

FCC TEST REPORT

FCC ID: 2AIGSEAS23

Product : Window Tablet

Model Name : EAS23

Additional Model EAW23

Model Description Only the Model names and colors are different

Brand : Edugear

Report No. : PTC800455160511E-FC01

Prepared for

MAG Digital Technologies Limited
Rm918,East Baihuo Plaza,No 3020, ShenNan East Road,Luohu District
Shenzhen China

Prepared by

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TEST RESULT CERTIFICATION

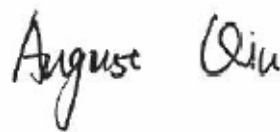
Applicant's name : MAG Digital Technologies Limited
Address : Rm918,East Baihuo Plaza,No 3020, ShenNan East Road,Luohu District
Shenzhen China
Manufacture's name : MAG Digital Technologies Limited
Address : Rm918,East Baihuo Plaza,No 3020, ShenNan East Road,Luohu District
Shenzhen China
Product name : Window Tablet
Model name : EAS23,EAW23
Standards : FCC CFR47 Part 15 Section 15.247
Test procedure : ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R05
Test Date : May. 24, 2016 ~ Jul.03, 2016
Date of Issue : Jul.04, 2016
Test Result : Pass

This device described above has been tested by PTC, 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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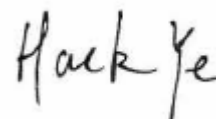
Testing Engineer

August Qiu



Technical Manager

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Authorized Signatory

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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
Conducted Spurious emissions	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	: Window Tablet
Model Name	: EAS23,EAW23
Model Description	: Only the Model names and colors are different
Operating frequency	: 802.11b/g/n HT20: 2412-2462MHz 802.11n HT40: 2422-2452MHz
Antenna installation:	: Internal Integrated Antenna
Antenna Gain:	: 0dBi
Type of Modulation	: 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
The lowest oscillator:	: 32.768kHz
Power supply	: DC 7.6V 6A 45.6Wh Power by Batteries, charging by adapter
Adapter	: Input: AC 100-240V 50/60Hz 1.5A max Output: DC 12V 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	/	/

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
Tests Carried Out Under FCC part 15.207				
Test Item		Test Mode		
Conduction Emission, 0.15MHz to 30MHz		WIFI Communication		

3.4 Test Site

Dongguan Precise Testing Service Co., Ltd.

Building D, Baoding Technology Park, Guangming Road2, Dongcheng District, Dongguan, Guangdong, China, Dongguan, 523129

China

FCC Registration Number: 371540

IC Registration Number: 12191A-1

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	SCHWARZECK	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	SCHWARZECK	BBHA9120D	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	SCHWARZECK	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 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Time	$\pm 2\%$
Duty Cycle	$\pm 2\%$
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$

5 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method:	: ANSI C63.10:2013
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)

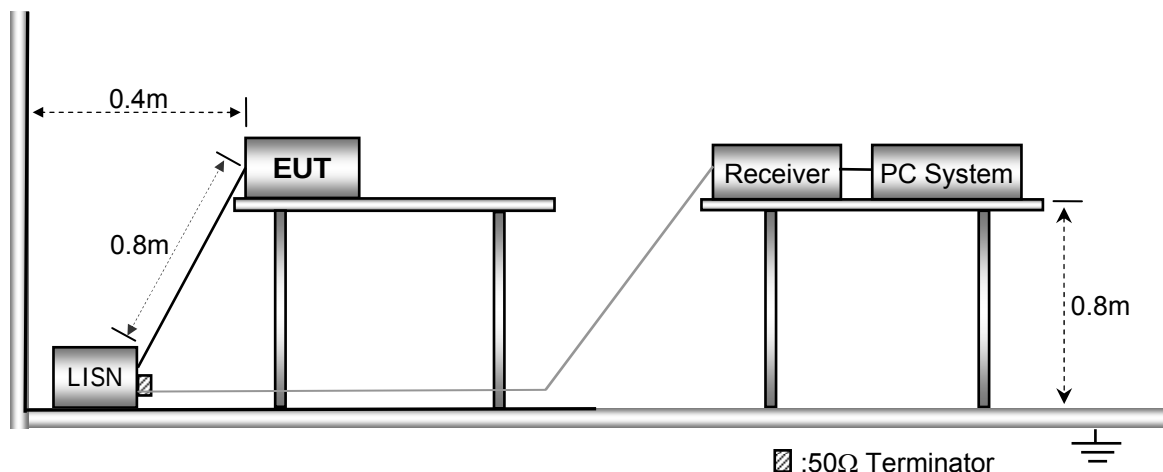
5.1 E.U.T. Operation

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 C63.10:2013.



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

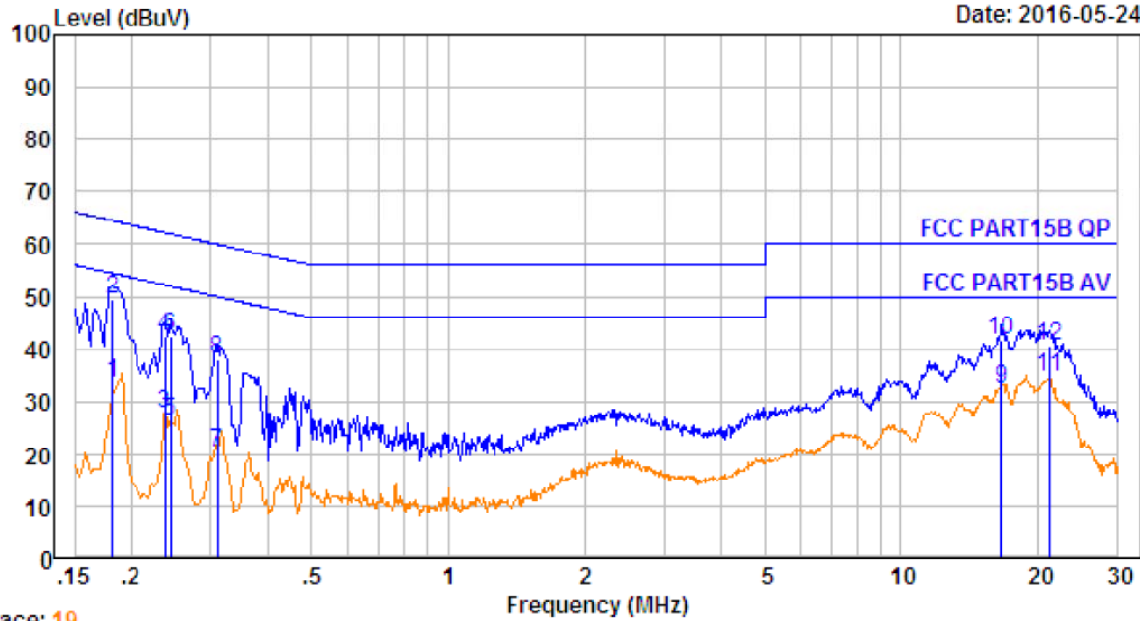
Live line:



Data: 20

File: E:\Test Data 843\Conduction Data\Mei ge.EM6 (26)

Date: 2016-05-24



Trace: 19

No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.182	10.61	0.60	22.20	33.41	54.42	-21.01	Average
2.	0.182	10.61	0.60	38.10	49.31	64.42	-15.11	QP
3.	0.238	10.62	0.60	16.28	27.50	52.17	-24.67	Average
4.	0.238	10.62	0.60	31.16	42.38	62.17	-19.79	QP
5.	0.246	10.62	0.60	14.88	26.10	51.91	-25.81	Average
6.	0.246	10.62	0.60	31.06	42.28	61.91	-19.63	QP
7.	0.310	10.63	0.60	8.97	20.20	49.97	-29.77	Average
8.	0.310	10.63	0.60	26.86	38.09	59.97	-21.88	QP
9.	16.661	10.78	0.60	21.22	32.60	50.00	-17.40	Average
10.	16.661	10.78	0.60	30.41	41.79	60.00	-18.21	QP
11.	21.147	10.79	0.60	23.31	34.70	50.00	-15.30	Average
12.	21.147	10.79	0.60	29.20	40.59	60.00	-19.41	QP



PRECISE TESTING

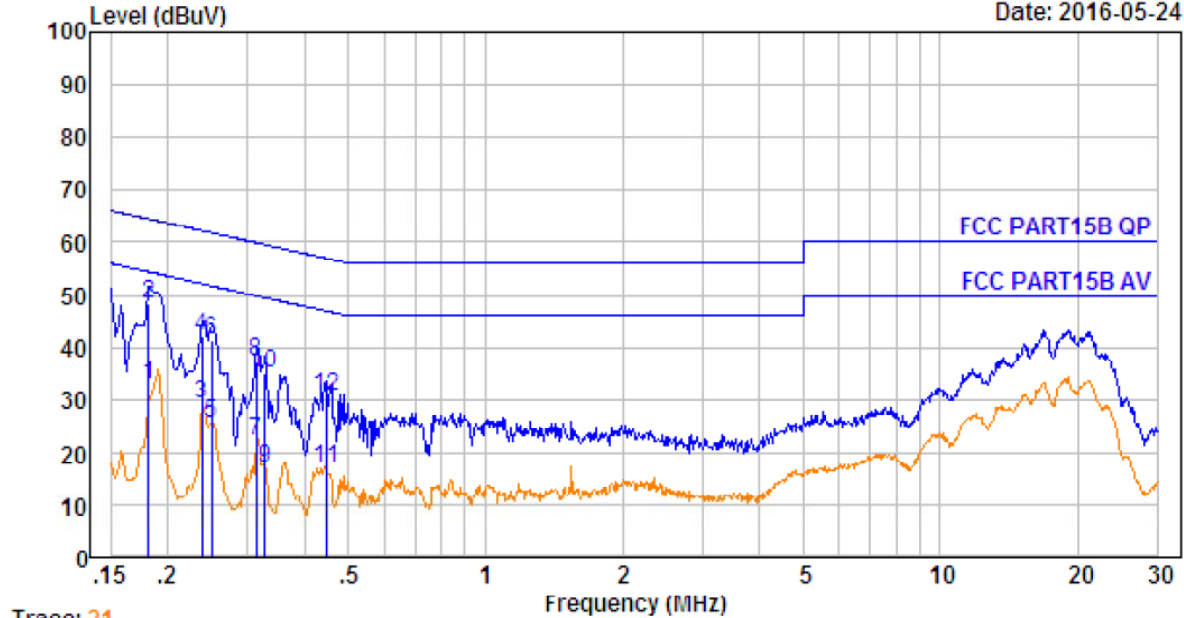
Report No.: PTC800455160511E-FC01

Neutral line:

Data: 22

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Date: 2016-05-24



Trace: 21

No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBUV	Emission Level dBUV	Limit dBUV	Over Limit dB	Remark
1.	0.182	10.61	0.60	21.80	33.01	54.42	-21.41	Average
2.	0.182	10.61	0.60	37.30	48.51	64.42	-15.91	QP
3.	0.238	10.62	0.60	18.08	29.30	52.17	-22.87	Average
4.	0.238	10.62	0.60	30.95	42.17	62.17	-20.00	QP
5.	0.249	10.62	0.60	14.08	25.30	51.78	-26.48	Average
6.	0.249	10.62	0.60	29.94	41.16	61.78	-20.62	QP
7.	0.313	10.63	0.60	10.87	22.10	49.88	-27.78	Average
8.	0.313	10.63	0.60	26.06	37.29	59.88	-22.59	QP
9.	0.327	10.63	0.60	5.87	17.10	49.53	-32.43	Average
10.	0.327	10.63	0.60	24.00	35.23	59.53	-24.30	QP
11.	0.447	10.64	0.60	5.86	17.10	46.93	-29.83	Average
12.	0.447	10.64	0.60	19.23	30.47	56.93	-26.46	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 V03R05

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

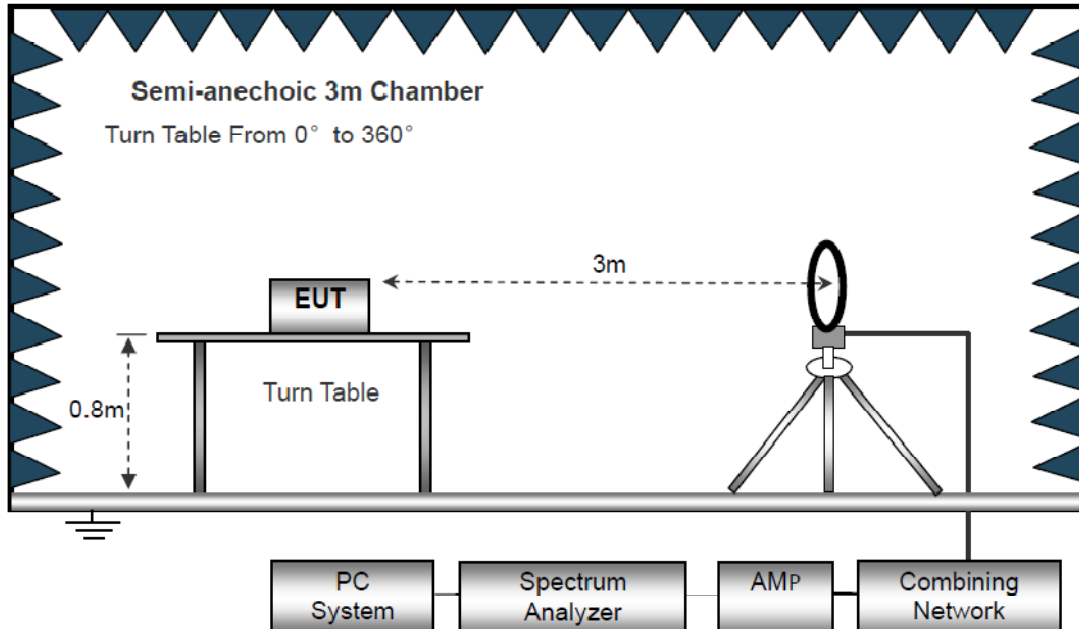
Atmospheric Pressure: : 101.2kPa

EUT Operation : : Refer to section 3.3

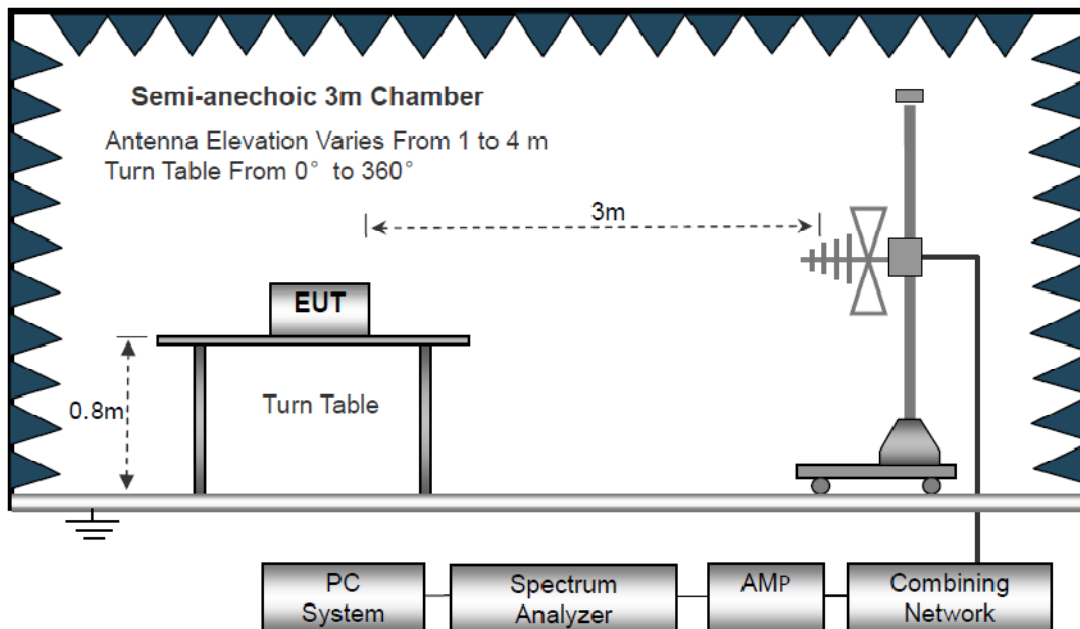
6.2 Test Setup

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

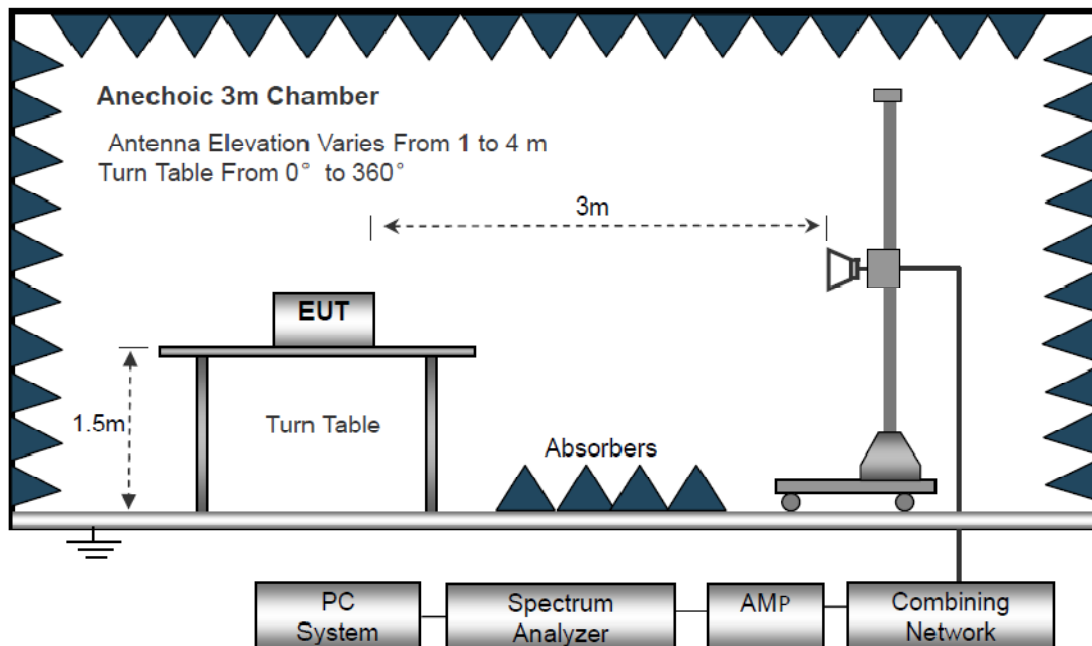
The test setup for emission measurement below 30MHz



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

IF Bandwidth	10kHz
Resolution Bandwidth	10kHz
Video Bandwidth	10kHz

30MHz ~ 1GHz

Detector	: PK
Resolution Bandwidth	: 100kHz
Video Bandwidth	: 300kHz
Detector	: QP
Resolution Bandwidth	: 120kHz
Video Bandwidth	: 300kHz

Above 1GHz

Detector	: PK
Resolution Bandwidth	: 1MHz
Video Bandwidth	: 3MHz
Detector	: AV
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 for below 1GHz and 1.5m for above 1GHz.
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.
8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room



.Summary of Test Results

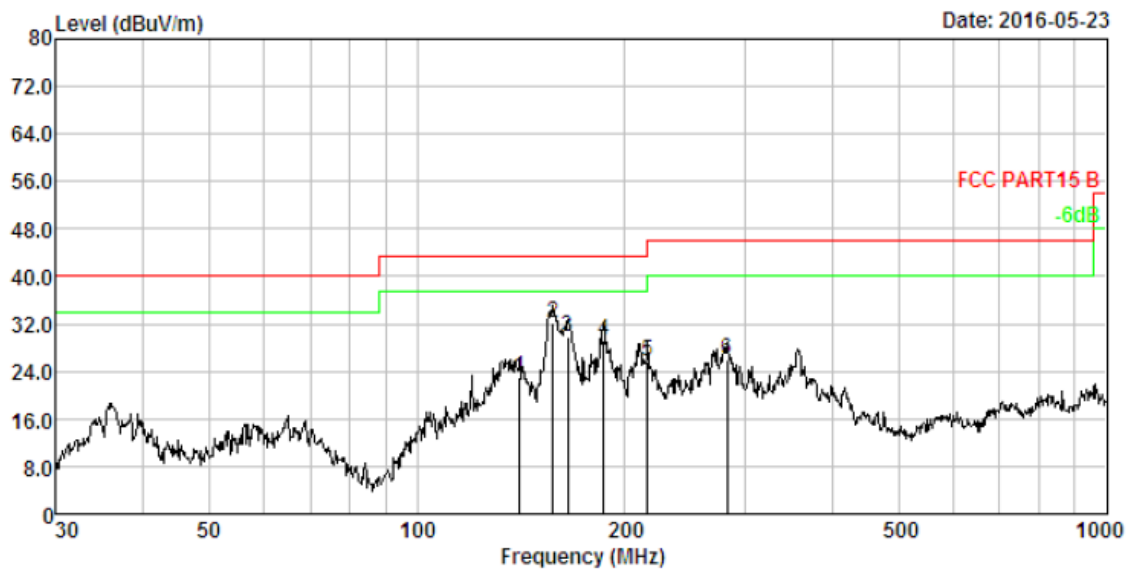
Test Frequency: Below 30MHz

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

Test Frequency: 30MHz ~ 1GHz

All applicable test modes have been tested and only the worst case (GFSK TX in middle channel) is recorded.

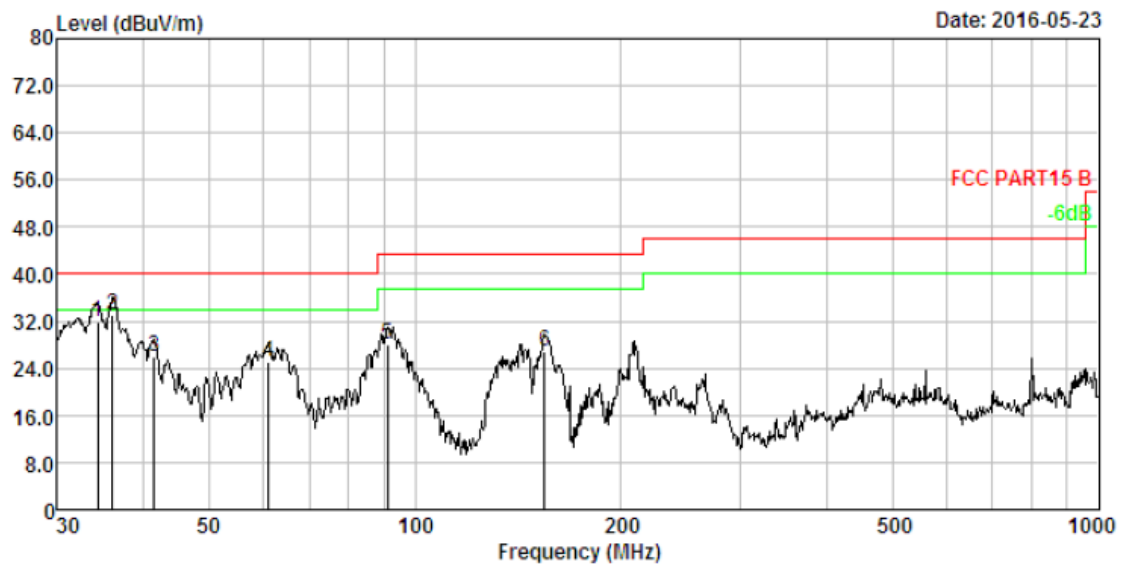
Antenna Polarization: Horizontal



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	140.835	2.46	13.41	37.52	30.51	22.88	43.50	-20.62	QP
2.	157.559	2.56	13.88	46.16	30.55	32.05	43.50	-11.45	QP
3.	165.487	2.60	13.57	44.10	30.56	29.71	43.50	-13.79	QP
4.	186.441	2.71	11.57	45.56	30.61	29.23	43.50	-14.27	QP
5.	216.024	2.84	10.69	42.92	30.66	25.79	46.00	-20.21	QP
6.	281.995	3.08	12.85	40.80	30.75	25.98	46.00	-20.02	QP



Antenna Polarization: Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamplifier Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	34.396	1.18	13.36	47.46	30.02	31.98	40.00	-8.02	QP
2.	36.127	1.22	13.45	48.52	30.03	33.16	40.00	-6.84	QP
3.	41.567	1.35	13.56	41.13	30.08	25.96	40.00	-14.04	QP
4.	61.132	1.70	12.09	41.62	30.22	25.19	40.00	-14.81	QP
5.	91.175	2.06	9.41	46.85	30.36	27.96	43.50	-15.54	QP
6.	154.821	2.54	13.89	40.83	30.54	26.72	43.50	-16.78	QP



Test Frequency: 1GHz ~ 18GHz

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11b Low Channel						
Harmonic & Spurious Emission						
1349.82	43.90	PK	-17.57	26.33	74.00	-47.67
1349.82	45.95	Ave	-17.57	28.38	54.00	-25.62
4824.00	48.83	PK	-1.06	47.77	74.00	-26.23
4824.00	45.55	Ave	-1.06	44.49	54.00	-9.51
7236.00	49.94	PK	1.33	51.27	74.00	-22.73
7236.00	43.47	Ave	1.33	44.80	54.00	-9.20
Restricted bands Emission						
2338.95	50.50	PK	-13.19	37.31	74.00	-36.69
2338.95	41.18	Ave	-13.19	27.99	54.00	-26.01
2709.87	52.65	PK	-12.54	40.11	74.00	-33.89
2709.87	48.01	Ave	-12.54	35.47	54.00	-18.53
3338.13	46.15	PK	-10.89	35.26	74.00	-38.74
3338.13	43.44	Ave	-10.89	32.55	54.00	-21.45
Remark:						
1. Corrected Factor = ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	44.53	PK	-17.57	26.96	74.00	-47.04
1349.82	46.84	Ave	-17.57	29.27	54.00	-24.73
4874.00	49.72	PK	-0.93	48.79	74.00	-25.21
4874.00	44.99	Ave	-0.93	44.06	54.00	-9.94
7311.00	50.20	PK	1.67	51.87	74.00	-22.13
7311.00	42.83	Ave	1.67	44.50	54.00	-9.50
Restricted bands Emission						
2310.67	49.99	PK	-13.19	36.80	74.00	-37.20
2310.67	42.12	Ave	-13.19	28.93	54.00	-25.07
2711.64	52.28	PK	-12.54	39.74	74.00	-34.26
2711.64	47.16	Ave	-12.54	34.62	54.00	-19.38
3336.02	46.92	PK	-10.89	36.03	74.00	-37.97
3336.02	44.40	Ave	-10.89	33.51	54.00	-20.49
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11b High Channel						
Harmonic & Spurious Emission						
1349.82	44.05	PK	-17.57	26.48	74.00	-47.52
1349.82	47.00	Ave	-17.57	29.43	54.00	-24.57
4924.00	50.52	PK	-0.87	49.65	74.00	-24.35
4924.00	44.77	Ave	-0.87	43.90	54.00	-10.10
7386.00	50.01	PK	1.84	51.85	74.00	-22.15
7386.00	42.46	Ave	1.84	44.30	54.00	-9.70
Restricted bands Emission						
2345.86	51.79	PK	-13.19	38.60	74.00	-35.40
2345.86	42.04	Ave	-13.19	28.85	54.00	-25.15
2718.69	51.40	PK	-12.54	38.86	74.00	-35.14
2718.69	45.92	Ave	-12.54	33.38	54.00	-20.62
3337.40	47.27	PK	-10.89	36.38	74.00	-37.62
3337.40	43.99	Ave	-10.89	33.10	54.00	-20.90
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.40	PK	-17.57	25.83	74.00	-48.17
1349.82	45.01	Ave	-17.57	27.44	54.00	-26.56
4824.00	49.80	PK	-1.06	48.74	74.00	-25.26
4824.00	45.73	Ave	-1.06	44.67	54.00	-9.33
7236.00	49.89	PK	1.33	51.22	74.00	-22.78
7236.00	43.71	Ave	1.33	45.04	54.00	-8.96
Restricted bands Emission						
2339.00	49.51	PK	-13.19	36.32	74.00	-37.68
2339.00	41.49	Ave	-13.19	28.30	54.00	-25.70
2693.28	52.46	PK	-12.54	39.92	74.00	-34.08
2693.28	48.54	Ave	-12.54	36.00	54.00	-18.00
3335.75	46.15	PK	-10.89	35.26	74.00	-38.74
3335.75	44.38	Ave	-10.89	33.49	54.00	-20.51
Remark:						
1. Corrected Factor = ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.34	PK	-17.57	25.77	74.00	-48.23
1349.82	45.54	Ave	-17.57	27.97	54.00	-26.03
4874.00	49.92	PK	-0.93	48.99	74.00	-25.01
4874.00	45.56	Ave	-0.93	44.63	54.00	-9.37
7311.00	50.63	PK	1.67	52.30	74.00	-21.70
7311.00	44.62	Ave	1.67	46.29	54.00	-7.71
Restricted bands Emission						
2338.20	49.99	PK	-13.19	36.80	74.00	-37.20
2338.20	42.12	Ave	-13.19	28.93	54.00	-25.07
2713.01	52.28	PK	-12.54	39.74	74.00	-34.26
2713.01	47.16	Ave	-12.54	34.62	54.00	-19.38
3334.15	46.92	PK	-10.89	36.03	74.00	-37.97
3334.15	44.40	Ave	-10.89	33.51	54.00	-20.49
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.88	PK	-17.57	26.31	74.00	-47.69
1349.82	45.55	Ave	-17.57	27.98	54.00	-26.02
4924.00	49.95	PK	-0.87	49.08	74.00	-24.92
4924.00	46.29	Ave	-0.87	45.42	54.00	-8.58
7386.00	50.98	PK	1.84	52.82	74.00	-21.18
7386.00	45.15	Ave	1.84	46.99	54.00	-7.01
Restricted bands Emission						
2347.37	51.79	PK	-13.19	38.60	74.00	-35.40
2347.37	42.04	Ave	-13.19	28.85	54.00	-25.15
2696.28	51.40	PK	-12.54	38.86	74.00	-35.14
2696.28	45.92	Ave	-12.54	33.38	54.00	-20.62
3338.69	47.27	PK	-10.89	36.38	74.00	-37.62
3338.69	43.99	Ave	-10.89	33.10	54.00	-20.90
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.18	PK	-17.57	25.61	74.00	-48.39
1349.82	46.83	Ave	-17.57	29.26	54.00	-24.74
4824.00	48.81	PK	-1.06	47.75	74.00	-26.25
4824.00	45.46	Ave	-1.06	44.40	54.00	-9.60
7236.00	50.58	PK	1.33	51.91	74.00	-22.09
7236.00	44.34	Ave	1.33	45.67	54.00	-8.33
Restricted bands Emission						
2314.18	49.67	PK	-13.19	36.48	74.00	-37.52
2314.18	41.87	Ave	-13.19	28.68	54.00	-25.32
2693.21	51.72	PK	-12.54	39.18	74.00	-34.82
2693.21	47.87	Ave	-12.54	35.33	54.00	-18.67
3334.73	45.66	PK	-10.89	34.77	74.00	-39.23
3334.73	44.81	Ave	-10.89	33.92	54.00	-20.08
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	42.33	PK	-17.57	24.76	74.00	-49.24
1349.82	46.71	Ave	-17.57	29.14	54.00	-24.86
4874.00	49.78	PK	-0.93	48.85	74.00	-25.15
4874.00	44.95	Ave	-0.93	44.02	54.00	-9.98
7311.00	51.25	PK	1.67	52.92	74.00	-21.08
7311.00	44.15	Ave	1.67	45.82	54.00	-8.18
Restricted bands Emission						
2320.65	49.99	PK	-13.19	36.80	74.00	-37.20
2320.65	42.12	Ave	-13.19	28.93	54.00	-25.07
2710.80	52.28	PK	-12.54	39.74	74.00	-34.26
2710.80	47.16	Ave	-12.54	34.62	54.00	-19.38
3333.03	46.92	PK	-10.89	36.03	74.00	-37.97
3333.03	44.40	Ave	-10.89	33.51	54.00	-20.49
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11n HT20 High Channel						
Harmonic & Spurious Emission						
1349.82	44.46	PK	-17.57	26.89	74.00	-47.11
1349.82	46.18	Ave	-17.57	28.61	54.00	-25.39
4924.00	50.44	PK	-0.87	49.57	74.00	-24.43
4924.00	45.65	Ave	-0.87	44.78	54.00	-9.22
7386.00	51.74	PK	1.84	53.58	74.00	-20.42
7386.00	44.02	Ave	1.84	45.86	54.00	-8.14
Restricted bands Emission						
2324.45	51.79	PK	-13.19	38.60	74.00	-35.40
2324.45	42.04	Ave	-13.19	28.85	54.00	-25.15
2719.76	51.40	PK	-12.54	38.86	74.00	-35.14
2719.76	45.92	Ave	-12.54	33.38	54.00	-20.62
3336.24	47.27	PK	-10.89	36.38	74.00	-37.62
3336.24	43.99	Ave	-10.89	33.10	54.00	-20.90
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	44.31	PK	-17.57	26.74	74.00	-47.26
1349.82	45.28	Ave	-17.57	27.71	54.00	-26.29
4844.00	46.28	PK	-1.06	45.22	74.00	-28.78
4844.00	43.65	Ave	-1.06	42.59	54.00	-11.41
7266.00	46.91	PK	1.33	48.24	74.00	-25.76
7266.00	42.25	Ave	1.33	43.58	54.00	-10.42
Restricted bands Emission						
2343.07	49.09	PK	-13.19	35.90	74.00	-38.10
2343.07	42.35	Ave	-13.19	29.16	54.00	-24.84
2691.21	52.07	PK	-12.54	39.53	74.00	-34.47
2691.21	48.14	Ave	-12.54	35.60	54.00	-18.40
3333.51	44.68	PK	-10.89	33.79	74.00	-40.21
3333.51	44.61	Ave	-10.89	33.72	54.00	-20.28
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.82	PK	-17.57	26.25	74.00	-47.75
1349.82	45.31	Ave	-17.57	27.74	54.00	-26.26
4874.00	46.58	PK	-0.93	45.65	74.00	-28.35
4874.00	43.58	Ave	-0.93	42.65	54.00	-11.35
7311.00	46.54	PK	1.67	48.21	74.00	-25.79
7311.00	41.99	Ave	1.67	43.66	54.00	-10.34
Restricted bands Emission						
2315.45	49.99	PK	-13.19	36.80	74.00	-37.20
2315.45	42.12	Ave	-13.19	28.93	54.00	-25.07
2713.58	52.28	PK	-12.54	39.74	74.00	-34.26
2713.58	47.16	Ave	-12.54	34.62	54.00	-19.38
3335.74	46.92	PK	-10.89	36.03	74.00	-37.97
3335.74	44.40	Ave	-10.89	33.51	54.00	-20.49
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



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						
Harmonic & Spurious Emission						
1349.82	43.12	PK	-17.57	25.55	74.00	-48.45
1349.82	46.26	Ave	-17.57	28.69	54.00	-25.31
4904.00	46.26	PK	-0.87	45.39	74.00	-28.61
4904.00	42.98	Ave	-0.87	42.11	54.00	-11.89
7356.00	46.22	PK	1.84	48.06	74.00	-25.94
7356.00	41.51	Ave	1.84	43.35	54.00	-10.65
Restricted bands Emission						
2314.49	51.79	PK	-13.19	38.60	74.00	-35.40
2314.49	42.04	Ave	-13.19	28.85	54.00	-25.15
2714.26	51.40	PK	-12.54	38.86	74.00	-35.14
2714.26	45.92	Ave	-12.54	33.38	54.00	-20.62
3333.22	47.27	PK	-10.89	36.38	74.00	-37.62
3333.22	43.99	Ave	-10.89	33.10	54.00	-20.90
Remark:						
1.Corrected Factor=ANT Factor + Cable Loss – Amp Gain						



Radiated band edge:

Frequency	Receiver Reading	Detector	Corrected Factor	Corrected Amplitude	Limit	Margin
(MHz)	(dBμV)	(PK/QP/Ave)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
802.11b						
2400.00	49.96	PK	-13.12	36.84	74.00	-37.16
2400.00	41.42	PK	-13.12	28.30	74.00	-45.70
2483.50	47.91	PK	-13.06	34.85	74.00	-39.15
2483.50	42.92	PK	-13.06	29.86	74.00	-44.14
802.11g						
2400.00	49.01	PK	-13.12	35.89	74.00	-38.11
2400.00	41.56	PK	-13.12	28.44	74.00	-45.56
2483.50	49.33	PK	-13.06	36.27	74.00	-37.73
2483.50	43.33	PK	-13.06	30.27	74.00	-43.73
802.11n HT20						
2400.00	48.46	PK	-13.12	35.34	74.00	-38.66
2400.00	40.47	PK	-13.12	27.35	74.00	-46.65
2483.50	49.19	PK	-13.06	36.13	74.00	-37.87
2483.50	44.54	PK	-13.06	31.48	74.00	-42.52
802.11n HT40						
2400.00	47.63	PK	-13.12	34.51	74.00	-39.49
2400.00	39.29	PK	-13.12	26.17	74.00	-47.83
2483.50	47.82	PK	-13.06	34.76	74.00	-39.24
2483.50	43.17	PK	-13.06	30.11	74.00	-43.89

Test Frequency: Above 18GHz

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

7 Conducted Spurious Emissions

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10 2013 ; KDB 558074 D01 DTS MEAS GUIDANCE V03R05
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, 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 Section 15.209(a) is not required. 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 Result	: PASS

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

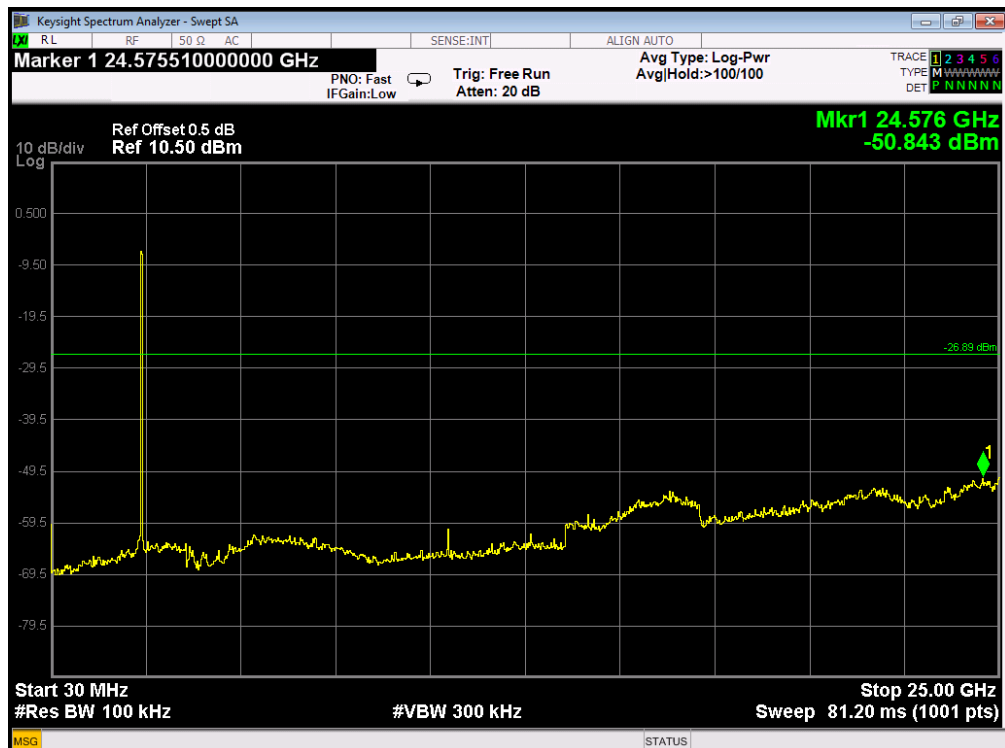
Detector function = peak, Trace = max hold

7.2 Test Result

Remark: only the worst data (802.11b mode middle channel) were reported.



Low Channel



Middle Channel





PRECISE TESTING

Report No.: PTC800455160511E-FC01

High Channel



8 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 V03R05
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

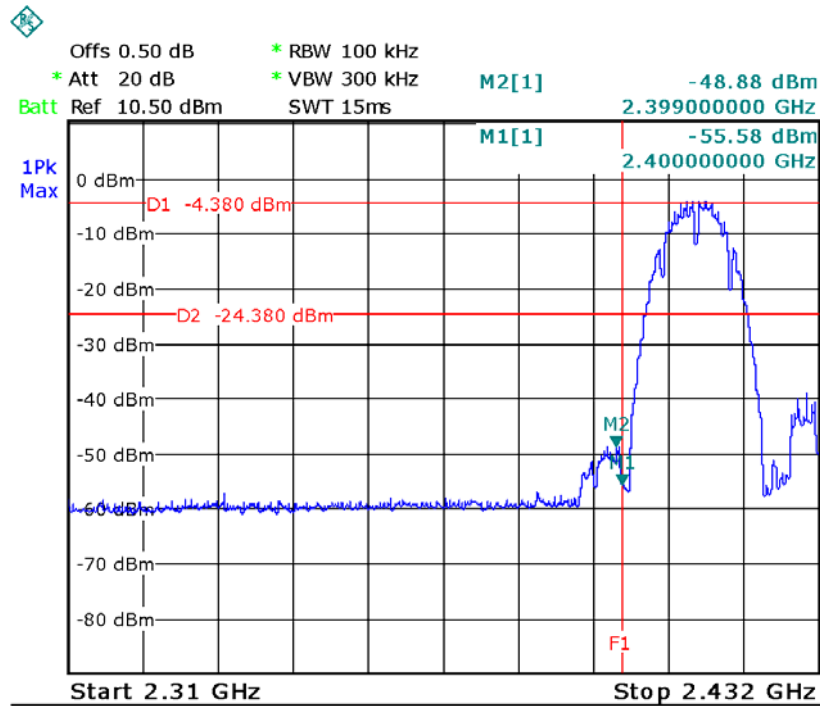
8.1 Test Procedure

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: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

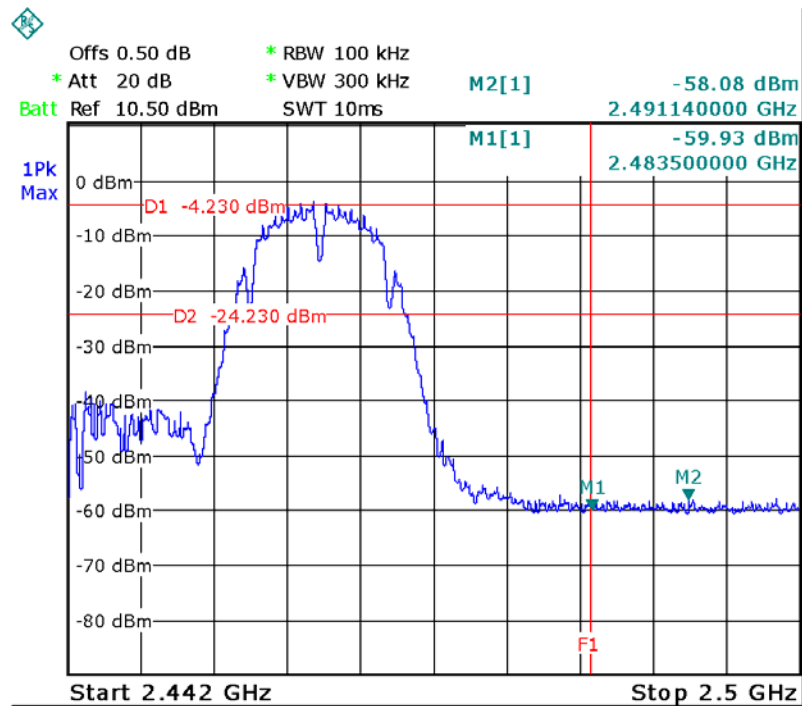


8.2 Test Result

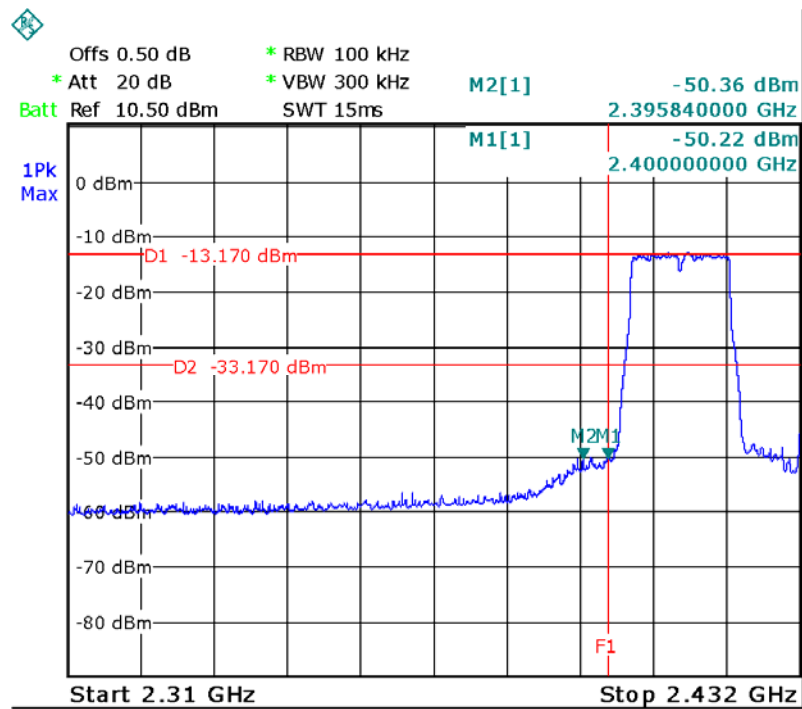
802.11b Band edge-left side



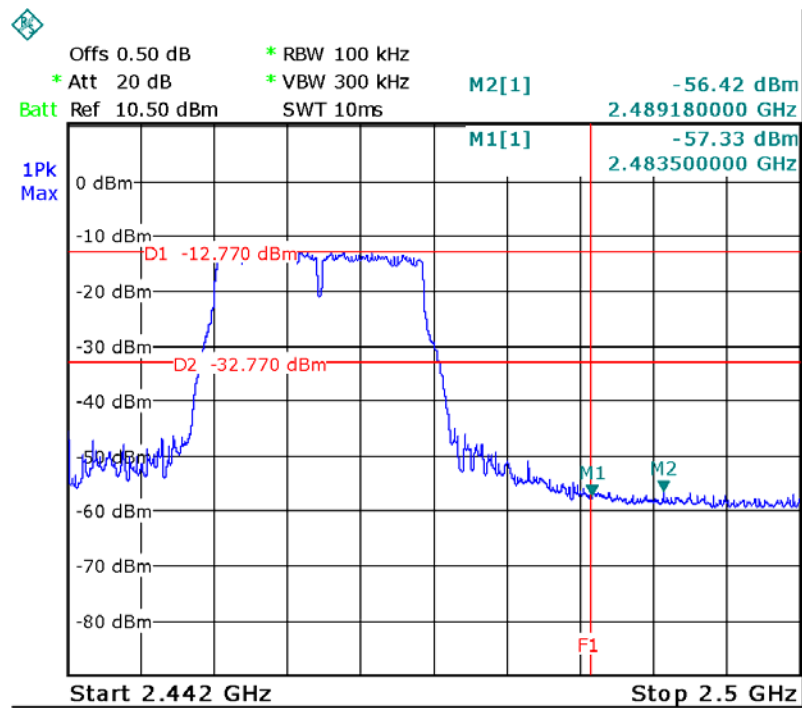
802.11b Band edge-right side



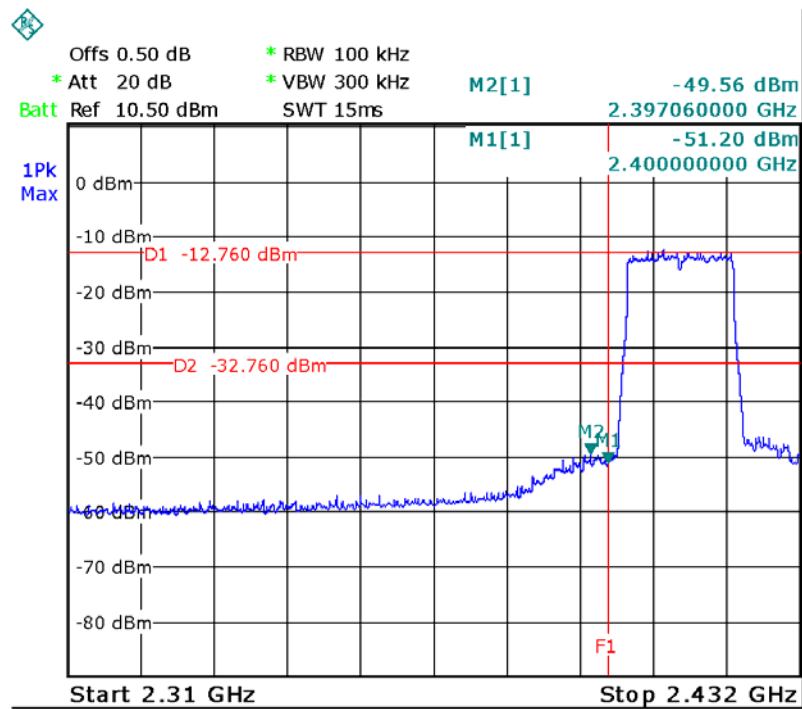
802.11g Band edge-left side



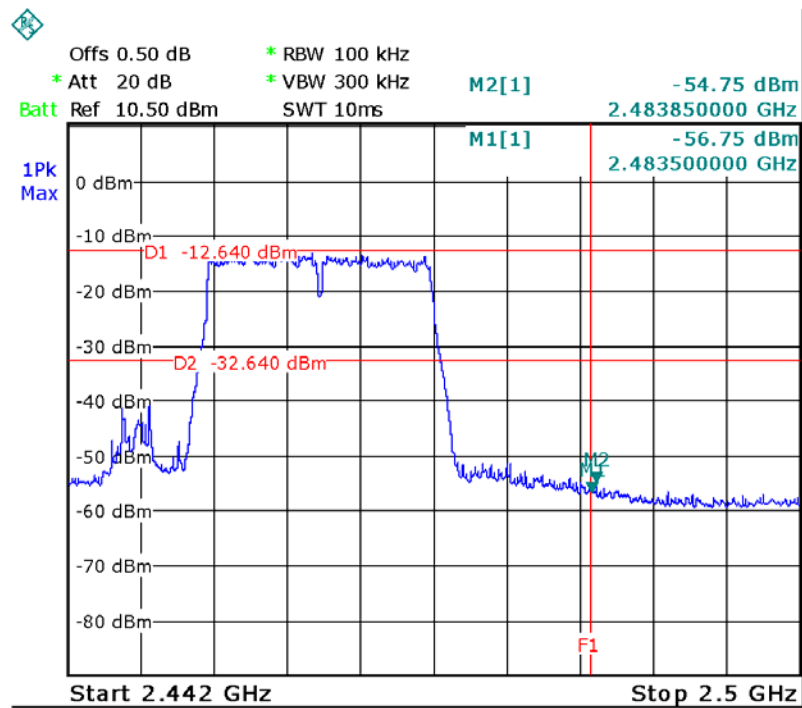
802.11g Band edge-right side



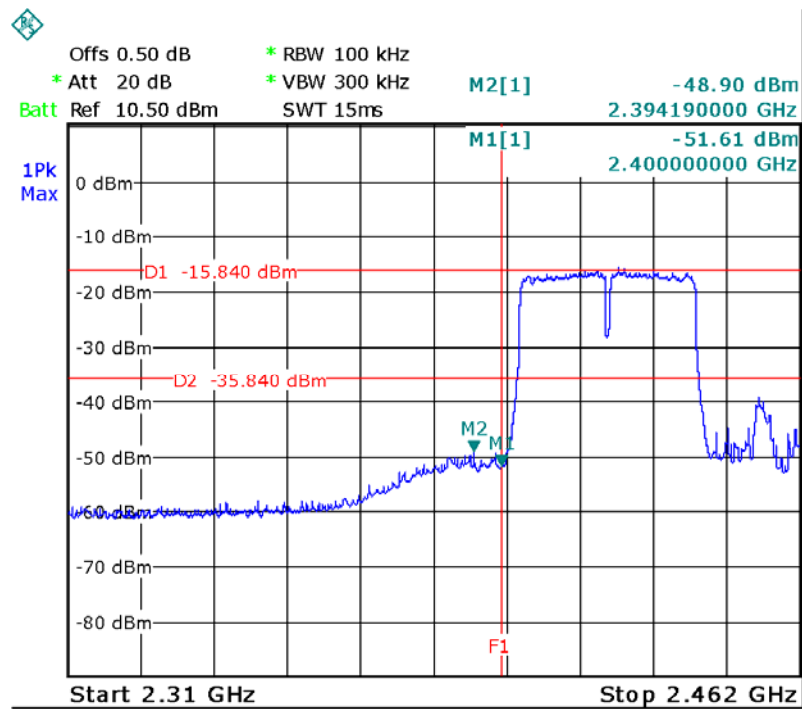
802.11n-HT20 Band edge-left side



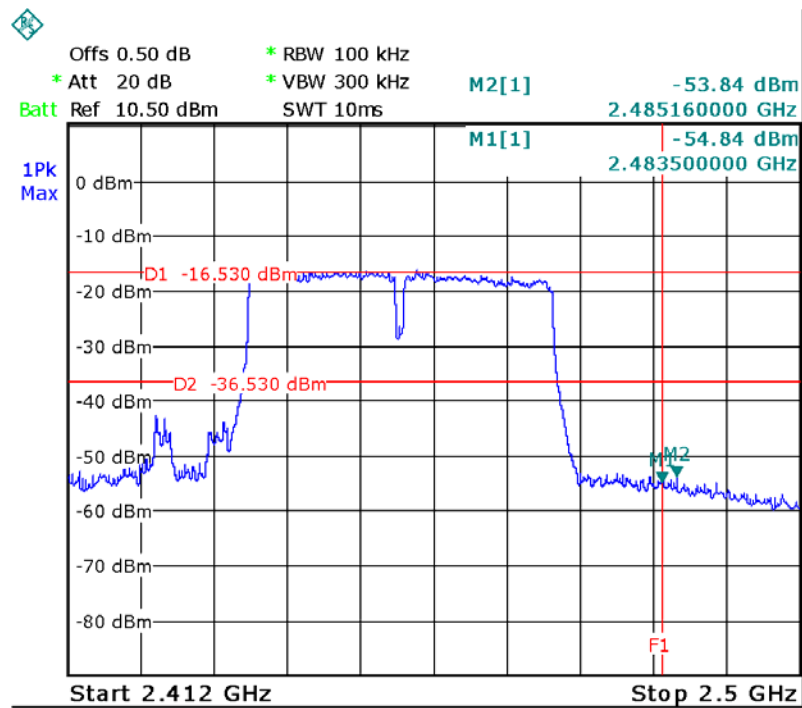
802.11n-HT20 Band edge-right side



802.11n-HT40 Band edge-left side



802.11n-HT40 Band edge-right side



9 6dB Bandwidth Measurement

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R05
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

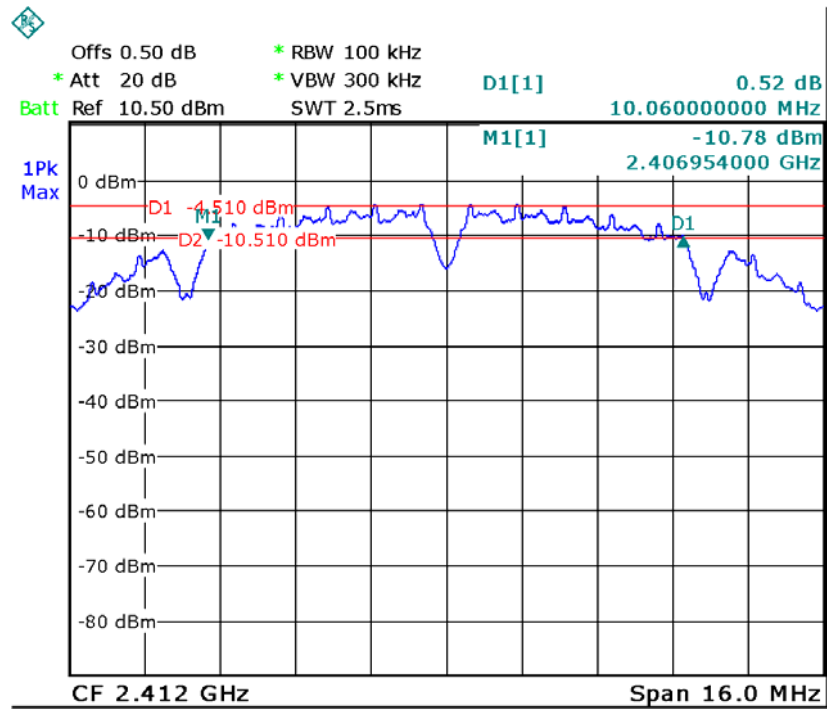
9.1 Test Procedure

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,

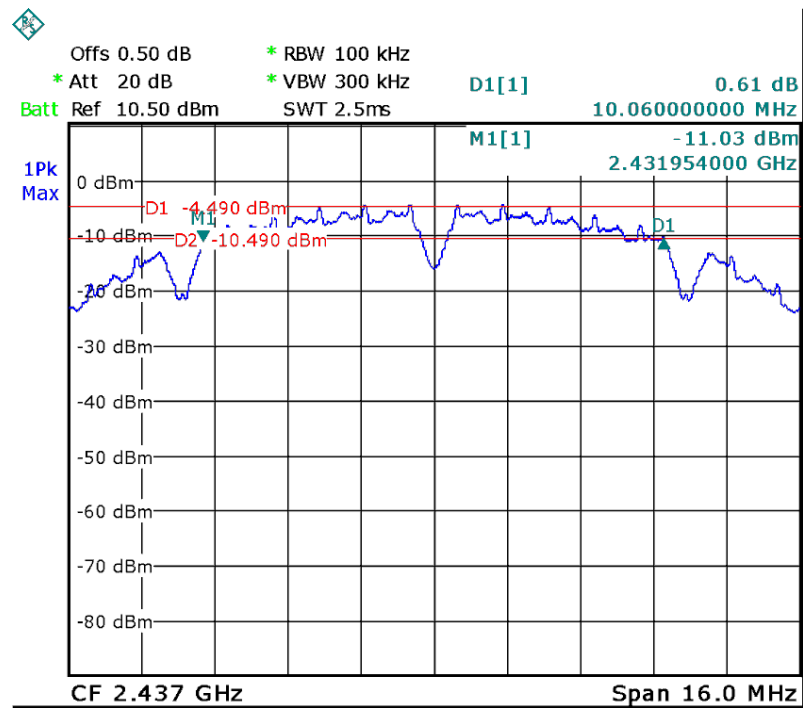
9.2 Test Result

Modulation	Bandwidth(MHz)			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	10.06	10.06	10.06	≥500kHz
802.11g	16.62	16.62	16.62	≥500kHz
802.11n-HT20	17.84	17.84	17.84	≥500kHz
802.11n-HT40	36.56	36.56	36.56	≥500kHz

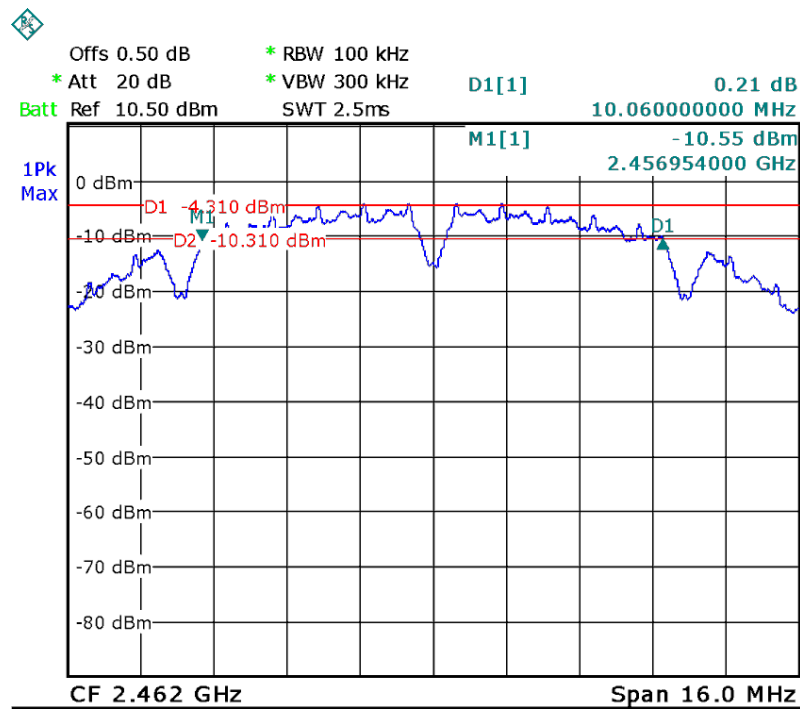
802.11b Low Channel



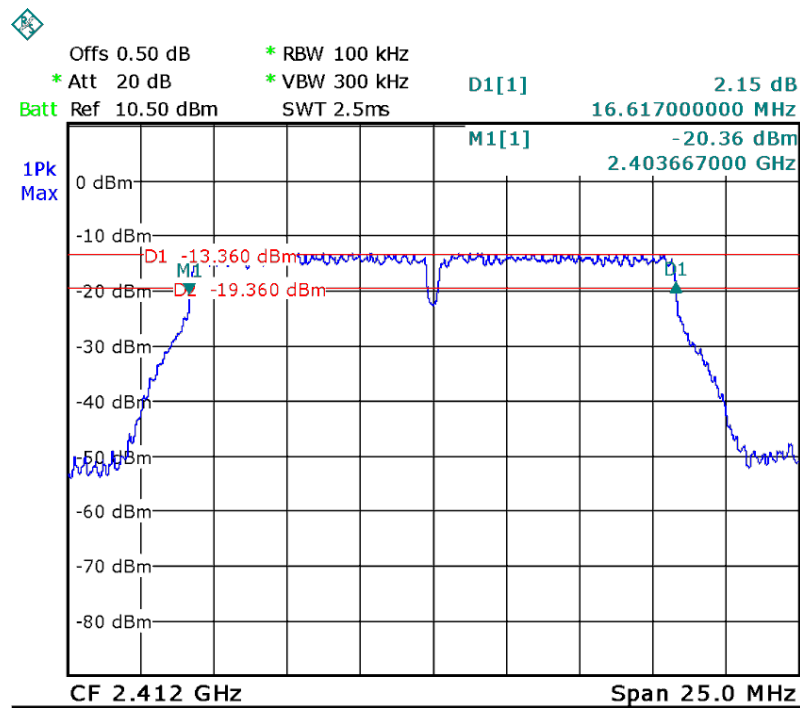
802.11b Middle Channel



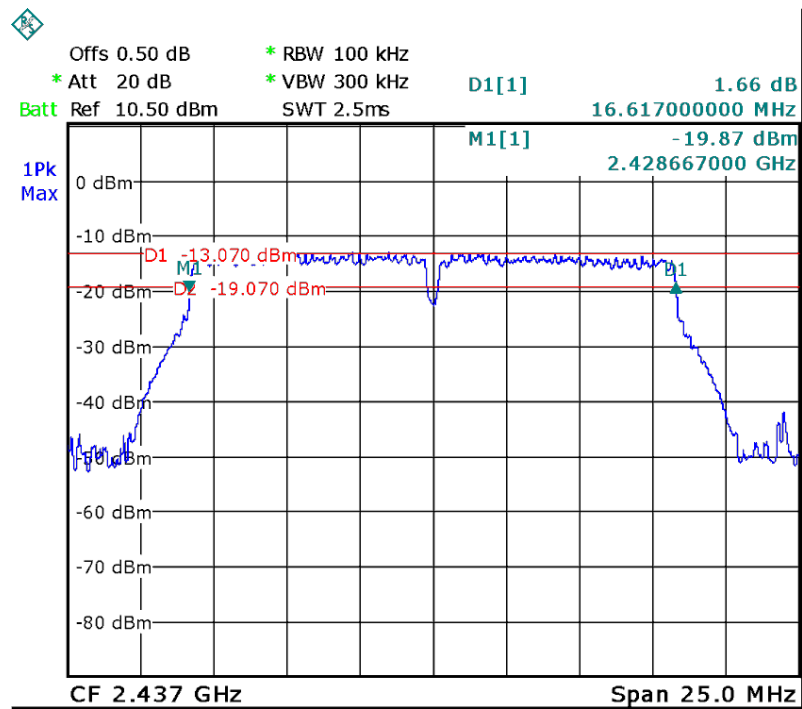
802.11b High Channel



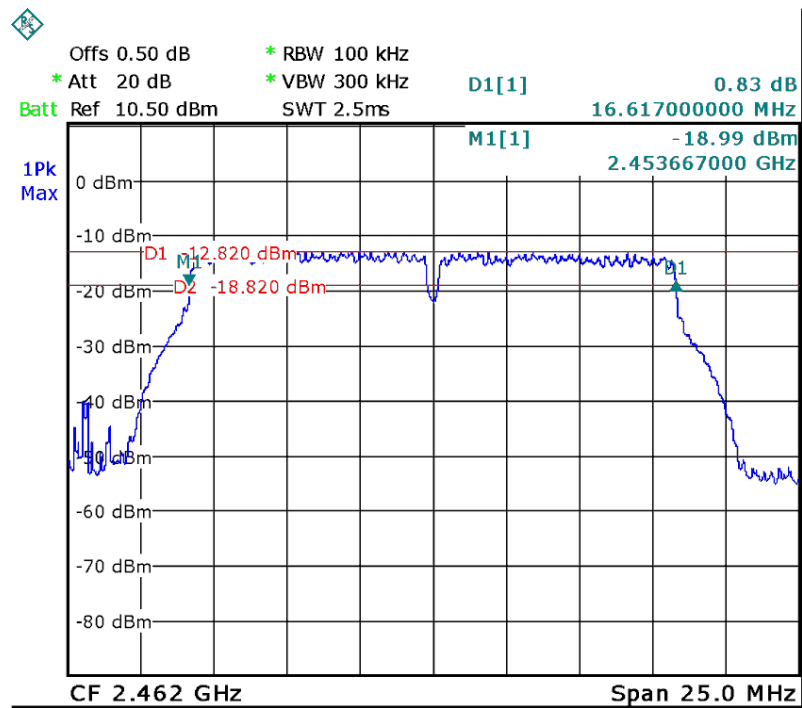
802.11g Low Channel



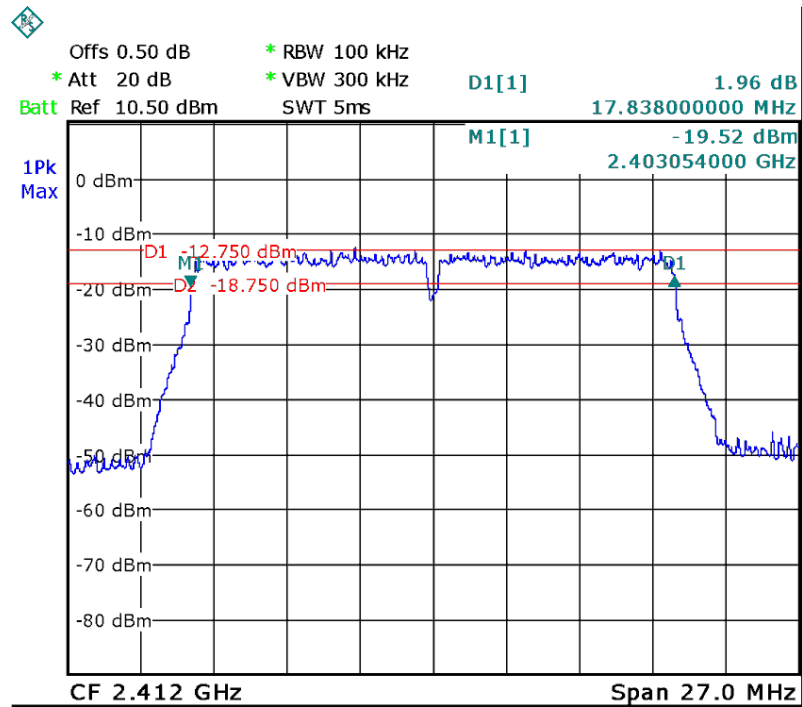
802.11g Middle Channel



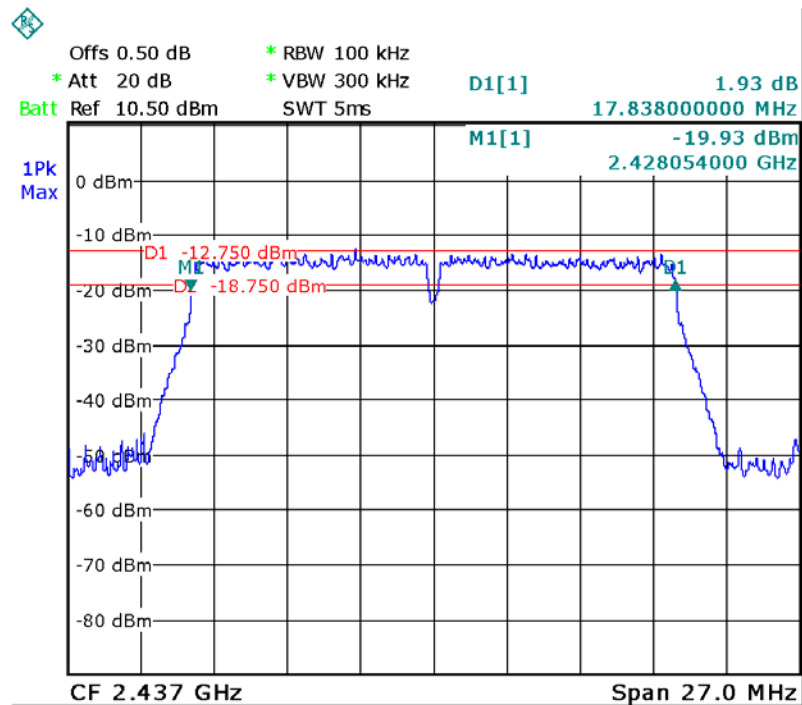
802.11g High Channel



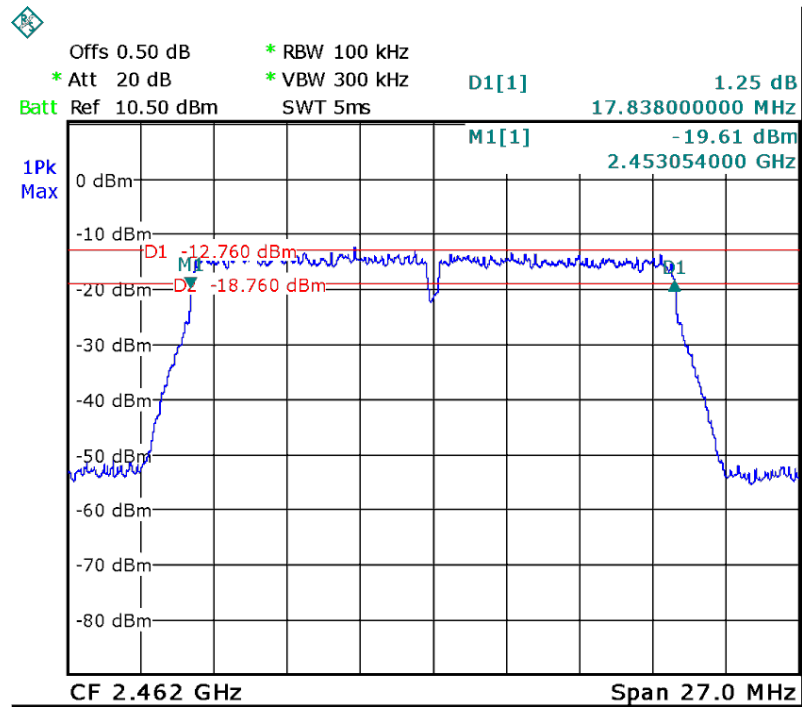
802.11n-HT20 Low Channel



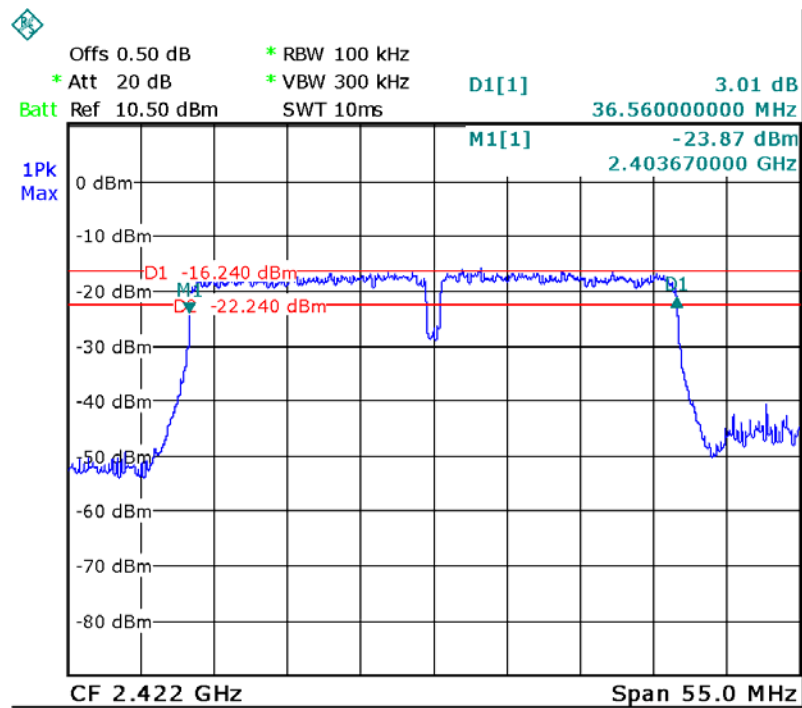
802.11n-HT20 Middle Channel



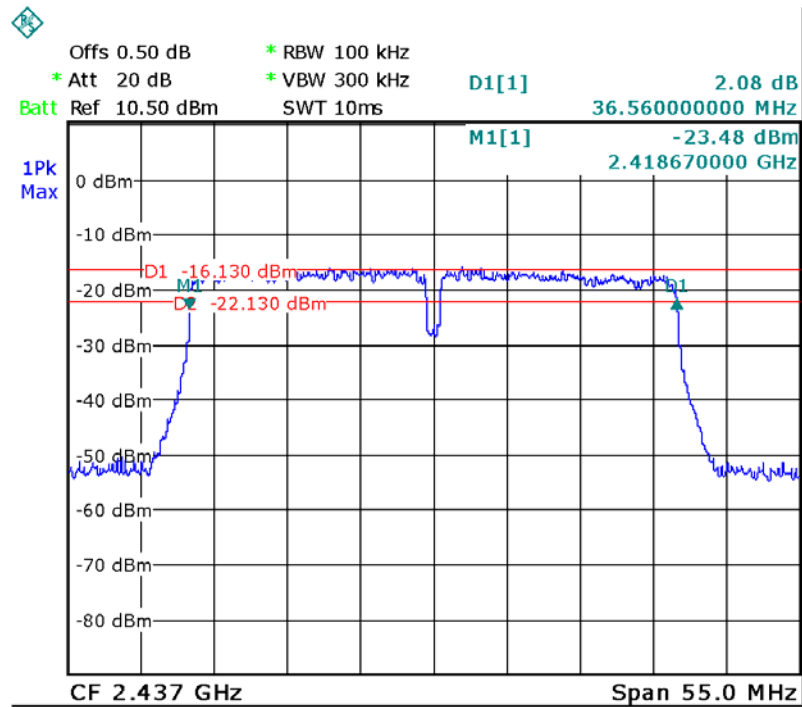
802.11n-HT20 High Channel



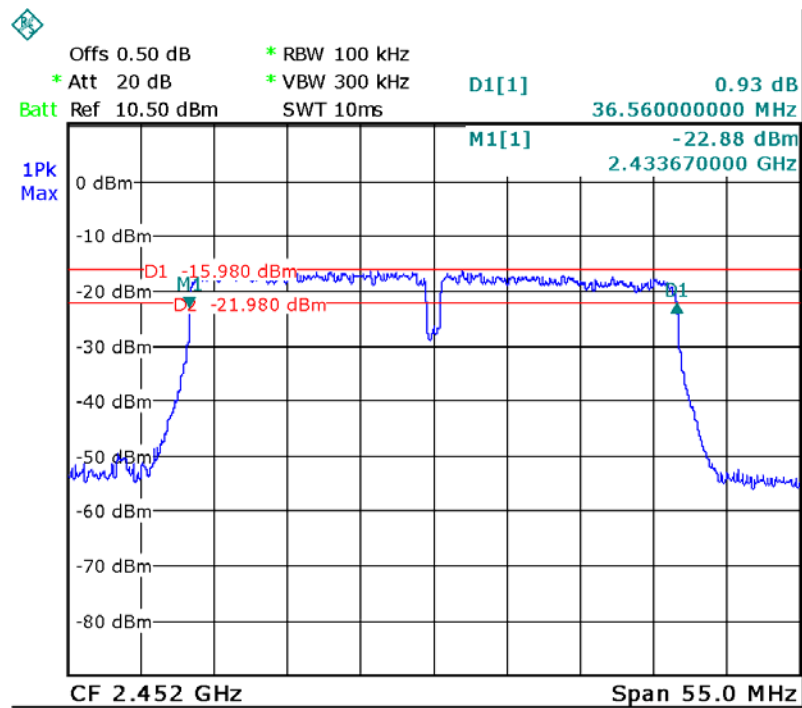
802.11n-HT40 Low Channel



802.11n-HT40 Middle Channel



802.11n-HT40 High Channel



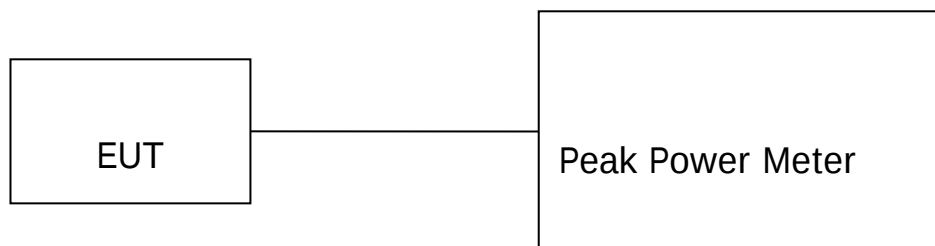
10 Maximum Peak Output Power

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R05
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
Test Method:		Test Results KDB 558074 9.1.2

Test Method:

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in dBm.

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.

10.1 Test Result

Modulation	Maximum Peak Output Power (dBm)			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	9.08	9.10	9.05	1W(30dBm)
802.11g	9.11	9.09	9.39	1W(30dBm)
802.11n-HT20	9.33	9.55	9.18	1W(30dBm)
802.11n-HT40	9.17	9.39	9.07	1W(30dBm)

11 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247
Test Method	: ANSI C63.10:2013, KDB 558074 D01 DTS MEAS GUIDANCE V03R05
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

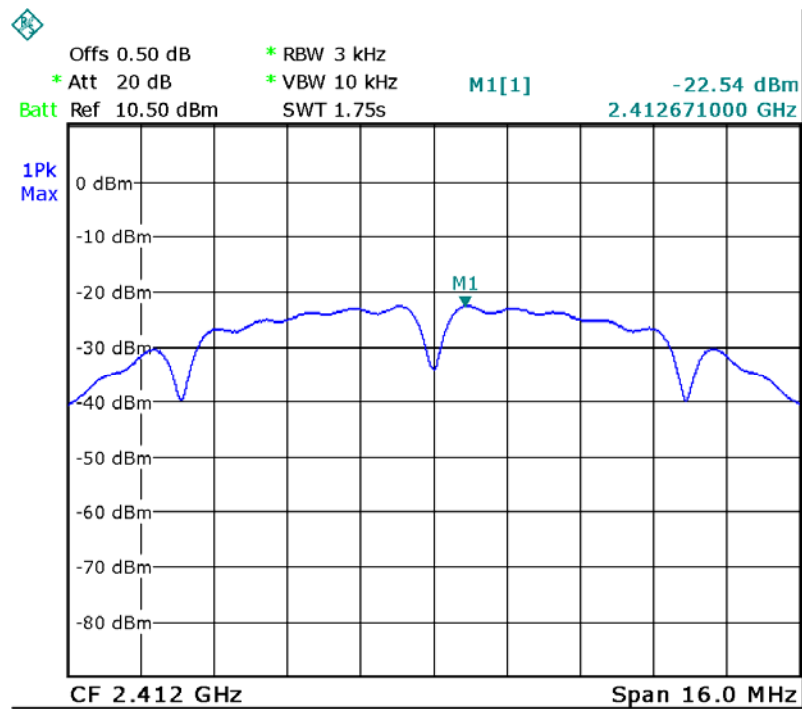
11.1 Test Procedure

KDB 558074 D01 DTS Meas Guidance V03R05

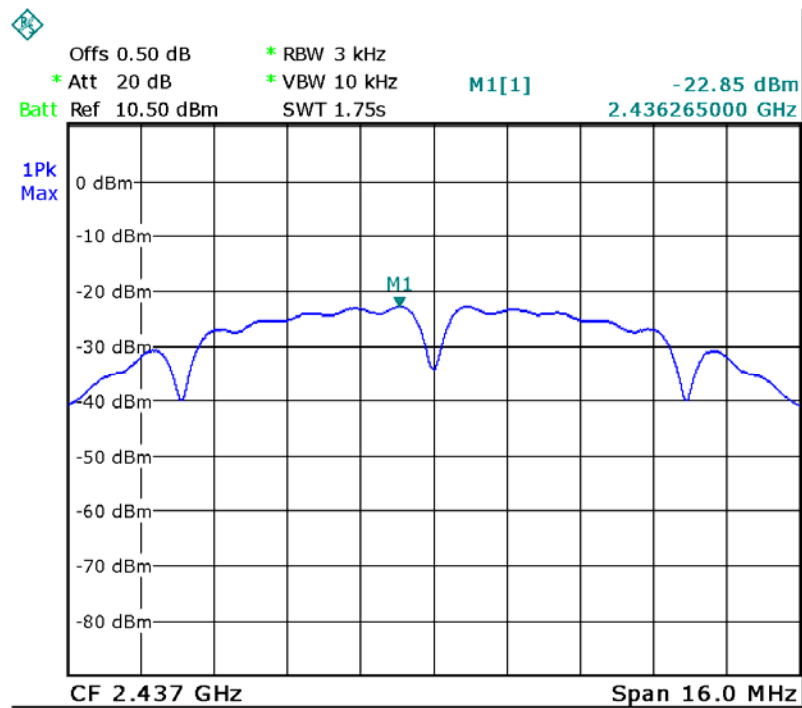
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Use the peak marker function to determine the maximum amplitude level within the RBW Test Result

Modulation	Power Spectral density (dBm/3kHz)			Limit
	Low Channel	Middle Channel	High Channel	
802.11b	-23.77	-22.54	-22.26	8dBm/3kHz
802.11g	-27.04	-27.20	-26.96	8dBm/3kHz
802.11n-HT20	-26.35	-27.42	-26.71	8dBm/3kHz
802.11n-HT40	-29.36	-27.45	-28.80	8dBm/3kHz

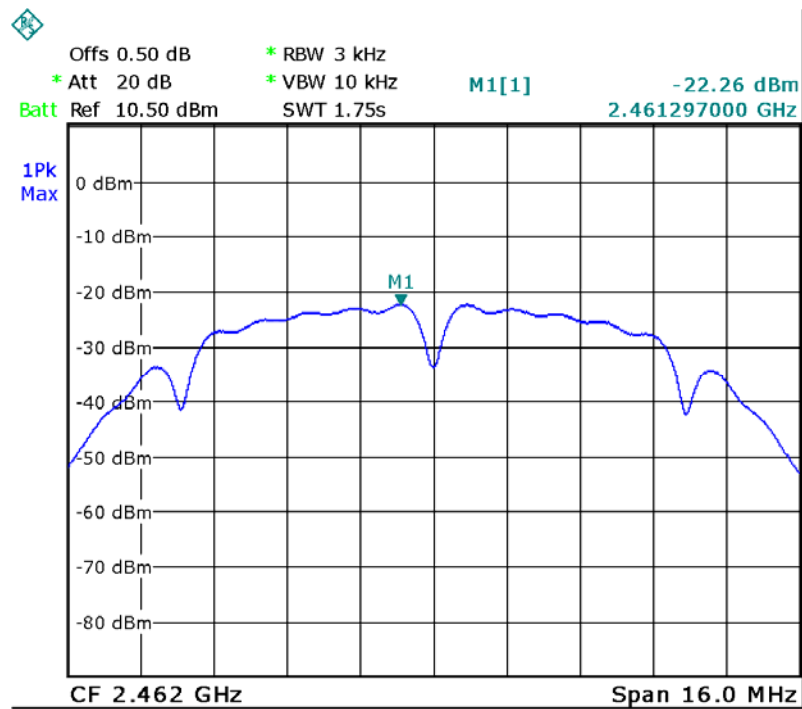
802.11b Low Channel



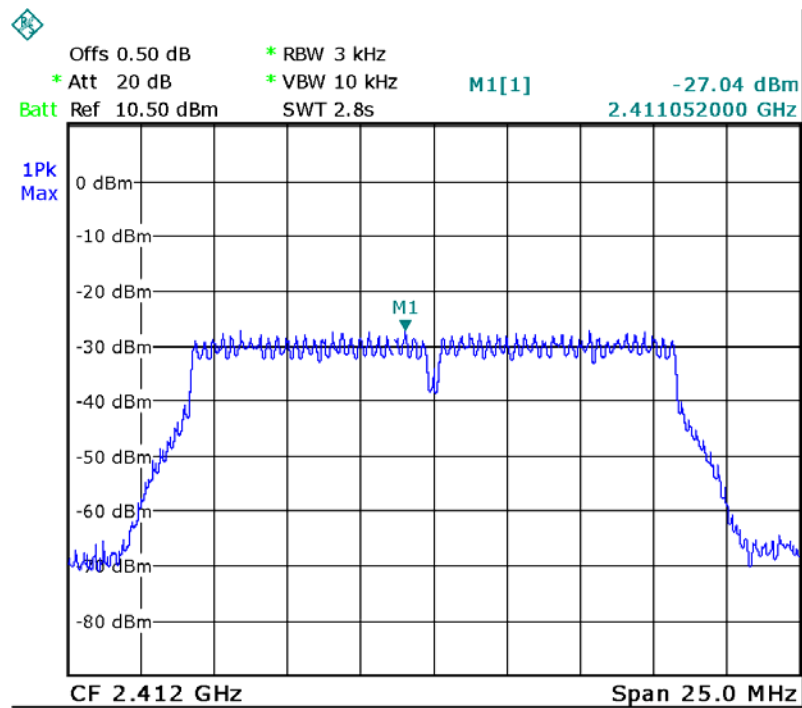
802.11b Middle Channel



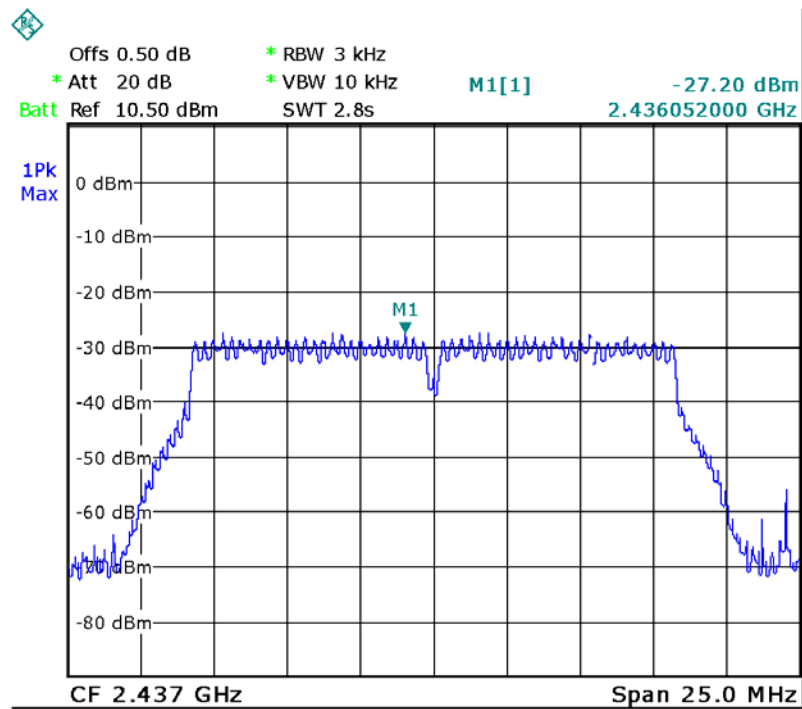
802.11b High Channel



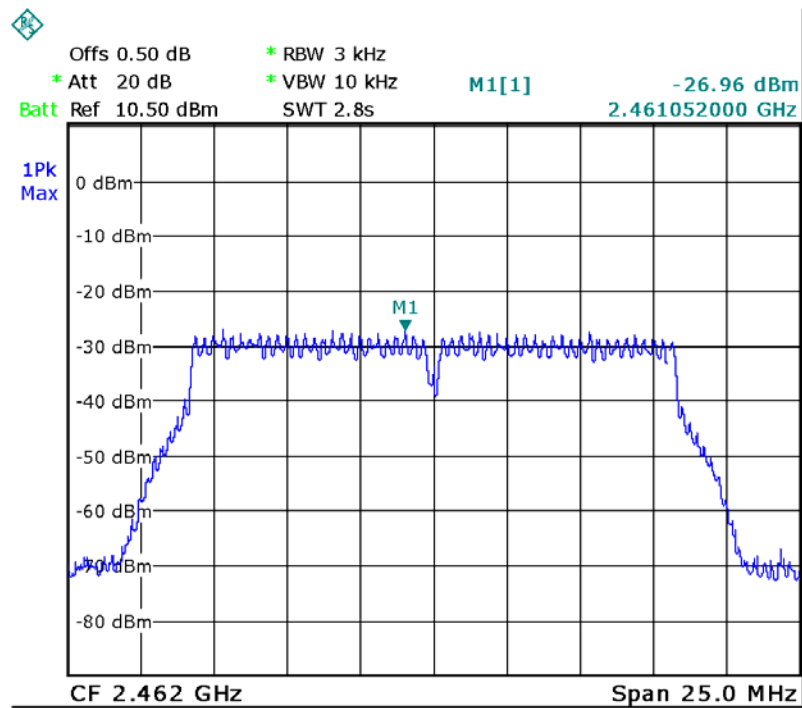
802.11g Low Channel



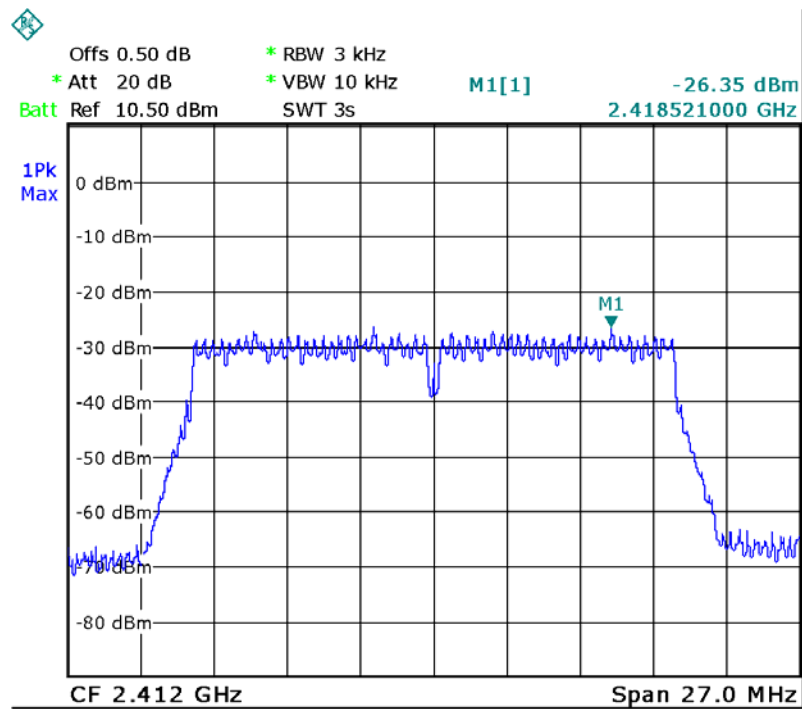
802.11g Middle Channel



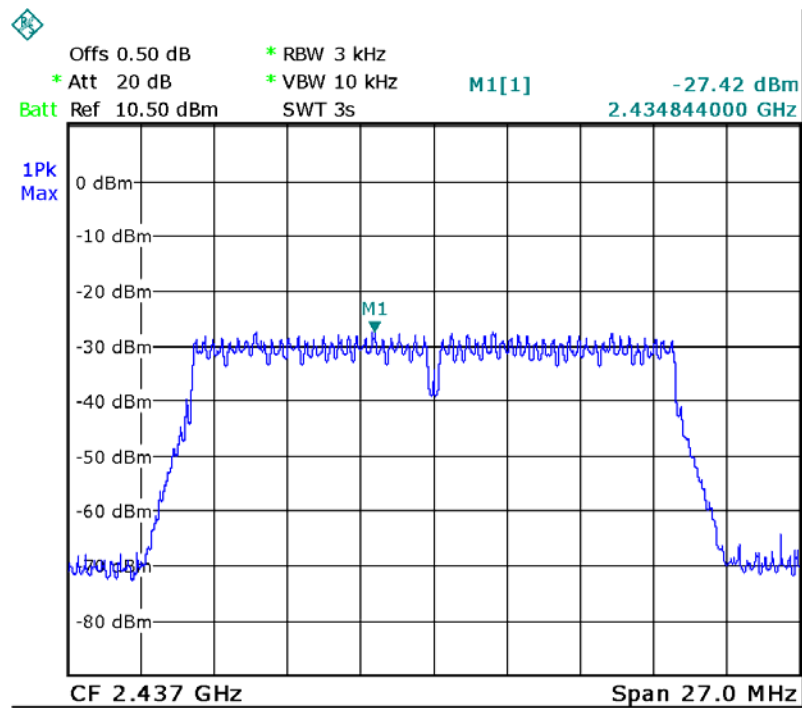
802.11g High Channel



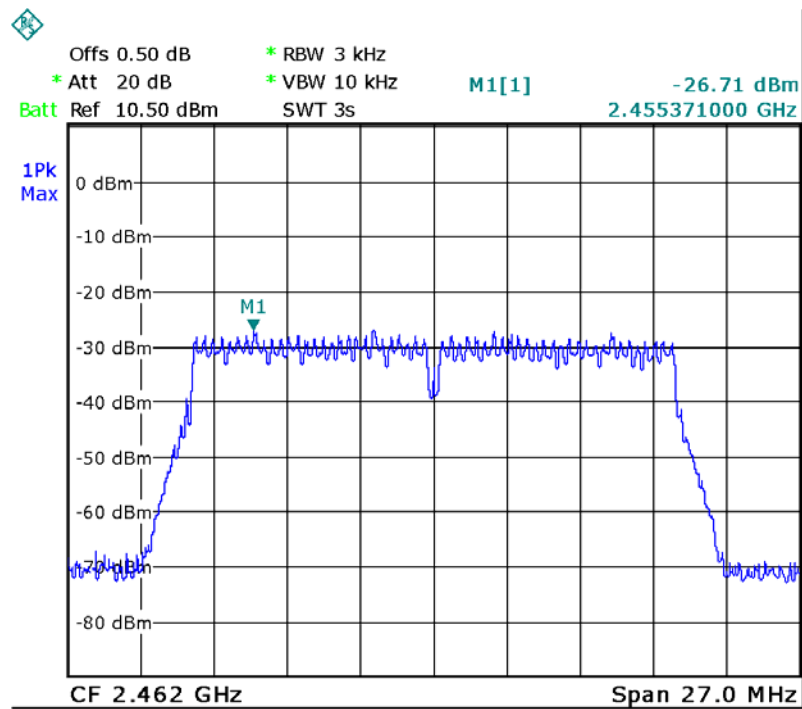
802.11n-HT20 Low Channel



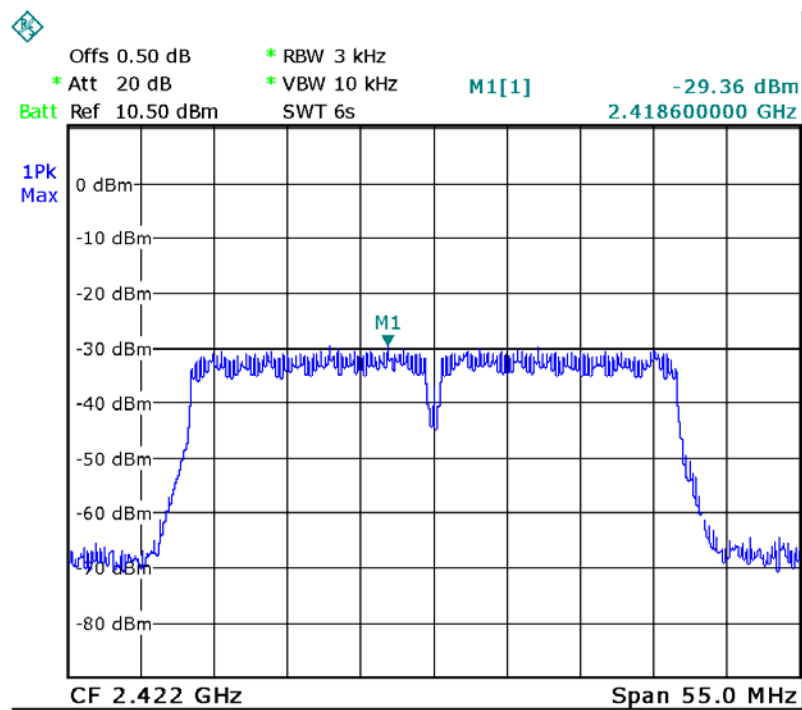
802.11n-HT20 Middle Channel



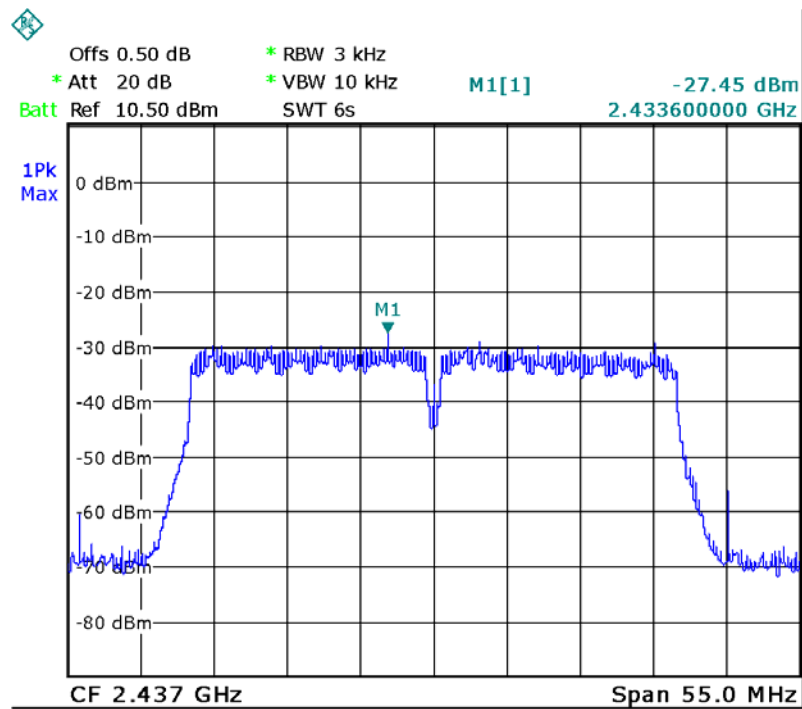
802.11n-HT20 High Channel



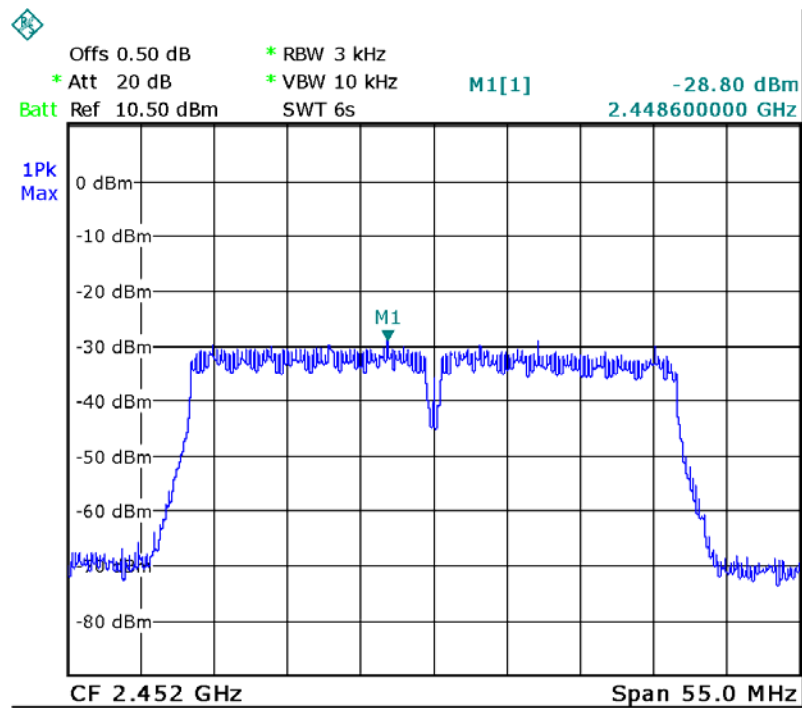
802.11n-HT40 Low Channel



802.11n-HT40 Middle Channel



802.11n-HT40 High Channel



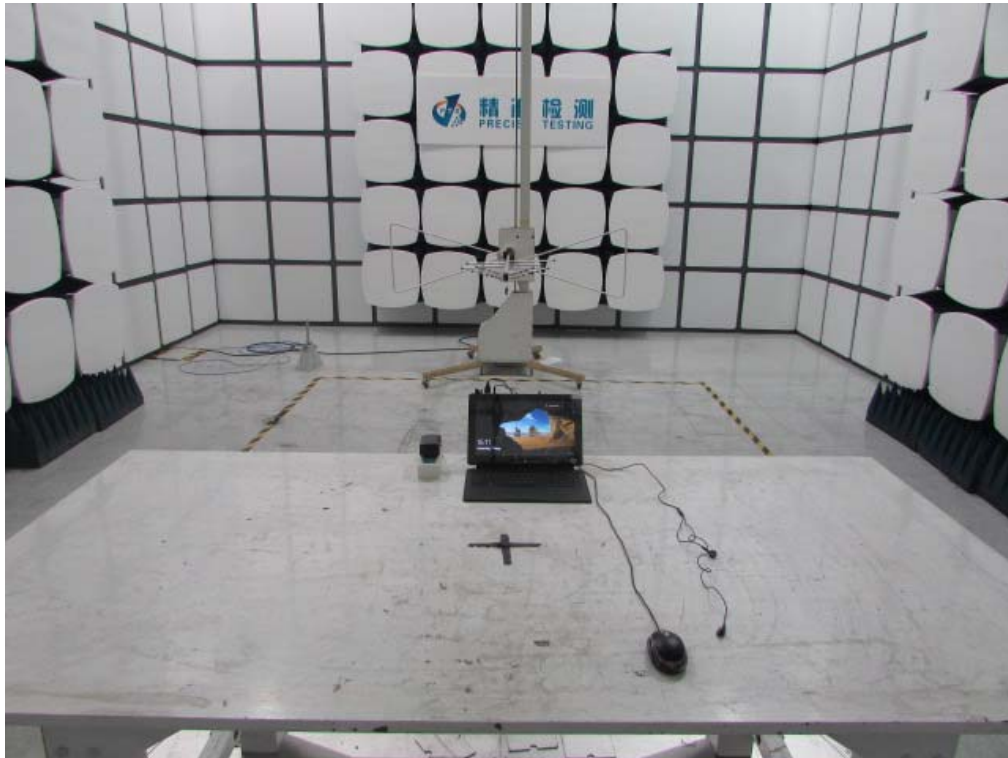


12 Antenna Requirement

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 Internal Integrated Antenna, it meet the requirement of this section.

13 Test Setup

Spurious Emissions
From 30MHz-1000MHz



Above 1GHz



Conducted Emissions





14 EUT Photos

External Photos







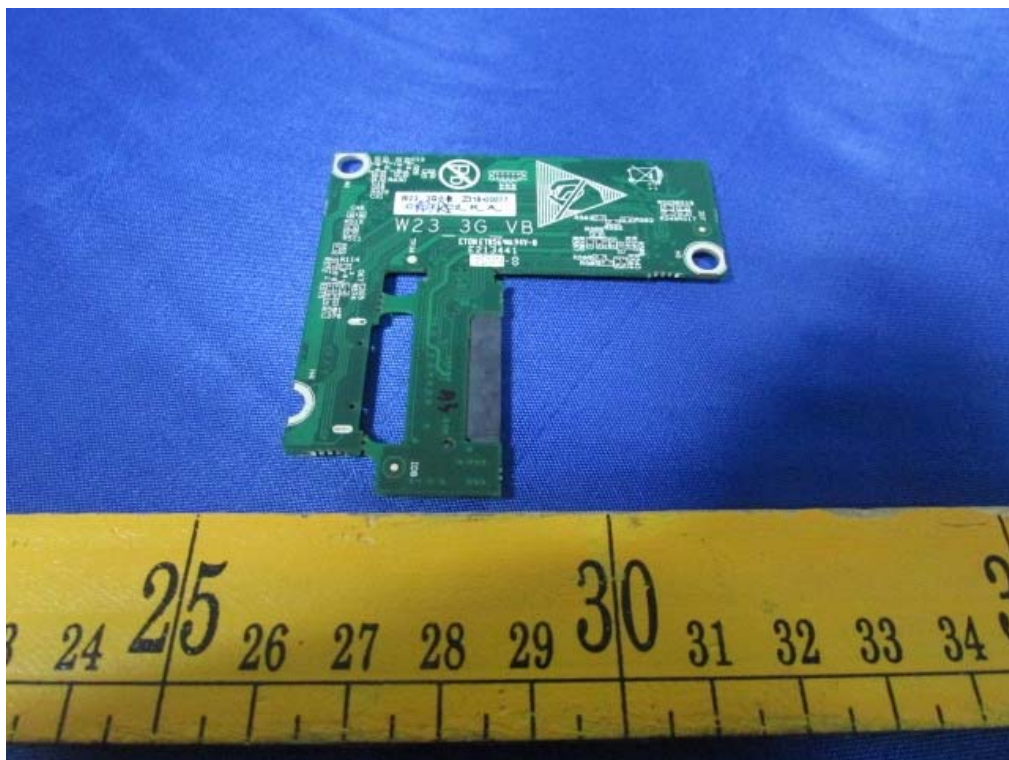


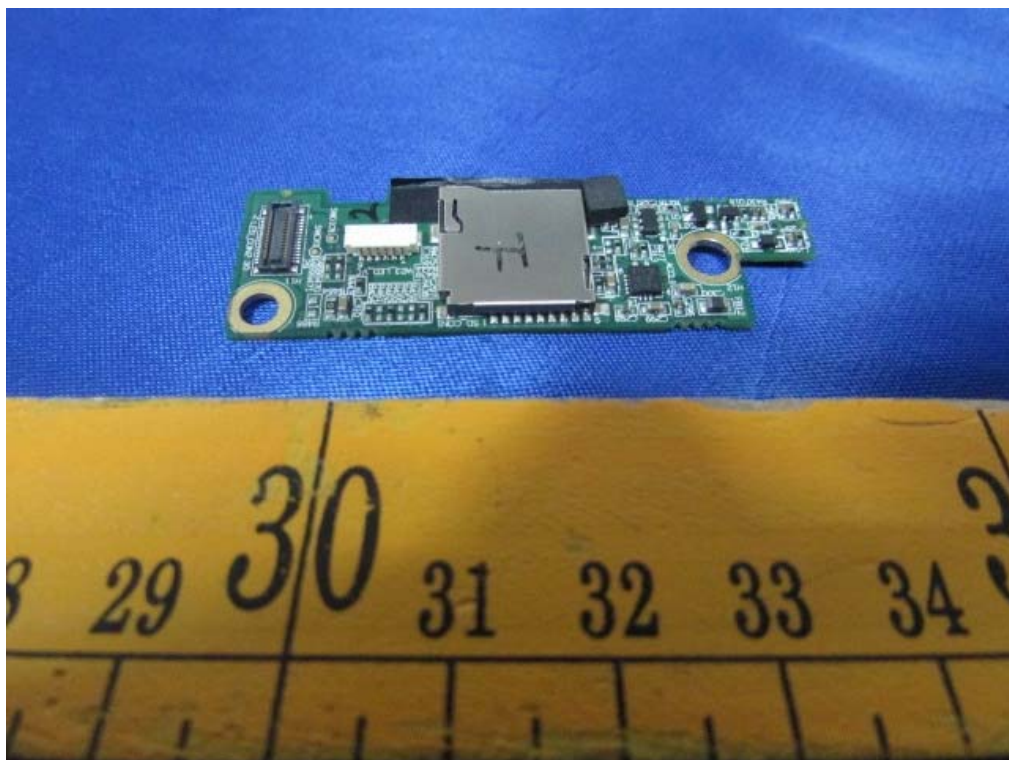
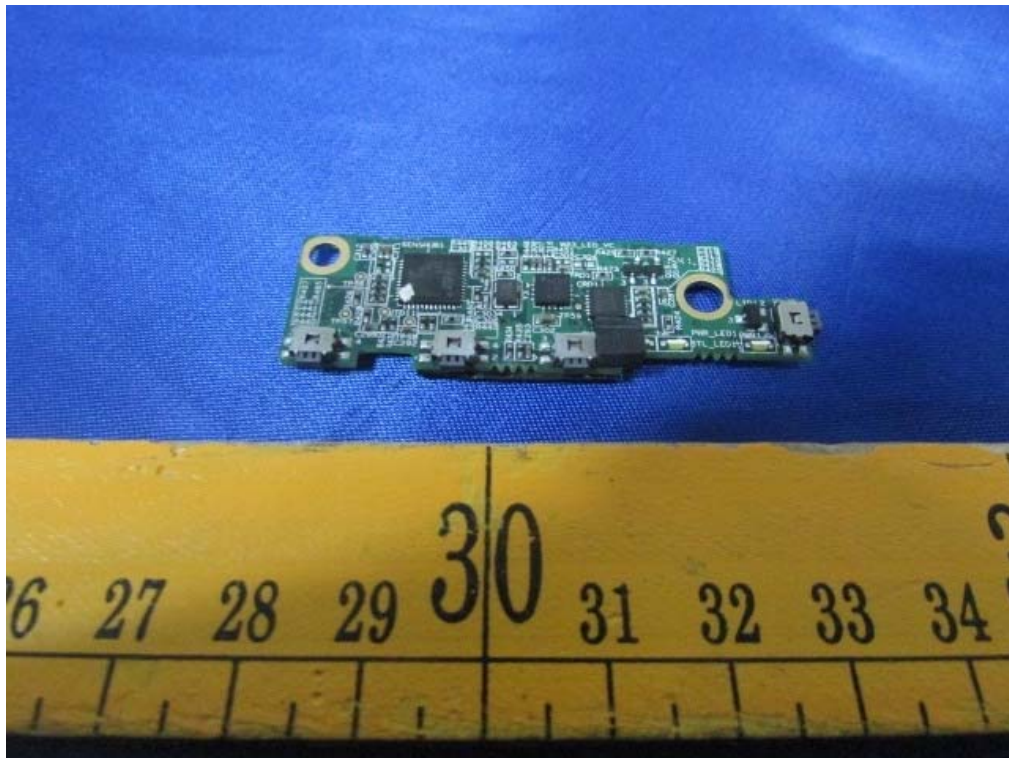
Internal Photos

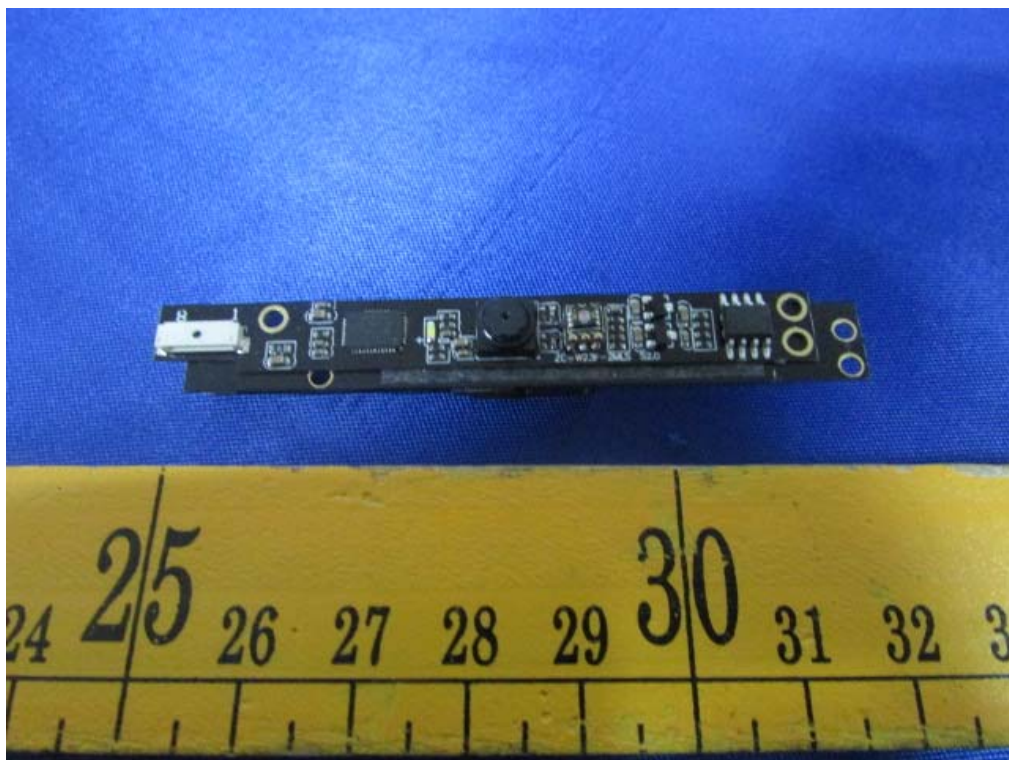
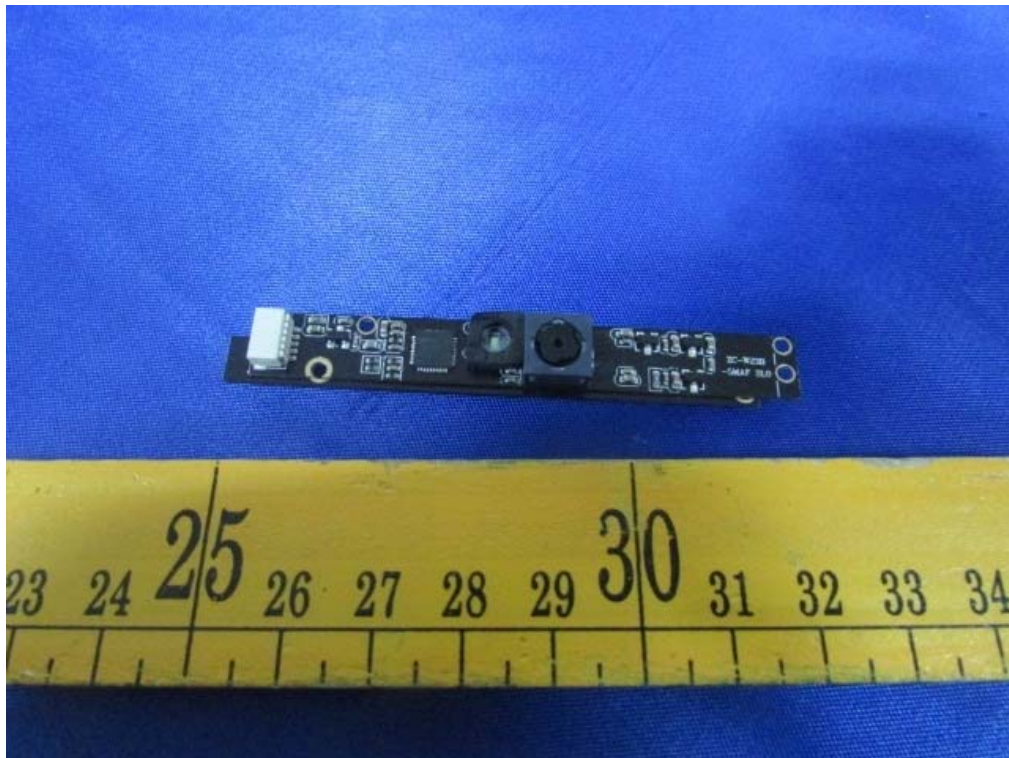














*****THE END REPORT*****