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Report Template Revision Date: 2021-11-03

Test Report

Report No.: CQASZ20220200210E-03

Applicant: Shenzhen Chuangkeyou Technology Co., Ltd.

Address of Applicant: Room 408, Block A, Zhantao Commercial Plaza, Tenglong Road, Dalang Street, Longhua District, Shenzhen, Guangdong

Equipment Under Test (EUT):

Product: All in one PC

Model No.: NX3, NX3T, NX1, NX1PRO, NX5, NX5PRO, NX7, NX7PRO, NX9, NX9PRO, Z1, Z2, Z3, Z5, Z6, Z7, Z8, Z9

Test Model No.: NX3

Brand Name: N/A

FCC ID: 2A4MD-NX3

Standards: 47 CFR Part 15, Subpart E
KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Date of Receipt: 2022-2-18

Date of Test: 2022-2-18 to 2022-2-24

Date of Issue: 2022-3-1

Test Result: **PASS***

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

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Rock Huang

(Rock Huang)

Approved By:

Jack Ai

(Jack Ai)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220200210E-03	Rev.01	Initial report	2022-3-1

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013; KDB789033	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart E Section 15.207	ANSI C63.10-2013; KDB789033	PASS
Maximum Conducted Output Power	47 CFR Part 15 Subpart C Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Emission Bandwidth	47 CFR Part 15 Subpart C Section 15.407 (a)(e)	ANSI C63.10-2013; KDB789033	PASS
Maximum Power Spectral Density	47 CFR Part 15 Subpart E Section 15.407 (a)	ANSI C63.10-2013; KDB789033	PASS
Band Edge Measurements	47 CFR Part 15 Subpart C Section 15.209 & 15.407(b)	ANSI C63.10-2013; KDB789033	PASS
Frequency stability	47 CFR Part 15 Subpart E Section 15.407 (g)	ANSI C63.10-2013; KDB789033	PASS
Operation in the absence of information to the transmit	47 CFR Part 15 Subpart E Section 15.407 (c)	47 CFR Part 15 Subpart E	PASS
Radiated Spurious Emissions	47 CFR Part 15 Subpart E Section 15.407 (b)	ANSI C63.10-2013; KDB789033	PASS

Remark:

The tested sample(s) and the sample information are provided by the client.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application

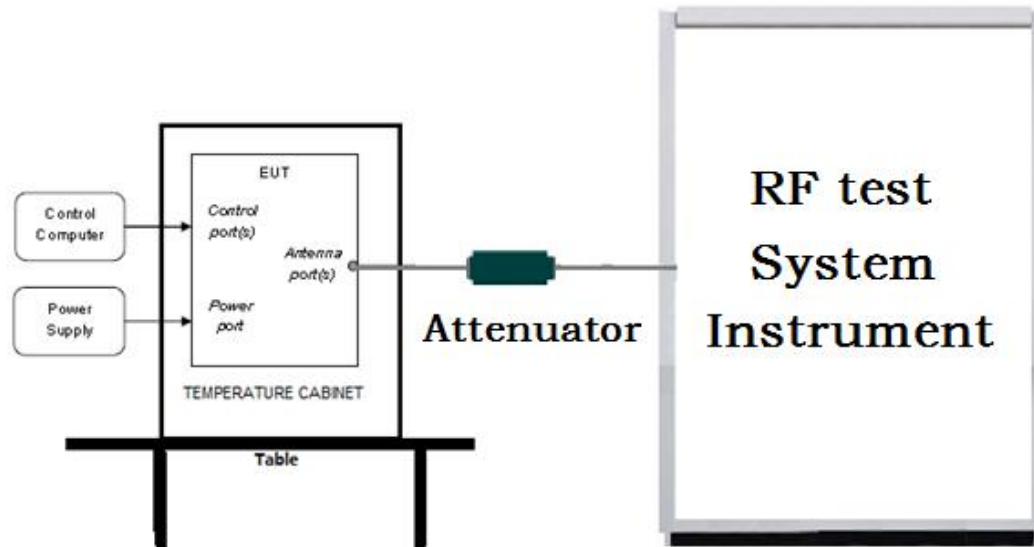
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4 Test Requirement

4.1 Test setup

4.1.1 For Conducted test setup



4.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

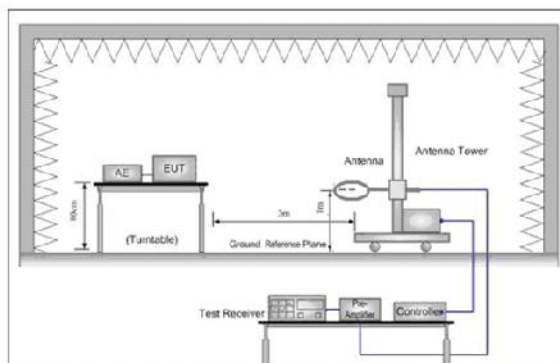


Figure 1. Below 30MHz

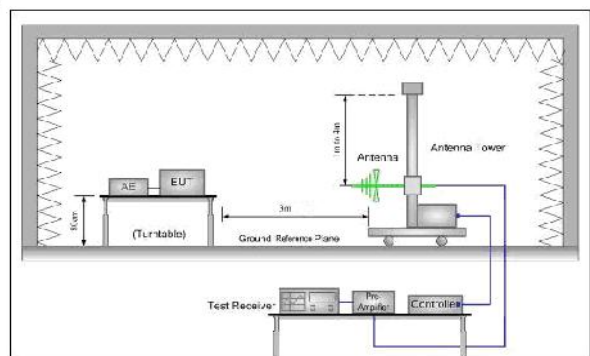


Figure 2. 30MHz to 1GHz

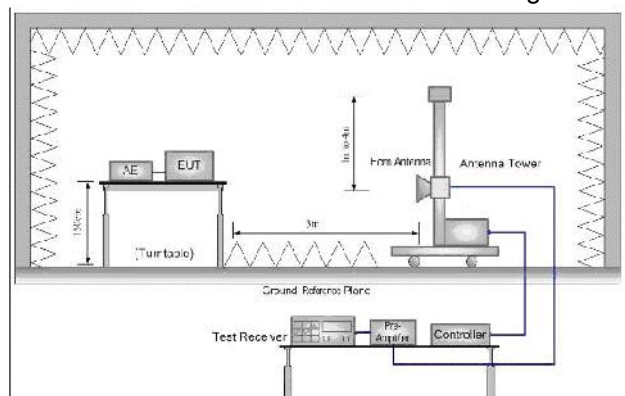
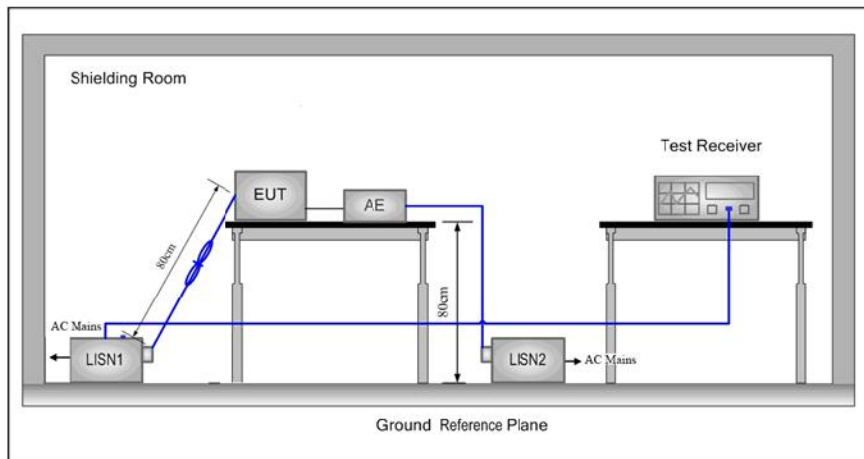


Figure 3. Above 1GHz

4.1.3 For Conducted Emissions test setup

Conducted Emissions setup



4.2 Test Environment

Operating Environment:		
Conducted Emissions:		
Temperature:	25.2 °C	
Humidity:	55 % RH	
Atmospheric Pressure:	1009 mbar	
Radiated Emissions:		
Temperature:	25.4 °C	
Humidity:	54 % RH	
Atmospheric Pressure:	1009mbar	
Radio conducted item test (RF Conducted test room):		
Temperature:	25.4 °C	
Humidity:	50 % RH	
Atmospheric Pressure:	1009 mbar	
Test Condition	Temperature (°C)	Voltage (V)
TN/VN	+15 to +35	3.85
TL/VL	0	3.465
TH/VL	50	3.465
TL/VH	0	4.235
TH/VH	50	4.235
Remark:		
1)The EUT just work in such extreme temperature of 0 °C to 50 °C and the extreme voltage of 6.84V to 8.36V, so here the EUT is tested in the temperature of 0 °C to 50 °C and the voltage of 6.84V to 8.36V.		
2)VN: Normal Voltage; TN: Normal Temperature;		
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;		
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.		

4.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11a/n/ac(20M)	5150MHz ~5250 MHz	Channel 36	Channel 40	Channel 48
		5180MHz	5200MHz	5240MHz
802.11n/ac(40M)	5150MHz ~5250 MHz	Channel 38	N/A	Channel 46
		5190MHz	N/A	5230MHz
802.11ac(80M)	5150MHz ~5250 MHz	N/A	Channel 42	N/A
		N/A	5210MHz	N/A

Run Software:



Test mode:

Pre-scan under all rate at lowest channel for Ant1

Through Pre-scan, 6Mbps is the worst case of 802.11a (20M); MCS0 is the worst case of 802.11n (20M); MCS0 is the worst case of 802.11ac (20M); MCS0 is the worst case of 802.11n(40M); MCS0 is the worst case of 802.11ac (40M); MCS0 is the worst case of 802.11ac(80M).

5 General Information

5.1 Client Information

Applicant:	Shenzhen Chuangkeyou Technology Co., Ltd.
Address of Applicant:	Room 408, Block A, Zhantao Commercial Plaza, Tenglong Road, Dalang Street, Longhua District, Shenzhen, Guangdong
Manufacturer:	Shenzhen Chuangkeyou Technology Co., Ltd.
Address of Manufacturer:	Room 408, Block A, Zhantao Commercial Plaza, Tenglong Road, Dalang Street, Longhua District, Shenzhen, Guangdong
Factory:	Shenzhen CYX Technology Co.,Ltd
Address of Factory:	5/F, One buildings, Xiazao Industrial Zone, Zaohe Road, Longhua District, Shenzhen, Guangdong, China

5.2 General Description of EUT

Product Name:	All in one PC
Model No.:	NX3, NX3T, NX1, NX1PRO, NX5, NX5PRO, NX7, NX7PRO, NX9, NX9PRO, Z1, Z2, Z3, Z5, Z6, Z7, Z8, Z9
Test Model No.:	NX3
Trade Mark:	N/A
Software Version:	WINDOWS 11
Hardware Version:	PA HM87 V1.1
Power Supply:	MODEL:ZF120A-1206500 INPUT:100-240V~ 50/60Hz 2.5A OUTPUT:12V= 6.5A
EUT Supports Radios application:	BT: 2402-2480MHz 2.4GHz: Wi-Fi: 802.11b/g/n(HT20): 2412MHz~2462MHz; 802.11n(HT40): 2422MHz~2452MHz 5GHz: Wi-Fi: U-NII-1: 5.15-5.25GHz;
EUT Type:	Client devices

5.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11a/n/ac(20M): 5150MHz ~5250 MHz IEEE802.11n/ac(40M): 5150MHz ~5250 MHz IEEE802.11ac(80M): 5150MHz ~5250 MHz
Channel Numbers:	IEEE 802.11a/n/ac(20M): 5150MHz ~5250MHz/ 4 channel IEEE 802.11n/ac(40M): 5150MHz ~5250MHz/ 2 channel IEEE 802.11ac(80M): 5150MHz ~5250MHz/ 1 channel
Type of Modulation:	OFDM
Sample Type:	☐ Mobile ☐ Portable ☒ Fix Location
Test Software of EUT:	MPTool
Antenna Type:	FPC Antenna
Antenna gain:	-1.5dBi

For 802.11a/n/ac(20M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

For 802.11n/ac(40M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

For 802.11ac(80M) Operation in the 5150MHz ~5250 MHz band			
Channel	Frequency	NA	NA
42	5210MHz	NA	NA

5.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

5.5 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

5.6 Test Facility

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

5.10 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	3×10^{-8}
2	RF power, conducted	0.86dB
3	Radiated Spurious emission test	5.12dB (Below 1GHz)
		4.6dB (Above 1GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.8°C
6	Humidity test	2.0%
7	DC power voltages	0.5%

6 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2021/09/10	2022/09/09
Spectrum analyzer	R&S	FSU26	CQA-038	2021/09/10	2022/09/09
Spectrum analyzer	R&S	FSU40	CQA-075	2021/09/10	2022/09/09
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2021/09/10	2022/09/09
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2021/09/10	2022/09/09
Preamplifier	EMCI	EMC184055SE	CQA-089	2021/09/10	2022/09/09
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2021/09/10	2022/09/09
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2021/09/10	2022/09/09
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2021/09/10	2022/09/09
Antenna Connector	CQA	RFC-01	CQA-080	2021/09/10	2022/09/09
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2021/09/10	2022/09/09
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2021/09/10	2022/09/09
Power meter	R&S	NRVD	CQA-029	2021/09/10	2022/09/09
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2021/09/10	2022/09/09
EMI Test Receiver	R&S	ESR7	CQA-005	2021/09/10	2022/09/09
LISN	R&S	ENV216	CQA-003	2021/09/10	2022/09/09
Coaxial cable	CQA	N/A	CQA-C009	2021/09/10	2022/09/09
DC power	KEYSIGHT	E3631A	CQA-028	2021/09/10	2022/09/09

Test software:

	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

7 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15E	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
3	KDB 789033 D02 General U-NII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15, subpart E
4	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band

Appendix A): Emission Bandwidth

26dB Emission bandwidth

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

Test Method: KDB 789033 D02 II C 1

6 dB bandwidth (5.725-5.85 GHz band)

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

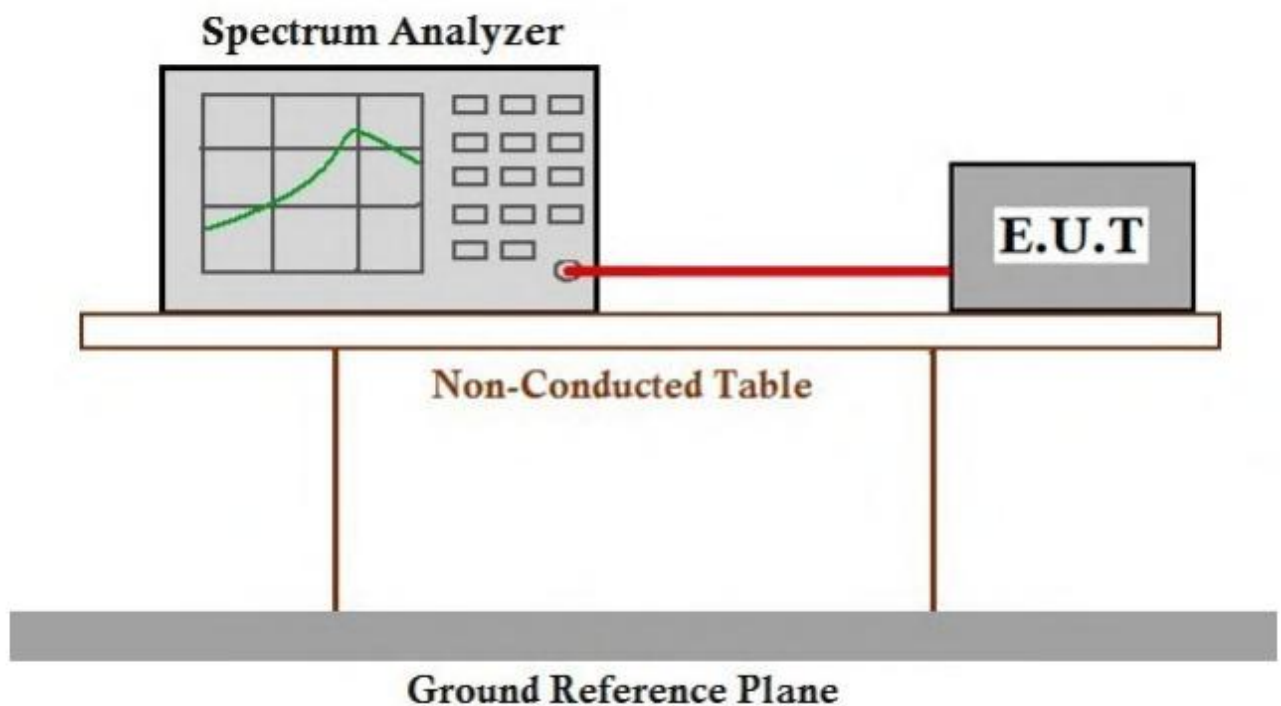
Test Method: KDB 789033 D02 II C 2

Limit: ≥ 500 kHz

Test Procedure:

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Test Setup Diagram

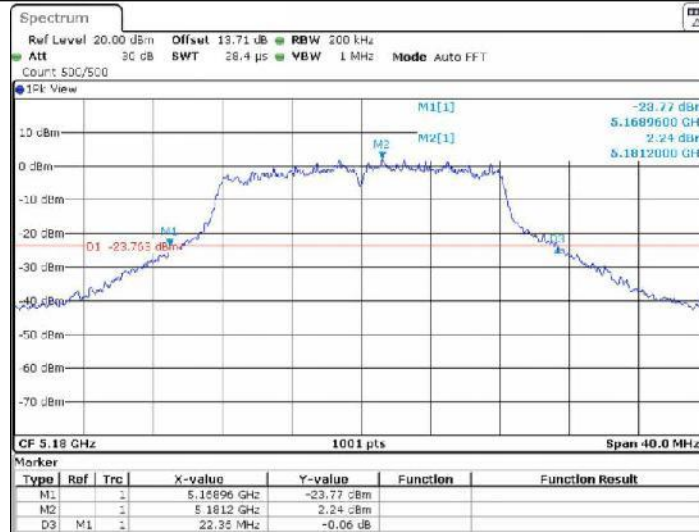


Appendix A1: Emission Bandwidth Test Result

TestMode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	22.360	5168.960	5191.320	---	PASS
		5200	23.680	5187.600	5211.280	---	PASS
		5240	22.720	5228.600	5251.320	---	PASS
11N20SISO	Ant1	5180	22.640	5169.240	5191.880	---	PASS
		5200	22.960	5188.320	5211.280	---	PASS
		5240	22.960	5228.960	5251.920	---	PASS
11N40SISO	Ant1	5190	42.720	5169.280	5212.000	---	PASS
		5230	42.880	5208.800	5251.680	---	PASS
11AC20SISO	Ant1	5180	22.360	5169.400	5191.760	---	PASS
		5200	23.440	5188.320	5211.760	---	PASS
		5240	24.880	5227.680	5252.560	---	PASS
11AC40SISO	Ant1	5190	42.480	5168.880	5211.360	---	PASS
		5230	44.320	5208.400	5252.720	---	PASS
11AC80SISO	Ant1	5210	90.880	5168.400	5259.280	---	PASS

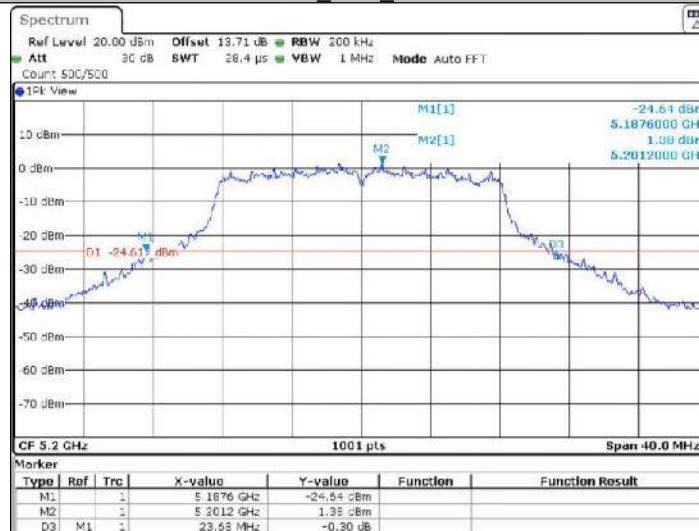
Test Graphs

11A_Ant1_5180



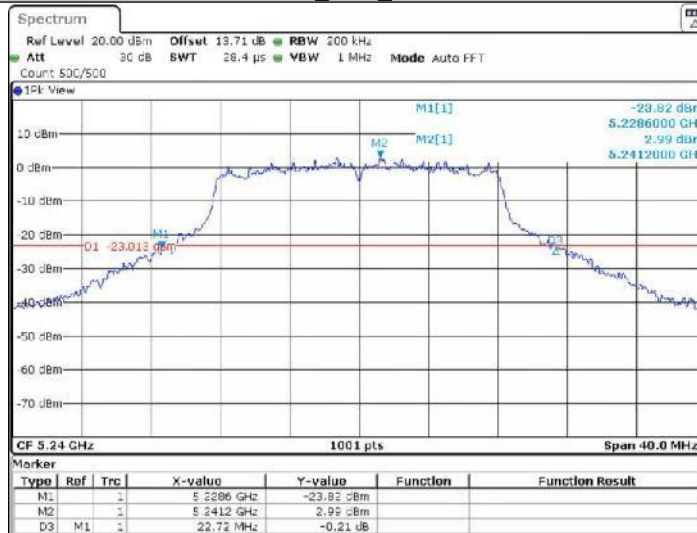
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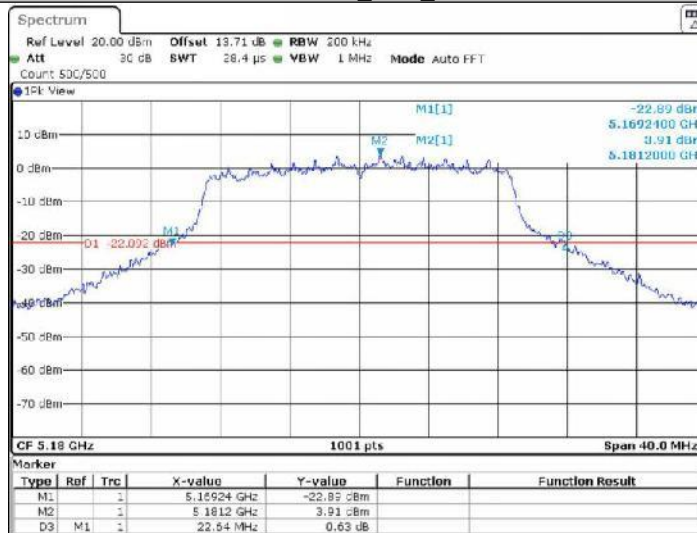
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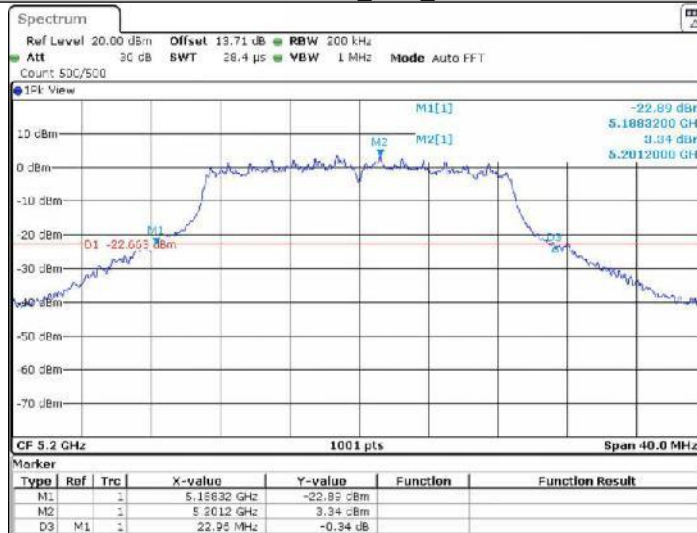
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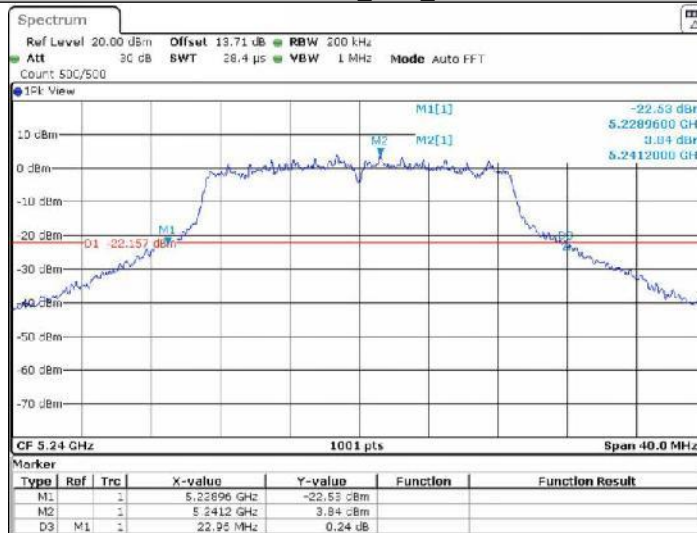
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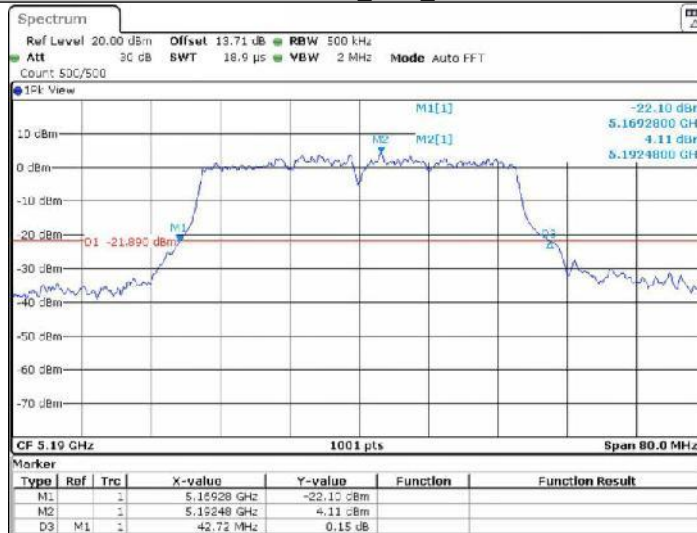
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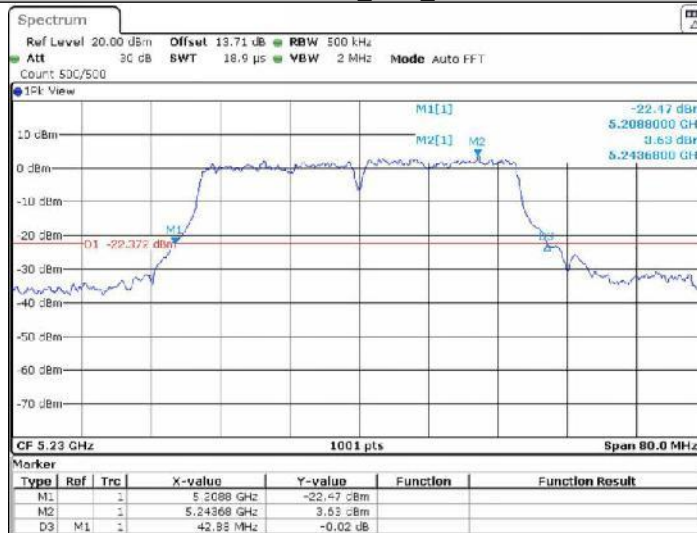
Date: 27.FEB.2022 07:58:19

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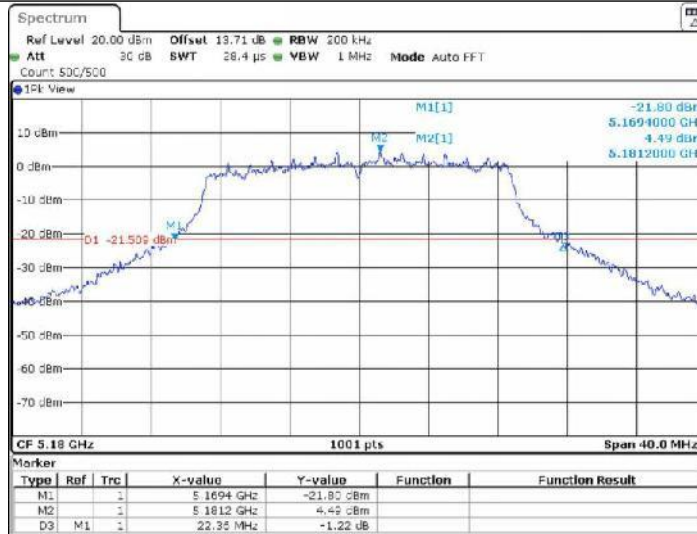
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11N40SISO_Ant1_5230



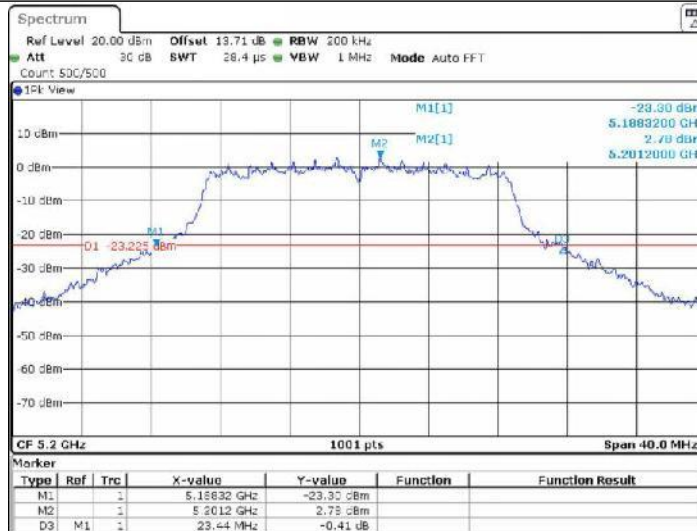
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11AC20SISO_Ant1_5180



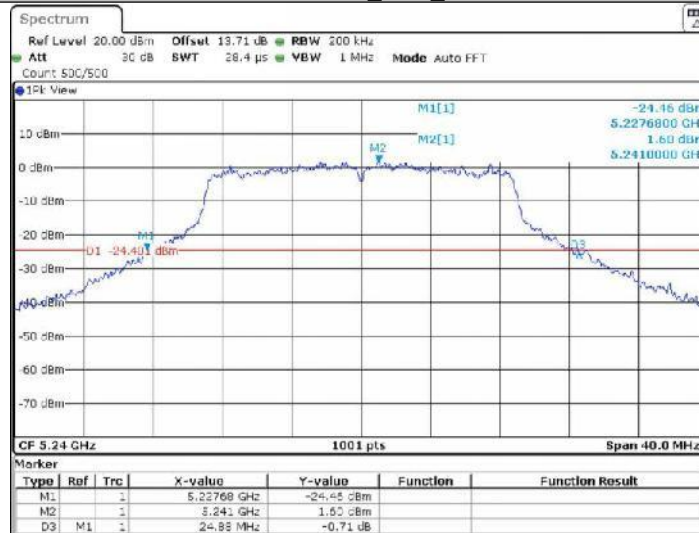
Date: 27.FEB.2022 08:29:01

11AC20SISO_Ant1_5200



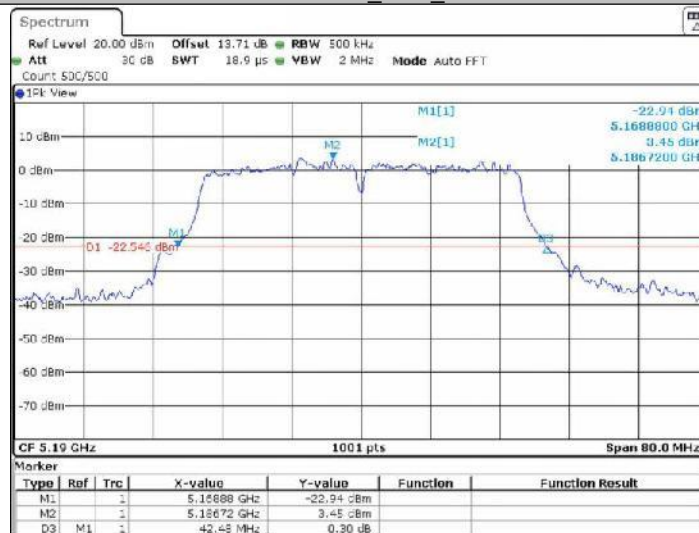
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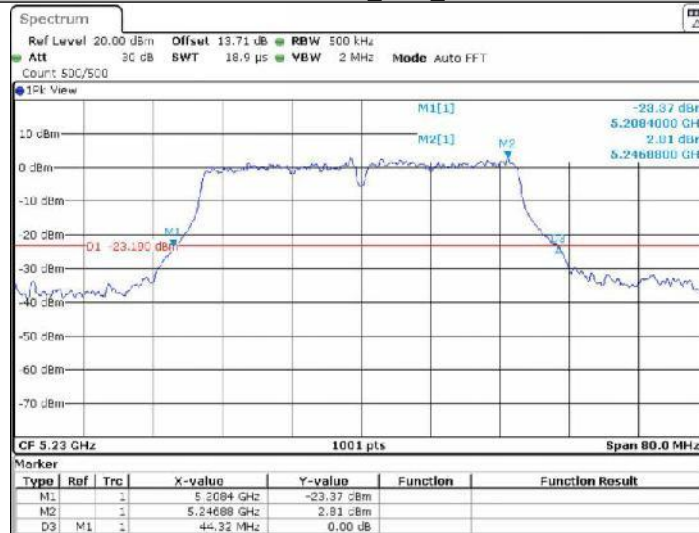
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11AC40SISO_Ant1_5190



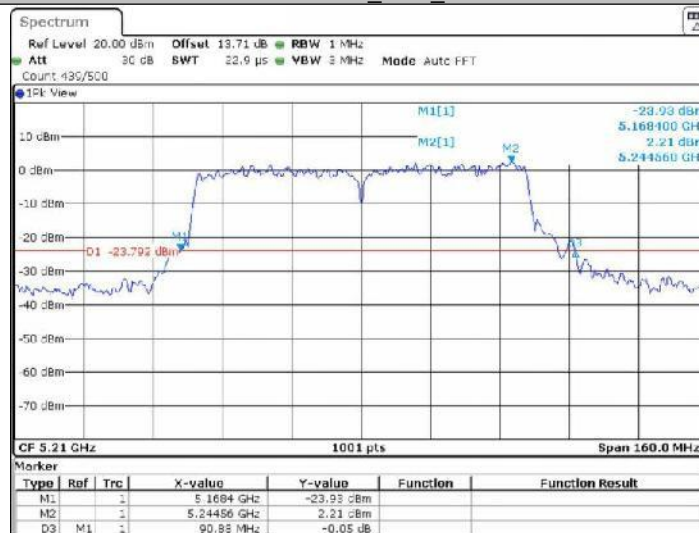
Date: 27 FEB 2022 08:48:31

11AC40SISO_Ant1_5230



Date: 27 FEB 2022 08:53:55

11AC80SISO_Ant1_5210



Date: 27 FEB 2022 09:00:00

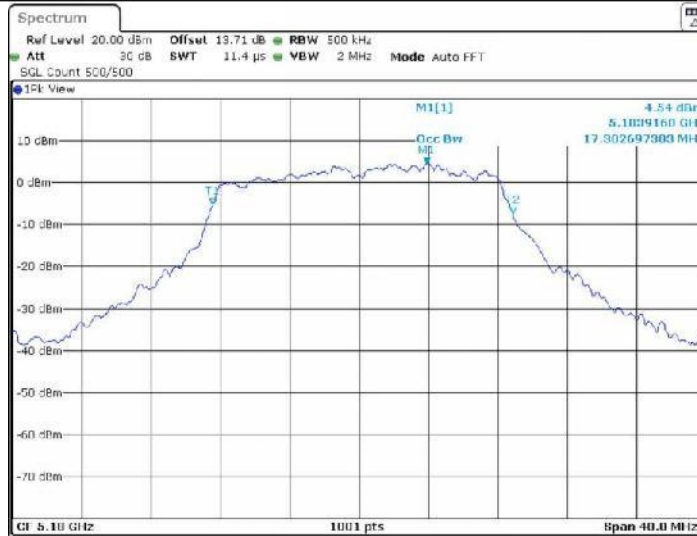
Appendix A2: Occupied channel bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	17.303	5171.528	5188.831	---	PASS
		5200	16.943	5191.489	5208.432	---	PASS
		5240	17.063	5231.489	5248.551	---	PASS
11N20SISO	Ant1	5180	18.462	5170.929	5189.391	---	PASS
		5200	18.262	5190.769	5209.031	---	PASS
		5240	18.262	5230.849	5249.111	---	PASS
11N40SISO	Ant1	5190	36.523	5171.778	5208.302	---	PASS
		5230	37.003	5211.618	5248.621	---	PASS
11AC20SISO	Ant1	5180	18.102	5170.969	5189.071	---	PASS
		5200	18.382	5190.769	5209.151	---	PASS
		5240	18.462	5230.849	5249.311	---	PASS
11AC40SISO	Ant1	5190	36.603	5171.698	5208.302	---	PASS
		5230	37.243	5211.379	5248.621	---	PASS
11AC80SISO	Ant1	5210	77.203	5171.638	5248.841	---	PASS

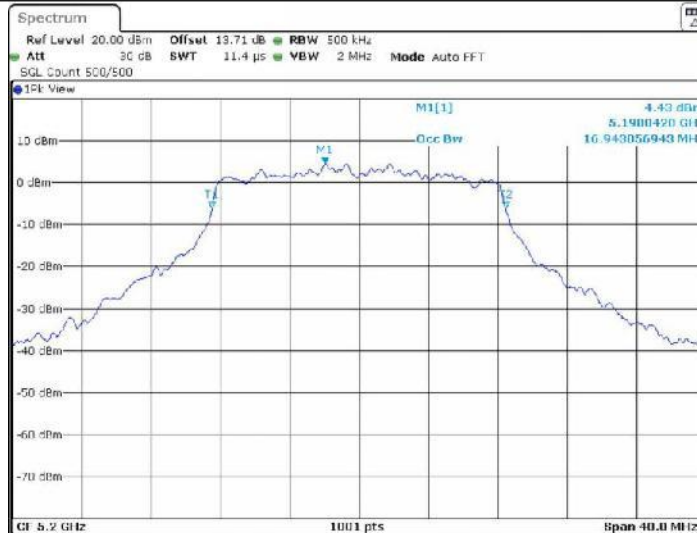
Test Graphs

11A_Ant1_5180



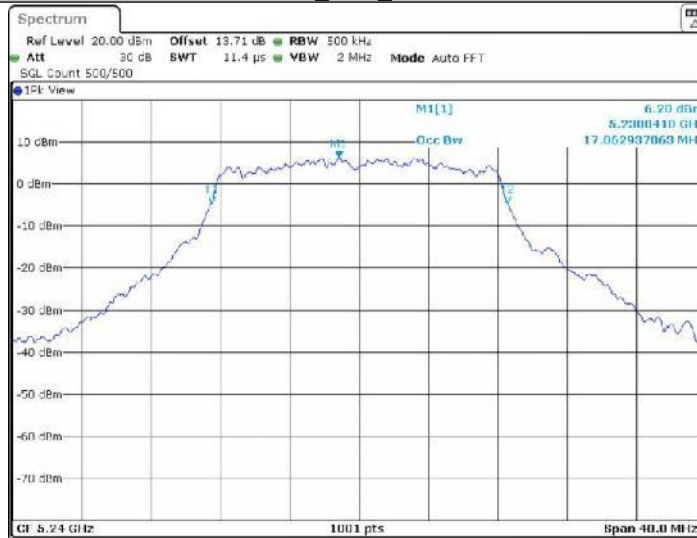
Date: 27 FEB 2022 07:28:15

11A_Ant1_5200



Date: 27 FEB 2022 07:34:57

11A_Ant1_5240



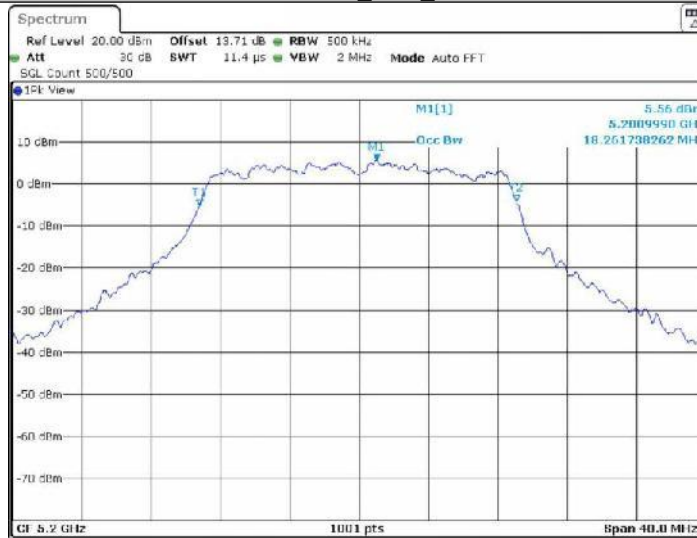
Date: 27.FEB.2022 07:41:18

11N20SISO_Ant1_5180



Date: 27.FEB.2022 07:47:28

11N20SISO_Ant1_5200



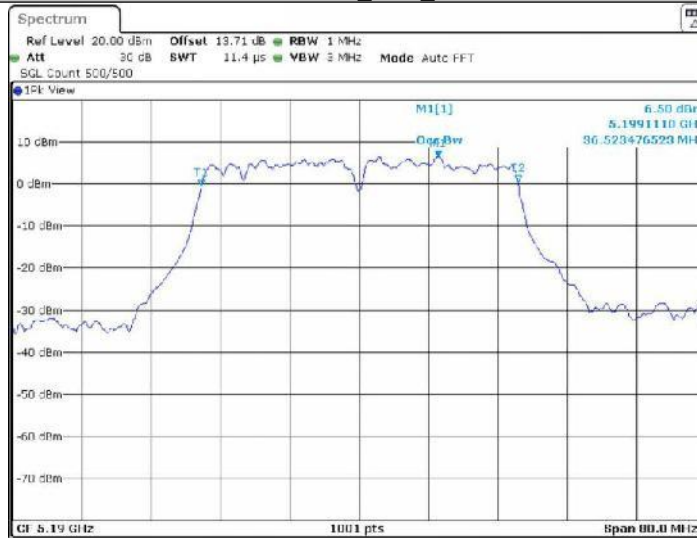
Date: 27.FEB.2022 07:53:32

11N20SISO_Ant1_5240



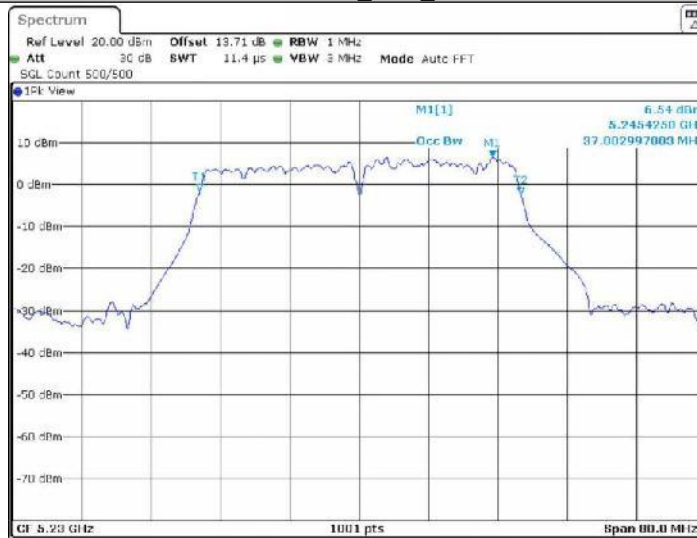
Date: 27.FEB.2022 07:58:20

11N40SISO_Ant1_5190



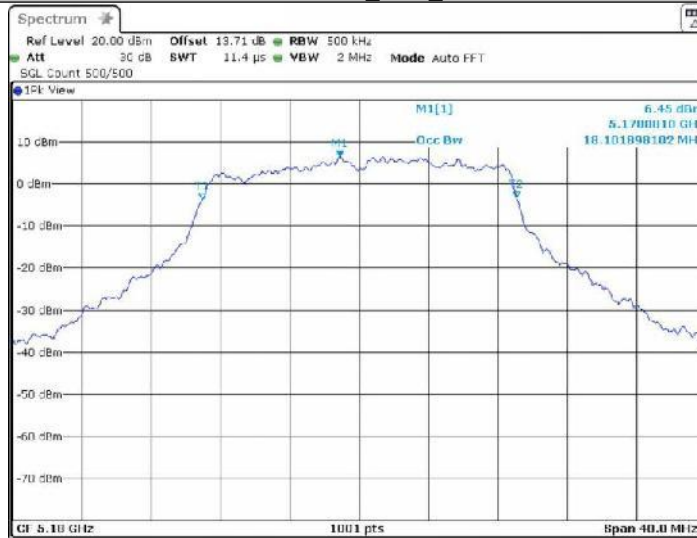
Date: 27.FEB.2022 08:05:21

11N40SISO_Ant1_5230



Date: 27.FEB.2022 08:10:53

11AC20SISO_Ant1_5180



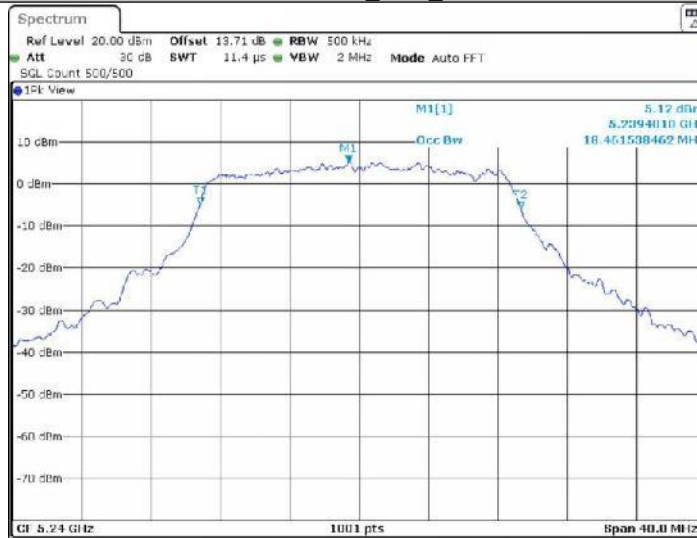
Date: 27 FEB 2022 08:29:12

11AC20SISO_Ant1_5200



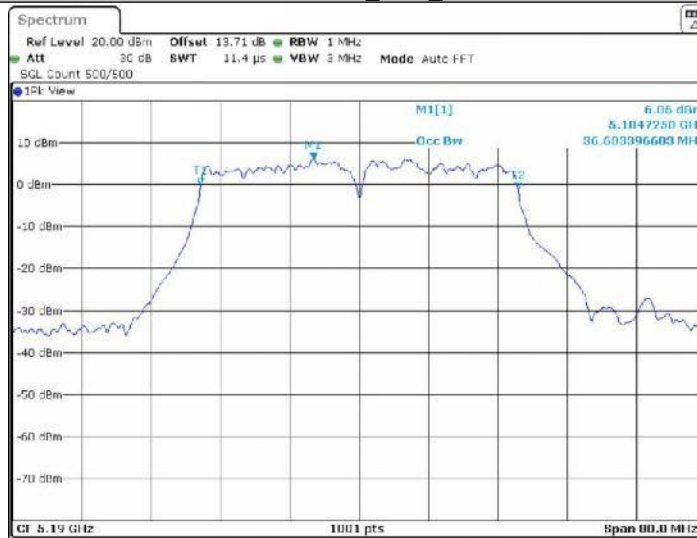
Date: 27 FEB 2022 08:38:24

11AC20SISO_Ant1_5240



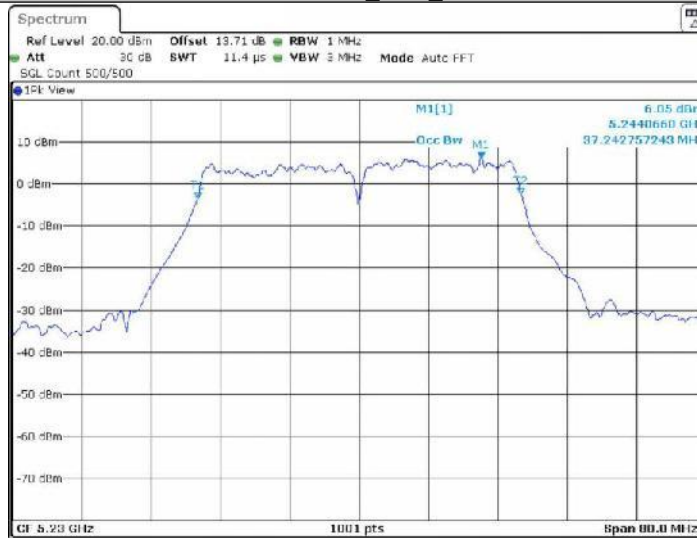
Date: 27.FEB.2022 08:42:31

11AC40SISO_Ant1_5190



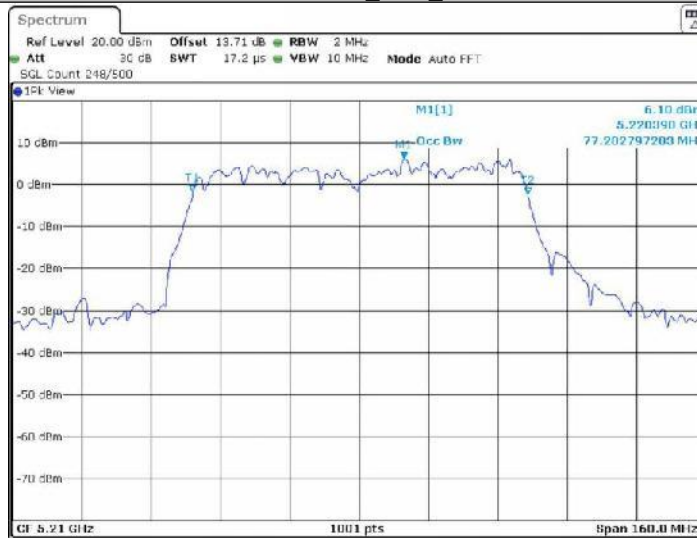
Date: 27.FEB.2022 08:48:41

11AC40SISO_Ant1_5230



Date: 27 FEB 2022 08:54:08

11AC80SISO_Ant1_5210



Date: 27 FEB 2022 09:00:20

Appendix B): Maximum Conduct Output Power

1.Duty Cycle (x)

Test Requirement KDB 789033 D02 II B 1

Test Method: KDB 789033 II B 1

Test Procedure:

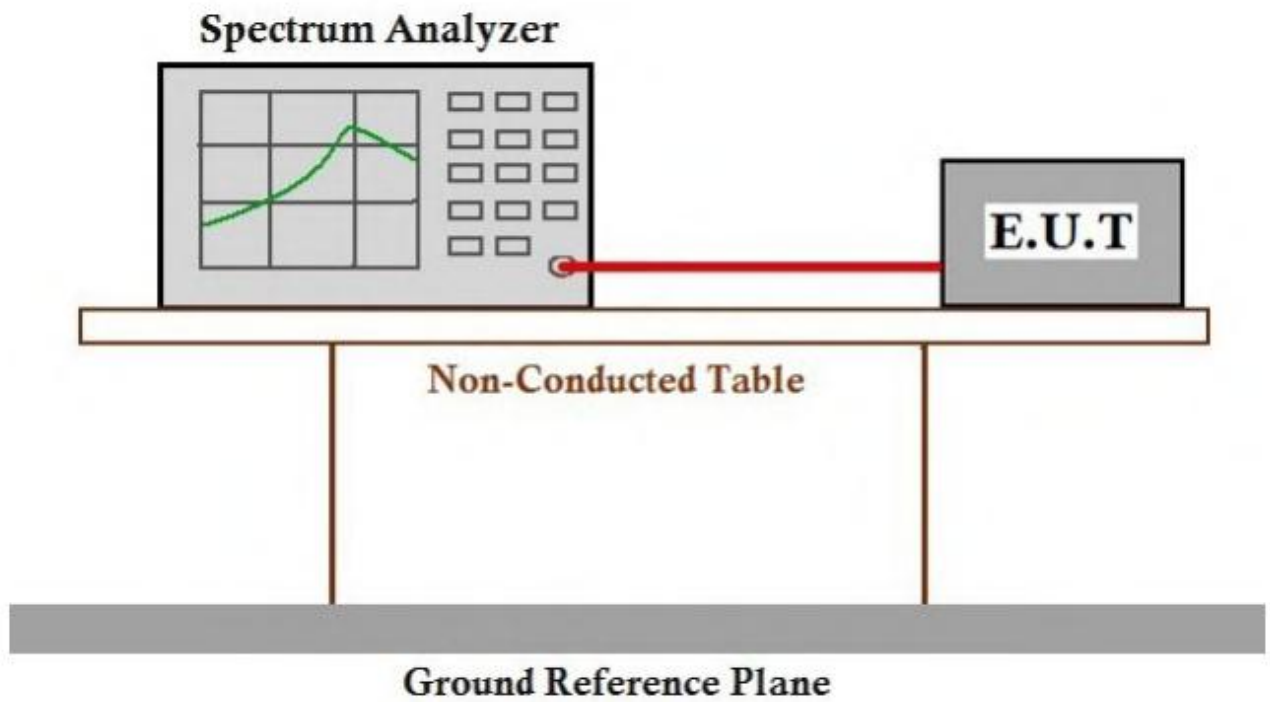
Set RBW = 10MHz

Set VBW = 10MHz

Set detector = peak.

Set span =0Hz

Test Setup Diagram



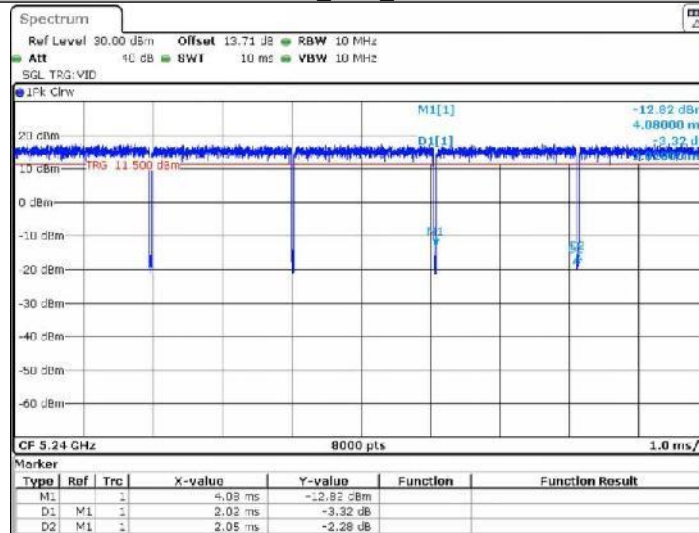
Measurement Data

Test Mode	Antenna	Channel	Duty Cycle[%]	10log(1/x) Factor[dB]
11A	Ant1	5180	98.54	0.06
11A	Ant1	5200	98.05	0.09
11A	Ant1	5240	98.54	0.06
11N20	Ant1	5180	96.00	0.18
11N20	Ant1	5200	96.00	0.18
11N20	Ant1	5240	96.00	0.18
11N40	Ant1	5190	76.47	1.17
11N40	Ant1	5230	76.47	1.17
11AC20	Ant1	5180	97.93	0.09
11AC20	Ant1	5200	98.44	0.07
11AC20	Ant1	5240	97.92	0.09
11AC40	Ant1	5190	76.47	1.17
11AC40	Ant1	5230	81.25	0.90
11AC80	Ant1	5210	55.56	2.57

Test Graphs

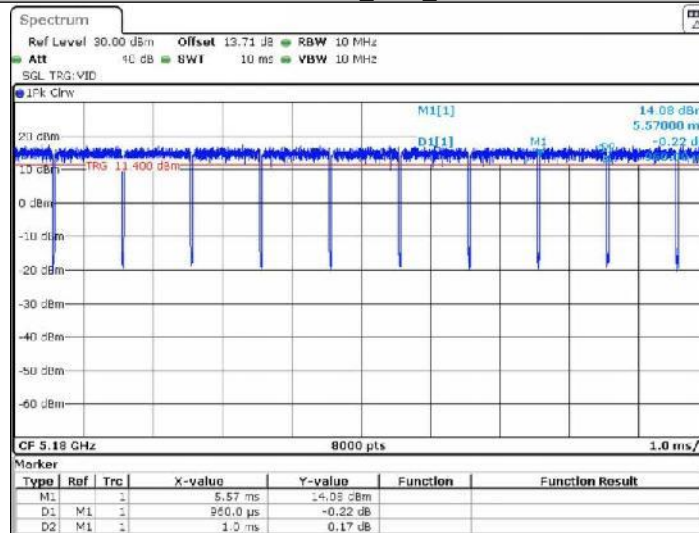


11A_Ant1_5240



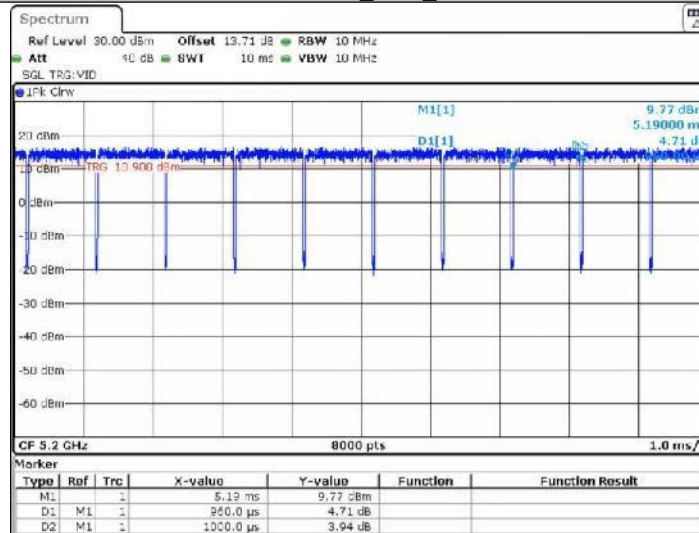
Date: 27 FEB 2022 07:41:32

11N20SISO_Ant1_5180



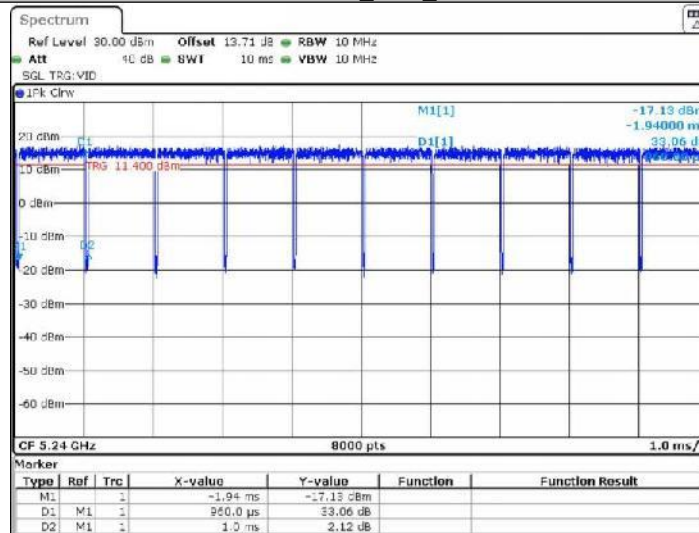
Date: 27 FEB 2022 07:47:42

11N20SISO_Ant1_5200



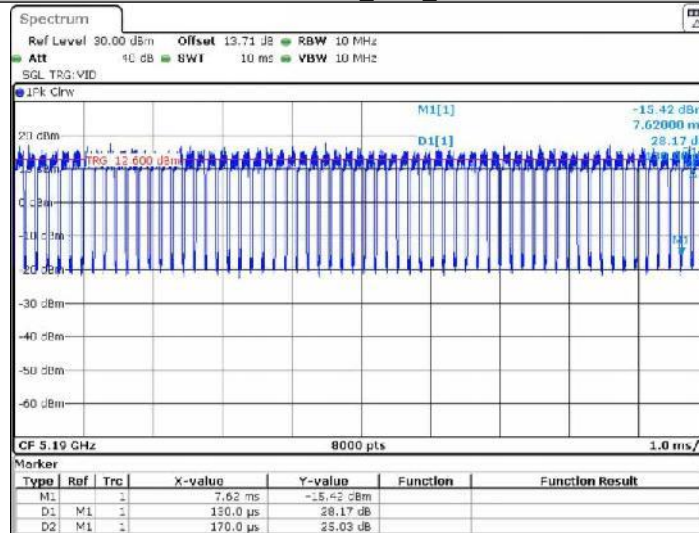
Date: 27 FEB 2022 07:53:43

11N20SISO_Ant1_5240



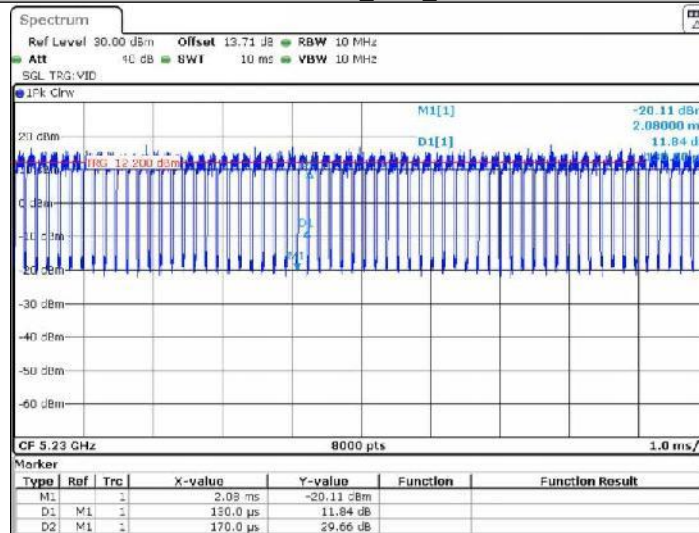
Date: 27 FEB 2022 07:58:43

11N40SISO_Ant1_5190



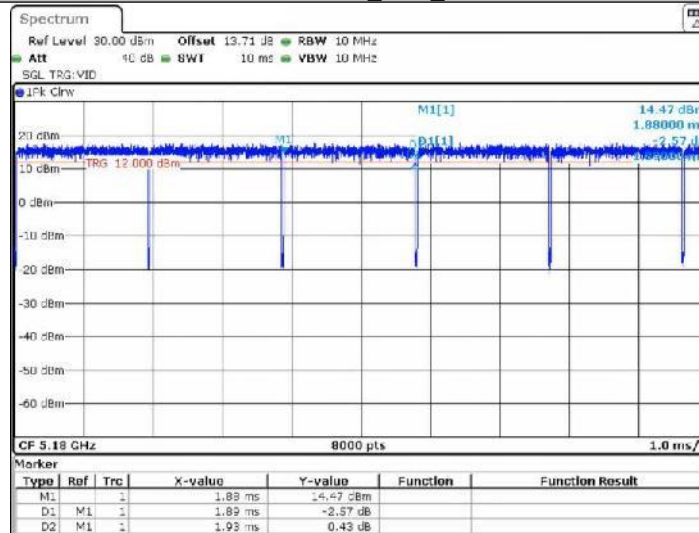
Date: 27 FEB 2022 08:05:35

11N40SISO_Ant1_5230



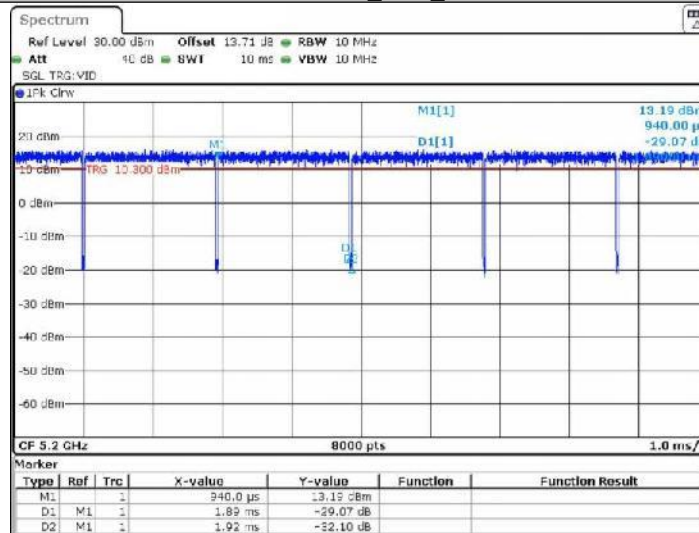
Date: 27 FEB 2022 08:11:07

11AC20SISO_Ant1_5180



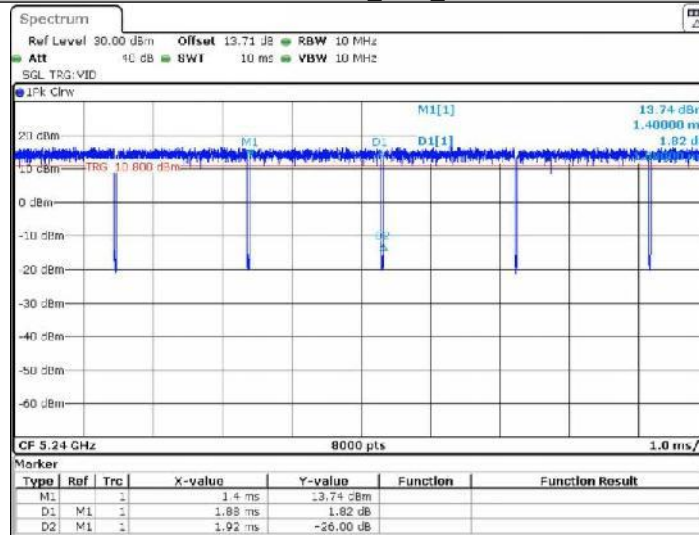
Date: 27 FEB 2022 08:29:25

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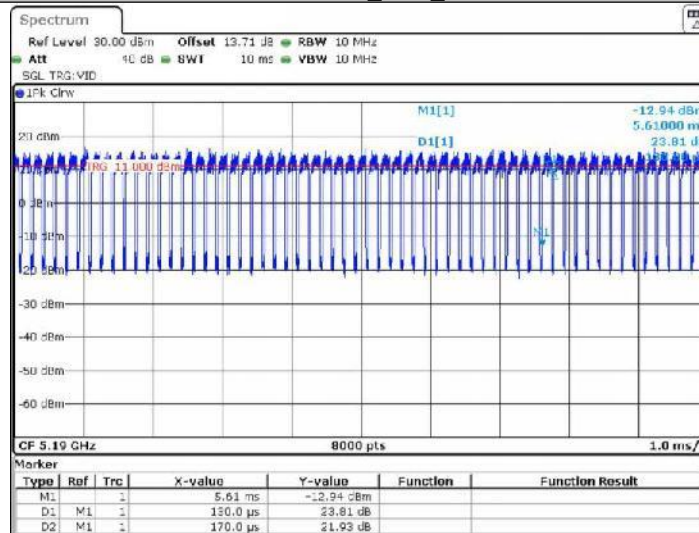
Date: 27 FEB 2022 08:36:38

11AC20SISO_Ant1_5240



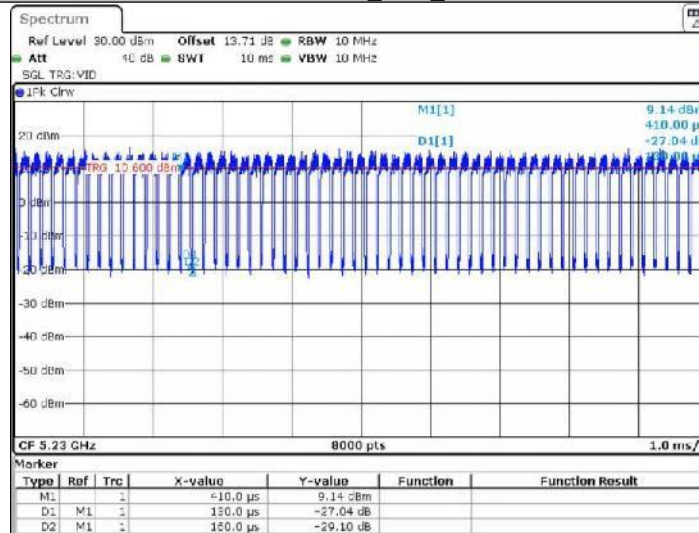
Date: 27 FEB 2022 08:42:45

11AC40SISO_Ant1_5190



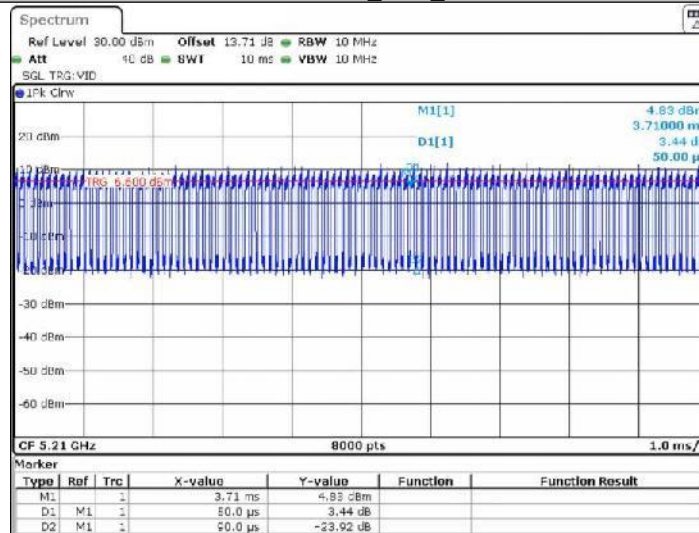
Date: 27 FEB 2022 08:48:54

11AC40SISO_Ant1_5230



Date: 27 FEB 2022 08:54:20

11AC80SISO_Ant1_5210



Date: 27 FEB 2022 09:00:34

2. Maximum Conducted Output Power

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

Test Method: KDB 789033 D02 II E

Limit:

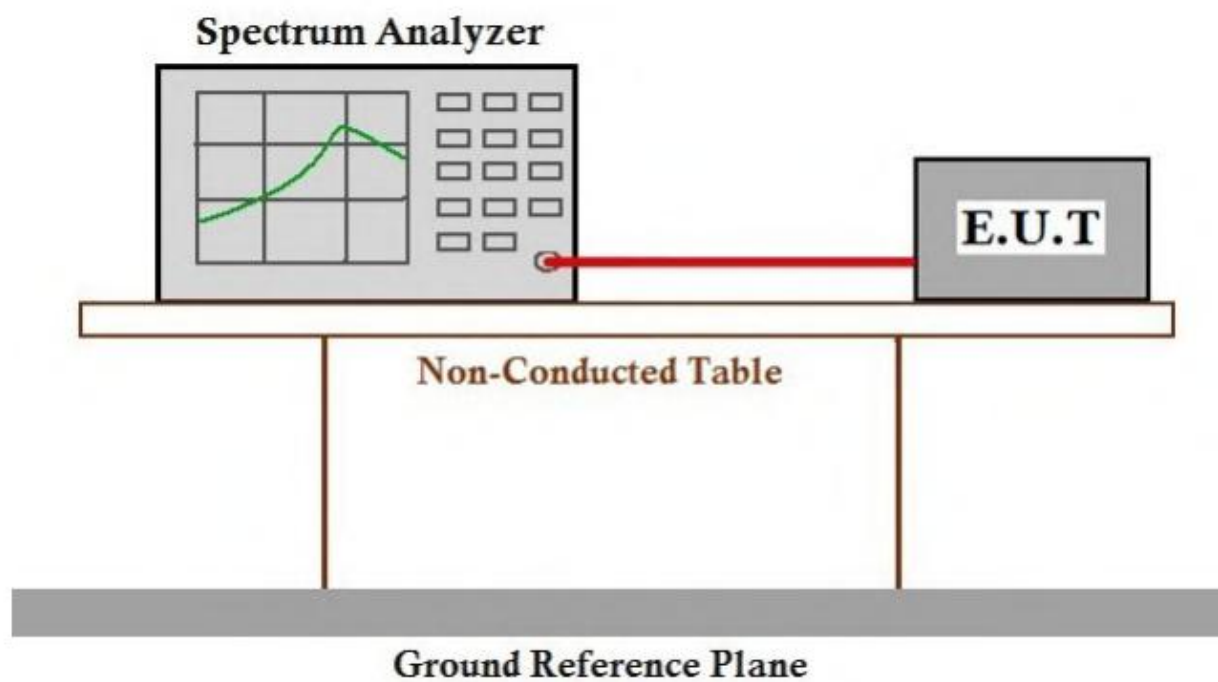
Frequency band(MHz)	Limit
5150-5250	$\leq 1\text{W}(30\text{dBm})$ for master device
	$\leq 250\text{mW}(24\text{dBm})$ for client device
5250-5350	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5470-5725	$\leq 250\text{mW}(24\text{dBm})$ for client device or $11\text{dBm}+10\log B^*$
5725-5850	$\leq 1\text{W}(30\text{dBm})$
Remark:	* Where B is the 26dB emission bandwidth in MHz. The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Procedure:

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- (1) Set RBW = 1 MHz.
- (2) Set VBW $\geq$ 3 MHz.
- (3) Detector = power average
- (4) Sweep time = auto.
- (5) Add duty cycle to the measured average power.

Test Setup Diagram



Measurement Data

Test Mode	Antenna	Channel	Meas.Level [dBm]	Av.Power [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	12.88	12.94	24	PASS
11A	Ant1	5200	12.47	12.56	24	PASS
11A	Ant1	5240	12.89	12.95	24	PASS
11N20	Ant1	5180	12.67	12.85	24	PASS
11N20	Ant1	5200	12.24	12.42	24	PASS
11N20	Ant1	5240	12.71	12.89	24	PASS
11N40	Ant1	5190	12.79	13.96	24	PASS
11N40	Ant1	5230	12.75	13.92	24	PASS
11AC20	Ant1	5180	13.13	13.22	24	PASS
11AC20	Ant1	5200	11.62	11.69	24	PASS
11AC20	Ant1	5240	12.06	12.15	24	PASS
11AC40	Ant1	5190	12.19	13.36	24	PASS
11AC40	Ant1	5230	11.94	12.84	24	PASS
11AC80	Ant1	5210	12.64	15.21	24	PASS

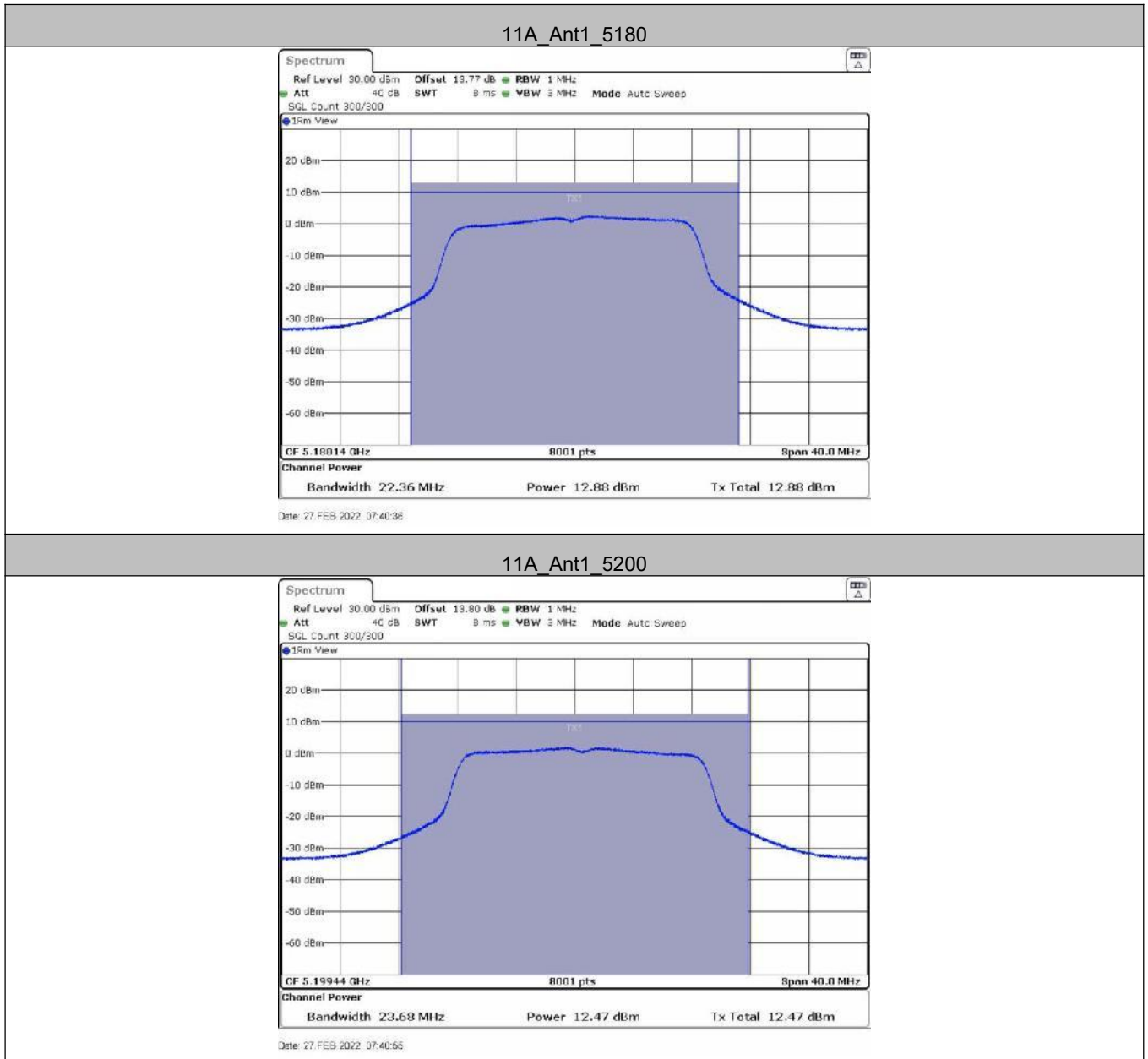
Remark:

Av.Power=Meas.Level+10 log (1/duty cycle)

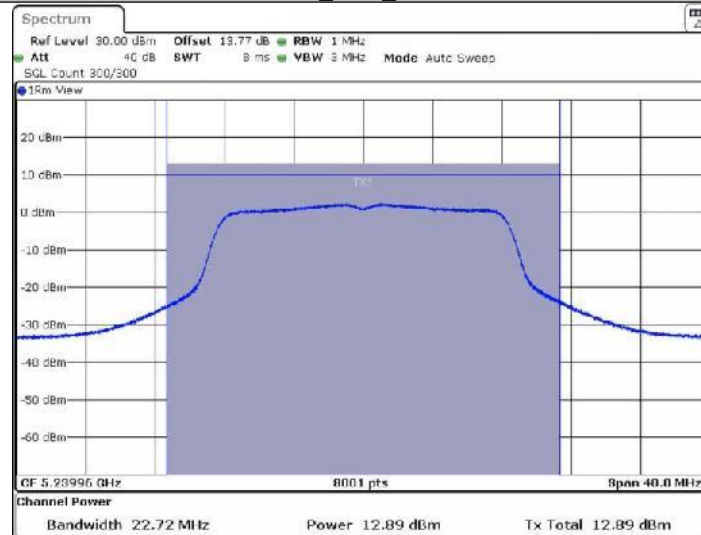
E.i.r.p=Av.Power+G,

G = antenna gain in dBi.

Test Graphs

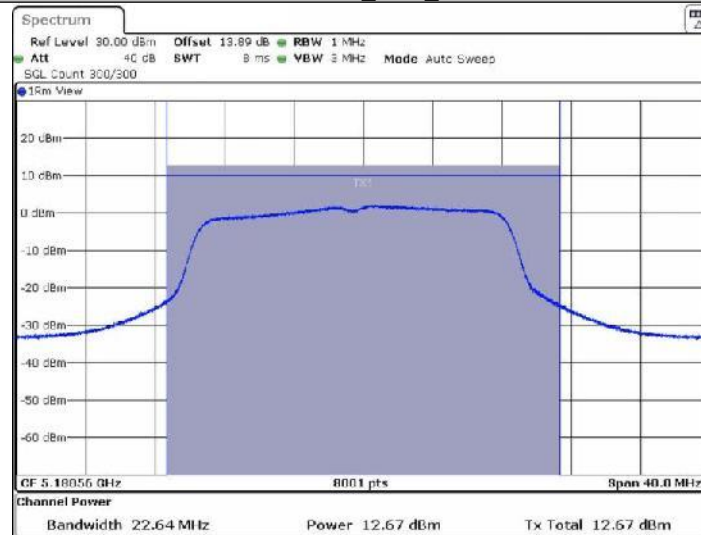


11A_Ant1_5240



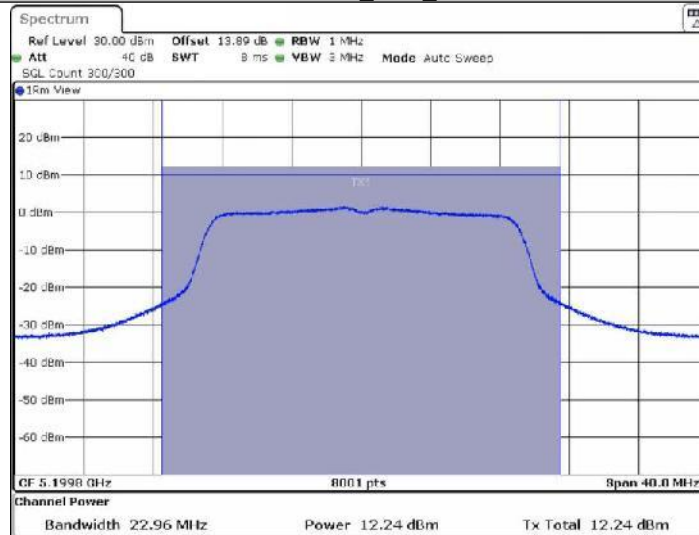
Date: 27 FEB 2022 07:41:43

11N20SISO_Ant1_5180



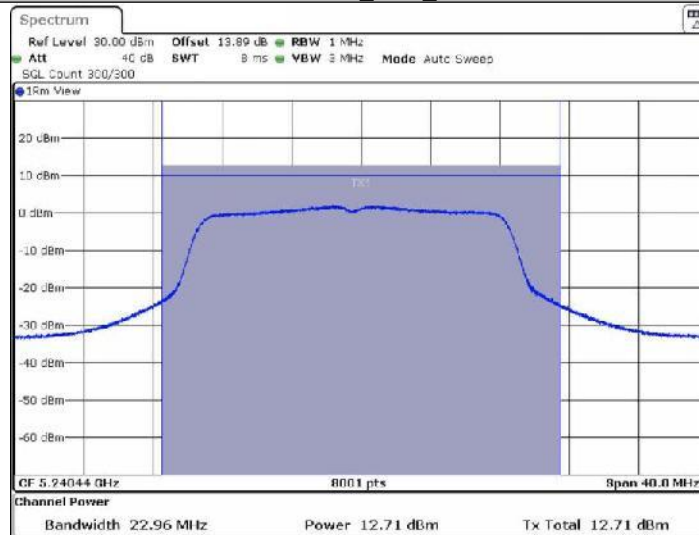
Date: 27 FEB 2022 07:47:53

11N20SISO_Ant1_5200



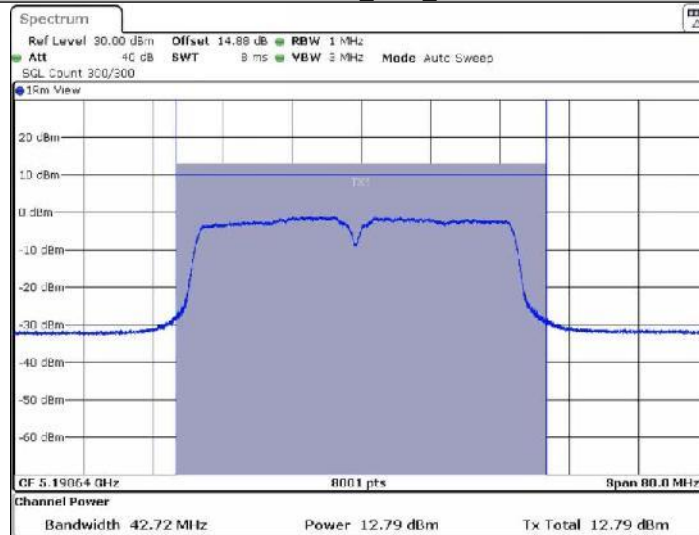
Date: 27 FEB 2022 07:53:57

11N20SISO_Ant1_5240



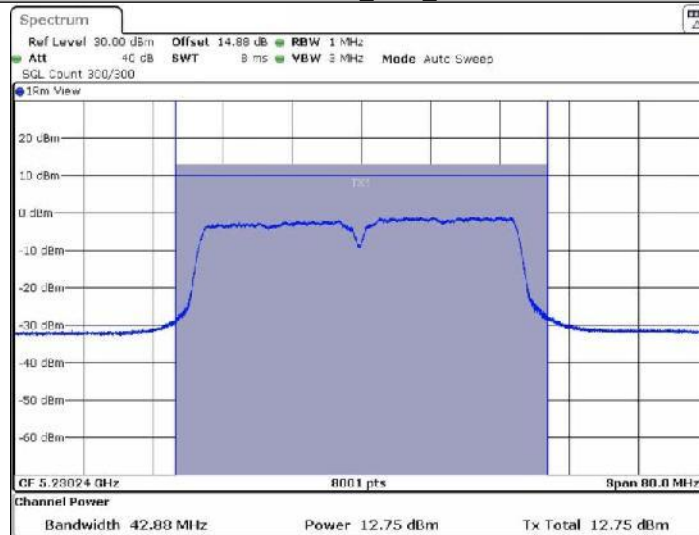
Date: 27 FEB 2022 07:58:54

11N40SISO_Ant1_5190



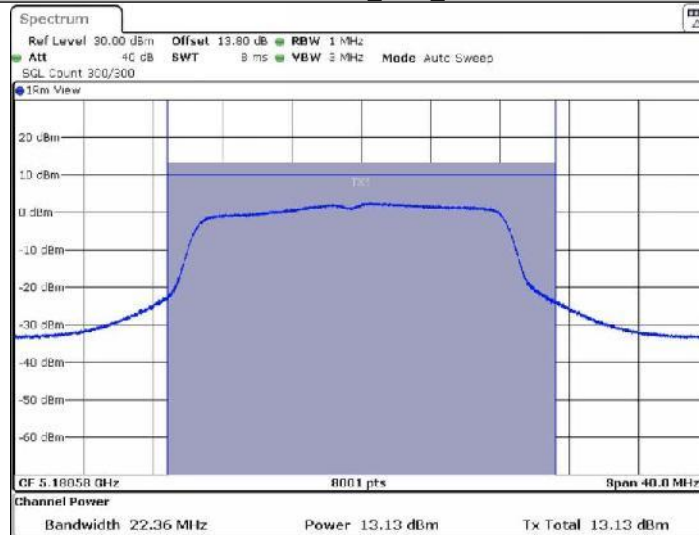
Date: 27 FEB 2022 08:05:47

11N40SISO_Ant1_5230



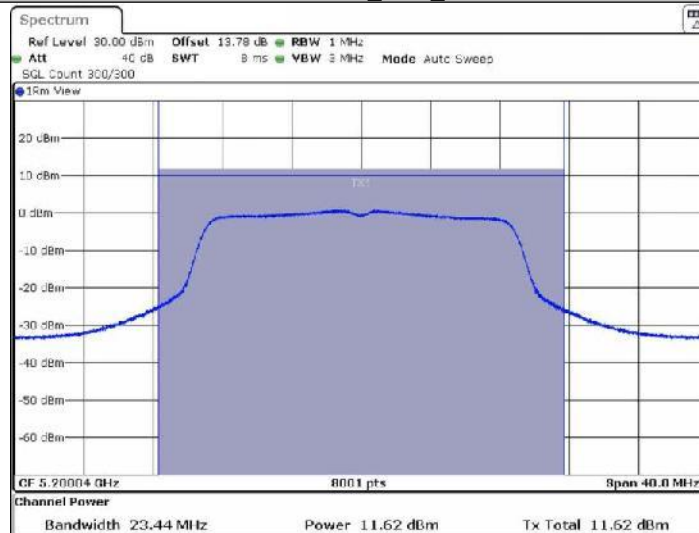
Date: 27 FEB 2022 08:11:19

11AC20SISO_Ant1_5180



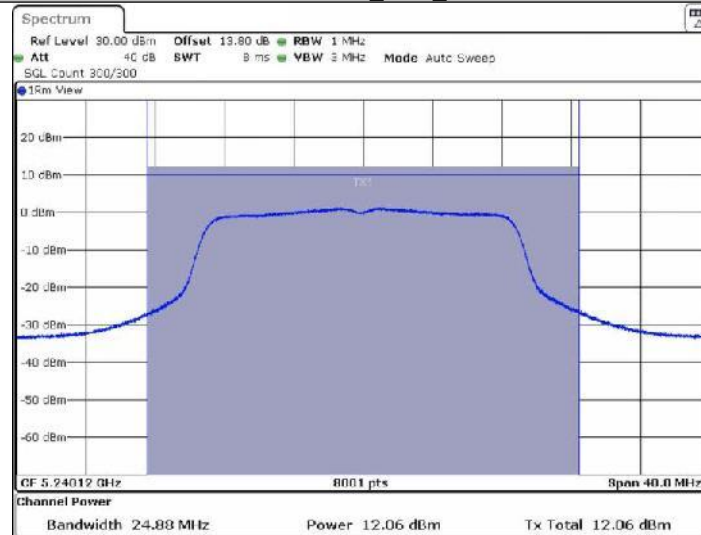
Date: 27 FEB 2022 08:29:37

11AC20SISO_Ant1_5200



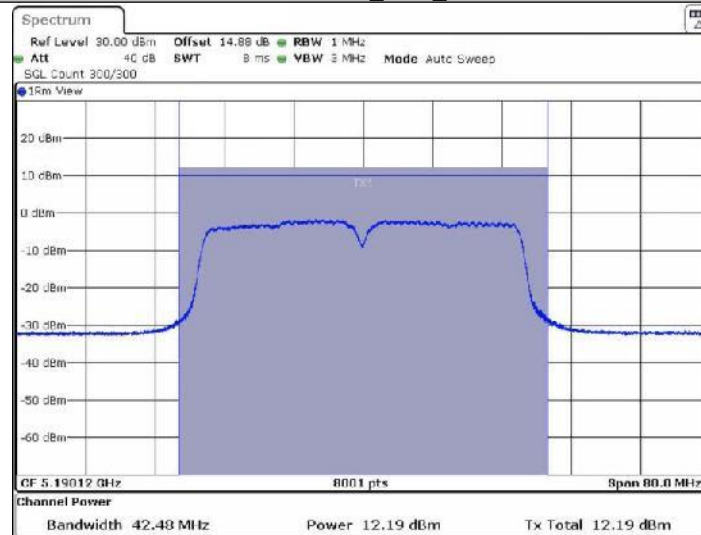
Date: 27 FEB 2022 08:38:40

11AC20SISO_Ant1_5240

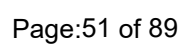


Date: 27 FEB 2022 08:42:58

11AC40SISO_Ant1_5190



Date: 27 FEB 2022 08:40:08



Appendix C): Maximum Power Spectral Density

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

Test Method: KDB 789033 D02 II F

Test Procedure:

For 5150-5725MHz:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 1MHz.
4. Set the VBW $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold.

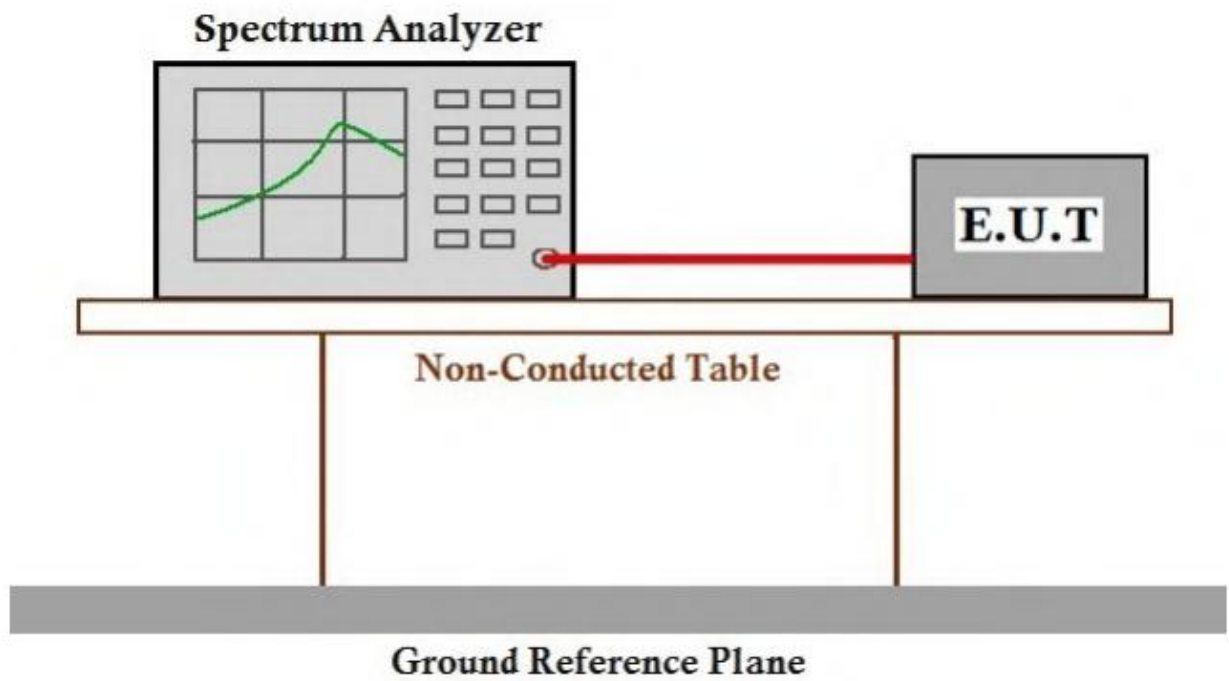
For 5725-5850MHz:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 500KHz.
4. Set the VBW $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold.

Limit:

Frequency band(MHz)	Limit
5150-5250	$\leq 17\text{dBm}$ in 1MHz for master device
	$\leq 11\text{dBm}$ in 1MHz for client device
5250-5350	$\leq 11\text{dBm}$ in 1MHz for client device
5470-5725	$\leq 11\text{dBm}$ in 1MHz for client device
5725-5850	$\leq 30\text{dBm}$ in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.

Test Setup Diagram



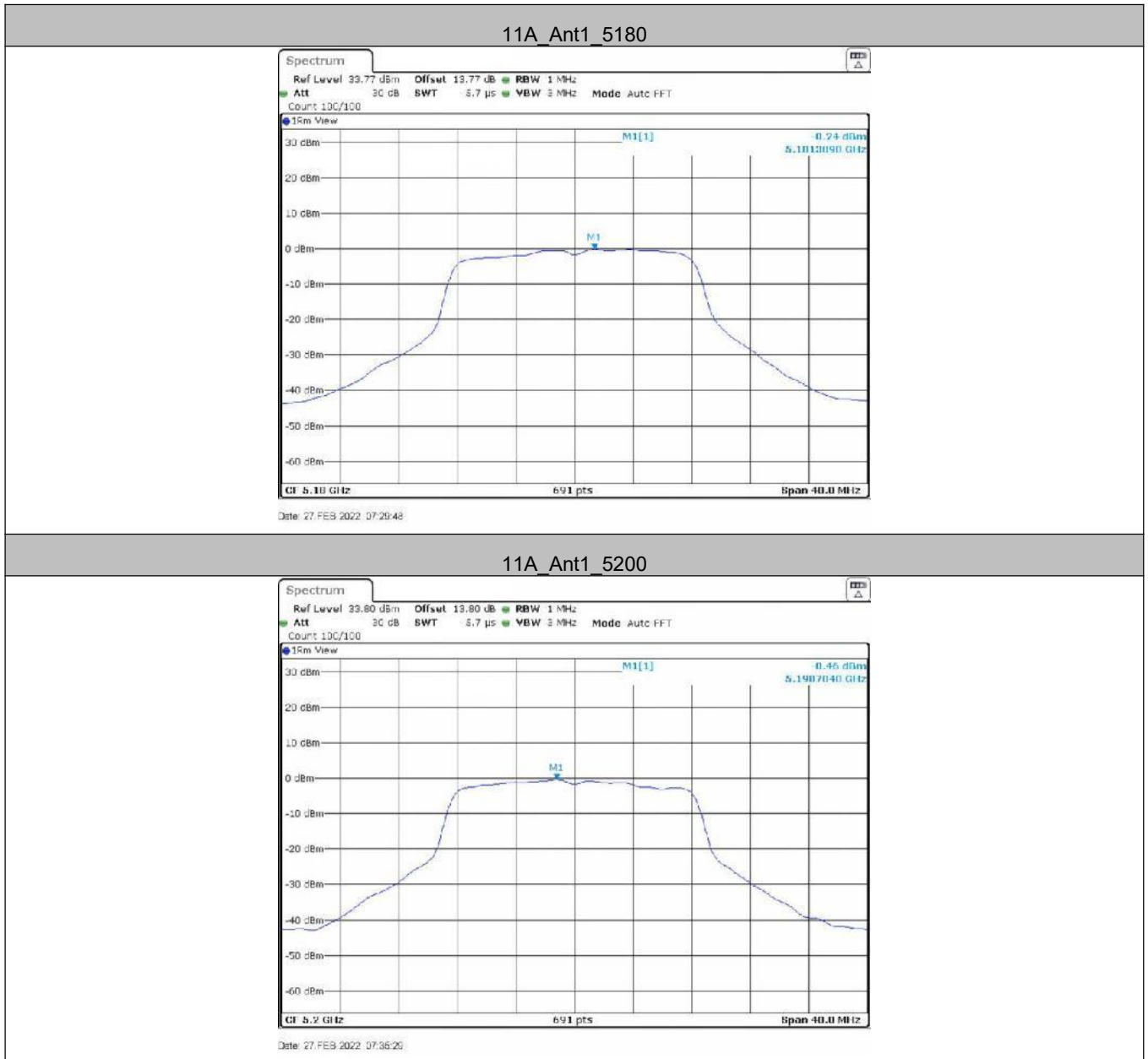
Test Result

TestMode	Antenna	Channel	Meas.Level [dBm]	Duty Cycle Factor [dB]	PSD [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	Ant1	5180	-0.24	0.06	-0.18	≤11	PASS
11A	Ant1	5200	-0.46	0.09	-0.37	≤11	PASS
11A	Ant1	5240	1.98	0.06	2.04	≤11	PASS
11N20SISO	Ant1	5180	1.75	0.18	1.93	≤11	PASS
11N20SISO	Ant1	5200	1.05	0.18	1.23	≤11	PASS
11N20SISO	Ant1	5240	1.44	0.18	1.62	≤11	PASS
11N40SISO	Ant1	5190	-1.15	1.17	0.02	≤11	PASS
11N40SISO	Ant1	5230	-0.9	1.17	0.27	≤11	PASS
11AC20SISO	Ant1	5180	2.08	0.09	2.17	≤11	PASS
11AC20SISO	Ant1	5200	0.54	0.07	0.61	≤11	PASS
11AC20SISO	Ant1	5240	0.92	0.09	1.01	≤11	PASS
11AC40SISO	Ant1	5190	-1.7	1.17	-0.53	≤11	PASS
11AC40SISO	Ant1	5230	-2	0.90	-1.1	≤11	PASS
11AC80SISO	Ant1	5210	-3.71	2.57	-1.14	≤11	PASS

Remark:

PSD = Meas PSD + Duty Cycle Factor

Test Graphs



11A_Ant1_5240



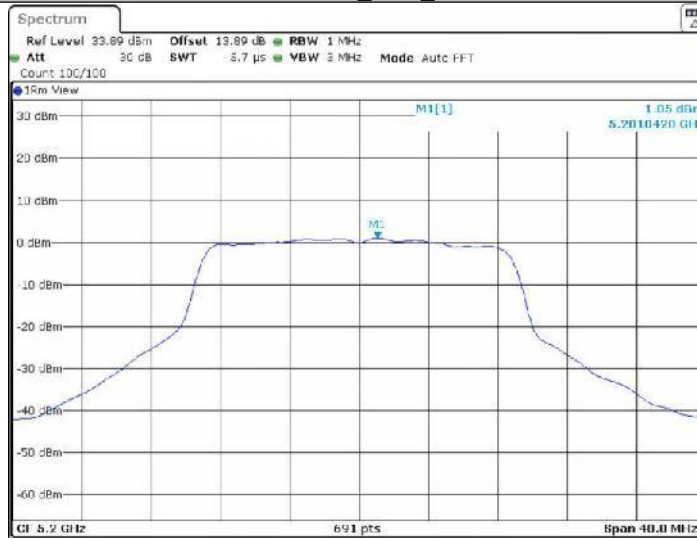
Date: 27.FEB.2022 07:41:50

11N20SISO_Ant1_5180



Date: 27.FEB.2022 07:48:00

11N20SISO_Ant1_5200



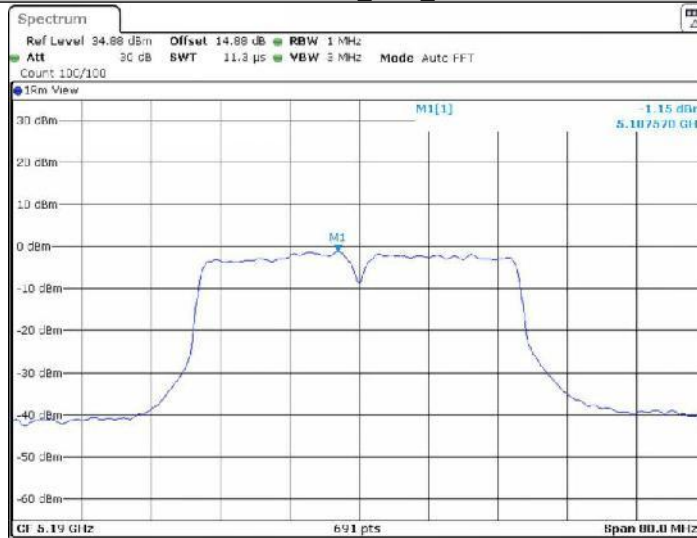
Date: 27.FEB.2022 07:54:04

11N20SISO_Ant1_5240



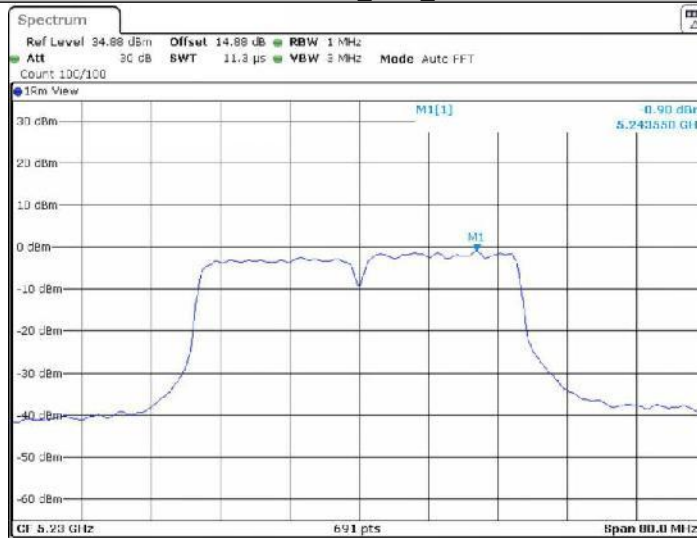
Date: 27.FEB.2022 07:50:01

11N40SISO_Ant1_5190



Date: 27 FEB 2022 08:05:53

11N40SISO_Ant1_5230



Date: 27 FEB 2022 08:11:25

11AC20SISO_Ant1_5180



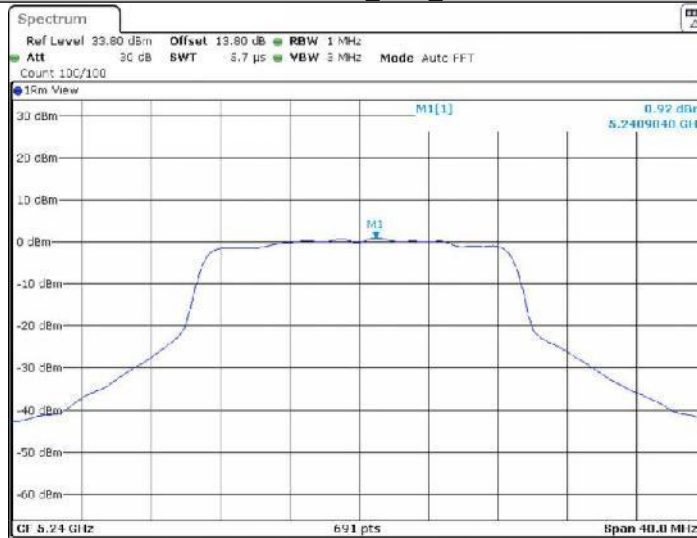
Date: 27 FEB 2022 08:29:44

11AC20SISO_Ant1_5200



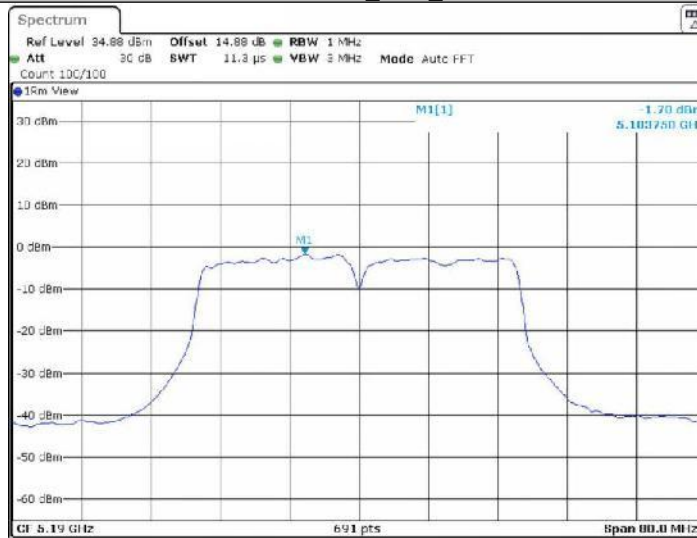
Date: 27 FEB 2022 08:36:56

11AC20SISO_Ant1_5240



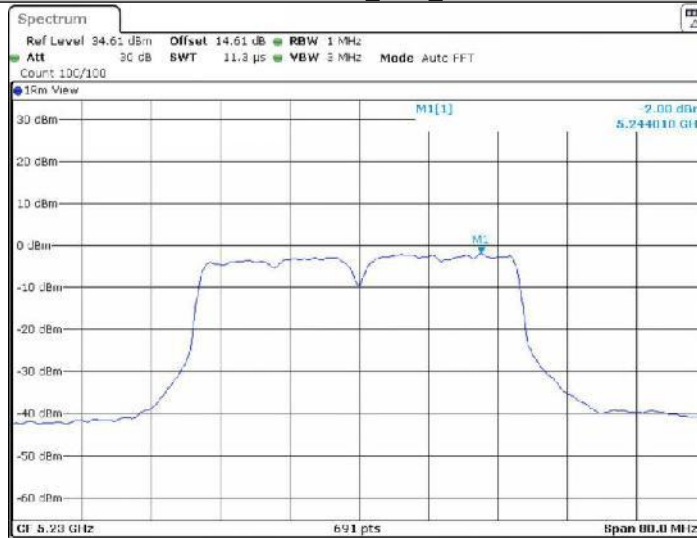
Date: 27 FEB 2022 08:43:03

11AC40SISO_Ant1_5190



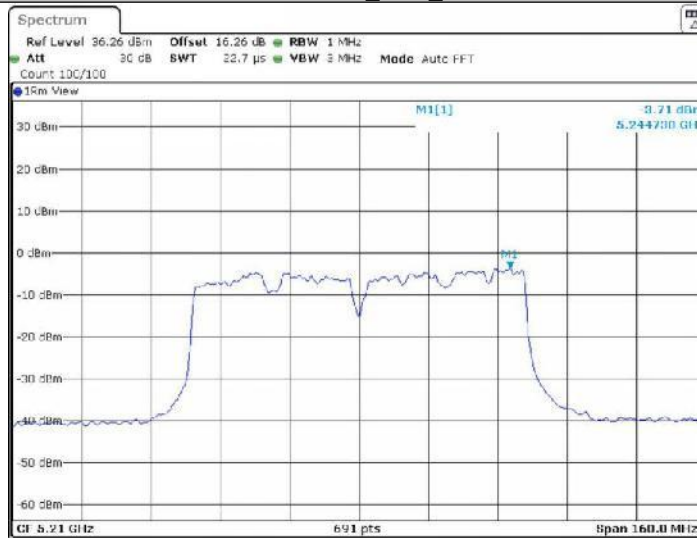
Date: 27 FEB 2022 08:40:12

11AC40SISO_Ant1_5230



Date: 27 FEB 2022 08:54:39

11AC80SISO_Ant1_5210



Date: 27 FEB 2022 09:00:52

Appendix D): Band Edge Measurements

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

Test Method: KDB 789033 D02 II G

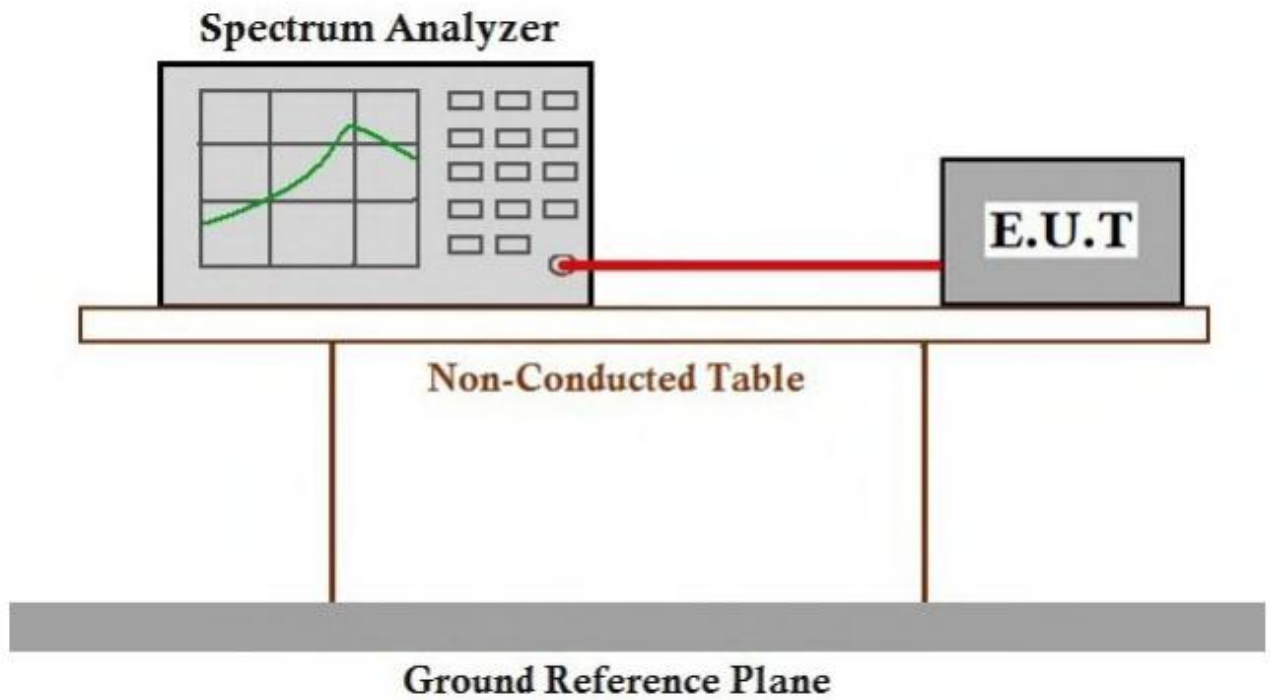
Test Procedure:

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=VBW=1MHz / Sweep=AUTO
 - (b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO

Limit:

For transmitters operating in the 5.15-5.25 GHz band:	All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.25-5.35 GHz band:	All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.47-5.725 GHz band:	All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz (68.2dBuV/m).
For transmitters operating in the 5.725-5.85 GHz band:	(i) All emissions shall be limited to a level of -27 dBm/MHz (68.2dBuV/m) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz (105.2dBuV/m) at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz (110.8dBuV/m) at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz (122.2dBuV/m) at the band edge.

Test Setup Diagram

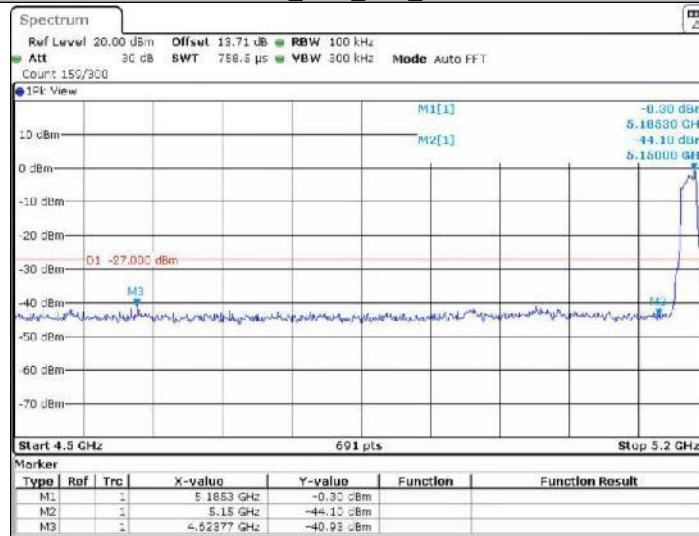


Test Result

TestMode	Antenna	ChName	Channel	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	Low	5180	-40.93	≤ -27	PASS
		High	5240	-41.38	≤ -27	PASS
11N20SISO	Ant1	Low	5180	-41.27	≤ -27	PASS
		High	5240	-40.52	≤ -27	PASS
11N40SISO	Ant1	Low	5190	-40.32	≤ -27	PASS
		High	5230	-41.85	≤ -27	PASS
11AC20SISO	Ant1	Low	5180	-40.64	≤ -27	PASS
		High	5240	-41.55	≤ -27	PASS
11AC40SISO	Ant1	Low	5190	-41.03	≤ -27	PASS
		High	5230	-41.41	≤ -27	PASS
11AC80SISO	Ant1	Low	5210	-41.43	≤ -27	PASS
		High	5210	-40.63	≤ -27	PASS

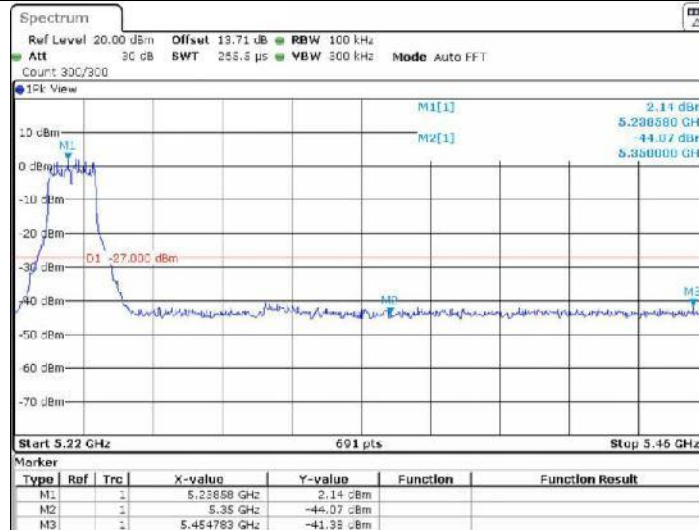
Test Graphs

11A_Ant1_Low_5180



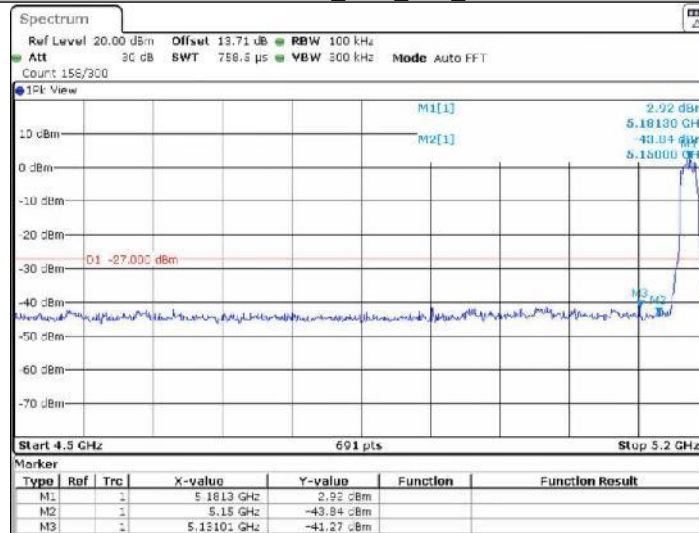
Date: 27 FEB 2022 07:30:01

11A_Ant1_High_5240



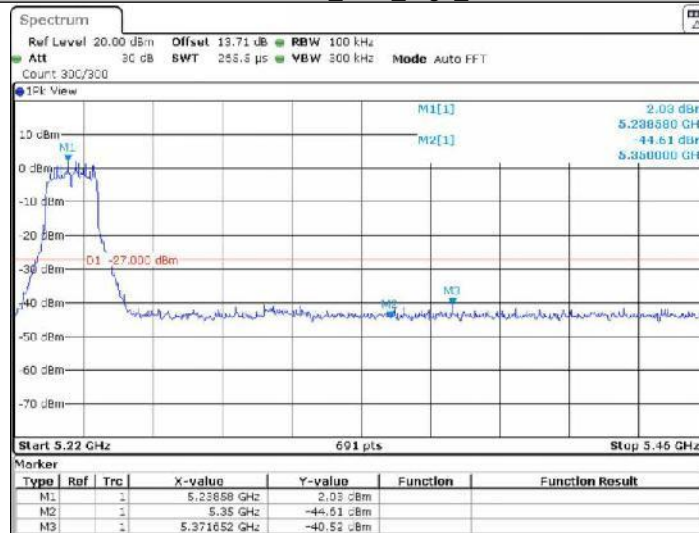
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11N20SISO_Ant1_Low_5180



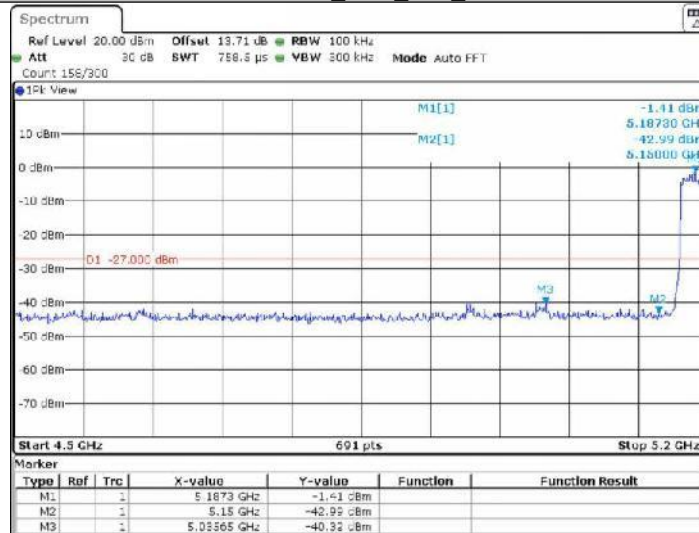
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11N20SISO_Ant1_High_5240



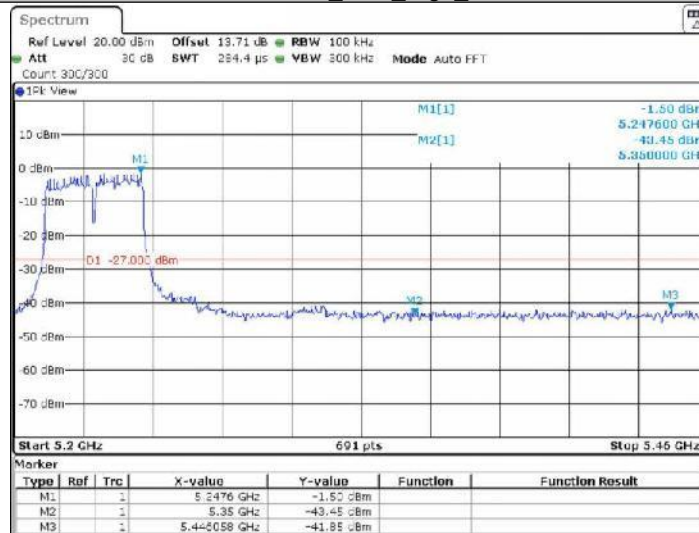
Date: 27 FEB 2022 07:50:14

11N40SISO_Ant1_Low_5190



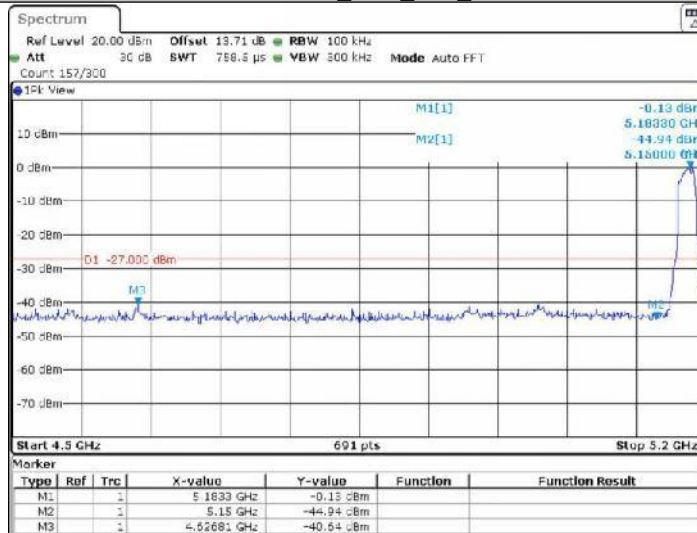
Date: 27 FEB 2022 08:06:09

11N40SISO_Ant1_High_5230



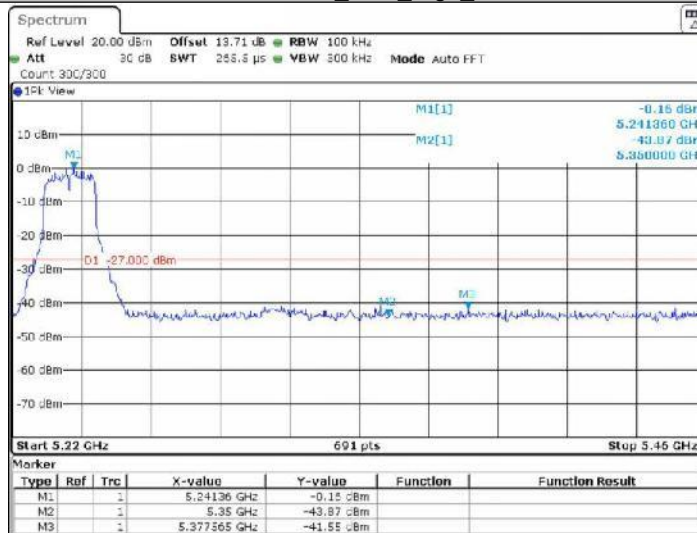
Date: 27 FEB 2022 08:11:30

11AC20SISO_Ant1_Low_5180



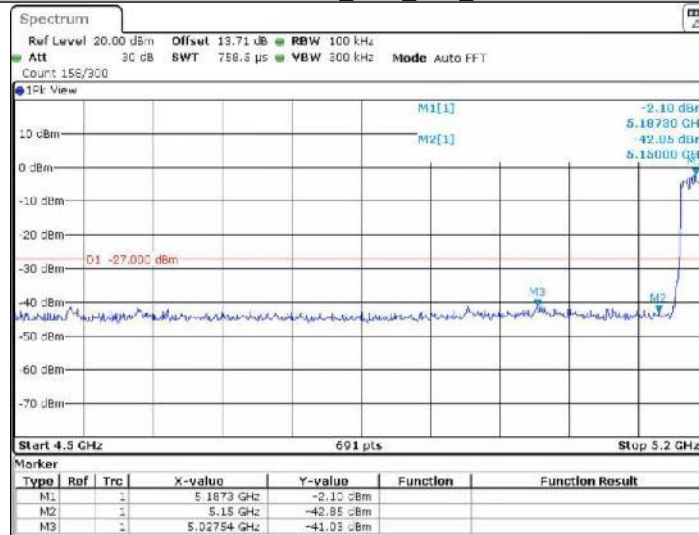
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11AC20SISO_Ant1_High_5240



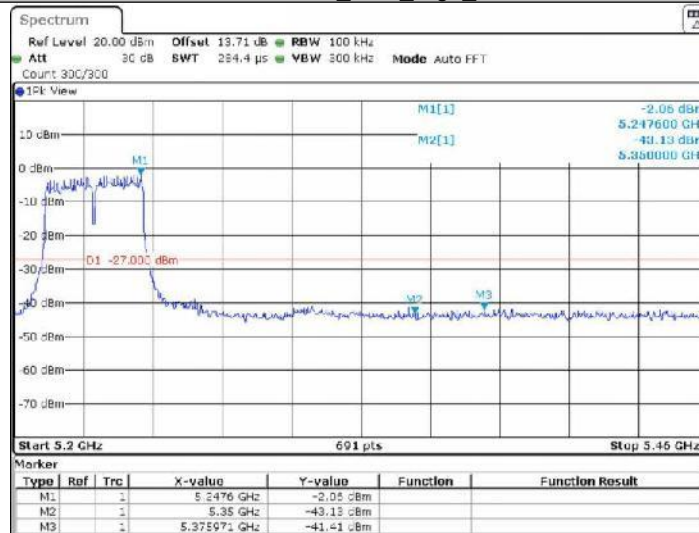
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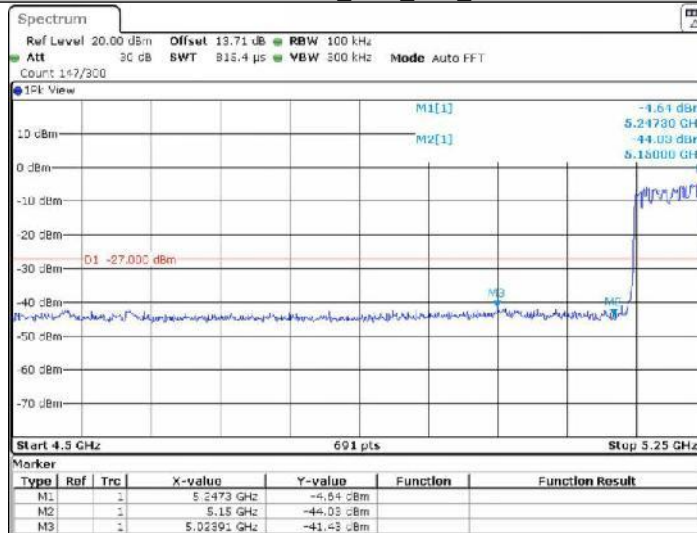
Date: 27 FEB 2022 08:40:25

11AC40SISO_Ant1_High_5230



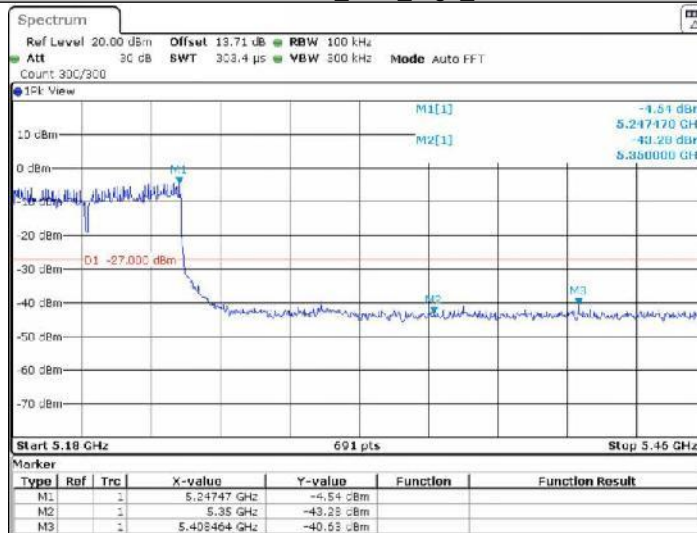
Date: 27 FEB 2022 08:54:52

11AC80SISO_Ant1_Low_5210



Date: 27 FEB 2022 00:01:05

11AC80SISO_Ant1_High_5210



Date: 27 FEB 2022 00:01:19

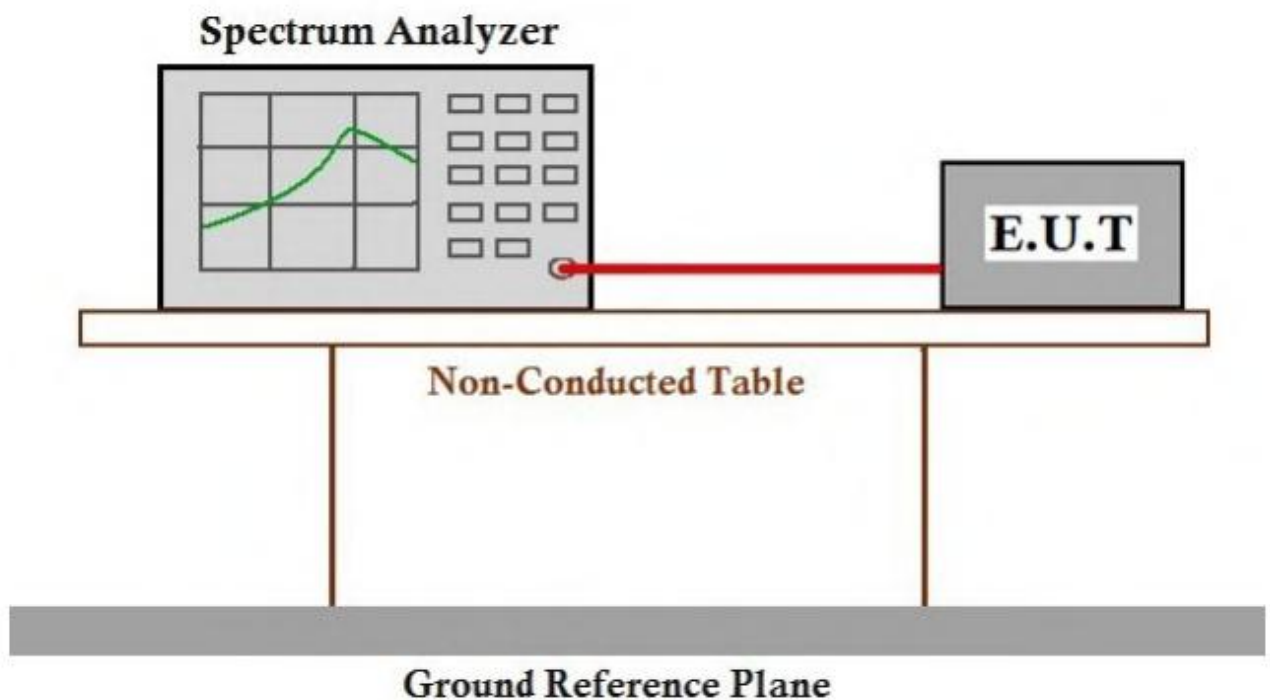
Appendix E): Frequency Stability

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

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

Limit: The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Test Setup Diagram



Measurement Data

Frequency Stability Versus Temp.			
Operating Frequency: 5240 MHz			
Temp	Voltage	Measured Frequency	Frequency Drift
(°C)		(MHz)	(ppm)
50	VN	5240.02	3.81679
40		5240.01	1.90840
30		5240.02	3.81679
20		5240.03	5.72519
10		5240.01	1.90840
0		5240.02	3.81679
-10		5240.03	5.72519
-20		5240.03	5.72519

Frequency Stability Versus Temp.			
Operating Frequency: 5210 MHz			
Temp.	Voltage	Measured Frequency	Frequency Drift
		(MHz)	(ppm)
TN	VL	5210.01	1.91938
	VN	5210.02	3.83877
	VH	5210.00	0.00000

Note: All the modulation and channels had been tested, but only the worst data recorded in the report.

Appendix F): Antenna Requirement

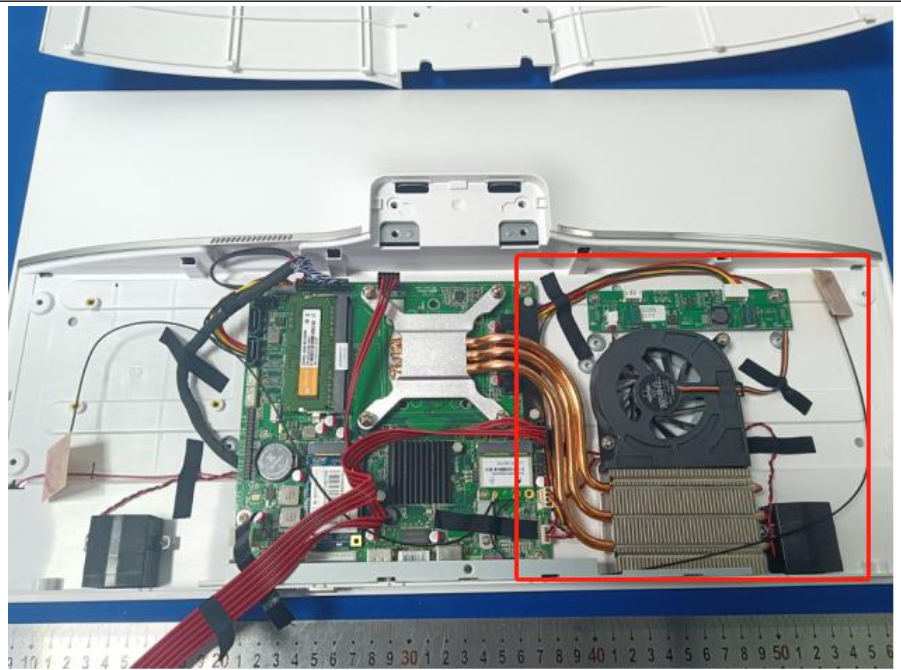
15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.407(a)(1) (2) requirement:

The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



The antenna is FPC antenna. The best case gain of the 5G WiFi antenna is -1.5dBi.

Appendix G): Operation in the absence of information to the transmit

15.407(c) requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

Operation in the absence of information to the transmit

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ASK message transmitting from remote device and verify whether it shall resend or discontinue transmission. (manufacturer declare)

Appendix H): AC Power Line Conducted Emission

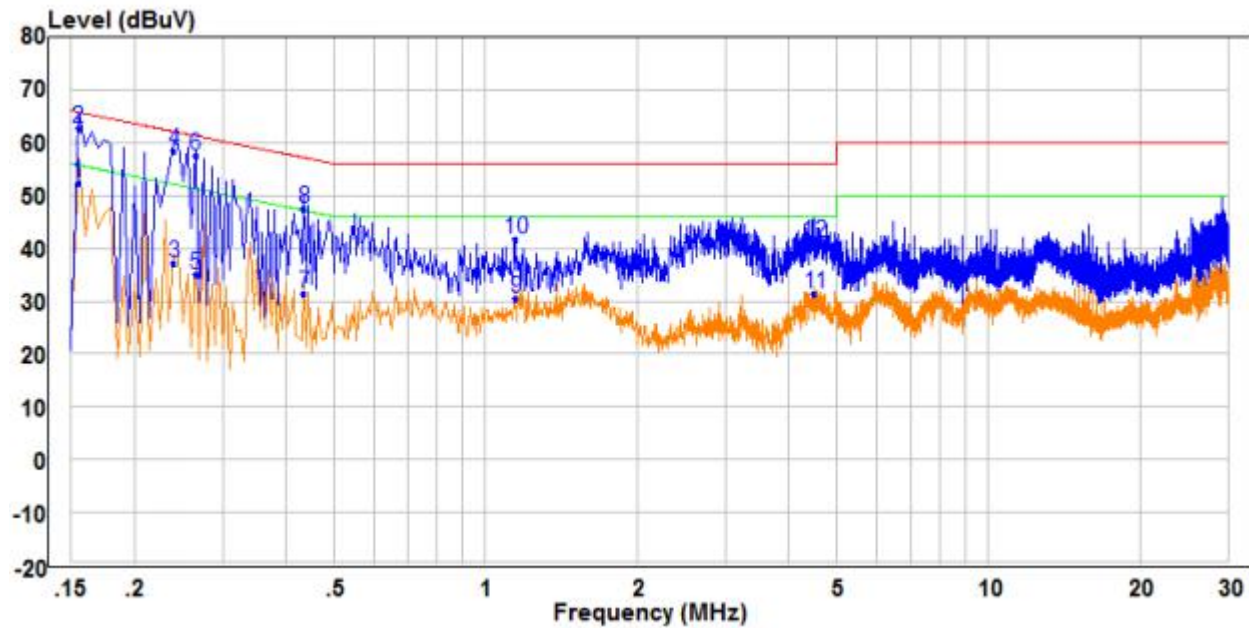
Test Procedure:	Test frequency range :150KHz-30MHz 1)The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.															
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr> <tr> <th>Quasi-peak</th><th>Average</th></tr> </thead> <tbody> <tr> <td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr> <tr> <td>0.5-5</td><td>56</td><td>46</td></tr> <tr> <td>5-30</td><td>60</td><td>50</td></tr> </tbody> </table> * The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE : The lower limit is applicable at the transition frequency		Frequency range (MHz)	Limit (dB μ V)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dB μ V)															
	Quasi-peak	Average														
0.15-0.5	66 to 56*	56 to 46*														
0.5-5	56	46														
5-30	60	50														

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

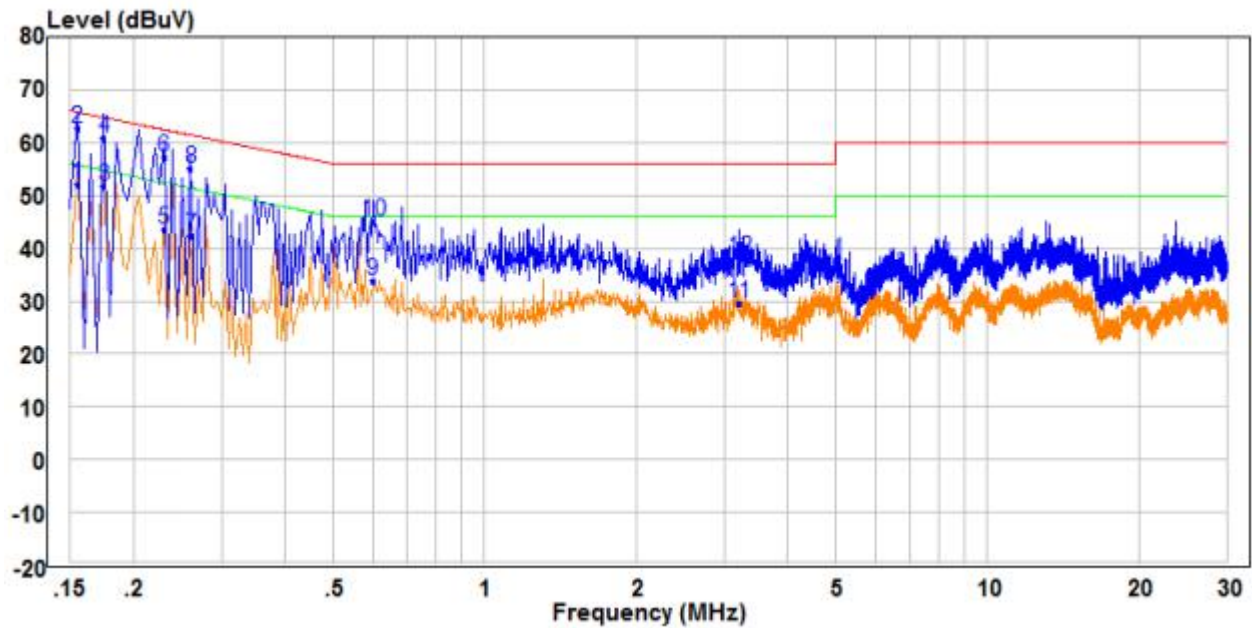
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



		Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	AV	0.155	42.69	9.69	52.38	55.73	-3.35	Average	Line
2	PP	0.155	53.04	9.69	62.73	65.73	-3.00	QP	Line
3		0.240	27.49	9.56	37.05	52.10	-15.05	Average	Line
4		0.240	48.90	9.56	58.46	62.10	-3.64	QP	Line
5		0.265	25.61	9.53	35.14	51.27	-16.13	Average	Line
6		0.265	48.14	9.53	57.67	61.27	-3.60	QP	Line
7		0.435	21.62	9.64	31.26	47.16	-15.90	Average	Line
8		0.435	37.73	9.64	47.37	57.16	-9.79	QP	Line
9		1.150	20.27	10.09	30.36	46.00	-15.64	Average	Line
10		1.150	31.77	10.09	41.86	56.00	-14.14	QP	Line
11		4.515	21.35	9.95	31.30	46.00	-14.70	Average	Line
12		4.515	31.30	9.95	41.25	56.00	-14.75	QP	Line

Neutral line:



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.155	42.33	9.69	52.02	55.73	-3.71	Average	Neutral
2 PP	0.155	53.03	9.69	62.72	65.73	-3.01	QP	Neutral
3 AV	0.175	41.95	9.65	51.60	54.72	-3.12	Average	Neutral
4	0.175	51.15	9.65	60.80	64.72	-3.92	QP	Neutral
5	0.230	34.02	9.56	43.58	52.45	-8.87	Average	Neutral
6	0.230	47.54	9.56	57.10	62.45	-5.35	QP	Neutral
7	0.260	32.94	9.53	42.47	51.43	-8.96	Average	Neutral
8	0.260	45.61	9.53	55.14	61.43	-6.29	QP	Neutral
9	0.600	24.00	9.80	33.80	46.00	-12.20	Average	Neutral
10	0.600	35.12	9.80	44.92	56.00	-11.08	QP	Neutral
11	3.205	19.66	9.77	29.43	46.00	-16.57	Average	Neutral
12	3.205	28.18	9.77	37.95	56.00	-18.05	QP	Neutral

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. The 6Mbps of rate of 802.11A_5240 is the worst case, only the worst data recorded in the report.

Appendix I): Restricted bands around fundamental frequency (Radiated Emission)

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:	Below 1GHz test procedure as below: - The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. - For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel Above 1GHz test procedure as below: - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre). - Test the EUT in the lowest channel , the Highest channel - The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. - Repeat above procedures until all frequencies measured was complete.				
Limit:	Frequency	Limit (dB μ V/m @3cm)		Remark	
	30MHz-88MHz	40.0		Quasi-peak Value	
	88MHz-216MHz	43.5		Quasi-peak Value	
	216MHz-960MHz	46.0		Quasi-peak Value	
	960MHz-1GHz	54.0		Quasi-peak Value	
	Above 1GHz	54.0		Average Value	
		74.0		Peak Value	

Test plot as follows:

Worse case mode:		802.11a(6Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	57.49	-3.63	53.86	74	-20.14	peak	H
5150	43.55	-3.63	39.92	54	-14.08	AVG	H
5150	58.22	-3.63	54.59	74	-19.41	peak	V
5150	45.80	-3.63	42.17	54	-11.83	AVG	V

Worse case mode:		802.11a(6Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	57.47	-3.59	53.88	74	-20.12	peak	H
5350	44.35	-3.59	40.76	54	-13.24	AVG	H
5350	57.98	-3.59	54.39	74	-19.61	peak	V
5350	45.85	-3.59	42.26	54	-11.74	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	57.87	-3.63	54.24	74	-19.76	peak	H
5150	44.17	-3.63	40.54	54	-13.46	AVG	H
5150	58.36	-3.63	54.73	74	-19.27	peak	V
5150	45.99	-3.63	42.36	54	-11.64	AVG	V

Worse case mode:		802.11n(HT20)(6.5Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	57.87	-3.59	54.28	74	-19.72	peak	H
5350	44.01	-3.59	40.42	54	-13.58	AVG	H
5350	57.50	-3.59	53.91	74	-20.09	peak	V
5350	45.99	-3.59	42.40	54	-11.60	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		38	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	57.63	-3.63	54.00	74	-20.00	peak	H
5150	43.54	-3.63	39.91	54	-14.09	AVG	H
5150	57.95	-3.63	54.32	74	-19.68	peak	V
5150	45.90	-3.63	42.27	54	-11.73	AVG	V

Worse case mode:		802.11n(HT40)(13.5Mbps)		Test channel:		46	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	58.14	-3.59	54.55	74	-19.45	peak	H
5350	44.10	-3.59	40.51	54	-13.49	AVG	H
5350	58.09	-3.59	54.50	74	-19.50	peak	V
5350	46.15	-3.59	42.56	54	-11.44	AVG	V

Worse case mode:		802.11ac(HT20)(6.5Mbps)		Test channel:		36	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	58.18	-3.63	54.55	74	-19.45	peak	H
5150	43.49	-3.63	39.86	54	-14.14	AVG	H
5150	58.28	-3.63	54.65	74	-19.35	peak	V
5150	46.29	-3.63	42.66	54	-11.34	AVG	V

Worse case mode:		802.11ac(HT20)(6.5Mbps)		Test channel:		48	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	58.19	-3.59	54.60	74	-19.40	peak	H
5350	44.01	-3.59	40.42	54	-13.58	AVG	H
5350	58.19	-3.59	54.60	74	-19.40	peak	V
5350	46.34	-3.59	42.75	54	-11.25	AVG	V

Worse case mode:		802.11ac(VHT40)(13.5Mbps)		Test channel:		38	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	57.88	-3.63	54.25	74	-19.75	peak	H
5150	43.69	-3.63	40.06	54	-13.94	AVG	H
5150	57.95	-3.63	54.32	74	-19.68	peak	V
5150	46.01	-3.63	42.38	54	-11.62	AVG	V

Worse case mode:		802.11ac(VHT40)(13.5Mbps)		Test channel:		46	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5350	58.34	-3.59	54.75	74	-19.25	peak	H
5350	43.93	-3.59	40.34	54	-13.66	AVG	H
5350	58.11	-3.59	54.52	74	-19.48	peak	V
5350	46.13	-3.59	42.54	54	-11.46	AVG	V

Worse case mode:		802.11ac(VHT80)(29.3Mbps)		Test channel:		42	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
5150	58.03	-3.63	54.40	74	-19.60	peak	H
5150	43.67	-3.63	40.04	54	-13.96	AVG	H
5150	58.04	-3.63	54.41	74	-19.59	peak	V
5150	46.09	-3.63	42.46	54	-11.54	AVG	V
5350	58.36	-3.59	54.77	74	-19.23	peak	H
5350	44.06	-3.59	40.47	54	-13.53	AVG	H
5350	57.77	-3.59	54.18	74	-19.82	peak	V
5350	45.51	-3.59	41.92	54	-12.08	AVG	V

Note:

1) Through Pre-scan transmitting mode with all kind of modulation and data rate, Only the worst case is recorded in the report.

2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

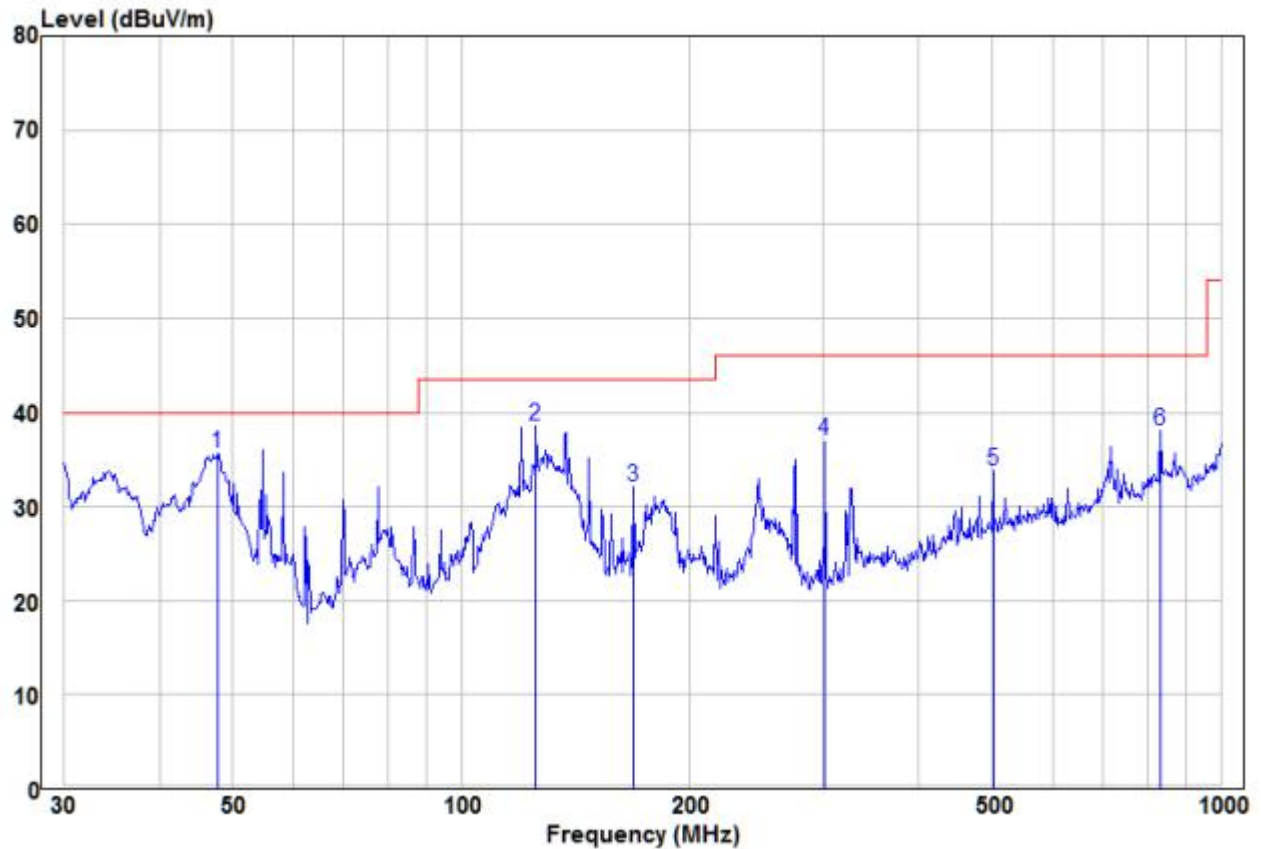
Appendix J): Radiated Spurious Emissions

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:					
Below 1GHz test procedure as below: a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Above 1GHz test procedure as below: g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre) h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBµV/cm)	Remark	Measurement distance (cm)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				
Test result:					
PASS					

Test Data:

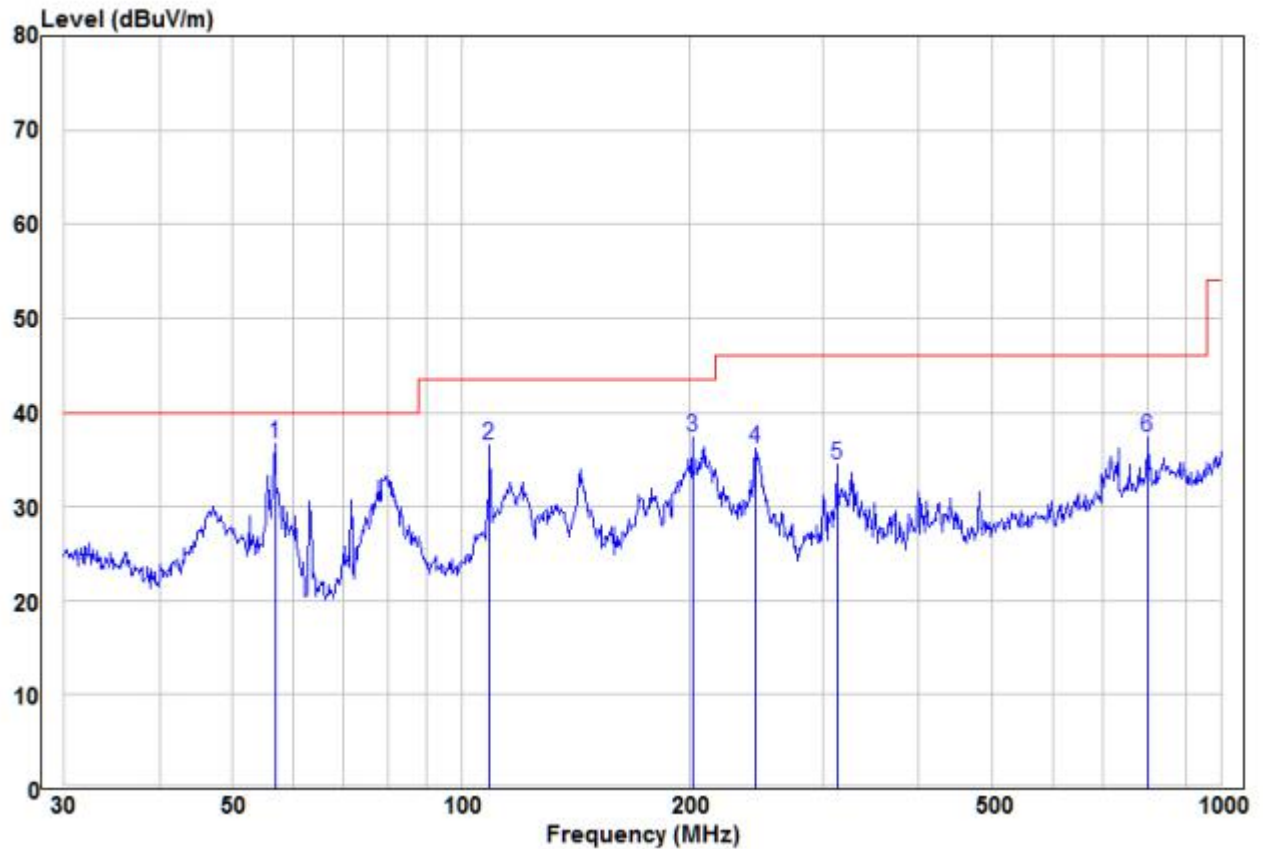
Radiated Emission below 1GHz

30MHz~1GHz		
Test mode:	Transmitting (802.11a 36CH)	Vertical



	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		
1 pp	47.66	26.39	9.19	35.58	40.00	-4.42	Peak	VERTICAL
2	125.45	28.11	10.49	38.60	43.50	-4.90	Peak	VERTICAL
3	168.41	24.42	7.64	32.06	43.50	-11.44	Peak	VERTICAL
4	301.42	23.33	13.76	37.09	46.00	-8.91	Peak	VERTICAL
5	501.18	15.52	18.29	33.81	46.00	-12.19	Peak	VERTICAL
6	833.32	13.99	23.97	37.96	46.00	-8.04	Peak	VERTICAL

Test mode:	Transmitting (802.11a 36CH)	Horizontal
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		Read		Limit	Over		
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Pol/Phase
1	pp	56.79	30.28	6.33	36.61	40.00	-3.39 Peak
2		109.03	26.23	10.22	36.45	43.50	-7.05 Peak
3		201.39	28.75	8.53	37.28	43.50	-6.22 Peak
4		244.23	24.24	11.87	36.11	46.00	-9.89 Peak
5		312.18	20.37	14.03	34.40	46.00	-11.60 Peak
6		801.79	14.65	22.67	37.32	46.00	-8.68 Peak

Simultaneous transmission of 2.4G WiFi and 5G WiFi only reflects a set of worst test results.

Transmitter Emission above 1GHz

Test mode: 802.11a(6Mbps)				Test channel:		36 CH	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
7236	50.96	1.18	52.14	74	-21.86	peak	H
10360	47.94	2.26	50.20	74	-23.80	peak	H
10360	32.64	2.26	34.90	54	-19.10	AVG	H
15540	48.20	3.75	51.95	74	-22.05	peak	H
15540	33.51	3.75	37.26	54	-16.74	AVG	H
7236	50.79	1.18	51.97	74	-22.03	peak	V
10360	50.08	2.26	52.34	74	-21.66	peak	V
10360	32.26	2.26	34.52	54	-19.48	AVG	V
15540	40.86	3.75	44.61	74	-29.39	peak	V
15540	33.15	3.75	36.90	54	-17.10	AVG	V

Test mode: 802.11a(6Mbps)				Test channel:		48 CH	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		H/V
7386	50.02	1.66	51.68	74	-22.32	peak	H
10480	49.06	2.31	51.37	74	-22.63	peak	H
10480	31.78	2.31	34.09	54	-19.91	AVG	H
15720	49.87	3.79	53.66	74	-20.34	peak	H
15720	31.77	3.79	35.56	54	-18.44	AVG	H
7386	50.36	1.66	52.02	74	-21.98	peak	V
10480	50.25	2.31	52.56	74	-21.44	peak	V
10480	31.09	2.31	33.40	54	-20.60	AVG	V
15720	41.68	3.79	45.47	74	-28.53	peak	V
15720	32.43	3.79	36.22	54	-17.78	AVG	V

Remark:

- 1) The 802.11a 6Mbps of rate is the worst case, only the worst data recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor
- 3) Scan from 9kHz to 40GHz, The disturbance above 18GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

8 Photographs - EUT Test Setup

8.1 Radiated Spurious Emission

9kHz~30MHz:



30MHz~1GHz:



Above 1GHz:



8.2 Conducted Emission



9 Photographs - EUT Constructional Details

Refer to PHOTOGRAPHS OF EUT for CQASZ20220200210E-01.

*** End of Report ***