



FCC 47CFR part 15C Test Report

For
Evoke F4
Evoke F440

Reference Standard: FCC 47CFR part 15C

Manufacturer: PURE

For type of equipment and serial number, refer to section 3

Report Number: 03-6711-7-13 issue 01

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Certificate of Test 6711/7

The unit noted below has been tested by **R.N. Electronics Limited** and, where appropriate, conforms to the relevant subpart of FCC 47CFR Part 15. This is a certificate of test only and should not be confused with an equipment authorisation. Other standards may also apply.

Equipment:	Evoke F4
Model Number:	Evoke F440
Proposed FCC ID:	X280065
Unique Serial Number:	ES5-1
Manufacturer:	PURE Home Park Industrial Estate Kings Langley Hertfordshire WD4 8LZ UK
Customer Purchase Order Number:	PO123605
Full measurement results are detailed in Report Number:	03-6711-7-13 issue 01
Test Standards:	FCC 47CFR Part 15.247 effective date October 1st 2012 , Class DTS Intentional Radiator

NOTE:

Certain tests were not performed based upon manufacturer's declarations. Certain other requirements are subject to manufacturer declaration only and have not been tested/verified. For details refer to section 3 of this report.

DEVIATIONS:

Deviations from the standards have been applied. For details refer to section 4.2 of this report.

This certificate relates only to the unit tested as identified by a unique serial number and in the condition at the time it was tested. It does not relate to any other similar equipment and performance of the product before or after the test cannot be guaranteed. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of unit not meeting the intentions of the standard or the requirements of the Directive, particularly under different conditions to those during testing. Any compliance statements are made reliant on (a) the application of the product and use of the assigned band being acceptable to one or more national authorities within the EU and (b) the modes of operation as instructed to us by the Customer based on their specific knowledge of the application and functionality of the EUT. Statements of compliance, where measurements were made, do not include the measurement uncertainty. The measurement uncertainty, where stated, is the expanded uncertainty based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Date of Test: 4th to 21st March 2013

Test Engineer:

Approved By:
Managing Director

Customer representative:

File name PURE.6711-7 ISSUE 01

The contents of this report, apart from the referenced ANSI C63.4-2003, are beyond the scope of UKAS Testing Laboratory No. 2360 accreditation.

1 Contents

1	Contents.....	3
2	Summary of test results	4
3	Equipment Under Test (EUT)	5
3.1	EQUIPMENT SPECIFICATION	5
3.2	EUT CONFIGURATIONS FOR TESTING	5
3.3	FUNCTIONAL DESCRIPTION.....	6
3.4	EUT MODES	6
3.5	EMISSIONS CONFIGURATION.....	7
4	Specifications	8
4.1	RELEVANT STANDARDS.....	8
4.2	DEVIATIONS.....	8
4.3	TESTS AT EXTREMES OF TEMPERATURE & VOLTAGE	8
4.4	MEASUREMENT UNCERTAINTIES	8
5	Tests, Methods and Results	9
5.1	AC CONDUCTED EMISSIONS.....	9
5.2	PEAK CONDUCTED POWER.....	11
5.3	MAXIMUM POWER SPECTRAL DENSITY.....	13
5.4	DUTY CYCLE.....	15
5.5	RADIATED EMISSIONS	16
5.6	OCCUPIED BANDWIDTH (6dB BW).....	20
5.7	BAND EDGE COMPLIANCE	22
5.8	FHSS PARAMETERS	24
6	Plots and Results	25
6.1	CONDUCTED EMISSIONS	25
6.2	RADIATED EMISSIONS 150kHz–1GHz	27
6.3	RADIATED EMISSIONS ABOVE 1GHz	30
6.4	6dB BANDWIDTH.....	42
6.5	BAND EDGE COMPLIANCE	60
6.6	DUTY CYCLE.....	96
6.7	PSD	96
7	Explanatory Notes	114
7.1	EXPLANATION OF TABLE OF SIGNALS MEASURED	114
7.2	EXPLANATION OF LIMIT LINE CALCULATIONS FOR RADIATED MEASUREMENTS	114
8	Photographs.....	115
9	Signal Leads	126
10	Test Equipment Calibration list	126
11	Auxiliary equipment	127
11.1	AUXILIARY EQUIPMENT SUPPLIED BY «CUSTOMER»	127
11.2	AUXILIARY EQUIPMENT SUPPLIED BY RN ELECTRONICS LIMITED.....	127
12	Modifications	127
12.1	MODIFICATIONS BEFORE TEST.....	127
12.2	MODIFICATIONS DURING TEST	127
13	Compliance information.....	128
14	Description of Test Sites.....	129
15	Abbreviations and Units.....	130

2 Summary of test results

The Evoke F440 was tested to the following standards: -

FCC 47CFR Part 15.247 (effective date October 1st, 2012)
Class DTS Intentional Radiator

Any compliance statements are made reliant on the modes of operation as instructed to us by the Manufacturer based on their specific knowledge of the application and functionality of the equipment tested. Whilst every effort is made to assure quality of testing, type tests are not exhaustive and although no non-conformances may be found, this doesn't exclude the possibility of equipment not meeting the intentions of the standard, particularly under different conditions to those during testing.

Title	Reference	Results
1. Conducted emissions	FCC Part 15C §15.207	PASSED
2. Radiated emissions	FCC Part 15C §15.205, §15.209 and §15.247(d)	PASSED
3. Occupied bandwidth	FCC Part 15C §15.215(c), §15.247(a)(2)	PASSED
4. Peak conducted power	FCC Part 15C §15.247(b)	PASSED
5. Frequency tolerance	FCC Part 15C §15.215(c)	NOT APPLICABLE ¹
6. Duty cycle	FCC Part 15C §15.35(c)	NOT APPLICABLE ²
7. Power Spectral Density	FCC Part 15C §15.247(e)	PASSED
8. Band edge compliance	FCC Part 15C §15.205, §15.209 and §15.247	PASSED
9. FHSS parameters	FCC Part 15C §15.247(a)(1)	NOT APPLICABLE ³

¹ No limits apply, however the requirement to contain the designated bandwidth of the emission within the specified frequency band includes the frequency stability of the transmitter over expected variations in temperature and supply voltage.

² No limits apply.

³ EUT does not employ FHSS technology.

3 Equipment Under Test (EUT)

3.1 Equipment Specification

Applicant	PURE Home Park Industrial Estate Kings Langley Hertfordshire WD4 8LZ UK								
Manufacturer of EUT	PURE								
Brand name of EUT	PURE								
Model Number of EUT	Evoke F440								
Proposed FCC ID	X280065								
Serial Number of EUT	ES5-1								
Date when equipment was received by RN Electronics	20 th February 2013								
Date of test:	4th to 21st March 2013								
Customer order number:	PO123605								
Visual description of EUT:	Rectangular plastic enclosure with controls and a display on the front. The unit has a battery compartment on the back, along with a telescopic antenna and several connector ports. The units Wi-Fi antenna is located inside the enclosure.								
Main function of the EUT:	Radio (Internet, DAB and FM) wireless streaming device								
Height	150mm								
Width	210mm								
Depth	90mm								
Weight	<1kg								
Voltage	5.5V DC from AC/DC adaptor, 3.7V DC from Lithium battery pack								
Current required from above voltage source	3.5A @5.5V								
EUT Supplied PSU	<table border="1"><tr><td>Manufacturer</td><td>Pure</td></tr><tr><td>Model Number</td><td>DSA-24CA-05</td></tr><tr><td>Serial Number</td><td>Not specified</td></tr><tr><td>Specification</td><td>100-240V AC input at 0.8A, +5.5V DC output @ 3.57A</td></tr></table>	Manufacturer	Pure	Model Number	DSA-24CA-05	Serial Number	Not specified	Specification	100-240V AC input at 0.8A, +5.5V DC output @ 3.57A
Manufacturer	Pure								
Model Number	DSA-24CA-05								
Serial Number	Not specified								
Specification	100-240V AC input at 0.8A, +5.5V DC output @ 3.57A								

3.2 EUT Configurations for testing

Frequency range	2412 – 2462 MHz
Normal use position	Desktop
Normal test signals	OFDM & DSSS up to 54MBPS
Declared power level	<+20dBm (+16dBm Nominal)
Declared channel bandwidth	20MHz
Highest frequency generated / used	2462MHz
Lowest frequency generated / used	12MHz USB clock

File name PURE.6711-7 ISSUE 01

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3.3 Functional Description

Radio that can tune to DAB or FM and can also stream audio media via a home Wi-Fi network, by use of a network Access Point. Also has the ability to stream audio through a separate Bluetooth USB dongle, shipped with the product.

3.4 EUT Modes

Mode	Description of mode	Used for Testing
Transmit Mod 2.412GHz	Unit in constant transmit with mod @ 2.412GHz	YES
Transmit Mod 2.437GHz	Unit in constant transmit with mod @ 2.437GHz	YES
Transmit Mod 2.462GHz	Unit in constant transmit with mod @ 2.462GHz	YES
Receive 2.412GHz	Unit in receive mode @2.412 GHz	YES
Receive 2.437GHz	Unit in receive mode @2.437 GHz	YES
Receive 2.462GHz	Unit in receive mode @2.462 GHz	YES

All Transmit modes were 100% duty cycle, modulated (except where stated otherwise), and left on the default max power setting.

The Transmit modes referred to above were checked in combination with the following table of modulation/ data rate schemes to fulfil the test requirements:-

Mode	Rate
802.11B	1 Mbps
802.11B	2 Mbps
802.11B	5.5 Mbps
802.11B	11 Mbps
802.11G	6 Mbps
802.11G	9 Mbps
802.11G	12 Mbps
802.11G	18 Mbps
802.11G	24 Mbps
802.11G	36 Mbps
802.11G	48 Mbps
802.11G	54 Mbps

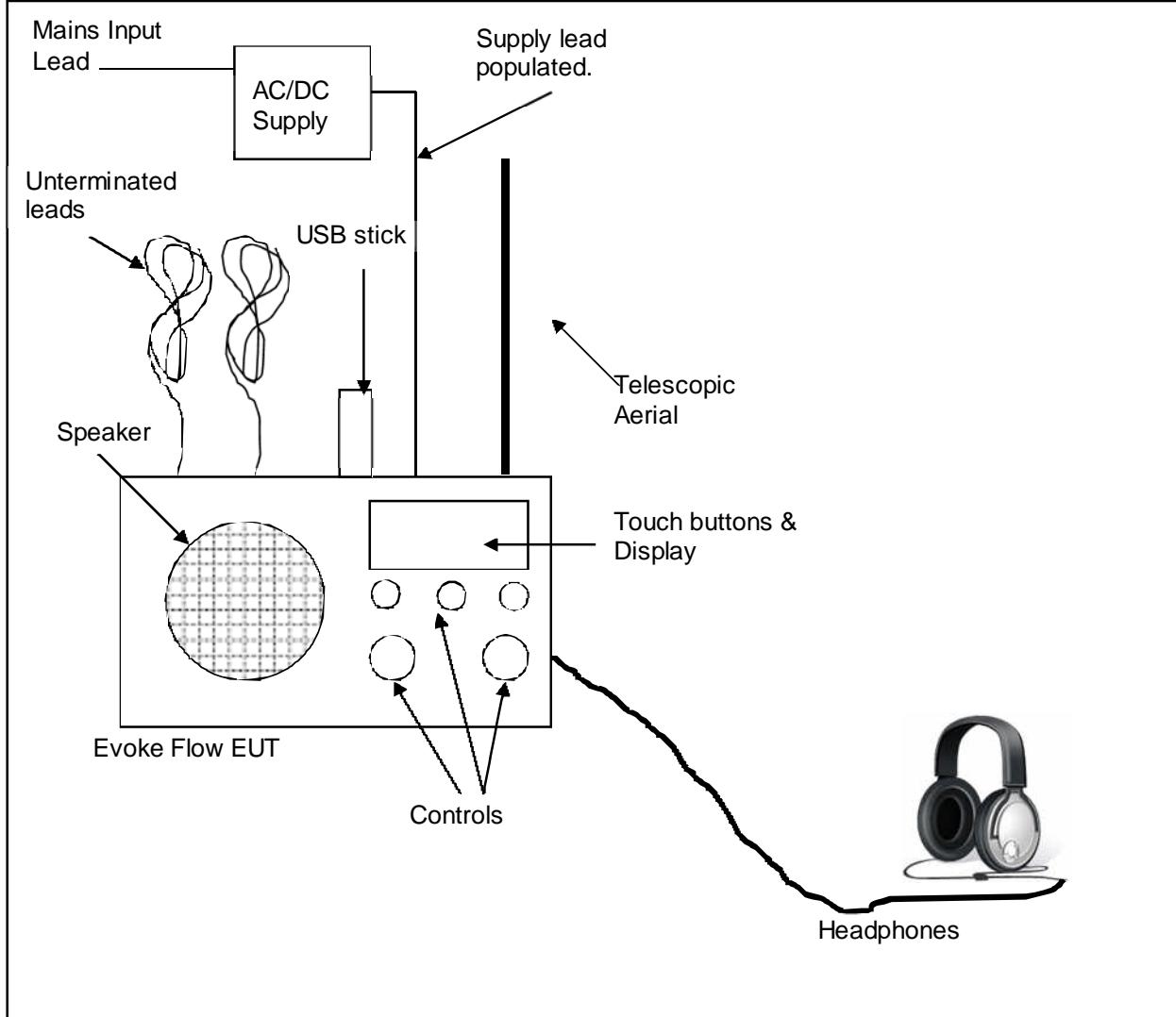
Note: A charge pak was fitted into the battery compartment for all tests and ensured that it was charging during tests.

Description of ancillary equipment connected to the equipment under test, for the purpose of tests, can be found in Section 10.

Any modifications made to the EUT, whilst under test, can be found in Section 11.

This report was printed on: 17 July 2013

3.5 Emissions Configuration



The unit was powered from the dedicated AC/DC adapter provided with the unit. For conducted tests the internal antenna was unsoldered and an SMA connector fitted in its place. The unit was configured with engineering menus in software to allow permanent transmit and receive modes of device on the top, middle and bottom channels as stated within section 3.4 of this report. The transmit mode was 100% continuous with modulation and the power settings for each channel were left at the default settings by the software.

For radiated and conducted emissions tests the unit was populated with typical leads, an audio input lead (using an iPhone as an audio source only), audio output lead, a USB device, and headphones, however, the headphones did cut out the use of the internal speakers and as they added no further noise to the emissions, they were removed from the unit for tests. The USB device was used to transfer software files to the EUT to allow the changing of software between transmit and receive engineering modes required for test. The AC/DC adapter was also placed on to the test table along with the main enclosure of the EUT. The same unit was used for both Radiated and Conducted tests.

The unit's rechargeable battery pack option was fitted for tests and ensured that it was sufficiently depleted so charging could take place during testing for worst case emissions.

4 Specifications

4.1 Relevant Standards

The tests were performed by RN Electronics Engineer Daniel Sims who set up the tests, the test equipment, and operated it in accordance with the **R.N. Electronics Ltd** procedures manual and the basic standards listed below.

R.N. Electronics Ltd sites M and OATS are listed with the FCC. Registration Number 293246

Reference	Standard Number	Year	Description
4.1.1	FCC 47CFR15	2012	Electromagnetic compatibility and radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements
4.1.2	ANSI C63.10	2009	American National Standard for Testing Unlicensed Wireless Devices
4.1.3	ANSI C63.4	2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
4.1.4	KDB558074	2012	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

4.2 Deviations

ANSI C63-10-2009 deviations:

The reference standard ANSI C63.4-2003 was used, not the latest ANSI C63.4-2009

FCC Part 15 deviations:

None.

4.3 Tests at Extremes of Temperature & Voltage

Not required.

- A permanent internal RF port was used for testing.
- A test fixture was used for testing.
- A temporary RF port was created for testing.
- A permanent internal RF Antenna was used for testing.

4.4 Measurement Uncertainties

Parameter	Uncertainty
Transmitter Tests	
Conducted RF power	<± 1.0 dB
Occupied bandwidth	± 1.9 %
Radiated RF power	± 3.5 dB
Radiated spurious emissions	30MHz - 1000MHz ±5.1dB 1000MHz - 2000MHz ±4.5dB 1 – 18 GHz ±3.5dB 18 – 26.5 GHz ±3.9dB
AC line conducted emissions	(For LISN) 150kHz to 30MHz ±3.6dB

File name PURE.6711-7 ISSUE 01

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5 Tests, Methods and Results

5.1 AC Conducted emissions

5.1.1 Test Methods

Test Requirements

FCC Part 15C, Reference (15.207)

Test Method:

ANSI C63.10, Reference (6.2.)

5.1.1.1 Configuration of EUT

The EUT and AC/DC adapter were placed on a wooden table 0.8m above the ground plane and the adapter was connected to a LISN via a 1m mains cable.

Details of the Peripheral and Ancillary Equipment connected for this test is listed in section 11.

During the initial scan, no discernible difference was noted between modes (refer to section 3.4) therefore full tests were performed with the unit transmitting on the centre channel.

5.1.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted in the 'Test Equipment' Section. Measurements were made on the live and neutral conductors using both average and quasi-peak detection.

At least 6 signals within 20dB and/or all signals within 10dB of the limit were investigated.

Tests were performed in Test Site F.

5.1.2 Test results

Temperature of test Environment: 18°C

Analyser plots for the Quasi-Peak / Average values as applicable can be found in Section 6.1 of this report.

Quasi-Peak and Average Live

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)	AV Amp (dBuV)	AV - Lim1 (dB)
1	0.251	46.0	42.7	-19.0	41.1	-10.6
2	0.310	41.6	38.5	-21.5	37.0	-13.0
3	0.473	36.7	35.8	-20.7	34.6	-11.9
4	0.503	39.3	38.4	-17.6	35.7	-10.3
5	0.591	35.5	35.0	-21.0	34.2	-11.8
6	0.621	35.1	34.4	-21.6	33.2	-12.8

Quasi-Peak and Average Neutral

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)	AV Amp (dBuV)	AV - Lim1 (dB)
1	0.251	49.3	46.1	-15.6	44.0	-7.7
2	0.310	43.6	41.2	-18.8	38.6	-11.4
3	0.339	42.2	39.6	-19.6	37.0	-12.2
4	0.339	42.7	39.6	-19.6	37.0	-12.2
5	0.502	40.6	39.3	-16.7	36.5	-9.5
6	0.531	38.1	36.5	-19.5	35.3	-10.7

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These results show that the **EUT** has **PASSED** this test.

5.1.2.1 Test Equipment used

E035, E410, E411, E412, E465, E150

See Section 10 for more details.

5.2 Peak Conducted power

5.2.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.247)

Test Method: FCC Part 15C, Reference (15.247)
ANSI C63.10, Reference (6.10.2.1 b))

5.2.1.1 Configuration of EUT

The EUT was measured on a bench using a spectrum analyser connected to the temporary internal RF port

The EUT was set to each mode and test signal in turn (see section 3.4) and highest power levels recorded.

5.2.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Peak stated reading is maximum power observed using a spectrum analyser channel power function over the 6dB bandwidth + 1MHz using a 1MHz RBW, per ANSI C63.10.

Measurements were made on a test bench.

5.2.2 Test results

Test Environment: Temperature: 22 °C Humidity: 28 %

Bottom channel results

Channel / scheme	Duty cycle adjustment (dB)	Total (dBm)	Peak ANSI C63.10 (mW)
1MB	0	17.6	57.5
2MB	0	17.4	55.0
5.5MB	0	17.8	60.3
11MB	0	18.2	66.1
6MB	0	16.7	46.8
9MB	0	17.0	50.1
12MB	0	16.4	43.7
18MB	0	16.3	42.7
24MB	0	16.5	44.7
36MB	0	16.6	45.7
48MB	0	14.8	30.2
54MB	0	14.7	29.5

Middle channel results

Channel / scheme	Duty cycle adjustment (dB)	Total (dBm)	Peak ANSI C63.10 (mW)
1MB	0	18.2	66.1
2MB	0	18.3	67.6
5.5MB	0	18.8	75.9
11MB	0	19.1	81.3
6MB	0	18.6	72.4
9MB	0	19.0	79.4
12MB	0	18.3	67.6
18MB	0	18.3	67.6
24MB	0	18.5	70.8
36MB	0	18.6	72.4
48MB	0	16.8	47.9
54MB	0	16.8	47.9

Top channel results

Channel / scheme	Duty cycle adjustment (dB)	Total (dBm)	Peak ANSI C63.10 (mW)
1MB	0	17.9	61.7
2MB	0	18.2	66.1
5.5MB	0	18.7	74.1
11MB	0	19.0	79.4
6MB	0	17.9	61.7
9MB	0	18.2	66.1
12MB	0	17.7	58.9
18MB	0	17.7	58.9
24MB	0	17.8	60.3
36MB	0	17.9	61.7
48MB	0	16.2	41.7
54MB	0	16.1	40.7

LIMITS:

15.247(b)(3)

For systems using digital modulation in the 902-928, 2400-2483.5 or 5725-5850 MHz bands 1 Watt.

These results show that the EUT has **PASSED** this test.

5.2.2.1 Test Equipment used

E342, E252, E266

See Section 10 for more details

5.3 Maximum Power Spectral Density

5.3.1 Test Methods

Test Requirements	FCC Part 15C, Reference (15.247)
Test Method:	FCC Part 15C, Reference (15.247) KDB558074, PSD Option 1

5.3.1.1 Configuration of EUT

The EUT was configured as for the peak conducted power test.

5.3.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below. The emission from the EUT was maximised before taking any plots. PEP (Peak power) was recorded in the required spans and using a 3kHz Resolution bandwidth. The analyser span for each mod scheme/rate was set to 1.5 times the measured 6dB BW result for that scheme/rate.

5.3.2 Test results

Tests were performed using Test Site A.

Temperature of test Environment: 22 °C

Table of results

Channel 1 (2412 MHz)

Mod/ scheme	PEP (dBm/3kHz)	Plot Ref
1MBPS	-11.4	0037
2MBPS	-9.68	0038
5.5MBPS	-11.0	0039
11MBPS	-10.2	0040
6MBPS	-14.9	0041
9MBPS	-12.2	0042
12MBPS	-11.4	0043
18MBPS	-10.8	0044
24MBPS	-10.6	0045
36MBPS	-8.3	0046
48MBPS	-9.2	0047
54MBPS	-10.4	0048

Channel 6 (2437 MHz)

Mod/ scheme	PEP (dBm/3kHz)	Plot Ref
1MBPS	-10.4	0049
2MBPS	-8.4	0050
5.5MBPS	-9.8	0051
11MBPS	-9.3	0052
6MBPS	-12.9	0053
9MBPS	-10	0054
12MBPS	-9.2	0055
18MBPS	-8.6	0056
24MBPS	-8.4	0057
36MBPS	-6.2	0058
48MBPS	-7.1	0059
54MBPS	-8.2	0060

Channel 11 (2462 MHz)

Mod/ scheme	PEP (dBm/3kHz)	Plot Ref
1MBPS	-11.1	0061
2MBPS	-8.9	0062
5.5MBPS	-10.2	0063
11MBPS	-9.8	0064
6MBPS	-14	0065
9MBPS	-11.2	0066
12MBPS	-10.4	0067
18MBPS	-9.8	0068
24MBPS	-9.5	0069
36MBPS	-7.1	0070
48MBPS	-8.2	0071
54MBPS	-9.3	0072

Note: Results were performed Conducted and referenced to any antenna Gain/Loss measured, However referenced plots may not show Ant Gain or loss.

LIMITS:

15.247(e) +8dBm/3kHz.

Any Analyser plots can be found in Section 6.7 of this report.

These results show that the **EUT** has **PASSED** this test.

5.3.2.1 Test Equipment used

E533, E534, E535, E252

See Section 10 for more details.

5.4 Duty cycle

Not applicable.

5.5 Radiated emissions

5.5.1 Test Methods

Test Requirements	FCC Part 15C, Reference (15.209)
Test Method:	ANSI C63.10, Reference (6.4 – 6.6.)

5.5.1.1 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres. The EUT was rotated in all three orthogonal planes. Radiated Emissions testing was performed using the dedicated AC/DC adapter provided with the EUT and with a battery pack in place and on charge. The EUT was operated in Transmit mode on the Lowest, Highest and Centre Channel frequencies (see section 3.4).

5.5.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below.

Below 30MHz, measurements were made in a semi-anechoic chamber (pre-scan), where applicable final measurements were made on an OATS without a ground plane. The antenna was placed 1m above the ground. The equipment and the antenna were rotated 360° to record the worst case emissions.

30MHz - 1GHz, measurements were made on a site listed with the FCC. The equipment was rotated 360° and the antenna scanned 1 – 4 metres in both horizontal and vertical polarisations to record the worst case emissions.

Above 1GHz, measurements were made in a semi-anechoic chamber with appropriate absorbing material for use in this range. The EUT was raised and antenna was placed 1.5m above the ground in line with the EUT, which was rotated through 360° to record the worst case emissions.

At least 6 signals within 20dB and all signals within 10dB of the limit were investigated.

5.5.2 Test results

Tests were performed using Test Site M & B.

Test Environments: M & B.

Temperature: 14-20°C Humidity: 31-40%

Analyser plots for the Quasi-Peak / Average values as applicable can be found in Section 6.2 and 6.3 of this report.

Note: EUT tested in a continuous transmit mode for ease of test. EUT was tested on Lowest, Highest and Centre Channel frequencies. However, Plots are only shown for Centre channel tests.

Horizontal 30-1000MHz.

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	240.017	35.4	34.2	-11.8
2	287.988	33.2	30.0	-16.0
3	294.914	31.9	29.9	-16.1
4	344.066	33.6	31.5	-14.5
5	360.025	39.8	38.6	-7.4
6	368.642	32.1	29.7	-16.3
7	420.029	34.2	31.9	-14.1
8	960.067	44.9	42.5	-11.5

Vertical 30-1000MHz.

Signal No.	Freq (MHz)	Peak Amp (dBuV)	QP Amp (dBuV)	QP - Lim1 (dB)
1	37.672	29.3	22.9	-17.1
2	49.783	25.9	20.2	-19.8
3	60.004	26.1	22.2	-17.8
4	287.993	30.0	26.9	-19.1
5	360.025	34.6	32.7	-13.3
6	368.642	30.1	27.1	-18.9
7	420.029	32.3	28.6	-17.4
8	960.068	43.2	40.8	-13.2

Note: Emissions above are considered generic and are common to all three channels tested, and as such are only listed here once.

Vertical Low Channel 2412 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1440.096	42.2	36.1	-31.8	-17.9
1920.133	43.5	35.1	-30.5	-18.9
2293.258	47.6	42.0	-26.4	-12.0
2311.537	45.3	35.0	-28.7	-19.0
2370.31	48.8	41.3	-25.2	-12.7
2452.239	48.0	37.2	-26.0	-16.8
2535.324	43.7	33.7	-30.3	-20.3
3216	48.0	42.5	-26.0	-11.5
4824	51.6	46.2	-22.4	-7.8
6432	51.9	43.7	-22.1	-10.3

Mid Channel 2437 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1440.096	40.5	33.3	-33.5	-20.7
1920.132	44.1	35.5	-29.9	-18.5
2294.285	45.7	38.3	-28.3	-15.7
2316.279	51.7	46.9	-22.3	-7.1
2399.425	49.7	40.8	-24.3	-13.2
2474.05	46.9	38.8	-27.1	-15.2
2558.982	47.5	40.9	-26.5	-13.1
3249	48.8	42.1	-25.2	-11.9
4874	52.1	47.2	-21.9	-6.8
6498	51.9	43.7	-22.1	-10.3

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High Channel 2462 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1440	41.6	35.5	-32.4	-18.5
1920	43.2	35.9	-30.8	-18.1
2322	47.8	42.8	-26.2	-11.2
2340	49.0	44.1	-25.0	-9.9
2422	51.5	43.7	-22.5	-10.3
2580	43.8	34.8	-30.2	-19.2
3283	47.6	40.1	-26.4	-13.9
4924	55.4	52.0	-18.6	-2.0
6565	51.3	42.8	-22.7	-11.2

Horizontal

Low Channel 2412 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1920.120	43.3	35.5	-30.7	-18.5
2270.754	45.2	37.9	-28.8	-16.1
2291.279	49.8	45.4	-24.2	-8.6
2312.711	45.5	38.2	-28.5	-15.8
2372.726	49.6	41.0	-24.4	-13.0
3216	47.2	40.5	-26.8	-13.5
4824	51.2	45.9	-22.8	-8.1
6432	51.4	46.1	-22.6	-7.9

Mid Channel 2437 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1440.12	39.4	30.0	-34.6	-24.0
1920.13	44.5	38.2	-29.5	-15.8
2296.372	47.1	41.9	-26.9	-12.1
2316.651	53.6	46.0	-20.4	-8.0
2396.297	51.0	43.7	-23.0	-10.3
2475.33	50.1	41.9	-23.9	-12.1
2556.28	49.2	43.8	-24.8	-10.2
2575.032	44.9	37.2	-29.1	-16.8
3249	48.7	43.4	-25.3	-10.6
4874	53.9	49.7	-20.1	-4.3
6498	49.8	38.4	-24.2	-15.6

High Channel 2462 MHz results

Freq (MHz)	Peak Amp (dBuV)	AV Amp (dBuV)	PK-Lim (dBuV)	AV-Lim (dBuV)
1920	45.3	39.5	-28.7	-14.5
2322	50.0	44.0	-24.0	-10.0
2341	51.2	45.7	-22.8	-8.3
2363	46.3	37.1	-27.7	-16.9
2422	51.9	42.0	-22.1	-12.0
2503	48.4	40.3	-25.6	-13.7
2581	47.9	40.4	-26.1	-13.6
3283	48.7	43.6	-25.3	-10.4
4924	55.9	52.9	-18.1	-1.1
6565	50.3	37.7	-23.7	-16.3

File name PURE.6711-7 ISSUE 01

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LIMITS:

15.209 limits are applicable in the restricted bands of 15.205 with the relevant detector.
15.247(d) other emissions, outside the intentional band, must be attenuated by at least 50dB from the level of the fundamental / meet the general limits of 15.209.

Plot references

Frequency range	Plot reference
150k-30MHz	6711-7 150k-30MHz Parallel/Perpendicular
30-300MHz	6711-7 Rad 1 VHF Horiz/Vert
300-1000MHz	6711-7 Rad 1 UHF Horiz/Vert
1 – 2 GHz	6711-7 Horiz/Vert 1-2GHz Mid channel TX
2 – 2.7 GHz	6711-7 Horiz/Vert 2-2.7GHz Mid channel TX
2.7 – 5 GHz	6711-7 Horiz/Vert 2.7-5GHz Mid channel TX
5 – 6.5 GHz	6711-7 Horiz/Vert 5-6.5GHz Mid channel TX
6.5 – 7.8 GHz	6711-7 Horiz/Vert 6.5-7.8GHz Mid channel TX
7.8 – 10 GHz	6711-7 Horiz/Vert 7.8-10GHz Mid channel TX
10 – 12.5 GHz	6711-7 Horiz/Vert 10-12.5GHz Mid channel TX
12.5 – 15 GHz	6711-7 Horiz/Vert 12.5-15GHz Mid channel TX
15 – 18 GHz	6711-7 Horiz/Vert 15-18GHz Mid channel TX
18 – 20 GHz	6711-7 Horiz/Vert 18-20GHz Mid channel TX
20 – 22 GHz	6711-7 Horiz/Vert 20-22GHz Mid channel TX
22 – 25 GHz	6711-7 Horiz/Vert 22-25GHz Mid channel TX

n.b. the general limits of 15.209 are as drawn on the respective plots.

These show that the **EUT** has **PASSED** this test.

5.5.2.1 Test Equipment used

E250, E252, E268, E410, E411, E412, E429, E533, E534, E535, TMS78, TMS79, TMS81, TMS82, TMS933, N243

See Section 10 for more details

5.6 Occupied bandwidth (6dB BW)

5.6.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.215)

Test Method: ANSI C63.10, Reference (6.9)

5.6.1.1 Configuration of EUT

The EUT was tested on a bench. Tests were performed using the temporary RF connector port. The EUT was tested whilst connected to and powered from its dedicated AC/DC adapter for maximised emissions. The EUT was operated in Transmit mode on the Lowest, Highest and Centre Channel frequencies (see section 3.4).

5.6.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below. A 100kHz RBW, 3x VBW, auto sweep time and max hold settings were used for the 6dB bandwidth.

5.6.2 Test results

Tests were performed using Test Site A.

Temperature of test Environment: 20°C

Analyser plots for the 6dB bandwidth can be found in Section 6.4 of this report.

Low Channel results

Mod scheme	Result (MHz)	Plot reference
1MBPS	10.125	0001
2MBPS	10.208	0002
5.5MBPS	10.042	0003
11MBPS	10.125	0004
6MBPS	15.25	0005
9MBPS	15.20	0006
12MBPS	15.25	0007
18MBPS	15.25	0008
24MBPS	15.25	0009
36MBPS	15.83	0010
48MBPS	15.46	0011
54MBPS	15.25	0012

Mid Channel results

Mod scheme	Result (MHz)	Plot reference
1MBPS	10.125	0013
2MBPS	10.17	0014
5.5MBPS	10.08	0015
11MBPS	10.08	0016
6MBPS	15.25	0017
9MBPS	15.25	0018
12MBPS	15.29	0019
18MBPS	15.50	0020
24MBPS	15.54	0021
36MBPS	15.38	0022
48MBPS	15.38	0023
54MBPS	15.25	0024

High Channel results

Mod scheme	Result (MHz)	Plot reference
1MBPS	10.08	0025
2MBPS	10.17	0026
5.5MBPS	10.125	0027
11MBPS	10.125	0028
6MBPS	15.29	0029
9MBPS	15.29	0030
12MBPS	15.25	0031
18MBPS	15.54	0032
24MBPS	15.25	0033
36MBPS	15.58	0034
48MBPS	15.46	0035
54MBPS	15.29	0036

LIMITS:

15.247(a)(2) The minimum 6dB bandwidth shall be at least 500kHz.

These results show that the **EUT** has **PASSED** this test.

5.6.2.1 Test Equipment used

E252, E420, TMS10, E397, E290, E342

See Section 10 for more details.

5.7 Band Edge Compliance

5.7.1 Test Methods

Test Requirements FCC Part 15C, Reference (15.215 and 15.247)

Test Method: FCC Part 15C, Reference (15.215)
ANSI C63.10-2009, Reference clause 6.9.3

5.7.1.1 Configuration of EUT

The EUT was placed on a 0.8 metres high turntable. The front edge of the EUT was initially positioned facing the antenna. The EUT was measured at a distance of 3 metres.

5.7.1.2 Test Procedure

Tests were made in accordance with FCC Part 15 using the measuring equipment noted below. The emission from the EUT was maximised before taking the plots..

5.7.2 Test results

Tests were performed using Test Site **B**.

Temperature of test Environment: 15-20°C

Analyser plots for the Band Edge Compliance can be found in Section 6.5 of this report. These also show the 20dBc/30dBc requirement of 15.247(d) are met at the band edges of 2400 and 2483.5 MHz. Restricted band edge plots are also shown in section 6.5.

The following tables list the field strengths observed in the adjacent restricted bands, which are required to meet the tighter 15.209 limits:

Bottom channel results

Channel 1 Scheme	Band edge PK reading (dBuV/m)	Band edge AV reading (dBuV/m)	Plot reference
1Mbps	60.9	51.7	J6711-7, Band edge AV (1M RBW) Low chan 1MBPS J6711-7, Band edge PK (1M RBW) Low chan 1MBPS
2Mbps	61.2	51.7	J6711-7, Band edge AV (1M RBW) Low chan 2MBPS J6711-7, Band edge PK (1M RBW) Low chan 2MBPS
5.5Mbps	61.1	50.7	J6711-7, Band edge AV (1M RBW) Low chan 5.5MBPS J6711-7, Band edge PK (1M RBW) Low chan 5.5MBPS
11Mbps	61.9	50.7	J6711-7, Band edge AV (1M RBW) Low chan 11MBPS J6711-7, Band edge PK (1M RBW) Low chan 11MBPS
6Mbps	60.6	47.9	J6711-7, Band edge AV (1M RBW) Low chan 6MBPS J6711-7, Band edge PK (1M RBW) Low chan 6MBPS
9Mbps	61.0	47.9	J6711-7, Band edge AV (1M RBW) Low chan 9MBPS J6711-7, Band edge PK (1M RBW) Low chan 9MBPS
12Mbps	60.2	48.2	J6711-7, Band edge AV (1M RBW) Low chan 12MBPS J6711-7, Band edge PK (1M RBW) Low chan 12MBPS
18Mbps	60.4	47.9	J6711-7, Band edge AV (1M RBW) Low chan 18MBPS J6711-7, Band edge PK (1M RBW) Low chan 18MBPS
24Mbps	60.3	47.9	J6711-7, Band edge AV (1M RBW) Low chan 24MBPS J6711-7, Band edge PK (1M RBW) Low chan 24MBPS
36Mbps	61.0	47.8	J6711-7, Band edge AV (1M RBW) Low chan 36MBPS J6711-7, Band edge PK (1M RBW) Low chan 36MBPS
48Mbps	59.7	47.1	J6711-7, Band edge AV (1M RBW) Low chan 48MBPS J6711-7, Band edge PK (1M RBW) Low chan 48MBPS
54Mbps	60.0	47.1	J6711-7, Band edge AV (1M RBW) Low chan 54MBPS J6711-7, Band edge PK (1M RBW) Low chan 54MBPS

Top channel results

Channel 11 Scheme	Band edge PK reading (dBuV/m)	Band edge AV reading (dBuV/m)	Plot reference
1Mbps	60.0	51.4	J6711-7, Band edge AV (1M RBW) High chan 1MBPS J6711-7, Band edge PK (1M RBW) High chan 1MBPS
2Mbps	61.9	51.3	J6711-7, Band edge AV (1M RBW) High chan 2MBPS J6711-7, Band edge PK (1M RBW) High chan 2MBPS
5.5Mbps	61.0	50.4	J6711-7, Band edge AV (1M RBW) High chan 5.5MBPS J6711-7, Band edge PK (1M RBW) High chan 5.5MBPS
11Mbps	59.7	50.4	J6711-7, Band edge AV (1M RBW) High chan 11MBPS J6711-7, Band edge PK (1M RBW) High chan 11MBPS
6Mbps	64.0	49.5	J6711-7, Band edge AV (1M RBW) High chan 6MBPS J6711-7, Band edge PK (1M RBW) High chan 6MBPS
9Mbps	64.6	49.6	J6711-7, Band edge AV (1M RBW) High chan 9MBPS J6711-7, Band edge PK (1M RBW) High chan 9MBPS
12Mbps	63.0	49.6	J6711-7, Band edge AV (1M RBW) High chan 12MBPS J6711-7, Band edge PK (1M RBW) High chan 12MBPS
18Mbps	62.0	49.8	J6711-7, Band edge AV (1M RBW) High chan 18MBPS J6711-7, Band edge PK (1M RBW) High chan 18MBPS
24Mbps	61.8	49.5	J6711-7, Band edge AV (1M RBW) High chan 24MBPS J6711-7, Band edge PK (1M RBW) High chan 24MBPS
36Mbps	63.1	49.1	J6711-7, Band edge AV (1M RBW) High chan 36MBPS J6711-7, Band edge PK (1M RBW) High chan 36MBPS
48Mbps	62.0	47.8	J6711-7, Band edge AV (1M RBW) High chan 48MBPS J6711-7, Band edge PK (1M RBW) High chan 48MBPS
54Mbps	59.8	47.6	J6711-7, Band edge AV (1M RBW) High chan 54MBPS J6711-7, Band edge PK (1M RBW) High chan 54MBPS

The band edge readings were performed with a peak detector (max held plot) and with the EUT set in a constant 100% transmit state.

Limits:
AV = 54dBuV/m at band edges
PK = 74dBuV/m at band edges

The restricted band edges closest to the EUT frequency of 2400-2483.5MHz are 2390 & 2483.5MHz.

Further wider span plots have been taken to show the fact that there are no spurious emissions above the restricted limits of 15.209.

These results show that the **EUT** has **PASSED** this test.

5.7.2.1 Test Equipment used

E268, E533, E534, E535, TMS82

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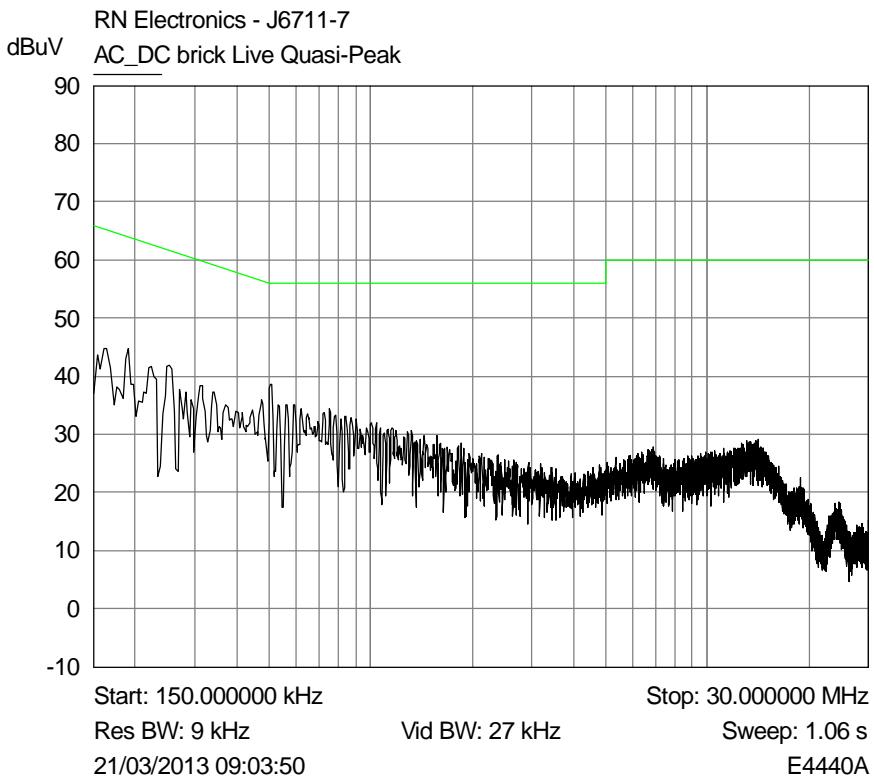
5.8 FHSS Parameters

The following tests were not applicable as the EUT does not employ FHSS Technology.

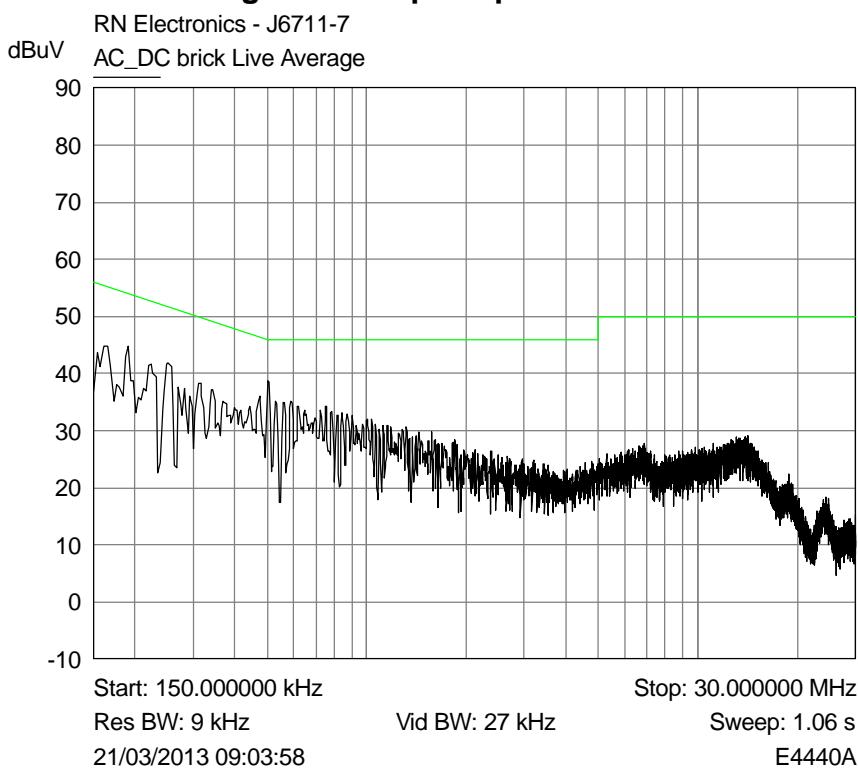
- 5.8.1 Frequency Separation**
- 5.8.2 Number of hopping Channels**
- 5.8.3 Dwell time**

6 Plots and Results

6.1 Conducted Emissions



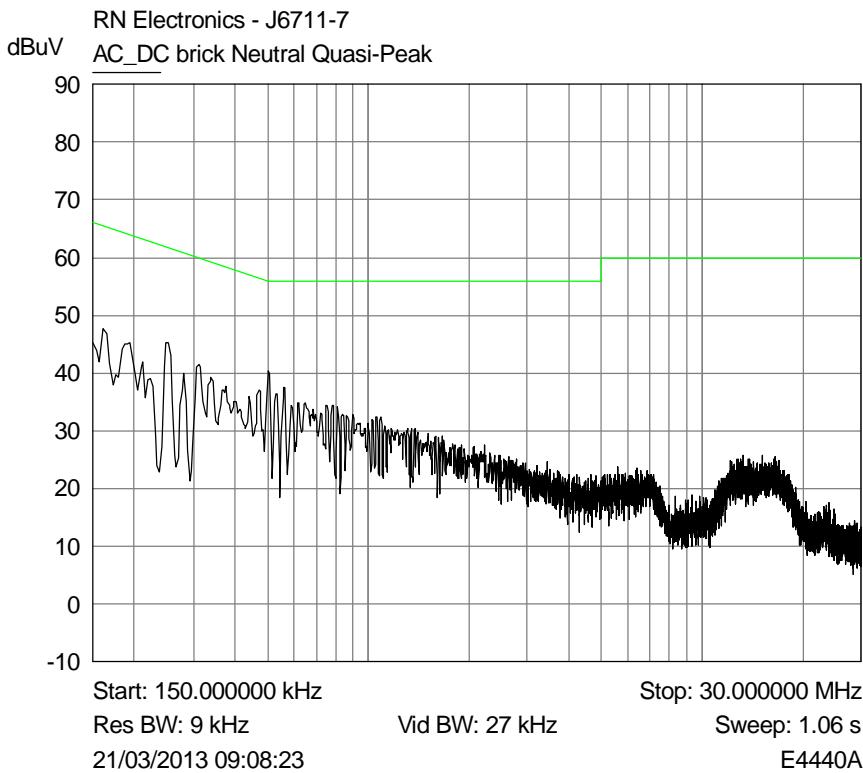
**Plot of peak emissions 150kHz - 30MHz on the mains live terminal
against the quasi-peak limit line.**



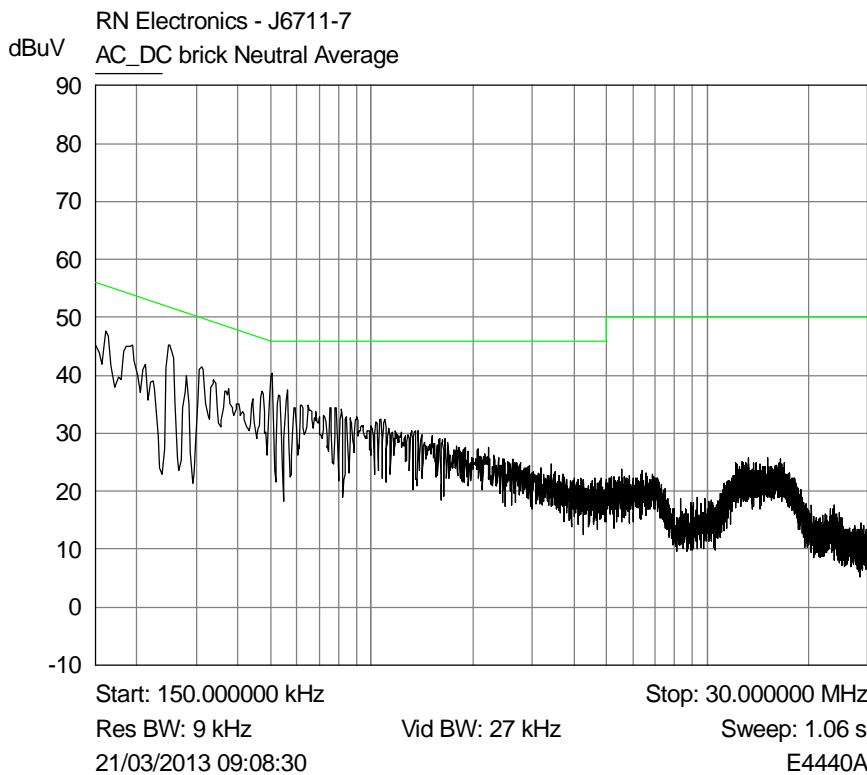
**Plot of peak emissions 150kHz - 30MHz on the mains live terminal
against the average limit line.**

File name PURE.6711-7 ISSUE 01

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Plot of peak emissions 150kHz - 30MHz on the mains neutral terminal against the quasi-peak limit line.



Plot of peak emissions 150kHz - 30MHz on the mains neutral terminal against the average limit line.

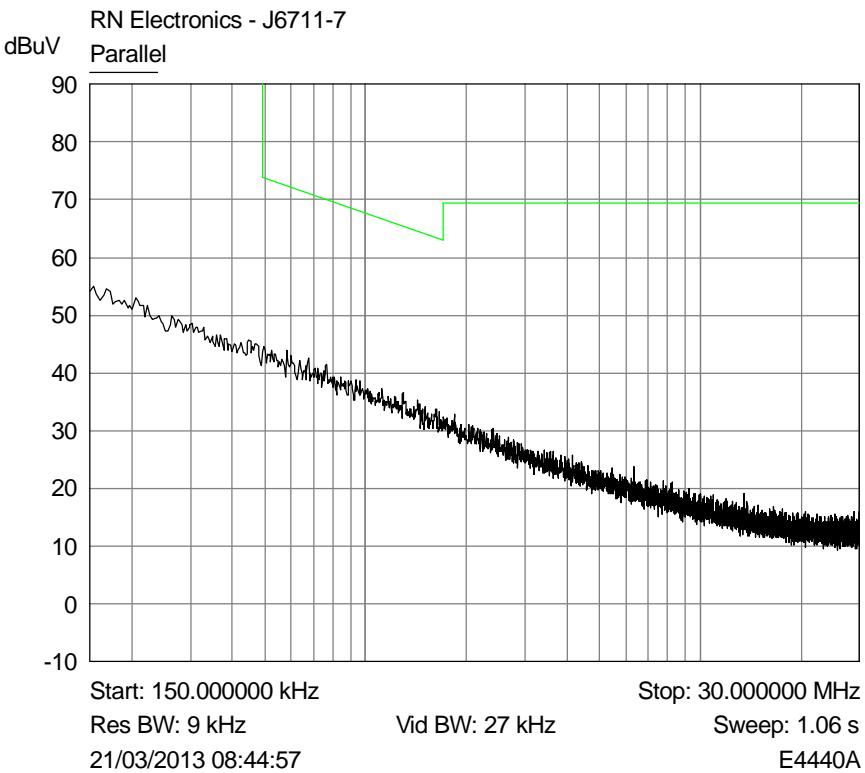
File name PURE.6711-7 ISSUE 01

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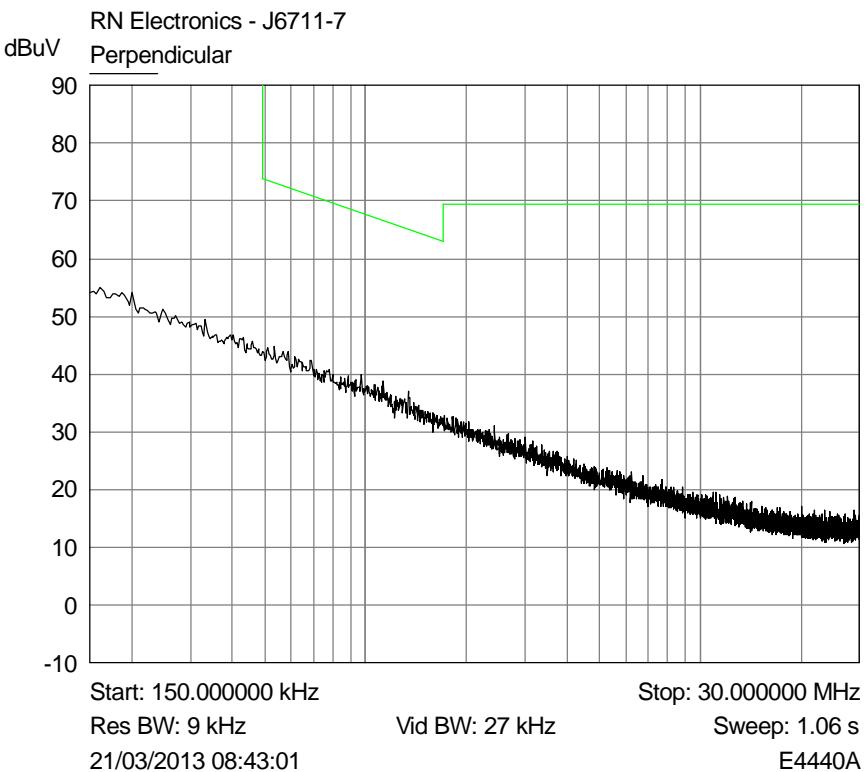
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 26 OF 130

6.2 Radiated Emissions 150kHz – 1GHz



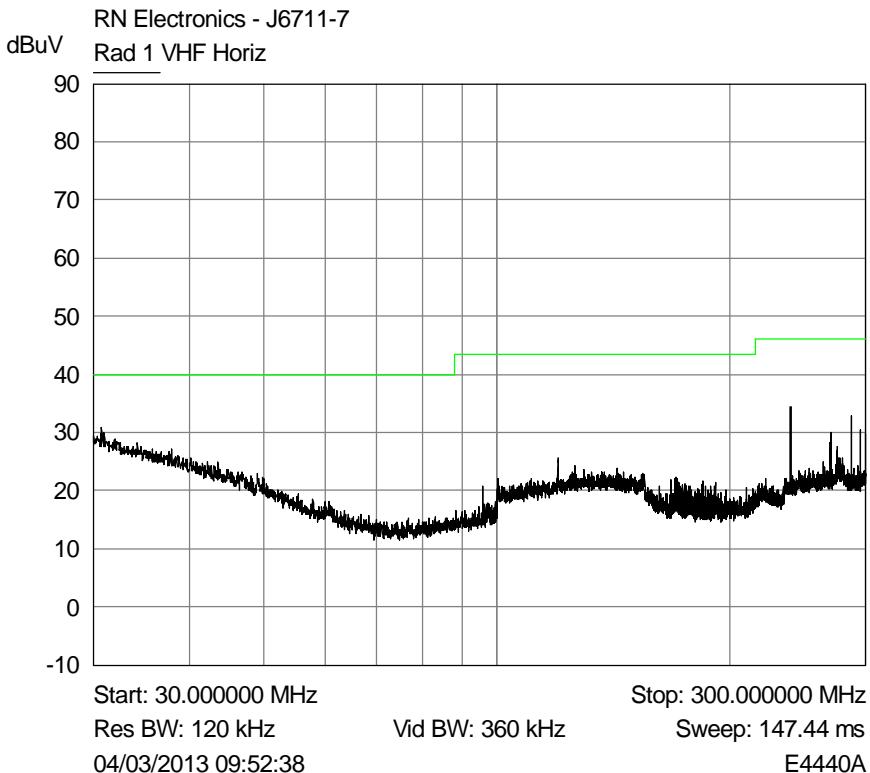
Plot of peak emissions Parallel 150kHz - 30MHz against the quasi-peak limit line.



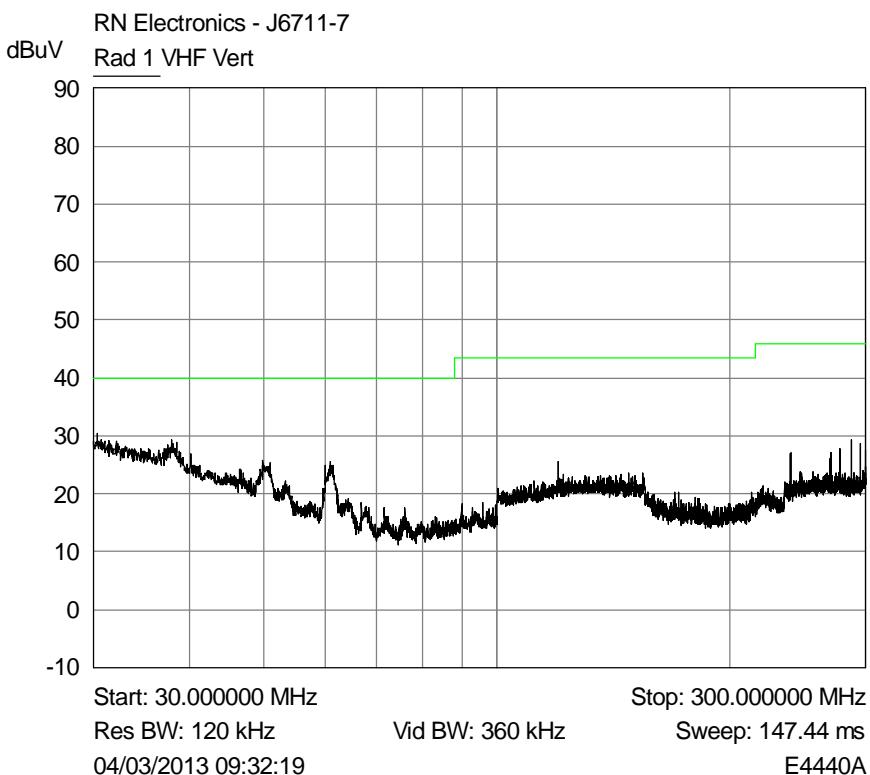
Plot of peak emissions Perpendicular 150kHz - 30MHz against the quasi-peak limit line.

File name PURE.6711-7 ISSUE 01

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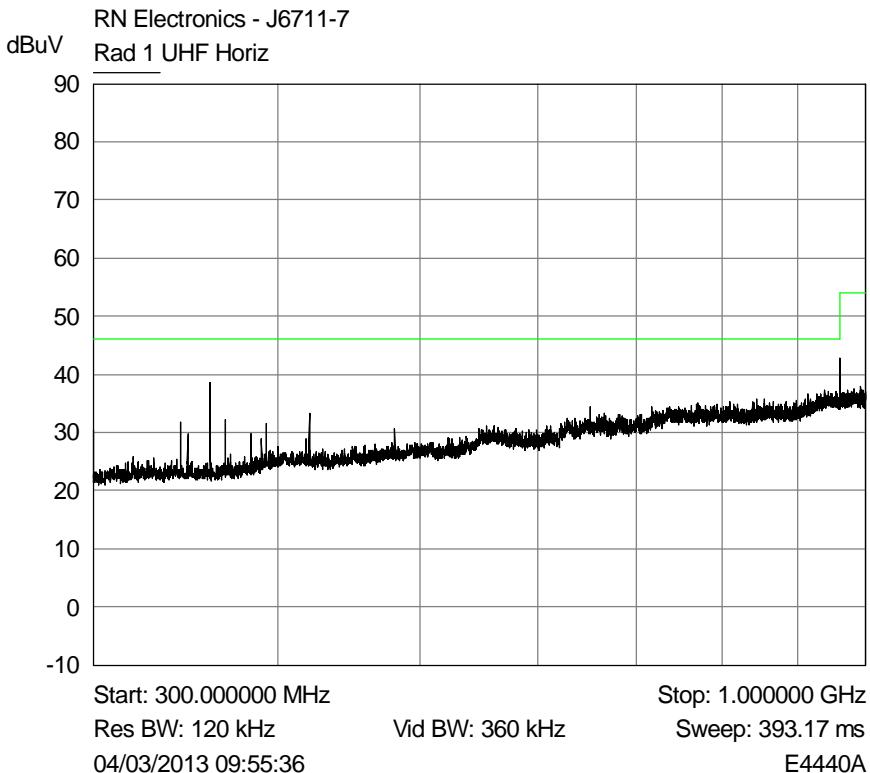
Plot of peak horizontal emissions 30MHz - 300MHz against the quasi-peak limit line.



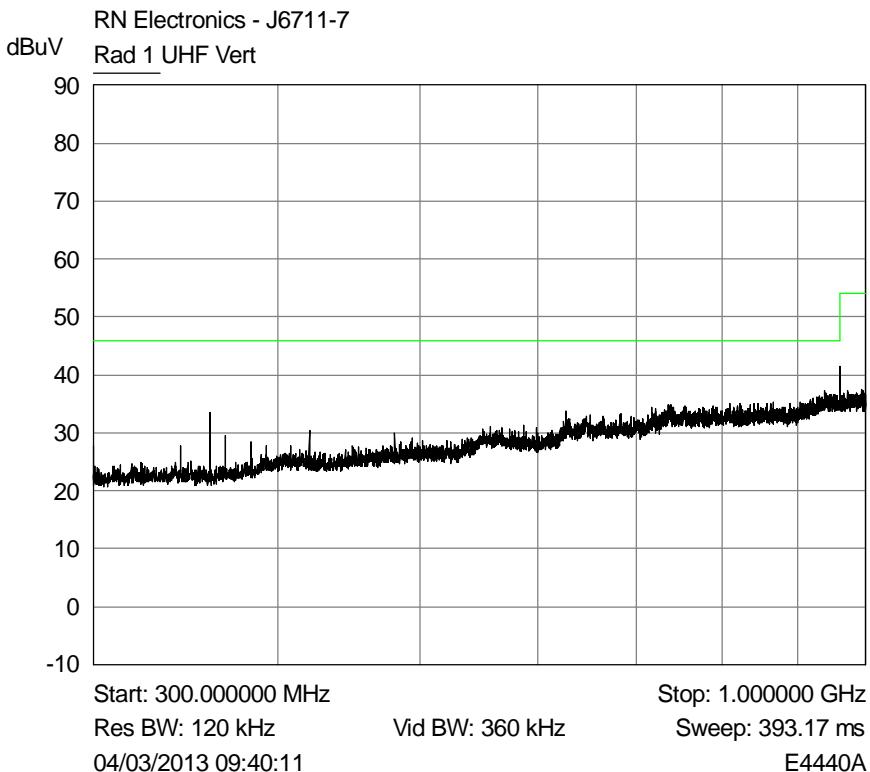
Plot of peak vertical emissions 30MHz - 300MHz against the quasi-peak limit line.

File name PURE.6711-7 ISSUE 01

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Plot of peak horizontal emissions 300MHz - 1GHz against the quasi-peak limit line.



Plot of peak vertical emissions 300MHz - 1GHz against the quasi-peak limit line.

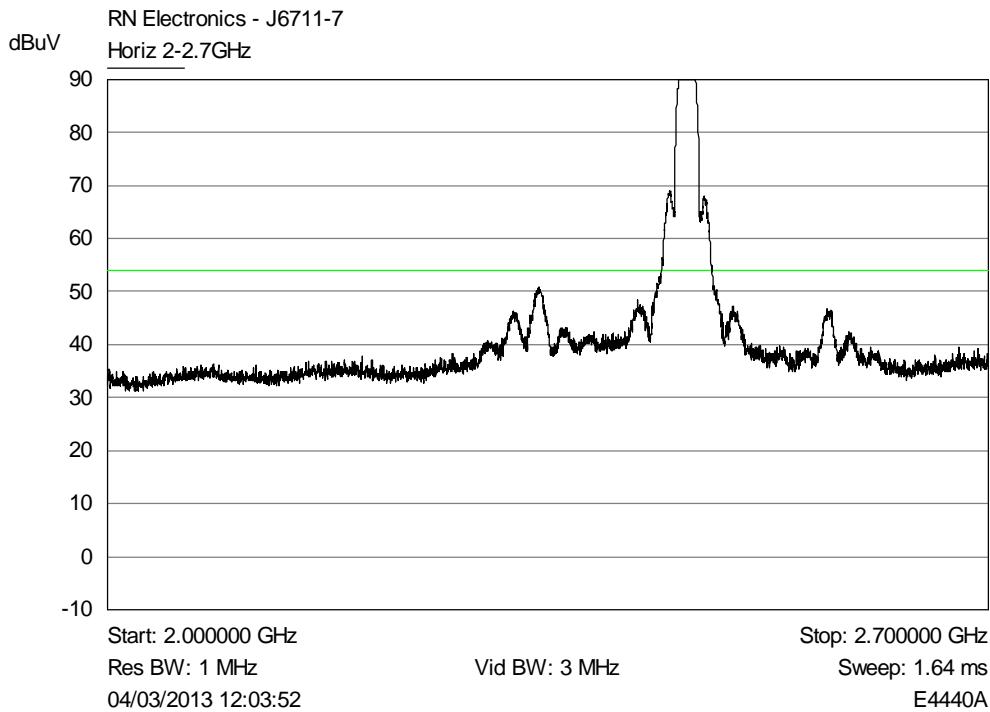
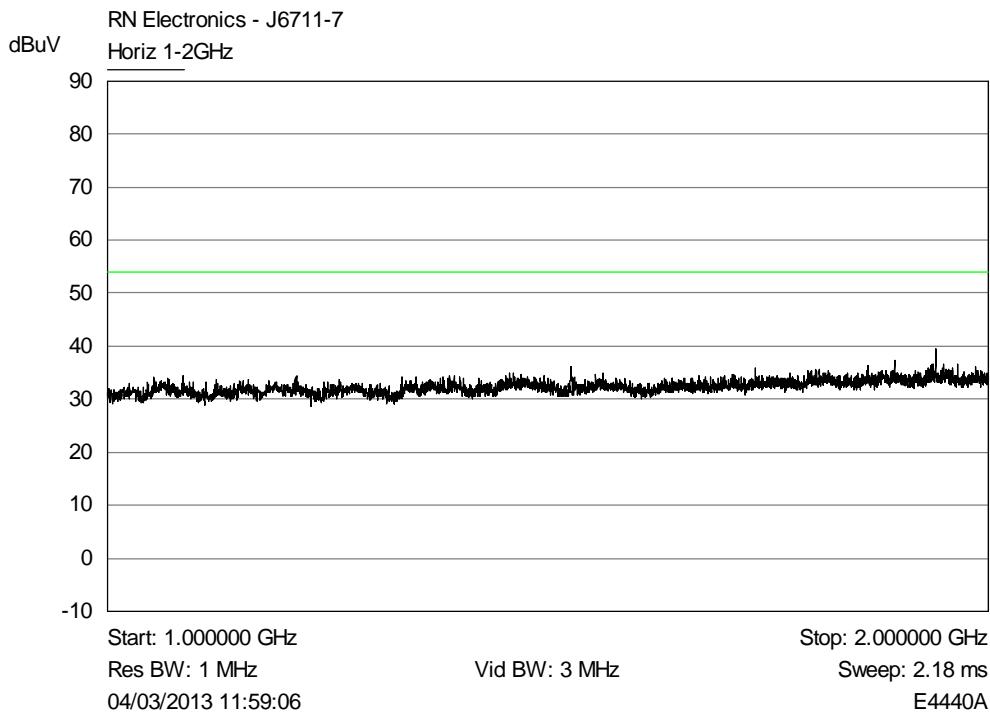
File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 29 OF 130

6.3 Radiated Emissions above 1GHz

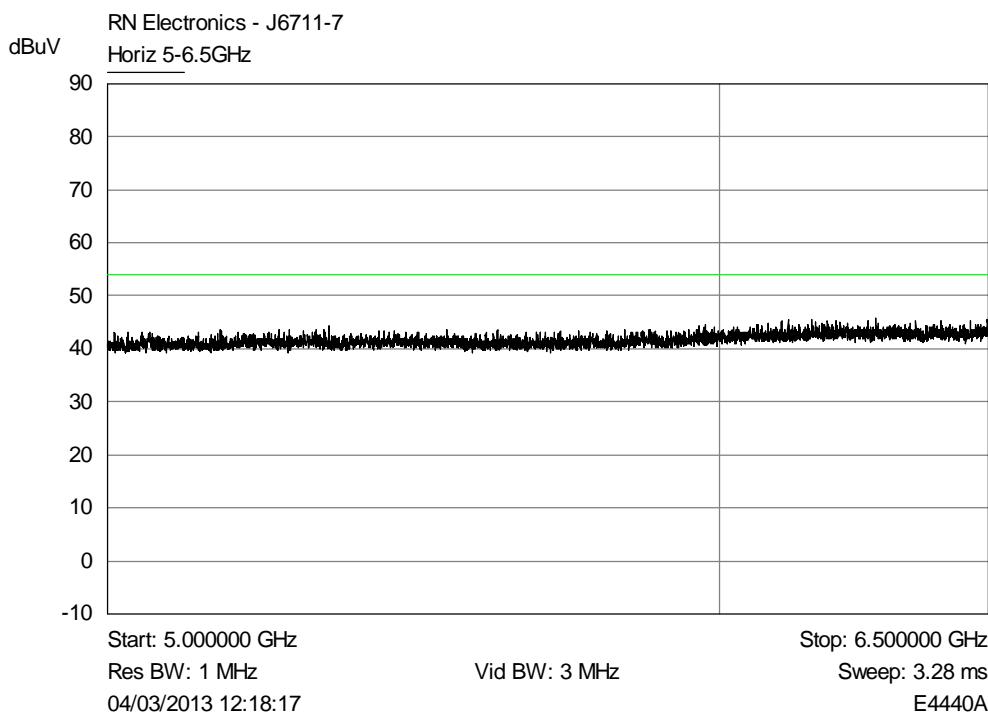
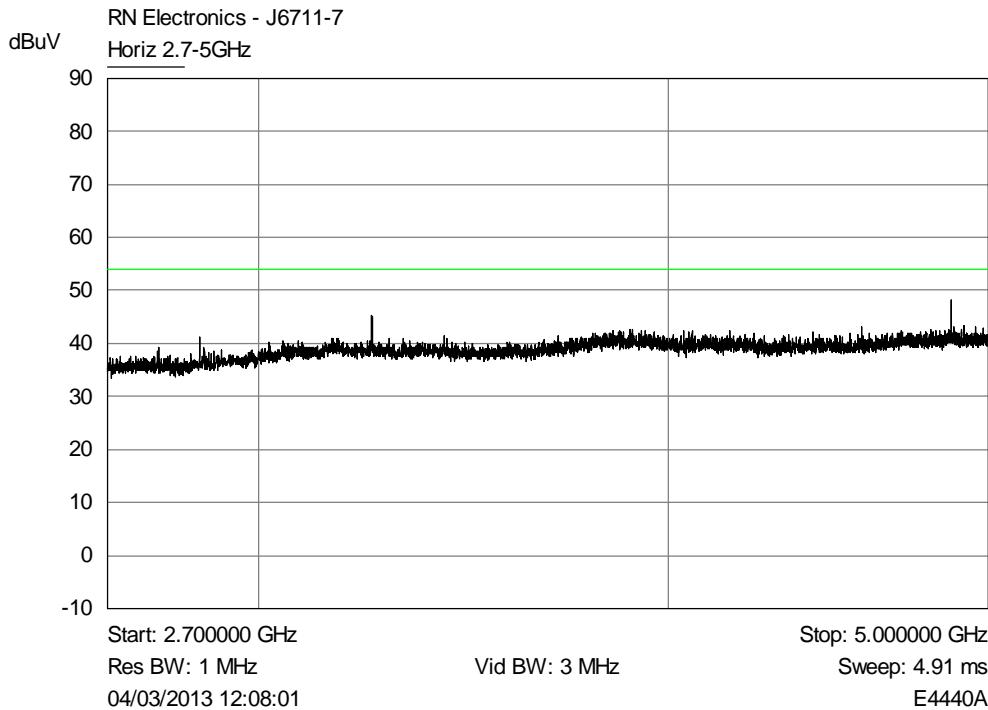


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 30 OF 130

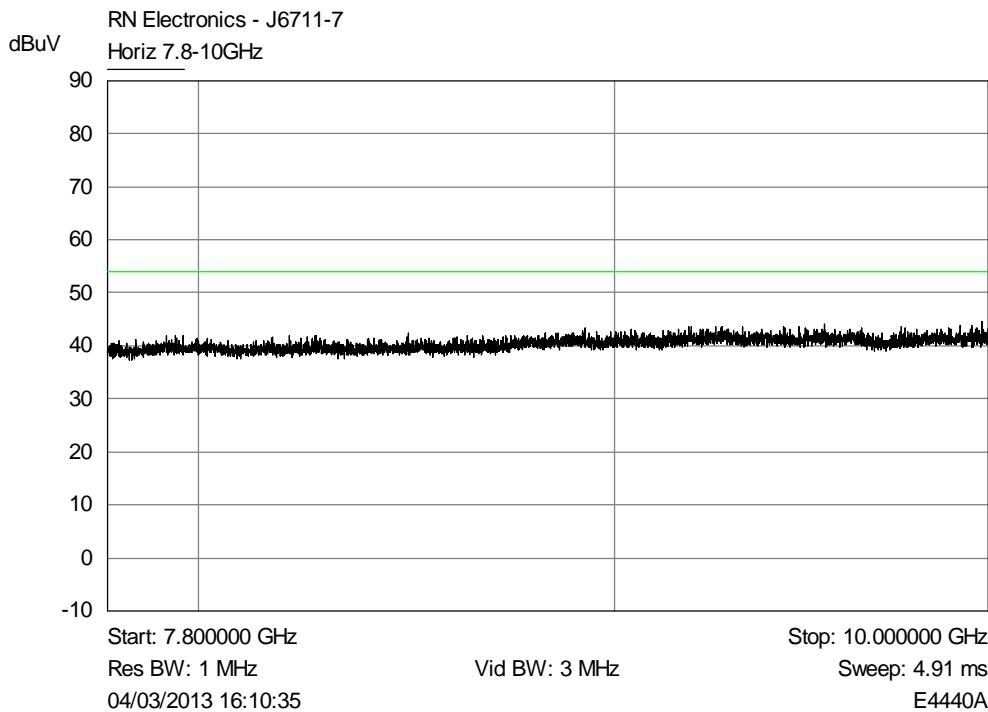
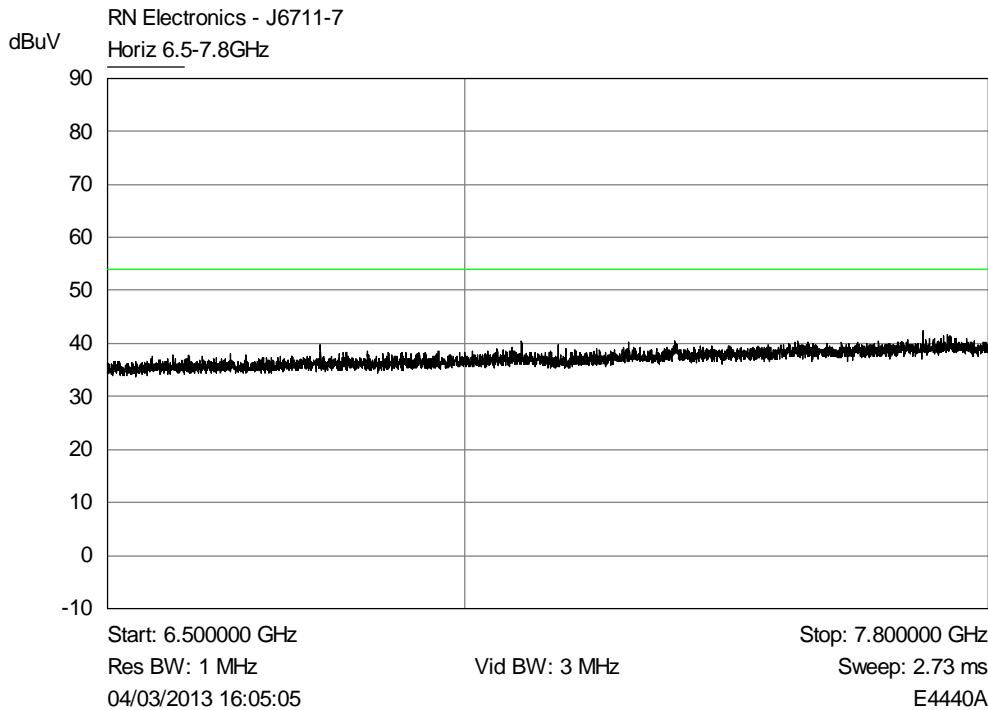


File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 31 OF 130

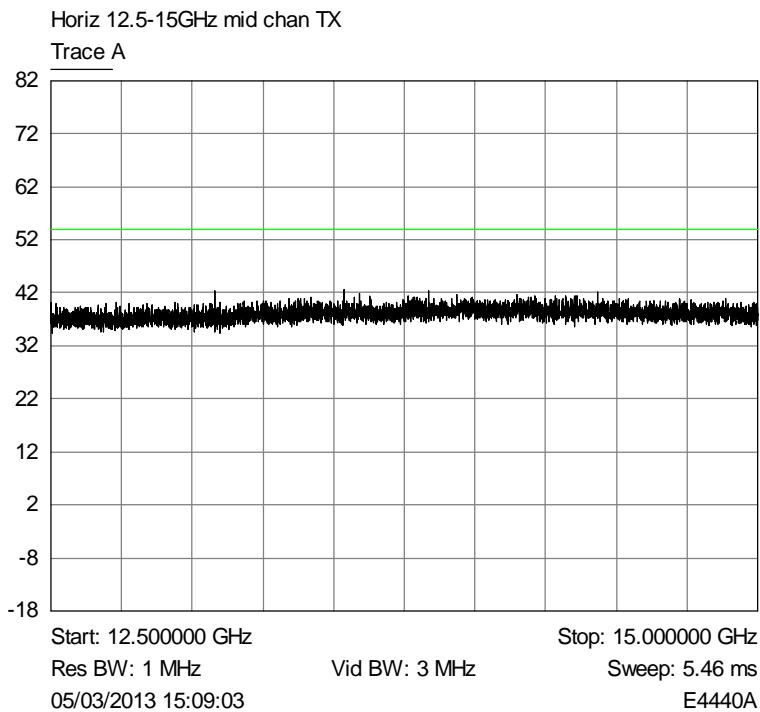
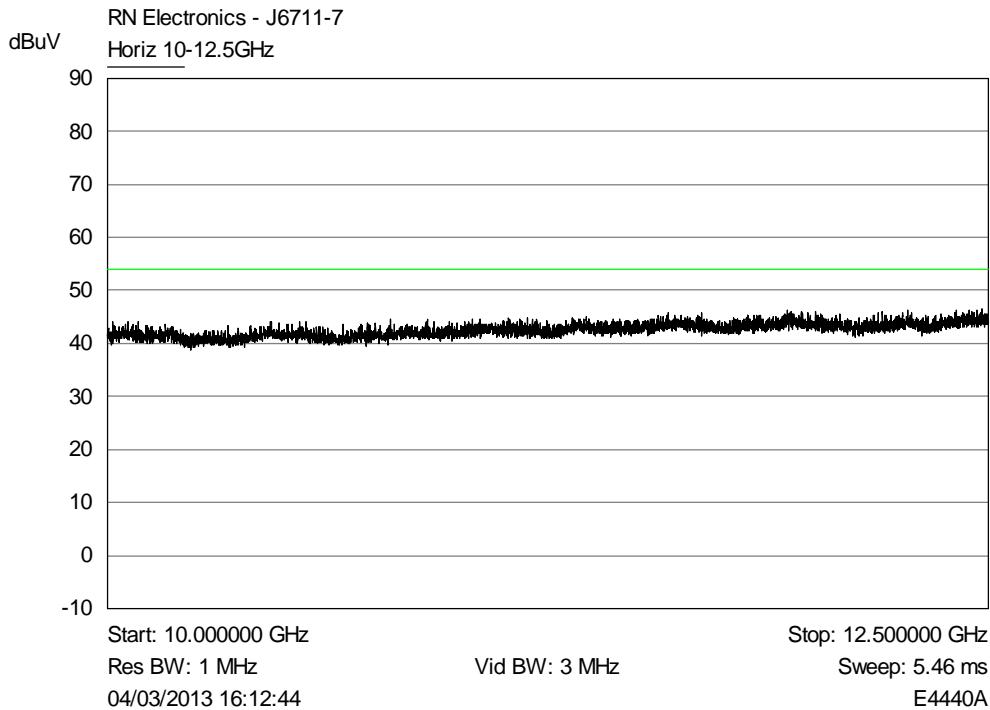


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 32 OF 130

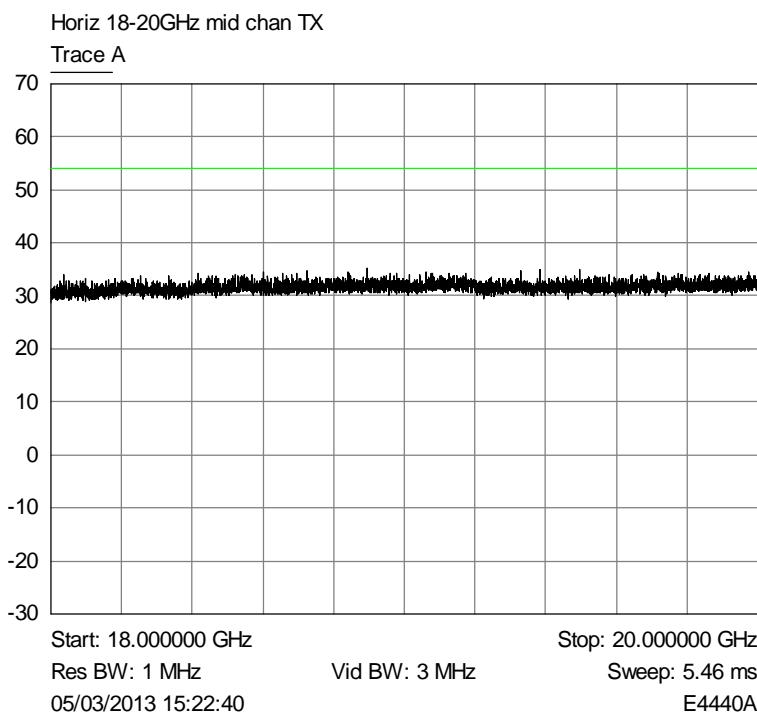
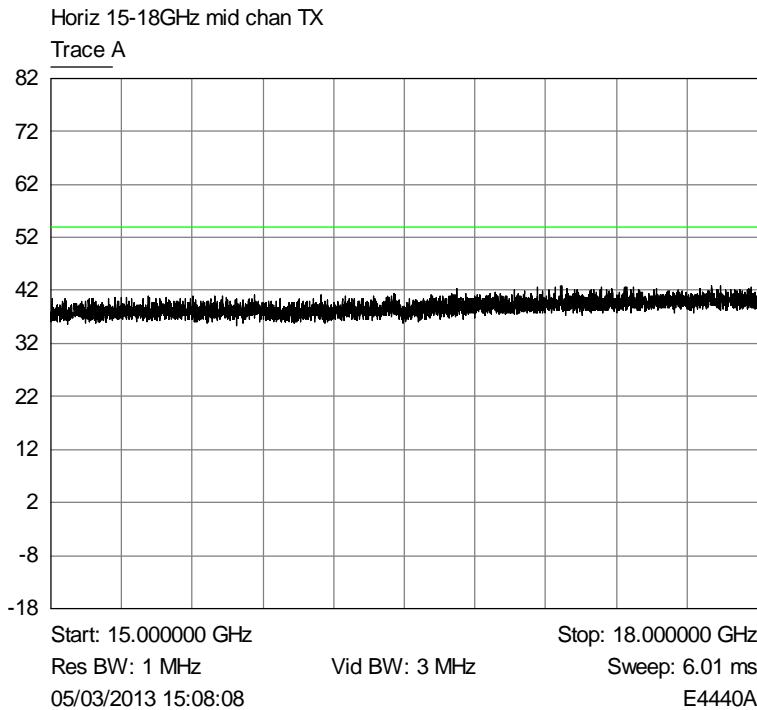


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 33 OF 130



File name PURE.6711-7 ISSUE 01

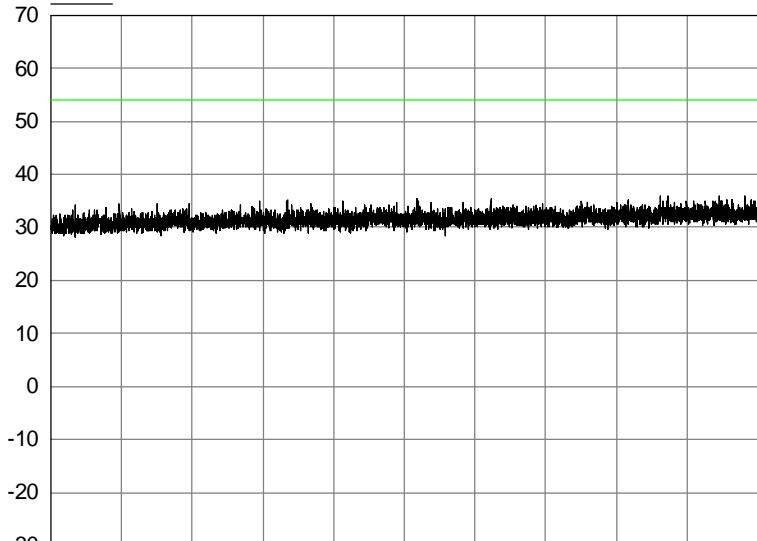
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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 34 OF 130

Horiz 20-22GHz mid chan TX

Trace A



Start: 20.00000 GHz

Stop: 22.00000 GHz

Res BW: 1 MHz

Vid BW: 3 MHz

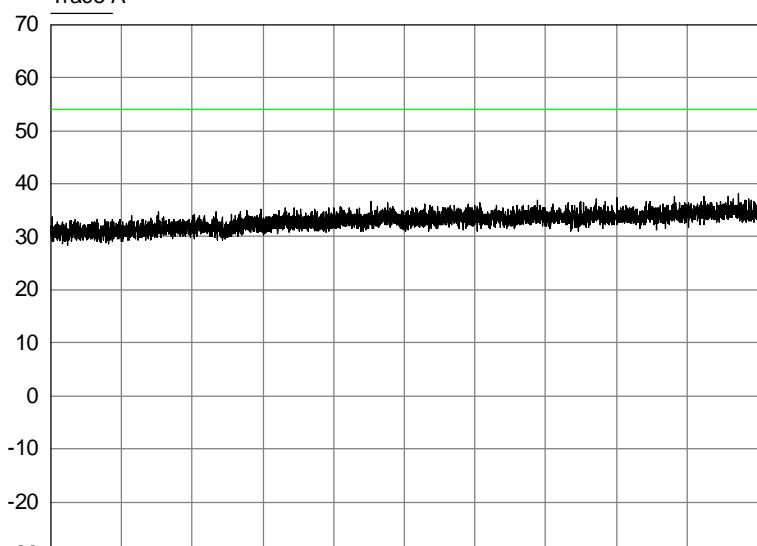
Sweep: 5.46 ms

05/03/2013 15:23:34

E4440A

Horiz 22-25GHz mid chan TX

Trace A



Start: 22.00000 GHz

Stop: 25.00000 GHz

Res BW: 1 MHz

Vid BW: 3 MHz

Sweep: 7.64 ms

05/03/2013 15:24:38

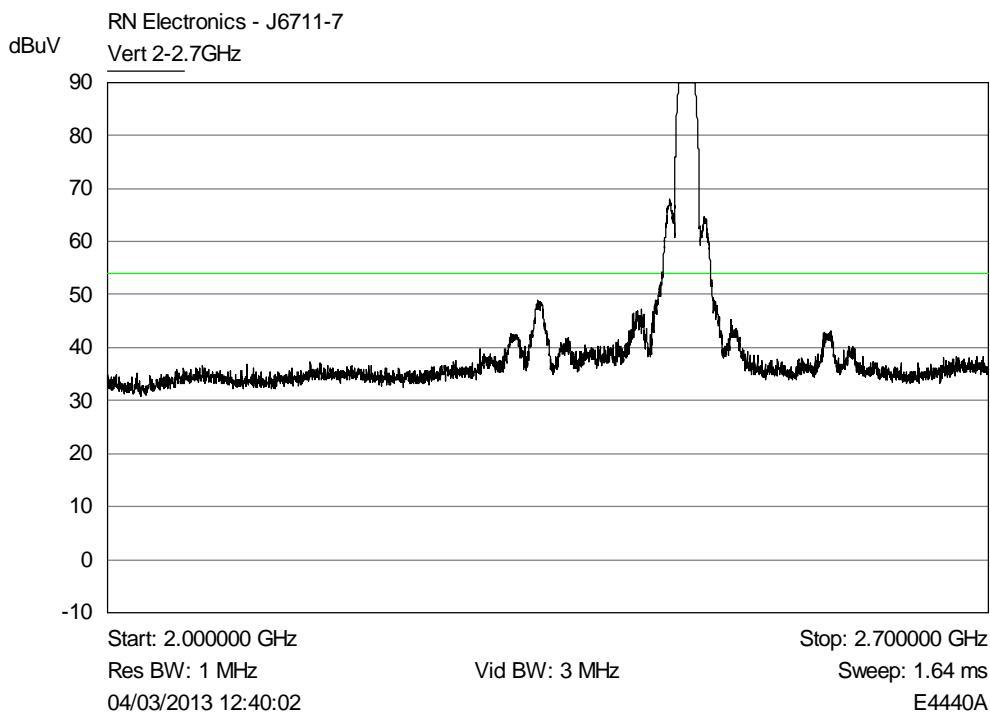
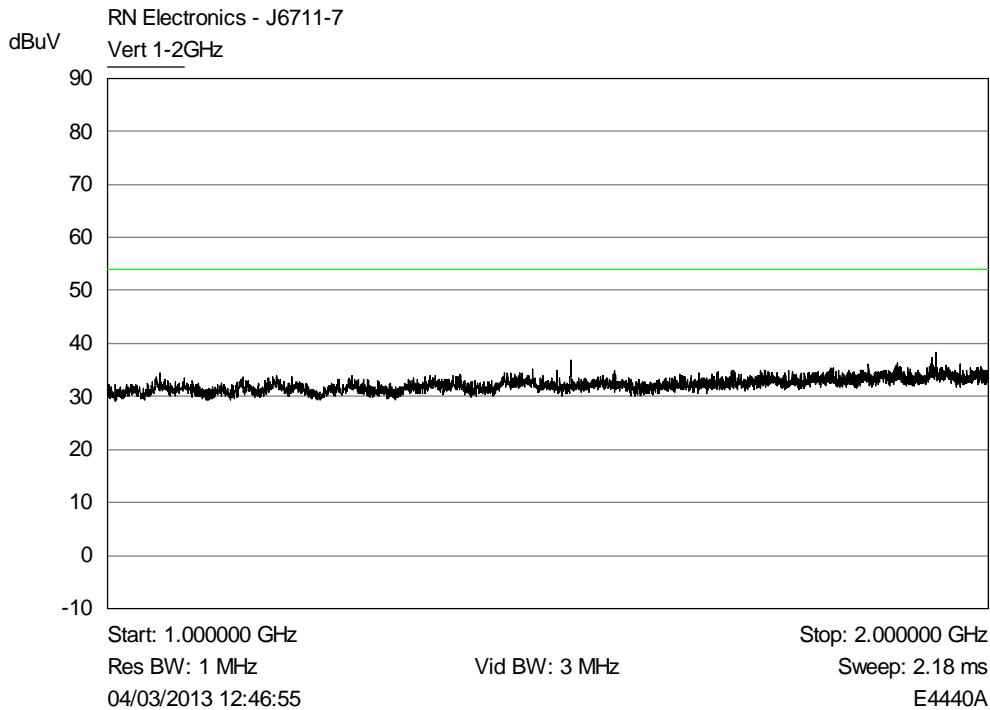
E4440A

File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 35 OF 130

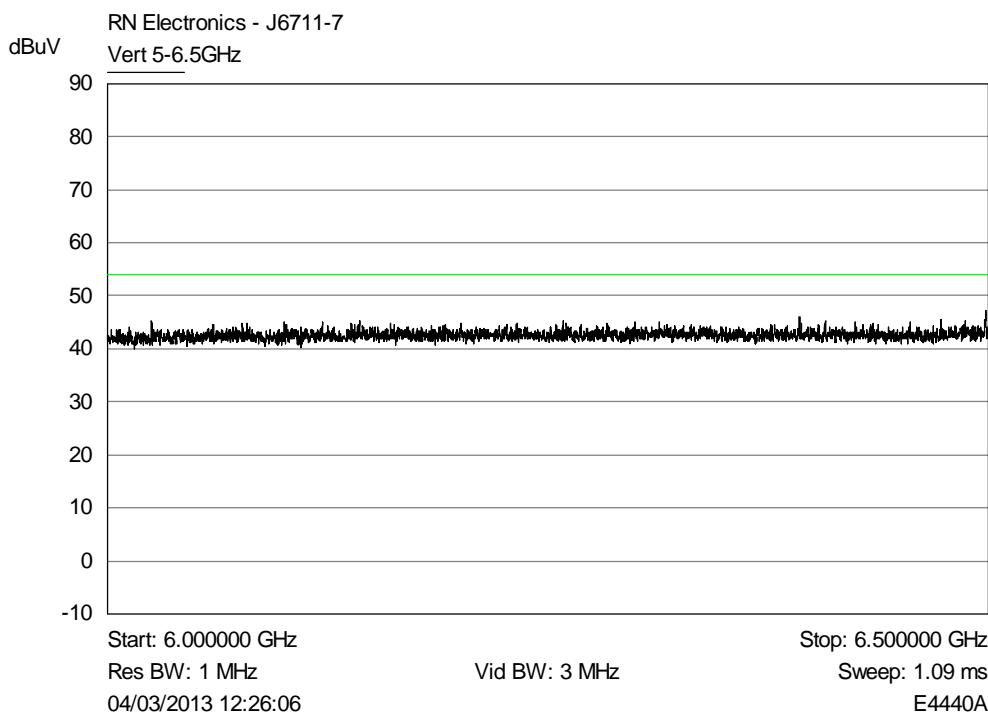
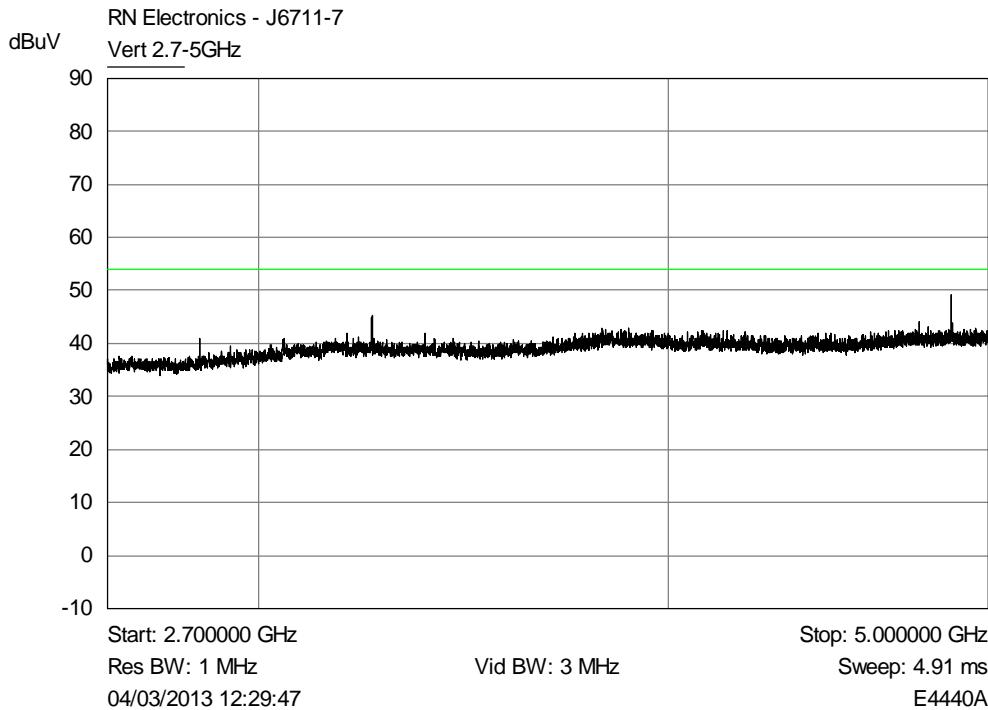


File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 36 OF 130

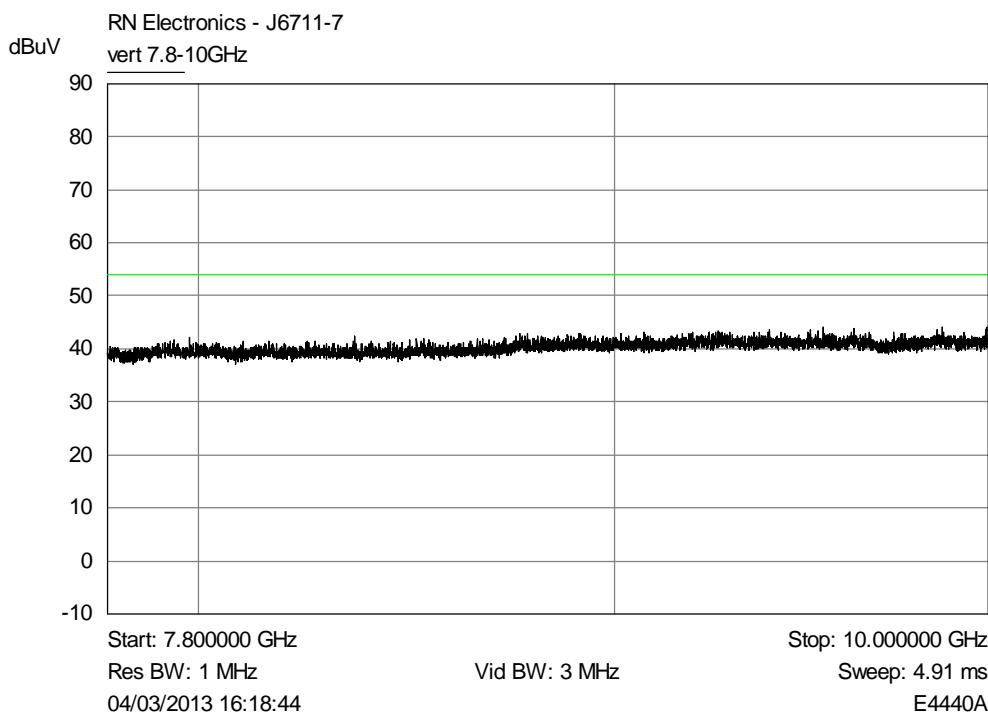
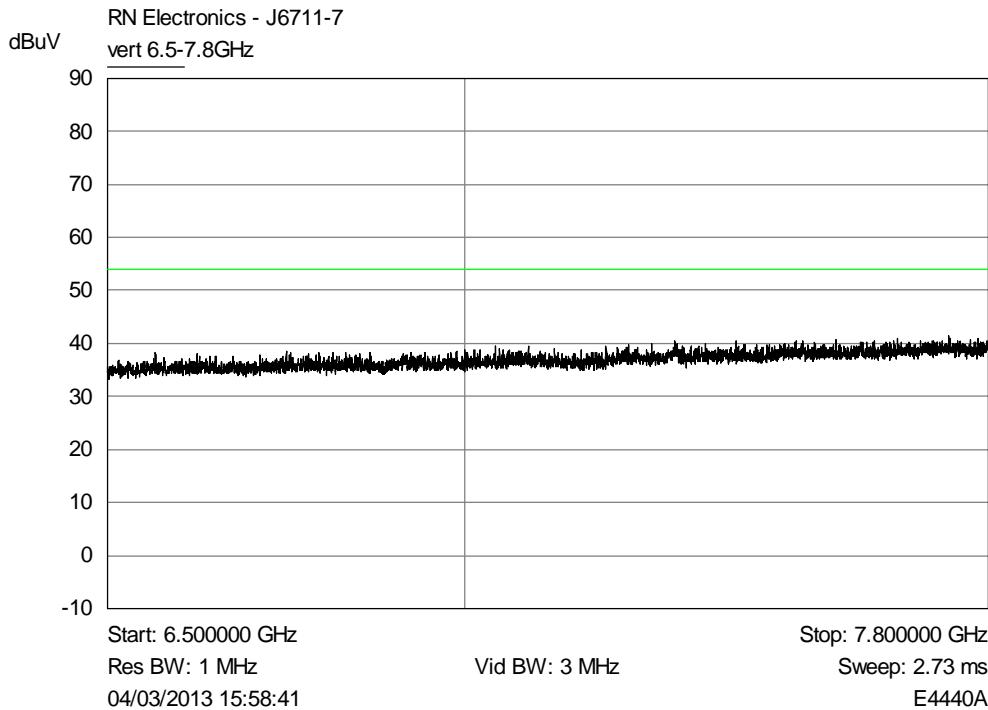


File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 37 OF 130

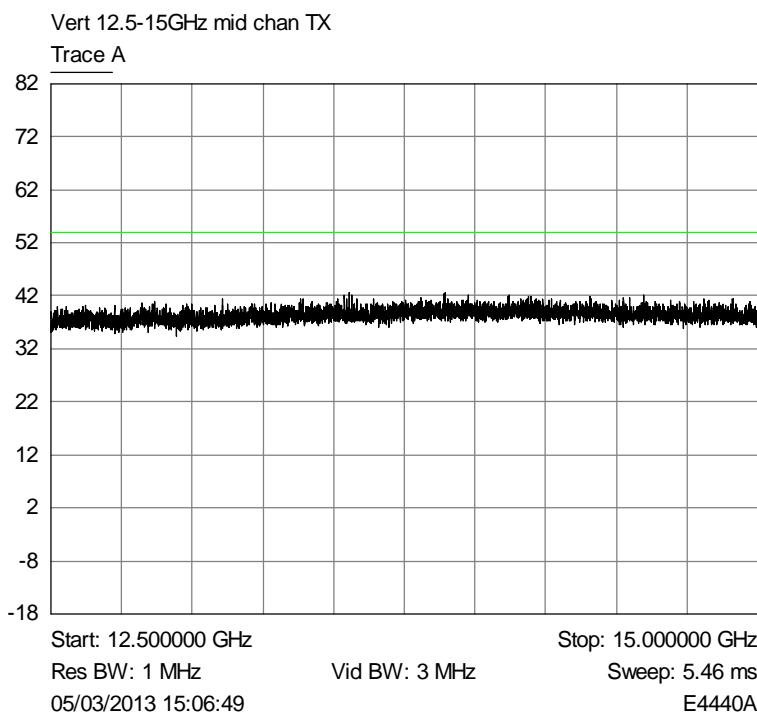
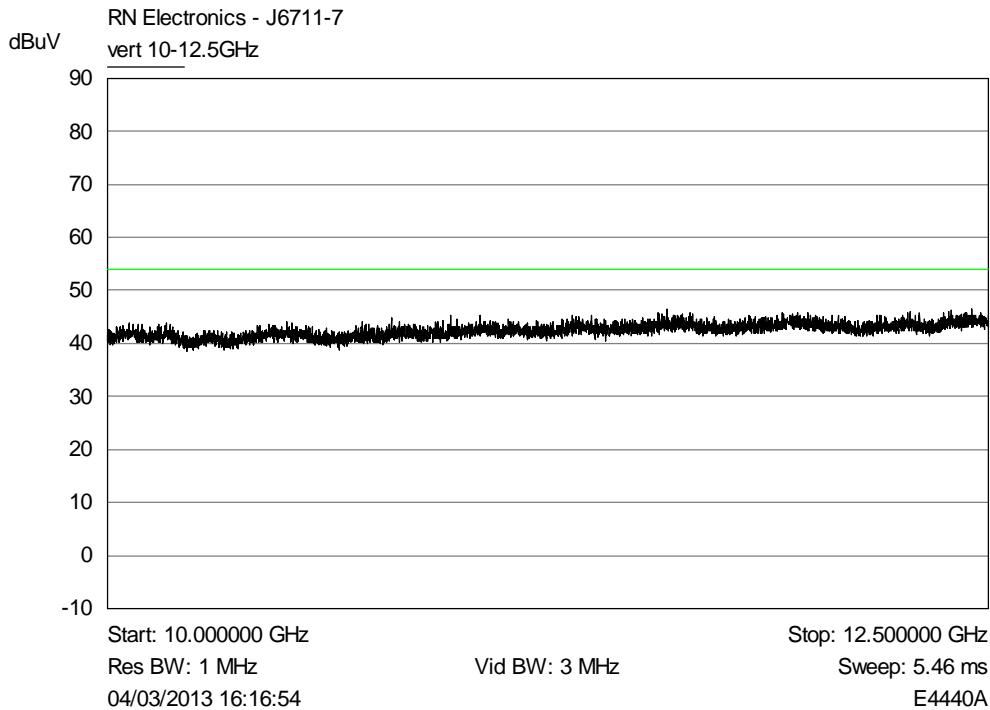


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 38 OF 130

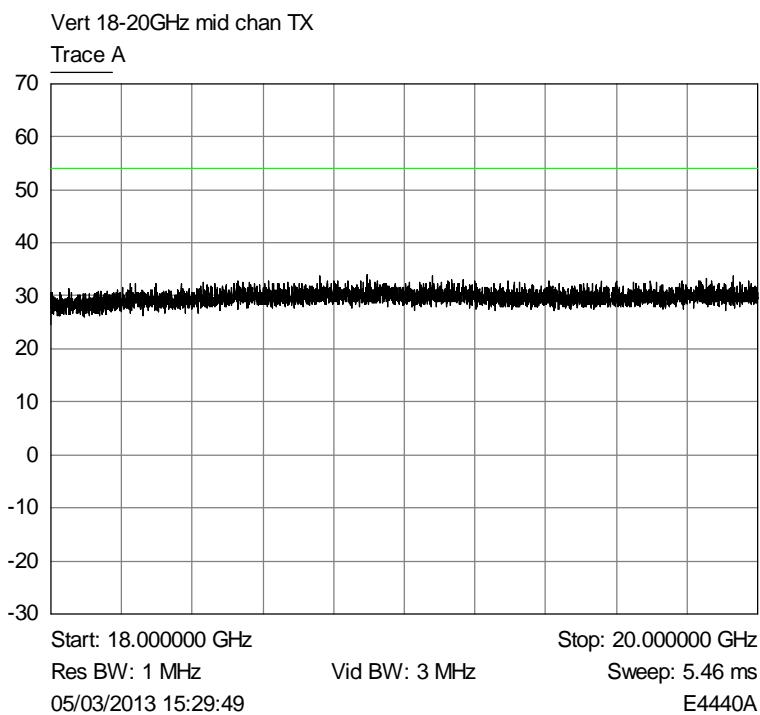
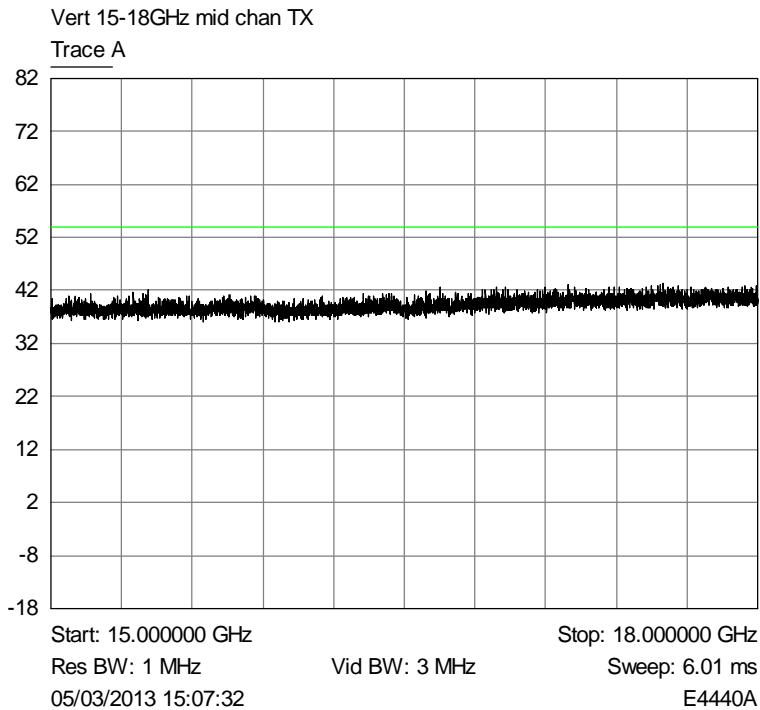


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 39 OF 130

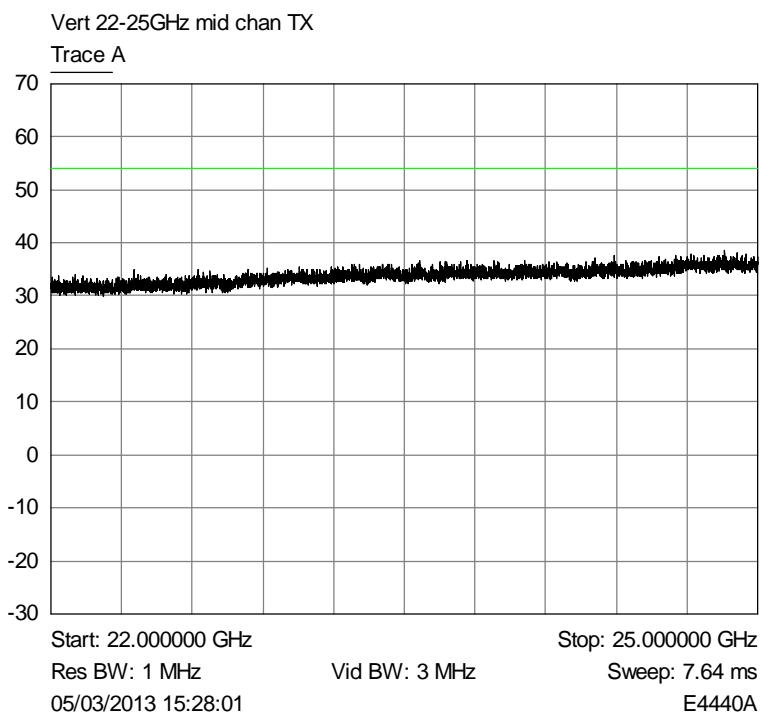
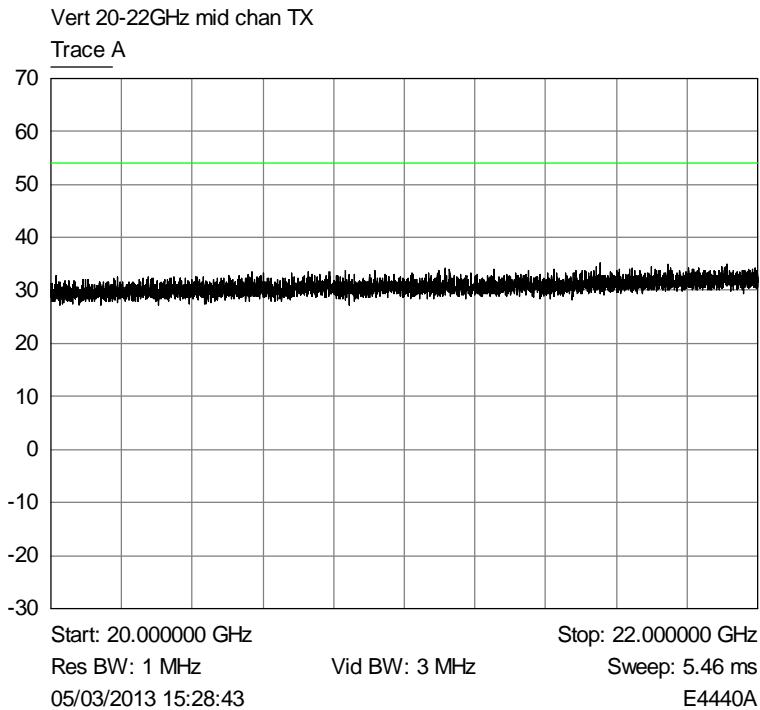


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 40 OF 130



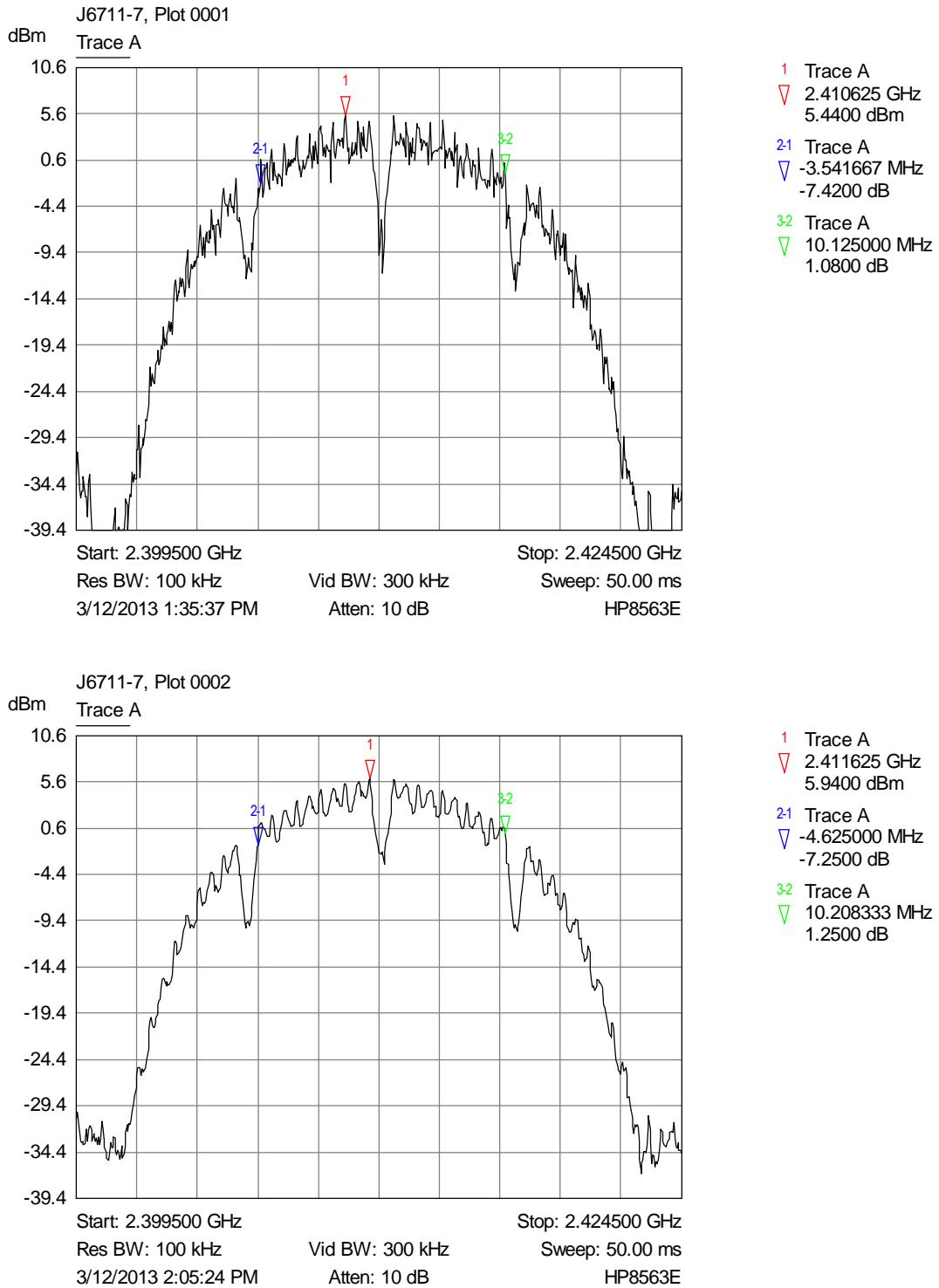
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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 41 OF 130

6.4 6dB Bandwidth

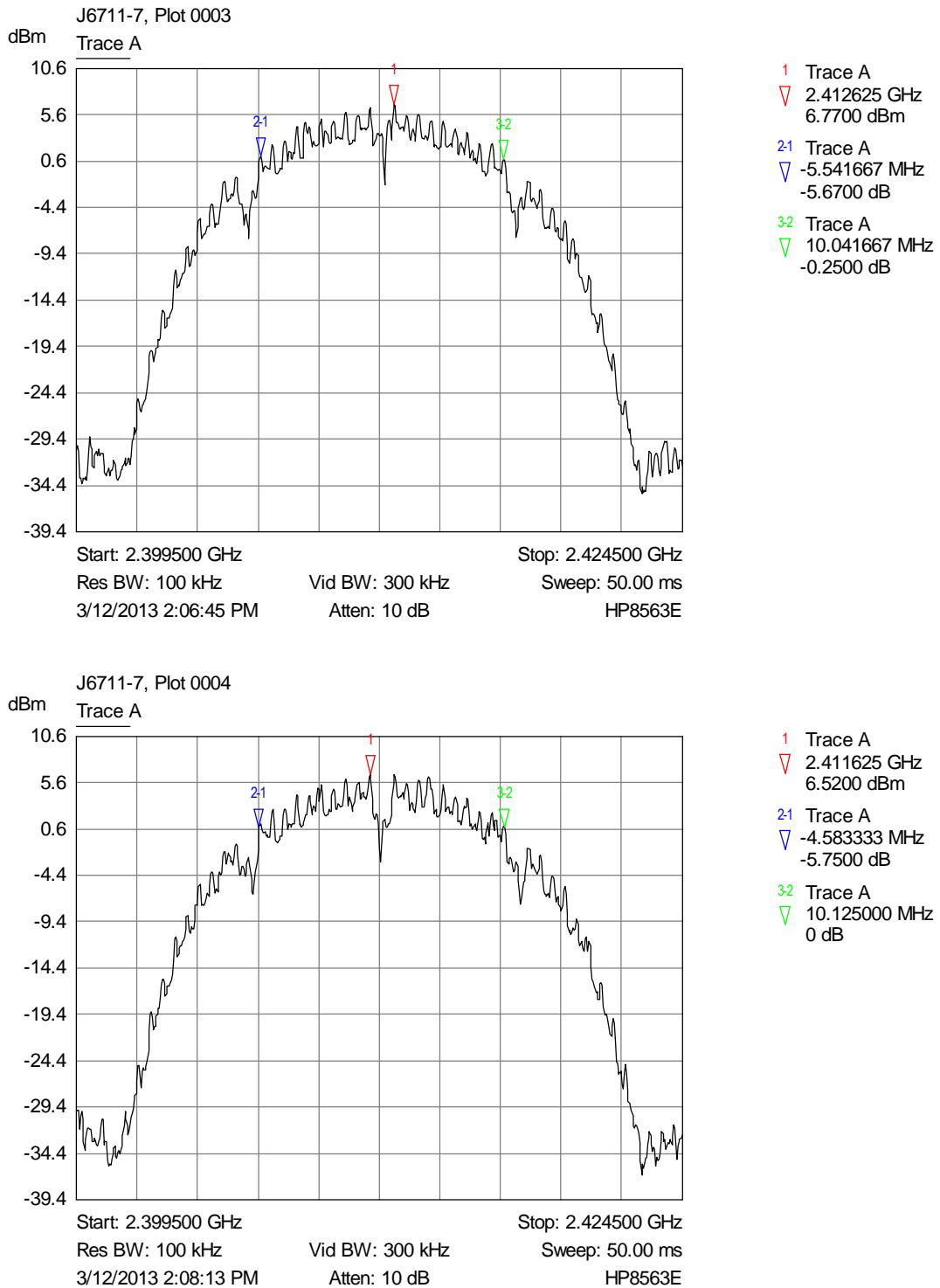


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 42 OF 130

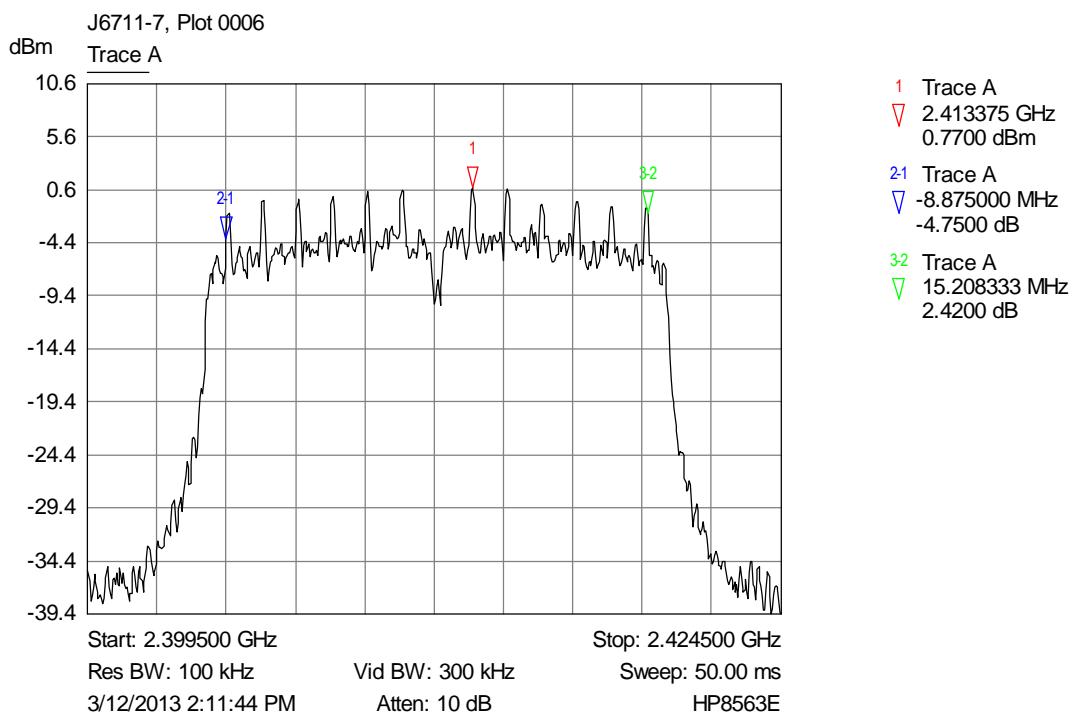
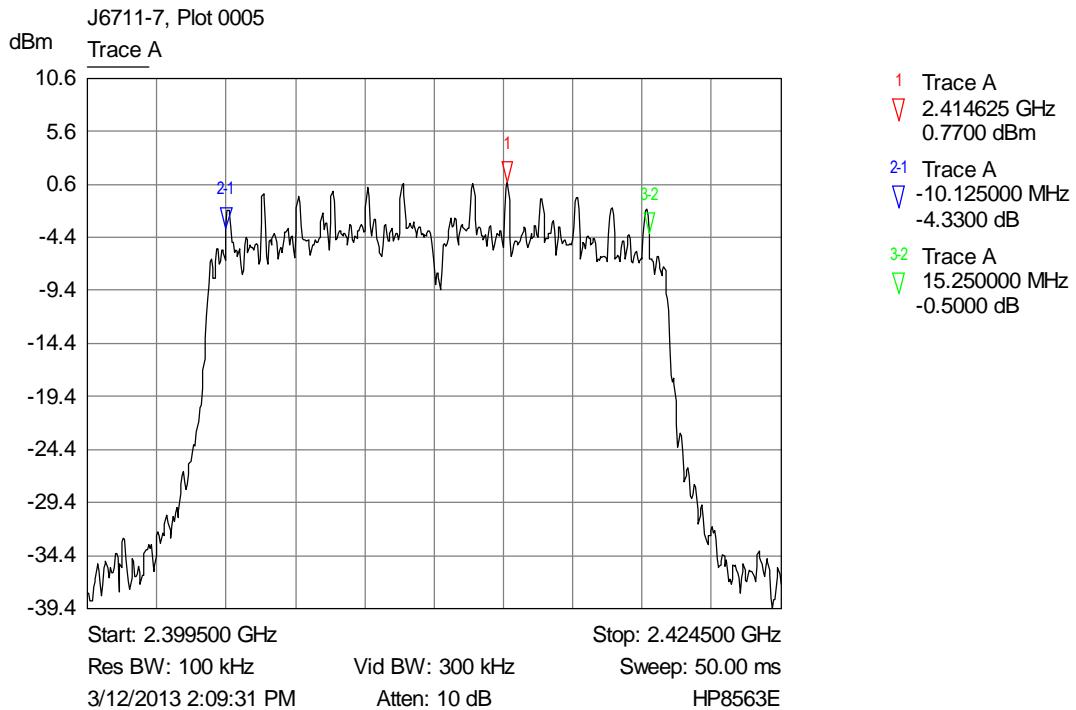


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 43 OF 130

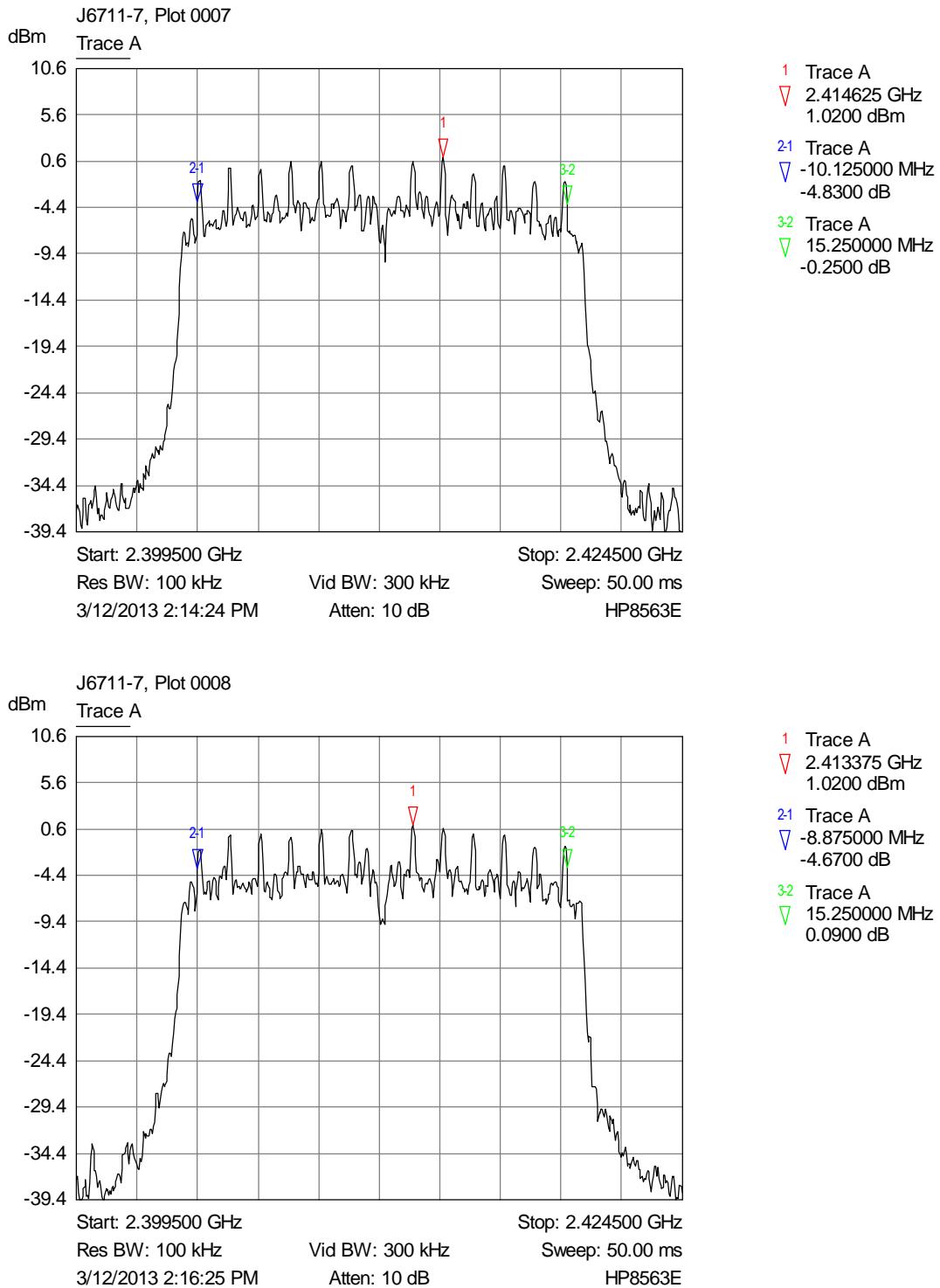


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 44 OF 130

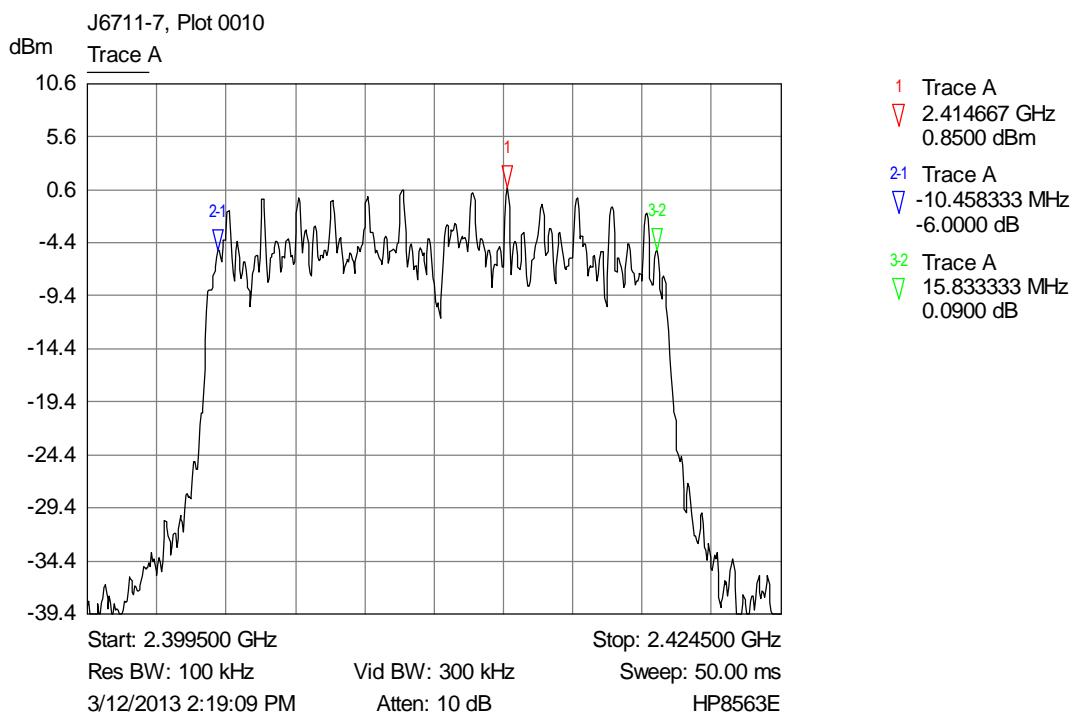
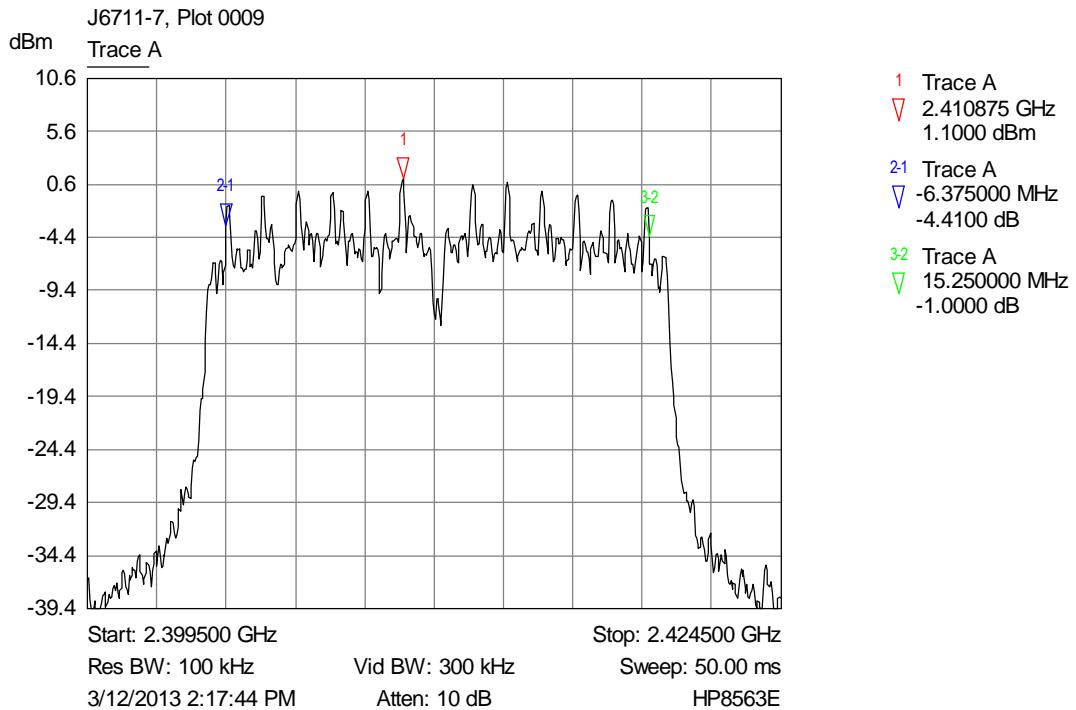


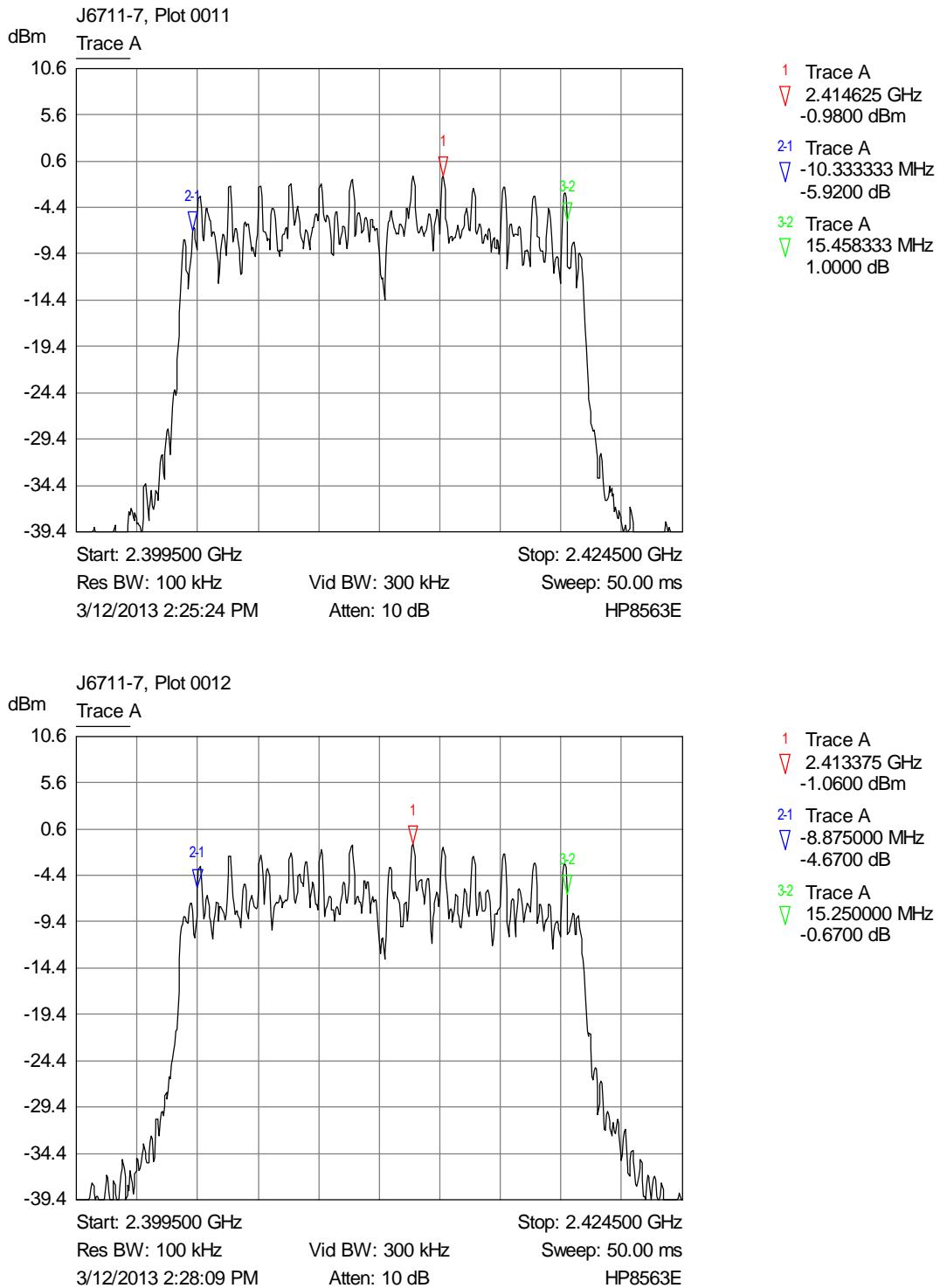
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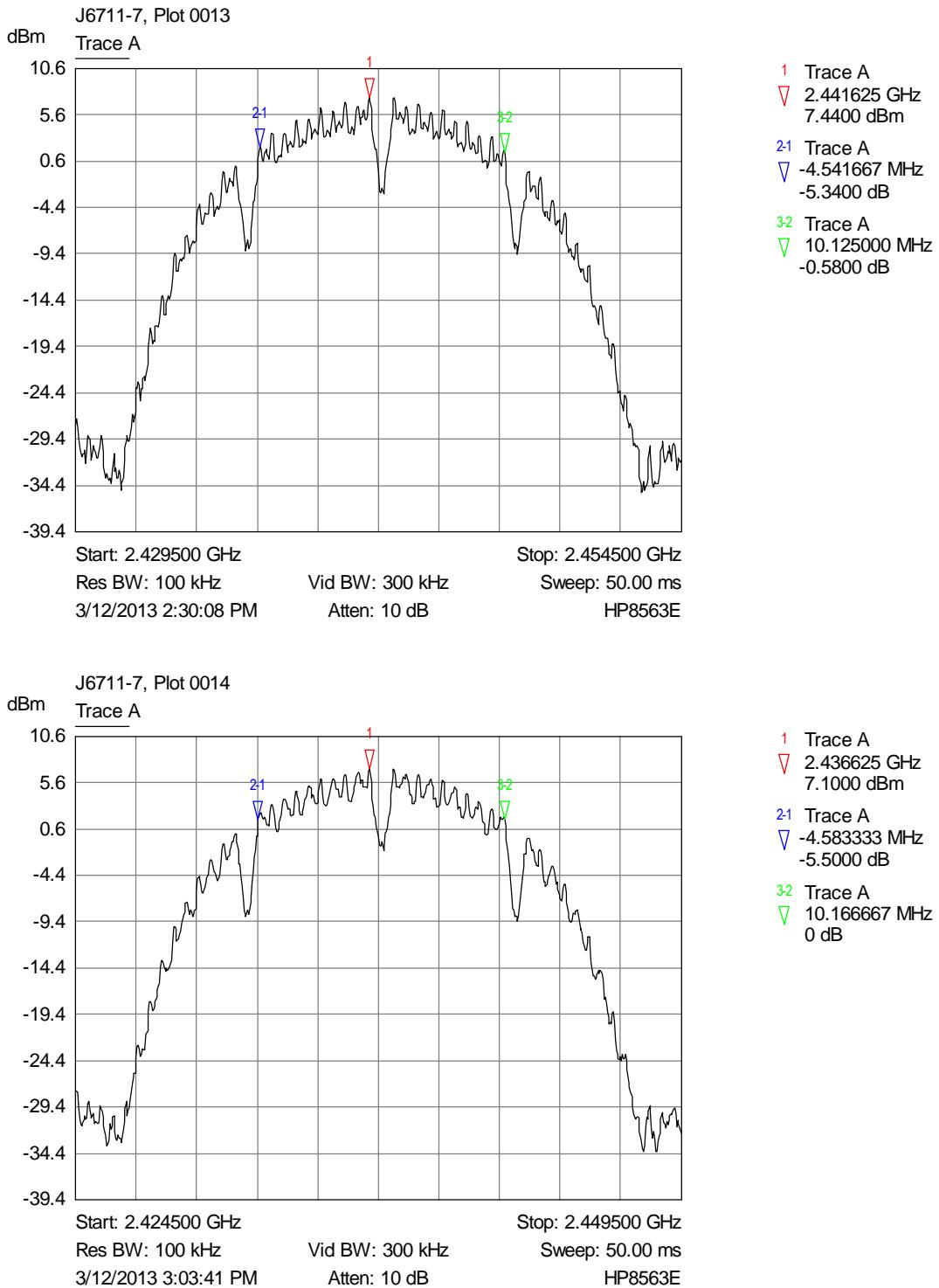
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 45 OF 130





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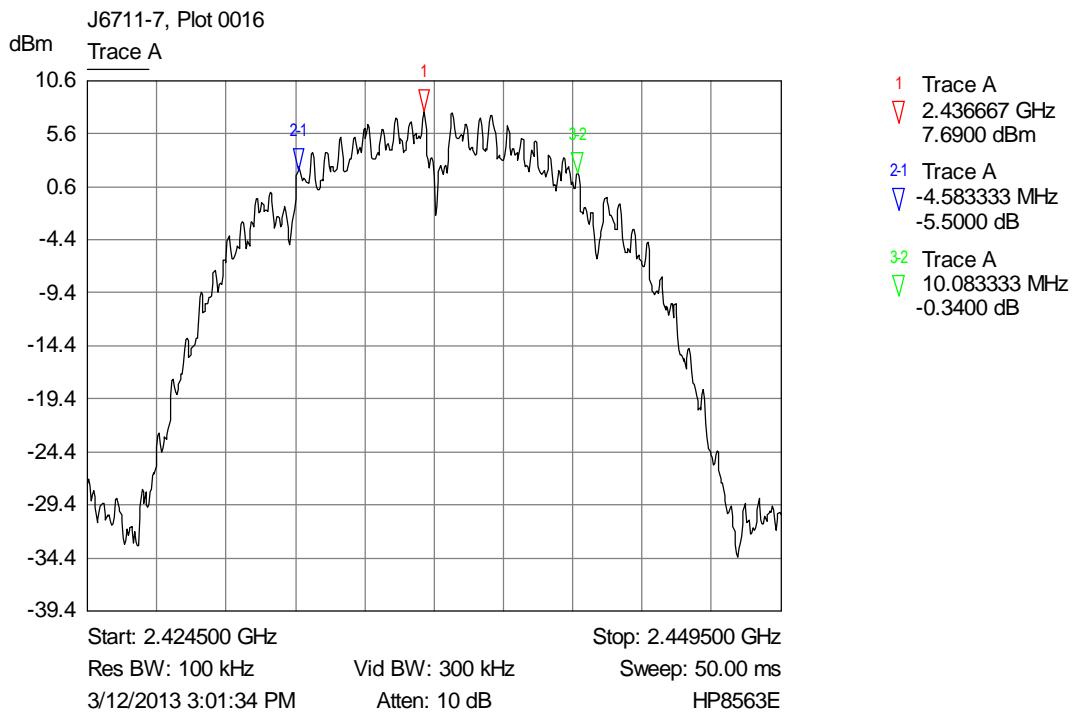
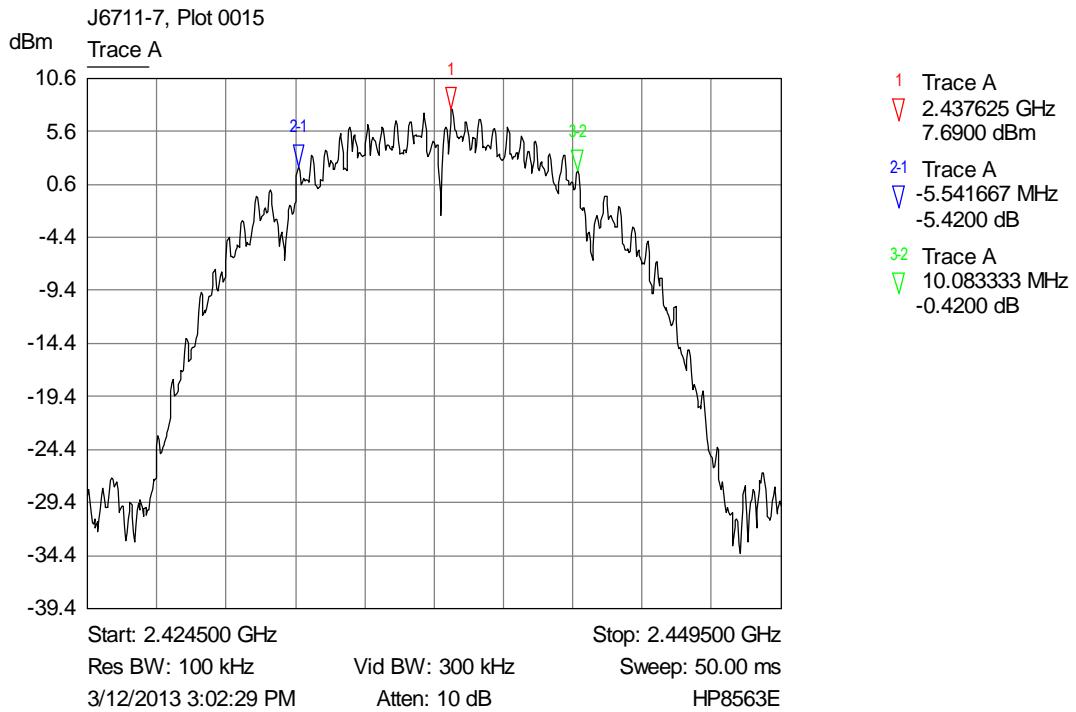


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 48 OF 130

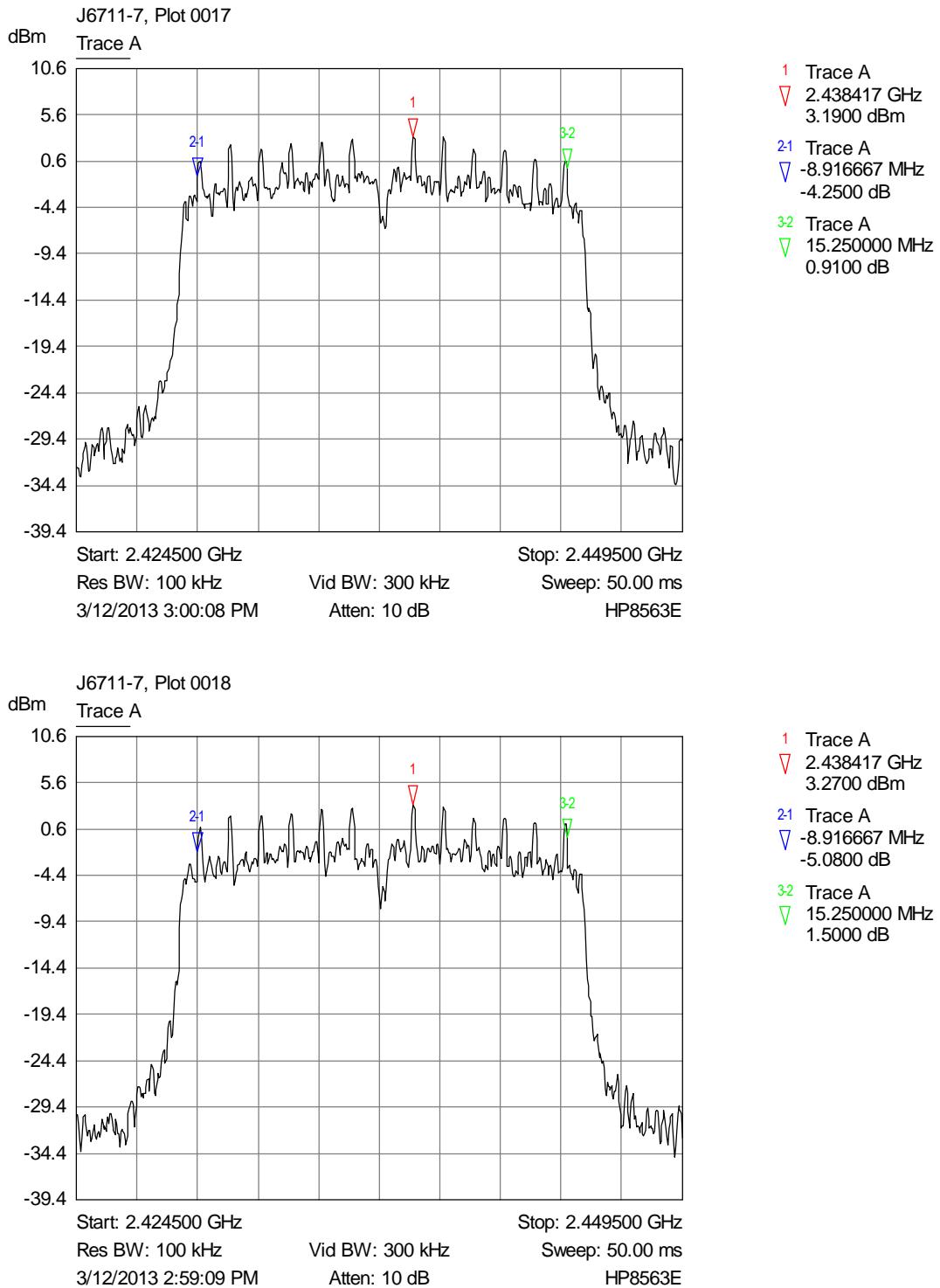


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 49 OF 130

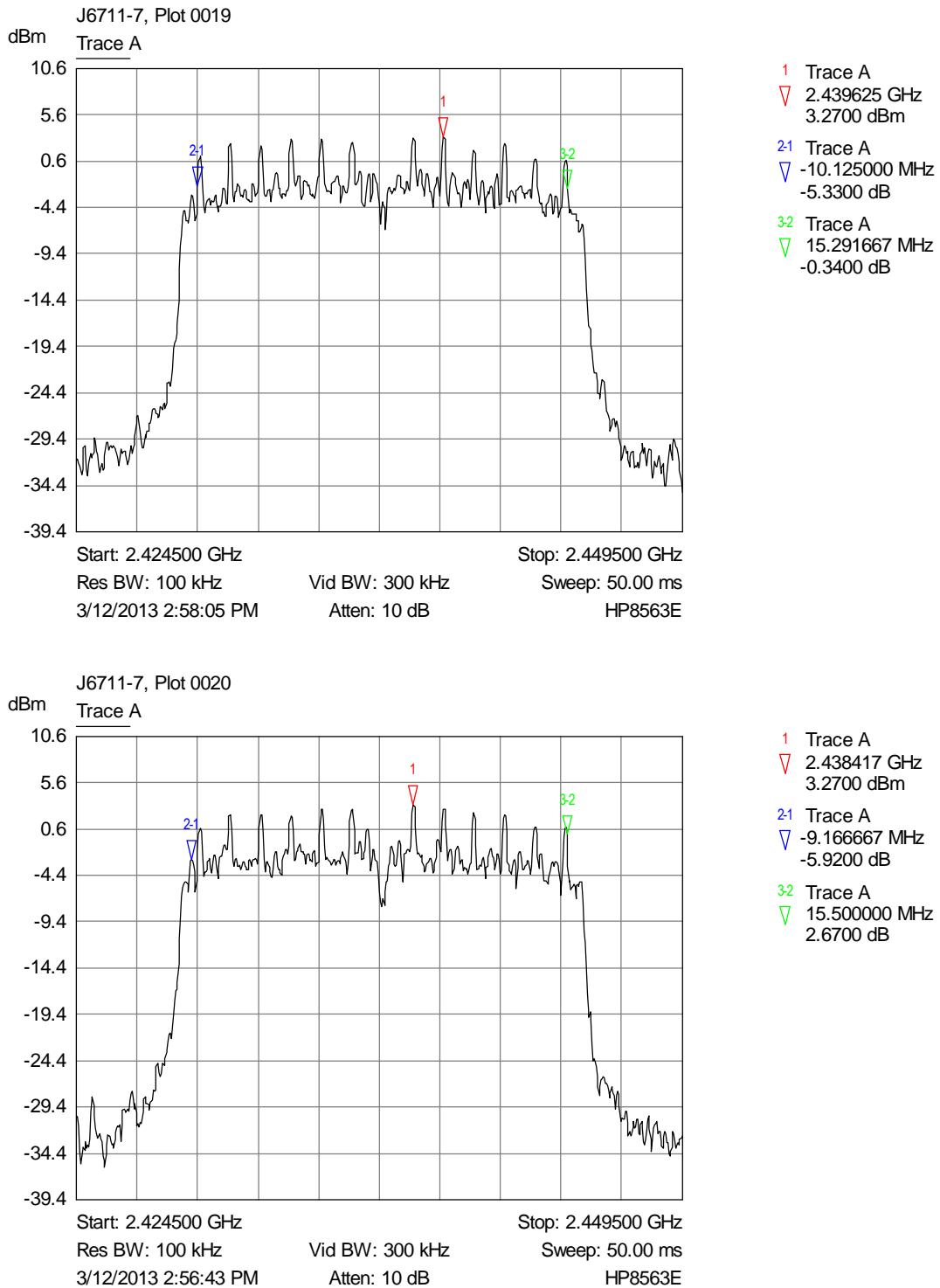


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 50 OF 130

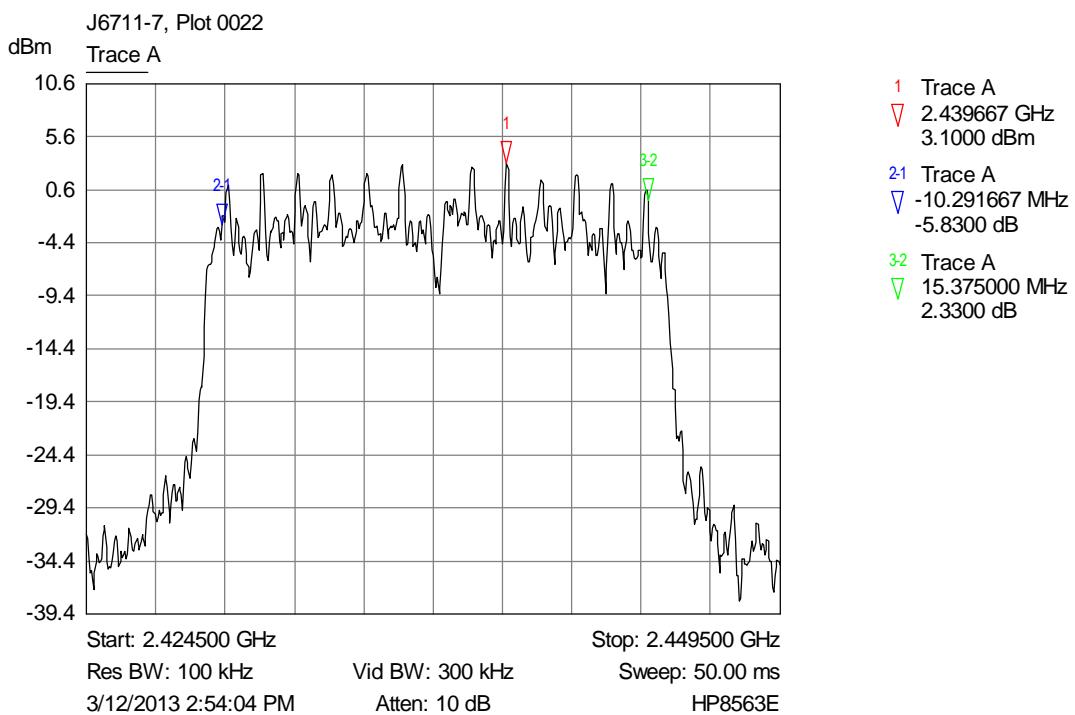
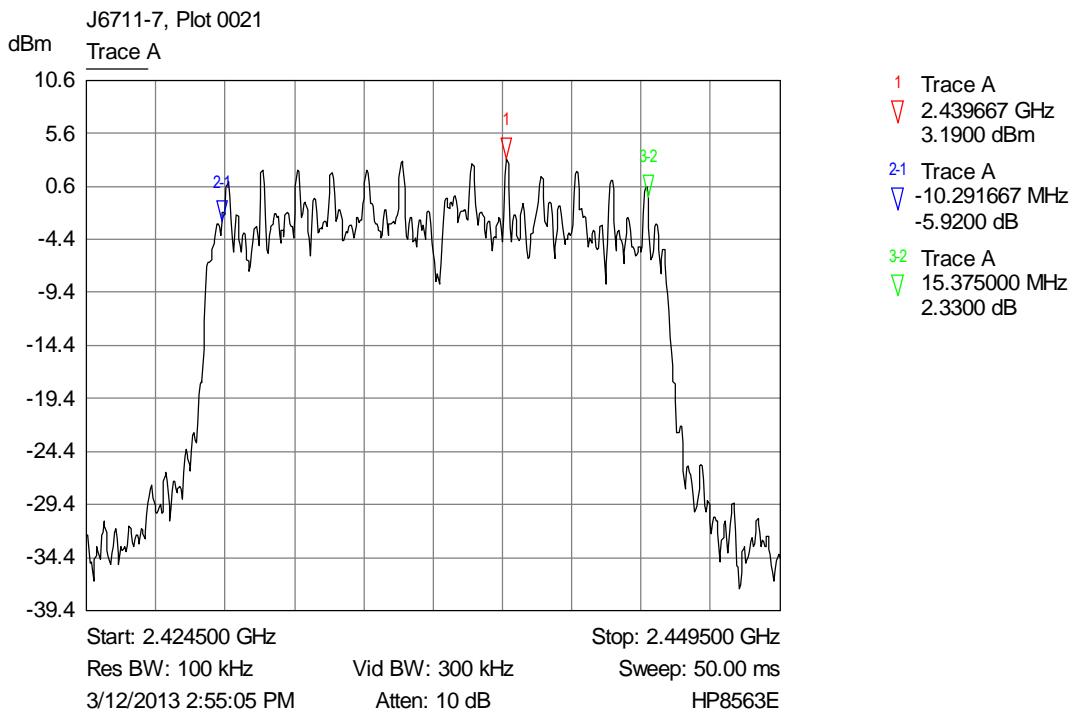


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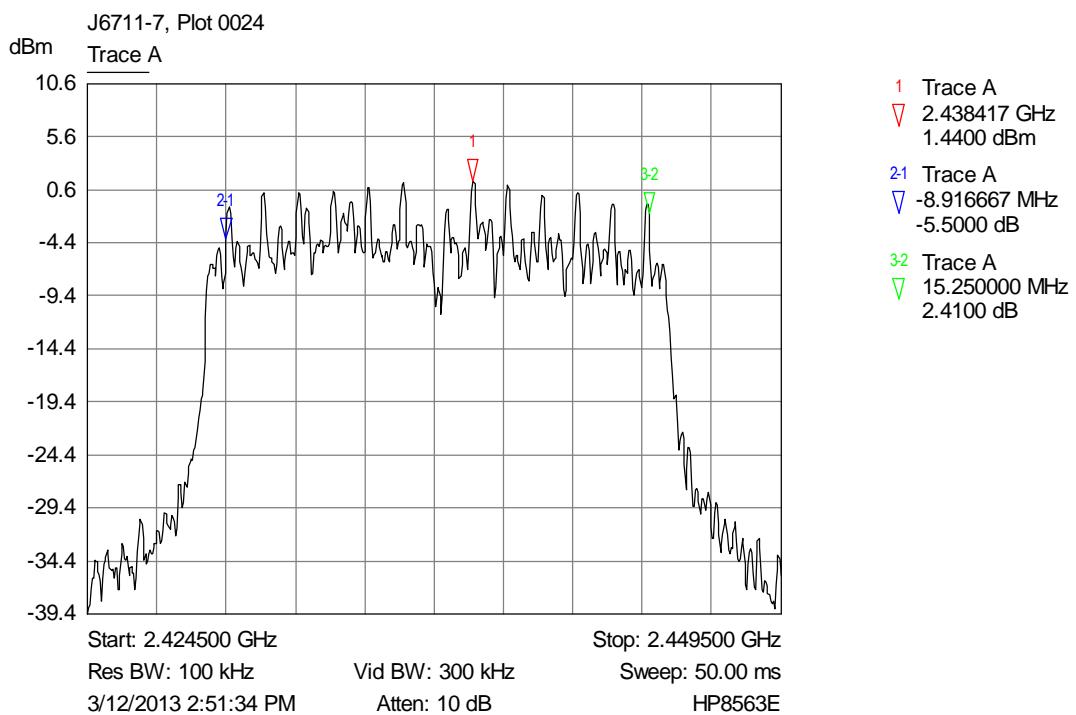
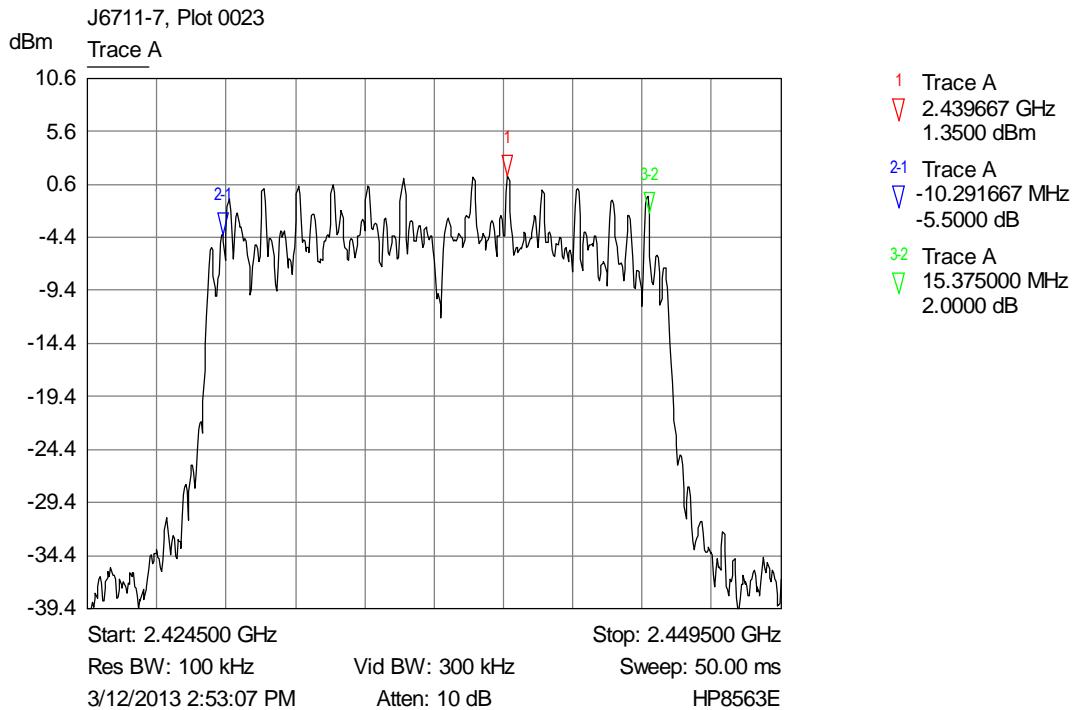
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 51 OF 130



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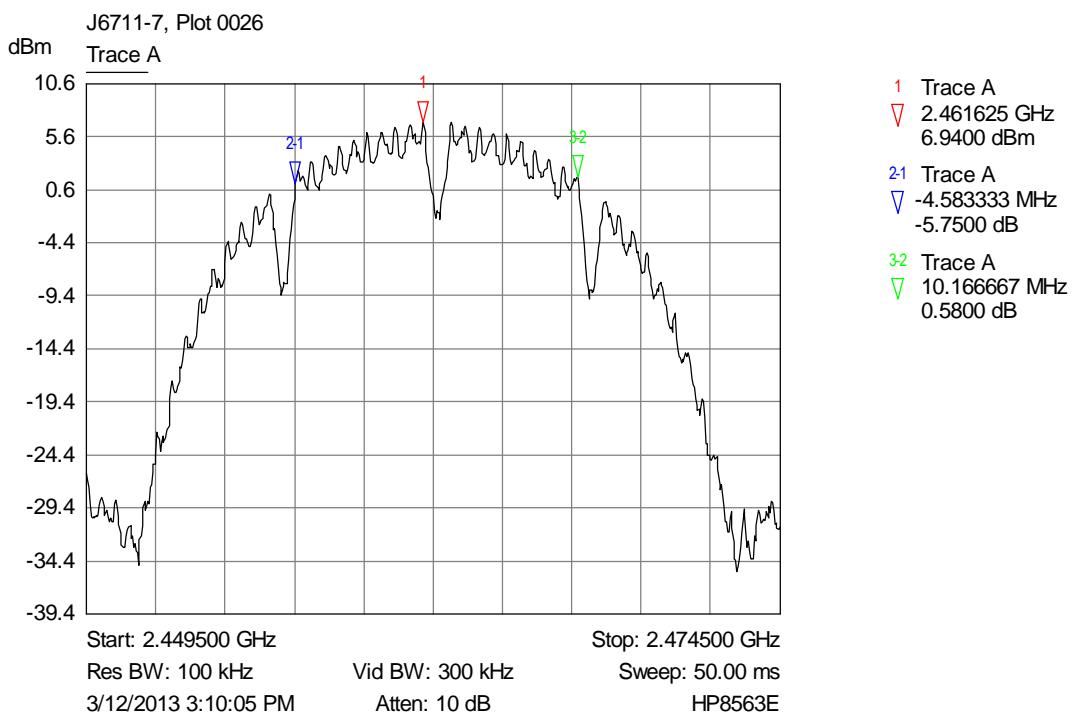
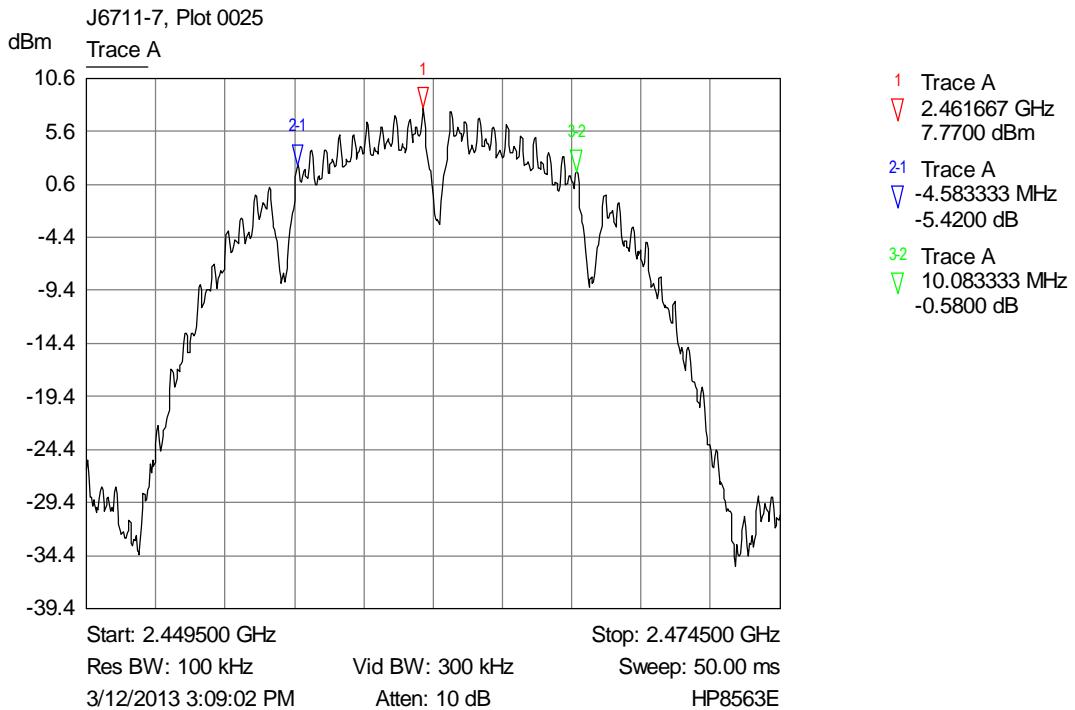


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 53 OF 130

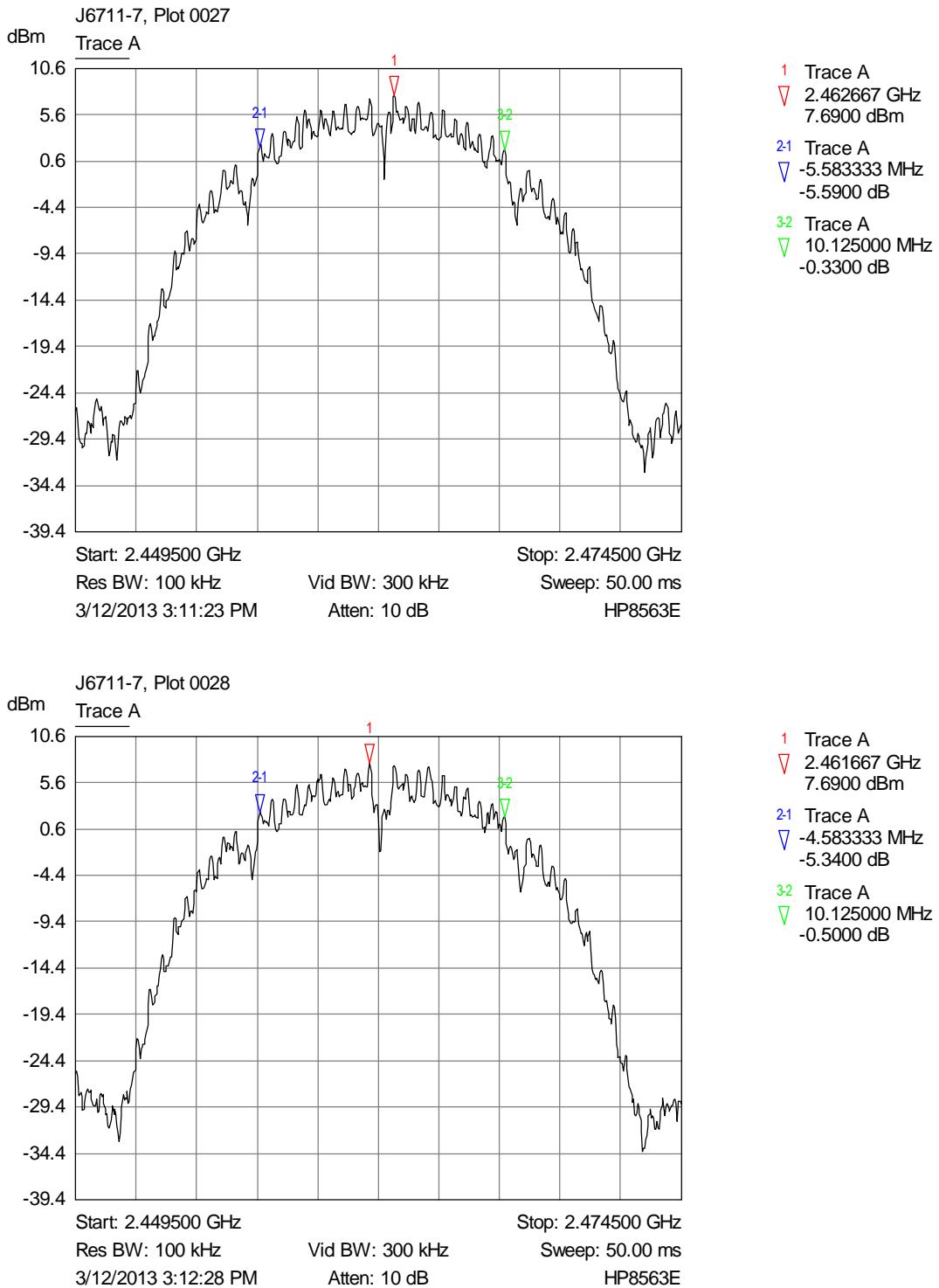


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 54 OF 130

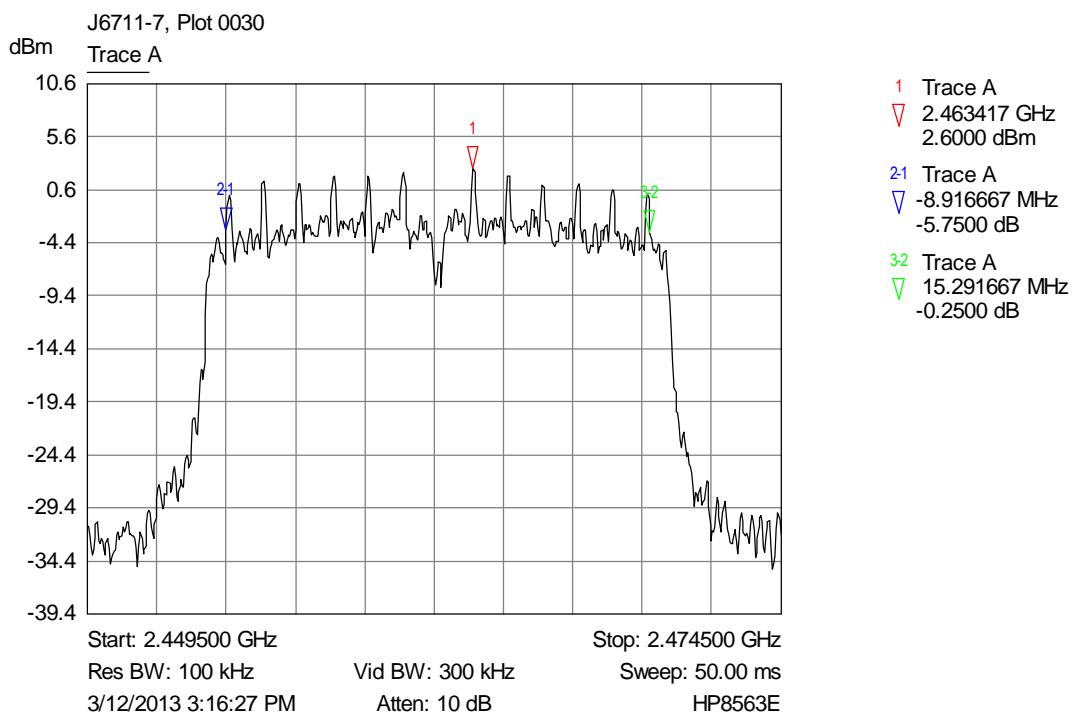
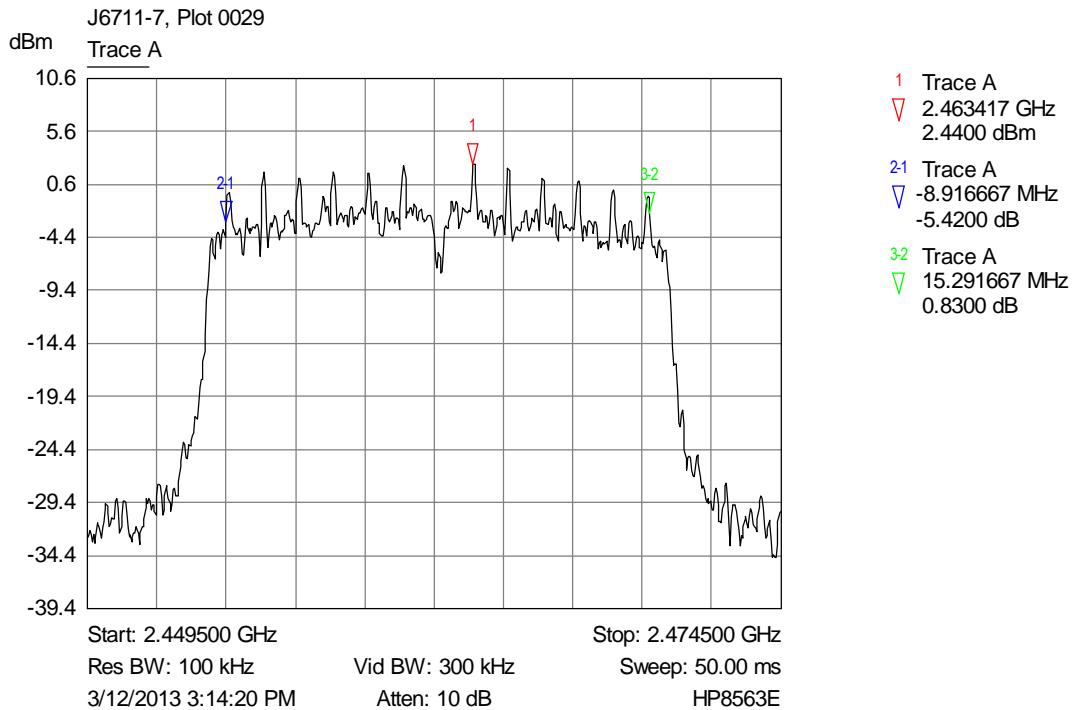


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 55 OF 130

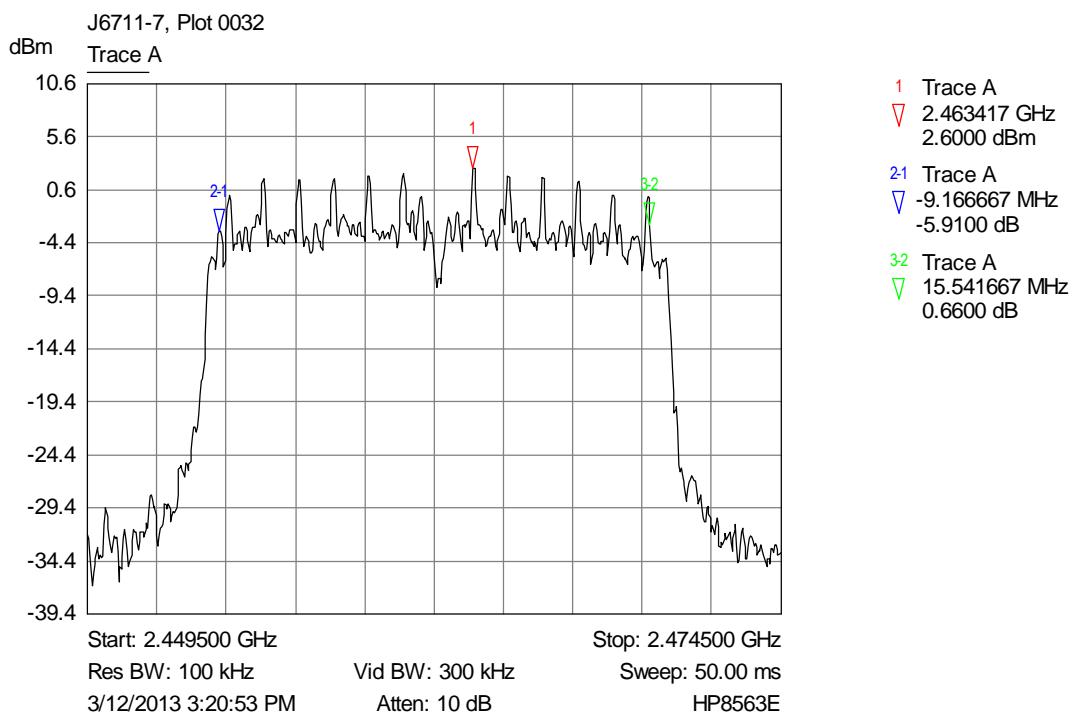
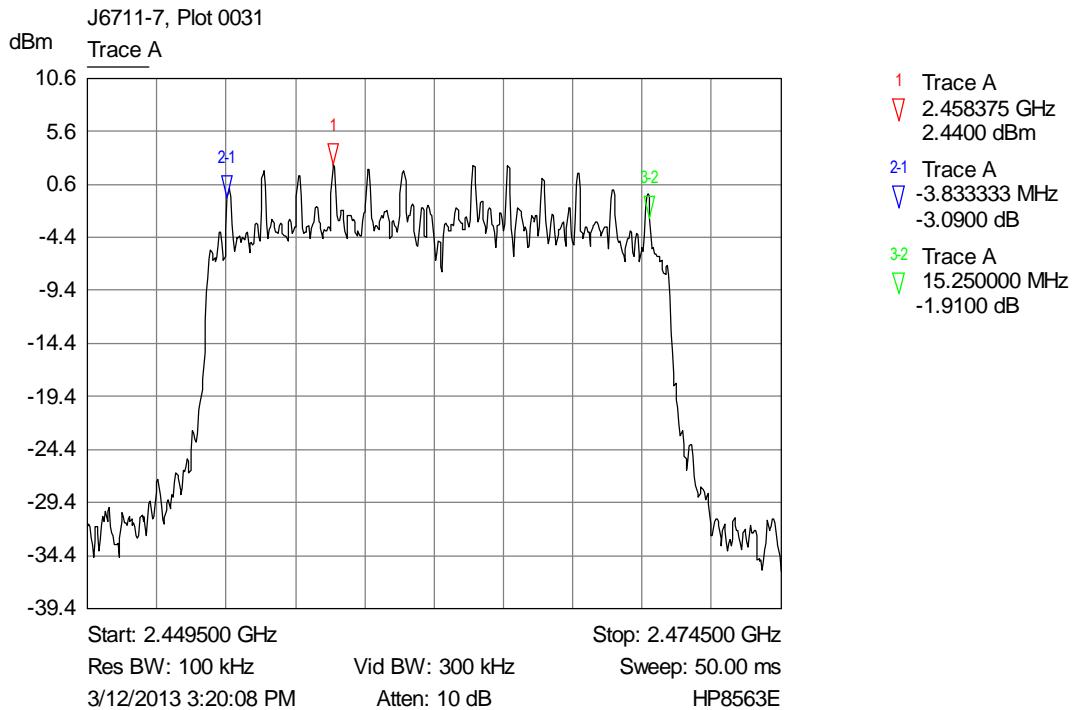


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 56 OF 130

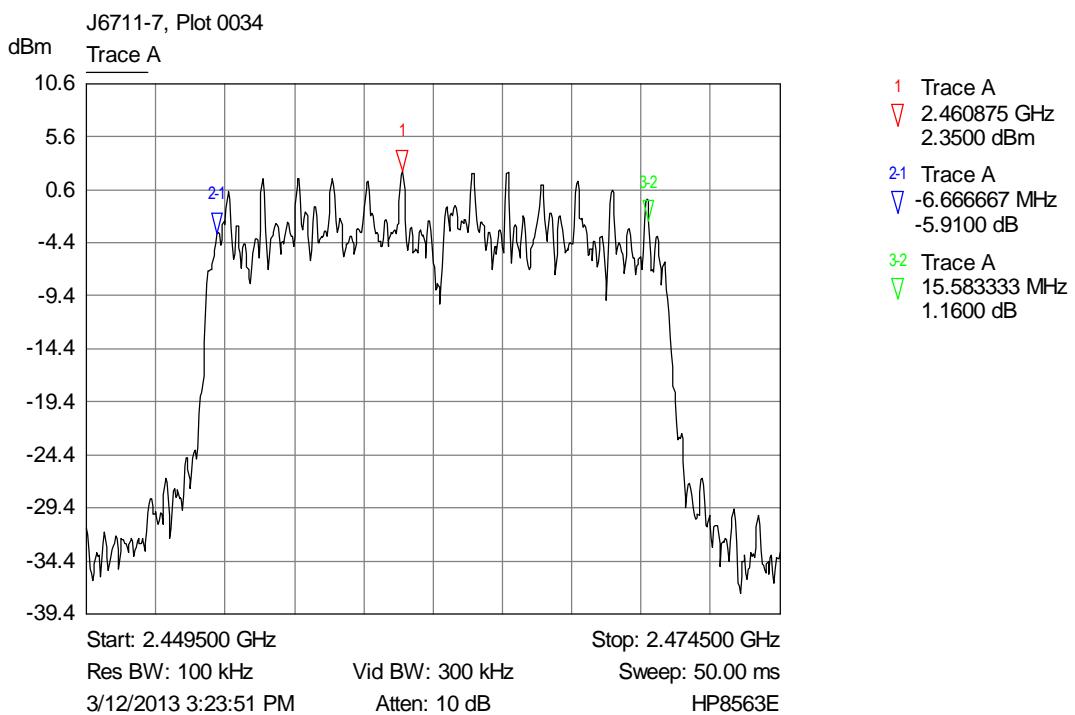
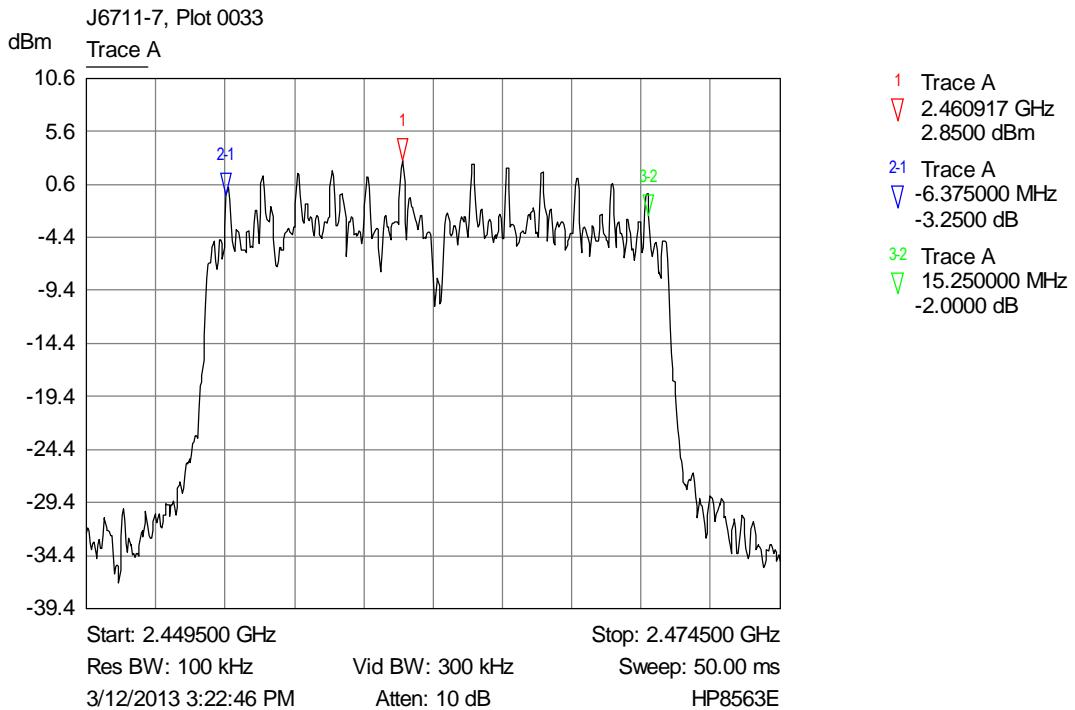


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 57 OF 130

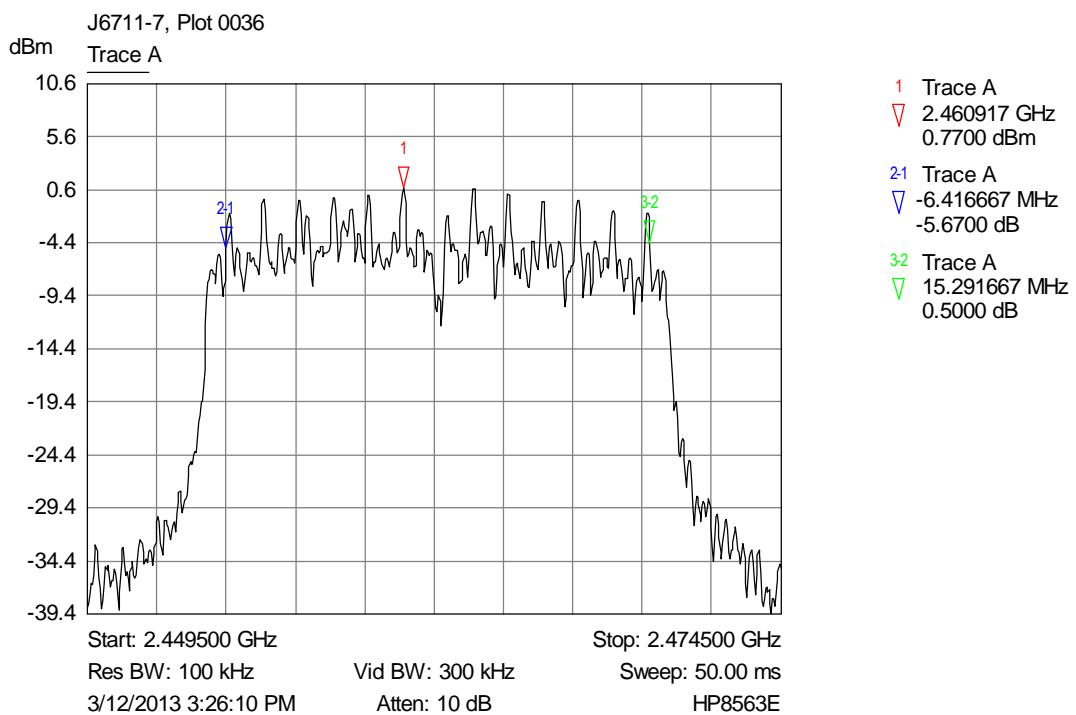
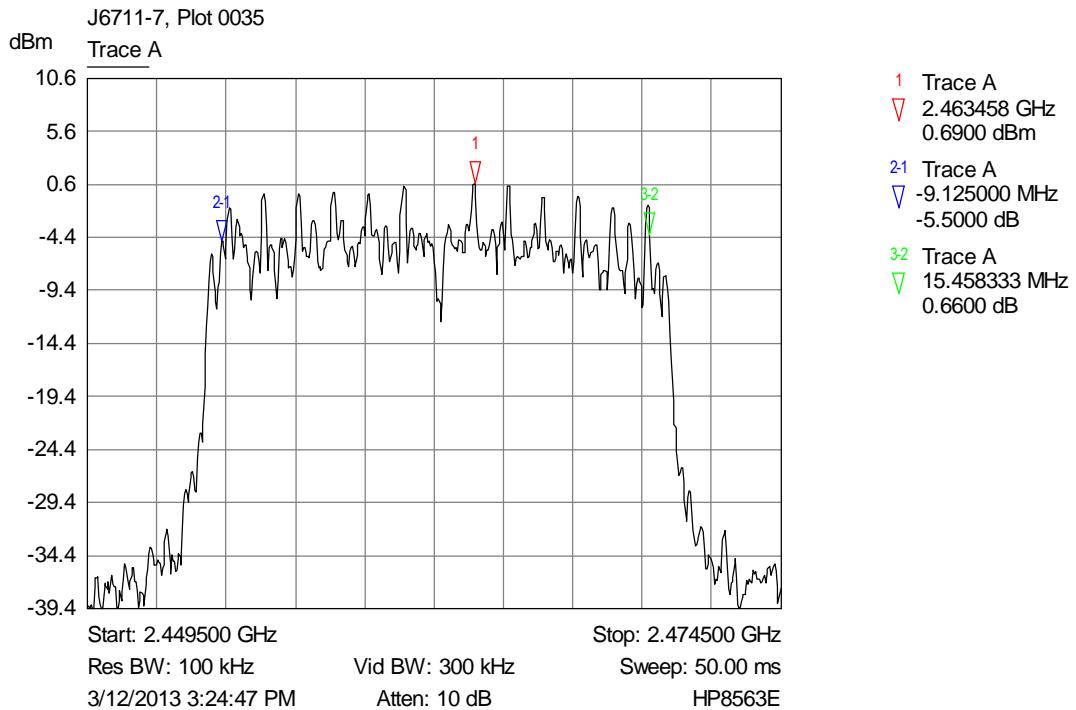


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 58 OF 130



File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

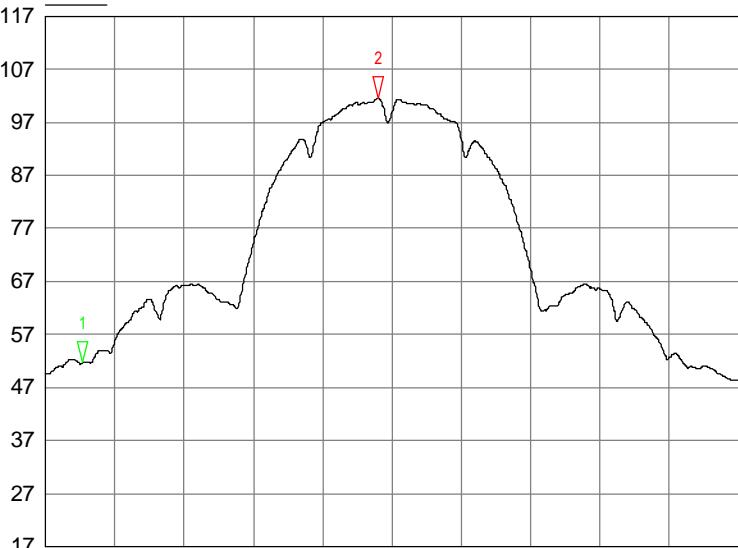
PAGE 59 OF 130

6.5 Band Edge Compliance

Band Edge & Restricted band edge.

dB J6711-7, Band edge AV (1M RBW) Low chan 1MBPS

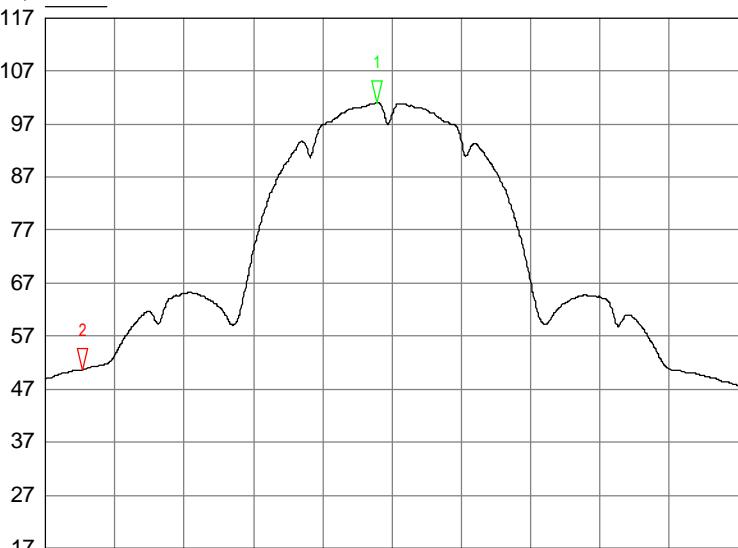
(uV/m) Trace A



- 1 Trace A
▽ 2.389997 GHz
51.6837 dB(uV/m)
- 2 Trace A
▽ 2.411283 GHz
101.5420 dB(uV/m)

dB J6711-7, Band edge AV (1MRBW) Low chan 11MBPS

(uV/m) Trace A



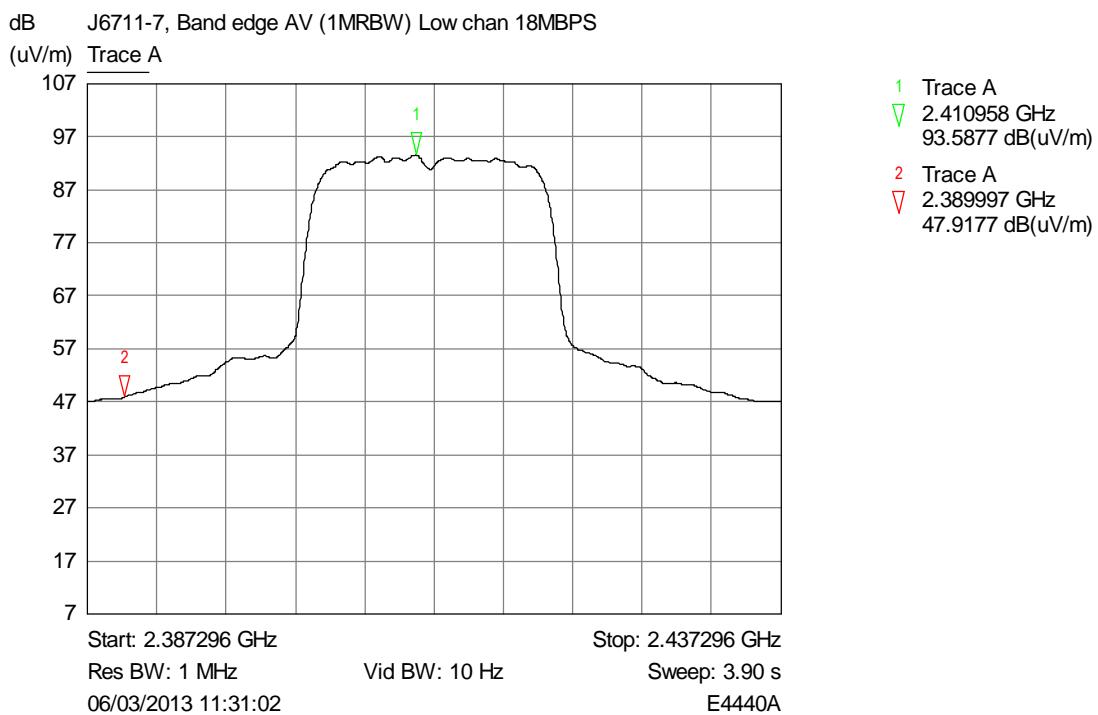
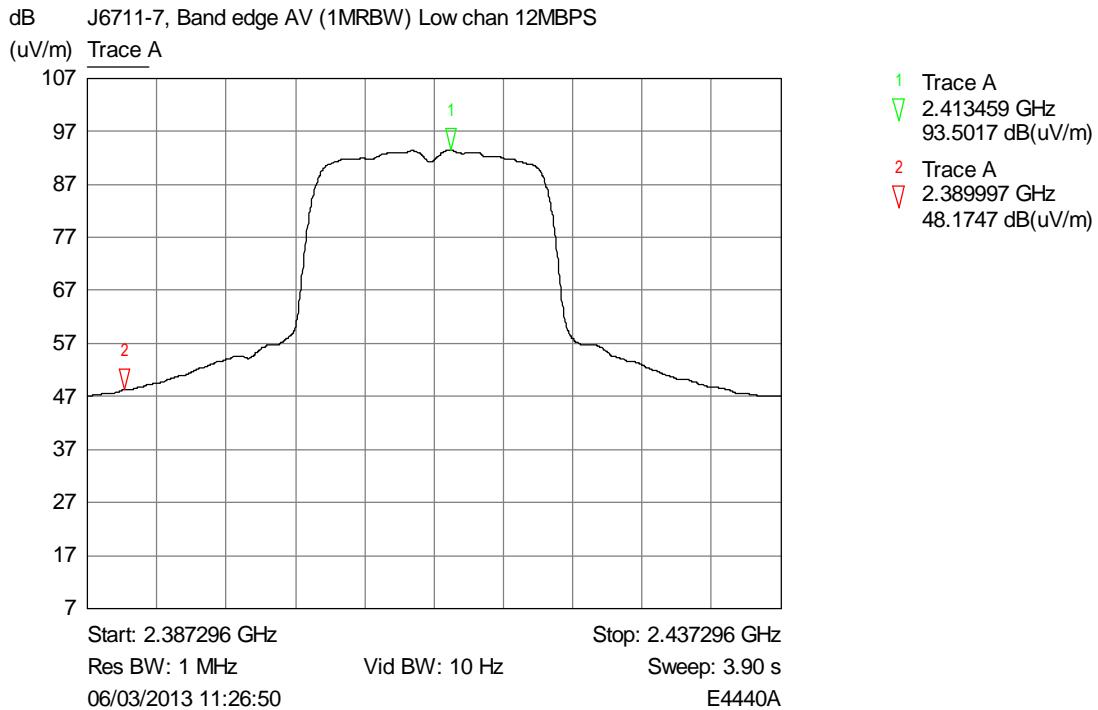
- 1 Trace A
▽ 2.411233 GHz
101.0620 dB(uV/m)
- 2 Trace A
▽ 2.389997 GHz
50.7387 dB(uV/m)

File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 60 OF 130

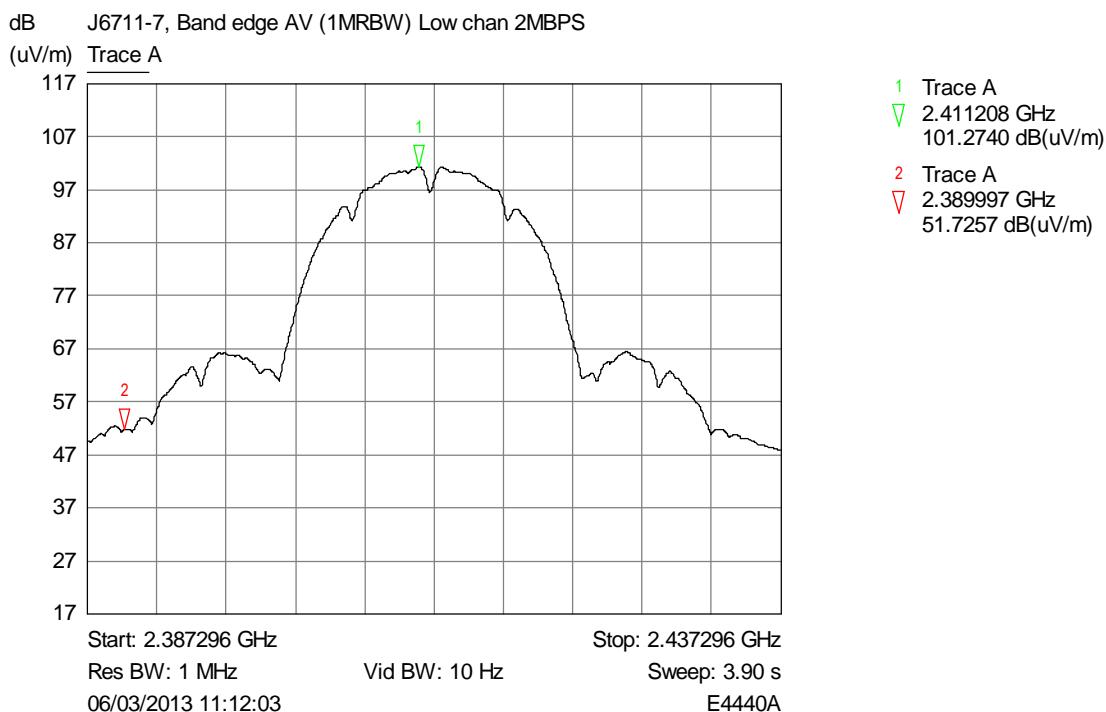
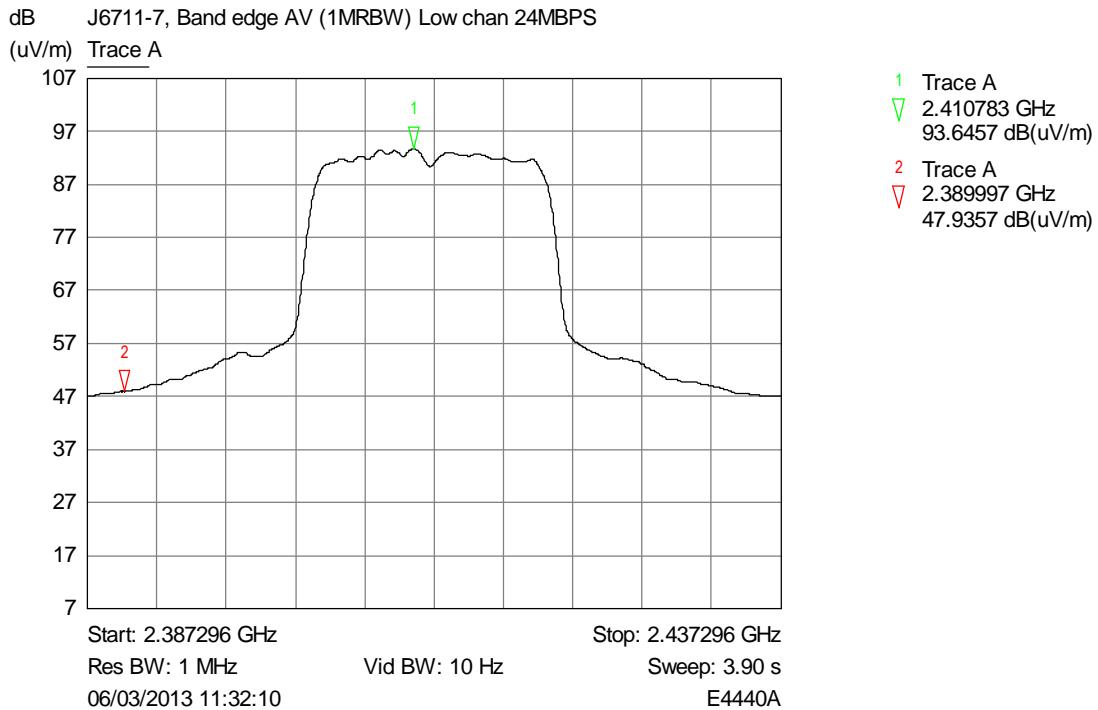


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 61 OF 130

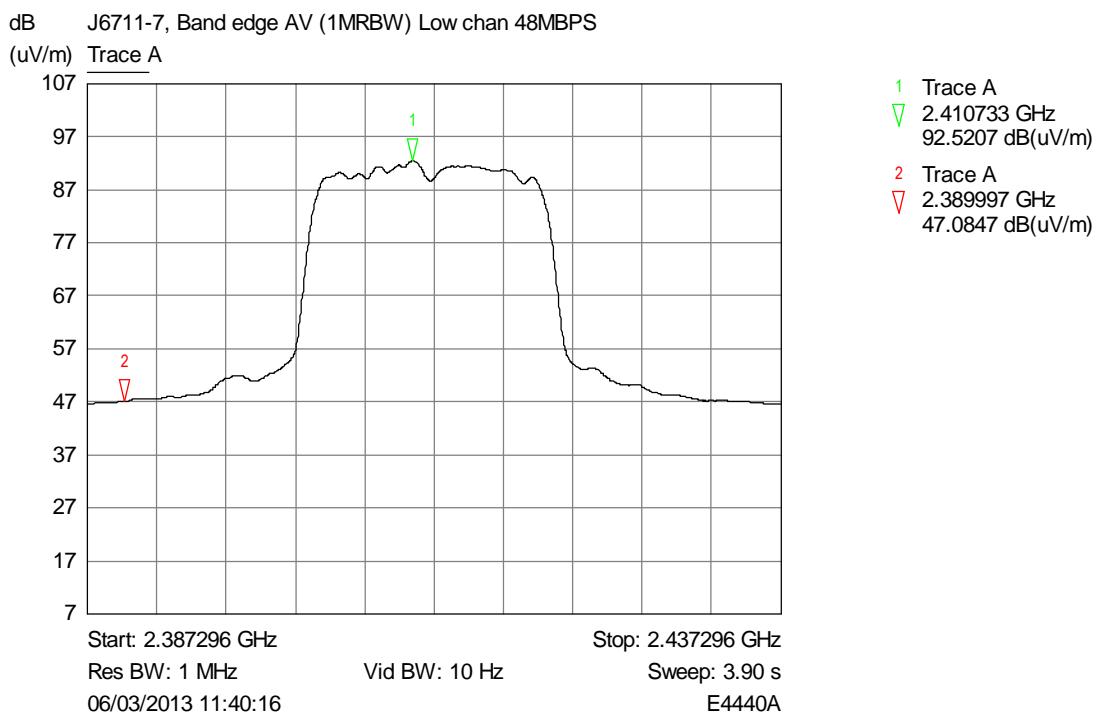
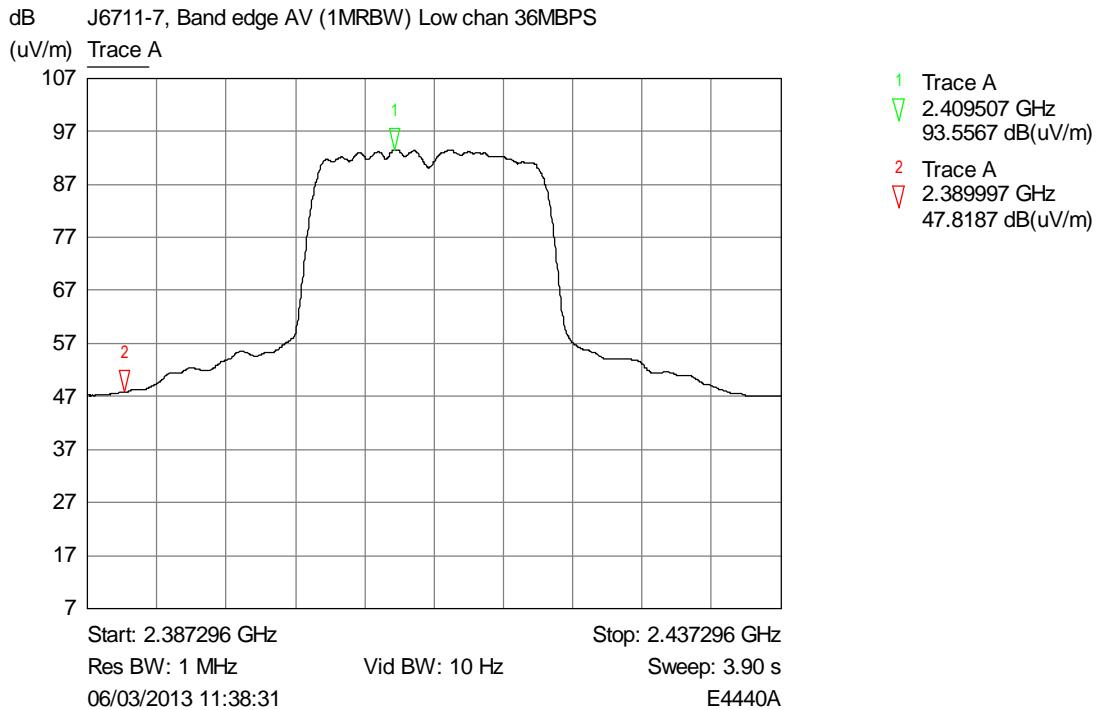


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 62 OF 130

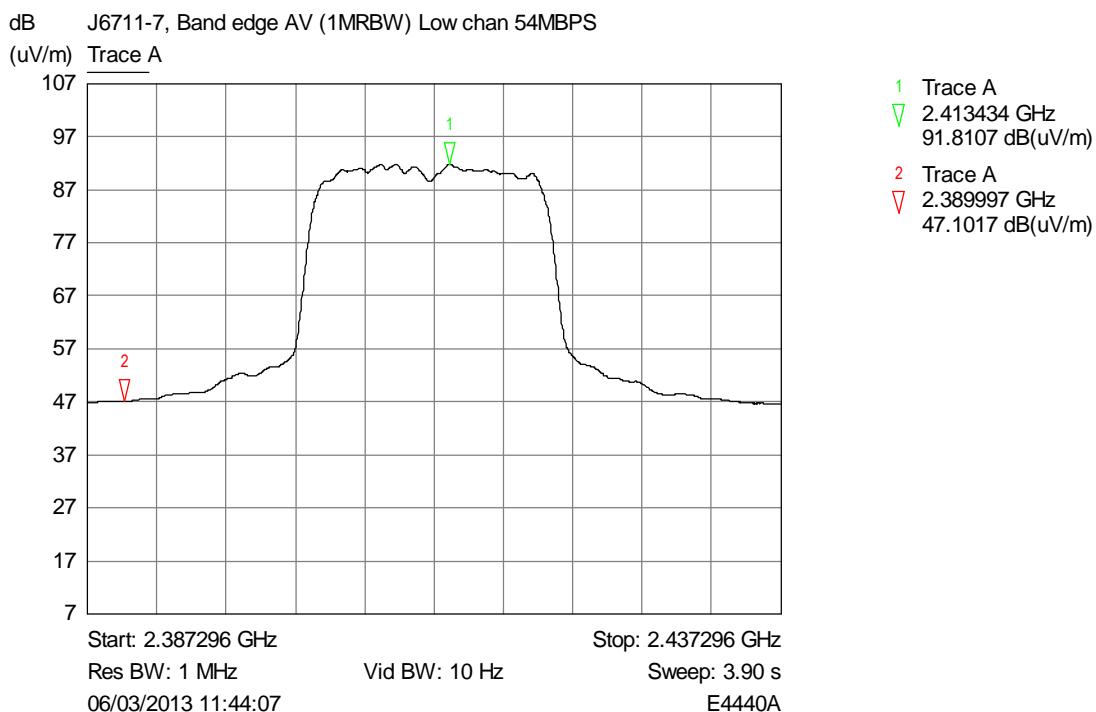
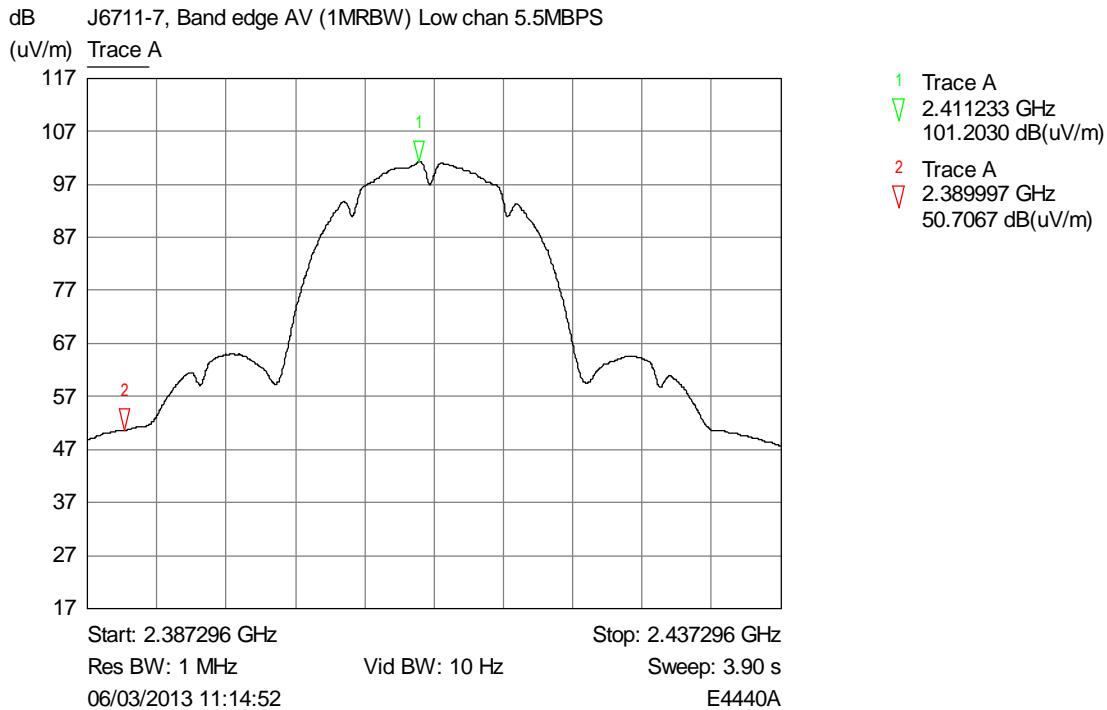


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 63 OF 130

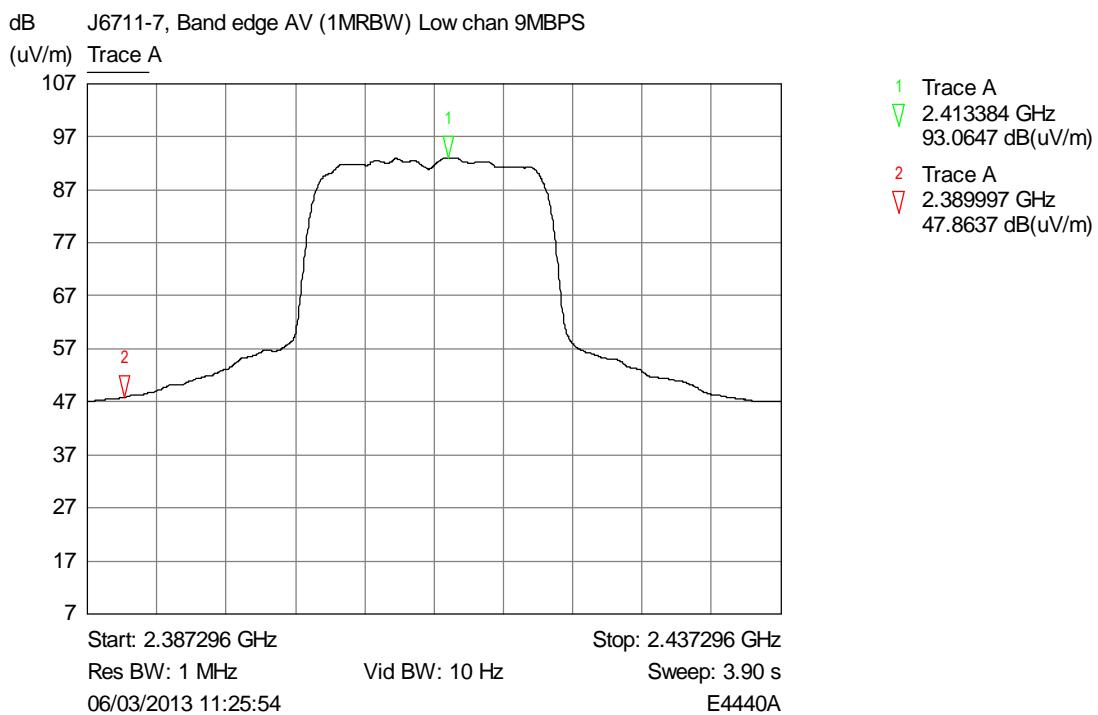
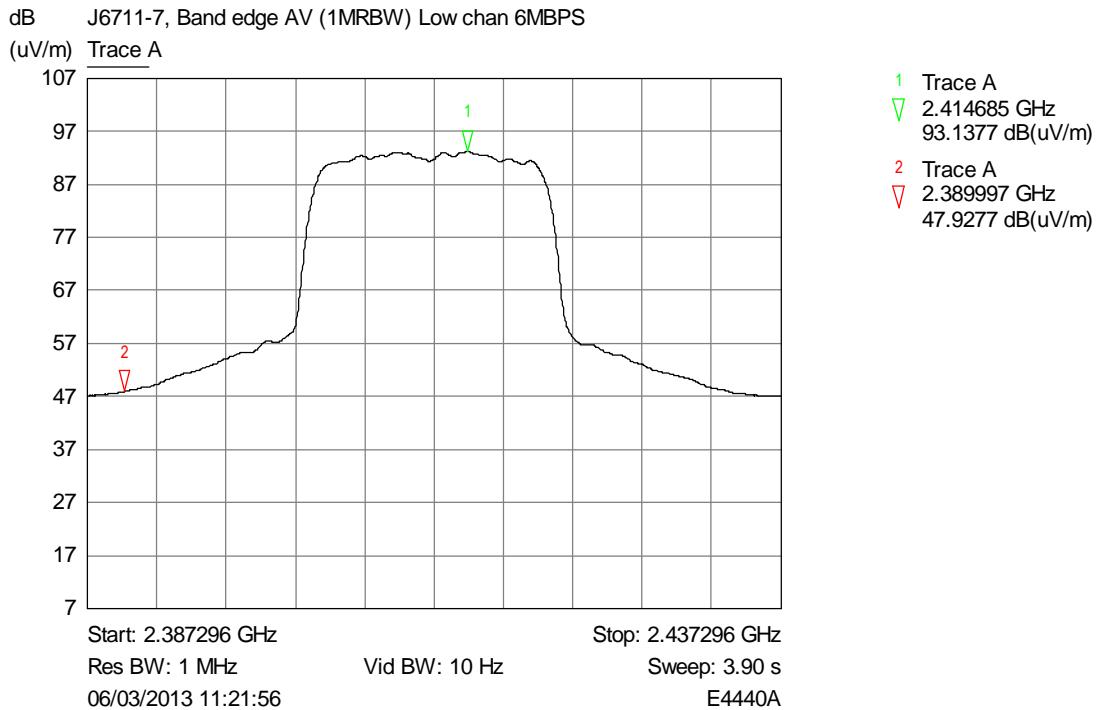


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 64 OF 130

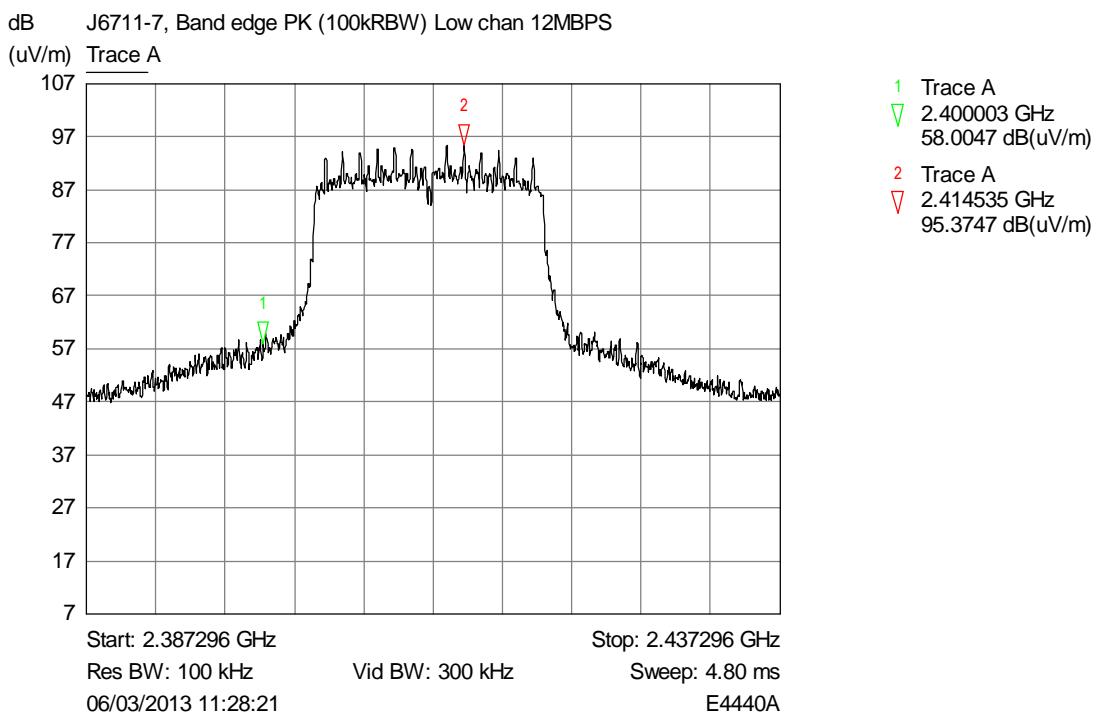
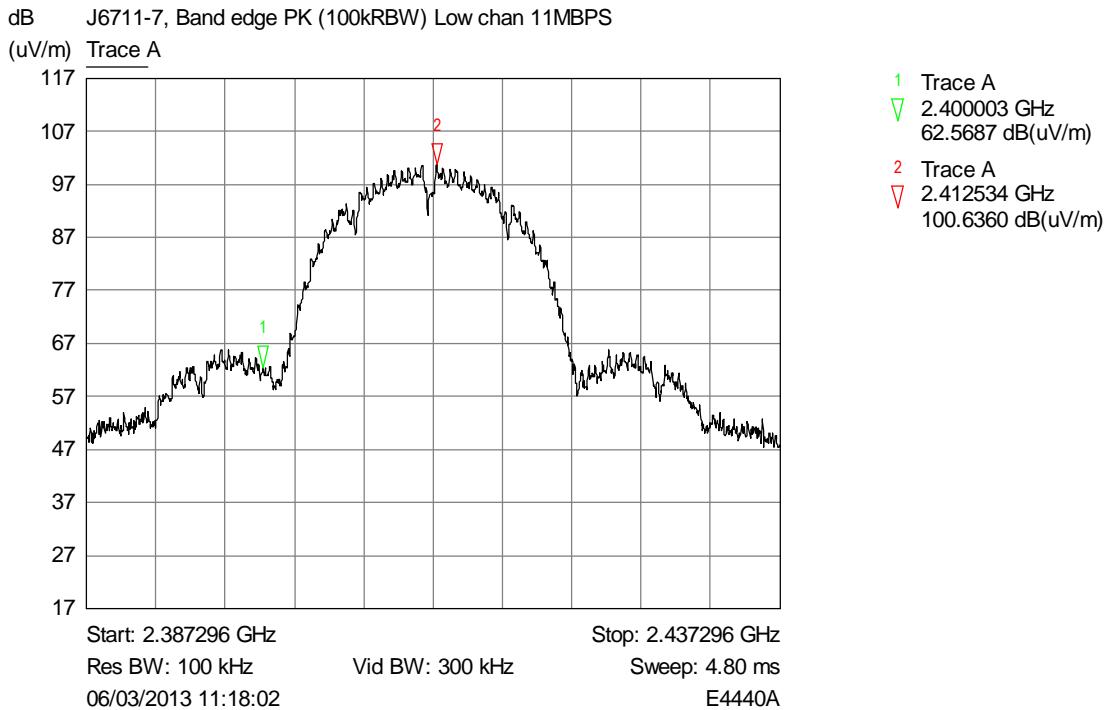


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 65 OF 130

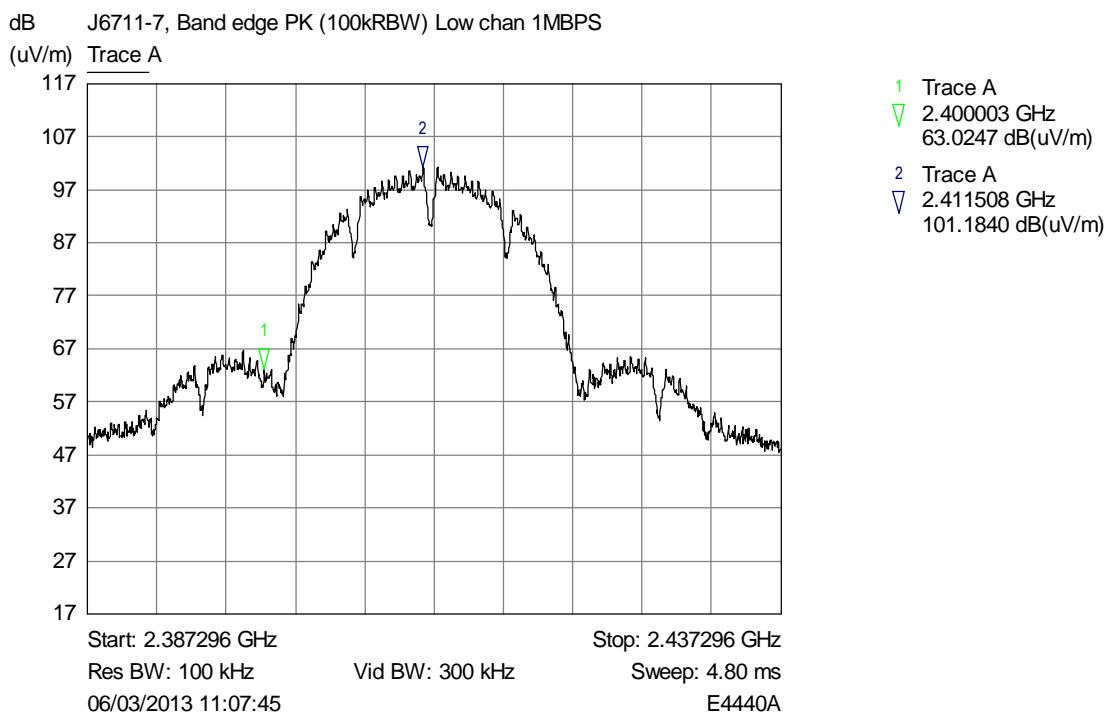
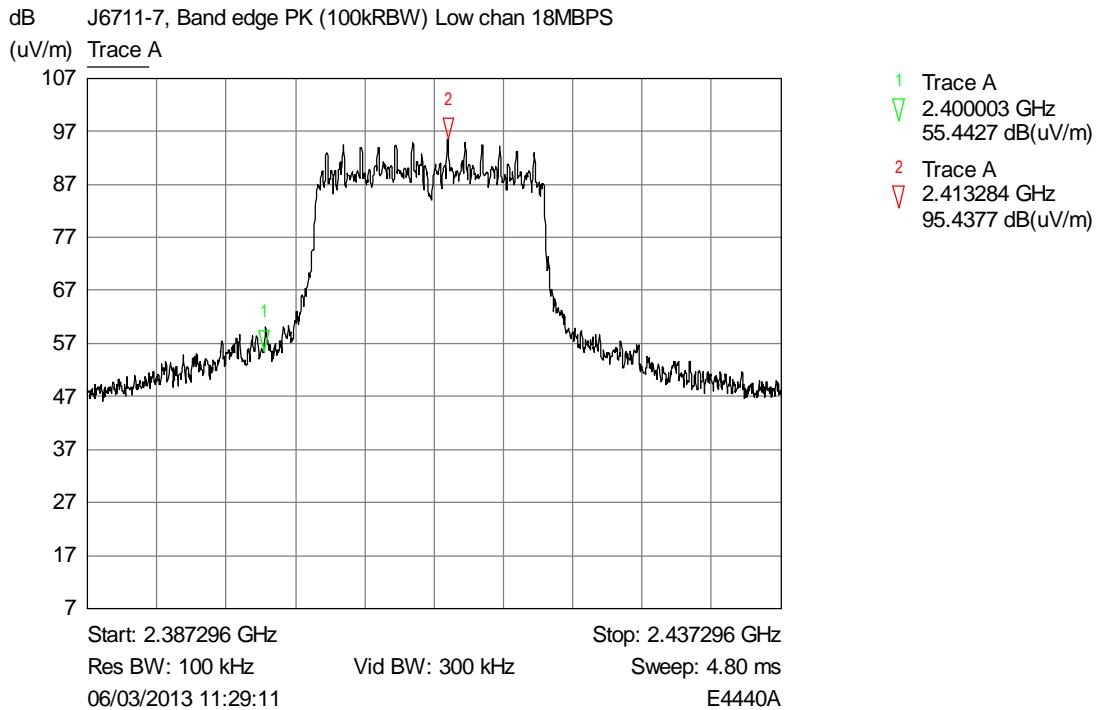


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 66 OF 130

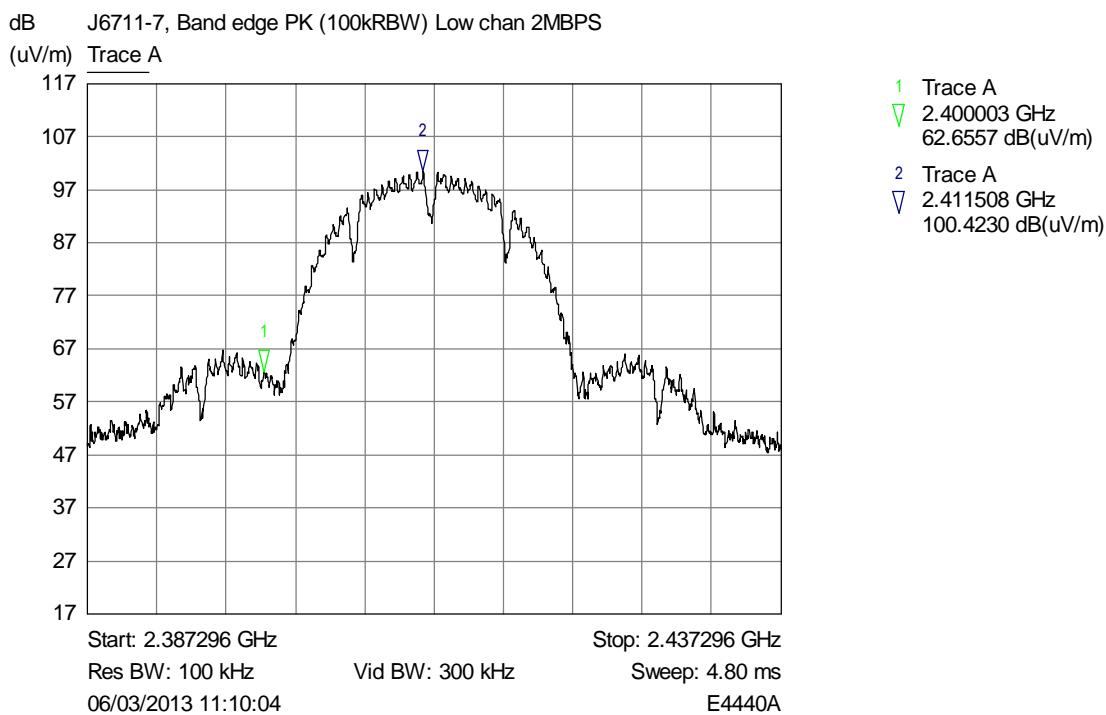
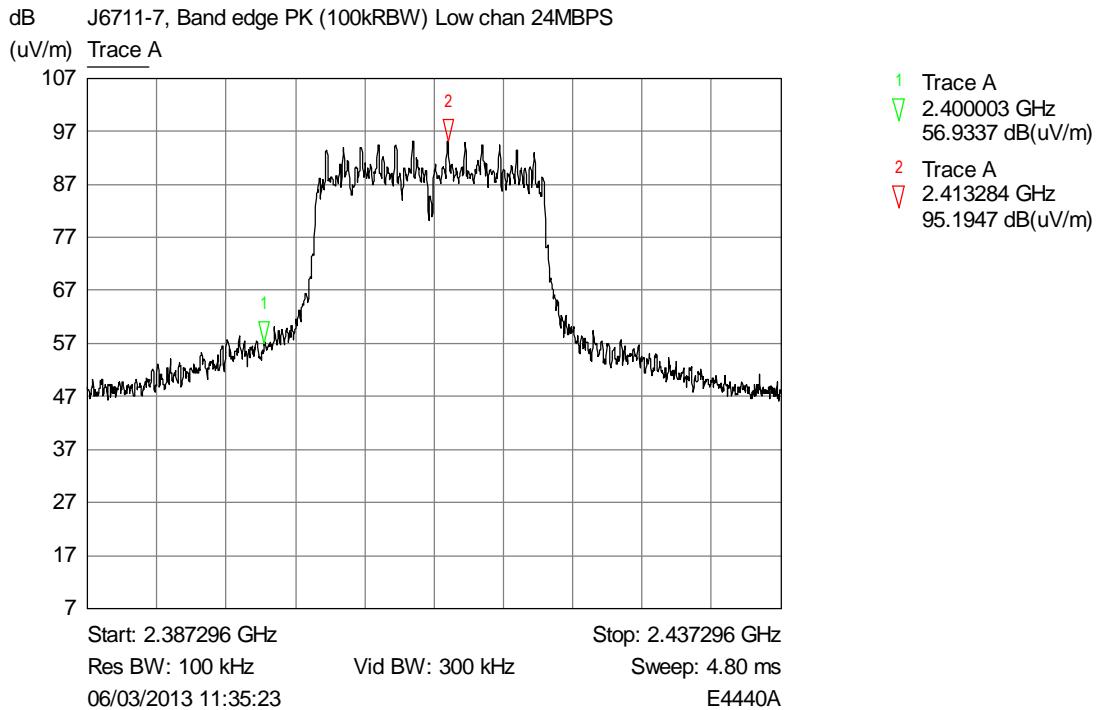


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 67 OF 130

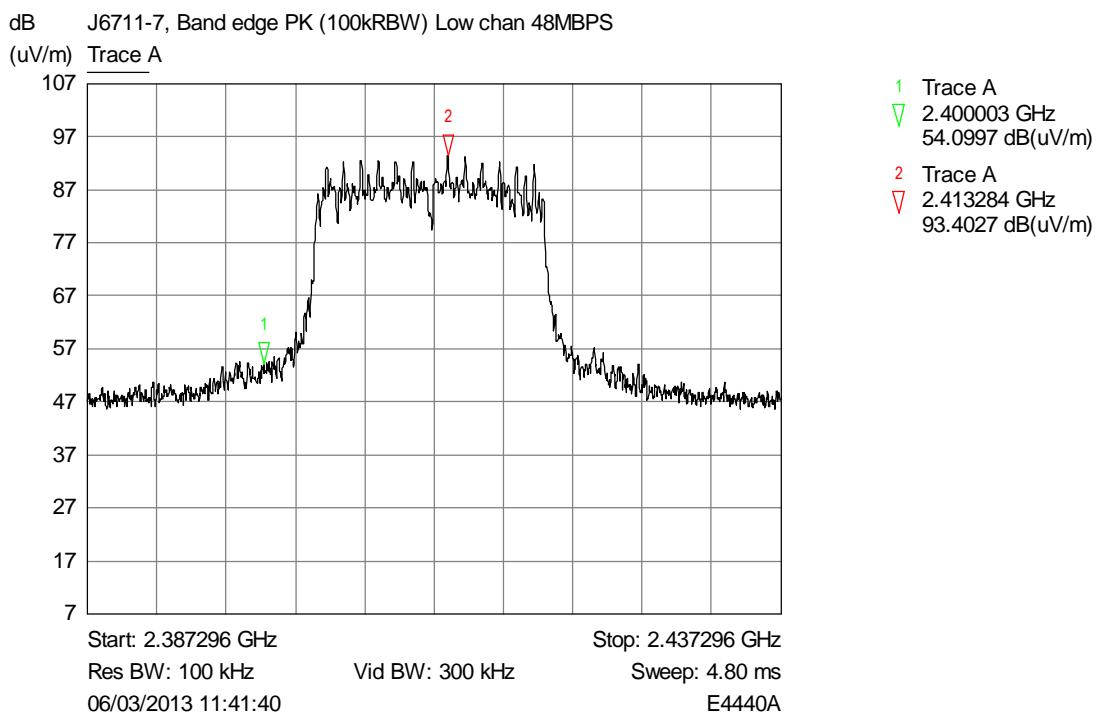
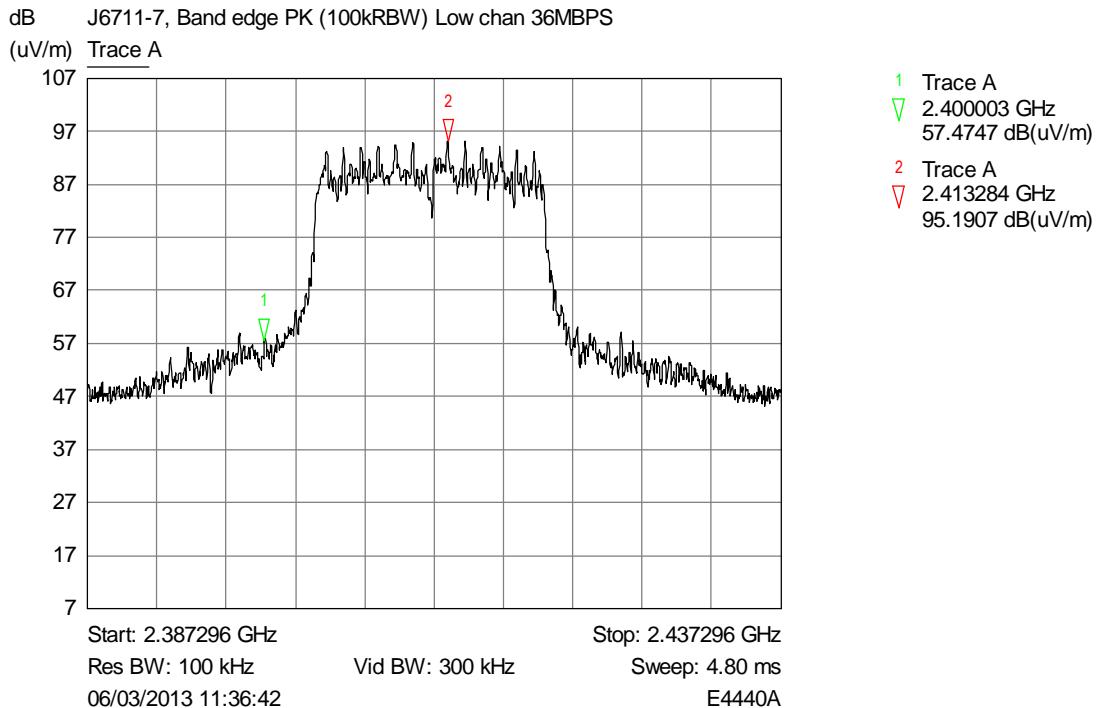


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 68 OF 130

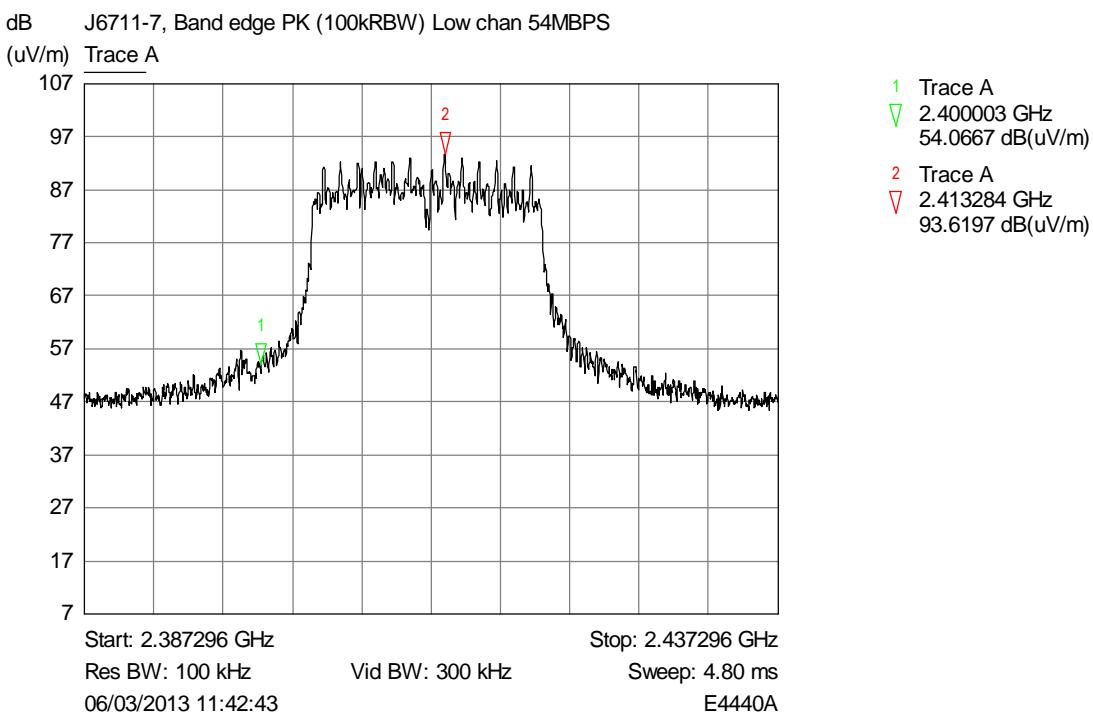
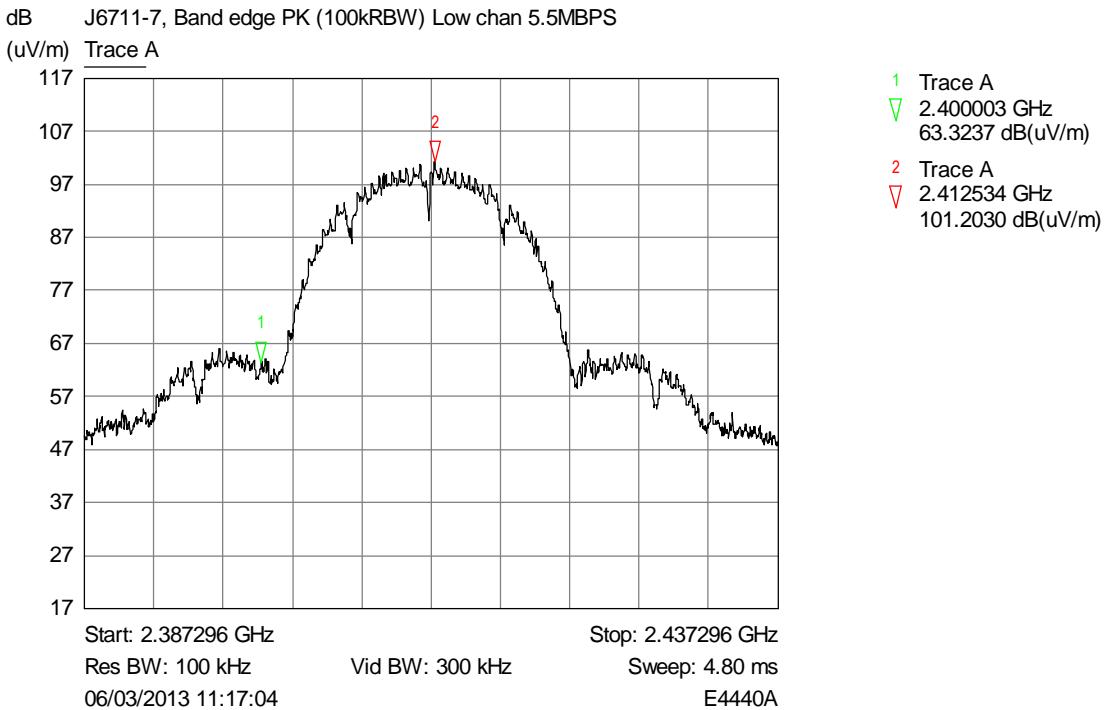


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 69 OF 130

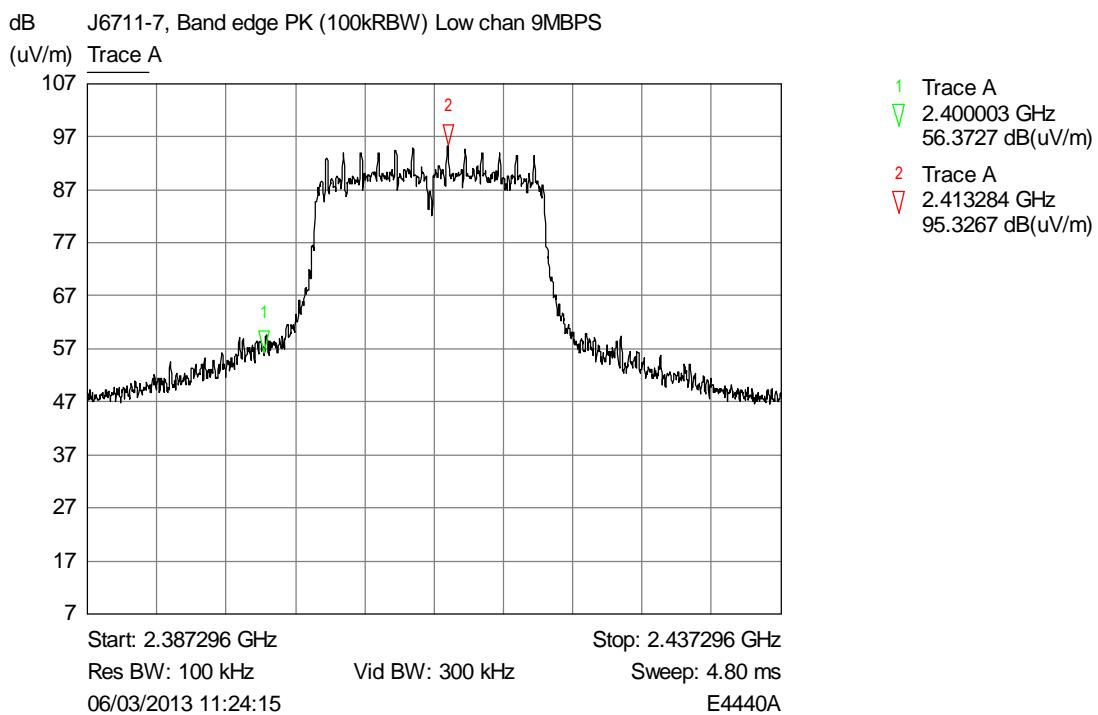
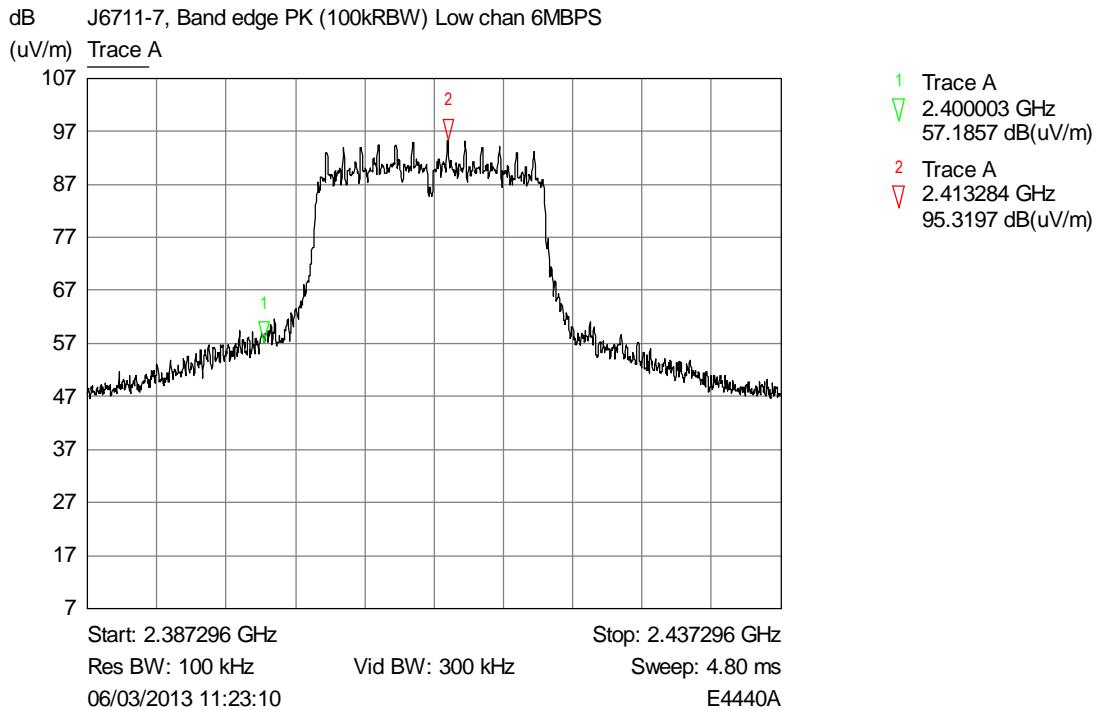


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 70 OF 130

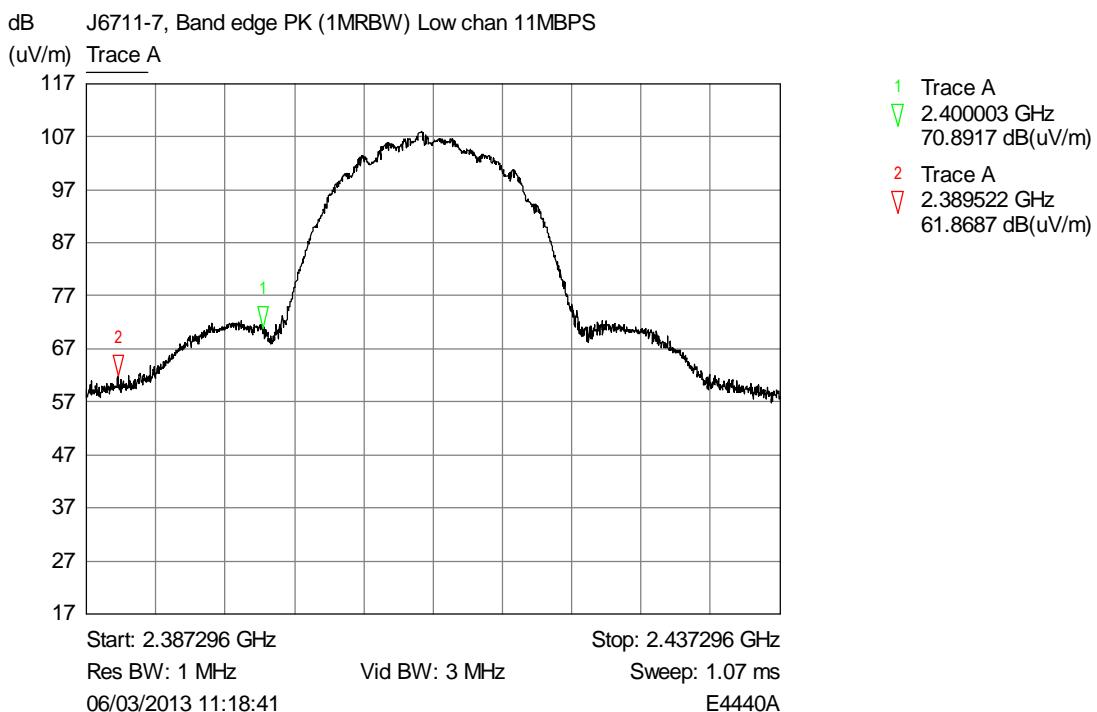
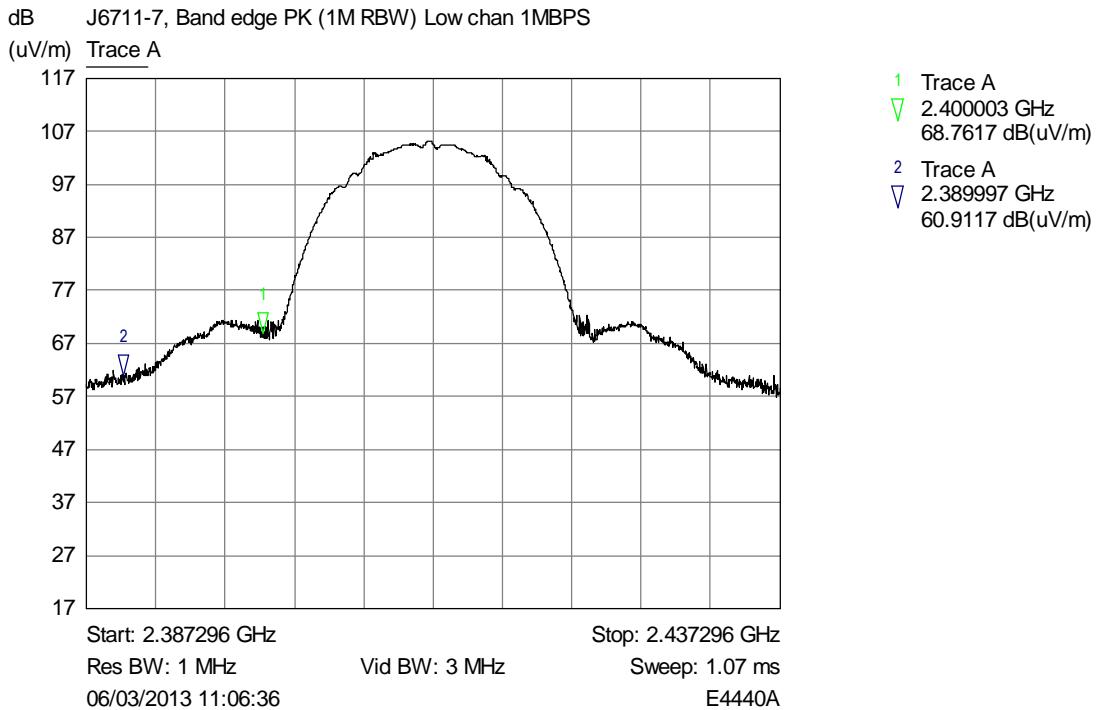


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 71 OF 130

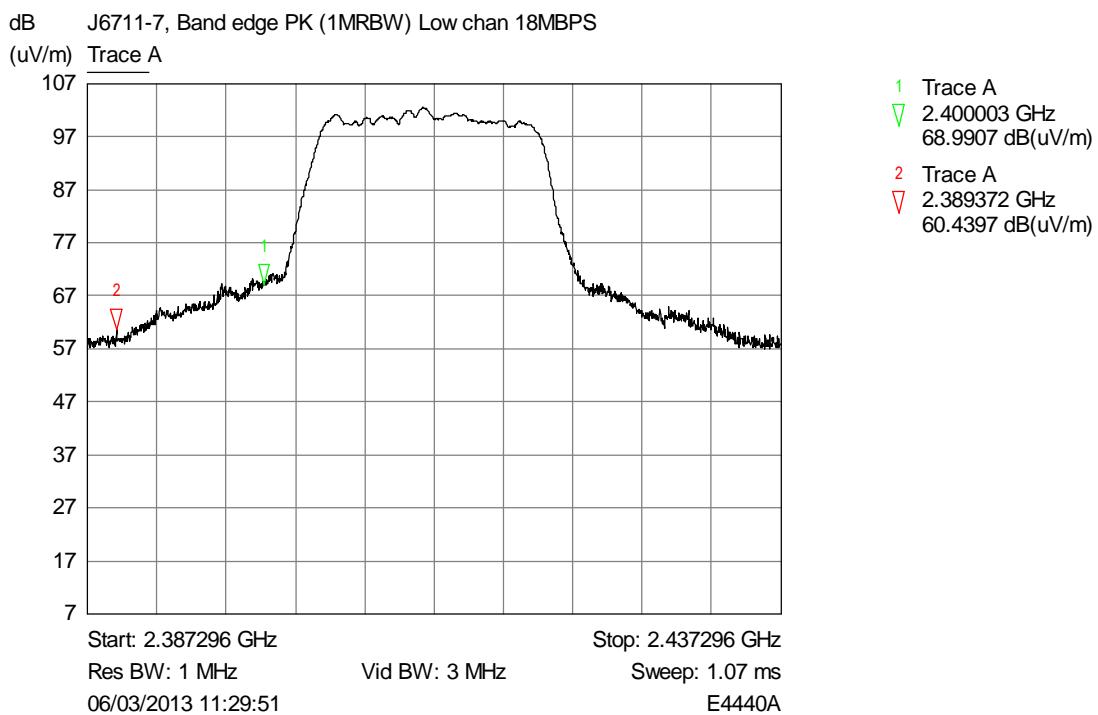
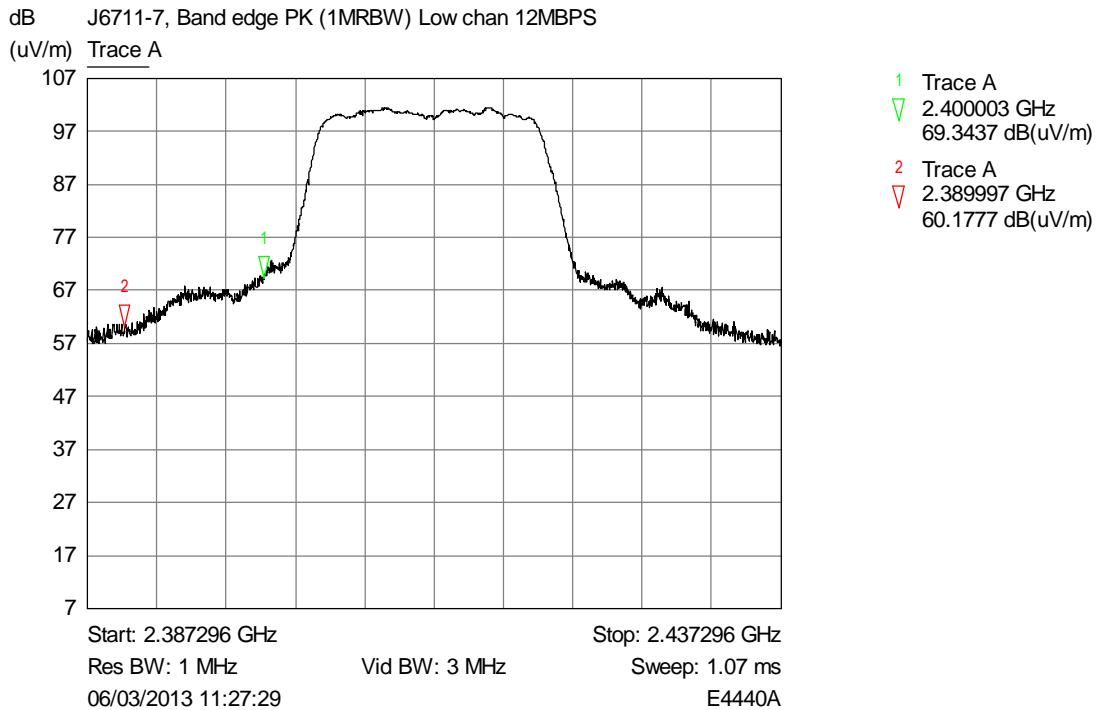


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 72 OF 130

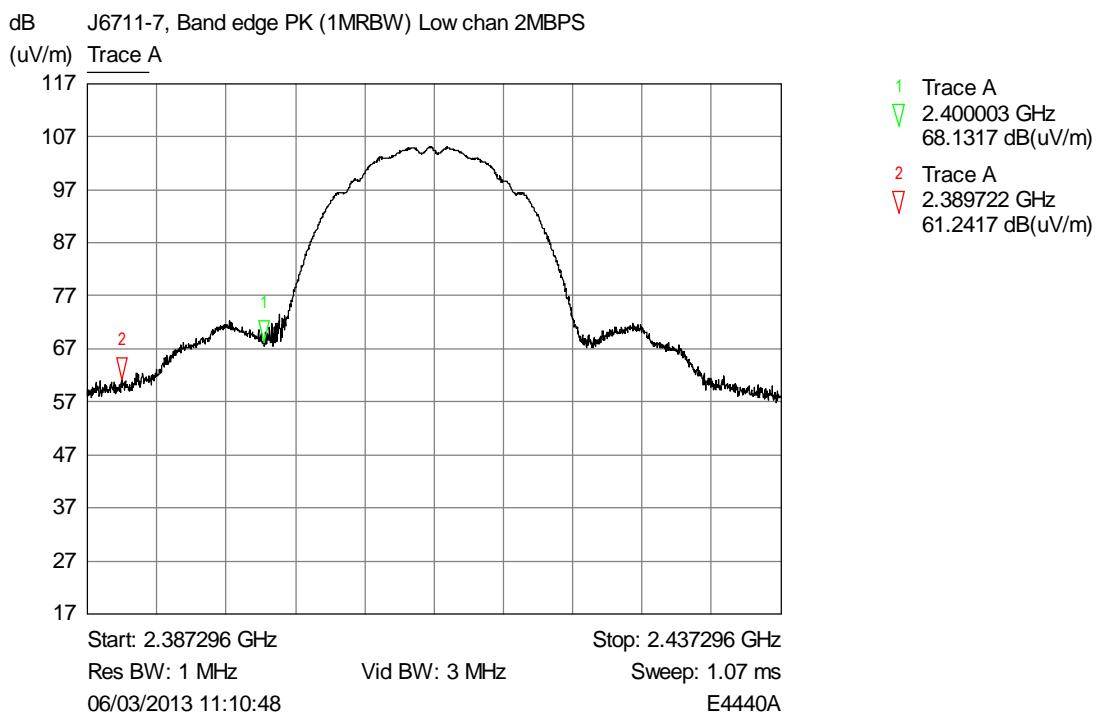
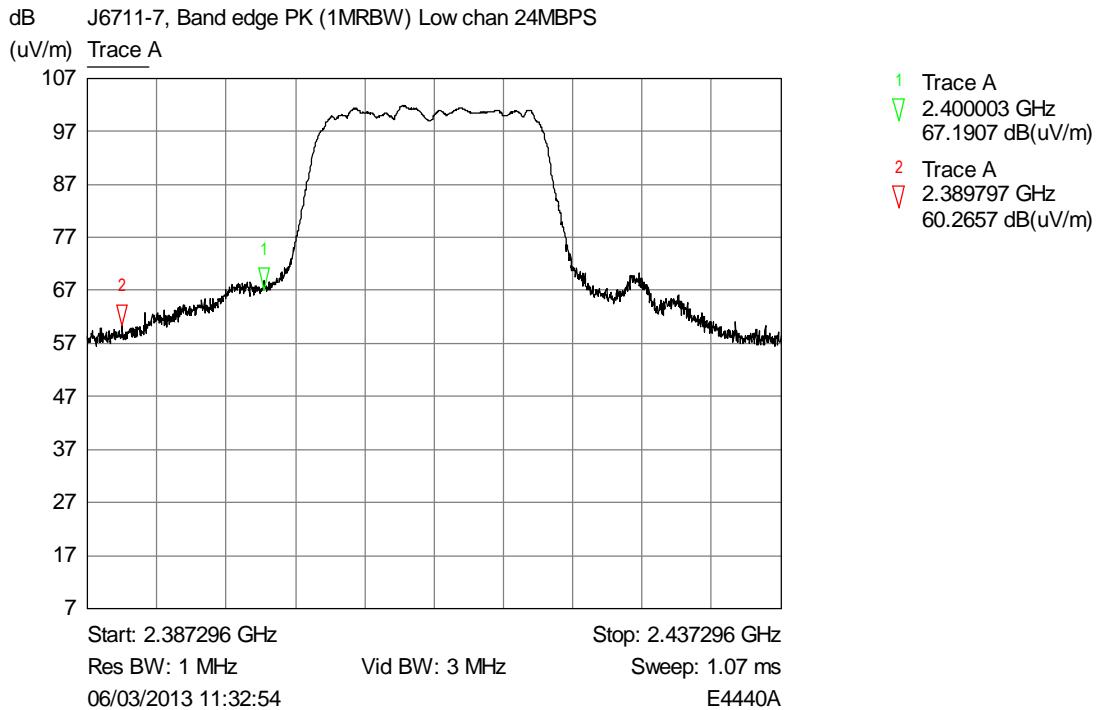


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 73 OF 130

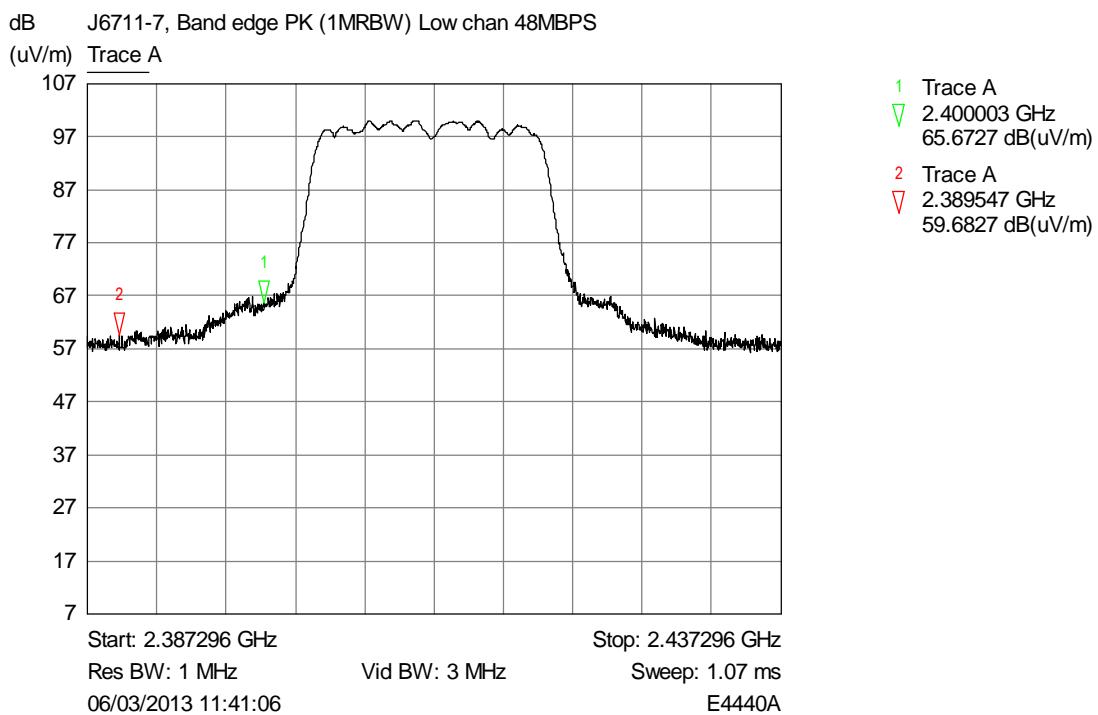
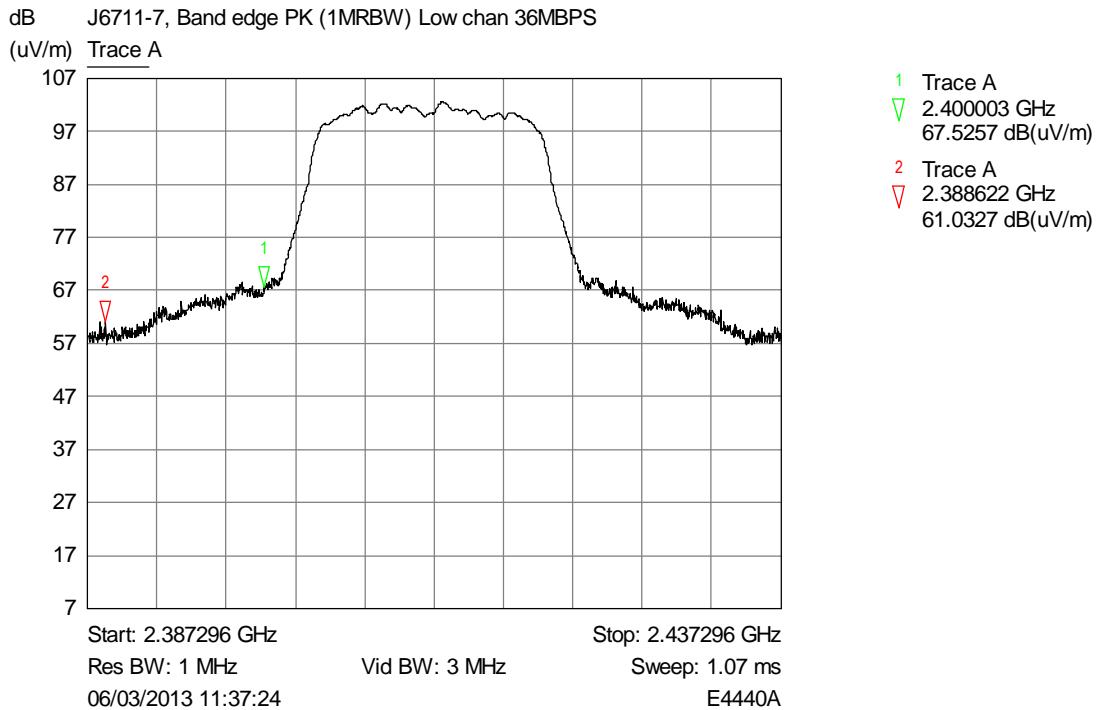


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 74 OF 130

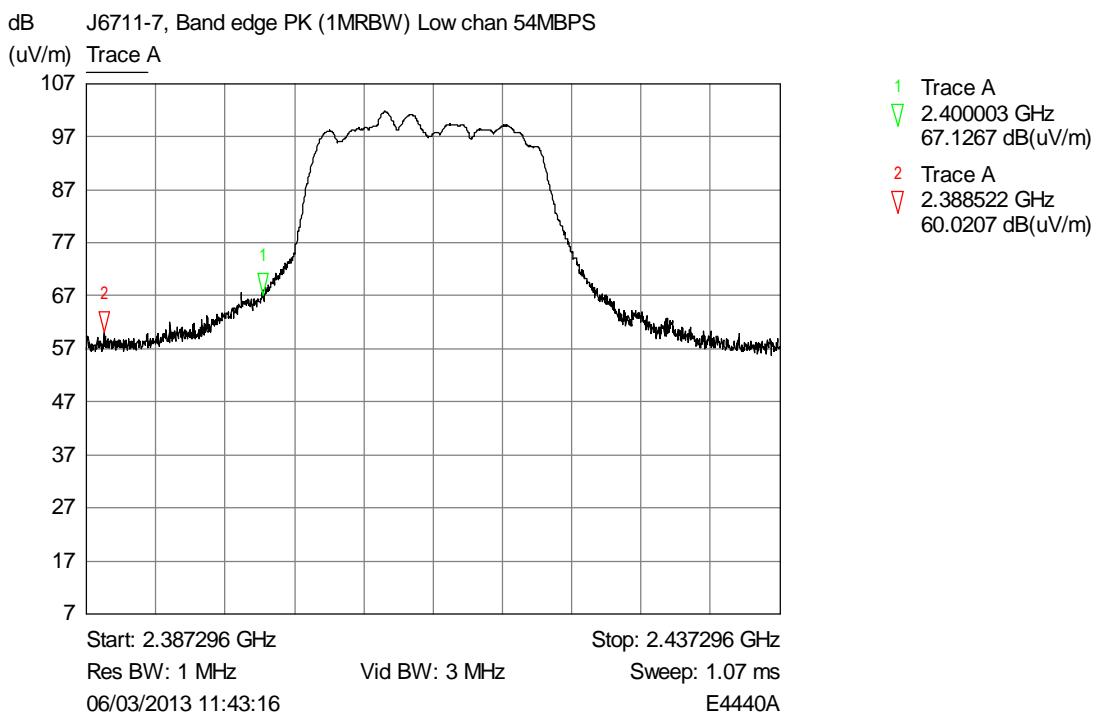
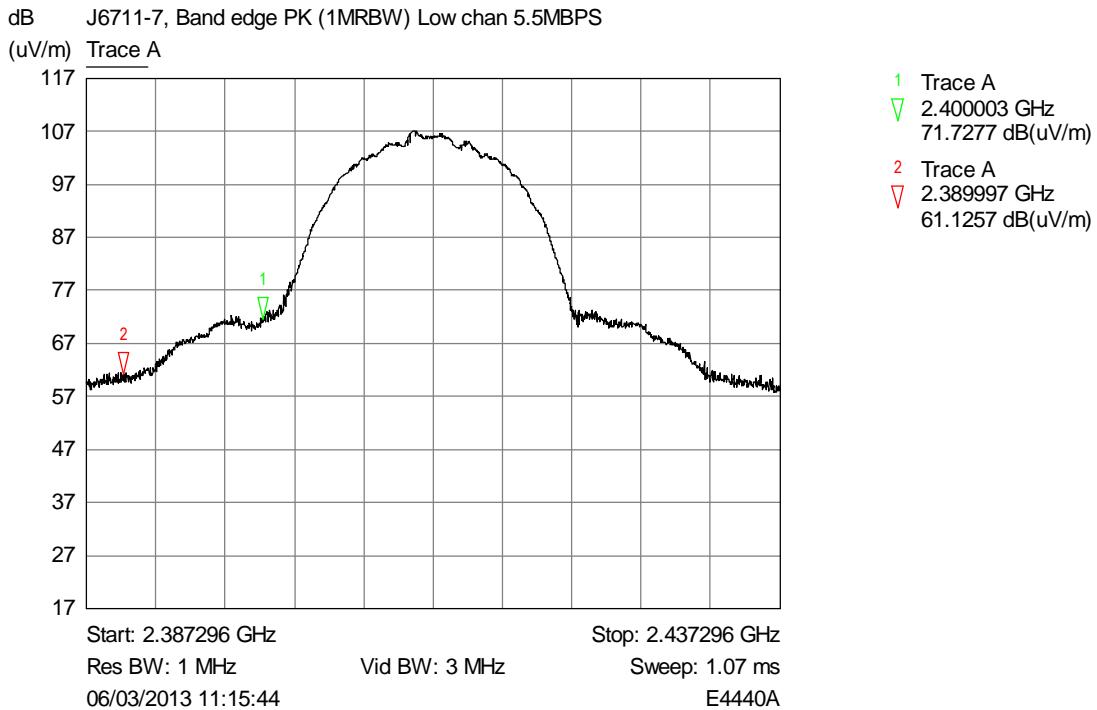


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 75 OF 130

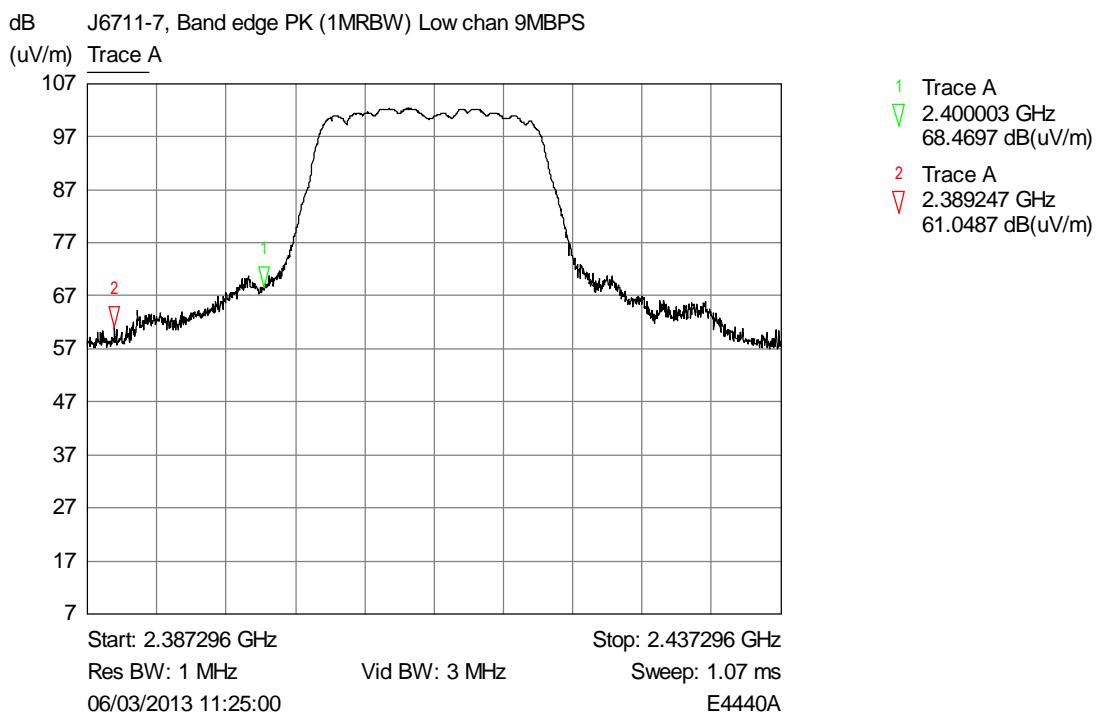
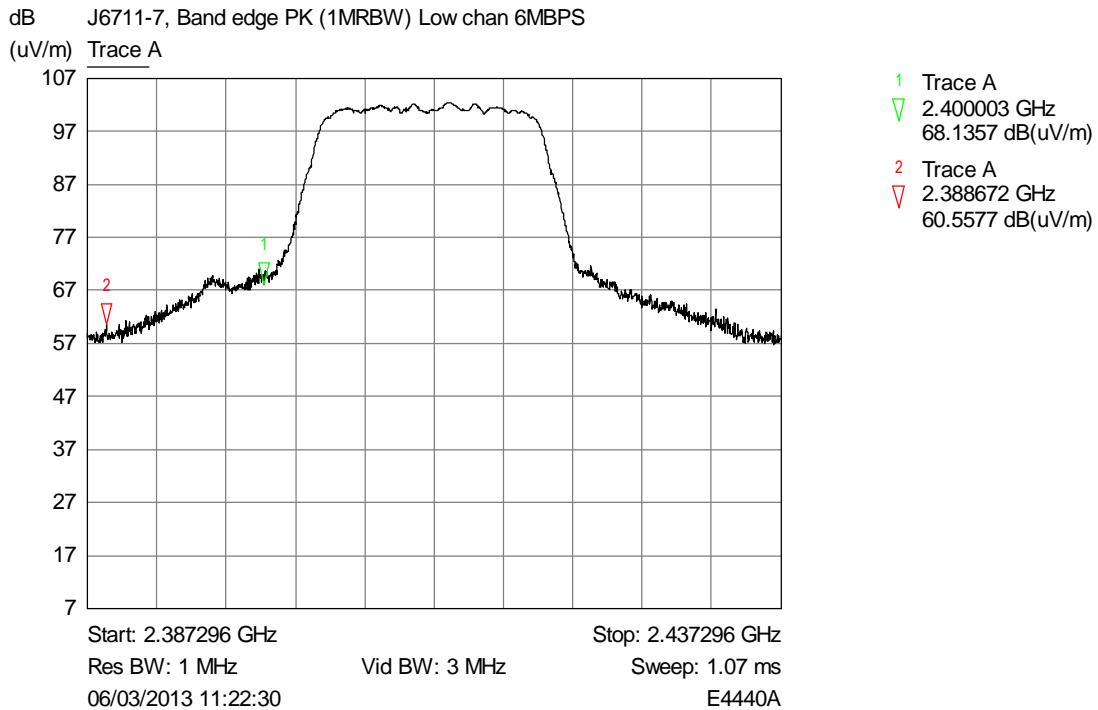


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 76 OF 130

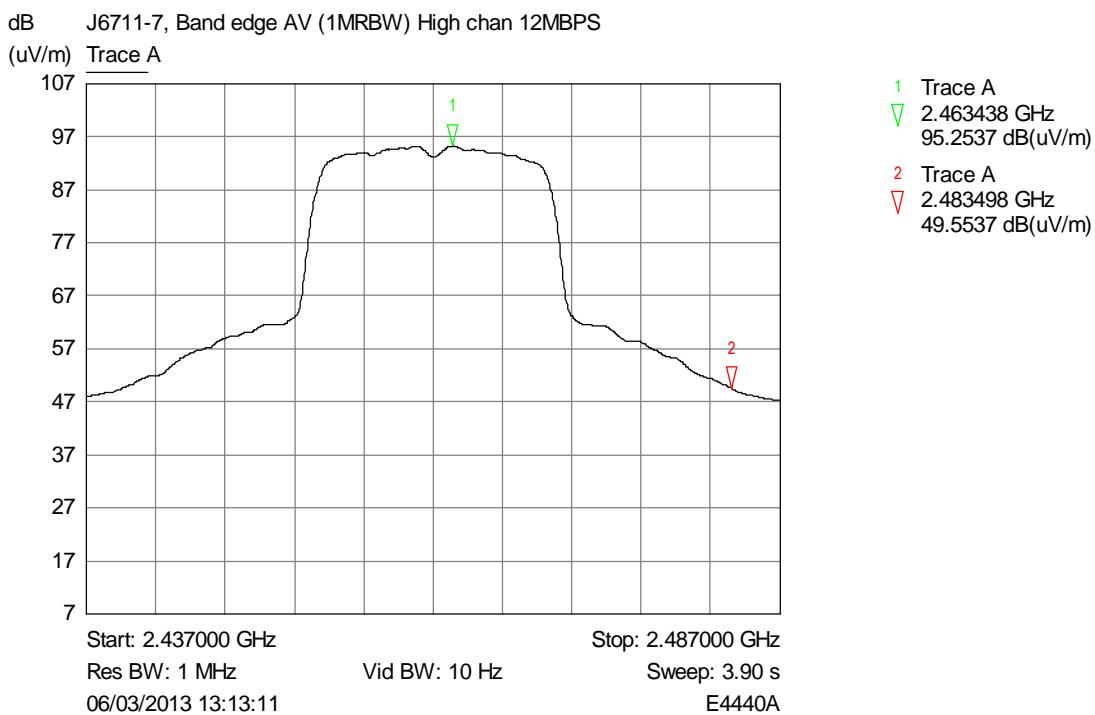
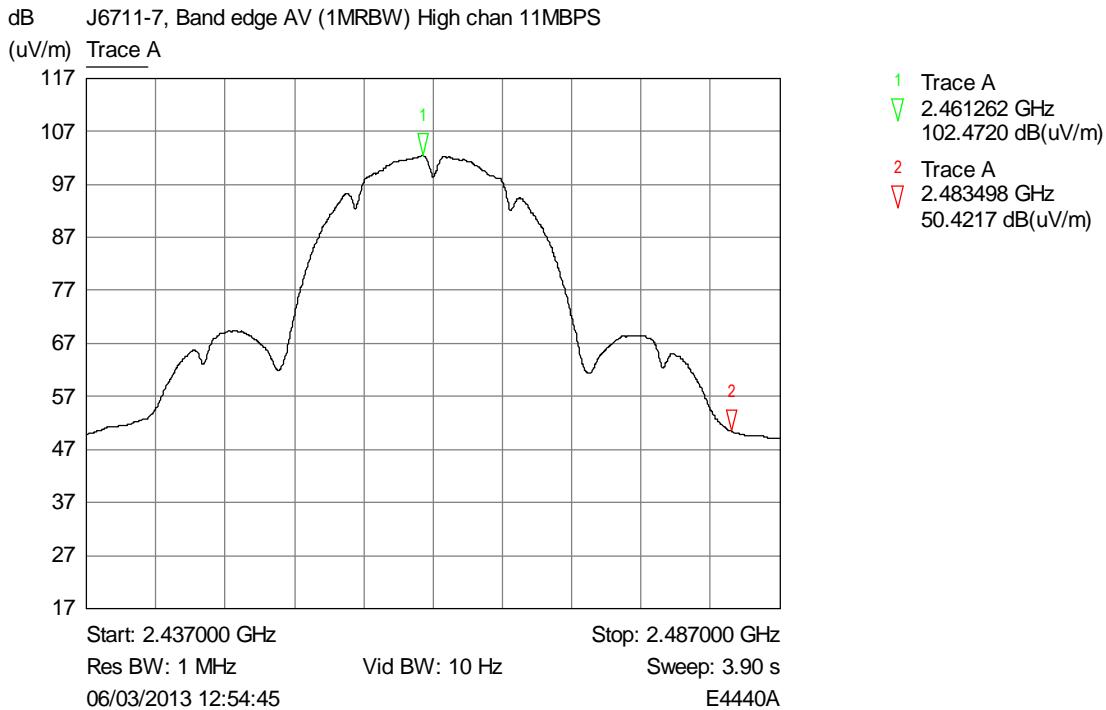


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 77 OF 130

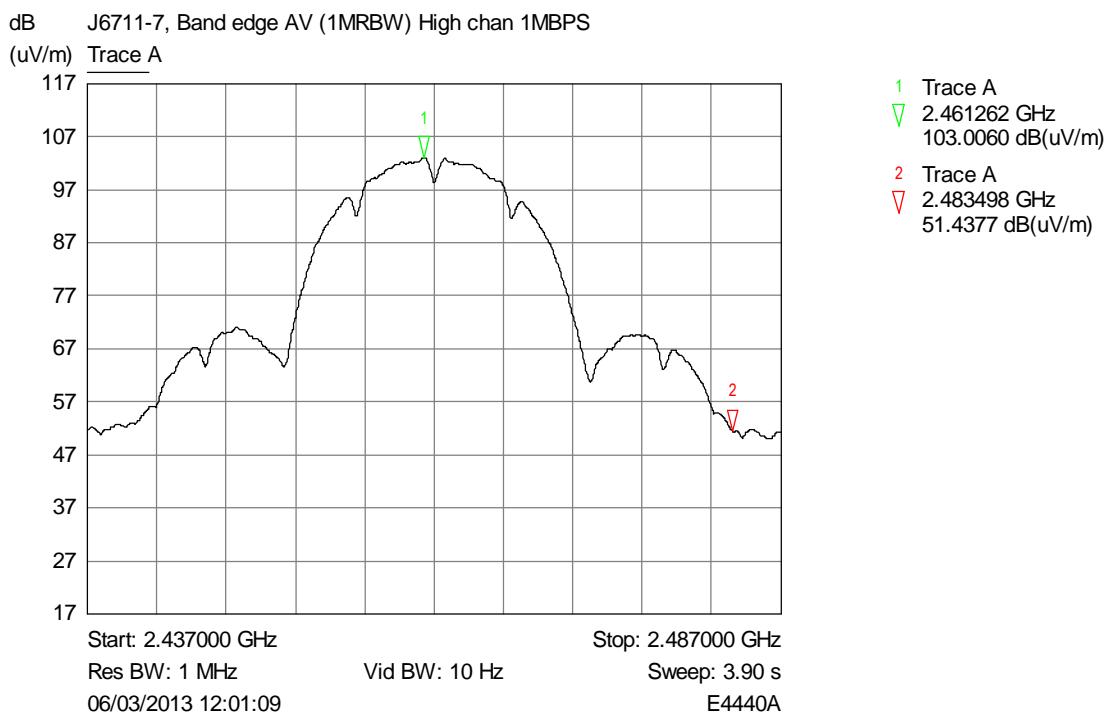
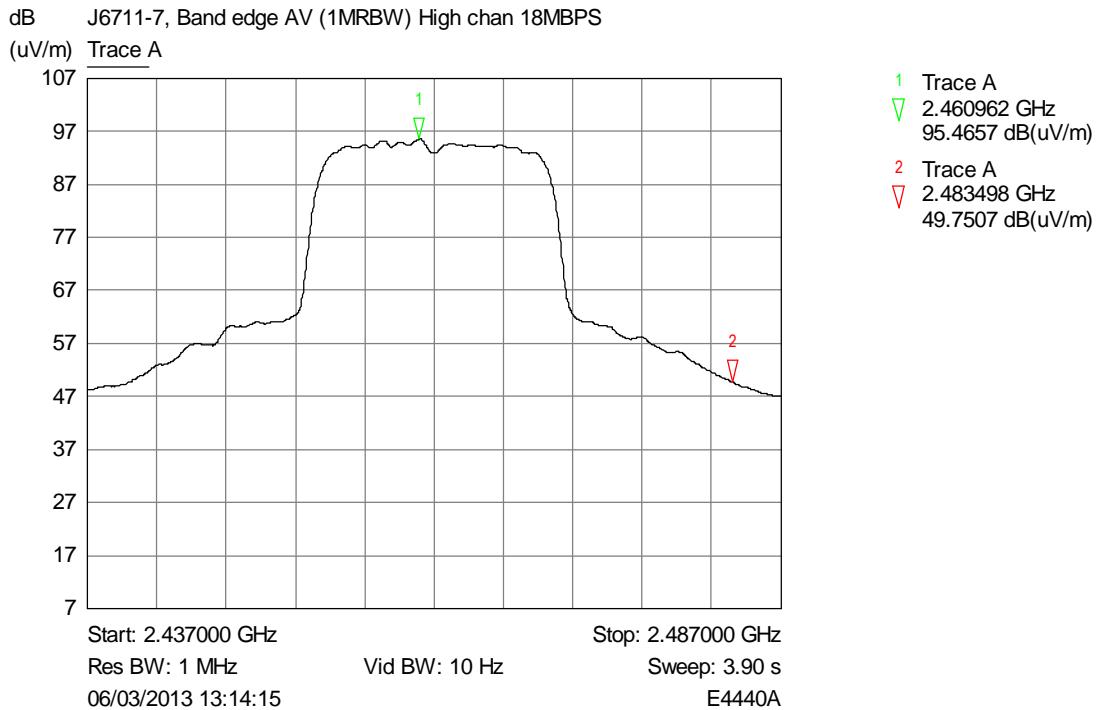


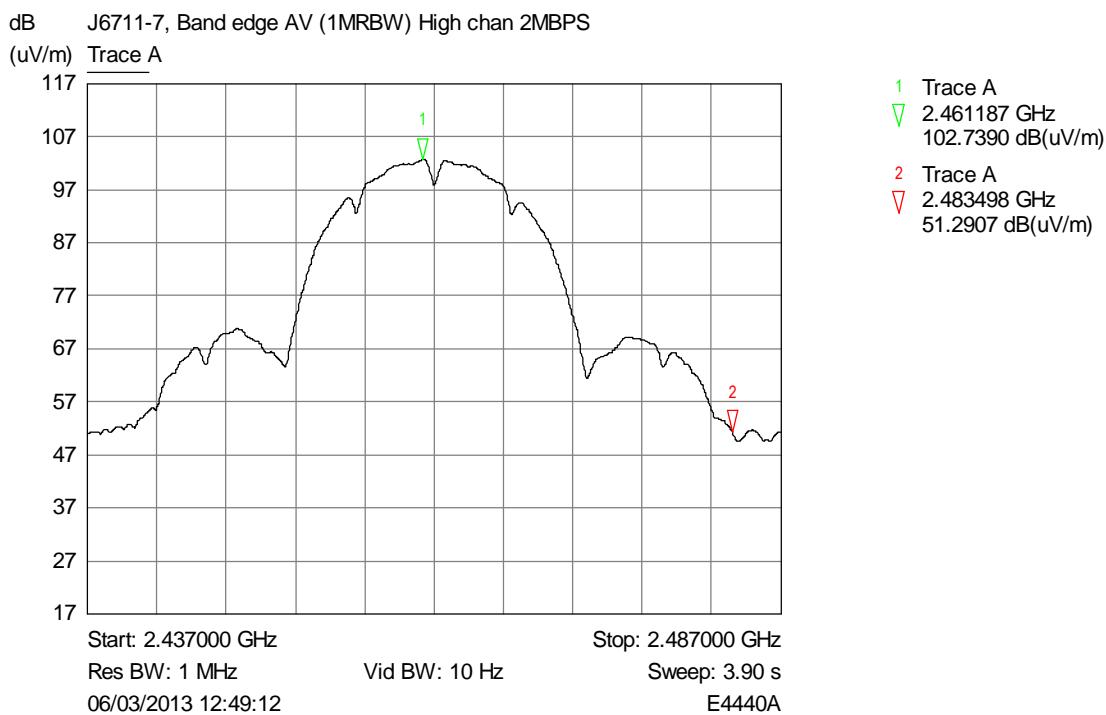
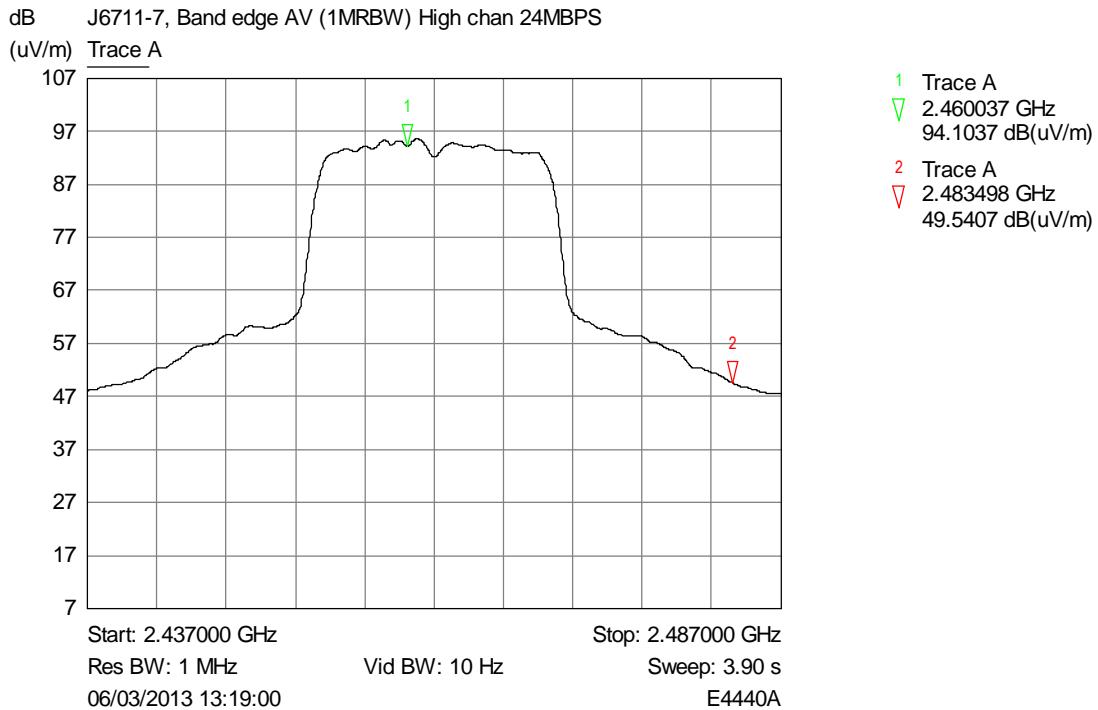
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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 78 OF 130



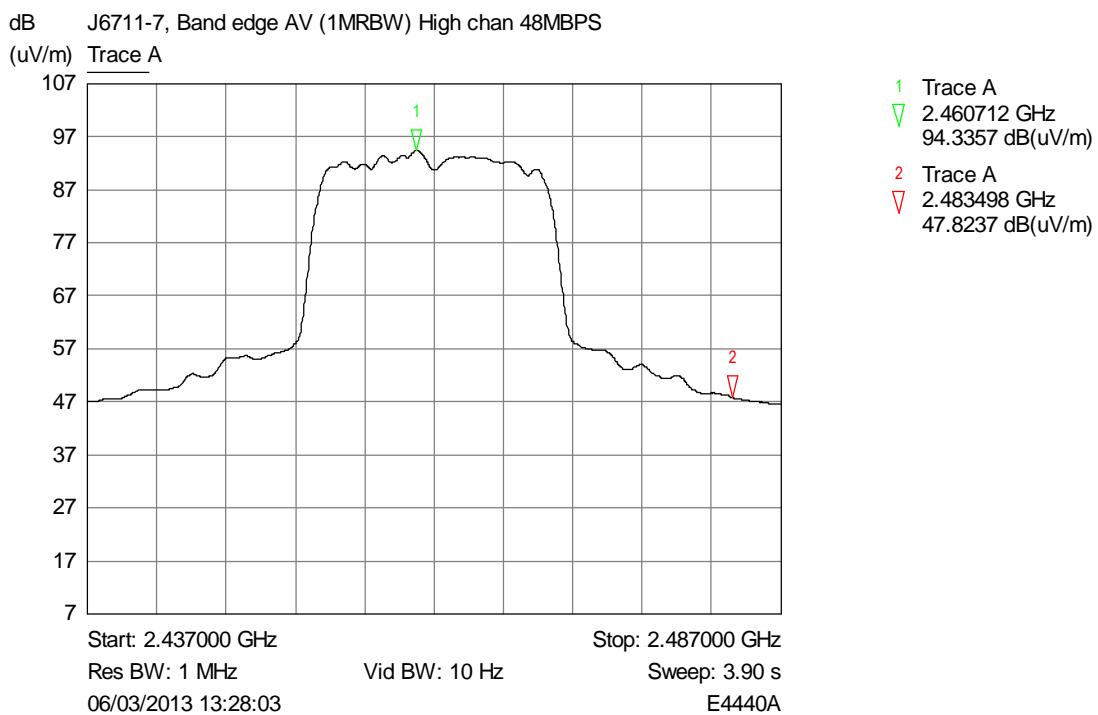
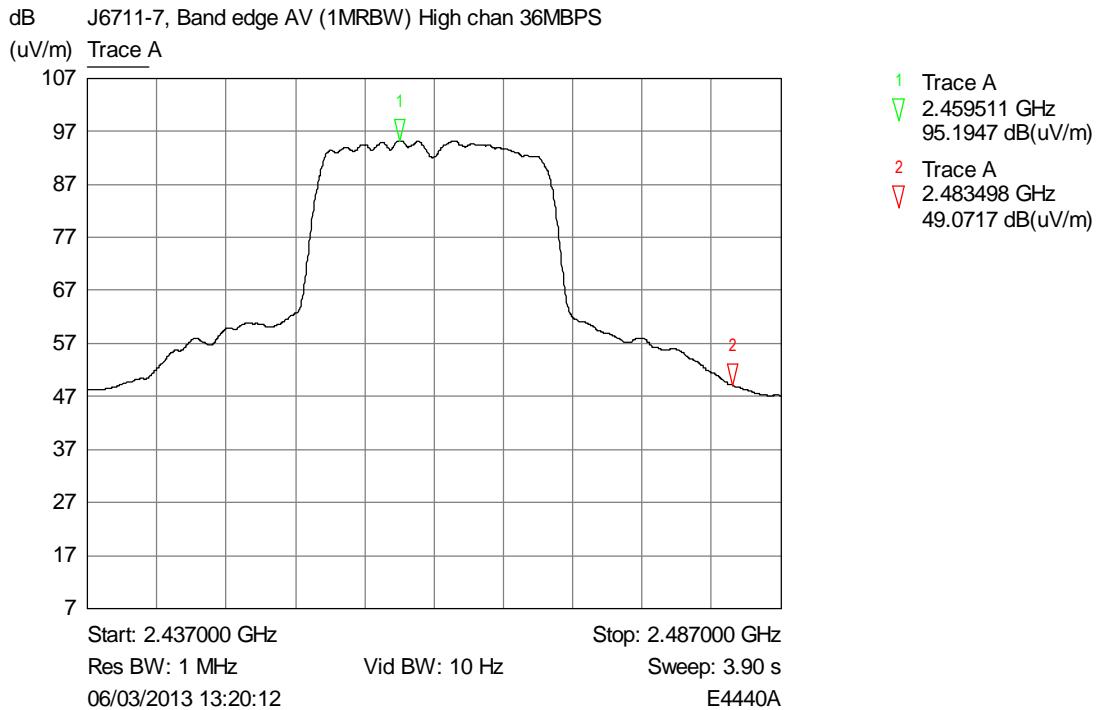


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 80 OF 130

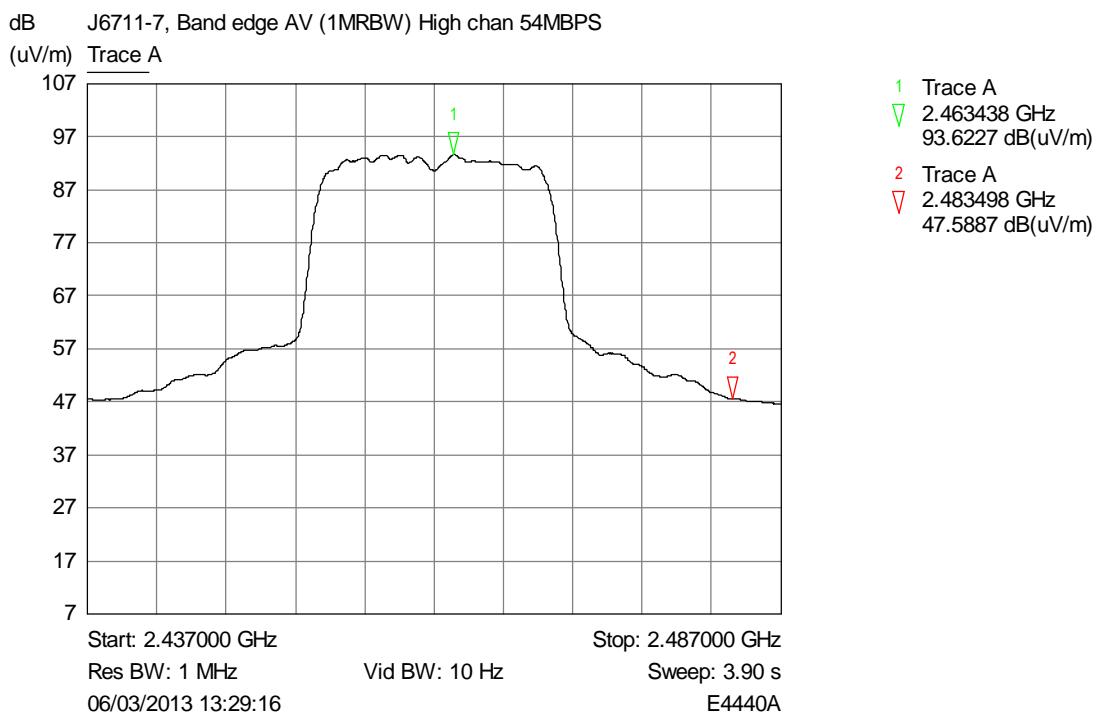
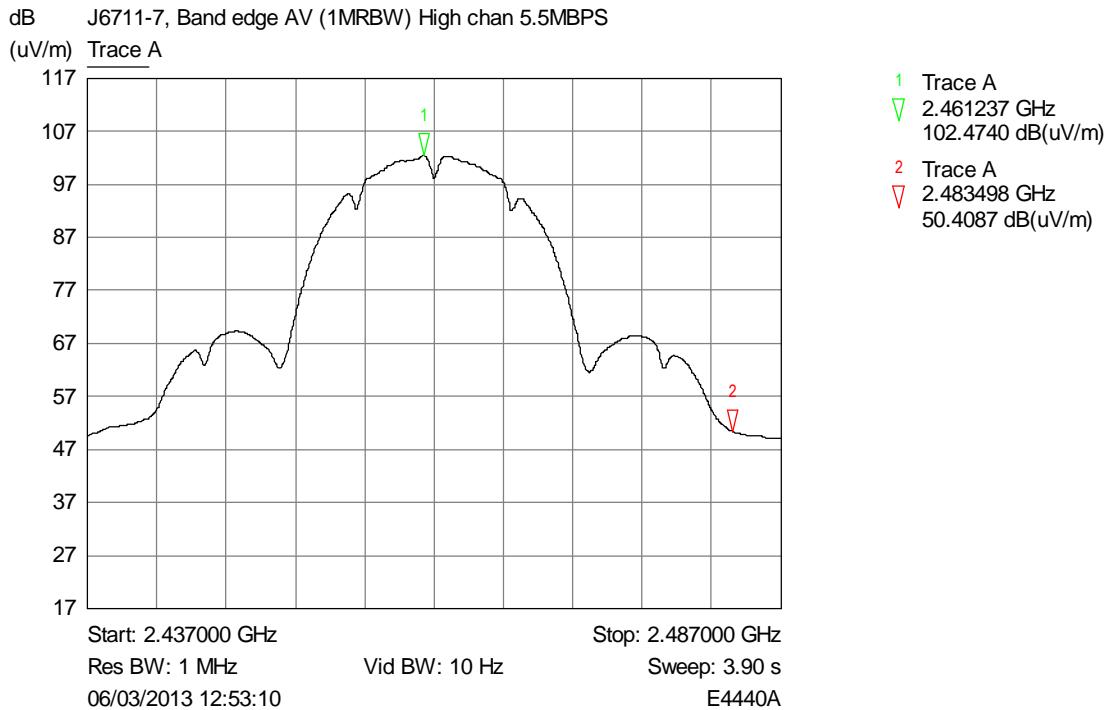


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 81 OF 130

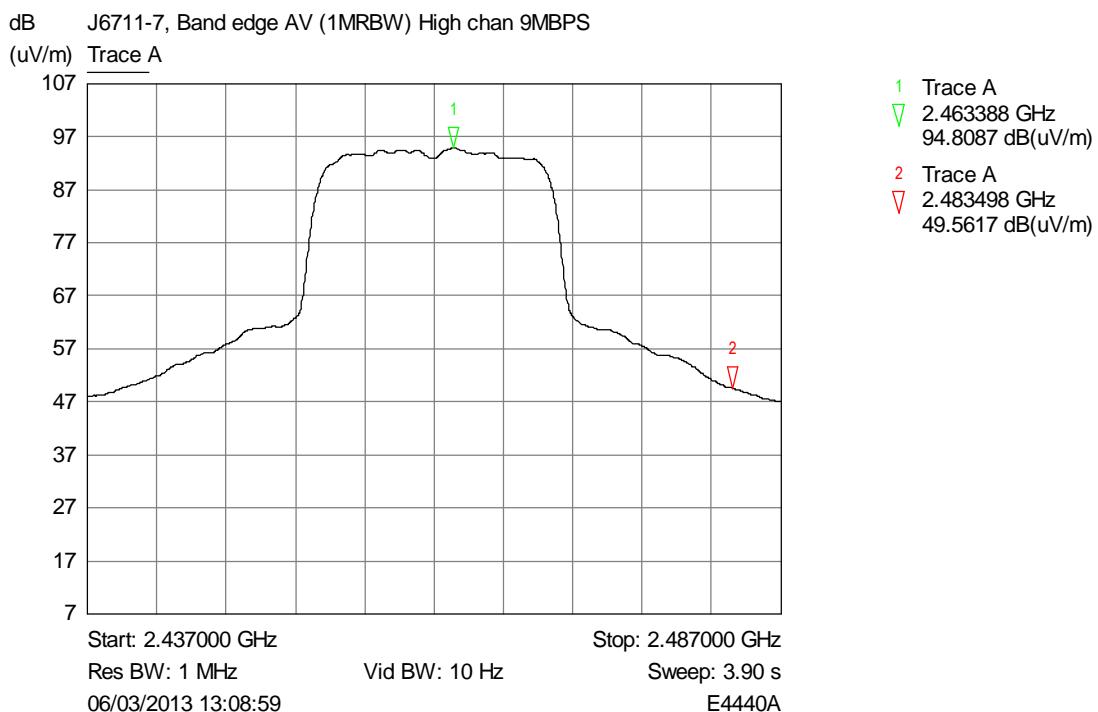
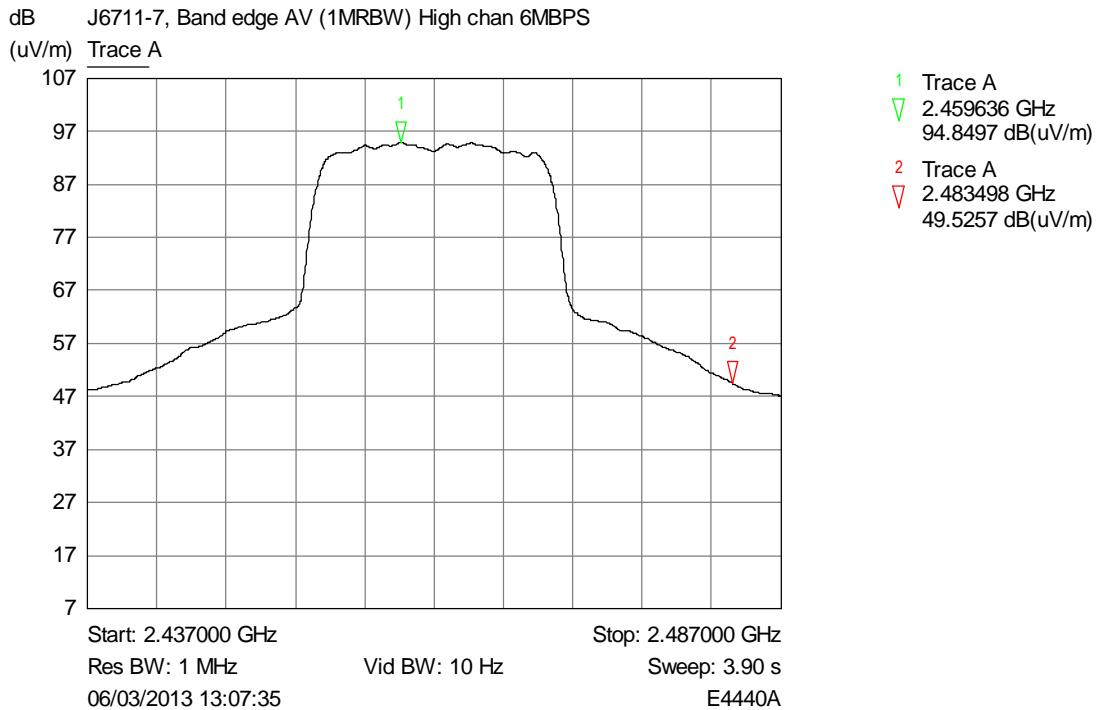


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 82 OF 130

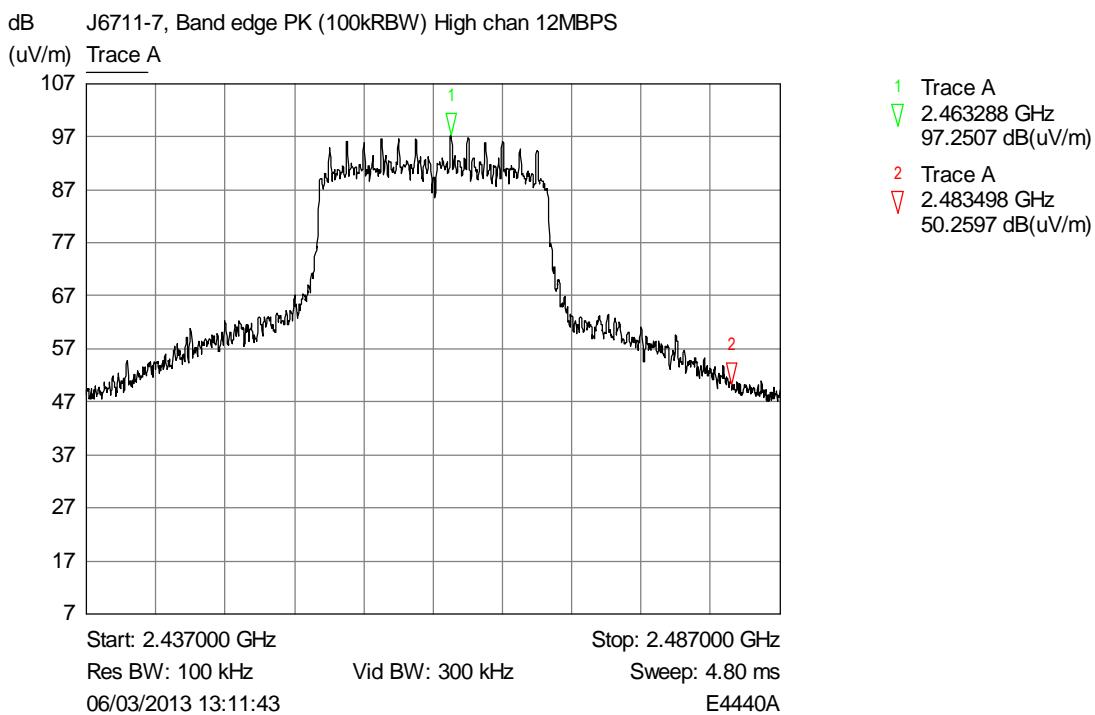
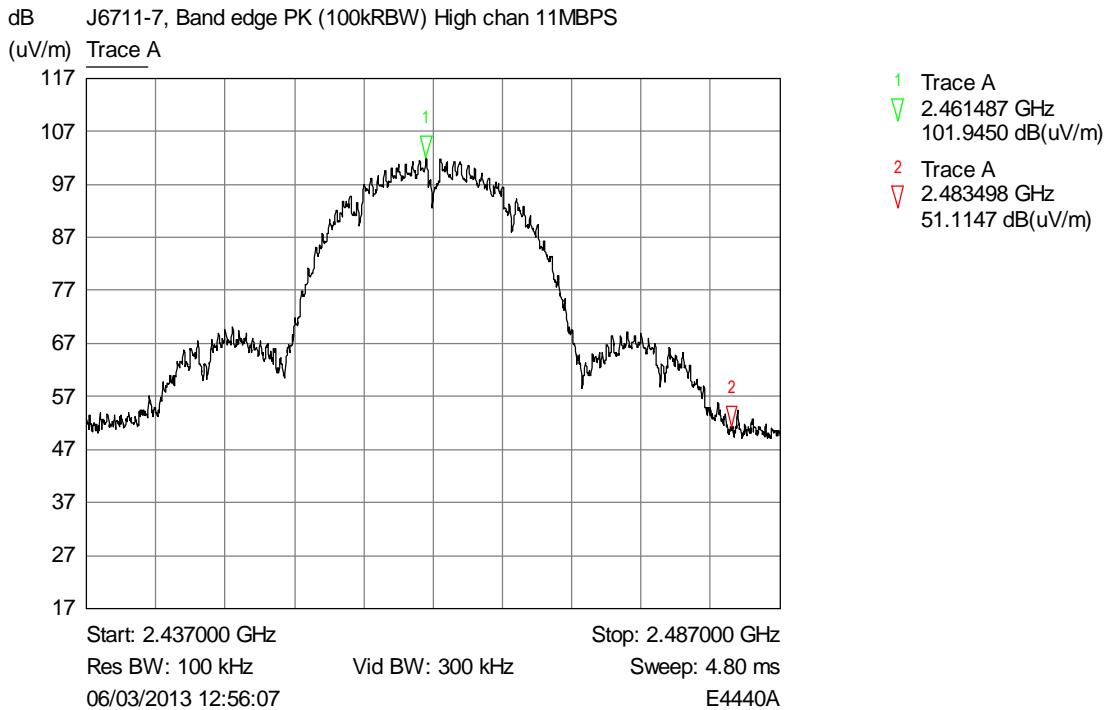


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 83 OF 130

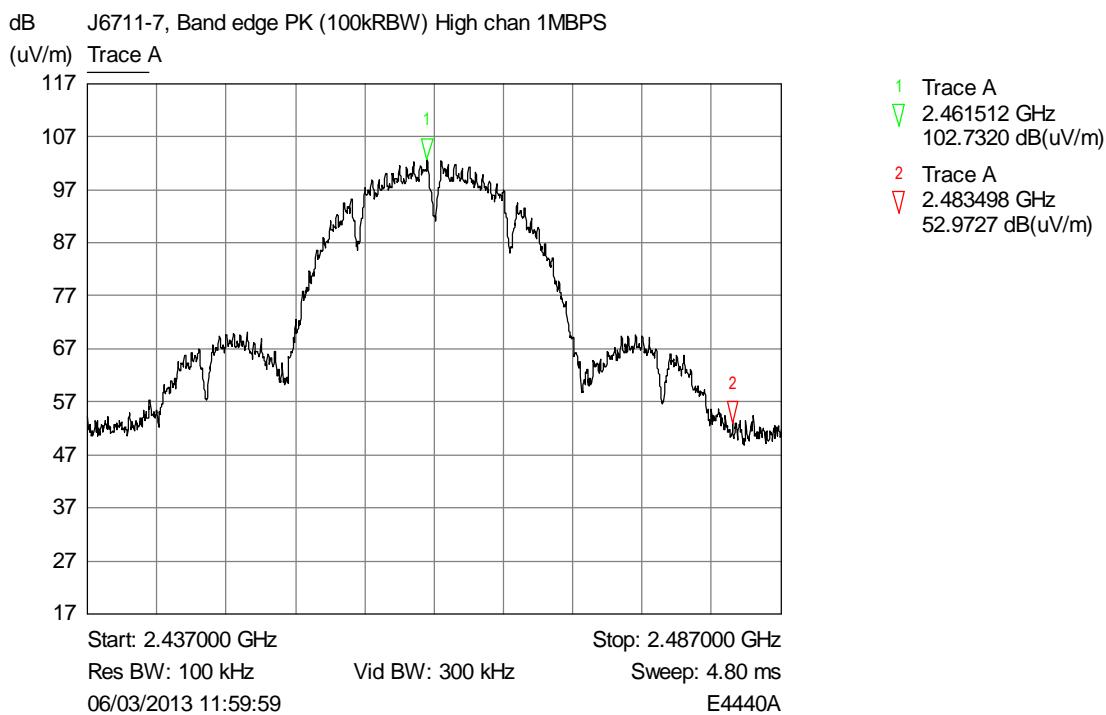
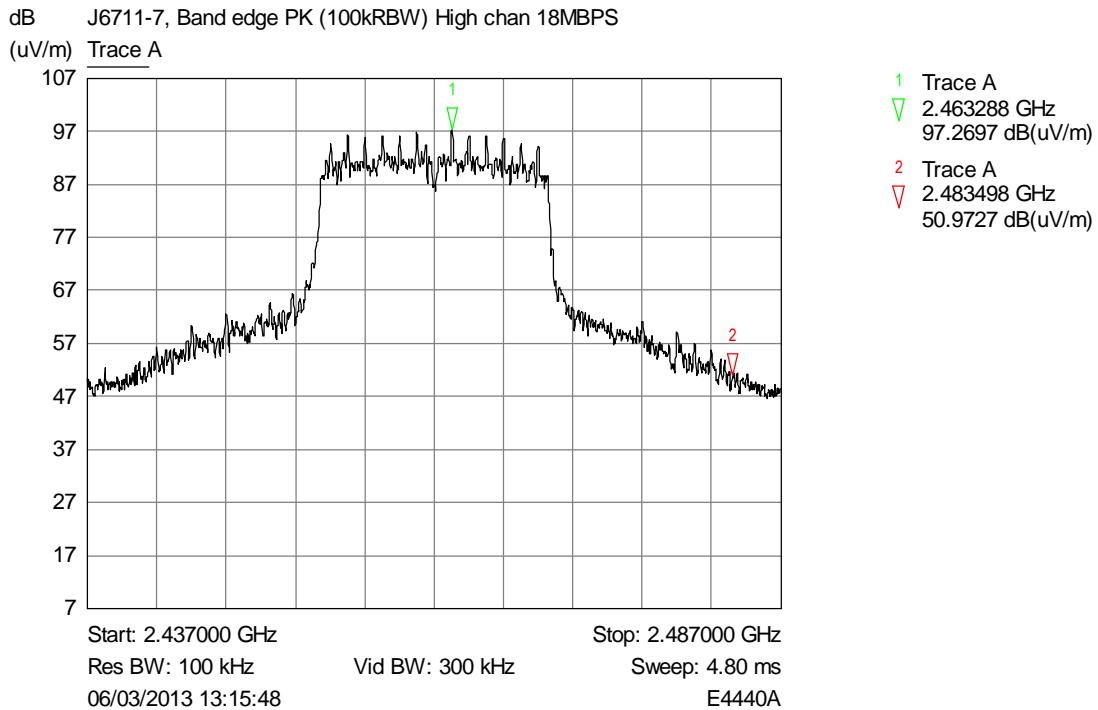


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 84 OF 130

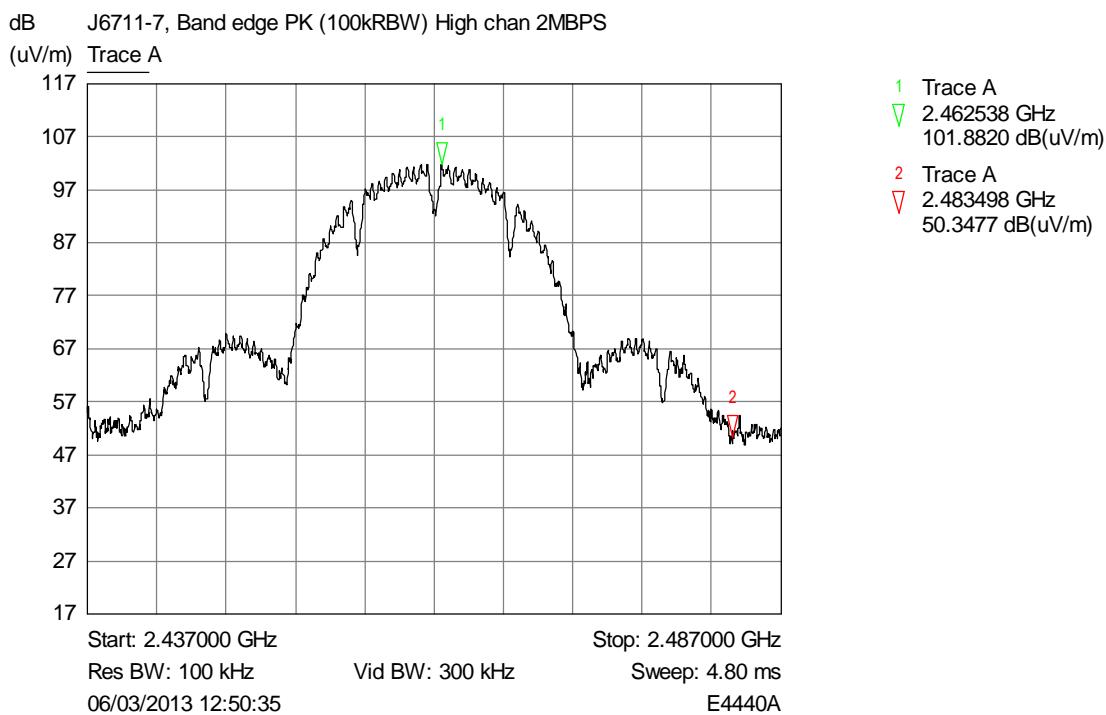
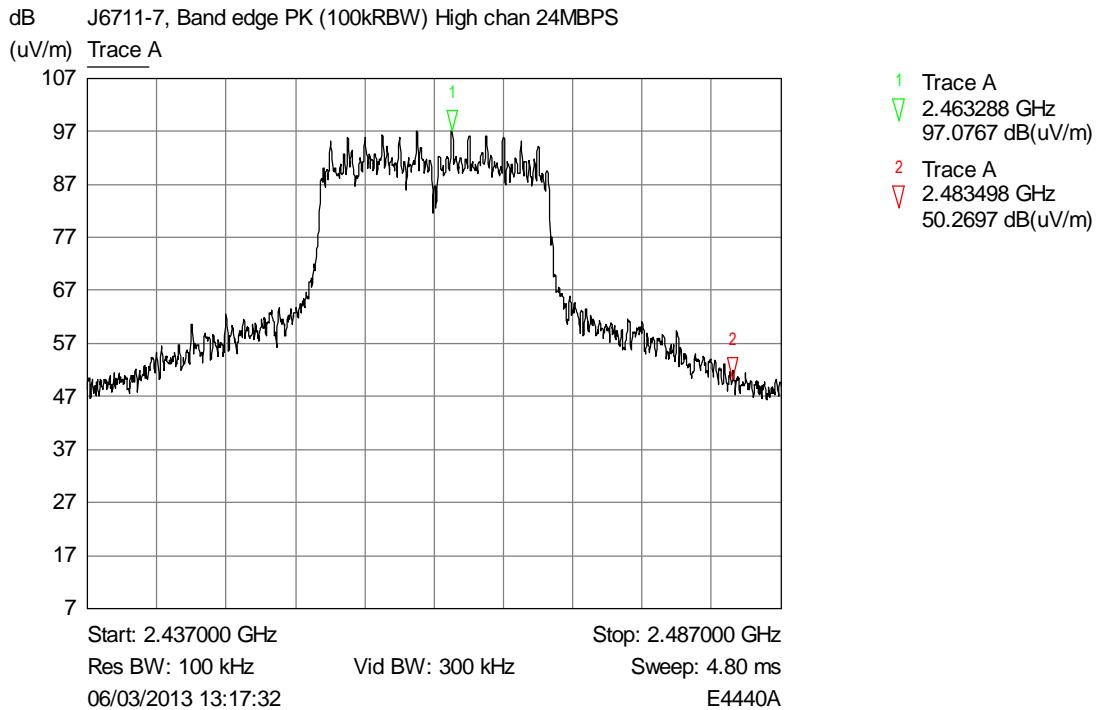


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 85 OF 130

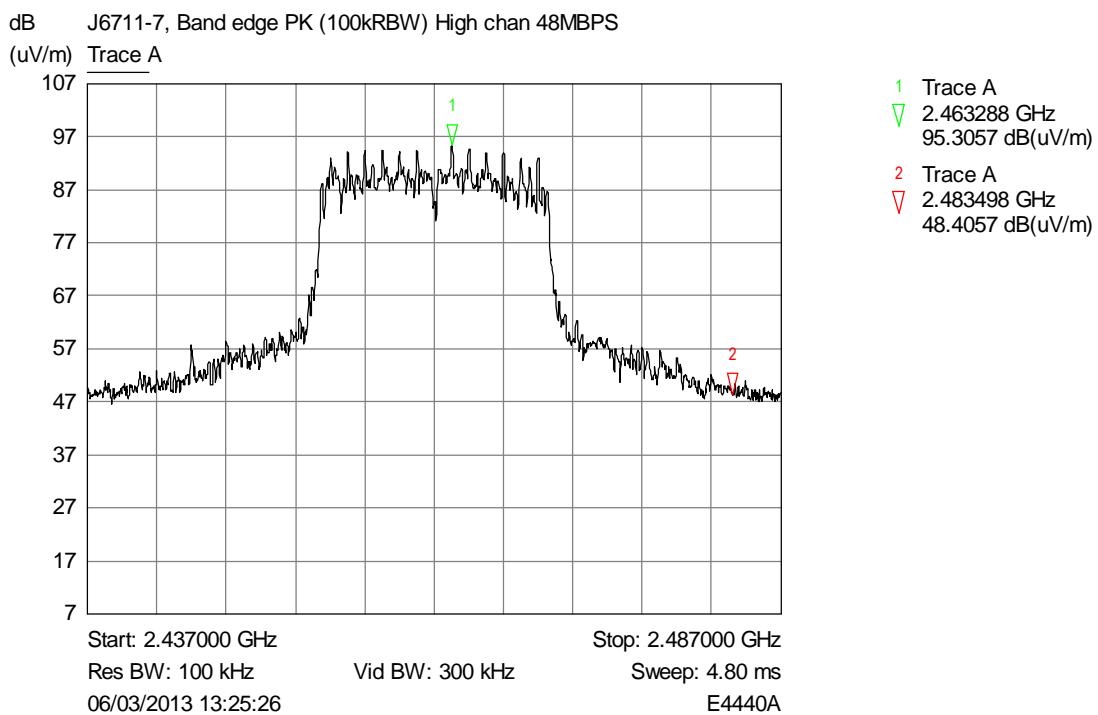
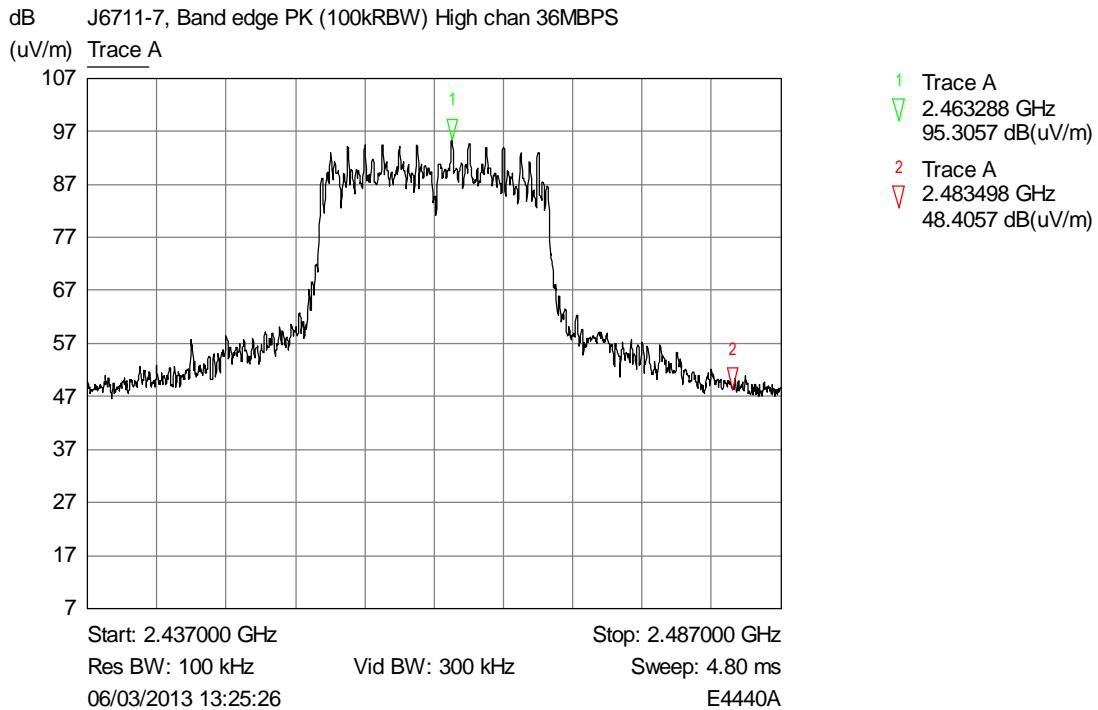


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 86 OF 130

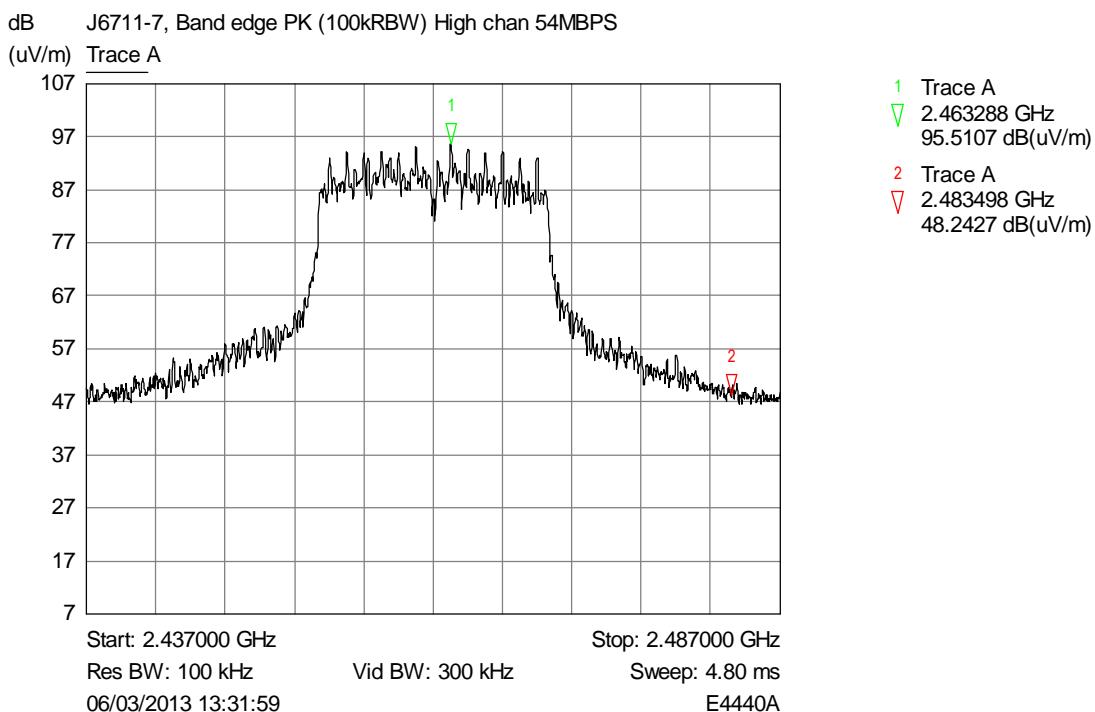
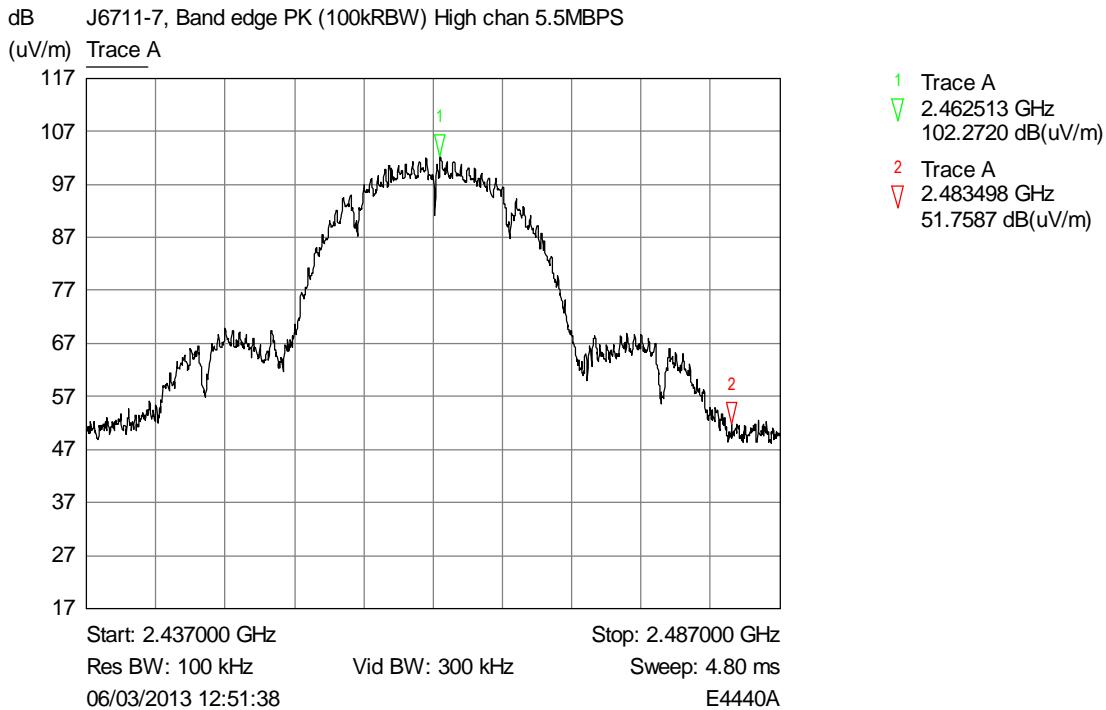


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 87 OF 130

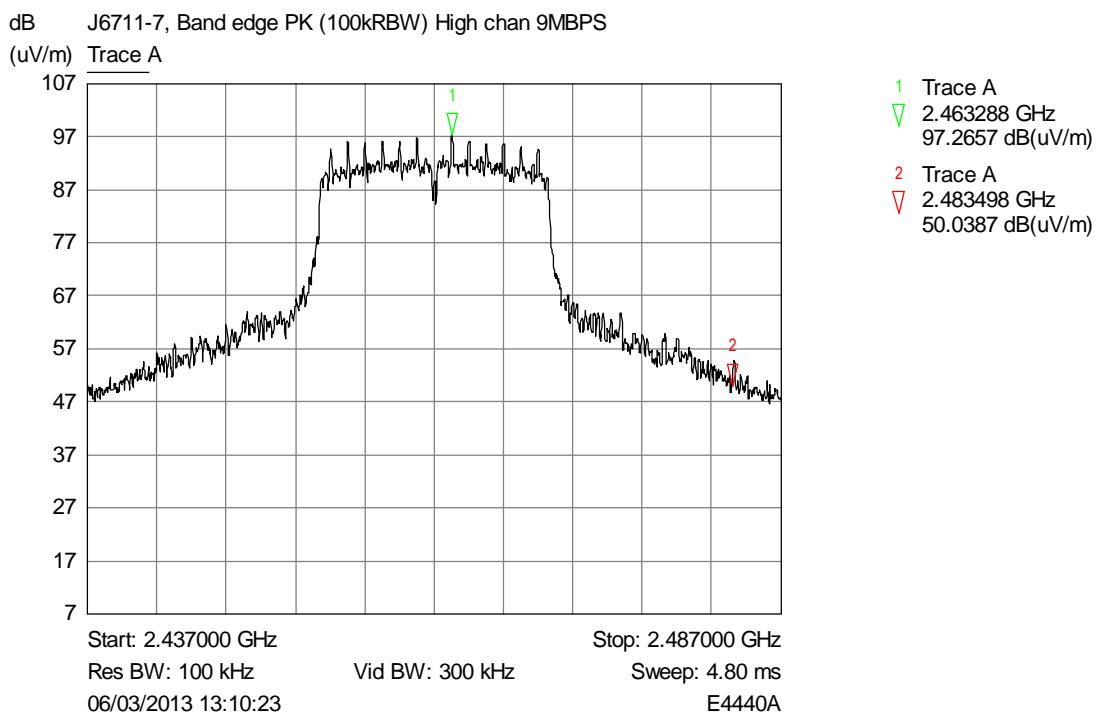
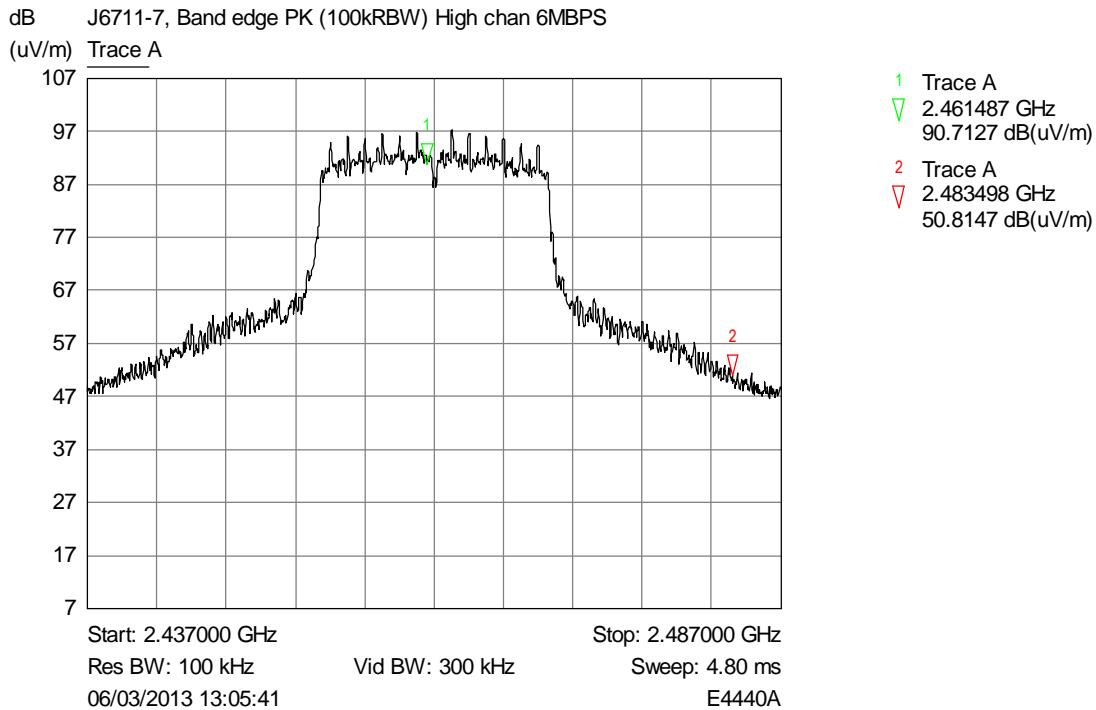


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 88 OF 130

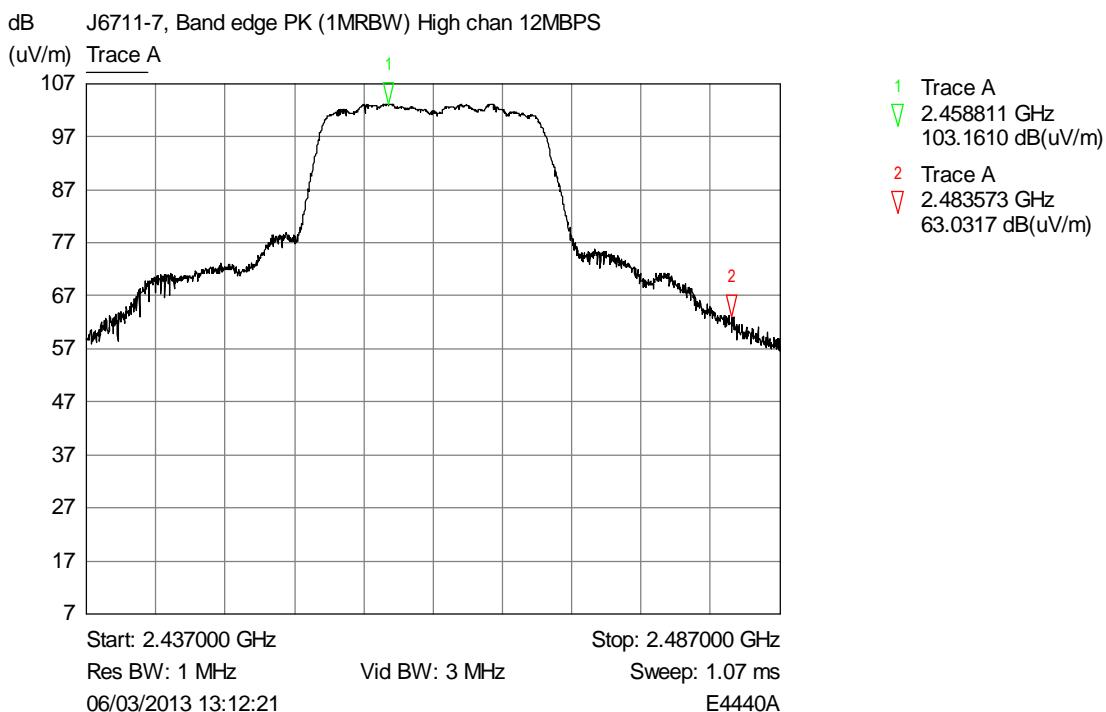
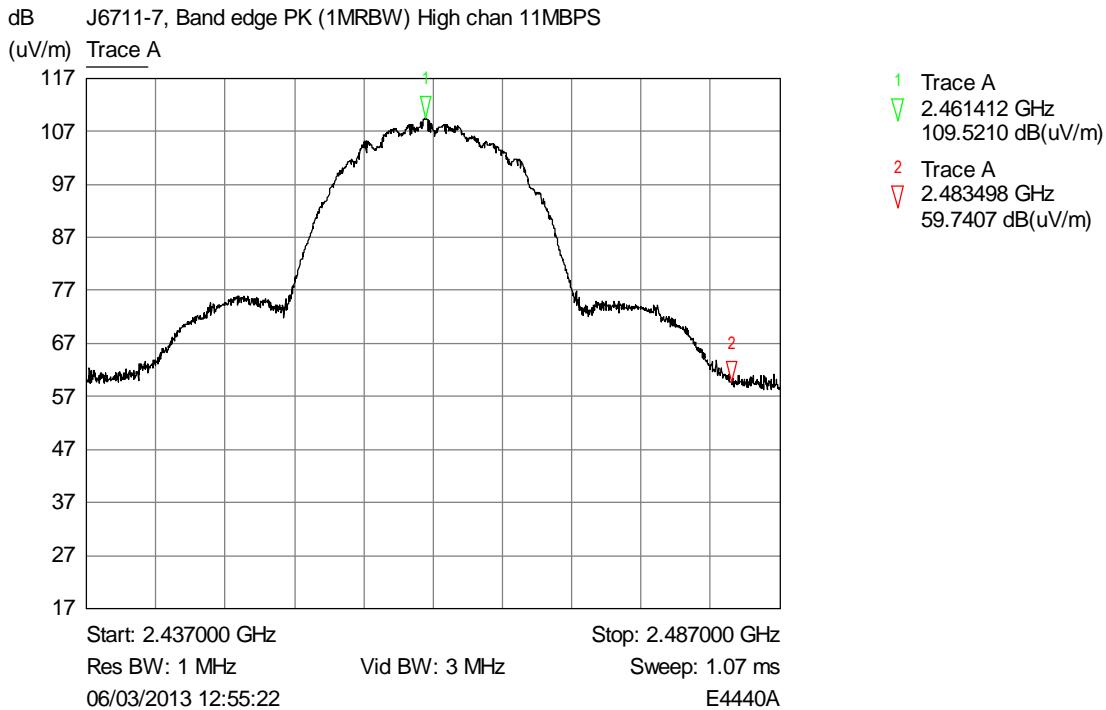


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 89 OF 130

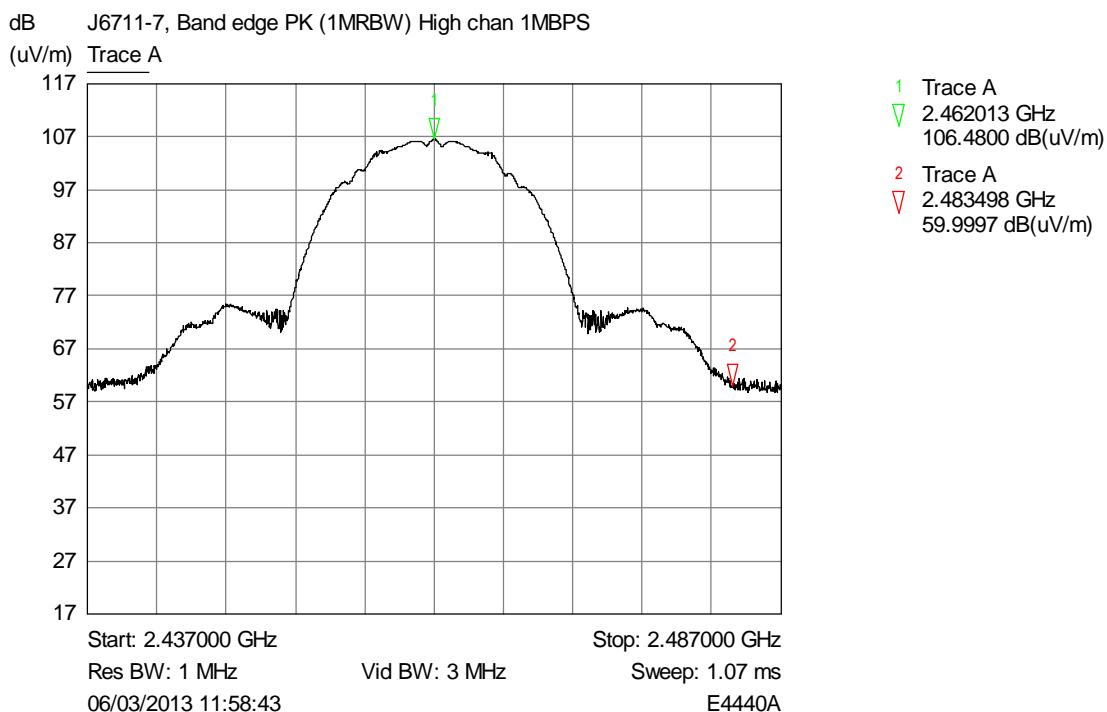
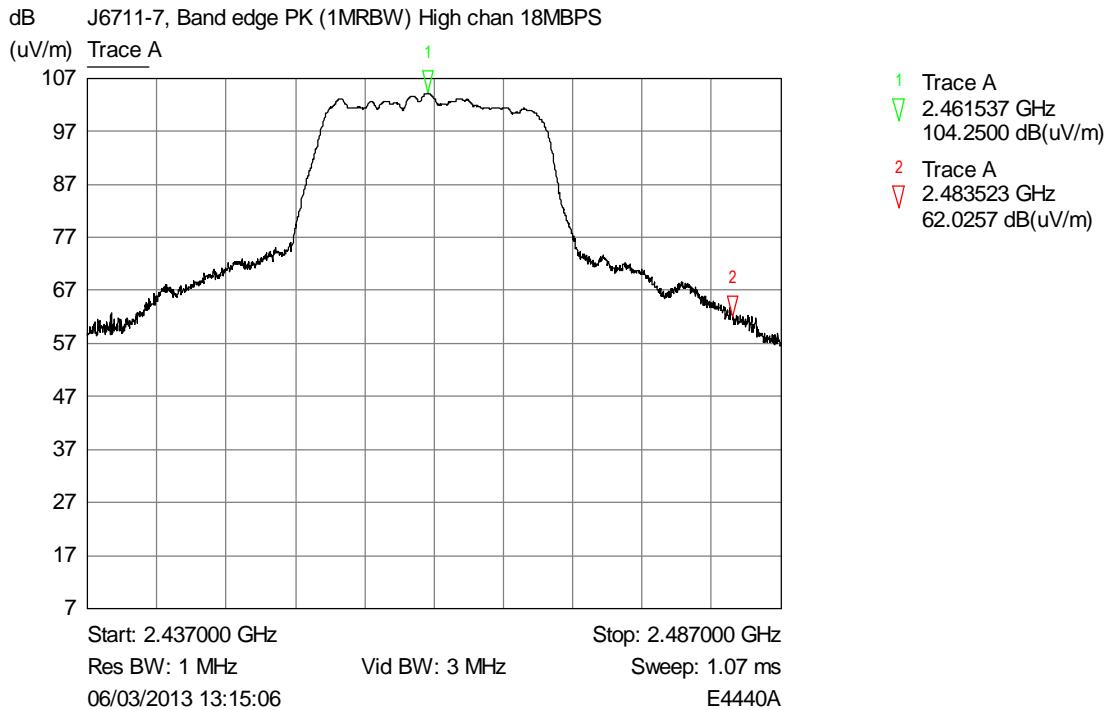


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 90 OF 130

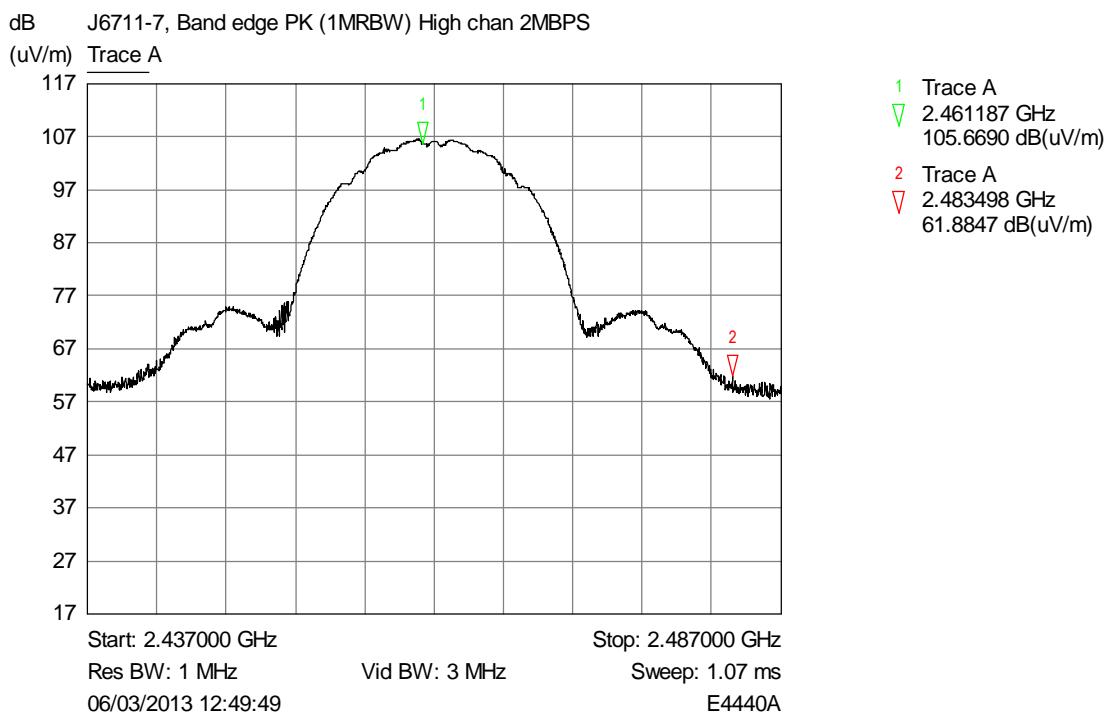
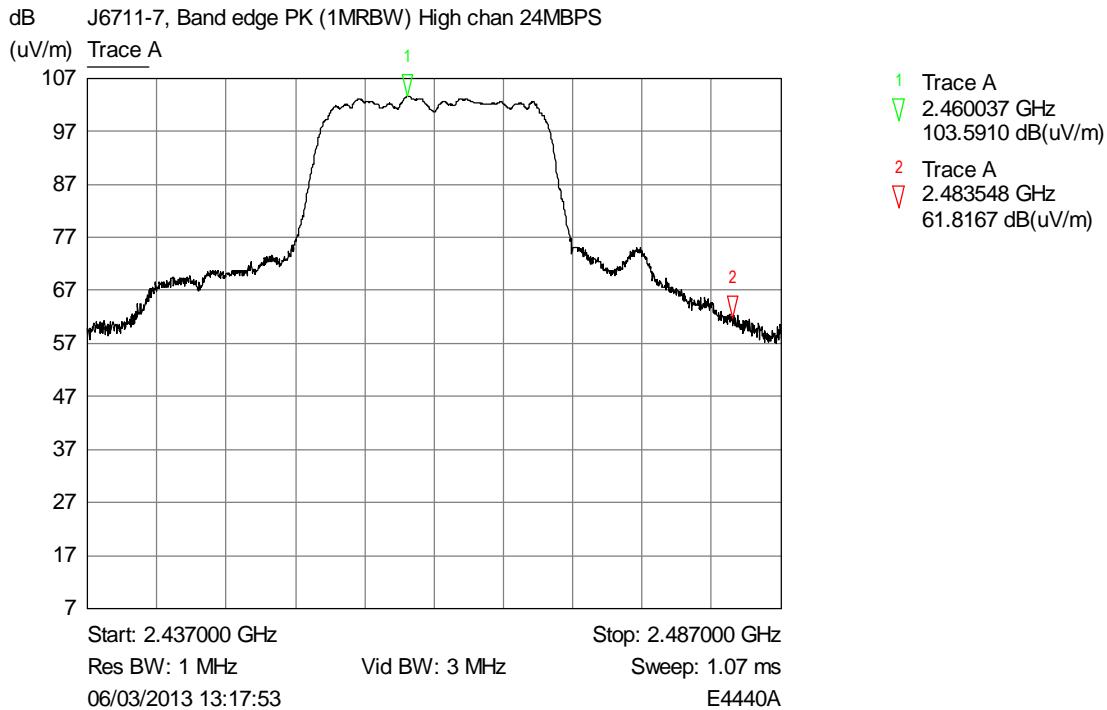


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 91 OF 130

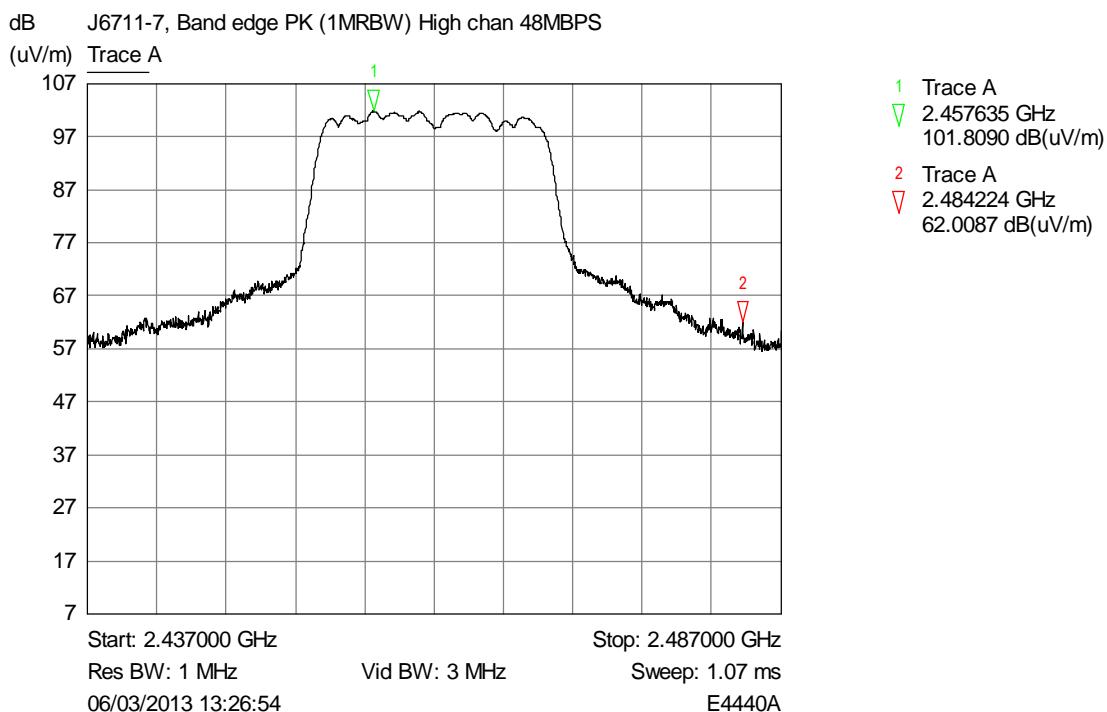
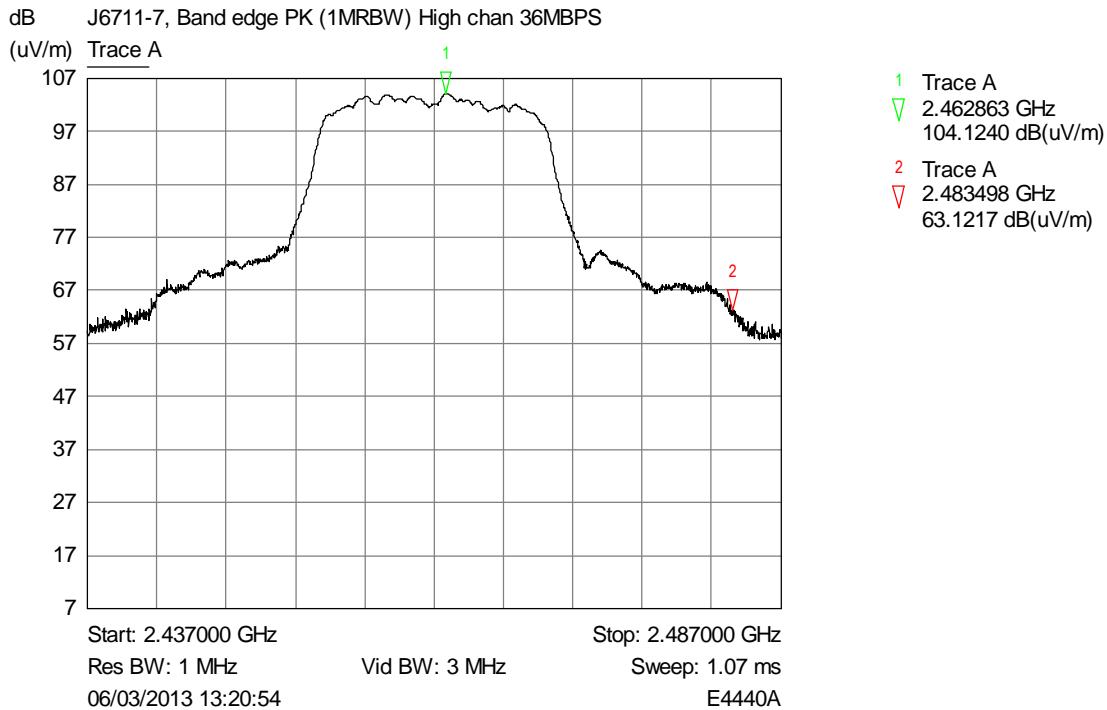


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 92 OF 130

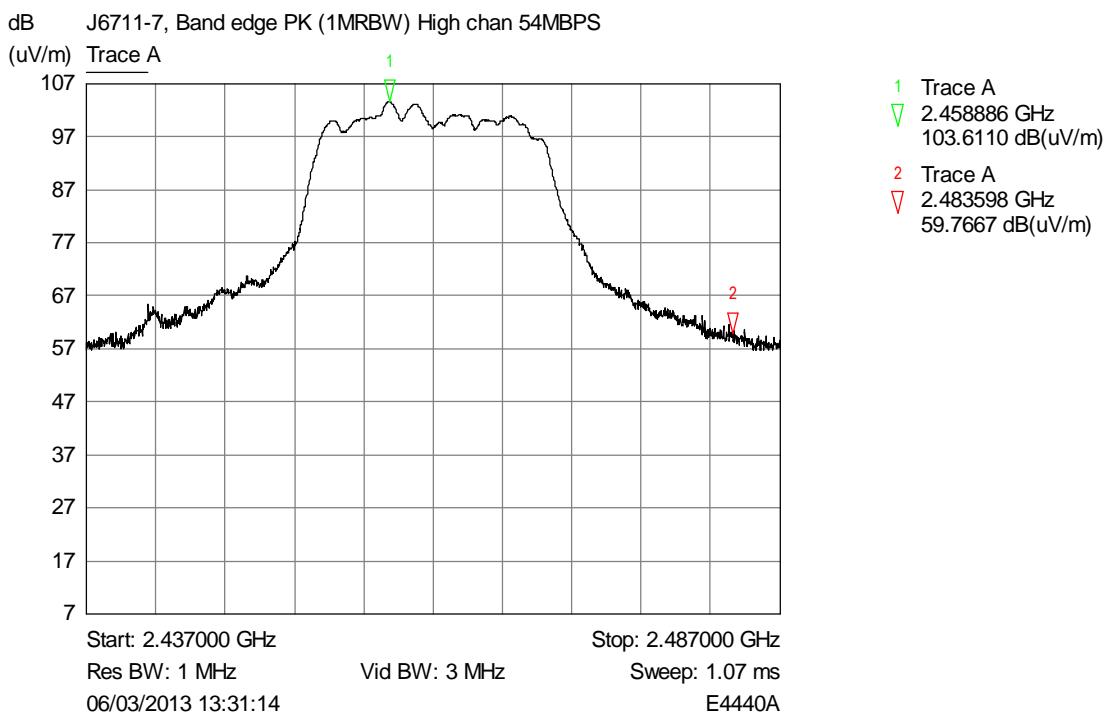
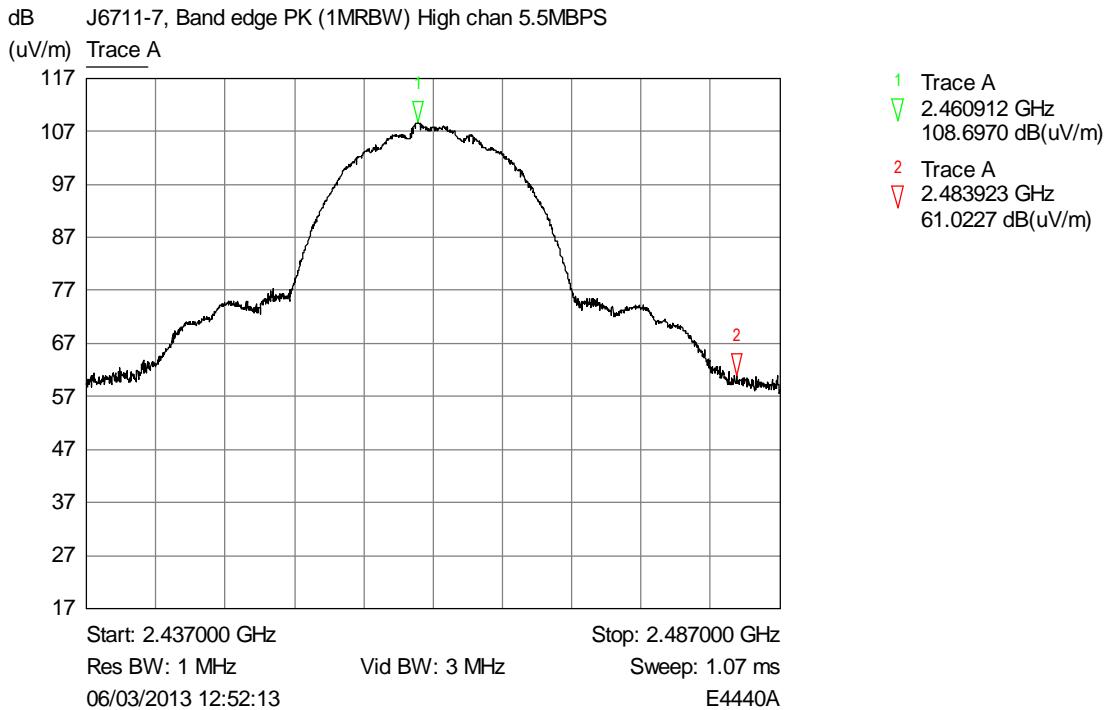


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 93 OF 130

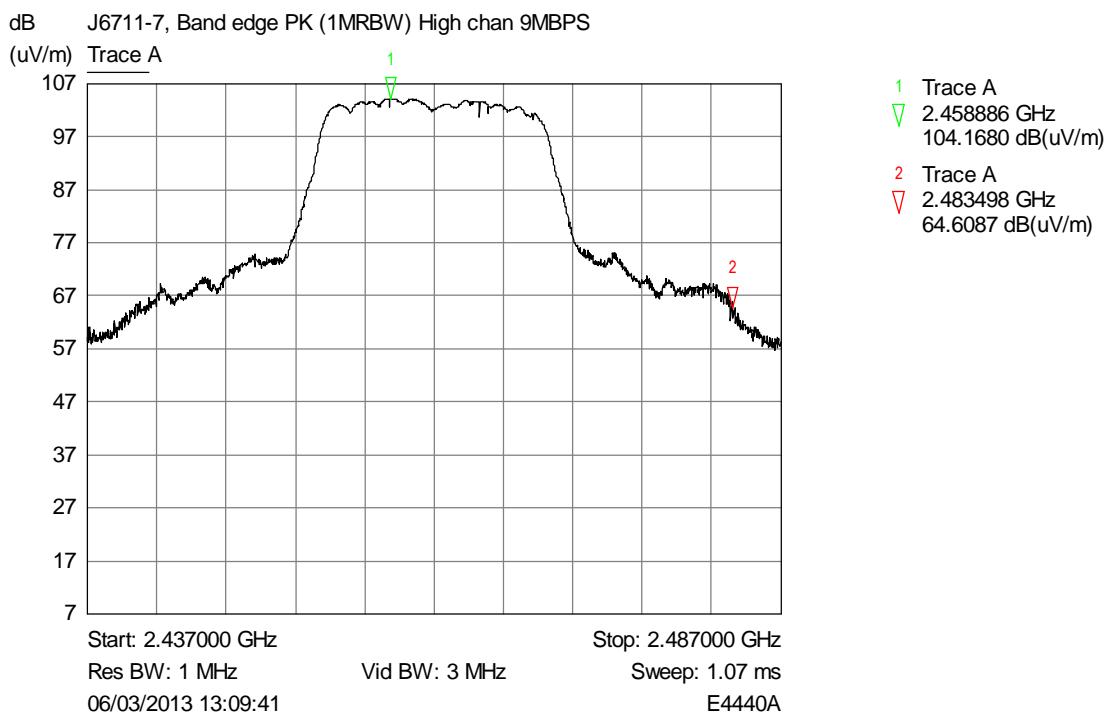
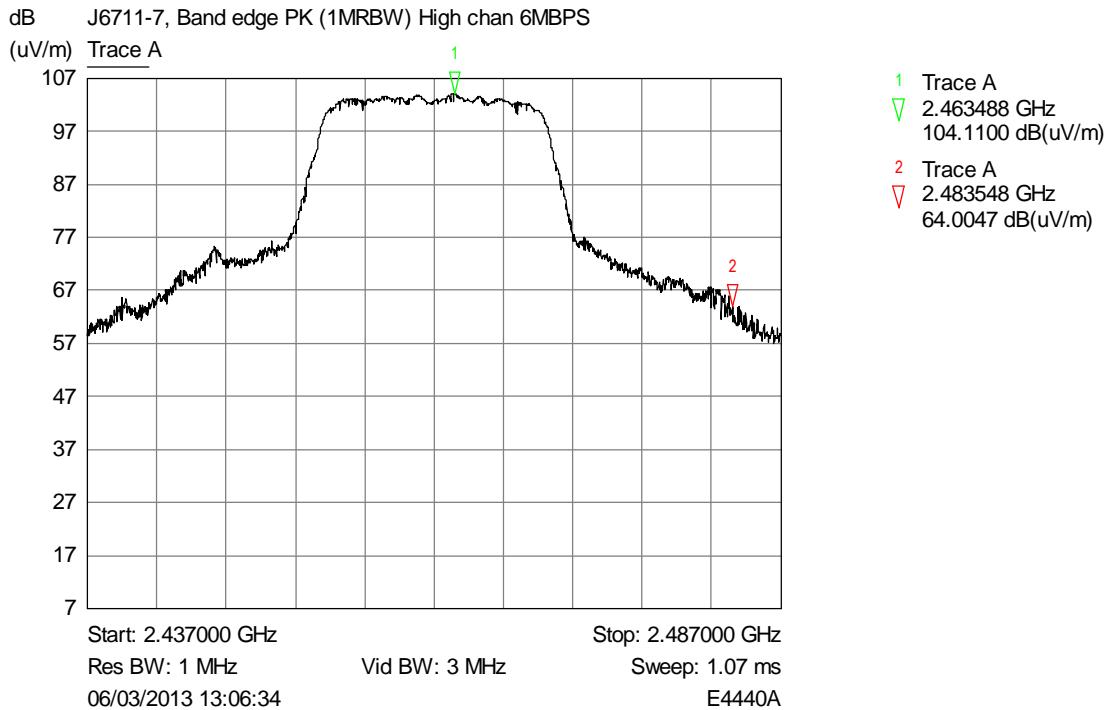


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 94 OF 130



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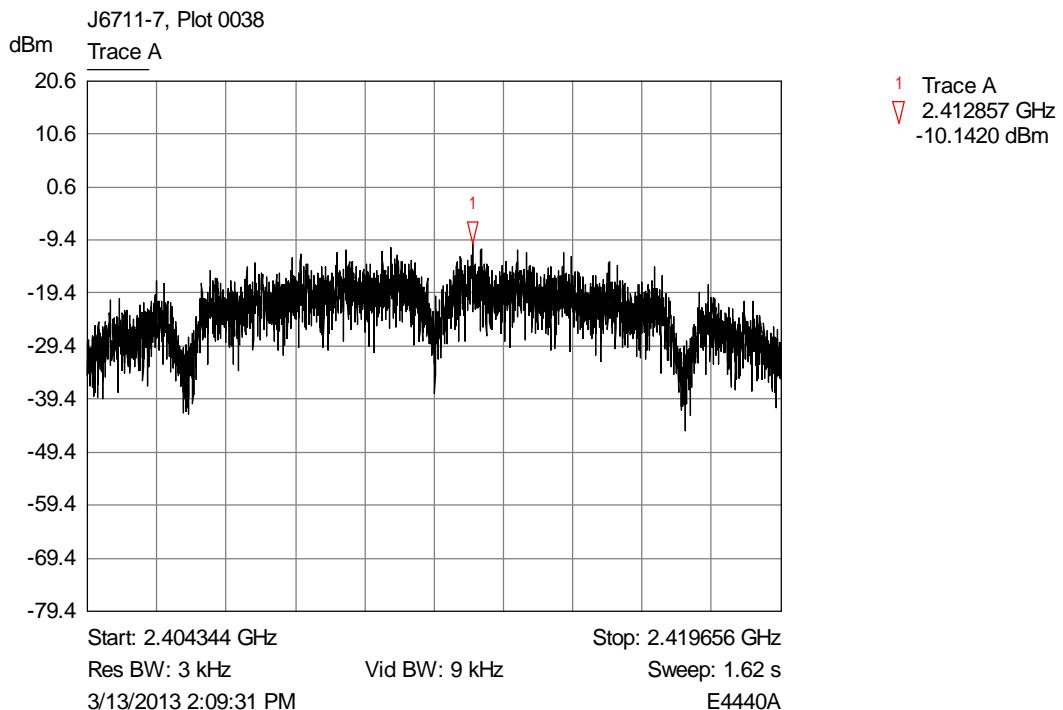
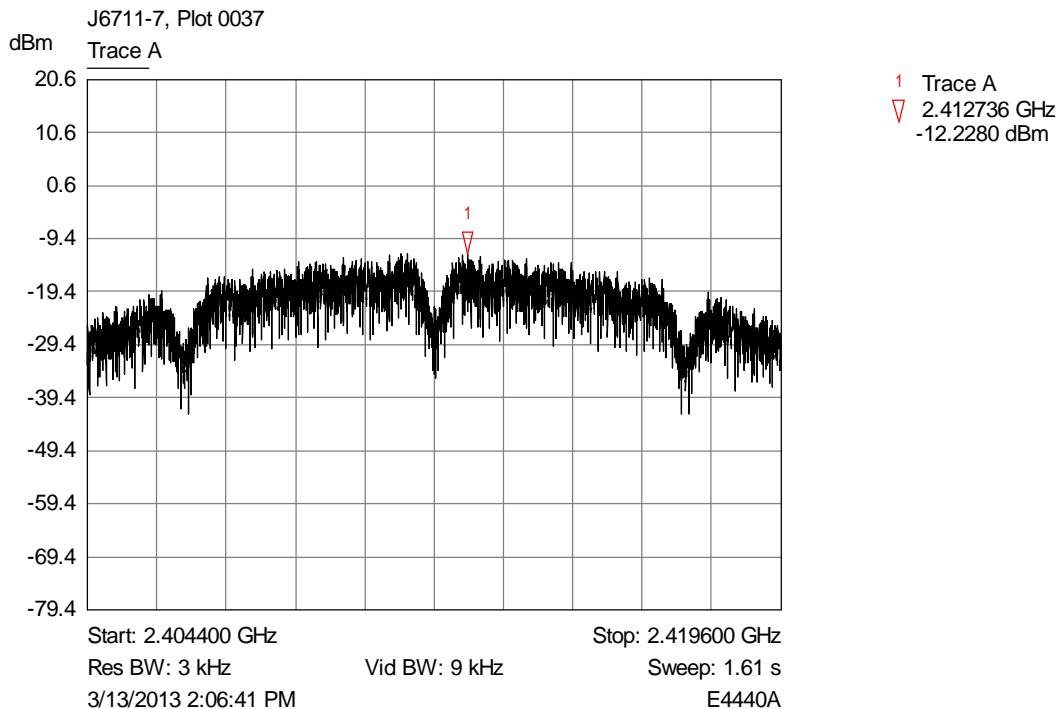
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 95 OF 130

6.6 Duty cycle

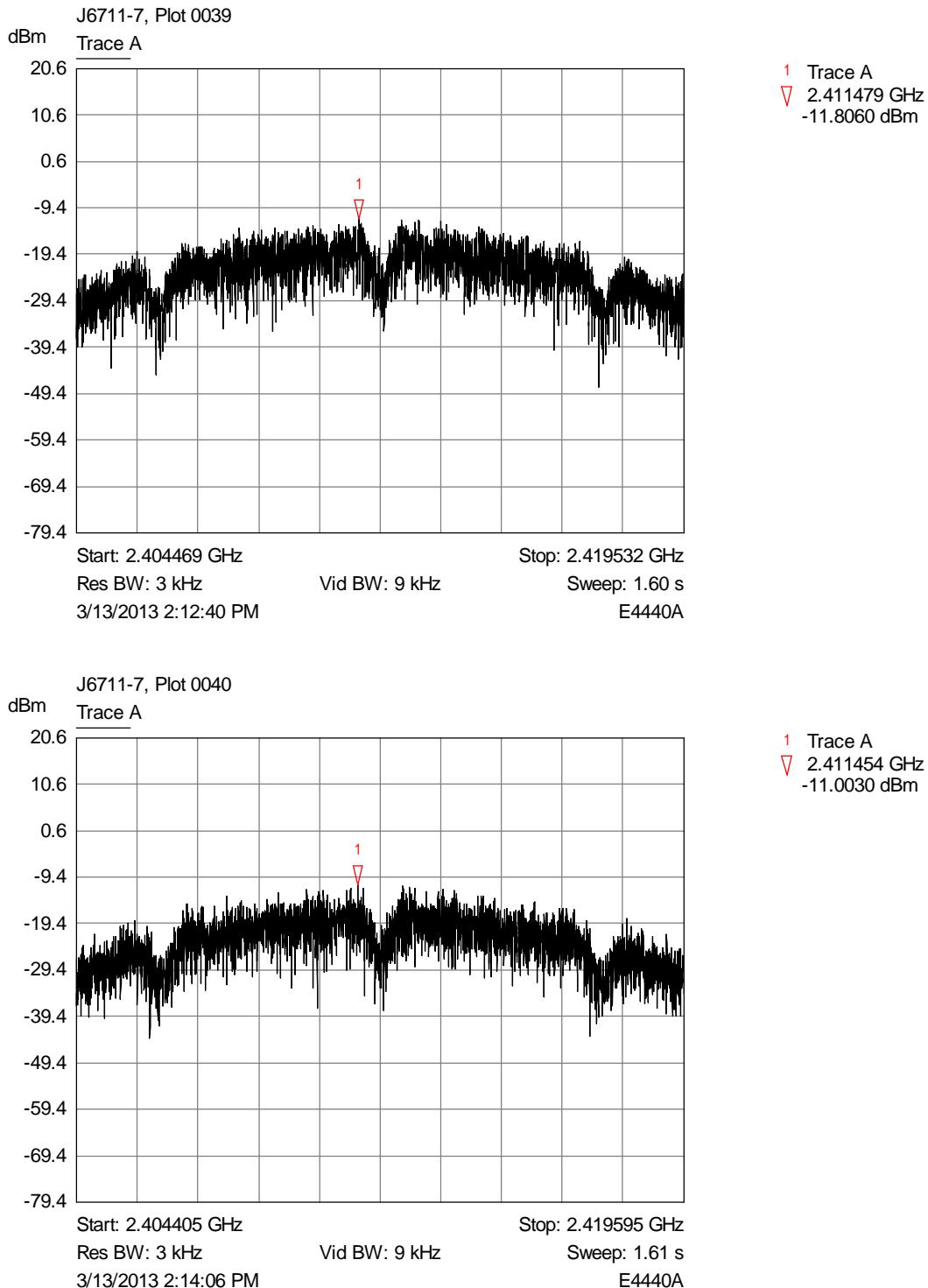
No plots taken, for the purposes of test the unit was put into a constant (100%) transmit state.
See section 3.4 modes.

6.7 PSD



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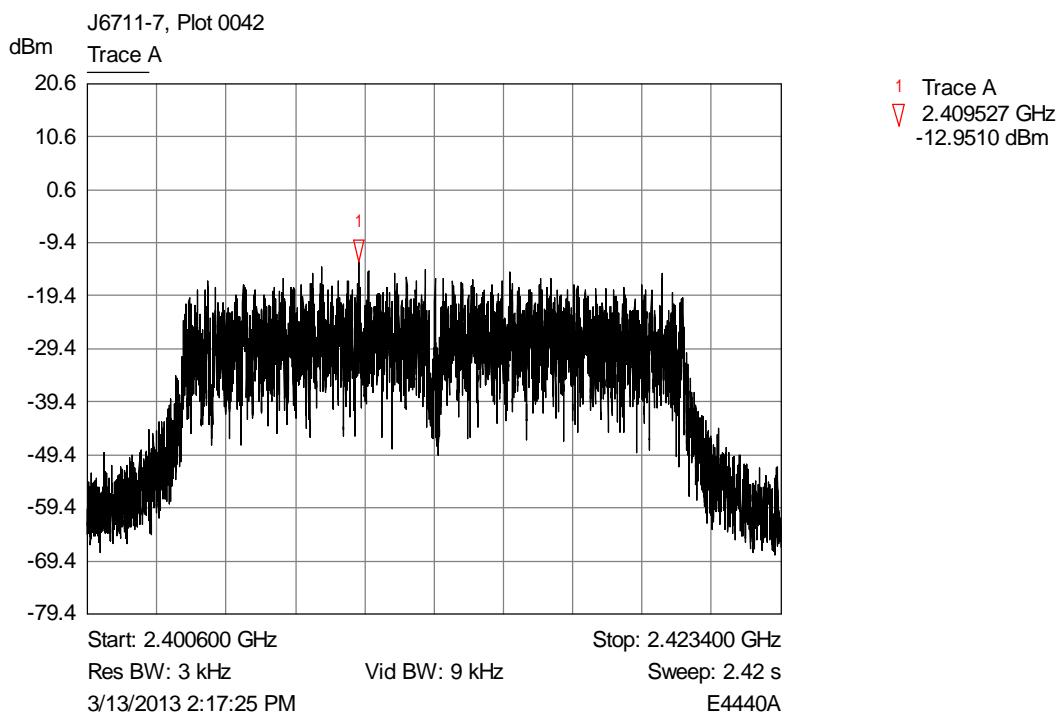
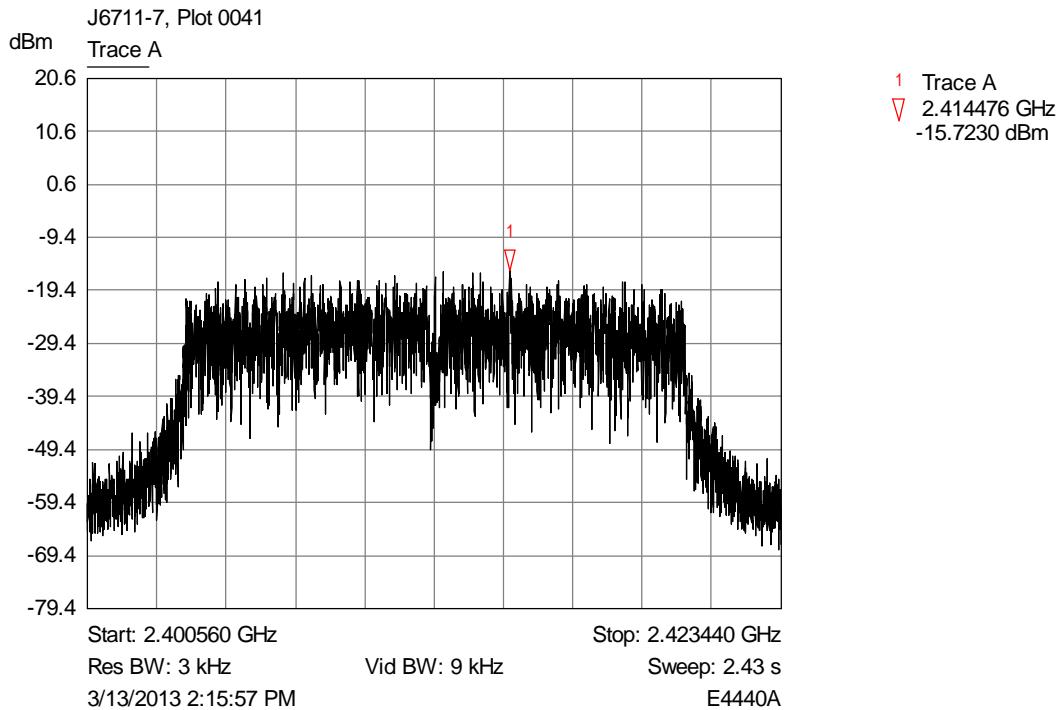


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 97 OF 130

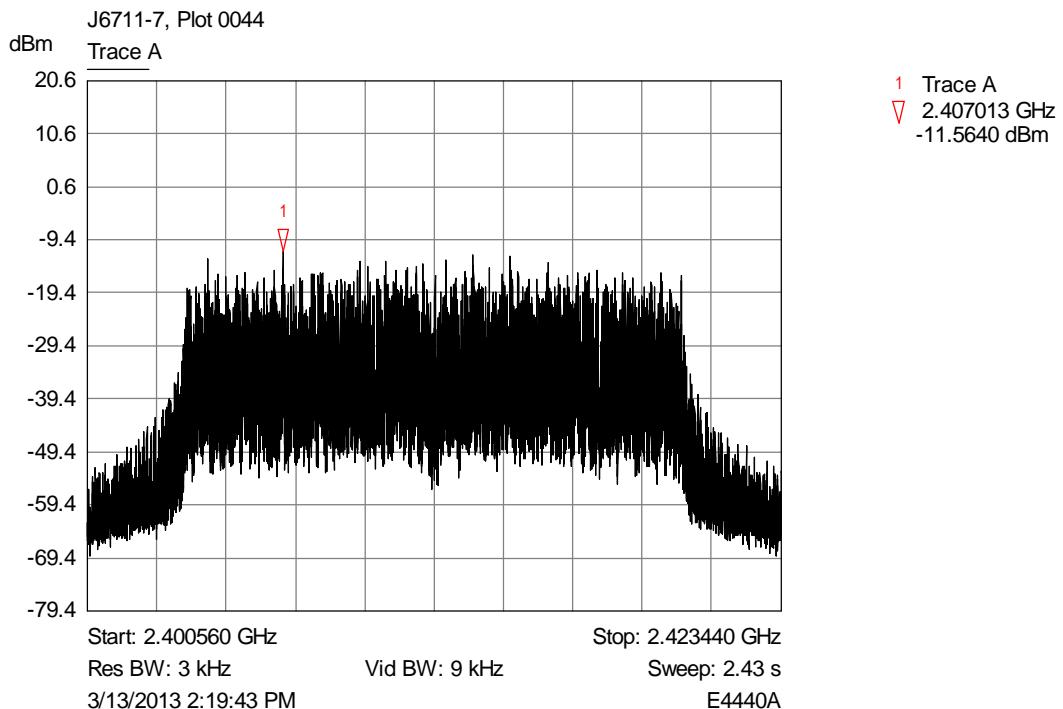
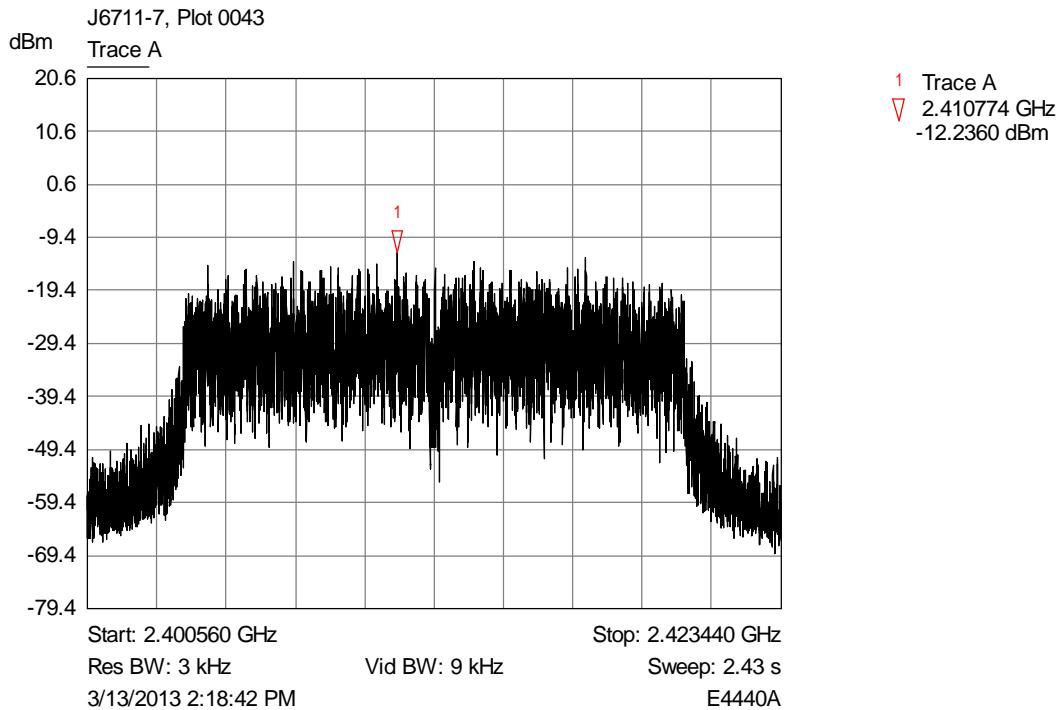


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 98 OF 130

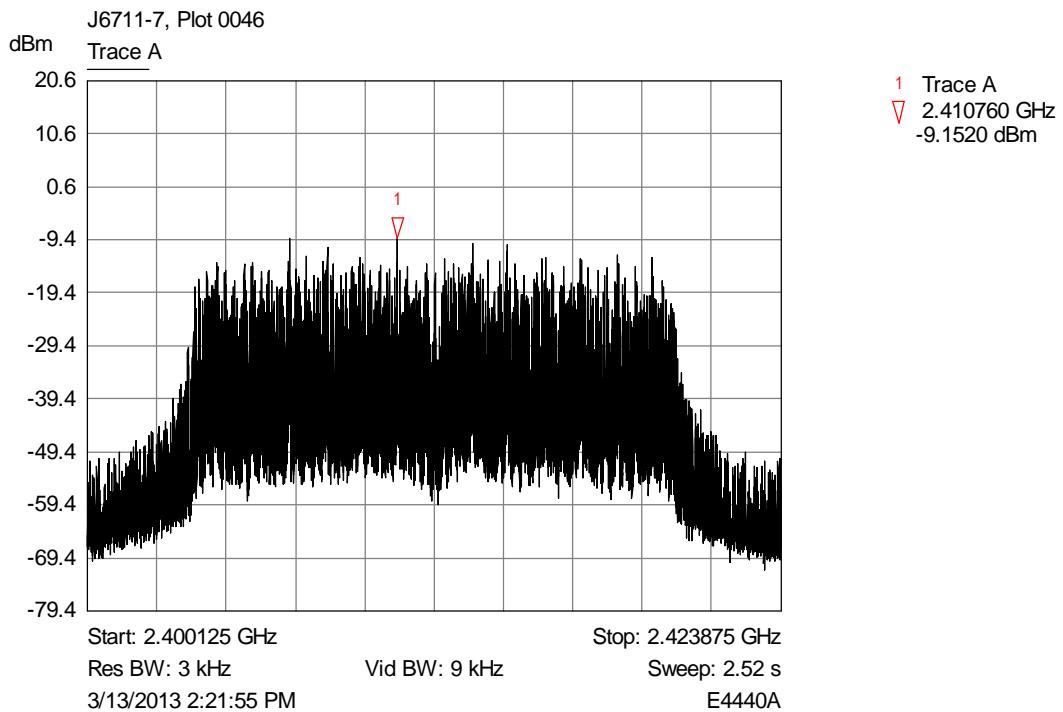
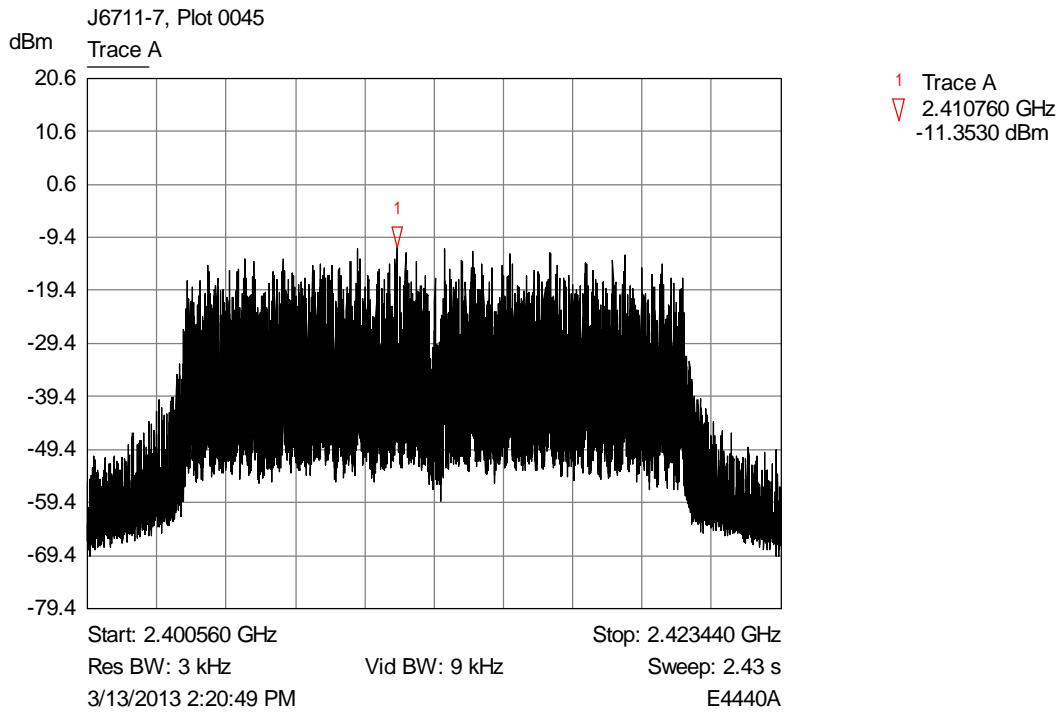


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 99 OF 130

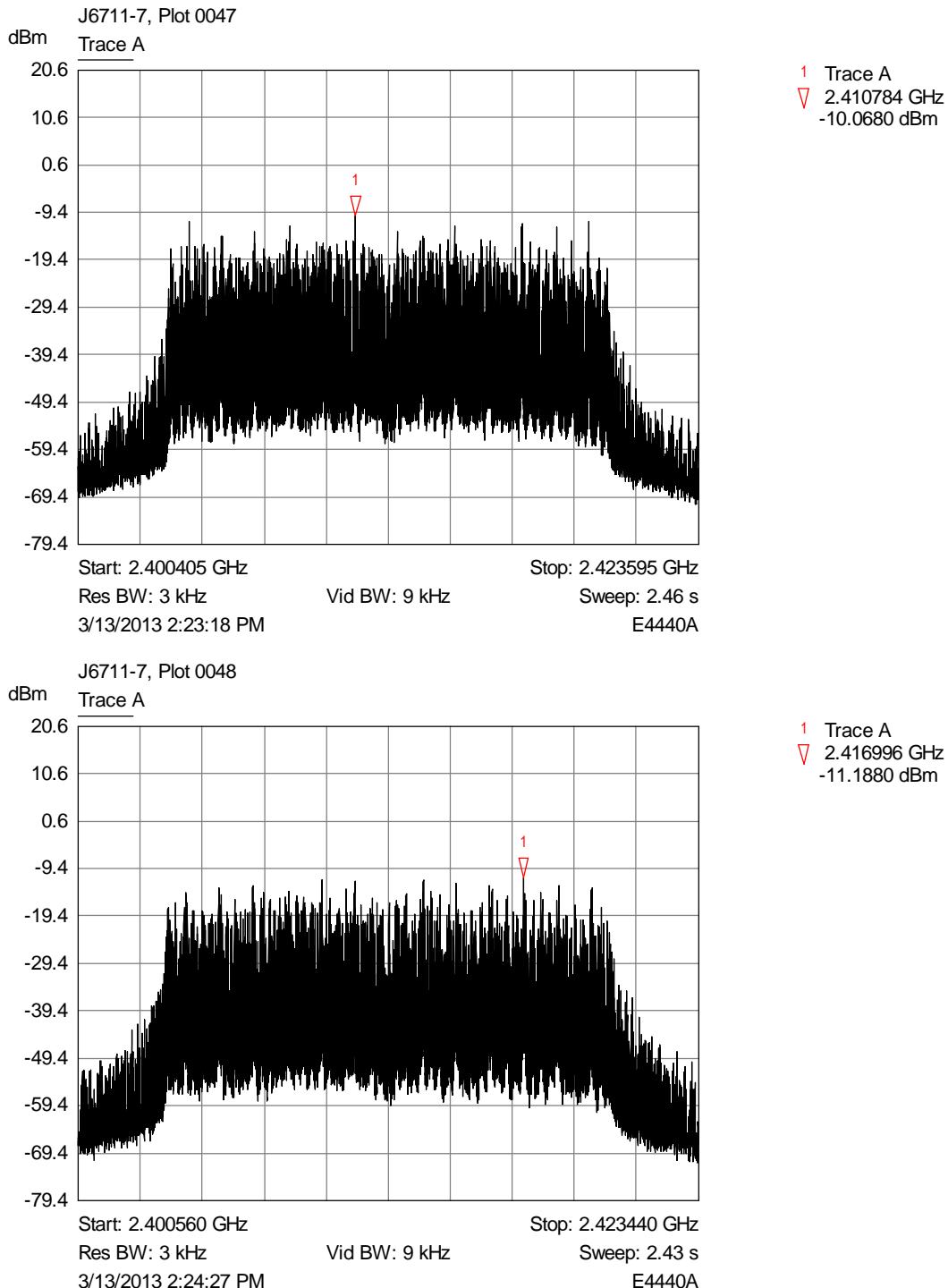


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 100 OF 130

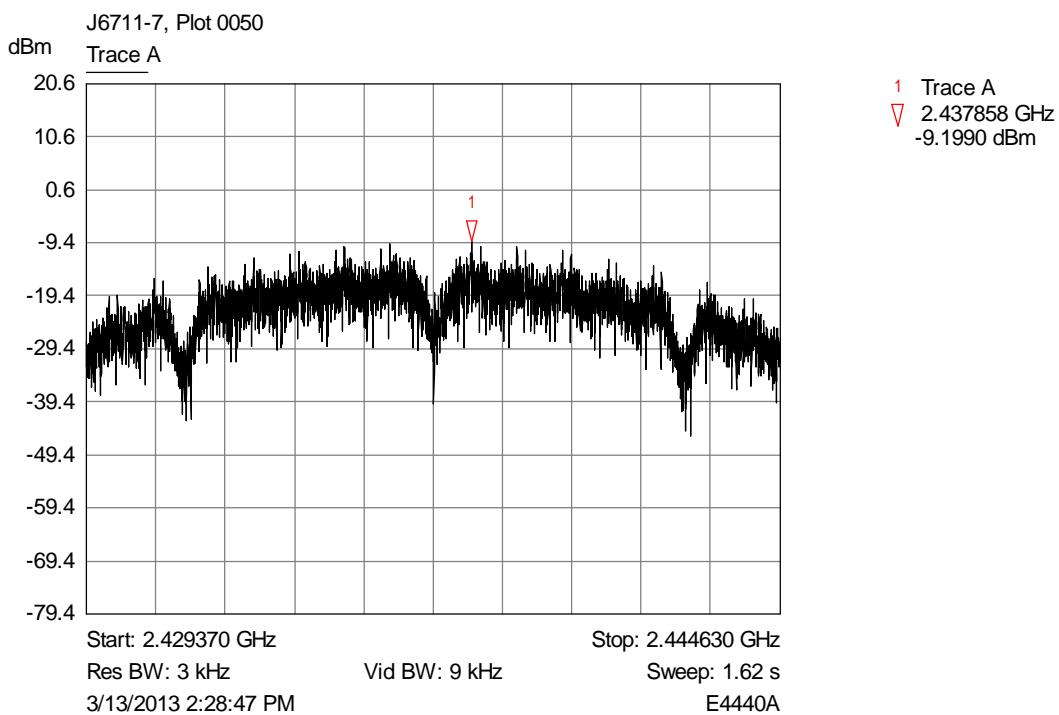
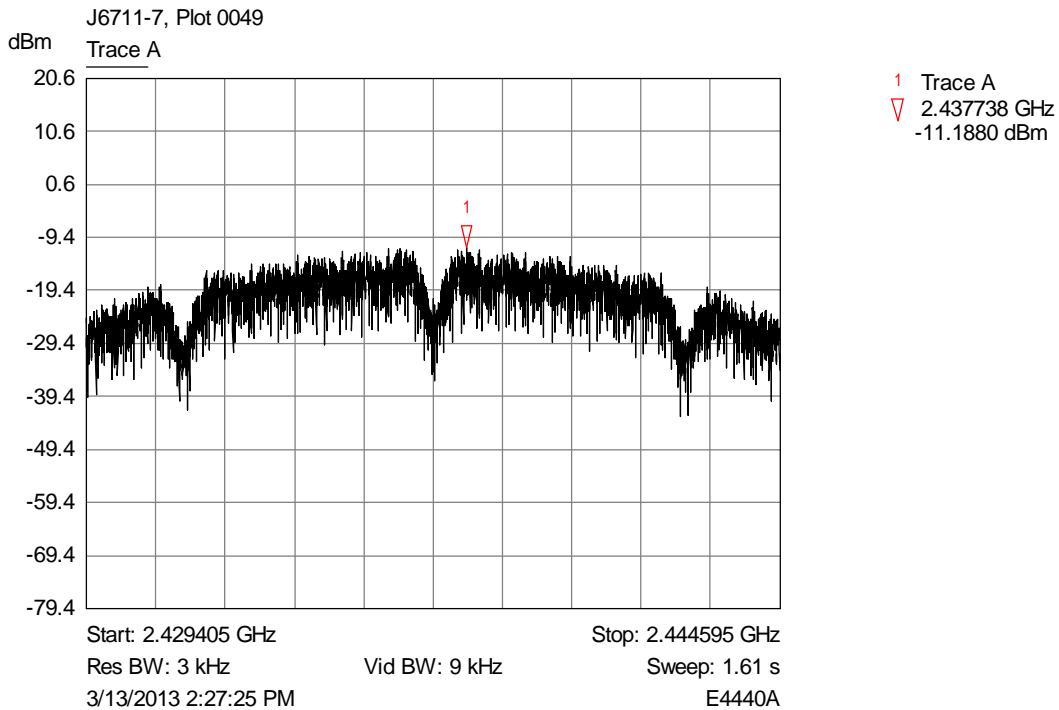


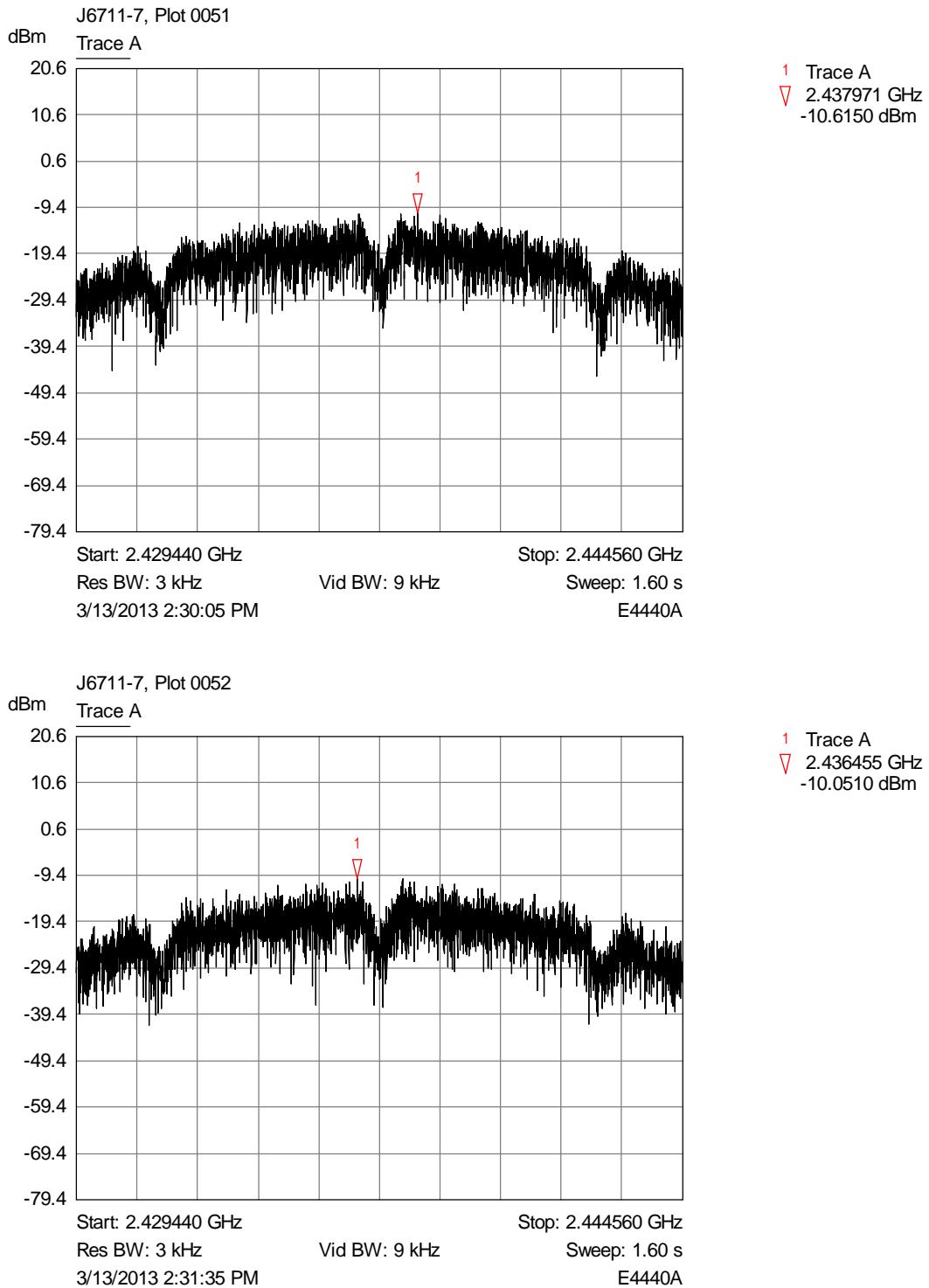
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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 101 OF 130



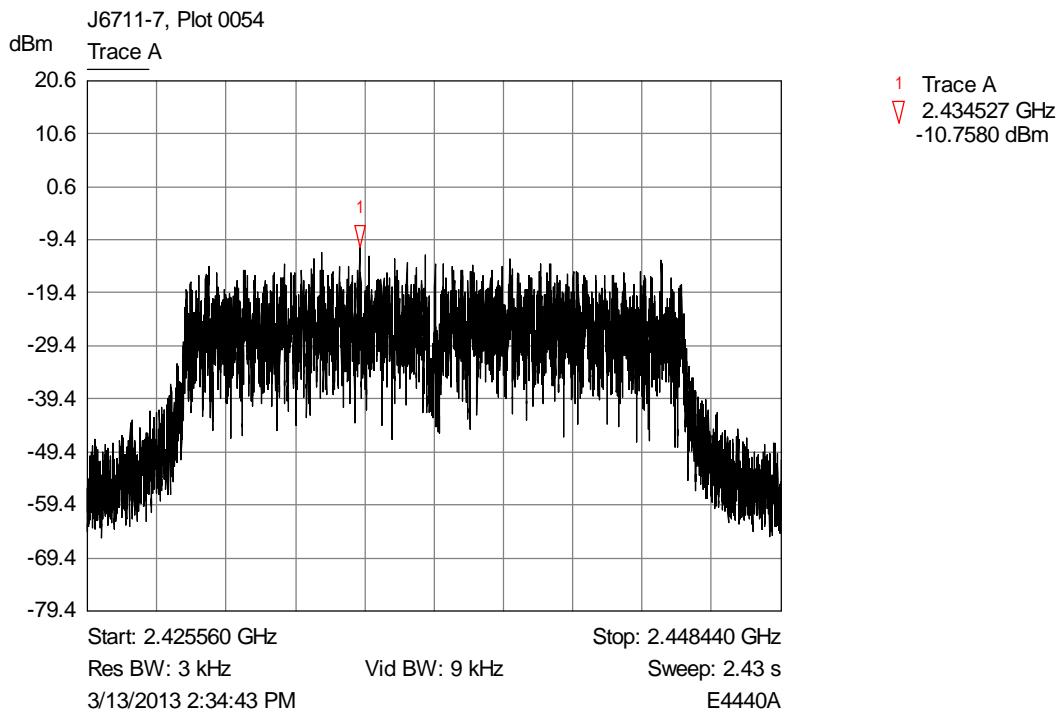
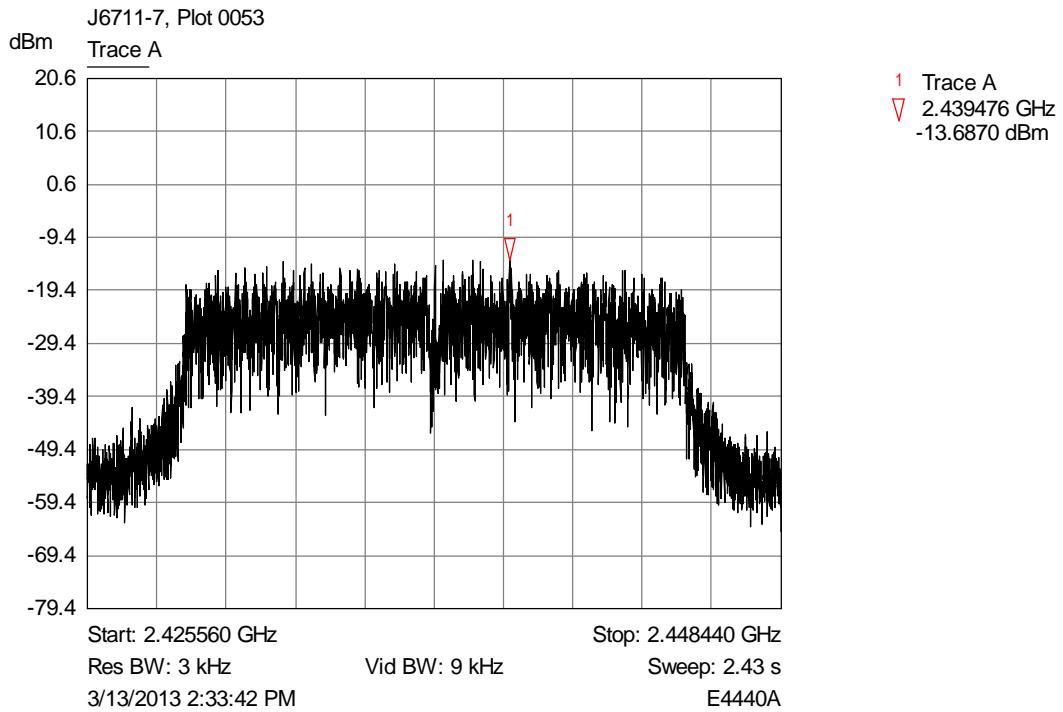


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 103 OF 130

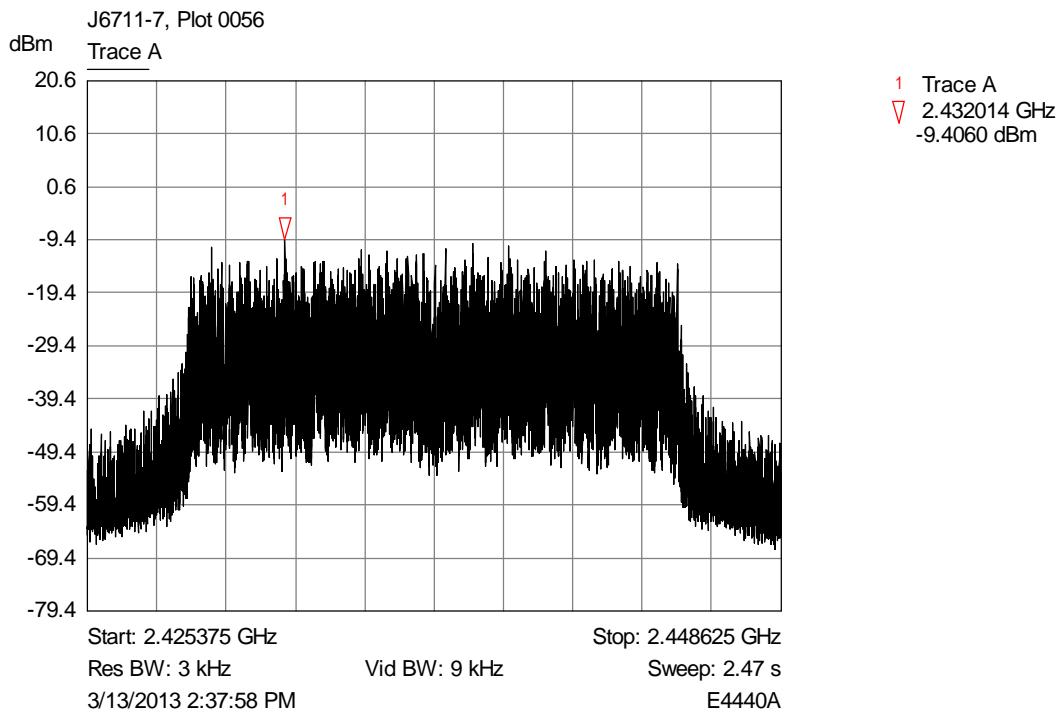
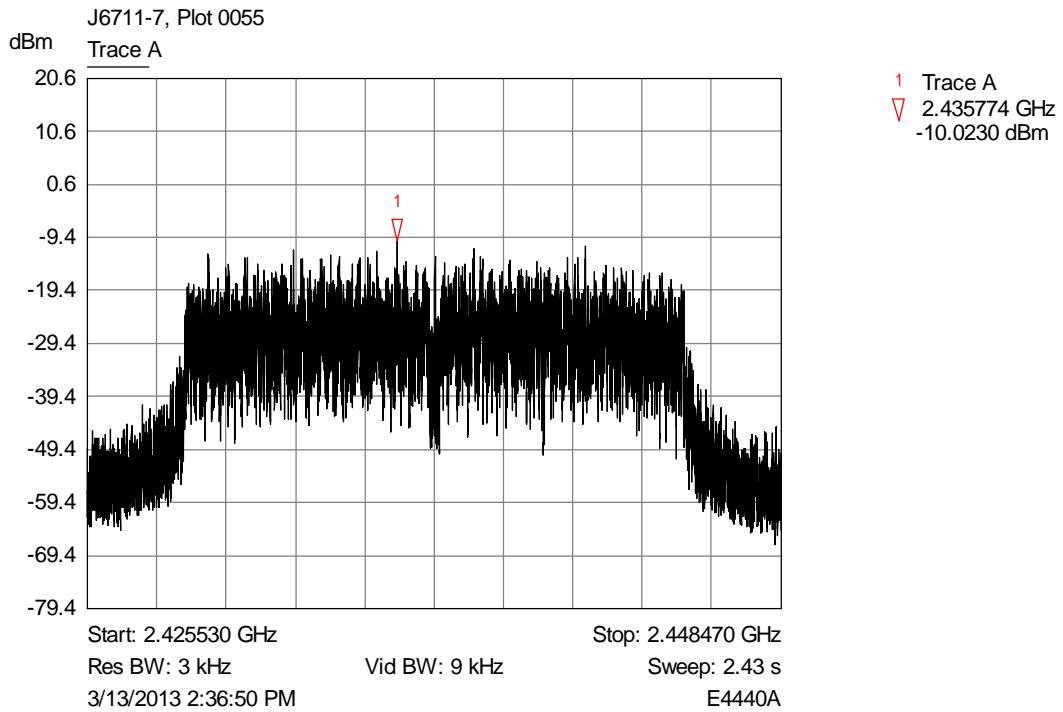


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 104 OF 130

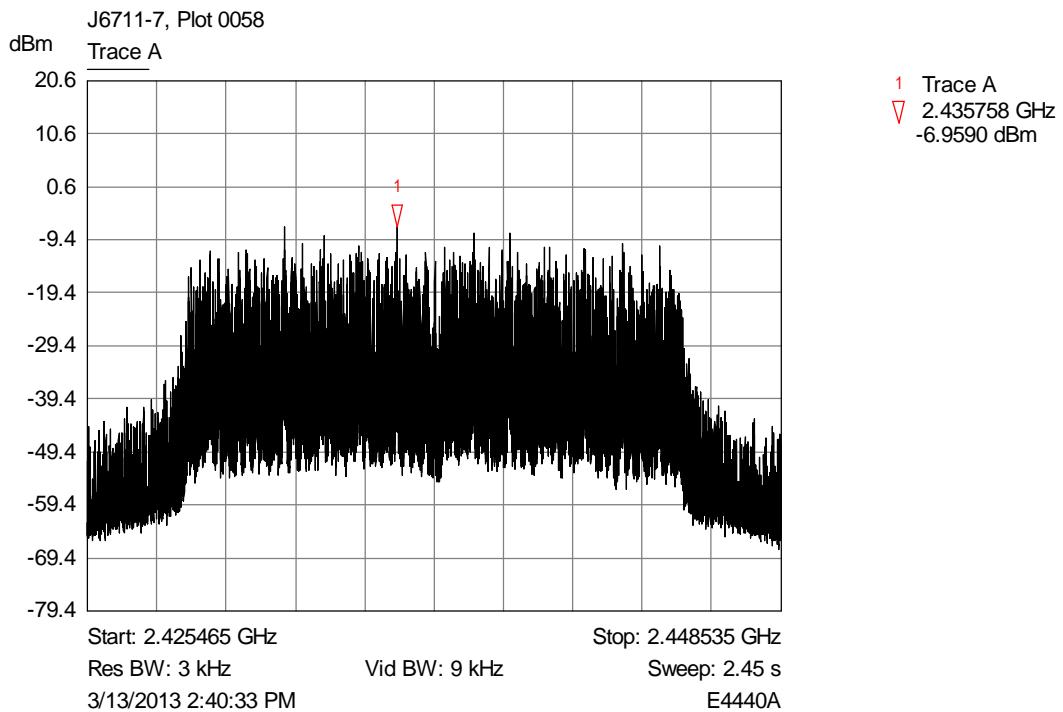
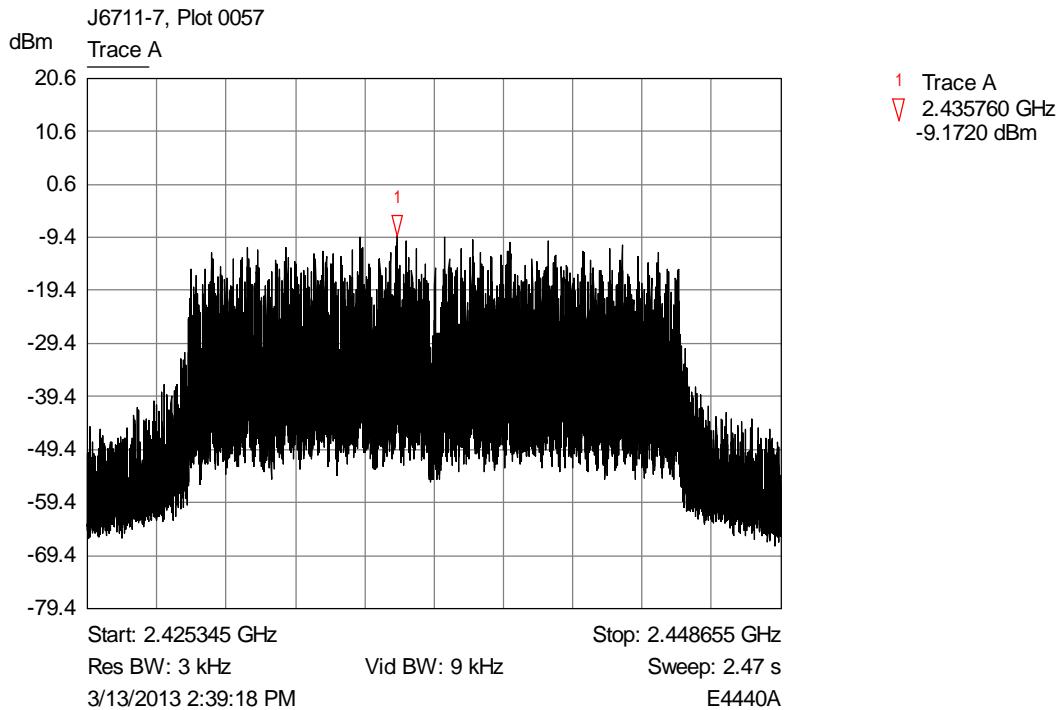


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 105 OF 130

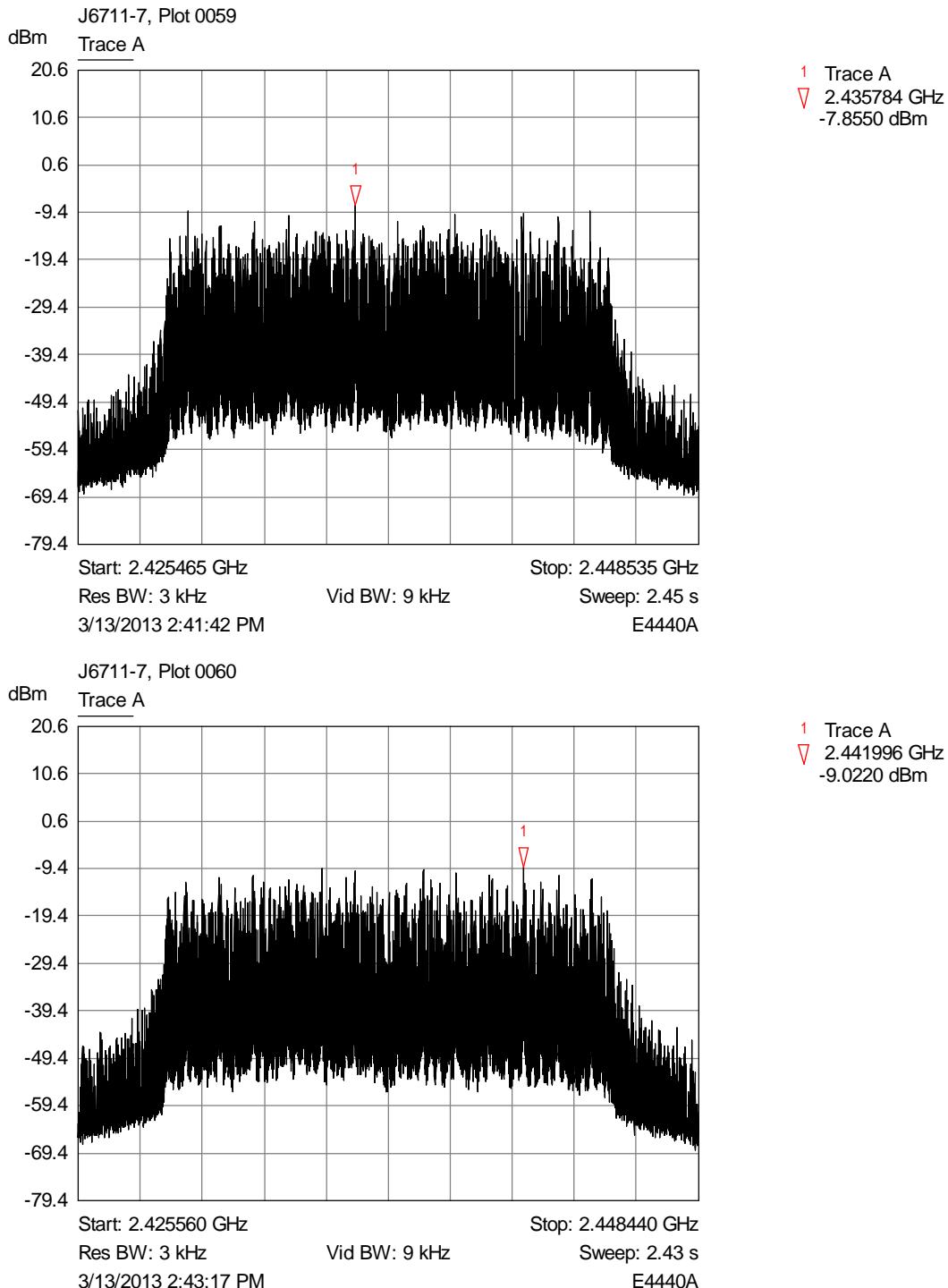


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 106 OF 130

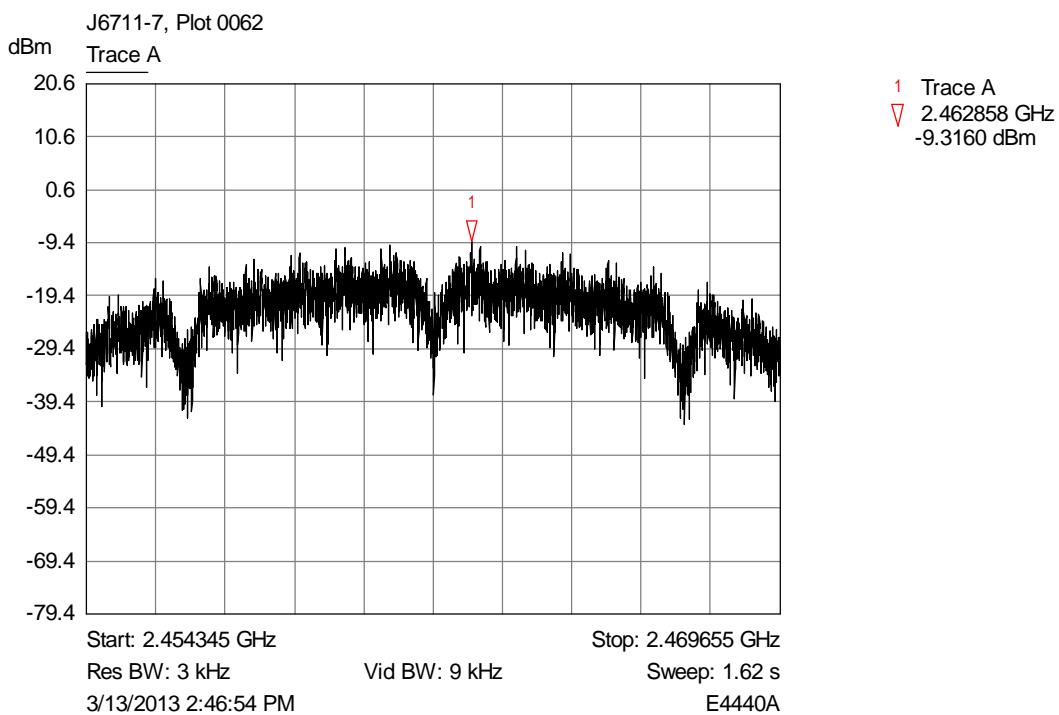
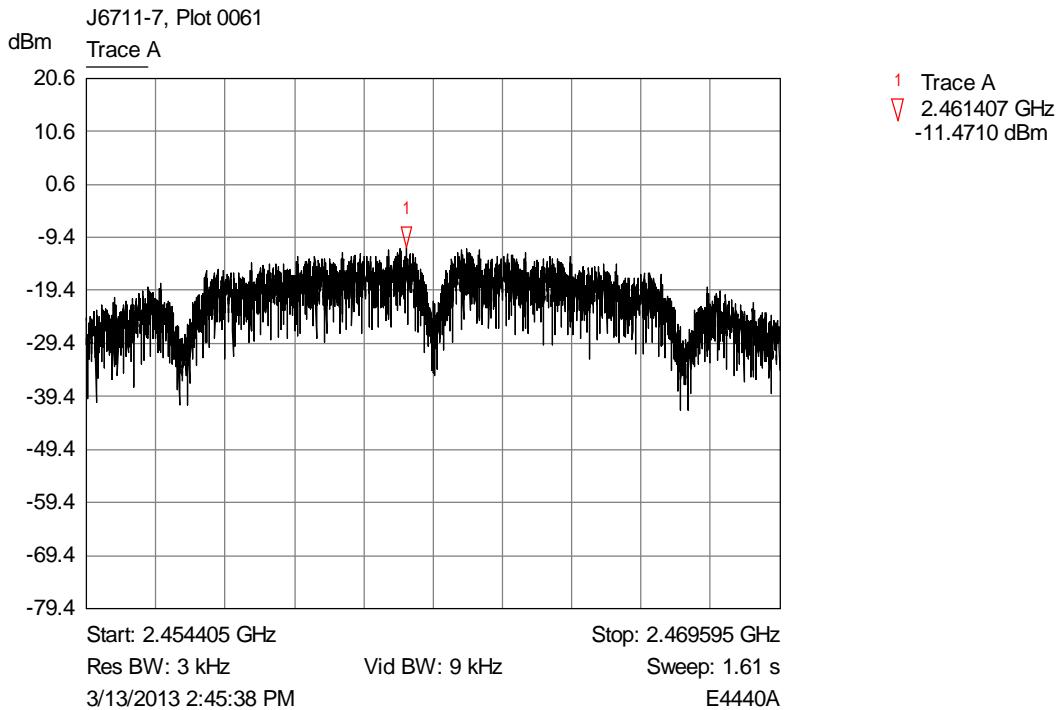


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 107 OF 130

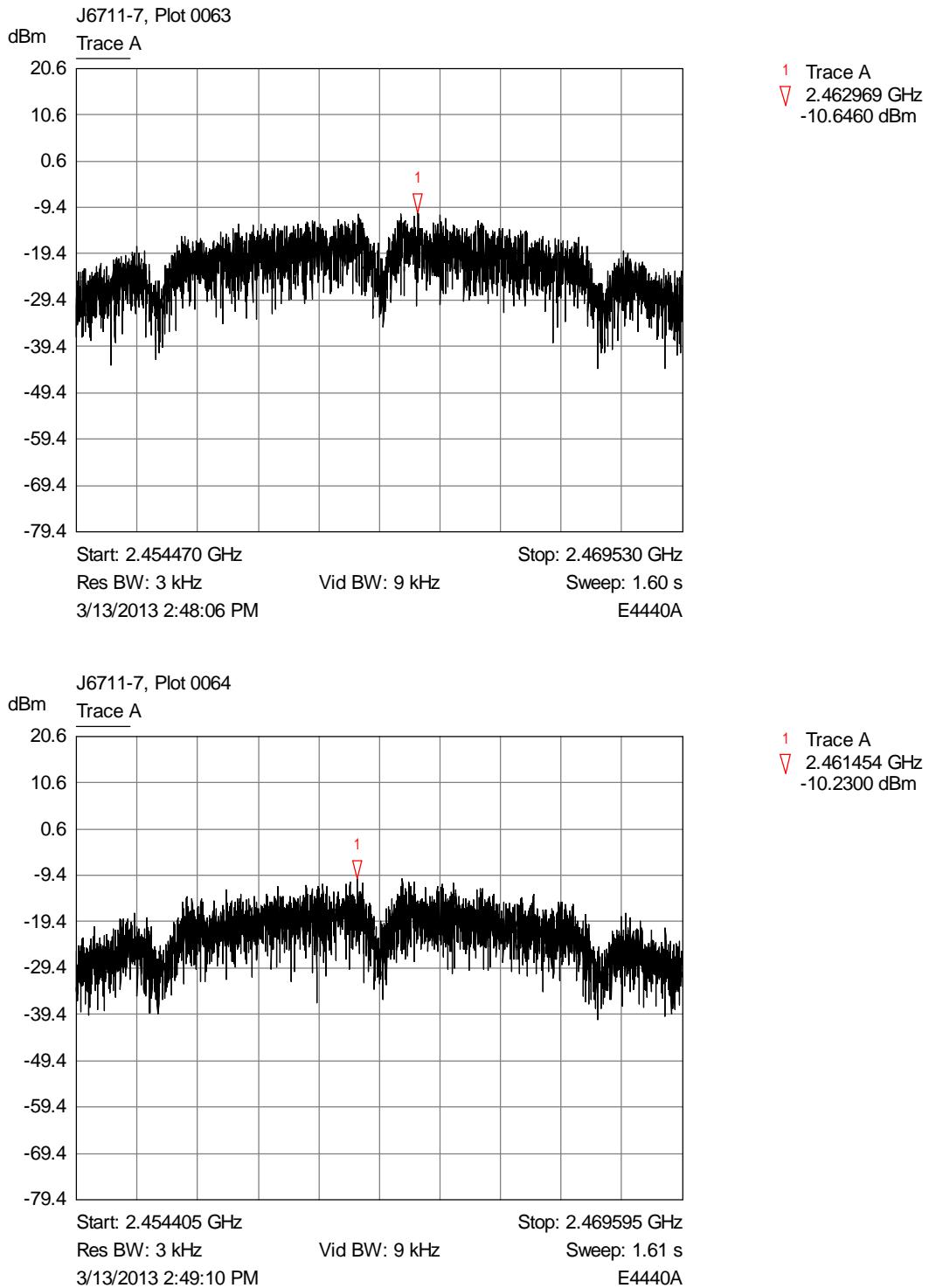


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 108 OF 130

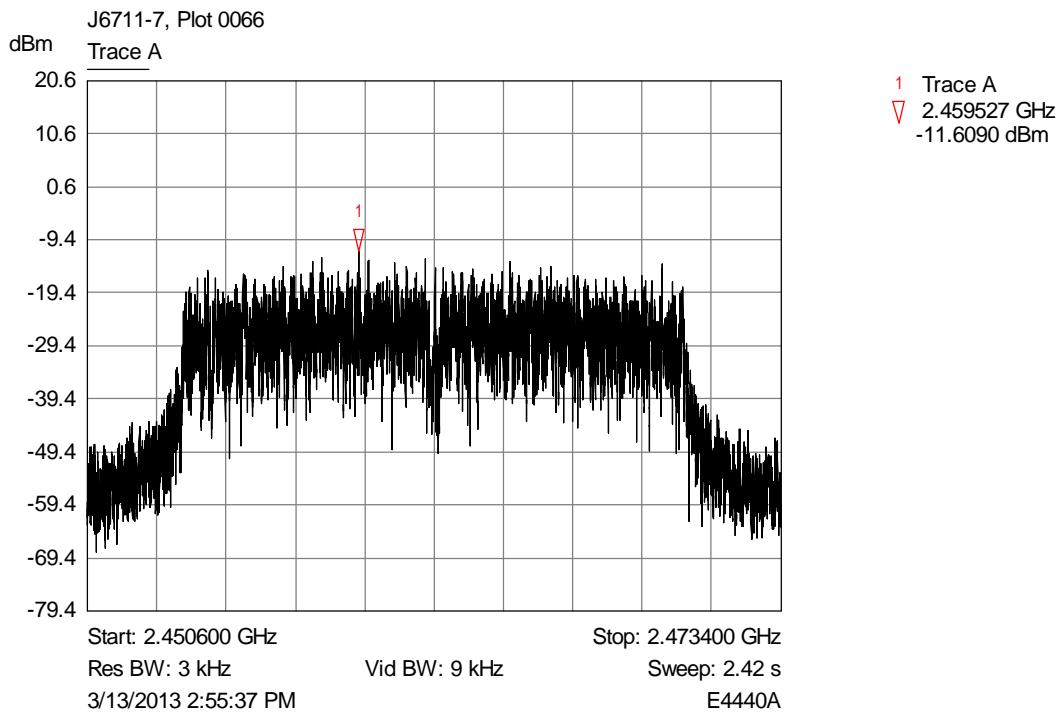
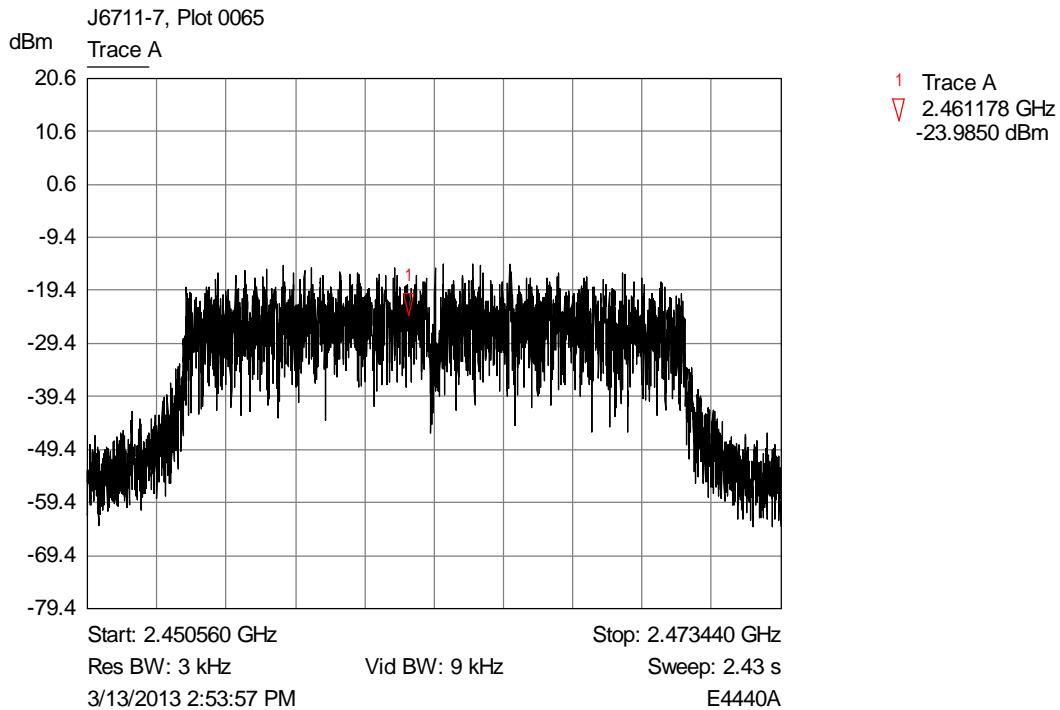


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 109 OF 130

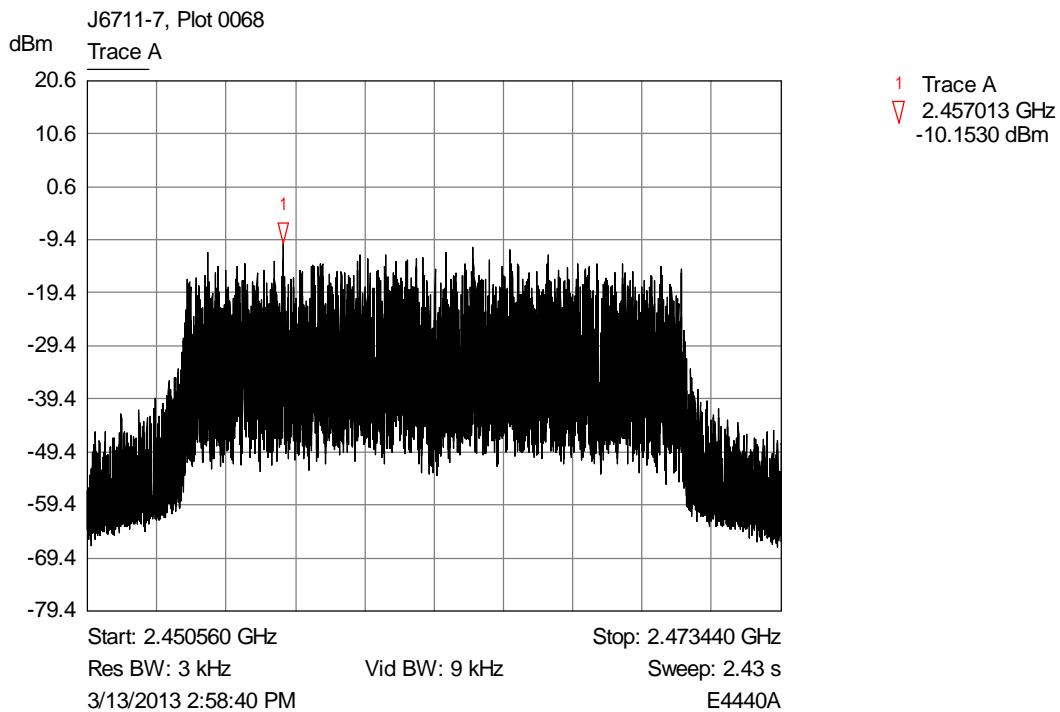
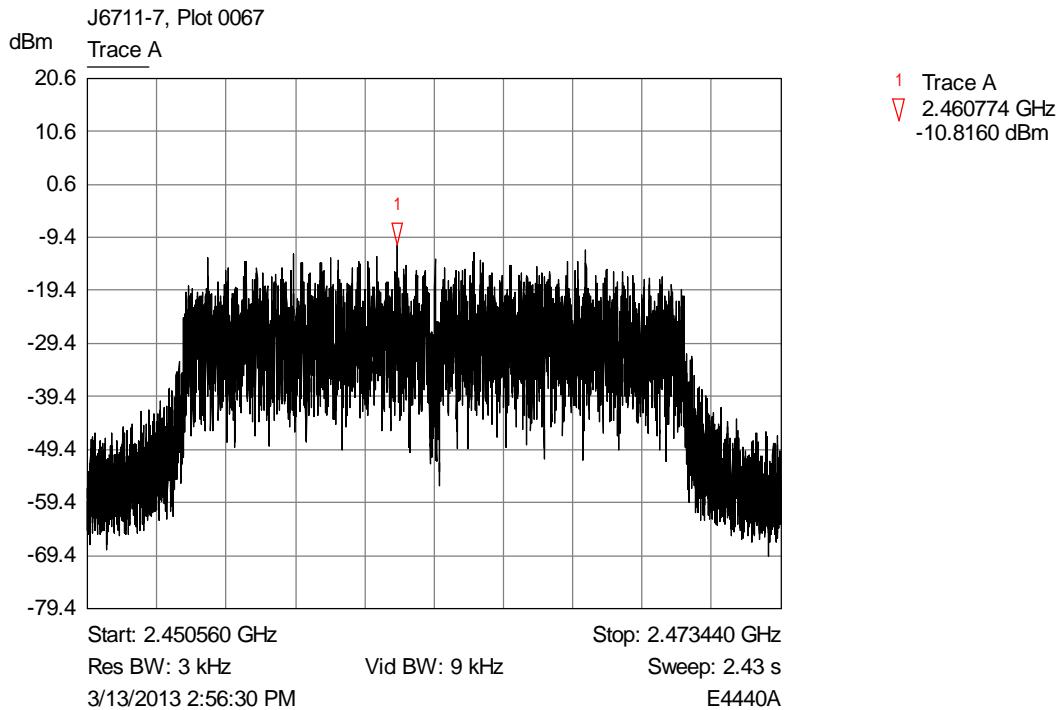


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 110 OF 130

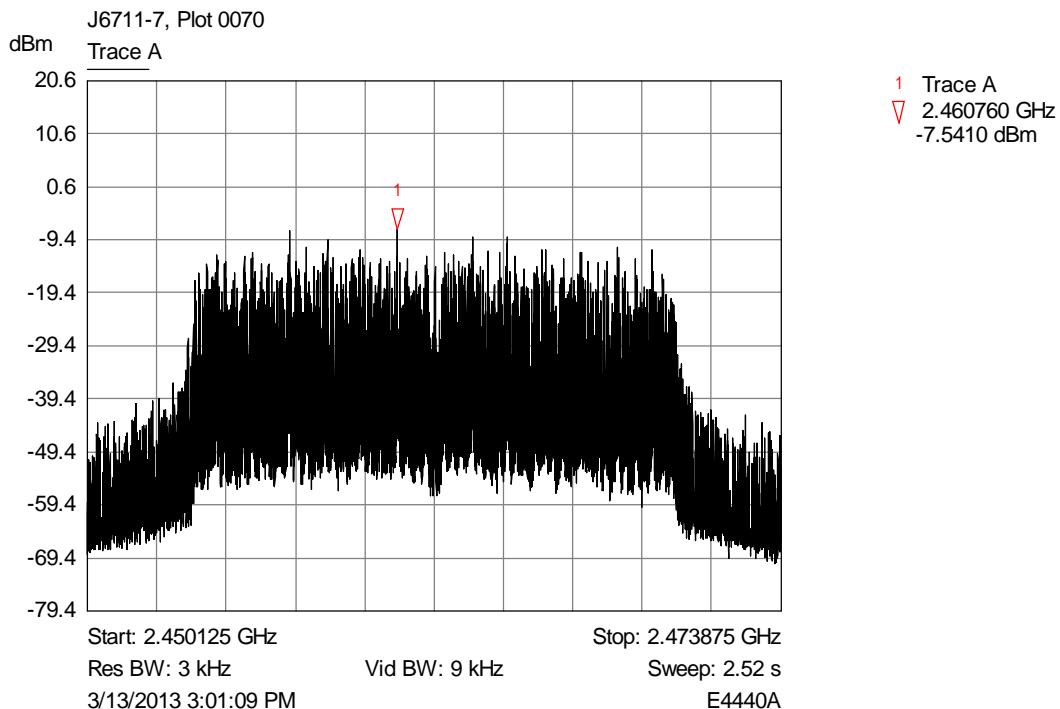
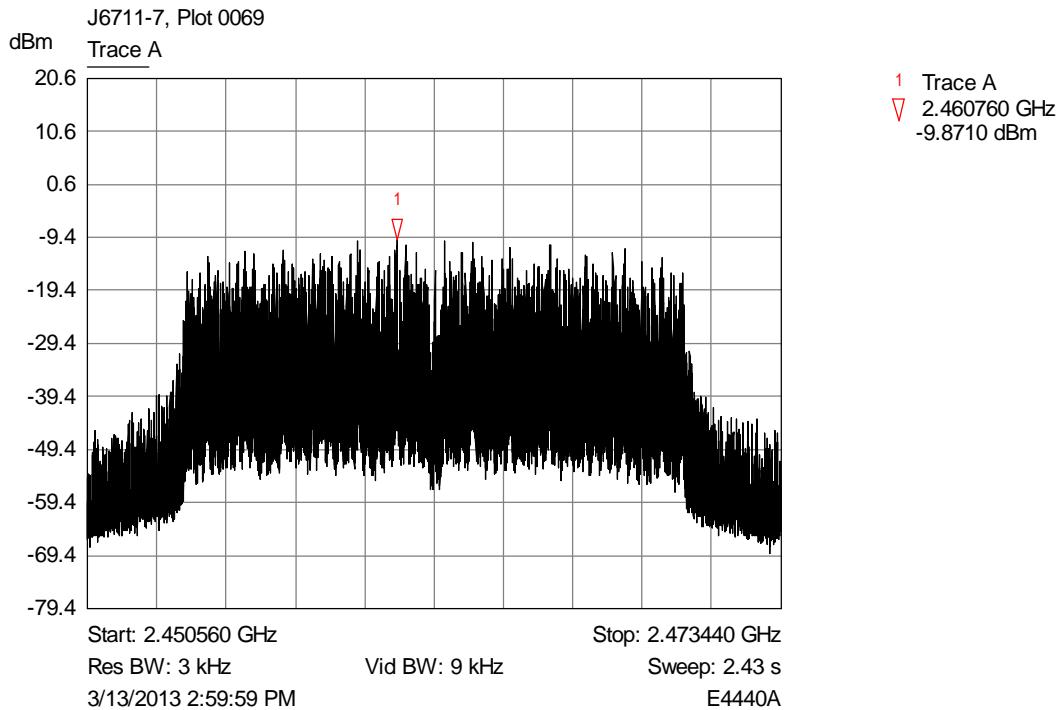


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 111 OF 130

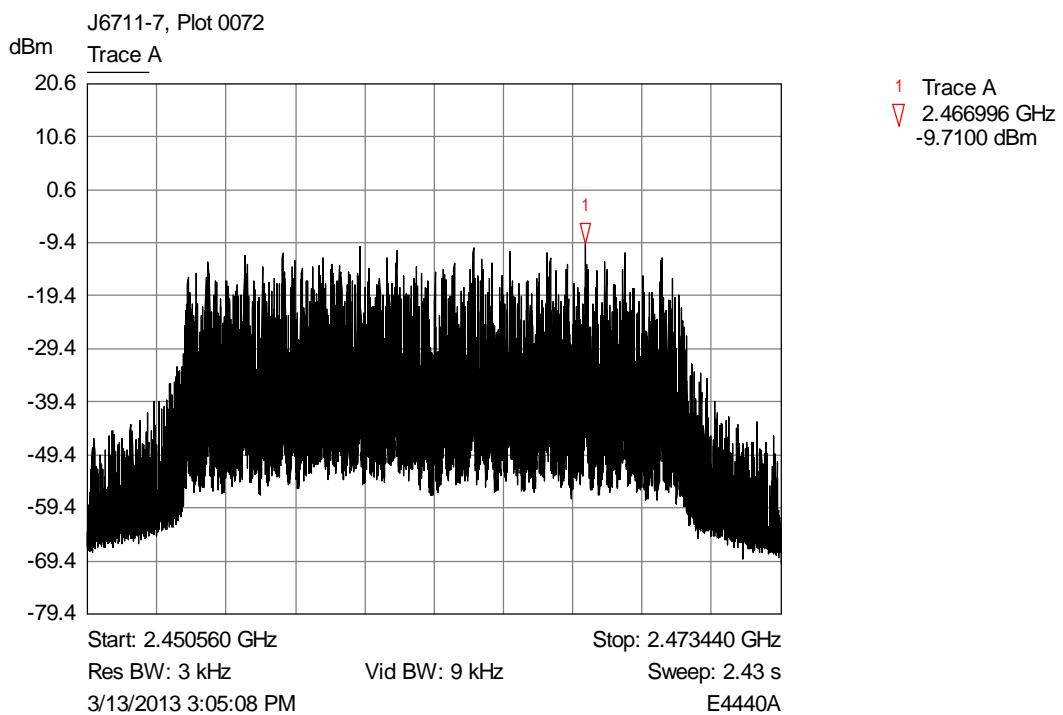
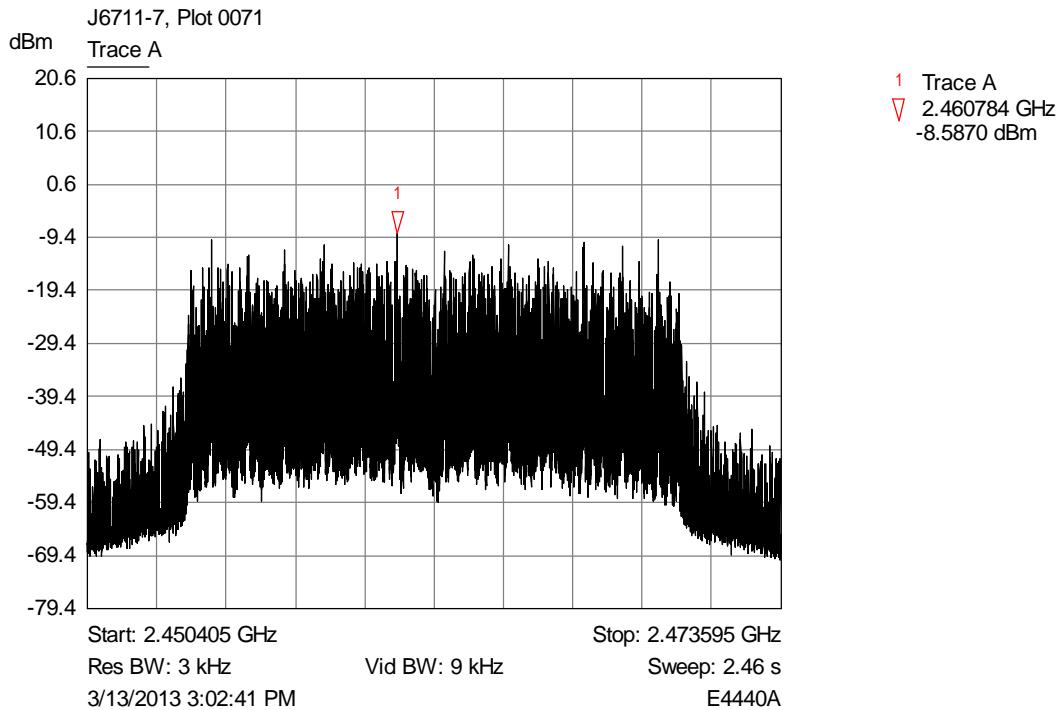


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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 112 OF 130



File name PURE.6711-7 ISSUE 01

The contents of this report, apart from the referenced ANSI C63.4-2003, are beyond the scope of UKAS Testing Laboratory No. 2360 accreditation.

QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 113 OF 130

7 Explanatory Notes

7.1 Explanation of Table of Signals Measured

Measurements are made as required by the standard. These measurements are made and recorded using detectors, either peak, quasi peak or average dependant on the test. A table of results has been given following the relevant plots. This table looks similar to the one illustrated below dependant on the measurements required by the test: -

Signal No.	Freq (MHz)	Peak Amp (dB μ V)	Pk – Lim 1 (dB)	QP Amp (dB μ V)	QP - Lim1 (dB)	Av Amp (dB μ V)	Av - Lim1 (dB)
1	12345	54.9	-10.5	48.0	-12.6	37.6	-14.4

Column One - Labelled Signal No. is an incremental number that the receiver has given to each signal that has been measured.

Column Two - Labelled Freq (MHz) is the approximate frequency of the signal received.

Column Three - Labelled Peak Amp (dB μ V) is the level of received signal that was measured in dB above 1 μ V using the peak detector.

Column Four - Labelled Pk - Lim1 (dB) is the difference in level from the peak signal given to the active limit line. If this column appears in the table the peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Five - Labelled QP Amp (dB μ V) is the level of received signal that was measured in dB above 1 μ V using the quasi-peak detector.

Column Six - Labelled QP - Lim1 (dB) is the difference in level from the quasi-peak signal given to the active limit line. If this column appears in the table the quasi-peak detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Column Seven - Labelled Av Amp (dB μ V) is the level of received signal that was measured in dB above 1 μ V using the average detector.

Column Eight - Labelled Av - Lim1 (dB) is the difference in level from the average signal given to the active limit line. If this column appears in the table the average detector measurement is required by the standard for this test. The results entered in this column indicate the signal level relative to the compliance limit required. Negative numbers indicate that the product is compliant.

Only signals highlighted in red are deemed to exceed the limit of the detector required.

7.2 Explanation of limit line calculations for radiated measurements

The limits given in the test standard are normally expressed as absolute values (e.g. in μ V/m at a specified distance), whereas the measured values are expressed as peak, quasi peak or average values in dB μ V/m referenced to the measuring instrument inputs. RN Electronics calibrate the test set-up to account for any path losses, antenna gains, etc. so that the value read at the receiver relates directly to the absolute value required, except that it is expressed in dB relative to one microVolt and may need to take account of any alternative measuring distance used. Examples:

- (a) limit of 500 μ V/m equates to $20 \log(500) = 54$ dB μ V/m.
- (b) limit of 300 μ V/m at 10m equates to $20 \log(300 \cdot 10/3) = 60$ dB μ V/m at 3m
- (c) limit of 30 μ V/m at 30m, but below 30MHz, equates to $20 \log(30) + 40 \log(30/3) = 69.5$ dB μ V/m at 3m, as extrapolation factor below 30MHz is 40dB/decade per 15.31(f)(2).

8 Photographs

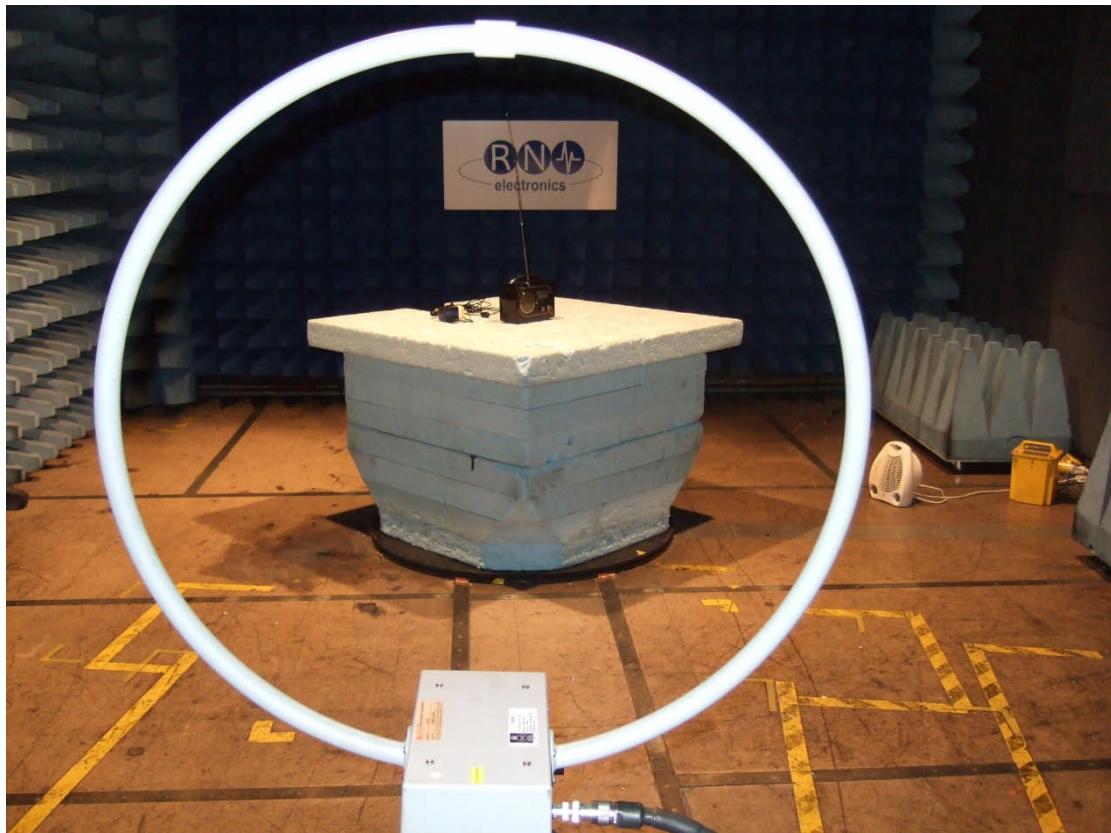


File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 115 OF 130



**Photograph of the EUT as viewed from in front of
the antenna, site M.**

File name PURE.6711-7 ISSUE 01

The contents of this report, apart from the referenced ANSI C63.4-2003, are beyond the scope of UKAS Testing Laboratory No. 2360 accreditation.

QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 116 OF 130

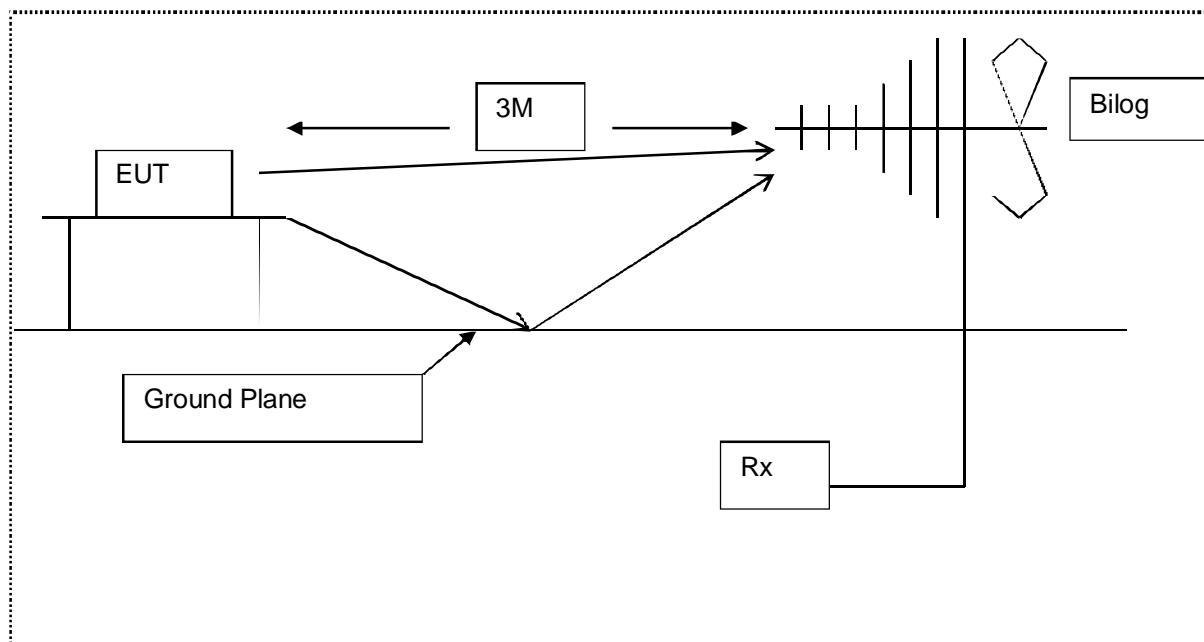


Diagram of the radiated emissions test setup.



Photograph of the EUT as viewed from screened
room (conducted emissions)

File name PURE.6711-7 ISSUE 01

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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 118 OF 130

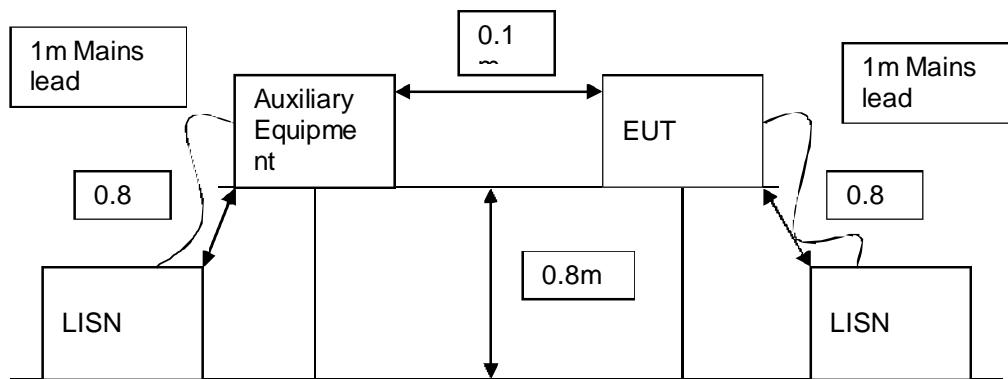


Diagram of the conducted emissions test setup.

Front



Rear



Identifying Photographs of the EUT

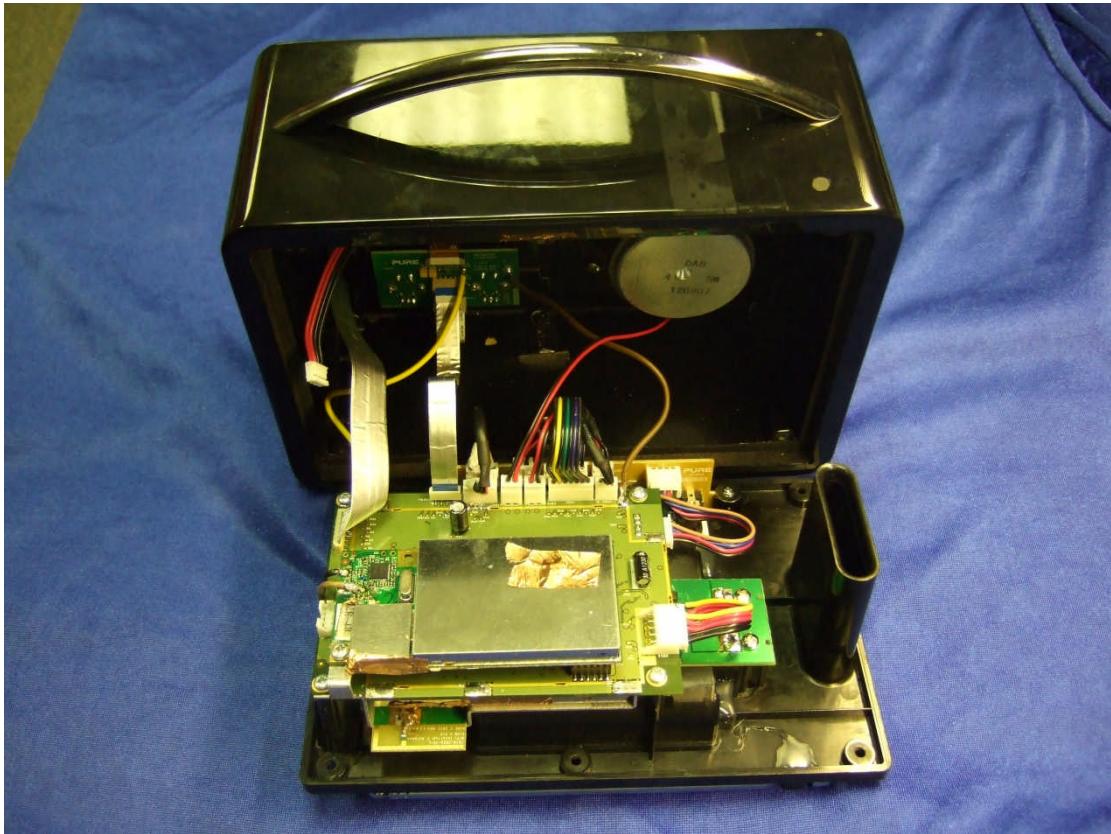
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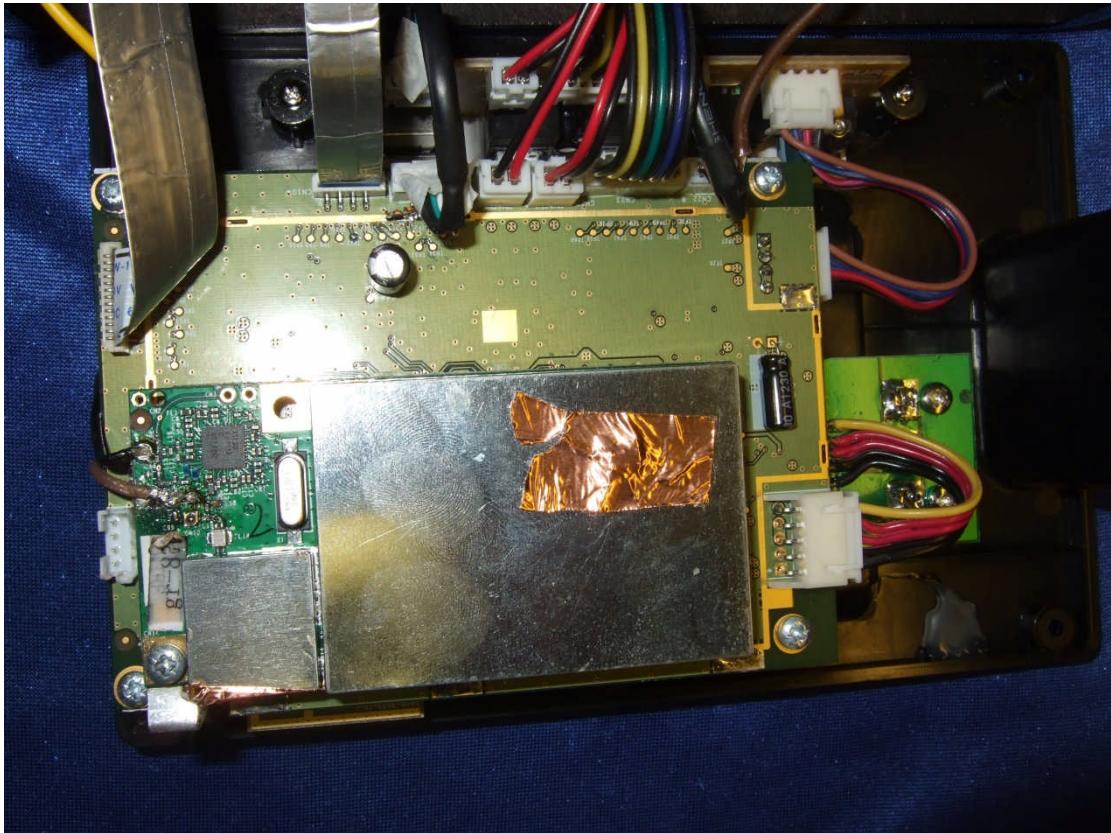
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 120 OF 130

Internal construction 1



Internal construction 2



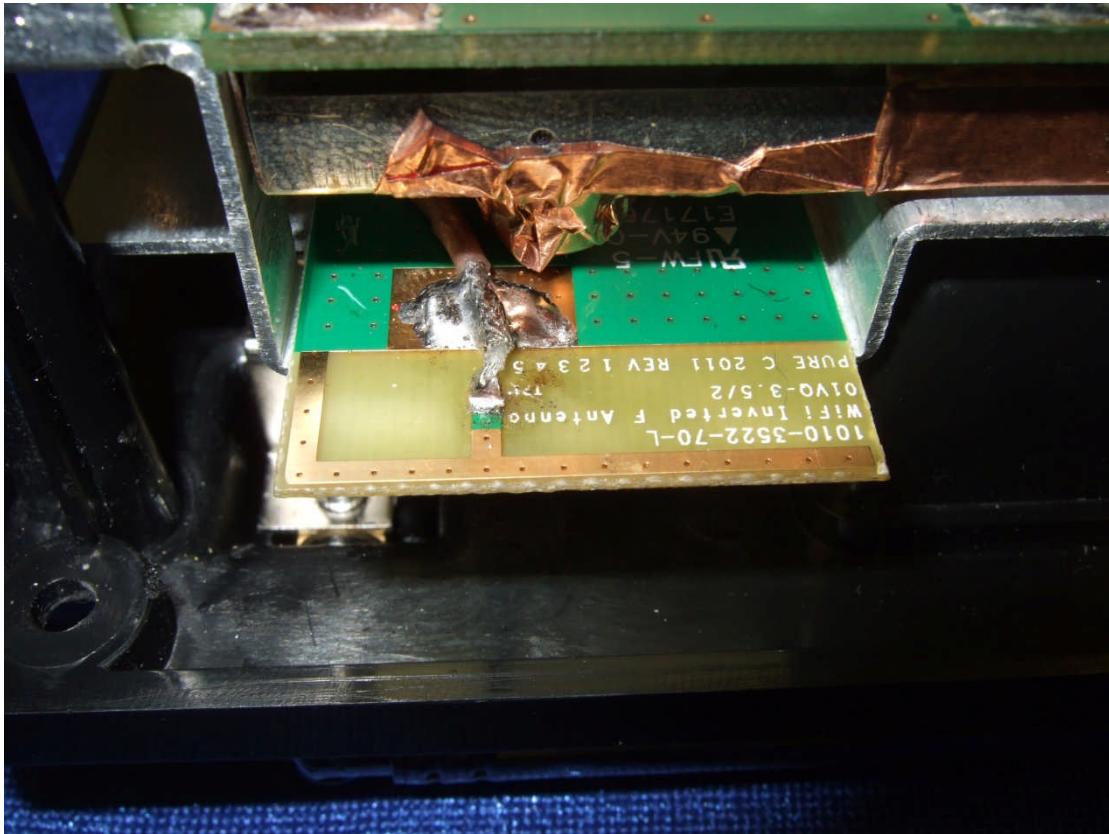
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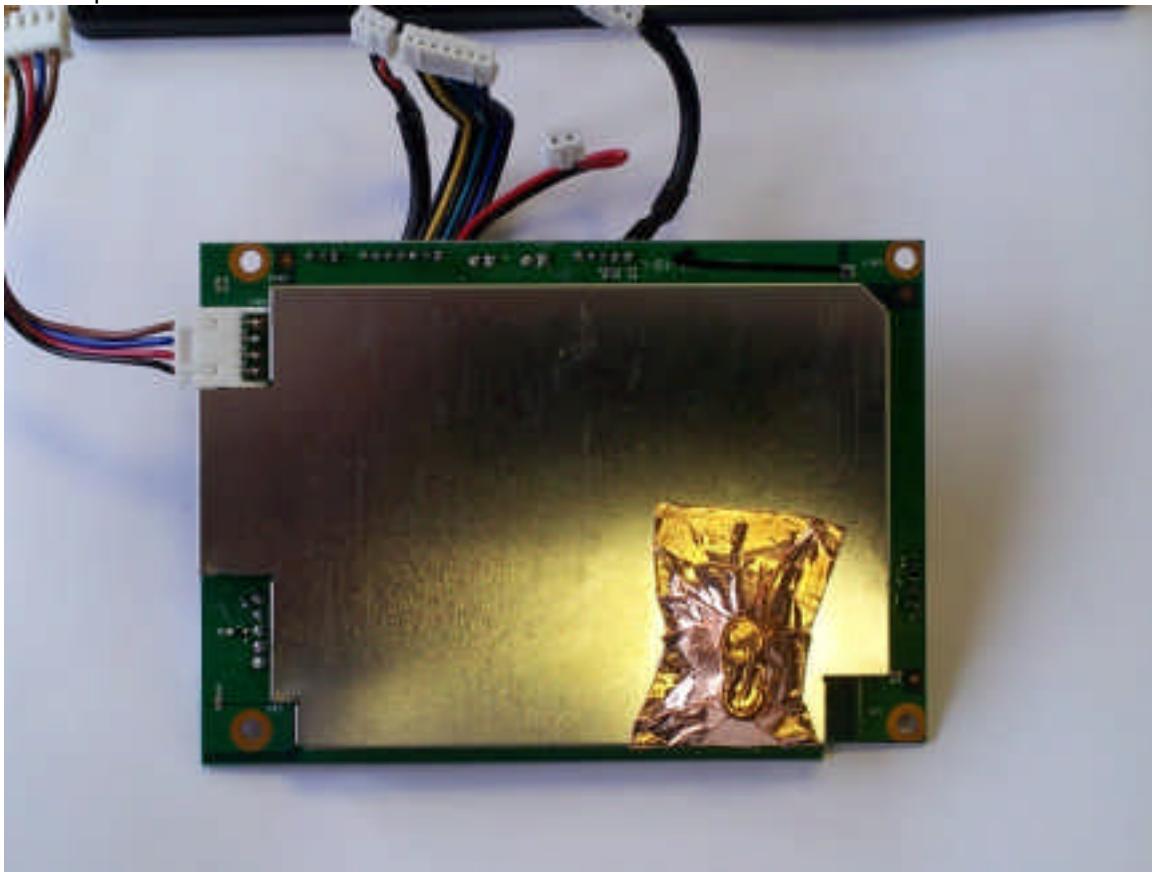
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 121 OF 130

Wi-Fi Antenna



Carrier pcb



File name PURE.6711-7 ISSUE 01

The contents of this report, apart from the referenced ANSI C63.4-2003, are beyond the scope of UKAS Testing Laboratory No. 2360 accreditation.

QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 122 OF 130

Carrier pcb cans removed



Radio module top



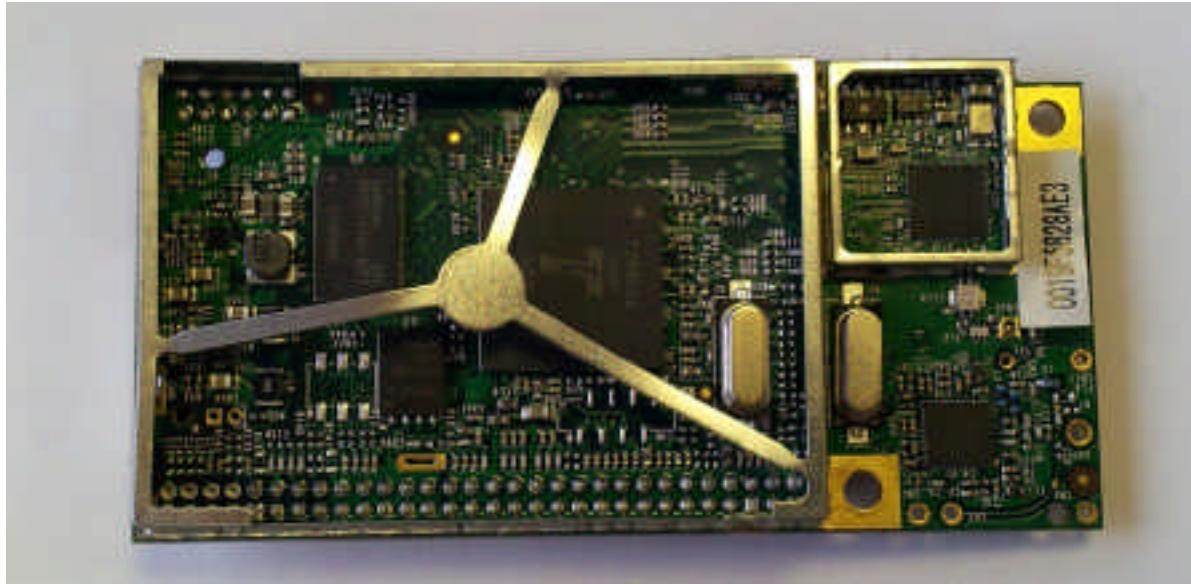
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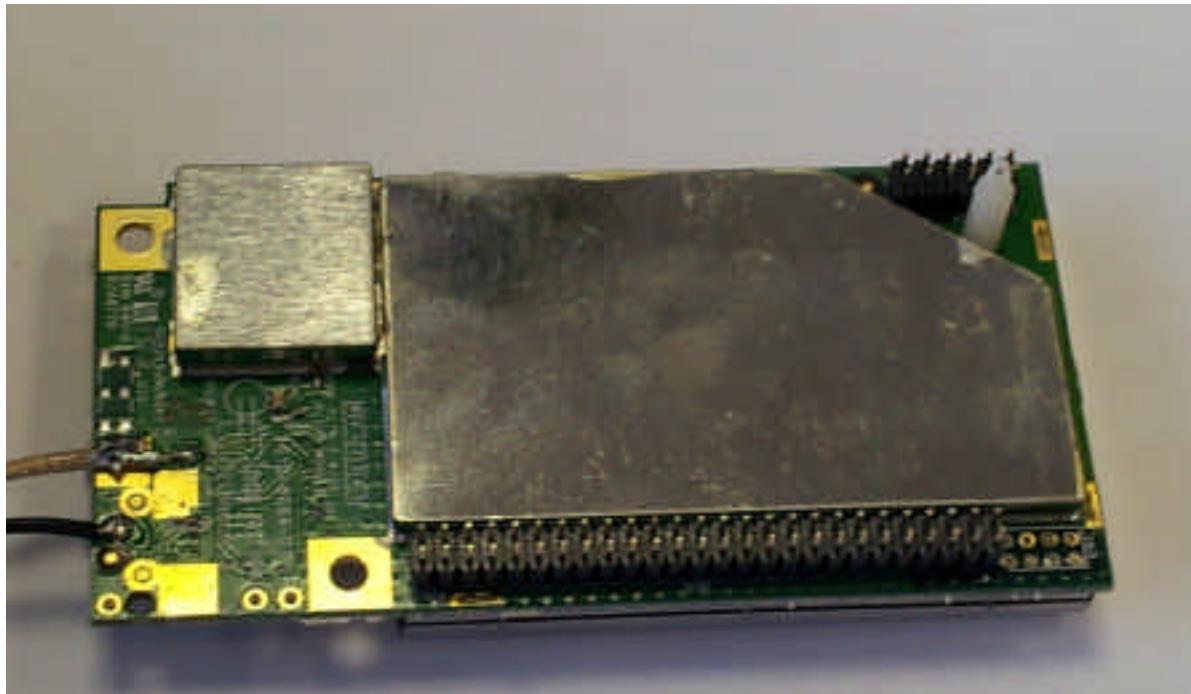
QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 123 OF 130

Radio module top cans removed



Radio module bottom



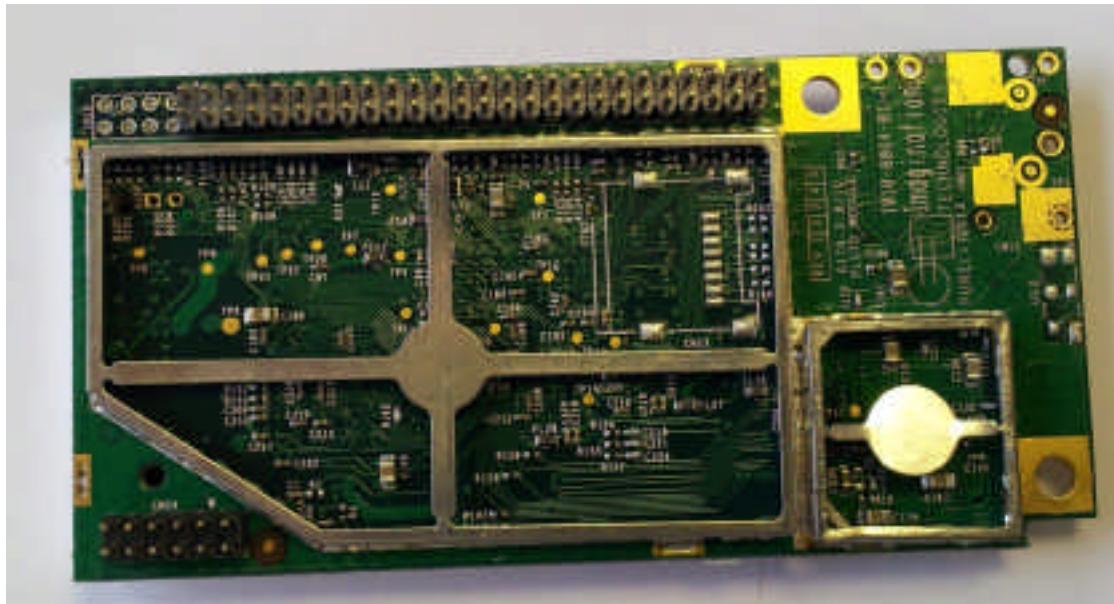
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QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 124 OF 130

Radio module bottom cans removed.



Internal Photographs of the EUT

File name PURE.6711-7 ISSUE 01

The contents of this report, apart from the referenced ANSI C63.4-2003, are beyond the scope of UKAS Testing Laboratory No. 2360 accreditation.

QMF21J – 3; 47CFR15.247, RNE ISSUE 01 SEP 2012

PAGE 125 OF 130

9 Signal Leads

Port Name	Cable Type
AC/DC brick	AC plug to two core DC lead
DC power input	two core
Aux Input	3.5mm audio
USB	standard USB
Aux speaker Output	3.5mm audio
Headphones	3.5mm audio

10 Test Equipment Calibration list

The following table lists the test equipment used, last calibration date and calibration interval. All test equipment used has been maintained within the calibration requirements of **R.N. Electronics Ltd.** test facility quality system. Calibration intervals are regularly reviewed dependent on equipment manufacturer's recommendations and actual usage of the equipment.

RNNo	Model	Description	Manufacturer	Date Calibrated	Period
E035	HP11947A	Transient Limiter + 10dB Atten.	Hewlett Packard	11-Feb-13	6
E150	MN2050	LISN 13A	Chase	02-Oct-12	12
E250	6806.19.A	6dB Attenuator	Hewlett Packard	02-Nov-12	12
E252	6810.19.A	10 dB Attenuator	Suhner	09-May-13	12
E266	2032	5.4GHz Signal Generator	Marconi Instruments	28-Jun-12	24
E268	BHA 9118	1-18 GHz Horn Antenna	Schaffner	25-Nov-13	12
E290	6914	Power Sensor	Marconi Instruments	23-Aug-11	24
E342	8563E	Spectrum Analyser 26.5 GHz	HP	28-May-13	24
E397	6960B	RF Power Meter	Marconi Instruments	16-Jul-11	24
E410	N5181A	3 GHz MXG Signal Generator	Agilent Technologies	26-Oct-11	36
E411	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies	18-Oct-12	12
E412	E4440A	3 Hz - 26.5 GHz PSA	Agilent Technologies	18-Oct-12	12
E420	E4438C	250 KHz - 3.0 GHz Signal Generator	Agilent	n/a	n/a
E429	-	5 Switch Filter Box 0.91 GHz - 16.3 GHz	RN Electronics	20-Nov-12	12
E465	PCR2000LA	AC Power Supply	KIKUSUI	09-May-13	12
E533	N5182A	6 GHz MXG Signal Generator	Agilent Technologies	26-Feb-13	36
E534	E4440A	3 Hz - 26.5 GHz PSA	Agilent Technologies	22-Feb-13	36
E535	N9039A	9 kHz - 1 GHz RF Filter Section	Agilent Technologies	22-Feb-13	36
E547	8493A	20dB Attenuator	HP	n/a	n/a
N240	CRT700/3/2C	100v Transformer	-	n/a	n/a
TMS10	TH200	ThermoHygrometer	RS Components	14-Sep-12	24
TMS78	3160-08	Std Gain Horn Antenna 12.4-18 GHz	ETS Systems	07-Jun-13	24
TMS79	3160-09	Std Gain Horn Antenna 18-26.5 GHz	ETS Systems	07-Jun-13	24
TMS81	6502	Active Loop Antenna	EMCO	24-Oct-12	24
TMS82	8449B	Pre Amplifier 1 - 26 GHz	Agilent	19-Nov-12	12
TMS933	CBL6141A	Bilog Antenna 30MHz - 2GHz	York EMC	12-Jun-12	24

File name PURE.6711-7 ISSUE 01

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11 Auxiliary equipment

11.1 Auxiliary equipment supplied by Pure Ltd

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

Manufacturer	Description	Model Number	Serial Number
Pure	USB stick	-	-

11.2 Auxiliary equipment supplied by RN Electronics Limited

Auxiliary equipment used for the purpose of test supplied by the above has been listed below

RN Numbr	Manufacturer	Description	Model Number	Serial Number
-	Apple Inc.	Iphone 5	Iphone 5	-

12 Modifications

In order for the EUT to produce the results shown within this report the following modifications, if any, were implemented.

12.1 Modifications before test

There were no modifications made by R.N. Electronics Ltd before testing commenced.

12.2 Modifications during test

There were no modifications made by R.N. Electronics Ltd during testing.

13 Compliance information

Products subject to the Declaration of Conformity procedure are required to be supplied with a compliance information statement. A copy of this statement may be included here:

CERTIFIED equipment – DoC not required.

14 Description of Test Sites

Site A	Radio / Calibration Laboratory and anechoic chamber
Site B	Semi-anechoic chamber
Site B1	Control Room for Site B
Site C	Transient Laboratory
Site D	Screened Room (Conducted Immunity)
Site E	Screened Room (Control Room for Site D)
Site F	Screened Room (Conducted Emissions) VCCI Registration No. C-2823
Site K	Screened Room (Control Room for Site M)
Site M	3m Semi-anechoic chamber (indoor OATS) FCC Registration No. 293246
Site Q	Fully-anechoic chamber
Site OATS	3m and 10m Open Area Test Site FCC Registration No. 293246 IC Registration No. 5612A-1 VCCI Registration No. R-2580
Site R	Screened Room (Conducted Immunity)
Site S	Safety Laboratory
Site T	Transient Laboratory

15 Abbreviations and Units

%	Percent	Hz	Hertz
µV	microVolts	IF	Intermediate Frequency
µW	microWatts	kHz	kiloHertz
AC	Alternating Current	LO	Local Oscillator
ALSE	Absorber Lined Screened Enclosure	mA	milliAmps
AM	Amplitude Modulation	max	maximum
Amb	Ambient	mbar	milliBars
ANSI	American National Standards Institute	MHz	MegaHertz
°C	Degrees Celsius	min	minimum
CFR	Code of Federal Regulations	mm	milliMetres
CS	Channel Spacing	ms	milliSeconds
CW	Continuous Wave	mW	milliWatts
dB	deciBels	NA	Not Applicable
dBµV	deciBels relative to 1µV	nom	Nominal
dbc	deciBels relative to Carrier	OATS	Open Area Test Site
dBm	deciBels relative to 1mW	OFDM	Orthogonal Frequency Division Multiplexing
DC	Direct Current	ppm	Parts per million
EIRP	Equivalent Isotropic Radiated Power	QAM	Quadrature Amplitude Modulation
ERP	Effective Radiated Power	QPSK	Quadrature Phase Shift Keying
EUT	Equipment Under Test	Ref	Reference
FCC	Federal Communications Commission	RF	Radio Frequency
FM	Frequency Modulation	RTP	Room Temperature and Pressure
FSK	Frequency Shift Keying	s	Seconds
g	Grams	Tx	Transmitter
GHz	GigaHertz	V	Volts