



# TEST REPORT

FCC ID: 2ADYY-T1

Product: Megabook

Model No.: T1

Additional Model No: N/A

Trade Mark: TECNO

Report No.: WSCT-A2LA-R&amp;E220300004A-Wi-Fi1

Issued Date: 01 August 2022

Issued for:

**TECNO MOBILE LIMITED**FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN  
NT HONGKONG

Issued By:

**World Standardization Certification & Testing Group(Shenzhen) Co.,Ltd.**Building A-B, Baoshi Science & Technology Park, Baoshi Road,  
Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-26996192

FAX: +86-755-86376605



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Report No.: WSCT-A2LA-R&E220300004A-Wi-Fi1

# 1. Test Certification

Product:	Megabook
Model No.:	T1
Additional Model No.:	N/A
Trade Mark:	TECNO
Applicant:	TECNO MOBILE LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Manufacturer:	TECNO MOBILE LIMITED
Address:	FLAT N 16/F BLOCK B UNIVERSAL INDUSTRIAL CENTRE 19-25 SHAN MEI STREET FOTAN NT HONGKONG
Date of Test:	13 July 2022 ~ 27 July 2022
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247

The above equipment has been tested by World Standardization Certification & Testing Group(Shenzhen)Co., Ltd. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By: Wang Xiang  
(Wang Xiang)

Checked By: Li Huaibi  
(Li Huaibi)



Approved By: Wang Fengbing  
(Wang Fengbing)

Date: 01 August 2022







## 2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3) §2.1046	PASS
6dB Emission Bandwidth	§15.247 (a)(2) §2.1049	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	1§5.247(d) §2.1051, §2.1057	PASS
Spurious Emission	§15.205/§15.209 §2.1053, §2.1057	PASS

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.







### 3. EUT Description

<b>Product:</b>	Megabook
<b>Model No.:</b>	T1
<b>Additional Model No.:</b>	N/A
<b>Trade Mark:</b>	TECNO
<b>Operation Frequency:</b>	2412MHz~2462MHz (802.11b/g/n/ax(HT20)) 2422MHz~2452MHz (802.11n/ax(HT40))
<b>Channel Separation:</b>	5MHz
<b>Modulation type:</b>	DSSS (DBPSK, DQPSK, CCK) for IEEE 802.11b OFDM/OFDMA(BPSK,QPSK,16QAM,64QAM,256QAM,1024QAM) for IEEE 802.11g/n/ax
<b>Antenna Type:</b>	Integral Antenna
<b>Antenna Gain</b>	4.44dBi
<b>Power supply:</b>	Rechargeable Li-ion Polymer Battery: 156 Rated Voltage: 11.55V Rated Capacity: 6060mAh/69.99Wh Typical Capacity:6160mAh/71.14Wh Limited Charge Voltage: 13.2V
<b>Adapter:</b>	Adapter: TCW-A61S-65W Input: 100-240V~50/60Hz 1.5A Max Output:5.0V---3.0A/9.0V---3.0A/12.0V---3.0A/15.0V---3.0A/20.0V3.25A
<b>Remark:</b>	N/A.







**Operation Frequency each of channel For 802.11b/g/n/ax(HT20)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

**Operation Frequency each of channel For 802.11n/ax (HT40)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
--	--	4	2427MHz	7	2442MHz	--	--
--	--	5	2432MHz	8	2447MHz	--	--
3	2422MHz	6	2437MHz	9	2452MHz		

**Note:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

**802.11b/g/n/ax (HT20)**

Channel	Frequency
The lowest channel	2412MHz
The middle channel	2437MHz
The Highest channel	2462MHz

**802.11n/ax (HT40)**

Channel	Frequency
The lowest channel	2422MHz
The middle channel	2437MHz
The Highest channel	2452MHz







## 4. Genera Information

### 4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)
<p>The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y &amp; Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.</p>	

<p>We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:</p>	
<p><b>Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.</b></p>	
	Mode
	802.11b
	802.11g
	802.11n/ax(H20)
	802.11n/ax(H40)
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation
<p>1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.2.According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20);Duty cycle setting during the transmission is 98.5% with maximum power setting for all modulations.</p>	





## 4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Adapter	Adapter1/ Adapter2	/	/	ADAPTER

**Note:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.







## 5. Facilities and Accreditations

### 5.1. Facilities

All measurement facilities used to collect the measurement data are located at **Building A-B, Baoshi Science & Technology Park, Baoshi Road, Bao'an District, Shenzhen, Guangdong, China of the World Standardization Certification & Testing Group(Shenzhen) CO., LTD**

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 5.2. ACCREDITATIONS

**China National Accreditation Service for Conformity Assessment (CNAS)**  
Registration number NO: L3732

**American Association for Laboratory Accreditation(A2LA)**

Registration NO : 5768.01

Copies of granted accreditation certificates are available for downloading from our web site,  
<http://www.wsct-cert.com>







### 5.3 Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission Test	$\pm 3.2\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1GHz)	$\pm 4.7\text{dB}$
5	All emissions, radiated(>1GHz)	$\pm 4.7\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2.0\%$







## 5.4 MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
Test software	--	EZ-EMC	CON-03A	-	-
EMI Test Receiver	R&S	ESCI	100005	11/05/2021	11/04/2022
LISN	AFJ	LS16	16010222119	11/05/2021	11/04/2022
LISN(EUT)	Mestec	AN3016	04/10040	11/05/2021	11/04/2022
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	11/05/2021	11/04/2022
Coaxial cable	Megalon	LMR400	N/A	11/05/2021	11/04/2022
GPIO cable	Megalon	GPIO	N/A	11/05/2021	11/04/2022
Spectrum Analyzer	R&S	FSU	100114	11/05/2021	11/04/2022
Pre Amplifier	H.P.	HP8447E	2945A02715	11/05/2021	11/04/2022
Pre-Amplifier	CDSI	PAP-1G18-38	--	11/05/2021	11/04/2022
Bi-log Antenna	SUNOL Sciences	JB3	A021907	11/05/2021	11/04/2022
9*6*6 Anechoic	--	--	--	11/05/2021	11/04/2022
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	11/05/2021	11/04/2022
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	11/05/2021	11/04/2022
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	11/05/2021	11/04/2022
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	-	11/05/2021	11/04/2022
Loop Antenna	EMCO	6502	00042960	11/05/2021	11/04/2022
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	11/05/2021	11/04/2022
Power meter	Anritsu	ML2487A	6K00003613	11/05/2021	11/04/2022
Power sensor	Anritsu	MX248XD	--	11/05/2021	11/04/2022



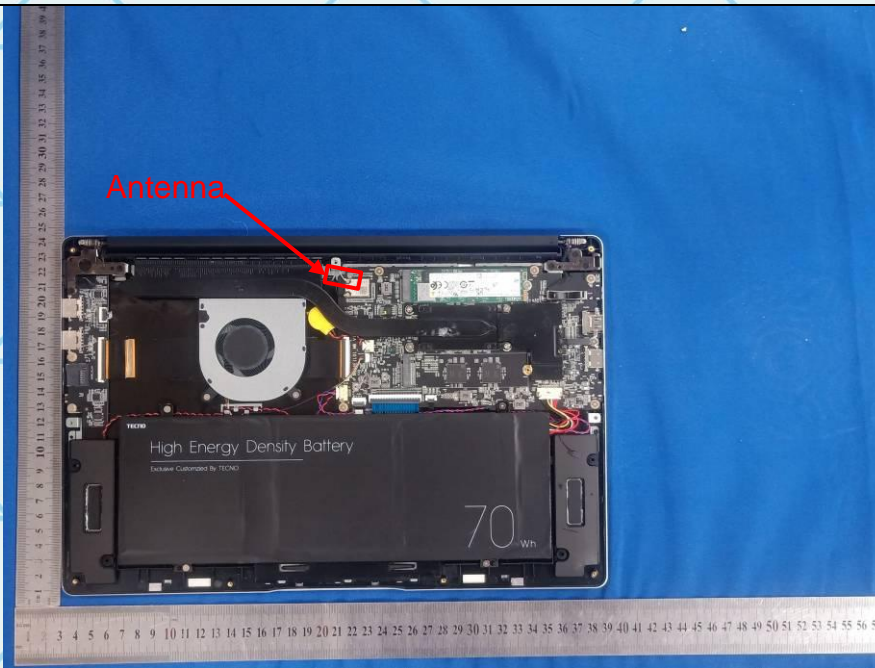




## 6. Test Results and Measurement Data

### 6.1. Antenna requirement

<b>Standard requirement:</b>	FCC Part15 C Section 15.203 /247(c)
15.203 requirement:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(c) (1)(i) requirement:	(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.
<b>E.U.T Antenna:</b>	
The WiFi antenna is a Integral Antenna. it meets the standards, and the best case gain of the antenna is 4.44dBi.	







## 6.2. Conducted Emission

### 6.2.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.207														
<b>Test Method:</b>	ANSI C63.10:2014														
<b>Frequency Range:</b>	150 kHz to 30 MHz														
<b>Receiver setup:</b>	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
<b>Limits:</b>	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
<b>Test Setup:</b>	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
<b>Test Mode:</b>	Charging + transmitting with modulation														
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</li> <li>Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2014 on conducted measurement.</li> </ol>														
<b>Test Result:</b>	PASS														



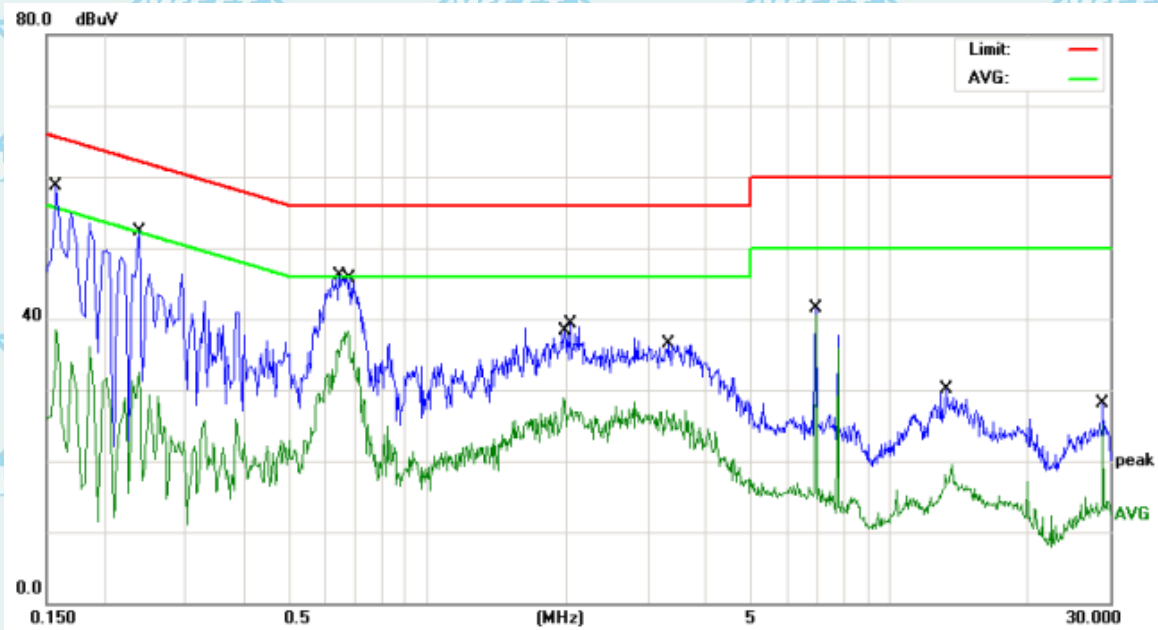




### 6.2.2. Test data

Please refer to following diagram for individual

### Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1580	48.37	10.41	58.78	65.56	-6.78	QP
2		0.1580	28.10	10.41	38.51	55.56	-17.05	AVG
3		0.2380	41.89	10.42	52.31	62.16	-9.85	QP
4		0.6460	35.66	10.48	46.14	56.00	-9.86	QP
5		0.6740	27.75	10.48	38.23	46.00	-7.77	AVG
6		1.9740	18.26	10.66	28.92	46.00	-17.08	AVG
7		2.0420	28.59	10.66	39.25	56.00	-16.75	QP
8		3.3020	16.39	10.67	27.06	46.00	-18.94	AVG
9		6.9460	30.82	10.73	41.55	60.00	-18.45	QP
10		6.9460	29.73	10.73	40.46	50.00	-9.54	AVG
11		13.3180	19.18	10.97	30.15	60.00	-29.85	QP
12		28.9700	14.15	10.96	25.11	50.00	-24.89	AVG

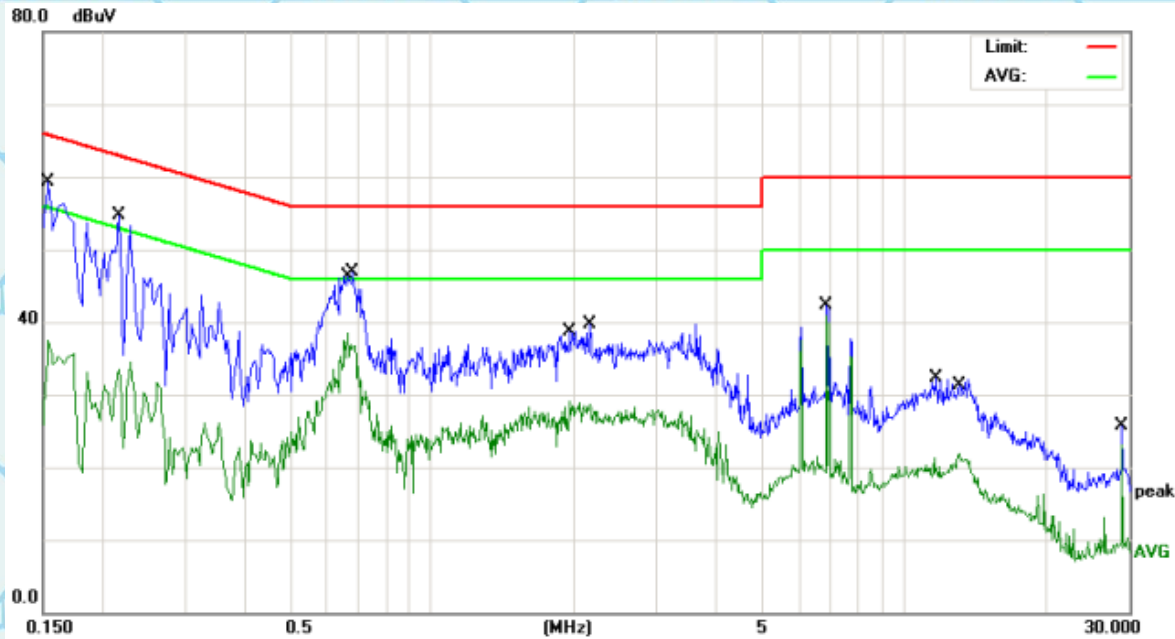
**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.





### Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1539	48.93	10.41	59.34	65.78	-6.44	QP
2		0.1539	27.06	10.41	37.47	55.78	-18.31	AVG
3		0.2180	44.22	10.41	54.63	62.89	-8.26	QP
4		0.6620	27.94	10.48	38.42	46.00	-7.58	AVG
5		0.6820	36.50	10.48	46.98	56.00	-9.02	QP
6		1.9660	18.36	10.65	29.01	46.00	-16.99	AVG
7		2.1619	29.03	10.66	39.69	56.00	-16.31	QP
8		6.8660	31.48	10.73	42.21	60.00	-17.79	QP
9		6.8660	30.23	10.73	40.96	50.00	-9.04	AVG
10		11.7299	21.49	10.88	32.37	60.00	-27.63	QP
11		13.0620	10.95	10.96	21.91	50.00	-28.09	AVG
12		28.9700	12.23	10.96	23.19	50.00	-26.81	AVG

**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

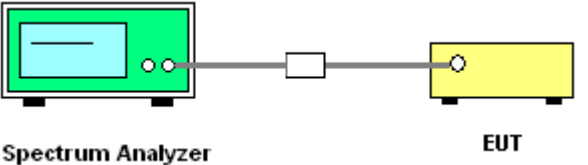






**6.2.3. Maximum Conducted (Average) Output Power**

**6.2.4. Test Specification**

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (b)(3)
<b>Test Method:</b>	KDB 558074
<b>Limit:</b>	30dBm
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04.</li> <li>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>4. Measure the conducted output power and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS







### 6.2.5. Test Data

20MHz(802.11b/g/n/ax)			
Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
Lowest	16.08	30.00	PASS
Middle	16.00	30.00	PASS
Highest	15.89	30.00	PASS

40MHz(802.11n/ax)			
Test channel	Maximum Conducted Output Power (dBm)	Limit (dBm)	Result
Lowest	14.91	30.00	PASS
Middle	14.70	30.00	PASS
Highest	14.58	30.00	PASS



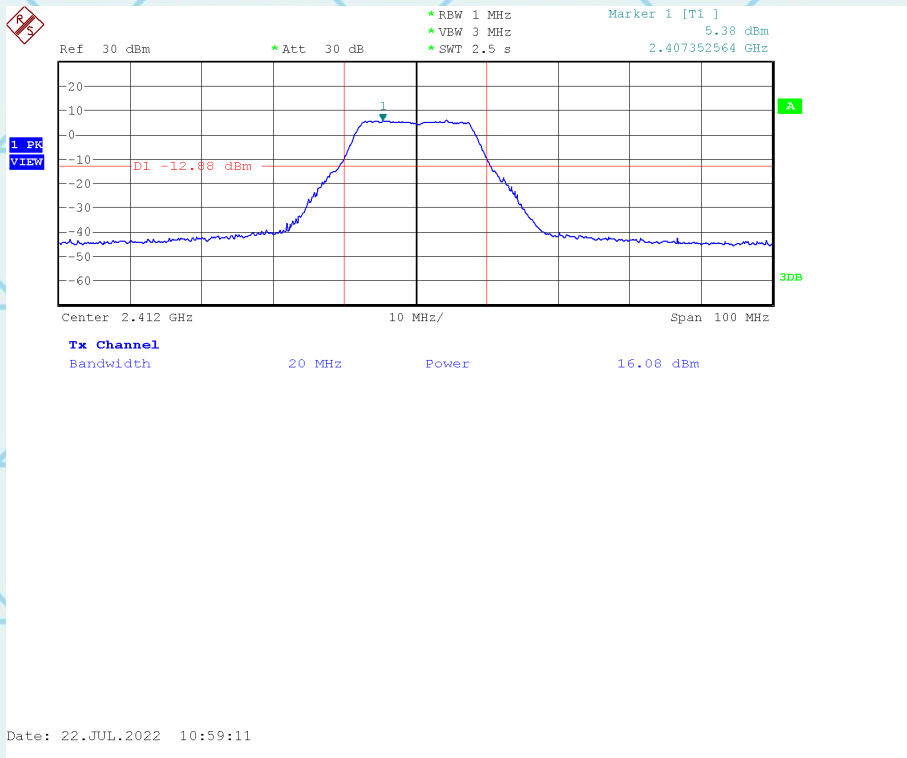




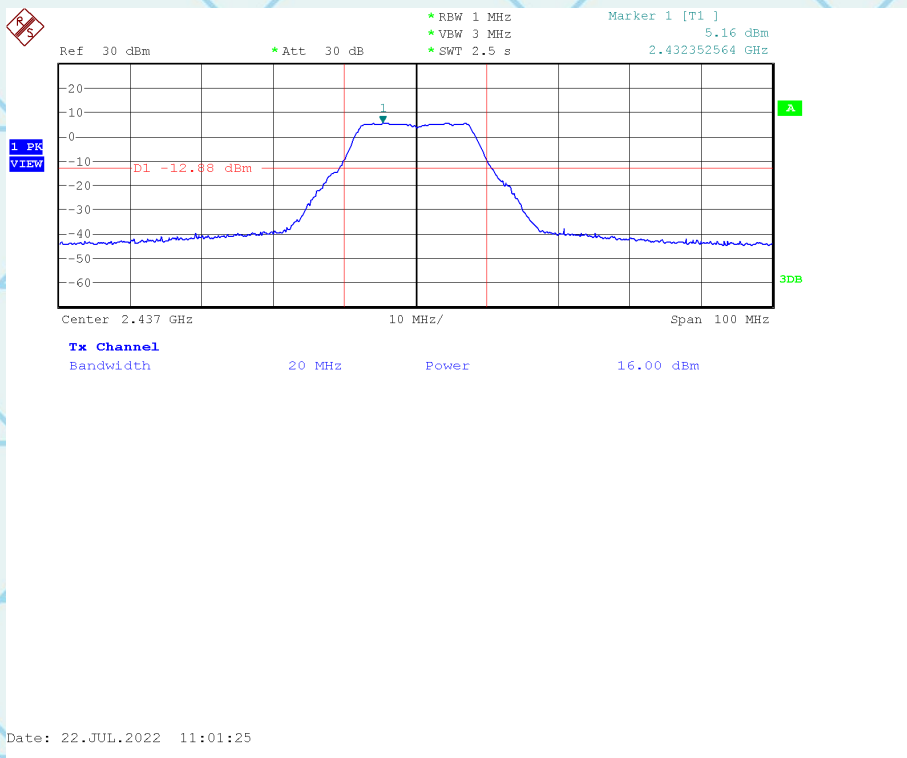
For Question, Please Contact with WSCT www.wsct-cert.com

Test plots as follows: 20MHz(802.11b/g/n/ax)

Lowest channel



Middle channel







For Question, Please Contact with WSCT www.wsct-cert.com

### Highest channel

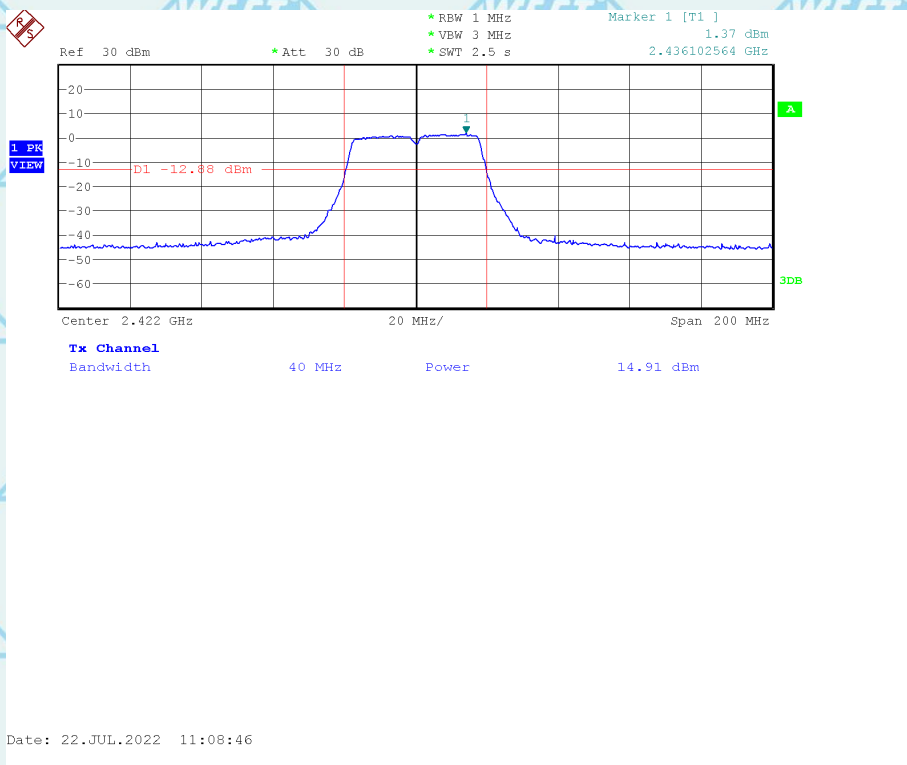




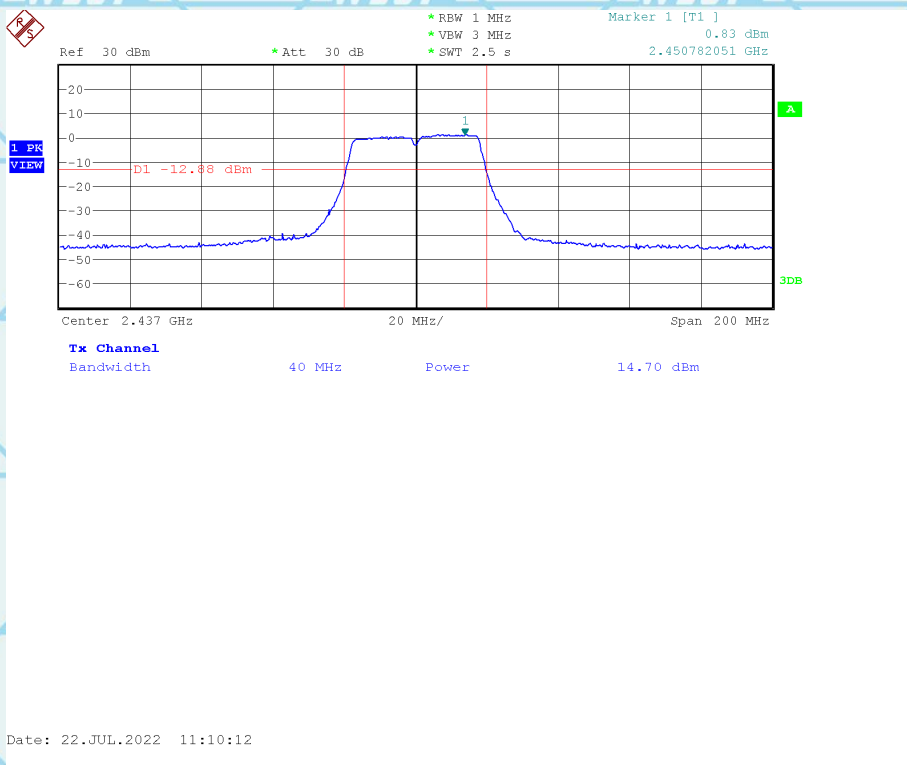


### 40MHz(802.11n/ax)

### Lowest channel



### Middle channel







For Question, Please Contact with WSCT www.wsct-cert.com

### Highest channel

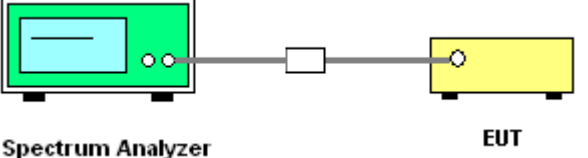






### 6.3. Emission Bandwidth

#### 6.3.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (a)(2)
<b>Test Method:</b>	KDB 558074
<b>Limit:</b>	>500kHz
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v04.</li> <li>2. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.</li> <li>4. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS







### 6.3.2. Test data(worst)

Test channel	6dB Emission Bandwidth (MHz)	
	20MHz(802.11b/g/n/ax)	40MHz(802.11n/ax)
Lowest	10.128	37.821
Middle	10.128	37.949
Highest	10.128	37.949
Limit:	>500KHz	
Test Result:	PASS	

Test plots as follows:



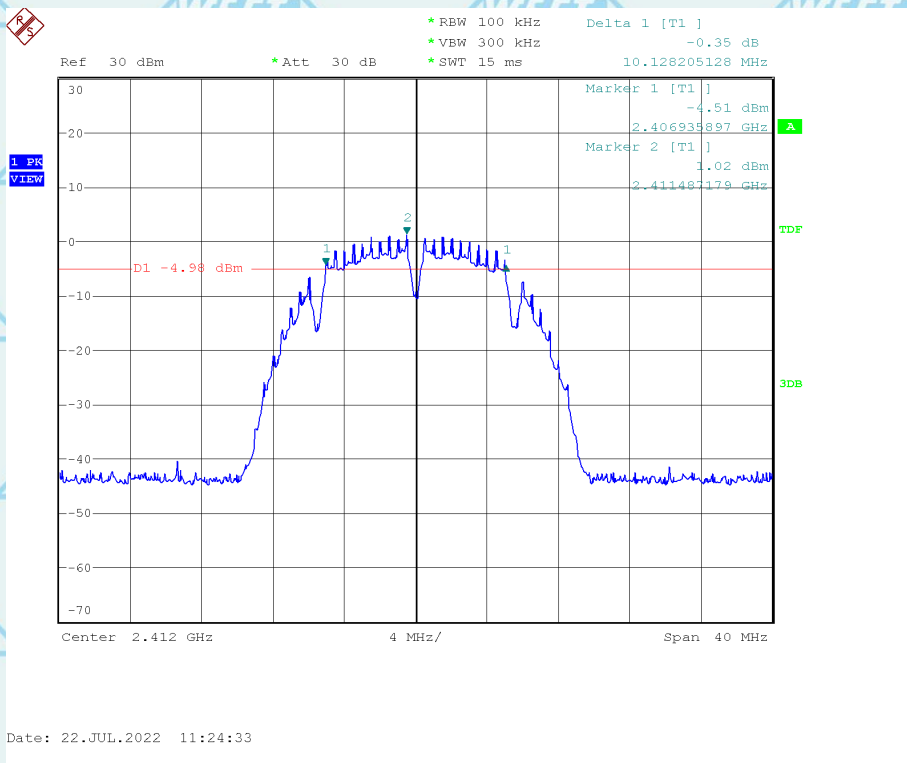




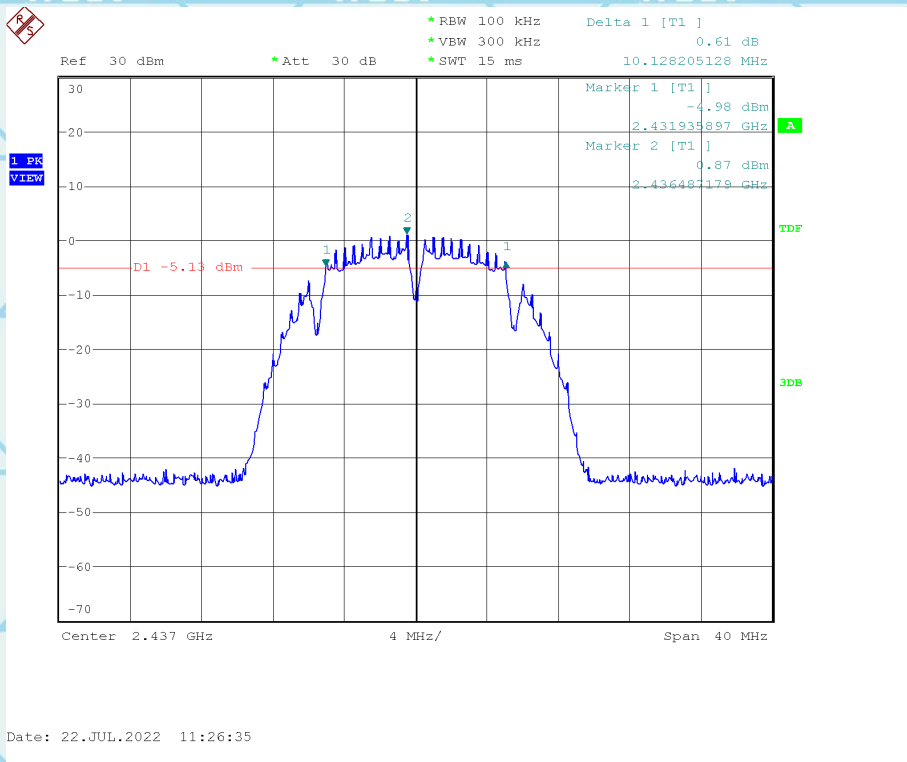
For Question, Please Contact with WSCT www.wsct-cert.com

### 20MHz(802.11b/g/n/ax)-worst

### Lowest channel



### Middle channel

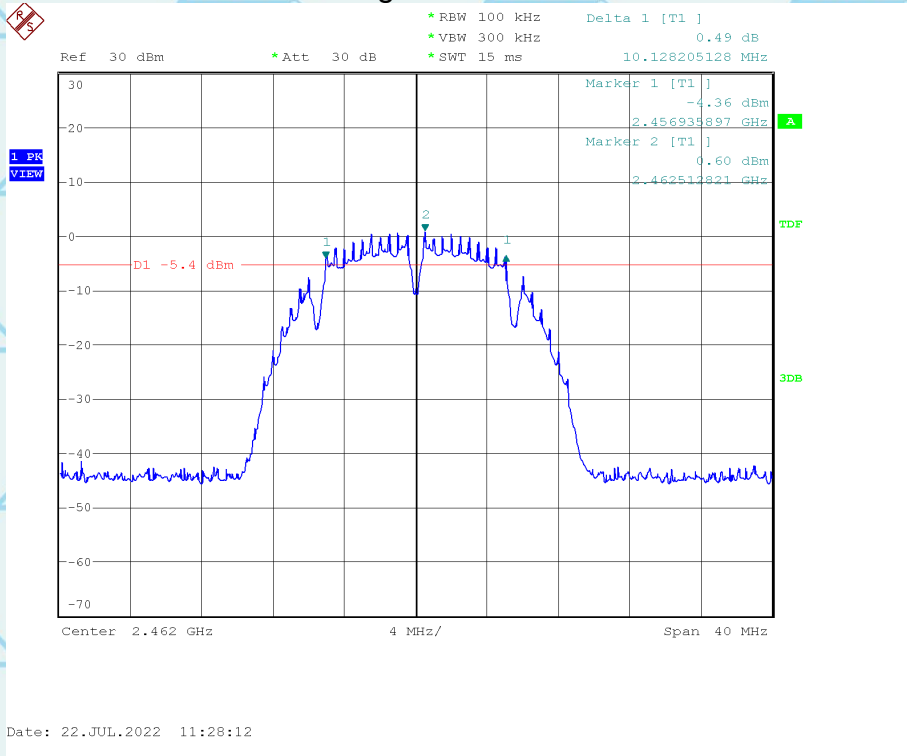






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### Highest channel

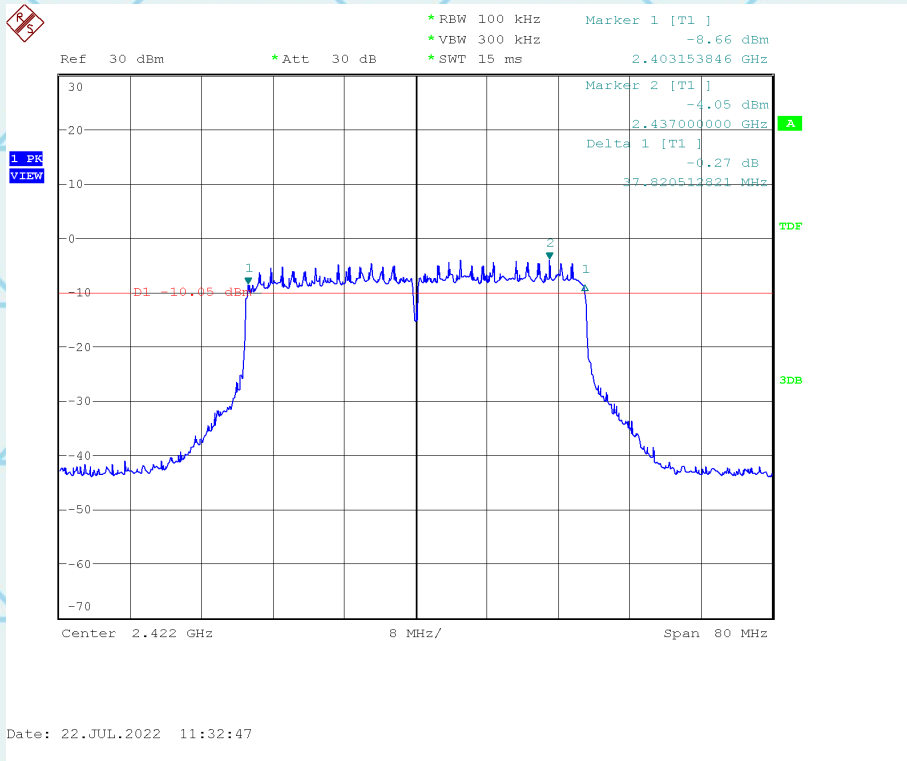




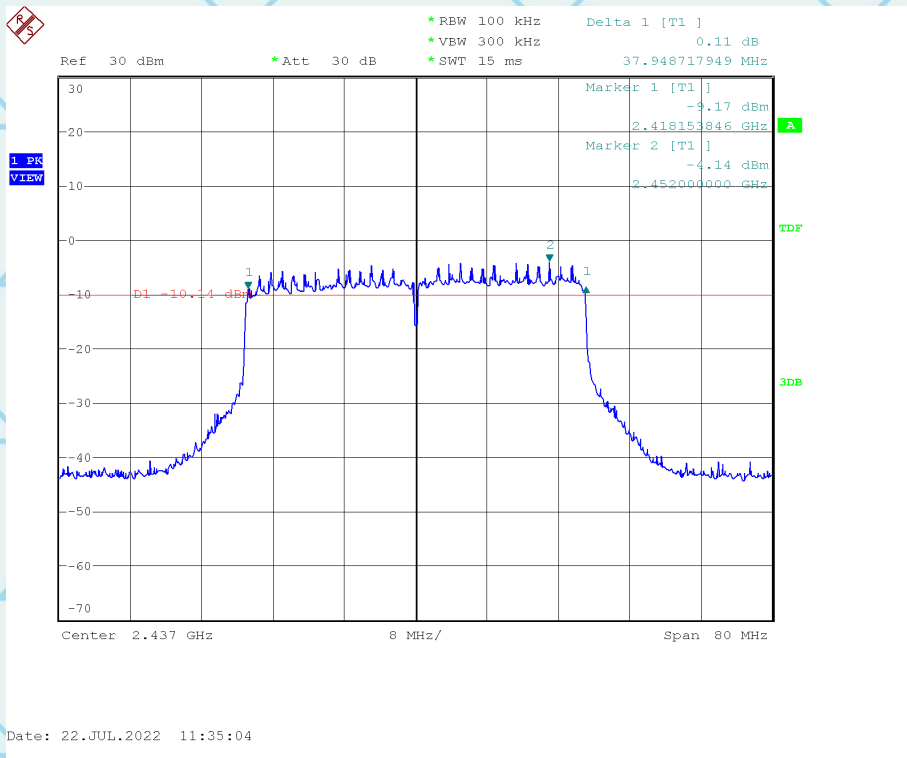


40MHz(802.11n/ax)-worst

Lowest channel



Middle channel

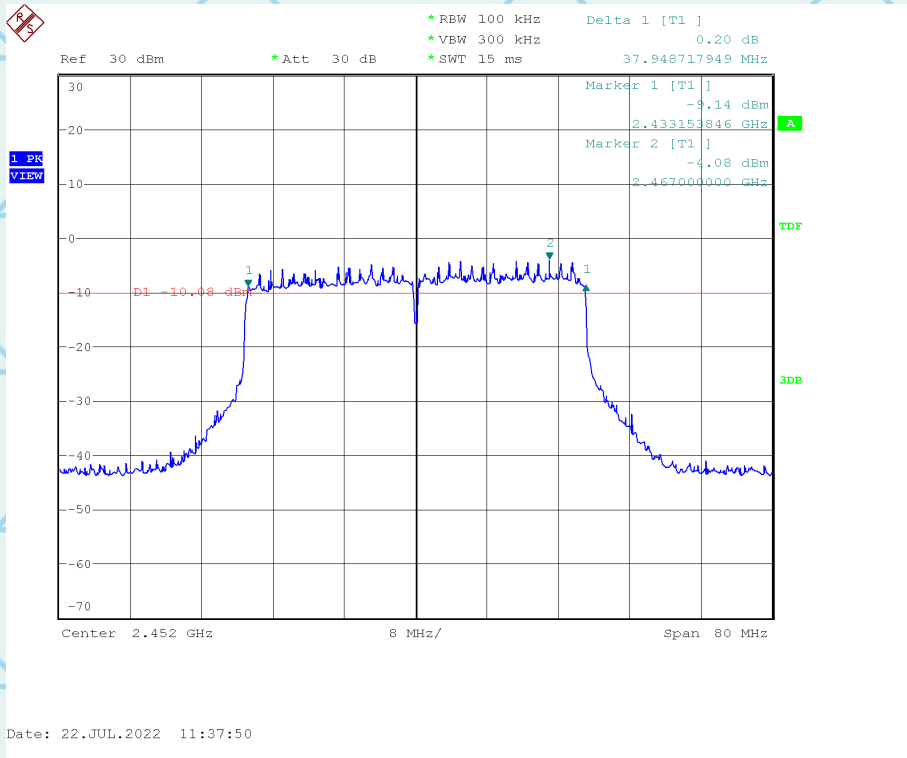






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### Highest channel

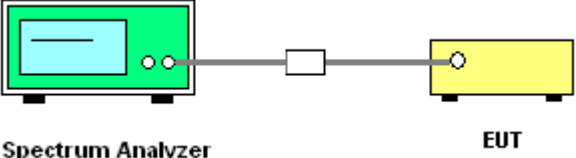






## 6.4. Power Spectral Density

### 6.4.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.247 (e)
<b>Test Method:</b>	KDB 558074
<b>Limit:</b>	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
<b>Test Setup:</b>	 <p style="text-align: center;">Spectrum Analyzer                      EUT</p>
<b>Test Mode:</b>	Transmitting mode with modulation
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1. The testing follows Measurement Procedure 10.3 Method AVGPSD of FCC KDB Publication No.558074 D01 DTS Meas. Guidance v04</li> <li>2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>3. Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): <math>3\text{ kHz} \leq \text{RBW} \leq 100\text{ kHz}</math>. Video bandwidth <math>\text{VBW} \geq 3 \times \text{RBW}</math>. Set the span to at least 1.5 times the OBW.</li> <li>5. Detector = RMS, Sweep time = auto couple.</li> <li>6. Employ trace averaging (RMS) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level.</li> <li>6. Measure and record the results in the test report.</li> </ol>
<b>Test Result:</b>	PASS





**6.4.2. Test data(worst)**

Test channel	AVG Power Spectral Density (dBm/3kHz)	
	20MHz(802.11b/g/n/ax)	40MHz(802.11n/ax)
Lowest	-14.14	-10.04
Middle	-13.68	-9.47
Highest	-14.10	-10.51
Limit:	8dBm/3kHz	
Test Result:	PASS	

Test plots as follows:

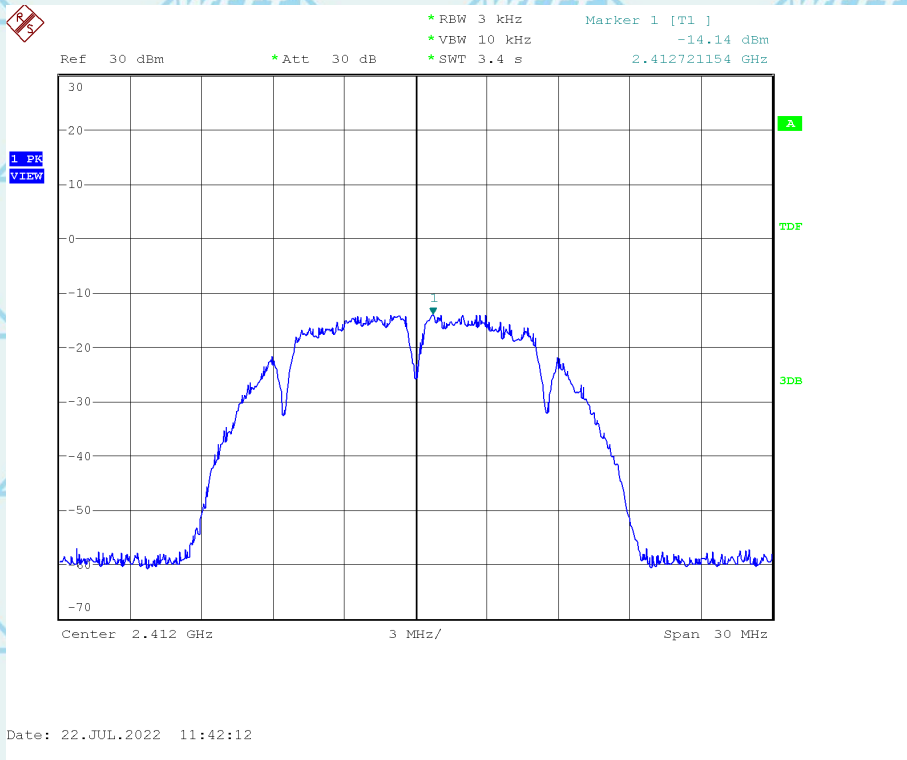




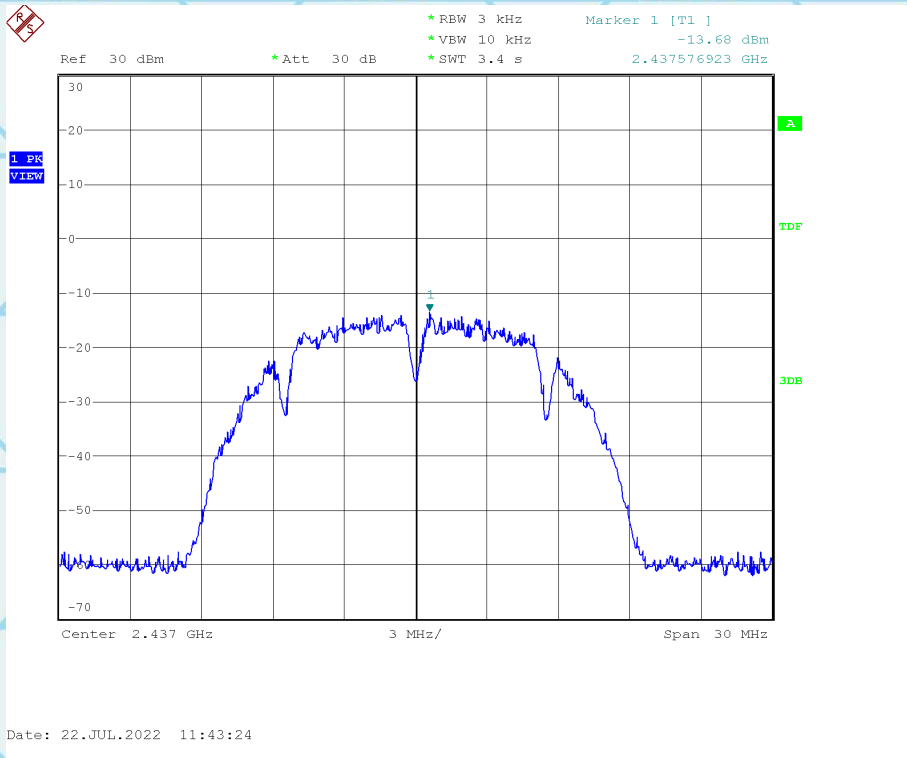


20MHz(802.11b/g/n/ax)-worst

Lowest channel



Middle channel

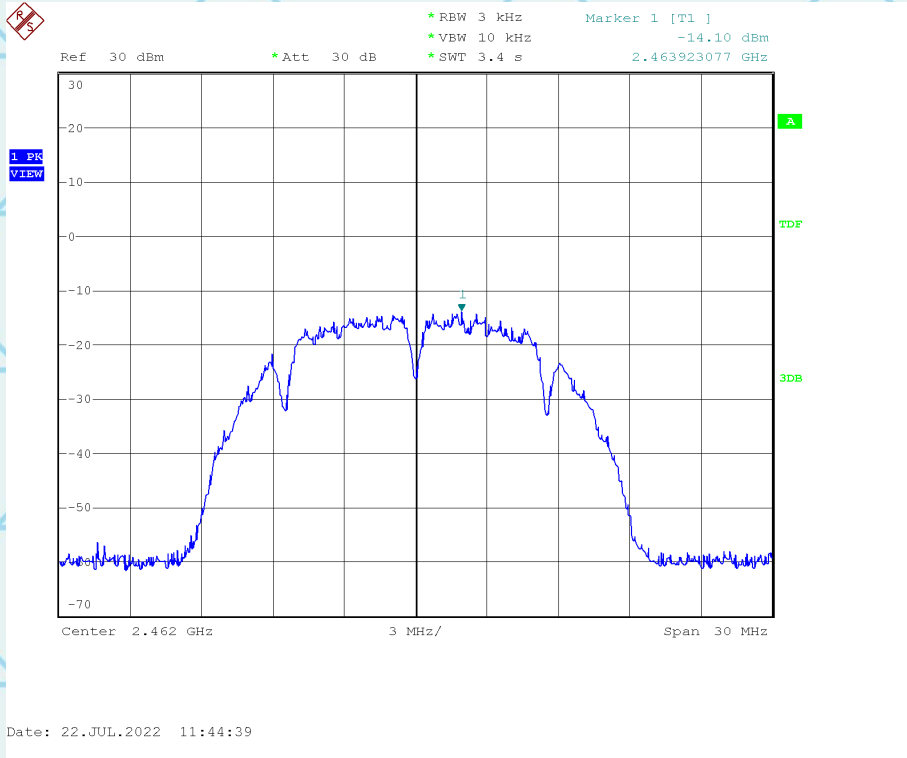






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### Highest channel



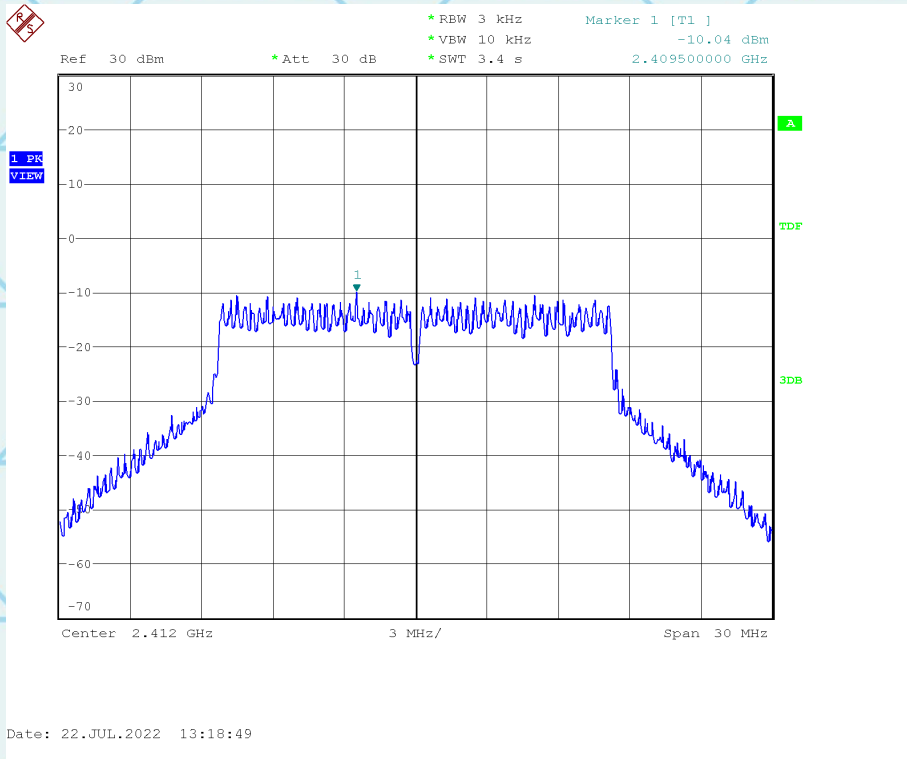




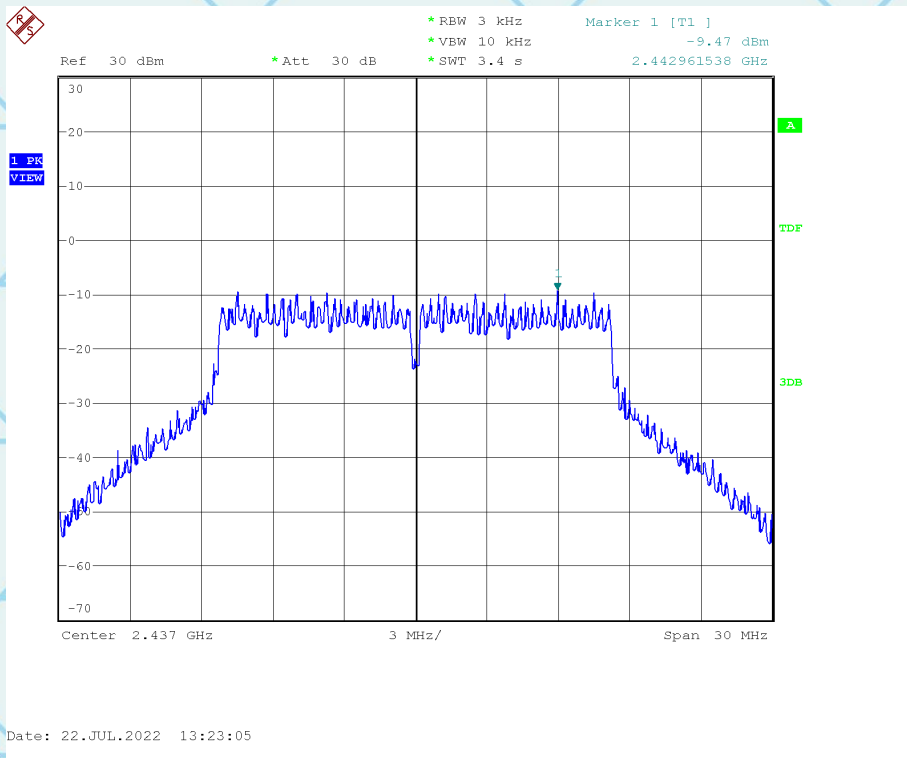
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40MHz(802.11n/ax)-worst

Lowest channel



Middle channel

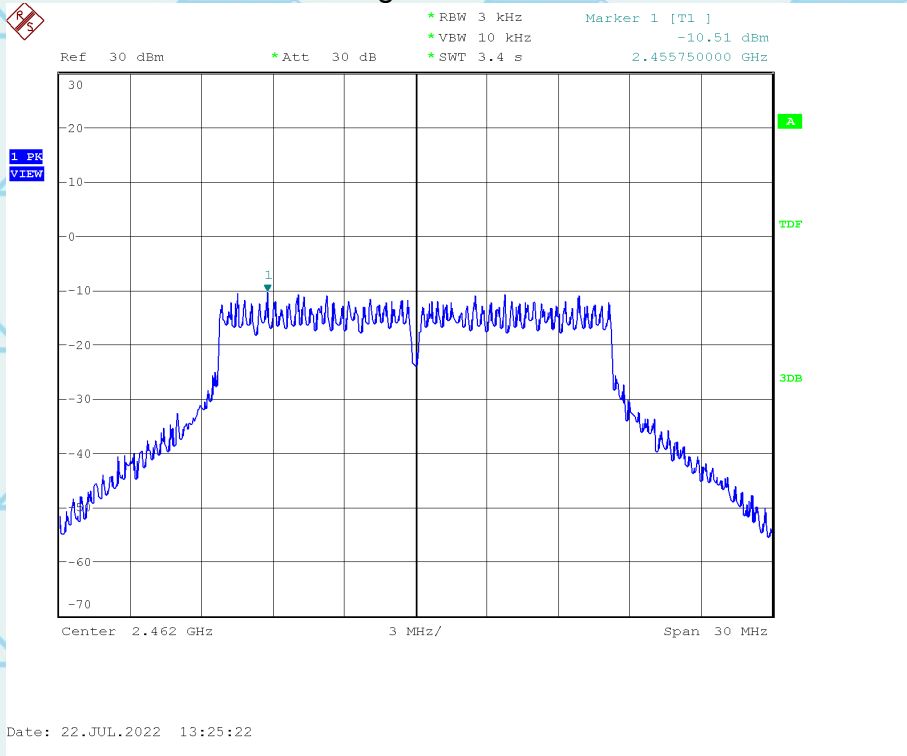






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### Highest channel







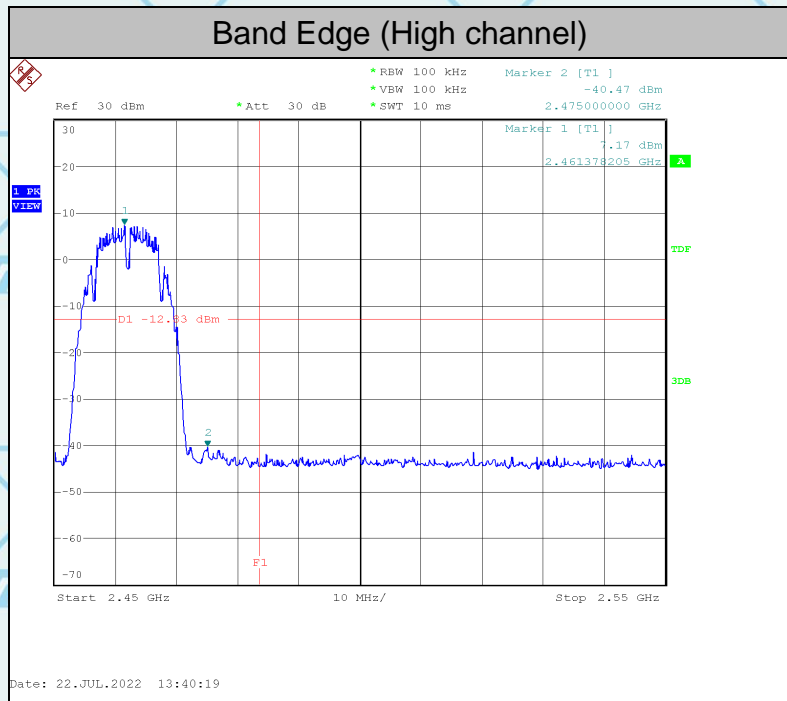
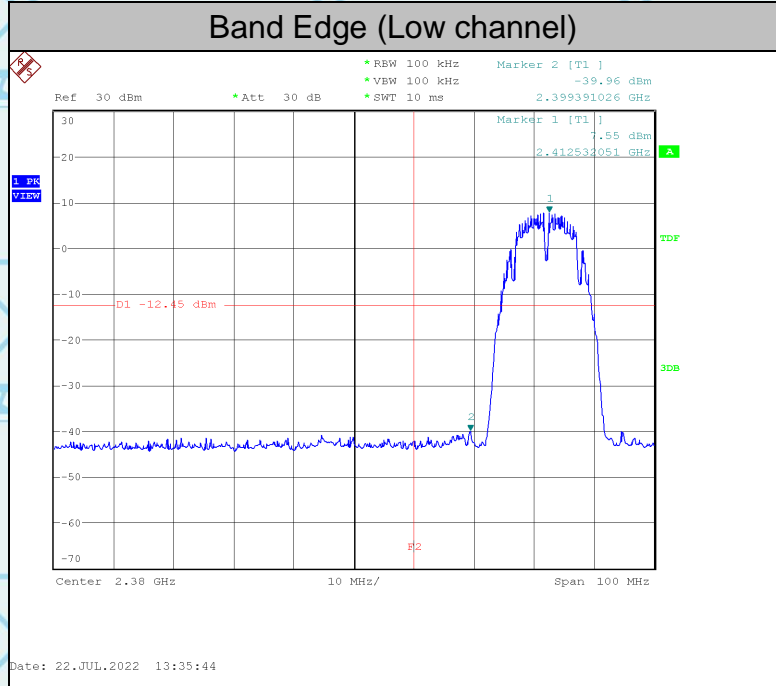




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### 6.5.2. Test Data

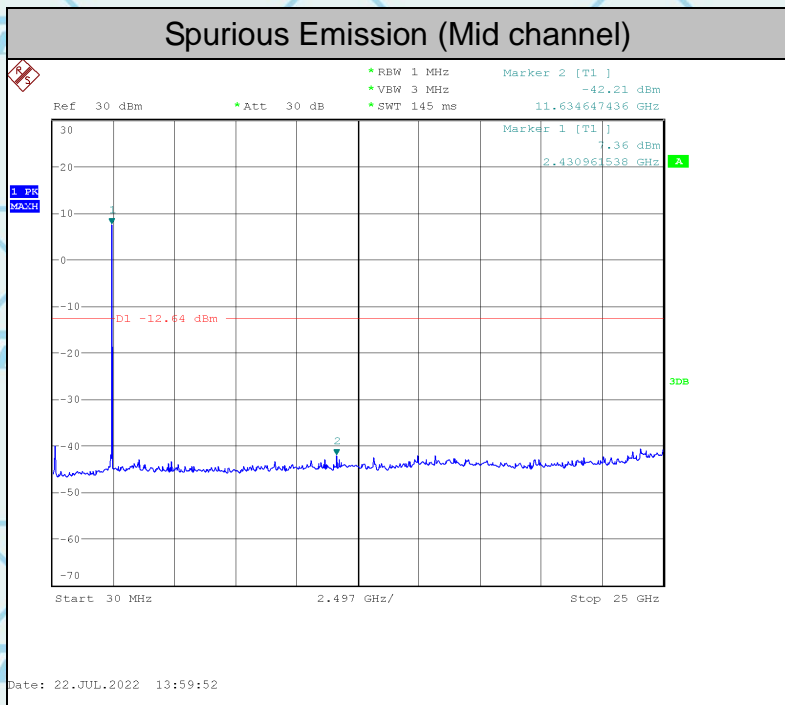
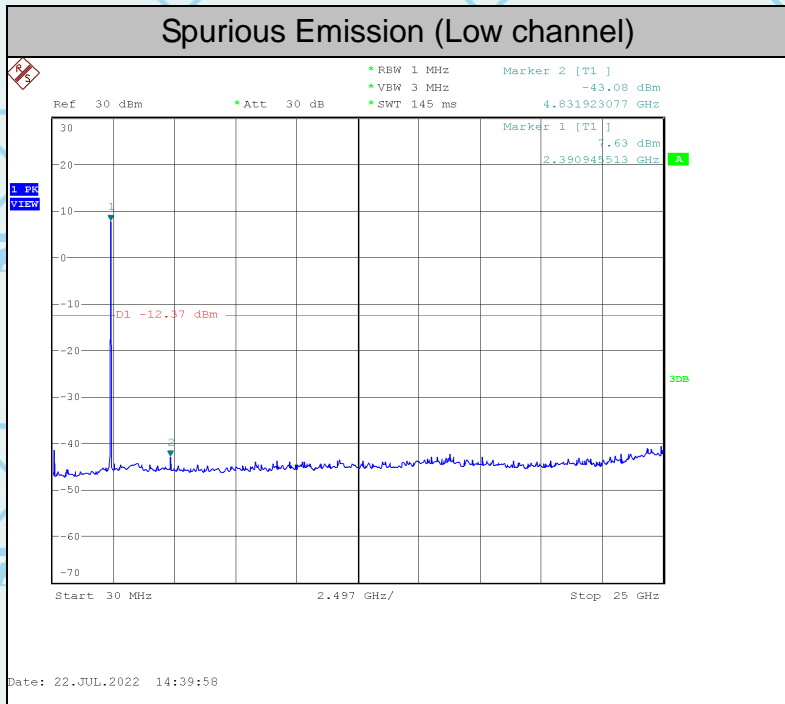
### 20MHz(802.11b/g/n/ax)-worst







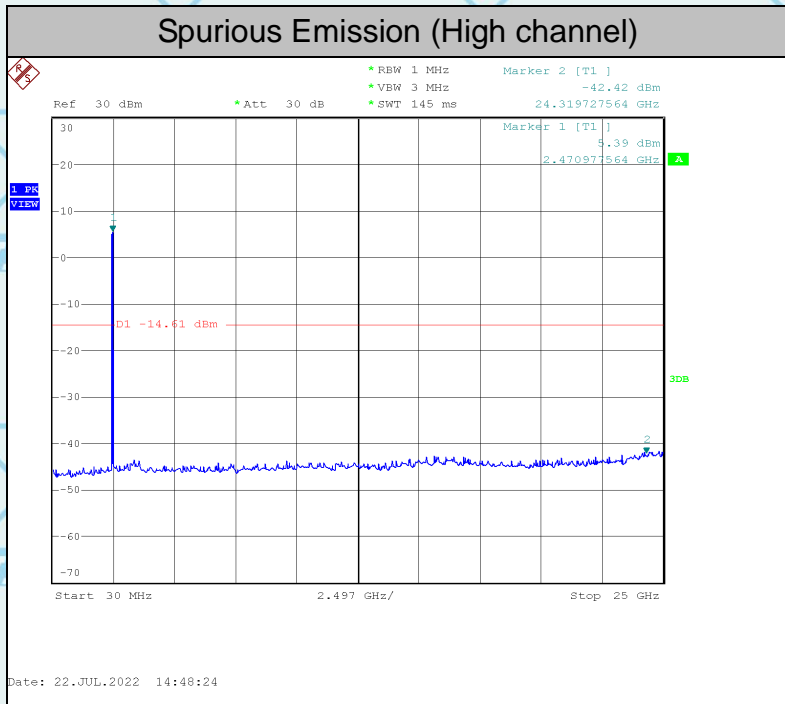
For Question, Please Contact with WSCT www.wsct-cert.com







For Question, Please Contact with WSCT www.wsct-cert.com

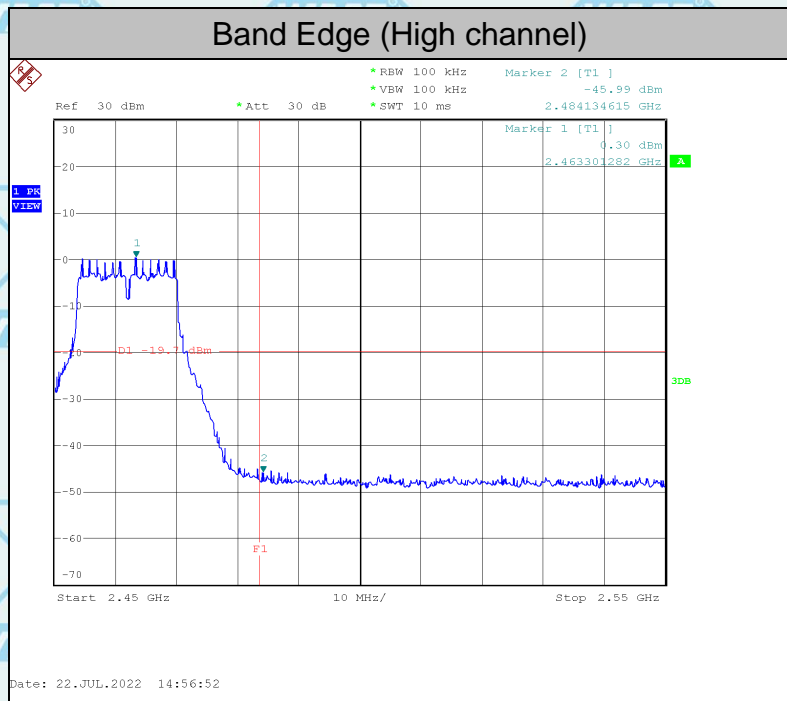
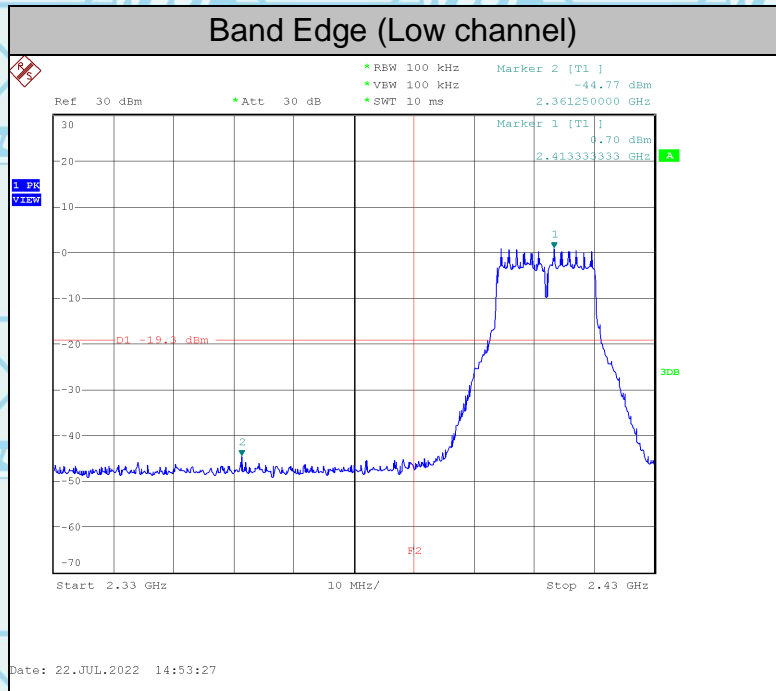






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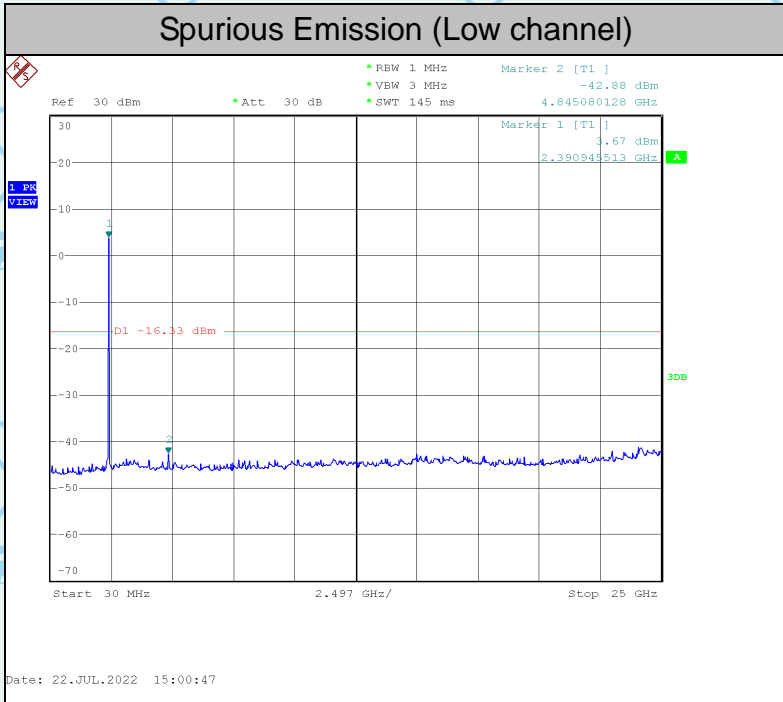
### 40MHz(802.11n/ax)



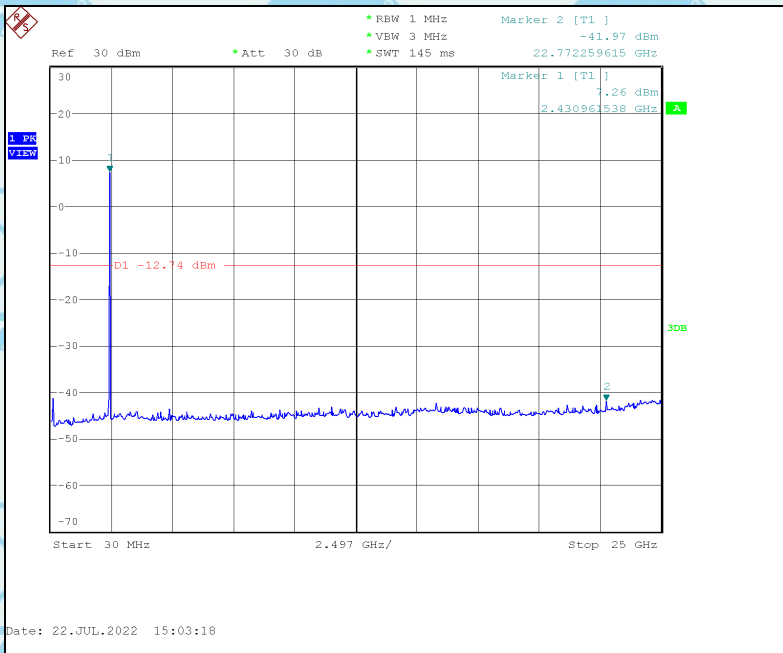




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### Spurious Emission (Mid channel)











## 6.6. Radiated Spurious Emission Measurement

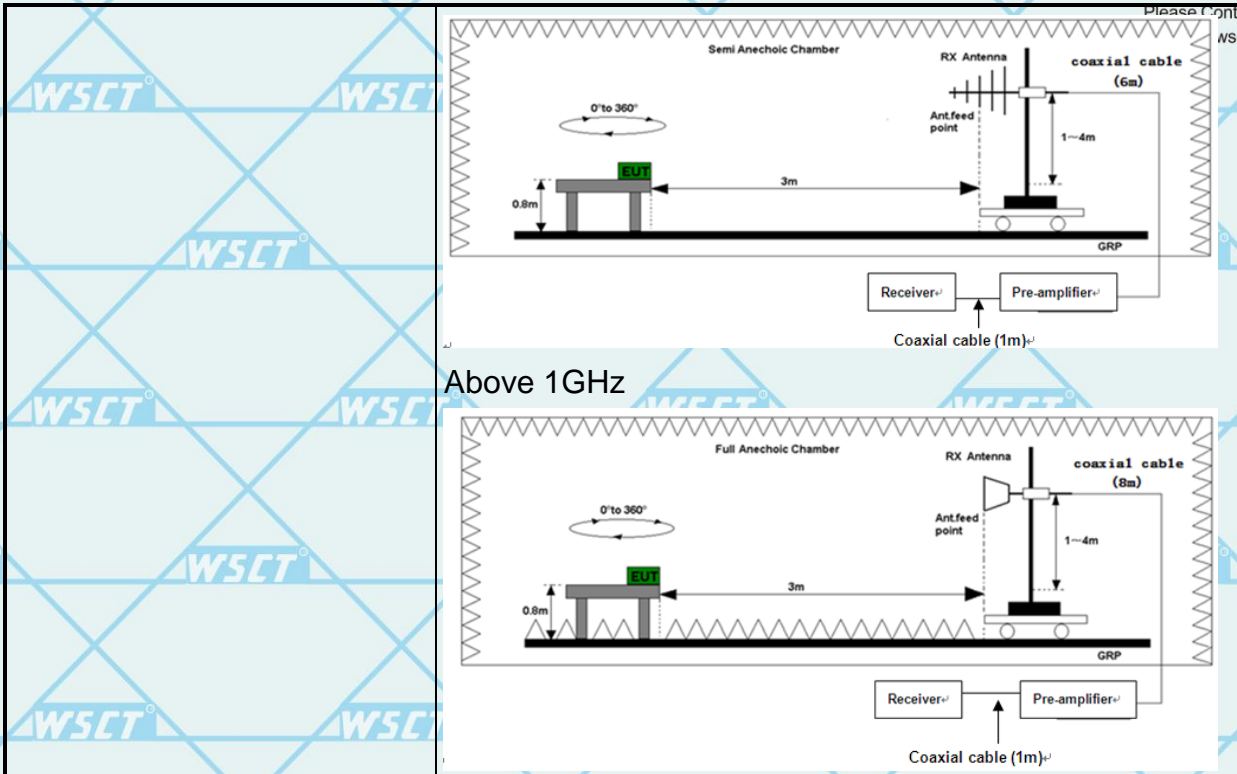
### 6.6.1. Test Specification

<b>Test Requirement:</b>	FCC Part15 C Section 15.209				
<b>Test Method:</b>	ANSI C63.10: 2014				
<b>Frequency Range:</b>	9 kHz to 25 GHz				
<b>Measurement Distance:</b>	3 m				
<b>Antenna Polarization:</b>	Horizontal & Vertical				
<b>Operation mode:</b>	Transmitting mode with modulation				
<b>Receiver Setup:</b>	Frequency	Detector	RBW	VBW	Remark
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
<b>Limit:</b>	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)		
	0.009-0.490	2400/F(KHz)	300		
	0.490-1.705	24000/F(KHz)	30		
	1.705-30	30	30		
	30-88	100	3		
	88-216	150	3		
	216-960	200	3		
	Above 960	500	3		
	Frequency	Field Strength (microvolts/meter)	Measurement Distance (meters)	Detector	
	Above 1GHz	500	3	Average	
		5000	3	Peak	
<b>Test setup:</b>	For radiated emissions below 30MHz				
	30MHz to 1GHz				





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Above 1GHz

**Test Procedure:**

- For the radiated emission test below 1GHz:  
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
- For the radiated emission test above 1GHz:  
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.







	<p>3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level</p> <p>4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.</p> <p>5. Use the following spectrum analyzer settings:</p> <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=100 kHz for <math>f &lt; 1</math> GHz; VBW <math>\geq</math> RBW; Sweep = auto; Detector function = peak; Trace = max hold;</p> <p>(3) Set RBW = 1 MHz, VBW= 3MHz for <math>f \geq 1</math> GHz for peak measurement.</p> <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW <math>\geq 1/T</math>, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
<p><b>Test results:</b></p>	<p>PASS</p>



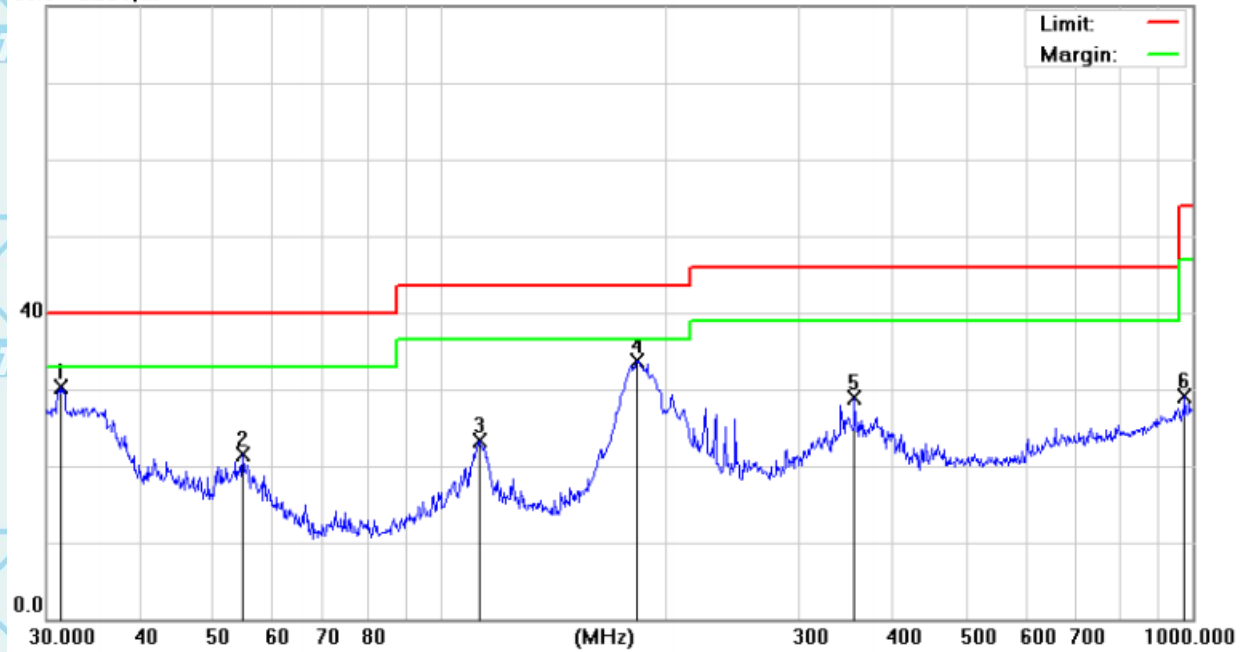




### 6.6.2. Test Data(worst)

Please refer to following diagram for individual  
Below 1GHz

Horizontal:  
80.0 dBuV/m



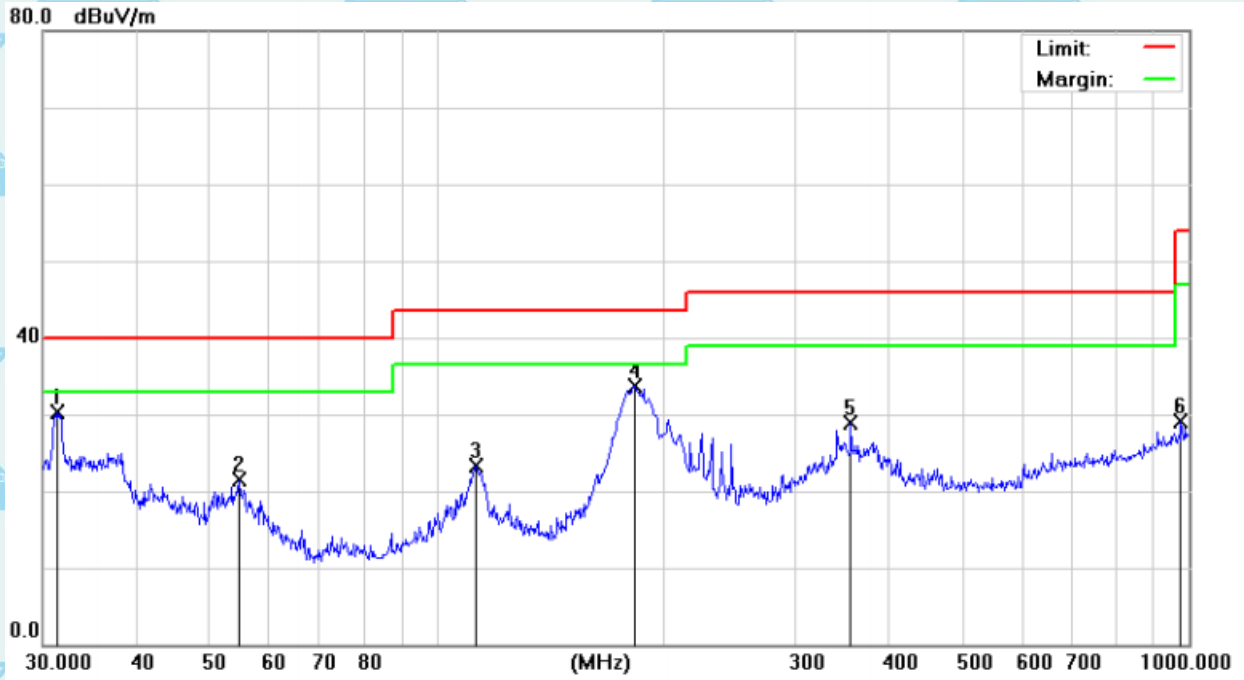
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	31.3992	26.11	4.26	30.37	40.00	-9.63	QP
2		54.6429	27.09	-5.57	21.52	40.00	-18.48	QP
3		112.9196	25.54	-2.15	23.39	43.50	-20.11	QP
4		182.5592	40.81	-7.07	33.74	43.50	-9.76	QP
5		355.4273	30.33	-1.51	28.82	46.00	-17.18	QP
6		975.7529	22.13	6.89	29.02	54.00	-24.98	QP







Vertical:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1	*	31.3992	26.11	4.26	30.37	40.00	-9.63	QP
2		54.6429	27.09	-5.57	21.52	40.00	-18.48	QP
3		112.9196	25.54	-2.15	23.39	43.50	-20.11	QP
4		183.8440	40.88	-7.09	33.79	43.50	-9.71	QP
5		355.4273	30.33	-1.51	28.82	46.00	-17.18	QP
6		975.7529	22.13	6.89	29.02	54.00	-24.98	QP

**Note:** 1. The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported  
2. Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Middle channel) was submitted only.







### Above 1GHz

#### 20MHz(802.11b/g/n/ax)

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	60.06	39.36	74	54	-13.94	-14.64
7236	V	59.84	40.40	74	54	-14.16	-13.60
4824	H	58.62	39.38	74	54	-15.38	-14.62
7236	H	58.45	39.45	74	54	-15.55	-14.55

Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	58.85	39.18	74	54	-15.15	-14.82
7311	V	59.09	40.94	74	54	-14.91	-13.06
4874	H	59.23	39.83	74	54	-14.77	-14.17
7311	H	58.41	39.41	74	54	-15.59	-14.59

Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	60.69	40.37	74	54	-13.31	-13.63
7386	V	59.82	40.98	74	54	-14.18	-13.02
4924	H	59.10	40.28	74	54	-14.90	-13.72
7386	H	59.66	40.66	74	54	-14.34	-13.34

**Note:**

- All emissions not reported were more than 20dB below the specified limit or in the noise floor.
  - Emission Level= Reading Level+ Probe Factor +Cable Loss.
- Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.







**40MHz(802.11n/ax)**

Freq. (MHz)	Low channel: 2412MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4824	V	58.62	40.27	74	54	-15.38	-13.73
7236	V	58.44	39.19	74	54	-15.56	-14.81
4824	H	59.26	39.51	74	54	-14.74	-14.49
7236	H	58.30	39.30	74	54	-15.70	-14.70

Freq. (MHz)	Middle channel: 2437MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4874	V	59.39	39.20	74	54	-14.61	-14.80
7311	V	59.66	40.52	74	54	-14.34	-13.48
4874	H	58.96	40.64	74	54	-15.04	-13.36
7311	H	58.87	39.87	74	54	-15.13	-14.13

Freq. (MHz)	High channel: 2462MHz						
	Ant.Pol	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
	H/V	PK	AV	PK	AV	PK	AV
4924	V	58.18	40.72	74	54	-15.82	-13.28
7386	V	59.49	39.91	74	54	-14.51	-14.09
4924	H	58.87	40.67	74	54	-15.13	-13.33
7386	H	58.24	39.24	74	54	-15.76	-14.76







**Restricted Bands Requirements**  
Test result for 802.11b Mode (the worst case)

Frequency	Reading	Correct Factor	Emission Level	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel							
2390	62.16	-8.73	53.43	74	20.57	H	PK
2390	54.96	-8.73	46.23	54	7.77	H	AV
2390	63.59	-8.73	54.86	74	19.14	V	PK
2390	56.76	-8.73	48.03	54	5.97	V	AV
High Channel							
2483.5	64.43	-8.17	56.26	74	17.74	H	PK
2483.5	53.17	-8.17	45.00	54	9.00	H	AV
2483.5	63.11	-8.17	54.94	74	19.06	V	PK
2483.5	54.02	-8.17	45.85	54	8.15	V	AV

**\*\*\*\*\*END OF REPORT\*\*\*\*\***

