Excellence in Compliance Testing

Certification Test Report

FCC ID: 2AGWS-INTUNEI2
IC: 21014-INTUNEI2

FCC Rule Part: 15.247
IC Radio Standards Specification: RSS-247

ACS Report Number: 15-2121.W06.1B

Applicant: DiabloSport, LLC
Model(s): inTune i2

Test Begin Date: **November 23, 2015**
Test End Date: **January 12, 2016**

Report Issue Date: March 9, 2016

ANAB ACCREDITED TESTING LABORATORY

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 ANAB, ANSI, or any agency of the Federal Government.

Project Manager:

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

Reviewed by:

Kirby Munroe
Director, Wireless Certifications
Advanced Compliance Solutions, Inc.

This report contains 51 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-247.

1.2 Applicant Information

DiabloSport / Holley
1865 SW 4th Ave Suite D2
Delray Beach, FL 33444

1.3 Product Description

The DiabloSport, LLC inTune i2 is a handheld embedded computer product used to modify the parameters of a vehicle engine. The device includes an IEEE 802.11b/g 2.4 GHz WLAN transceiver.

Technical Details

Mode of Operation:	IEEE 802.11b/g
Frequency Range:	2412 MHz - 2462 MHz
Number of Channels:	11
Channel Separation:	5 MHz
Modulations:	802.11b: DSSS 802.11g: OFDM
Antenna Type/Gain:	Ceramic Chip Antenna, 0.5 dBi
Input Power:	5 VDC

Model Number: inTune i2

Test Sample Serial Number(s): None provided

Test Sample Condition: The sample evaluated was in good operating condition and no physical damage.

1.4 Test Methodology and Considerations

The EUT was evaluated while connected to a laptop computer and a vehicle computer.

The RF power measurements were performed for the EUT at all available data rates for both modes of operation. The configuration leading to the highest RF output power was considered the worst case configuration and was used for the measurements.

A preliminary radiated emission evaluation was performed for the EUT set in three orthogonal orientations. The final measurements were collected using the orientation of the EUT leading to the highest emissions as compared to the limits. The worst case orientation was observed to be for the EUT set vertically on the table top.

Table 1.4-1: IEEE 802.11b/g Radio Test Configuration

Mode of Operation	Frequency (MHz)	Channel	Test Software Power Setting	Data Rate Setting)
802.11b	2412	1	44	1 Mbps
	2437	6		
	2462	11		
802.11g	2412	1	44	48 Mbps
	2437	6		
	2462	11		

The EUT was also evaluated for unintentional emissions. The results are documented separately in a Declaration of Conformity/Verification test 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

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 ANAB 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 flooring.

The turntable is driven by pneumatic motor, which is capable of supporting a 2000 lb. load. The turntable is flush 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:

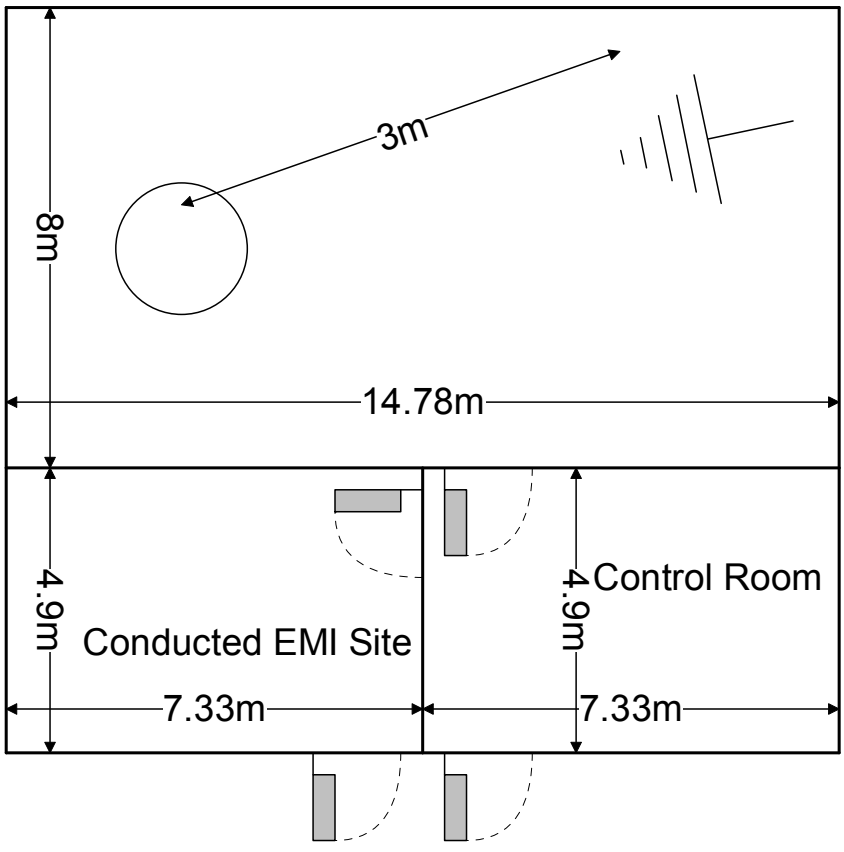


Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

2.3.2 Conducted Emissions Test Site Description

The dimensions of the shielded conducted room are 7.3 x 4.9 x 3 m^3. The power line conducted emission site includes two LISNs: a Solar Model 8028-50 50 Ω/50 µH and an EMCO Model 3825/2R, which are installed as shown in the figure below. For evaluations requiring 230 V, 50 Hz AC input, a Polarad LISN (S/N 879341/048) is used in conjunction with a California Instruments signal generator Model 2001RP-OP1.

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

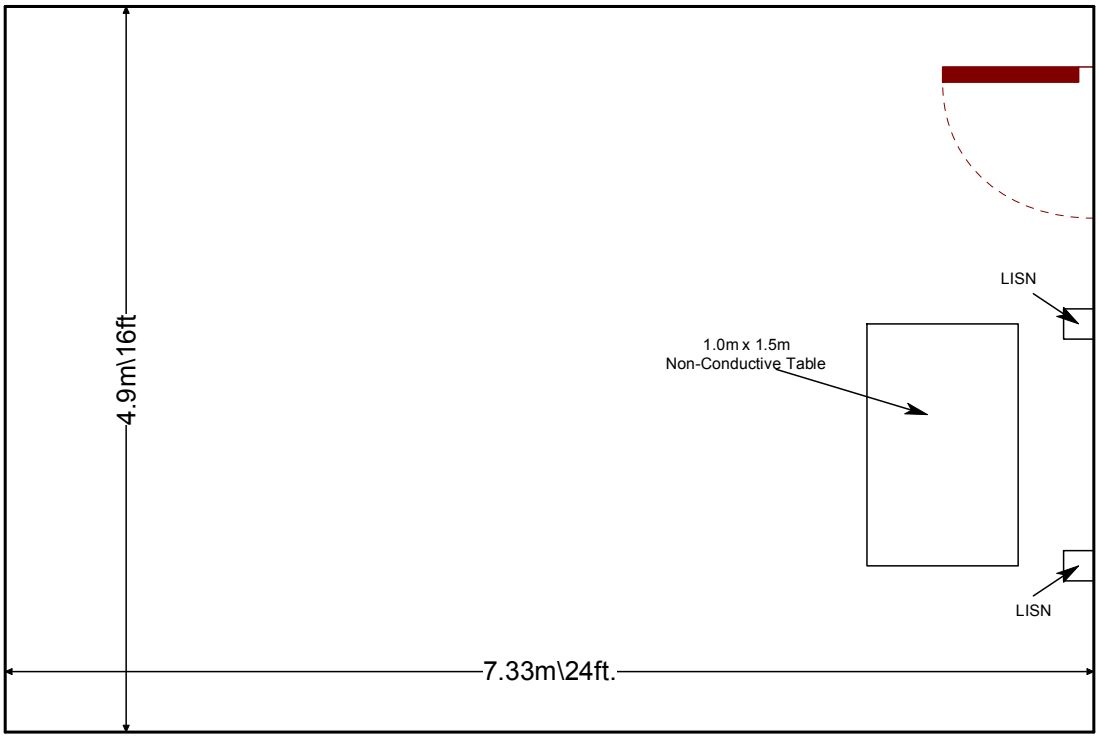


Figure 2.3.2-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ANSI C63.4-2014: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9 kHz to 40 GHz.
- ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2016.
- US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2016
- Industry Canada Radio Standards Specification: RSS-247 — Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices, Issue 1, May 2015.
- 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
22	Agilent	8449B	Amplifiers	3008A00526	5/18/2015	5/18/2016
479	Electro-Metrics	ALP-70	Antennas	158	12/2/2013	12/2/2015
479	Electro-Metrics	ALP-70	Antennas	158	12/3/2015	12/3/2017
523	Agilent	E7405	Spectrum Analyzers	MY45103293	12/26/2014	12/26/2016
653	Suhner	SF-102A	Cables	0944/2A	4/13/2015	4/13/2016
2003	EMCO	3108	Antennas	2148	2/18/2014	2/18/2016
2005	FAU EMI R&D Lab	Lazarus	Antennas	EM001	1/27/2014	1/27/2016
2006	EMCO	3115	Antennas	2573	4/14/2015	4/14/2017
2008	COM-Power	AH-826	Antennas	81009	NCR	NCR
2011	Hewlett-Packard	HP 8447D	Amplifiers	2443A03952	11/18/2015	11/18/2016
2022	EMCO	LISN3825/2R	LISN	1095	9/14/2015	9/14/2017
2045	ACS Boca	Conducted Cable Set	Cable Set	2045	11/11/2015	11/11/2016
2070	Mini Circuits	VHF-8400+	Filter	2070	11/17/2015	11/17/2016
2072	Mini Circuits	VHF-3100+	Filter	30737	11/17/2015	11/17/2016
2082	Teledyne Storm Products	90-010-048	Cables	2082	4/22/2015	4/22/2016
2086	Merrimac	FAN-6-10K	Attenuators	23148-83-1	11/16/2015	11/16/2016
2095	ETS Lindgren	TILE4! - Version 4.2.A	Software	85242	NCR	NCR
2111	Aeroflex Inmet	40AH2W-20	Attenuator	2111	7/22/2015	7/22/2016
2121	ACS Boca	Radiated Cable Set	Cable Set	2121	8/22/2015	8/22/2016
3004	Teseq	CFL 9206A	Attenuators	34720	10/7/2015	10/7/2016
RE619	Rhode & Schwarz	ESU26	Spectrum Analyzers	1302.6005K26 Ser. 100190	11/5/2014	11/5/2016

Notes:

- **NCR=No Calibration Required**
- **The asset calibration information is provided to cover the entire test period.**

5 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	DiabloSport	inTune i2	N/A
2	OBD Interface Fixture	DiabloSport	N/A	N/A
3	Vehicle Control Module	Continental Corporation	A2C7591670400	T00EP2724A0E40
4	3 VDC Analog Input	DiabloSport	N/A	N/A
5	Laptop	DELL	Latitude E6430s	10436043781
6	19.5V-4.62A Laptop AC Adapter	DELL	LA65NS2-01	CN-06TM1C-72438-358-218F-A01
7	Mouse	DELL	M-UAR DEL7	LZ9440C43W5
8	Headphone	Maxell	N/A	N/A
9	Power Supply	BK Precision	1692	S940035931
10	Ferrite	FAIR-RITE	0431164181	N/A
11	Ferrite	FAIR-RITE	0431164951	N/A
12	Ferrite	FAIR-RITE	0431164281	N/A

Table 5-2: Cable Description

Cable #	Cable Type	Length	Shield	Termination
A	OBD II cable	1.79 m	No	EUT to OBD Box
B	Mini USB cable	1.8 m	No	EUT to Laptop
C	2.5mm Power cable	2.8 m	No	EUT to 3 VDC Analog Input
D	OBD cable	0.7 m	No	OBD Box to Vehicle Controller
E	Power Cable	2.45 m	No	OBD Box to Ext Power Supply
F	Power	1.8 m	No	Power Supply to AC Mains
G	audio cable	0.95 m	No	Laptop to Headphone
H	USB cable	1.8 m	No	Laptop to Mouse
I	Power	1.72 m	No	Laptop to AC Adapter
J	Power Cord	0.9 m	No	Laptop AC Adapter to Extension Cord
K	Extension Power Cord	1.82 m	No	Power Cord to AC Mains

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

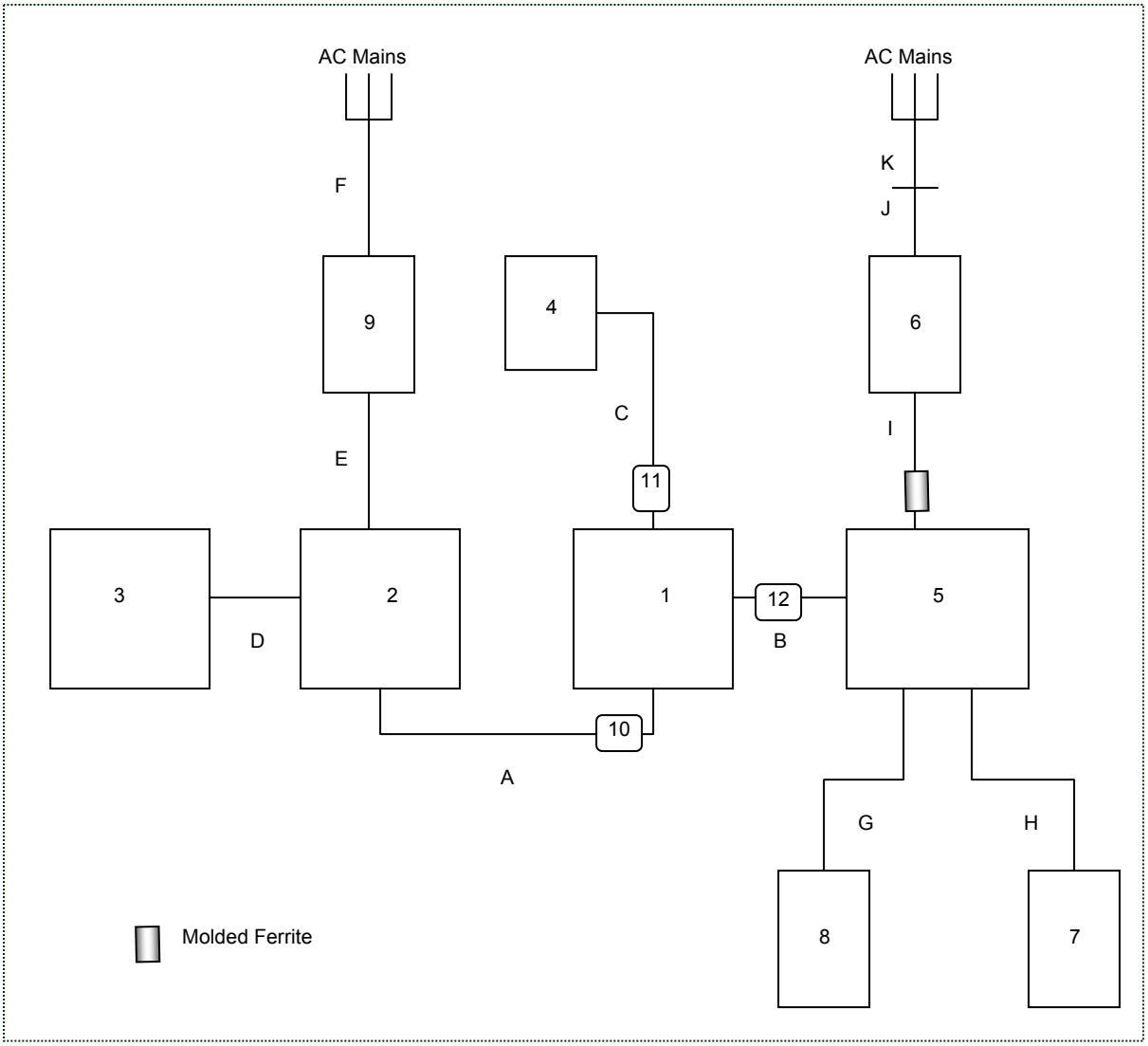


Figure 6-1: EUT Test Setup

*Note: The ferrites listed in the block diagram are required for compliance of the digital device to the unintentional emissions requirements.

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 WLAN transceiver of the inTune I2 uses an internal ceramic chip antenna, that is directly soldered to the PCB. The antenna is not removable without damaging the device, thus meeting the requirements of FCC Section 15.203.

7.2 6 dB Bandwidth - FCC: Section 15.247(a)(2) IC: RSS-247 5.5(1); 99% Bandwidth IC: RSS-GEN 6.6

7.2.1 Measurement Procedure

The 6dB bandwidth was measured in accordance with ANSI C63.10:2013 Section 11.8 DTS 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 emissions and >> RBW.

The 99% occupied bandwidth was measured with the spectrum analyzer span set to fully display the emission. The RBW was set to 1% to 5% of the approximated bandwidth. The occupied 99% bandwidth was measured by using 99% bandwidth equipment function of the spectrum analyzer.

7.2.2 Measurement Results

Results are shown below.

802.11b

Table 7.2.2-1: 6dB / 99% Bandwidth

Frequency [MHz]	6dB Bandwidth [MHz]	99% Bandwidth (MHz)
2412	10.067	14.744
2437	10.071	14.744
2462	10.073	14.744

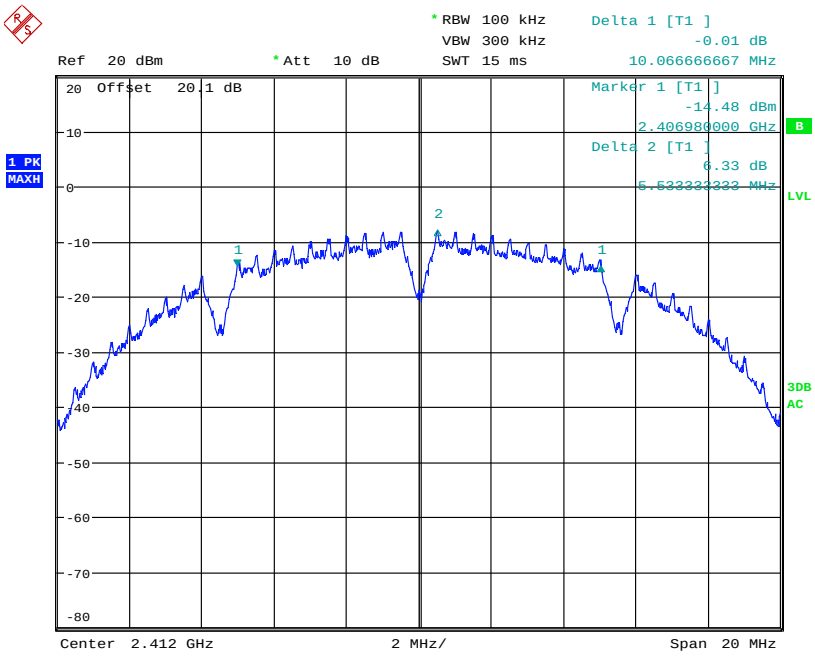


Figure 7.2.2-1: 6dB BW - Low Channel

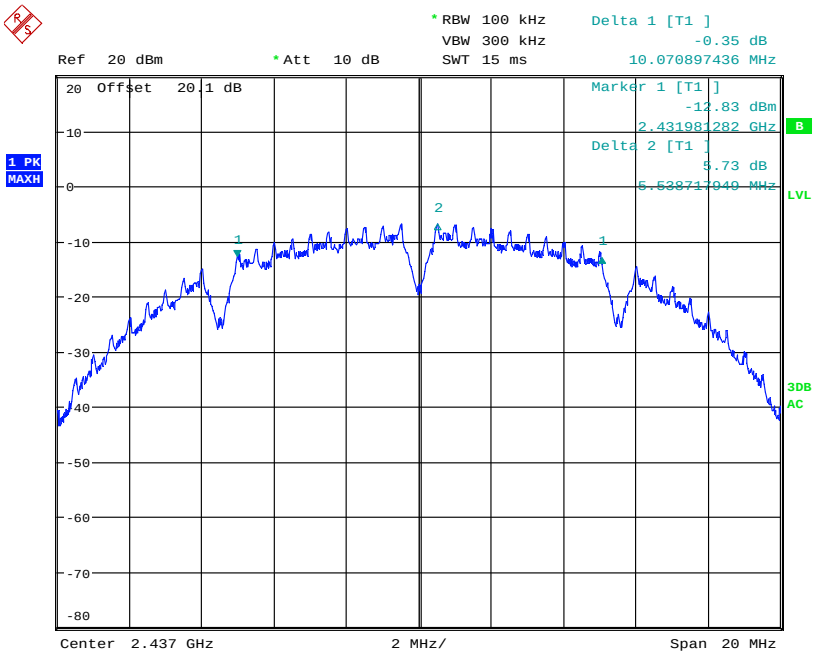


Figure 7.2.2-2: 6dB BW - Middle Channel

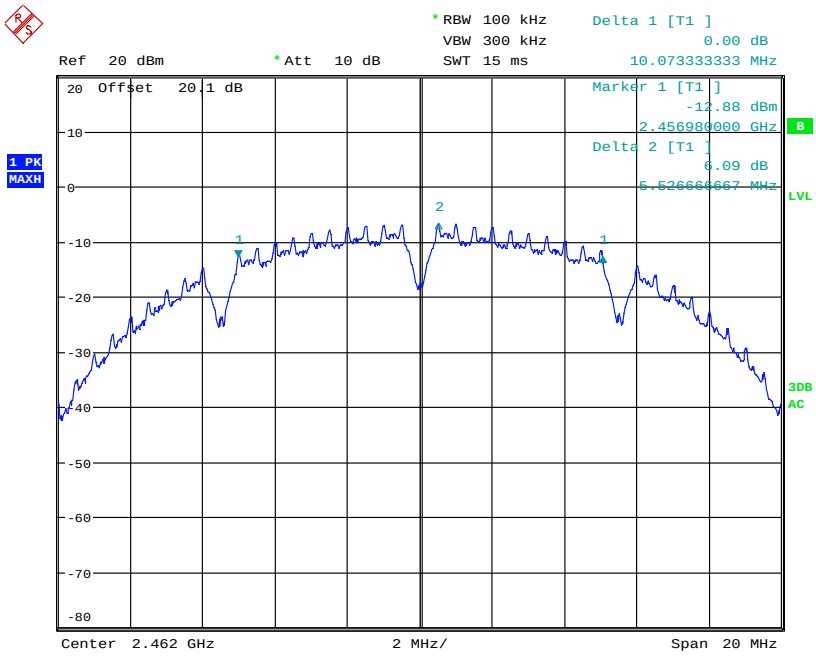


Figure 7.2.2-3: 6dB BW - High Channel

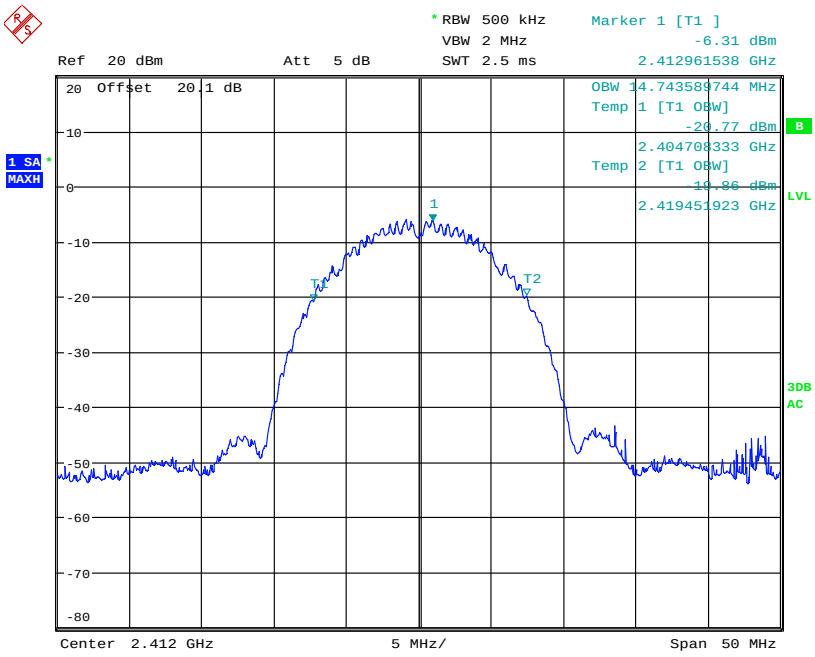


Figure 7.2.2-4: 99% OBW - Low Channel

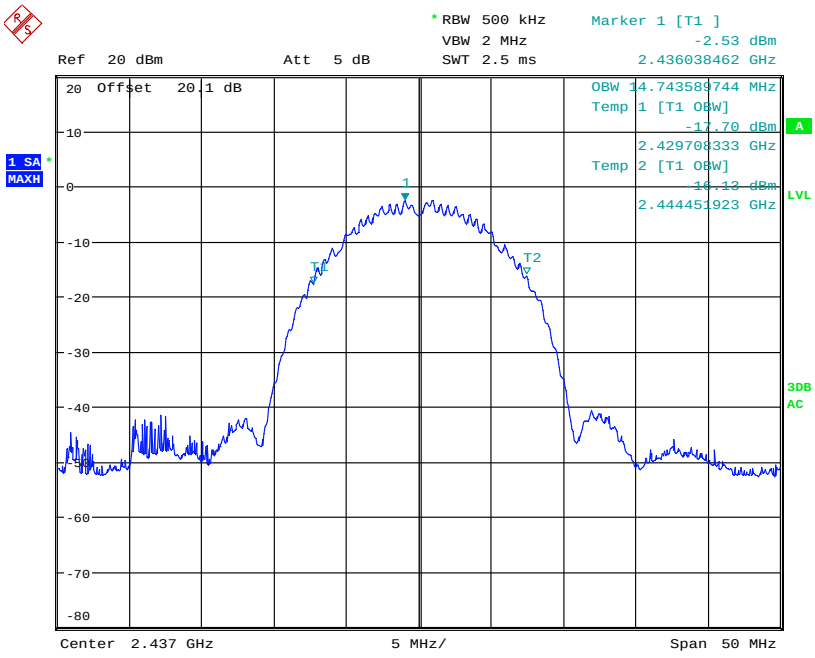


Figure 7.2.2-5: 99% OBW - Middle Channel

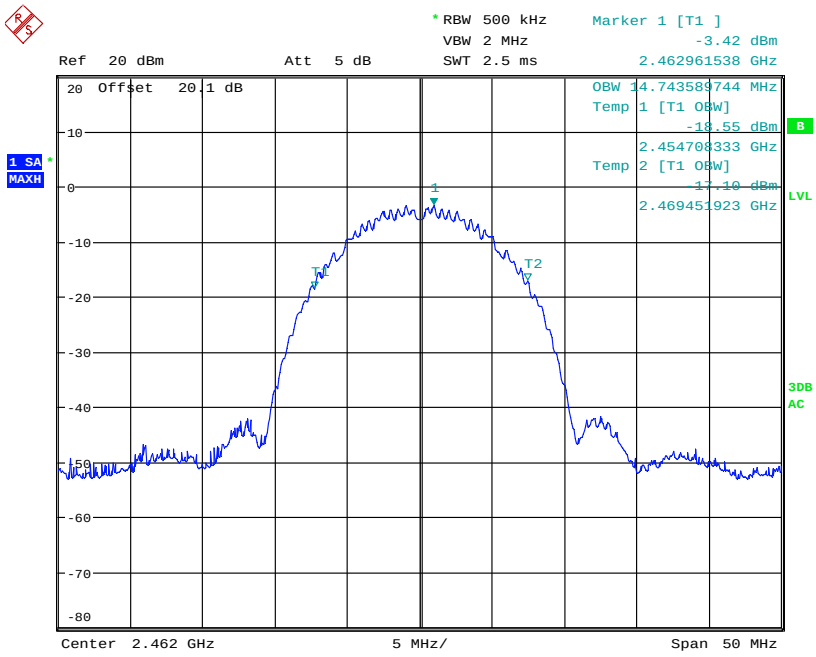


Figure 7.2.2-6: 99% OBW - High Channel

802.11g

Table 7.2.2-2: 6dB / 99% Bandwidth

Frequency [MHz]	6dB Bandwidth [MHz]	99% Bandwidth (MHz)
2412	16.460	16.987
2437	16.460	16.907
2462	16.453	16.987

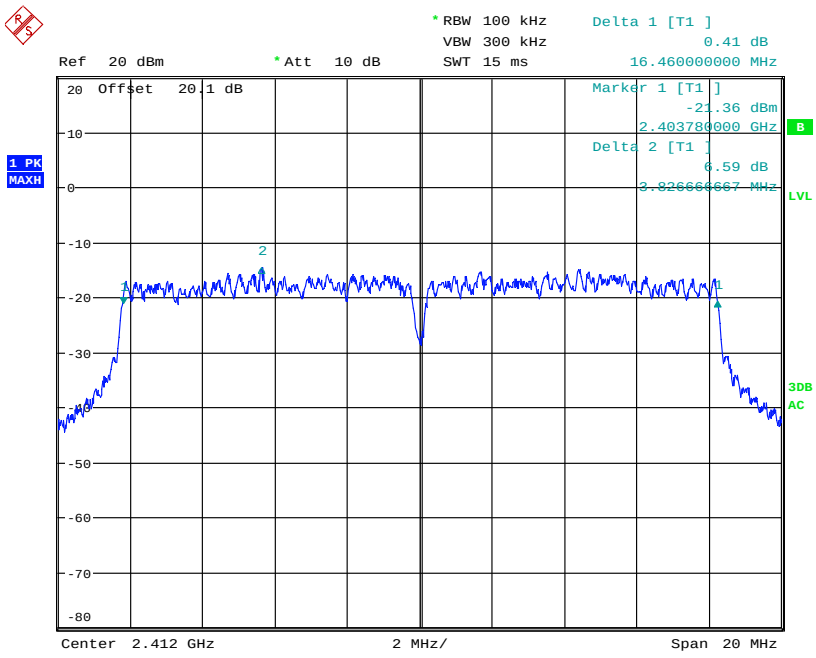


Figure 7.2.2-7: 6dB BW - Low Channel

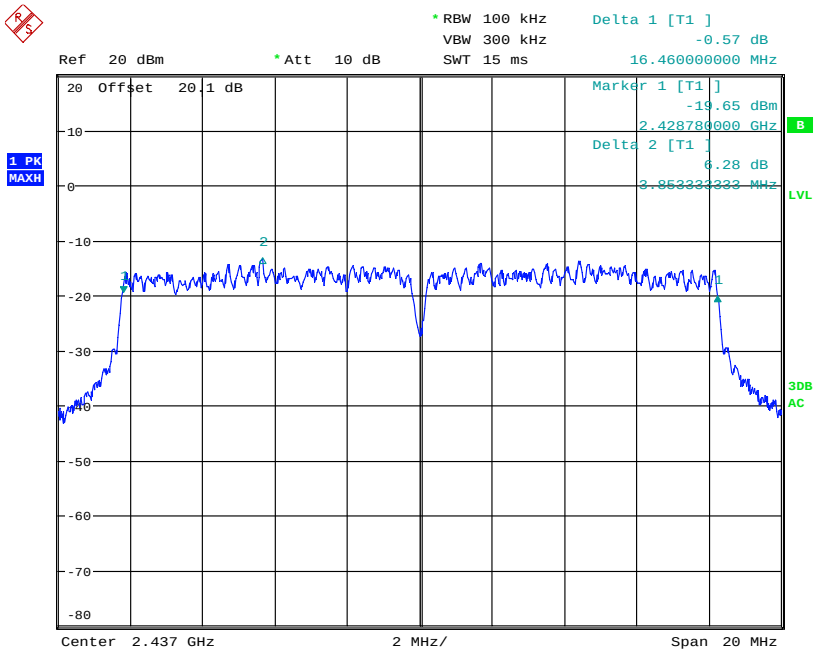


Figure 7.2.2-8: 6dB BW - Middle Channel

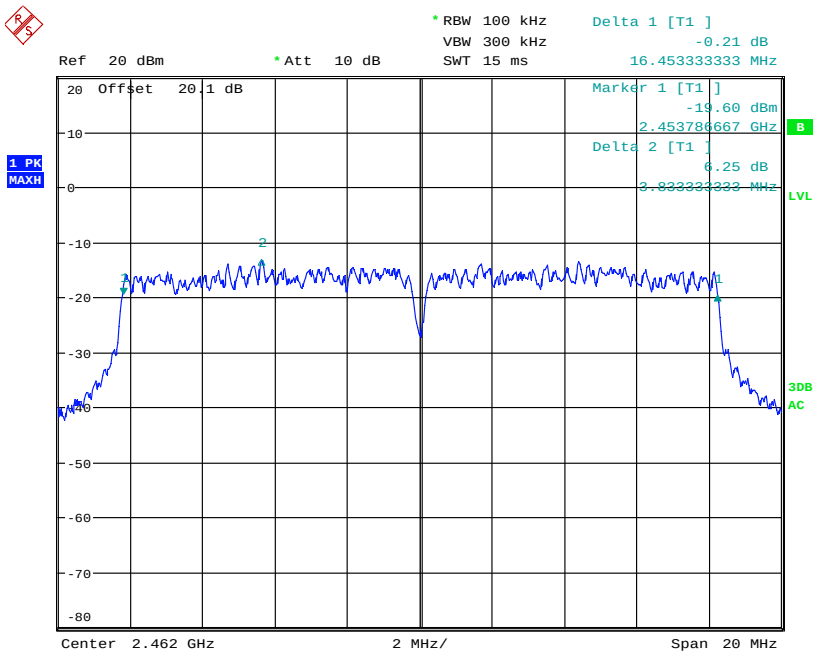


Figure 7.2.2-9: 6dB BW - High Channel

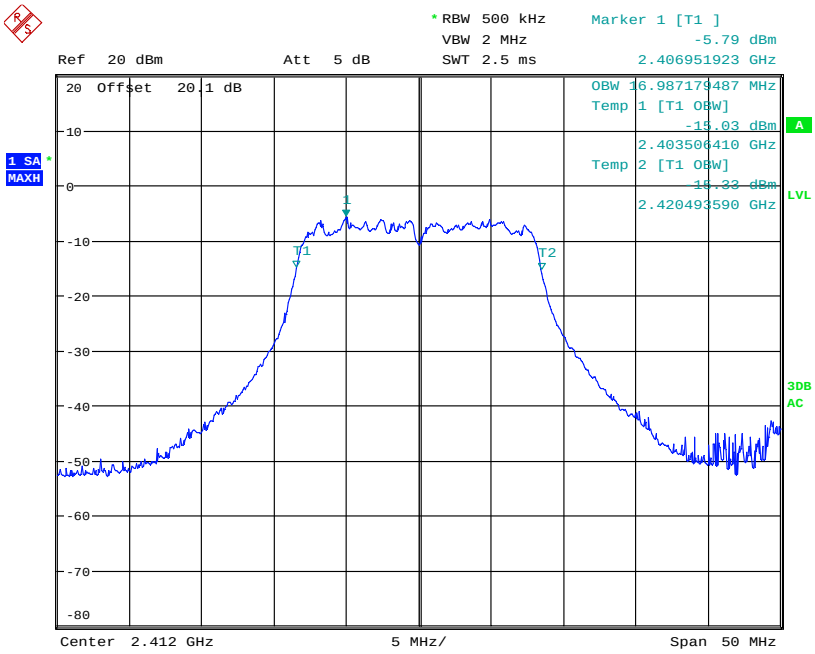


Figure 7.2.2-10: 99% OBW - Low Channel

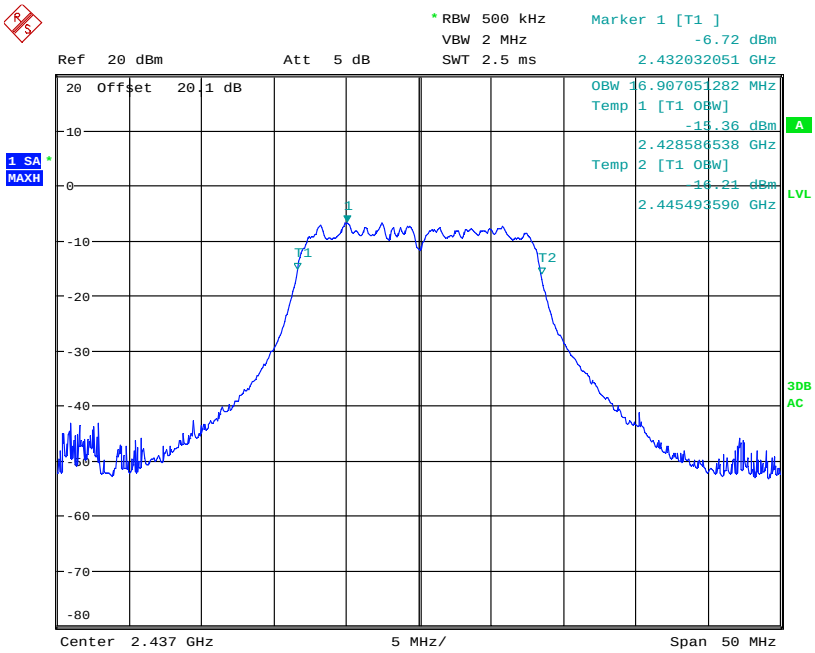


Figure 7.2.2-11: 99% OBW - Middle Channel

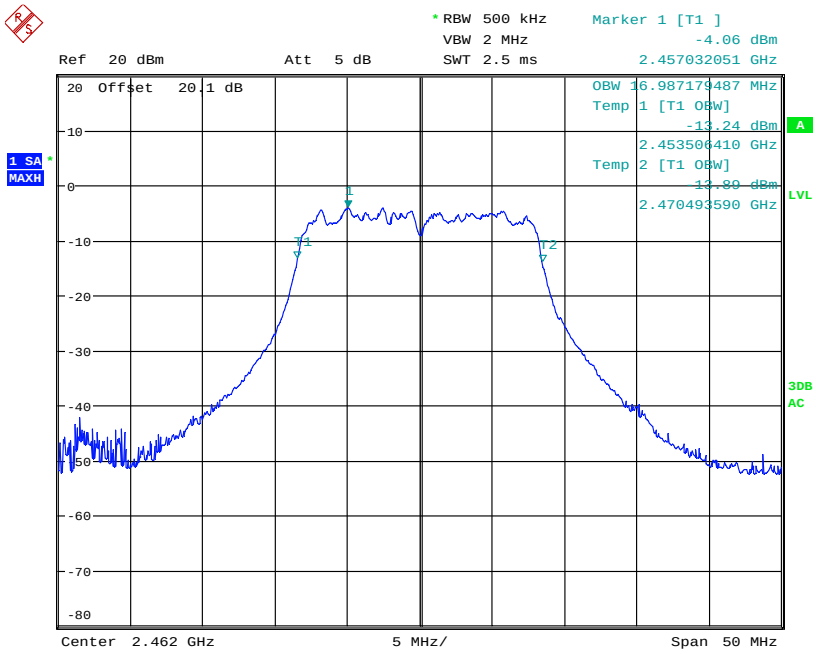


Figure 7.2.2-12: 99% OBW - High Channel

7.3 Maximum Conducted Output Power - FCC Section 15.247(b)(3) IC: RSS-247 5.4(4))

7.3.1 Measurement Procedure (Conducted Method)

The fundamental emission output power was measured in accordance with ANSI C63.10:2013 Section 11.9.2.2.2 Method AVGSA-1. The power was measured over the 99% bandwidth. 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.

802.11b

Table 7.3.2-1: RF Output Power

Frequency [MHz]	Level [dBm]
2412	2.70
2437	5.00
2462	5.12

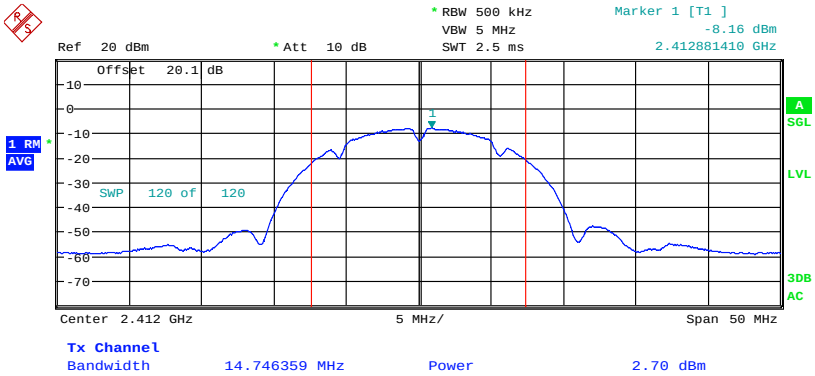
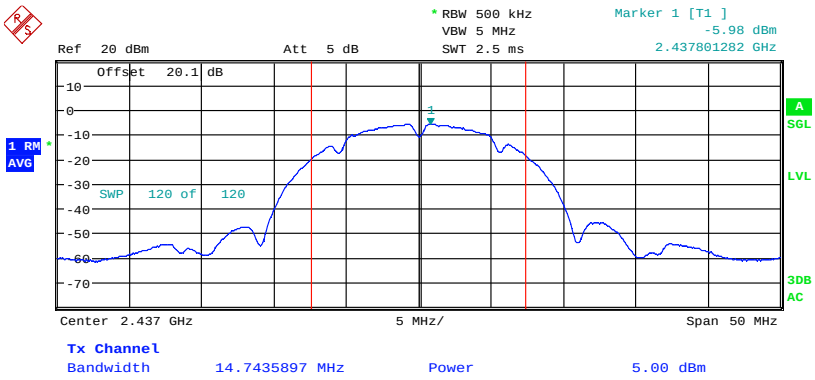
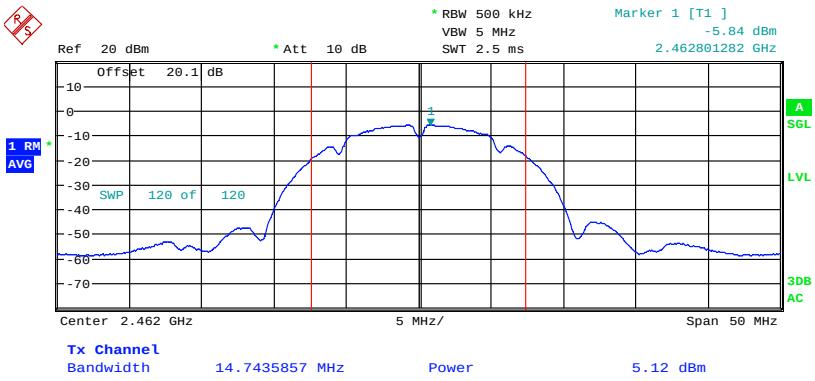


Figure 7.3.2-1: RF Output Power - Low Channel



Date: 25.NOV.2015 20:24:32

Figure 7.3.2-2: RF Output Power - Middle Channel



Date: 28.NOV.2015 20:27:41

Figure 7.3.2-3: RF Output Power - High Channel

802.11g

Table 7.3.2-2: RF Output Power

Frequency [MHz]	Level [dBm]
2412	-1.71
2437	0.56
2462	0.72

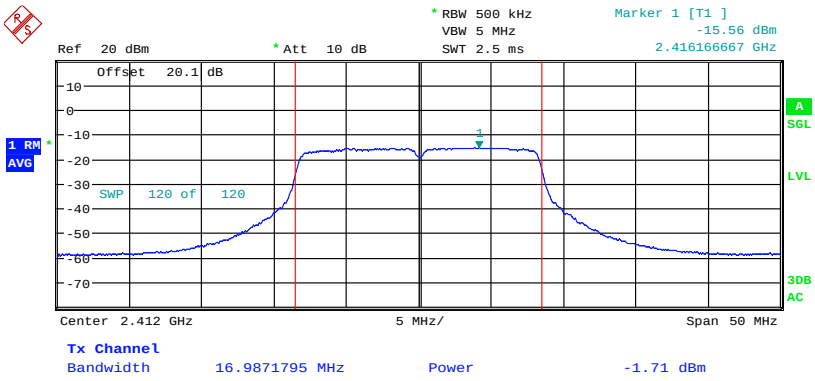


Figure 7.3.2-4: RF Output Power - Low Channel

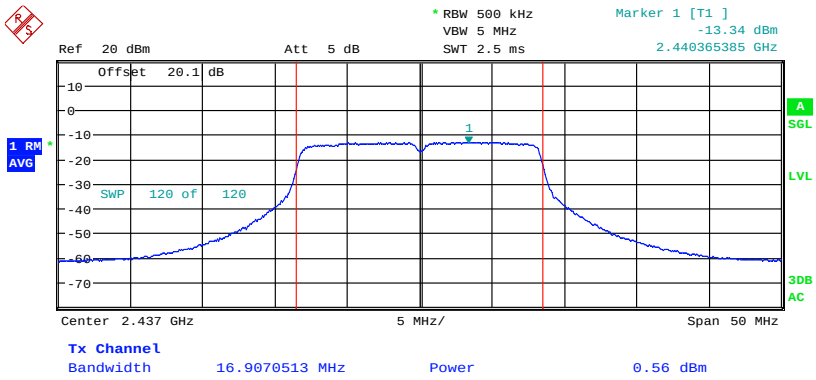


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Figure 7.3.2-5: RF Output Power - Middle Channel

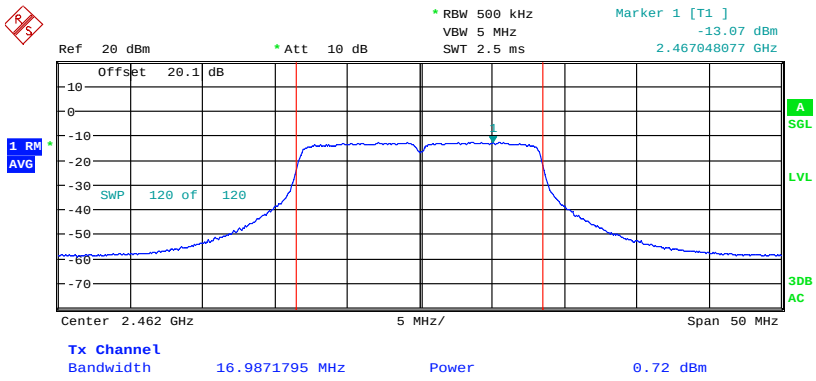

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Figure 7.3.2-6: RF Output Power - High Channel

7.4 Band-Edge Compliance and Spurious Emissions-FCC 15.247(d) IC: RSS-247 5.5

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.

802.11b

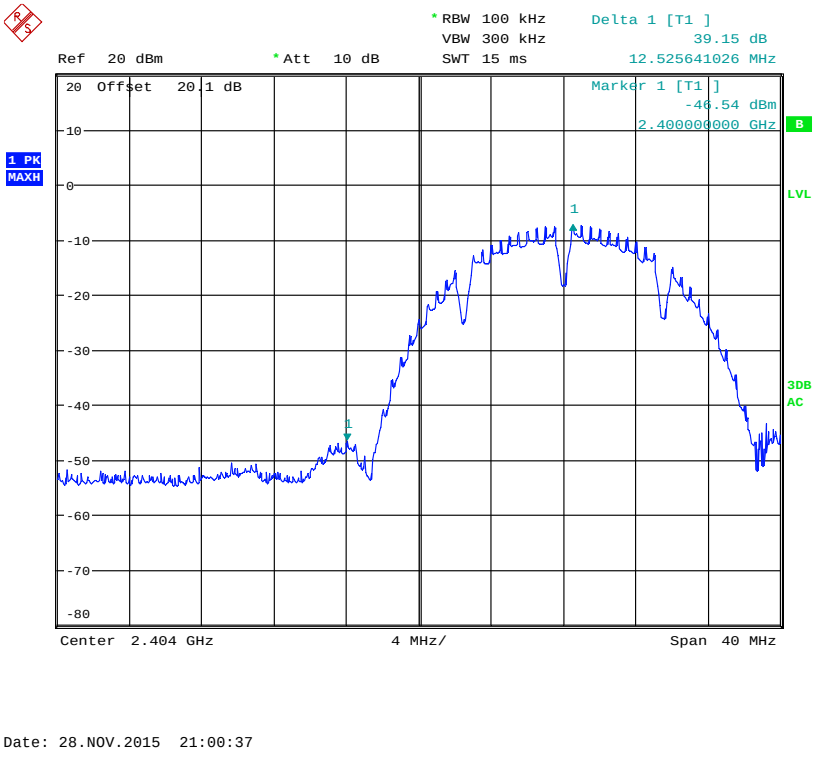


Figure 7.4.1.2-1: Lower Band-edge

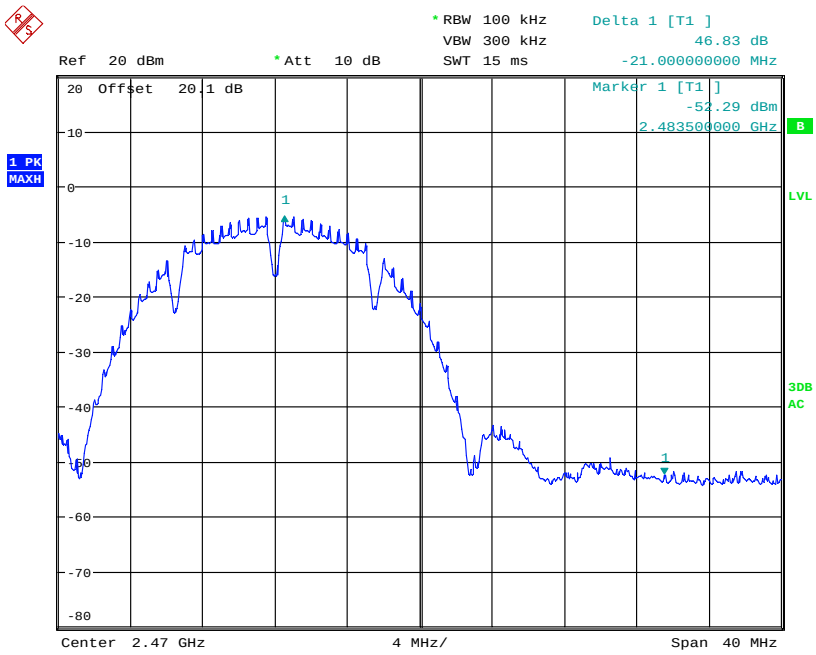


Figure 7.4.1.2-2: Upper Band-edge

802.11g

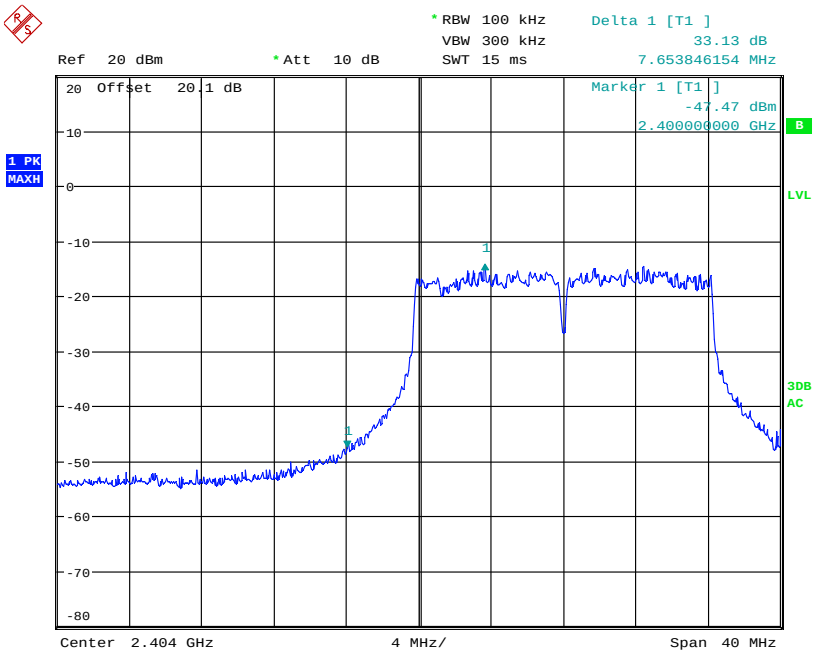


Figure 7.4.1.2-3: Lower Band-edge

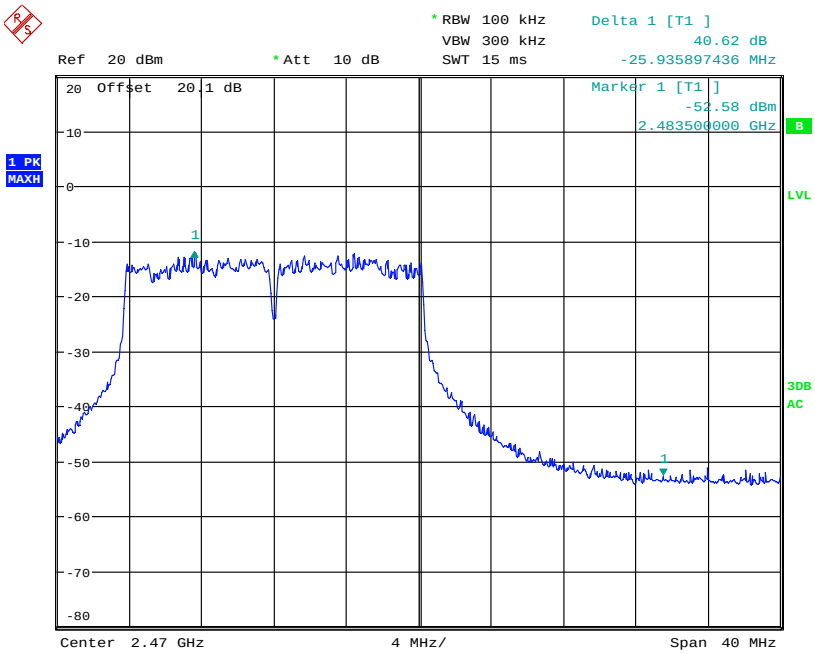


Figure 7.4.1.2-4: Upper Band-edge

7.4.2 RF Conducted Spurious Emissions

7.4.2.1 Measurement Procedure

The RF Conducted Spurious Emissions were measured in accordance with ANSI C63.10:2013 Section 11.11 Emissions in non-restricted frequency bands. 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 30 MHz 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 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.

802.11b

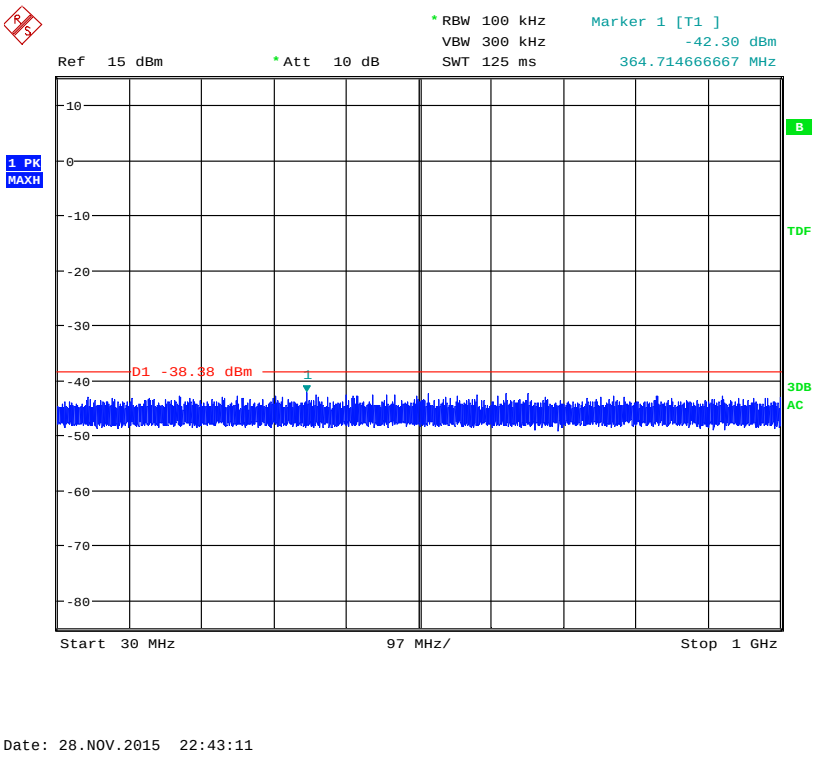
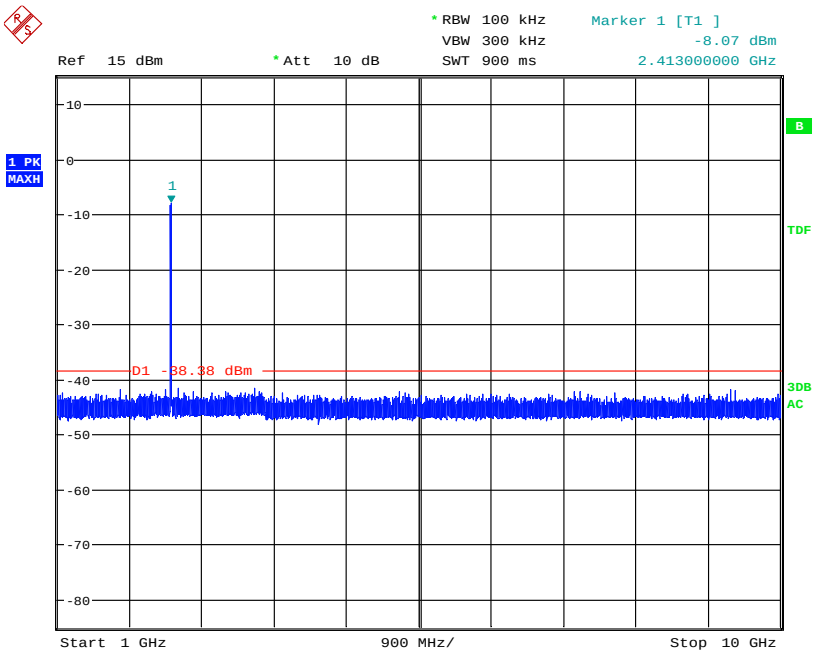


Figure 7.4.2.2-1: 30 MHz – 1 GHz – Low Channel



Date: 28.NOV.2015 22:34:41

Figure 7.4.2.2-2: 1 GHz –10 GHz – Low Channel

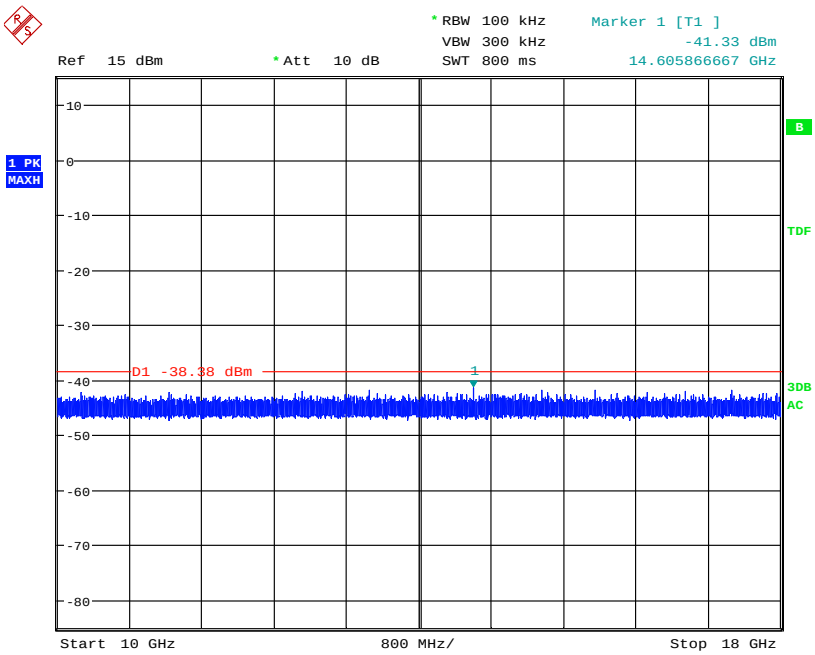


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Figure 7.4.2.2-3: 10 GHz –18 GHz – Low Channel

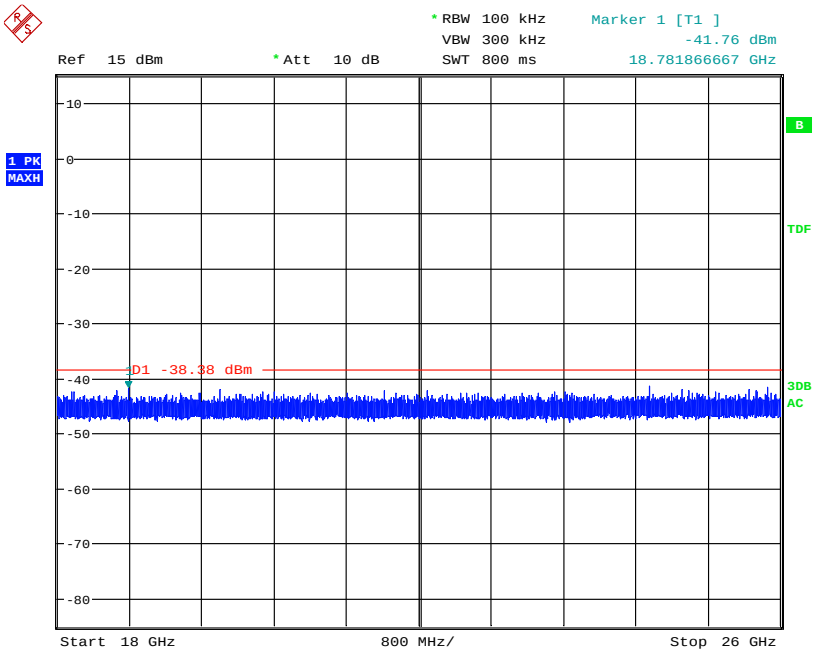

Figure 7.4.2.2-4: 18 GHz – 26 GHz – Low Channel

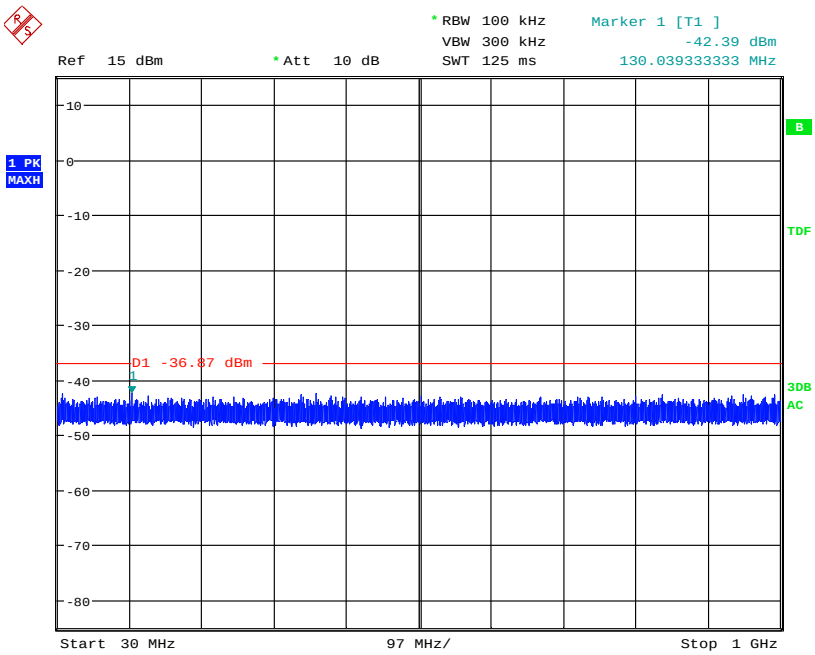

Figure 7.4.2.2-5: 30 MHz – 1 GHz –Middle Channel

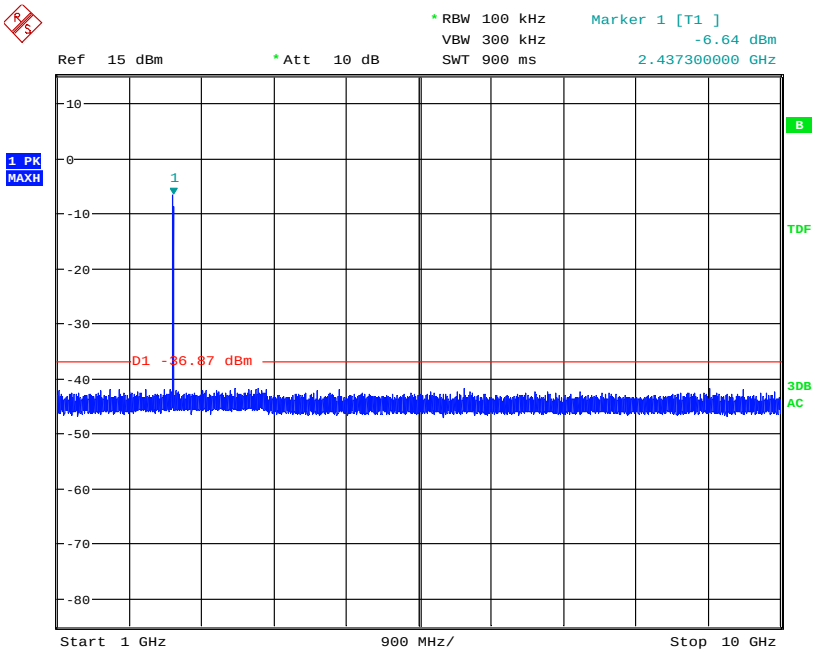

Figure 7.4.2.2-6: 1 GHz –10 GHz – Middle Channel

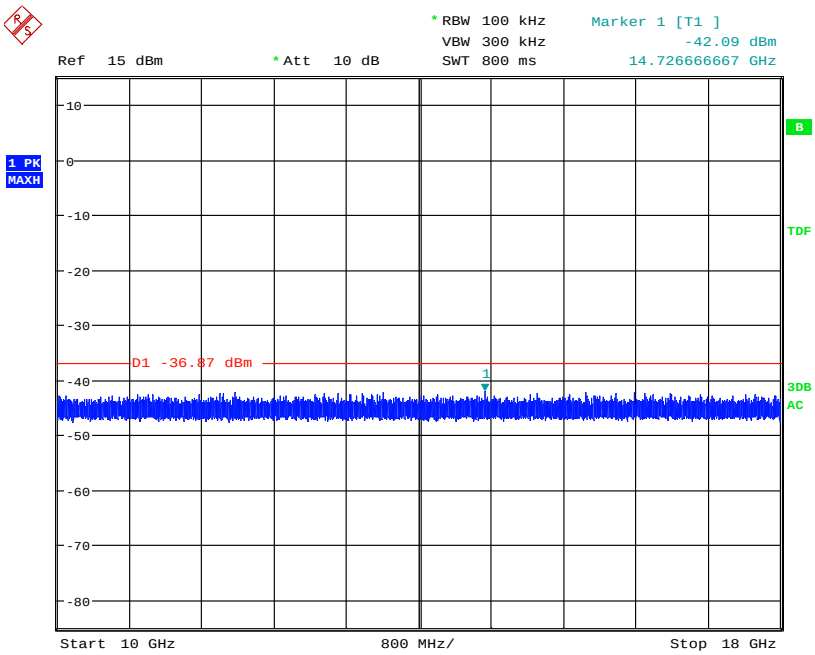

Figure 7.4.2.2-7: 10 GHz –18 GHz – Middle Channel

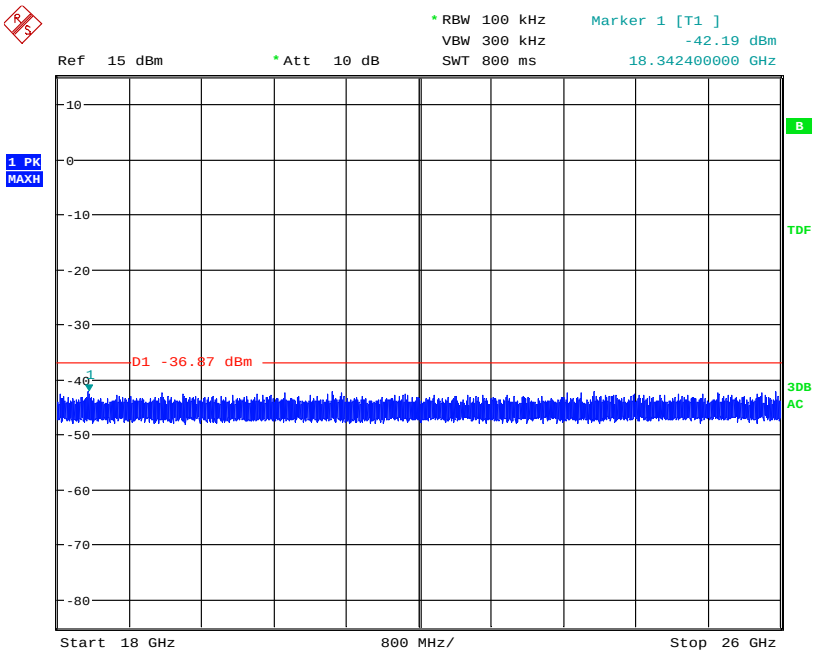

Figure 7.4.2.2-8: 18 GHz – 26 GHz – Middle Channel

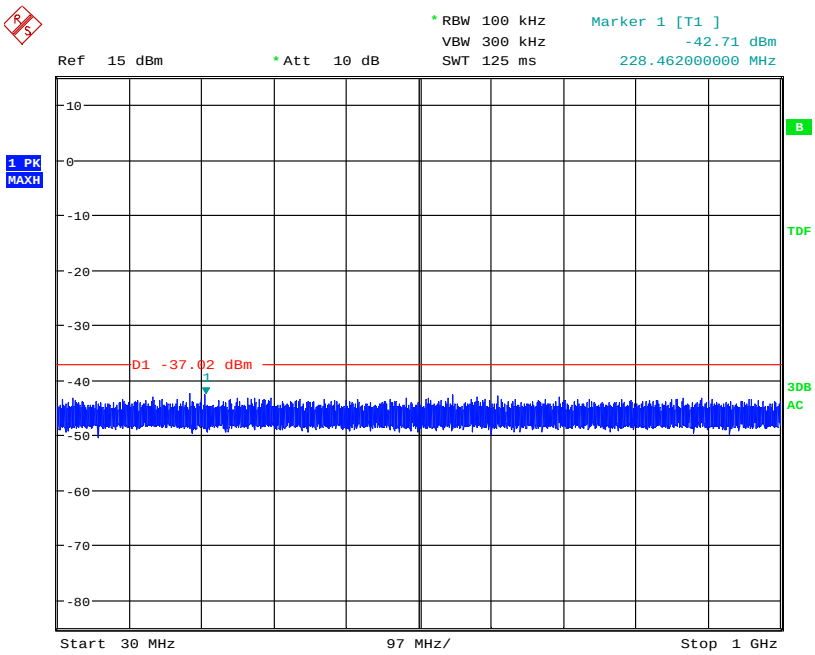

Figure 7.4.2.2-9: 30 MHz – 1 GHz – High Channel

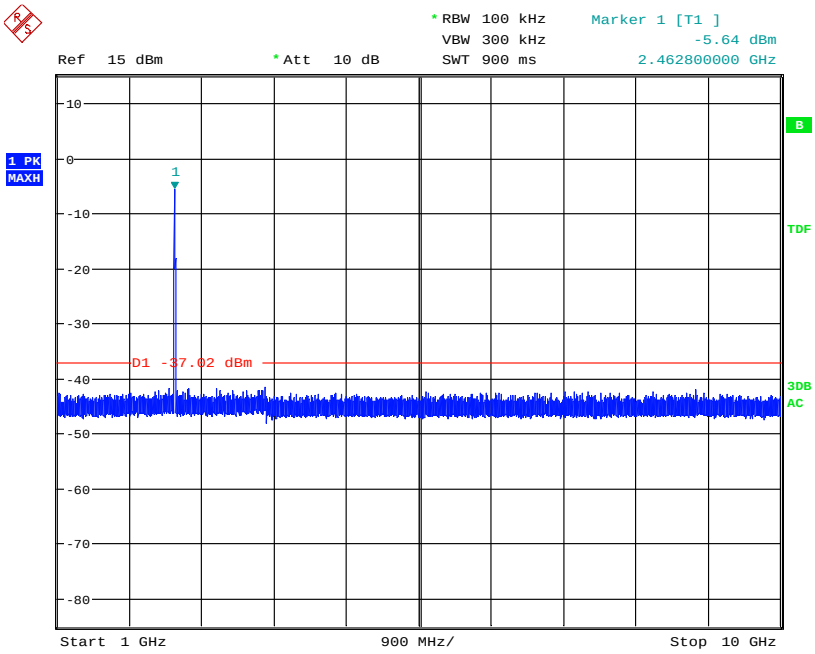

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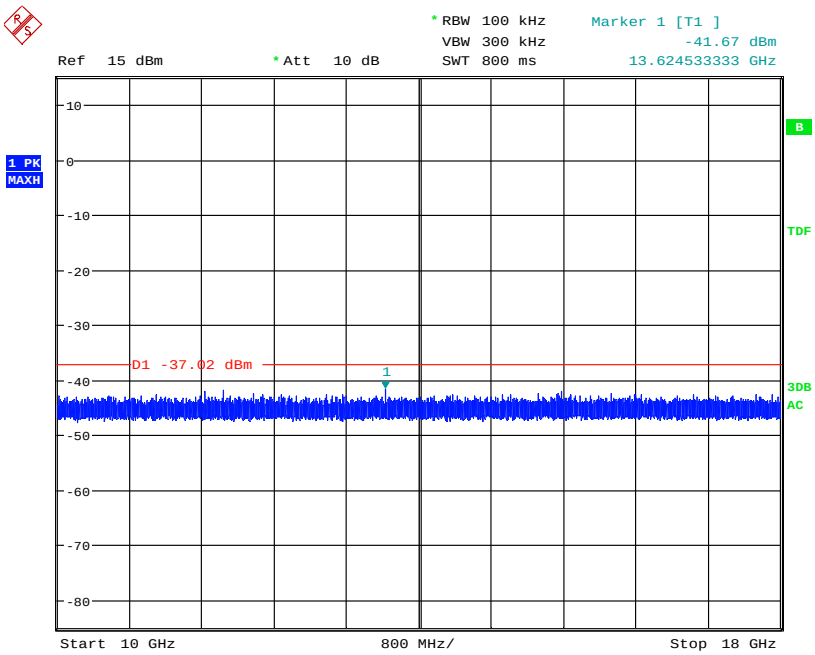
Figure 7.4.2.2-10: 1 GHz –10 GHz –High Channel



Date: 28.NOV.2015 23:04:38

Figure 7.4.2.2-11: 10 GHz – 18 GHz –High Channel

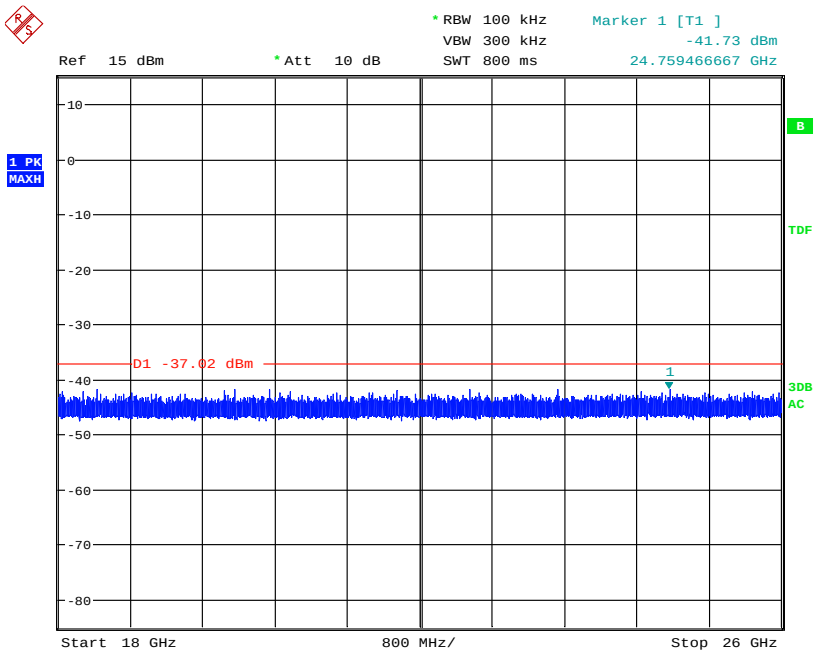


Figure 7.4.2.2-12: 18 GHz – 26 GHz –High Channel

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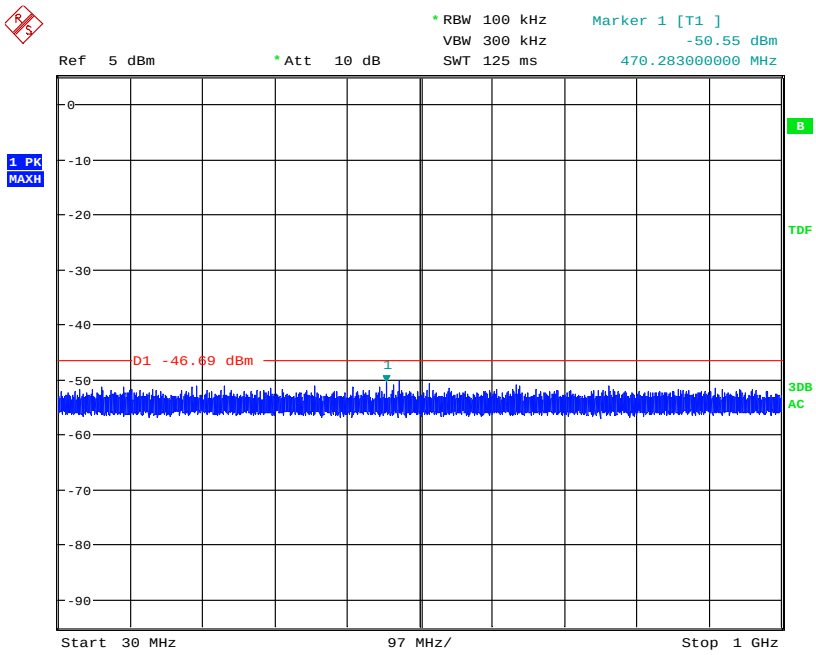


Figure 7.4.2.2-13: 30 MHz – 1 GHz – Low Channel

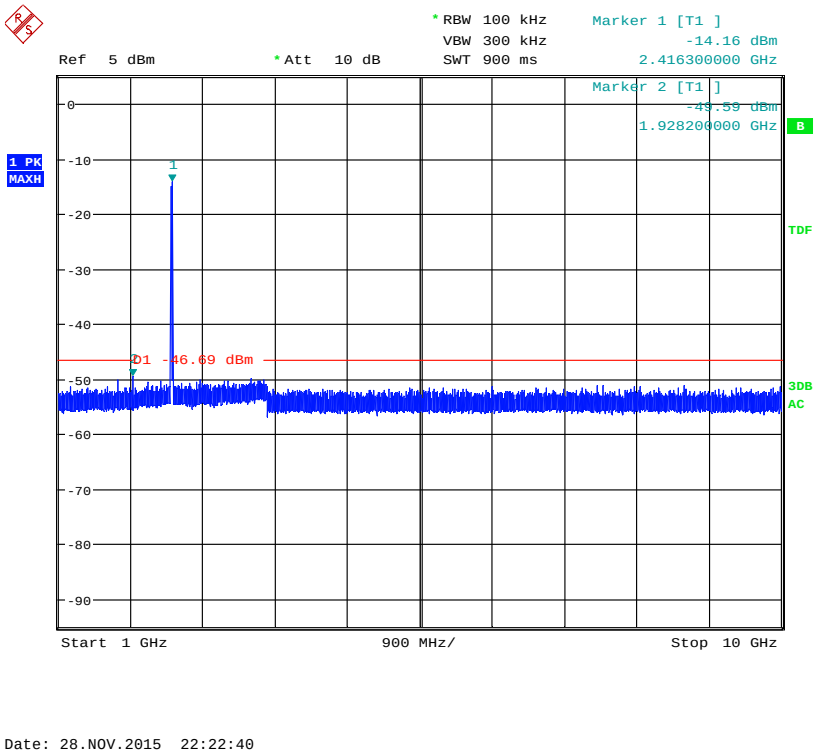


Figure 7.4.2.2-14: 1 GHz –10 GHz – Low Channel

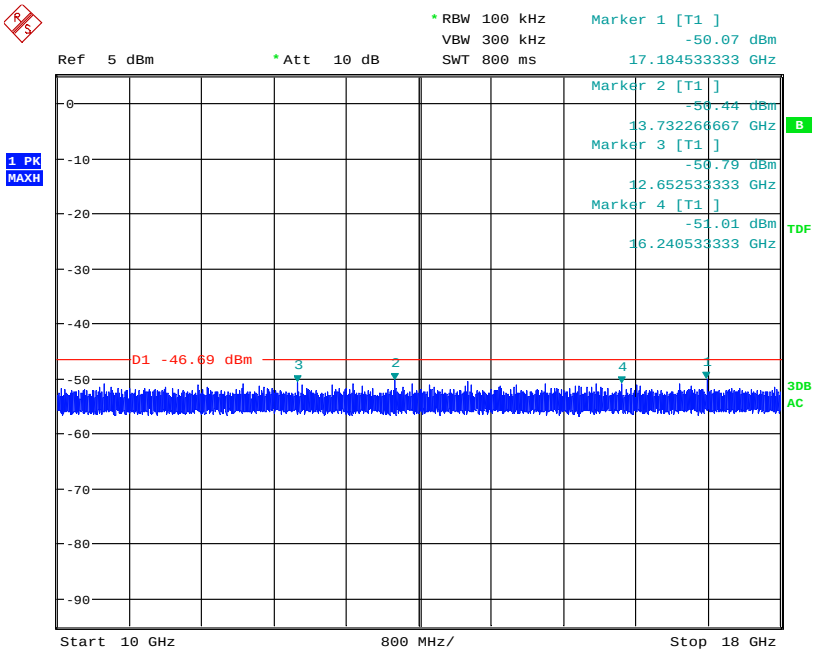


Figure 7.4.2.2-15: 10 GHz –18 GHz – Low Channel

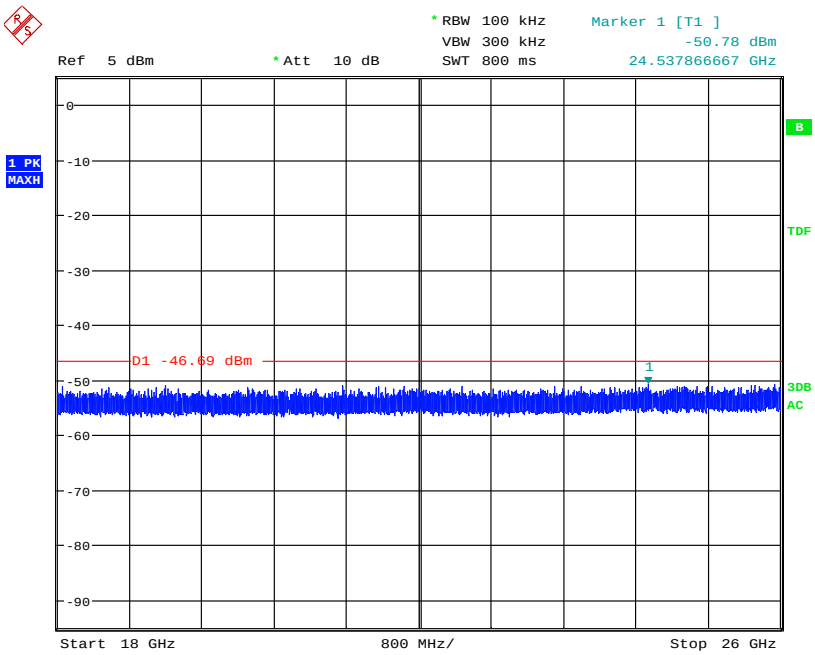


Figure 7.4.2.2-16: 18 GHz – 26 GHz – Low Channel

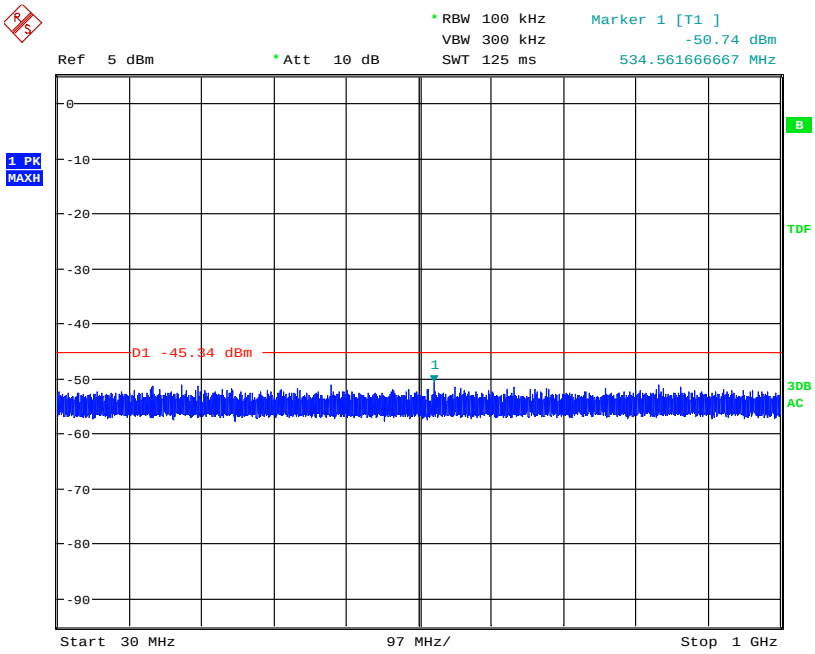


Figure 7.4.2.2-17: 30 MHz – 1 GHz –Middle Channel

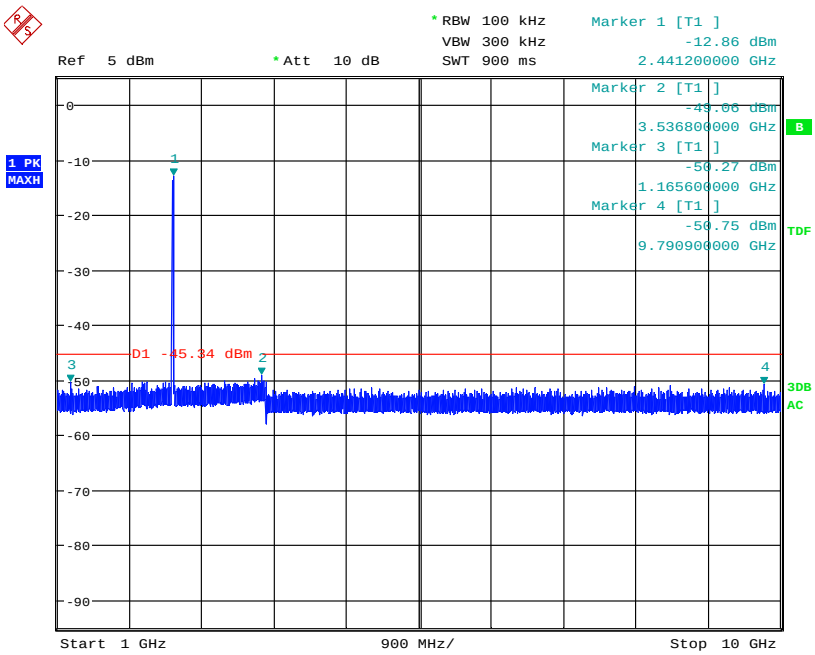
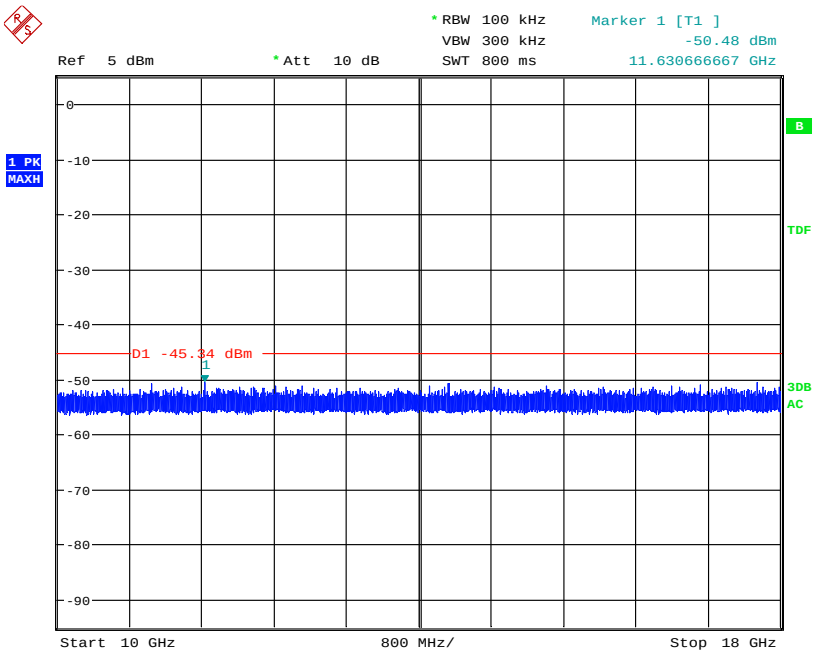
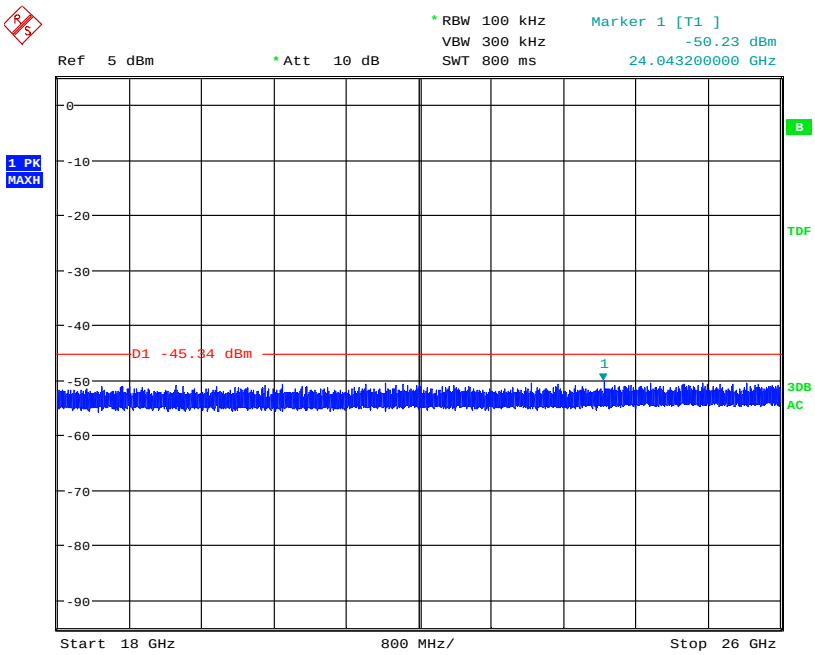


Figure 7.4.2.2-18: 1 GHz – 10 GHz – Middle Channel



Date: 28.NOV.2015 21:36:36

Figure 7.4.2.2-19: 10 GHz – 18 GHz – Middle Channel



Date: 28.NOV.2015 21:42:25

Figure 7.4.2.2-20: 18 GHz – 26 GHz – Middle Channel

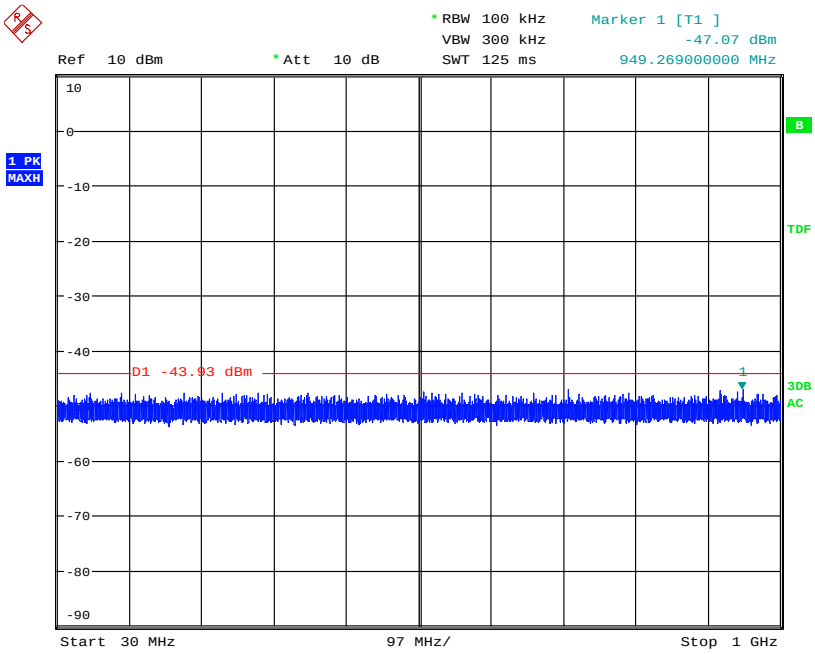


Figure 7.4.2.2-21: 30 MHz – 1 GHz – High Channel

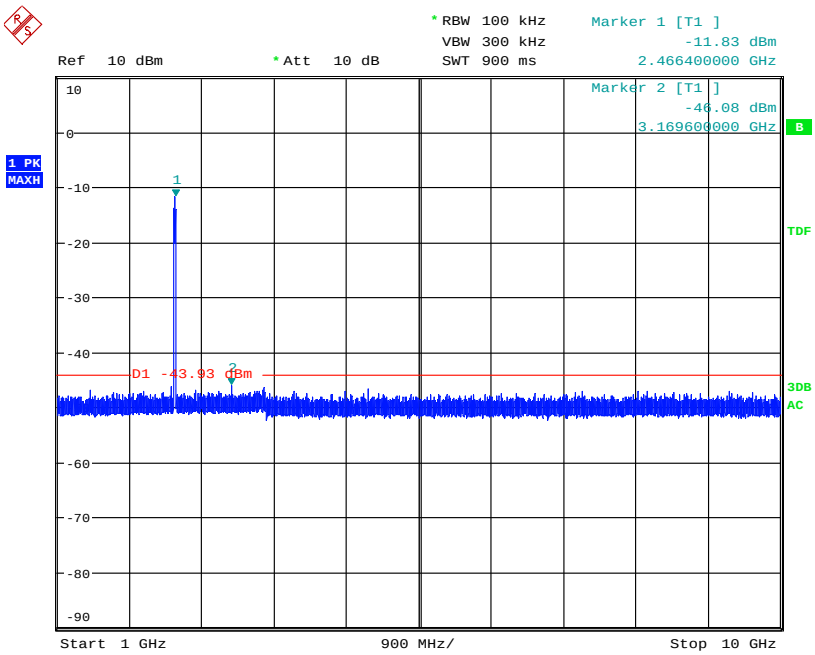


Figure 7.4.2.2-22: 1 GHz – 10 GHz –High Channel

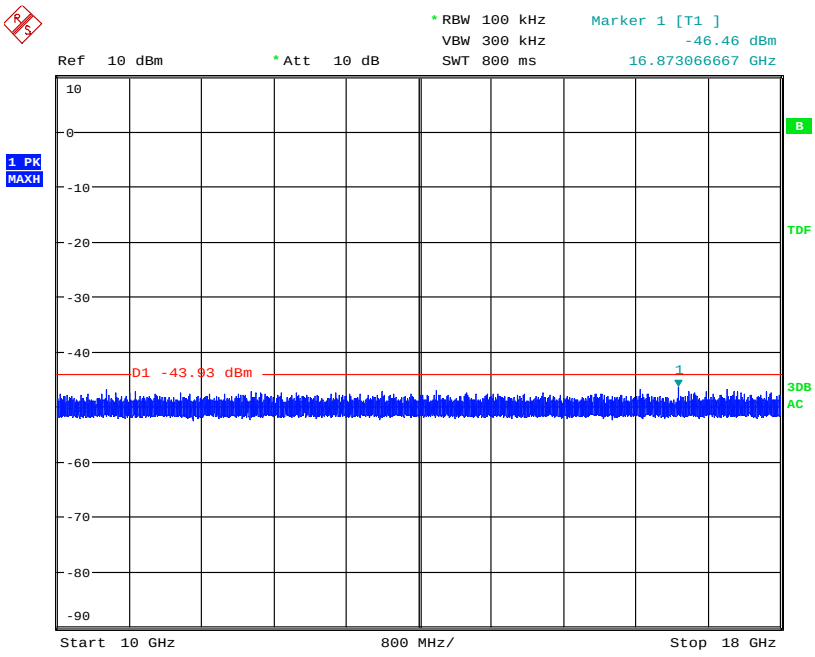


Figure 7.4.2.2-23: 10 GHz – 18 GHz –High Channel

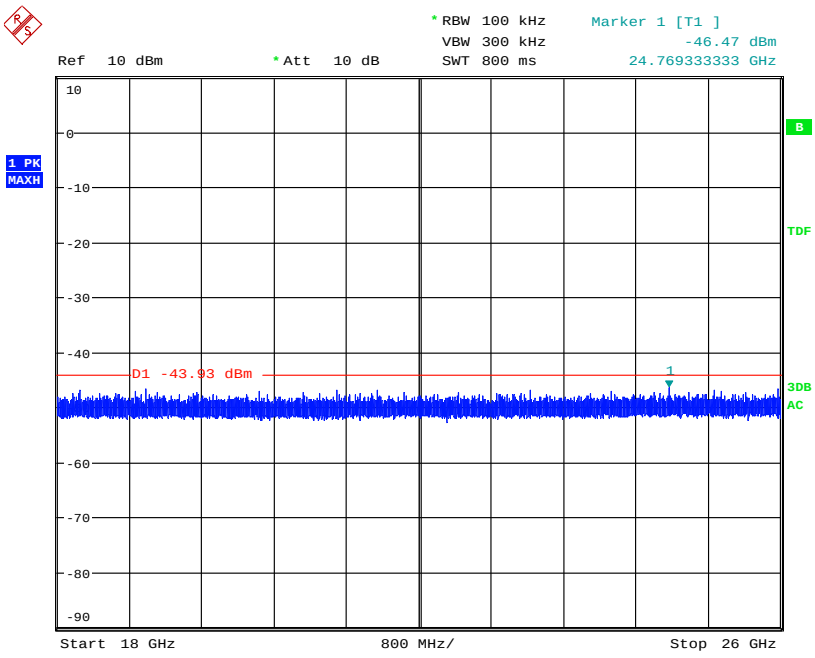


Figure 7.4.2.2-24: 18 GHz – 26 GHz –High Channel

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 9 kHz 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.

For measurements below 30 MHz, the receive antenna height was set to 1m and the EUT was rotated through 360 degrees. The resolution bandwidth was set to 200 Hz below 150 kHz and to 9 kHz above 150 kHz.

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 9 kHz to 26 GHz are reported in the tables below.

802.11b

Table 7.4.3.2-1: Radiated Spurious Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel = 2412 MHz										
1141	52.32	40.26	V	-6.57	45.75	33.69	74.0	54.0	28.3	20.3
2390	51.20	38.07	H	0.31	51.51	38.38	74.0	54.0	22.5	15.6
2390	50.14	37.31	V	0.31	50.45	37.62	74.0	54.0	23.6	16.4
4824	47.57	44.79	H	8.60	56.17	53.39	74.0	54.0	17.8	0.6
4824	46.51	42.95	V	8.60	55.11	51.55	74.0	54.0	18.9	2.4
Middle Channel = 2437 MHz										
109.8	58.07	55.83	H	-17.01	---------	38.82	--------	43.5	---------	4.7
109.8	55.28	53.20	V	-17.01	---------	36.19	--------	43.5	---------	7.3
4874	47.51	44.59	H	8.78	56.29	53.37	74.0	54.0	17.7	0.6
4874	46.82	43.48	V	8.78	55.60	52.26	74.0	54.0	18.4	1.7
7311	40.23	27.32		13.63	53.86	40.95	74.0	54.0	20.1	13.1
7311	39.82	26.86	V	13.63	53.45	40.49	74.0	54.0	20.6	13.5
High Channel = 2462 MHz										
4924	45.46	42.06	H	8.96	54.42	51.02	74.0	54.0	19.6	3.0
4924	45.92	42.15	V	8.96	54.88	51.11	74.0	54.0	19.1	2.9
7386	39.85	28.10	H	13.83	53.68	41.93	74.0	54.0	20.3	12.1
7386	39.53	26.58	V	13.83	53.36	40.41	74.0	54.0	20.6	13.6

Note: All the emissions above 7.38 GHz were attenuated below the limits and the noise floor of the measurement equipment.

802.11g

Table 7.4.3.2-2: Radiated Spurious Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity	Correction Factors	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg	(H/V)	(dB)	pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel = 2412 MHz										
2390	51.53	37.55	H	0.31	51.84	37.86	74.0	54.0	22.2	16.1
2390	52.33	37.81	V	0.31	52.64	38.12	74.0	54.0	21.4	15.9
4824	42.06	30.50	H	8.60	50.66	39.10	74.0	54.0	23.3	14.9
4824	40.54	28.27	V	8.60	49.14	36.87	74.0	54.0	24.9	17.1
Middle Channel = 2437 MHz										
4874	40.47	28.31	H	8.78	49.25	37.09	74.0	54.0	24.7	16.9
4874	40.83	28.51	V	8.78	49.61	37.29	74.0	54.0	24.4	16.7
High Channel = 2462 MHz										
2483.5	50.36	37.12	H	0.79	51.15	37.91	74.0	54.0	22.9	16.1
2483.5	50.95	37.06	V	0.79	51.74	37.85	74.0	54.0	22.3	16.2
4924	42.03	30.17	H	8.96	50.99	39.13	74.0	54.0	23.0	14.9
4924	40.68	28.14	V	8.96	49.64	37.10	74.0	54.0	24.4	16.9

Note: All the emissions above 4.92 GHz were attenuated below the limits and the noise floor of the measurement equipment.

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

Example Calculation: Peak
Corrected Level: 52.32+ (-6.57) = 45.75 dBµV/m
Margin: 74 dBµV/m – 45.75 dBµV/m = 28.3 dB

Example Calculation: Average
Corrected Level: 40.26 + (-6.57) = 33.69 dBµV/m
Margin: 54 dBµV/m – 33.69 dBµV/m = 20.3 dB

7.5 Power Spectral Density - FCC Section 15.247(e) IC: RSS-247 5.2(2)

7.5.1 PSD Measurement Procedure (Conducted Method)

The power spectral density was measured in accordance with ANSI C63.10:2013 Section 11.10.2 Method PKPSD (Peak PSD). The RF output port of the EUT was directly connected to the input of the spectrum analyzer. Offset values were input for cable and external attenuation. The spectrum analyzer RBW was set to 100 kHz and VBW 300 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.

802.11b

Table 7.5.2-1: Power Spectral Density

Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
2412	-26.83	8	34.83
2437	-27.25	8	35.25
2462	-26.10	8	34.10

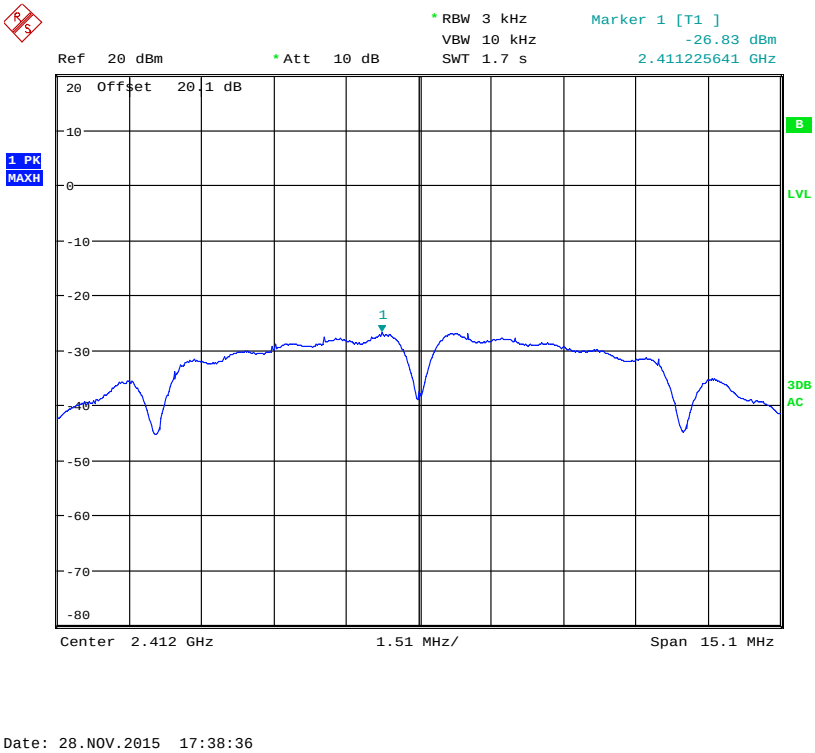


Figure 7.5.2-1: Power Spectral Density - Low Channel

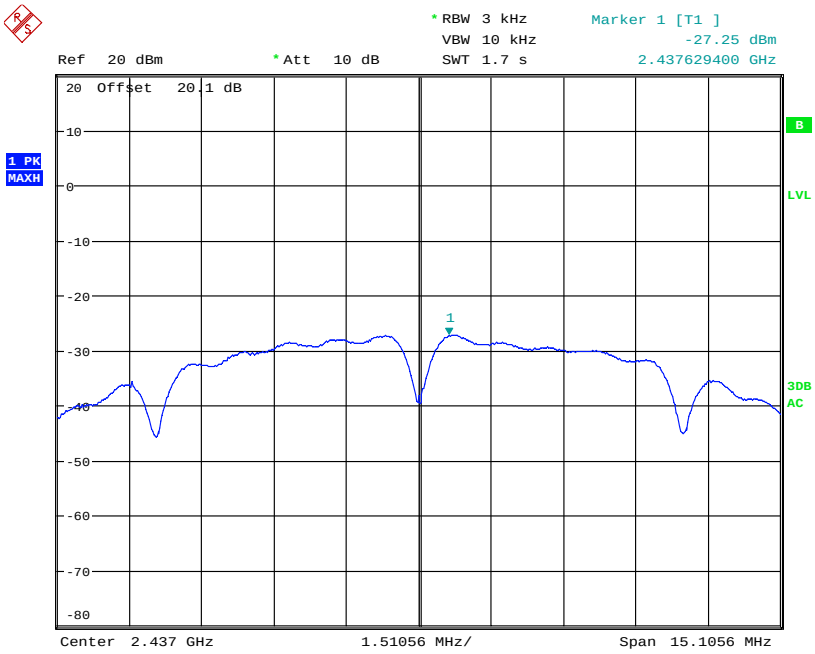


Figure 7.5.2-2: Power Spectral Density - Middle Channel

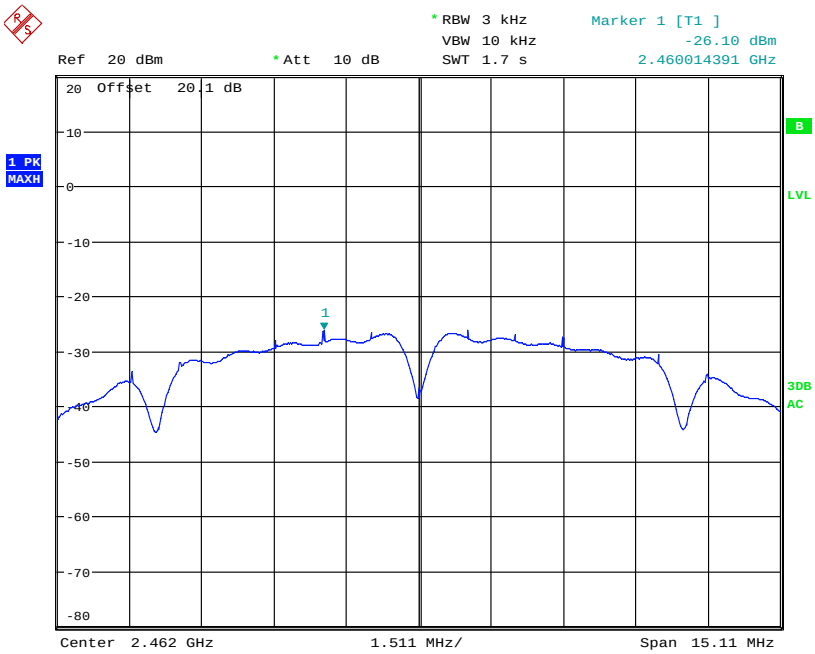


Figure 7.5.2-3: Power Spectral Density – High Channel

802.11g

Table 7.5.2-2: Power Spectral Density

Frequency (MHz)	PSD (dBm)	Limit (dBm)	Margin (dB)
2412	-30.29	8	38.29
2437	-29.49	8	37.49
2462	-28.13	8	36.13

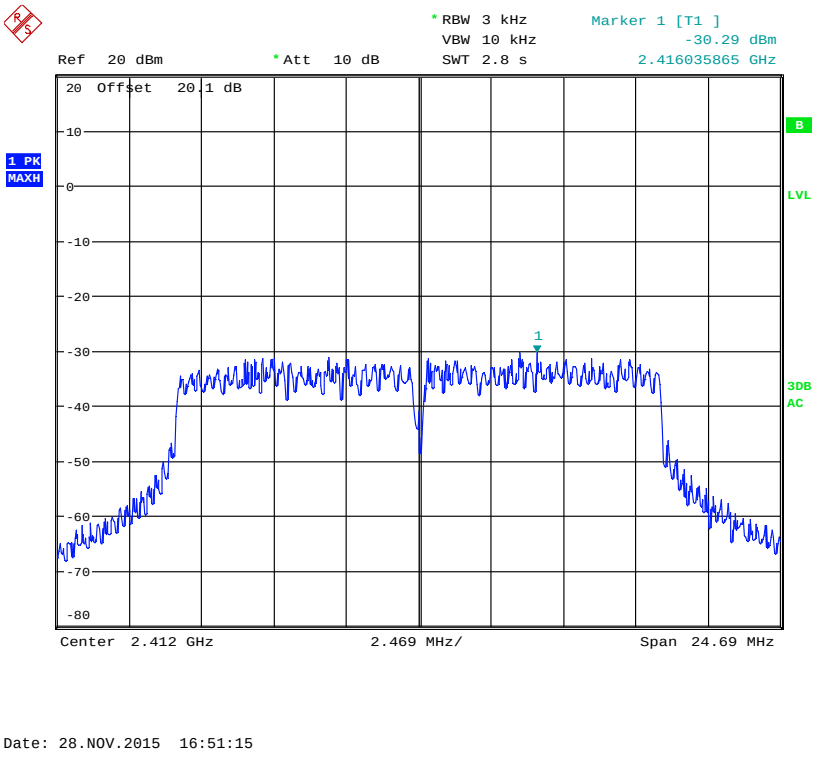


Figure 7.5.2-4: Power Spectral Density - Low Channel

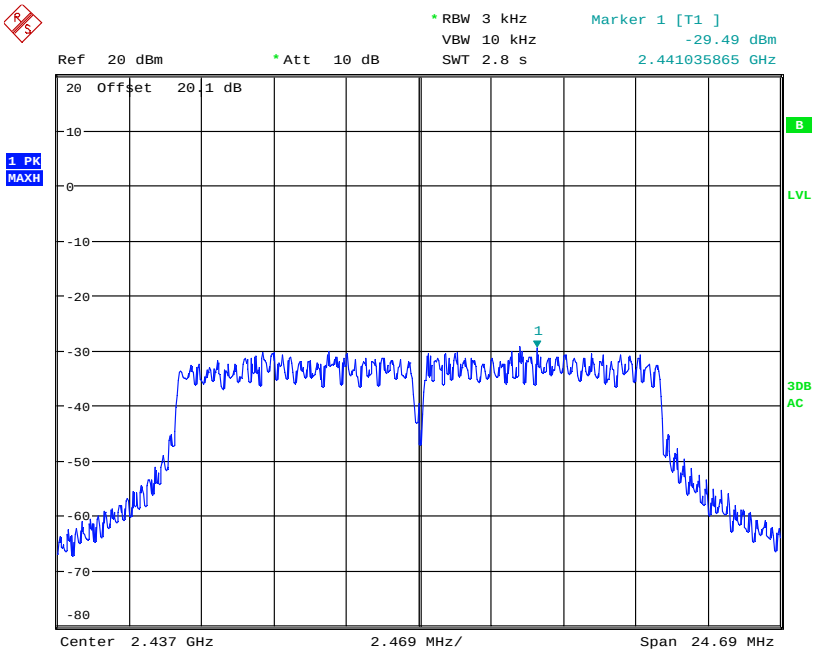


Figure 7.5.2-5: Power Spectral Density - Middle Channel

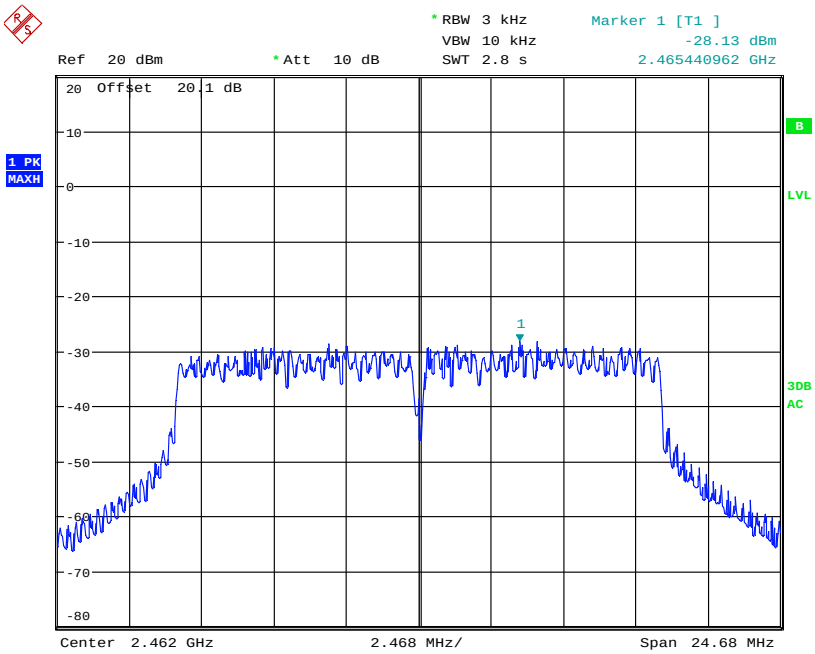


Figure 7.5.2-6: Power Spectral Density – High Channel

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:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Applicable Limit - Corrected Reading

7.6.2 Measurement Results

Results are shown below.

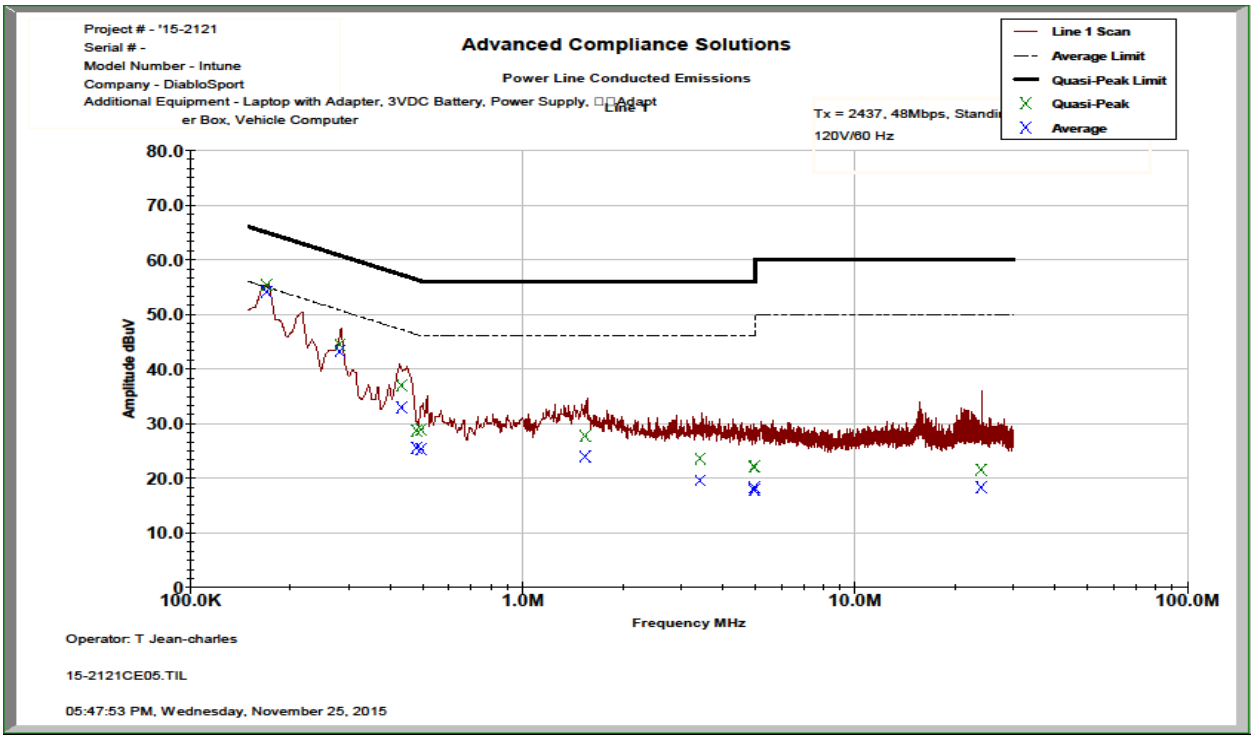


Figure 7.6.2-1: Conducted Emissions Results – Line 1

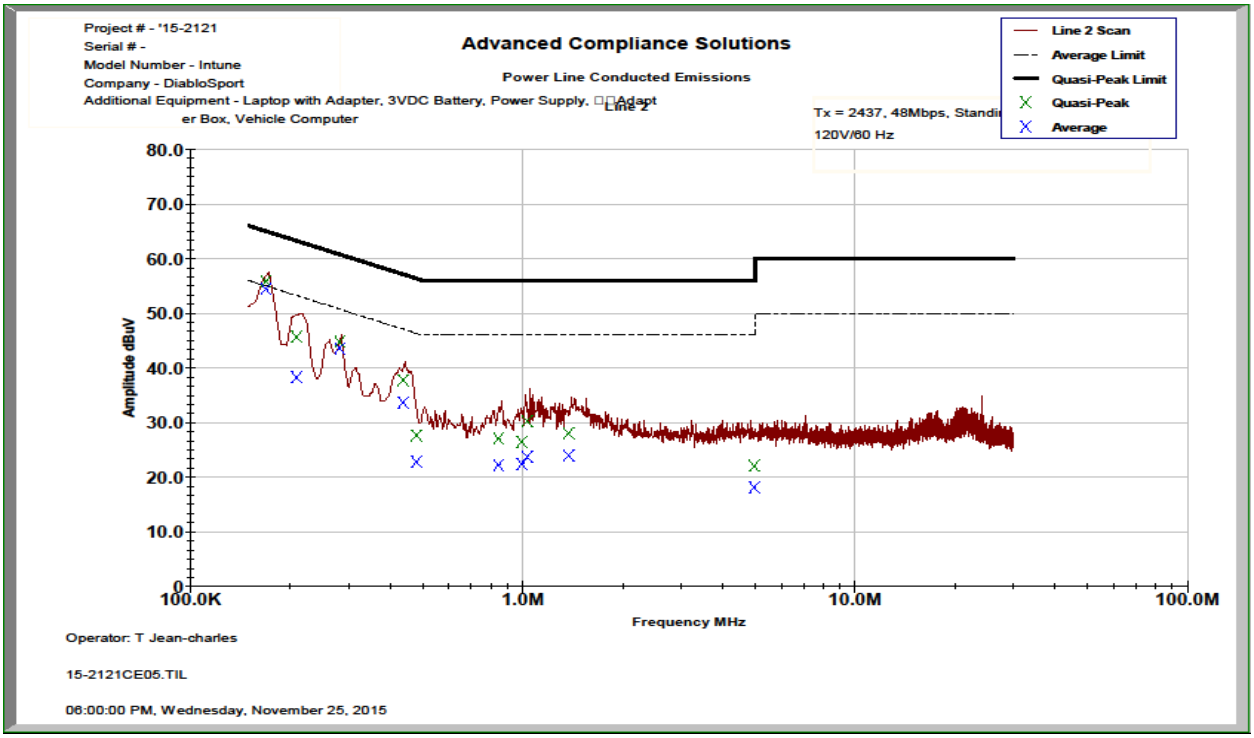


Figure 7.6.2-2: Conducted Emissions Results – Line 2

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: 15-2121CE05
Power Supply Description: Dell 19.5 VDC

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
Line 1									
0.170088	45.229	44.049	10.20	55.43	54.25	64.96	54.96	9.5	0.7
0.281674	34.385	33.155	10.20	44.58	43.35	60.77	50.77	16.2	7.4
0.433013	26.916	22.839	10.21	37.13	33.05	57.19	47.19	20.1	14.1
0.479999	18.683	15.522	10.21	28.89	25.73	56.34	46.34	27.4	20.6
0.495663	18.838	15.26	10.21	29.05	25.47	56.07	46.07	27.0	20.6
1.54041	17.614	13.904	10.20	27.82	24.11	56.00	46.00	28.2	21.9
3.42096	13.356	9.33	10.35	23.71	19.68	56.00	46.00	32.3	26.3
4.98	11.744	7.95	10.39	22.14	18.34	56.00	46.00	33.9	27.7
4.9801	11.839	7.482	10.39	22.23	17.87	56.00	46.00	33.8	28.1
23.9801	10.502	7.22	11.15	21.65	18.37	60.00	50.00	38.3	31.6
Line 2									
0.169038	45.737	44.31	10.23	55.97	54.54	65.01	55.01	9.0	0.5
0.209062	35.57	28.202	10.22	45.79	38.42	63.24	53.24	17.5	14.8
0.281824	34.702	33.482	10.21	44.91	43.69	60.76	50.76	15.9	7.1
0.437488	27.668	23.56	10.21	37.88	33.77	57.11	47.11	19.2	13.3
0.48	17.562	12.736	10.21	27.77	22.95	56.34	46.34	28.6	23.4
0.8464	17.002	12.117	10.21	27.21	22.33	56.00	46.00	28.8	23.7
0.99565	16.392	12.323	10.21	26.60	22.53	56.00	46.00	29.4	23.5
1.03296	20.162	13.673	10.25	30.41	23.92	56.00	46.00	25.6	22.1
1.37624	17.958	13.862	10.25	28.21	24.11	56.00	46.00	27.8	21.9
4.98	11.7	7.753	10.44	22.14	18.20	56.00	46.00	33.9	27.8

8 CONCLUSION

In the opinion of ACS, Inc., the model inTune i2 manufactured by DiabloSport, LLC meets the requirements of FCC Part 15 subpart C and Industry Canada's Radio Standards Specification RSS-247 for the test procedures documented in the test report.

END REPORT