



Shenzhen GUOREN Certification Technology Service Co., Ltd.

101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community,
Fenghuang Street, Guangming District, Shenzhen, China

TEST REPORT

Ordinance Article 2 paragraph 1 item (78)

Report Reference No..... : GRCTR250302097-03

Compiled by

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Date of issue..... : Apr. 21, 2025



Testing Laboratory Name : Shenzhen GUOREN Certification Technology Service Co., Ltd.

Address..... : 101#, Building K & Building T, The Second Industrial Zone, Jiazitang
Community, Fenghuang Street, Guangming District, Shenzhen, China

Applicant's name..... : Shenzhen Sanjiang Lechuang Technology Co., Ltd.

Address..... : 25th Floor, Jinluan International Business Building, No. 98 Heping
East Road, Sanlian Community, Longhua Street, Longhua District,
Shenzhen, China

Test specification..... :

Standard..... : **Ordinance Article 2 paragraph 1 item (78)**

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Test item description..... : Car Dash Cam

Trade Mark..... : VANTRUE

Manufacturer..... : Shenzhen Sanjiang Lechuang Technology Co., Ltd.

Model/Type reference..... : N5S

Listed Models : /

Firmware Version..... : VTN5S

Hardware Version..... : V1.0

Modulation : OFDM

Frequency..... : 5180MHz-5240MHz

Ratings..... : DC 5V from car charger

Result..... : **PASS**

TEST REPORT

Equipment under Test : Car Dash Cam

Model /Type : N5S

Listed Models : /

Applicant : **Shenzhen Sanjiang Lechuang Technology Co., Ltd.**

Address : 25th Floor, Jinluan International Business Building, No. 98
: Heping East Road, Sanlian Community, Longhua Street,
Longhua District, Shenzhen, China

Manufacturer : **Shenzhen Sanjiang Lechuang Technology Co., Ltd.**

Address : 25th Floor, Jinluan International Business Building, No. 98
: Heping East Road, Sanlian Community, Longhua Street,
Longhua District, Shenzhen, China

Test Result:	PASS
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 SUMMAR

1.1 Test Standards

The tests were performed according to following standards:

[ARIB STD-T71](#): 5 GHz band low-power data communication system (5.2GHz band)

[MIC Notice No.88 Appendix No.45](#): 2.4 GHz band wide-band low-power data communication system

1.2 Test Description

ARIB STD-T71		
Clause	Description of Test	Result
3.1.2 (2) & 3.1.2 (3) & 3.1.2 (5)	Tolerances Of Antenna Power & E.I.R.P	PASS
3.1.2 (4)	Tolerance Of Frequency	PASS
3.1.2 (7)	Transmission Burst Length	PASS
3.1.2 (8) & 3.1.2 (10)	Tolerance Of Unwanted Emission Intensity & Tolerance Of Out-Of-Band Leakage Power	PASS
3.1.2 (9)	Tolerance Of Adjacent Channel Leakage Power	PASS
3.1.2 (11)	Tolerance Of Occupied Bandwidth	PASS
3.1.3 (1)	Secondary Radiated Emissions	PASS
3.1.4.1	Interference prevention function	PASS
3.1.5	Carrier Sensing function	PASS
Note: (1) N/A is an abbreviation for Not Applicable. (2) N/T means this test item is not tested.		

Note: 1. "N/A" denotes test is not applicable in this Test Report

2. MIC Public Notice 88:2004, annex 45

3. MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20

4. Referenced in the standard ARIB STD-T71

5. The device only operating at W52 band.

1.3 TEST ENVIRONMENT

1.3.1 Address of the test laboratory

Shenzhen GUOREN Certification Technology Service Co., Ltd.

101#, Building K & Building T, The Second Industrial Zone, Jiazitang Community, Fenghuang Street, Guangming District, Shenzhen, China

1.3.2 Test Facility

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

FCC-Registration No.: 920798 Designation Number: CN1304

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6202.01

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

ISED#: 27264 CAB identifier: CN0115

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

CNAS-Lab Code: L15631

Shenzhen GUOREN Certification Technology Service Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories for the Competence of Testing and Calibration Laboratories.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

1.4 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) $K=1.96$ or $K=2$ (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal).

Parameter	Uncertainty
Frequency error / 99%&90% bandwidth	$\pm 1.58 \cdot 10^{-6}$
Total RF power, conducted	$\pm 0.7\text{dB}$
Spurious emissions, conducted	$\pm 0.7\text{dB}$
DC and low frequency voltages	$\pm 0.04\%$
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$

2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	Mar. 29, 2025
Testing commenced on	:	Mar. 29, 2025
Testing concluded on	:	Apr. 21, 2025

2.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Voltage	Normal Voltage	DC 5.0V
	High Voltage	DC 5.5V
	Low Voltage	DC 4.5V
Other	Normal Temperature	25°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

Note: As the EUT was powered by DC 5.0V from car charger, and with the voltage stabilizing circuit used, the chip voltage received floating not exceed $\pm 1\%$ of nominal condition when working on extreme voltage, so all test performed at nominal voltage only.

2.3 General Description of EUT

Product Name:	Car Dash Cam			
Model/Type reference:	N5S			
Listed Models	/			
Power supply:	DC 5V from car charger			
WIFI				
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system
	IEEE 802.11a	IEEE 802.11n	IEEE 802.11ac	N/A
	IEEE 802.11n	IEEE 802.11ac		
	IEEE 802.11ac			
Operation frequency:	5180MHz-5240MHz	5190MHz-5230MHz	5210MHz	N/A
Modulation:	OFDM	OFDM	OFDM	N/A
Channel number:	4	2	1	N/A
Channel separation:	20MHz	40MHz	80MHz	N/A
Rated power:	1.0mW/MHz	0.5mW/MHz	0.3mW/MHz	N/A
TPC:	Not support			
Antenna type:	FPC antenna			
Antenna gain:	1.34 dBi			
Remark:				

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.4 Description of Test Modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Operating band	20MHz		40MHz		80MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
W52 (5150MHz-5250MHz)	36	5180	38	5190	42	5210
	40	5200				
	44	5220	46	5230		
	48	5240				

Note: Test performed at the lowest/middle/highest frequencies selected in the list above for EUT supported while working on specified mode.

2.5 Measurement Instruments List

Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Cal. Institution	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	Agilent	N9020A	GRCTEE002	Lisai	2024/09/19	2025/09/18
2	DC Power Supply	Hong Kong longwei instrumentation Co., Ltd	LW-3010KDS	GRCTES031	CEMT	2024/10/11	2025/10/10
3	Power Meter	Agilent	U2021X	GRCTEE063	Lisai	2024/09/19	2025/09/18
4	RF controller switch	Tonscend	JS0806-F	GRCTES051	Lisai	2024/09/19	2025/09/18
5	Signal Generator	R&S	SML03	GRCTEE006	Lisai	2024/09/19	2025/09/18
6	Digital multimeter	Shenzhen Shengli High Electronic Technology Co., Ltd	VICTOR 203	GRCTES024	CEMT	2024/10/11	2025/10/10
7	Digital oscillograph	Tektronix	TDS1012	GRCTES003	CEMT	2024/10/11	2025/10/10

Calibration by the calibration agencies listed in the table correspond to Article 102-18 paragraph(1) in the Radio Law".

Lisai-Guangzhou Lisai Metrology & Test Co., Ltd.

CEMT-Shenzhen Zhongdian Metrology and Testing Technology Co., Ltd.

Remark:

(a) Calibration conducted by Guangzhou Lisai Metrology & Test Co., Ltd.(hereinafter referred to as "Lisai") and Shenzhen Zhongdian Metrology and Testing Technology Co., Ltd.(hereinafter referred to as "CEMT") or a designated calibration agency under Article 102-18 paragraph(1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the GRG and CEMT or a designated calibration agency under Article 102-18 paragraph (1).(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c)

From JRL Article 24-2, paragraph 4, Item 2.

Notice: Calibration duration for above equipments is 1 year.

2.6 Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Frequency Band	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
5180~5240MHz	36	5180	44	5220
	38	5190	46	5230
	40	5200	48	5240
	42	5210	/	/
For IEEE 802.11a/n HT20/ac VHT20, Channel 36, 40 and 48 were tested. For IEEE 802.11n HT40/ac VHT40, Channel 38 and 46 were tested. For IEEE 802.11ac VHT80, Channel 42 was tested.				

2.7 Description of Test Modes

Tested mode, channel, and data rate information				
Mode	Preliminary Test Data Rate (Mbps)	Final Test Data Rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11a	6/54	6	Low :CH36	5180
	6/54	6	Middle: CH40	5200
	6/54	6	High: CH48	5240
IEEE 802.11n HT20	HT0/HT7	HT0	Low :CH36	5180
	HT0/HT7	HT0	Middle: CH40	5200
	HT0/HT7	HT0	High: CH48	5240
IEEE 802.11n HT40	HT0/HT7	HT0	Low :CH38	5190
	HT0/HT7	HT0	High: CH46	5230
IEEE 802.11ac VHT20	VHT0/VHT8	VHT0	Low :CH36	5180
	VHT0/VHT8	VHT0	Middle: CH40	5200
	VHT0/VHT8	VHT0	High: CH48	5240
IEEE 802.11ac VHT40	VHT0/VHT8	VHT0	Low :CH38	5190
	VHT0/VHT8	VHT0	High: CH46	5230
IEEE 802.11ac VHT80	VHT0/VHT8	VHT0	CH42	5210
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.				

2.8 Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	DC 5.0V	DC 5.5V	DC 4.5V
Output To RF Module	DC 3.3V	DC 3.3V	DC 3.3V
Voltage Variation (%)	0	0	0

Note:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage)/ Output Normal Voltage* 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

The sample power supply was confirmed that input voltage variation at the radio unit in the radio equipment to be tested is less than +1% against a variation of +10% at the input voltage from the external power supply to the radio equipment, and the radio equipment was designed so as to be operated in a specified voltage variation limit within +10%, Radio can only tested at rated voltage.

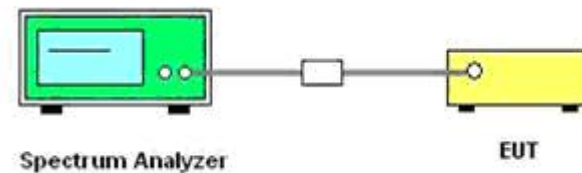
3 Test conditions and Results

3.1 Frequency Error

LIMIT

Tolerance of frequency shall be $\pm 20 \times 10^{-6}$.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: non-modulation

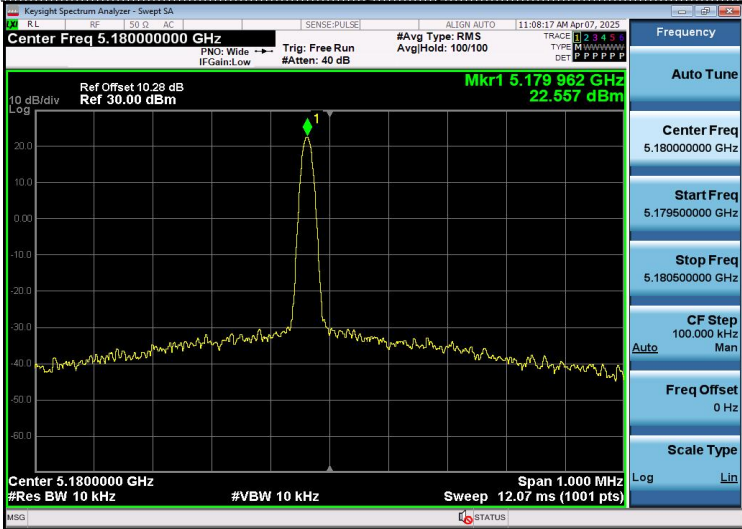
Spectrum Condition:

- Frequency: test frequency
- Span: 300 KHz
- RBW: 10 KHz
- VBW: 10 KHz
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

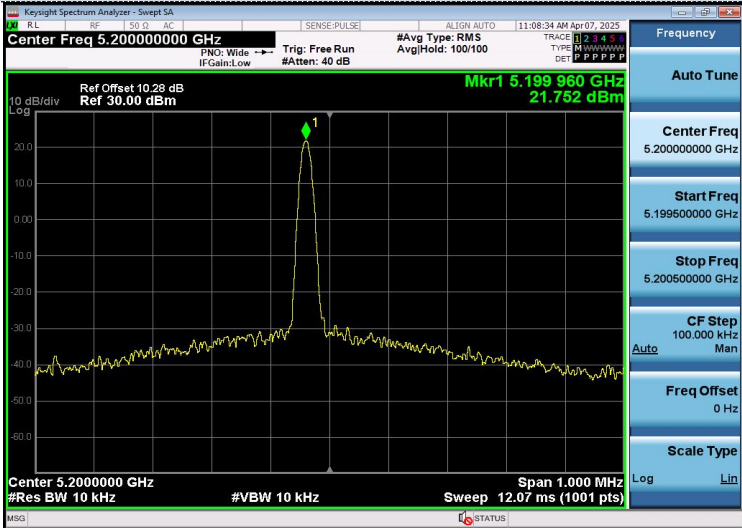
TEST RESULTS

Test voltage (V)	Frequency (MHz)	Read (MHz)	Deviation (MHz)	Tolerance (ppm)	Limit (ppm)	Result
Non-modulation	5180.00	5179.962	0.038	-7.33591	± 20.00	Pass
	5200.00	5199.960	0.040	-7.69231		
	5240.00	5239.960	0.040	-7.63359		
	5190.00	5189.960	0.040	-7.70713		
	5230.00	5229.960	0.040	-7.64818		
	5210.00	5209.960	0.040	-7.67754		

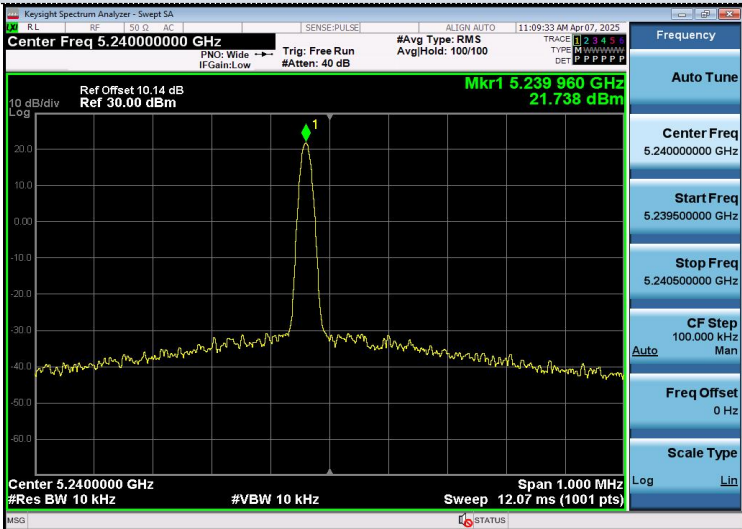
Test Plot of Frequency Tolerance



5180 MHz

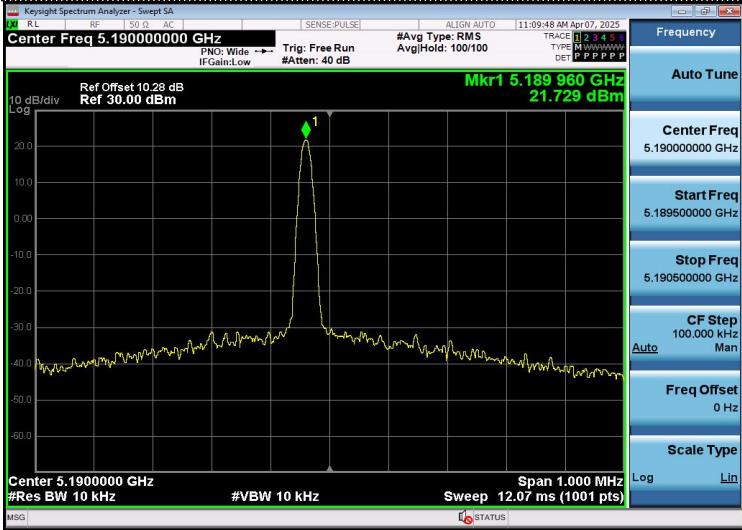


5200 MHz

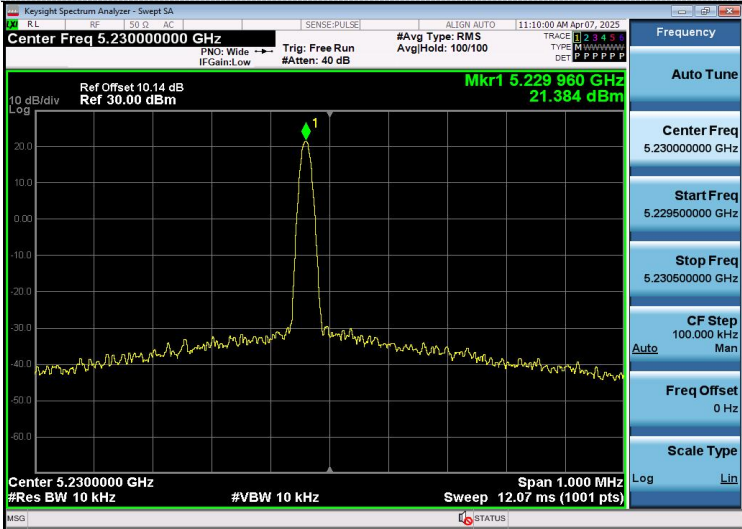


5240 MHz

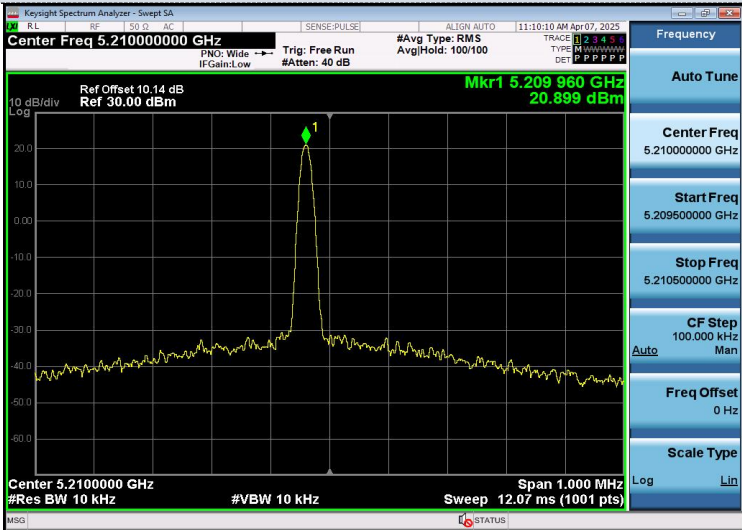
Test Plot of Frequency Tolerance



5190 MHz



5230 MHz



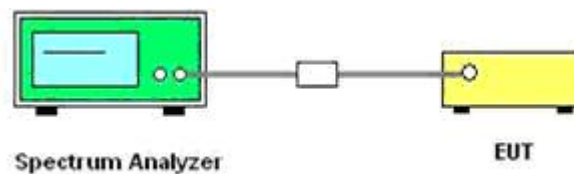
5210 MHz

3.2 Antenna Output Power and Output Power Tolerance

LIMIT

Operation Band	Item	20MHz system	40MHz system	80MHz system
W52	Antenna Power	OFDM	OFDM	OFDM
		2mW/MHz	1mW/MHz	0.5mW/MHz
	Antenna power Tolerance	+20%, -80%		

TEST CONFIGURATION



TEST PROCEDURE

- Connect the UUT to the spectrum analyzer as TEST CONFIGURATION and use the following settings:
- Connected the EUT's antenna port to the Spectrum Analyzer by suitable attenuator, set the Spectrum Analyzer as below:

Centre Frequency: The center frequency of the channel under test.

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: Wide enough to cover the complete power envelope of the signal of the EUT.

Trigger condition: Free run.

Sweep mode: Continuous sweeping.

Detector: Peak.

Trace Mode: Max Hold.

- When the trace is complete, find the peak value of the power envelope and record.

- Make the following changes to the setting of the Spectrum Analyzer:

Centre Frequency: Equal to the frequency recorded in step c

Resolution BW: 1MHz.

Video BW: 1MHz.

Span: 3MHz

Trigger condition: Free run.

Sweep mode: Continuous sweeping.

Detector: Average

Trace Mode: Max Hold.

When the trace is complete, find the peak value (value "A" in dBm) of the power envelope and record.

- Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.

- If applicable, add the additional beamforming gain "Y" in dB.

The equivalent isotopically radiated power (P) shall be calculated using the formula below:

$$P = A + G + Y$$

TEST RESULTS

Mode	Channel (MHz)	Power (dBm/MHz)	Output power (mW/MHz)	Limit (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit	Result
IEEE 802.11a	5180	0.36	1.0864	2	1.0	8.64%	-80%~20%	Pass
	5200	0.34	1.0814	2	1.0	8.14%		
	5240	0.75	1.1885	2	1.0	18.85%		
IEEE 802.11n HT20	5180	0.25	1.0593	2	1.0	5.93%	-80%~20%	Pass
	5200	0.75	1.1885	2	1.0	18.85%		
	5240	0.78	1.1967	2	1.0	19.67%		
IEEE 802.11n HT40	5190	-3.65	0.4315	1	0.5	-13.70%	-80%~20%	Pass
	5230	-3.89	0.4083	1	0.5	-18.34%		
IEEE 802.11ac HT20	5180	0.43	1.1041	2	1.0	10.41%	-80%~20%	Pass
	5200	0.25	1.0593	2	1.0	5.93%		
	5240	0.31	1.0740	2	1.0	7.40%		
IEEE 802.11ac HT40	5190	-3.53	0.4436	1	0.5	-11.28%	-80%~20%	Pass
	5230	-3.50	0.4467	1	0.5	-10.66%		
IEEE 802.11ac HT80	5210	-5.35	0.2917	0.5	0.3	-2.77%	-80%~20%	Pass

Note:

- 1). Test Result: Pass.
- 2). All test modes have been tested and we only record the worst result.

EIRP

Mode	Channel (MHz)	Power (dBm/MHz)	Antenna Gain (dBi)	EIRP (dBm/MHz)	EIRP/MHz (mW/MHz)	Limit (mW/MHz)	Result
IEEE 802.11a	5180	0.36	1.34	1.70	1.4791	2	Pass
	5200	0.34	1.34	1.68	1.4723	2	
	5240	0.75	1.34	2.09	1.6181	2	
IEEE 802.11n HT20	5180	0.25	1.34	1.59	1.4421	2	Pass
	5200	0.75	1.34	2.09	1.6181	2	
	5240	0.78	1.34	2.12	1.6293	2	
IEEE 802.11n HT40	5190	-3.65	1.34	-2.31	0.5875	1	Pass
	5230	-3.89	1.34	-2.55	0.5559	1	
IEEE 802.11ac HT20	5180	0.43	1.34	1.77	1.5031	2	Pass
	5200	0.25	1.34	1.59	1.4421	2	
	5240	0.31	1.34	1.65	1.4622	2	
IEEE 802.11ac HT40	5190	-3.53	1.34	-2.19	0.6039	1	Pass
	5230	-3.50	1.34	-2.16	0.6081	1	
IEEE 802.11ac HT80	5210	-5.35	1.34	-4.01	0.3972	0.5	Pass

Note:

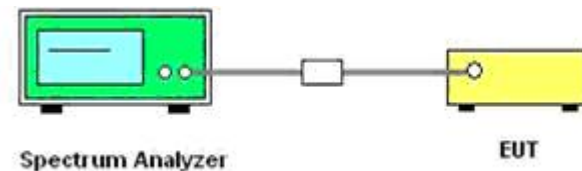
- 1). Test Result: Pass.
- 2). All test modes have been tested and we only record the worst result.
- 3). EIRP = Power meter power + Antenna gain

3.3 Occupied Bandwidth

LIMIT

Operation Band	20MHz system	40MHz system	80MHz system
W52	OFDM	OFDM	OFDM
	20MHz	40MHz	80MHz

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

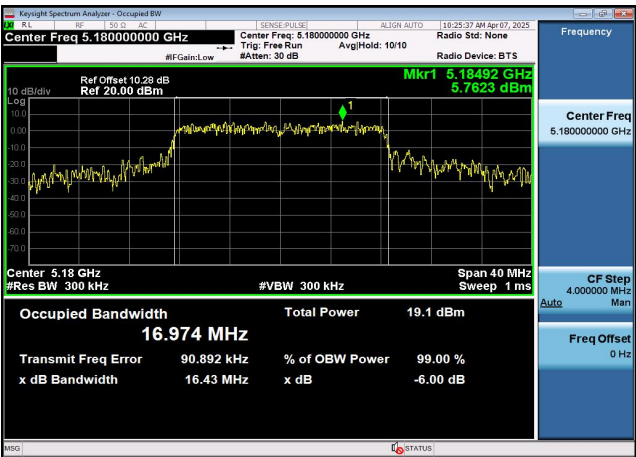
Spectrum Condition:

1. Setting of SA is following as fellow:
 - RBW: under 3% of OBW
 - VBW: = RBW
 - Sweep time: Auto
 - Sweep Mode: Continuous sweep
 - Detect mode: Positive peak
 - Trace mode: Max hold
2. EUT have transmitted the maximum modulation signal and fixed channelize.
3. SA set to 99% of occupied bandwidth to measure occupied bandwidth.

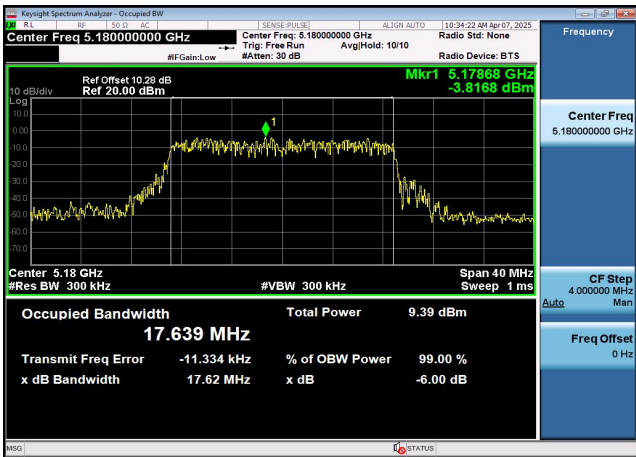
TEST RESULTS

Type	Channel (MHz)	Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11a	5180	16.974	<20	Pass
	5200	16.531		
	5240	16.559		
IEEE 802.11n HT20	5180	17.639	<20	
	5200	17.622		
	5240	17.741		
IEEE 802.11n HT40	5190	36.100	<40	
	5230	36.189		
IEEE 802.11ac HT20	5180	17.621	<20	
	5200	17.678		
	5240	17.719		
IEEE 802.11ac HT40	5190	35.816	<40	
	5230	36.145		
IEEE 802.11ac HT80	5210	75.788	<80	

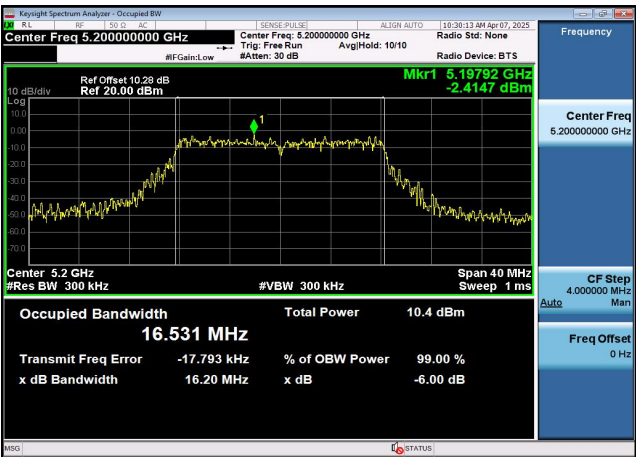
IEEE 802.11a



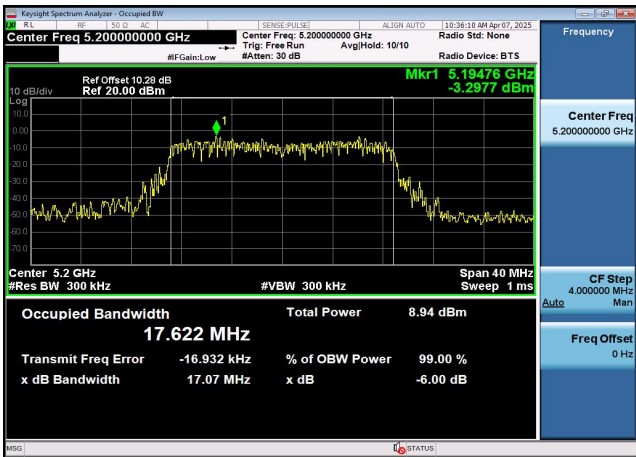
IEEE 802.11n HT20



5180 MHz



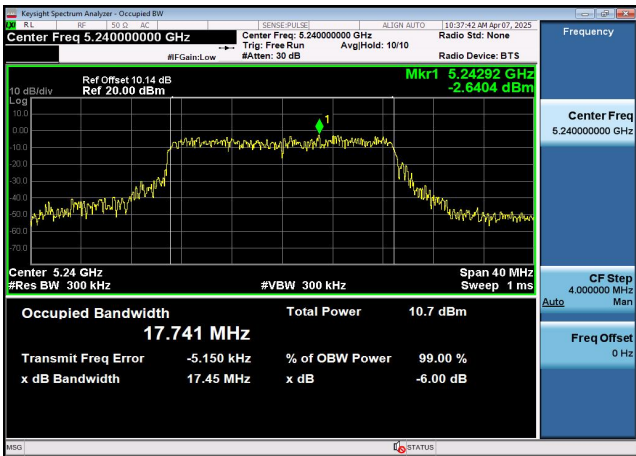
5180 MHz



5200 MHz



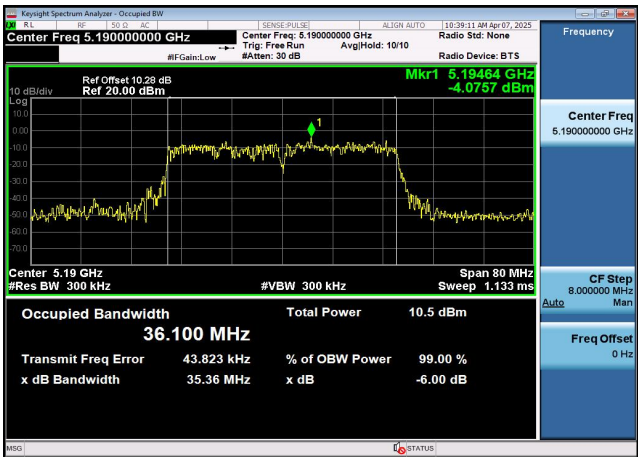
5200 MHz



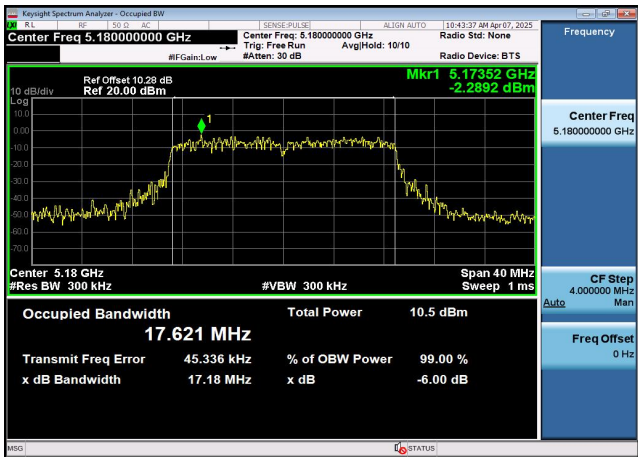
5240 MHz

5240 MHz

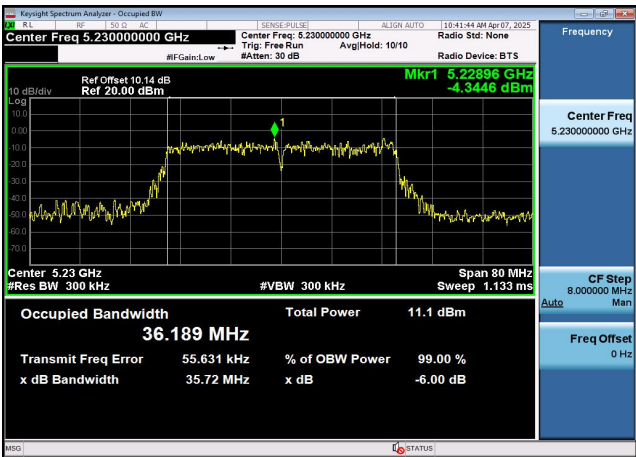
IEEE 802.11n HT40



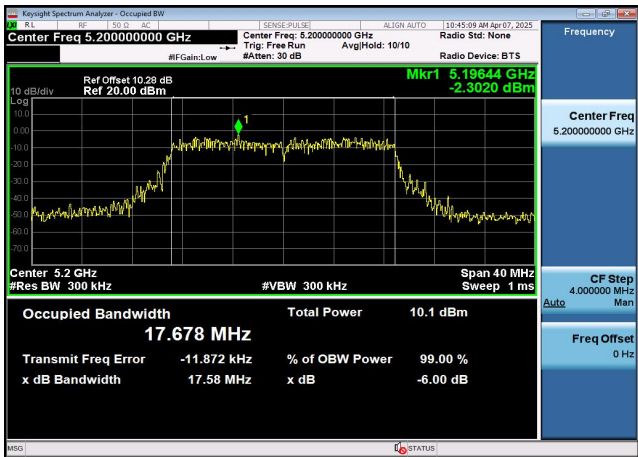
IEEE 802.11ac VHT20



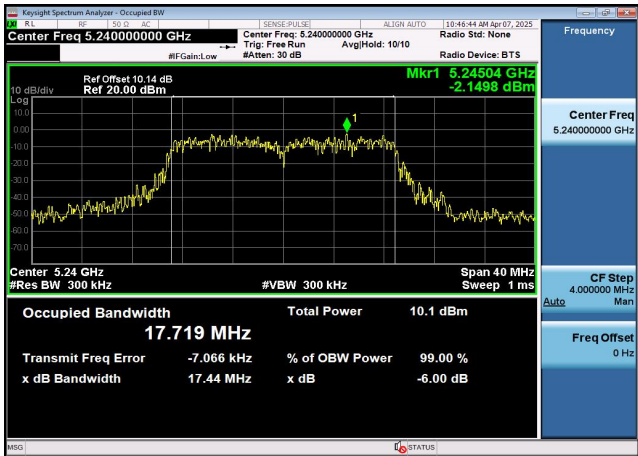
5190 MHz



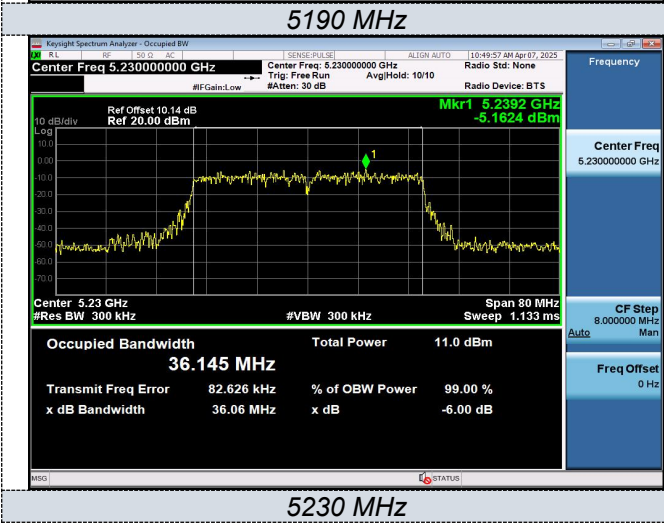
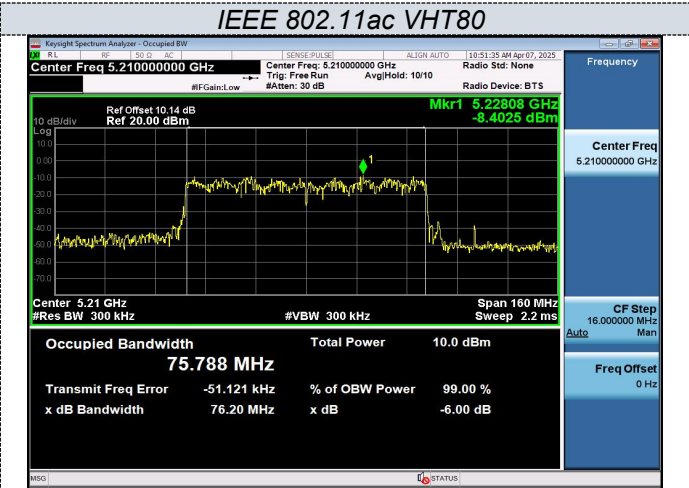
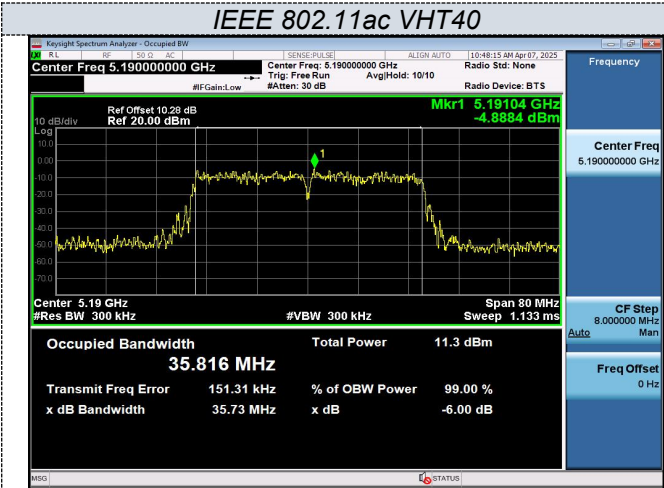
5180 MHz



5230 MHz



5240 MHz

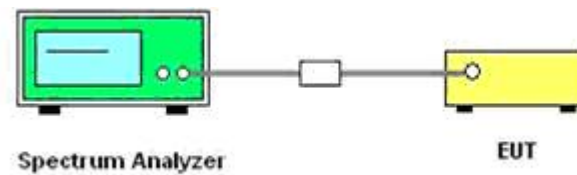


3.4 Adjacent Channel Power

LIMIT

20MHz system	40MHz system	80MHz system	160MHz system
OFDM	OFDM	OFDM	OFDM
$F_c \pm 20\text{MHz}$ $\pm 10\text{MHz BW: -25dBc}$	$F_c \pm 40\text{MHz}$ $\pm 20\text{MHz BW: -25dBc}$	$F_c \pm 80\text{MHz}$ $\pm 40\text{MHz BW: -20dBc}$	--
$F_c \pm 40\text{MHz}$ $\pm 10\text{MHz BW: -40dBc}$	$F_c \pm 80\text{MHz}$ $\pm 20\text{MHz BW: -40dBc}$		

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

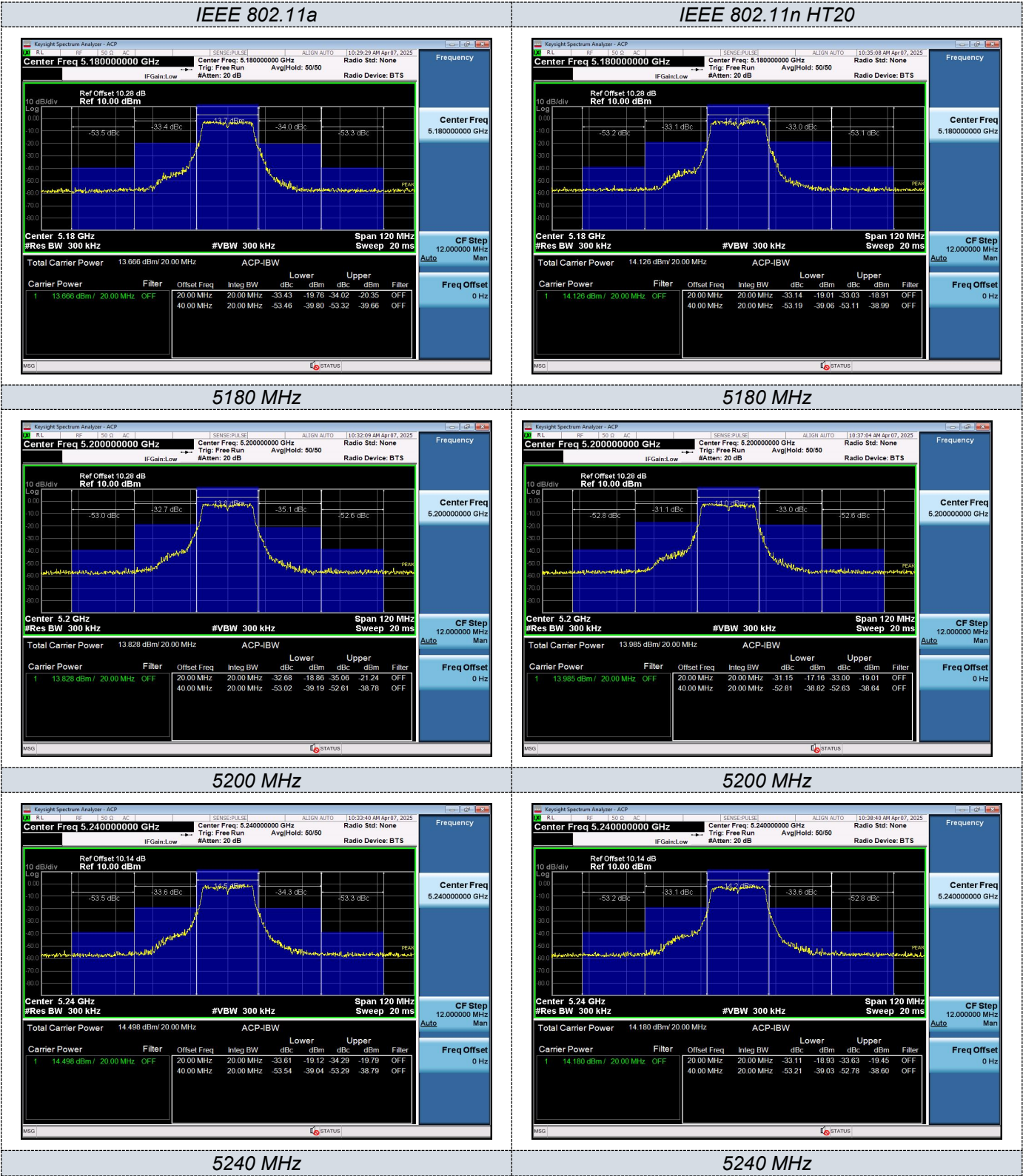
Use Spectrum's ACP measurement function and set spectrum analyzer as follow:

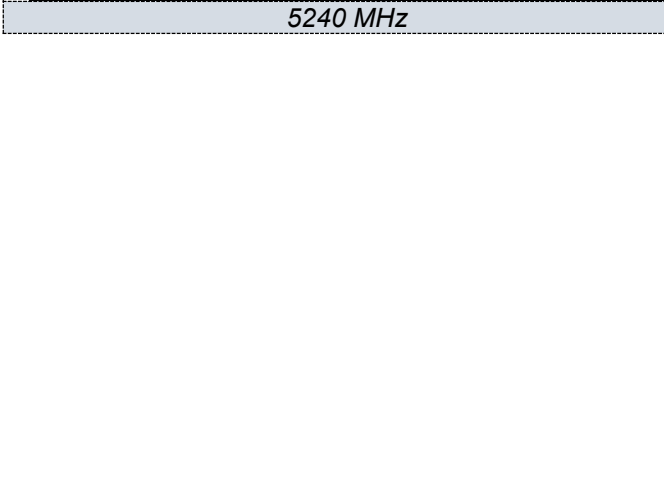
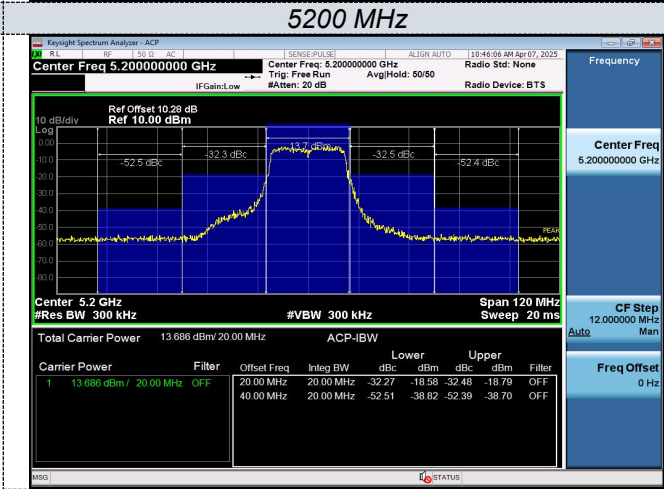
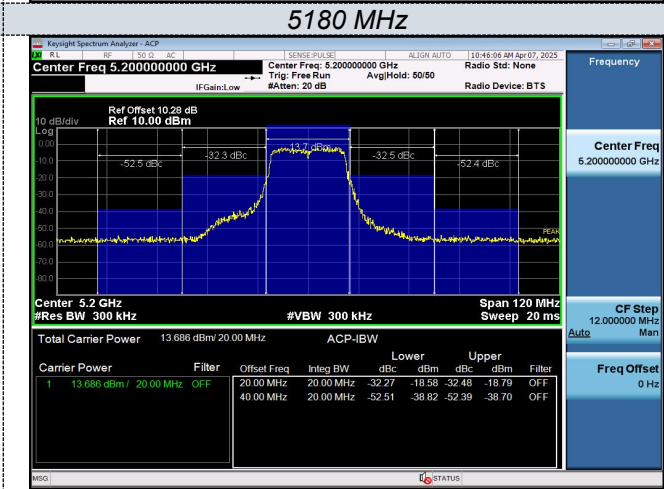
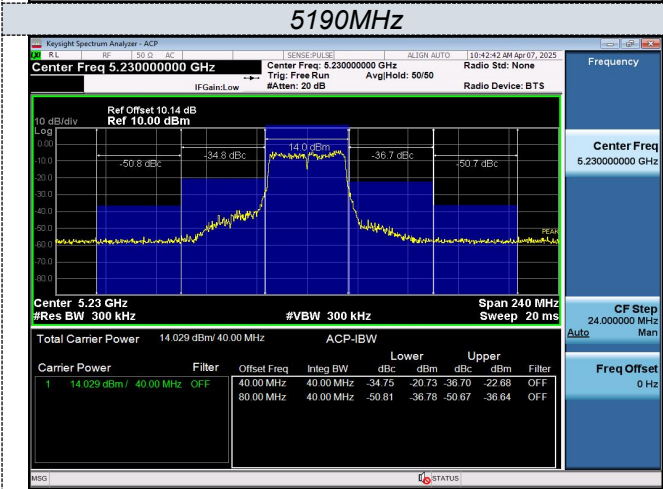
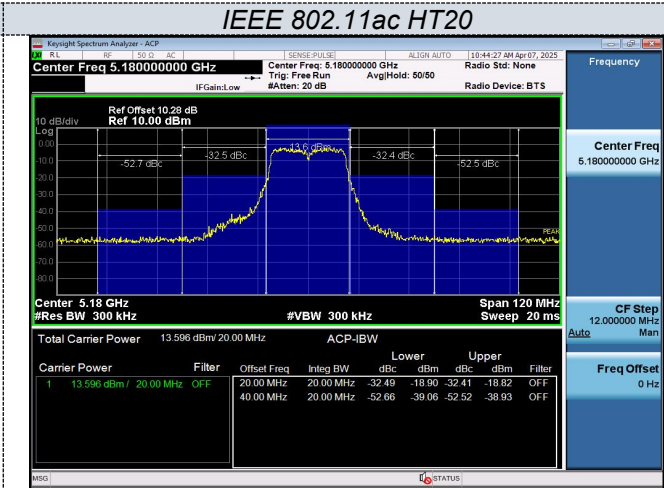
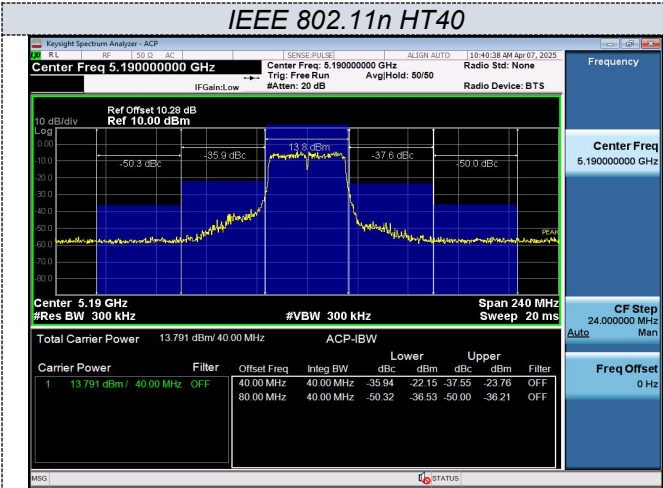
Spectrum Condition:

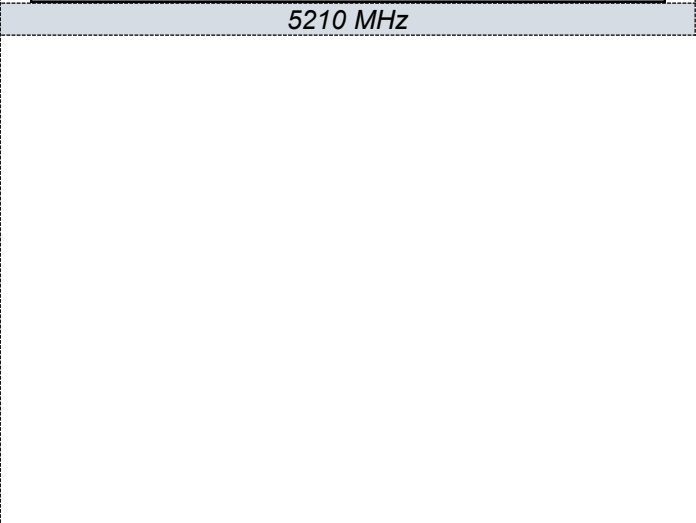
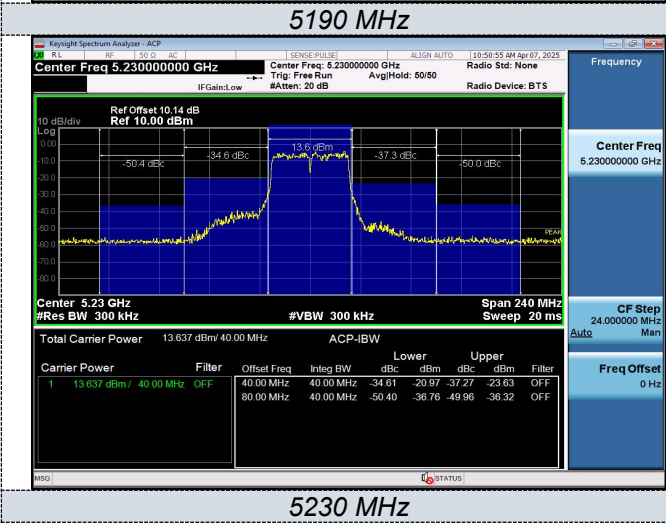
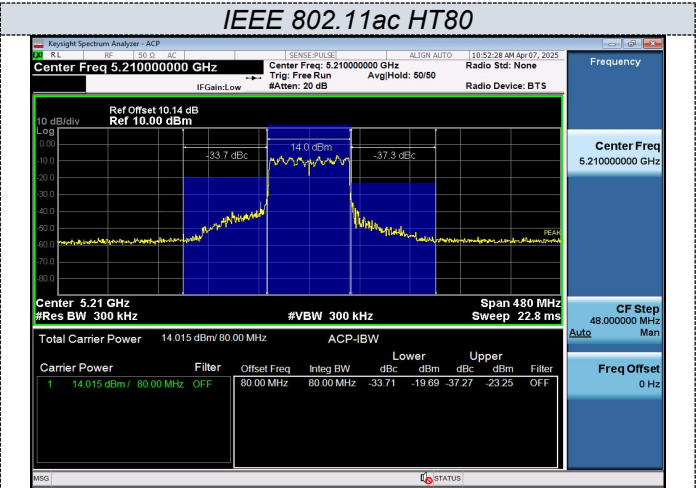
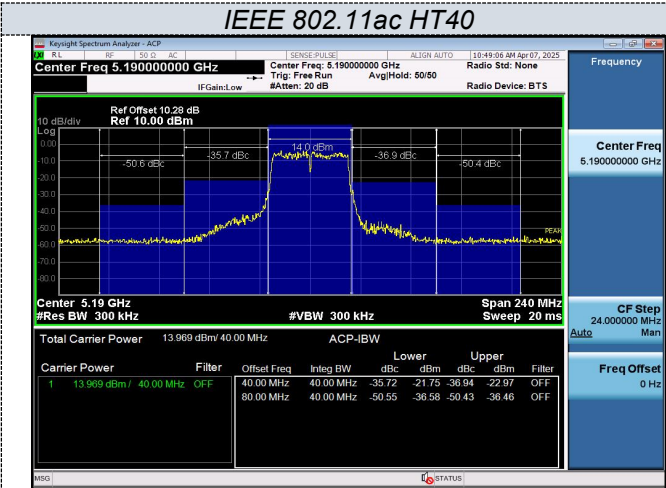
- Frequency: test frequency
- Span: .>4 times integrate bandwidth
- RBW: 300 KHz
- VBW: 300 KHz
- Sweep time: Auto
- Sweep mode: Continuous
- Detector mode: Sample
- Indication mode: max hold

TEST RESULTS

TestMode	Frequency [MHz]	Offset [MHz]	Result [dBc]	Limit [dBc]	Verdict
IEEE 802.11a	5180	-40	-53.46	≤ -40	PASS
		-20	-33.43	≤ -25	PASS
		+20	-34.02	≤ -25	PASS
		+40	-53.32	≤ -40	PASS
	5200	-40	-53.02	≤ -40	PASS
		-20	-32.68	≤ -25	PASS
		+20	-35.06	≤ -25	PASS
		+40	-52.61	≤ -40	PASS
	5240	-40	-53.54	≤ -40	PASS
		-20	-33.61	≤ -25	PASS
		+20	-34.29	≤ -25	PASS
		+40	-53.29	≤ -40	PASS
IEEE 802.11n HT20	5180	-40	-53.19	≤ -40	PASS
		-20	-33.14	≤ -25	PASS
		+20	-33.03	≤ -25	PASS
		+40	-53.11	≤ -40	PASS
	5200	-40	-52.81	≤ -40	PASS
		-20	-31.15	≤ -25	PASS
		+20	-33.00	≤ -25	PASS
		+40	-52.63	≤ -40	PASS
	5240	-40	-53.21	≤ -40	PASS
		-20	-33.11	≤ -25	PASS
		+20	-33.63	≤ -25	PASS
		+40	-52.78	≤ -40	PASS
IEEE 802.11n HT40	5190	-80	-50.32	≤ -40	PASS
		-40	-35.94	≤ -25	PASS
		+40	-37.55	≤ -25	PASS
		+80	-50.00	≤ -40	PASS
	5230	-80	-50.81	≤ -40	PASS
		-40	-34.75	≤ -25	PASS
		+40	-36.70	≤ -25	PASS
		+80	-50.67	≤ -40	PASS
IEEE 802.11ac HT20	5180	-40	-52.66	≤ -40	PASS
		-20	-32.49	≤ -25	PASS
		+20	-32.41	≤ -25	PASS
		+40	-52.52	≤ -40	PASS
	5200	-40	-52.51	≤ -40	PASS
		-20	-32.27	≤ -25	PASS
		+20	-32.48	≤ -25	PASS
		+40	-52.39	≤ -40	PASS
	5240	-40	-53.06	≤ -40	PASS
		-20	-33.77	≤ -25	PASS
		+20	-32.88	≤ -25	PASS
		+40	-52.82	≤ -40	PASS
IEEE 802.11ac HT40	5190	-80	-50.55	≤ -40	PASS
		-40	-35.72	≤ -25	PASS
		+40	-36.94	≤ -25	PASS
		+80	-50.43	≤ -40	PASS
	5230	-80	-50.40	≤ -40	PASS
		-40	-34.61	≤ -25	PASS
		+40	-37.27	≤ -25	PASS
		+80	-49.96	≤ -40	PASS
IEEE 802.11ac HT80	5210	-80	-33.71	≤ -25	PASS
		+80	-37.27	≤ -25	PASS





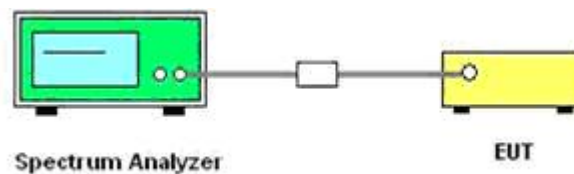


3.5 Out of Band Leakage Power

LIMIT

W52	20MHz system	
	OBW: 18MHz or less	OBW:18-19MHz
	5140-5142MHz: 2.5μW/MHz 5142-5150MHz: 15μW/MHz 5250-5251MHz: $10^{1-(f-9)}$ mW/MHz 5251-5260MHz: $10^{1-(8/90)(f-11)}$ mW/MHz 5260-5266.7MHz: $10^{-1.8-(6/50)(f-20)}$ mW/MHz 5266.7-5360MHz: 2.5μW/MHz f=MHz, Different from 5240(MHz)	5135-5142MHz: 2.5μW/MHz 5142-5150MHz: 15μW/MHz 5250-5251MHz: $10^{1-(f-9)}$ mW/MHz 5251-5260MHz: $10^{1-(8/90)(f-11)}$ mW/MHz 5260-5266.7MHz: $10^{-1.8-(6/50)(f-20)}$ mW/MHz 5266.7-5365MHz: 2.5μW/MHz f=MHz, Different from 5240(MHz)
	40MHz system	80MHz system
	5100-5141.6MHz: 2.5μW/MHz 5141.6-5150MHz: 15μW/MHz 5250-5251MHz: $10^{-(f-20)+\log(1/2)}$ mW/MHz 5251-5270MHz: $10^{-(8/190)(f-21)-1+\log(1/2)}$ mW/MHz 5270-5278.4MHz: $10^{-(3/50)(f-40)-1.8+\log(1/2)}$ mW/MHz 5278.4-5400MHz: 2.5μW/MHz f=MHz, Different from 5230(MHz)	5020-5123.2MHz: 2.5μW/MHz 5123.2-5150MHz: 15μW/MHz 5250-5251MHz: $10^{-(f-40)+\log(1/4)}$ mW/MHz 5251-5290MHz: $10^{-(8/390)(f-41)-1+\log(1/4)}$ mW/MHz 5290-5296.7MHz: $10^{-(3/100)(f-80)-1.8+\log(1/4)}$ mW/MHz 5296.7-5480MHz: 2.5μW/MHz f=MHz, Different from 5210(MHz)

TEST CONFIGURATION



TEST PROCEDURE

Enable EUT under transmission mode and connected it to the spectrum analyzer through antenna output port as the block diagram show in TEST CONFIGURATION

Use Spectrum's ACP measurement function and set spectrum analyzer as follow:

Spectrum Condition:

Step 1:

- Frequency: include each specified frequency range
- RBW: 1 MHz
- VBW: 1 MHz
- Span: Wide enough to cover the complete power envelope of the signal of the UUT.
- Detector: Peak
- Trace Mode: Max Hold

Step 2:

When the trace is complete, find the peak value of the power envelope and record the frequency.

Step 3:

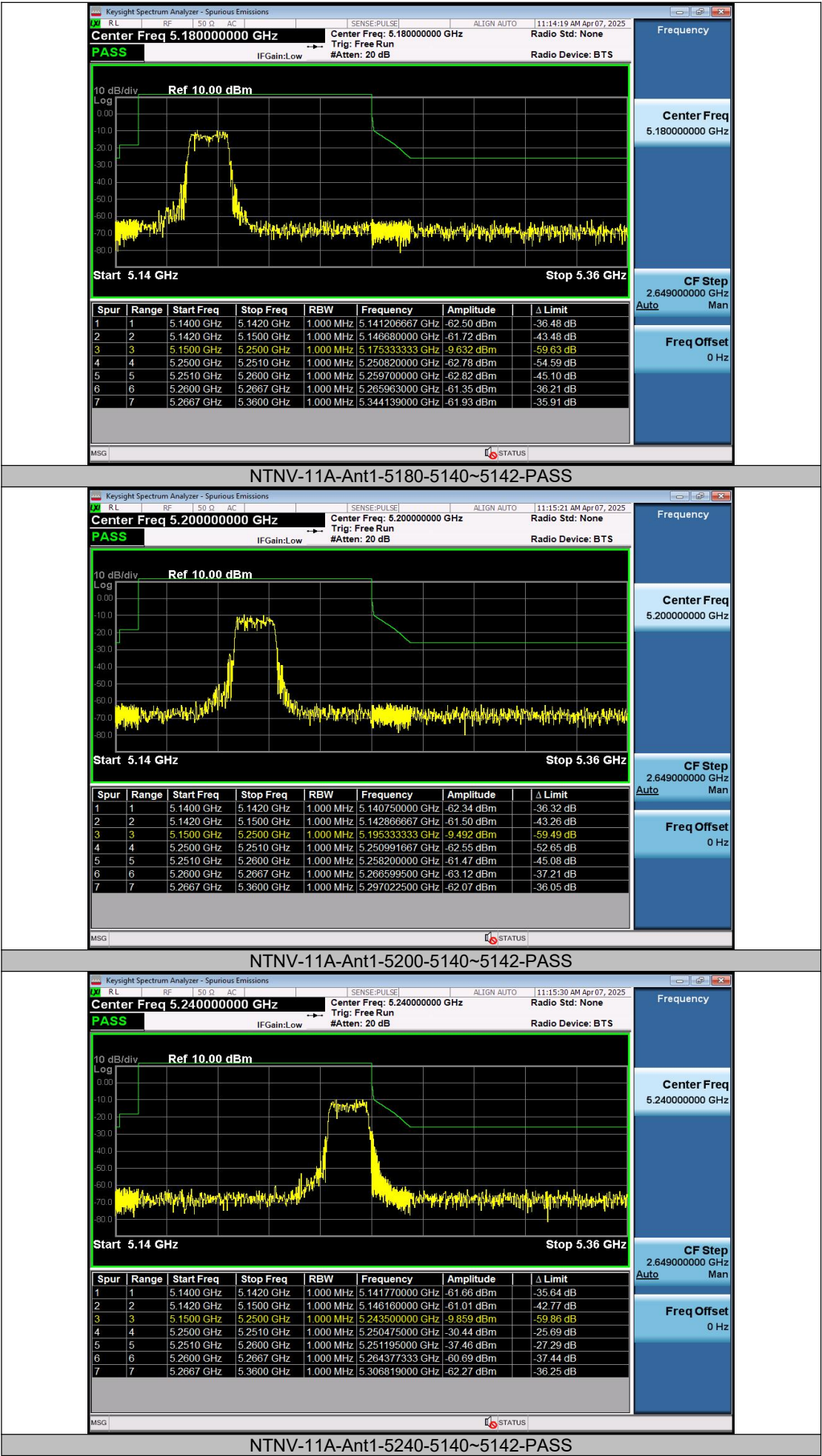
Make the following changes to the settings of the spectrum analyzer:

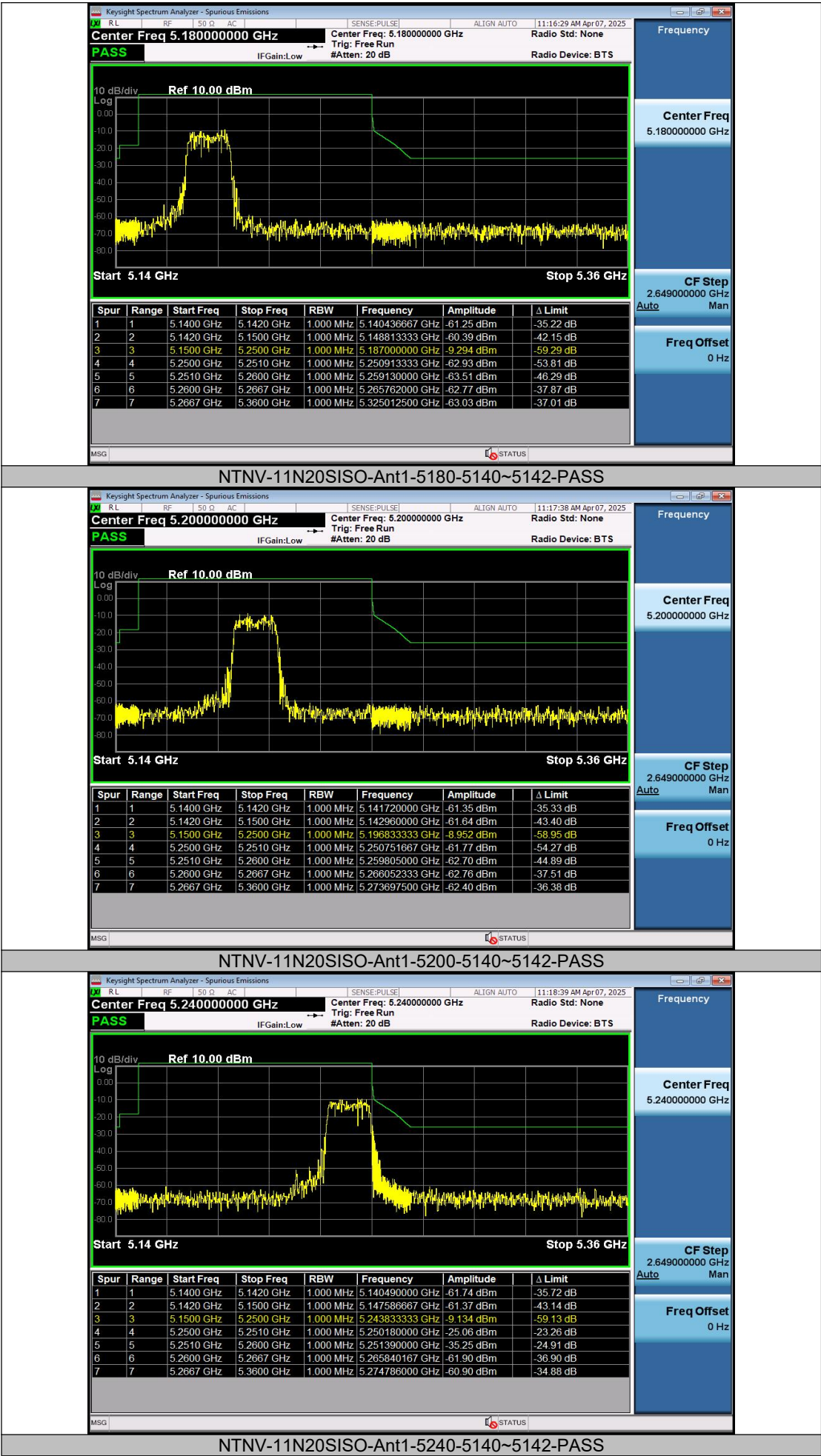
- Centre Frequency: Equal to the frequency recorded in step 2.
- Span: 0 Hz
- RBW: 1 MHz
- VBW: 1 MHz
- Detector: RMS
- Trace Mode: Clear Write

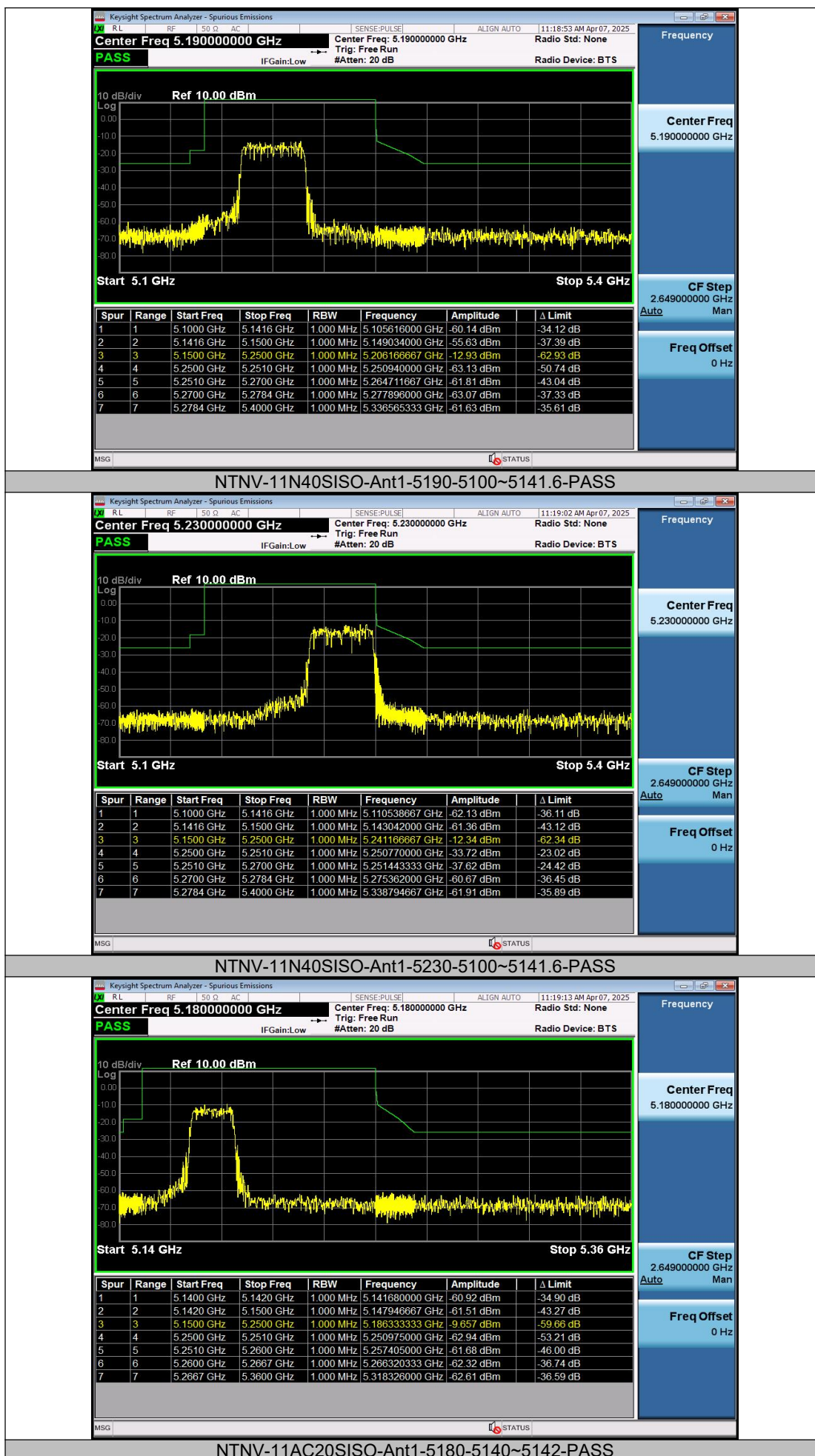
TEST RESULTS

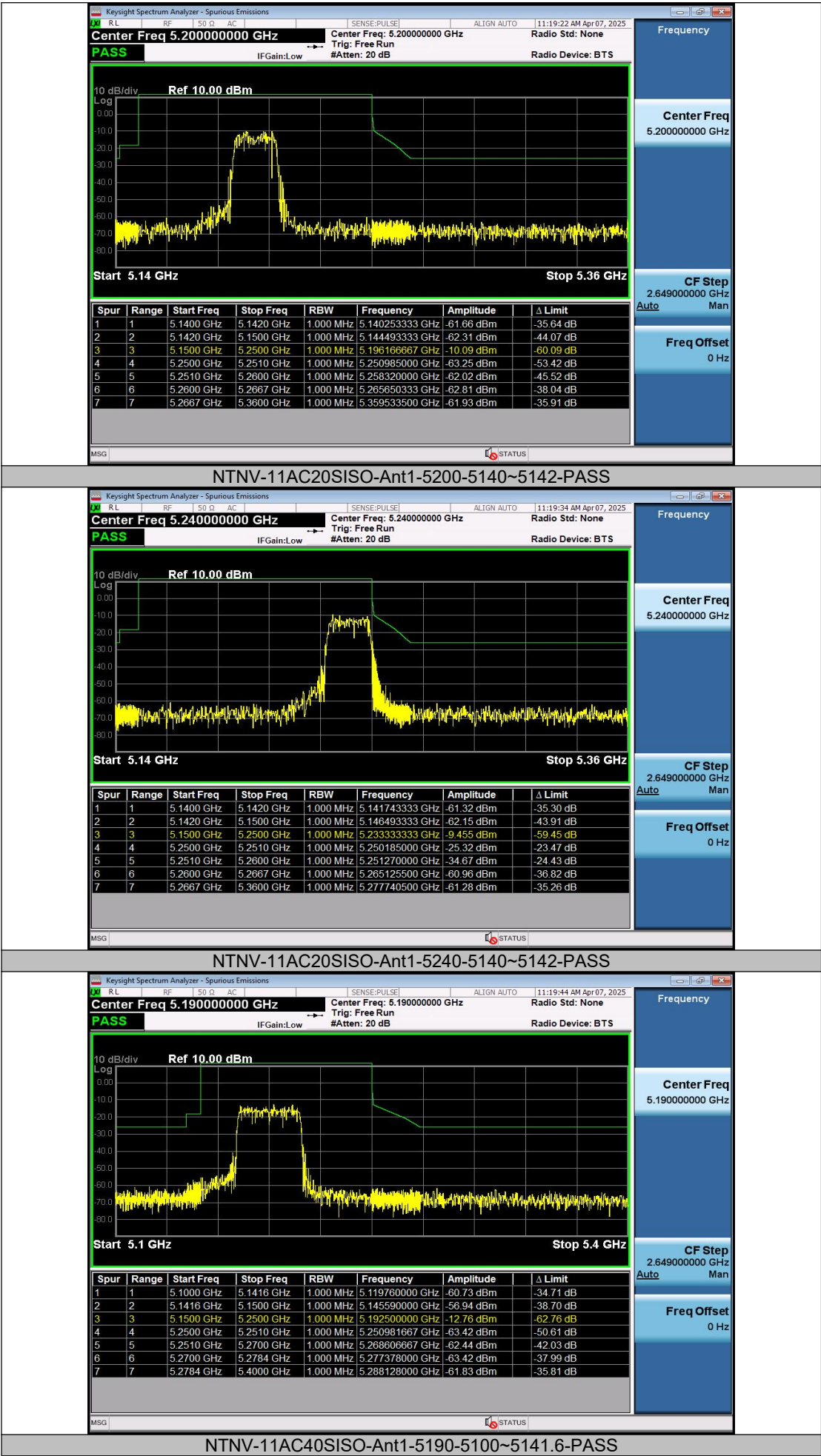
TestMode	Frequency[MHz]	FreRang [MHz]	Max.Freq. [MHz]	EIRP [dBm]	Limit [dBm]	Verdict
11A	5180	5140~5142	5141.21	-62.50	-26.02	PASS
		5142~5150	5146.68	-61.72	-18.24	PASS
		5250~5251	5250.82	-62.78	-8.19	PASS
		5251~5260	5259.70	-62.82	-17.72	PASS
		5260~5266.7	5265.96	-61.35	-25.14	PASS
		5266.7~5360	5344.14	-61.93	-26.02	PASS
	5200	5140~5142	5140.75	-62.34	-26.02	PASS
		5142~5150	5142.87	-61.50	-18.24	PASS
		5250~5251	5250.99	-62.55	-9.90	PASS
		5251~5260	5258.20	-61.47	-16.39	PASS
		5260~5266.7	5266.60	-63.12	-25.91	PASS
		5266.7~5360	5297.02	-62.07	-26.02	PASS
	5240	5140~5142	5141.77	-61.66	-26.02	PASS
		5142~5150	5146.16	-61.01	-18.24	PASS
		5250~5251	5250.48	-30.44	-4.75	PASS
		5251~5260	5251.20	-37.46	-10.17	PASS
		5260~5266.7	5264.38	-60.69	-23.25	PASS
		5266.7~5360	5306.82	-62.27	-26.02	PASS
11N20SISO	5180	5140~5142	5140.44	-61.25	-26.02	PASS
		5142~5150	5148.81	-60.39	-18.24	PASS
		5250~5251	5250.91	-62.93	-9.12	PASS
		5251~5260	5259.13	-63.51	-17.22	PASS
		5260~5266.7	5265.76	-62.77	-24.90	PASS
		5266.7~5360	5325.01	-63.03	-26.02	PASS
	5200	5140~5142	5141.72	-61.35	-26.02	PASS
		5142~5150	5142.96	-61.64	-18.24	PASS
		5250~5251	5250.75	-61.77	-7.50	PASS
		5251~5260	5259.81	-62.70	-17.81	PASS
		5260~5266.7	5266.05	-62.76	-25.25	PASS
		5266.7~5360	5273.70	-62.40	-26.02	PASS
	5240	5140~5142	5140.49	-61.74	-26.02	PASS
		5142~5150	5147.59	-61.37	-18.24	PASS
		5250~5251	5250.18	-25.06	-1.80	PASS
		5251~5260	5251.39	-35.25	-10.34	PASS
		5260~5266.7	5265.84	-61.90	-25.00	PASS
		5266.7~5360	5274.79	-60.90	-26.02	PASS
11N40SISO	5190	5100~5141.6	5105.62	-60.14	-26.02	PASS
		5141.6~5150	5149.03	-55.63	-18.24	PASS
		5250~5251	5250.94	-63.13	-12.39	PASS
		5251~5270	5264.71	-61.81	-18.77	PASS
		5270~5278.4	5277.90	-63.07	-25.74	PASS
		5278.4~5400	5336.57	-61.63	-26.02	PASS
	5230	5100~5141.6	5110.54	-62.13	-26.02	PASS
		5141.6~5150	5143.04	-61.36	-18.24	PASS
		5250~5251	5250.77	-33.72	-10.70	PASS
		5251~5270	5251.44	-37.62	-13.20	PASS
		5270~5278.4	5275.36	-60.67	-24.22	PASS
		5278.4~5400	5338.79	-61.91	-26.02	PASS
11AC20SISO	5180	5140~5142	5141.68	-60.92	-26.02	PASS
		5142~5150	5147.95	-61.51	-18.24	PASS
		5250~5251	5250.98	-62.94	-9.73	PASS
		5251~5260	5257.41	-61.68	-15.68	PASS
		5260~5266.7	5266.32	-62.32	-25.58	PASS
		5266.7~5360	5318.33	-62.61	-26.02	PASS
	5200	5140~5142	5140.25	-61.66	-26.02	PASS
		5142~5150	5144.49	-62.31	-18.24	PASS

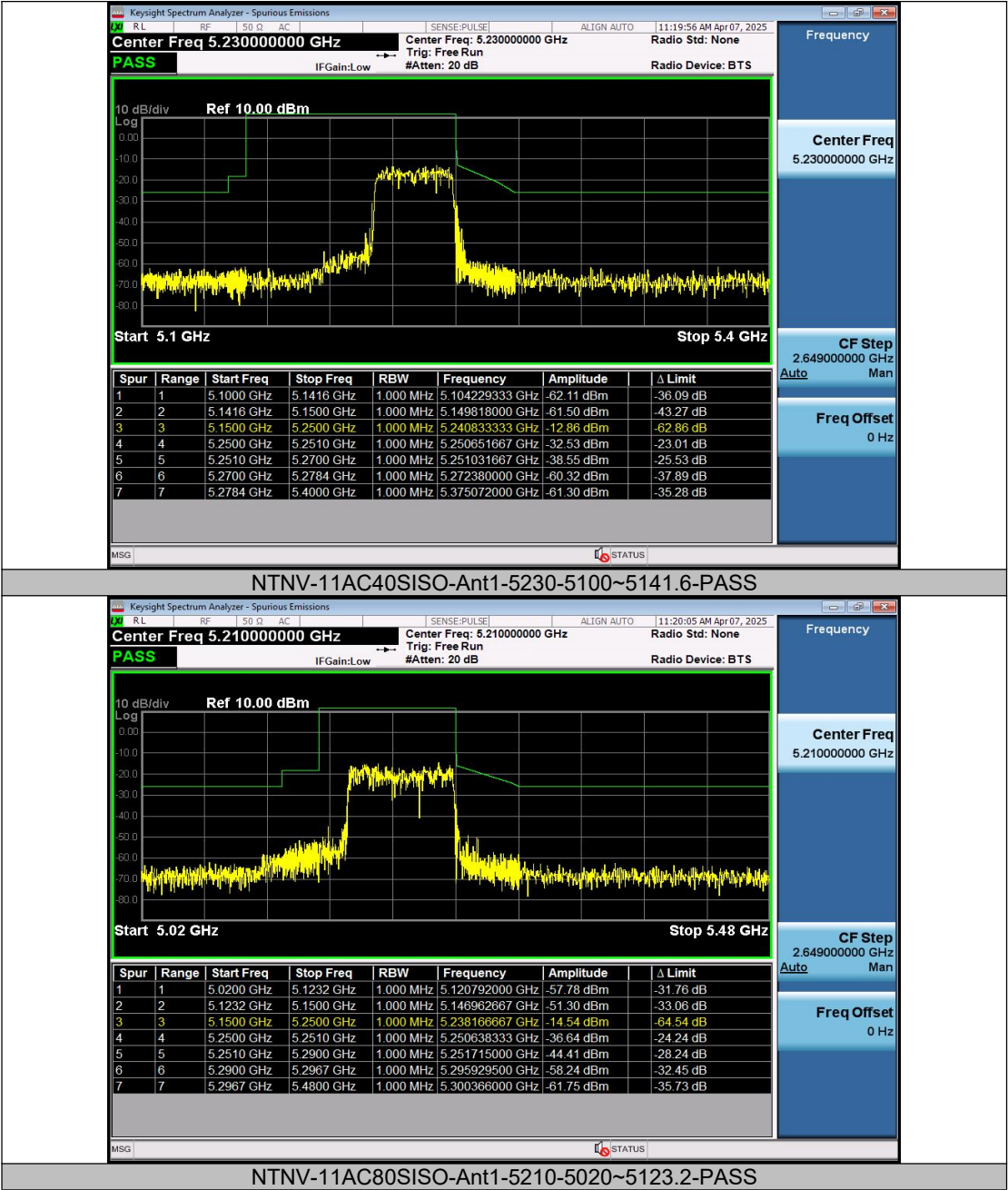
		5250~5251	5250.99	-63.25	-9.83	PASS
		5251~5260	5258.32	-62.02	-16.50	PASS
		5260~5266.7	5265.65	-62.81	-24.77	PASS
		5266.7~5360	5359.53	-61.93	-26.02	PASS
	5240	5140~5142	5141.74	-61.32	-26.02	PASS
		5142~5150	5146.49	-62.15	-18.24	PASS
		5250~5251	5250.19	-25.32	-1.85	PASS
		5251~5260	5251.27	-34.67	-10.24	PASS
		5260~5266.7	5265.13	-60.96	-24.14	PASS
		5266.7~5360	5277.74	-61.28	-26.02	PASS
11AC40SISO	5190	5100~5141.6	5119.76	-60.73	-26.02	PASS
		5141.6~5150	5145.59	-56.94	-18.24	PASS
		5250~5251	5250.98	-63.42	-12.81	PASS
		5251~5270	5268.61	-62.44	-20.41	PASS
		5270~5278.4	5277.38	-63.42	-25.43	PASS
		5278.4~5400	5288.13	-61.83	-26.02	PASS
	5230	5100~5141.6	5104.23	-62.11	-26.02	PASS
		5141.6~5150	5149.82	-61.50	-18.24	PASS
		5250~5251	5250.65	-32.53	-9.52	PASS
		5251~5270	5251.03	-38.55	-13.02	PASS
		5270~5278.4	5272.38	-60.32	-22.43	PASS
		5278.4~5400	5375.07	-61.30	-26.02	PASS
11AC80SISO	5210	5020~5123.2	5120.79	-57.78	-26.02	PASS
		5123.2~5150	5146.96	-51.30	-18.24	PASS
		5250~5251	5250.64	-36.64	-12.40	PASS
		5251~5290	5251.72	-44.41	-16.17	PASS
		5290~5296.7	5295.93	-58.24	-25.79	PASS
		5296.7~5480	5300.37	-61.75	-26.02	PASS









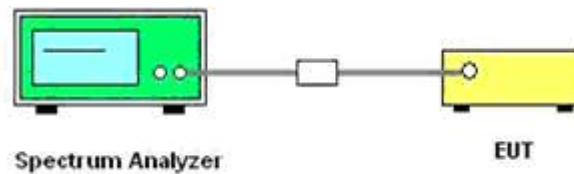


3.6 Unwanted Emission Strength

LIMIT

Operation Band	20MHz system		40MHz system	80MHz system
	DSSS, etc	OFDM	OFDM	OFDM
W52 & W53	30~5,140MHz: 2.5 μ W/MHz	30~5,135MHz: 2.5 μ W/MHz	30~5,100MHz: 2.5 μ W/MHz	30~5,020MHz: 2.5 μ W/MHz
	5,360MHz~26GHz: 2.5 μ W/MHz	5,365MHz~26GHz: 2.5 μ W/MHz	5,400MHz~26GHz: 2.5 μ W/MHz	5,480MHz~26GHz: 2.5 μ W/MHz

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

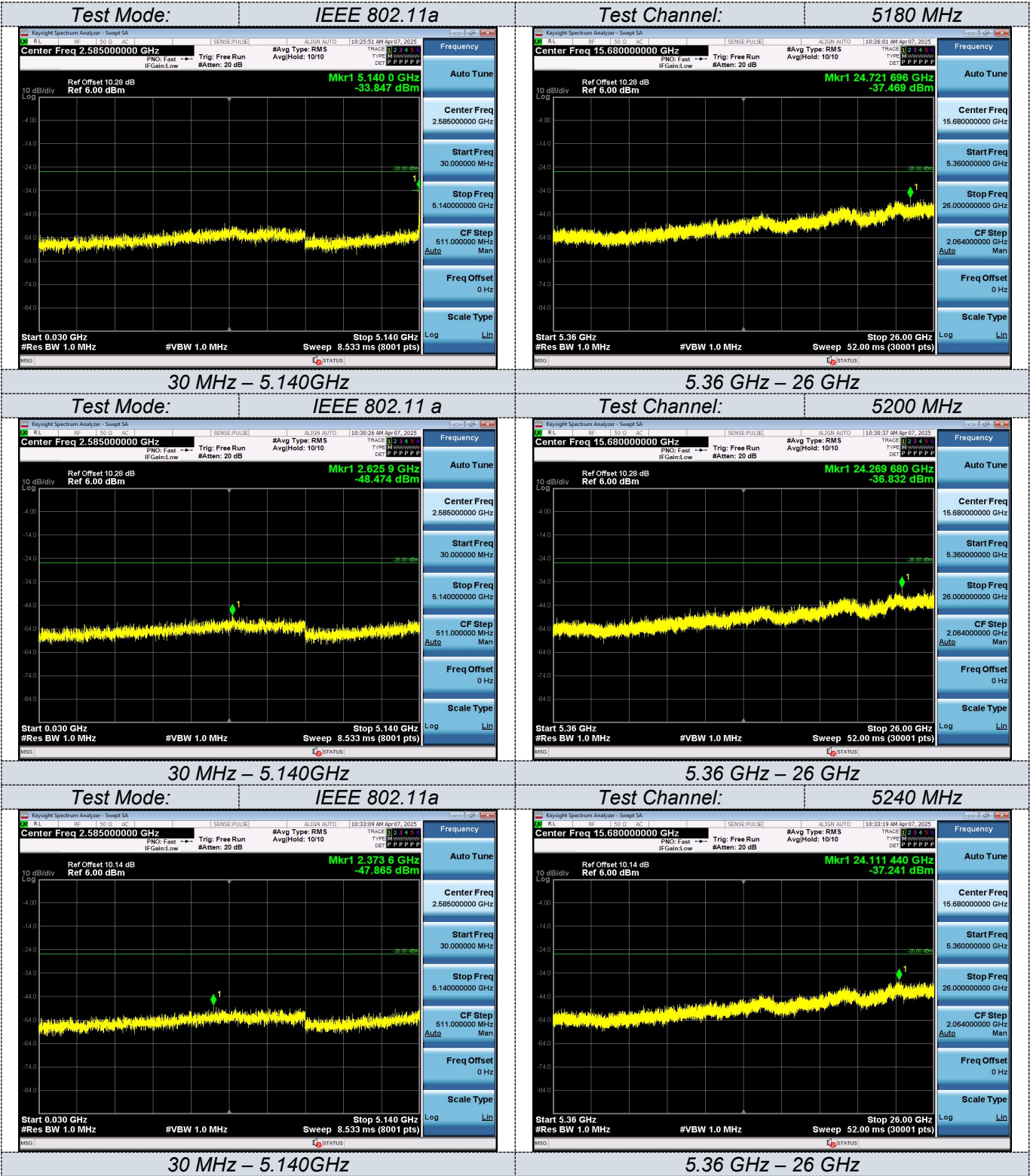
EUT Condition: modulation

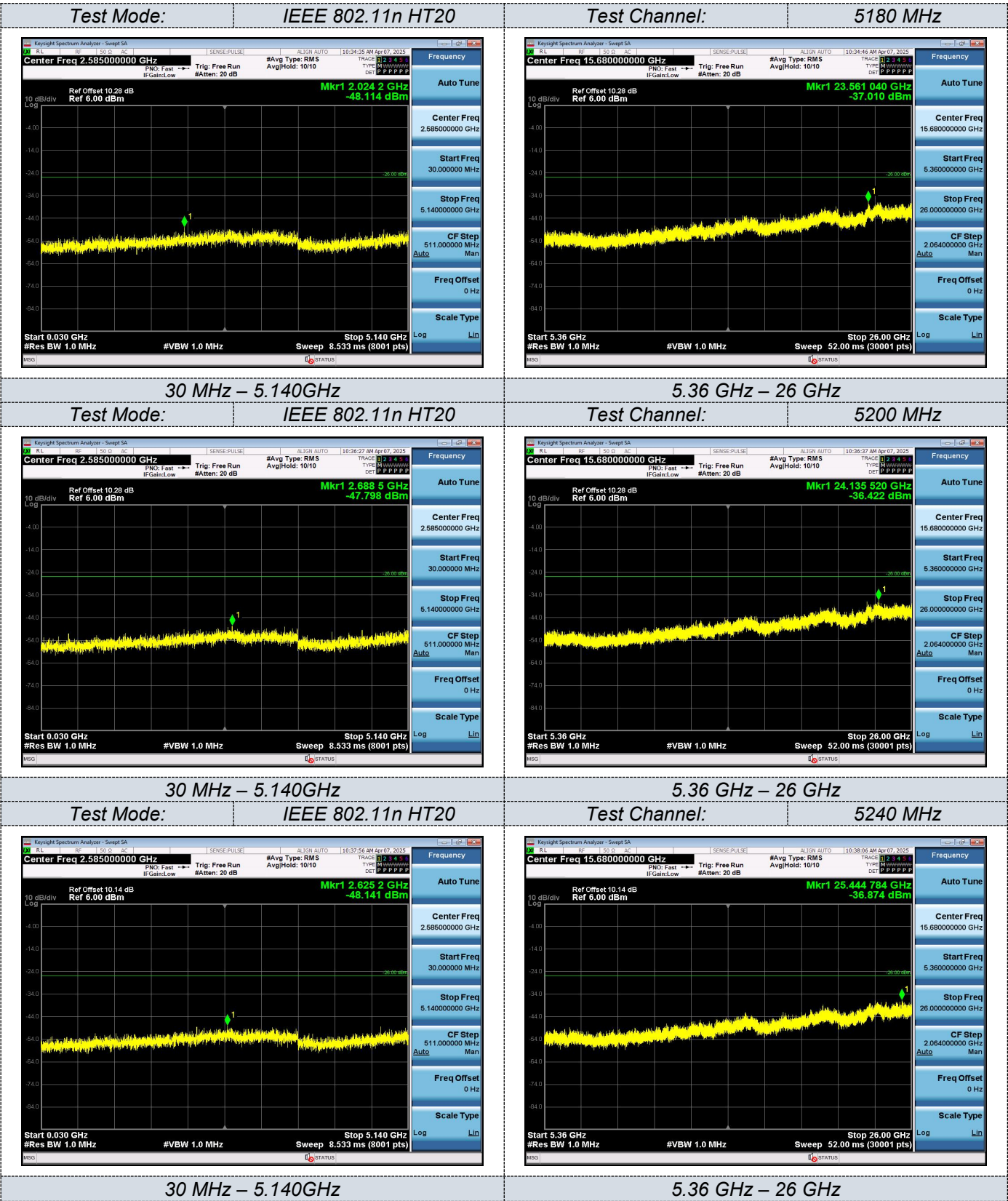
Spectrum Condition:

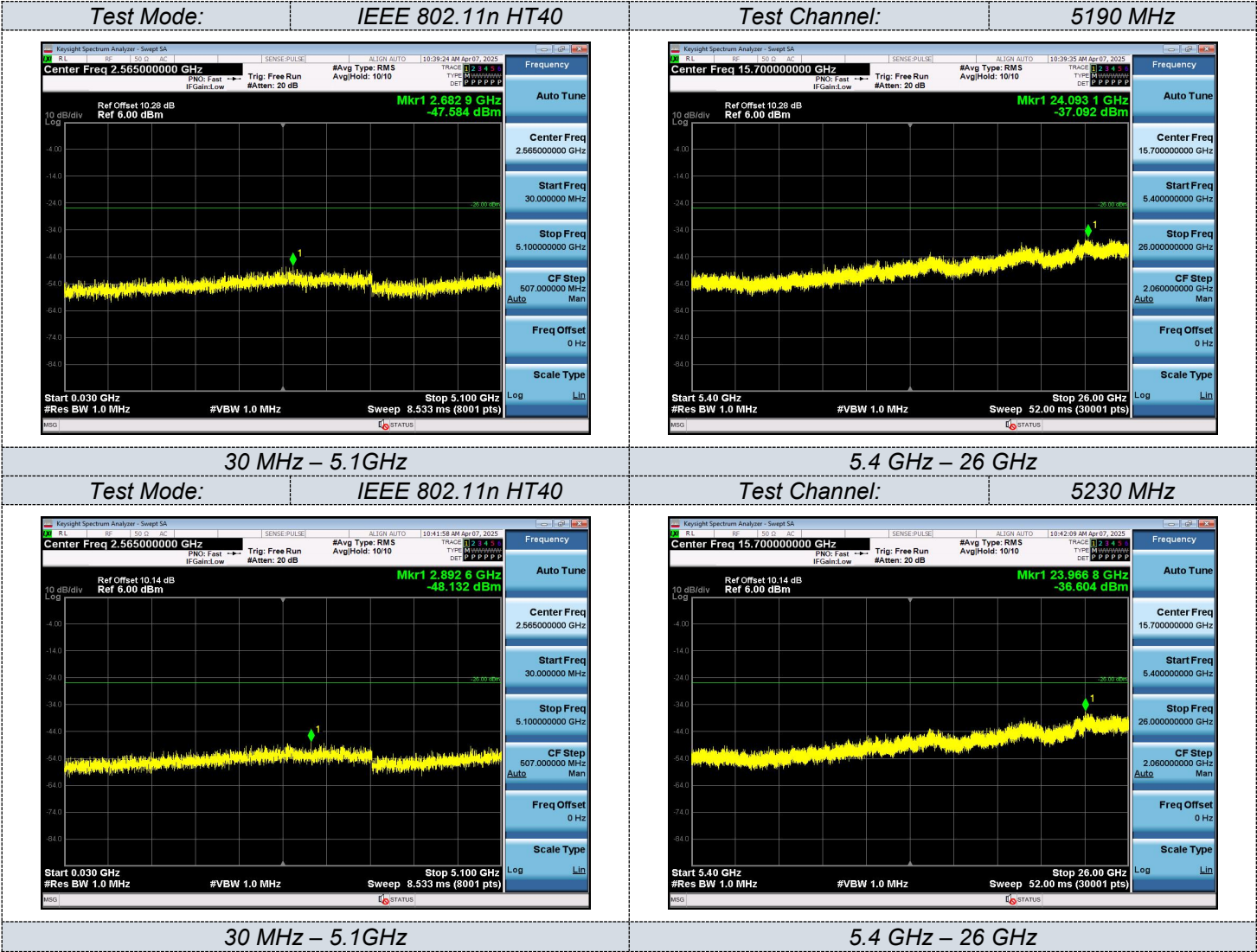
- Frequency: 30MHz-26GHz
- RBW: 1MHz (30MHz-26GHz)
- VBW: 1MHz (30MHz-26GHz)
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

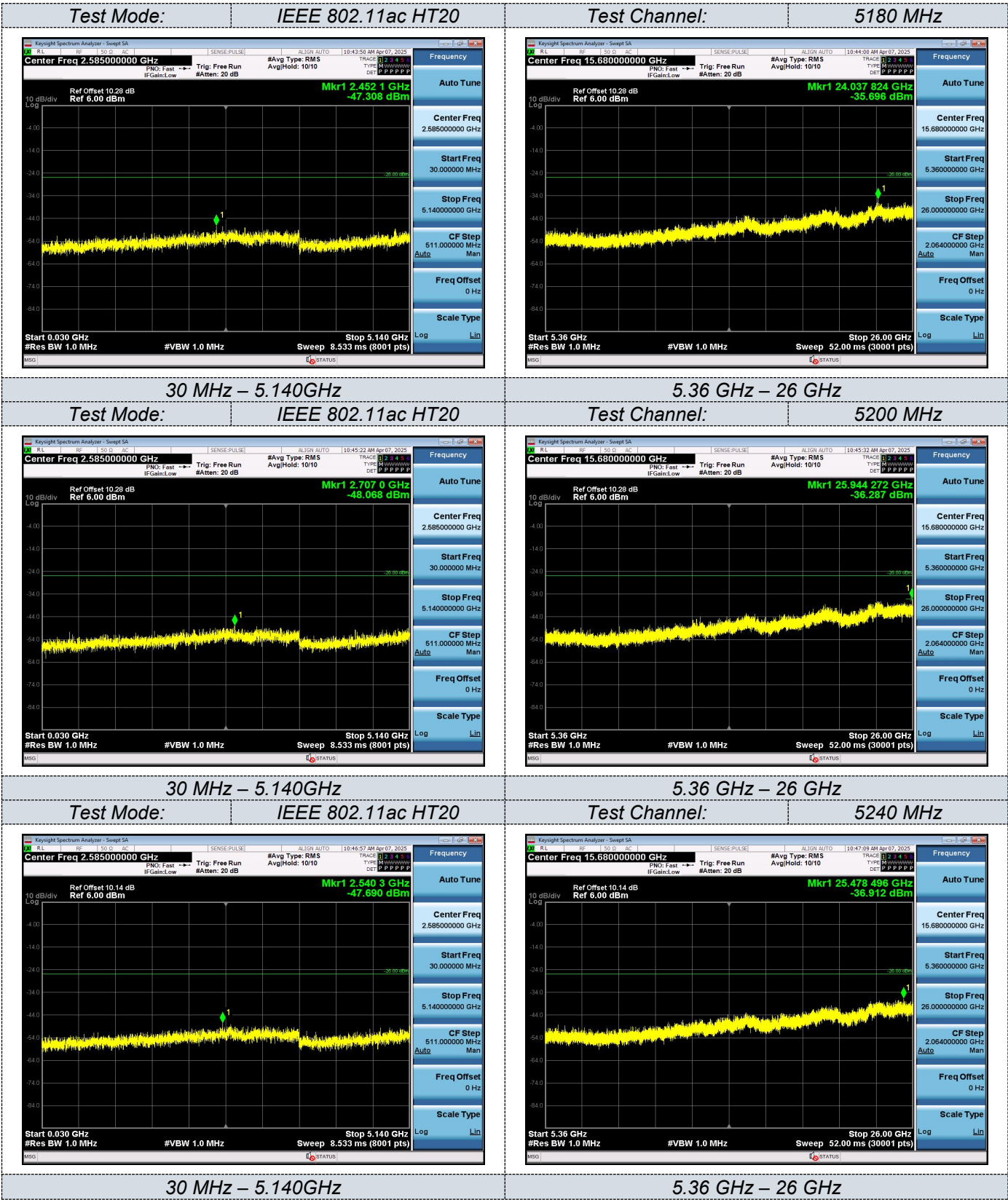
TEST RESULTS

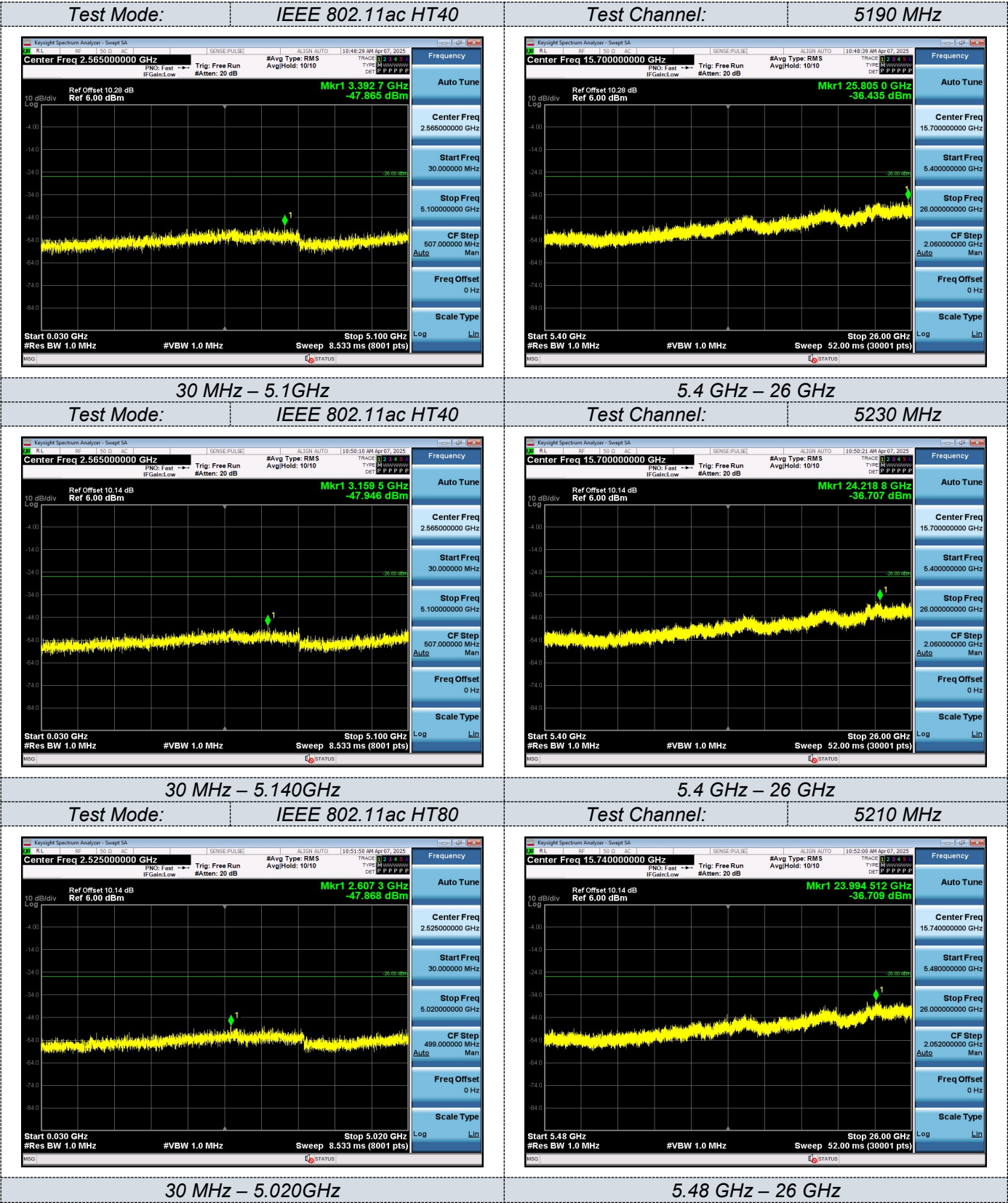
TestMode	Frequency [MHz]	Freq.Range [MHz]	Max.Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	5180	30~5140	5140.00	-33.85	≤-26	PASS
11A	5180	5360~26000	24721.70	-37.47	≤-26	PASS
11A	5200	30~5140	2625.88	-48.47	≤-26	PASS
11A	5200	5360~26000	24269.68	-36.83	≤-26	PASS
11A	5240	30~5140	2373.57	-47.87	≤-26	PASS
11A	5240	5360~26000	24111.44	-37.24	≤-26	PASS
11N20SISO	5180	30~5140	2024.18	-48.11	≤-26	PASS
11N20SISO	5180	5360~26000	23561.04	-37.01	≤-26	PASS
11N20SISO	5200	30~5140	2688.48	-47.80	≤-26	PASS
11N20SISO	5200	5360~26000	24135.52	-36.42	≤-26	PASS
11N20SISO	5240	30~5140	2625.24	-48.14	≤-26	PASS
11N20SISO	5240	5360~26000	25444.78	-36.87	≤-26	PASS
11N40SISO	5190	30~5100	2682.88	-47.58	≤-26	PASS
11N40SISO	5190	5400~26000	24093.13	-37.09	≤-26	PASS
11N40SISO	5230	30~5100	2892.65	-48.13	≤-26	PASS
11N40SISO	5230	5400~26000	23966.78	-36.60	≤-26	PASS
11AC20SISO	5180	30~5140	2452.14	-47.31	≤-26	PASS
11AC20SISO	5180	5360~26000	24037.82	-35.70	≤-26	PASS
11AC20SISO	5200	30~5140	2707.00	-48.07	≤-26	PASS
11AC20SISO	5200	5360~26000	25944.27	-36.29	≤-26	PASS
11AC20SISO	5240	30~5140	2540.29	-47.69	≤-26	PASS
11AC20SISO	5240	5360~26000	25478.50	-36.91	≤-26	PASS
11AC40SISO	5190	30~5100	3392.68	-47.87	≤-26	PASS
11AC40SISO	5190	5400~26000	25804.99	-36.44	≤-26	PASS
11AC40SISO	5230	30~5100	3159.46	-47.95	≤-26	PASS
11AC40SISO	5230	5400~26000	24218.79	-36.71	≤-26	PASS
11AC80SISO	5210	30~5020	2607.34	-47.87	≤-26	PASS
11AC80SISO	5210	5480~26000	23994.51	-36.71	≤-26	PASS









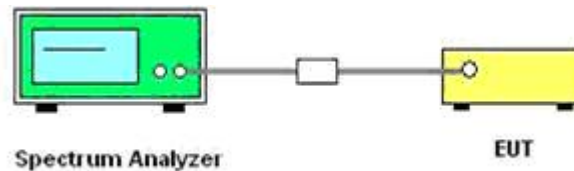


3.7 Secondary Radiated Emission Strength

LIMIT

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

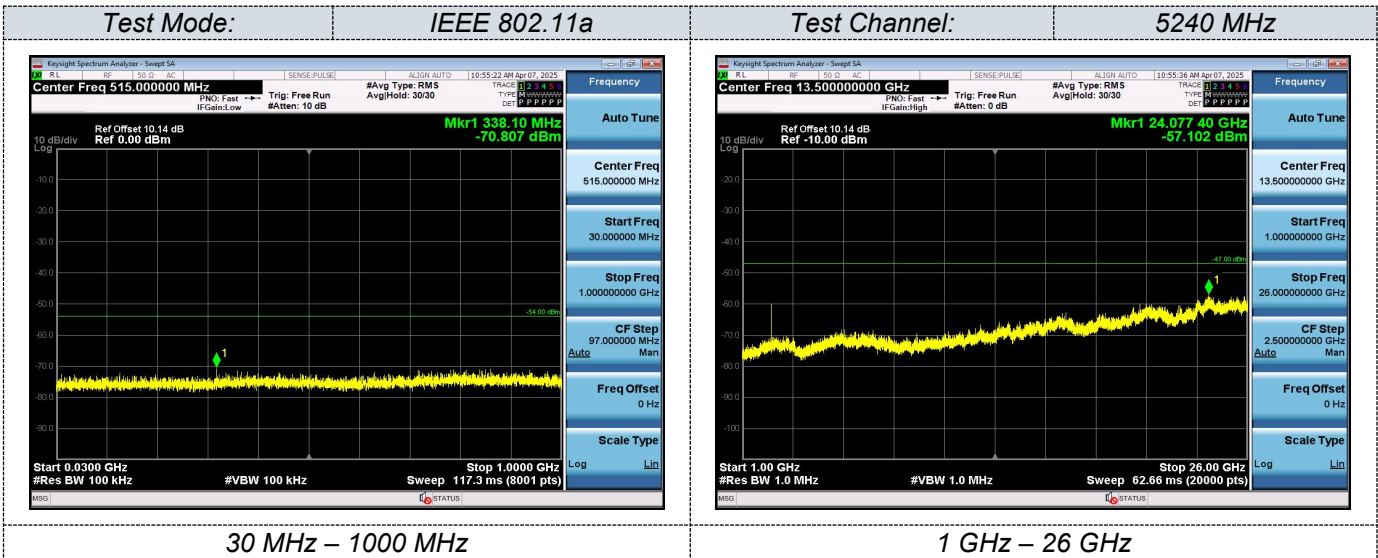
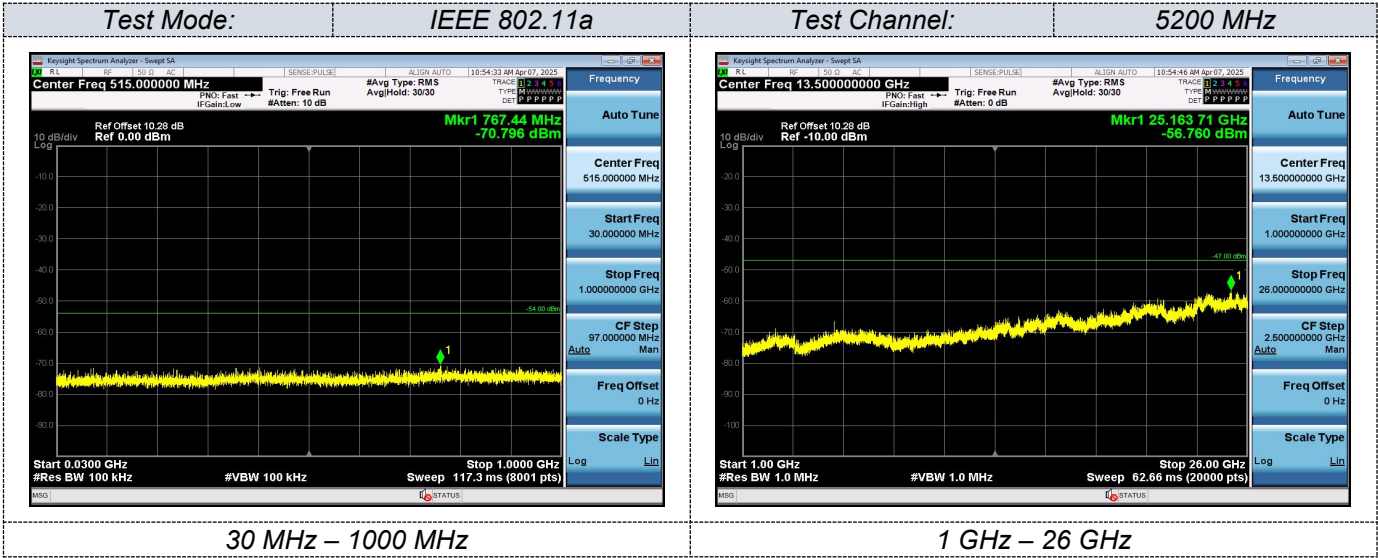
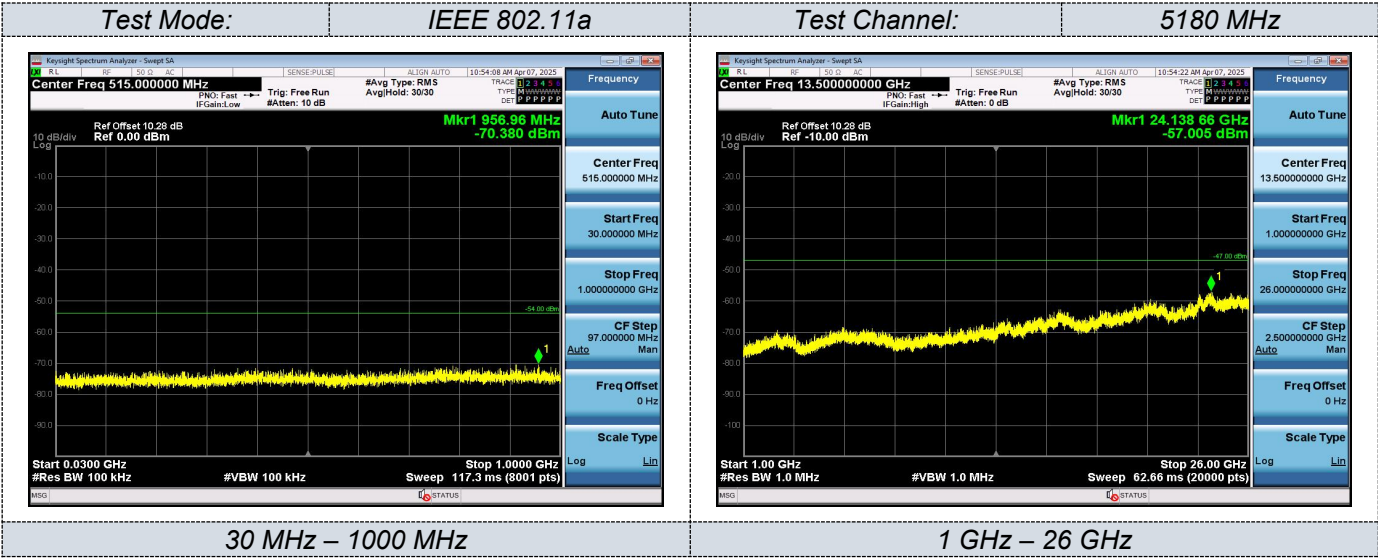
EUT Condition: modulation

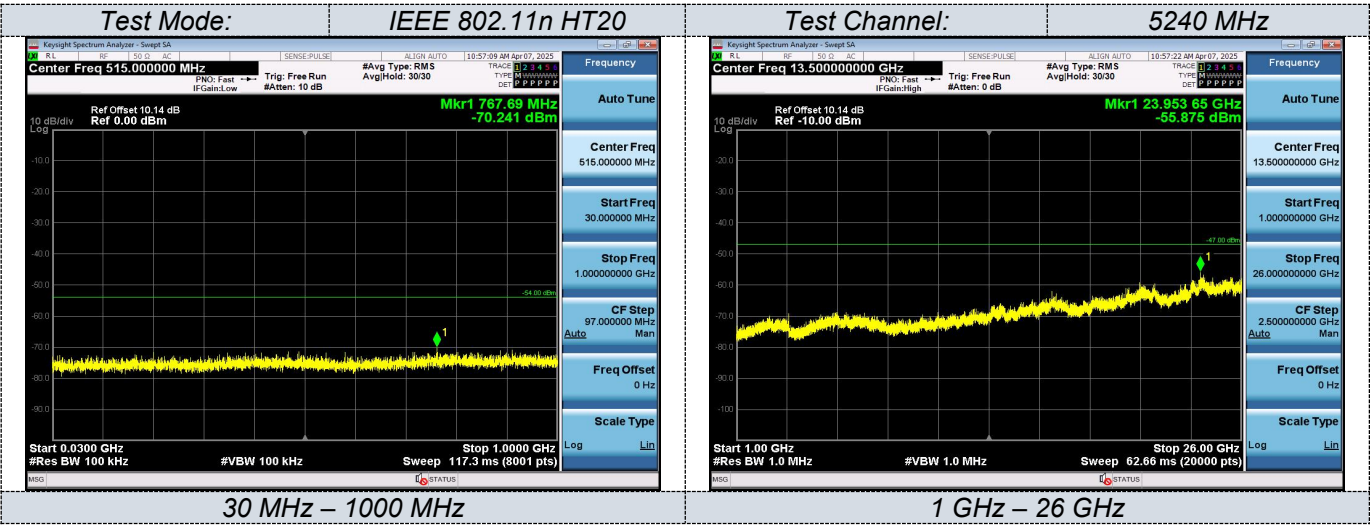
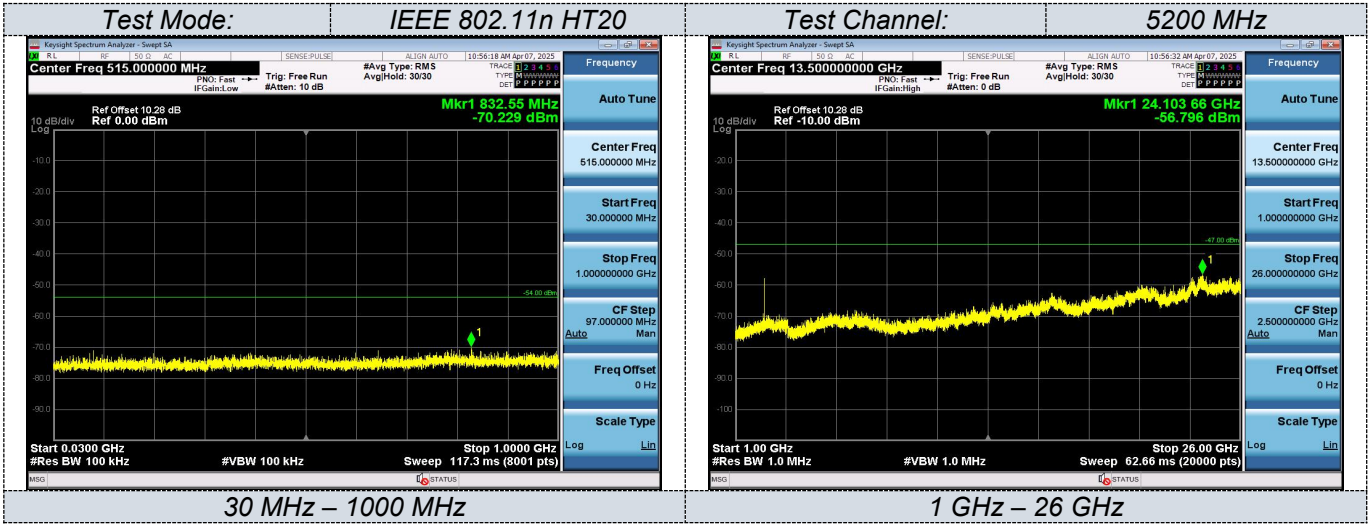
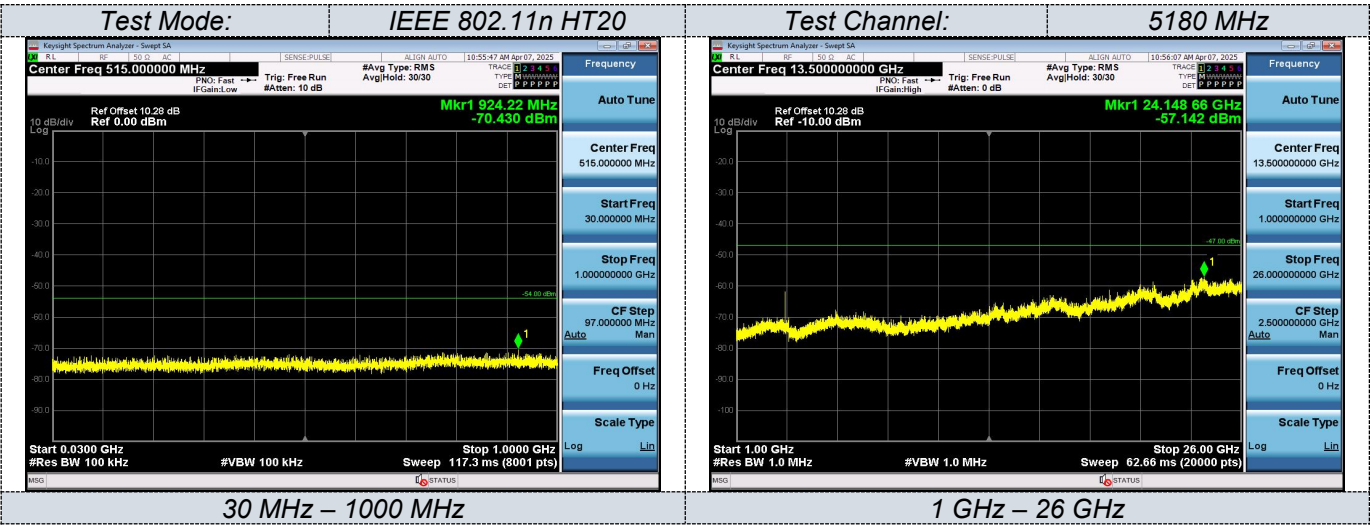
Spectrum Condition:

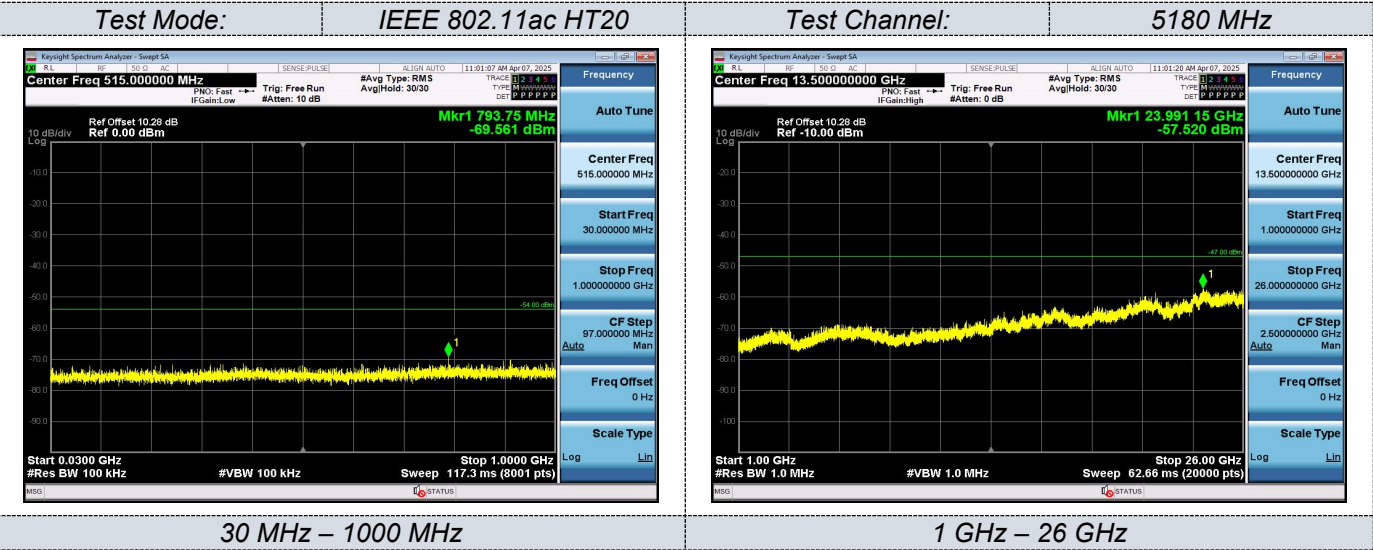
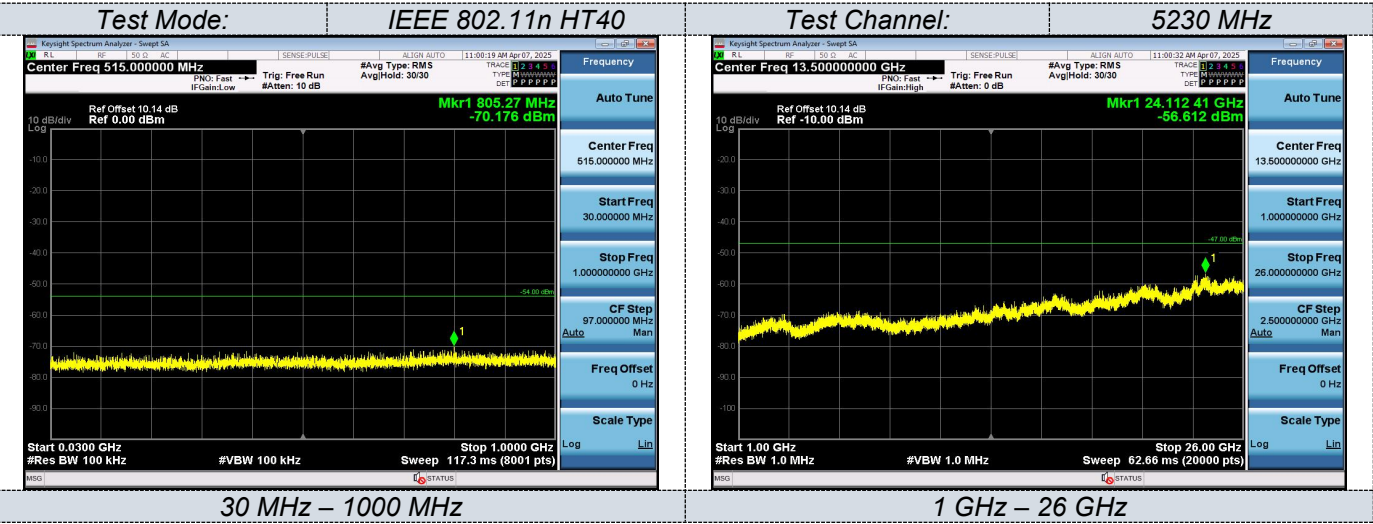
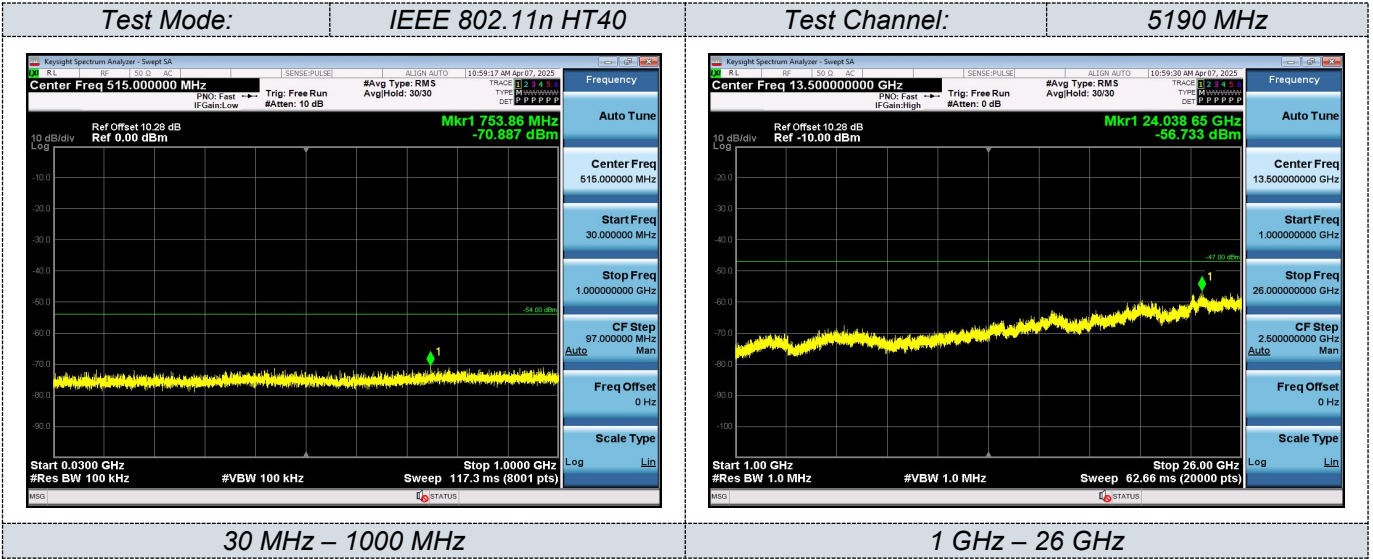
- Frequency: 30MHz-26GHz
- RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-26GHz)
- VBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-26GHz)
- Sweep time: Auto
- Detector mode: Positive peak
- Indication mode: max hold

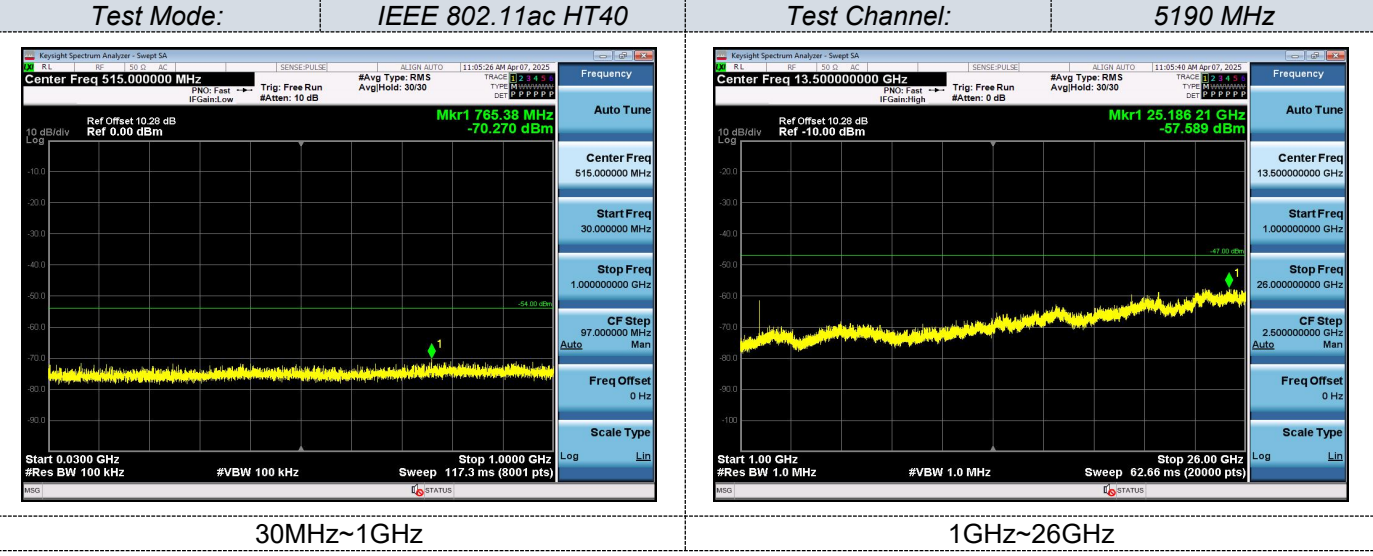
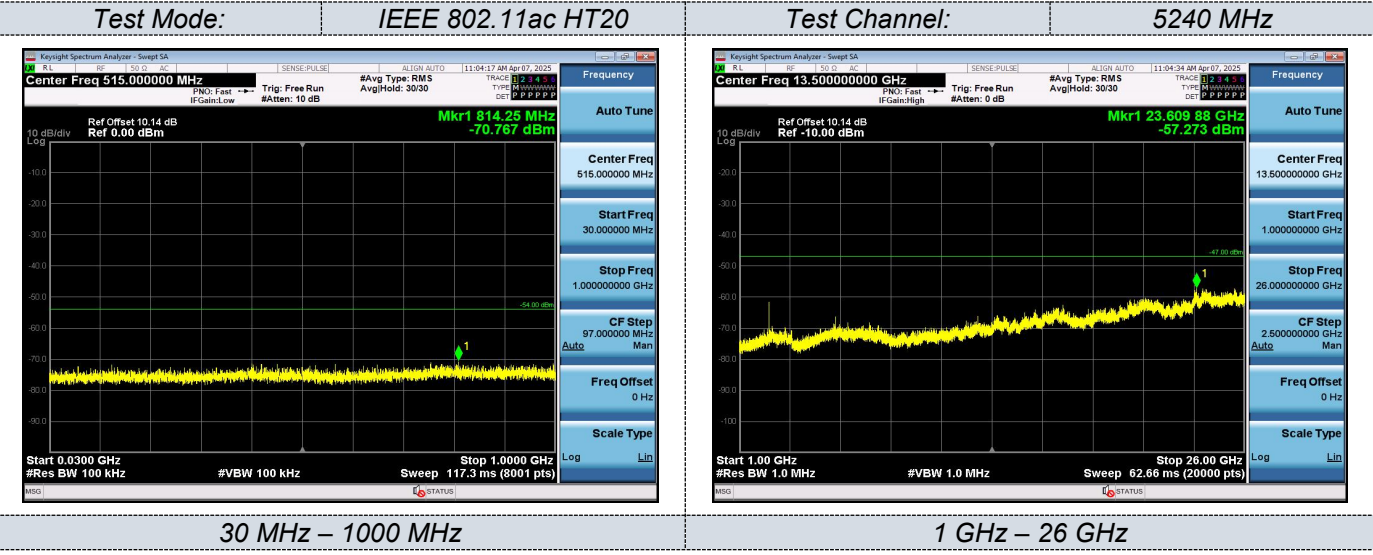
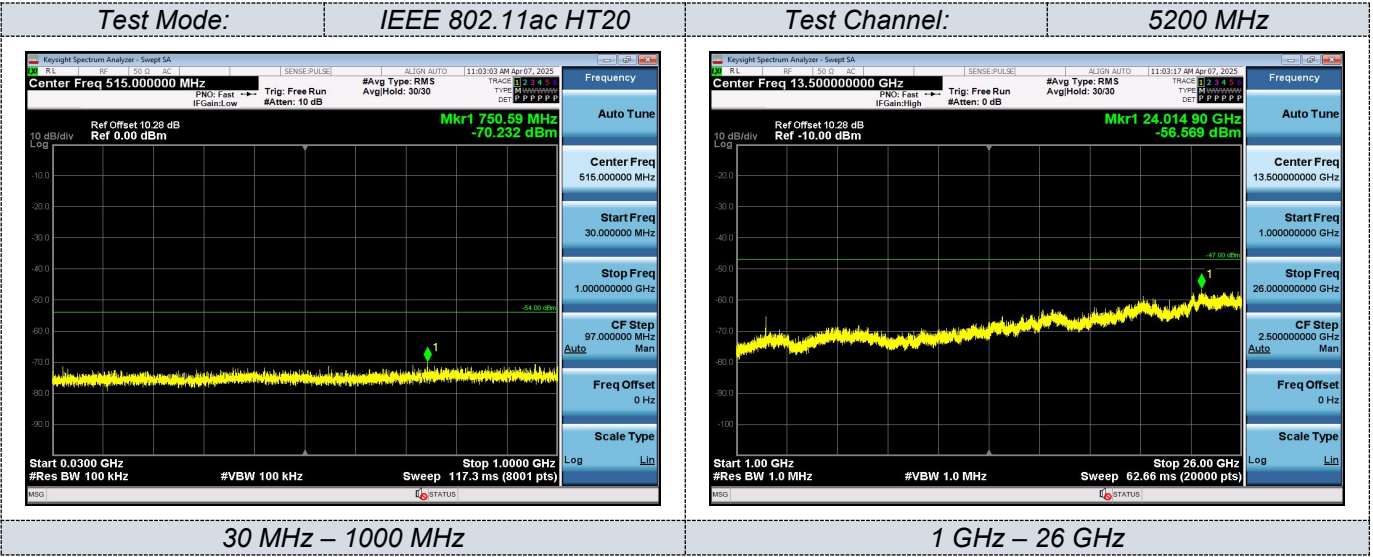
TEST RESULTS

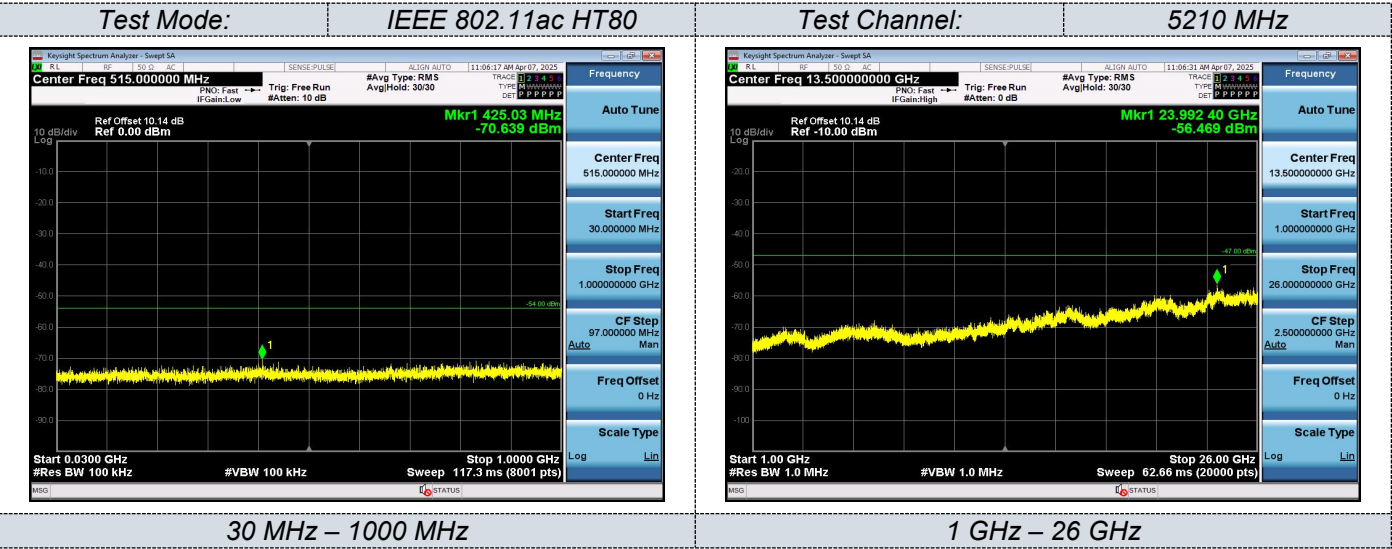
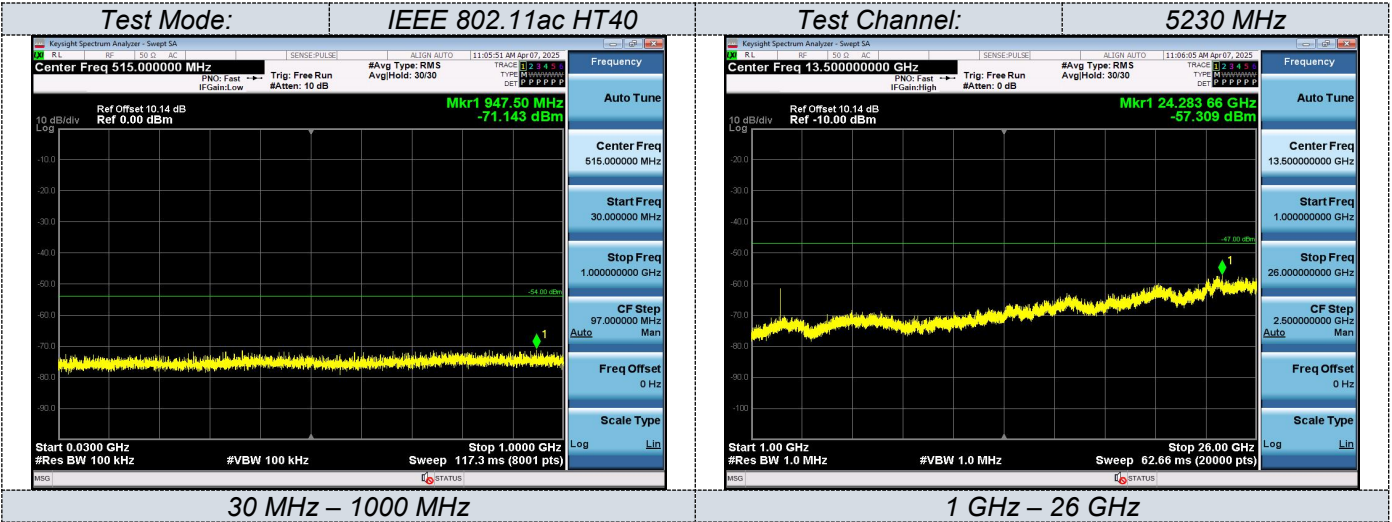
TestMode	Frequency [MHz]	Freq.Range [MHz]	Max.Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
11A	5180	30~1000	956.96	-70.38	≤-54	PASS
11A	5180	1000~26000	24138.66	-57.01	≤-47	PASS
11A	5200	30~1000	767.44	-70.80	≤-54	PASS
11A	5200	1000~26000	25163.71	-56.76	≤-47	PASS
11A	5240	30~1000	338.10	-70.81	≤-54	PASS
11A	5240	1000~26000	24077.40	-57.10	≤-47	PASS
11N20SISO	5180	30~1000	924.22	-70.43	≤-54	PASS
11N20SISO	5180	1000~26000	24148.66	-57.14	≤-47	PASS
11N20SISO	5200	30~1000	832.55	-70.23	≤-54	PASS
11N20SISO	5200	1000~26000	24103.66	-56.80	≤-47	PASS
11N20SISO	5240	30~1000	767.69	-70.24	≤-54	PASS
11N20SISO	5240	1000~26000	23953.65	-55.88	≤-47	PASS
11N40SISO	5190	30~1000	753.86	-70.89	≤-54	PASS
11N40SISO	5190	1000~26000	24038.65	-56.73	≤-47	PASS
11N40SISO	5230	30~1000	805.27	-70.18	≤-54	PASS
11N40SISO	5230	1000~26000	24112.41	-56.61	≤-47	PASS
11AC20SISO	5180	30~1000	793.75	-69.56	≤-54	PASS
11AC20SISO	5180	1000~26000	23991.15	-57.52	≤-47	PASS
11AC20SISO	5200	30~1000	750.59	-70.23	≤-54	PASS
11AC20SISO	5200	1000~26000	24014.9	-56.57	≤-47	PASS
11AC20SISO	5240	30~1000	814.25	-70.77	≤-54	PASS
11AC20SISO	5240	1000~26000	23609.88	-57.27	≤-47	PASS
11AC40SISO	5190	30~1000	765.38	-70.27	≤-54	PASS
11AC40SISO	5190	1000~26000	25186.21	-57.59	≤-47	PASS
11AC40SISO	5230	30~1000	947.50	-71.14	≤-54	PASS
11AC40SISO	5230	1000~26000	24283.66	-57.31	≤-47	PASS
11AC80SISO	5210	30~1000	425.03	-70.64	≤-54	PASS
11AC80SISO	5210	1000~26000	23992.4	-56.47	≤-47	PASS









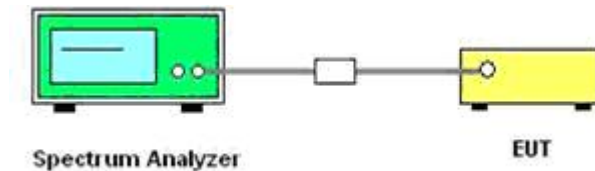


3.8 Transmission Burst Length

LIMIT

Transmission Burst Length shall be 8ms or less.

TEST CONFIGURATION



TEST PROCEDURE

Enable EUT under transmission mode and connected it to the spectrum analyzer through antenna output port as the block diagram show in TEST CONFIGURATION

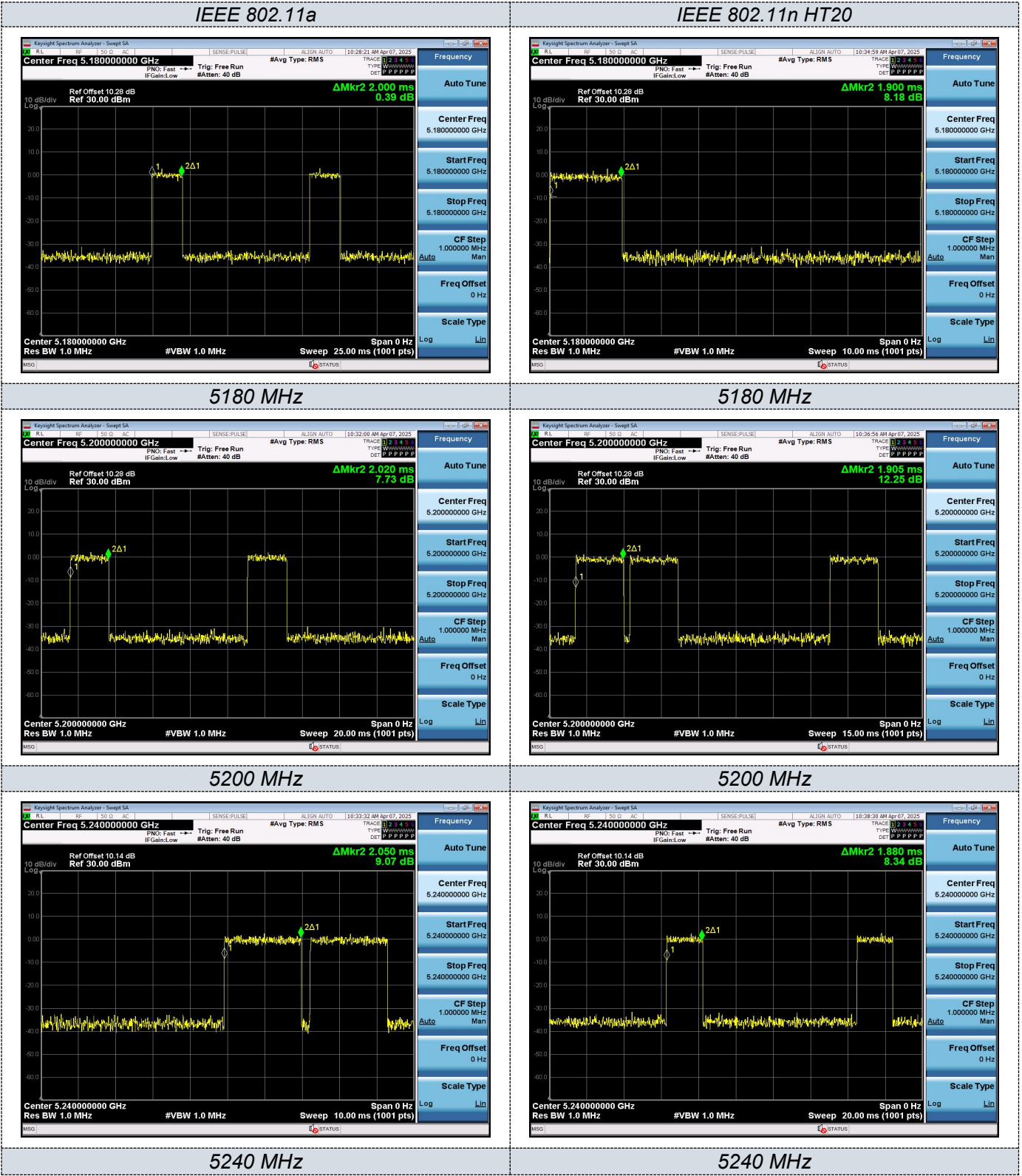
Use Spectrum's ACP measurement function and set spectrum analyzer as follow:

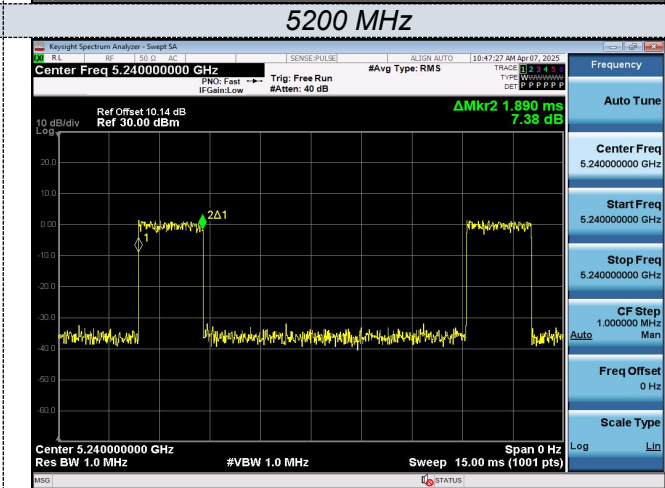
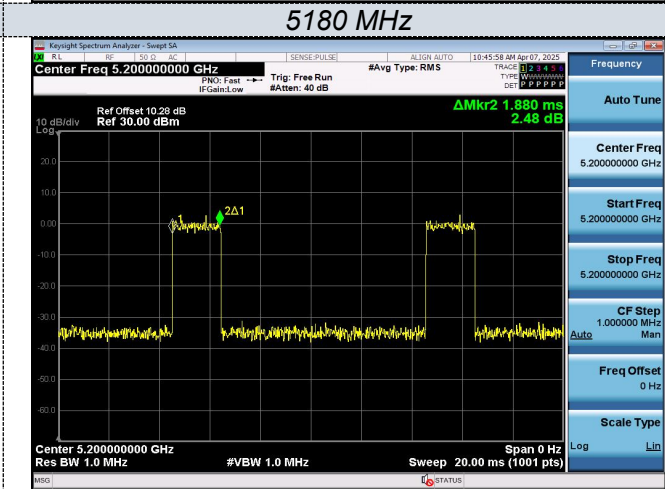
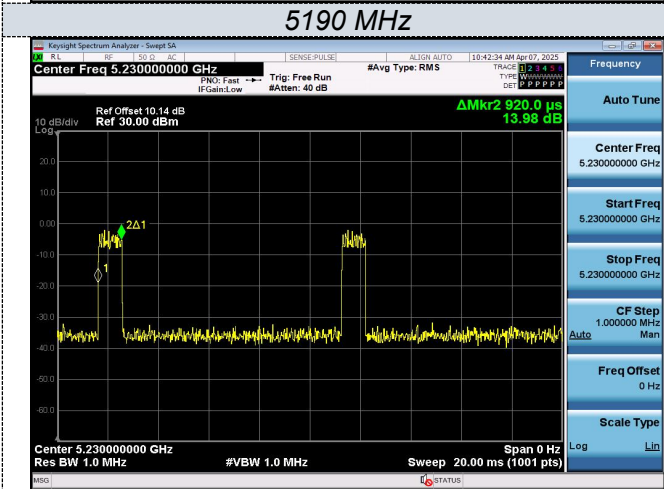
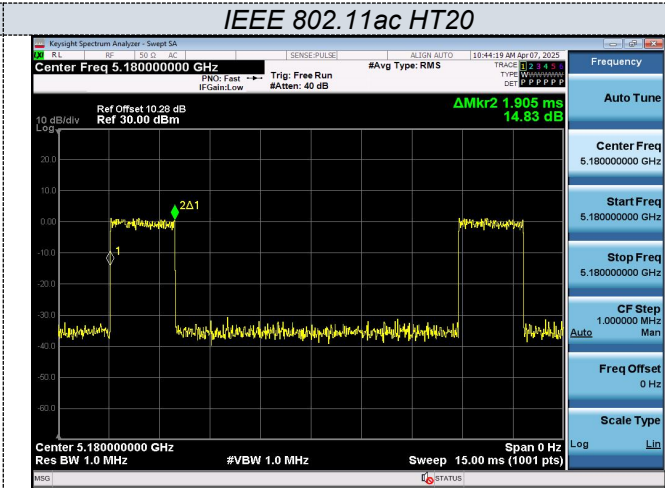
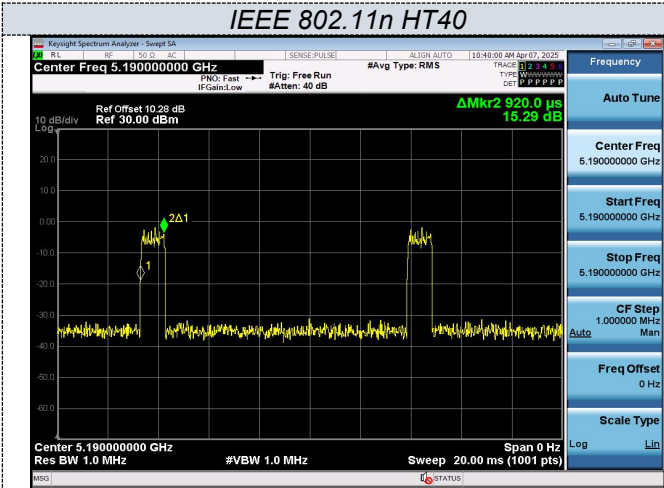
Spectrum Condition:

- Frequency: test frequency
- Span: 0Hz
- RBW: 10MHz
- VBW: =RBW
- Sweep time: Auto
- Sweep mode: single
- Detector mode: Peak
- Indication mode: max hold

TEST RESULTS

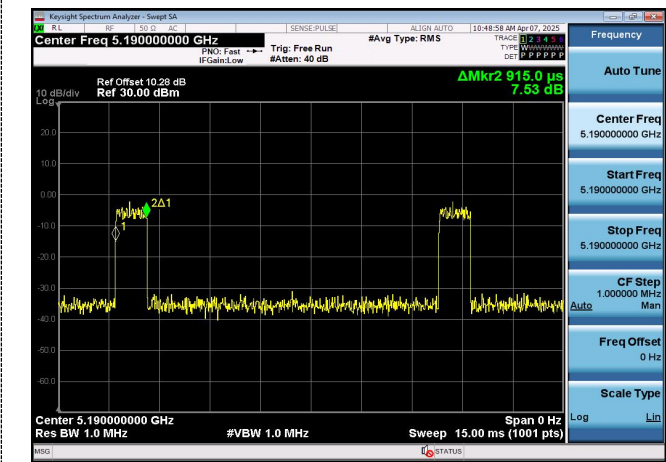
Mode	Channel (MHz)	Transmission Burst (ms)	Limit (ms)	Result
IEEE 802.11a	5180	2.00	≤8	Pass
	5200	2.02		
	5240	2.05		
IEEE 802.11n HT20	5180	1.90	≤8	
	5200	1.91		
	5240	1.88		
IEEE 802.11n HT40	5190	0.92	≤8	
	5230	0.92		
IEEE 802.11ac VHT20	5180	1.91	≤8	
	5200	1.88		
	5240	1.89		
IEEE 802.11ac VHT40	5190	0.92	≤8	
	5230	0.90		
IEEE 802.11ac VHT80	5210	1.89	≤8	



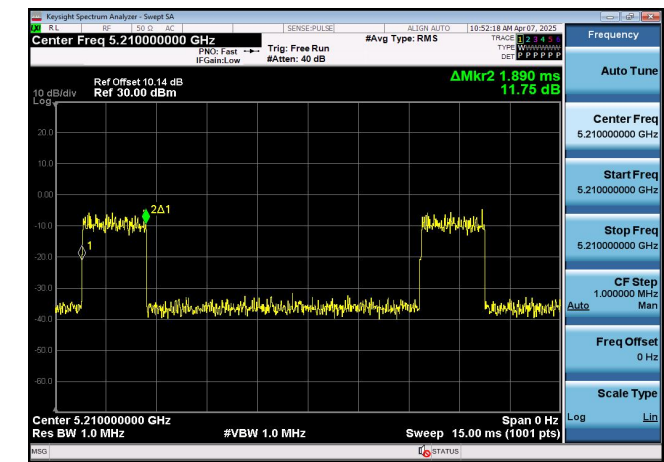


5240 MHz

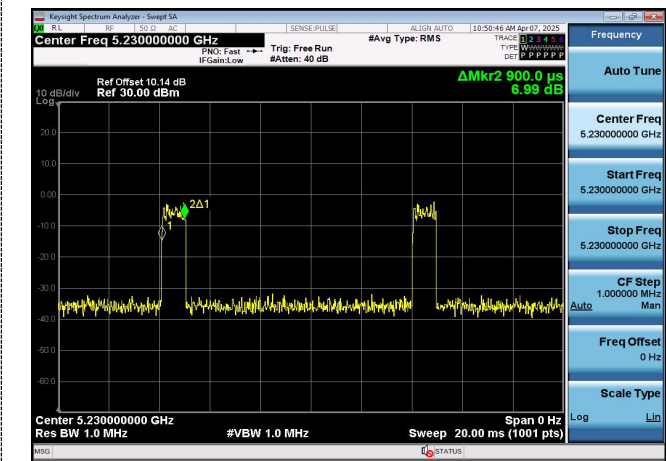
IEEE 802.11ac HT40



IEEE 802.11ac HT80



5190 MHz



5210 MHz



5230 MHz



3.9 Carrier Sense Capability

LIMIT

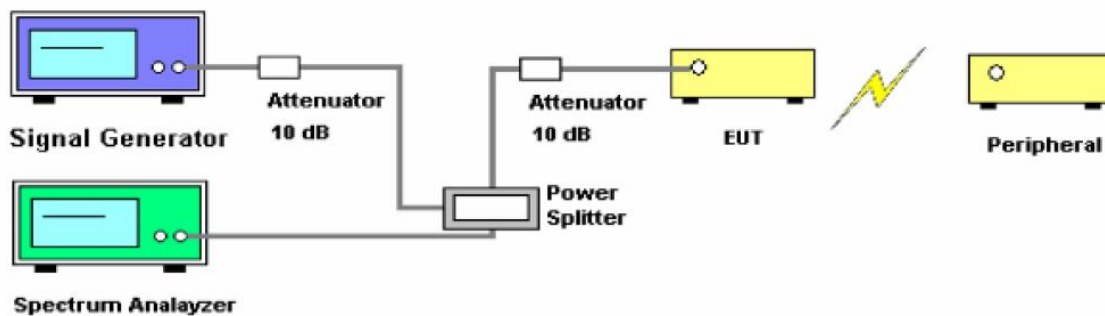
Item	Limits
Carrier Sense	Good - EUT stop RF transmission signal after carrier inject to EUT. (On $22.79 + Gr - 20 \cdot \log(f)$ [dBm] (Gr: dBi; f: MHz) or 100mV/m)

INSTRUMENTS SETTING

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

TEST CONFIGURATION



TEST PROCEDURE

1. Set The EUT state in "normal mode link with wireless router".
2. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is (on $22.79 + G - 20 \cdot \log(f)$ dBm) (G is the antenna gain is the test frequency).
3. Turn off the RF signal of the SG.
4. EUT have transmitted the maximum modulation signal and fixed channelize.
5. Setting the spectrum as follow:
RBW/VBW=1MHz/1MHz
Span=50MHz
Sweep time=auto
Sweep mode=continuous
Detect mode=positive peak
6. SG RF signal on.
7. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

TEST RESULTS

Remark: we test all modes, only worst cases were reported as below:

Test mode	Test frequency (MHz)	Interference signal level (dBm)	Test result
IEEE 802.11ac HT20	5180	-44.84	Good
IEEE 802.11ac HT40	5230	-44.47	Good
IEEE 802.11ac HT80	5210	-44.62	Good

3.10 Construction protection method

REQUIREMENT

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

CONFIRMATION METHOD

And all high-frequency section and modulation section was shield by metal shield.

3.11 Interference Prevention Function

REQUIREMENT

Clarify the one automatically to transmit and to receive identification code with the wireless equipment of the wireless station used in the same premises.

Item	Limits
Identification code	≥ 48 bits

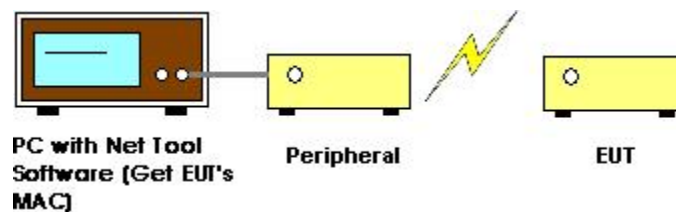
CONFIRMATION METHOD

A communication link was made where the ID code is correct (Identical).

TEST PROCEDURE

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification codes from EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes from the counterpart. b. Check if communication is normal. c. Transmit the other signals than predetermined ID codes from the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

TEST CONFIGURATION

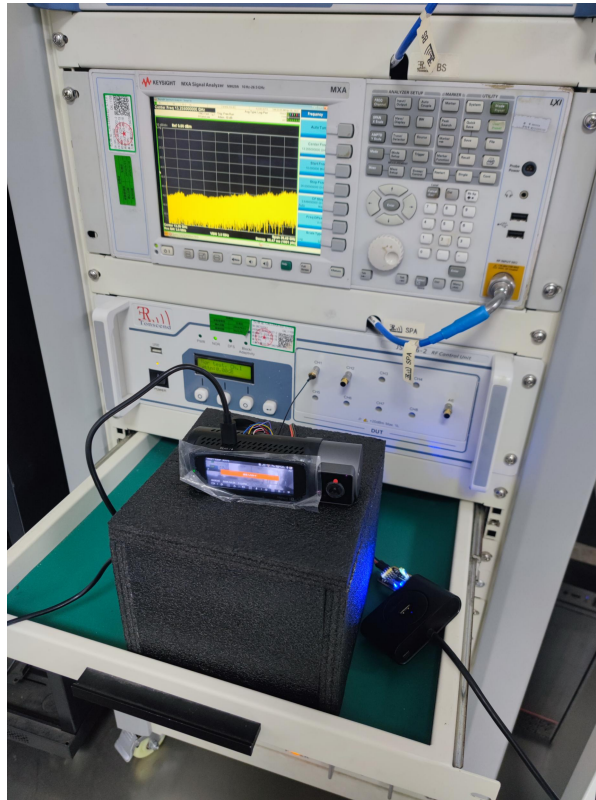


TEST RESULTS

PASS

MAC: 53-18-A2-8C-46-5D

4 Test Setup Photos of the EUT



5 Photos of the EUT

Reference to the test report No. GRCTR250302097-01.

***** End of Report *****