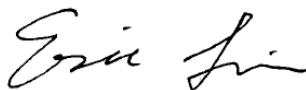


TEST REPORT

Application No.: KSCR2204000422AT
FCC ID: 2AAGE-TAB10RK66
.Applicant: Chengdu Vantron Technology Co., Ltd.
Address of Applicant: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China
Manufacturer: Chengdu Vantron Technology Co., Ltd.
Address of Manufacturer: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China
Factory: Chengdu Vantron Technology Co., Ltd.
Address of Factory: No.5 GaoPeng Road, Hi-Tech Zone, Chengdu, SiChuan, P.R. China
Equipment Under Test (EUT):
EUT Name: Tablet
Model No.: M10 Lite
Trade Mark: Vantron
Standard(s) : 47 CFR Part 15, Subpart E 15.407
Date of Receipt: 2022-04-02
Date of Test: 2022-04-15 to 2022-07-15
Date of Issue: 2022-08-10

Test Result:	Pass*
---------------------	--------------

* In the configuration tested, the EUT complied with the standards specified above.



Eric Lin
Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2022-08-10		Original

Authorized for issue by:			
		Pawn. Liu	
		Pawn.Liu/Project Engineer	
		Eric Lin	
		Eric Lin /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
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)	Pass
Duty Cycle		KDB 789033 II B 1	KDB 789033 D02 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 (Above 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	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
Frequency Stability		ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart C 15.407 (g)	Pass
Radiated Emissions (Below 1GHz)		KDB 789033 D02 II G	47 CFR Part 15, Subpart C 15.209 & 15.407(b)	Pass

Remark: This report use the reference data documented in the test report no KSCR220400042004. So the data of worse case have test in this report.



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Report No.: KSCR220400042204

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.8V by Battery Battery Model:GSP27103107 Battery:8000mAh,3.8V,30.4Wh
Operation Frequency (20MHz):	U-NII-1: 5180-5240MHz; U-NII-3: 5745-5825MHz
Operation Frequency (40MHz):	U-NII-1: 5190-5230MHz; U-NII-3: 5755-5795MHz
Operation Frequency (80MHz):	U-NII-1: 5210MHz; U-NII-3: 5775MHz
Moudulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz; 802.11n(HT40)/ac(HT40): 40MHz; 802.11ac(HT80): 80MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	U-NII-1:4.3dBi;U-NII-3:3dBi (Provided by manufacturer)
Test Voltage:	AC 120V/60Hz

4.2 Power level setting using in test:

Channel	802.11a	802.11n(HT20)	802.11ac(VHT20)
	Ant 1	Ant 1	Ant 1
48	Default	Default	Default
Channel	802.11n(HT40)	802.11ac(VHT40)	
	Ant 1	Ant 1	
46	Default	Default	
Channel	802.11ac(VHT80)		
	Ant 1		
155	Default		

4.3 Environment Parameter

Environment Parameter	Selected Values During Tests
Relative Humidity	Ambient



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Value	Temperature(°C)	Voltage(V)
NTNV	25	AC 120
Note:		
NV:Normal Voltage	LV:Low Extreme Test Voltage	HV:High Extreme Test Voltage
NT:Normal Temperature	LT:Low Extreme Test Temperature	HT:High Extreme Test Temperature

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Mingxin	MX15U-050300UU	/

4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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Report No.: KSCR220400042204

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4.6 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).

2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

4.7 Test Facility

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

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals (150kHz-30MHz)						
1	EMI Test Receive	R&S	ESCI	KS301101	01/22/2022	01/21/2023
2	LISN	R&S	ENV216	KS301197	01/22/2022	01/21/2023
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/22/2022	01/21/2023
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/22/2022	01/21/2023
5	CE test Cable	Thermax	/	CZ301102	11/14/2021	11/13/2022
6	Test Software	Farad	EZ-EMC	/	N.C.R	N.C.R
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	10/11/2021	10/10/2022
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	09/17/2021	09/16/2022
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/22/2022	01/21/2023
4	Signal Generator	R&S	SMW200A	KSEM020-1	10/12/2021	10/11/2022
5	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/27/2021	08/26/2022
6	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	09/23/2021	09/22/2022
7	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	04/01/2022	03/31/2023
8	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	10/12/2021	10/11/2022
9	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
10	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
11	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/16/2022	01/15/2023
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	04/01/2021	03/31/2023
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	04/01/2021	03/31/2023
15	Software	BST	TST-PASS	/	N/A	N/A
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	10/11/2021	10/10/2022
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	04/01/2022	03/31/2023
3	Signal Generator	Agilent	E8257C	KS301066	10/18/2021	10/17/2022
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	04/13/2021	04/12/2023
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2021	06/28/2023
6	Bilog Antenna	SCHWARZBECK	VULB9160	CZ301016	04/13/2021	04/12/2024
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	10/26/2020	10/25/2022
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	02/22/2021	02/21/2023
9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	03/22/2022	03/21/2023
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/22/2022	01/21/2023
11	Amplifier(18~40GHz)	COM-POWER	PAM-840A	KUS1710E001	01/22/2022	01/21/2023
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	11/14/2021	11/13/2022
13	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	01/04/2022	31/03/2023
14	Software	Faratronic	EZ-EMC-v 3A1	/	N/A	N/A



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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

Standard 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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PIFA Antenna and no consideration of replacement. The best case gain of the U-NII-1:4.3dBi;U-NII-3:3dBi;

Antenna location: Refer to Appendix (Internal Photos)



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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

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 signaling 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:

RF chip BCM43456 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 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207 & 15.407 b(6)

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dB μ V)	
	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 logarithm of the frequency.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

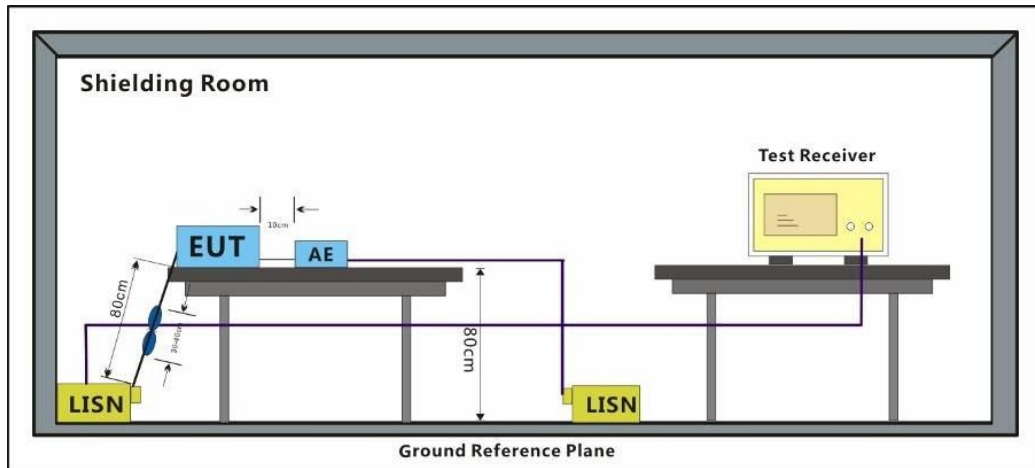


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7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



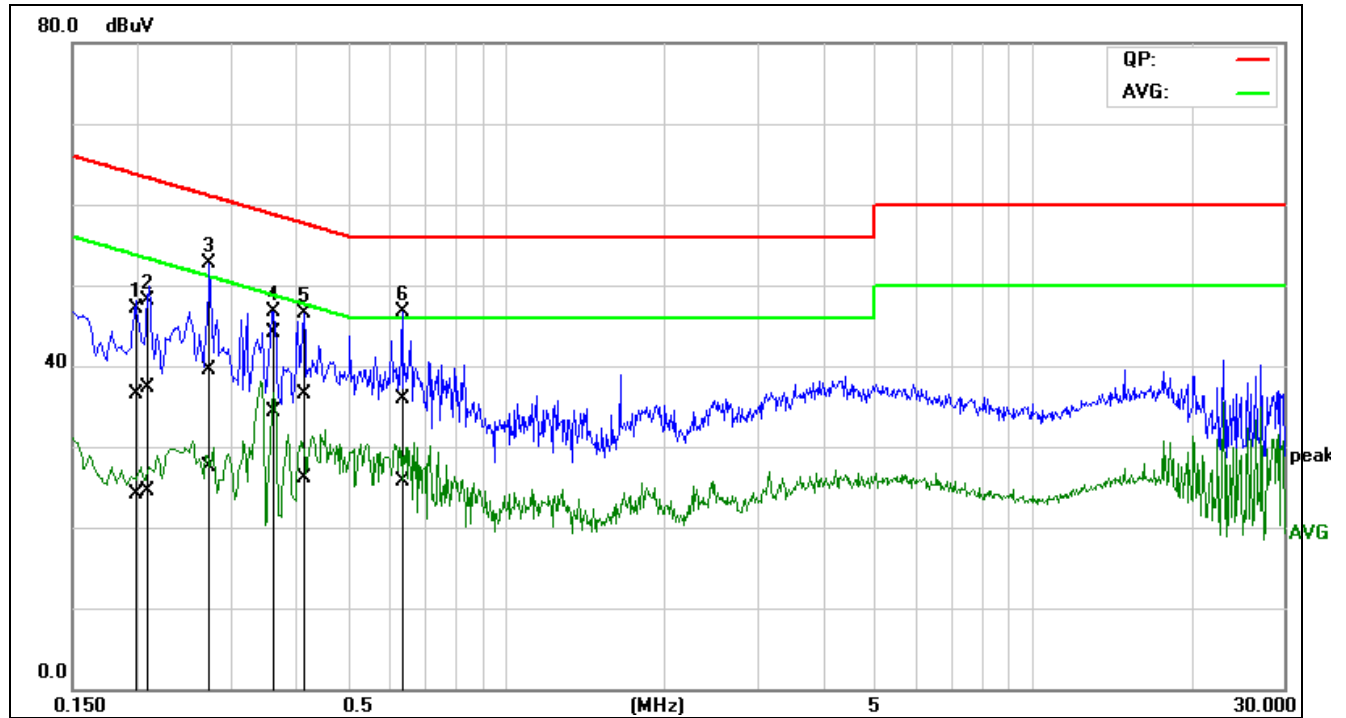
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Test Mode: 01; Line: Live line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2003	16.94	4.65	19.50	36.44	24.15	63.60	53.60	-27.16	-29.45	Pass
2	0.2056	17.83	5.08	19.50	37.33	24.58	63.38	53.38	-26.05	-28.80	Pass
3	0.2752	19.90	7.98	19.51	39.41	27.49	60.96	50.96	-21.55	-23.47	Pass
4*	0.3585	24.55	14.71	19.52	44.07	34.23	58.76	48.76	-14.69	-14.53	Pass
5	0.4143	17.03	6.49	19.54	36.57	26.03	57.56	47.56	-20.99	-21.53	Pass
6	0.6400	16.26	6.15	19.57	35.83	25.72	56.00	46.00	-20.17	-20.28	Pass



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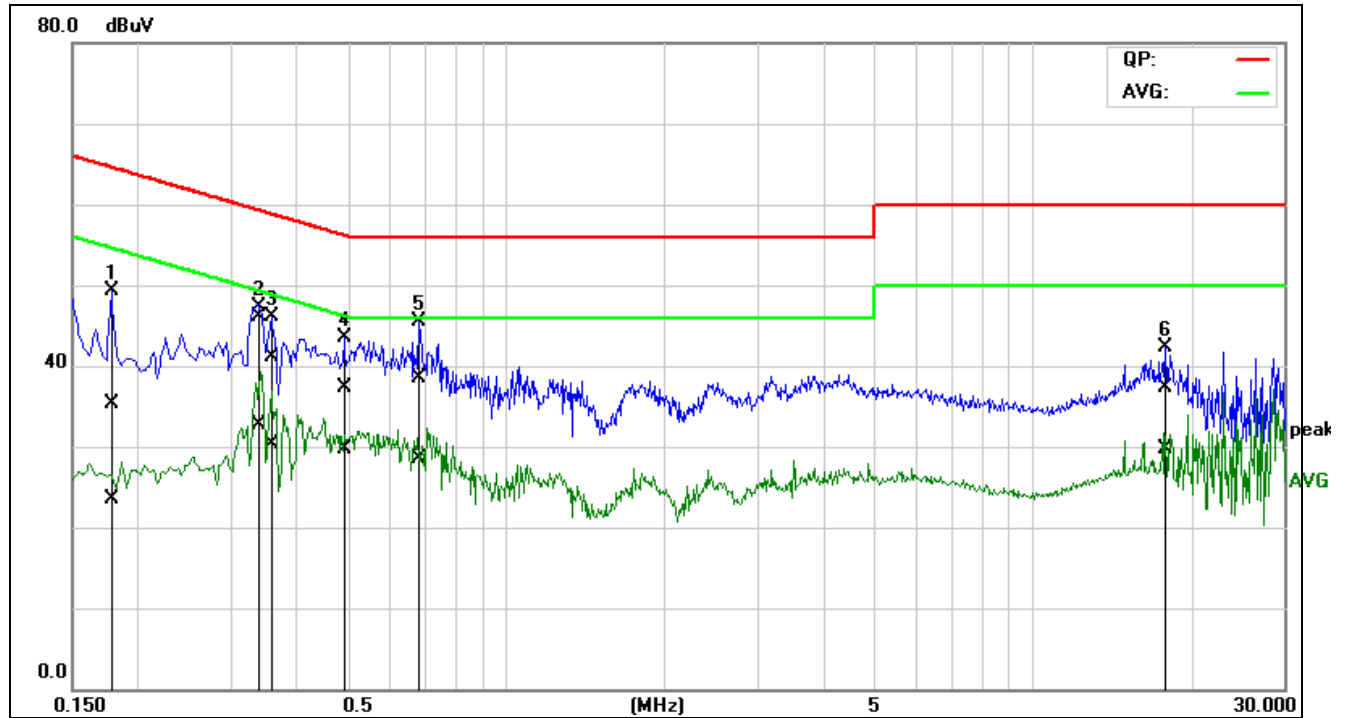
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Test Mode: 01; Line: Neutral Line



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1796	15.90	4.08	19.49	35.39	23.57	64.50	54.50	-29.11	-30.93	Pass
2*	0.3422	26.69	13.16	19.51	46.20	32.67	59.15	49.15	-12.95	-16.48	Pass
3	0.3538	21.52	10.88	19.51	41.03	30.39	58.87	48.87	-17.84	-18.48	Pass
4	0.4964	17.72	10.05	19.56	37.28	29.61	56.06	46.06	-18.78	-16.45	Pass
5	0.6872	18.87	8.97	19.56	38.43	28.53	56.00	46.00	-17.57	-17.47	Pass
6	17.9180	16.94	9.41	20.30	37.24	29.71	60.00	50.00	-22.76	-20.29	Pass



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7.2 Duty Cycle

Test Requirement KDB 789033 D02 II B 1

Test Method: KDB 789033 II B 1

7.2.1 E.U.T. Operation

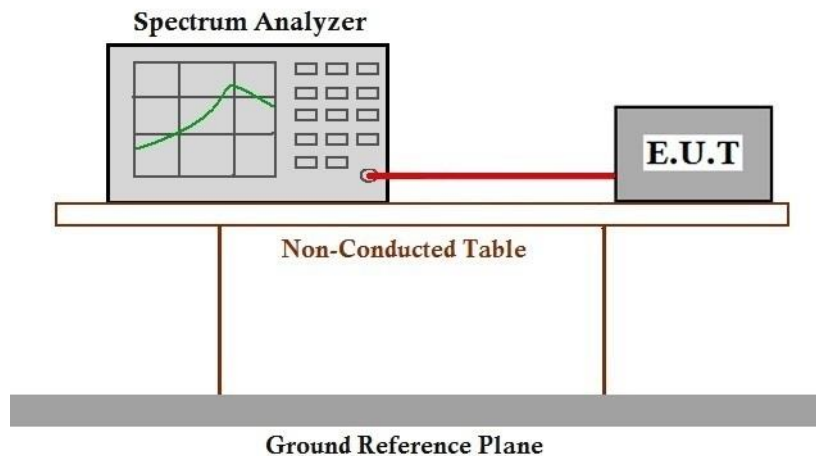
Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.2.3 Test Setup Diagram



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Report No.: KSCR220400042204

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7.2.4 Measurement Procedure and Data

Please Refer to Appendix D for KSCR220400042204



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7.3 99% Bandwidth

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

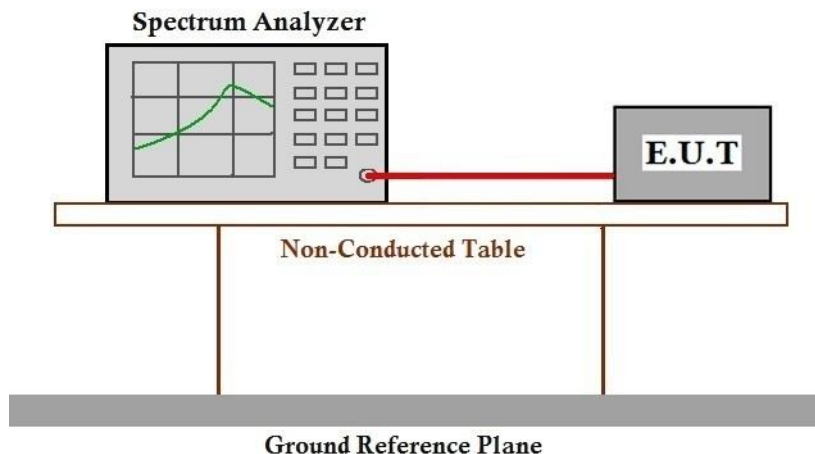
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.3.3 Test Setup Diagram



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7.3.4 Measurement Procedure and Data

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7.4 26dB Emission bandwidth

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

Test Method: KDB 789033 D02 II C 1

7.4.1 E.U.T. Operation

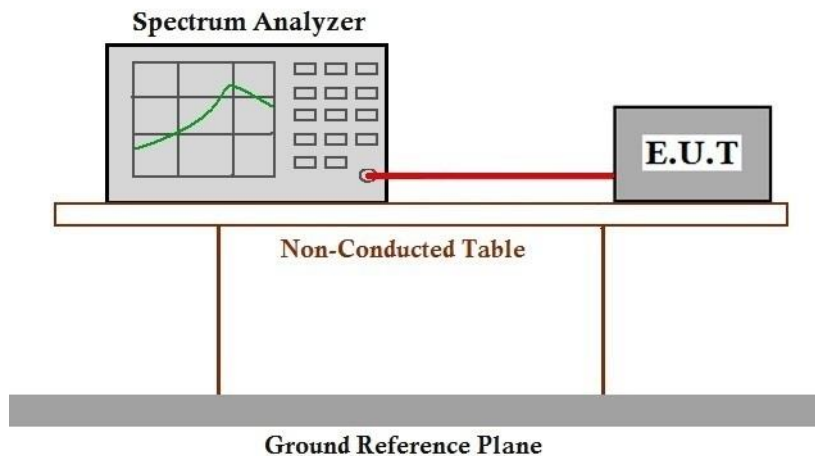
Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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



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7.4.4 Measurement Procedure and Data

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7.5 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

7.5.1 E.U.T. Operation

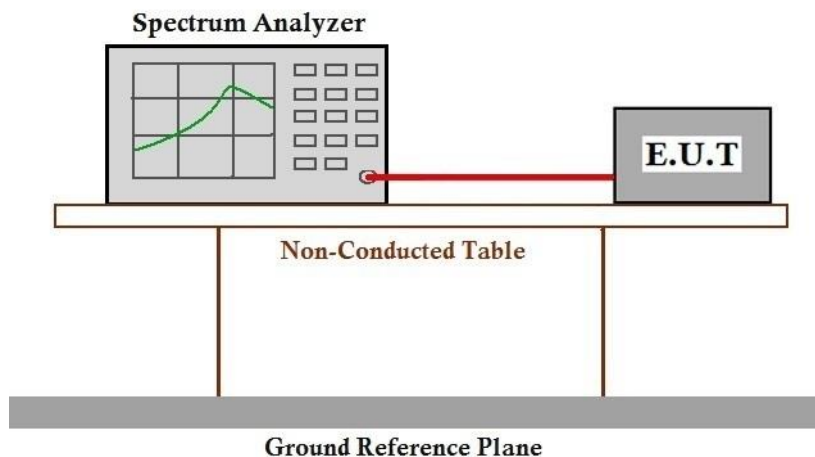
Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.5.3 Test Setup Diagram



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7.5.4 Measurement Procedure and Data

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7.6 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:	<p>* Where B is the 26dB emission bandwidth in MHz.</p> <p>The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</p>

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.



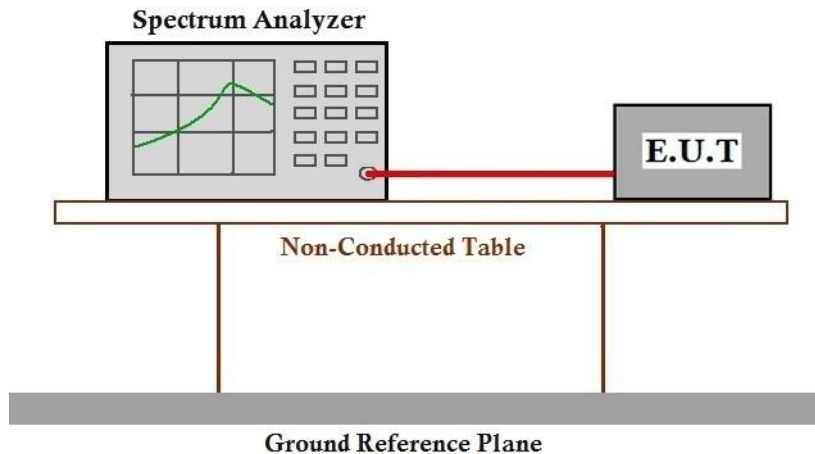
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7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

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7.7 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.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.



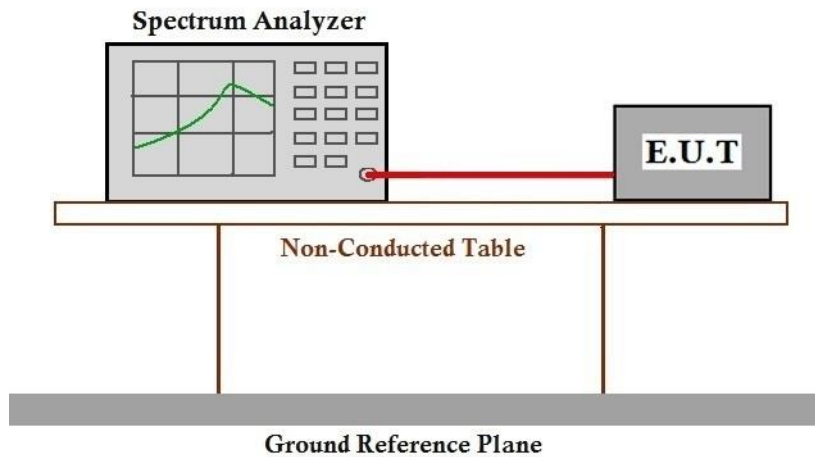
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7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

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7.8 Radiated Emissions (Above 1GHz)

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

Test Method: KDB 789033 D02 II G

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1GHz	500	3
<p>*(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.</p> <p>(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.</p> <p>(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.</p> <p>(4) For transmitters operating in the 5.725-5.85 GHz band:</p> <p>(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.</p> <p>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.</p>		

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
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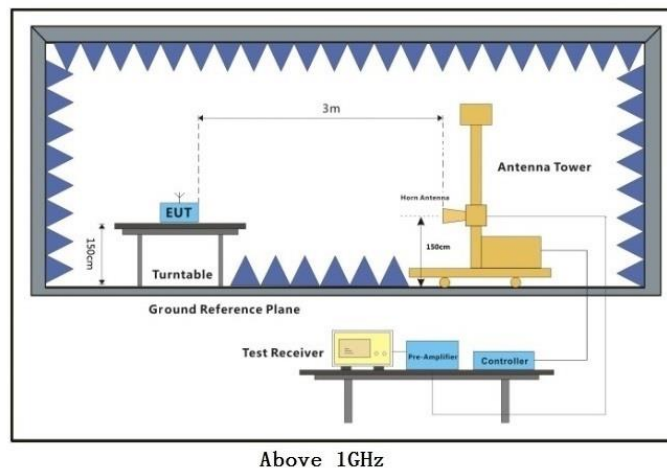
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Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 6Mbps is the worst case of IEEE 802.11a; 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.8.3 Test Setup Diagram



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7.8.4 Measurement Procedure and Data

- a. 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.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 18GHz to 40GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



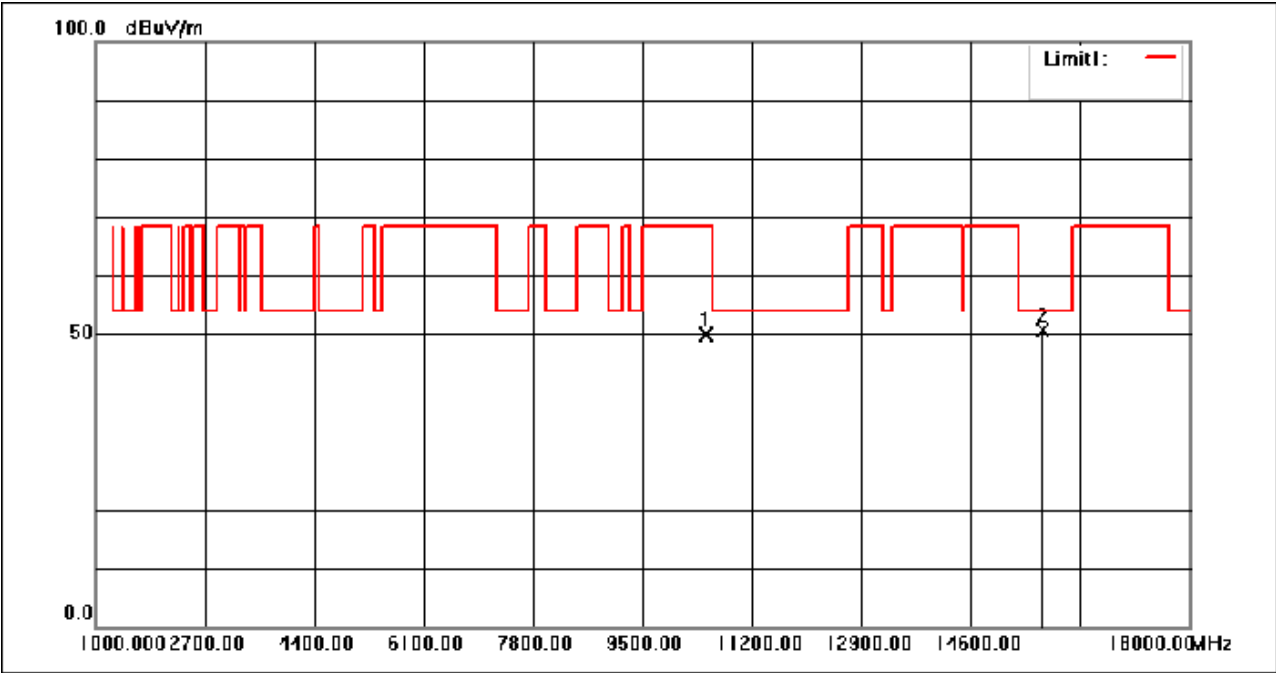
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	49.51	0.40	49.91	68.30	-18.39	peak
2	15720.000	44.53	6.10	50.63	54.00	-3.37	peak



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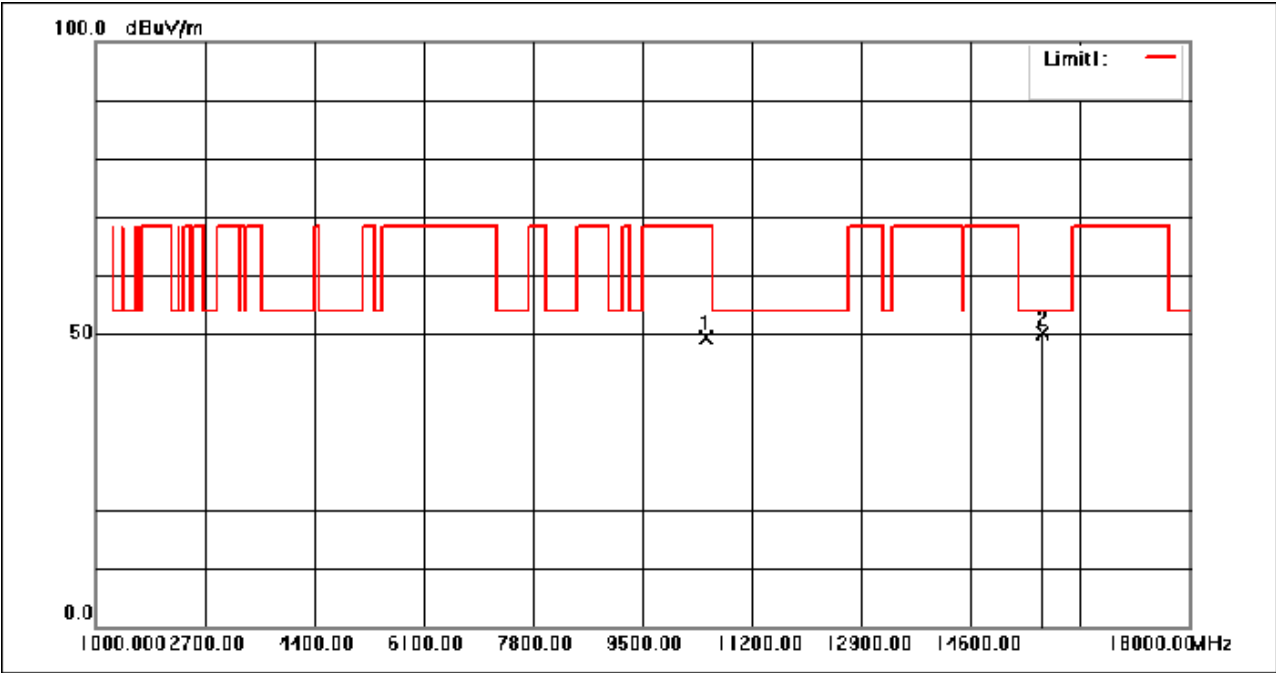
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	49.07	0.40	49.47	68.30	-18.83	peak
2	15720.000	44.10	6.10	50.20	54.00	-3.80	peak



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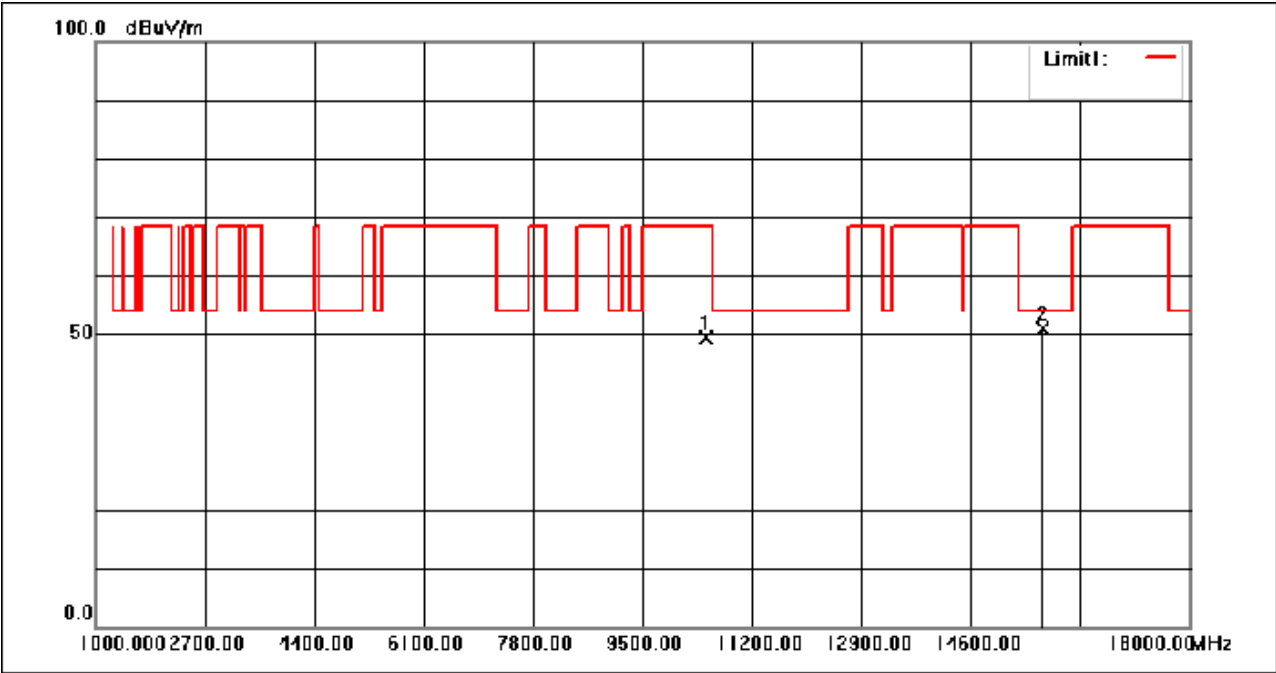
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	49.06	0.40	49.46	68.30	-18.84	peak
2	15720.000	44.80	6.10	50.90	54.00	-3.10	peak



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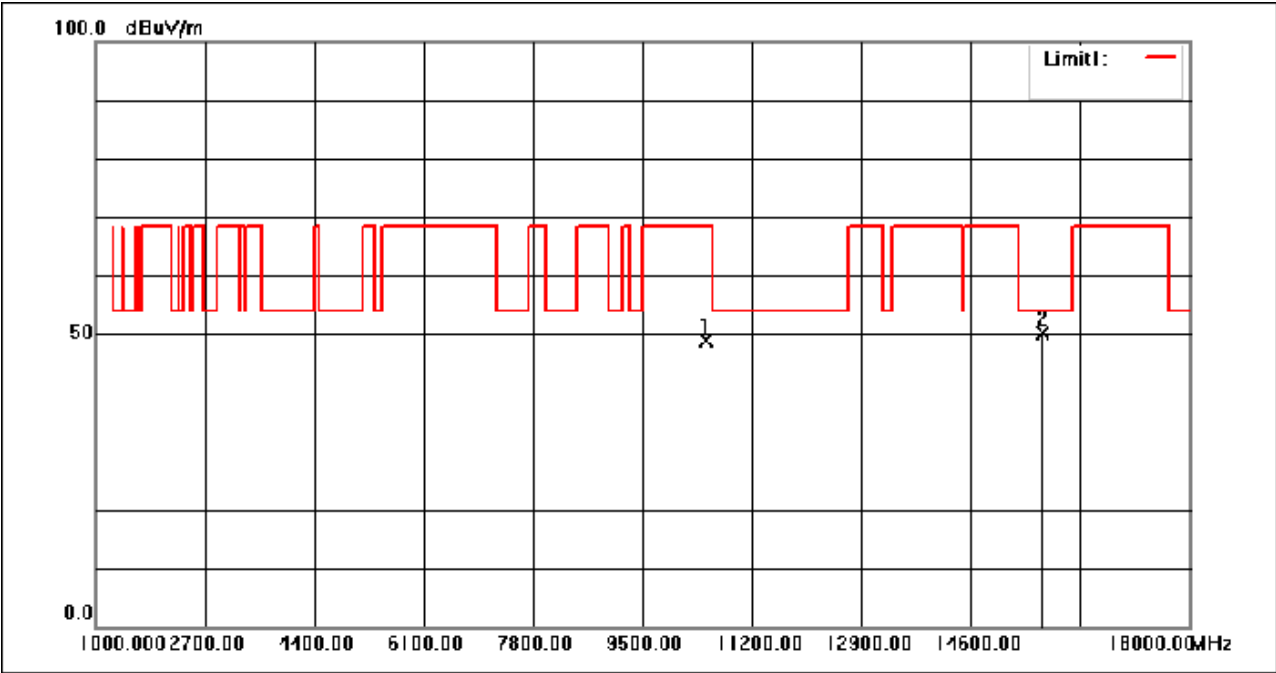
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	48.47	0.40	48.87	68.30	-19.43	peak
2	15720.000	44.01	6.10	50.11	54.00	-3.89	peak



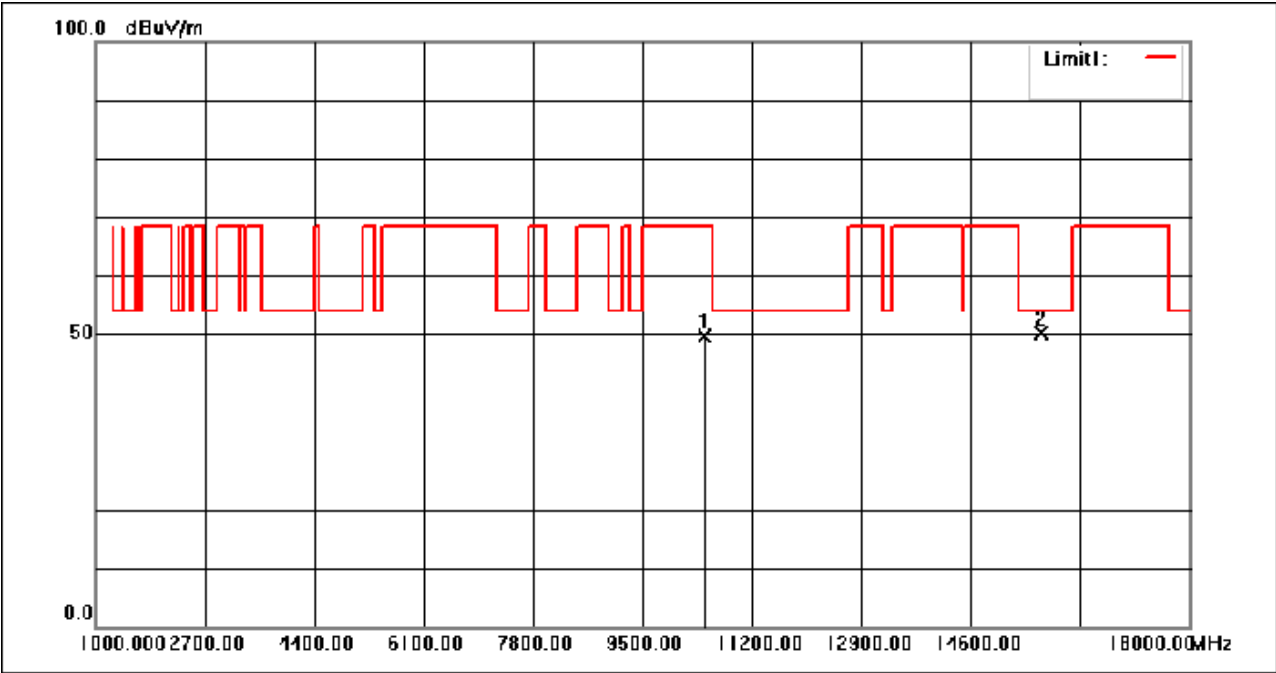
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	49.23	0.36	49.59	68.30	-18.71	peak
2	15690.000	44.10	6.04	50.14	54.00	-3.86	peak



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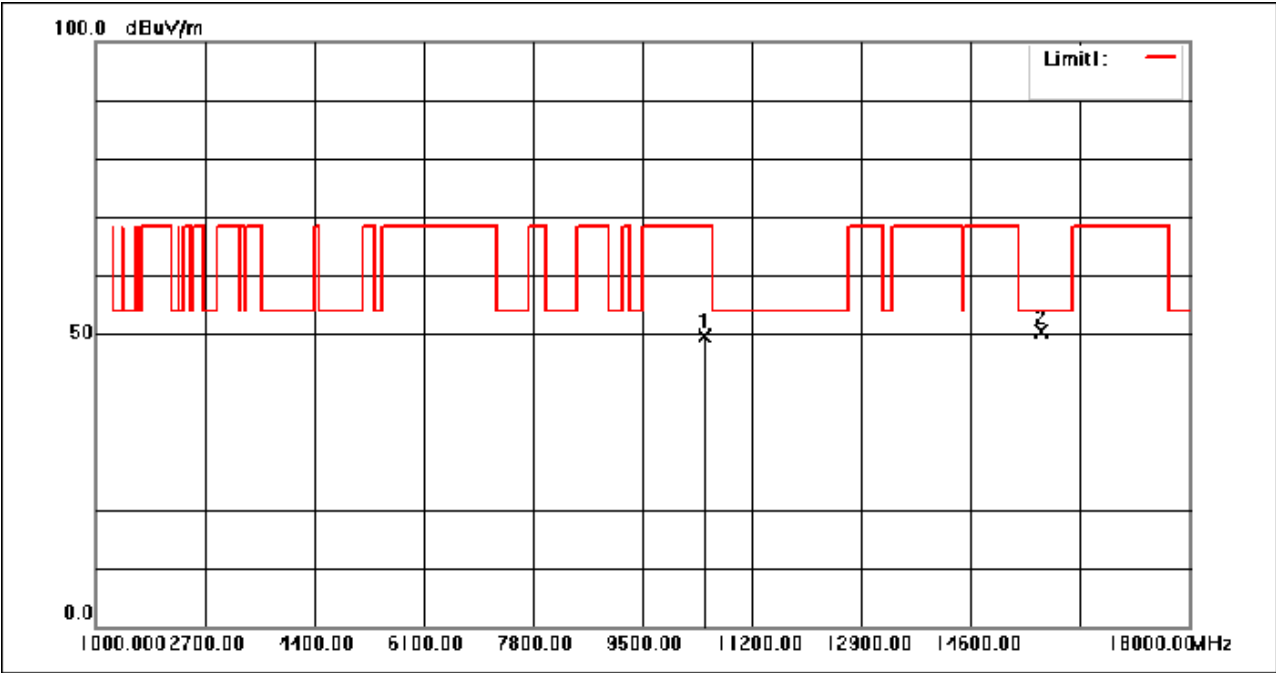
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	49.31	0.36	49.67	68.30	-18.63	peak
2	15690.000	44.45	6.04	50.49	54.00	-3.51	peak



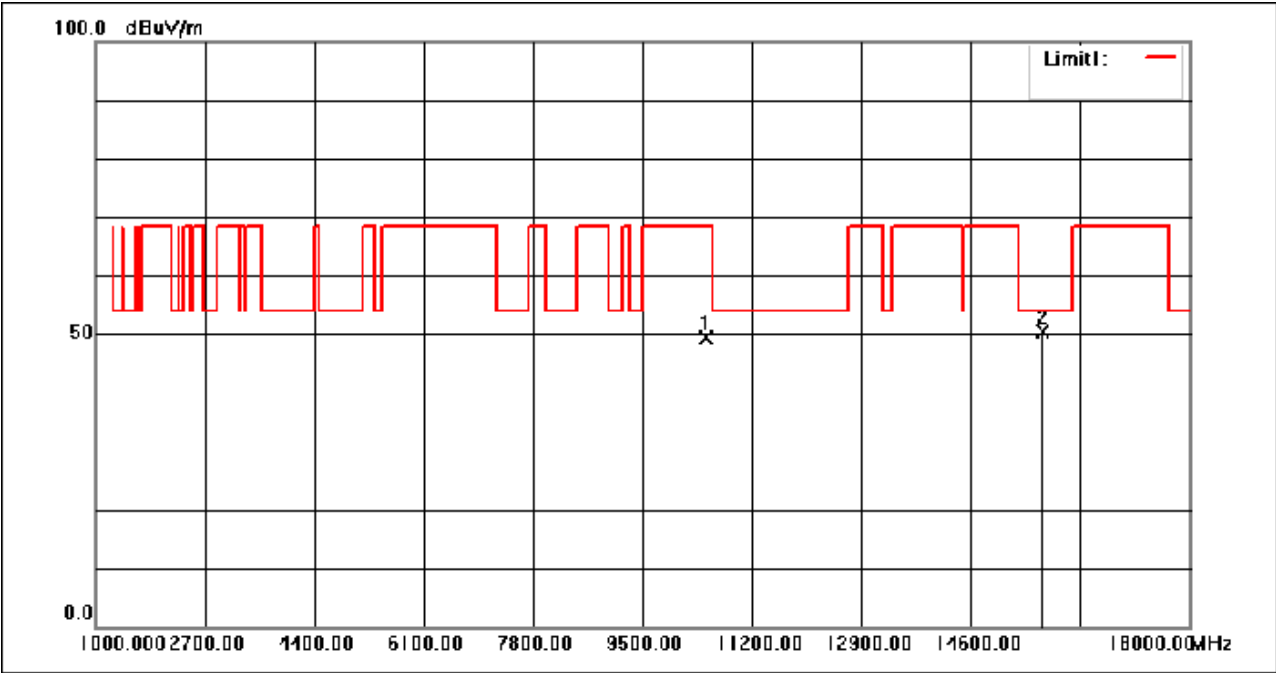
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	48.99	0.40	49.39	68.30	-18.91	peak
2	15720.000	44.20	6.10	50.30	54.00	-3.70	peak



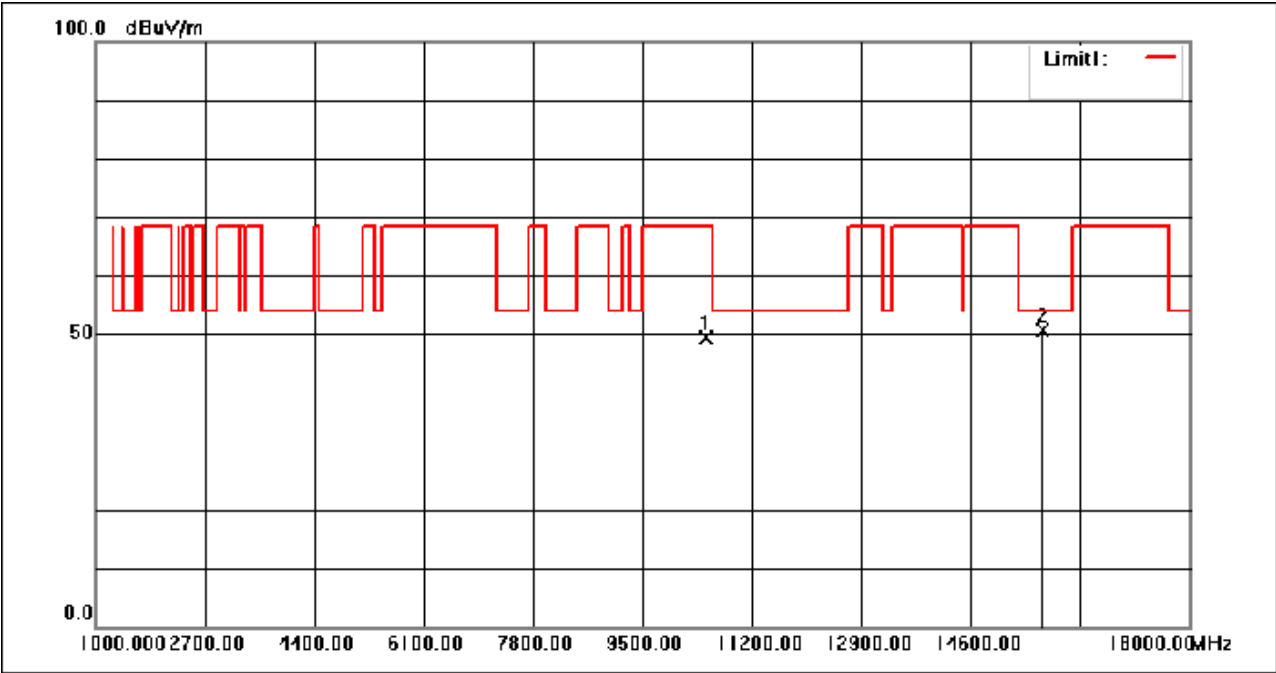
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10480.000	48.97	0.40	49.37	68.30	-18.93	peak
2	15720.000	44.64	6.10	50.74	54.00	-3.26	peak



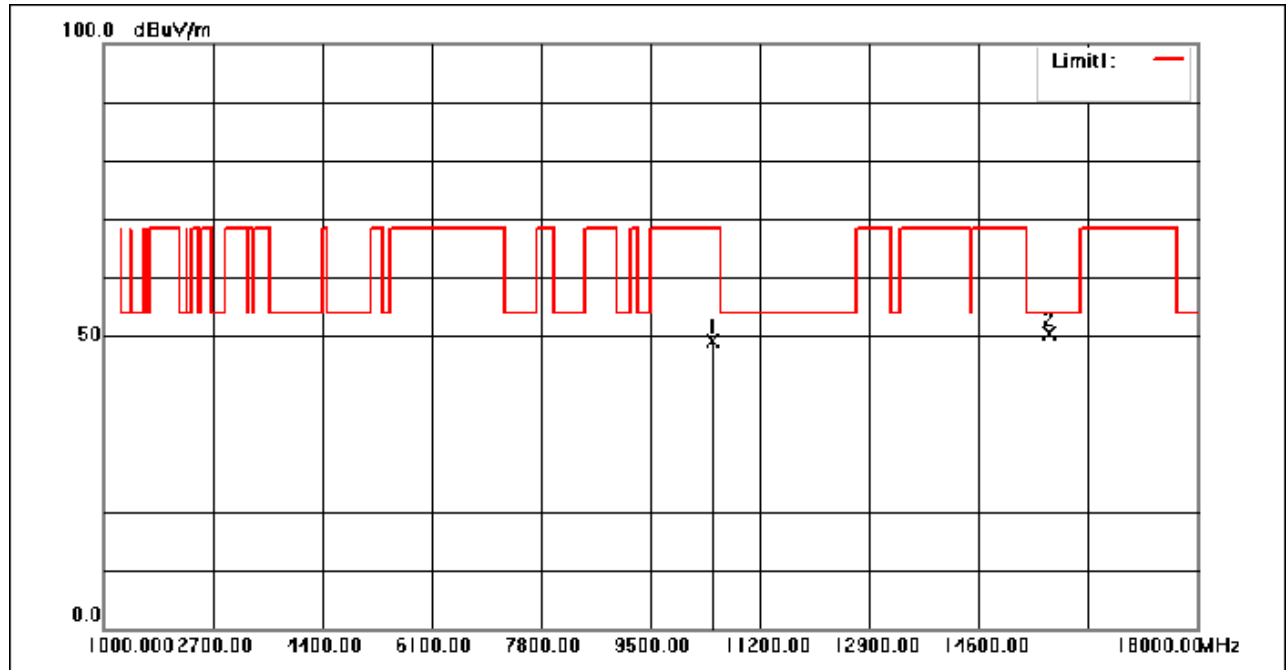
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No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	48.73	0.36	49.09	68.30	-19.21	peak
2	15690.000	44.35	6.04	50.39	54.00	-3.61	peak



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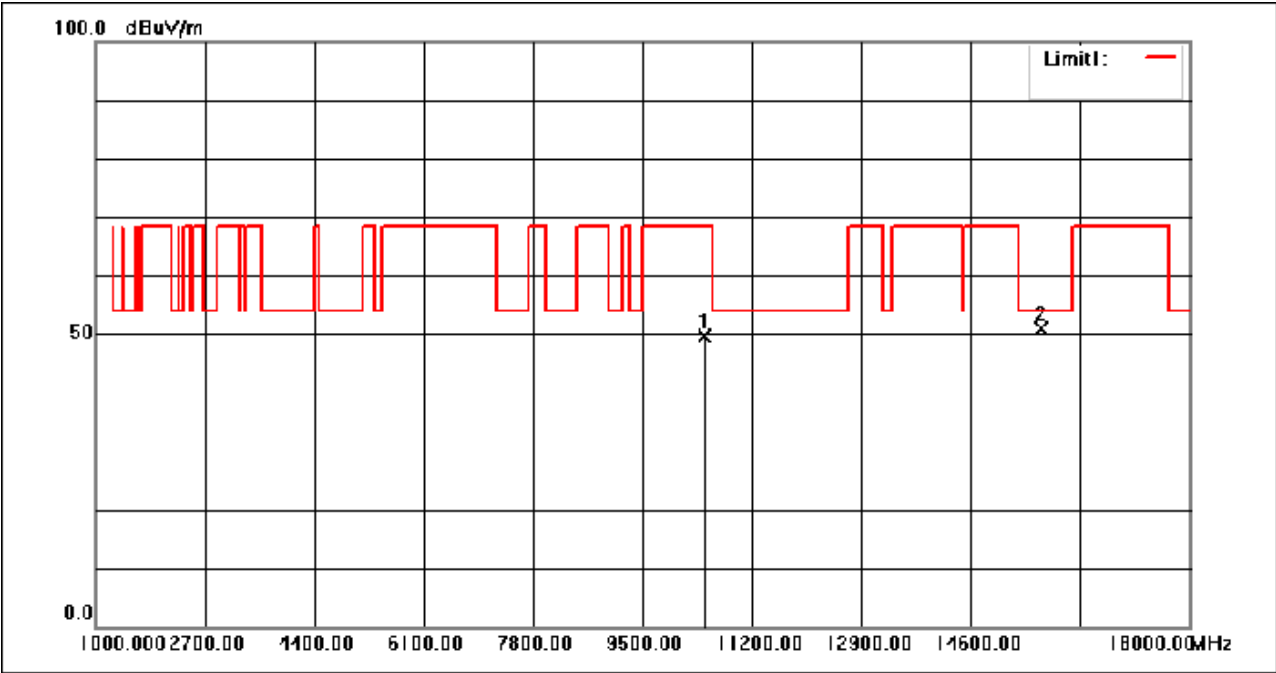
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Report No.: KSCR220400042204

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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10460.000	49.33	0.36	49.69	68.30	-18.61	peak
2	15690.000	44.75	6.04	50.79	54.00	-3.21	peak



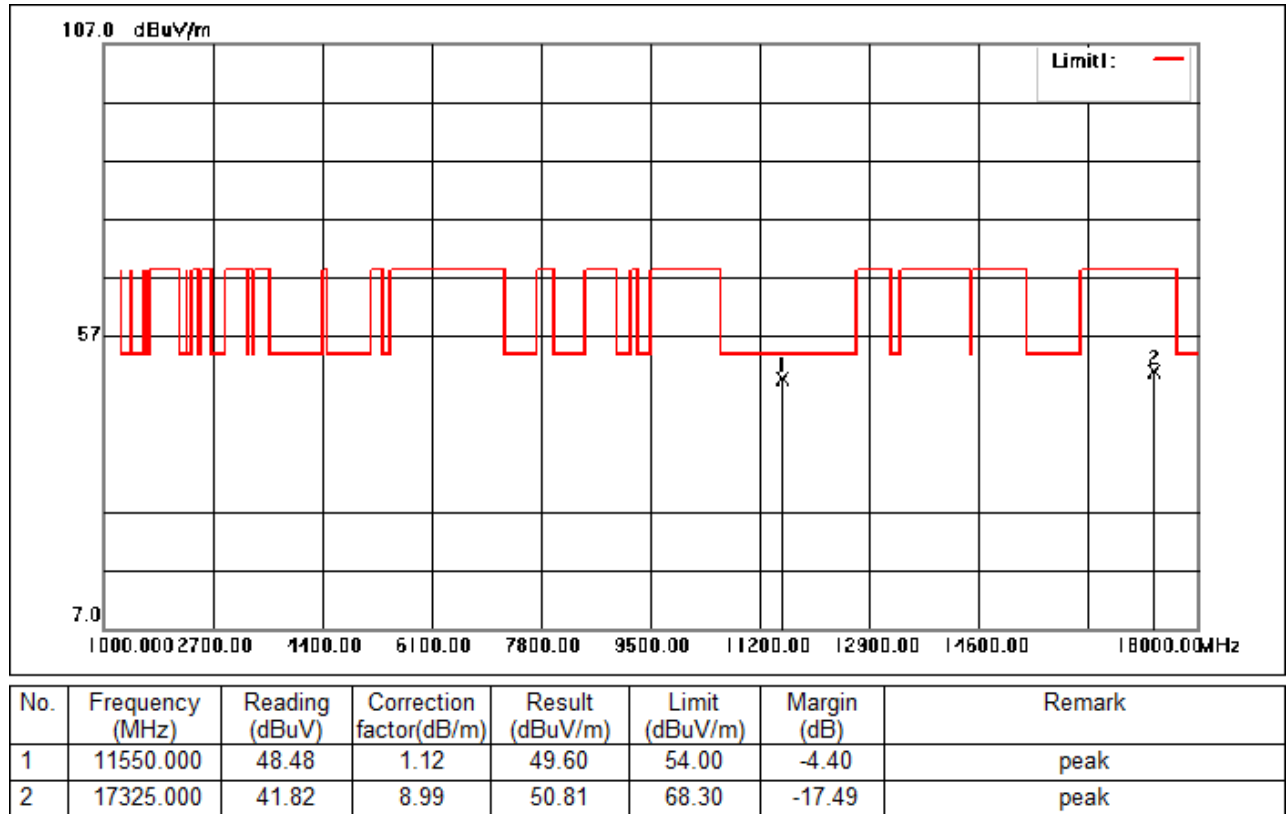
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Test Mode: 02; Polarity: Horizontal; Modulation: 802.11ac; Bandwidth: 80MHz; Channel: middle



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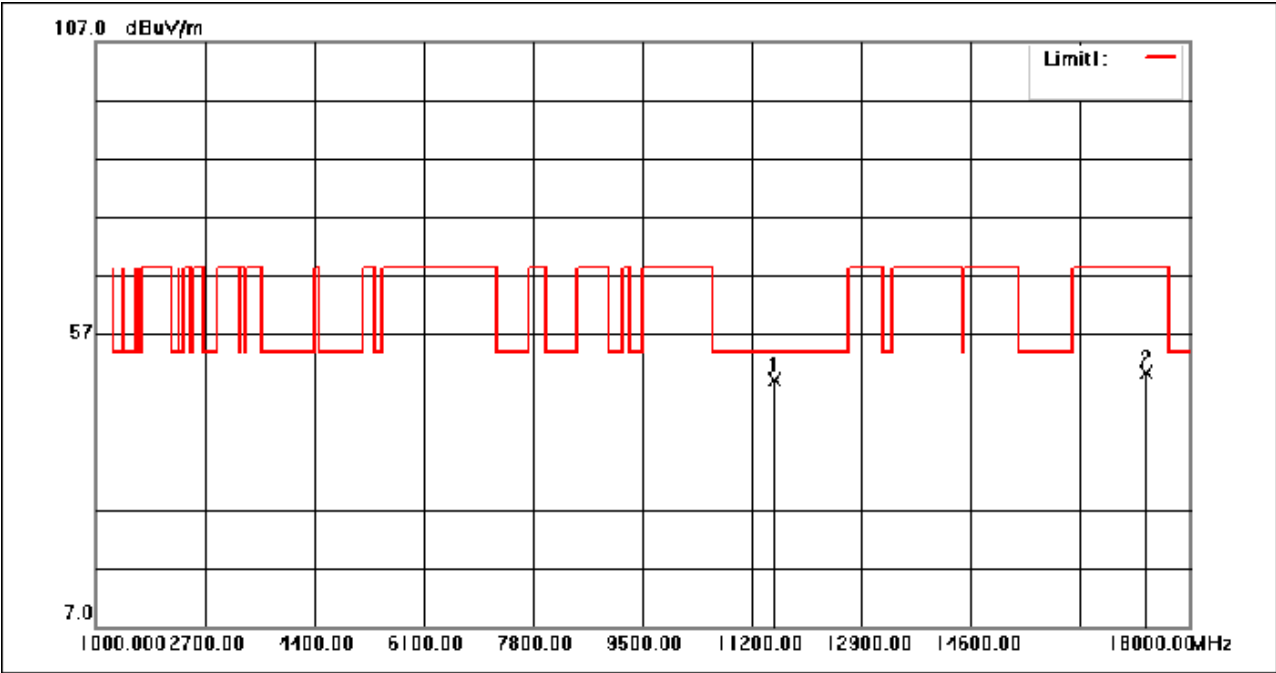
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Test Mode: 02; Polarity: Vertical; Modulation:802.11ac; Bandwidth:80MHz; Channel:middle



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	11550.000	48.07	1.12	49.19	54.00	-4.81	peak
2	17325.000	41.30	8.99	50.29	68.30	-18.01	peak



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7.9 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

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.



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Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR220400042204

Page: 44 of 88

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

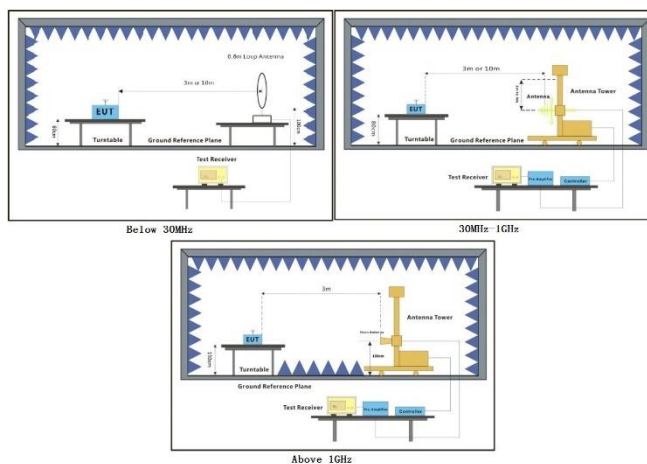
Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.9.3 Test Setup Diagram



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7.9.4 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



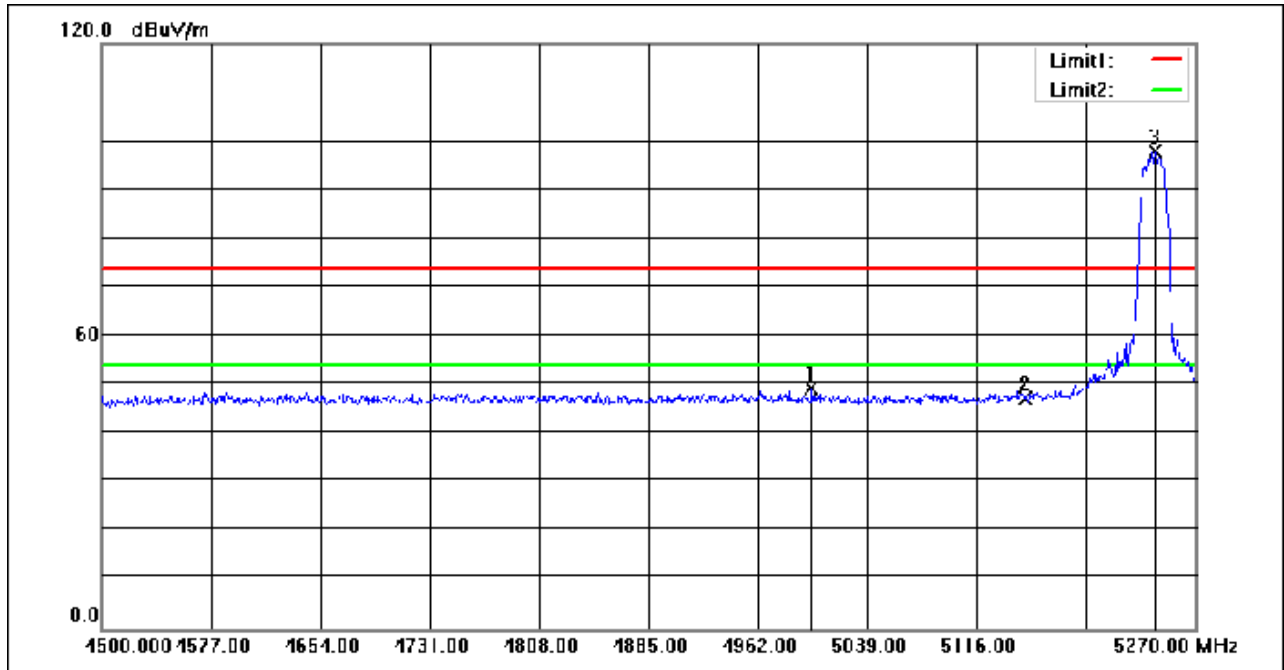
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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11a; Bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4999.730	57.59	-8.18	49.41	74.00	-24.59	peak
2	5150.000	55.01	-7.84	47.17	74.00	-26.83	peak
3	5241.510	105.47	-7.56	97.91	74.00	23.91	peak



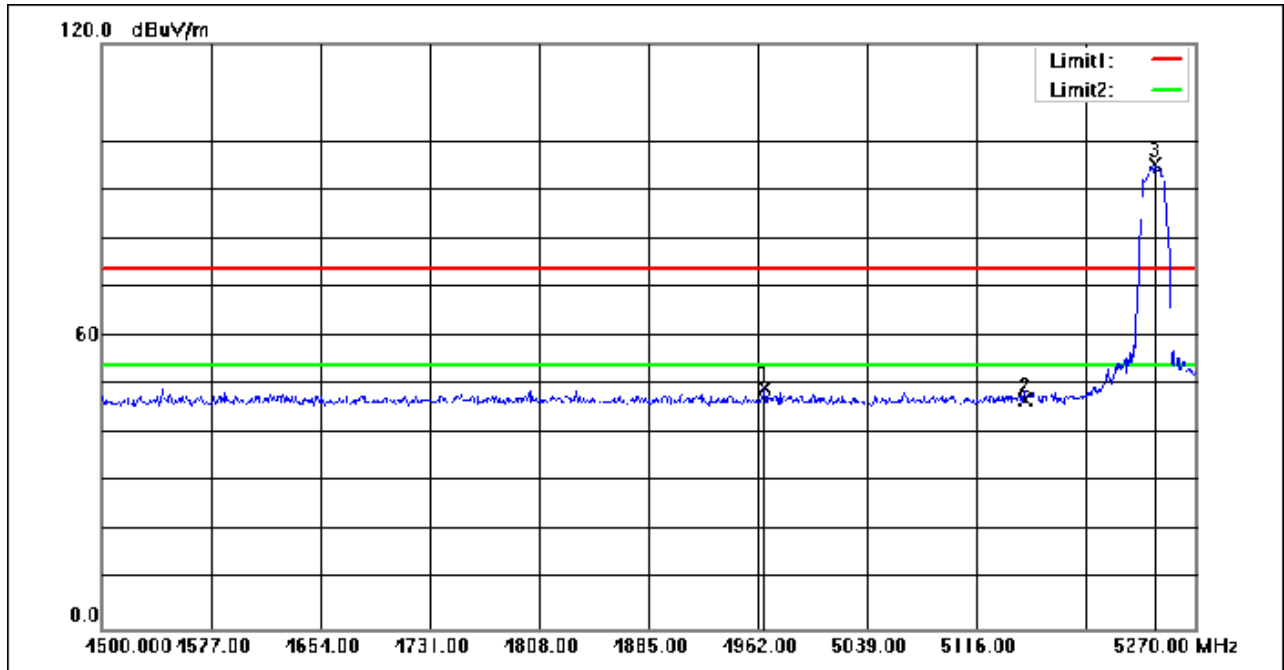
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Test Mode: 01; Polarity: Vertical; Modulation:802.11a; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4966.620	57.69	-8.30	49.39	74.00	-24.61	peak
2	5150.000	54.69	-7.84	46.85	74.00	-27.15	peak
3	5241.510	102.70	-7.56	95.14	74.00	21.14	peak



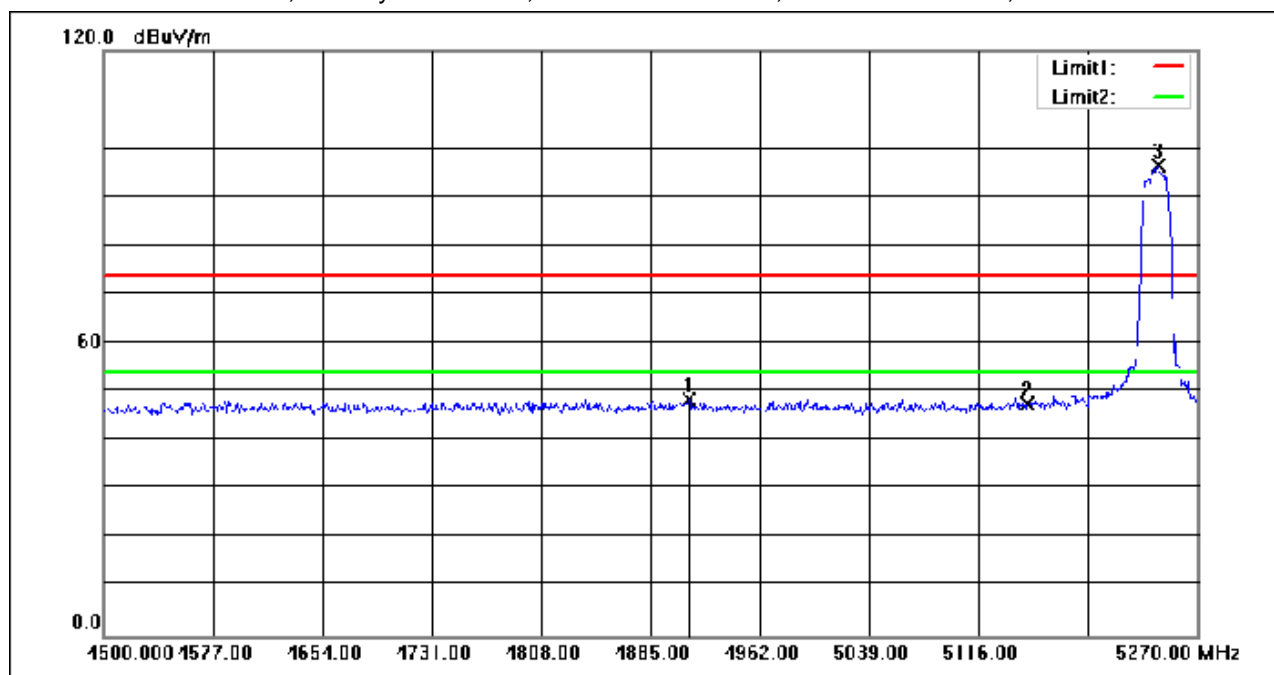
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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4911.950	56.98	-8.48	48.50	74.00	-25.50	peak
2	5150.000	55.29	-7.84	47.45	74.00	-26.55	peak
3	5242.280	104.08	-7.56	96.52	74.00	22.52	peak



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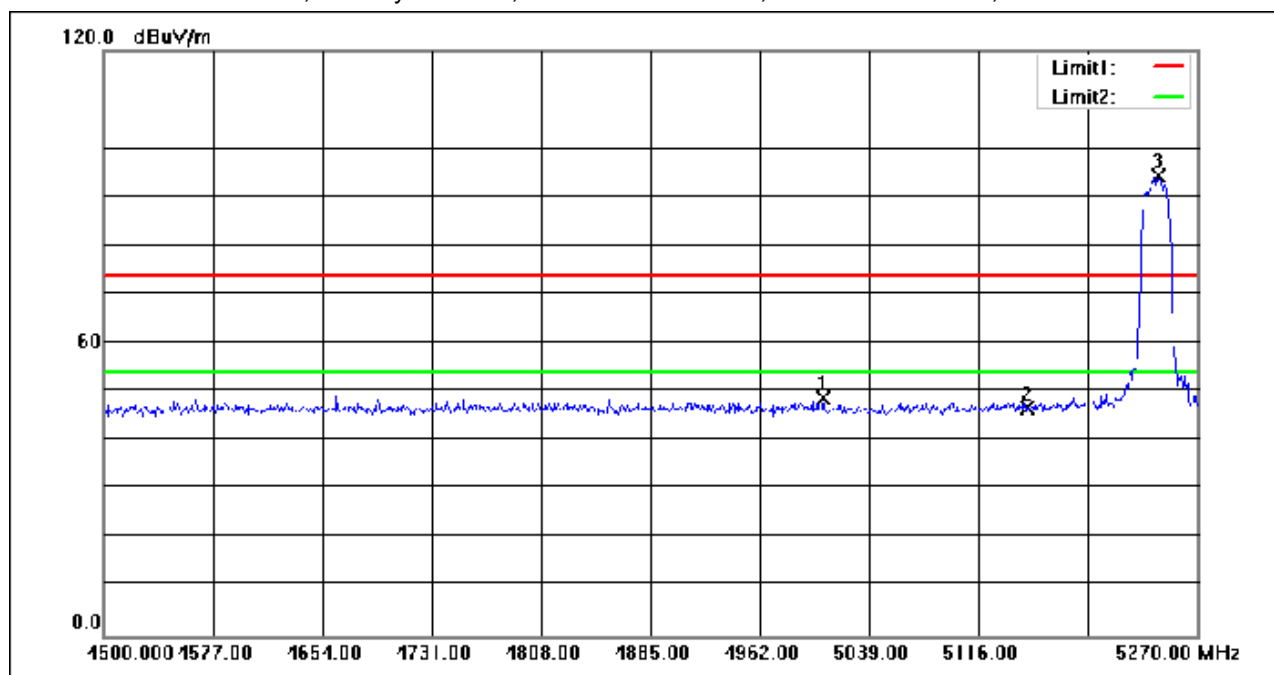
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Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5006.660	56.85	-8.16	48.69	74.00	-25.31	peak
2	5150.000	54.56	-7.84	46.72	74.00	-27.28	peak
3	5242.280	101.82	-7.56	94.26	74.00	20.26	peak



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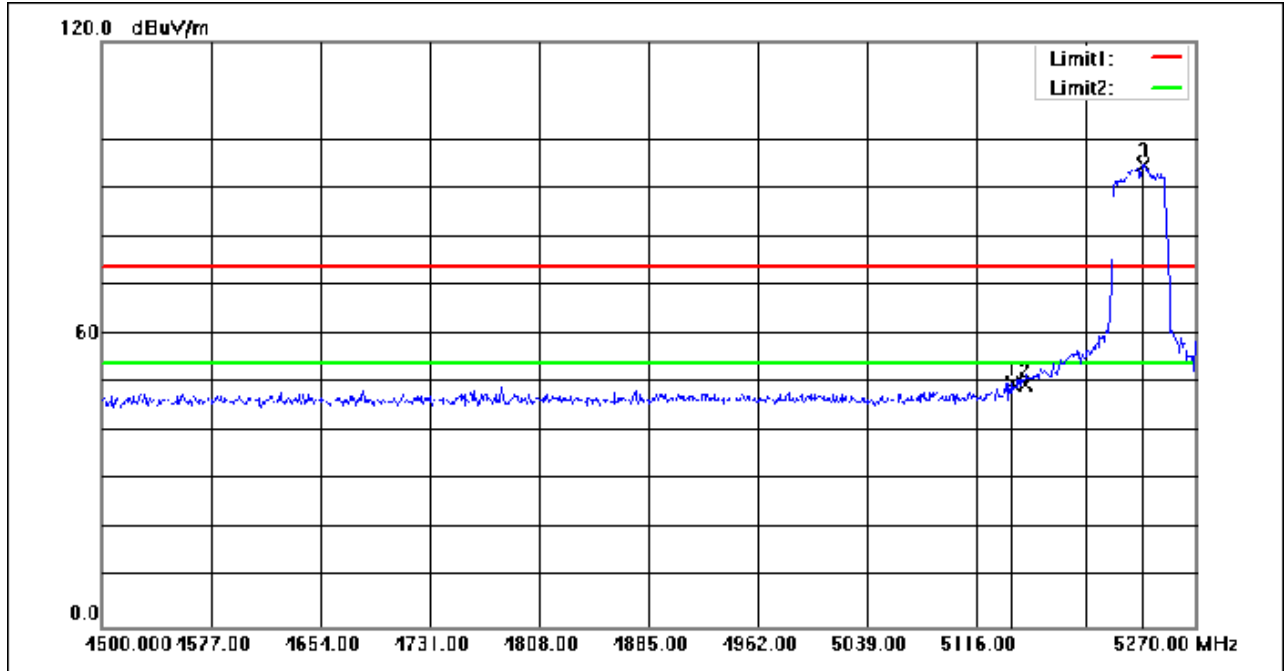
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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11n; Bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5141.410	57.95	-7.86	50.09	74.00	-23.91	peak
2	5150.000	57.36	-7.84	49.52	74.00	-24.48	peak
3	5233.810	102.40	-7.60	94.80	74.00	20.80	peak



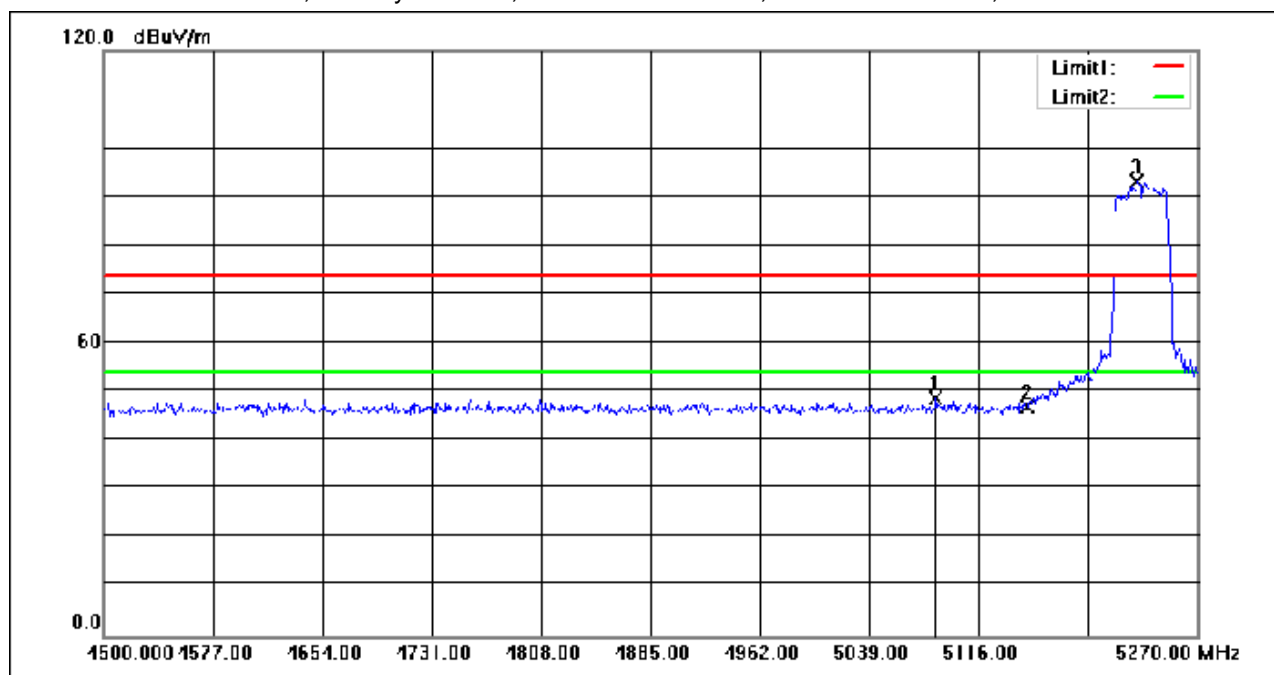
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Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5085.970	56.71	-7.99	48.72	74.00	-25.28	peak
2	5150.000	54.78	-7.84	46.94	74.00	-27.06	peak
3	5227.650	100.86	-7.63	93.23	74.00	19.23	peak



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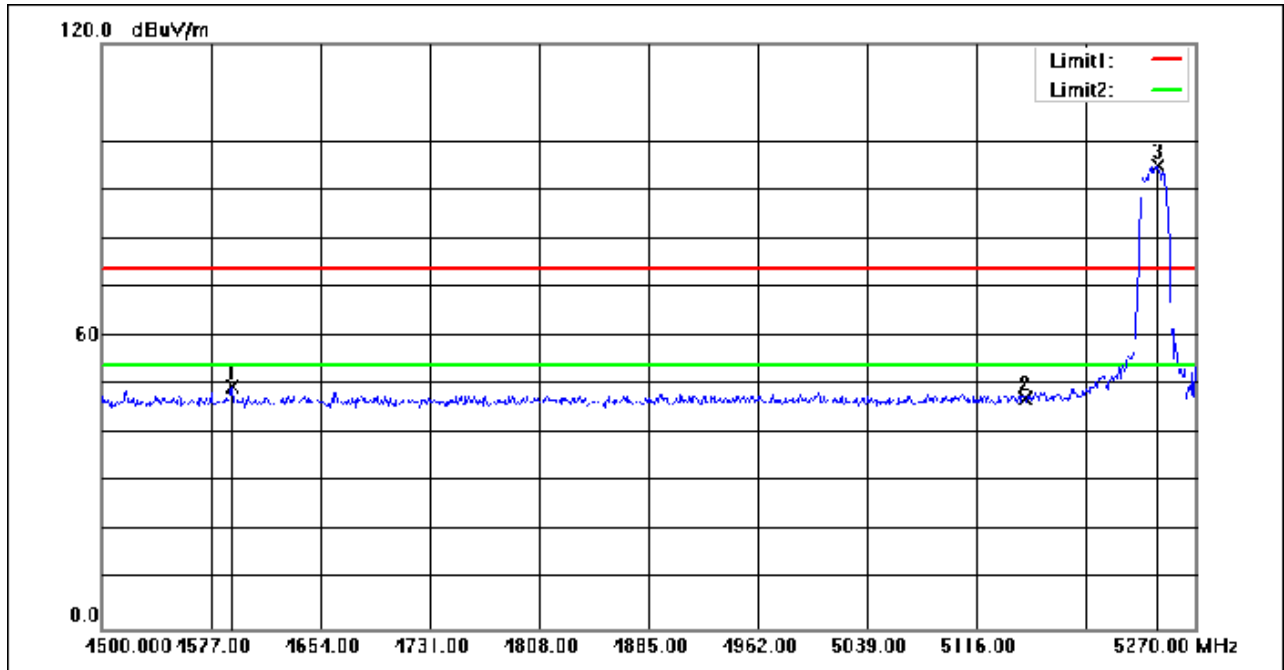
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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11ac; Bandwidth: 20MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4591.630	58.07	-8.54	49.53	74.00	-24.47	peak
2	5150.000	55.09	-7.84	47.25	74.00	-26.75	peak
3	5243.820	102.46	-7.56	94.90	74.00	20.90	peak



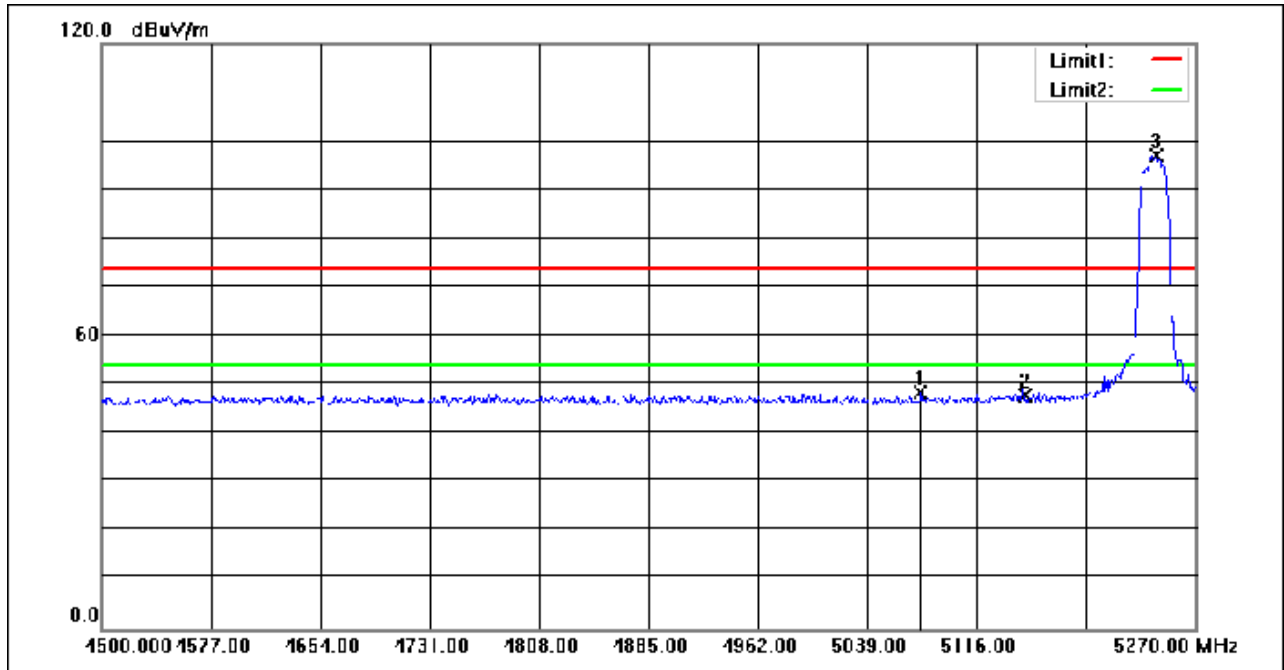
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Test Mode: 01; Polarity: Vertical; Modulation:802.11ac; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5076.730	56.35	-8.01	48.34	74.00	-25.66	peak
2	5150.000	55.82	-7.84	47.98	74.00	-26.02	peak
3	5243.050	104.76	-7.56	97.20	74.00	23.20	peak



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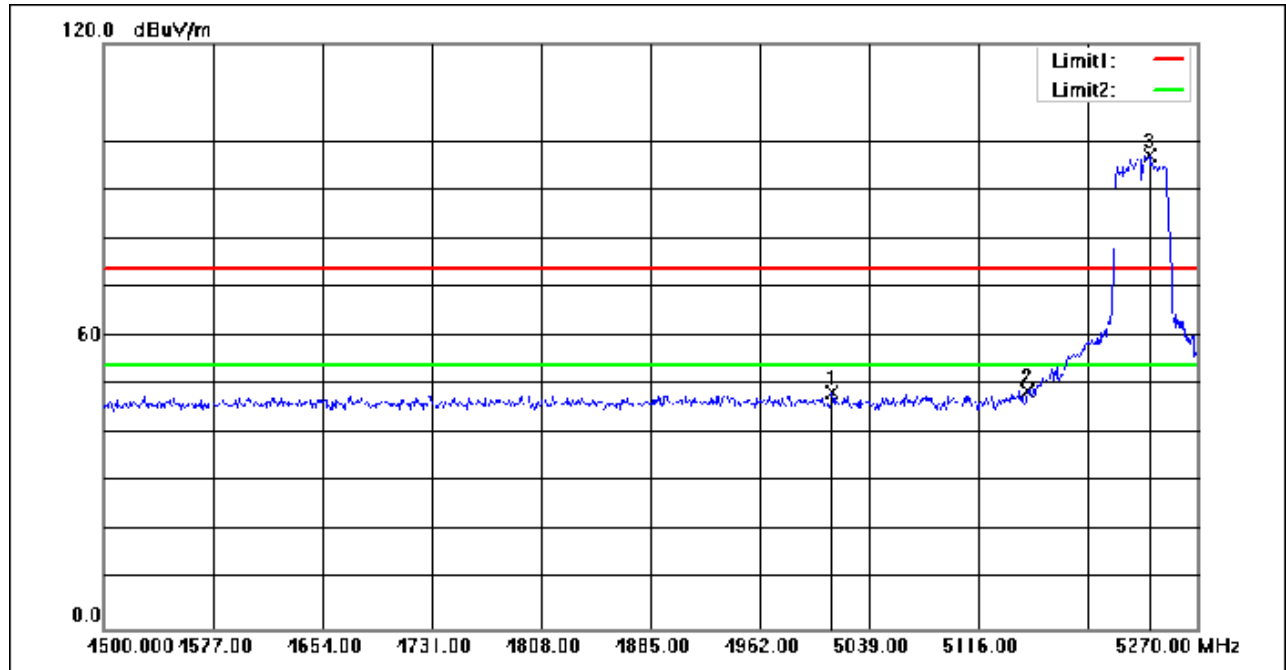
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Test Mode: 01; Polarity: Horizontal; Modulation: 802.11ac; Bandwidth: 40MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5012.820	56.53	-8.15	48.38	74.00	-25.62	peak
2	5150.000	56.70	-7.84	48.86	74.00	-25.14	peak
3	5236.120	104.77	-7.59	97.18	74.00	23.18	peak



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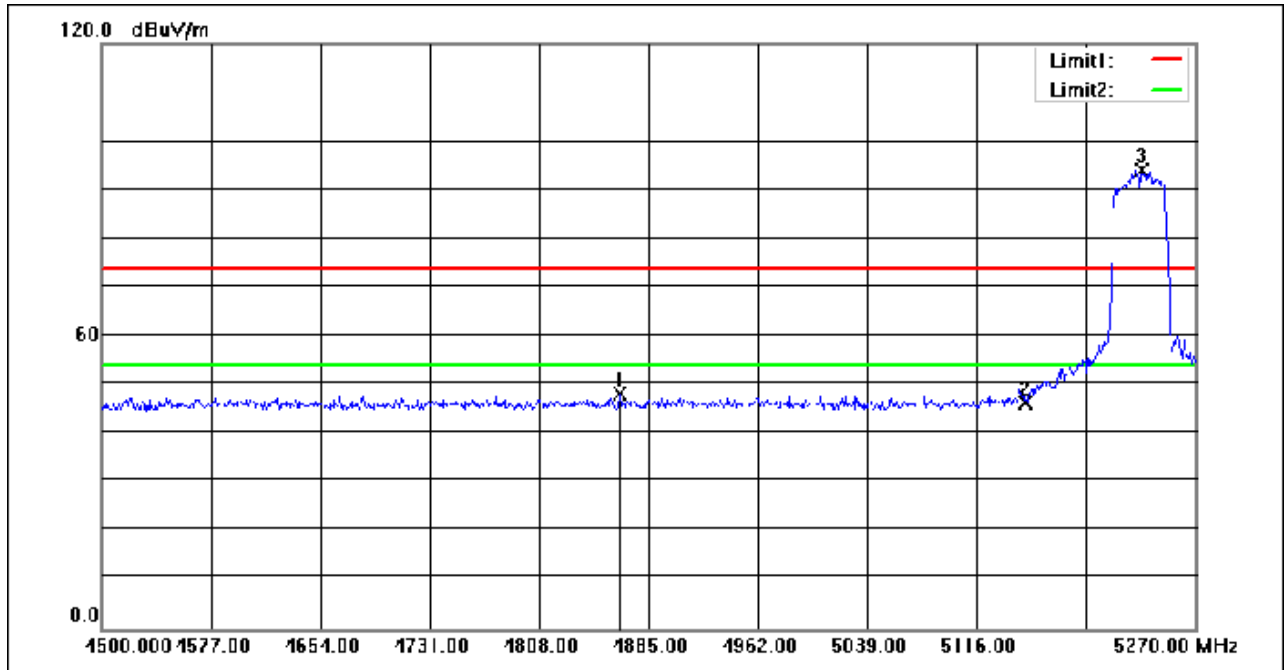
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Report No.: KSCR220400042204

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



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4864.980	56.88	-8.64	48.24	74.00	-25.76	peak
2	5150.000	54.08	-7.84	46.24	74.00	-27.76	peak
3	5232.270	101.66	-7.61	94.05	74.00	20.05	peak



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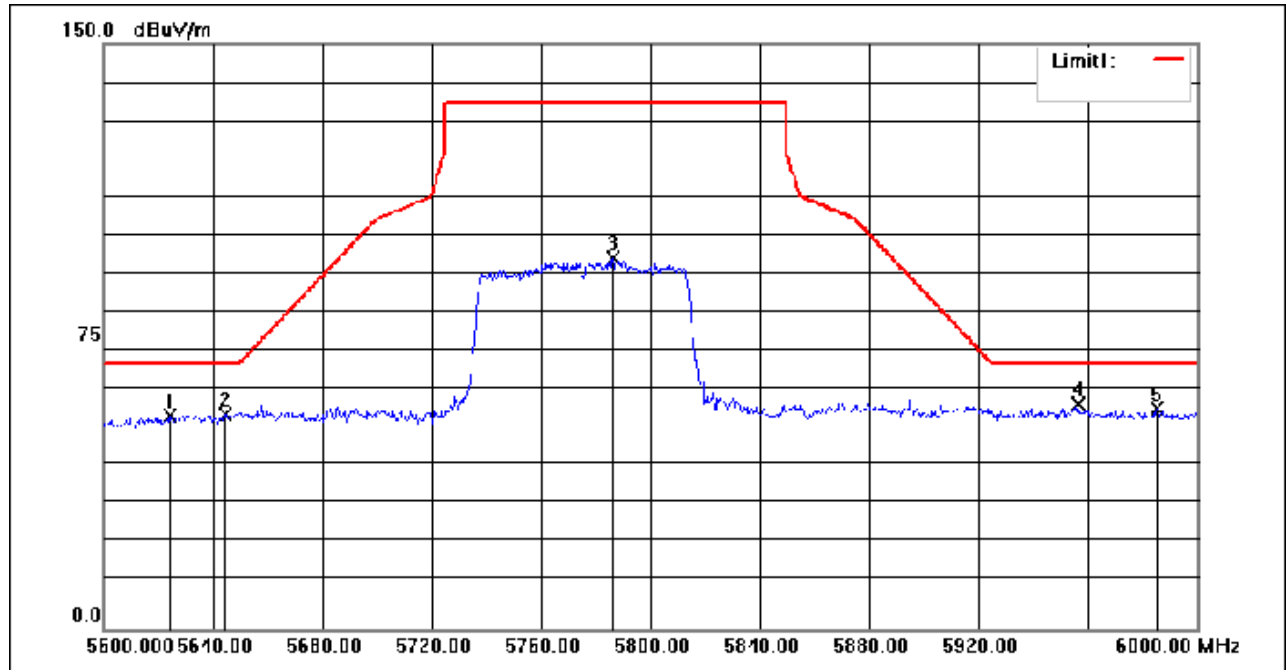
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Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR220400042204

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Test Mode: 02; Polarity: Horizontal; Modulation: 802.11ac; Bandwidth: 80MHz; Channel: Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5624.000	61.28	-6.90	54.38	68.20	-13.82	peak
2	5644.400	61.82	-6.85	54.97	68.20	-13.23	peak
3	5786.400	101.50	-6.49	95.01	135.00	-39.99	peak
4	5956.400	62.99	-5.60	57.39	68.20	-10.81	peak
5	5985.200	61.93	-5.44	56.49	68.20	-11.71	peak



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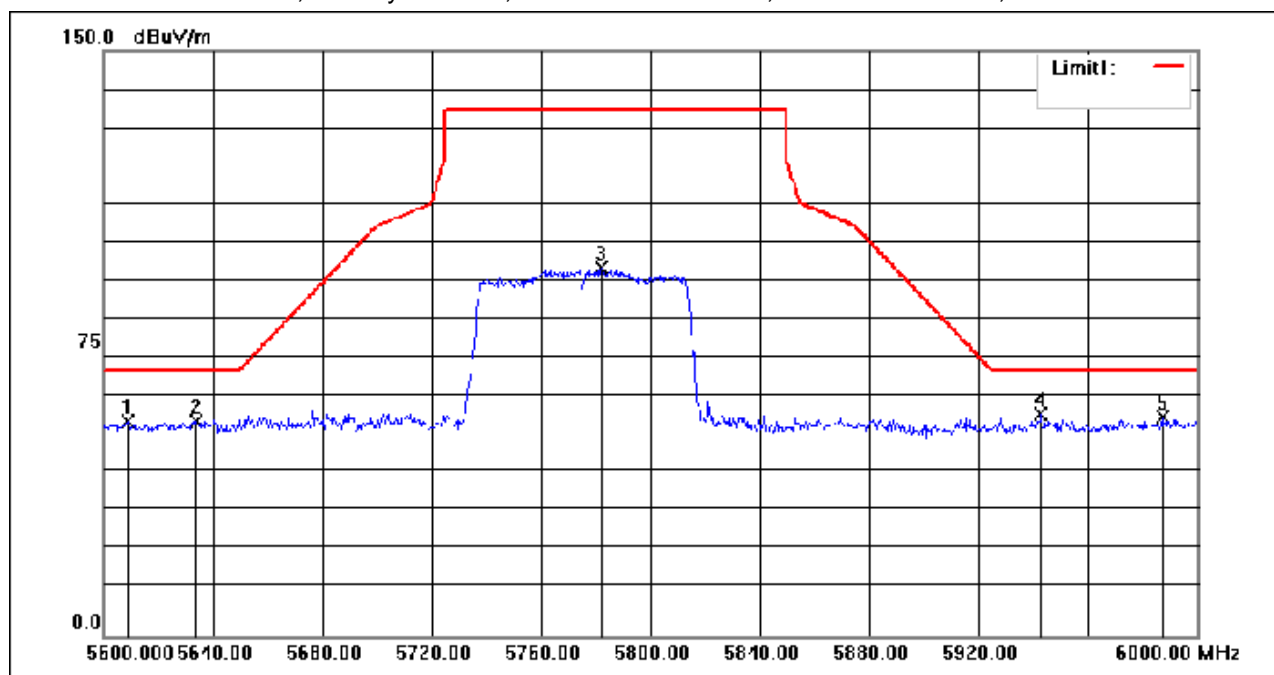
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Test Mode: 02; Polarity: Vertical; Modulation:802.11ac; Bandwidth:80MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5608.800	61.79	-6.95	54.84	68.20	-13.36	peak
2	5633.600	61.90	-6.88	55.02	68.20	-13.18	peak
3	5782.000	100.88	-6.51	94.37	135.00	-40.63	peak
4	5942.800	62.67	-5.67	57.00	68.20	-11.20	peak
5	5987.200	61.40	-5.43	55.97	68.20	-12.23	peak



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Report No.: KSCR220400042204

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7.10 Frequency Stability

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

Test Method: ANSI C63.10 (2013) Section 6.8

7.10.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.10.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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.

7.10.3 Test Setup Diagram

7.10.4 Measurement Procedure and Data

Please Refer to Appendix D for KSCR220400042204



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7.11 Radiated Emissions (Below 1GHz)

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

Test Method: KDB 789033 D02 II G

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
960-1000	500	3

7.11.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar

7.11.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge+TX mode (U-NII-1)_Keep the EUT in charging and 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	Charge+TX mode (U-NII-3)_Keep the EUT in charging and 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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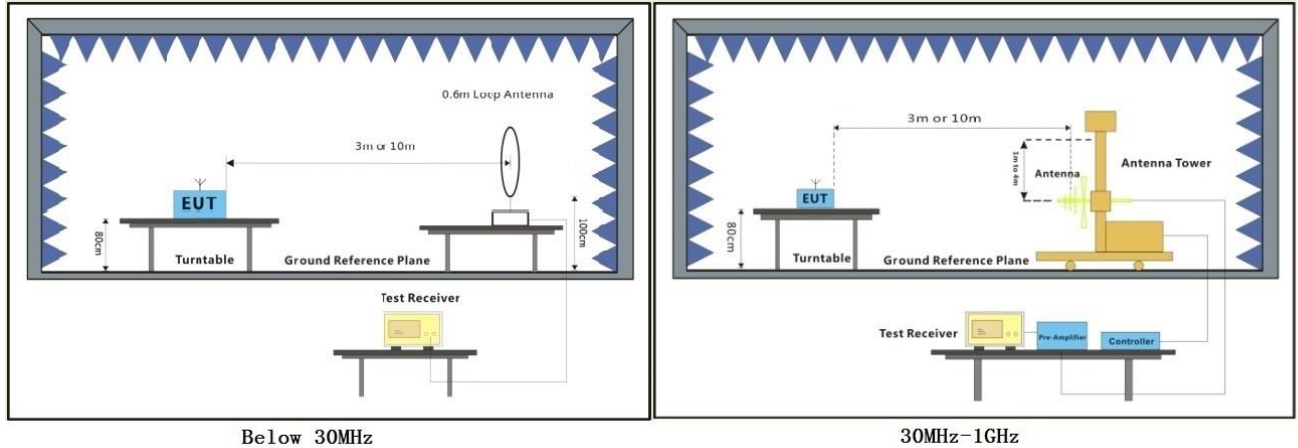
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7.11.3 Test Setup Diagram



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7.11.4 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 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. 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.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel of 802.11a. Only the worst case is recorded in the report.
3. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
4. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



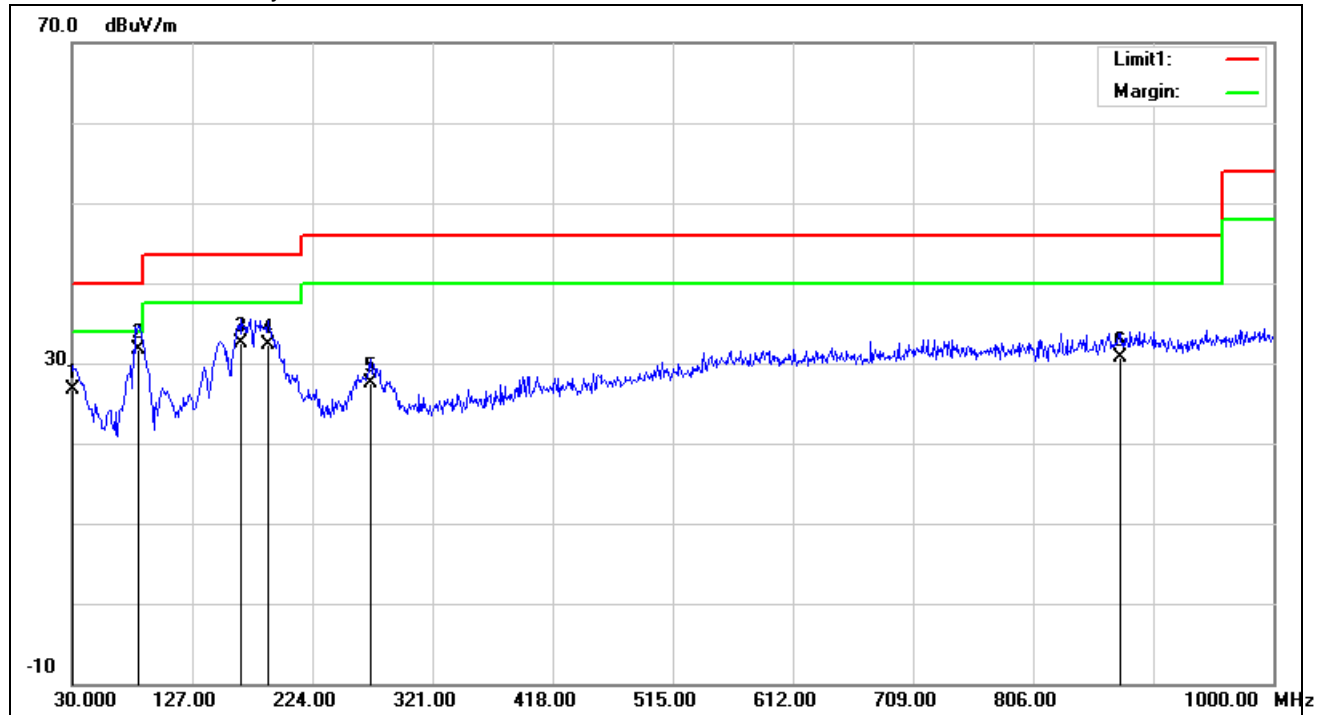
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Test Mode: 01; Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.0000	1.47	25.25	26.72	40.00	-13.28	100	300	QP
2	83.3500	17.68	14.05	31.73	40.00	-8.27	200	321	QP
3	166.7700	15.37	17.15	32.52	43.50	-10.98	200	298	QP
4	188.1100	15.95	16.36	32.31	43.50	-11.19	100	302	QP
5	270.5600	7.10	20.40	27.50	46.00	-18.50	100	88	QP
6	875.8400	28.49	2.30	30.79	46.00	-15.21	200	268	QP



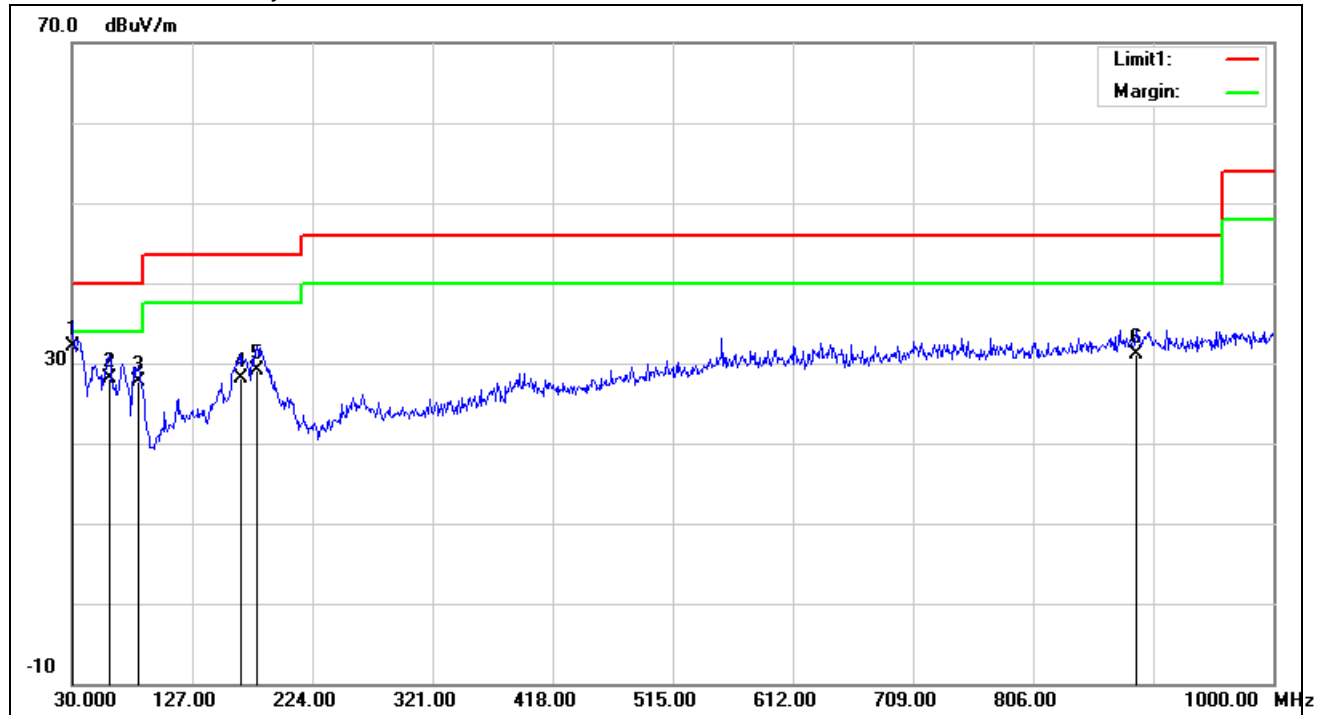
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Test Mode: 01; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.0000	6.86	25.25	32.11	40.00	-7.89	100	311	QP
2	60.0700	13.11	14.92	28.03	40.00	-11.97	100	298	QP
3	83.3500	13.68	14.05	27.73	40.00	-12.27	200	280	QP
4	166.7700	10.97	17.15	28.12	43.50	-15.38	100	180	QP
5	179.3800	12.39	16.65	29.04	43.50	-14.46	100	212	QP
6	889.4200	1.63	29.46	31.09	46.00	-14.91	200	331	QP



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2204000422AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2204000422AT



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10 Appendix

Appendix D for KSCR220400042204

1. Duty Cycle

1.1 Ant1

1.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11a	SISO	5240	1.397	1.438	97.15	0.13	0.03
802.11n (HT20)	SISO	5240	1.309	1.350	96.96	0.13	0.03
802.11n (HT40)	SISO	5230	0.651	0.690	94.35	0.25	0.03
802.11ac (VHT20)	SISO	5240	1.317	1.357	97.05	0.13	0.03
802.11ac (VHT40)	SISO	5230	0.658	0.697	94.40	0.25	0.03
802.11ac (VHT80)	SISO	5775	0.328	0.366	89.62	0.48	0.11



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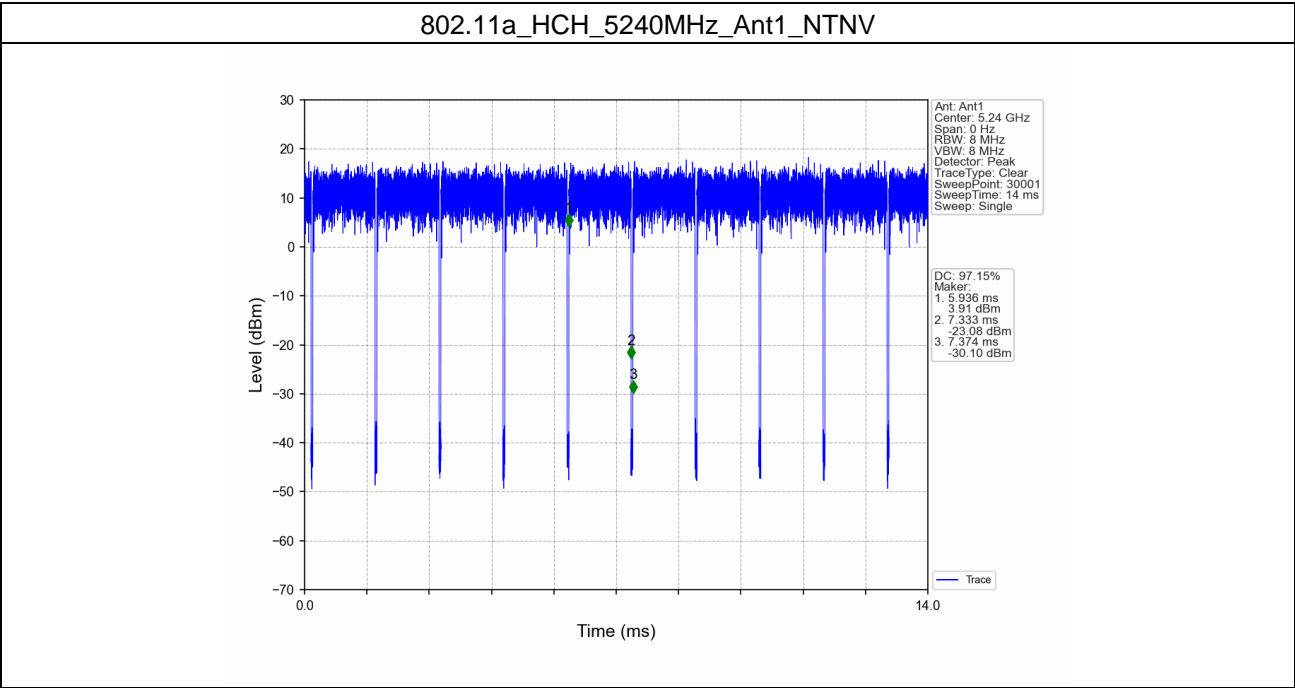
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1.1.2 Test Graph



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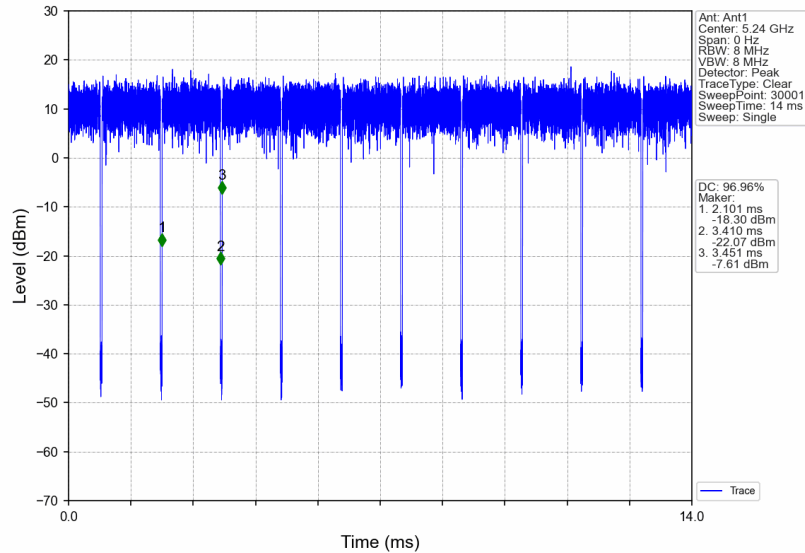
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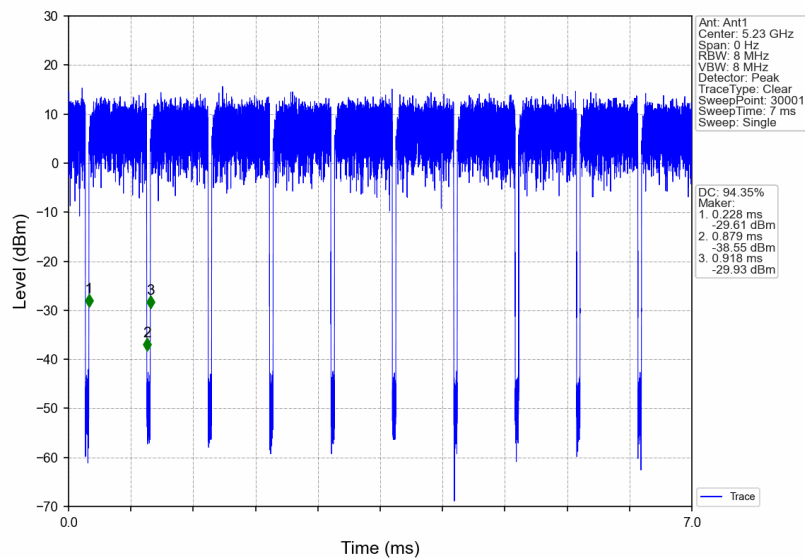
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802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



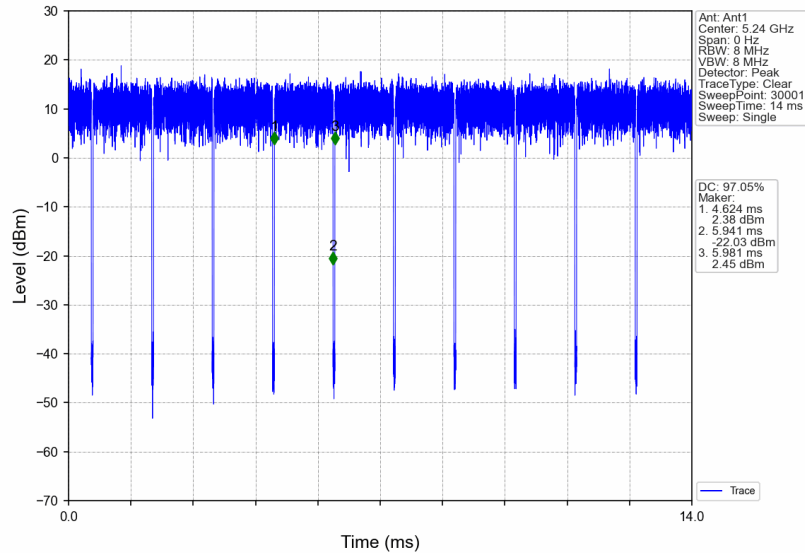
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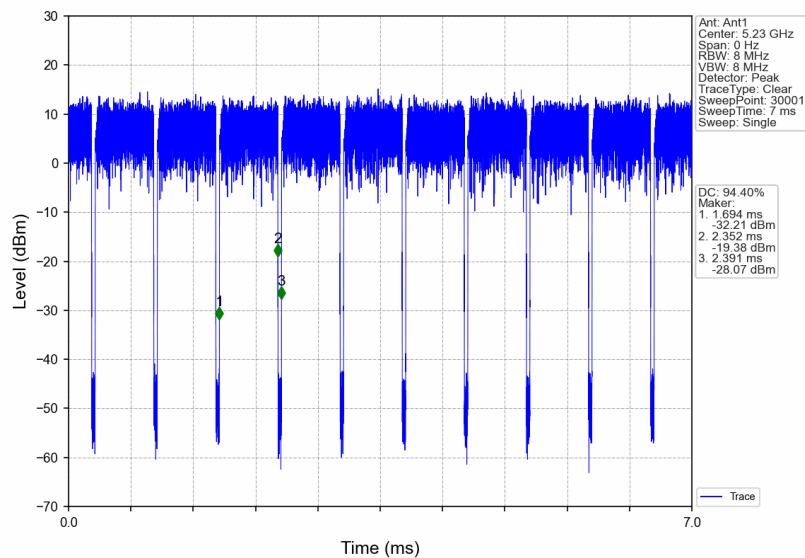
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802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



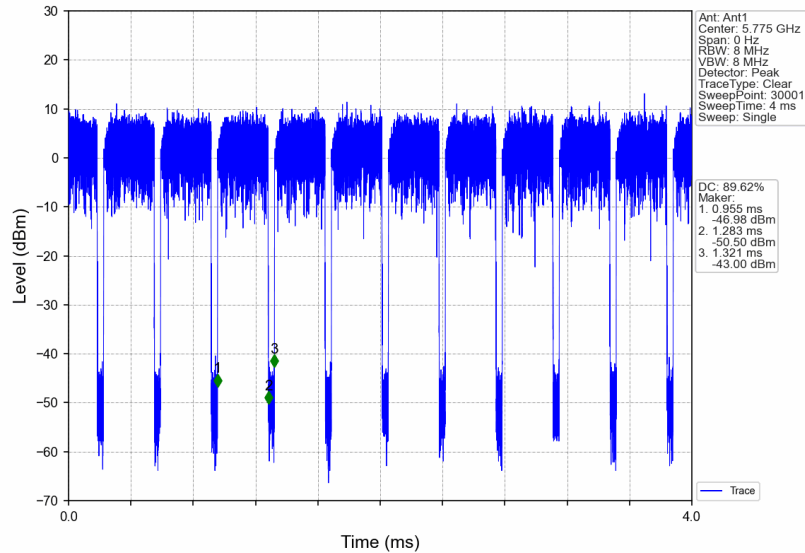
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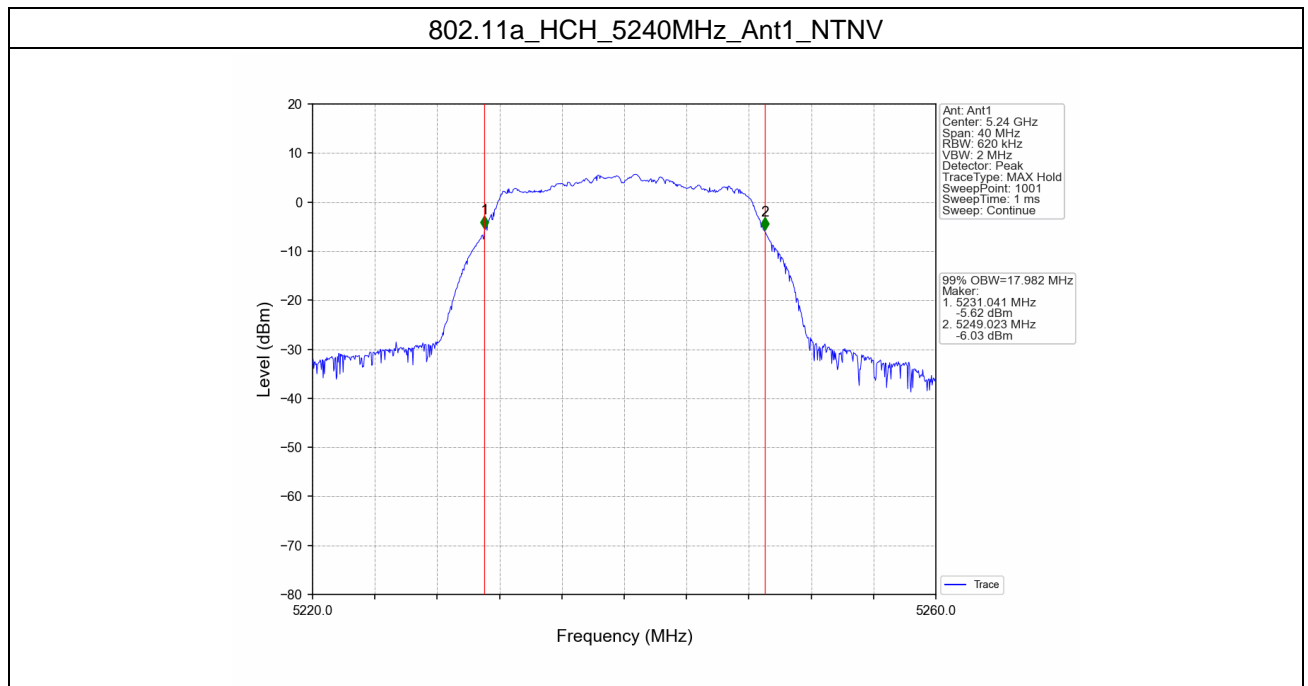
2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)	Verdict
				Result	
802.11a	SISO	5240	1	17.982	Pass
802.11n (HT20)	SISO	5240	1	18.769	Pass
802.11n (HT40)	SISO	5230	1	36.586	Pass
802.11ac (VHT20)	SISO	5240	1	18.782	Pass
802.11ac (VHT40)	SISO	5230	1	36.552	Pass
802.11ac (VHT80)	SISO	5775	1	77.212	Pass

2.1.2 Test Graph



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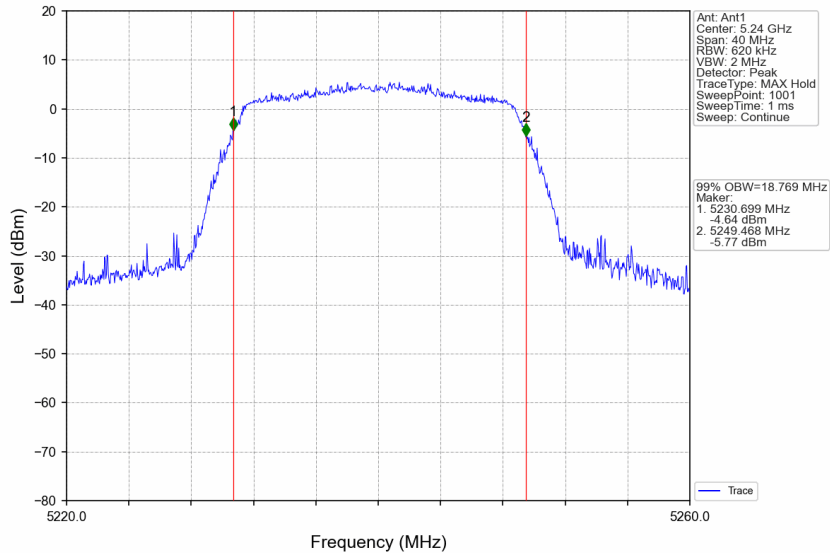
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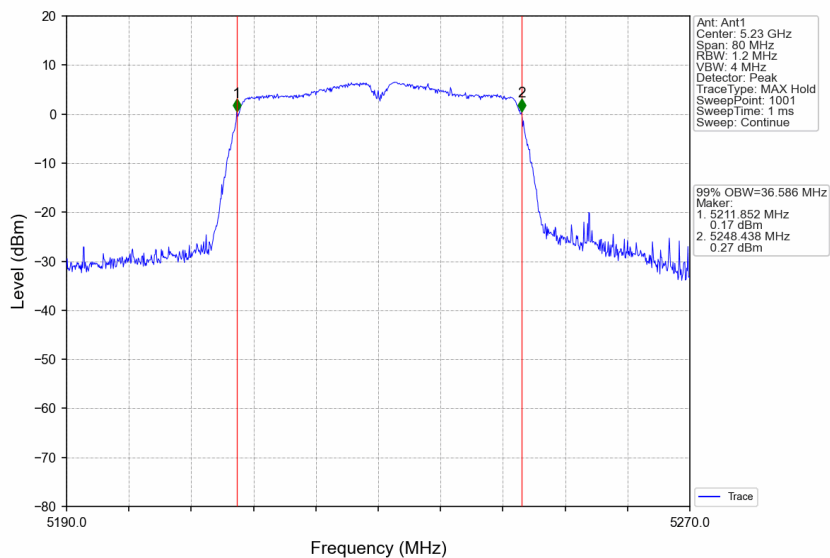
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802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



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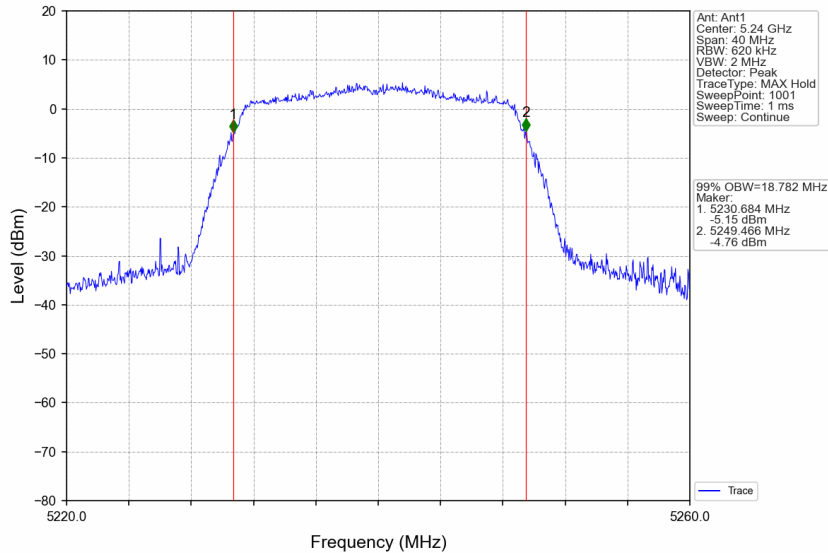
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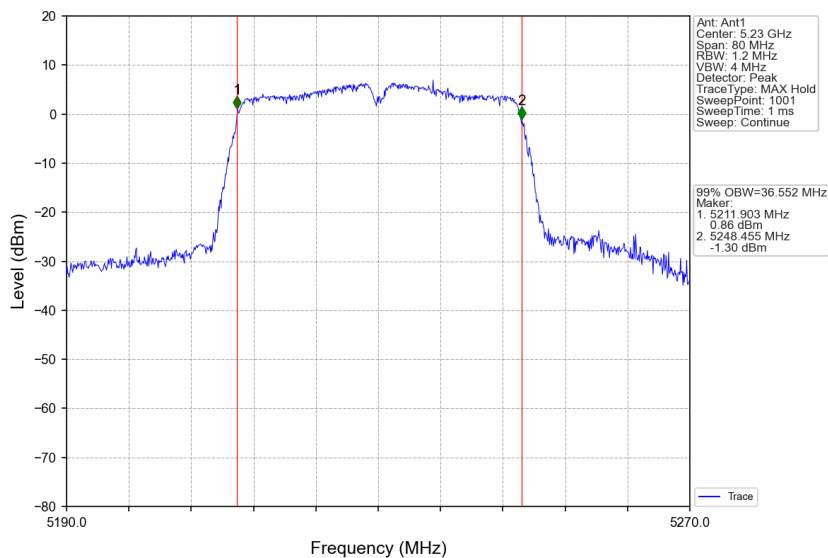
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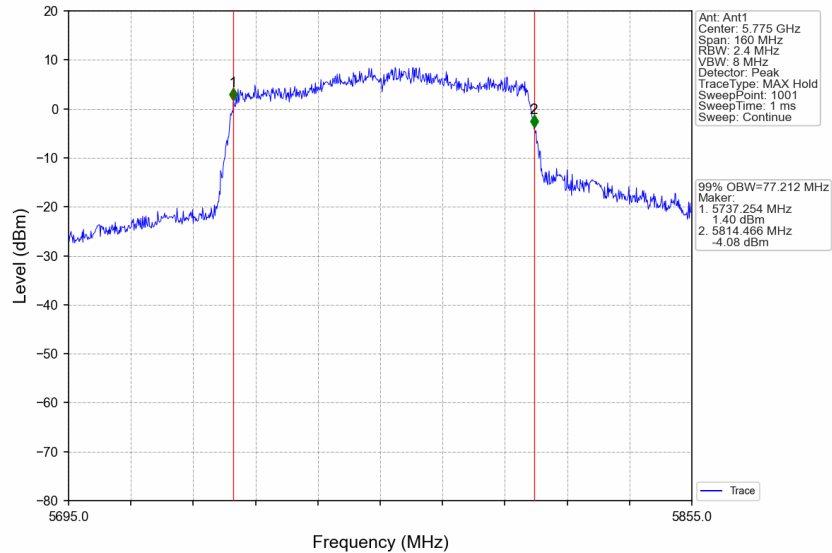
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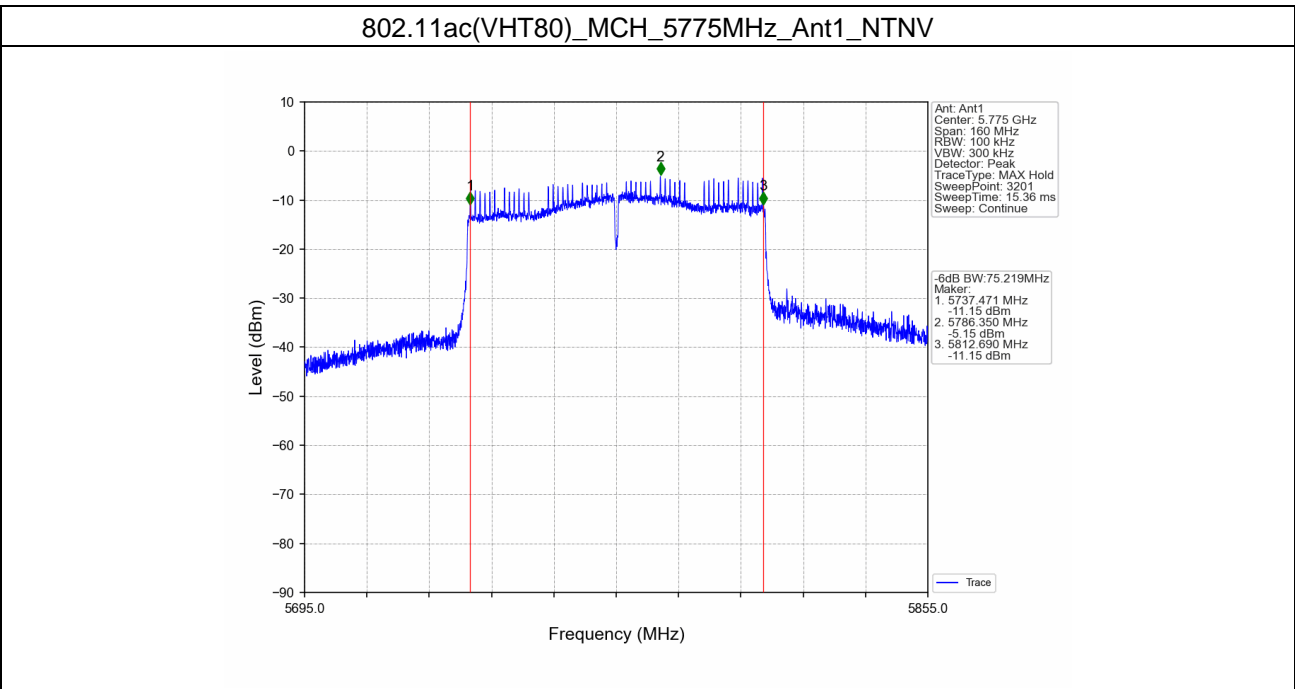
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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11ac (VHT80)	SISO	5775	1	75.219	≥ 0.5	Pass

2.2.2 Test Graph



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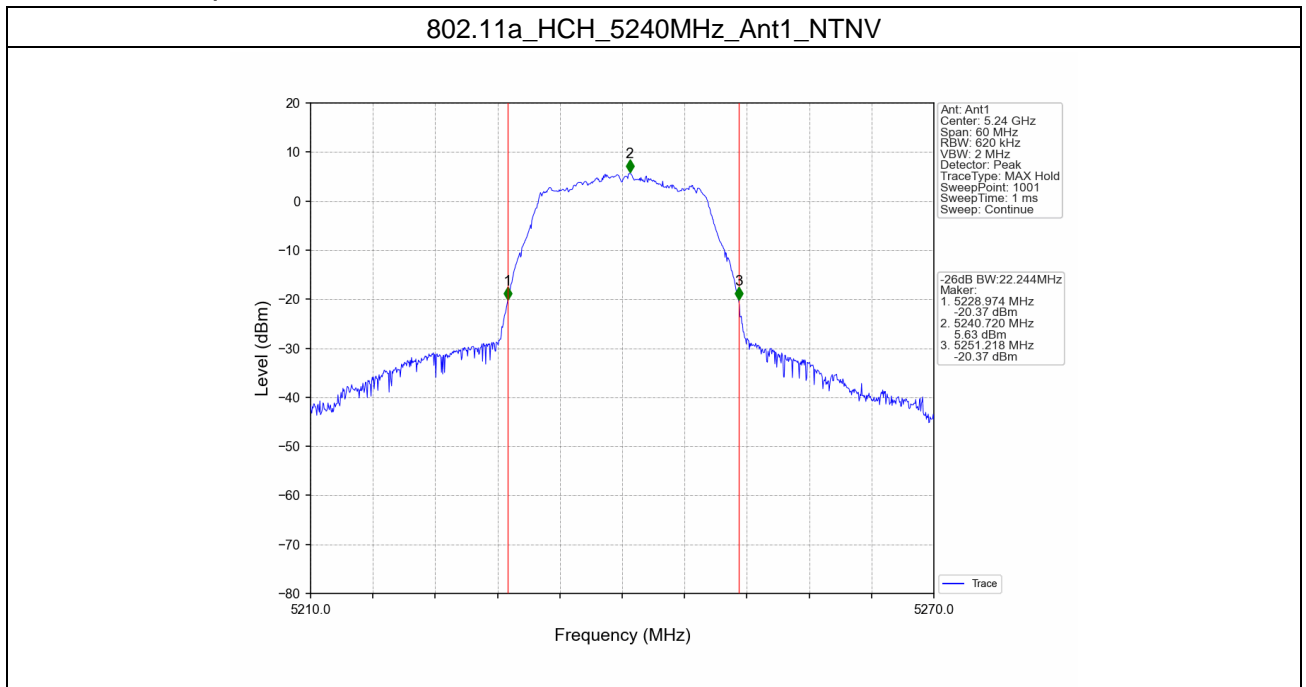
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2.3 26dB BW

2.3.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	26dB Bandwidth (MHz)	Verdict
				Result	
802.11a	SISO	5240	1	22.244	Pass
802.11n (HT20)	SISO	5240	1	22.293	Pass
802.11n (HT40)	SISO	5230	1	41.224	Pass
802.11ac (VHT20)	SISO	5240	1	22.285	Pass
802.11ac (VHT40)	SISO	5230	1	41.071	Pass

2.3.2 Test Graph



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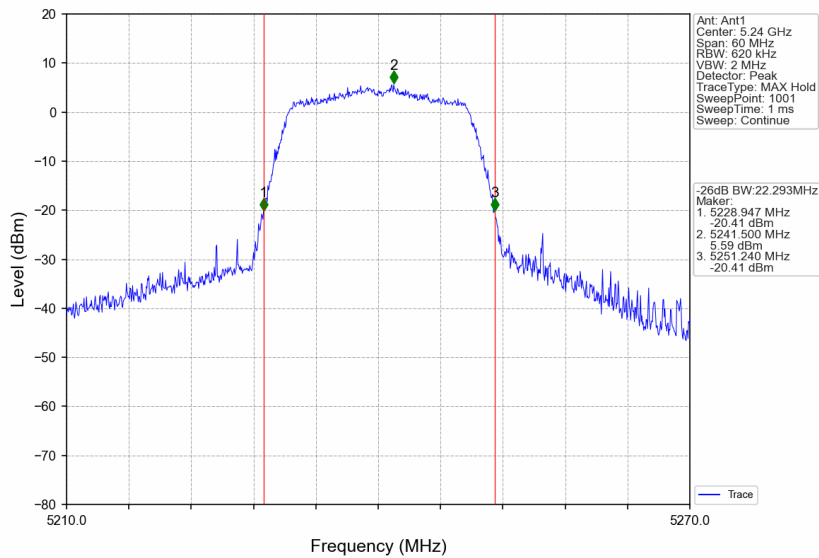
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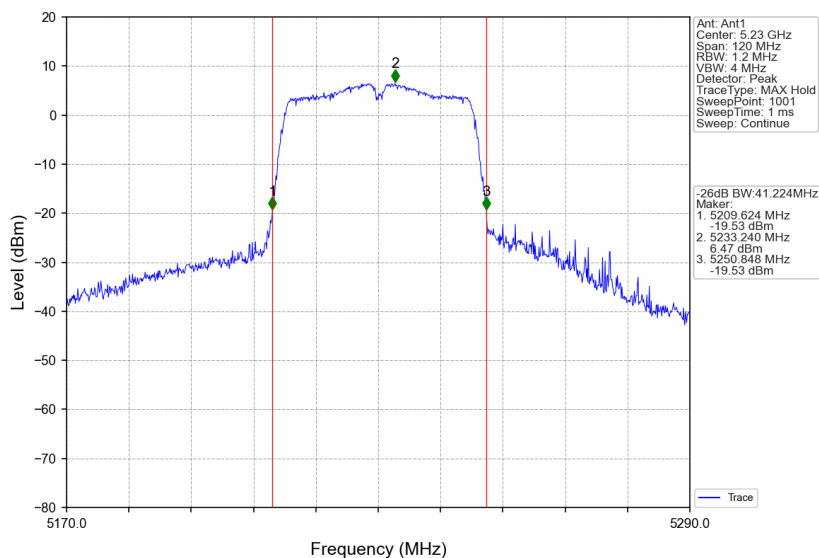
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802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



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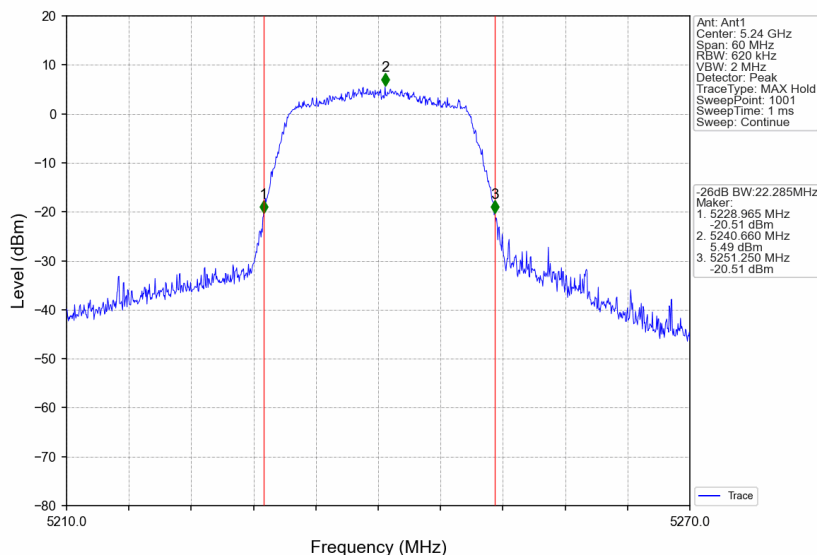
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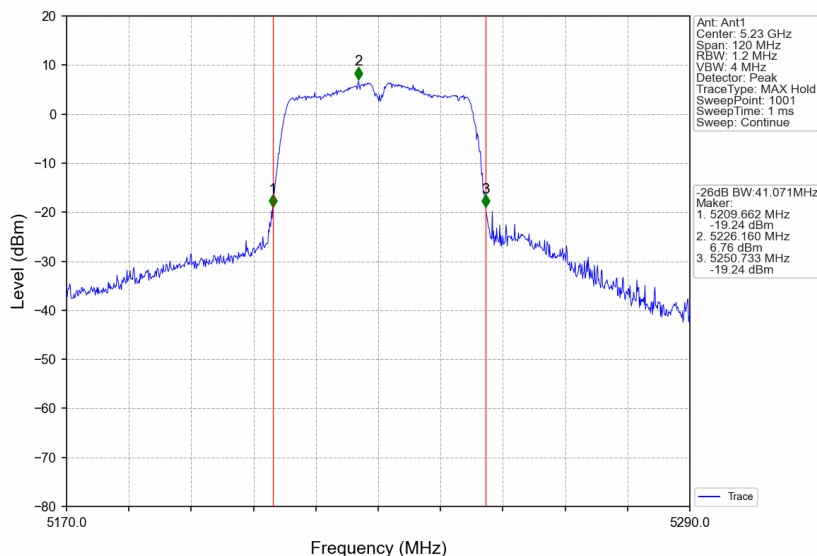
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802.11ac(VHT20)_HCH_5240MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



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3. Maximum Conducted Output Power

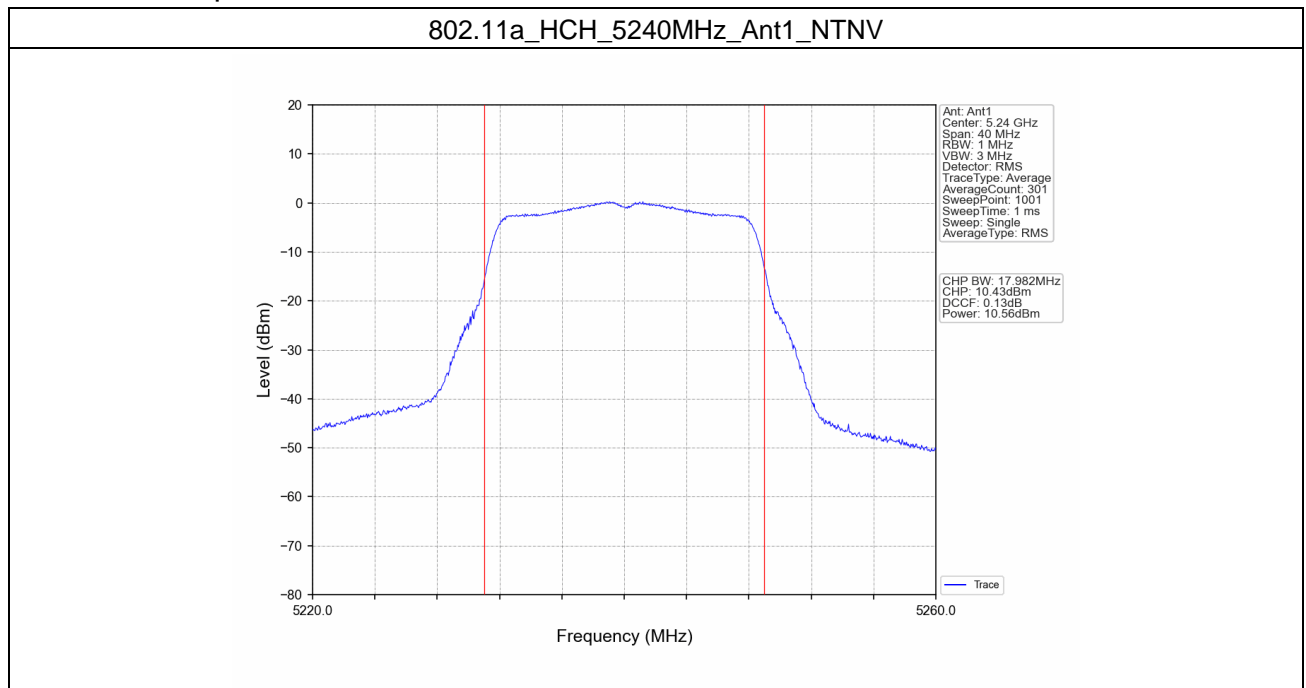
3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11a	SISO	5240	10.56	≤ 23.98	Pass
802.11n (HT20)	SISO	5240	10.30	≤ 23.98	Pass
802.11n (HT40)	SISO	5230	10.47	≤ 23.98	Pass
802.11ac (VHT20)	SISO	5240	10.19	≤ 23.98	Pass
802.11ac (VHT40)	SISO	5230	10.36	≤ 23.98	Pass
802.11ac (VHT80)	SISO	5775	10.13	≤ 30	Pass

Note1: Antenna Gain: Ant1: U-NII-1:4.3dBi; U-NII-3:3dBi

3.1.2 Test Graph



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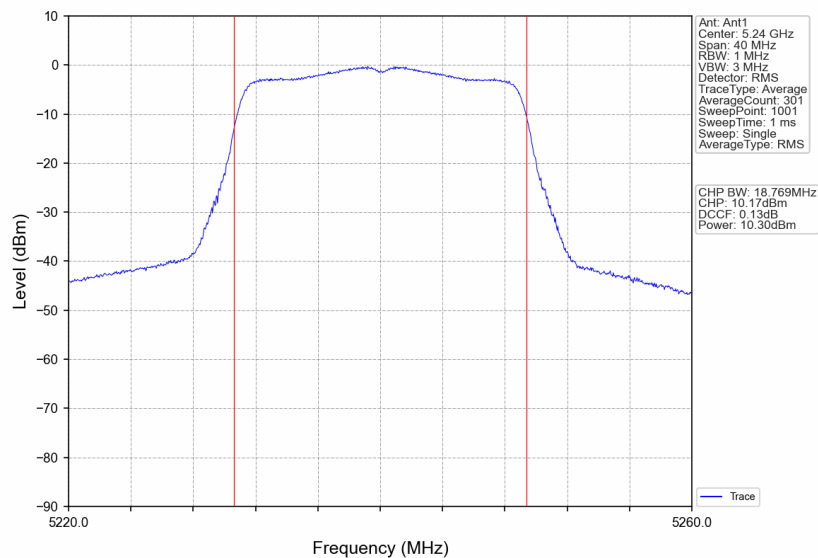
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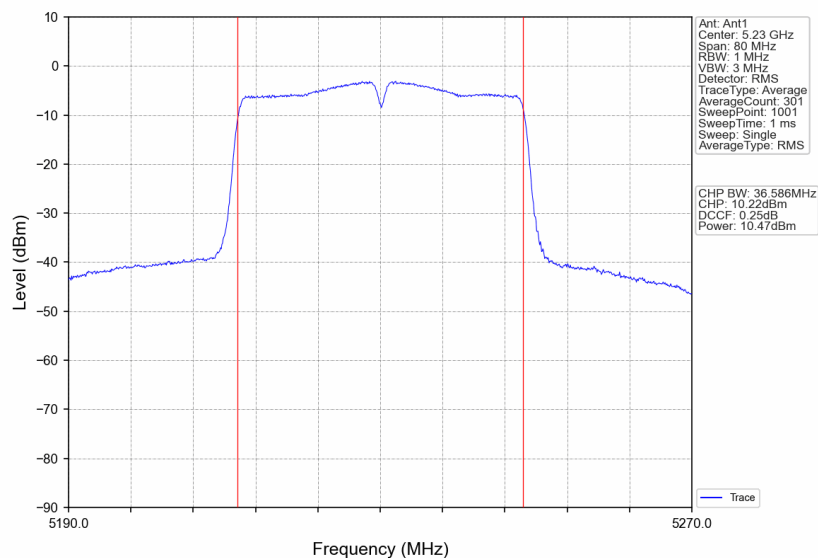
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802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



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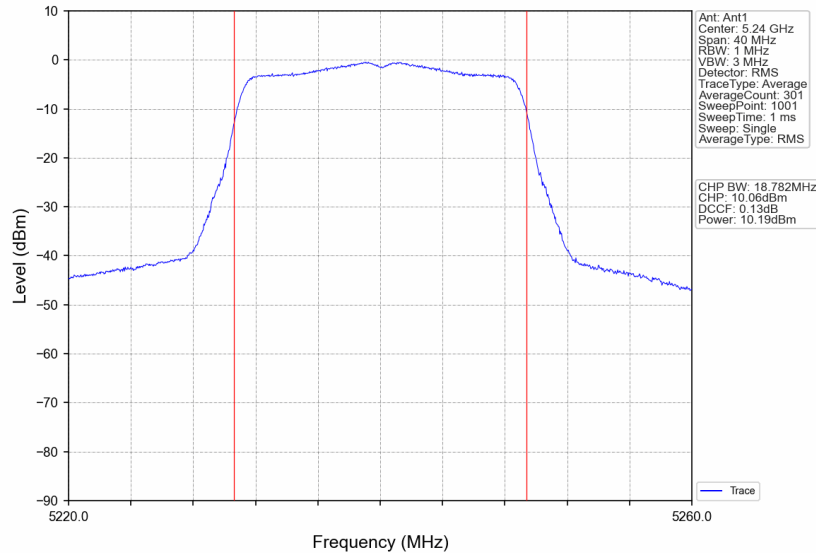
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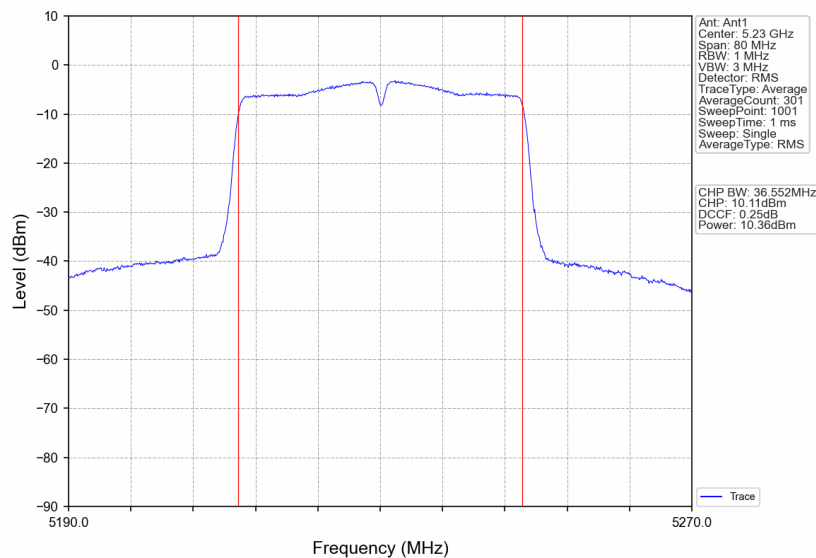
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802.11ac(VHT20)_HCH_5240MHz_Ant1_NTNV



802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



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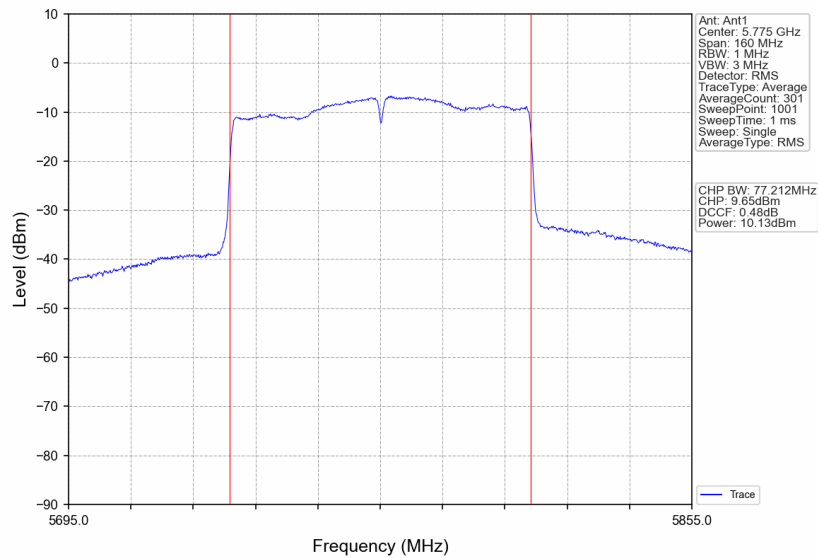
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4. Maximum Power Spectral Density

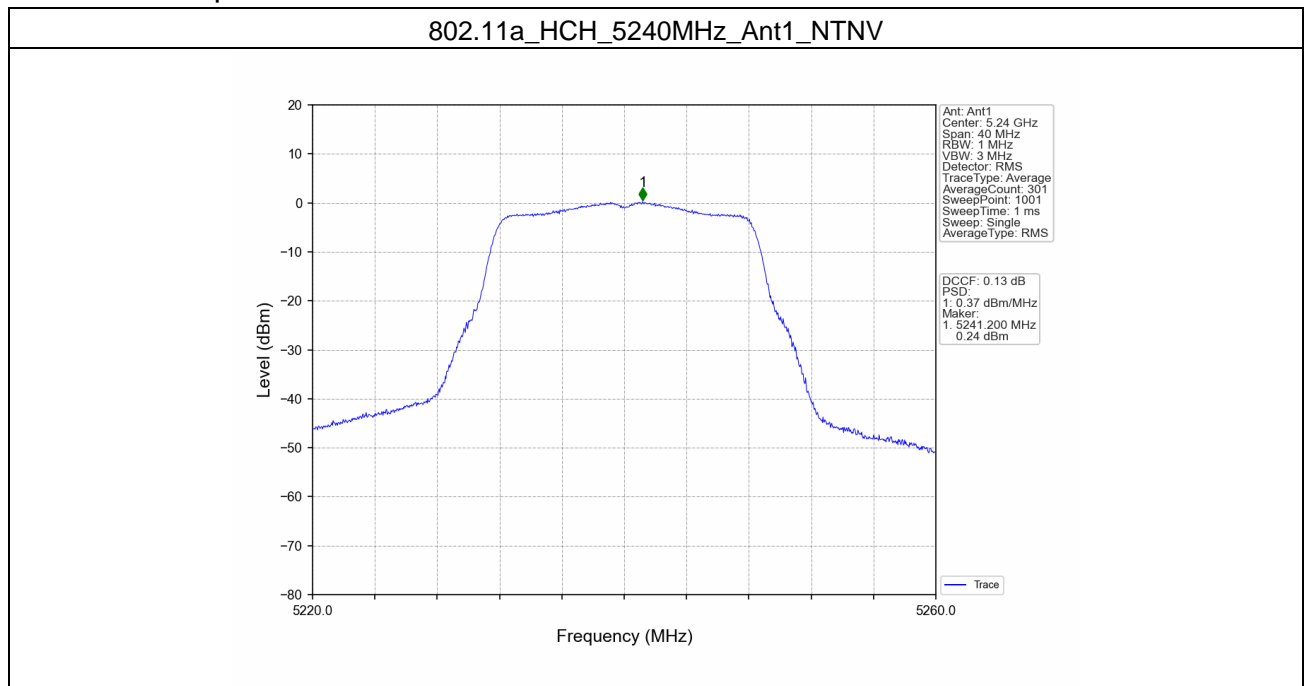
4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/MHz)		Verdict
			ANT1	Limit	
802.11a	SISO	5240	0.37	≤ 11	Pass
802.11n (HT20)	SISO	5240	-0.22	≤ 11	Pass
802.11n (HT40)	SISO	5230	-2.80	≤ 11	Pass
802.11ac (VHT20)	SISO	5240	-0.30	≤ 11	Pass
802.11ac (VHT40)	SISO	5230	-2.99	≤ 11	Pass

Note1: Antenna Gain: Ant1: U-NII-1:4.3dBi;

4.1.2 Test Graph



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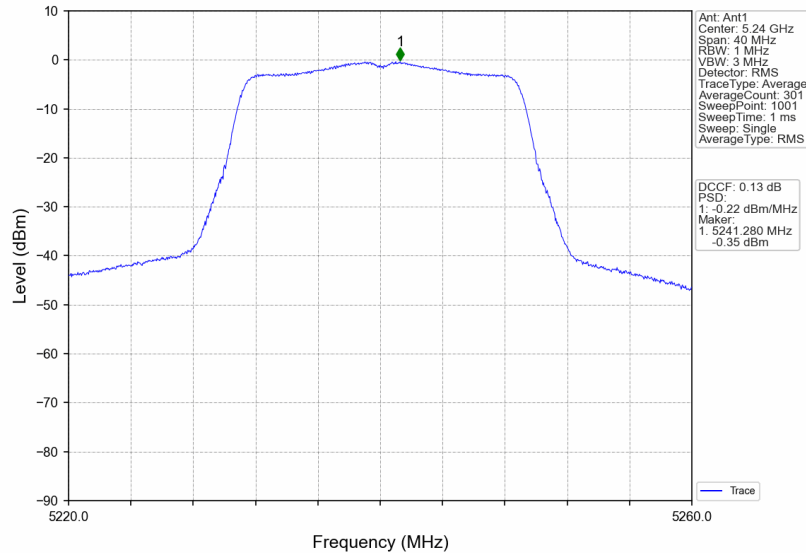
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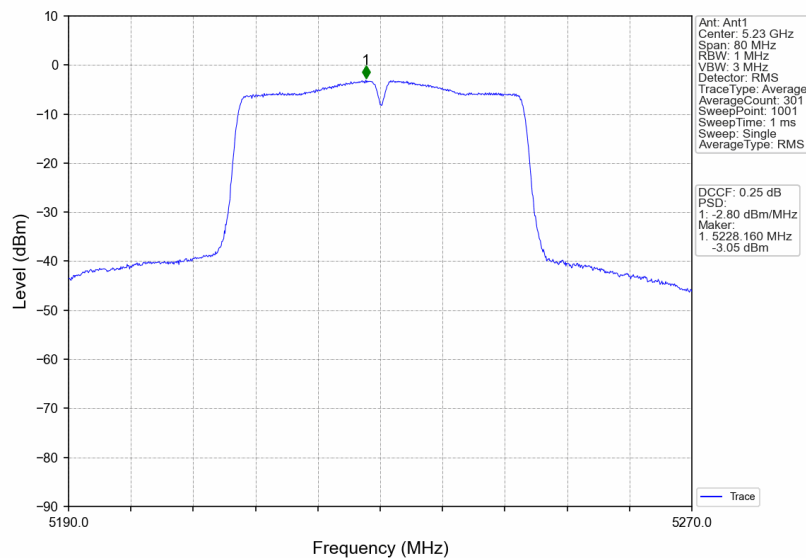
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802.11n(HT20)_HCH_5240MHz_Ant1_NTNV



802.11n(HT40)_HCH_5230MHz_Ant1_NTNV



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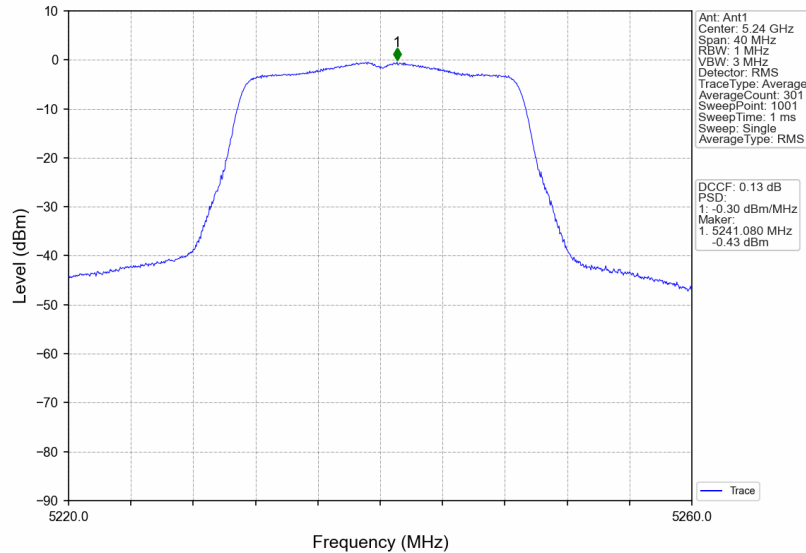
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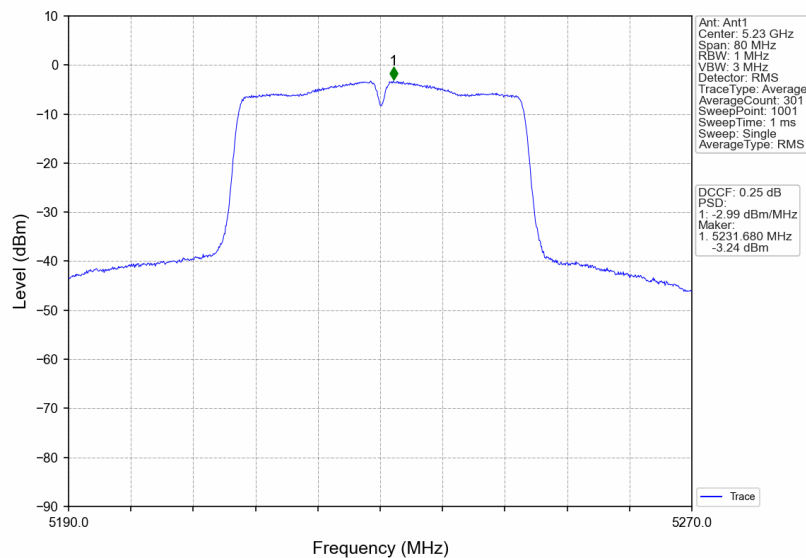
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802.11ac(VHT40)_HCH_5230MHz_Ant1_NTNV



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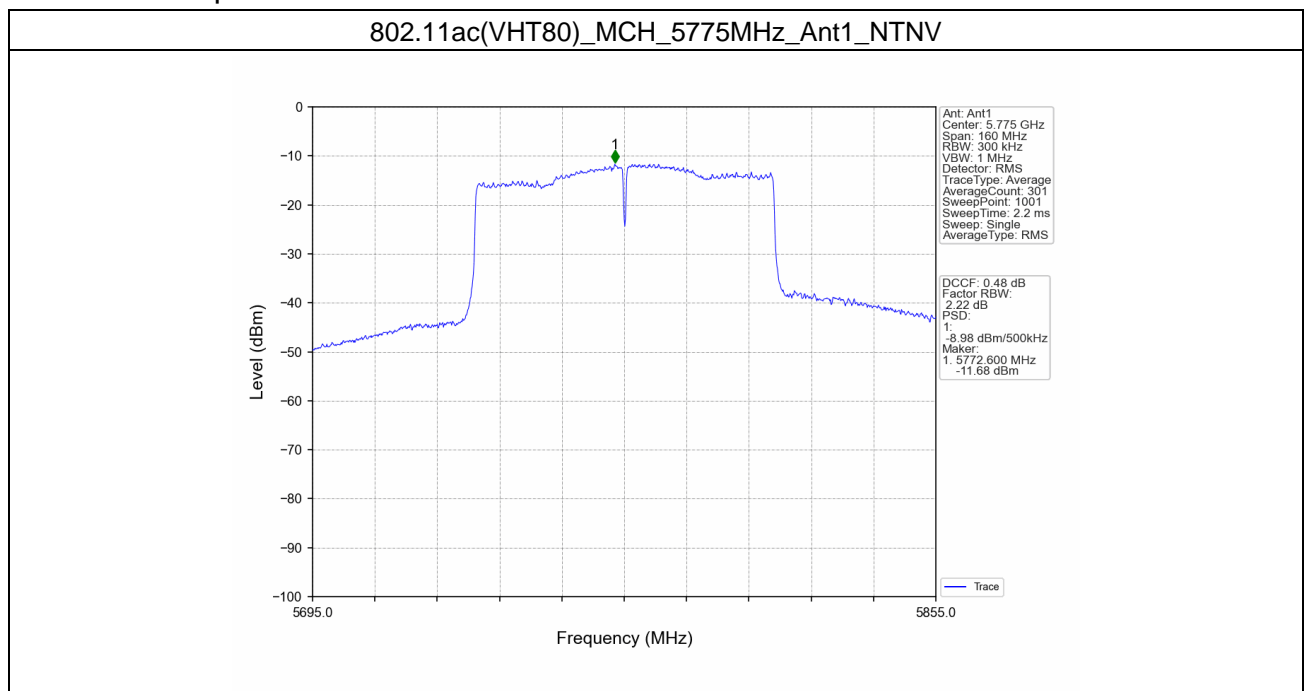
4.2 PSD-Band3

4.2.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/500kHz)		Verdict
			ANT1	Limit	
802.11ac (VHT80)	SISO	5775	-8.98	<=30	Pass

Note1: Antenna Gain: Ant1: U-NII-3:3dBi;

4.2.2 Test Graph



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5. Frequency Stability

5.1 Ant1

5.1.1 Test Result

Ant1							
Mode	TX Type	Frequency (MHz)	Temperature (°C)	Voltage (VAC)	Measured Frequency (MHz)	Limit (MHz)	Verdict
802.11a	SISO	5240	20	102	5240.060	5150 to 5250	Pass
				120	5240.040	5150 to 5250	Pass
				138	5240.060	5150 to 5250	Pass
			-30	120	5240.080	5150 to 5250	Pass
			-20	120	5240.080	5150 to 5250	Pass
			-10	120	5240.060	5150 to 5250	Pass
			0	120	5240.100	5150 to 5250	Pass
			10	120	5240.040	5150 to 5250	Pass
			30	120	5240.080	5150 to 5250	Pass
			40	120	5240.080	5150 to 5250	Pass
			50	120	5240.060	5150 to 5250	Pass
802.11n (HT20)	SISO	5240	20	102	5240.140	5150 to 5250	Pass
				120	5240.040	5150 to 5250	Pass
				138	5240.080	5150 to 5250	Pass
			-30	120	5240.080	5150 to 5250	Pass
			-20	120	5240.080	5150 to 5250	Pass
			-10	120	5240.080	5150 to 5250	Pass
			0	120	5240.080	5150 to 5250	Pass
			10	120	5240.140	5150 to 5250	Pass
			30	120	5240.020	5150 to 5250	Pass
			40	120	5240.020	5150 to 5250	Pass
			50	120	5240.100	5150 to 5250	Pass
802.11n (HT40)	SISO	5230	20	102	5230.120	5150 to 5250	Pass
				120	5230.160	5150 to 5250	Pass
				138	5230.160	5150 to 5250	Pass
			-30	120	5230.200	5150 to 5250	Pass
			-20	120	5230.160	5150 to 5250	Pass
			-10	120	5230.120	5150 to 5250	Pass
			0	120	5230.160	5150 to 5250	Pass



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			10	120	5230.160	5150 to 5250	Pass
			30	120	5230.200	5150 to 5250	Pass
			40	120	5230.120	5150 to 5250	Pass
			50	120	5230.160	5150 to 5250	Pass
802.11ac (VHT20)	SISO	5240	20	102	5240.080	5150 to 5250	Pass
				120	5240.080	5150 to 5250	Pass
				138	5240.080	5150 to 5250	Pass
			-30	120	5240.120	5150 to 5250	Pass
			-20	120	5240.080	5150 to 5250	Pass
			-10	120	5240.060	5150 to 5250	Pass
			0	120	5240.080	5150 to 5250	Pass
			10	120	5240.100	5150 to 5250	Pass
			30	120	5240.060	5150 to 5250	Pass
			40	120	5240.080	5150 to 5250	Pass
			50	120	5240.060	5150 to 5250	Pass
802.11ac (VHT40)	SISO	5230	20	102	5230.160	5150 to 5250	Pass
				120	5230.160	5150 to 5250	Pass
				138	5230.160	5150 to 5250	Pass
			-30	120	5230.160	5150 to 5250	Pass
			-20	120	5230.080	5150 to 5250	Pass
			-10	120	5230.120	5150 to 5250	Pass
			0	120	5230.120	5150 to 5250	Pass
			10	120	5230.120	5150 to 5250	Pass
			30	120	5230.160	5150 to 5250	Pass
			40	120	5230.120	5150 to 5250	Pass
			50	120	5230.120	5150 to 5250	Pass
802.11ac (VHT80)	SISO	5775	20	102	5775.225	5725 to 5850	Pass
				120	5775.225	5725 to 5850	Pass
				138	5775.150	5725 to 5850	Pass
			-30	120	5775.150	5725 to 5850	Pass
			-20	120	5775.075	5725 to 5850	Pass
			-10	120	5775.225	5725 to 5850	Pass
			0	120	5775.225	5725 to 5850	Pass
			10	120	5775.225	5725 to 5850	Pass
			30	120	5775.150	5725 to 5850	Pass
			40	120	5775.225	5725 to 5850	Pass
			50	120	5775.225	5725 to 5850	Pass



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- End of the Report -



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