



REPORT

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Radio measurements on WCDMA 1900 MHz Radio Equipment with FCC ID: TA8AKRC161134-2

(9 appendices)

Test object

RRU22 1940, Product no. KRC 161 134/2, revision R1C

Appendix 1 provides information about the test object and the test set-up.
Appendix 9 provides external photos of the test object.

Summary

Standard	Compliant	Appendix	Remarks
FCC CFR 47			
2.1046 RF power output	Yes	2	-
2.1049 Occupied bandwidth	Yes	3	-
2.1051 Band edge	Yes	4	-
2.1051 Spurious emission at antenna terminals	Yes	5	-
2.1053 Field strength of spurious radiation	Yes	6	-
2.1055 Frequency stability	Yes	7	-
Industry Canada RSS-133			
Section 6.7. Receiver spurious emissions	Yes	8	-

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**Description – Test object**

Equipment: WCDMA Radio Equipment RRU22 1940, with 1900 MHz single and multi carrier configuration.

Tx Frequency range: 1932.4-1987.6 MHz

Modulations: QPSK and 16QAM

Maximum output power: Single carrier: 1x 46 dBm (40W)
Multi carrier: 2x 43 dBm (20W)

Nominal power voltage: -48 VDC

Tested channels

UARFCN	Frequency
9662	1932.4 MHz
9712	1942.4 MHz
9763	1952.6 MHz
9788	1957.6 MHz
9813	1962.6 MHz
9888	1977.6 MHz
9938	1987.6 MHz

Operation mode during measurements**Test models**

All measurements were performed with the test object transmitting the Test models 1 and 5 defined in 3GPP TS 25.141. Test model 1 uses the QPSK modulation only, and Test model 5 includes the 16QAM modulation.

Conducted measurements

All RF conducted measurements were performed with the test object powered with -48 VDC. All TX measurements were done at the output connector Ant 1 of the RRU22 1940, KRC 161134/2. All measurements were performed at maximum output power with both modulations.

The settings below was found to be representative for all traffic scenarios when several settings were tested to find the setting for worst case.

Single carrier

Test model 1: 64 DPCH:s at 30 ksps (SF=128)

Test model 5: 30 DPCH:s at 30 ksps (SF=128) and 8 HS-PDSCH:s at 240 ksps (SF=16)

Multi carrier

Test model 1: 32 DPCH:s at 30 ksps (SF=128)

Test model 5: 30 DPCH:s at 30 ksps (SF=128) and 8 HS-PDSCH:s at 240 ksps (SF=16)



Radiated measurements

All radiated measurements were performed with the test object powered with -48 VDC, either directly (power configuration 1) or with 120 VAC, 60 Hz via the PSU AC/DC converter (power configuration 2) or via both PSU and ACCU (power configuration 3). The configurations were selected to represent worst cases.

The RRU22 was activated as Single Carrier 1x 46 dBm and as Multi Carrier 2x 43 dBm. The RF output power ports were terminated with 50 ohm loads.

The RRU22 was measured with the following settings:

Single Carrier:

Modulation	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Downlink UARFCN	9662 (1932.4 MHz)	9662 (1932.4 MHz)	9788 (1957.6 MHz)	9788 (1957.6 MHz)	9938 (1987.6 MHz)	9938 (1987.6 MHz)
Uplink UARFCN	9262 (1852.4 MHz)	9262 (1852.4 MHz)	9388 (1877.6 MHz)	9388 (1877.6 MHz)	9538 (1907.6 MHz)	9538 (1907.6 MHz)
Test model	1	5	1	5	1	5
Power configuration	1	1	2	2	3	3

Test model 1: 64 DPCH:s at 30 ksps (SF=128)

Test model 5: 30 DPCH:s at 30 ksps (SF=128) and 8 HS-PDSCH:s at 240 ksps (SF=16)

Multi Carrier:

Cell	1	2
Modulation	QPSK	16QAM
Downlink	9662 (1932.4 MHz)	9712 (1942.4 MHz)
Uplink	9262 (1852.4 MHz)	9312 (1862.4 MHz)
Test model	1	5
Power configuration	1	1

Test model 1: 32 DPCH:s at 30 ksps (SF=128)

Test model 5: 30 DPCH:s at 30 ksps (SF=128) and 8 HS-PDSCH:s at 240 ksps (SF=16)

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable items of FCC CFR 47 and Industry Canada RSS-133.

References

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

- ANSI 63.4-2003
- ANSI/TIA/EIA-603-B-2002
- 3GPP TS 25.141



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Appendix 1

Reservation

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

Delivery of test object

The test object was delivered: 2007-09-10

Manufacturer's representative

Xiaoying Jiang, Ericsson (China) Communications Company Ltd.

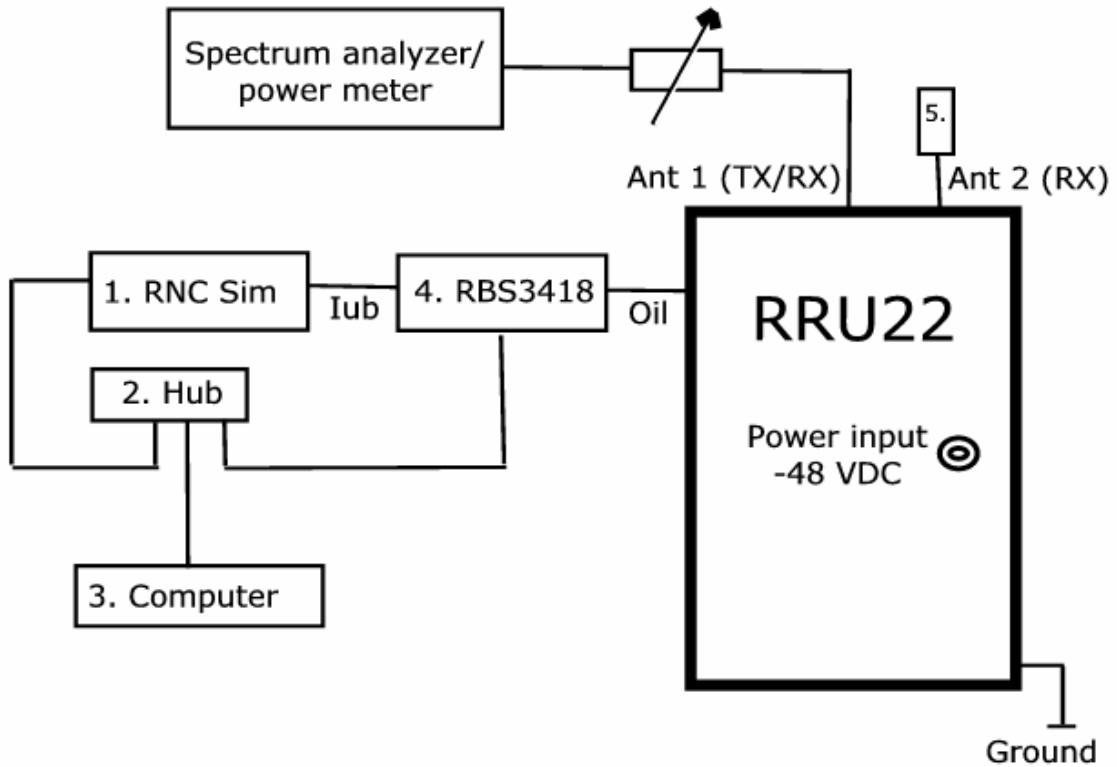
Test engineers

Jonas Bremholt, Stefan Larsson and Reinhold Reul

Test witnesses

Xiaoying Jiang and Bo Yang, Ericsson (China) Communications Company Ltd.

Test set-up, TX conducted measurements



Test object

RRU22 1940, KRC 161 134/2, rev. R1C, serial no: CB44297485
 Software CXP 9011610/1 rev. R11AG02
 with updated RRU load module CXP9011683/2 rev. R2D01
 FCC ID: TA8AKRC161134-2

Functional test equipment

1. RNC Mini-sim #48, 4780FA SN0218 Rev DBA
2. Hub, TP-Link, TL HP8MU, 10Base-T Ethernet
3. Computer, Sun Blade 1500, asset ID AP016574
4. RBS3418, product no. BFE4011019, serial no. TA63805732
5. Termination (50 ohm)

Note: The Iub link between RNC Mini sim and RBS3418 is configured as T1.

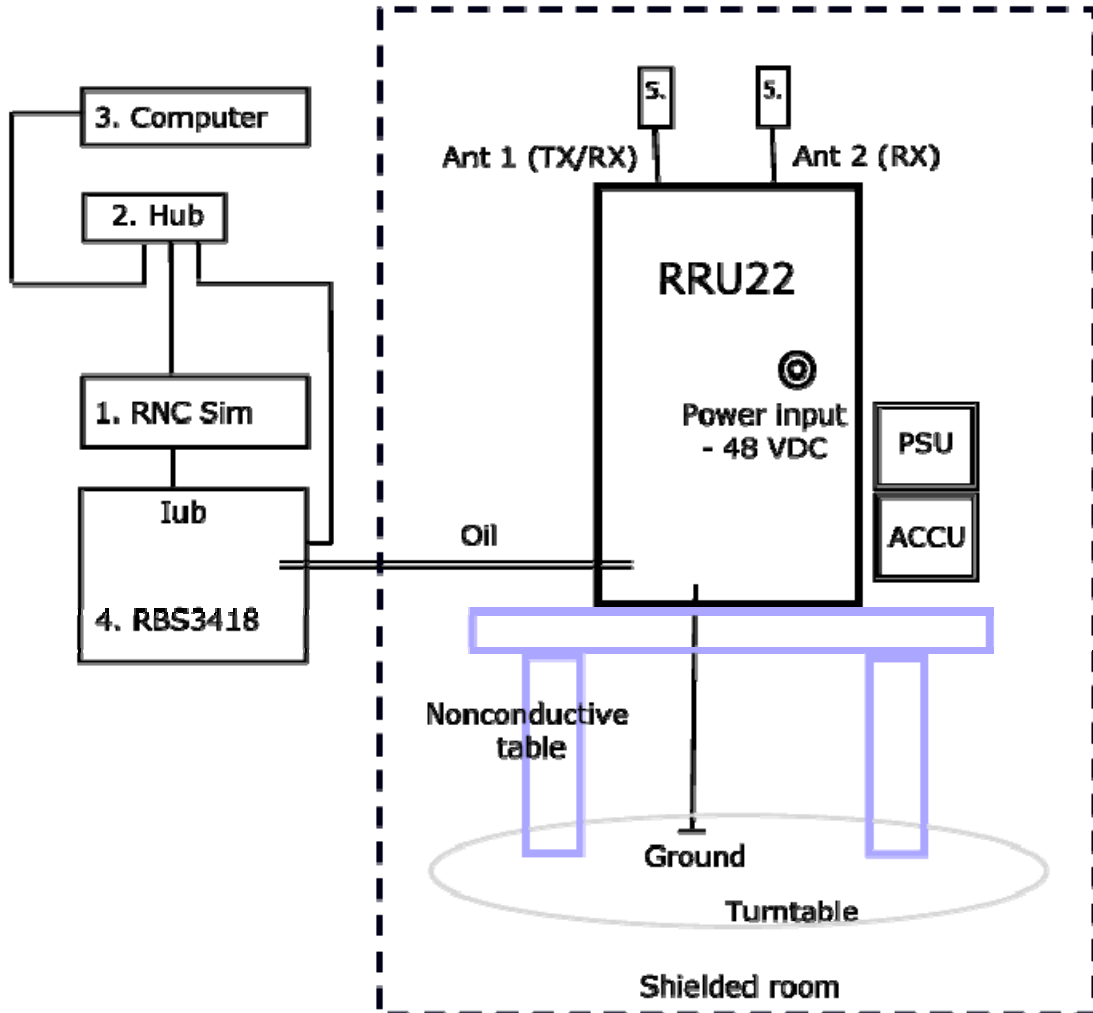
Interfaces:

Power input, -48 VDC
 Ant 1 (TX/RX): Coaxial cable with N connector and adaptor to 7/16"
 Ant 2 (RX): 50 ohm terminator with N connector and adaptor to 7/16"
 Oil - optical interface link, data connection between RBS3418 and EUT

Type of port:

Power
 Antenna
 Antenna
 Opto interface

Test set-up, radiated measurements



Test object

RRU22 1940, KRC 161 134/2, rev.R1C, serial no: CB44297485
 Software CXP 9011610/1 rev. R11AG02
 with updated RRU load module CXP9011683/2 rev. R2D01
 FCC ID: TA8AKRC161134-2

Auxiliary equipment

PSU, power supply unit, converting 120 VAC, 60 Hz to -48 VDC (only power configurations 2 and 3)
 ACCU, lightning protection (only power configuration 3)

Functional test equipment

1. RNC Mini-sim #48, 4780FA SN0218 Rev DBA
2. Hub, TP-Link, TL HP8MU, 10Base-T Ethernet
3. Computer, Sun Blade 1500, asset ID AP016574
4. RBS3418, product no. BFE4011019, serial no. TA63805732
5. Terminator (50 ohm)



Interfaces:

Tested 3 different supply power configurations:

Type of port:

Power

Power configuration 1: DC, -48 VDC directly connected to power input

Power configuration 2: AC indoor, 120 VAC/60 Hz, connected to PSU, interconnection cable from PSU to -48 VDC power input

Power configuration 3: AC outdoor, 120 VAC/60 Hz, connected to ACCU; ACCU interconnected to PSU, PSU interconnected to -48 VDC power input

Ant 1: Combined TX/RX connector 7/16" terminated in 50 ohm via adapter 7/16" to N.

Antenna

Ant 2: RX connector 7/16" terminated in 50 ohm via adapter 7/16" to N.

Antenna

Oil, optical link to RBS3418

Opto interface

GND

Safety ground



RF power output measurements according to 47 CFR 2.1046

Date 2007-09-19	Temperature 22 °C ± 3 °C	Humidity 40 % ± 5 %
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Test set-up and procedure

The output was connected to a peak power analyzer. The transmitter was set up according to Test model 1 and Test model 5 during the measurements.

Measurement equipment	Calibration Due	SP number
Boonton RF Peak power meter/analyzer	2008-12	503 144
Boonton Power sensor 56518-S/4	2009-06	503 146
Multimeter Fluke 87	2007-12	502 190
Testo 610, Temperature and humidity meter	2009-04	502 658

Measurement uncertainty: 0.5 dB

Results

Single carrier

Rated output power level at Ant 1 connector (maximum): 1x 46 dBm

Test conditions T_{nom} 22 °C/ V_{nom} -48 V DC	Transmitter power (dBm) RMS		
	Frequency 1932.4 MHz	Frequency 1957.6 MHz	Frequency 1987.6 MHz
QPSK	45.3	45.4	45.4
16QAM	46.1	46.1	46.1

Multi carrier

Rated output power level at Ant 1 connector (maximum): 2x 43 dBm

Test conditions T_{nom} 22 °C/ V_{nom} -48 V DC	Transmitter combined power (dBm) RMS		
	Frequencies 1932.4 MHz 1942.4 MHz	Frequencies 1952.6 MHz 1962.6 MHz	Frequencies 1977.6 MHz 1987.6 MHz
QPSK	45.3	45.3	45.3
16QAM	46.0	46.0	46.1

Limit

§24.232: Maximum output power shall not exceed 100W (50 dBm).

Complies?	Yes
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Occupied bandwidth measurements according to 47 CFR 2.1049

Date 2007-09-20	Temperature 22 °C ± 3 °C	Humidity 45 % ± 5 %
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Test set-up and procedure

The measurements were made per definition in §2.1049. Measurements were performed on the combined TX/RX antenna terminal Ant 1. The output was connected to a spectrum analyzer. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements. The transmitter was set up according to Test model 1 and Test model 5 during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2008-10	503 738
Testo 610, Temperature and humidity meter	2009-04	502 658

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 3.1

QPSK

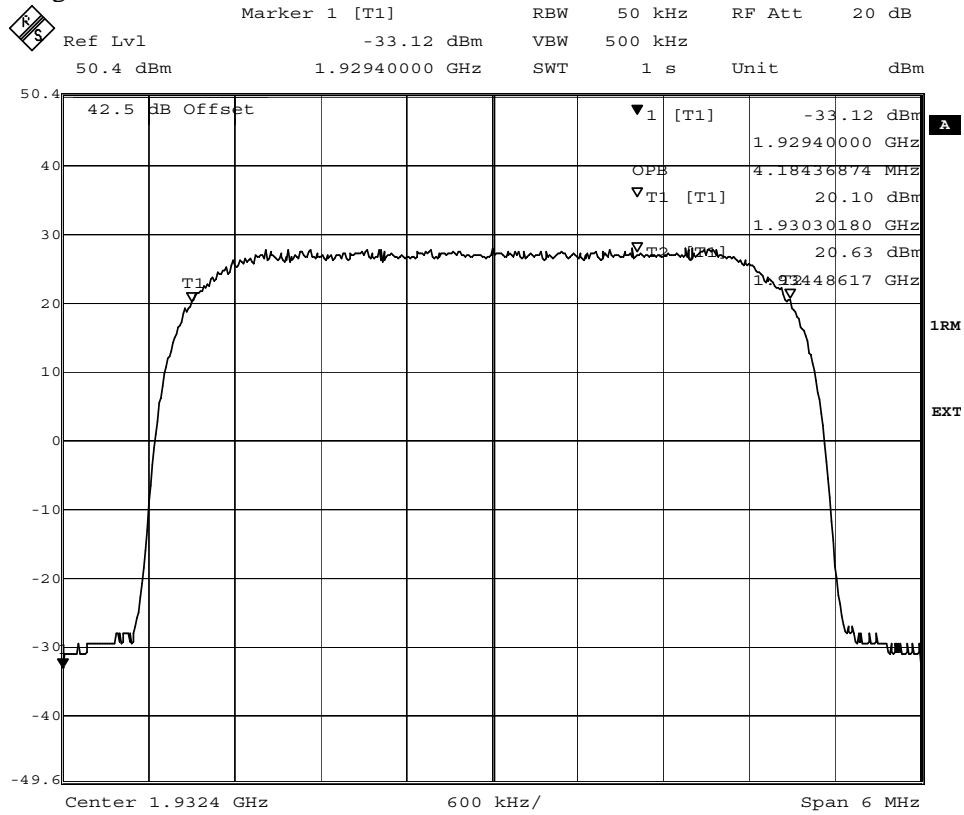
	Frequency	OBW
Diagram 1	1932.4 MHz	4.2 MHz
Diagram 2	1957.6 MHz	4.2 MHz
Diagram 3	1987.6 MHz	4.2 MHz

16QAM

	Frequency	OBW
Diagram 4	1932.4 MHz	4.2 MHz
Diagram 5	1957.6 MHz	4.2 MHz
Diagram 6	1987.6 MHz	4.2 MHz

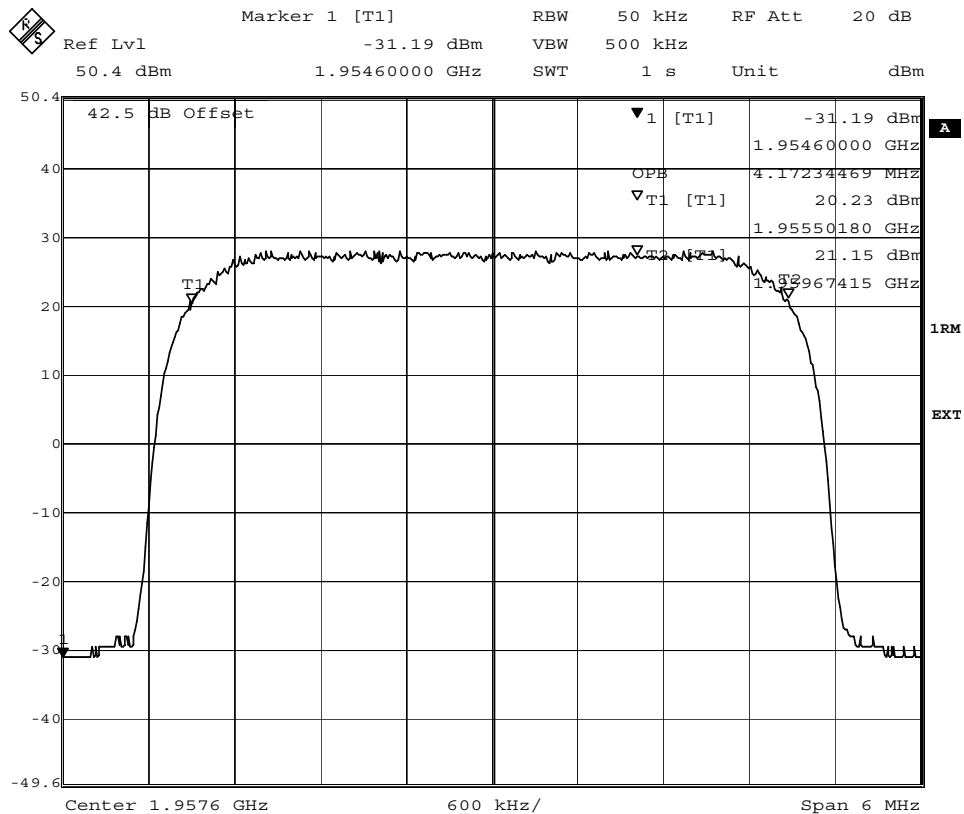


Diagram 1



Date: 20.SEP.2007 11:47:49

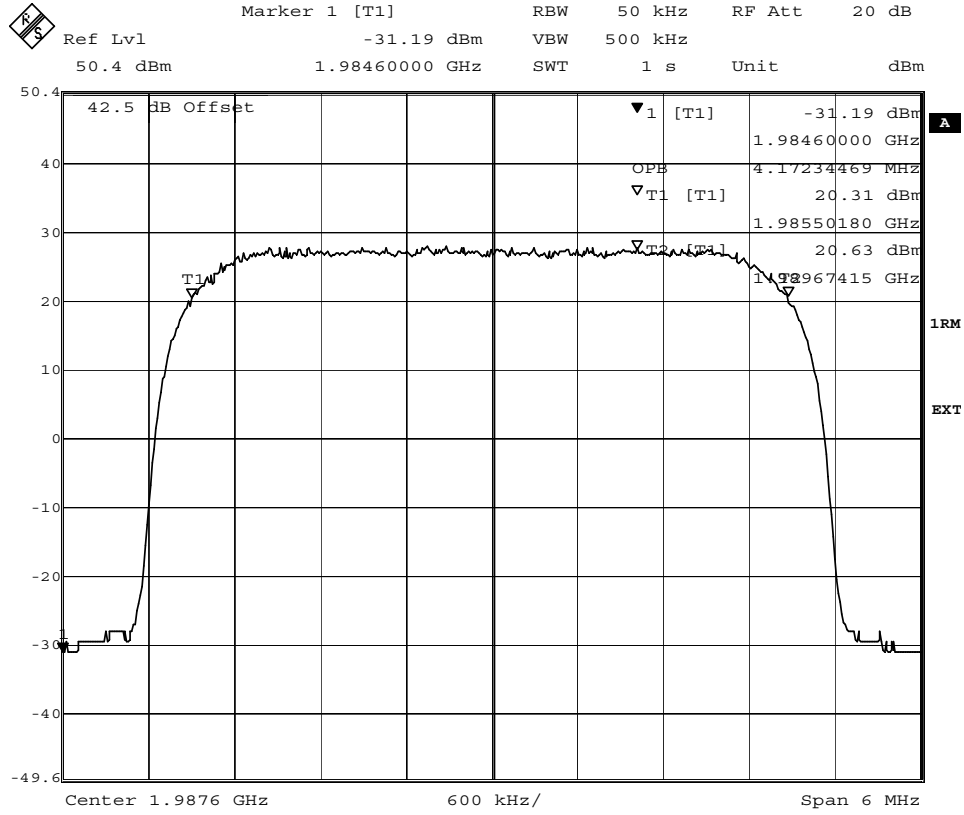
Diagram 2



Date: 20.SEP.2007 10:53:52

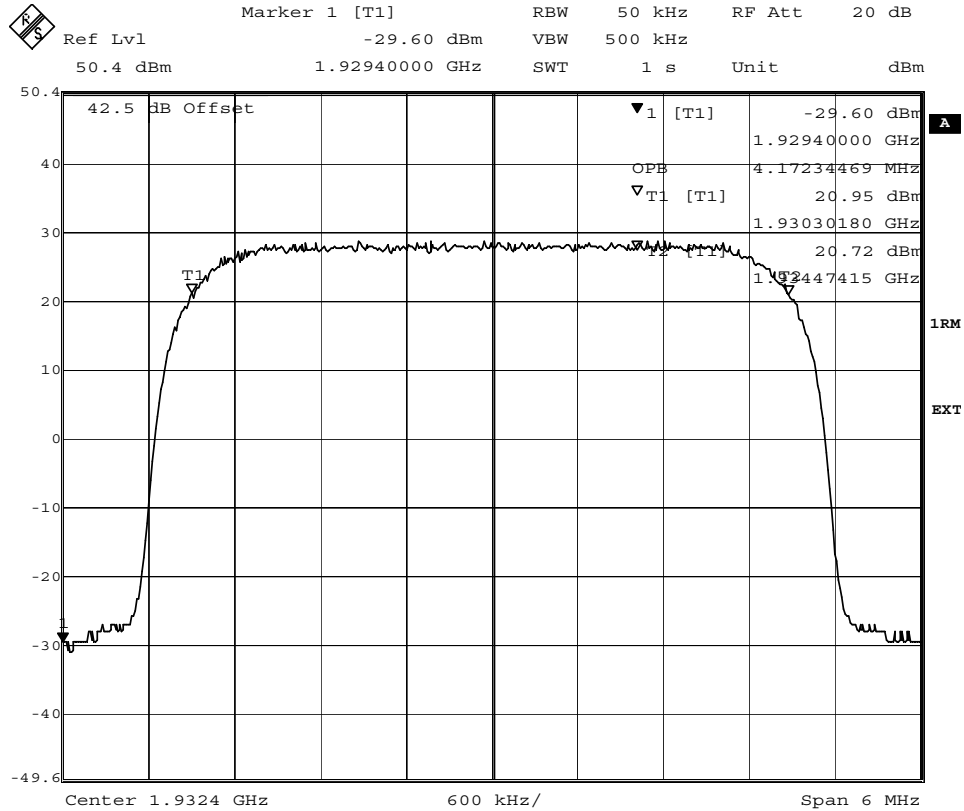


Diagram 3



Date: 20.SEP.2007 13:30:37

Diagram 4



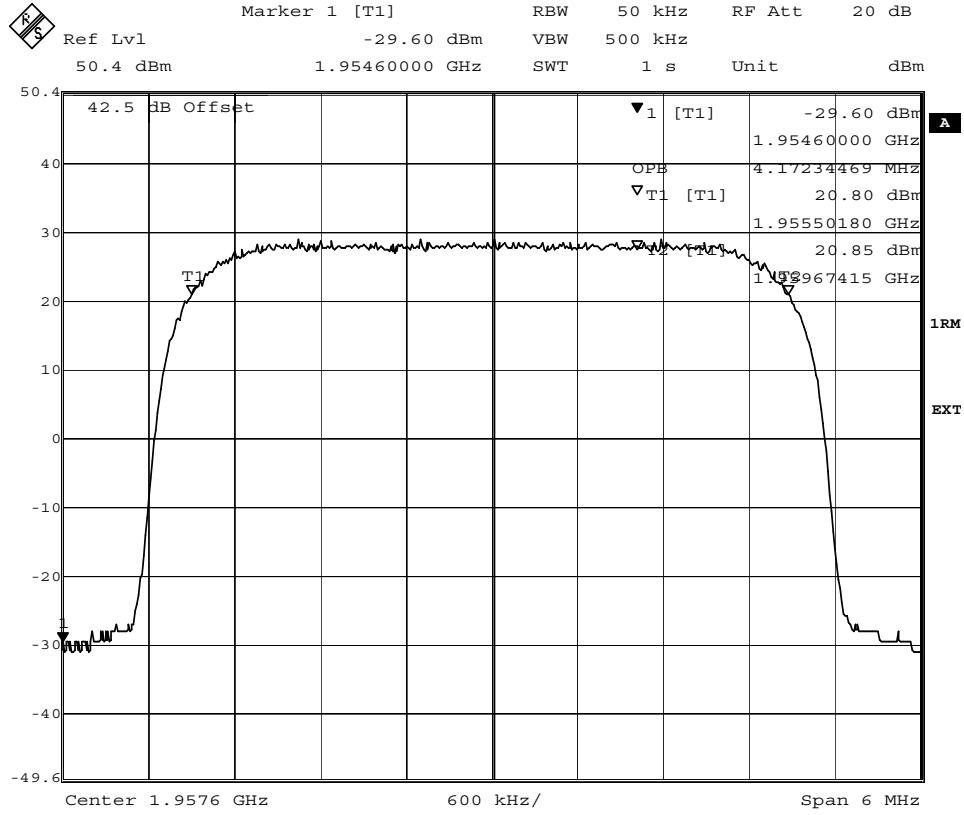
Date: 20.SEP.2007 12:16:24



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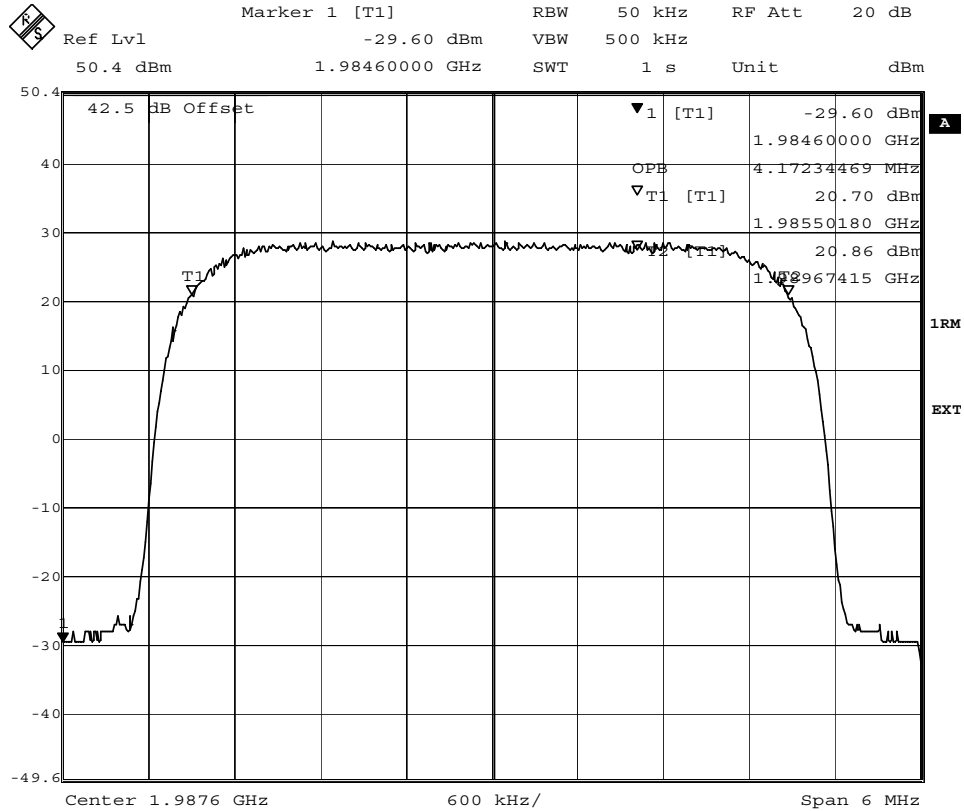
Appendix 3.1

Diagram 5



Date: 20.SEP.2007 11:17:26

Diagram 6



Date: 20.SEP.2007 13:34:39



Band edge measurements according to 47 CFR 2.1051

Date 2007-09-20	Temperature 22 °C ± 3 °C	Humidity 45 % ± 5 %
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Test set-up and procedure

The measurements were made per definition in §24.238. Measurements were performed on the combined TX/RX antenna terminal Ant 1. The output was connected to a spectrum analyzer with the RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements. A resolution bandwidth of 30 kHz was used up to 1 MHz away from the band edges. 30 kHz is <1% of the emission bandwidth (4.25 MHz between the 26 dB points). The limit was adjusted with 1.5 dB to -14.5 dBm to compensate for the reduced bandwidth. A RBW of 50 kHz was used between 1 to 5 MHz away from the band edges. As the FCC rules specify a RBW of 1 MHz for measurements of emissions >1 MHz away from the band edges, the limit was adjusted with -13 dB to -26 dBm to compensate for the reduced measurement bandwidth. The transmitter was set up according to Test model 1 and Test model 5 during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2008-10	503 738
Testo 610, Temperature and humidity meter	2009-04	502 658

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 4.1

Single carrier

QPSK

Diagram 1: 1932.4 MHz
Diagram 2: 1987.6 MHz

16QAM

Diagram 3: 1932.4 MHz
Diagram 4: 1987.6 MHz

Multi carrier

QPSK

Diagram 5: 1932.4+1942.4 MHz
Diagram 6: 1977.6+1987.6 MHz

16QAM

Diagram 7: 1932.4+1942.4 MHz
Diagram 8: 1977.6+1987.6 MHz

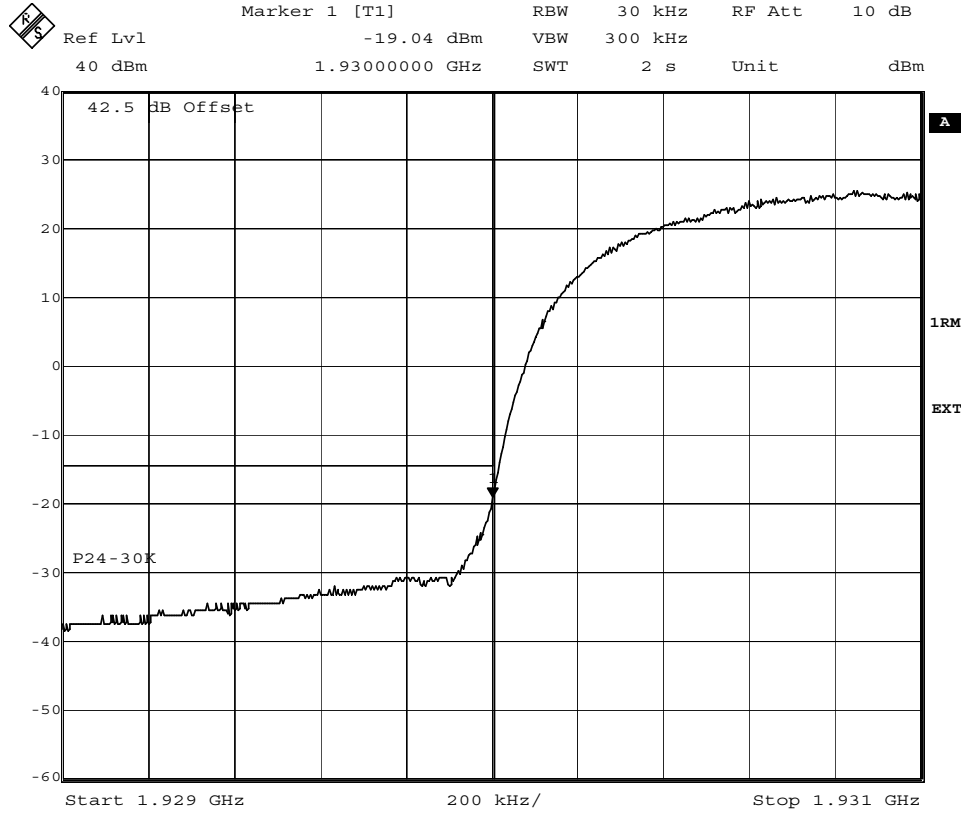
Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10 log P dB.

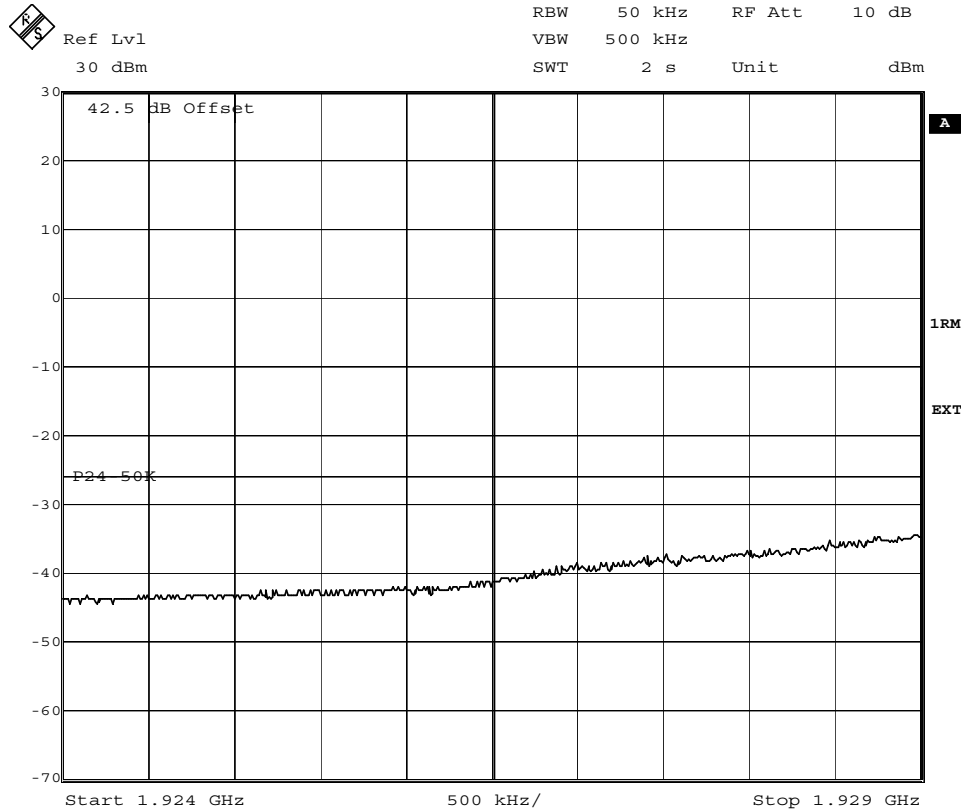
Complies?	Yes
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Diagram 1-1



Date: 20.SEP.2007 11:30:05



Date: 20.SEP.2007 11:30:33



Diagram 1-2

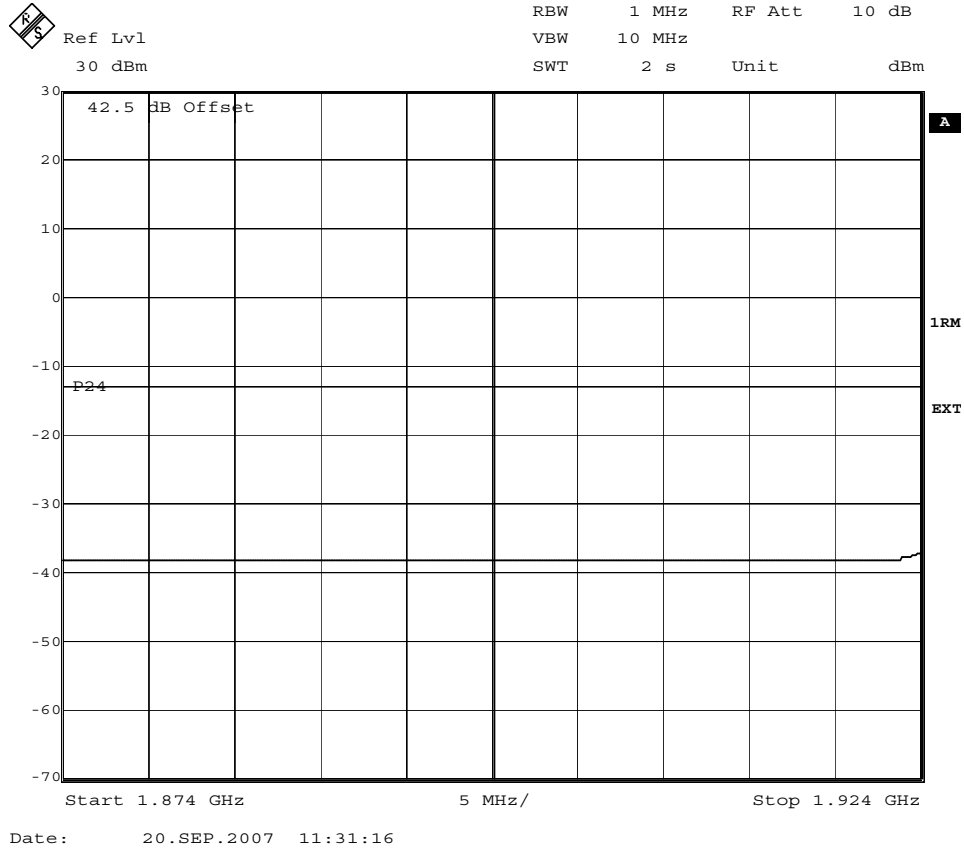
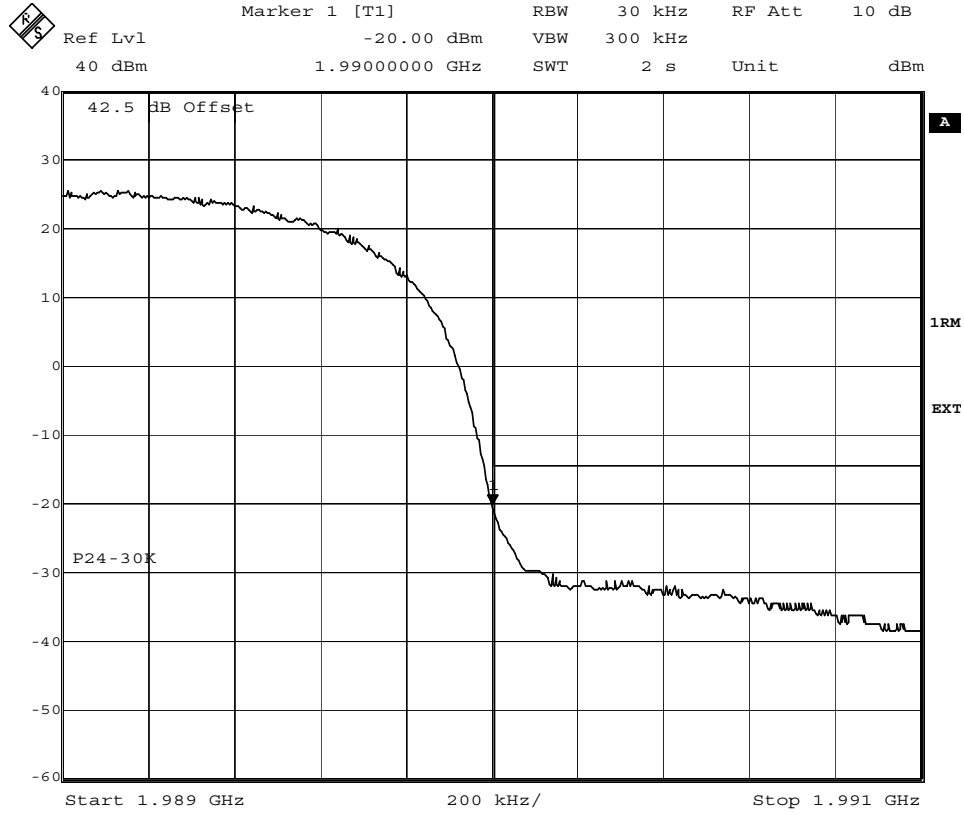
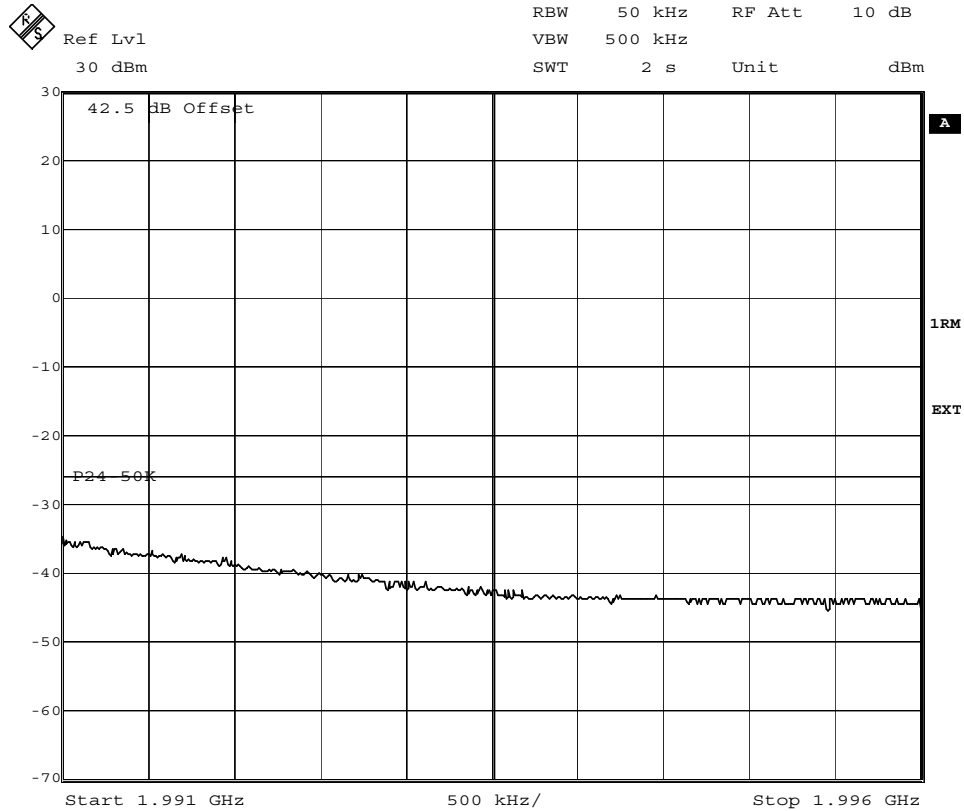




Diagram 2-1



Date: 20.SEP.2007 13:26:51



Date: 20.SEP.2007 13:28:05



FCC ID: TA8AKRC161134-2

Appendix 4.1

Diagram 2-2

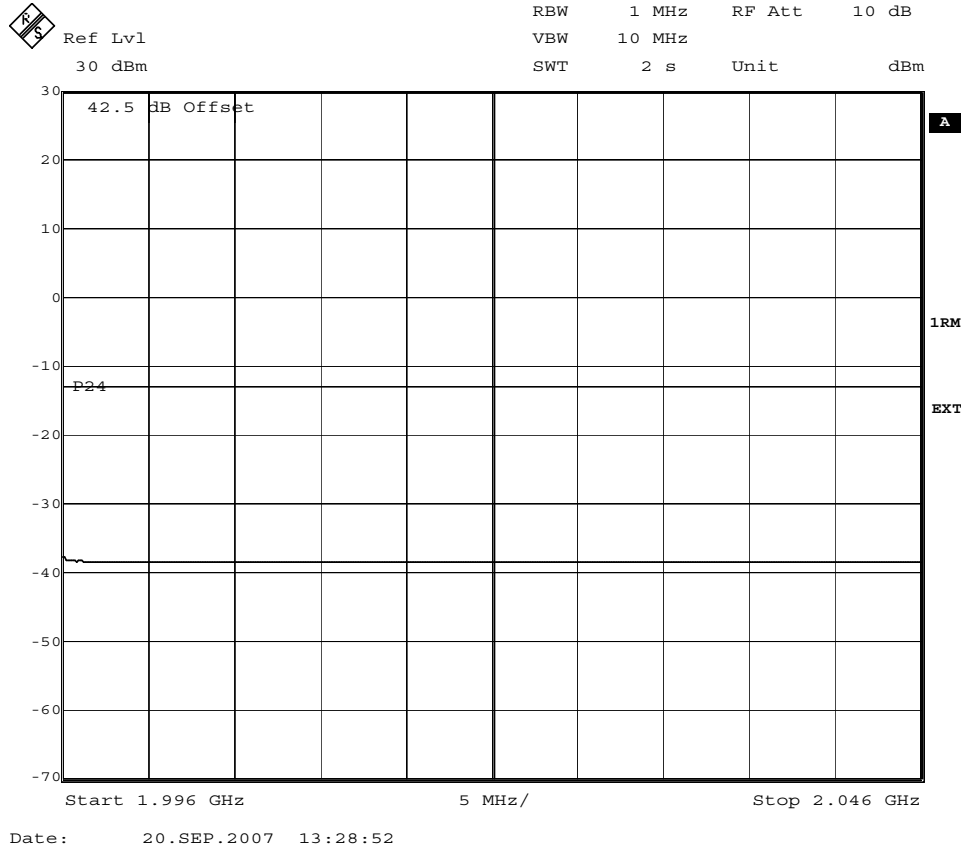
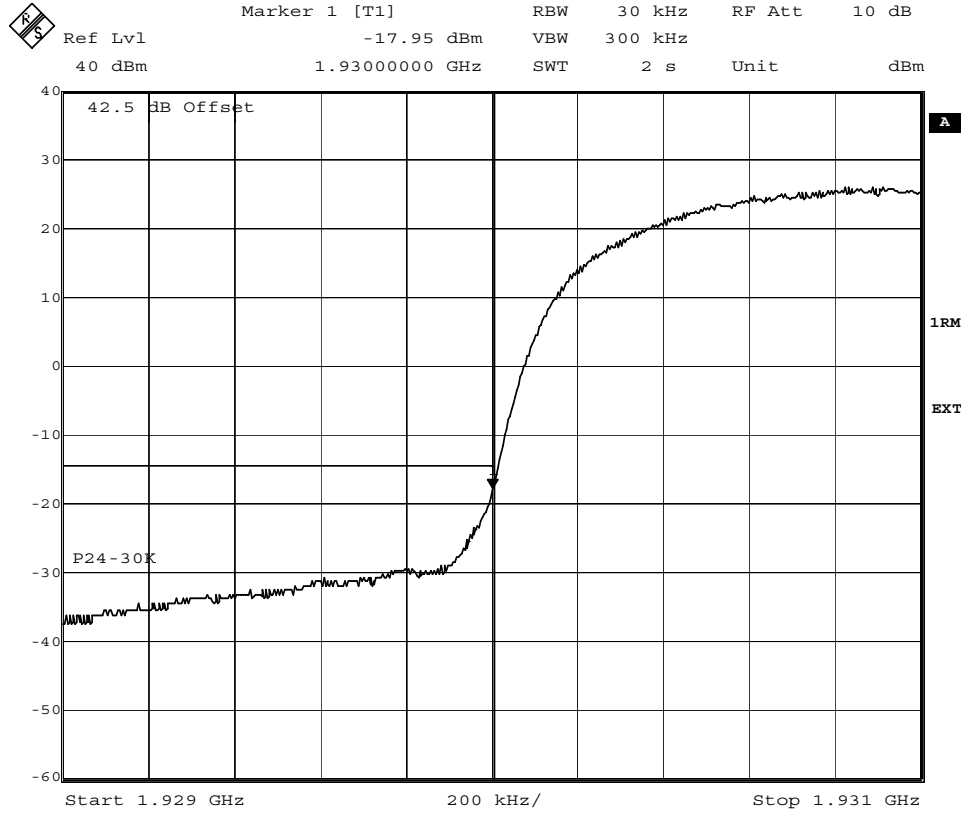
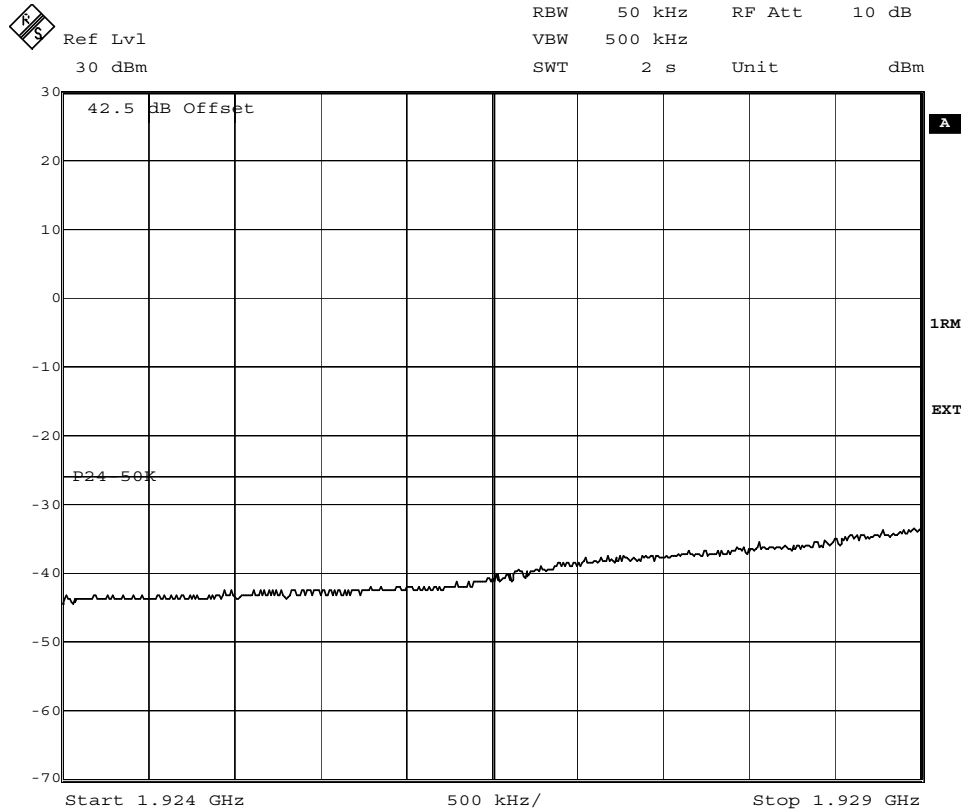




Diagram 3-1



Date: 20.SEP.2007 12:20:12



Date: 20.SEP.2007 12:21:08



FCC ID: TA8AKRC161134-2

Appendix 4.1

Diagram 3-2

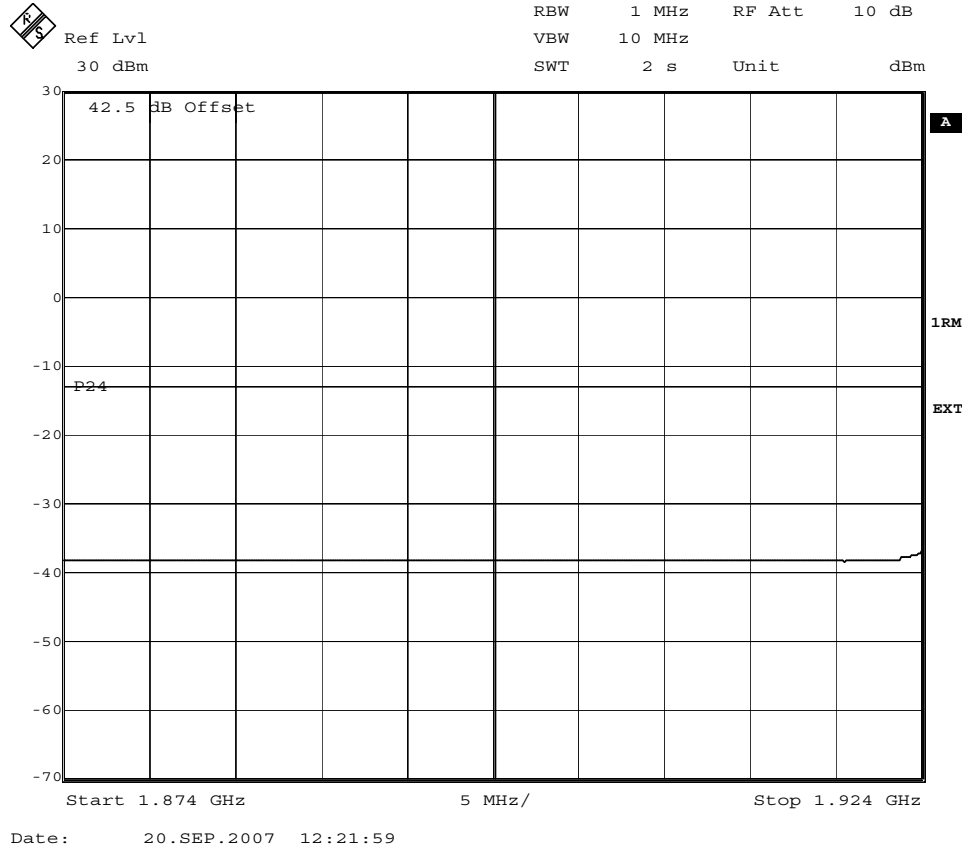
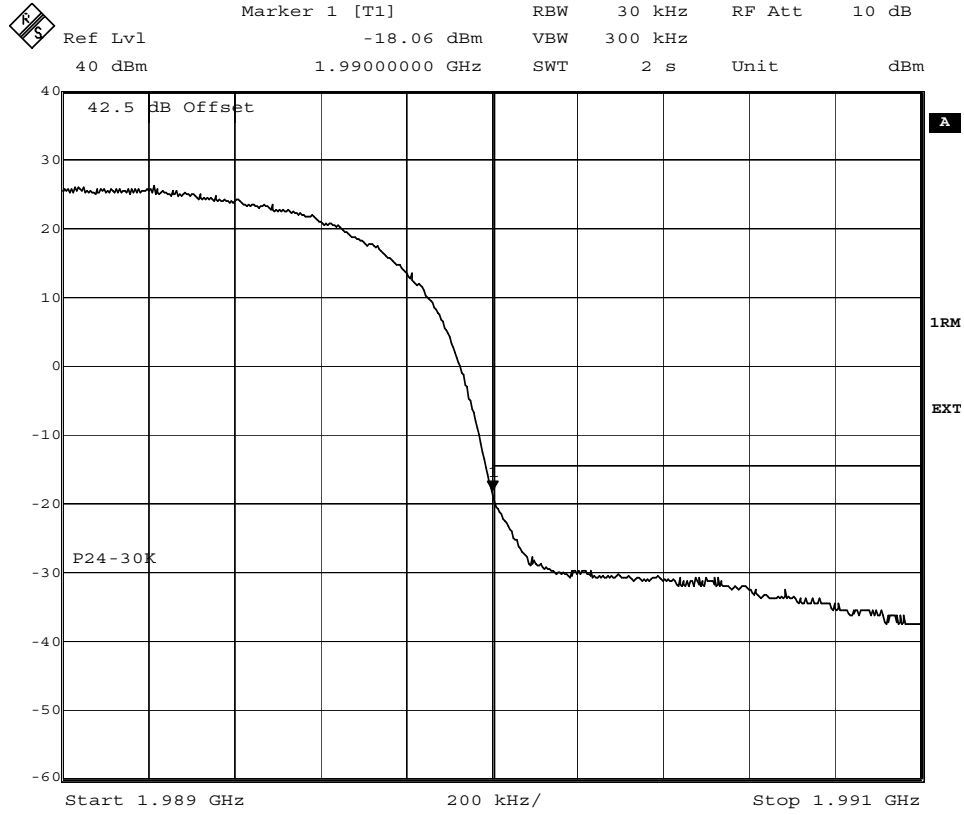
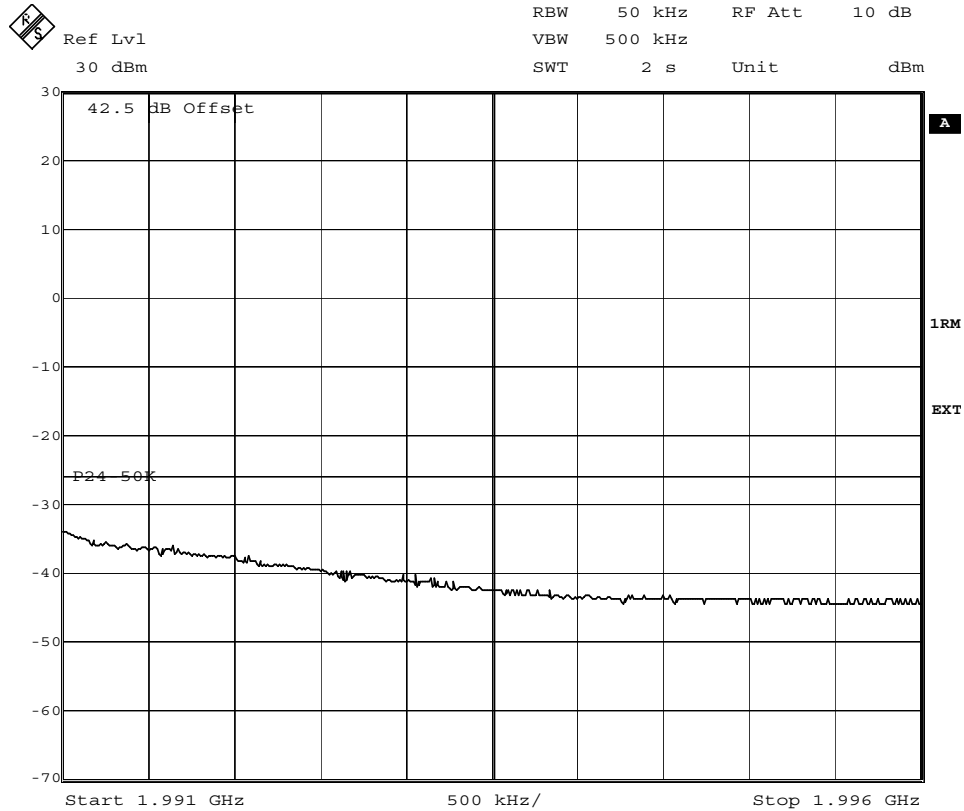




Diagram 4-1



Date: 20.SEP.2007 13:39:53



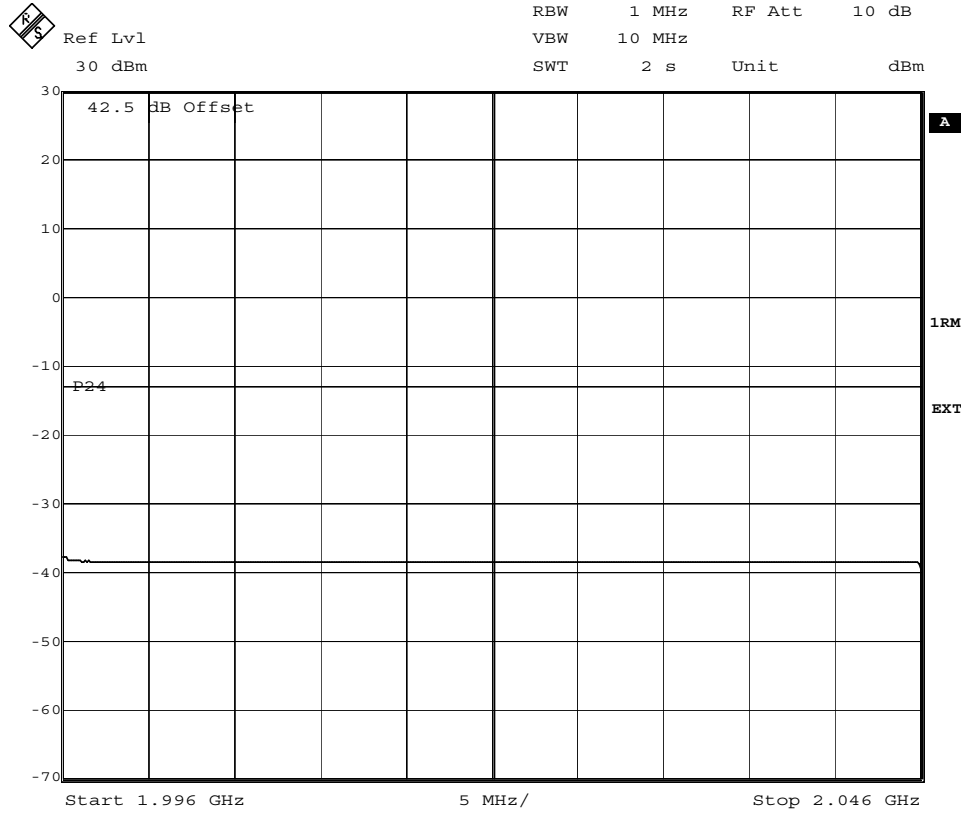
Date: 20.SEP.2007 13:39:27



FCC ID: TA8AKRC161134-2

Appendix 4.1

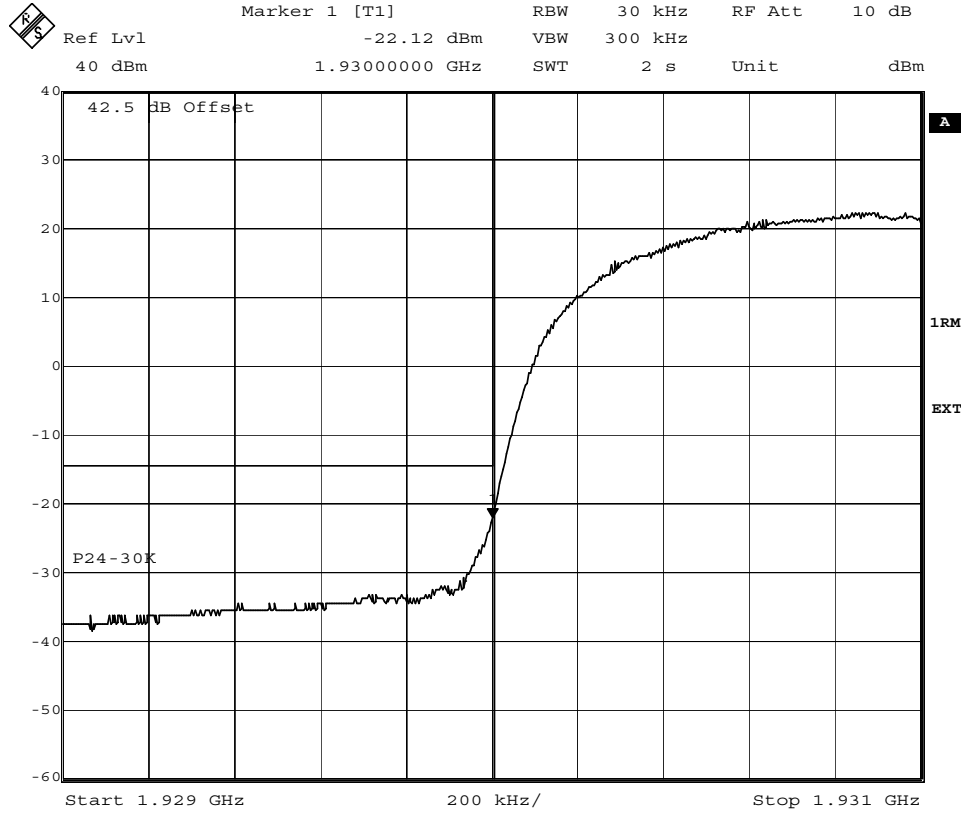
Diagram 4-2



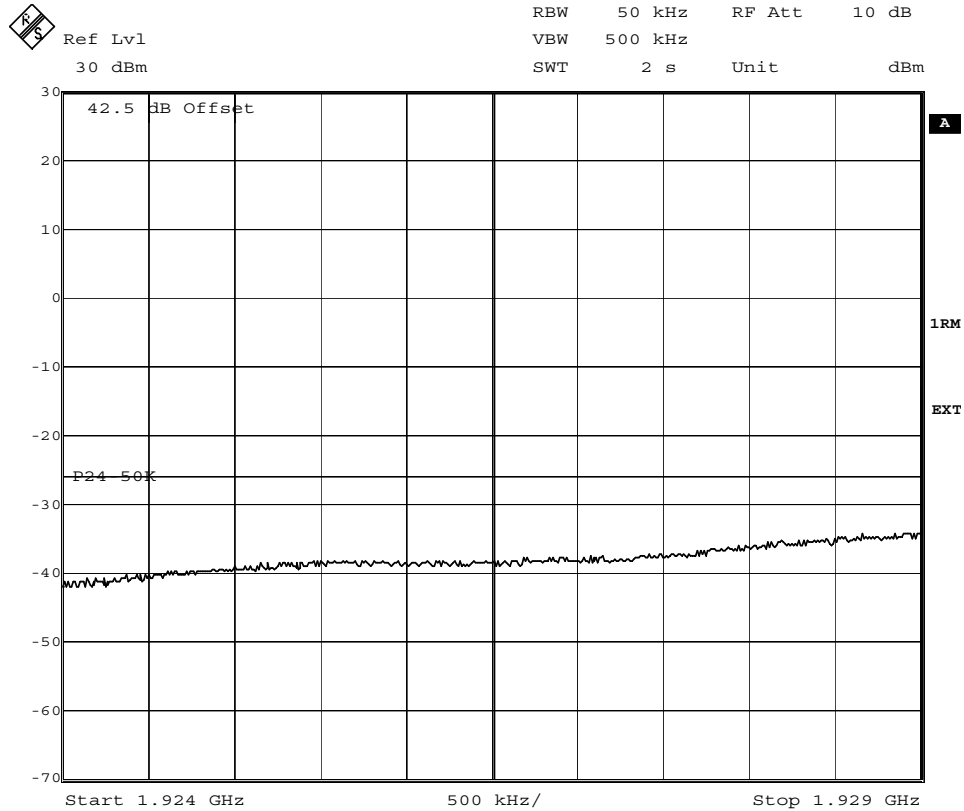
Date: 20.SEP.2007 13:38:55



Diagram 5-1



Date: 20.SEP.2007 09:23:51



Date: 20.SEP.2007 09:24:15



FCC ID: TA8AKRC161134-2

Appendix 4.1

Diagram 5-2

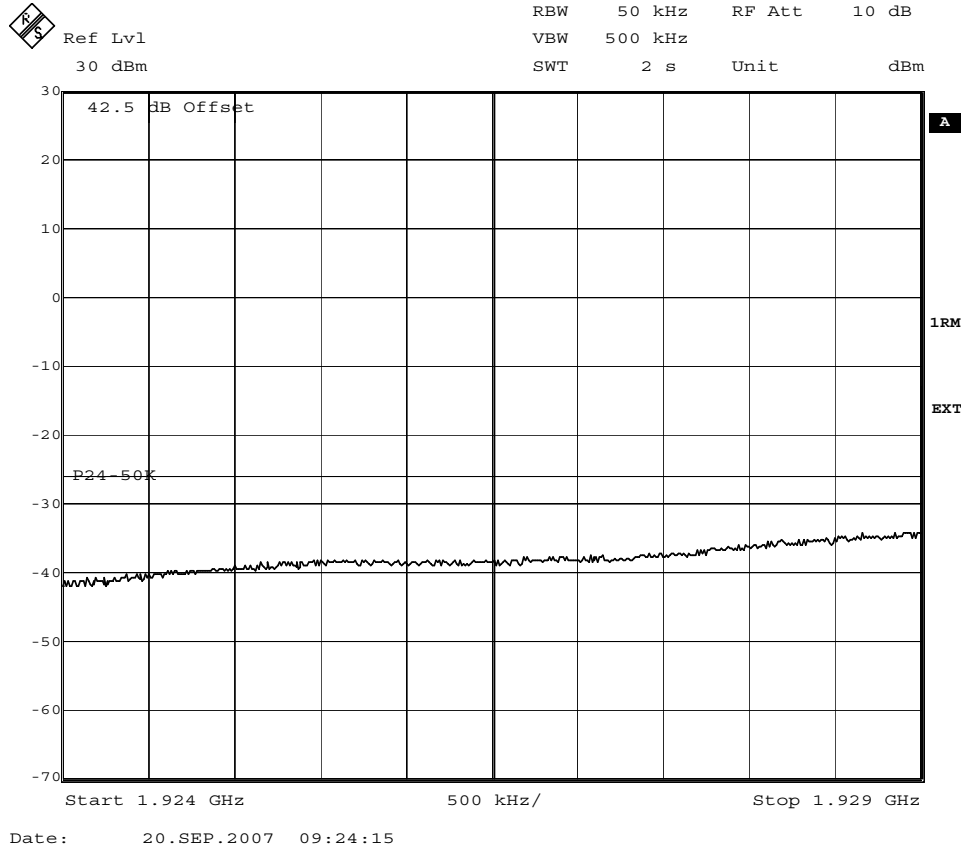
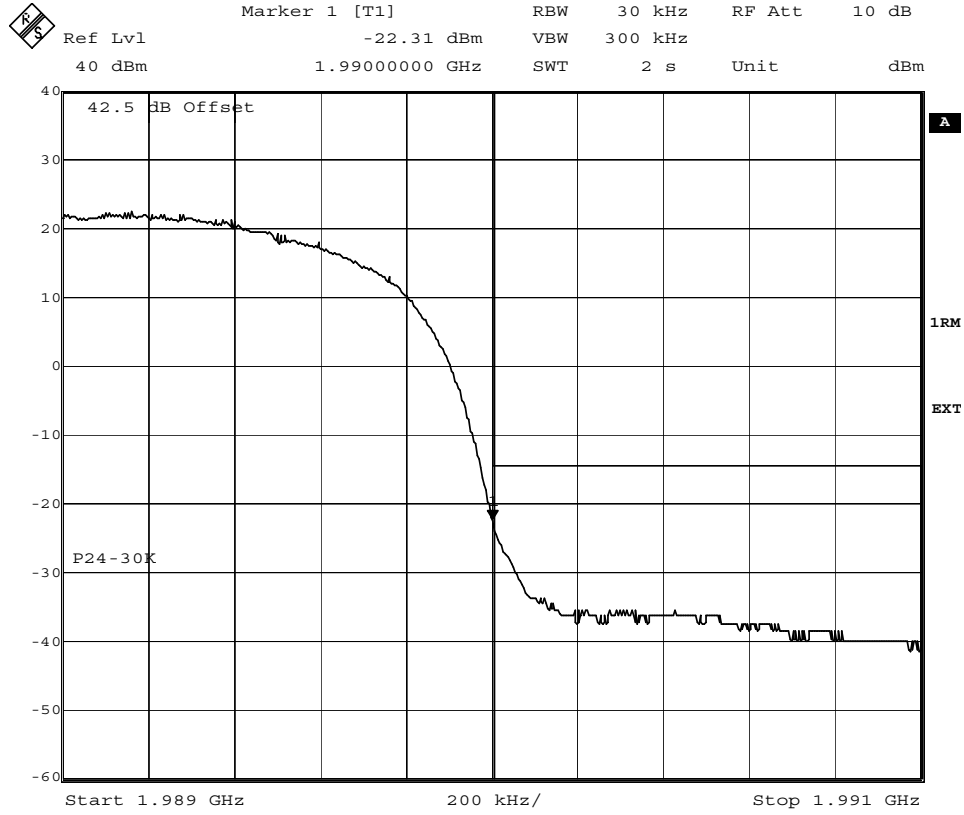
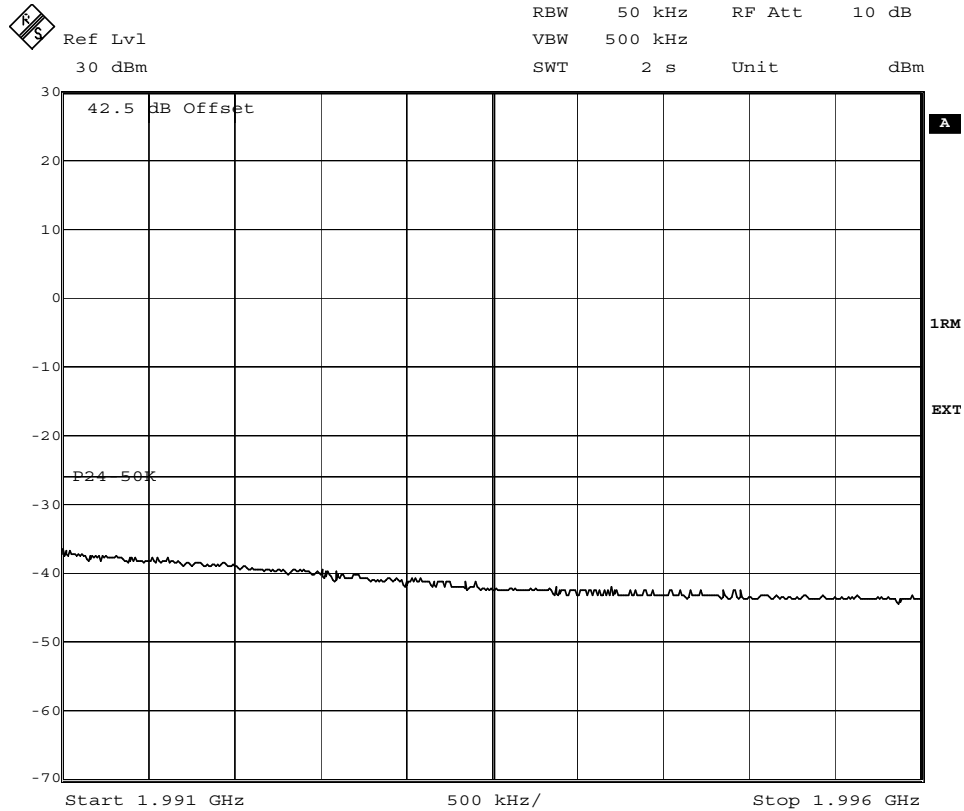




Diagram 6-1



Date: 20.SEP.2007 09:13:53



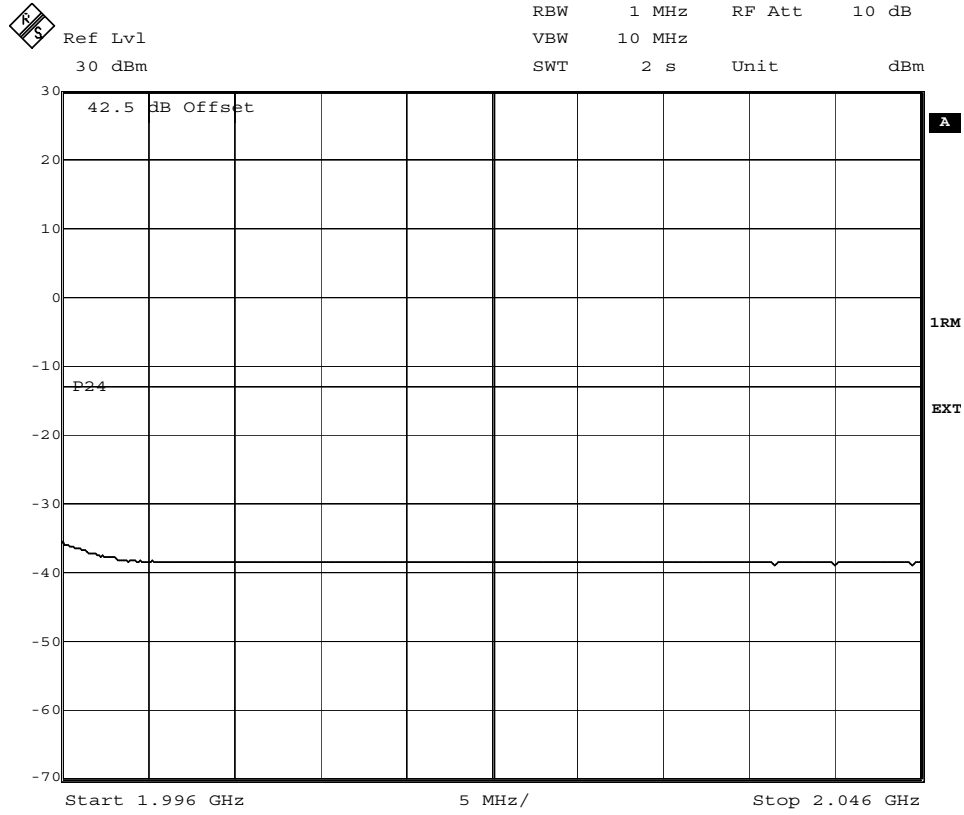
Date: 20.SEP.2007 09:14:37



FCC ID: TA8AKRC161134-2

Appendix 4.1

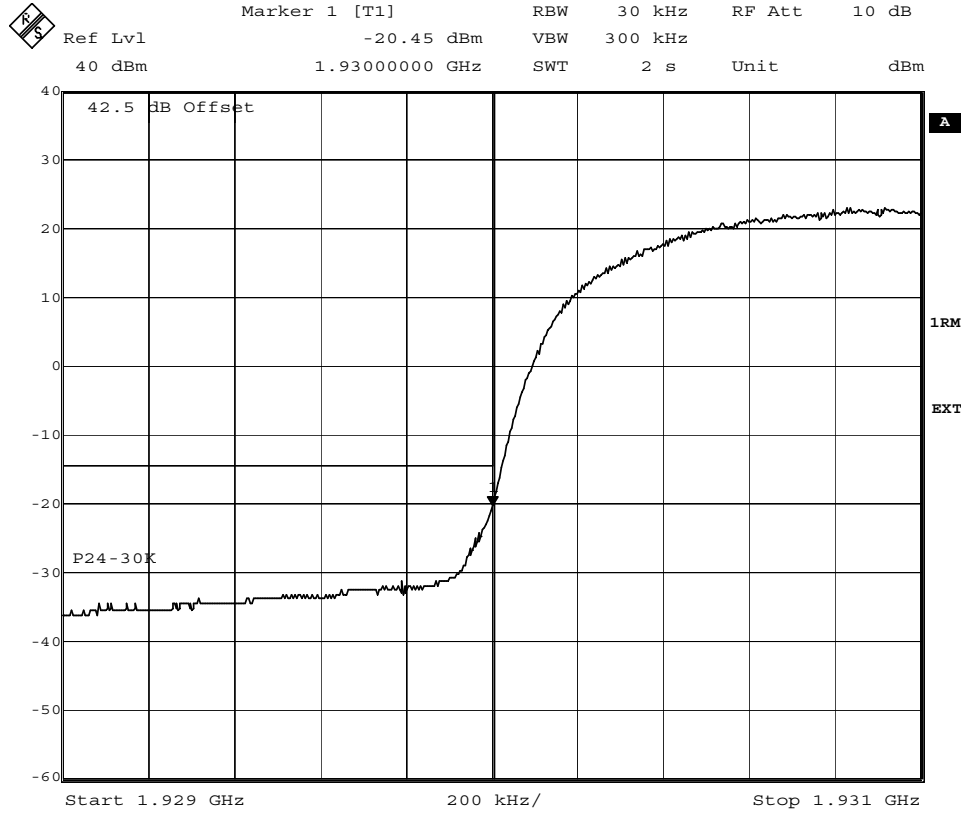
Diagram 6-2



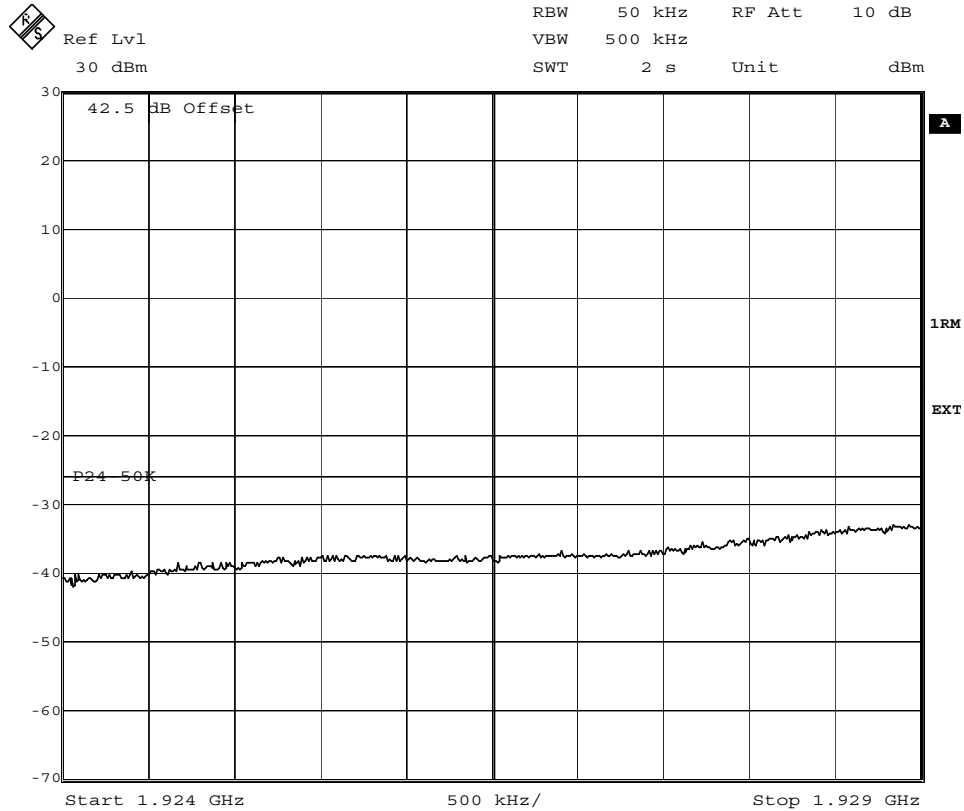
Date: 20.SEP.2007 09:15:21



Diagram 7-1



Date: 20.SEP.2007 09:35:45



Date: 20.SEP.2007 09:38:45



FCC ID: TA8AKRC161134-2

Appendix 4.1

Diagram 7-2

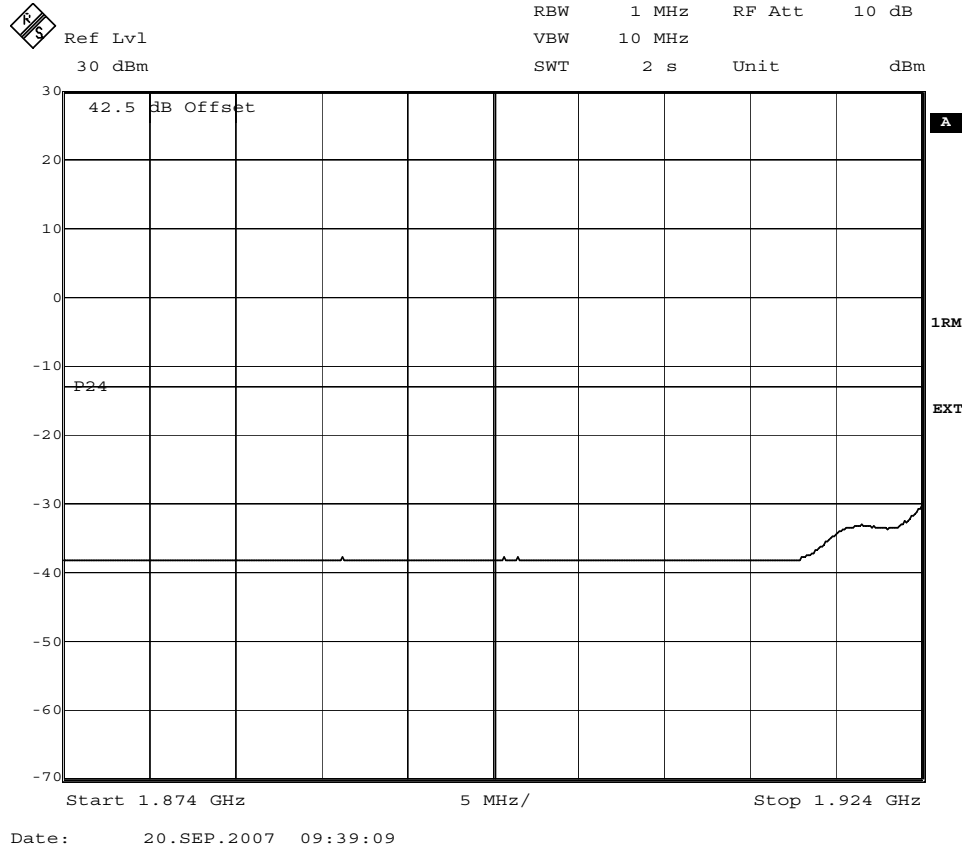
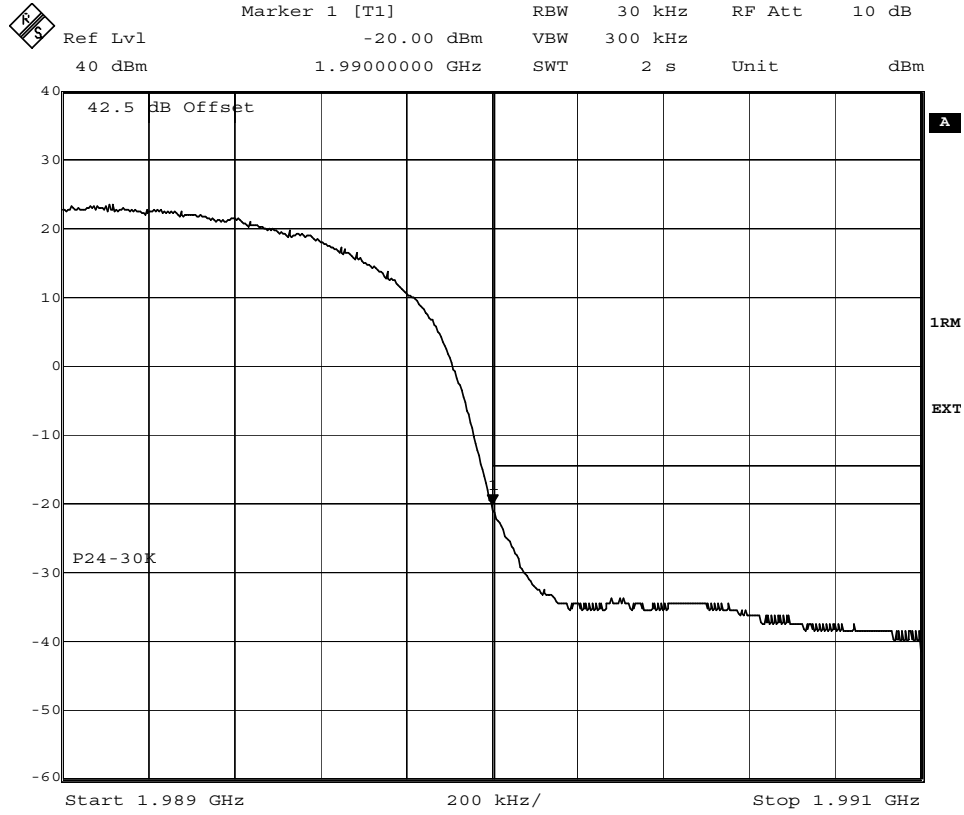
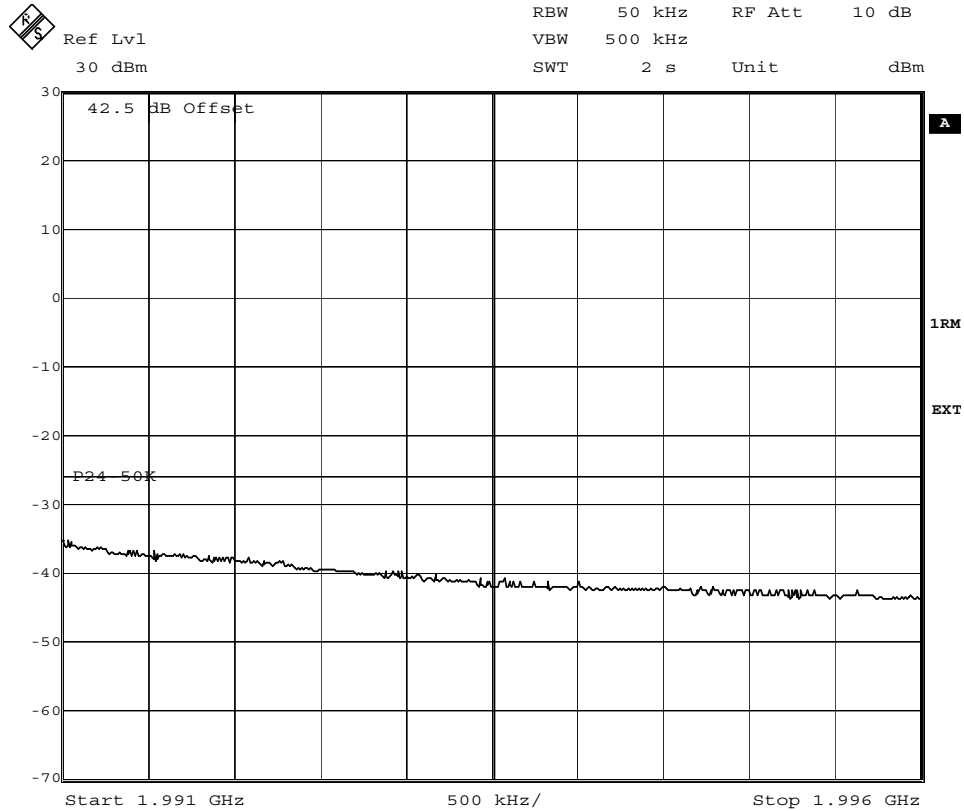




Diagram 8-1



Date: 20.SEP.2007 08:46:35



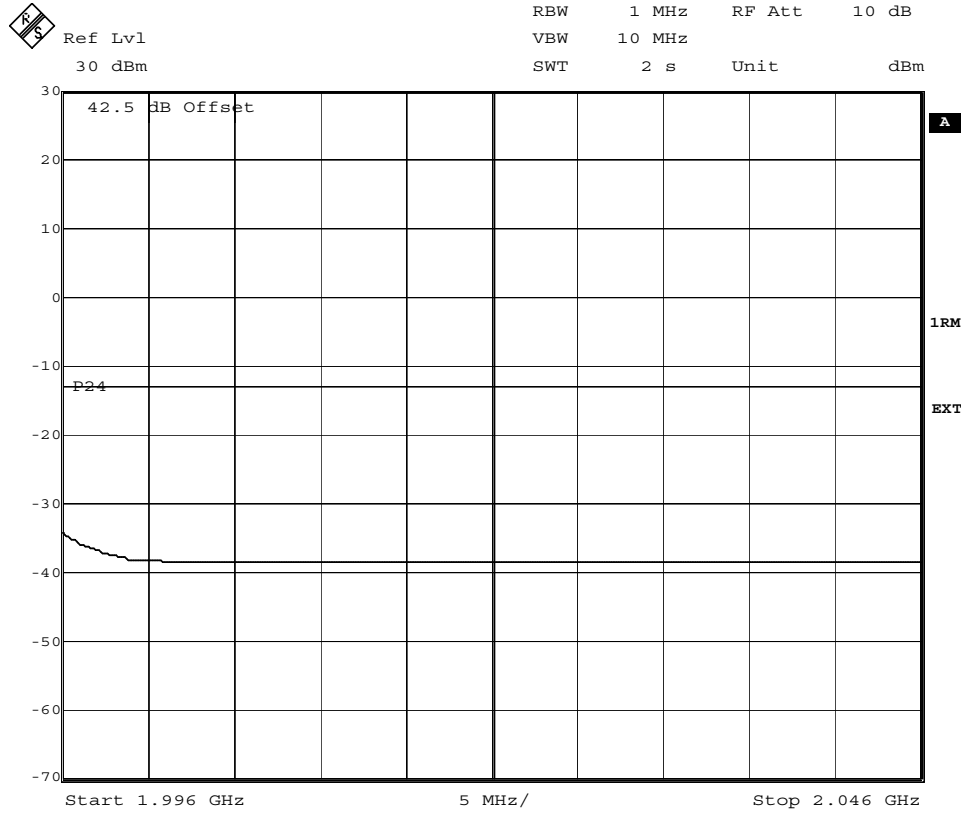
Date: 20.SEP.2007 08:46:10



FCC ID: TA8AKRC161134-2

Appendix 4.1

Diagram 8-2



Date: 20.SEP.2007 08:47:16



Conducted spurious emission measurements according to 47 CFR 2.1051

Date 2007-09-20	Temperature 22 °C ± 3 °C	Humidity 45 % ± 5 %
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Test set-up and procedure

The measurements were made per definition in §24.238. Measurements were performed on the combined TX/RX antenna terminal Ant 1. The output was connected to a spectrum analyzer. First a pre-measurement with activated peak detector was performed. For emissions close to or exceeding the limit a measurement with activated RMS detector was performed and the RMS measurement result was noted. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements. The transmitter was set up according to Test model 1 and Test model 5 during the measurements.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2008-10	503 738
High pass filter	2008-07	503 739
Testo 610, Temperature and humidity meter	2009-04	502 658

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 5.1

Single carrier

QPSK

- Diagram 1: 1932.4 MHz
- Diagram 2: 1957.6 MHz
- Diagram 3: 1987.6 MHz

16QAM

- Diagram 4: 1932.4 MHz
- Diagram 5: 1957.6 MHz
- Diagram 6: 1987.6 MHz

Multi carrier

QPSK

- Diagram 7: 1932.4+1942.4 MHz
- Diagram 8: 1952.6+1962.6 MHz
- Diagram 9: 1977.6+1987.6 MHz

16QAM

- Diagram 10: 1932.4+1942.4 MHz
- Diagram 11: 1952.6+1962.6 MHz
- Diagram 12: 1977.6+1987.6 MHz

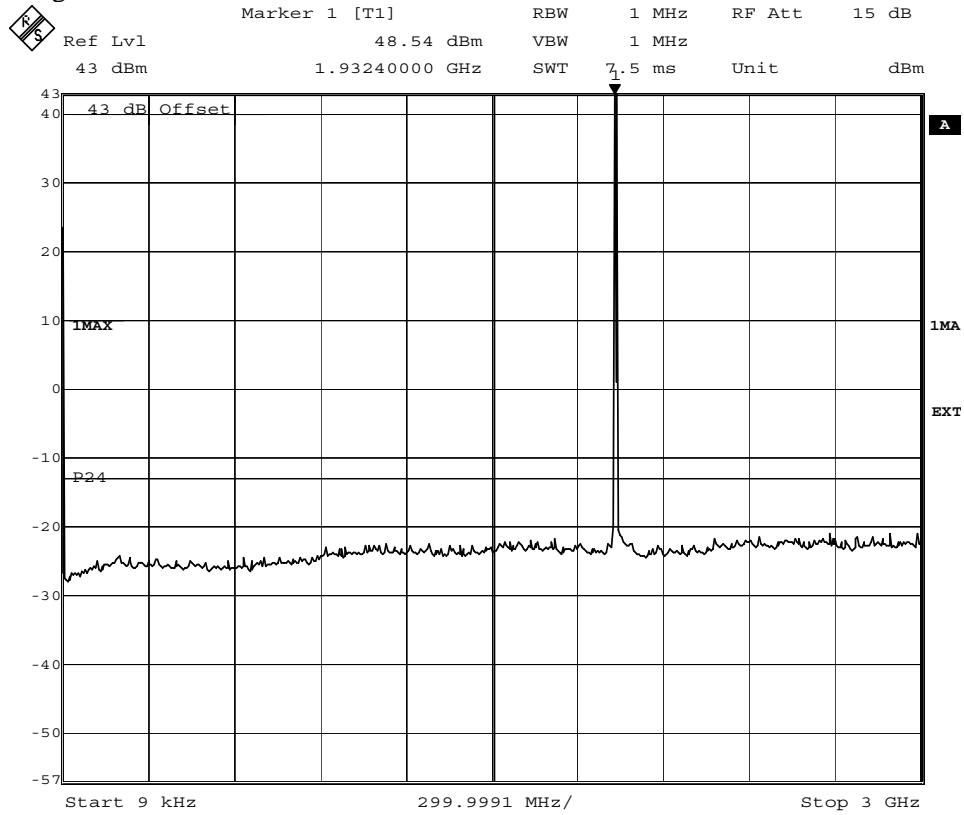
Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least 43 + 10 log P dB.

Complies?	Yes
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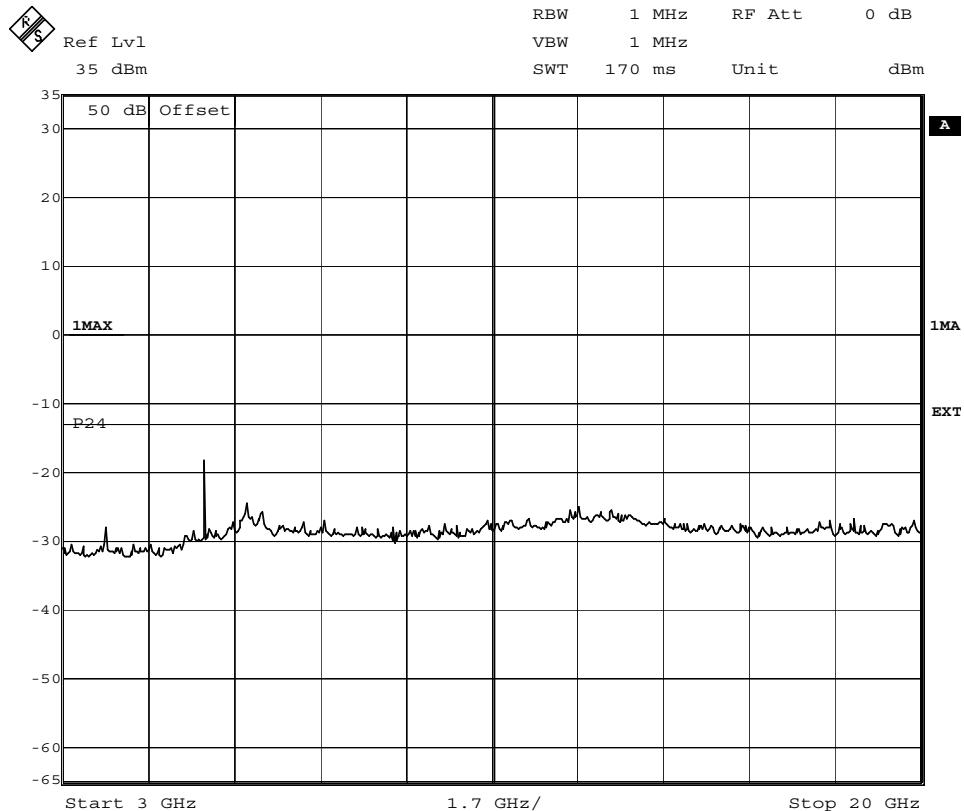


Diagram 1



Date: 20.SEP.2007 11:34:34

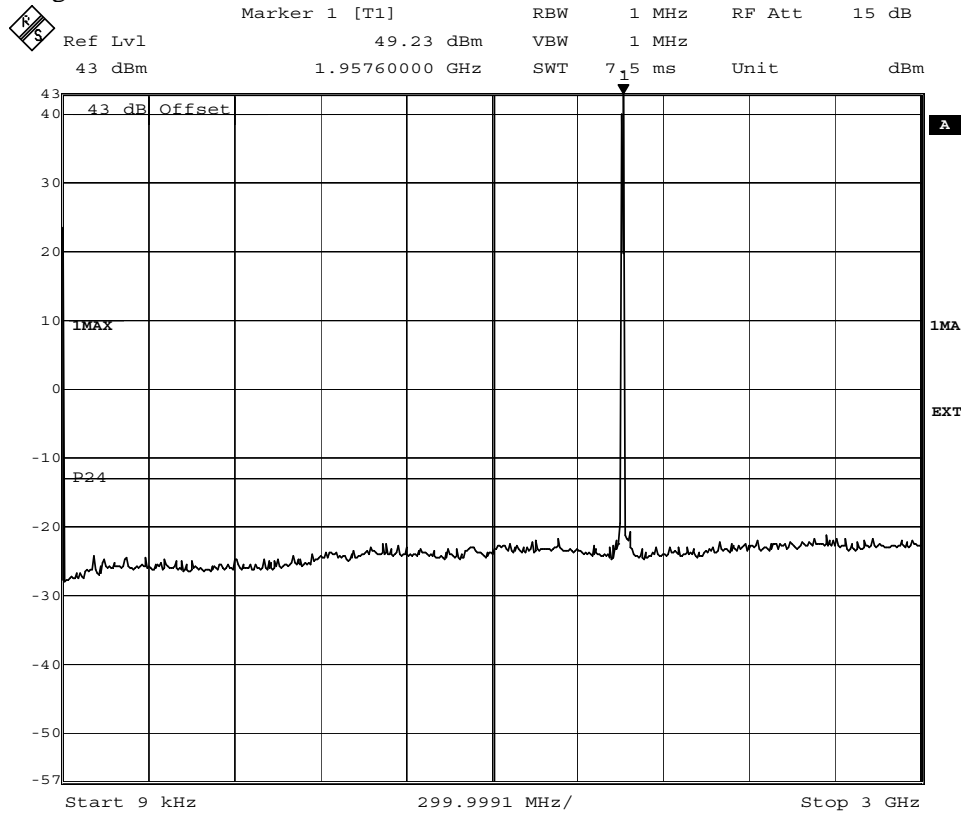
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 11:36:40

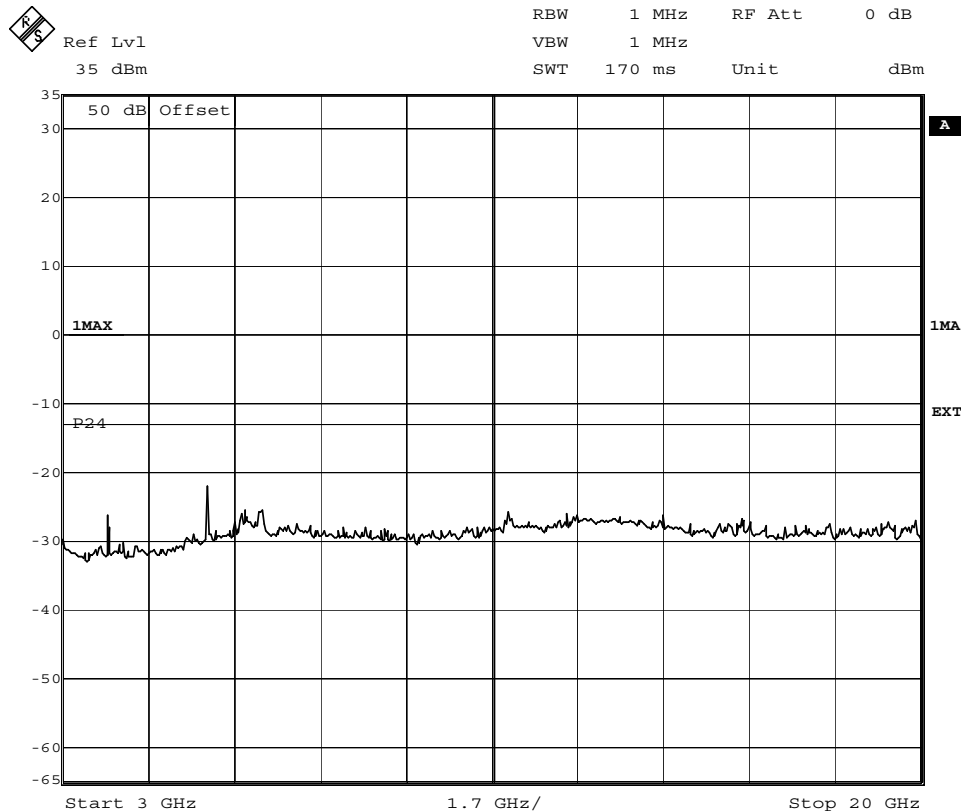


Diagram 2



Date: 20.SEP.2007 10:25:39

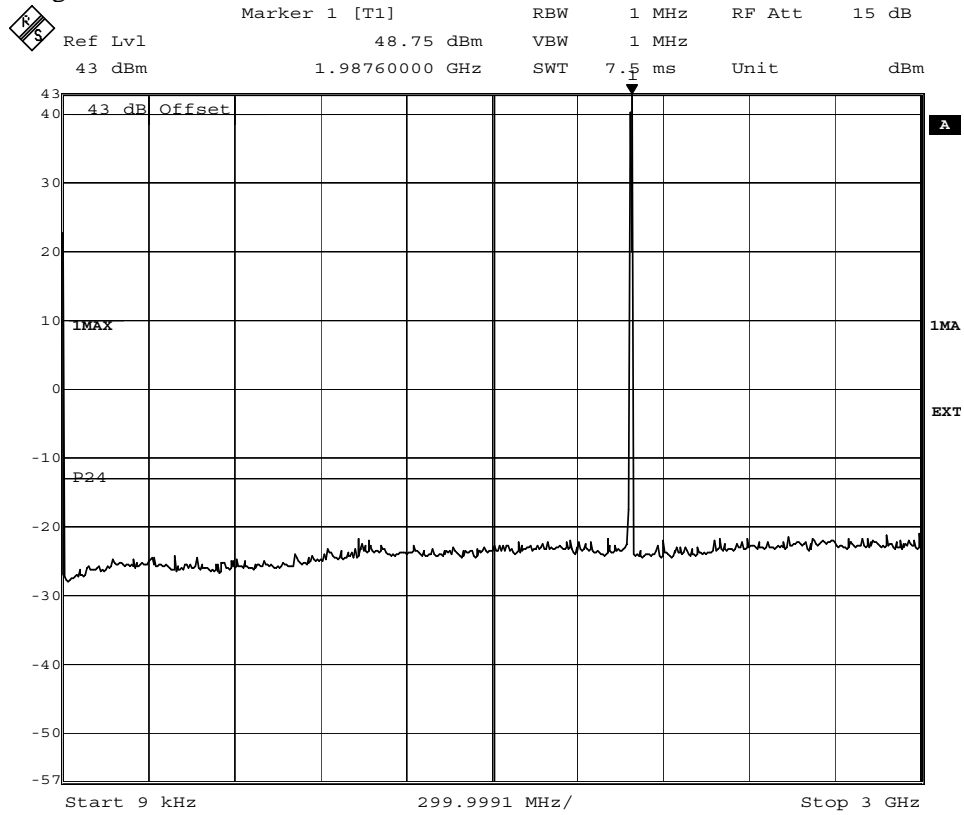
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 10:27:59

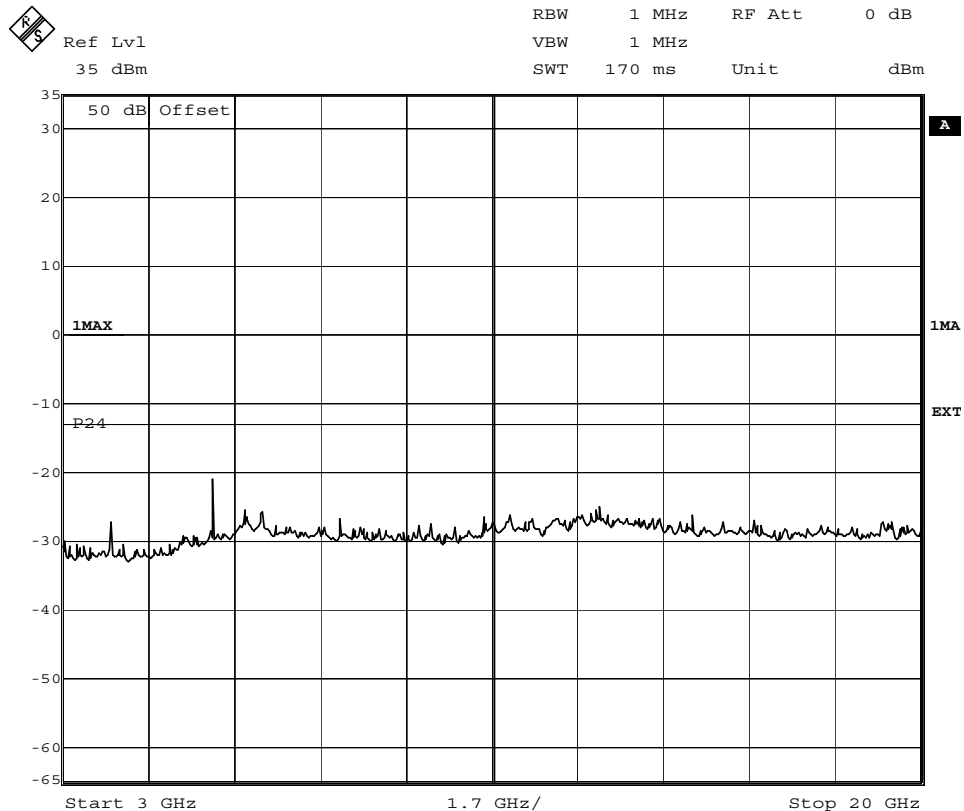


Diagram 3



Date: 20.SEP.2007 13:24:26

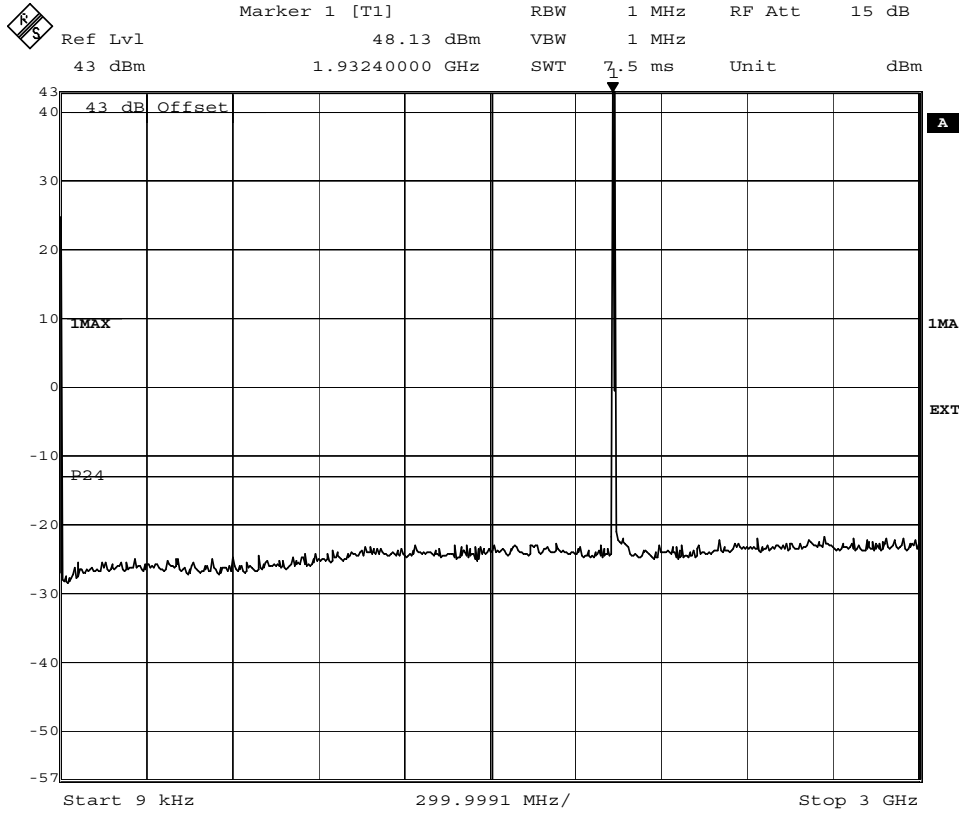
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 13:21:06

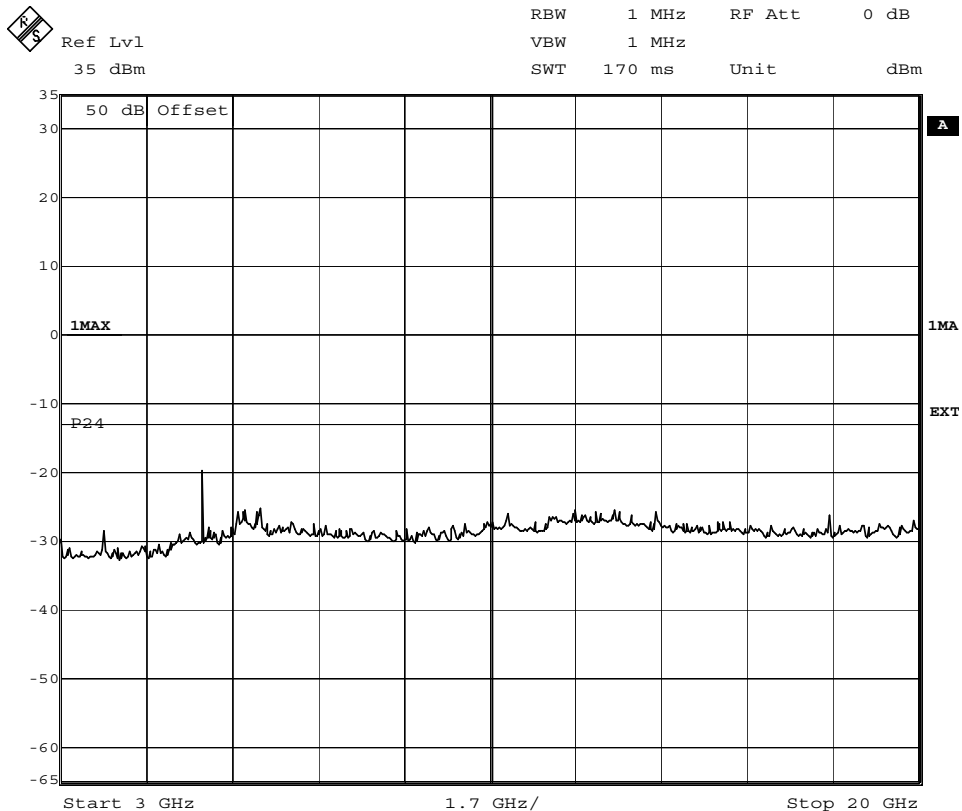


Diagram 4



Date: 20.SEP.2007 12:23:57

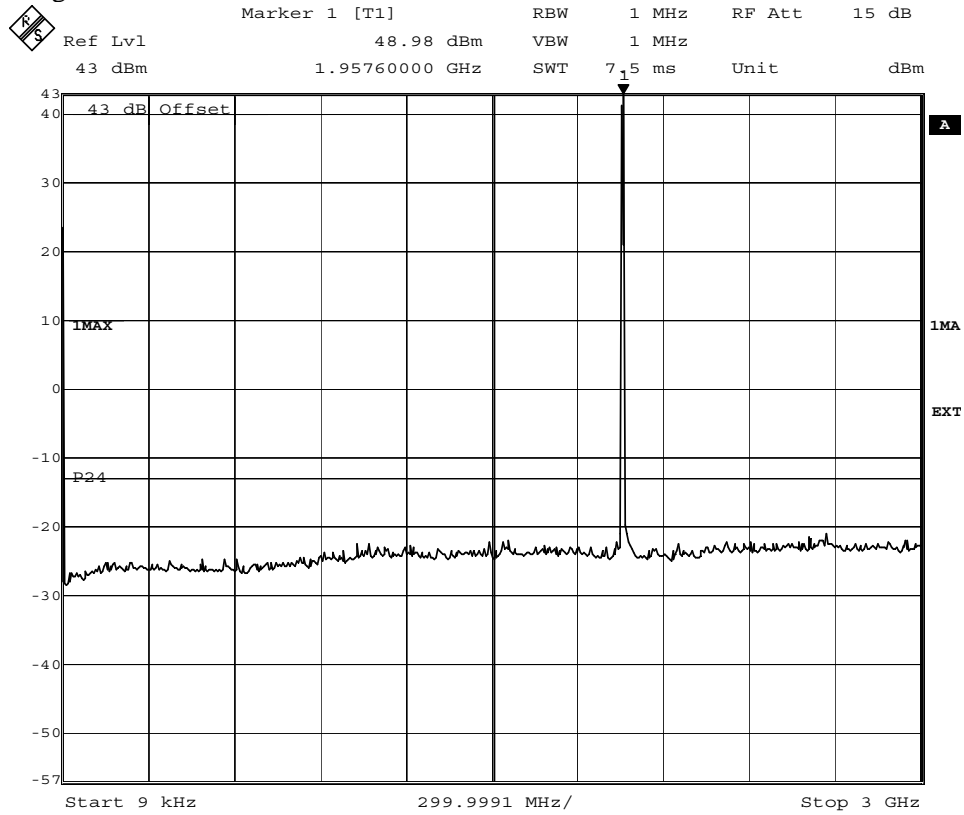
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 12:26:11

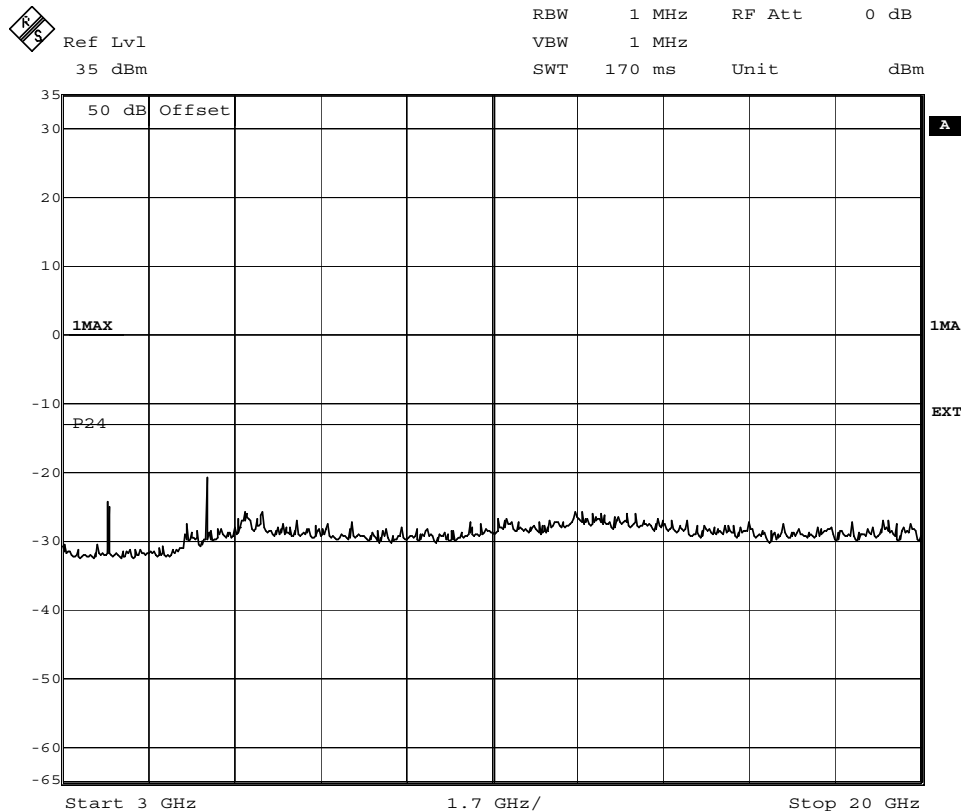


Diagram 5



Date: 20.SEP.2007 10:59:17

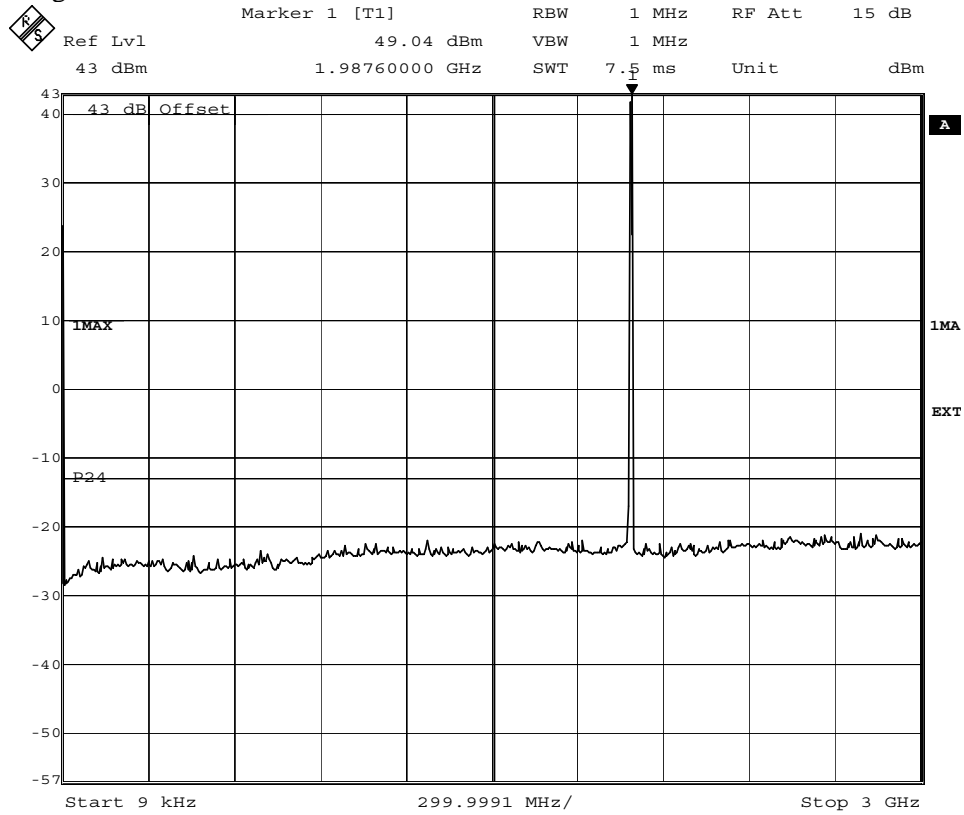
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 11:03:57

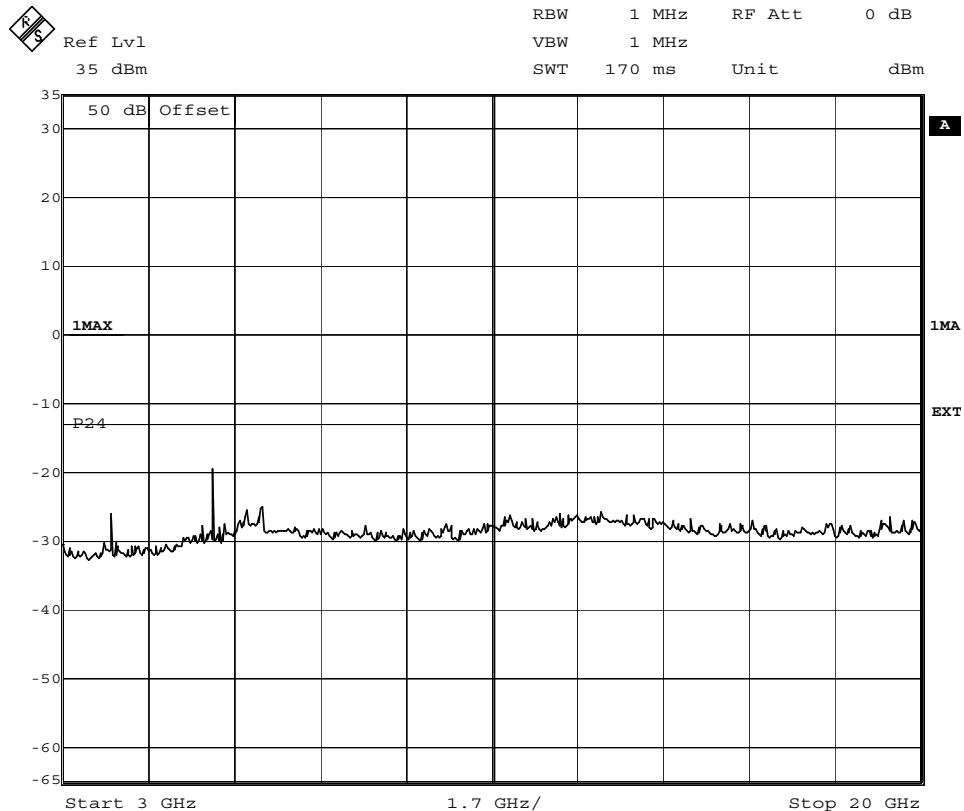


Diagram 6



Date: 20.SEP.2007 13:42:37

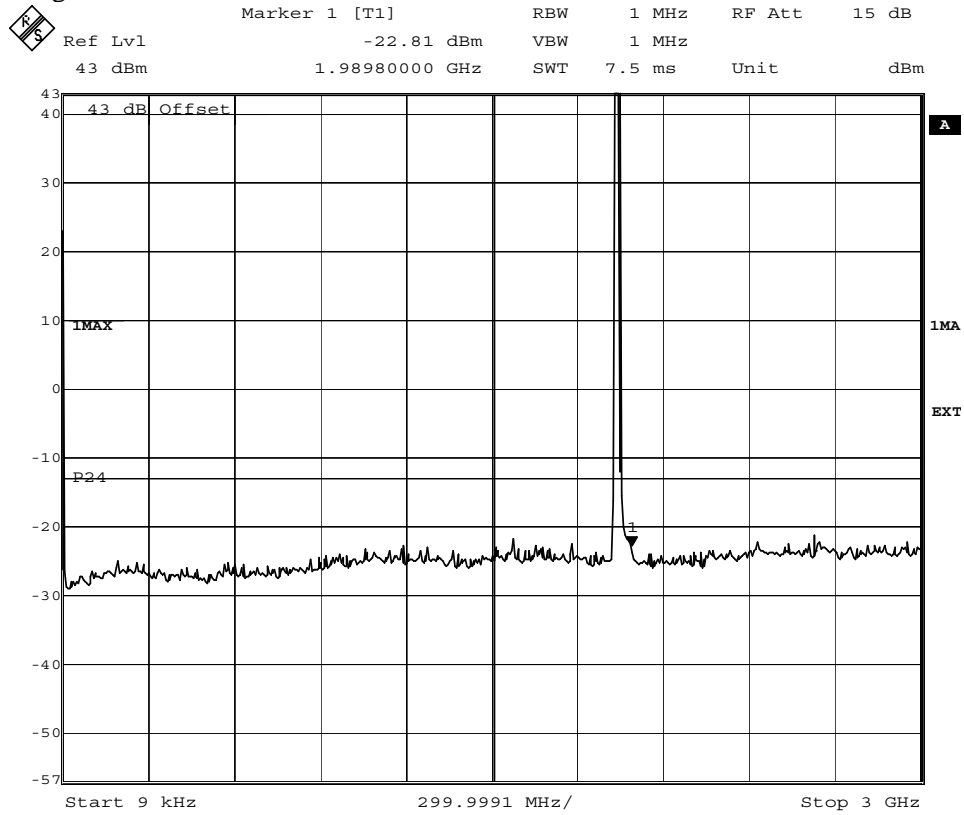
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 13:44:59

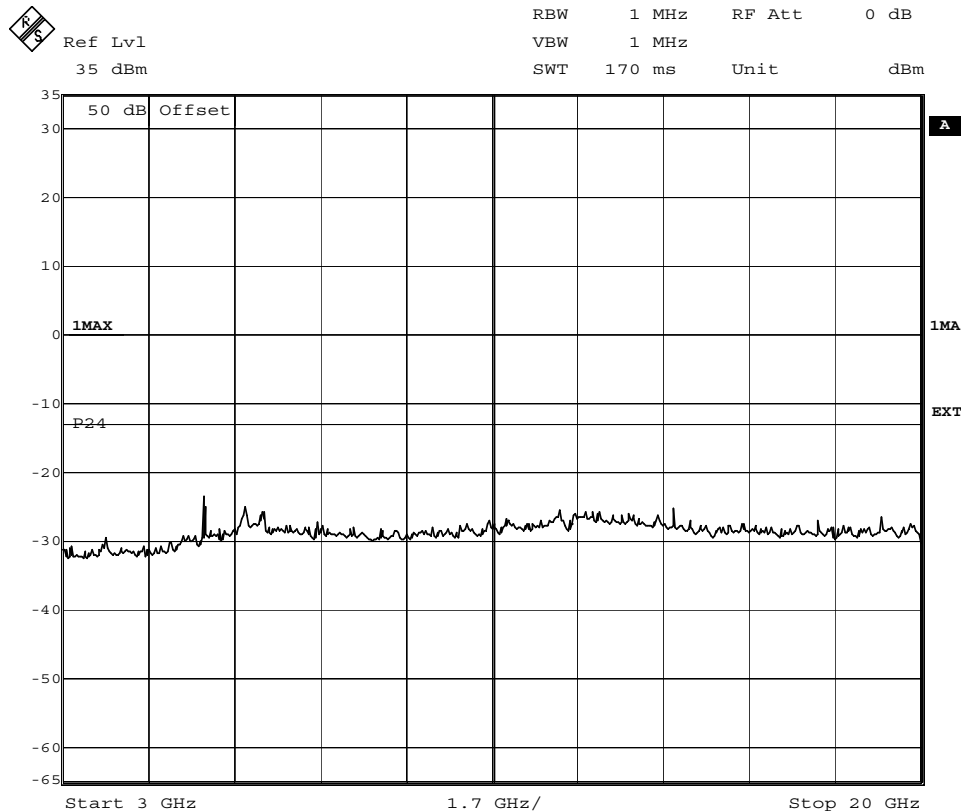


Diagram 7



Date: 20.SEP.2007 09:25:29

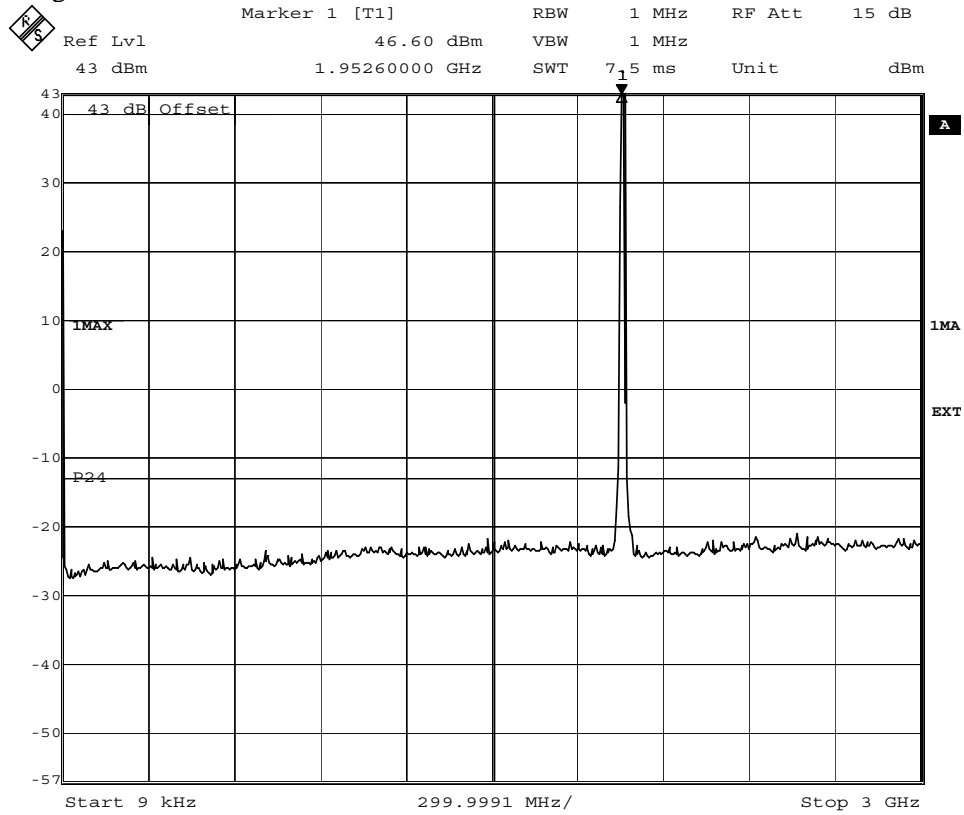
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 09:27:42

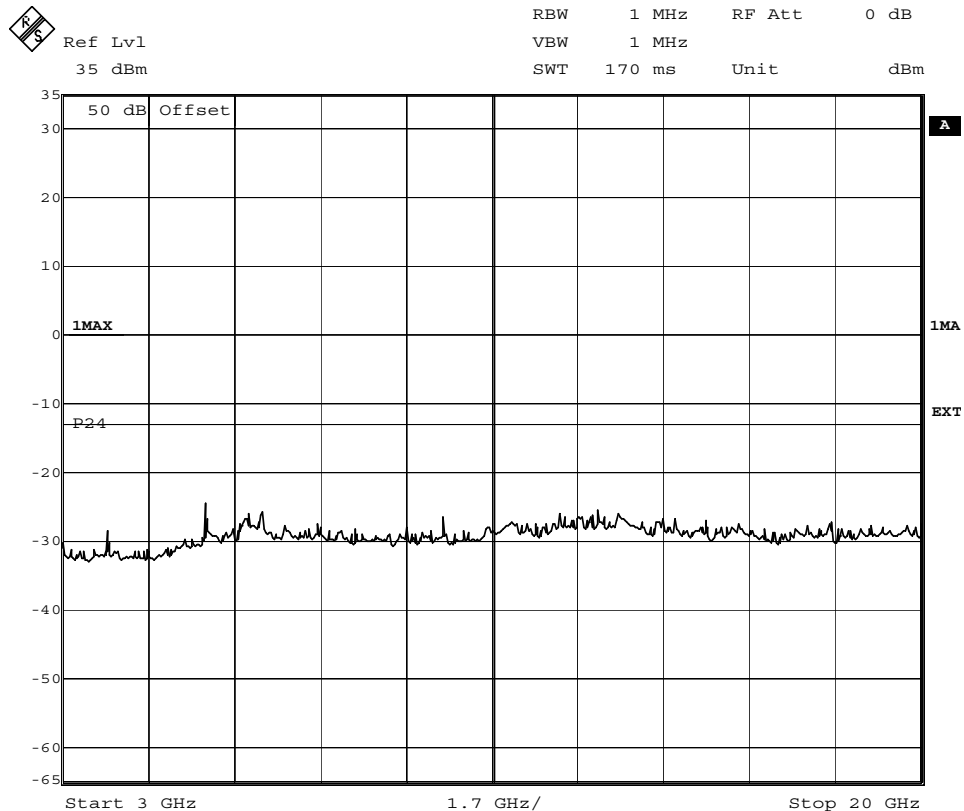


Diagram 8



Date: 20.SEP.2007 10:05:23

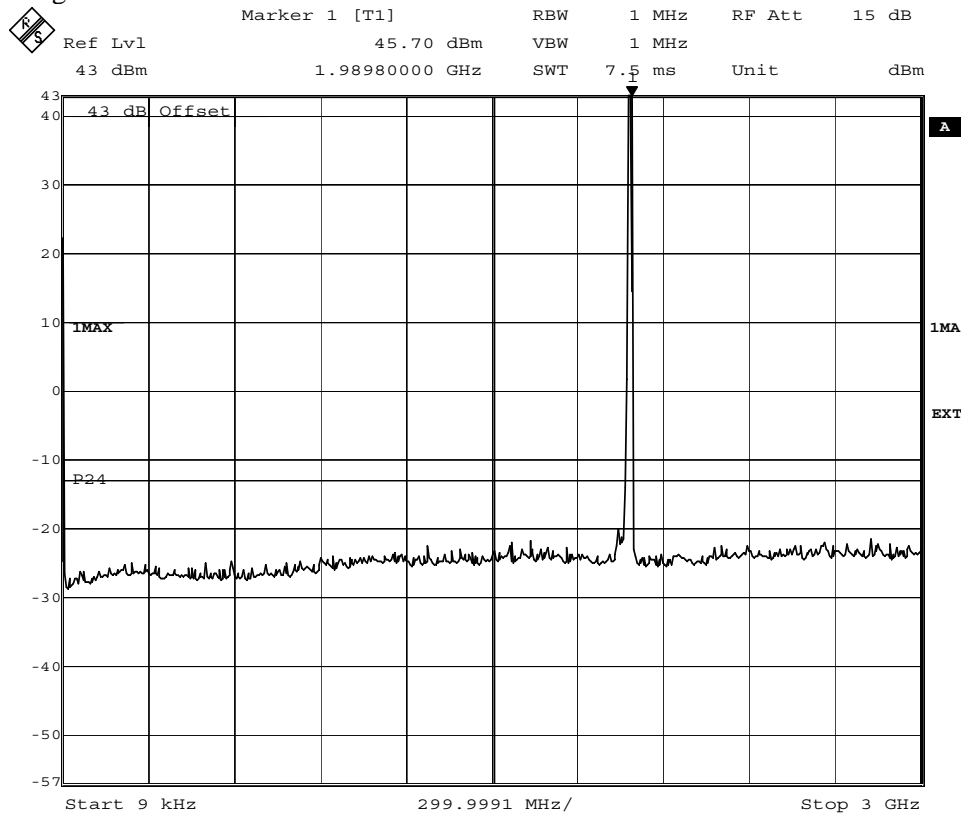
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 10:07:20

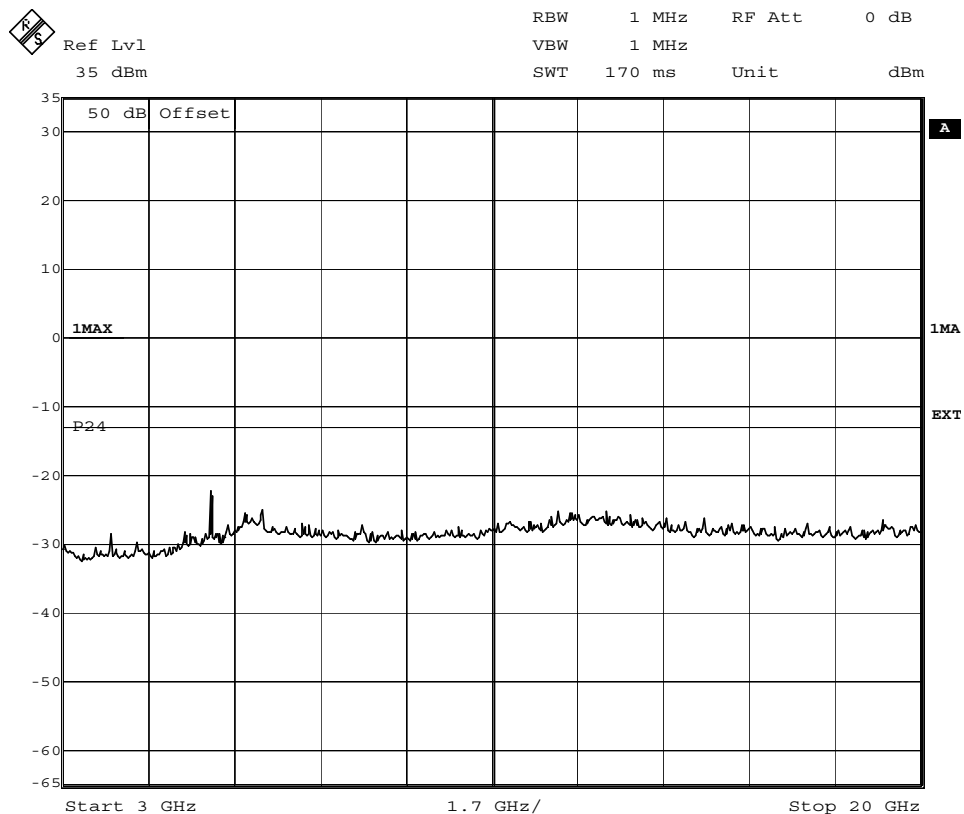


Diagram 9



Date: 20.SEP.2007 09:10:41

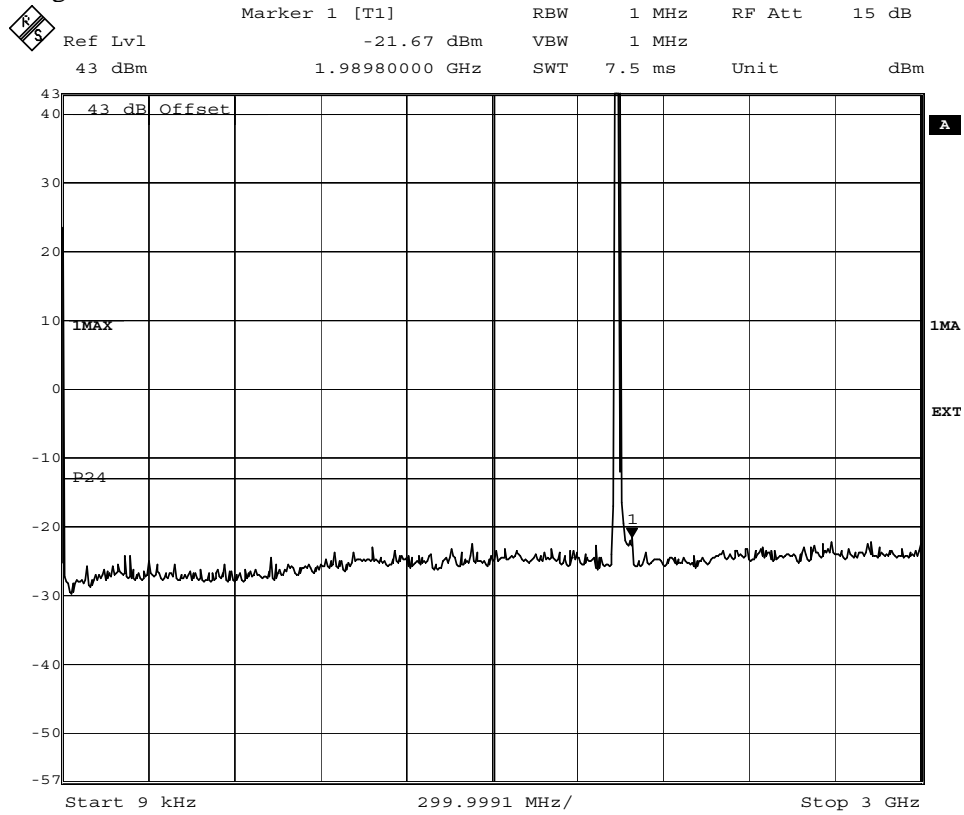
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 09:09:07

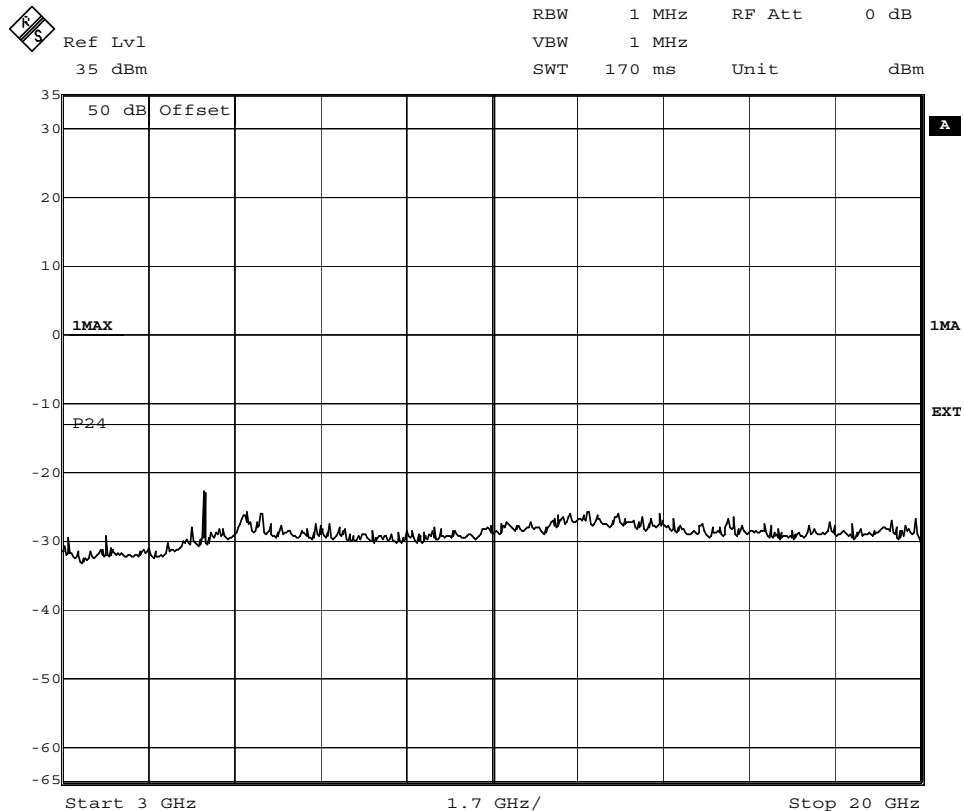


Diagram 10



Date: 20.SEP.2007 09:33:51

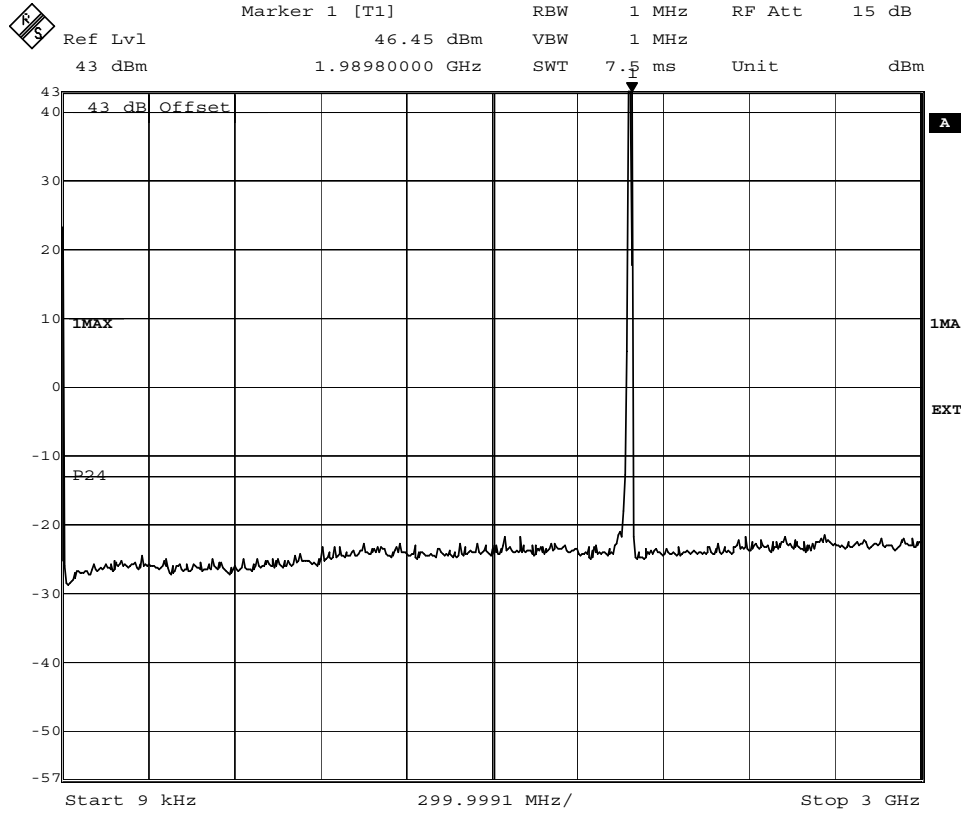
Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 09:33:07

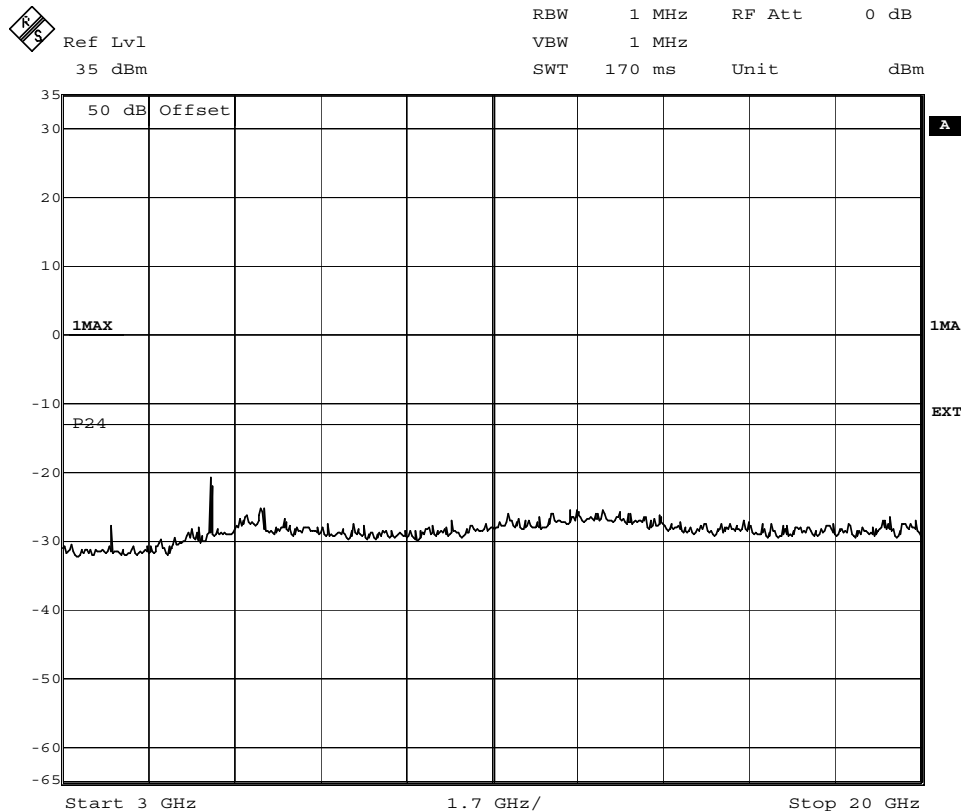


Diagram 12



Date: 20.SEP.2007 08:49:22

Note: The emission at 9 kHz was related to the LO feedthrough. A complementary measurement was performed with a smaller RBW to verify that there were no emission in the frequency range 9k-10MHz.



Date: 20.SEP.2007 09:02:14

Field strength of spurious radiation measurements according to 47 CFR 2.1053

Date	Temperature	Humidity
2007-09-14	22 °C ± 3 °C	49 % ± 5 %
2007-09-17	21 °C ± 3 °C	49 % ± 5 %
2007-09-18	22 °C ± 3 °C	44 % ± 5 %

Test set-up and procedure

The test site is listed at FCC, Columbia with registration number: 93866. The test site also complies with RSS 212, Issue 1, Industry Canada file no.:IC 3482.

The transmitter was modulated with pseudorandom data during the measurements. The antenna ports were terminated with 50 ohm loads.

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

A pre-measurement was first performed:

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

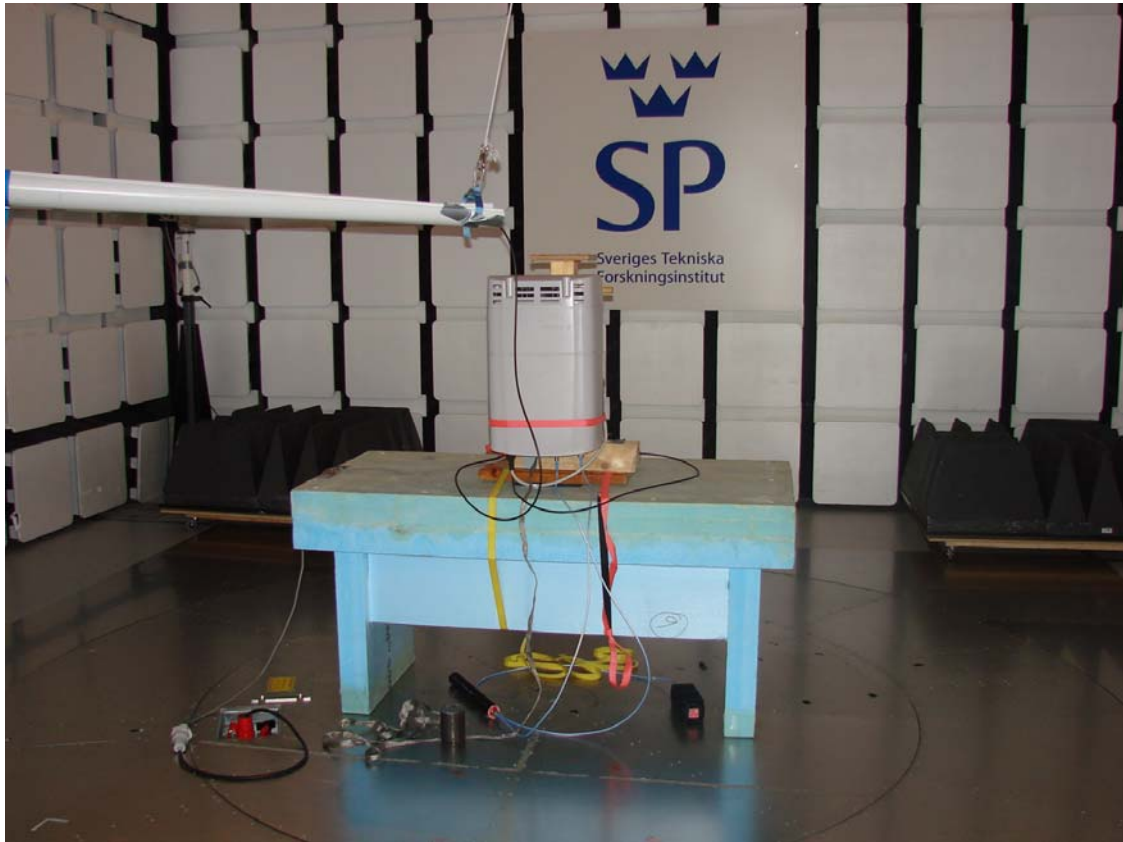
$$\gamma = 20 \log \left(\frac{4\pi D}{\lambda} \right), \gamma \text{ is the propagation loss and } D \text{ is the antenna distance.}$$

The measurement procedure was as the following:

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

Measurement equipment	Calibration Due	SP number
Test site	2008-11	503 881
R&S ESI 26	2008-07	503 292
R&S FSIQ	2008-10	503 738
Control computer	-	503 479
Software: R&S ES-K1, ver. 1.60	-	-
Chase Bilog antenna CBL 6111A	2008-11	503 182
EMCO Horn Antenna 3115	2007-11	502 175
Flann Standard gain horn 16240-25	-	503 939
Flann Standard gain horn 18240-25	-	503 900
Flann Standard gain horn 20240-20	-	503 674
MITEQ Low Noise Amplifier	2008-08	503 285
High pass filter	2008-07	503 739
Testo 615, Temperature and humidity meter	2007-09	503 505

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



Results

For single carrier, multi carrier and all supply power configurations given in appendix 1:

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-20 000	All emission > 20 dB below limit	All emission > 20 dB below limit
Measurement uncertainty		4.7 dB

Limits

The power of any emission outside the frequency band shall be attenuated below the transmitter power (P) by at least $43 + 10 \log P$ dB.

Complies?	Yes
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Frequency stability according to 47 CFR 2.1055

Date	Temperature	Humidity
2007-09-11	24 °C ± 3 °C	40 % ± 5 %
2007-09-12	22 °C ± 3 °C	43 % ± 5 %
2007-09-13	23 °C ± 3 °C	24 % ± 5 %

Nominal Voltage -48 V DC
46 dBm output power at UARFCN 9788 (1957.6 MHz)

Measurements were performed on the combined TX/RX antenna terminal Ant 1.

Measurement equipment	Calibration Due	SP number
R&S FSIQ	2008-10	503 738
Testo 610, Temperature and humidity meter	2009-04	502 658
Rotronic, Temperature and humidity meter	2008-04	502 946
Temperature chamber	2009-12	501 031

Test conditions		Frequency error (Hz)	
Supply voltage DC (V)	T (°C)	QPSK	16QAM
-48.0	+20	-7	-9
-55.2	+20	-11	+8
-40.8	+20	+6	-9
-48.0	+30	+7	+9
-48.0	+40	-10	-11
-48.0	+50	-11	+5
-48.0	+10	-14	-6
-48.0	0	-11	-11
-48.0	-10	-12	-6
-48.0	-20	-9	-10
-48.0	-30	+11	+10
Maximum freq. error (Hz)		-14	
Measurement uncertainty		< ± 1 x 10 ⁻⁷	

Limits (according to 3GPP TS 25.141)

The frequency error shall be within ± 0.05 PPM ± 12 Hz (109.88 Hz).

Complies?	Yes
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Receiver conducted spurious according to Industry Canada RSS-133, section 6.7.

Date 2007-09-19	Temperature 23 °C ± 3 °C	Humidity 34 % ± 5 %
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Test set-up and procedure

The measurements were performed according to ANSI C63.4.

Measurements were performed on the receiver antenna terminal (Ant 2). The measurement is first performed with peak detector. Emission on frequencies close to or above the limit is re-measured with quasi-peak detector (average detector above 1000 MHz).

Measurement equipment	Calibration Due	SP number
R&S FSIQ 40	2008-10	503 738
High pass filter	2008-07	503 739
Testo 615, Temperature and humidity meter	2009-04	502 658

Result

The results are shown in appendix 8.1:

- Rx frequency
- Diagram 1 1852.4 MHz
- Diagram 2 1877.6 MHz
- Diagram 3 1907.6 MHz

Note: During the measurement on the RX port ant 2 the combined TX/RX port ant 1 was terminated with 50 ohm, the TX was active in single carrier mode with test model 1.

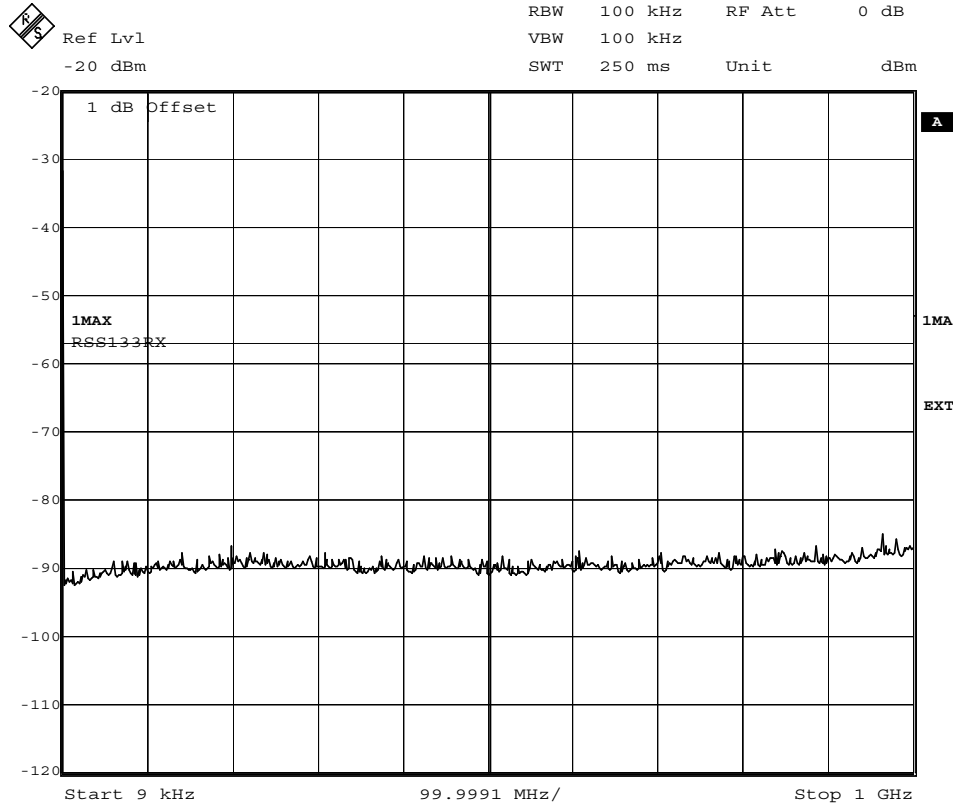
Limit

The power of any spurious output signals appearing at the antenna terminals must not exceed -57 dBm (2 nanowatts) per any 4 kHz in the band 30 MHz to 1 GHz, or -53 dBm (5 nanowatts) above 1 GHz.

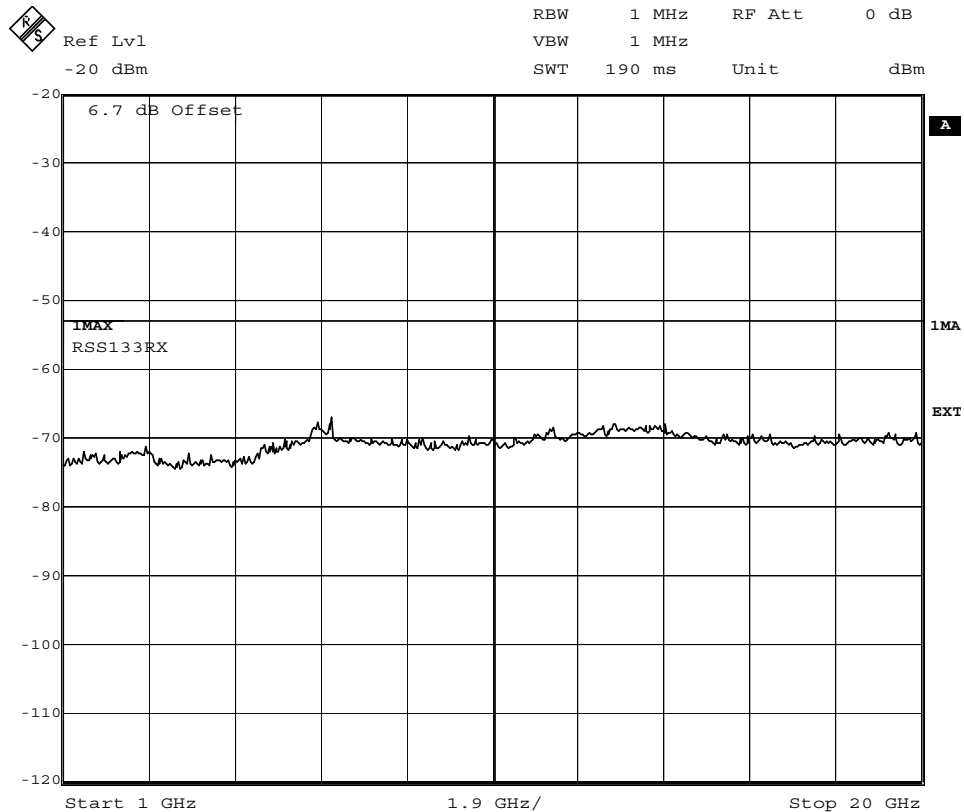
Emission below limit?	Yes
-----------------------	-----



Diagram 1



Date: 19.SEP.2007 13:45:06



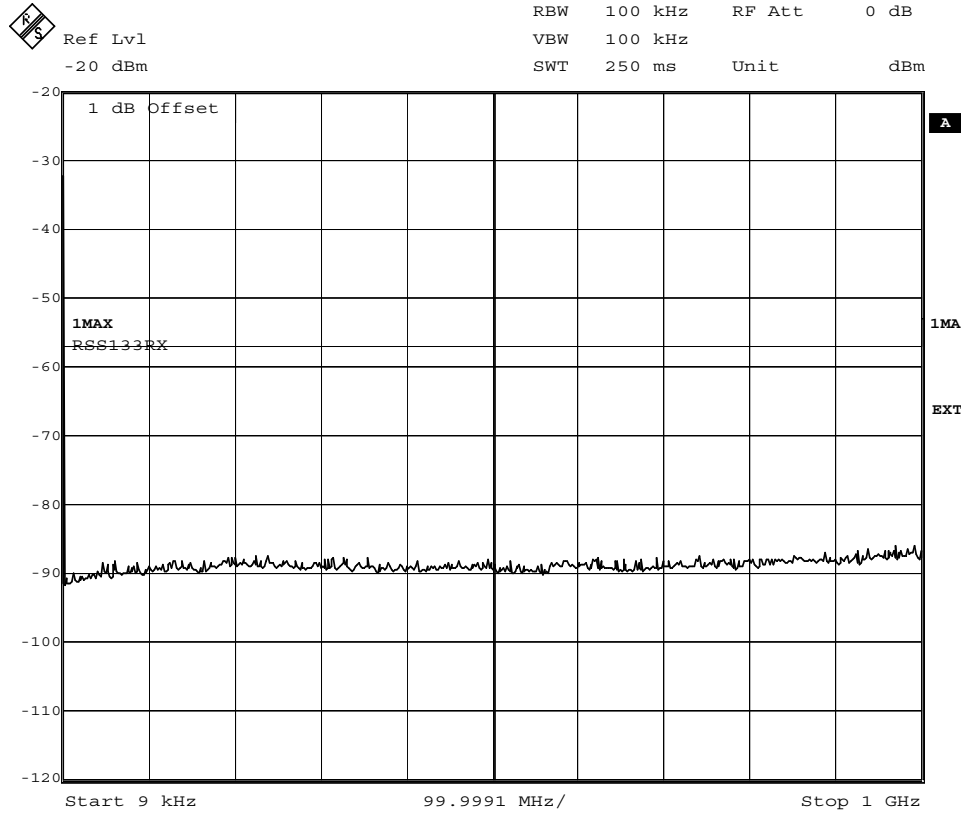
Date: 19.SEP.2007 13:42:13



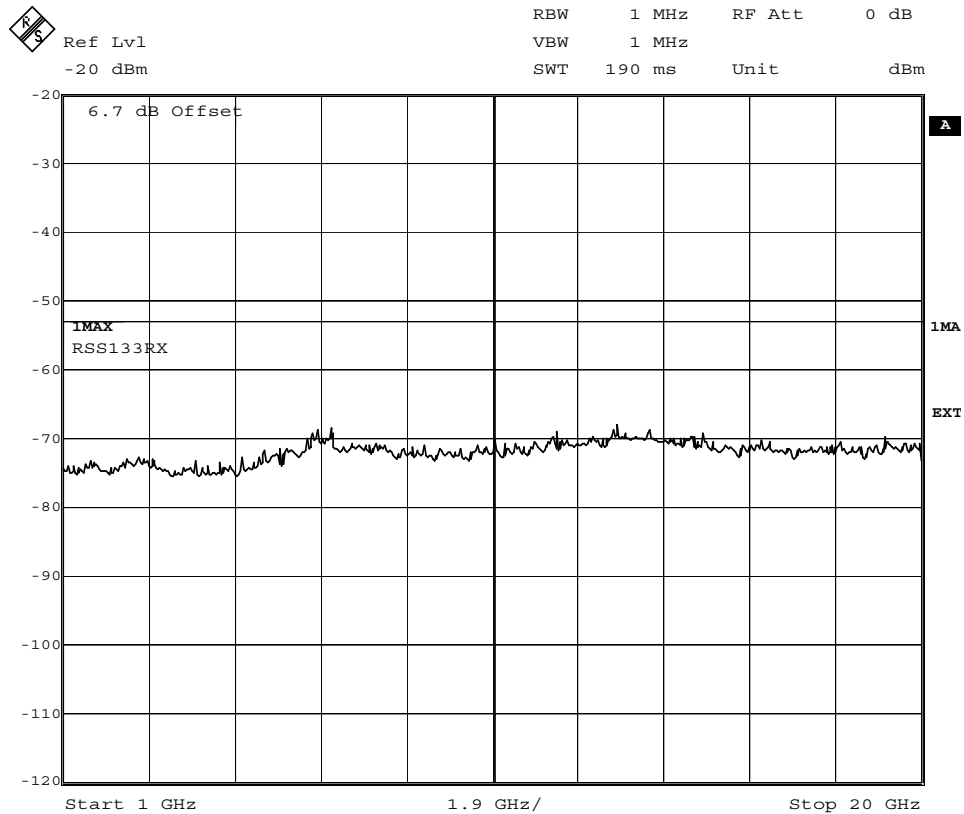
FCC ID: TA8AKRC161134-2

Appendix 8.1

Diagram 2



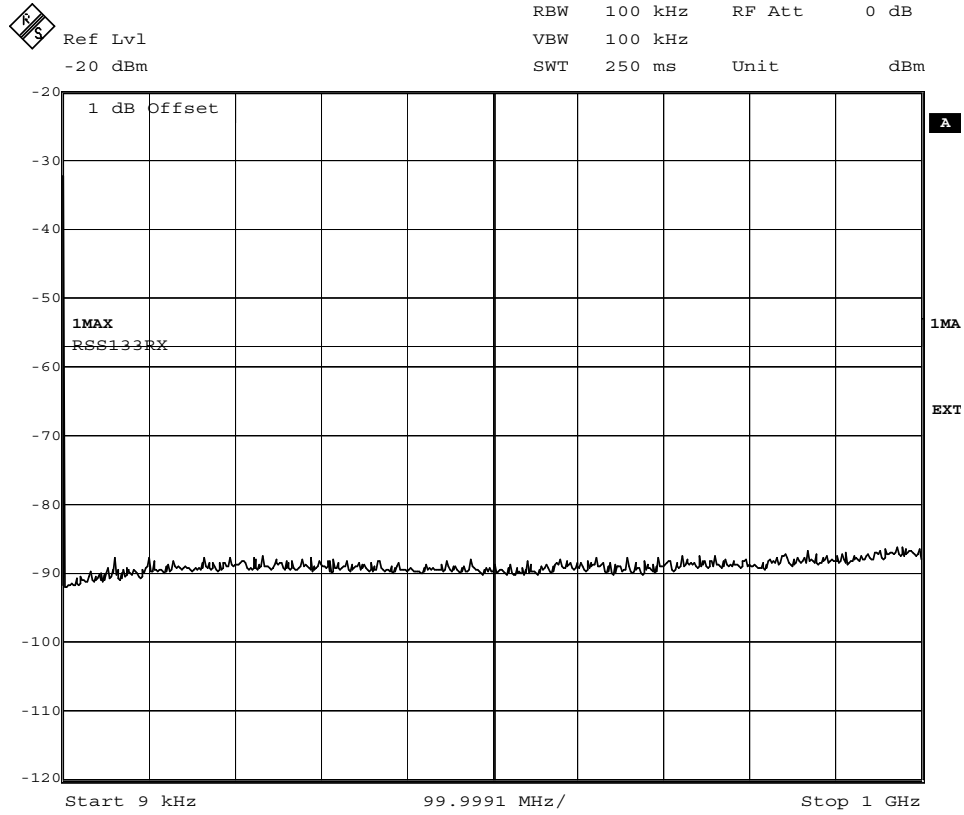
Date: 19.SEP.2007 13:54:20



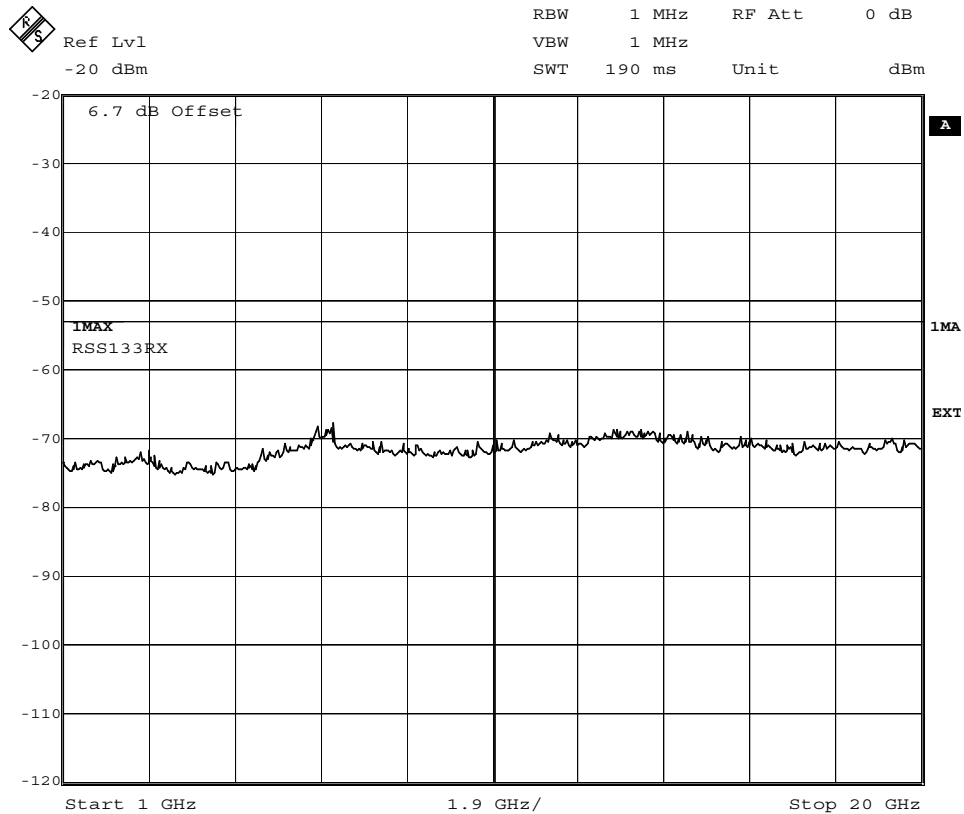
Date: 19.SEP.2007 13:55:17



Diagram 3



Date: 19.SEP.2007 14:05:19



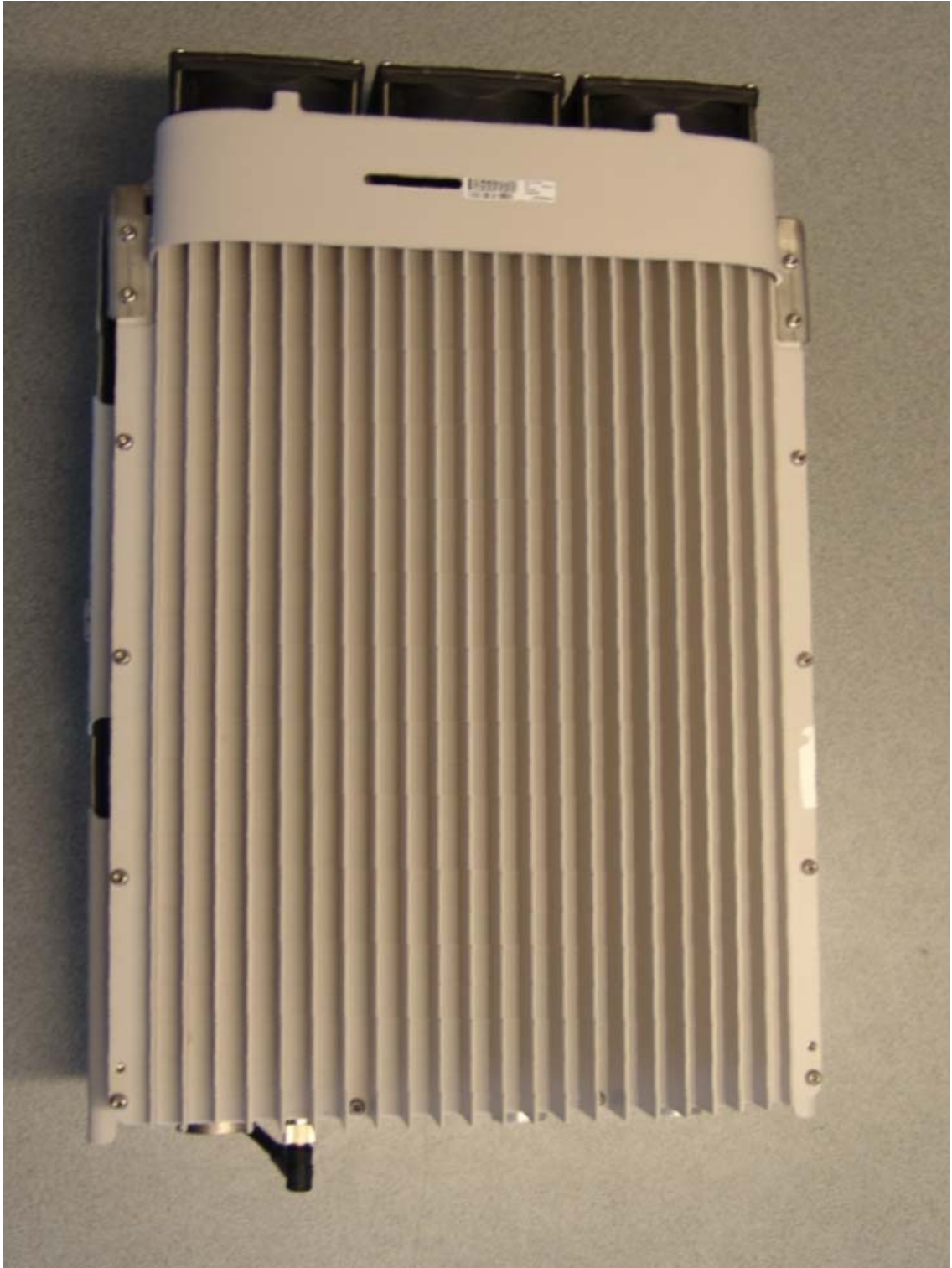
Date: 19.SEP.2007 14:02:44

External photos Radio Equipment RRU22 1940, KRC161 134/2

Front side



Front side, solar covers removed



Left side



Right side



The pictures show the AC-outdoor configuration, with all interconnecting cables attached.

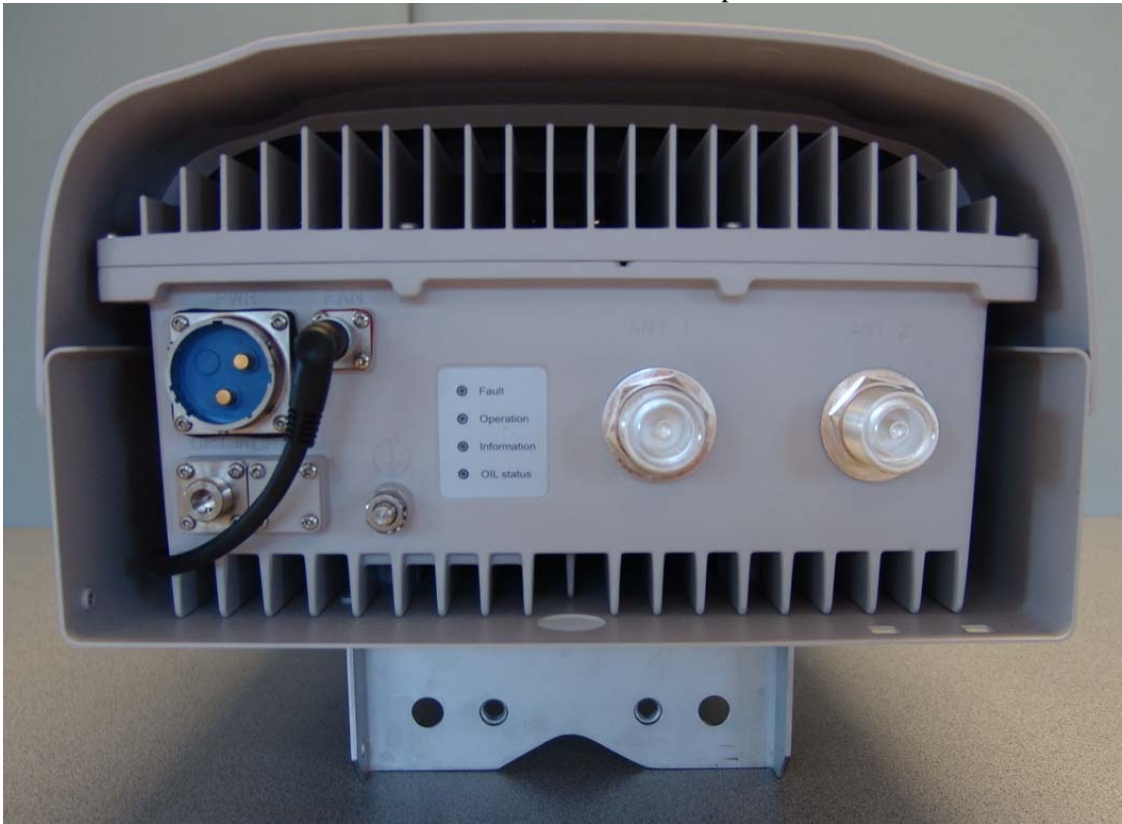
Rear side, DC-configuration (PSU and ACCU removed)



Rear side, AC outdoor configuration, PSU & ACCU attached, including interconnecting cables



View on bottom side with EUT ports



View on top side fan units (solar cover removed)

