FCC RADIO TEST REPORT

FCC ID: 2AMKRTDXW801

Sample :	AUTO DIAGNOSTIC TOOL
Trade Name :	IDUTEX
Main Model :	IDUTEX DS810 Plus
Additional Model :	IDUTEX DS810, IDUTEX DS810 Pro, IDUTEX TS810, IDUTEX TS810 Plus, IDUTEX TS810 Pro, IDUTEX TD830, IDUTEX TD830 Pro, IDUTEX TS910 Pro, IDUTEX TD 930 Plus, IDUTEX TD930 Pro
Report No. :	UNIA22022304ER-63

Prepared for

Shenzhen IDUTEX Tech Co., Ltd

Room 401, Building B11, Yintian Industrial Zone, Yantian, Xixiang, Baoan, Shenzhen, China

Prepared by

Shenzhen United Testing Technology Co., Ltd.

2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

TEST RESULT CERTIFICATION

Applicant	Shenzhen IDUTEX Tech Co., Ltd
Address	Room 401, Building B11, Yintian Industrial Zone, Yantian, Xixiang, Baoan, Shenzhen, China
Manufacturer	Shenzhen IDUTEX Tech Co., Ltd
Address	Room 401, Building B11, Yintian Industrial Zone, Yantian, Xixiang, Baoan, Shenzhen, China

Product description

Product	AUTO DIAGNOSTIC TOOL
Trade Name	IDUTEX
Model Name	IDUTEX DS810 Plus, IDUTEX DS810, IDUTEX DS810 Pro, IDUTEX TS810, IDUTEX TS810 Plus, IDUTEX TS810 Pro, IDUTEX TD830, IDUTEX TD830 Pro, IDUTEX TS910 Pro, IDUTEX TD 930 Plus, IDUTEX TD930 Pro
Test Methods	FCC Rules and Regulations Part 15 Subpart E Section 15.407 KDB 789033 D02 v02r01

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
This report shall not be reproduced except in full, without the written approval of UNI, this document may be altered or revised by Shenzhen United Testing Technology Co., Ltd., personnel only, and shall be noted in the revision of the document.

Date of Test	
Date (s) of performance of tests	Feb. 23, 2022 ~ Apr. 07, 2022
Date of Issue	Apr. 08, 2022
Test Result	Pass

Prepared by: Jackson Fang

Jackson Fang/Editor

Reviewer: kahn.yang

Kahn yang/Supervisor

Approved & Authorized Signer: liuze

Liuze/Manager

1. GENERAL INFORMATION

1.1. PRODUCT DESCRIPTION

Product:	AUTO DIAGNOSTIC TOOL
Trade Name:	IDUTEX
Main Model:	IDUTEX DS810 Plus
Additional Model:	IDUTEX DS810, IDUTEX DS810 Pro, IDUTEX TS810, IDUTEX TS810 Plus, IDUTEX TS810 Pro, IDUTEX TD830, IDUTEX TD830 Pro, IDUTEX TS910 Pro, IDUTEX TD 930 Plus, IDUTEX TD930 Pro
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: IDUTEX DS810 Plus.
FCC ID:	2AMKRTDXW801
Operation Frequency:	5.18GHz-5.24GHz
Number of Channels:	20MHz: 5CH 40MHz: 2CH 80MHz: 1CH
Modulation Type:	BPSK, QPSK, 16QAM, 64QAM, 128QAM, 256QAM,OFDM
Antenna Type:	Internal Antenna
Antenna Gain:	1.26dBi
Battery:	DC 3.7V, 8000mAh
Adapter:	Model: FJ-SW126G1202000N Input: 100-240~, 50/60Hz, 0.6A Max Output: DC 12.0V, 2.0A, 24.0W
Power Source:	DC 12V form Adapter or DC 3.7V from Li-battery

Note:

1. The EUT is designed as Client without Radar Detection device
2. The device do not support TPC.

1.2. TABLE OF CARRIER FREQUENCYS

Channel List							
802.11a/n/ac (20MHz) (5.15-5.25GHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	44	5220	48	5240
38	5190	42	5210	46	5230	-	-
802.11n/ac (40MHz) (5.15-5.25GHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	42	5210	46	5230	-	-
40	5200	44	5220	-	-	-	-
802.11ac (80MHz) (5.15-5.25GHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	-	-	-	-	-	-

Note:

For 20MHZ bandwidth system use Channel 36,,38,40,46,48.

For 40MHZ bandwidth system use Channel 38,44.

For 80MHZ bandwidth system use Channel 42.

2. MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		Above 1000MHz	4.13	

3. DESCRIPTION OF TEST MODES

Mode	Tested channel	Modulation	Date rate(Mbps)
802.11a/n20/ac20	149,157, 165	OFDM	6Mbps/MCS0
802.11n40/ac40	151,159	OFDM	MCS0
802.11ac80	155	42, 155	OFDM

Note:

1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%.
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.

4. SYSTEM TEST CONFIGURATION

4.1. CONFIGURATION OF EUT SYSTEM

Configure 1:

4.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
E-1	AUTO DIAGNOSTIC TOOL	N/A	IDUTEX DS810 Plus	EUT

4.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	6dB Bandwidth	Compliant
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

5. TEST FACILITY

Test Laboratory : Shenzhen United Testing Technology Co., Ltd.

Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, Xixiang Str, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

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

A2LA Certificate Number: 4747.01

The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 21947

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

6. TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2022.09.22
3	AAN	TESEQ	T8-Cat6	38888	2022.09.22
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2022.05.17
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2022.09.22
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2022.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2024.02.26
4	PREAMP	HP	8449B	3008A00160	2022.09.22
5	PREAMP	HP	8447D	2944A07999	2022.05.17
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2022.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2022.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2022.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2022.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2022.05.17
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2022.05.17
13	RF power divider	Anritsu	K241B	992289	2022.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2022.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2022.07.25
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2022.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2022.05.23
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2022.09.27
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2022.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2022.09.22
21	Spctrum Analyzer	Rohde&Schwarz	FSP 40	100501	2022.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2022.09.22
23	Frequency Meter	VICTOR	VC2000	997406086	2022.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2022.09.22

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

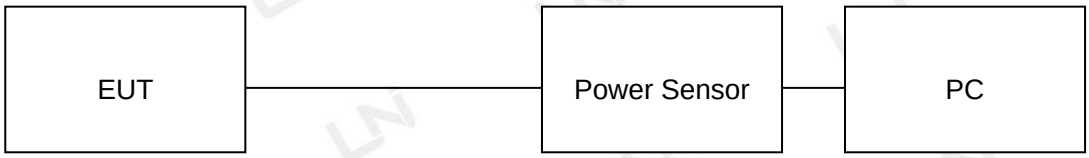
For average power test:

1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note：The EUT was tested according to KDB 789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

7.2. TEST SET-UP

AVERAGE POWER SETUP



7.3. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5180	7.35	30	Pass
5200	7.69	30	Pass
5240	7.58	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5180	7.37	30	Pass
5200	7.65	30	Pass
5240	7.45	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11AC20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5180	7.37	30	Pass
5200	7.44	30	Pass
5240	7.38	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11N40 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5190	7.84	30	Pass
5230	7.58	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11AC40 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5190	8.61	30	Pass
5230	8.56	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11AC80 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5210	8.85	30	Pass

8. -26dB BANDWIDTH

8.1.1 -26dB BANDWIDTH MEASUREMENT PROCEDURE

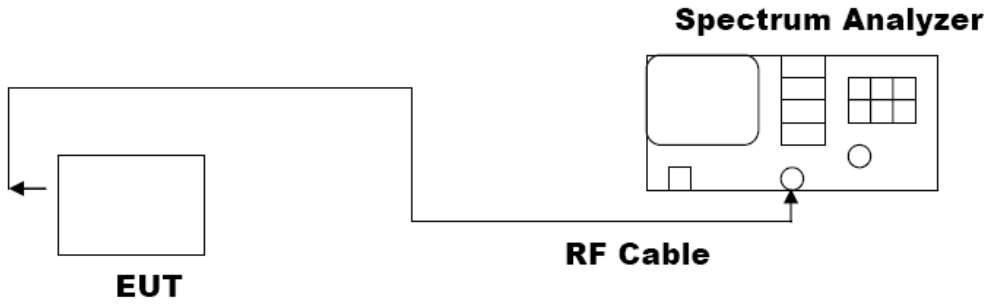
a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. Spectrum Setting: RBW= 300kHz(802.11a/n20/ac20), RBW=510kHz(802.11n40/ac40), RBW=1MHz(802.11ac80),VBW≧RBW, Sweep time = Auto.

8.1.2 99% OCCUPIED BANDWIDTH

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 1.5 to 5 times the OBW, centered on a nominal channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 789033 D02 v02r01 for compliance to FCC 47CFR 15.407 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3. LIMITS AND MEASUREMENT RESULTS

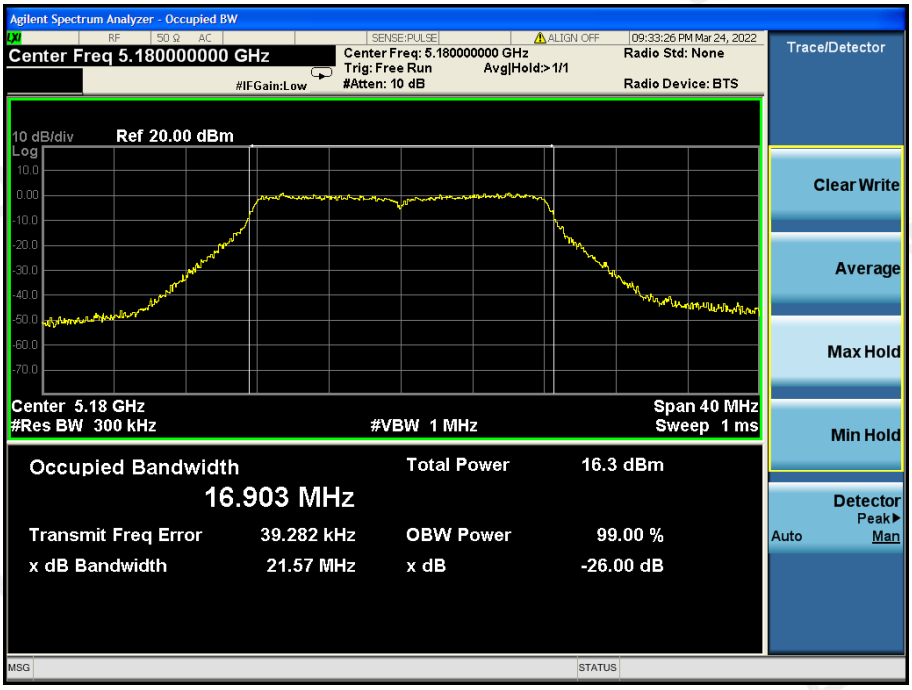
LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	
>500KHZ	5180MHz	21.57	16.903	PASS
	5200MHz	21.88	16.881	PASS
	5240MHz	21.63	16.861	PASS

LIMITS AND MEASUREMENT RESULT FOR 802.11N20/40 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	
>500KHZ	5180MHz	22.00	17.938	PASS
	5200MHz	21.97	17.891	PASS
	5240MHz	21.96	17.916	PASS
	5190MHz	43.55	36.627	PASS
	5230MHz	43.85	36.524	PASS

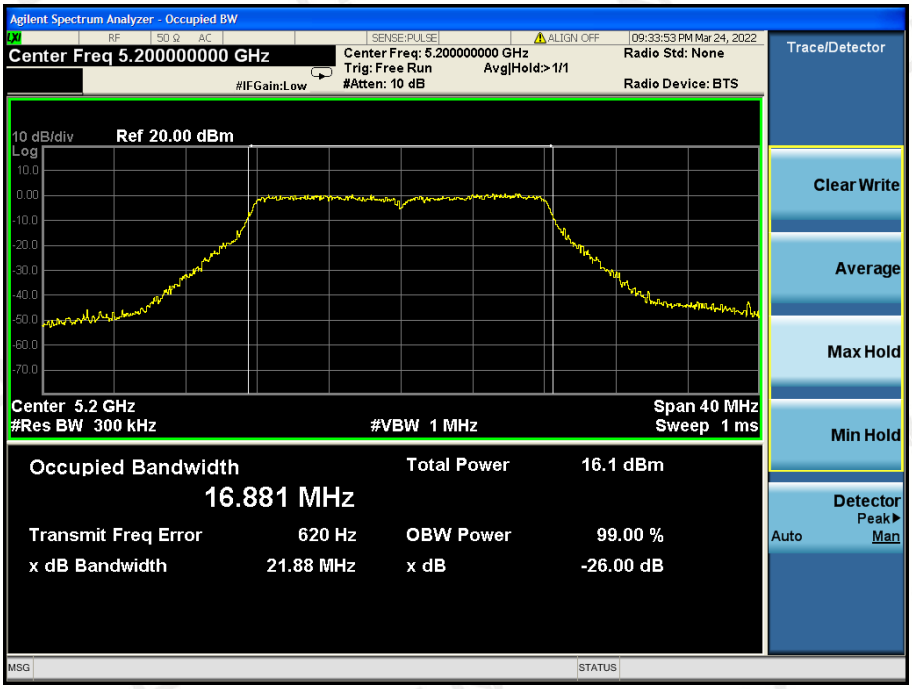
LIMITS AND MEASUREMENT RESULT FOR 802.11AC20/40/80 MODULATION				
Applicable Limits	Applicable Limits			
	Test Data (MHz)			Criteria
	Frequency (MHz)	-26dB Bandwidth	99.00% Occupied Bandwidth	
>500KHZ	5180MHz	22.00	17.879	PASS
	5200MHz	21.99	17.915	PASS
	5240MHz	21.93	17.876	PASS
	5190MHz	43.65	36.592	PASS
	5230MHz	43.88	36.549	PASS
	5210MHz	81.54	75.146	PASS

802.11a20 TEST RESULT

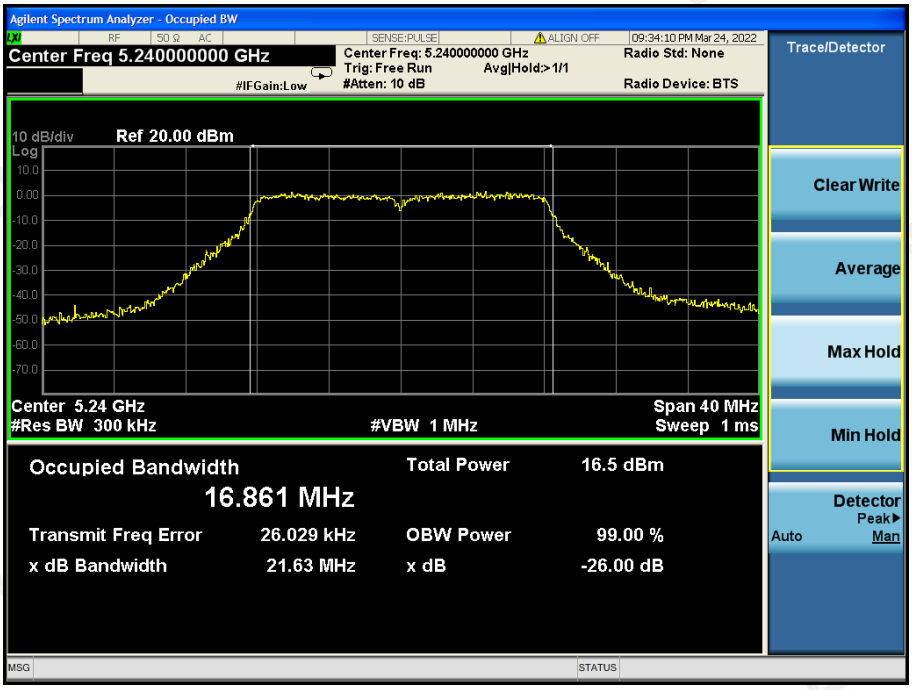
BANDWIDTH FOR 5180MHz（-26dB BANDWIDTH）



BANDWIDTH FOR 5200MHz（-26dB BANDWIDTH）

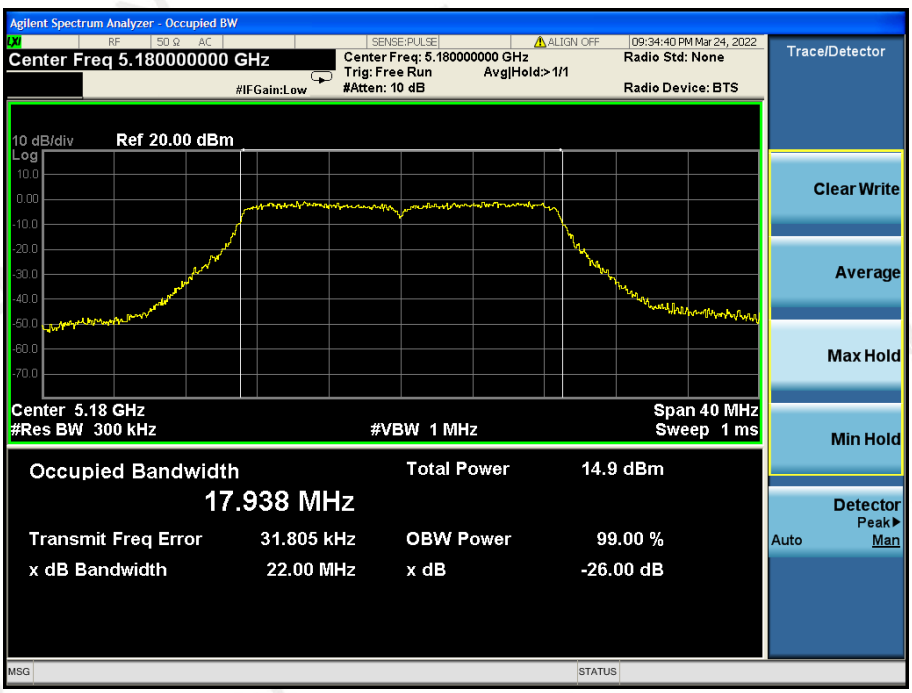


BANDWIDTH FOR 5240MHz（-26dB BANDWIDTH）

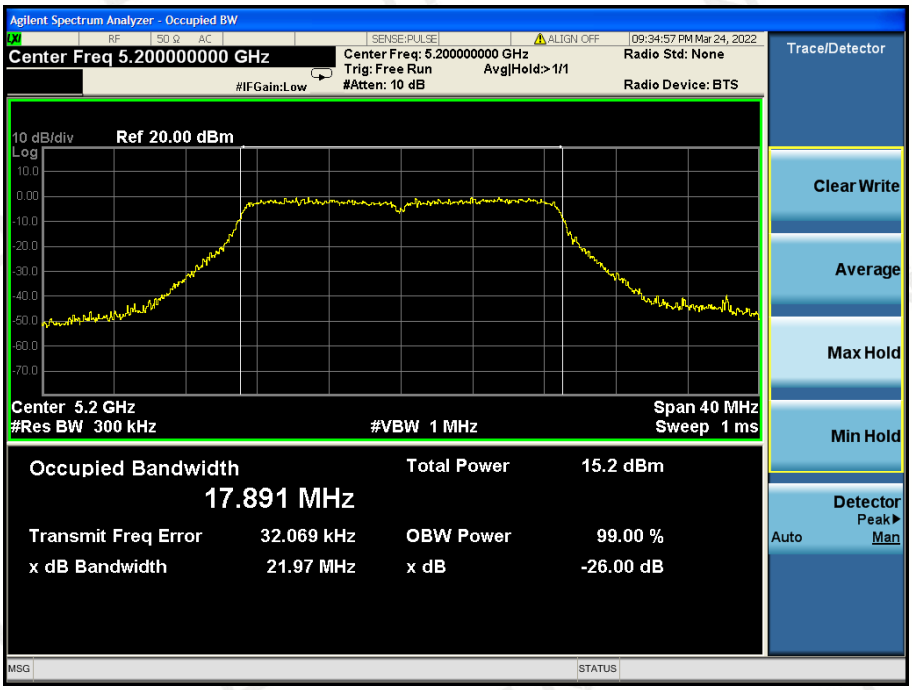


802.11n20 TEST RESULT

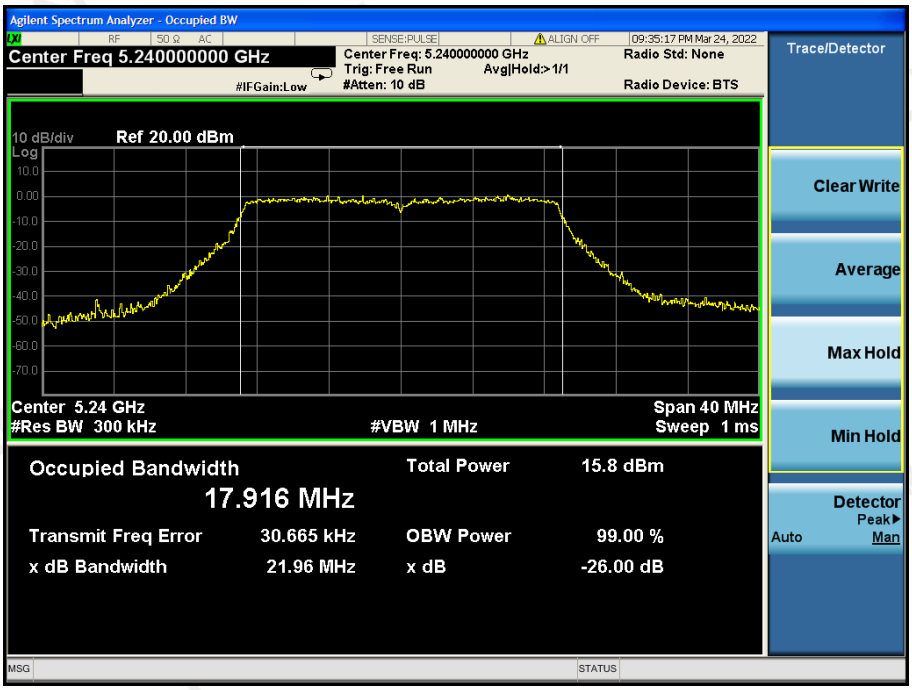
BANDWIDTH FOR 5180MHz（-26dB BANDWIDTH）



BANDWIDTH FOR 5200MHz（-26dB BANDWIDTH）

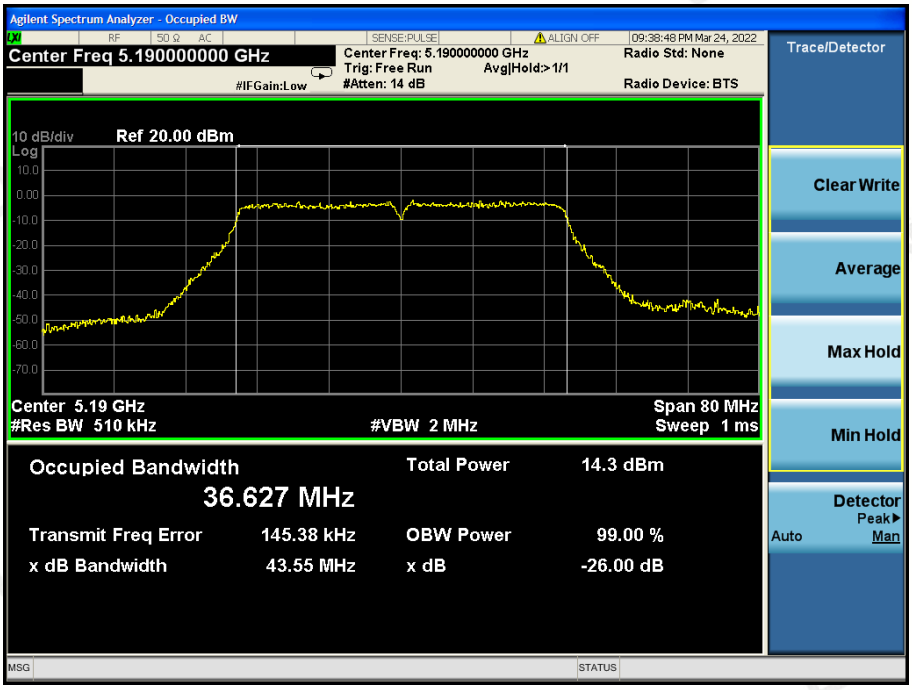


BANDWIDTH FOR 5240MHz（-26dB BANDWIDTH）

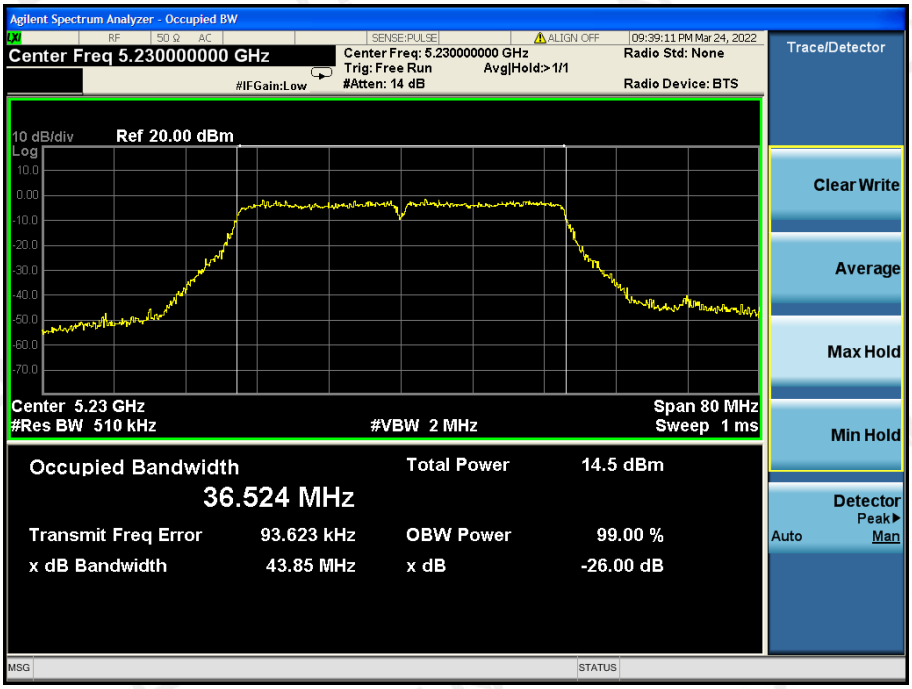


802.11n40 TEST RESULT

BANDWIDTH FOR 5190MHz（-26dB BANDWIDTH）

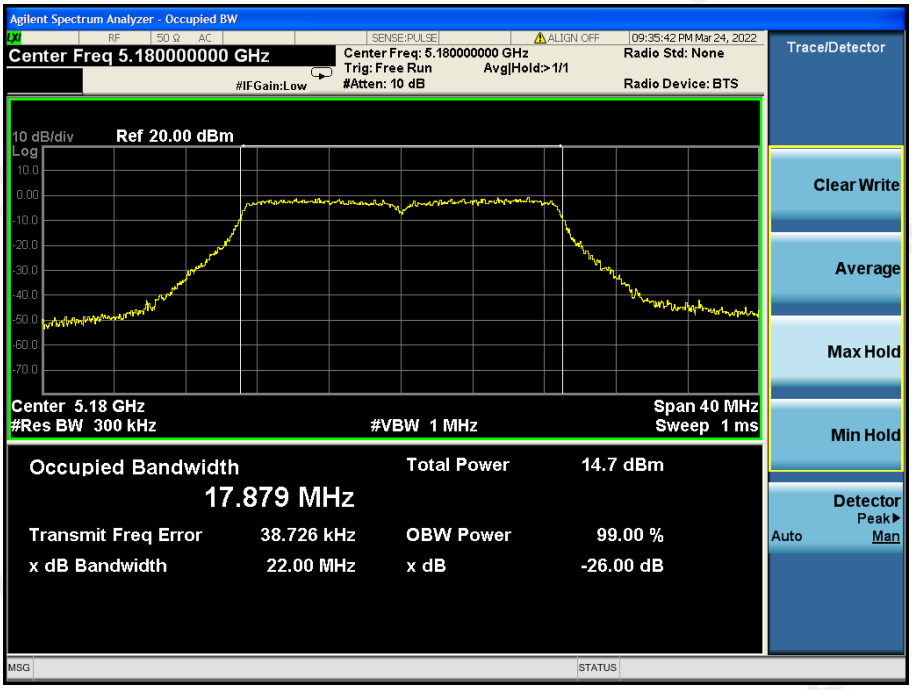


BANDWIDTH FOR 5230MHz（-26dB BANDWIDTH）

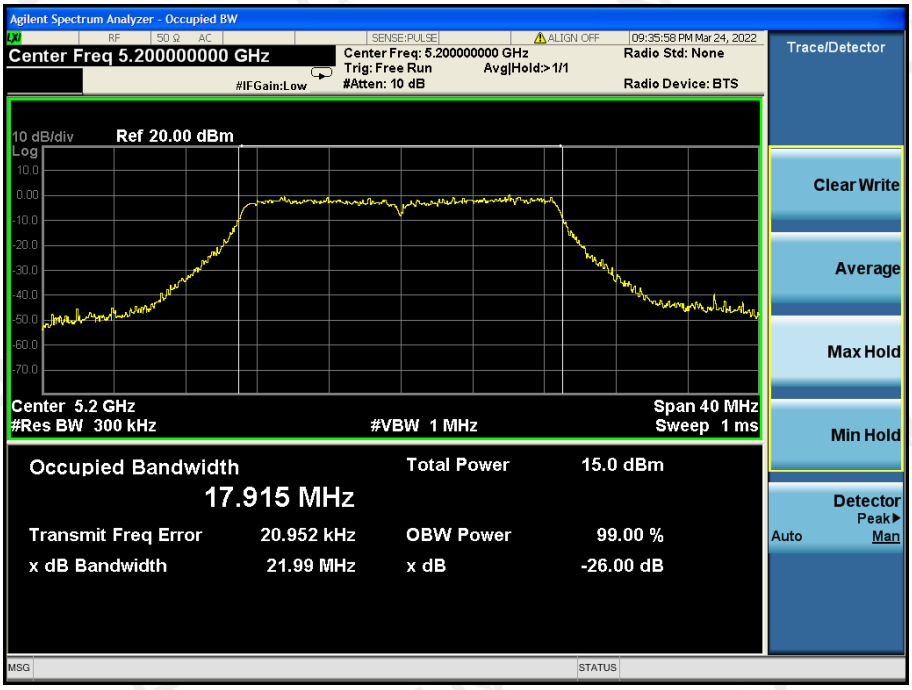


802.11ac20 TEST RESULT

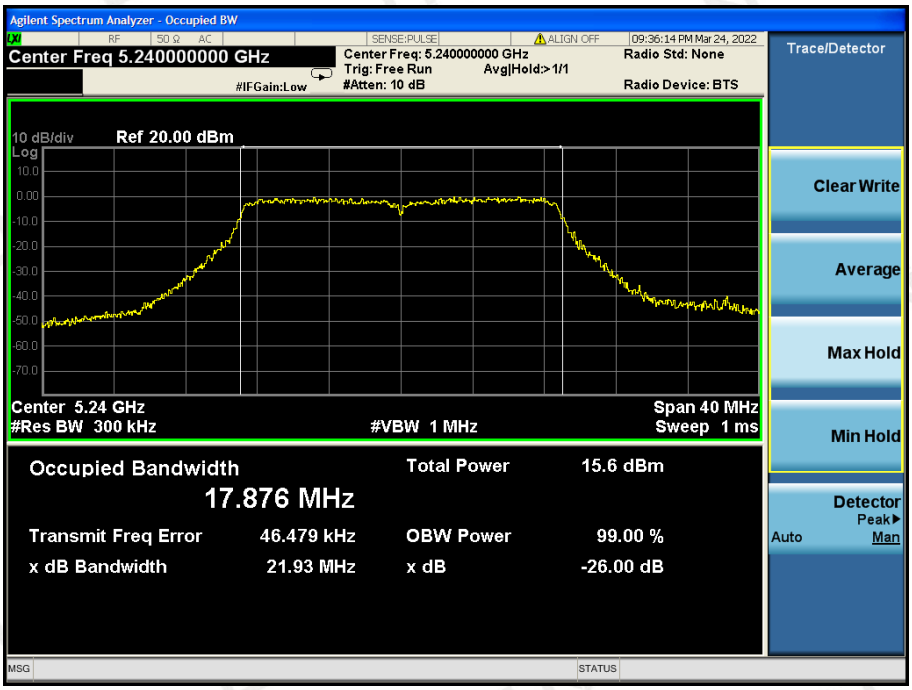
BANDWIDTH FOR 5180MHz（-26dB BANDWIDTH）



BANDWIDTH FOR 5200MHz（-26dB BANDWIDTH）

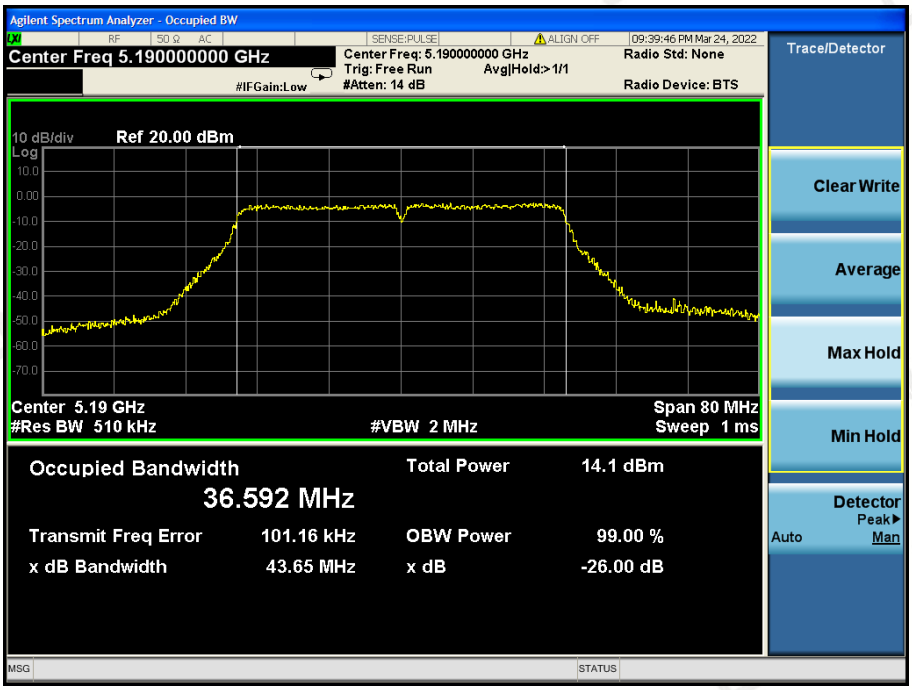


BANDWIDTH FOR 5240MHz（-26dB BANDWIDTH）

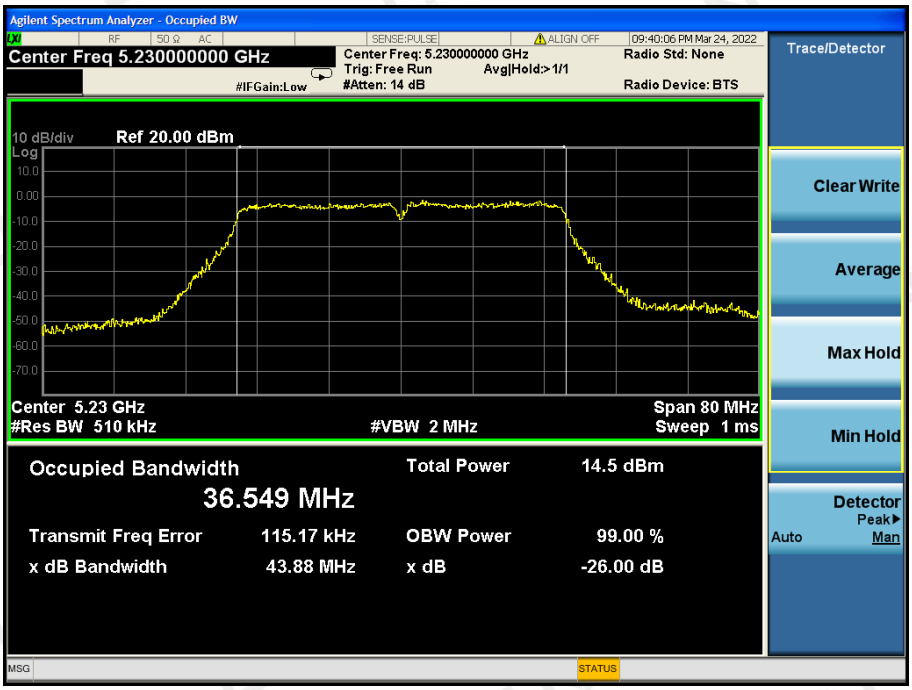


802.11ac40 TEST RESULT

BANDWIDTH FOR 5190MHz（-26dB BANDWIDTH）

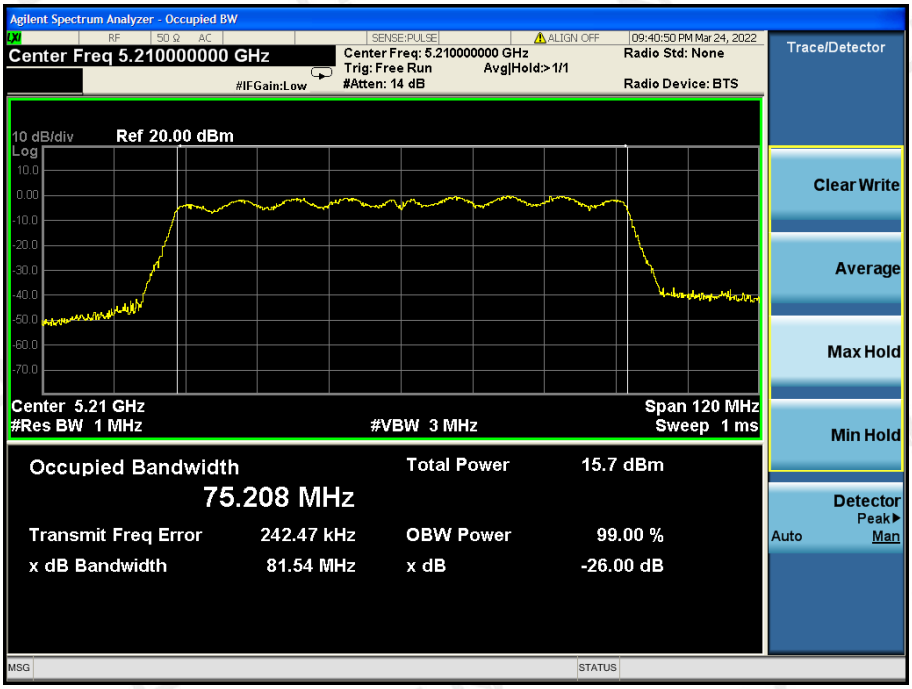


BANDWIDTH FOR 5230MHz（-26dB BANDWIDTH）



802.11ac80 TEST RESULT

BANDWIDTH FOR 5210MHz（-26dB BANDWIDTH）



9. MAXIMUM CONDUCTED OUTPUT AVERAGE POWER SPECTRAL DENSITY

9.1 MEASUREMENT PROCEDURE

Refer to KDB 789033 D02 v02r01 section F

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

9.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

9.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5180	3.068	30	Pass
5200	3.922	30	Pass
5240	4.123	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.11N20 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5180	2.251	30	Pass
5200	2.550	30	Pass
5240	2.683	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.1N40 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5190	-1.331	30	Pass
5230	-0.812	30	Pass

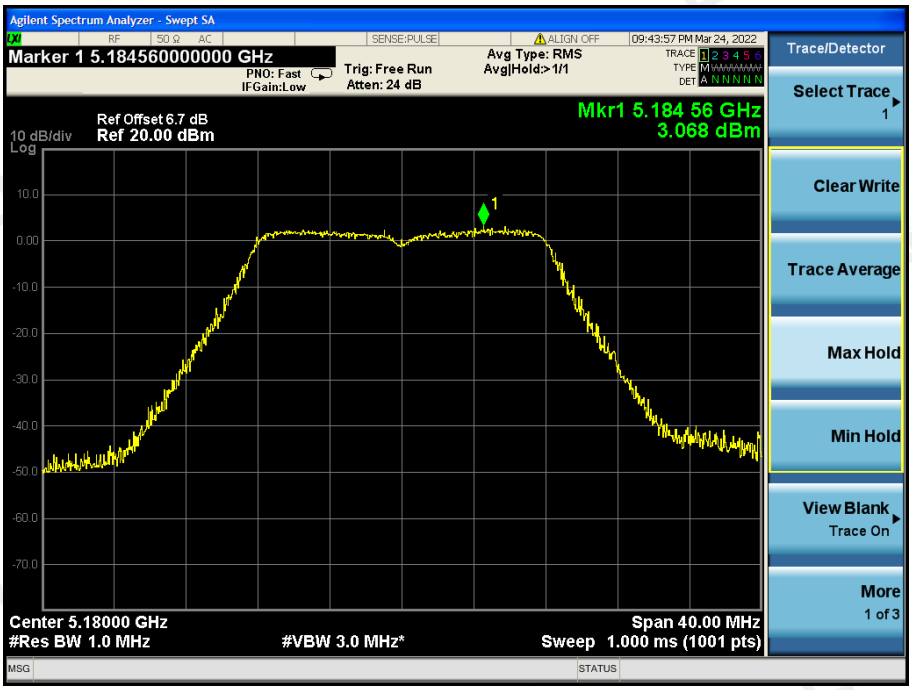
LIMITS AND MEASUREMENT RESULT FOR 802.11AC20 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5180	1.914	30	Pass
5200	2.113	30	Pass
5240	2.938	30	Pass

LIMITS AND MEASUREMENT RESULT FOR 802.1AC40 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5190	-1.539	30	Pass
5230	-0.612	30	Pass

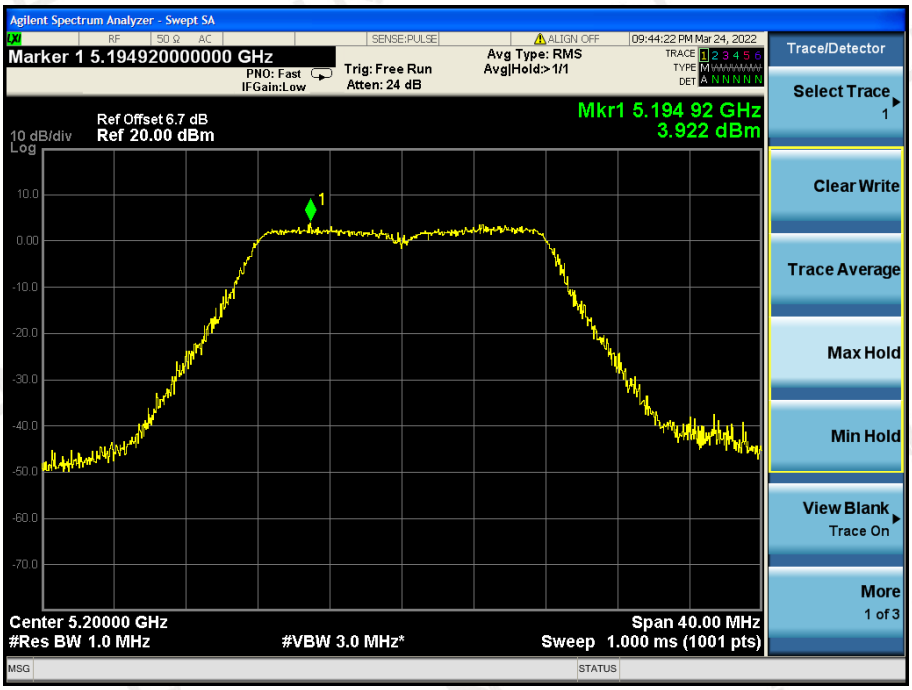
LIMITS AND MEASUREMENT RESULT FOR 802.1AC80 MODULATION			
Frequency (MHz)	Power density (30dBm/500kHz)	Applicable Limits (30dBm/500kHz)	Pass or Fail
5210	-1.858	30	Pass

802.11a20 TEST RESULT

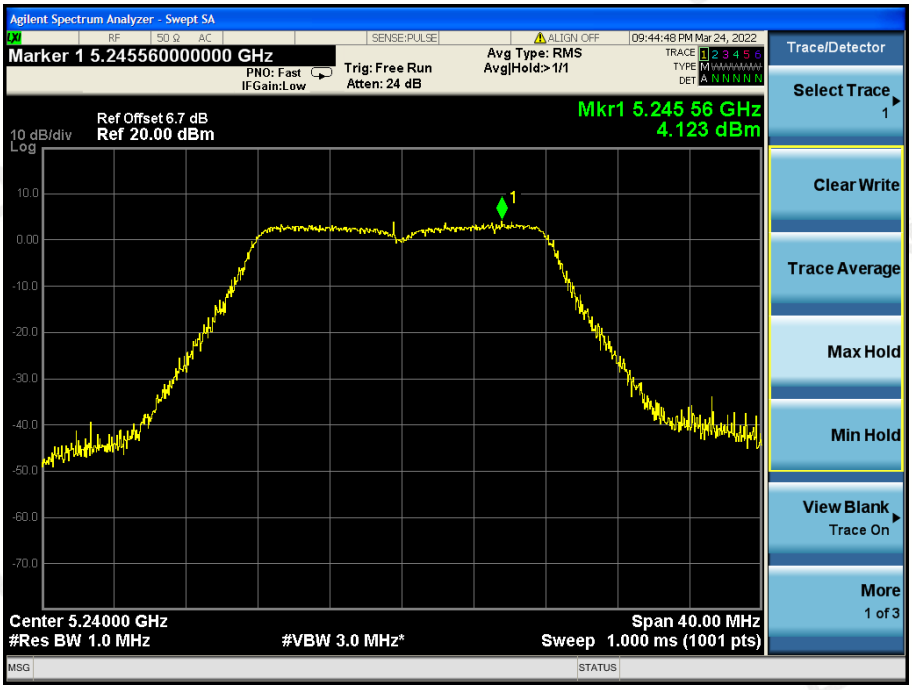
SPECTRAL DENSITY FOR 5180MHz



SPECTRAL DENSITY FOR 5200MHz

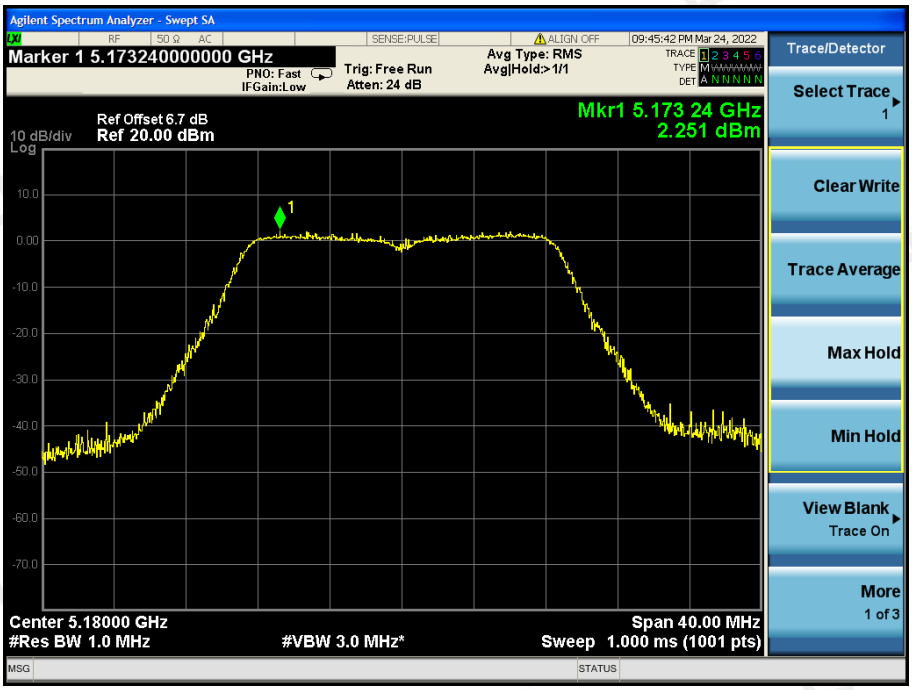


SPECTRAL DENSITY FOR 5240MHz

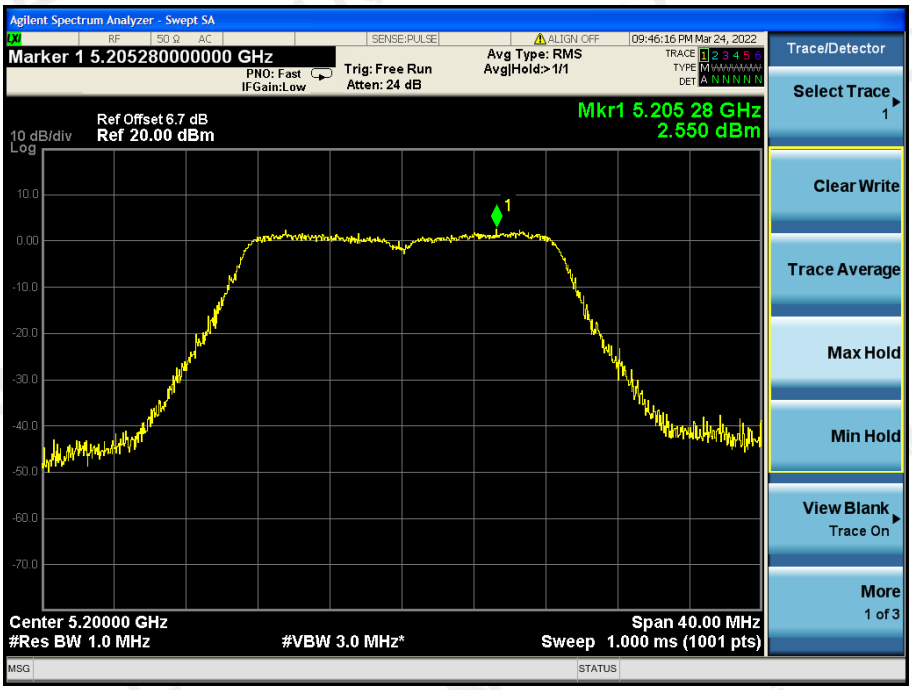


802.11n20 TEST RESULT

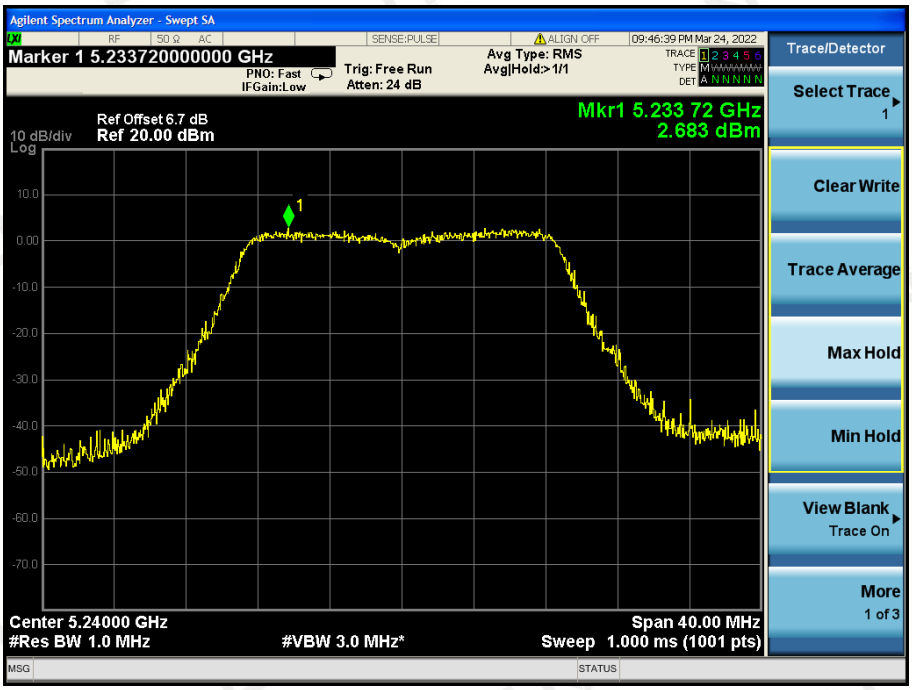
SPECTRAL DENSITY FOR 5180MHz



SPECTRAL DENSITY FOR 5200MHz

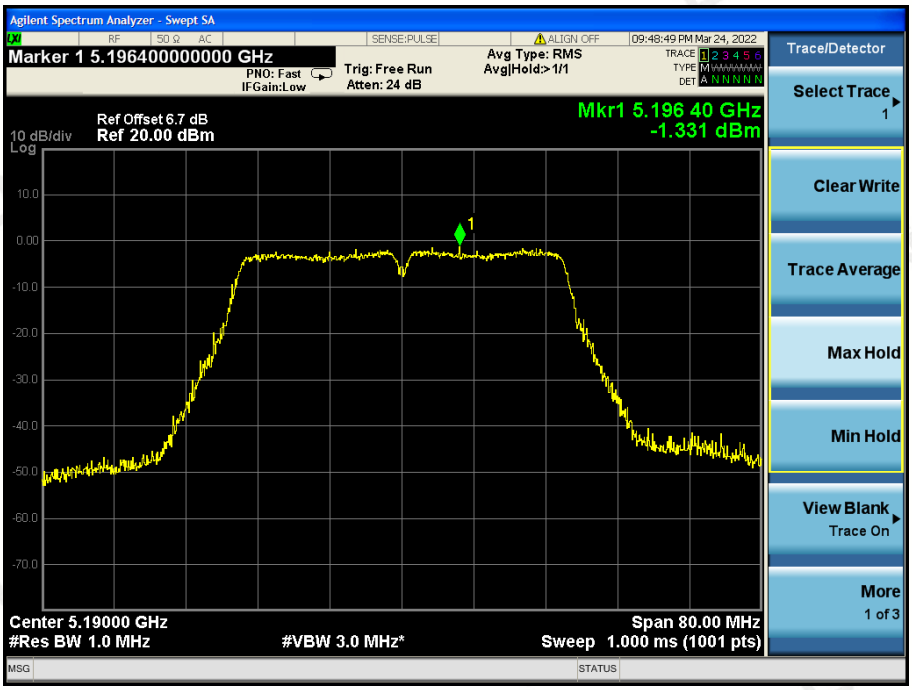


SPECTRAL DENSITY FOR 5240MHz

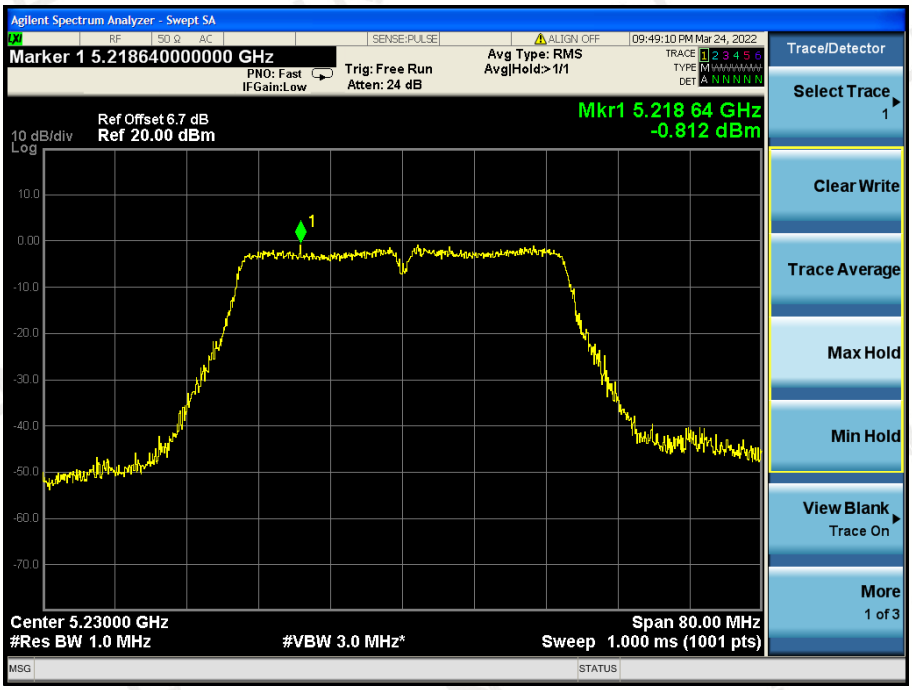


802.11n40 TEST RESULT

SPECTRAL DENSITY FOR 5190MHz

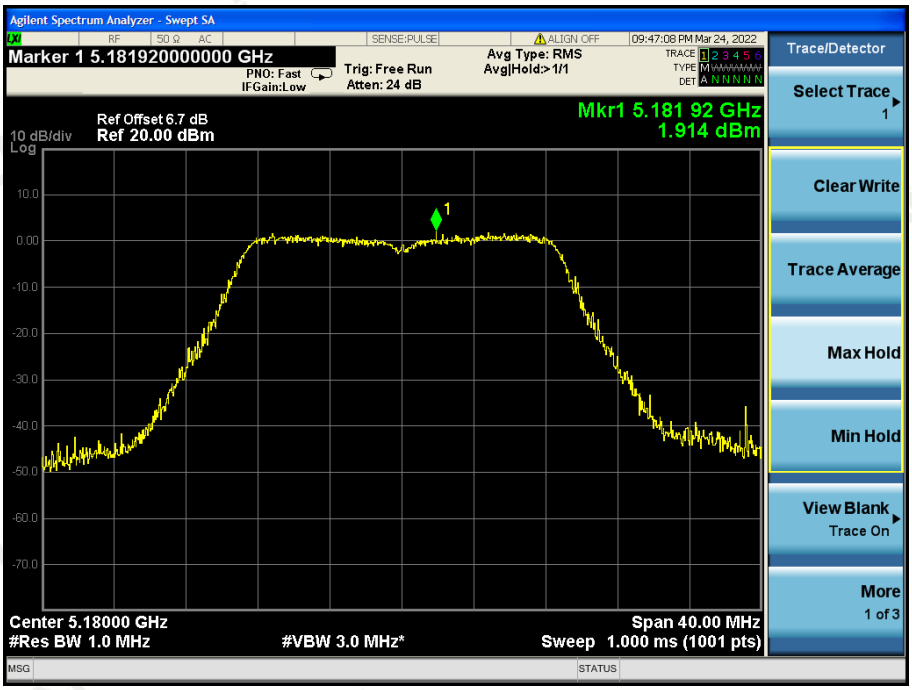


SPECTRAL DENSITY FOR 5230MHz

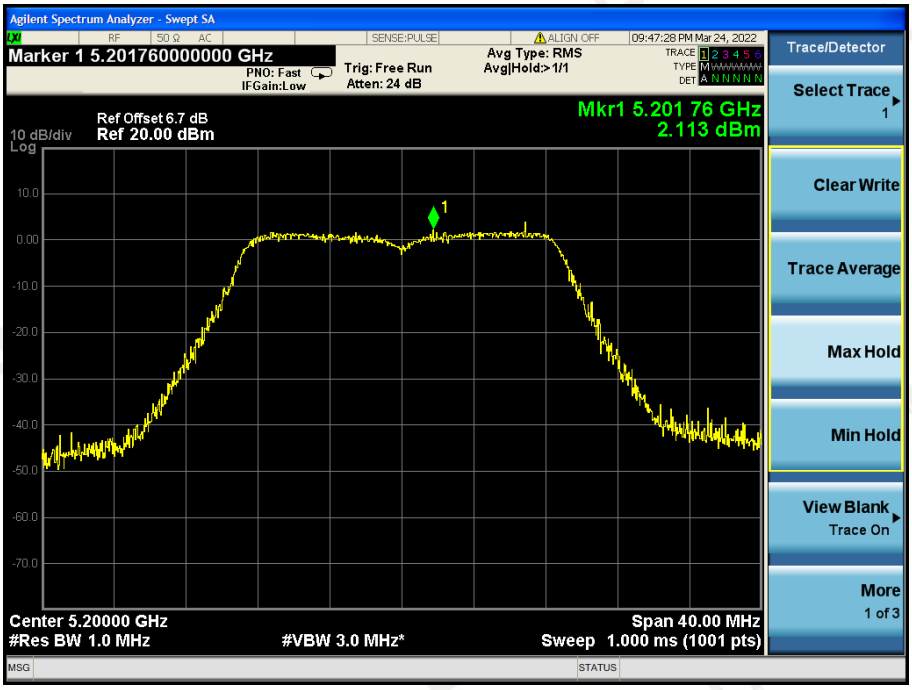


802.11ac20 TEST RESULT

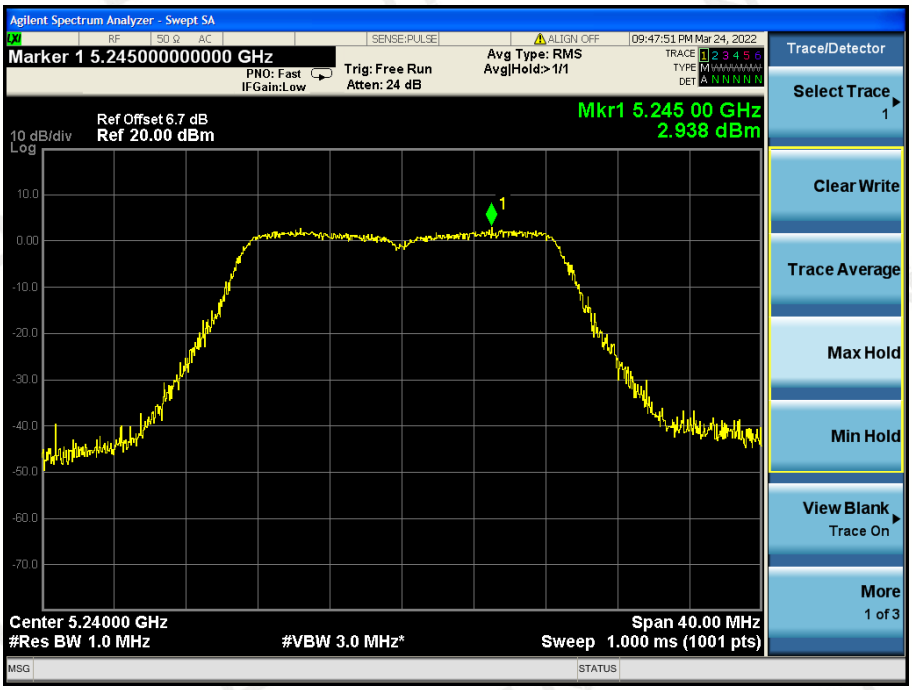
SPECTRAL DENSITY FOR 5180MHz



SPECTRAL DENSITY FOR 5200MHz

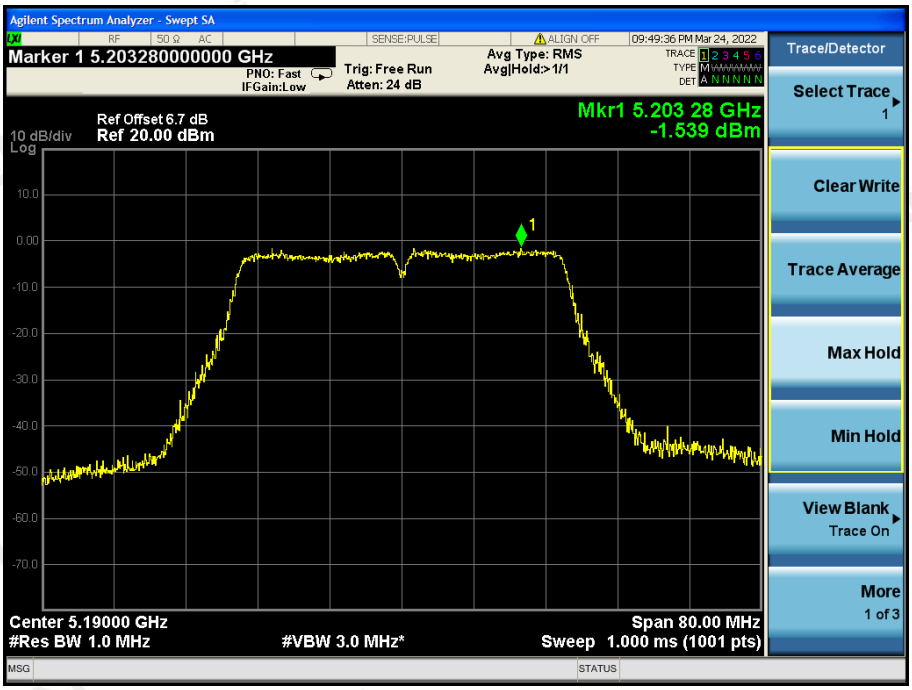


SPECTRAL DENSITY FOR 5240MHz

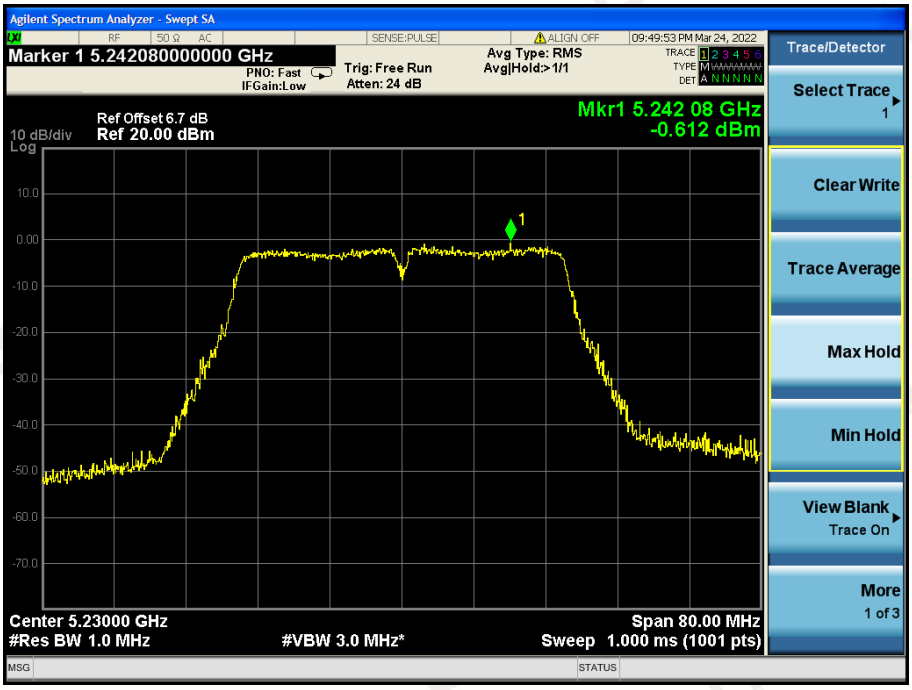


802.11ac40 TEST RESULT

SPECTRAL DENSITY FOR 5190MHz

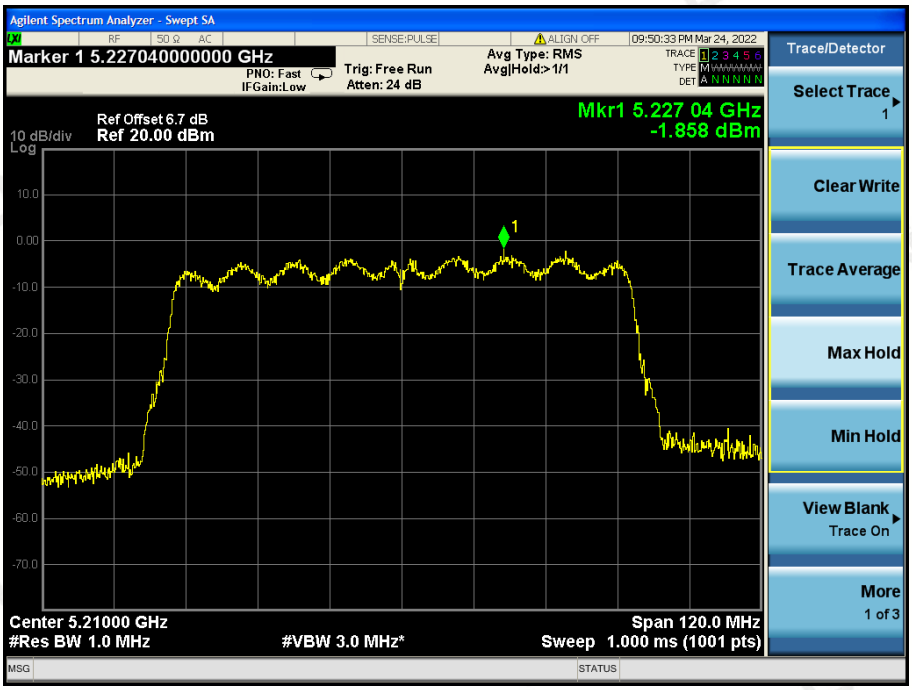


SPECTRAL DENSITY FOR 5230MHz



802.11ac80 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5210MHz



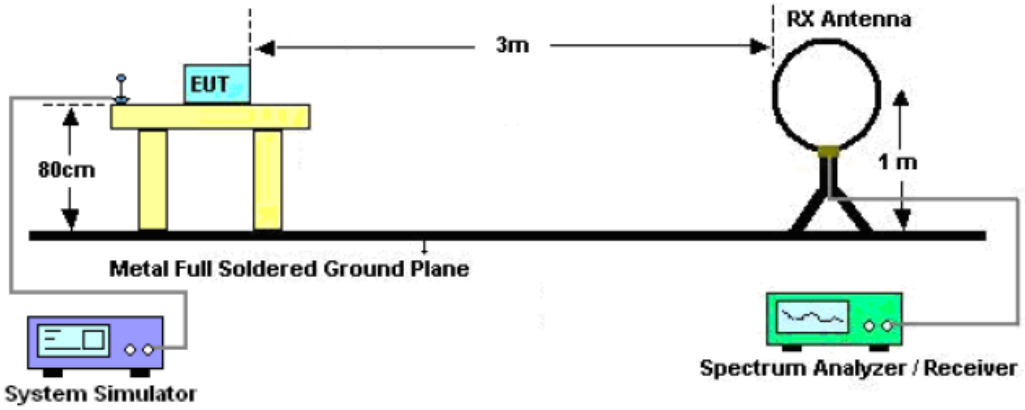
10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

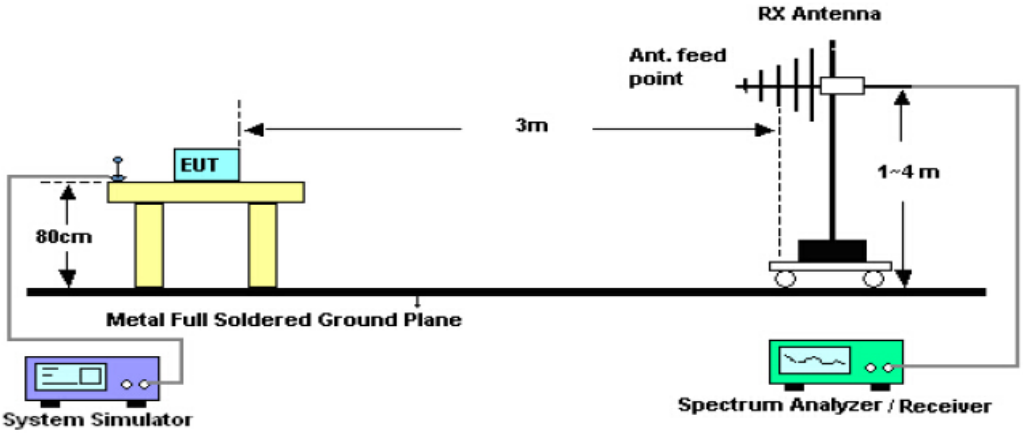
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3M VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

10.2. TEST SETUP

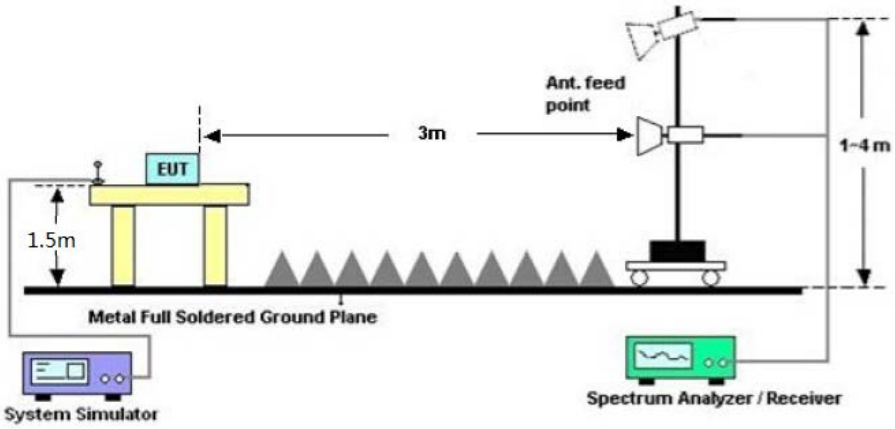
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



10.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/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

Note: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

10.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

RADIATED EMISSION BELOW 1GHz

Between 9KHz – 30 MHz

EUT：	AUTO DIAGNOSTIC TOOL	Model Name. ：	IDUTEX DS810 Plus
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010 hPa	Test Date：	2022-03-14
Test Mode ：	TX(802.11a CH149 worst case)	Polarization：	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	N/A
--	--	--	--	N/A

Note:

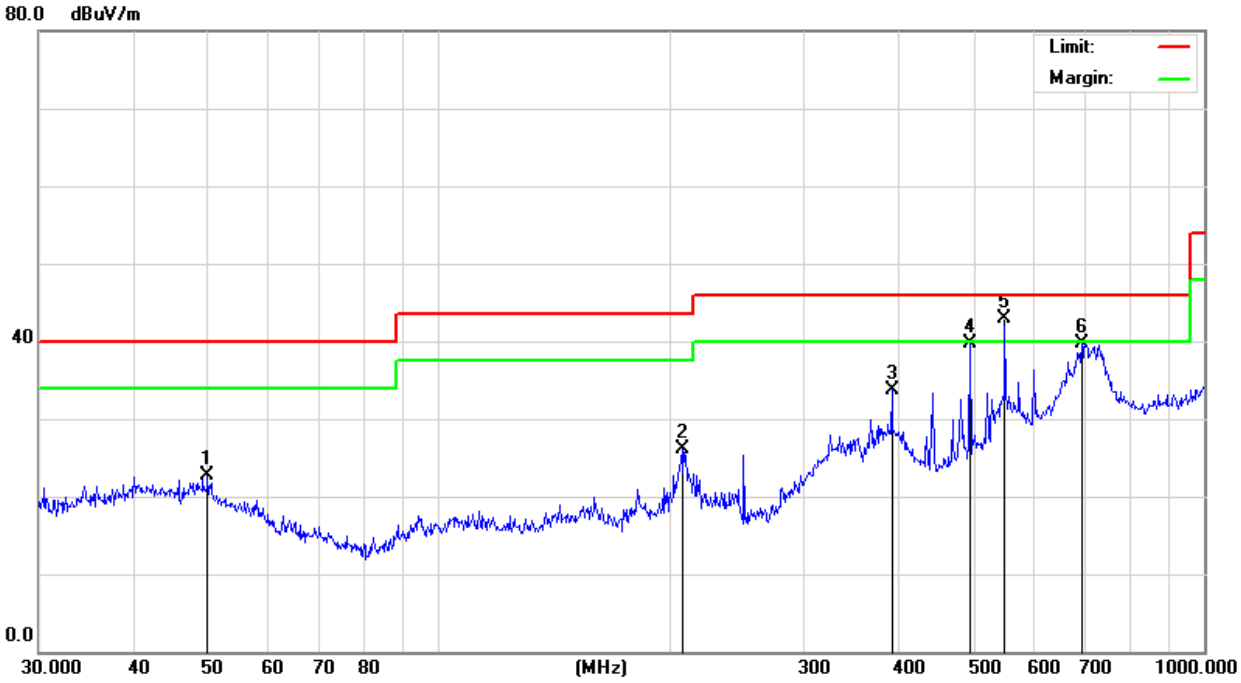
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

Between30 – 1000 MHz

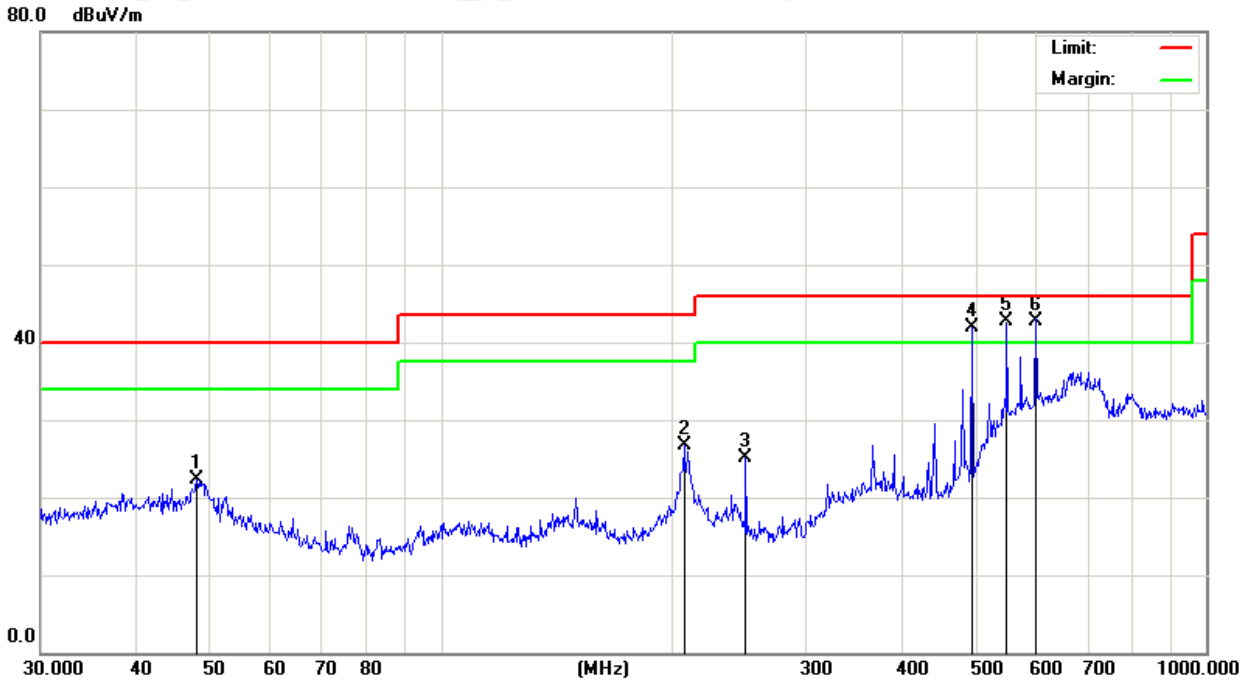
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 14, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 802.11a 5180MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		49.8814	25.91	-3.22	22.69	40.00	-17.31	peak
2		207.8501	33.35	-7.16	26.19	43.50	-17.31	peak
3		390.7226	37.17	-3.50	33.67	46.00	-12.33	peak
4		494.1984	38.67	1.07	39.74	46.00	-6.26	peak
5	*	547.0977	38.21	4.61	42.82	46.00	-3.18	QP
6		691.9867	32.81	6.97	39.78	46.00	-6.22	peak

RESULT: PASS

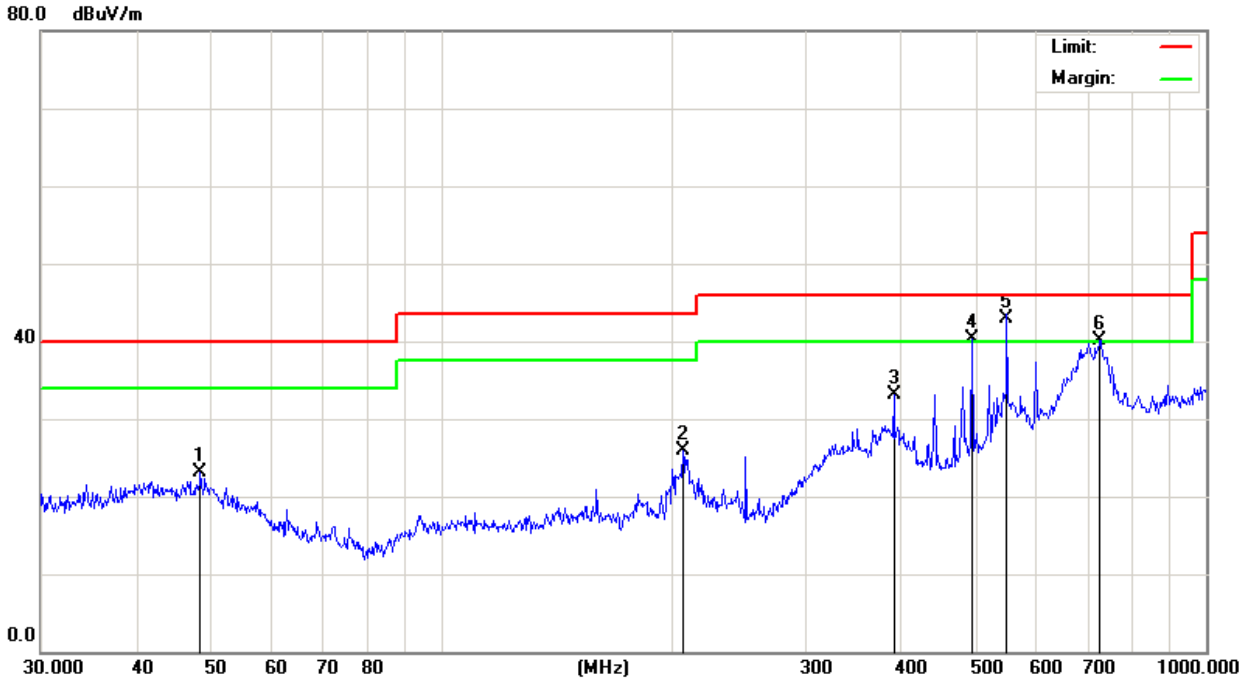
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 14, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 802.11a 5180MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		47.9940	27.66	-5.44	22.22	40.00	-17.78	peak
2		207.8501	31.15	-4.45	26.70	43.50	-16.80	peak
3		250.3012	34.00	-8.93	25.07	46.00	-20.93	peak
4	!	494.1984	44.22	-2.24	41.98	46.00	-4.02	peak
5	!	547.0977	41.10	1.61	42.71	46.00	-3.29	QP
6	*	599.3212	39.50	3.30	42.80	46.00	-3.20	peak

RESULT: PASS

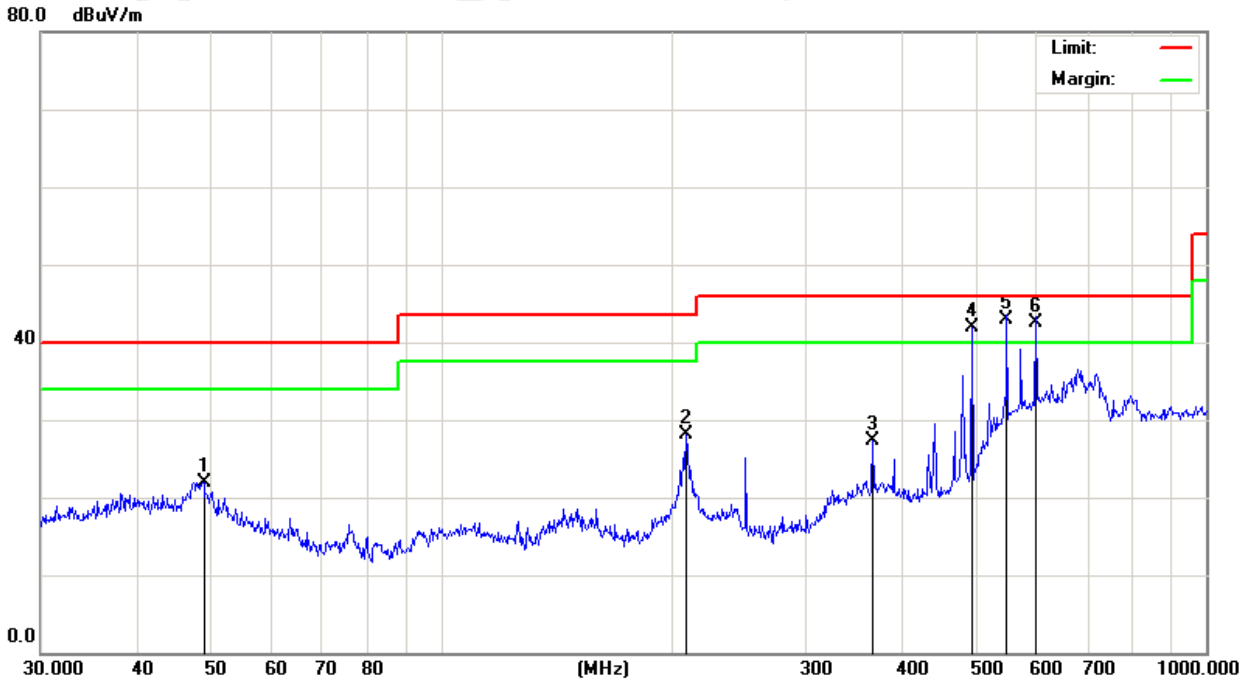
Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 14, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Horizontal
Test Mode:	Transmitting mode of 802.11a 5240MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		48.5016	26.07	-3.05	23.02	40.00	-16.98	peak
2		207.1226	33.16	-7.17	25.99	43.50	-17.51	peak
3		390.7226	36.51	-3.50	33.01	46.00	-12.99	peak
4	!	494.1984	39.22	1.07	40.29	46.00	-5.71	peak
5	*	547.0977	38.30	4.61	42.91	46.00	-3.09	QP
6	!	726.8052	32.97	7.22	40.19	46.00	-5.81	peak

RESULT: PASS

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 14, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Vertical
Test Mode:	Transmitting mode of 802.11a 5240MHz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		49.0145	27.61	-5.74	21.87	40.00	-18.13	peak
2		209.3129	32.03	-3.96	28.07	43.50	-15.43	peak
3		366.8231	31.62	-4.25	27.37	46.00	-18.63	peak
4	!	494.1984	44.12	-2.24	41.88	46.00	-4.12	peak
5	*	547.0977	41.25	1.61	42.86	46.00	-3.14	QP
6	!	599.3212	39.30	3.30	42.60	46.00	-3.40	QP

RESULT: PASS

Note: All test channels had been tested. The 802.11a20 is the worst case and recorded in the test report..

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The “Factor” value can be calculated automatically by software of measurement system.

Above 1 GHz Test Results:

802.11a20 Mode:

802.11a-5180 MHz	H	11490	32.32	16.82	49.14	74.00	-24.86	PEAK
	H	17235	29.33	22.93	52.26	74.00	-21.74	PEAK
	V	11490	30.75	16.82	47.57	74.00	-26.43	PEAK
	V	17235	29.41	22.93	52.34	74.00	-21.66	PEAK

802.11a-5200 MHz	H	11570	32.45	16.71	49.16	74.00	-24.84	PEAK
	H	17355	27.44	24.37	51.81	74.00	-22.19	PEAK
	V	11570	30.26	16.71	46.97	74.00	-27.03	PEAK
	V	17355	28.42	24.37	52.79	74.00	-21.21	PEAK

802.11a-5240 MHz	H	11650	34.13	16.61	50.74	74.00	-23.26	PEAK
	H	17475	27.30	25.01	52.31	74.00	-21.69	PEAK
	V	11650	32.12	16.61	48.73	74.00	-25.27	PEAK
	V	17475	28.75	25.01	53.76	74.00	-20.24	PEAK

Note:

1. Measure Level = Reading Level + Factor.
2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.
3. All test channels had been tested. The 802.11a20 is the worst case and recorded in the test report. Other frequencies radiation emission from 1 to 40GHz at least have 20dB margin and not recorded in the test report.

11. BAND EDGE EMISSION

11.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

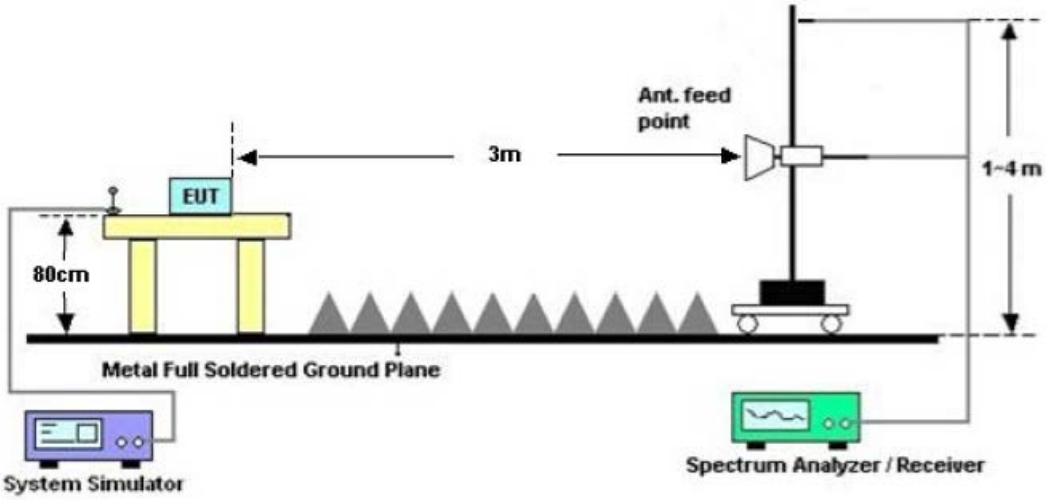
(b) AVERAGE: RBW=1MHz ; VBW=3MHz/ Sweep=AUTO

3. Other procedures refer to clause 11.2.

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.
3. Only the data of band edge emission at the restricted band 4.5GHz-5.15GHz record in the report. Other restricted band 5.35GHz-5.46GHz and 7.25GHz-7.77GHz were considered as ambient noise. No recording in the test report.

11.2. TEST SET-UP



11.3. TEST RESULT

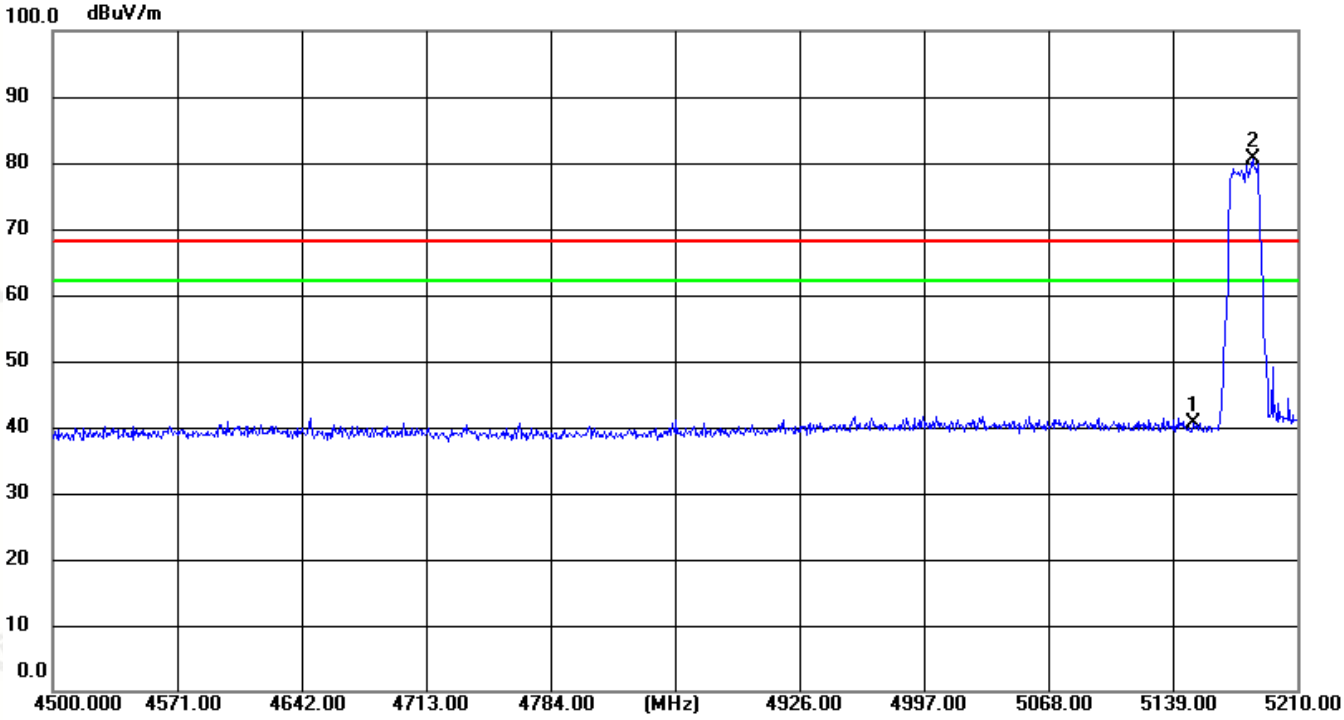
RESULT: PASS

EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11a		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

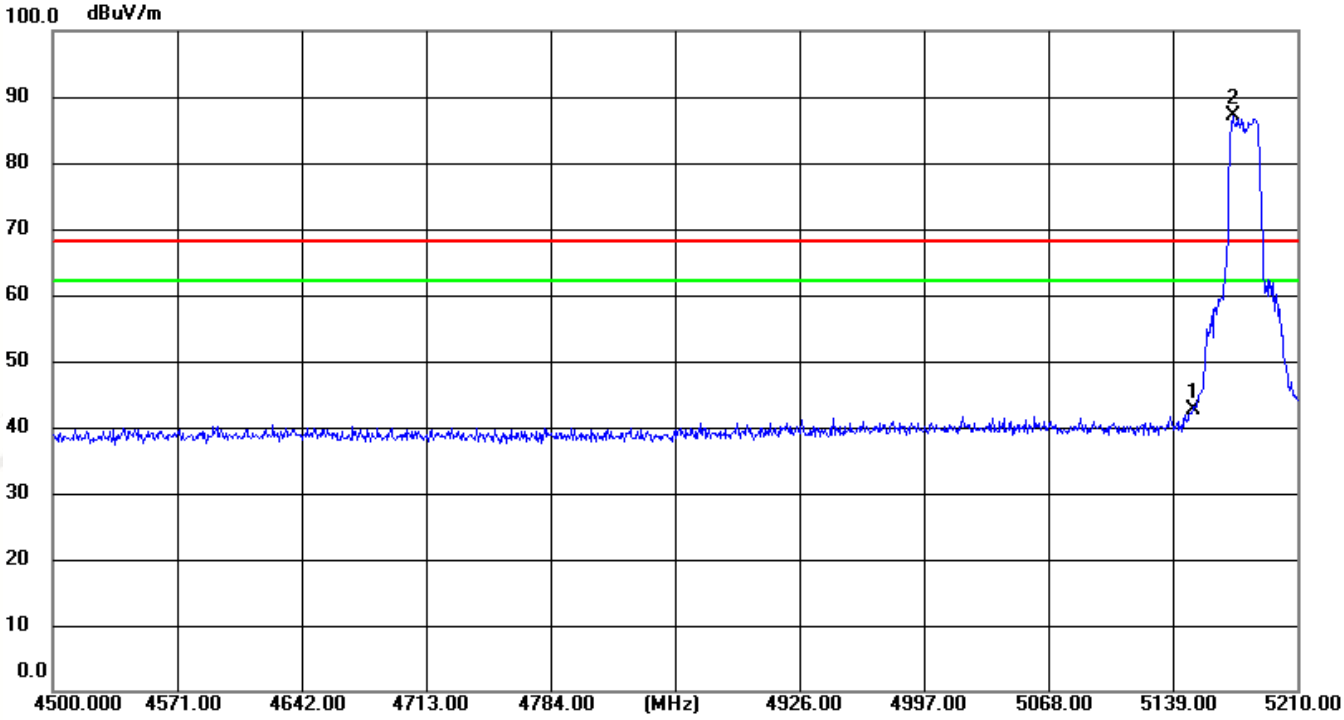
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	35.81	4.78	40.59	68.20	CH36
5184.440	V	76.01	4.67	---	---	CH36
5150.000	H	37.73	4.78	42.51	68.20	CH36
5173.080	H	82.48	4.71	---	---	CH36
5243.020	V	76.22	4.52	---	---	CH48
5350.000	V	34.40	4.30	38.70	68.20	CH48
5244.340	H	80.00	4.52	---	---	CH48
5350.000	H	34.80	4.30	39.10	68.20	CH48

802.11a (5.15GHz-5.25GHz)
CH 36 (Lower) Data rate 6Mbps

Detector mode: Peak **Polarity: Vertical**

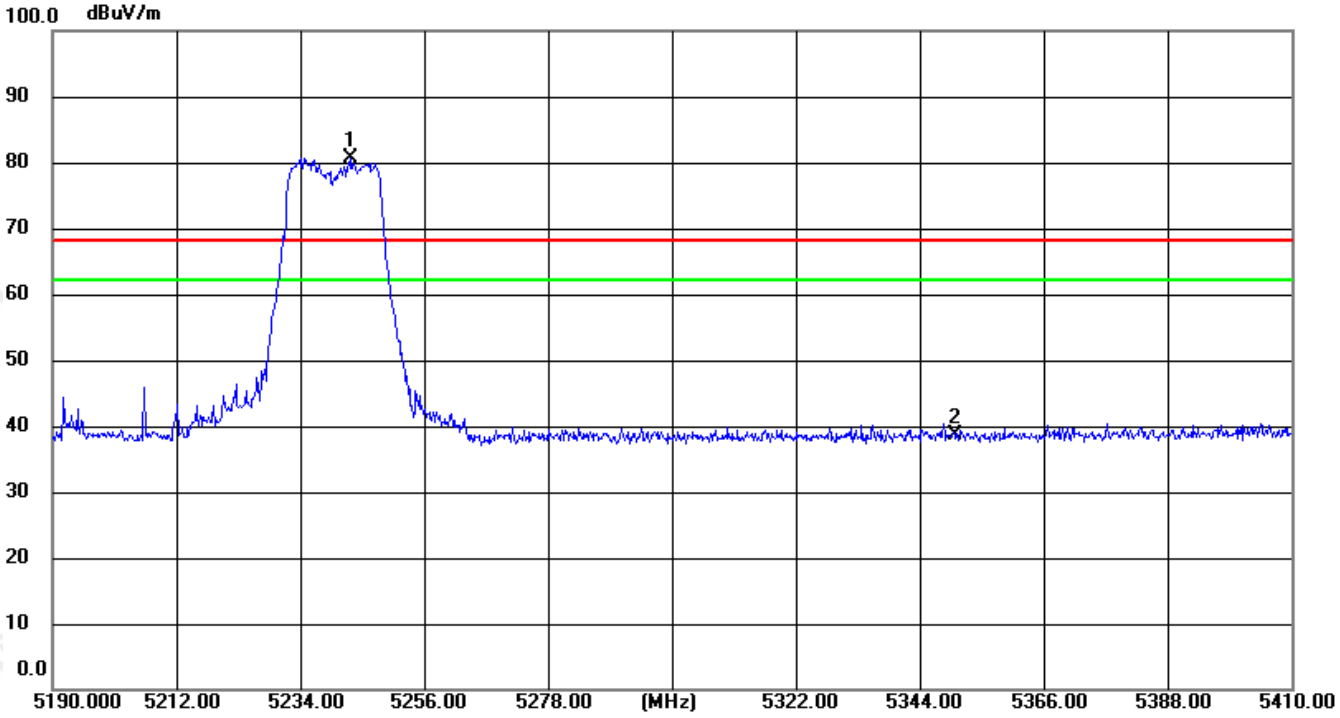


Detector mode: Peak **Polarity: Horizontal**

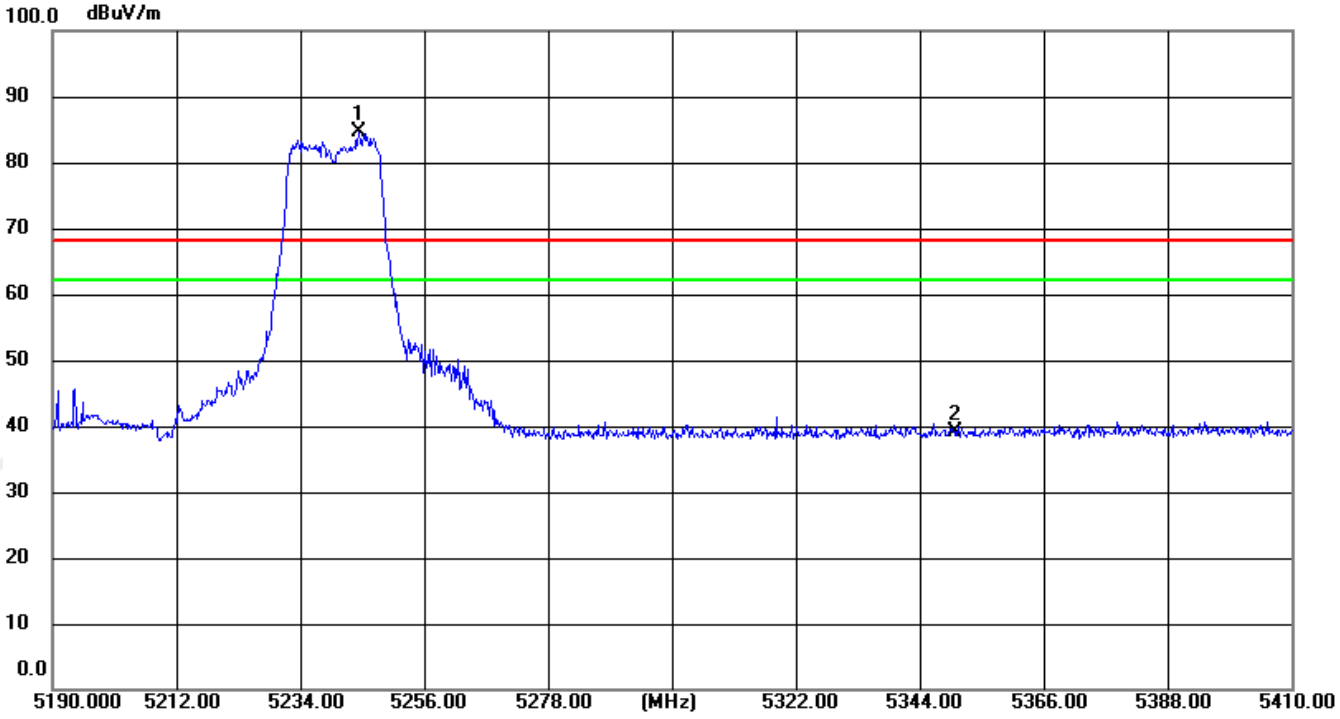


802.11a (5.15GHz-5.25GHz)
CH 48 (Upper) Data rate 6Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

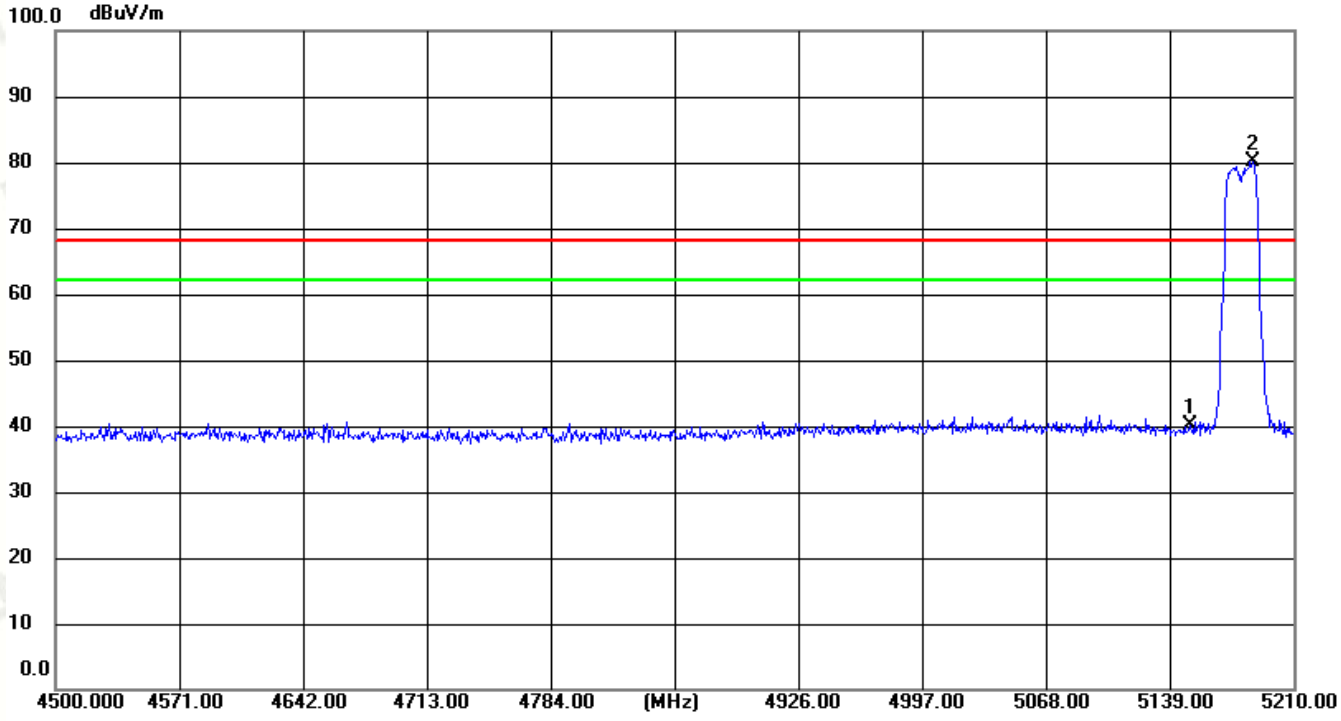


EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11n BW20MHz		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

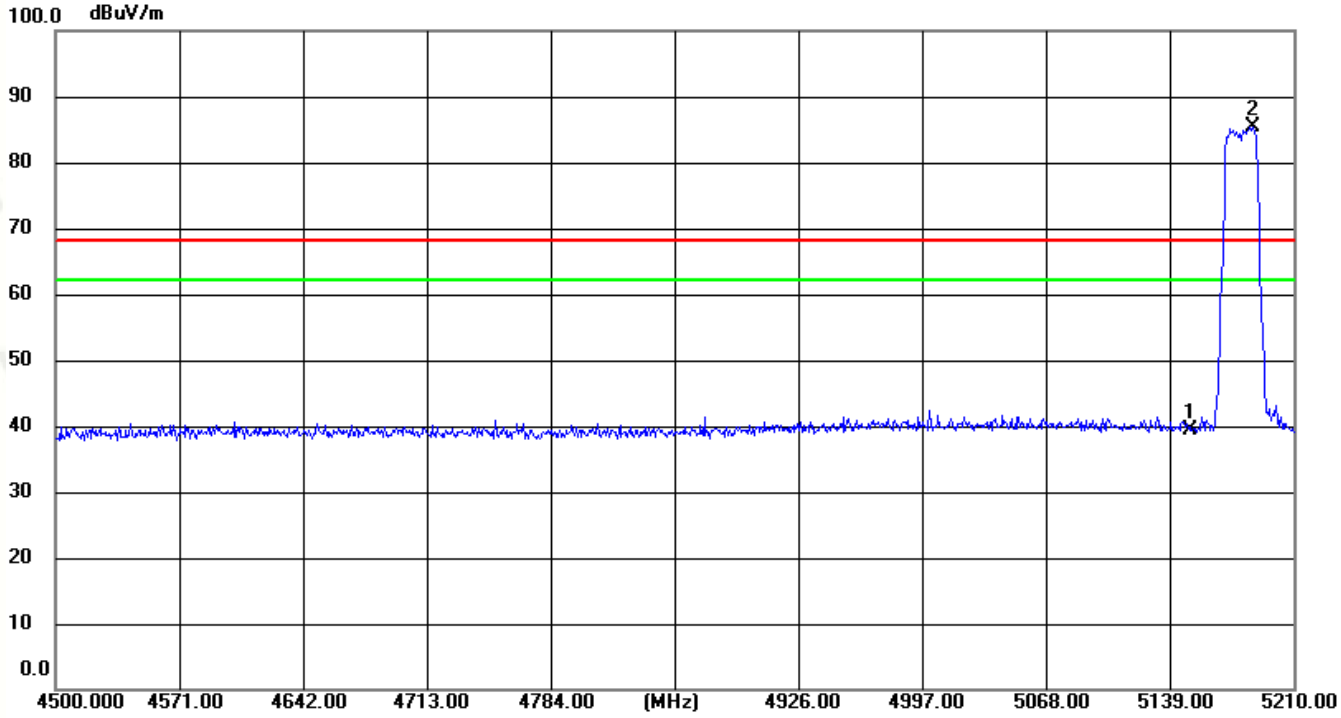
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	35.40	4.78	40.18	68.20	CH36
5186.570	V	75.46	4.66	---	---	CH36
5150.000	H	34.50	4.78	39.28	68.20	CH36
5186.570	H	80.68	4.66	---	---	CH36
5246.760	V	73.74	4.51	---	---	CH48
5350.000	V	34.09	4.30	38.39	68.20	CH48
5245.660	H	81.51	4.51	---	---	CH48
5350.000	H	35.26	4.30	39.56	68.20	CH48

802.11n(20M) (5.15GHz-5.25GHz)
CH 36 (Lower) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**

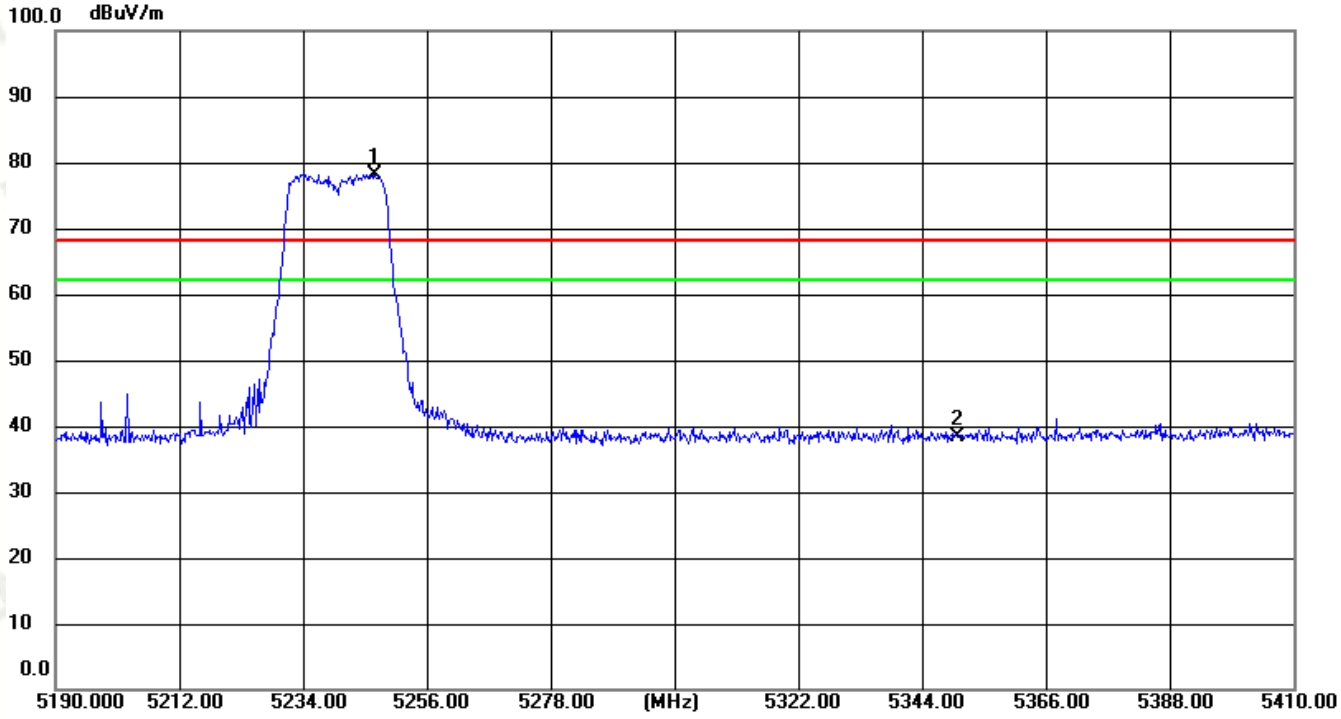


Detector mode: Peak **Polarity: Horizontal**

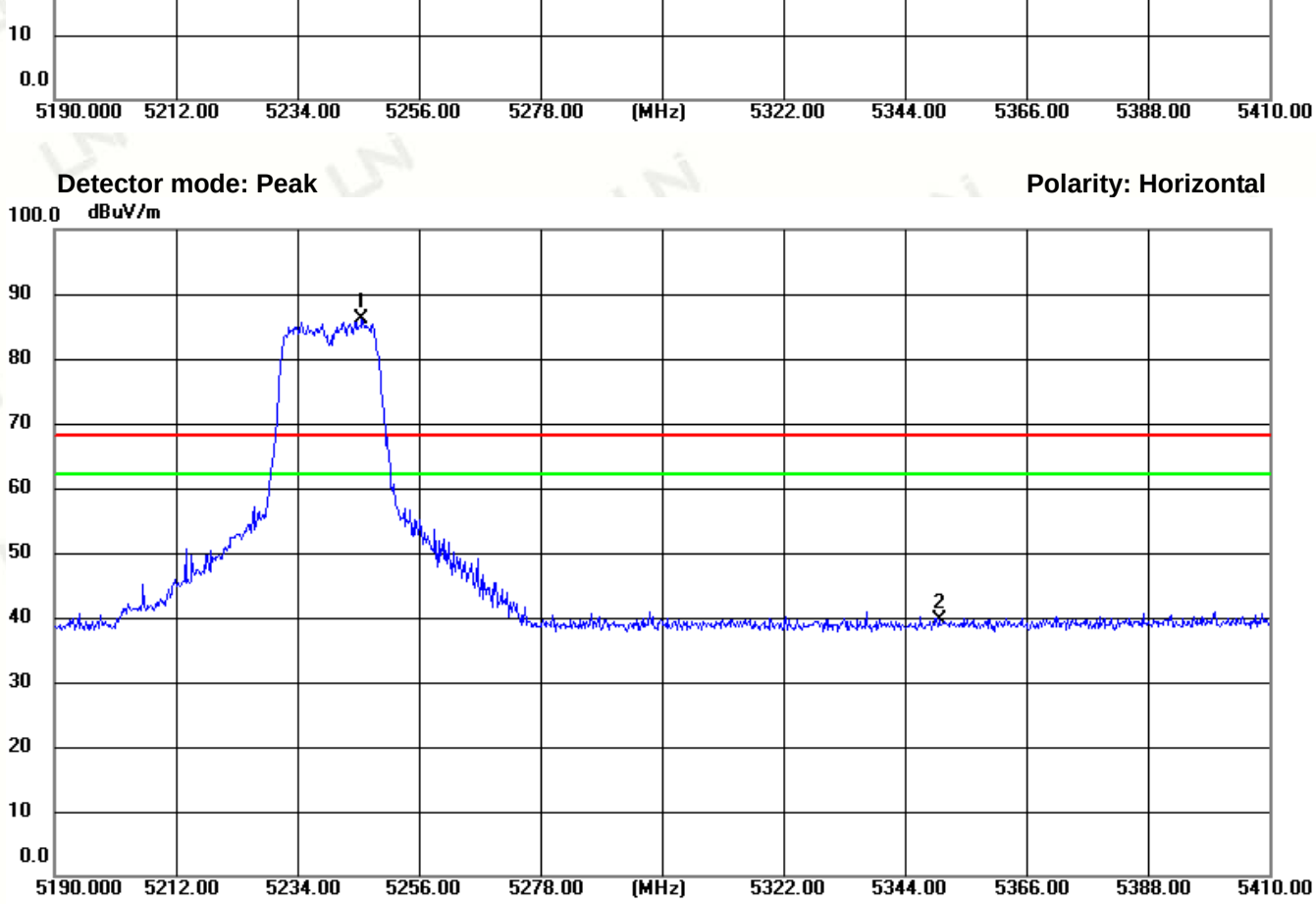


802.11n(20M) (5.15GHz-5.25GHz)
CH 48(Upper) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

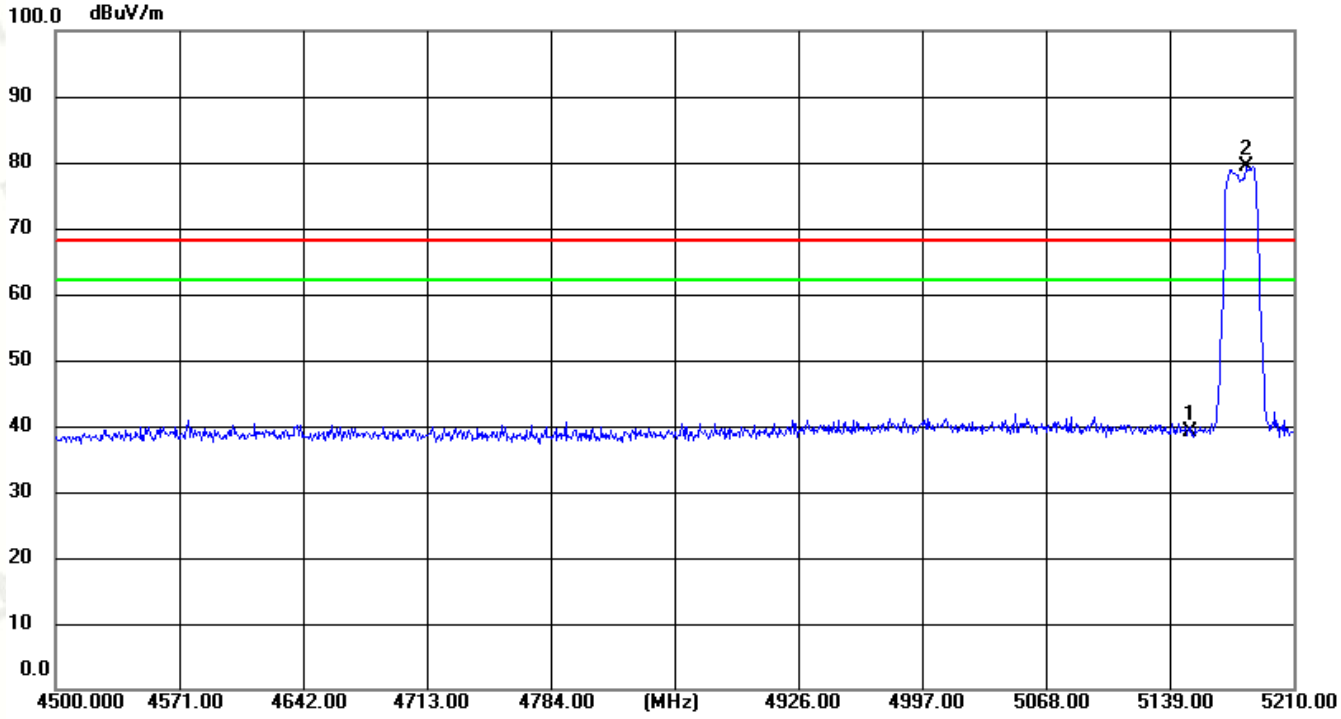


EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11ac BW20MHz		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

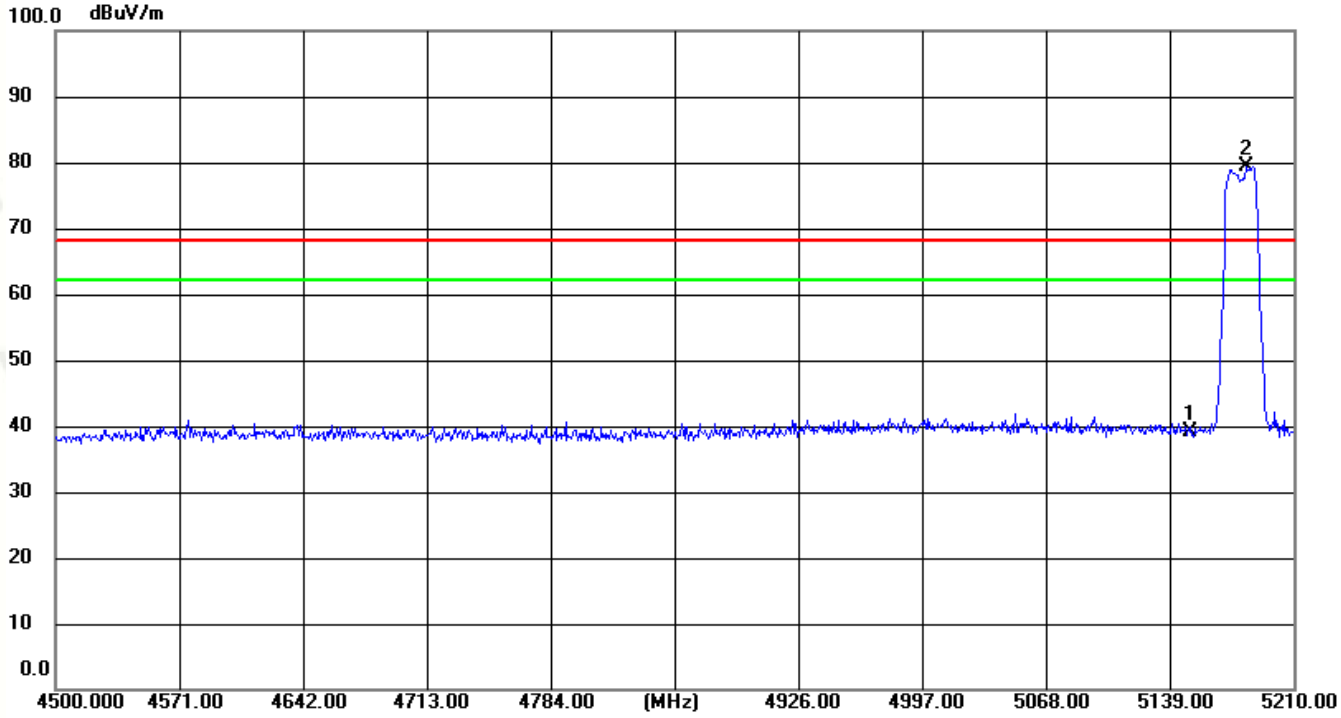
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	34.28	4.78	39.06	68.20	CH36
5183.020	V	74.79	4.67	---	---	CH36
5150.000	H	34.98	4.78	39.76	68.20	CH36
5173.080	H	82.29	4.71	---	---	CH36
5245.880	V	75.51	4.51	---	---	CH48
5350.000	V	33.27	4.30	37.57	68.20	CH48
5246.100	H	82.53	4.51	---	---	CH48
5350.000	H	34.14	4.30	38.44	68.20	CH48

802.11ac(20M) (5.15GHz-5.25GHz)
CH 36 (Lower) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**

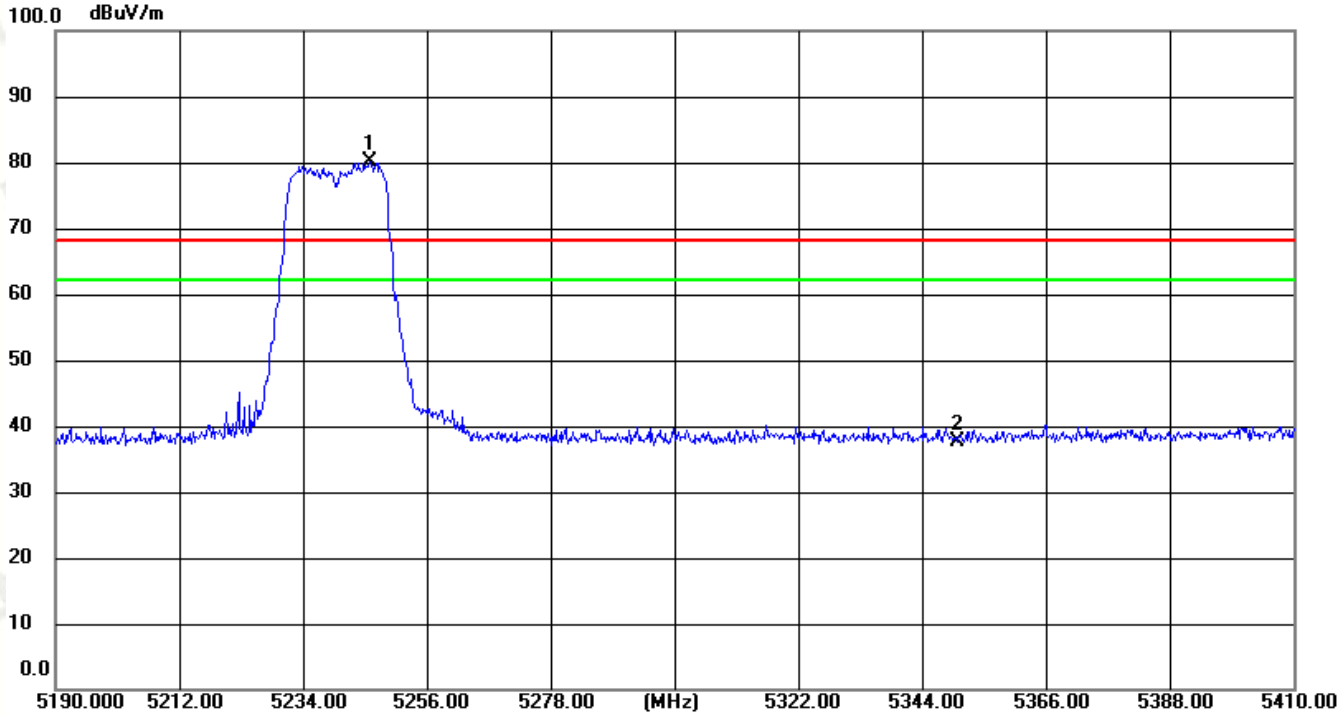


Detector mode: Peak **Polarity: Horizontal**

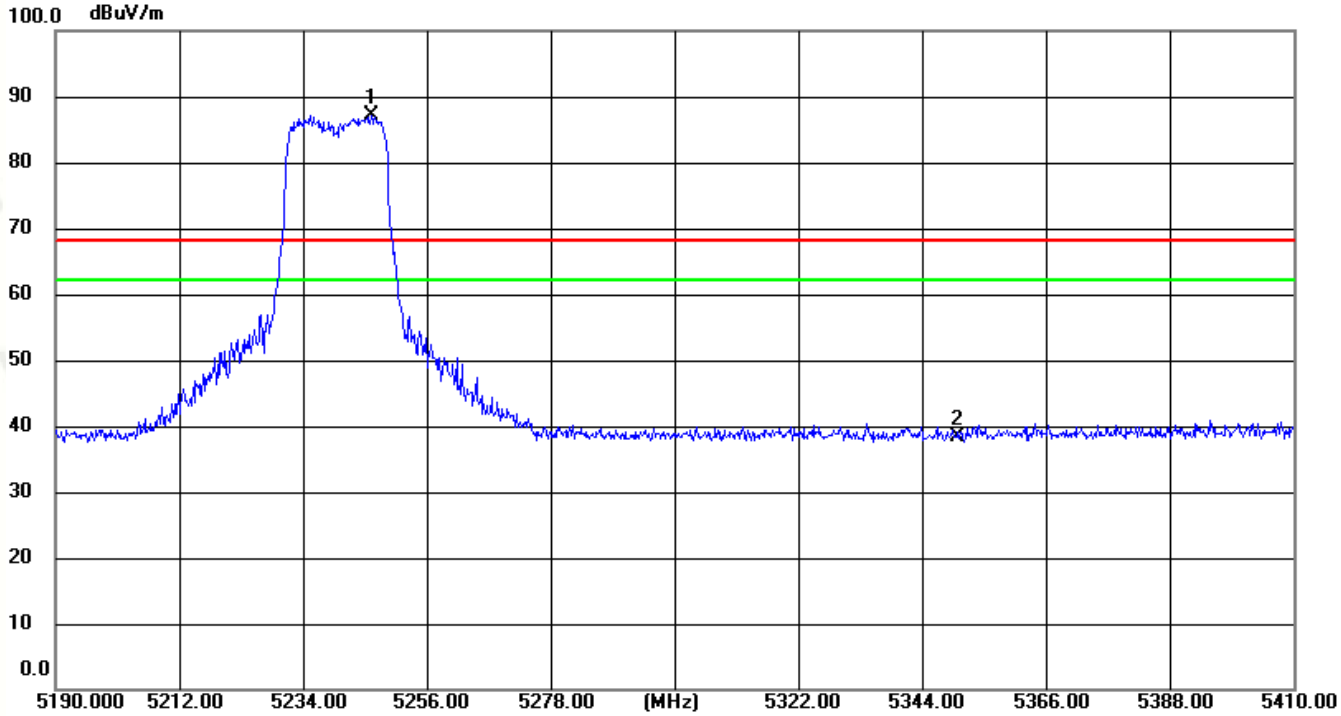


802.11 ac(20M) (5.15GHz-5.25GHz)
CH 48(Upper) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

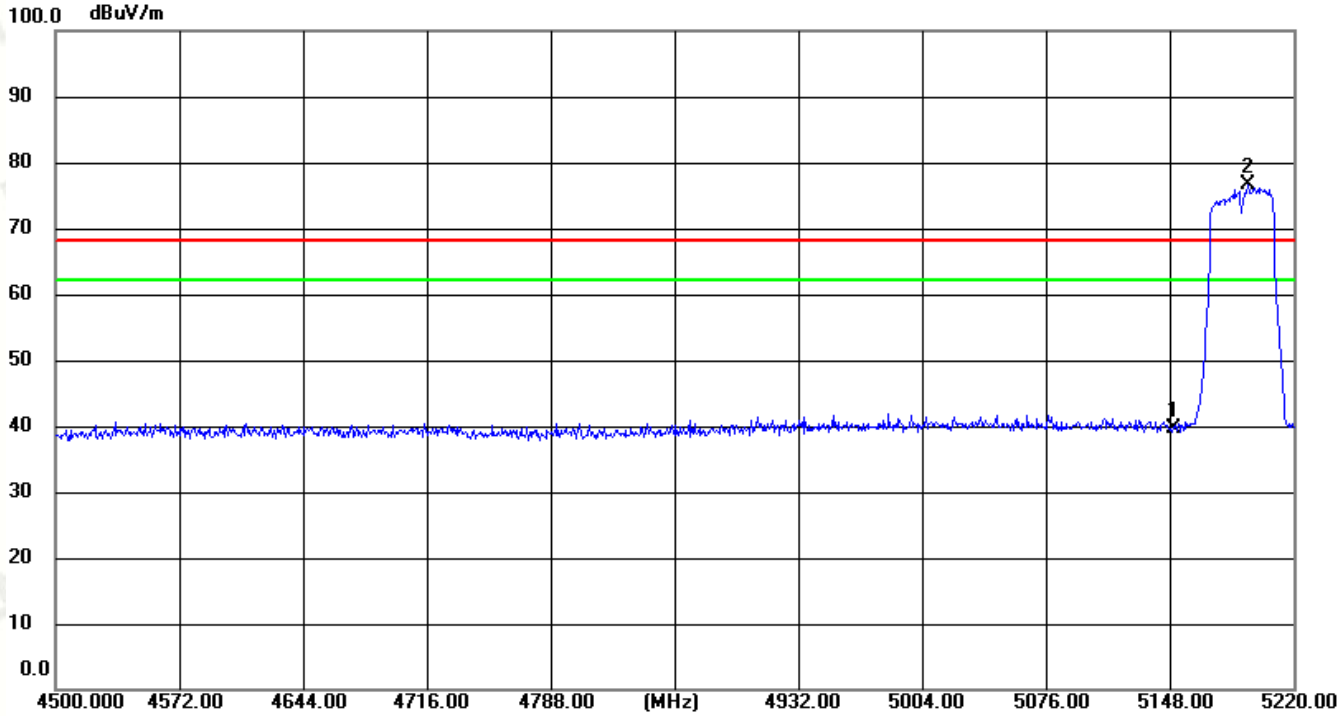


EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11n BW40MHz		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

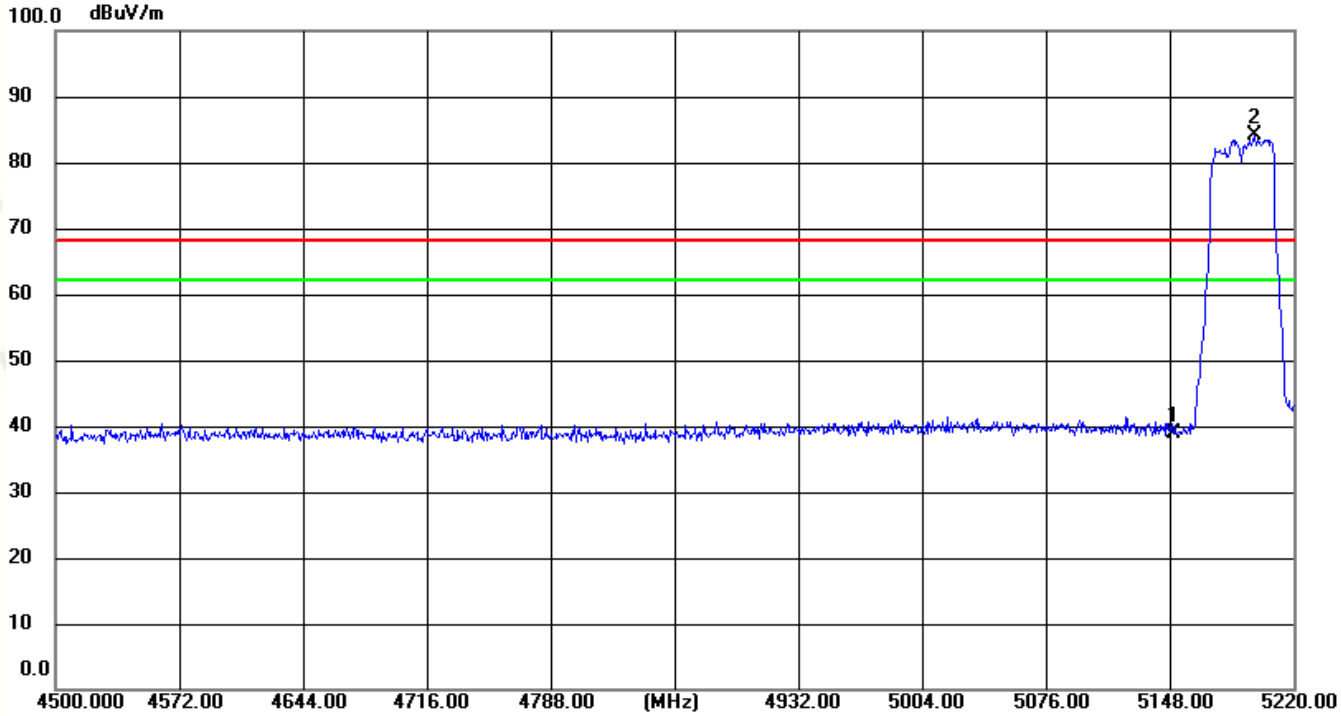
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	34.93	4.78	39.71	68.20	CH38
5193.360	V	71.88	4.64	---	---	CH38
5150.000	H	34.07	4.78	38.85	68.20	CH38
5196.960	H	79.58	4.63	---	---	CH38
5233.340	V	72.89	4.54	---	---	CH46
5350.000	V	34.83	4.30	39.13	68.20	CH46
5243.020	H	78.39	4.52	---	---	CH46
5350.000	H	34.28	4.30	38.58	68.20	CH46

802.11n(40M) (5.15GHz-5.25GHz)
CH 38 (Lower) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**

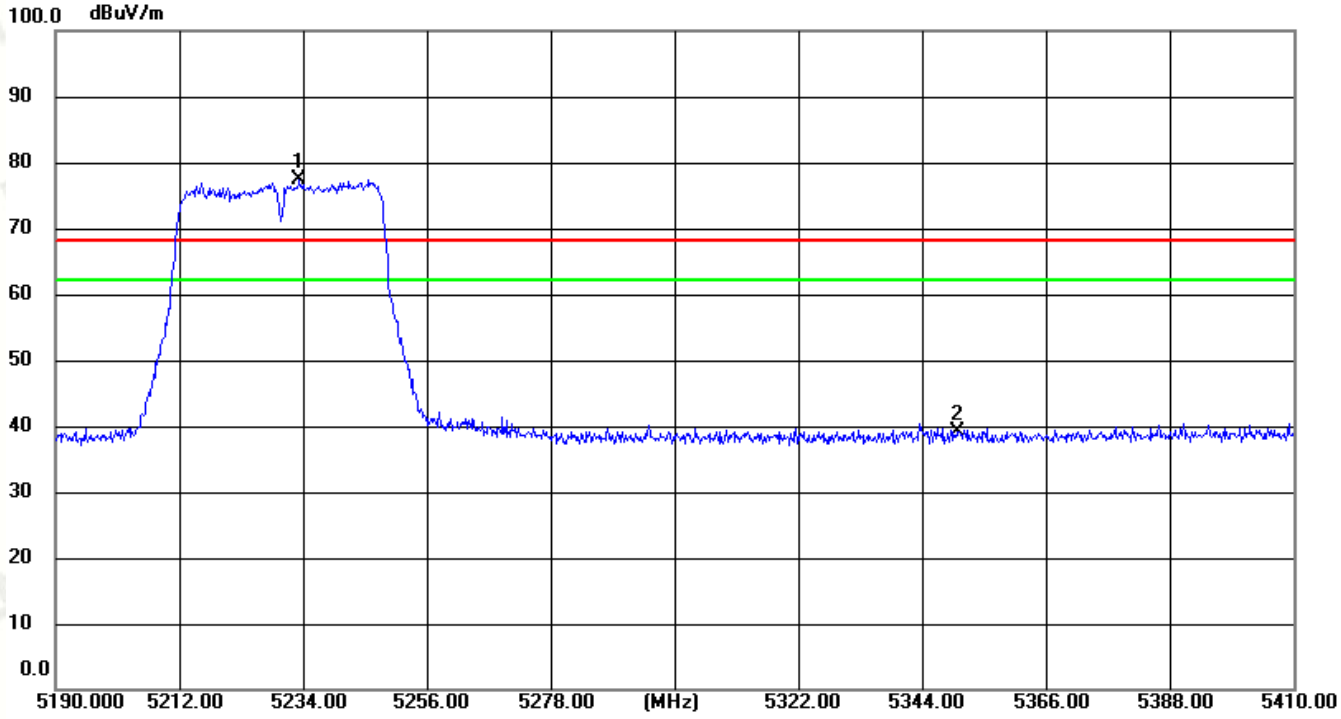


Detector mode: Peak **Polarity: Horizontal**

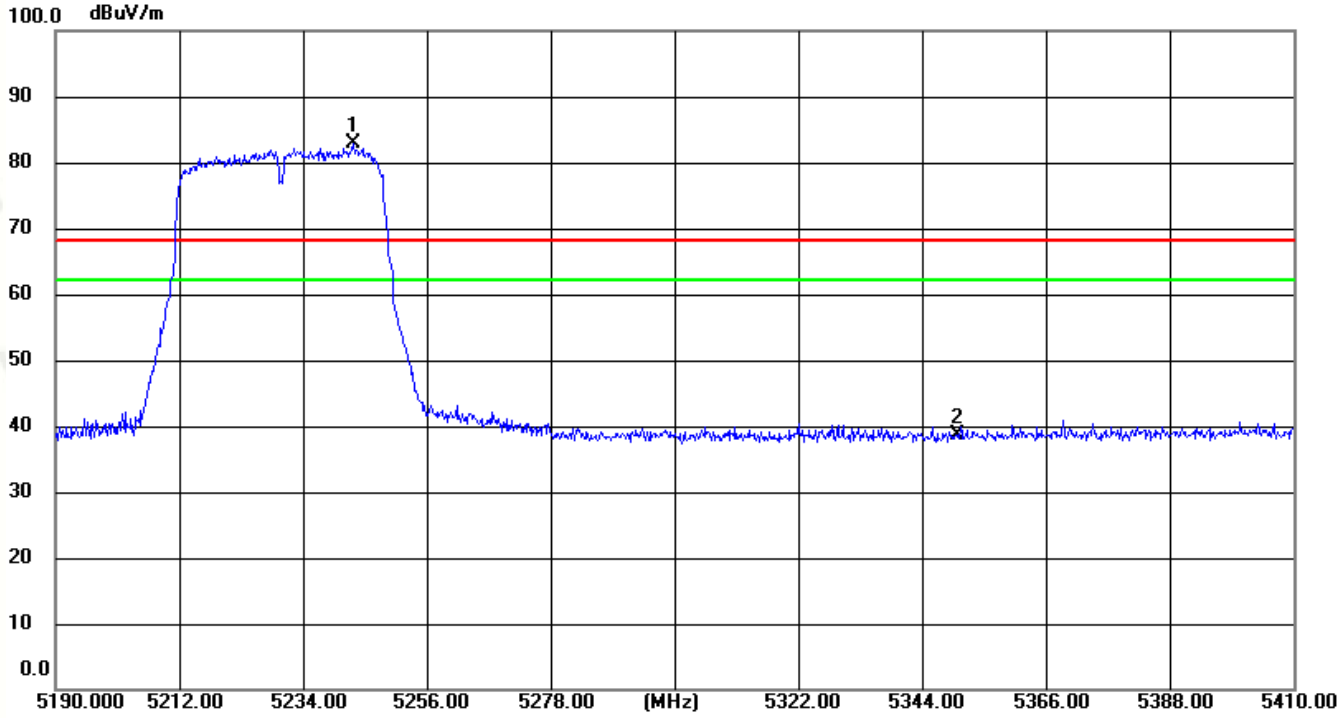


802.11n(40M) (5.15GHz-5.25GHz)
CH 46(Upper) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

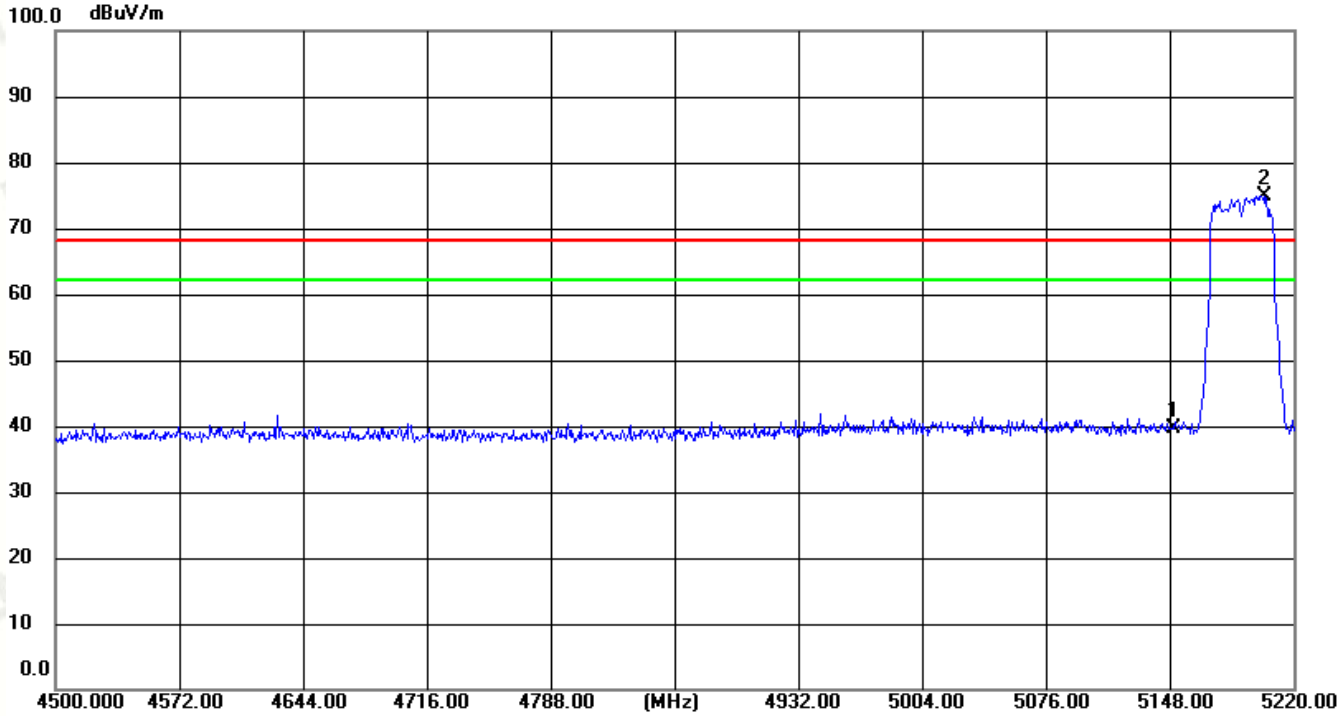


EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11ac BW40MHz		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

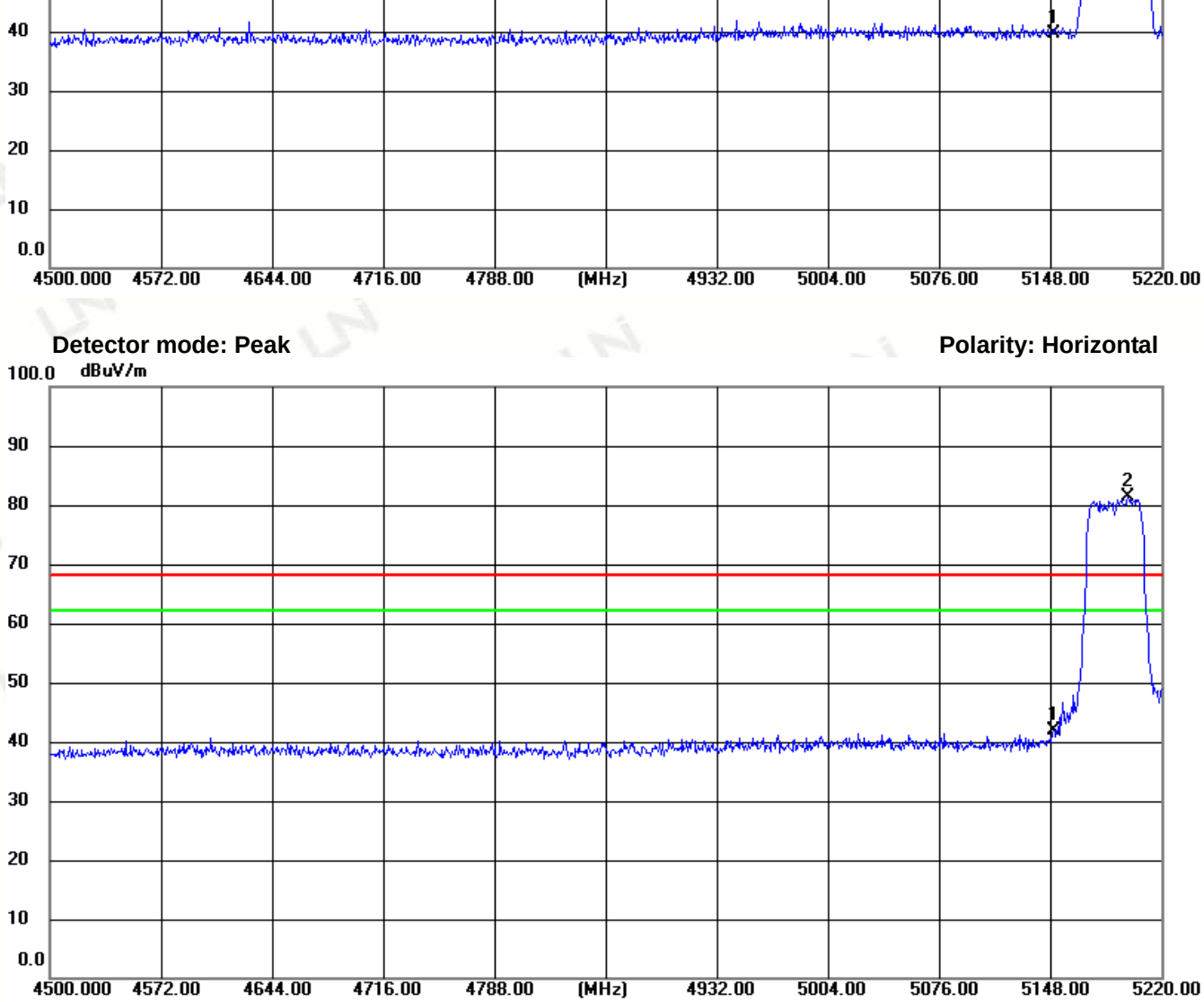
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	34.86	4.78	39.64	68.20	CH38
5203.440	V	70.40	4.60	---	---	CH38
5150.000	H	37.04	4.78	41.82	68.20	CH38
5198.400	H	76.75	4.62	---	---	CH38
5242.360	V	72.33	4.52	---	---	CH46
5350.000	V	33.68	4.30	37.98	68.20	CH46
5244.120	H	76.54	4.52	---	---	CH46
5350.000	H	34.23	4.30	38.53	68.20	CH46

802.11ac(40M) (5.15GHz-5.25GHz)
CH 38 (Lower) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**

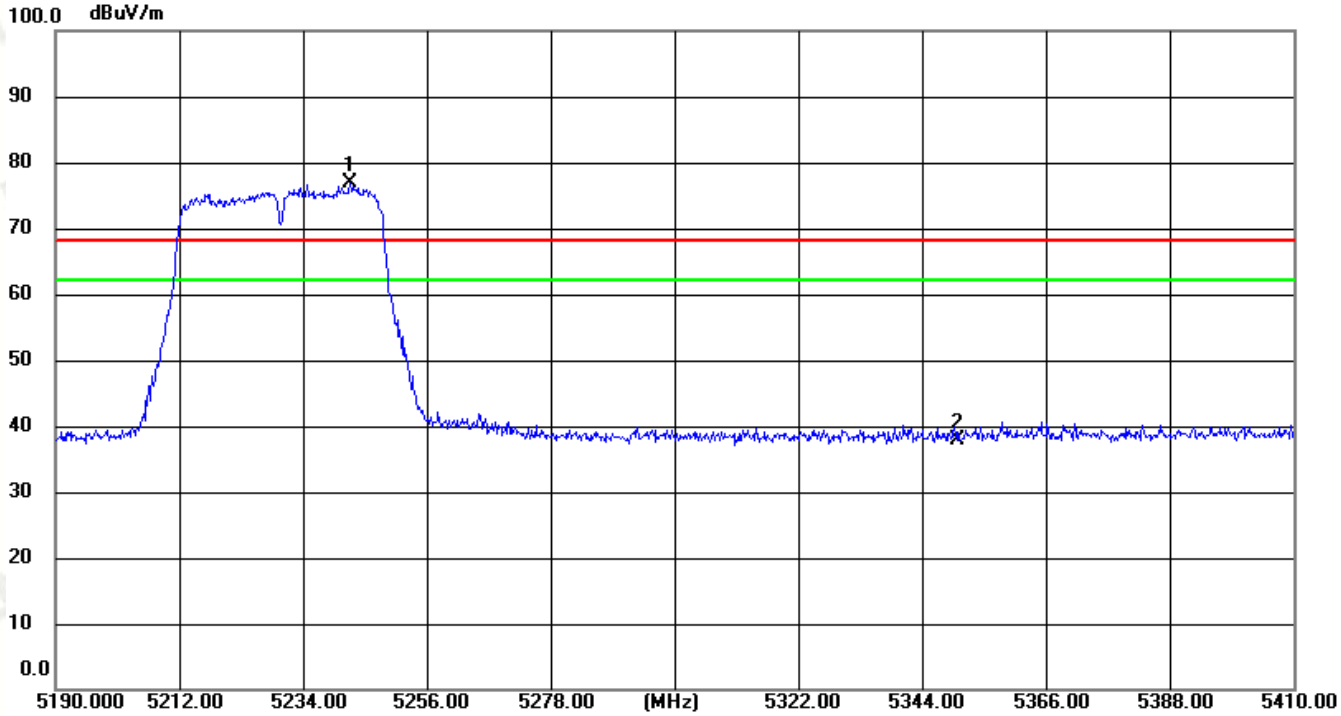


Detector mode: Peak **Polarity: Horizontal**

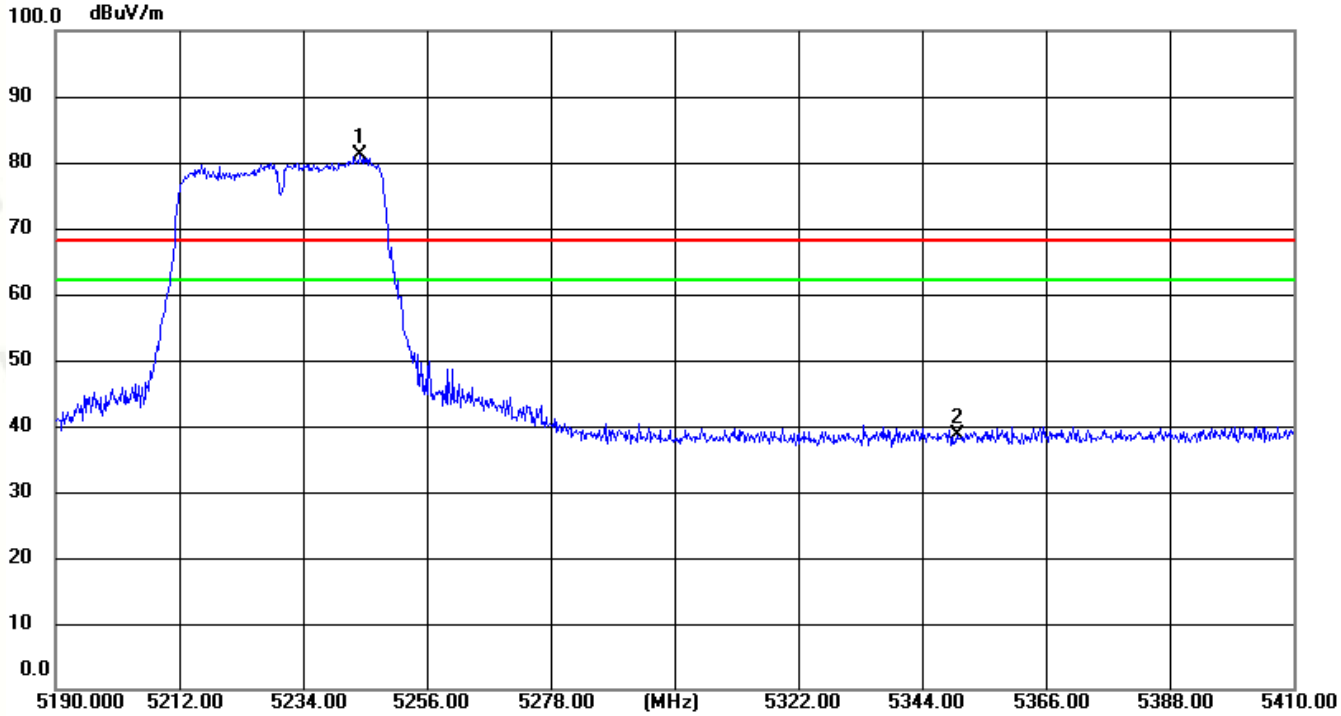


802.11ac(40M) (5.15GHz-5.25GHz)
CH 46(Upper) Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**

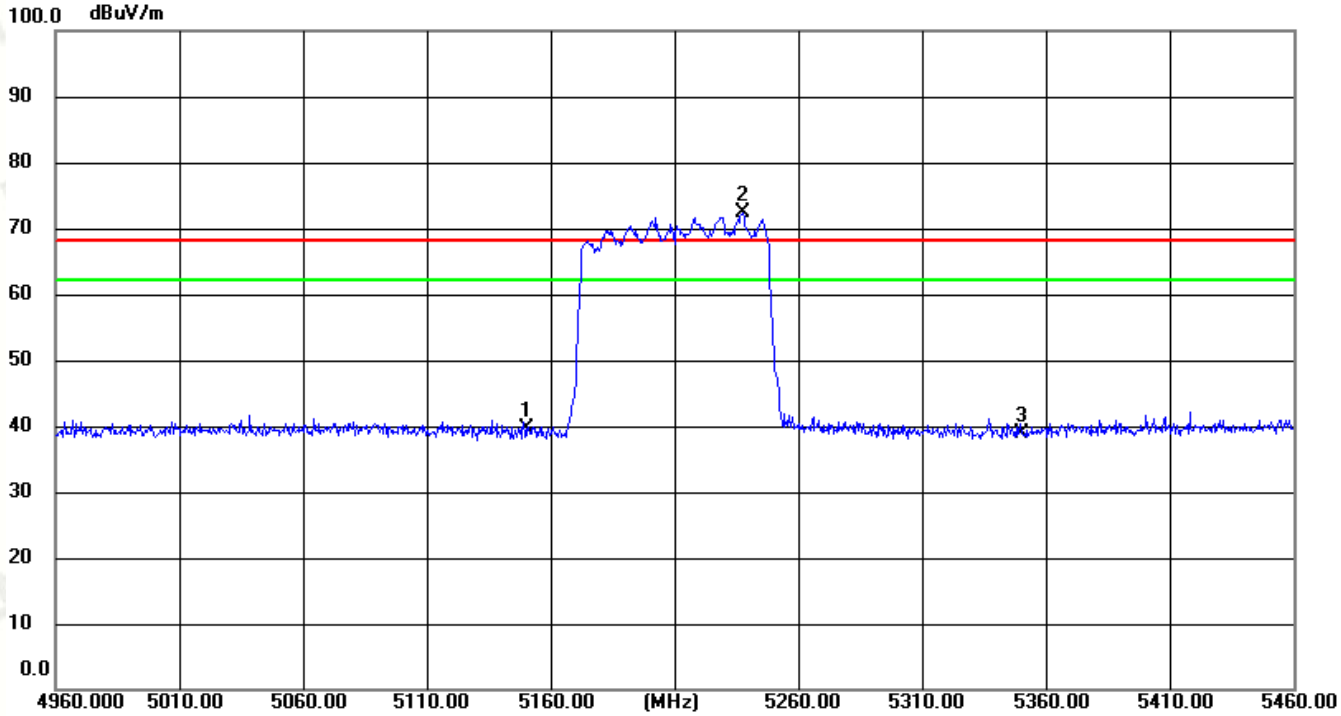


EUT：	AUTO DIAGNOSTIC TOOL	Model Name ：	IDUTEX DS810 Plus
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1010 hPa	Test Voltage：	DC12V from adapter
Test Mode ：	802.11ac BW80MHz		
Test Date：	2022-03-14		
Note：	In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 20dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.		

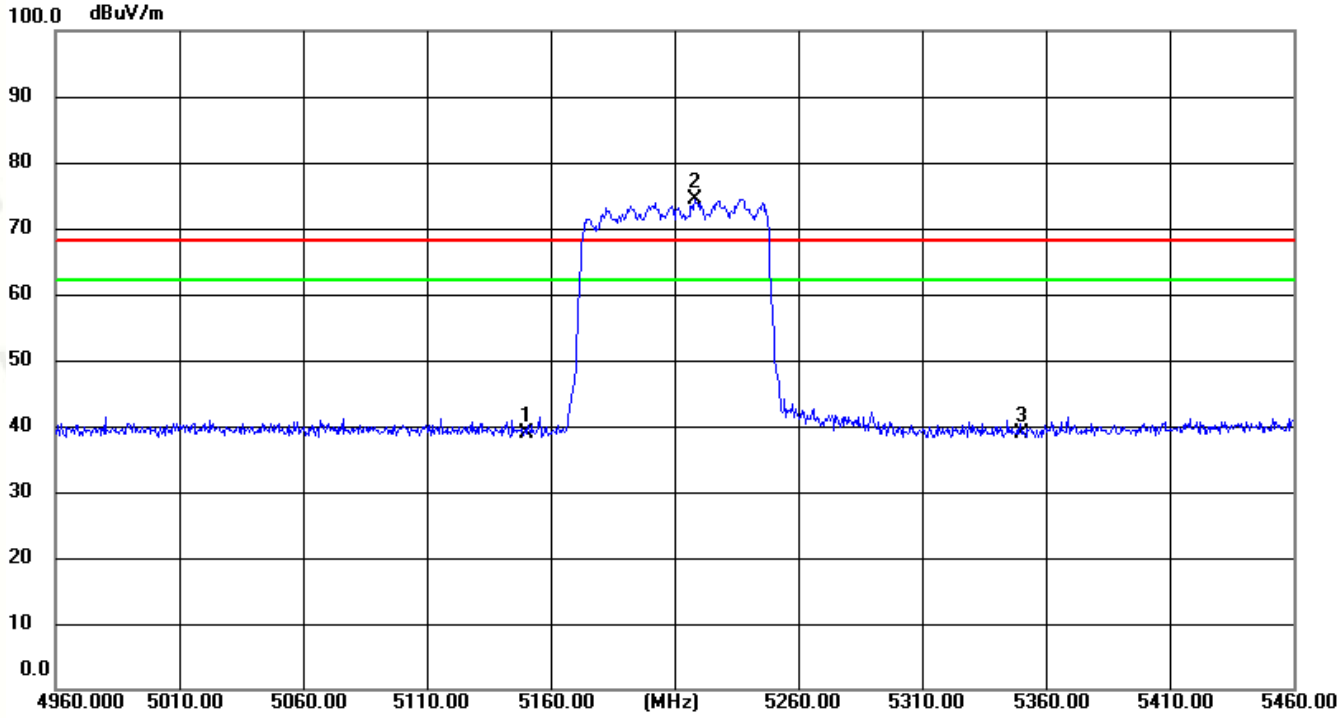
Freq. (MHz) (Peak)	Ant.Pol. H/V	Reading Peak (dBuv)	Ant/CF Peak (dB)	Act Peak (dBuv/m)	Limit Peak (dBuv/m)	Note
5150.000	V	34.88	4.78	39.66	68.20	CH42
5237.500	V	67.75	4.53	---	---	CH42
5350.000	V	34.57	4.30	38.87	68.20	CH42
5150.000	H	34.14	4.78	38.92	68.20	CH42
5218.000	H	69.86	4.58	---	---	CH42
5350.000	H	34.88	4.30	39.00	68.20	CH42

802.11ac(80M) (5.15GHz-5.25GHz)
CH 42 Data rate 7.2Mbps

Detector mode: Peak **Polarity: Vertical**



Detector mode: Peak **Polarity: Horizontal**



12. FCC LINE CONDUCTED EMISSION TEST

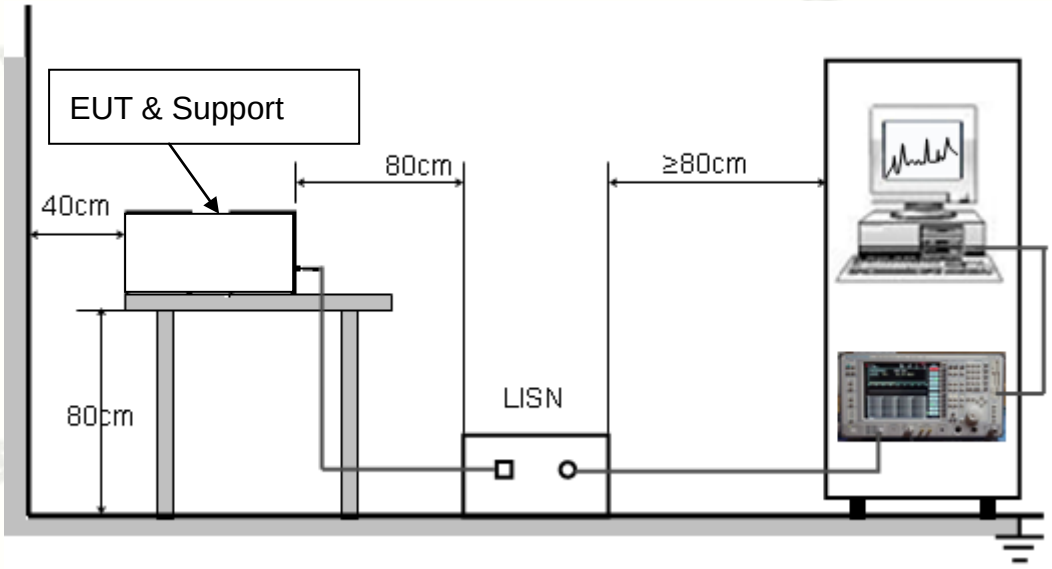
12.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

12.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



12.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

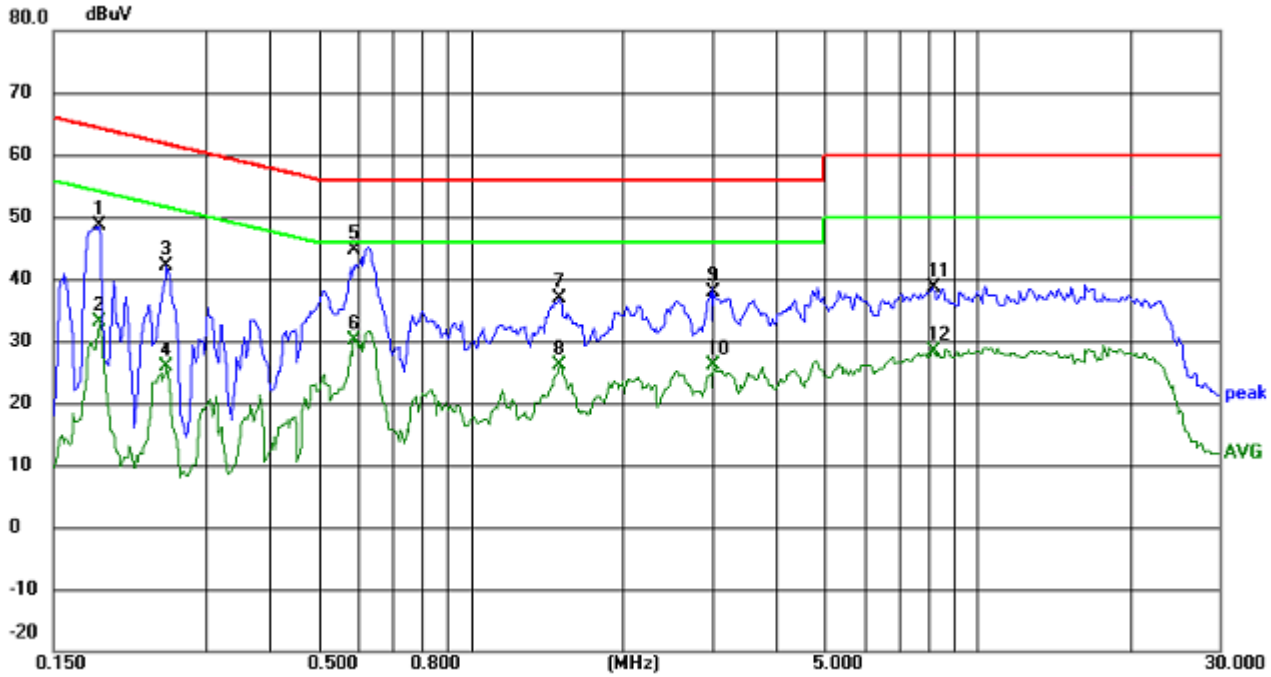
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

12.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

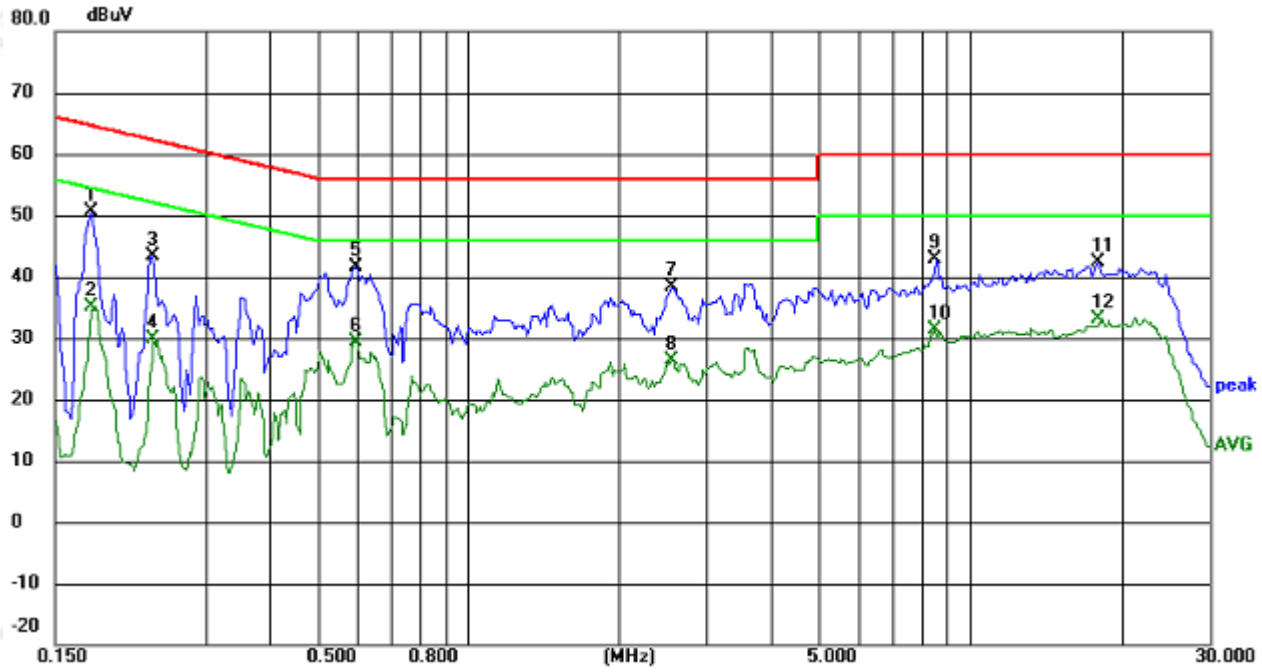
12.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 11, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Line
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1849	38.79	9.76	48.55	64.26	-15.71	peak	P
2	0.1849	23.43	9.76	33.19	54.26	-21.07	AVG	P
3	0.2514	32.27	9.75	42.02	61.71	-19.69	peak	P
4	0.2514	16.06	9.75	25.81	51.71	-25.90	AVG	P
5 *	0.5885	34.90	9.77	44.67	56.00	-11.33	peak	P
6	0.5885	20.39	9.77	30.16	46.00	-15.84	AVG	P
7	1.4955	27.02	9.79	36.81	56.00	-19.19	peak	P
8	1.4955	16.27	9.79	26.06	46.00	-19.94	AVG	P
9	3.0156	28.10	9.84	37.94	56.00	-18.06	peak	P
10	3.0156	16.20	9.84	26.04	46.00	-19.96	AVG	P
11	8.1555	28.53	10.07	38.60	60.00	-21.40	peak	P
12	8.1555	18.21	10.07	28.28	50.00	-21.72	AVG	P

Temperature:	24℃	Relative Humidity:	48%
Test Date:	Mar. 11, 2022	Pressure:	1010hPa
Test Voltage:	AC 120V, 60Hz	Phase:	Neutral
Test Mode:	Transmitting mode of 802.11a20 5180MHz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1 *	0.1773	40.79	9.77	50.56	64.61	-14.05	peak	P
2	0.1773	25.39	9.77	35.16	54.61	-19.45	AVG	P
3	0.2358	33.55	9.75	43.30	62.24	-18.94	peak	P
4	0.2358	20.10	9.75	29.85	52.24	-22.39	AVG	P
5	0.5985	31.78	9.77	41.55	56.00	-14.45	peak	P
6	0.5985	19.66	9.77	29.43	46.00	-16.57	AVG	P
7	2.5524	28.44	9.82	38.26	56.00	-17.74	peak	P
8	2.5524	16.66	9.82	26.48	46.00	-19.52	AVG	P
9	8.5029	32.69	10.09	42.78	60.00	-17.22	peak	P
10	8.5029	21.36	10.09	31.45	50.00	-18.55	AVG	P
11	18.0150	13.80	28.58	42.38	60.00	-17.62	peak	P
12	18.0150	4.50	28.58	33.08	50.00	-16.92	AVG	P

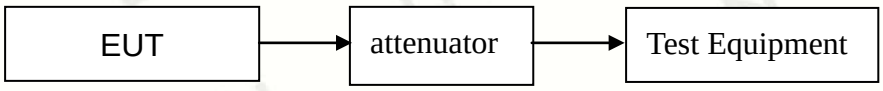
RESULT: PASS

13. Frequency Stability

13.1. TEST LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

13.2. BLOCK DIAGRAM OF SETUP



13.3 Test Procedure

Determining compliance with the peak excursion requirement shall be done by confirming that the ratio of the maximum of the peak-max-hold spectrum to the maximum of the average spectrum for continuous transmission does not exceed the regulatory requirement. The procedure for this method is as follows:

a) The following guidance for limiting the number of tests applies only to peak excursion measurements:

1) Testing each modulation mode on a single channel in a single operating band is sufficient to determine compliance with the peak excursion requirement. (If all modulation modes are not available on a single channel in a single band, then testing must be extended to other channels and bands as needed to ensure that all modulation modes are tested.)

2) Tests must include all variations in signal structure, such as:

i) All signal types [e.g., direct sequence spread spectrum (DSSS) and OFDM].

ii) All modulation types [e.g., binary phase-shift keying (BPSK), quadrature phase-shift keying (QPSK), 16-QAM, 64-QAM, and 256-QAM].

iii) All bandwidth modes.

iv) All variations in signal parameters (e.g., changes in subcarrier spacing or number of subcarriers).

3) For a given signal structure, testing of multiple error-correction coding rates is not

required (e.g., 1/2, 2/3, and 3/4).

4) For MIMO devices, testing of a single output port is sufficient to determine compliance with the peak excursion requirement. If a given signal structure can be exercised with various combinations of spatial multiplexing (such as different numbers of spatial streams), beamforming, and cyclic delay diversity, peak excursion tests are not required to include those variations.

b) The procedure is as follows:

1) Set the span of the spectrum analyzer or EMI receiver to view the entire emission bandwidth or occupied bandwidth.

2) Find the maximum of the peak-max-hold spectrum:

i) Set RBW = 1 MHz.

ii) VBW = 3 MHz.

iii) Detector = peak.

iv) Trace mode = max-hold.

v) Allow the sweeps to continue until the trace stabilizes.

vi) Use the peak search function to find the peak of the spectrum.

3) Use the procedure found in 12.5 to measure the PPSD.

4) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

13.4 Deviation From Test Standard

No deviation

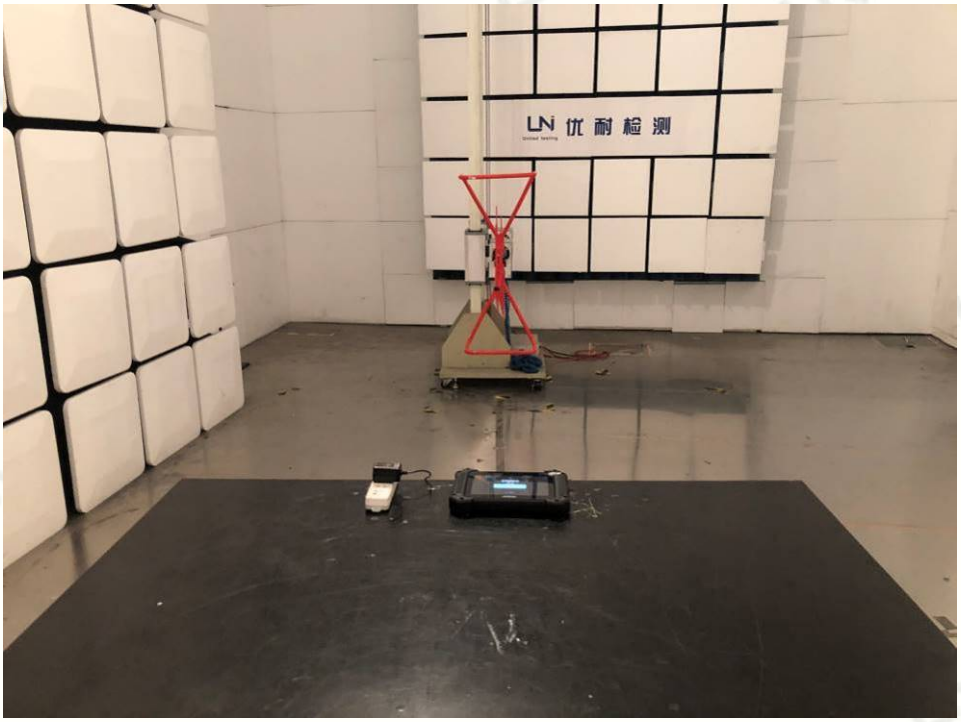
13.5. TEST RESULT

801.11a U-NII-3: 5180 MHz:

Voltage vs. Frequency Stability	
Voltage (V)	**Measurement Frequency (MHz)**
4.5	5180.0154
5	5180.0187
5.5	5180.0365
Limit Range (MHz)	5150-5250
Result	PASS
Temperature vs. Frequency Stability	
Temperature (℃)	**Measurement Frequency (MHz)**
0	5180.0654
10	5180.0234
20	5180.0242
30	5180.0322
40	5180.0313
50	5180.0334
Limit Range (MHz)	5150-5250
Result	**PASS**

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION



CONDUCTED EMISSION

----END OF REPORT----