

FCC TEST REPORT

FCC ID: 2ADACMINIXNEOU1

Product : Media hub for Android

Model Name : MINIX NEO U1

Brand : MINIX

Report No. : PT151123016E-FC02

Prepared for

MINIX TECHNOLOGY LIMITED

Unit 01, 15/F, Chevalier Commercial Center, No.8 Wang Hoi Road, Kowloon Bay, Kowloon,
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TEST RESULT CERTIFICATION

Applicant's name : MINIX TECHNOLOGY LIMITED

Address : Unit 01, 15/F, Chevalier Commercial Center, No.8 Wang Hoi Road,
Kowloon Bay, Kowloon, Hong Kong

Manufacture's name : XIANGUAN ELECTRONICS LIMITED

Address : 13F., Building B, Haisong Edifice, Tairan 9th Rd., Futian
District, Shenzhen, P:518040

Product name : Media hub for Android

Model name : MINIX NEO U1

Standards : FCC CFR47 Part 15 Section 15.247

Test procedure : ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE
V03R03

Test Date : Nov. 25, 2015 ~ Dec.17, 2015

Date of Issue : Dec. 21, 2015

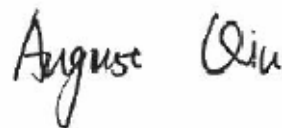
Test Result : Pass

This device described above has been tested by PTS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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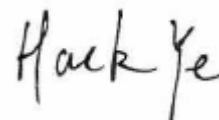
Testing Engineer

August Qiu



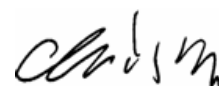
Technical Manager

Hack Ye



Authorized Signatory

Chris Du



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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203	PASS

Remark:

N/A: Not Applicable

3 General Information

3.1 General Description of E.U.T.

Product Name	:	Media hub for Android
Model Name	:	MINIX NEO U1
Model Description	:	N/A
Bluetooth Version	:	V4.1
Operating frequency	:	For BT3.0: 2402-2480MHz, 79 channels For BLE: 2402-2480MHz, 40 channels For WIFI 2412-2462MHz, 11 channels
Antenna installation:	:	ANT1: Integrated Antenna ANT2: External antenna with RP-SMA connector Remark: ANT1 & ANT2 cannot transmit at the same time.
Antenna Gain:	:	ANT1: 0dBi, ANT2:0dBi
Type of Modulation	:	For BT3.0: GFSK, Pi/4DQPSK, 8DPSK For BLE: GFSK For WIFI: IEEE 802.11b CCK/QPSK/BPSK IEEE 802.11g BPSK/QPSK/16QAM/64QAM IEEE 802.11n-HT20 BPSK/QPSK/16QAM/64QAM IEEE 802.11n-HT40 BPSK/QPSK/16QAM/64QAM
Power supply	:	DC 5V 3A Power by AC adapter
Adapter	:	Input:100-240V ~50/60Hz 0.5A max Output: DC 5V 3.0A

3.2 Channel List

WIFI							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452	/	/
BLE							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

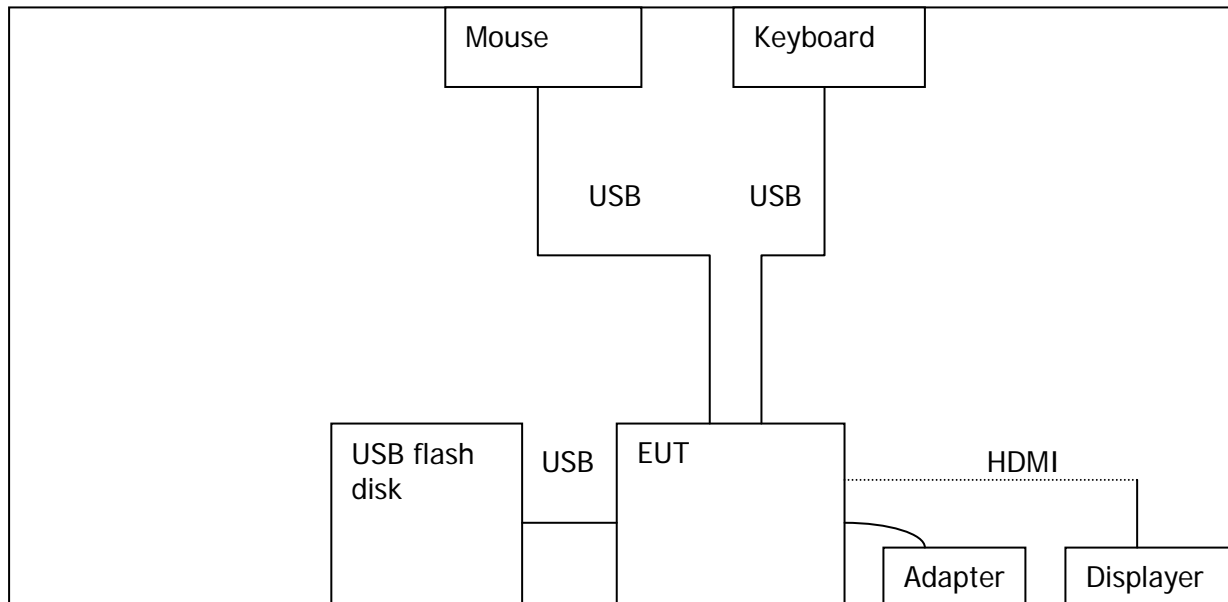
3.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Modulation	Test mode	Low channel	Middle channel	High channel
802.11b/g/n-HT20	Transmitting	2412MHz	2437MHz	2462MHz
802.11n-HT40	Transmitting	2412MHz	2437MHz	2452MHz
GFSK(BLE)	Transmitting	2402MHz	2440MHz	2480MHz
Tests Carried Out Under FCC part 15.207				
Test Item		Test Mode		
Conduction Emission, 0.15MHz to 30MHz		WIFI & BT Communication		



3.4 Configuration of System



4 Equipment During Test

4.1 Equipments List

RF Conducted Test							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMC Analyzer (9k~26.5GHz)	Agilent	E4407B	MY45109572	Aug.04, 2015	Aug.03, 2016	1 year
2	EXA Signal Analyzer	Keysight	N9010A	MY50520207 526B25MPB W7X	Aug.04, 2015	Aug.03, 2016	1 year
3	EMI Test Receiver	R&S	ESCI	101155	July 15, 2015	July 14, 2016	1 year
Radiated Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	Rohde&Schwarz	ESCI	101417	July 15, 2015	July 14, 2016	1 year
2	Trilog Broadband Antenna	SCHWARZB ECK	VULB9160	9160-3355	July 15, 2015	July 14, 2016	1 year
3	Amplifier	EM	EM-30180	060538	July 15, 2015	July 14, 2016	1 year
4	Horn Antenna	SCHWARZB ECK	BBHA9120 D	9120D-1246	July 15, 2015	July 14, 2016	1 year
Conducted Emissions							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	EMI Test Receiver	R&S	ESCI	101155	July 15, 2015	July 14, 2016	1 year
2	LISN	SCHWARZB ECK	NSLK 8128	8128-289	July 15, 2015	July 14, 2016	1 year
3	Cable	LARGE	RF300	-	July 15, 2015	July 14, 2016	1 year

4.2 Description of Support Units

Equipment	Manufacturer	Model No.	Series No.
Mouse	Lisheng	M202	M-1101
Key board	Lisheng	KB202	KB-1102
USB flash disk	Kingston	DTSE9	U-1101
Displayer	PHILIPS	40PFL6340/T3	XM1A1518000483

4.3 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB

5 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method:	: ANSI C63.4:2014
Test Result:	: PASS
Frequency Range:	: 150kHz to 30MHz
Class/Severity:	: Class B
Limit:	: 66-56 dB μ V between 0.15MHz & 0.5MHz
	: 56 dB μ V between 0.5MHz & 5MHz
	: 60 dB μ V between 5MHz & 30MHz
Detector:	: Peak for pre-scan (9kHz Resolution Bandwidth)

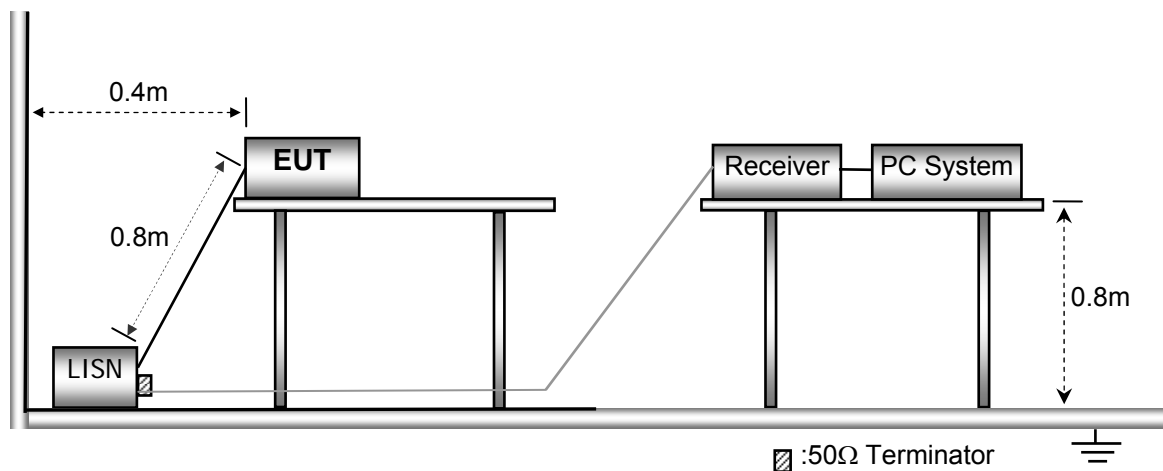
5.1 E.U.T. Operation

Operating Environment :

Temperature:	: 25.5 °C
Humidity:	: 51 % RH
Atmospheric Pressure:	: 101.2kPa
EUT Operation :	: Refer to section 3.3

5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.4:2003.

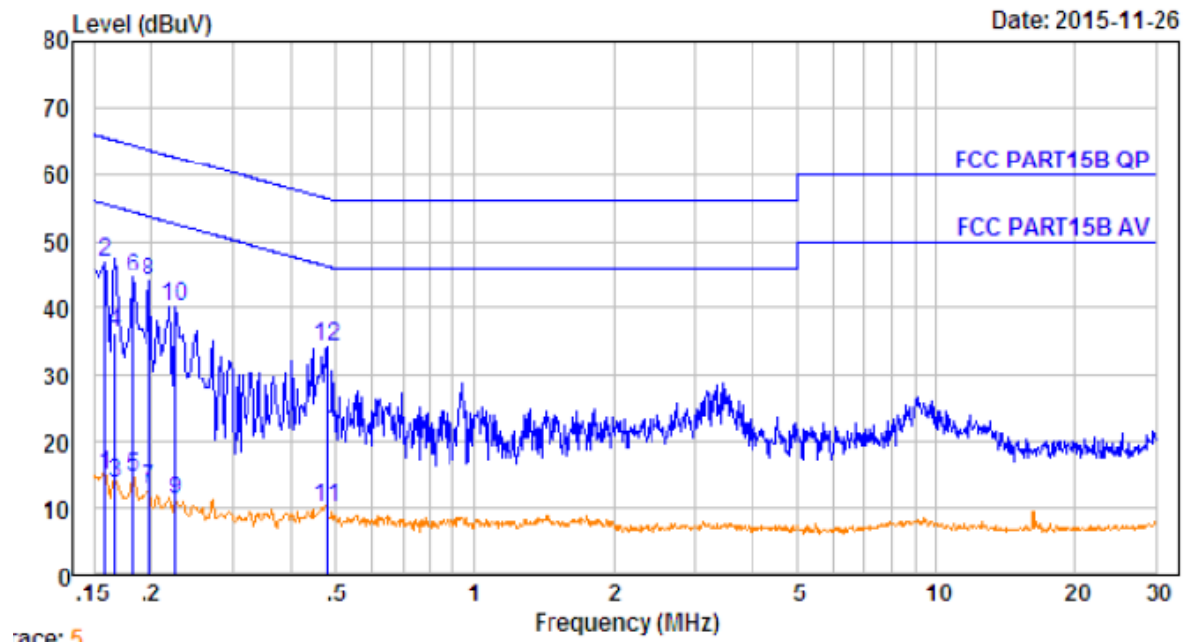


5.3 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.4 Conducted Emission Test Result

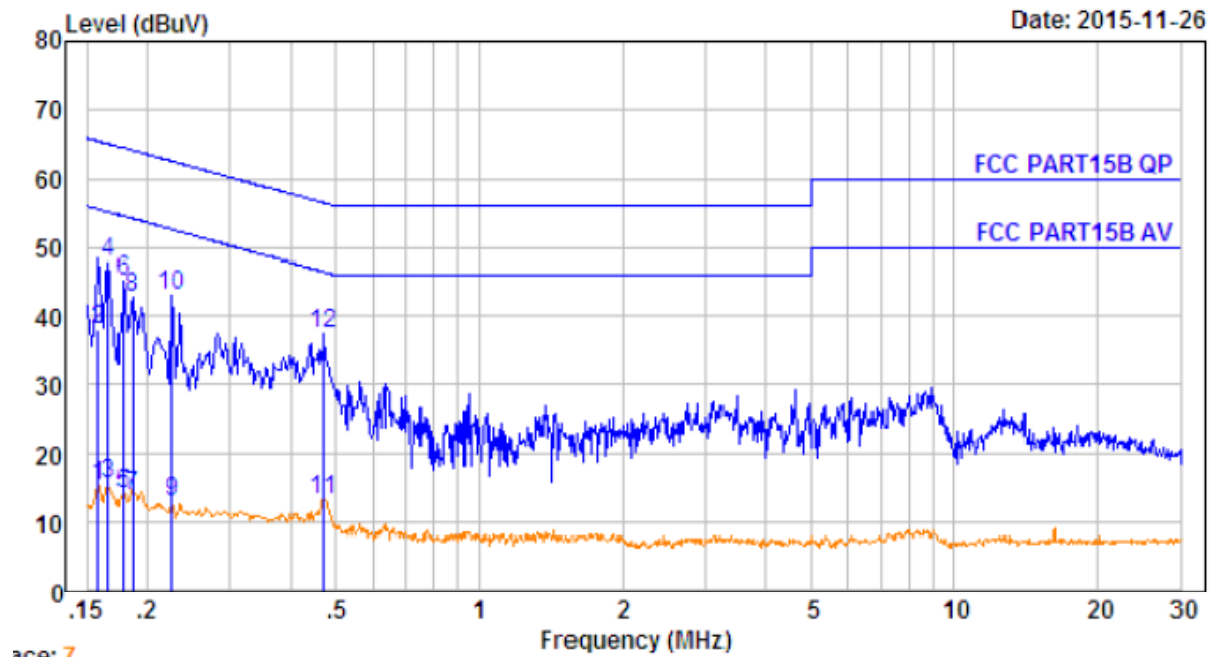
Live line:



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.158	10.60	0.60	3.84	15.04	55.56	-40.52	Average
2.	0.158	10.60	0.60	35.84	47.04	65.56	-18.52	QP
3.	0.166	10.60	0.60	2.70	13.90	55.16	-41.26	Average
4.	0.166	10.60	0.60	25.20	36.40	65.16	-28.76	QP
5.	0.182	10.61	0.60	3.42	14.63	54.42	-39.79	Average
6.	0.182	10.61	0.60	33.42	44.63	64.42	-19.79	QP
7.	0.198	10.61	0.60	1.72	12.93	53.71	-40.78	Average
8.	0.198	10.61	0.60	32.72	43.93	63.71	-19.78	QP
9.	0.226	10.62	0.60	0.06	11.28	52.61	-41.33	Average
10.	0.226	10.62	0.60	29.06	40.28	62.61	-22.33	QP
11.	0.479	10.64	0.60	-1.13	10.11	46.36	-36.25	Average
12.	0.479	10.64	0.60	22.87	34.11	56.36	-22.25	QP



Neutral line:



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No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.158	10.60	0.60	4.20	15.40	55.56	-40.16	Average
2.	0.158	10.60	0.60	26.80	38.00	65.56	-27.56	QP
3.	0.166	10.60	0.60	4.51	15.71	55.16	-39.45	Average
4.	0.166	10.60	0.60	36.51	47.71	65.16	-17.45	QP
5.	0.178	10.61	0.60	2.92	14.13	54.59	-40.46	Average
6.	0.178	10.61	0.60	33.92	45.13	64.59	-19.46	QP
7.	0.186	10.61	0.60	2.71	13.92	54.20	-40.28	Average
8.	0.186	10.61	0.60	31.71	42.92	64.20	-21.28	QP
9.	0.226	10.62	0.60	1.87	13.09	52.61	-39.52	Average
10.	0.226	10.62	0.60	31.87	43.09	62.61	-19.52	QP
11.	0.471	10.64	0.60	2.11	13.35	46.49	-33.14	Average
12.	0.471	10.64	0.60	26.11	37.35	56.49	-19.14	QP

6 Radiated Spurious Emissions

Test Requirement: : FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: : ANSI C63.10:2013,KDB 558074 D01 DTS MEAS GUIDANCE V03R03

Test Result: : PASS

Measurement Distance: : 3m

Limit: : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

Operating Environment :

Temperature: : 23.5 °C

Humidity: : 51.1 % RH

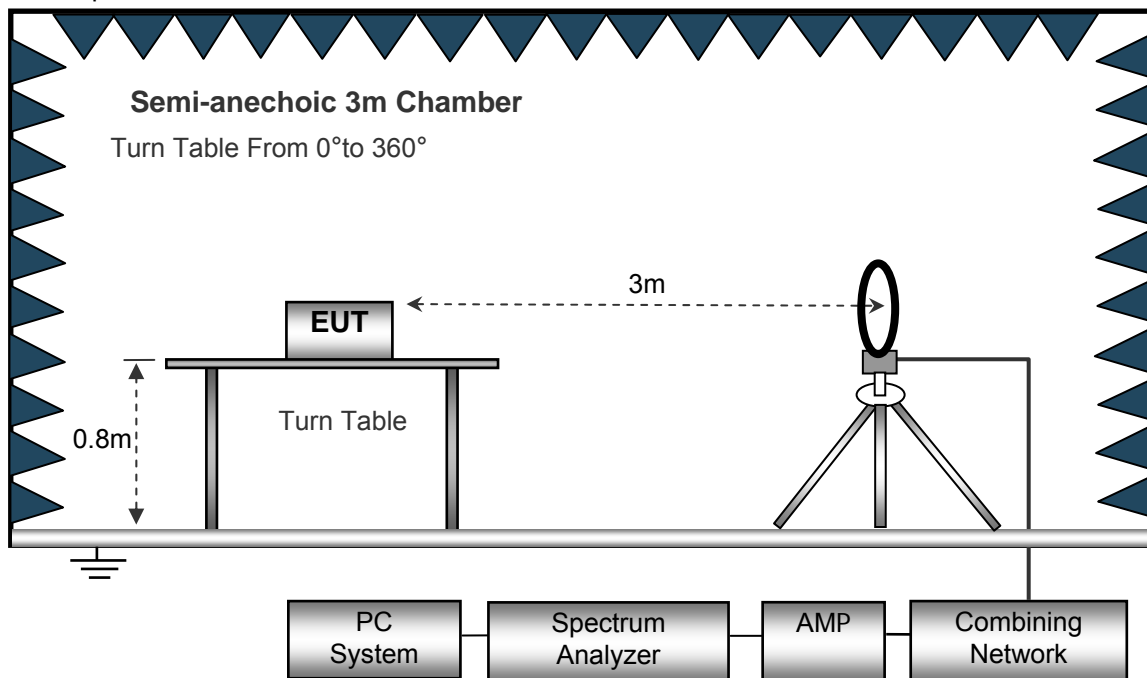
Atmospheric Pressure: : 101.2kPa

EUT Operation : : Refer to section 3.3

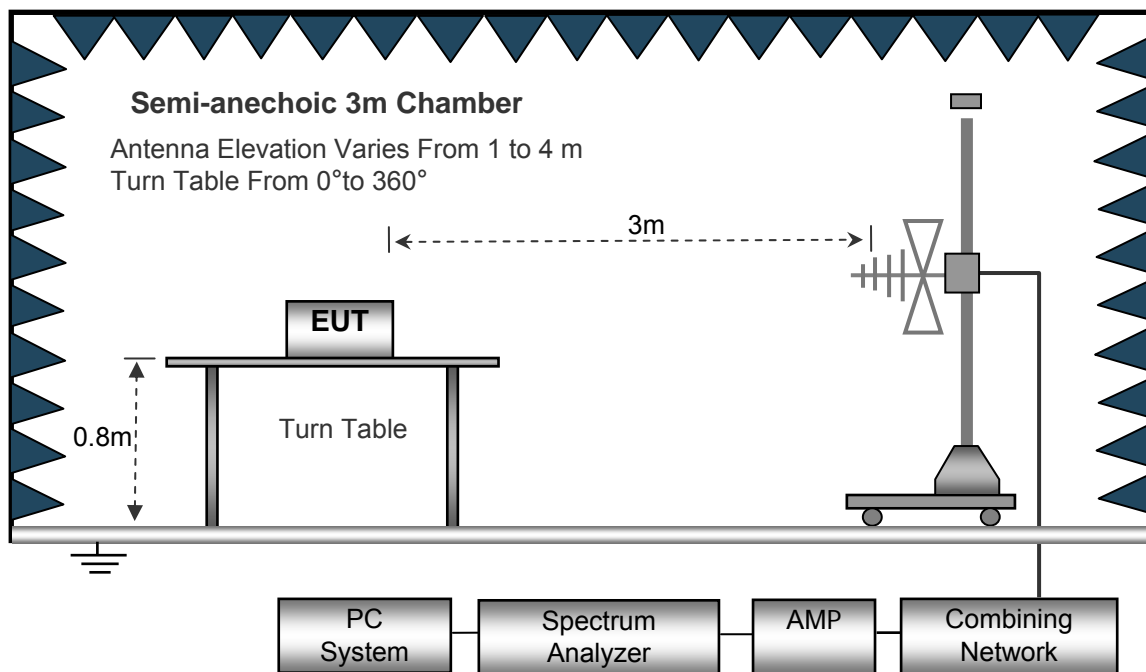
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

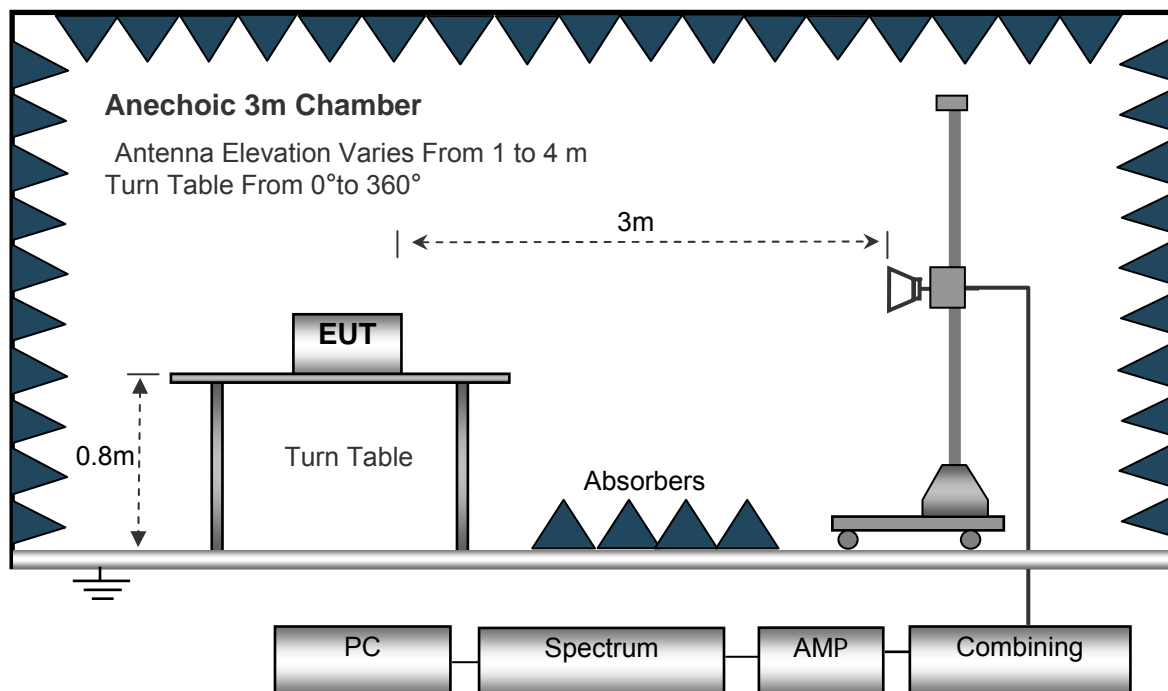
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



6.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed Auto
IF Bandwidth 10kHz
Video Bandwidth 10kHz
Resolution Bandwidth 10kHz

30MHz ~ 1GHz

Sweep Speed Auto
Detector PK
Resolution Bandwidth 100kHz
Video Bandwidth 300kHz

Above 1GHz

Sweep Speed Auto
Detector PK
Resolution Bandwidth 1MHz
Video Bandwidth 3MHz
Detector Ave.
Resolution Bandwidth 1MHz
Video Bandwidth 10Hz

6.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

6.5 Summary of Test Results

Test Frequency: Below 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 18GHz

Remark: only the worst data(GFSK modulation mode) were reported.

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK(BLE) Low Channel						
576.48	43.35	QP	-8.37	34.98	43.50	-8.52
576.48	38.85	QP	-8.37	30.48	43.50	-13.02
4804.00	49.69	PK	-1.06	48.63	74.00	-25.37
4804.00	44.48	Ave	-1.06	43.42	54.00	-10.58
7206.00	50.40	PK	1.33	51.73	74.00	-22.27
7206.00	43.25	Ave	1.33	44.58	54.00	-9.42
2333.25	45.02	PK	-13.19	31.83	74.00	-42.17
2333.25	39.30	Ave	-13.19	26.11	54.00	-27.89
2356.73	42.91	PK	-13.14	29.77	74.00	-44.23
2356.73	38.12	Ave	-13.14	24.98	54.00	-29.02
2499.29	42.47	PK	-13.08	29.39	74.00	-44.61
2499.29	40.29	Ave	-13.08	27.21	54.00	-26.79



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
GFSK(BLE) Middle Channel						
576.48	44.13	QP	-8.37	35.76	43.50	-7.74
576.48	38.08	QP	-8.37	29.71	43.50	-13.79
4880.00	50.52	PK	-0.93	49.59	74.00	-24.41
4880.00	43.77	Ave	-0.93	42.84	54.00	-11.16
7320.00	50.83	PK	1.67	52.50	74.00	-21.50
7320.00	43.22	Ave	1.67	44.89	54.00	-9.11
2345.70	44.53	PK	-13.19	31.34	74.00	-42.66
2345.70	39.80	Ave	-13.19	26.61	54.00	-27.39
2366.23	42.02	PK	-13.14	28.88	74.00	-45.12
2366.23	38.75	Ave	-13.14	25.61	54.00	-28.39
2485.91	43.36	PK	-13.08	30.28	74.00	-43.72
2485.91	39.48	Ave	-13.08	26.40	54.00	-27.60



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
GFSK(BLE) High Channel						
576.48	45.04	QP	-8.37	36.67	43.50	-6.83
576.48	38.68	QP	-8.37	30.31	43.50	-13.19
4960.00	50.23	PK	-0.87	49.36	74.00	-24.64
4960.00	43.80	Ave	-0.87	42.93	54.00	-11.07
7440.00	50.98	PK	1.84	52.82	74.00	-21.18
7440.00	44.03	Ave	1.84	45.87	54.00	-8.13
2319.68	44.41	PK	-13.19	31.22	74.00	-42.78
2319.68	39.12	Ave	-13.19	25.93	54.00	-28.07
2376.97	42.33	PK	-13.14	29.19	74.00	-44.81
2376.97	37.97	Ave	-13.14	24.83	54.00	-29.17
2498.93	44.23	PK	-13.08	31.15	74.00	-42.85
2498.93	40.46	Ave	-13.08	27.38	54.00	-26.62



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
802.11b Low Channel						
139.64	46.68	QP	-15.51	31.17	43.50	-12.33
139.64	43.93	QP	-15.51	28.42	43.50	-15.08
4824.00	48.94	PK	-1.06	47.88	74.00	-26.12
4824.00	44.62	Ave	-1.06	43.56	54.00	-10.44
7236.00	49.43	PK	1.33	50.76	74.00	-23.24
7236.00	44.10	Ave	1.33	45.43	54.00	-8.57
2335.09	45.02	PK	-13.19	31.83	74.00	-42.17
2335.09	39.30	Ave	-13.19	26.11	54.00	-27.89
2356.89	42.91	PK	-13.14	29.77	74.00	-44.23
2356.89	38.12	Ave	-13.14	24.98	54.00	-29.02
2492.52	42.47	PK	-13.08	29.39	74.00	-44.61
2492.52	40.29	Ave	-13.08	27.21	54.00	-26.79



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11b Middle Channel						
139.64	46.79	QP	-15.51	31.28	43.50	-12.22
139.64	43.67	QP	-15.51	28.16	43.50	-15.34
4874.00	48.80	PK	-0.93	47.87	74.00	-26.13
4874.00	44.81	Ave	-0.93	43.88	54.00	-10.12
7311.00	48.48	PK	1.67	50.15	74.00	-23.85
7311.00	44.49	Ave	1.67	46.16	54.00	-7.84
2349.56	45.38	PK	-13.19	32.19	74.00	-41.81
2349.56	38.44	Ave	-13.19	25.25	54.00	-28.75
2353.57	43.22	PK	-13.14	30.08	74.00	-43.92
2353.57	39.11	Ave	-13.14	25.97	54.00	-28.03
2500.11	43.24	PK	-13.08	30.16	74.00	-43.84
2500.11	40.70	Ave	-13.08	27.62	54.00	-26.38



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
802.11b High Channel						
139.64	46.15	QP	-15.51	30.64	43.50	-12.86
139.64	43.63	QP	-15.51	28.12	43.50	-15.38
4924.00	47.91	PK	-0.87	47.04	74.00	-26.96
4924.00	45.33	Ave	-0.87	44.46	54.00	-9.54
7386.00	47.92	PK	1.84	49.76	74.00	-24.24
7386.00	44.81	Ave	1.84	46.65	54.00	-7.35
2329.28	46.21	PK	-13.19	33.02	74.00	-40.98
2329.28	38.36	Ave	-13.19	25.17	54.00	-28.83
2354.05	43.46	PK	-13.14	30.32	74.00	-43.68
2354.05	39.93	Ave	-13.14	26.79	54.00	-27.21
2486.97	43.88	PK	-13.08	30.80	74.00	-43.20
2486.97	41.50	Ave	-13.08	28.42	54.00	-25.58



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11g Low Channel						
139.64	46.39	QP	-15.51	30.88	43.50	-12.62
139.64	45.18	QP	-15.51	29.67	43.50	-13.83
4824.00	47.64	PK	-1.06	46.58	74.00	-27.42
4824.00	46.05	Ave	-1.06	44.99	54.00	-9.01
7236.00	50.06	PK	1.33	51.39	74.00	-22.61
7236.00	43.90	Ave	1.33	45.23	54.00	-8.77
2335.66	45.02	PK	-13.19	31.83	74.00	-42.17
2335.66	39.30	Ave	-13.19	26.11	54.00	-27.89
2359.17	42.91	PK	-13.14	29.77	74.00	-44.23
2359.17	38.12	Ave	-13.14	24.98	54.00	-29.02
2489.95	42.47	PK	-13.08	29.39	74.00	-44.61
2489.95	40.29	Ave	-13.08	27.21	54.00	-26.79



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11g Middle Channel						
139.64	46.24	QP	-15.51	30.73	43.50	-12.77
139.64	44.91	QP	-15.51	29.40	43.50	-14.10
4874.00	46.66	PK	-0.93	45.73	74.00	-28.27
4874.00	45.65	Ave	-0.93	44.72	54.00	-9.28
7311.00	51.04	PK	1.67	52.71	74.00	-21.29
7311.00	44.45	Ave	1.67	46.12	54.00	-7.88
2316.95	44.80	PK	-13.19	31.61	74.00	-42.39
2316.95	39.07	Ave	-13.19	25.88	54.00	-28.12
2381.23	42.23	PK	-13.14	29.09	74.00	-44.91
2381.23	38.64	Ave	-13.14	25.50	54.00	-28.50
2496.74	42.06	PK	-13.08	28.98	74.00	-45.02
2496.74	40.94	Ave	-13.08	27.86	54.00	-26.14



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11g High Channel						
139.64	45.54	QP	-15.51	30.03	43.50	-13.47
139.64	44.52	QP	-15.51	29.01	43.50	-14.49
4924.00	46.46	PK	-0.87	45.59	74.00	-28.41
4924.00	45.42	Ave	-0.87	44.55	54.00	-9.45
7386.00	51.35	PK	1.84	53.19	74.00	-20.81
7386.00	44.11	Ave	1.84	45.95	54.00	-8.05
2330.68	44.61	PK	-13.19	31.42	74.00	-42.58
2330.68	38.09	Ave	-13.19	24.90	54.00	-29.10
2367.95	41.49	PK	-13.14	28.35	74.00	-45.65
2367.95	37.70	Ave	-13.14	24.56	54.00	-29.44
2493.74	42.95	PK	-13.08	29.87	74.00	-44.13
2493.74	41.46	Ave	-13.08	28.38	54.00	-25.62



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n-HT20 Low Channel						
139.64	45.96	QP	-15.51	30.45	43.50	-13.05
139.64	45.06	QP	-15.51	29.55	43.50	-13.95
4824.00	48.04	PK	-1.06	46.98	74.00	-27.02
4824.00	45.49	Ave	-1.06	44.43	54.00	-9.57
7236.00	49.71	PK	1.33	51.04	74.00	-22.96
7236.00	43.87	Ave	1.33	45.20	54.00	-8.80
2315.79	45.02	PK	-13.19	31.83	74.00	-42.17
2315.79	39.30	Ave	-13.19	26.11	54.00	-27.89
2378.56	42.91	PK	-13.14	29.77	74.00	-44.23
2378.56	38.12	Ave	-13.14	24.98	54.00	-29.02
2498.57	42.47	PK	-13.08	29.39	74.00	-44.61
2498.57	40.29	Ave	-13.08	27.21	54.00	-26.79



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n-HT20 Middle Channel						
139.64	46.27	QP	-15.51	30.76	43.50	-12.74
139.64	44.26	QP	-15.51	28.75	43.50	-14.75
4874.00	48.00	PK	-0.93	47.07	74.00	-26.93
4874.00	45.34	Ave	-0.93	44.41	54.00	-9.59
7311.00	49.87	PK	1.67	51.54	74.00	-22.46
7311.00	44.48	Ave	1.67	46.15	54.00	-7.85
2340.88	44.20	PK	-13.19	31.01	74.00	-42.99
2340.88	39.91	Ave	-13.19	26.72	54.00	-27.28
2354.96	43.11	PK	-13.14	29.97	74.00	-44.03
2354.96	38.27	Ave	-13.14	25.13	54.00	-28.87
2494.11	42.81	PK	-13.08	29.73	74.00	-44.27
2494.11	39.99	Ave	-13.08	26.91	54.00	-27.09



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dB μ V)	(PK/QP/Ave)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)
802.11n-HT20 High Channel						
139.64	46.18	QP	-15.51	30.67	43.50	-12.83
139.64	45.17	QP	-15.51	29.66	43.50	-13.84
4924.00	48.14	PK	-0.87	47.27	74.00	-26.73
4924.00	45.28	Ave	-0.87	44.41	54.00	-9.59
7386.00	49.87	PK	1.84	51.71	74.00	-22.29
7386.00	43.74	Ave	1.84	45.58	54.00	-8.42
2319.24	44.09	PK	-13.19	30.90	74.00	-43.10
2319.24	39.55	Ave	-13.19	26.36	54.00	-27.64
2372.82	43.78	PK	-13.14	30.64	74.00	-43.36
2372.82	39.01	Ave	-13.14	25.87	54.00	-28.13
2496.14	42.74	PK	-13.08	29.66	74.00	-44.34
2496.14	39.93	Ave	-13.08	26.85	54.00	-27.15



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n-HT40 Low Channel						
139.64	45.96	QP	-15.51	30.45	43.50	-13.05
139.64	45.06	QP	-15.51	29.55	43.50	-13.95
4844.00	46.04	PK	-1.06	44.98	74.00	-29.02
4844.00	43.26	Ave	-1.06	42.20	54.00	-11.80
7266.00	47.33	PK	1.33	48.66	74.00	-25.34
7266.00	41.69	Ave	1.33	43.02	54.00	-10.98
2323.57	45.02	PK	-13.19	31.83	74.00	-42.17
2323.57	39.30	Ave	-13.19	26.11	54.00	-27.89
2368.39	42.91	PK	-13.14	29.77	74.00	-44.23
2368.39	38.12	Ave	-13.14	24.98	54.00	-29.02
2499.73	42.47	PK	-13.08	29.39	74.00	-44.61
2499.73	40.29	Ave	-13.08	27.21	54.00	-26.79



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n-HT40 Middle Channel						
139.64	46.19	QP	-15.51	30.68	43.50	-12.82
139.64	44.68	QP	-15.51	29.17	43.50	-14.33
4874.00	46.93	PK	-0.93	46.00	74.00	-28.00
4874.00	44.09	Ave	-0.93	43.16	54.00	-10.84
7311.00	47.92	PK	1.67	49.59	74.00	-24.41
7311.00	41.22	Ave	1.67	42.89	54.00	-11.11
2337.58	45.17	PK	-13.19	31.98	74.00	-42.02
2337.58	38.50	Ave	-13.19	25.31	54.00	-28.69
2380.49	42.67	PK	-13.14	29.53	74.00	-44.47
2380.49	38.83	Ave	-13.14	25.69	54.00	-28.31
2499.03	41.49	PK	-13.08	28.41	74.00	-45.59
2499.03	39.98	Ave	-13.08	26.90	54.00	-27.10

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n-HT40 High Channel						
139.64	45.75	QP	-15.51	30.24	43.50	-13.26
139.64	45.24	QP	-15.51	29.73	43.50	-13.77
4904.00	47.52	PK	-0.87	46.65	74.00	-27.35
4904.00	43.76	Ave	-0.87	42.89	54.00	-11.11
7356.00	48.47	PK	1.84	50.31	74.00	-23.69
7356.00	41.27	Ave	1.84	43.11	54.00	-10.89
2321.78	44.75	PK	-13.19	31.56	74.00	-42.44
2321.78	38.05	Ave	-13.19	24.86	54.00	-29.14
2372.02	41.88	PK	-13.14	28.74	74.00	-45.26
2372.02	39.69	Ave	-13.14	26.55	54.00	-27.45
2489.68	40.71	PK	-13.08	27.63	74.00	-46.37
2489.68	40.92	Ave	-13.08	27.84	54.00	-26.16

Test Frequency: Above 18GHz

The measurements were more than 20 dB below the limit and not reported

7 Band Edge Measurement

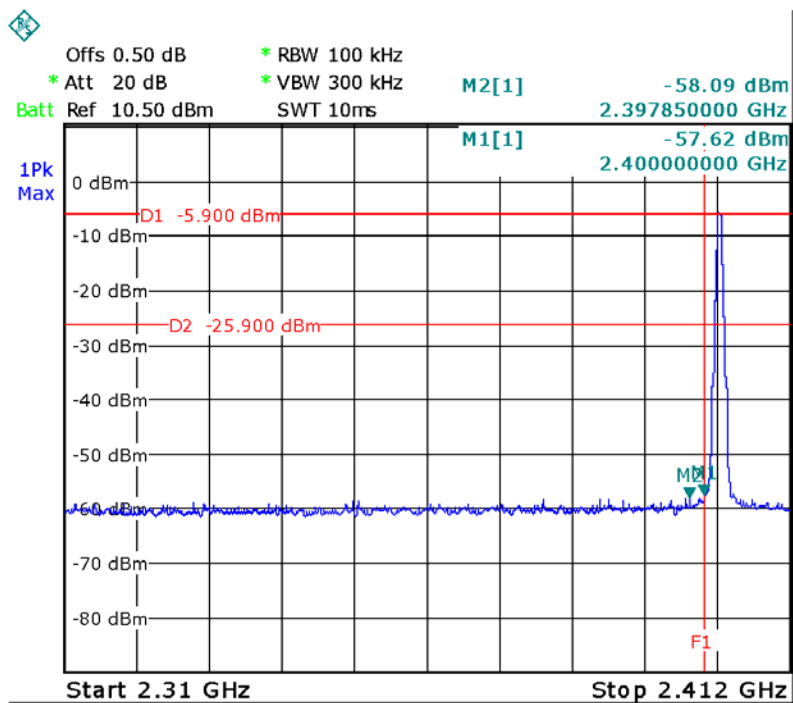
Test Requirement	: Section 15.247(d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R03
Test Limit	: Regulation 15.247 (d), In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode	: Refer to section 3.3

7.1 Test Procedure

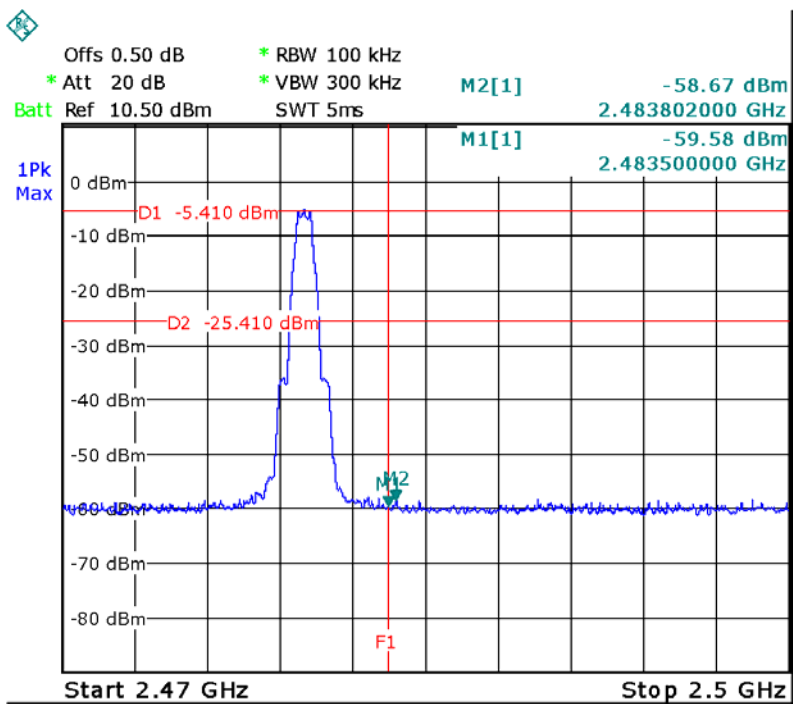
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
 2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
- Detector function = peak, Trace = max hold

7.2 Test Result

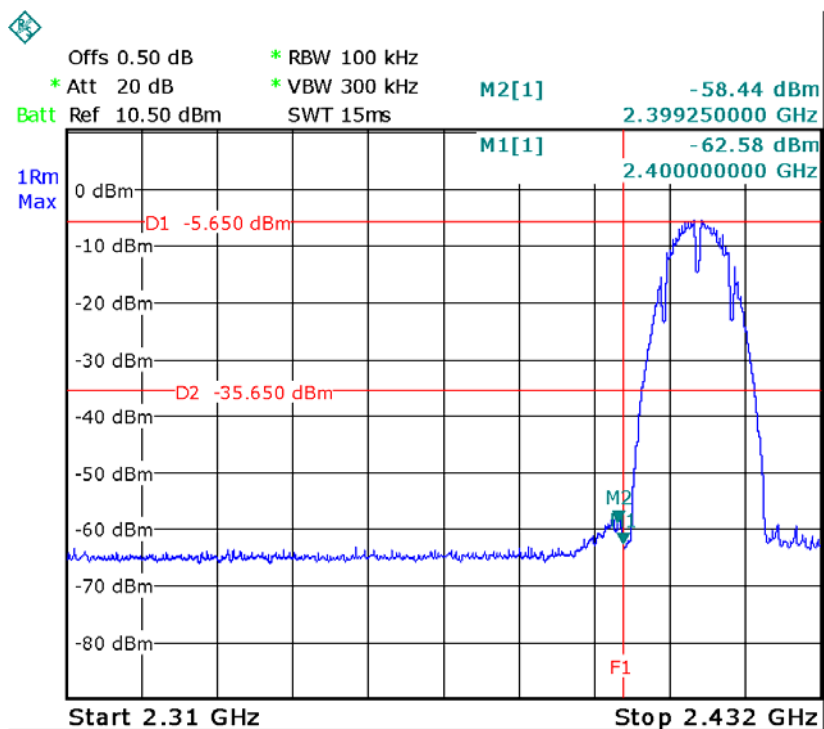
GFSK(BLE) Band edge-left side



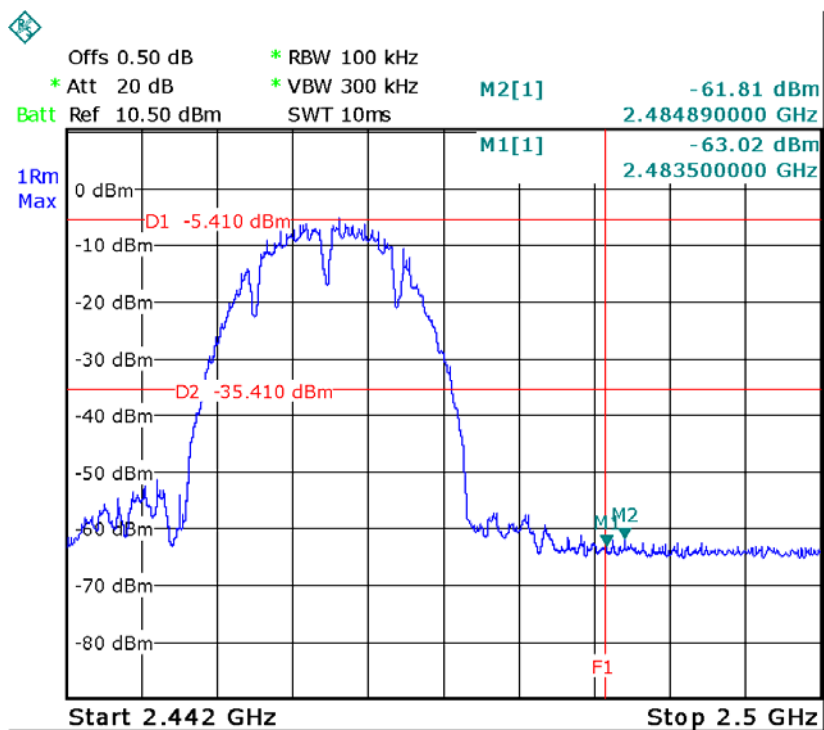
GFSK(BLE) Band edge-right side



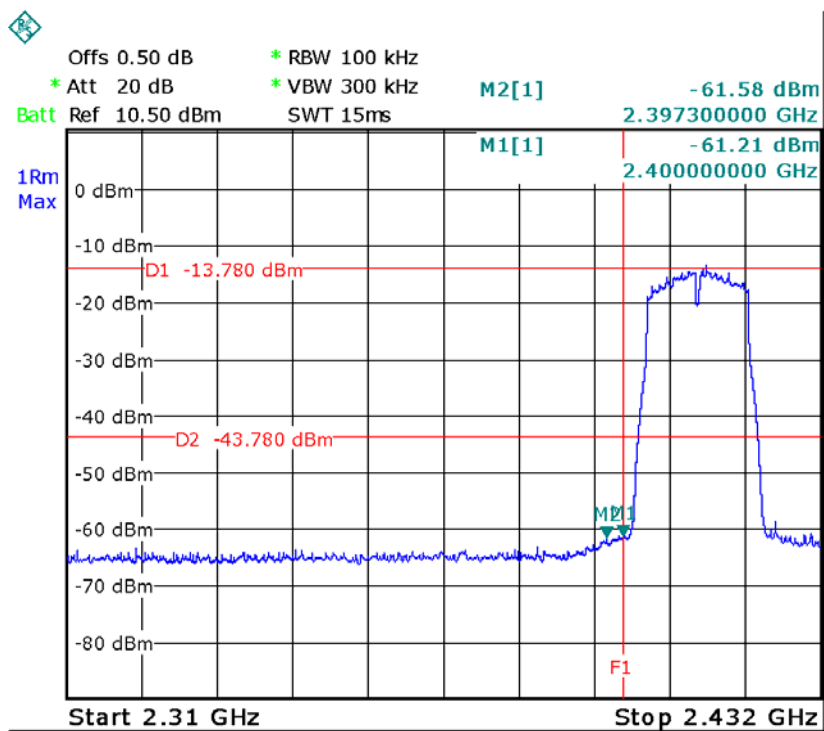
802.11b Band edge-left side



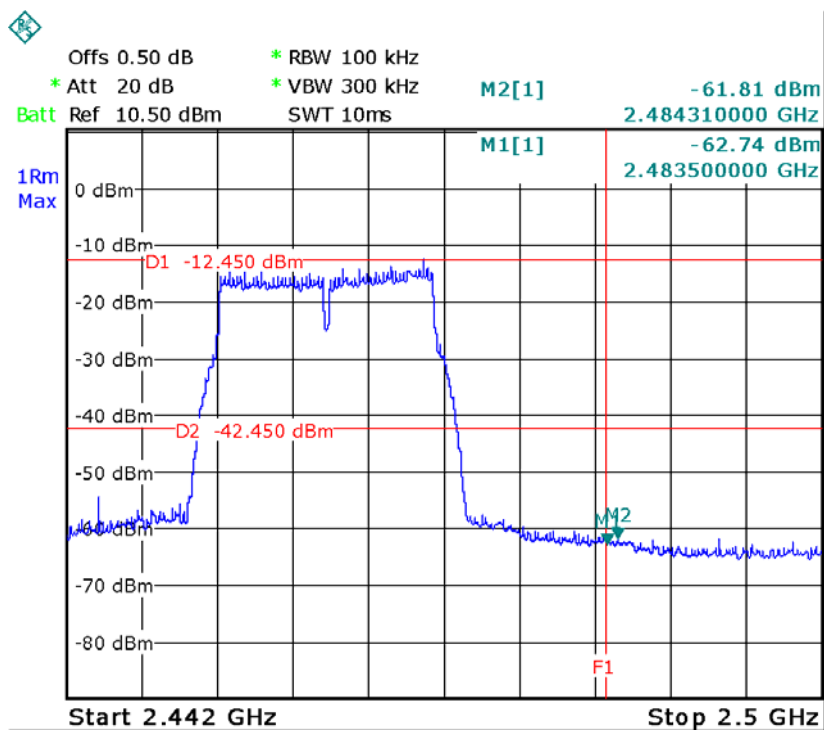
802.11b Band edge-right side



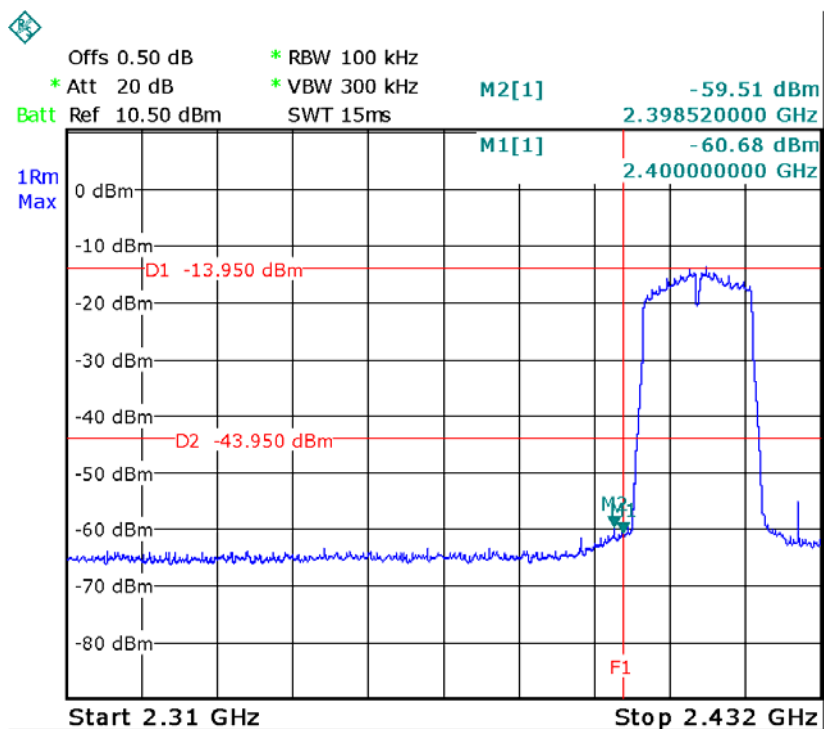
802.11g Band edge-left side



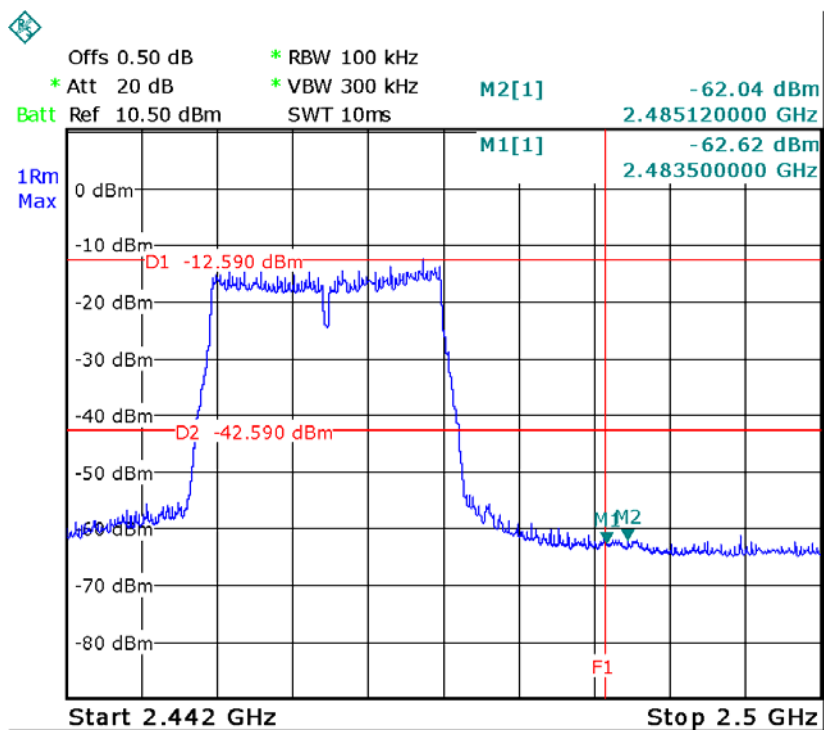
802.11g Band edge-right side



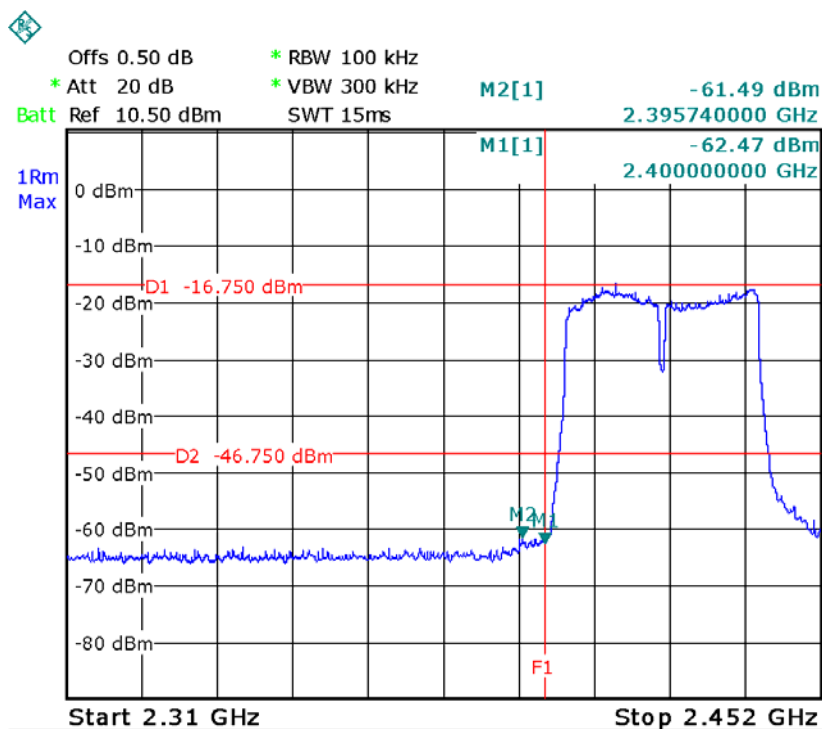
802.11n-HT20 Band edge-left side



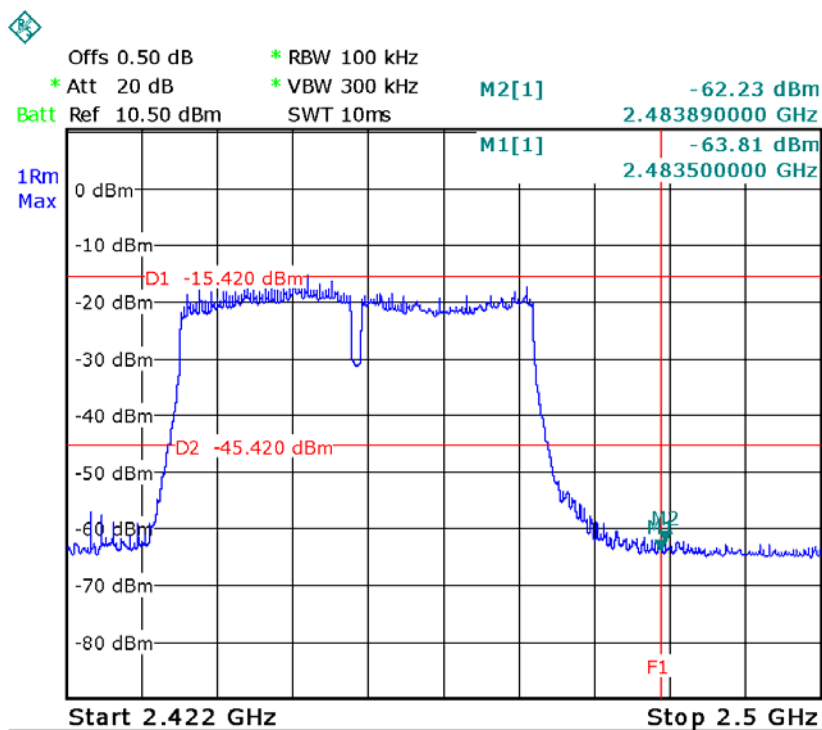
802.11n-HT20 Band edge-right side



802.11n-HT40 Band edge-left side



802.11n-HT40 Band edge-right side



8 6dB Bandwidth Measurement

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R03
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.
Test Mode	: Refer to section 3.3

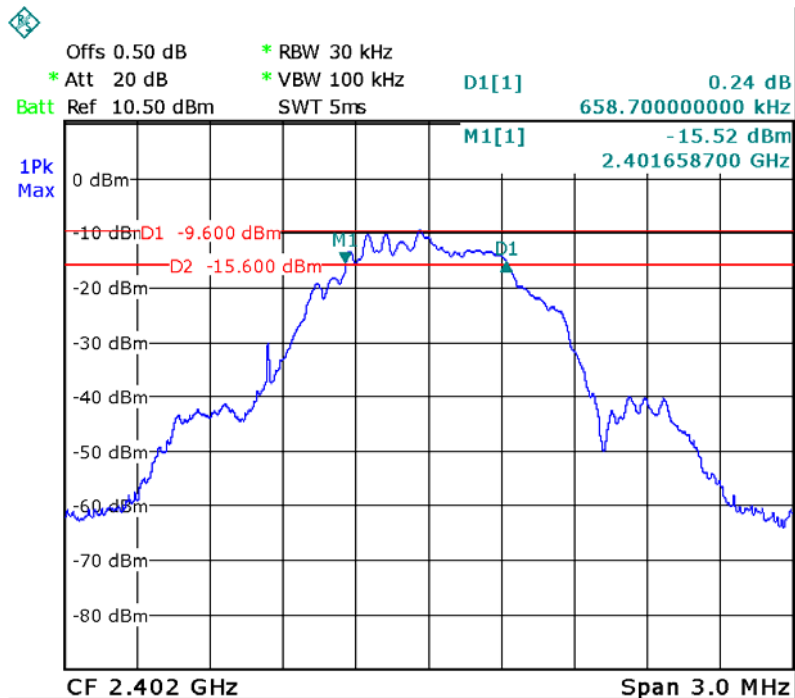
8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: For BLE, RBW = 30kHz, VBW = 100kHz, For WIFI, RBW = 100kHz, VBW = 300kHz,

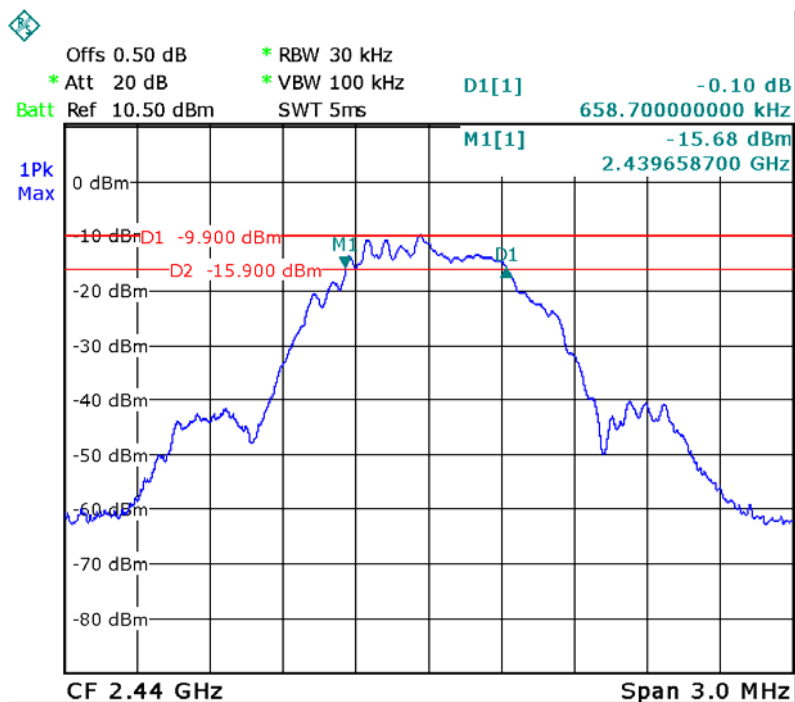
8.2 Test Result

Modulation	Bandwidth(MHz)			Limit
	Low Channel	Middle Channel	High Channel	
GFSK(BLE)	0.659	0.659	0.659	≥500kHz
802.11b	9.517	9.517	9.517	≥500kHz
802.11g	16.467	16.567	16.567	≥500kHz
802.11n-HT20	17.784	17.784	17.784	≥500kHz
802.11n-HT40	36.560	36.560	36.560	≥500kHz

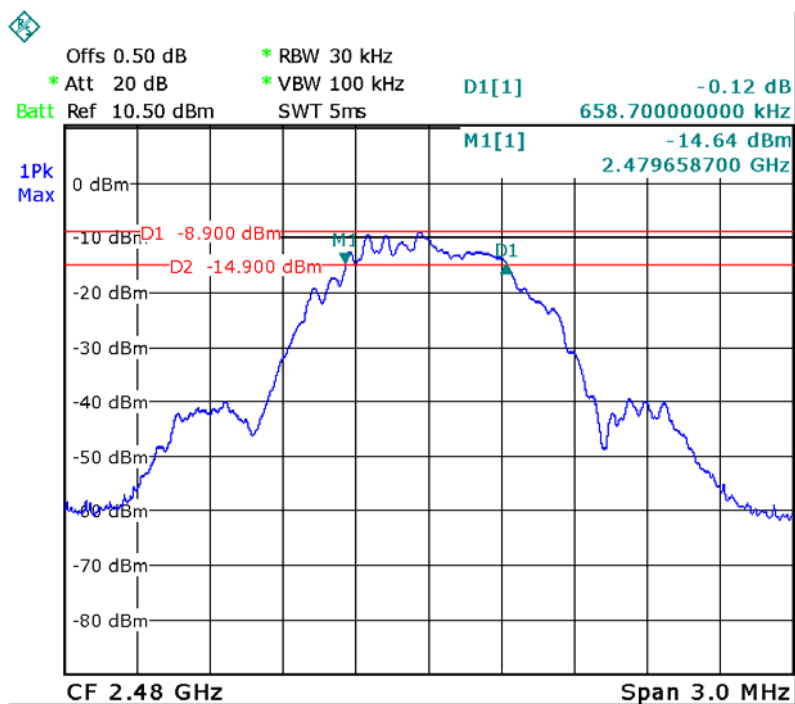
GFSK(BLE) Low Channel



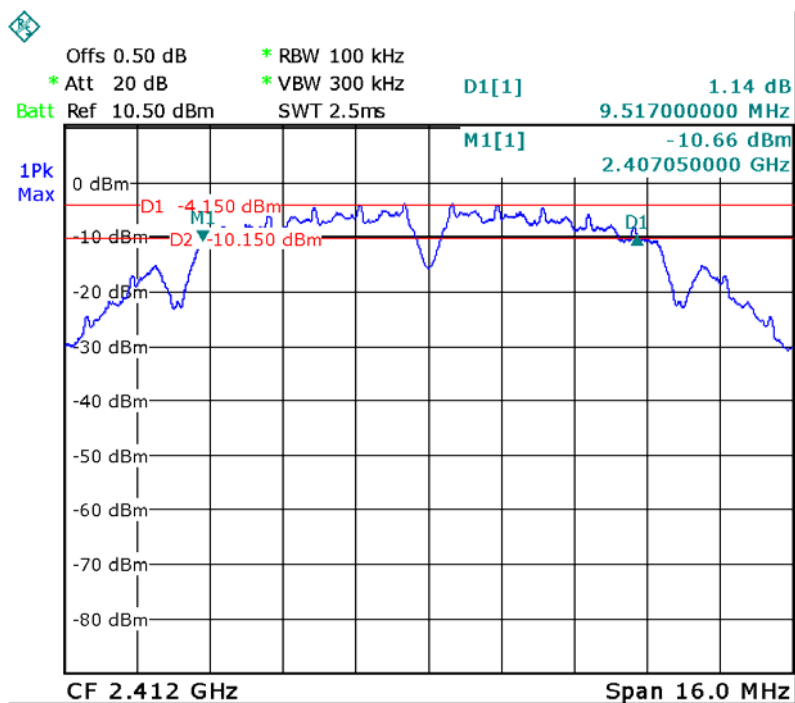
GFSK(BLE) Middle Channel



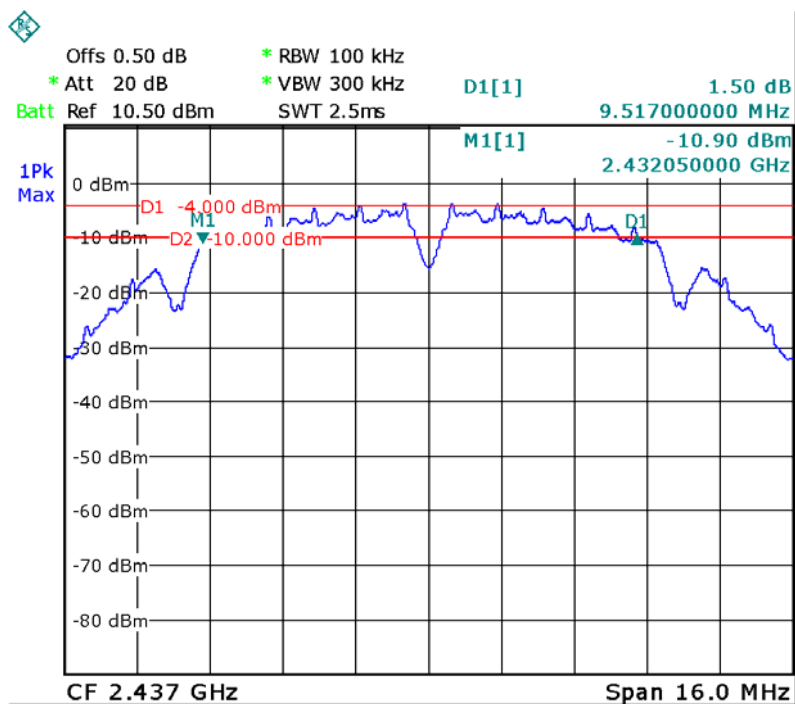
GFSK(BLE) High Channel



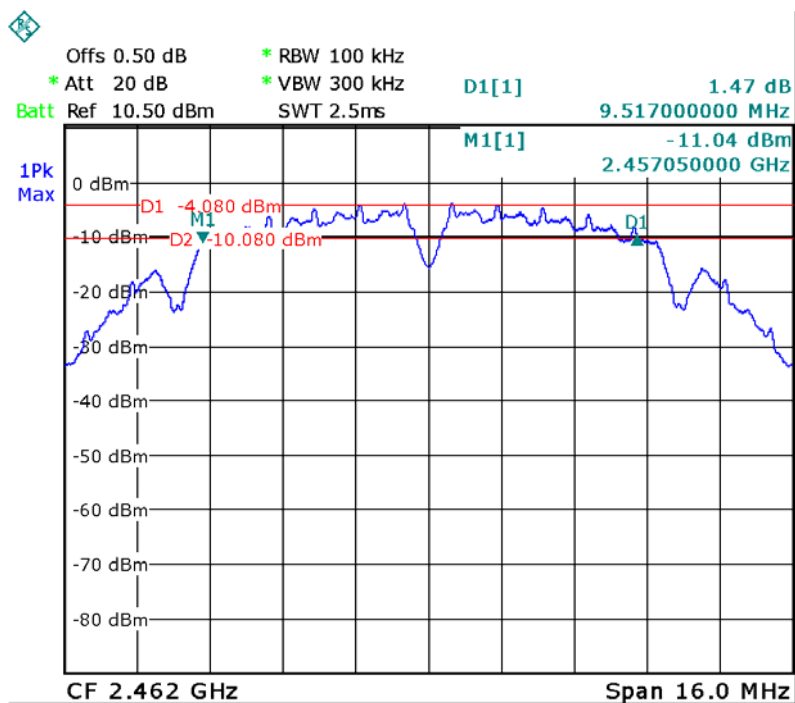
802.11b Low Channel



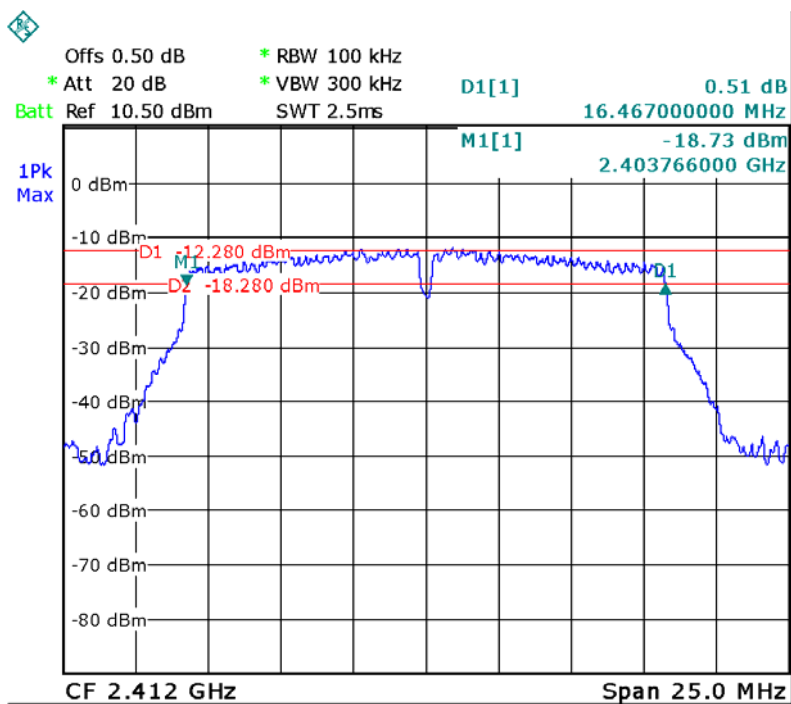
802.11b Middle Channel



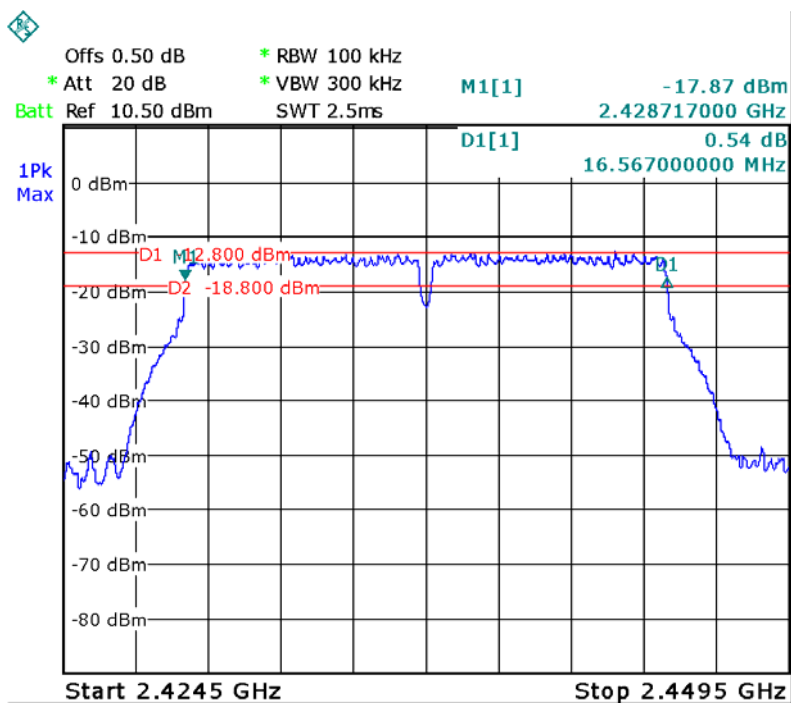
802.11b High Channel



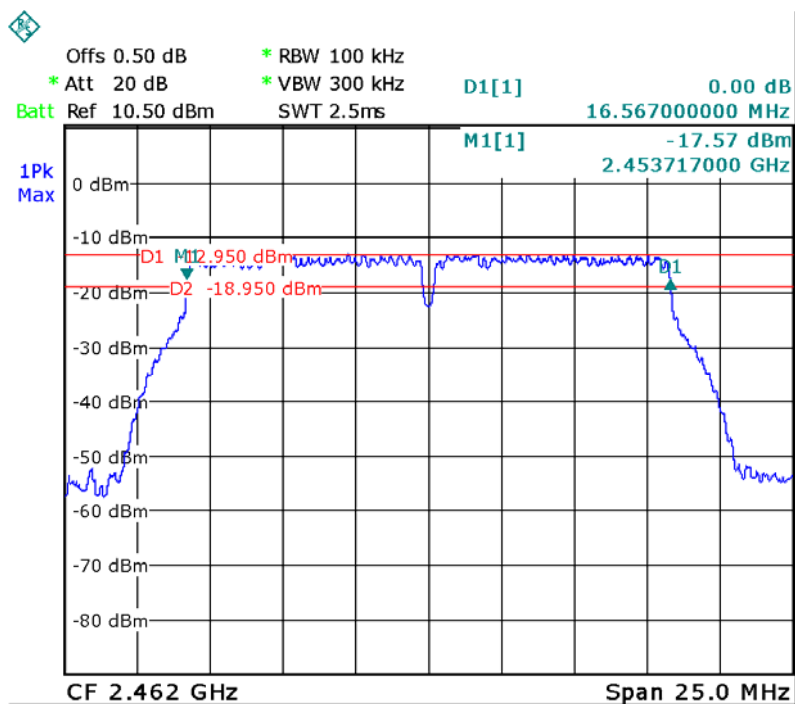
802.11g Low Channel



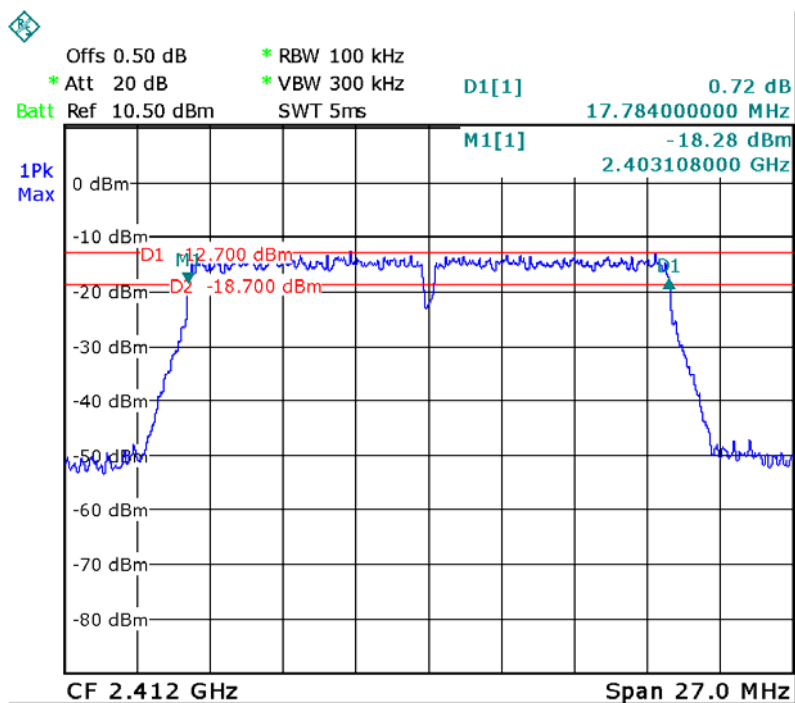
802.11g Middle Channel



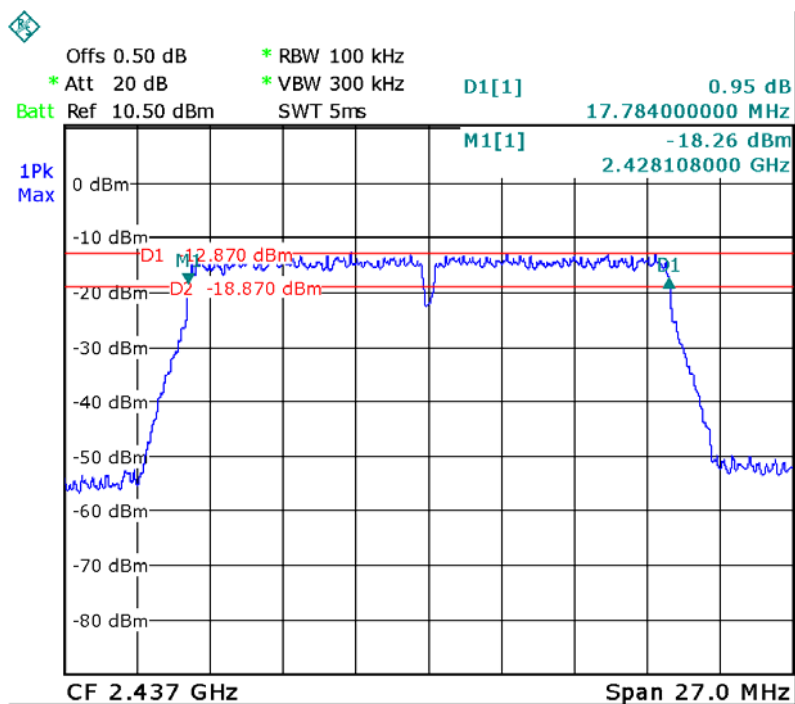
802.11g High Channel



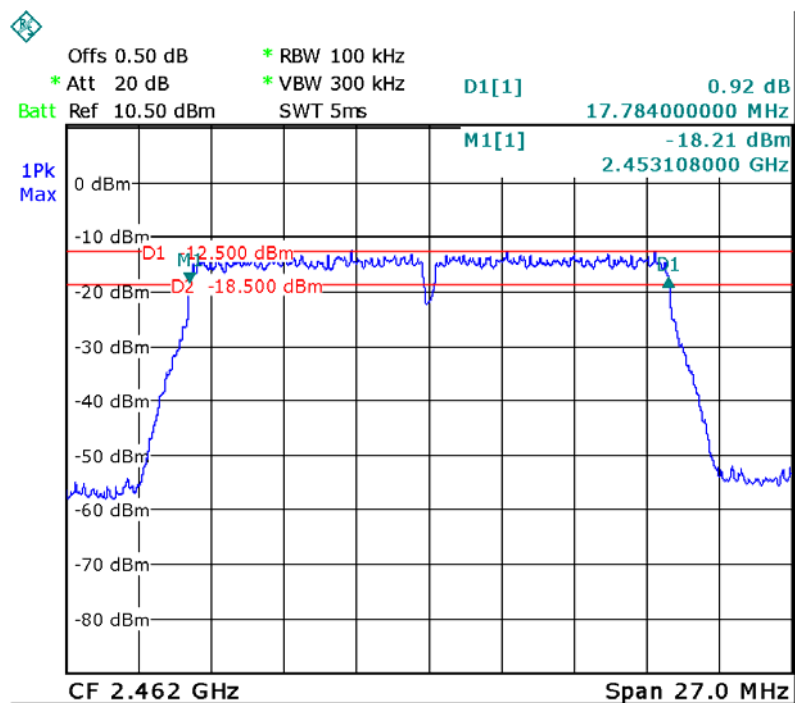
802.11n-HT20 Low Channel



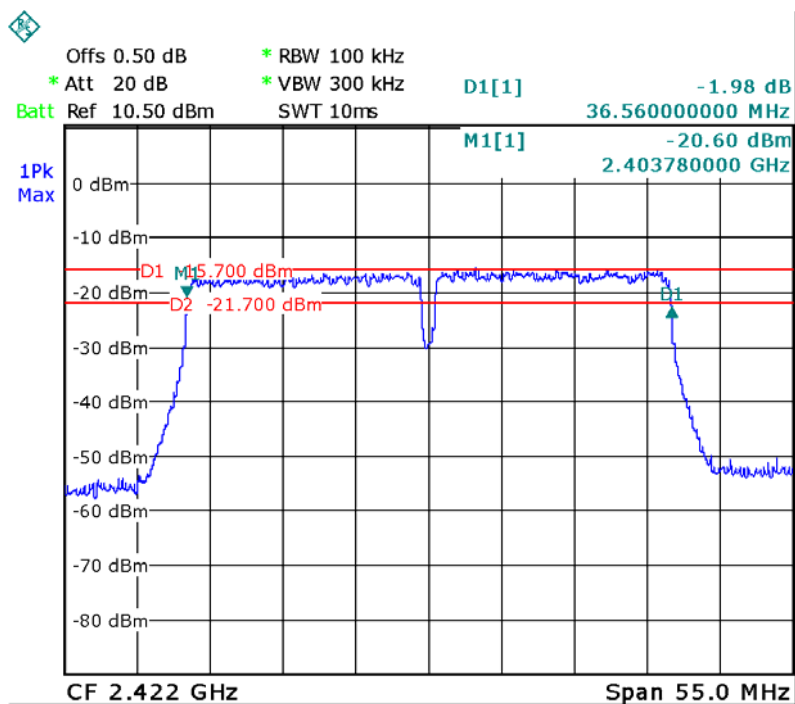
802.11n-HT20 Middle Channel



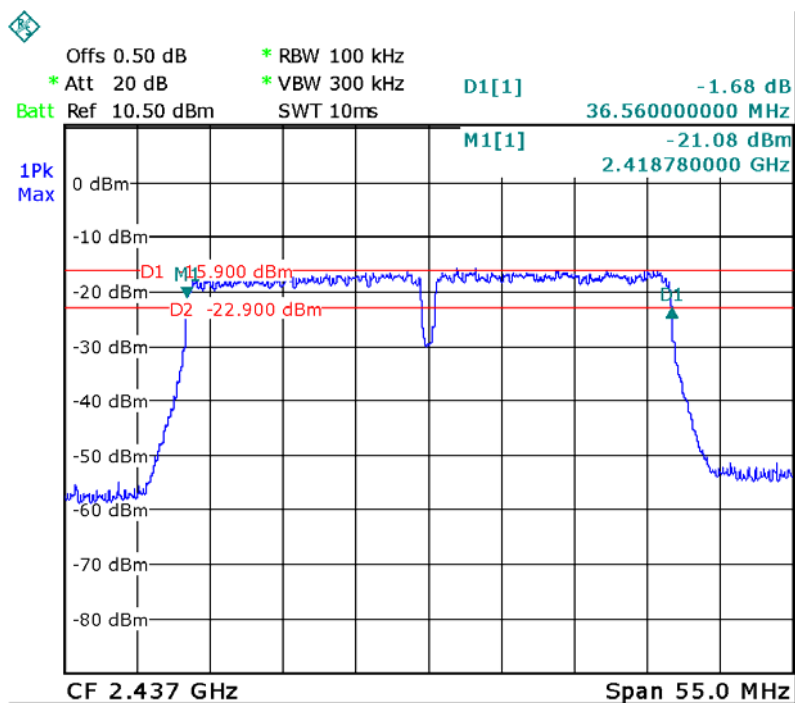
802.11n-HT20 High Channel



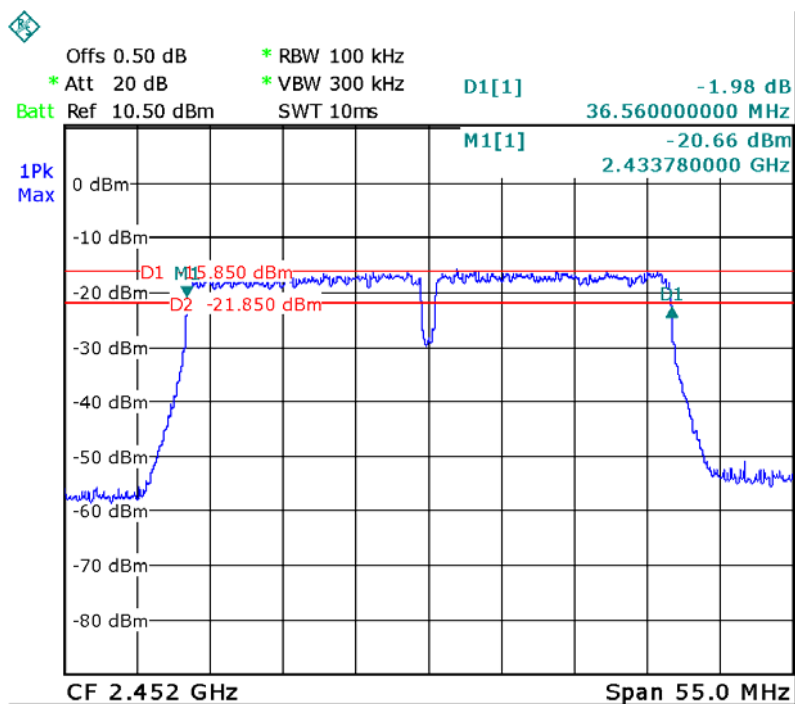
802.11n-HT40 Low Channel



802.11n-HT40 Middle Channel



802.11n-HT40 High Channel



9 Maximum Peak Output Power

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R03
Test Limit	: Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.
Test Mode	: Refer to section 3.3

9.1 Test Procedure

KDB 558074 D01 DTS Meas Guidance v03r03

section 9.1.1 (For BLE)

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq 3 RBW.
- c) Set span \geq 3 x RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

section 9.1.2 (For WIFI)

This procedure may be used when the maximum available RBW of the measurement instrument is less than the DTS bandwidth.

- a) Set the RBW = 1 MHz.
- b) Set the VBW \geq 3 RBW
- c) Set the span \geq 1.5 x DTS bandwidth.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select peak

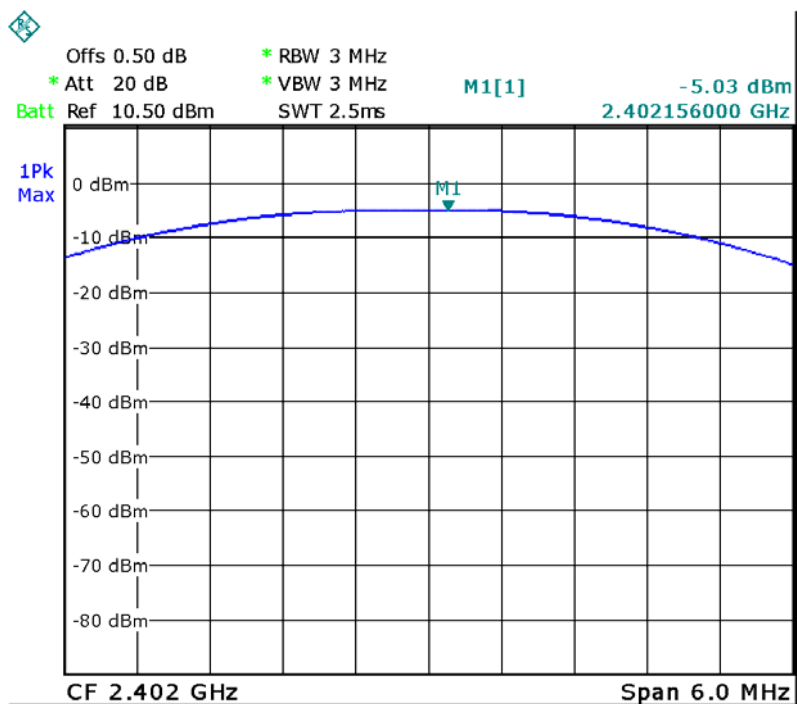


detector). If the instrument does not have a band power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS bandwidth.

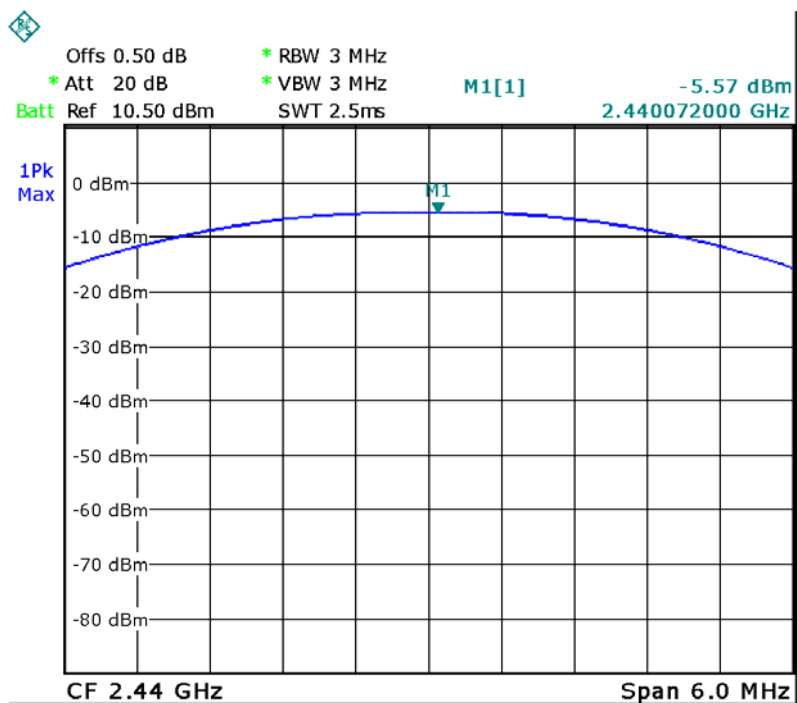
9.2 Test Result

Modulation	Maximum Peak Output Power (dBm)			Limit
	Low Channel	Middle Channel	High Channel	
GFSK(BLE)	-5.03	-5.57	-4.51	1W(30dBm)
802.11b	9.06	9.44	9.07	1W(30dBm)
802.11g	9.18	9.33	9.37	1W(30dBm)
802.11n-HT20	9.13	9.34	9.35	1W(30dBm)
802.11n-HT40	9.10	9.29	9.27	1W(30dBm)

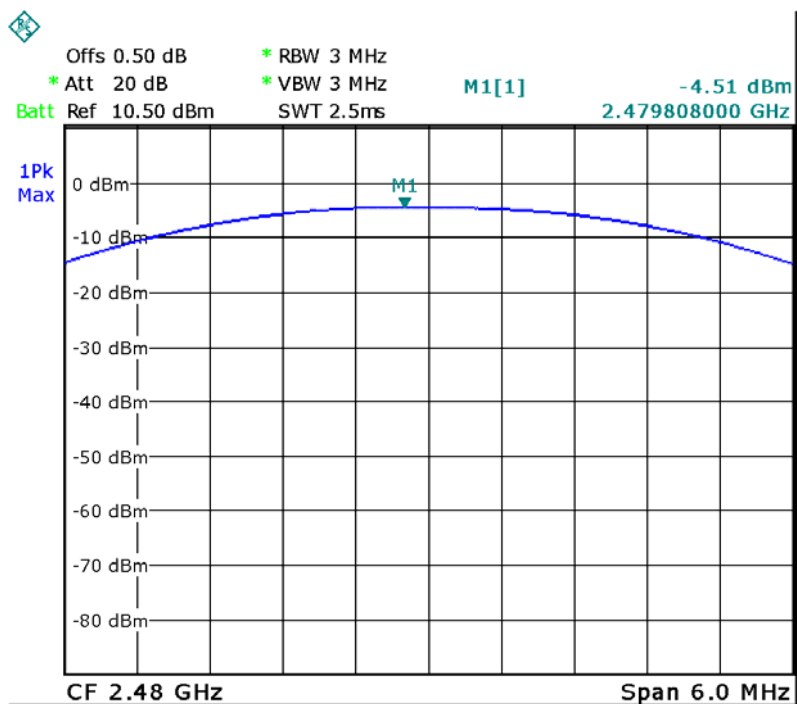
GFSK(BLE) Low Channel



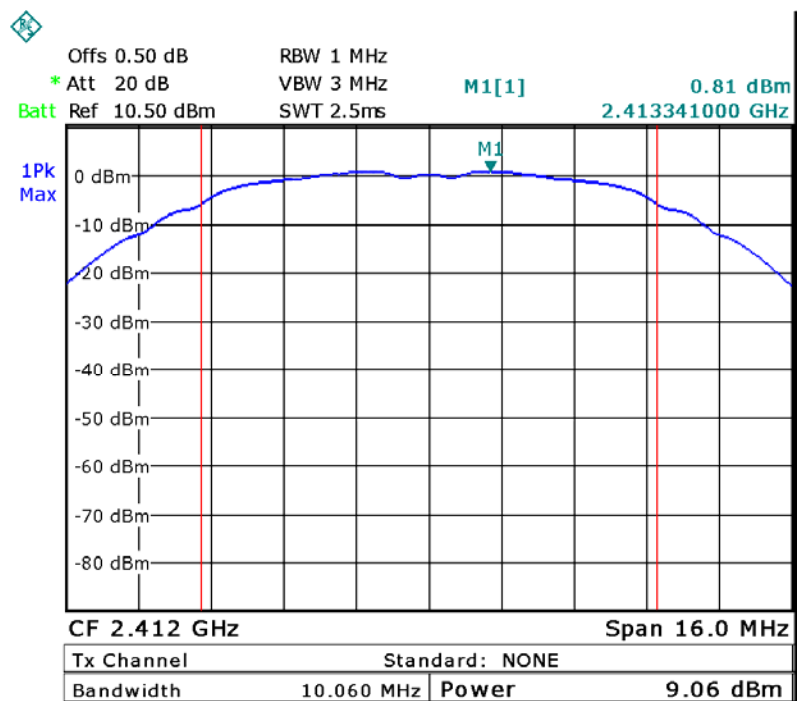
GFSK(BLE) Middle Channel



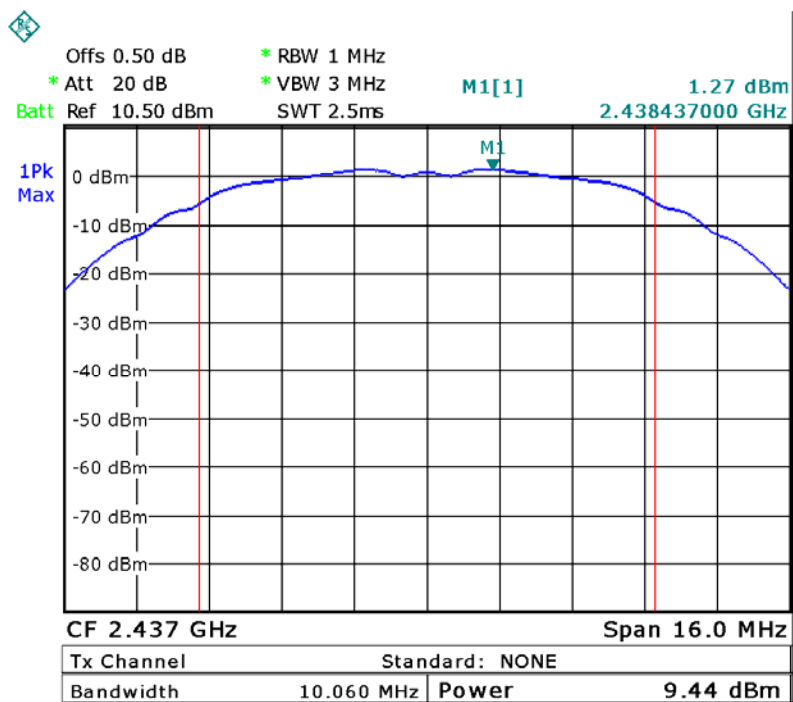
GFSK(BLE) High Channel



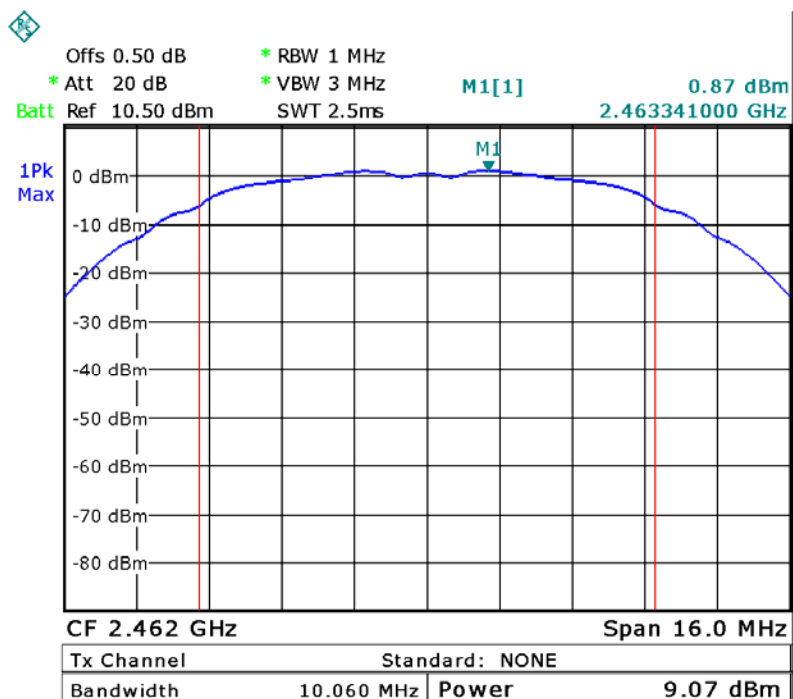
802.11b Low Channel



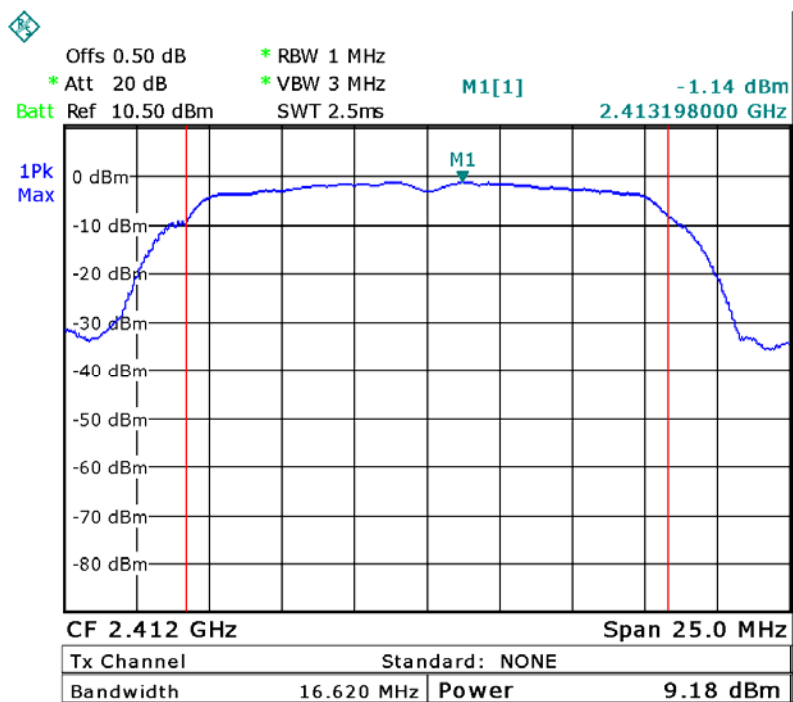
802.11b Middle Channel



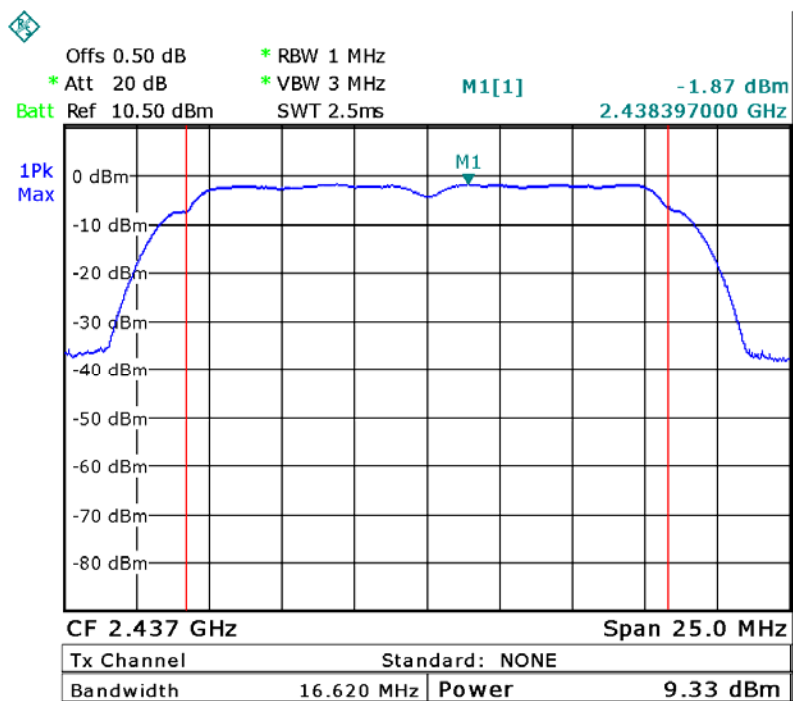
802.11b High Channel



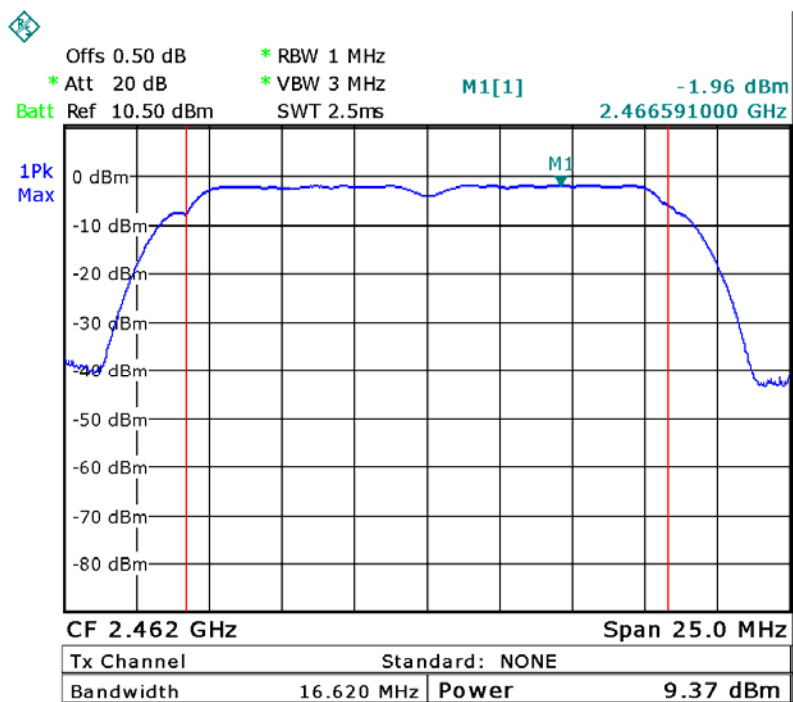
802.11g Low Channel



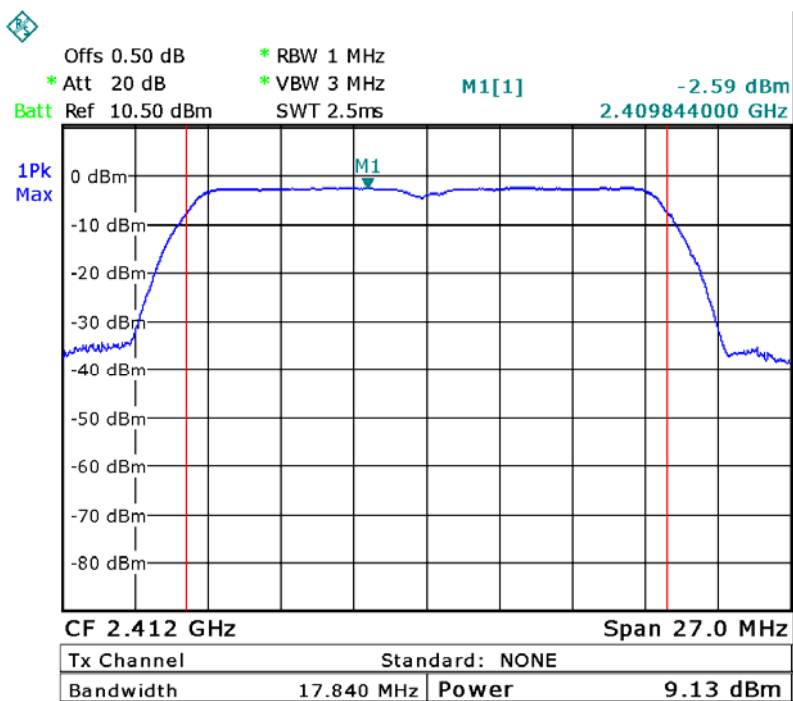
802.11g Middle Channel



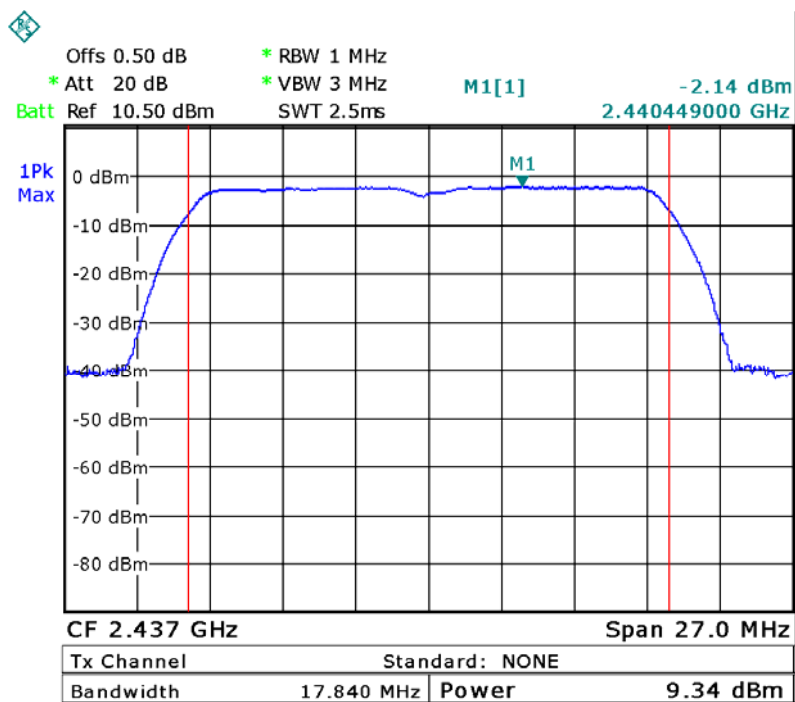
802.11g High Channel



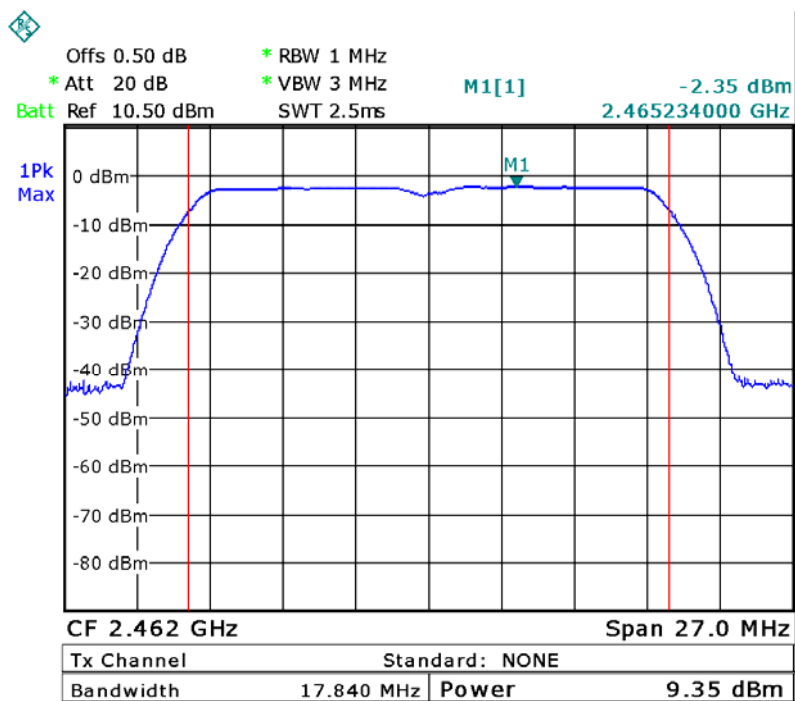
802.11n-HT20 Low Channel



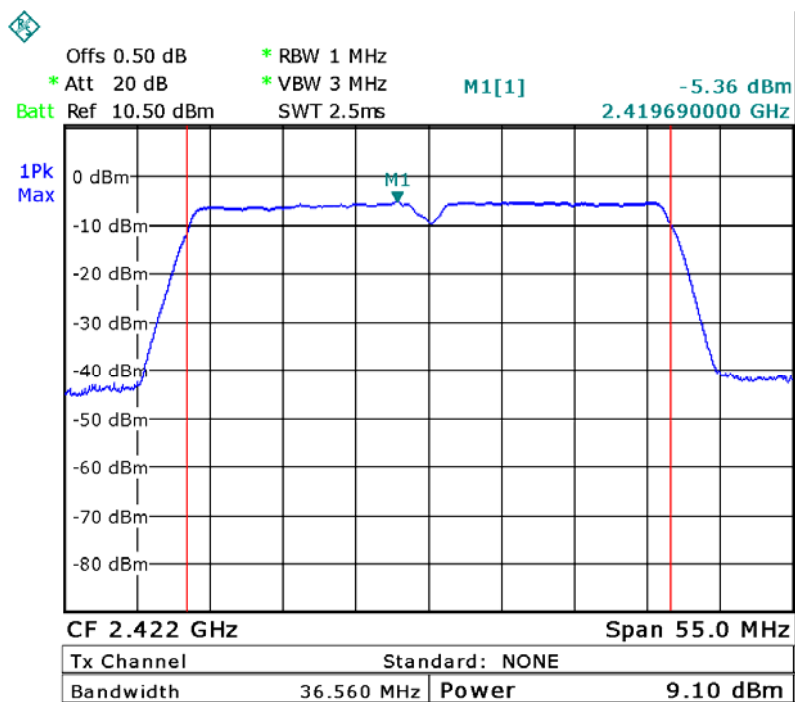
802.11n-HT20 Middle Channel



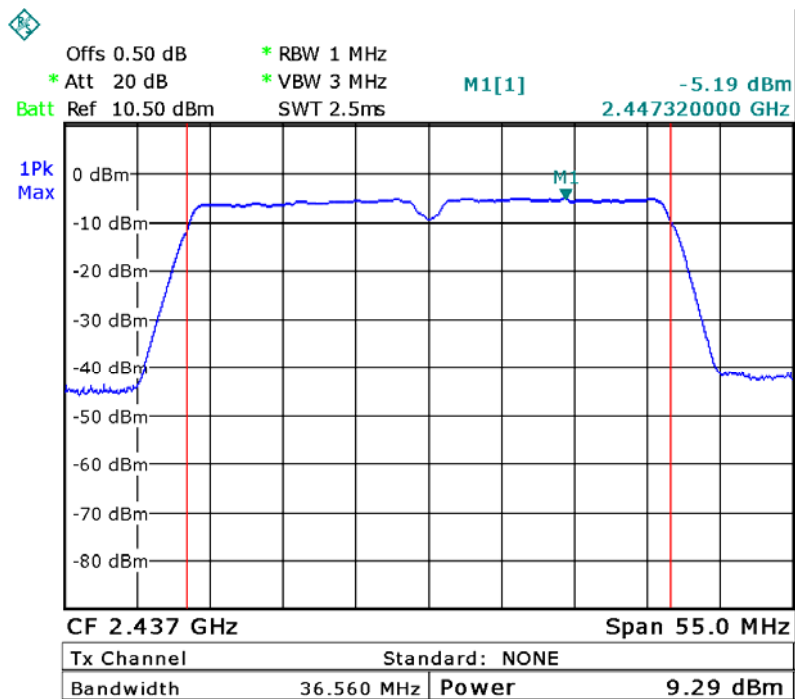
802.11n-HT20 High Channel



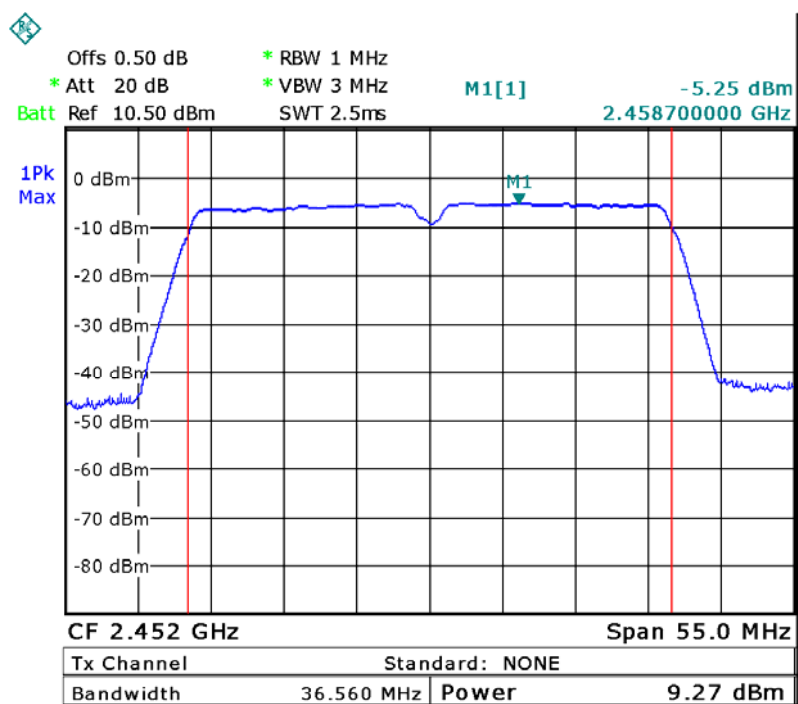
802.11n-HT40 Low Channel



802.11n-HT40 Middle Channel



802.11n-HT40 High Channel



10 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R03
Test Limit	: Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
Test Mode	: Refer to section 3.3

10.1 Test Procedure

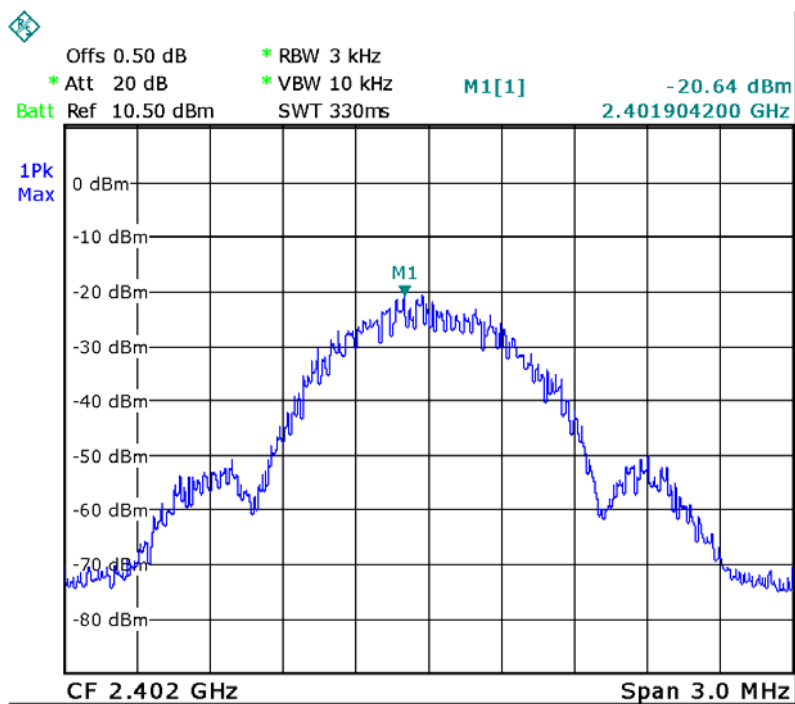
KDB 558074 D01 DTS Meas Guidance v03r03

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

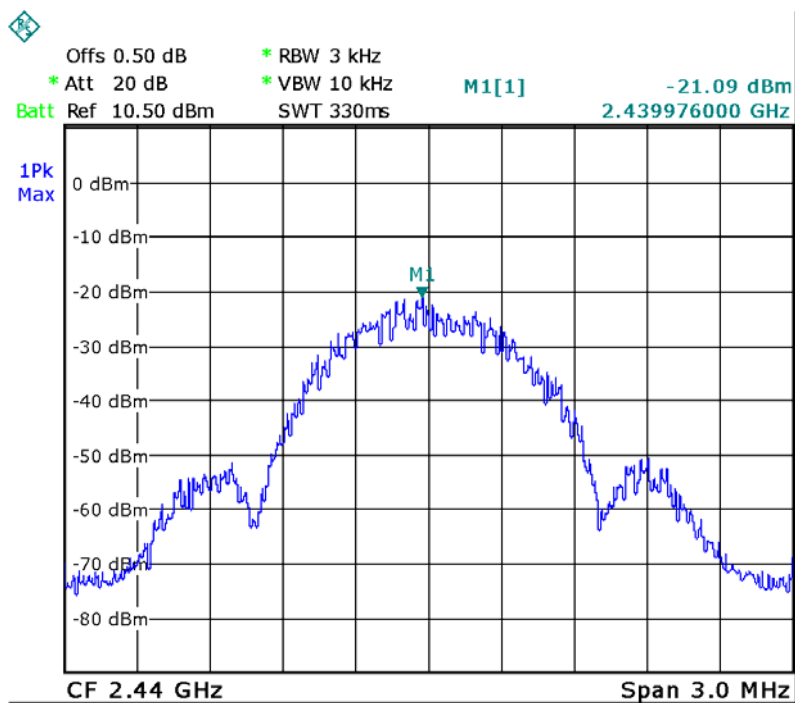
10.2 Test Result

Modulation	Power Spectral density (dBm/3kHz)			Limit
	Low Channel	Middle Channel	High Channel	
GFSK(BLE)	-20.64	-21.09	-20.08	8dBm/3kHz
802.11b	-22.32	-22.07	-22.27	8dBm/3kHz
802.11g	-25.75	-27.11	-27.33	8dBm/3kHz
802.11n-HT20	-26.64	-26.86	-26.07	8dBm/3kHz
802.11n-HT40	-28.91	-27.86	-28.30	8dBm/3kHz

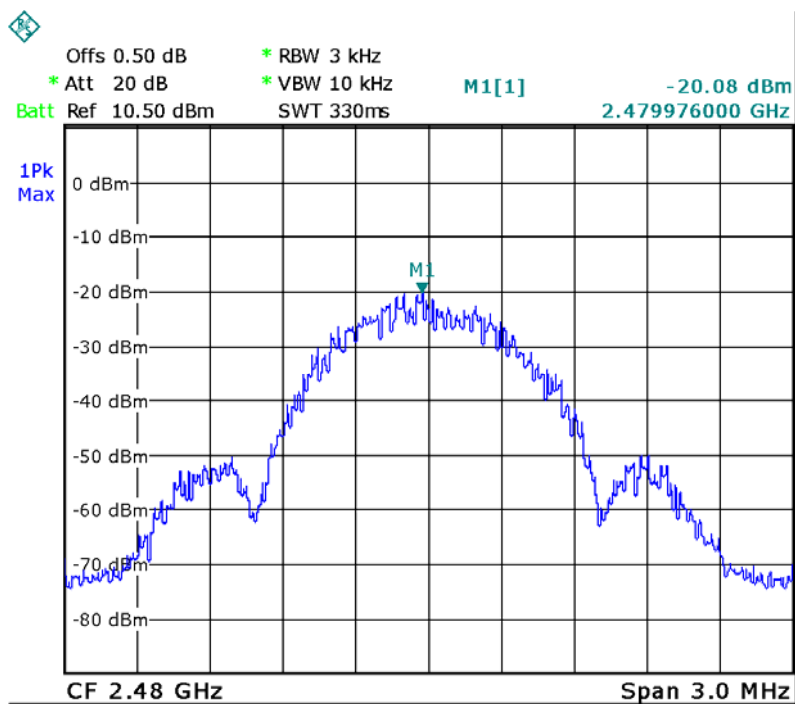
GFSK(BLE) Low Channel



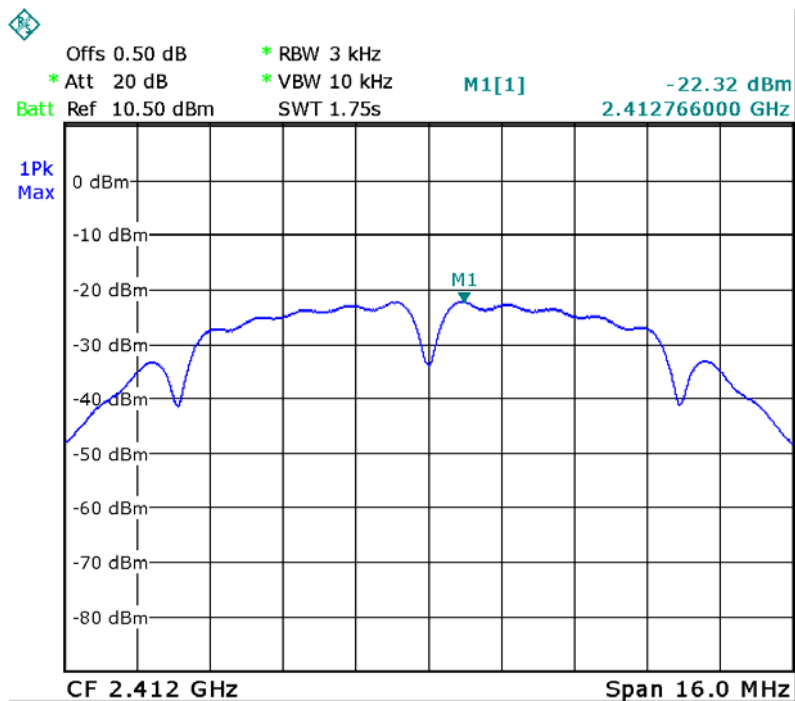
GFSK(BLE) Middle Channel



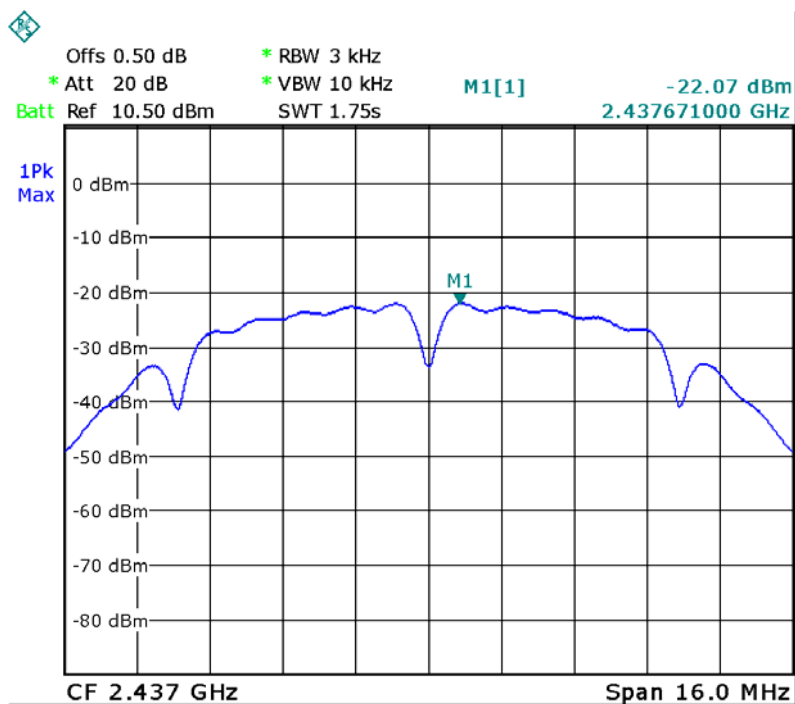
GFSK(BLE) High Channel



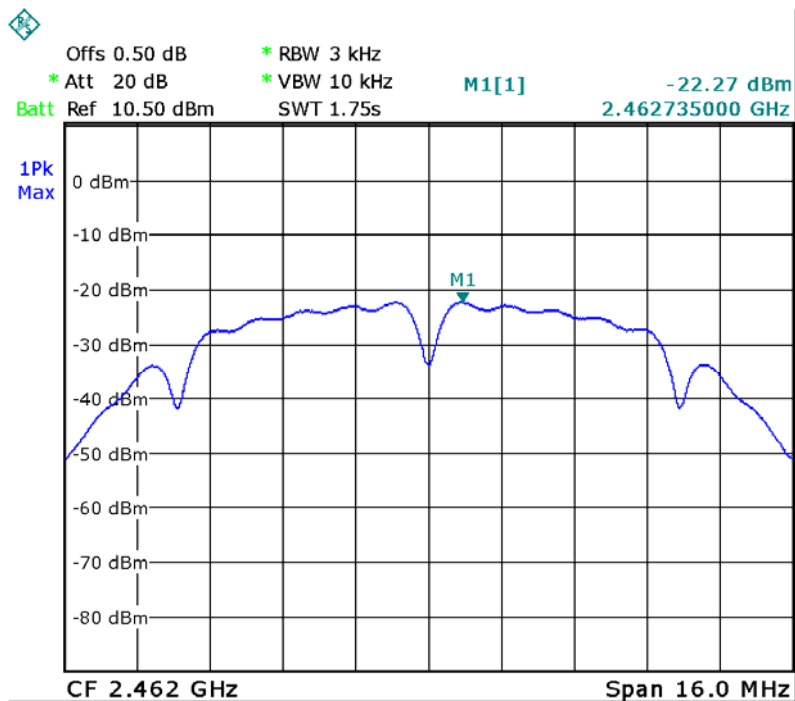
802.11b Low Channel



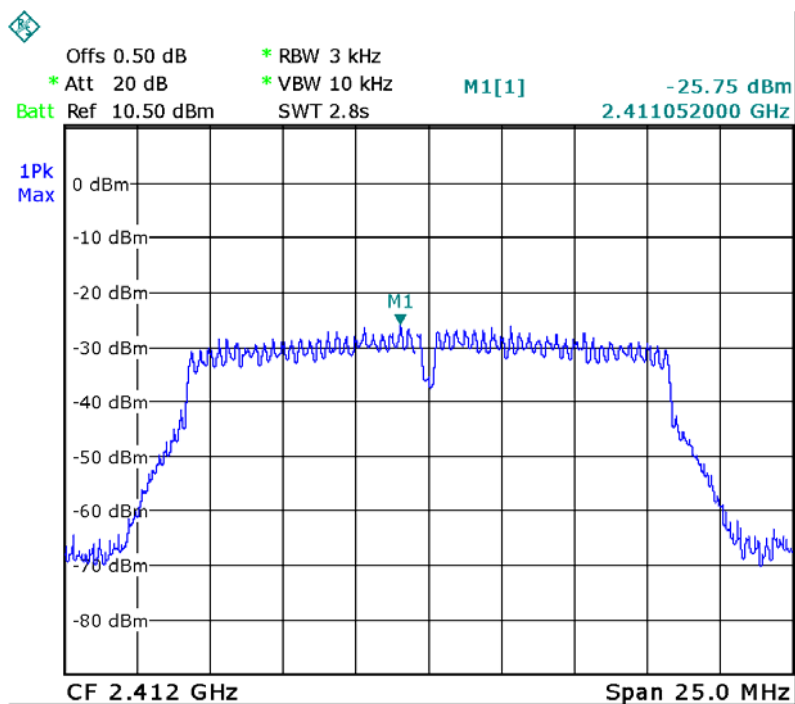
802.11b Middle Channel



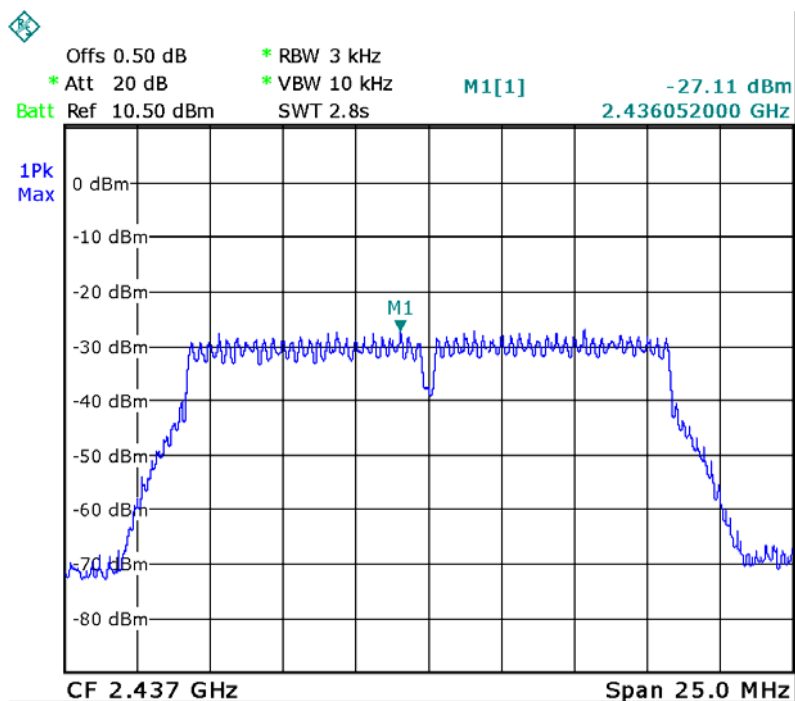
802.11b High Channel



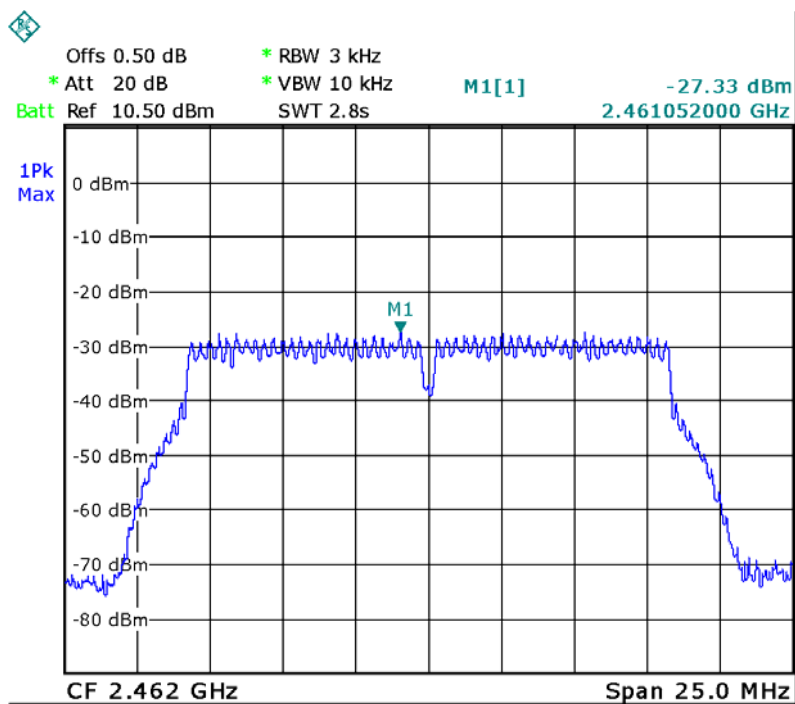
802.11g Low Channel



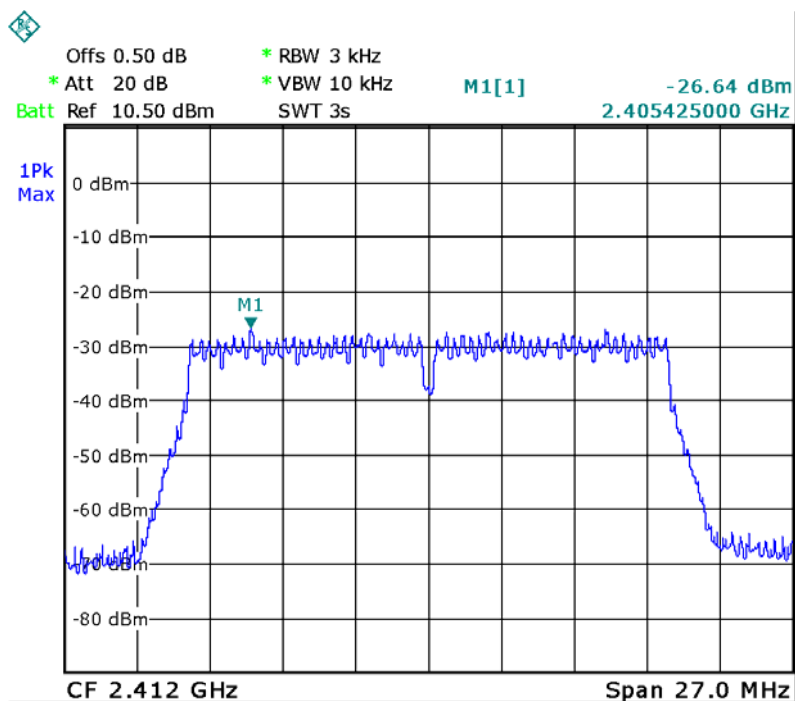
802.11g Middle Channel



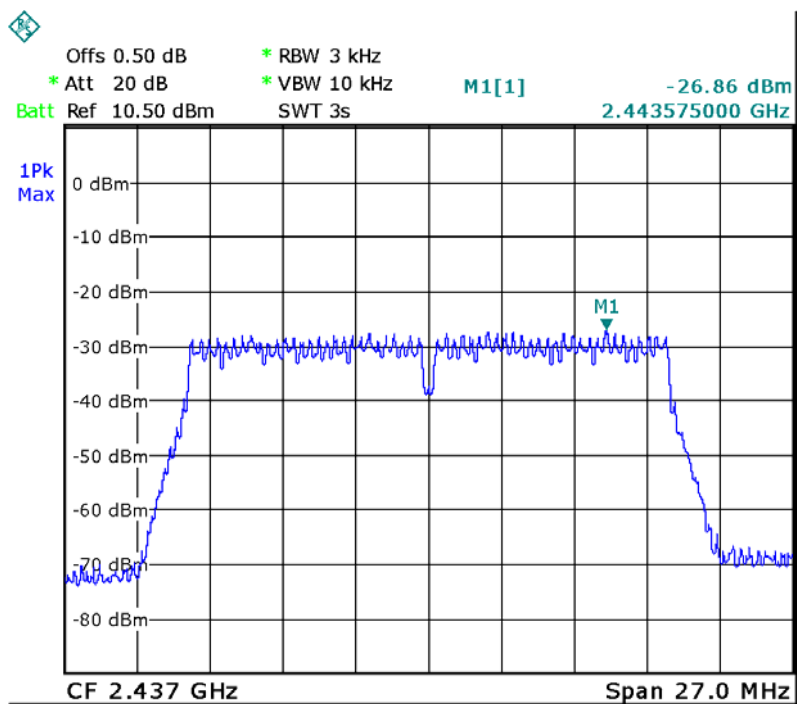
802.11g High Channel



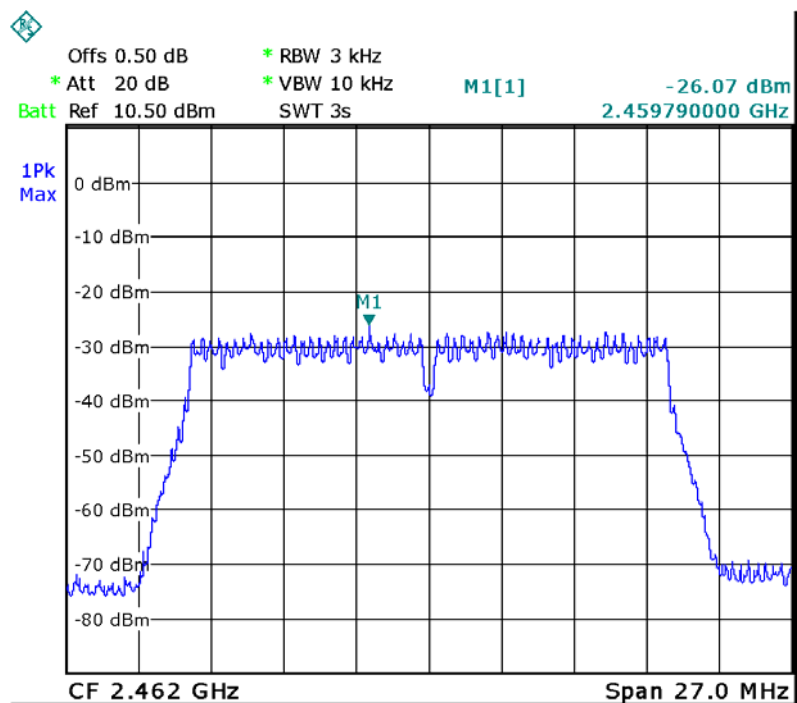
802.11n-HT20 Low Channel



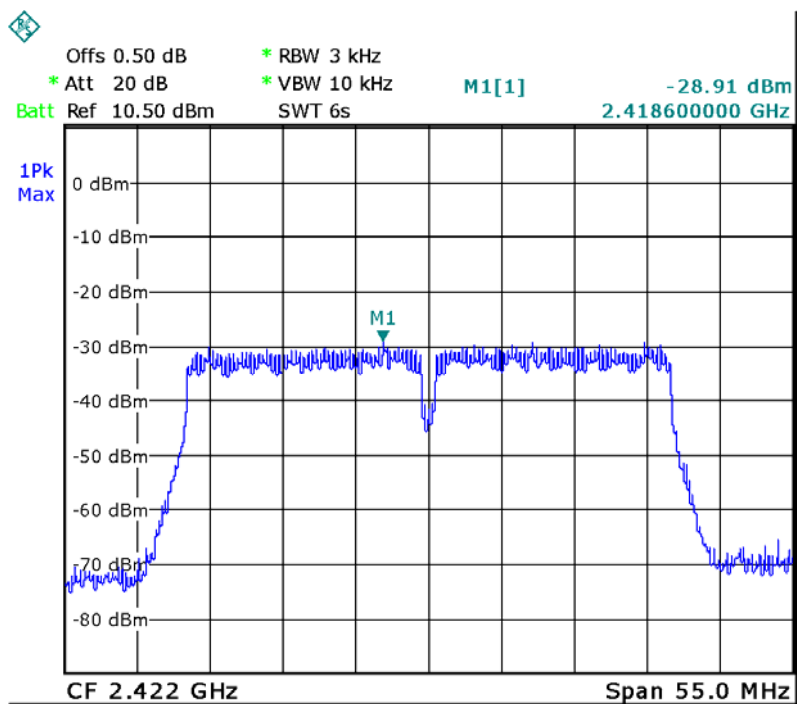
802.11n-HT20 Middle Channel



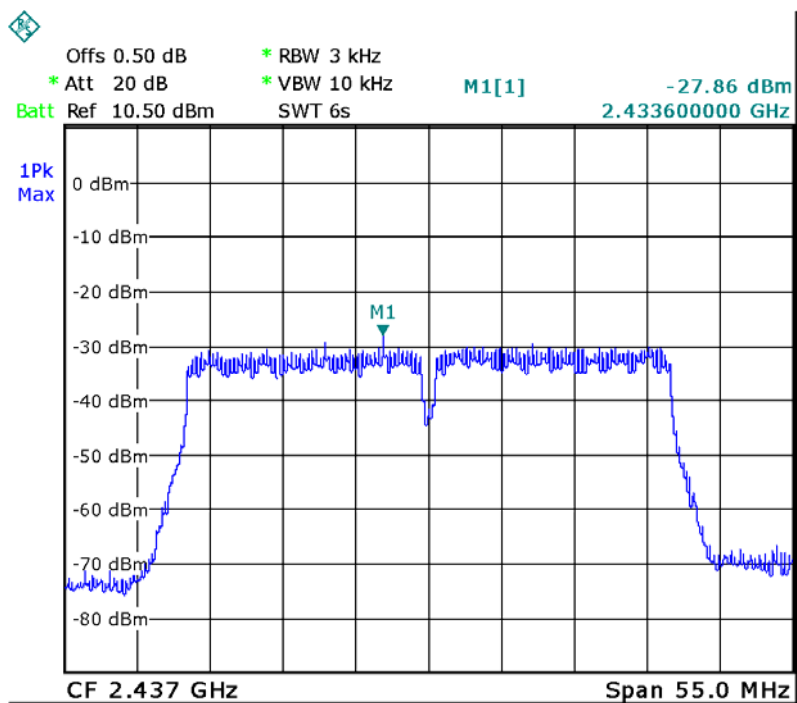
802.11n-HT20 High Channel



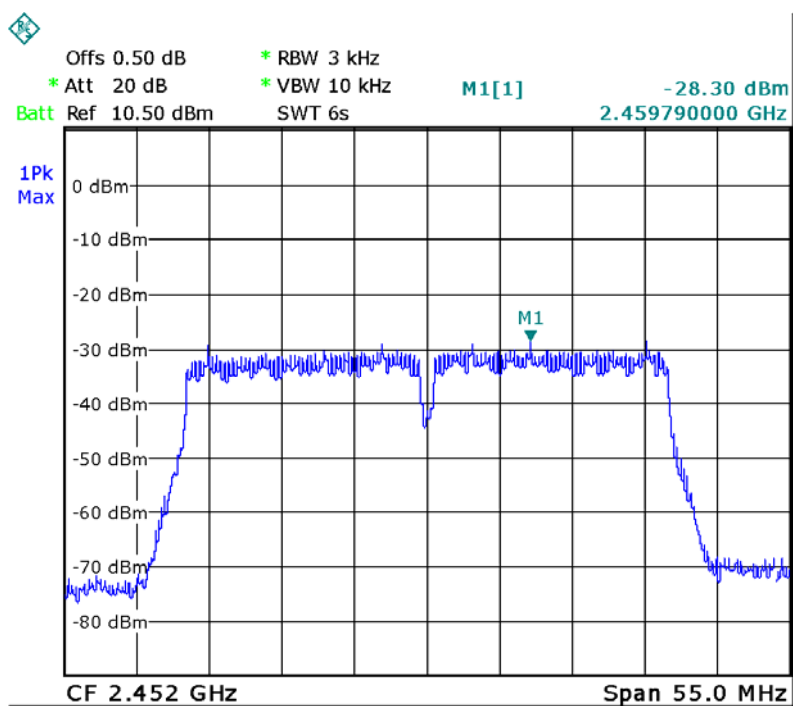
802.11n-HT40 Low Channel



802.11n-HT40 Middle Channel



802.11n-HT40 High Channel





11 Antenna Requirement

According to the FCC part15.203, a transmitter can only be sold or operated with antennas with which it was approved. This product has an external antenna with RP-SMA connector or internal permanent antenna, it meet the requirement of this section.

*****THE END REPORT*****