

Report No.: ZR/2021/3003304

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FCC TEST REPORT

Application No.: ZR/2021/30033 Applicant: HMD Global Ov

Address of Applicant Bertel Jungin aukio 9, Espoo 02600, Finland

Manufacturer: HMD Global Oy

Address of Manufacturer Bertel Jungin aukio 9, Espoo 02600, Finland

EUT Description: Smart Phone Model No.: TA-1391 **Trade Mark:** Nokia

FCC ID: 2AJOTTA-1391

47 CFR FCC Part 2, Subpart J Standards:

47 CFR Part 15, Subpart C

Date of Receipt:

Date of Test: 2021/4/2 to 2021/4/15

Date of Issue: 2021/4/21 Test Result: PASS *

In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:

Derek Yang Wireless Laboratory Manager



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Version 1

Revision Record					
Version	Chapter	Date	Modifier	Remark	
01		2021-04-21		Original	

Authorized for issue by:	
Prepared By	Dee.Zheng
	(Dee Zheng) / Engineer
Checked By	July
	(Jim Huang) / Reviewer





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2 **Test Summary**

Test Item	Test Requirement	Test Method	Test Result	Result	Test Lab*
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS	В
Duty Cycle			Clause 4.3	PASS	Α
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.4	PASS	Α
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.5	PASS	Α
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.6	PASS	Α
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	Α
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.8	PASS	Α
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS	В
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.10	PASS	В

Remark: All test were performed by Lab A and B.

Lab A SGS-CSTC Standards Technical Services Co., Ltd.

Lab B SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.





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General Information 3

3.1 Details of Client

Applicant:	HMD Global Oy	
Address of Applicant	Bertel Jungin aukio 9, Espoo 02600, Finland	
Manufacturer:	HMD Global Oy	
Address of Manufacturer	Bertel Jungin aukio 9, Espoo 02600, Finland	

3.2 Test Location

Lab A:

Company: SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch	
Address: No. 1 Workshop, M-10, Middle section, Science & Technology Par Shenzhen, Guangdong, China	
Post code:	518057
Test engineer:	Dee Zheng,Swing Hu,Habit Zeng

I ab B:

Eud D.	
Company: SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) C	
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Leah Chen,Ken Liu,Andy Yao





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3.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Lab A:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC -Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

Lab B:

A2LA (Certificate No. 4854.01)

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

FCC-Designation Number: CN1271.





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3.4 General Description of EUT

EUT Description:	Smart Phone		
Model No.:	TA-1391		
Trade Mark:	Nokia		
Hardware Version:	19545_1_10		
Software Version:	V0.100_A01(SW_T19545AA1_V010_M10_NF_NOKIA_Iris_USR_TEST)		
IEEE 802.11 WLAN Mode Supported	 ⋈ 802.11B (20 MHz channel bandwidth), ⋈ 802.11G (20 MHz channel bandwidth) ⋈ 802.11N (20 MHz channel bandwidth), ⋈ 802.11N (40 MHz channel bandwidth) 		
Operation Frequency:	2400 MHz -2483.5MHz fc = 2407 MHz + N * 5 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth, or 3 to 9 for the 40 MHz channel bandwidth.		
Type of Modulation:	IEEE for 802.11B: DSSS IEEE for 802.11G: OFDM IEEE for 802.11N(HT20): OFDM		
Sample Type:	□ Portable Device, □ Module		
Antenna Type:	☐ External, ☑ Integrated		
Antenna Ports			
Antenna Gain:	0.7dBi		

Operation Frequency of each channel (802.11B/G/N HT20)							
Channel Frequency Channel Frequency Channel Frequency Channel Frequency							Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		



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Remark:

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:

Channel	Frequency for 802.11B/G/N (HT20)
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

3.5 Test Environment and Mode

Operating Environment:				
Temperature:	25.0 °C			
Humidity:	50 % RH			
Atmospheric Pressure:	101.30 KPa			
Test mode:				
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.			

3.6 Description of Support Units

The EUT has been tested independent unit.





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Test results and Measurement Data 4

4.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C 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(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.7dBi.



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207			
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150kHz to 30MHz			
Limit:	- 441)	Limit (dl	BuV)	
	Frequency range (MHz)	Quasi-peak	Average	
	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
	* Decreases with the log	arithm of the frequency.		
Test Procedure:	 The mains terminal disturbance voltage test was conducted in a shielded room. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The 			
	reference plane. The LIS unit under test and bond mounted on top of the gr between the closest poir the EUT and associated In order to find the maxir	e plane was bonded to the hole of the plane was placed 0.8 m from the plane of the aground reference plane ound reference plane. This did not softhe LISN 1 and the EUT equipment was at least 0.8 m and emission, the relative pointerface cables must be charonducted measurement.	ne boundary of the ne for LISNs istance was All other units of n from the LISN 2. sitions of	



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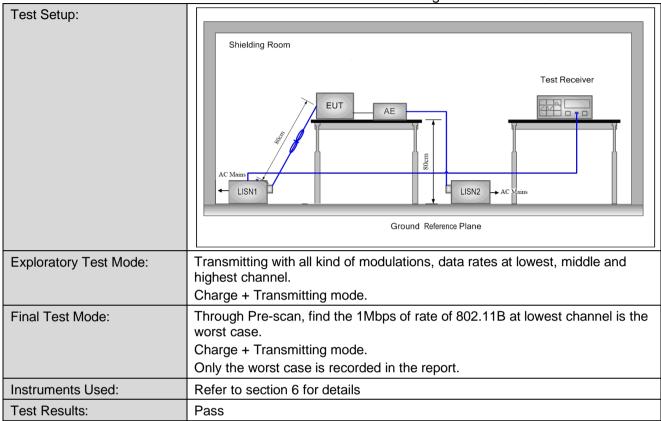
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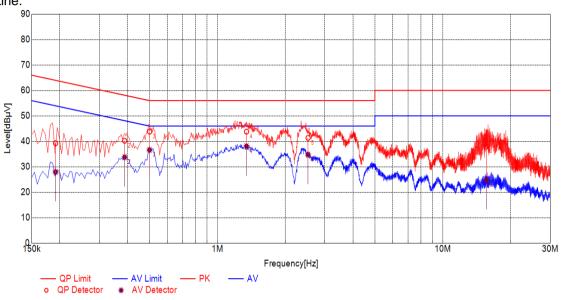
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Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live Line:



Test Graph

Final	Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]				
1	0.1916	10.10	39.27	63.97	24.70	27.95	53.97	26.02				
2	0.3880	10.10	40.22	58.11	17.89	33.75	48.11	14.36				
3	0.5005	10.10	43.80	56.00	12.20	36.62	46.00	9.38				
4	1.3468	10.10	43.81	56.00	12.19	38.07	46.00	7.93				
5	2.5262	10.10	41.34	56.00	14.66	34.71	46.00	11.29				
6	15.6038	10.11	37.97	60.00	22.03	24.86	50.00	25.14				



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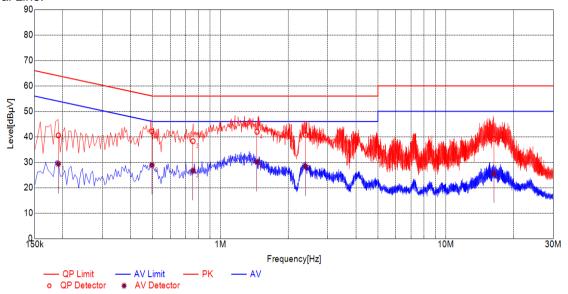
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Test Graph

Final	Final Data List												
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]					
1	0.1911	10.10	40.56	63.99	23.43	29.38	53.99	24.61					
2	0.4971	10.10	42.05	56.05	14.00	28.90	46.05	17.15					
3	0.7563	10.10	38.27	56.00	17.73	26.65	46.00	19.35					
4	1.4546	10.10	41.98	56.00	14.02	30.17	46.00	15.83					
5	2.3872	10.10	40.77	56.00	15.23	28.39	46.00	17.61					
6	16.3316	10.11	39.16	60.00	20.84	25.62	50.00	24.38					

Remark:

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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4.3 Duty Cycle

The detailed test data see: Appendix

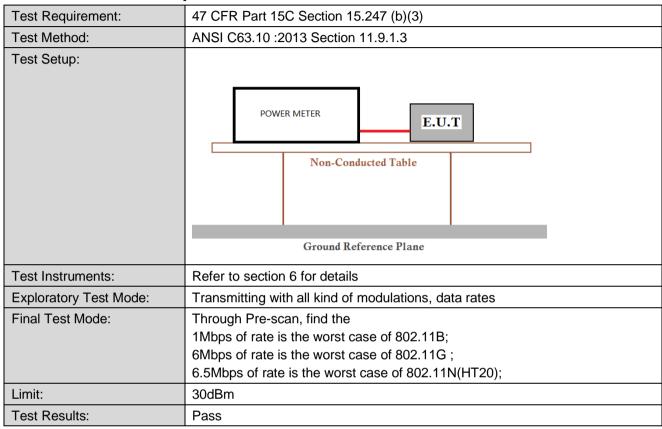




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4.4 Conducted Output Power



The detailed test data see: Appendix





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4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)					
Test Method:	ANSI C63.10: 2013 Section 11.8.1 Option 1					
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane					
Instruments Used:	Refer to section 6 for details					
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates					
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11B; 6Mbps of rate is the worst case of 802.11G; 6.5Mbps of rate is the worst case of 802.11N(HT20);					
Limit:	≥ 500 kHz					
Test Results:	Pass					

The detailed test data see: Appendix

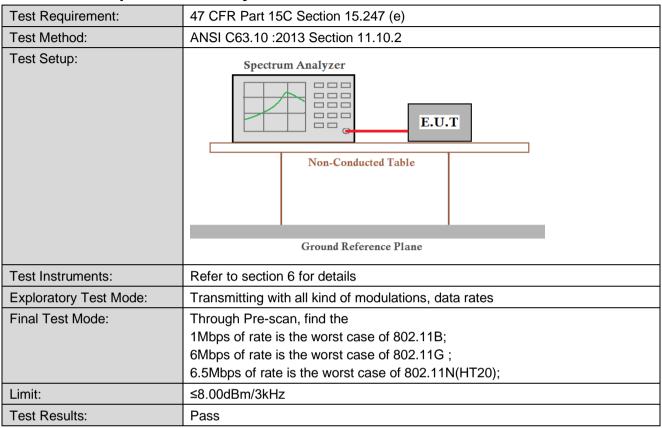




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4.6 Power Spectral Density



The detailed test data see: Appendix

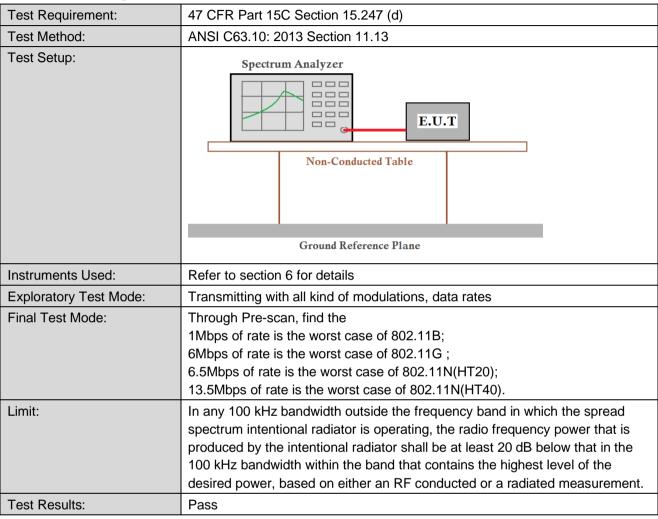




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4.7 Band-edge for RF Conducted Emissions



The detailed test data see: Appendix

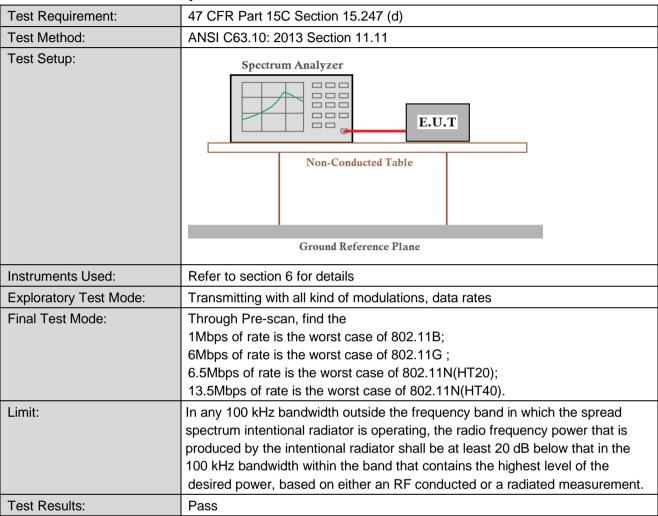




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4.8 RF Conducted Spurious Emissions



The detailed test data see: Appendix





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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section	n 15.209 and 15.20	05					
Test Method:	ANSI C63.10 :2013 Sect	tion 11.12						
Test Site:	Measurement Distance:	3m or 10m (Semi-	Anechoic Ch	amber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark			
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak			
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average			
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak			
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average			
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak			
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak			
		Peak	1MHz	3MHz	Peak			
		Peak	1MHz	10Hz	Average			
	Above 1GHz			(DC≥0.98)				
				≥1/T				
				(DC<0.98)				
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)			
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300			
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30			
	1.705MHz-30MHz	30	-	-	30			
	30MHz-88MHz	100	40.0	Quasi-peak	3			
	88MHz-216MHz	150	43.5	Quasi-peak	3			
	216MHz-960MHz	200	46.0	Quasi-peak	3			
	960MHz-1GHz	500	54.0	Quasi-peak	3			
	Above 1GHz	500	54.0	Average	3			
Remark: 15.35(b),Unless otherwise specified, the limit on peak radio freque missions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total pemission level radiated by the device.								



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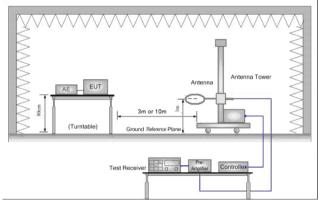
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Test Setup:



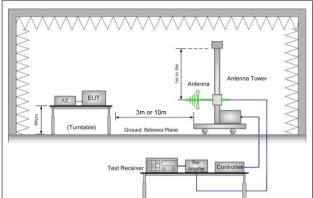


Figure 1. Below 30MHz

Figure 2. 30MHz to 1GHz

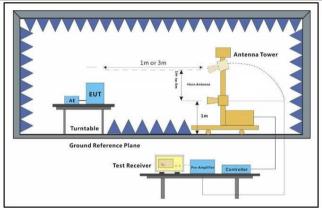


Figure 3. Above 1 GHz

Test Procedure:

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Use the following spectrum analyzer settings:
 - Span shall wide enough to fully capture the emission being (1) measured;
 - Set RBW=100 kHz for f < 1 GHz, RBW=1MHz for f>1GHz; (2) VBW ≥ RBW; Sweep = auto;
 - Detector function = peak; Trace = max hold for peak
 - For average measurement: use duty cycle correction factor method per 15.35(c).

Duty cycle = On time/100 milliseconds



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	1 agc. 22 01 101
	On time = N 1 *L 1 +N 2 *L 2 ++N n-1 *LN n-1 +N n *L n Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc. Average Emission Level = Peak Emission Level + 20*log(Duty cycle) f. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. h. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. i. Test the EUT in the lowest channel, the middle channel ,the Highest channel. j. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case. k. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge + Transmitting mode. Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11B; 6Mbps of rate is the worst case of 802.11G; 6.5Mbps of rate is the worst case of 802.11N(HT20); For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11B at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



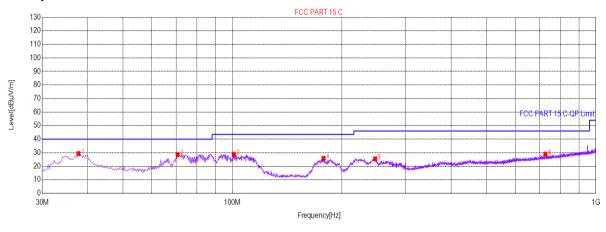


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4.9.1 Radiated emission below 1GHz

4.9.1.1 **Charge + Transmitting Test Graph**



- QP Limit --- Vertical PK

Suspected List

<u> </u>	otou List							
Susp	ected List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.7616	29.38	-28.20	40.00	10.62	186	278	Vertical
2	70.7482	28.61	-30.65	40.00	11.39	165	256	Vertical
3	101.018	28.81	-28.13	43.50	14.69	178	98	Vertical
4	178.245	25.84	-29.83	43.50	17.66	204	158	Vertical
5	247.129	25.50	-26.86	46.00	20.50	208	175	Vertical
6	726.405	28.95	-16.82	46.00	17.05	165	140	Vertical

Final Data List



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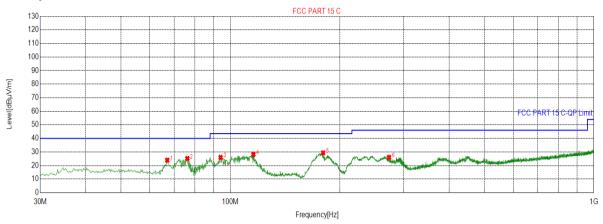
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Test Graph



QP Detector

- Horizontal PK

Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	67.0614	23.97	-29.76	40.00	16.03	201	92	Horizontal				
2	76.1812	25.18	-31.61	40.00	14.82	212	40	Horizontal				
3	94.0328	26.02	-29.15	43.50	17.48	211	240	Horizontal				
4	115.765	28.24	-29.02	43.50	15.26	208	212	Horizontal				
5	179.992	29.32	-29.76	43.50	14.18	209	261	Horizontal				
6	273.324	26.10	-26.35	46.00	19.90	198	117	Horizontal				

Final Data List





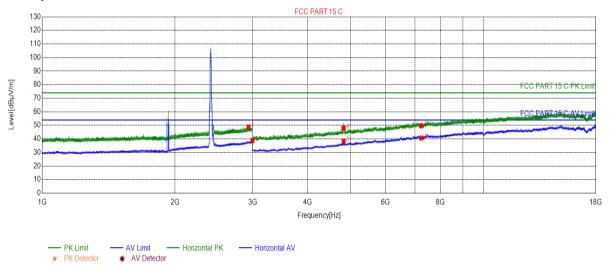
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Transmitter emission above 1GHz 4.9.2

4.9.2.1 802.11B Channel 1

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2936.29	48.78	10.52	74.00	25.22	155	161	Horizontal				
2	2995.79	38.77	10.68	54.00	15.23	159	12	Horizontal				
3	4824.00	38.30	-15.31	54.00	15.70	196	286	Horizontal				
4	4824.00	47.98	-15.31	74.00	26.02	174	280	Horizontal				
5	7236.00	49.66	-8.82	74.00	24.34	185	263	Horizontal				
6	7236.00	40.71	-8.82	54.00	13.29	166	337	Horizontal				

Final Data List



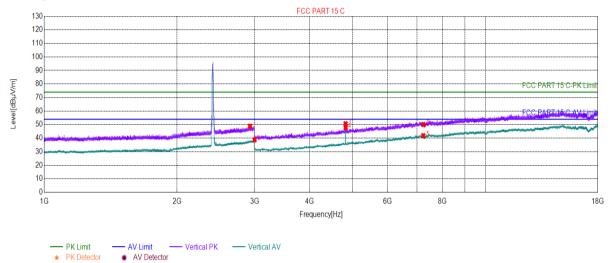


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802.11B Channel 1 4.9.2.2

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2928.19	48.89	10.52	74.00	25.11	234	186	Vertical				
2	2999.40	38.74	10.79	54.00	15.26	264	265	Vertical				
3	4824.00	50.67	-15.31	74.00	23.33	222	258	Vertical				
4	4824.00	47.71	-15.31	54.00	6.29	291	255	Vertical				
5	7236.00	41.87	-8.82	54.00	12.13	278	108	Vertical				
6	7236.00	50.10	-8.82	74.00	23.90	266	298	Vertical				

Final Data List



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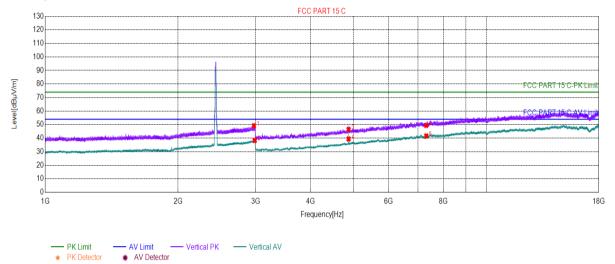


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802.11B Channel 6 4.9.2.3

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2972.49	49.21	10.38	74.00	24.79	151	45	Vertical				
2	2985.59	38.26	10.51	54.00	15.74	162	101	Vertical				
3	4874.00	46.50	-15.09	74.00	27.50	192	249	Vertical				
4	4874.00	39.43	-15.09	54.00	14.57	188	253	Vertical				
5	7311.00	41.66	-8.93	54.00	12.34	160	119	Vertical				
6	7311.00	49.41	-8.93	74.00	24.59	173	113	Vertical				

Final Data List



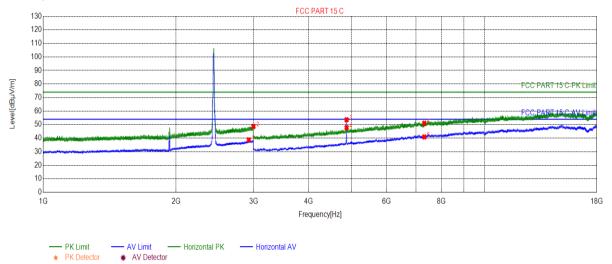


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802.11B Channel 6 4.9.2.4

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2925.69	38.75	10.48	54.00	15.25	233	206	Horizontal				
2	2996.89	48.66	10.71	74.00	25.34	241	275	Horizontal				
3	4874.00	53.59	-15.09	74.00	20.41	264	338	Horizontal				
4	4874.00	47.75	-15.09	54.00	6.25	285	315	Horizontal				
5	7311.00	40.89	-8.93	54.00	13.11	221	39	Horizontal				
6	7311.00	51.04	-8.93	74.00	22.96	208	174	Horizontal				

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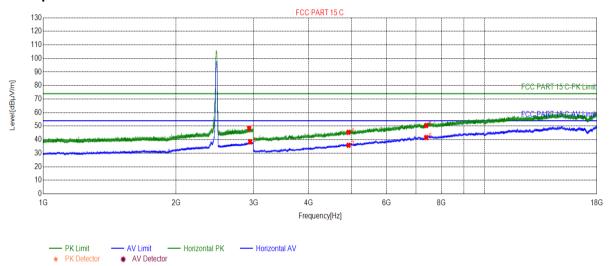


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802.11B Channel 11 4.9.2.5

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2929.89	48.46	10.55	74.00	25.54	150	179	Horizontal				
2	2945.59	38.47	10.54	54.00	15.53	194	131	Horizontal				
3	4924.00	35.90	-14.74	54.00	18.10	175	86	Horizontal				
4	4924.00	45.42	-14.74	74.00	28.58	168	217	Horizontal				
5	7386.00	50.41	-7.78	74.00	23.59	173	22	Horizontal				
6	7386.00	41.63	-7.78	54.00	12.37	185	11	Horizontal				

Final Data List



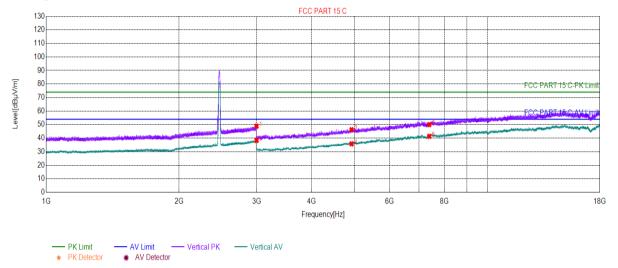


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802.11B Channel 11 4.9.2.6

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2998.09	48.83	10.75	74.00	25.17	284	258	Vertical			
2	2998.69	38.35	10.77	54.00	15.65	286	2	Vertical			
3	4924.00	46.24	-14.74	74.00	27.76	277	185	Vertical			
4	4924.00	35.79	-14.74	54.00	18.21	243	185	Vertical			
5	7386.00	41.35	-7.78	54.00	12.65	236	167	Vertical			
6	7386.00	49.97	-7.78	74.00	24.03	264	59	Vertical			

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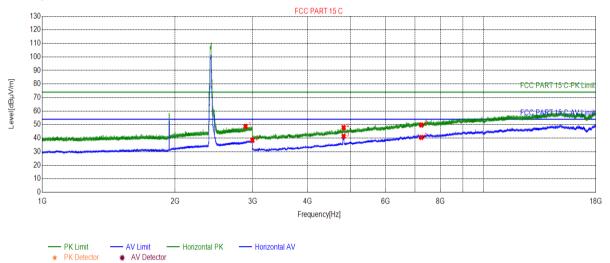


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802.11G Channel 1 4.9.2.7

Test Graph



Suspected List

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2889.79	48.64	9.96	74.00	25.36	156	59	Horizontal		
2	2996.09	38.46	10.68	54.00	15.54	175	328	Horizontal		
3	4824.00	41.42	-15.31	54.00	12.58	199	286	Horizontal		
4	4824.00	47.79	-15.31	74.00	26.21	186	280	Horizontal		
5	7236.00	49.72	-8.82	74.00	24.28	153	263	Horizontal		
6	7236.00	40.57	-8.82	54.00	13.43	151	125	Horizontal		

Final Data List



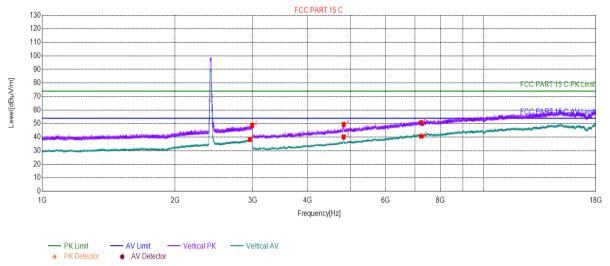


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802.11G Channel 1 4.9.2.8

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2956.59	38.31	10.53	54.00	15.69	229	74	Vertical			
2	2993.09	48.76	10.59	74.00	25.24	239	170	Vertical			
3	4824.00	40.23	-15.31	54.00	13.77	234	252	Vertical			
4	4824.00	49.43	-15.31	74.00	24.57	255	246	Vertical			
5	7236.00	50.81	-8.82	74.00	23.19	267	168	Vertical			
6	7236.00	40.68	-8.82	54.00	13.32	276	246	Vertical			

Final Data List



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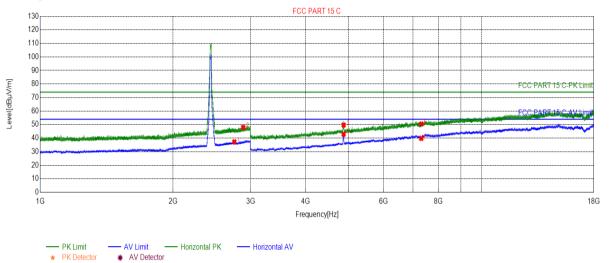


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802.11G Channel 6 4.9.2.9

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2755.08	37.26	9.46	54.00	16.74	154	285	Horizontal			
2	2885.09	47.98	9.92	74.00	26.02	168	201	Horizontal			
3	4874.00	49.69	-15.09	74.00	24.31	173	253	Horizontal			
4	4874.00	42.90	-15.09	54.00	11.10	164	224	Horizontal			
5	7311.00	39.84	-8.93	54.00	14.16	191	279	Horizontal			
6	7311.00	50.49	-8.93	74.00	23.51	186	228	Horizontal			

Final Data List



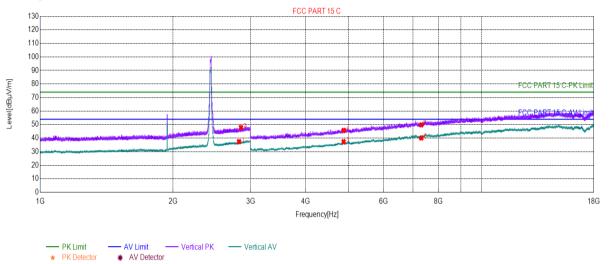


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802.11G Channel 6 4.9.2.10

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2822.79	37.43	9.71	54.00	16.57	220	13	Vertical			
2	2851.39	47.85	9.64	74.00	26.15	231	306	Vertical			
3	4874.00	37.41	-15.09	54.00	16.59	253	333	Vertical			
4	4874.00	45.72	-15.09	74.00	28.28	296	248	Vertical			
5	7311.00	49.84	-8.93	74.00	24.16	274	36	Vertical			
6	7311.00	40.13	-8.93	54.00	13.87	255	108	Vertical			

Final Data List



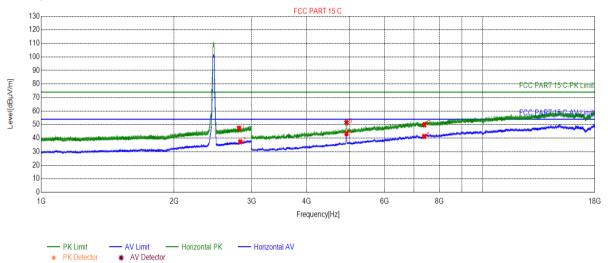


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802.11G Channel 11 4.9.2.11

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2808.69	47.37	9.26	74.00	26.63	164	177	Horizontal			
2	2826.09	37.30	9.71	54.00	16.70	155	245	Horizontal			
3	4924.00	51.48	-14.74	74.00	22.52	186	263	Horizontal			
4	4924.00	43.43	-14.74	54.00	10.57	172	285	Horizontal			
5	7386.00	41.26	-7.78	54.00	12.74	195	351	Horizontal			
6	7386.00	49.79	-7.78	74.00	24.21	151	285	Horizontal			

Final Data List



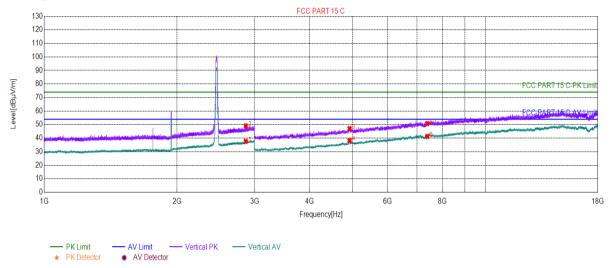


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802.11G Channel 11 4.9.2.12

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2863.29	37.66	9.88	54.00	16.34	201	67	Vertical			
2	2864.39	49.04	9.90	74.00	24.96	220	295	Vertical			
3	4924.00	47.07	-14.74	74.00	26.93	236	251	Vertical			
4	4924.00	38.22	-14.74	54.00	15.78	246	260	Vertical			
5	7386.00	41.29	-7.78	54.00	12.71	295	206	Vertical			
6	7386.00	50.74	-7.78	74.00	23.26	284	326	Vertical			

Final Data List



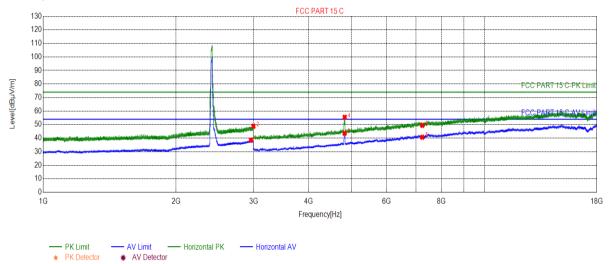


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802.11N20 Channel 1 4.9.2.13

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2958.49	38.57	10.52	54.00	15.43	165	195	Horizontal				
2	2995.69	48.82	10.67	74.00	25.18	184	58	Horizontal				
3	4824.00	43.61	-15.31	54.00	10.39	194	287	Horizontal				
4	4826.47	55.45	-15.30	74.00	18.55	150	275	Horizontal				
5	7236.00	40.72	-8.82	54.00	13.28	166	88	Horizontal				
6	7236.00	49.48	-8.82	74.00	24.52	173	236	Horizontal				

Final Data List



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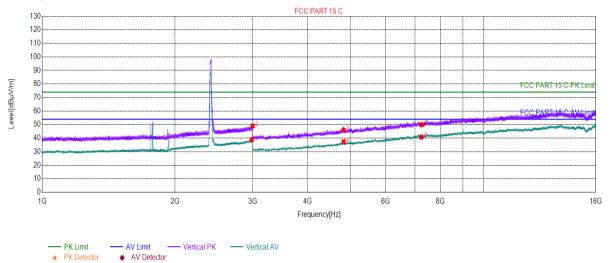


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802.11N20 Channel 1 4.9.2.14

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2986.09	38.87	10.51	54.00	15.13	294	280	Vertical				
2	2999.90	49.01	10.81	74.00	24.99	286	27	Vertical				
3	4824.00	45.89	-15.31	74.00	28.11	288	190	Vertical				
4	4824.00	37.36	-15.31	54.00	16.64	264	246	Vertical				
5	7236.00	40.83	-8.82	54.00	13.17	215	348	Vertical				
6	7236.00	49.98	-8.82	74.00	24.02	233	18	Vertical				

Final Data List



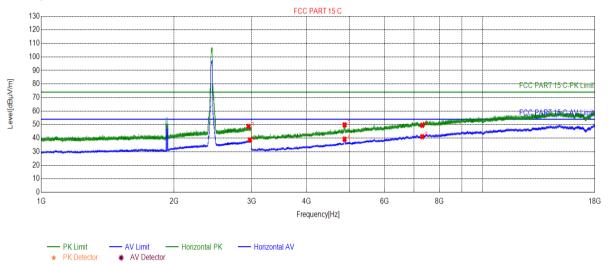


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802.11N20 Channel 6 4.9.2.15

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2951.29	48.68	10.56	74.00	25.32	155	327	Horizontal				
2	2973.49	38.72	10.40	54.00	15.28	162	248	Horizontal				
3	4874.00	49.80	-15.09	74.00	24.20	189	280	Horizontal				
4	4874.00	39.24	-15.09	54.00	14.76	175	280	Horizontal				
5	7311.00	49.52	-8.93	74.00	24.48	163	257	Horizontal				
6	7311.00	41.08	-8.93	54.00	12.92	171	297	Horizontal				

Final Data List



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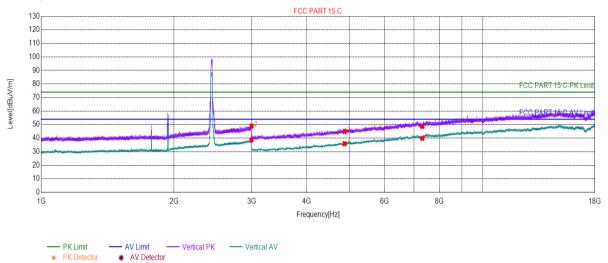


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802.11N20 Channel 6 4.9.2.16

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2995.59	38.64	10.67	54.00	15.36	208	0	Vertical				
2	2998.59	48.98	10.77	74.00	25.02	210	64	Vertical				
3	4874.00	44.97	-15.09	74.00	29.03	235	126	Vertical				
4	4874.00	35.90	-15.09	54.00	18.10	249	199	Vertical				
5	7311.00	39.86	-8.93	54.00	14.14	281	103	Vertical				
6	7311.00	48.69	-8.93	74.00	25.31	277	86	Vertical				

Final Data List



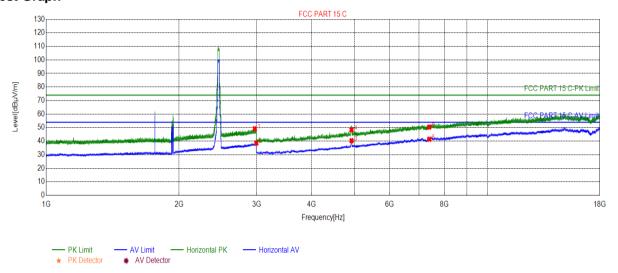


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802.11N20 Channel 11 4.9.2.17

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2970.69	49.18	10.34	74.00	24.82	153	0	Horizontal				
2	2994.49	38.59	10.63	54.00	15.41	150	34	Horizontal				
3	4924.00	40.36	-14.74	54.00	13.64	161	124	Horizontal				
4	4924.00	48.36	-14.74	74.00	25.64	188	107	Horizontal				
5	7386.00	50.36	-7.78	74.00	23.64	192	215	Horizontal				
6	7386.00	41.44	-7.78	54.00	12.56	172	193	Horizontal				

Final Data List



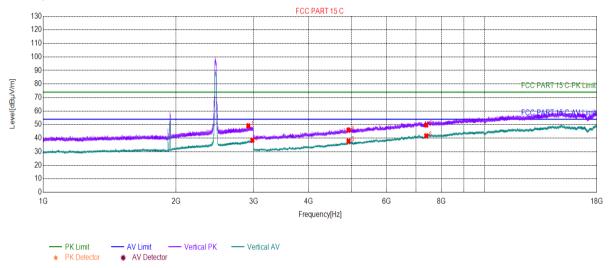


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802.11N20 Channel 11 4.9.2.18

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2917.39	49.11	10.34	74.00	24.89	201	348	Vertical				
2	2979.79	38.45	10.54	54.00	15.55	245	116	Vertical				
3	4924.00	37.88	-14.74	54.00	16.12	261	311	Vertical				
4	4924.00	45.96	-14.74	74.00	28.04	263	351	Vertical				
5	7386.00	49.69	-7.78	74.00	24.31	291	204	Vertical				
6	7386.00	41.67	-7.78	54.00	12.33	243	136	Vertical				

Final Data List

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
 - Final Test Level =Receiver Reading + Antenna Factor + Cable Factor Preamplifier Factor
- 2) Scan from 9kHz to 25GHz, the disturbance between 9KHz to 30MHz and 18GHz to 25GHz was very low, and the above harmonics were the highest point could be found when testing, The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
- 4) All Modes have been tested, but only the worst case data displayed in this report.



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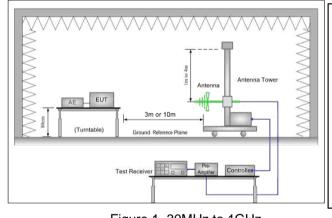


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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 1	5.209 and 15.205									
Test Method:	ANSI C63.10: 2013 Section	า 11.12									
Test Site:	Measurement Distance: 3n	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)									
Limit:	Frequency	Limit (dBuV/m)	Remark								
	30MHz-88MHz	40.0	Quasi-peak								
	88MHz-216MHz	43.5	Quasi-peak								
	216MHz-960MHz	46.0	Quasi-peak								
	960MHz-1GHz	54.0	Quasi-peak								
	Above 4CUs	54.0	Average Value								
	Above IGHZ	Above 1GHz 74.0 Peak Value									
Test Setup:		-									



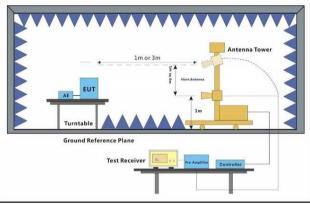


Figure 1. 30MHz to 1GHz

Figure 2. Above 1 GHz



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	5
Test Procedure:	a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
	c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
	d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
	e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
	f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	g. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
	h. Test the EUT in the lowest channel , the Highest channel
	i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
	j. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge + Transmitting mode.
	Through Pre-scan, find the
	1Mbps of rate is the worst case of 802.11B;
	6Mbps of rate is the worst case of 802.11G;
	6.5Mbps of rate is the worst case of 802.11N(HT20);
	Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



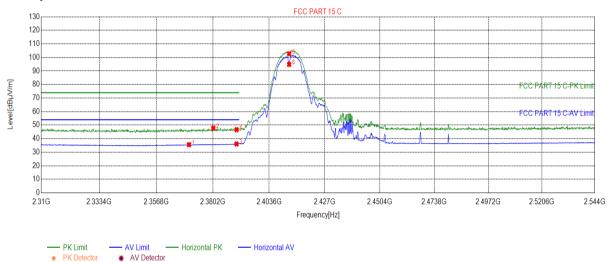


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Test Plots 4.10.1 802.11B Channel 1 4.10.1.1

Test Graph



Suspected List

Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2370.25	35.61	9.07	54.00	18.39	151	192	Horizontal				
2	2380.31	47.79	9.34	74.00	26.21	187	26	Horizontal				
3	2390.00	36.10	9.60	54.00	17.90	195	321	Horizontal				
4	2390.00	46.66	9.60	74.00	27.34	164	18	Horizontal				
5	2412.00	102.70	9.85	0.00	-102.70	172	203	Horizontal				
6	2412.00	94.87	9.85	0.00	-94.87	155	200	Horizontal				

Final Data List



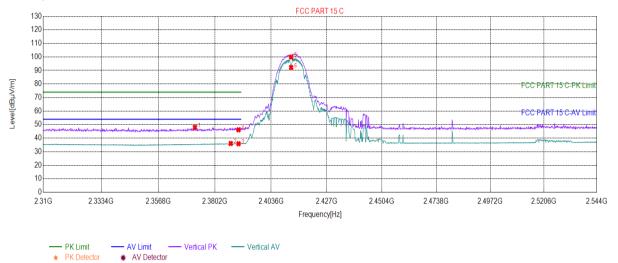


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802.11B Channel 1 4.10.1.2

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2371.89	48.01	9.11	74.00	25.99	264	228	Vertical				
2	2386.75	36.09	9.51	54.00	17.91	254	145	Vertical				
3	2390.00	35.88	9.60	54.00	18.12	291	39	Vertical				
4	2390.00	46.19	9.60	74.00	27.81	275	62	Vertical				
5	2412.00	99.90	9.85	0.00	-99.90	263	205	Vertical				
6	2412.00	92.18	9.85	0.00	-92.18	230	215	Vertical				

Final Data List



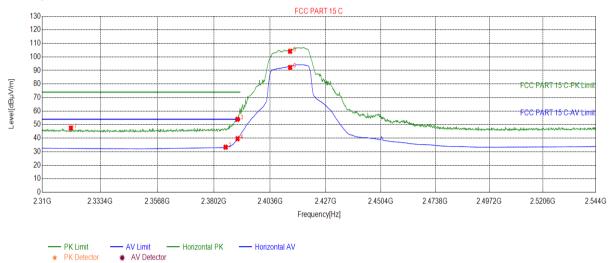


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802.11G Channel 1 4.10.1.3

Test Graph



Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2321.58	47.50	8.92	74.00	26.50	198	256.0	Horizontal				
2	2385.03	33.36	9.47	54.00	20.64	198	256.0	Horizontal				
3	2390.00	53.96	9.60	74.00	20.04	198	256.0	Horizontal				
4	2390.00	39.58	9.60	54.00	14.42	198	256.0	Horizontal				
5	2412.00	104.15	9.85	0.00	-104.15	198	256.0	Horizontal				
6	2412.00	92.21	9.85	0.00	-92.21	198	256.0	Horizontal				

Final Data List



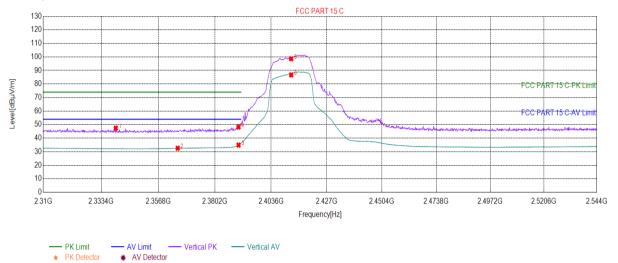


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802.11G Channel 1 4.10.1.4

Test Graph



Suspected List

Susp	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2339.38	47.42	8.67	74.00	26.58	225	25	Vertical				
2	2364.78	32.57	8.92	54.00	21.43	264	234	Vertical				
3	2390.00	34.89	9.60	54.00	19.11	271	125	Vertical				
4	2390.00	48.18	9.60	74.00	25.82	280	334	Vertical				
5	2412.00	98.61	9.85	0.00	-98.61	294	186	Vertical				
6	2412.00	86.71	9.85	0.00	-86.71	263	345	Vertical				

Final Data List



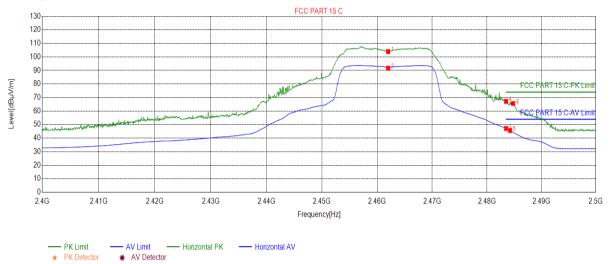


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802.11G Channel 11 4.10.1.5

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	103.95	8.25	0.00	-103.95	155	31	Horizontal			
2	2462.00	91.69	8.25	0.00	-91.69	167	46	Horizontal			
3	2483.50	47.14	8.48	54.00	6.86	199	186	Horizontal			
4	2483.50	67.17	8.48	74.00	6.83	184	345	Horizontal			
5	2484.24	45.64	8.49	54.00	8.36	167	354	Horizontal			
6	2484.79	65.56	8.49	74.00	8.44	155	264	Horizontal			

Final Data List



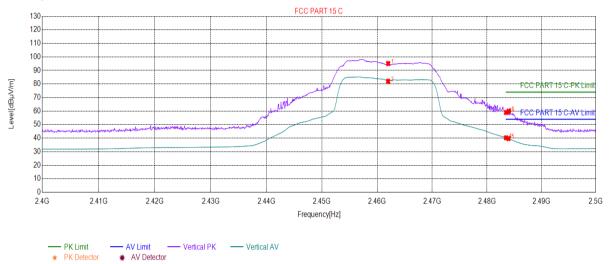


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802.11G Channel 11 4.10.1.6

Test Graph



Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	95.13	8.25	0.00	-95.13	264	35	Vertical			
2	2462.00	82.03	8.25	0.00	-82.03	209	167	Vertical			
3	2483.50	58.96	8.48	74.00	15.04	294	267	Vertical			
4	2483.50	40.28	8.48	54.00	13.72	154	332	Vertical			
5	2483.94	39.69	8.49	54.00	14.31	231	164	Vertical			
6	2483.99	59.91	8.49	74.00	14.09	221	262	Vertical			

Final Data List



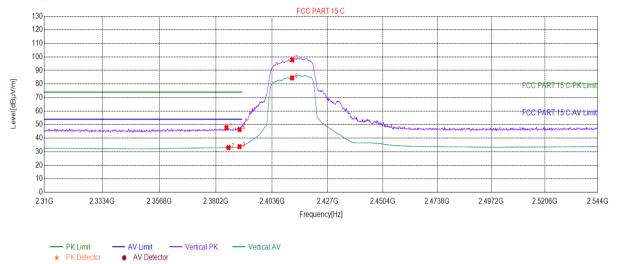


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802.11N20 Channel 1 4.10.1.7

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2384.56	47.76	9.46	74.00	26.24	156	35	Vertical			
2	2385.38	33.04	9.48	54.00	20.96	195	264	Vertical			
3	2390.00	33.76	9.60	54.00	20.24	177	301	Vertical			
4	2390.00	46.41	9.60	74.00	27.59	183	15	Vertical			
5	2412.00	97.84	9.85	0.00	-97.84	157	152	Vertical			
6	2412.00	84.51	9.85	0.00	-84.51	182	161	Vertical			

Final Data List



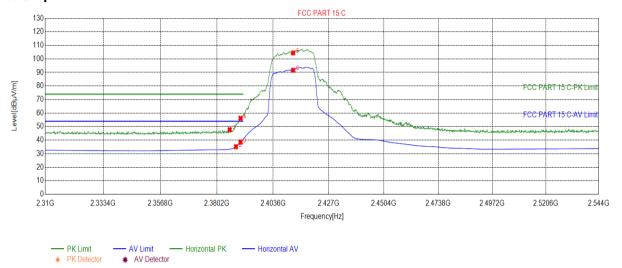


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802.11N20 Channel 1 4.10.1.8

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2385.50	47.78	9.48	74.00	26.22	201	250	Horizontal			
2	2388.07	35.14	9.55	54.00	18.86	233	123	Horizontal			
3	2390.00	38.51	9.60	54.00	15.49	291	110	Horizontal			
4	2390.00	56.12	9.60	74.00	17.88	283	12	Horizontal			
5	2412.00	104.42	9.85	0.00	-104.42	291	26	Horizontal			
6	2412.00	91.62	9.85	0.00	-91.62	205	301	Horizontal			

Final Data List



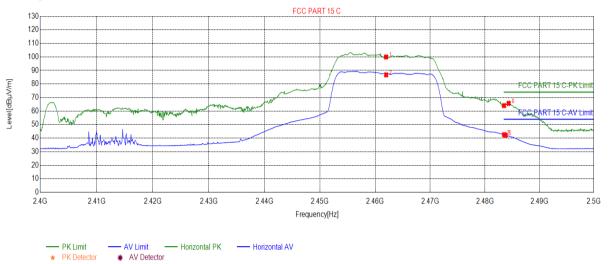


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802.11N20 Channel 11 4.10.1.9

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	99.94	8.25	0.00	-99.94	153	32	Horizontal			
2	2462.00	86.75	8.25	0.00	-86.75	162	16	Horizontal			
3	2483.50	42.57	8.48	54.00	11.43	182	260	Horizontal			
4	2483.50	64.04	8.48	74.00	9.96	194	189	Horizontal			
5	2483.79	42.22	8.48	54.00	11.78	265	351	Horizontal			
6	2484.34	65.71	8.49	74.00	8.29	173	326	Horizontal			

Final Data List



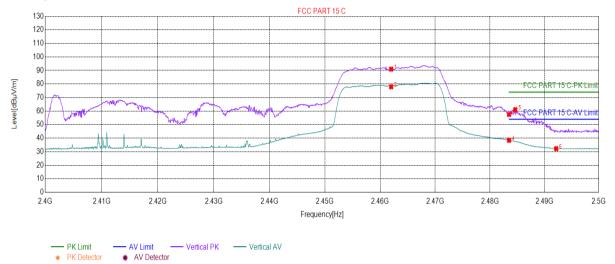


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802.11N20 Channel 11 4.10.1.10

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	90.97	8.25	0.00	-90.97	213	20	Vertical			
2	2462.00	77.92	8.25	0.00	-77.92	248	265	Vertical			
3	2483.50	57.55	8.48	74.00	16.45	266	231	Vertical			
4	2483.50	38.44	8.48	54.00	15.56	290	36	Vertical			
5	2484.64	61.07	8.49	74.00	12.93	205	321	Vertical			
6	2492.14	32.26	8.55	54.00	21.74	236	285	Vertical			

Final Data List



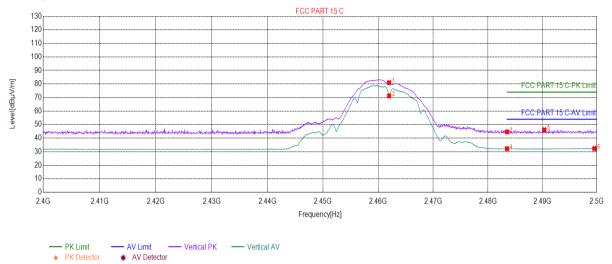


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802.11B Channel 11 4.10.1.11

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	80.97	8.25	0.00	-80.97	183	22	Vertical			
2	2462.00	71.23	8.25	0.00	-71.23	182	153	Vertical			
3	2483.50	44.65	8.48	74.00	29.35	173	29	Vertical			
4	2483.50	32.20	8.48	54.00	21.80	195	56	Vertical			
5	2490.34	46.13	8.51	74.00	27.87	166	342	Vertical			
6	2499.54	32.33	8.71	54.00	21.67	153	251	Vertical			

Final Data List



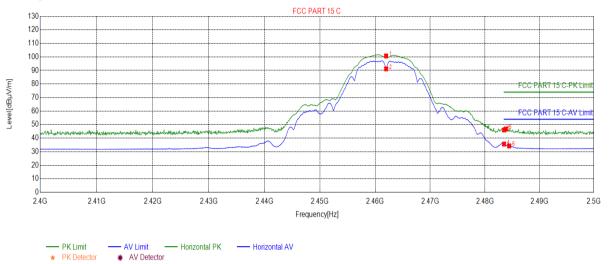


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802.11B Channel 11 4.10.1.12

Test Graph



Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2462.00	100.70	8.25	0.00	-100.70	162	163	Horizontal			
2	2462.00	91.20	8.25	0.00	-91.20	290	182	Horizontal			
3	2483.50	46.05	8.48	74.00	27.95	185	264	Horizontal			
4	2483.50	35.64	8.48	54.00	18.36	173	305	Horizontal			
5	2483.84	46.78	8.49	74.00	27.22	166	225	Horizontal			
6	2484.44	34.26	8.49	54.00	19.74	180	248	Horizontal			

Final Data List

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor All Modes have been tested, but only the worst case data displayed in this report.





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Measurement Uncertainty (95% confidence levels, k=2)

Lab A:

No.	Item	Measurement Uncertainty		
1	Total RF power, conducted	±0.41dB		
2	RF power density, conducted	±1.96dB		
3	Spurious emissions, conducted	±0.41dB		
4	Radio Frequency	±7.10 x 10 ⁻⁸		
5	Duty Cycle	±0.49%		
6	Occupied Bandwidth	±0.2%		

Lab B:

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
		± 4.8dB (Below 1GHz)
2	D # 4 15 1 1	± 4.8dB (1GHz to 6GHz)
	Radiated Emission	± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)





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Equipment List

		RF conducted			
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
Signal Analyzer	Rohde & Schwarz	FSV	W025-05	2020/4/16	2021/4/15
DC Power Supply	Rohde & Schwarz	HMP2020	W009-08	2020/7/15	2021/7/15
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020/7/14	2021/7/13
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	HTC-1	W006-17	2020/4/21	2021/4/20

	CE Test System									
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date					
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10					
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10					
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03					
5G UXM	Keysight	E7515B	XAW01-19-02	2020-09-11	2021-09-10					
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05					
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR					





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RSE Test System							
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date		
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10		
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2021-04-01	2022-03-31		
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10		
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12		
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12		
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12		
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR		
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR		
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR		
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR		
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2020-10-26	2021-10-25		
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25		
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26		
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25		
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10		
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05		
Measurement Software	Tonscend	TS+ RSE	XAW02-05-01	NCR	NCR		

V3.0.0.2



Measurement Software

Tonscend

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7 **Photographs - EUT Constructional Details**

Refer to Appendix A Setup Photos.





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Appendix A





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DTS Bandwidth Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2412	9.120	2407.440	2416.560	0.5	PASS
11B	Ant1	2437	9.150	2432.440	2441.590	0.5	PASS
		2462	9.120	2457.440	2466.560	0.5	PASS
		2412	16.410	2403.810	2420.220	0.5	PASS
11G	Ant1	2437	16.410	2428.810	2445.220	0.5	PASS
		2462	16.380	2453.810	2470.190	0.5	PASS
		2412	17.640	2403.180	2420.820	0.5	PASS
11N20SISO	Ant1	2437	17.640	2428.180	2445.820	0.5	PASS
		2462	17.640	2453.180	2470.820	0.5	PASS

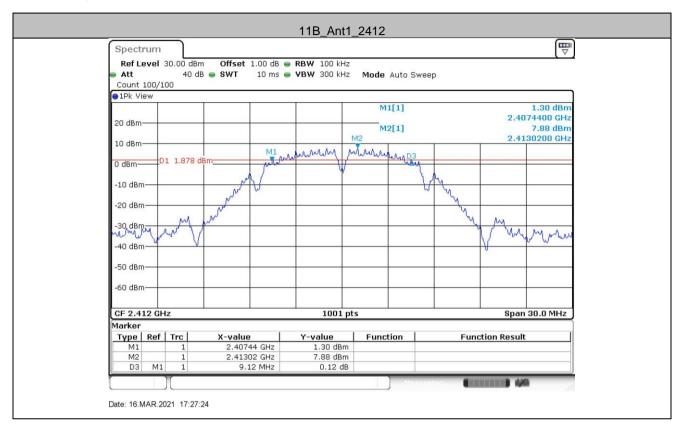




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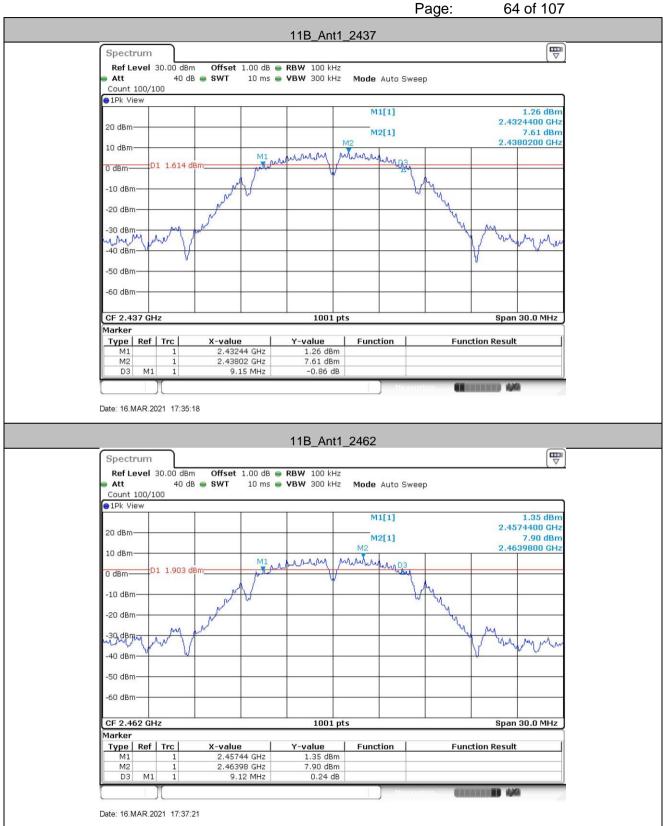
Test Graphs







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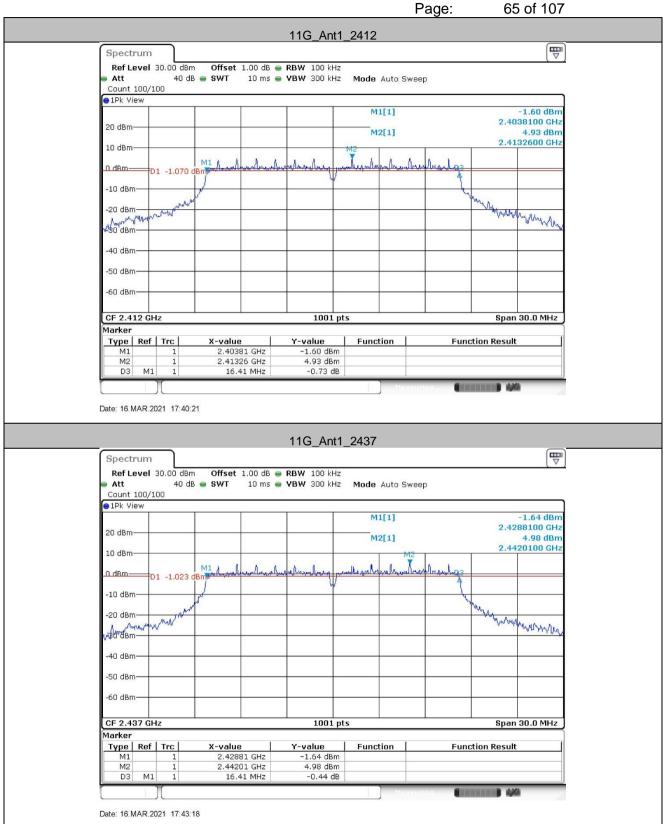
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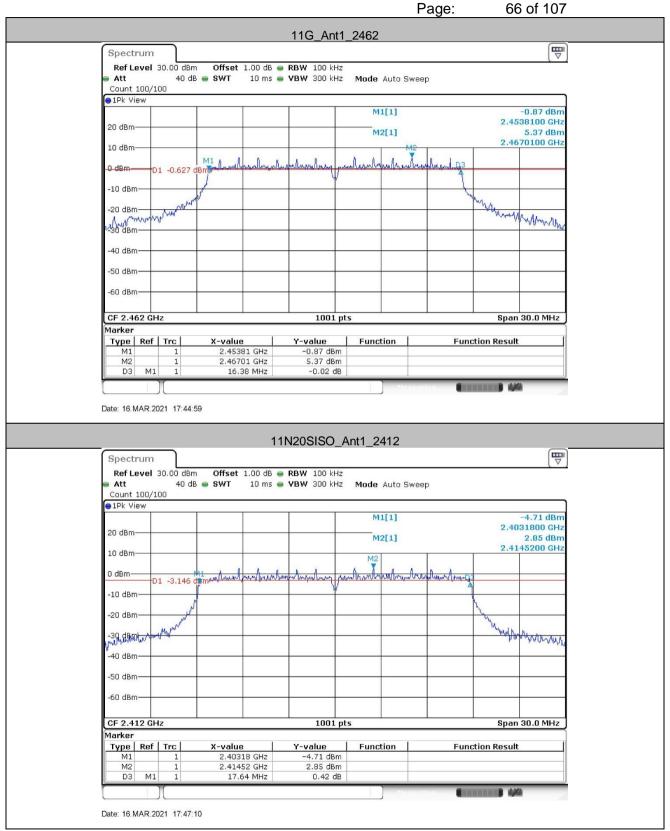
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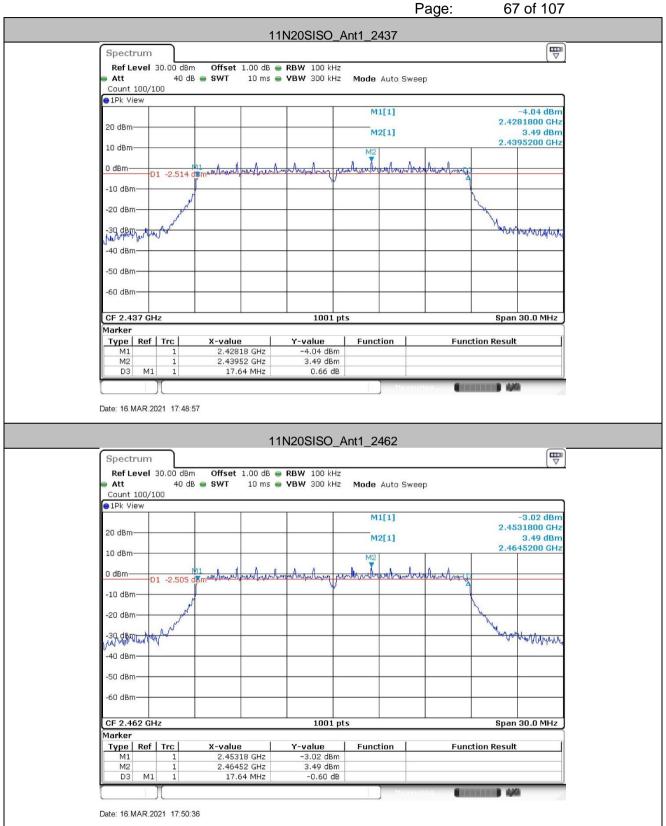
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Occupied Channel Bandwidth Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
		2412	12.168	2405.916	2418.084		PASS
11B	Ant1	2437	12.048	2431.006	2443.054		PASS
		2462	12.168	2455.916	2468.084		PASS
		2412	17.532	2403.279	2420.811		PASS
11G	Ant1	2437	17.383	2428.339	2445.721		PASS
		2462	17.413	2453.249	2470.661		PASS
		2412	18.012	2403.009	2421.021		PASS
11N20SISO	Ant1	2437	18.042	2428.009	2446.051		PASS
		2462	18.042	2452.979	2471.021		PASS



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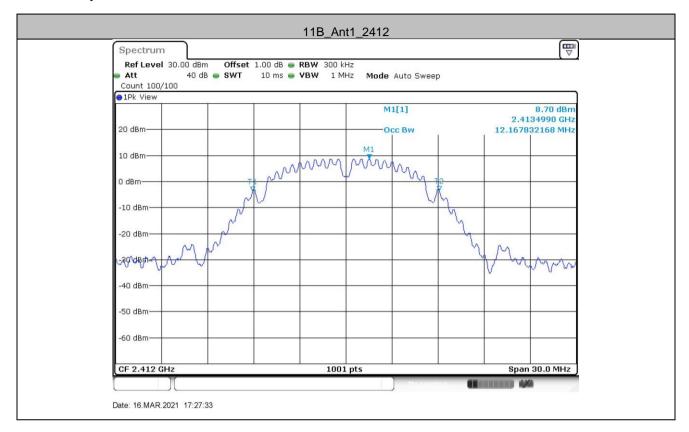
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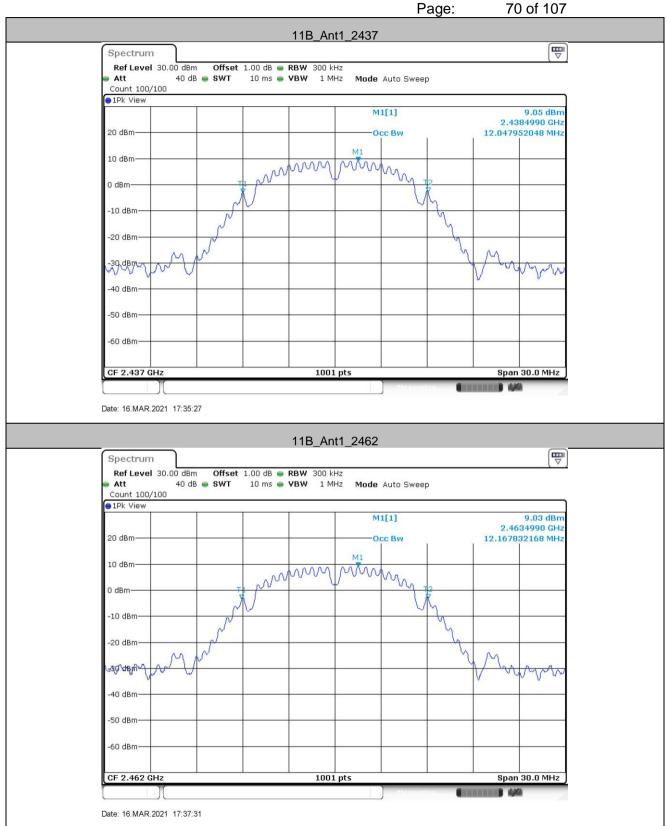
Test Graphs







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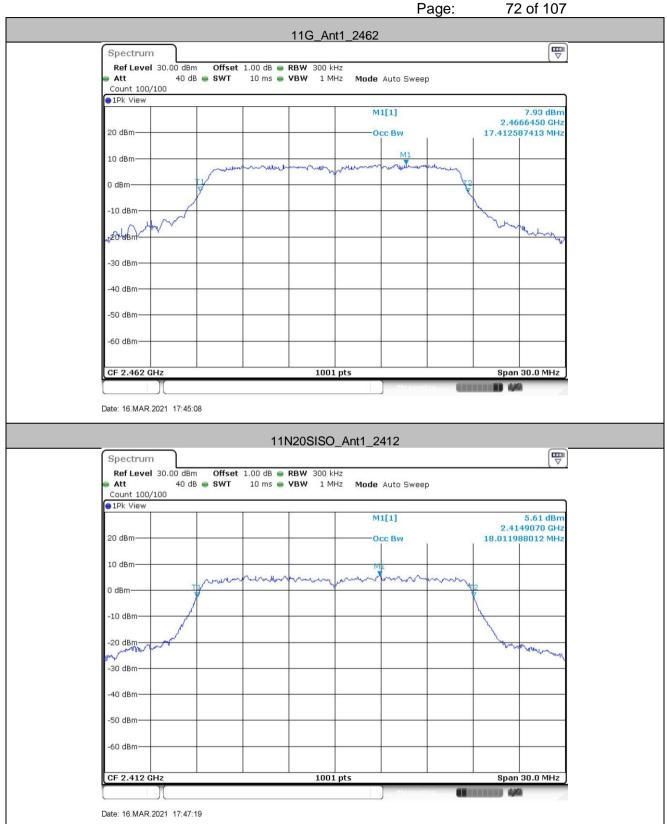
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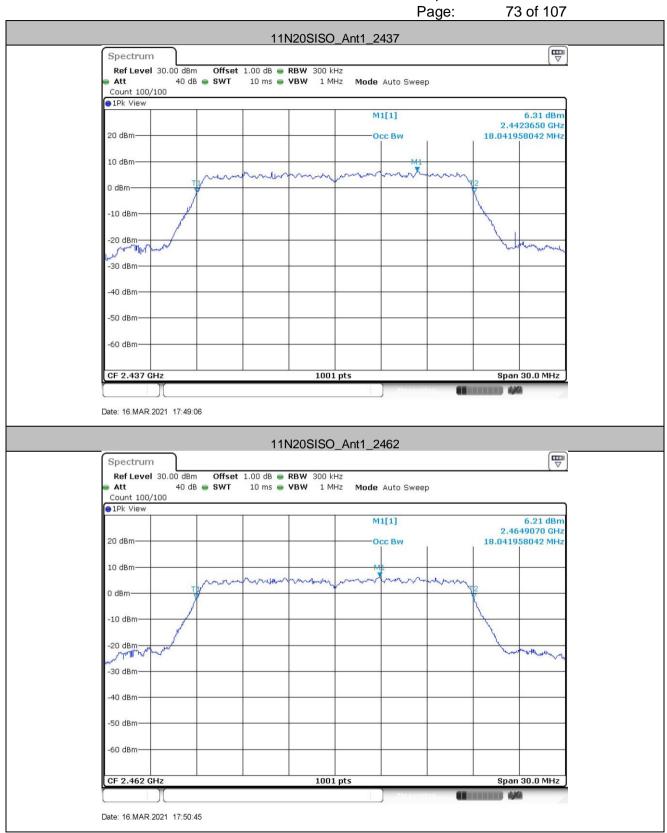
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Maximum conducted output power **Test Result**

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	19.92	<=30	PASS
		2437	20.24	<=30	PASS
		2462	20.23	<=30	PASS
11G	Ant1	2412	24.14	<=30	PASS
		2437	24.41	<=30	PASS
		2462	24.66	<=30	PASS
11N20SISO	Ant1	2412	22.45	<=30	PASS
		2437	22.98	<=30	PASS
		2462	22.90	<=30	PASS





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Maximum power spectral density Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-8.39	<=8	PASS
		2437	-7.16	<=8	PASS
		2462	-7.14	<=8	PASS
11G	Ant1	2412	-9.22	<=8	PASS
		2437	-9.12	<=8	PASS
		2462	-9.88	<=8	PASS
11N20SISO	Ant1	2412	-12.12	<=8	PASS
		2437	-11.09	<=8	PASS
		2462	-10.93	<=8	PASS



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