



F2 Labs
16740 Peters Road
Middlefield, Ohio 44062
United States of America
www.f2labs.com

CERTIFICATION TEST REPORT

Manufacturer: Securus Technologies
4000 International Parkway
Carrollton, Texas 75007 USA

Applicant: Same As Above

Product Name: JP6S

Product Description: 7" Lithium Capacitive Touch Tablet for Inmates

Model: JP6S

FCC ID: 2AUJ4JP6S

Testing Commenced: Aug. 14, 2019

Testing Ended: Feb. 17, 2020

Summary of Test Results: In Compliance

The EUT complies with the EMC requirements when manufactured identically as the unit tested in this report, including any required modifications and/or manufacturer's statement. Any changes to the design or build of this unit subsequent to this testing may deem it non-compliant.

Standards:

- **FCC Part 15 Subpart C, Section 15.247**
- **FCC15.207 - Conducted Limits**
- **FCC Part 15.31(e)**
- **ANSI C63.10:2013**



Order Number: F2P21445A

Applicant: Securus Technologies
Model: JP6S

Evaluation Conducted by:

Julius Chiller, EMC/Wireless Engineer

Report Reviewed by:

Ken Littell, Director of EMC & Wireless Operations

F2 Labs
26501 Ridge Road
Damascus, MD 20872
Ph 301.253.4500

F2 Labs
16740 Peters Road
Middlefield, OH 44062
Ph 440.632.5541

F2 Labs
8583 Zionsville Road
Indianapolis, IN 46268
Ph 317.610.0611

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

1.2 Measurement Procedure:

All measurements were performed according to the 2013 version of ANSI C63.10 and recommended FCC procedure of measurement of DTS operating under Section 15.247 and in KDB558074. A list of the measurement equipment can be found in Section 6.

1.3 Uncertainty Budget:

The uncertainty in EMC measurements arises from several factors which affect the results, some associated with environmental conditions in the measurement room, the test equipment being used, and the measurement techniques adopted.

The measurement uncertainty budgets detailed below are calculated from the test and calibration data and are expressed with a 95% confidence factor. Note: Only measurements listed below which relate to tests included in this Test Report are applicable to it.

Measurement Range	Expanded Uncertainty	Combined Uncertainty
Radiated Emissions <1 GHz @ 3m	$\pm 5.07\text{dB}$	± 2.54
Radiated Emissions <1 GHz @10m	$\pm 5.09\text{dB}$	± 2.55
Radiated Emissions 1 GHz to 2.7 GHz	$\pm 3.62\text{dB}$	± 1.81
Radiated Emissions 2.7 GHz to 18 GHz	$\pm 3.10\text{dB}$	± 1.55
AC Power Line Conducted Emissions, 150kHz to 30 MHz	$\pm 2.76\text{dB}$	± 1.38

This Uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1.4 Document History

Document Number	Description	Issue Date	Approved By
F2P21445A-01E	First Issue	Feb. 17, 2020	K. Littell

**2 SUMMARY OF TEST RESULTS**

Test Name	Standard(s)	Results
-6dB Occupied Bandwidth	CFR 47 Part 15.247(a)(2) / KDB558074	Complies
Conducted Output Power	CFR 47 Part 15.247(b)(3) / KDB558074	Complies
Voltage Variations	CFR 47 Part 15.31(e)	Complies
Conducted Spurious Emissions	CFR 47 Part 15.247(d) / Part 15.207 / KDB558074	Complies
Radiated Spurious Emission	CFR 47 Part 15.247(d) / Part 15.209 / KDB558074	Complies
Peak Power Spectral Density	CFR 47 Part 15.247(e) / KDB558074	Complies
Frequency Separation	ANSI 63.10 2013 (7.8.2)	N/A
Number of Hopping Frequencies	ANSI 63.10 2013 (7.8.3)	N/A
Dwell Time	ANSI 63.10 2013 (7.8.4)	N/A
Conducted Emissions	CFR 47 Part 15.207(a)	Complies

Modifications Made to the Equipment
None

**3 TABLE OF MEASURED RESULTS****Bluetooth**

Test		Low Channel 2402 MHz	Mid Channel 2440 MHz	High Channel 2480 MHz
Conducted Output Power		3.55mW (5.51dBm)	3.98mW (6.00dBm)	4.04mW (6.07dBm)
Conducted Output Power Limit		1 Watt, (30dBm)	1 Watt, (30dBm)	1 Watt, (30dBm)
E.I.R.P. with 2.0dBi Integral Antenna		5.63mW (7.51dBm)	6.31mW (8.0dBm)	6.36mW (8.07dBm)
E.I.R.P. Limit		4 Watts, (36.02dBm)	4 Watts, (36.02dBm)	4 Watts, (36.02dBm)
Peak Power Spectral Density		-9.23 dBm	-8.70 dBm	-8.33 dBm
Peak Power Spectral Density Limit		8 dBm	8 dBm	8 dBm
-6dB Occupied Bandwidth		0.712 MHz	0.712 MHz	0.704 MHz
-6dB Occupied Bandwidth Limit		≥ 500kHz	≥ 500kHz	≥ 500kHz
Voltage Variations	93.5V	4.75dBm	5.43dBm	5.61dBm
	126.5V	4.77dBm	5.43dBm	5.62dBm
Limit		1W 30dBm	1W 30dBm	1W 30dBm



Wi-Fi, 2.4 GHz

Test		Low Channel 2412 MHz	Mid Channel 2437 MHz	High Channel 2462 MHz
¹ Conducted Output Power	CCK, 11mbps	37.84mW / 15.78dBm	42.36mW / 16.27dBm	39.26mW / 15.94dBm
Conducted Output Power Limit		1 Watt / 30dBm	1 Watt / 30dBm	1 Watt / 30dBm
E.I.R.P. with 2dBi Integral Antenna	CCK, 11mbps	59.98mW / 17.78dBm	67.14mW / 18.27dBm	62.23mW / 17.94dBm
E.I.R.P. Limit		4000mW / 36dBm	4000mW / 36dBm	4000mW / 36dBm
² Peak Power Spectral Density		-6.58dBm	-6.41dBm	-5.89dBm
Peak Power Spectral Density Limit		8dBm	8dBm	8dBm
² -6dB Occupied Bandwidth		9.521 MHz	9.521 MHz	9.58 MHz
-6dB Occupied Bandwidth Limit		≥ 500kHz	≥ 500kHz	≥ 500kHz
² Voltage Variations	93.5V	13.93dBm	14.16dBm	15.15dBm
	126.5V	14.31dBm	14.76dBm	15.37dBm
Limit		1W 30dBm	1W 30dBm	1W 30dBm

¹ The Conducted Output Power had to be reduced because SAR evaluation measurement exceeded the allowed levels. The power setting on the device was reduced to the 14 setting.

² These results were measured with the output power setting at 19 dBm and were from prior to the power reduction required for the device to meet SAR requirements. The Conducted Power was reduced; therefore, these values were not required to be remeasured as they would not increase beyond the allowed limits.



4 ENGINEERING STATEMENT

This report has been prepared on behalf of Securus Technologies to provide documentation for the testing described herein. This equipment has been tested and found to comply with Part 15.247 of the FCC Rules using ANSI C63.10:2013 and KDB558074 standards. The test results found in this test report relate only to the items tested.



5 EUT INFORMATION AND DATA

5.1 Equipment Under Test:

Product: Tablet

Model: JP6S

Serial No.: None Specified

FCC ID: **2AUJ4JP6S**

5.2 Trade Name:

Securus Technologies

5.3 Power Supply:

Charger, Securus model MX15X-0502500UX

5.4 Applicable Rules:

CFR 47, Part 15.247, subpart C

5.5 Equipment Category:

Radio Transmitter-DTS

5.6 Antenna:

Integral

5.7 Accessories:

N/A

5.8 Test Item Condition:

The equipment to be tested was received in good condition.

5.9 Testing Algorithm:

The EUT was configured to permit frequency changes from low-mid-upper transmission channel using digital modulation (required for digital transmission systems). For RF antenna conducted tests, the EUT was equipped with an SMA connector for connection to the measuring equipment. For radiated emissions tests in a semi-anechoic chamber, the EUT was equipped with integral/internal chip antenna. The highest emissions were recorded in the data tables.

**6 LIST OF MEASUREMENT INSTRUMENTATION**

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	AlbatrossProjects	B83117-DF435-T261	US140023	Mar. 31, 2020
Temp/Hum. Recorder	CL263	Extech	445814	06	Mar. 6, 2020
Temp/Hum. Recorder	CL261	Extech	445814	04	Mar. 6, 2020
Receiver	CL151	Rohde & Schwarz	ESU40	100319	Oct. 21, 2020
Receiver	CL204	Rohde & Schwarz	ESR7	101714	Oct. 16, 2020
Horn Antenna	CL098	Emco	3115	9809-5580	Jan. 31, 2021
Pre-Amplifier	0197	Hewlett Packard	8447D	1726A01006	Jan. 31, 2020
Pre-Amplifier	CL153	Agilent	83006-69007	MY39500791	Aug. 5, 2020
Amplifier w/Monopole & 18" Loop	CL163-Loop	A.H. Systems, Inc.	EHA-52B	100	July 24, 2020
Software:	Tile Version 3.4.B.3		Software Verified: Aug. 14-19, 2019; Jan. 21, 2020		
Software:	EMC 32, Version 8.53.0		Software Verified: Aug. 14-19, 2019; Jan. 21, 2020		
Antenna, JB3 Combination	CL175	Sunol Sciences	JB3	A030315	Oct. 14, 2020
Antenna, Horn	CL114	A. H. Systems, Inc.	SAS-572	237	Feb. 4, 2021
Spectrum Analyzer	CL147	Agilent	E7402	MY45101241	Jan. 25, 2020
Transient Limiter	0202	Hewlett Packard	11947A	3107A00729	July 29, 2020
LISN	CL181	Com-Power	LI-125A	191226	Sept. 6, 2020
LISN	CL182	Com-Power	LI-125A	191225	Sept. 6, 2020
Horn Antenna (26.5-40 GHz)	CL188	Com-Power	AH-640	091065	July 23, 2021
Pre-Amplifier (18 GHz-40 GHz)	CL189	Com-Power	PAM-840A	461303	July 31, 2021



7 OCCUPIED BANDWIDTH

7.1 Requirements:

The -6dB bandwidth shall be greater than 500 kHz.

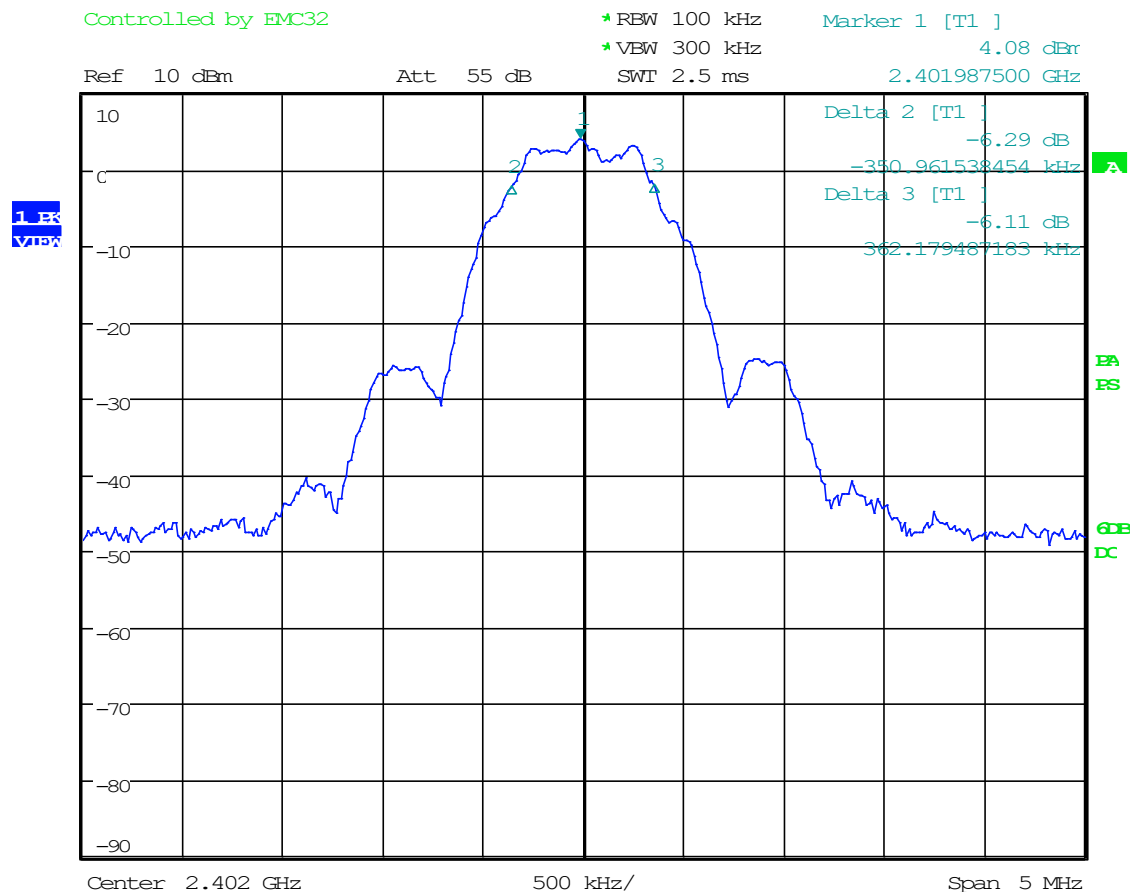
Bandwidth measurements were made at the low, mid and upper frequencies with the resolution Bandwidth set according to KDB558074. The bandwidth was measured using the marker delta method.



7.2 Occupied Bandwidth Test Data

Test Date:	Aug. 14, 2019; Aug. 19, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(a)(2); KDB558074	Air Temperature:	20.3°C
		Relative Humidity:	68%

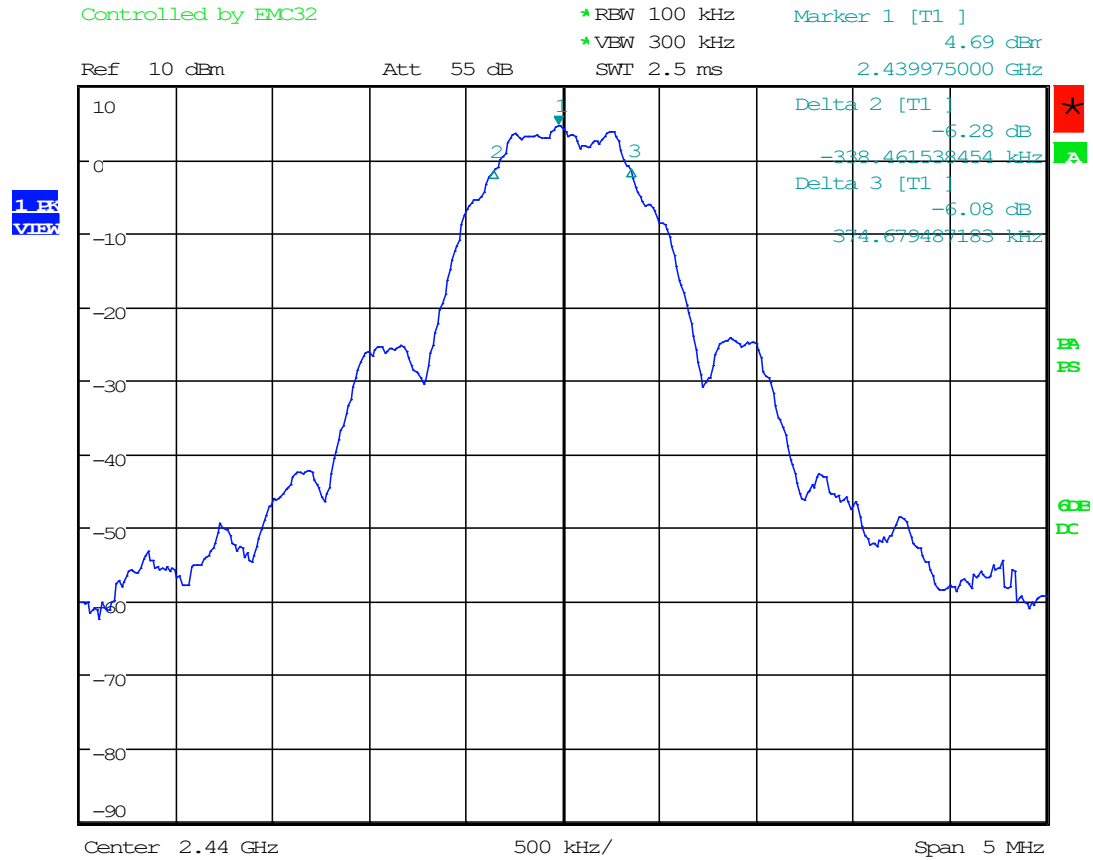
Bluetooth: Low Channel



Date: 14.AUG.2019 13:54:49



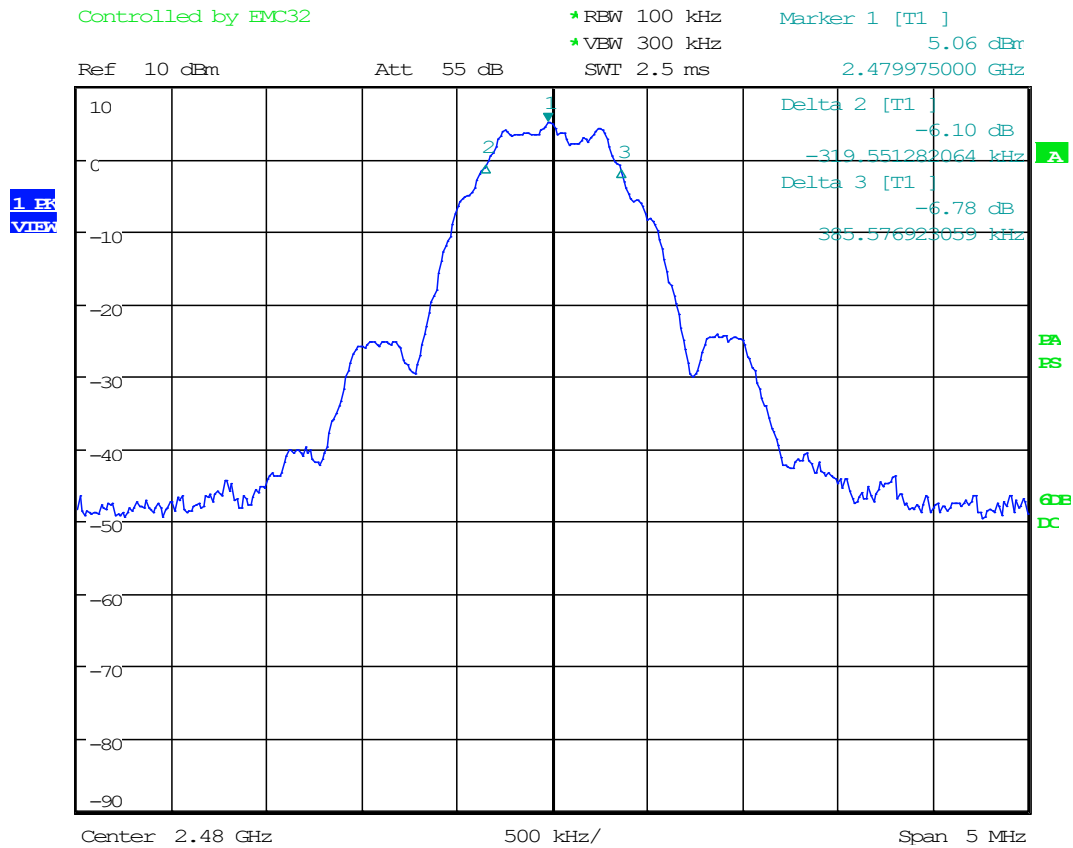
Bluetooth: Mid Channel



Date: 14.AUG.2019 14:00:04



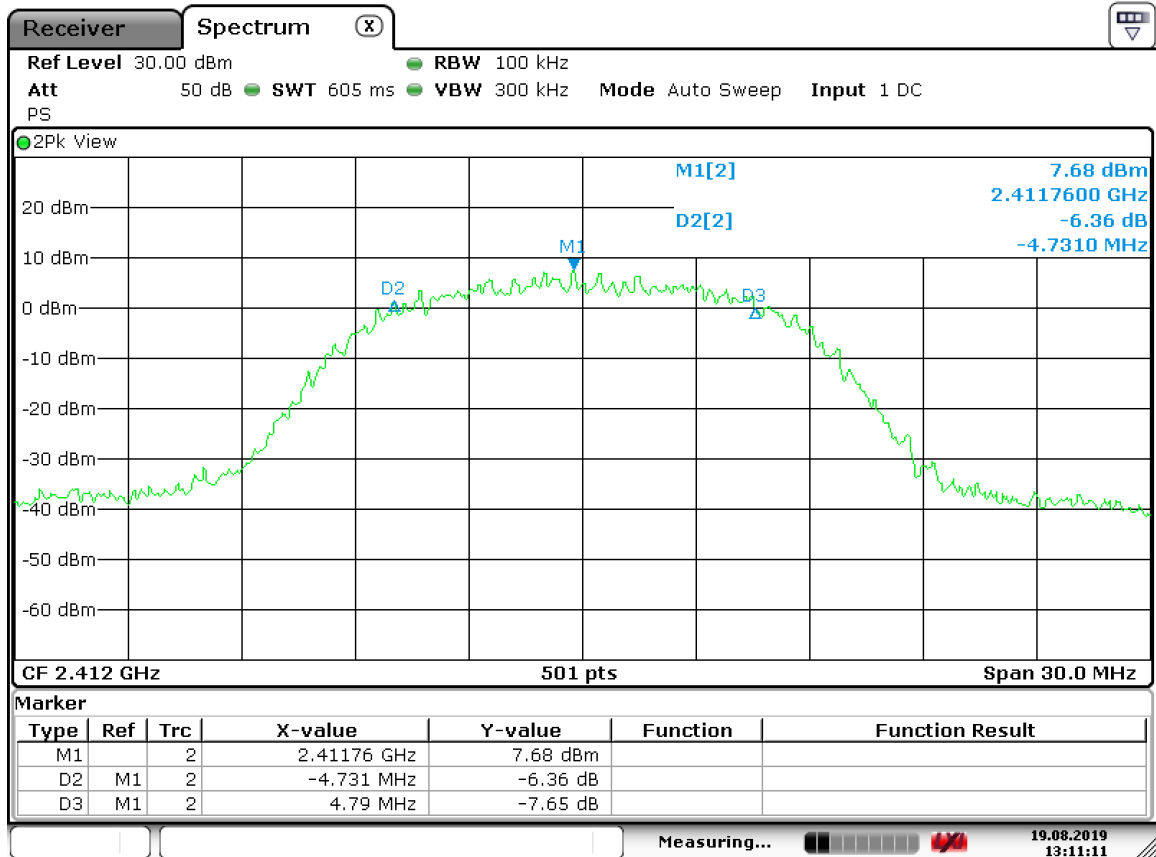
Bluetooth: High Channel



Date: 14.AUG.2019 14:03:21



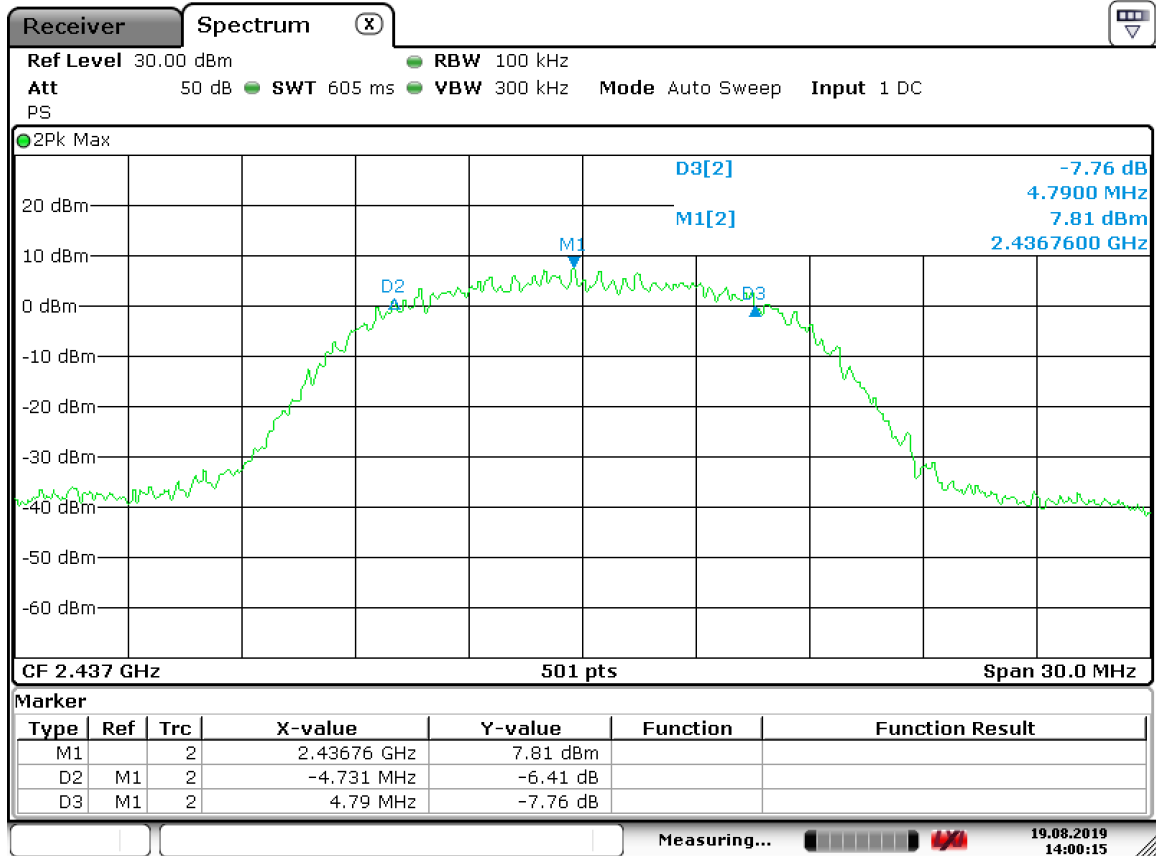
Wi-Fi, 2.4 GHz - CCK: Low Channel



Date: 19.AUG.2019 13:11:12



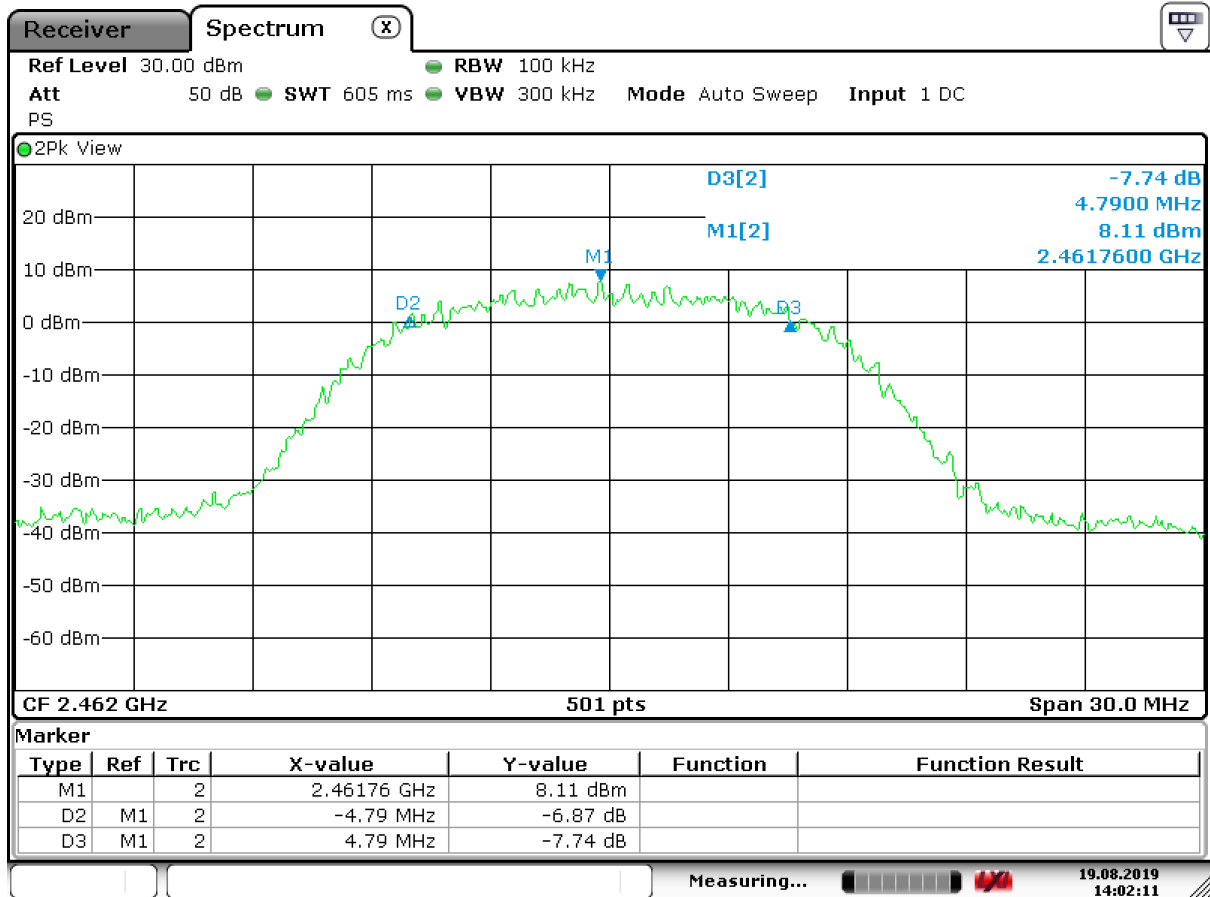
Wi-Fi, 2.4 GHz - CCK: Mid Channel



Date: 19.AUG.2019 14:00:15



Wi-Fi, 2.4 GHz - CCK: High Channel



Date: 19.AUG.2019 14:02:12



8 CONDUCTED OUTPUT POWER

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the receiver. The peak power output was measured.

8.1 Requirements:

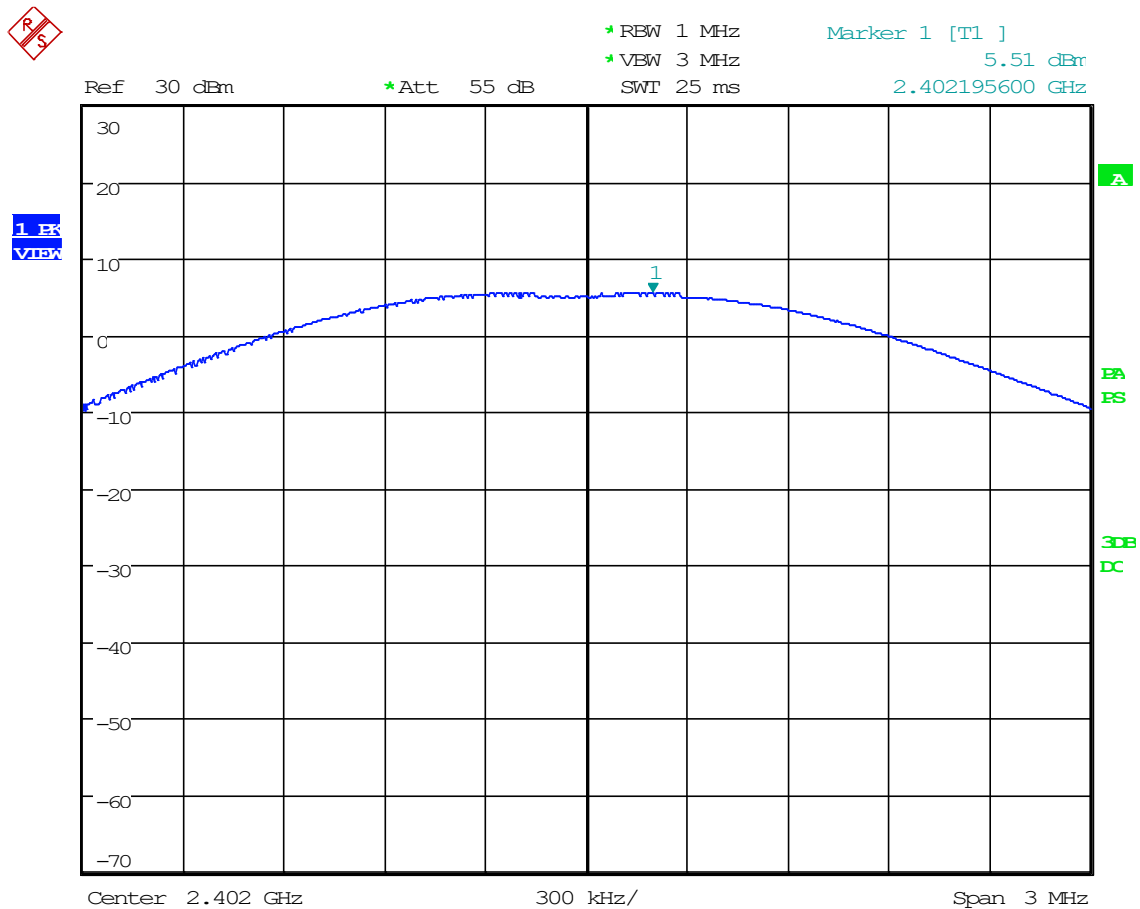
The peak power output shall be 1 watt (30 dBm) or less when using an antenna with a gain of less than 6dBi. For antennas having a gain of more than 6dBi, the limit is reduced by 1dB for every dB the antenna gain is over 6dBi.



8.2 Conducted Output Power Test Data

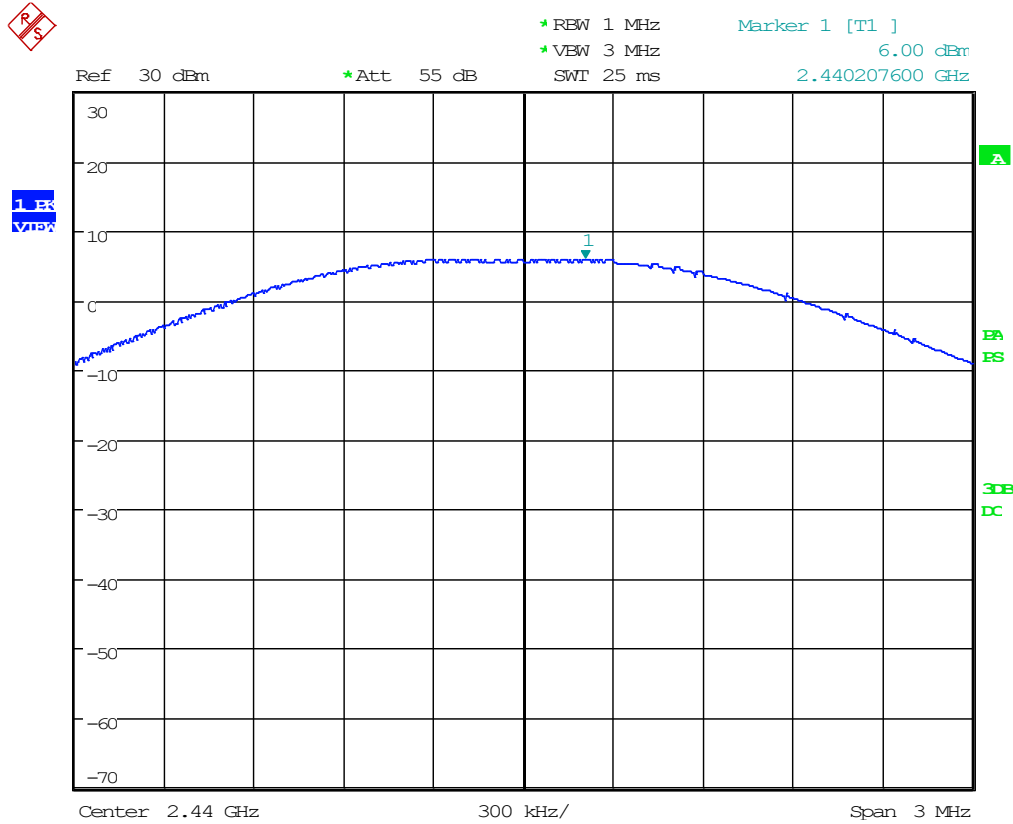
Test Date:	Dec. 9, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	23.1°C
		Relative Humidity:	25%

Bluetooth: Low Channel



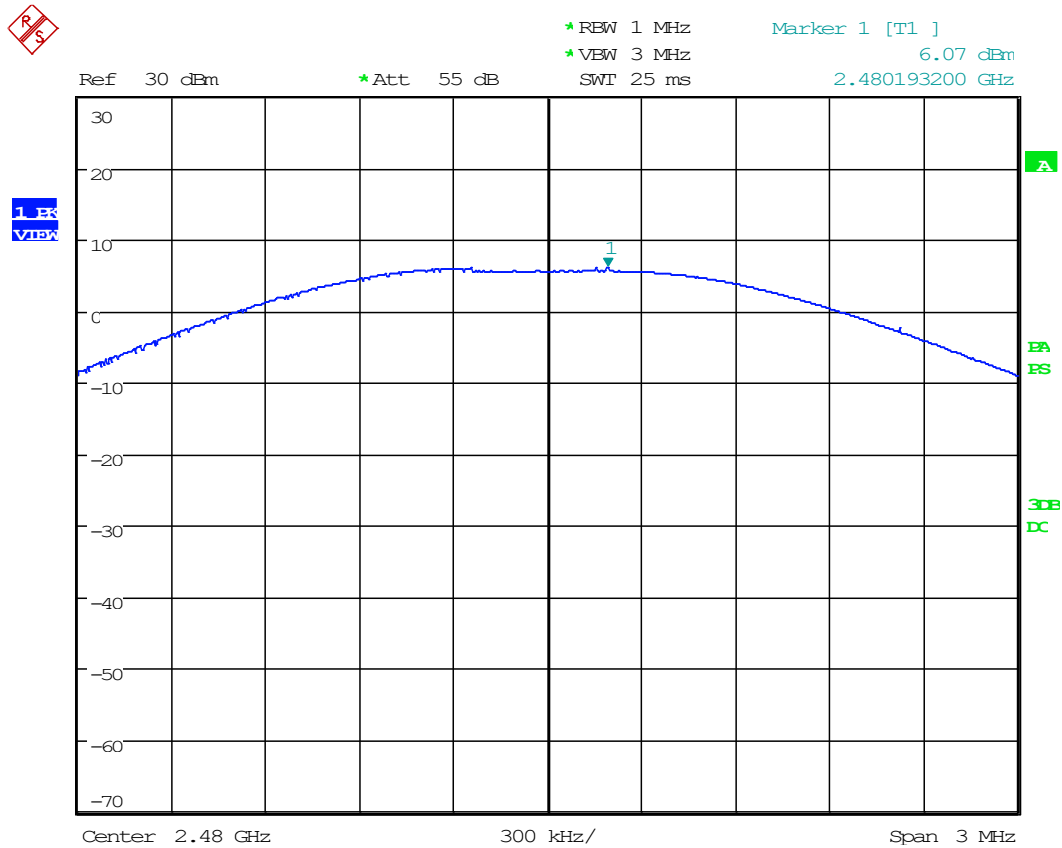


Bluetooth: Mid Channel



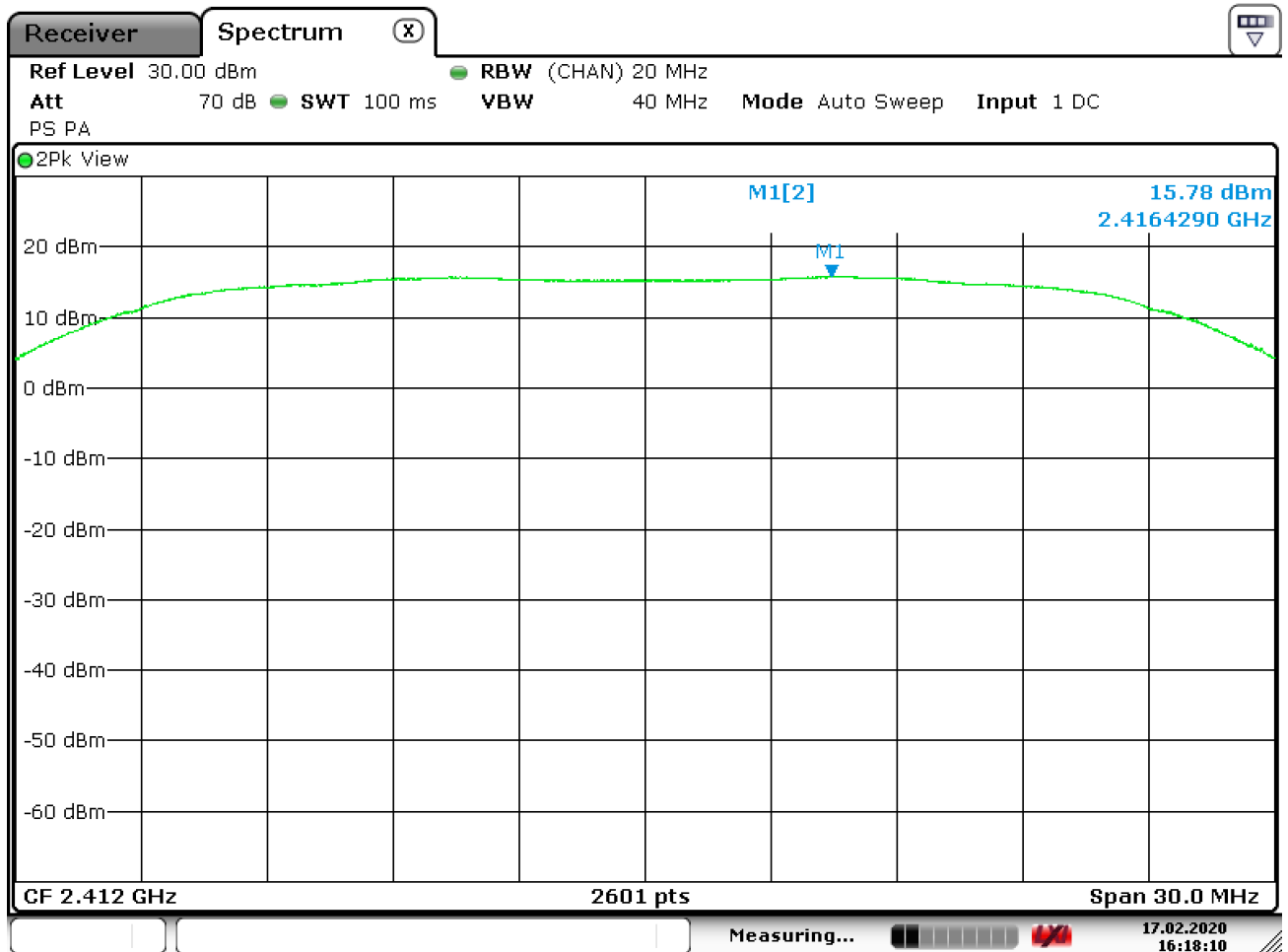


Bluetooth: High Channel





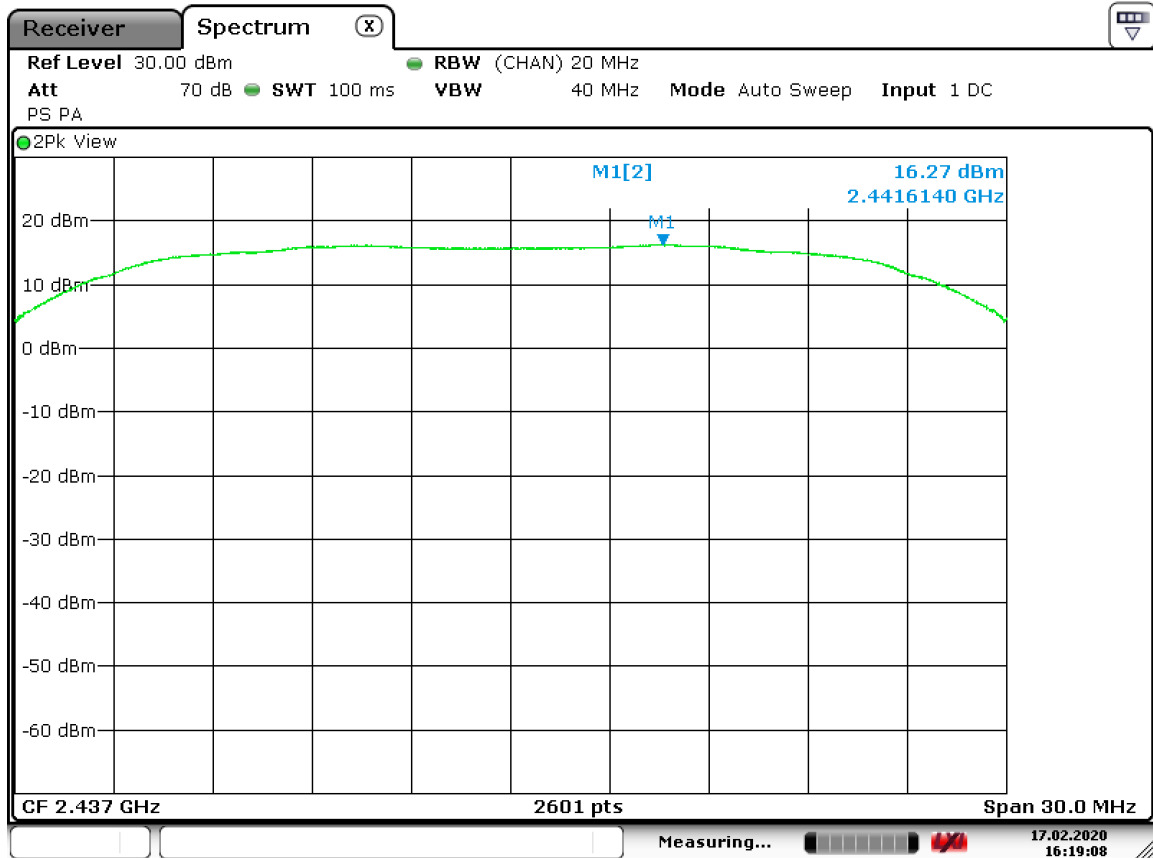
Test Date:	Feb. 17, 2020	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	21.4°C
		Relative Humidity:	31%

Wi-Fi, 2.4 GHz - CCK: Low Channel

Date: 17.FEB.2020 16:18:10



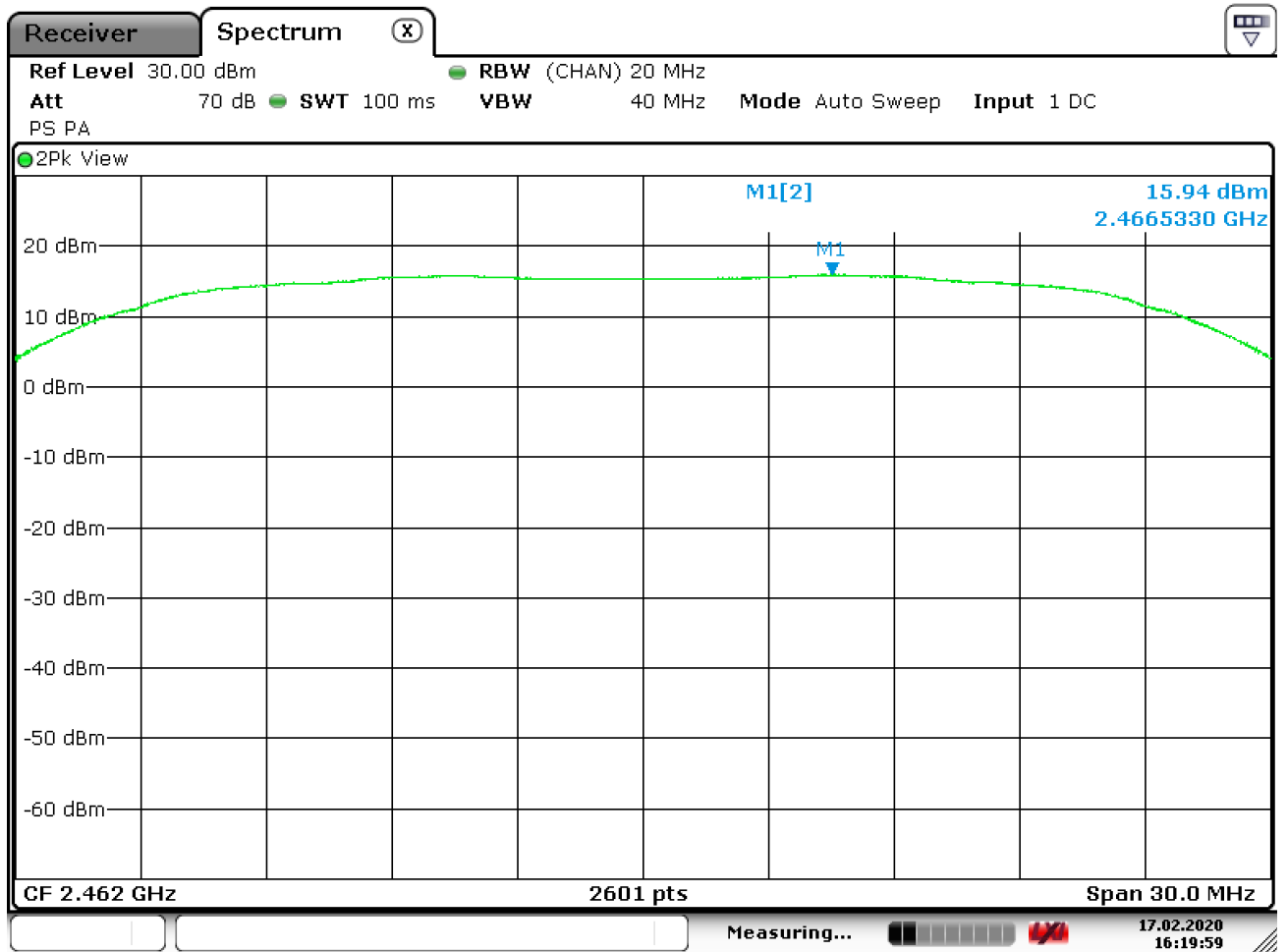
Wi-Fi, 2.4 GHz - CCK: Mid Channel



Date: 17.FEB.2020 16:19:08



Wi-Fi, 2.4 GHz - CCK: High Channel



Date: 17.FEB.2020 16:20:00



Order Number: F2P21445A

Applicant: Securus Technologies

Model: JP6S

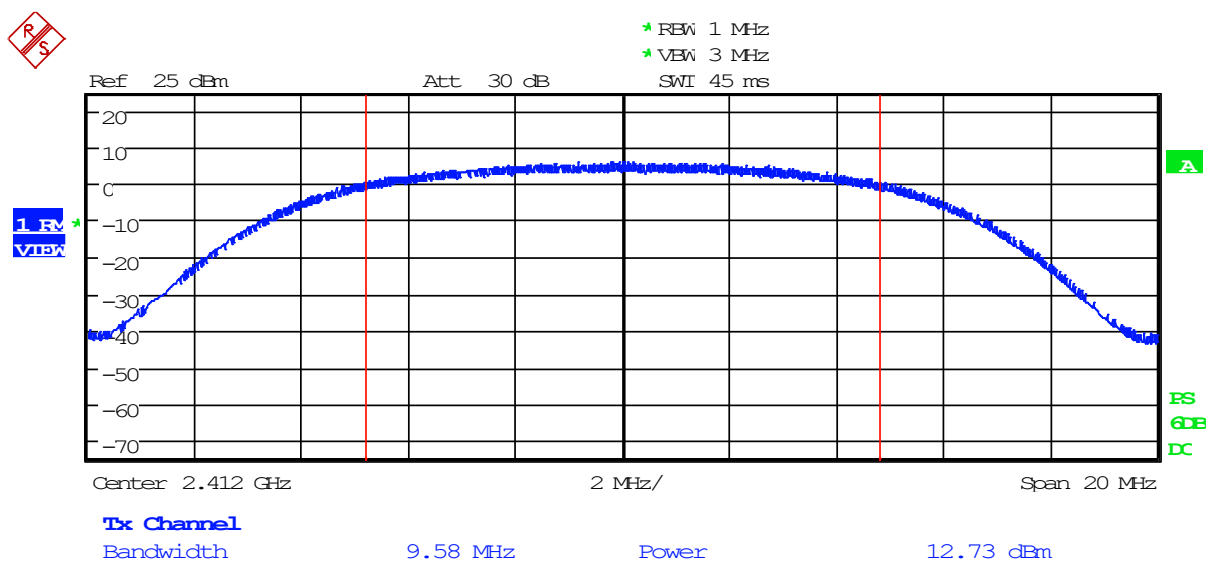
Test Date:	Feb. 14, 2020	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(b)(3); KDB558074	Air Temperature:	21.4°C

**AVERAGE POWER, FOR REFERENCE ONLY:
Wi-Fi, 2.4 GHz**

Test		Low Channel 2412 MHz	Mid Channel 2437 MHz	High Channel 2462 MHz
*Conducted Output Power	CCK, 11mbps	18.75mW / 12.73dBm	20.27mW / 13.07dBm	20.46mW / 13.11dBm
Conducted Output Power Limit		1 Watt / 30dBm	1 Watt / 30dBm	1 Watt / 30dBm

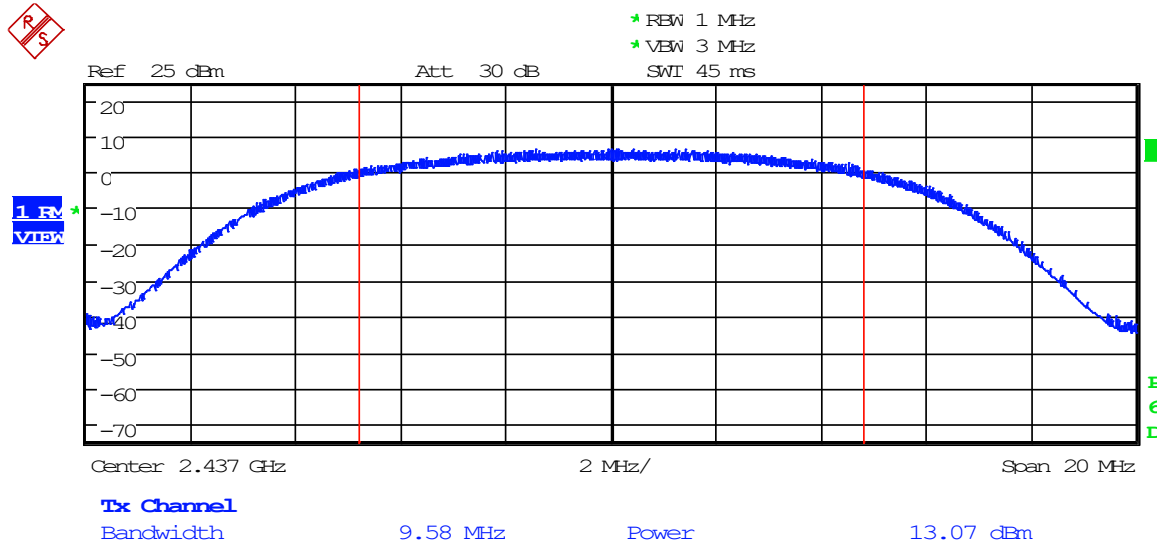
**The Conducted Output Power had to be reduced because SAR evaluation measurement exceeded the allowed levels. The power setting on the device was reduced to the 14 setting.*

**AVERAGE POWER, FOR REFERENCE ONLY:
Wi-Fi, 2.4 GHz - CCK: Low Channel**





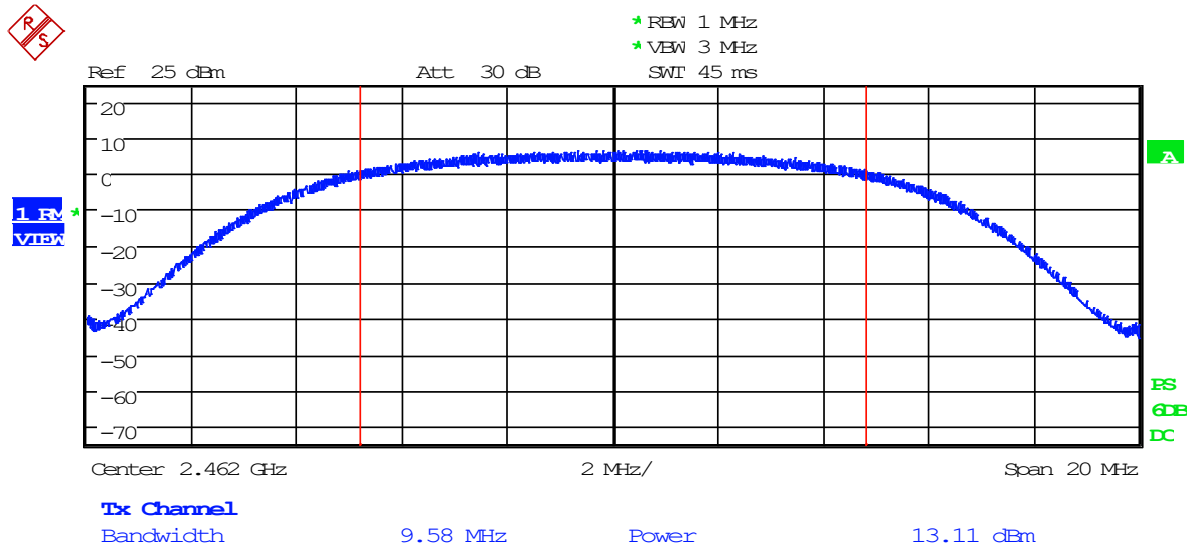
**AVERAGE POWER, FOR REFERENCE ONLY:
Wi-Fi, 2.4 GHz - CCK: Mid Channel**



Date: 14.FEB.2020 15:36:25



**AVERAGE POWER, FOR REFERENCE ONLY:
Wi-Fi, 2.4 GHz - CCK: High Channel**



Date: 14.FEB.2020 15:35:26



9 VOLTAGE VARIATIONS

9.1 Requirements

For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery-operated equipment, the equipment tests shall be performed using a new battery.

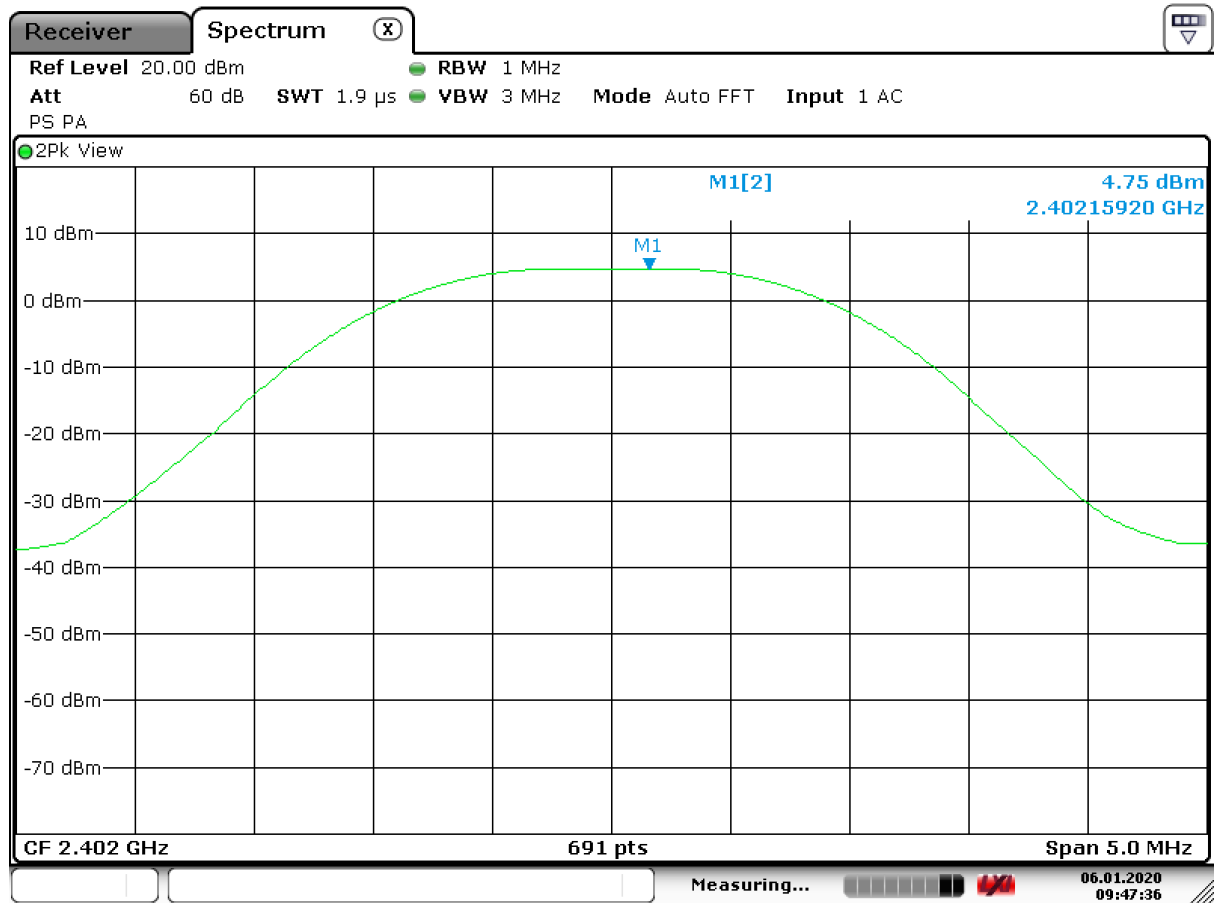
On the following plots, Trace 1 Blue = 110 VAC, Trace 2 Black = 93 VAC and Trace 3 Green = 127 VAC.



9.2 Voltage Variations Test Data

Test Date(s):	Jan. 6, 2020	Test Engineer:	J. Chiller
Rule:	15.31(e)	Air Temperature:	23.3
Test Results:	Complies	Relative Humidity:	30%

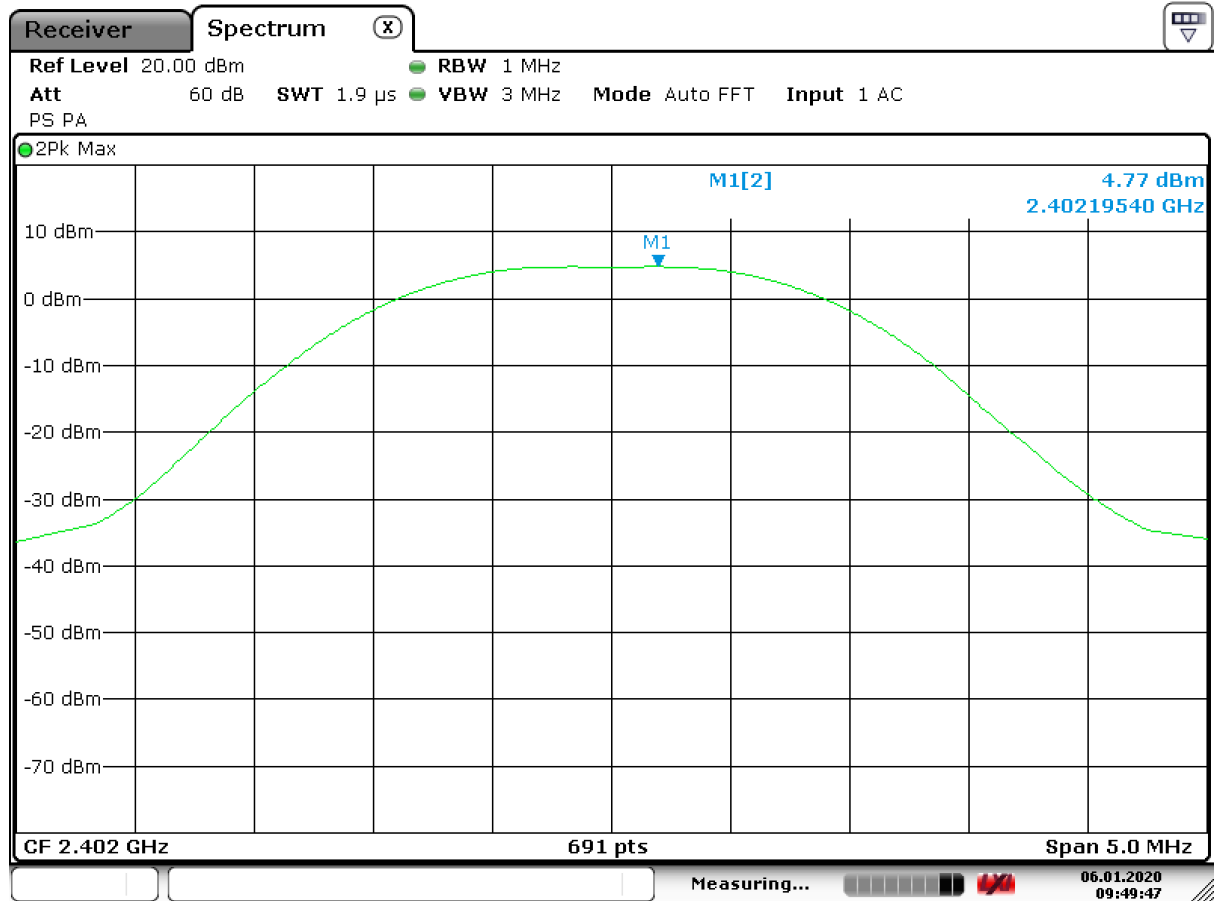
Bluetooth, Low Channel @ 85%



Date: 6.JAN.2020 09:47:36



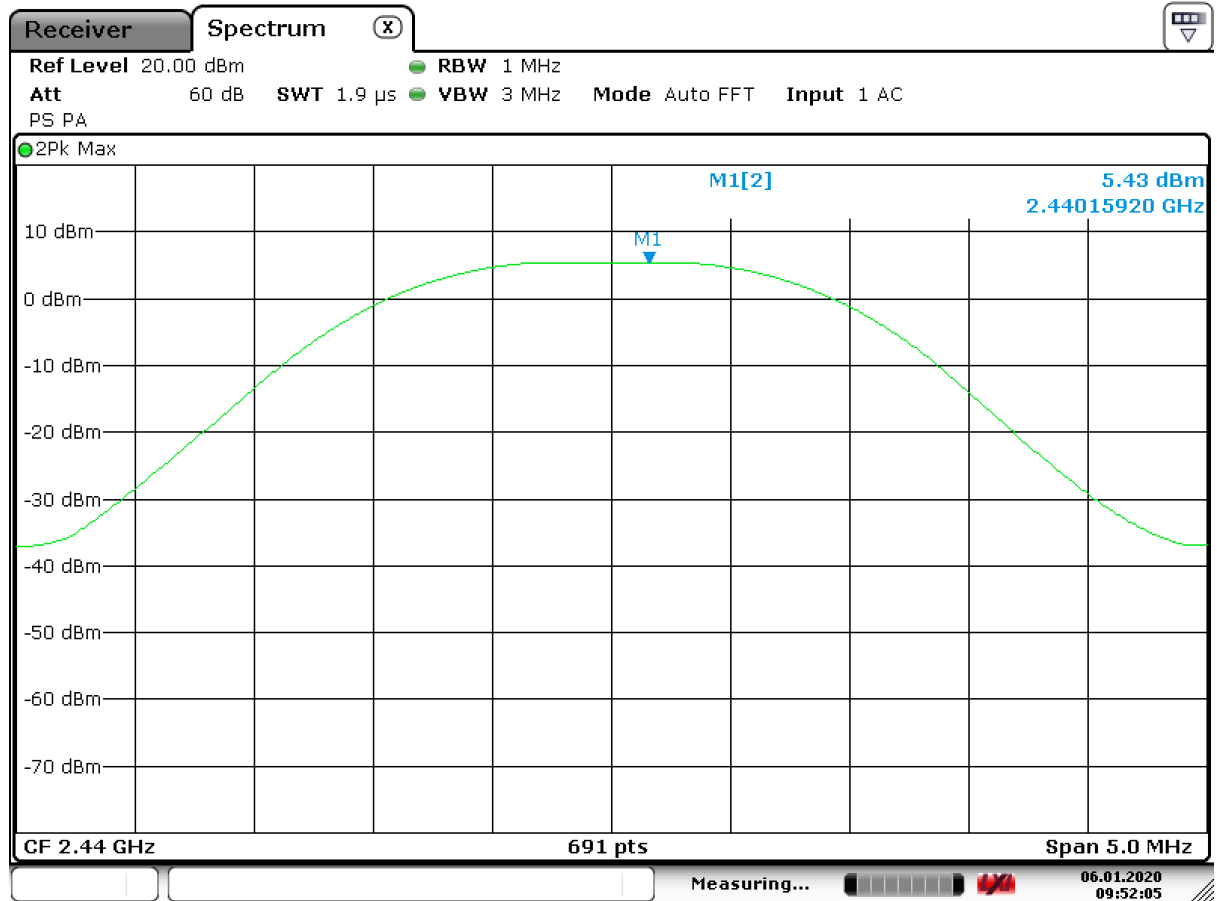
Bluetooth, Low Channel @ 115%



Date: 6.JAN.2020 09:49:47



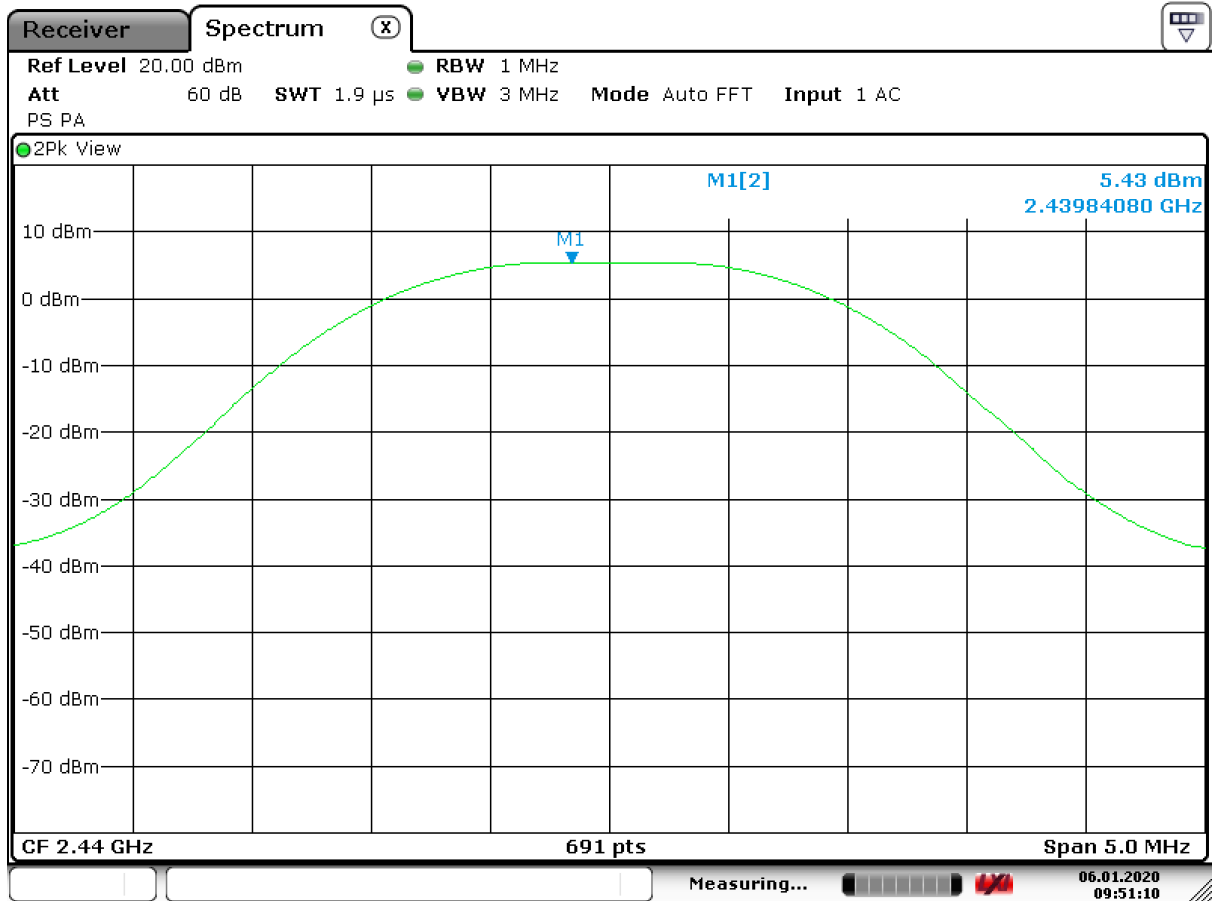
Bluetooth, Mid Channel @ 85%



Date: 6.JAN.2020 09:52:05



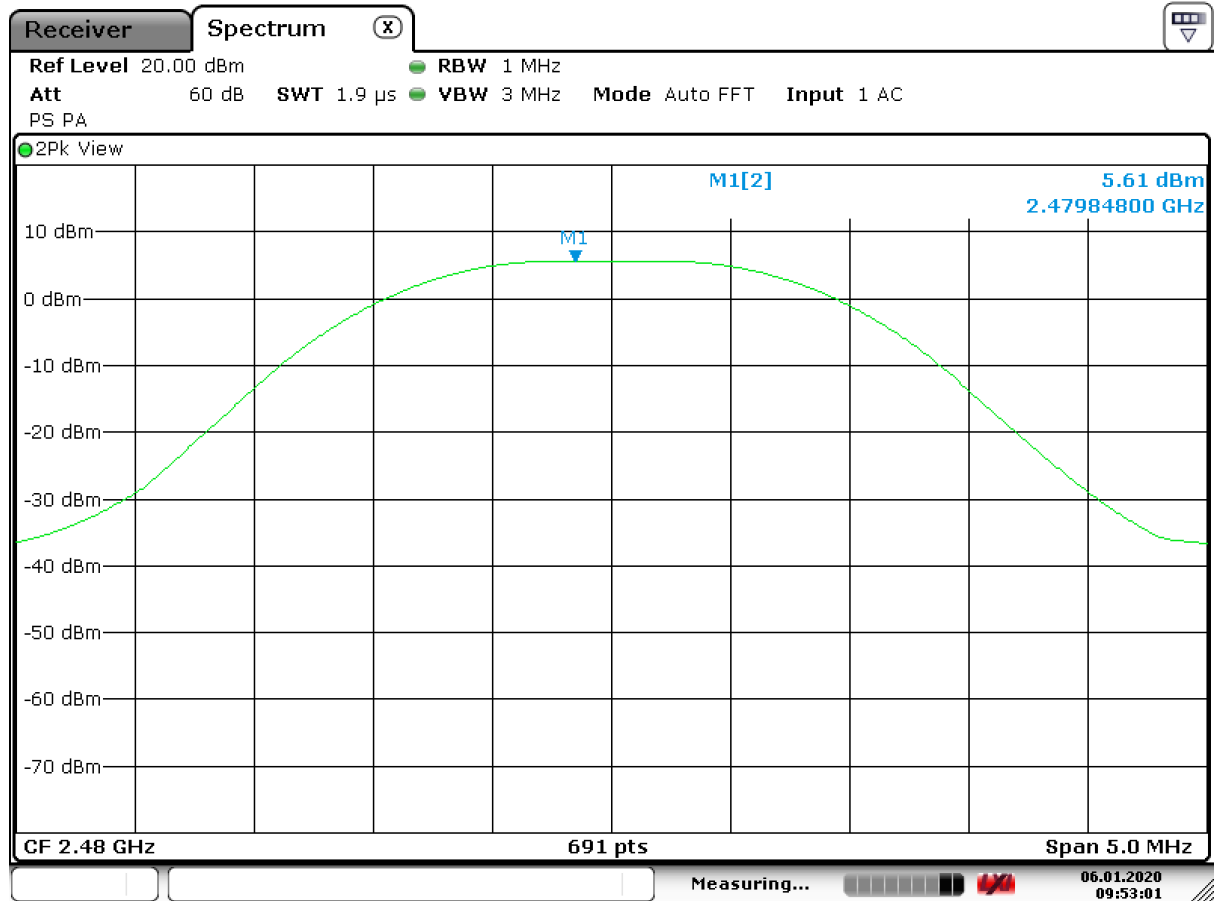
Bluetooth, Mid Channel @ 115%



Date: 6.JAN.2020 09:51:10



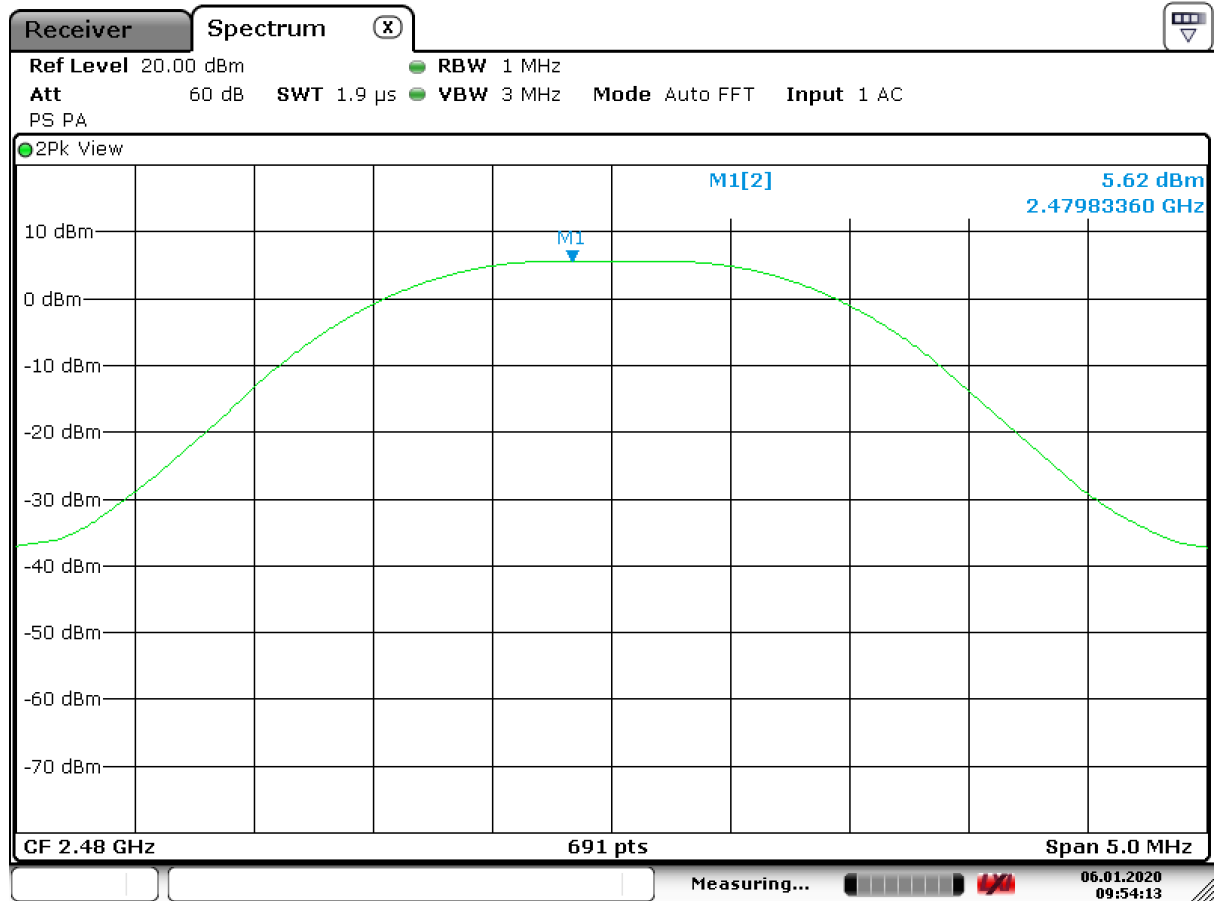
Bluetooth, High Channel @ 85%



Date: 6.JAN.2020 09:53:02



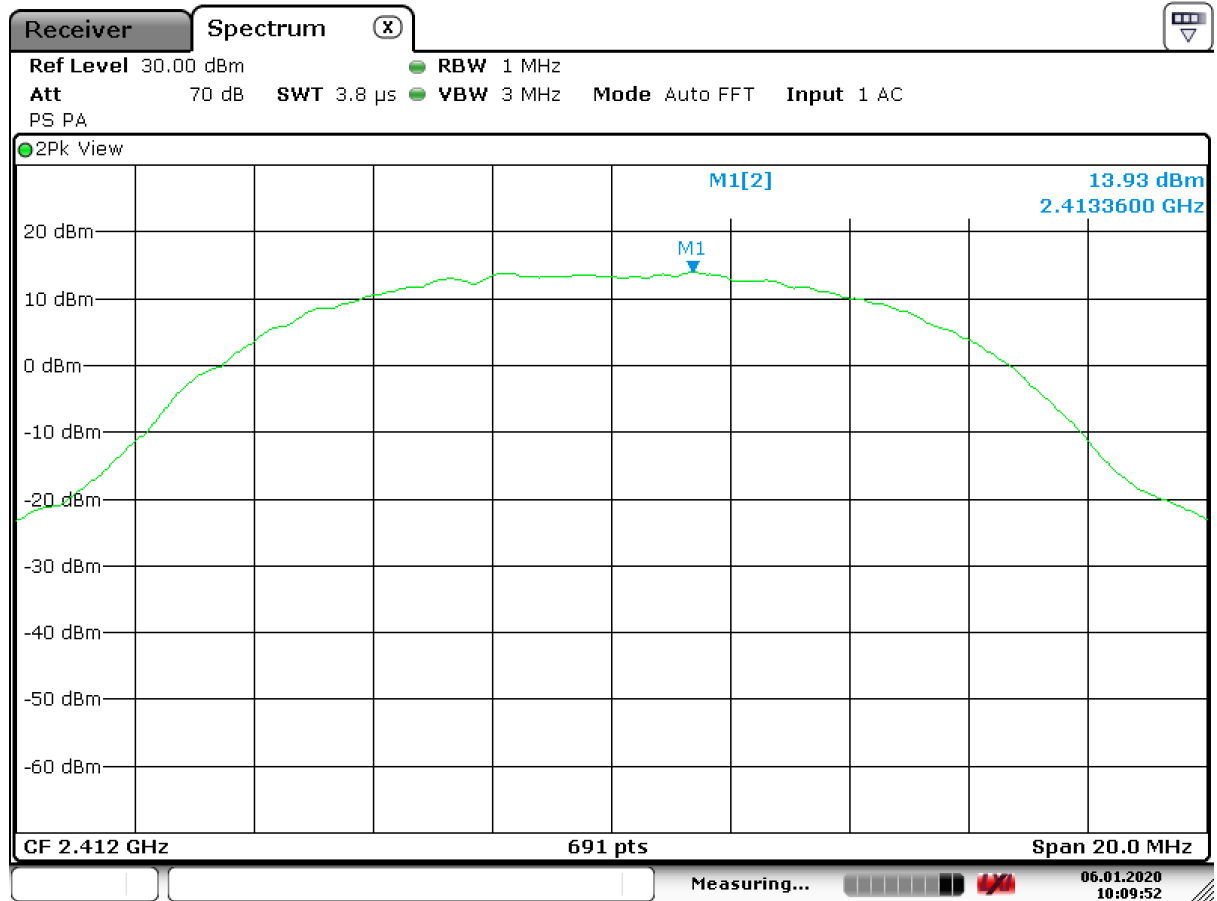
Bluetooth, High Channel @ 115%



Date: 6.JAN.2020 09:54:13



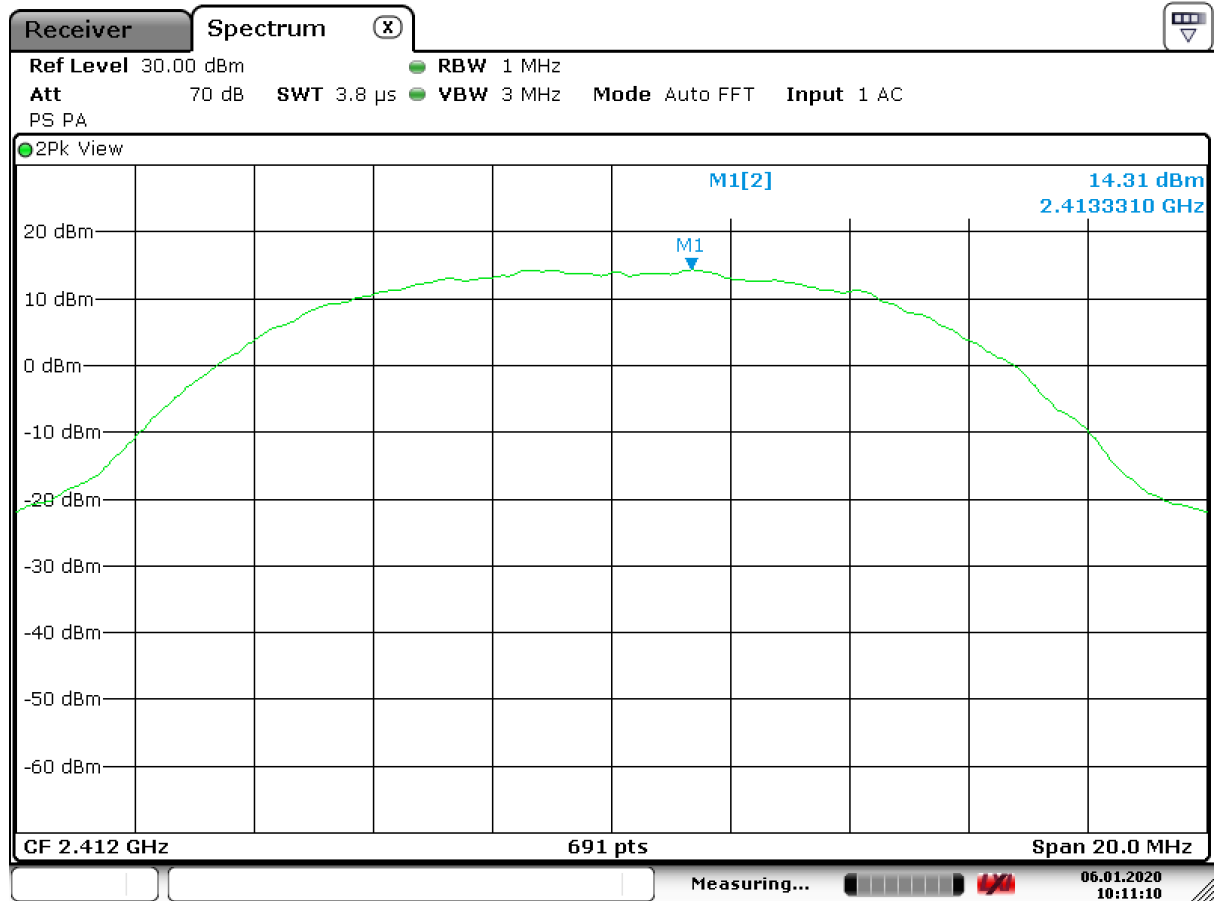
Wi-Fi, 2.4 GHz, Low Channel @ 85%



Date: 6.JAN.2020 10:09:52



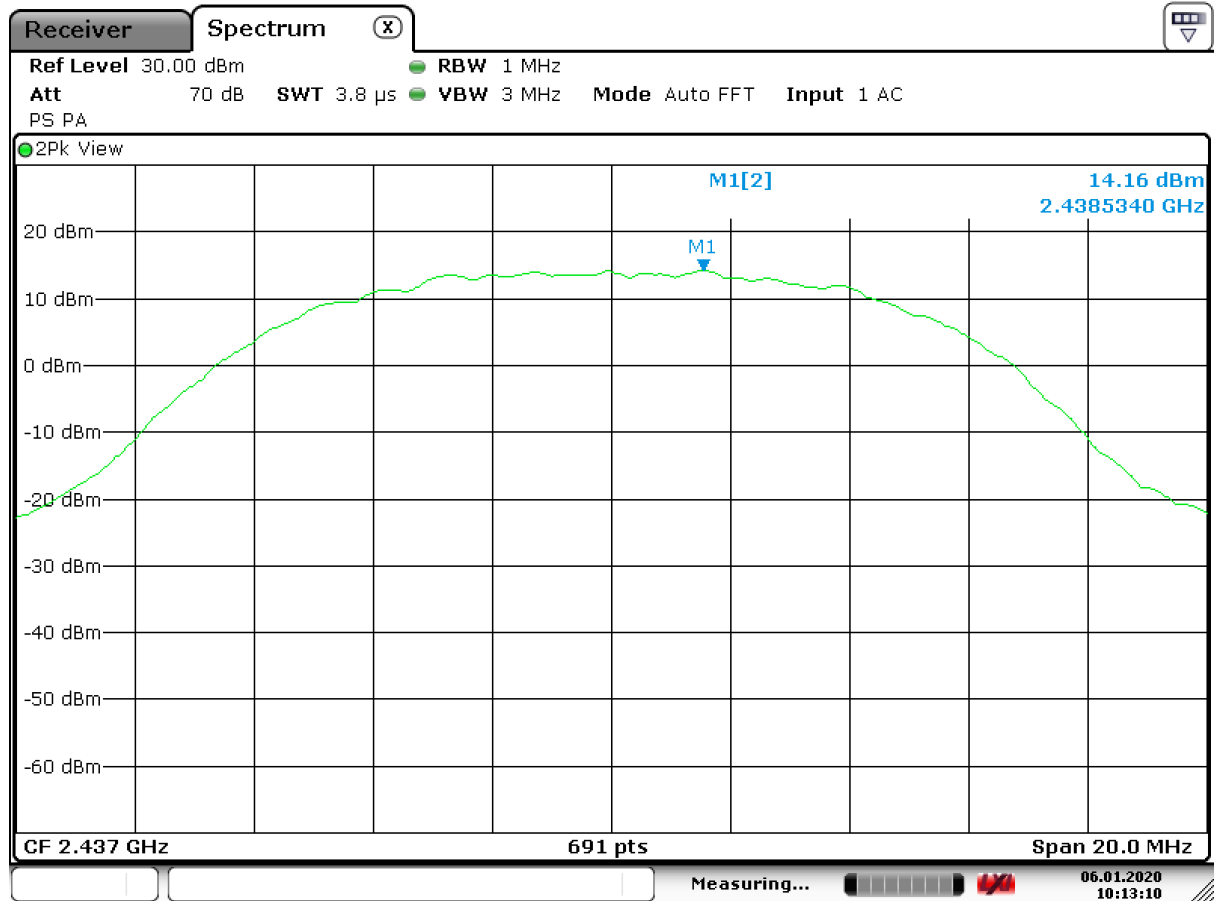
Wi-Fi, 2.4 GHz, Low Channel @ 115%



Date: 6.JAN.2020 10:11:10



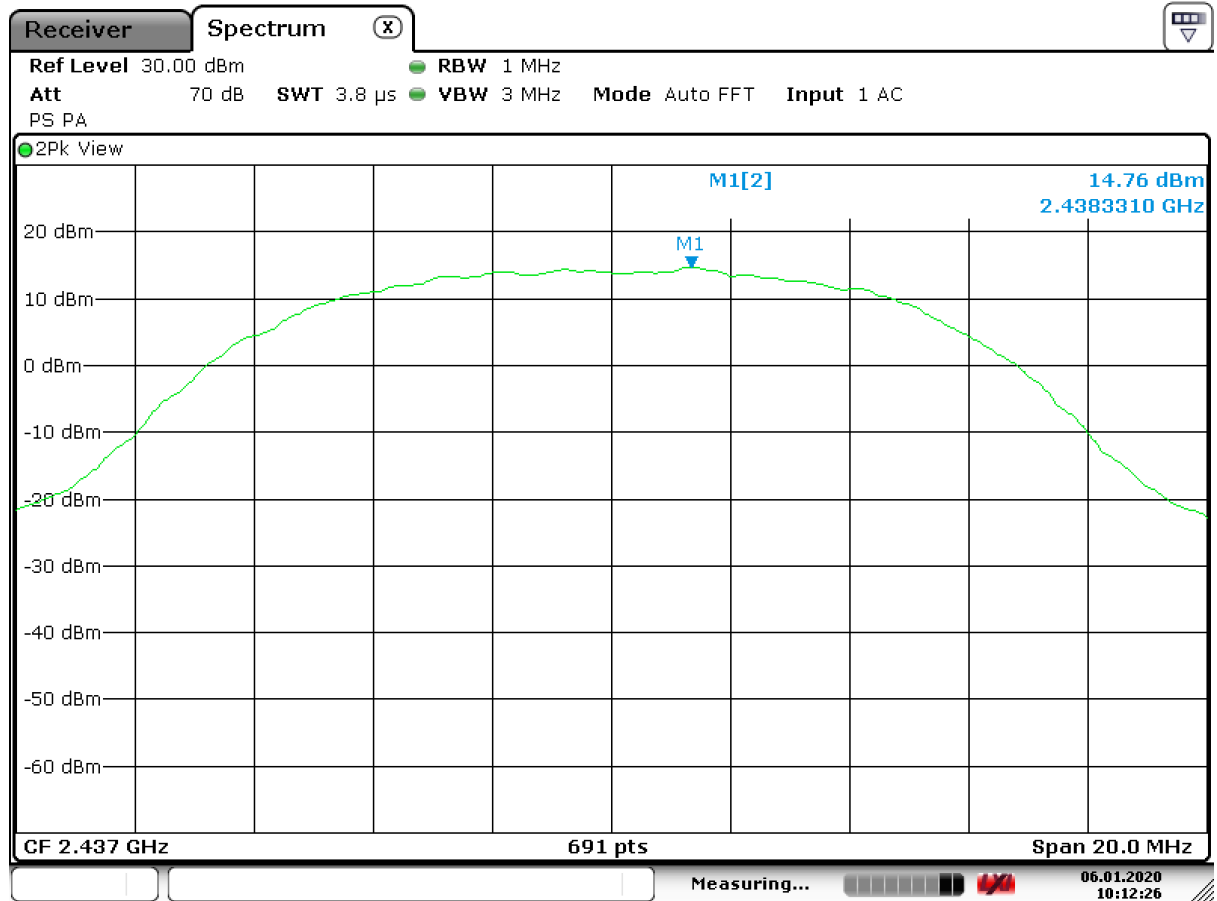
Wi-Fi, 2.4 GHz, Mid Channel @ 85%



Date: 6.JAN.2020 10:13:10



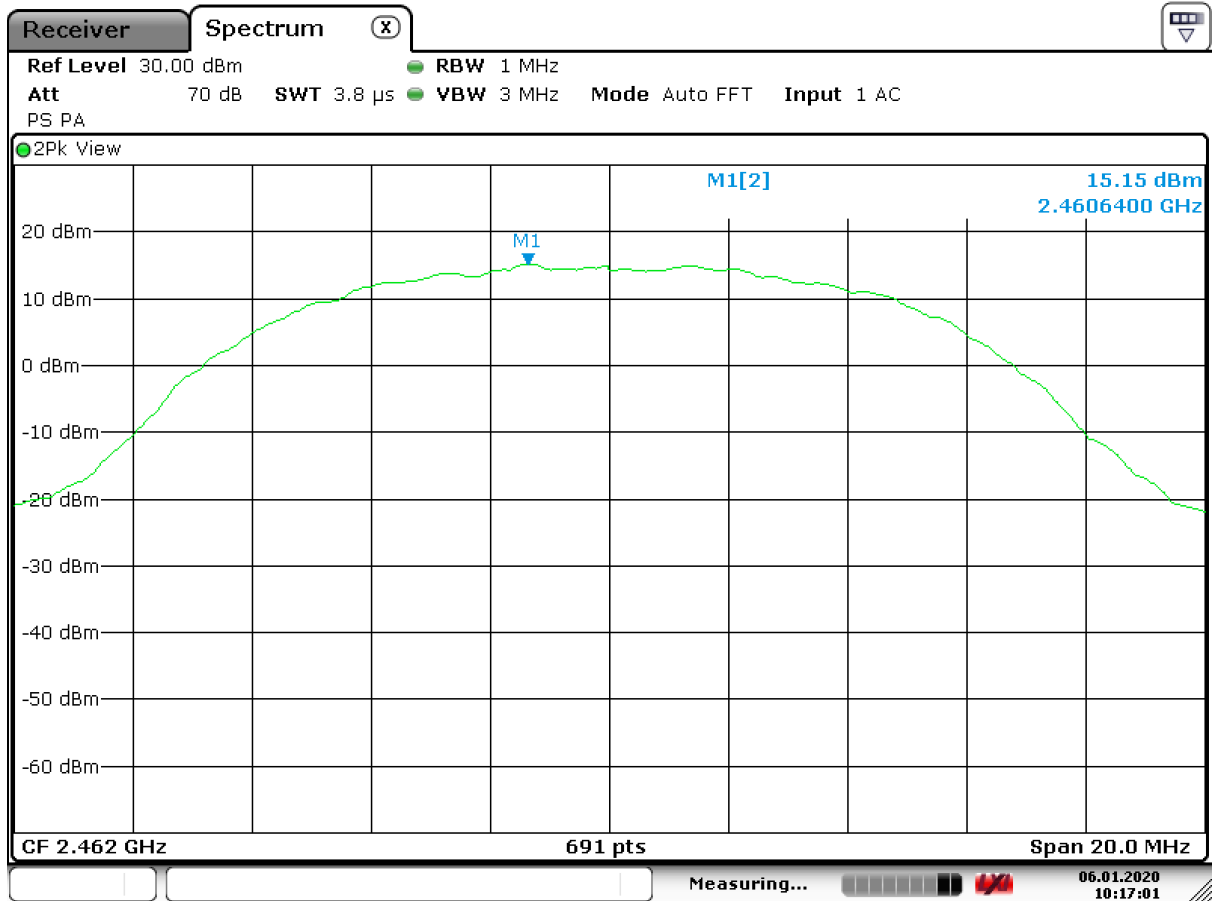
Wi-Fi, 2.4 GHz, Mid Channel @ 115%



Date: 6.JAN.2020 10:12:27



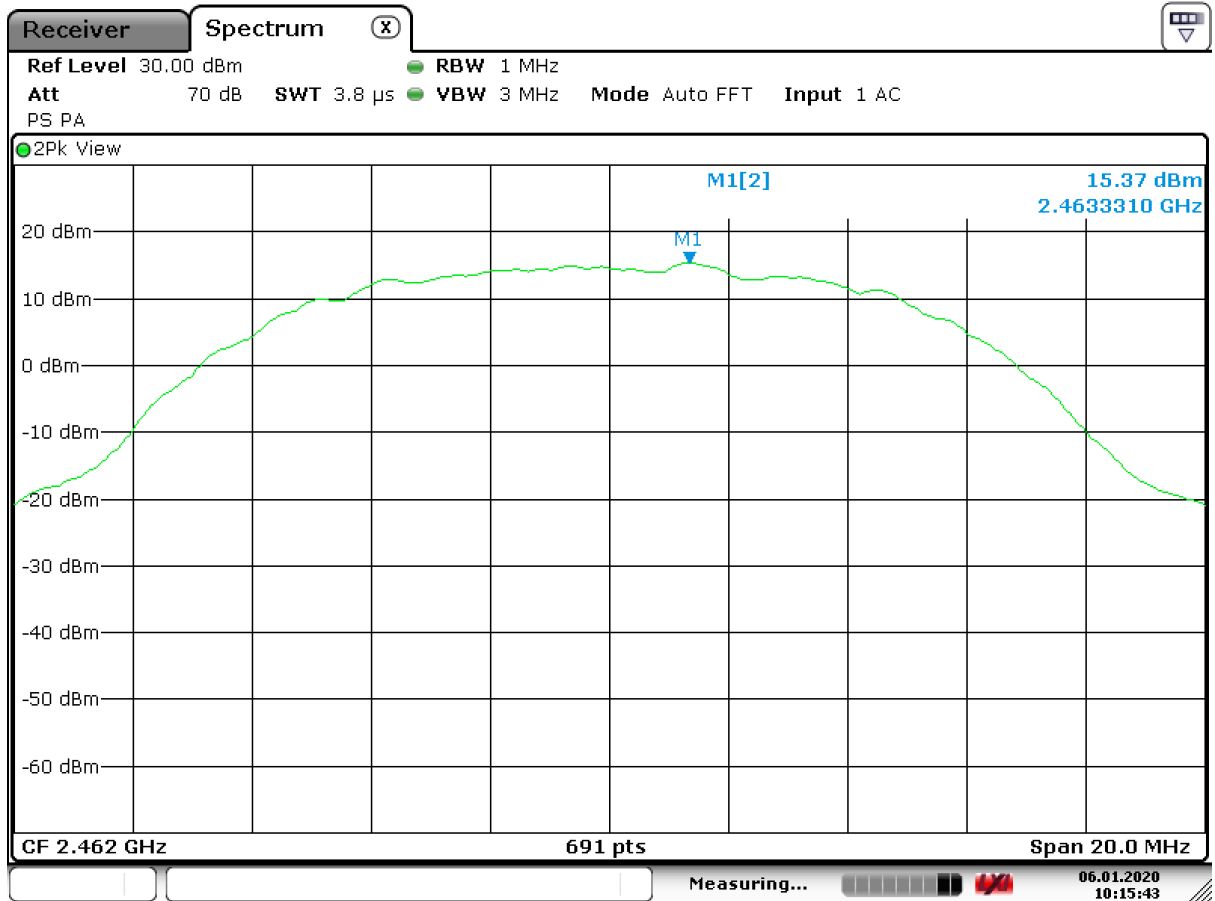
Wi-Fi, 2.4 GHz, High Channel @ 85%



Date: 6.JAN.2020 10:17:02



Wi-Fi, 2.4 GHz, High Channel @ 115%



Date: 6.JAN.2020 10:15:43



10 CONDUCTED SPURIOUS EMISSIONS

The following tests were performed to demonstrate compliance.

RF Antenna Conducted Test

The EUT antenna port was fitted with an SMA connector and directly connected to the input of the spectrum analyzer.

10.1 Requirements:

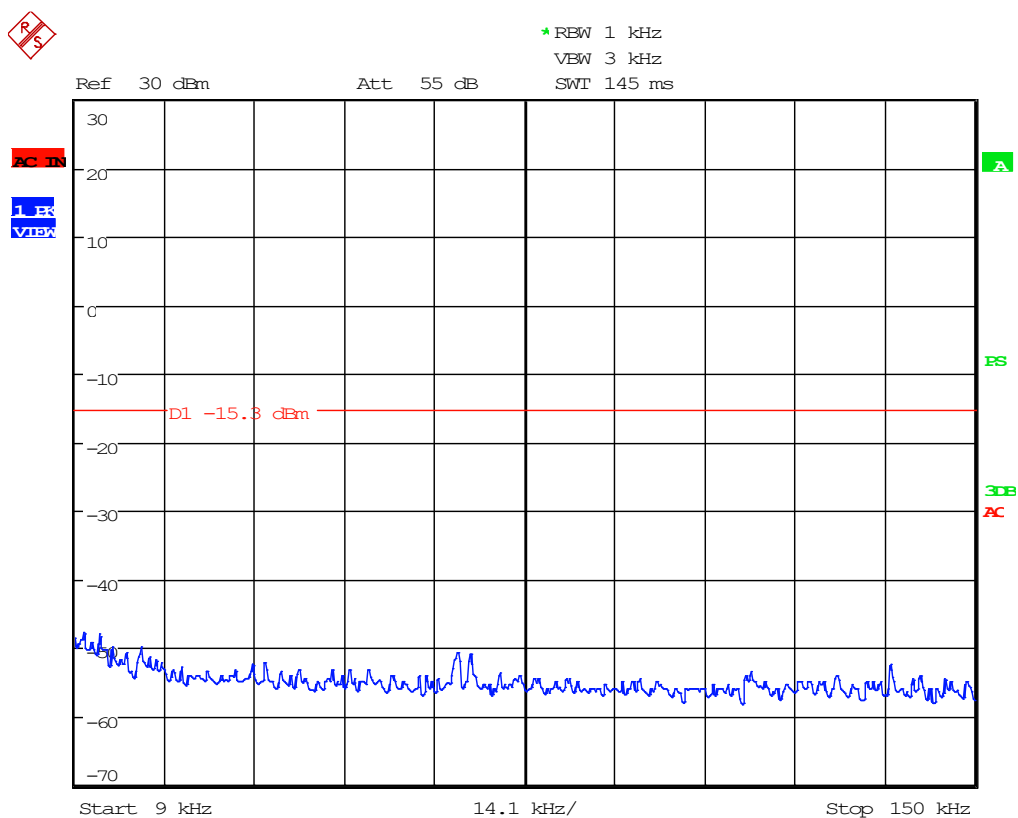
All Spurious Emissions must be at least 20dB down from the highest emission level measured within the authorized band up through the tenth harmonic.

Spurious emissions measurements were made at the low, mid, and upper channels with the appropriate spectrum analyzer impulse bandwidth. Additionally, 20dB down points were measured for the low and high channels to verify band edge compliance.



10.2 Conducted Spurious Emissions Test Data

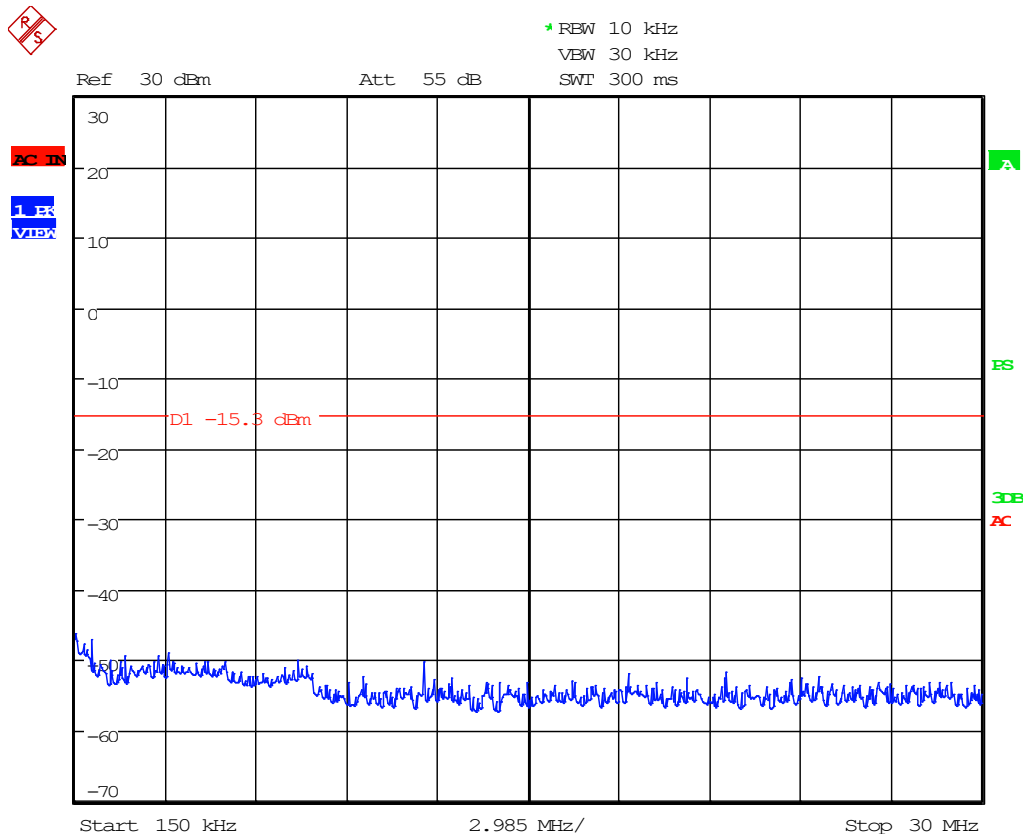
Test Date:	Aug. 14, 2019 / Dec. 10, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(d) / Part 15.207 KDB558074	Air Temperature:	20.6°C / 21.9 °C
		Relative Humidity:	68% / 32%

Bluetooth: Low Channel
0.009 MHz to 0.15 MHz

Date: 10.DEC.2019 16:05:07



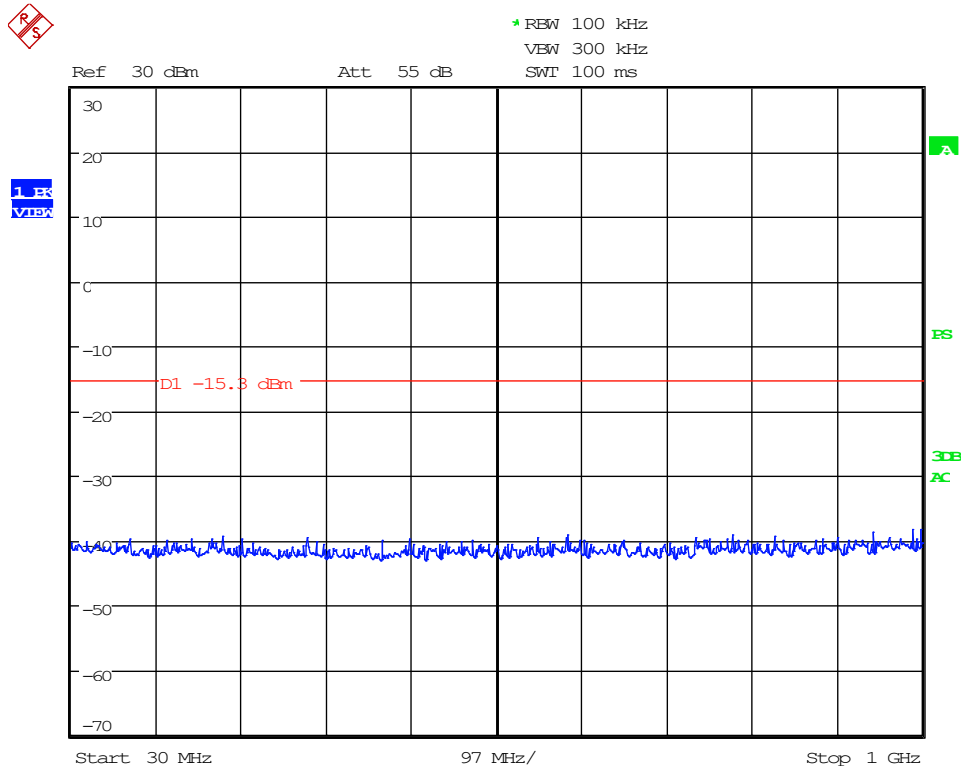
Bluetooth: Low Channel
0.15 MHz to 30 MHz



Date: 10.DEC.2019 16:03:29



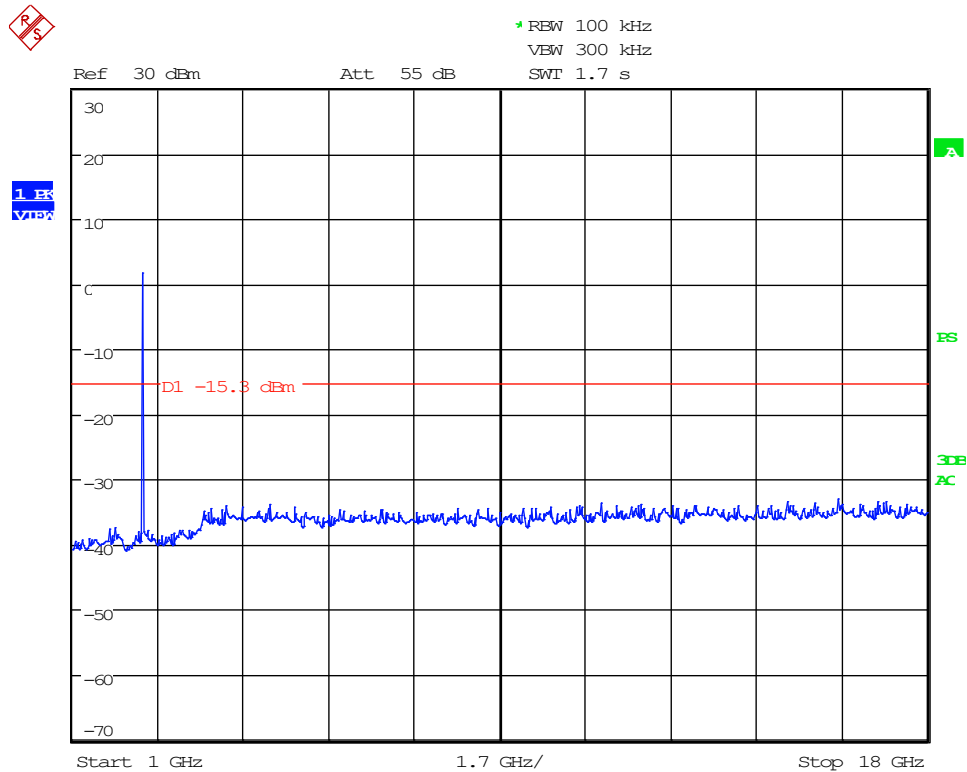
Bluetooth: Low Channel
30 MHz to 1000 MHz



Date: 10.DEC.2019 16:02:27



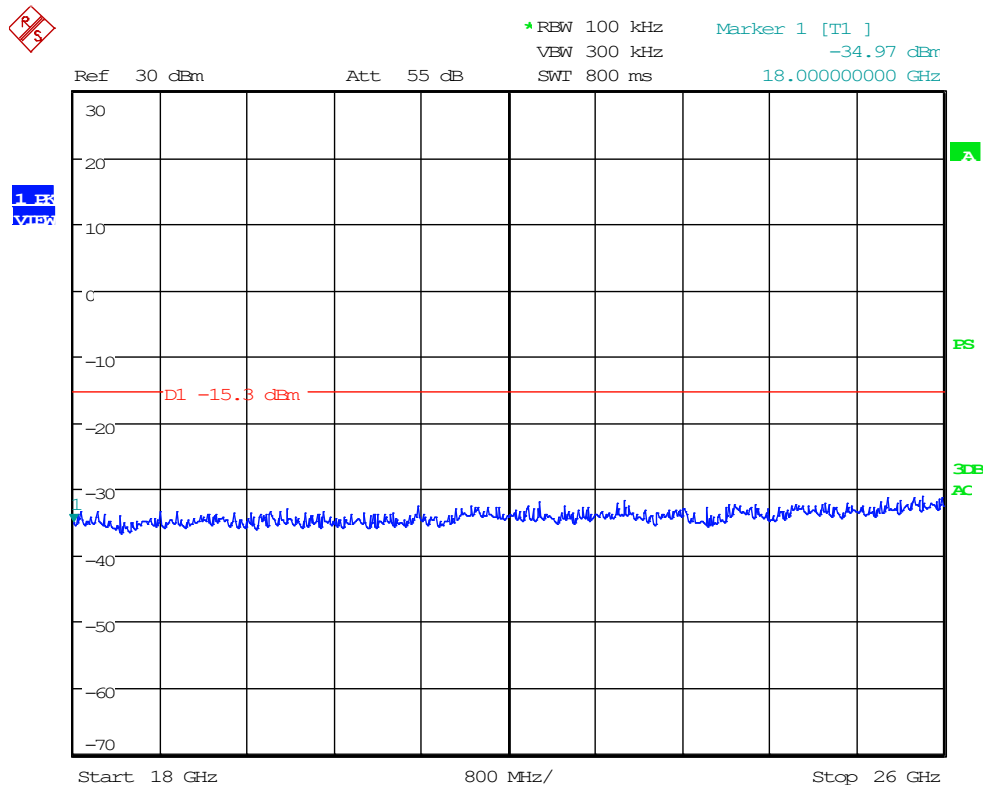
Bluetooth: Low Channel
1 GHz to 18 GHz



Date: 10.DEC.2019 16:01:25



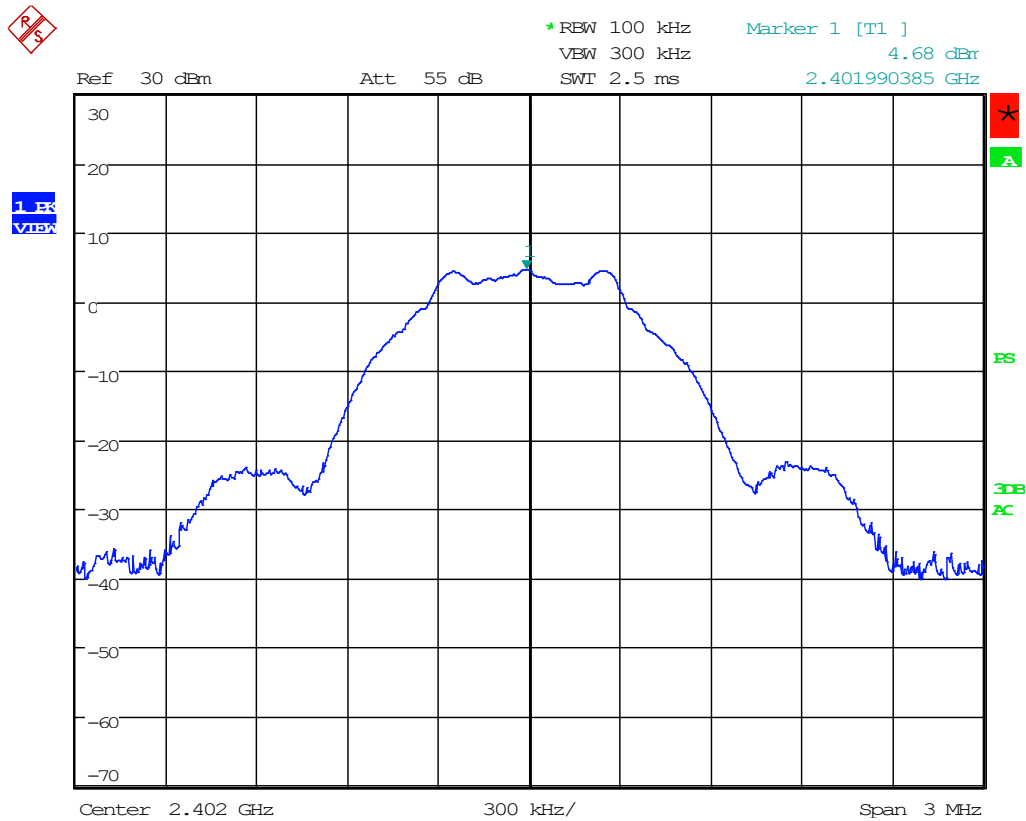
Bluetooth: Low Channel 18 GHz to 26 GHz



Date: 10.DEC.2019 16:00:09



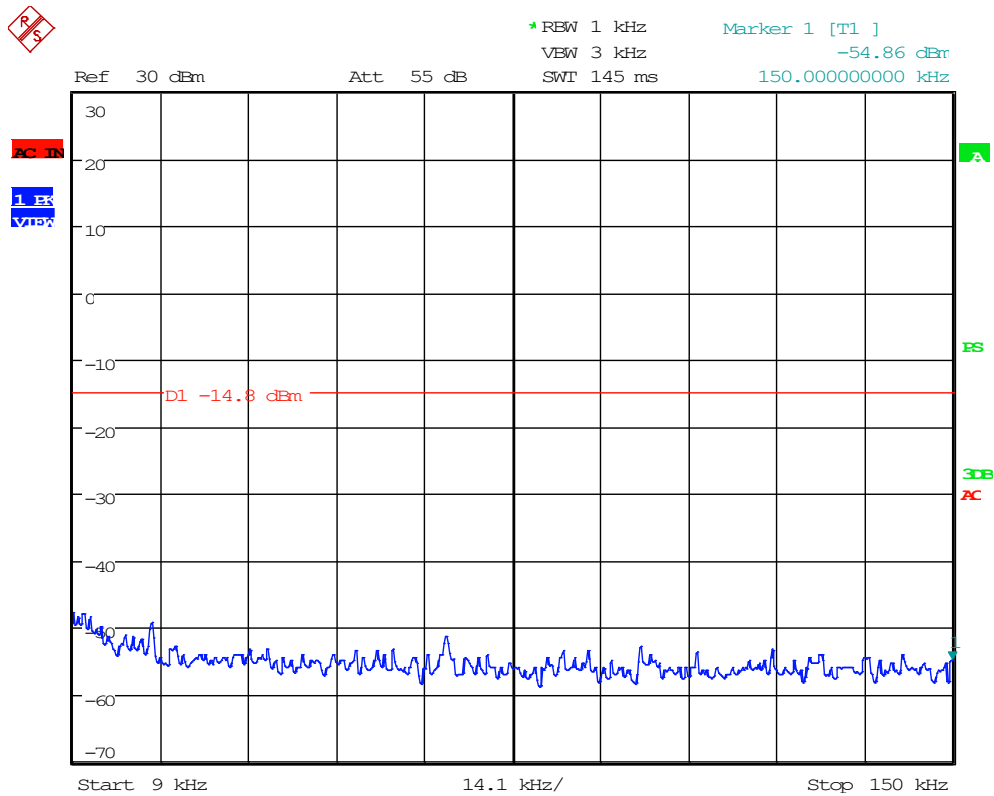
Bluetooth: Low Channel, Spur Reference



Date: 10.DEC.2019 15:46:49

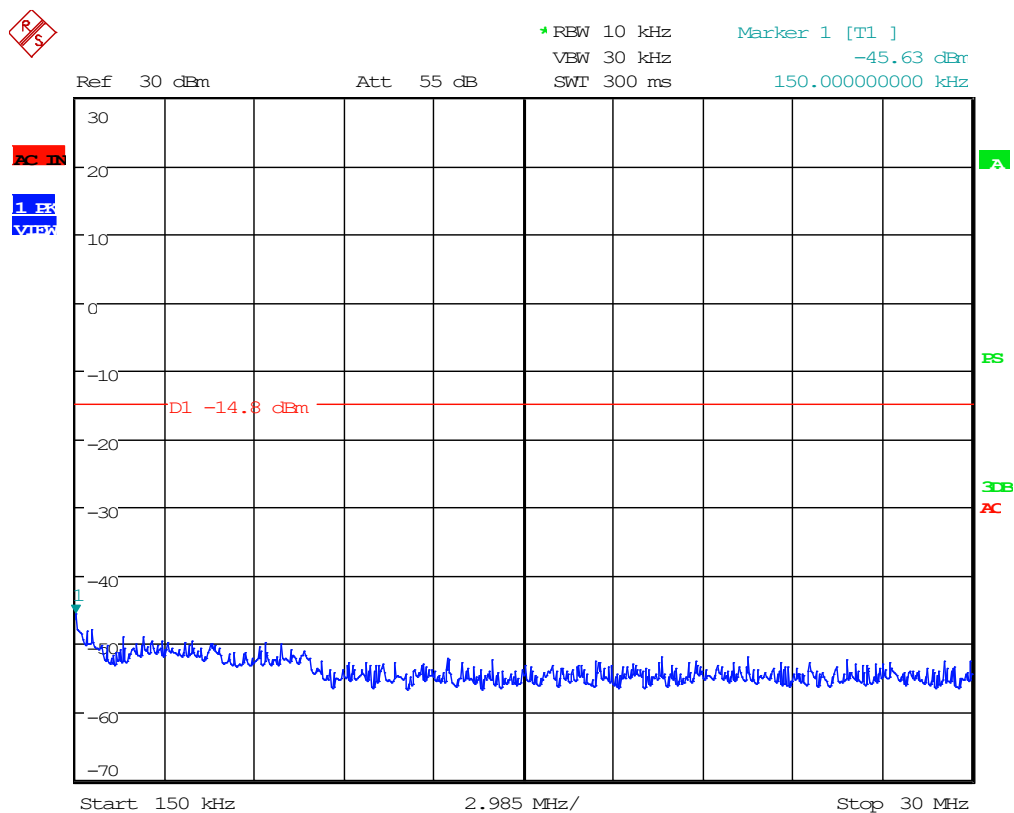


Bluetooth: Mid Channel
0.009 MHz to 0.15 MHz



Date: 10.DEC.2019 16:23:05

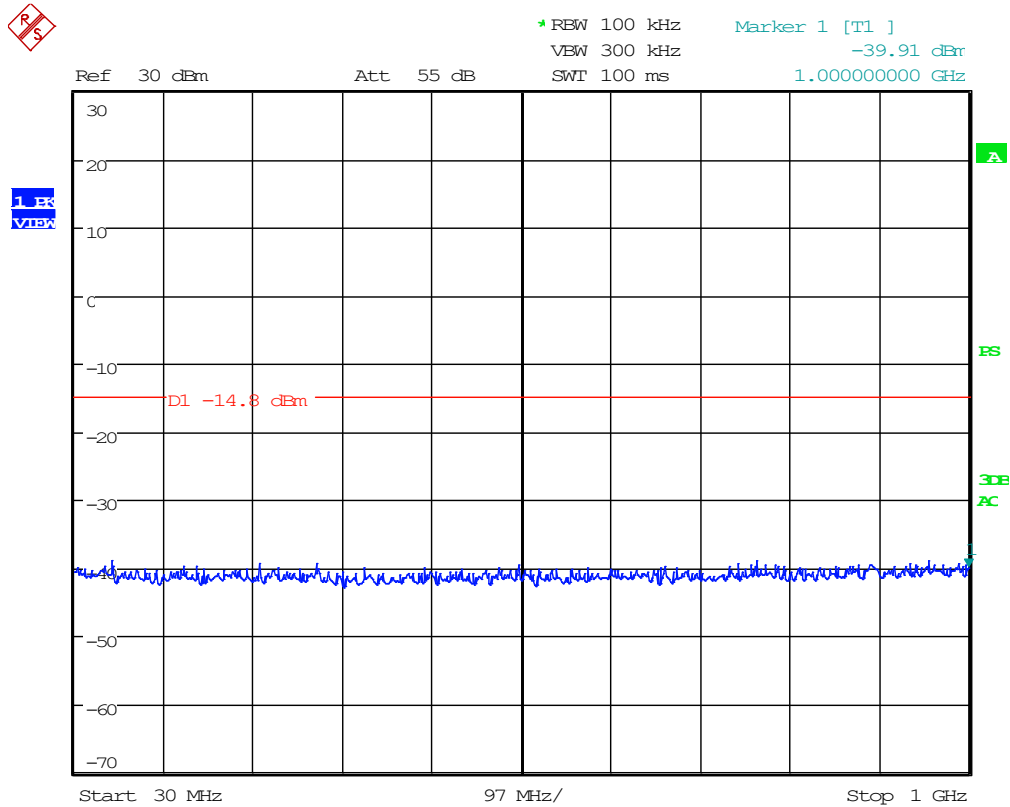
Bluetooth: Mid Channel
0.15 MHz to 30 MHz



Date: 10.DEC.2019 16:22:07



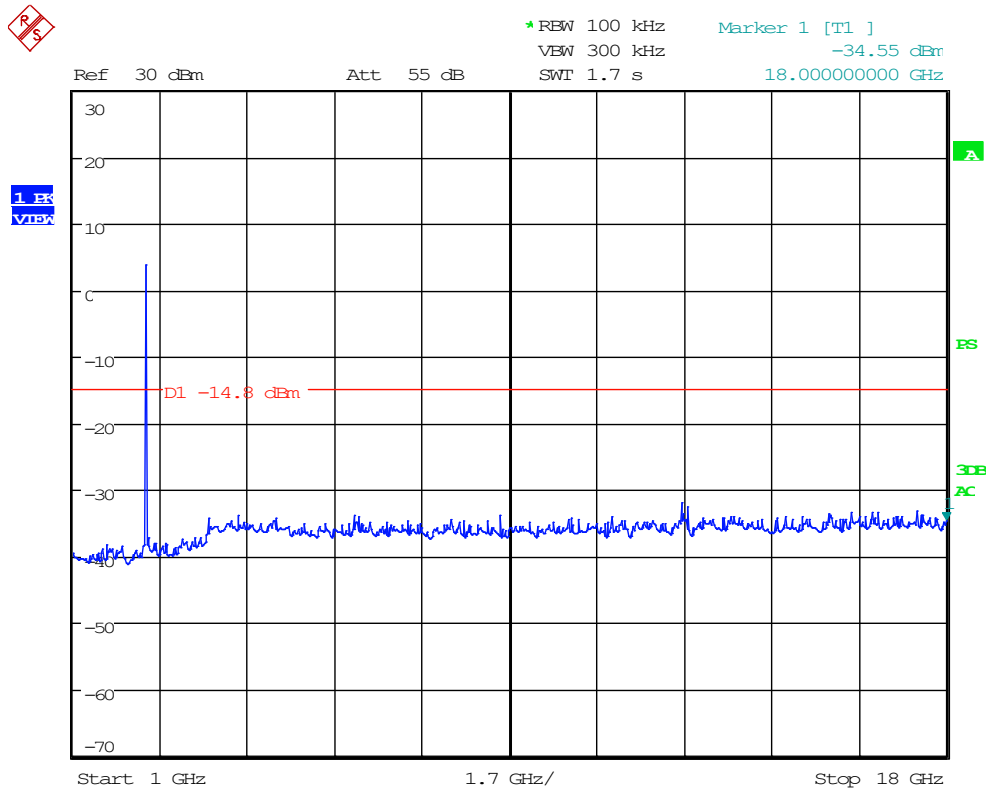
Bluetooth: Mid Channel
30 MHz to 1000 MHz



Date: 10.DEC.2019 16:19:21



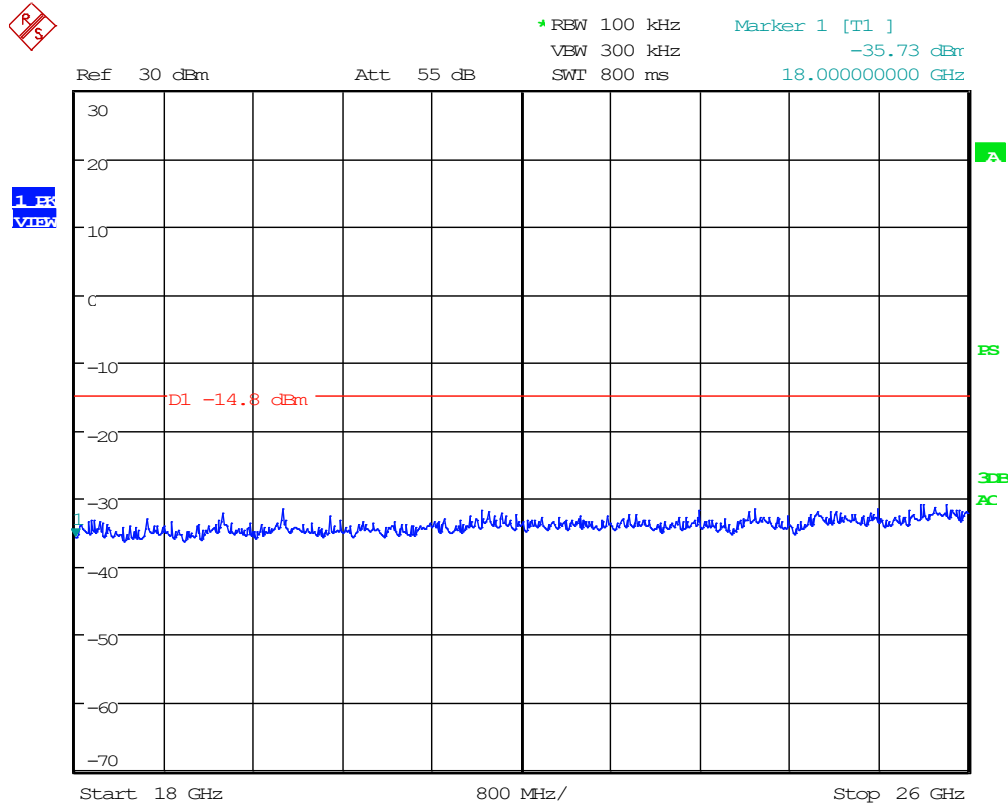
Bluetooth: Mid Channel
1 GHz to 18 GHz



Date: 10.DEC.2019 16:18:09



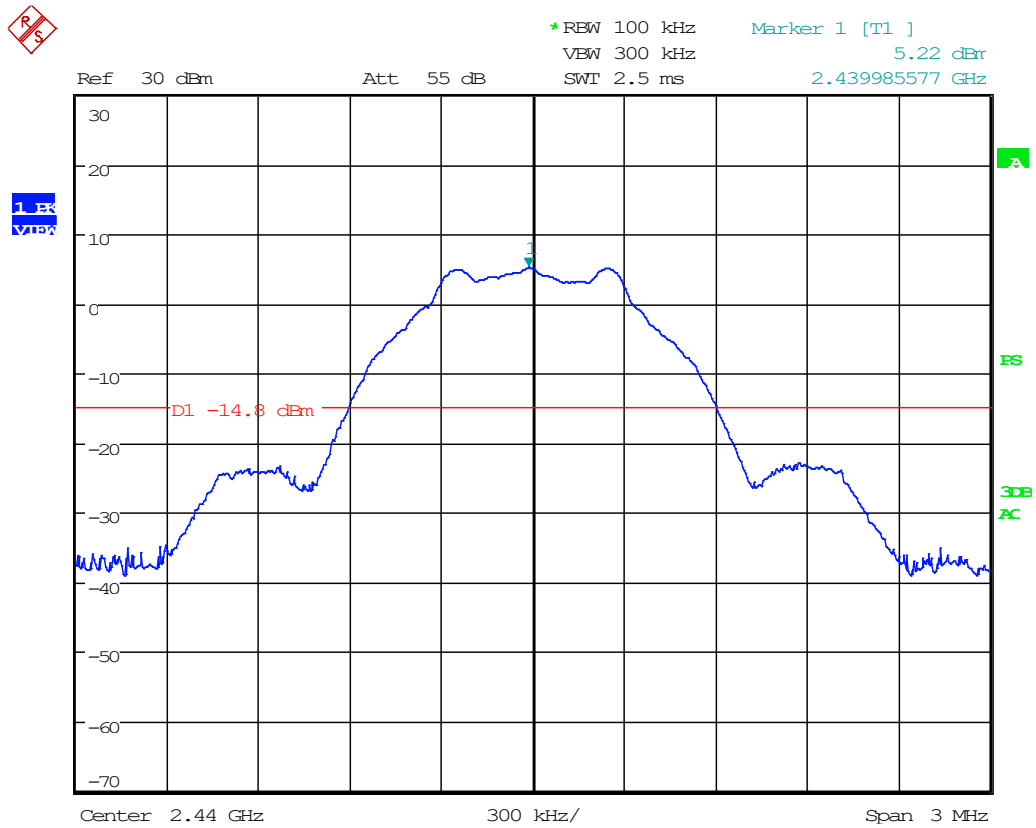
Bluetooth: Mid Channel
18 GHz to 26 GHz



Date: 10.DEC.2019 16:17:12



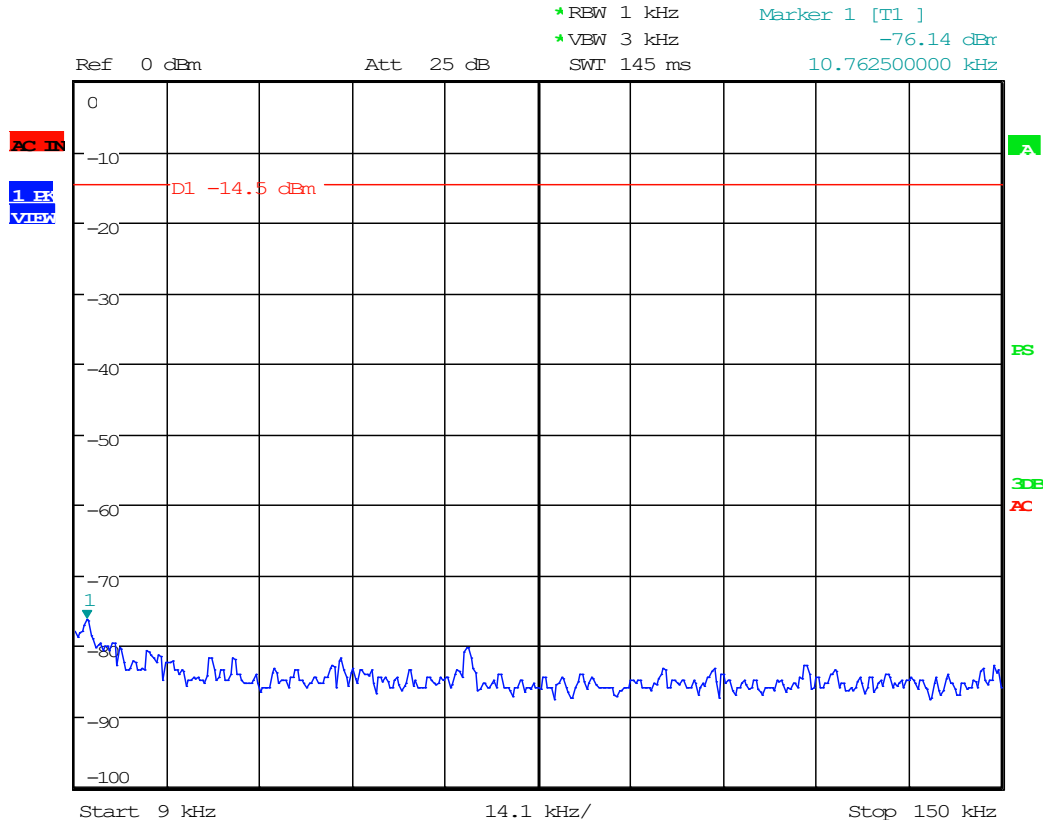
Bluetooth: Mid Channel, Spur Reference



Date: 10.DEC.2019 16:08:02



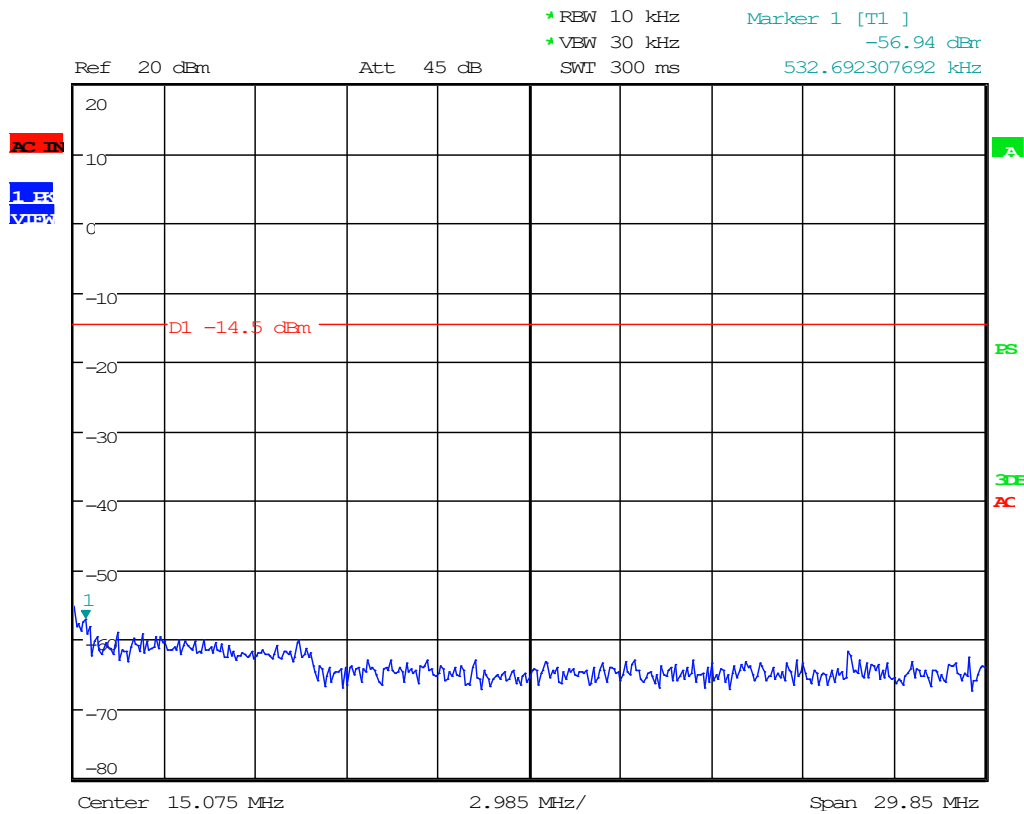
Bluetooth: High Channel
0.009 MHz to 0.15 MHz



Date: 14.AUG.2019 15:04:46



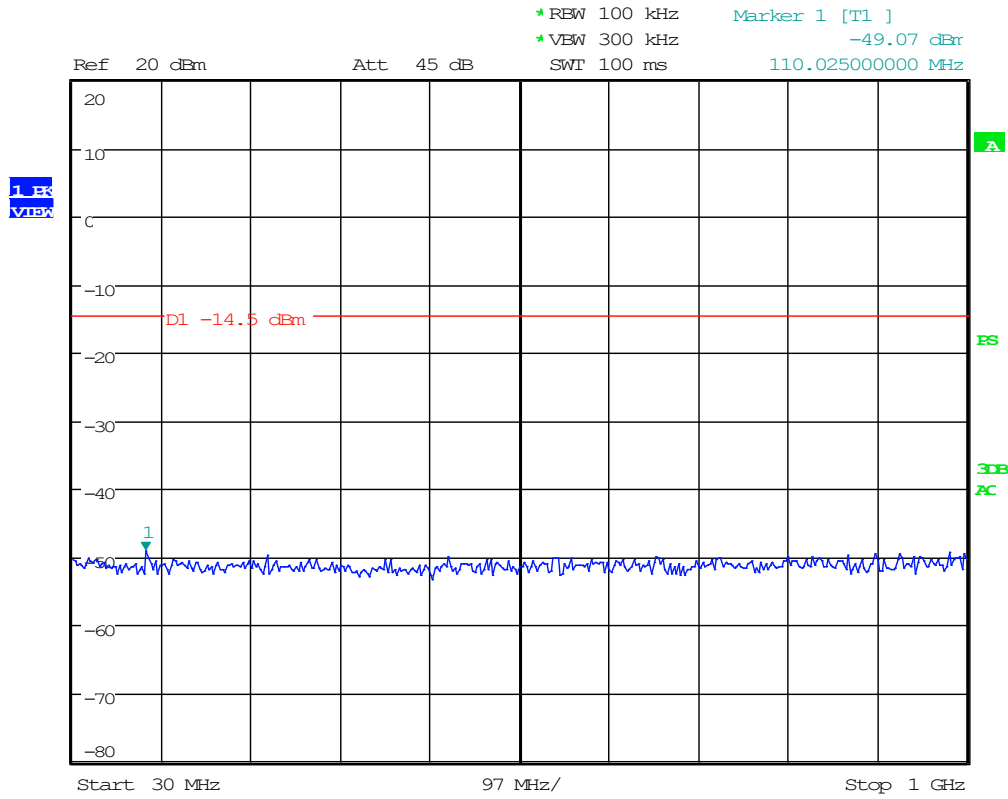
Bluetooth: High Channel 0.15 MHz to 30 MHz



Date: 14.AUG.2019 15:03:20



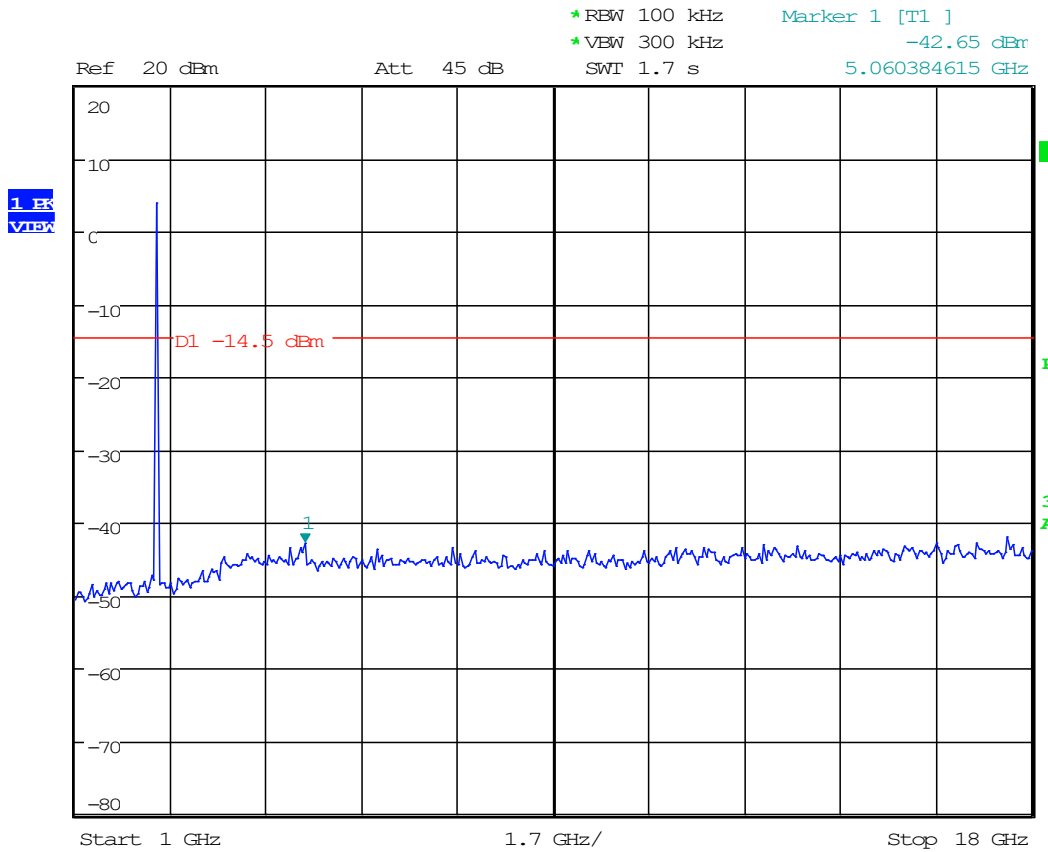
Bluetooth: High Channel
30 MHz to 1000 MHz



Date: 14.AUG.2019 15:01:44



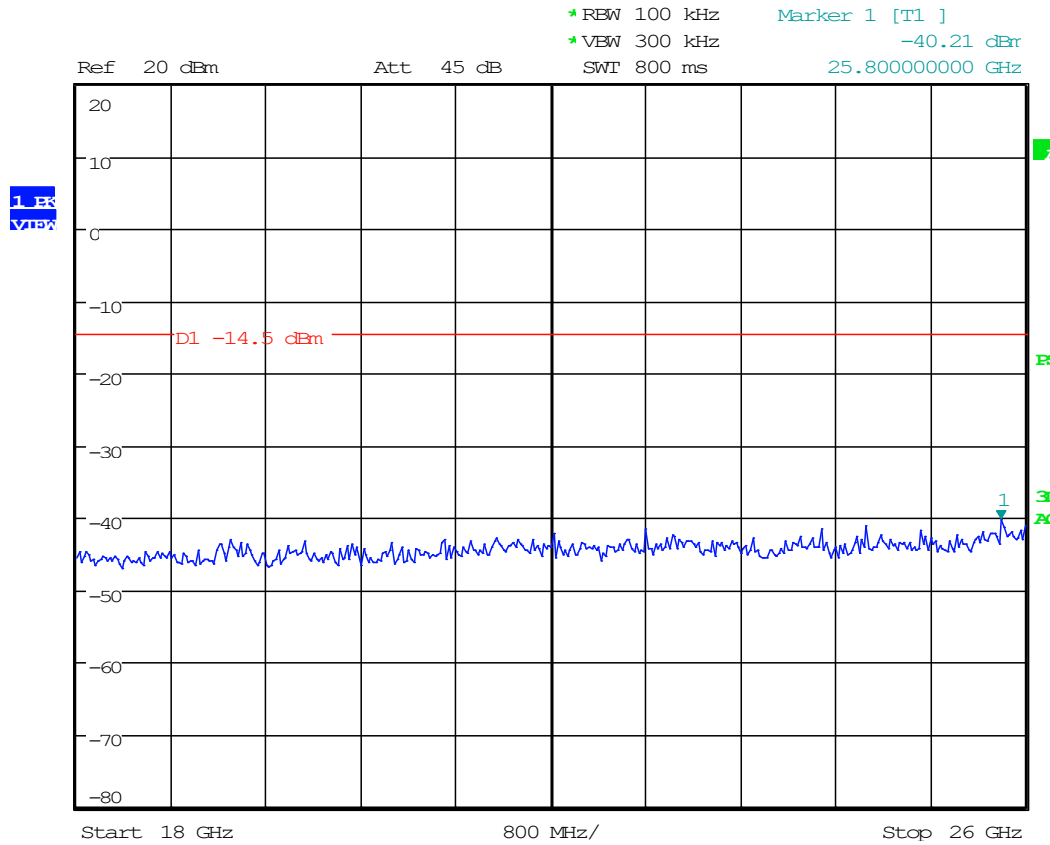
Bluetooth: High Channel 1 GHz to 18 GHz



Date: 14.AUG.2019 15:00:56



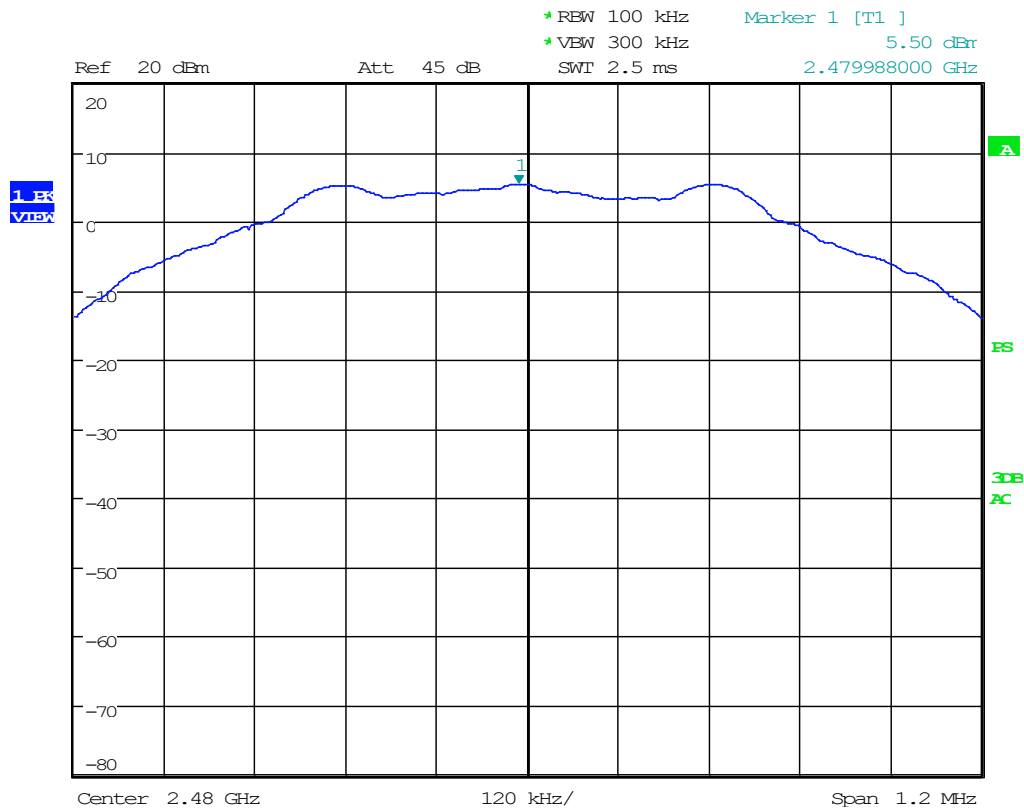
Bluetooth: High Channel
18 GHz to 26 GHz



Date: 14.AUG.2019 14:59:37



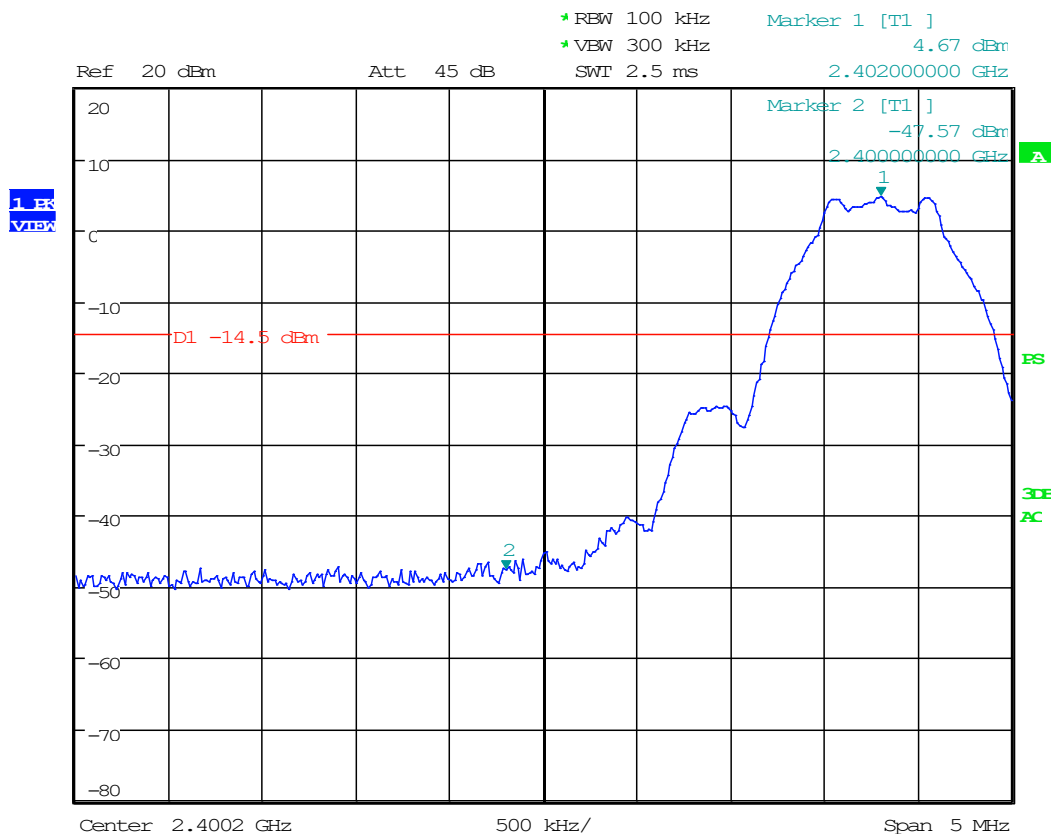
Bluetooth: High Channel, Spur Reference



Date: 14.AUG.2019 14:55:53



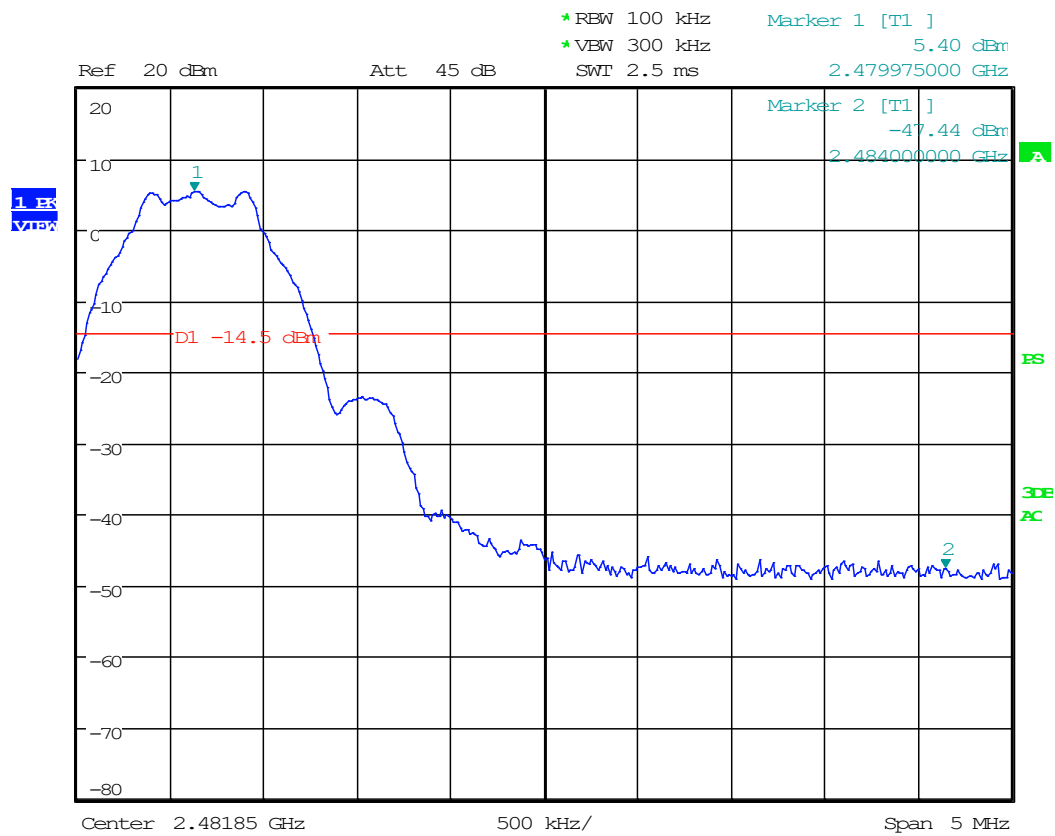
Bluetooth: Low Band Edge



Date: 14.AUG.2019 15:10:06



Bluetooth: High Band Edge



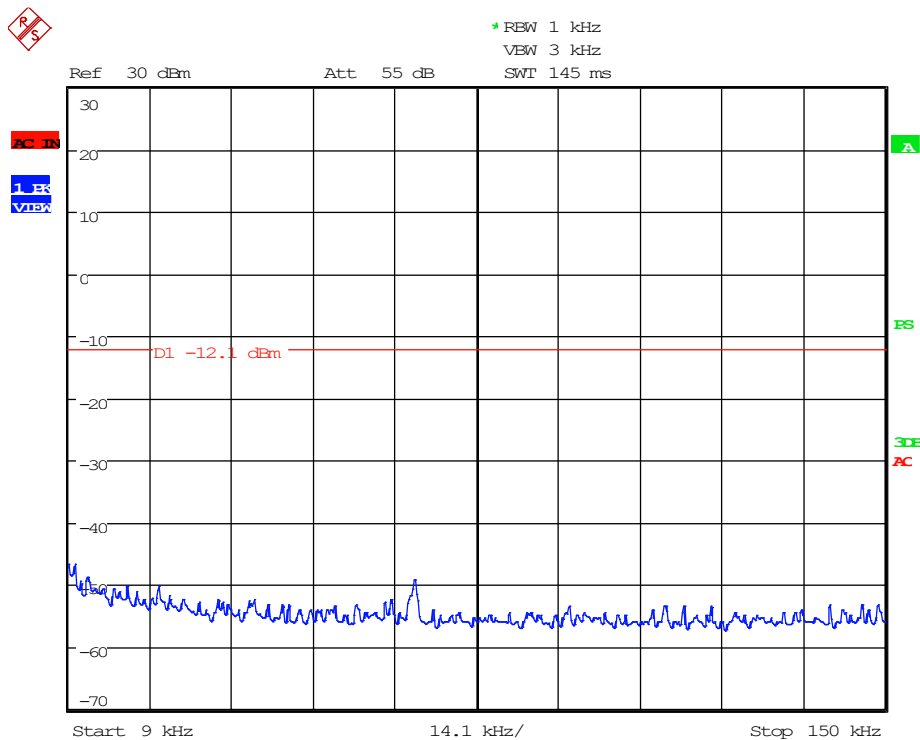
Date: 14.AUG.2019 15:08:30



Test Date:	Aug. 20-22, 2019 / Dec. 10, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(d) / Part 15.207 KDB558074	Air Temperature:	22.8°C / 22.1 °C
		Relative Humidity:	38% / 31%

Note: The following results were measured with the output power setting at 19 dBm, prior to the power reduction required for the device to meet SAR requirements. The Conducted Power was reduced; therefore, these values did not require remeasurement as they would not increase beyond the allowed limits.

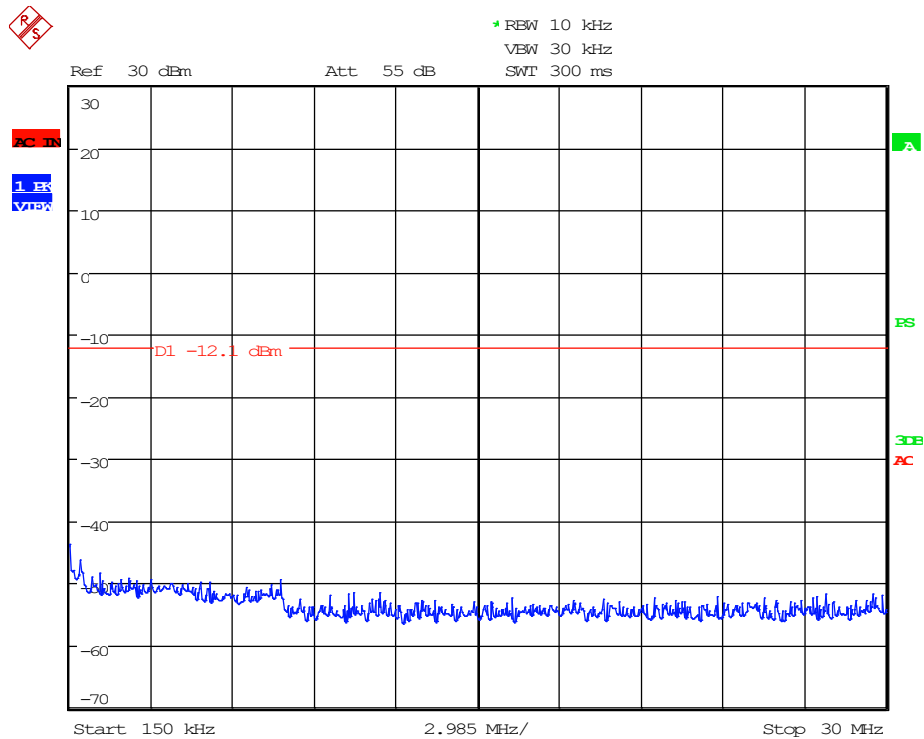
Wi-Fi, 2.4 GHz - CCK: Low Channel 0.009 MHz to 0.15 MHz



Date: 10.DEC.2019 16:40:54



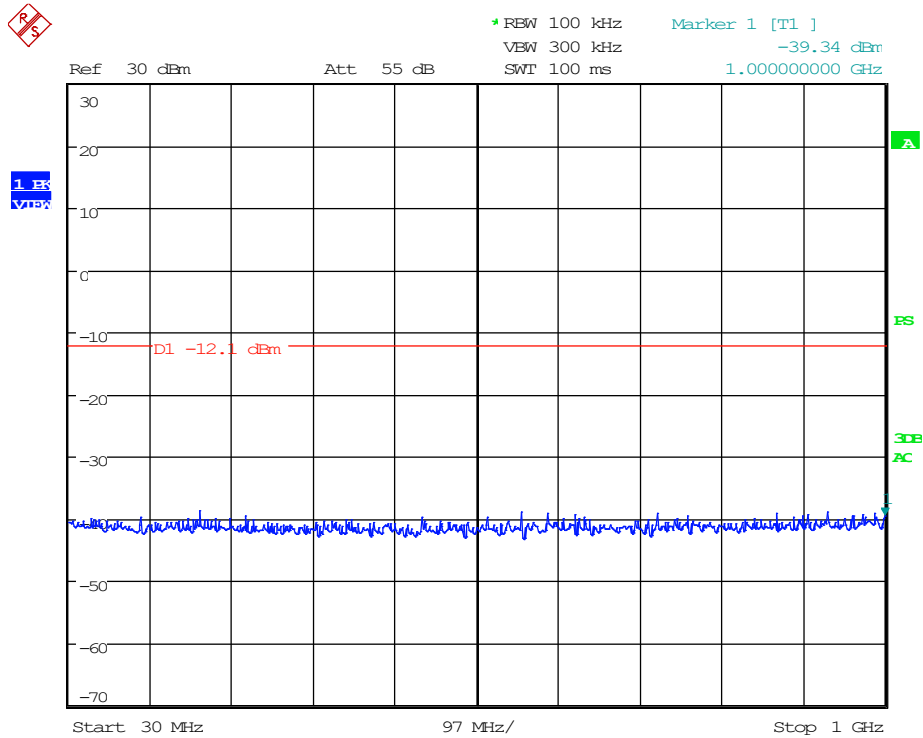
Wi-Fi, 2.4 GHz - CCK: Low Channel 0.15 MHz to 30 MHz



Date: 10.DEC.2019 16:39:56



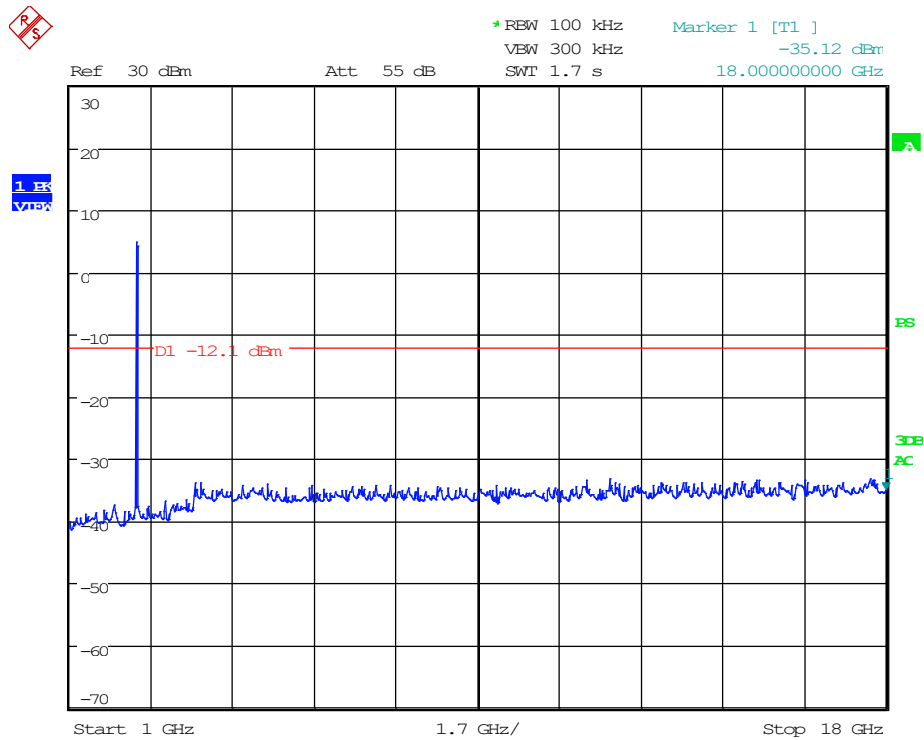
Wi-Fi, 2.4 GHz - CCK: Low Channel
30 MHz to 1000 MHz



Date: 10.DEC.2019 16:38:30



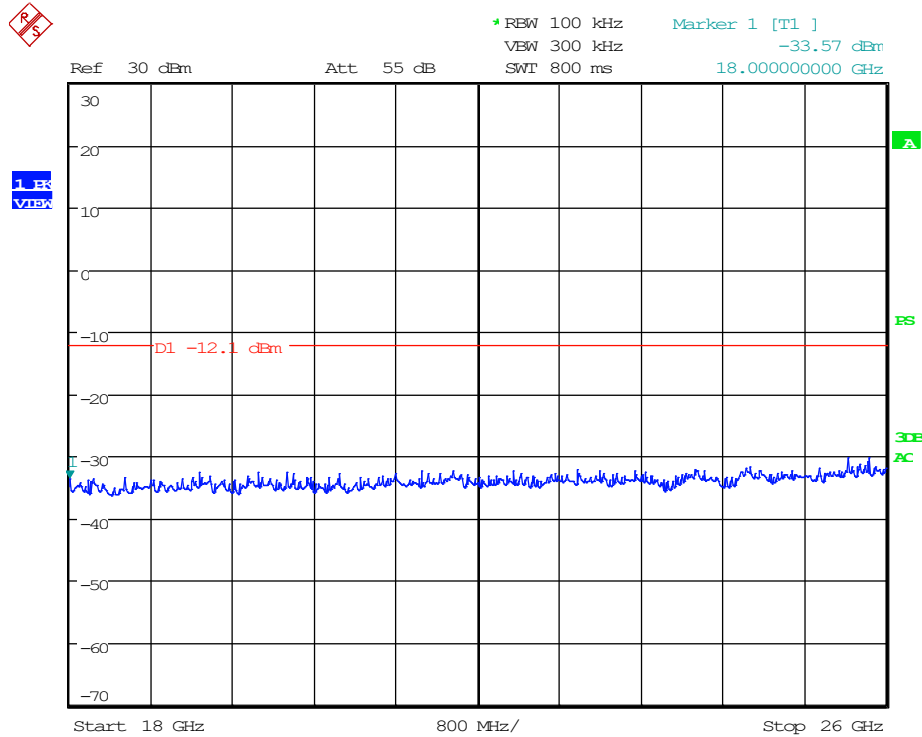
Wi-Fi, 2.4 GHz - CCK: Low Channel 1 GHz to 18 GHz



Date: 10.DEC.2019 16:37:25



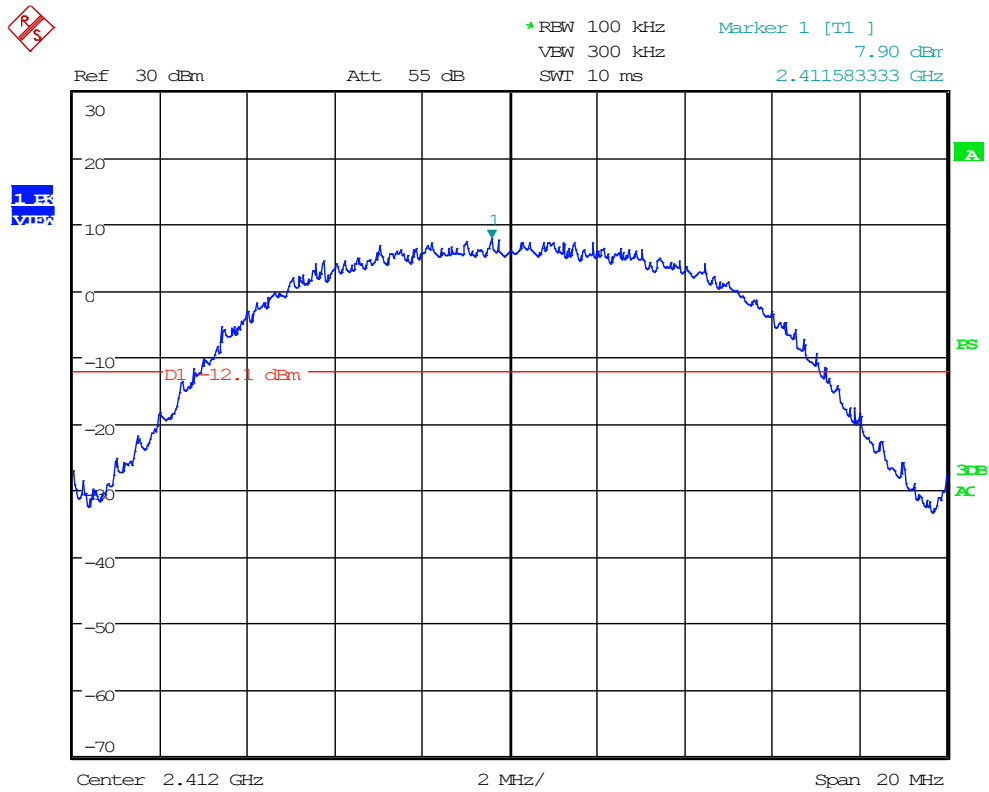
Wi-Fi, 2.4 GHz - CCK: Low Channel
18 GHz to 26 GHz



Date: 10.DEC.2019 16:36:34



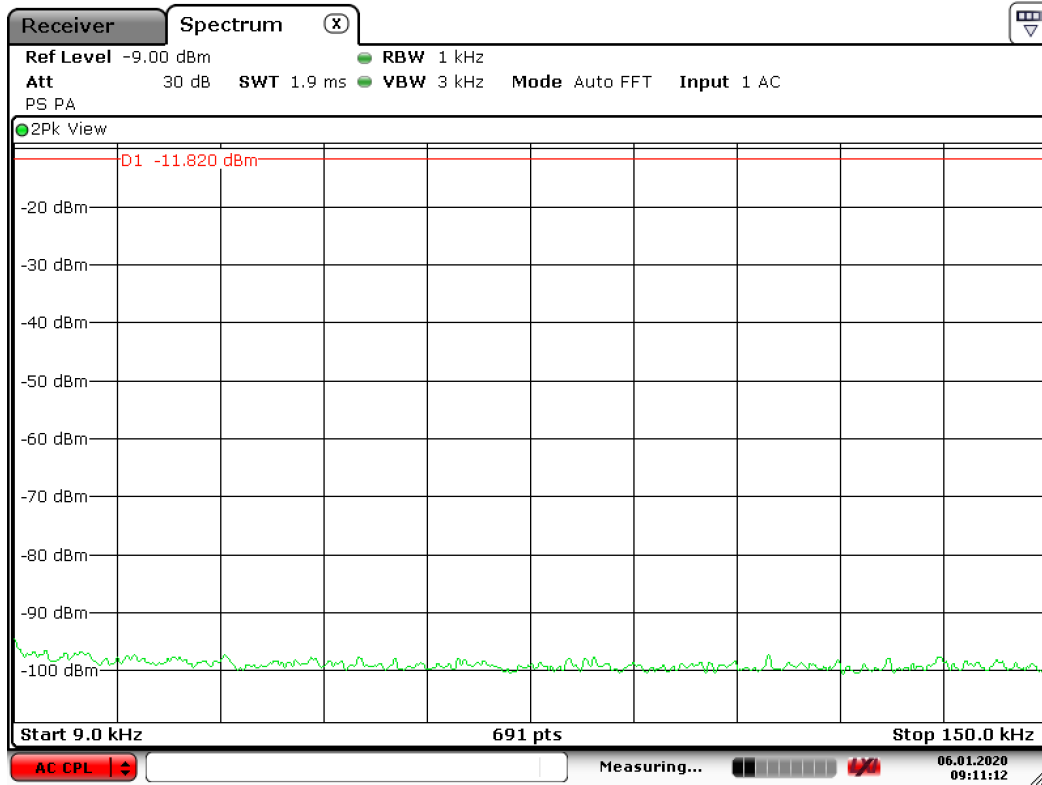
Wi-Fi, 2.4 GHz - CCK: Low Channel, Spur Reference



Date: 10.DEC.2019 16:35:29



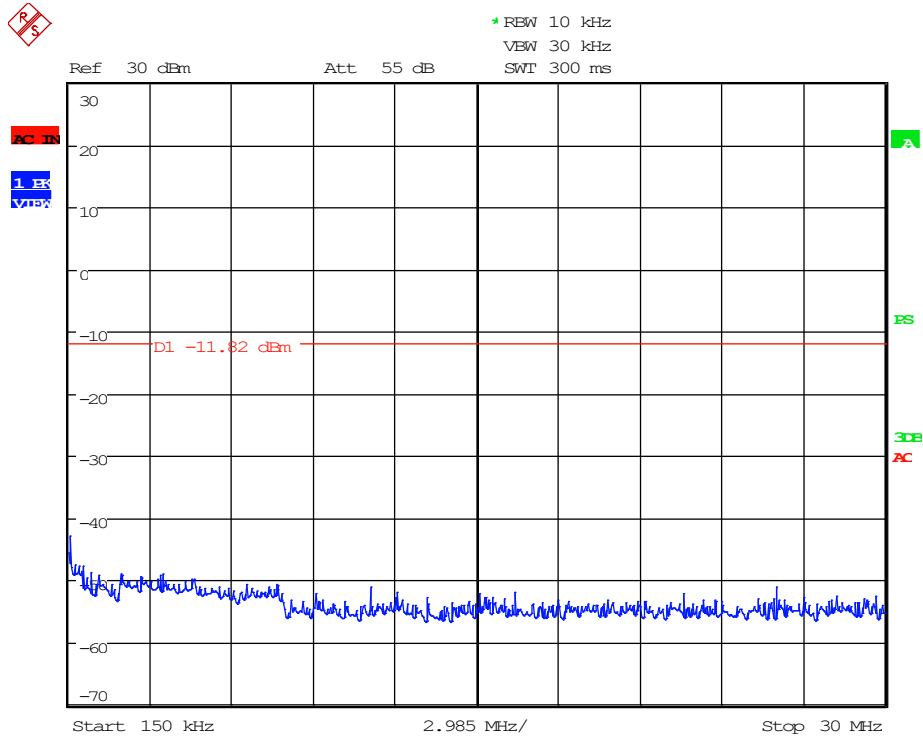
Wi-Fi, 2.4 GHz - CCK: Mid Channel
0.009 MHz to 0.15 MHz



Date: 6.JAN.2020 09:11:12



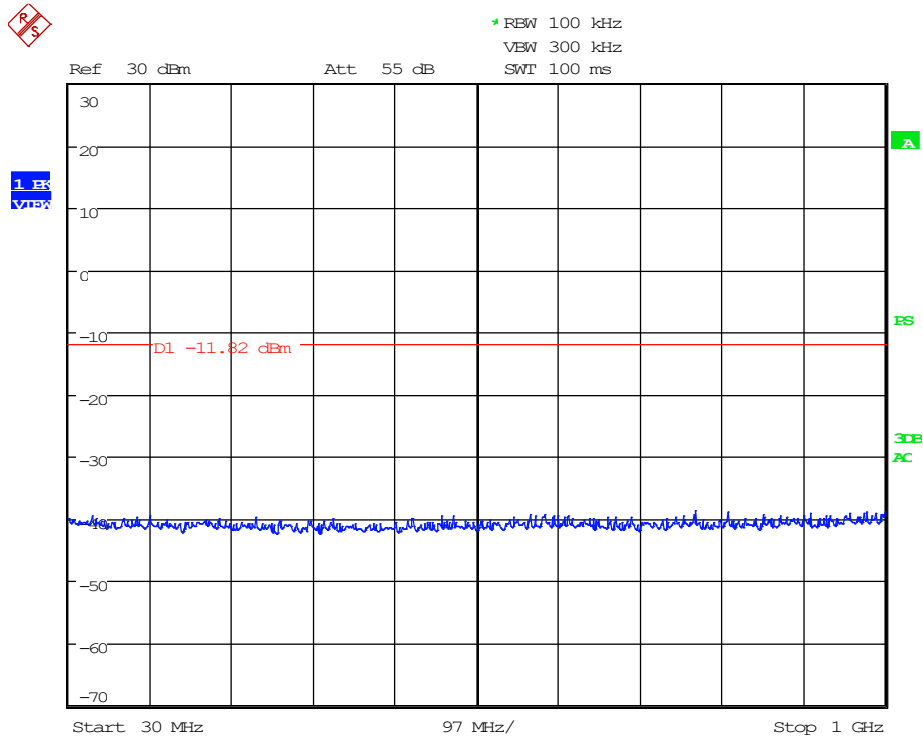
Wi-Fi, 2.4 GHz - CCK: Mid Channel
0.15 MHz to 30 MHz



Date: 10.DEC.2019 16:52:20



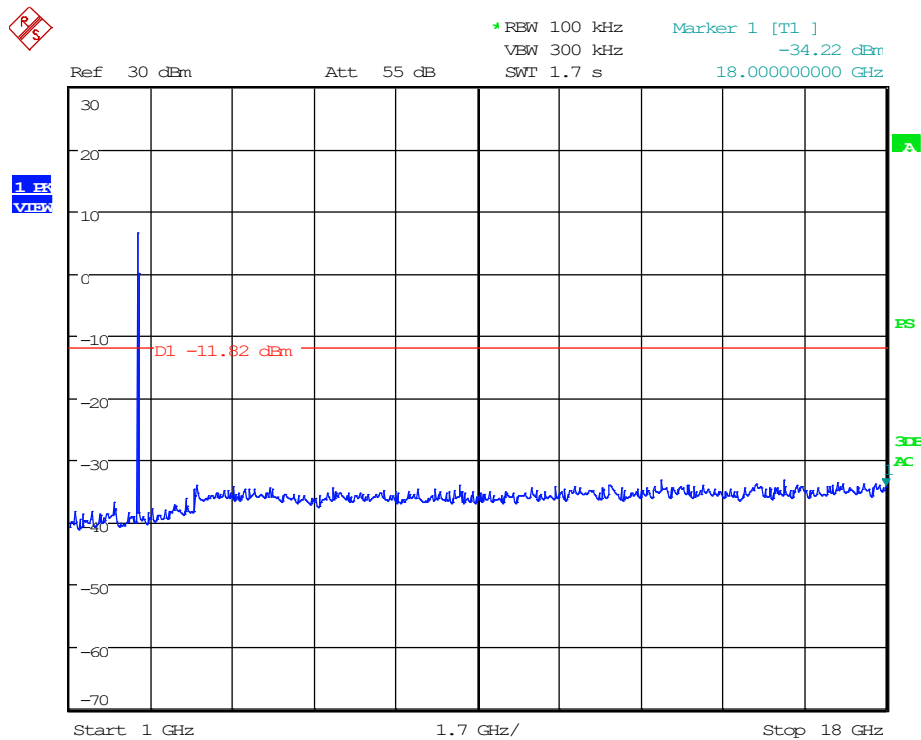
Wi-Fi, 2.4 GHz - CCK: Mid Channel
30 MHz to 1000 MHz



Date: 10.DEC.2019 16:51:13



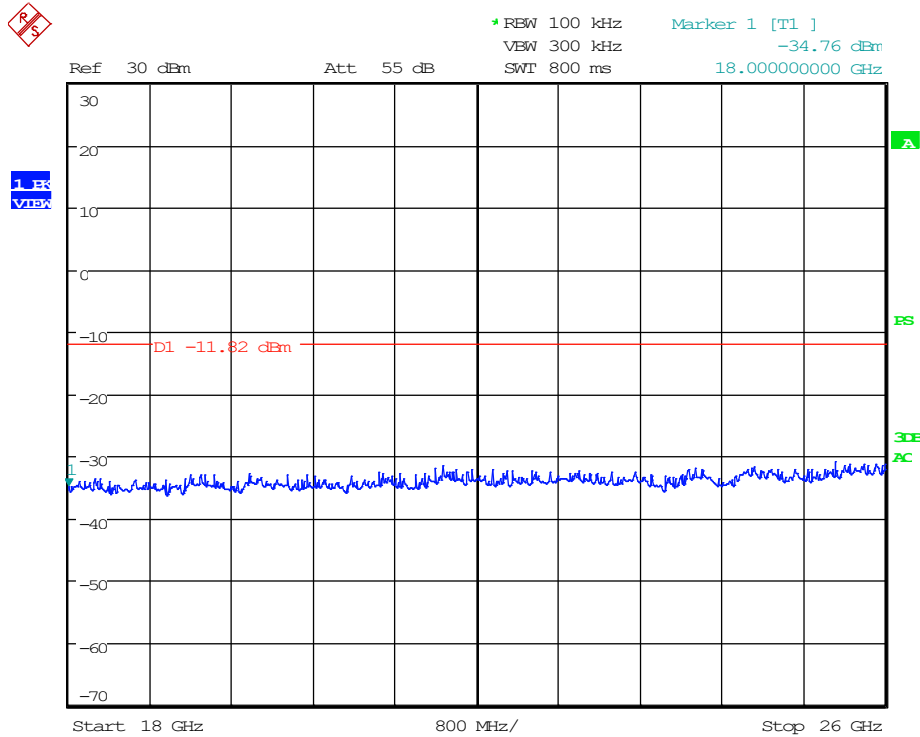
Wi-Fi, 2.4 GHz - CCK: Mid Channel
1 GHz to 18 GHz



Date: 10.DEC.2019 16:50:09



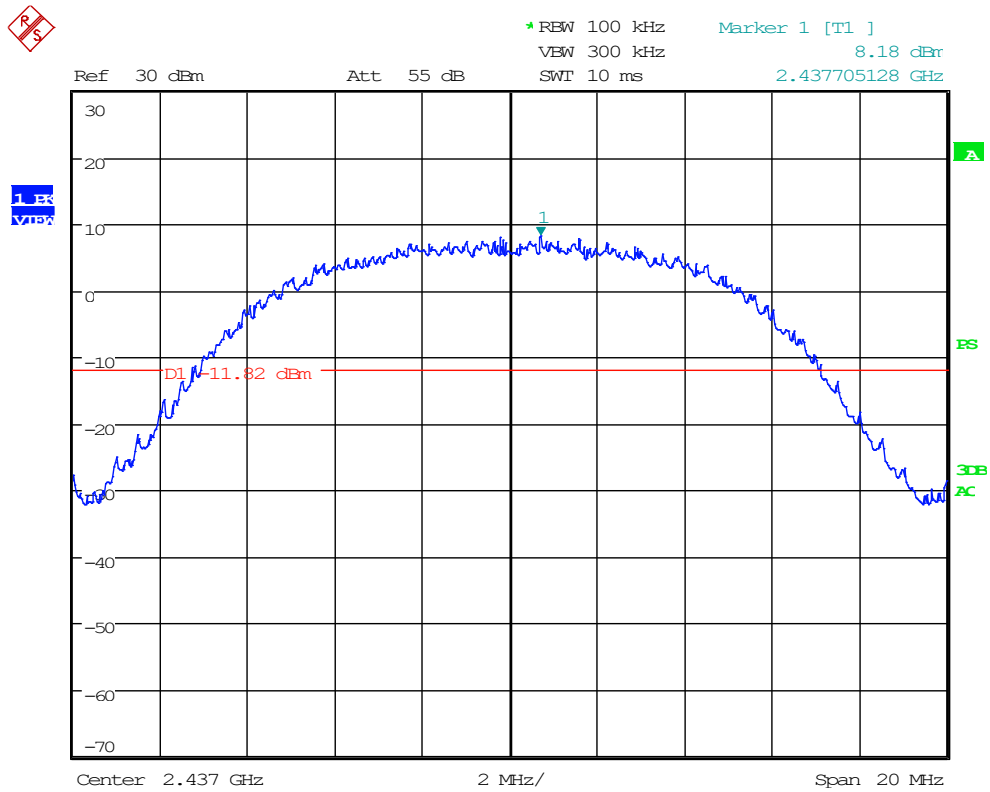
Wi-Fi, 2.4 GHz - CCK: Mid Channel
18 GHz to 26 GHz



Date: 10.DEC.2019 16:49:18



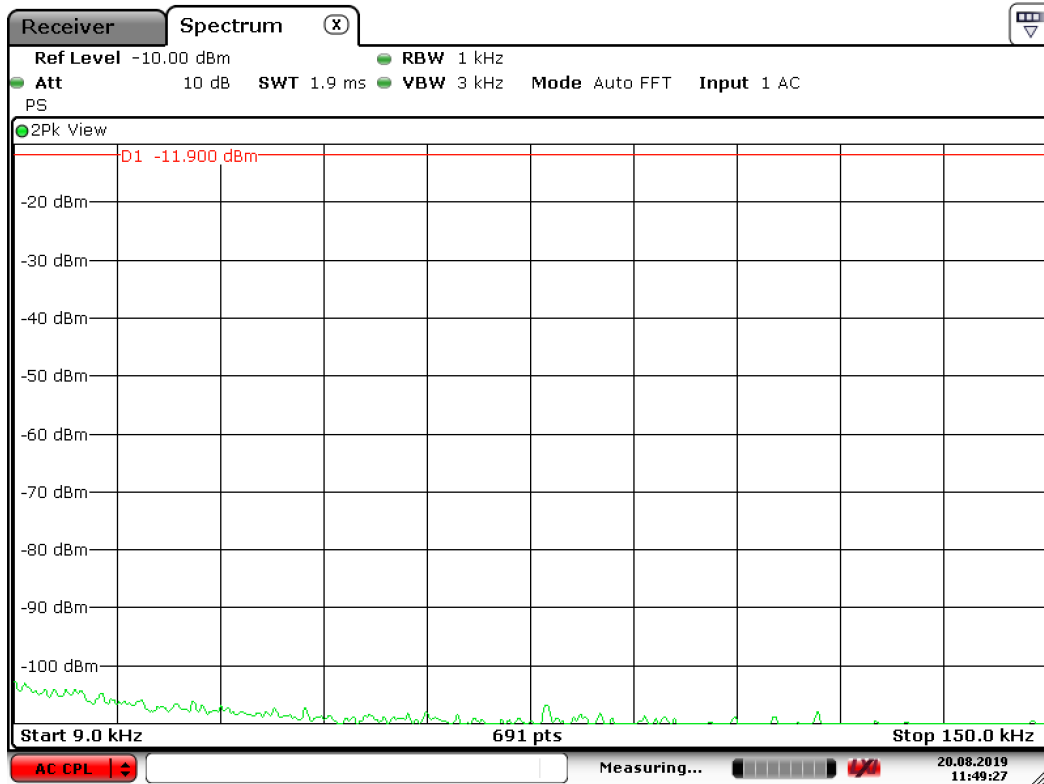
Wi-Fi, 2.4 GHz - CCK: Mid Channel, Spur Reference



Date: 10.DEC.2019 16:48:02



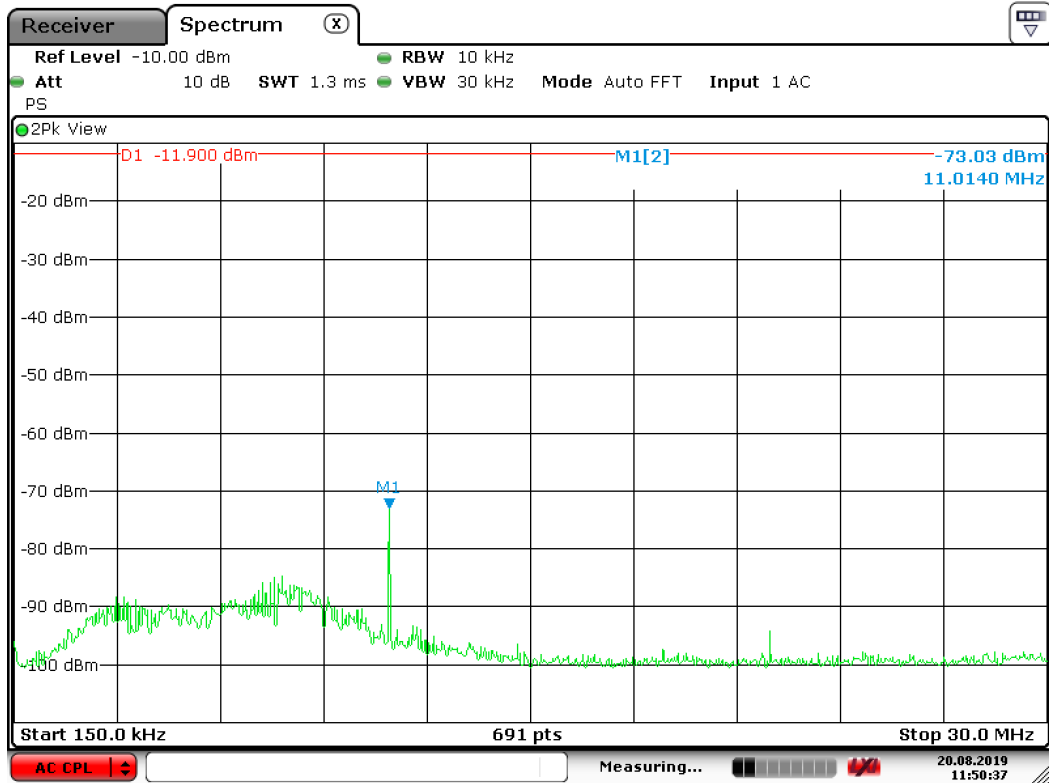
Wi-Fi, 2.4 GHz - CCK: High Channel
0.009 MHz to 0.15 MHz



Date: 20.AUG.2019 11:49:28



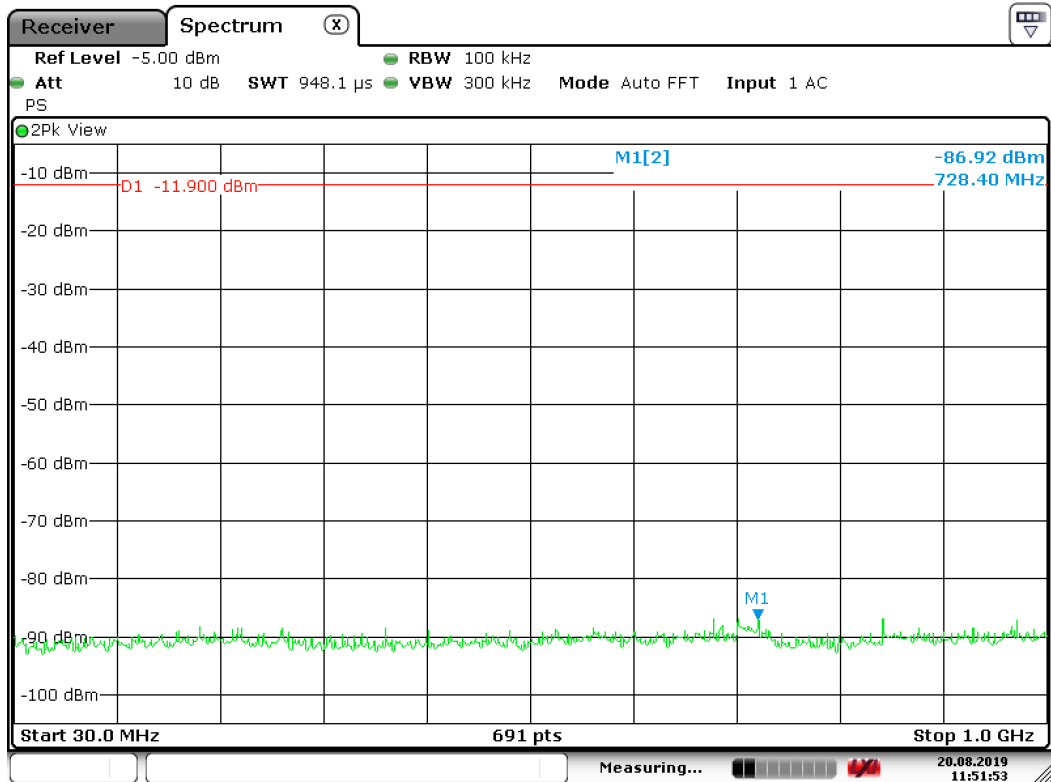
Wi-Fi, 2.4 GHz - CCK: High Channel
0.15 MHz to 30 MHz



Date: 20.AUG.2019 11:50:37



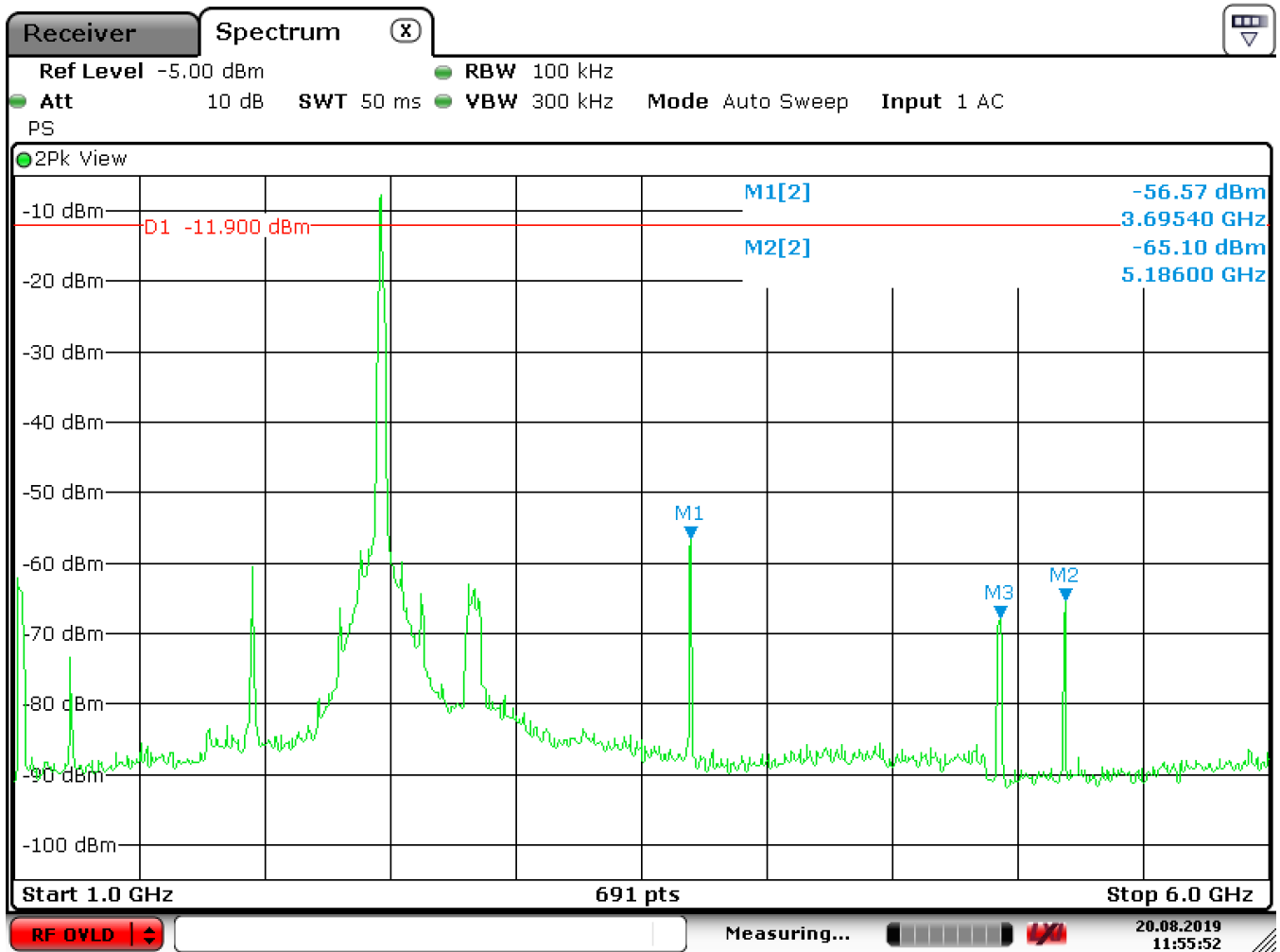
Wi-Fi, 2.4 GHz - CCK: High Channel
30 MHz to 1000 MHz



Date: 20.AUG.2019 11:51:53



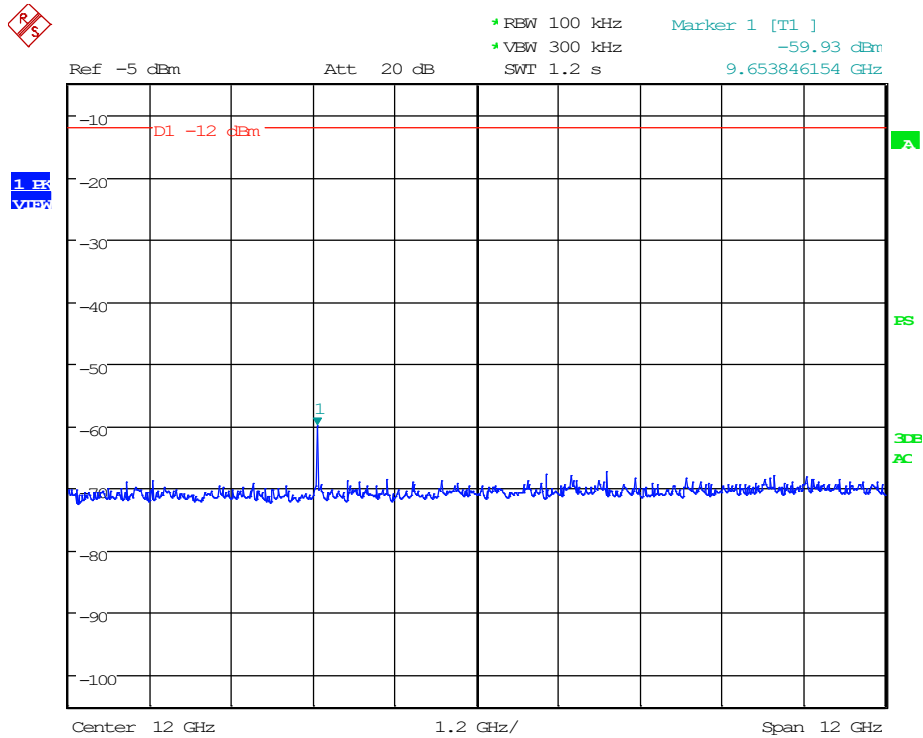
Wi-Fi, 2.4 GHz - CCK: High Channel
1 GHz to 6 GHz



Date: 20.AUG.2019 11:55:52



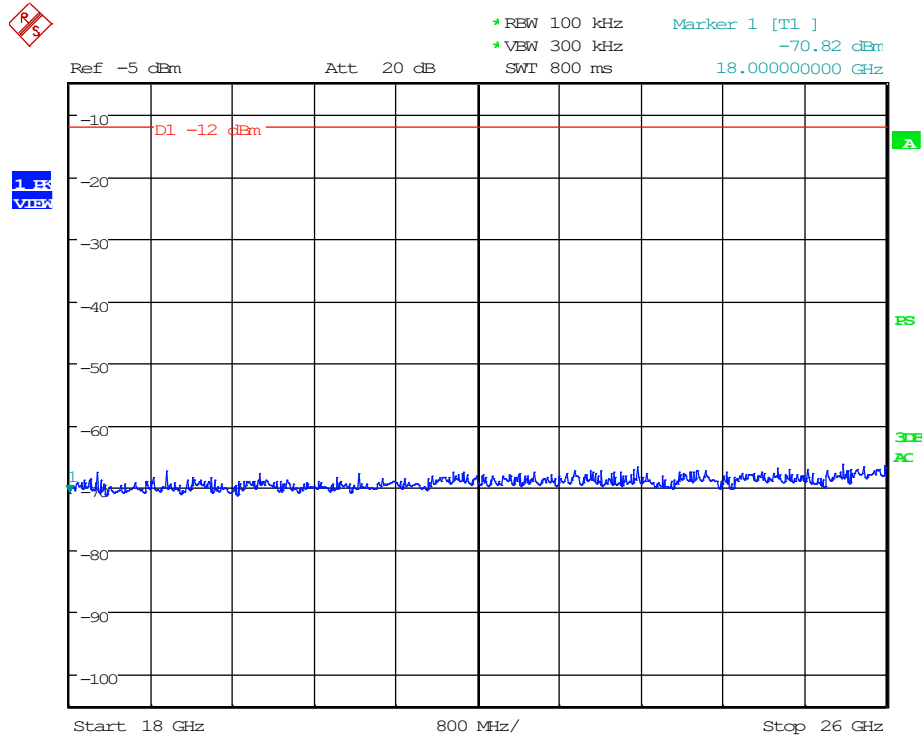
Wi-Fi, 2.4 GHz - CCK: High Channel 6 GHz to 18 GHz



Date: 22.AUG.2019 13:10:48



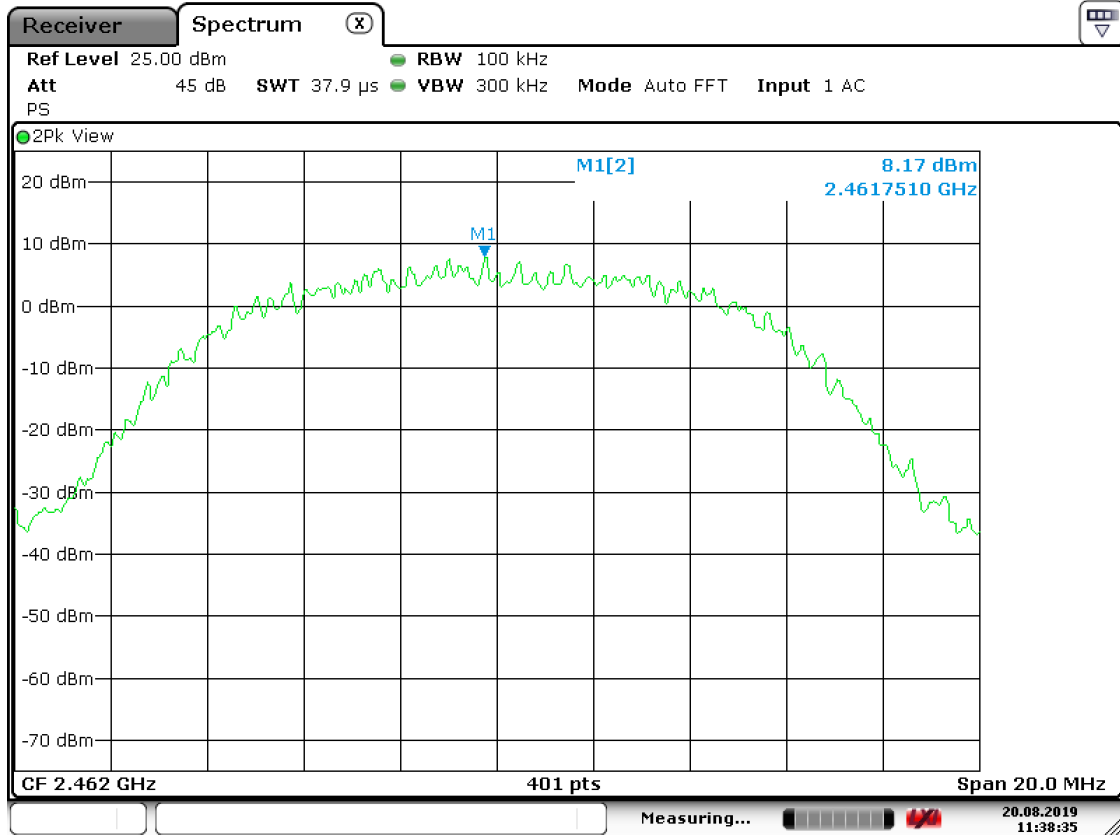
Wi-Fi, 2.4 GHz - CCK: High Channel
18 GHz to 26 GHz



Date: 22.AUG.2019 13:11:36



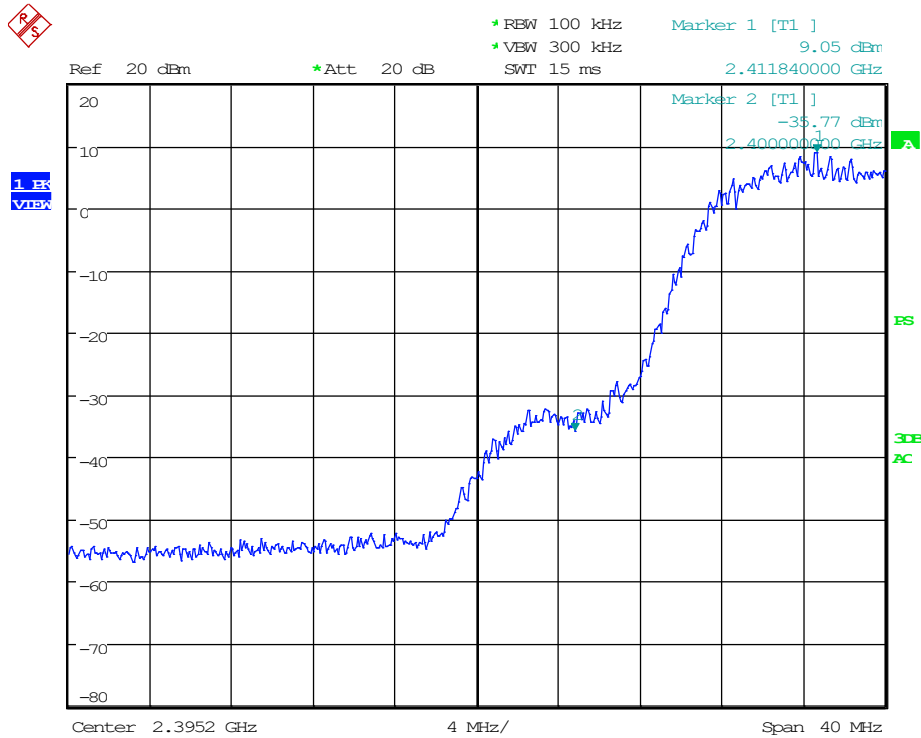
Wi-Fi, 2.4 GHz - CCK: High Channel, Spur Reference



Date: 20.AUG.2019 11:38:35



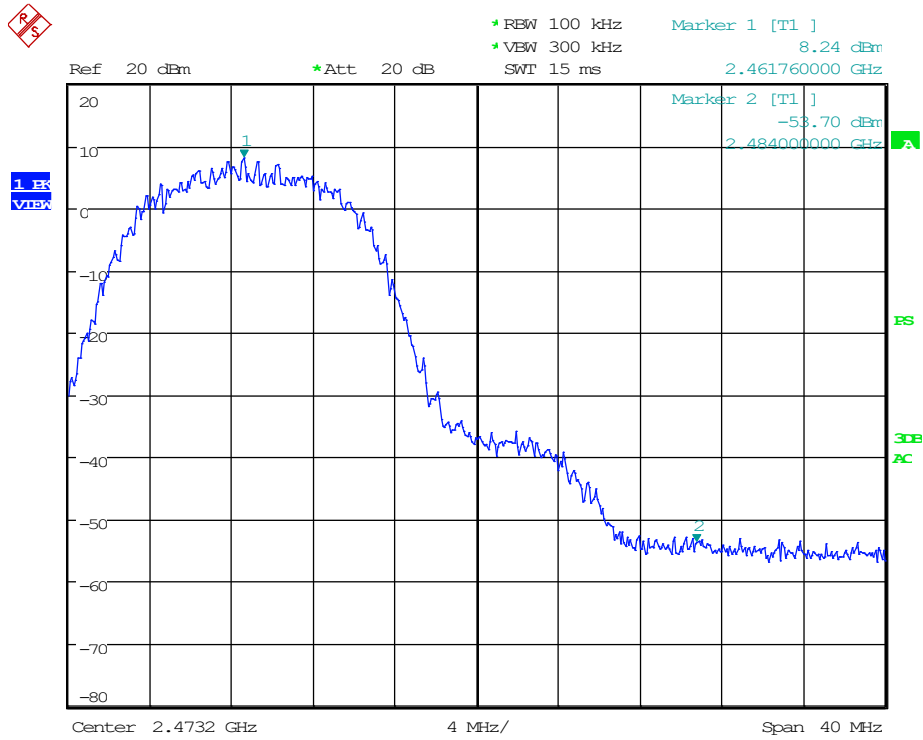
Wi-Fi, 2.4 GHz - CCK: Low Band Edge



Date: 22.AUG.2019 15:59:11



Wi-Fi, 2.4 GHz - CCK: High Band Edge



Date: 22.AUG.2019 16:01:21



11 RADIATED SPURIOUS EMISSION

The EUT's emissions were recorded with its integral/internal chip antenna. Radiated emissions were measured in a Semi-Anechoic Chamber. All emissions generated that fall in the restricted bands per FCC Part 15.205 were examined.

11.1 Requirements:

All emissions that fall in the restricted bands defined in FCC Part 15.205 shall not exceed the maximum field strength listed in FCC Part 15.209(a).



11.2 Test Procedure

Notes: Plots are peak, max hold prescan data included only to determine what frequencies to investigate and measure. The EUT was initially placed in a semi-anechoic chamber and rotated in all three orthogonal positions to maximize the emissions. Characterization measurements were then performed to determine at which frequencies significant emissions occurred. These graphs are shown below.

The equipment was fully exercised with all cabling attached to the EUT and was positioned in the SAC for maximum emissions. While the equipment was energized, the receiving antenna was scanned from 1.0 meter to 4.0 meters in both vertical and horizontal polarities while the turntable was adjusted 360 degrees to determine the maximum field strength. The tables of measured results can be found below.

Some of the frequencies did not change with the EUT on or off. At those frequencies, the test distance was shortened to 1 meter and still no emissions from the EUT were visible or over the ambient or limit.

In the following plots, the black line indicates the active scan and the green line indicates the MaxPk measurement with the EUT on. Emissions to be found by the EUT were measured and listed in tables. The plots are for reference only and the limit lines are not actual limit lines but merely a guide.

The high, mid, and low channels were scanned and the following plots reflect the high channel which was found to be the worst-case emissions, and test data presented in the tables are from all three channels.



11.3 Radiated Spurious Emissions Test Data

Test Date(s):	Aug. 14, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	Air Temperature:	20.8°C
		Relative Humidity:	61%

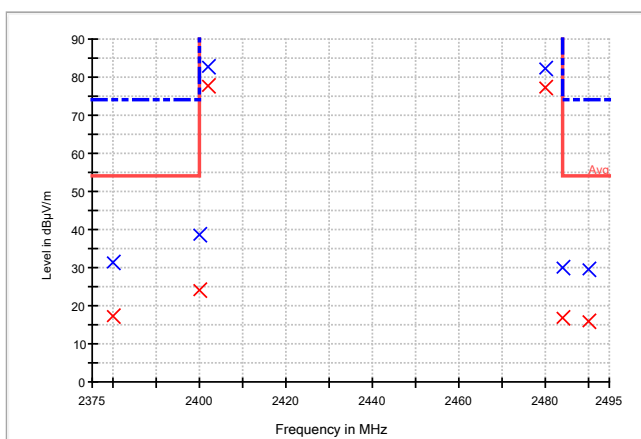
Bluetooth – Band Edges

MaxPeak

Frequency (MHz)	Antenna Polarization	Reading (dBμV)	Cable Loss & Antenna Factor (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2380.000000	H	50.4	-19.1	31.30	74.0	-42.7
2400.000000	H	58.0	-19.4	38.60	74.0	-35.4
2402.000000	H	102.1	-19.4	82.70		
2480.000000	H	101.5	-19.1	82.40		
2483.500000	H	48.9	-19.0	29.90	74.0	-44.1
2490.000000	H	48.3	-19.0	29.30	74.0	-44.7

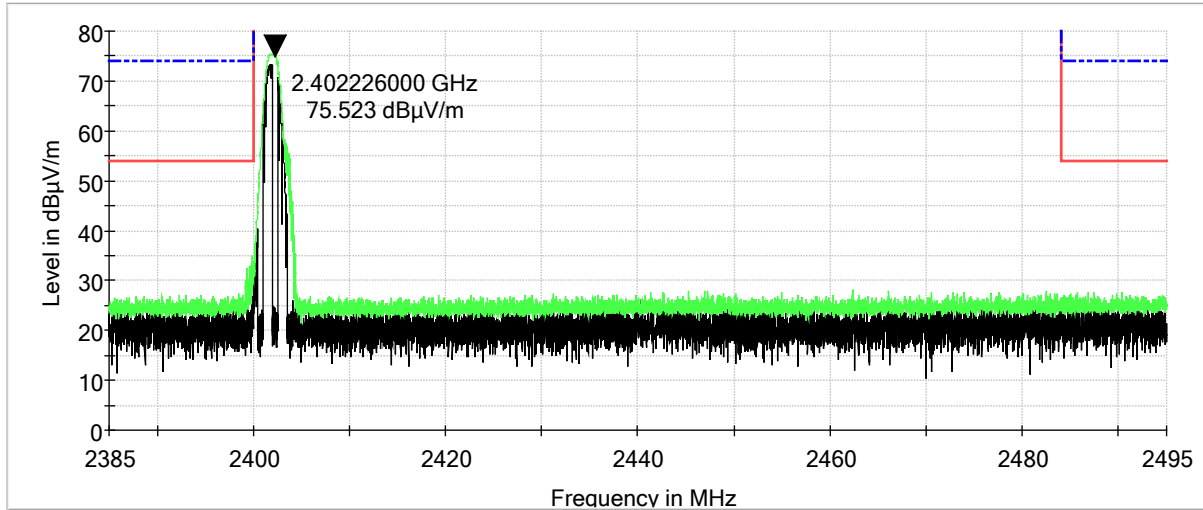
AVG

Frequency (MHz)	Antenna Polarization	Reading (dBμV)	Cable Loss & Antenna Factor (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2380.000000	H	36.4	-19.1	17.30	54.0	-36.7
2400.000000	H	43.7	-19.4	24.30	54.0	-29.7
2402.000000	H	97.0	-19.4	77.60		
2480.000000	H	94.3	-19.1	75.20		
2483.500000	H	35.6	-19.0	16.60	54.0	-37.4
2490.000000	H	35.1	-19.0	16.10	54.0	-37.9

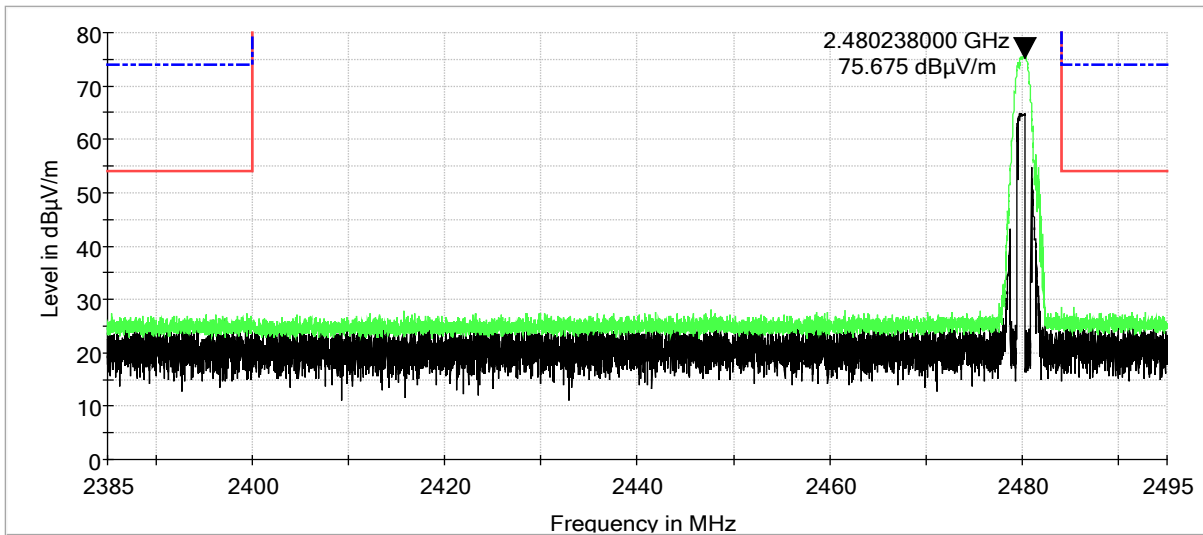




Bluetooth: Lower Band Edge, Horizontal

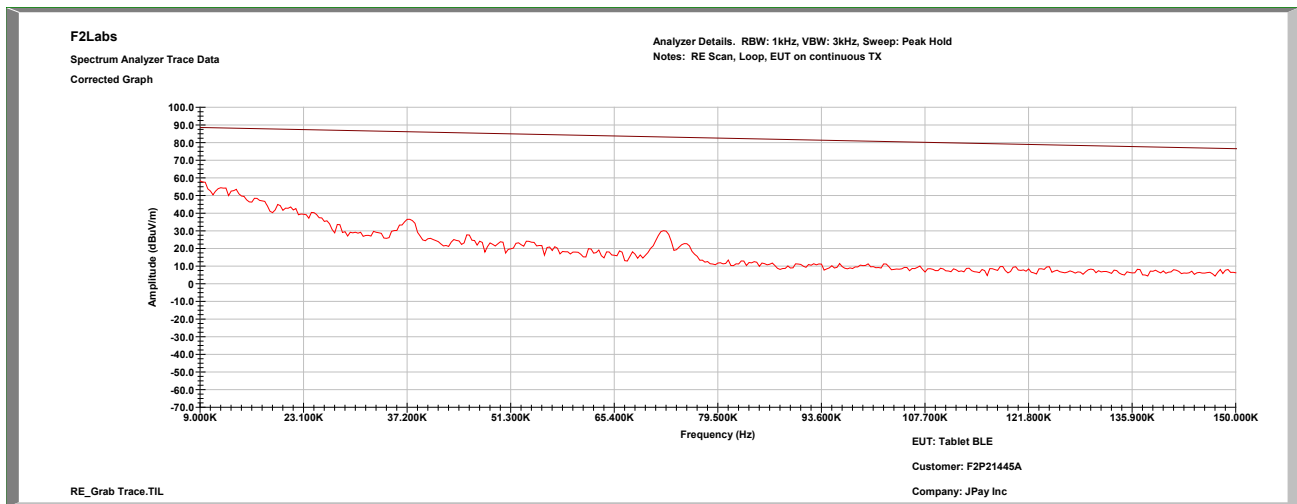


Bluetooth: Upper Band Edge, Horizontal

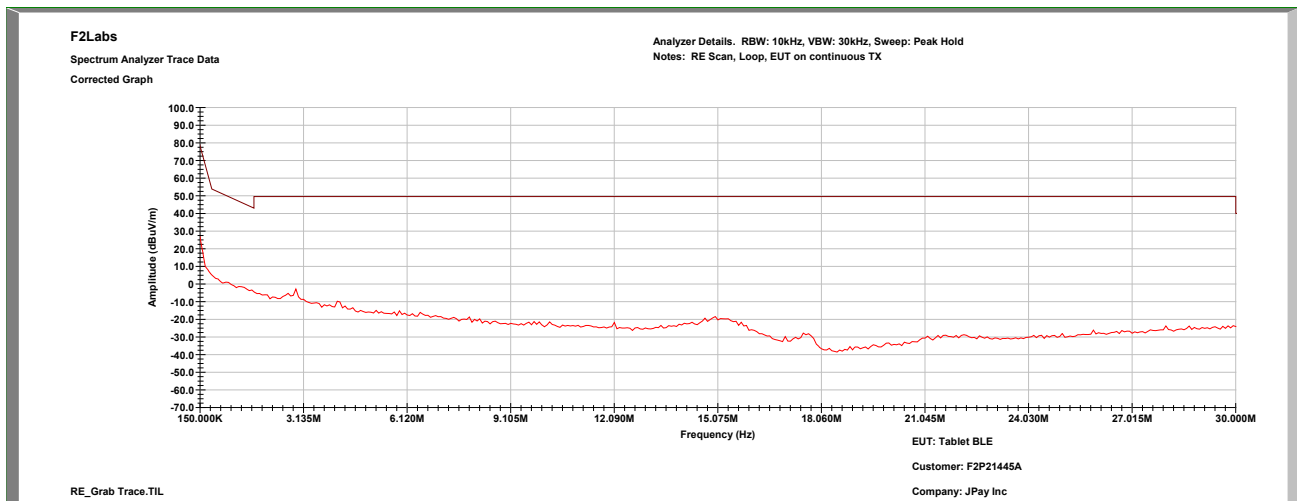




Bluetooth: 0.009 MHz to 0.15 MHz

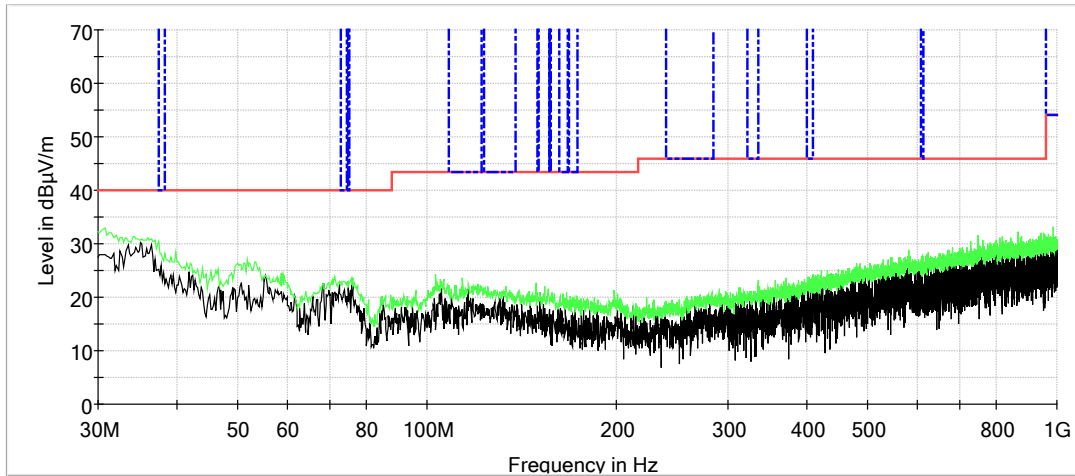


Bluetooth: 0.15 MHz to 30.0 MHz

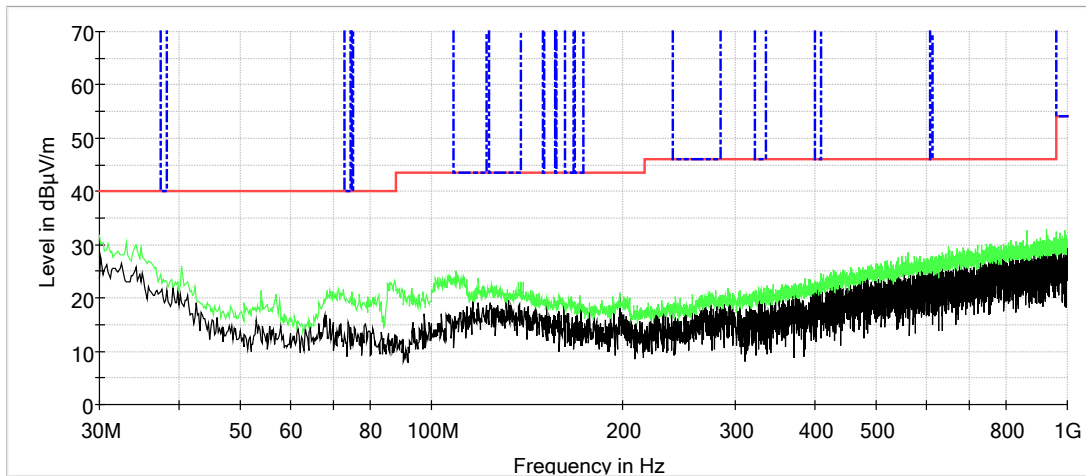




Bluetooth: 30 MHz to 1000 MHz, Vertical

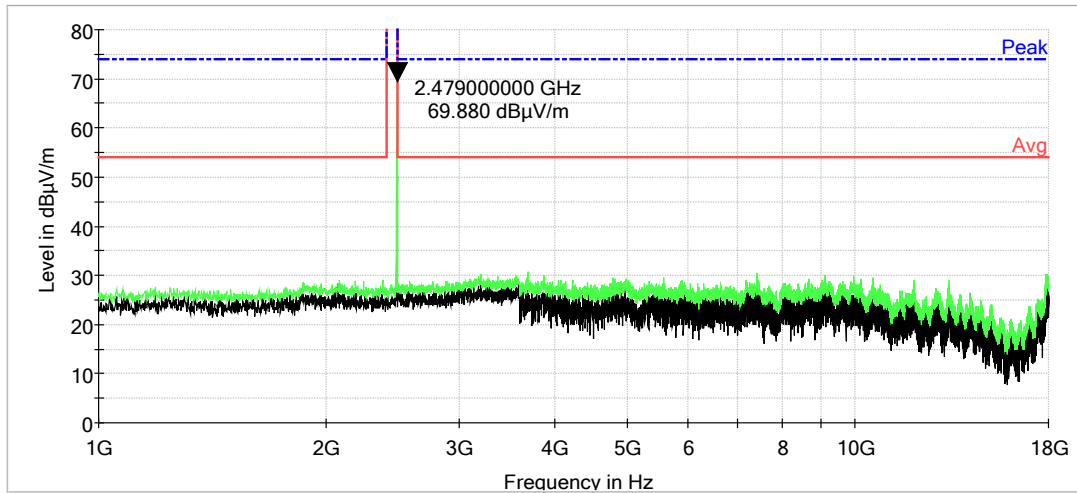


Bluetooth: 30 MHz to 1000 MHz, Horizontal

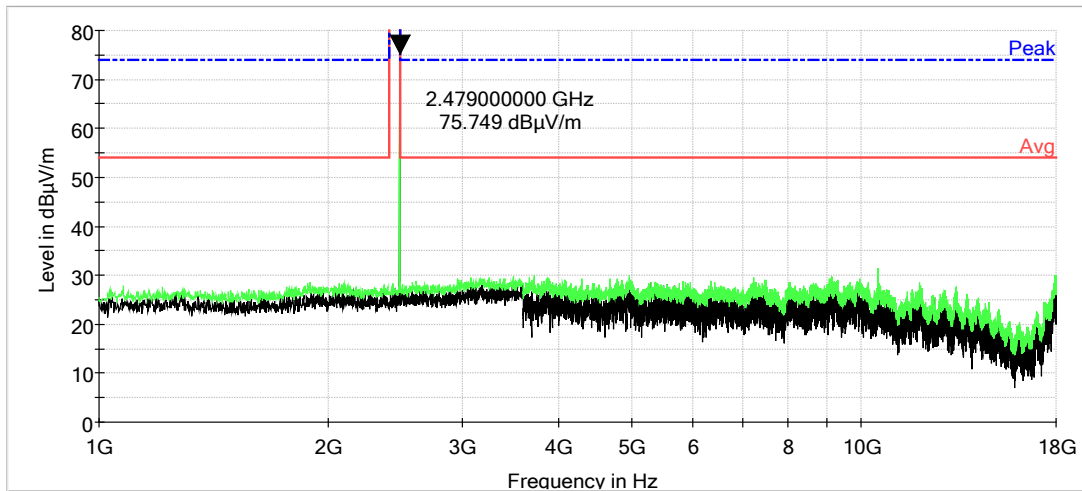




Bluetooth: 1 GHz to 18 GHz, Vertical

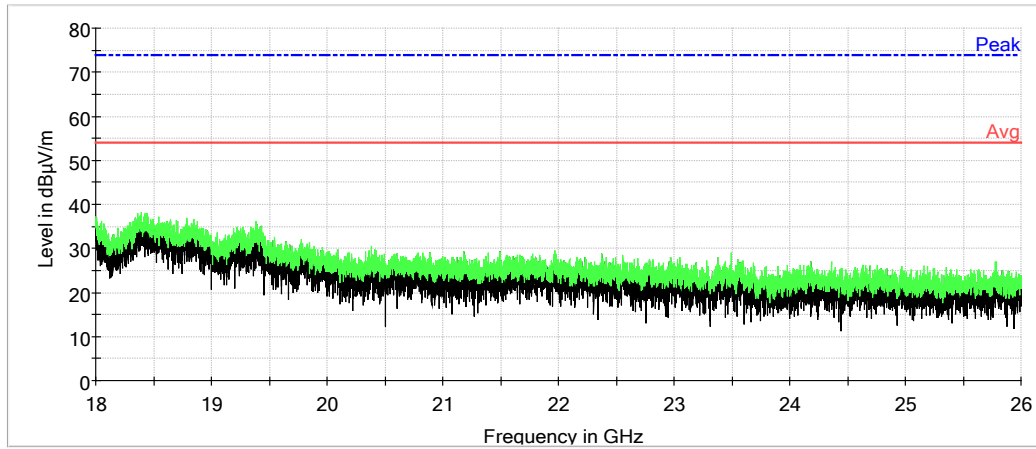


Bluetooth: 1 GHz to 18 GHz, Horizontal

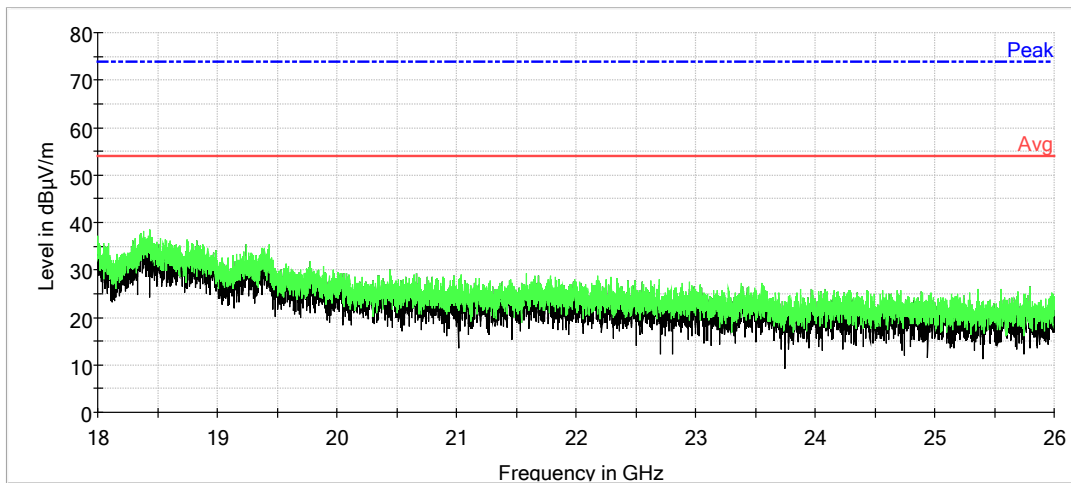




Bluetooth: 18 GHz to 26 GHz, Vertical



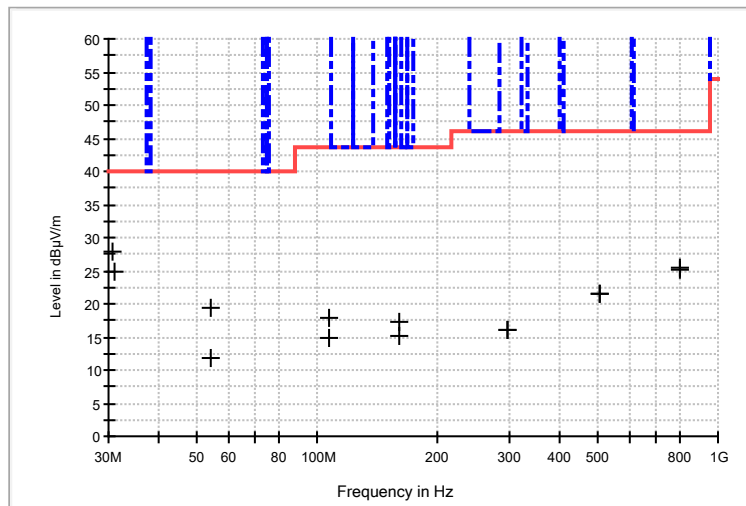
Bluetooth: 18 GHz to 26 GHz, Horizontal





Bluetooth

Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Cable Loss & Antenna Factor (dB)	Emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
30.600000	V	24.2	3.7	27.90	40.0	-12.1
31.000000	H	21.3	3.4	24.70	40.0	-15.3
54.040000	H	22.1	-10.3	11.80	40.0	-28.2
54.040000	V	29.7	-10.3	19.40	40.0	-20.6
106.840000	H	20.7	-5.9	14.80	43.5	-28.7
106.840000	V	23.7	-5.9	17.80	43.5	-25.7
159.000000	H	20.5	-5.4	15.10	43.5	-28.4
159.000000	V	22.5	-5.4	17.10	43.5	-26.4
298.120000	V	20.2	-4.1	16.10	46.0	-29.9
298.120000	H	20.0	-4.1	15.90	46.0	-30.1
507.640000	V	21.4	0.0	21.40	46.0	-24.6
507.640000	H	21.4	0.0	21.40	46.0	-24.6
806.000000	H	21.2	4.1	25.30	46.0	-20.7
806.000000	V	21.2	4.1	25.30	46.0	-20.7





Test Date(s):	Aug. 16, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(d); Part 15.209 / KDB558074	Air Temperature:	20.3°C
		Relative Humidity:	62%

Note: These results were measured with the output power setting at 19 dBm, prior to the power reduction required for the device to meet SAR requirements. The Conducted Power was reduced; therefore, these values did not require remeasurement as they would not increase beyond the allowed limits.

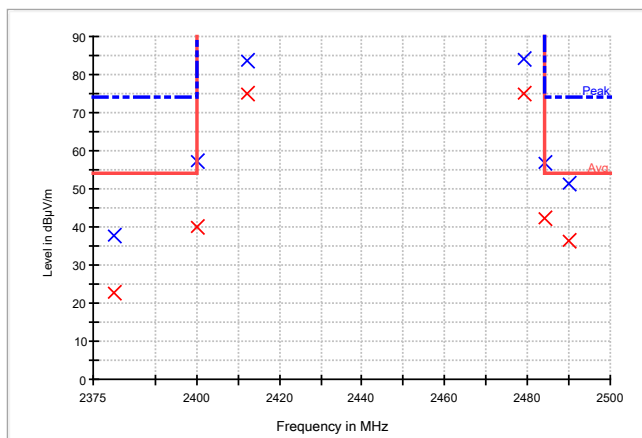
Wi-Fi, 2.4 GHz – CCK: Band Edges

MaxPeak

Frequency (MHz)	Antenna Polarization	Reading (dBμV)	Cable Loss & Antenna Factor (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2380.000000	H	57.0	-19.1	37.90	74.0	-36.1
2400.000000	H	76.6	-19.4	57.20	74.0	-16.8
2412.000000	H	103.0	-19.3	83.70		
2479.000000	H	103.1	-19.1	84.00		
2483.500000	H	75.9	-19.0	56.90	74.0	-17.1
2490.000000	H	70.6	-19.0	51.60	74.0	-22.4

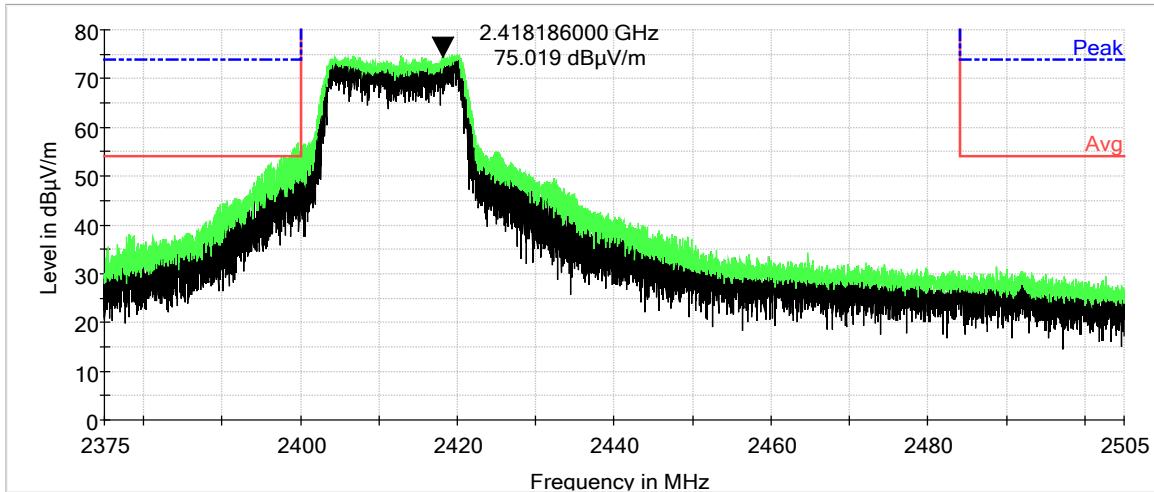
AVG

Frequency (MHz)	Antenna Polarization	Reading (dBμV)	Cable Loss & Antenna Factor (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
2380.000000	H	42.0	-19.1	22.90	54.0	-31.1
2400.000000	H	59.5	-19.4	40.10	54.0	-13.9
2412.000000	H	94.3	-19.3	75.00		
2479.000000	H	94.2	-19.1	75.10		
2483.500000	H	61.1	-19.0	42.10	54.0	-11.9
2490.000000	H	55.3	-19.0	36.30	54.0	-17.7

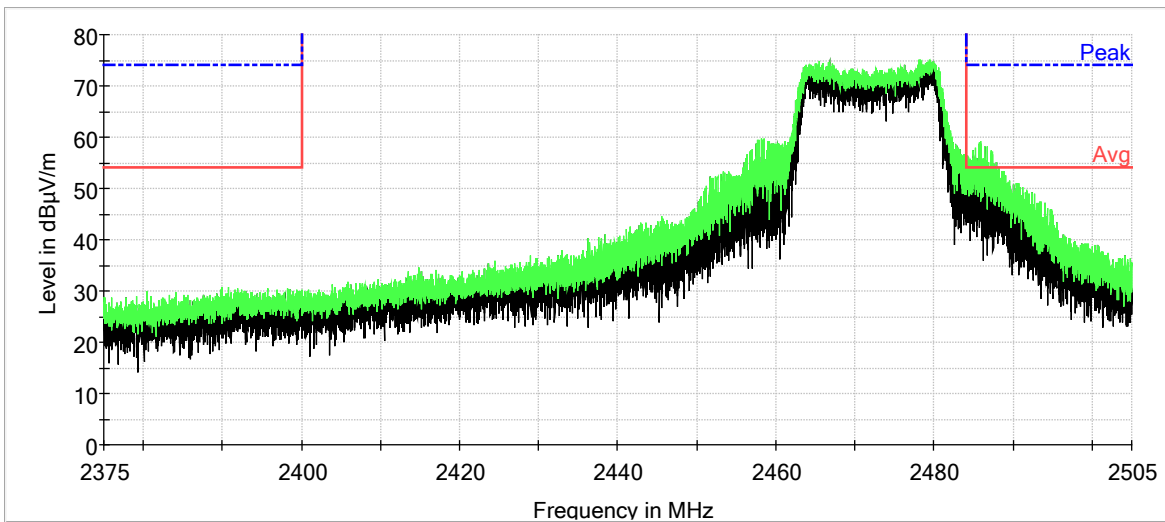




Wi-Fi, 2.4 GHz - CCK: Lower Band Edge, Horizontal

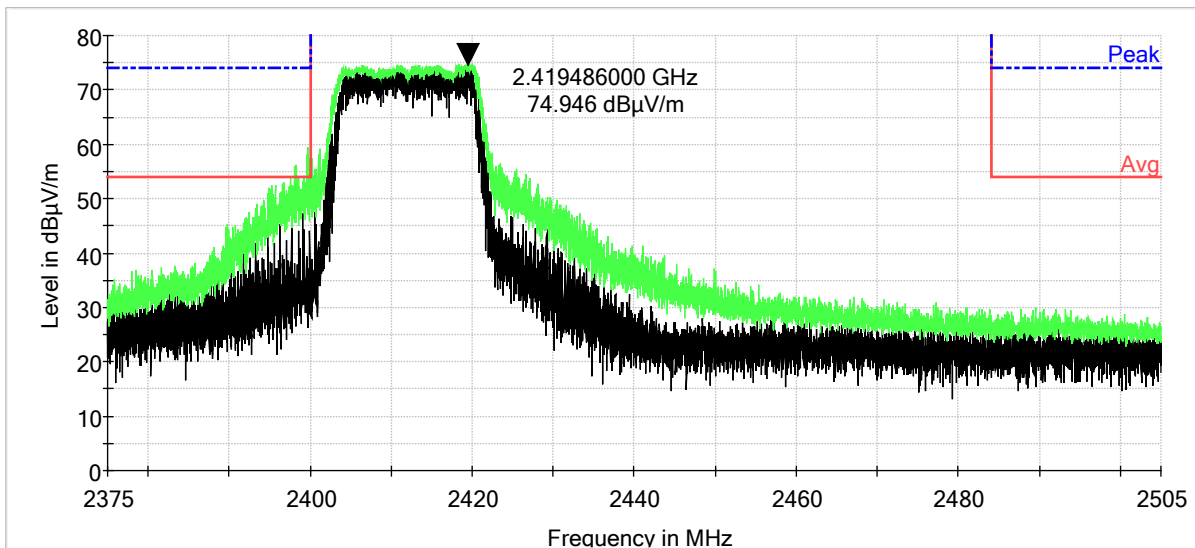


Wi-Fi, 2.4 GHz - CCK: Upper Band Edge, Horizontal

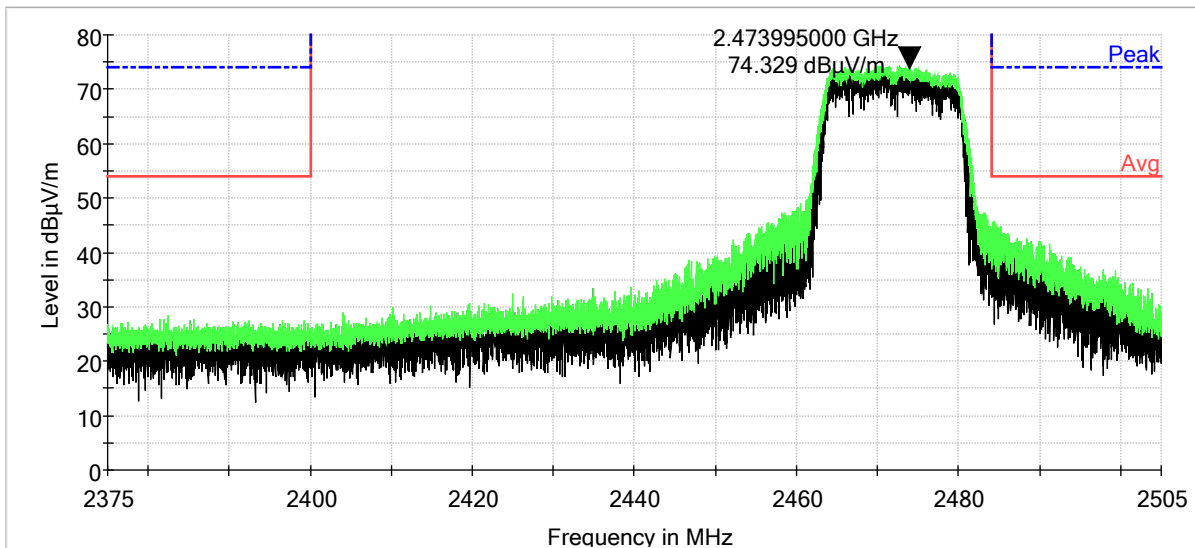




Wi-Fi, 2.4 GHz - CCK: Lower Band Edge, Vertical

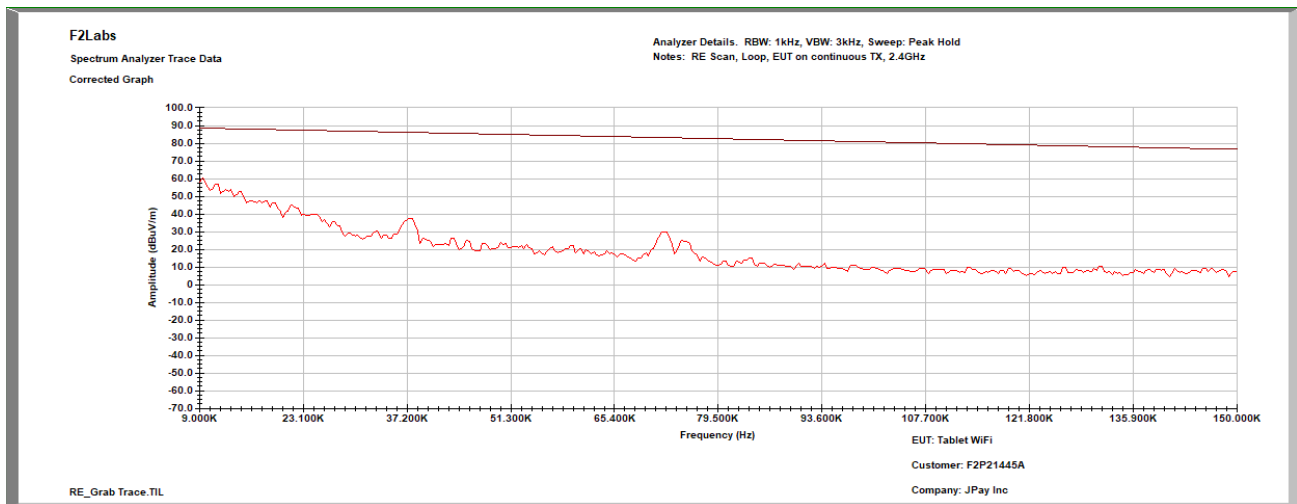


Wi-Fi, 2.4 GHz - CCK: Upper Band Edge, Vertical

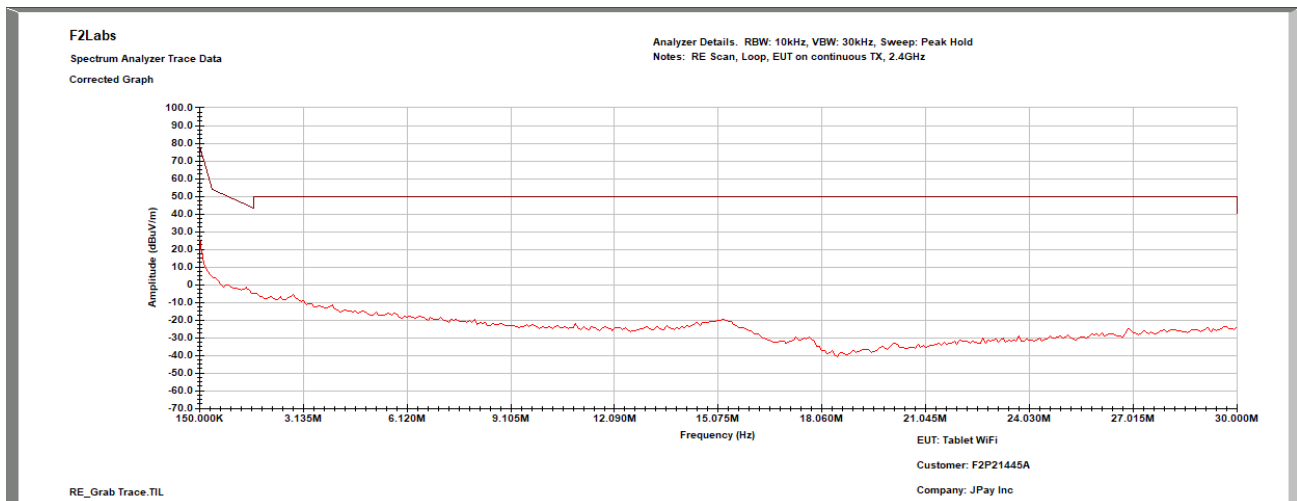




Wi-Fi, 2.4 GHz - CCK: 0.009 MHz to 0.15 MHz

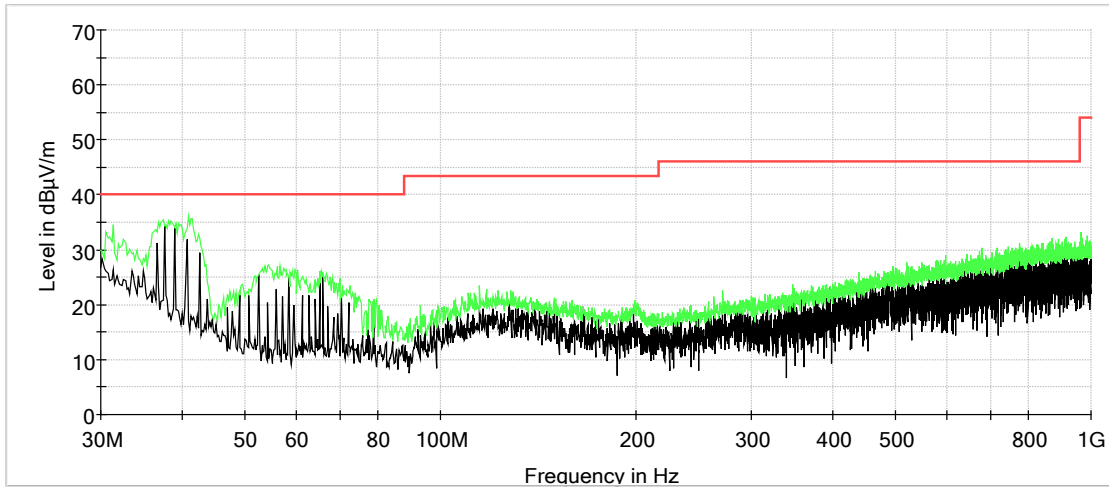


Wi-Fi, 2.4 GHz - CCK: 0.15 MHz to 30.0 MHz

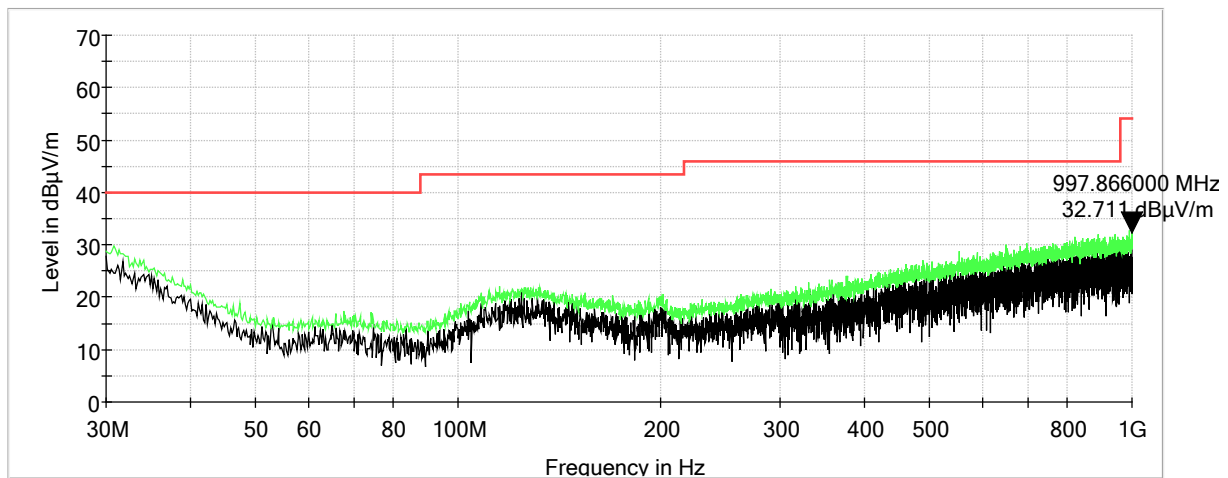




Wi-Fi, 2.4 GHz - CCK: 30 MHz to 1000 MHz, Vertical



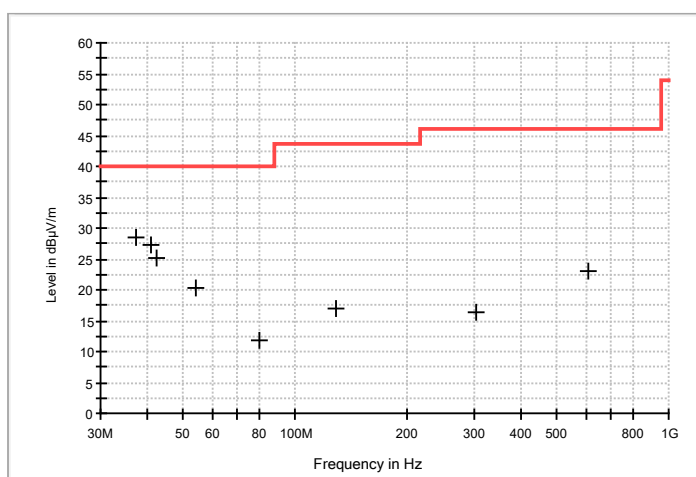
Wi-Fi, 2.4 GHz - CCK: 30 MHz to 1000 MHz, Horizontal





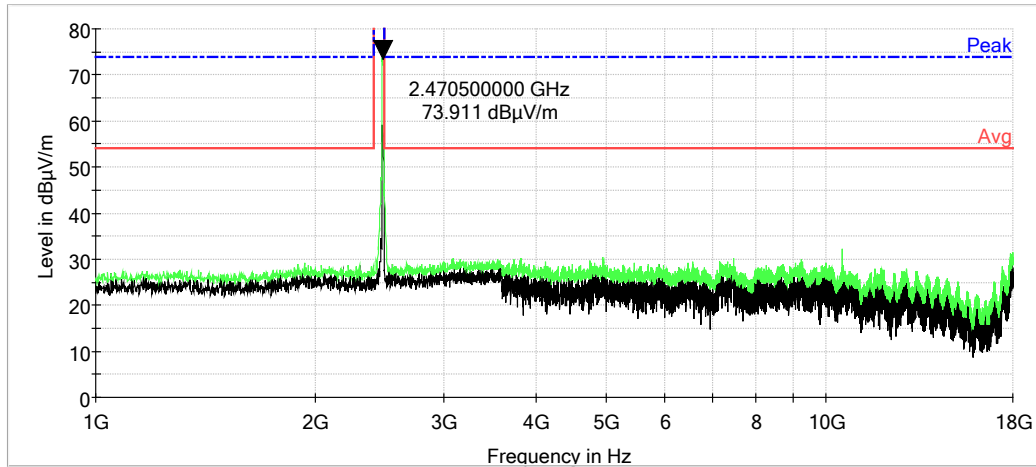
Wi-Fi, 2.4 GHz – CCK: Measurements

Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Azimuth (deg)	Reading (dBμV)	Correction Factors (dB)	Emission (dBμV/m)	Limit (dBμV/m)	Margin (dB)
37.360000	V	100.00	357.00	30.3	-1.7	28.6	40.0	-11.4
40.880000	V	100.00	18.00	31.7	-4.3	27.4	40.0	-12.6
42.600000	V	100.00	340.00	30.9	-5.6	25.3	40.0	-14.7
54.240000	V	100.00	46.00	30.5	-10.3	20.2	40.0	-19.8
79.680000	V	100.00	0.00	22.0	-10.1	11.9	40.0	-28.1
128.960000	V	100.00	0.00	20.7	-3.9	16.8	43.5	-26.7
303.920000	V	100.00	0.00	20.1	-3.9	16.2	46.0	-29.8
608.520000	V	100.00	0.00	21.6	1.4	23.0	46.0	-23.0

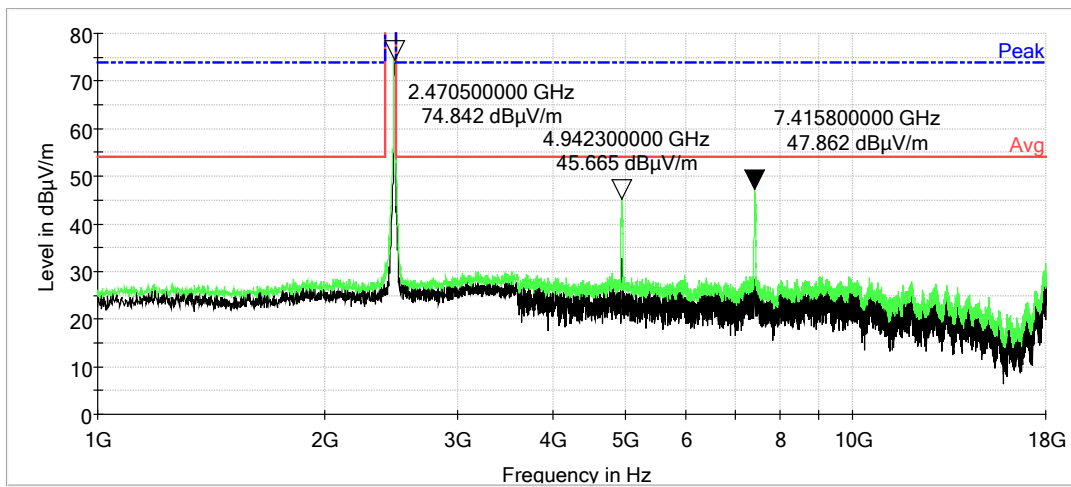




Wi-Fi, 2.4 GHz - CCK: 1 GHz to 18 GHz, Vertical

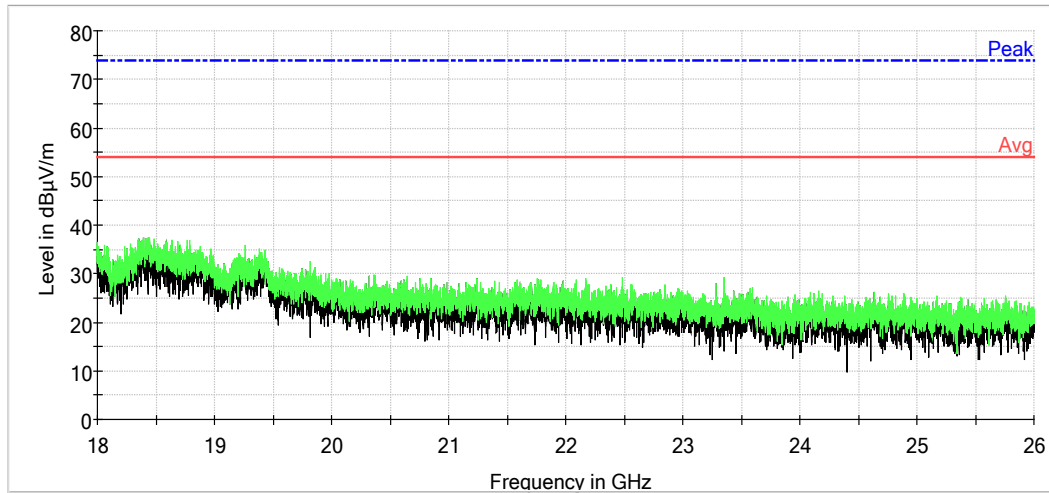


Wi-Fi, 2.4 GHz - CCK: 1 GHz to 18 GHz, Horizontal

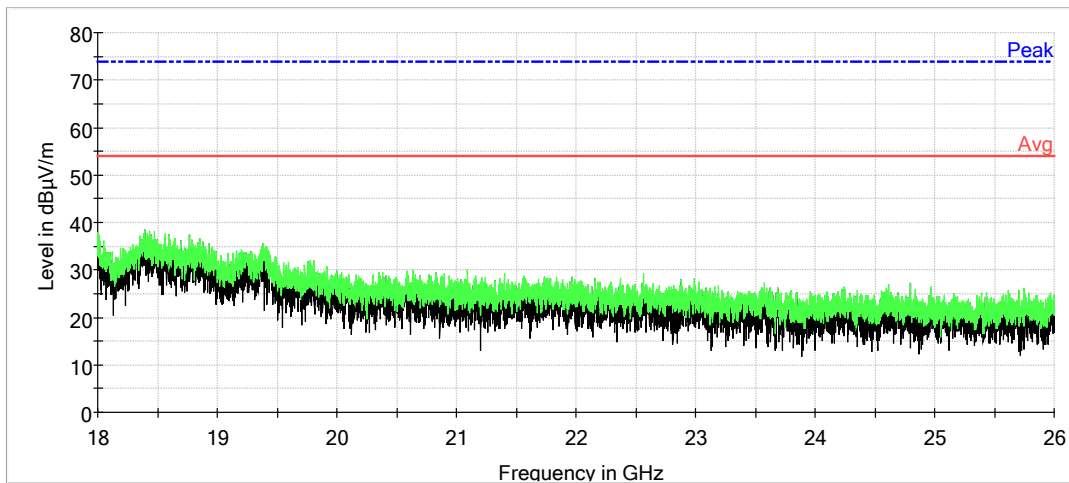




Wi-Fi, 2.4 GHz - CCK: 18 GHz to 26 GHz, Vertical



Wi-Fi, 2.4 GHz - CCK: 18 GHz to 26 GHz, Horizontal

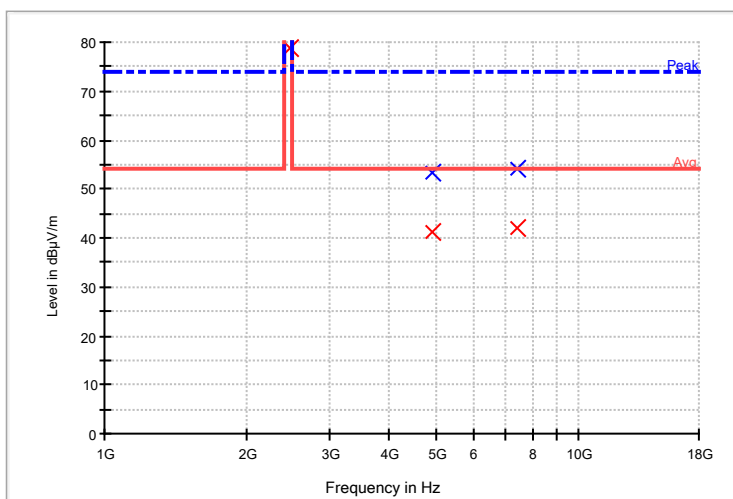


**Wi-Fi, 2.4 GHz - CCK: High Channel – Harmonics - MaxPeak**

Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Cable Loss & Antenna Factor (dB)	Emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2471.000000	H	86.2	-19.1	67.10		
4947.000000	H	70.3	-17.1	53.20	74.0	-20.8
7424.000000	H	69.5	-15.5	54.00	74.0	-20.0

Wi-Fi, 2.4 GHz - CCK: High Channel – Harmonics – AVG

Frequency (MHz)	Antenna Polarization	Reading (dB μ V)	Cable Loss & Antenna Factor (dB)	Emission (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2471.000000	H	97.7	-19.1	78.60		
4947.000000	H	58.1	-17.1	41.00	54.0	-13.0
7424.000000	H	57.4	-15.5	41.90	54.0	-12.1





12 PEAK POWER SPECTRAL DENSITY (PSD)

Peak power spectral density measurements were performed.

12.1 Requirements:

The peak power spectral density shall not exceed +8dBm in any 3 kHz band during any time interval of continuous transmission.

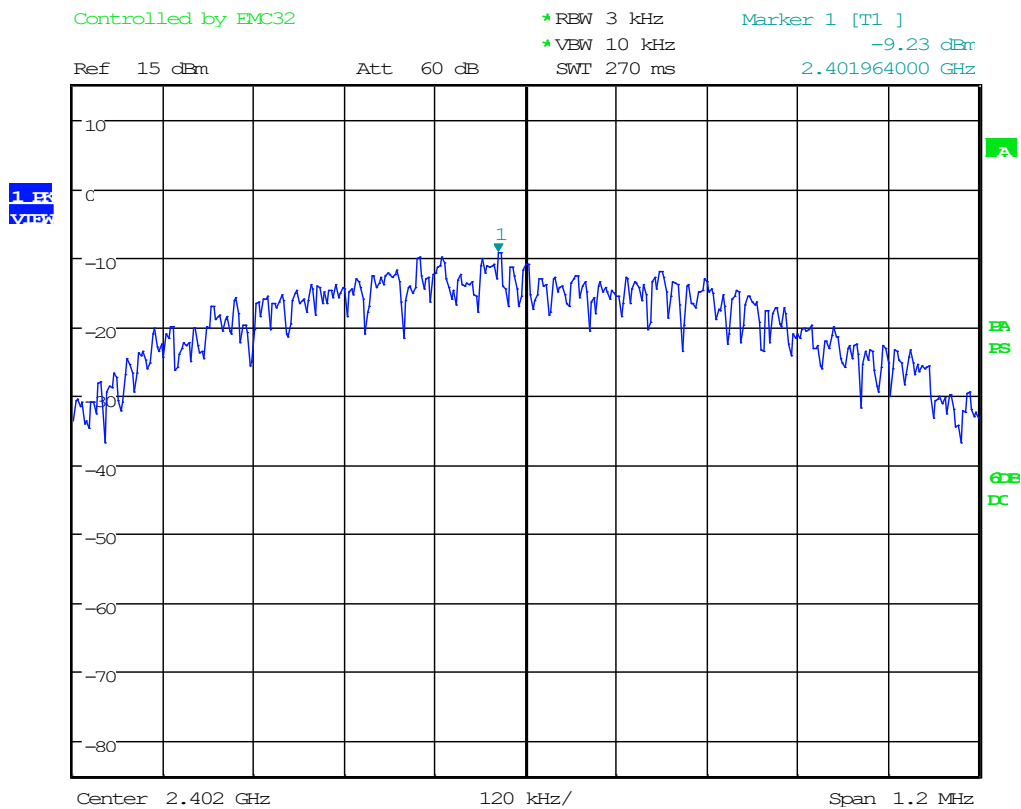
Power spectral density measurements were performed at a resolution bandwidth of 3 kHz (video bandwidth set at 10 KHz). The peak spectral densities were measured at the low, mid, and upper channels.



12.2 Peak Power Spectral Density Test Data

Test Date(s):	Aug. 14, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(e); KDB558074	Air Temperature:	20.6 °C
		Relative Humidity:	68%

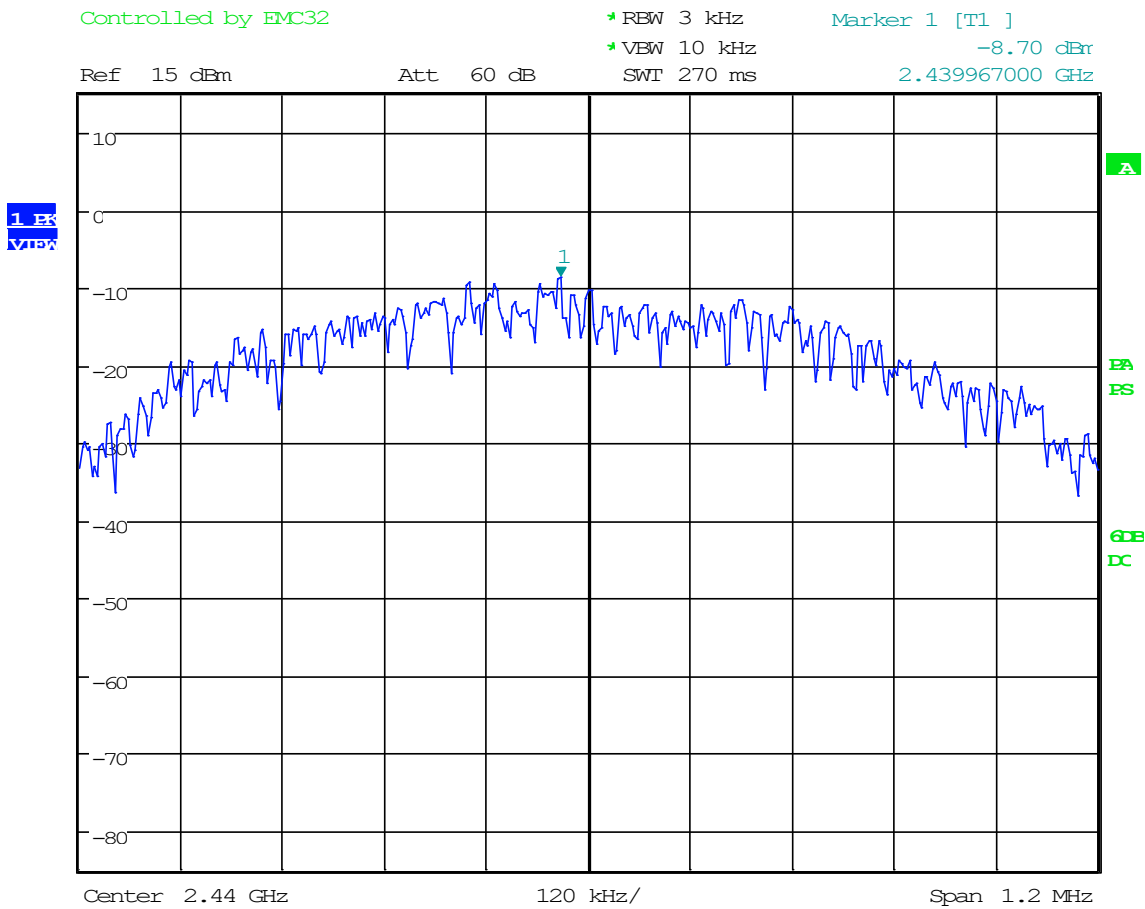
Bluetooth: Low Channel



Date: 14.AUG.2019 14:26:48



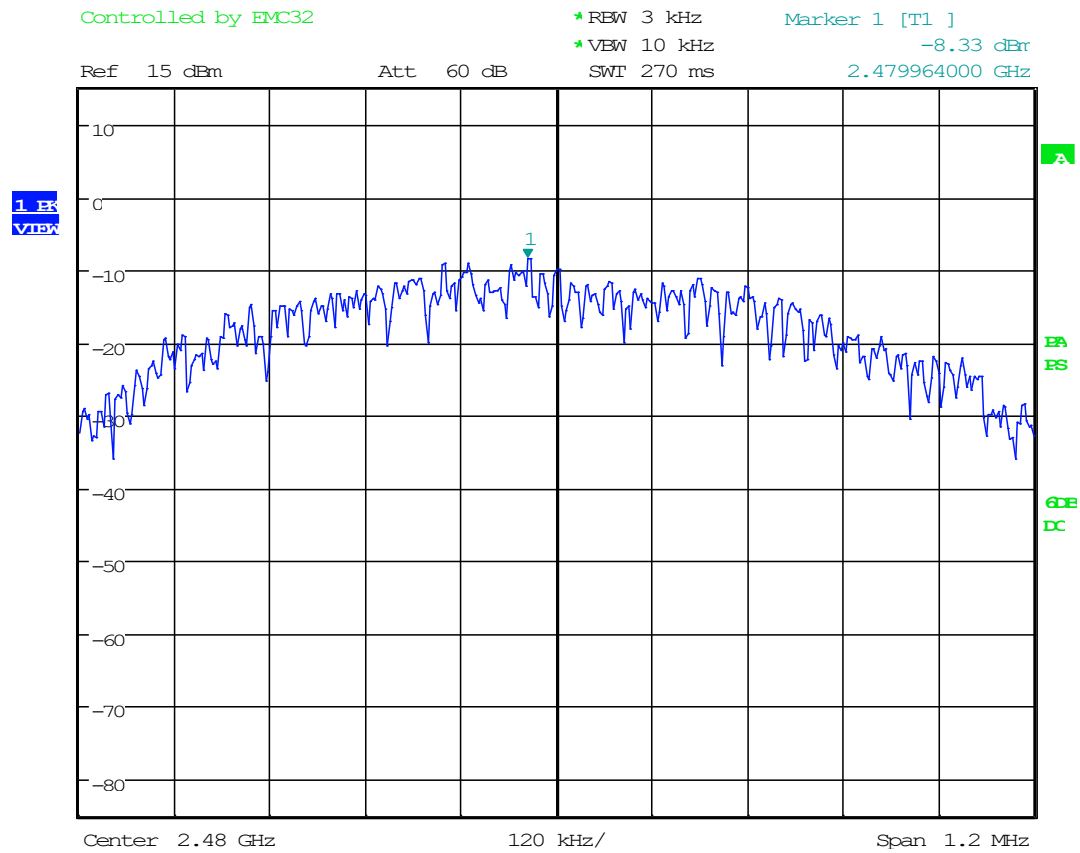
Bluetooth: Mid Channel



Date: 14.AUG.2019 14:27:50



Bluetooth: High Channel



Date: 14.AUG.2019 14:28:55



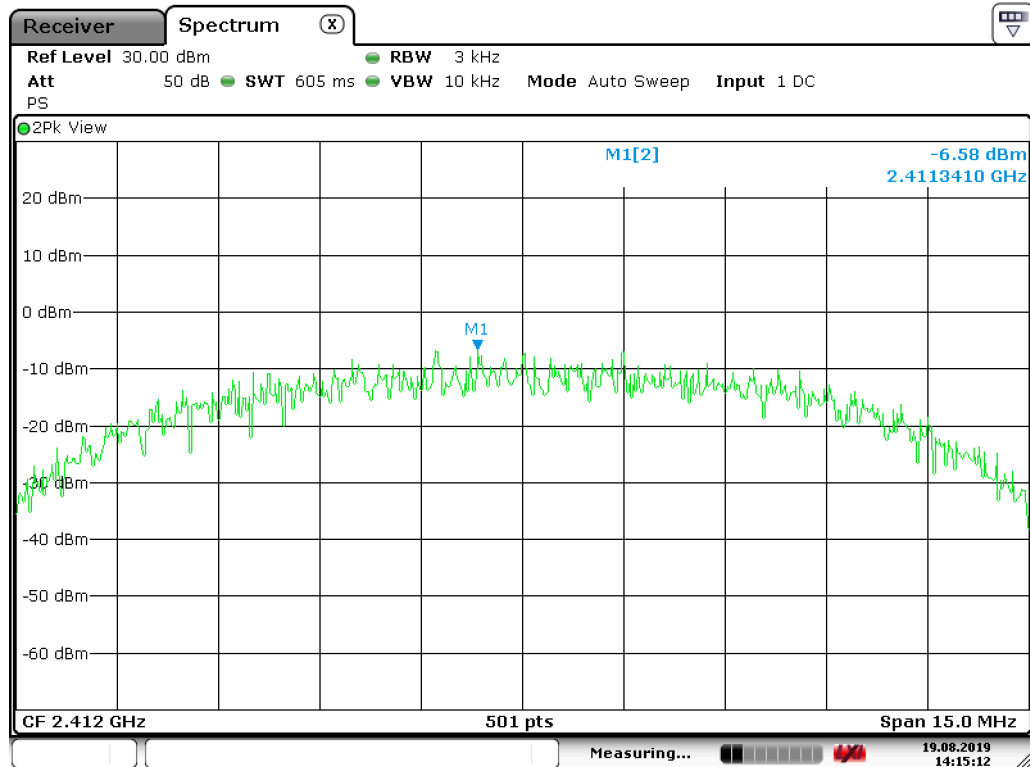
Order Number: F2P21445A

Applicant: Securus Technologies

Model: JP6S

Test Date(s):	Aug. 19, 2019	Test Engineer:	J. Chiller
Standards:	CFR 47 Part 15.247(e); KDB558074	Air Temperature:	21.9 °C
		Relative Humidity:	37%

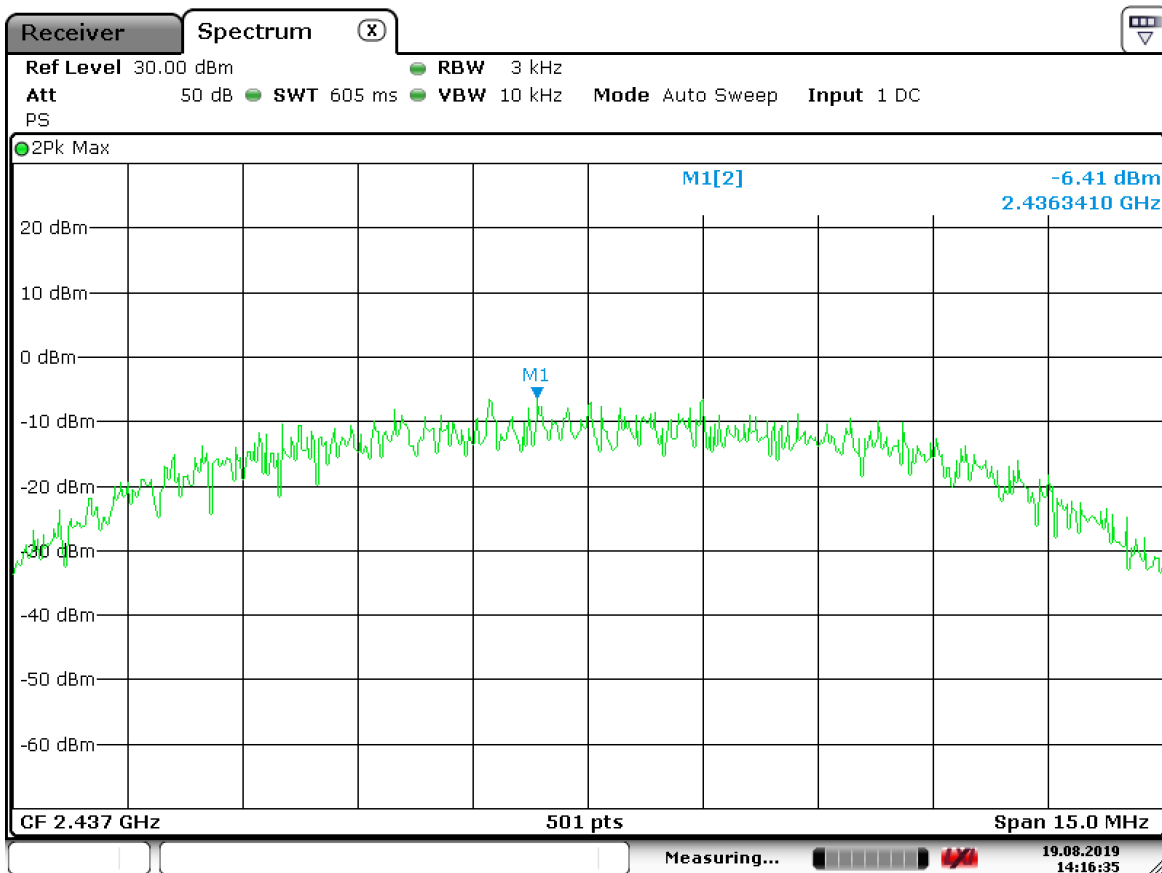
Wi-Fi, 2.4 GHz - CCK: Low Channel



Date: 19.AUG.2019 14:15:12



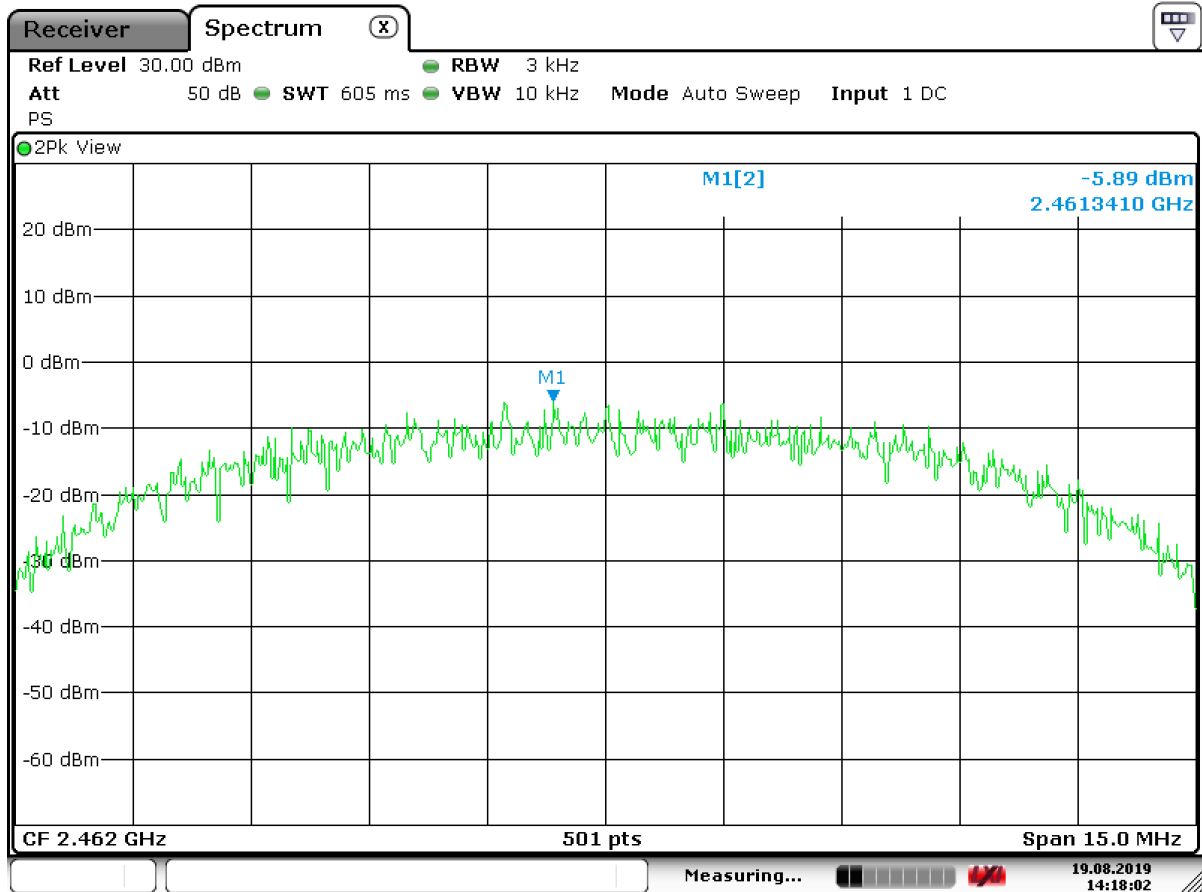
Wi-Fi, 2.4 GHz - CCK: Mid Channel



Date: 19.AUG.2019 14:16:35



Wi-Fi, 2.4 GHz - CCK: High Channel



Date: 19.AUG.2019 14:18:03



13 CONDUCTED EMISSIONS

13.1 Requirements

In accordance with FCC CFR 47 Part 15.207(a), "Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

13.2 Test Procedure

The EUT was placed on a 1.0 x 1.5 meter non-conductive table, 0.8 meter above a horizontal ground plane and 0.4 meter from a vertical ground plane. Power was provided to the EUT through a LISN bonded to a 3 x 2 meter ground plane. The LISN and peripherals were supplied power through a filtered AC power source. The output of the LISN was connected to the input of the receiver via a transient limiter, and emissions in the range 150 kHz to 30 MHz were measured. The measurements were recorded using the quasi-peak and average detectors as directed by the standard, and the resolution bandwidth during testing was 9 kHz. The raw measurements were corrected to allow for attenuation from the LISN, transient limiter and cables.

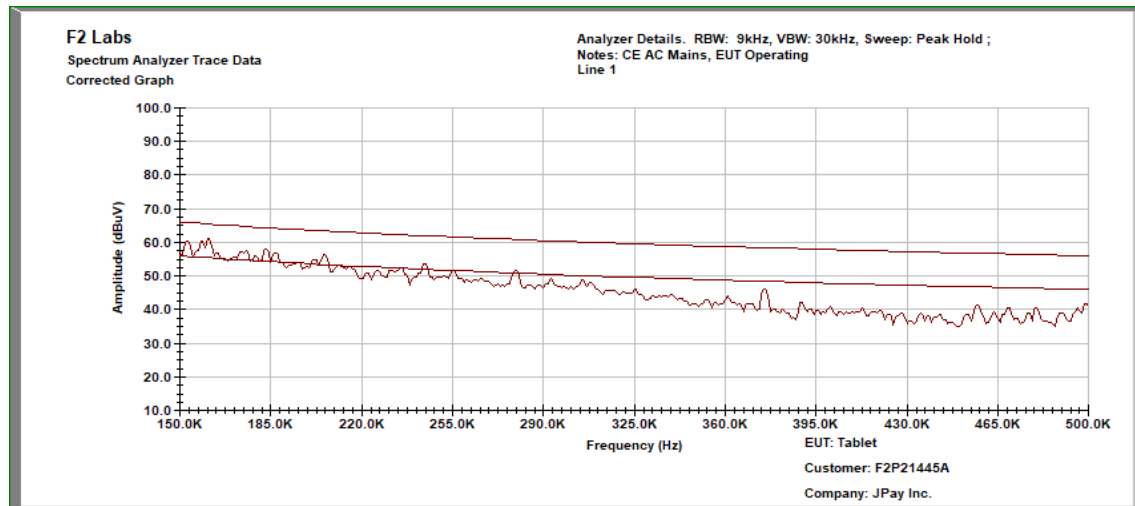
The following results are from the worse-case channel of the worse-case protocol which was the high channel of OFDM 40M.



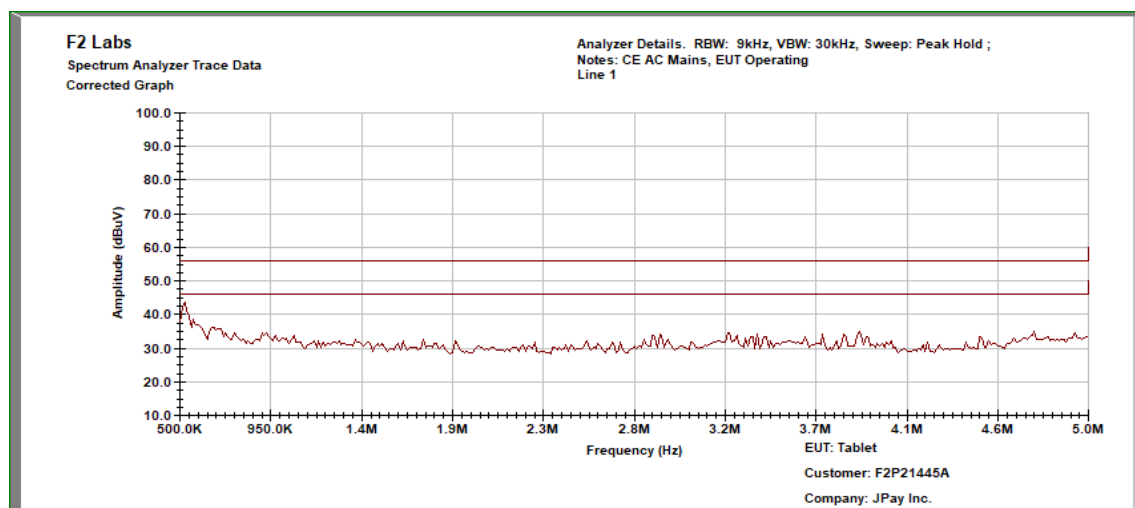
13.3 Conducted Emissions Test Data

Test Date:	Aug. 15, 2019	Test Engineer:	J. Chiller
Rule:	15.207	Air Temperature:	21.6° C
Test Results:	Pass	Relative Humidity:	47%

Conducted Test – Line 1: 0.15 MHz to 0.5 MHz

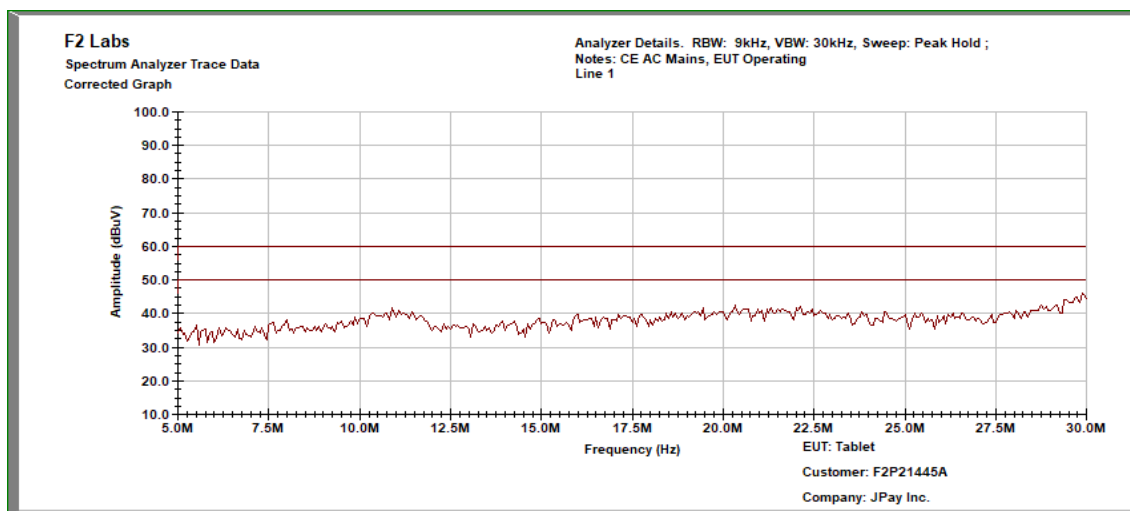


Conducted Test – Line 1: 0.5 MHz to 5.0 MHz





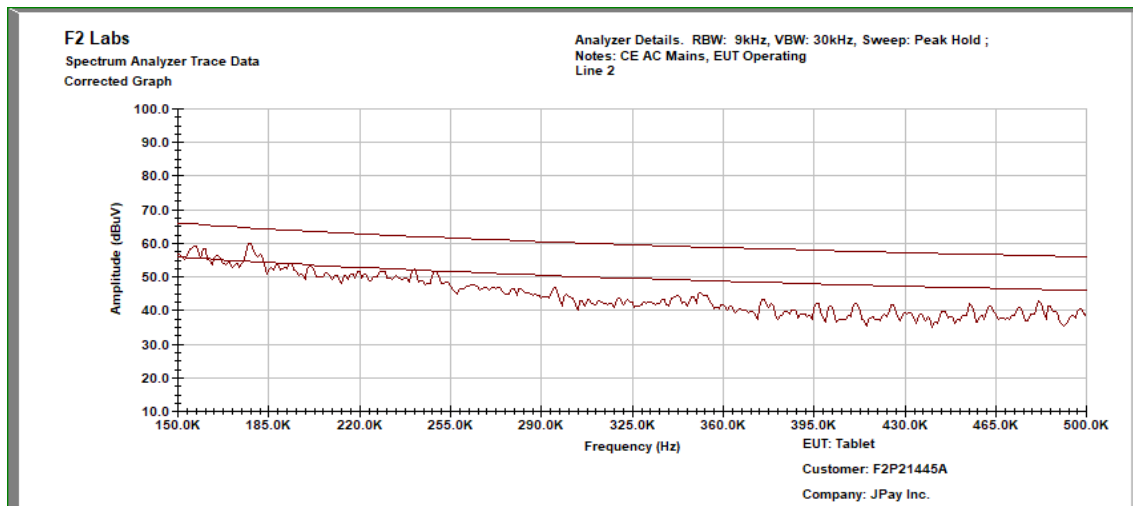
Conducted Test – Line 1: 5.0 MHz to 30.0 MHz



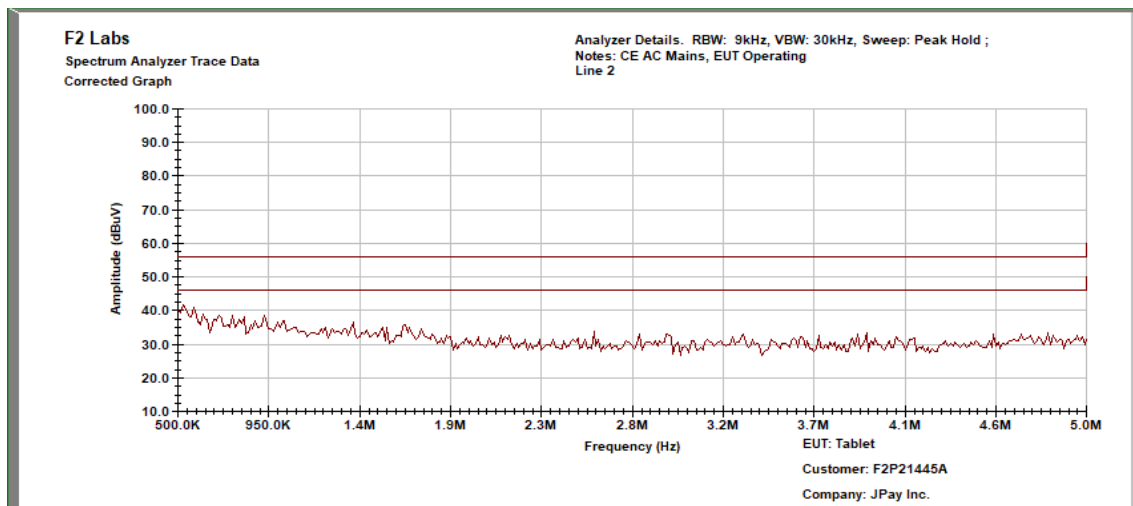
Top Discrete Measurements								
No.	Conductor	Frequency (MHz)	Detector	Level (dBμV)	Adjustment (dB)	Results (dBμV)	Limit (dBμV)	Margin (dB)
1	Line 1	0.152625	Quasi-Peak	43.64	11.77	55.41	65.857	-10.4
			Average	26.42	11.77	38.19	55.857	-17.7
2	Line 1	0.161375	Quasi-Peak	40.16	11.668	51.83	65.394	-13.6
			Average	24.0	11.668	35.67	55.394	-19.7
3	Line 1	0.184125	Quasi-Peak	40.09	11.404	51.49	64.298	-12.8
			Average	22.71	11.404	34.11	54.298	-20.2
4	Line 1	0.206	Quasi-Peak	36.82	11.173	47.99	63.366	-15.4
			Average	20.52	11.173	31.69	53.366	-21.7
5	Line 1	0.2445	Quasi-Peak	33.58	10.873	44.45	61.942	-17.5
			Average	19.2	10.873	30.07	51.942	-21.9
6	Line 1	0.28	Quasi-Peak	31.8	10.77	42.57	60.805	-18.2
			Average	16.8	10.77	27.57	50.805	-23.2



Conducted Test – Line 2: 0.15 MHz to 0.5 MHz

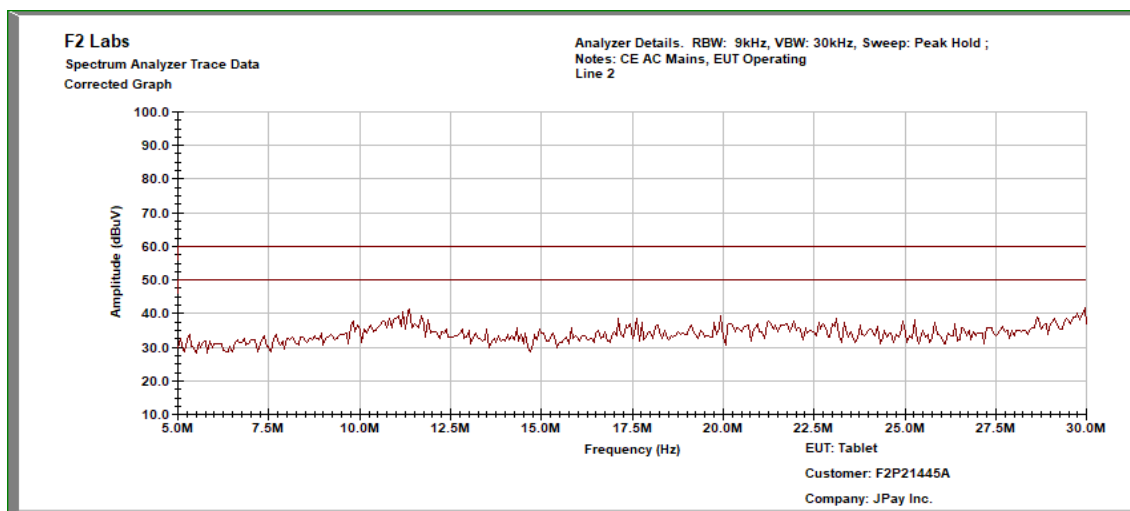


Conducted Test – Line 2: 0.5 MHz to 5.0 MHz





Conducted Test – Line 2: 5.0 MHz to 30.0 MHz

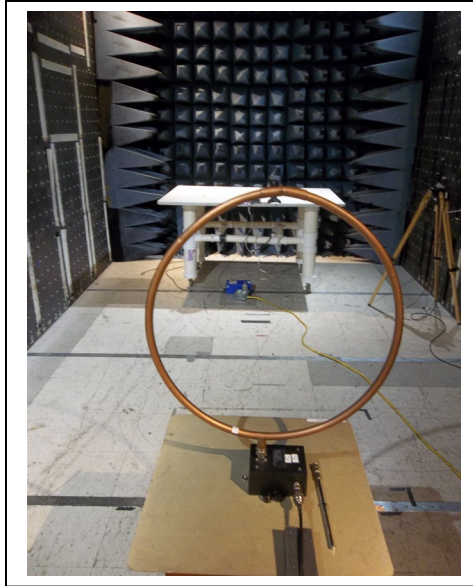


Top Discrete Measurements								
No.	Conductor	Frequency (MHz)	Detector	Level (dBμV)	Adjustment (dB)	Results (dBμV)	Limit (dBμV)	Margin (dB)
1	Line 2	0.157	Quasi-Peak	44.97	12.183	57.15	65.622	-8.5
			Average	22.41	12.183	34.59	55.622	-21.0
2	Line 2	0.178	Quasi-Peak	41.3	11.923	53.22	64.580	-11.4
			Average	21.33	11.923	33.25	54.580	-21.3
3	Line 2	0.19375	Quasi-Peak	40.28	11.727	52.01	63.875	-11.9
			Average	20.73	11.727	32.46	53.875	-21.4
4	Line 2	0.229625	Quasi-Peak	36.28	11.401	47.68	62.464	-14.8
			Average	18.91	11.401	30.31	52.464	-22.2
5	Line 2	0.2418	Quasi-Peak	35.5	11.298	46.80	62.032	-15.2
			Average	19.14	11.298	30.44	52.032	-21.6
6	Line 2	0.25	Quasi-Peak	33.81	11.228	45.04	61.736	-16.7
			Average	18.32	11.228	29.55	51.736	-22.2

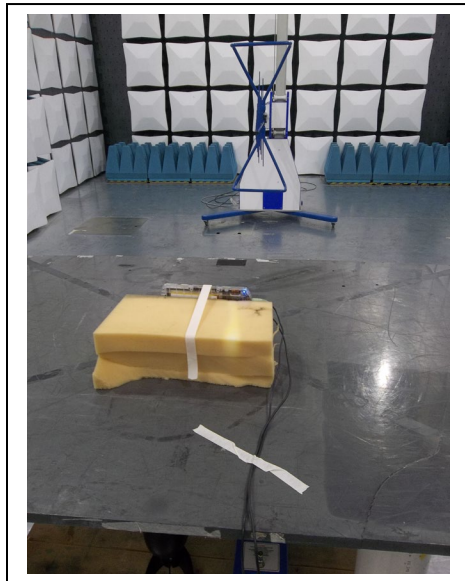


14 PHOTOGRAPHS

Radiated Spurious Emission, Less Than 30 MHz

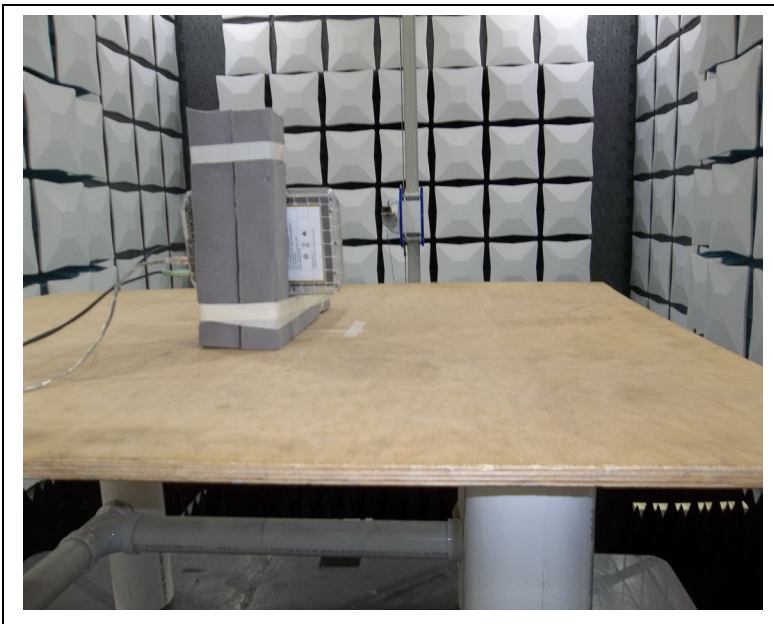


Radiated Spurious Emission, 30 MHz to 1000 MHz

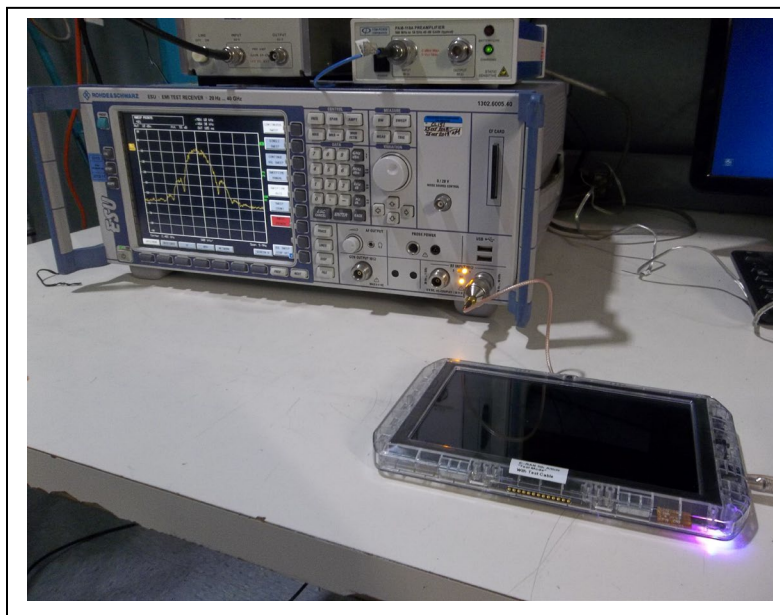




Radiated Spurious Emission, above 1 GHz



Conducted Output Power, Peak Power Spectral Density, Occupied Bandwidth, and Conducted Spurious Emissions





Voltage Variations



Conducted Emissions

