

Report No.: XEWA2306000055RG04

Rev.: 01

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TEST REPORT

Application No.: XEWA2306000055RG

Applicant: Quectel Wireless Solutions Co., Ltd.

Address of Applicant: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Manufacturer: Quectel Wireless Solutions Co., Ltd.

Address of Manufacturer: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

EUT Description: Wi-Fi & Bluetooth Module

Model No.: FC66E

Trade Mark: Quectel

FCC ID: XMR2023FC66E

Standards: FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart E

Date of Receipt: 2023/03/03 (for original report XEWA2302000005RG04)

Date of Test: 2023/03/06 to 2023/05/16 (for original report XEWA2302000005RG04)
2023/06/29 to 2023/07/15 (for new report XEWA2306000055RG04)

Date of Issue: 2023/07/20

Test Result :	PASS *
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* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Authorized Signature:



Peter Tan
Regulatory Technical Manager



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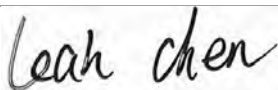
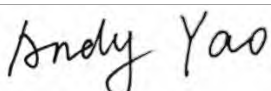
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023/07/20		Original

Prepared By	 (Leah Chen) / Test Engineer
Checked By	 (Andy Yao) / Reviewer



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2 Test Summary

Test Item	Band ^[1]	FCC rules No.	Test Requirements	Test Result	Result
Antenna Requirement	--	15.203/15.407(a)	--	Clause 4.1	PASS
26dB Emission Bandwidth	Band I	15.407(a)(1)	No limit.	Clause 4.5	For Report Purpose
	Band II-A	15.407(a)(2)			
	Band II-C	15.407(a)(2)			
6dB Emission Bandwidth	Band III	15.407(e)	≥ 500 kHz.	Clause 4.6	PASS
99% Occupied Bandwidth	Band I	KDB 789033 D02§ D	No limit.	Clause 4.7	For Report Purpose
	Band II-A				
	Band II-C				
	Band III				
Duty Cycle	Band I Band II-A Band II-C Band III	--	No limit.	Clause 4.3	For Report Purpose
Maximum Conducted Output Power	Band I	15.407(a)(iv)	< 250mW	Clause 4.4	PASS
	Band II-A	15.407(a)(2)	<MIN{250mW, 11dBm+10*lg(EBW)}		
	Band II-C	15.407(a)(3)	< 1W		
	Band III	15.407(a)(3)	< 1W		
Maximum Power Spectral Density	Band I	15.407(a)(iv)	<11dBm/MHz	Clause 4.8	PASS
	Band II-A	15.407(a)(2)	<11dBm/MHz*		
	Band II-C	15.407(a)(2)	<11dBm/MHz*		
	Band III	15.407(a)(3)	<30dBm/500KHz*		
Radiated Spurious Emissions	Band I	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.15-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).	Clause 4.9	PASS ^[1]
	Band II-A	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.25-5.35 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS ^[1]
	Band II-C	15.407(b) 15.205/15.209	F<1GHz: §15.209 limit (QP). F≥1GHz & out-restricted: <-27dBm/MHz PK e.i.r.p. (exl. 5.47-5.725 GHz). F≥1GHz & in-restricted: §15.209 limit (AV&PK).		PASS ^[1]



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	Band III	15.407(b) 15.205/15.209	<p>F<1GHz: §15.209 limit (QP) F≥1GHz & out-restricted:(PK) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p> <p>F≥1GHz & in-restricted: §15.209 limit (AV&PK).</p>		PASS ^[1]
Restricted bands around fundamental frequency	Band I Band II-A Band II-C Band III	15.407(b) 15.205/15.209	---	Clause 4.10	PASS
AC Power Line Conducted Emissions	Band I Band II-A Band II-C Band III	15.207	---	Clause 4.2	PASS
Dynamic Frequency Selection	Band II-A Band II-C	15.407	Channel Move Time:10 Seconds	Clause 4.11	PASS
Frequency Stability	Band I Band II-A Band II-C Band III	15.407(g)	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual	N/A	N/A

Note 1:

Band I: 5150-5250MHz

Band II-A: 5250-5350MHz

Band II-C: 5470-5725MHz

Band III: 5725-5850MHz

Remark: *Because directional gain for PSD of 5470-5725MHz and 5725-5850MHz exceeds 6dBi, So PSD limit =PSD limit – (Directional gain – 6dBi).

^[1]"PASS*" There is FCC ID XMR2023FC66E (this model) spot check data. "Pass" refers to FCC ID XMR2023FC66EB (parent model) data.


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Remark:

This test report (Report No.: XEWA2306000055RG04 issue on 2023/07/20) is based on the original test report (Report No.: XEWA2302000005RG04 issue on 2023/05/16).

Introduction section:

Quectel Wireless Solutions Co., Ltd, hereby declares that the test data reuse policy of FCC KDB 484596D01 v01 has been followed and take full responsibility that the test data as referenced form the parent model report FCC ID XMR2023FC66EB represents compliance for the new FCC ID XMR2023FC66E.

Difference section:

Quectel Wireless Solutions Co., Ltd, hereby declares FCC ID XMR2023FC66E (this model) is the variant from FCC ID XMR2023FC66EB (parent model). There is no any other internal difference between them and the change are mounted part of Bluetooth individual antenna which won't affect the WiFi RF portions.

Reference detail section:

Therefore in this report only the items of Power and AC Power Line Conducted Emission were tested, Radiated Spurious Emissions were performed based on the worst case of the original report with report number XEWA2302000005RG04 issue on 2023/05/16 and other test data in this report are based on the previous report with report number XEWA2302000005RG04 issue on 2023/05/16.

Rule part	Equipment class	Reference FCC ID	Type Grant /permissive Change	Reference Report	Variant model FCC ID	Variant model Report
15E	NII	XMR2023FC66EB	Original Grant	XEWA2302000005RG04	XMR2023FC66E	XEWA2306000055RG04

Summary of the Spot check:

Radiated Spurious Emissions test against the variant model based on the worst-case condition from the original model was performed in this filing and the verification test results similar to the original FCC ID. All tests meet FCC technical limits. Detail sport check test result can be found in the variant model report.

Test Item	XMR2023FC66E Worst Result	XMR2023FC66EB Worst Result	Difference(dB)
Radiated Spurious Emissions	55.09	55.66	-0.57



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3 General Information

3.1 Details of Client

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address of Applicant:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd.
Address:	1/F, Unit D, Building 1, Kanghong Orange Science Park, No.137, Keyuan 3rd Road, Fengdong New Town, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Qiang Zhang, Jacky Xue

3.3 Test Facility

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

• **A2LA (Certificate No. 4854.01)**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services (Xi'an) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0095.

IC#: 25613.

• **FCC –Designation Number: CN1337**

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Designation Number: CN1337.

Test Firm Registration Number: 917410



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3.4 General Description of EUT

EUT Description:	Wi-Fi & Bluetooth Module	
Model No.:	FC66E	
Trade Mark:	Quectel	
Hardware Version:	R1.0	
Software Version:	/	
SN:	E1N23AV0F000018	
WLAN Mode Supported:	802.11a:	20 MHz channel bandwidth
	802.11n:	20 MHz / 40 MHz channel bandwidth
	802.11ac:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
	802.11ax:	20 MHz / 40 MHz / 80 MHz / 160 MHz channel bandwidth
Operation Frequency:	5150MHz to 5250MHz	
	5250MHz to 5350MHz	
	5470MHz to 5725MHz	
	5725MHz to 5850MHz	
Modulation Type:	802.11a:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11n:	OFDM (BPSK, QPSK, 16QAM, 64QAM)
	802.11ac:	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
	802.11ax:	OFDM/OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Channel Spacing:	20MHz:	802.11a/n(HT20)/ac(VHT20)/ax(HE20)
	40MHz:	802.11n(HT40)/ac(VHT40)/ax(HE40)
	80MHz:	802.11ac(VHT80)/ax(HE80)
	160MHz:	802.11ac(VHT160)/ax(HE160)
Antenna Type:	<input checked="" type="checkbox"/> External, <input type="checkbox"/> Integrated	
Antenna Gain:	5150MHz to 5250MHz: 3.26dBi(Ant0); 2.66dBi(Ant1);	
	5250MHz to 5350MHz: 3.26dBi(Ant0); 2.61dBi(Ant1);	
	5470MHz to 5725MHz: 4.24dBi(Ant0); 3.93dBi(Ant1);	
	5725MHz to 5850MHz: 4.22dBi(Ant0); 4.22dBi(Ant1);	
Smart System:	Note: The antenna gain are derived from the gain information report provided by the manufacturer.	
	<input type="checkbox"/> SISO	802.11a/n/ac/ax
	<input checked="" type="checkbox"/> MIMO	802.11n/ac/ax: 2Tx & 2Rx
	<input checked="" type="checkbox"/> Diversity	802.11a: 2Tx & 2Rx



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TPC Function:	<input checked="" type="checkbox"/> Support, <input type="checkbox"/> Not Support	
DFS Function:	<input type="checkbox"/> Master	
	<input type="checkbox"/> Slave with radar detection	<input checked="" type="checkbox"/> Slave without radar detection
RF Cable:	1.5dB	
Remark: As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.		

Antenna Information					
	Brand Name	Model Name	Operation Frequency	Peak Gain	Type
Ant 0	HIGH-TEK HARNESS ENTERPRISE	F7G280	5150MHz to 5250MHz	3.26dBi	PIFA Antenna
			5250MHz to 5350MHz	3.26dBi	
			5470MHz to 5725MHz	4.24dBi	
			5725MHz to 5850MHz	4.22dBi	
Ant 1	HIGH-TEK HARNESS ENTERPRISE	F7G250	5150MHz to 5250MHz	2.66dBi	PIFA Antenna
			5250MHz to 5350MHz	2.61dBi	
			5470MHz to 5725MHz	3.93dBi	
			5725MHz to 5850MHz	4.22dBi	



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Remark:

In FCC 15.31, for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table, and the selected channel to perform the test as below:

Frequency range over which device operates	Number of Measurement Frequencies Required	Location of Measurement Frequency in Band of Operation
1 MHz or less	1	centre
1 MHz to 10 MHz	2	1 near high end, 1 near low end
Greater than 10 MHz	3	1 near high end, 1 near centre

For UNII Band I:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac/ax 80MHz	The Middle channel	5210



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For UNII Band II-A:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5260
	The Middle channel	5280
	The Highest channel	5320
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac/ax 80MHz	The Middle channel	5290
IEEE 802.11ac/ax 160MHz	The Middle channel	5250

For UNII Band II-C:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5510
	The Middle channel	5550
	The Highest channel	5670
IEEE 802.11ac/ax 80MHz	The Middle channel	5530
IEEE 802.11ac/ax 160MHz	The Middle channel	5570

For UNII Band III:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac/ax 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825
IEEE 802.11n/ac/ax 40MHz	The Lowest channel	5755
	The Highest channel	5795
IEEE 802.11ac/ax 80MHz	The Middle channel	5775



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3.5 Test Environment and Mode

Environment Parameter	96~101 kPa Selected Values During Tests	
Relative Humidity	40-60 % RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~25	2.0
Remark: NV: Normal Voltage NT: Normal Temperature		

3.6 Description of Support Units

Description	Manufacturer	Model No.
Router	Netgear	R7800
Mother board*	Quectel	5G-EVB Q1-A7138
Adapter*	Shenzhen Keyu Power Supply Techology Co.,Ltd	KA1801A-0503000DE
Remark: the information with "*" are provided by client.		

3.7 Worst-case configuration and mode

Low data rate was used to test on antenna port conducted tests and radiated spurious emissions since it has the highest maximum power. Following are the worst-case data rates set for test:

Modulation Type	SISO - Data Rate	CDD/MIMO - Data Rate
802.11a	/	12 Mbps
802.11n (HT 20)	/	MCS0 (13 Mbps)
802.11n (HT 40)	/	MCS0 (27 Mbps)
802.11ac (VHT 20)	/	MCS0 (13 Mbps)
802.11ac (VHT 40)	/	MCS0 (27 Mbps)
802.11ac (VHT 80)	/	MCS0 (58.5 Mbps)
802.11ac (VHT 160)	/	MCS0 (117 Mbps)
802.11ax (HE 20)	/	MCS0 (16 Mbps)
802.11ax (HE 40)	/	MCS0 (32 Mbps)
802.11ax (HE 80)	/	MCS0 (68 Mbps)
802.11ax (HE 160)	/	MCS0 (136 Mbps)



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4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15 Section 15.203
<p>The antenna is External antenna on the main PCB and no consideration of replacement.</p> <p>The best case gain of the antenna is</p> <p>5150MHz to 5250MHz: 3.26dBi(Ant0); 2.66dBi(Ant1);*</p> <p>5250MHz to 5350MHz: 3.26dBi(Ant0); 2.61dBi(Ant1);*</p> <p>5470MHz to 5725MHz: 4.24dBi(Ant0); 3.93dBi(Ant1);*</p> <p>5725MHz to 5850MHz: 4.22dBi(Ant0); 4.22dBi(Ant1);*</p> <p><i>*Note:</i></p> <p><i>The antenna gain are derived from the gain information report provided by the manufacturer.</i></p> <p><i>Remark:</i></p> <p><i>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</i></p>	



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Cyclic Delay Diversity (CDD) System:

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

If all antennas have the same gain, G_{ANT} , Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

- For power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

For power, the directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

For PSD, the directional gain calculation is following F2)f)ii) of KDB 662911 D01 v02r01.

The Power and PSD limit should be modified if the directional gain of eut is over 6dbi.

The EUT supports CDD System.

Unequal antenna gain:

Operation Frequency	ANT Gain0 (dBi)	ANT Gain1 (dBi)	Directional gain For Power (dBi)	Directional gain For PSD (dBi)	Power Limit Reduction (dBm)	PSD Limit Reduction (dBm)
5150MHz to 5250MHz	3.26	2.66	3.26	5.98	0	0
5250MHz to 5350MHz	3.26	2.61	3.26	5.95	0	0
5470MHz to 5725MHz	4.24	3.93	4.24	7.10	0	1.10
5725MHz to 5850MHz	4.22	4.22	4.22	7.23	0	1.23

5150MHz to 5250MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

5250MHz to 5350MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

5470MHz to 5725MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain > 6dBi) =7.10 - 6 = 1.10

5725MHz to 5850MHz:

Power Limit Reduction = Directional gain – 6dBi, (Directional gain < 6dBi) =0

PSD Limit Reduction = Directional gain – 6dBi, (Directional gain > 6dBi) =7.23 - 6 = 1.23



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.207		
Test Method:	ANSI C63.10-2020 Section 6.2		
Test Frequency Range:	150kHz to 30MHz		
Receiver Setup:	RBW = 9kHz, VBW = 30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	<ol style="list-style-type: none"> 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 50Ω/50μH + 5Ω 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 C63.10-2020 on conducted measurement. 		



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Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Refer to section 3.7 for details. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass



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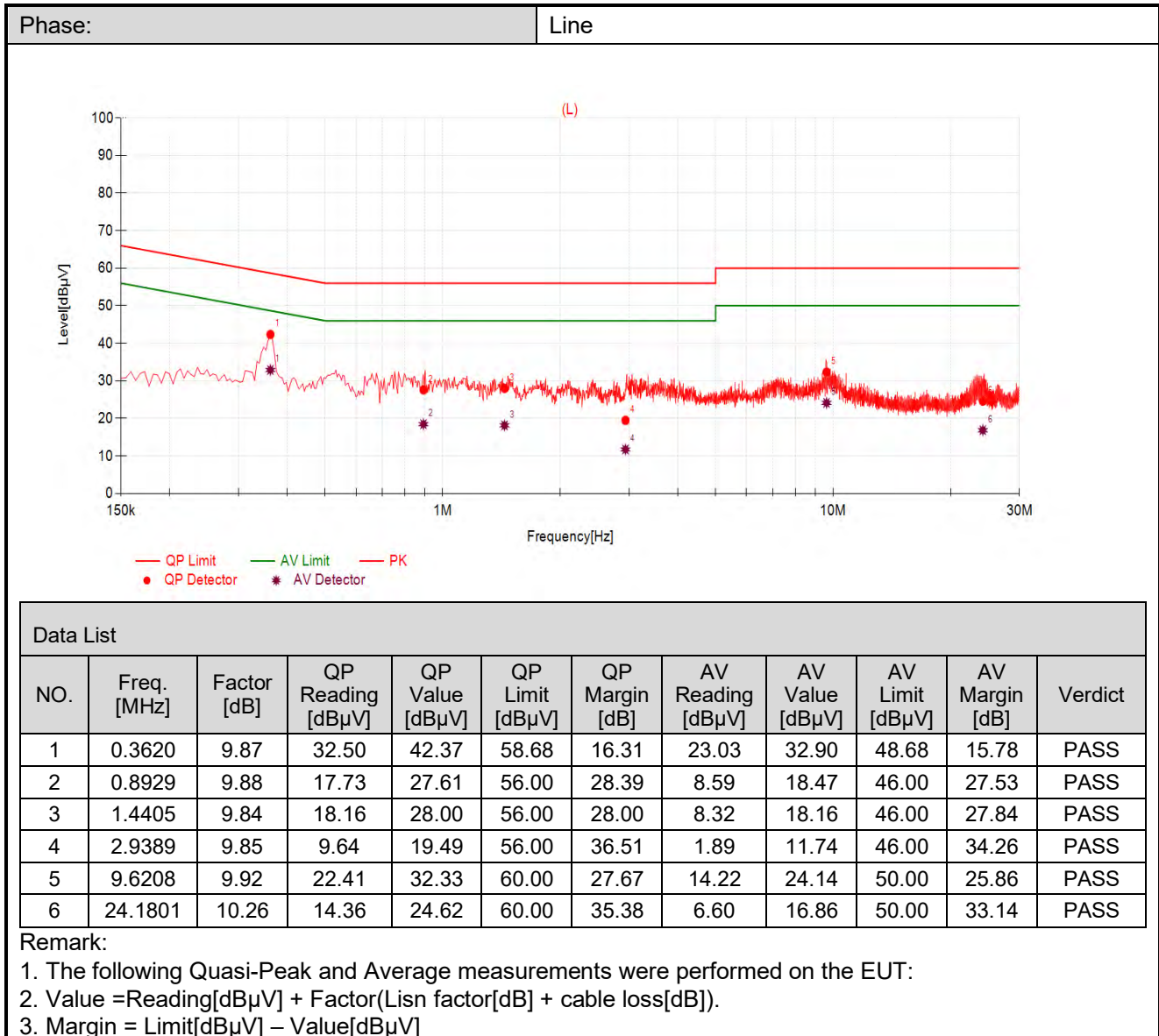
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Measurement Data

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.

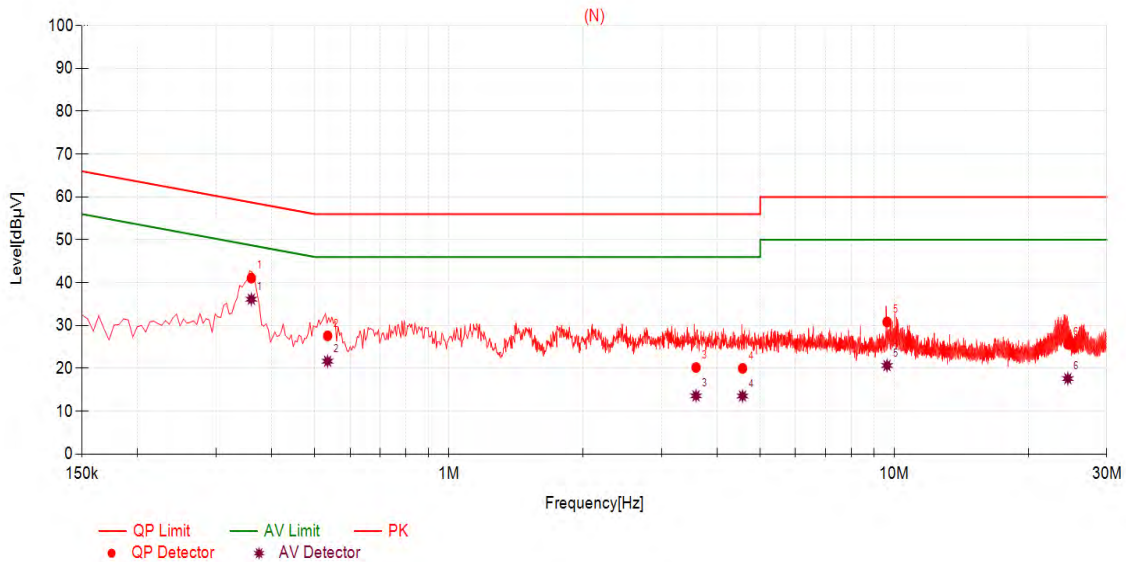


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Phase: Neutral



Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBμV]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.3600	9.79	31.28	41.07	58.73	17.66	26.36	36.15	48.73	12.58	PASS
2	0.5340	9.86	17.75	27.61	56.00	28.39	11.82	21.68	46.00	24.32	PASS
3	3.5882	9.96	10.25	20.21	56.00	35.79	3.63	13.59	46.00	32.41	PASS
4	4.5642	9.98	10.04	20.02	56.00	35.98	3.58	13.56	46.00	32.44	PASS
5	9.6330	10.06	20.77	30.83	60.00	29.17	10.62	20.68	50.00	29.32	PASS
6	24.5339	10.31	15.31	25.62	60.00	34.38	7.31	17.62	50.00	32.38	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Value = Reading[dBμV] + Factor(Lisn factor[dB] + cable loss[dB]).
3. Margin = Limit[dBμV] – Value[dBμV]



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4.3 Duty Cycle

The detailed test data see: **Appendix**



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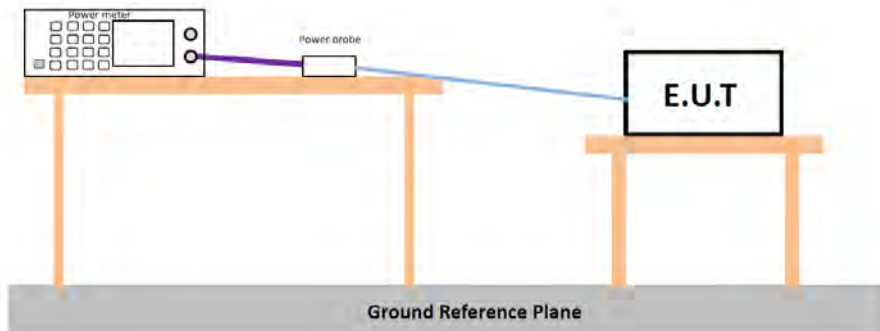
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4.4 Conducted Output Power

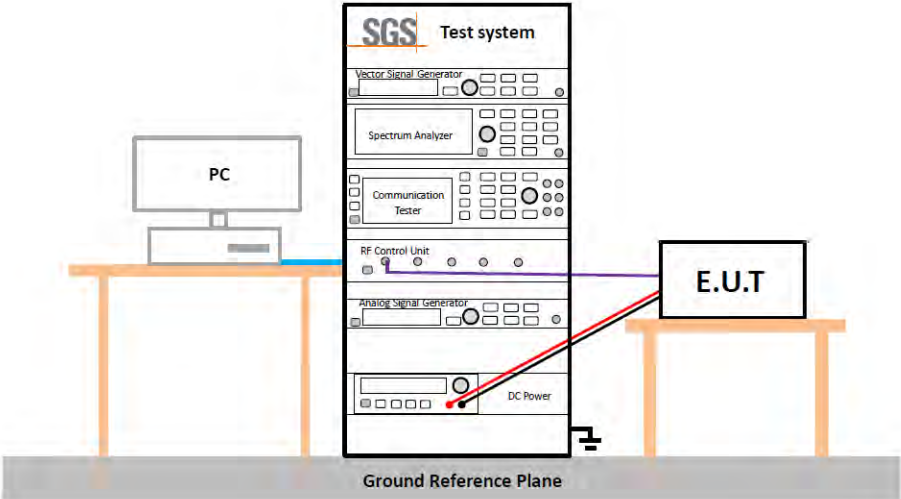
Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10-2020 Section 12.4.3.2	
Test Setup:	<div></div> <p>* Test with power meter (Detector function: Average) Method PM-G is measurement using a gated RF average power meter. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.</p>	
Test Instruments:	Refer to section 6 for details.	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Refer to section 3.7 for details.	
Limit:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(23.98dBm)
	5250-5350MHz	The lesser of 250mW(23.98dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(23.98dBm) or 11+ 10logB
	5725-5850MHz	Not exceed 1W(30dBm)
	*Where B is the 26dB emission bandwidth in MHz	
Test Results:	Pass	
The detailed test data see: Appendix		

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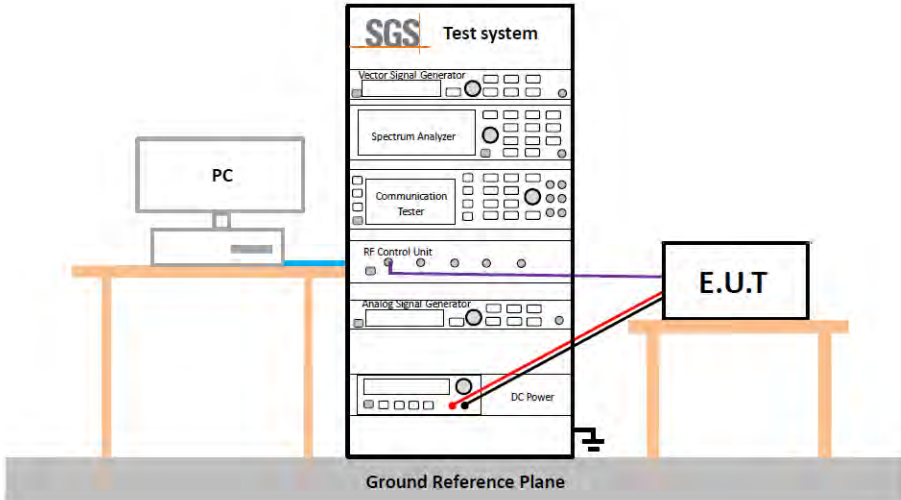
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4.5 26dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a), KDB 789033 D02& C
Test Method:	ANSI C63.10-2020 Section 12.5.2
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix	

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4.6 6dB Emission Bandwidth

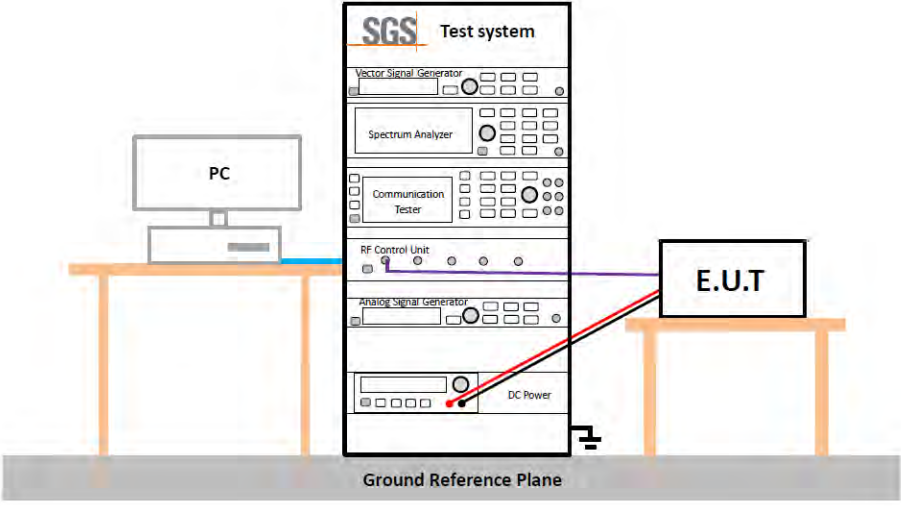
Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10-2020 Section 12.5.1	
Test Setup:		
Test Instruments:	Refer to section 6 for details.	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Refer to section 3.7 for details.	
Limit:	Frequency Band	Limit
	5725-5850MHz	At lease 500kHz
Test Results:	Pass	
The detailed test data see: Appendix		

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4.7 99% Occupied Bandwidth

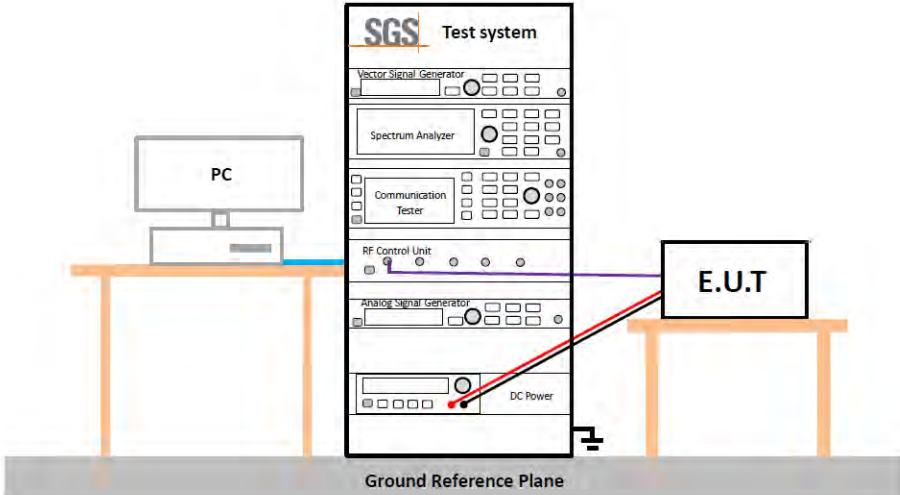
Test Requirement:	KDB 789033 D02§ D
Test Method:	ANSI C63.10-2020 Section 12.5.3
Test Setup:	
Instruments Used:	Refer to section 6 for details.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Refer to section 3.7 for details.
Limit:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix	

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4.8 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10-2020 Section 12.6 KDB 789033 D02 v02r01, Section F.	
Test Setup:		
Instruments Used:	Refer to section 6 for details.	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Refer to section 3.7 for details.	
Limit:	Frequency Band	Limit
	5150-5250MHz	The power spectral density less than 11dBm/1MHz
	5250-5350MHz	The power spectral density less than 11dBm/1MHz
	5470-5725MHz	The power spectral density less than 11dBm/1MHz
	5725-5850MHz	The power spectral density less than <30dBm/500KHz
Test Results:	Pass	
The detailed test data see: Appendix		

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4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.205/15.209/15.407(b)
Test Method:	ANSI C63.10-2020 Section 6.4 / 6.5 / 6.6
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Test frequency:	9kHz ~ 40GHz(or 10 Harmonic)

Test Setup:

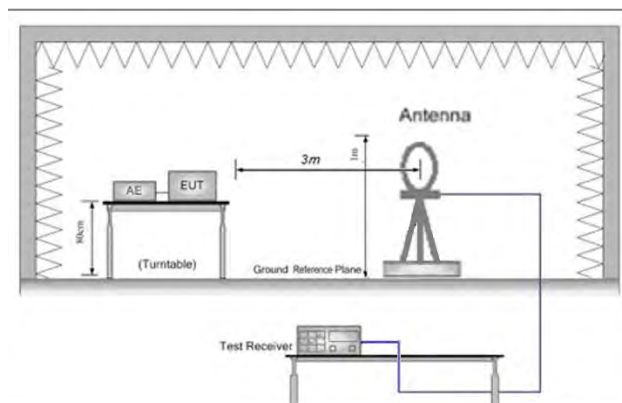


Figure 1. 9kHz to 30MHz

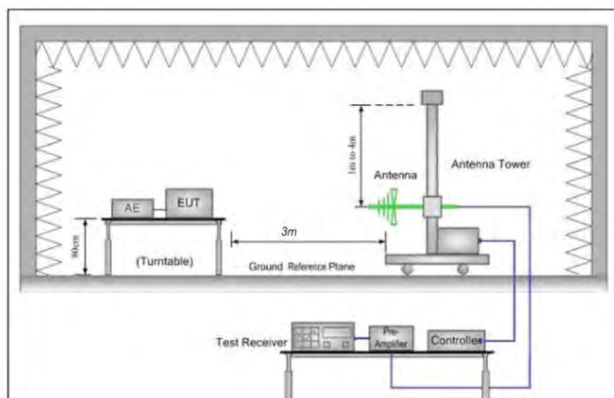


Figure 1. 30MHz to 1GHz

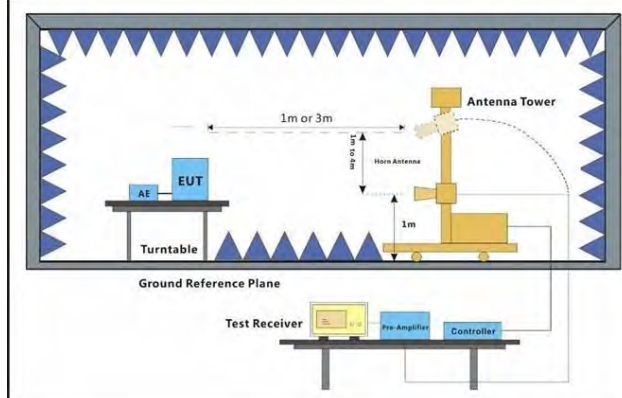


Figure 2. Above 1 GHz

Test Procedure:

- For below 1GHz test, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz test, the EUT was placed on the top of a rotating table 1.5 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. (Distance from antenna to EUT is 1m for measurements >18GHz).
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.



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	<p>d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</p> <p>e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</p> <p>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>g. Test the EUT in the outermost channels.</p> <p>h. 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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p> <p>j. The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported</p> <p>k. The disturbance above 18GHz was very low, and the harmonics were the highest point could be found when testing, so only the harmonics had been displayed.</p> <p>l. At a measurement distance of 1 meter the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54 \text{ dB}$.</p>
Test Configuration:	<p>Measurements below 30MHz</p> <ul style="list-style-type: none"> • RBW = 10 kHz • VBW = 30 kHz • Detector = Peak & Average & Quasi-peak • Trace mode = max hold <p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW $\geq 3 \text{ MHz}$ • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.



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Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: Appendix	



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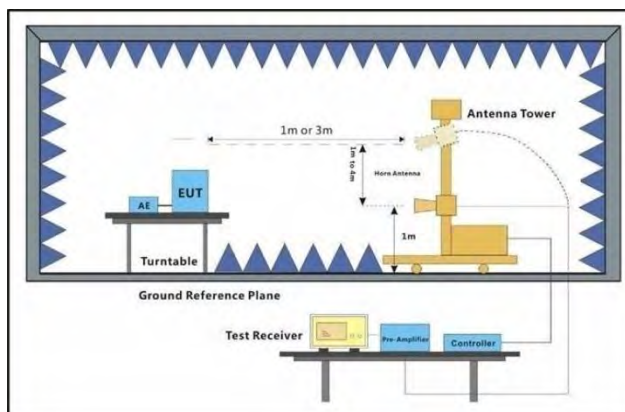
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4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15 Section 15.205/15.209/15.407(b)		
Test Method:	ANSI C63.10-2020 Section 12.7		
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m)	Remark
	30MHz-88MHz	40.0	Quasi-peak
	88MHz-216MHz	43.5	Quasi-peak
	216MHz-960MHz	46.0	Quasi-peak
	960MHz-1GHz	54.0	Quasi-peak
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test Setup:



Test Procedure:

- The EUT was placed on the top of a rotating table 1.5 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 table 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

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	<p>modulation for lowest and highest channel</p> <p>g. Test the EUT in the outermost channels.</p> <p>h. 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.</p> <p>i. Repeat above procedures until all frequencies measured was complete.</p>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> • RBW = 120 kHz • VBW = 300 kHz • Detector = Quasi-peak • Trace mode = max hold <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW \geq 3 MHz • Detector = Peak • Sweep time = auto • Trace mode = max hold <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> • RBW = 1 MHz • VBW = 10Hz, when duty cycle is no less than 98 percent. • VBW \geq 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
Final Test Mode:	Refer to section 3.7 for details.
Instruments Used:	Refer to section 6 for details.
Test Results:	Pass
The detailed test data see: Appendix	



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4.11 Dynamic Frequency Selection

4.11.1 DFS Overview

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not required	Yes
<i>DFS Detection Threshold</i>	Yes	Not required	Yes
<i>Channel Availability Check Time</i>	Yes	Not required	Not required
<i>U-NII Detection Bandwidth</i>	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required
Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

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4.11.2 DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP \geq 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
<p>Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.</p> <p>Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.</p> <p>Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.</p>	



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4.11.3 RADAR TEST WAVEFORMS

Table 5 – Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					



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Table 5a - Pulse Repetition Intervals Values for Test A

Pulse Repetition Frequency Number	Pulse Repetition Frequency (Pulses Per Second)	Pulse Repetition Interval (Microseconds)
1	1930.5	518
2	1858.7	538
3	1792.1	558
4	1730.1	578
5	1672.2	598
6	1618.1	618
7	1567.4	638
8	1519.8	658
9	1474.9	678
10	1432.7	698
11	1392.8	718
12	1355	738
13	1319.3	758
14	1285.3	778
15	1253.1	798
16	1222.5	818
17	1193.3	838
18	1165.6	858
19	1139	878
20	1113.6	898
21	1089.3	918
22	1066.1	938
23	326.2	3066

The aggregate is the average of the percentage of successful detections of Short Pulse Radar Types 1-4. For example, the following table indicates how to compute the aggregate of percentage of successful detections.

Radar Type	Number of Trials	Number of Successful Detections	Minimum Percentage of Successful Detection
1	35	29	82.9%
2	30	18	60%
3	30	27	90%
4	50	44	88%
Aggregate $(82.9\% + 60\% + 90\% + 88\%) / 4 = 80.2\%$			



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Table 6 – Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 7 – Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

4.11.4 Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

The detailed test data see: **Appendix**



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

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$ GHz
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 0.2\%$
4	RF conducted power	± 0.21 dB
5	RF power density	± 2.84 dB
6	Conducted Spurious emissions	± 0.75 dB
7	Conduction Emission	± 3.0 dB (150kHz to 30MHz)
8	Radiated Emission	± 4.6 dB (9kHz to 30MHz)
		± 4.9 dB (30MHz to 1GHz)
		± 4.9 dB (1GHz to 6GHz)
		± 4.7 dB (6GHz to 18GHz)
		± 5.26 dB (Above 18GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{CISPR/ETSI}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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6 Equipment List

RF Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
MXA signal analyzer	Agilent	N9020A	XAW01-06-07	2023/02/16	2024/02/15
MXG vector signal Generator	Agilent	N5182B	XAW01-07-16	2023/02/16	2024/02/15
Measurement Software	Tonscend	JS1120-3 (3.2.18)	XAW02-14-01	NCR	NCR
RF control unit	Tonscend	JS0806-2	XAW03-37-01	NCR	NCR
Power Meter	Anritsu	ML2495A	XAW01-25-03	2023/02/16	2024/02/15
Power Supply	Agilent	66311b	XAW01-17-01	2023/02/16	2024/02/15
Temperature and humidity meter	MingGao	T809	XAW01-01-16	2022/09/18	2023/09/17

CE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/dd)	Cal.Due date (yyyy/mm/dd)
Shielding Room	Brilliant-emc	N/A	XAW04-03-01	N/A	N/A
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07
Artificial network*	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2022/06/30	2023/06/29
				2023/06/30	2024/06/29
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-07-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Artificial network*	ROHDE&SCHWARZ	ENV216	XAW01-04-02	2022/06/30	2023/06/29
				2023/06/30	2024/06/29

Note*: This equipment is not used on 2023/06/30.



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RSE Test System					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy/mm/d d)	Cal.Due date (yyyy/mm/d d)
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2021/09/09	2024/09/08
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2023/02/16	2024/02/15
Spectrum Analyzer	ROHDE &SCHWARZ	FSV3044	XAW01-13-05	2022/05/24	2023/05/23
				2023/05/15	2024/05/14
Test receiver	ROHDE &SCHWARZ	ESR	XAW01-08-01	2022/09/08	2023/09/07
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2022/07/28	2024/07/27
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2022/07/28	2024/07/27
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2022/07/23	2024/07/22
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP9K3G32	XAW01-41-01	2022/05/24	2023/05/23
				2023/05/15	2024/05/14
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2022/09/14	2023/09/13
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2022/09/14	2023/09/13
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2022/09/14	2023/09/13
Temperature and humidity meter	MingGao	TH101B	XAW01-01-02	2022/09/18	2023/09/17
Radio communication analyzer	ROHDE&SCH WARZ	CMW 500	XAW01-03-02	2023/02/16	2024/02/15
Measurement Software	Tonscend	TS+ V4.0.0.0	XAW02-05-01	NCR	NCR
Loop Antenna	Schwarzbeck	FMZB 1519B	XAW01-48-02	2022/05/26	2024/05/25



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7 Photographs - Setup Photos

Refer to Appendix A.2 WLAN Setup Photos.



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Appendix

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Emission Bandwidth Test Result

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Verdict
11a-CDD	Ant1	5180	18.800	5170.440	5189.240	For Report Purpose
	Ant0	5180	19.520	5170.120	5189.640	
	Ant1	5200	20.520	5190.000	5210.520	
	Ant0	5200	19.080	5190.520	5209.600	
	Ant1	5240	18.680	5230.560	5249.240	
	Ant0	5240	19.640	5229.920	5249.560	
	Ant1	5260	18.440	5250.880	5269.320	
	Ant0	5260	19.040	5250.560	5269.600	
	Ant1	5280	19.720	5270.400	5290.120	
	Ant0	5280	18.960	5270.520	5289.480	
	Ant1	5320	21.480	5309.400	5330.880	
	Ant0	5320	18.520	5310.720	5329.240	
	Ant1	5500	18.840	5490.640	5509.480	
	Ant0	5500	22.400	5490.040	5512.440	
	Ant1	5580	19.120	5570.360	5589.480	
	Ant0	5580	19.000	5570.520	5589.520	
	Ant1	5700	19.840	5689.640	5709.480	
	Ant0	5700	19.120	5690.480	5709.600	
	Ant1	5745	18.520	5735.680	5754.200	
	Ant0	5745	19.840	5734.840	5754.680	
	Ant1	5785	18.440	5775.840	5794.280	
	Ant0	5785	19.200	5775.400	5794.600	
	Ant1	5825	19.360	5815.520	5834.880	
	Ant0	5825	19.840	5815.000	5834.840	
11n20MIMO	Ant1	5180	21.600	5169.120	5190.720	
	Ant0	5180	20.120	5169.800	5189.920	
	Ant1	5200	21.600	5188.680	5210.280	
	Ant0	5200	20.040	5189.880	5209.920	
	Ant1	5240	19.840	5230.000	5249.840	
	Ant0	5240	20.200	5229.880	5250.080	
	Ant1	5260	20.120	5250.160	5270.280	
	Ant0	5260	20.320	5249.960	5270.280	
	Ant1	5280	20.760	5269.960	5290.720	
	Ant0	5280	19.640	5270.200	5289.840	
	Ant1	5320	21.880	5309.080	5330.960	
	Ant0	5320	20.000	5309.960	5329.960	
	Ant1	5500	20.480	5490.080	5510.560	
	Ant0	5500	20.320	5489.880	5510.200	
	Ant1	5580	19.920	5570.040	5589.960	
	Ant0	5580	20.360	5569.720	5590.080	
	Ant1	5700	20.840	5688.960	5709.800	
	Ant0	5700	20.720	5689.440	5710.160	
	Ant1	5745	19.920	5735.000	5754.920	
	Ant0	5745	20.720	5734.400	5755.120	
	Ant1	5785	19.680	5775.240	5794.920	
	Ant0	5785	19.840	5775.120	5794.960	
	Ant1	5825	20.520	5814.720	5835.240	
	Ant0	5825	21.080	5814.480	5835.560	



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11n40MIMO	Ant1	5190	39.040	5170.560	5209.600
	Ant0	5190	39.520	5169.840	5209.360
	Ant1	5230	38.640	5210.800	5249.440
	Ant0	5230	39.360	5210.320	5249.680
	Ant1	5270	39.280	5250.560	5289.840
	Ant0	5270	38.720	5250.560	5289.280
	Ant1	5310	39.520	5290.320	5329.840
	Ant0	5310	39.360	5290.240	5329.600
	Ant1	5510	39.040	5490.320	5529.360
	Ant0	5510	39.040	5490.320	5529.360
	Ant1	5550	39.600	5529.840	5569.440
	Ant0	5550	38.960	5530.400	5569.360
	Ant1	5670	39.360	5650.160	5689.520
	Ant0	5670	40.000	5649.600	5689.600
	Ant1	5755	39.200	5735.240	5774.440
	Ant0	5755	40.480	5734.520	5775.000
	Ant1	5795	39.280	5775.320	5814.600
	Ant0	5795	39.280	5775.480	5814.760
11ac20MIMO	Ant1	5180	22.120	5168.320	5190.440
	Ant0	5180	19.800	5170.160	5189.960
	Ant1	5200	21.760	5188.520	5210.280
	Ant0	5200	21.200	5189.360	5210.560
	Ant1	5240	20.440	5229.920	5250.360
	Ant0	5240	20.240	5229.720	5249.960
	Ant1	5260	20.240	5250.160	5270.400
	Ant0	5260	20.480	5249.880	5270.360
	Ant1	5280	20.040	5269.960	5290.000
	Ant0	5280	20.000	5269.960	5289.960
	Ant1	5320	20.600	5309.600	5330.200
	Ant0	5320	19.840	5310.080	5329.920
	Ant1	5500	20.200	5489.800	5510.000
	Ant0	5500	19.880	5489.960	5509.840
	Ant1	5580	20.400	5569.68	5581.20
	Ant0	5580	20.240	5569.720	5589.960
	Ant1	5700	20.840	5689.320	5710.160
	Ant0	5700	20.160	5689.880	5710.040
	Ant1	5745	19.920	5734.800	5754.720
	Ant0	5745	20.800	5734.480	5755.280
	Ant1	5785	19.720	5775.320	5795.040
	Ant0	5785	20.040	5775.080	5795.120
	Ant1	5825	20.200	5815.160	5835.360
	Ant0	5825	20.120	5814.920	5835.040
11ac40MIMO	Ant1	5190	39.120	5170.240	5209.360
	Ant0	5190	39.440	5170.160	5209.600
	Ant1	5230	39.040	5210.480	5249.520
	Ant0	5230	38.720	5210.480	5249.200
	Ant1	5270	39.040	5250.560	5289.600
	Ant0	5270	39.360	5250.240	5289.600
	Ant1	5310	41.200	5289.600	5330.800
	Ant0	5310	39.520	5290.400	5329.920
	Ant1	5510	39.280	5490.080	5529.360
	Ant0	5510	39.280	5490.160	5529.440
	Ant1	5550	39.440	5530.240	5569.680
	Ant0	5550	39.440	5530.240	5569.680



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	Ant0	5550	39.440	5530.160	5569.600
	Ant1	5670	42.000	5648.160	5690.160
	Ant0	5670	40.400	5649.360	5689.760
	Ant1	5755	39.600	5735.000	5774.600
	Ant0	5755	40.080	5734.760	5774.840
	Ant1	5795	39.040	5775.720	5814.760
	Ant0	5795	40.080	5774.840	5814.920
11ac80MIMO	Ant1	5210	83.200	5167.920	5251.120
	Ant0	5210	80.960	5169.520	5250.480
	Ant1	5290	80.960	5249.840	5330.800
	Ant0	5290	80.800	5249.520	5330.320
	Ant1	5530	79.360	5489.840	5569.200
	Ant0	5530	81.440	5489.200	5570.640
	Ant1	5610	80.480	5570.640	5651.120
	Ant0	5610	81.440	5569.360	5650.800
	Ant1	5775	81.120	5734.680	5815.800
11ac160MIMO	Ant0	5775	80.320	5734.840	5815.160
	Ant1	5250	163.520	5168.080	5331.600
	Ant0	5250	162.240	5168.720	5330.960
	Ant1	5570	163.840	5487.760	5651.600
11ax20MIMO	Ant0	5570	161.920	5489.040	5650.960
	Ant1	5180	23.000	5168.440	5191.440
	Ant0	5180	20.520	5169.680	5190.200
	Ant1	5200	21.000	5189.400	5210.400
	Ant0	5200	20.560	5189.640	5210.200
	Ant1	5240	20.680	5229.720	5250.400
	Ant0	5240	20.600	5229.640	5250.240
	Ant1	5260	20.360	5250.040	5270.400
	Ant0	5260	20.600	5249.640	5270.240
	Ant1	5280	20.600	5269.600	5290.200
	Ant0	5280	20.840	5269.400	5290.240
	Ant1	5320	20.680	5309.680	5330.360
	Ant0	5320	20.920	5309.400	5330.320
	Ant1	5500	21.280	5489.120	5510.400
	Ant0	5500	20.640	5489.800	5510.440
	Ant1	5580	20.640	5569.720	5590.360
	Ant0	5580	21.280	5569.440	5590.720
	Ant1	5700	21.000	5689.360	5710.360
	Ant0	5700	21.440	5688.640	5710.080
	Ant1	5745	20.440	5734.720	5755.160
	Ant0	5745	20.560	5734.600	5755.160
	Ant1	5785	20.320	5774.920	5795.240
	Ant0	5785	20.400	5774.880	5795.280
	Ant1	5825	20.560	5814.800	5835.360
	Ant0	5825	20.960	5814.760	5835.720
11ax40MIMO	Ant1	5190	40.560	5169.680	5210.240
	Ant0	5190	40.160	5169.920	5210.080
	Ant1	5230	39.680	5210.160	5249.840
	Ant0	5230	39.840	5210.080	5249.920
	Ant1	5270	39.840	5250.160	5290.000
	Ant0	5270	39.760	5250.160	5289.920
	Ant1	5310	40.160	5289.760	5329.920
	Ant0	5310	39.680	5290.080	5329.760



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	Ant1	5510	39.840	5489.840	5529.680
	Ant0	5510	39.840	5489.840	5529.680
	Ant1	5550	40.160	5529.760	5569.920
	Ant0	5550	39.840	5530.080	5569.920
	Ant1	5670	40.640	5649.200	5689.840
	Ant0	5670	40.560	5649.760	5690.320
	Ant1	5755	40.320	5734.840	5775.160
	Ant0	5755	40.080	5735.000	5775.080
	Ant1	5795	39.760	5775.000	5814.760
	Ant0	5795	40.240	5775.000	5815.240
11ax80MIMO	Ant1	5210	83.360	5168.560	5251.920
	Ant0	5210	80.800	5169.360	5250.160
	Ant1	5290	80.960	5249.840	5330.800
	Ant0	5290	81.280	5249.360	5330.640
	Ant1	5530	80.800	5489.200	5570.000
	Ant0	5530	81.600	5489.040	5570.640
	Ant1	5610	81.280	5570.160	5651.440
	Ant0	5610	81.440	5569.360	5650.800
	Ant1	5775	80.960	5734.520	5815.480
	Ant0	5775	80.800	5734.360	5815.16
11ax160MIMO	Ant1	5250	162.880	5168.080	5330.960
	Ant0	5250	162.880	5168.400	5331.280
	Ant1	5570	162.240	5488.720	5650.960
	Ant0	5570	162.880	5488.720	5651.600



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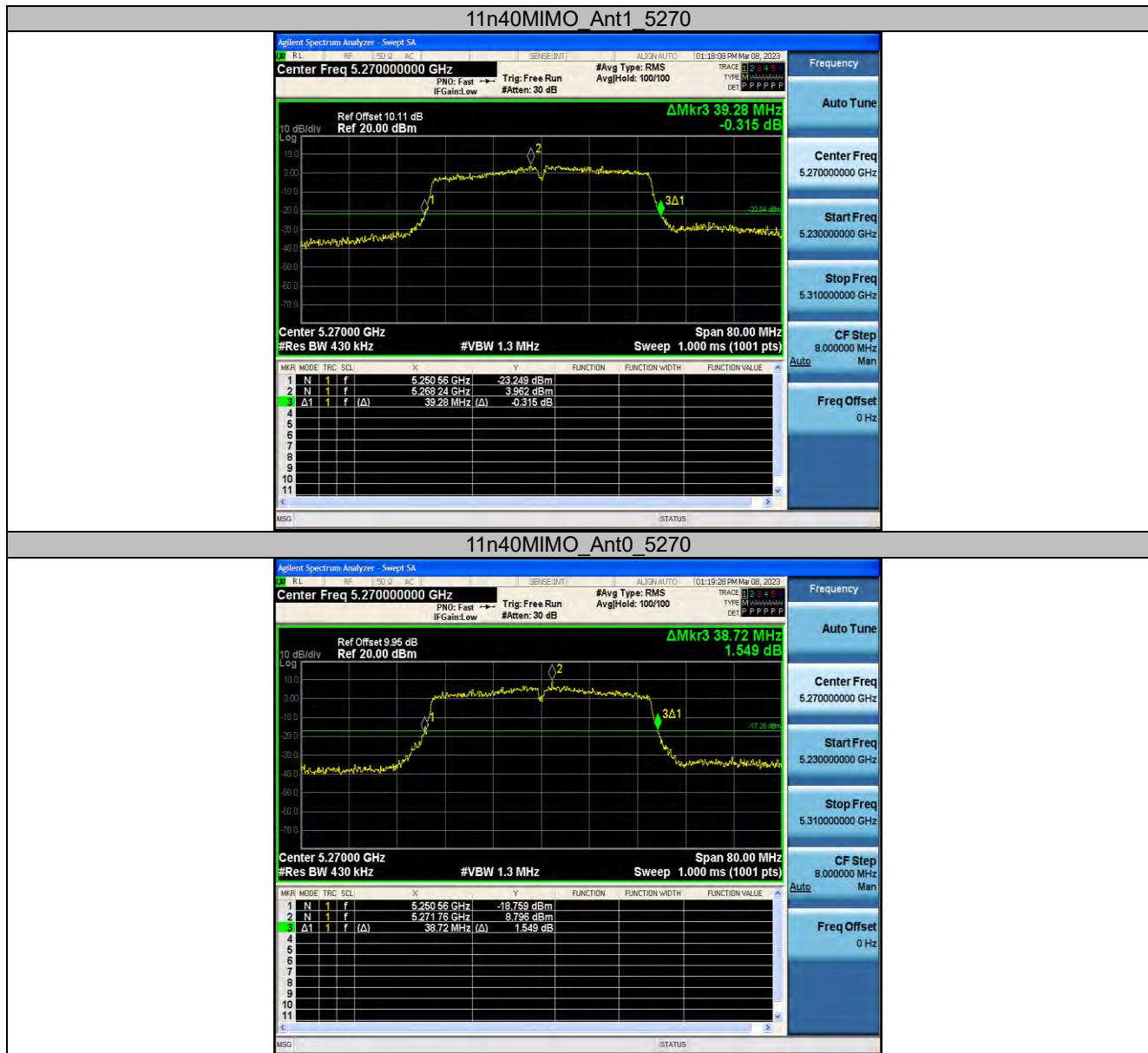
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