



TEST REPORT

Application No.:	GZCR2206000724AT
Applicant:	Winegard Company
Address of Applicant:	3000 Kirkwood Street, Burlington, Iowa 52601, United States
Manufacturer:	Winegard Company
Address of Manufacturer:	3000 Kirkwood Street, Burlington, Iowa 52601, United States
Factory:	1. Aztech Communication Device (DG) Ltd 2. IOT Manufacturing SDN.BHD.
Address of Factory:	1. Jiu Jiang Shui Village, Chang Ping Town, Dong Guan City, Guang Dong Province, China 2. No. 8 & 10, Setia Business Park, Jalan Laman Setia 7/4, Taman Laman Setia, 81550 Gelang Patah, Johor Bahru, Malaysia

Equipment Under Test (EUT):

EUT Name:	Gateway PRO 2x2
Model No.:	WF2-5G1, GW-5G01 ♣
* Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.	
Trade Mark:	Winegard
Standard(s) :	47 CFR Part 15, Subpart E 15.407
Date of Receipt:	2022-05-17
Date of Test:	2022-05-18 to 2022-06-13
Date of Issue:	2022-06-16

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022-06-16		<i>Original</i>

Authorized for issue by			
		 _____ Curry Wu/Project Engineer	
		 _____ Ricky Liu/Reviewer	

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart C 15.203	Pass
Transmission in the Absence of Data		N/A	47 CFR Part 15, Subpart C 15.407 (c)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Duty Cycle	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 12.2	KDB 789033 D02 v02r01 II B 1	Pass
99% Bandwidth		KDB 789033 II D	N/A	Pass
26dB Emission bandwidth		KDB 789033 D02 II C 1	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)		KDB 789033 D02 II C 2	47 CFR Part 15, Subpart C 15.407 (e)	Pass
Maximum Conducted output power		KDB 789033 D02 II E	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Peak Power spectrum density		KDB 789033 D02 II F	47 CFR Part 15, Subpart C 15.407 (a)	Pass
Radiated Emissions which fall in the restricted bands		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Radiated Emissions (below 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Radiated Emissions (above 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass
Frequency Stability		ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.407 (g)	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

Remark:

Model No.: WF2-5G1, GW-5G01

in this report Radiated Emissions which fall in the restricted bands and Radiated Spurious Emissions was tested on model WF2-5G1, GW-5G01, RF Conducted was tested on mode WF2-5G1, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model No., antenna and Exterior dimensions.

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 12V			
Internal source:	More than 108MHz			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
UNII Band I		802.11a/n(HT20)/ac(HT20)	5180-5240	4
		802.11n(HT40)/ac(HT40)	5190-5230	2
		802.11ac(HT80)	5210	1
UNII Band II-A		802.11a/n(HT20)/ac(HT20)	5260-5320	4
		802.11n(HT40)/ac(HT40)	5270-5310	2
		802.11ac(HT80)	5290	1
UNII Band II-C		802.11a/n(HT20)/ac(HT20)	5500-5700	11
		802.11n(HT40)/ac(HT40)	5510-5670	5
		802.11ac(HT80)	5530,5610	2
UNII Band III		802.11a/n(HT20)/ac(HT20)	5745-5825	5
		802.11n(HT40)/ac(HT40)	5755-5795	2
		802.11ac(HT80)	5775	1
Modulation Type:	802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
DFS Function:	Master			
TPC Function:	Support			
Sample Type:	Fixed devices			
WF2-5G1's Antenna Type:	PCB antenna			
WF2-5G1's Antenna Gain:	Antenna1/Antenna2: 4.6dBi Note: MIMO for 802.11n/ac.			
GW-5G01's Antenna Type:	PCB antenna			
GW-5G01's Antenna Gain:	Antenna1: 4.6dBi, Antenna2:4.0dBi Note: MIMO for 802.11n/ac.			

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC Power Supply	GWINSTEK	GPS-3030DD (Input: AC100-240V, 50/60Hz;Output: DC Max.30V, 3A)	EMC0008
RJ45 Cable (1.2m length)	/	/	/

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4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Duty Cycle	± 0.37%
99% Bandwidth	± 3%
26dB Emission bandwidth	± 3%
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	± 3%
Maximum Conducted output power	± 0.75dB
Peak Power spectrum density	± 2.84dB
Radiated Emissions which fall in the restricted bands	±5.00dB (30MHz-1GHz; 3m); ± 5.12dB (1GHz-6GHz); ± 5.38dB (6GHz-18GHz); ± 5.61dB (18GHz-40GHz)
Radiated Emissions (below 1GHz)	±5.00dB (30MHz-1GHz; 3m); ±4.38dB (30MHz-1GHz; 10m);
Radiated Emissions (above 1GHz)	± 5.12dB (1GHz-6GHz); ± 5.38dB (6GHz-18GHz); ± 5.61dB (18GHz-40GHz)
Frequency Stability	± 7.25 x 10-8

4.4 Test Location

All tests were performed at:

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Guangzhou, China 510663

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No tests were sub-contracted.

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4.5 Test Facility

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

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Duty Cycle					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

99% Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

26dB Emission bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Minimum 6 dB bandwidth (5.725-5.85 GHz band)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A



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Maximum Conducted output power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A
Power Meter (U2021XA_Ch2)	Agilent Technologies	U2021XA_Ch2	SEM009-02	2022-05-16	2023-05-15

Peak Power spectrum density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver (20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

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Radiated Spurious Emissions Below 1GHz					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver (10Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna (25MHz-1GHz)- Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2022-03-03	2025-03-02
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2022-05-16	2023-05-15
High Pass Filter (915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2021-12-17	2022-12-16
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Active Loop Antenna	EMCO	6502	EMC0523	2020-05-19	2022-05-18
				2022-05-17	2024-05-16

Radiated Emissions which fall in the restricted bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver (20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable(Above 1GHz)	Scoflex	KMKG-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver (10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

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Frequency Stability

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2022-03-29	2024-03-28
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A
Temperature Chamber	GZ GongWen Co.Ltd.	GDJW-100	EMC0039	2021-07-04	2022-07-03

General used equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of 15.211, 15.213, 15.217, 15.219, 15.221, or 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

WF2-5G1's Antenna:

The antenna connector is a IPEX type that comply with FCC standard, the best case gain of the antenna1/antenna2 is 4.6dBi, According to KDB662911 2) a) (i) guidelines:

Directional Gain = $G_{ANT} + 10^{\log(N_{ANT})} = 4.6 + 10^{\log(2)} = 7.61\text{dBi}$.

GW-5G01's Antenna:

The antenna connector is a IPEX type that comply with FCC standard, the best case gain of the antenna1 is 4.6dBi, antenna2 is 4.0dBi, According to KDB662911 2) d) (i) guidelines:

Directional Gain = $10^{\log((10^{G1/20} + 10^{G2/20})^2 / N_{ANT})} = 7.32\text{dBi}$.

Antenna location: Refer to internal photo.

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6.2 Transmission in the Absence of Data

6.2.1 Test Requirement:

47 CFR Part 15, Subpart C 15.407 (c)

6.2.2 Conclusion

6.2.2 Conclusion

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

WIFI chip support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.



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7 Radio Spectrum Matter Test Results

7.1 Duty Cycle

Test Requirement KDB 789033 D02 v02r01 II B 1
Test Method: ANSI C63.10 (2013) Section 12.2

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.5 °C Humidity: 55.3 % RH Atmospheric Pressure: 1015 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	02	TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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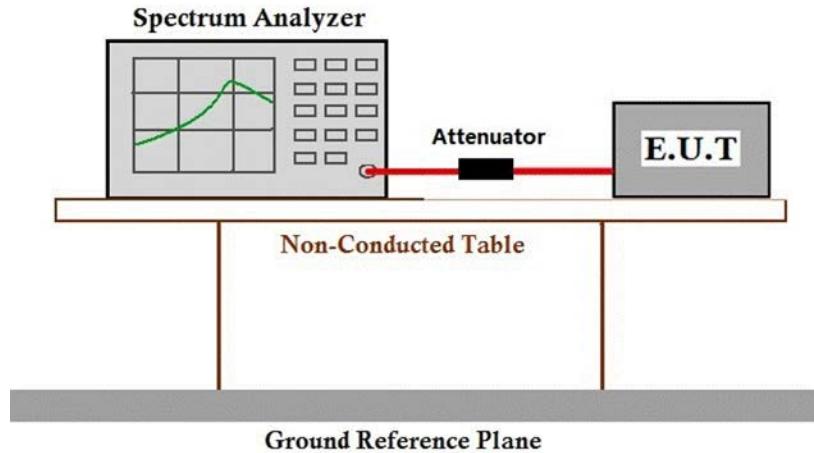
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7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.2 99% Bandwidth

Test Requirement N/A
 Test Method: KDB 789033 II D

7.2.1 E.U.T. Operation

Operating Environment:
 Temperature: 22.5 °C Humidity: 55.3 % RH Atmospheric Pressure: 1015 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	02	TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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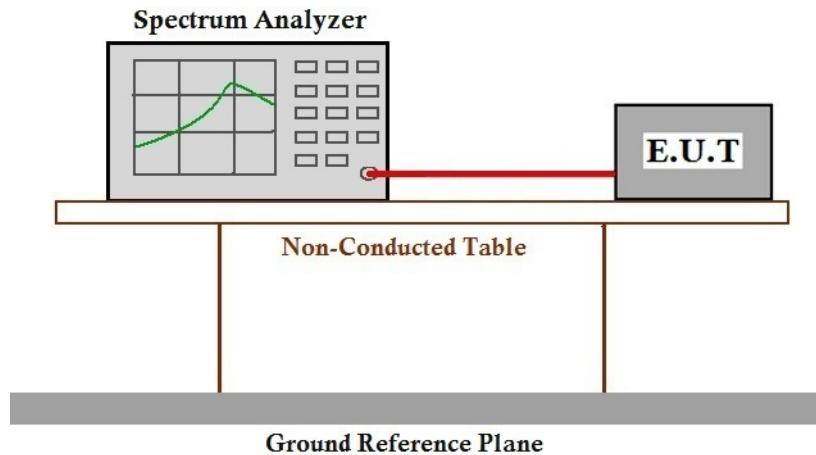
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7.2.3 Test Setup Diagram**7.2.4 Measurement Procedure and Data**

Please Refer to Appendix for Details

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7.3 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)
Test Method: KDB 789033 D02 II C 1

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 55.3 % RH Atmospheric Pressure: 1015 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	02	TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

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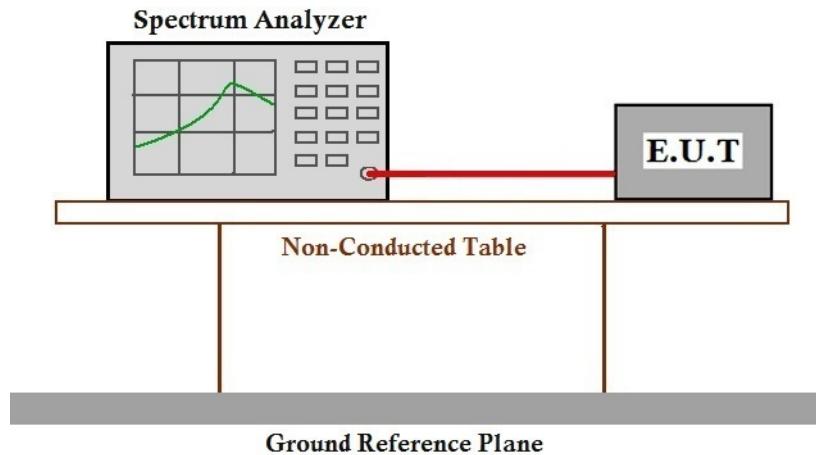
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7.3.3 Test Setup Diagram**7.3.4 Measurement Procedure and Data**

Please Refer to Appendix for Details

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7.4 Minimum 6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart C 15.407 (e)

Test Method: KDB 789033 D02 II C 2

Limit:

Frequency band(MHz)	Limit
5725-5850	≥500 kHz

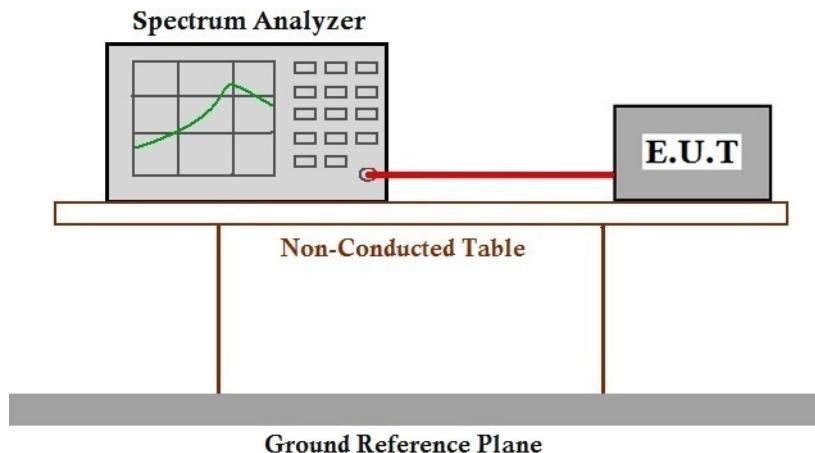
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 55.5 % RH Atmospheric Pressure: 1015 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram**7.4.4 Measurement Procedure and Data**

Please Refer to Appendix for Details

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7.5 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band(MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*
5725-5850	≤1W(30dBm)

Remark:

* Where B is the 26dB emission bandwidth in MHz.

The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C

Humidity: 55.5 % RH

Atmospheric Pressure: 1015 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	02	TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all

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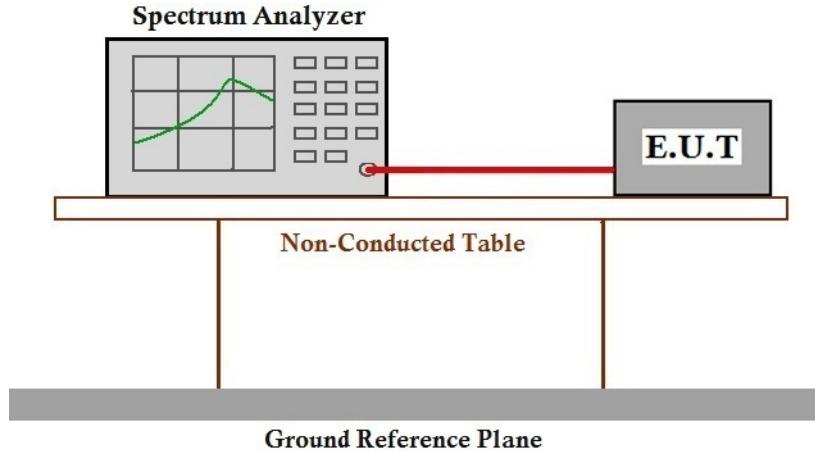
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modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

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7.6 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart C 15.407 (a)

Test Method: KDB 789033 D02 II F

Limit:

Frequency band(MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz

Remark:

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22.5 °C Humidity: 55.5 % RH Atmospheric Pressure: 1015 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	02	TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	03	TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.
Final test	04	TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested

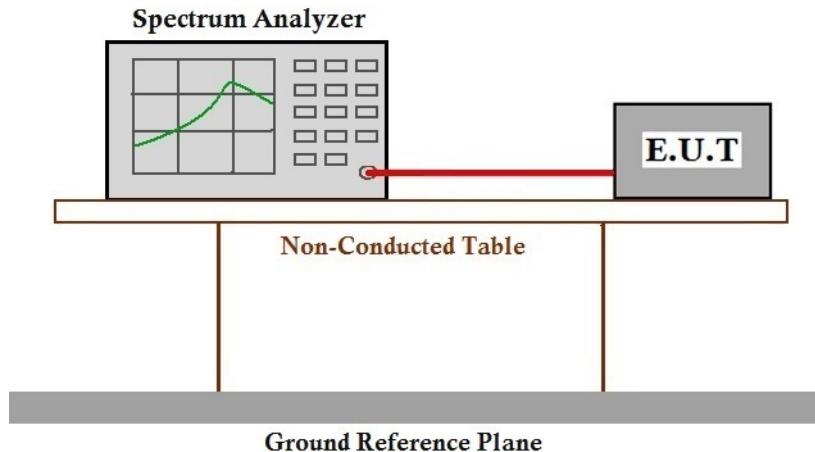
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and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

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7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.407(b)

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

***(1)** For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.2 °C Humidity: 55.3 % RH Atmospheric Pressure: 1015 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	TX mode (U-NII-1)_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst

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case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

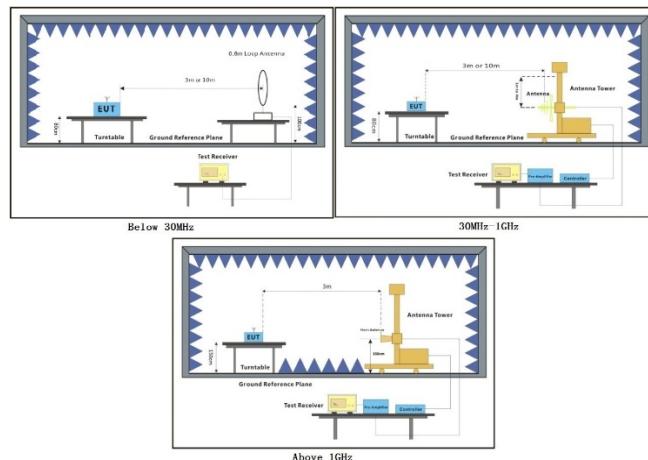
TX mode (U-NII-2A)_Keep the EUT in continuously transmitting mode with all modulation types.All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

TX mode (U-NII-2C)_Keep the EUT in continuously transmitting mode with all modulation types.All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

TX mode (U-NII-3)_Keep the EUT in continuously transmitting mode with all modulation types.All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; data rate @ MCS0 is the worst case of IEEE 802.11n(HT20); data rate @ MCS0 is the worst case of IEEE 802.11n(HT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT20); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT40); data rate @ MCS0 is the worst case of IEEE 802.11ac(VHT80). Only the data of worst case is recorded in the report.

Final test 02**Final test 03****Final test 04**

7.7.3 Test Setup Diagram



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7.7.4 Measurement Procedure and Data

- 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 chamber. 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 fully-anechoic chamber. 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 (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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle 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 the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



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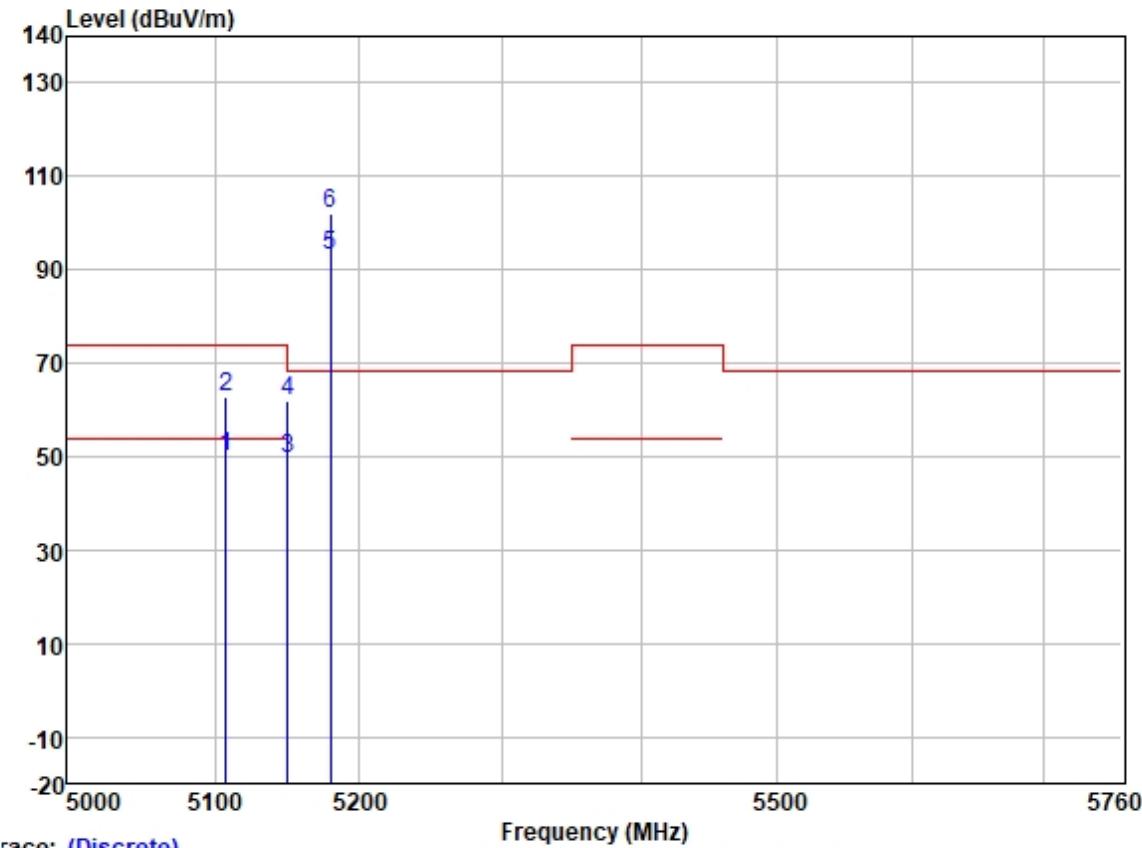
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Test data for WF2-5G1

Test Mode: 01; Polarity: Horizontal; Modulation:802.11a; Bandwidth:20MHz; Channel:Low



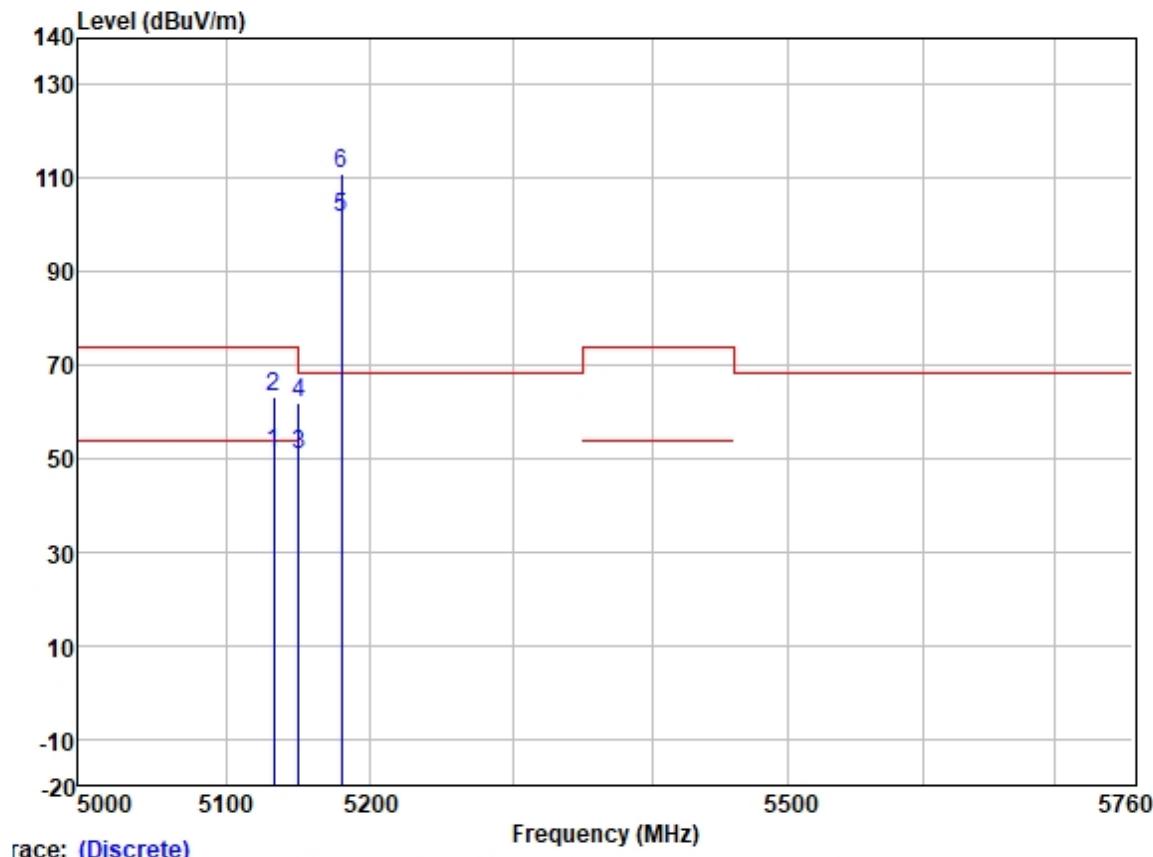
Mode: (Discrete)

ReadAntenna	Cable	Preamp	Limit	Over	Remark								
					Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB	dB	dB	dB	dB	
1 5107.730	49.26	31.72	5.65	36.86	49.77	54.00	-4.23	HORIZONTAL	Average				
2 5107.730	62.33	31.72	5.65	36.86	62.84	74.00	-11.16	HORIZONTAL	Peak				
3 5149.980	48.92	31.72	5.62	36.86	49.40	54.00	-4.60	HORIZONTAL	Average				
4 5149.980	61.25	31.72	5.62	36.86	61.73	74.00	-12.27	HORIZONTAL	Peak				
5 5180.000	92.58	31.73	5.61	36.87	93.05	-----	-----	HORIZONTAL	Average				
6 * 5180.000	101.68	31.73	5.61	36.87	102.15	68.20	33.95	HORIZONTAL	Peak				

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Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:Low



Mode: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB	
1	5132.885	50.57	31.72	5.63	36.86	51.06	54.00	-2.94	VERTICAL	Average
2	5132.885	62.60	31.72	5.63	36.86	63.09	74.00	-10.91	VERTICAL	Peak
3	5149.980	50.29	31.72	5.62	36.86	50.77	54.00	-3.23	VERTICAL	Average
4	5149.980	61.58	31.72	5.62	36.86	62.06	74.00	-11.94	VERTICAL	Peak
5	5180.000	100.99	31.73	5.61	36.87	101.46	-----	-----	VERTICAL	Average
6 *	5180.000	110.33	31.73	5.61	36.87	110.80	68.20	42.60	VERTICAL	Peak

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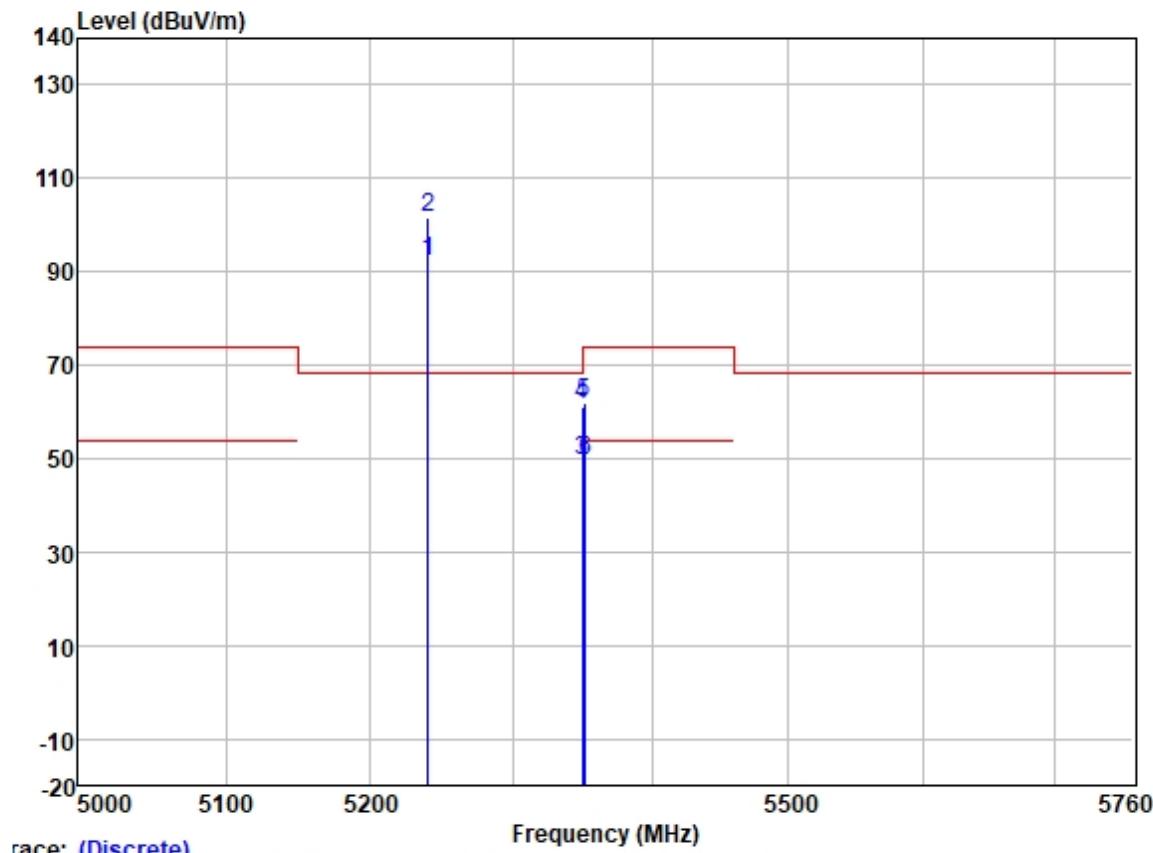
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Test Mode: 01; Polarity: Horizontal; Modulation:802.11a; Bandwidth:20MHz; Channel:High



Type: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB		
1	5240.000	91.59	31.75	5.74	36.87	92.21	-----	-----	-----	HORIZONTAL	Average
2 *	5240.000	100.84	31.75	5.74	36.87	101.46	68.20	33.26	33.26	HORIZONTAL	Peak
3	5350.020	48.63	31.77	6.05	36.88	49.57	54.00	-4.43	54.00	HORIZONTAL	Average
4	5350.020	60.34	31.77	6.05	36.88	61.28	74.00	-12.72	74.00	HORIZONTAL	Peak
5	5351.070	61.12	31.77	6.05	36.88	62.06	74.00	-11.94	74.00	HORIZONTAL	Peak
6	5352.203	48.70	31.77	6.05	36.88	49.64	54.00	-4.36	54.00	HORIZONTAL	Average

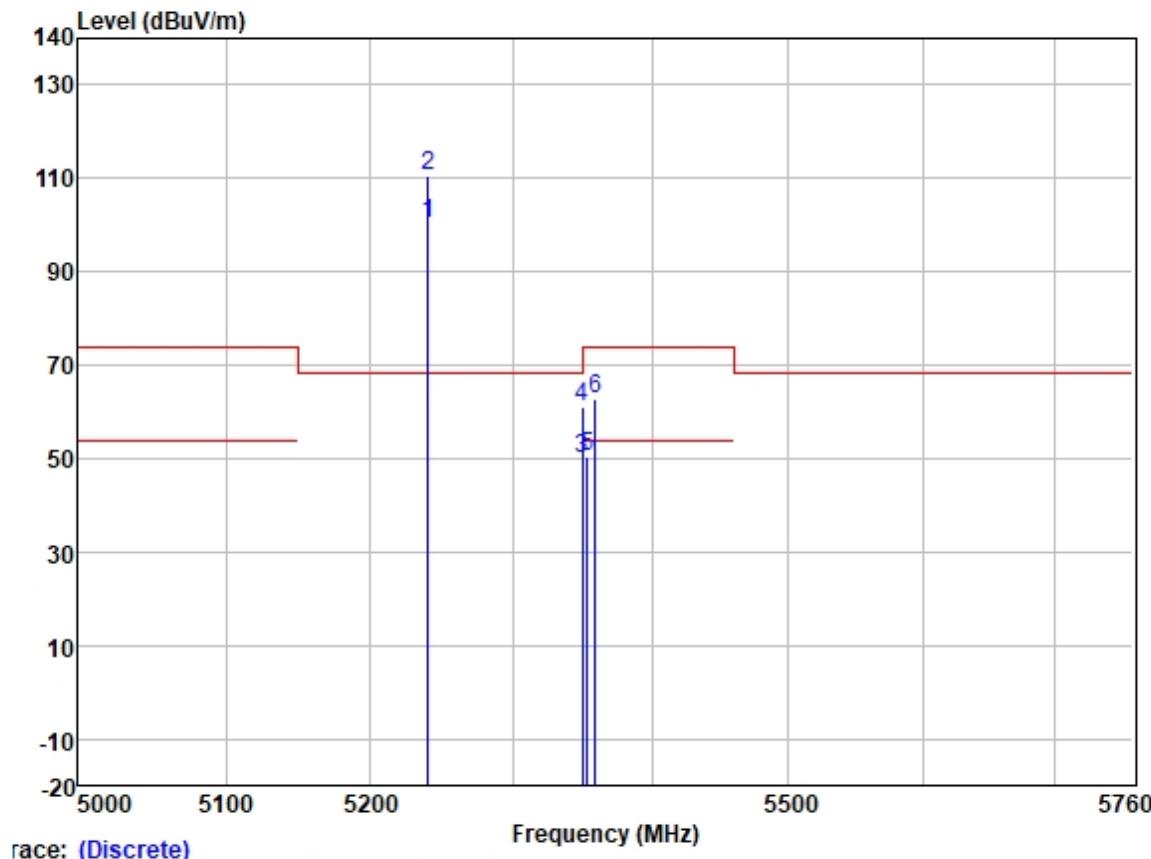
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Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:High



Mode: (Discrete)

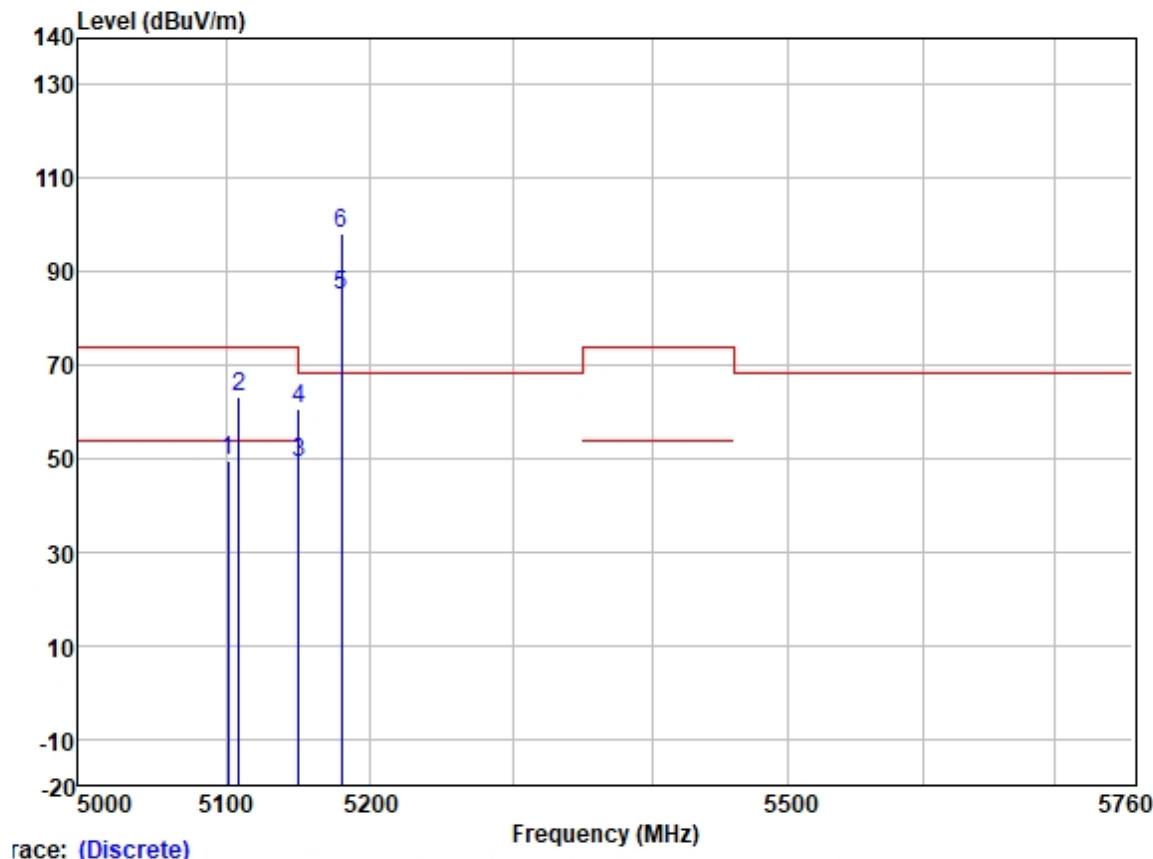
Freq	ReadAntenna		Cable		Preamp Factor	Loss	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	Level	dB							
1	5240.000	99.73	31.75	5.74	36.87	100.35	-----	-----	-----	-----	Average
2 *	5240.000	109.81	31.75	5.74	36.87	110.43	68.20	42.23	VERTICAL	VERTICAL	Peak
3	5350.020	49.01	31.77	6.05	36.88	49.95	54.00	-4.05	VERTICAL	VERTICAL	Average
4	5350.020	60.21	31.77	6.05	36.88	61.15	74.00	-12.85	VERTICAL	VERTICAL	Peak
5	5353.195	49.34	31.77	6.05	36.88	50.28	54.00	-3.72	VERTICAL	VERTICAL	Average
6	5358.724	61.87	31.78	6.03	36.88	62.80	74.00	-11.20	VERTICAL	VERTICAL	Peak

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Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Index	Frequency (MHz)	ReadAntenna		Cable		Preamp		Limit Line	Over Line	Pol/Phase	Remark
		Freq	Level	Factor	Loss	Factor	Level				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB		
1	5101.188	48.98	31.72	5.65	36.86	49.49	54.00	-4.51	HORIZONTAL	Average	
2	5109.020	62.49	31.72	5.65	36.86	63.00	74.00	-11.00	HORIZONTAL	Peak	
3	5149.980	48.57	31.72	5.62	36.86	49.05	54.00	-4.95	HORIZONTAL	Average	
4	5149.980	60.25	31.72	5.62	36.86	60.73	74.00	-13.27	HORIZONTAL	Peak	
5	5180.000	84.60	31.73	5.61	36.87	85.07	-----	-----	HORIZONTAL	Average	
6 *	5180.000	97.63	31.73	5.61	36.87	98.10	68.20	29.90	HORIZONTAL	Peak	

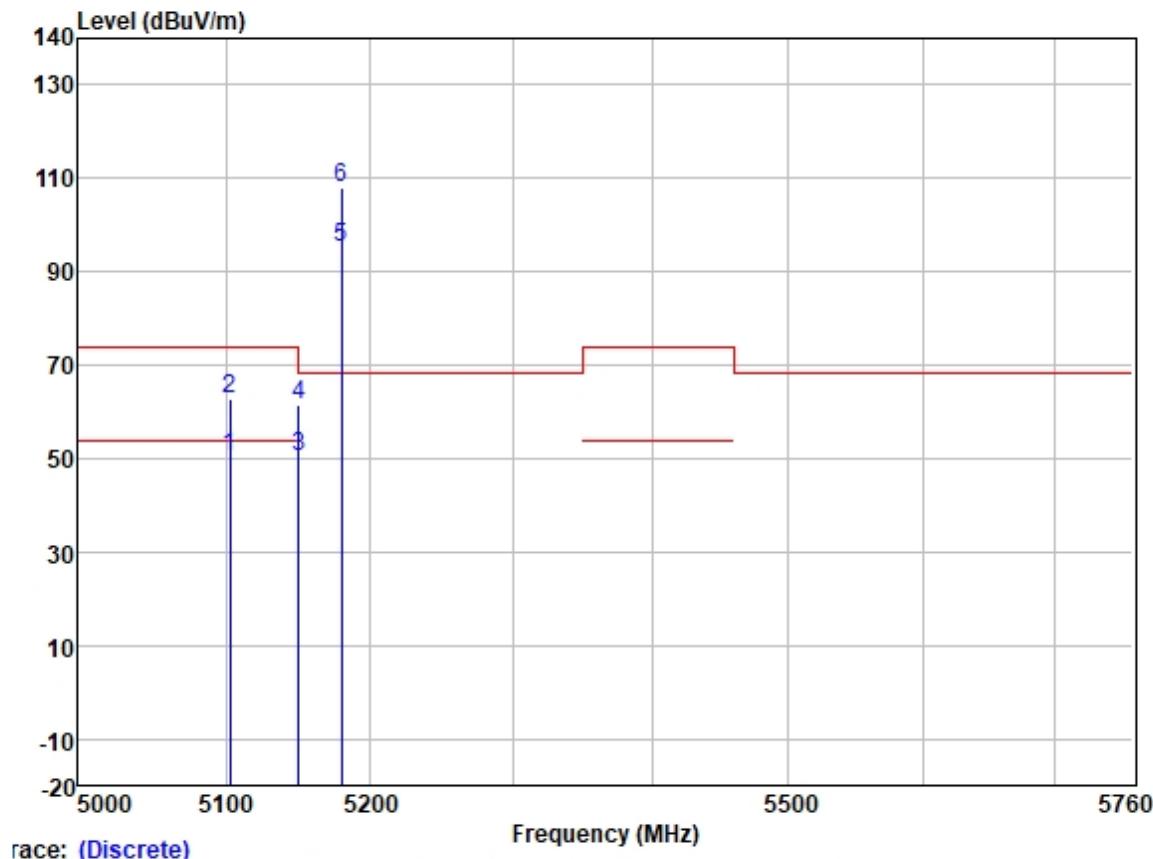
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Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Trace: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB	
1	5102.873	50.08	31.72	5.65	36.86	50.59	54.00	-3.41	VERTICAL	Average
2	5102.873	62.32	31.72	5.65	36.86	62.83	74.00	-11.17	VERTICAL	Peak
3	5149.980	49.86	31.72	5.62	36.86	50.34	54.00	-3.66	VERTICAL	Average
4	5149.980	61.22	31.72	5.62	36.86	61.70	74.00	-12.30	VERTICAL	Peak
5	5180.000	94.77	31.73	5.61	36.87	95.24	-----	-----	VERTICAL	Average
6 *	5180.000	107.40	31.73	5.61	36.87	107.87	68.20	39.67	VERTICAL	Peak

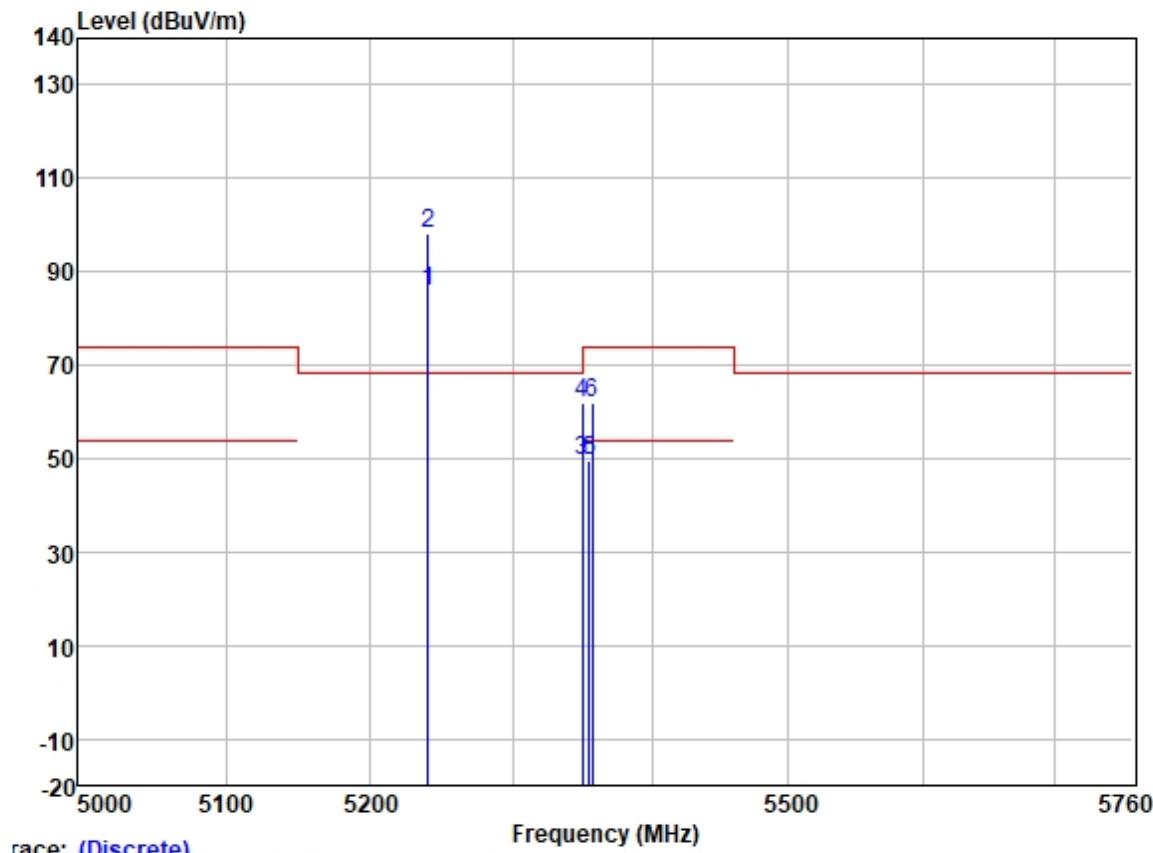
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Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



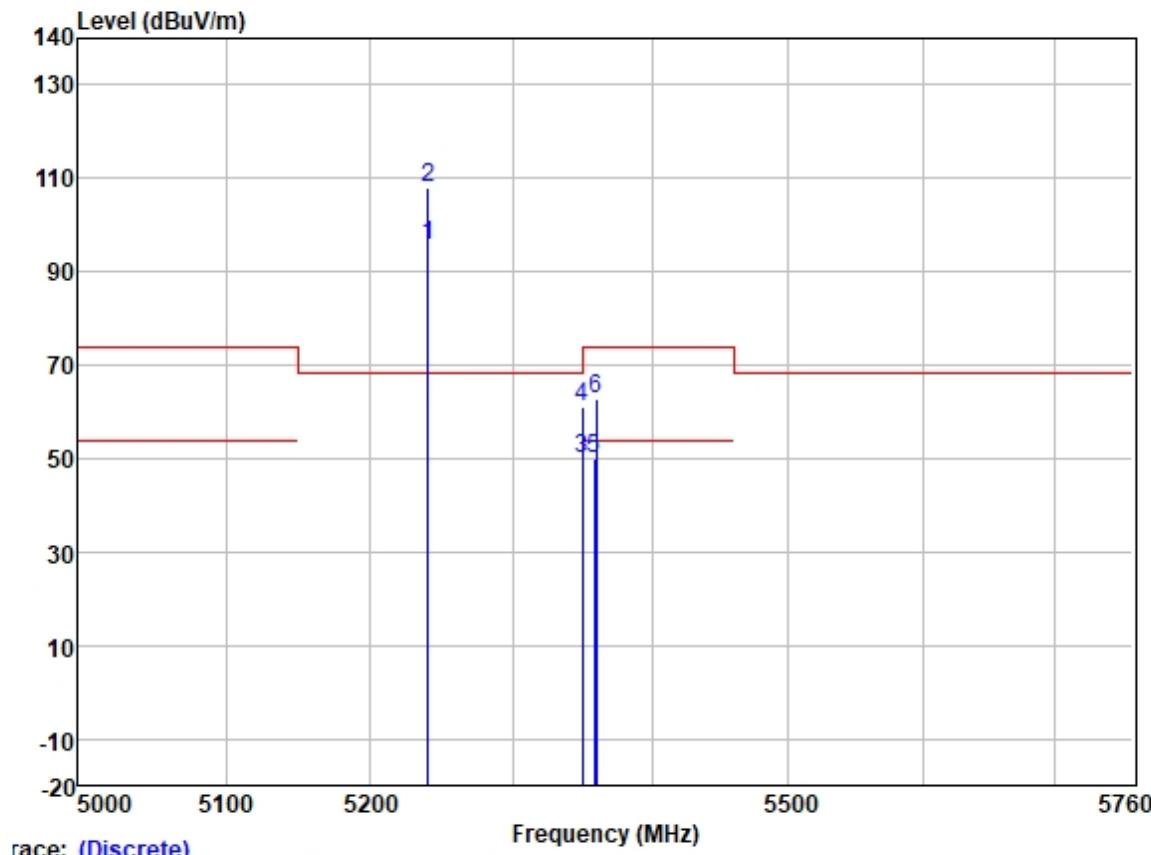
Trace: (Discrete)	ReadAntenna		Cable		Preamp		Limit	Over	Over	Pol/Phase	Remark
	Freq	Level	Factor	Loss	Factor	Level					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB		
1	5240.000	85.11	31.75	5.74	36.87	85.73	-----	-----	-----	HORIZONTAL	Average
2 *	5240.000	97.77	31.75	5.74	36.87	98.39	68.20	30.19	-----	HORIZONTAL	Peak
3	5350.020	48.47	31.77	6.05	36.88	49.41	54.00	-4.59	-----	HORIZONTAL	Average
4	5350.020	60.96	31.77	6.05	36.88	61.90	74.00	-12.10	-----	HORIZONTAL	Peak
5	5355.037	48.63	31.78	6.03	36.88	49.56	54.00	-4.44	-----	HORIZONTAL	Average
6	5357.022	61.16	31.78	6.03	36.88	62.09	74.00	-11.91	-----	HORIZONTAL	Peak

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Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



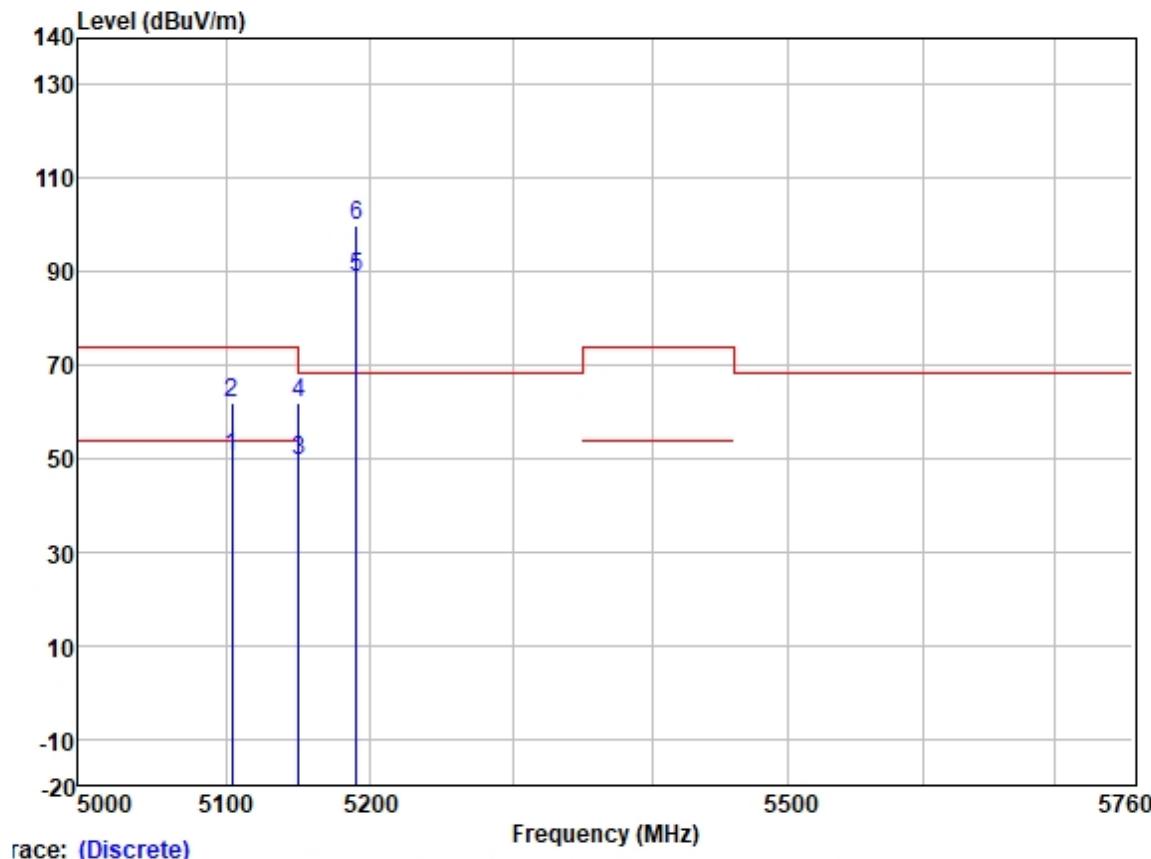
Trace: (Discrete)	ReadAntenna										Limit	Over	Pol/Phase	Remark
	Freq	Level	Factor	Cable	Preamp	Loss	Factor	Level	Line	Line				
	MHz	dBuV	dB/m		dB	dB	dBuV/m	dBuV/m		dB				
1	5240.000	94.97	31.75	5.74	36.87	95.59	-----	-----	-----	-----	VERTICAL	Average		
2 *	5240.000	107.39	31.75	5.74	36.87	108.01	68.20	39.81	68.20	39.81	VERTICAL	Peak		
3	5350.020	49.05	31.77	6.05	36.88	49.99	54.00	-4.01	54.00	-4.01	VERTICAL	Average		
4	5350.020	60.24	31.77	6.05	36.88	61.18	74.00	-12.82	74.00	-12.82	VERTICAL	Peak		
5	5358.298	49.23	31.78	6.03	36.88	50.16	54.00	-3.84	54.00	-3.84	VERTICAL	Average		
6	5359.433	61.66	31.78	6.03	36.88	62.59	74.00	-11.41	74.00	-11.41	VERTICAL	Peak		

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Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



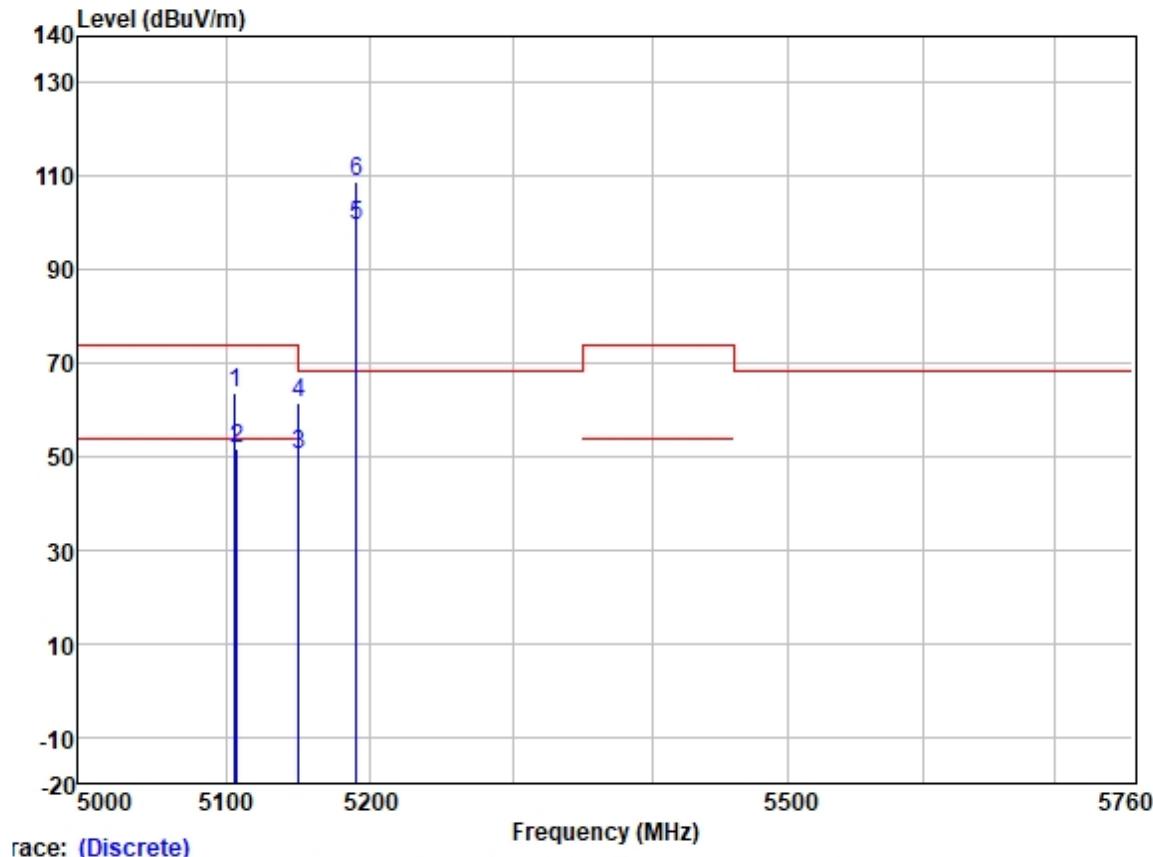
Mode: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB	
1	5104.153	49.81	31.72	5.65	36.86	50.32	54.00	-3.68	HORIZONTAL	Average
2	5104.153	61.62	31.72	5.65	36.86	62.13	74.00	-11.87	HORIZONTAL	Peak
3	5149.980	49.24	31.72	5.62	36.86	49.72	54.00	-4.28	HORIZONTAL	Average
4	5149.980	61.42	31.72	5.62	36.86	61.90	74.00	-12.10	HORIZONTAL	Peak
5	5190.000	88.19	31.73	5.60	36.87	88.65	-----	-----	HORIZONTAL	Average
6 *	5190.000	99.59	31.73	5.60	36.87	100.05	68.20	31.85	HORIZONTAL	Peak

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Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



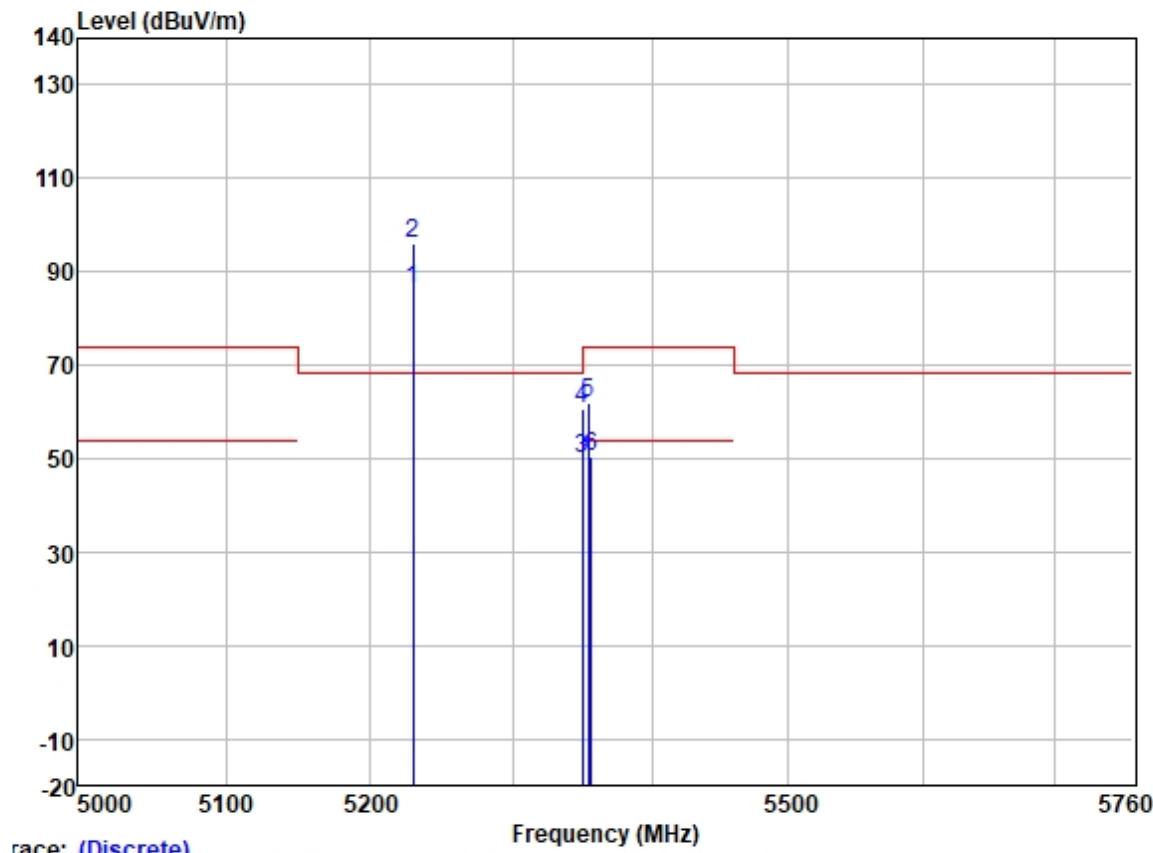
Mode: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB	
1	5106.528	62.98	31.72	5.65	36.86	63.49	74.00	-10.51	VERTICAL	Peak
2	5107.715	51.02	31.72	5.65	36.86	51.53	54.00	-2.47	VERTICAL	Average
3	5149.980	50.06	31.72	5.62	36.86	50.54	54.00	-3.46	VERTICAL	Average
4	5149.980	60.84	31.72	5.62	36.86	61.32	74.00	-12.68	VERTICAL	Peak
5	5190.000	99.08	31.73	5.60	36.87	99.54	-----	-----	VERTICAL	Average
6 *	5190.000	108.29	31.73	5.60	36.87	108.75	68.20	40.55	VERTICAL	Peak

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Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Type: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB		
1	5230.000	85.49	31.74	5.70	36.87	86.06	-----	-----	-----	HORIZONTAL	Average
2 *	5230.000	95.62	31.74	5.70	36.87	96.19	68.20	27.99	27.99	HORIZONTAL	Peak
3	5350.020	49.23	31.77	6.05	36.88	50.17	54.00	-3.83	-3.83	HORIZONTAL	Average
4	5350.020	59.66	31.77	6.05	36.88	60.60	74.00	-13.40	-13.40	HORIZONTAL	Peak
5	5354.155	60.97	31.78	6.03	36.88	61.90	74.00	-12.10	-12.10	HORIZONTAL	Peak
6	5356.428	49.45	31.78	6.03	36.88	50.38	54.00	-3.62	-3.62	HORIZONTAL	Average

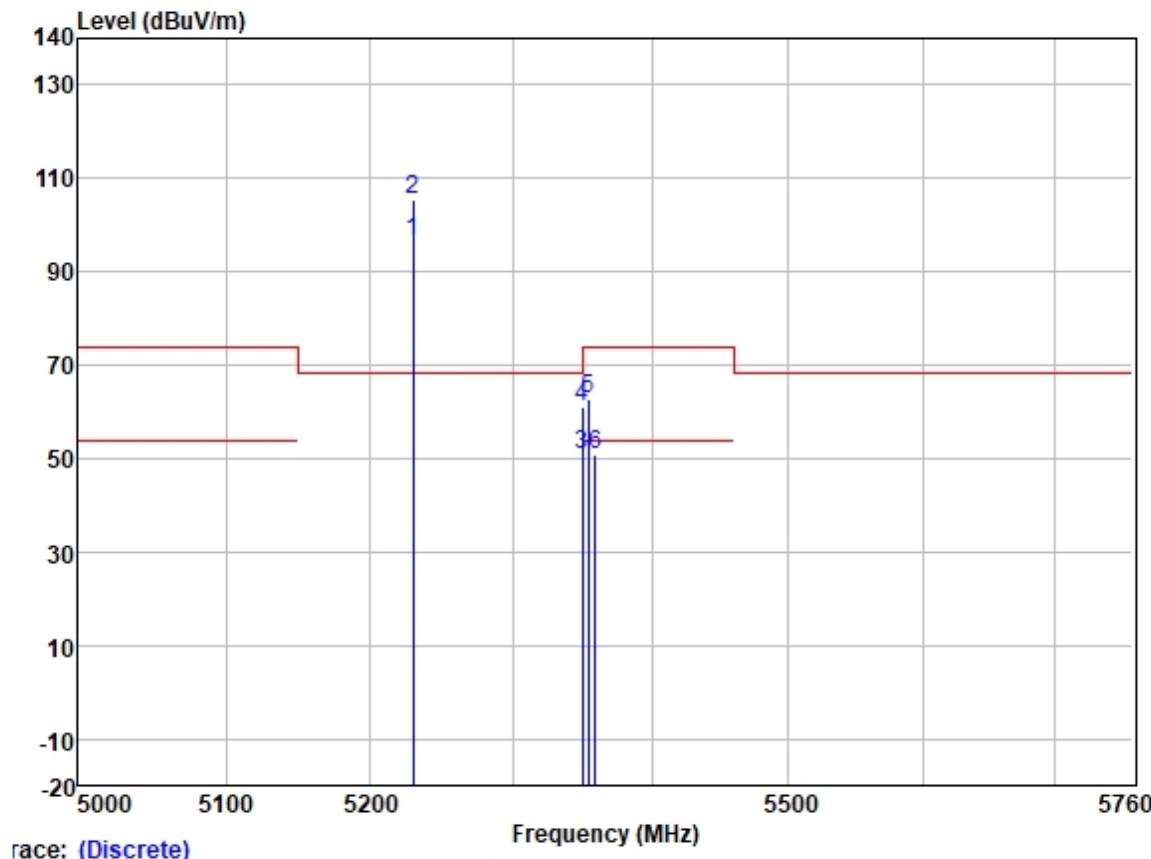
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中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



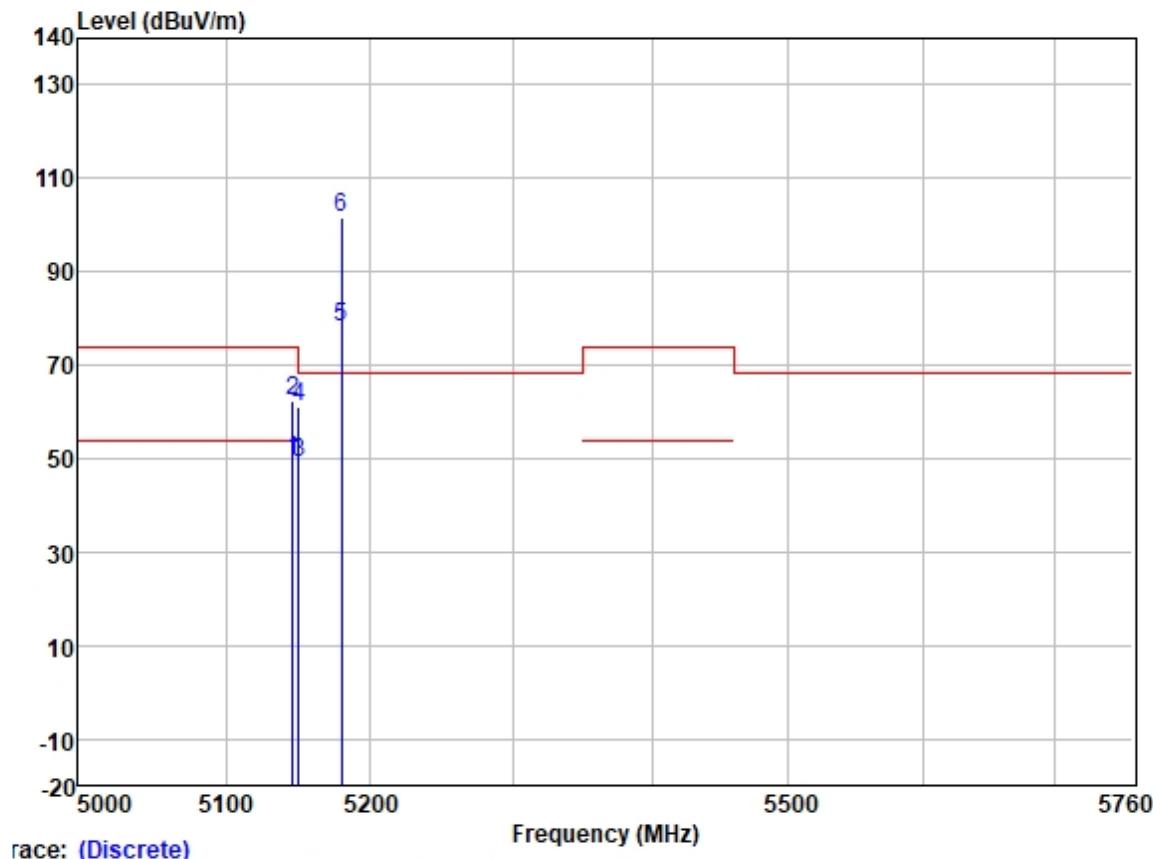
ReadAntenna	Cable	Preamp	Limit	Over	Remark										
					Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB	dB	dB	dB	dB			
1	5230.000	95.72	31.74	5.70	36.87	96.29	-----	-----	-----	-----	-----	-----	-----	VERTICAL	Average
2 *	5230.000	104.91	31.74	5.70	36.87	105.48	68.20	37.28	37.28	37.28	37.28	37.28	37.28	VERTICAL	Peak
3	5350.020	49.80	31.77	6.05	36.88	50.74	54.00	-3.26	-3.26	-3.26	-3.26	-3.26	-3.26	VERTICAL	Average
4	5350.020	60.10	31.77	6.05	36.88	61.04	74.00	-12.96	-12.96	-12.96	-12.96	-12.96	-12.96	VERTICAL	Peak
5	5353.831	61.64	31.77	6.05	36.88	62.58	74.00	-11.42	-11.42	-11.42	-11.42	-11.42	-11.42	VERTICAL	Peak
6	5358.863	50.01	31.78	6.03	36.88	50.94	54.00	-3.06	-3.06	-3.06	-3.06	-3.06	-3.06	VERTICAL	Average

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Test Mode: 01; Polarity: Horizontal; Modulation:802.11ac; Bandwidth:20MHz; Channel:Low



Mode: (Discrete)

ReadAntenna	Cable	Preamp	Limit	Over	Limit		Over	Pol/Phase	Remark
					Freq	Level			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 5145.859	48.90	31.72	5.62	36.86	49.38	54.00	-4.62	HORIZONTAL	Average
2 5145.859	61.77	31.72	5.62	36.86	62.25	74.00	-11.75	HORIZONTAL	Peak
3 5149.980	48.59	31.72	5.62	36.86	49.07	54.00	-4.93	HORIZONTAL	Average
4 5149.980	60.67	31.72	5.62	36.86	61.15	74.00	-12.85	HORIZONTAL	Peak
5 5180.000	77.85	31.73	5.61	36.87	78.32	-----	-----	HORIZONTAL	Average
6 * 5180.000	100.98	31.73	5.61	36.87	101.45	68.20	33.25	HORIZONTAL	Peak

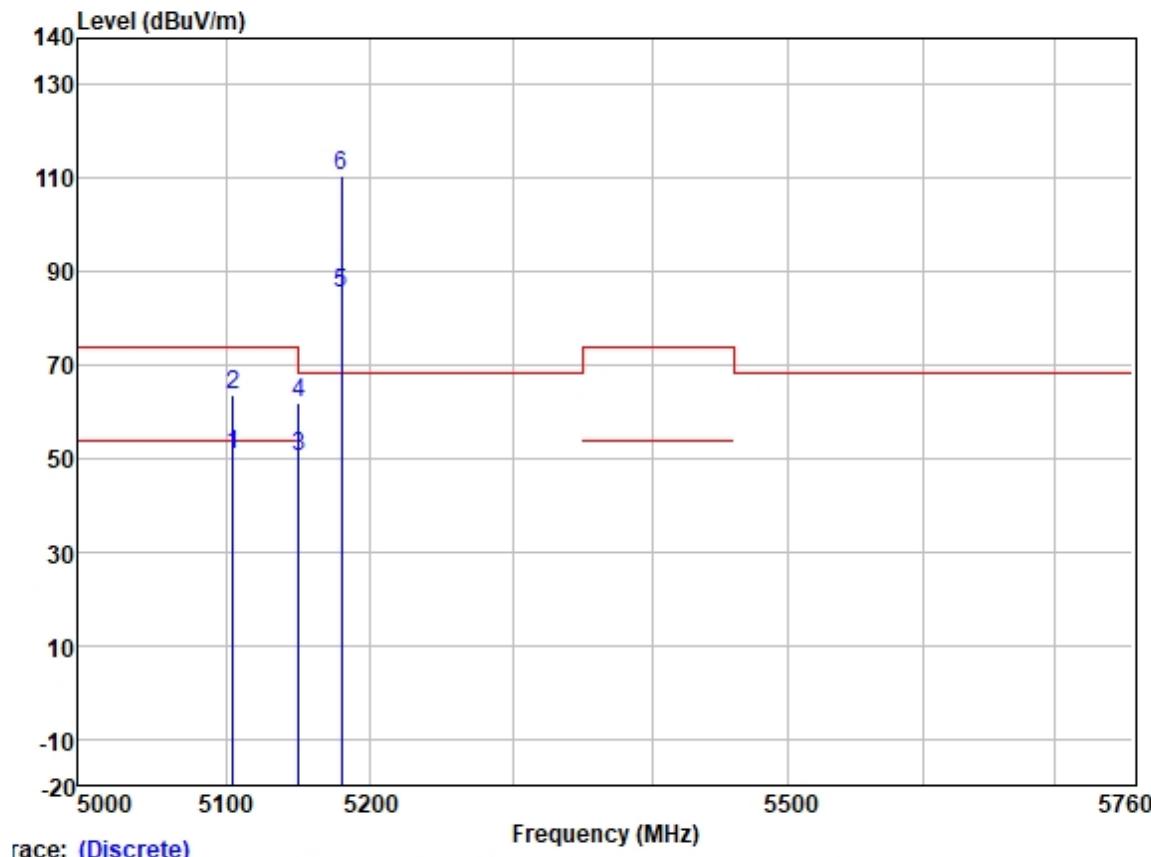
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Test Mode: 01; Polarity: Vertical; Modulation:802.11ac; Bandwidth:20MHz; Channel:Low



Mode: (Discrete)

Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level				
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5105.053	50.45	31.72	5.65	36.86	50.96	54.00	-3.04	VERTICAL	Average
2	5105.053	63.15	31.72	5.65	36.86	63.66	74.00	-10.34	VERTICAL	Peak
3	5149.980	49.97	31.72	5.62	36.86	50.45	54.00	-3.55	VERTICAL	Average
4	5149.980	61.38	31.72	5.62	36.86	61.86	74.00	-12.14	VERTICAL	Peak
5	5180.000	84.89	31.73	5.61	36.87	85.36	-----	-----	VERTICAL	Average
6 *	5180.000	110.21	31.73	5.61	36.87	110.68	68.20	42.48	VERTICAL	Peak

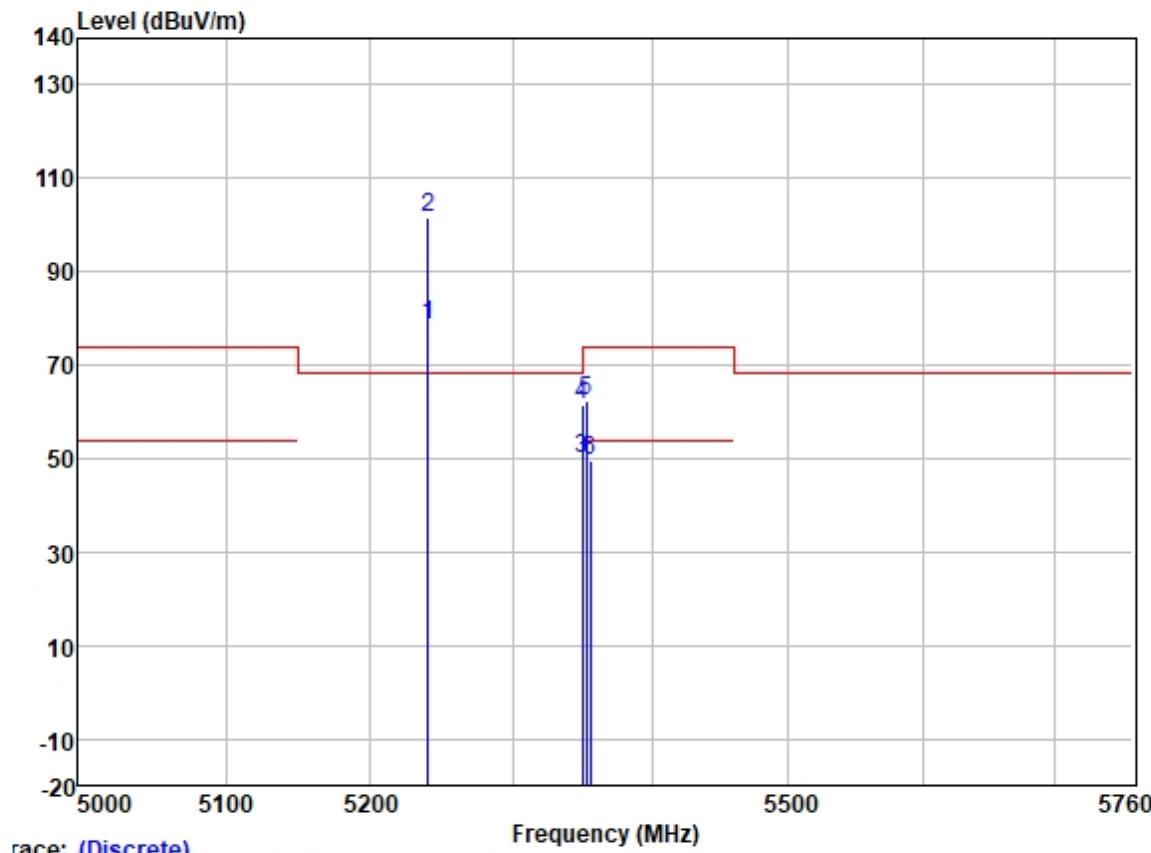
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Guangzhou Branch Testing Center EEC Laboratory

Test Mode: 01; Polarity: Horizontal; Modulation:802.11ac; Bandwidth:20MHz; Channel:High



Mode: (Discrete)

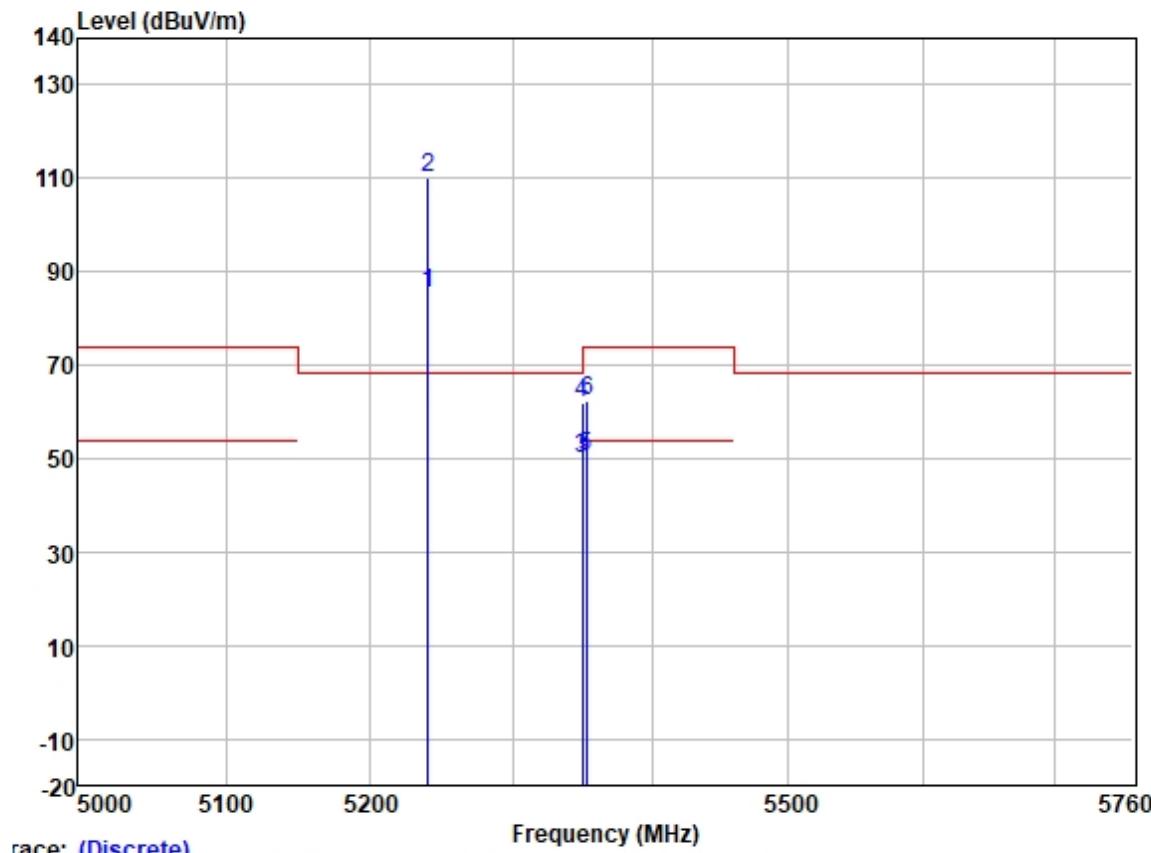
ReadAntenna	Cable	Preamp	Limit	Over	Remark								
					Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	dB	dB	dB	dB	dB	
1	5240.000	77.99	31.75	5.74	36.87	78.61	-----	-----	-----	-----	-----	-----	HORIZONTAL Average
2 *	5240.000	101.13	31.75	5.74	36.87	101.75	68.20	33.55	33.55	HORIZONTAL	Peak	Peak	
3	5350.020	48.87	31.77	6.05	36.88	49.81	54.00	-4.19	54.00	HORIZONTAL	Average		
4	5350.020	60.66	31.77	6.05	36.88	61.60	74.00	-12.40	74.00	HORIZONTAL	Peak		
5	5352.628	61.23	31.77	6.05	36.88	62.17	74.00	-11.83	74.00	HORIZONTAL	Peak		
6	5355.321	48.62	31.78	6.03	36.88	49.55	54.00	-4.45	54.00	HORIZONTAL	Average		

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Test Mode: 01; Polarity: Vertical; Modulation:802.11ac; Bandwidth:20MHz; Channel:High



Mode: (Discrete)

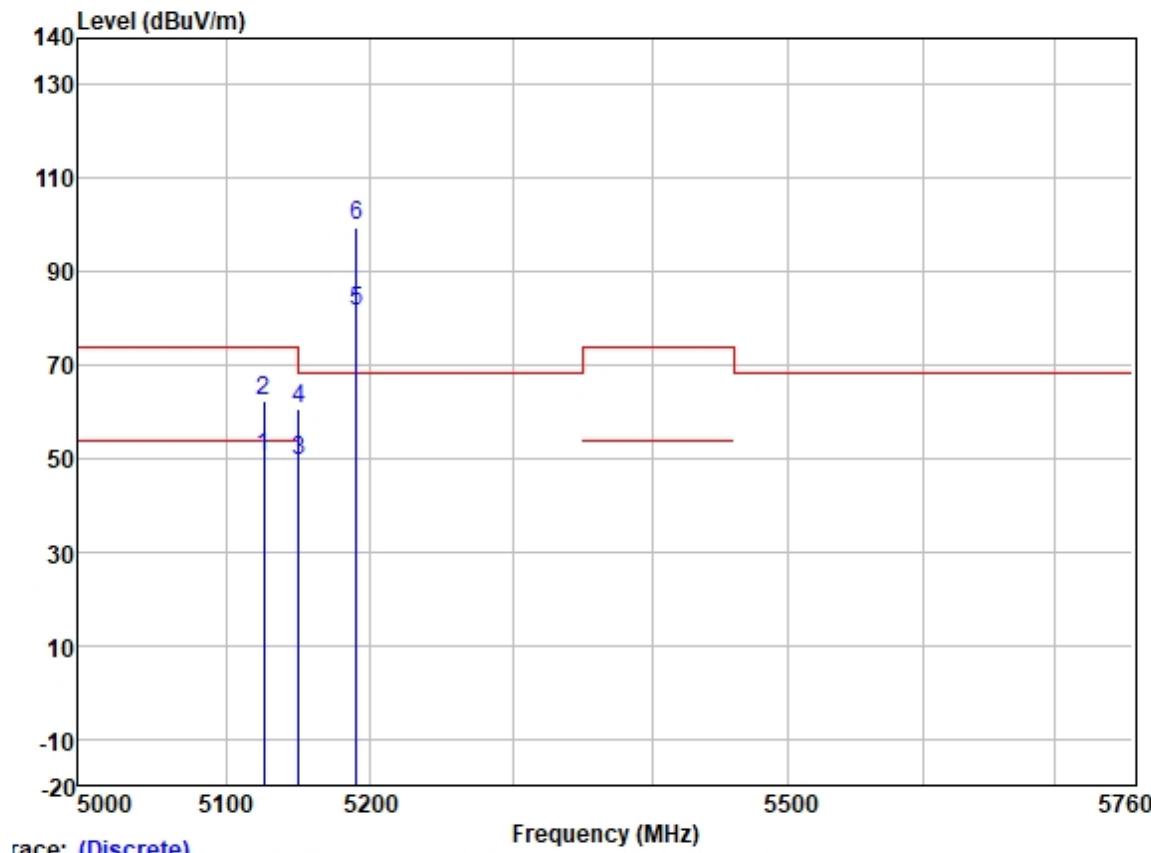
Freq	ReadAntenna		Cable		Preamp		Limit	Over	Pol/Phase	Remark
	MHz	Level	Factor	Loss	Factor	Level	dBuV/m	dBuV/m	dB	
1	5240.000	84.75	31.75	5.74	36.87	85.37	-----	-----	-----	VERTICAL Average
2 *	5240.000	109.58	31.75	5.74	36.87	110.20	68.20	42.00	VERTICAL	Peak
3	5350.020	49.13	31.77	6.05	36.88	50.07	54.00	-3.93	VERTICAL	Average
4	5350.020	60.77	31.77	6.05	36.88	61.71	74.00	-12.29	VERTICAL	Peak
5	5352.770	49.52	31.77	6.05	36.88	50.46	54.00	-3.54	VERTICAL	Average
6	5353.620	61.40	31.77	6.05	36.88	62.34	74.00	-11.66	VERTICAL	Peak

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Test Mode: 01; Polarity: Horizontal; Modulation:802.11ac; Bandwidth:40MHz; Channel:Low

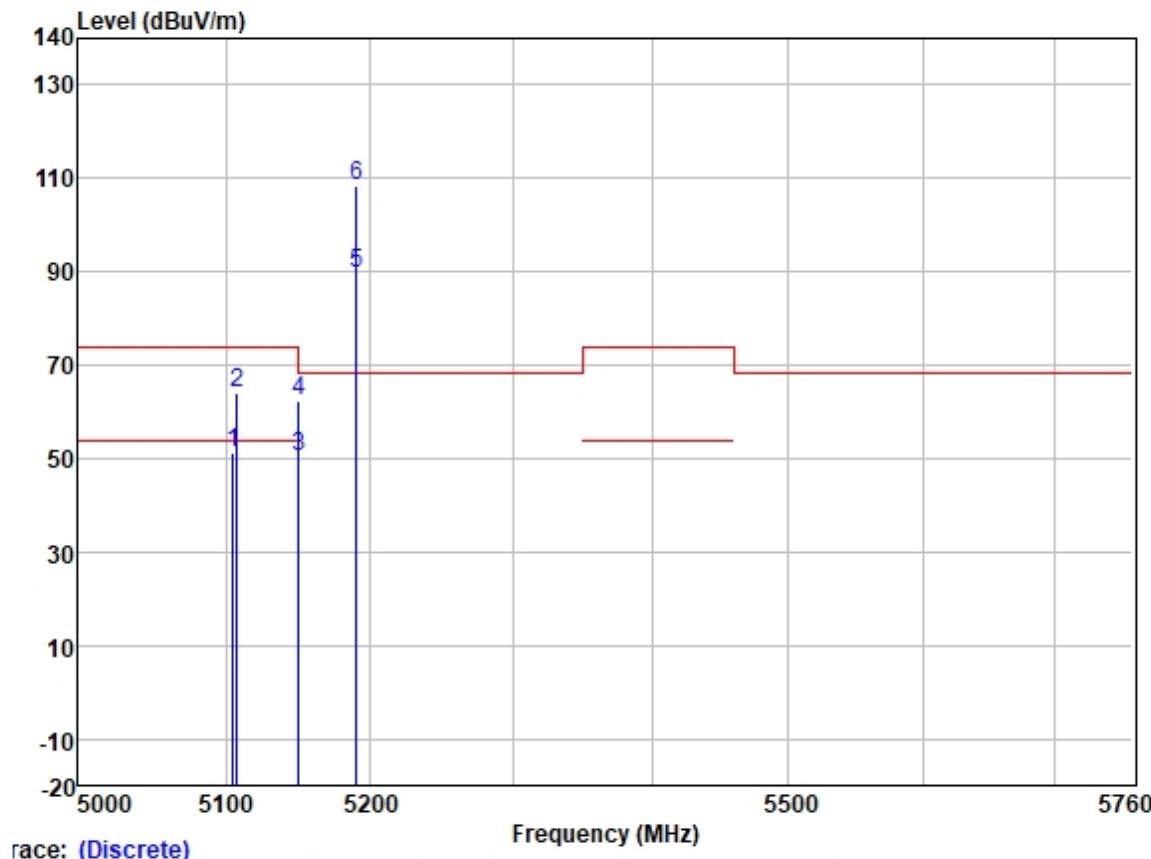


ReadAntenna	Cable	Preamp	Limit	Over	Limit		Over	Pol/Phase	Remark
					Freq	Level			
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 5126.042	49.71	31.72	5.64	36.86	50.21	54.00	-3.79	HORIZONTAL	Average
2 5126.042	61.88	31.72	5.64	36.86	62.38	74.00	-11.62	HORIZONTAL	Peak
3 5149.980	49.21	31.72	5.62	36.86	49.69	54.00	-4.31	HORIZONTAL	Average
4 5149.980	60.22	31.72	5.62	36.86	60.70	74.00	-13.30	HORIZONTAL	Peak
5 5190.000	81.00	31.73	5.60	36.87	81.46	-----	-----	HORIZONTAL	Average
6 * 5190.000	99.22	31.73	5.60	36.87	99.68	68.20	31.48	HORIZONTAL	Peak

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Test Mode: 01; Polarity: Vertical; Modulation:802.11ac; Bandwidth:40MHz; Channel:Low



Sample	Freq	ReadAntenna		Cable		Preamp	Limit	Over	Pol/Phase	Remark
		Freq	Level	Factor	Loss					
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	5104.509	50.69	31.72	5.65	36.86	51.20	54.00	-2.80	VERTICAL	Average
2	5107.715	63.35	31.72	5.65	36.86	63.86	74.00	-10.14	VERTICAL	Peak
3	5149.980	49.87	31.72	5.62	36.86	50.35	54.00	-3.65	VERTICAL	Average
4	5149.980	61.68	31.72	5.62	36.86	62.16	74.00	-11.84	VERTICAL	Peak
5	5190.000	89.31	31.73	5.60	36.87	89.77	-----	-----	VERTICAL	Average
6 *	5190.000	108.15	31.73	5.60	36.87	108.61	68.20	40.41	VERTICAL	Peak

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