



DATE: 22 April 2019

**I.T.L. (PRODUCT TESTING) LTD.
FCC Radio Test Report
for
Orcam Technologies Ltd.**

**Equipment under test:
Wearable Device**

ORCAM MYME

Tested by: _____


M. Zohar

Approved by: _____


D. Shidlow

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This report relates only to items tested.



Measurement/Technical Report for Orcam Technologies Ltd.

Wearable Device

ORCAM MYME

FCC ID: 2AAWI-ORCAM-MYME

This report concerns:	Original Grant: X Class I Change: Class II Change:
Equipment type:	FCC: (DTS) Digital Transmission System
Limits used:	47CFR15 Section 15.247

Measurement procedure used is KDB 558074 D01 v05 and ANSI C63.10:2013

Application for Certification
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1. General Information

1.1 Administrative Information

Manufacturer: Orcam Technologies Ltd.

Manufacturer's Address: 3 Kiryat Mada St.
P.O. Box 45157
Jerusalem, 9777603, Israel
Tel: +972-2-591-7805
Fax: +972-2-586-0121

Manufacturer's Representative: Ram Ben-Yehuda

Equipment Under Test (E.U.T): Wearable Device

Equipment PMN: ORCAM MYME

Equipment Serial No.: 18380173

Date of Receipt of E.U.T: December 6, 2018

Start of Test: December 6, 2018

End of Test: January 23, 2019

Test Laboratory Location: I.T.L (Product Testing) Ltd.
1 Batsheva St.,
Lod
ISRAEL 7120101

Test Specifications: FCC Part 15, Subpart C



1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation No. IL1005.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. Industry Canada (Canada), IC File No.: 46405-4025; Site Nos. IC 4025A-1, IC 4025A-2.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.



1.3 Product Description

OrCam MyMe is a wearable device that uses smart artificial vision technology to recognize people.

Working voltage	3.7VDC Rechargeable battery
Mode of operation	Transceiver
Modulations	For Wi-Fi/g: OFDM(BPSK,QPSK,16QAM ,64QAM) For Wi-Fi/n: OFDM(BPSK,QPSK,16QAM ,64QAM) For BLE: GFSK
Assigned Frequency Range	2400.0-2483.5MHz
Operating Frequency Range	For Wi-Fi/g/n: 2412.0-2462.0MHz For BLE: 2402.0-2480.0MHz
Antenna Gain	-2dBi
Modulation BW	For Wi-Fi/g/n: 20MHz For BLE: 2MHz
Bit rate (Mbit/s)	For Wi-Fi/g: 6, 9, 12, 18, 24, 36, 48, 54 For Wi-Fi/n: 6.5,13,19.5,26,39,52,58.5,65 For BLE: 1,2,3

1.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in KDB 558074 D01 v05 and ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

1.6 Measurement Uncertainty

Conducted Emission

Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4)
0.15 – 30 MHz:

Expanded Uncertainty (95% Confidence, K=2):
± 3.44 dB

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site:

30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):
± 4.96 dB

1 GHz to 6 GHz

Expanded Uncertainty (95% Confidence, K=2):
±5.19 dB

>6 GHz

Expanded Uncertainty (95% Confidence, K=2):
±5.51 dB

2. System Test Configuration

2.1 Justification

1. The E.U.T contains 2 optional transceivers: IEEE 802.15.1 standard (BLE) or IEEE 802.11g/n standard (Wi-Fi/g/n) with only 20MHz CBW.
2. For BLE - The unit was evaluated while transmitting at the low channel (2402MHz), the mid channel (2440MHz) and the high channel (2480MHz).
For Wi-Fi b/g/n - The unit was evaluated while transmitting at the low channel (2412MHz), the mid channel (2437MHz) and the high channel (2462MHz).
3. The evaluation was performed while the E.U.T was connected to typical AC/DC adapter via laptop for charge mode as the “worst case”.
4. Conducted AC line emission testing was performed with 2 optional charge modes: AC/DC adapter via laptop & AC/DC adapter wall charger.
5. Conducted emission tests were performed with the E.U.T. antenna terminal connected by a RF cable to the Spectrum Analyzer through a 30dB external attenuator.
6. Final radiated emission for Wi-Fi g/n modes tests were performed using the lowest and highest bit rates for each different protocol type. The bit rates for each protocol are shown in the table below:

Protocol Type	“Worst Case” Bit Rate
Wi-Fi/g	6,54 Mbit/s
Wi-Fi/n	6.5,65 Mbit/s (MCS0,MCS7)

7. Final radiated emission tests was performed after exploratory emission testing that was performed in 3 orthogonal polarities to determine the “worst case” radiation. According to below results the worst case was at the X axis

Orientation	Frequency	Field Strength	2 nd Harmonic	3 rd Harmonic	Band Edge
	(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
X axis	2412.0	94.4	54.7	68.0	64.3
	2437.0	91.9	57.0	63.0	-
	2462.0	92.8	58.2	67.5	62.8
Y axis	2412.0	93.3	54.6	67.8	63.8
	2437.0	89.6	56.1	63.0	-
	2462.0	90.4	54.0	66.8	
Z axis	2412.0	94.2	53.9	64.6	64.5
	2437.0	91.8	55.7	61.8	-
	2462.0	91.6	56.2	63.2	63.1

Figure 1. Screening Results



2.2 ***EUT Exercise Software***

No special exercise software was used.

2.3 ***Special Accessories***

Equipment	Manufacturer	Part Number	Serial Number
Laptop	DELL	LATITUDE E5440	14290776829
AC/DC adapter	DELL	LA90PM130	N/A
Wall charger	EDACPOWER ELEC.	EM1005AVEU	001626

2.4 ***Equipment Modifications***

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

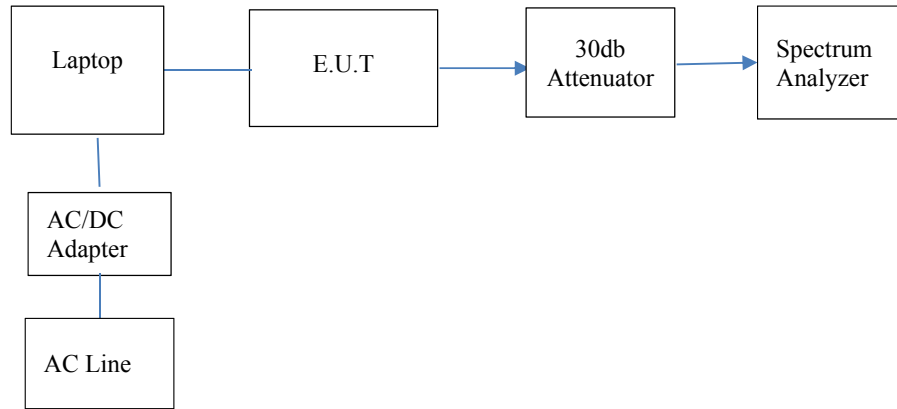


Figure 2. Configuration of Tested System Conducted

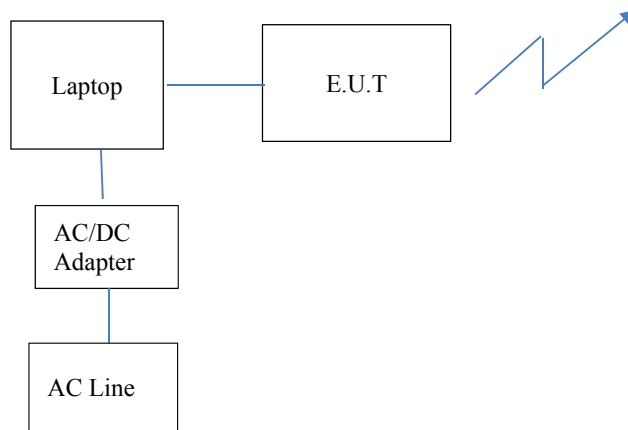


Figure 3. Configuration of Tested System Radiated

3. Conducted & Radiated Measurement Test Set-Up Photos



Figure 4. Conducted Emission from AC Line Test, AC/DC wall charger mode



Figure 5. Conducted Emission from AC Line Test, AC/DC adapter via laptop charge mode



Figure 6. Radiated Emission Test, 0.009-30MHz



Figure 7. Radiated Emission Test, 30-200MHz



Figure 8. Radiated Emission Test, 200-1000MHz



Figure 9. Radiated Emission Test, 1-18GHz



Figure 10. Radiated Emission Test, 18-26.5GHz

4. Conducted Emission From AC Mains

4.1 Test Specification

FCC Part 15, Subpart C, Section 15.207

4.2 Test Procedure

(Temperature (20°C)/ Humidity (50%RH))

The E.U.T operation mode and test setup are as described in Section 2 of this report. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on a 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 μ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T.

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configurations tested are shown in the photographs, *Figure 4* and *Figure 5*.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver and are displayed on the receiver's spectrum display.

The E.U.T was evaluated in TX operation mode.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Test Limit

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.



4.4 **Test Results**

JUDGEMENT: Passed by 6.32 dB

The margin between the emission levels and the specification limit is, in the worst case, 6.32 dB for the phase line at 0.366 MHz and 9.14 dB at 0.442 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 11* to *Figure 18*.



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: : Peak, Quasi-peak, Average
Power Operation Wall Charger

EDIT PEAK LIST (Final Measurement Results)				
Trace1:	CE22BQP			
Trace2:	CE22BAP			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB	
1 Quasi Peak	182 kHz	43.26	-21.13	
2 Average	242 kHz	30.30	-21.72	
1 Quasi Peak	366 kHz	45.79	-12.79	
2 Average	366 kHz	42.27	-6.32	
1 Quasi Peak	606 kHz	30.61	-25.38	
2 Average	730 kHz	21.54	-24.45	
2 Average	758 kHz	21.97	-24.02	
1 Quasi Peak	762 kHz	35.22	-20.78	
2 Average	1.274 MHz	22.42	-23.57	
1 Quasi Peak	1.366 MHz	30.84	-25.15	
1 Quasi Peak	2.19 MHz	26.50	-29.49	
2 Average	2.822 MHz	19.45	-26.54	
2 Average	3.662 MHz	17.94	-28.05	
1 Quasi Peak	4.522 MHz	24.54	-31.45	
1 Quasi Peak	7.882 MHz	22.72	-37.27	
2 Average	8.19 MHz	16.31	-33.69	
2 Average	13.558 MHz	23.14	-26.85	
1 Quasi Peak	16.394 MHz	23.54	-36.45	
1 Quasi Peak	20.538 MHz	27.66	-32.33	
2 Average	20.662 MHz	22.57	-27.42	

Date: 17.JAN.2019 15:26:34

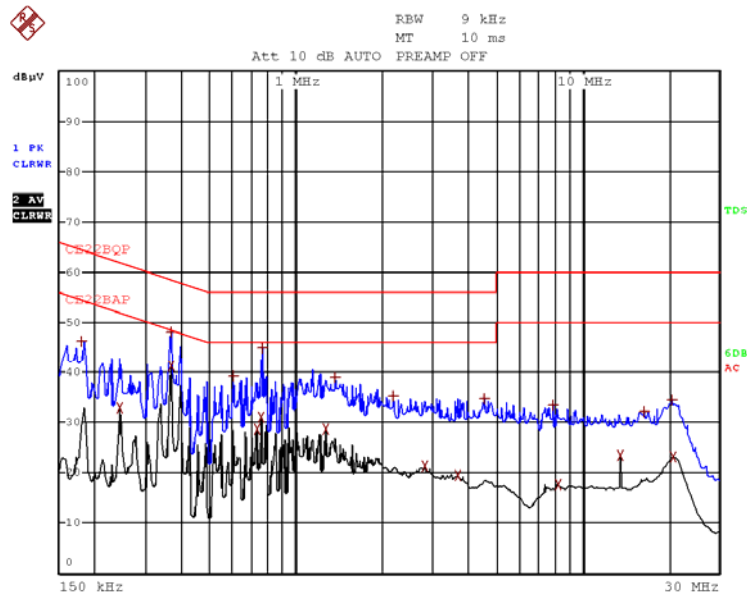
Figure 11. Detectors: Peak, Quasi-peak, Average

Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: Peak, Quasi-peak, Average
Power Operation Wall charger



Date: 17.JAN.2019 15:25:18

Figure 12. Detectors: Peak, Quasi-peak, Average



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Peak, Quasi-peak, Average
Power Operation Wall charger

EDIT PEAK LIST (Final Measurement Results)			
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
Trace1:	CE22BQP		
Trace2:	CE22BAP		
Trace3:	---		
1 Quasi Peak	162 kHz	47.02	-18.33
2 Average	218 kHz	31.26	-21.62
1 Quasi Peak	378 kHz	38.55	-19.76
2 Average	378 kHz	31.86	-16.46
1 Quasi Peak	618 kHz	25.81	-30.18
2 Average	622 kHz	19.96	-26.03
1 Quasi Peak	758 kHz	29.94	-26.05
2 Average	758 kHz	18.22	-27.77
1 Quasi Peak	1.294 MHz	22.53	-33.46
2 Average	1.918 MHz	14.22	-31.77
1 Quasi Peak	2.138 MHz	22.75	-33.25
2 Average	2.758 MHz	18.06	-27.93
1 Quasi Peak	3.654 MHz	25.52	-30.47
2 Average	4.414 MHz	16.84	-29.15
2 Average	6.582 MHz	20.59	-29.40
1 Quasi Peak	7.182 MHz	24.65	-35.34
2 Average	13.562 MHz	23.92	-26.07
1 Quasi Peak	17.586 MHz	24.97	-35.02
1 Quasi Peak	20.458 MHz	27.64	-32.35
2 Average	20.814 MHz	21.88	-28.11

Date: 17.JAN.2019 15:15:11

Figure 13. Detectors: Peak, Quasi-peak, Average

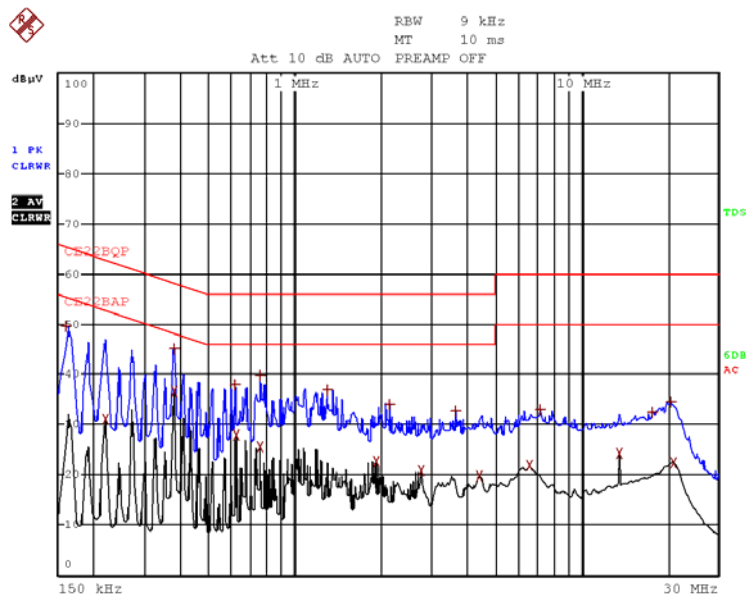
Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Peak, Quasi-peak, Average
Power Operation Wall charger



Date: 17.JAN.2019 15:12:16

Figure 14 Detectors: Peak, Quasi-peak, Average



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: : Peak, Quasi-peak, Average
Power Operation AC/DC adapter

EDIT PEAK LIST (Final Measurement Results)				
Trace1:		CE22BQP		
Trace2:		CE22BAP		
Trace3:		---		
TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	150 kHz	47.58	-18.41
2	Average	174 kHz	25.72	-29.04
1	Quasi Peak	206 kHz	42.12	-21.23
2	Average	214 kHz	25.63	-27.41
1	Quasi Peak	278 kHz	36.58	-24.28
2	Average	302 kHz	20.67	-29.51
1	Quasi Peak	402 kHz	33.96	-23.84
2	Average	430 kHz	29.70	-17.54
2	Average	438 kHz	32.30	-14.79
1	Quasi Peak	442 kHz	38.46	-18.56
2	Average	566 kHz	20.72	-25.27
1	Quasi Peak	586 kHz	23.39	-32.60
2	Average	738 kHz	12.53	-33.46
1	Quasi Peak	806 kHz	21.44	-34.55
1	Quasi Peak	1.118 MHz	20.56	-35.43
2	Average	1.242 MHz	15.08	-30.91
1	Quasi Peak	1.538 MHz	27.30	-28.69
2	Average	1.594 MHz	15.13	-30.87
2	Average	2.058 MHz	21.35	-24.64
1	Quasi Peak	2.102 MHz	33.16	-22.83

Date: 17.JAN.2019 14:56:06

Figure 15. Detectors: Peak, Quasi-peak, Average

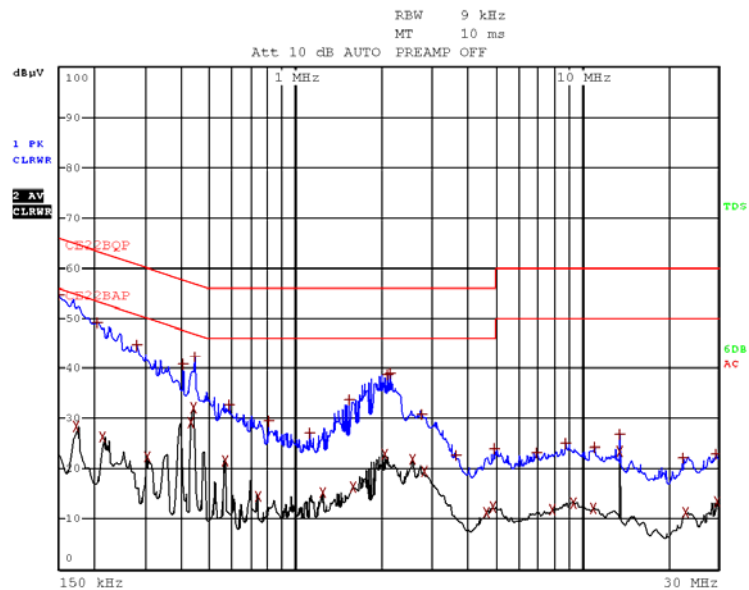
Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Phase
Detectors: Peak, Quasi-peak, Average
Power Operation AC/DC adapter



Date: 17.JAN.2019 14:52:45

Figure 16. Detectors: Peak, Quasi-peak, Average



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Peak, Quasi-peak, Average
Power Operation AC/DC adapter

EDIT PEAK LIST (Final Measurement Results)				
TRACE		FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
Trace1:	CE22BQP			
Trace2:	CE22BAP			
Trace3:	---			
1	Quasi Peak	154 kHz	47.51	-18.27
2	Average	170 kHz	29.03	-25.93
1	Quasi Peak	258 kHz	39.23	-22.26
2	Average	402 kHz	32.14	-15.66
1	Quasi Peak	442 kHz	38.27	-18.74
2	Average	442 kHz	37.88	-9.14
1	Quasi Peak	970 kHz	30.95	-25.04
2	Average	970 kHz	30.19	-15.80
2	Average	1.37 MHz	28.44	-17.55
1	Quasi Peak	1.982 MHz	31.83	-24.16
1	Quasi Peak	2.51 MHz	35.90	-20.09
2	Average	2.51 MHz	30.47	-15.52
2	Average	4.45 MHz	18.15	-27.84
1	Quasi Peak	4.722 MHz	20.98	-35.01
1	Quasi Peak	10.214 MHz	29.31	-30.68
2	Average	10.338 MHz	24.09	-25.90
2	Average	10.466 MHz	23.50	-26.49
1	Quasi Peak	10.474 MHz	29.98	-30.01
1	Quasi Peak	29.122 MHz	23.36	-36.63
2	Average	29.122 MHz	19.42	-30.57

Date: 23.JAN.2019 13:02:26

Figure 17. Detectors: Peak, Quasi-peak, Average

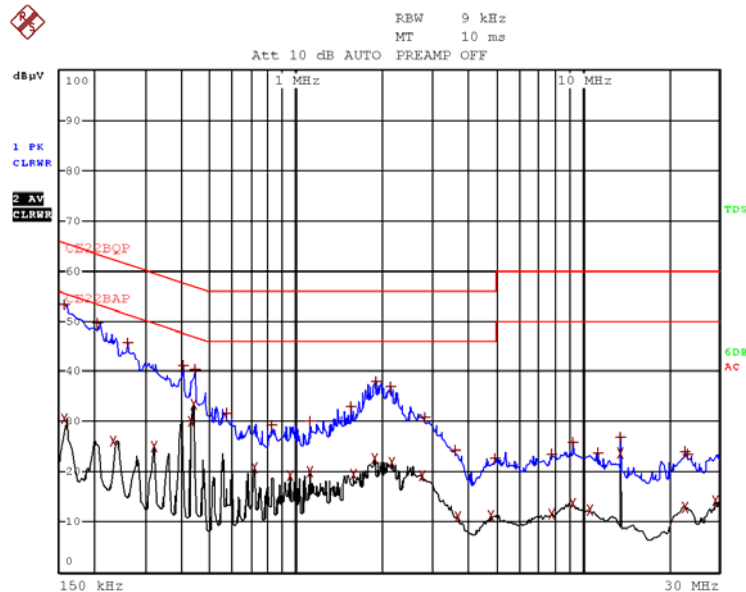
Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.



Conducted Emission

E.U.T Description Wearable Device
Type ORCAM MYME
Serial Number: 18380173

Specification: FCC Part 15, Subpart C
Lead: Neutral
Detectors: Peak, Quasi-peak, Average
Power Operation AC/DC adapter



Date: 17.JAN.2019 15:01:10

Figure 18 Detectors: Peak, Quasi-peak, Average

4.5 Test Equipment Used; Conducted Emission from AC Mains

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LISN	Fischer	FCC-LISN-25A	127	July 20, 2018	July 31, 2019
Transient Limiter	HP	11947A	3107A03041	June 25, 2018	June 25, 2019
EMI Receiver	Rohde & Schwarz	ESCI7	100724	February 19, 2018	February 19, 2019
Cable CE Chamber 3M + 3M	Testline 18 + RJ214	11556	-	March 31, 2018	March 31, 2019

Figure 19 Test Equipment Used

5. 6 dB Minimum Bandwidth

5.1 Test Specification

FCC Part 15, Subpart C, Section 247(a)(2)

5.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (loss=30.5 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded. The RBW was set to 100 kHz.

5.3 Test Limit

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.

5.4 Test Results

Protocol Type	Operation Frequency (MHz)	Reading (kHz)	Limit (kHz)
BLE	2402.0	729.0	>500.0
	2440.0	719.0	>500.0
	2480.0	729.0	>500.0
Wi-fi/g(6Mbit/s)	2412.0	16,128.0	>500.0
	2437.0	15,808.0	>500.0
	2462.0	16,048.0	>500.0
Wi-fi/g(54Mbit/s)	2412.0	16,437.0	>500.0
	2437.0	16,128.0	>500.0
	2462.0	16,447.0	>500.0
Wi-fi/n(6.5Mbit/s)	2412.0	15,449.0	>500.0
	2437.0	16,208.0	>500.0
	2462.0	16,038.0	>500.0
Wi-fi/n(65Mbit/s)	2412.0	16,208.0	>500.0
	2437.0	17,485.0	>500.0
	2462.0	16,607.0	>500.0

Figure 20 6 dB Minimum Bandwidth



JUDGEMENT: Passed

For additional information see *Figure 21* to *Figure 35*.

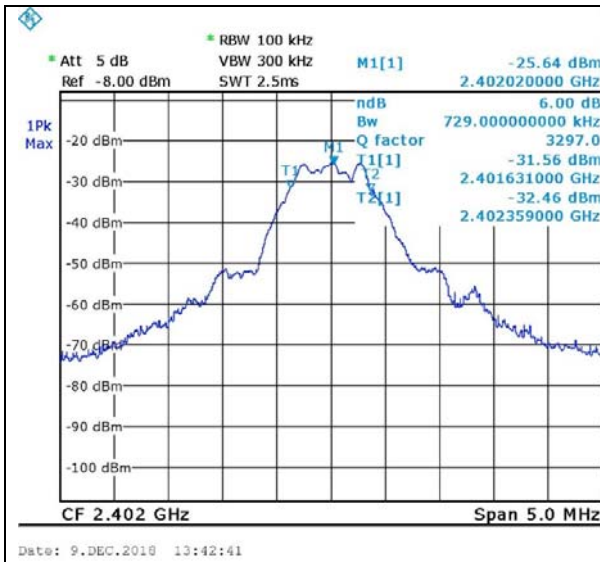


Figure 21. 2402.0 MHz, BLE

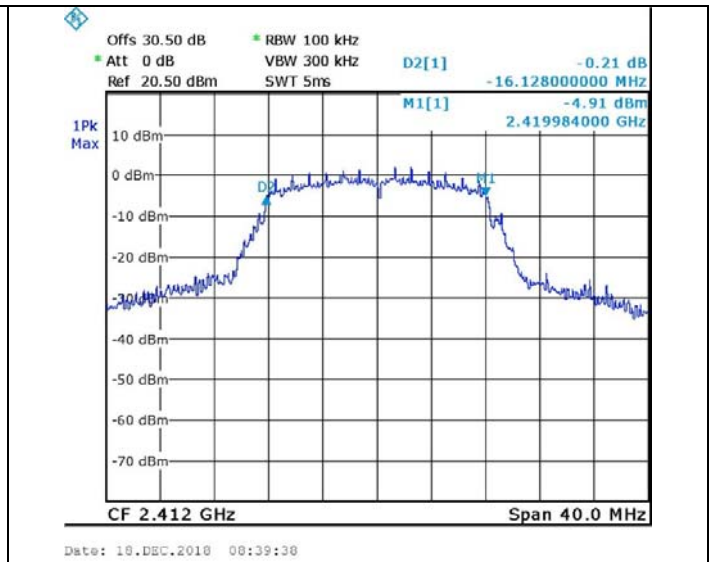


Figure 22. 2412.0 MHz, Wi-fi/g(6Mbit/s)



Figure 23. 2440.0 MHz, BLE

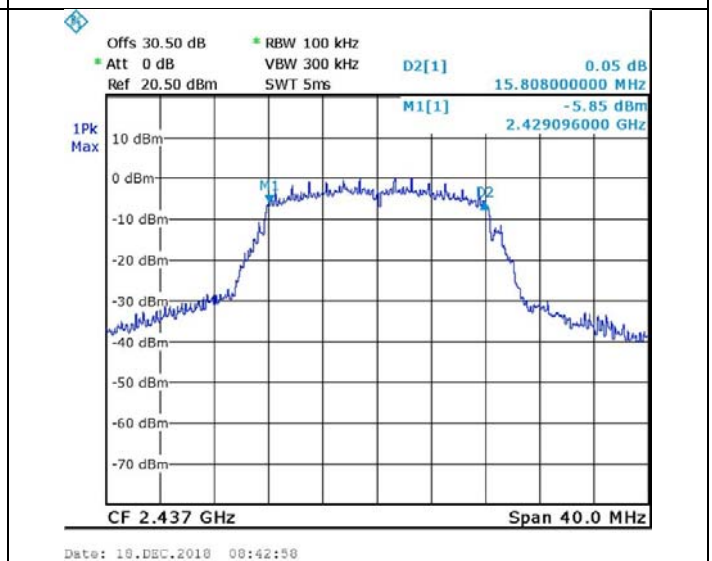


Figure 24. 2437.0 MHz, Wi-fi/g(6Mbit/s)

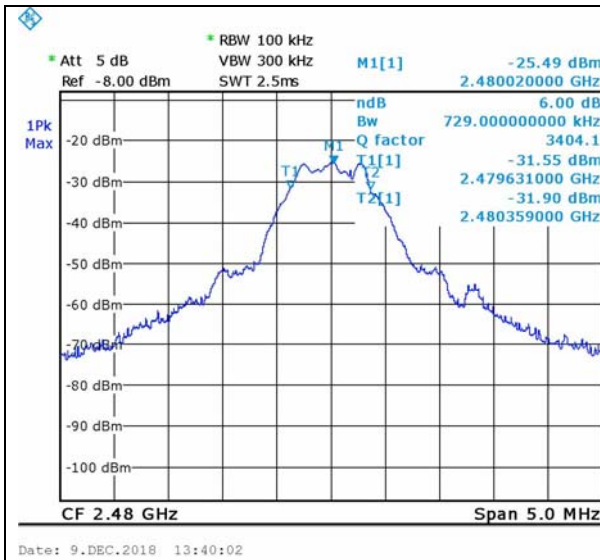


Figure 25. 2480.0 MHz, BLE

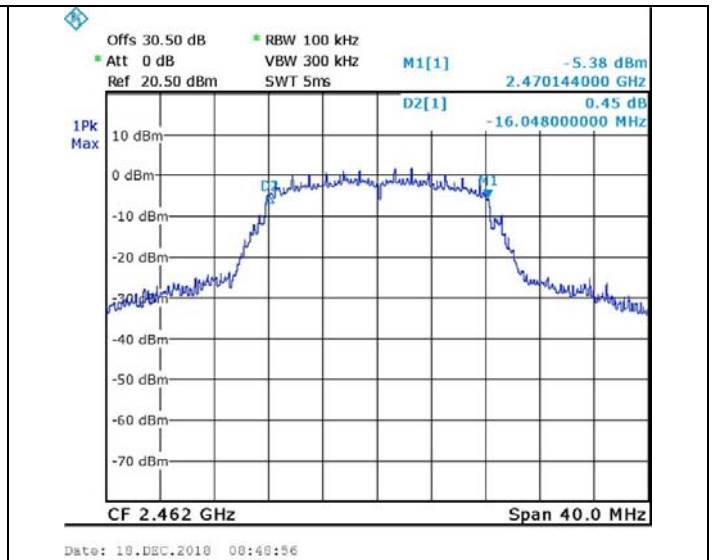


Figure 26. 2462.0 MHz, Wi-fi/g(6Mbit/s)

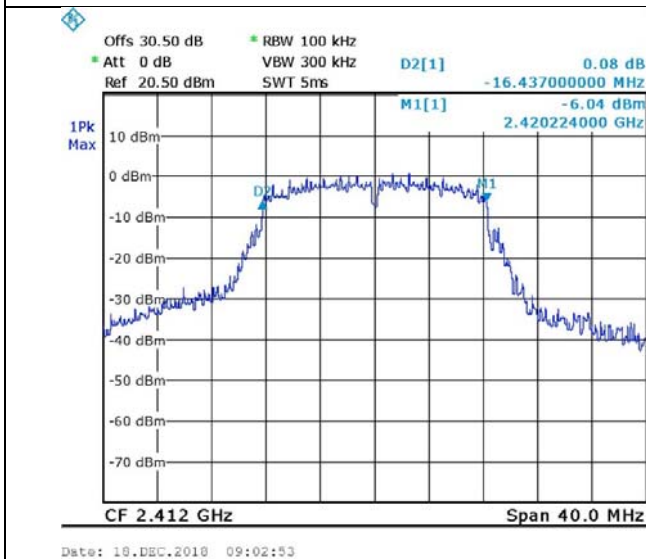


Figure 27. 2412.0 MHz, Wi-fi/g(54Mbit/s)

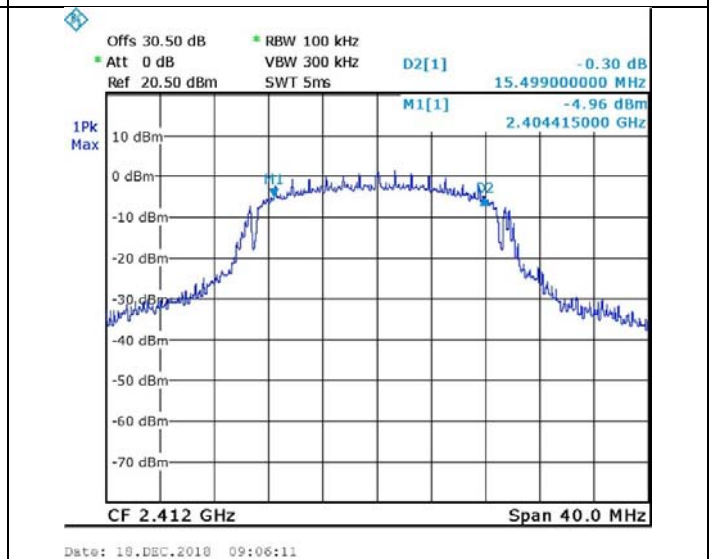


Figure 28. 2412.0 MHz, Wi-fi/n(6.5Mbit/s)

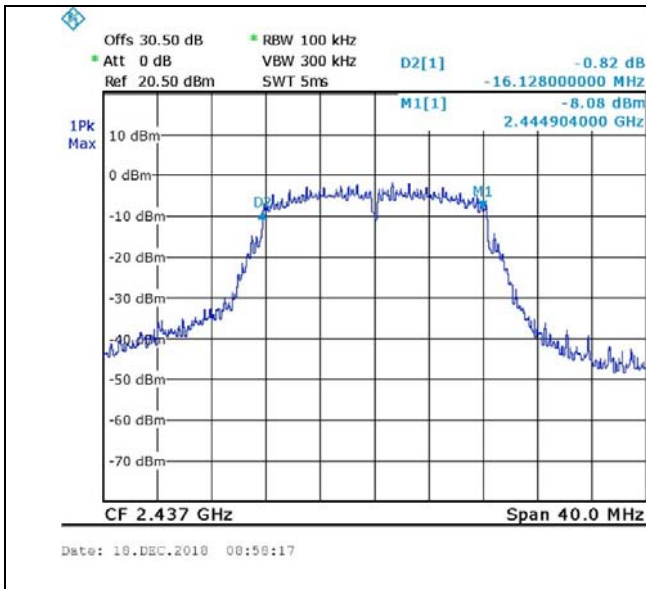


Figure 29. 2437.0 MHz, Wi-fi/g(54Mbit/s)

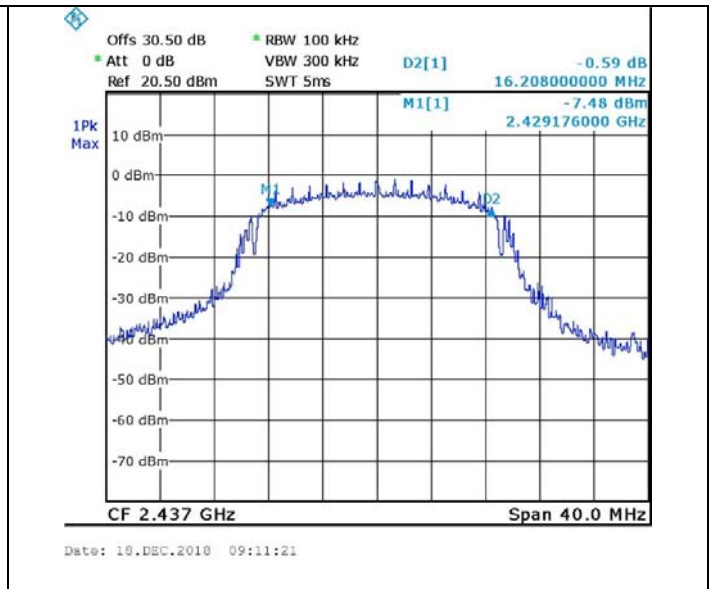


Figure 30. 2437.0 MHz, Wi-fi/n(6.5Mbit/s)

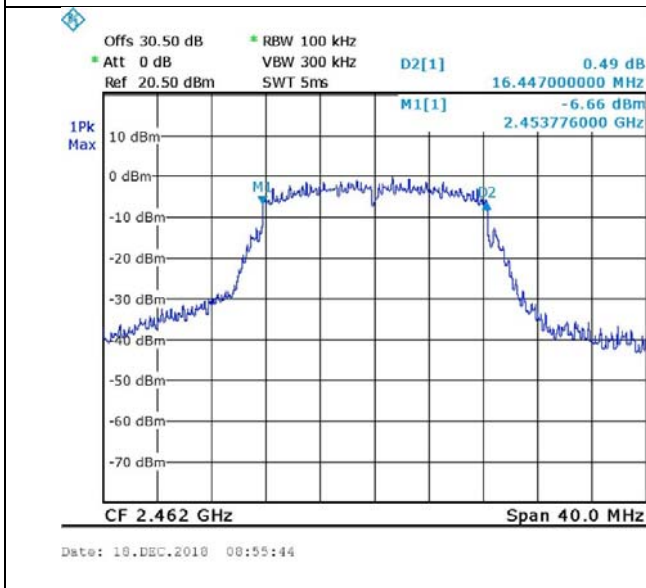


Figure 31. 2462.0 MHz, Wi-fi/g(54Mbit/s)

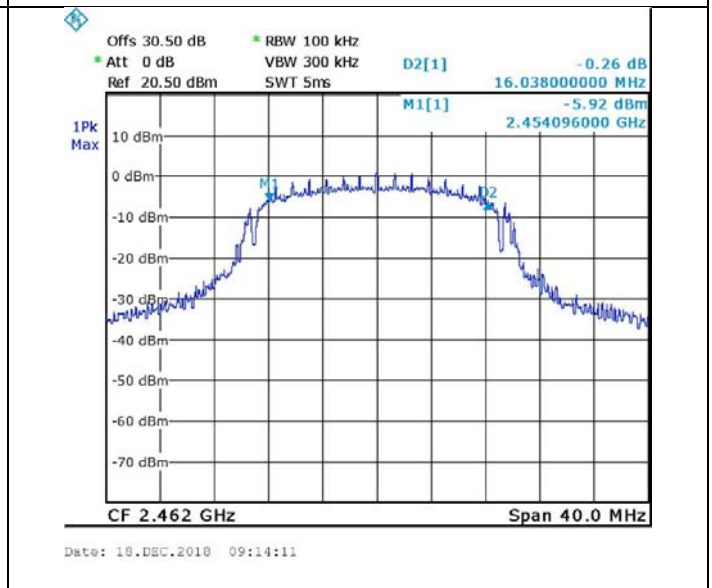


Figure 32. 2462.0 MHz, Wi-fi/n(6.5Mbit/s)

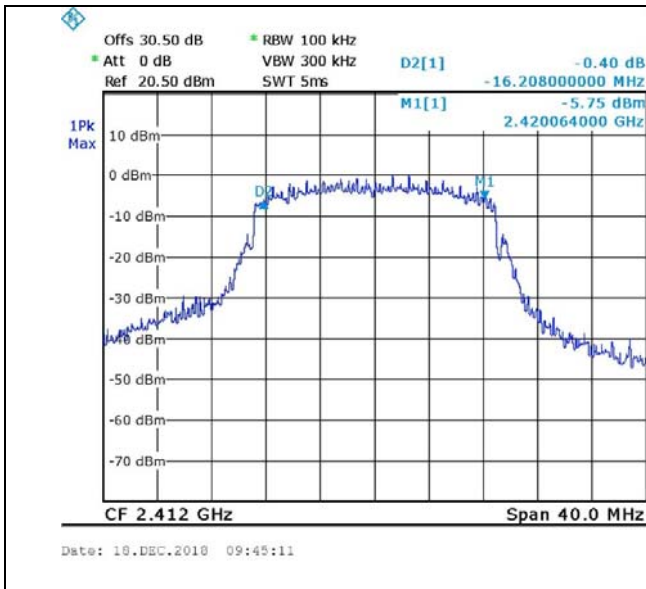


Figure 33. 2412.0 MHz, Wi-fi/n(65Mbit/s)

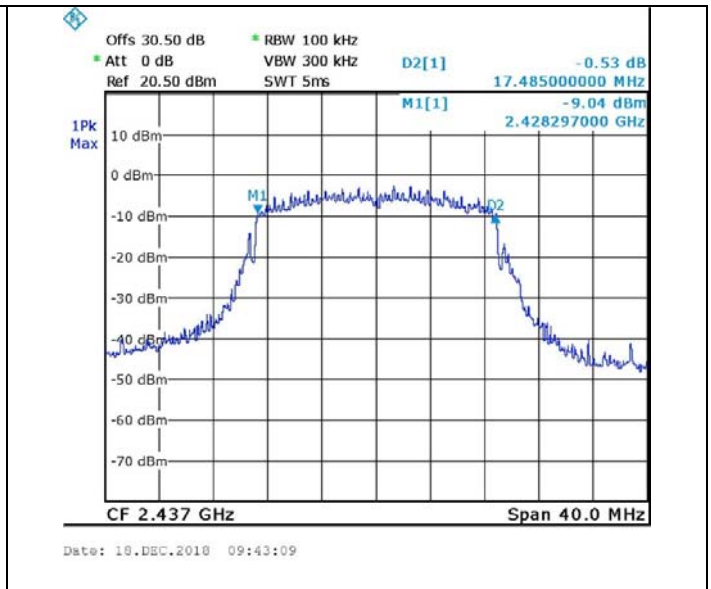


Figure 34. 2437.0 MHz, Wi-fi/n(65Mbit/s)

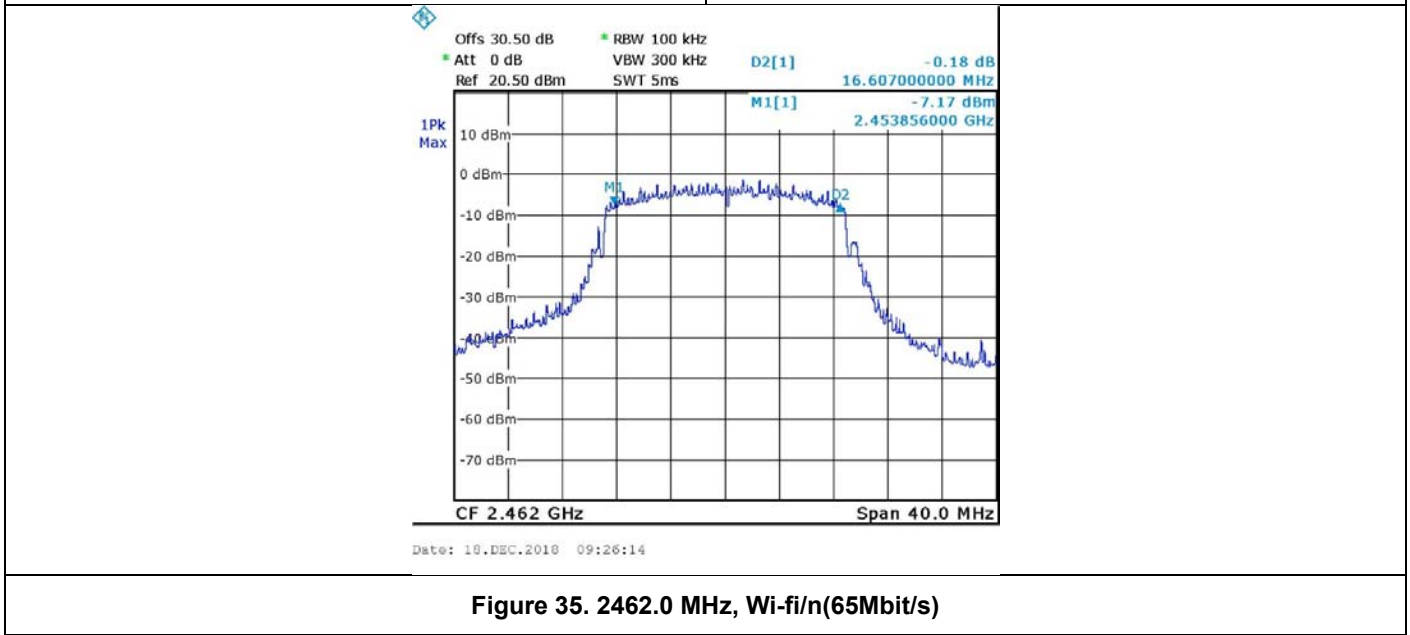


Figure 35. 2462.0 MHz, Wi-fi/n(65Mbit/s)

5.5 Test Equipment Used; 6dB Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	February 19, 2018	February 19, 2019
30dB Attenuator	MCL	BW-S30W5	533	October 1, 2017	December 31, 2018 See Note below
RF Cable	Huber Suner	Sucoflex	27502/4PEA	October 1, 2017	December 31, 2018 See Note below

Note: Testing concluded December 18, 2018

Figure 36 Test Equipment Used



6. Maximum Conducted Output Power

6.1 Test Specification

FCC, Part 15, Subpart C, Section 247(b)(3)

6.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T was tested in the chamber, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 1.5 meters above the ground. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

Radiated output power levels were measured at selected operation frequencies and the results were converted to power level according to the formula as shown below:

$$P = \frac{(E_{V/m} \times d)^2}{(30 \times G)} \text{ [W]}$$

E - Field Strength (V/m)

d – Distance from transmitter (m)

G – Antenna gain

P – Peak power (W)

6.3 Test Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

6.4 Test Results

Protocol Type	Operation Frequency	Pol.	Field Strength	EIRP	Antenna Gain	Conducted Power	Conducted Power	Limit	Margin
	(MHz)	(V/H)	(dBuV/m)	(dBm)	(dB)	(dBm)	(mW)	(mW)	(mW)
BLE	2402.0	V	79.9	-15.3	-2.0	-13.3	0.05	1000.0	-999.95
		H	85.2	-10.0	-2.0	-8.0	0.16	1000.0	-999.84
	2440.0	V	80.8	-14.4	-2.0	-12.4	0.06	1000.0	-999.94
		H	84.7	-10.5	-2.0	-8.5	0.14	1000.0	-999.86
	2480.0	V	80.1	-15.1	-2.0	-13.1	0.05	1000.0	-999.95
		H	81.7	-13.5	-2.0	-11.5	0.07	1000.0	-999.93
Wi-fi/g(6Mbit/s)	2412.0	V	90.0	-5.2	-2.0	-3.2	0.48	1000.0	-999.52
		H	93.2	-2.0	-2.0	0.0	1.00	1000.0	-999.00
	2437.0	V	88.0	-7.2	-2.0	-5.2	0.30	1000.0	-999.70
		H	91.7	-3.5	-2.0	-1.5	0.71	1000.0	-999.29
	2462.0	V	81.5	-13.7	-2.0	-11.7	0.07	1000.0	-999.93
		H	91.8	-3.4	-2.0	-1.4	0.72	1000.0	-999.28
Wi-fi/g(54Mbit/s)	2412.0	V	89.5	-5.7	-2.0	-3.7	0.43	1000.0	-999.57
		H	93.9	-1.3	-2.0	0.7	1.17	1000.0	-998.83
	2437.0	V	86.2	-9.0	-2.0	-7.0	0.20	1000.0	-999.8
		H	91.1	-4.1	-2.0	-2.1	0.62	1000.0	-999.38
	2462.0	V	89.6	-5.6	-2.0	-3.6	0.44	1000.0	-999.56
		H	90.6	-4.6	-2.0	-2.6	0.55	1000.0	-999.45
Wi-fi/n(6.5Mbit/s)	2412.0	V	88.1	-7.1	-2.0	-5.1	0.31	1000.0	-999.69
		H	94.9	-0.3	-2.0	1.7	1.48	1000.0	-998.52
	2437.0	V	86.3	-8.9	-2.0	-6.9	0.20	1000.0	-999.80
		H	93.0	-2.2	-2.0	-0.2	0.95	1000.0	-999.05
	2462.0	V	87.2	-8.0	-2.0	-6.0	0.25	1000.0	-999.75
		H	92.6	-2.6	-2.0	-0.6	0.87	1000.0	-999.13
Wi-fi/n(65Mbit/s)	2412.0	V	86.9	-8.3	-2.0	-6.3	0.23	1000.0	-999.77
		H	94.0	-1.2	-2.0	0.8	1.20	1000.0	-998.80
	2437.0	V	84.5	-10.7	-2.0	-8.7	0.13	1000.0	-999.87
		H	91.5	-3.7	-2.0	-1.7	0.68	1000.0	-999.32
	2462.0	V	86.0	-9.2	-2.0	-7.2	0.19	1000.0	-999.81
		H	91.4	-3.8	-2.0	-1.8	0.66	1000.0	-999.34

Figure 37 Maximum Peak Power Output



JUDGEMENT: Passed by 998.52 mW
For additional information see *Figure 38* to *Figure 67*.

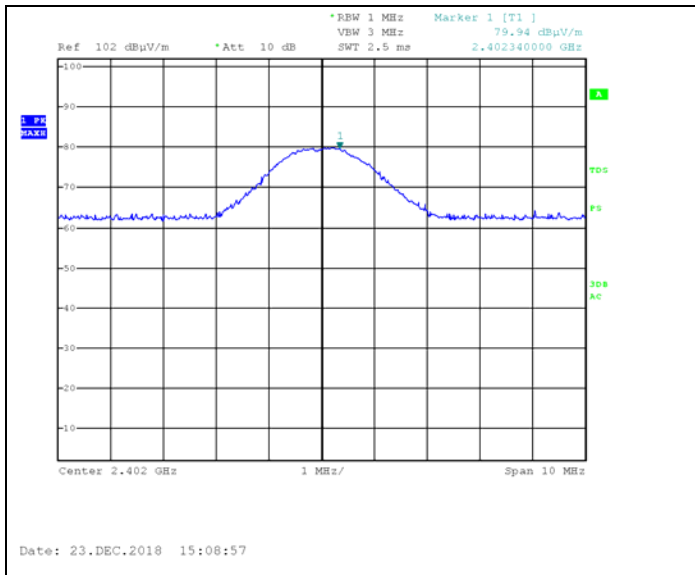


Figure 38. 2402.0 MHz, BLE, Vertical

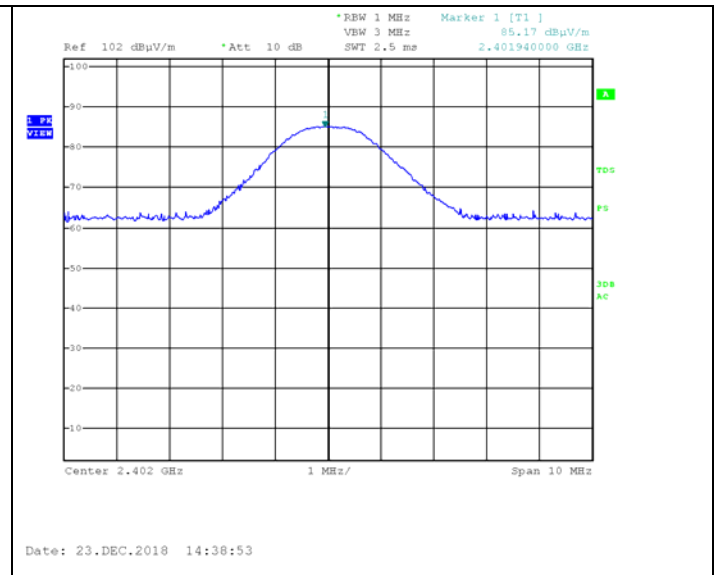


Figure 39. 2402.0 MHz, BLE, Horizontal

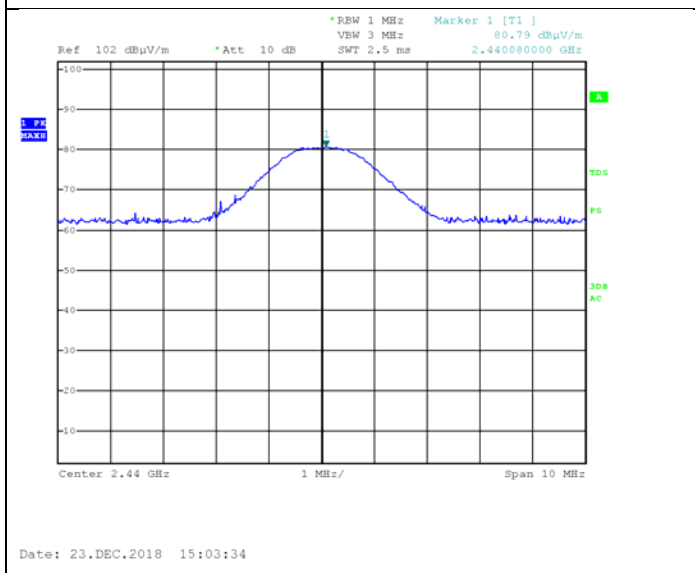


Figure 40. 2440.0 MHz, BLE, Vertical

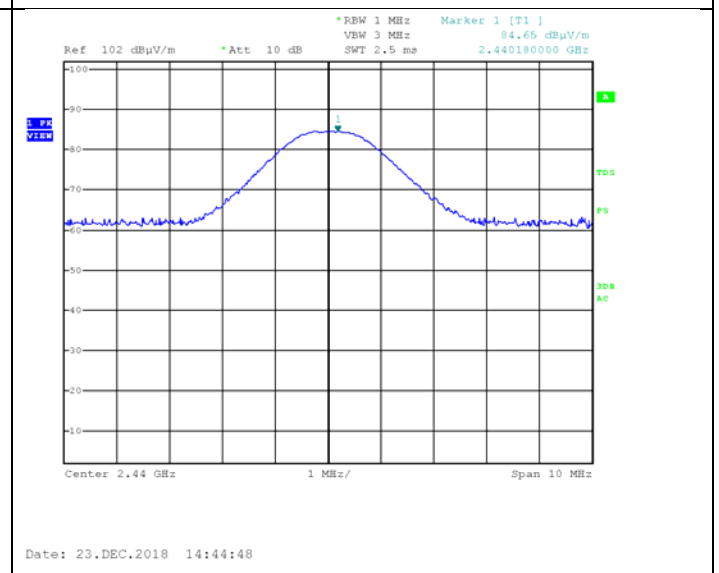


Figure 41. 2440.0 MHz, BLE, Horizontal

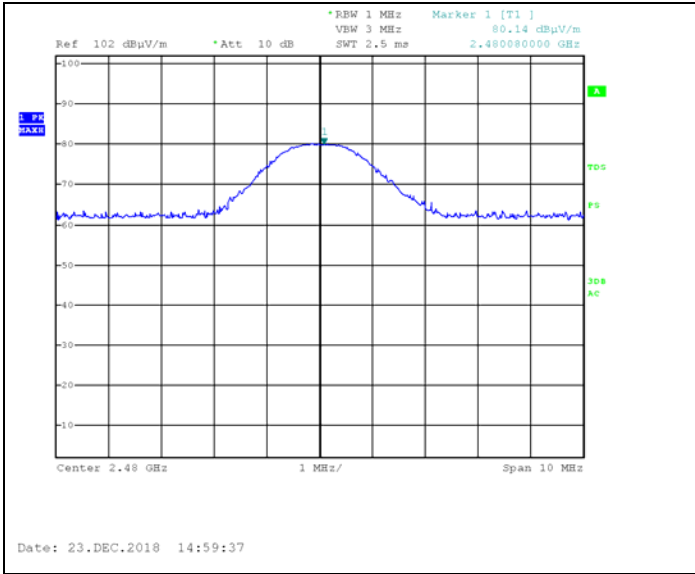


Figure 42. 2480.0 MHz, BLE, Vertical

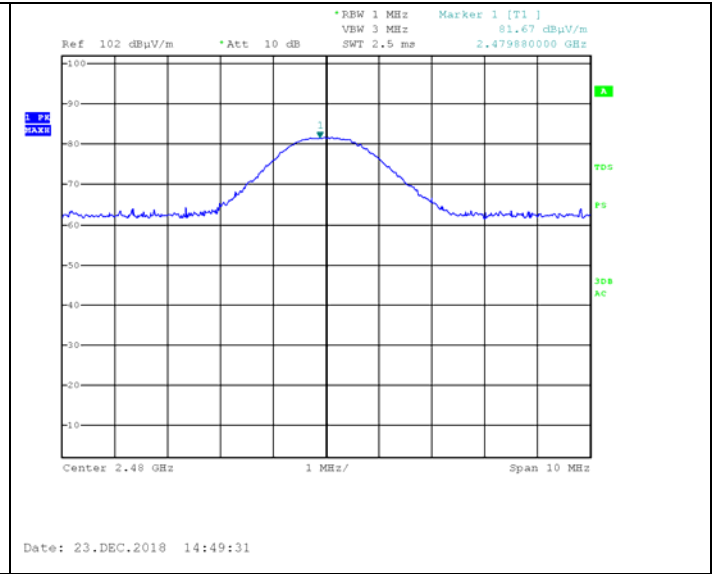


Figure 43. 2480.0 MHz, BLE, Horizontal

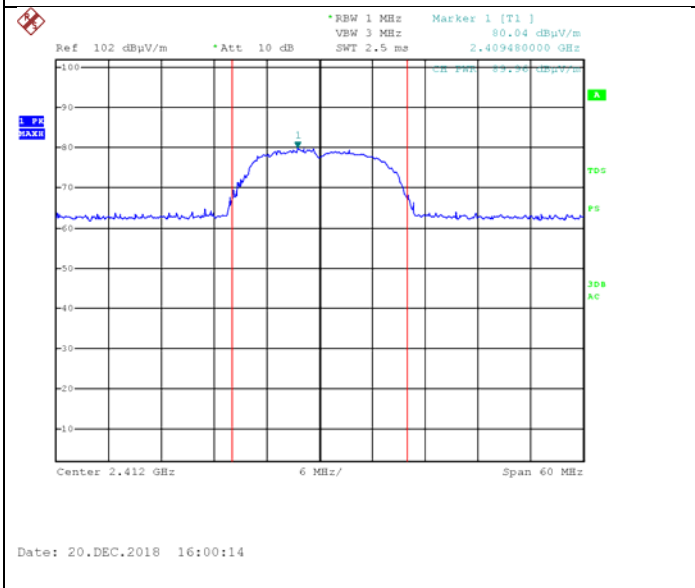


Figure 44. 2412.0 MHz, Wi-Fi/g(6Mbit/s), Vertical

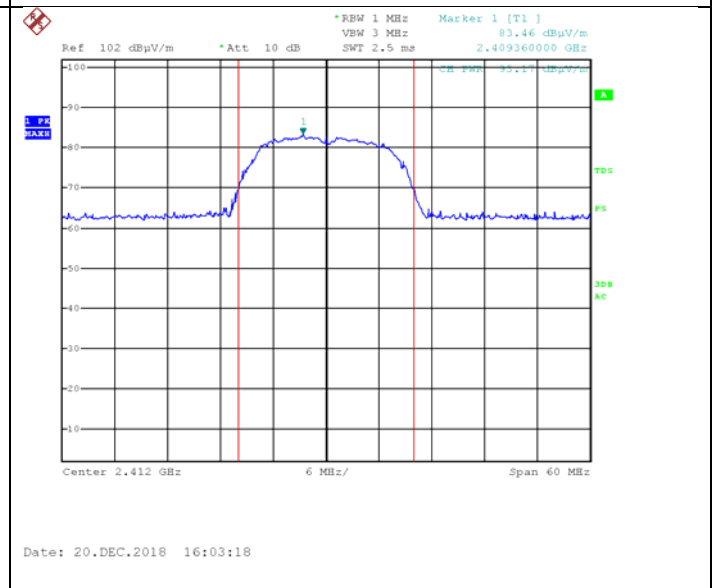


Figure 45. 2412.0 MHz, Wi-Fi/g(6Mbit/s), Horizontal

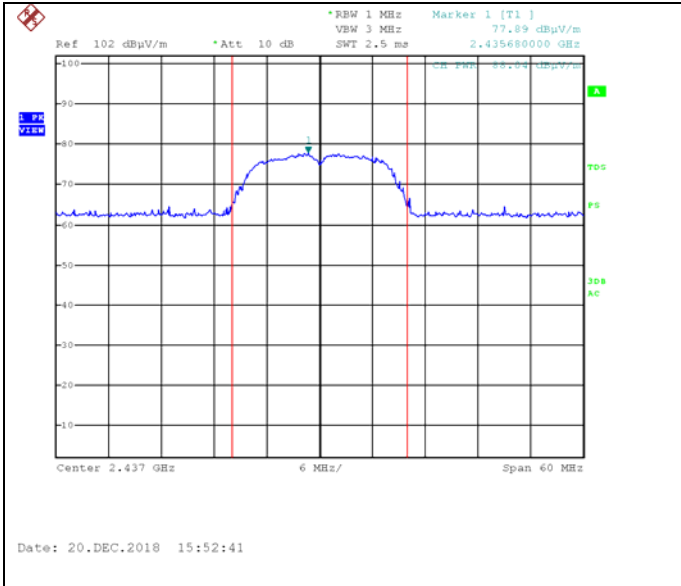


Figure 46. 2437.0 MHz, Wi-fi/g(6Mbit/s), Vertical

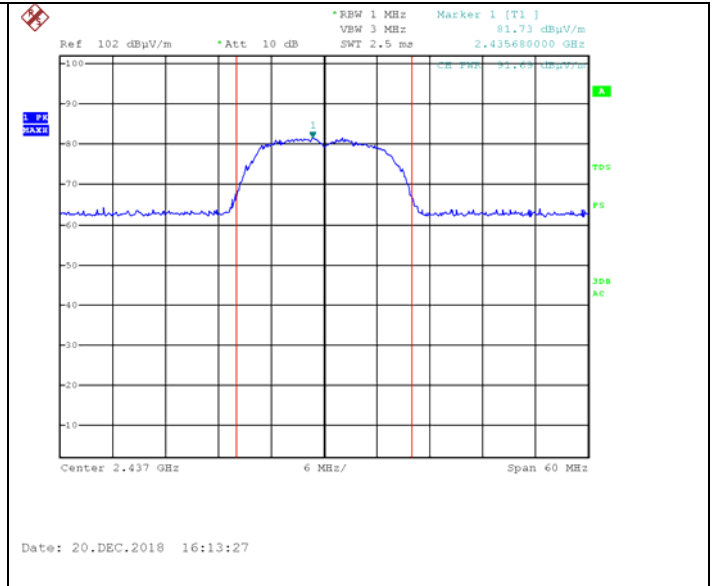


Figure 47. 2437.0 MHz, Wi-fi/g(6Mbit/s), Horizontal

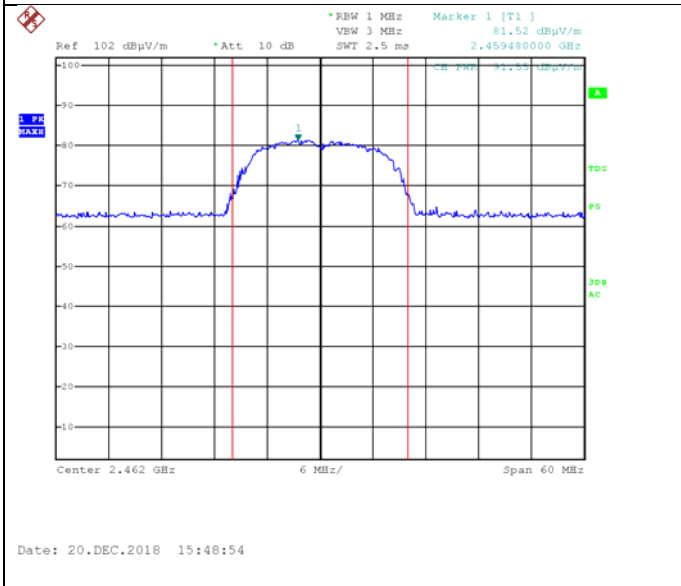


Figure 48. 2462.0 MHz, Wi-fi/g(6Mbit/s), Vertical

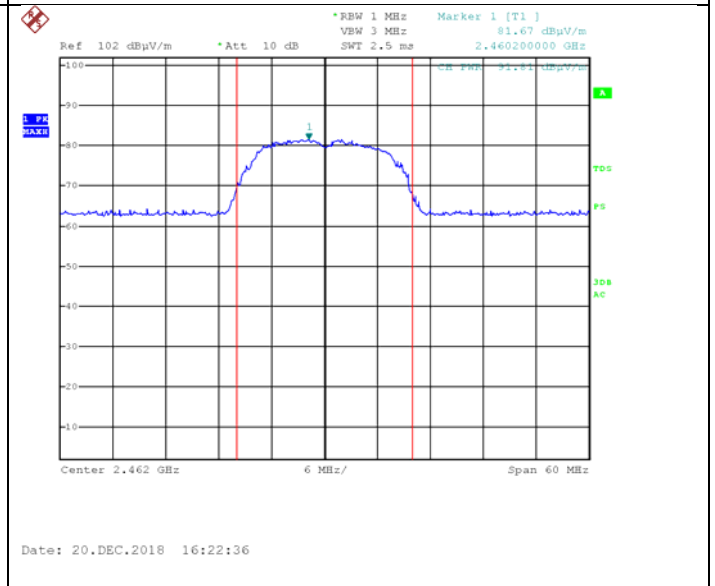


Figure 49. 2462.0 MHz, Wi-fi/g(6Mbit/s), Horizontal

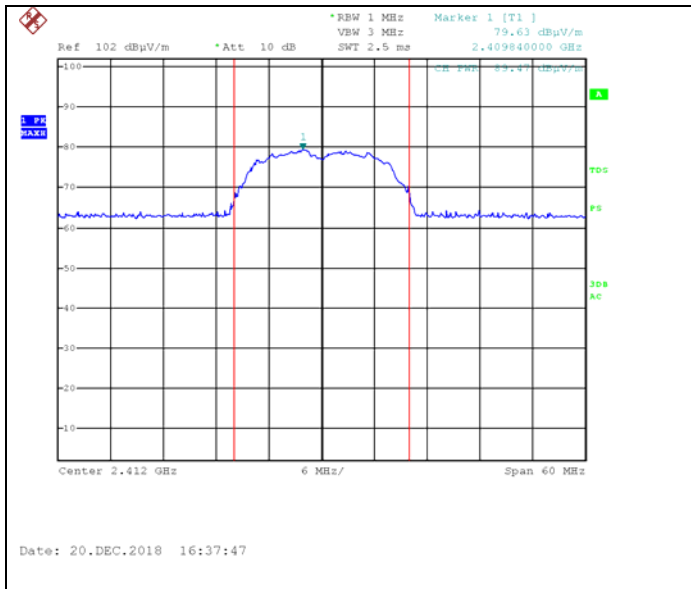


Figure 50. 2412.0 MHz, Wi-fi/g(54Mbit/s), Vertical

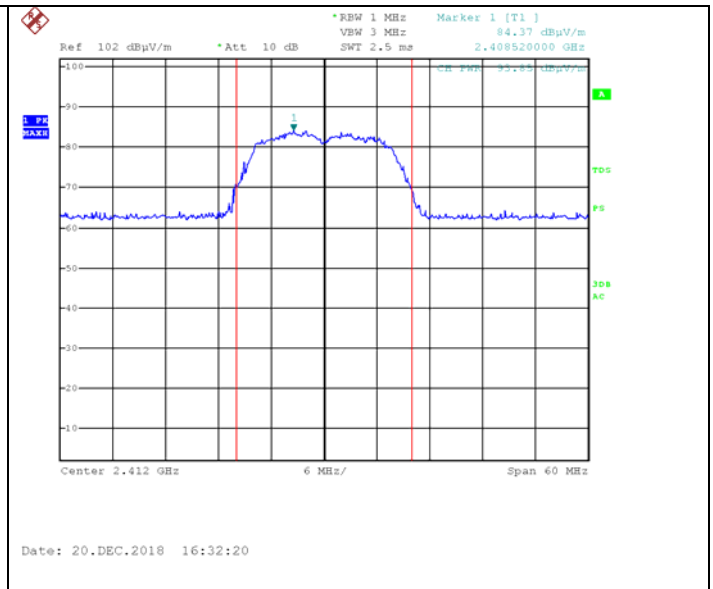


Figure 51. 2412.0 MHz, Wi-fi/g(54Mbit/s), Horizontal

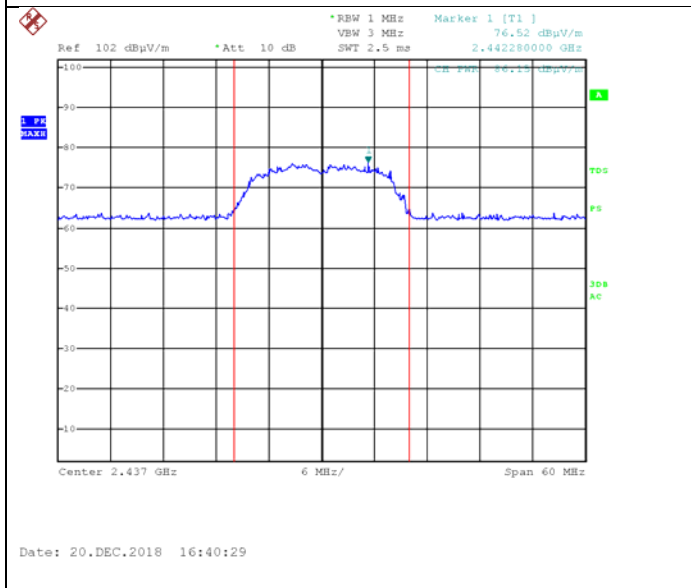


Figure 52. 2437.0 MHz, Wi-fi/g(54Mbit/s), Vertical

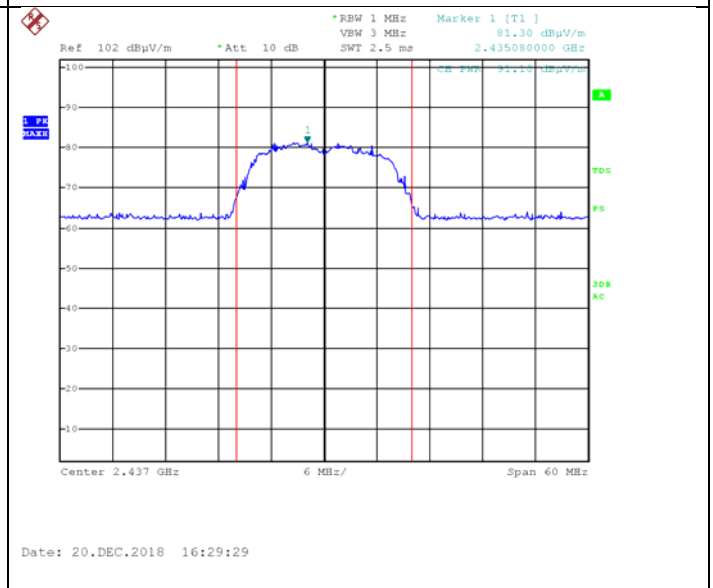


Figure 53. 2437.0 MHz, Wi-fi/g(54Mbit/s), Horizontal

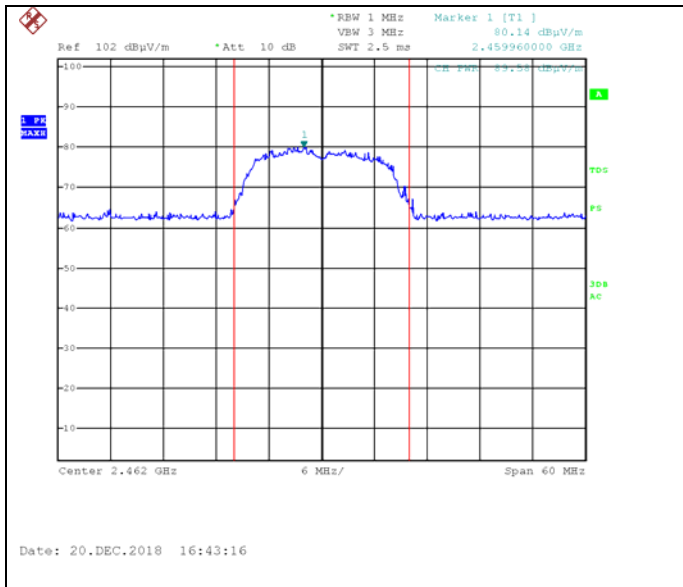


Figure 54. 2462.0 MHz, Wi-fi/g(54Mbit/s), Vertical

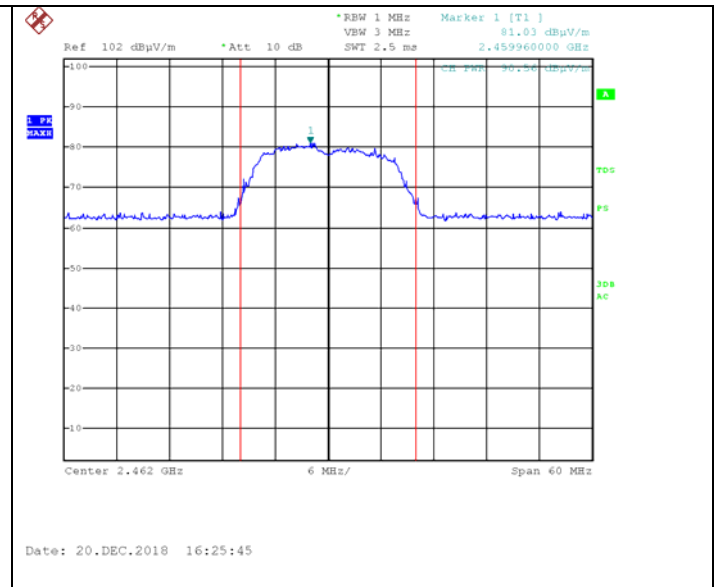


Figure 55. 2462.0 MHz, Wi-fi/g(54Mbit/s), Horizontal

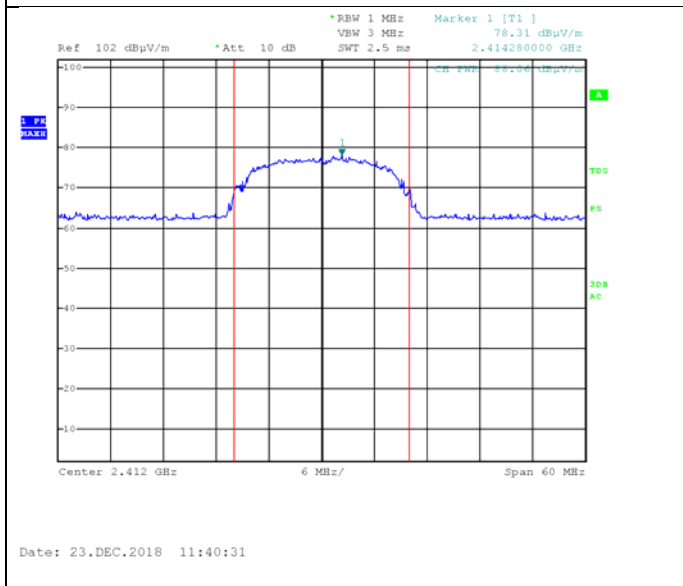


Figure 56. 2412.0 MHz, Wi-fi/n(6.5Mbit/s), Vertical

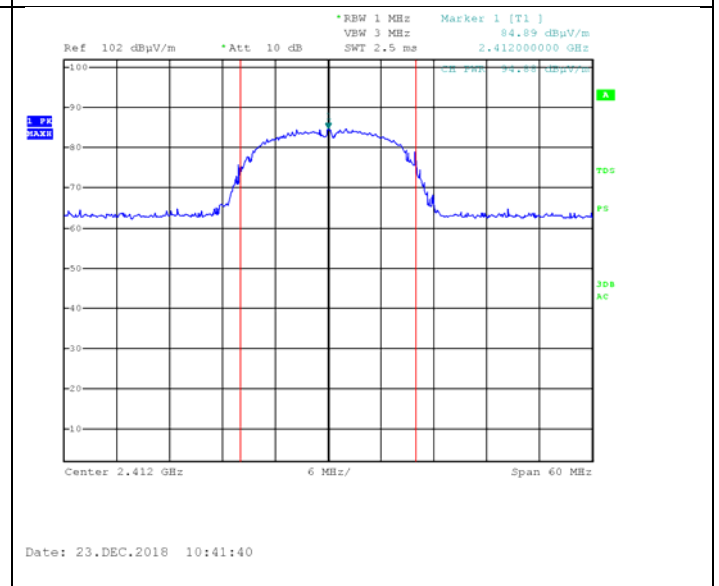


Figure 57. 2412.0 MHz, Wi-fi/n(6.5Mbit/s), Horizontal

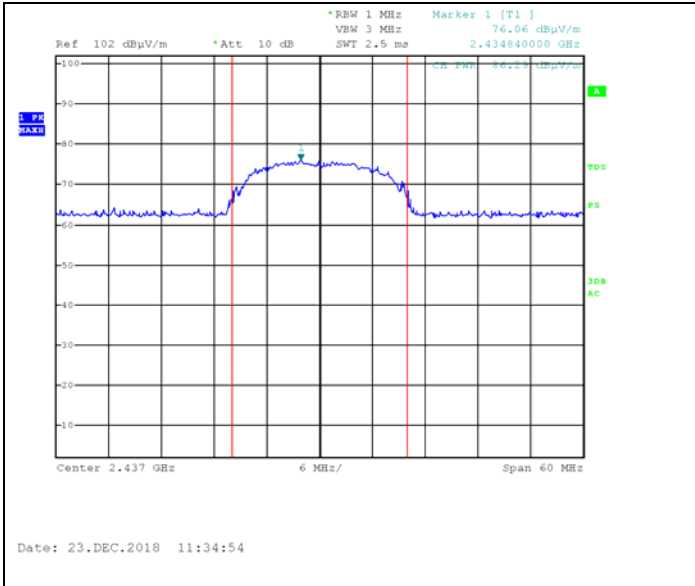


Figure 58. 2437.0 MHz, Wi-fi/n(6.5Mbit/s), Vertical

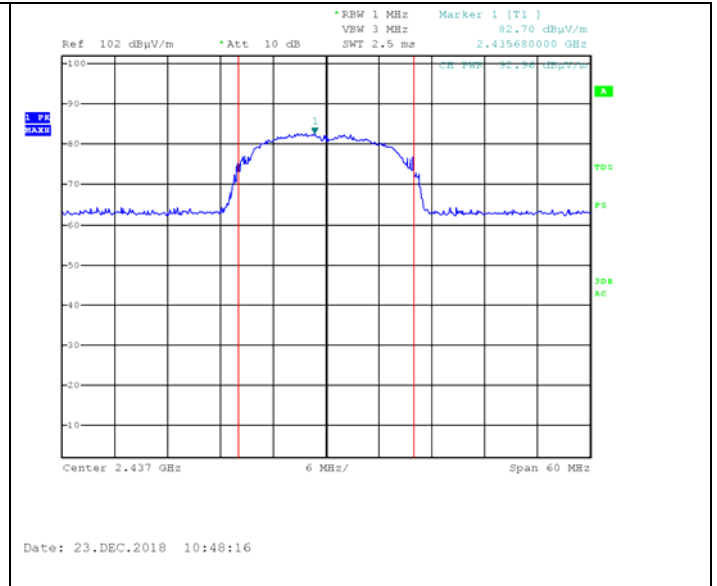


Figure 59. 2437.0 MHz, Wi-fi/n(6.5Mbit/s), Horizontal

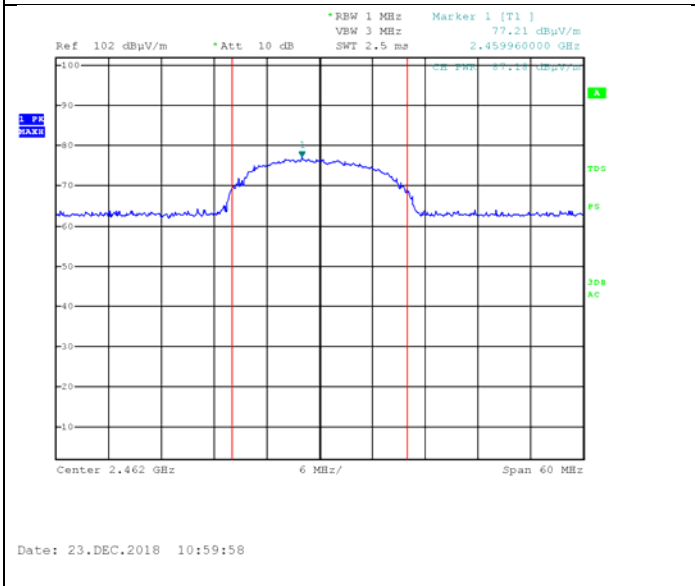


Figure 60. 2462.0 MHz, Wi-fi/n(6.5Mbit/s), Vertical

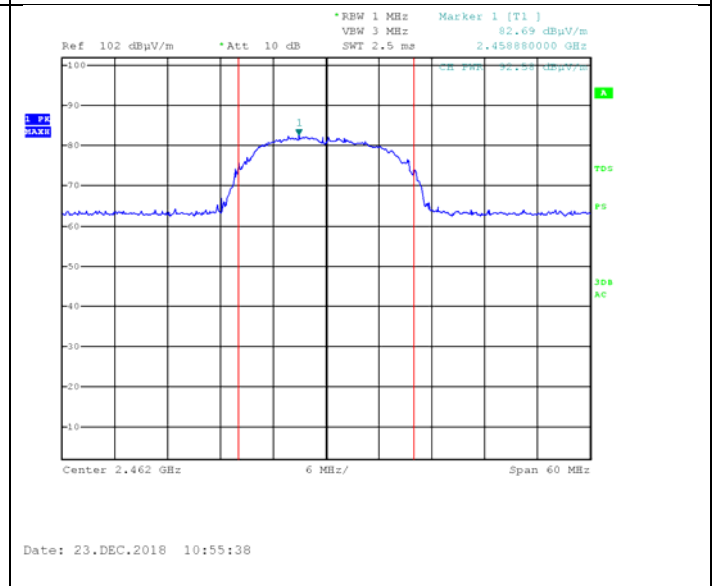


Figure 61. 2462.0 MHz, Wi-fi/n(6.5Mbit/s), Horizontal

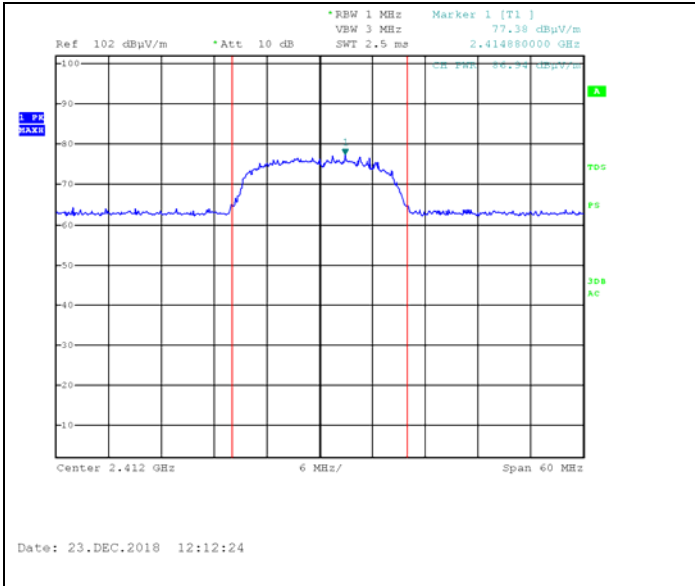


Figure 62. 2412.0 MHz, Wi-fi/n(65Mbit/s), Vertical

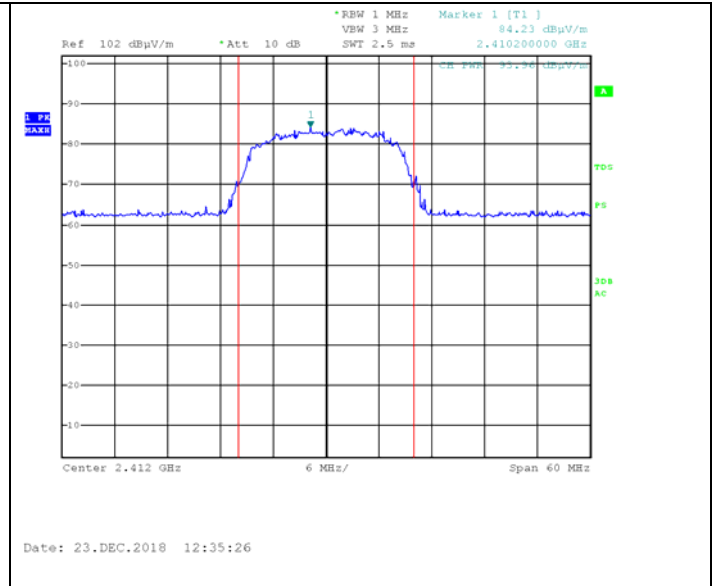


Figure 63. 2412.0 MHz, Wi-fi/n(65Mbit/s), Horizontal

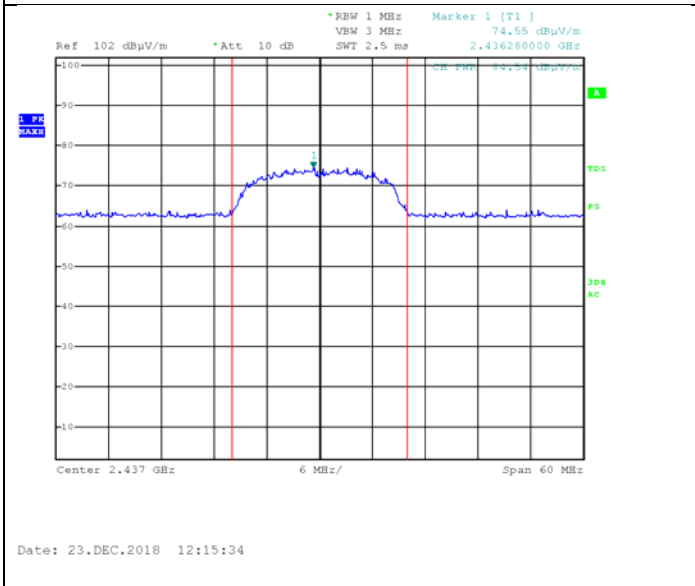


Figure 64. 2437.0 MHz, Wi-fi/n(65Mbit/s), Vertical

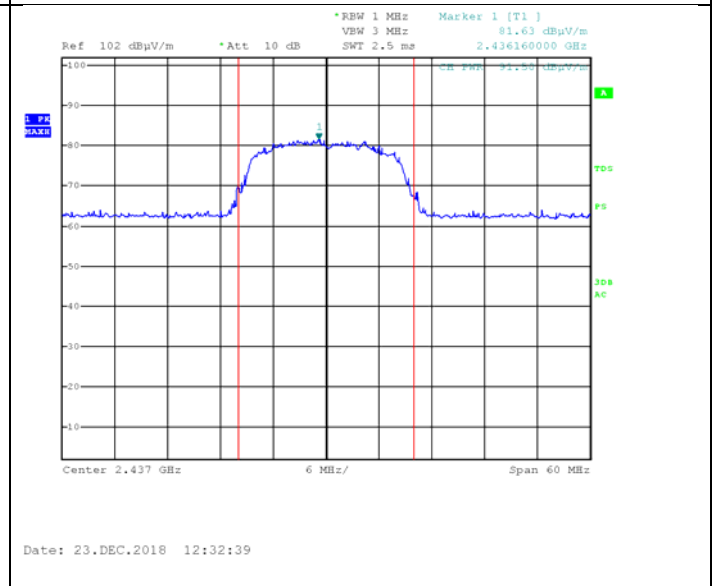


Figure 65. 2437.0 MHz, Wi-fi/n(65Mbit/s), Horizontal

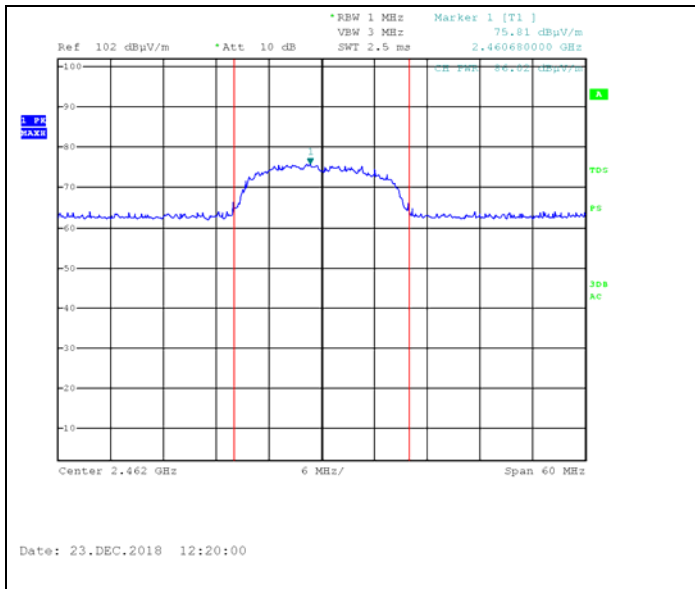


Figure 66. 2462.0 MHz, Wi-fi/n(65Mbit/s), Vertical

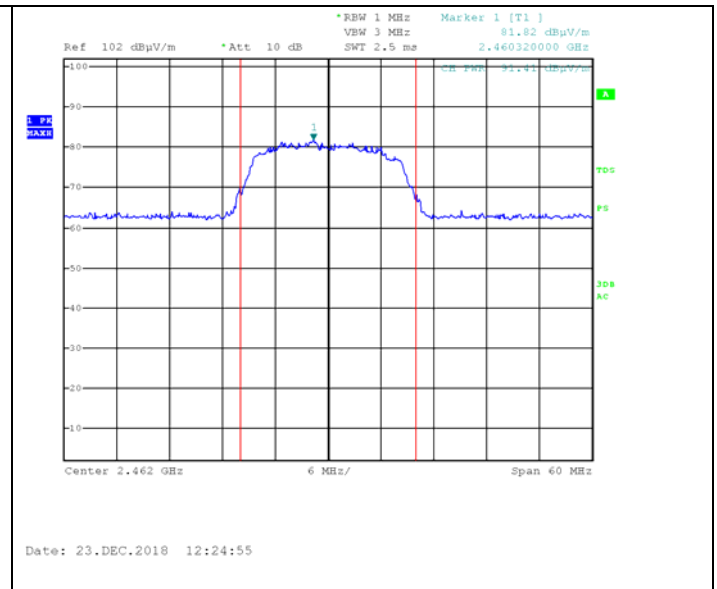


Figure 67. 2462.0 MHz, Wi-fi/n(65Mbit/s), Horizontal

6.5 Test Equipment Used; Maximum Conducted Output Power

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	February 19, 2018	February 19, 2019
Horn Antenna	ETS	3115	6142	May 31, 2018	May 31, 2021
RF Cable	Commscope ORS	0623 WBC-400	G020132	October 1, 2017	December 31, 2018 See Note below
Semi Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR

Note: Testing concluded December 23, 2018

Figure 68 Test Equipment Used

7. Band Edge Spectrum

7.1 Test Specification

FCC, Part 15, Subpart C, Section 247(d)

7.2 Test Procedure

(Temperature (20°C)/ Humidity (59%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.

The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (loss=30.5 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

The RBW was set to 100 kHz.

7.3 Test Limit

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.

7.4 Test Results

Protocol Type	Operation Frequency (MHz)	Band Edge Frequency (MHz)	Spectrum Level (dBm)	Limit (dBm)	Margin (dB)
BLE	2402.0	2400.0	-37.4	-15.2	-22.2
	2480.0	2483.5	-44.9	-14.7	-30.2
Wi-fi/g(6Mbit/s)	2412.0	2400.0	-25.4	-18.2	-7.2
	2462.0	2483.5	-35.5	-17.7	-17.8
Wi-Fi/g(54Mbit/s)	2412.0	2400.0	-30.0	-19.3	-10.7
	2462.0	2483.5	-40.5	-20.3	-20.2
Wi-Fi/n(6.5Mbit/s)	2412.0	2400.0	-27.4	-19.8	-7.6
	2462.0	2483.5	-36.9	-19.3	-17.6
Wi-fi/n(65Mbit/s)	2412.0	2400.0	-30.7	-20.5	-10.2
	2462.0	2483.5	-45.3	-21.3	-24.0

Figure 69 Band Edge Spectrum



JUDGEMENT: Passed by 7.2 dB

For additional information see *Figure 70* and *Figure 79*.

Band Edge Spectrum

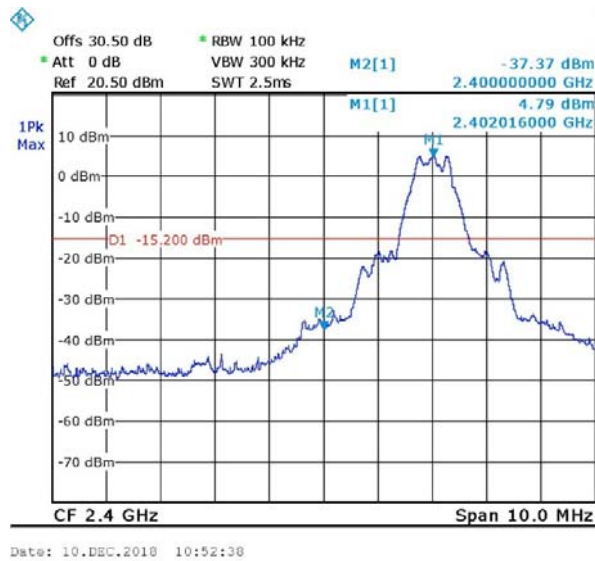


Figure 70 Band Edge Low, BLE

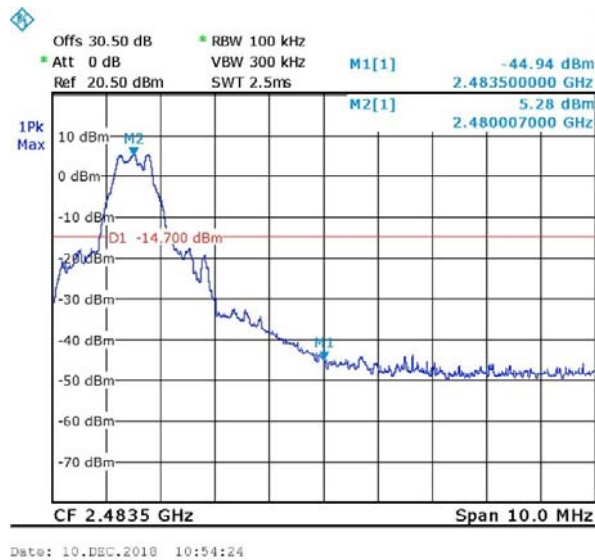


Figure 71 Band Edge High, BLE

Band Edge Spectrum

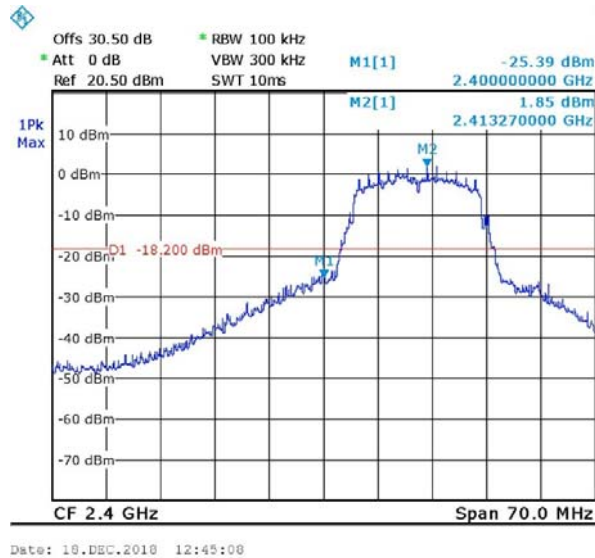


Figure 72 Band Edge Low, Wi-fi/g(6Mbit/s)

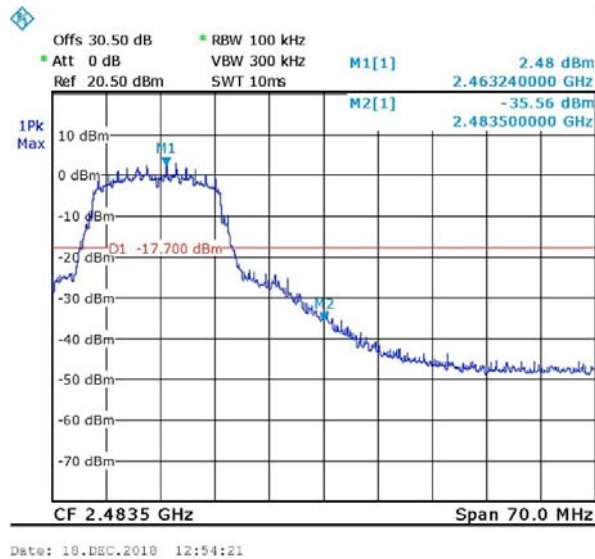
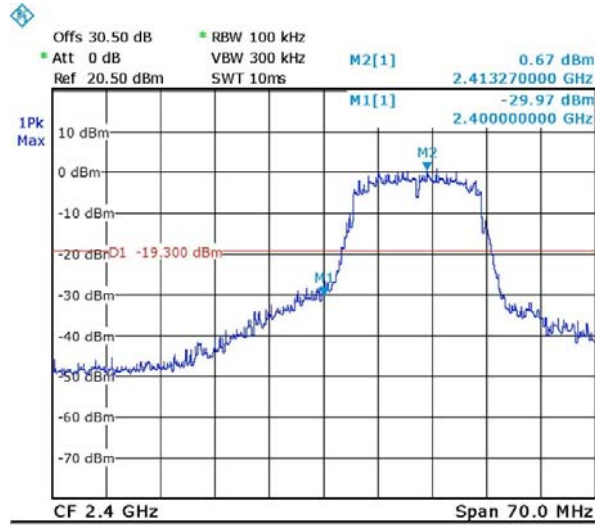


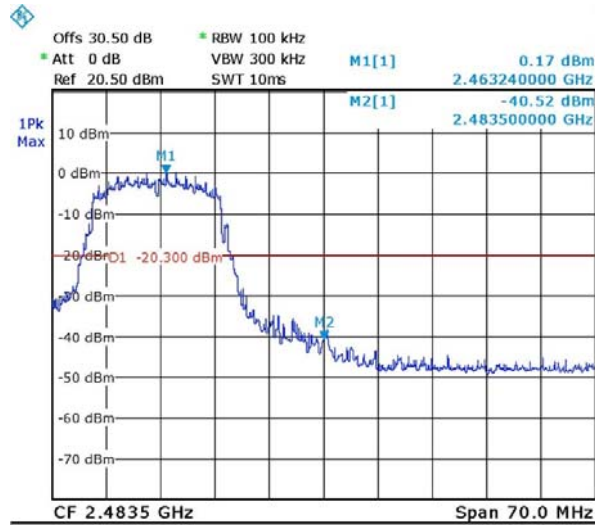
Figure 73 Band Edge High, Wi-fi/g(6Mbit/s)

Band Edge Spectrum



Date: 18.DEC.2018 12:47:42

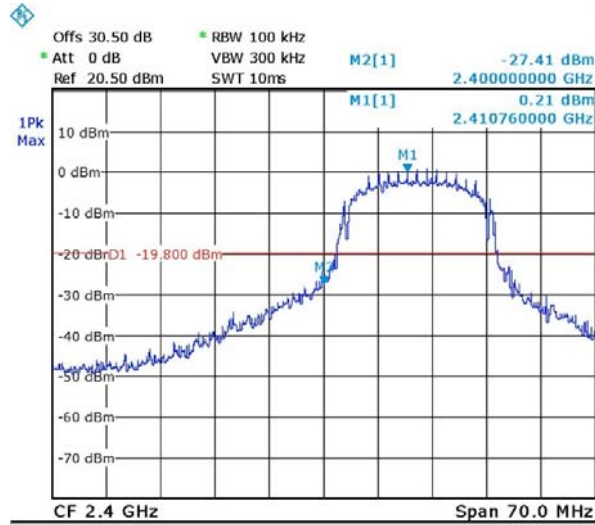
Figure 74 Band Edge Low, Wi-fi/g(54Mbit/s)



Date: 18.DEC.2018 12:50:47

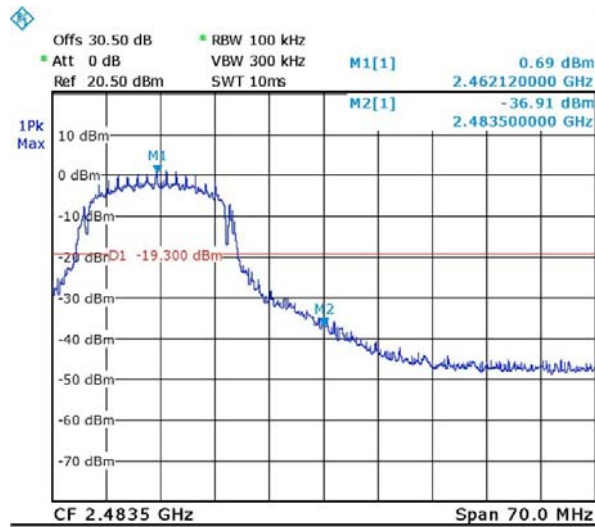
Figure 75 Band Edge High, Wi-fi/g(54Mbit/s)

Band Edge Spectrum



Date: 18.DEC.2018 10:37:21

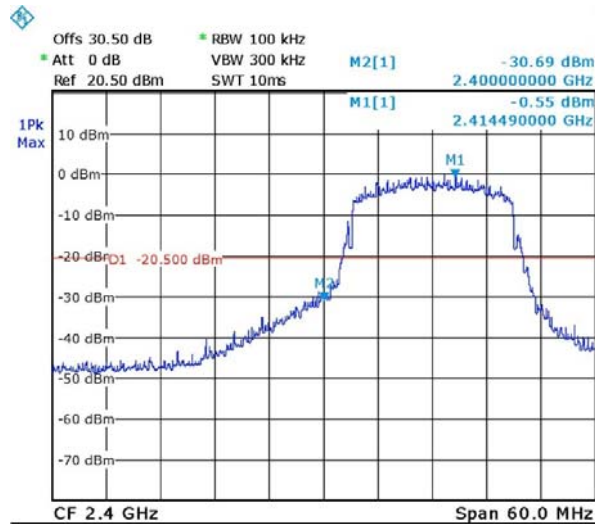
Figure 76 Band Edge Low, Wi-fi/n(6.5Mbit/s)



Date: 18.DEC.2018 10:35:12

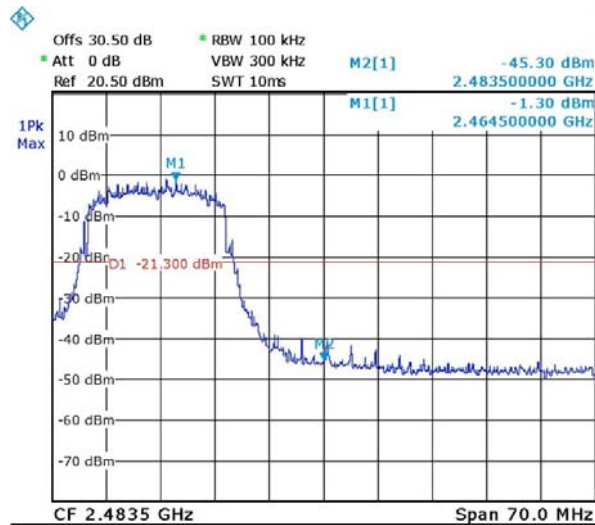
Figure 77 Band Edge High, Wi-fi/n(6.5Mbit/s)

Band Edge Spectrum



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Figure 78 Band Edge Low, Wi-fi/n(65Mbit/s)



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Figure 79 Band Edge High, Wi-fi/n(65Mbit/s)



7.5 Test Equipment Used; Band Edge

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	February 19, 2018	February 19, 2019
30dB Attenuator	MCL	BW-S30W5	533	October 1, 2017	December 31, 2018 See Note below
RF Cable	Huber Suner	Sucofelex	27502/4PE A	October 1, 2017	December 31, 2018 See Note below

Note: Testing concluded December 18, 2019

Figure 80 Test Equipment Used