50.0
9.4	30.3	-29.8	60.0	21.2	-28.8	50.0
10.86	30.0	-30.0	60.0	21.3	-28.7	50.0
29.955	33.1	-26.9	60.0	28.9	-21.1	50.0



FCC ID: NXW-RF600R

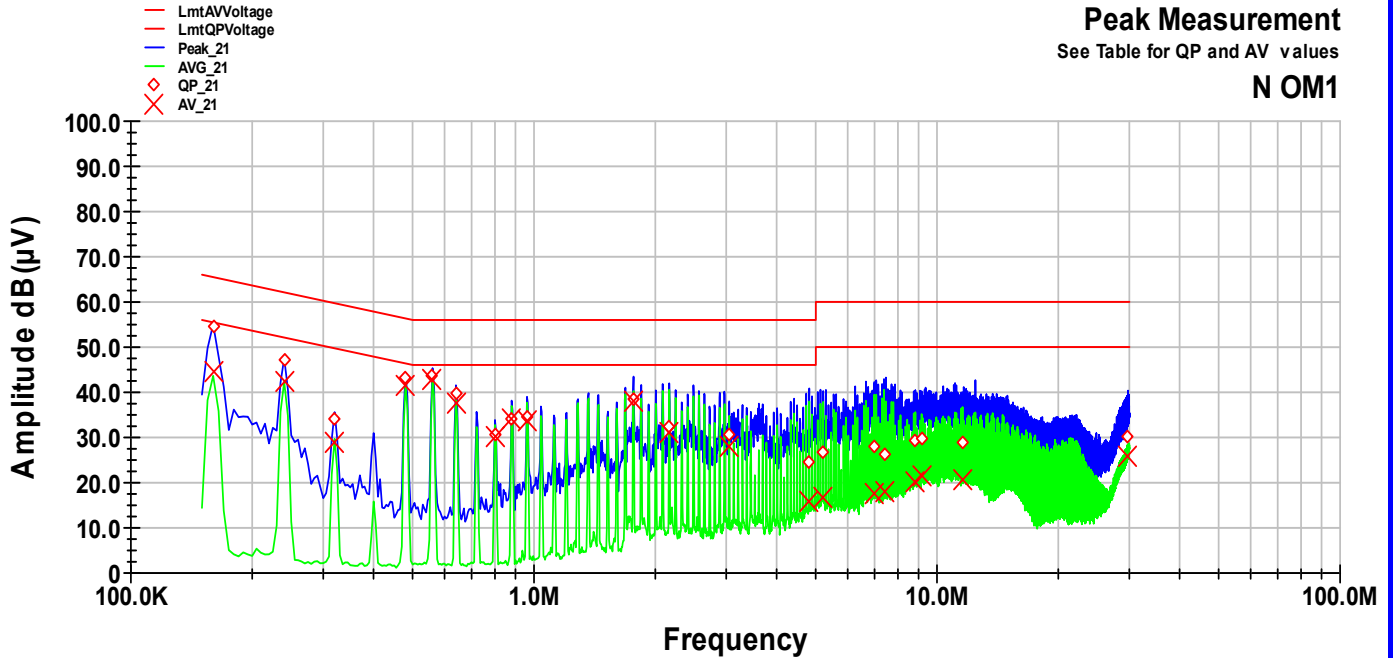
Test point: N  
 Operation mode: Tag reading mode supplying 27.0 dBm  
 Remarks: RF630R-2

Result: Passed

Peak Measurement

See Table for QP and AV values

N OM1



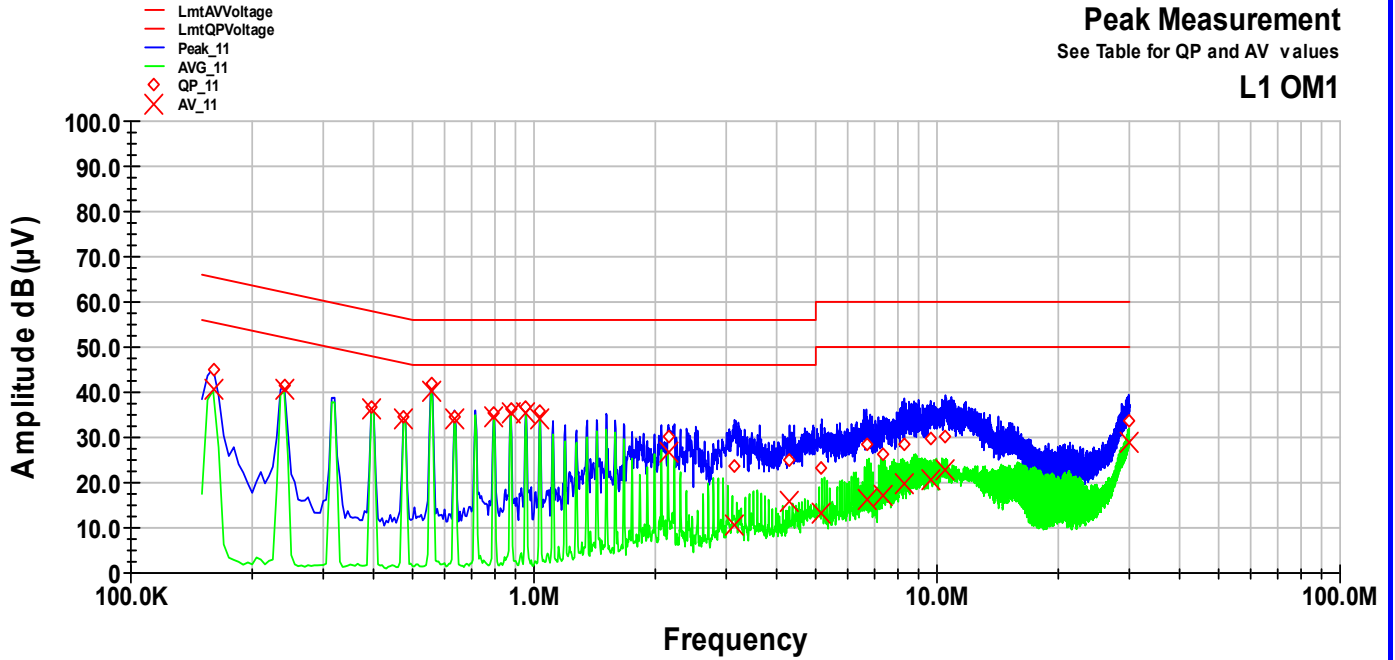
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	54.6	-10.9	65.5	44.7	-10.7	55.5
0.24	47.1	-15.0	62.1	42.4	-9.7	52.1
0.32	34.0	-25.7	59.7	29.0	-20.7	49.7
0.48	43.2	-13.1	56.3	41.4	-4.9	46.3
0.56	43.7	-12.3	56.0	42.8	-3.3	46.0
0.64	39.9	-16.1	56.0	37.6	-8.4	46.0
0.8	30.7	-25.3	56.0	30.1	-15.9	46.0
0.88	34.3	-21.7	56.0	33.9	-12.1	46.0
0.96	34.7	-21.3	56.0	33.9	-12.1	46.0
1.765	38.5	-17.5	56.0	37.9	-8.1	46.0
2.165	32.4	-23.6	56.0	31.3	-14.7	46.0
3.05	30.5	-25.5	56.0	28.0	-18.0	46.0
4.815	24.6	-31.4	56.0	15.7	-30.3	46.0
5.215	26.7	-33.3	60.0	16.9	-33.2	50.0
6.98	27.9	-32.1	60.0	17.6	-32.4	50.0
7.385	26.3	-33.7	60.0	17.9	-32.1	50.0
8.83	29.4	-30.6	60.0	20.2	-29.8	50.0
9.15	29.9	-30.1	60.0	21.6	-28.4	50.0
11.56	28.9	-31.1	60.0	20.7	-29.3	50.0
29.745	30.4	-29.6	60.0	25.8	-24.2	50.0

### FCC ID: NXW-RF600R

Test point: L1  
 Operation mode: Standby mode  
 Remarks: RF630R-2

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**L1 OM1**



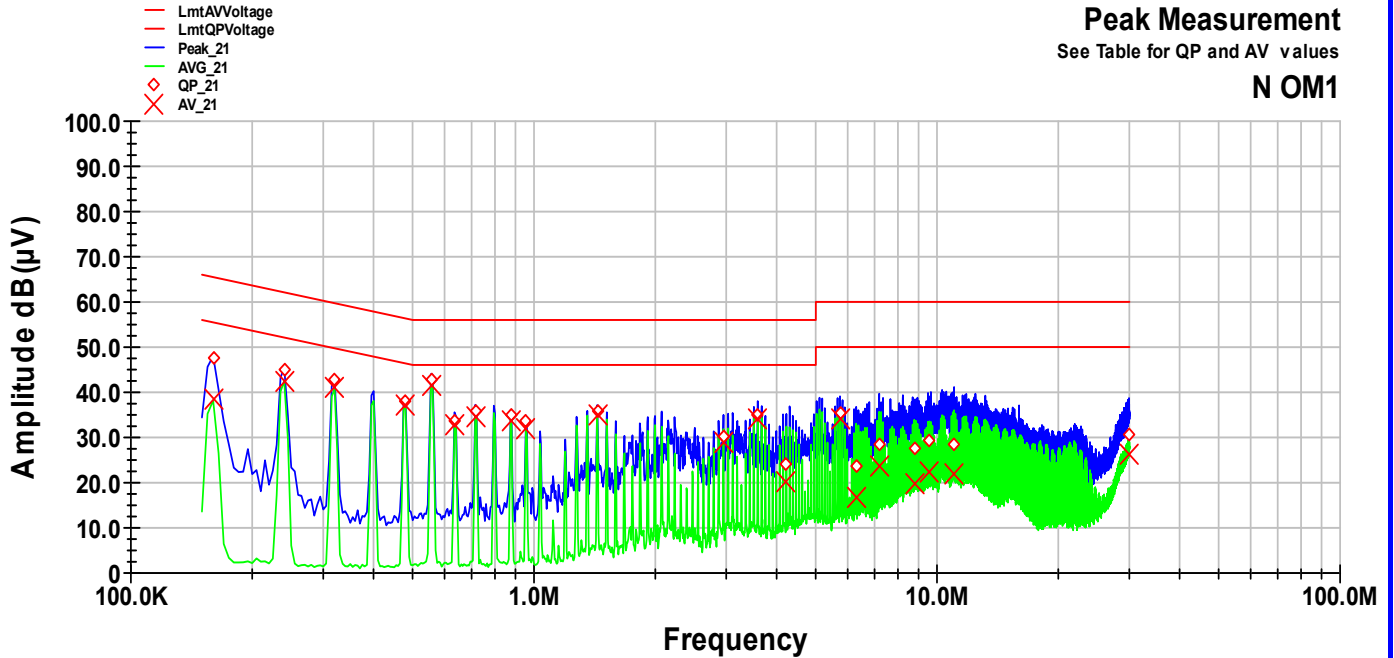
Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	44.8	-20.6	65.5	40.6	-14.9	55.5
0.24	41.6	-20.5	62.1	40.6	-11.5	52.1
0.395	36.6	-21.3	58.0	36.2	-11.8	48.0
0.475	34.7	-21.8	56.4	34.2	-12.2	46.4
0.555	41.8	-14.2	56.0	40.3	-5.7	46.0
0.635	34.6	-21.4	56.0	34.1	-11.9	46.0
0.795	35.5	-20.5	56.0	34.7	-11.3	46.0
0.875	36.4	-19.6	56.0	35.3	-10.7	46.0
0.955	36.9	-19.1	56.0	35.5	-10.5	46.0
1.035	36.0	-20.0	56.0	34.3	-11.7	46.0
2.15	30.0	-26.0	56.0	26.5	-19.5	46.0
3.145	23.5	-32.5	56.0	10.7	-35.3	46.0
4.305	25.1	-30.9	56.0	15.7	-30.3	46.0
5.175	23.4	-36.6	60.0	13.2	-36.8	50.0
6.675	28.3	-31.7	60.0	16.1	-33.9	50.0
7.325	26.1	-33.9	60.0	17.0	-33.0	50.0
8.285	28.2	-31.8	60.0	19.7	-30.3	50.0
9.635	29.9	-30.1	60.0	20.8	-29.2	50.0
10.485	30.4	-29.6	60.0	22.7	-27.3	50.0
29.875	33.5	-26.5	60.0	29.0	-21.0	50.0

### FCC ID: NXW-RF600R

Test point: N  
 Operation mode: Standby mode  
 Remarks: RF630R-2

Result: Passed

**Peak Measurement**  
 See Table for QP and AV values  
**N OM1**



Frequency MHz	QP Level dB(µV)	QP Margin dB	QP Limit dB	AV Level dB(µV)	AV Margin dB	AV Limit dB
0.16	47.6	-17.8	65.5	38.7	-16.8	55.5
0.24	45.1	-17.0	62.1	42.5	-9.5	52.1
0.32	42.8	-16.9	59.7	40.9	-8.8	49.7
0.48	38.3	-18.1	56.3	37.2	-9.1	46.3
0.555	42.8	-13.2	56.0	41.4	-4.6	46.0
0.635	33.8	-22.2	56.0	32.6	-13.4	46.0
0.715	35.7	-20.3	56.0	34.6	-11.4	46.0
0.875	35.0	-21.0	56.0	33.6	-12.4	46.0
0.955	33.5	-22.5	56.0	31.8	-14.2	46.0
1.435	35.6	-20.4	56.0	35.0	-11.0	46.0
2.95	30.3	-25.7	56.0	29.1	-16.9	46.0
3.59	35.0	-21.0	56.0	34.2	-11.8	46.0
4.225	24.1	-31.9	56.0	20.1	-25.9	46.0
5.745	35.3	-24.7	60.0	33.9	-16.1	50.0
6.3	23.8	-36.2	60.0	16.5	-33.5	50.0
7.18	28.2	-31.8	60.0	23.6	-26.4	50.0
8.775	27.7	-32.3	60.0	19.6	-30.4	50.0
9.575	29.4	-30.6	60.0	22.5	-27.5	50.0
11.01	28.7	-31.3	60.0	21.9	-28.1	50.0
29.935	30.7	-29.3	60.0	26.2	-23.8	50.0

## FCC ID: NXW-RF600R

### 5.2 20 dB bandwidth

For test instruments and accessories used see section 6 Part MB.

#### 5.2.1 Description of the test location

Test location: AREA4

#### 5.2.2 Photo documentation of the test set-up



#### 5.2.1 Applicable standard

According to FCC Part 15C, Section 15.247(a):

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

#### 5.2.2 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -20 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

**FCC ID: NXW-RF600R**

**5.2.3 Test result**

RF640R - Power setting 30.0 dBm:

Channel No.	-20 dB Bandwidth below peak (kHz)
CH 1 (902.25 MHz)	93.60
CH 26 (914.75 MHz)	93.60
CH 52 (927.75 MHz)	93.60

RF630R-2 - Power setting 27.0 dBm:

Channel No.	-20 dB Bandwidth below peak (kHz)
CH 1 (902.25 MHz)	93.60
CH 26 (914.75 MHz)	93.60
CH 52 (927.75 MHz)	93.60

Bandwidth limit according to FCC Part15C, Section 15.247(a):

Frequency (MHz)	Hopping channels	Limit -20 db bandwidth (kHz)
<b>902-928</b>	<b>≥ 50</b>	<b>&lt; 250</b>

The requirements are **FULFILLED**.

**Remarks:** For detailed test result please refer to following test protocol.

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FCC ID: NXW-RF600R

5.2.4 Test protocol

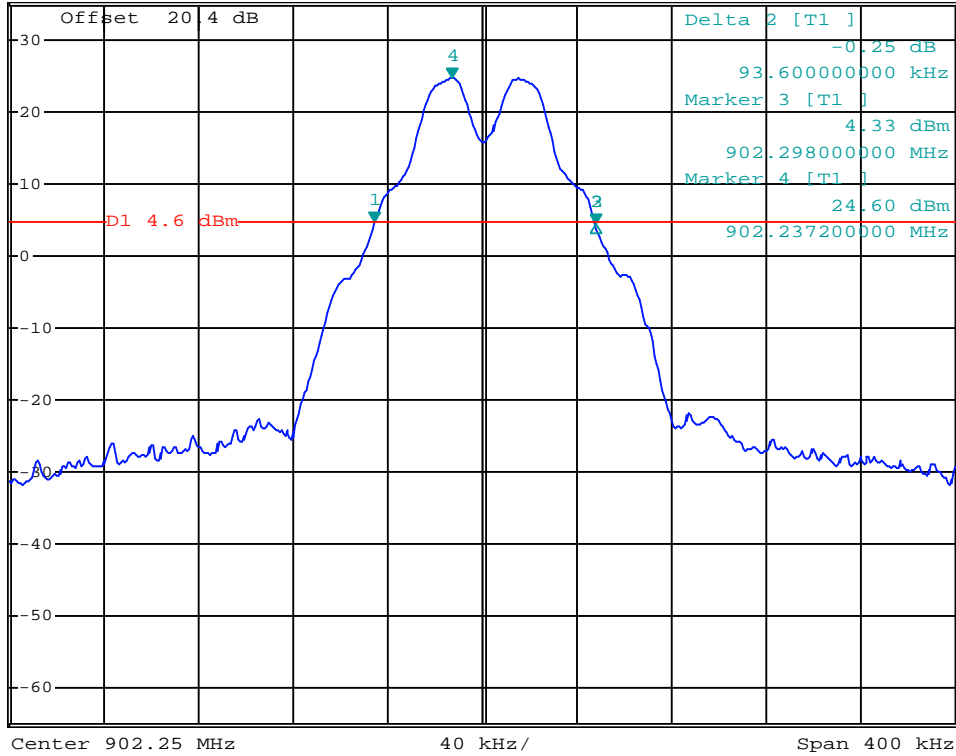
RF640R  
Channel 1  
902.25 MHz



\*RBW 10 kHz    Marker 1 [T1 ]  
VBW 30 kHz        4.59 dBm  
SWT 5 ms         902.204400000 MHz

Ref 35 dBm        Att 50 dB

1 PK  
VIEW















**FCC ID: NXW-RF600R**

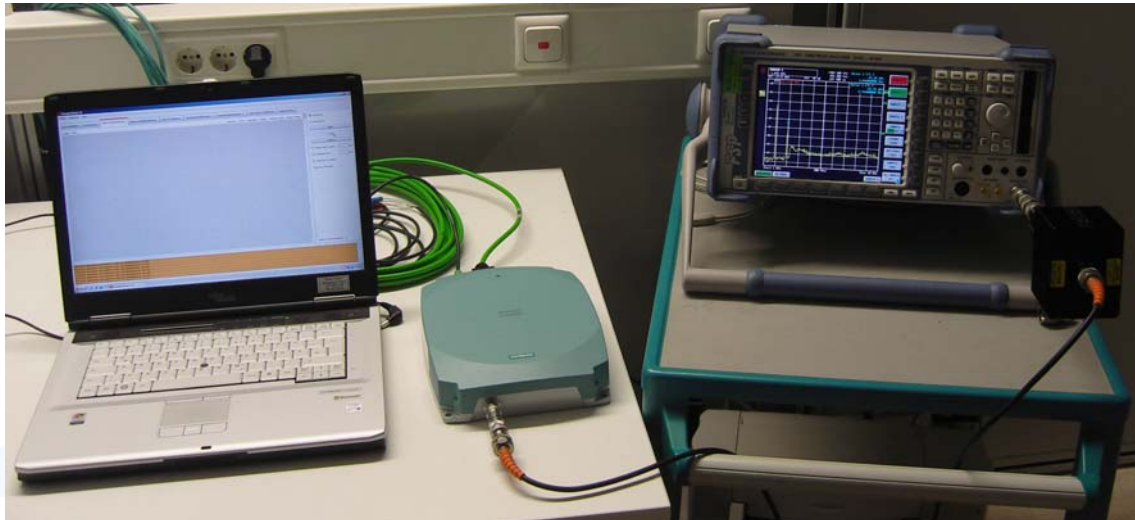
**5.3 Maximum peak conducted output power**

For test instruments and accessories used see section 6 Part CPC 2.

**5.3.1 Description of the test location**

Test location: AREA4

**5.3.2 Photo documentation of the test set-up**



**5.3.3 Applicable standard**

According to FCC Part 15C, Section 15.247(b)(2):

For frequency hopping systems operating in the 902-928 MHz band the maximum peak conducted output power shall not exceed the limit of 1 watt for systems employing at least 50 hopping channels.

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**5.3.4 Description of Measurement**

A spectrum analyzer is connected to the output of the transmitter via a suitable attenuator while EUT was operating in transmit mode using the assigned frequency.

Spectrum analyser settings:

RBW	100 kHz	Sweep time	5 ms (Auto)
VBW	300 kHz	Power Mode	Max. hold
Detector	Peak	Span	500 kHz

**FCC ID: NXW-RF600R**

**5.3.5 Test result**

a.) RF640R, power setting 30.0 dBm  
=>RF660A, antenna gain: 6.0 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Delta (dB)
1	902.25	29.01	30.0	-0.99
26	914.75	29.71	30.0	-0.29
52	927.75	29.68	30.0	-0.32

b.) RF640R, power setting 29.0 dBm  
=>RF642A, antenna gain: 7.0 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Delta (dB)
1	902.25	28.12	30.0	-1.88
26	914.75	28.93	30.0	-1.07
52	927.75	28.57	30.0	-1.43

c.) RF630R-2, power setting 27.0 dBm  
=>RF660A, antenna gain: 6.0 dBi

Channel	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Delta (dB)
1	902.25	27.00	30.0	-3.00
26	914.75	26.99	30.0	-3.01
52	927.75	26.32	30.0	-3.68

**Note:** Test cable loss and fixed attenuation of 20 dB are included in the analyzer reading (Transducer factor).

Peak Power Limit according to FCC Part 15C, Section 15.247(b)(2):

Frequency (MHz)	Hopping channels	Hop. CH carrier frequ. separation	Peak Power Limit	
			(dBm)	(W)
<b>902-928</b>	<b>≥ 50</b>		<b>30</b>	<b>1.0</b>

The requirements are **FULFILLED**.

**Remarks:** The conducted output power has been reduced by the amount in dB that the directional gain of the antenna (7.0 dBi) exceeds 6 dBi. Refer to 5.3.5 b.) above.

## FCC ID: NXW-RF600R

### 5.4 Spurious RF conducted emissions

For test instruments and accessories used see section 6 Part SEC1, SEC2 and SEC3.

#### 5.4.1 Description of the test location

Test location: AREA4

#### 5.4.2 Photo documentation of the test set-up



#### 5.4.3 Applicable standard

According to FCC Part 15C, Section 15.247(d):

In any 100 kHz bandwidth outside the frequency band 902 to 928 MHz, the digitally modulated 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 either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a).

#### 5.4.4 Description of Measurement

A spectrum analyzer is connected to the output of the transmitter via a suitable attenuator while EUT was operating in transmit mode at the assigned frequency.

Spectrum analyzer settings:

RBW	100 kHz
VBW	300 kHz
Detector	Max. peak
Trace:	Max. hold
Sweep time	auto

**FCC ID: NXW-RF600R**

**5.4.5 Test result**

Power setting 30.0 dBm

Hopping frequency from 902.25 to 927.75 MHz, max. level 29.65 dBm			
Frequency (MHz)	Peak power * (dBm)	Limit (-20 dB) (dBm)	Delta (dB)
1846.0	-34.28	9.65	-43.93

\* Fixed attenuation of 20 dB is included in the Peak power.

The requirements are **FULFILLED**.

- Remarks:** All spurious emissions falling in restricted bands have been measured radiated.
- For detailed results please refer to following test protocols.
- In the frequency range from 9 kHz to 30 MHz no emissions could be measured.
- Test was performed in frequency hopping mode from 902.25 to 927.75 MHz.
- This mode represents the worst case mode of the EuT.

### FCC ID: NXW-RF600R

Conducted RF emission from 9 kHz to 30 MHz

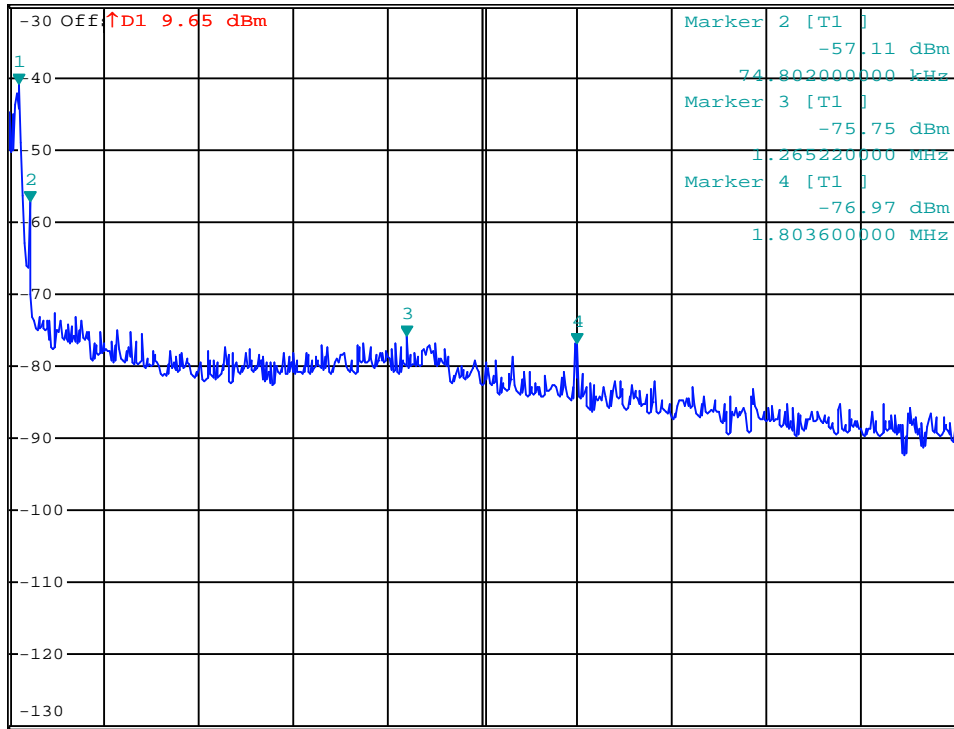


Ref -30 dBm Att 10 dB SWT 34 s

\*RBW 300 Hz VBW 1 kHz

Marker 1 [T1] -40.93 dBm  
38.91000000 kHz

1 PK VIEW



Start 9 kHz 299.1 kHz/ Stop 3 MHz

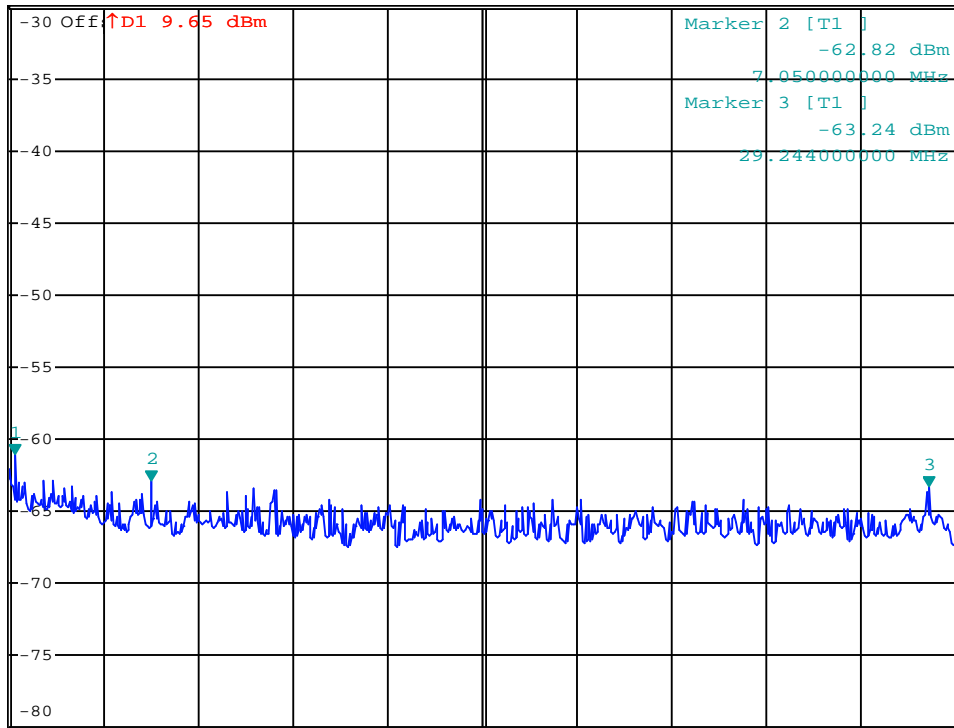


Ref -30 dBm Att 10 dB SWT 5 ms

\*RBW 100 kHz VBW 300 kHz

Marker 1 [T1] -61.03 dBm  
3.16200000 MHz

1 PK VIEW



Start 3 MHz 2.7 MHz/ Stop 30 MHz

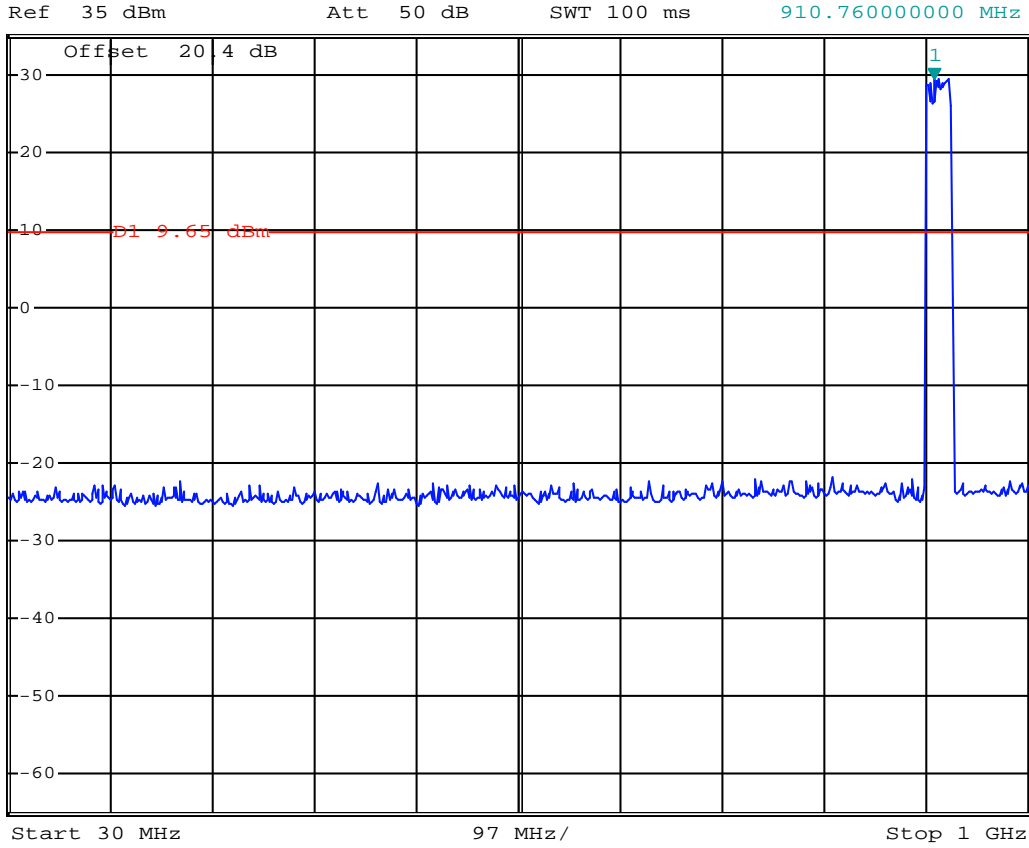


FCC ID: NXW-RF600R

Conducted RF emission from 30 to 1000 MHz



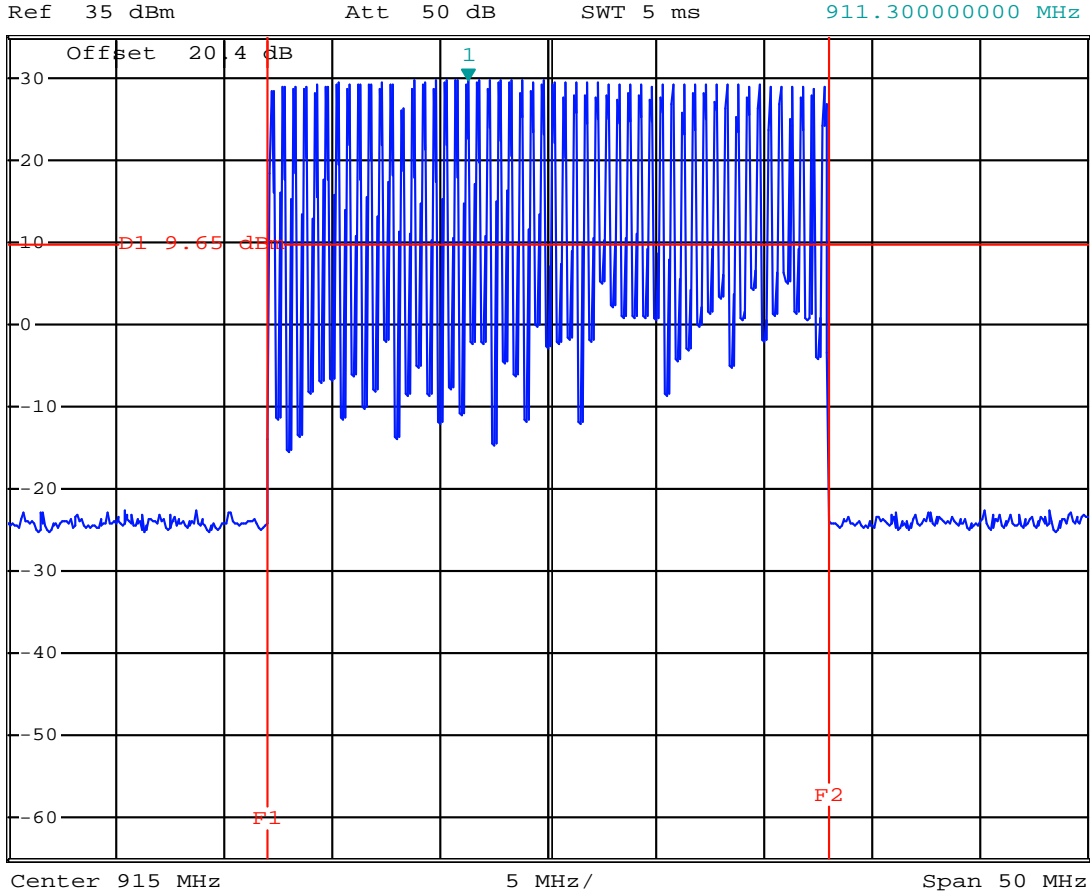
\*RBW 100 kHz Marker 1 [T1]  
 VBW 300 kHz 29.42 dBm  
 SWT 100 ms 910.76000000 MHz



**FCC ID: NXW-RF600R**  
 Conducted RF emission from 30 to 1000 MHz  
 (Band edge)



\*RBW 100 kHz Marker 1 [T1 ]  
 VBW 300 kHz 29.65 dBm  
 SWT 5 ms 911.30000000 MHz



**FCC ID: NXW-RF600R**  
 Conducted RF emission from 1 to 10 GHz

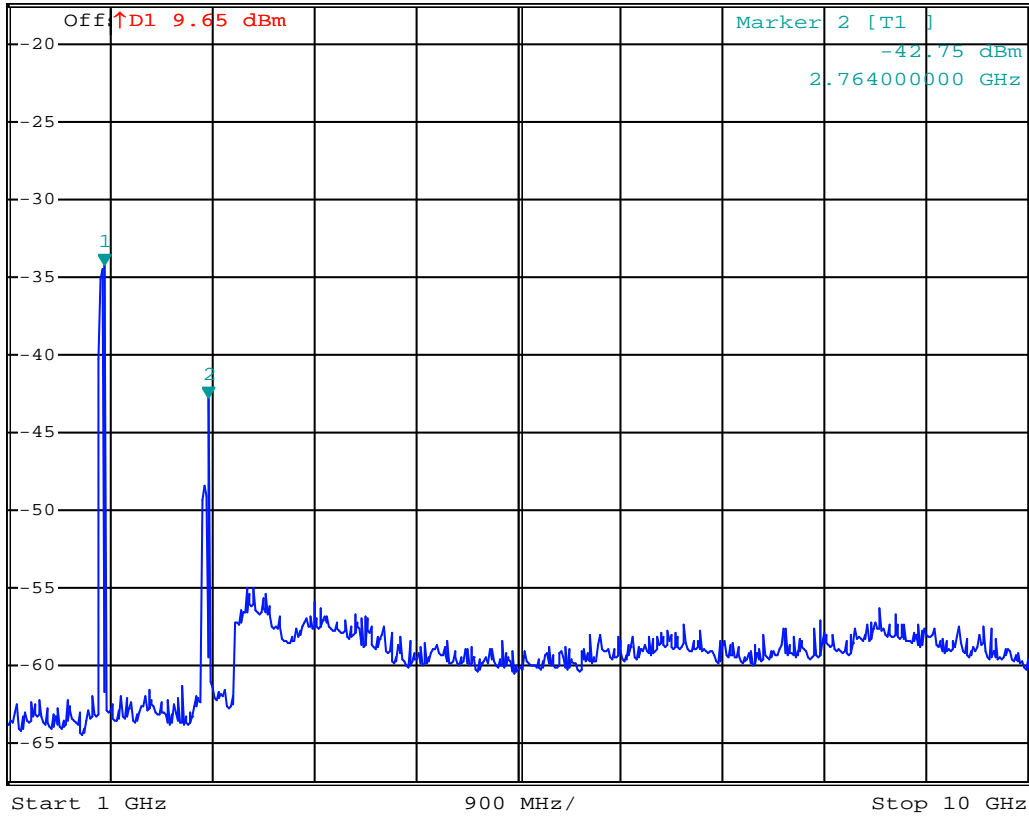


\*RBW 100 kHz Marker 1 [T1 ]  
 VBW 300 kHz -34.28 dBm  
 SWT 900 ms 1.846000000 GHz

Ref -17.5 dBm

Att 10 dB

1 PK VIEW



Note: Signal level no. 2 is located in restricted band.

## FCC ID: NXW-RF600R

### 5.5 Spurious radiated emissions

For test instruments and accessories used see section 6 Part **SER 1**, **SER 2**, **SER 3**.

#### 5.5.1 Description of the test location

Test location: OATS1  
Test distance: 3 metres

Test location: Anechoic Chamber A2  
Test distance: 3 metres

#### 5.5.2 Photo documentation of the test set-up



## FCC ID: NXW-RF600R



### 5.5.3 Applicable standard

According to FCC Part 15, Section 15.247(d):

In any 100 kHz bandwidth outside the frequency bands 902 to 928 MHz, the digitally modulated 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 either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a) (see Section 15.205(c)).

### 5.5.4 Description of Measurement

Radiated spurious emissions from the EUT are measured in the frequency range of 9 kHz to 1000 MHz using a tuned receiver and appropriate broadband linear polarized antennas. The measurements are made with 120 kHz bandwidth and quasi-peak detection (200 Hz, 9 kHz up to 30 MHz). The EUT was placed on a 1.0 X 1.5 metres non-conducting table 80 centimetres above the ground plane. The set up of the equipment under test will be in accordance to ANSI C63.4. The antenna was positioned 3 metres horizontally from the EUT. To locate maximum emissions from the EUT the antenna is shifted in height from 1 to 4 metres, after the EUT is rotated 360 degrees. The measurement scan is made in horizontal and vertical polarization of the antenna.

For the radiated measurement up from 1 GHz to maximum frequency as specified in Section 15.33, a spectrum analyzer and appropriate linear polarized antennas are used. The EUT is placed on a 1.0 X 1.5 metres non-conducting table 80 centimetres above the ground plane. The set up of the EUT will be in accordance to ANSI C63.4. The antenna was positioned 3 m horizontally from the EUT. To locate maximum emissions the EUT was rotated 360 degrees in the fully anechoic chamber. The measurement scan is made in horizontal and vertical polarization of the antenna. For testing above 1 GHz, if the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.

## FCC ID: NXW-RF600R

### 5.5.5 Test result

#### 5.5.5.1 Radiated emission test $f < 1$ GHz

In the frequency range from 9 kHz to 30 MHz no radiated emissions could be measured.

In the frequency range from 30 MHz to 1 GHz no radiated emissions could be measured.

#### 5.5.5.2 Radiated emission test $f > 1$ GHz

RF640R, power setting 30.0 dBm  
=>RF660A, antenna gain: 6.0 dBi

Frequency (GHz)	L: PK (dB $\mu$ V)	L: AV (dB $\mu$ V)	Bandwidth (kHz)	Correct. (dB)	L: PK dB( $\mu$ V/m)	L: AV dB( $\mu$ V/m)	Limit AV dB( $\mu$ V/m)	Delta (dB)
2.764	50.83	39.58	1000	-9.2	41.6	30.4	54.0	-23.6

\*) Average values were measured with spectrum analyzer by the following settings

RBW: 1 MHz  
VBW: 10 Hz  
Sweep: Auto

Radiated limits according to FCC Part 15C, Section 15.209(a) for spurious emissions:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (metres)
	( $\mu$ V/m)	dB( $\mu$ V/m)	
0.009 - 0.490	2400/F(kHz)		300
0.490 - 1.705	24000/F(kHz)		30
1.705 - 30	30	29,5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

**FCC ID: NXW-RF600R**

**Restricted bands of operation:**

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209: (Refer to section 5.5.5.1)

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	Above 38.6

The requirements are **FULFILLED**.

- Remarks:**
- During the test the EUT was set into TX continuous mode with normal modulation.
  - The measurement was performed up to the 10<sup>th</sup> harmonic (10000 MHz).
  - Test was performed in frequency hopping mode from 902.25 to 927.75 MHz.
  - This mode represents the worst case mode of the EuT.





**FCC ID: NXW-RF600R****5.7 Equal hopping frequency use**

Requirement according to FCC Part 15C, Section 15.247(a):  
Each frequency must be used equally on the average by each transmitter.

**Remarks:** The device fulfills the requirement according to FCC Part 15C, Section 15.247(a).  
The manufacturer declares in the system manual that this function is controlled via software.  
For detailed information about the hopping sequence, please refer to  
"Theory of Operation Manual".

**5.8 Receiver input bandwidth**

Requirement according to FCC Part 15C, Section 15.247(a):  
The system receivers shall have input bandwidth that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signal.

**Remarks:** The receiver bandwidth is equal to the transmitter bandwidth in the 52 hopping channel mode.  
(Declared by the manufacturer.)  
For detailed information about the hopping sequence, please refer to  
"Theory of Operation Manual".

## FCC ID: NXW-RF600R

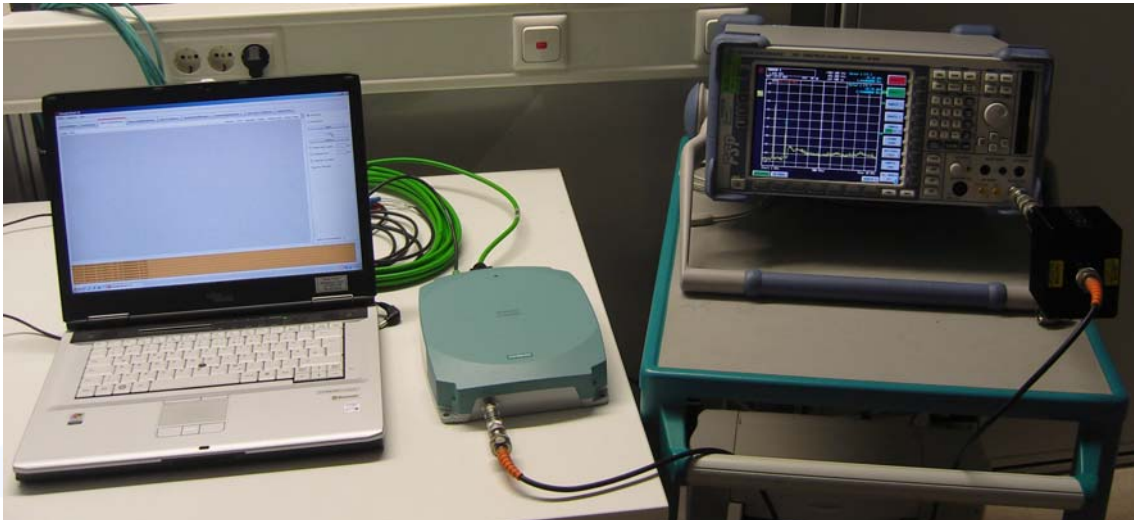
### 5.9 Dwell time

For test instruments and accessories used see section 6 Part DC.

#### 5.9.1 Description of the test location

Test location: AREA4

#### 5.9.2 Photo documentation of the test set-up



#### 5.9.3 Applicable standard

According to FCC Part 15, Section 15.247(a)(i):

Frequency hopping systems operating in the 902-928 MHz band: The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

#### 5.9.4 Description of Measurement

The measurement was done using a spectrum analyser in time domain function and able to store the maximum time of a period. This time period has been stored and added up the appropriate time intervals the hopping system has applied this channel.

**FCC ID: NXW-RF600R**

**5.9.5 Test result**

Channel frequency (MHz)	Pulse Time (ms)	Number of Bursts (in 1 time period)	Dwell time (ms)
914.75	360	1	360

Requirement according to FCC Part15C, Section 15.247(a):

Frequency (MHz)	Hopping channels	time of one period (s)	Limit dwell time, AV (ms)
<b>902-928</b>	<b>≥ 50</b>	<b>20</b>	<b>&lt; 400</b>

The requirements are **FULFILLED**.

**Remarks:** For detailed test result please refer to following test protocol.  
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 \_\_\_\_\_  
 \_\_\_\_\_  
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**FCC ID: NXW-RF600R**

**5.10 Channel separation**

For test instruments and accessories used see section 6 Part MB.

**5.10.1 Description of the test location**

Test location: AREA4

**5.10.2 Photo documentation of the test set-up**



**5.10.3 Applicable standard**

According to FCC Part 15, Section 15.247(a)(1):

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.

**5.10.4 Description of Measurement**

This measurement was done by using a spectrum analyser. The Span of the analyzer was set wide enough to capture 2 frequencies. The result of the channel separation was compared with the 20 dB bandwidth and recorded.

**5.10.5 Test result**

- RF640R:

Channel 1 (MHz)	Channel 2 (MHz)	Channel separation (kHz)
902.25	902.75	500

- RF630R-2:

Channel 1 (MHz)	Channel 2 (MHz)	Channel separation (kHz)
902.25	902.75	500



FCC ID: NXW-RF600R

RF630R-2  
Channel separation

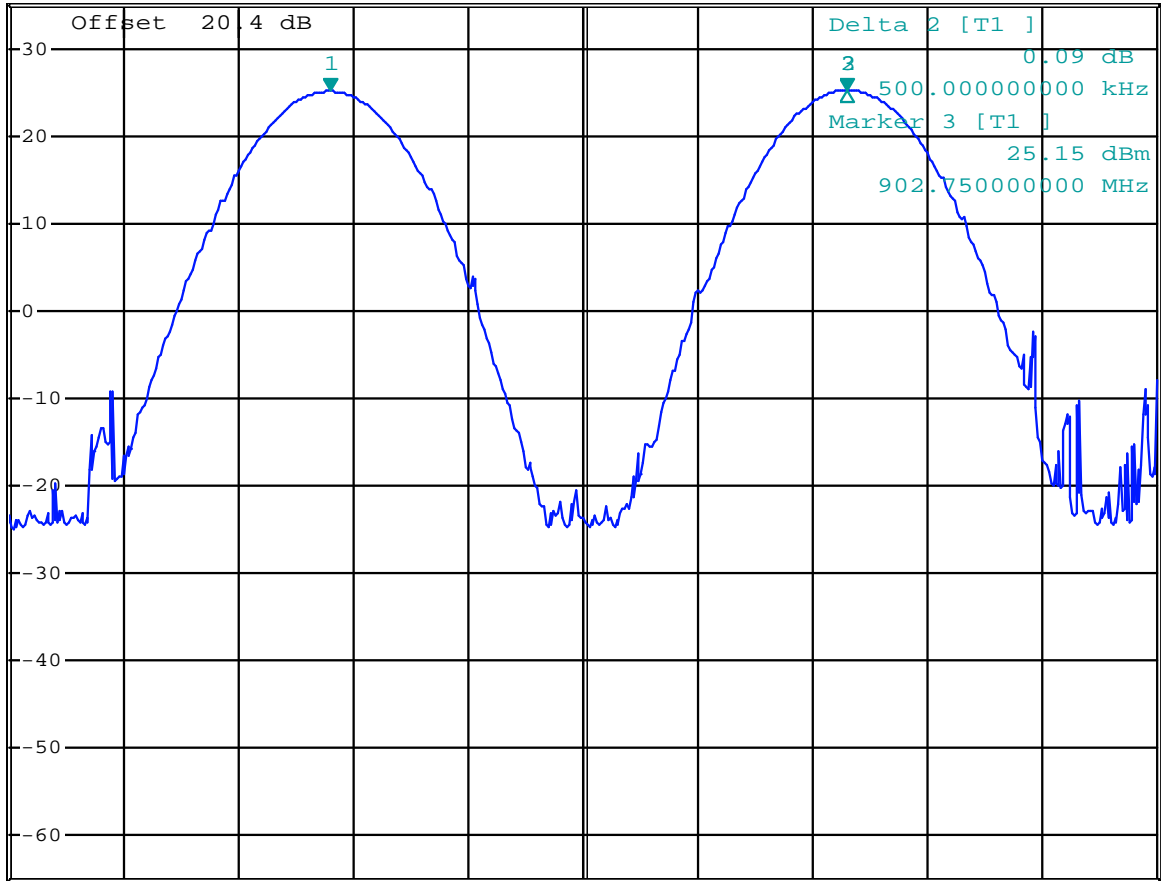


\*RBW 100 kHz Marker 1 [T1 ]  
 VBW 300 kHz 25.05 dBm  
 SWT 2.5 ms 902.250000000 MHz

Ref 35 dBm

Att 50 dB

1 PK  
VIEW



A

LVL

3DB

Center 902.495 MHz

111 kHz/

Span 1.11 MHz

**FCC ID: NXW-RF600R**

**5.11 Quantity of hopping channels**

For test instruments and accessories used see section 6 Part MB.

**5.11.1 Description of the test location**

Test location: AREA4

**5.11.2 Photo documentation of the test set-up**



**5.11.3 Applicable standard**

According to FCC Part 15, Section 15.247(a)(1)(i):  
 For frequency hopping systems operating in the 902-928 MHz band: If the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies.

**5.11.4 Description of Measurement**

This measurement was done by using a spectrum analyser. The EuT was transmitting at its maximum data rate. The Span of the analyzer was set wide enough to capture the frequency band from 902-928 MHz.

**5.11.5 Test result**

Hopping channel frequency range	Quantity of hopping channels value	Quantity of hopping channels minimum limit
902-928 MHz	52	50



**FCC ID: NXW-RF600R**

Limit according to FCC Part 15C, Section 15.247(1):

Frequency range (MHz)	LIMIT (Quantity of Hopping Channels)			
	20dB Bandwidth < 250kHz	20dB Bandwidth > 250kHz	20dB Bandwidth < 1 MHz	20dB Bandwidth > 1MHz
<b>902 - 928</b>	<b>50</b>	25	---	---

The requirements are **FULFILLED**.

**Remarks:** For detailed test result please refer to following test protocol.

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FCC ID: NXW-RF600R

5.11.6 Test protocol

Quantity of hopping channel



\*RBW 100 kHz Marker 1 [T1 ]  
 VBW 300 kHz 29.83 dBm  
 SWT 5 ms 913.26000000 MHz

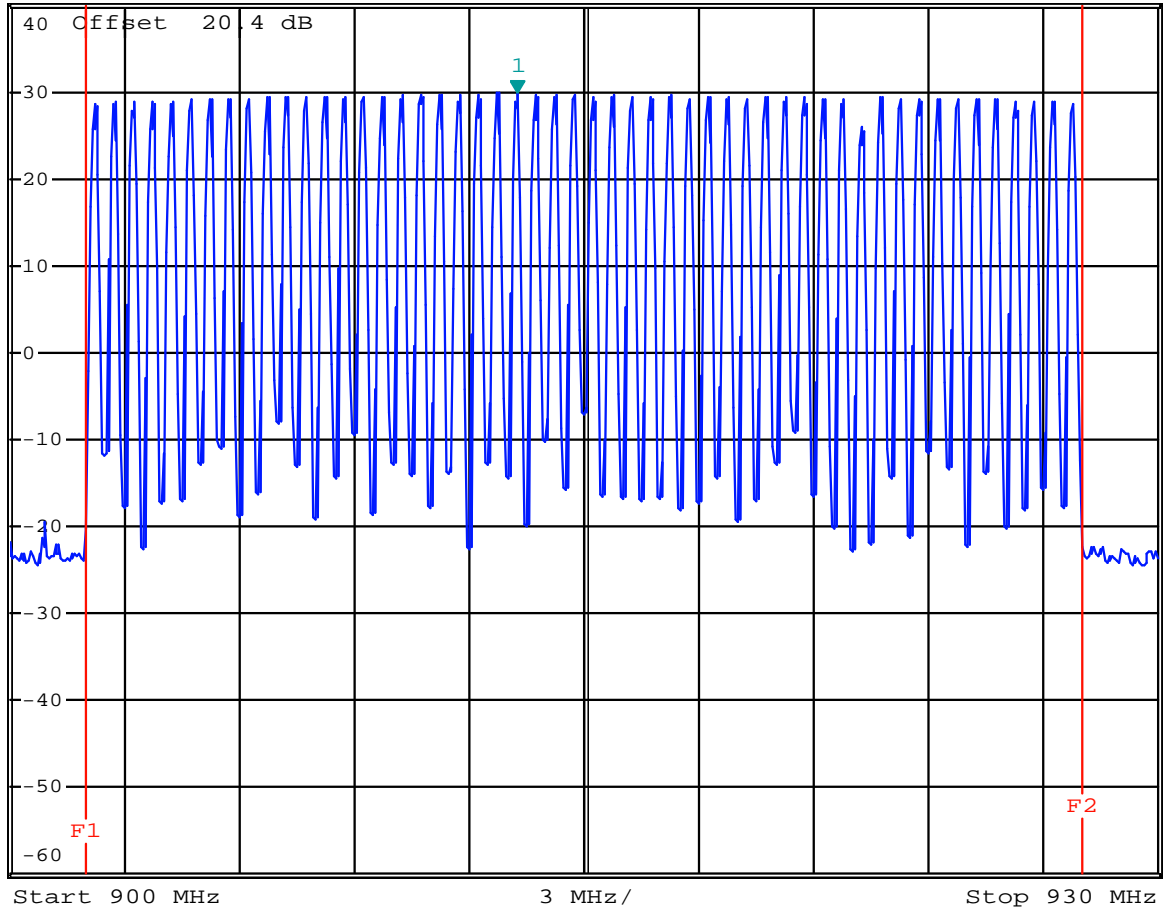
Ref 40 dBm

Att 50 dB

SWT 5 ms

913.26000000 MHz

1 PK VIEW



**FCC ID: NXW-RF600R****5.12 Antenna application - Detailed photos see Attachment A****5.12.1 Applicable standard**

According to FCC Part 15C, Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit that broken antennas can be replaced by the user, but the use of a standard antenna jack is prohibited.

The EUT has reverse TNC plugs to connect the defined antennas supplied by the manufacturer.  
All supplied antennas meet the requirements of part 15.203 and 15.204.

**5.12.2 Antenna requirements**

According to FCC Part 15C, Section 15.247 (b)(4):

The conducted output power limit specified in paragraph (b) of 15.247 is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from intentional radiator shall be reduced below the stated values in paragraph (b)(1), (b)(2) and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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## FCC ID: NXW-RF600R

### 5.13 Maximum permissible exposure (MPE) – See Attachment B

For test instruments and accessories used see section 6 Part **CPC 2**.

#### 5.13.1 Description of the test location

Test location: None

#### 5.13.2 Applicable standard

According to FCC Part 15, Section 15.247(i):

Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

The test methods used comply with ANSI/IEEE C95.1, "IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz".

This test report shows the compliance with the limits for Maximum Permissible Exposure (MPE) specified in FCC Part 1, Section 1.1310 and the criteria to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in FCC Part 1, Section 1.1307(b).

#### 5.13.3 Description of Measurement

The maximum total power input to the antenna has been measured conducted as described in clause 5.3 of this document. Through the Friis transmission formula, the known maximum gain of the antenna and the maximum power, the MPE can be calculated in a defined distance away from the product.

Friis transmission formula: 
$$P_d = \frac{P_{out} * G}{4 * \pi * r^2}$$

where

$P_d$  = power density (mW/cm<sup>2</sup>)

$P_{out}$  = output power to antenna (mW)

$G$  = gain of antenna (linear scale)

$r$  = distance between antenna and observation point (cm)

**Remarks:** For detailed test result please refer Attachment B.

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**FCC ID: NXW-RF600R**

**6 USED TEST EQUIPMENT AND ACCESSORIES**

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESHS 30	02-02/03-05-002	30/06/2012	30/06/2011		
	NNLK 8129	02-02/20-05-001			09/07/2012	09/01/2012
	ESH 2 - Z 5	02-02/20-05-004	12/05/2012	12/05/2011	09/07/2012	09/01/2012
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155			05/04/2012	05/10/2011
	SP 103 /3.5-60	02-02/50-05-182				
CPC 2	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	Inmet 18N50W-20 dB	02-02/50-10-001				
DC	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	Inmet 18N50W-20 dB	02-02/50-10-001				
MB	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	Inmet 18N50W-20 dB	02-02/50-10-001				
SEC 1-3	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	WHJS 1000-10EE	02-02/50-05-070				
	Inmet 18N50W-20 dB	02-02/50-10-001				
SER 1	FMZB 1516	01-02/24-01-018			16/02/2013	16/02/2012
	ESCI	02-02/03-05-005	21/11/2012	21/11/2011		
	S10162-B	02-02/50-05-031				
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
SER 2	ESVS 30	02-02/03-05-006	20/06/2012	20/06/2011		
	VULB 9168	02-02/24-05-005	07/03/2012	07/03/2011	08/09/2012	08/03/2012
	S10162-B	02-02/50-05-031				
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
SER 3	FSP 40	02-02/11-11-001	02/09/2012	02/09/2011		
	AFS4-01000400-10-10P-4	02-02/17-05-003				
	AMF-4F-04001200-15-10P	02-02/17-05-004				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	3117	02-02/24-05-009	16/02/2013	16/02/2012		
	Sucoflex N-1600-SMA	02-02/50-05-073				
	Sucoflex N-2000-SMA	02-02/50-05-075				