



REPORT

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The test site complies with RSS-Gen, IC file no: 3482A

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Radio measurements on 700 MHz cellular equipment with FCC ID: TA8BKRC161241-1 (8 appendices)

Test object

RRUS 11 B12, KRC 161 241/1 Rev. R2A, S/N (S)CB4F914678

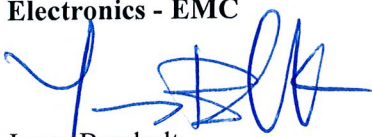
Appendix 1 provides information about the test object and the test set-up.
Appendix 8 provides external photos of the test object.

Summary

| Standard | Compliant | Appendix | Comment |
|---|-----------|----------|---------|
| FCC CFR 47 | Yes | | |
| 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 | - |
| 15.111 Receiver spurious emissions | N.A. | - | Note 1 |

Note 1: The client declared that the test object has no stand-by mode. Both TX are always active. RX measurements were considered not applicable.

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FCC ID: TA8BKRC161241-1

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**Description of test object**

| | |
|---|---|
| Equipment: | Radio equipment RRUS 11 B12 in LTE mode |
| Frequency band | TX: 728 - 746 MHz RX: 698 - 716 MHz |
| Supported channel bandwidth configuration | 1.4 MHz (6 RB), 3MHz (15 RB), (5 MHz (25 RB), 10 MHz (50 RB) and 15 MHz (75 RB) according 3GPP 36.141 section 5.6 |
| Modulation and access scheme | OFDMA in FDD |
| OFDM subcarrier modulation | System information and pilots use BPSK and QPSK. For payload data QPSK, 16QAM and 64QAM can be used. |
| Maximum rated output power: | 2x 44.8 dBm (2x 30 W) |
| Number of antenna ports: | 2 combined TX/RX ports |
| Supported configuration: | Dual single carrier. Both RF chains are identical. |
| Nominal power voltage: | -48 VDC |

Tested frequencies and EARFCNs for TX measurements

| EARFCN | Frequency / [MHz] | BW configuration / [MHz] | Comment |
|--------|-------------------|--------------------------|---|
| 5007 | 728.7 | 1.4 | B - Lowest supported TX carrier frequency |
| 5015 | 729.5 | 3 | B - Lowest supported TX carrier frequency |
| 5025 | 730.5 | 5 | B - Lowest supported TX carrier frequency |
| 5050 | 733.0 | 10 | B - Lowest supported TX carrier frequency |
| 5075 | 735.5 | 15 | B - Lowest supported TX carrier frequency |
| 5090 | 737.0 | 1.4, 3, 5, 10 and 15 | M - TX band center frequency common for all BW configurations |
| 5105 | 738.5 | 15 | T - Highest supported TX carrier frequency |
| 5130 | 741.0 | 10 | T - Highest supported TX carrier frequency |
| 5155 | 743.5 | 5 | T - Highest supported TX carrier frequency |
| 5165 | 744.5 | 3 | T - Highest supported TX carrier frequency |
| 5173 | 745.3 | 1.4 | T - Highest supported TX carrier frequency |

Both test object RF chains were always configured to the same EARFCN. The RX were set to the corresponding EARFCN offset by a value of +18000 in respect to the TX EARFCN.

Note: EARFCN are derived from 3GPP TS 36.141 Version 8.5.0, table 5.7.3-1.



Operation mode during measurements

The test object was powered with -48 VDC. Measurements were performed with both TRX RF chains activated and both TX transmitting at maximum nominal power the test models defined in 3GPP TS 36.141. Test model E-TM1.1 was used to represent QPSK, test model E-TM3.2 to represent 16QAM and test model E-TM3.1 to represent 64QAM payload modulation. The RF port not tested was via an attenuator terminated into 50 ohm.

The setting maximum nominal output power 44.8 dBm (30 W) in channel bandwidth configuration 5 MHz transmitting E-TM1.1 was found to be representative for all traffic scenarios when several settings with the different modulations were tested to find the worst case setting. This setting was used for all measurements unless noted otherwise.

Conducted measurements

Complete TX measurements were done at connector RF A. Limited complementary TX measurements were done at connector RF B to verify identical performance for both transmitter chains. RX measurements were not applicable, the test object can not provide a stand-by mode. Both TX are always active.

Radiated measurements

During the measurements both output ports RF A and RF B were via RF attenuators and a directional coupler connected to functional test equipment outside the shielded chamber for supervision of the transmitted signals.

Purpose of test

The purpose of the tests is to verify compliance to the performance characteristics specified in applicable items of FCC CFR 47.

References

Measurements were done according to relevant parts of the following standards:
FCC CFR 47, part 27, October 2010
ANSI/TIA/EIA-603-B-2002
3GPP TS 36.141, Version 8.5.0

Measurement equipment

| Measurement equipment | Calibration Due | SP number |
|--|-----------------|-----------|
| Test site Tesla | 2012-10 | 503 881 |
| Rohde & Schwarz FSQ 40 | 2011-07 | 504 143 |
| Rohde & Schwarz FSIQ 40 | 2011-07 | 503 738 |
| Rohde & Schwarz ESI 26 | 2011-08 | 503 292 |
| High pass filter 1 – 15 GHz, Wainright | 2011-07 | 504 199 |
| HP filter 3-18 GHz, RLC Electronics | 2012-07 | 503 739 |
| HP filter 18-26 GHz, RLC Electronics | 2011-07 | 503 740 |
| RF attenuator | 2011-07 | 504 159 |
| RF attenuator | 2011-08 | 900 233 |
| Boonton RF Peak power meter/analyzer | 2011-10 | 503 144 |
| Boonton Power sensor 56518-S/4 | 2012-10 | 503 145 |
| Chase Bilog antenna CBL 6111A | 2011-10 | 503 182 |
| EMCO Horn Antenna 3115 | 2011-01 | 502 175 |
| Std. gain horn mod. 20240-20 | -- | 503 674 |
| MITEQ Low Noise Amplifier | 2011-07 | 503 285 |
| µComp Nordic, Low Noise Amplifier | 2011-07 | 504 160 |
| Climate chamber 2 | 2013-11 | 501 031 |
| Multimeter Fluke 87 | 2011-03 | 502 190 |
| Testo 635 temperature and humidity meter | 2011-03 | 504 203 |
| Testo 625 temperature and humidity meter | 2011-06 | 504 188 |

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation "SP-QD 10885". The measurement uncertainties can be found in the table below. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).

Reservation

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

Delivery of test object

The test object was delivered 2011-01-13.

Manufacturer's representative

Mats Falk, Ericsson AB

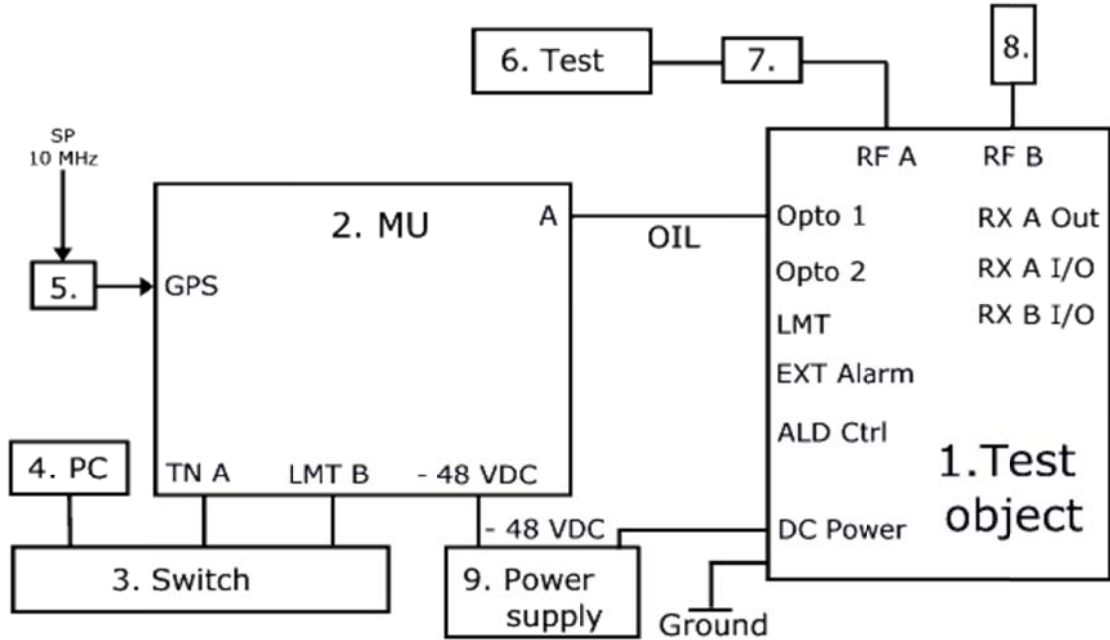
Test engineers

Jörgen Wassholm, Andreas Johnsson, Tomas Lennhager, and Jonas Bremholt

Test participant

Christer Hjorth, Ericsson AB (Partially)

Test set-up conducted measurements



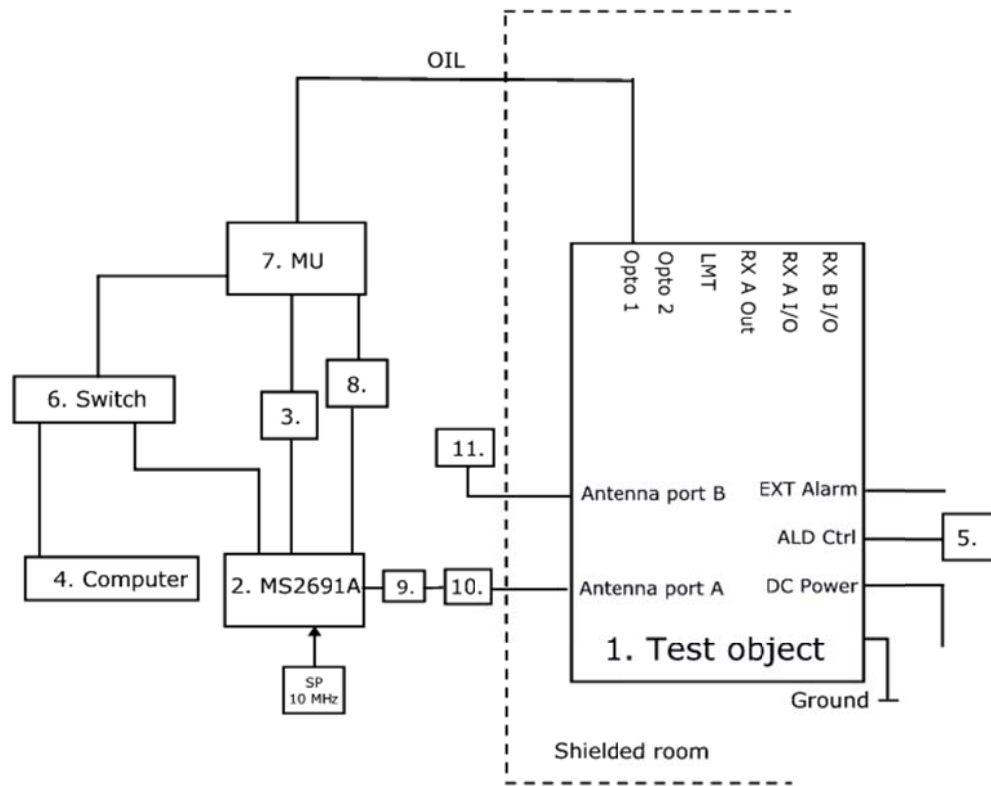
Test object

| | |
|----|--|
| 1. | RRUS 11 B12, KRC 161 241/1, R2A, (S)CB4F914678 FCC ID: TA8BKRC161241-1 with software CXP 102 051/10 rev. R5FZ |
|----|--|

Functional test equipment

| | |
|----|---|
| 2. | Main unit, see details in Appendix 1.1 |
| 3. | Switch, Netgear ProSafe GSM 7224, BAMS – 1000850754 |
| 4. | Computer, Sun Ultra 27, BAMS – 1000758436 |
| 5. | Jointing Box, NCD 901 40/1, R1A, A401222715 |
| 6. | SP test instrument according measurement quipment list |
| 7. | RF attenuator, SP 504 159 and SP 900 233 |
| 8. | Attenuator, Weinschel model 48-30-33, Terminator, Weinschel model 1433-4-LIM, NC023BH8677 |

Test set-up radiated measurements



Test object

| | |
|----|--|
| 1. | RRUS 11 B12, KRC 161 241/1, R2A, (S)CB4F914678 FCC ID: TA8BKRC161241-1 with software CXP 102 051/10 rev. R5FZ |
|----|--|

Functional test equipment

| | |
|-----|---|
| 2. | Signal Analyzer, Anritsu MS2691A, BAMS – 1000739660 |
| 3. | Trigger, LTY 151 0799/1, R1A, A401150948 |
| 4. | Computer, Sun Ultra 27, BAMS – 1000758436 |
| 5. | RET – Remote Electrical Tilt unit |
| 6. | Switch, Netgear ProSafe GSM 7224, BAMS – 1000850754 |
| 7. | Main unit, see details in Appendix 1.1 |
| 8. | Joining Box, NCD 901 40/1, R1A, A401222715 |
| 9. | Directional coupler, BAMS - 1000739626 |
| 10. | Attenuator, Weinschel model 48-30-33, BH8677 |
| 11. | Terminator, Weinschel model 1433-4-LIM, NC023 |



Test object ports

| Interface: | Type of port: |
|---|----------------------|
| Ground connection | Ground |
| Supply power -48 VDC | DC Power |
| Antenna port "RF A", 7/16 connector, female, combined TX/RX | Antenna |
| Antenna port "RF B", 7/16 connector, female, combined TX/RX | Antenna |
| Opto 1, connected via optical data link to DUL port A | Signal |
| Opto 2, not supported | Signal |
| LMT, not supported | Signal |
| RX A I/O, not supported | Signal |
| RX A Out, not supported | Signal |
| RX B I/O, not supported | Signal |
| EXT Alarm, external alarm, not connected during conducted measurements, connected to 15 m shielded multiwire during radiated measurements | Signal |
| ALD ctrl, not connected during conducted measurements, connected to remote electrical tilt unit during radiated measurements | Signal |



REPORT

FCC ID: TA8BKRC161241-1

Appendix 1.1

RBS 6601 Main unit

| Product name | Product number | R-state | Serial number |
|--------------|-----------------|---------|---------------|
| DUL 20 01 | KDU 137 533/4 | R1A | (S)C823774053 |
| SUP 6601 | 1/BFL 901 009/1 | R3B | (S)BR80911163 |
| DUMMY 31 | SXK 109 8971/1 | - | - |



RF power output measurements according to 47 CFR 2.1046

| | | |
|------------|--------------|------------|
| Date | Temperature | Humidity |
| 2011-01-26 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2011-01-27 | 23 °C ± 3 °C | 10 % ± 5 % |

Test set-up and procedure

The output was connected to a peak power analyzer with the CDF mode activated.

| Measurement equipment | SP number |
|--|-----------|
| Boonton RF Peak power meter/analyzer | 503 144 |
| Boonton Power sensor 56518-S/4 | 503 145 |
| RF attenuator | 504 159 |
| Multimeter Fluke 87 | 502 190 |
| Testo 635 temperature and humidity meter | 504 203 |

Measurement uncertainty: 0.5 dB

Results

Rated output power level at connector RF A (maximum): 44.8 dBm (30 W).

| Test conditions, Test model in BW configuration | Transmitter power RMS (dBm) / PAR (dB) | | |
|--|---|--------------|--------------|
| | Channel B | Channel M | Channel T |
| E-TM1.1 in 1.4 MHz | 44.6 / 7.0 | 44.8 / 7.0 | 44.7 / 6.9 |
| E-TM1.1 in 3 MHz | 44.7 / 6.9 | 44.8 / 6.7 | 44.8 / 6.8 |
| E-TM1.1 in 5 MHz | 44.8 / 6.8 | 44.8 / 6.5 | 44.8 / 6.6 |
| E-TM1.1 in 10 MHz | 44.8 / 7.2 | 44.8 / 6.4 | 44.8 / 6.8 |
| E-TM1.1 in 15 MHz | 44.6 / 7.1 | 44.5 / 6.7 | 44.6 / 6.6 |
| E-TM1.1 in 1.4 MHz, Port B | - | 44.7 / 7.0 | - |

Limit

Derived from CFR 47 § 27.50 (c) (3): Base stations transmitting in the 698 –746 MHz band with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz.

The peak-to-average ratio (PAR) shall not exceed 13 dB.

| | |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|



Occupied bandwidth measurements according to 47 CFR 2.1049

| Date | Temperature | Humidity |
|------------|--------------|------------|
| 2011-01-26 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2011-01-27 | 23 °C ± 3 °C | 10 % ± 5 % |

Test set-up and procedure

The measurements were made as defined in §2.1049. 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.

| Measurement instrument | SP number |
|--|-----------|
| Rohde & Schwarz FSQ40 | 504 143 |
| RF attenuator | 504 159 |
| Testo 635 temperature and humidity meter | 504 203 |

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 3.1

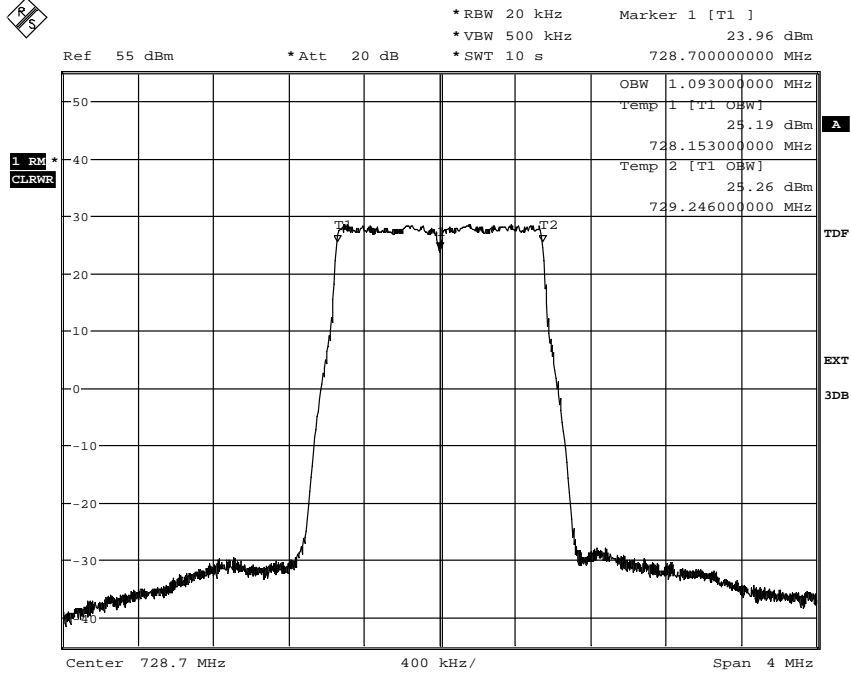
| | BW configuration | Tested port | Channel | OBW |
|------------|------------------|-------------|---------|------------|
| Diagram 1 | 1.4 MHz | RF A | B | 1.093 MHz |
| Diagram 2 | 15 MHz | RF A | B | 13.410 MHz |
| Diagram 3 | 1.4 MHz | RF A | M | 1.093 MHz |
| Diagram 4 | 3 MHz | RF A | M | 2.694 MHz |
| Diagram 5 | 5 MHz | RF A | M | 4.478 MHz |
| Diagram 6 | 10 MHz | RF A | M | 8.940 MHz |
| Diagram 7 | 15 MHz | RF A | M | 13.418 MHz |
| Diagram 8 | 1.4 MHz | RF A | T | 1.092 MHz |
| Diagram 9 | 15 MHz | RF A | T | 13.418 MHz |
| Diagram 10 | 1.4 MHz | RF B | M | 1.093 MHz |

Remark

Test of one configuration was repeated for the transmitter chain at port RF B, giving identical results within measurement uncertainty.

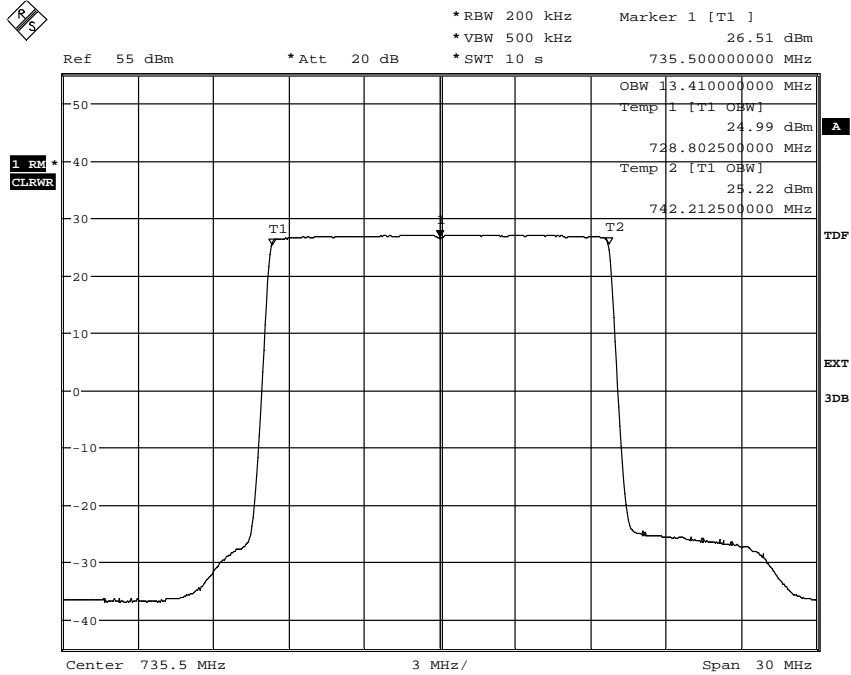


Diagram 1:



Date: 26.JAN.2011 15:29:47

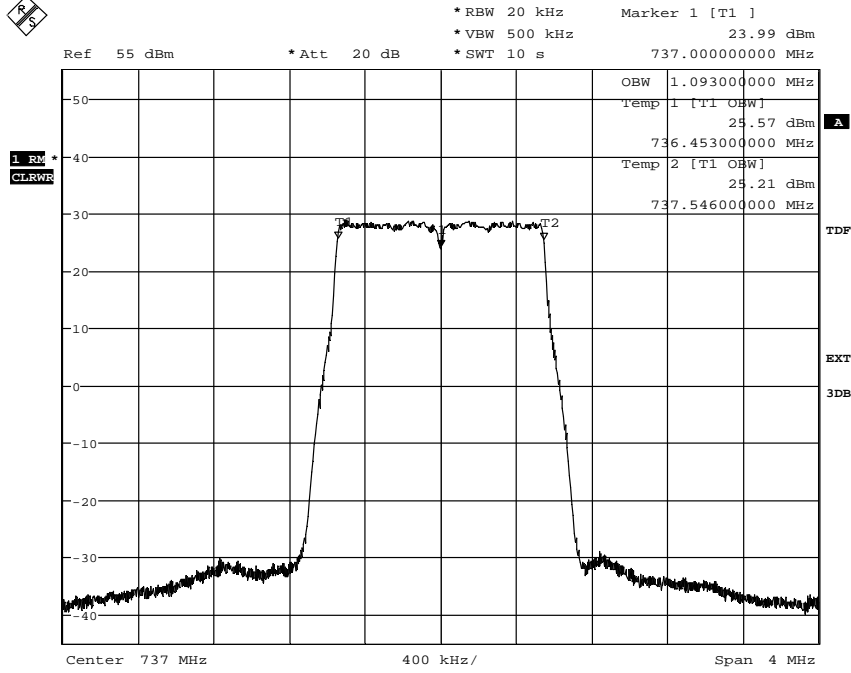
Diagram 2:



Date: 27.JAN.2011 09:56:22

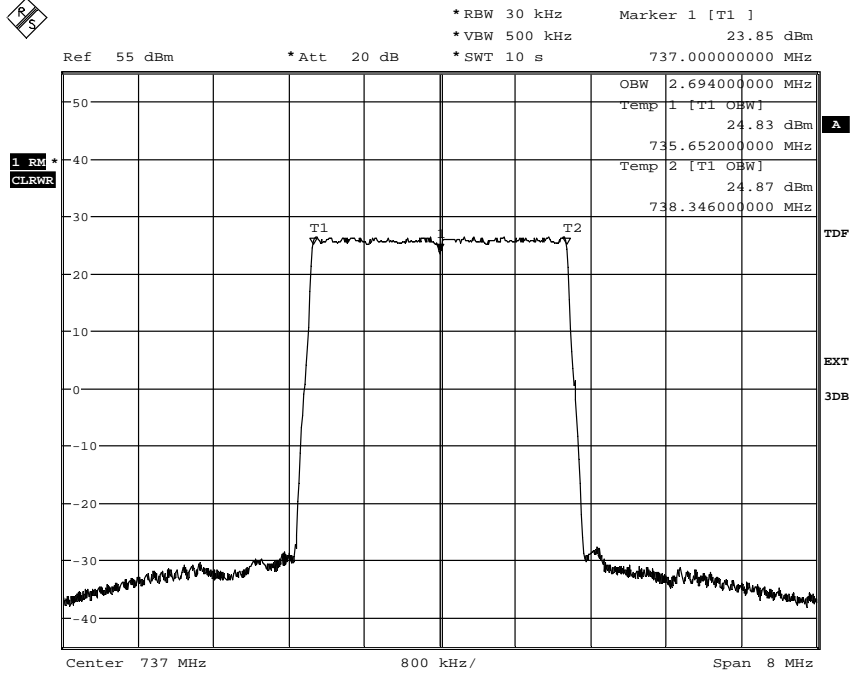


Diagram 3:



Date: 27.JAN.2011 13:07:28

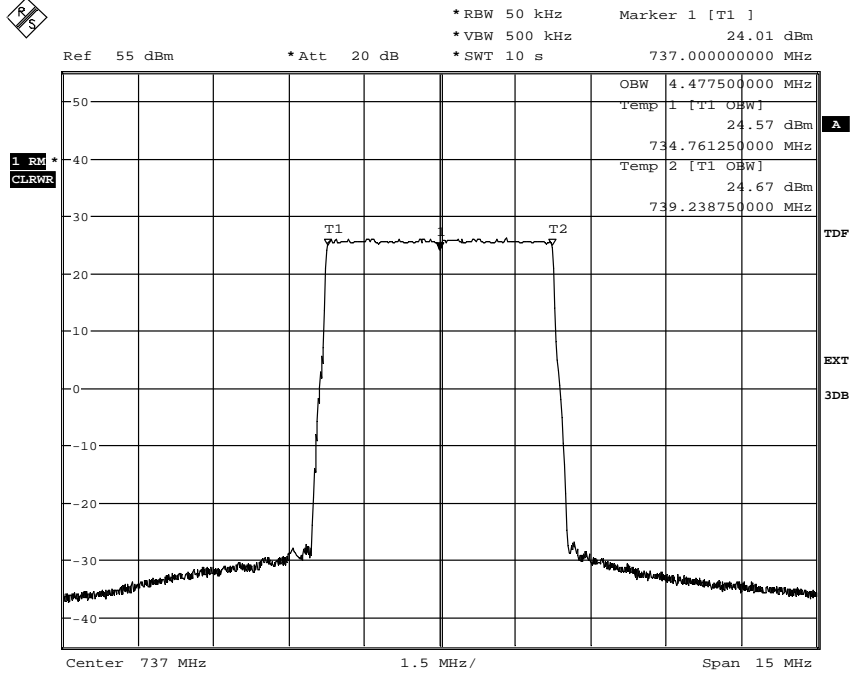
Diagram 4:



Date: 27.JAN.2011 13:11:45

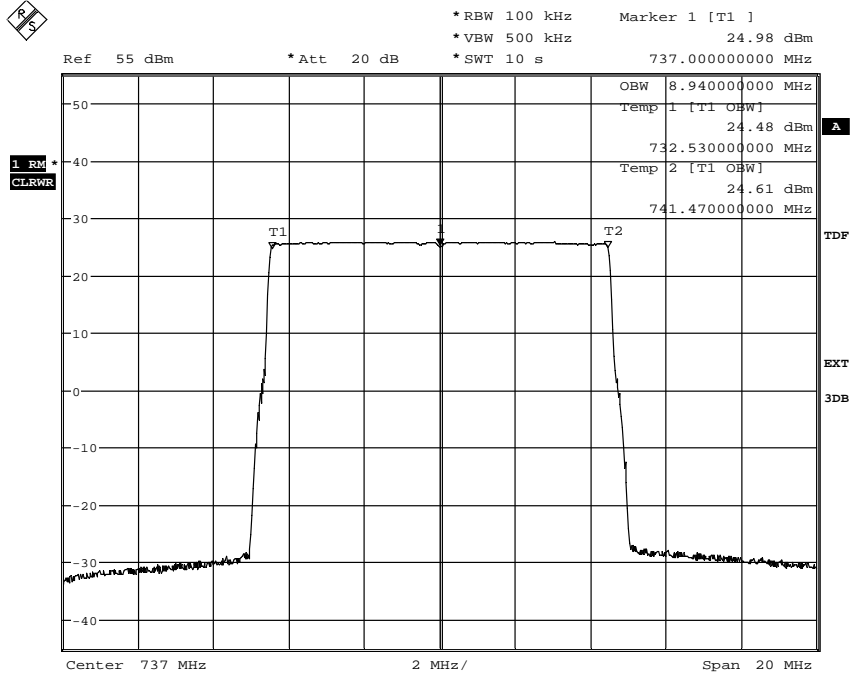


Diagram 5:



Date: 27.JAN.2011 13:35:43

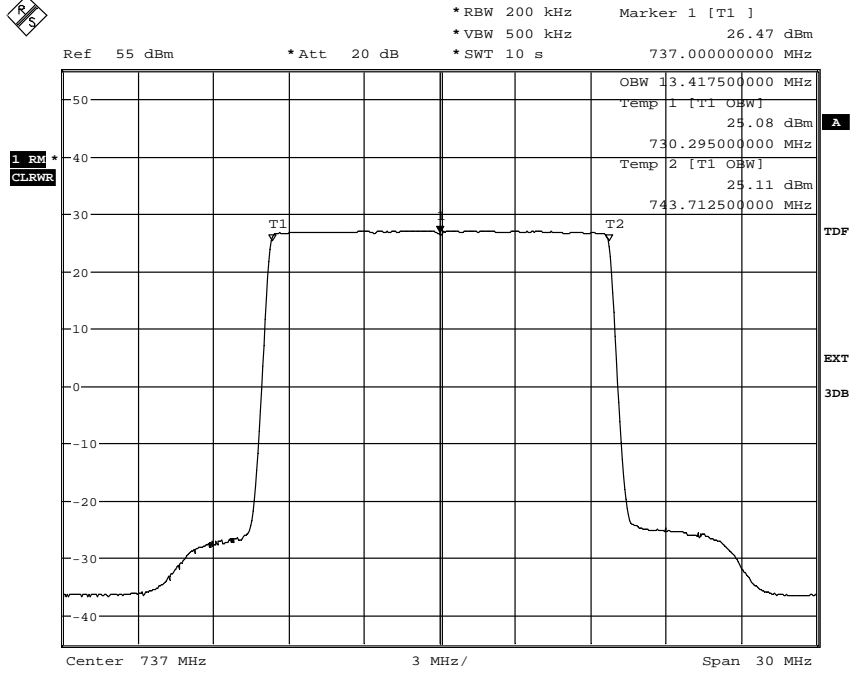
Diagram 6:



Date: 27.JAN.2011 15:14:12

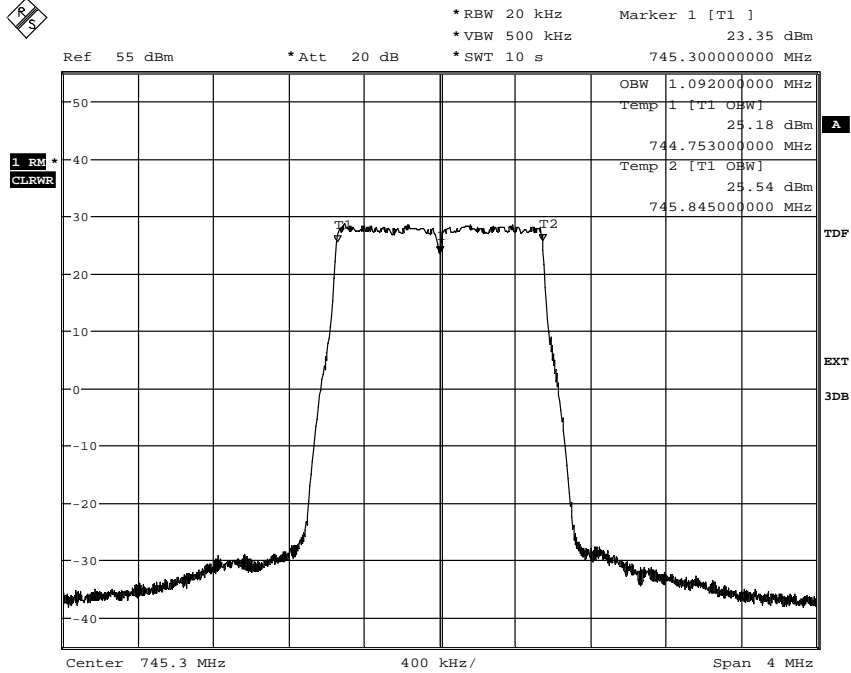


Diagram 7:



Date: 27.JAN.2011 15:33:04

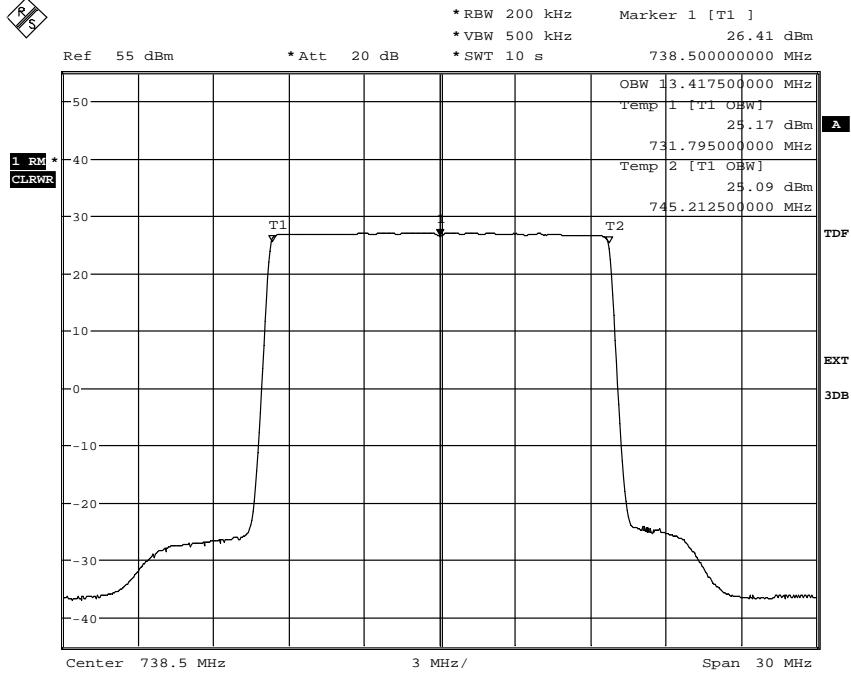
Diagram 8:



Date: 27.JAN.2011 12:36:44

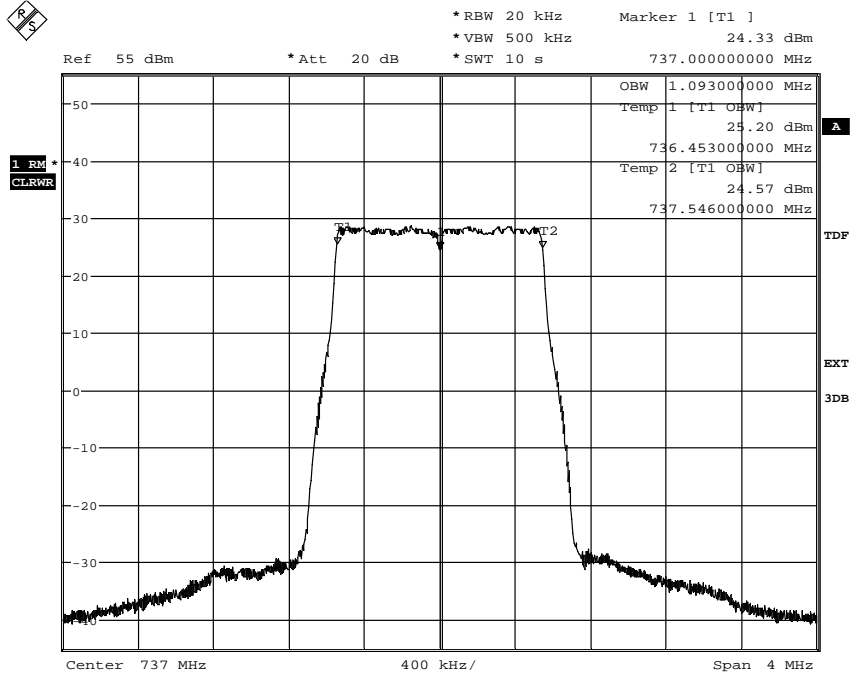


Diagram 9:



Date: 27.JAN.2011 10:40:01

Diagram 10:



Date: 27.JAN.2011 16:00:57



Band edge measurements according to 47 CFR 2.1051

| | | |
|------------|--------------|------------|
| Date | Temperature | Humidity |
| 2011-01-26 | 23 °C ± 3 °C | 18 % ± 5 % |
| 2011-01-27 | 23 °C ± 3 °C | 10 % ± 5 % |

Test set-up and procedure

The test object 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.

The measurements were made as defined in §27.53 (g). A resolution bandwidth of 30 kHz was used for frequencies offset up to 5 MHz from the band edges. After the 100 kHz immediately outside the band edges the limit was adjusted -5.2 dB (10 log (30/100)) to -18.2 dBm in order to compensate for the reduced measurement bandwidth.

| Measurement instrument | SP number |
|--|-----------|
| Rohde & Schwarz FSQ40 | 504 143 |
| RF attenuator | 504 159 |
| Testo 635 temperature and humidity meter | 504 188 |

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 4.1

| | Bandwidth configuration | Channel | Tested port |
|------------------|-------------------------|---------|-------------|
| Diagram 1 a & b | 1.4 MHz | B | RF A |
| Diagram 2 a & b | 3 MHz | B | RF A |
| Diagram 3 a & b | 5 MHz | B | RF A |
| Diagram 4 a & b | 10 MHz | B | RF A |
| Diagram 5 a & b | 15 MHz | B | RF A |
| Diagram 6 a & b | 1.4 MHz | T | RF A |
| Diagram 7 a & b | 3 MHz | T | RF A |
| Diagram 8 a & b | 5 MHz | T | RF A |
| Diagram 9 a & b | 10 MHz | T | RF A |
| Diagram 10 a & b | 15 MHz | T | RF A |
| Diagram 11 a & b | 1.4 MHz | B | RF B |
| Diagram 12 a & b | 1.4 MHz | T | RF B |

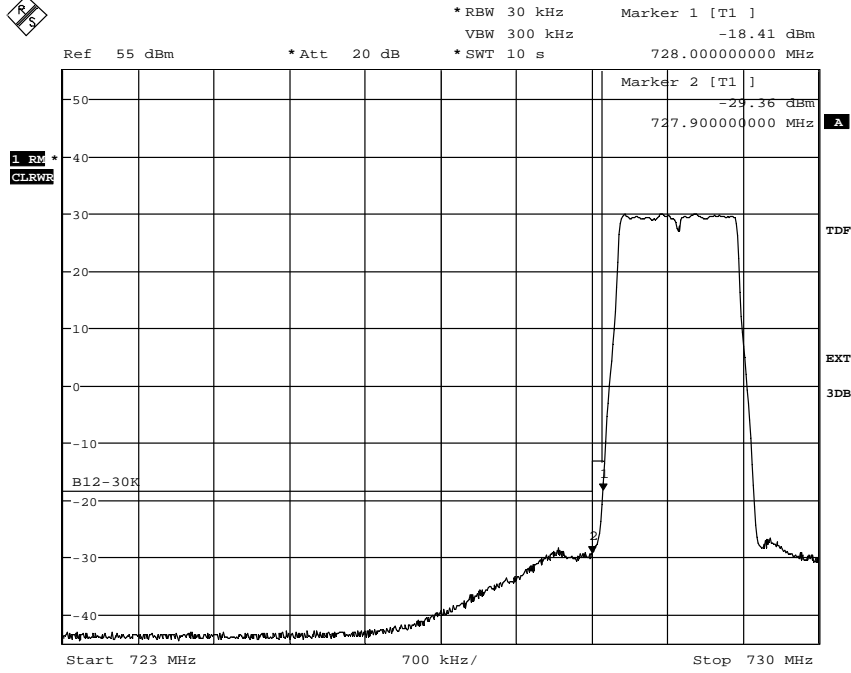
Limits

Derived from CFR 47 § 27.53 (g): Outside outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, resulting in a limit of -13 dBm.

| | |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

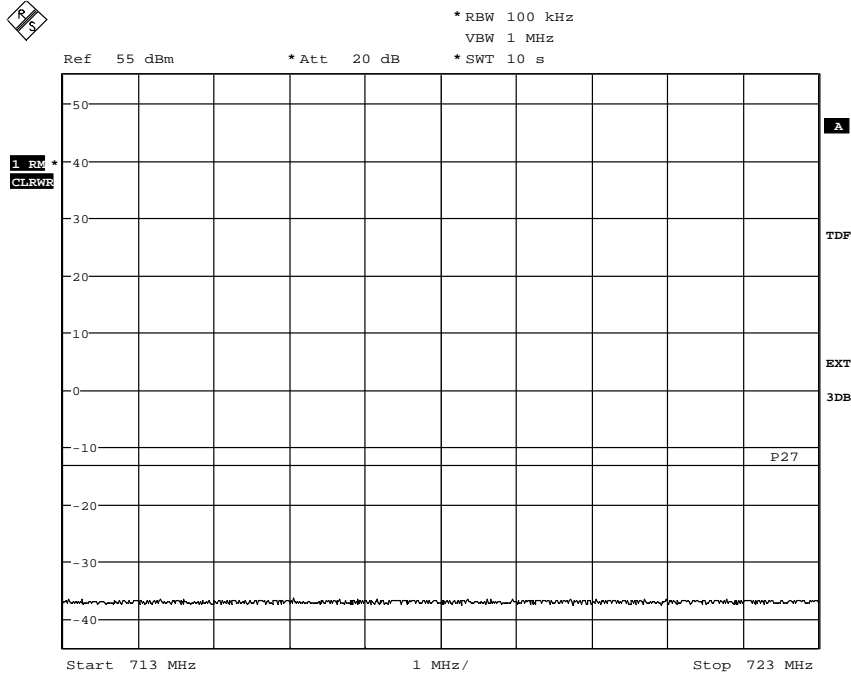


Diagram 1 a:



Date: 26.JAN.2011 15:39:40

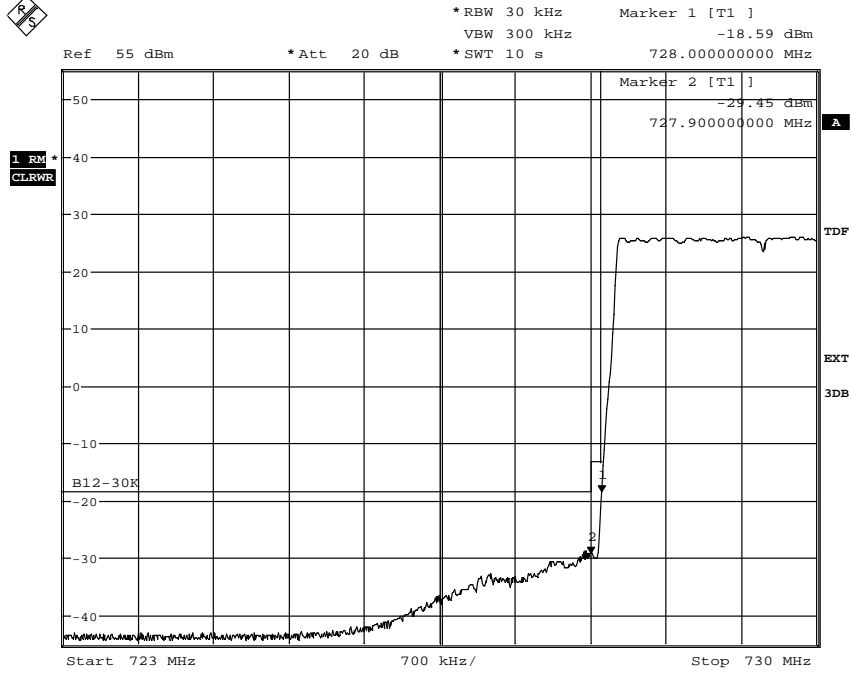
Diagram 1 b:



Date: 26.JAN.2011 15:41:26

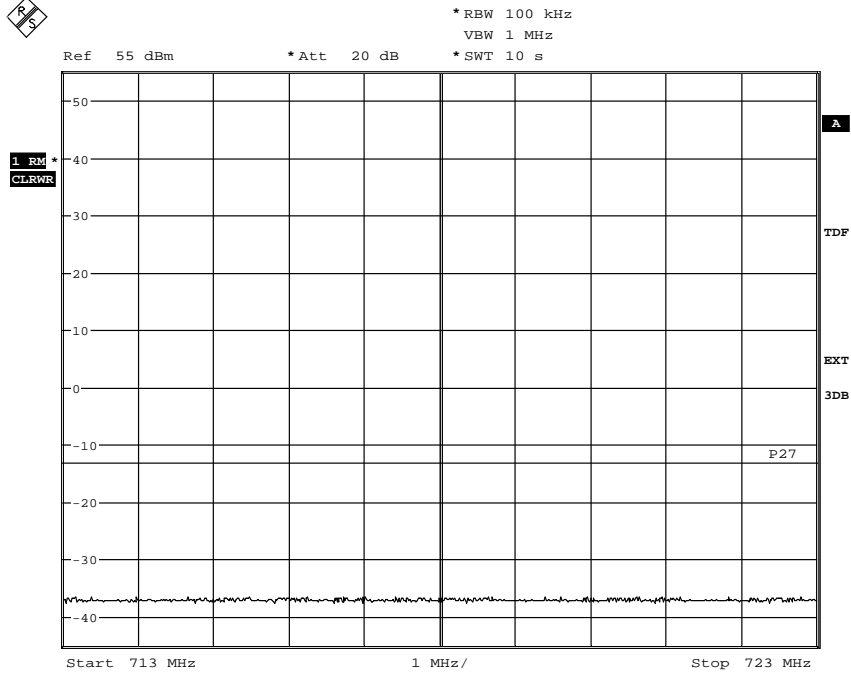


Diagram 2 a:



Date: 27.JAN.2011 08:47:44

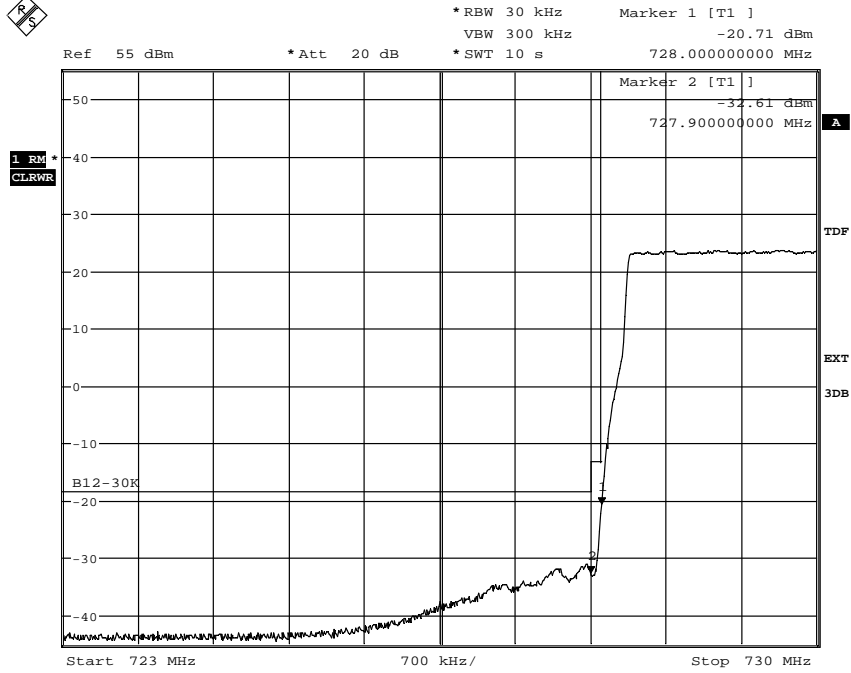
Diagram 2 b:



Date: 27.JAN.2011 08:45:34

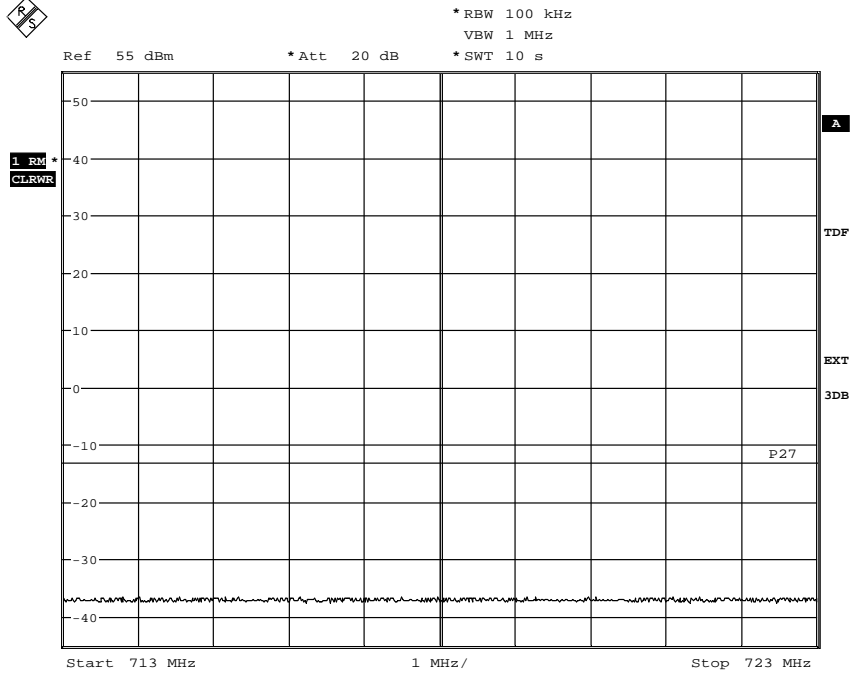


Diagram 3 a:



Date: 27.JAN.2011 08:56:29

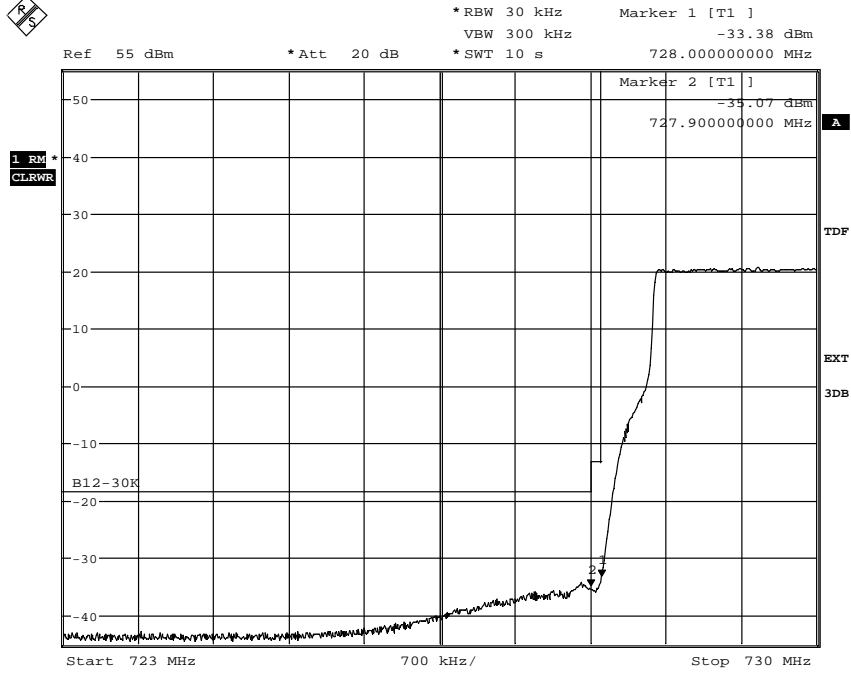
Diagram 3 b:



Date: 27.JAN.2011 09:02:06

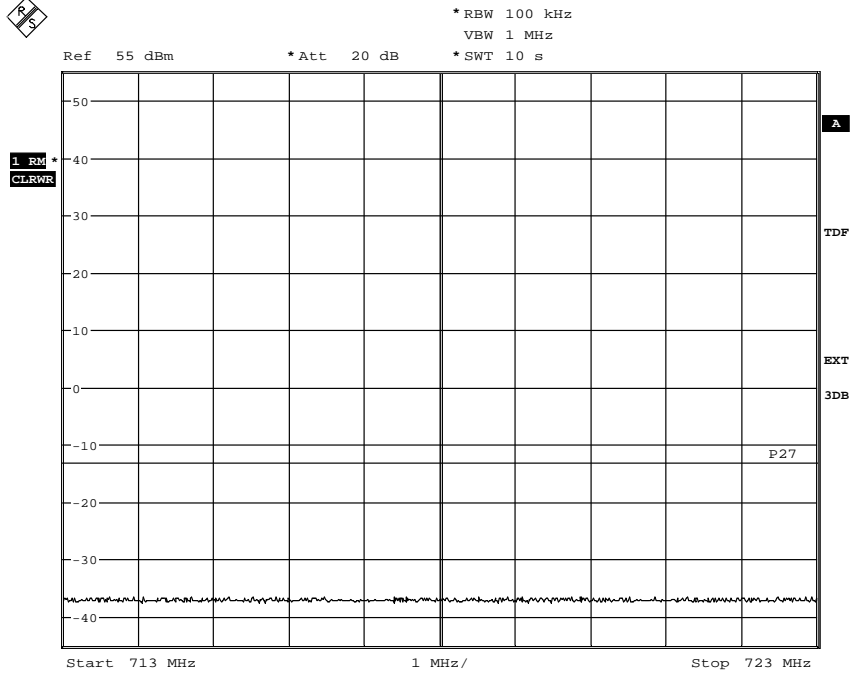


Diagram 4 a:



Date: 27.JAN.2011 09:14:11

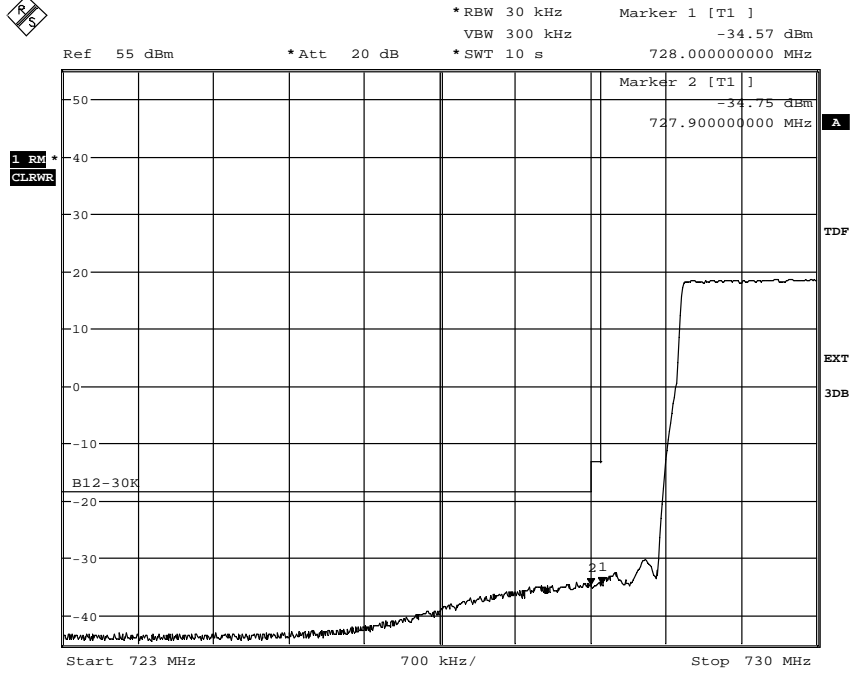
Diagram 4 b:



Date: 27.JAN.2011 09:15:33

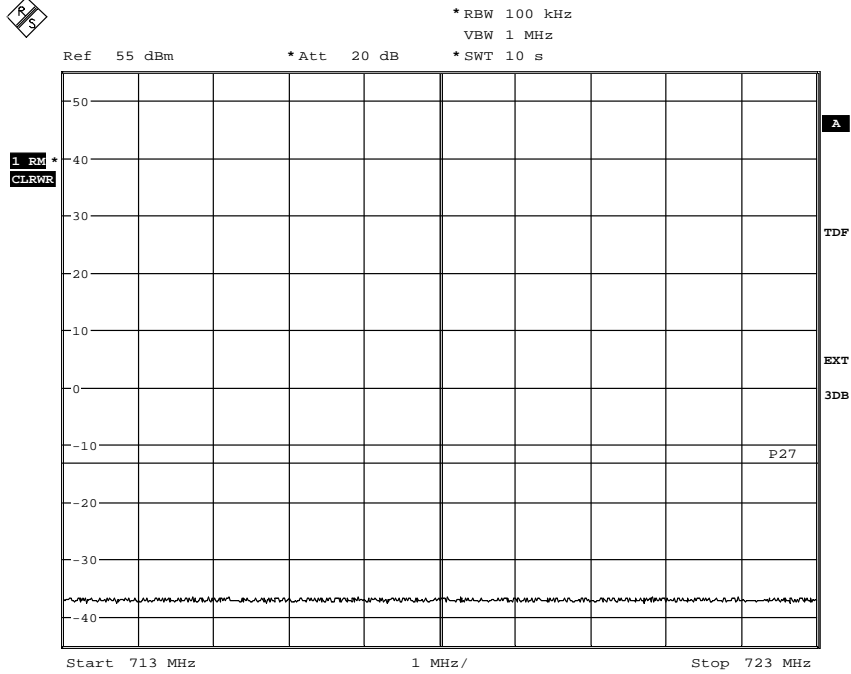


Diagram 5 a:



Date: 27.JAN.2011 09:51:33

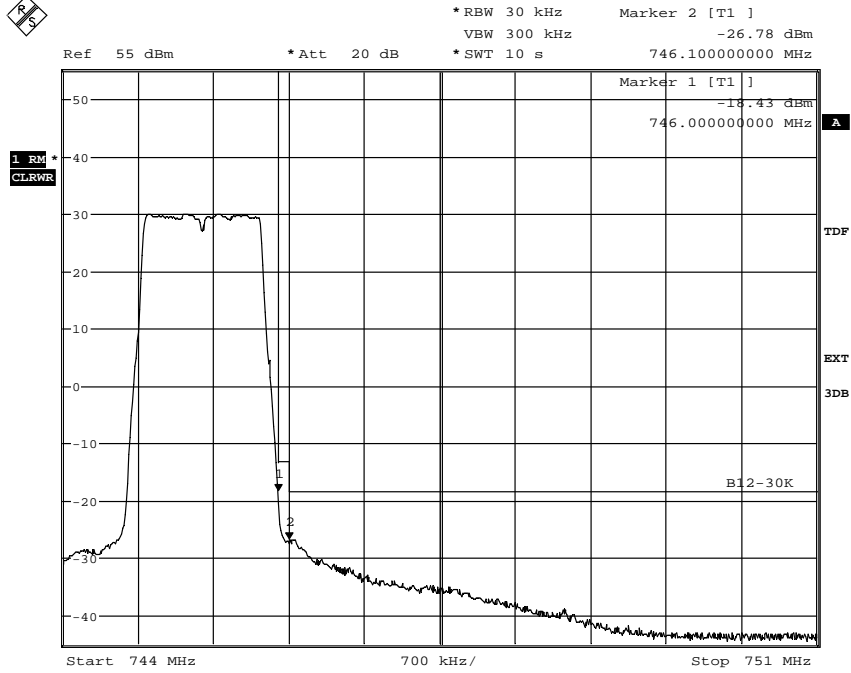
Diagram 5 b:



Date: 27.JAN.2011 09:49:51

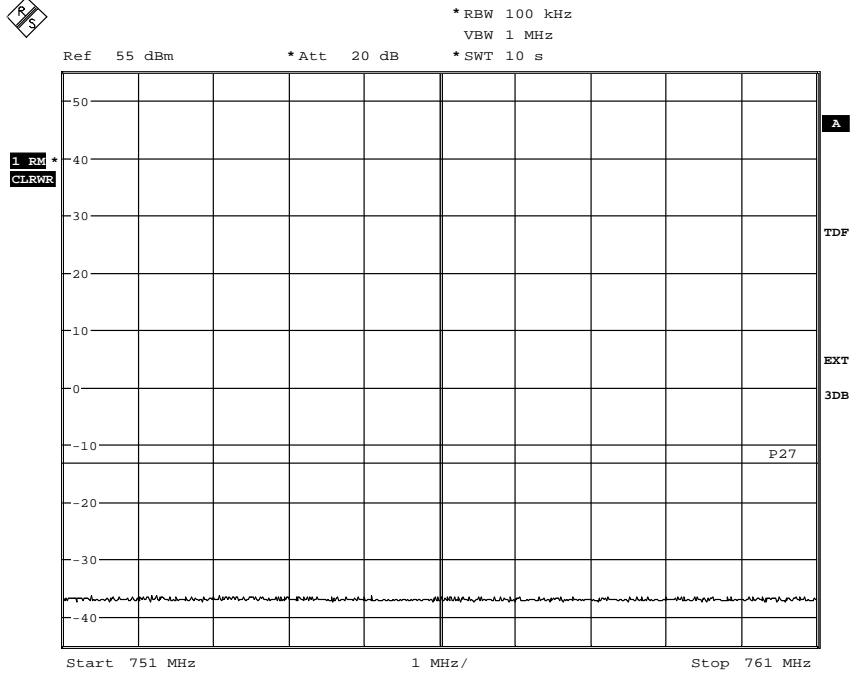


Diagram 6 a:



Date: 27.JAN.2011 12:31:49

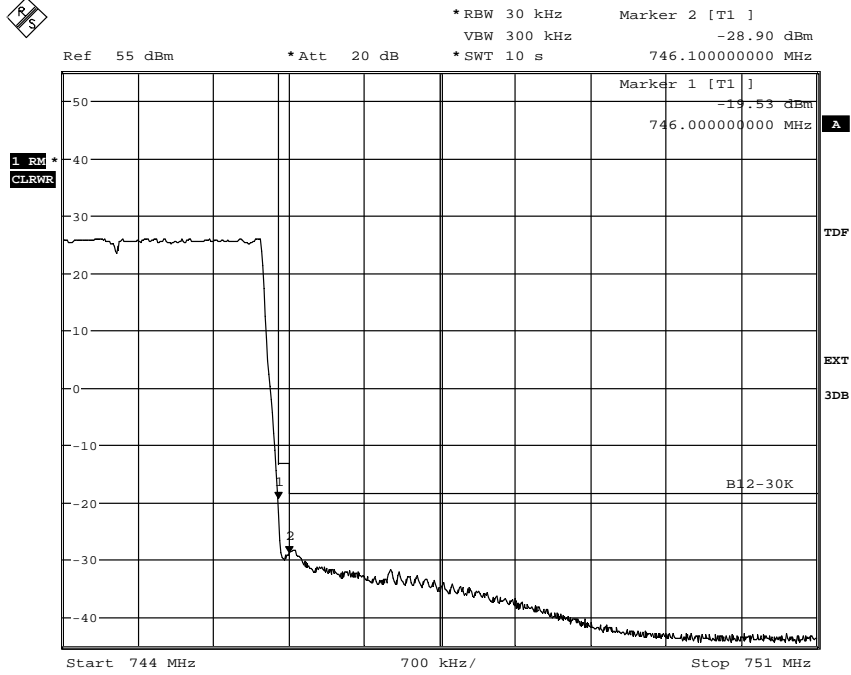
Diagram 6 b:



Date: 27.JAN.2011 12:33:08

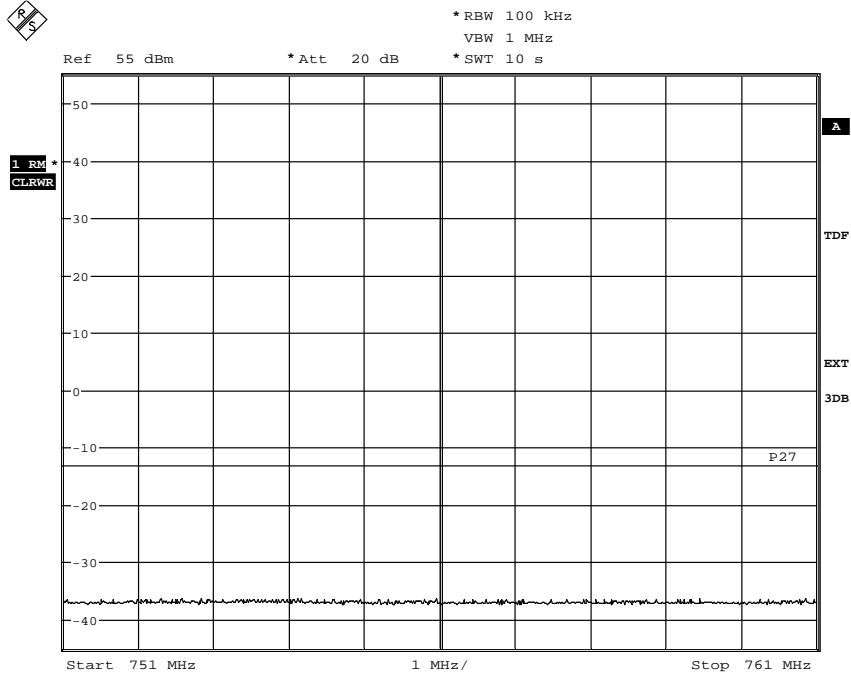


Diagram 7 a:



Date: 27.JAN.2011 11:07:34

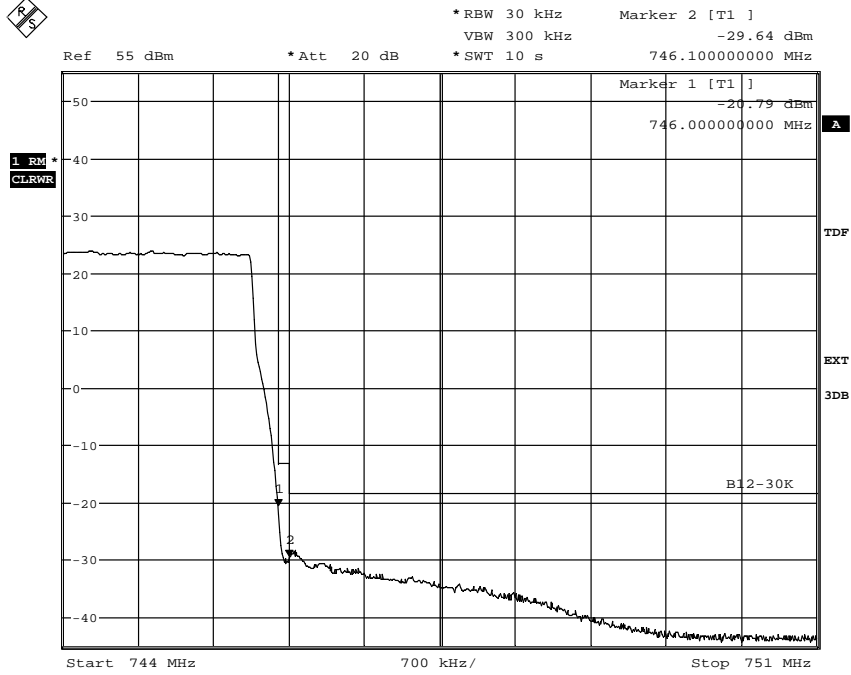
Diagram 7 b:



Date: 27.JAN.2011 11:08:59

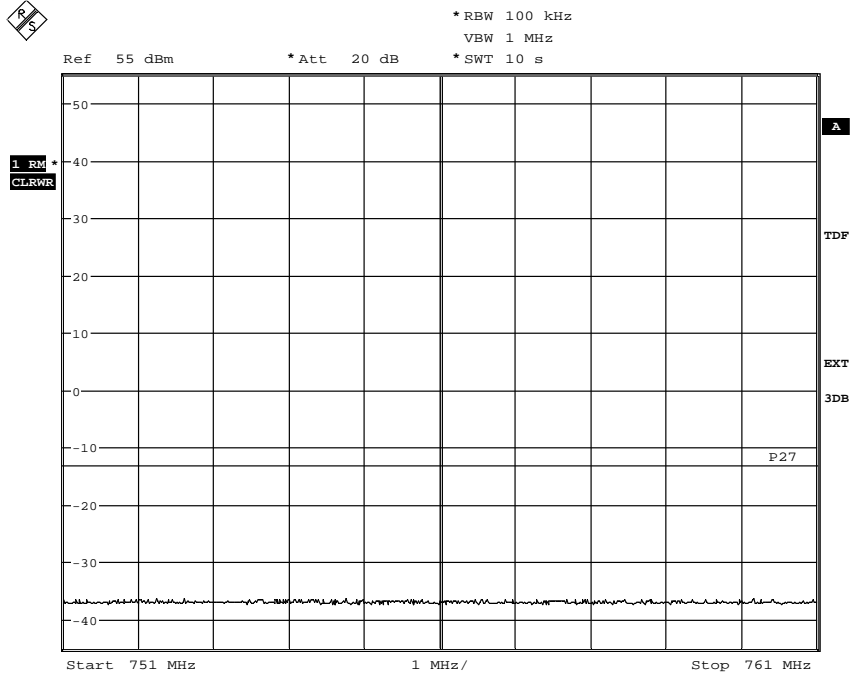


Diagram 8 a:



Date: 27.JAN.2011 10:58:58

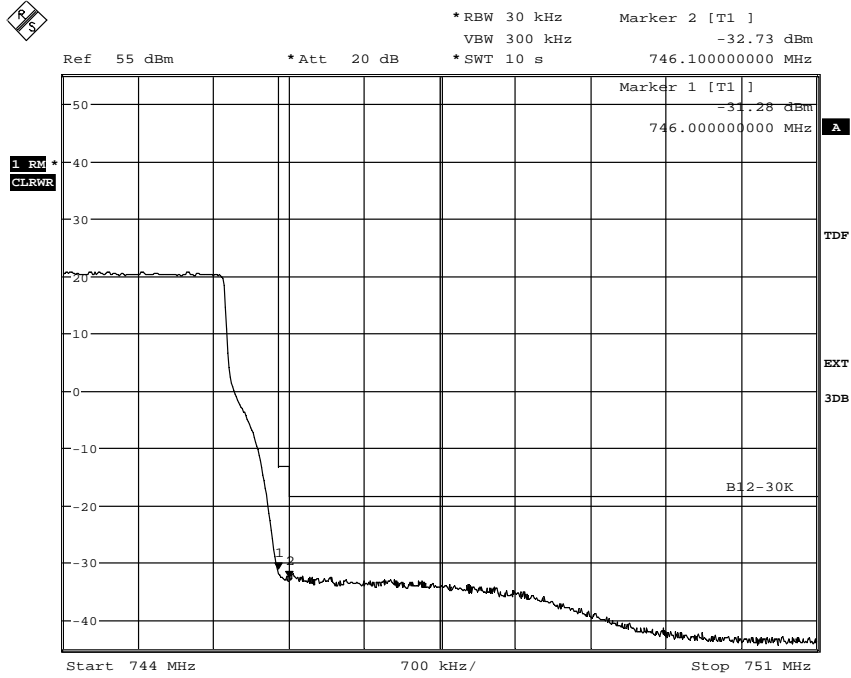
Diagram 8 b:



Date: 27.JAN.2011 11:00:06

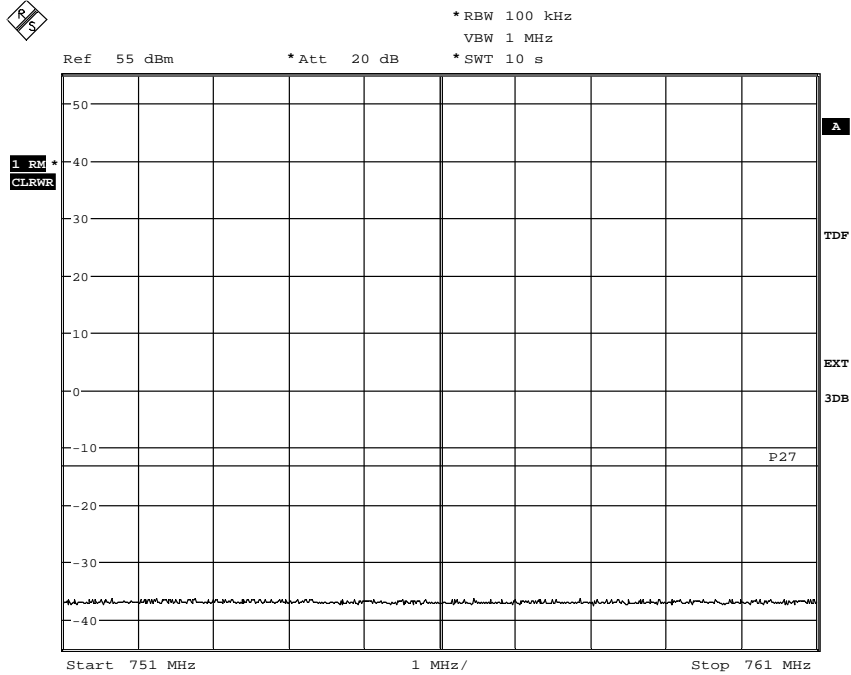


Diagram 9 a:



Date: 27.JAN.2011 10:51:38

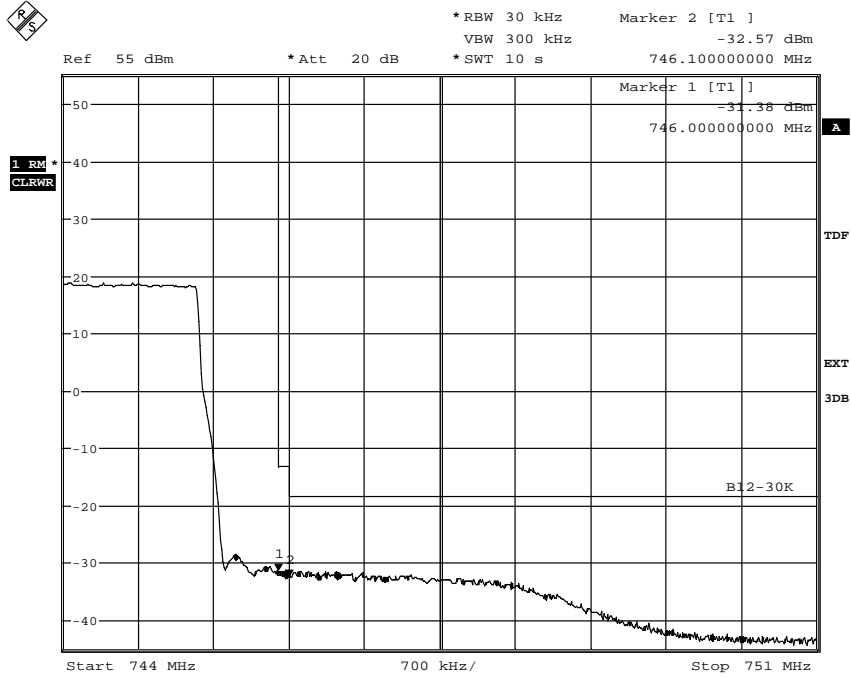
Diagram 9 b:



Date: 27.JAN.2011 10:52:53

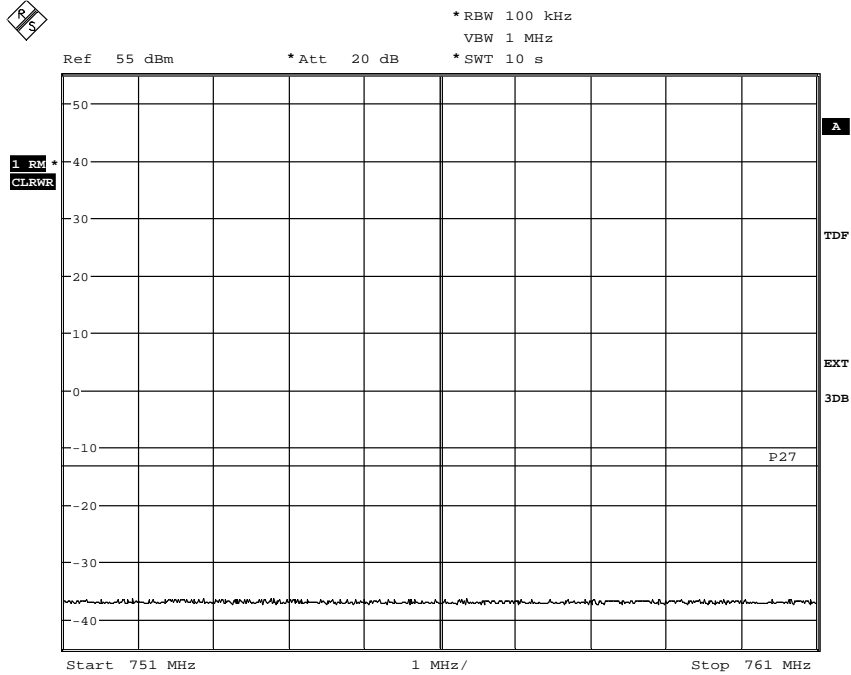


Diagram 10 a:



Date: 27.JAN.2011 10:33:50

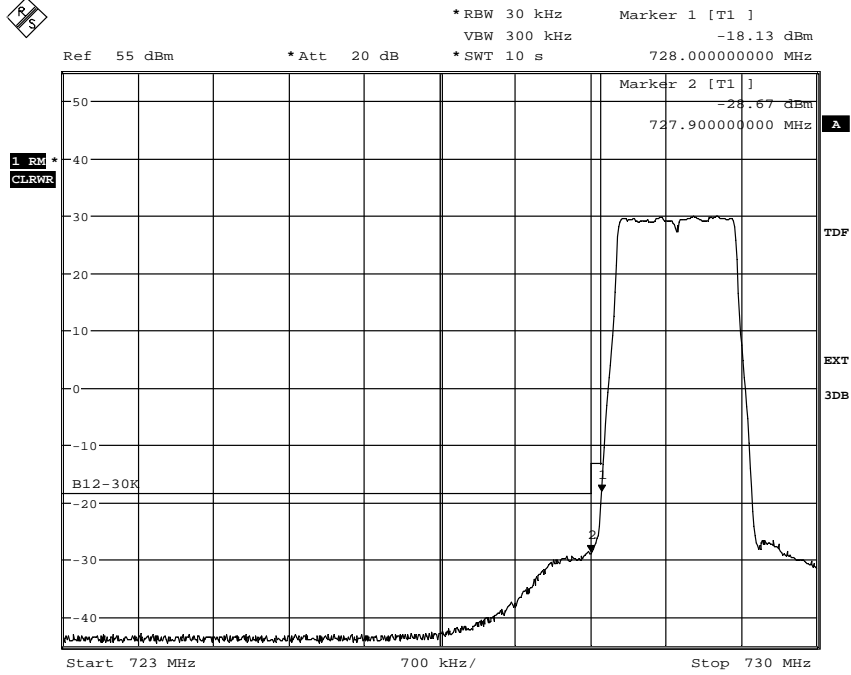
Diagram 10 b:



Date: 27.JAN.2011 10:34:53

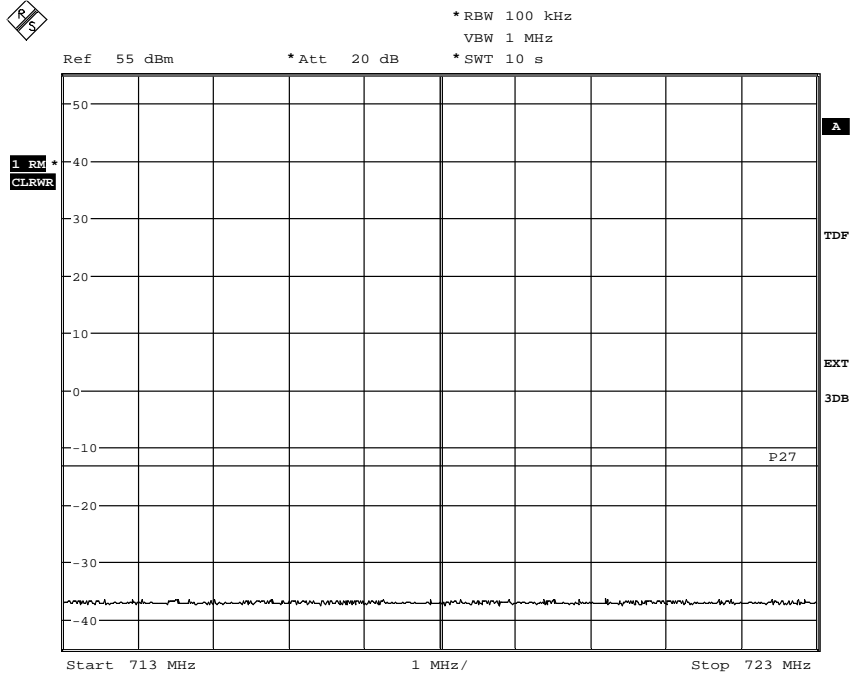


Diagram 11 a:



Date: 27.JAN.2011 16:07:41

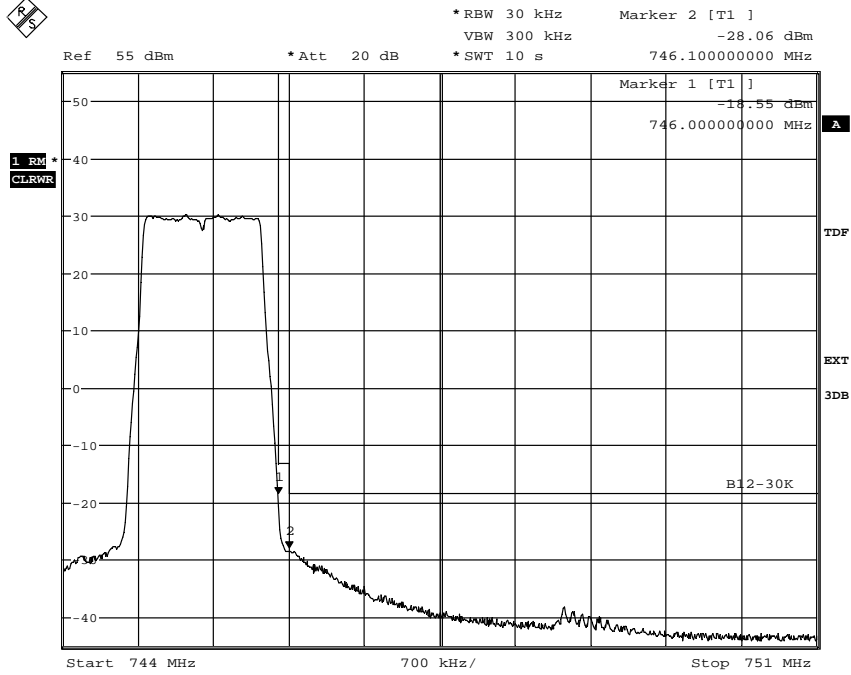
Diagram 11 b:



Date: 27.JAN.2011 16:09:10

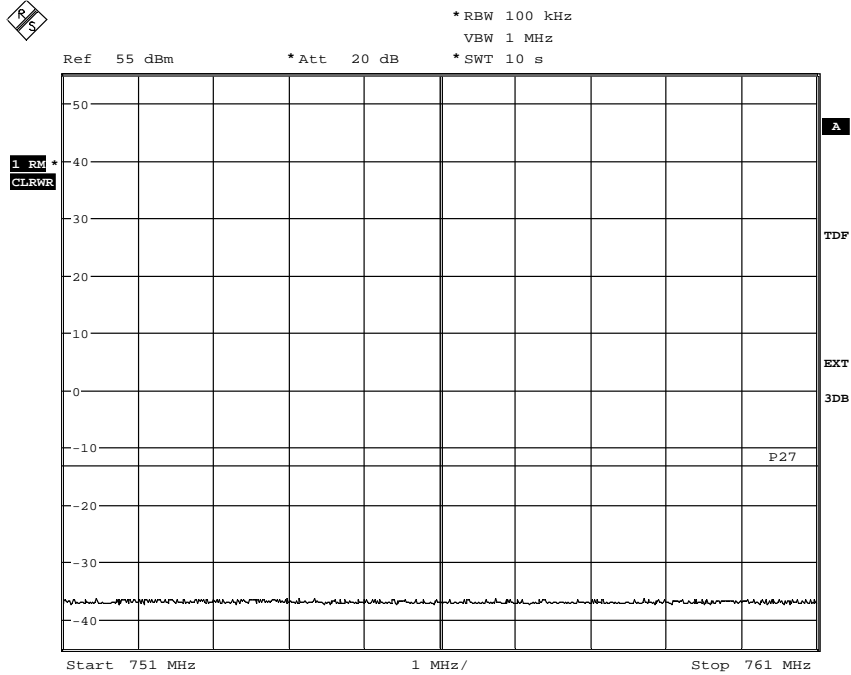


Diagram 12 a:



Date: 27.JAN.2011 16:14:42

Diagram 12 b:



Date: 27.JAN.2011 16:15:40



Conducted spurious emission measurements according to 47 CFR 2.1051

| | | |
|----------------------------------|-----------------------------------|------------------------------|
| Date 2011-01-26 to 2011-01-28 | Temperature 22 to 23 °C ± 3 °C | Humidity 10 to 18 % ± 5 % |
|----------------------------------|-----------------------------------|------------------------------|

Test set-up and procedure

The measurements were made as defined in §27.53 (g). The output was connected to a spectrum analyzer. First a pre-measurement with activated peak detector was performed. Emissions close to or above the limit is measured with activated RMS detector and the RMS measurement result is noted. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

| Measurement equipment | SP number |
|--|-----------|
| Rohde & Schwarz FSQ40 | 504 143 |
| RF attenuator | 504 159 |
| RF attenuator | 900 233 |
| High pass filter 1 – 15 GHz, Wainright | 504 199 |
| HP filter 3-18 GHz , RLC Electronics | 503 739 |
| HP filter 18-26 GHz, RLC Electronics | 503 740 |
| Testo 635 temperature and humidity meter | 504 203 |

Measurement uncertainty: 3.7 dB

Results

The results are shown in appendix 5.1

| | Bandwidth configuration | Tested port | TX channel | Measured range |
|------------|-------------------------|-------------|------------|----------------|
| Diagram 1 | 1.4 MHz | RF A | B | 9 kHz – 25 GHz |
| Diagram 2 | 15 MHz | RF A | B | 9 kHz – 25 GHz |
| Diagram 3 | 1.4 MHz | RF A | M | 9 kHz – 25 GHz |
| Diagram 4 | 3 MHz | RF A | M | 9 kHz – 25 GHz |
| Diagram 5 | 5 MHz | RF A | M | 9 kHz – 25 GHz |
| Diagram 6 | 10 MHz | RF A | M | 9 kHz – 25 GHz |
| Diagram 7 | 15 MHz | RF A | M | 9 kHz – 25 GHz |
| Diagram 8 | 1.4 MHz | RF A | T | 9 kHz – 25 GHz |
| Diagram 9 | 15 MHz | RF A | T | 9 kHz – 25 GHz |
| Diagram 10 | 1.4 MHz | RF B | M | 9 kHz – 25 GHz |



Remarks

The emission at 9 kHz on some plots was not generated by the test object. A complementary measurement with a smaller RBW showed that it was related to the LO feed-through. The highest internal frequency as declared by the client was 2.4576, thus the choice of the upper frequency boundary to $10 \times 2.5\text{GHz} = 25\text{ GHz}$ for TX emission measurements. A comparative test of one configuration was done for the transmitter chain at port RF B.

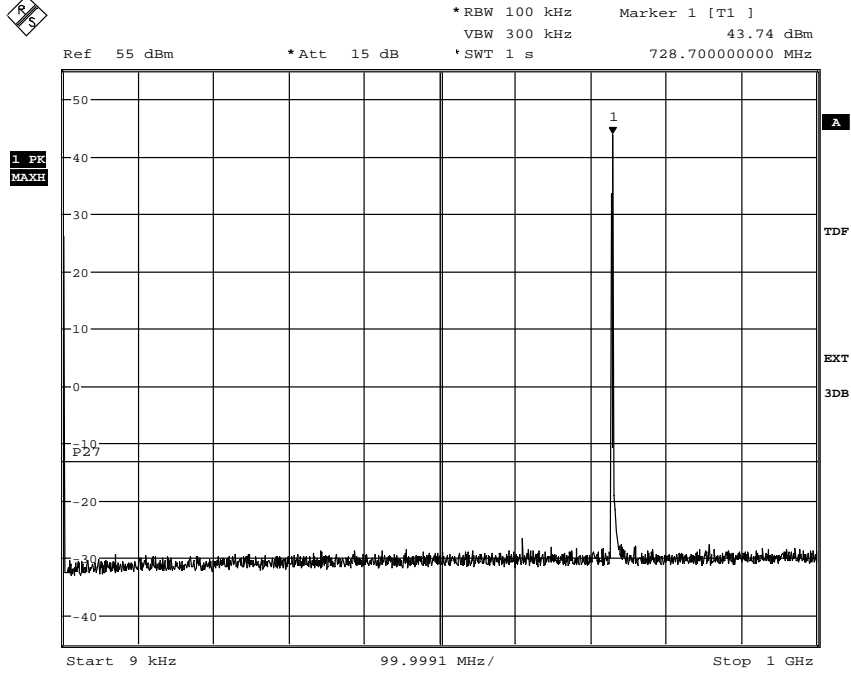
Limits

Derived from CFR 47 § 27.53 (g): Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB, resulting in a limit of -13 dBm per 100 kHz RBW.

| | |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

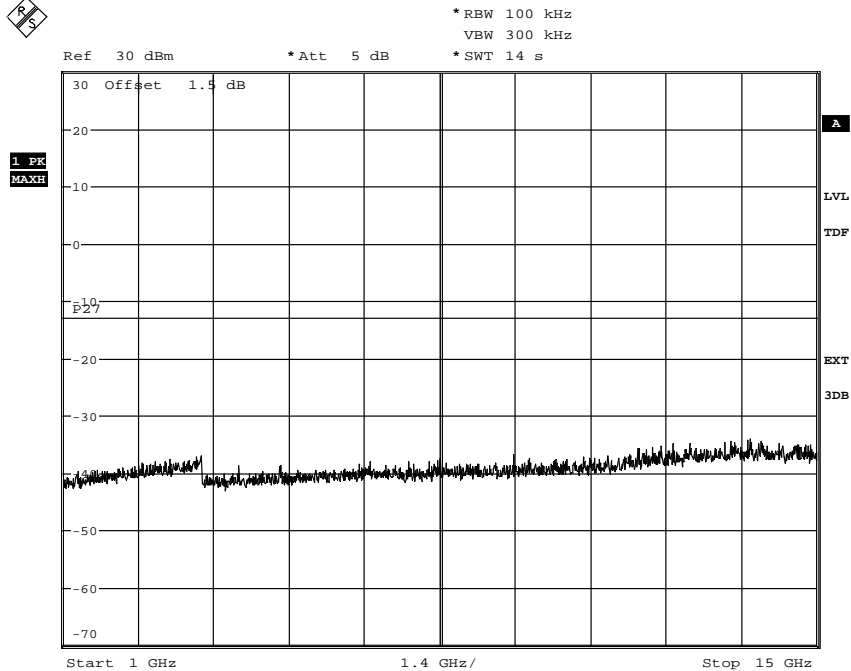


Diagram 1a:



Date: 4.FEB.2011 08:08:55

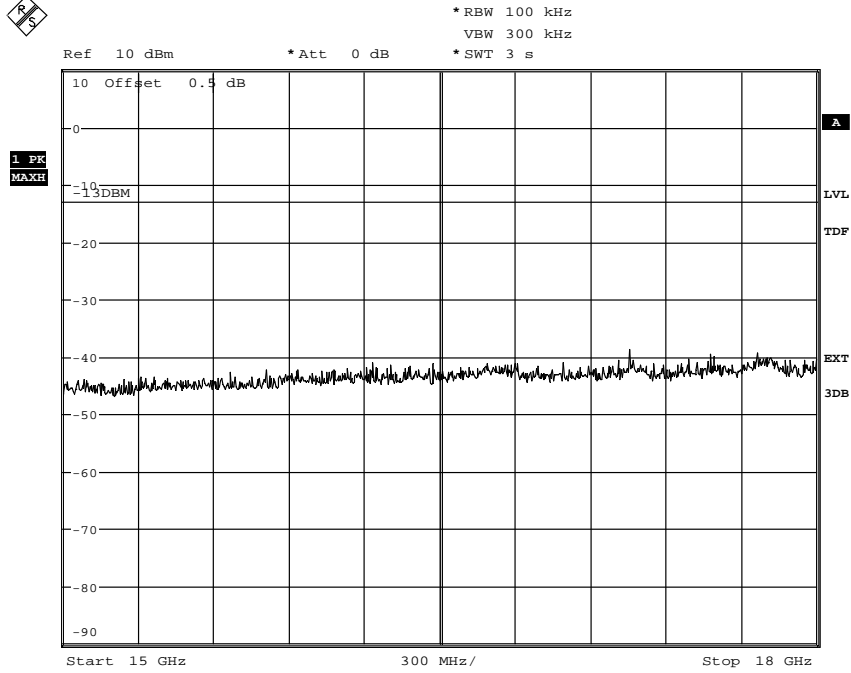
Diagram 1b:



Date: 26.JAN.2011 15:12:27

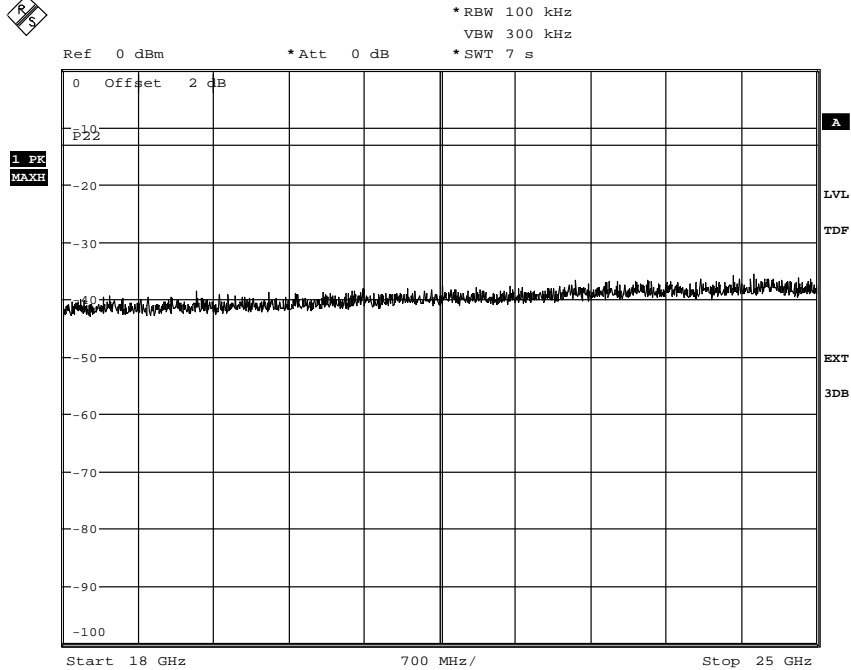


Diagram 1c:



Date: 26.JAN.2011 15:15:01

Diagram 1d:



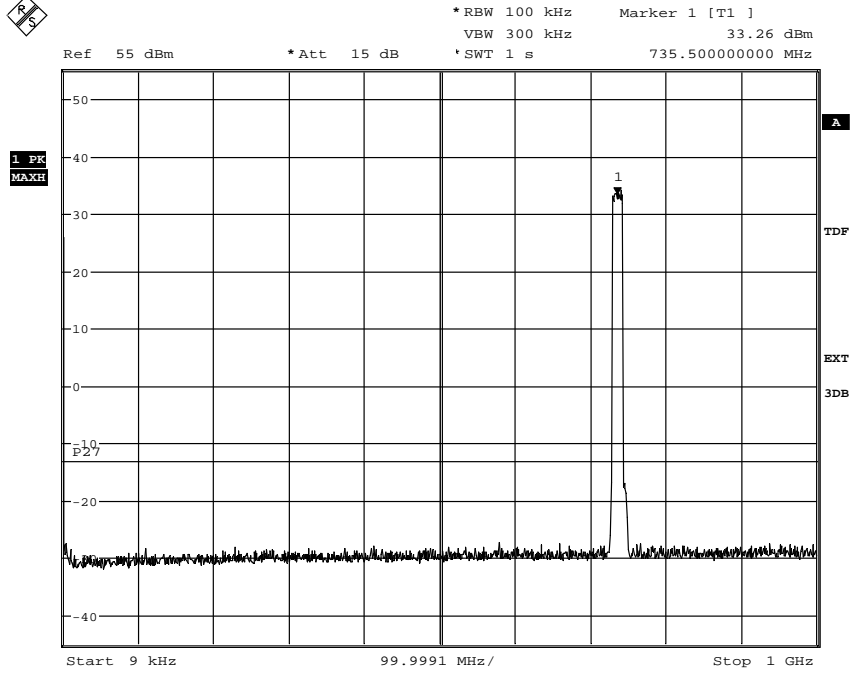
Date: 28.JAN.2011 13:49:39



FCC ID: TA8BKRC161241-1

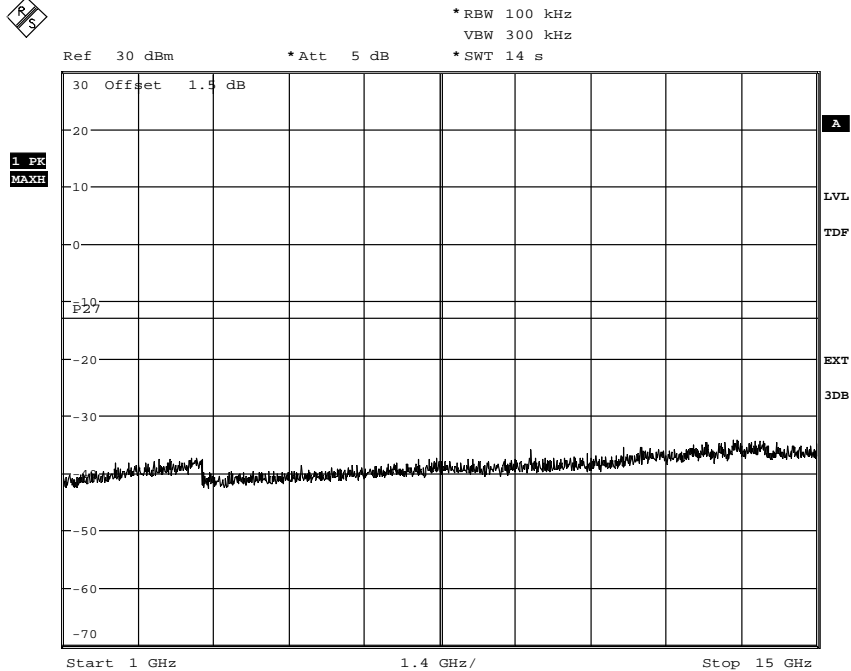
Appendix 5.1

Diagram 2a:



Date: 4.FEB.2011 07:51:07

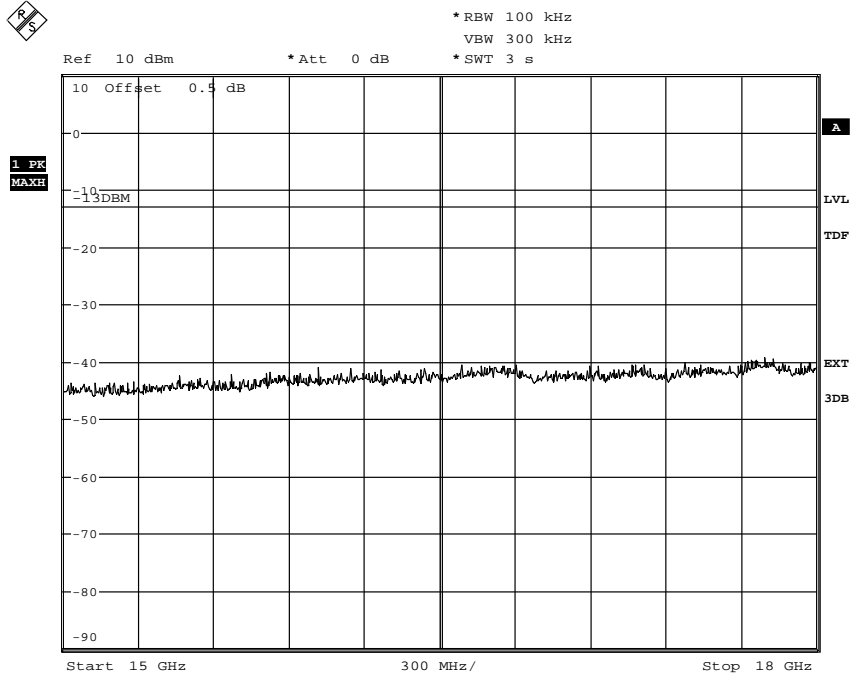
Diagram 2b:



Date: 27.JAN.2011 10:05:09

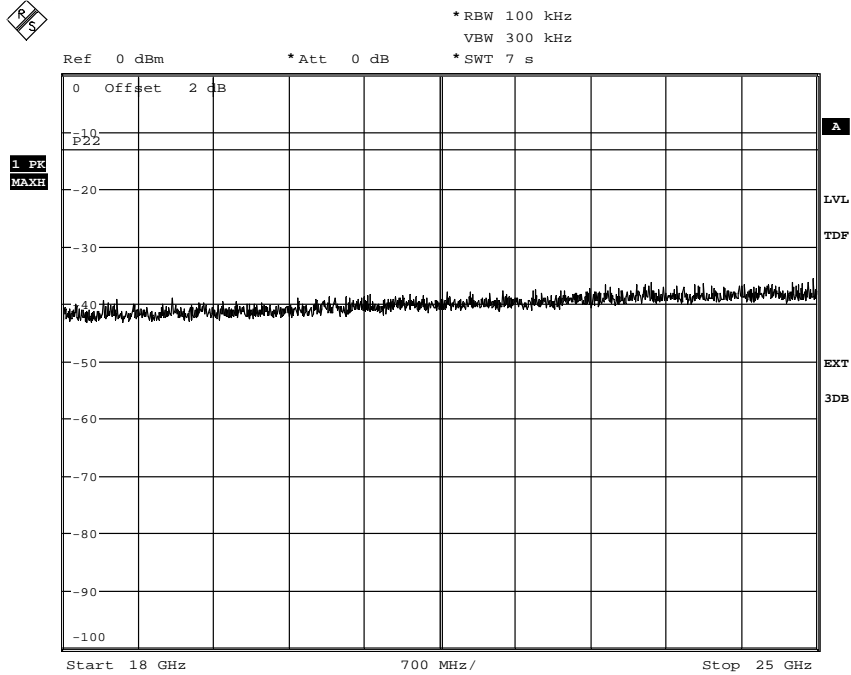


Diagram 2c:



Date: 27.JAN.2011 10:06:28

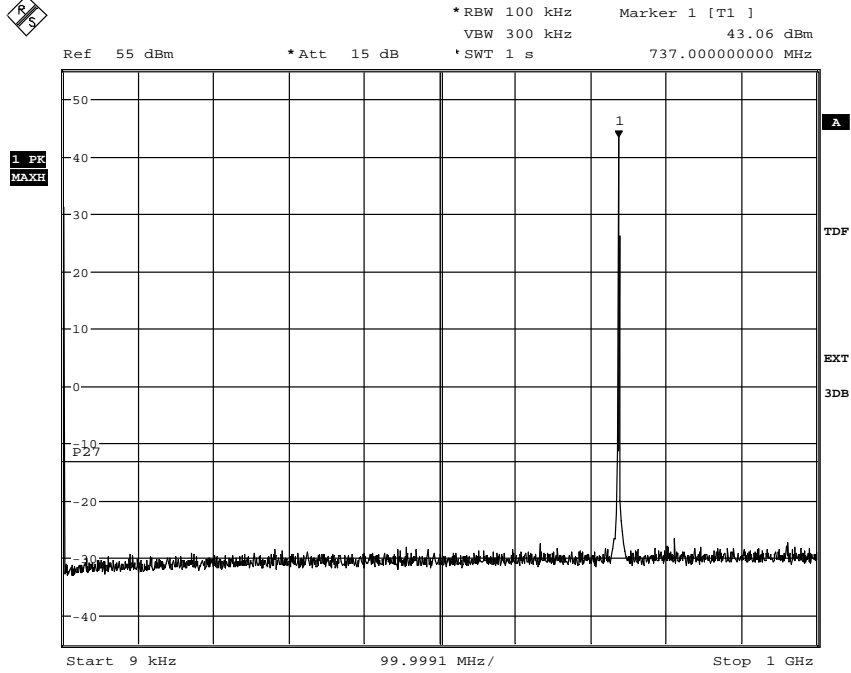
Diagram 2d:



Date: 28.JAN.2011 13:46:08

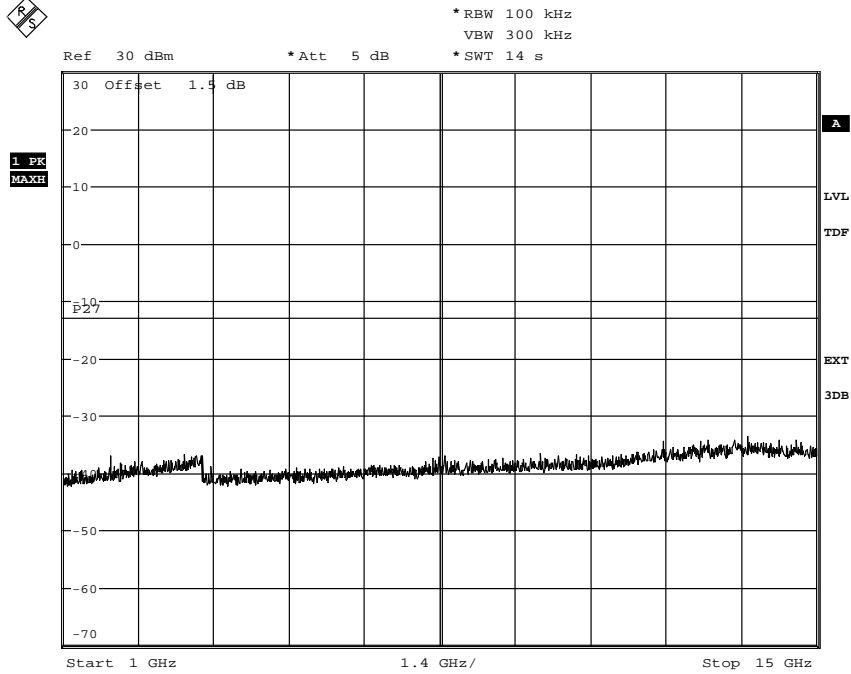


Diagram 3a:



Date: 4.FEB.2011 08:33:05

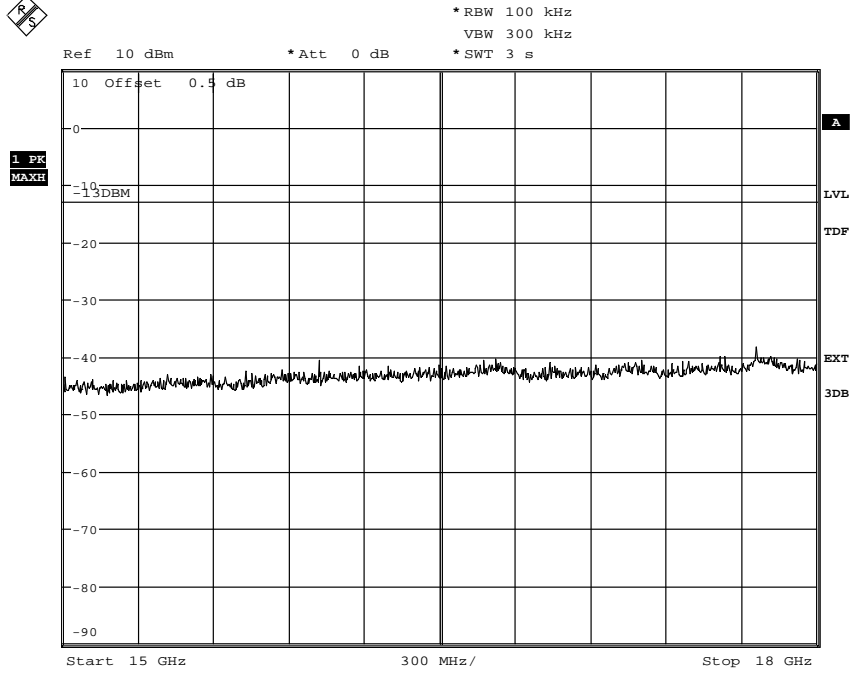
Diagram 3b:



Date: 27.JAN.2011 13:00:26

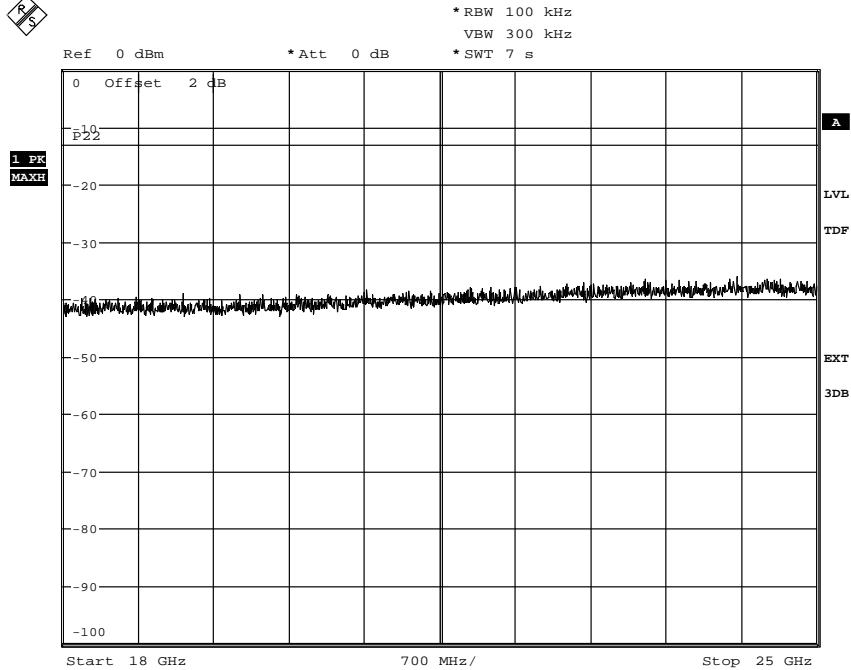


Diagram 3c:



Date: 27.JAN.2011 12:58:12

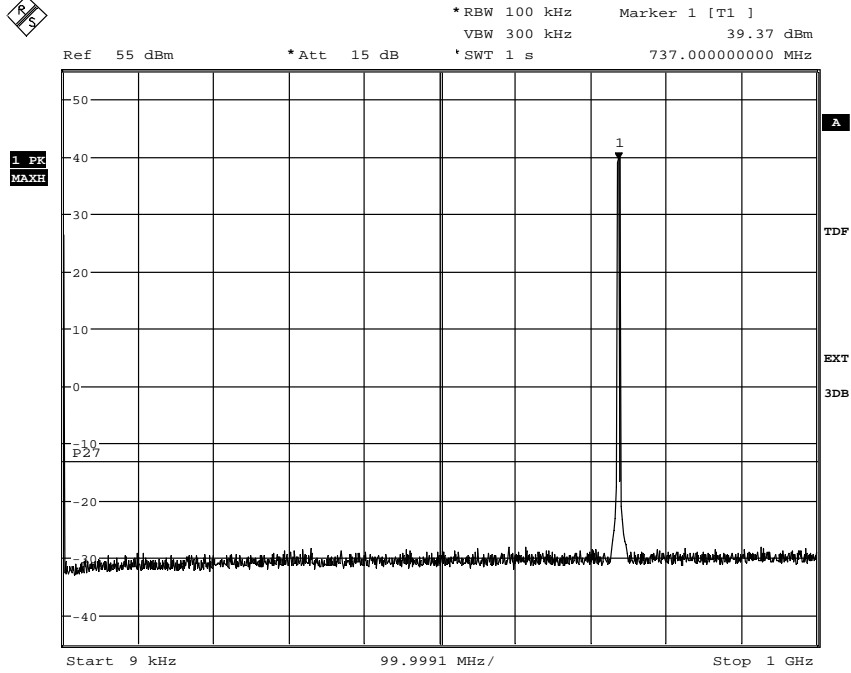
Diagram 3d:



Date: 28.JAN.2011 13:43:08

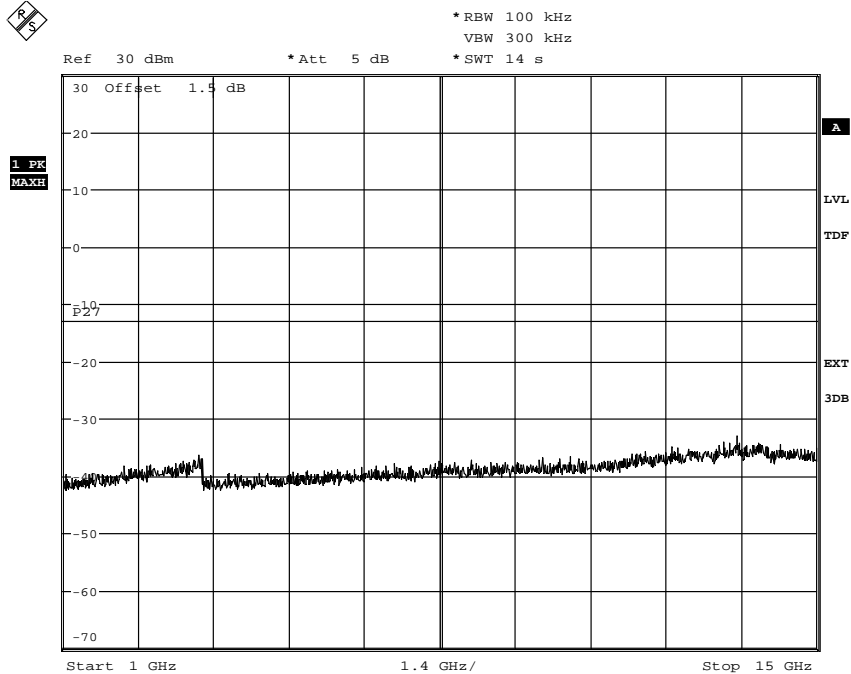


Diagram 4a:



Date: 4.FEB.2011 08:47:36

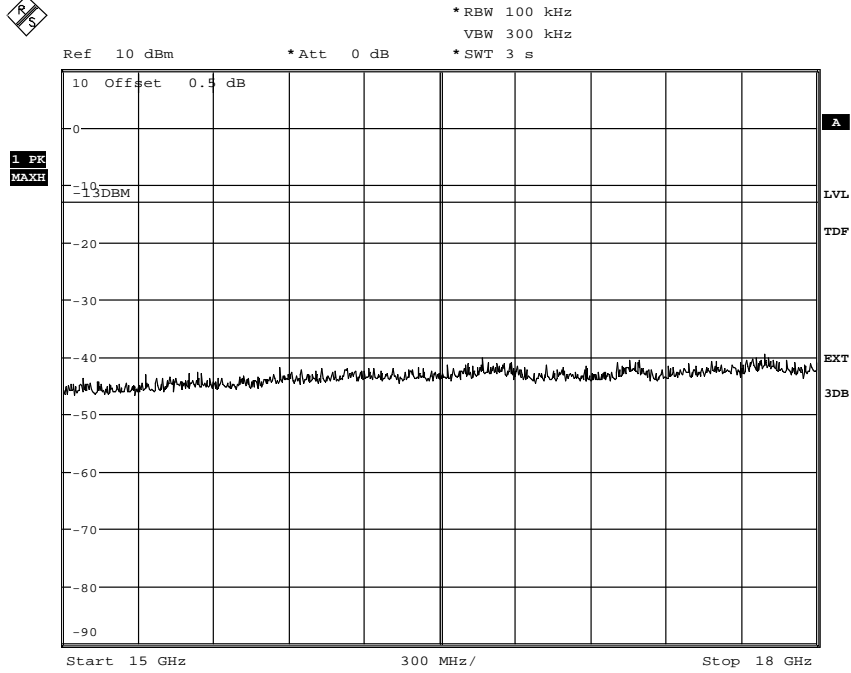
Diagram 4b:



Date: 27.JAN.2011 13:16:21

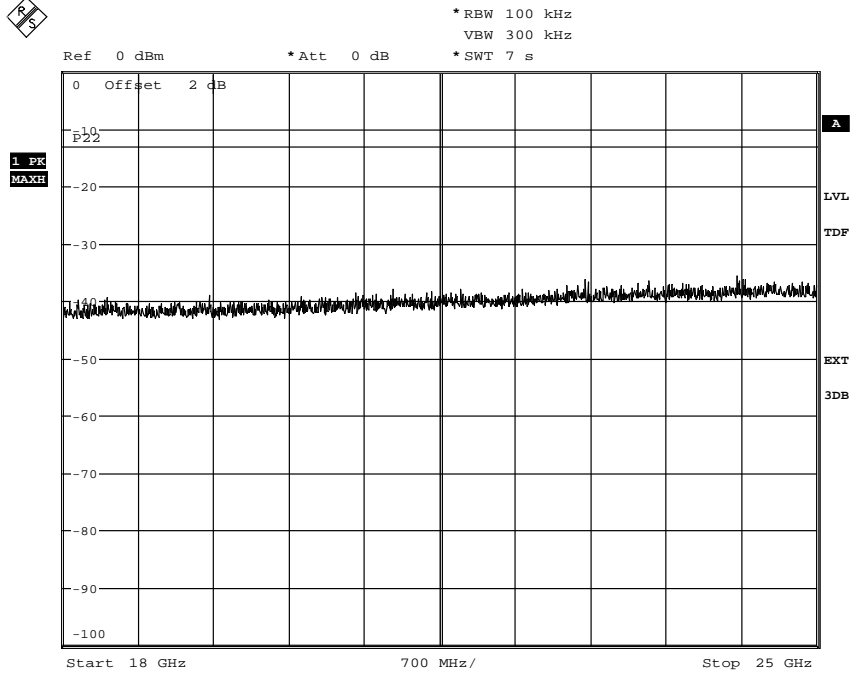


Diagram 4c:



Date: 27.JAN.2011 13:18:08

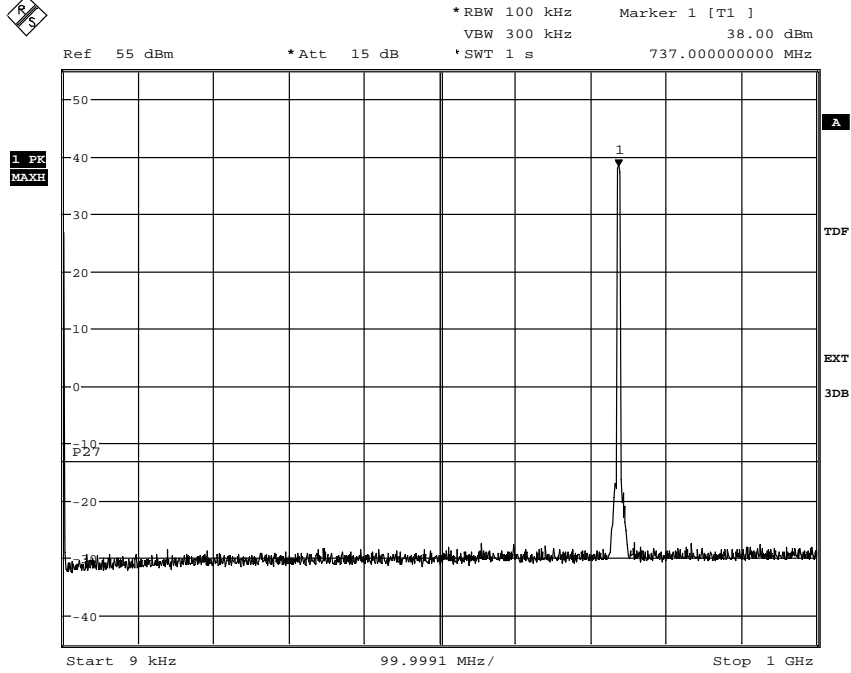
Diagram 4d:



Date: 28.JAN.2011 13:40:24

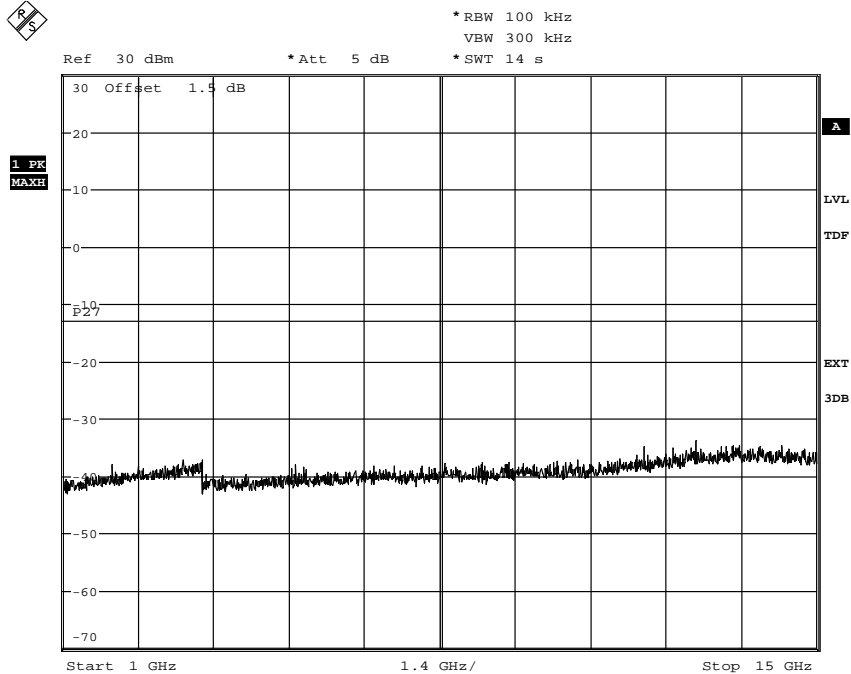


Diagram 5a:



Date: 4.FEB.2011 08:53:05

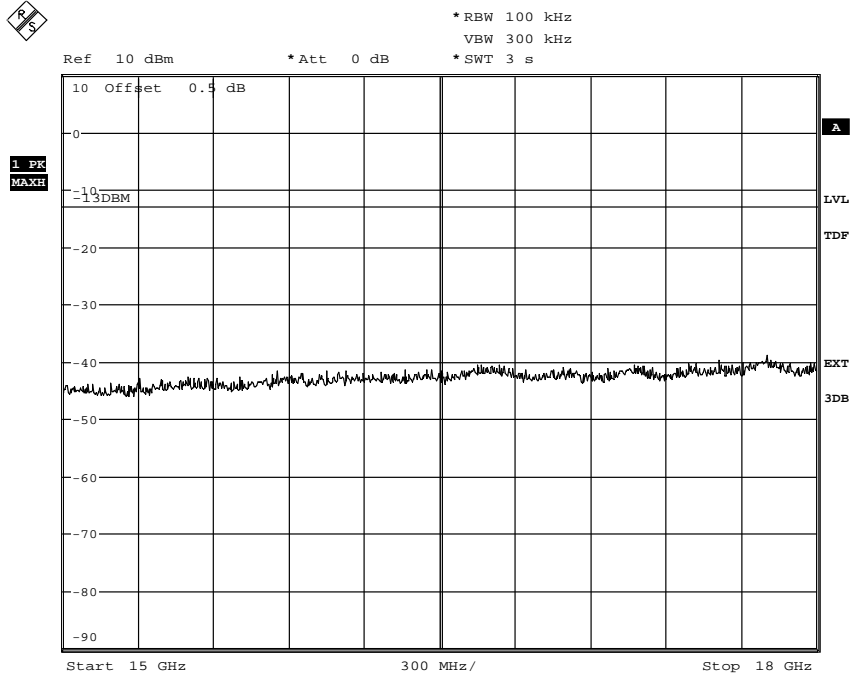
Diagram 5b:



Date: 27.JAN.2011 13:39:48

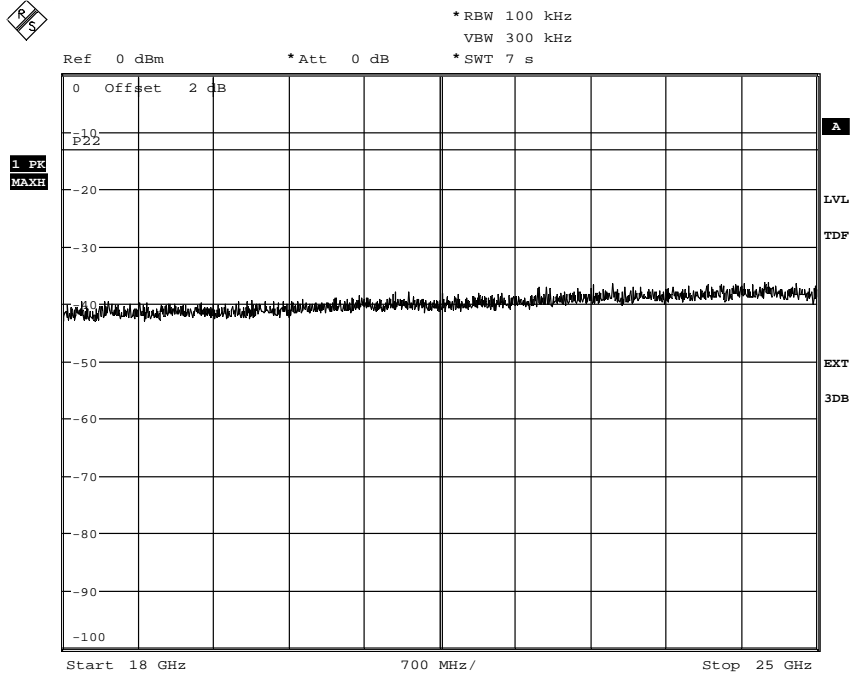


Diagram 5c:



Date: 27.JAN.2011 13:41:27

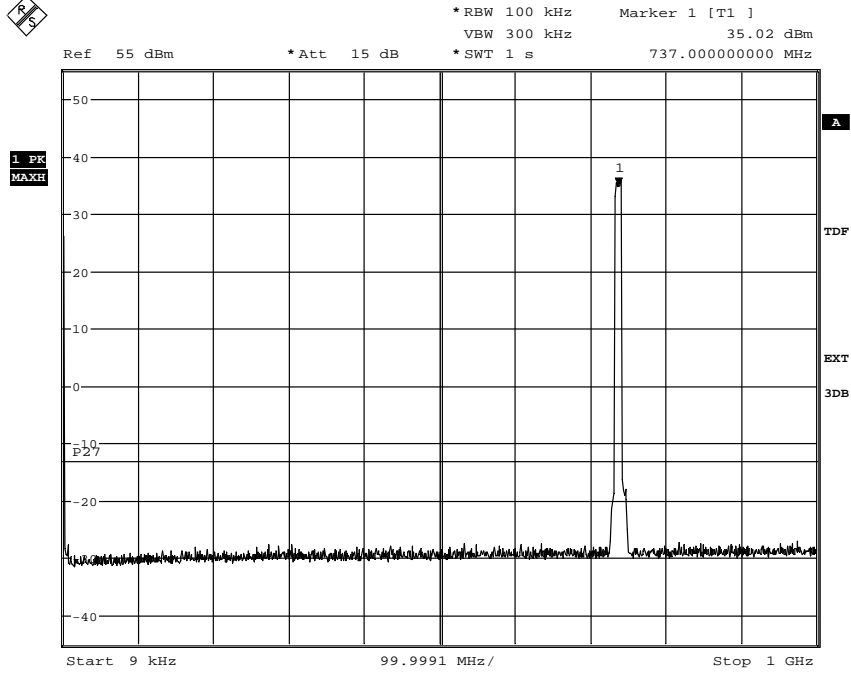
Diagram 5 d:



Date: 28.JAN.2011 13:34:13

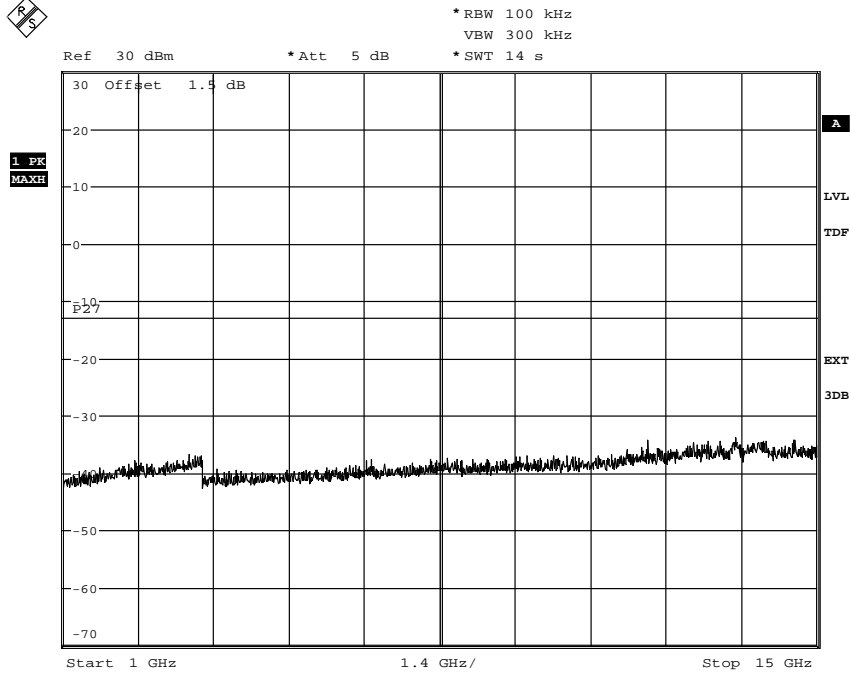


Diagram 6a:



Date: 4.FEB.2011 09:12:54

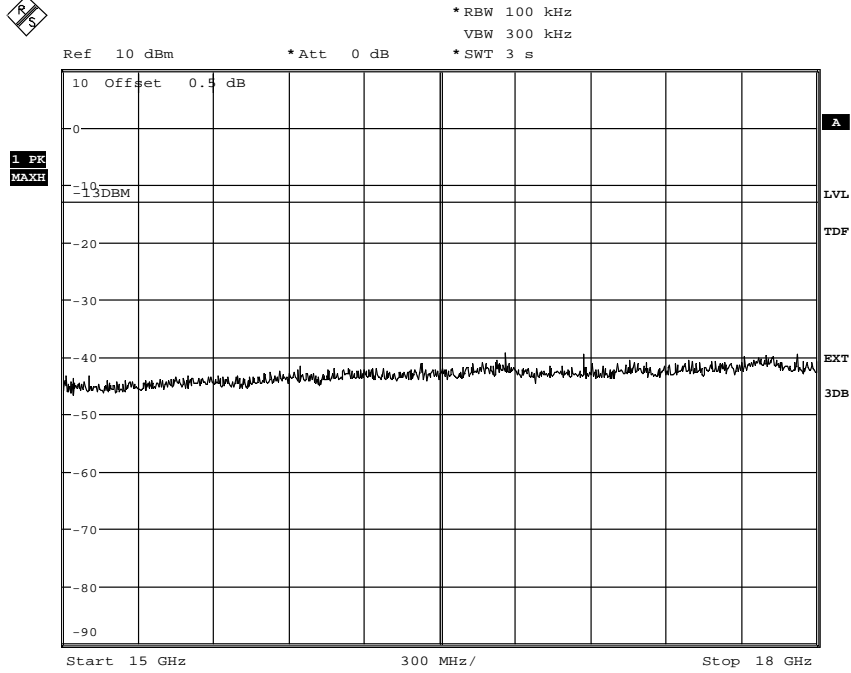
Diagram 6b:



Date: 27.JAN.2011 13:48:21

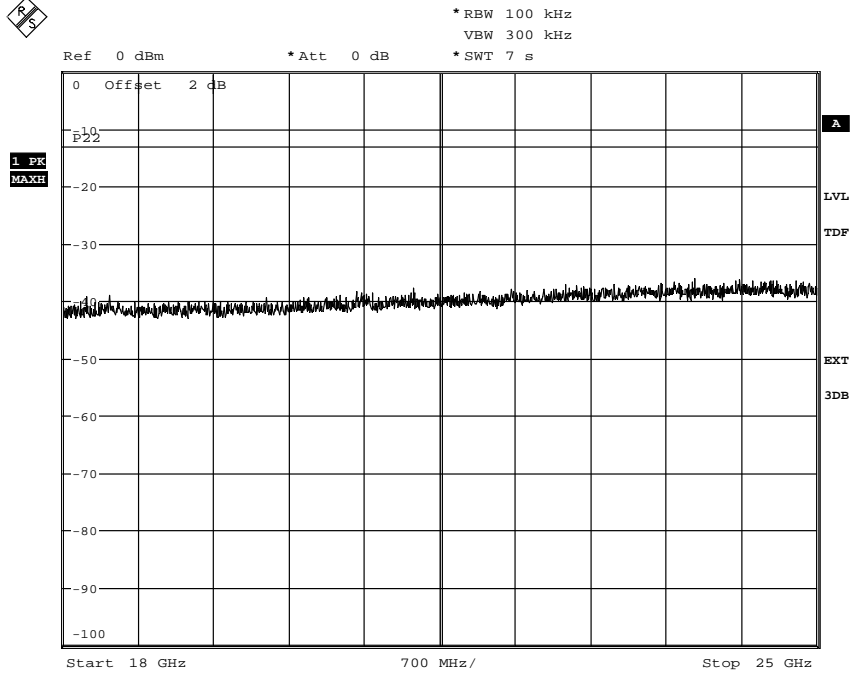


Diagram 6c:



Date: 27.JAN.2011 13:46:37

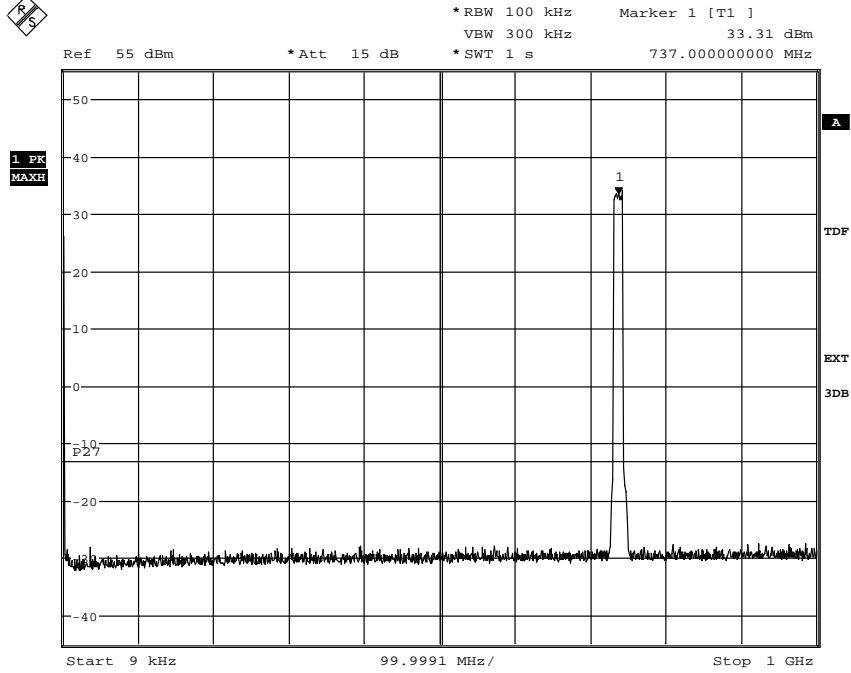
Diagram 6d:



Date: 28.JAN.2011 13:31:57

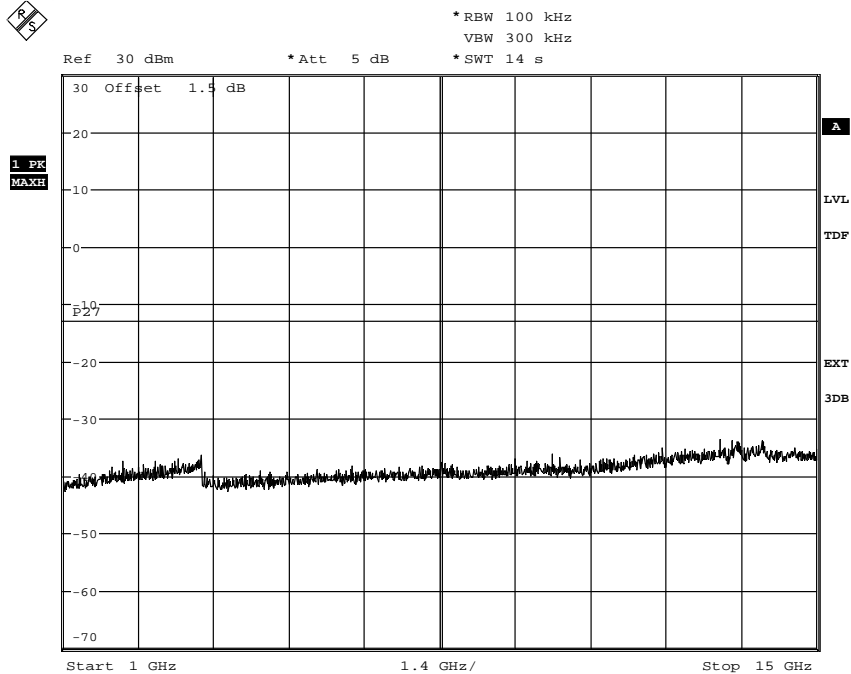


Diagram 7a:



Date: 4.FEB.2011 09:19:32

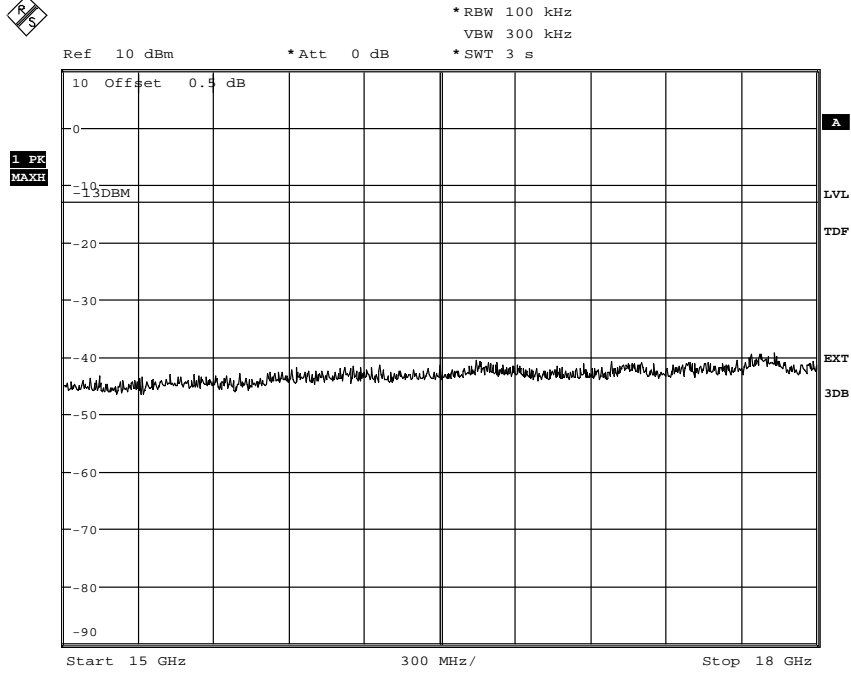
Diagram 7b:



Date: 27.JAN.2011 15:39:01

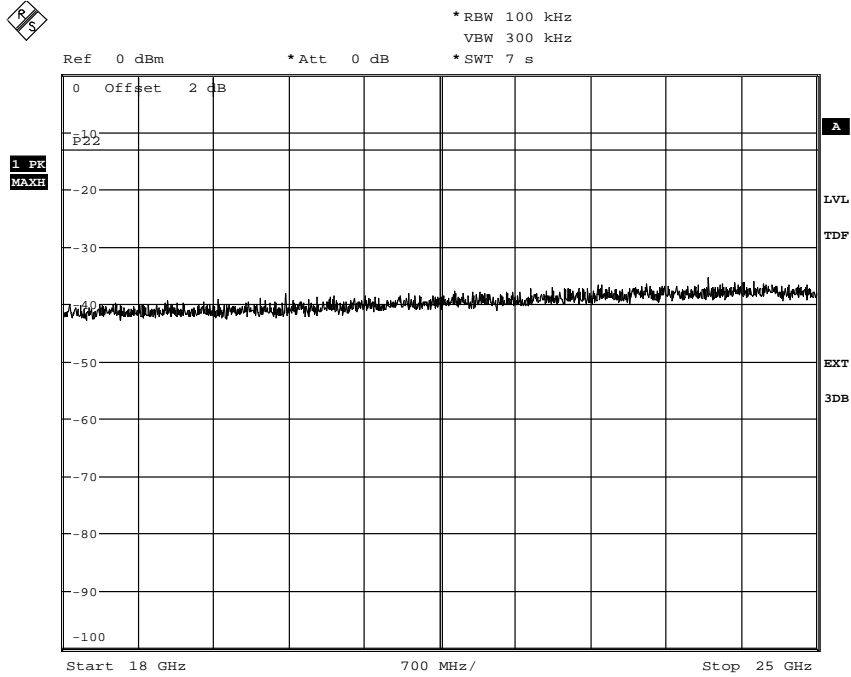


Diagram 7c:



Date: 27.JAN.2011 15:40:40

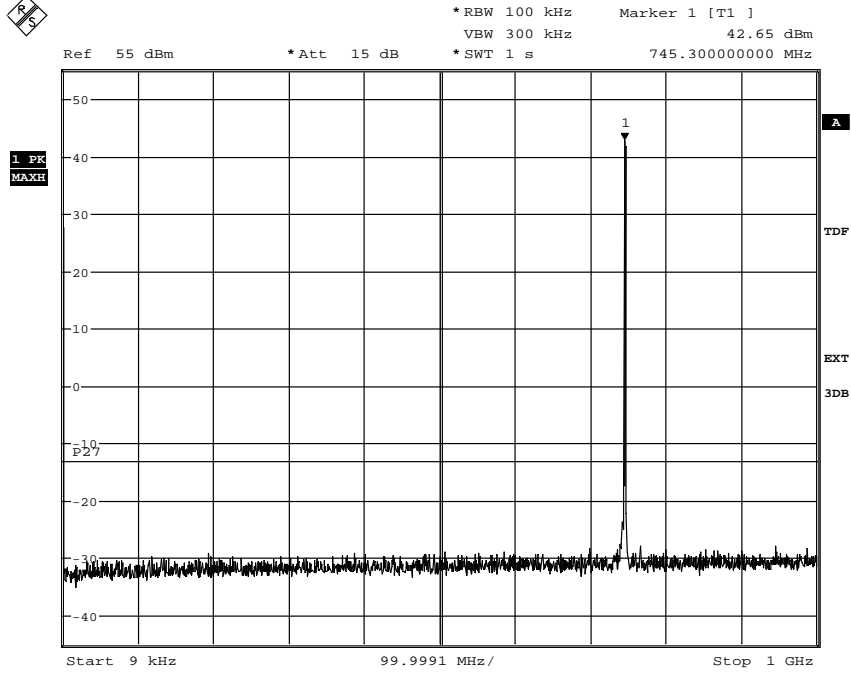
Diagram 7d:



Date: 28.JAN.2011 13:28:03

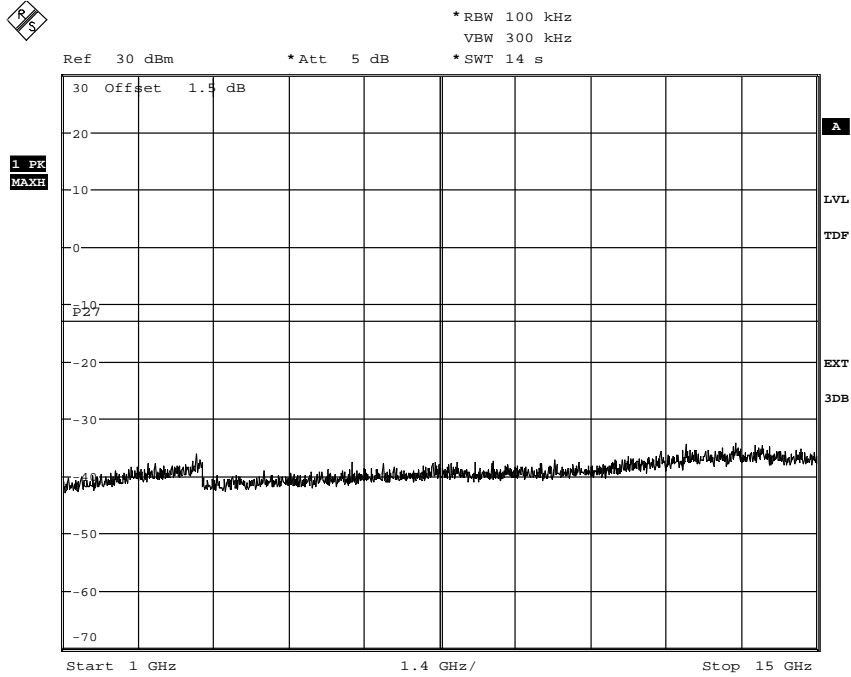


Diagram 8a:



Date: 4.FEB.2011 10:05:15

Diagram 8b:



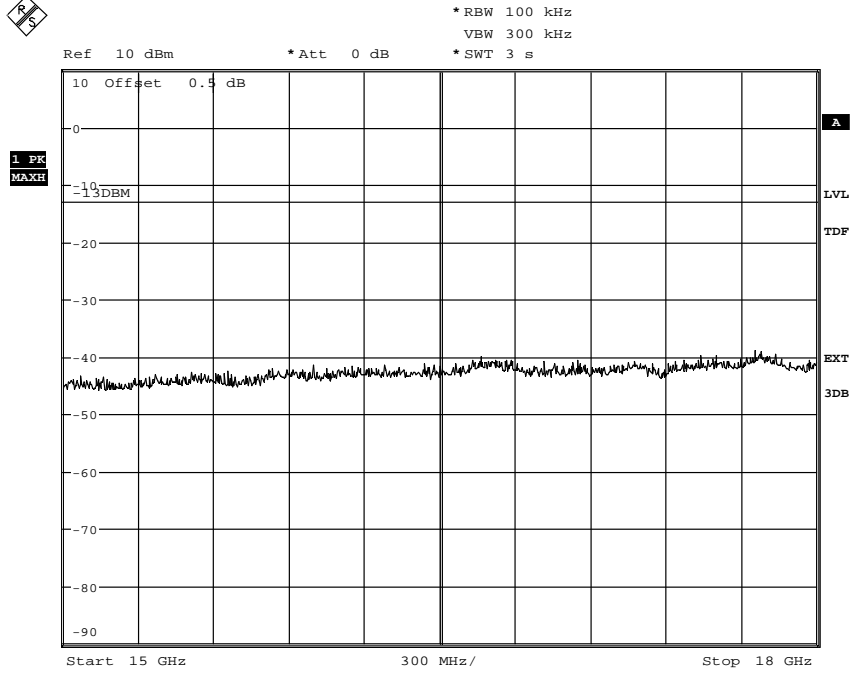
Date: 27.JAN.2011 12:43:44



FCC ID: TA8BKRC161241-1

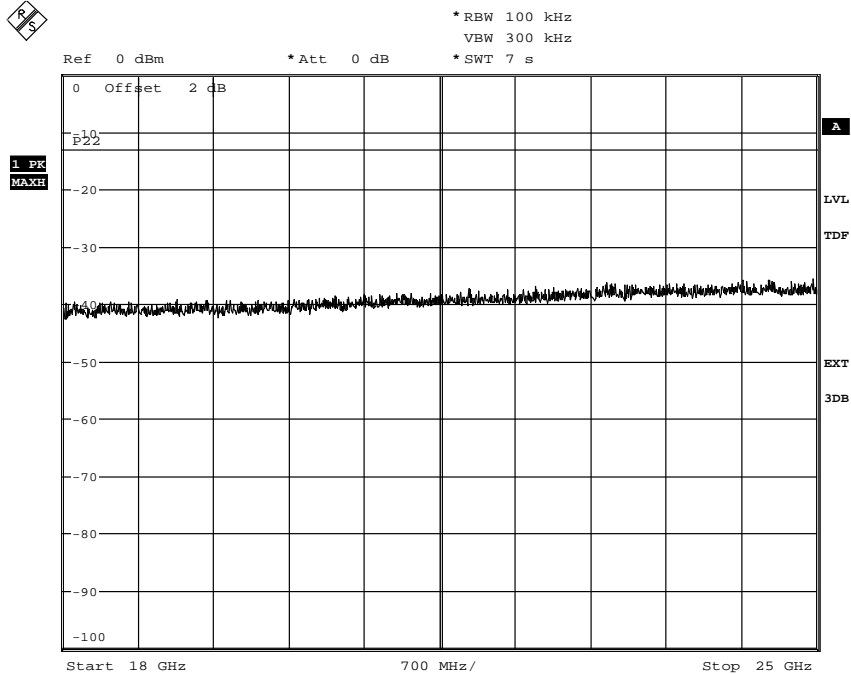
Appendix 5.1

Diagram 8c:



Date: 27.JAN.2011 12:46:10

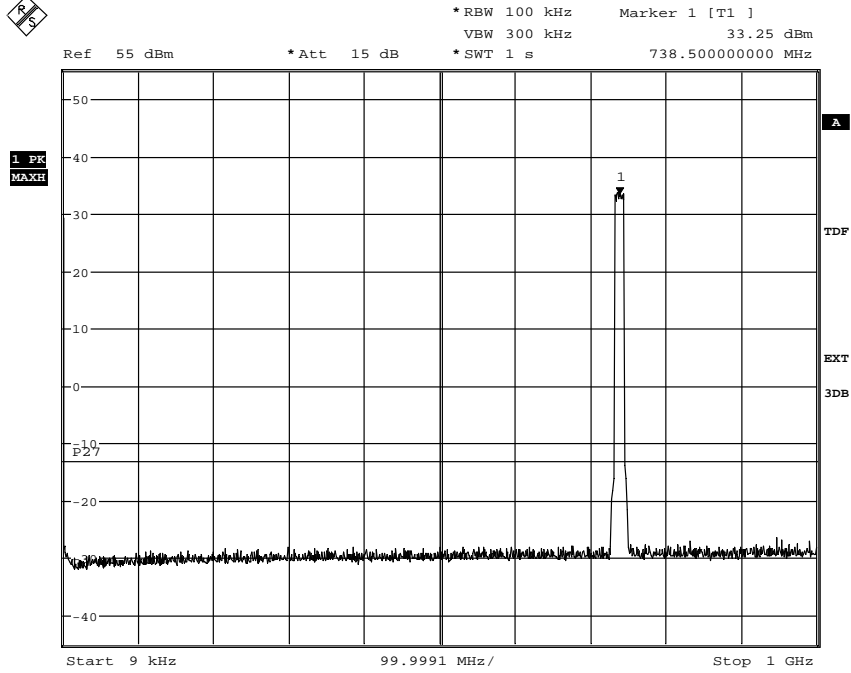
Diagram 8d:



Date: 28.JAN.2011 13:18:39

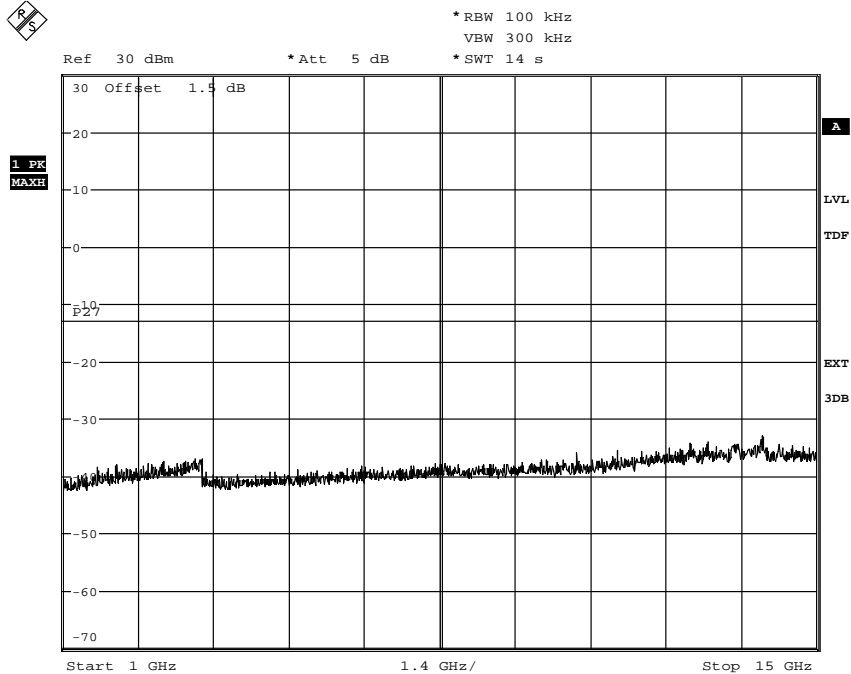


Diagram 9a:



Date: 4.FEB.2011 09:54:59

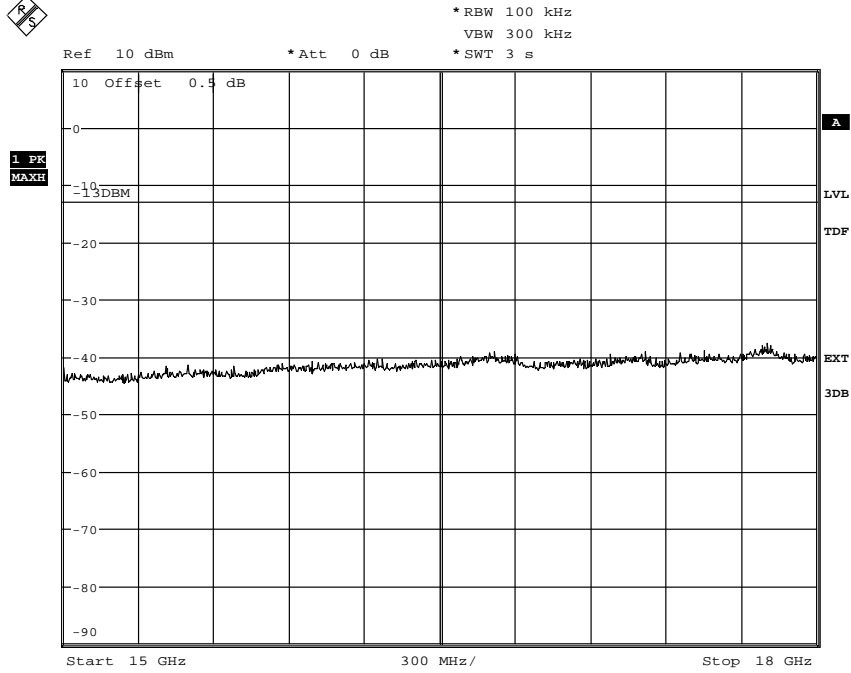
Diagram 9b:



Date: 27.JAN.2011 10:24:43

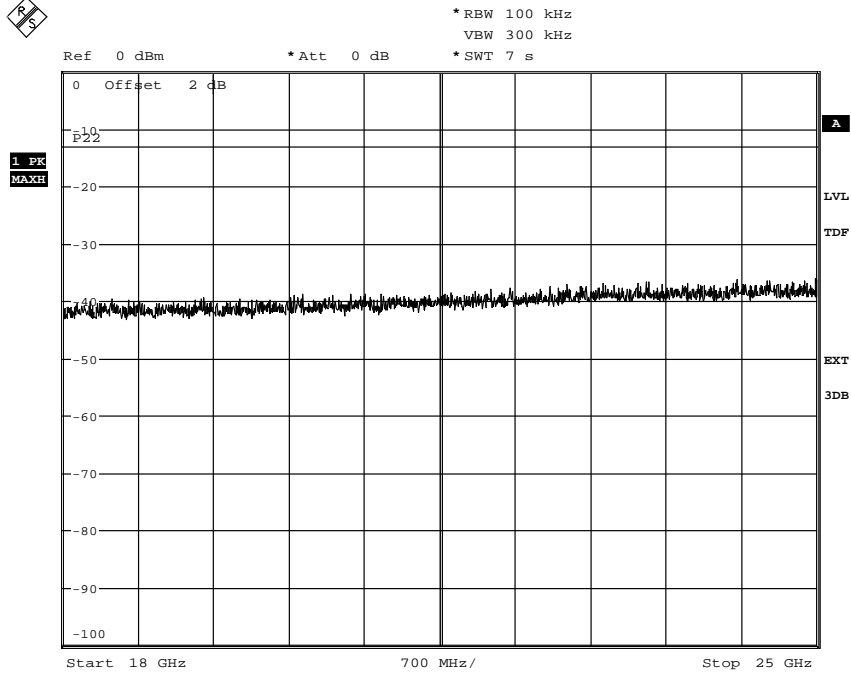


Diagram 9c:



Date: 27.JAN.2011 10:22:53

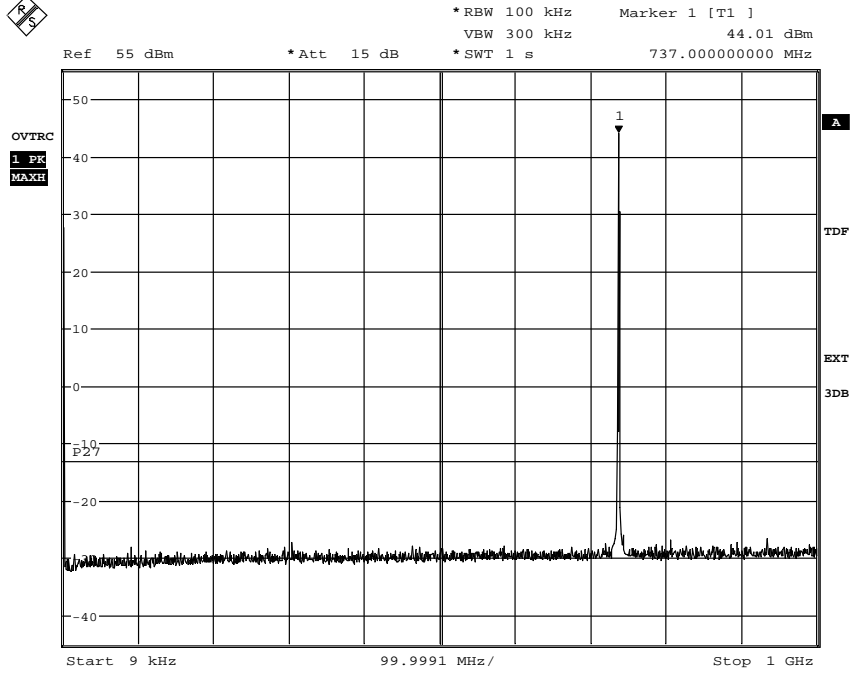
Diagram 9d:



Date: 28.JAN.2011 13:23:20

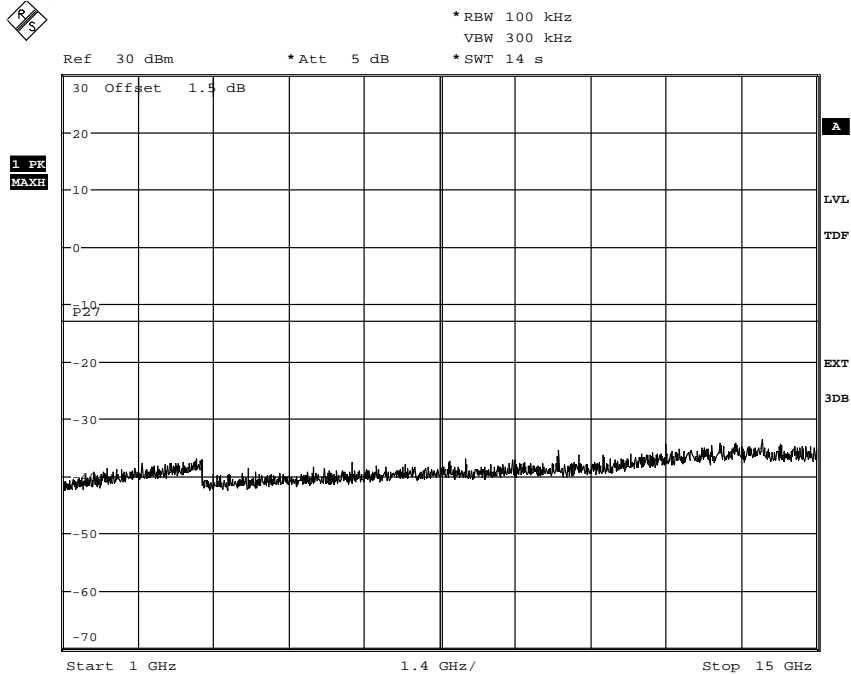


Diagram 10a:



Date: 4.FEB.2011 10:19:35

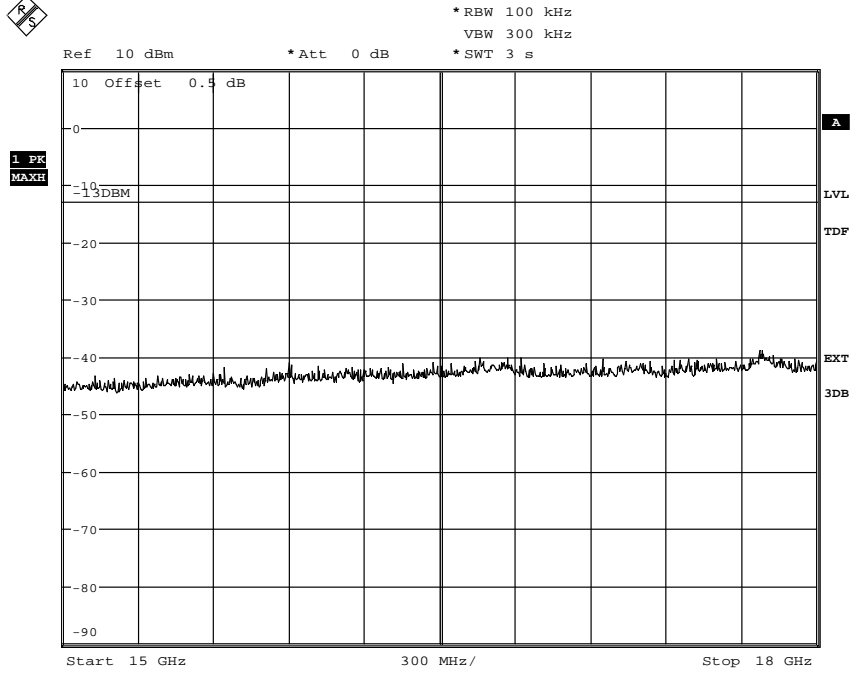
Diagram 10b:



Date: 27.JAN.2011 15:58:22

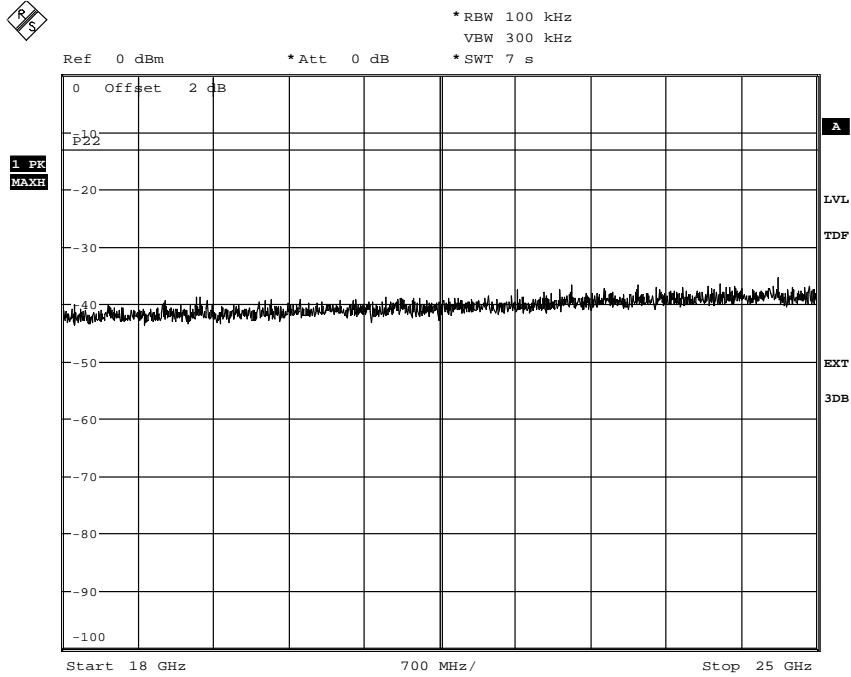


Diagram 10 c:



Date: 27.JAN.2011 15:53:31

Diagram 10 d:



Date: 28.JAN.2011 13:12:01

Field strength of spurious radiation measurements according to 47 CFR 2.1053/27.53 (g)

| | | |
|----------------------------------|-----------------------------------|-----------------------------|
| Date 2011-01-17 to 2011-01-19 | Temperature 22 to 23 °C ± 3 °C | Humidity 21 to 28% ± 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-Gen, Industry Canada file no.: 3482A-1.

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 to 15 GHz and 1 m in the frequency range 15 GHz to 25 GHz.

1. A pre-measurement was first performed:
2. In the frequency range 30 MHz-25 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,,

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

3. The measurement procedure was as the following:
4. 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.
5. 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 | SP number |
|--|-----------|
| Test site Tesla | 503 881 |
| Rohde & Schwarz ESI 26 | 503 292 |
| Rohde & Schwarz FSIQ 40 | 503 738 |
| Control computer | 503 479 |
| Software: Rohde & Schwarz EMC32, ver. 8.20.1 | - |
| Chase Bilog antenna CBL 6111A | 503 182 |
| Std. gain horn mod. 20240-20 | 503 674 |
| EMCO Horn Antenna 3115 | 502 175 |
| µComp Nordic, Low Noise Amplifier | 504 160 |
| MITEQ Low Noise Amplifier | 503 285 |
| Testo 625 temperature and humidity meter | 504 188 |

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



Results

| Frequency (MHz) | Spurious emission level (dBm) | |
|--------------------------------|----------------------------------|----------------------------------|
| | Vertical | Horizontal |
| 30 - 25000 | All emission > 20 dB below limit | All emission > 20 dB below limit |
| Measurement uncertainty 4.7 dB | | |

Limits

Derived from CFR 47 § 27.53 (g): Outside a licensee's frequency band(s) of operation the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, resulting in a limit of -13 dBm per 100 kHz RBW.

| | |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|



Frequency stability according to 47 CFR 2.1055

| | | |
|----------------------------------|---|---|
| Date 2011-01-21 to 2011-01-23 | Temperature (test equipment) 22 to 23 ± 3 °C | Humidity (test equipment) 18 to 19 % ± 5 % |
|----------------------------------|---|---|

Test set-up and procedure

The measurement was made per 3GPP TS 36.141. Port RF A was connected to a spectrum analyzer. Port RF B was terminated in a 50 ohm load. The spectrum analyzer was connected to an external 10 MHz reference standard.

| Measurement equipment | SP number |
|--|-----------|
| Rohde & Schwarz FSQ 40 | 504 143 |
| Climate chamber 2 | 501 031 |
| Testo 635 temperature and humidity meter | 504 203 |

Results

Nominal supply voltage: -48.0 V DC. E-TM1.1 in 5 MHz channel BW configuration was transmitted at the TX band center frequency (M) 737.0 MHz at maximum nominal output power 44.8 dBm (30 W) for both transmitter branches.

| Test conditions | | Frequency error (Hz) |
|--------------------------|--------|--------------------------|
| Supply voltage DC (V) | T (°C) | |
| -48.0 | +22 | -2 |
| -55.2 | +22 | -3 |
| -40.8 | +22 | +2 |
| -48.0 | +30 | -2 |
| -48.0 | +40 | -2 |
| -48.0 | +50 | -2 |
| -48.0 | +10 | -2 |
| -48.0 | 0 | -2 |
| -48.0 | -10 | -2 |
| -48.0 | -20 | -2 |
| -48.0 | -30 | -2 |
| Maximum freq. error (Hz) | | -3 |
| Measurement uncertainty | | < ± 1 x 10 ⁻⁷ |

Limit according to 3GPP TS 36.141 Version 8.5.0:
The frequency error shall be within ± 0.05 PPM ± 12 Hz (±48.85 Hz).

| | |
|-----------|-----|
| Complies? | Yes |
|-----------|-----|

External photos of the test object

Front side



Rear side



FCC ID: TA8BKRC161241-1

Appendix 8

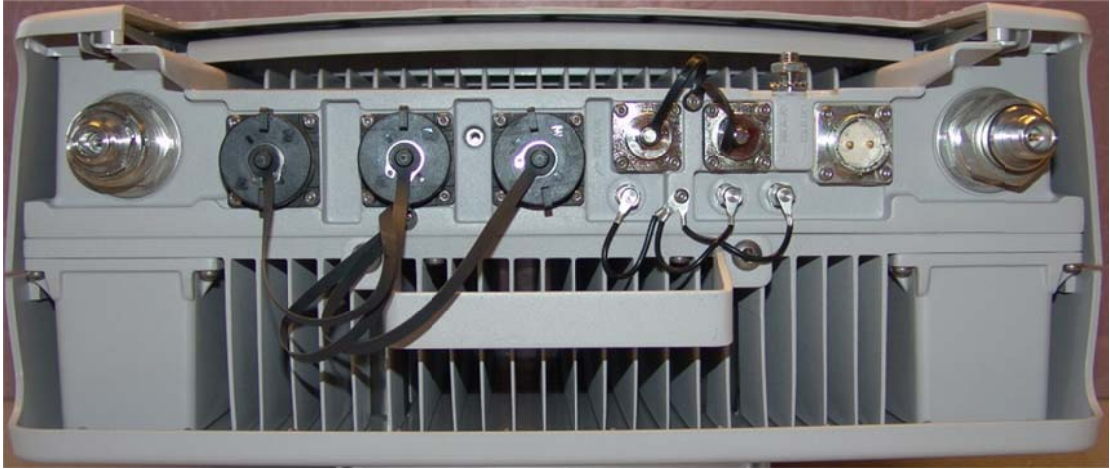
Left side



Right side



Bottom side



Top side

