



DATE: 26 October 2017

I.T.L. (PRODUCT TESTING) LTD. FCC Radio Test Report

**for
Vitalerter LTD**

**Equipment under test:
Sensor**

**Vitals v2.0
(Wi-Fi & BLE transceivers)**

Tested by:


M. Zohar

Approved by:


D. Shidlow

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This report relates only to items tested.



Measurement/Technical Report for Vitalerter LTD

Sensor

Vitals v2.0

FCC ID: 2ANR2-VITALSV20

This report concerns:

Original Grant: X

Class I Change:

Class II Change:

Equipment type:

Digital Transmission System

Limits used:

47CFR15 Section 15.247

Measurement procedure used is KDB 558074 D01 v03r05 and ANSI C63.10:2013.

Application for Certification
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Applicant for this device:
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1. General Information

1.1 Administrative Information

Manufacturer:	Vitalerter LTD
Manufacturer's Address:	2 Ha-Yarden Airport City, 7019990 Israel Tel: +972775511194
Manufacturer's Representative:	Mor Raviv
Equipment Under Test (E.U.T):	Sensor
Equipment Model No.:	Vitals v2.0
Equipment Serial No.:	LA17050041
Date of Receipt of E.U.T:	August 27, 2017
Start of Test:	August 27, 2017
End of Test:	September 25, 2017
Test Laboratory Location:	I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 7120101
Test Specifications:	FCC Part 15, Subpart C, Section 15.247



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

The Vitalerter Vitals is a contact free medical device intended to provide continuous measurement and monitoring of patient vitals heart rate, respiration rate and body motion for preventive care analysis while patient is at rest or during sleep.

Model name	Vitals v2.0
Working voltage	3.7VDC Rechargeable battery operated via AC/DC adapter
Mode of operation	Transceiver
Modulations	For Wi-Fi/b: DSSS,CCK 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/b/g/n: 2412.0-2462.0MHz For BLE: 2402.0-2480.0MHz
Transmit power(conducted)	For Wi-Fi/b/g/n: ~18.0dBm For BLE: ~4.0dBm
Antenna Gain	1.9 dBi chip antenna
Modulation BW	For Wi-Fi/b/g/n: 20MHz For BLE: 2MHz
Bit rate (Mbit/s)	For Wi-Fi/b: 1, 2, 5.5, 11 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 v03r05 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 Power Lines (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 transceivers: IEEE 802.15.1 standard (BLE) and IEEE 802.11b/g/n standard (Wi-Fi/b/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 for charge mode as the “worst case”.
4. 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.
5. Final conducted/radiated emission for Wi-Fi b/g/n modes test were performed after finding 2 of the “worst case” for each different protocol type. The results are shown in the below table:

Protocol type	“worst case” bit rate
Wi-Fi/b	1,11 Mbit/s
Wi-Fi/g	6,54 Mbit/s
Wi-Fi/n	6.5,65 Mbit/s

6. Final Radiated emission test for spurious emission in restricted band was performed after exploratory emission testing that was performed in 3 orthogonal polarities to determine the “worst case” radiation.

7. According to results in the following table, the worst case for Wi-Fi mode was the X axis for all channels.

Orientation	Frequency	Fundamental	2 nd Harmonic	3 th Harmonic	Band Edge
	(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
X axis	2412.0	110.6	56.1	62.9	71.3
	2437.0	111.6	56.3	62.9	-
	2462.0	112.4	56.1	62.7	71.5
Y axis	2412.0	110.2	55.9	62.6	70.9
	2437.0	110.2	54.1	61.6	-
	2462.0	112.1	56.2	62.5	71.0
Z axis	2412.0	107.8	55.1	62.9	70.7
	2437.0	109.9	55.6	63.1	-
	2462.0	110.3	55.7	64.0	71.0

Figure 1. Screening Results Wi-Fi mode

8. For BLE, according to the below screening results the worst case was the X axis for the mid and high channels and the Y axis for the low channel.

Orientation	Frequency	Fundamental	2 nd Harmonic	3 th Harmonic	Band Edge
	(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
X axis	2402.0	101.7	54.5	64.8	72.3
	2440.0	101.3	54.8	65.3	-
	2480.0	100.3	54.4	65.4	71.5
Y axis	2402.0	103.2	55.0	64.8	73.5
	2440.0	100.9	54.5	65.1	-
	2480.0	98.8	54.2	64.8	70.0
Z axis	2402.0	101.9	54.6	64.6	72.4
	2440.0	101.1	54.6	65.2	-
	2480.0	98.6	54.2	65.0	70.3

Figure 2. Screening Results BLE mode

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

AC/DC adapter manufactured by: MEAN WELL ENTERPRISES.LTD.

Model no.: GSM40A05

S/N: EB4AA11258

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

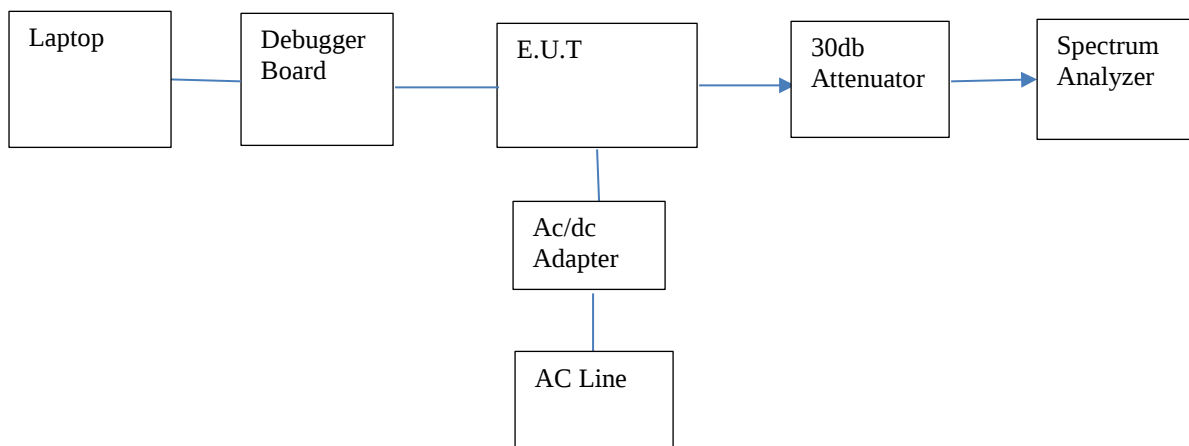


Figure 3. Configuration of Tested System Conducted

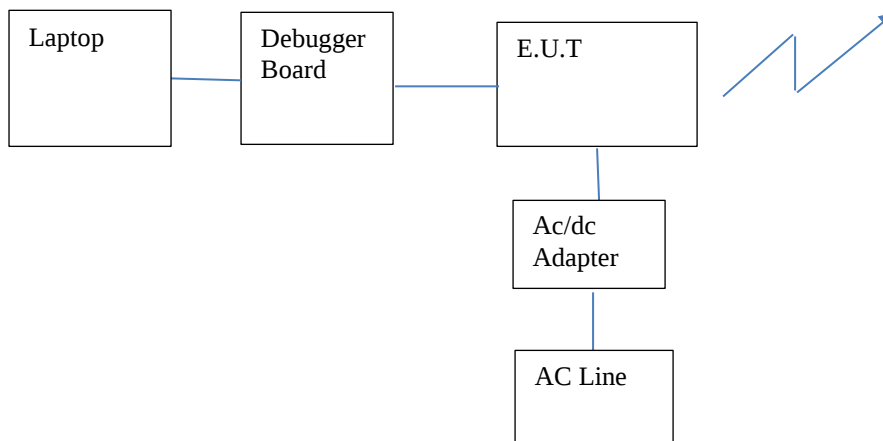


Figure 4. Configuration of Tested System Radiated

3. Conducted & Radiated Measurement Test Set-Up Photos



Figure 5. Conducted Emission from AC Mains Test

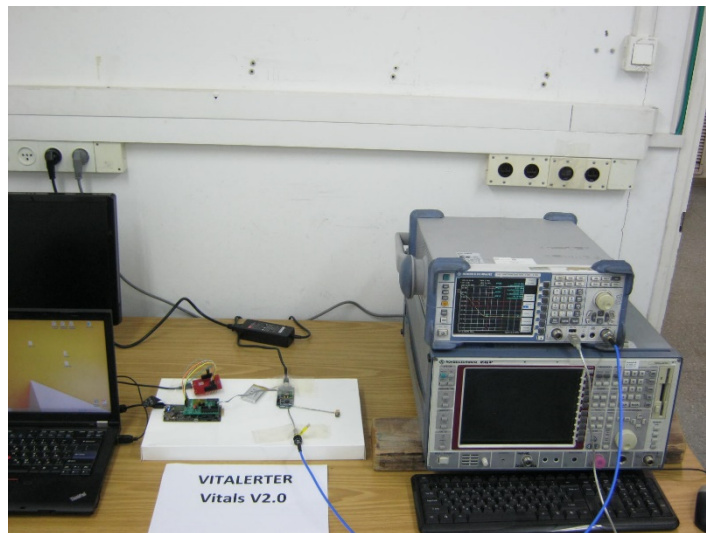


Figure 6. Conducted Emission From Antenna Ports Test



Figure 7. Radiated Emission Test, 0.009-30MHz



Figure 8. Radiated Emission Test, 30-200MHz



Figure 9. Radiated Emission Test, 200-1000MHz



Figure 10. Radiated Emission Test 1-18GHz

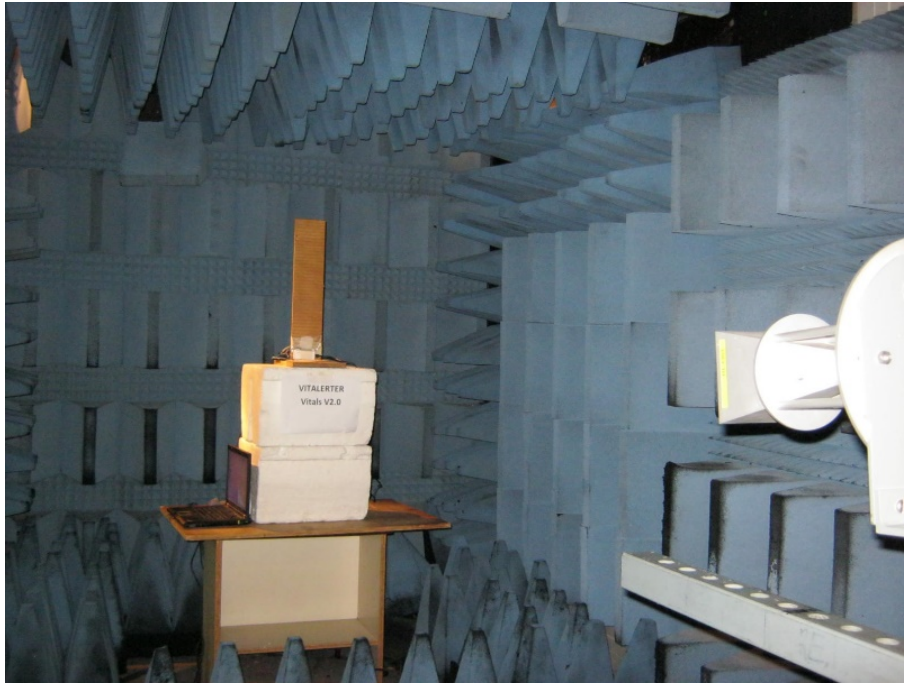


Figure 11. Radiated Emission Test 18-25GHz

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 (63%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 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 while transmitting Wi-Fi and BLE simultaneously.

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 4.51 dB

The margin between the emission levels and the specification limit is, in the worst case, 8.2 dB for the phase line at 0.42 MHz and 8.7 dB at 0.43 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 12* to *Figure 15*.

Conducted Emission

E.U.T Description Sensor
Type Vitals v2.0
Serial Number: LA17050041

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 dBuV	DELTA	LIMIT dB
1 Quasi Peak	150 kHz	49.29	-16.70	
2 Average	154 kHz	42.88	-12.90	
1 Quasi Peak	422 kHz	46.84	-10.56	
2 Average	422 kHz	39.20	-8.20	
1 Quasi Peak	434 kHz	44.07	-13.10	
2 Average	722 kHz	33.83	-12.16	
1 Quasi Peak	954 kHz	40.70	-15.29	
2 Average	1.006 MHz	32.92	-13.08	
1 Quasi Peak	1.826 MHz	39.38	-16.61	
2 Average	1.87 MHz	33.86	-12.13	
2 Average	2.758 MHz	31.50	-14.49	
1 Quasi Peak	2.942 MHz	45.53	-10.46	
1 Quasi Peak	3.726 MHz	39.03	-16.96	
2 Average	3.79 MHz	31.67	-14.33	
1 Quasi Peak	10.31 MHz	40.55	-19.44	
2 Average	10.354 MHz	35.21	-14.78	
1 Quasi Peak	11.138 MHz	42.68	-17.31	
2 Average	11.318 MHz	37.11	-12.89	
2 Average	18.182 MHz	21.21	-28.78	
1 Quasi Peak	26.278 MHz	26.42	-33.57	

Date: 30.AUG.2017 15:16:33

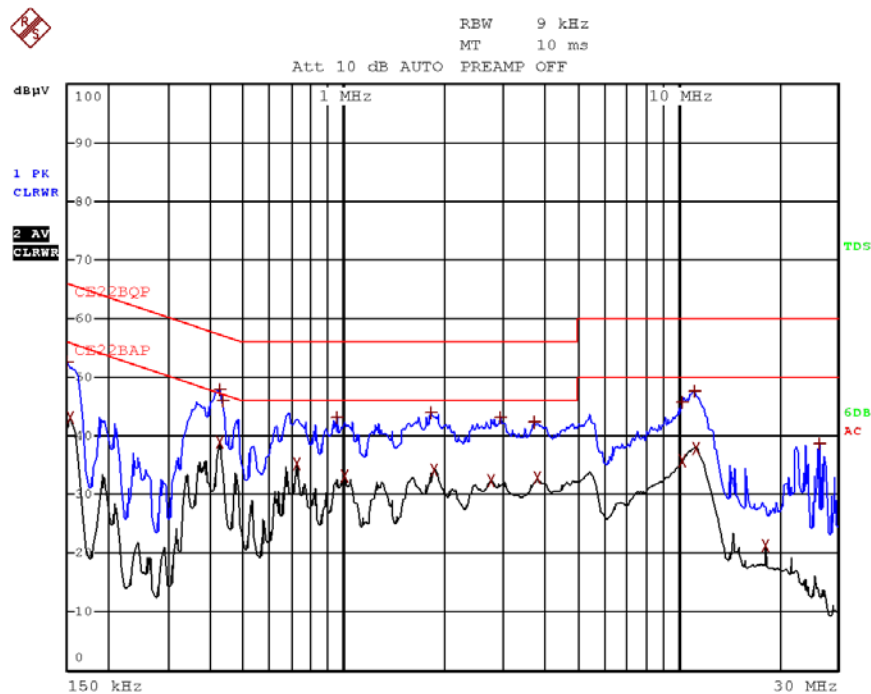
Figure 12. Detectors: Peak, Quasi-peak, Average

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 Sensor
Type Vitals v2.0
Serial Number: LA17050041

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



Date: 30.AUG.2017 15:10:41

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

Conducted Emission

E.U.T Description Sensor
Type Vitals v2.0
Serial Number: LA17050041

Specification: FCC Part 15, Subpart C
Lead: Neutral
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	154 kHz	48.98	-16.79
2 Average	158 kHz	40.23	-15.33
1 Quasi Peak	418 kHz	46.92	-10.56
2 Average	426 kHz	38.63	-8.69
1 Quasi Peak	434 kHz	44.09	-13.07
2 Average	478 kHz	33.98	-12.38
1 Quasi Peak	742 kHz	41.54	-14.45
2 Average	1.006 MHz	32.99	-13.00
1 Quasi Peak	1.778 MHz	38.47	-17.52
2 Average	1.854 MHz	33.77	-12.22
2 Average	2.702 MHz	31.91	-14.08
1 Quasi Peak	2.974 MHz	37.71	-18.28
2 Average	3.938 MHz	31.68	-14.31
1 Quasi Peak	4.69 MHz	36.66	-19.33
1 Quasi Peak	10.318 MHz	40.61	-19.39
2 Average	10.358 MHz	35.26	-14.73
2 Average	11.098 MHz	36.88	-13.11
1 Quasi Peak	11.358 MHz	42.27	-17.72
2 Average	18.182 MHz	21.33	-28.66
1 Quasi Peak	24.002 MHz	33.76	-26.23

Date: 30.AUG.2017 15:25:30

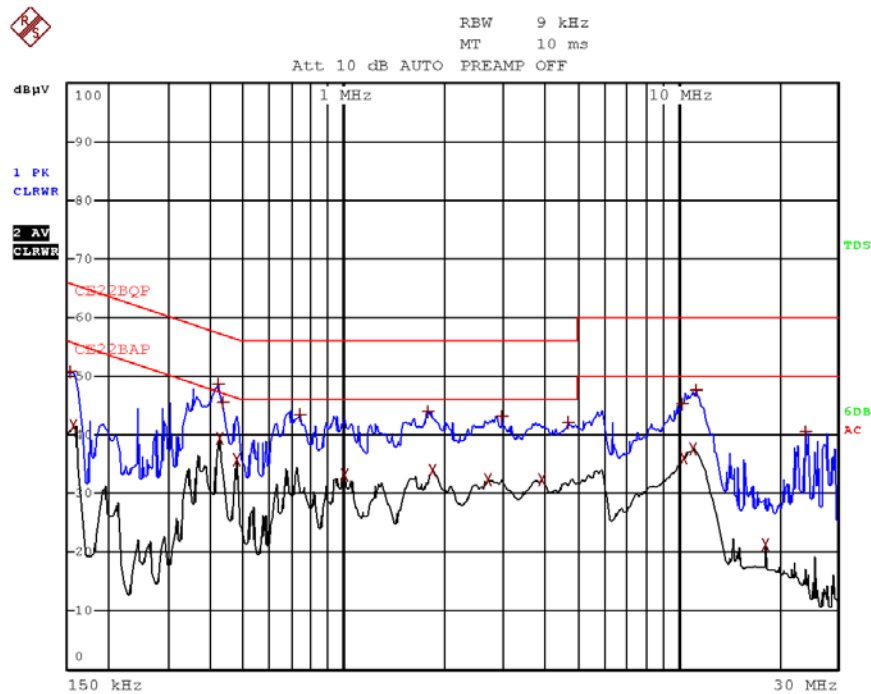
Figure 14. Detectors: Peak, Quasi-peak, Average

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 Sensor
Type Vitals v2.0
Serial Number: LA17050041

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



Date: 30.AUG.2017 15:23:09

Figure 15 Detectors: Peak, Quasi-peak, Average



4.5 *Test Equipment Used; Conducted Emission*

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
LISN	Fischer	FCC-LISN-25A	127	July 20, 2017	July 20, 2018
Transient Limiter	HP	11947A	3107A03041	June 29, 2017	June 29, 2018
EMI Receiver	Rohde & Schwarz	ESCI7	100724	February 28, 2017	February 28, 2018

Figure 16 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 (23°C)/ Humidity (70%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 (total loss=32.0 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	Reading	Limit
	(MHz)	(kHz)	(kHz)
BLE	2402.0	838.0	>500.0
	2440.0	878.0	>500.0
	2480.0	778.0	>500.0
Wi-fi/b(1Mbit/s)	2412.0	9,099.0	>500.0
	2437.0	8,368.0	>500.0
	2462.0	8,463.0	>500.0
Wi-fi/b(11Mbit/s)	2412.0	10,074.0	>500.0
	2437.0	10,155.0	>500.0
	2462.0	8,942.0	>500.0
Wi-fi/g(6Mbit/s)	2412.0	15,376.0	>500.0
	2437.0	15,273.0	>500.0
	2462.0	15,010.0	>500.0
Wi-fi/g(54Mbit/s)	2412.0	16,269.0	>500.0
	2437.0	16,491.0	>500.0
	2462.0	16,447.0	>500.0
Wi-fi/n(6.5Mbit/s)	2412.0	15,213.0	>500.0
	2437.0	15,110.0	>500.0
	2462.0	14,930.0	>500.0
Wi-fi/n(65Mbit/s)	2412.0	17,731.0	>500.0
	2437.0	17,710.0	>500.0
	2462.0	17,645.0	>500.0

Figure 17 6 dB Minimum Bandwidth

JUDGEMENT: Passed

For additional information see *Figure 18 to Figure 38*.

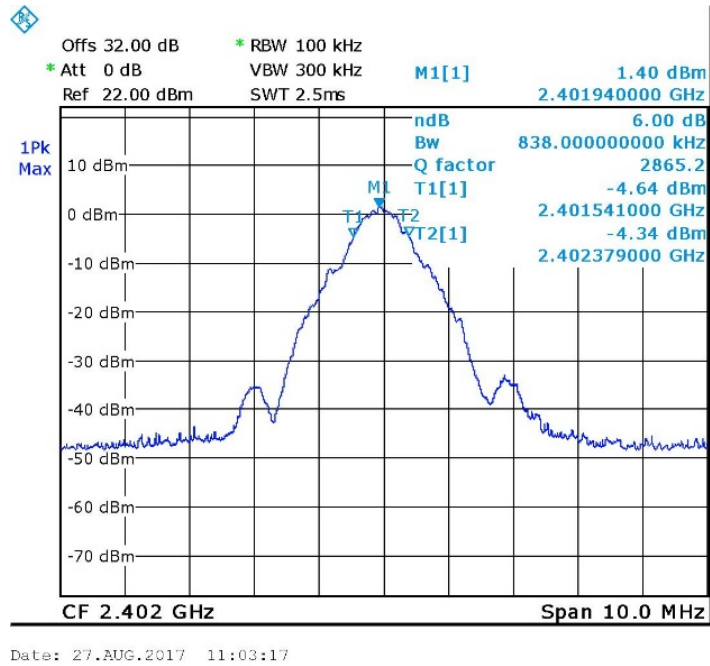


Figure 18. 2402.0 MHz, BLE

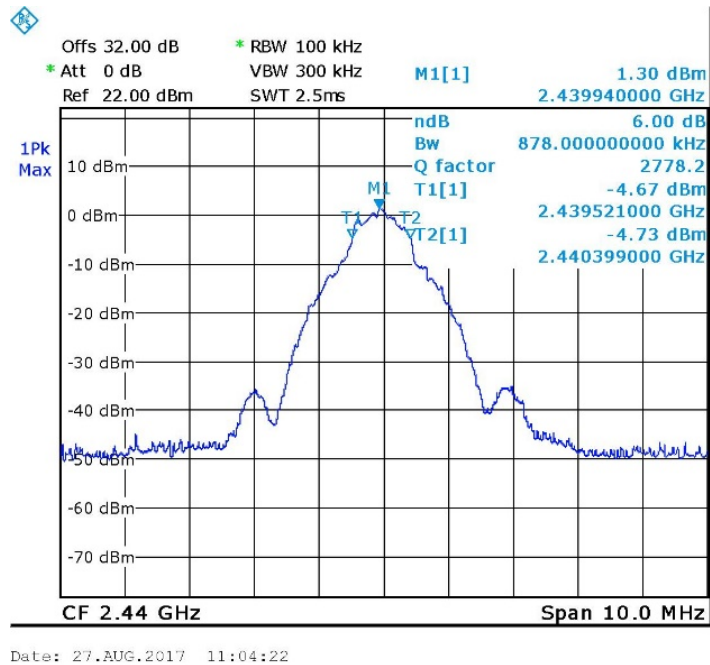


Figure 19. 2440.0 MHz, BLE

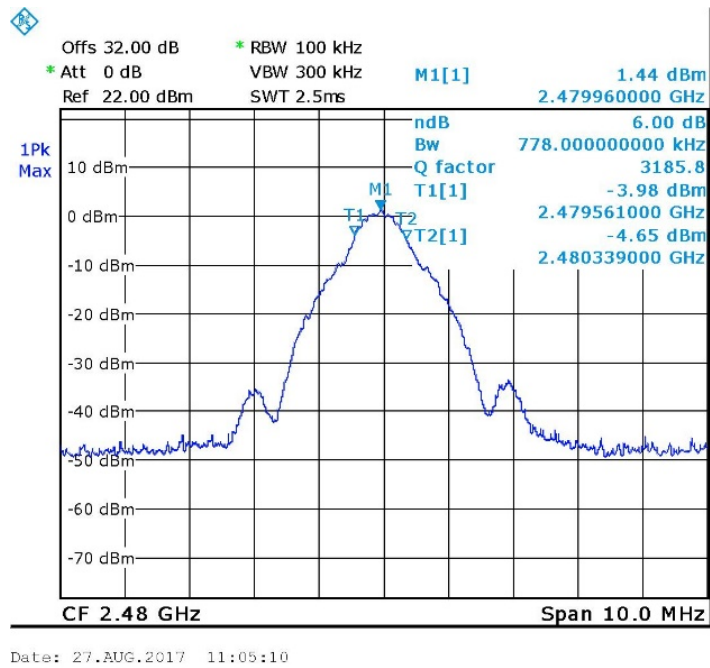


Figure 20. 2480.0 MHz, BLE

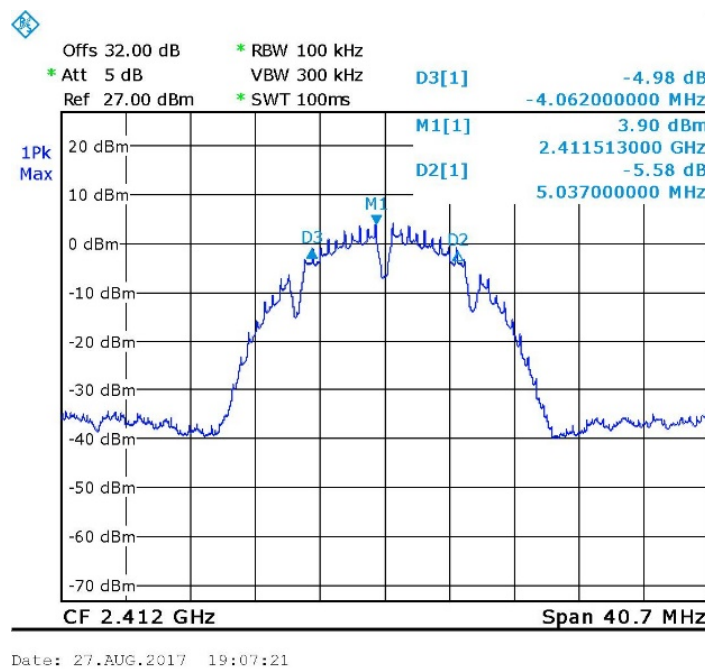


Figure 21. 2412.0 MHz, Wi-fi/b(1Mbit/s)

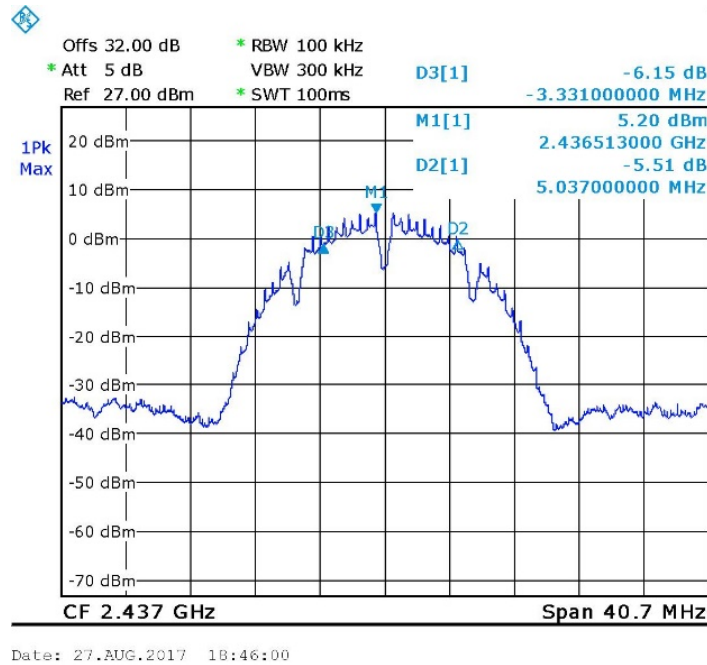


Figure 22. 2437.0 MHz, Wi-fi/b(1Mbit/s)

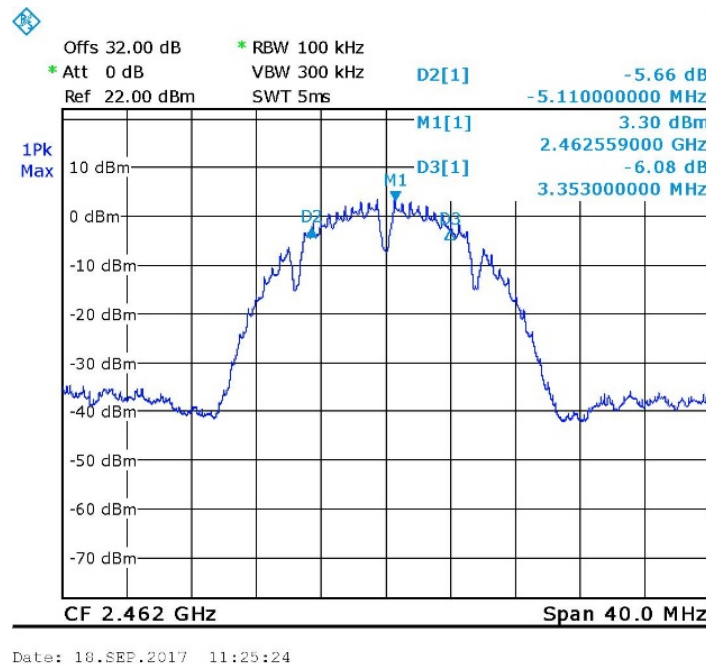


Figure 23. 2462.0 MHz, Wi-fi/b(1Mbit/s)

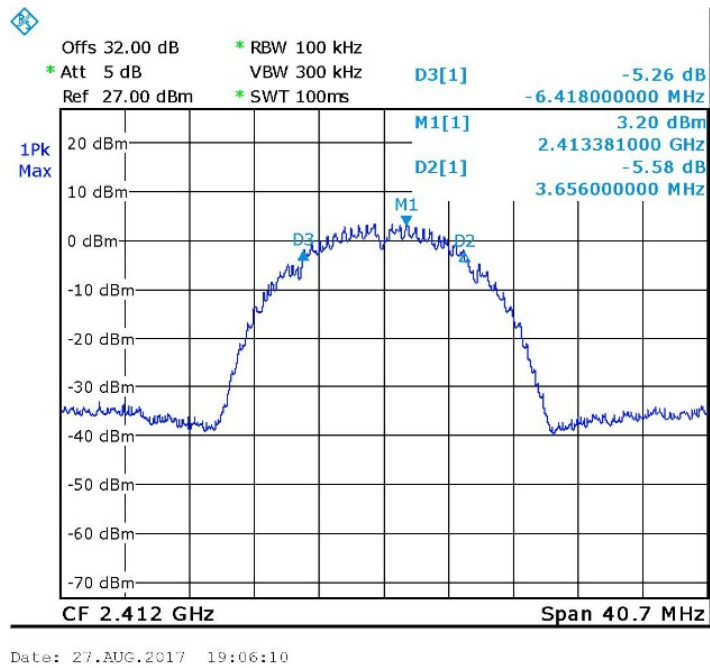


Figure 24. 2412.0 MHz, Wi-fi/b(11Mbit/s)

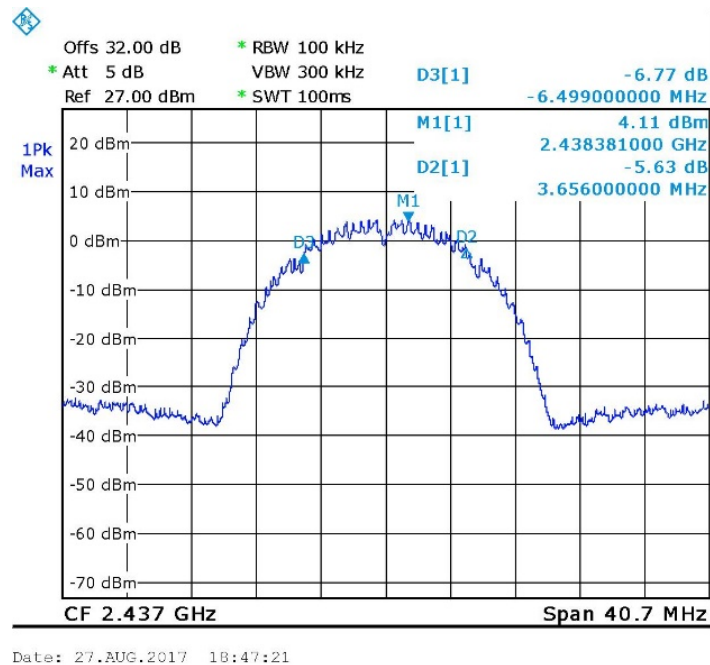


Figure 25. 2437.0 MHz, Wi-fi/b(11Mbit/s)

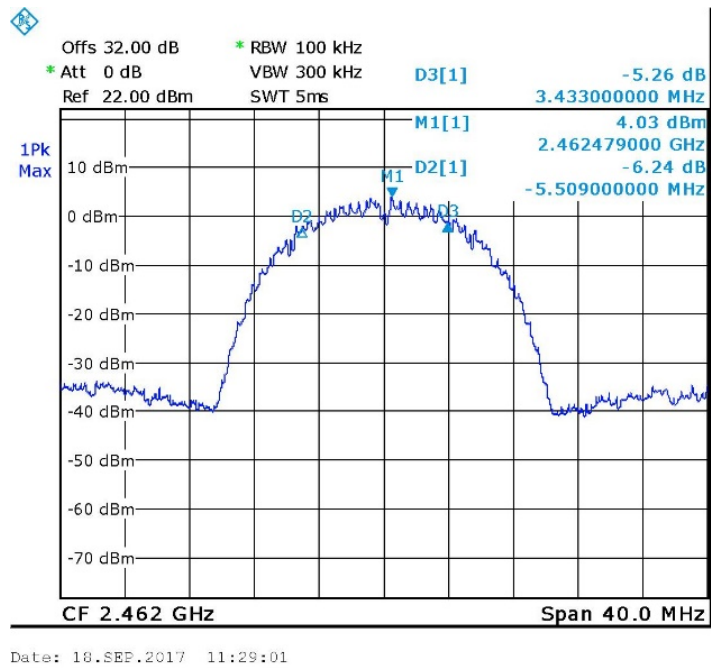


Figure 26. 2462.0 MHz, Wi-fi/b(11Mbit/s)

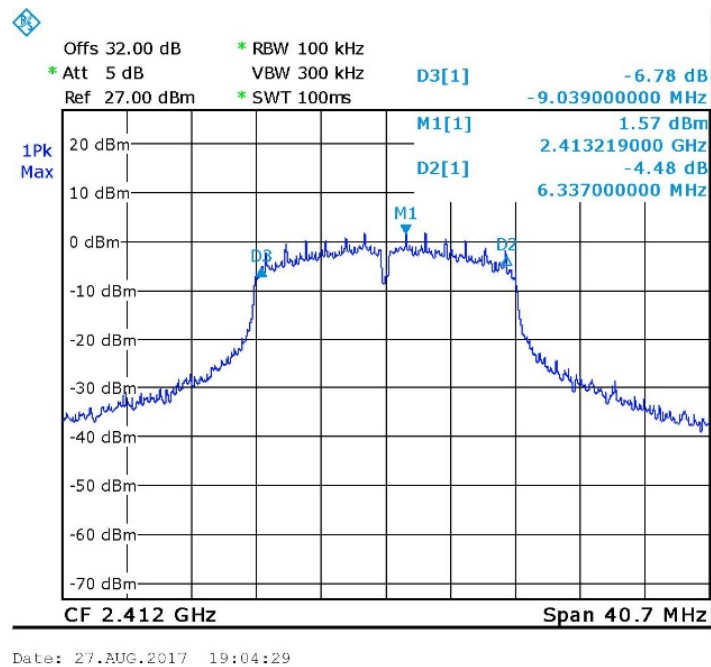


Figure 27. 2412.0 MHz, Wi-fi/g(6Mbit/s)

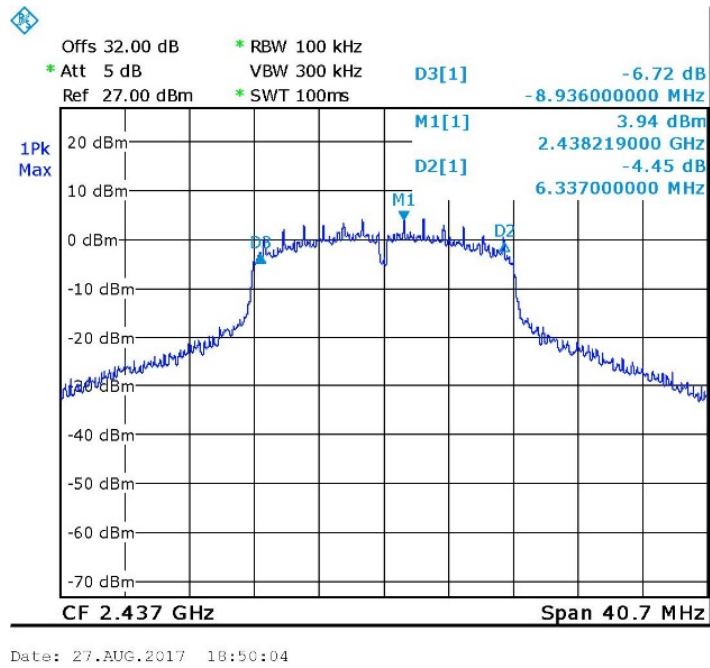


Figure 28. 2437.0 MHz, Wi-fi/g(6Mbit/s)

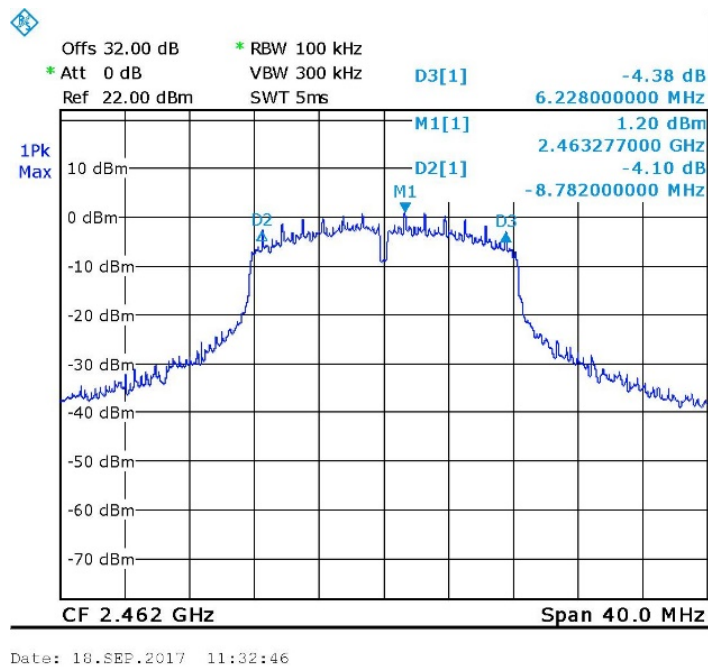


Figure 29. 2462.0 MHz, Wi-fi/g(6Mbit/s)

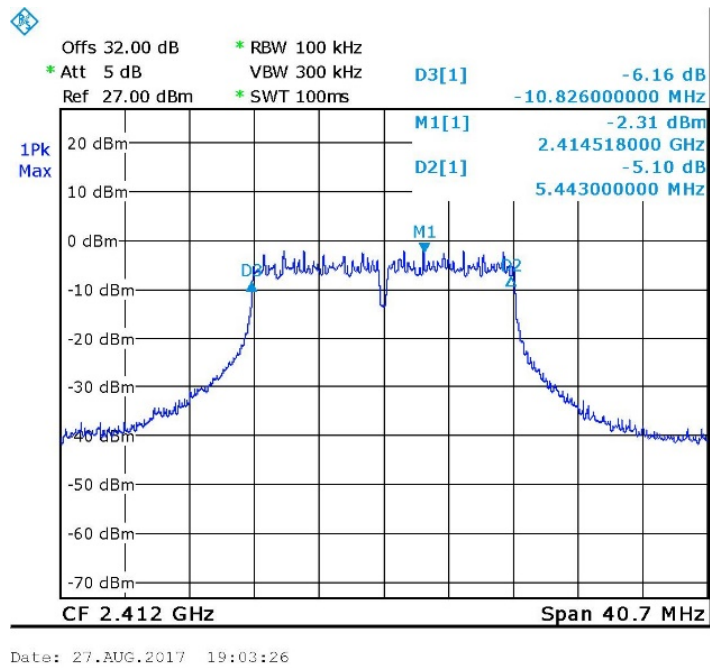


Figure 30. 2412.0 MHz, Wi-fi/g(54Mbit/s)

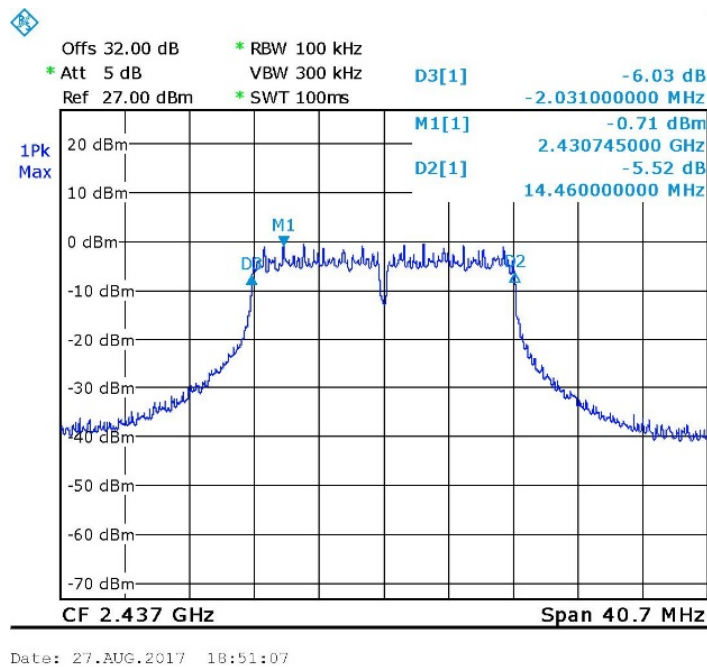


Figure 31. 2437.0 MHz, Wi-fi/g(54Mbit/s)

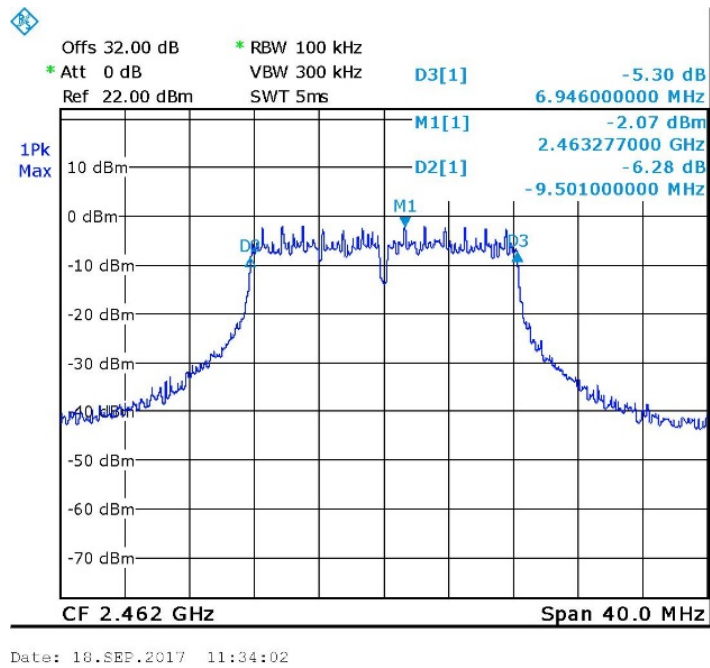


Figure 32. 2462.0 MHz, Wi-fi/g(54Mbit/s)

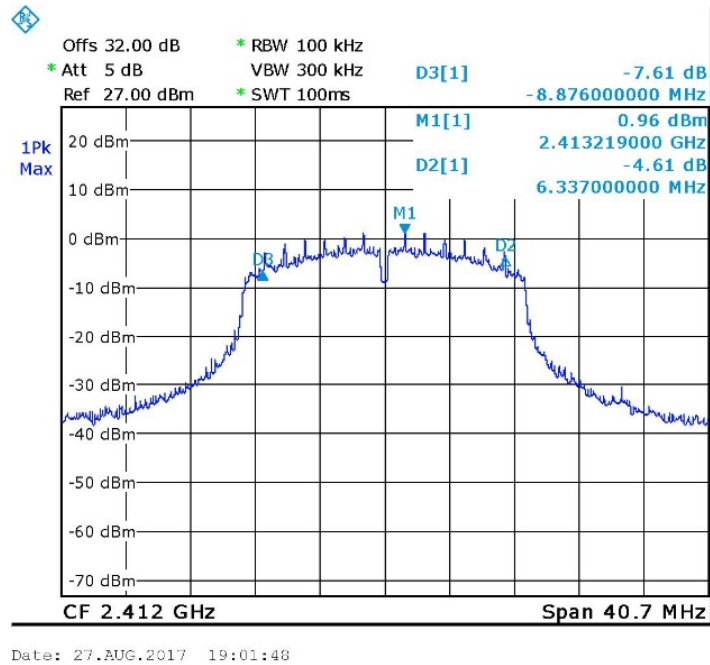


Figure 33. 2412.0 MHz, Wi-fi/n(6.5Mbit/s)

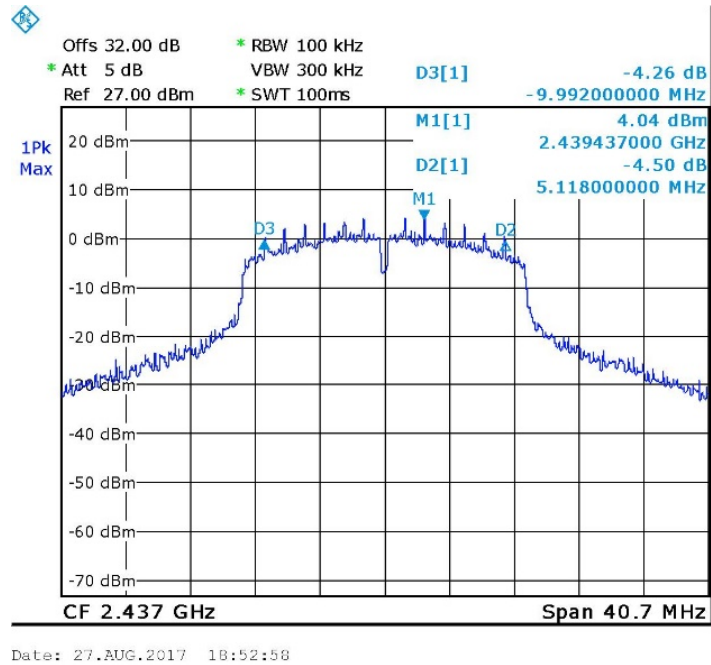


Figure 34. 2437.0 MHz, Wi-fi/n(6.5Mbit/s)

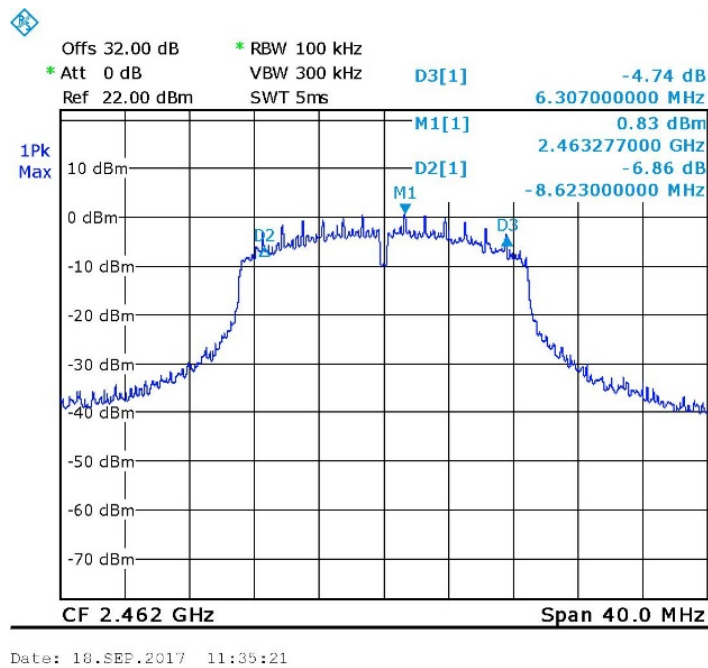


Figure 35. 2462.0 MHz, Wi-fi/n(6.5Mbit/s)

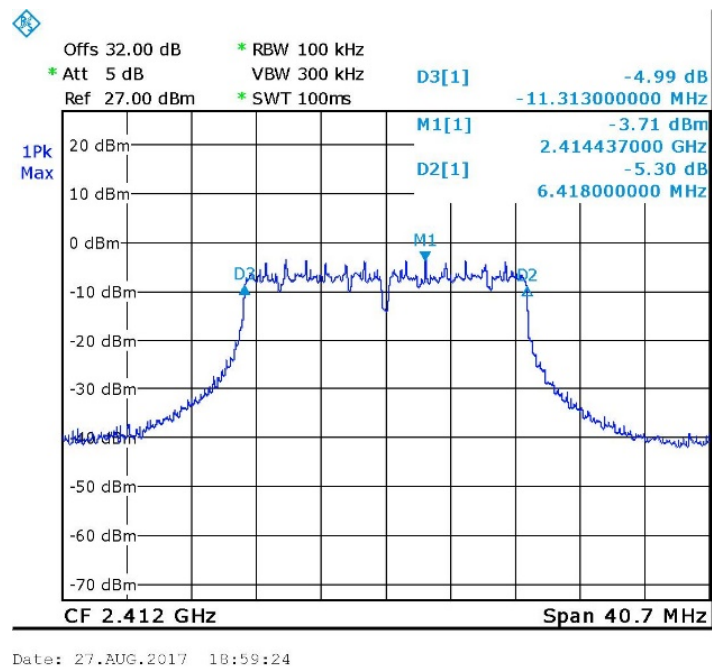


Figure 36. 2412.0 MHz, Wi-fi/n(65Mbit/s)

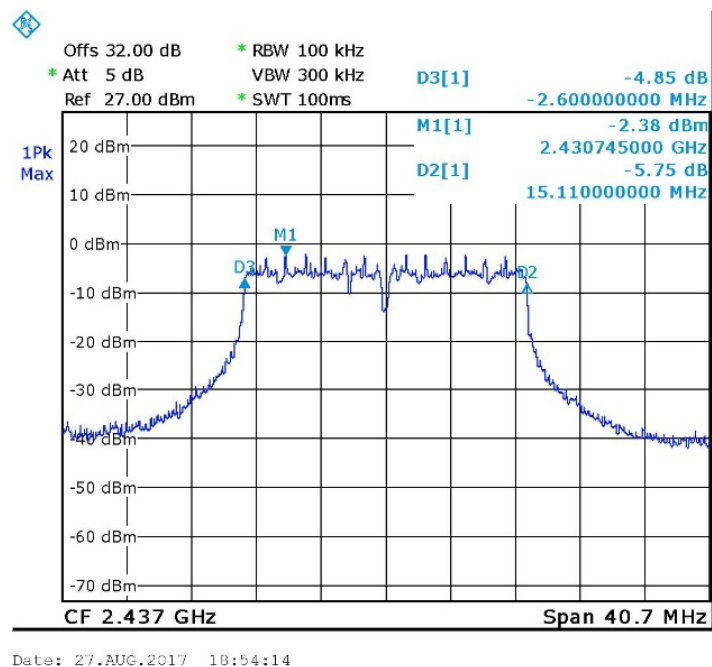


Figure 37. 2437.0 MHz, Wi-fi/n(65Mbit/s)

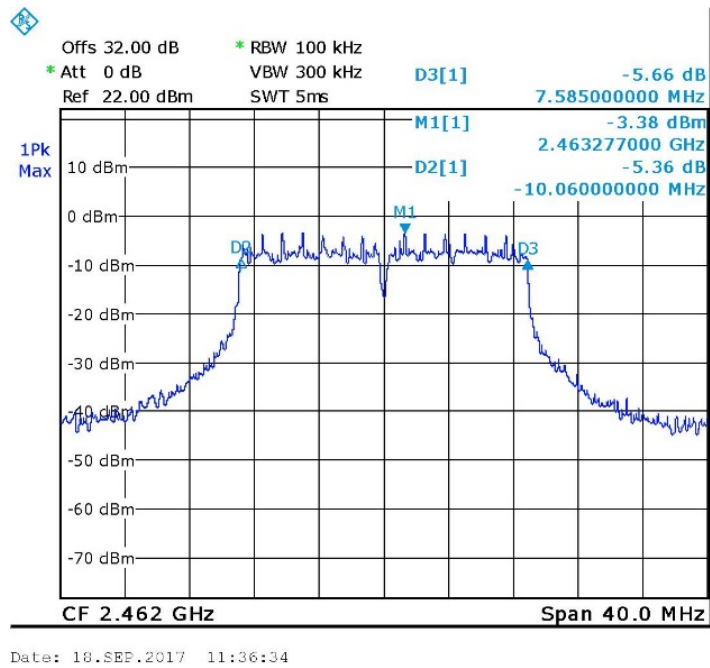


Figure 38. 2462.0 MHz, Wi-fi/n(65Mbit/s)

5.5 Test Equipment Used; 6dB Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	March 2, 2017	March 2, 2018
30dB Attenuator	MCL	BW-S30W5	533	July 31, 2017	July 31, 2018

Figure 39 Test Equipment Used

6. Maximum Transmitted Peak Power Output

6.1 Test Specification

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

6.2 Test Procedure

(Temperature (23°C)/ Humidity (70%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 (total loss=32.0 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

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 5725-5850MHz bands: 1 Watt.

6.4 Test Results

Protocol Type	Operation Frequency	Power	Power	Limit	Margin
	(MHz)	(dBm)	(mW)	(mW)	(mW)
BLE	2402.0	3.2	2.09	1000.0	-997.91
	2440.0	2.8	1.91	1000.0	-998.09
	2480.0	2.8	1.91	1000.0	-998.09
Wi-fi/b(1Mbit/s)	2412.0	16.8	47.9	1000.0	-952.1
	2437.0	18.0	63.1	1000.0	-936.9
	2462.0	17.9	61.7	1000.0	-938.3
Wi-fi/b(11Mbit/s)	2412.0	19.8	95.5	1000.0	-904.5
	2437.0	21.0	126.0	1000.0	-874.0
	2462.0	20.3	107.0	1000.0	-893.0
Wi-fi/g(6Mbit/s)	2412.0	19.1	81.3	1000.0	-918.7
	2437.0	21.7	148.0	1000.0	-852.0
	2462.0	19.0	79.4	1000.0	-920.6
Wi-fi/g(54Mbit/s)	2412.0	16.0	39.8	1000.0	-960.2
	2437.0	18.1	64.6	1000.0	-935.4
	2462.0	16.0	39.8	1000.0	-960.2
Wi-fi/n(6.5Mbit/s)	2412.0	18.3	67.6	1000.0	-932.4
	2437.0	21.3	135.0	1000.0	-865.0
	2462.0	18.3	67.6	1000.0	-932.4
Wi-fi/n(65Mbit/s)	2412.0	14.4	27.5	1000.0	-972.5
	2437.0	16.6	45.7	1000.0	-954.3
	2462.0	16.8	47.9	1000.0	-952.1

Figure 40 Maximum Peak Power Output

JUDGEMENT: Passed by 852.0 mW

For additional information see *Figure 41* to *Figure 61*.

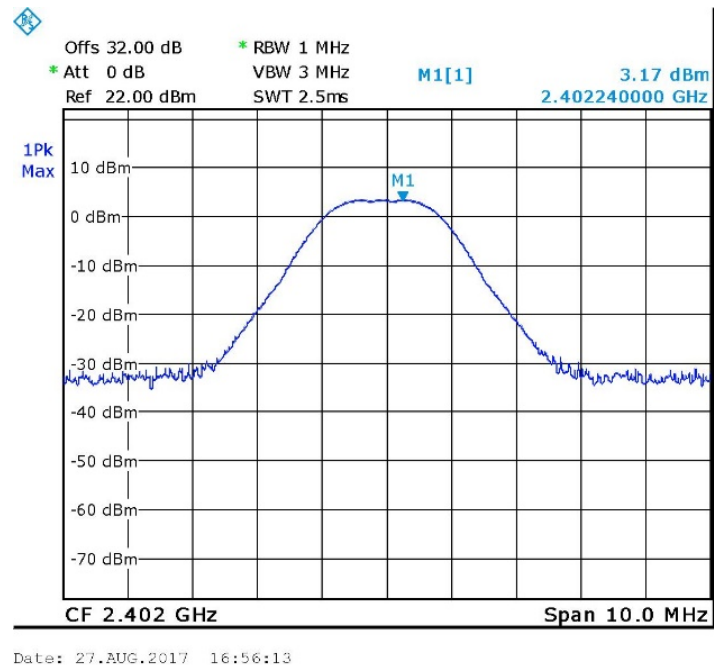


Figure 41 2402.0 MHz, BLE

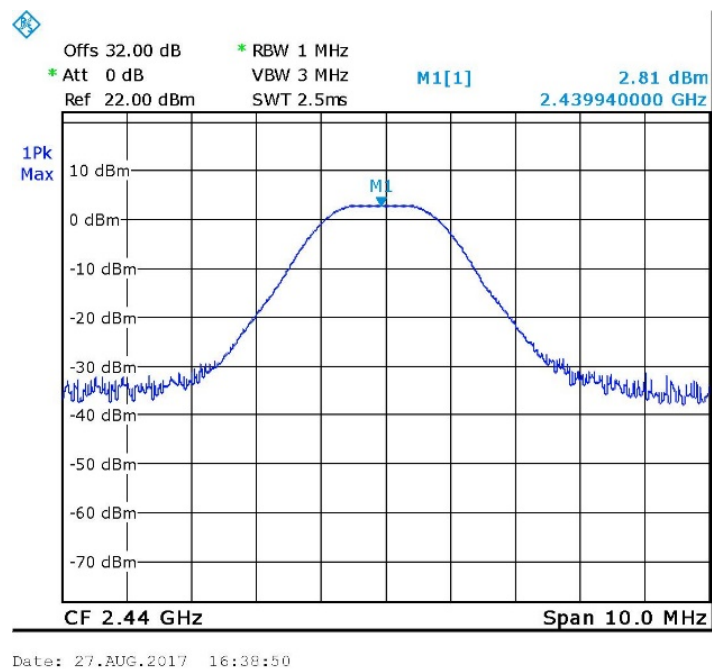


Figure 42 2440.0 MHz, BLE

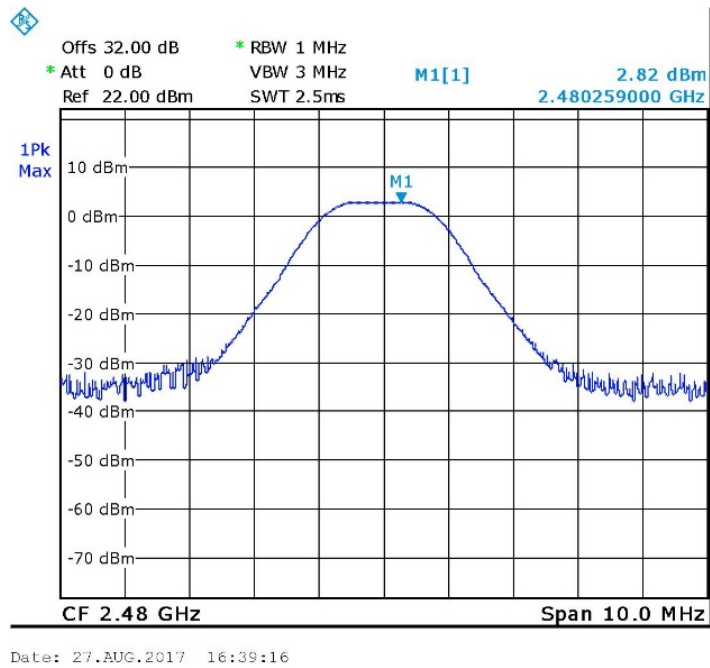


Figure 43 2480.0 MHz, BLE

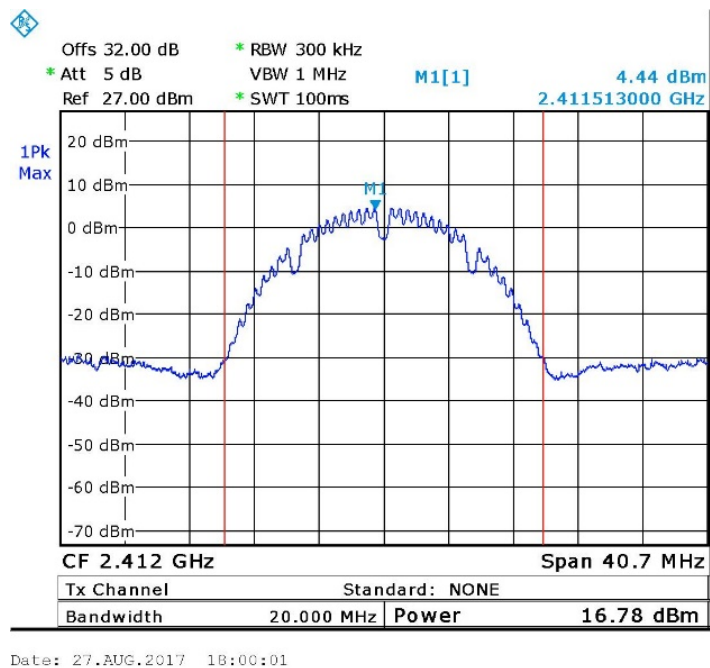


Figure 44 2412.0 MHz, WI-FI/b(1Mbit/s)

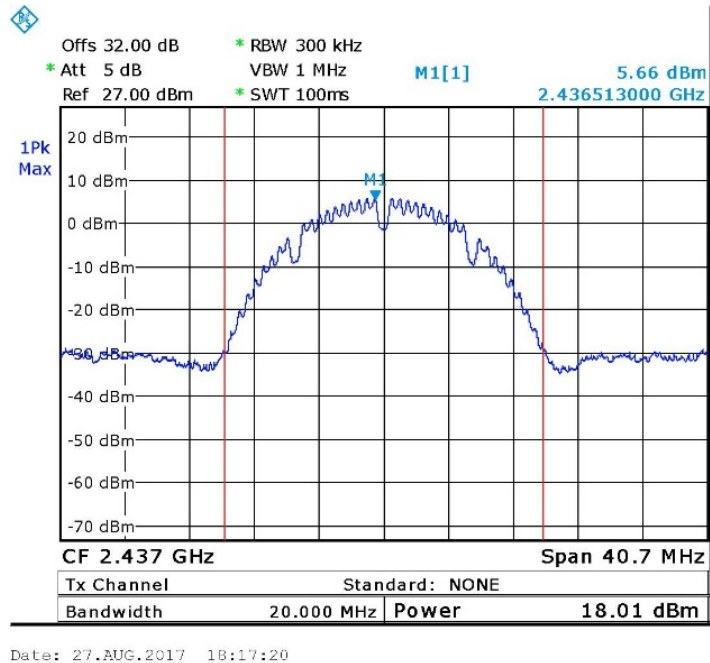


Figure 45 2437.0 MHz, WI-FI/b(1Mbit/s)

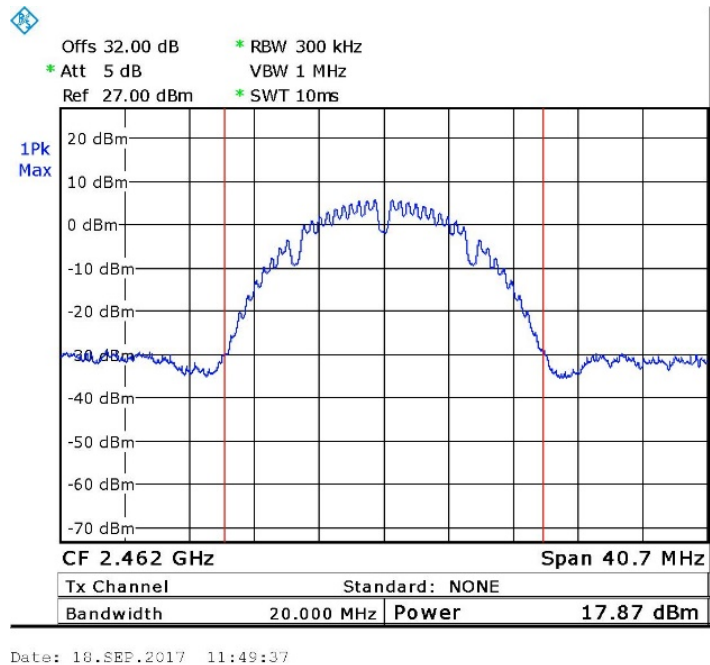


Figure 46 2462.0 MHz, WI-FI/b(1Mbit/s)

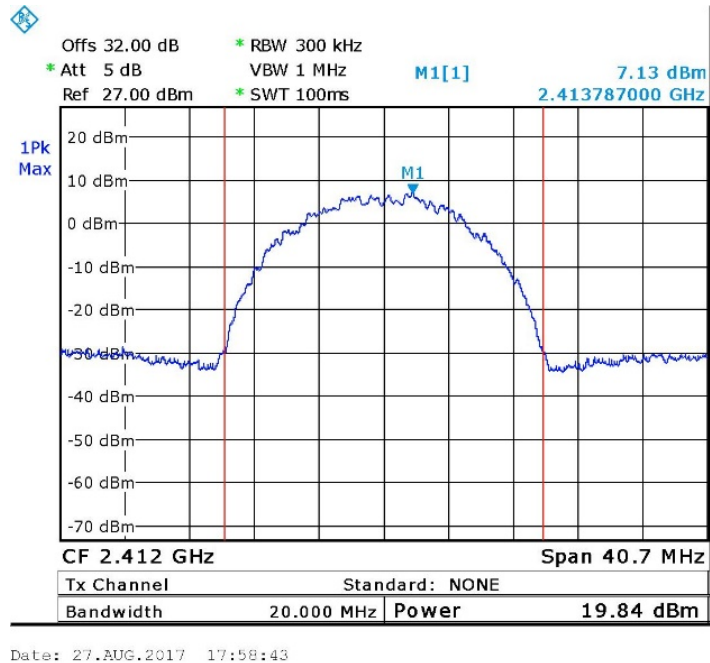


Figure 47 2412.0 MHz, WI-FI/b(11Mbit/s)

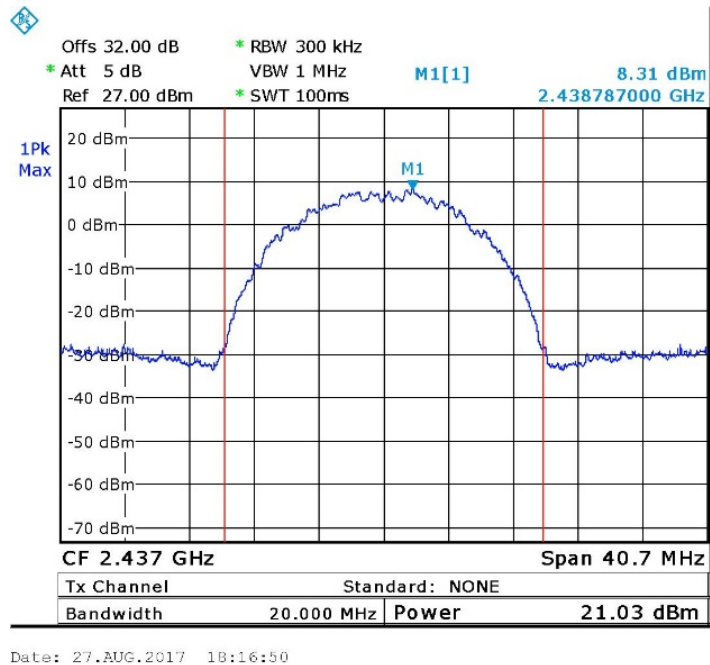


Figure 48 2437.0 MHz, WI-FI/b(11Mbit/s)

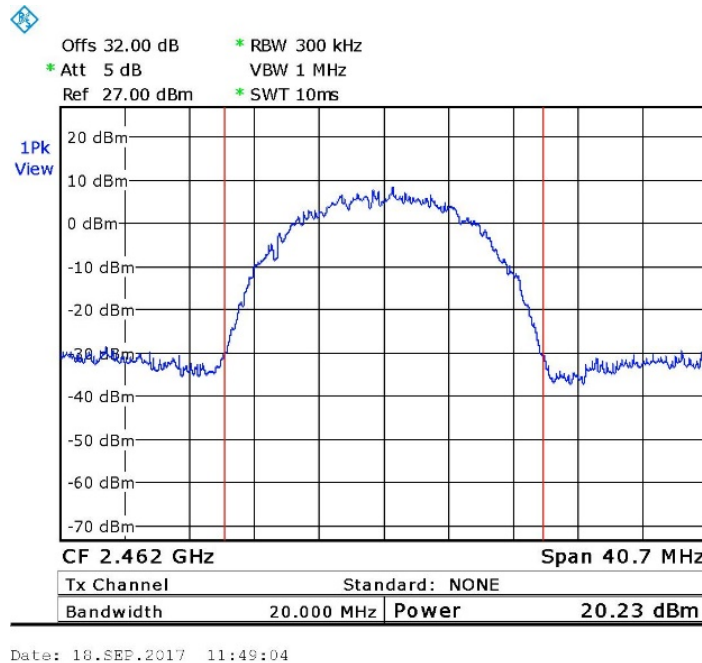


Figure 49 2462.0 MHz, WI-FI/b(11Mbit/s)

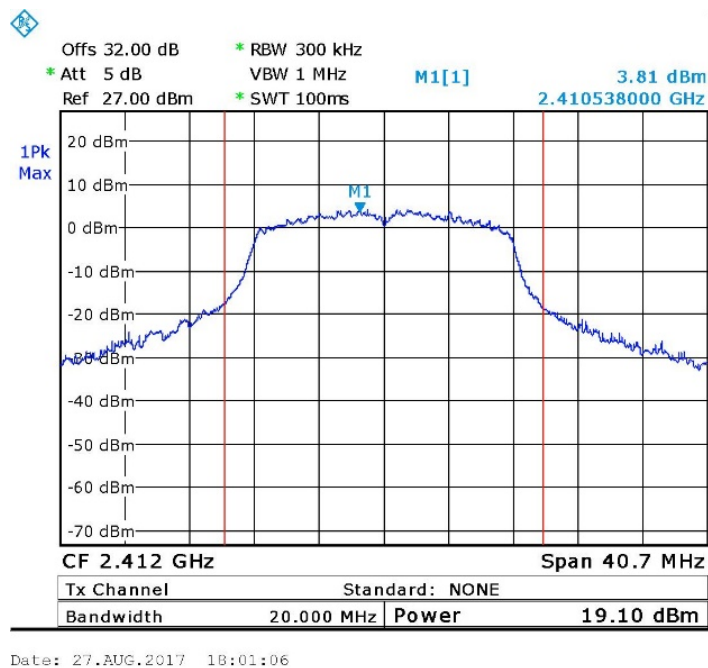


Figure 50 2412.0 MHz, WI-FI/g(6Mbit/s)

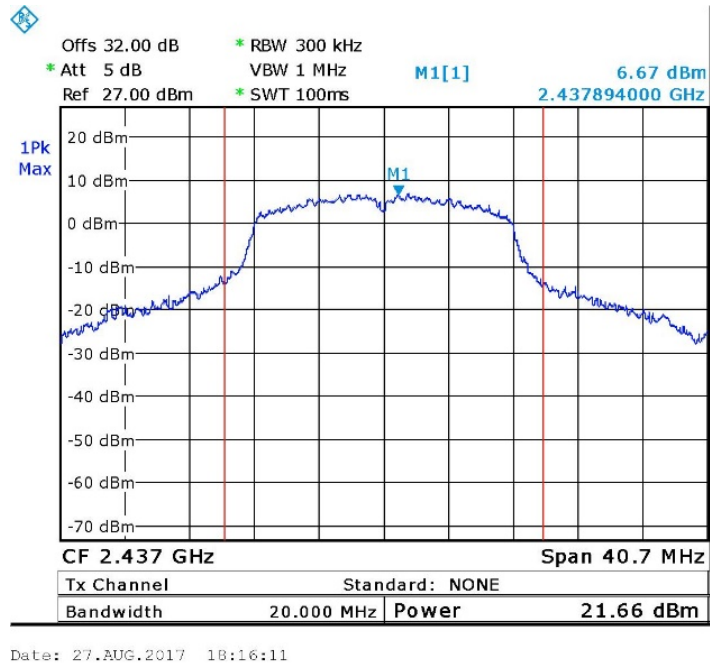


Figure 51 2437.0 MHz, WI-FI/g(6Mbit/s)

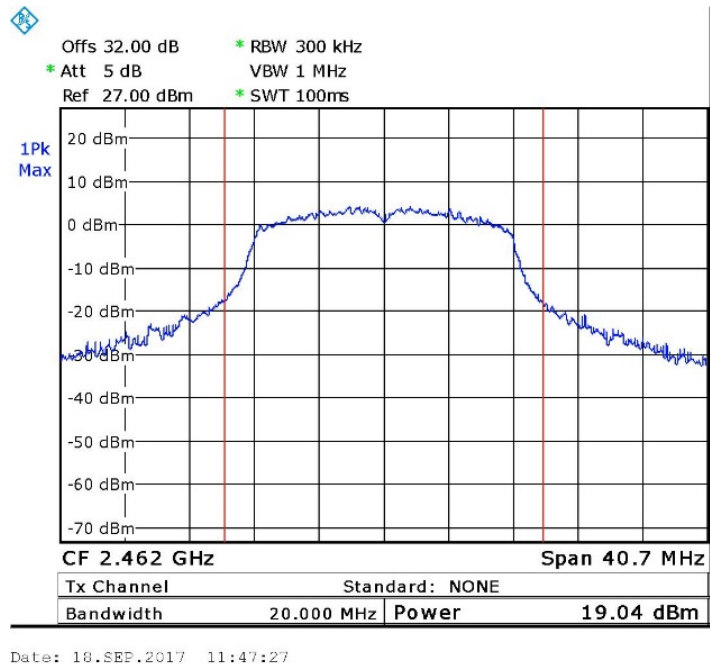


Figure 52 2462.0 MHz, WI-FI/g(6Mbit/s)

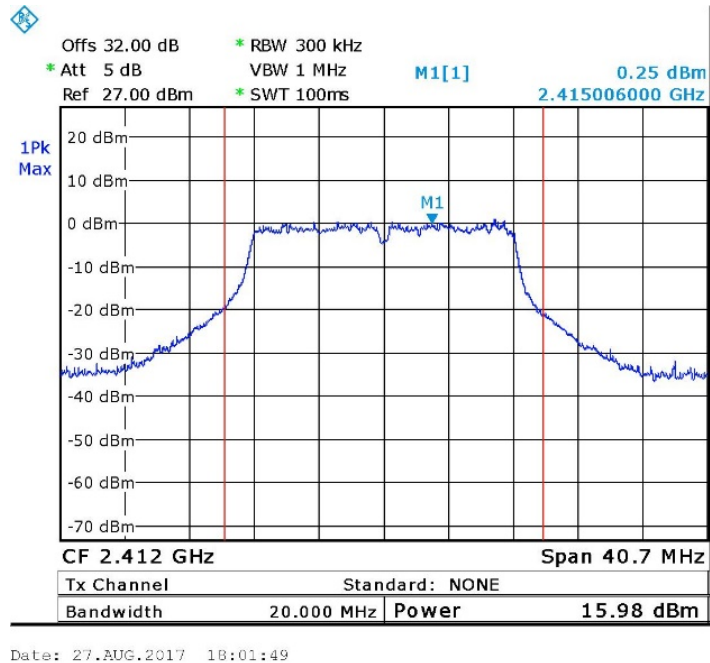


Figure 53 2412.0 MHz, WI-FI/g(54Mbit/s)

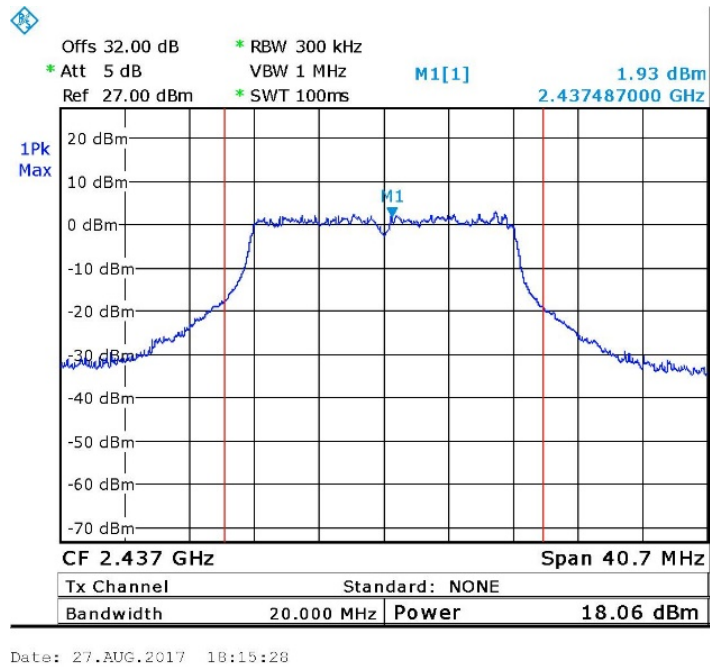


Figure 54 2437.0 MHz, WI-FI/g(54Mbit/s)

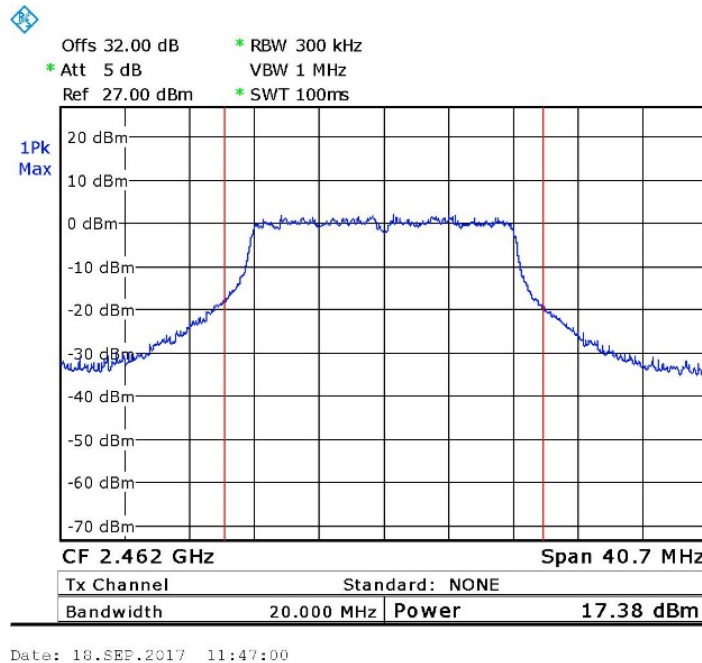


Figure 55 2462.0 MHz, WI-FI/g(54Mbit/s)

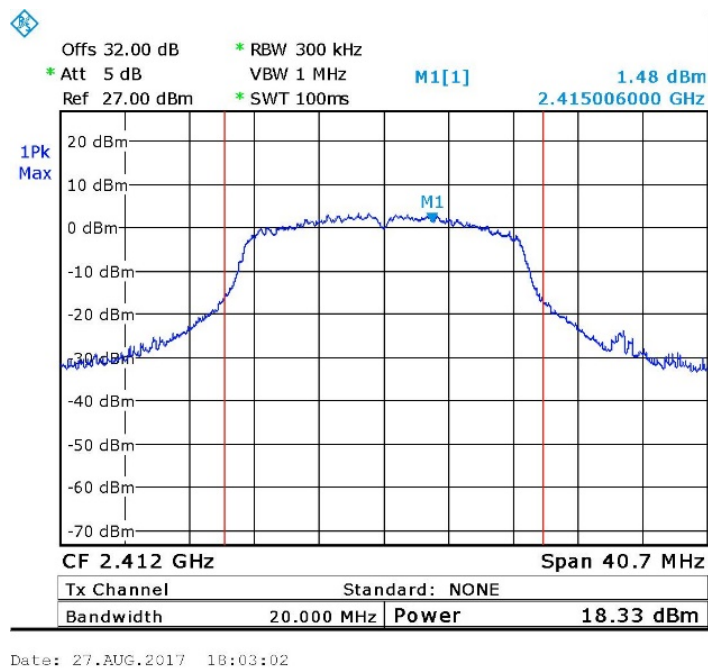
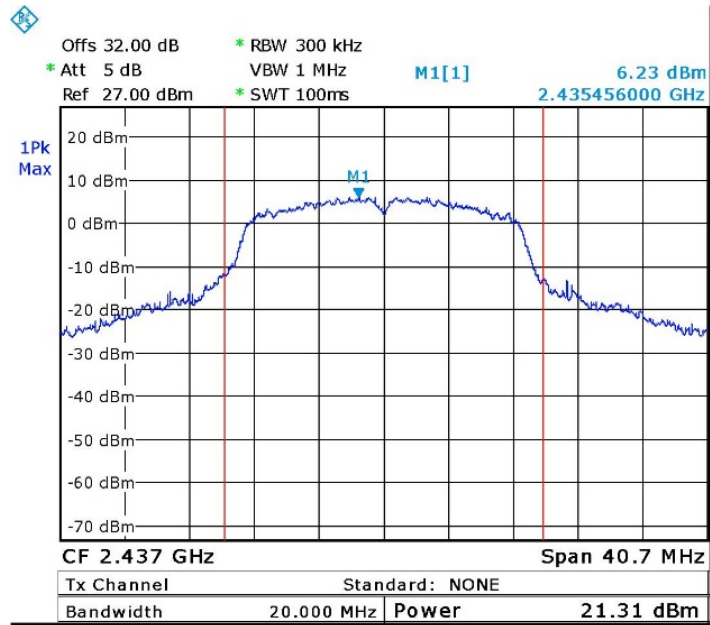
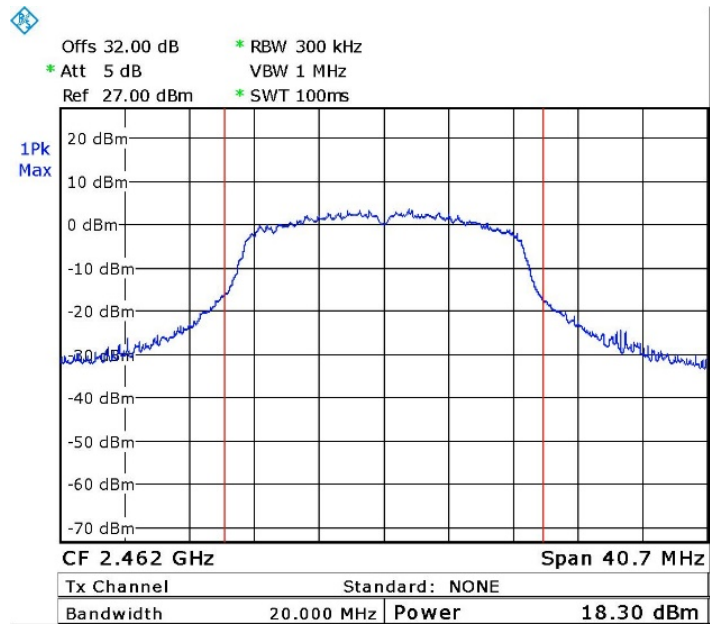


Figure 56 2412.0 MHz, WI-FI/n(6.5Mbit/s)



Date: 27.AUG.2017 18:14:36

Figure 57 2437.0 MHz, WI-FI/n(6.5Mbit/s)



Date: 18.SEP.2017 11:46:26

Figure 58 2462.0 MHz, WI-FI/n(6.5Mbit/s)

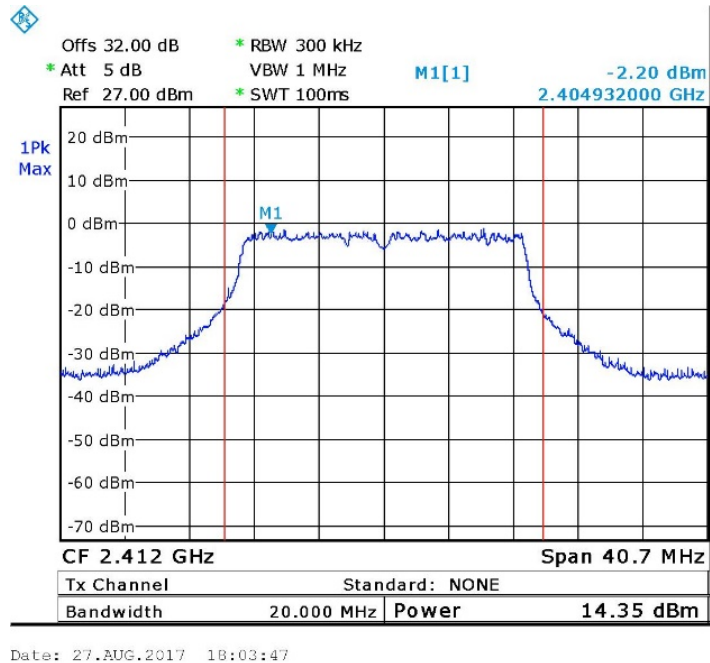


Figure 59 2412.0 MHz, WI-FI/n(65Mbit/s)

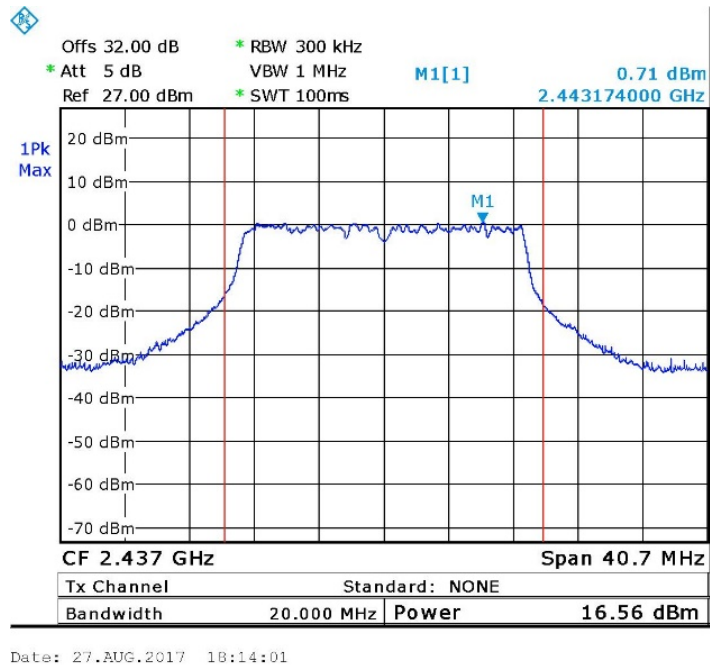


Figure 60 2437.0 MHz, WI-FI/n(65Mbit/s)

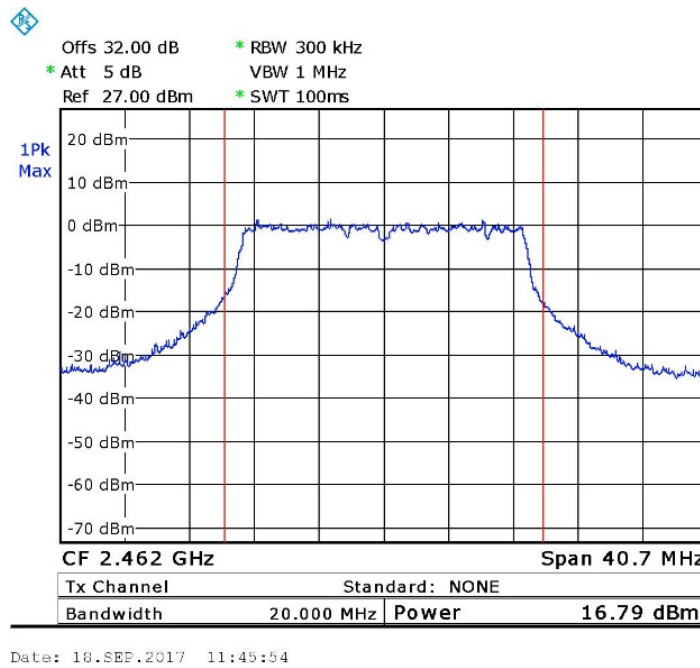


Figure 61 2462.0 MHz, WI-FI/n(65Mbit/s)

6.5 Test Equipment Used; Maximum Peak Power Output

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Spectrum Analyzer	R&S	FSL6	100194	March 2, 2017	March 2, 2018
30dB Attenuator	MCL	BW-S30W5	533	July 31, 2017	July 31, 2018

Figure 62 Test Equipment Used