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# FCC TEST REPORT

Application No.:	ZR/2021/40016		
Applicant:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.		
Address of Applicant	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China		
Manufacturer:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.		
Address of Manufacturer	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China		
EUT Description:	Mobile Phone		
Model No.:	CPH2251		
Trade Mark:	OPPO		
FCC ID:	R9C-CPH2251		
Standards:	47 CFR FCC Part 2, Subpart J		
	47 CFR Part 15, Subpart C		
Date of Receipt:	2021/4/21		
Date of Test:	2021/4/21 to 2021/6/8		
Date of Issue:	2021/6/10		
Test Result :	PASS *		

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

Authorized Signature:

Derele yang

Derek Yang Wireless Laboratory Manager

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# 1 Version

		<b>Revision Record</b>		
Version	Chapter	Date	Modifier	Remark
01		2021-06-10		Original

Authorized for issue by:	
Prepared By	Dee.Zheng
	(Dee Zheng) / Engineer
Checked By	John Hong
	(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	А
Conducted Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.4	PASS	А
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.5	PASS	А
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.6	PASS	А
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	PASS	А
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.8	PASS	А
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. Shenzhen Branch

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



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# **3** General Information

# 3.1 Details of Client

Applicant:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Applicant	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China
Manufacturer:	Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Manufacturer	NO.18 Haibin Road, Wusha Village, Chang'an Town, Dongguan City, Guangdong, China

# 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 Park, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Dee Zheng,Swing Hu,Habit Zeng

#### Lab B:

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



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# SGS

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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:	Mobile Phone
Model No.:	CPH2251
Trade Mark:	OPPO
Hardware Version:	11
Software Version:	ColorOS V11.3
IEEE 802.11 WLAN Mode Supported	<ul> <li>☑ 802.11B (20 MHz channel bandwidth),</li> <li>☑ 802.11G (20 MHz channel bandwidth)</li> <li>☑ 802.11N/AC/AX (20 MHz channel bandwidth),</li> <li>☑ 802.11N/AC/AX (40 MHz channel bandwidth)</li> </ul>
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)/AC(VHT20)/AX(VHE20) : OFDM/OFDMA IEEE for 802.11N(HT40)/AC(VHT40)/AX(VHE40) : OFDM/OFDMA
Sample Type:	⊠ Portable Device, □Module
Antenna Type:	External, 🛛 Integrated
Antenna Ports	🖂 Ant 2, 🖂 Ant 7
Smart System	<ul> <li>☑ SISO (for 802.11B/G/N/AC/AX),</li> <li>☑ MIMO (for 802.11B/G/N/AC/AX): 2 Tx &amp; 2 Rx,</li> <li>☑ Diversity (for 802.11B/G): Tx &amp; Rx</li> </ul>
Antenna Gain:	-5dBi(ANT2); -3.5dBi(ANT7);

(	Operation Frequency of each channel (802.11B/G/N HT20 AC VHT20 AX VHE20)						
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 of each channel (802.11N HT40 AC VHT40 AX VHE40)						
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422MHz	6	2437MHz	9	2452MHz		
4	2427MHz	7	2442MHz				
5	2432MHz	8	2447MHz				



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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)/AC(VHT20)/AX(VHE20)	Frequency for 802.11N (HT40)/AC(VHT40)/AX(VHE40)
The Lowest channel	2412MHz	2422MHz
The Middle channel	2437MHz	2437MHz
The Highest channel	2462MHz	2452MHz

# 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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# 4 Test results and Measurement Data

### 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-5dBi(ANT2); -3.5dBi(ANT7).



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# 4.2 AC Power Line Conducted Emissions

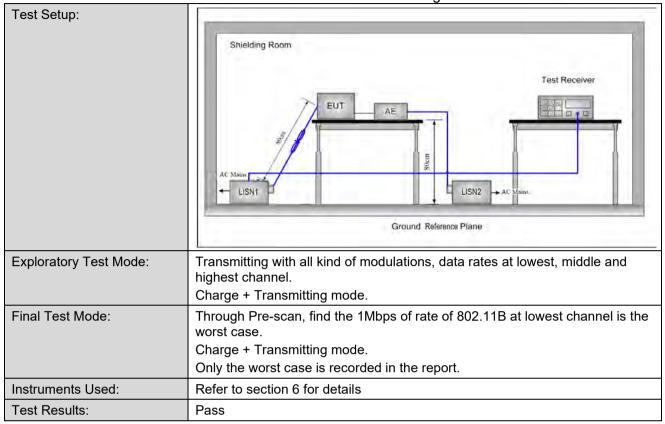
Test Requirement:	47 CFR Part 15C Section 15.207			
Test Method:	ANSI C63.10: 2013			
Test Frequency Range:	150kHz to 30MHz			
Limit:	Ereguenov rongo (MHz)	Limit (d	BuV)	
	Frequency range (MHz)	Quasi-peak	Average	
	0.15-0.5	66 to 56*	56 to 46*	
	0.5-5	56	46	
	5-30	60	50	
	* Decreases with the log	arithm of the frequency.		
Test Procedure:	room. 2) The EUT was connect Impedance Stabilization impedance. The power of a second LISN 2, which plane in the same way a multiple socket outlet str single LISN provided the 3) The tabletop EUT was ground reference plane. placed on the horizontal 4) The test was perform of the EUT shall be 0.4 r vertical ground reference 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 maxin equipment and all of the	isturbance voltage test was concerned to AC power source throw Network) which provides a 50 cables of all other units of the was bonded to the ground reference and the LISN 1 for the unit being ip was used to connect multiple arating of the LISN was not ex- us placed upon a non-metallic And for floor-standing arranger ground reference plane, ned with a vertical ground reference plane for the vertical ground reference plane be plane was bonded to the hole SN 1 was placed 0.8 m from the led to a ground reference plane round reference plane. This dia to f the LISN 1 and the EUT equipment was at least 0.8 m mum emission, the relative po interface cables must be cha conducted measurement.	ugh a LISN 1 (Line $\Omega\Omega/50\mu$ H + 5Ω linear EUT were connected to rerence g measured. A ble power cables to a acceeded. table 0.8m above the ement, the EUT was rence plane. The rear erence plane. The rear erence plane. The rizontal ground he boundary of the he for LISNs istance was All other units of h from the LISN 2. sitions of	



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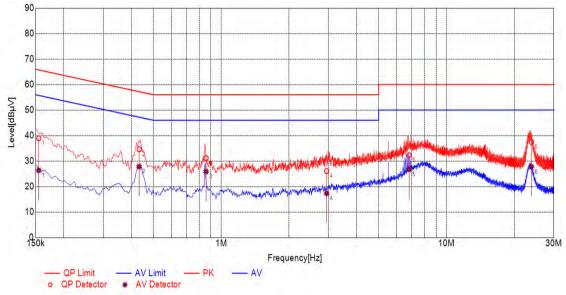


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#### Measurement Data

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	0.1550	10.10	38.94	65.73	26.79	26.33	55.73	29.40
2	0.4325	10.10	34.63	57.20	22.57	27.85	47.20	19.35
3	0.8570	10.10	31.16	56.00	24.84	25.88	46.00	20.12
4	2.9397	10.10	26.10	56.00	29.90	17.35	46.00	28.65
5	6.8205	10.10	32.30	60.00	27.70	26.73	50.00	23.27
6	23.8503	10.11	37.43	60.00	22.57	27.75	50.00	22.25



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Report No.: ZR/2021/4001604 Page: 13 of 146 Neutral Line: 90 80 70 60 Level[dBµV] 50 40 þ 30 20 10 150k 1M 10M 30M Frequency[Hz] QP Limit AV Limit PK AV o QP Detector AV Detector

#### 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	0.1660	10.10	37.50	65.16	27.66	25.38	55.16	29.78
2	0.4348	10.10	37.15	57.16	20.01	32.29	47.16	14.87
3	0.8526	10.10	29.56	56.00	26.44	23.30	46.00	22.70
4	3.0702	10.10	25.35	56.00	30.65	17.43	46.00	28.57
5	12.6005	10.11	33.66	60.00	26.34	29.10	50.00	20.90
6	23.8370	10.11	37.53	60.00	22.47	27.94	50.00	22.06

#### 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

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)		
Test Method:	ANSI C63.10 :2013 Section 11.9.1.3		
Test Setup:	POWER METER E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	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)/AC(VHT20)/AX(VHE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40).		
Limit:	30dBm		
Test Results:	Pass		

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)/AC(VHT20)/AX(VHE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40).		
Limit:	≥ 500 kHz		
Test Results:	Pass		

The detailed test data see: Appendix



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### 4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)		
Test Method:	ANSI C63.10 :2013 Section 11.10.2		
Test Setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	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)/AC(VHT20)/AX(VHE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40).		
Limit:	≤8.00dBm/3kHz		
Test Results:	Pass		

The detailed test data see: Appendix



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# 4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)		
Test Method:	ANSI C63.10: 2013 Section 11.13		
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)/AC(VHT20)/AX(VHE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40).		
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.		
Test Results:	Pass		

The detailed test data see: Appendix



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### 4.8 **RF Conducted Spurious Emissions**

Test Requirement:	47 CFR Part 15C Section 15.247 (d)		
Test Method:	ANSI C63.10: 2013 Section 11.11		
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)/AX(HE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/AX(HE40).		
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.		
Test Results:	Pass		

The detailed test data see: Appendix



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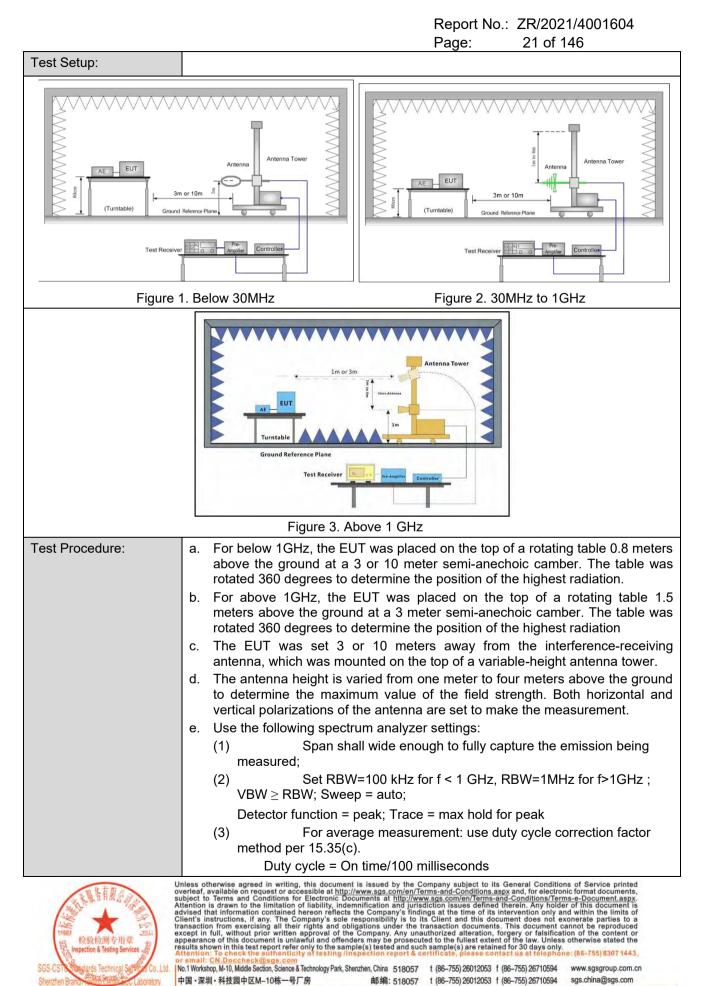
# 4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205						
Test Method:	ANSI C63.10 :2013 Section 11.12						
Test Site:	Measurement Distance:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)					
Receiver Setup:	Frequency Detector RBW VBW Re				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 frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.						



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	<ul> <li>On time = N 1 *L 1 +N 2 *L 2 ++N n-1 *LN n-1 +N n *L n</li> <li>Where N 1 is number of type 1 pulses, L 1 is length of type 1 pulses, etc.</li> <li>Average Emission Level = Peak Emission Level + 20*log(Duty cycle)</li> <li>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.</li> <li>g. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> <li>i. Test the EUT in the lowest channel, the middle channel ,the Highest channel.</li> <li>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.</li> <li>k. Repeat above procedures until all frequencies measured was complete.</li> </ul>	
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)/AC(VHT20)/AX(VHE20); 13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40). 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	

The detailed test data see: Appendix

Pass

Test Results:



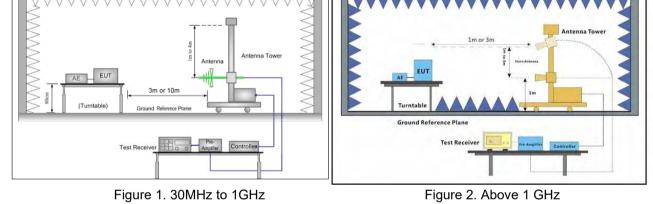
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### 4.10Restricted bands around fundamental frequency

Test Requirement:	st Requirement: 47 CFR Part 15C Section 15.209 and 15.205					
Test Requirement.						
Test Method:	ANSI C63.10: 2013 Section	ANSI C63.10: 2013 Section 11.12				
Test Site:	Measurement Distance: 3m	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)				
Limit:	Frequency	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 1GHz	54.0	Average Value			
	Above IGHZ	74.0	Peak Value			
Test Setup:	Test Setup:					





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Test Procedure:	<ul> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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 maximum reading.</li> <li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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</li> <li>h. Test the EUT in the lowest channel , the Highest channel</li> <li>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.</li> <li>j. Repeat above procedures until all frequencies measured was complete.</li> </ul>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	
Final Test Wode:	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)/AC(VHT20)/AX(VHE20);
	13.5Mbps of rate is the worst case of 802.11N(HT40)/ AC(VHT40)/AX(VHE40).
	Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass

The detailed test data see: Appendix



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# 5 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 <sup>-8</sup>
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	Radiated Emission	± 4.8dB (1GHz to 6GHz)		
2		± 4.5dB (6GHz to 18GHz)		
		± 5.02dB (Above 18GHz)		



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# 6 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	2021/4/14	2022/4/13
DC Power Supply	DC Power Supply Rohde & Schwarz		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	2021/4/14	2022/4/13

	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					
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					
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05					
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR					



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# 7 Photographs - EUT Constructional Details

Refer to Appendix A Setup Photos.



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# Appendix



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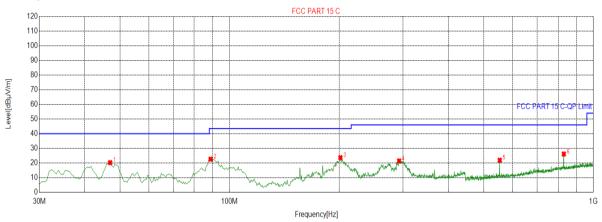


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### **Radiated Spurious Emissions**

#### Radiated emission below 1GHz

#### Charge + Transmitting Test Graph



QP Detector

### Suspected List

Suspe	ected List				_			
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.9835	20.23	-21.39	40.00	19.77	252	229	Horizontal
2	88.7144	22.61	-24.85	43.50	20.89	174	271	Horizontal
3	201.775	23.67	-22.38	43.50	19.83	195	218	Horizontal
4	292.516	21.42	-19.46	46.00	24.58	175	54	Horizontal
5	553.091	21.91	-13.03	46.00	24.09	162	279	Horizontal
6	829.679	26.15	-8.70	46.00	19.85	145	286	Horizontal
	- 4 - 1 1 - 4							

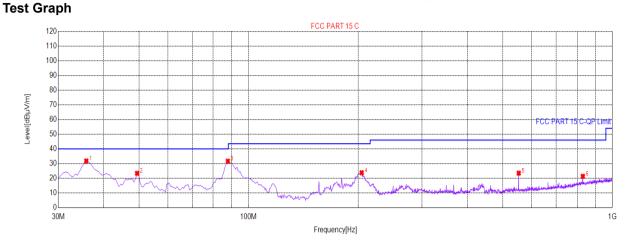
Final Data List



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#### QP Detector

Sus	spe	ec	ted	L	.is	st	
0			- 4 -			• •	4

Suspe	Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	35.8229	31.78	-23.68	40.00	8.22	252	353	Vertical	
2	49.4097	23.37	-21.37	40.00	16.63	174	353	Vertical	
3	87.7439	31.66	-25.12	40.00	8.34	165	76	Vertical	
4	204.687	23.76	-22.16	43.50	19.74	184	222	Vertical	
5	553.091	23.51	-13.03	46.00	22.49	164	46	Vertical	
6	829.679	21.36	-8.70	46.00	24.64	184	7	Vertical	

**Final Data List** 



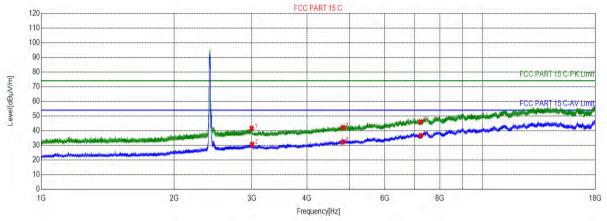
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#### Transmitter emission above 1GHz

#### 802.11B\_Channel 1 MIMO Test Graph



PK Detector
 \* AV Detector

#### Suspected List Suspected List Freq. Level Factor Limit Margin Height Angle NO. Polarity [MHz] [dBµV/m] [dB] [dBµV/m] [dB] [cm] [°] 2996.89 41.49 10.71 32.51 187 1 74.00 159 Horizontal 3003.00 2 30.69 -21.18 54.00 23.31 198 172 Horizontal 4824.00 3 42.16 -15.31 74.00 31.84 165 201 Horizontal 4824.00 4 32.23 -15.31 54.00 21.77 177 289 Horizontal 7236.00 5 36.73 -8.82 54.00 17.27 182 100 Horizontal 7236.00 46.09 -8.82 74.00 194 318 6 27.91 Horizontal

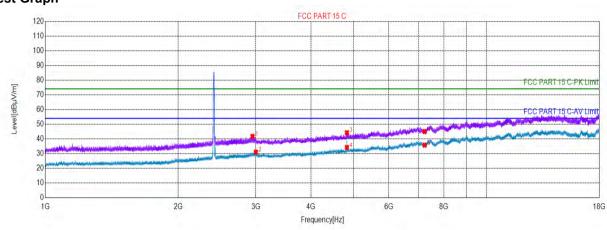
**Final Data List** 



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#### 802.11B \_Channel 1 MIMO Test Graph

PK Detector
 \* AV Detector

#### Suspected List

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2948.09	41.75	10.55	74.00	32.25	188	45	Vertical		
2	2999.80	30.98	10.80	54.00	23.02	174	7	Vertical		
3	4824.00	44.20	-15.31	74.00	29.80	169	79	Vertical		
4	4824.00	34.16	-15.31	54.00	19.84	158	51	Vertical		
5	7236.00	35.77	-8.82	54.00	18.23	192	51	Vertical		
6	7236.00	45.00	-8.82	74.00	29.00	210	299	Vertical		

**Final Data List** 



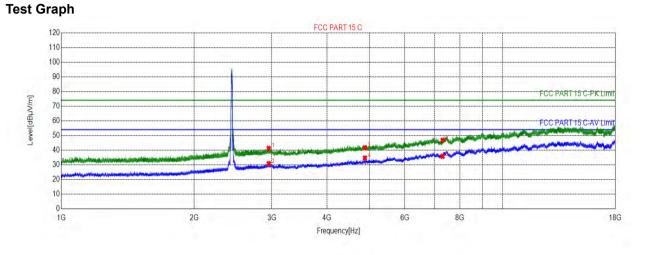
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#### 802.11B \_Channel 6 MIMO



#### PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2951.69	41.23	10.56	74.00	32.77	174	350	Horizontal		
2	2952.69	30.86	10.55	54.00	23.14	158	262	Horizontal		
3	4874.00	41.72	-15.09	74.00	32.28	169	42	Horizontal		
4	4874.00	34.65	-15.09	54.00	19.35	177	42	Horizontal		
5	7311.00	35.80	-8.93	54.00	18.20	185	127	Horizontal		
6	7311.00	46.73	-8.93	74.00	27.27	150	127	Horizontal		

**Final Data List** 

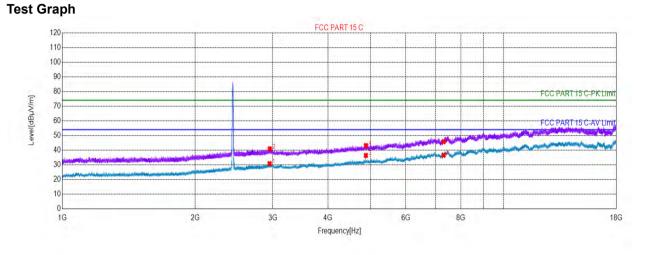


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#### 802.11B \_Channel 6 MIMO



PK Detector
 \* AV Detector

#### Suspected List

Suspe	Suspected List									
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	2949.19	30.79	10.56	54.00	23.21	215	249	Vertical		
2	2952.79	40.85	10.55	74.00	33.15	198	96	Vertical		
3	4874.00	36.39	-15.09	54.00	17.61	201	70	Vertical		
4	4874.00	43.12	-15.09	74.00	30.88	157	2	Vertical		
5	7311.00	45.82	-8.93	74.00	28.18	168	217	Vertical		
6	7311.00	36.60	-8.93	54.00	17.40	194	70	Vertical		

**Final Data List** 

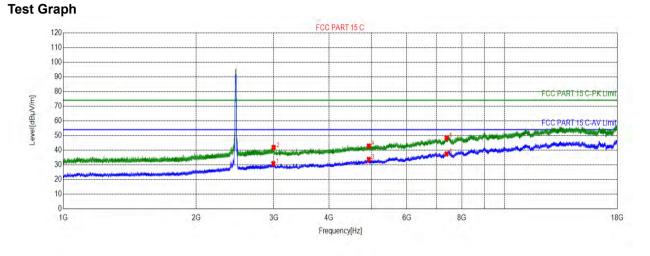


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#### 802.11B \_Channel 11 MIMO



PK Detector
 AV Detector

#### Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2991.59	30.86	10.54	54.00	23.14	187	109	Horizontal
2	2996.99	41.81	10.71	74.00	32.19	196	70	Horizontal
3	4924.00	33.71	-14.74	54.00	20.29	158	41	Horizontal
4	4924.00	42.87	-14.74	74.00	31.13	164	303	Horizontal
5	7386.00	48.38	-7.78	74.00	25.62	193	230	Horizontal
6	7386.00	37.41	-7.78	54.00	16.59	151	318	Horizontal

**Final Data List** 

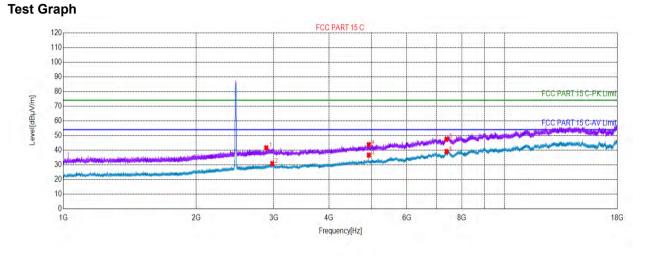


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## 802.11B \_Channel 11 MIMO



PK Detector
 AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2883.79	41.62	9.91	74.00	32.38	213	235	Vertical			
2	2974.69	30.90	10.43	54.00	23.10	223	222	Vertical			
3	4924.00	36.63	-14.74	54.00	17.37	236	71	Vertical			
4	4924.00	43.78	-14.74	74.00	30.22	254	71	Vertical			
5	7386.00	47.60	-7.78	74.00	26.40	175	158	Vertical			
6	7386.00	39.11	-7.78	54.00	14.89	198	71	Vertical			

**Final Data List** 

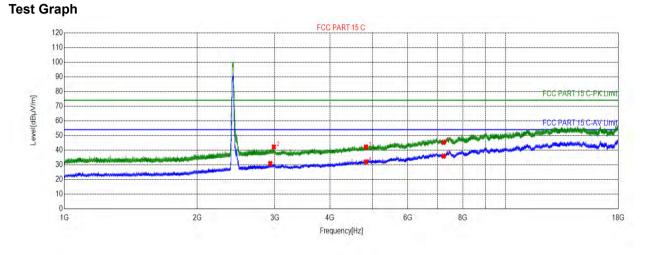


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## 802.11G\_Channel 1 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2928.89	30.89	10.53	54.00	23.11	175	358	Horizontal			
2	2983.99	42.20	10.52	74.00	31.80	152	325	Horizontal			
3	4824.00	42.18	-15.31	74.00	31.82	163	332	Horizontal			
4	4824.00	32.02	-15.31	54.00	21.98	158	230	Horizontal			
5	7236.00	36.00	-8.82	54.00	18.00	169	100	Horizontal			
6	7236.00	45.42	-8.82	74.00	28.58	213	70	Horizontal			

**Final Data List** 

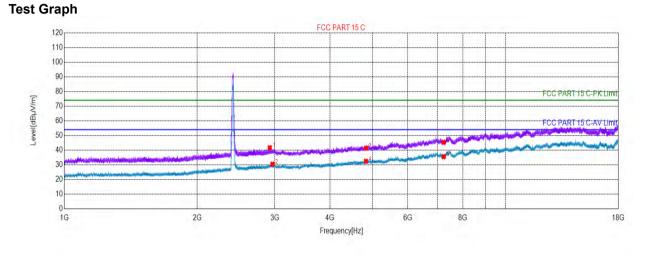


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Report No.: ZR/2021/4001604 Page: 39 of 146

## 802.11G \_Channel 1 MIMO



### PK Detector AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2921.99	41.67	10.42	74.00	32.33	215	33	Vertical			
2	2961.79	30.43	10.48	54.00	23.57	198	337	Vertical			
3	4824.00	41.35	-15.31	74.00	32.65	175	245	Vertical			
4	4824.00	32.44	-15.31	54.00	21.56	167	304	Vertical			
5	7236.00	35.55	-8.82	54.00	18.45	184	333	Vertical			
6	7236.00	45.37	-8.82	74.00	28.63	152	245	Vertical			

**Final Data List** 

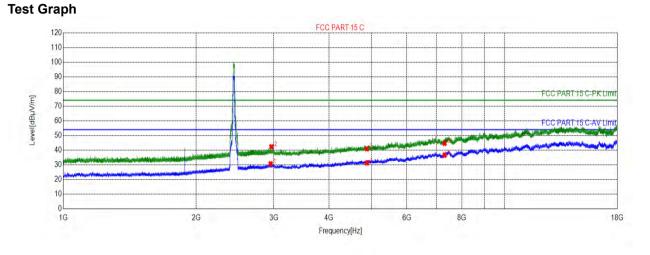


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## 802.11G \_Channel 6 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2949.19	30.75	10.56	54.00	23.25	198	224	Horizontal			
2	2961.49	42.33	10.49	74.00	31.67	214	110	Horizontal			
3	4874.00	40.87	-15.09	74.00	33.13	254	101	Horizontal			
4	4874.00	31.27	-15.09	54.00	22.73	169	359	Horizontal			
5	7311.00	36.56	-8.93	54.00	17.44	174	101	Horizontal			
6	7311.00	44.62	-8.93	74.00	29.38	185	71	Horizontal			

**Final Data List** 

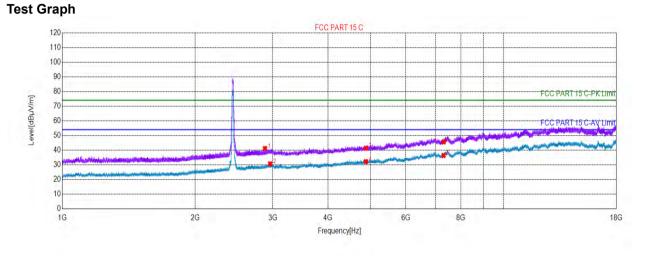


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## 802.11G \_Channel 6 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2879.29	41.13	9.90	74.00	32.87	178	120	Vertical			
2	2957.79	30.65	10.53	54.00	23.35	196	358	Vertical			
3	4874.00	41.31	-15.09	74.00	32.69	154	231	Vertical			
4	4874.00	32.13	-15.09	54.00	21.87	182	70	Vertical			
5	7311.00	36.40	-8.93	54.00	17.60	199	318	Vertical			
6	7311.00	45.64	-8.93	74.00	28.36	236	231	Vertical			

**Final Data List** 

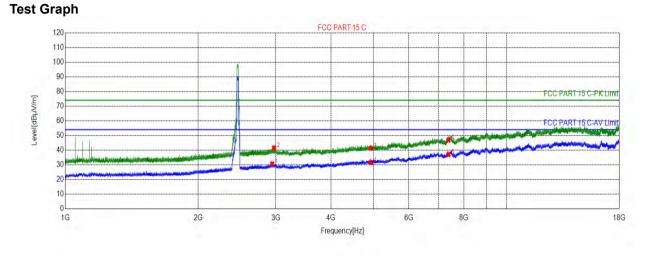


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## 802.11G \_Channel 11 MIMO



PK Detector
 \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2942.49	30.66	10.52	54.00	23.34	156	239	Horizontal			
2	2971.29	41.54	10.36	74.00	32.46	241	350	Horizontal			
3	4924.00	41.32	-14.74	74.00	32.68	158	12	Horizontal			
4	4924.00	31.60	-14.74	54.00	22.40	175	199	Horizontal			
5	7386.00	37.04	-7.78	54.00	16.96	196	214	Horizontal			
6	7386.00	46.90	-7.78	74.00	27.10	182	108	Horizontal			

**Final Data List** 

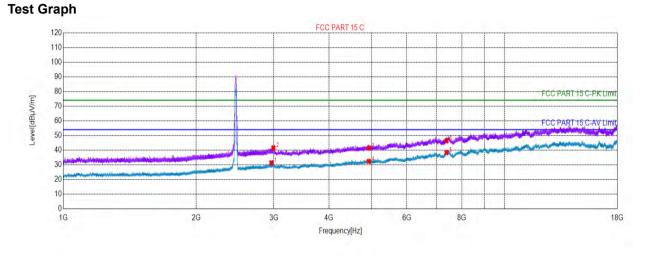


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## 802.11G \_Channel 11 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List											
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity				
1	2962.29	31.40	10.47	54.00	22.60	187	307	Vertical				
2	2992.19	41.56	10.56	74.00	32.44	157	295	Vertical				
3	4924.00	41.47	-14.74	74.00	32.53	168	248	Vertical				
4	4924.00	32.36	-14.74	54.00	21.64	159	56	Vertical				
5	7386.00	38.33	-7.78	54.00	15.67	181	129	Vertical				
6	7386.00	46.36	-7.78	74.00	27.64	179	333	Vertical				

Final Data List

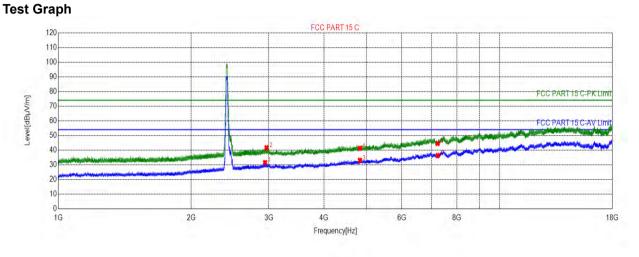


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## 802.11N20\_Channel 1 MIMO



PK Detector
 AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2941.49	31.58	10.51	54.00	22.42	175	109	Horizontal			
2	2963.49	41.62	10.45	74.00	32.38	164	312	Horizontal			
3	4824.00	33.12	-15.31	54.00	20.88	158	41	Horizontal			
4	4824.00	41.25	-15.31	74.00	32.75	192	246	Horizontal			
5	7236.00	44.55	-8.82	74.00	29.45	178	56	Horizontal			
6	7236.00	36.39	-8.82	54.00	17.61	156	246	Horizontal			

**Final Data List** 

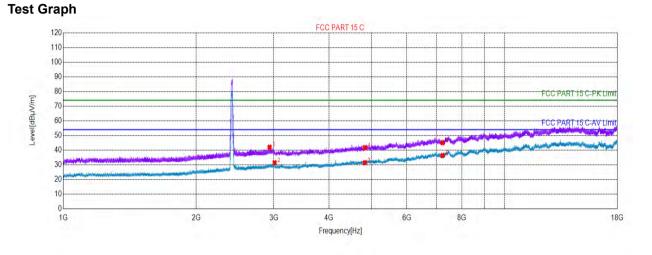


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## 802.11N20\_Channel 1 MIMO



PK Detector
 \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2934.19	41.98	10.53	74.00	32.02	188	300	Vertical			
2	3012.00	31.44	-21.16	54.00	22.56	155	303	Vertical			
3	4824.00	31.44	-15.31	54.00	22.56	165	113	Vertical			
4	4824.00	41.75	-15.31	74.00	32.25	174	56	Vertical			
5	7236.00	45.05	-8.82	74.00	28.95	256	56	Vertical			
6	7236.00	36.39	-8.82	54.00	17.61	198	26	Vertical			

**Final Data List** 



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18G

#### **Test Graph** FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LIM Level[dBµV/m] 70 60 FCC PART 15 C-AV Lim 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G Frequency[Hz]

## 802.11N20\_Channel 6 MIMO



#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2937.49	30.77	10.52	54.00	23.23	187	311	Horizontal			
2	2965.29	41.37	10.42	74.00	32.63	175	336	Horizontal			
3	4874.00	31.58	-15.09	54.00	22.42	165	26	Horizontal			
4	4874.00	41.68	-15.09	74.00	32.32	194	99	Horizontal			
5	7311.00	46.45	-8.93	74.00	27.55	158	202	Horizontal			
6	7311.00	36.34	-8.93	54.00	17.66	147	12	Horizontal			

**Final Data List** 

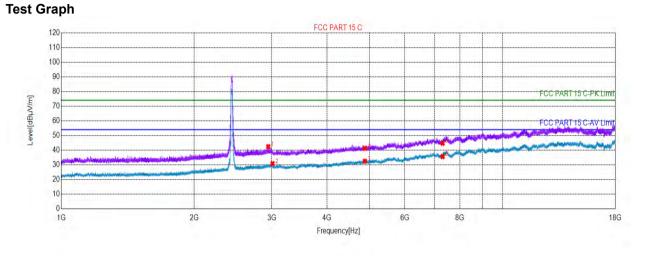


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## 802.11N20\_Channel 6 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2944.29	42.36	10.53	74.00	31.64	187	152	Vertical			
2	3010.20	30.81	-21.16	54.00	23.19	175	157	Vertical			
3	4874.00	32.44	-15.09	54.00	21.56	162	85	Vertical			
4	4874.00	41.28	-15.09	74.00	32.72	195	41	Vertical			
5	7311.00	44.72	-8.93	74.00	29.28	169	55	Vertical			
6	7311.00	35.63	-8.93	54.00	18.37	158	142	Vertical			

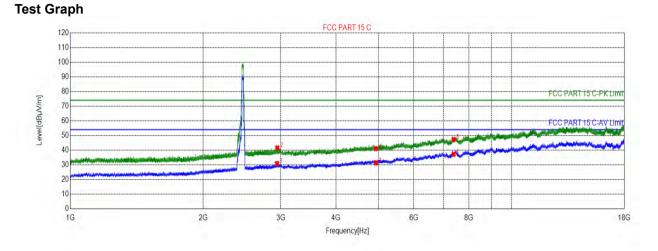
**Final Data List** 



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### 802.11N20\_Channel 11 MIMO

PK Detector
 \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2941.19	30.88	10.51	54.00	23.12	178	236	Horizontal			
2	2944.89	41.58	10.53	74.00	32.42	195	210	Horizontal			
3	4924.00	31.29	-14.74	54.00	22.71	159	70	Horizontal			
4	4924.00	41.03	-14.74	74.00	32.97	167	246	Horizontal			
5	7386.00	47.28	-7.78	74.00	26.72	188	332	Horizontal			
6	7386.00	37.16	-7.78	54.00	16.84	154	275	Horizontal			

**Final Data List** 

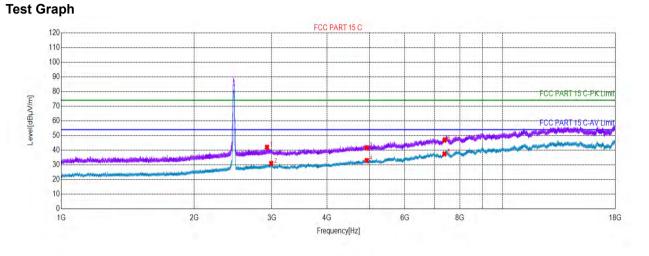


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## 802.11N20\_Channel 11 MIMO



### PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2924.79	41.97	10.46	74.00	32.03	178	135	Vertical			
2	2989.89	30.98	10.49	54.00	23.02	214	45	Vertical			
3	4924.00	41.58	-14.74	74.00	32.42	156	188	Vertical			
4	4924.00	32.98	-14.74	54.00	21.02	195	2	Vertical			
5	7386.00	37.46	-7.78	54.00	16.54	177	2	Vertical			
6	7386.00	46.83	-7.78	74.00	27.17	155	203	Vertical			

**Final Data List** 

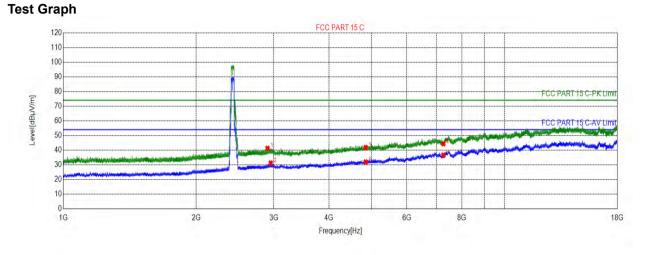


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## 802.11N40\_Channel 3 MIMO



### PK Detector \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2902.49	41.26	10.18	74.00	32.74	215	45	Horizontal			
2	2951.79	31.23	10.56	54.00	22.77	208	7	Horizontal			
3	4844.00	41.79	-15.21	74.00	32.21	150	172	Horizontal			
4	4844.00	31.93	-15.21	54.00	22.07	178	114	Horizontal			
5	7266.00	36.59	-9.04	54.00	17.41	195	303	Horizontal			
6	7266.00	44.35	-9.04	74.00	29.65	166	215	Horizontal			

**Final Data List** 



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FCC PART 15 C-PK LIM

FCC PART 15 C-AV Limi

18G

#### FCC PART 15 C 120 110 100 90 80 Level[dBµV/m] 70 60 50 40 30

3G

## 802.11N40\_Channel 3 MIMO





6G

8G

PK Detector \* AV Detector

2G

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2989.69	40.76	10.49	74.00	33.24	150	110	Vertical			
2	2998.29	30.63	10.76	54.00	23.37	177	21	Vertical			
3	4844.00	32.56	-15.21	54.00	21.44	148	12	Vertical			
4	4844.00	41.81	-15.21	74.00	32.19	198	186	Vertical			
5	7266.00	44.74	-9.04	74.00	29.26	156	260	Vertical			
6	7266.00	35.35	-9.04	54.00	18.65	159	158	Vertical			

Final Data List



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18G

#### **Test Graph** FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LIM Level[dBµV/m] 70 60 FCC PART 15 C-AV Lim 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G Frequency[Hz]

## 802.11N40\_Channel 6 MIMO



### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2938.79	30.74	10.51	54.00	23.26	178	72	Horizontal			
2	2988.29	41.76	10.50	74.00	32.24	195	84	Horizontal			
3	4874.00	40.78	-15.09	74.00	33.22	165	115	Horizontal			
4	4874.00	32.19	-15.09	54.00	21.81	174	202	Horizontal			
5	7311.00	35.72	-8.93	54.00	18.28	159	320	Horizontal			
6	7311.00	45.62	-8.93	74.00	28.38	188	85	Horizontal			

**Final Data List** 



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18G

#### **Test Graph** FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LIM Level[dBµV/m] 70 60 FCC PART 15 C-AV Lim 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G Frequency[Hz]

## 802.11N40\_Channel 6 MIMO



### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2925.39	41.27	10.47	74.00	32.73	215	358	Vertical			
2	2932.19	30.94	10.54	54.00	23.06	224	160	Vertical			
3	4874.00	42.17	-15.09	74.00	31.83	236	268	Vertical			
4	4874.00	31.49	-15.09	54.00	22.51	208	33	Vertical			
5	7311.00	36.57	-8.93	54.00	17.43	214	166	Vertical			
6	7311.00	45.41	-8.93	74.00	28.59	178	284	Vertical			

**Final Data List** 

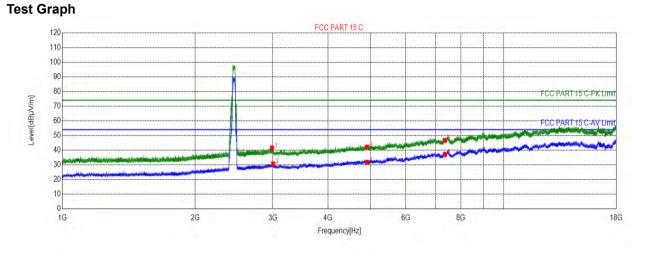


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## 802.11N40\_Channel 9 MIMO



### PK Detector \* AV Detector

### 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	41.51	10.51	74.00	32.49	205	196	Horizontal			
2	3004.20	30.62	-21.18	54.00	23.38	218	41	Horizontal			
3	4904.00	42.14	-14.95	74.00	31.86	224	252	Horizontal			
4	4904.00	31.70	-14.95	54.00	22.30	275	326	Horizontal			
5	7356.00	36.88	-7.68	54.00	17.12	268	237	Horizontal			
6	7356.00	46.59	-7.68	74.00	27.41	231	77	Horizontal			

**Final Data List** 

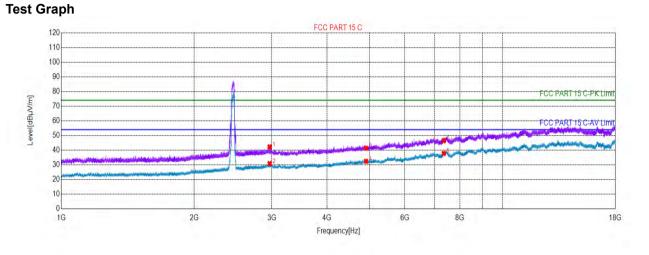


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## 802.11N40\_Channel 9 MIMO



PK Detector
 \* AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2964.59	42.18	10.43	74.00	31.82	178	186	Vertical			
2	2965.39	30.85	10.41	54.00	23.15	198	204	Vertical			
3	4904.00	41.36	-14.95	74.00	32.64	156	230	Vertical			
4	4904.00	32.40	-14.95	54.00	21.60	167	143	Vertical			
5	7356.00	37.80	-7.68	54.00	16.20	177	186	Vertical			
6	7356.00	46.40	-7.68	74.00	27.60	169	2	Vertical			

**Final Data List** 

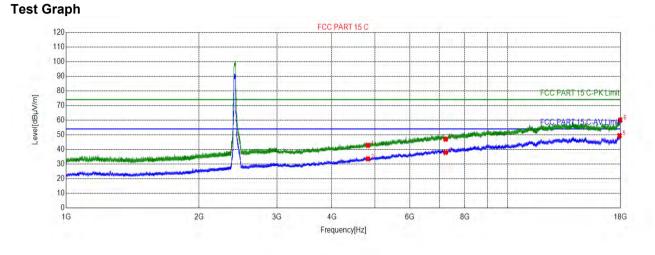


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### 802.11AC20\_Channel 1 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4824.00	42.81	-15.31	74.00	31.19	184	99	Horizontal			
2	4824.00	33.53	-15.31	54.00	20.47	204	143	Horizontal			
3	7236.00	46.99	-8.82	74.00	27.01	189	56	Horizontal			
4	7236.00	37.91	-8.82	54.00	16.09	146	12	Horizontal			
5	17927.3	49.42	2.35	54.00	4.58	204	301	Horizontal			
6	17992.1	60.06	1.54	74.00	13.94	232	186	Horizontal			

**Final Data List** 

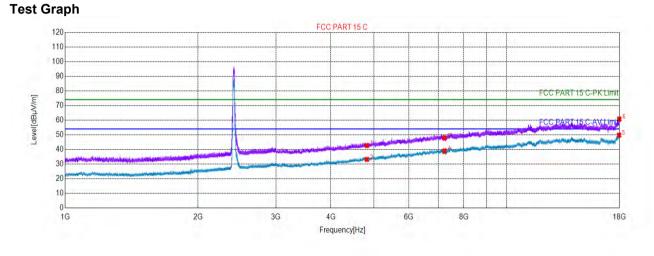


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### 802.11AC20\_Channel 1 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4824.00	42.62	-15.31	74.00	31.38	236	172	Vertical			
2	4824.00	33.17	-15.31	54.00	20.83	325	56	Vertical			
3	7236.00	47.85	-8.82	74.00	26.15	248	99	Vertical			
4	7236.00	39.02	-8.82	54.00	14.98	255	114	Vertical			
5	17979.5	49.77	1.81	54.00	4.23	296	272	Vertical			
6	17998.8	60.70	1.41	74.00	13.30	301	12	Vertical			

**Final Data List** 

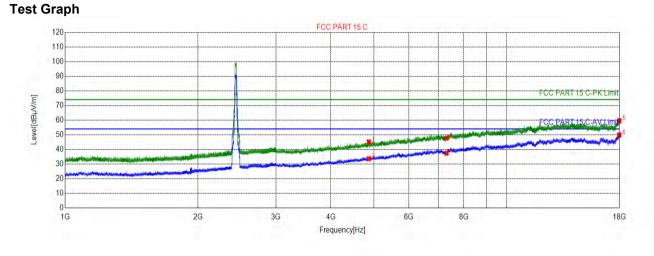


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### 802.11AC20\_Channel 6 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4874.00	45.15	-15.09	74.00	28.85	156	230	Horizontal			
2	4874.00	33.64	-15.09	54.00	20.36	260	345	Horizontal			
3	7311.00	47.74	-8.93	74.00	26.26	187	143	Horizontal			
4	7311.00	37.46	-8.93	54.00	16.54	199	13	Horizontal			
5	17996.9	59.55	1.44	74.00	14.45	204	84	Horizontal			
6	17998.8	49.86	1.41	54.00	4.14	231	314	Horizontal			

**Final Data List** 

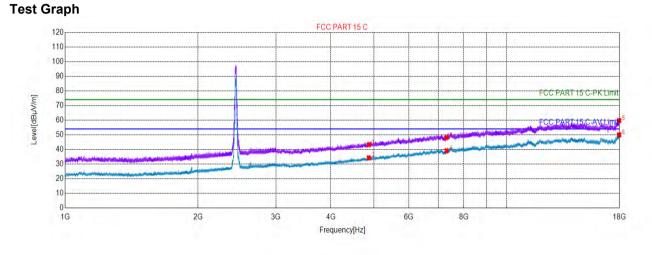


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### 802.11AC20\_Channel 6 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4874.00	43.22	-15.09	74.00	30.78	236	40	Vertical			
2	4874.00	34.21	-15.09	54.00	19.79	287	28	Vertical			
3	7311.00	48.15	-8.93	74.00	25.85	321	147	Vertical			
4	7311.00	39.08	-8.93	54.00	14.92	241	186	Vertical			
5	17983.7	59.68	1.72	74.00	14.32	204	104	Vertical			
6	17984.3	49.95	1.71	54.00	4.05	265	288	Vertical			

**Final Data List** 

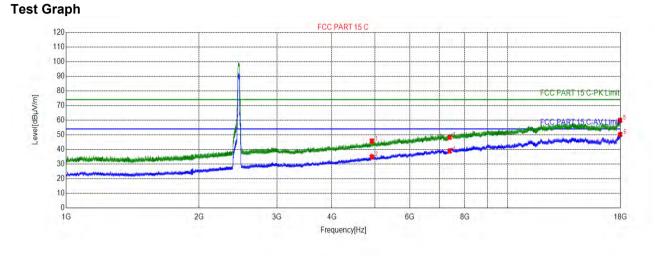


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### 802.11AC20\_Channel 11 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4924.00	45.78	-14.74	74.00	28.22	156	88	Horizontal			
2	4924.00	34.93	-14.74	54.00	19.07	235	221	Horizontal			
3	7386.00	48.21	-7.78	74.00	25.79	187	101	Horizontal			
4	7386.00	38.86	-7.78	54.00	15.14	102	2	Horizontal			
5	17977.1	59.93	1.86	74.00	14.07	122	236	Horizontal			
6	17989.1	50.20	1.61	54.00	3.80	134	347	Horizontal			

**Final Data List** 

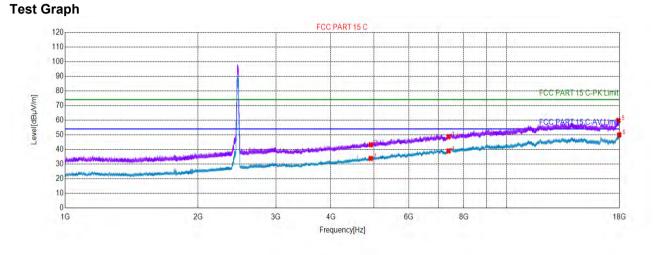


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### 802.11AC20\_Channel 11 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4924.00	33.84	-14.74	54.00	20.16	158	307	Vertical			
2	4924.00	43.10	-14.74	74.00	30.90	325	56	Vertical			
3	7386.00	48.66	-7.78	74.00	25.34	256	56	Vertical			
4	7386.00	38.93	-7.78	54.00	15.07	321	332	Vertical			
5	17915.3	59.82	2.31	74.00	14.18	321	56	Vertical			
6	17996.9	49.96	1.44	54.00	4.04	125	190	Vertical			

**Final Data List** 

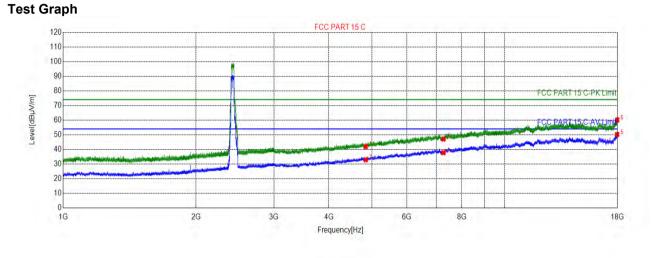


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### 802.11AC40\_Channel 3 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Susp	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4844.00	41.86	-15.21	74.00	32.14	204	13	Horizontal			
2	4844.00	32.93	-15.21	54.00	21.07	189	156	Horizontal			
3	7266.00	47.10	-9.04	74.00	26.90	146	85	Horizontal			
4	7266.00	37.78	-9.04	54.00	16.22	177	343	Horizontal			
5	17986.7	50.17	1.66	54.00	3.83	165	125	Horizontal			
6	17993.9	60.15	1.51	74.00	13.85	125	185	Horizontal			

**Final Data List** 

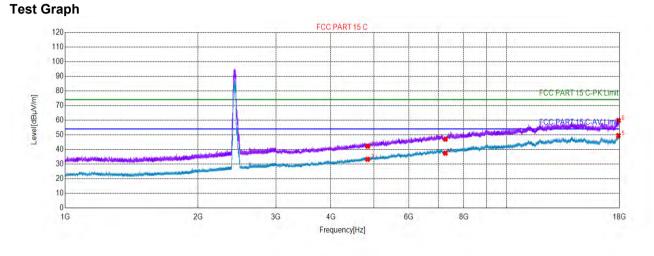


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### 802.11AC40\_Channel 3 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4844.00	42.19	-15.21	74.00	31.81	266	56	Vertical			
2	4844.00	33.22	-15.21	54.00	20.78	288	84	Vertical			
3	7266.00	47.03	-9.04	74.00	26.97	321	117	Vertical			
4	7266.00	37.45	-9.04	54.00	16.55	256	129	Vertical			
5	17913.5	49.44	2.31	54.00	4.56	263	56	Vertical			
6	17933.3	59.79	2.37	74.00	14.21	211	174	Vertical			

**Final Data List** 

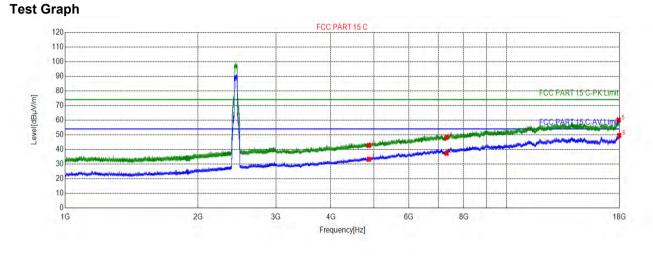


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### 802.11AC40\_Channel 6 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4874.00	33.28	-15.09	54.00	20.72	147	224	Horizontal			
2	4874.00	42.65	-15.09	74.00	31.35	236	239	Horizontal			
5	17936.3	60.08	2.38	74.00	13.92	254	42	Horizontal			
4	7311.00	48.31	-8.93	74.00	25.69	188	86	Horizontal			
3	7311.00	37.33	-8.93	54.00	16.67	198	218	Horizontal			
6	17990.3	49.53	1.58	54.00	4.47	125	44	Horizontal			

**Final Data List** 

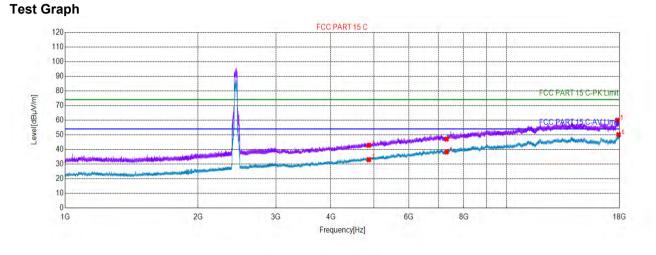


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### 802.11AC40\_Channel 6 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4874.00	42.81	-15.09	74.00	31.19	287	2	Vertical			
2	4874.00	32.98	-15.09	54.00	21.02	154	147	Vertical			
3	7311.00	47.04	-8.93	74.00	26.96	253	288	Vertical			
4	7311.00	38.26	-8.93	54.00	15.74	324	114	Vertical			
5	17807.3	59.90	1.07	74.00	14.10	185	24	Vertical			
6	17931.5	50.10	2.37	54.00	3.90	200	331	Vertical			

**Final Data List** 

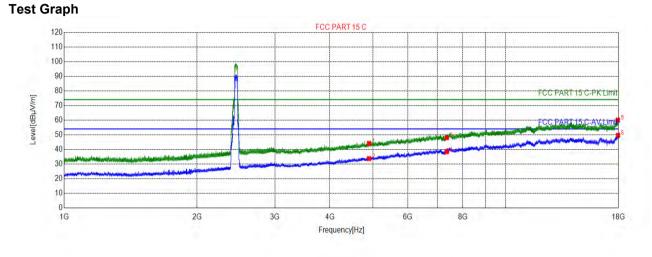


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### 802.11AC40\_Channel 9 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4904.00	44.12	-14.95	74.00	29.88	189	192	Horizontal			
2	4904.00	33.70	-14.95	54.00	20.30	230	12	Horizontal			
3	7356.00	47.94	-7.68	74.00	26.06	241	287	Horizontal			
4	7356.00	38.43	-7.68	54.00	15.57	188	2	Horizontal			
5	17951.9	59.99	2.38	74.00	14.01	164	56	Horizontal			
6	17974.7	49.61	1.91	54.00	4.39	155	12	Horizontal			

**Final Data List** 

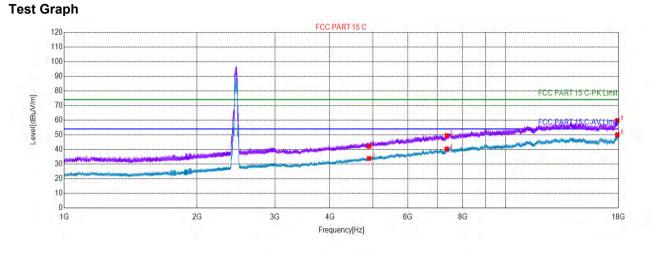


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### 802.11AC40\_Channel 9 MIMO



\* PK Detector \* AV Detector

#### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	4904.00	42.06	-14.95	74.00	31.94	236	291	Vertical			
2	4904.00	33.81	-14.95	54.00	20.19	254	234	Vertical			
3	7356.00	49.40	-7.68	74.00	24.60	213	172	Vertical			
4	7356.00	40.29	-7.68	54.00	13.71	325	2	Vertical			
5	17912.9	59.75	2.31	74.00	14.25	288	350	Vertical			
6	17912.9	50.02	2.31	54.00	3.98	246	11	Vertical			

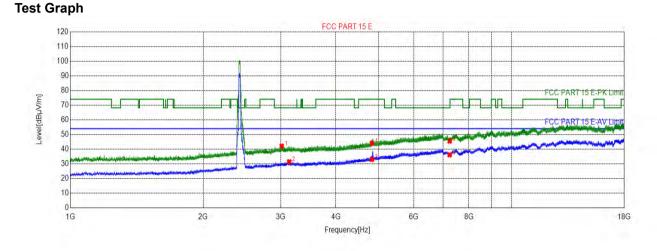
**Final Data List** 



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### 802.11AX20\_Channel 1 MIMO

+ PK Delector + RMS Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	3013.70	42.10	10.74	68.20	26.10	187	53	Horizontal			
2	3133.40	31.36	11.08	54.00	22.64	192	30	Horizontal			
3	4824.00	33.00	15.83	54.00	21.00	164	228	Horizontal			
4	4824.00	44.03	15.83	74.00	29.97	175	205	Horizontal			
5	7236.00	45.50	-8.59	68.20	22.70	189	268	Horizontal			
6	7236.00	36.15	-8.59	54.00	17.85	199	222	Horizontal			

**Final Data List** 



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#### FCC PART 15 E 120 110 100 90 80 CC PART 15 F-PKT Level[dBµV/m] Л hΠ 70 -----T 1.1..... 60 CC PART 15 E-AV 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G 18G Frequency[Hz]

## 802.11AX20\_Channel 1 MIMO



### Suspected List

**Test Graph** 

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	3090.50	31.24	10.84	54.00	22.76	178	178	Vertical			
2	3136.10	42.00	10.95	68.20	26.20	196	253	Vertical			
3	4824.00	43.19	15.83	74.00	30.81	156	291	Vertical			
4	4824.00	32.41	15.83	54.00	21.59	171	32	Vertical			
5	7236.00	45.73	-8.59	68.20	22.47	152	199	Vertical			
6	7236.00	36.36	-8.59	54.00	17.64	194	85	Vertical			

**Final Data List** 



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#### FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LI Level[dBµV/m] 70 60 FCC PART 15 50 40 di biba 30 20 10 0 1G 2G 3G 4G 6G 8G 18G Frequency[Hz]

## 802.11AX20\_Channel 6 MIMO

★ PK Detector ★ AV Detector

### Suspected List

**Test Graph** 

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2999.60	41.82	10.80	74.00	32.18	254	349	Horizontal			
2	3125.40	30.97	-20.93	54.00	23.03	158	83	Horizontal			
3	4874.00	33.43	-15.09	54.00	20.57	169	26	Horizontal			
4	4874.00	42.57	-15.09	74.00	31.43	265	170	Horizontal			
5	7311.00	46.40	-8.93	74.00	27.60	247	356	Horizontal			
6	7311.00	37.05	-8.93	54.00	16.95	231	170	Horizontal			

**Final Data List** 



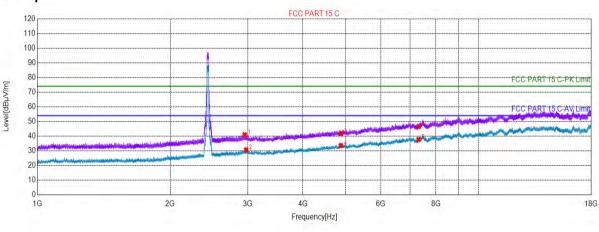
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### **Test Graph** FCC PART 15 C 120 110 100 90 80

### 802.11AX20\_Channel 6 MIMO



#### + PK Detector # AV Detector

### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2950.59	40.94	10.56	74.00	33.06	214	275	Vertical			
2	2972.39	30.65	10.38	54.00	23.35	256	173	Vertical			
3	4874.00	41.70	-15.09	74.00	32.30	239	200	Vertical			
4	4874.00	33.59	-15.09	54.00	20.41	178	70	Vertical			
5	7311.00	37.75	-8.93	54.00	16.25	195	26	Vertical			
6	7311.00	46.53	-8.93	74.00	27.47	165	40	Vertical			

Final Data List



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18G

#### **Test Graph** FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LIN Level[dBµV/m] 70 60 FCC PART 15 C AVTI 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G Frequency[Hz]

## 802.11AX20\_Channel 11 MIMO



### Suspected List

Suspe	Suspected List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	2943.99	41.45	10.53	74.00	32.55	241	137	Horizontal			
2	2995.99	30.80	10.68	54.00	23.20	256	49	Horizontal			
3	4924.00	34.35	-14.74	54.00	19.65	233	85	Horizontal			
4	4924.00	41.62	-14.74	74.00	32.38	198	13	Horizontal			
5	7386.00	48.23	-7.78	74.00	25.77	175	345	Horizontal			
6	7386.00	38.56	-7.78	54.00	15.44	162	27	Horizontal			

**Final Data List** 

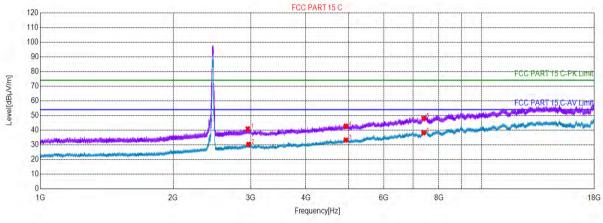


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## 802.11AX20\_Channel 11 MIMO Test Graph



### \* PK Delector \* AV Detector

### Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2951.89	40.90	10.56	74.00	33.10	236	110	Vertical
2	2963.09	30.32	10.46	54.00	23.68	187	149	Vertical
3	4924.00	33.25	-14.74	54.00	20.75	195	190	Vertical
4	4924.00	42.78	-14.74	74.00	31.22	211	118	Vertical
5	7386.00	48.01	-7.78	74.00	25.99	236	205	Vertical
6	7386.00	38.17	-7.78	54.00	15.83	174	102	Vertical

Final Data List

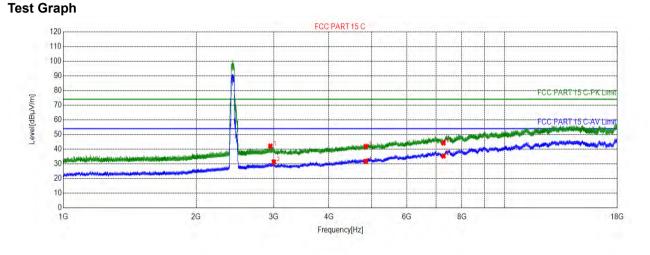


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## 802.11AX40\_Channel 3 MIMO



#### + PK Delector + AV Detector

### Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2946.09	42.03	10.54	74.00	31.97	236	23	Horizontal
2	2999.60	31.25	10.80	54.00	22.75	241	350	Horizontal
3	4844.00	41.84	-15.21	74.00	32.16	258	2	Horizontal
4	4844.00	31.82	-15.21	54.00	22.18	269	99	Horizontal
5	7266.00	35.36	-9.04	54.00	18.64	217	55	Horizontal
6	7266.00	44.25	-9.04	74.00	29.75	222	99	Horizontal

**Final Data List** 

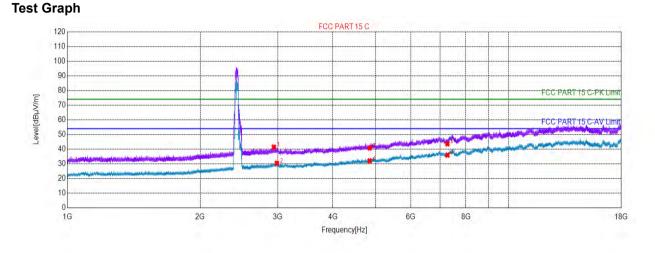


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### 802.11AX40\_Channel 3 MIMO



#### \* PK Detector \* AV Detector

### Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2938.19	41.38	10.51	74.00	32.62	236	300	Vertical
2	2985.09	30.45	10.52	54.00	23.55	156	136	Vertical
3	4844.00	40.75	-15.21	74.00	33.25	259	258	Vertical
4	4844.00	32.07	-15.21	54.00	21.93	215	26	Vertical
5	7266.00	43.59	-9.04	74.00	30.41	243	84	Vertical
6	7266.00	35.93	-9.04	54.00	18.07	211	143	Vertical

**Final Data List** 



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#### **Test Graph** FCC PART 15 C 120 110 100 90 80 FCC PART 15 C-PK LIN Level[dBµV/m] 70 60 FCC PART 15 C-AV LI 50 40 30 20 10 0 1G 2G 3G 4G 6G 8G 18G Frequency[Hz]

## 802.11AX40\_Channel 6 MIMO



#### **Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2960.19	30.69	10.51	54.00	23.31	215	313	Horizontal
2	2998.89	41.73	10.77	74.00	32.27	224	113	Horizontal
3	4874.00	41.18	-15.09	74.00	32.82	274	328	Horizontal
4	4874.00	31.94	-15.09	54.00	22.06	285	242	Horizontal
5	7311.00	35.81	-8.93	54.00	18.19	263	171	Horizontal
6	7311.00	46.29	-8.93	74.00	27.71	223	242	Horizontal

**Final Data List** 



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