FCC PART 15.247

TEST REPORT

For

SZ DJI TECHNOLOGY CO., LTD

14th floor, West Wing, Skyworth Semiconductor Design Building NO.18 Gaoxin South 4th Ave, Nanshan, Shenzhen, Guangdong, China

FCC ID: SS3-WM3231507

Report Type:	**Product Type:**
Original Report	Phantom 3 Professional

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Report Number:	RDG150703002-00A
Report Date:	2015-07-13
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SZ DJI TECHNOLOGY CO., LTD*'s product, model number: *W323A (FCC ID: SS3-WM3231507)* (the "EUT") in this report was a *Phantom 3 Professional,* which was measured approximately: 50cm (L) x 50 cm (W) x 18.5 cm(H), rated input voltage: DC 15.2V from lithium battery or DC 17.5V from adapter.

Adapter information: dji
Model: ADE019
Input: AC 100-240V, 1.4A, 50-60Hz
Output: DC 17.5V, 5.7A

** All measurement and test data in this report was gathered from production sample serial number: 150703002. (Assigned by BACL.Dongguan). The EUT was received on 2015-07-03.*

Objective

This report is prepared on behalf of *SZ DJI TECHNOLOGY CO., LTD* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communications Commission's rules

The tests were performed in order to determine the compliance of the EUT with FCC Part 15-Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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.

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2015. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

For 2.4G band, 8 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2406.5	5	2446.5
2	2416.5	6	2456.5
3	2426.5	7	2466.5
4	2436.5	8	2476.5

3channels were tested: 2406.5MHz, 2436.5MHz, 2476.5 MHz

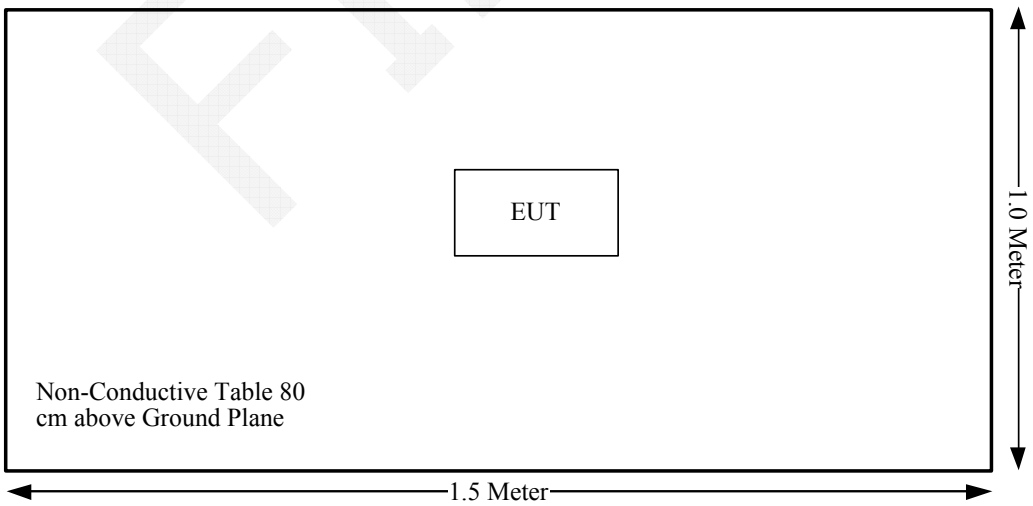
EUT Exercise Software

The software "DJI Pilot" was used for testing, which was provided by manufacturer. The maximum power with 100% duty cycle was configured by system default setting.

Equipment Modifications

No modification was made to the EUT.

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 & §2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.207 (a)	AC Line Conducted Emissions	Not Applicable
§15.247(d)	Spurious Emissions at Antenna Port	Compliance
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliance
§15.247 (a)(2)	6 dB Bandwidth	Compliance
§15.247(b)(3)	Maximum Peak Conducted Output Power	Compliance
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliance
§15.247(e)	Power Spectral Density	Compliance

Not Applicable: The EUT powered by lithium battery.

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FCC §15.247 (i) & §1.1307 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247(i) and subpart §1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculated Formulary:

Predication of MPE limit at a given distance
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

Calculated Data:

Frequency (MHz)	Antenna Gain		Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
	(dBi)	(numeric)	(dBm)	(mW)			
2406.5	2	1.58	27.87	612.35	20.00	0.19258	1.0

Result: The device meet FCC MPE at 20 cm distance

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Antenna Connector Construction

The EUT has 4 internal antennas arrangement, and the antenna gain is 2.0dBi, fulfill the requirement of the item. Please refer to the internal photos.

Result: Compliance.

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FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

FCC §15.247 (d); §15.209; §15.205;

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner:

If U_{lab} is less than or equal to U_{cispr} of Table 2, then:
- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If U_{lab} is greater than U_{cispr} of Table 2, then:
- compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
- non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

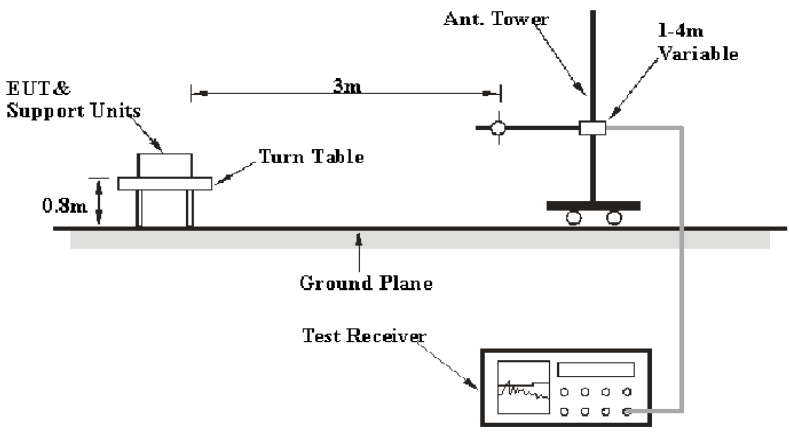
Based on CISPR 16-4-2-2011, measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:
30M~200MHz: 5.0 dB
200M~1GHz: 6.2 dB
1G~6GHz: 4.45 dB
6G~18GHz: 5.23 dB

Table 2 – Values of U_{cispr}

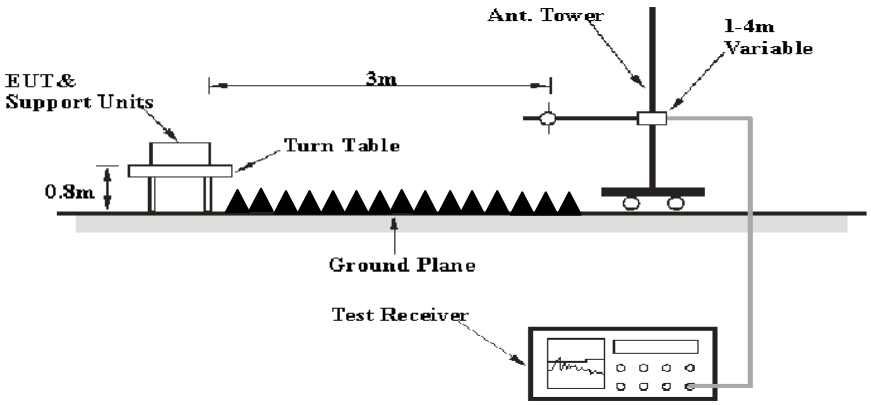
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.247 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Loss + Cable Loss - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2014-09-01	2015-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2012-09-06	2015-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2014-06-16	2017-06-15
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2014-09-06	2015-09-06

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Section 15.205, 15.209 and 15.247, with the worst margin reading of:

4.28 dB at **2483.5 MHz** in the **Vertical** polarization

Test Data

Environmental Conditions

Temperature:	28.9 °C
Relative Humidity:	45 %
ATM Pressure:	99.6 kPa

The testing was performed by Allen Qiao on 2015-07-06.

Mode: Transmitting (the test performed at worse mode determined by conducted output power test)

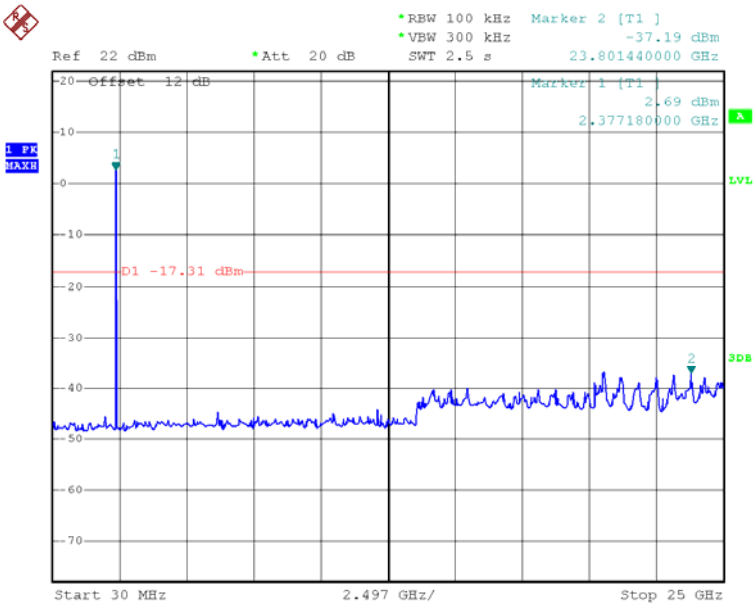
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	FCC 15.247	
	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB/m)				Limit (dBμV/m)	Margin (dB)
Low Channel: 2406.5 MHz									
2406.5	73.72	PK	H	25.66	3.67	0.00	103.05	N/A	N/A
2406.5	60.09	AV	H	25.66	3.67	0.00	89.42	N/A	N/A
2406.5	84.31	PK	V	25.66	3.67	0.00	113.64	N/A	N/A
2406.5	69.26	AV	V	25.66	3.67	0.00	98.59	N/A	N/A
2390	30.84	PK	V	25.61	3.63	0.00	60.08	74.00	13.92
2390	14.33	AV	V	25.61	3.63	0.00	43.57	54.00	10.43
4813	32.57	PK	V	30.61	5.05	27.41	40.82	74.00	33.18
4813	19.24	AV	V	30.61	5.05	27.41	27.49	54.00	26.51
7219.5	31.72	PK	V	34.13	6.63	25.91	46.57	74.00	27.43
7219.5	18.7	AV	V	34.13	6.63	25.91	33.55	54.00	20.45
9626	30.15	PK	V	36.00	8.54	27.51	47.18	74.00	26.82
9626	15.88	AV	V	36.00	8.54	27.51	32.91	54.00	21.09
3445	33.2	PK	V	28.62	4.96	27.22	39.56	74.00	34.44
3445	19.89	AV	V	28.62	4.96	27.22	26.25	54.00	27.75
506.27	42.3	QP	V	18.10	2.75	22.04	41.11	46.00	4.89*
Middle Channel: 2436.5 MHz									
2436.5	72.9	PK	H	25.73	3.75	0.00	102.38	N/A	N/A
2436.5	58.88	AV	H	25.73	3.75	0.00	88.36	N/A	N/A
2436.5	83.56	PK	V	25.73	3.75	0.00	113.04	N/A	N/A
2436.5	68.38	AV	V	25.73	3.75	0.00	97.86	N/A	N/A
4873	32.73	PK	V	30.77	5.13	27.42	41.21	74.00	32.79
4873	19.38	AV	V	30.77	5.13	27.42	27.86	54.00	26.14
7309.5	32.66	PK	V	34.34	6.74	25.88	47.86	74.00	26.14
7309.5	19.87	AV	V	34.34	6.74	25.88	35.07	54.00	18.93
9746	30.49	PK	V	36.29	8.61	27.24	48.15	74.00	25.85
9746	16.36	AV	V	36.29	8.61	27.24	34.02	54.00	19.98
1750	35.4	PK	V	24.10	2.62	27.60	34.52	74.00	39.48
1750	19.3	AV	V	24.10	2.62	27.60	18.42	54.00	35.58
3070	33.65	PK	V	27.42	6.72	27.47	40.32	74.00	33.68
3070	20.45	AV	V	27.42	6.72	27.47	27.12	54.00	26.88
506.27	42.5	QP	V	18.10	2.75	22.04	41.31	46.00	4.69*
High Channel: 2476.5 MHz									
2476.5	71.22	PK	H	25.84	3.69	0.00	100.75	N/A	N/A
2476.5	57.14	AV	H	25.84	3.69	0.00	86.67	N/A	N/A
2476.5	81.65	PK	V	25.84	3.69	0.00	111.18	N/A	N/A
2476.5	66.68	AV	V	25.84	3.69	0.00	96.21	N/A	N/A
2483.5	36.5	PK	V	25.86	3.67	0.00	66.03	74.00	7.97
2483.5	20.19	AV	V	25.86	3.67	0.00	49.72	54.00	4.28*
4953	33.39	PK	V	30.98	5.36	27.43	42.30	74.00	31.70
4953	20.08	AV	V	30.98	5.36	27.43	28.99	54.00	25.01
7429.5	33.67	PK	V	34.63	6.88	25.94	49.24	74.00	24.76
7429.5	20.11	AV	V	34.63	6.88	25.94	35.68	54.00	18.32
9906	29.8	PK	V	36.67	8.70	26.72	48.45	74.00	25.55
9906	15.49	AV	V	36.67	8.70	26.72	34.14	54.00	19.86
1870	35.81	PK	V	24.34	3.06	27.51	35.70	74.00	38.30
1870	19.57	AV	V	24.34	3.06	27.51	19.46	54.00	34.54
506.27	41.6	QP	V	18.10	2.75	22.04	40.41	46.00	5.59*

**Within measurement uncertainty!*

Conducted Spurious Emissions at Antenna Port

Note: the test performed at high power

Antenna 1 Low Channel



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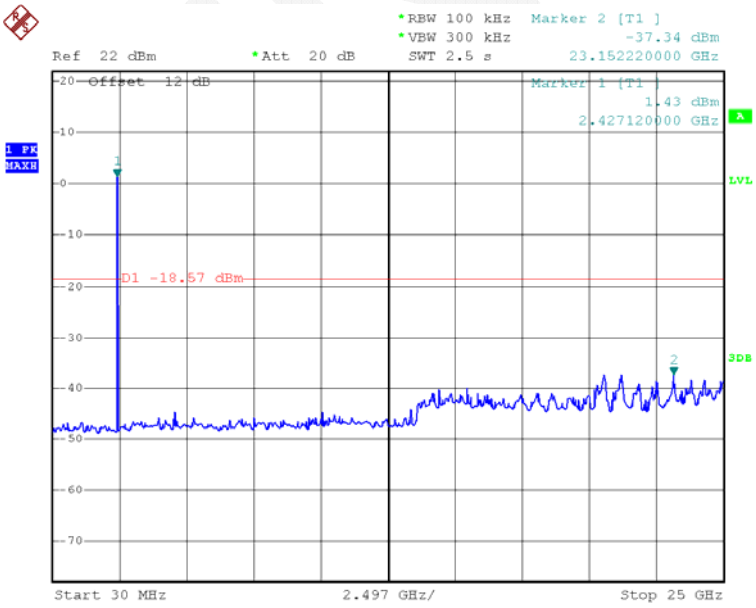
Antenna 1 Middle Channel



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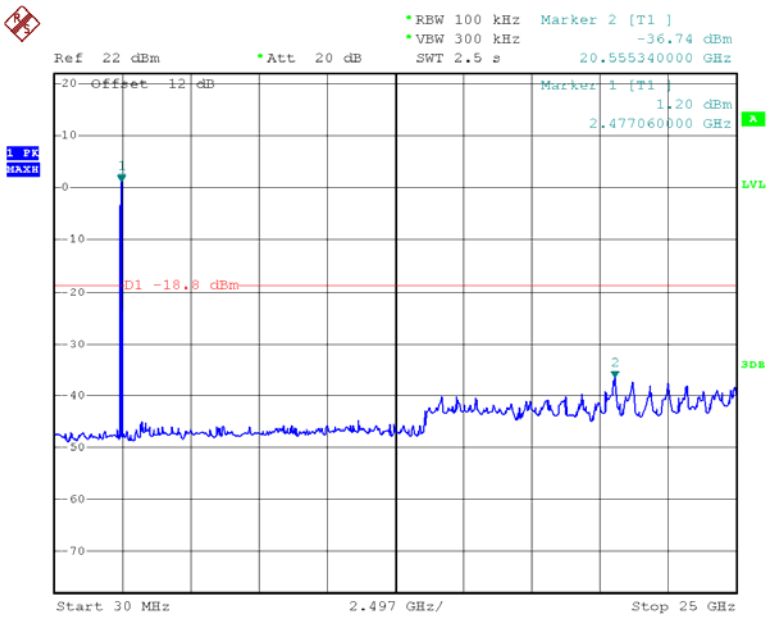
Antenna 1 High Channel



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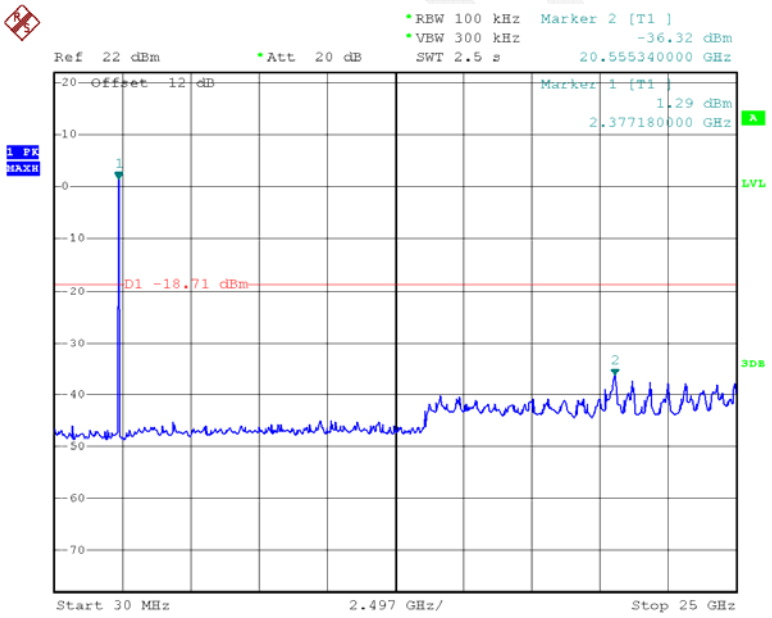
Antenna 2 Low Channel



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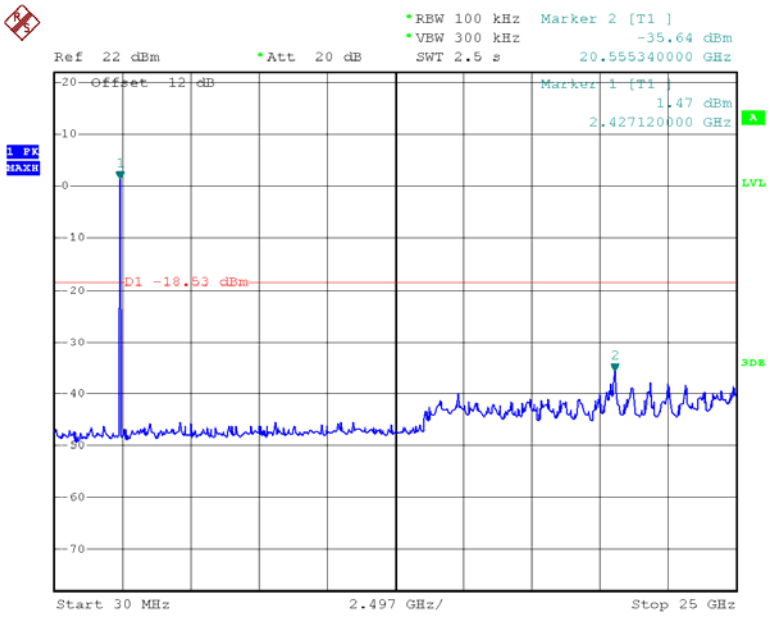
Antenna 2 Middle Channel



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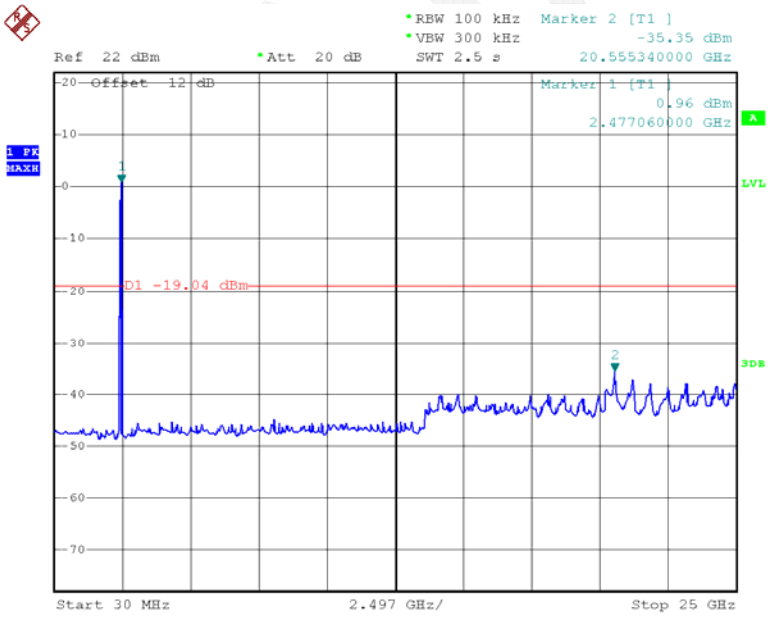

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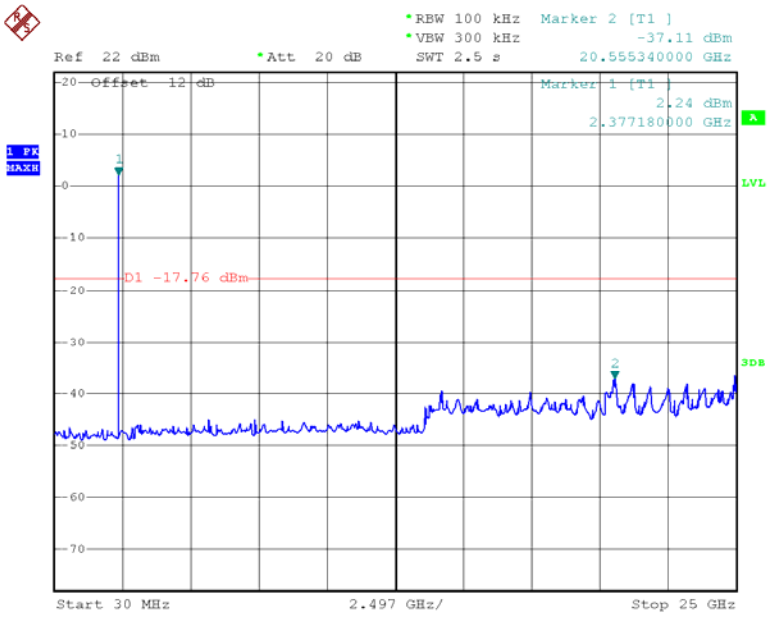
Antenna 3 Low Channel



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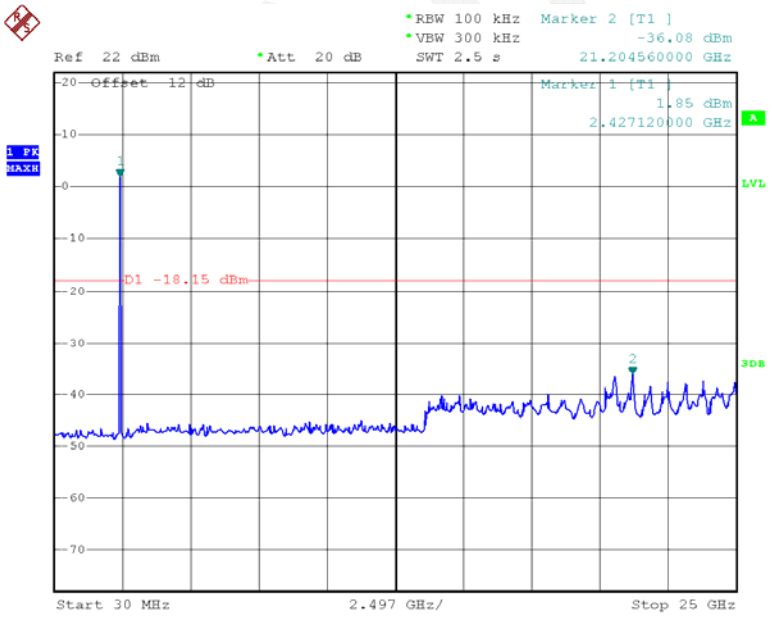
Antenna 3 Middle Channel



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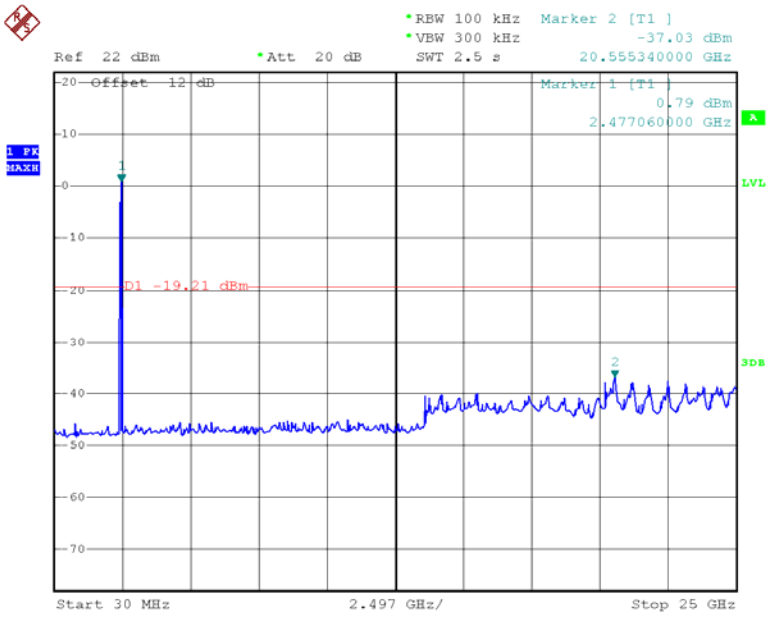

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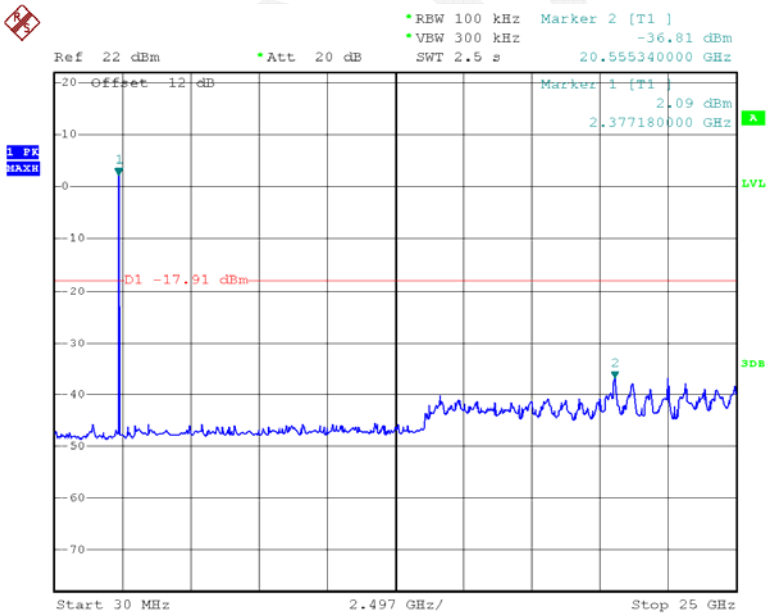
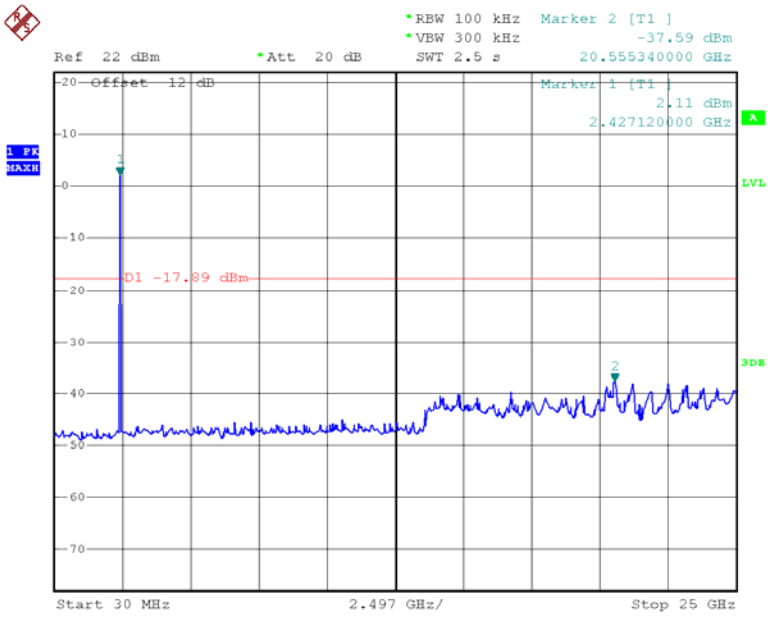
Antenna 4 Low Channel



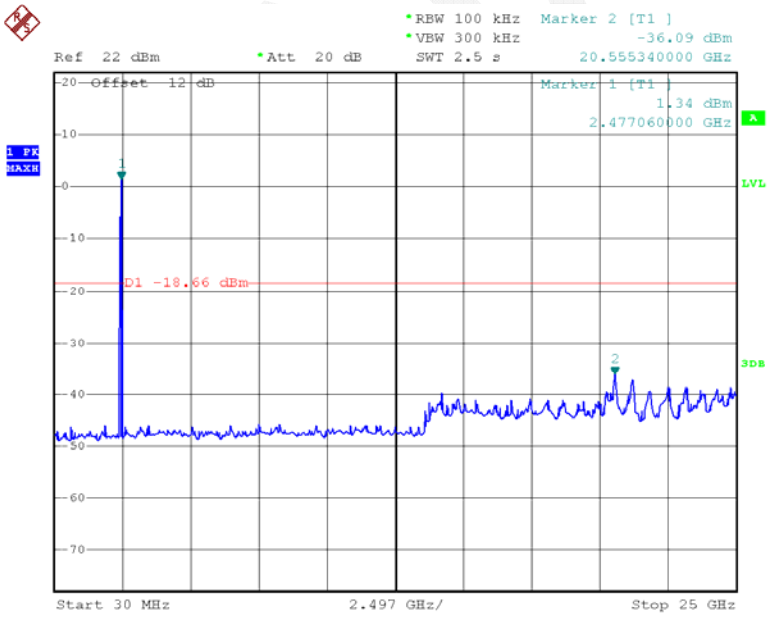
Date: 6.JUL.2015 19:19:31

Antenna 4 Middle Channel



Date: 6.JUL.2015 19:12:41

Antenna 4 High Channel



Date: 6.JUL.2015 19:11:33

FCC §15.247(a) (2) – 6dB BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.1 °C
Relative Humidity:	58 %
ATM Pressure:	99.4 kPa

The testing was performed by Allen Qiao on 2015-07-03.

Test Result: Pass.

Please refer to the following tables and plots.

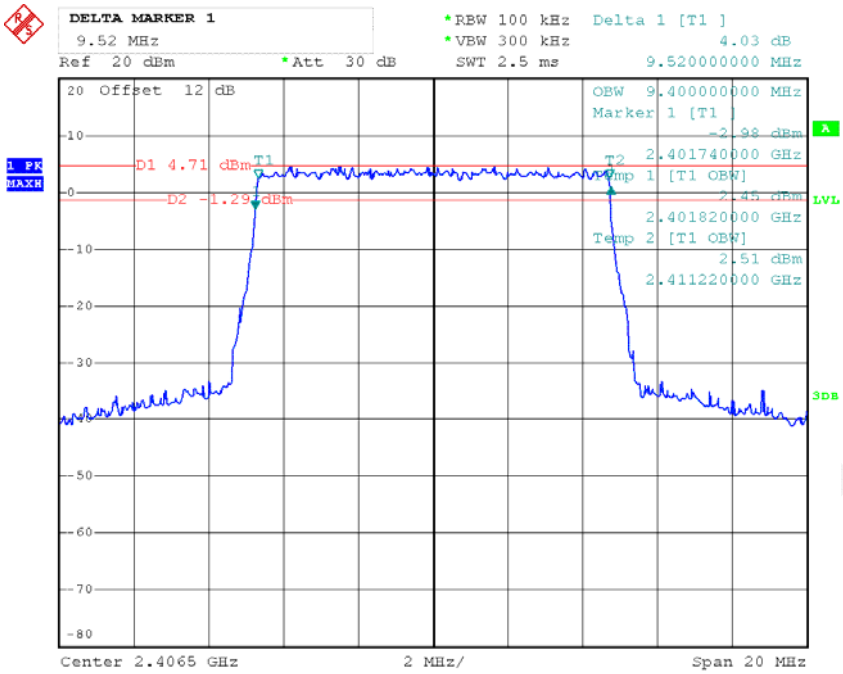
Test Mode: Transmitting (the test performed at high power)

Test Mode	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
Antenna 1	Low	2406.5	9.52
	Middle	2436.5	9.52
	High	2476.5	9.52
Antenna 2	Low	2406.5	9.52
	Middle	2436.5	9.56
	High	2476.5	9.52
Antenna 3	Low	2406.5	9.52
	Middle	2436.5	9.52
	High	2476.5	9.52
Antenna 4	Low	2406.5	9.48
	Middle	2436.5	9.56
	High	2476.5	9.52

FINAL

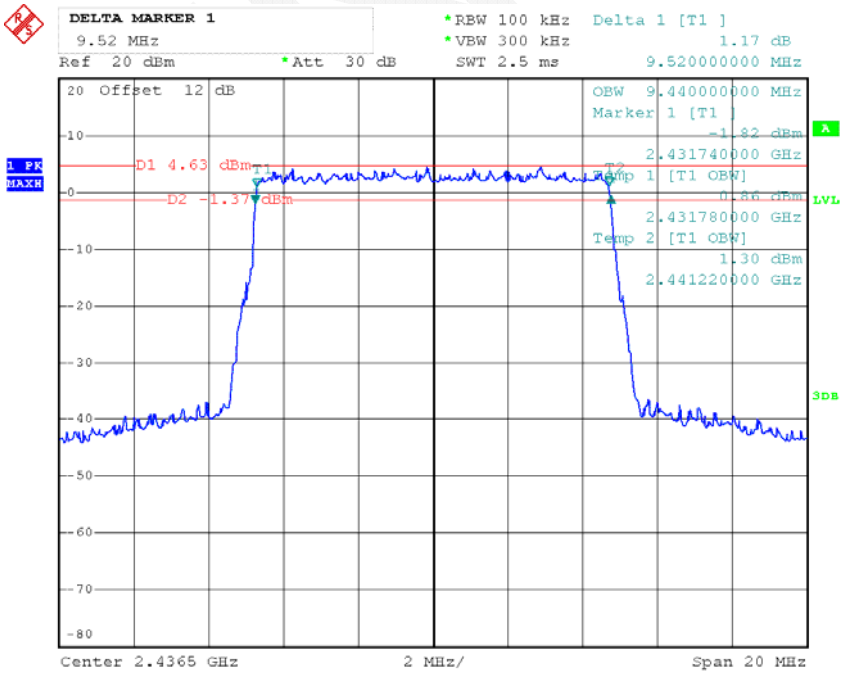
6 dB Bandwidth:

Antenna 1 Low Channel



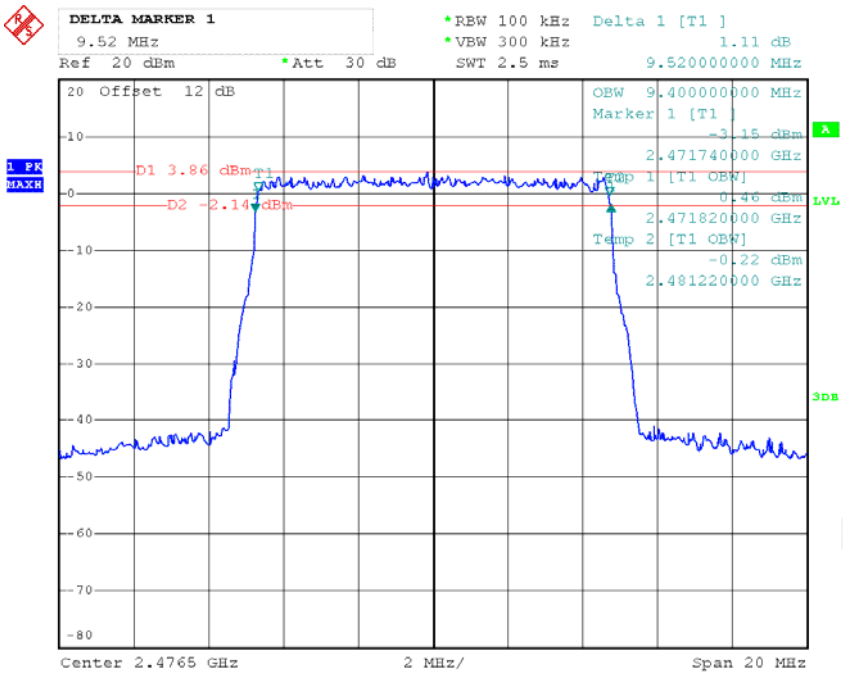
Date: 3.JUL.2015 15:51:44

Antenna 1 Middle Channel



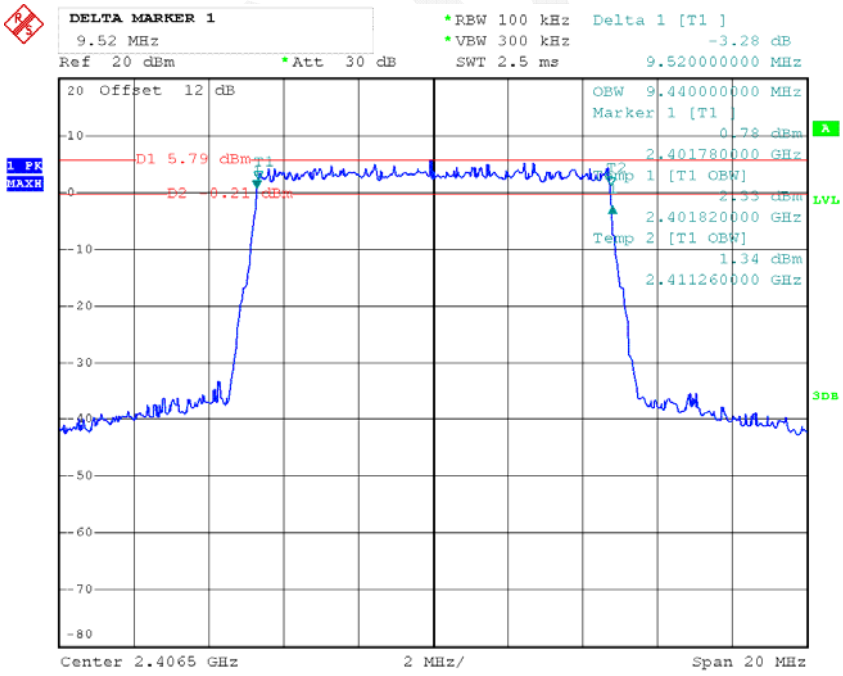
Date: 3.JUL.2015 15:49:49

Antenna 1 High Channel



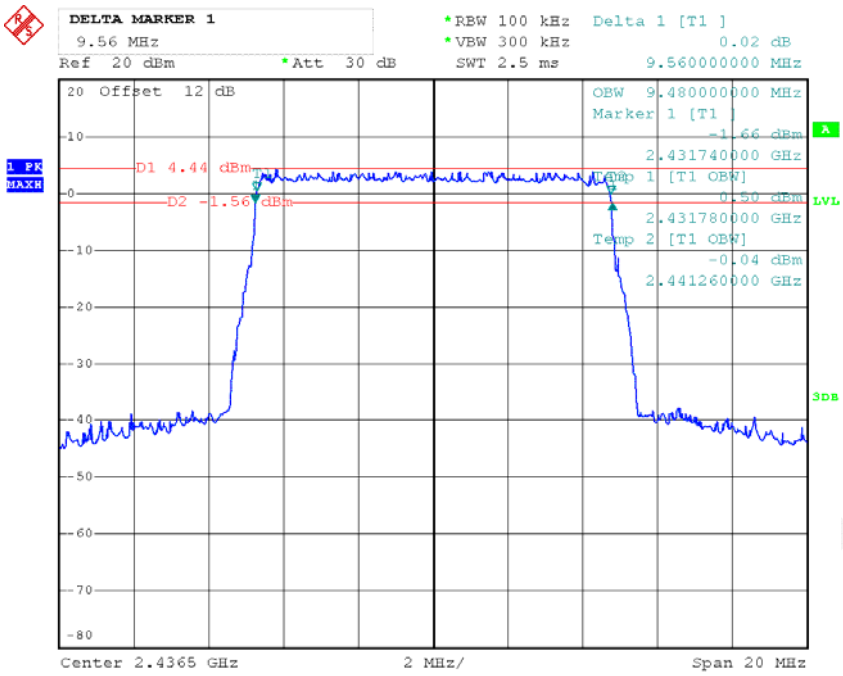
Date: 3.JUL.2015 15:43:48

Antenna 2 Low Channel



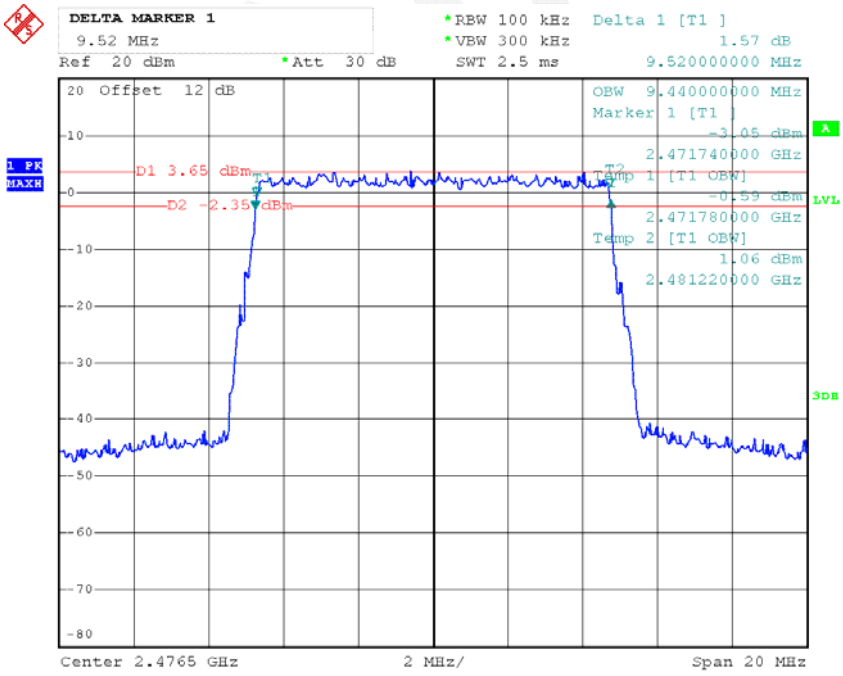
Date: 3.JUL.2015 15:33:29

Antenna 2 Middle Channel



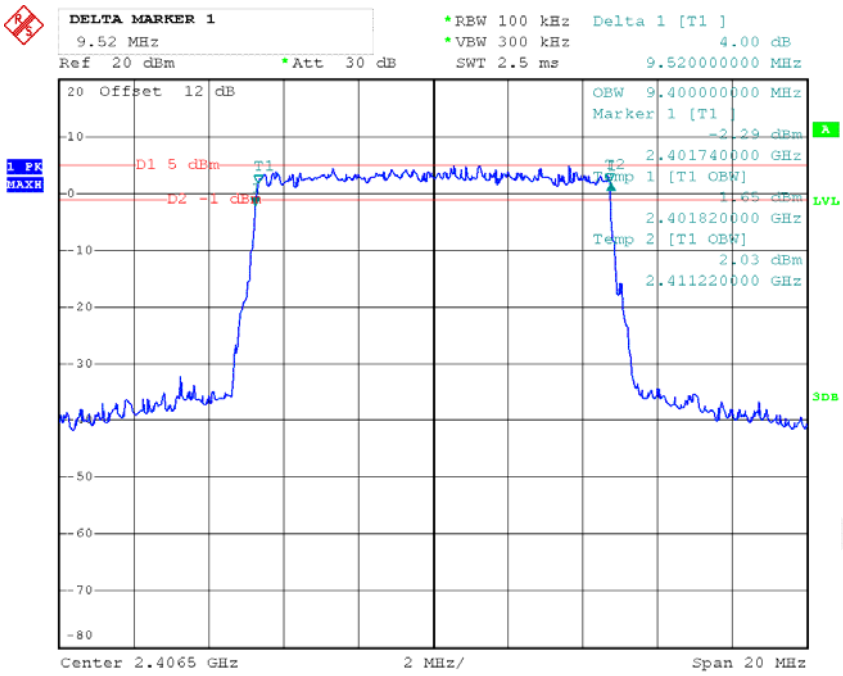
Date: 3.JUL.2015 15:35:40

Antenna 2 High Channel



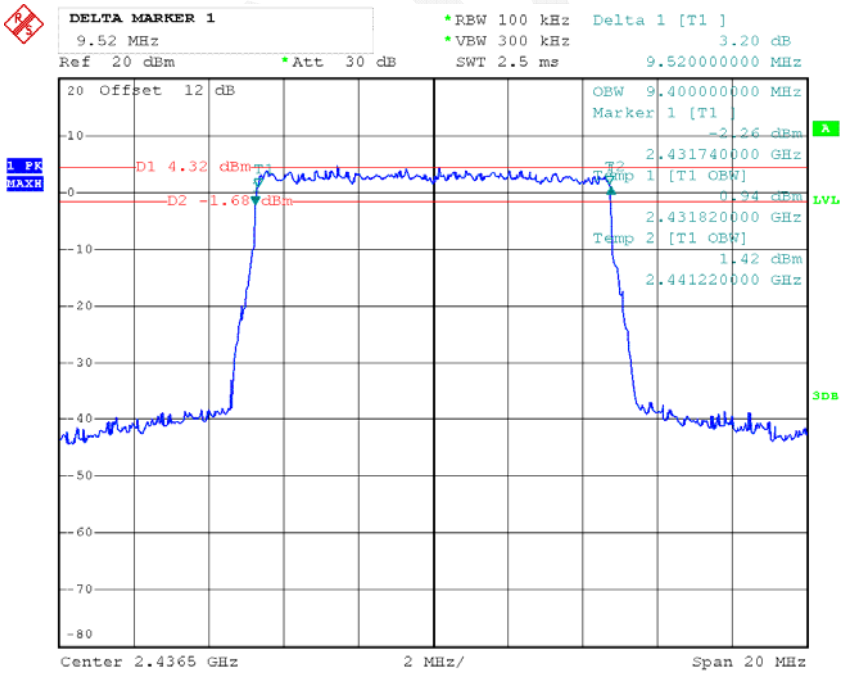
Date: 3.JUL.2015 15:41:34

Antenna 3 Low Channel



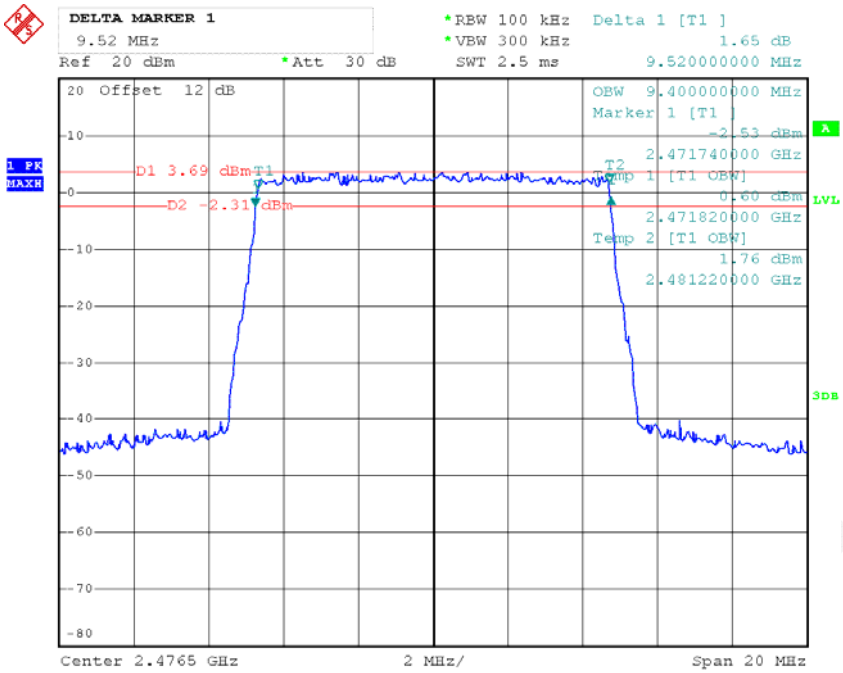
Date: 3.JUL.2015 15:52:49

Antenna 3 Middle Channel



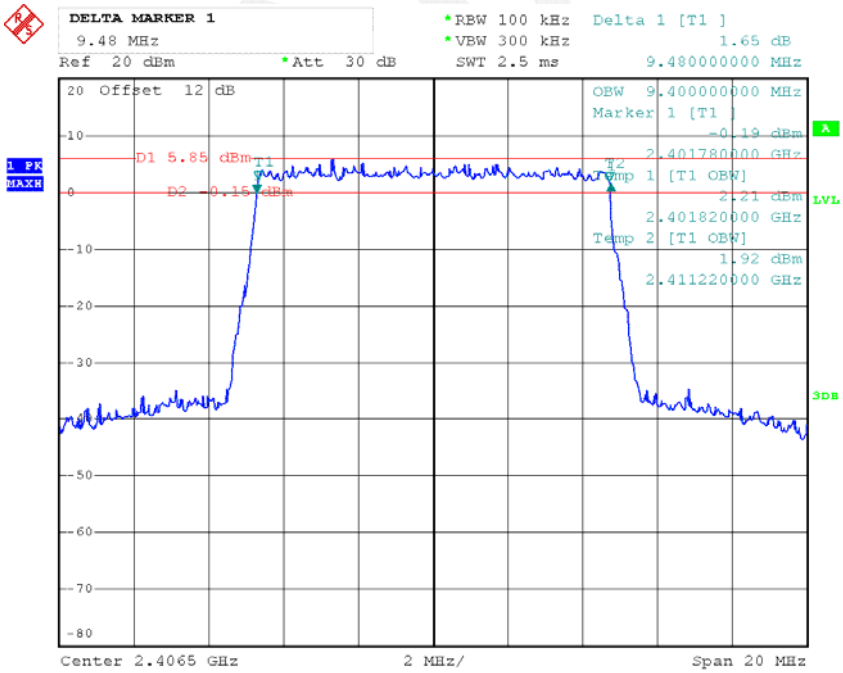
Date: 3.JUL.2015 15:48:21

Antenna 3 High Channel



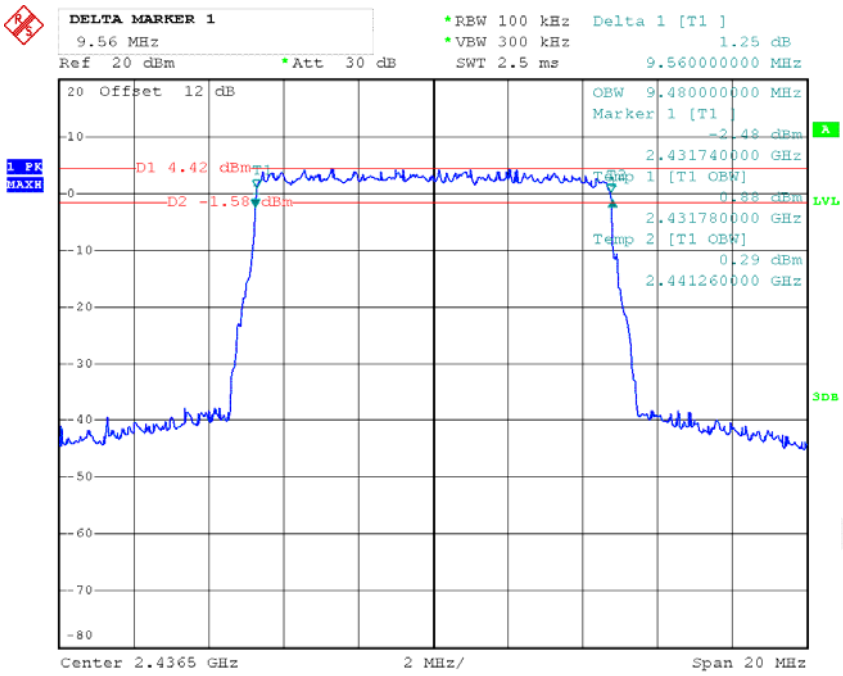
Date: 3.JUL.2015 15:46:44

Antenna 4 Low Channel



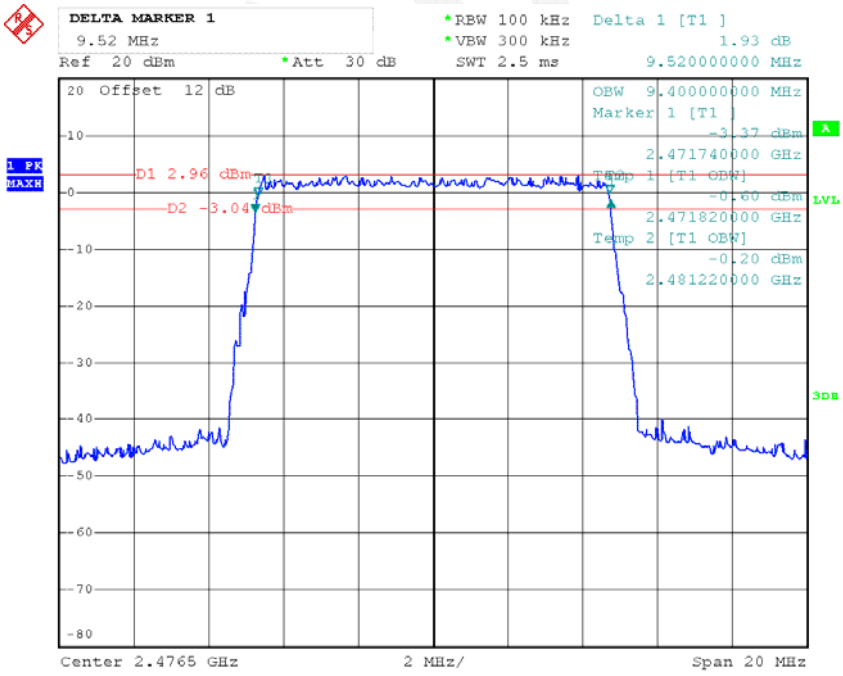
Date: 3.JUL.2015 15:31:10

Antenna 4 Middle Channel



Date: 3.JUL.2015 15:37:25

Antenna 4 High Channel



Date: 3.JUL.2015 15:39:38

FCC §15.247(b) (3) - MAXIMUM PEAK CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

1. According to KDB 558074 D01 DTS Meas Guidance v03r02, place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Test Equipment.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	Wideband Power Sensor	N1921A	MY54210016	2014-11-03	2015-11-03
Agilent	Wideband Power Sensor	N1921A	MY54170013	2014-11-03	2015-11-03
Agilent	P-Series Power Meter	N1912A	MY5000448	2014-11-03	2015-11-03

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.3 °C
Relative Humidity:	57 %
ATM Pressure:	99.6 kPa

The testing was performed by Allen Qiao on 2015-07-06.

Test Mode: Transmitting

Channel	Frequency	Conducted Peak Output Power (dBm)			
	MHz	Ant. 1	Ant. 2	Ant. 3	Ant. 4
High Power					
Low	2406.5	24.85	24.10	24.83	24.05
Middle	2436.5	24.19	23.42	24.22	23.52
High	2476.5	24.28	23.03	24.25	23.09
Low Power					
Low	2406.5	2.15	0.29	2.11	0.38
Middle	2436.5	2.73	1.03	2.68	1.02
High	2476.5	0.78	1.05	0.82	1.08

The system employed Space Time Block Codes (STBC) technology, and the signals are completely uncorrelated, the system configured two antennas with high power for good performance, and the rest antennas were configured with low power, the worst case in the following table:

Channel	Frequency	Conducted Peak Output Power (dBm)					Limit	Result
	MHz	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Total	dBm	
Low	2406.5	24.85	0.29	24.83	0.38	27.87	30	Pass
Middle	2436.5	24.19	1.03	24.22	1.02	27.24	30	Pass
High	2476.5	24.28	1.05	24.25	1.08	27.30	30	Pass

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

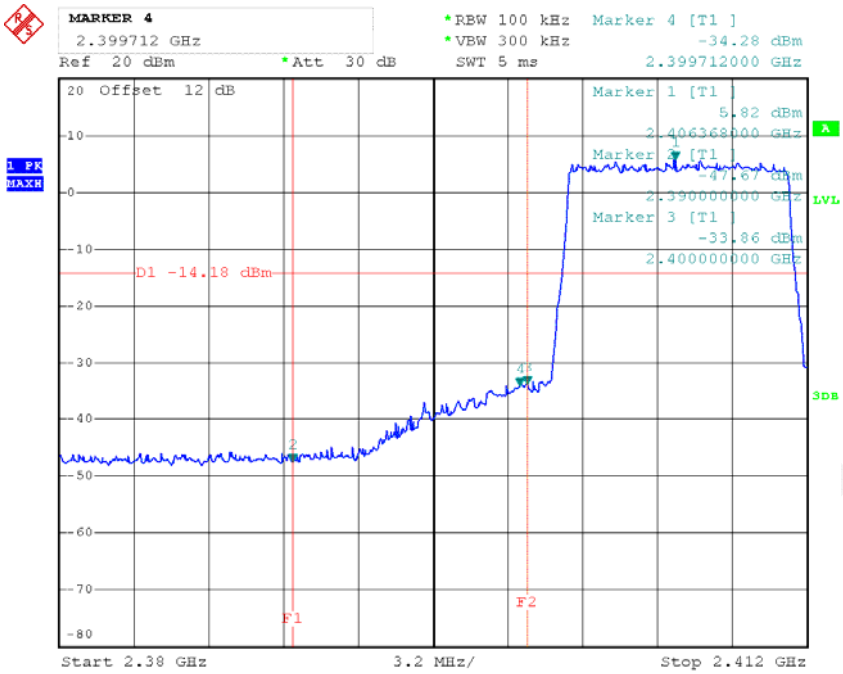
Temperature:	23.8 °C
Relative Humidity:	53 %
ATM Pressure:	99.6 kPa

The testing was performed by Allen Qiao on 2015-07-03.

Test Result: *Compliance(the test performed at high power)*

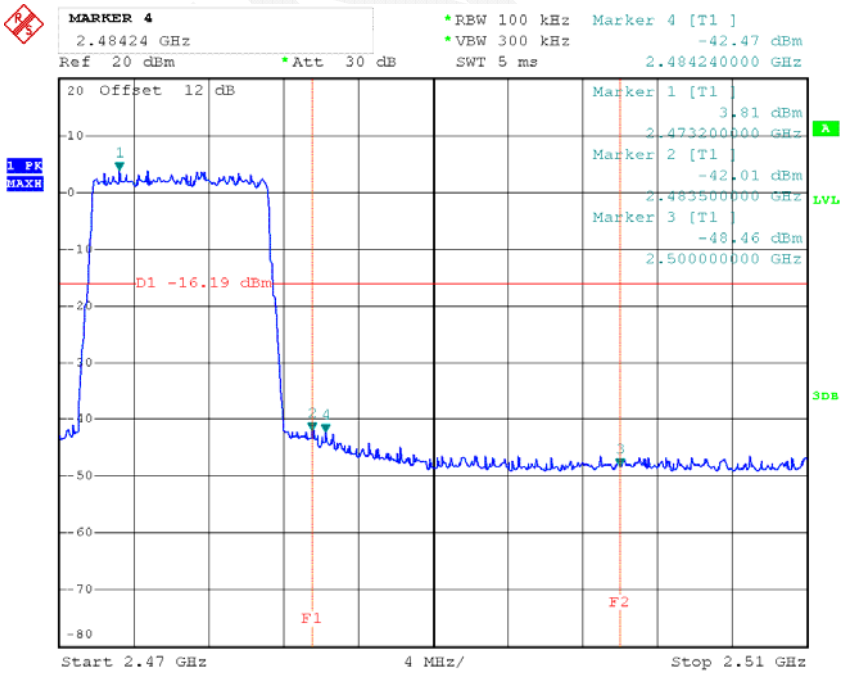
Please refer to following plots.

Antenna 1: Band Edge, Left Side



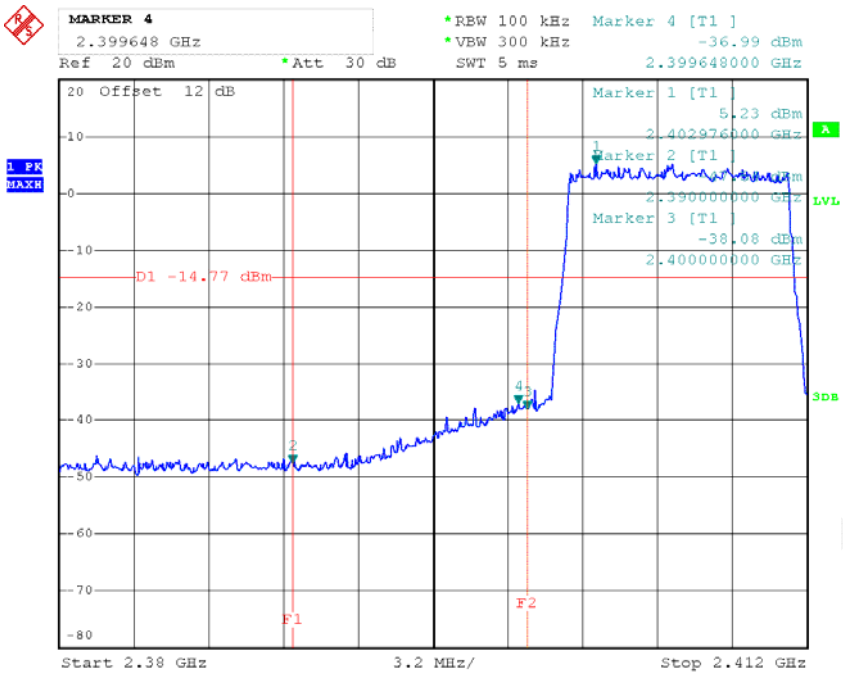
Date: 3.JUL.2015 15:59:35

Antenna 1: Band Edge, Right Side



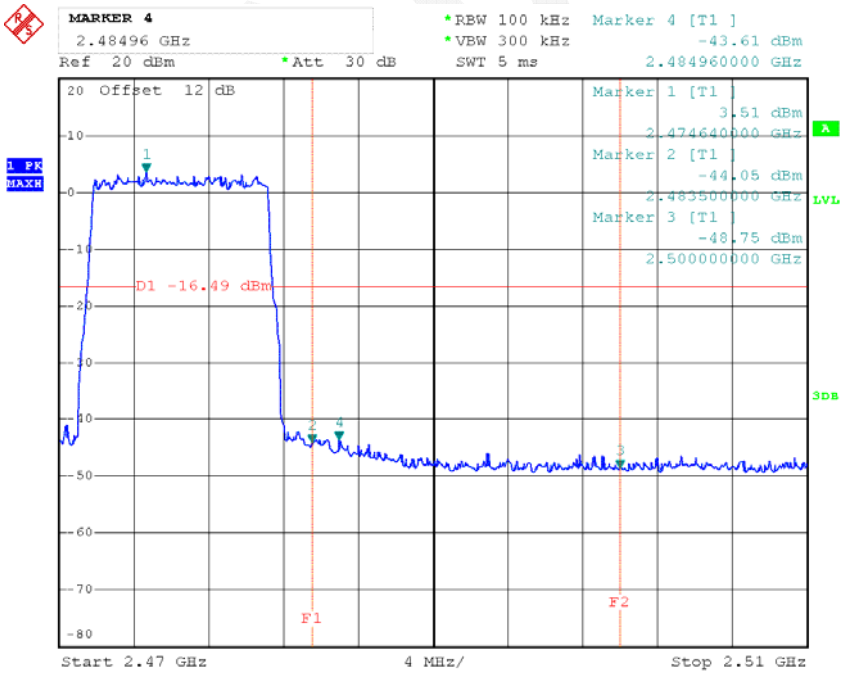
Date: 3.JUL.2015 16:10:34

Antenna 2: Band Edge, Left Side



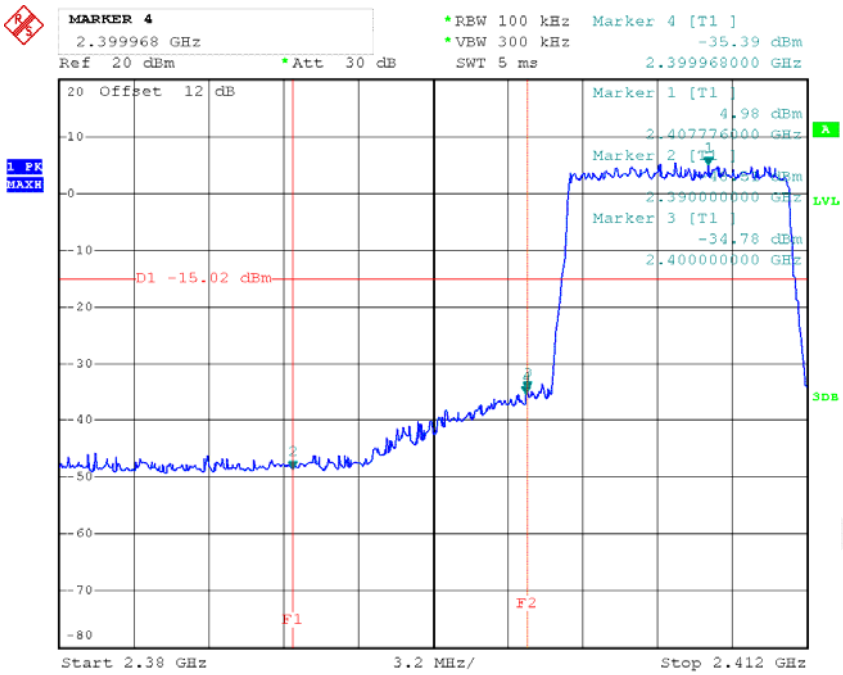
Date: 3.JUL.2015 16:03:58

Antenna 2: Band Edge, Right Side



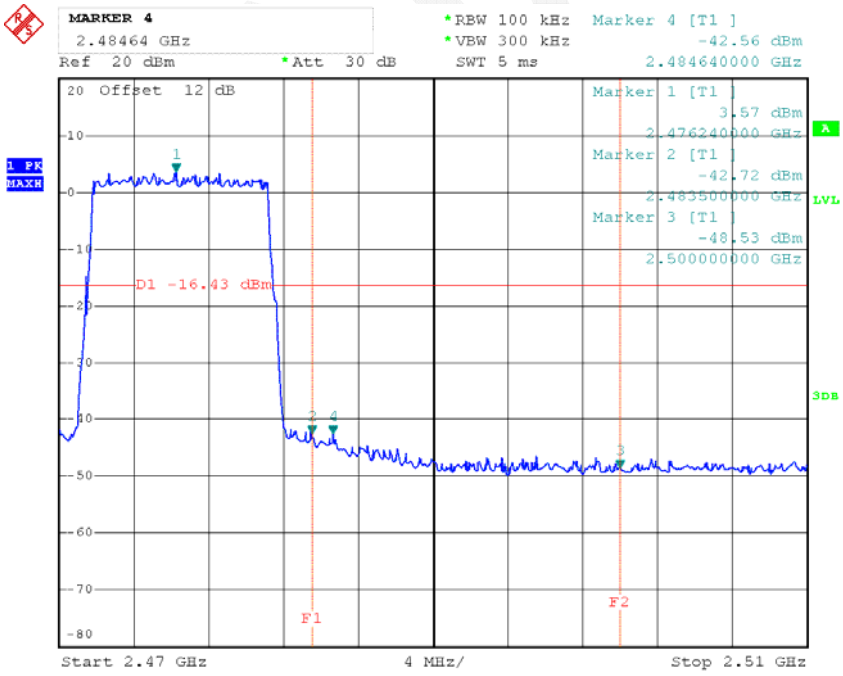
Date: 3.JUL.2015 16:07:11

Antenna 3 Band Edge, Left Side



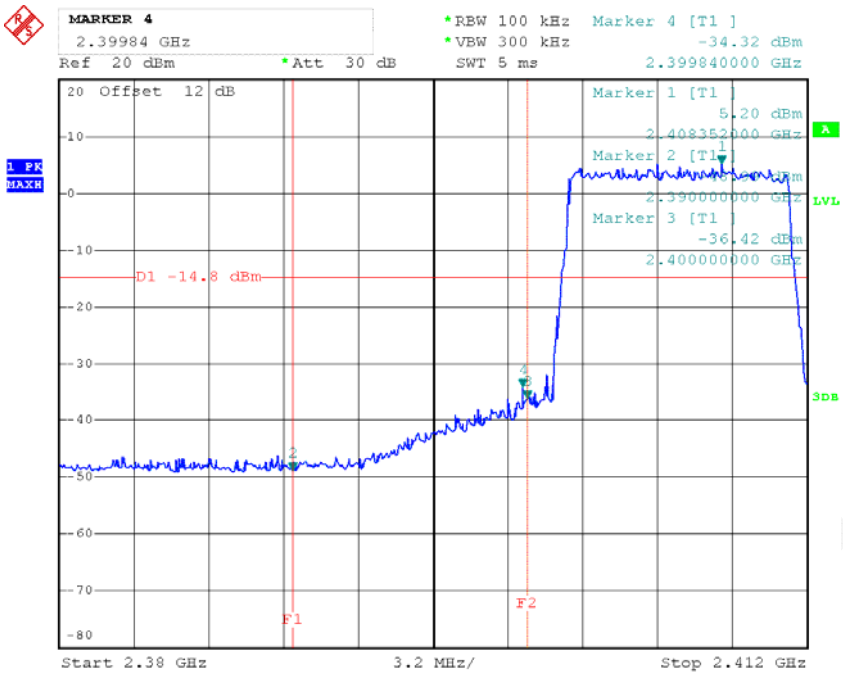
Date: 3.JUL.2015 16:01:00

Antenna 3 Band Edge, Right Side



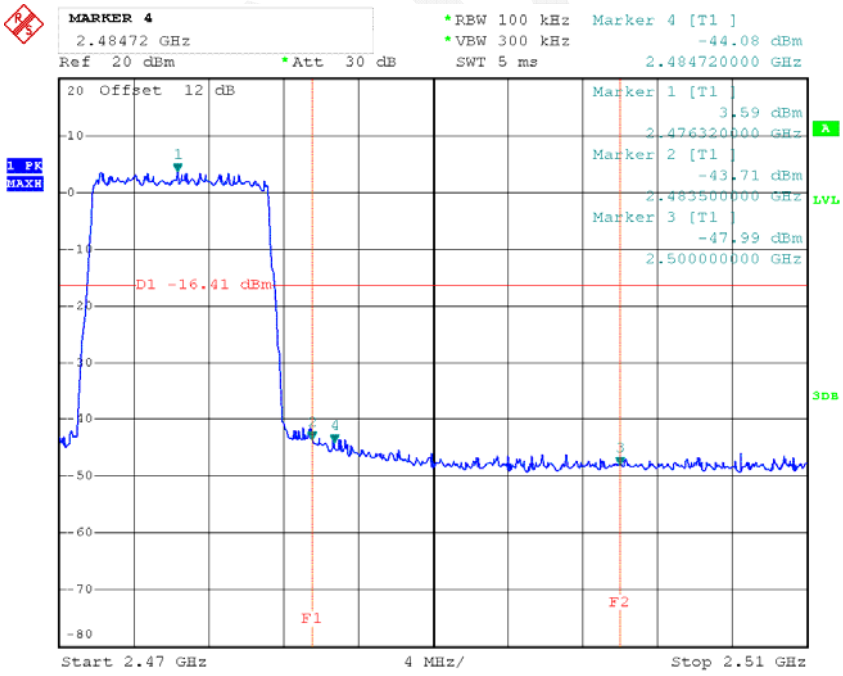
Date: 3.JUL.2015 16:11:52

Antenna 4 Band Edge, Left Side



Date: 3.JUL.2015 16:05:24

Antenna 4 Band Edge, Right Side



Date: 3.JUL.2015 16:08:47

FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the RBW = 3 kHz, VBW = 10 kHz, Set the span to 1.5 times the DTS bandwidth.
4. Use the peak marker function to determine the maximum amplitude level.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	53 %
ATM Pressure:	99.4 kPa

The testing was performed by Allen Qiao on 2015-07-03.

Test Mode: Transmitting

Test Result: Pass

Test Mode: Transmitting

Channel	Frequency	Power Spectral Density (dBm/3kHz)			
	MHz	Ant. 1	Ant. 2	Ant. 3	Ant. 4
High Power					
Low	2406.5	-11.11	-11.56	-11.29	-11.03
Middle	2436.5	-11.87	-12.40	-11.56	-11.90
High	2476.5	-12.86	-13.33	-12.43	-13.05
Low Power					
Low	2406.5	-33.73	-35.31	-34.08	-35.23
Middle	2436.5	-34.01	-34.73	-33.39	-34.51
High	2476.5	-35.11	-34.09	-35.17	-34.36

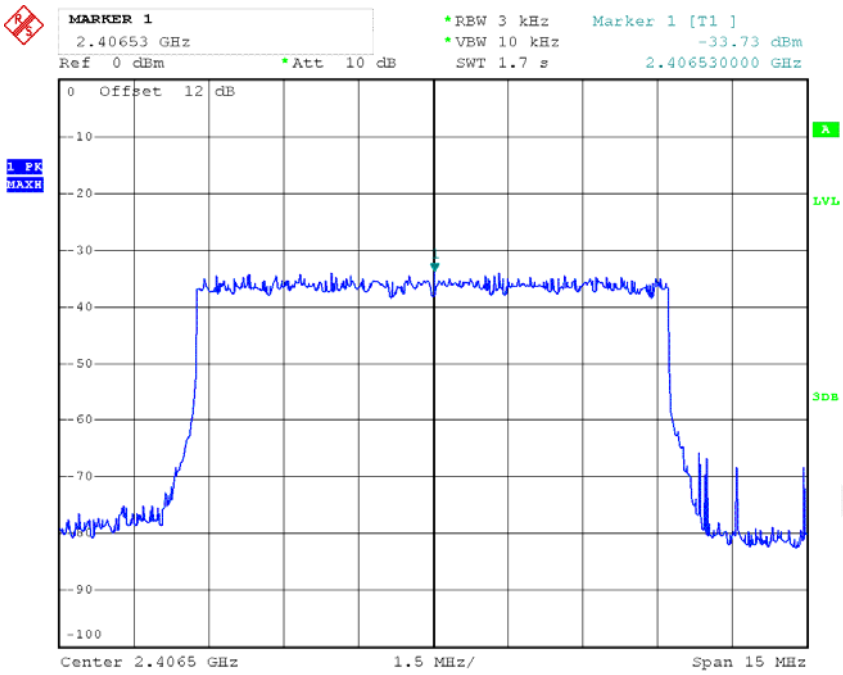
The system employed Space Time Block Codes (STBC) technology, and the signals are completely uncorrelated, the system configured two antennas with high power for good performance, and the rest antennas were configured with low power, the worst case in the following table:

Channel	Frequency	Power Spectral Density (dBm/3kHz)					Limits	Result
	MHz	Ant. 1	Ant. 2	Ant. 3	Ant. 4	Total	dBm/3kHz	
Low	2406.5	-11.11	-35.31	-34.08	-11.03	-8.04	8	Pass
Middle	2436.5	-11.87	-34.73	-11.56	-34.51	-8.68	8	Pass
High	2476.5	-12.86	-34.09	-12.43	-34.36	-9.60	8	Pass

Please refer to the following plots

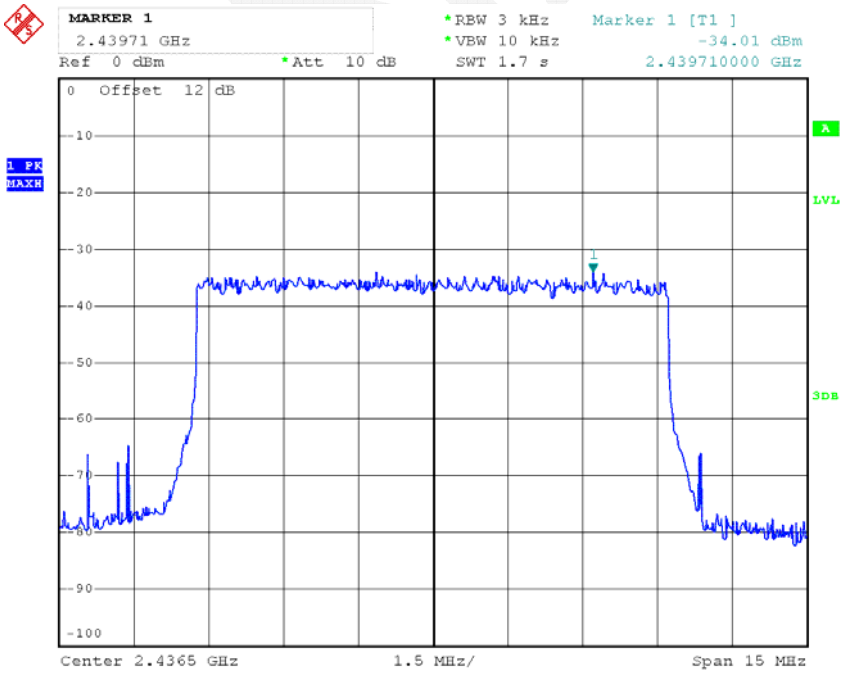
Low Power:

Power Spectral Density, Antenna 1 Low Channel



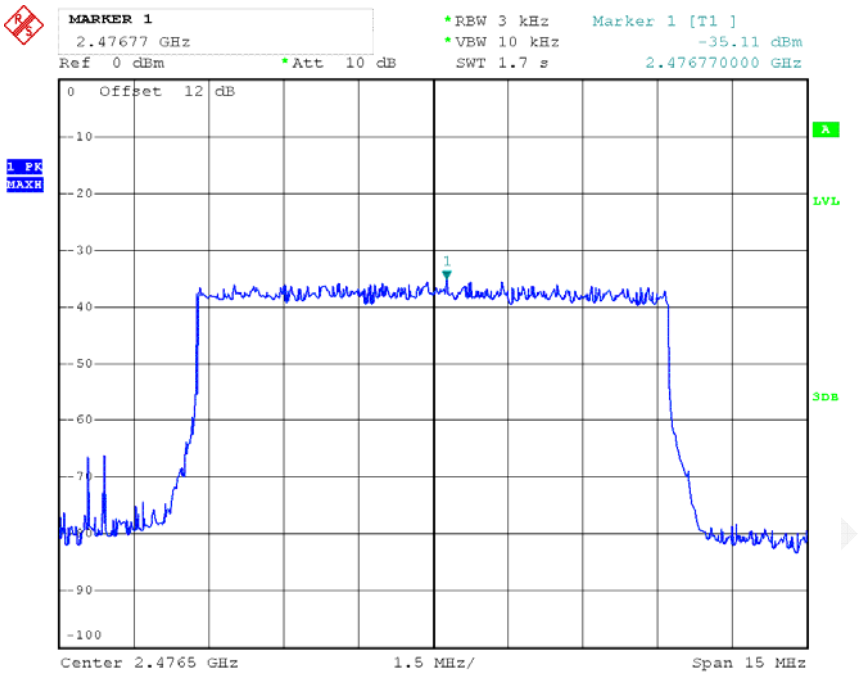
Date: 3.JUL.2015 15:16:54

Power Spectral Density, Antenna 1 Middle Channel



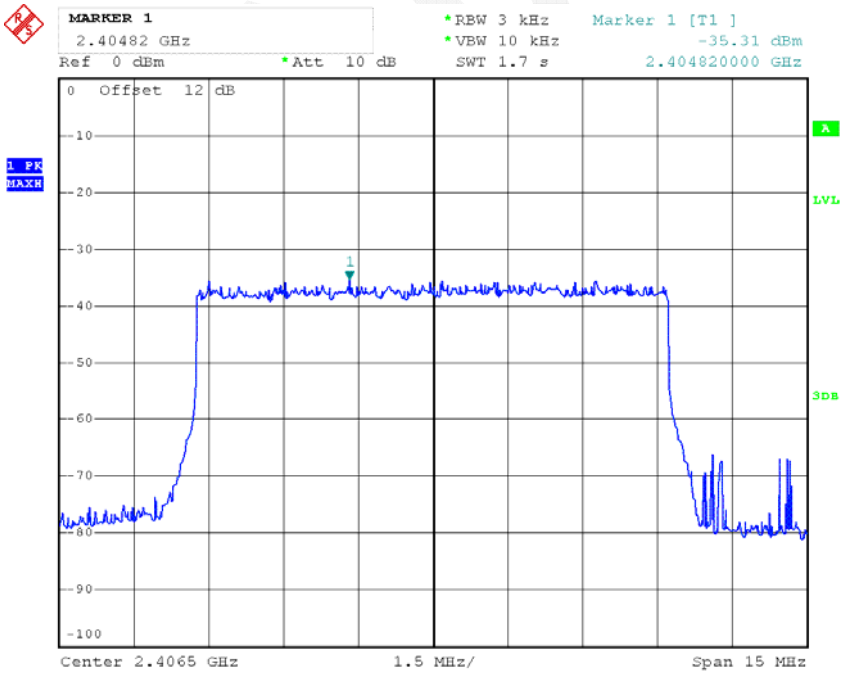
Date: 3.JUL.2015 15:16:03

Power Spectral Density, Antenna 1 High Channel



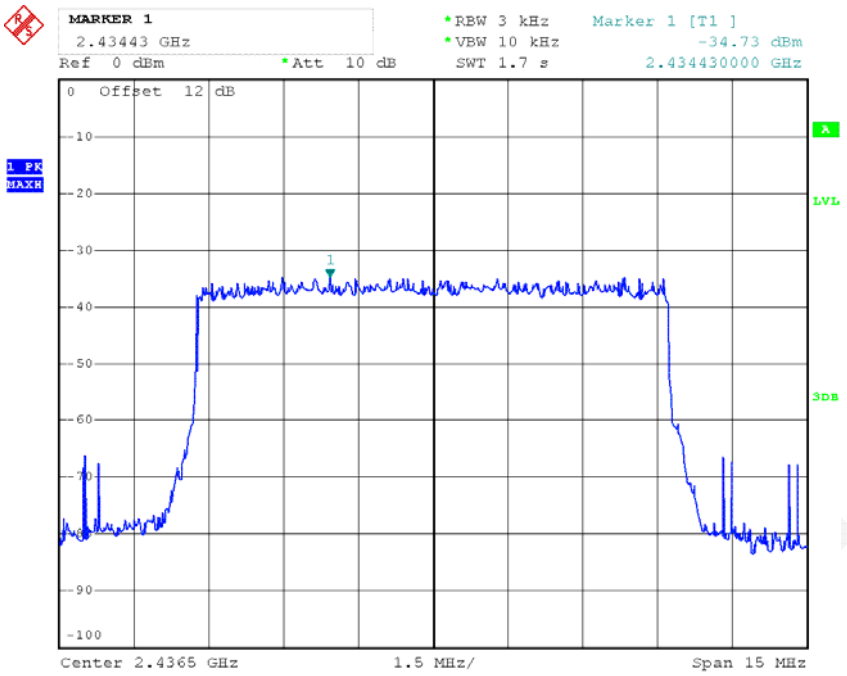
Date: 3.JUL.2015 15:13:45

Power Spectral Density, Antenna 2 Low Channel



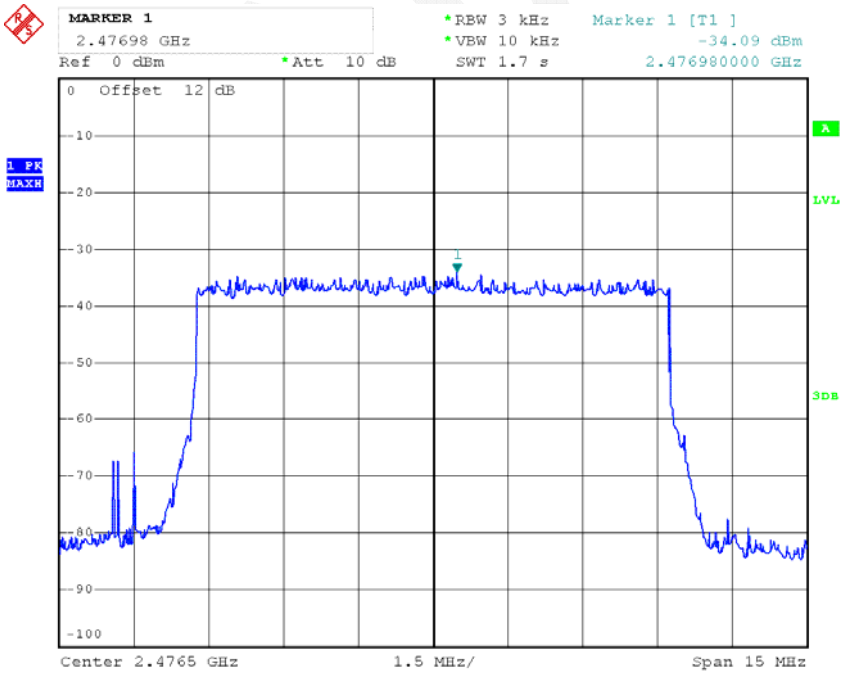
Date: 3.JUL.2015 15:06:19

Power Spectral Density, Antenna 2 Middle Channel



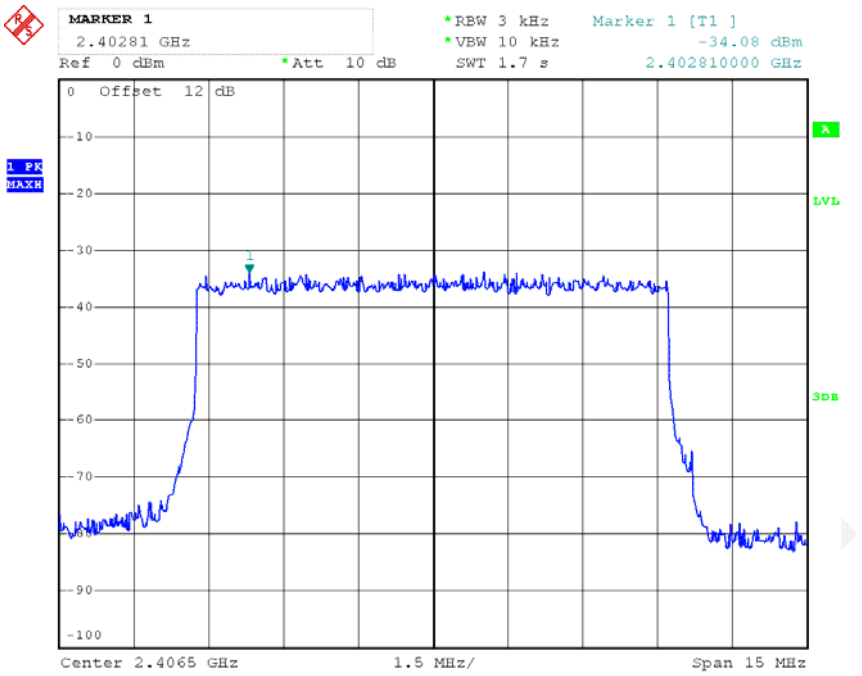
Date: 3.JUL.2015 15:09:12

Power Spectral Density, Antenna 2 High Channel



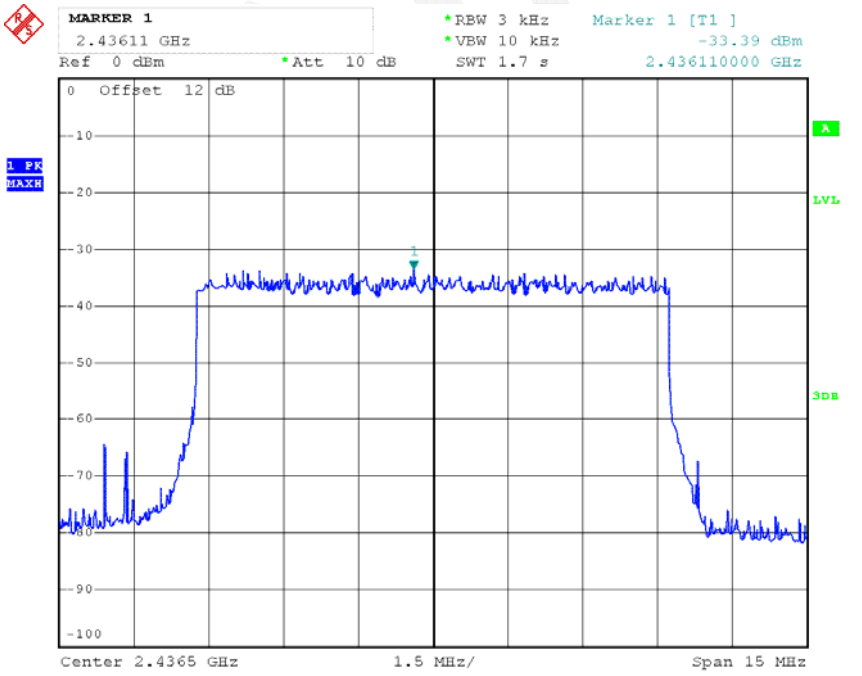
Date: 3.JUL.2015 15:10:02

Power Spectral Density, Antenna 3 Low Channel



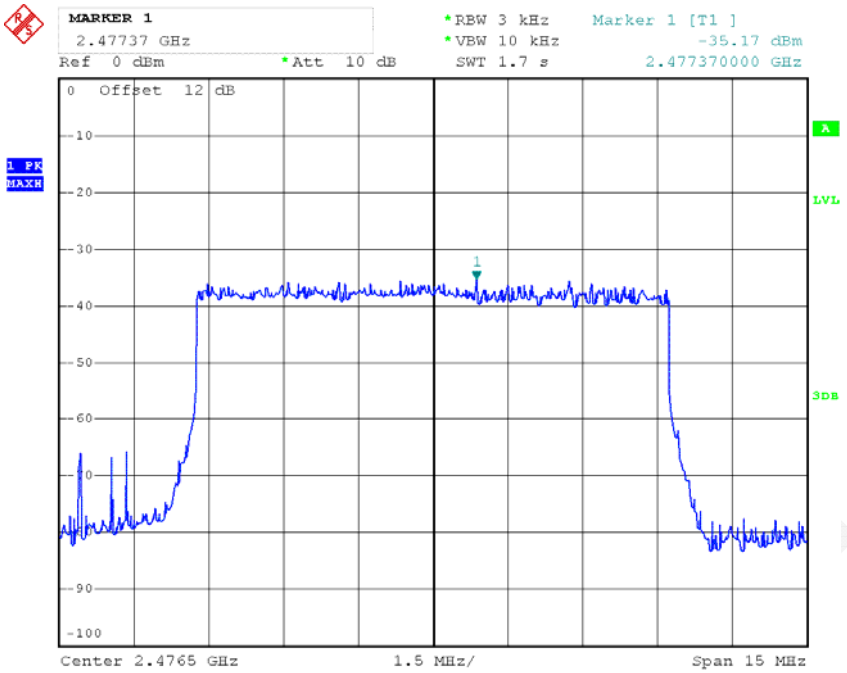
Date: 3.JUL.2015 15:17:33

Power Spectral Density, Antenna 3 Middle Channel



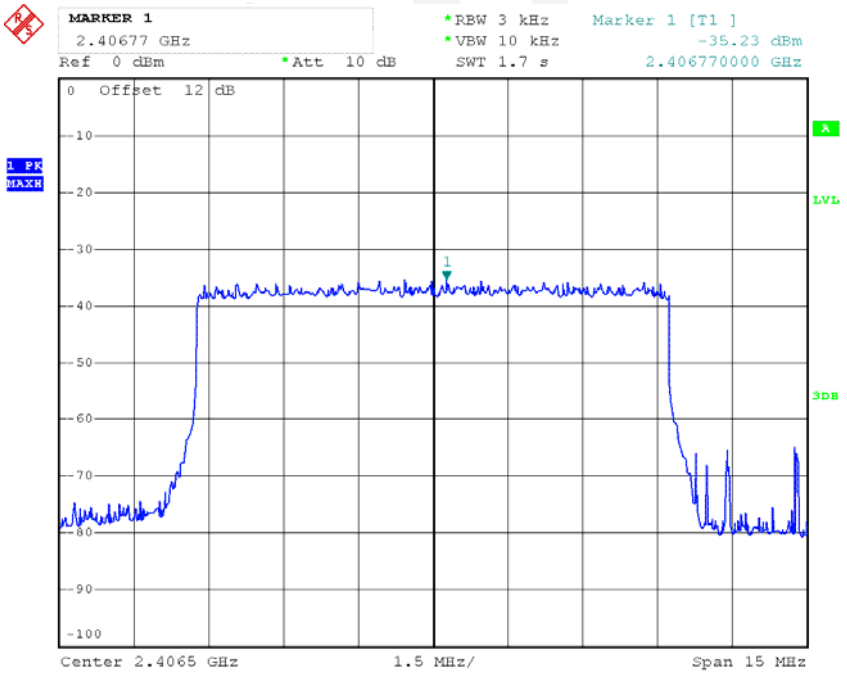
Date: 3.JUL.2015 15:15:25

Power Spectral Density, Antenna 3 High Channel



Date: 3.JUL.2015 15:14:24

Power Spectral Density, Antenna 4 Low Channel



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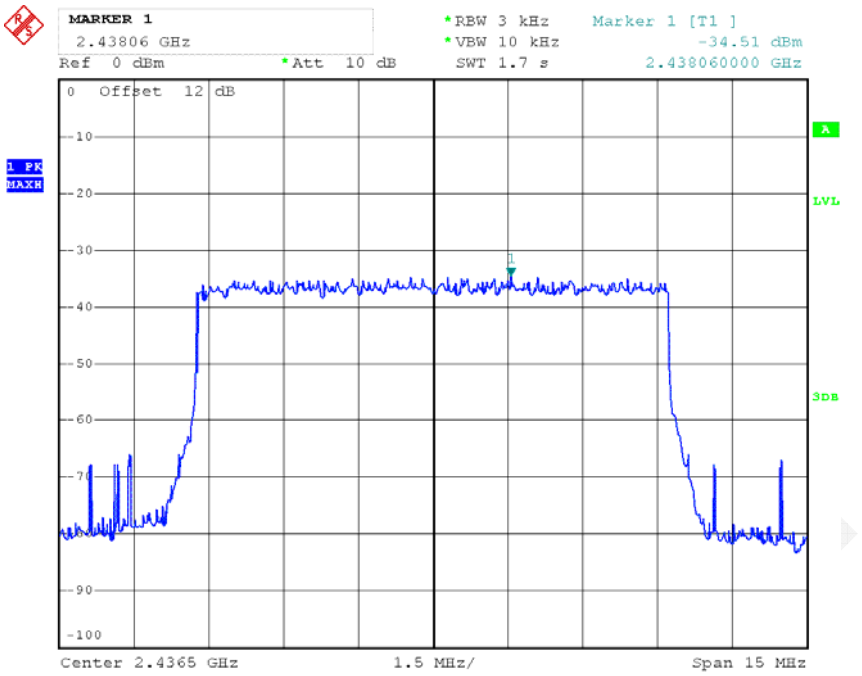
Power Spectral Density, Antenna 4 Middle Channel



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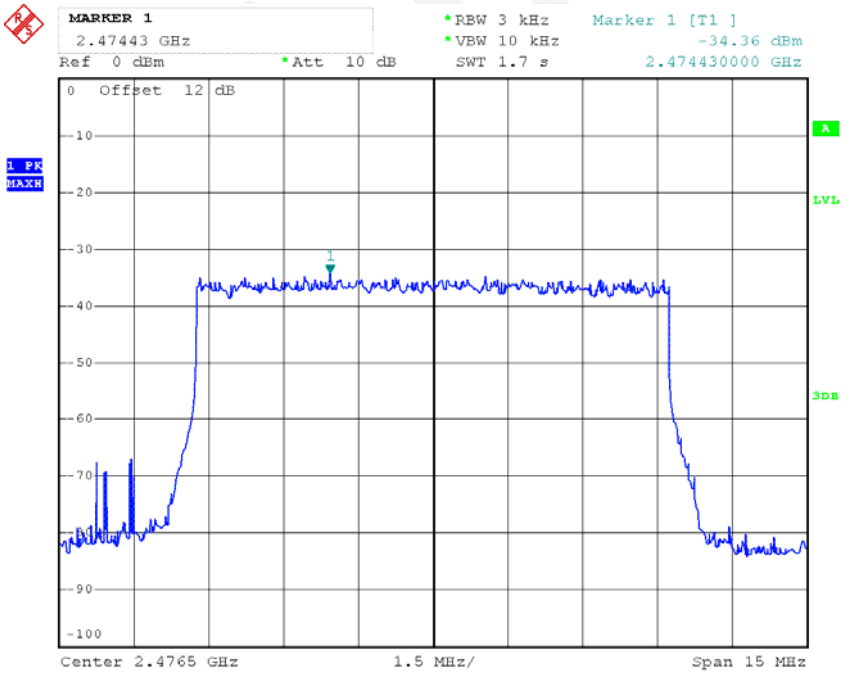
Power Spectral Density, Antenna 4 High Channel



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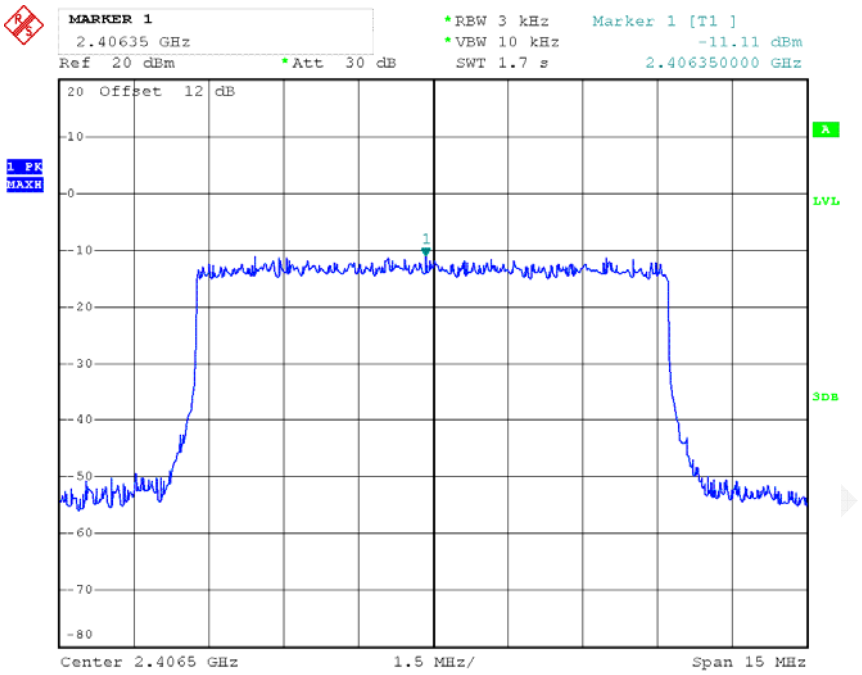
High Power:

Power Spectral Density, Antenna 1 Low Channel



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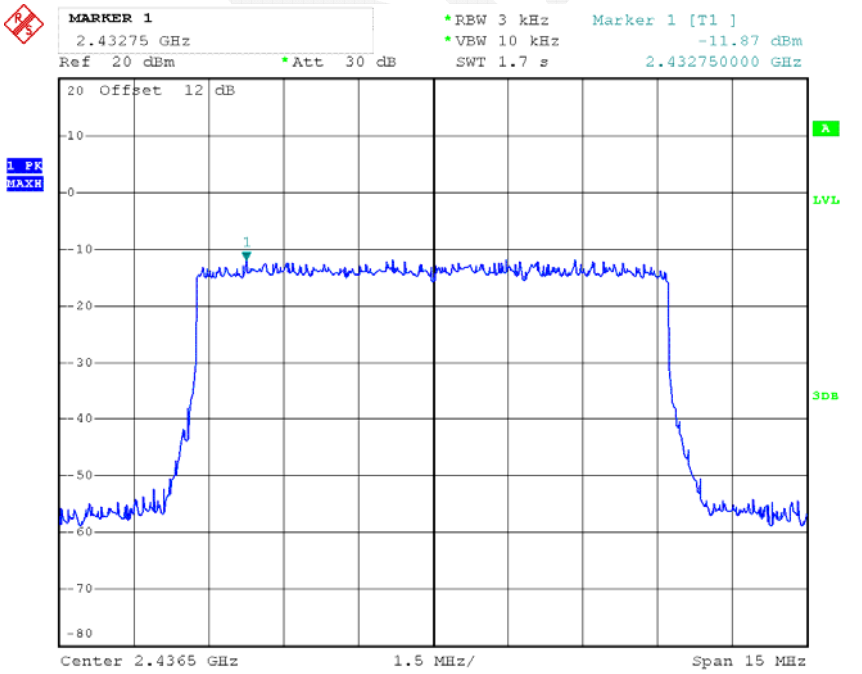
Power Spectral Density, Antenna 1 Middle Channel



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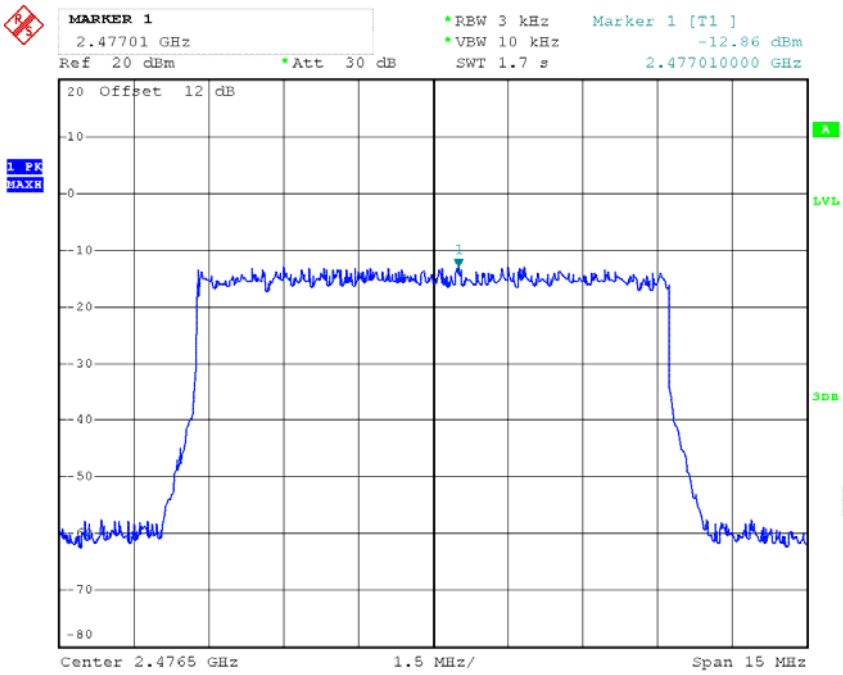
Power Spectral Density, Antenna 1 High Channel



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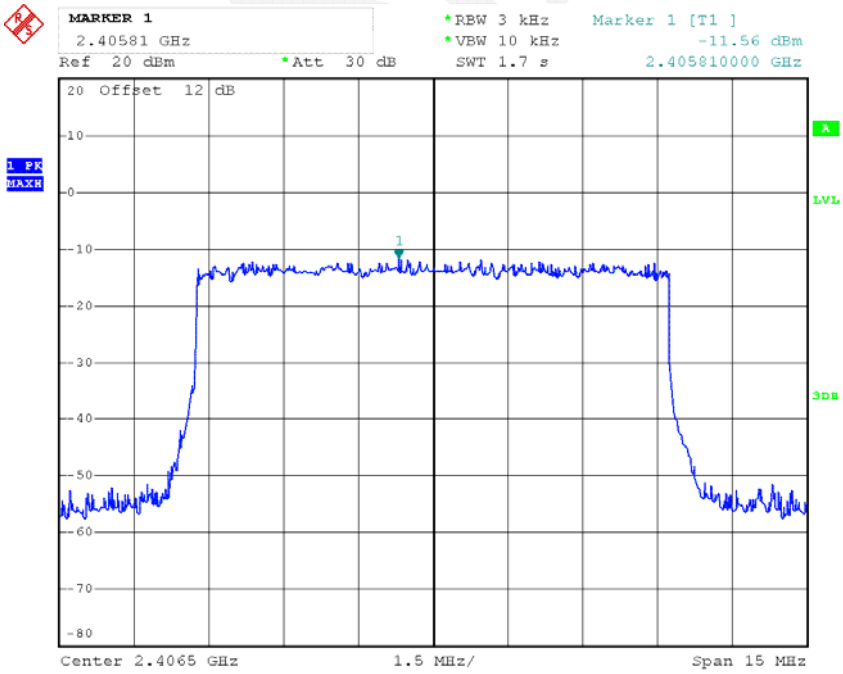
Power Spectral Density, Antenna 2 Low Channel



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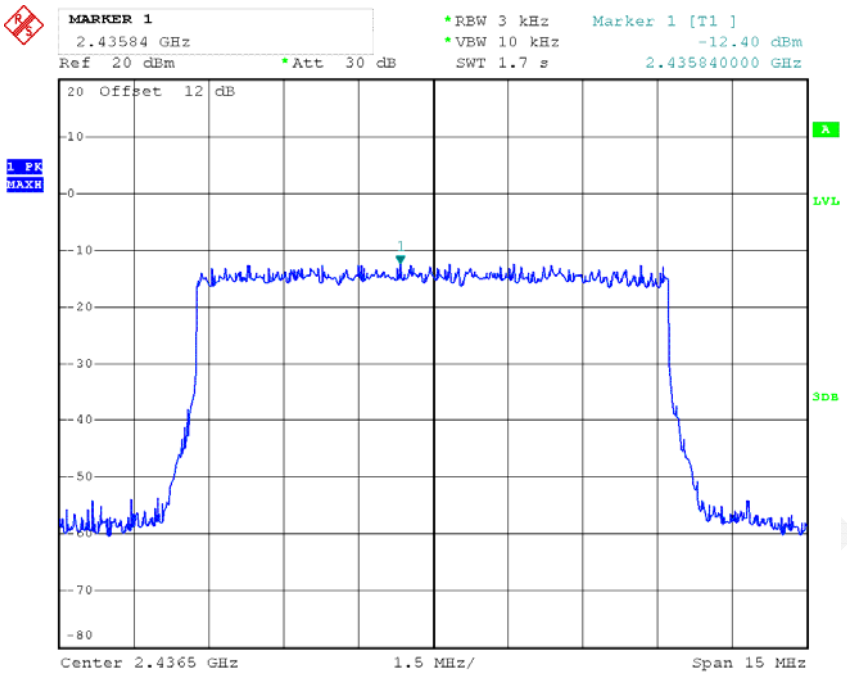
Power Spectral Density, Antenna 2 Middle Channel



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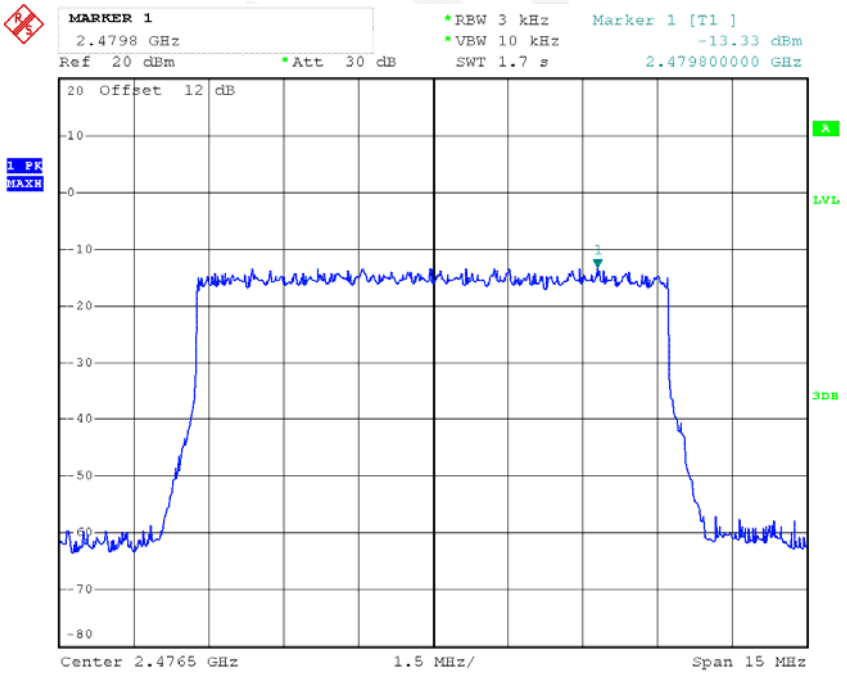
Power Spectral Density, Antenna 2 High Channel



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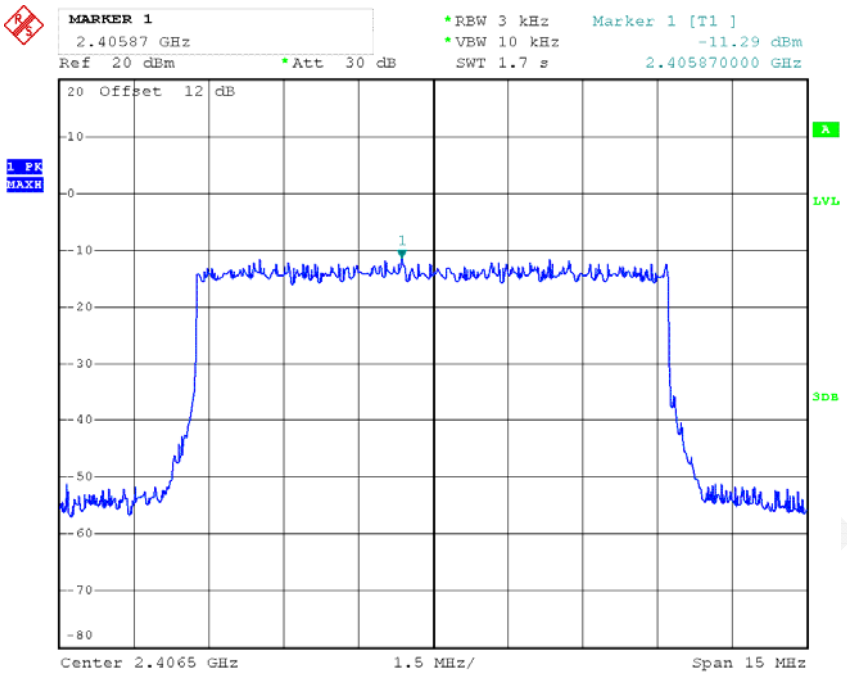
Power Spectral Density, Antenna 3 Low Channel



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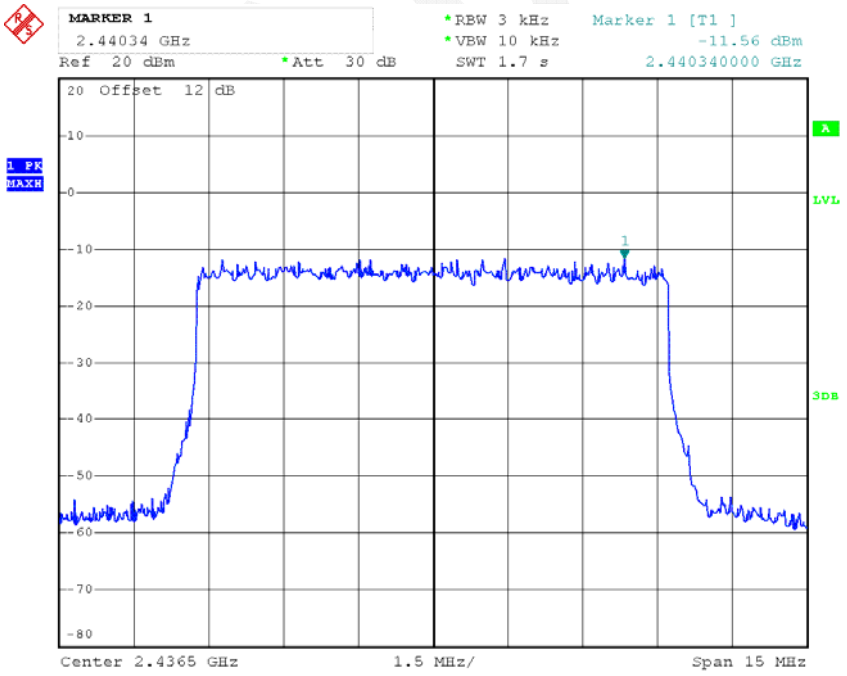
Power Spectral Density, Antenna 3 Middle Channel



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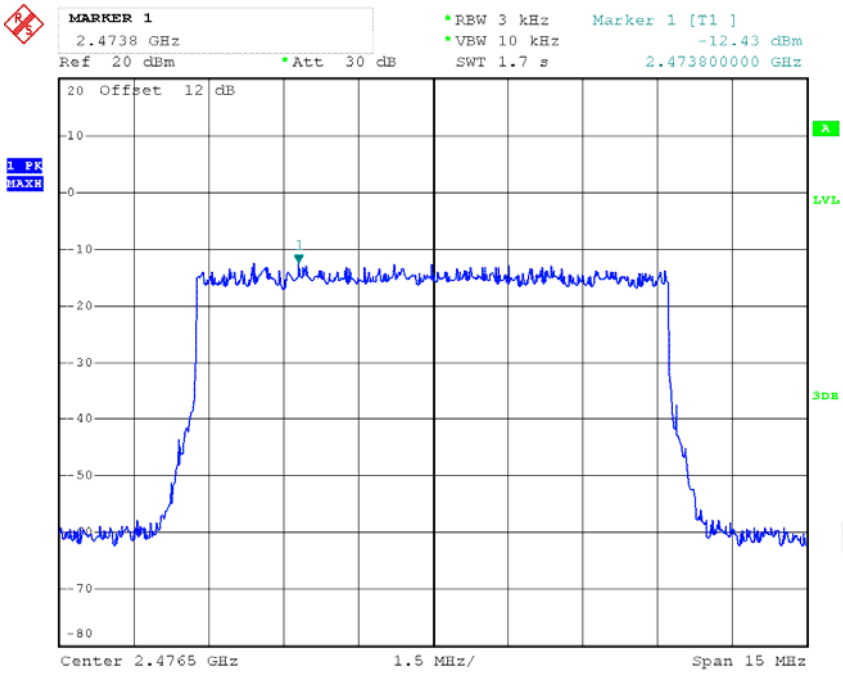
Power Spectral Density, Antenna 3 High Channel



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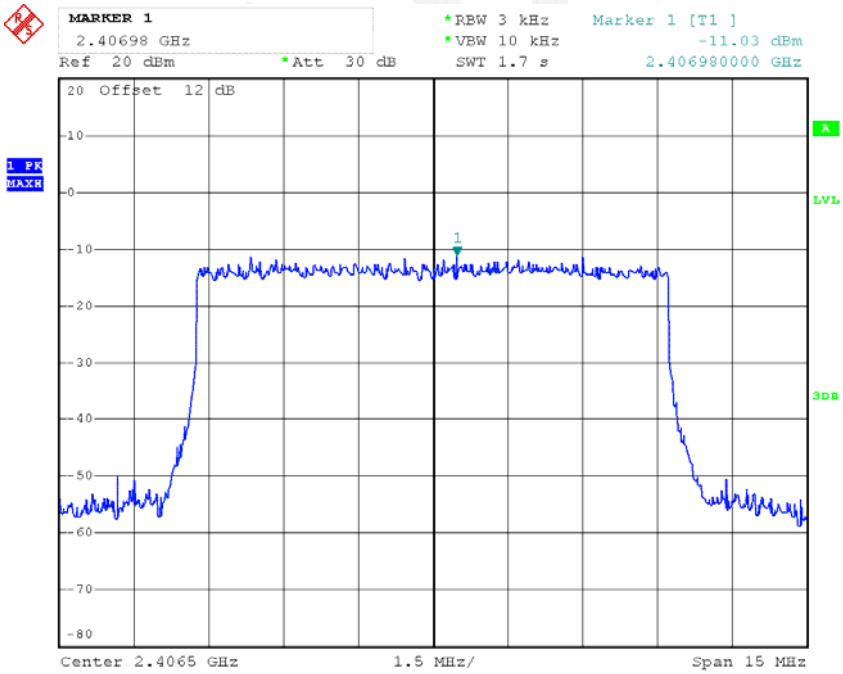
Power Spectral Density, Antenna 4 Low Channel



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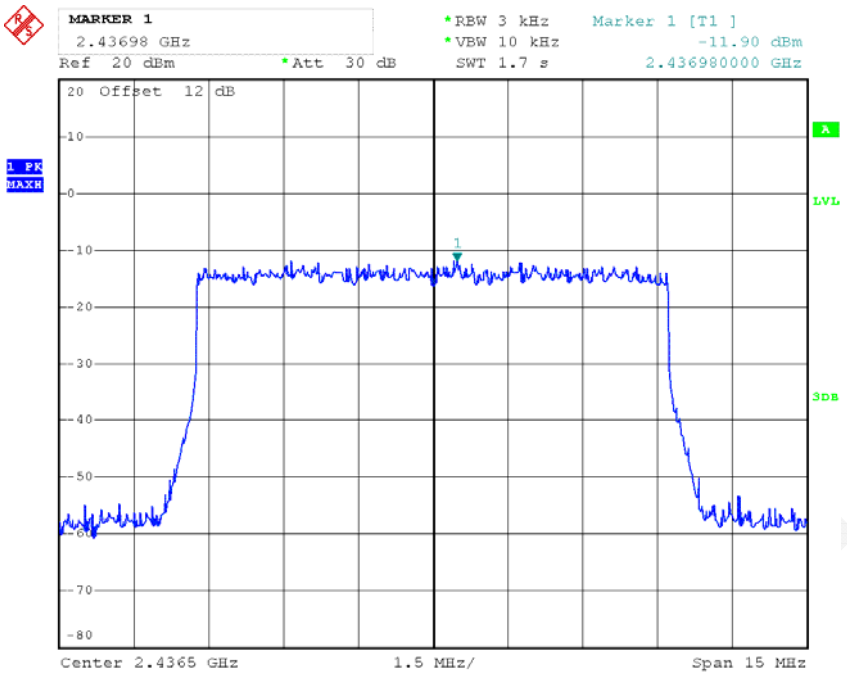
Power Spectral Density, Antenna 4 Middle Channel



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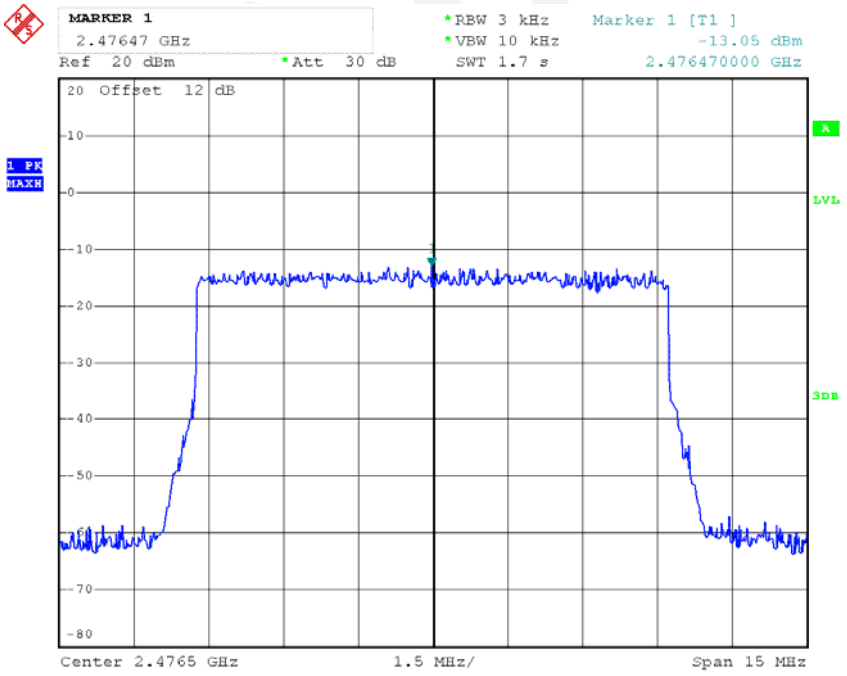
Power Spectral Density, Antenna 4 High Channel



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*******END OF REPORT*******