

Report No.: SUHR/2021/C000105  
Rev.: 01  
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# TEST REPORT

<b>Application No.:</b>	HR/2021/C0001
<b>Applicant:</b>	Honor Device Co., Ltd.
<b>Address of Applicant</b>	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
<b>Manufacturer:</b>	Honor Device Co., Ltd.
<b>Address of Manufacturer</b>	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
<b>EUT Description:</b>	Smart Phone
<b>Model No.:</b>	NTN-LX3
<b>Trade Mark:</b>	HONOR
<b>FCC ID:</b>	2AYGCNTN-LX3
<b>Standards:</b>	47 CFR FCC Part 2, Subpart J 47 CFR Part 15, Subpart C
<b>Date of Receipt:</b>	2021/12/8
<b>Date of Test:</b>	2021/12/15 to 2021/12/18
<b>Date of Issue:</b>	2021/12/18

<b>Test Result :</b>	<b>PASS *</b>
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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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## 1 Version

### Revision Record

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

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

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## 2 Test Summary

Test Item	Test Requirement	Test Method	Test Result	Result
Antenna Requirement	15.203/247(b)	--	Clause 4.1	Refer to HR/2021/1001404-01
AC Power Line Conducted Emission	15.207	ANSI C63.10 2013	Clause 4.2	PASS
Duty Cycle	--	--	Clause 4.3	Refer to HR/2021/1001404-01
Output Power	15.247 (b)(3)	ANSI C63.10 2013	Clause 4.4	Refer to HR/2021/1001404-01
DTS (6 dB) Bandwidth & 99% Occupied Bandwidth	15.247 (a)(2)	ANSI C63.10 2013	Clause 4.5	Refer to HR/2021/1001404-01
Power Spectral Density	15.247 (e)	ANSI C63.10 2013	Clause 4.6	Refer to HR/2021/1001404-01
Band-edge for RF Conducted Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.7	Refer to HR/2021/1001404-01
RF Conducted Spurious Emissions	15.247(d)	ANSI C63.10 2013	Clause 4.8	Refer to HR/2021/1001404-01
Radiated Spurious Emissions	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.9	PASS
Restricted bands around fundamental frequency (Radiated Emission)	15.247(d);15.205/15.209	ANSI C63.10 2013	Clause 4.10	PASS

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Wireless Laboratory Technical Services (Shenzhen) Co., Ltd

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Remark:

This test report (Report No.: SUHR/2021/C000105) is based on the original test report (Report No.: HR/2021/1001404-02) 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 referred to the original test report.



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### 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"/> 802.11b (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11g (20 MHz channel bandwidth) <input checked="" type="checkbox"/> 802.11n (20 MHz channel bandwidth), <input checked="" type="checkbox"/> 802.11 n (40 MHz channel bandwidth)								
Operation Frequency:	2400 MHz -2483.5MHz fc = 2407 MHz + N * 5 MHz, where: -fc = "Operating Frequency" in MHz, -N = "Channel Number" with the range from 1 to 11 for the 20 MHz channel bandwidth, or 3 to 9 for the 40 MHz channel bandwidth.								
Type of Modulation:	IEEE for 802.11b: DSSS IEEE for 802.11g : OFDM IEEE for 802.11n(HT20) : OFDM IEEE for 802.11n(HT40) : OFDM								
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 802.11b/g/n), <input type="checkbox"/> MIMO (for 802.11 b/g/n): 2 Tx & 2 Rx, <input type="checkbox"/> Diversity (for 802.11b/g) : Tx & Rx								
Antenna Gain*:	<input checked="" type="checkbox"/> Provided by applicant -2.2dBi								
RF Cable*:	<input checked="" type="checkbox"/> Provided by applicant <table border="1"> <tr> <td>0.5dB(0.6~1GHz)</td> <td>0.8dB(1.4~2GHz)</td> <td>1.0dB(2.1~2.7GHz)</td> </tr> <tr> <td>1.5dB(3~4GHz)</td> <td>1.8dB(4.4~6GHz)</td> <td></td> </tr> </table>			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)	
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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**Operation Frequency of each channel (802.11b/g/n HT20)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

**Operation Frequency of each channel (802.11n HT40)**

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422MHz	6	2437MHz	9	2452MHz		
4	2427MHz	7	2442MHz				
5	2432MHz	8	2447MHz				

**Remark:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency for 802.11 b/g/n (HT20)	Frequency for 802.11n (HT40)
The Lowest channel	2412MHz	2422MHz
The Middle channel	2437MHz	2437MHz
The Highest channel	2462MHz	2452MHz

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### 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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## 4 Test results and Measurement Data

### 4.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(c)
15.203 requirement:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:	The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
The antenna is integrated and no consideration of replacement. The best case gain of the antenna is -2.2dBi.	

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## 4.2 AC Power Line Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
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"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> 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.</li> <li>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,</li> <li>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. 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.</li> </ol>		

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Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel. Charge + Transmitting mode.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11B at lowest channel is the worst case. Charge + Transmitting mode. Only the worst case is recorded in the report.
Instruments Used:	Refer to section 6 for details
Test Results:	Pass



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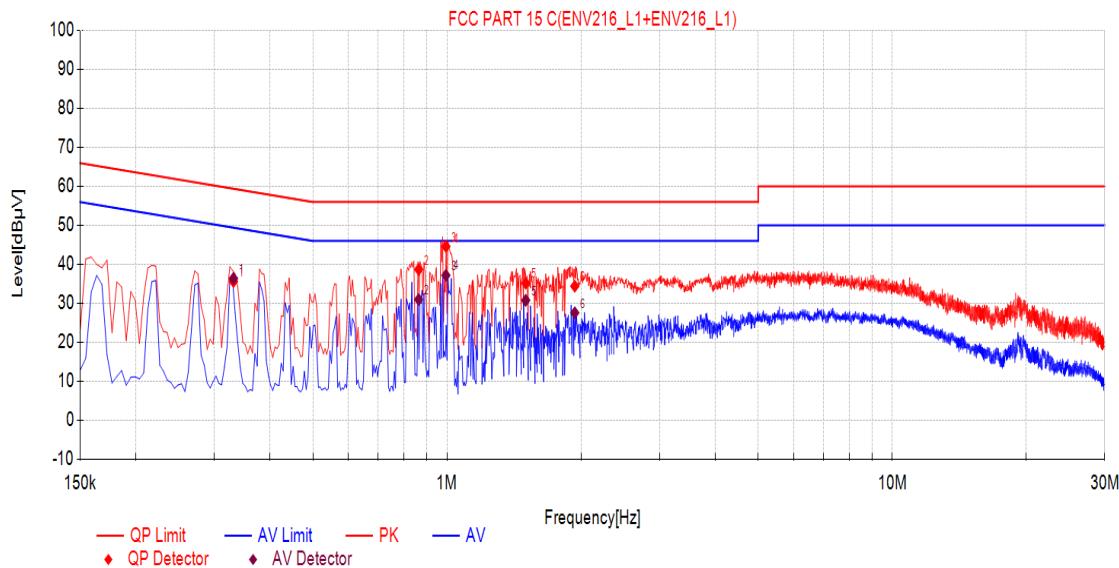
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### Measurement Data

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.

#### 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
0.3316	9.55	35.61	59.41	23.80	36.39	49.41	13.02	0.3316	PASS
0.8640	9.57	38.68	56.00	17.32	30.98	46.00	15.02	0.8640	PASS
0.9948	9.50	44.59	56.00	11.41	37.18	46.00	8.82	0.9948	PASS
1.0043	9.49	44.34	56.00	11.66	37.47	46.00	8.53	1.0043	PASS
1.5030	9.78	35.18	56.00	20.82	30.77	46.00	15.23	1.5030	PASS
1.9368	9.70	34.39	56.00	21.61	27.56	46.00	18.44	1.9368	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.



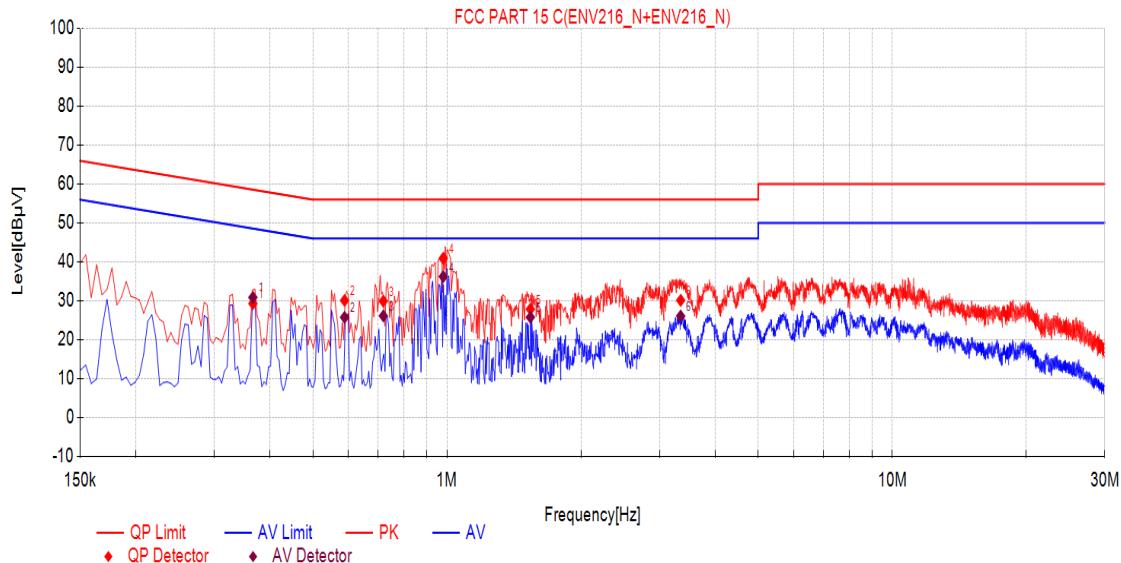
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Neutral Line:



Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dB $\mu$ V]	QP Limit [dB $\mu$ V]	QP Margin [dB]	AV Value [dB $\mu$ V]	AV Limit [dB $\mu$ V]	AV Margin [dB]	Verdict
1	0.3667	9.81	29.27	58.58	29.31	30.86	48.58	17.72	PASS
2	0.5890	9.69	30.08	56.00	25.92	25.74	46.00	20.26	PASS
3	0.7198	9.81	29.91	56.00	26.09	26.10	46.00	19.90	PASS
4	0.9812	9.66	40.92	56.00	15.08	36.21	46.00	9.79	PASS
5	1.5396	9.77	27.83	56.00	28.17	25.76	46.00	20.24	PASS
6	3.3484	9.64	30.10	56.00	25.90	26.06	46.00	19.94	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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## 4.3 Duty Cycle

The detailed test data see: **Appendix of HR/2021/1001404-01**



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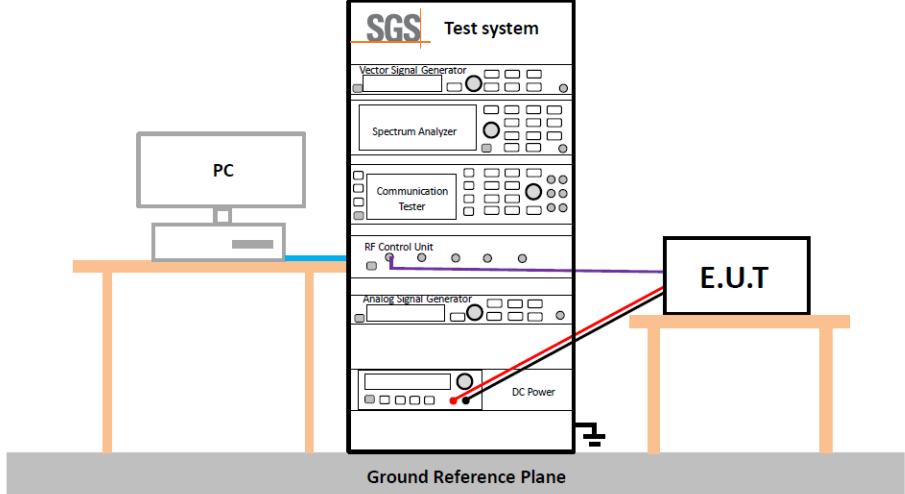
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## 4.4 Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10 :2013 Section 11.9.1.3
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 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).
Limit:	30dBm
Test Results:	Pass
The detailed test data see: <b>Appendix of HR/2021/1001404-01</b>	

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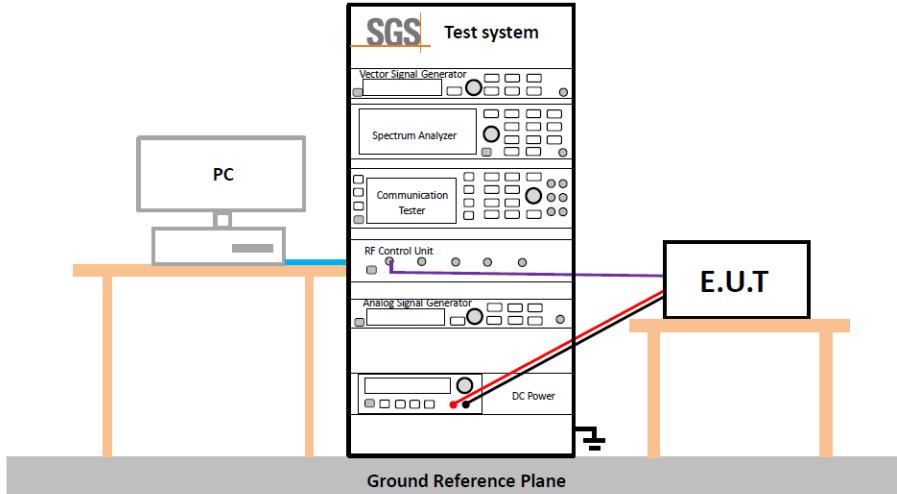
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## 4.5 DTS (6 dB) Bandwidth & 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013 Section 11.8.1 Option 1
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 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).
Limit:	$\geq 500$ kHz
Test Results:	Pass
The detailed test data see: <b>Appendix of HR/2021/1001404-01</b>	

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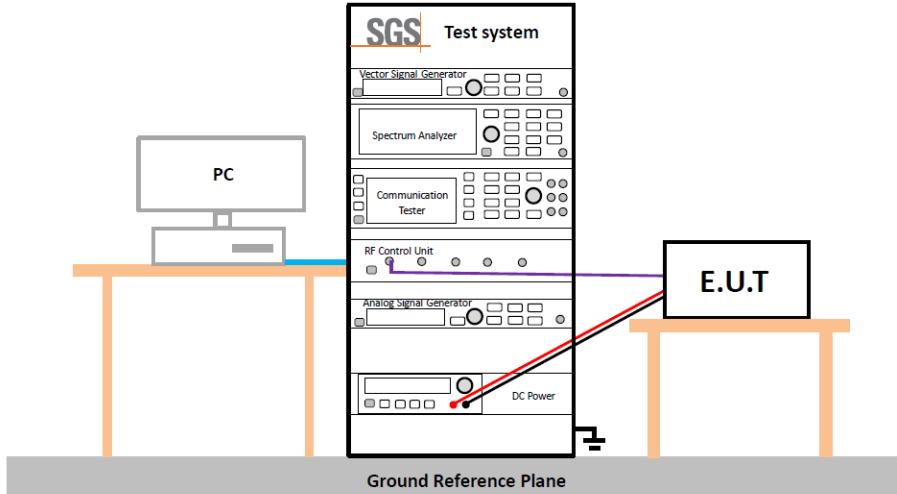
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## 4.6 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10 :2013 Section 11.10.2
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 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).
Limit:	$\leq 8.00 \text{ dBm}/3\text{kHz}$
Test Results:	Pass
The detailed test data see: <b>Appendix of HR/2021/1001404-01</b>	



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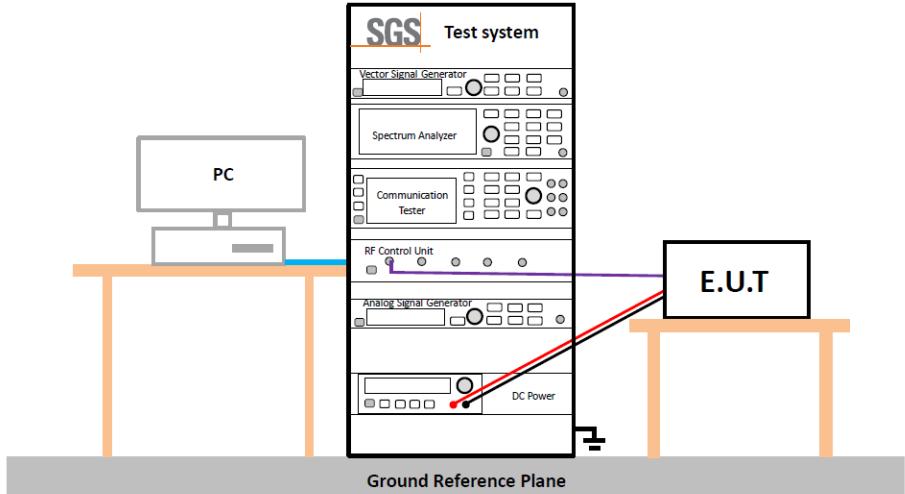
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## 4.7 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.13
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 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass

The detailed test data see: **Appendix of HR/2021/1001404-01**



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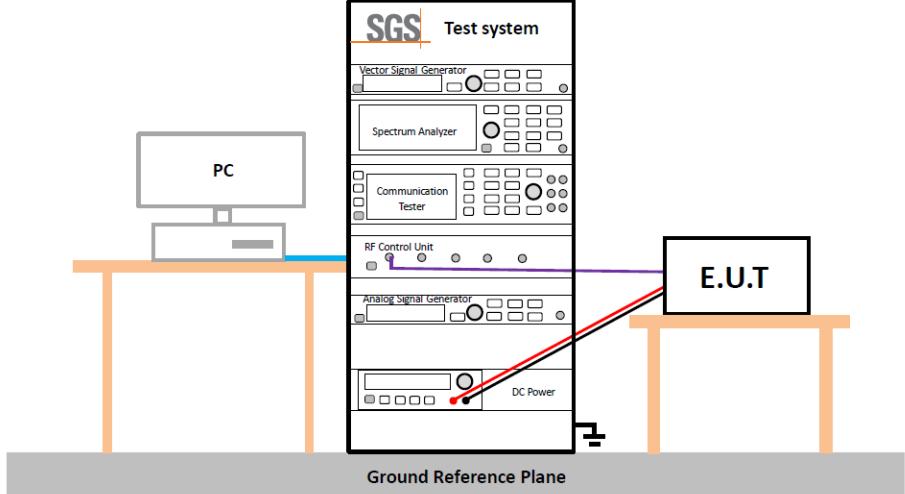
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## 4.8 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013 Section 11.11
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 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g ; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40).
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test Results:	Pass
The detailed test data see: <b>Appendix of HR/2021/1001404-01</b>	

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## 4.9 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205				
Test Method:	ANSI C63.10 :2013 Section 11.12				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz (DC≥0.98) ≥1/T (DC<0.98)	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Remark: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

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## Test Setup:

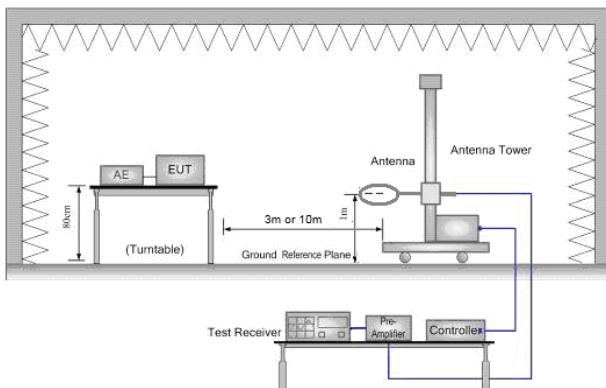


Figure 1. Below 30MHz

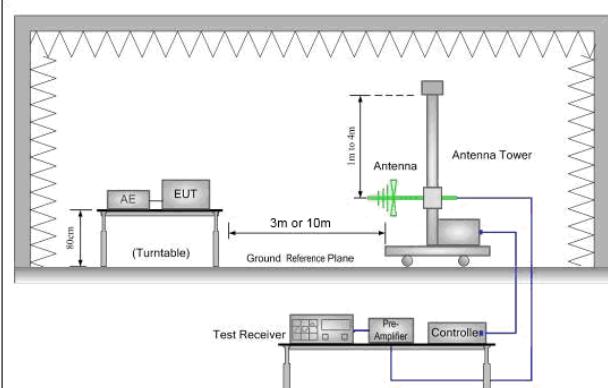


Figure 2. 30MHz to 1GHz

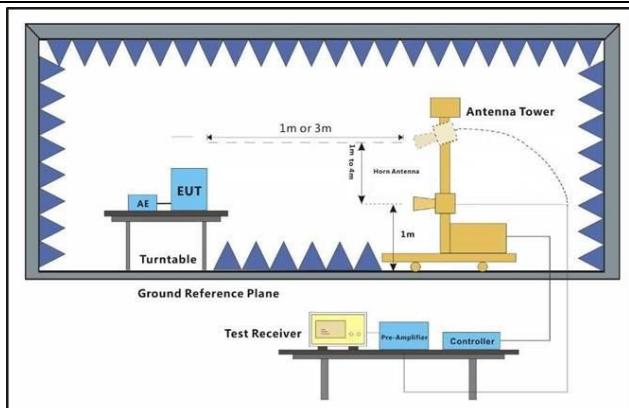


Figure 3. Above 1 GHz

## Test Procedure:

- For below 1GHz, 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, 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(for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) 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.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT

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	<p>would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</p> <p>h. Test the EUT in the lowest channel, the middle channel ,the Highest channel.</p> <p>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq</math> 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW = 10 Hz, when duty cycle is no less than 98 percent.</li> <li>• VBW <math>\geq</math> 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.</li> </ul>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	<p>Pretest the EUT at Charge + Transmitting mode.</p> <p>Through Pre-scan, find the</p> <p>1Mbps of rate is the worst case of 802.11b;</p> <p>6Mbps of rate is the worst case of 802.11g;</p> <p>6.5Mbps of rate is the worst case of 802.11n(HT20);</p> <p>13.5Mbps of rate is the worst case of 802.11nHT40);</p> <p>For below 1GHz, through Pre-scan, find the 1Mbps of rate of 802.11b at lowest channel is the worst case. 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: <b>Appendix</b>	

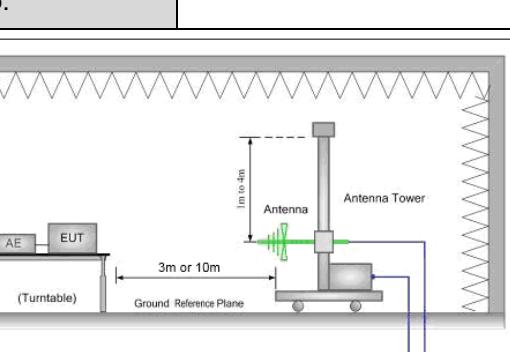
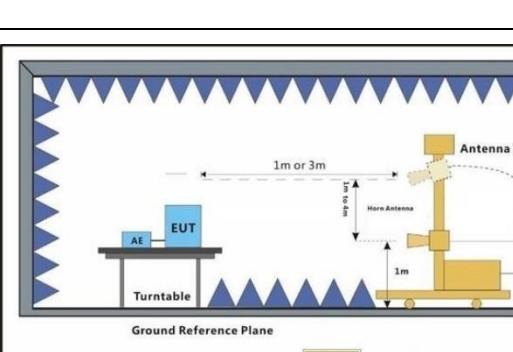
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## 4.10 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205					
Test Method:	ANSI C63.10: 2013 Section 11.12					
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:						
						
						

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Test Procedure:	<ol style="list-style-type: none"> <li>a. For below 1GHz, 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.</li> <li>b. For above 1GHz, 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.</li> <li>c. 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.</li> <li>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.</li> <li>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.</li> <li>f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>g. 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</li> <li>h. Test the EUT in the lowest channel , the Highest channel</li> <li>i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li> <li>j. Repeat above procedures until all frequencies measured was complete.</li> </ol>
Test Configuration:	<p>Measurements Below 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 120 kHz</li> <li>• VBW = 300 kHz</li> <li>• Detector = Peak</li> <li>• Trace mode = max hold</li> </ul> <p>Peak Measurements Above 1000 MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq</math> 3 MHz</li> <li>• Detector = Peak</li> <li>• Sweep time = auto</li> <li>• Trace mode = max hold</li> </ul> <p>Average Measurements Above 1000MHz</p> <ul style="list-style-type: none"> <li>• RBW = 1 MHz</li> <li>• VBW <math>\geq</math> 3MHz</li> <li>• Detector = power averaging (rms)</li> <li>• Sweep time = auto.</li> </ul> <p>transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p>
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates. Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Charge + Transmitting mode.

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	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20); 13.5Mbps of rate is the worst case of 802.11n(HT40); 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: <b>Appendix</b>	

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

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

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## 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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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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## 7 Photographs - EUT Constructional Details

Refer to Appendix A Setup Photos.



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# Appendix



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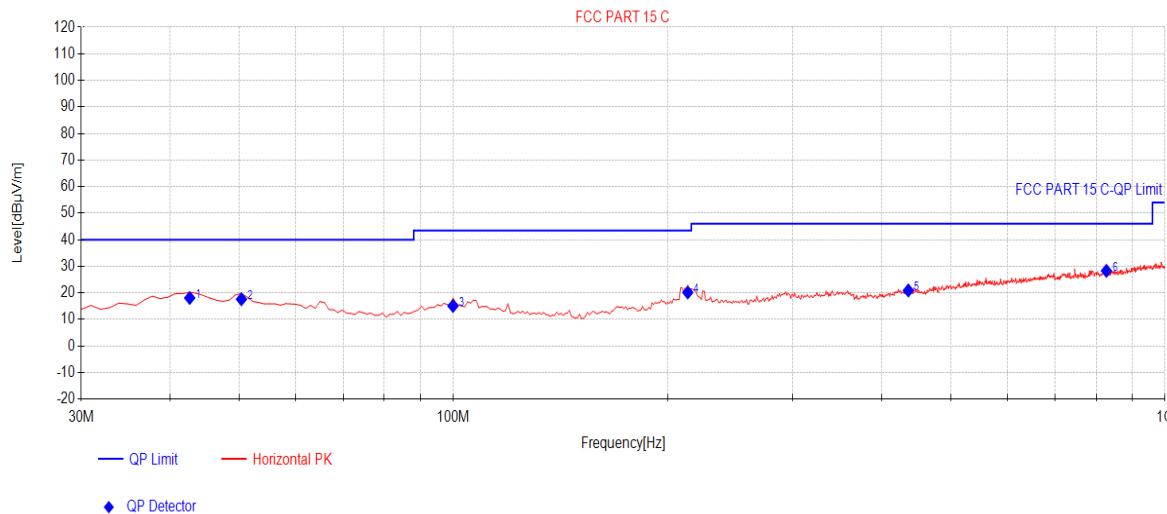
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## Radiated Spurious Emissions

### Radiated emission below 1GHz

#### 802.11g\_Channel 03 worse case



Final Data List								
NO.	Frequency [MHz]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.6226	-15.44	18.08	40.00	21.92	163	74	Horizontal
2	50.3904	-14.29	17.60	40.00	22.40	102	11	Horizontal
3	99.9099	-16.57	15.07	43.50	28.43	212	303	Horizontal
4	213.5135	-15.39	20.13	43.50	23.37	333	221	Horizontal
5	435.8659	-8.95	20.90	46.00	25.10	219	249	Horizontal
6	827.1672	-2.57	28.28	46.00	17.72	105	145	Horizontal

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

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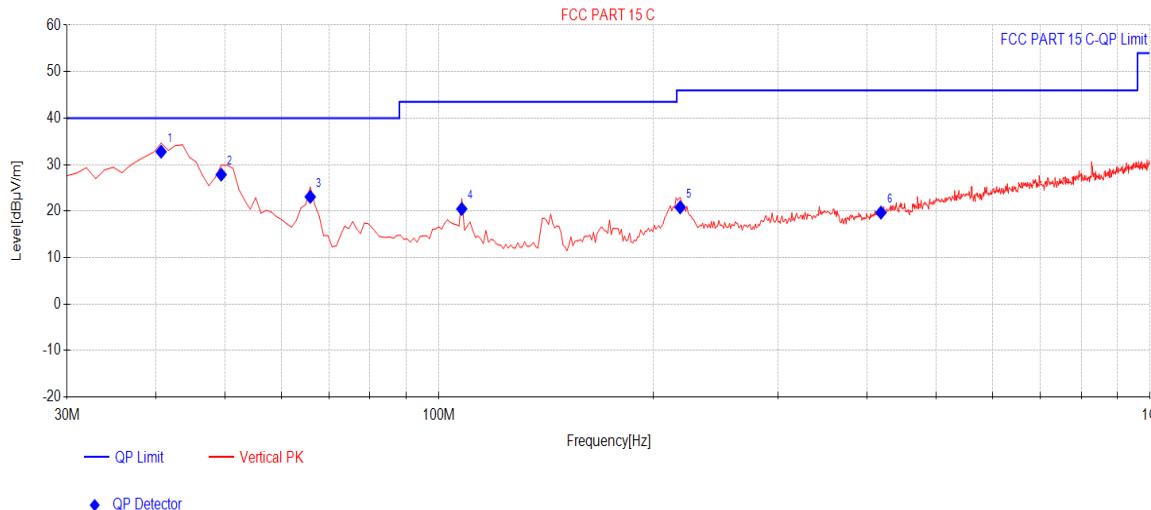


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## 802.11g\_Channel 03 worse case



Final Data List								
NO.	Frequency [MHz]	Factor [dB]	QP Value [dB $\mu$ V/m]	QP Limit [dB $\mu$ V/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	40.6807	-15.84	32.79	40.00	7.21	103	132	Vertical
2	49.4194	-14.30	27.86	40.00	12.14	302	338	Vertical
3	65.9259	-17.90	23.08	40.00	16.92	216	358	Vertical
4	107.6777	-16.68	20.47	43.50	23.03	185	294	Vertical
5	218.3684	-15.05	20.82	46.00	25.18	179	97	Vertical
6	418.3884	-9.37	19.69	46.00	26.31	201	218	Vertical

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

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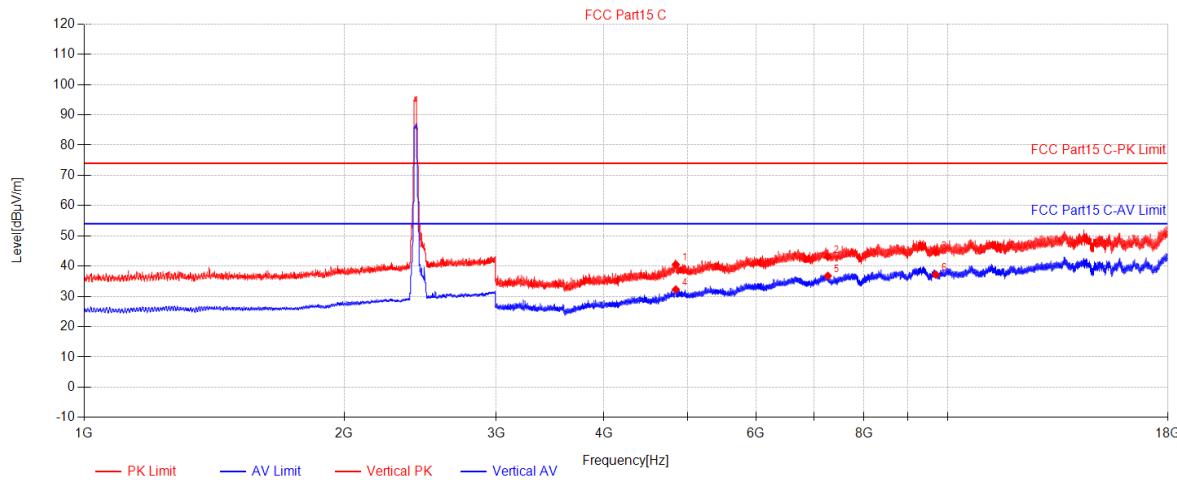
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## Transmitter emission above 1GHz

### 802.11gEmission\_Channel 03



Data List									
NO.	Frequency [MHz]	Reading [dB $\mu$ V/m]	Factor [dB]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4844	53.63	-13.09	40.54	74.00	33.46	231	182	Vertical
2	7266	50.15	-7.07	43.08	74.00	30.92	256	129	Vertical
3	9688	45.68	-1.12	44.56	74.00	29.44	145	106	Vertical
4	4844	45.39	-13.09	32.30	54.00	21.70	182	81	Vertical
5	7266	43.86	-7.07	36.79	54.00	17.21	241	285	Vertical
6	9688	38.33	-1.12	37.21	54.00	16.79	310	9	Vertical

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

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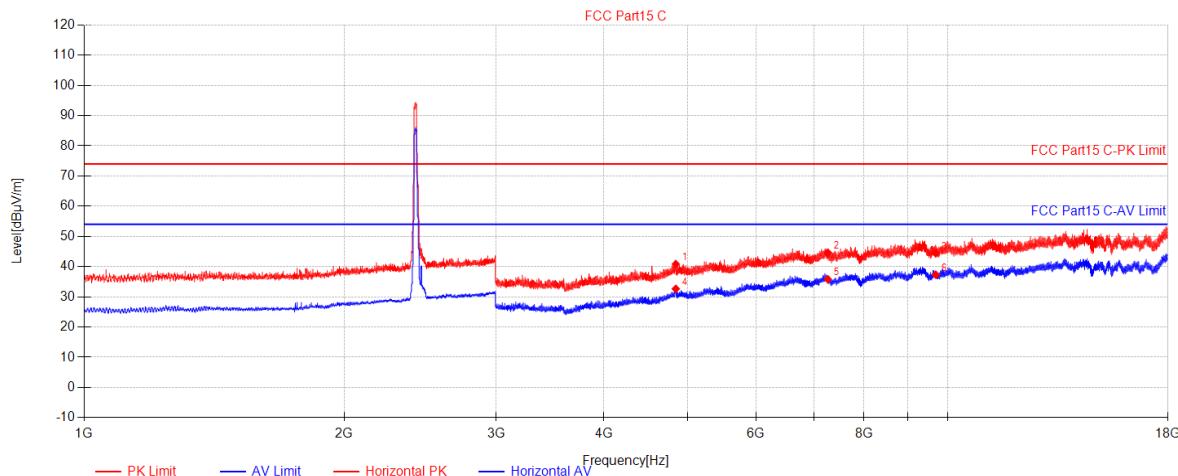
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## 802.11gEmission\_Channel 03



Data List									
NO.	Frequency [MHz]	Reading [dB $\mu$ V/m]	Factor [dB]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	4844	53.92	-13.09	40.83	74.00	33.17	244	235	Horizontal
2	7266	51.69	-7.07	44.62	74.00	29.38	265	66	Horizontal
3	9688	45.50	-1.12	44.38	74.00	29.62	103	186	Horizontal
4	4844	45.74	-13.09	32.65	54.00	21.35	152	109	Horizontal
5	7266	42.88	-7.07	35.81	54.00	18.19	245	84	Horizontal
6	9688	38.46	-1.12	37.34	54.00	16.66	287	256	Horizontal

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

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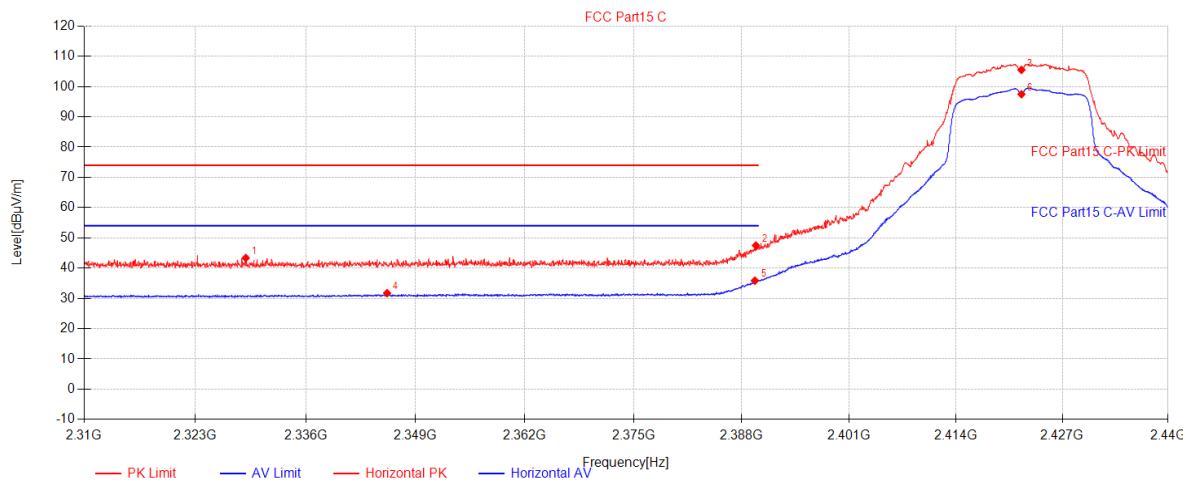


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## Bandedge

### 802.11g Band\_EDGE\_Channel 03



Data List									
NO.	Frequency [MHz]	Reading [dB $\mu$ V/m]	Factor [dB]	Level [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2328.9367	40.28	3.09	43.37	74.00	30.63	254	111	Horizontal
2	2389.7333	44.41	3.07	47.48	74.00	26.52	254	111	Horizontal
3	2422	102.31	3.21	105.52	73.91	-31.61	254	111	Horizontal
4	2345.62	28.65	3.09	31.74	54.00	22.26	254	111	Horizontal
5	2389.6033	32.79	3.07	35.86	54.00	18.14	254	111	Horizontal
6	2422	94.26	3.21	97.47	53.94	-43.53	254	111	Horizontal

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

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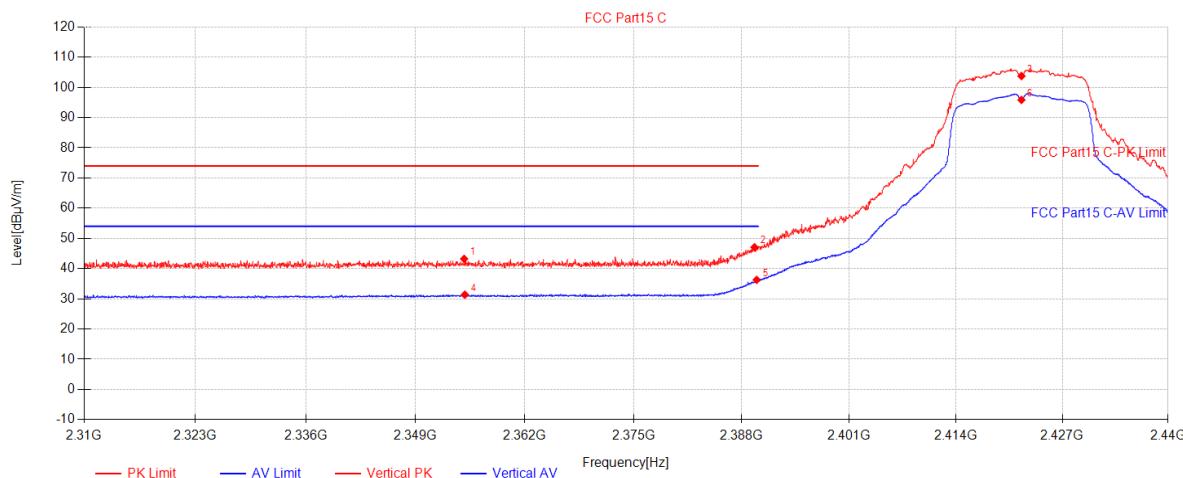
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## 802.11g Band\_EDGE\_Channel 03



Data List									
NO.	Frequency [MHz]	Reading [dBμV/m]	Factor	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2354.7633	40.15	3.08	43.23	74.00	30.77	105	257	Vertical
2	2389.56	44.00	3.07	47.07	74.00	26.93	105	257	Vertical
3	2422	100.56	3.21	103.77	73.91	-29.86	105	257	Vertical
4	2354.85	28.30	3.08	31.38	54.00	22.62	105	257	Vertical
5	2389.82	33.22	3.07	36.29	54.00	17.71	105	257	Vertical
6	2422	92.65	3.21	95.86	53.94	-41.92	105	257	Vertical

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

The End

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