

## **Certification Test Report**

**FCC ID: 2ACQD-COMMOD01**  
**IC: 12381A-COMMOD01**

**FCC Rule Part: 15.247**  
**IC Radio Standards Specification: RSS-210**

**ACS Report Number: 14-2071.W06.1A**

Applicant: Infrac Systems, Inc.  
Model(s): COMM01

Test Begin Date: **July 29, 2014**  
Test End Date: **January 17, 2015**

Report Issue Date: January 20, 2015



FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER AT-1533

This report must not be used by the client to claim product certification, approval, or endorsement by ACCLASS, ANSI, or any agency of the Federal Government.

**Reviewed by:**

A handwritten signature in blue ink that reads "Thierry Jean-Charles".

**Thierry Jean-Charles**  
**EMC Engineer**  
**Advanced Compliance Solutions, Inc.**

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**This report contains 34 pages**

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## **1 GENERAL**

### **1.1 Purpose**

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations and Industry Canada's Radio Standards Specification RSS-210 for modular approval.

### **1.2 Applicant Information**

Infrac Systems, Inc.  
3637 4th Street North #330  
St Petersburg, FL 33704

### **1.3 Product Description**

The Infrac Systems, Inc. communication module, model COMMOD01, is a 2.4 GHz transceiver module. The module is intended to be installed inside smart meters.

#### Technical Details

Mode of Operation:	DTS
Frequency Range:	2405 MHz - 2475 MHz
Number of Channels:	15
Channel Separation:	5 MHz
Modulations:	O-QPSK
Antenna Type/Gain:	Printed Dipole Antenna / 2.5 dBi
Input Power:	3.3 VDC

Model Number: COMMOD01

Test Sample Serial Number(s): 11eb

Test Sample Condition: The EUT was in good condition with no observable physical damage.

### **1.4 Test Methodology and Considerations**

The EUT was evaluated for radiated, power line and RF conducted emissions. The EUT was evaluated while connected to the host interface board (HIB). All the measurements were performed using a test setting of 14 on the commod\_radio\_tester software.

The radiated emissions were performed for the EUT set in three orientations. The report documents the results for the orientation leading to the highest emissions as compared to the limits. The worst case orientation was observed to be the COMMOD01 upright.

For the power line conducted emissions evaluations, the testing was performed with the COMMOD01/HIB installed inside of a host meter.

The EUT was also evaluated for unintentional emissions. The results are provided separately in a verification report.

## **2 TEST FACILITIES**

### **2.1 Location**

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions, Inc.  
3998 FAU Blvd, Suite 310  
Boca Raton, Florida 33431  
Phone: (561) 961-5585  
Fax: (561) 961-5587  
[www.acstestlab.com](http://www.acstestlab.com)

FCC Test Firm Registration #: 475089  
Industry Canada Lab Code: 4175C

### **2.2 Laboratory Accreditations/Recognitions/Certifications**

ACS is accredited to ISO/IEC 17025 by ANSI-ASQ National Accreditation Board under their ACLASS program and has been issued certificate number AT-1533 in recognition of this accreditation. Unless otherwise specified, all test methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

**2.3 Radiated & Conducted Emissions Test Site Description**

**2.3.1 Semi-Anechoic Chamber Test Site**

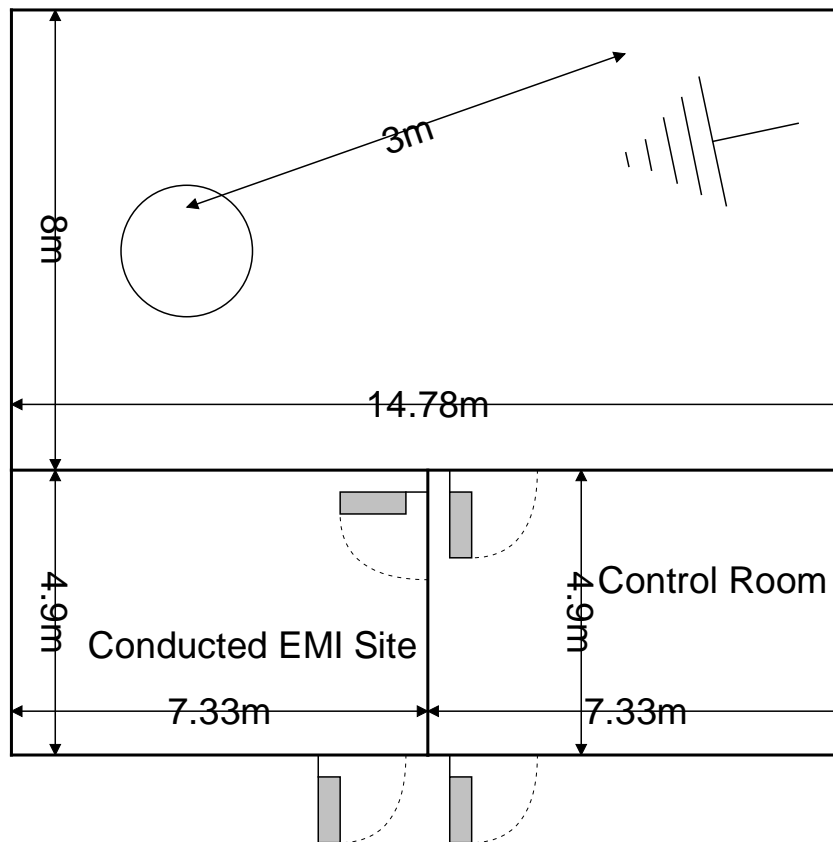
The EMC radiated test facility consists of an RF-shielded enclosure. The interior dimensions of the indoor semi-anechoic chamber are approximately 48 feet (14.6 m) long by 36 feet (10.8 m) wide by 24 feet (7.3 m) high and consist of rigid, 1/8 inch (0.32 cm) steel-clad, wood core modular panels with steel framing. In the shielded enclosure, the faces of the panels are galvanized and the chamber is self-supporting. 8-foot RF absorbing cones are installed on 4 walls and the ceiling. The steel-clad ground plane is covered with vinyl floor.

The turntable is driven by pneumatic motor, which is capable of supporting a 2000 lb. load. The turntable is flushed with the chamber floor which it is connected to, around its circumference, with a continuous metallic loaded spring. An EMCO Model 1050 Multi-device Controller controls the turntable position.

A pneumatic motor is used to control antenna polarizations and height relative to the ground. The height information is displayed on the control unit EMCO Model 1050.

The control room is an RF shielded enclosure attached to the semi-anechoic chamber with two bulkhead panels for connecting RF, and control cables. The dimension of the room is 7.3 m x 4.9 m x 3 m high and the entrance doors of both control and conducted rooms are 3 feet (0.91 m) by 7 feet (2.13 m).

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

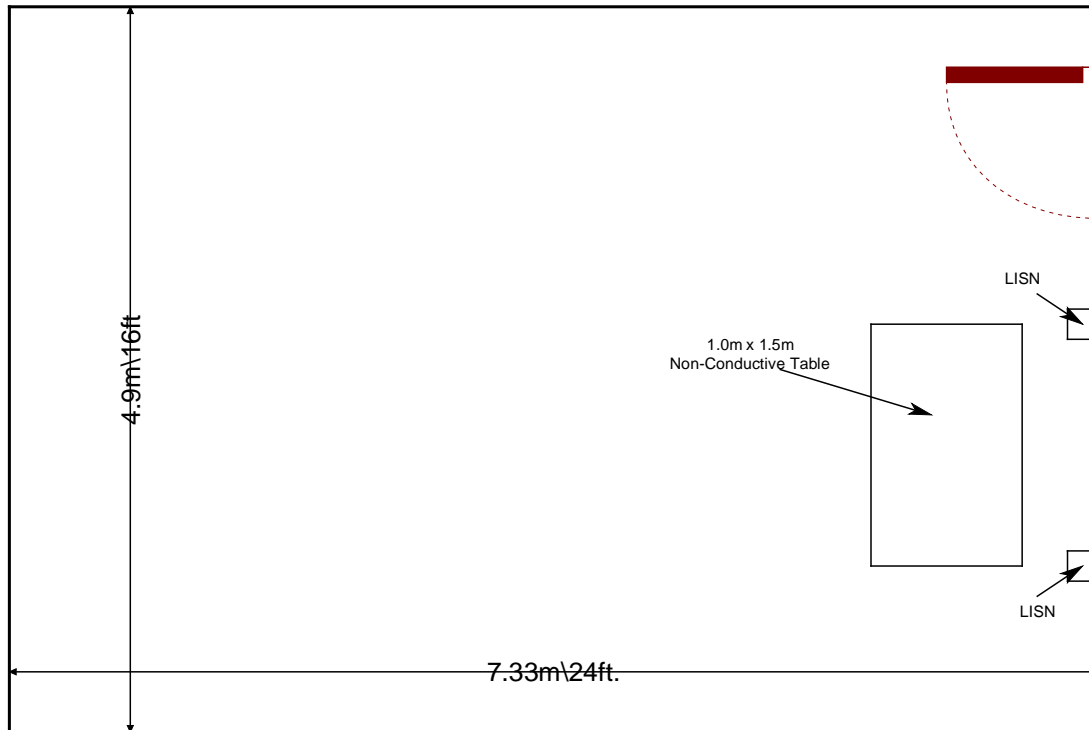


**Figure 2.3.1-1: Semi-Anechoic Chamber Test Site**

**2.3.2 Conducted Emissions Test Site Description**

The dimensions of the shielded conducted room are 7.3 x 4.9 x 3 m<sup>3</sup>. As per ANSI C63.4 2003 requirements, the data were taken using two LISNs; a Solar Model 8028-50 50 Ω/50 μH and an EMCO Model 3825, which are installed as shown in Photograph 3. For 220 V, 50 Hz, a Polarad LISN (S/N 879341/048) is used in conjunction with a 1 kVA, 50 Hz/220 V EDGAR variable frequency generator, Model 1001B, to filter conducted noise from the generator.

A diagram of the room is shown below in figure 2.3.2-1:



**Figure 2.3.2-1: AC Mains Conducted EMI Site**

### **3 APPLICABLE STANDARD REFERENCES**

The following standards were used:

- ❖ ANSI C63.4-2009: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9 kHz to 40 GHz.
- ❖ ANSI C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices.
- ❖ US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2015.
- ❖ US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2015
- ❖ KDB Publication No. 558074 D01 DTS Meas Guidance v03r02 – Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247, June 5, 2014.
- ❖ Industry Canada Radio Standards Specification: RSS-210 - Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment, Issue 8 December 2010.
- ❖ Industry Canada Radio Standards Specification: RSS-GEN – General Requirements for Compliance of Radio Apparatus, Issue 4, November 2014.

#### 4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

**Table 4-1: Test Equipment**

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Last Calibration Date	Calibration Due Date
523	Agilent	E7405	Spectrum Analyzers	MY45103293	1/8/2013	1/8/2015
523	Agilent	E7405	Spectrum Analyzers	MY45103293	12/26/2014	12/26/2016
2002	EMCO	3108	Antennas	2147	11/22/2013	11/22/2015
2004	EMCO	3146	Antennas	1385	11/22/2013	11/22/2015
2006	EMCO	3115	Antennas	2573	4/24/2013	4/24/2015
2008	COM-Power	AH-826	Antennas	81009	NCR	NCR
2011	Hewlett-Packard	HP 8447D	Amplifiers	2443A03952	12/31/2013	12/31/2014
2011	Hewlett-Packard	HP 8447D	Amplifiers	2443A03952	12/31/2014	12/31/2015
2037	ACS Boca	Chamber EMI Cable Set	Cable Set	2037	2/27/2014	2/27/2015
2044	QMI	N/A	Cables	2044	12/31/2013	12/31/2014
2044	QMI	N/A	Cables	2044	12/31/2014	12/31/2015
2076	Hewlett Packard	HP5061-5458	Cables	2076	12/31/2013	12/31/2014
2070	Mini Circuits	VHF-8400+	Filter	2070	1/1/2014	1/1/2015
2070	Mini Circuits	VHF-8400+	Filter	2070	12/31/2014	12/31/2015
2072	Mini Circuits	VHF-3100+	Filter	30737	1/1/2014	1/1/2015
2072	Mini Circuits	VHF-3100+	Filter	30737	12/31/2014	12/31/2015
2082	Teledyne Storm Products	90-010-048	Cables	2082	5/8/2014	5/8/2015
2086	Merrimac	FAN-6-10K	Attenuators	23148-83-1	12/31/2013	12/31/2014
2086	Merrimac	FAN-6-10K	Attenuators	23148-83-1	12/31/2014	12/31/2015
2089	Agilent Technologies, Inc.	83017A	Amplifiers	3123A00214	12/16/2013	12/16/2014
2089	Agilent Technologies, Inc.	83017A	Amplifiers	3123A00214	12/12/2014	12/12/2015
2095	ETS Lindgren	TILE4! - Version 4.2.A	Software	85242	NCR	NCR
2022	EMCO	LISN3825/2R	LISN	1095	9/9/2013	9/9/2015
2045	ACS Boca	Conducted Cable Set	Cable Set	2045	1/1/2014	1/1/2015
2045	ACS Boca	Conducted Cable Set	Cable Set	2045	1/1/2015	1/1/2016
3004	Teseq	CFL 9206A	Attenuators	34720	10/21/2013	10/21/2015
341	Aeroflex/Weinschel	54A-20	Attenuators	4686	7/25/2014	7/25/2015

**Notes:**

- **NCR = No Calibration Required**
- **The asset calibration information is provided to cover the entire test period.**
- **Asset 2076 was retired at the end of the year 2014 and was only used during the active cycle of the calibration.**



## 5 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment (Radiated Emissions)

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Infrac	COMMOD01	11eb
2	RF Board	Infrac	62-160400	SX-50-13240-01 018
3	Laptop	Dell	Latitude D620	CN-0TD761-12961- 68G-3106
4	Power Supply	Dell	PA-1650-05D2	CN-0F7970-71615- 54P-C958

Table 5-2: Cable Description (Radiated Emissions)

Cable #	Cable Type	Length	Shield	Termination
A	USB	10 m	No	EUT to Laptop
B	Power cable	1.83 m	No	Laptop to AC Adapter
C	Power cord	0.9 m	No	Adapter to AC mains

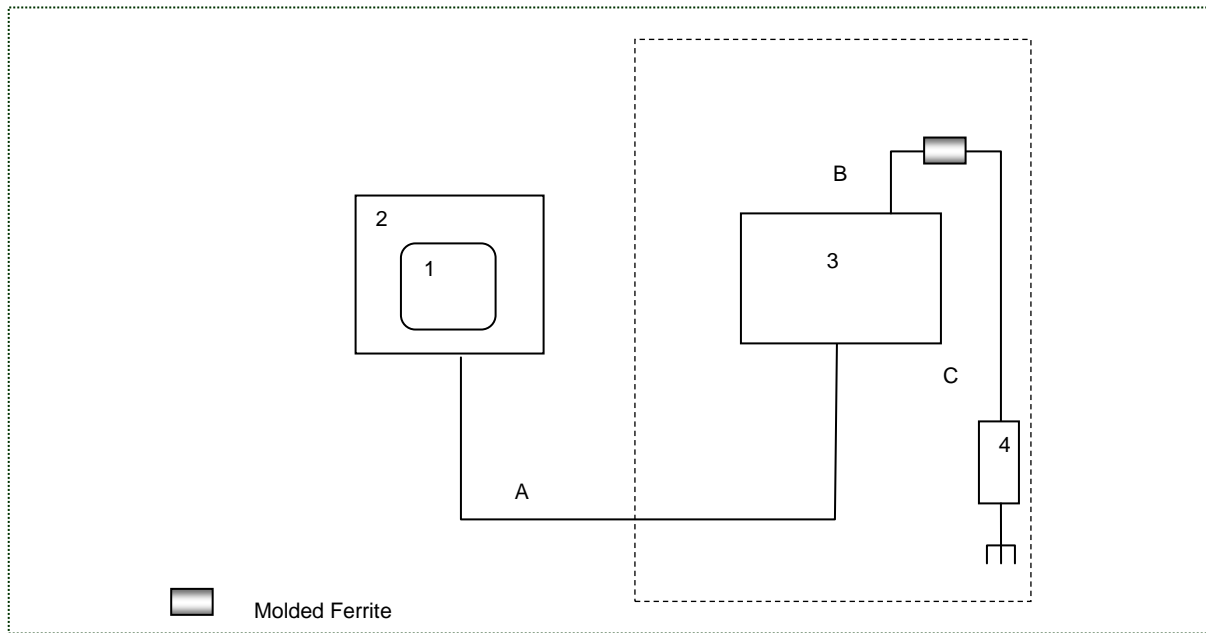
Table 5-3: EUT and Support Equipment (Power Line Conducted Emissions)

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Infrac	COMMOD01	11eb
2	Meter	ltron	CL200 120V	6JF303923009
3	Meter Socket	EATON	E236144	30-43647-2

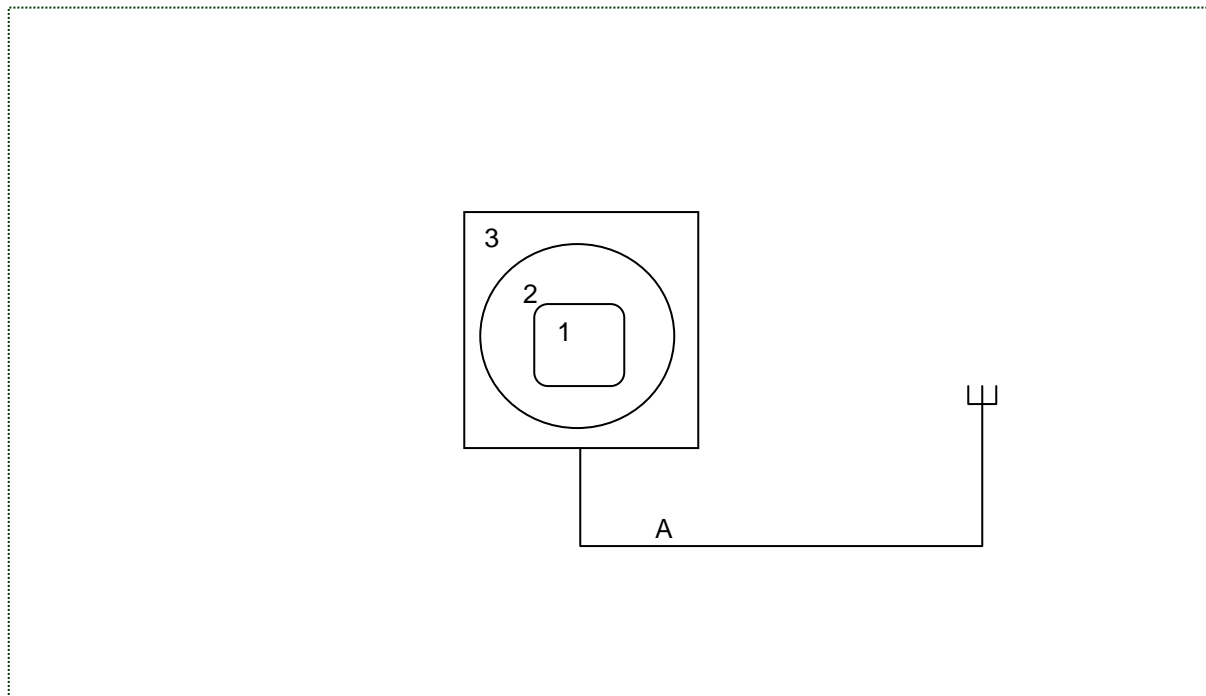
Table 5-4: Cable Description (Power Line Conducted Emissions)

Cable #	Cable Type	Length	Shield	Termination
A	Power cord	1.6 m	No	Meter to AC mains

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM



Note: The equipment within the dotted box was set outside of the test environment during the radiated emission evaluation.



## 7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

### 7.1 Antenna Requirement – FCC: Section 15.203

The EUT uses UFL connectors at the RF port and at the host interface board (HIB) for the 2.5 dBi printed dipole antenna. The EUT uses a unique connector thus meets the requirements of FCC Section 15.203.

### 7.2 6 dB Bandwidth - FCC: Section 15.247(a)(2) 99% Bandwidth IC: RSS-210 A8.2(a)

#### 7.2.1 Measurement Procedure

The 6dB bandwidth was measured in accordance with the FCC KDB Publication No. 558074 “Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)” DTS 6-dB Signal Bandwidth Option 1. The RBW of the spectrum analyzer was set to 100 kHz and VBW 300 kHz. Span was set large enough to capture the entire emissions and >> RBW.

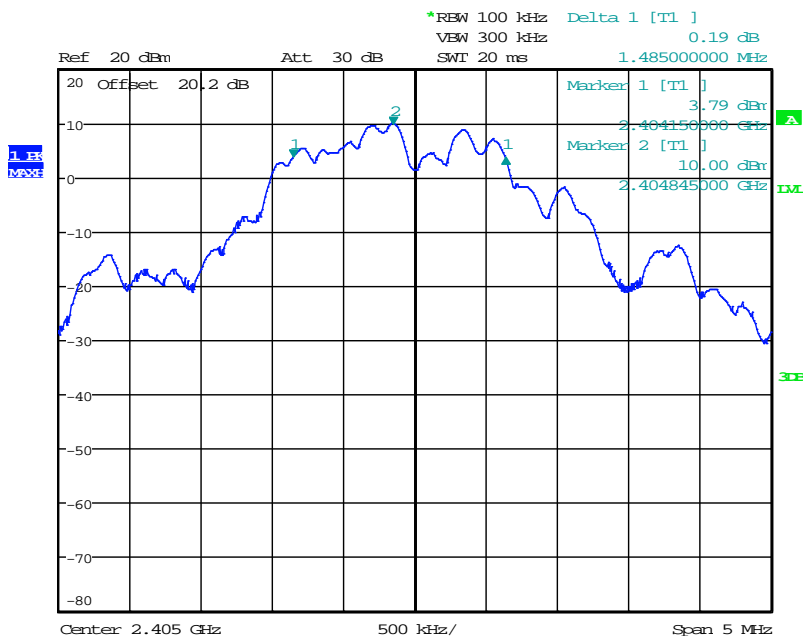
The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission, including the emissions skirts. The RBW was to 1% to 5% of the occupied bandwidth. The occupied 99% bandwidth was measured using the occupied bandwidth function of the analyzer.

#### 7.2.2 Measurement Results

Results are shown below.

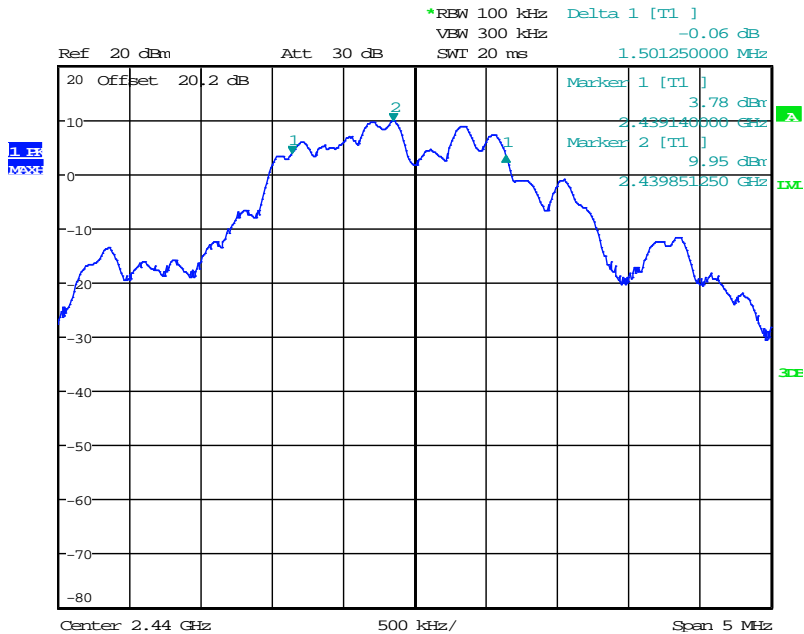
**Table 7.2.2-1: 6dB / 99% Bandwidth**

Frequency [MHz]	6dB Bandwidth [kHz]	99% Bandwidth (kHz)
2405	1485.00	2440.00
2440	1501.25	2560.00
2475	1570.00	2660.00



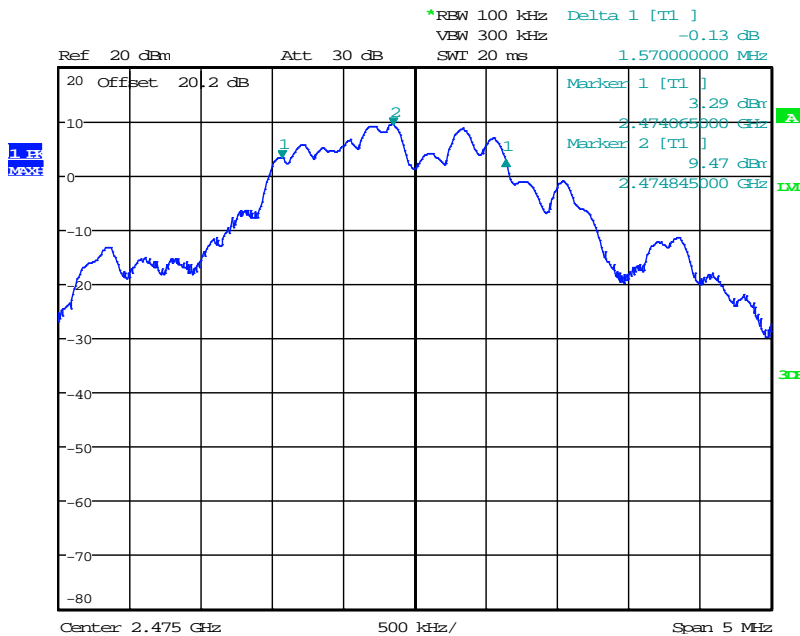
Date: 5.AUG.2014 22:02:45

Figure 7.2.2-1: 6dB BW - Low Channel



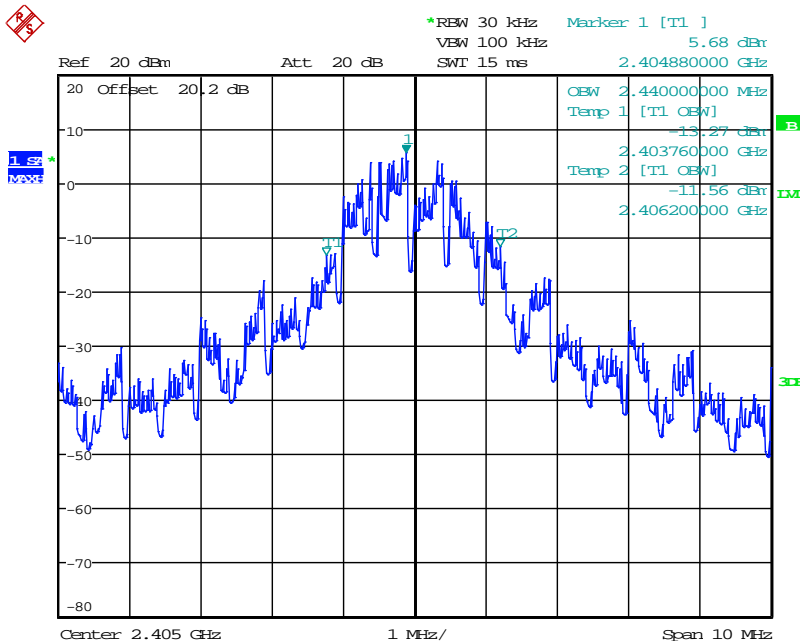
Date: 5.AUG.2014 22:07:49

Figure 7.2.2-2: 6dB BW - Middle Channel



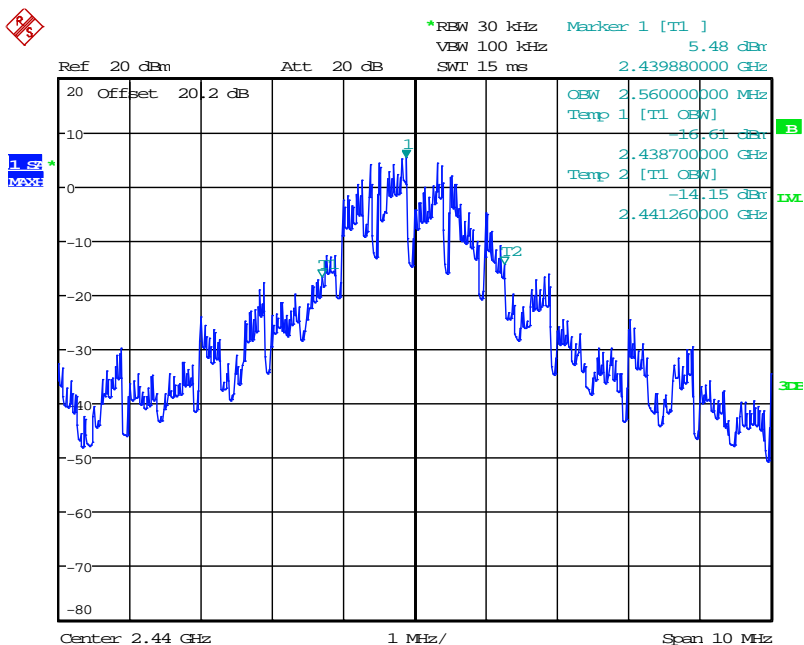
Date: 5.AUG.2014 22:11:01

Figure 7.2.2-3: 6dB BW - High Channel



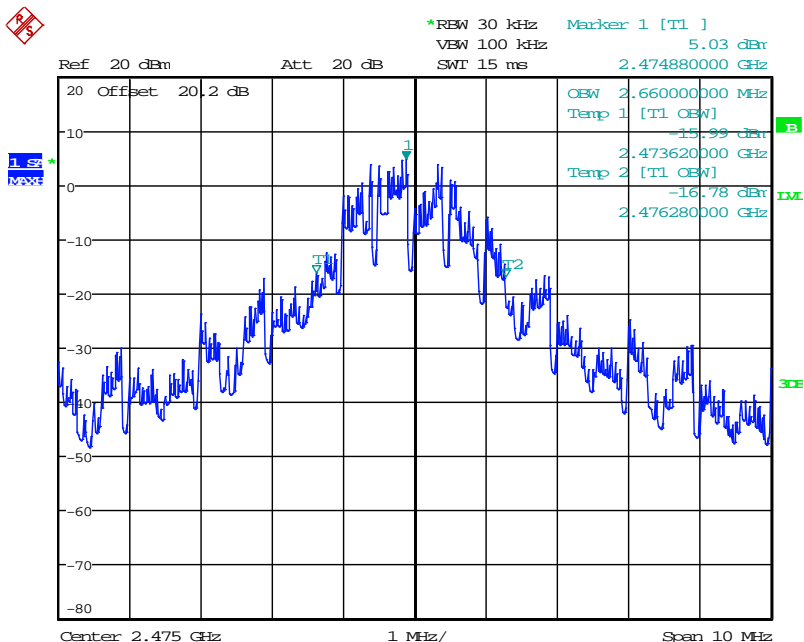
Date: 16.JAN.2015 17:06:09

Figure 7.2.2-4: 99% OBW - Low Channel



Date: 16.JAN.2015 17:08:27

Figure 7.2.2-5: 99% OBW - Middle Channel



Date: 16.JAN.2015 17:09:44

Figure 7.2.2-6: 99% OBW - High Channel

7.3 Peak Output Power - FCC Section 15.247(b)(3) IC: RSS-210 A8.4(4)

7.3.1 Measurement Procedure (Conducted Method)

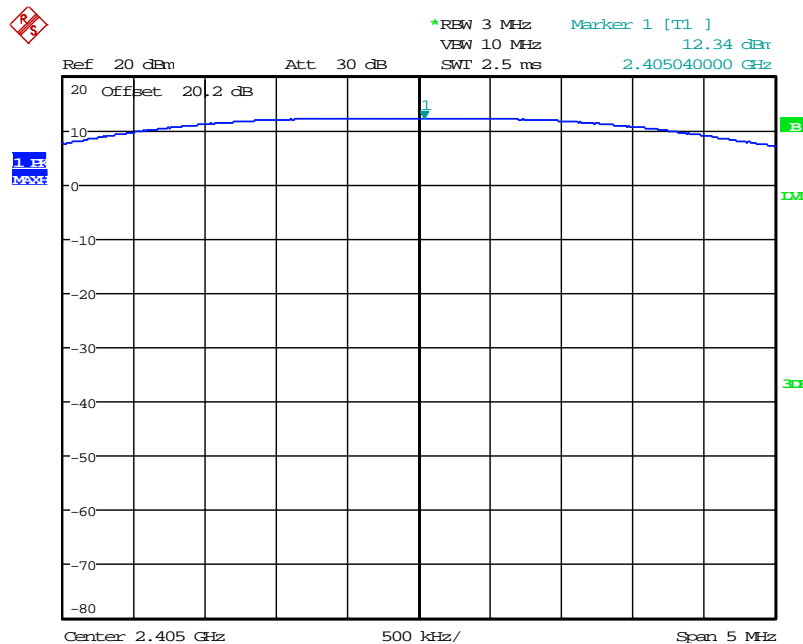
The Peak Output Power was measured in accordance with the FCC KDB Publication No. 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)" Section 9.1.1 RBW ≥ DTS Bandwidth Method. The RF output of the equipment under test was directly connected to the input of the spectrum analyzer through suitable attenuation.

7.3.2 Measurement Results

Results are shown below.

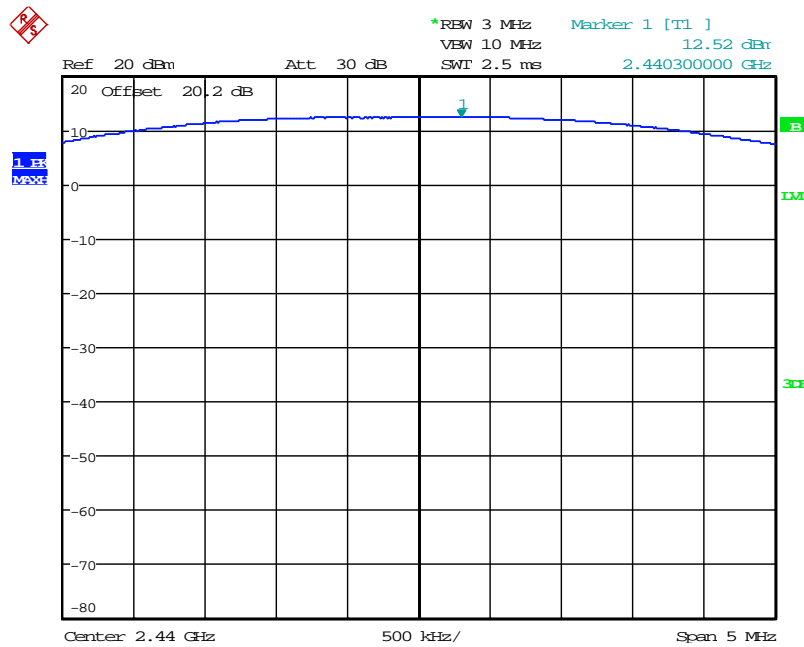
Table 7.3.2-1: RF Output Power

Frequency [MHz]	Level [dBm]
2405	12.34
2440	12.52
2475	12.03



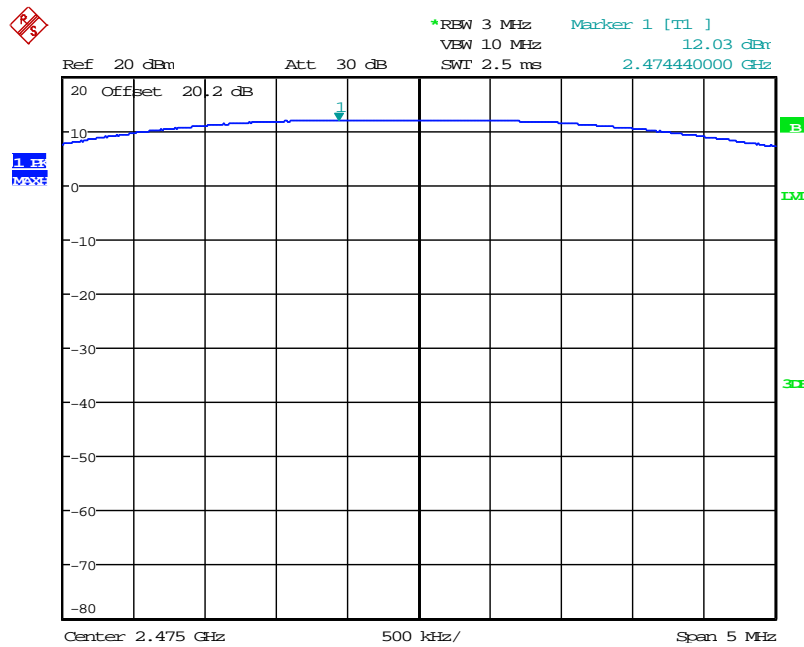
Date: 17.JAN.2015 23:10:37

Figure 7.3.2-1: RF Output Power - Low Channel



Date: 17.JAN.2015 23:11:47

Figure 7.3.2-2: RF Output Power - Middle Channel



Date: 17.JAN.2015 23:17:54

Figure 7.3.2-3: RF Output Power - High Channel



7.4 Band-Edge Compliance and Spurious Emissions-FCC 15.247(d) IC: RSS-210 A8.5

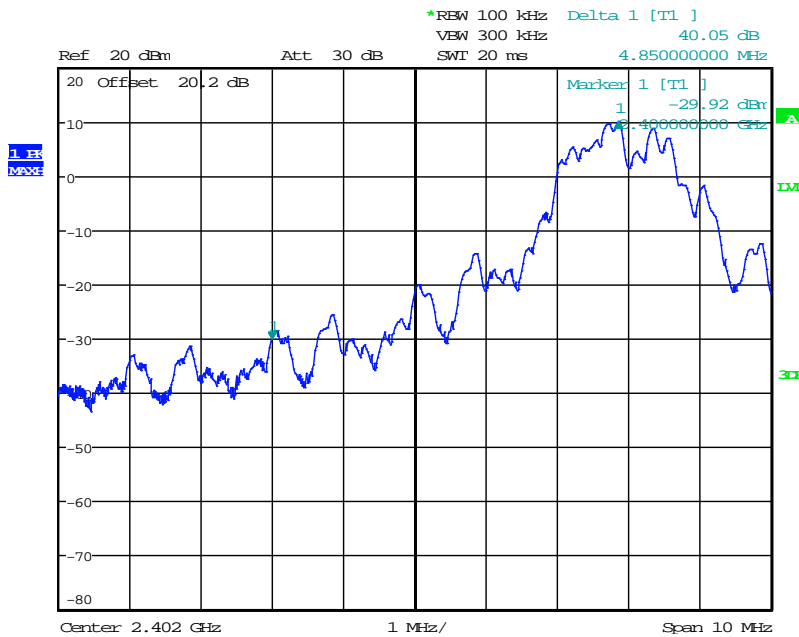
7.4.1 Band-Edge Compliance of RF Conducted Emissions

7.4.1.1 Measurement Procedure

The RF output port of the EUT was directly connected to the input of the spectrum analyzer via suitable attenuation. The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to 100 kHz, and the VBW was set to 300 kHz.

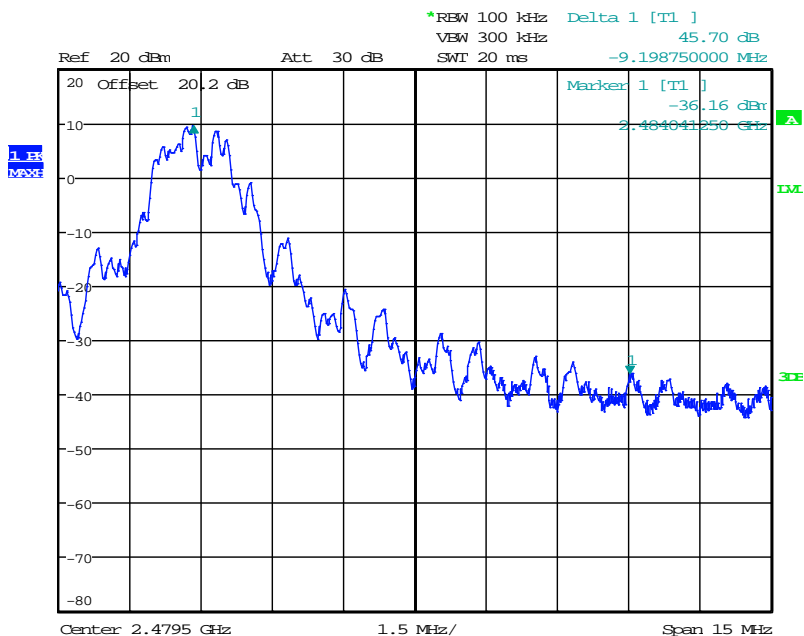
7.4.1.2 Measurement Results

Results are shown below.



Date: 5.AUG.2014 22:53:54

Figure 7.4.1.2-1: Lower Band-edge



Date: 5.AUG.2014 23:01:15

Figure 7.4.1.2-2: Upper Band-edge

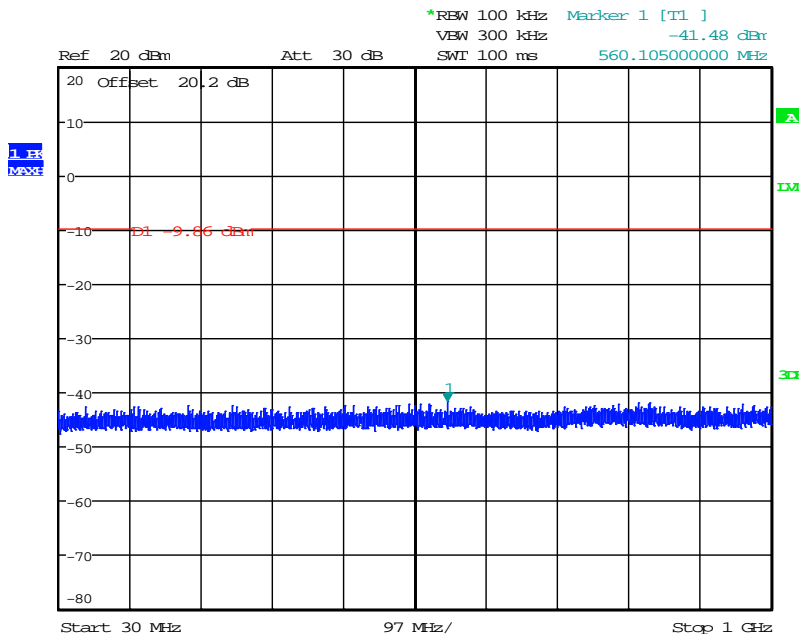
### 7.4.2 RF Conducted Spurious Emissions

#### 7.4.2.1 Measurement Procedure

The RF Conducted Spurious Emissions were measured in accordance with the FCC KDB Publication No. 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)". The RF output port of the equipment under test was directly connected to the input of the spectrum analyzer. The EUT was investigated for conducted spurious emissions from 30MHz to 26 GHz, 10 times the highest fundamental frequency. Measurements were made at the low, center and high channels of the EUT. For each measurement, the spectrum analyzer's RBW was set to 100 kHz and the VBW was set to 300 kHz. The peak Max Hold function of the analyzer was utilized. The reference level for the limits was determined by measuring the Peak PSD level in any 100 kHz bandwidth within the DTS channel bandwidth.

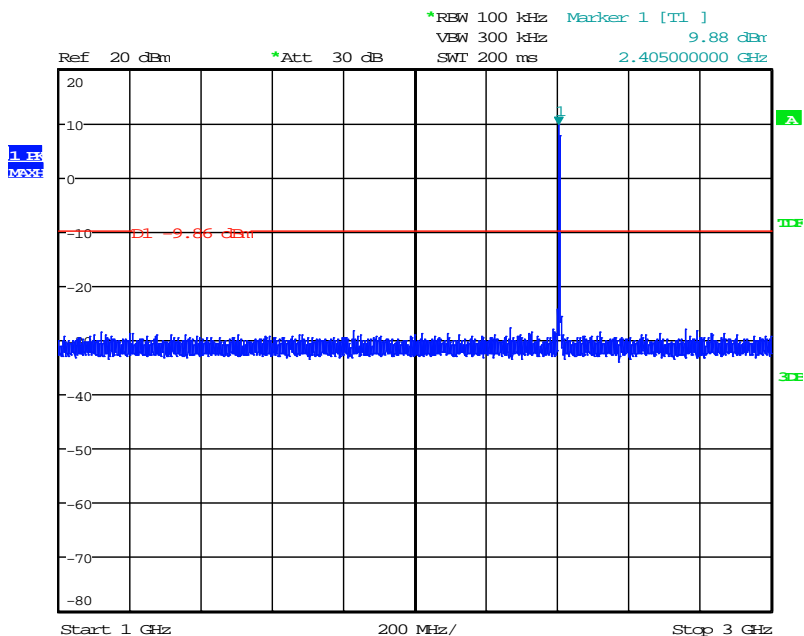
#### 7.4.2.2 Measurement Results

Results are shown below.



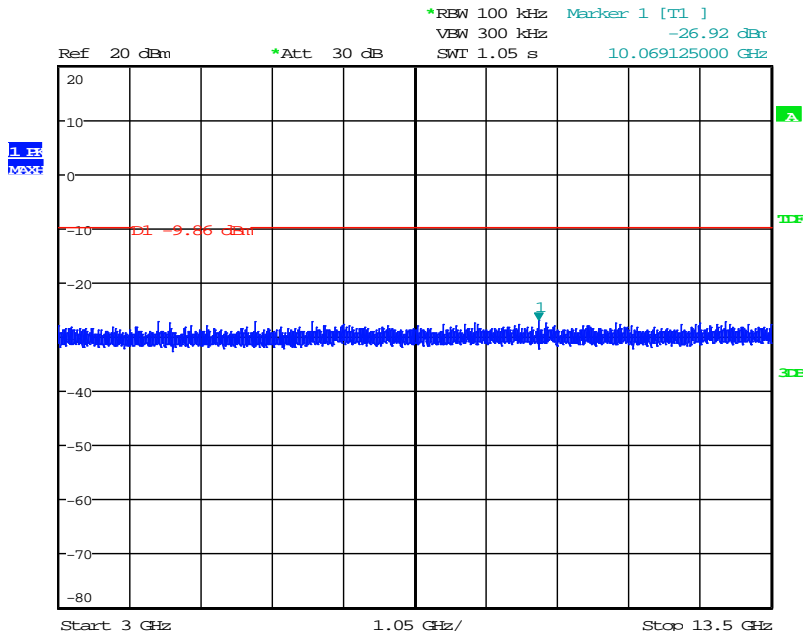
Date: 5.AUG.2014 23:06:30

Figure 7.4.2.2-1: 30 MHz – 1 GHz – Low Channel



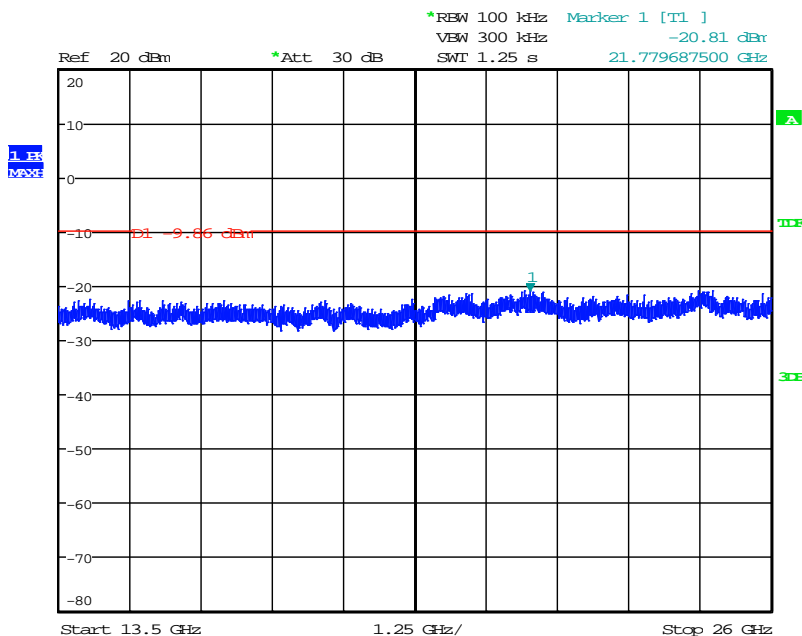
Date: 5.AUG.2014 23:25:54

Figure 7.4.2.2-2: 1 GHz – 3 GHz – Low Channel



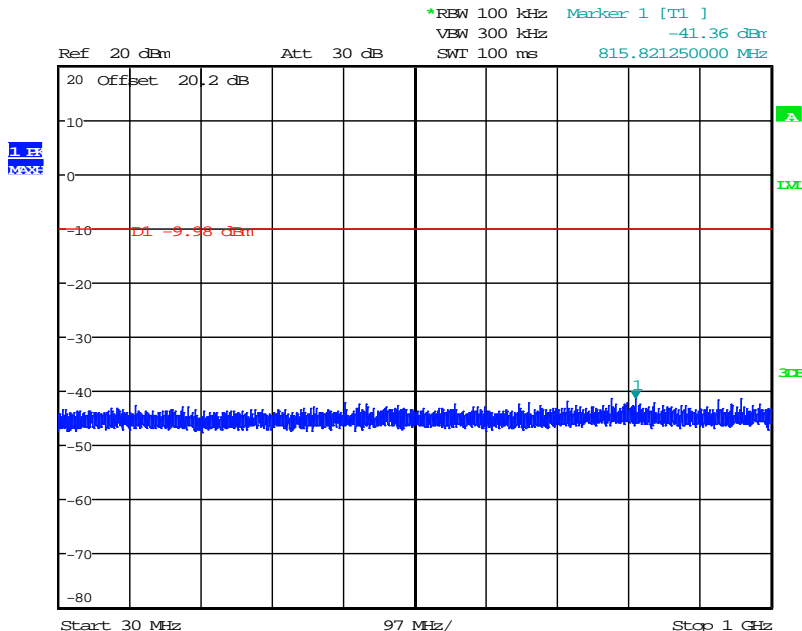
Date: 5.AUG.2014 23:24:49

Figure 7.4.2.2-3: 3 GHz – 13.5 GHz – Low Channel



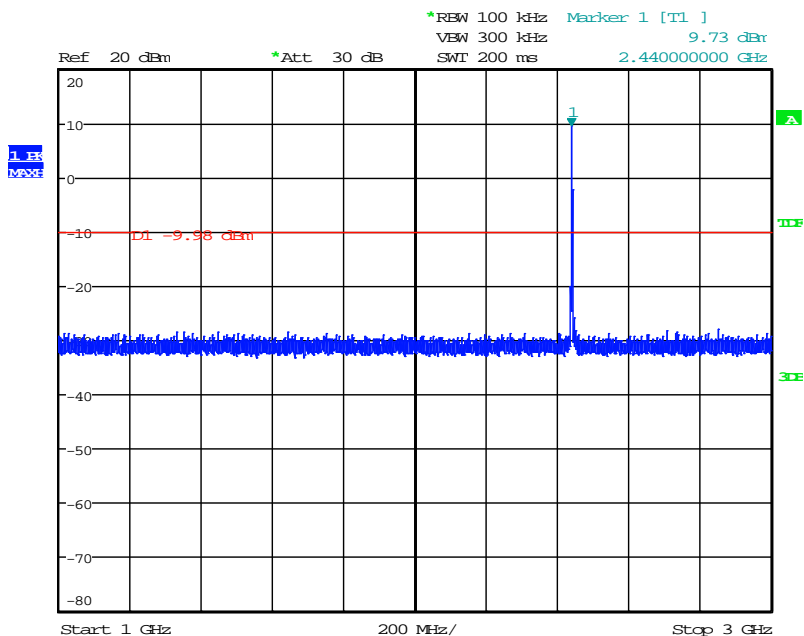
Date: 5.AUG.2014 23:22:40

Figure 7.4.2.2-4: 13.5 GHz – 26 GHz – Low Channel



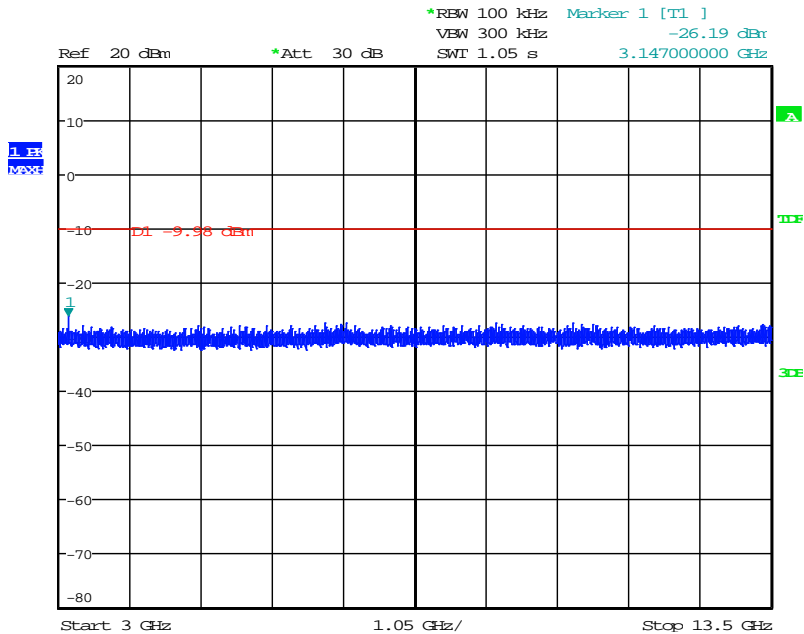
Date: 5.AUG.2014 23:05:08

Figure 7.4.2.2-5: 30 MHz – 1 GHz – Middle Channel



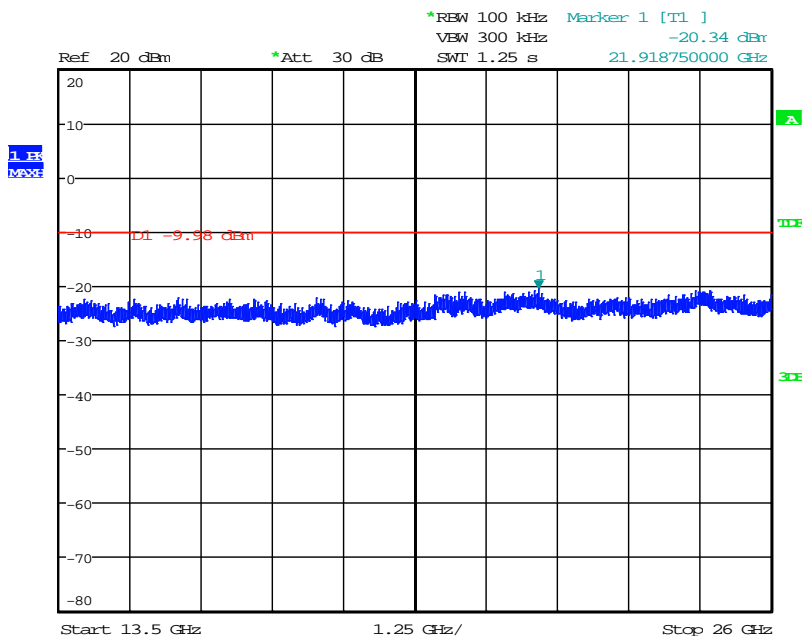
Date: 5.AUG.2014 23:27:51

Figure 7.4.2.2-6: 1 GHz – 3 GHz – Middle Channel



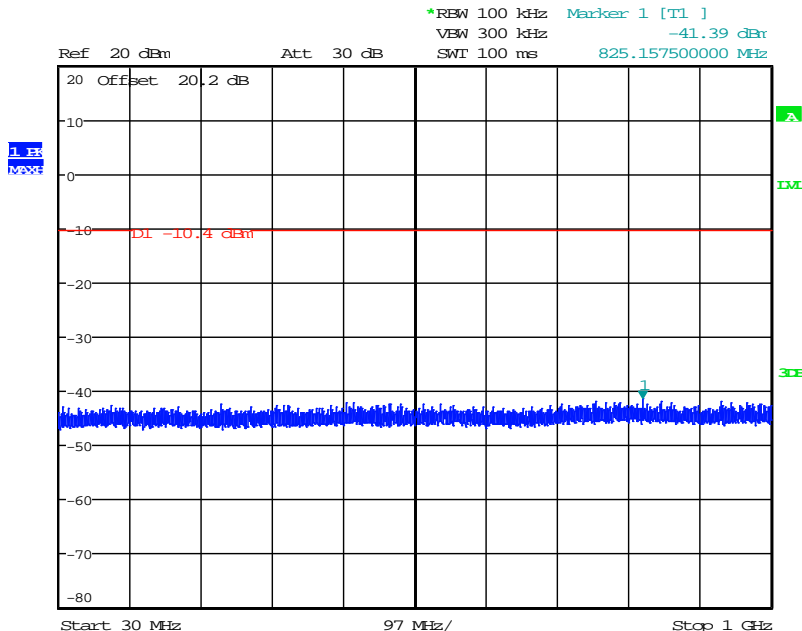
Date: 5.AUG.2014 23:29:35

Figure 7.4.2.2-7: 3 GHz – 13.5 GHz – Middle Channel



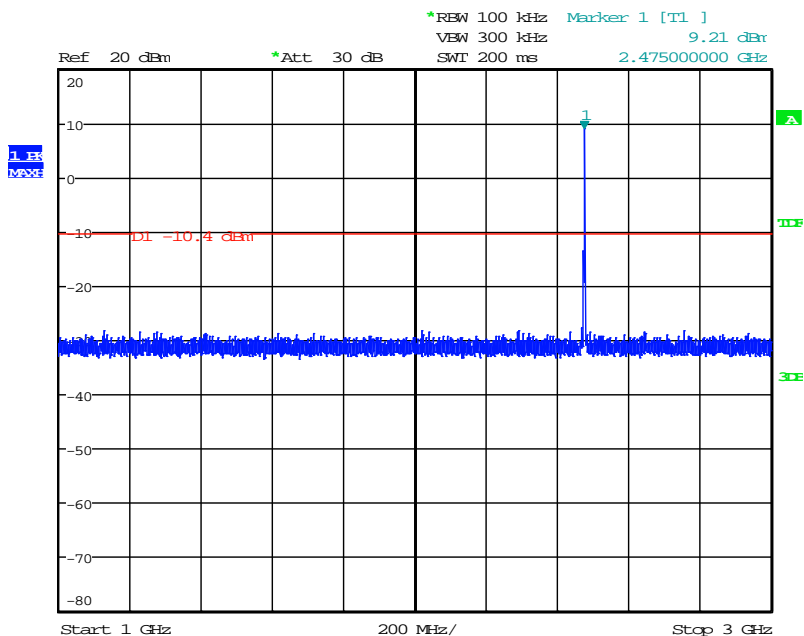
Date: 5.AUG.2014 23:31:33

Figure 7.4.2.2-8: 13.5 GHz – 26 GHz – Middle Channel



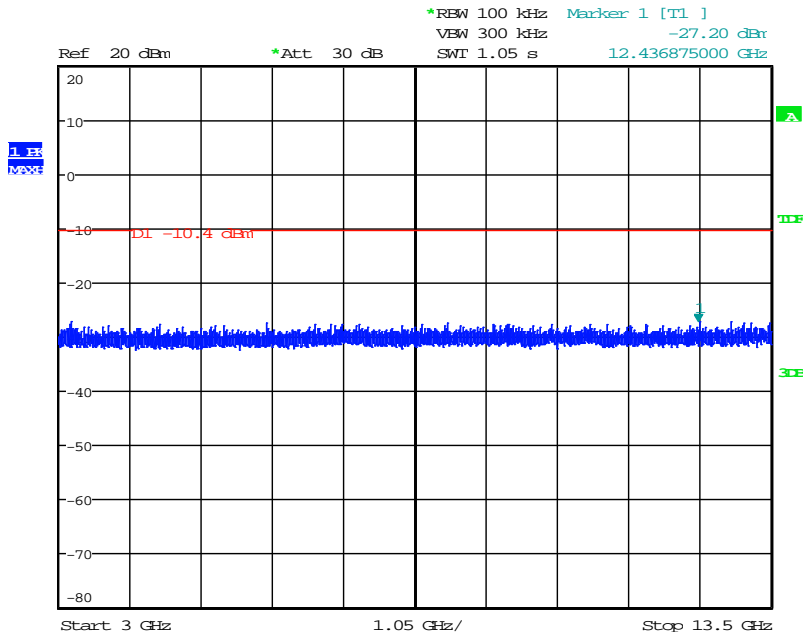
Date: 5.AUG.2014 23:03:50

Figure 7.4.2.2-9: 30 MHz – 1 GHz – High Channel



Date: 5.AUG.2014 23:36:08

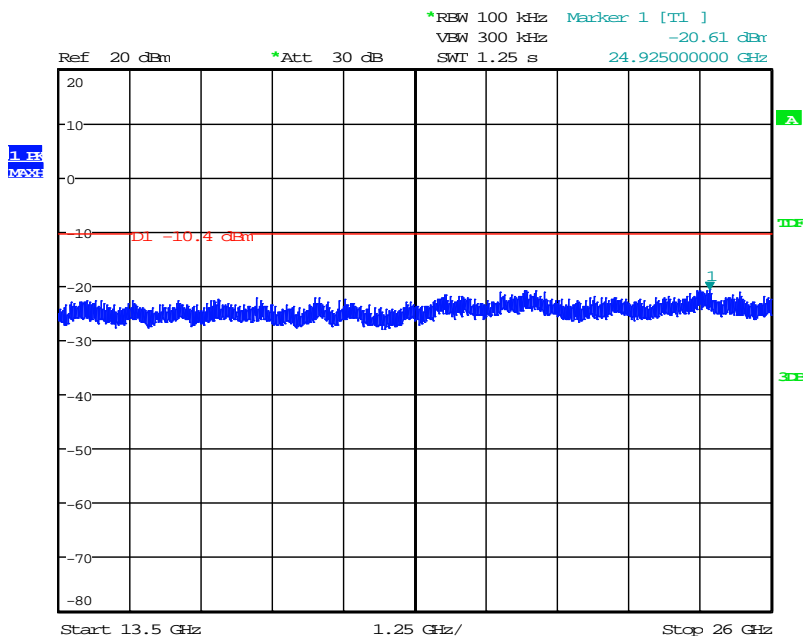
Figure 7.4.2.2-10: 1 GHz – 3 GHz –High Channel



Date: 5.AUG.2014 23:34:50

Figure 7.4.2.2-11: 3 GHz – 13.5 GHz –High Channel





Date: 5.AUG.2014 23:33:15

Figure 7.4.2.2-12: 13.5 GHz – 26 GHz –High Channel

**7.4.3 Radiated Spurious Emissions into Restricted Frequency Bands - FCC 15.205, 15.209; IC: RSS-210 2.2, RSS-Gen 8.9, 8.10****7.4.3.1 Measurement Procedure**

Radiated emissions tests were made over the frequency range of 30 MHz to 26 GHz, 10 times the highest fundamental frequency. Each emission found to be in a restricted band as defined by section 15.205, including any emission at the operational band-edge, was compared to the radiated emission limits as defined in section 15.209.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000 MHz, peak measurements are made with RBW of 1 MHz and VBW of 3 MHz. Average measurements are performed in the linear scale using VBW of 30 Hz over a 5 second sweep.

**7.4.3.2 Measurement Results**

Radiated band-edge and spurious emissions found in the restricted frequency bands of 30MHz to 26 GHz are reported in the tables below.

Table 7.4.3.2-1: Radiated Spurious Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity (H/V)	Correction Factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg			pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
<b>Low Channel 2405 MHz</b>										
2390	63.68	54.27	H	-7.86	55.82	32.43	74.0	54.0	18.2	21.6
2390	59.26	47.49	V	-7.86	51.40	25.65	74.0	54.0	22.6	28.3
4810	68.63	63.50	H	0.35	68.98	49.88	74.0	54.0	5.0	4.1
4810	61.99	56.32	V	0.35	62.34	42.70	74.0	54.0	11.7	11.3
12025	53.43	45.57	H	12.74	66.17	44.33	83.5	63.5	17.3	19.2
12025	49.33	39.46	V	12.74	62.07	38.22	83.5	63.5	21.4	25.3
19240	43.33	31.04	V	10.96	54.29	28.02	83.5	63.5	29.2	35.5
<b>Middle Channel 2440 MHz</b>										
4880	67.37	62.07	H	0.55	67.92	48.64	74.0	54.0	6.1	5.4
4880	60.85	54.83	V	0.55	61.40	41.40	74.0	54.0	12.6	12.6
7320	53.31	44.79	H	5.31	58.62	36.12	74.0	54.0	15.4	17.9
7320	53.22	44.62	V	5.31	58.53	35.95	74.0	54.0	15.5	18.1
12200	53.74	46.03	H	12.99	66.73	45.04	83.5	63.5	16.8	18.5
12200	51.44	42.84	V	12.99	64.43	41.85	83.5	63.5	19.1	21.6
19520	41.59	29.32	H	11.30	52.89	26.64	83.5	63.5	30.6	36.9
19520	41.26	30.43	V	11.30	52.56	27.75	83.5	63.5	30.9	35.7
<b>High Channel 2475 MHz</b>										
2483.5	72.13	63.81	H	-7.47	64.66	42.36	74.0	54.0	9.3	11.6
2483.5	62.95	52.25	V	-7.47	55.48	30.80	74.0	54.0	18.5	23.2
4950	66.95	61.88	H	0.75	67.70	48.65	74.0	54.0	6.3	5.4
4950	60.77	55.02	V	0.75	61.52	41.79	74.0	54.0	12.5	12.2
7425	53.47	44.93	H	5.62	59.09	36.57	74.0	54.0	14.9	17.4
7425	53.16	44.79	V	5.62	58.78	36.43	74.0	54.0	15.2	17.6
12375	52.03	43.97	H	13.24	65.27	43.23	83.5	63.5	18.2	20.3
12375	48.02	39.23	V	13.24	61.26	38.49	83.5	63.5	22.2	25.0
19800	41.43	29.34	H	12.73	54.16	28.09	83.5	63.5	29.3	35.4
19800	43.07	30.89	V	12.73	55.80	29.64	83.5	63.5	27.7	33.9

**Note:**

- The average measurements were further corrected using duty cycle correction factor of 20% as described in the manufacturer's Theory of Operations.
- All emissions above 19800 MHz were attenuated below the limits and the noise floor of the measurement equipment.
- The emissions above 10 GHz were measured at a test distance of 1m. The limits are corrected accordingly using a distance correction factor equal to  $10 \cdot \log(3/1)$  dB = 9.5 dB.

**7.4.3.3 Sample Calculation:**

$$R_C = R_U + CF_T$$

Where:

$CF_T$  = Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)

$R_U$  = Uncorrected Reading

$R_C$  = Corrected Level

AF = Antenna Factor

CA = Cable Attenuation

AG = Amplifier Gain

DC = Duty Cycle Correction Factor

$$\text{Duty Cycle Correction Factor} = 20 \cdot \log(20/100) \text{ dB} = -13.98 \text{ dB}$$

**Example Calculation: Peak**

$$\text{Corrected Level: } 63.68 + (-7.86) = 55.82 \text{ dB}\mu\text{V/m}$$

$$\text{Margin: } 74 \text{ dB}\mu\text{V/m} - 55.82 \text{ dB}\mu\text{V/m} = 18.2 \text{ dB}$$

**Example Calculation: Average**

$$\text{Corrected Level: } 54.27 + (-7.86) - 13.98 = 32.43 \text{ dB}\mu\text{V/m}$$

$$\text{Margin: } 54 \text{ dB}\mu\text{V/m} - 32.43 \text{ dB}\mu\text{V/m} = 21.6 \text{ dB}$$

7.5 Power Spectral Density - FCC Section 15.247(e) IC: RSS-210 A8.2(b)

7.5.1 PSD Measurement Procedure (Conducted Method)

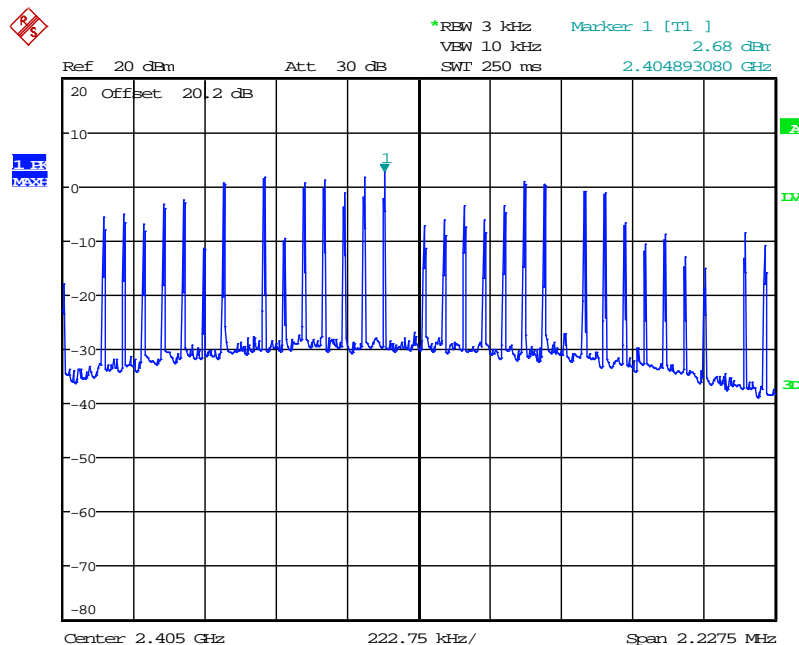
The power spectral density was measured in accordance with the FCC KDB Publication No. 558074 "Guidance for Performing Compliance Measurements on Digital Transmission Systems (47 CFR 15.247)" Section 10.2 Method PKPSD (peak PSD). The RF output port of the EUT was directly connected to the input of the spectrum analyzer. Reference level of the equipment was offset to account for cable loss and external attenuation. The spectrum analyzer RBW was set to 3 kHz and VBW 10 kHz. Span was adjusted to 1.5 times the 6 dB bandwidth and the sweep time was set to auto.

7.5.2 Measurement Results

Results are shown below.

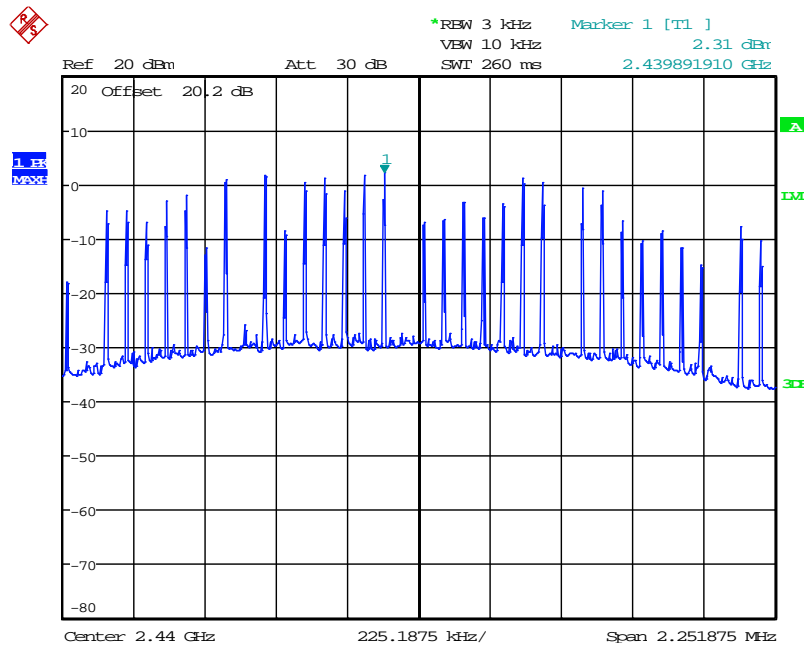
Table 7.5.2-1: Power Spectral Density

Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
2405	2.68	8.0	5.32
2440	2.31	8.0	5.69
2475	1.87	8.0	6.13



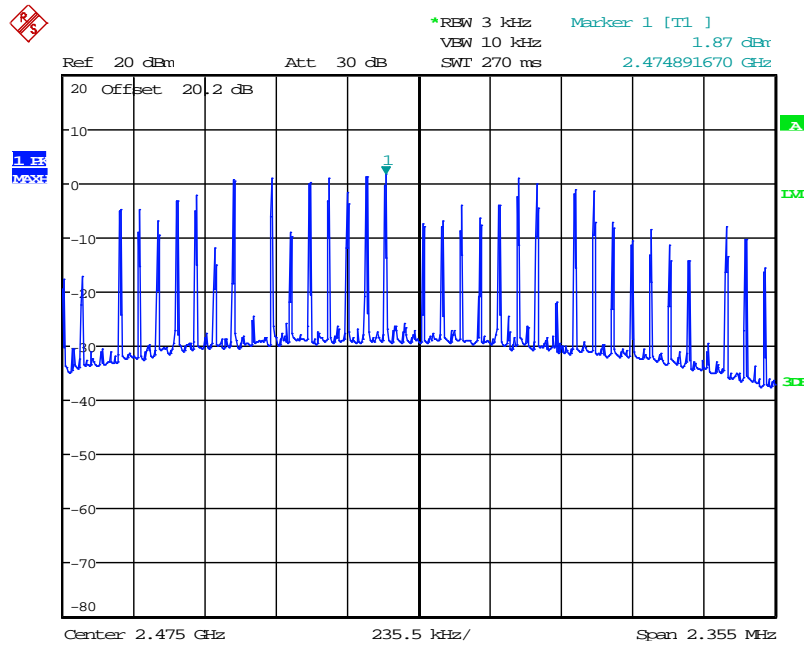
Date: 17.JAN.2015 23:09:29

Figure 7.5.2-1: Power Spectral Density - Low Channel



Date: 17.JAN.2015 23:12:54

Figure 7.5.2-2: Power Spectral Density - Middle Channel



Date: 17.JAN.2015 23:17:19

Figure 7.5.2-3: Power Spectral Density – High Channel

7.6 Power Line Conducted Emissions – FCC: Section 15.207 IC: RSS-Gen 8.8

7.6.1 Measurement Procedure

ANSI C63.4 sections 6 and 7 were the guiding documents for this evaluation. Conducted emissions were performed from 150 kHz to 30 MHz with the spectrum analyzer’s resolution bandwidth set to 9 kHz and the video bandwidth set to 30 kHz. The calculation for the conducted emissions is as follows:

$$\text{Corrected Reading} = \text{Analyzer Reading} + \text{LISN Loss} + \text{Cable Loss}$$

$$\text{Margin} = \text{Applicable Limit} - \text{Corrected Reading}$$

7.6.2 Measurement Results

Results are shown below.

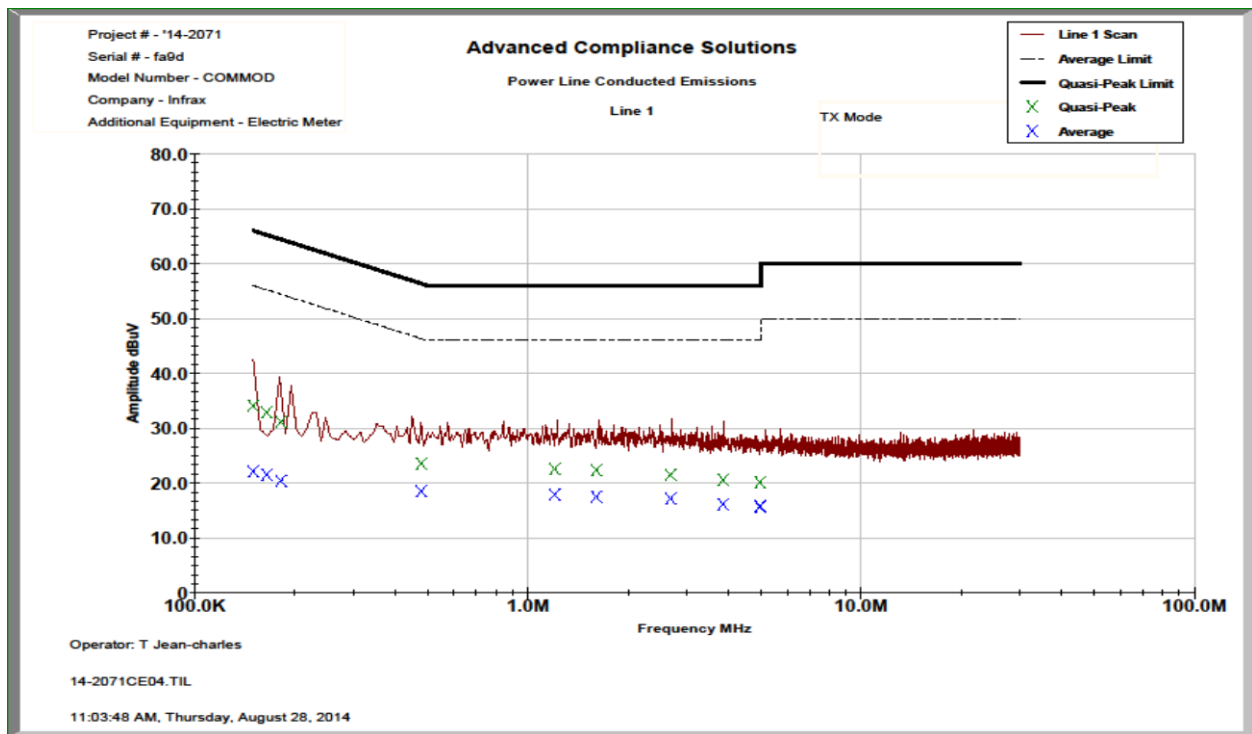


Figure 7.6.2-1: Conducted Emissions Results – Line 1

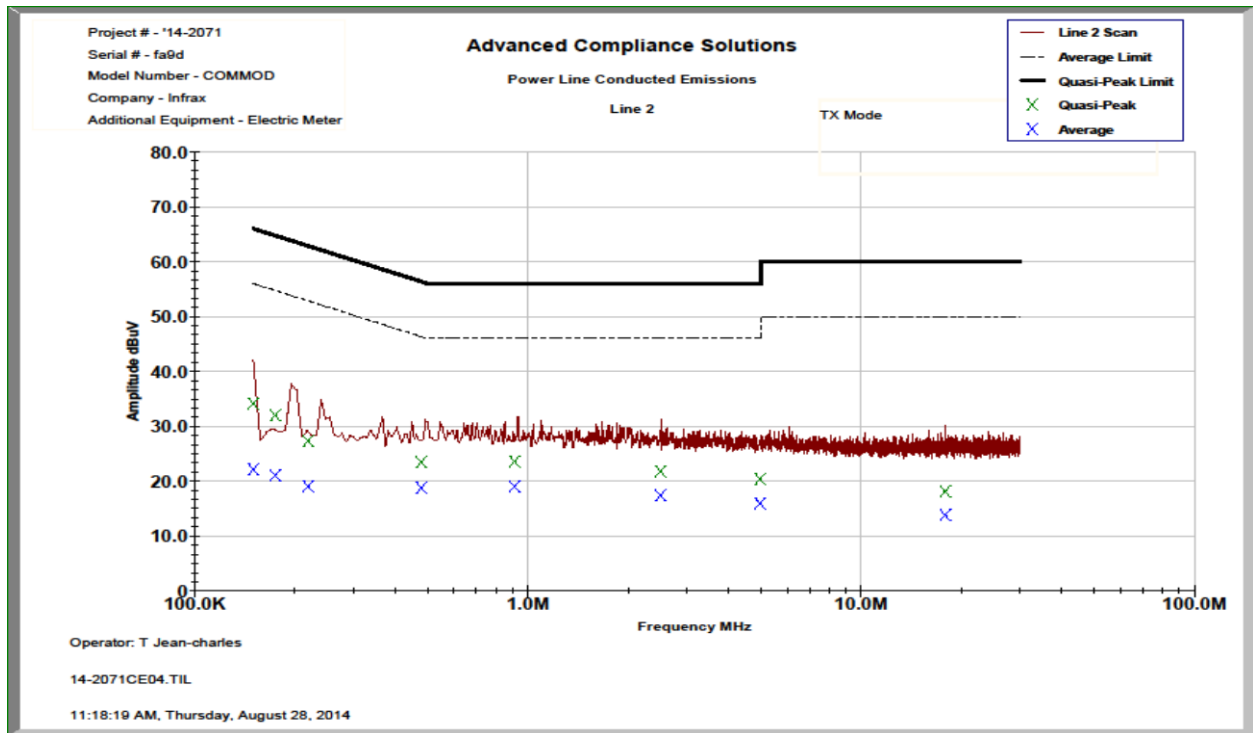


Figure 7.6.2-2: Conducted Emissions Results – Line 2



Table 7.6.2-1: Conducted EMI Results

Line 1    Line 2    Line 3  
 Line 4  
 To Ground    Floating  
 Telecom Port \_\_\_\_\_  
 dBµV    dBµA  
 Plot Number: 14-2071CE04  
 Power Supply Description: N/A

Frequency (MHz)	Uncorrected Reading		Total Correction Factor (dB)	Corrected Level		Limit		Margin (dB)	
	Quasi-Peak	Average		Quasi-Peak	Average	Quasi-Peak	Average	Quasi-Peak	Average
<b>Line 1</b>									
0.150217	24.034	12.055	10.10	34.13	22.15	65.99	55.99	31.9	33.8
0.164799	22.785	11.448	10.10	32.88	21.54	65.22	55.22	32.3	33.7
0.181925	21.098	10.37	10.09	31.18	20.46	64.40	54.40	33.2	33.9
0.479999	13.524	8.458	10.08	23.60	18.54	56.34	46.34	32.7	27.8
1.2046	12.438	7.802	10.11	22.55	17.91	56.00	46.00	33.5	28.1
1.60758	12.181	7.414	10.11	22.29	17.52	56.00	46.00	33.7	28.5
2.68218	11.323	6.927	10.18	21.50	17.11	56.00	46.00	34.5	28.9
3.86125	10.315	5.846	10.23	20.54	16.07	56.00	46.00	35.5	29.9
4.98	9.771	5.479	10.28	20.05	15.76	56.00	46.00	36.0	30.2
4.9801	9.79	5.335	10.28	20.07	15.61	56.00	46.00	35.9	30.4
<b>Line 2</b>									
0.150305	24.075	12.053	10.08	34.15	22.13	65.98	55.98	31.8	33.9
0.174775	21.907	11.003	10.07	31.97	21.07	64.73	54.73	32.8	33.7
0.219549	17.245	8.995	10.08	27.33	19.08	62.84	52.84	35.5	33.8
0.479999	13.387	8.743	10.05	23.44	18.80	56.34	46.34	32.9	27.5
0.913563	13.534	8.986	10.08	23.61	19.06	56.00	46.00	32.4	26.9
2.50307	11.631	7.206	10.14	21.77	17.34	56.00	46.00	34.2	28.7
4.98	10.039	5.611	10.24	20.28	15.85	56.00	46.00	35.7	30.1
4.9801	10.046	5.639	10.24	20.29	15.88	56.00	46.00	35.7	30.1
17.8907	7.318	3.022	10.76	18.07	13.78	60.00	50.00	41.9	36.2

**8 CONCLUSION**

In the opinion of ACS, Inc., the model COMMOD01 meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-210 for the test procedures documented in the test report.

**END REPORT**