REPORT

Issued by an FCC listed Laboratory Reg. no. 93866.
The test site complies with RSS-Gen, IC file no. 3482A-1

1002
ISO/IEC 17025

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Radio measurements on mRRUS 12 B12 radio equipment with FCC ID: TA8AKRC161331 and IC: 287AB-AS161331

(9 appendices)

Test object

Product name: mRRUS 12 B12
Product number: KRC 161 331/X, see appendix 1 for details.

Summary

Standard		Compliant	Appendix
FCC CFR 47 / IC RSS-130 ISSUE 1			
2.1046 / RSS-130 4.4	RF power output	Yes	2
2.1046 / RSS-130 4.4	RF power output, radiated	Yes	3
2.1049 / RSS-Gen 4.6.1	Occupied bandwidth	Yes	4
2.1051 / RSS-130 4.6	Band edge	Yes	5
2.1051 / RSS-130 4.6	Spurious emission at antenna terminals	Yes	6
2.1053 / RSS-130 4.6	Field strength of spurious radiation	Yes	7
2.1055 / RSS-130 4.3	Frequency stability	Yes	8

Note: Above RSS-130 items are given as cross-reference only. Measurements were performed according to ANSI procedures referenced by FCC and covered by SP's accreditation

SP Technical Research Institute of Sweden
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Performed by

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Description of the test object

Equipment:	Product name: mRRUS 12 B12, supporting LTE Product number: KRC 161 331/1, 110-240 VAC internal antenna Product number: KRC 161 331/2, -48VDC internal antenna Product number: KRC 161 331/3, 110-240 VAC no internal antenna Product number: KRC 161 331/4, -48 VDC no internal antenna FCC ID: TA8AKRC161331 IC ID: 287AB-AS161331 IC model numbers: IC MODEL NO: AS1613311 IC MODEL NO: AS1613312 IC MODEL NO: AS1613313 IC MODEL NO: AS1613314
Antenna ports:	2 TX/RX ports
RF configurations:	Single carrier, multi carrier, TX diversity and MIMO 2x2
Frequency bands:	TX: 729 – 745 MHz RX: 699 – 715 MHz
Nominal output power per antenna port:	Single carrier: 1x 37.0 dBm (1 x 5W) Multi carrier: 2 x 34.0 dBm (2 x 2.5W) 4 x 31.0 dBm (4 x 1.25W)
Internal antenna type:	Integrated wide sector antenna, cross polarized antenna elements. Product no KRE 101 2134/1:
Internal Antenna gain:	5dBi
Tested external antenna type:	Semi-Integrated Omni Antenna for indoor and outdoor use. Product no KRE 101 2245/1:
Tested external antenna gain:	2dBi
Modulations:	QPSK, 16QAM and 64QAM
Channel bandwidth Single carrier:	5 MHz, 10 MHz and 15 MHz.
Channel bandwidth Multi carrier:	1.4 MHz, 3MHz ,5 MHz and 10 MHz
Nominal power voltage:	-48 VDC 110-240 VAC

Operation mode during measurements

Measurements were performed with the test object transmitting test models as defined in 3GPP TS 36.141. Test model E-TM1.1 represent QPSK modulation, test model E-TM3.2 represent 16QAM modulation and test model E-TM3.1 represent 64QAM modulation.

The settings below were deemed representative for all traffic scenarios when settings with different modulations, channel bandwidths, number of carriers and RF configurations has been tested to find the worst case setting. All measurements were performed with the test object configured for maximum transmit power. The settings below were used for all measurements if not otherwise noted.

MIMO mode, single carrier: E-TM1.1
MIMO mode, multi carrier: 2 carriers E-TM1.1

Conducted measurements

The test object was supplied with -48 VDC by an external power supply.
Frequency stability measurements were also tested using 120 VAC.
Additional connections are documented in the set-up drawings below.
All measurements were made on RF A and additional measurements on RF B to verify that the ports were electrical identical, as declared by the client.

Radiated measurements

The test object was powered with -48 VDC and 120VAC.

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 IC RSS-130 and RSS-Gen.

References

Measurements were done according to relevant parts of the following standards:
3GPP TS 36.141, version 11.4.0
ANSI/TIA/EIA-603-C-2004
CFR 47 part 2, December 16th , 2013
CFR 47 part 27, December 16th, 2013
RSS-Gen Issue 3
RSS-130 Issue 1

Measurement equipment

	Calibration Due	SP number
Test site Tesla	2017-01	503 881
R&S FSIQ 40	2014-07	503 738
R&S ESIB 26	2014-07	503 292
R&S FSQ 40	2014-07	504 143
R&S FSW 43	2014-07	902 073
Control computer with R&S software EMC32 version 8.52.0	-	503 899
High pass filter	2015-01	BX40074
High pass filter	2014-07	901 501
High pass filter	2014-07	901 502
High pass filter	2014-07	504 199
High pass filter	2014-09	901 373
High pass filter	2014-09	503 739
High pass filter	2014-07	503 740
RF attenuator	2014-07	504 159
RF attenuator	2014-07	900 233
RF attenuator	2014-07	900 691
RF attenuator	2014-07	901 384
RF attenuator	2014-11	901 508
Chase Bilog Antenna CBL 6111A	2014-10	503 182
EMCO Horn Antenna 3115	2015-09	502 175
Std.gain horn FLANN model 20240-20	-	503 674
Std.gain horn FLANN model 22240-20	-	503 674
µComp Nordic, Low Noise Amplifier	2015-01	901 545
Miteq Low Noise Amplifier	2014-09	503 285
Schwartzbeck preamplifier BBV 9742	2015-02	504 085
Temperature and humidity meter, Testo 635	2015-03	504 203
Temperature and humidity meter, Testo 625	2014-06	504 188
Temperature Chamber	2015-03	501 031
Multimeter Fluke 87	2014-08	502 190

Uncertainties

Measurement and test instrument uncertainties are described in the quality assurance documentation ”SP-QD 10885”. The uncertainties are calculated with a coverage factor k=2 (95% level of confidence).
Compliance evaluation is based on a shared risk principle with respect to the measurement uncertainty.

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 2014-05-16.

Manufacturer’s representative

Christer Gustavsson, Ericsson AB.

Test engineers

Andreas Johnson, Tomas Lennhager, Tomas Isbring, Jörgen Wassholm and Rolf Kühn, SP

Test participant

Mihai Simon, Ericsson AB.

Appendix 1

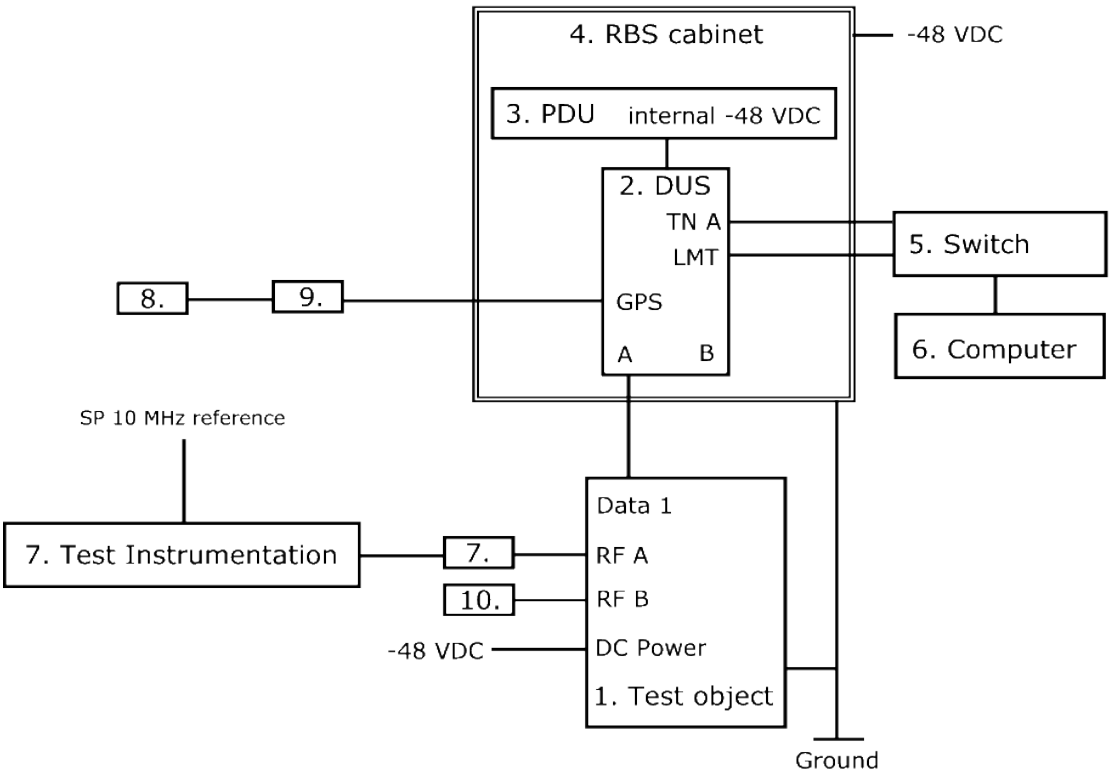
Test frequencies during measurements

EARFCN Downlink	Frequency [MHz]	BW [MHz]	Symbolic name	Comment
5035	731.5	5	B	TX bottom frequency in 5 MHz BW configuration
5060	734.0	10	B	TX bottom frequency in 10 MHz BW configuration
5085	736.5	15	B	TX bottom frequency in 15 MHz BW configuration
5090	737.0	all	M	TX mid frequency all BW configurations
5145	742.5	5	T	TX top frequency in 5 MHz BW configuration
5120	740.0	10	T	TX top frequency in 10 MHz BW configuration
5095	737.5	15	T	TX top frequency in 15 MHz BW configuration
5017 5145	729.7 742.5	1.4 5	B1.4	2 carrier TX bottom frequency in 1.4 and 5 MHz BW configuration with maximum spacing inbetween and with 1.4MHz centered close to band edge.
5025 5145	730.5 742.5	3 5	B3	2 carrier TX bottom frequency in 3 and 5 MHz BW configuration with maximum spacing inbetween and with 3MHz centered close to band edge.
5035 5145	731.5 742.5	1.4 5	B1.4-2.5be	2 carrier TX bottom frequency in 1.4 and 5 MHz BW configuration with maximum spacing inbetween, and with 1.4MHz centered 2.5MHz offset to band edge.
5035 5145	731.5 742.5	3 5	B3-2.5be	2 carrier TX bottom frequency in 3 and 5 MHz BW configuration with maximum spacing inbetween, and with 3MHz centered 2.5MHz offset to band edge.
5090 5145	737 742.5	1.4 5	M1.4	2 carrier TX mid frequency in 1.4 and 5 MHz BW configuration with maximum spacing inbetween
5090 5145	737 742.5	3 5	M3	2 carrier TX mid frequency in 3 and 5 MHz BW configuration with maximum spacing inbetween
5035 5145	731.5 742.5	5 1.4	T1.4-2.5be	2 carrier TX top frequency in 5 and 1.4 MHz BW configuration with maximum spacing inbetween, and with 1.4MHz centered 2.5MHz offset to band edge.
5035 5145	731.5 742.5	5 3	T3-2.5be	2 carrier TX top frequency in 5 and 3 MHz BW configuration with maximum spacing inbetween, and with 3MHz centered 2.5MHz offset to band edge.
5035 5163	731.5 744.3	5 1.4	T1.4	2 carrier TX top frequency in 5 and 1.4 BW configuration with maximum spacing inbetween and with 1.4MHz centered close to band edge.
5035 5155	731.5 743.5	5 3	T3	2 carrier TX top frequency in 5 and 3 MHz BW configuration with maximum spacing inbetween and with 3MHz centered close to band edge.
5035 5067	731.5 734.7	5 1.4	B2_1	2 carrier TX bottom frequency in 5 and 1.4 MHz BW configuration
5035 5075	731.5 735.5	5 3	B2_2	2 carrier TX bottom frequency in 5 and 3 MHz BW configuration
5035 5067	731.5 734.7	1.4 5	B2_3	2 carrier TX bottom frequency in 1.4 and 5 MHz BW configuration, and with 1.4MHz centered 2.5MHz offset to band edge.
5035 5075	731.5 735.5	3 5	B2_4	2 carrier TX bottom frequency in 3 and 5 MHz BW configuration, and with 3MHz centered 2.5MHz offset to band edge.
5017 5049	729.7 732.9	1.4 5	B2_5	2 carrier TX bottom frequency in 1.4 and 5 MHz BW configuration, and with 1.4MHz centered close to band edge.
5025 5065	730.5 734.5	3 5	B2_6	2 carrier TX bottom frequency in 3 and 5 MHz BW configuration, and with 3MHz centered close to band edge.
5065 5097	734.5 737.7	1.4 5	M2_1	2 carrier TX mid frequency in 1.4 and 5 MHz BW configuration
5065 5105	734.5 738.5	3 5	M2_2	2 carrier TX mid frequency in 3 and 5 MHz BW configuration
5105 5145	738.5 742.5	3 5	T2_2	2 carrier TX top frequency in 3 and 5 MHz BW configuration
5113 5145	739.3 742.5	5 1.4	T2_3	2 carrier TX top frequency in 5 and 1.4 MHz BW configuration, and with 1.4MHz centered 2.5MHz offset to band edge.
5105 5145	738.5 742.5	5 3	T2_4	2 carrier TX top frequency in 5 and 3 MHz BW configuration, and with 3MHz centered 2.5MHz offset to band edge.
5131 5163	741.1 744.3	5 1.4	T2_5	2 carrier TX top frequency in 5 and 1.4 MHz BW configuration, and with 1.4MHz centered close to band edge.
5115 5155	739.5 743.5	5 3	T2_6	2 carrier TX top frequency in 5 and 3 MHz BW configuration, and with 3MHz centered close to band edge.

5035 5075 5105 5145	731.5 735.5 738.5 742.5	5 3 3 5	B4	4 carrier TX bottom frequency in 5, 3, 3 and 5 MHz BW configuration

All RX frequencies were configured 30 MHz below the corresponding TX frequency according the applicable duplex offset for the operating band.

Test setup conducted measurements



Test object

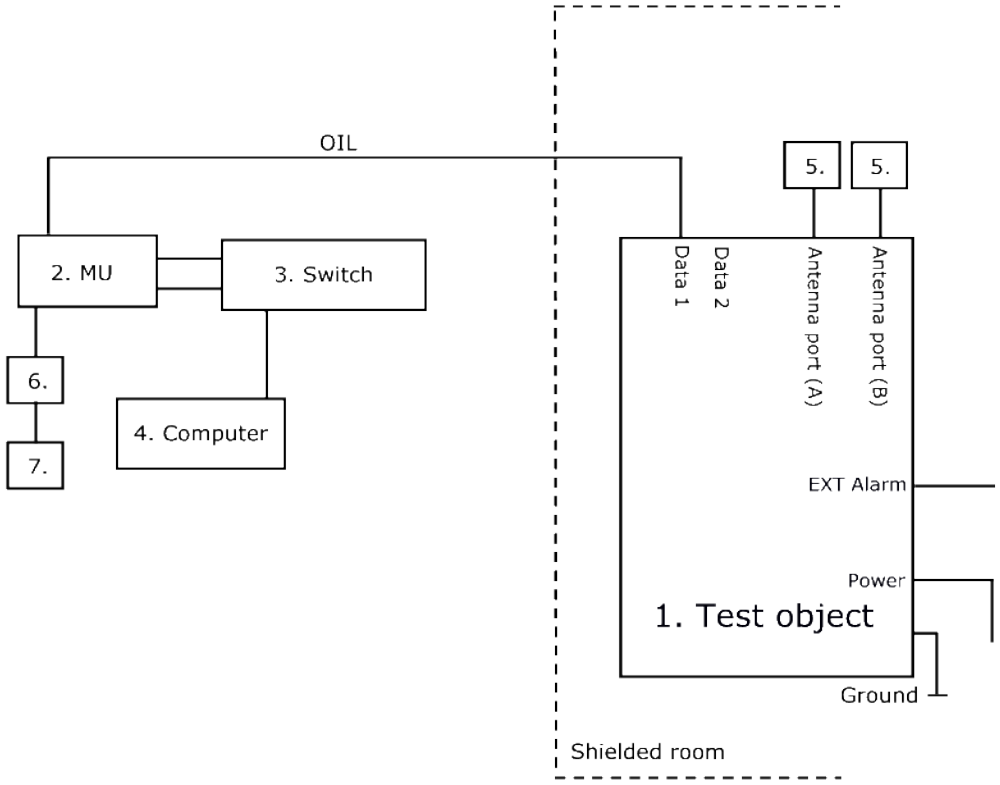
1.	mRRUS 12 B12, KRC 161 331/4, rev. R1C, s/n: C827931793 software CXP 901 7316/2, rev. R51NN with FCC ID: TA8AKRC161331 and IC ID: 287AB-AS161331 For frequency stability AC: KRC 161 331/3, rev. R1C, s/n: C827929841

Functional test equipment

2.	DUS 41 01, KDU 137 624/1, rev. R5A/A, s/n: D16C491372
3.	SUP 6601 1/BFL 901 009/4, rev. R1E, s/n: BR88237597
4.	RBS 6601, BFL 901 009/4
5	Fast Ethernet switch, Netgear GSM7212, BAMS:1000517295
6.	Computer, Ultra 27, BAMS – 1000758440
7.	SP Test Instrumentation according to measurement equipment list
8.	GPS Active Antenna, KRE 101 2082/1, and 1x4 GPS splitter, KRY 101 1946/1
9.	GPS 02 01, NCD 901 41/1, rev. R1D, s/n: TU8K474887
10.	Terminator, 50 ohm

Appendix 1

Test setup radiated measurements



Test object:

1.	mRRUS 12 B12, KRC 161 331/2, rev. R1C, s/n: C827930693 mRRUS 12 B12, KRC 161 331/4, rev. R1C, s/n: C827931793 working software CXP 901 7316/2, rev. R51NN with FCC ID: TA8AKRC161331 and IC ID: 287AB-AS161331

Functional test equipment:

2.	Main Unit SUP 6601 1/BFL 901 009/4, rev. R1E, s/n. BR88258854 DUS 41 01, KDU 137 624/1, rev. R5A, s/n: D168382181
3.	Netgear Switch GSM7212, BAMS – 1000517299
4.	Computer Sun ultra27-01, BAMS – 1000758436
5.	Terminator or Antenna, see antenna details below
6.	GPS 02 01, NCD 901 41/1, rev. R1C, s/n: A401677751
7.	GPS Active Antenna, KRE 101 2082/1

Integrated antenna
Sector antenna, KRE 101 2134/1, rev. R1C, s/n: T89U200136
Representing version: KRC 161 331/1 and KRC 161 331/2

Semi-integrated omni antenna
VPol Omni 694-894, KRE 101 2245/1, s/n: D7G3305551, D7G3305547
Type no. 80010846
Representing version: KRC 161 331/3 and KRC 161 331/4

Interfaces:

Power: -48 VDC	Power
Antenna port (A), N-connector	Antenna
Antenna port (B), N-connector	Antenna
Data 1, Optical Interface Link, single mode opto fibre	Signal
Data 2, Optical Interface Link, single mode opto fibre, not used in this configuration	Signal
EXT Alarm, shielded multi-wire	Signal
Ground wire	Ground

RBS software:

Product number	**Revision**
CXP 102 051/19	R39BC

RF power output measurements according to CFR 47 §27.50 and RSS-130 4.4, conducted

Date	Temperature	Humidity
2014-06-05 to 2014-06-27	19°C to 24°C ± 3°C	33% to 60% ± 5%

Test set-up and procedure

The test object was connected to a signal analyser measuring peak and RMS output power in CDF mode. A resolution bandwidth of 80 MHz was used.

Measurement equipment	SP number
R&S FSW	902 073
RF attenuator	900 691
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 1.1 dB

Results

MIMO mode, single carrier
Rated output power level at RF connector 1x 37.0 dBm.

Tested configuration	[RMS dBm/ PAR dB]		
BW and frequency	Port RF A	Port RF B	Total power[1)]
5 MHz, B	36.54/ 6.78	36.82/ 6.78	39.69
10 MHz, B	36.73/ 6.90	36.85/ 6.88	39.80
15 MHz, B	36.73/ 6.94	36.80/ 6.92	39.78
5 MHz, M	36.71/ 6.72	36.79/ 6.72	39.76
10 MHz, M	36.60/ 6.76	36.81/ 6.76	39.72
15 MHz, M	36.67/ 6.90	36.75/ 6.32	39.72
5 MHz, T	36.85/ 6.72	36.90/ 6.74	39.89
10 MHz, T	36.80/ 6.74	36.84/ 6.76	39.83
15 MHz, T	36.73/ 6.86	36.78/ 6.84	39.77

Appendix 2

MIMO mode, multi Carrier
Rated output power 2 x 34.0 dBm per RF port.
Channel Power measurements of 1.4 and 3 MHz

Carrier BW [MHz]	Symbolic name	[RMS dBm]		Total power[1)] [RMS dBm]
		Port RF A	Port RF B	
1.4	B1.4	33.24	33.22	36.24
3	B3	33.52	33.43	36.49
1.4	B1.4-2.5be	33.44	33.48	36.47
3	B3-2.5be	33.56	33.60	36.59
1.4	M1.4	33.69	33.76	36.74
3	M3	33.73	33.86	36.81
1.4	T1.4-2.5be	33.82	33.79	36.82
3	T3-2.5be	33.82	33.85	36.85
1.4	T1.4	33.84	33.67	36.77
3	T3	33.87	33.85	36.87

MIMO mode, multi Carrier
Rated output power 2 x 34.0 dBm per RF port.

Tested configuration	[RMS dBm/ PAR dB]		
BW and frequency	Port RF A	Port RF B	Total power[1)]
5+1.4 MHz, B2_1	36.80/ 6.94	36.80/ 6.96	39.81
5+3 MHz, B2_2	36.91/6.88	36.92/6.88	39.87
1.4+5 MHz, B2_3	36.76/6.98	36.67/6.92	39.73
3+5 MHz, B2_4	36.69/6.86	36.54/6.86	39.63
1.4+5 MHz, B2_5	36.59/6.98	36.65/6.98	39.63
3+5 MHz, B2_6	36.69/6.94	36.74/6.92	39.73
5+1.4 MHz, M2_1	36.54/ 6.90	36.58/ 6.90	39.57
3+5 MHz, M2_2	37.63/ 6.78	36.76/ 6.78	39.71
3+5 MHz, T2_2	36.71/6.78	36.82/6.80	39.78
5+1.4 MHz, T2_3	36.64/6.88	36.65/6.76	39.66
5+3 MHz, T2_4	36.75/6.76	36.72/6.78	39.75
5+1.4 MHz, T2_5	36.57/6.90	36.59/6.94	39.59
5+3 MHz, T2_6	36.65/6.78	36.65/6.80	39.66

Rated output power 4 x 31.0 dBm per RF port.

Tested configuration	[RMS dBm/ PAR dB]		
BW and frequency	Port RF A	Port RF B	Total power[1)]
5+3+3+5 MHz, B4	36.66/ 6.96	36.57/ 6.96	39.63

[1)]: Summed output power according to FCC KDB662911 Multiple transmitter output v02r01.

Note: The PAR value is the 0.1 % Peak to Average Ratio.

Single carrier, MIMO

Measured output power per 1 MHz.

Carrier BW [MHz]	Symbolic name	[RMS dBm]		Total power[1)] [RMS dBm]
		Port RF A	Port RF B	
5	B	30,62	30.83	33.83
10	B	27.80	27.93	30.93
15	B	26.03	25.96	29.03
5	M	30.68	30.69	33.69
10	M	27.65	27.78	30.78
15	M	25.96	26.03	29.03
5	T	30.73	30.78	33.78
10	T	27.72	27.80	30.80
15	T	26.06	26.03	29.06

2 carrier MIMO (1.4 and 3.0 MHz carrier only supported together with at least a 5MHz carrier BW)

Carrier BW [MHz]	Symbolic name	[RMS dBm]		Total power[1)] [RMS dBm]
		Port RF A	Port RF B	
1.4	B1.4	32,17	32.16	35.17
3	B3	29.37	29.32	32.37
1.4	B1.4-2.5be	32,43	32.40	35.43
3	B3-2.5be	29.49	29.50	32.50
1.4	M1.4	32.66	32.78	35.78
3	M3	29.68	29.68	32.68
1.4	T1.4-2.5be	32.78	32.46	35.78
3	T3-2.5be	29.76	29.61	32.76
1.4	T1.4	32.77	32.56	35.77
3	T3	29.74	29.71	32.74

[1)]: Measured according to FCC KDB662911 D01 Multiple Transmitter Output v02r01. Method E), 2), c). “Measure and add 10 log(N_{Ant})”.

Remark

ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensee's are required to take into account maximum antenna gain used in combination with above power settings to prevent the radiated output power to exceed the limits.

Limits

§ 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.
RSS-130 4.4:	The transmitter output power shall be measured in terms of average power. For base and fixed equipment, refer to SRSP-518 for power limits The maximum output power may not exceed 3280 W (EIRP)/ MHz In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

Complies?	Yes

Appendix 3

RF power output measurements according to CFR 47 §27.50 / IC RSS-130 4.4, radiated

Date	Temperature	Humidity
2014-05-27	22°C ± 3°C	32 % ± 5 %
2014-05-28	22°C ± 3°C	27 % ± 5 %
2014-06-02	23°C ± 3°C	33 % ± 5 %

Test set-up and procedure

The measurements were performed according to ANSI C63.4-2009.

The test was performed with continuous transmission.

The test of radiated emission was performed in a semi anechoic chamber. The measurements were performed with both horizontal and vertical polarizations of the antenna. The antenna distance was 3.0 m.

The fundamental was scanned with PEAK-detector with the antenna height was varied between 1-4 m and the turntable was rotated between 0-360 degrees for maximum response. The carrier power was measured with RMS- detector activated with a RBW of 1 MHz. The output power was verified with the substitution method .The antenna distance during the measurements was 3.0 m.

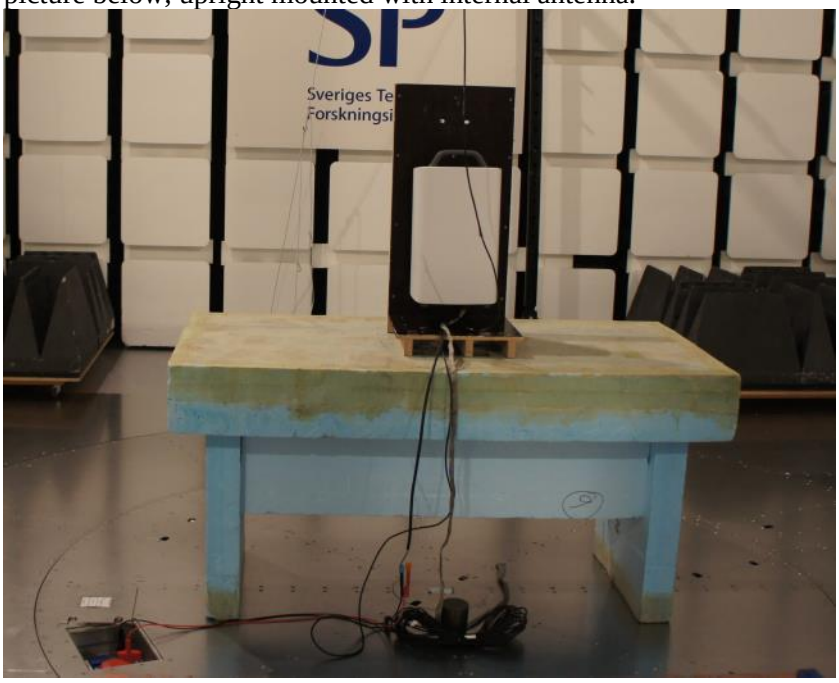
Measurement equipment

Measurement equipment	SP number
Semi anechoic chamber	503 881
R&S ESI 26	503 292
EMC 32 ver. 8.52.0	503 899
Schwarzbeck dipol	500 592
R&S SMB 100A	900 120
Attenuator	504 159
Testo 635 temperature and humidity meter	504 203

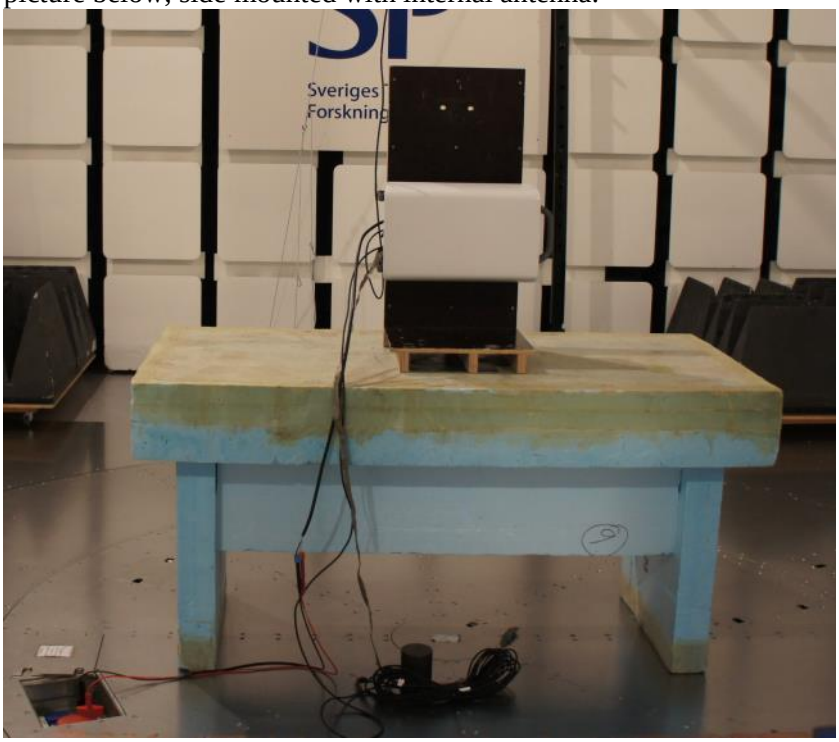
Measurement uncertainty:

3.2 dB

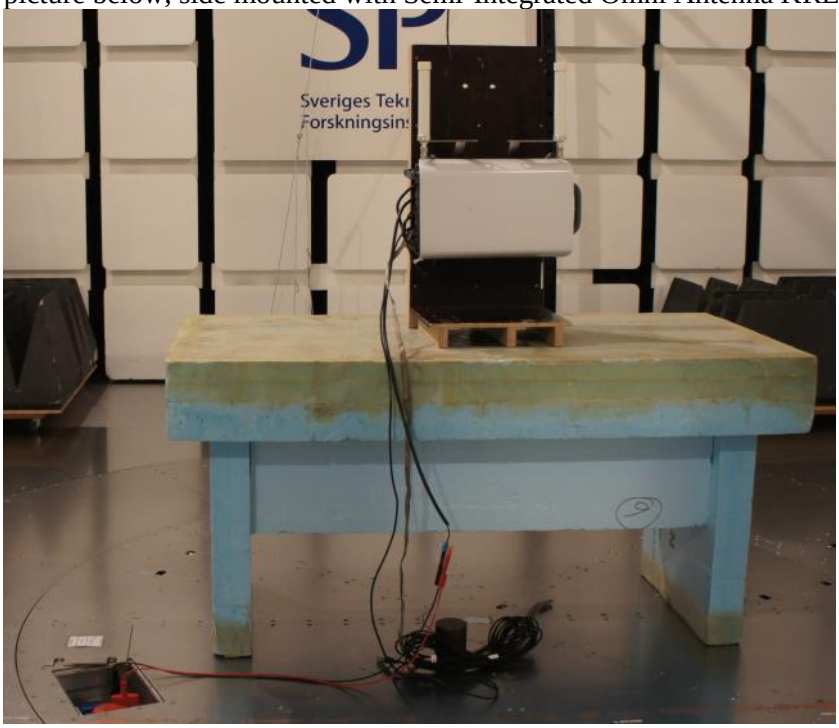
The test set-up during the effective radiated output power measurements is shown in the picture below, upright mounted with internal antenna.



The test set-up during the effective radiated output power measurements is shown in the picture below, side mounted with internal antenna.



The test set-up during the effective radiated output power measurements is shown in the picture below, side mounted with Semi-Integrated Omni Antenna KRE 101 2245/1.



Results

Internal antenna, upright mounted

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	32.9/ 32.0	1.9/ 1.6	-	-
10	-	-	29.8/ 28.9	1.0/ 0.8	-	-
15	-	-	28.3/ 27.0	0.7/ 0.5	-	-
1.4+5	35.6/ 34.4	3.6/ 2.8	35.5/ 34.3	3.5/ 2.7	35.7/ 35.4	3.7/ 3.5
3+5	-	-	32.1/ 30.8	1.6/ 1.2	-	-

Appendix 3

Internal antenna, side mounted

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	30.9/ 34.2	1.2/ 2.6	-	-
10	-	-	28.8/ 31.2	0.8/ 1.3	-	-
15	-	-	27.6/ 30.2	0.6/ 1.0	-	-
1.4+5	34.7/ 36.7	3.0/ 4.7	34.7/ 36.6	3.0/ 4.6	34.8/ 37.4	3.0/ 5.5
3+5	-	-	31.1/ 32.9	1.3/ 1.9	-	-

External antenna, side mounted (Semi-Integrated Omni Antenna KRE 101 2245/1)

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)		Horizontal/ Vertical RMS power (ERP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	25.4/ 32.4	0.3/ 1.7	-	-
10	-	-	22.4/ 29.0	0.2/ 0.8	-	-
15	-	-	20.7/ 27.7	0.1/ 0.6	-	-
1.4+5	28.2/ 34.8	0.7/ 3.0	27.4/ 34.5	0.5/ 2.8	28.5/ 35.1	0.7/ 3.2
3+5	-	-	24.5/ 31.0	0.3/ 1.3	-	-

Appendix 3

Internal antenna, upright mounted

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	35.1/ 34.2	3.2/ 2.6	-	-
10	-	-	32.0/ 31.1	1.6/ 1.3	-	-
15	-	-	30.5/ 29.2	1.1/ 0.8	-	-
1.4+5	37.8/ 36.6	6.0/ 4.5	37.7/ 36.5	5.8/ 4.4	37.9/ 37.6	6.1/ 5.7
3+5	-	-	34.3/ 33.0	2.7/ 2.0	-	-

Internal antenna, side mounted

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	33.1/ 36.4	2.0/ 4.3	-	-
10	-	-	31.0/ 33.4	1.2/ 2.2	-	-
15	-	-	29.8/ 32.4	0.9/ 1.7	-	-
1.4+5	36.9/ 38.9	4.8/ 7.7	36.9/ 38.9	4.8/ 7.5	37.0/ 39.6	5.0/ 9.0
3+5	-	-	33.3/ 35.1	2.1/ 3.2	-	-

Appendix 3

External antenna, side mounted (Semi-Integrated Omni Antenna KRE 101 2245/1)

Bandwidth configuration (MHz)	Tested frequency B		Tested frequency M		Tested frequency T	
	Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)		Horizontal/ Vertical RMS power (EIRP)	
	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz	dBm/ MHz	W/ MHz
5	-	-	27.6/ 34.6	0.6/ 2.9	-	-
10	-	-	24.6/ 31.2	0.3/ 1.3	-	-
15	-	-	22.9/ 29.9	0.2/ 1.0	-	-
1.4+5	30.4/ 37.0	1.1/ 5.0	29.6/ 36.7	0.9/ 4.6	30.7/ 37.3	1.2/ 5.3
3+5	-	-	26.7/ 33.2	0.5/ 2.1	-	-

Remark

ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/IC Bureau(s). Licensee's are required to take into account maximum antenna gain used in combination with above power settings to prevent the radiated output power to exceed the limits.

Limits

§ 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.
RSS-130 4.4:	The transmitter output power shall be measured in terms of average power. For base and fixed equipment, refer to SRSP-518 for power limits The maximum output power may not exceed 3280 W (EIRP)/ MHz In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

Complies?	Yes

Appendix 4

Occupied bandwidth measurements according to CFR 47 2.1049 and RSS-Gen 4.6.1

Date	Temperature	Humidity
2014-06-19	21 °C ± 3 °C	51 % ± 5 %
2014-06-26	22 °C ± 3 °C	38 % ± 5 %
2014-06-27	22 °C ± 3 °C	38 % ± 5 %

Test set-up and procedure

The measurements were made per definition in §2.1049 and RSS-Gen 4.6.1. The output was connected to a signal analyzer with the RMS detector activated. The signal analyzer was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSW 43	902 073
RF attenuator	900 691
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

Single carrier

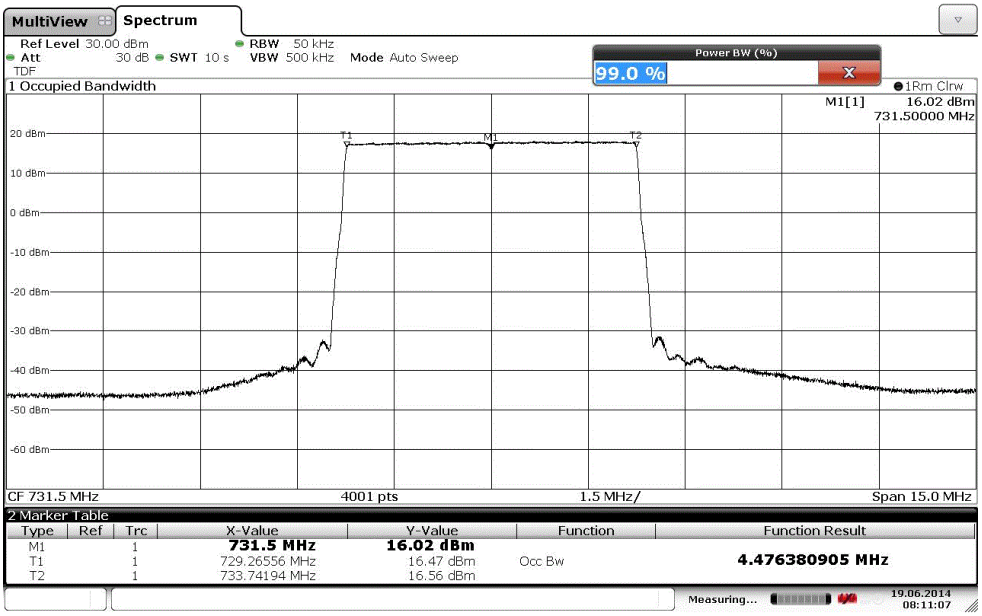
Diagram	BW configuration	Tested frequency	Tested Port	Occupied BW (99%) [MHz]
1	5 MHz	B	RF A	4.48
2	10 MHz	B	RF A	8.93
3	15 MHz	B	RF A	13.40
4	5 MHz	M	RF A	4.48
5	5 MHz	M	RF B	4.48
6	10 MHz	M	RF A	8.93
7	10 MHz	M	RF B	8.94
8	15 MHz	M	RF A	13.41
9	15 MHz	M	RF B	13.41
10	5 MHz	T	RF A	4.48
11	10 MHz	T	RF A	8.93
12	15 MHz	T	RF A	13.41

(1.4 and 3.0 MHz carrier only supported together with at least a 5MHz carrier BW)

Diagram	BW configuration	Tested frequency	Tested Port	Occupied BW (99%) [MHz]
13	1.4 MHz	B1.4	RF A	1.09
14	3 MHz	B3	RF A	2.69
15	1.4 MHz	M1.4	RF A	1.09
16	1.4 MHz	M1.4	RF B	1.09
17	3 MHz	M3	RF A	2.69
18	3 MHz	M3	RF B	2.69
19	1.4 MHz	T1.4	RF A	1.09
20	3 MHz	T3	RF A	2.69

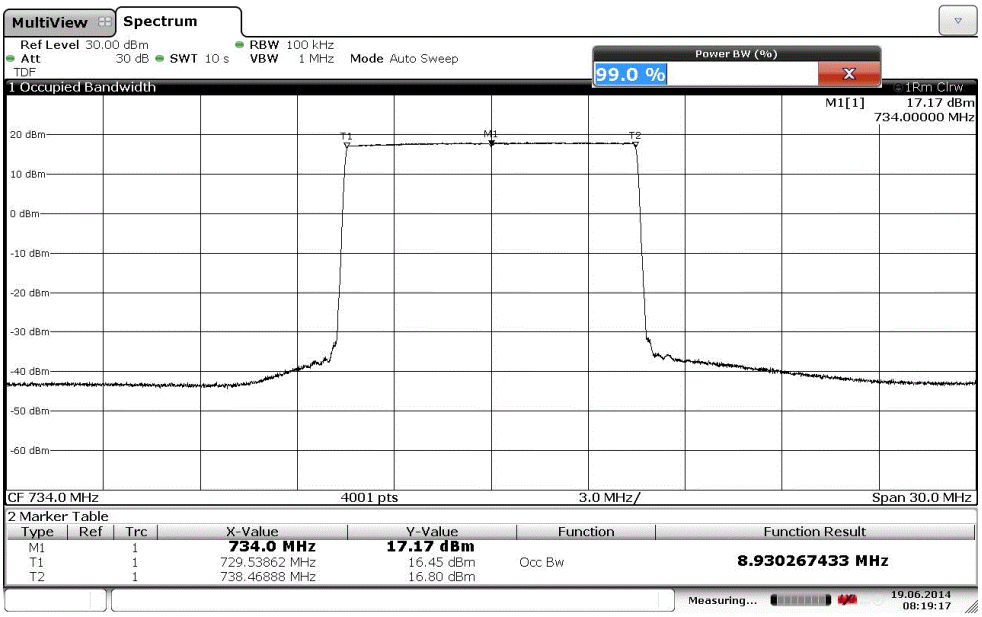
Appendix 4

Diagram 1:



Date: 19.JUN.2014 08:11:07

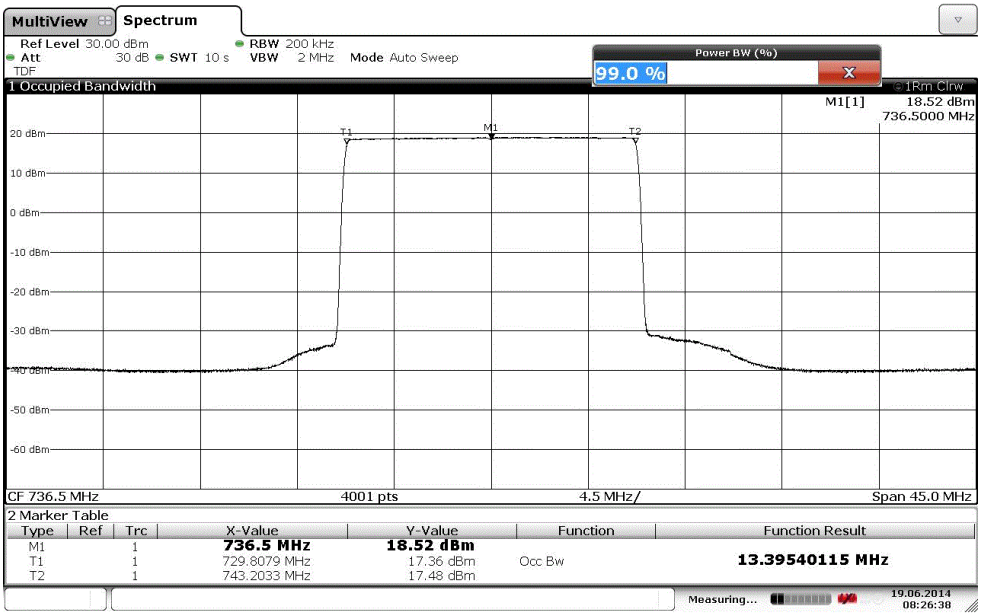
Diagram 2:



Date: 19.JUN.2014 08:19:17

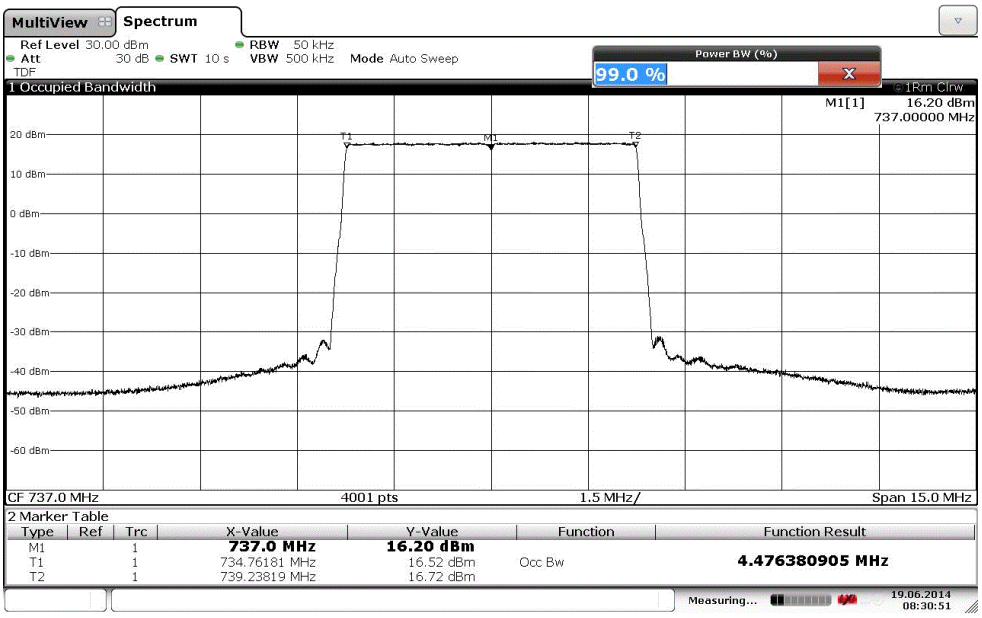
Appendix 4

Diagram 3:



Date: 19.JUN.2014 08:26:38

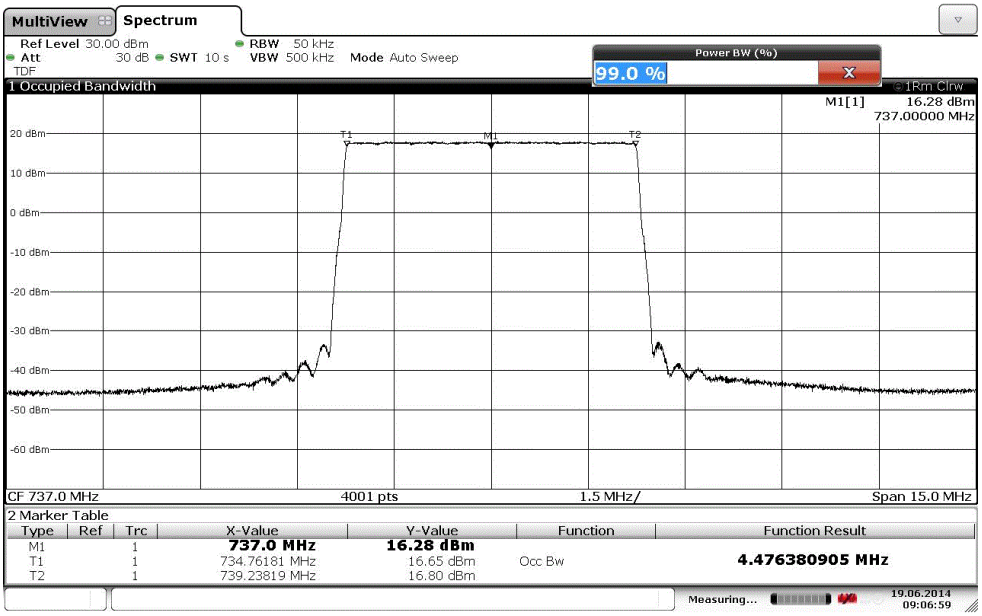
Diagram 4:



Date: 19.JUN.2014 08:30:51

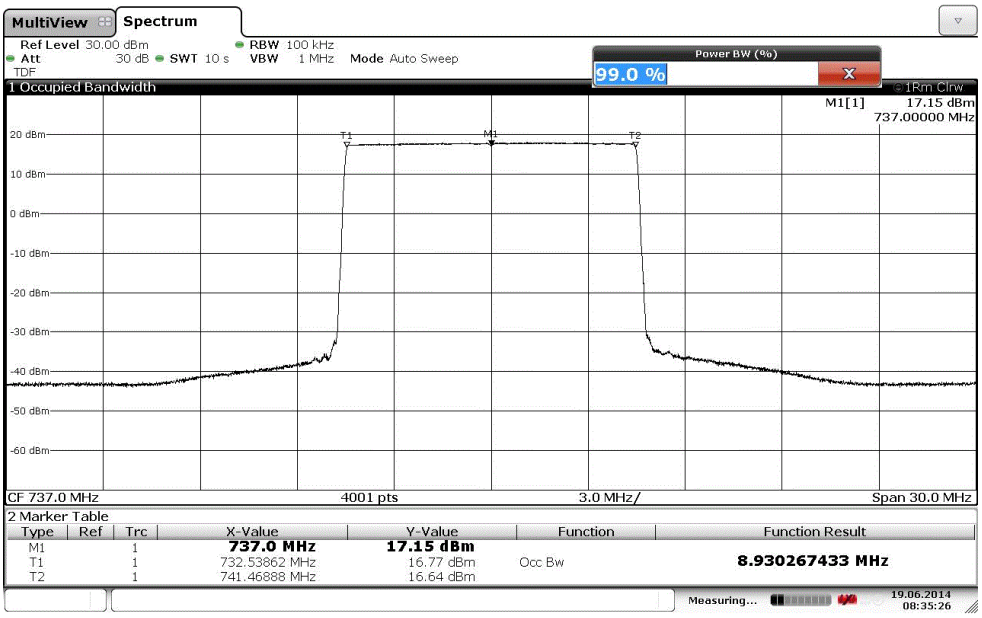
Appendix 4

Diagram 5:



Date: 19.JUN.2014 09:06:59

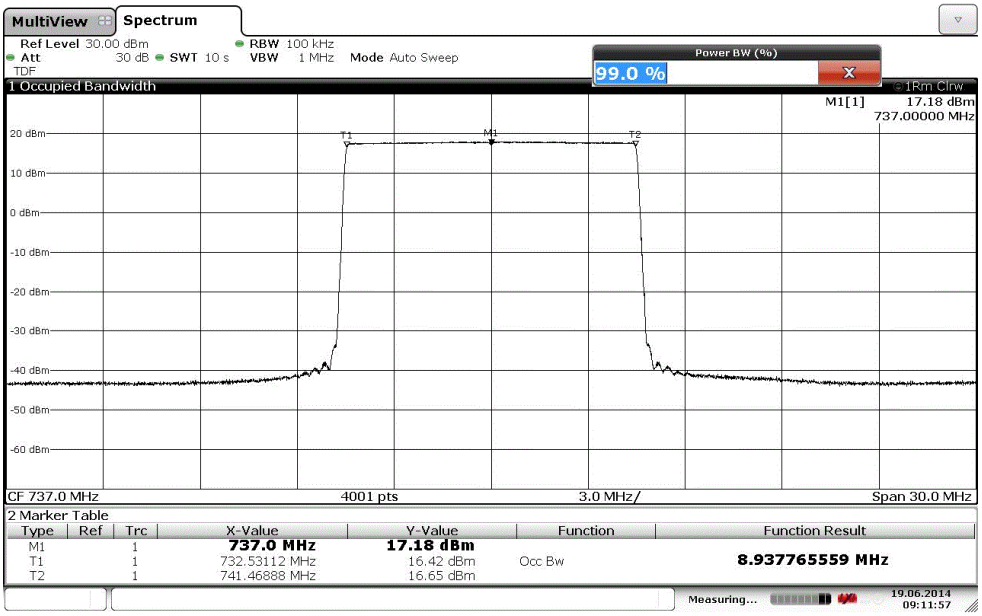
Diagram 6:



Date: 19.JUN.2014 08:35:26

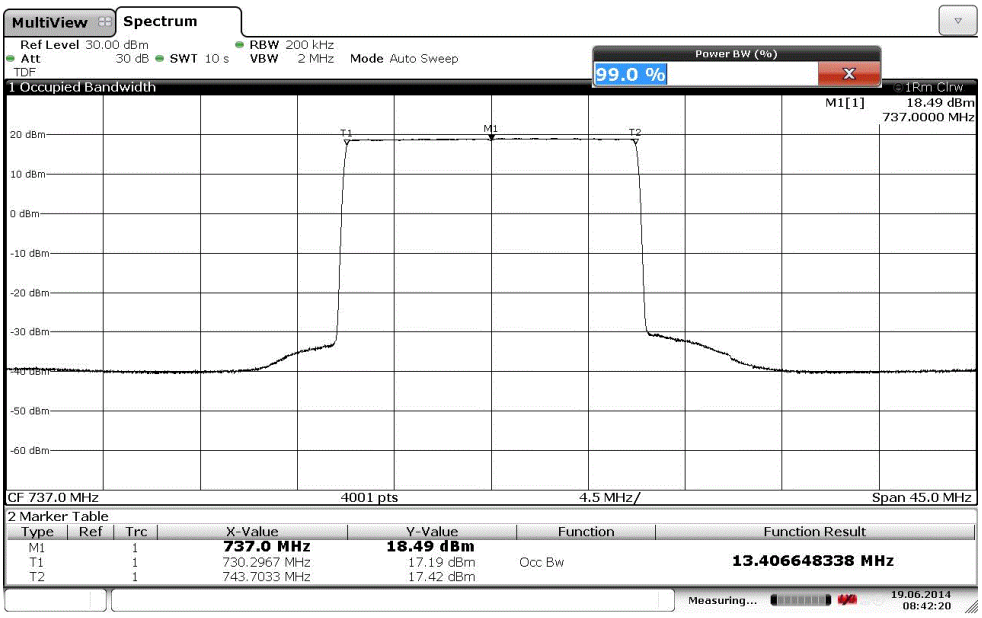
Appendix 4

Diagram 7:



Date: 19.JUN.2014 09:11:57

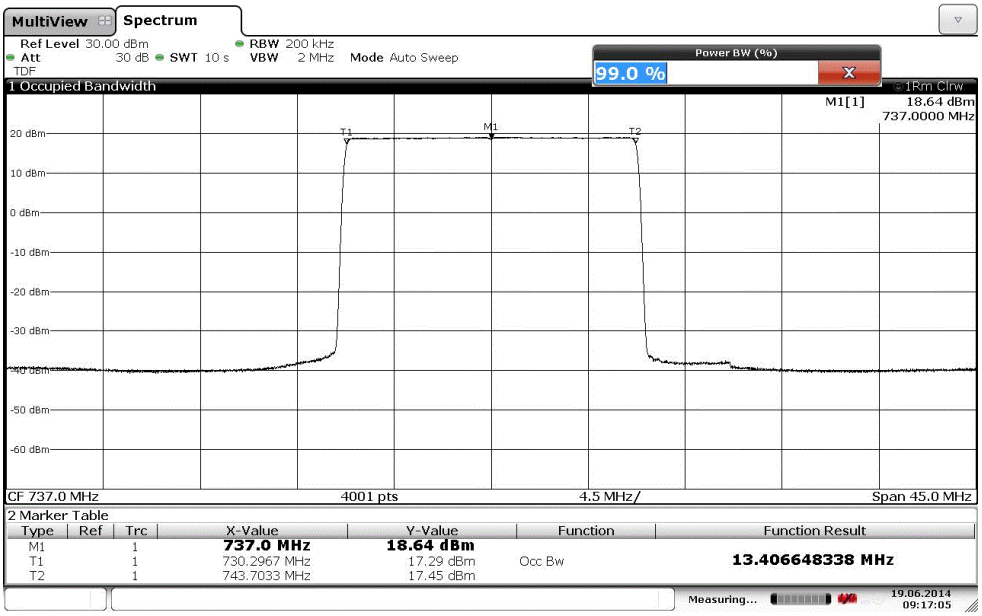
Diagram 8:



Date: 19.JUN.2014 08:42:20

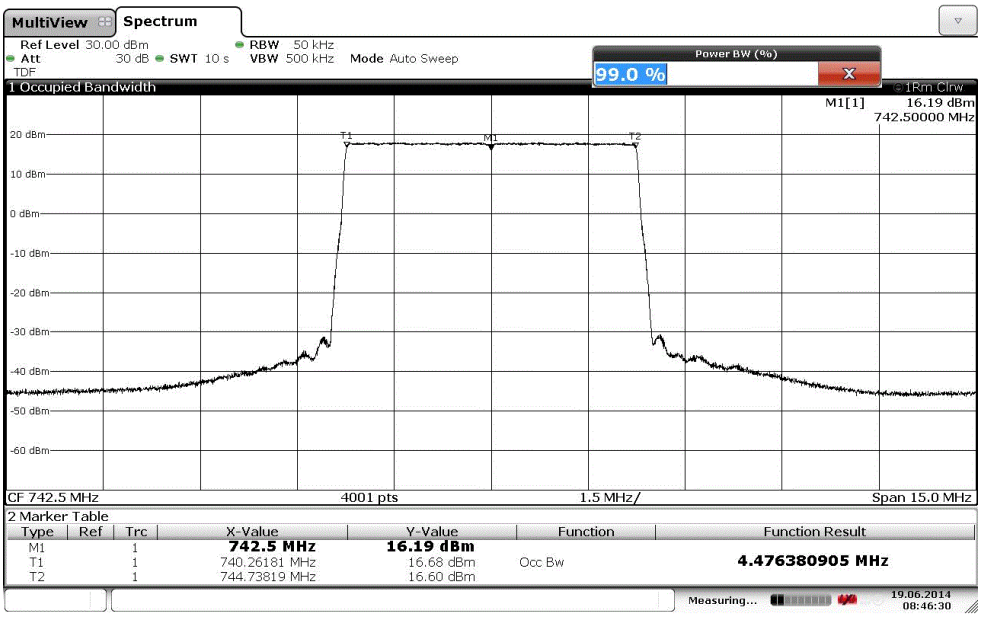
Appendix 4

Diagram 9:



Date: 19.JUN.2014 09:17:05

Diagram 10:



Date: 19.JUN.2014 08:46:30

Appendix 4

Diagram 11:

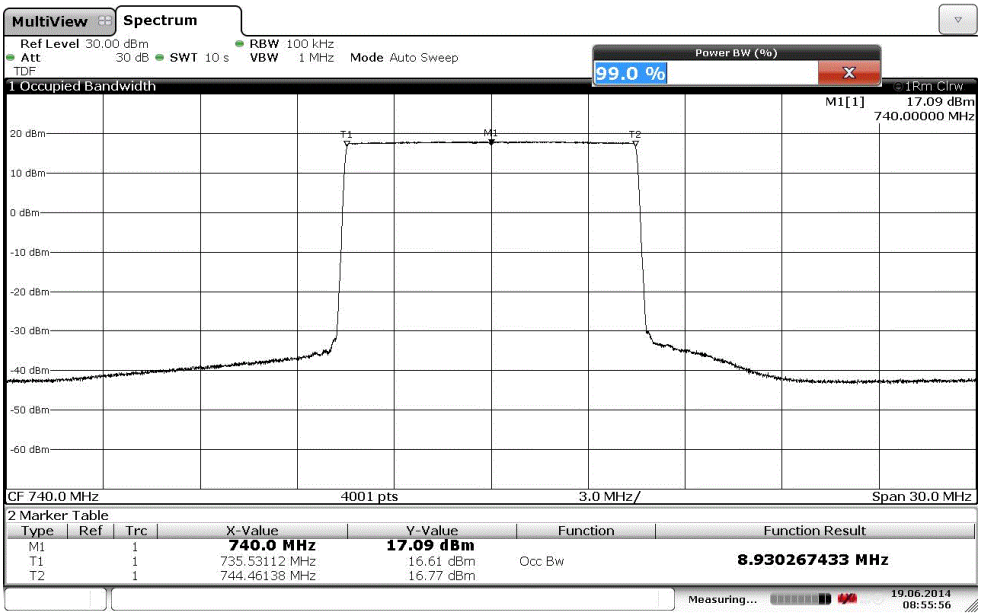


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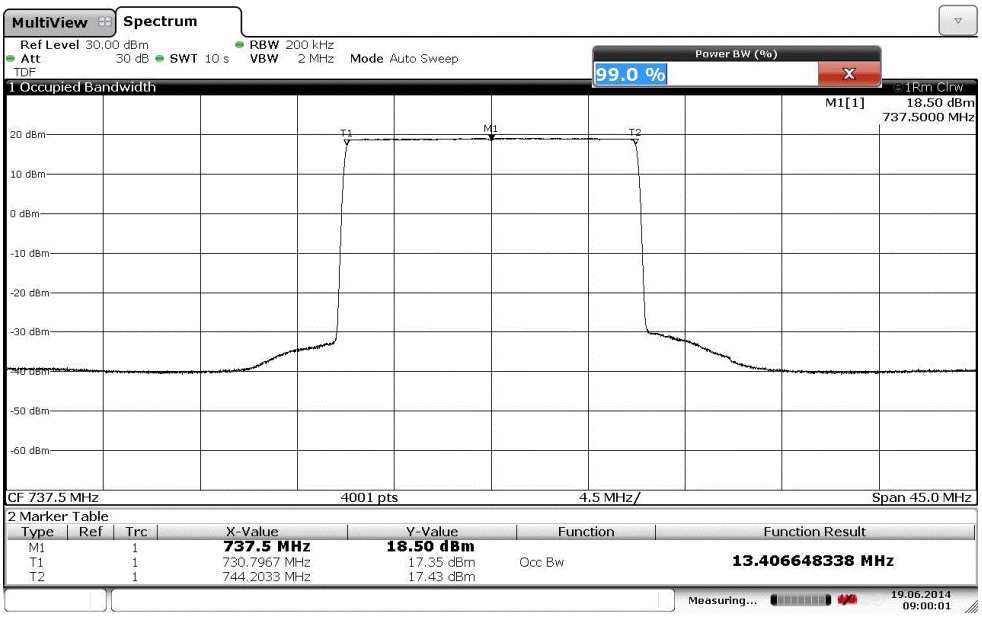
Diagram 12:



Date: 19.JUN.2014 09:00:01

Appendix 4

Diagram 13:

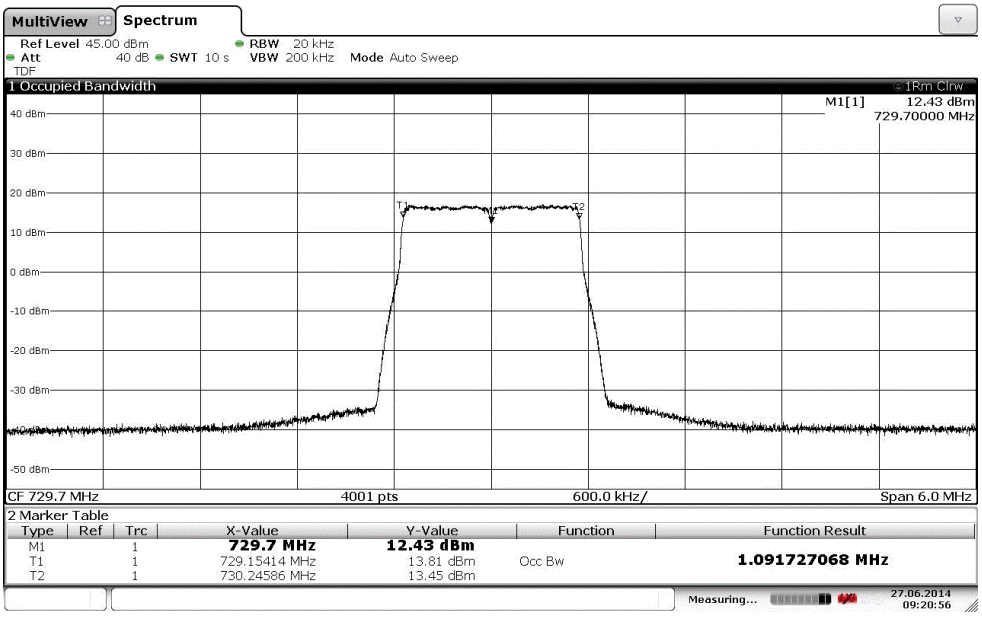


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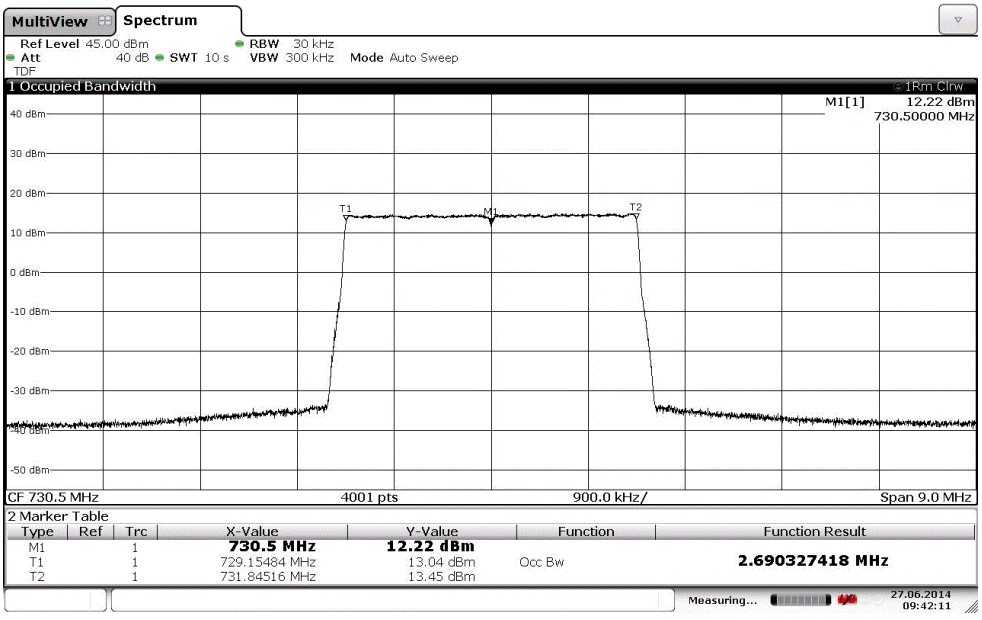
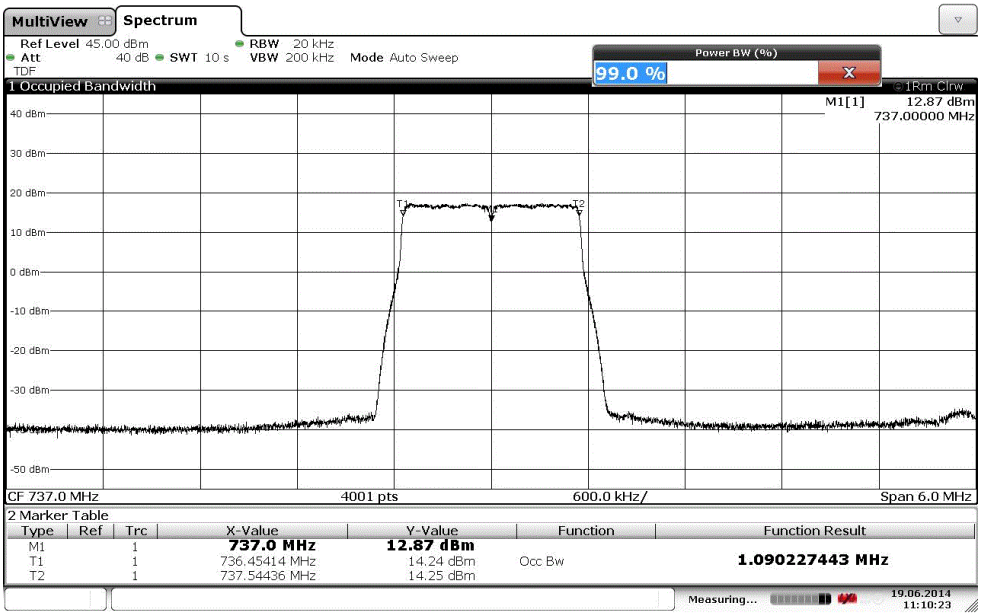
Diagram 14:



Date: 27.JUN.2014 09:42:11

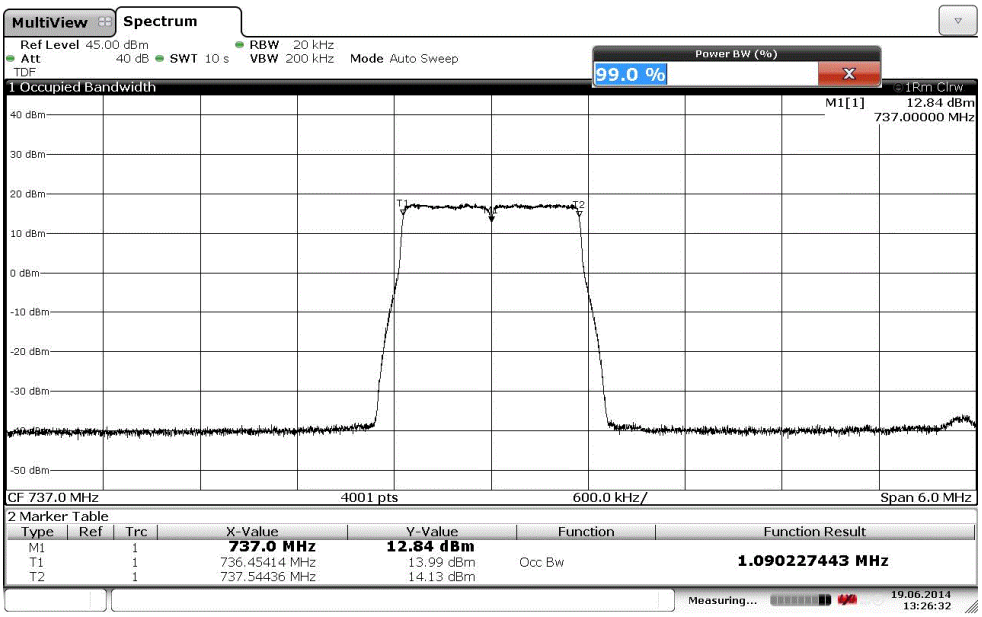
Appendix 4

Diagram 15:



Date: 19.JUN.2014 11:10:23

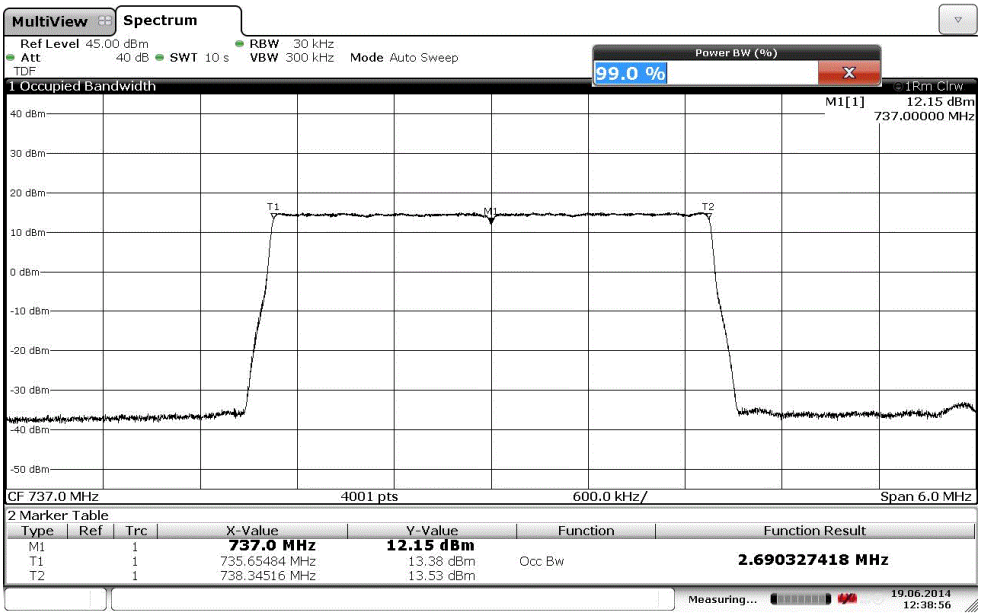
Diagram 16:



Date: 19.JUN.2014 13:26:32

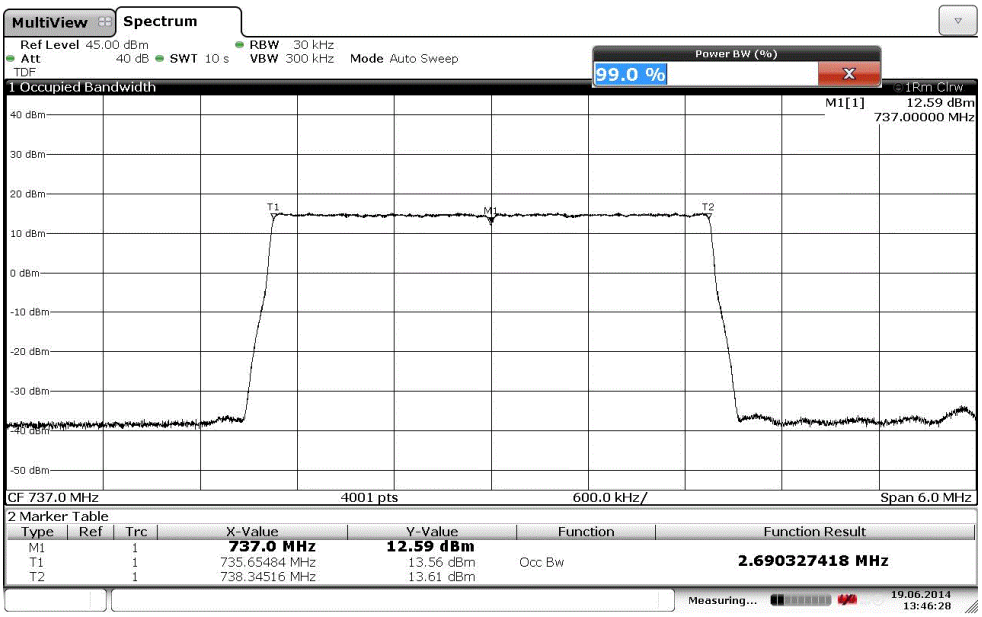
Appendix 4

Diagram 17:



Date: 19.JUN.2014 12:38:56

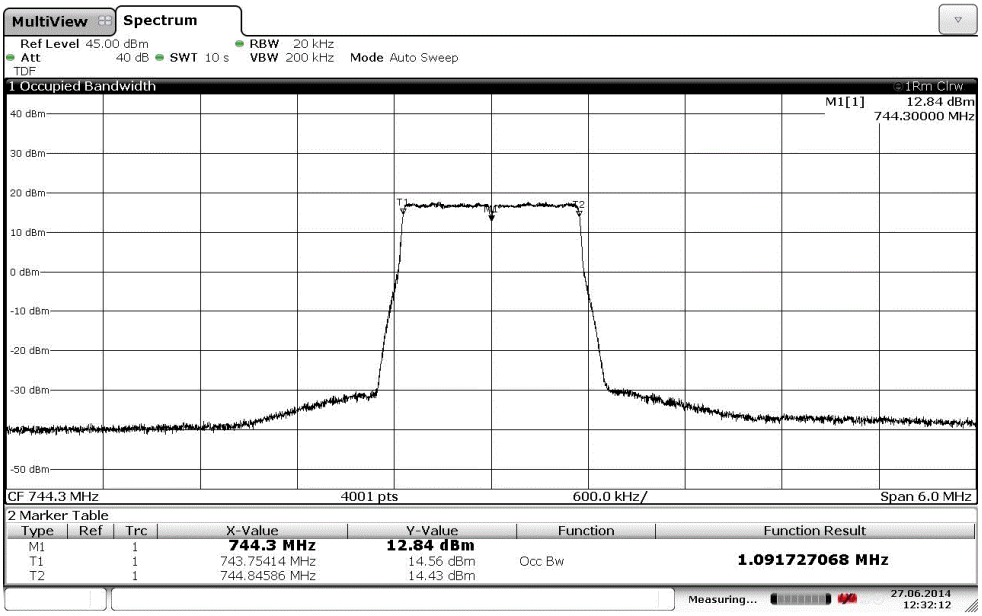
Diagram 18:



Date: 19.JUN.2014 13:46:27

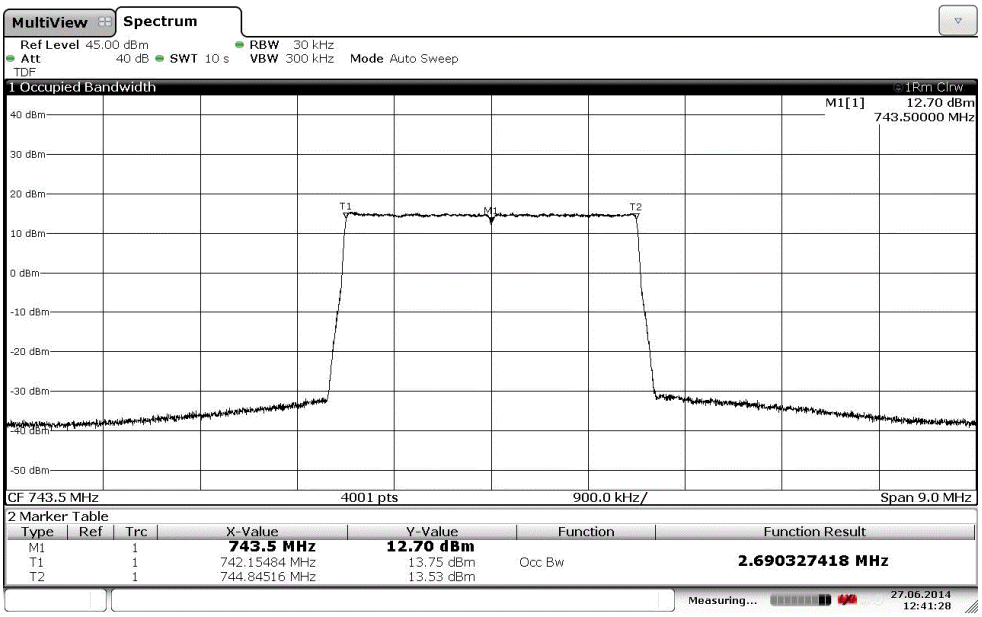
Appendix 4

Diagram 19:



Date: 27.JUN.2014 12:32:12

Diagram 20:



Date: 27.JUN.2014 12:41:28

Appendix 5

Band edge measurements according to CFR 47 2.1051 / RSS-130 4.6

Date	Temperature	Humidity
2014-06-10 to 2014-06-27	19°C to 24°C ± 3°C	28% to 60% ± 5 %

Test set-up and procedure

The measurements were made per definition in CFR 47 §27.53 The test object 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 (f). The FCC rules, specifying a RBW of at least 30k up to 100 kHz away from the band edges and a RBW of 100 kHz for measurements of emissions more than 100 kHz away from the band edges.

A resolution bandwidth of 100 kHz was used at the band edges up to 10 MHz from the band edges

Before comparing the results to the limit, 3 dB [10 log (2)] should be added according to method 2 “measure and add 10 log(N_{ANT})” of FCC KDB662911 D01 Multiple Transmitter Output v01r02

Measurement equipment	SP number
R&S FSW 43	902 073
RF attenuator	900 691
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

Single carrier

Diagram	BW configuration	Tested frequency	Tested Port
1	5 MHz	B	RF A
2	5 MHz	B	RF B
3	10 MHz	B	RF A
4	15 MHz	B	RF A
5	15 MHz	B	RF B
6	5 MHz	T	RF A
7	5 MHz	T	RF B
8	10 MHz	T	RF A
9	15 MHz	T	RF A
10	15 MHz	T	RF B

Multi carrier

Diagram	BW configuration	Testedfrequency	Tested Port
11	5 and 1.4 MHz	B2_1	RF A
12	5 and 3 MHz	B2_2	RF A
13	5 and 3 MHz	B2_2	RF B
14 a+b	1.4 and 5 MHz	B2_5	RF A
15 a+b	3 and 5 MHz	B2_6	RF A
16	3 and 5 MHz	T2_2	RF A
17	3 and 5 MHz	T2_2	RF B
18 a+b	5 and 1.4 MHz	T2_5	RF A
19 a+b	5 and 3 MHz	T2_6	RF A
20	5+3+3+5 MHz	B4	RF A
21	5+3+3+5 MHz	B4	RF B

Limits

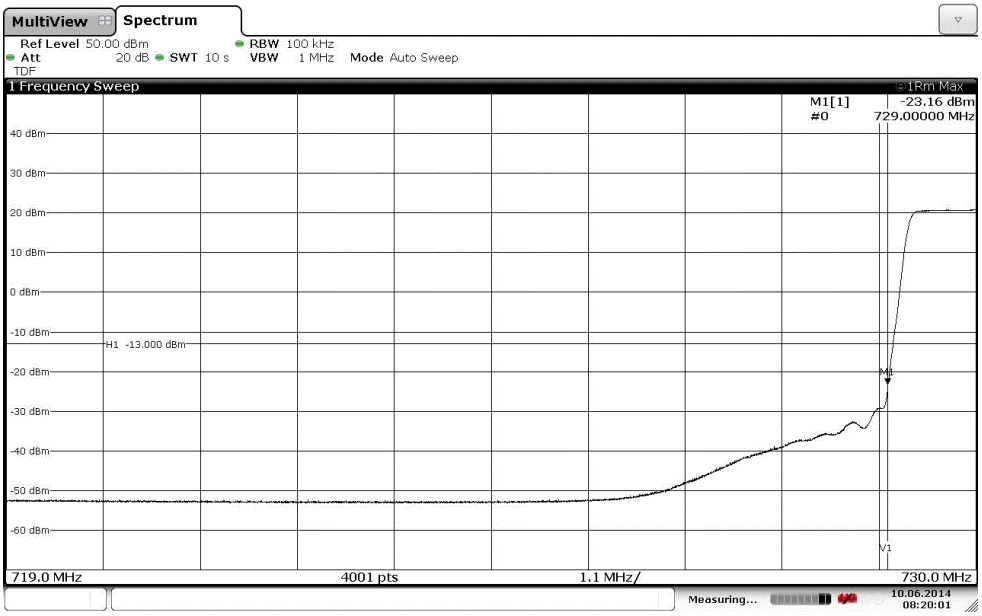
CFR 47 § 27.53 (f) and RSS-130 4.6:

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

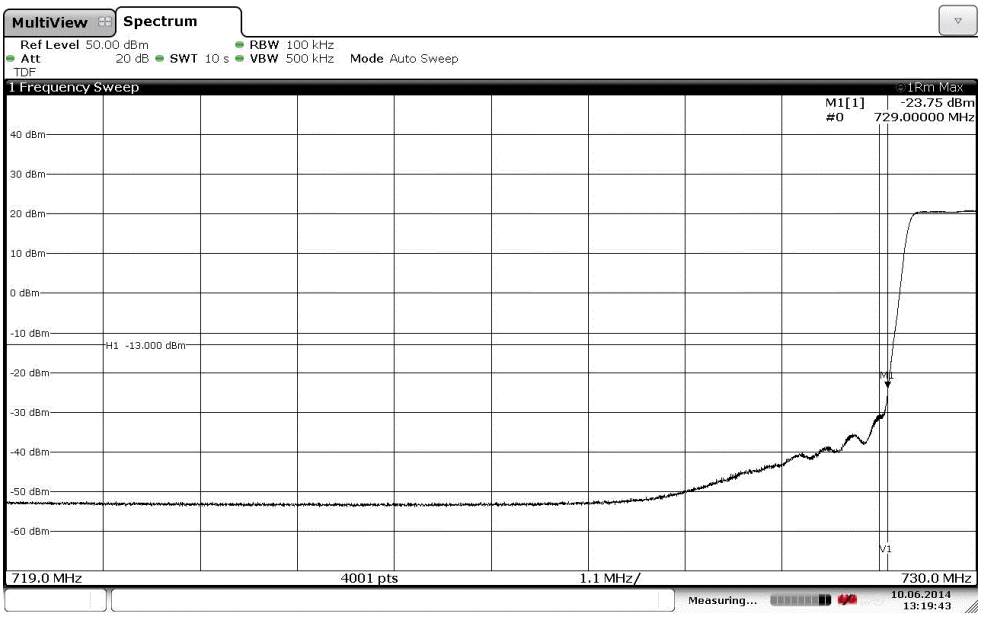
Appendix 5

Diagram 1:



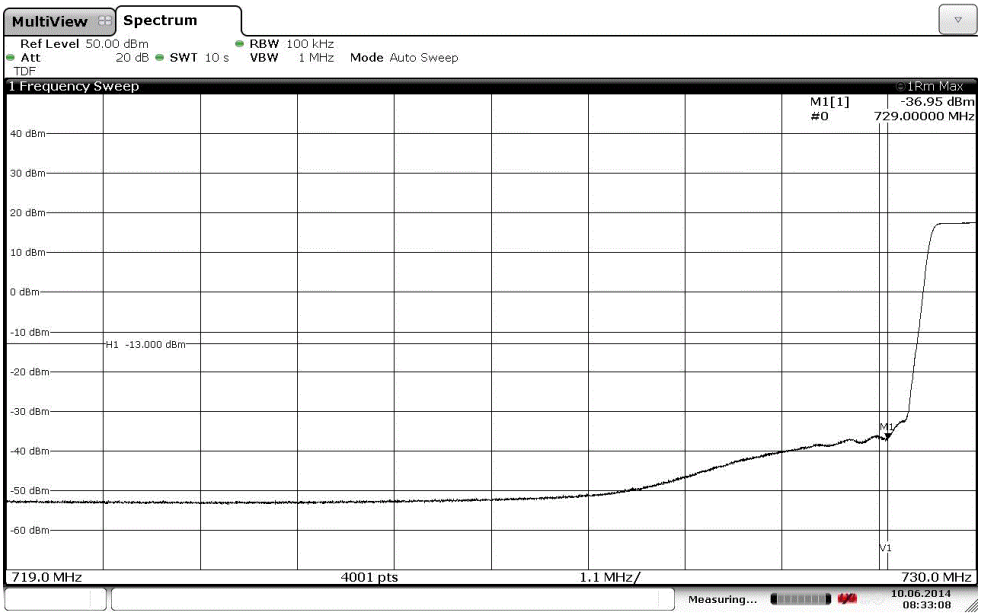
Date: 10.JUN.2014 08:20:01

Diagram 2:



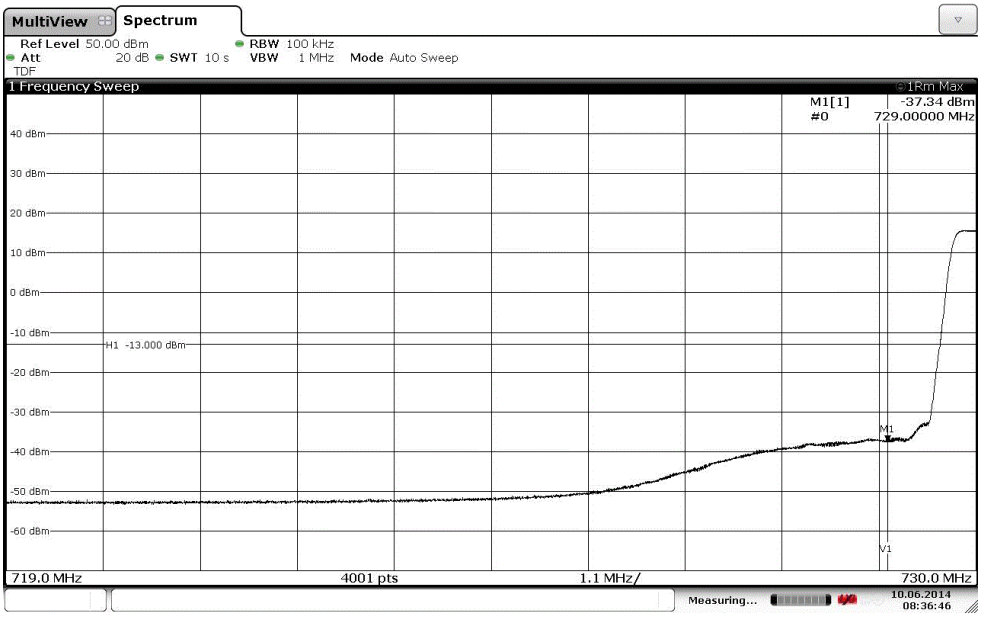
Date: 10.JUN.2014 13:19:43

Diagram 3:



Date: 10.JUN.2014 08:33:09

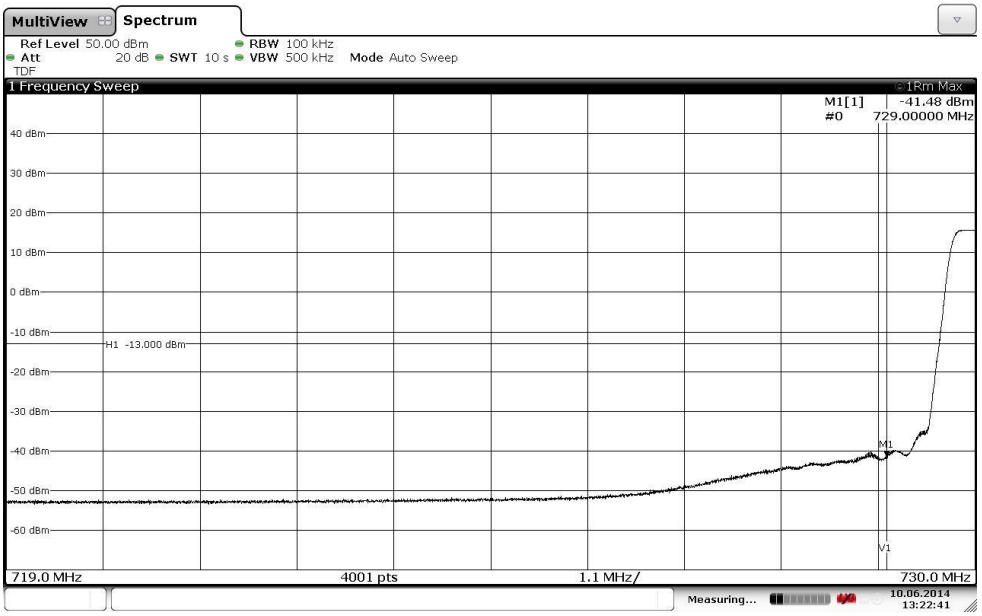
Diagram 4:



Date: 10.JUN.2014 08:36:47

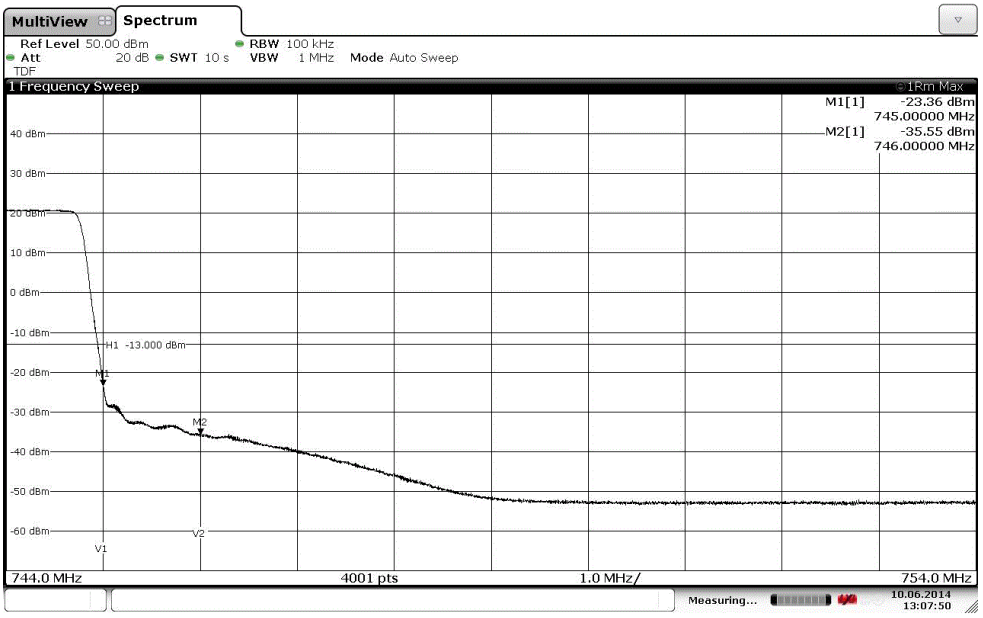
Appendix 5

Diagram 5:



Date: 10.JUN.2014 13:22:41

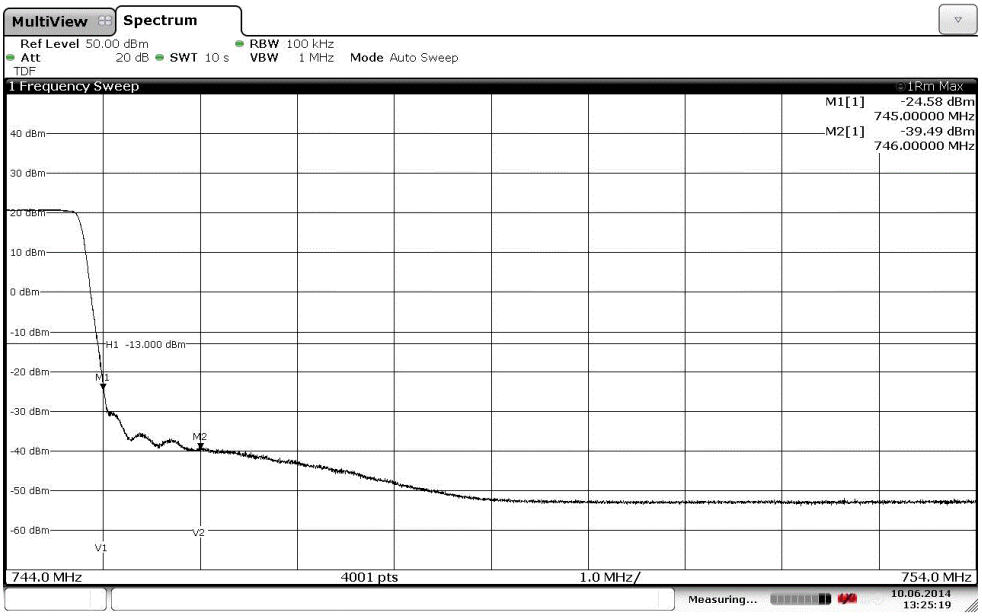
Diagram 6:



Date: 10.JUN.2014 13:07:49

Appendix 5

Diagram 7:



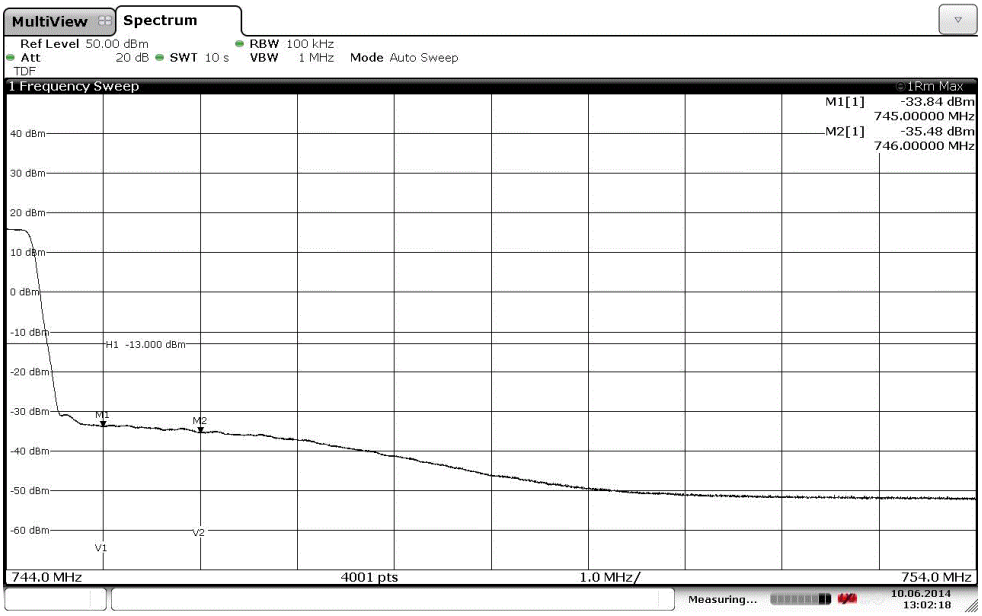
Date: 10.JUN.2014 13:25:18

Diagram 8:

Date: 10.JUN.2014 13:11:24

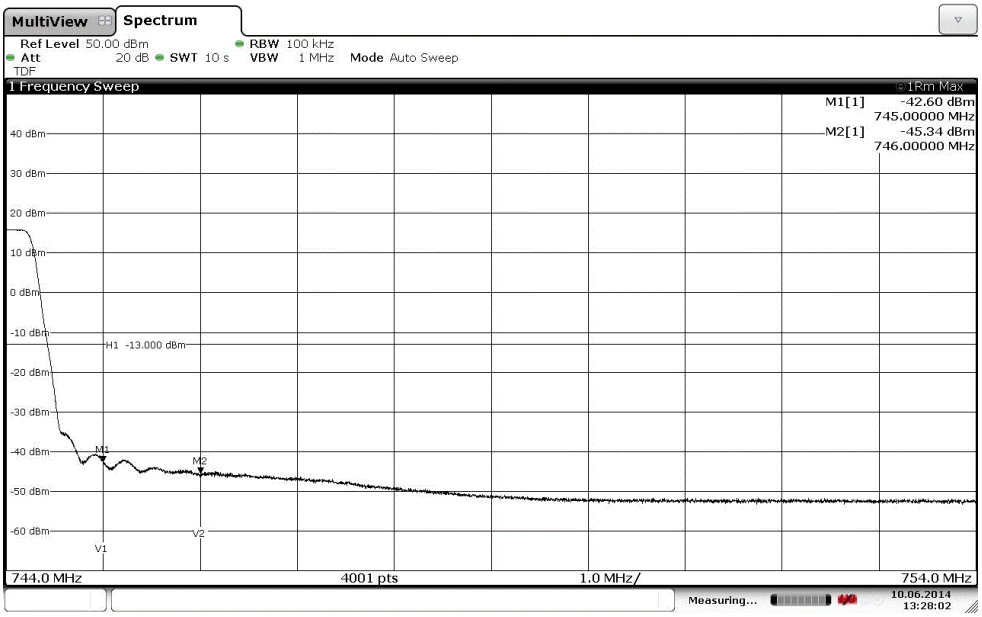
Appendix 5

Diagram 9:



Date: 10.JUN.2014 13:02:18

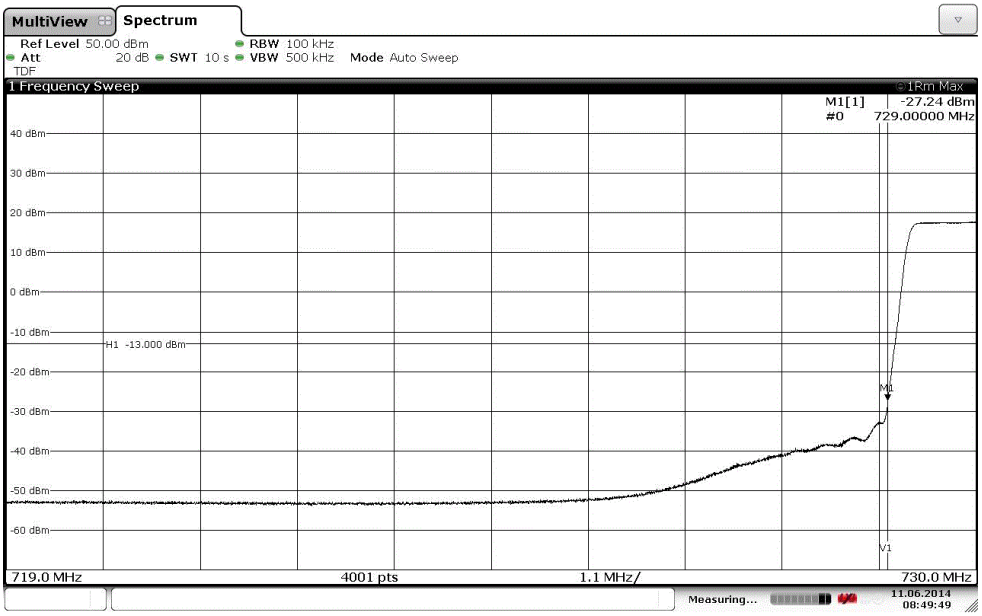
Diagram 10:



Date: 10.JUN.2014 13:28:02

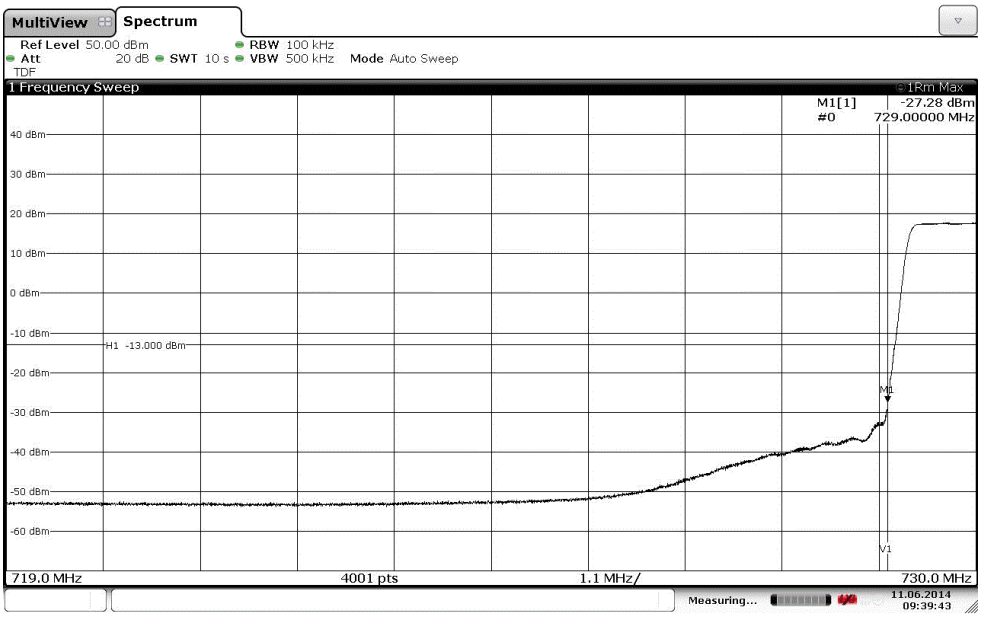
Appendix 5

Diagram 11:



Date: 11.JUN.2014 08:49:48

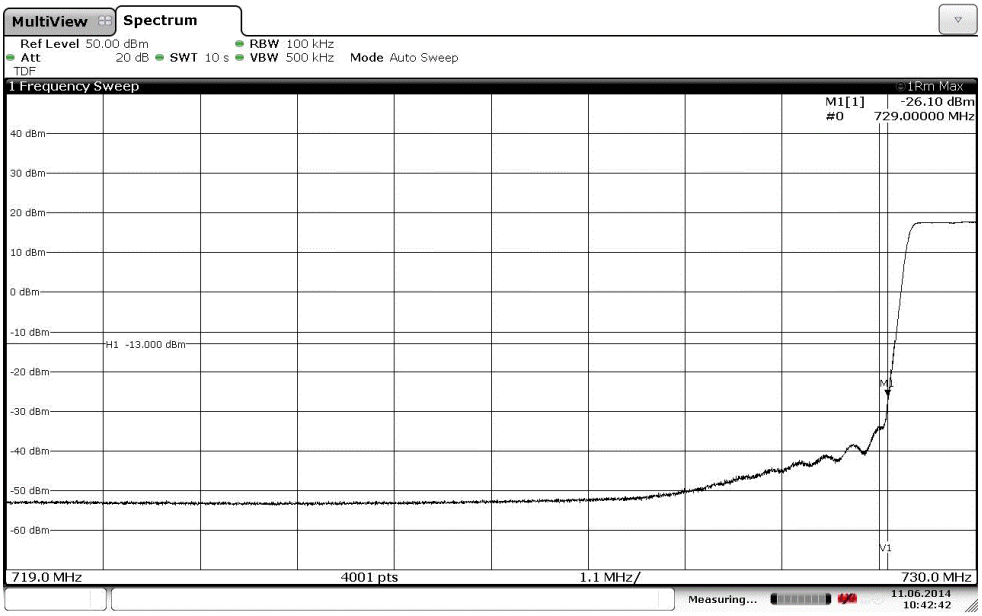
Diagram 12:



Date: 11.JUN.2014 09:39:42

Appendix 5

Diagram 13:



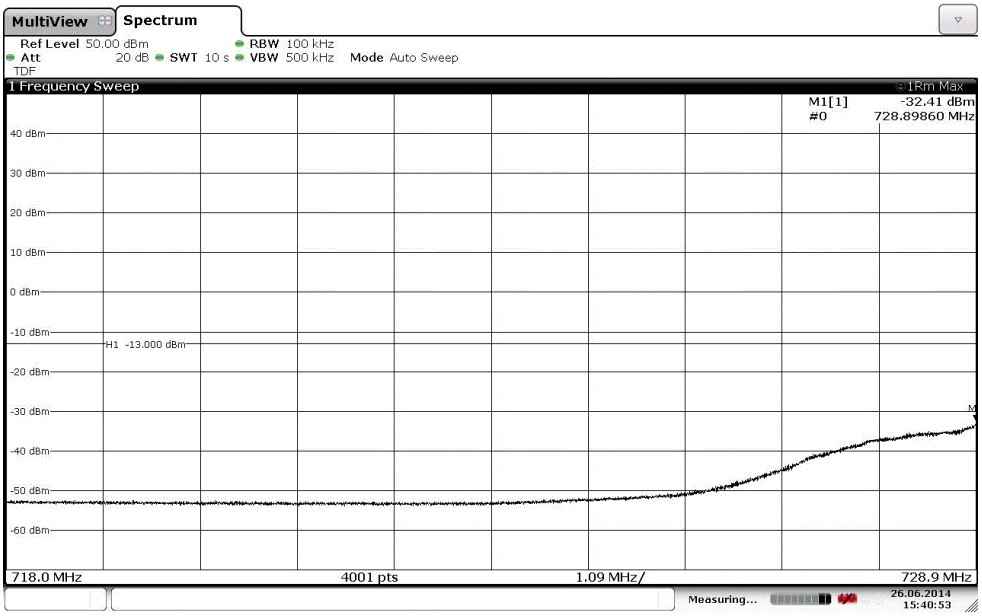
Date: 11.JUN.2014 10:42:42

Diagram 14a:

Date: 26.JUN.2014 14:59:19

Appendix 5

Diagram 14b:



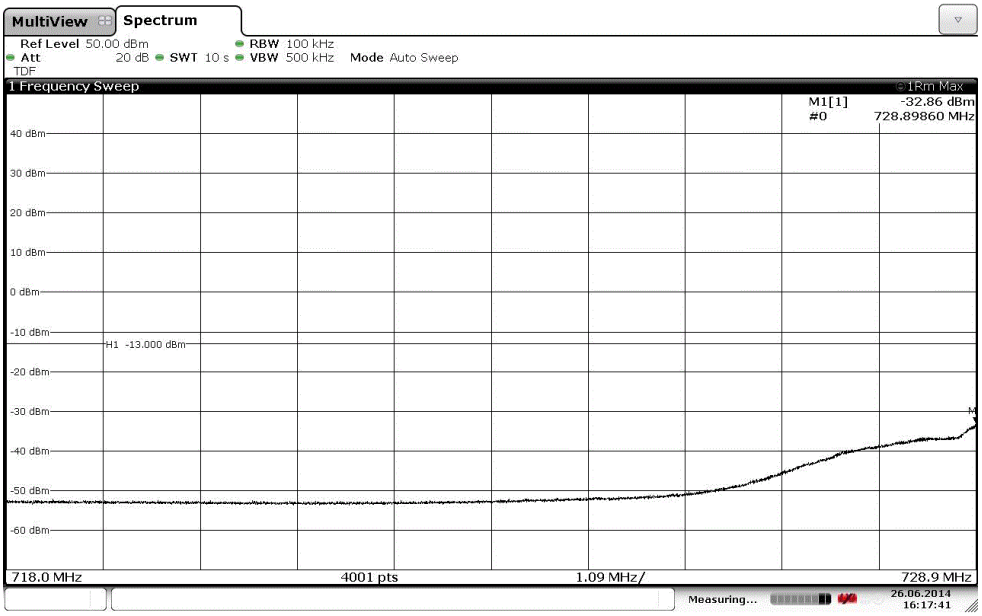
Date: 26.JUN.2014 15:40:53

Diagram 15a:

Date: 26.JUN.2014 16:16:07

Appendix 5

Diagram 15b:



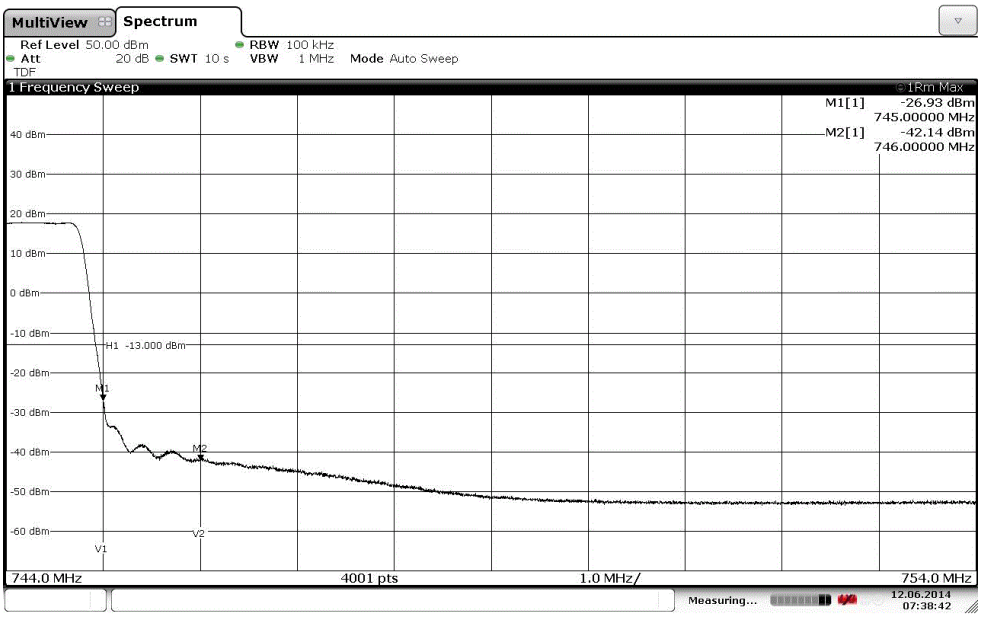
Date: 26.JUN.2014 16:17:41

Diagram 16:

Date: 12.JUN.2014 08:04:01

Appendix 5

Diagram 17:



Date: 12.JUN.2014 07:38:42

Appendix 5

Diagram 18a:

Date: 27.JUN.2014 06:58:41

Diagram 18b:

Date: 27.JUN.2014 07:03:51

Appendix 5

Diagram 19a:

Date: 27.JUN.2014 07:10:29

Diagram 19b:

Date: 27.JUN.2014 07:09:14

Appendix 5

Diagram 20:

Date: 12.JUN.2014 09:38:23

Diagram 21:

Date: 12.JUN.2014 09:54:00

Appendix 5

Conducted spurious emission measurements according to CFR 47 §27.53 and RSS-130 4.6

Date	Temperature	Humidity
2014-06-11 to 2014-06-27	19°C to 23°C ± 3°C	28% to 60 % ± 5%

Test set-up and procedure

The measurements were made per definition in §27.53. The output was connected to a spectrum analyzer with a RBW setting of 1 MHz and RMS detector activated. The spectrum analyzer was connected to an external 10 MHz reference standard during the measurements.

Before comparing the results to the limit, 3 dB [10 log (2)] should be added according to method 2 “measure and add 10 log(N_{ANT})” of FCC KDB662911 D01 Multiple Transmitter Output v02

Measurement equipment	SP number
R&S FSW 43	902 073
RF attenuator	900 691
RF filter	901501
Testo 635, temperature and humidity meter	504 203

Measurement uncertainty: 3.7 dB

Results

Single carrier

Diagram	BW configuration [MHz]	Tested frequency	Tested Port
1 a+b	5 MHz	B	RF A
2 a+b	15 MHz	B	RF A
3 a+b	5 MHz	M	RF A
4 a+b	5 MHz	M	RF B
5 a+b	10 MHz	M	RF A
6 a+b	15 MHz	M	RF A
7 a+b	5 MHz	T	RF A
8 a+b	15 MHz	T	RF A

Appendix 5

Multi carrier

Diagram	BW configuration	Tested frequency	Tested Port
9 a+b	5+1.4 MHz	B2_1	RF A
10 a+b	5+1.4 MHz	B2_1	RF B
11 a+b	5+3 MHz	B2_2	RF A
12 a+b	5+3 MHz	B2_2	RF B
13 a+b	1.4+5 MHz	B2_5	RF A
14 a+b	3+5 MHz	B2_6	RF A
15 a+b	1.4+5 MHz	M2_1	RF A
16 a+b	1.4+5 MHz	M2_1	RF B
17 a+b	3+5 MHz	M2_2	RF A
18 a+b	3+5 MHz	M2_2	RF B
19 a+b	3+5 MHz	T2_2	RF A
20 a+b	3+5 MHz	T2_2	RF B
21 a+b	5+1.4 MHz	T2_5	RF A
22 a+b	5+3 MHz	T2_6	RF A
23 a+b	5+3+3+5 MHz	B4	RF A
24 a+b	5+3+3+5 MHz	B4	RF B

Note: Measurements were limited to port RF A due to the measurement result in LTE single carrier MIMO mode that shows that the ports are electrical identical as declared by the client.

Remark

The emission at 9 kHz on the 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 fundamental frequency is 745 MHz. The measurements were made up to 8 GHz (10x745 MHz = 7.45 GHz).

Limits

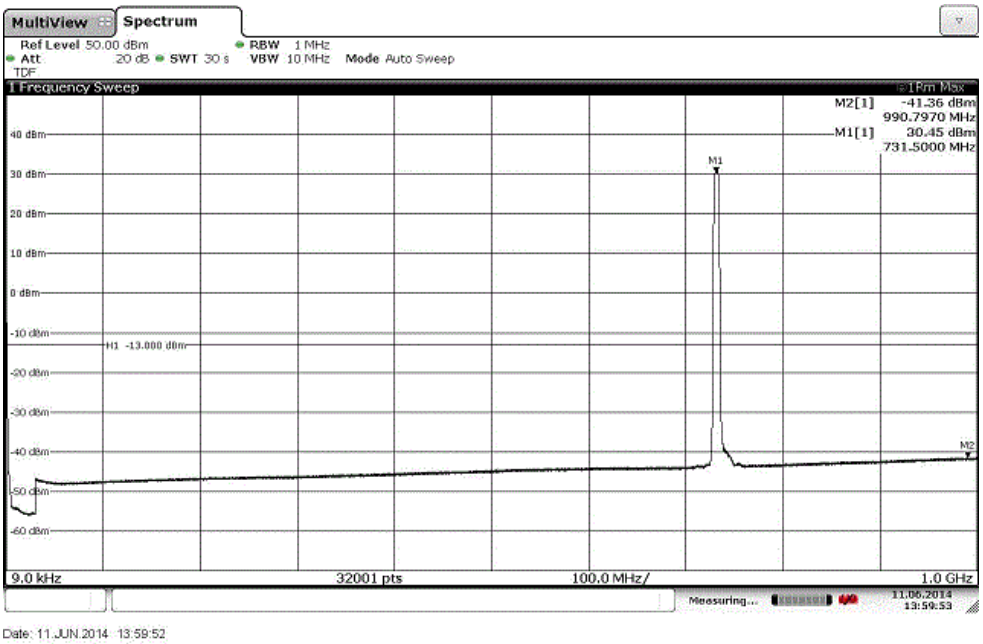
CFR 47 § 27.53 (f) and RSS-130 4.6:

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

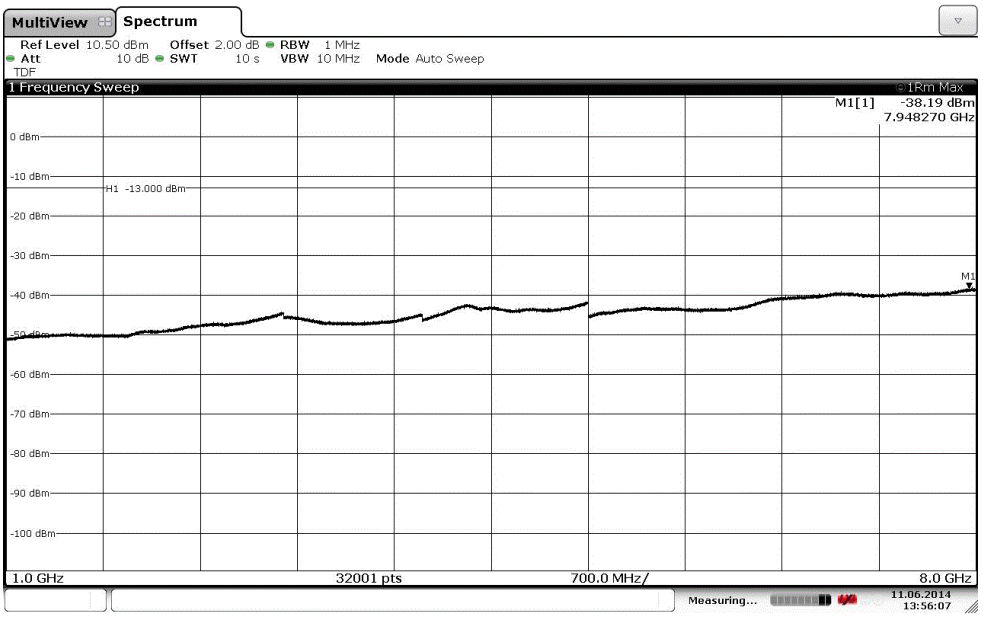
Appendix 5

Diagram 1a:



Date: 11.JUN.2014 13:59:52

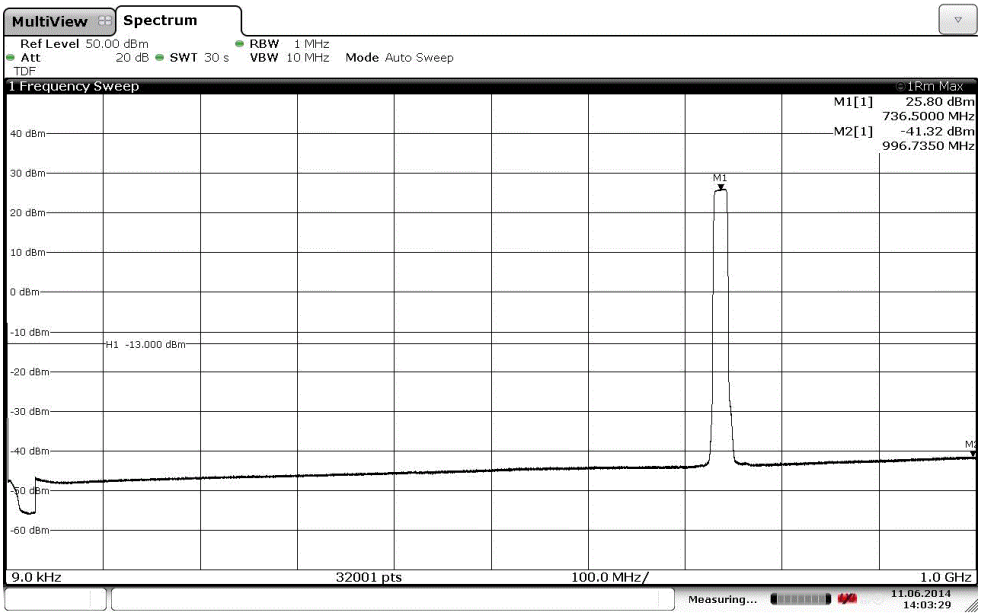
Diagram 1b:



Date: 11.JUN.2014 13:56:07

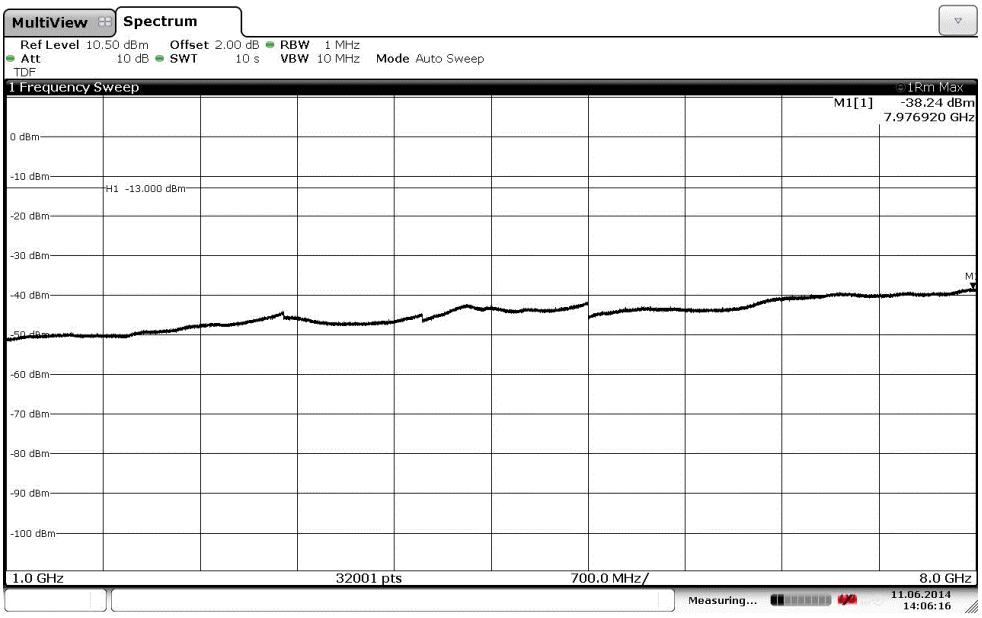
Appendix 5

Diagram 2a:



Date: 11.JUN.2014 14:03:28

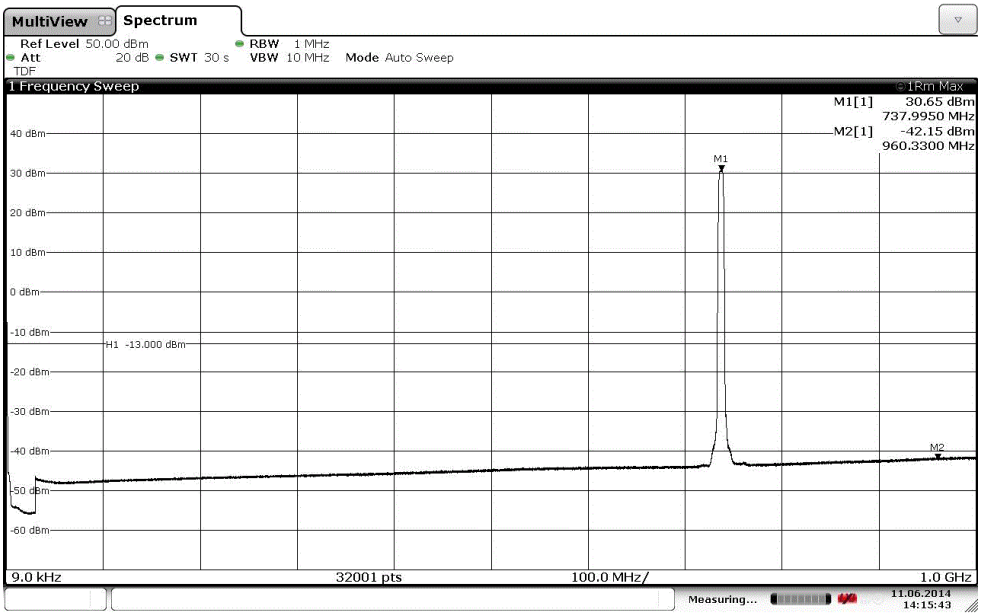
Diagram 2b:



Date: 11.JUN.2014 14:06:15

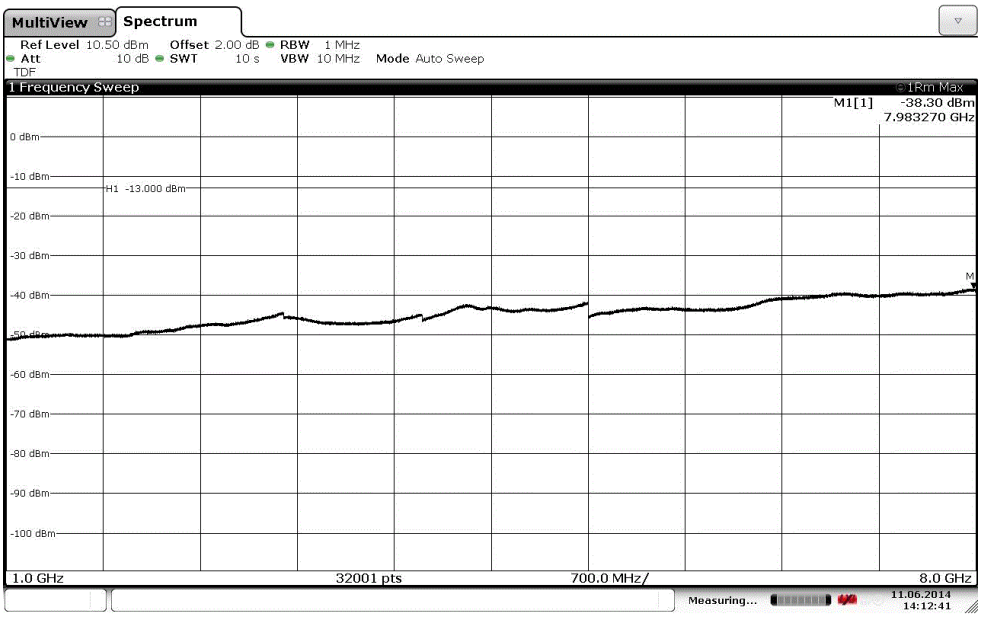
Appendix 5

Diagram 3a:



Date: 11.JUN.2014 14:15:43

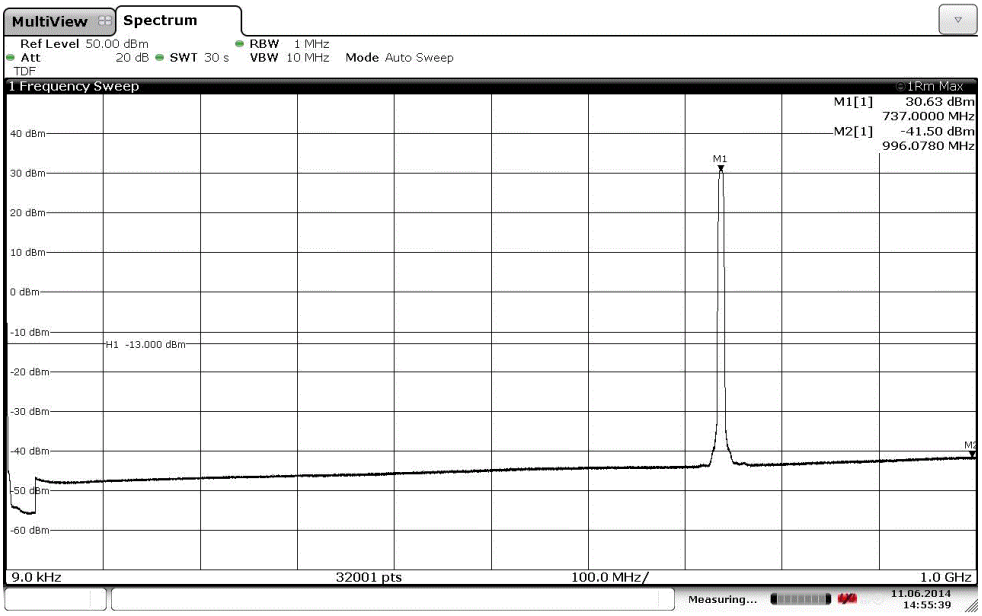
Diagram 3b:



Date: 11.JUN.2014 14:12:41

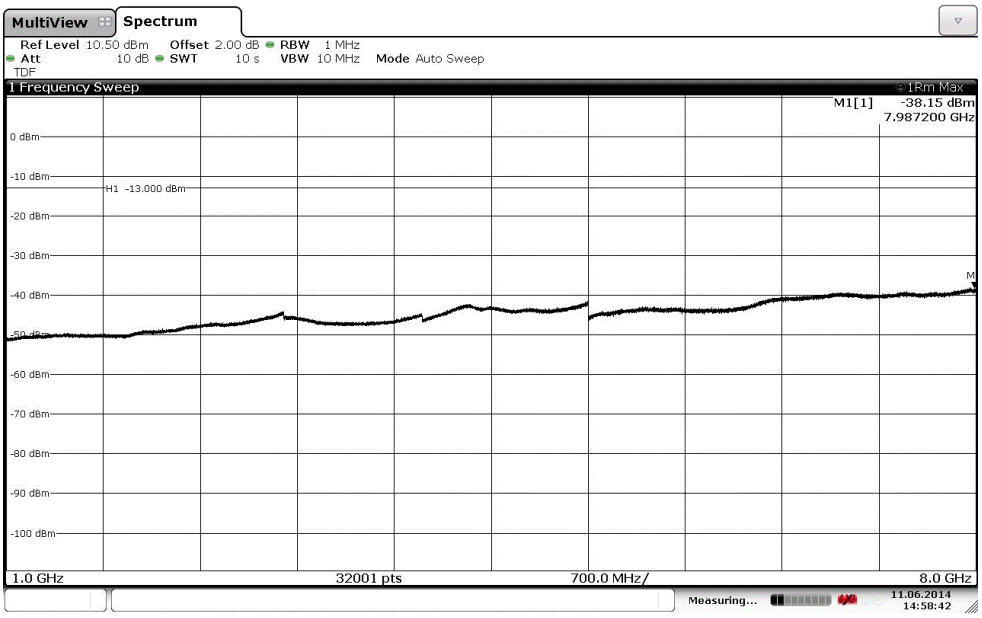
Appendix 5

Diagram 4a:



Date: 11.JUN.2014 14:55:39

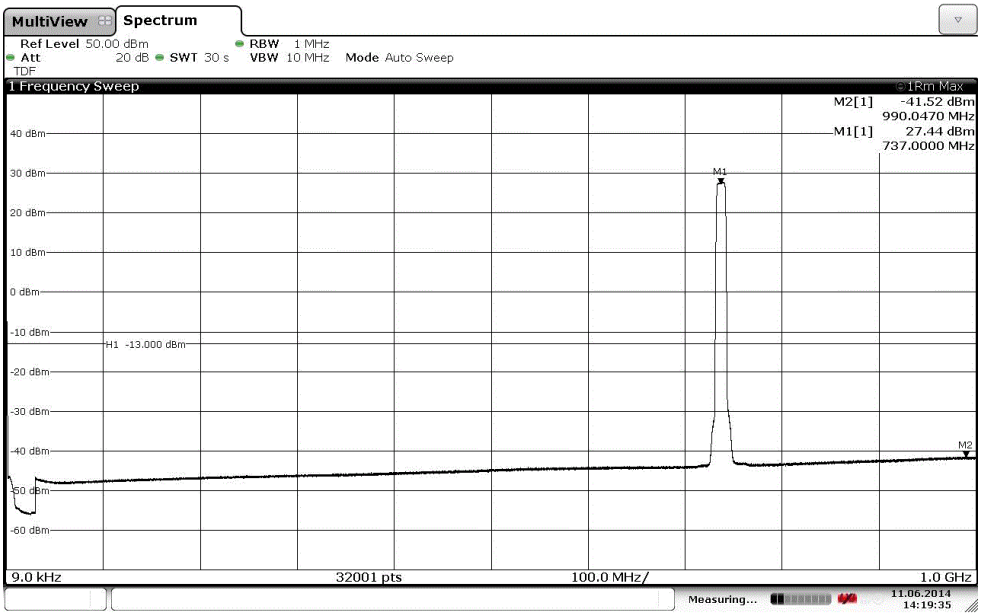
Diagram 4b:



Date: 11.JUN.2014 14:58:42

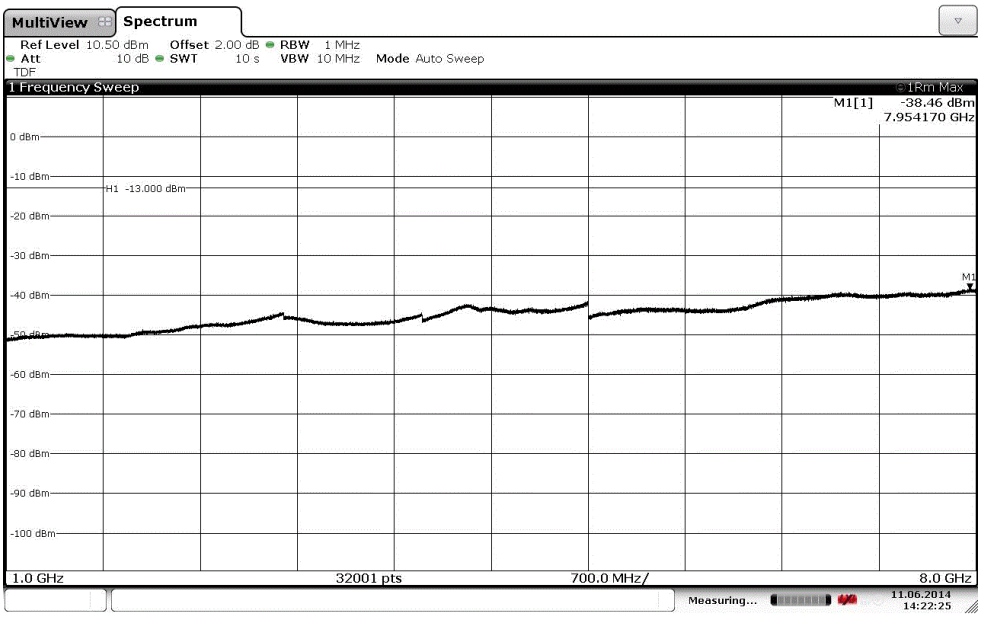
Appendix 5

Diagram 5a:



Date: 11.JUN.2014 14:19:35

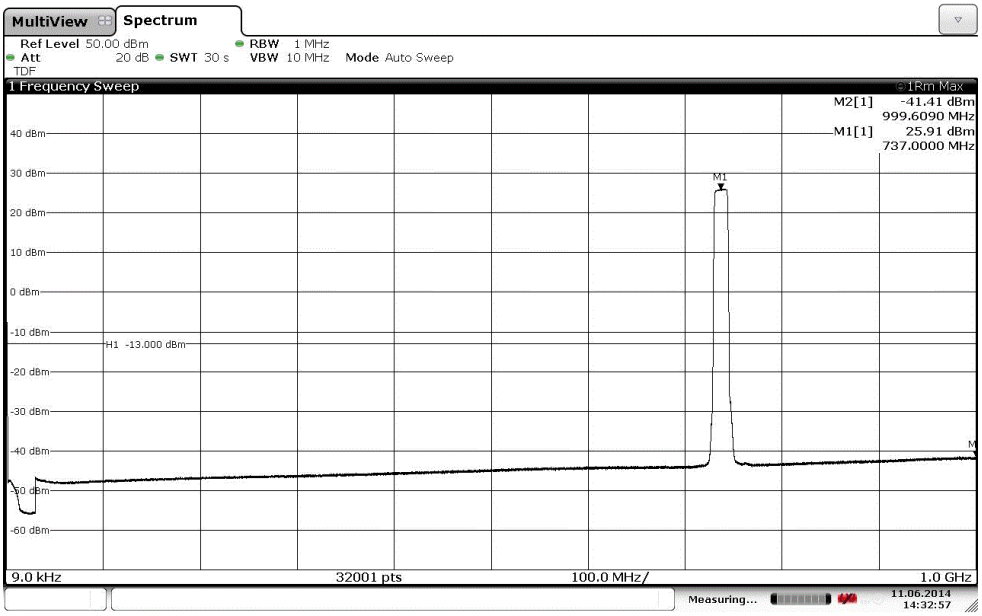
Diagram 5b:



Date: 11.JUN.2014 14:22:25

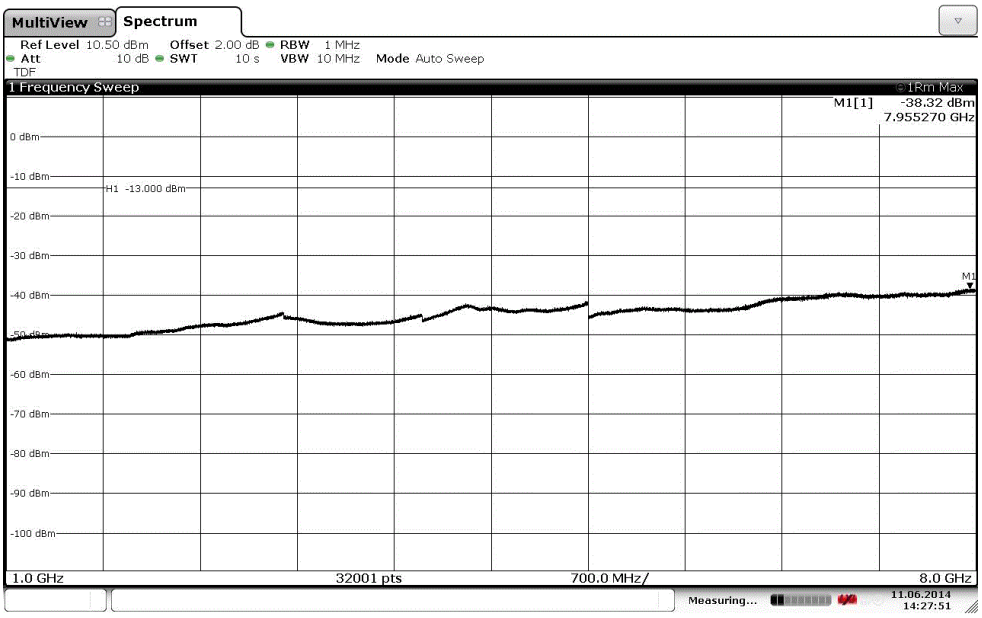
Appendix 5

Diagram 6a:



Date: 11.JUN.2014 14:32:58

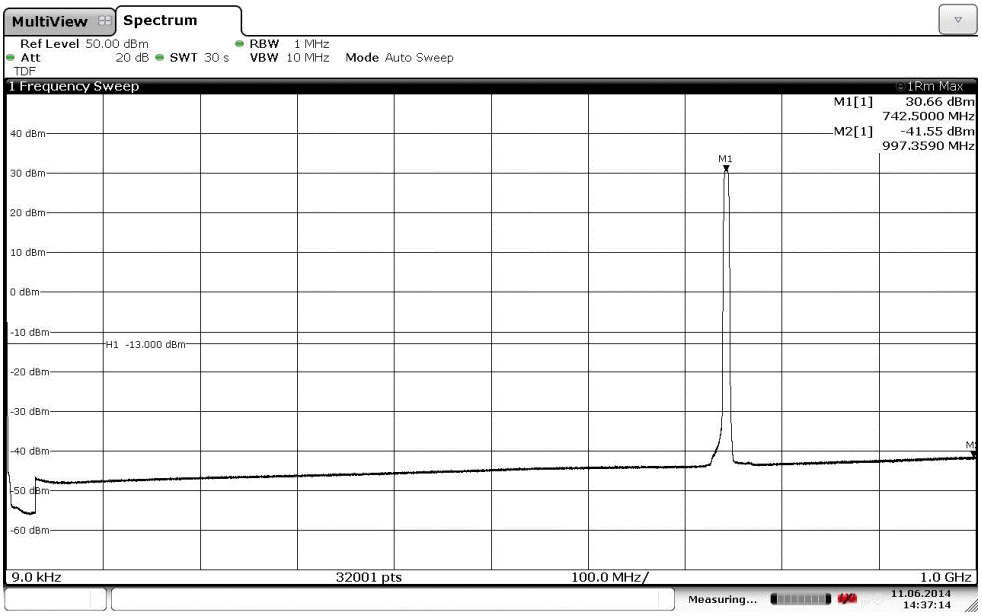
Diagram 6b:



Date: 11.JUN.2014 14:27:51

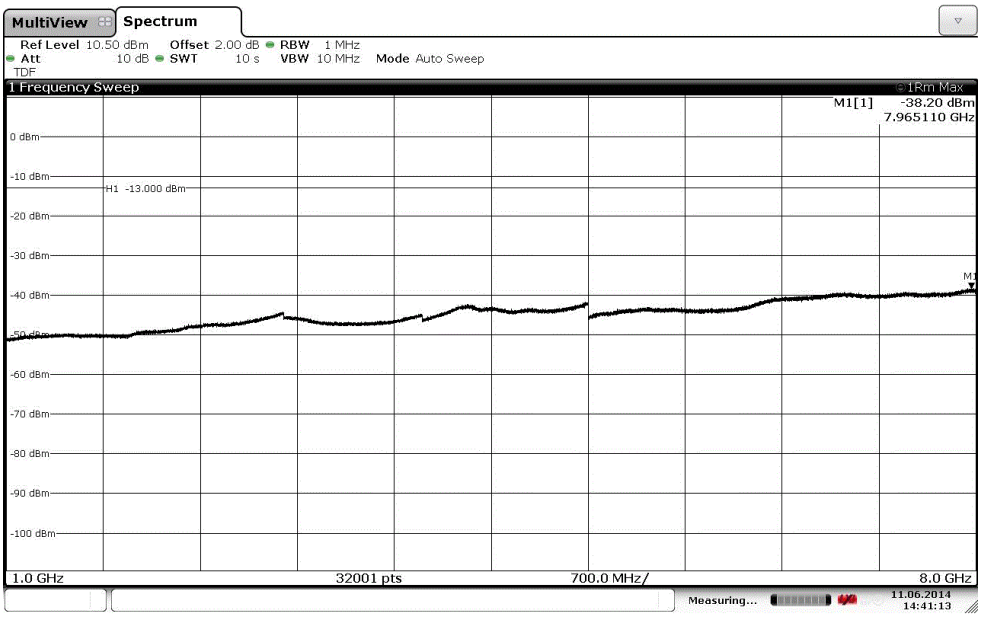
Appendix 5

Diagram 7a:



Date: 11.JUN.2014 14:37:13

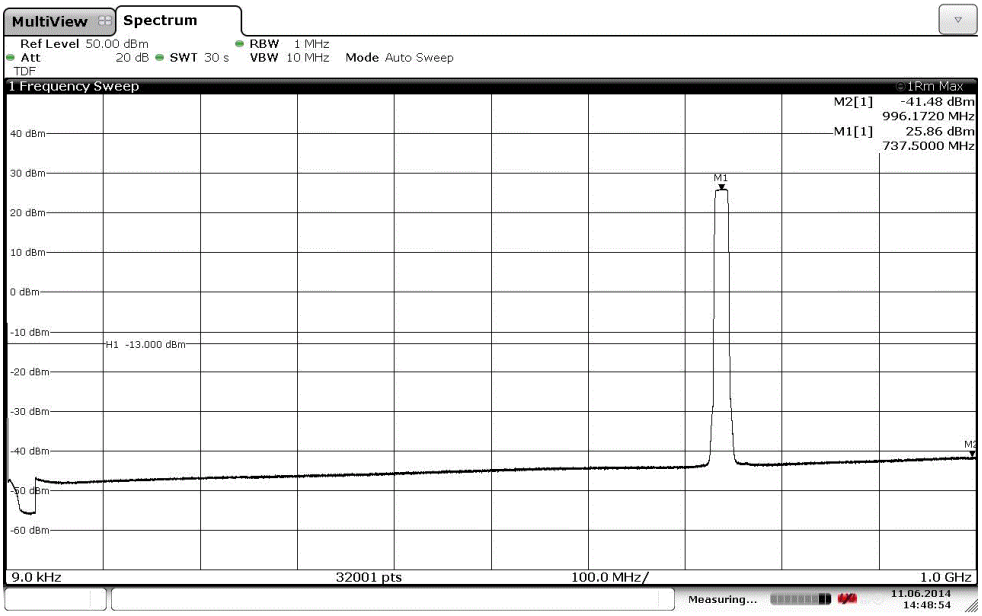
Diagram 7b:



Date: 11.JUN.2014 14:41:13

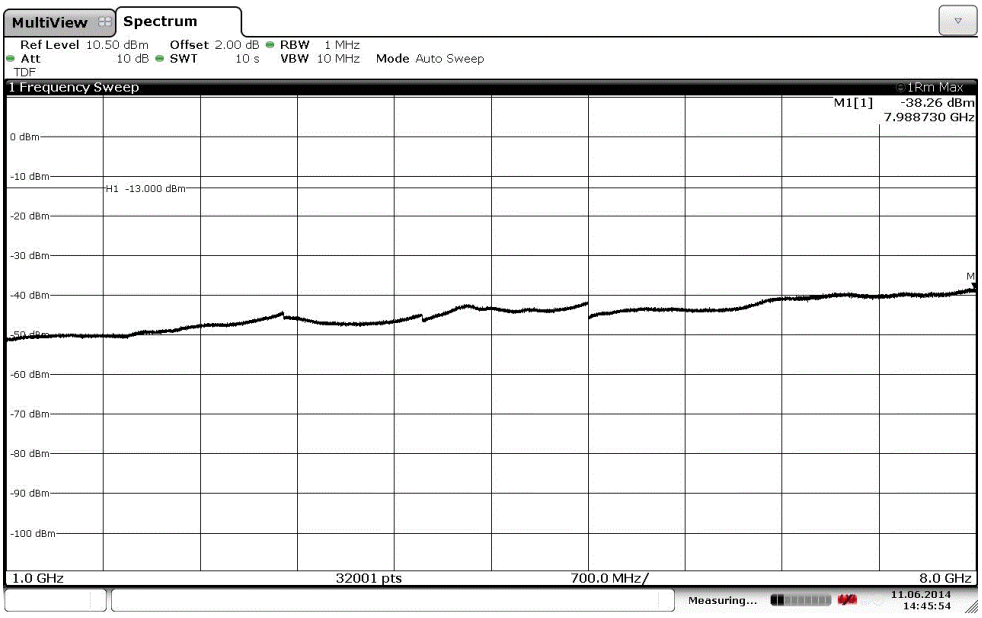
Appendix 5

Diagram 8a:



Date: 11.JUN.2014 14:48:54

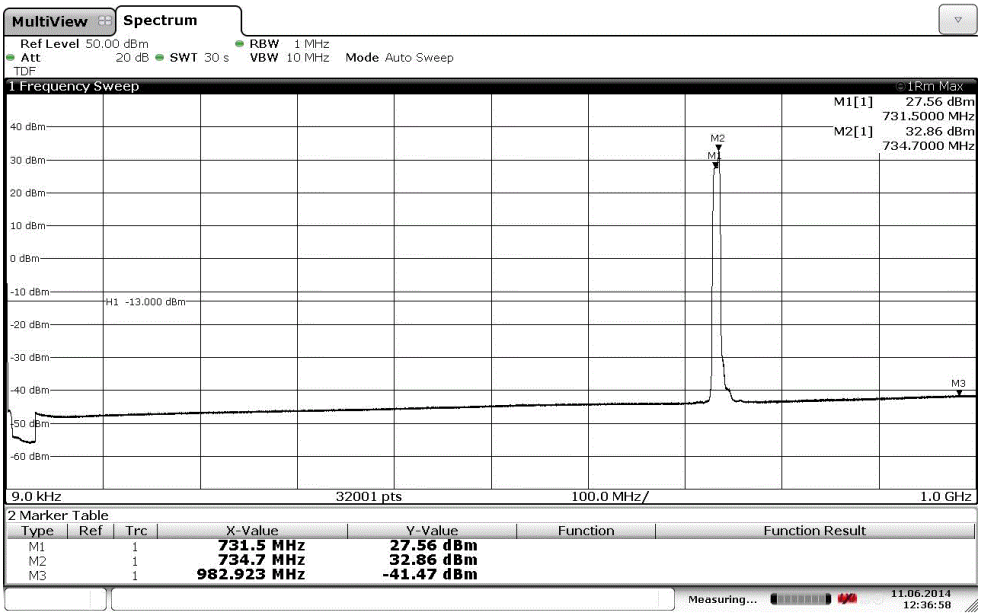
Diagram 8b:



Date: 11.JUN.2014 14:45:54

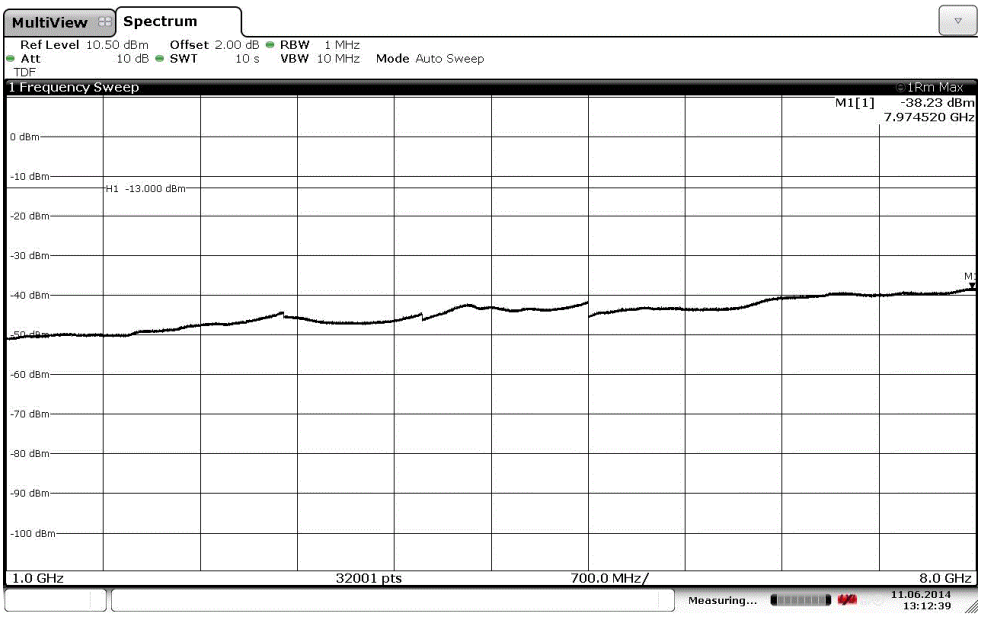
Appendix 5

Diagram 9a:



Date: 11.JUN.2014 12:36:57

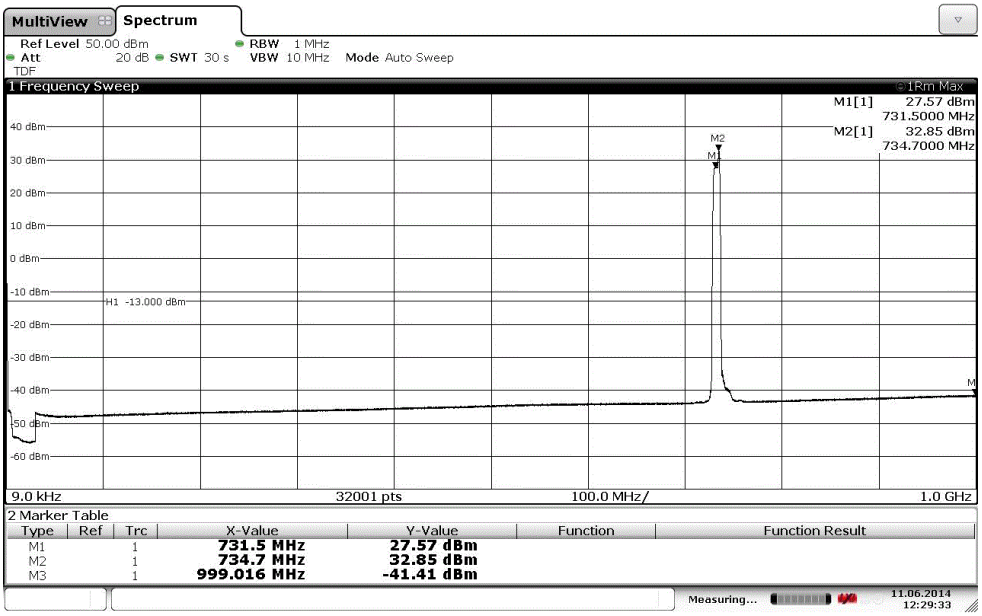
Diagram 9b:



Date: 11.JUN.2014 13:12:38

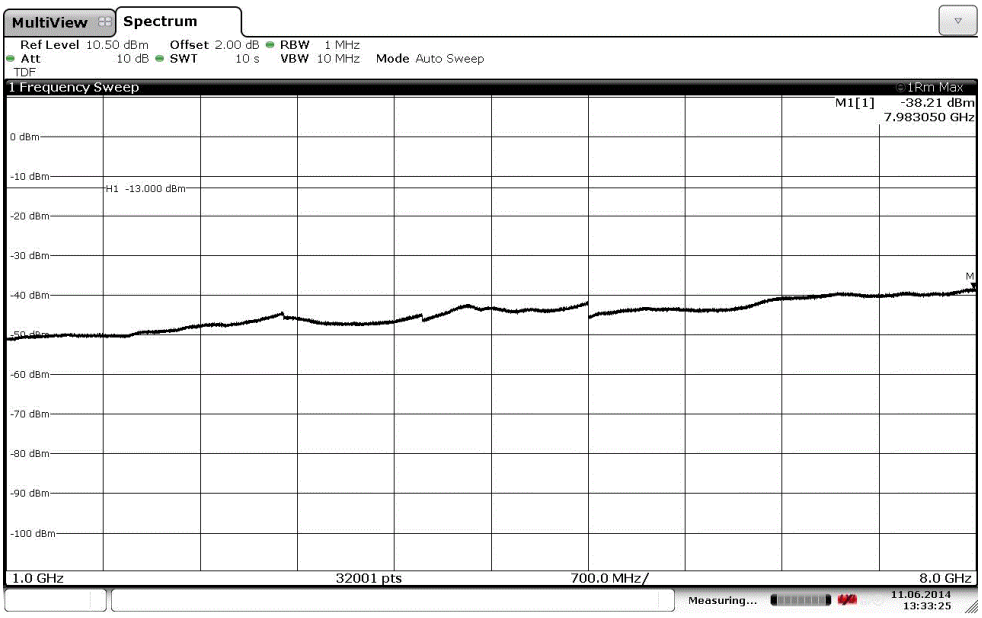
Appendix 5

Diagram 10a:



Date: 11.JUN.2014 12:29:33

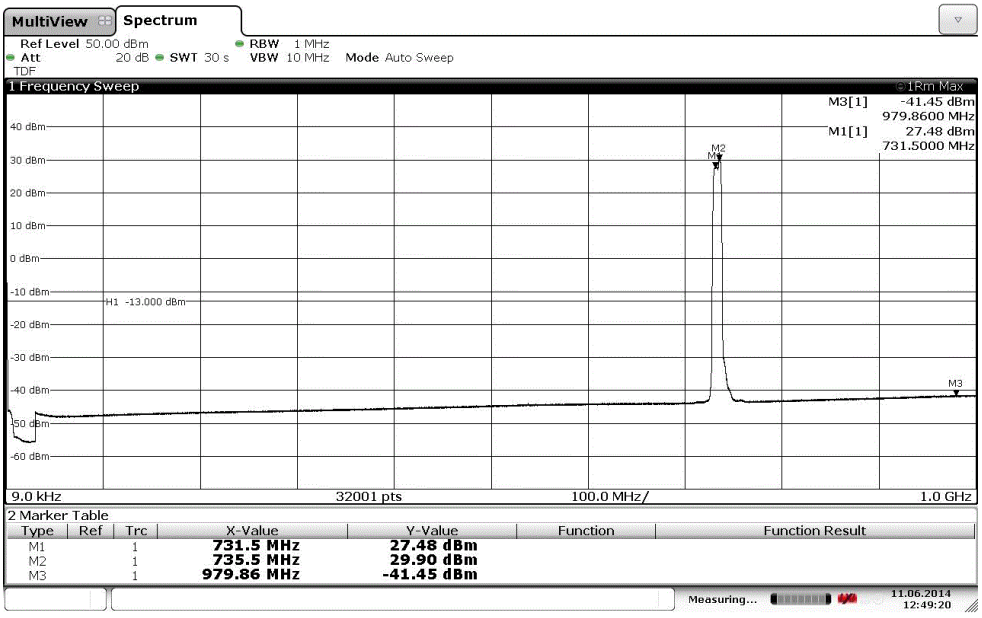
Diagram 10b:



Date: 11.JUN.2014 13:33:24

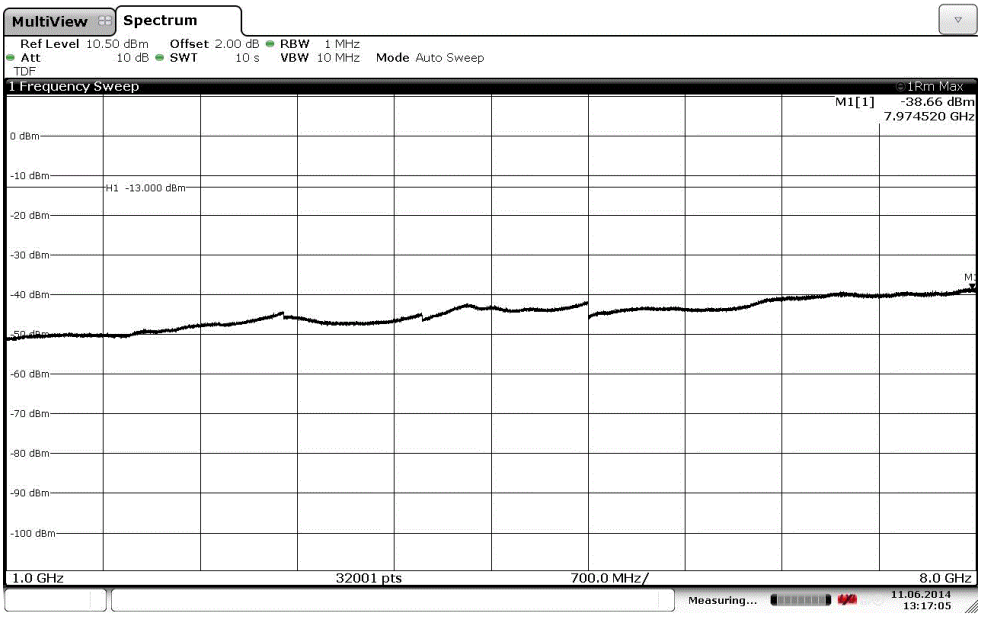
Appendix 5

Diagram 11a:



Date: 11.JUN.2014 12:49:20

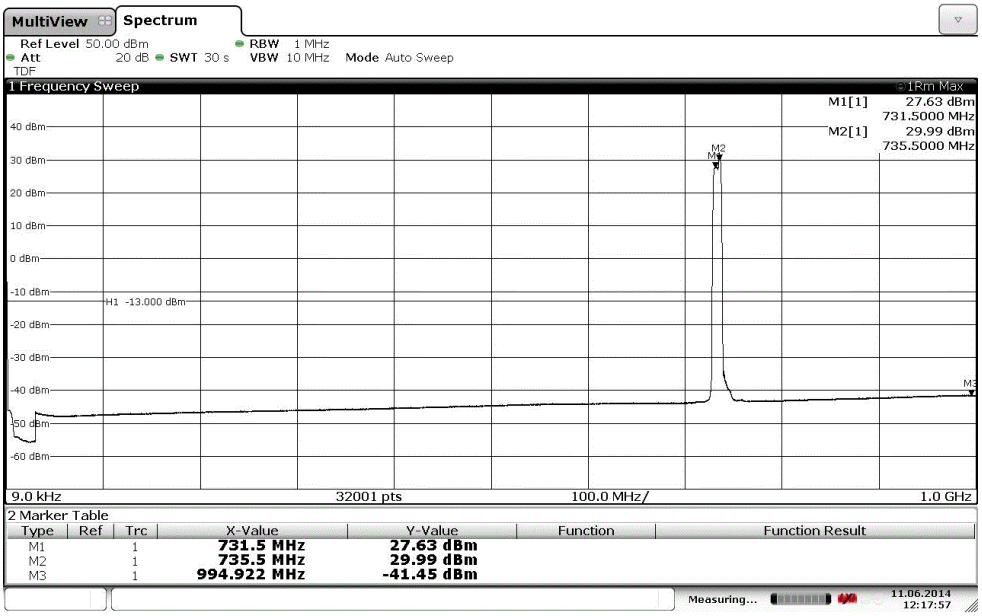
Diagram 11b:



Date: 11.JUN.2014 13:17:06

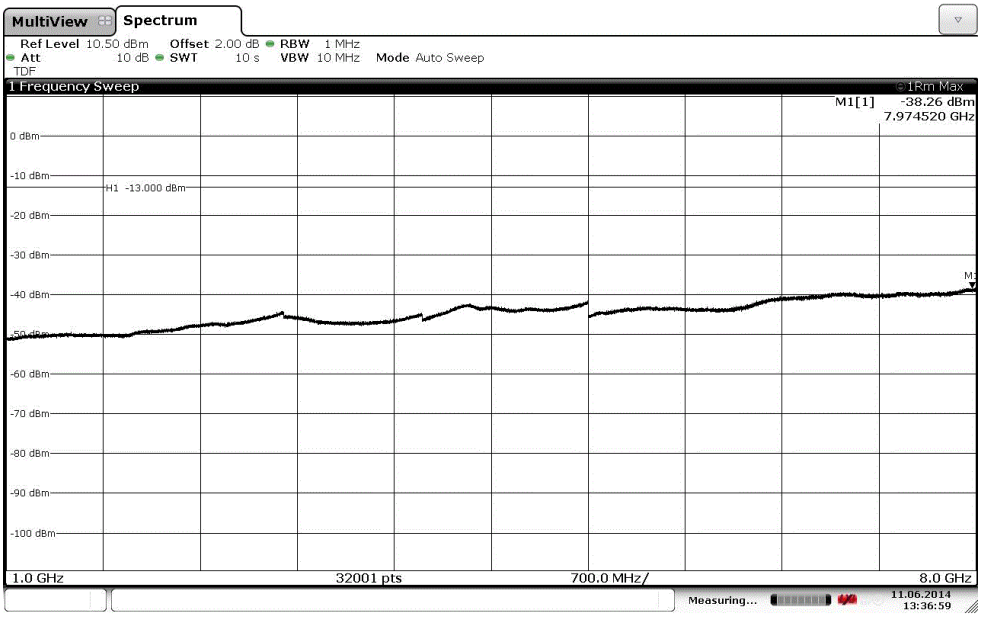
Appendix 5

Diagram 12a:



Date: 11.JUN.2014 12:17:57

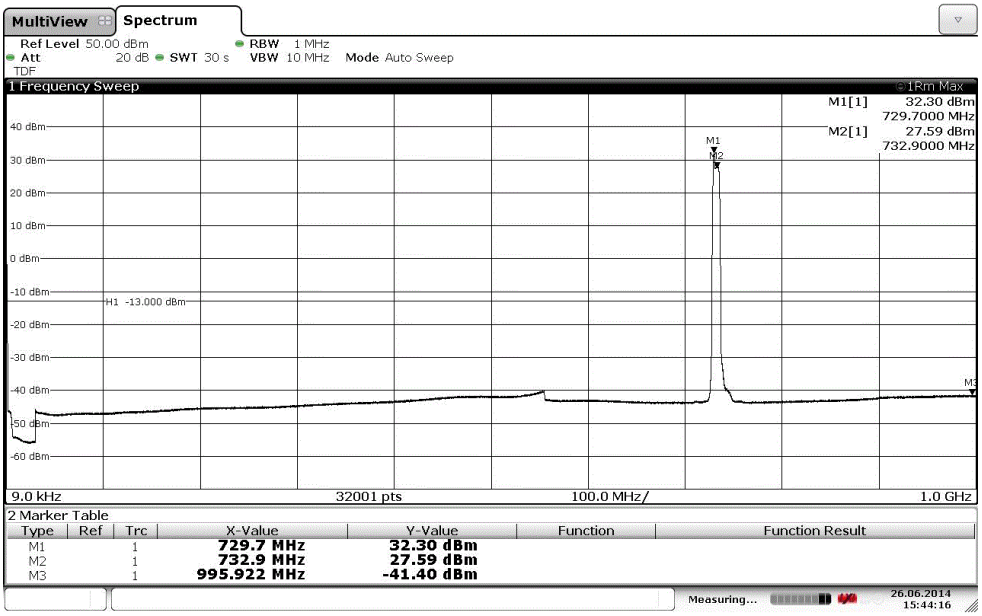
Diagram 12b:



Date: 11.JUN.2014 13:36:58

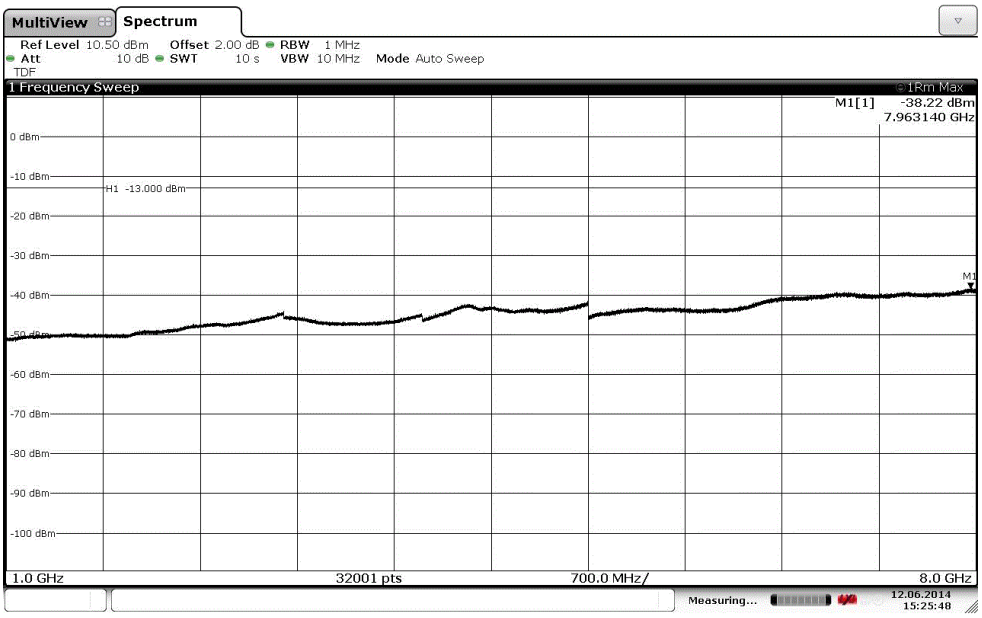
Appendix 5

Diagram 13a:



Date: 26.JUN.2014 15:44:16

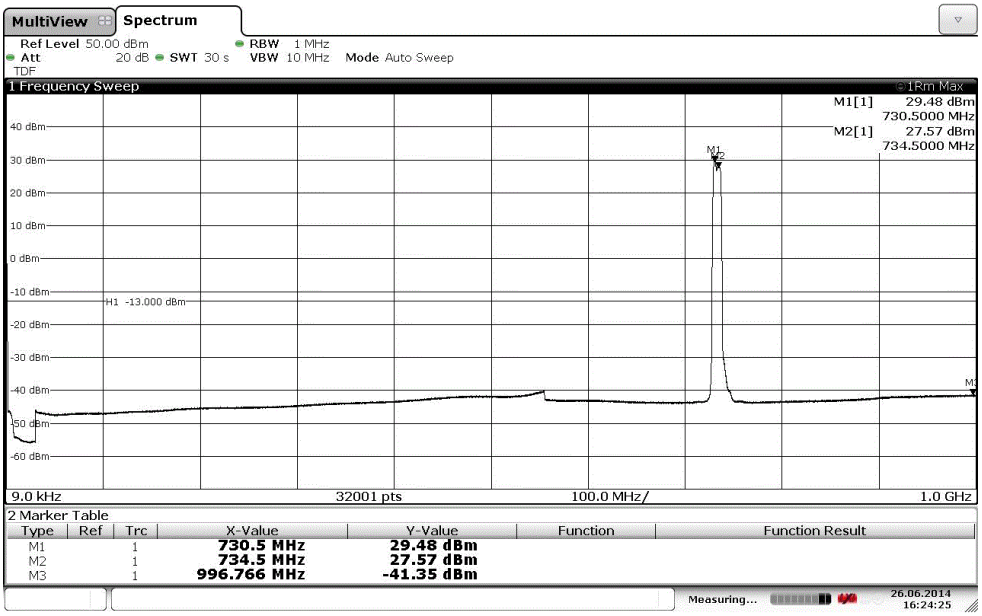
Diagram 13b:



Date: 12.JUN.2014 15:25:48

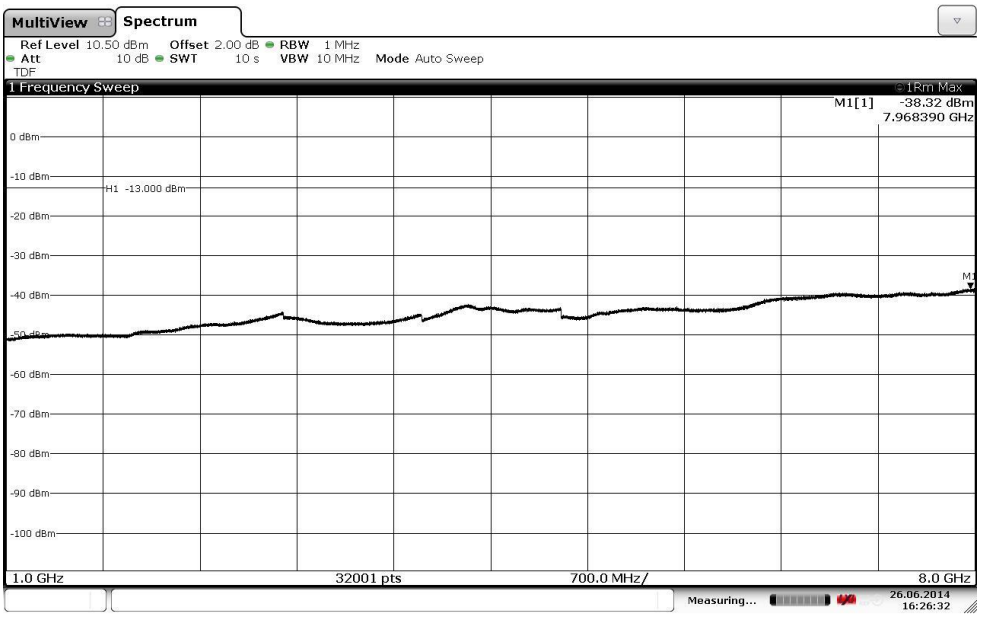
Appendix 5

Diagram 14a:



Date: 26.JUN.2014 16:24:26

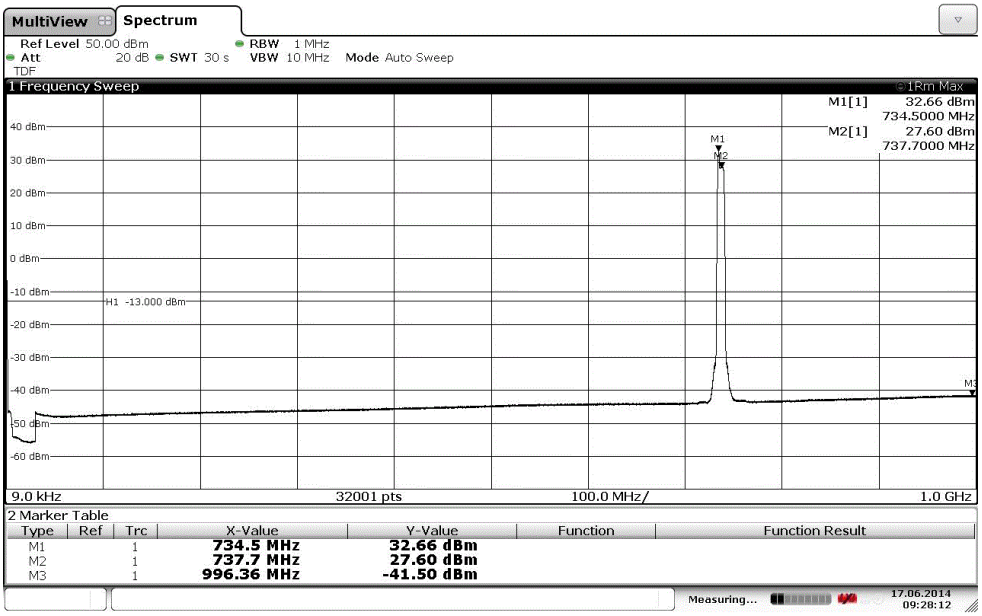
Diagram 14b:



Date: 26.JUN.2014 16:26:32

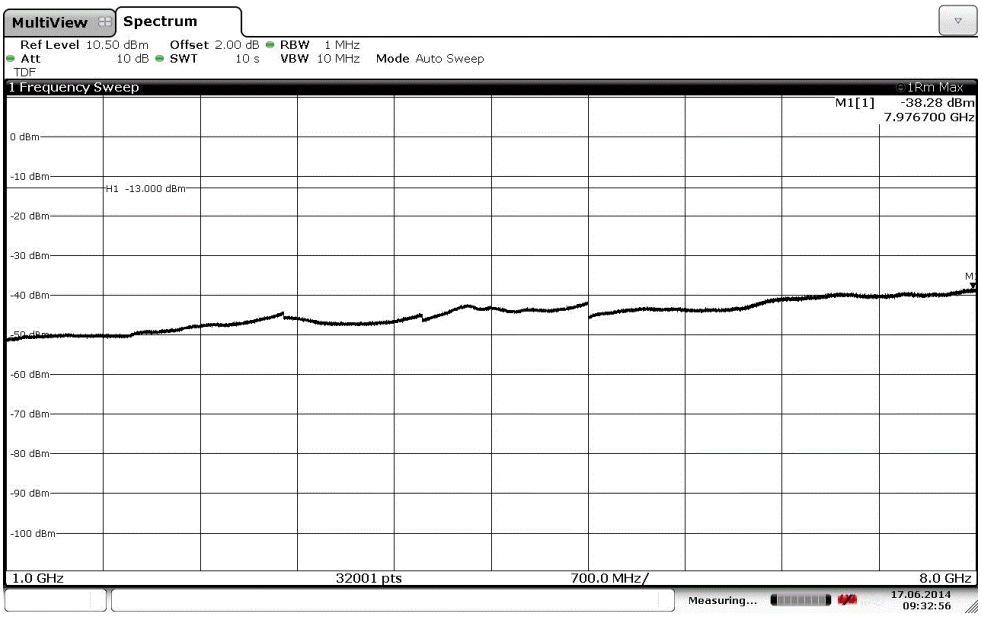
Appendix 5

Diagram 15a:



Date: 17.JUN.2014 09:28:12

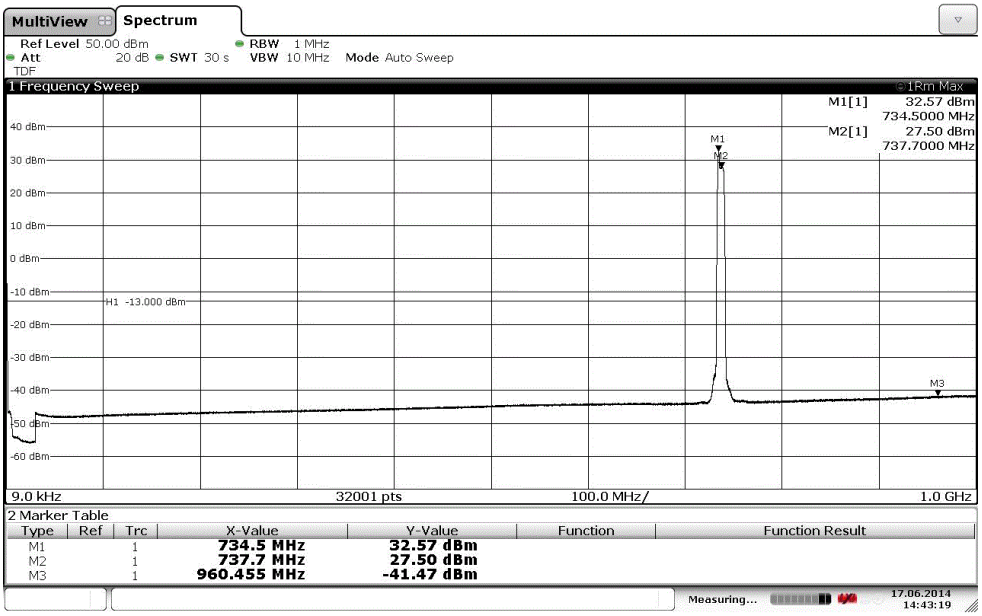
Diagram 15b:



Date: 17.JUN.2014 09:32:56

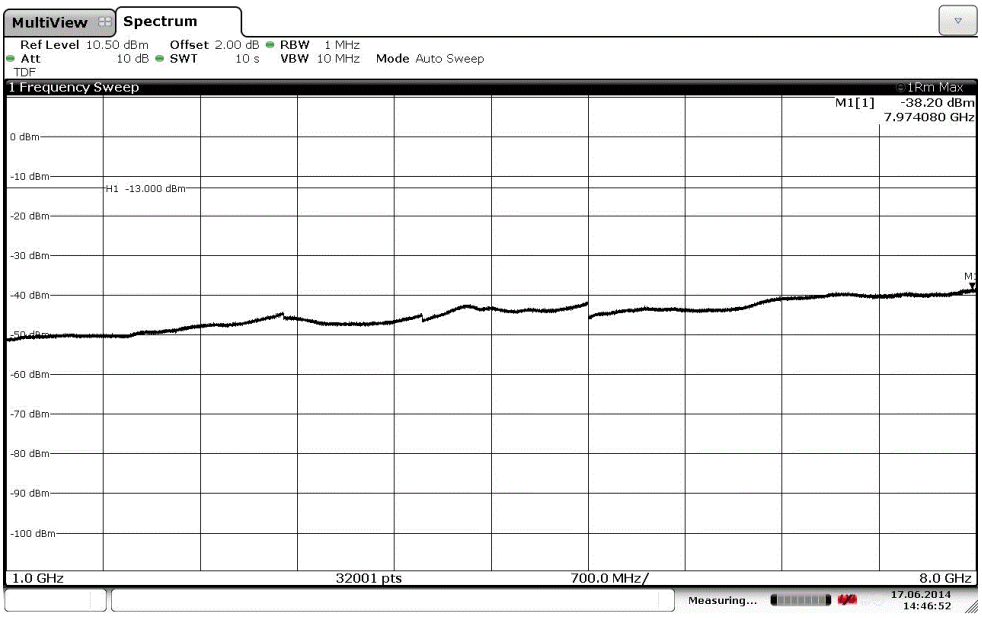
Appendix 5

Diagram 16a:



Date: 17.JUN.2014 14:43:19

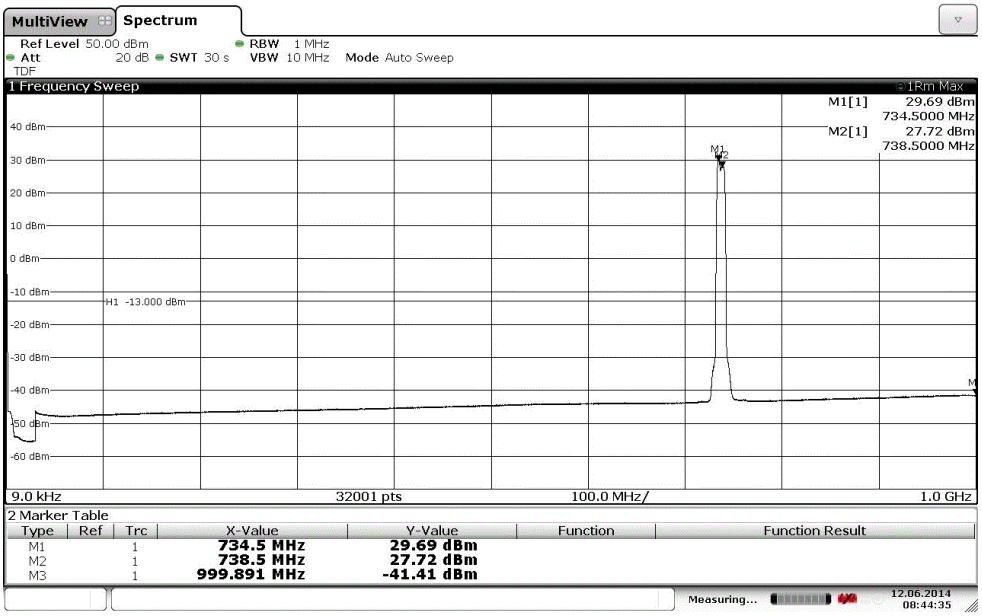
Diagram 16b:



Date: 17.JUN.2014 14:46:52

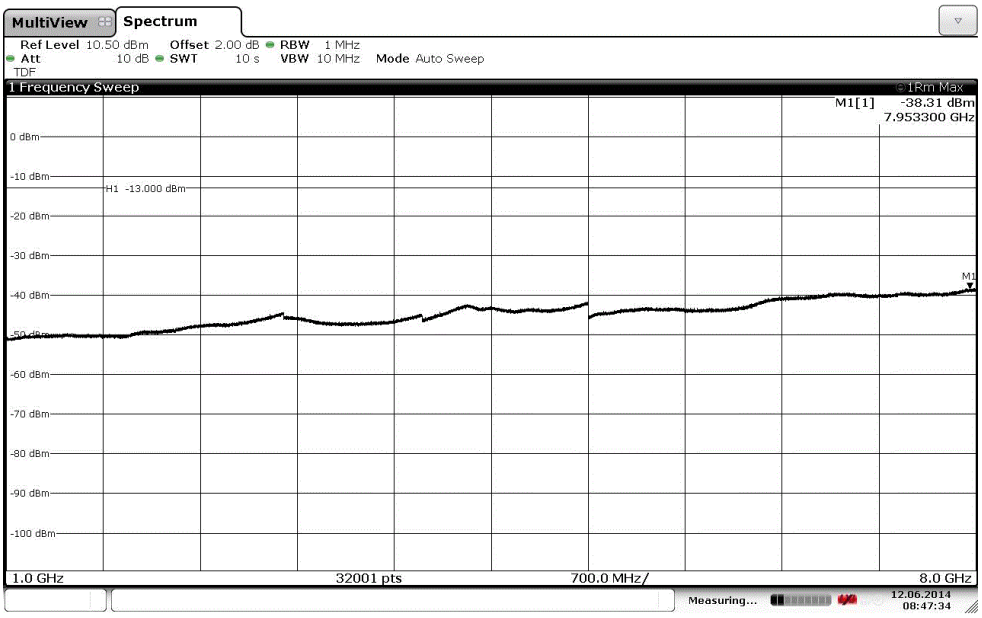
Appendix 5

Diagram 17a:



Date: 12.JUN.2014 08:44:35

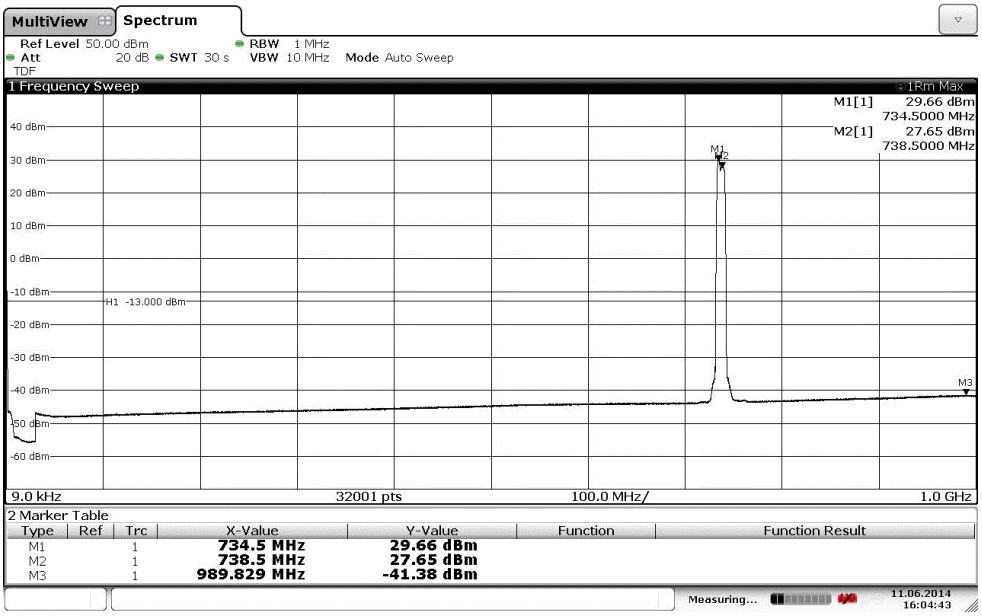
Diagram 17b:



Date: 12.JUN.2014 08:47:35

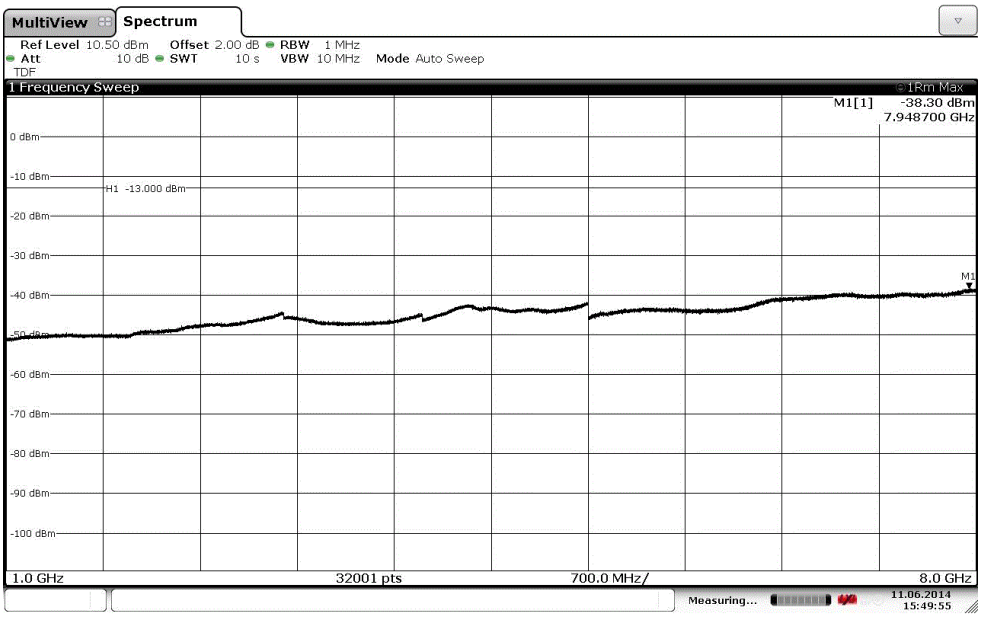
Appendix 5

Diagram 18a:



Date: 11.JUN.2014 16:04:43

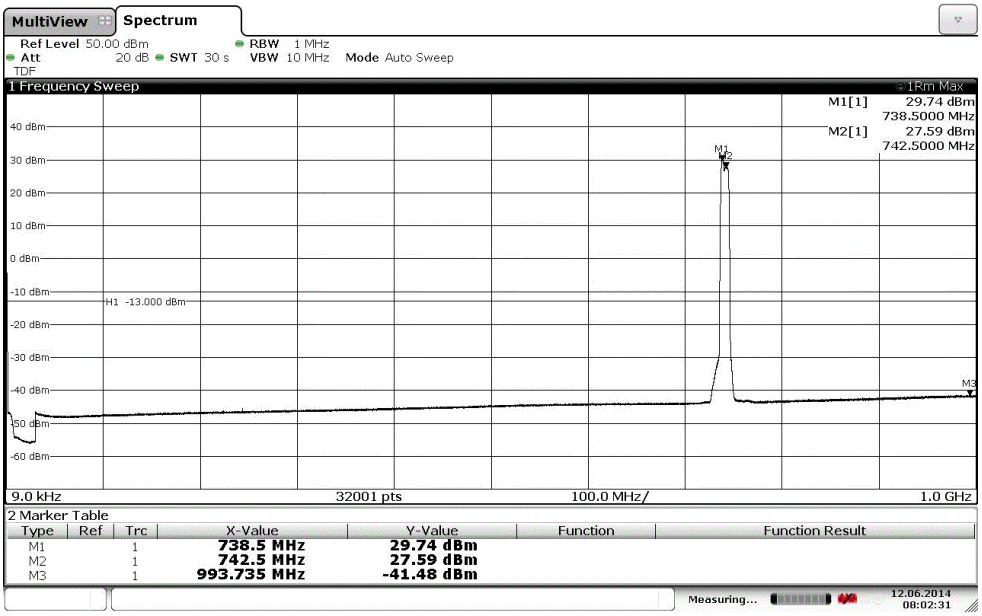
Diagram 18b:



Date: 11.JUN.2014 15:49:55

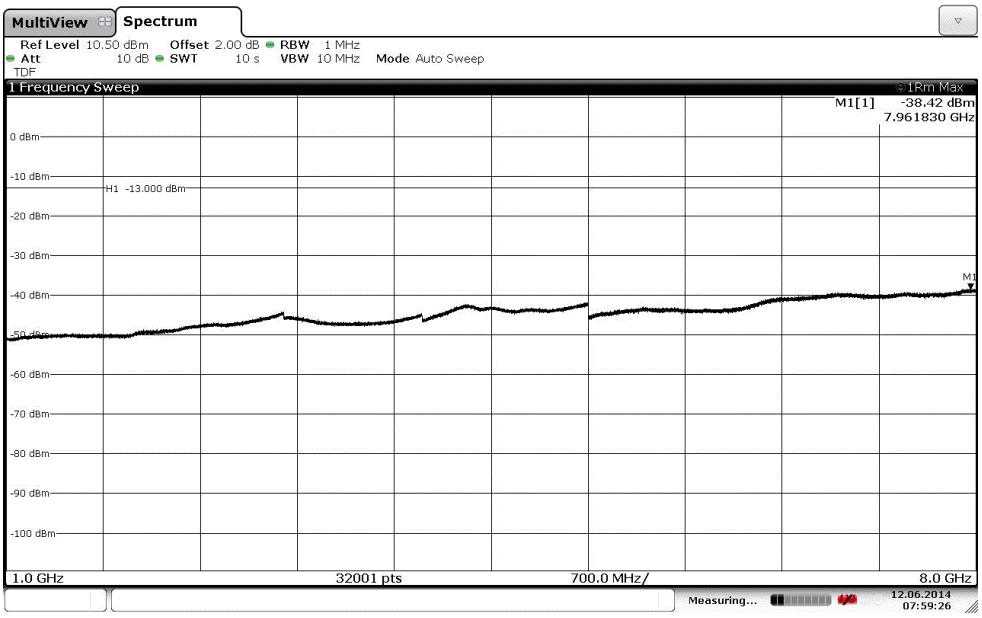
Appendix 5

Diagram 19a:



Date: 12.JUN.2014 08:02:31

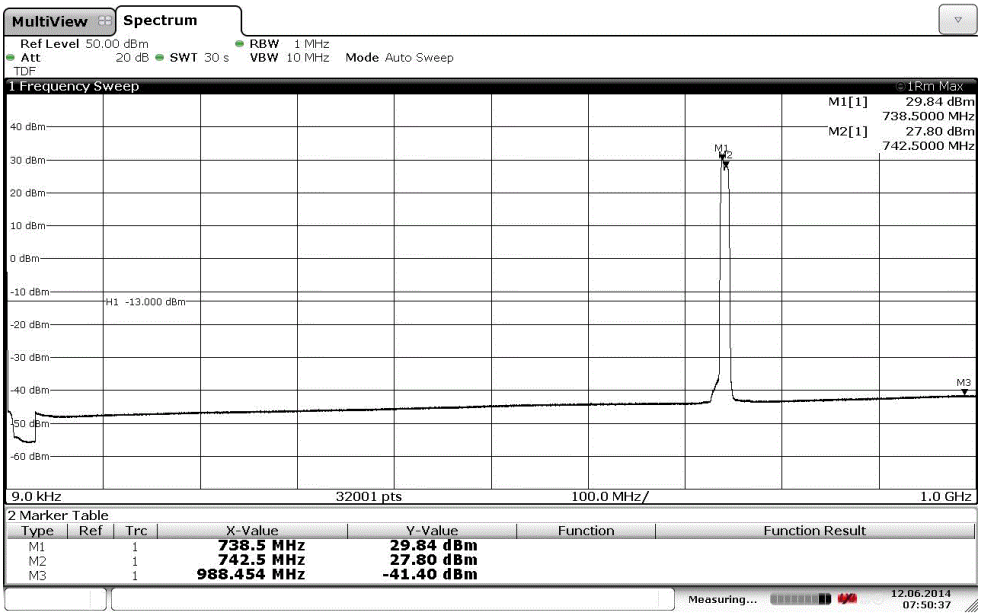
Diagram 19b:



Date: 12.JUN.2014 07:59:26

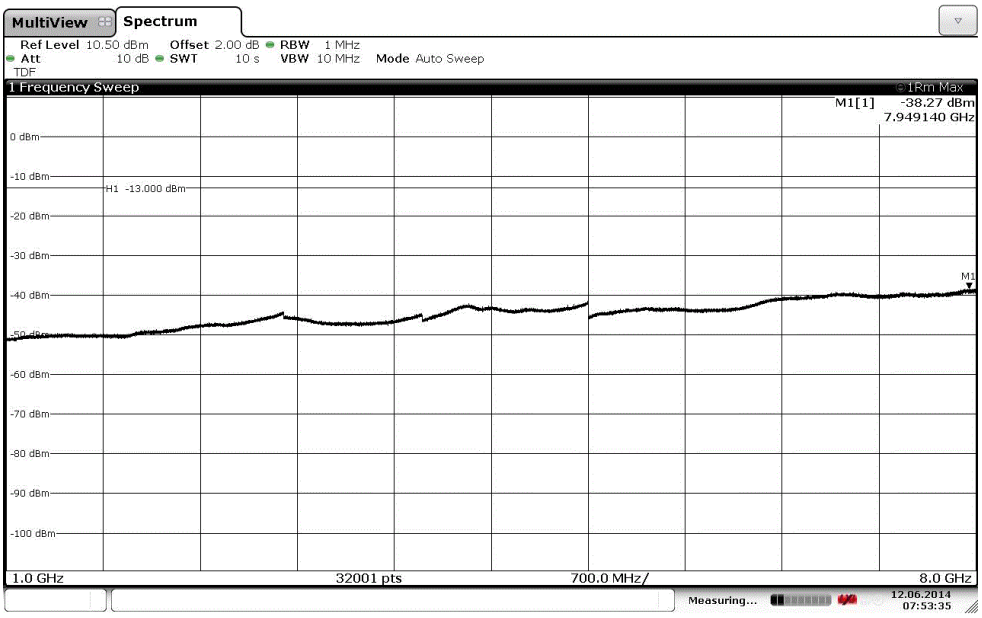
Appendix 5

Diagram 20a:



Date: 12.JUN.2014 07:50:37

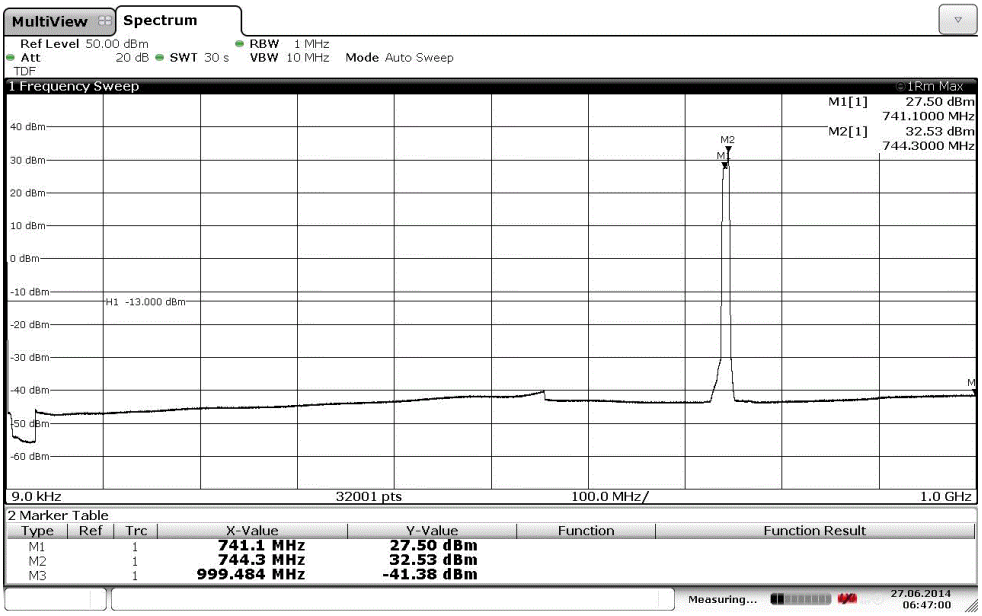
Diagram 20b:



Date: 12.JUN.2014 07:53:34

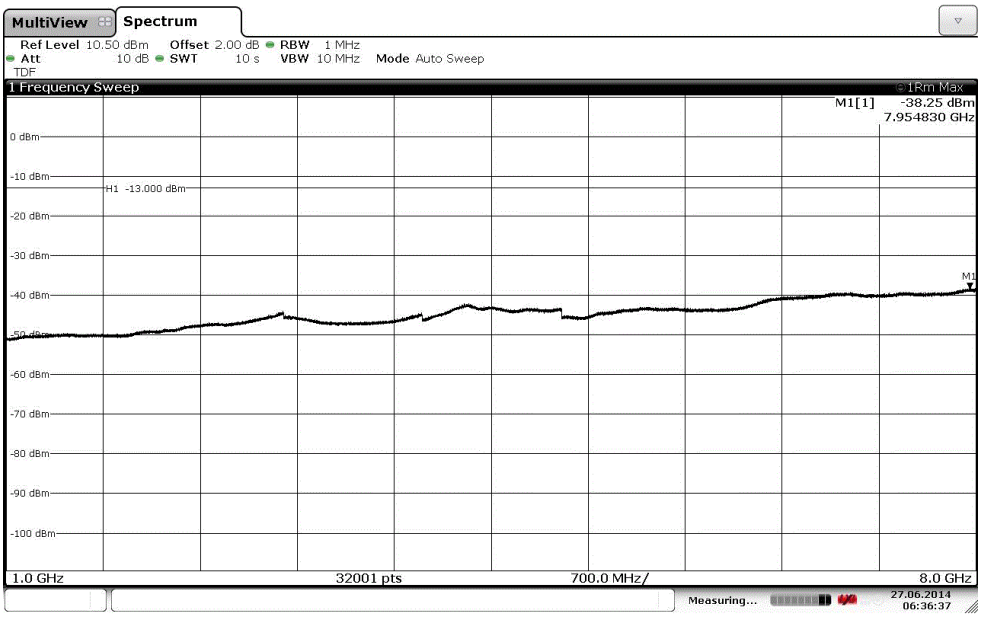
Appendix 5

Diagram 21a:



Date: 27.JUN.2014 06:46:59

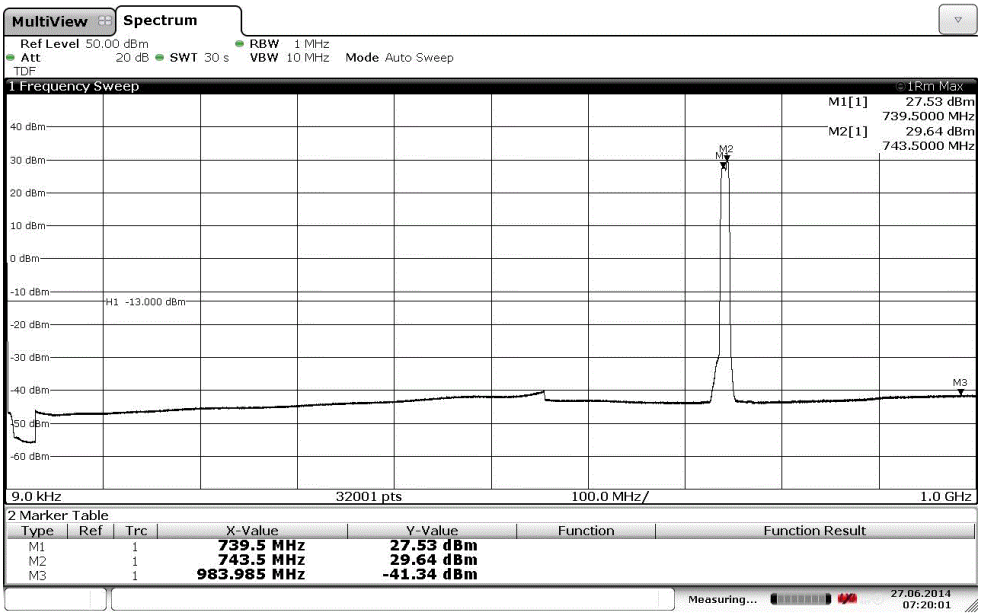
Diagram 21b:



Date: 27.JUN.2014 06:36:36

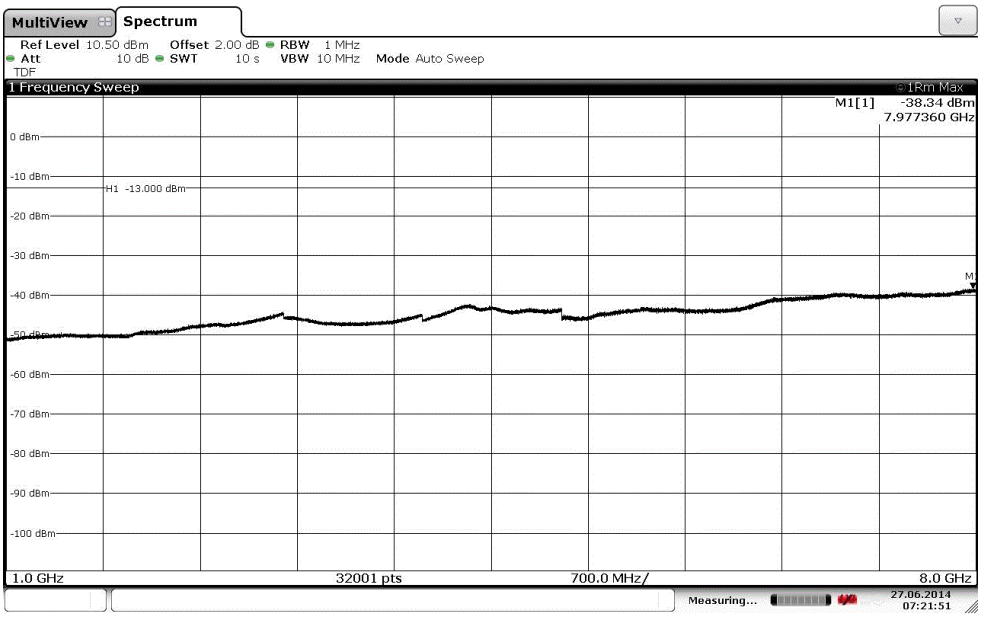
Appendix 5

Diagram 22a:



Date: 27.JUN.2014 07:20:00

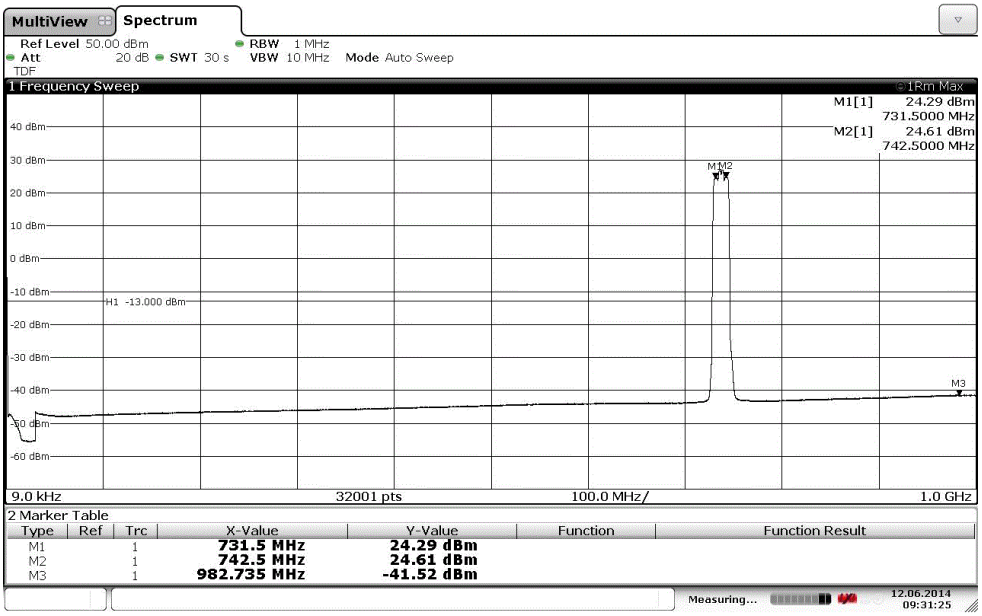
Diagram 22b:



Date: 27.JUN.2014 07:21:51

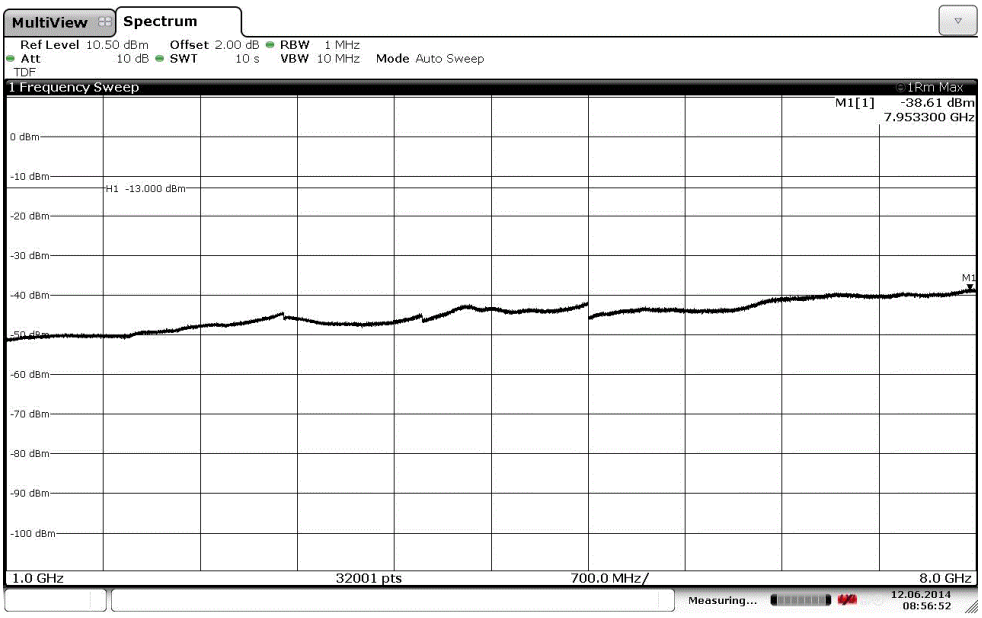
Appendix 5

Diagram 23a:



Date: 12.JUN.2014 09:31:24

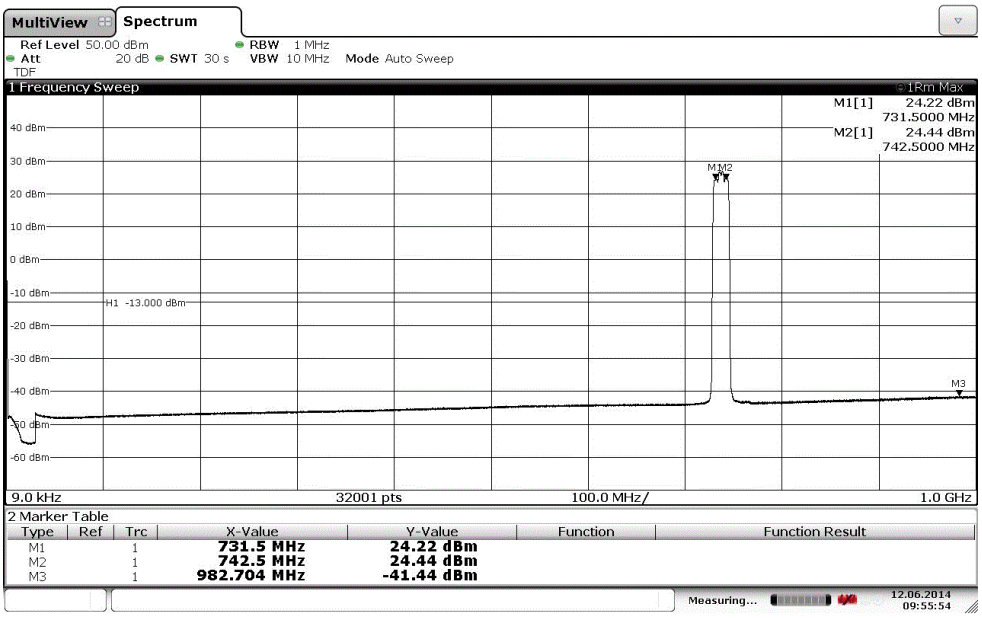
Diagram 23b:



Date: 12.JUN.2014 08:56:52

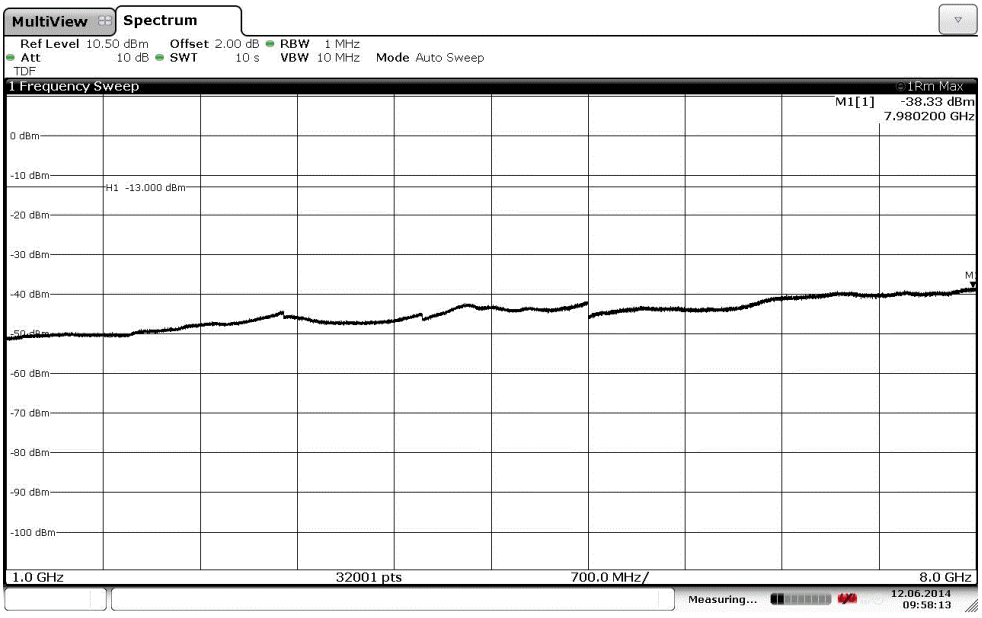
Appendix 5

Diagram 24a:



Date: 12.JUN.2014 09:55:54

Diagram 24b:



Date: 12.JUN.2014 09:58:13

Appendix 7

Field strength of spurious radiation measurements according to 47 CFR 27.53 (f) / IC RSS-130 4.6

Date	Temperature	Humidity
2014-05-26	23°C ± 3°C	36 % ± 5 %

Test set-up and procedure

The test sites are listed at FCC, Columbia with registration number: 93866. The test site complies with RSS-Gen, Industry Canada file no. 3482A-1.

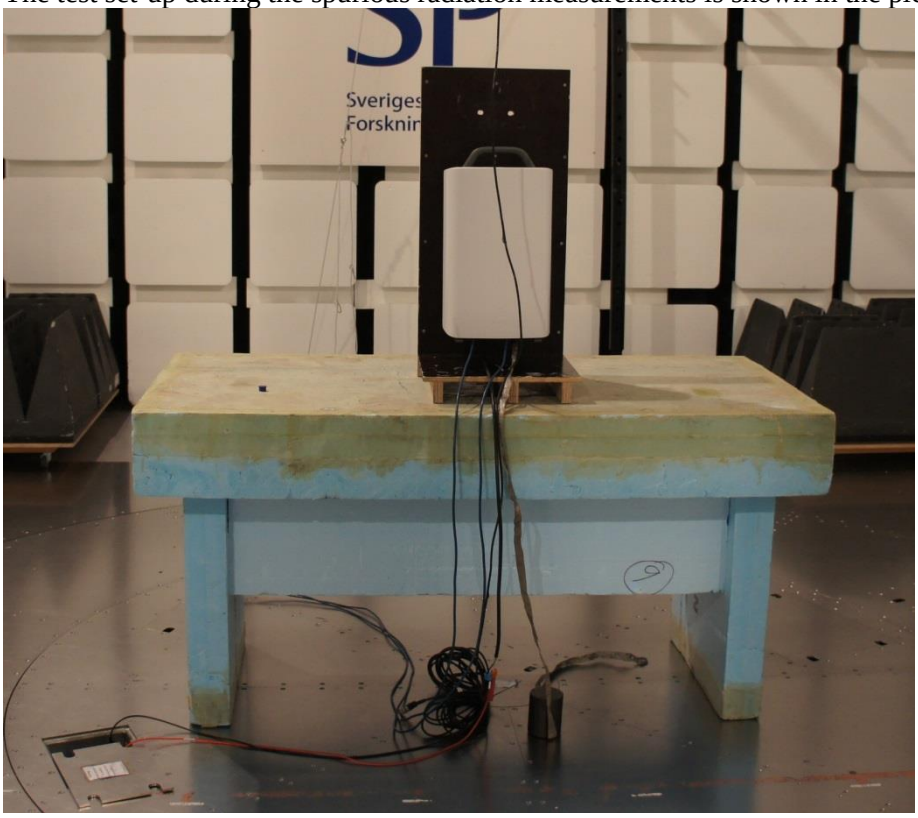
The measurements were performed with both horizontal and vertical polarization of the antenna. The antenna distance was 3 m in the frequency range 30 MHz – 8 GHz.

In the frequency range 30 MHz – 8 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 $\gamma = 20\log\left(\frac{4\pi D}{\lambda}\right)$, γ is the propagation loss and D is the antenna distance.

The measurement procedure was as the following:

1. A pre-measurement is performed with peak detector. For measurement < 1 GHz the test object is measured in eight directions with the antenna at three heights, 1.0 m, 1.5 m and 2.0. For measurements > 1 GHz the test object was measured in seventeen directions with the antenna at 1.0 m in height.
2. Spurious radiation on frequencies closer than 20 dB to the limit in the pre-measurement 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 when measured with the RMS detector were measured with the substitution method according to the standard.

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



Measurement equipment

Measurement equipment	SP number
Semi anechoic chamber	503 881
R&S ESI 26	503 292
EMC 32 ver. 8.52.0	503 899
Chase Bilog Antenna CBL 6111A	503 182
EMCO Horn Antenna 3115	502 175
High pass filter, RLC Electronics	901 373
µComp Nordic, Low Noise Amplifier	901 545
Testo 625 temperature and humidity meter	504 188

Tested configurations

B
M
T
M2_1
M2_2
M4_1

Results, representing worst case

M, BW: 5 MHz Diagram 1 a-b

Frequency (MHz)	Spurious emission level (dBm)	
	Vertical	Horizontal
30-8000	All emission > 20 dB below limit	All emission > 20 dB below limit

Measurement uncertainty:

3.2 dB up to 18 GHz

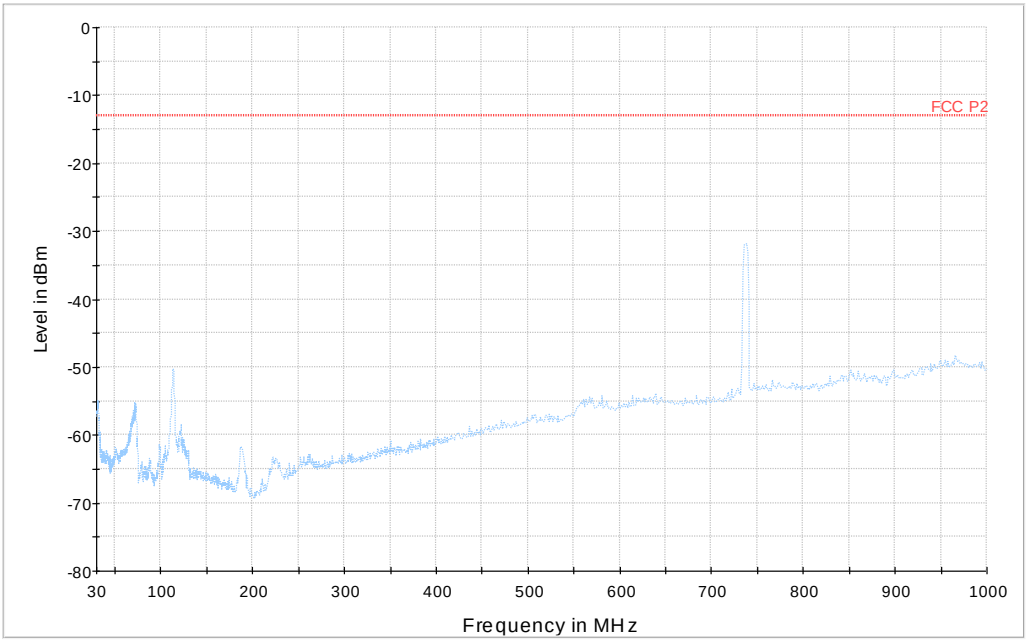
Limits

CFR 47 §27.53 (f) / RSS-130 4.6

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.

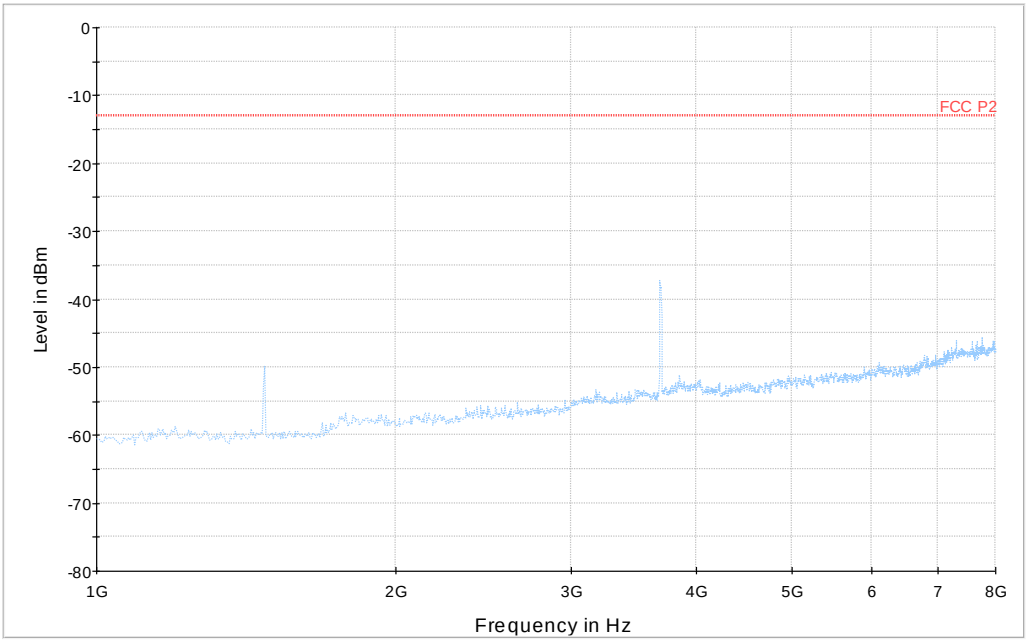
Complies?	Yes

Diagram 1a:



Note: The emission between 729 to 745 MHz is the carriers frequency and shall be ignored in the context.

Diagram 1b:



Appendix 8

Frequency stability measurements according to CFR 47 § 27.54 / IC RSS 130 4.3

Date	Temperature (test equipment)	Humidity (test equipment)
2014-05-19	23°C ± 3 °C	26% ± 5 %
2014-05-20	22°C ± 3 °C	28% ± 5 %

Test set-up and procedure

The measurement was made per 3GPP TS 36.141. The output was connected to a spectrum analyser. The spectrum analyser was connected to an external 10 MHz reference standard during the measurements.

Measurement equipment	SP number
R&S FSQ 40	504 143
RF attenuator	900 233
RF Terminator	-
Temperature Chamber	503 360
Testo 635, temperature and humidity meter	504 203
Multimeter Fluke 87	502 190

Results

Nominal Voltage -48 V DC

Maximum output power at mid channel (M)

Channel Bandwidth 5 MHz

Test conditions		Frequency error (Hz)
Supply voltage DC (V)	T (°C)	Test model E-TM1.1
-48.0	+20	-8
-55.2	+20	-6
-40.8	+20	-7
-48.0	+30	-7
-48.0	+40	-9
-48.0	+50	-9
-48.0	+10	-10
-48.0	0	-7
-48.0	-10	-8
-48.0	-20	-8
-48.0	-30	-7
Maximum freq. error (Hz)		-10
Measurement uncertainty		$< \pm 1 \times 10^{-7}$

Measurements according to 3GPP TS 36.141.

Results

Nominal Voltage 120 V AC, 60 Hz

Maximum output power at mid channel (M)

Channel Bandwidth 5MHz

Test conditions		Frequency error (Hz)
Supply voltage AC (V)	T (°C)	Test model E-TM1.1
102.0	+20	-7
120.0	+20	-8
138.0	+20	-8
Maximum freq. error (Hz)		-8
Measurement uncertainty		$< \pm 1 \times 10^{-7}$

Measurements according to 3GPP TS 36.141.

Results

Rated output power level at connector RF A (maximum): 37.0 dBm (5 W)

Test conditions			Frequency margin to band edge at -16dBm			
Supply voltage DC [V]	Temp [°C].	Carrier Bandwidth [MHz]	Test frequency Symbolic name Bottom		Test frequency Symbolic name Top	
			fL [MHz]	Offset to lower band edge (728 MHz) [kHz]	fH [MHz]	Offset to upper band edge (746 MHz) [kHz]
-48.0	+20	5	729.086	1086	744.918	1082

Measurements according to IC RSS 130 4.3.

The frequency error results clearly shows that the frequency stability is good enough to ensure that the transmitted carrier stay within the operating band.

Remark

It was deemed sufficient to test one combination of TX frequency, channel bandwidth configuration and test model (modulation), as all combinations share a common internal reference to derive the TX frequency from.

Limits

Limit according to 3GPP TS 36.141:

The frequency error shall be within ± 0.1 PPM ± 12 Hz (± 86.5 Hz).

CFR 47 § 27.54 Frequency stability

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

RSS-130 4.3 Frequency:
The frequency stability shall be sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

Complies?	Yes

Appendix 9

External photos

Front side

Rear side

Left side

Rigth side

Appendix 9

Bottom side

Appendix 9

Top side