

Report No.: SUHR/2021/C000106

Rev.: 01

Page: 1 of 40


TEST REPORT

Application No.: HR/2021/C0001
Applicant: Honor Device Co., Ltd.
Address of Applicant: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No.8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China
Manufacturer: Honor Device Co., Ltd.
Address of Manufacturer: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No.8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China
EUT Description: Smart Phone
Model No.: NTN-LX3
Trade Mark: HONOR
FCC ID: 2AYGCNTN-LX3
Standards: 47 CFR FCC Part 2, Subpart J
47 CFR FCC Part 15, Subpart E
Date of Receipt: 2021/12/8
Date of Test: 2021/12/15 to 2021/12/18
Date of Issue: 2021/12/18

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:



Panta Sun
Wireless Laboratory Manager



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 2 of 40

1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021/12/18		Original

Prepared By	Weller Liu
	(Weller Liu) / Engineer
Checked By	Well Wei
	(Well Wei) / Reviewer



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 3 of 40

2 Test Summary

Test Item	Band ^[1]	FCC rules	Test Requirements	Test Result	Result
Antenna Requirement	--	15.203/407(a)	--	Clause 4.1	Refer to HR/2021/1001405-01
26dB Emission Bandwidth	Band I	15.407(a)(1)	No limit.	Clause 4.5	Refer to HR/2021/1001405-01
	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	Refer to HR/2021/1001405-01
99% Occupied Bandwidth	Band I	KDB 789033 D02§ D	No limit.	Clause 4.7	Refer to HR/2021/1001405-01
	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	Refer to HR/2021/1001405-01
Maximum Output Power	Band I	15.407(a)	< 250mW	Clause 4.4	Refer to HR/2021/1001405-01
	Band II-A	15.407(a)(2)	<MIN{250mW, 11dBm+10*lg(EBW)}		
	Band II-C	15.407(a)(2)	< 1W		
	Band III	15.407(a)(3)	< 1W		
Maximum Power Spectral Density	Band I	15.407(a)	<11dBm/MHz	Clause 4.8	Refer to HR/2021/1001405-01
	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		
Unwanted Emissions that fall Out of the Restricted Bands (Radiated)	Band I	15.209 15.407(b)	F<1GHz: §15.209/§7.2.5 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/§7.2.5 limit (AV&PK).	Clause 4.9	PASS
	Band II-A	15.407(b) 15.209	F<1GHz: §15.209/§7.2.5 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/§7.2.5 limit (AV&PK).		PASS
	Band II-C	15.407(b) 15.209	F<1GHz: §15.209/§7.2.5 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/§7.2.5 limit (AV&PK).		PASS
	Band III	15.407(b)	F<1GHz:		PASS



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 4 of 40

		15.209	<p>§15.209/§7.2.5 limit (QP) F≥1GHz & out-restricted:(QP)</p> <p>a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;</p> <p>b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;</p> <p>c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and</p> <p>d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.</p> <p>F≥1GHz & in-restricted: §15.209/§7.2.5 limit (AV&PK).</p>		
Unwanted Emissions in the Restricted Bands (Radiated)	Band I Band II-A Band II-C Band III	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
Frequency Stability	Band I Band II-A Band II-C Band III	15.407(g)	---	Clause 4.11	Refer to HR/2021/1001405-01
Dynamic Frequency Selection	Band II-A Band II-C	47 CFR Part 15, Subpart E 15.407	Channel Move Time:10 Seconds	Clause 4.12	Refer to HR/2021/1001405-01
<p>Note 1 :</p> <p>Band I: 5150-5250MHz</p> <p>Band II-A: 5250-5350MHz</p> <p>Band II-C: 5470-5725MHz</p> <p>Band III: 5725-5850MHz</p>					



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 5 of 40

Remark:

This test report (Report No.: SUHR/2021/C000106) is based on the original test report (Report No.: HR/2021/1001405-01) issued on 2021-05-15.

According to the difference declaration from the applicant, radiation spurious emissions and Conducted Emission are performed based on the worst case of the original report and the other test data can be refereed to the original test report.



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Contents

1	Version	2
2	Test Summary.....	3
3	General Information	7
3.1	Details of Client.....	7
3.2	Test Location.....	7
3.3	Test Facility	7
3.4	General Description of EUT	8
3.5	Test Environment and Mode	11
3.6	Description of Support Units	11
4	Test results and Measurement Data	12
4.1	Antenna Requirement.....	12
4.2	AC Power Line Conducted Emissions	13
4.3	Duty Cycle	17
4.4	Conducted Output Power	18
4.5	26dB Emission Bandwidth	19
4.6	6dB Emission Bandwidth	20
4.7	99% Occupied Bandwidth	21
4.8	Power Spectral Density	22
4.9	Radiated Spurious Emissions	23
4.10	Restricted bands around fundamental frequency	25
4.11	Frequencies Stability.....	27
4.12	Dynamic Frequency Selection	28
4.12.1	DFS Overview.....	28
4.12.2	DFS Detection Thresholds	29
4.12.3	Response Requirements	29
5	Measurement Uncertainty (95% confidence levels, k=2)	30
6	Equipment List	31
7	Photographs - EUT Constructional Details	33



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 7 of 40

3 General Information

3.1 Details of Client

Applicant:	Honor Device Co., Ltd.
Address of Applicant:	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No.8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China
Manufacturer:	Honor Device Co., Ltd.
Address of Manufacturer:	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No.8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China

3.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test engineer:	Weller Liu, King-p Li, Nature Shen, Tizzy Song

3.3 Test Facility

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

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 6336.01.

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

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 0031225543



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3.4 General Description of EUT

EUT Description:	Smart Phone
Model No.:	NTN-LX3
Trade Mark:	HONOR
Hardware Version:	HL1NTNM
Software Version:	11.0.2.88(C900E85R1P3)
IEEE 802.11 WLAN Mode Supported	<input checked="" type="checkbox"/> 802.11a (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n (40 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11ac (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac (40 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac (80 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11ac (160 MHz channel bandwidth)
Operation Frequency:	IEEE 802.11 a/n(HT20/40)/ac(VHT20/40/80): 5150MHz to 5250MHz IEEE 802.11 a/n(HT20/40)/ac(VHT20/40/80/160): 5250MHz to 5350MHz IEEE 802.11 a/n(HT20/40)/ac(VHT20/40/80/160): 5470MHz to 5725MHz IEEE 802.11 a/n(HT20/40)/ac(VHT20/40/80): 5725MHz to 5850MHz
Type of Modulation:	OFDM
DFS mode:	<input type="checkbox"/> Master <input type="checkbox"/> Slave with radar detection <input checked="" type="checkbox"/> Slave without radar detection
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated
Antenna Ports	<input checked="" type="checkbox"/> Ant 1, <input type="checkbox"/> Ant 2, <input type="checkbox"/> Ant 3
Smart System	<input checked="" type="checkbox"/> SISO (for 802.11a/n/ac), <input type="checkbox"/> MIMO (for 802.11n/ac), <input type="checkbox"/> Diversity (for 802.11a).
Antenna Gain*:	<input checked="" type="checkbox"/> Provided by applicant -1.1dBi
RF Cable*:	<input checked="" type="checkbox"/> Provided by applicant 0.5dB(0.6~1GHz); 0.8dB(1.4~2GHz); 1.0dB(2.1~2.7GHz); 1.5dB(3~4GHz); 1.8dB(4.4~6GHz);
Remark: *Since the above data and/or information is provided by the applicant relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.	



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 9 of 40

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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 of Operation Operating Frequency Range (in each Band)	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 20MHz	The Lowest channel	5180
	The Middle channel	5200
	The Highest channel	5240
IEEE 802.11n/ac 40MHz	The Lowest channel	5190
	The Highest channel	5230
IEEE 802.11ac 80MHz	The Middle channel	5210

For UNII Band II-A:

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5260
	The Middle channel	5280
	The Highest channel	5320
IEEE 802.11n/ac 40MHz	The Lowest channel	5270
	The Highest channel	5310
IEEE 802.11ac 80MHz	The Middle channel	5290



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 10 of 40

For UNII Band II-C:		
Mode	Channel	Frequency(MHz)
IEEE 802.11a/n/ac 20MHz	The Lowest channel	5500
	The Middle channel	5580
	The Highest channel	5700
IEEE 802.11n/ac 40MHz	The Lowest channel	5510
	The Middle channel	5550
	The Highest channel	5670
IEEE 802.11ac 80MHz	The Lowest channel	5530
	The Highest channel	5610

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



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 11 of 40

3.5 Test Environment and Mode

Environment Parameter	101 KPa Selected Values During Tests	
Relative Humidity	44~46% RH Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	22~23	3.87
LTNV	-10	3.87
HTNV	55	3.87
Remark: NV: Normal Voltage NT: Normal Temperature LT: Low Extreme Test Temperature HT: High Extreme Test Temperature		

3.6 Description of Support Units

The EUT has been tested independent unit.



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Rev.: 01

Page: 12 of 40

4 Test results and Measurement Data

4.1 Antenna Requirement

Standard requirement:	47 CFR Part 15 Section 15.203
The antenna is integrated antenna and no consideration of replacement. The best case gain of the antenna is -1.1dBi.	



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4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
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: 2013 on conducted measurement. 		



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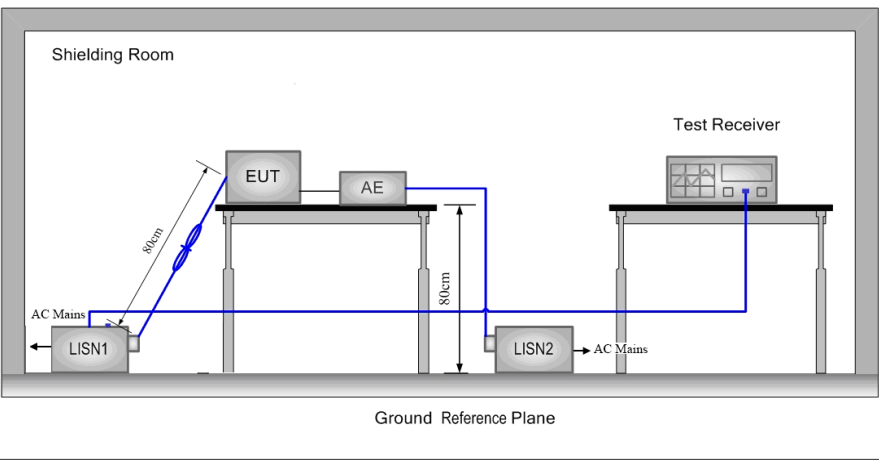
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Rev.: 01

Page: 14 of 40

Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate of 802.11a at lowest channel is the worst case. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



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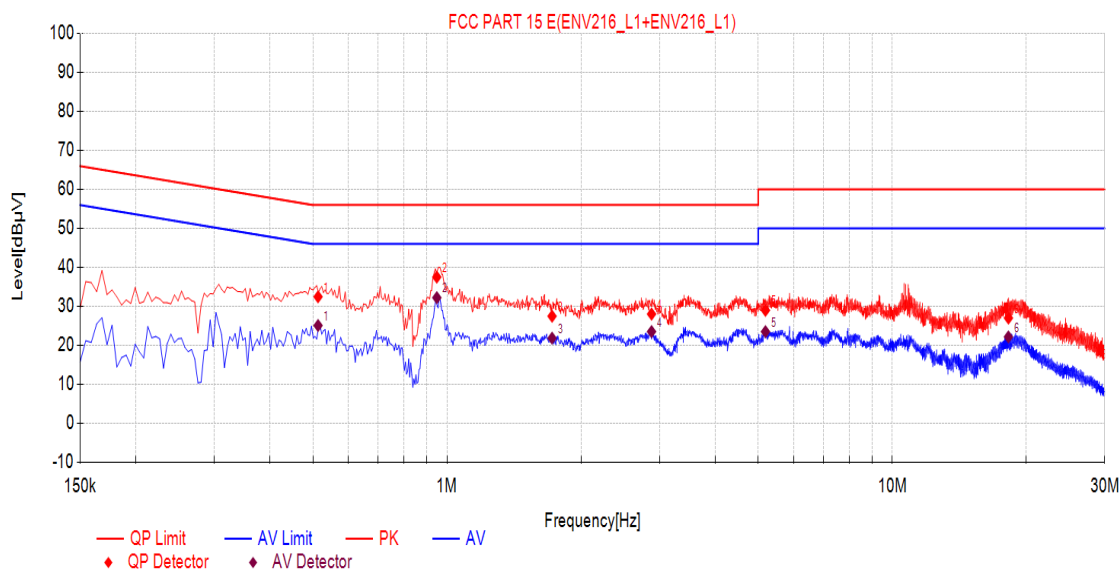
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Page: 15 of 40

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:



Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.5136	9.61	32.44	56.00	23.56	25.06	46.00	20.94	PASS
2	0.9491	9.55	37.49	56.00	18.51	32.21	46.00	13.79	PASS
3	1.7224	9.74	27.45	56.00	28.55	21.83	46.00	24.17	PASS
4	2.8805	9.66	28.00	56.00	28.00	23.50	46.00	22.50	PASS
5	5.1912	9.65	28.97	60.00	31.03	23.48	50.00	26.52	PASS
6	18.2335	9.47	26.99	60.00	33.01	22.14	50.00	27.86	PASS

Remark:

- The following Quasi-Peak and Average measurements were performed on the EUT:
- Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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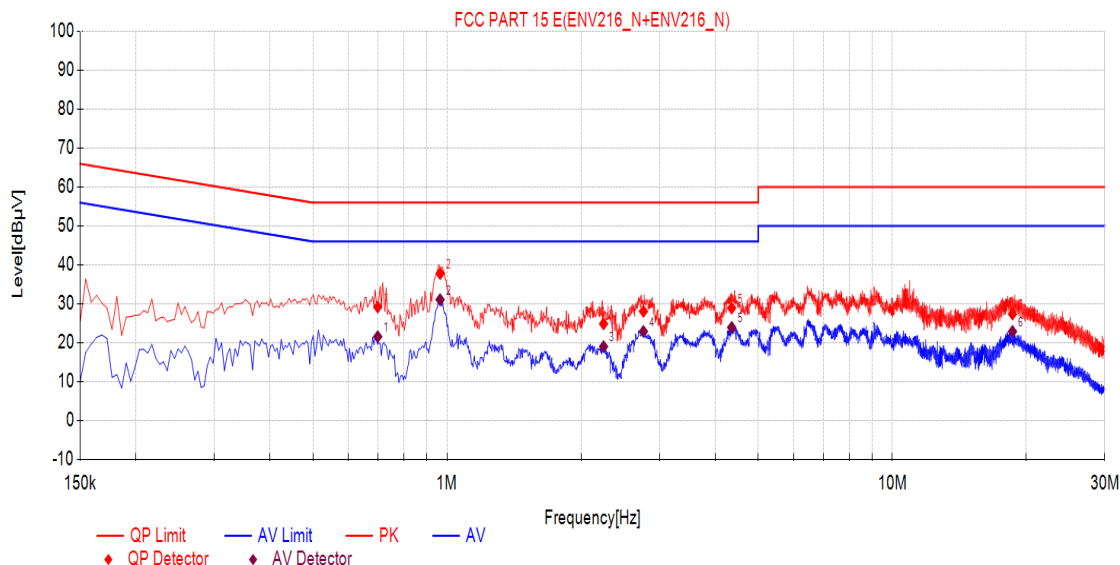
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Rev.: 01

Page: 16 of 40

Neutral Line:



Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.6991	9.81	29.16	56.00	26.84	21.53	46.00	24.47	PASS
2	0.9654	9.68	37.77	56.00	18.23	31.06	46.00	14.94	PASS
3	2.2478	9.78	24.86	56.00	31.14	18.99	46.00	27.01	PASS
4	2.7622	9.68	28.06	56.00	27.94	22.89	46.00	23.11	PASS
5	4.3598	9.71	28.89	56.00	27.11	23.90	46.00	22.10	PASS
6	18.6187	9.45	27.37	60.00	32.63	22.87	50.00	27.13	PASS

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.



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Page: 17 of 40

4.3 Duty Cycle

The detailed test data see: **Appendix of HR/2021/1001405-01**



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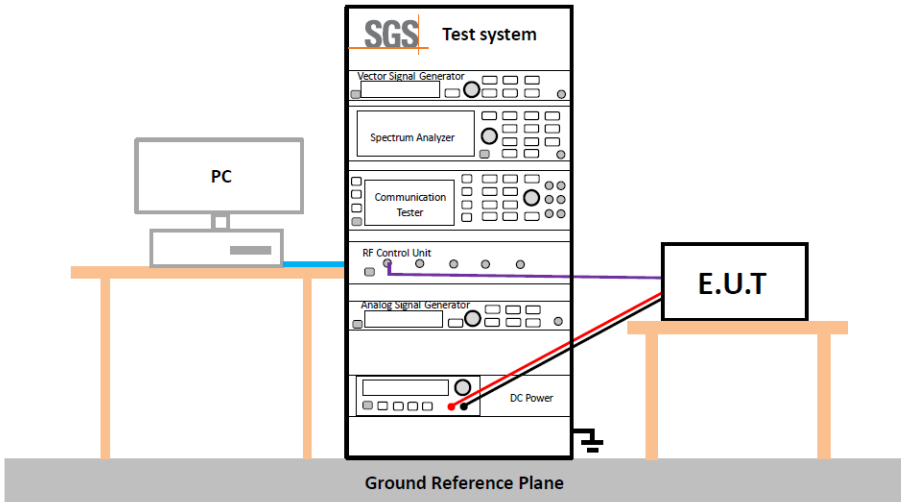
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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 18 of 40

4.4 Output Power

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10 :2013	
Test Setup:		
Test Instruments:	Refer to section 6 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20) ; MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(VHT20). MCS0 of rate is the worst case of 802.11ac(VHT40). MCS0 of rate is the worst case of 802.11ac(VHT80). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5150-5250MHz	Not exceed 250mW(24dBm)
	5250-5350MHz	The lesser of 250mW(24dBm) or 11+ 10logB
	5470-5725MHz	The lesser of 250mW(24dBm) 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 of HR/2021/1001405-01		



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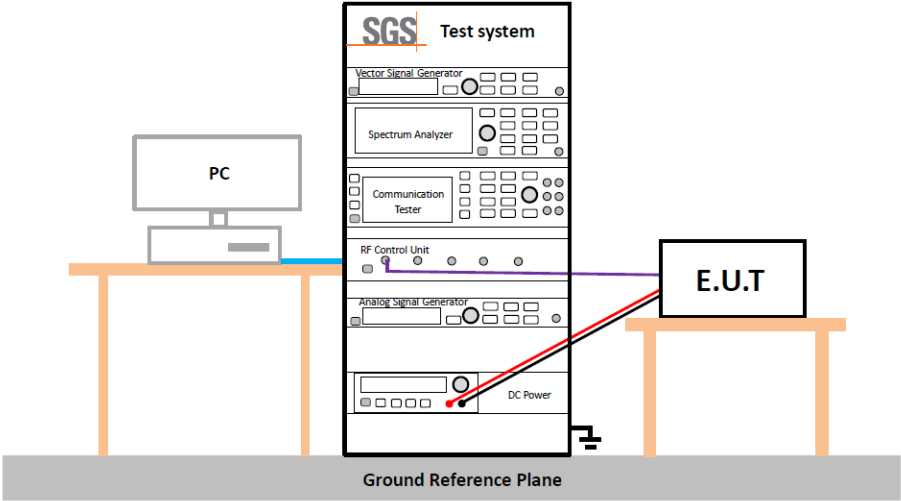
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Rev.: 01
Page: 19 of 40

4.5 26dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	<p>Through Pre-scan, find the</p> <p>6Mbps of rate is the worst case of 802.11a;</p> <p>MCS0 of rate is the worst case of 802.11n(HT20) ;</p> <p>MCS0 of rate is the worst case of 802.11n(HT40);</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT20).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT40).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT80).</p> <p>Only the worst case is recorded in the report.</p>
Limit:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix of HR/2021/1001405-01	



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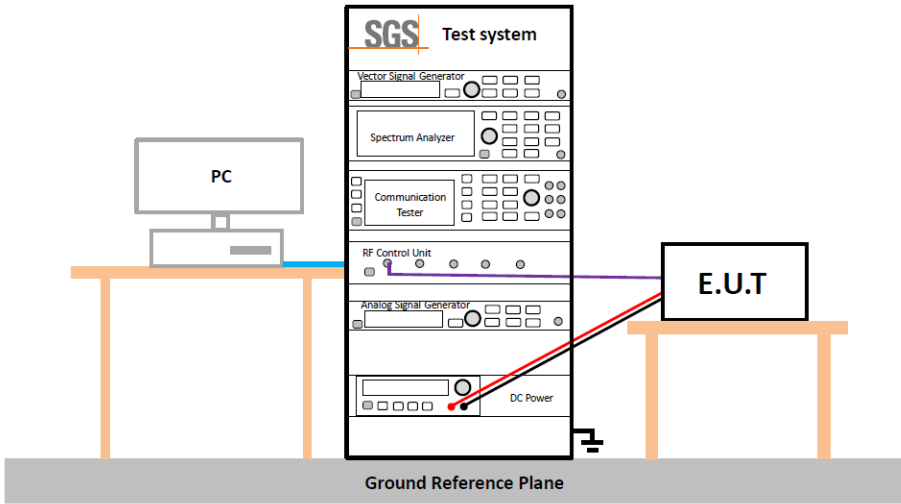
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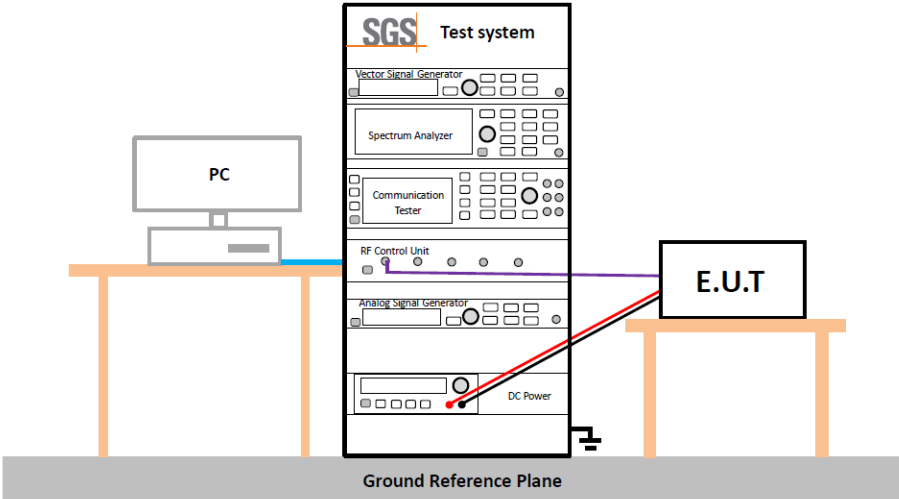
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 Page: 20 of 40

4.6 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10: 2013	
Test Setup:		
Test Instruments:	Refer to section 6 for details	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates	
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20) ; MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(VHT20). MCS0 of rate is the worst case of 802.11ac(VHT40). MCS0 of rate is the worst case of 802.11ac(VHT80). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5725-5850MHz	At lease 500kHz
Test Results:	Pass	
The detailed test data see: Appendix of HR/2021/1001405-01		

4.7 99% Occupied Bandwidth

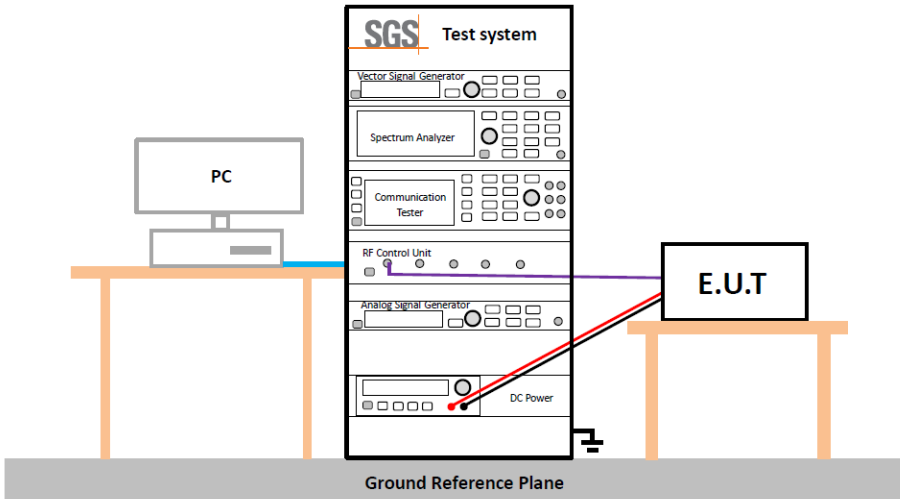
Test Requirement:	KDB 789033 D02§ D
Test Method:	ANSI C63.10: 2013
Test Setup:	
Instruments Used:	Refer to section 6 for details
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	<p>Through Pre-scan, find the</p> <p>6Mbps of rate is the worst case of 802.11a;</p> <p>MCS0 of rate is the worst case of 802.11n(HT20) ;</p> <p>MCS0 of rate is the worst case of 802.11n(HT40);</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT20).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT40).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT80).</p> <p>Only the worst case is recorded in the report.</p>
Limit:	No restriction limits
Test Results:	Pass
The detailed test data see: Appendix of HR/2021/1001405-01	

Report No.: SUHR/2021/C000106

Rev.: 01

Page: 22 of 40

4.8 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013 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:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20) ; MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(VHT20). MCS0 of rate is the worst case of 802.11ac(VHT40). MCS0 of rate is the worst case of 802.11ac(VHT80). Only the worst case is recorded in the report.	
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 of HR/2021/1001405-01		



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 23 of 70

4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.205 and 15.209
Test Method:	ANSI C63.10: 2013
Test Site:	Measurement Distance: 3m or 10m (Semi-Anechoic Chamber)
Test Setup:	

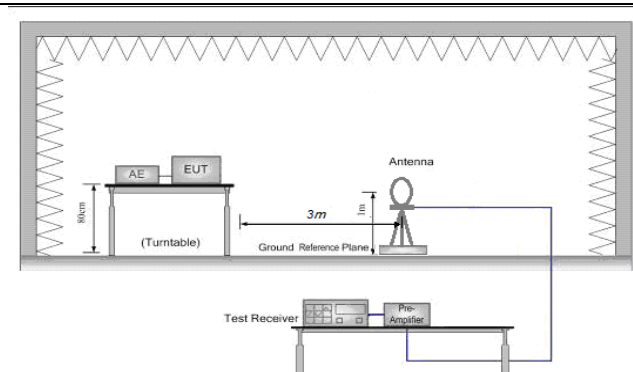


Figure 1. 9kHz to 30MHz

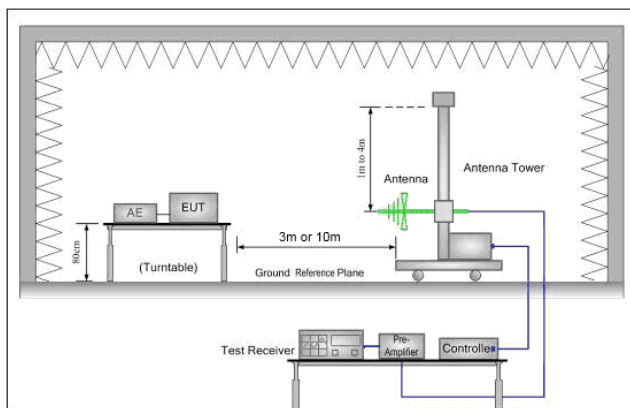


Figure 1. 30MHz to 1GHz

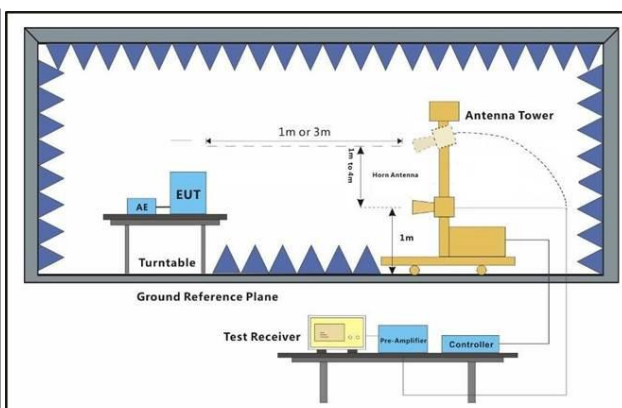


Figure 2. Above 1 GHz

Test Procedure:	<ol style="list-style-type: none"> 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. 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. 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
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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 24 of 70

	<p>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>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
Final Test Mode:	<p>Through Pre-scan, find the</p> <p>6Mbps of rate is the worst case of 802.11a;</p> <p>MCS0 of rate is the worst case of 802.11n(HT20) ;</p> <p>MCS0 of rate is the worst case of 802.11n(HT40);</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT20).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT40).</p> <p>MCS0 of rate is the worst case of 802.11ac(VHT80).</p> <p>For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11a at lowest channel is the worst case.</p> <p>Only the worst case is recorded in the report.</p>
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: Appendix	



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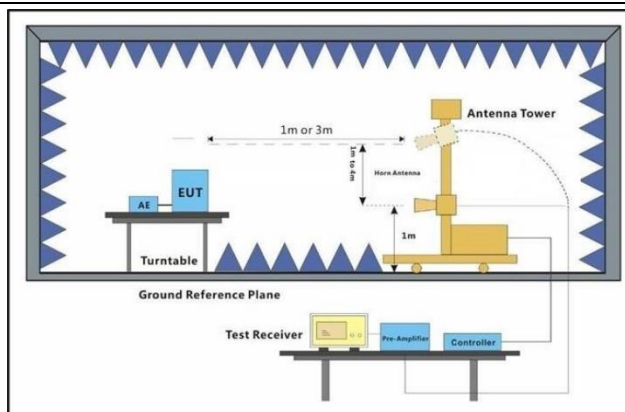
Report No.: SUHR/2021/C000106

Rev.: 01

Page: 25 of 40

4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15 Section 15.407(b)		
Test Method:	ANSI C63.10: 2013		
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:	<ol style="list-style-type: none"> 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 modulation for lowest and highest channel Test the EUT in the outermost channels. The radiation measurements are performed in X, Y, Z axis positioning for
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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 26 of 40

	Transmitting mode, And found the X axis positioning which it is worse case. i. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates.
Final Test Mode:	Through Pre-scan, find the 6Mbps of rate is the worst case of 802.11a; MCS0 of rate is the worst case of 802.11n(HT20) ; MCS0 of rate is the worst case of 802.11n(HT40); MCS0 of rate is the worst case of 802.11ac(VHT20). MCS0 of rate is the worst case of 802.11ac(VHT40). MCS0 of rate is the worst case of 802.11ac(VHT80). Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass
The detailed test data see: Appendix	



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Rev.: 01

Page: 27 of 40

4.11 Frequencies Stability

The detailed test data see: **Appendix of HR/2021/1001405-01**



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4.12 Dynamic Frequency Selection

4.12.1 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.		

4.12.2 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>	

4.12.3 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.
<p>Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.</p> <p>Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> 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.</p> <p>Note 3: During the <i>U-NII Detection Bandwidth</i> 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.</p>	



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Report No.: SUHR/2021/C000106

Rev.: 01

Page: 30 of 40

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

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 2.90\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 3.13\text{dB}$ (9k -30MHz)
		$\pm 4.8\text{dB}$ (30M -1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 18GHz)
		$\pm 4.8\text{dB}$ (Above 18GHz)



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Page: 31 of 40

6 Equipment List

CE Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	SUWI-04-03-01	2021/5/8	2024/5/7
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-01	2021/2/20	2022/2/19
Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-02	2021/2/20	2022/2/19
Measurement Software	Tonscend	JS32-CE V3.0.0.1	SUWI-02-09-05	NCR	NCR
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2021/2/20	2022/2/19



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Rev.: 01

Page: 32 of 40

9*6*6 Test Equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	2021/5/8	2024/5/7
Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2021/2/20	2022/2/19
Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	2021/5/28	2022/5/27
Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2021/2/20	2022/2/19
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9163	SUWI-01-11-01	2021/5/16	2022/5/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	2021/5/16	2022/5/15
Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	2021/5/14	2022/5/13
Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	2021/6/10	2022/6/9
Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2021/2/20	2022/2/19
Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2021/2/20	2022/2/19
Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2021/2/20	2022/2/19



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Rev.: 01
Page: 33 of 40

7 Photographs - EUT Constructional Details

Refer to Appendix A Setup Photos.



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Appendix



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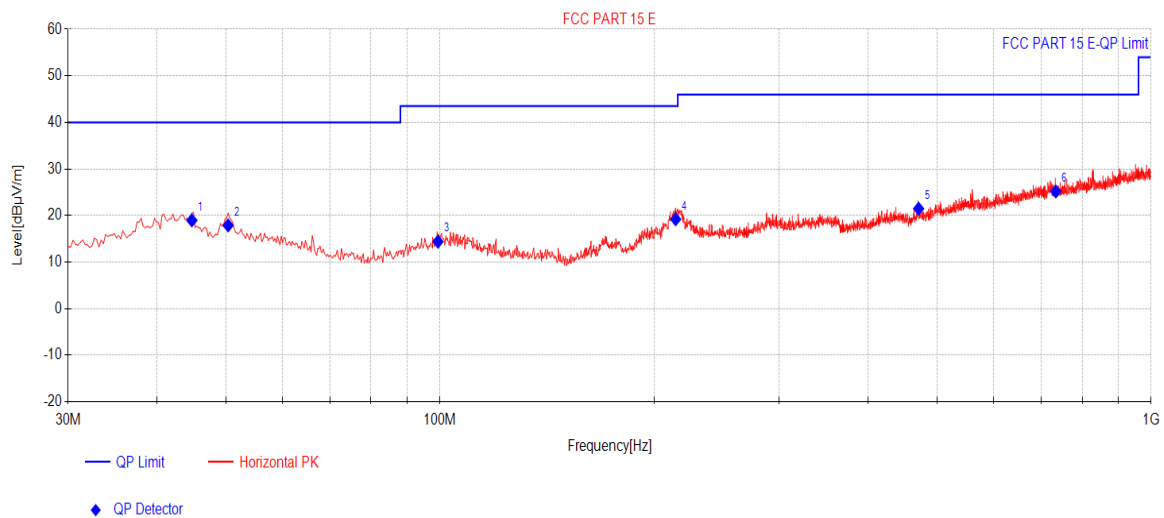
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Radiated Spurious Emissions

Radiated emission below 1GHz

802.LF11a_Channel 100



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	44.7925	-14.99	18.97	40.00	21.03	163	357	Horizontal
2	50.3700	-14.28	17.90	40.00	22.10	185	57	Horizontal
3	99.3550	-16.66	14.40	43.50	29.10	216	86	Horizontal
4	214.5425	-15.32	19.20	43.50	24.30	319	233	Horizontal
5	471.1075	-8.49	21.49	46.00	24.51	105	161	Horizontal
6	734.4625	-3.70	25.17	46.00	20.83	218	295	Horizontal

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss - Preamplifier Factor



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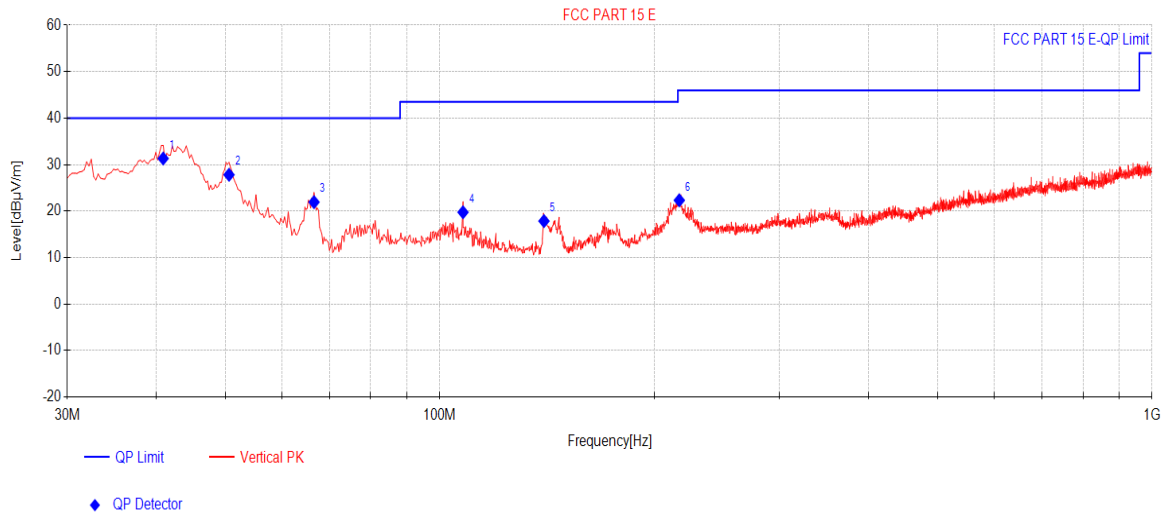
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Page: 36 of 40

802.LF11a_Channel 100



Final Data List

NO.	Frequency [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.9125	-15.79	31.33	40.00	8.67	163	127	Vertical
2	50.6125	-14.33	27.82	40.00	12.18	251	132	Vertical
3	66.6175	-18.09	21.94	40.00	18.06	301	314	Vertical
4	107.8425	-16.69	19.76	43.50	23.74	185	281	Vertical
5	140.0950	-19.65	17.87	43.50	25.63	102	141	Vertical
6	216.9675	-15.15	22.33	46.00	23.67	112	3	Vertical

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss - Preamplifier Factor



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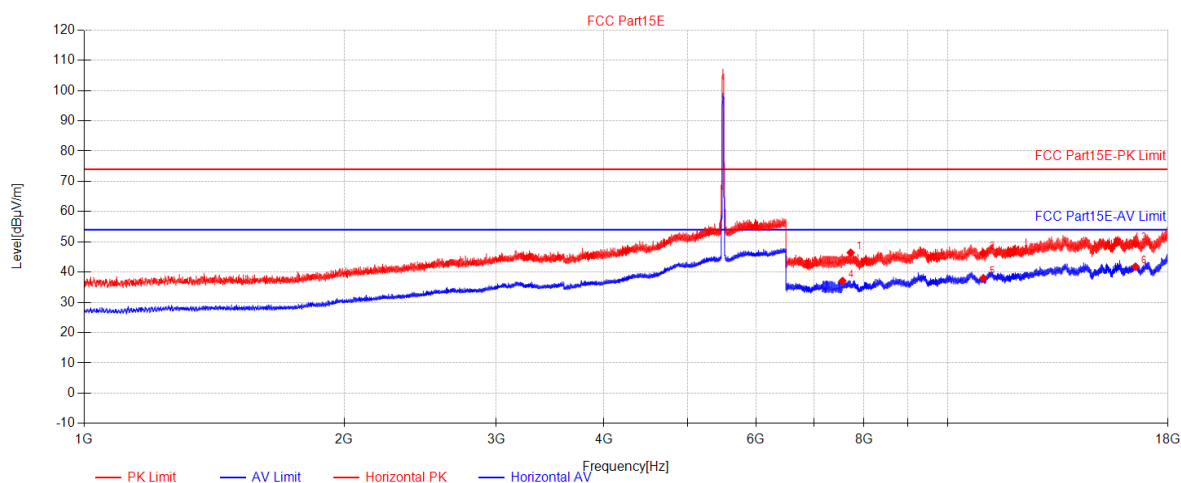
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Rev.: 01
Page: 37 of 40

Transmitter emission above 1GHz

802.11aEmission_Channel 100



Data List

NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	7722.3542	52.67	-6.24	46.43	74.00	27.57	223	186	Horizontal
2	11000	44.81	1.48	46.29	74.00	27.71	214	164	Horizontal
3	16500	45.74	3.64	49.38	74.00	24.62	201	250	Horizontal
4	7555.6042	43.61	-6.52	37.09	54.00	16.91	150	122	Horizontal
5	11000	36.53	1.48	38.01	54.00	15.99	150	144	Horizontal
6	16500	38.18	3.64	41.82	54.00	12.18	250	79	Horizontal

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss - Preamplifier Factor



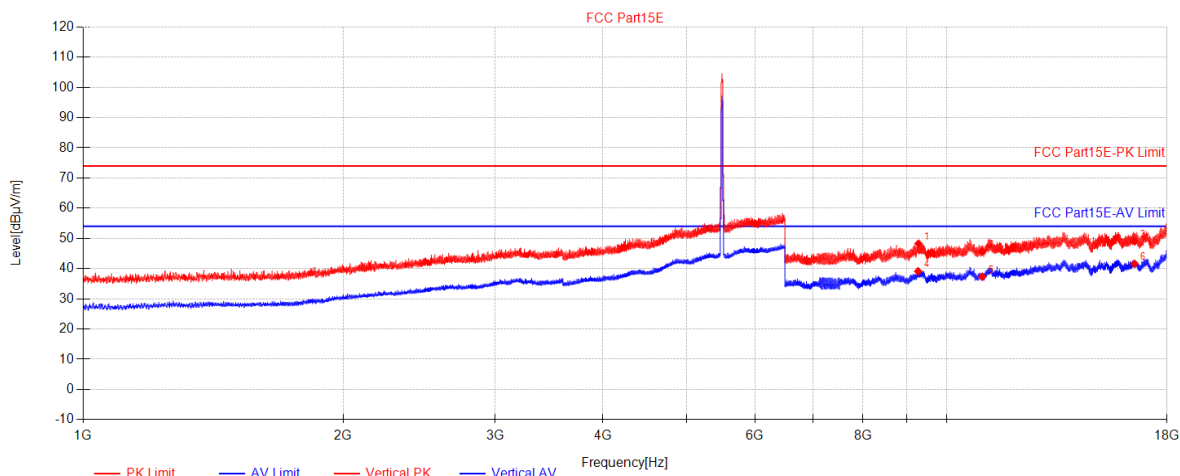
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802.11aEmission_Channel 100



Data List									
NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	9276.2917	49.89	-1.64	48.25	74.00	25.75	140	76	Vertical
2	11000	44.27	1.48	45.75	74.00	28.25	265	164	Vertical
3	16500	45.41	3.64	49.05	74.00	24.95	247	16	Vertical
4	9268.1458	40.76	-1.64	39.12	54.00	14.88	150	315	Vertical
5	11000	35.86	1.48	37.34	54.00	16.66	105	54	Vertical
6	16500	37.98	3.64	41.62	54.00	12.38	271	272	Vertical

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss - Preamplifier Factor



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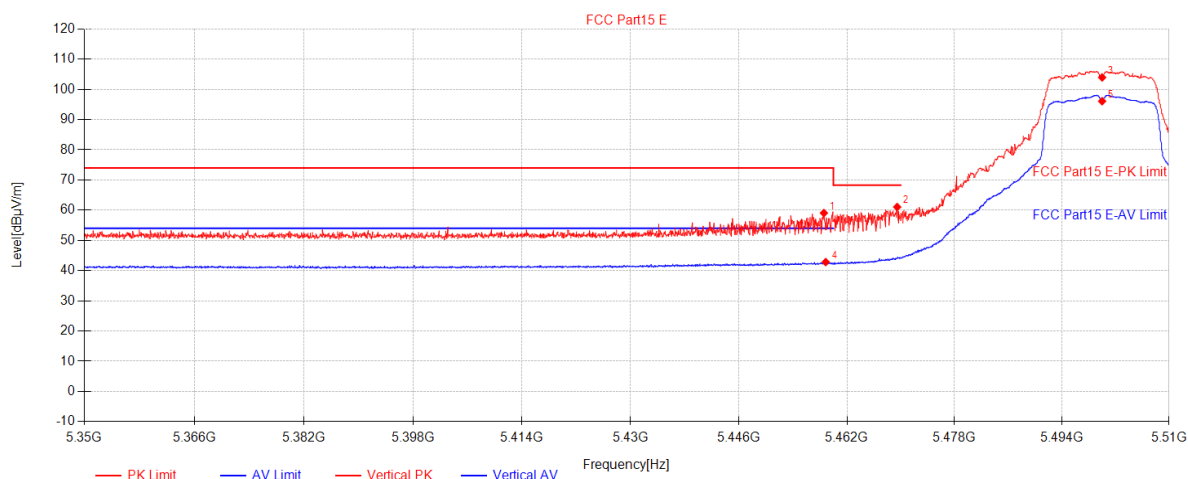
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Rev.: 01

Page: 39 of 40

Bandedge

802.11a Band_EDGE_Channel 100



Data List									
NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	5458.5867	46.41	12.67	59.08	74.00	14.92	290	90	Vertical
2	5469.4667	48.37	12.70	61.07	68.30	7.23	290	90	Vertical
3	5500	91.19	12.77	103.96	0.00	-103.96	290	90	Vertical
4	5458.8533	30.16	12.67	42.83	54.00	11.17	290	90	Vertical
5	5500	83.32	12.77	96.09	0.00	-96.09	290	90	Vertical

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss



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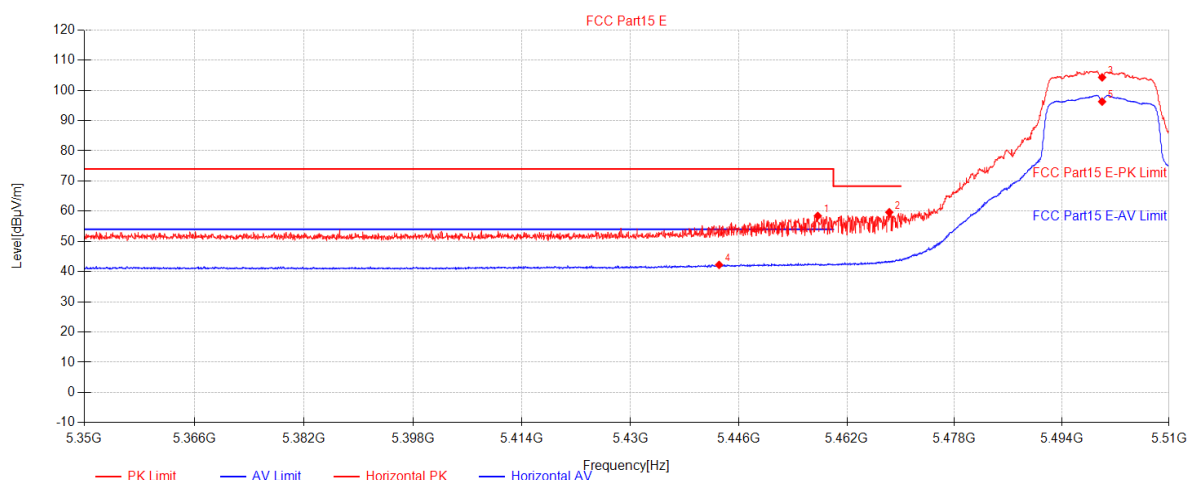
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802.11a Band_EDGE_Channel 100



Data List									
NO.	Frequency [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	5457.68	45.79	12.67	58.46	74.00	15.54	105	65	Horizontal
2	5468.2933	46.98	12.69	59.67	68.30	8.63	105	65	Horizontal
3	5500	91.54	12.77	104.31	0.00	-104.31	105	65	Horizontal
4	5443.0667	29.61	12.63	42.24	54.00	11.76	105	65	Horizontal
5	5500	83.51	12.77	96.28	0.00	-96.28	105	65	Horizontal

Remark: Final Value = Receiver Read level + Antenna Factor + Cable loss

The End



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