



**SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch**

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Report No.: SZEM160900756207

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## FCC REPORT

**Application No:** SZEM1609007562CR (SGS SH No.:SHEM1609005962CR)  
**Applicant:** Powervision Robot Inc.  
**Manufacturer:** Powervision Robot Inc.  
**Factory:** Huizhou BYD Electronic Co., Ltd  
**Product Name:** PowerEgg Base Station  
**Model No.(EUT):** PEGRS10  
**Trade Mark:** PowerVision  
**FCC ID:** 2AJTNPEGRS10  
**Standards:** 47 CFR Part 15, Subpart E (2015)  
**Date of Receipt:** 2016-09-08  
**Date of Test:** 2016-09-09 to 2016-10-09  
**Date of Issue:** 2016-10-17

<b>Test Result:</b>	<b>PASS *</b>
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. \* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang  
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-10-17		Original

Authorized for issue by:				
Tested By		<div>Hank yan.</div> <div></div> <div>(Hank Yan) /Project Engineer</div>		2016-10-09
				<div></div> <div>Date</div>
Checked By		<div>Eric Fu</div> <div></div> <div>(Eric Fu) /Reviewer</div>		2016-10-17
				<div></div> <div>Date</div>



### 3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Section 15.203	ANSI C63.10: 2013	PASS
Conducted Output Power	47 CFR Part 15 Section 15.407(a)	ANSI C63.10: 2013	PASS
Equivalent Isotropic Radiated Power (e.i.r.p.)	47 CFR Part 15 Section 15.407(a)	ANSI C63.10: 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15 Section 15.407(e)	ANSI C63.10: 2013	PASS
26 dB Emission Bandwidth & 99% Occupied Bandwidth	47 CFR Part 15 Section 15.407(a)	ANSI C63.10: 2013	PASS
Power Spectral Density	47 CFR Part 15 Section 15.407(a)	ANSI C63.10: 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15 Section 15.407(b)	ANSI C63.10: 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Section 15.407(b)	ANSI C63.10: 2013	PASS
Frequency Stability	47 CFR Part 15 Section 15.407(g)	ANSI C63.10: 2013	PASS



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## 5 General Information

### 5.1 Client Information

Applicant:	Powervision Robot Inc.
Address of Applicant:	1st floor, Building No.33 YUNGU park, No.79 SHUANGYING west road, Technology Park, Changping District, Beijing
Manufacturer:	Powervision Robot Inc.
Address of Manufacturer:	1st floor, Building No.33 YUNGU park, No.79 SHUANGYING west road, Technology Park, Changping District, Beijing
Factory:	Huizhou BYD Electronic Co., Ltd
Address of Factory:	Xiangshui River, Economic Development Zone, Daya Bay, Huizhou, Guangdong, 516083, P.R.China

### 5.2 General Description of EUT

Product Name:	PowerEgg Base Station			
Model No.:	PEGRS10			
Trade Mark:	PowerVision			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII	IEEE 802.11a	5745-5825	5
	Band III	IEEE 802.11n 20MHz	5745-5825	5
Type of Modulation:	IEEE 802.11a: OFDM(BPSK/QPSK/16QAM/64QAM) IEEE 802.11n: OFDM(BPSK/QPSK/16QAM/64QAM)			
Channel Numbers:	5 Channel Numbers:			
Sample Type:	Portable Device			
Antenna Type:	Dipole Antenna			
Antenna Gain:	3dBi			
Power Supply:	DC 3.7V Li-ion Battery			



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**Note:**

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 III:**

Mode	Channel	Frequency(MHz)
IEEE 802.11a/n 20MHz	The Lowest channel	5745
	The Middle channel	5785
	The Highest channel	5825



### 5.3 Test Environment and Mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1005 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

### 5.4 Description of Support Units

The EUT has been tested independent unit.

### 5.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch,  
No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.



## 5.6 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 3816.01.

• **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

## 5.7 Deviation from Standards

None.

## 5.8 Abnormalities from Standard Conditions

None.

## 5.9 Other Information Requested by the Customer

None.





## 5.10 Equipment List

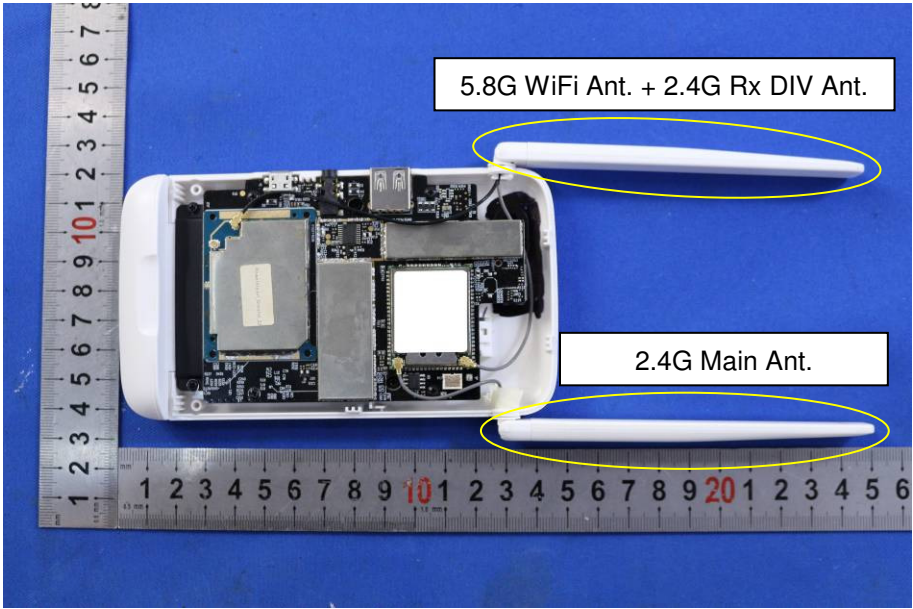
RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2015-10-09	2016-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2015-10-09	2016-10-09
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2015-10-09	2016-10-09

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
2	EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2016-04-25	2017-04-25
3	Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
4	Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06
5	Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEM004-04	2016-04-25	2017-04-25
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2015-10-09	2016-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2015-10-09	2016-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

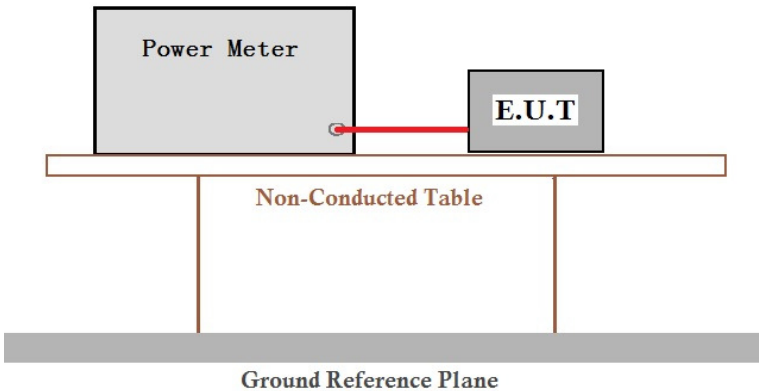
## 6 Test results and Measurement Data

### 6.1 Antenna Requirement

<b>Test Requirement:</b>	47 CFR Part 15 Section 15.203
<b>EUT Antenna:</b>	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 3dBi.	



## 6.2 Conducted 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 5.10 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). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5725-5850MHz	Not exceed 1W(30dBm)
Test Results:	Pass	



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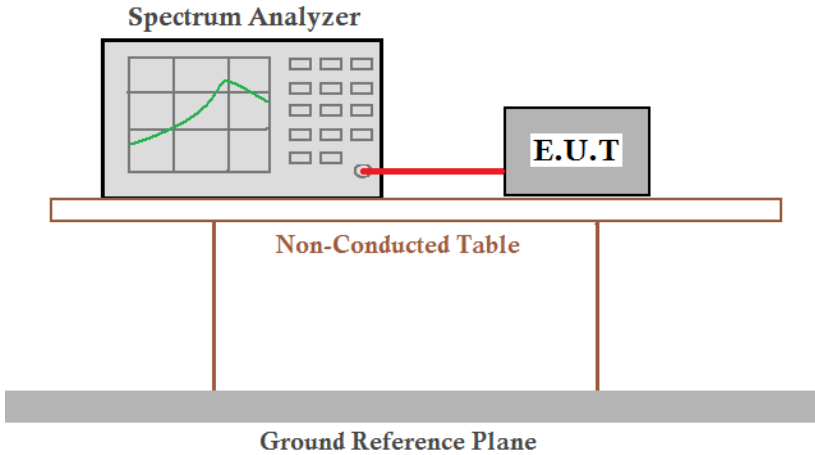
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**Measurement Data:**

802.11a mode			
Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Result
5745	7.87	30.00	Pass
5785	9.35	30.00	Pass
5825	8.15	30.00	Pass

802.11n(HT20) mode			
Frequency (MHz)	Conducted Output Power (dBm)	Limit (dBm)	Result
5745	7.52	30.00	Pass
5785	9.07	30.00	Pass
5825	8.03	30.00	Pass

### 6.3 99% Occupied Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(a)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
Instruments Used:	Refer to section 5.10 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). Only the worst case is recorded in the report.
Limit:	No restriction limits
Test Results:	Pass



**Measurement Data:**

802.11a mode	
Frequency (MHz)	99% Occupied Bandwidth (MHz)
5745	17.10
5785	17.10
5825	17.07

802.11n(HT20) mode	
Frequency (MHz)	99% Occupied Bandwidth (MHz)
5745	18.12
5785	18.12
5825	18.12



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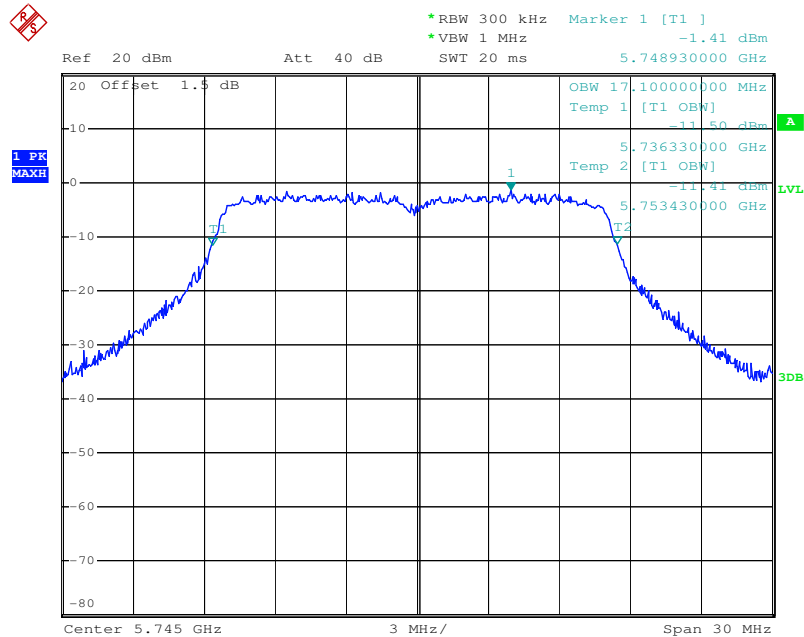
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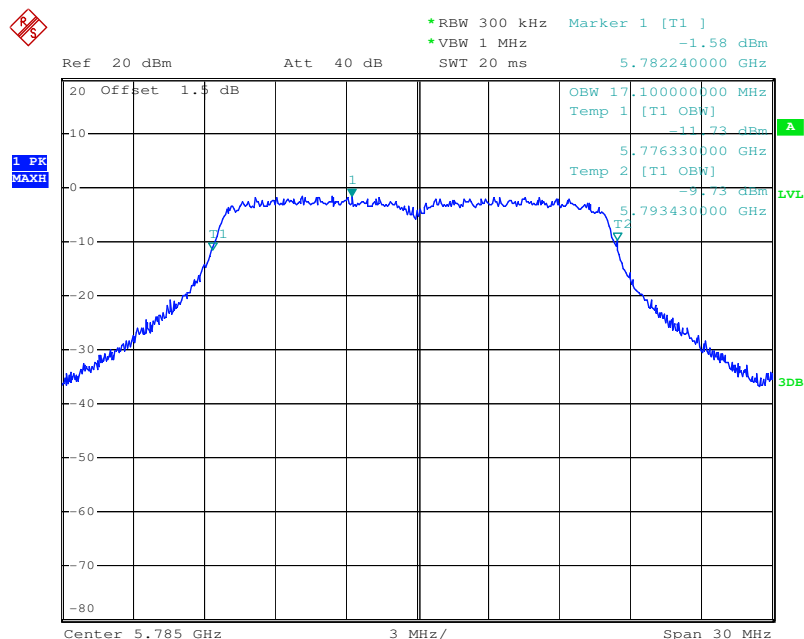
99% occupied bandwidth

Test plot as follows:

Test mode:	802.11a	Frequency(MHz):	5745
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Test mode:	802.11a	Frequency(MHz):	5785
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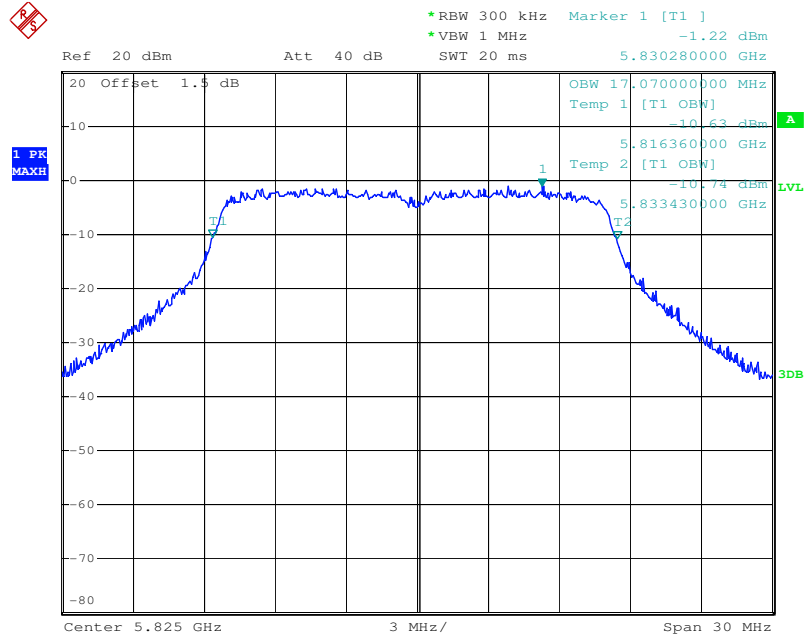


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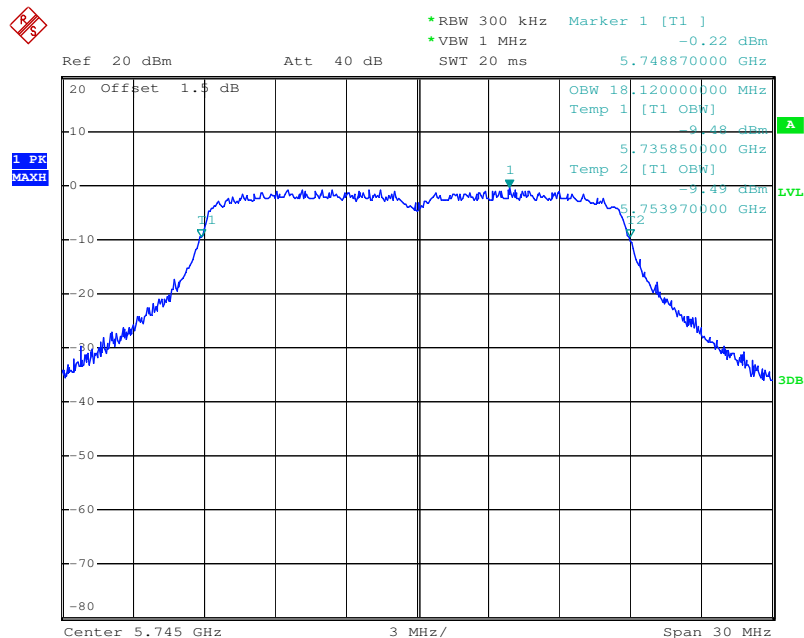
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Test mode:	802.11a	Frequency(MHz):	5825
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Test mode:	802.11n(HT20)	Frequency(MHz):	5745
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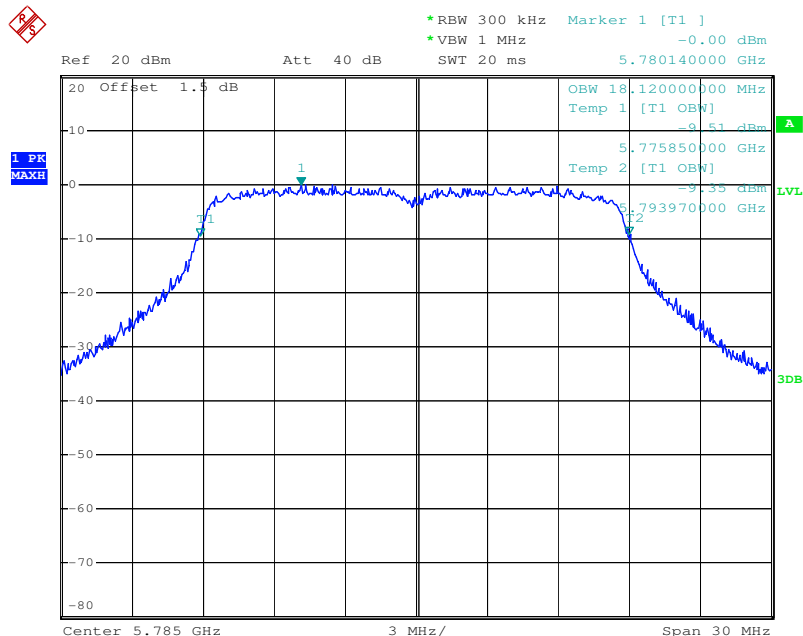


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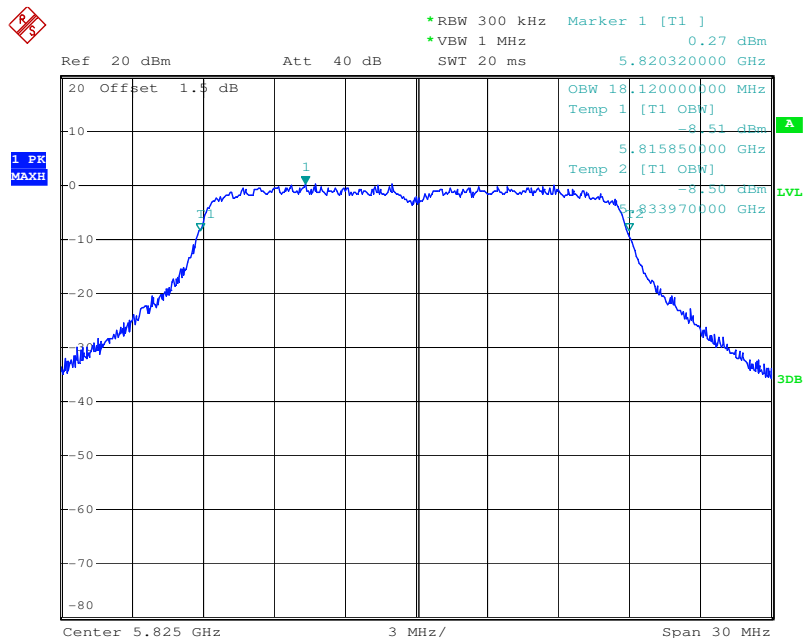
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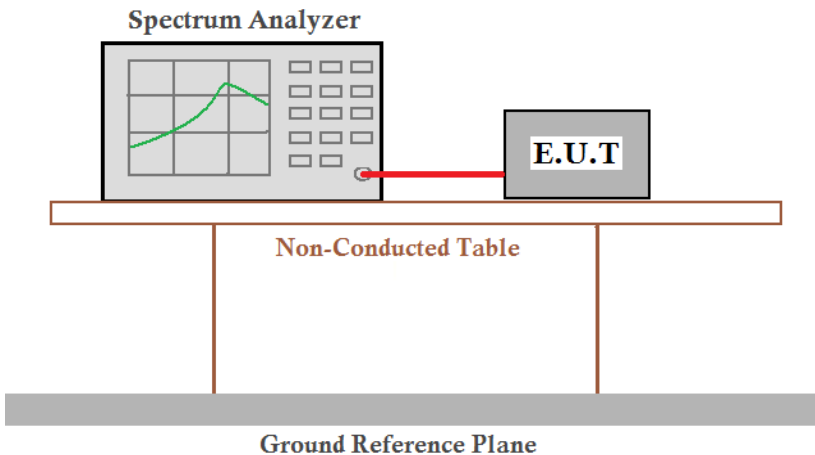
Test mode:	802.11n(HT20)	Frequency(MHz):	5785
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Test mode:	802.11n(HT20)	Frequency(MHz):	5825
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## 6.4 6dB Emission Bandwidth

Test Requirement:	47 CFR Part 15 Section 15.407(e)	
Test Method:	ANSI C63.10: 2013	
Test Setup:		
Instruments Used:	Refer to section 5.10 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). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5725-5850MHz	At least 500kHz
Test Results:	Pass	



**Measurement Data:**

802.11a mode			
Frequency (MHz)	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
5745	16.59	≥500	Pass
5785	16.56	≥500	Pass
5825	16.53	≥500	Pass

802.11n(HT20) mode			
Frequency (MHz)	6dB Occupy Bandwidth (MHz)	Limit (kHz)	Result
5745	17.73	≥500	Pass
5785	17.82	≥500	Pass
5825	17.79	≥500	Pass

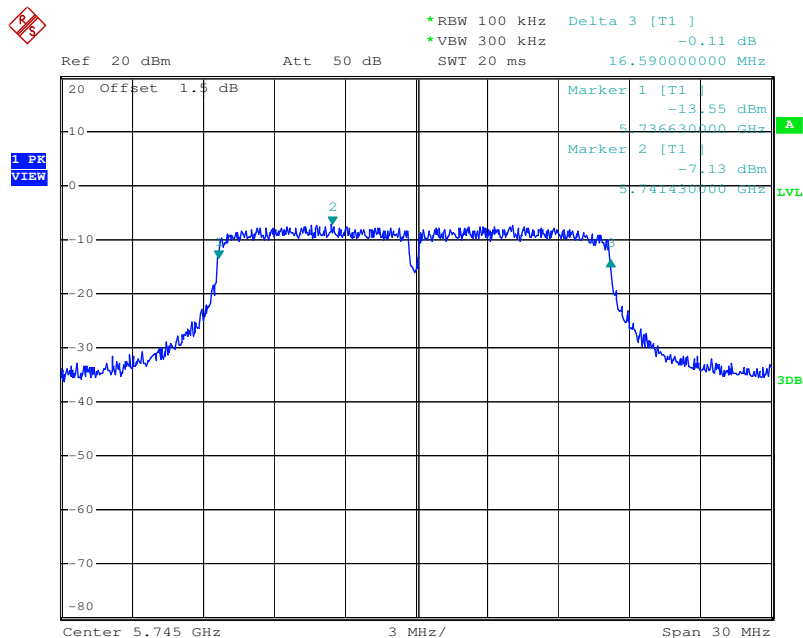


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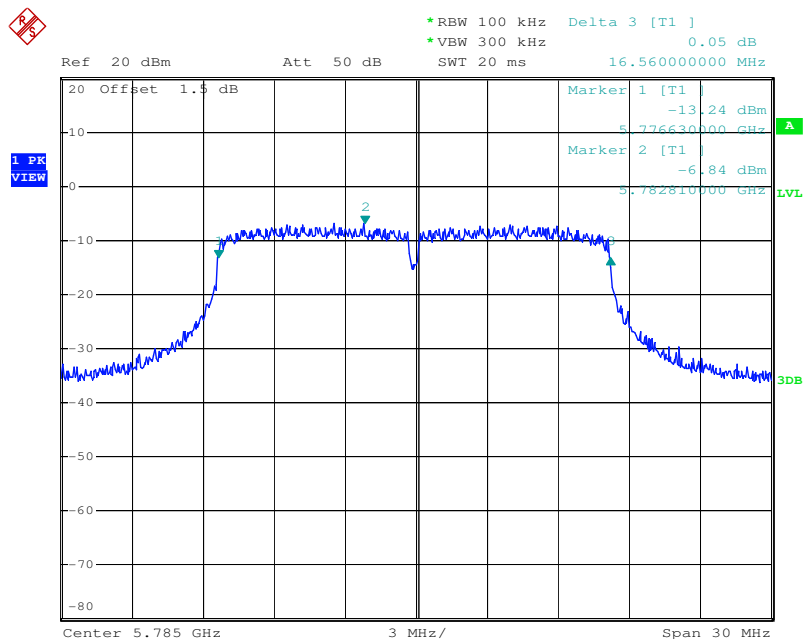
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Test plot as follows:

Test mode:	802.11a	Frequency(MHz):	5745
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Test mode:	802.11a	Frequency(MHz):	5785
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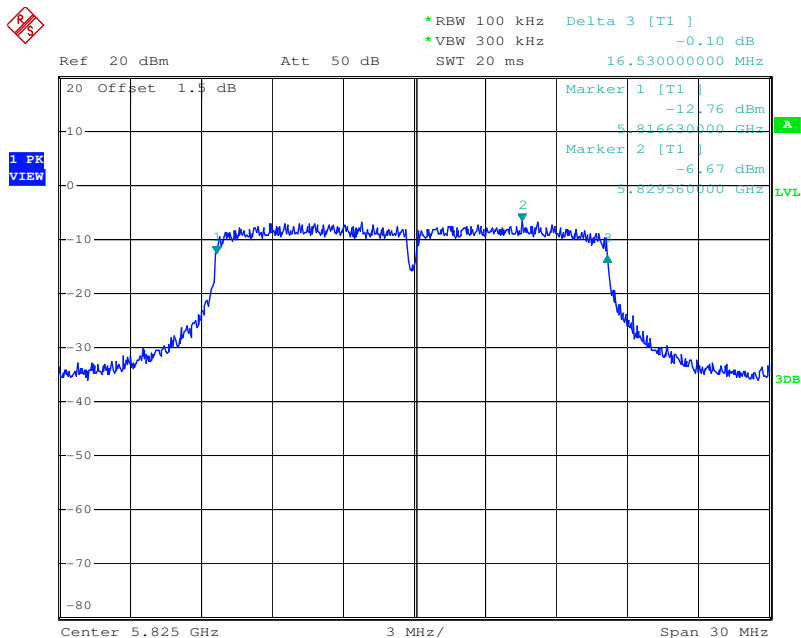


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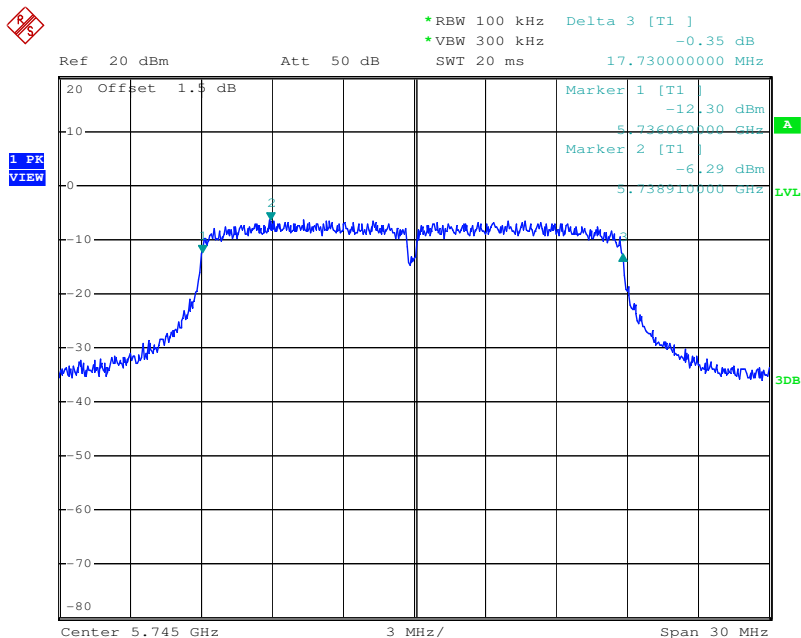
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Test mode:	802.11a	Frequency(MHz):	5825
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Test mode:	802.11n(HT20)	Frequency(MHz):	5745
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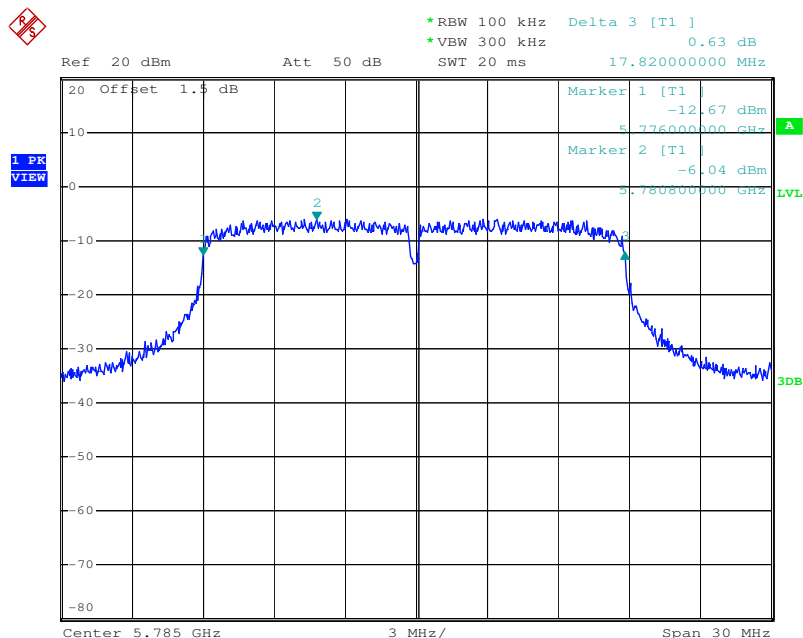




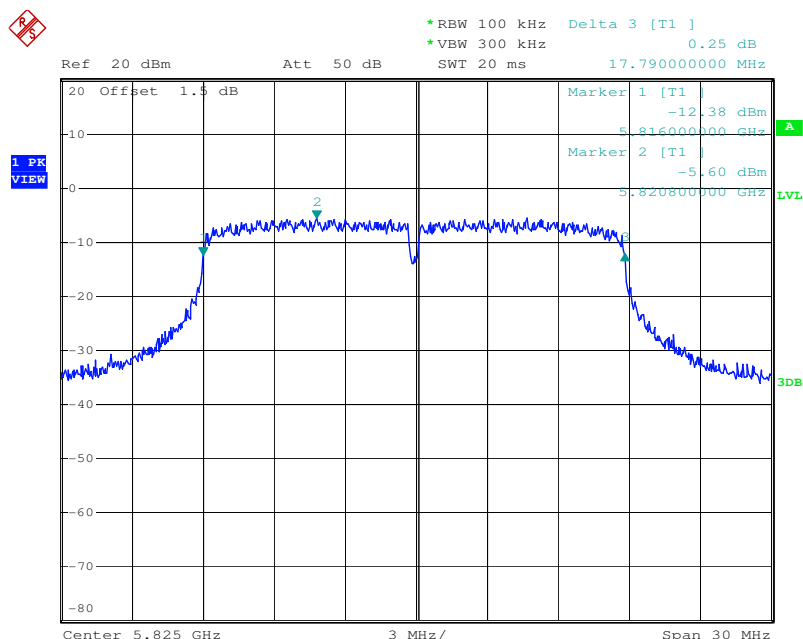
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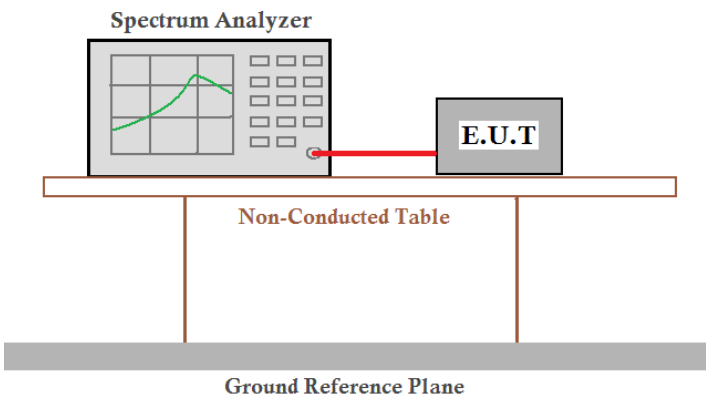
Test mode:	802.11n(HT20)	Frequency(MHz):	5785
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Test mode:	802.11n(HT20)	Frequency(MHz):	5825
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## 6.5 Power Spectral Density

Test Requirement:	47 CFR Part 15 Section 15.407(a)	
Test Method:	ANSI C63.10: 2013	
Test Setup:	 <p><i>Remark:</i>  Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</p>	
Test Instruments:	Refer to section 5.10 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). Only the worst case is recorded in the report.	
Limit:	Frequency Band	Limit
	5725-5850MHz	The power spectral density less than 30dBm/500kHz
Test Results:	Pass	



**Measurement Data:**

802.11a mode			
Frequency (MHz)	Power Spectral Density	Limit	Result
5745	-7.09	$\leq 30\text{dBm}/500\text{kHz}$	Pass
5785	-7.03	$\leq 30\text{dBm}/500\text{kHz}$	Pass
5825	-7.41	$\leq 30\text{dBm}/500\text{kHz}$	Pass

802.11n(HT20) mode			
Frequency (MHz)	Power Spectral Density	Limit	Result
5745	-9.23	$\leq 30\text{dBm}/500\text{kHz}$	Pass
5785	-9.08	$\leq 30\text{dBm}/500\text{kHz}$	Pass
5825	-8.07	$\leq 30\text{dBm}/500\text{kHz}$	Pass





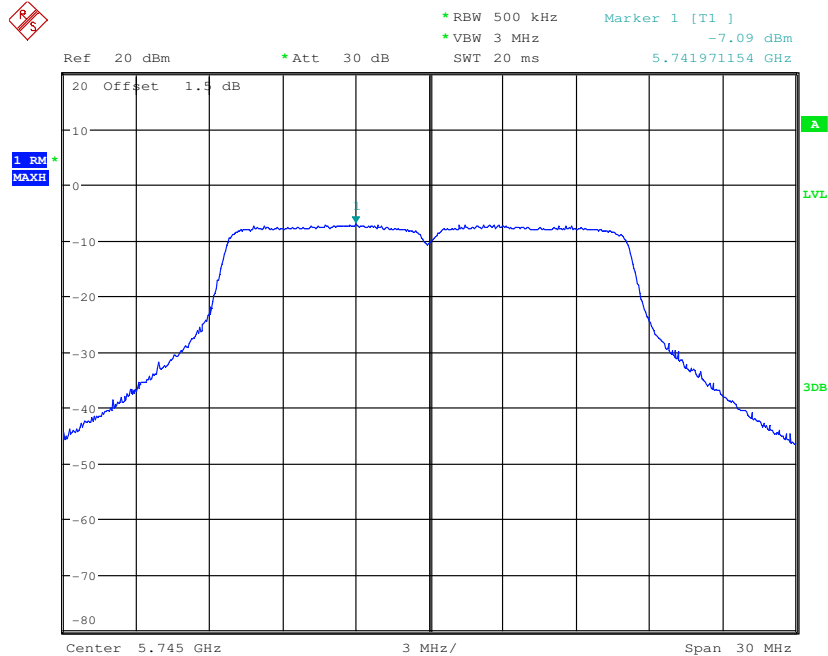
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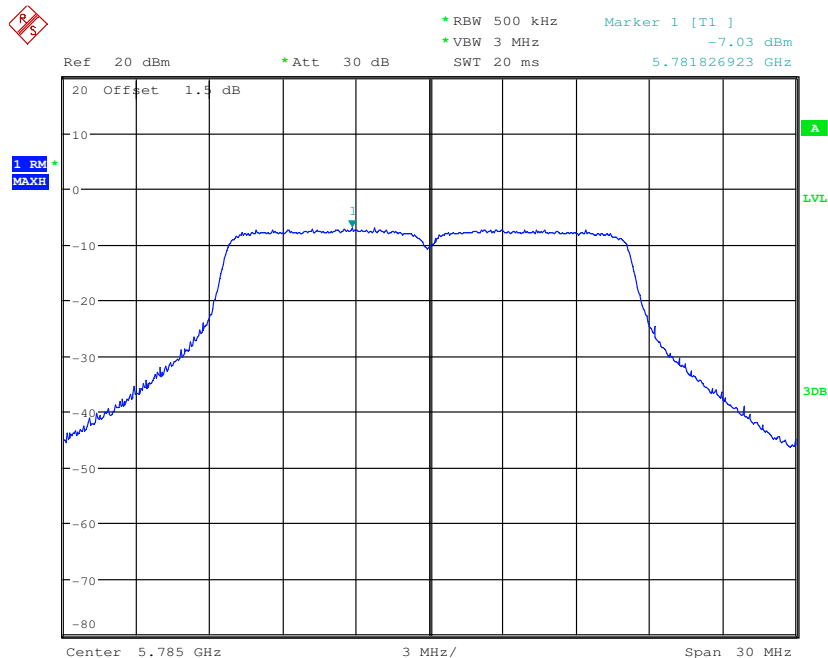
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Test plot as follows:

Test mode:	802.11a	Frequency(MHz):	5745
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Test mode:	802.11a	Frequency(MHz):	5785
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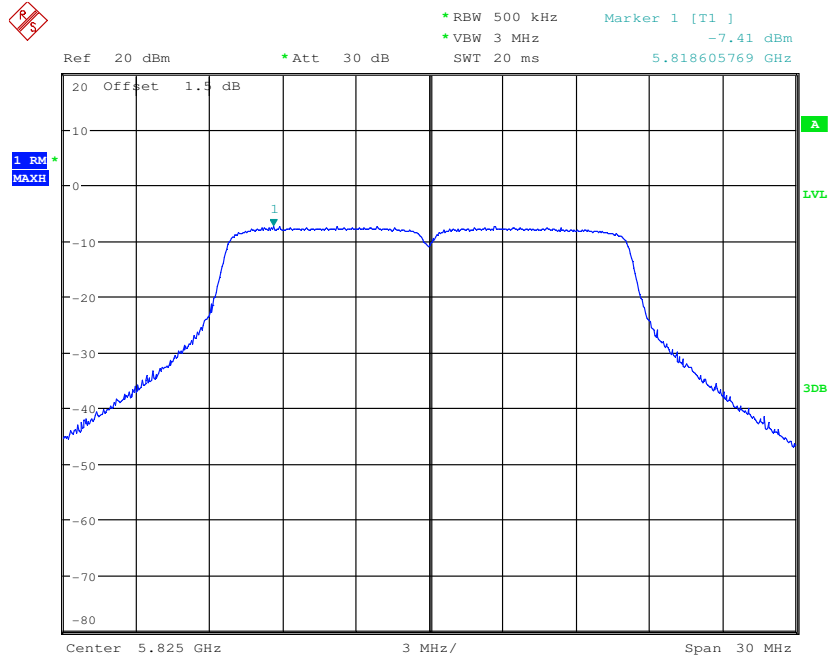


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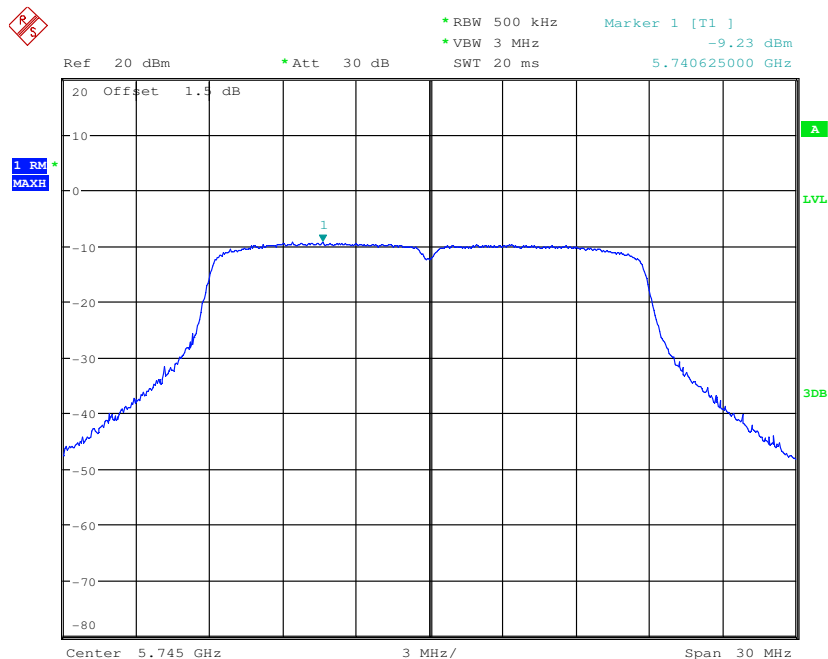
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Test mode:	802.11a	Frequency(MHz):	5825
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Test mode:	802.11n(HT20)	Frequency(MHz):	5745
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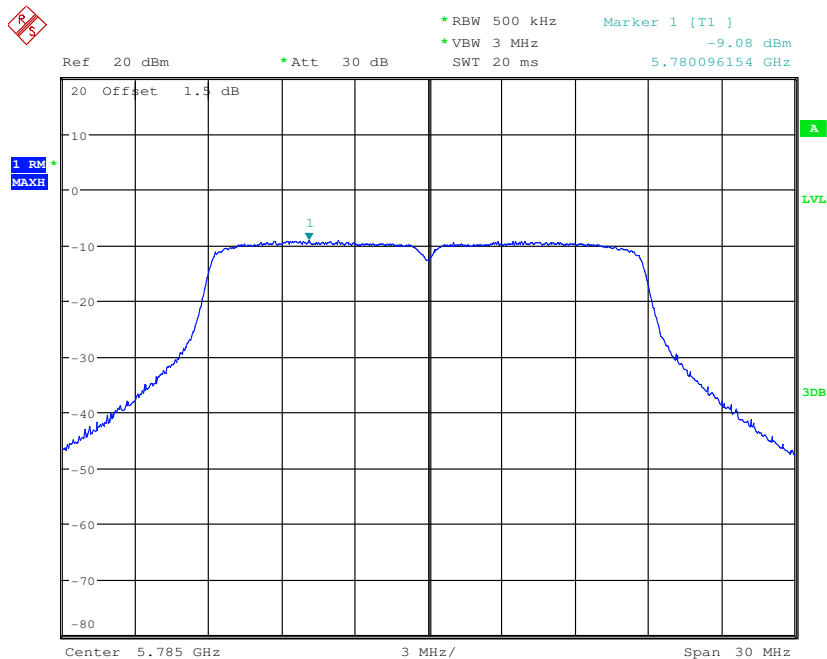




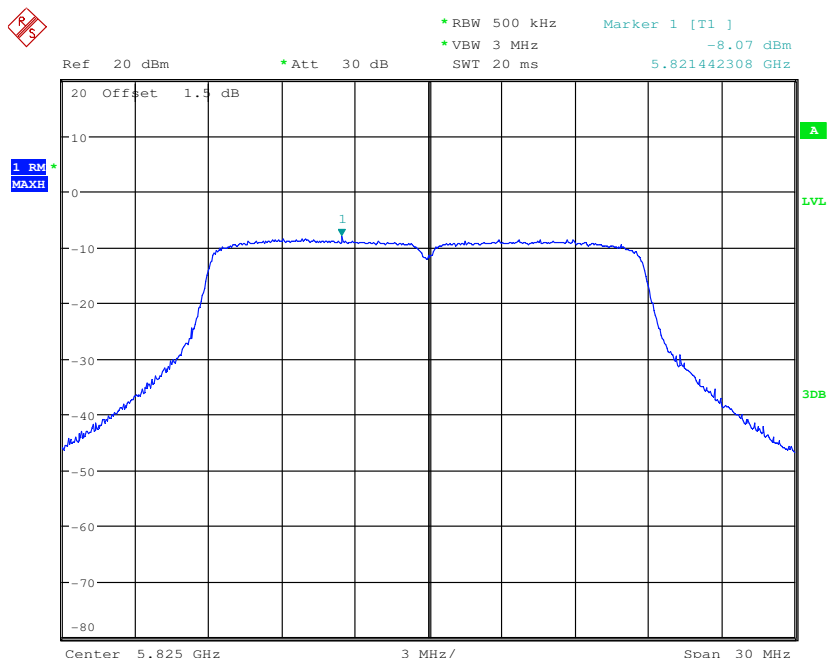
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Test mode:	802.11n(HT20)	Frequency(MHz):	5785
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Test mode:	802.11n(HT20)	Frequency(MHz):	5825
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## 6.6 Radiated Spurious Emissions

Test Requirement:	47 CFR Part 15 Section 15.407(b)
Test Method:	ANSI C63.10: 2013
Test Site:	Below 1GHz: Measurement Distance: 10m (Semi-Anechoic Chamber) Above 1GHz: Measurement Distance: 3m (Full-Anechoic Chamber)
Test Setup:	

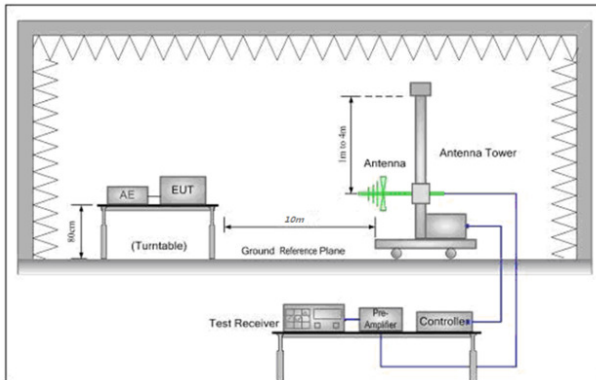


Figure 1. 30MHz to 1GHz

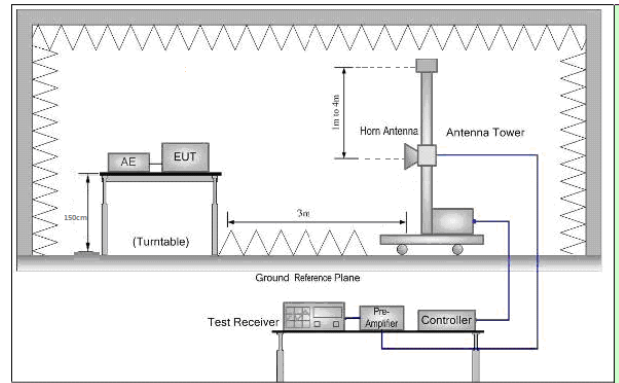


Figure 2. Above 1 GHz

Test Procedure:	<ol style="list-style-type: none"> <li>For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li> <li>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>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>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.</li> <li>The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</li> <li>Test the EUT in the lowest channel, the middle channel, and the Highest channel</li> <li>The radiation measurements are performed in X, Y, Z axis positioning for</li> </ol>
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	Transmitting mode, and found the X axis positioning which it is the worst case. j. 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). For below 1GHz, through Pre-scan, find the 1Mbps 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 5.10 for details
Test Results:	Pass

For frequencies below 1GHz, the test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_3 / L_{10} = D_{10} / D_3$$

Note:

$L_3$ : Level @ 3m distance. Unit:  $\mu\text{V/m}$ ;

$L_{10}$ : Level @ 10m distance. Unit:  $\mu\text{V/m}$ ;

$D_3$ : 3m distance. Unit: m

$D_{10}$ : 10m distance. Unit: m

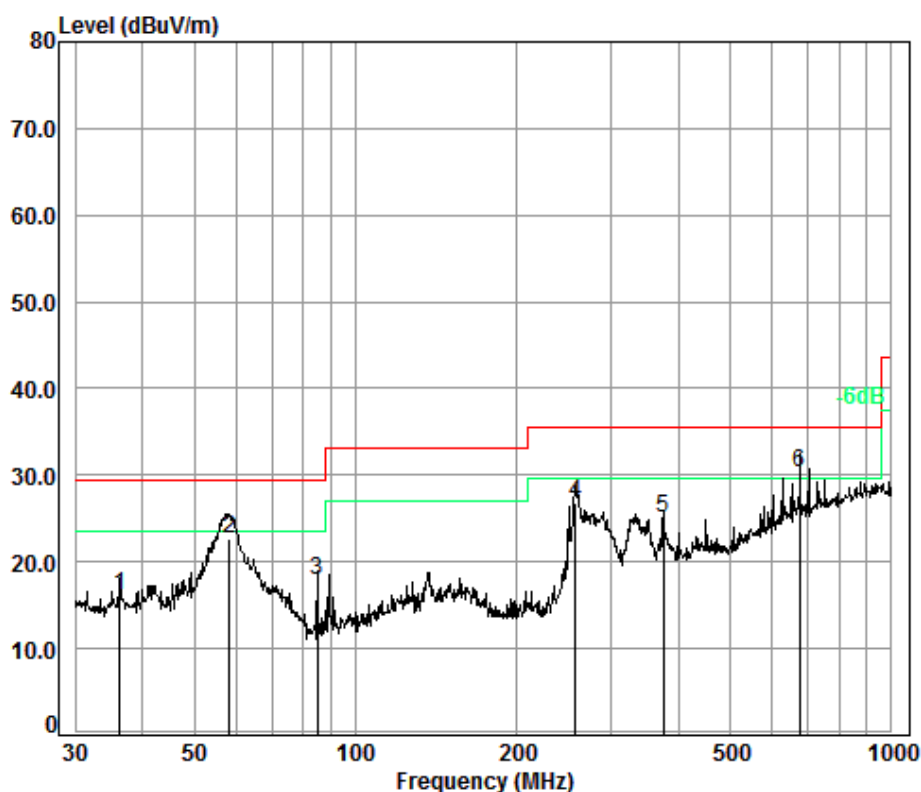
The level at 3m test distance is below:

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 10m ( $\mu\text{V/m}$ )	Level @ 3m ( $\mu\text{V/m}$ )	Level @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dB)	Ant. Polarization
36.38	16.11	6.39	21.30	26.57	40.00	-13.43	V
58.20	22.59	13.47	44.91	33.05	40.00	-6.95	V
85.00	17.89	7.84	26.14	28.35	40.00	-11.65	V
257.42	26.75	21.75	72.51	37.21	46.00	-8.79	V
375.94	24.99	17.76	59.21	35.45	46.00	-10.55	V
675.00	30.33	32.85	109.49	40.79	46.00	-5.21	V
41.57	15.09	5.68	18.94	25.55	40.00	-14.45	H
58.20	13.64	4.81	16.03	24.10	40.00	-15.90	H
160.35	15.09	5.68	18.94	25.55	43.50	-17.95	H
287.99	16.64	6.79	22.64	27.10	46.00	-18.90	H
451.14	24.26	16.33	54.44	34.72	46.00	-11.28	H
942.13	28.13	25.50	84.99	38.59	46.00	-7.41	H



## 6.6.1 Radiated emission below 1GHz

30MHz~1GHz (QP)		
Test mode:	Transmitting mode	Vertical



Condition: 10m VERTICAL

Job No. : 7562CR

Test Mode: TX mode

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	36.38	6.73	12.84	32.98	29.52	16.11	29.50	-13.39
2	58.20	7.00	12.13	32.96	36.42	22.59	29.50	-6.91
3	85.00	7.15	8.62	32.85	34.97	17.89	29.50	-11.61
4	257.42	7.89	11.42	32.64	40.08	26.75	35.60	-8.85
5	375.94	8.30	14.41	32.60	34.88	24.99	35.60	-10.61
6 pp	675.00	9.09	19.84	32.60	34.00	30.33	35.60	-5.27

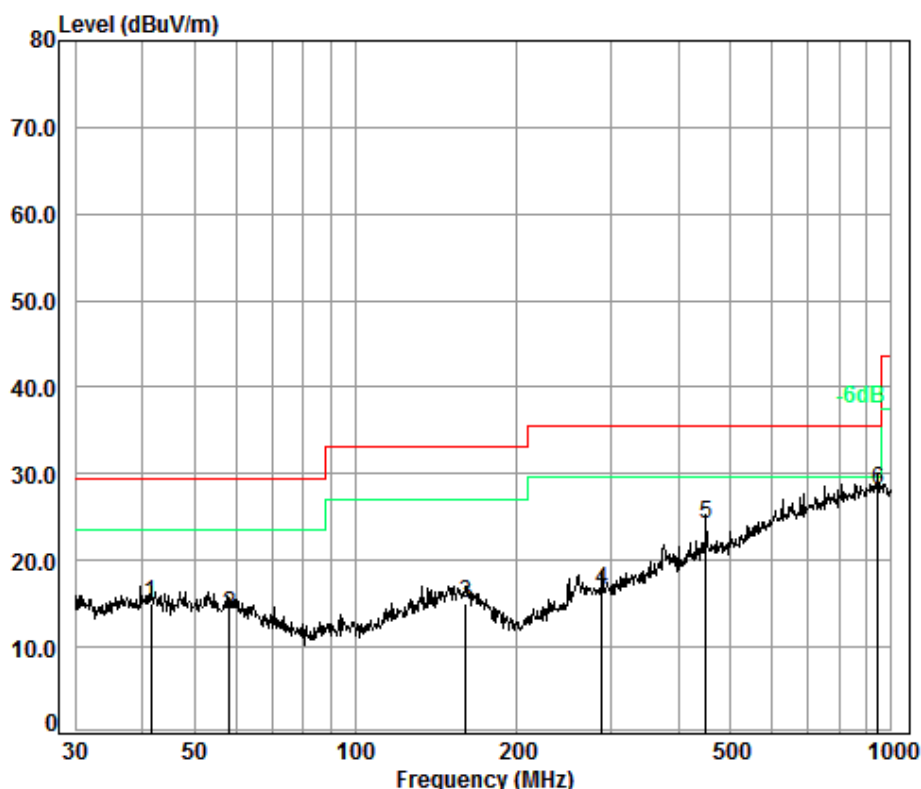


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Test mode:	Transmitting mode	Horizontal
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Condition: 10m HORIZONTAL

Job No. : 7562CR

Test Mode: TX mode

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	41.57	6.80	13.18	32.99	28.10	15.09	29.50	-14.41
2	58.20	7.00	12.13	32.96	27.47	13.64	29.50	-15.86
3	160.35	7.50	13.36	32.73	26.96	15.09	33.10	-18.01
4	287.99	8.02	12.36	32.61	28.87	16.64	35.60	-18.96
5	451.14	8.43	16.19	32.60	32.24	24.26	35.60	-11.34
6 pp	942.13	9.56	22.68	32.50	28.39	28.13	35.60	-7.47



## 6.6.2 Transmitter emission above 1GHz

Test plot as follows:

Test mode:		802.11a		Frequency(MHz):		5745		Remark:	Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
7899.514	36.54	11.01	37.49	42.14	52.20	74.00	-21.80	Vertical	
9632.455	37.53	12.51	36.98	39.63	52.69	74.00	-21.31	Vertical	
11490.000	38.09	14.01	37.80	37.86	52.16	74.00	-21.84	Vertical	
13105.510	38.76	15.58	39.43	37.72	52.63	74.00	-21.37	Vertical	
15431.710	41.39	16.96	40.06	34.93	53.22	74.00	-20.78	Vertical	
17235.000	43.08	19.50	37.98	29.18	53.78	74.00	-20.22	Vertical	
8057.754	36.53	11.15	37.39	40.98	51.27	74.00	-22.73	Horizontal	
9937.399	37.59	12.68	36.83	38.92	52.36	74.00	-21.64	Horizontal	
11490.000	38.09	14.01	37.80	38.18	52.48	74.00	-21.52	Horizontal	
13254.890	38.70	15.62	39.61	37.83	52.54	74.00	-21.46	Horizontal	
15301.090	41.36	16.84	40.19	35.79	53.80	74.00	-20.20	Horizontal	
17235.000	43.08	19.50	37.98	29.30	53.90	74.00	-20.10	Horizontal	

Test mode:		802.11a		Frequency(MHz):		5785		Remark:	Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
8265.873	36.28	11.49	37.37	41.02	51.42	74.00	-22.58	Vertical	
9714.682	37.54	12.56	36.94	38.61	51.77	74.00	-22.23	Vertical	
11570.000	38.17	14.09	37.88	38.10	52.48	74.00	-21.52	Vertical	
13610.090	38.73	15.81	40.04	38.54	53.04	74.00	-20.96	Vertical	
15890.200	41.24	17.40	39.61	34.70	53.73	74.00	-20.27	Vertical	
17355.000	43.23	19.92	37.87	28.20	53.48	74.00	-20.52	Vertical	
8265.873	36.28	11.49	37.37	42.02	52.42	74.00	-21.58	Horizontal	
9816.135	37.56	12.61	36.89	39.19	52.47	74.00	-21.53	Horizontal	
11570.000	38.17	14.09	37.88	38.10	52.48	74.00	-21.52	Horizontal	
13610.090	38.73	15.81	40.04	38.54	53.04	74.00	-20.96	Horizontal	
15785.500	41.29	17.30	39.71	34.02	52.90	74.00	-21.10	Horizontal	
17355.000	43.23	19.92	37.87	27.67	52.95	74.00	-21.05	Horizontal	





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Test mode:		802.11a		Frequency(MHz):		5825	Remark:		Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
8608.476	36.13	11.84	37.34	41.25	51.88	74.00	-22.12	Vertical	
10126.890	37.47	12.81	36.87	38.31	51.72	74.00	-22.28	Vertical	
11650.000	38.25	14.18	37.96	38.35	52.82	74.00	-21.18	Vertical	
13469.420	38.61	15.67	39.87	38.48	52.89	74.00	-21.11	Vertical	
15446.290	41.39	16.98	40.05	34.99	53.31	74.00	-20.69	Vertical	
17475.000	43.37	20.33	37.77	27.35	53.28	74.00	-20.72	Vertical	
8714.822	36.26	11.82	37.33	40.61	51.36	74.00	-22.64	Horizontal	
10126.890	37.47	12.81	36.87	39.31	52.72	74.00	-21.28	Horizontal	
11650.000	38.25	14.18	37.96	38.35	52.82	74.00	-21.18	Horizontal	
13713.310	38.86	15.93	40.16	37.59	52.22	74.00	-21.78	Horizontal	
15578.150	41.37	17.10	39.91	34.64	53.20	74.00	-20.80	Horizontal	
17475.000	43.37	20.33	37.77	27.69	53.62	74.00	-20.38	Horizontal	

Test mode:		802.11n(HT20)		Frequency(MHz):		5745	Remark:		Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
8511.462	36.01	11.85	37.35	40.77	51.28	74.00	-22.72	Vertical	
9862.599	37.57	12.64	36.87	38.15	51.49	74.00	-22.51	Vertical	
11490.000	38.09	14.01	37.80	37.86	52.16	74.00	-21.84	Vertical	
13469.420	38.61	15.67	39.87	38.93	53.34	74.00	-20.66	Vertical	
15431.710	41.39	16.96	40.06	34.93	53.22	74.00	-20.78	Vertical	
17235.000	43.08	19.50	37.98	28.61	53.21	74.00	-20.79	Vertical	
7825.257	36.50	10.97	37.57	41.55	51.45	74.00	-22.55	Horizontal	
9532.901	37.51	12.46	37.03	38.88	51.82	74.00	-22.18	Horizontal	
11490.000	38.09	14.01	37.80	38.27	52.57	74.00	-21.43	Horizontal	
12872.430	38.83	15.20	39.18	38.54	53.39	74.00	-20.61	Horizontal	
15229.010	41.35	16.77	40.27	35.70	53.55	74.00	-20.45	Horizontal	
17235.000	43.08	19.50	37.98	28.53	53.13	74.00	-20.87	Horizontal	



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Test mode:		802.11n(HT20)		Frequency(MHz):		5785	Remark:		Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
8367.987	36.15	11.65	37.36	41.06	51.50	74.00	-22.50	Vertical	
9816.135	37.56	12.61	36.89	38.19	51.47	74.00	-22.53	Vertical	
11570.000	38.17	14.09	37.88	37.83	52.21	74.00	-21.79	Vertical	
13752.220	38.91	15.97	40.21	37.86	52.53	74.00	-21.47	Vertical	
15315.550	41.36	16.85	40.18	34.93	52.96	74.00	-21.04	Vertical	
17355.000	43.23	19.92	37.87	28.34	53.62	74.00	-20.38	Vertical	
8328.564	36.20	11.58	37.37	40.93	51.34	74.00	-22.66	Horizontal	
10050.670	37.55	12.75	36.83	38.36	51.83	74.00	-22.17	Horizontal	
11570.000	38.17	14.09	37.88	38.35	52.73	74.00	-21.27	Horizontal	
13558.770	38.67	15.75	39.98	37.79	52.23	74.00	-21.77	Horizontal	
15681.480	41.33	17.20	39.81	34.33	53.05	74.00	-20.95	Horizontal	
17355.000	43.23	19.92	37.87	28.04	53.32	74.00	-20.68	Horizontal	

Test mode:		802.11n(HT20)		Frequency(MHz):		5825	Remark:		Peak
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	
7847.461	36.51	10.98	37.54	41.54	51.49	74.00	-22.51	Vertical	
9550.925	37.51	12.47	37.02	38.94	51.90	74.00	-22.10	Vertical	
11650.000	38.25	14.18	37.96	37.69	52.16	74.00	-21.84	Vertical	
13267.410	38.69	15.62	39.63	37.67	52.35	74.00	-21.65	Vertical	
15301.090	41.36	16.84	40.19	34.79	52.80	74.00	-21.20	Vertical	
17475.000	43.37	20.33	37.77	27.60	53.53	74.00	-20.47	Vertical	
8289.327	36.25	11.52	37.37	40.61	51.01	74.00	-22.99	Horizontal	
9650.668	37.53	12.52	36.97	38.18	51.26	74.00	-22.74	Horizontal	
11650.000	38.25	14.18	37.96	37.76	52.23	74.00	-21.77	Horizontal	
13330.210	38.67	15.64	39.71	38.27	52.87	74.00	-21.13	Horizontal	
15243.400	41.35	16.78	40.25	35.47	53.35	74.00	-20.65	Horizontal	
17480.630	43.38	20.35	37.76	27.51	53.48	74.00	-20.52	Horizontal	



Remark:

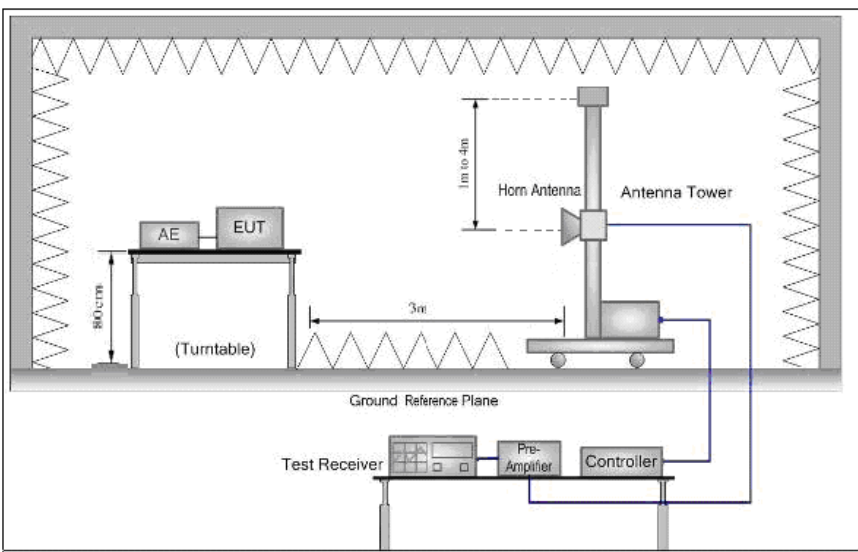
1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) Scan from 9kHz to 40GHz, The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

3) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

## 6.7 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 (Full-Anechoic Chamber)		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value
Test Setup:			



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Test Procedure:	<ul style="list-style-type: none"><li>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</li><li>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</li><li>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.</li><li>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.</li><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>f. 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>g. Test the EUT in the outermost channels.</li><li>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.</li><li>i. Repeat above procedures until all frequencies measured was complete.</li></ul>
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). Only the worst case is recorded in the report.
Instruments Used:	Refer to section 5.10 for details
Test Results:	Pass



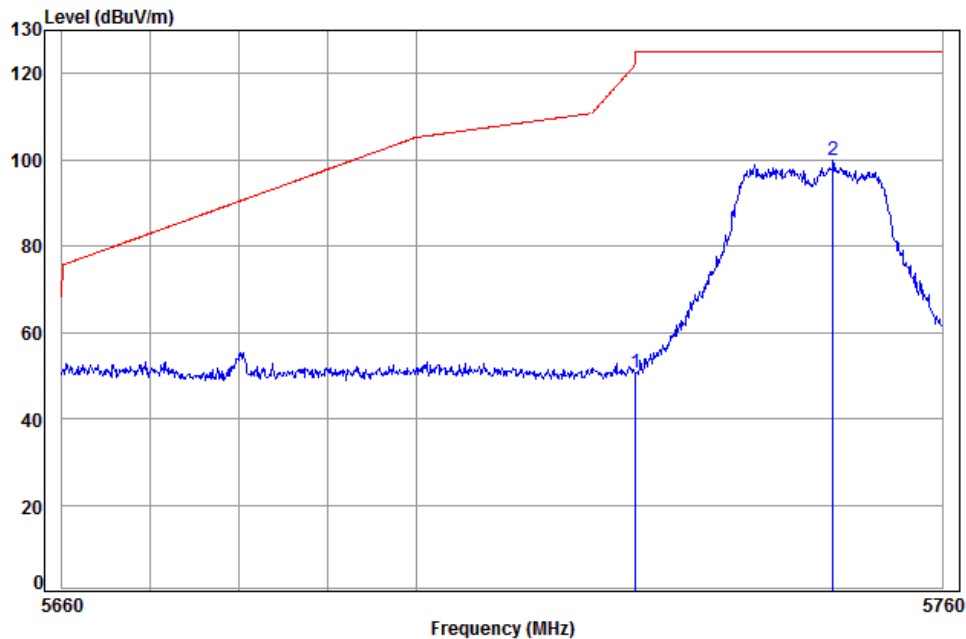
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Test plot as follows:

Test mode:	802.11a	Frequency(MHz):	5745	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

Mode: : 5745 Band edge

: Radio station A20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5725.000	8.48	34.54	39.03	46.84	50.83	122.20	-71.37	
2	5747.505	8.50	34.55	39.02	95.75	99.78	125.20	-25.42	

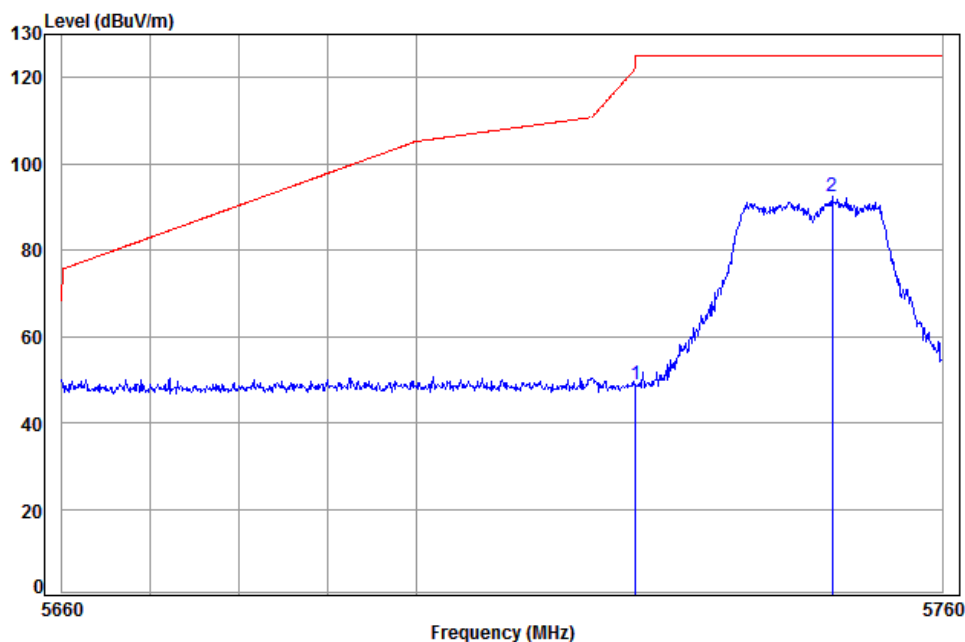


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Test mode:	802.11a	Frequency(MHz):	5745	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7562CR

Mode: : 5745 Band edge

: Radio station A20

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Limit Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5725.000	8.48	34.54	39.03	44.94	48.93	122.20	-73.27
2 pp	5747.404	8.50	34.55	39.02	88.54	92.57	125.20	-32.63

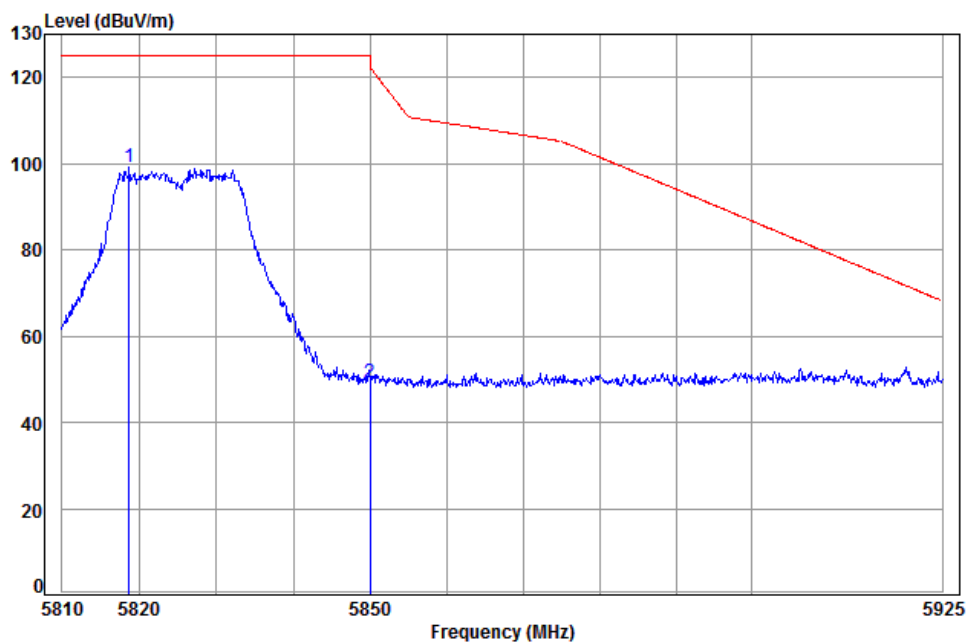


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Test mode:	802.11a	Frequency(MHz):	5825	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

Mode: : 5825 Band edge

: Radio station A20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	pp 5818.661	8.57	34.59	39.02	95.10	99.24	125.20	-25.96
2	5850.000	8.60	34.61	39.01	44.90	49.10	122.20	-73.10



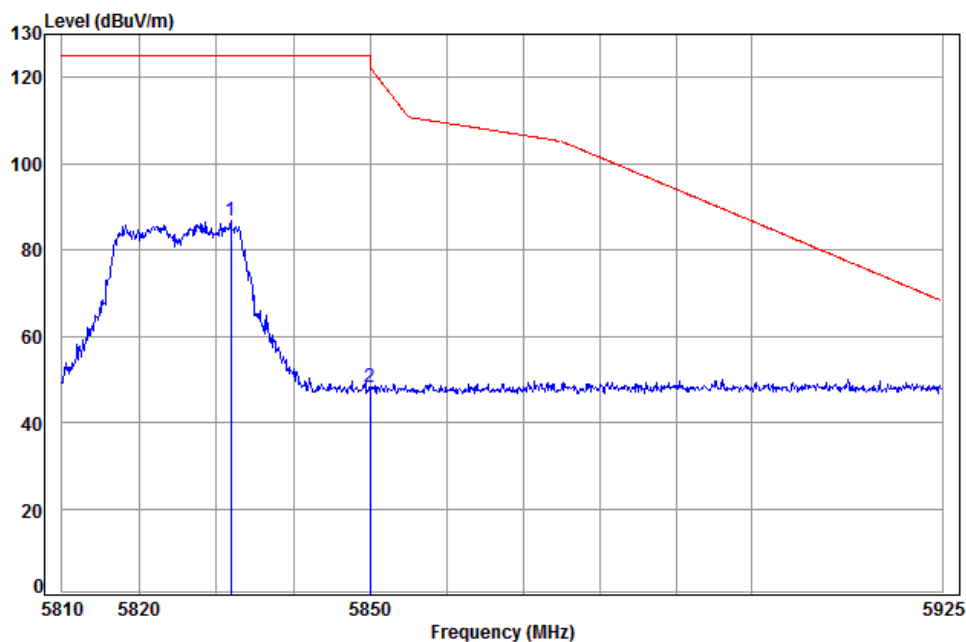


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Test mode:	802.11a	Frequency(MHz):	5825	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7562CR

Mode: : 5825 Band edge

: Radio station A20

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Limit Level	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	5831.905	8.59	34.60	39.02	82.73	86.90	125.20	-38.30
2	5850.000	8.60	34.61	39.01	43.86	48.06	122.20	-74.14

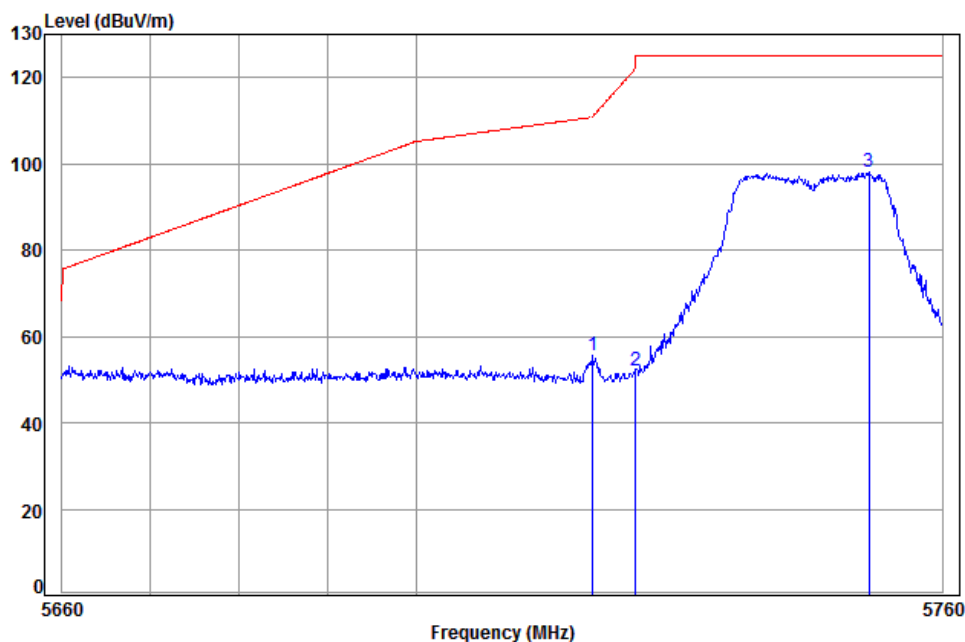


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Test mode:	802.11n(HT20)	Frequency(MHz):	5745	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

Mode: : 5745 Band edge

: Radio station N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5720.090	8.48	34.54	39.03	51.78	55.77	111.01	-55.24	
2	5725.000	8.48	34.54	39.03	48.02	52.01	122.20	-70.19	
3 pp	5751.633	8.51	34.55	39.02	93.98	98.02	125.20	-27.18	

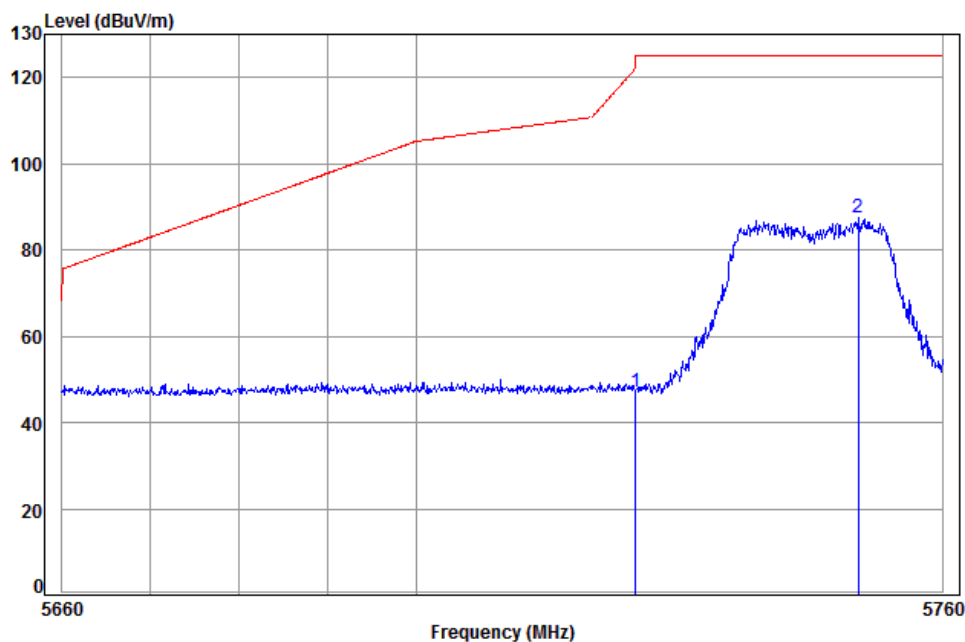


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Test mode:	802.11n(HT20)	Frequency(MHz):	5745	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7562CR

Mode: : 5745 Band edge

: Radio station N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	5725.000	8.48	34.54	39.03	43.13	47.12	122.20	-75.08	
2 pp	5750.424	8.51	34.55	39.02	83.28	87.32	125.20	-37.88	

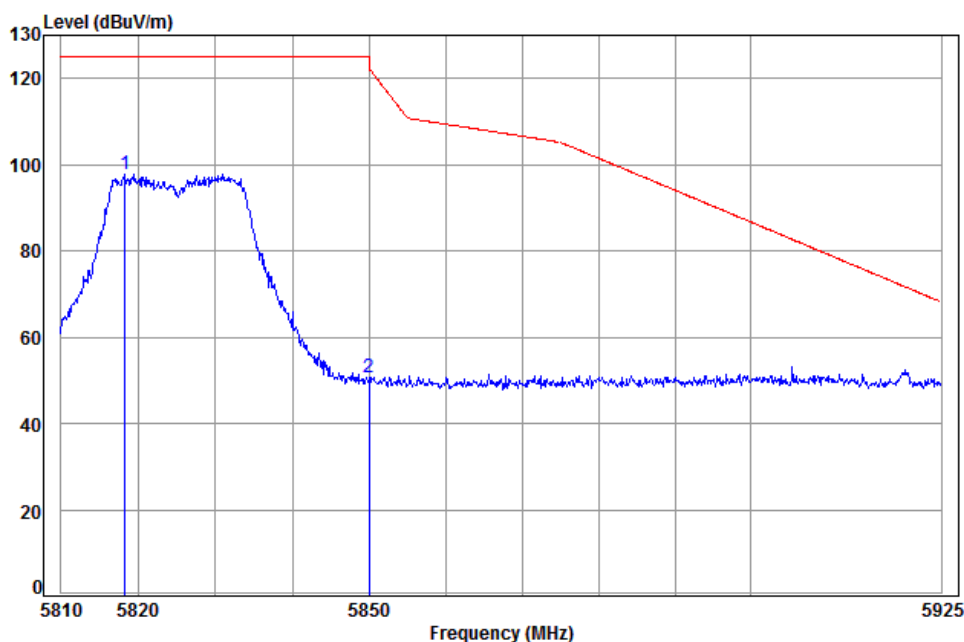


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Test mode:	802.11n(HT20)	Frequency(MHz):	5825	Vertical
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Condition: 3m VERTICAL

Job No: : 7562CR

Mode: : 5825 Band edge

: Radio station N20

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	5818.319	8.57	34.59	39.02	93.52	97.66	125.20	-27.54
2	5850.000	8.60	34.61	39.01	46.41	50.61	122.20	-71.59

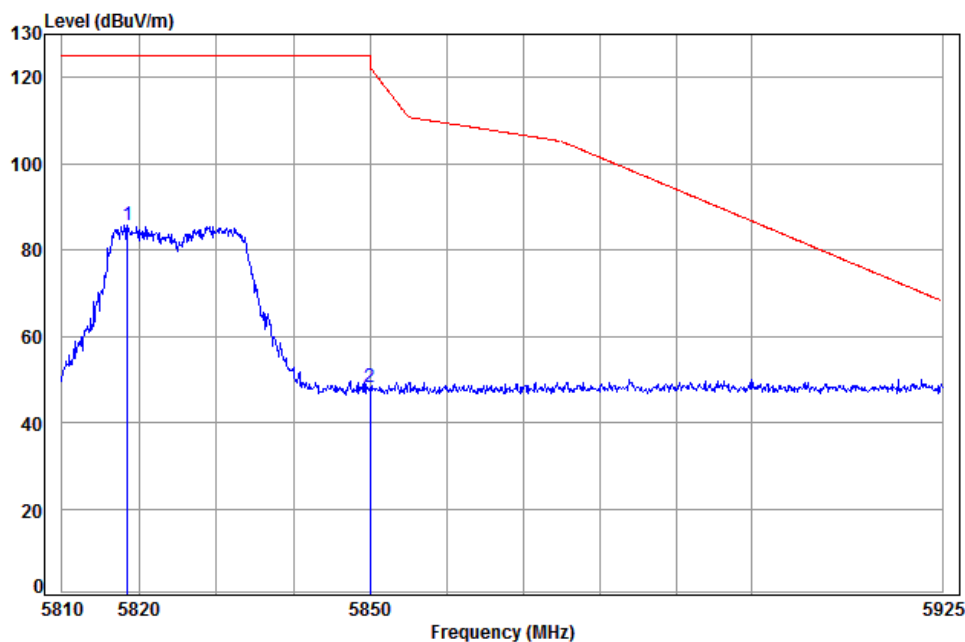


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Test mode:	802.11n(HT20)	Frequency(MHz):	5825	Horizontal
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Condition: 3m HORIZONTAL

Job No: : 7562CR

Mode: : 5825 Band edge

: Radio station N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	pp 5818.433	8.57	34.59	39.02	81.55	85.69	125.20	-39.51	
2	5850.000	8.60	34.61	39.01	43.81	48.01	122.20	-74.19	

**Note:**

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

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$



## 6.8 Frequency Stability

Test Requirement:	47 CFR Part 15 Section 15.407(g)
Test Method:	ANSI C63.10: 2013
Test Setup:	<pre> graph LR     SA[Spectrum Analyzer] --- EUT[EUT]     subgraph TC [Temperature Chamber]         EUT     end     P[AC/DC Power supply] --- EUT </pre>
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Procedure:	<ol style="list-style-type: none"> <li>The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage.</li> <li>Turn the EUT on and couple its output to a spectrum analyzer.</li> <li>Turn the EUT off and set the chamber to the highest temperature specified.</li> <li>Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.</li> <li>Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.</li> <li>The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.</li> </ol>
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); Only the worst case is recorded in the report.



**Test plot as follows:**

Test mode:	802.11a	Frequency(MHz):	5745
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5746.1797	Pass
25		5746.1800	Pass
15		5746.1801	Pass
5		5746.1798	Pass
0		5746.1792	Pass
20	4.2	5746.1794	Pass
	3.7	5746.1800	Pass
	3.6	5746.1802	Pass

Test mode:	802.11a	Frequency(MHz):	5785
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5786.1798	Pass
25		5786.1800	Pass
15		5786.1805	Pass
5		5786.1803	Pass
0		5786.1799	Pass
20	4.2	5786.1795	Pass
	3.7	5786.1800	Pass
	3.6	5786.1809	Pass

Test mode:	802.11a	Frequency(MHz):	5825
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5826.1798	Pass
25		5826.1800	Pass
15		5826.1807	Pass
5		5826.1802	Pass
0		5826.1800	Pass
20	4.2	5826.1797	Pass
	3.7	5826.1800	Pass
	3.6	5826.1805	Pass



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Test mode:	802.11n(HT20)	Frequency(MHz):	5745
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5746.3494	Pass
25		5746.3500	Pass
15		5746.3503	Pass
5		5746.3495	Pass
0		5746.3490	Pass
20	4.2	5746.3496	Pass
	3.7	5746.3500	Pass
	3.6	5746.3509	Pass

Test mode:	802.11n(HT20)	Frequency(MHz):	5785
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5786.3498	Pass
25		5786.3500	Pass
15		5786.3505	Pass
5		5786.3496	Pass
0		5786.3495	Pass
20	4.2	5786.3498	Pass
	3.7	5786.3500	Pass
	3.6	5786.3506	Pass

Test mode:	802.11n(HT20)	Frequency(MHz):	5825
Temperature (°C)	Voltage(VDC)	Measurement Frequency(MHz)	Result
35	3.7	5826.3490	Pass
25		5826.3500	Pass
15		5826.3502	Pass
5		5826.3494	Pass
0		5826.3492	Pass
20	4.2	5826.3499	Pass
	3.7	5826.3500	Pass
	3.6	5826.3509	Pass





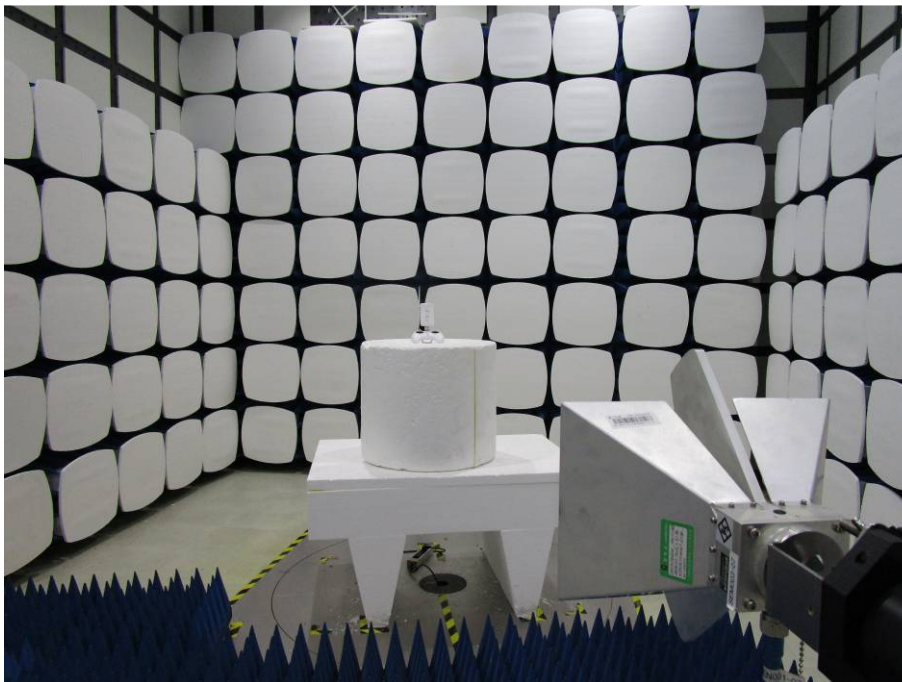
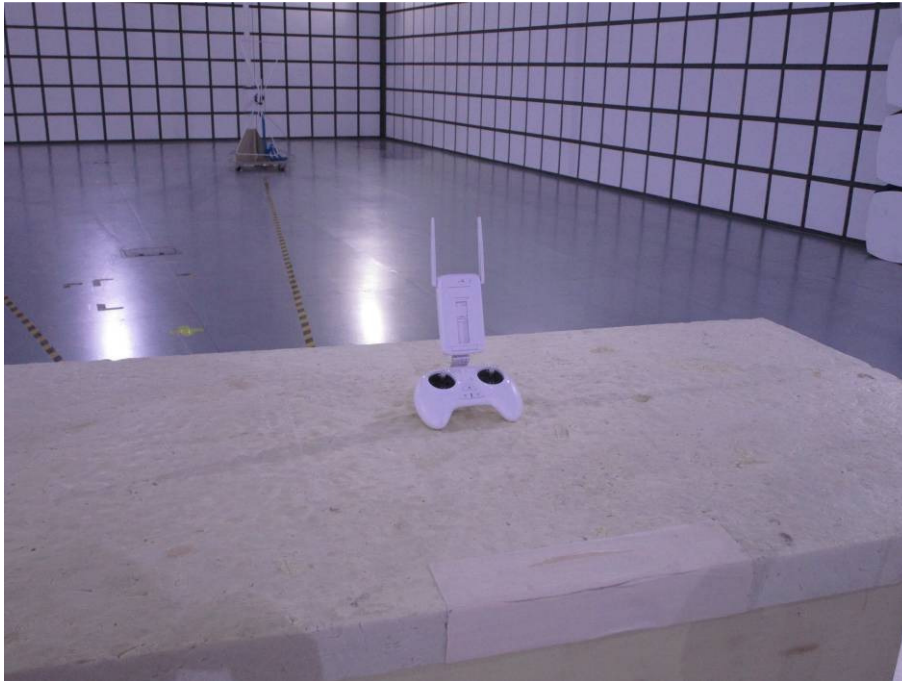
## 6.9 Automatically Discontinue Transmission Requirement

<b>Test Requirement:</b>	47 CFR Part 15 Section 15.407 (c)
<b>Declaration from applicant</b>	WIFI chip (AR9342) support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.

## 7 Photographs - EUT Test Setup

Test model No.: PEGRS10

### 7.1 Radiated Spurious Emission





## **8 Photographs - EUT Constructional Details**

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1609007562CR.