TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: SZRHD5-1200

Product: Digital Video Recorder

Model No.: HD5-1200

Additional Model No.: N/A

Trade Mark: REI

Report No.: TCT161117E014

Issued Date: Dec. 06, 2016

Issued for:

Radio Engineering Industries Inc.

6534 L Street Omaha, Nebraska 68117, United States

Issued By:

Shenzhen Tongce Testing Lab.

1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China

TEL: +86-755-27673339

FAX: +86-755-27673332

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	Digital Video Recorder
Model No.:	HD5-1200
Additional Model No.:	N/A
Applicant:	Radio Engineering Industries Inc.
Address:	6534 L Street Omaha, Nebraska 68117, United States
Manufacturer:	Radio Engineering Industries Inc.
Address:	6534 L Street Omaha, Nebraska 68117, United States
Date of Test:	Nov. 18 – Dec. 02, 2016
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r03

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Garen	***Date:***	***Dec. 02, 2016***
Reviewed By:	Joe Zhou	***Date:***	***Dec. 06, 2016***
Approved By:	Tomsin	***Date:***	***Dec. 06, 2016***

2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	N/A
Maximum Conducted Output Power	§15.407(a) §2.1046	PASS
6dB Emission Bandwidth	§15.407(a) §2.1049	PASS
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a) §2.1049	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a) §2.1053	PASS
Frequency Stability	§15.407(g) §2.1055	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. EUT Description

Product Name:	Digital Video Recorder
Model :	HD5-1200
Additional Model:	N/A
Trade Mark:	REI
Operation Frequency:	Band IV: 5745MHz~5825MHz
Channel Bandwidth:	802.11n: 20MHz, 40MHz
Modulation Technology:	Orthogonal Frequency Division Multiplexing(OFDM)
Modulation Type	256QAM, 64QAM, 16QAM, BPSK, QPSK
Antenna Type:	External antenna
Antenna Gain:	Band IV: 5745MHz~5825MHz: 3.5dBi
Power Supply:	DC 8V-30V
Test Power:	DC 12V

Band IV (5725 - 5850 MHz) Power level setup in software			
Mode	Channel	Frequency	Soft set
11n (HT20)	CH149	5745	13
11n (HT20)	CH157	5785	19
11n (HT20)	CH165	5825	13
11n (HT40)	CH151	5755	13
11n (HT40)	CH159	5795	13

Note: The Soft set value is the internal setting required to meet the requirements and does not necessarily mean the 'dBm' value

Operation Frequency each of channel

20MHz		40MHz	
Channel	Frequency	Channel	Frequency
36	5180	38	5190
40	5200	46	5230
44	5220	54	5270
48	5240	62	5310
52	5260	102	5510
56	5280	110	5550
60	5300	134	5670
64	5320	151	5755
100	5500	159	5790
104	5520		
108	5540		
112	5560		
116	5580		
132	5660		
136	5680		
140	5700		
149	5745		
153	5765		
157	5785		
161	5805		
165	5825		

Note:

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:

For 802.11a/n(HT20)

Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)
149	Low	5745
157	Mid	5785
165	High	5825

For 802.11n (HT40)

Band IV (5725 - 5850 MHz)		
Channel Number	Channel	Frequency (MHz)
151	Low	5755
159	High	5795

4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
802.11n(HT20)	6.5 Mbps
802.11n(HT40)	13.5 Mbps
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation

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4.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Lead-acid Battery	DC12VED	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 572331
  Shenzhen Tongce Testing Lab
  The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
- IC - Registration No.: 10668A-1
  The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing
- CNAS - Registration No.: CNAS L6165
  Shenzhen TCT Testing Technology Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6165.

5.2. Location

Shenzhen Tongce Testing Lab
Address: 1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China
Tel: 86-755-36638142

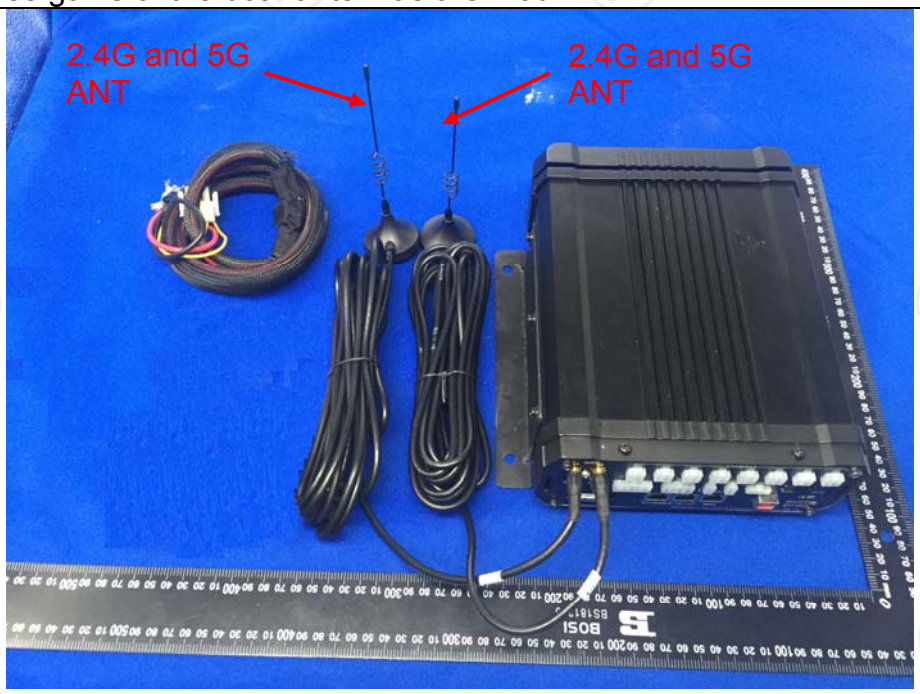
5.3. Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:	FCC Part15 C 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.	
E.U.T Antenna:	
The EUT has two External antennas which is the R-SMA antenna connector used, and the best case gains of the both antennas are 4.5dBi.	
	

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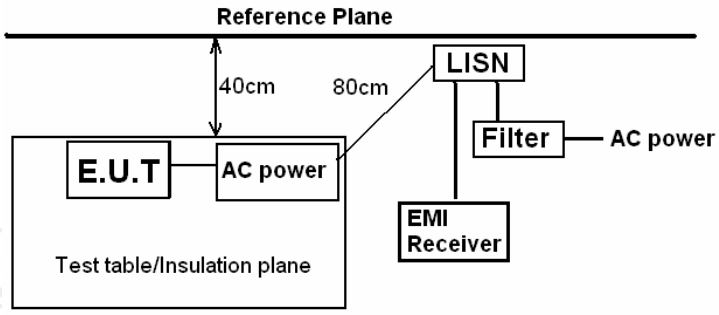
6.2. Conducted Emission

6.2.1. Test Specification

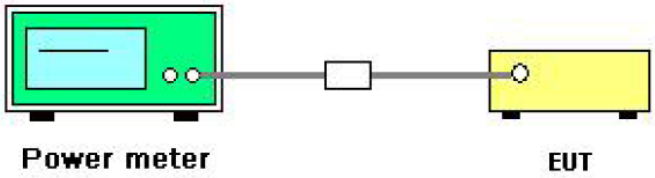
<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Tx Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. 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.</td></tr>
<tr><td>Test Result:</td><td>The EUT is powered by car’s power DC 12V, So not applicable.</td></tr>
</table>

6.3. Maximum Conducted Output Power

6.3.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046</td></tr>
<tr><td>Test Method:</td><td>KDB662911 D01 Multiple Transmitter Output v02r01
KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section E</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<tr><td>5150-5250</td><td>1W for indoor access point</td></tr>
<tr><td>5250-5350</td><td>250 mW or 11 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5470-5725</td><td>250 mW or 11 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5725-5850</td><td>1 W</td></tr>
<tr><td colspan="2">Note: Where “B” is the 26 dB emissions bandwidth in MHz.</td></tr>
</table>
RSS-247, 6.2
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<tr><td>5150-5250</td><td>N/A</td></tr>
<tr><td>5250-5350</td><td>250 mW or 11 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5470-5725</td><td>250 mW or 11 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5725-5850</td><td>1 W</td></tr>
<tr><td colspan="2">Note: Where “B” is the 99% emissions bandwidth in MHz.</td></tr>
</table>
The maximum e.i.r.p. shall not exceed:
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<tr><td>5150-5250</td><td>200 mW or 10 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5250-5350</td><td>1W or 17 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5470-5725</td><td>1W or 17 dBm + 10log B, whichever is less.</td></tr>
<tr><td>5725-5850</td><td>N/A</td></tr>
<tr><td colspan="2">Note: Where “B” is the 99% emissions bandwidth in MHz.</td></tr>
</table>
</td></tr>
</table>

Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section E, 3, a 2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement. 3. Set to the maximum power setting and enable the EUT transmit continuously. 5. Measure the conducted output power and record the results in the test report.
Test Result:	PASS
Remark:	Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

6.3.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Due
Power Meter	Agilent	N1911A	MY45101557	Aug. 12, 2017
Power Sensor	Agilent	N1922A	MY44124432	Aug. 12, 2017
RF cable	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.3.3. Test Data

Configuration Band IV (5725 - 5850 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)			FCC Limit (dBm)	Result
		Ant1	Ant2	Total		
11n (HT20)	CH149	15.05	14.24	17.67	29.49	PASS
11n (HT20)	CH157	14.67	14.73	17.71	29.49	PASS
11n (HT20)	CH161	14.72	14.53	17.64	29.49	PASS
11n (HT40)	CH151	16.69	16.21	19.47	29.49	PASS
11n (HT40)	CH159	16.36	16.05	19.22	29.49	PASS

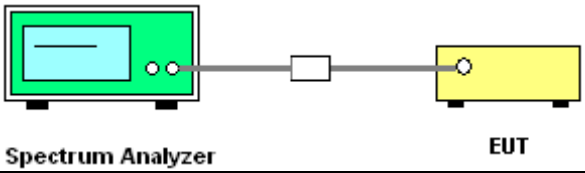
Note 1: G_{ANT} =3.5dBi, Array Gain=10log(N_{ANT}/N_{SS})=3.01dBi, Directional Gain=G_{ANT} + Array Gain=7.51dBi,

6.51dBi >6dBi so limit=30-(6.51-6)=29.49dBm/MHz

Note2: The limit is 250 mW or 11 dBm + 10log B, whichever is less. In IC Standard, Where "B" is the 99% emissions bandwidth in MHz. In FCC Standard, Where "B" is the 26dB emissions bandwidth in MHz. Please refer to section 6.4.

6.4. 6dB Emission Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section C
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
RF cable	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.4.3. Test data

ANT 1

Band IV (5725 - 5850 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11n(HT20)	CH149	5745	15.88	0.5	PASS
11n(HT20)	CH157	5785	15.86	0.5	PASS
11n(HT20)	CH161	5825	15.86	0.5	PASS
11n(HT40)	CH151	5755	35.24	0.5	PASS
11n(HT40)	CH159	5795	35.25	0.5	PASS

ANT 2

Band IV (5725 - 5850 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
11n(HT20)	CH149	5745	15.85	0.5	PASS
11n(HT20)	CH157	5785	15.85	0.5	PASS
11n(HT20)	CH161	5825	15.86	0.5	PASS
11n(HT40)	CH151	5755	35.23	0.5	PASS
11n(HT40)	CH159	5795	35.25	0.5	PASS

Test plots as follows:

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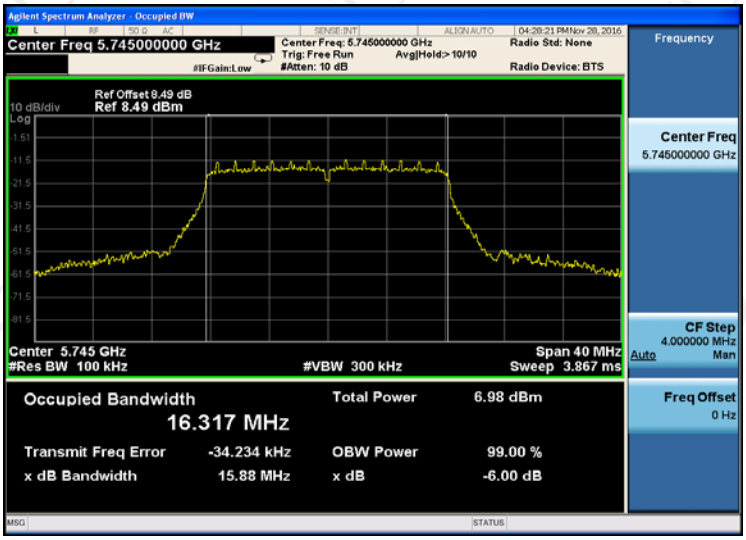
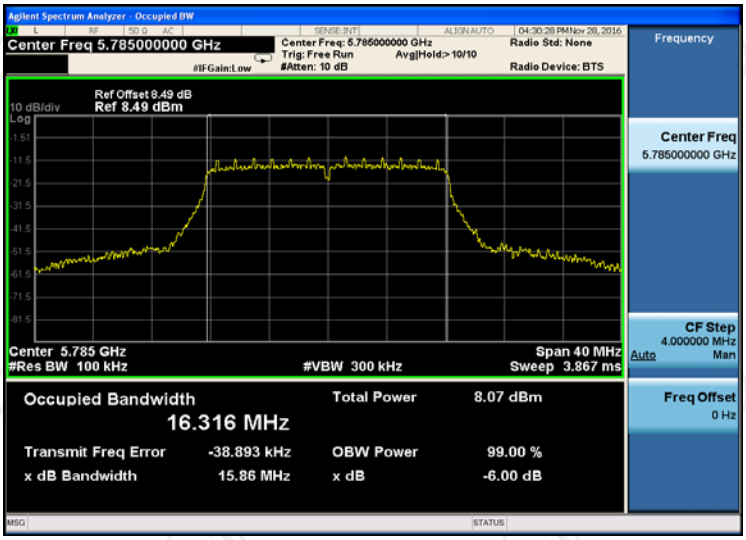
ANT 1

Band IV (5725 – 5850 MHz)

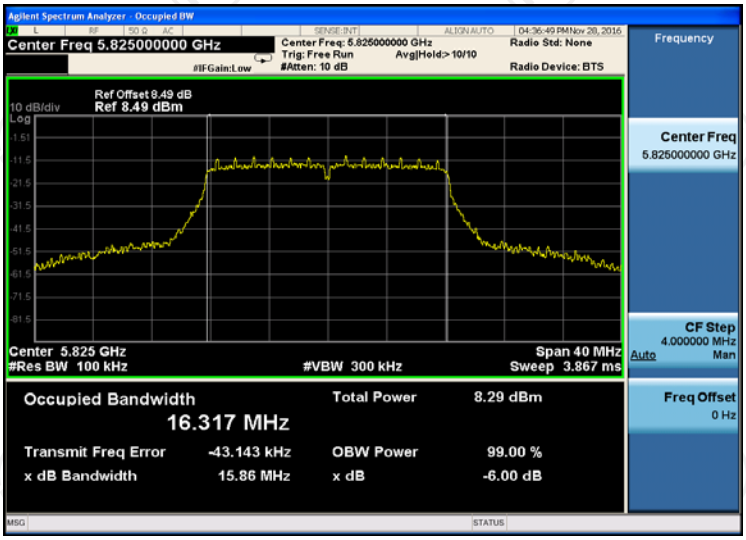
11n(HT20) CH149



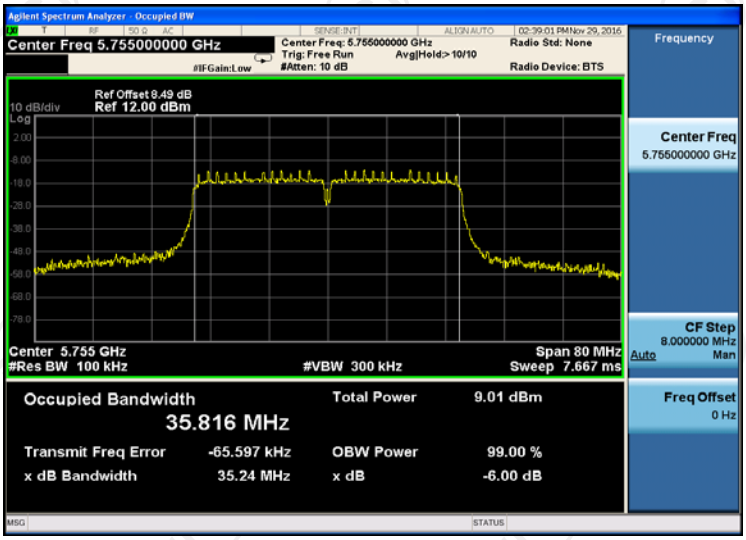
CH157



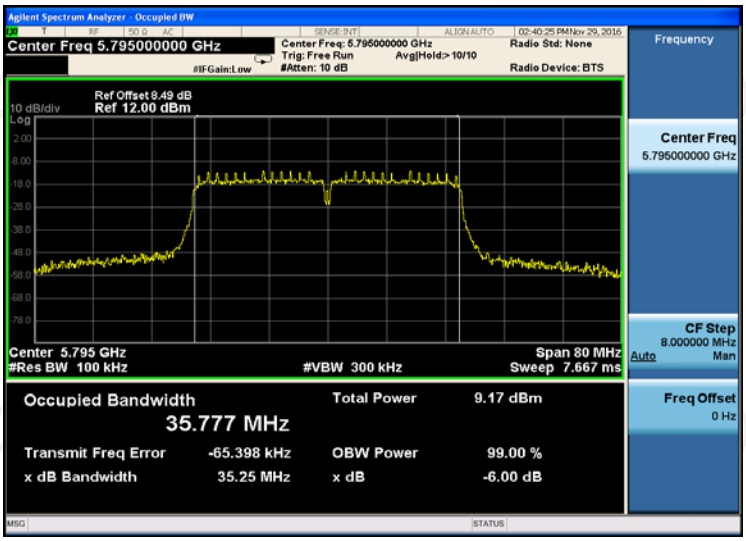
CH161



11n(HT40) CH151



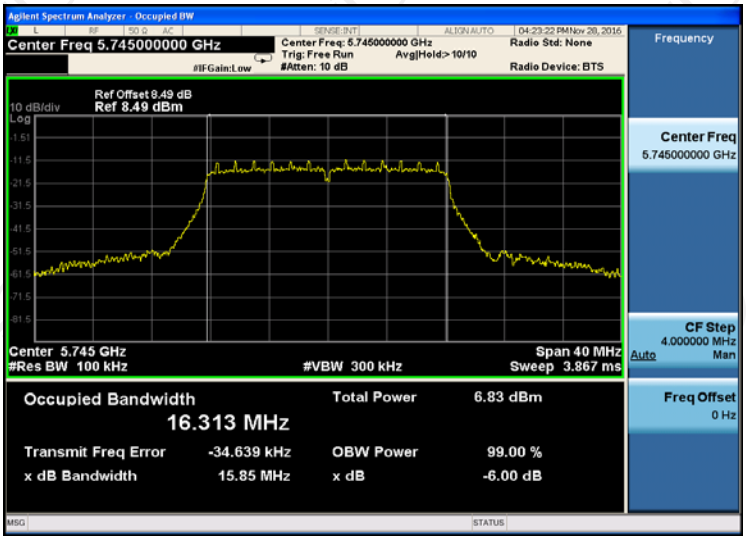
CH159



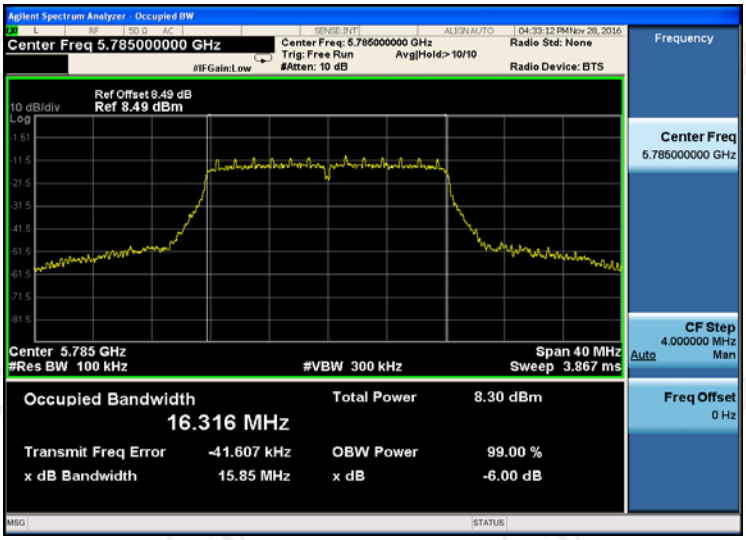
ANT 2

Band IV (5725 – 5850 MHz)

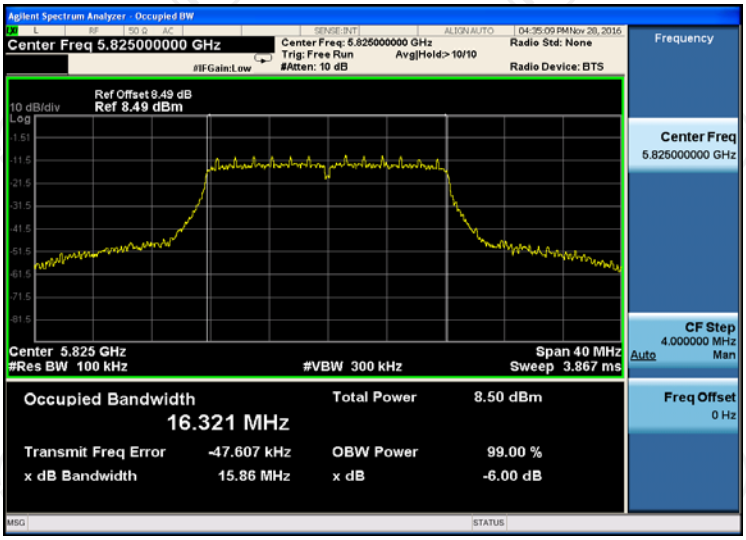
11n(HT20) CH149



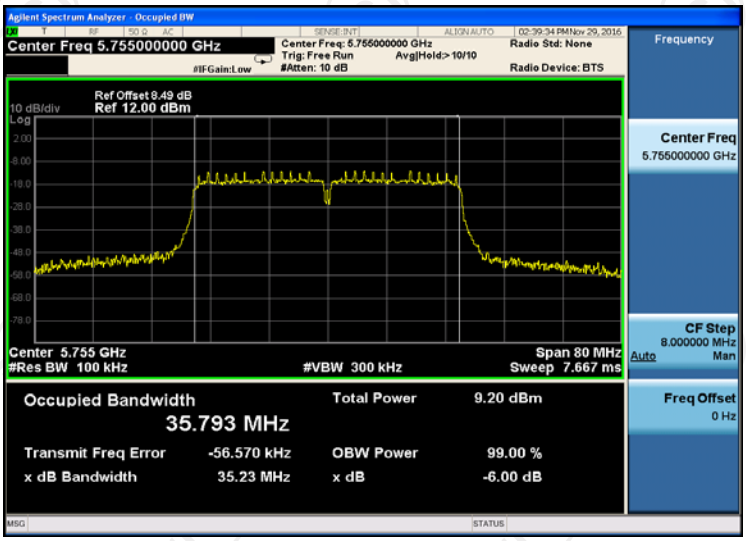
CH157



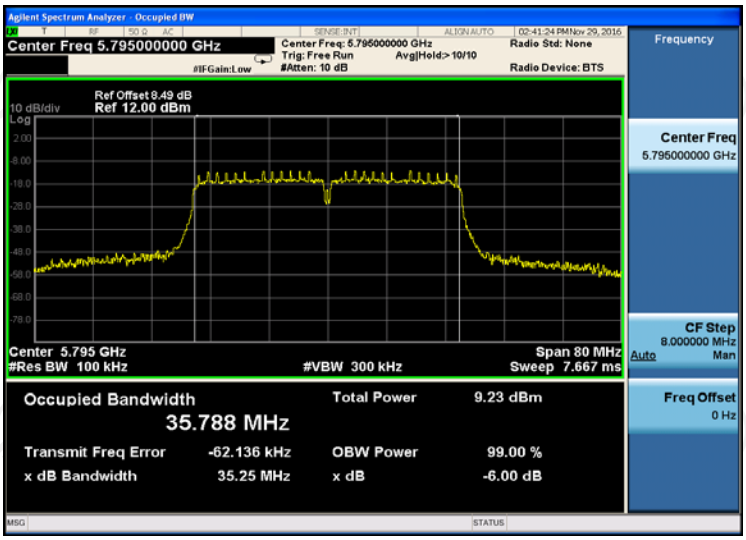
CH161



11n(HT40) CH151

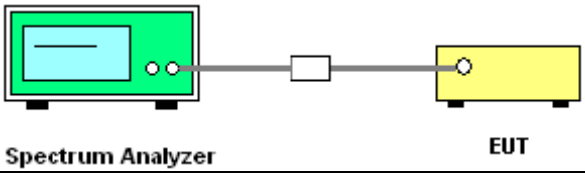


CH159



6.5. 26dB Bandwidth and 99% Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section D
Limit:	No restriction limits
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

6.5.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
RF cable	TCT	RE-06	N/A	Aug. 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug. 12, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.5.3. Test data

ANT 1:

Band IV

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11n(HT20)	CH149	5745	20.01	17.404
11n(HT20)	CH157	5785	20.06	17.421
11n(HT20)	CH161	5825	20.02	17.424
11n(HT40)	CH151	5755	39.58	35.867
11n(HT40)	CH159	5795	39.35	35.858

ANT 2:

Band IV

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
11n(HT20)	CH149	5745	20.08	17.428
11n(HT20)	CH157	5785	20.06	17.419
11n(HT20)	CH161	5825	20.03	17.421
11n(HT40)	CH151	5755	39.37	35.876
11n(HT40)	CH159	5795	39.31	35.847

Test plots as follows:

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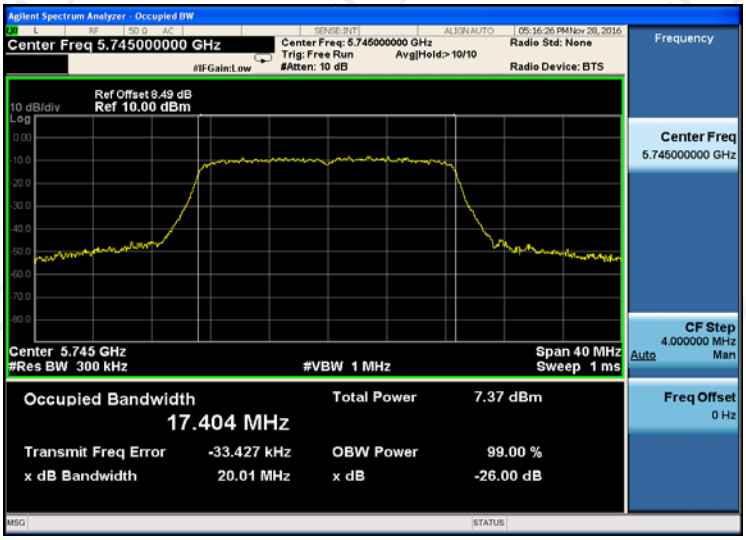
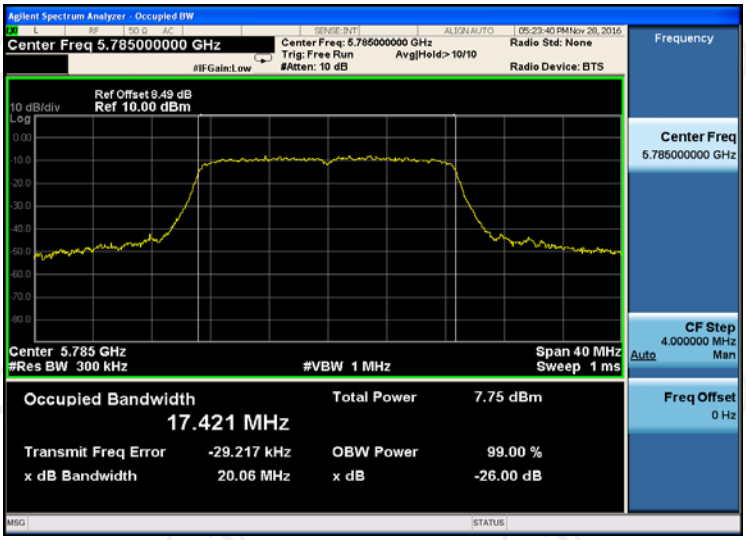
ANT 1

Band IV (5725 – 5850 MHz)

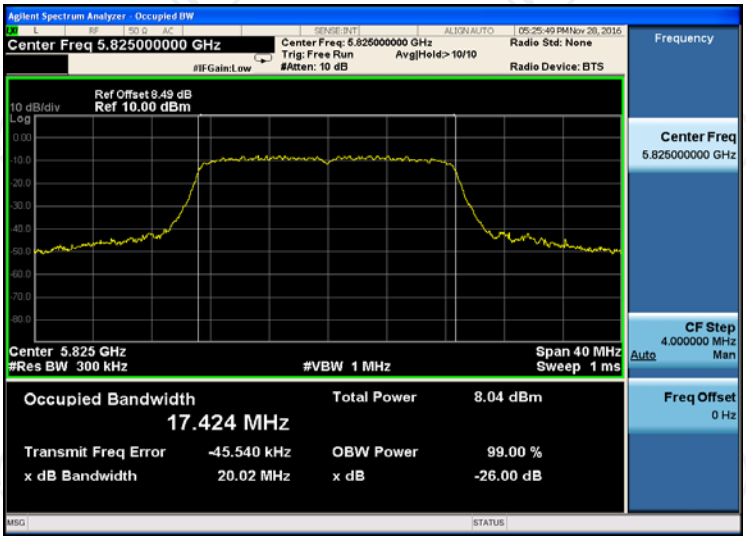
11n(HT20) CH149



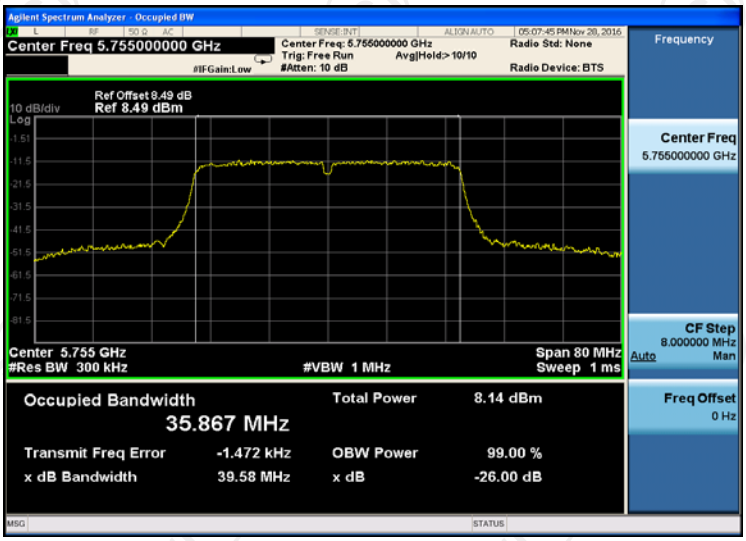
CH157



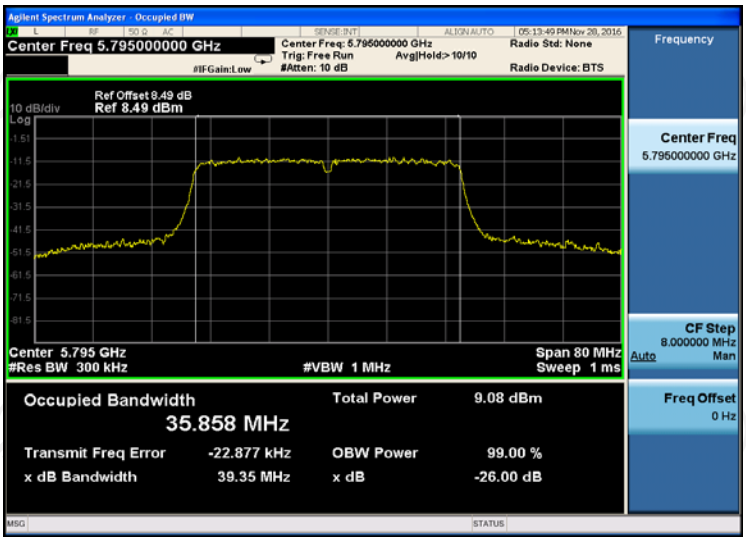
CH161



11n(HT40) CH151



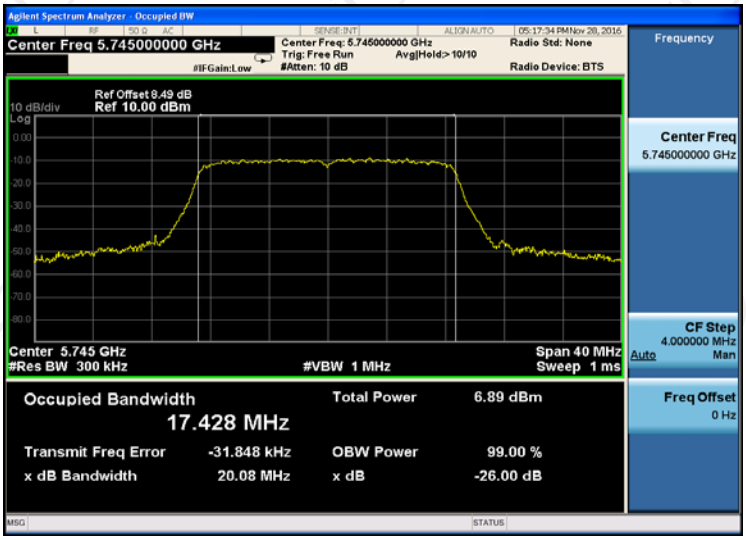
CH159



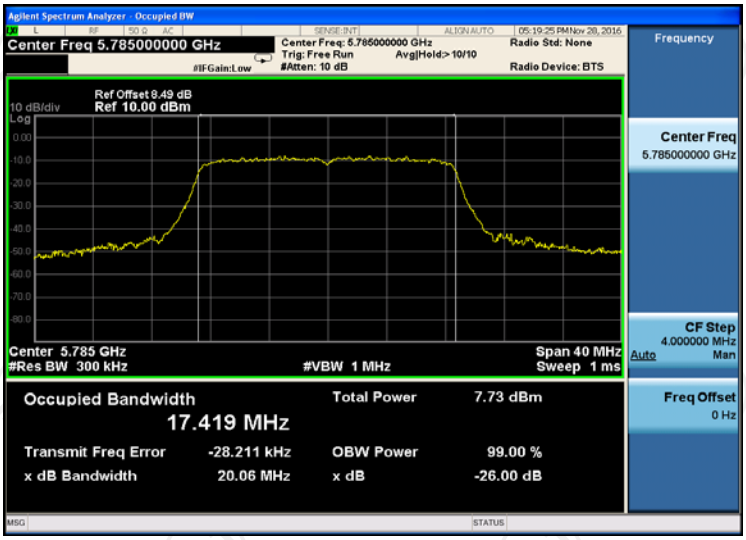
ANT 2

Band IV (5725 – 5850 MHz)

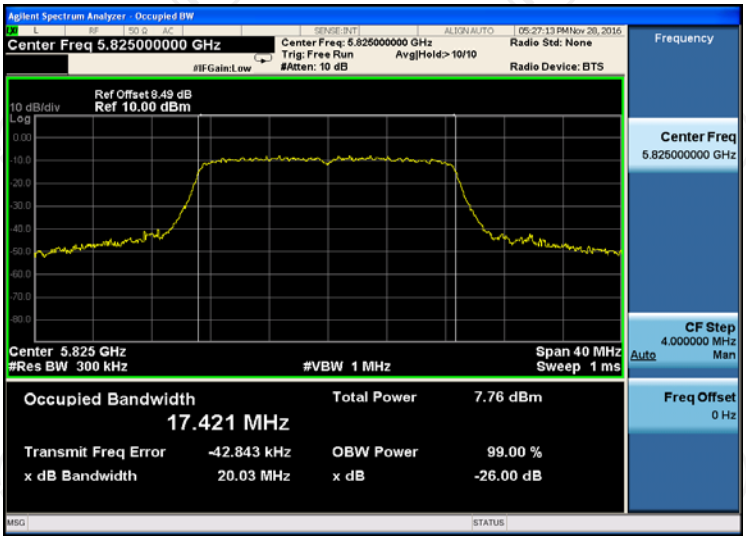
11n(HT20) CH149



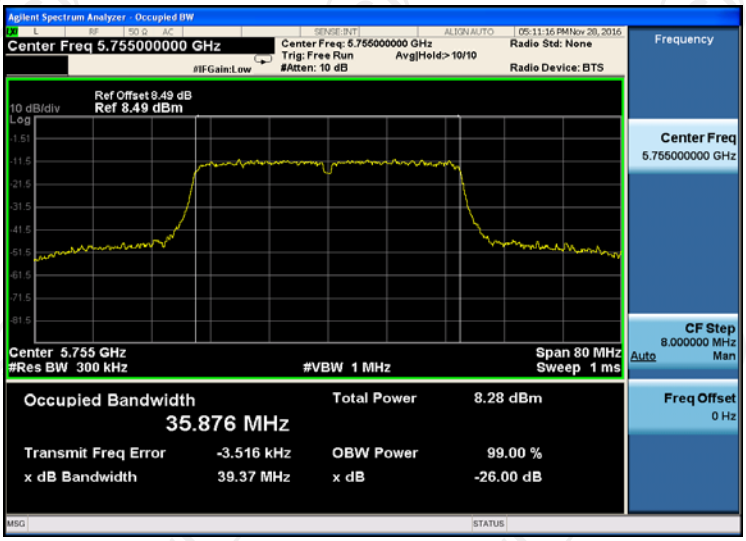
CH157



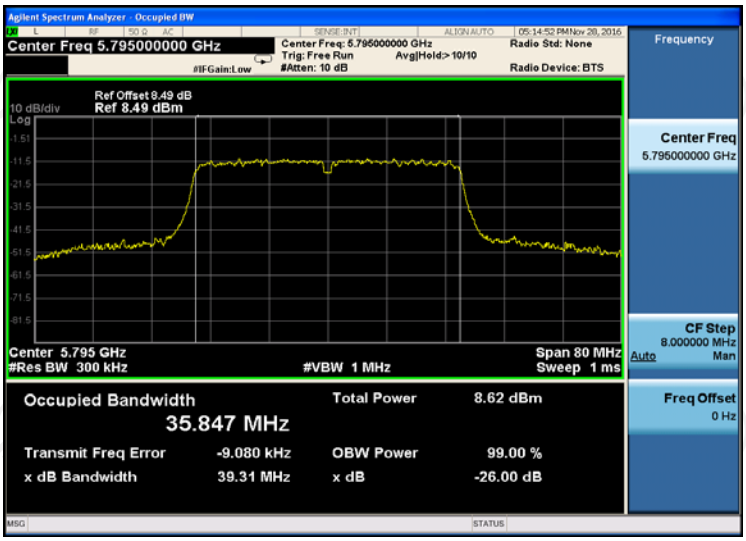
CH161



11n(HT40) CH151



CH159



6.6. Power Spectral Density

6.6.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r03 Section F
Limit:	≤17.00dBm/MHz for Band I 5150MHz-5250MHz ≤11.00dBm/MHz for Band II 5250MHz-5350MHz ≤11.00dBm/MHz for Band III 5450MHz-5725MHz ≤30.00dBm/500KHz for Band IV 5725MHz-5850MHz The e.i,r,p spectral density for Band I 5150MHz – 5250 MHz should not exceed 10dBm/MHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level. 4. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment.
Test Result:	PASS

6.6.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug 12, 2017
RF cable	TCT	RE-06	N/A	Aug 12, 2017
Antenna Connector	TCT	RFC-01	N/A	Aug 12, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.6.3. Test data

Configuration Band IV (5725 - 5850 MHz) / Antenna 0+Antenna 1						
Mode	Test channel	Power Spectral Density			Limit (dBm/500kHz)	Result
		Ant1	Ant2	Total		
11n(HT20)	CH149	-7.502	-7.723	-4.60	29.49	PASS
11n(HT20)	CH157	-6.536	-7.241	-3.86	29.49	PASS
11n(HT20)	CH161	-6.772	-6.636	-3.69	29.49	PASS
11n(HT40)	CH151	-7.237	-7.224	-4.22	29.49	PASS
11n(HT40)	CH159	-9.115	-8.913	-6.00	29.49	PASS

Note: 1. All antennas have the same gain. G_{ANT}=3.5dBi, Array Gain=10log(N_{ANT}/N_{SS})=3.01dBi

Directional Gain=G_{ANT}+ Array Gain=6.51dBi, 6.51dBi >6dBi
so limit=30-(6.51-6)=29.49dBm/MHz

2. The total PSD method used the sum spectra maxima across the outputs.

Test plots as follows:

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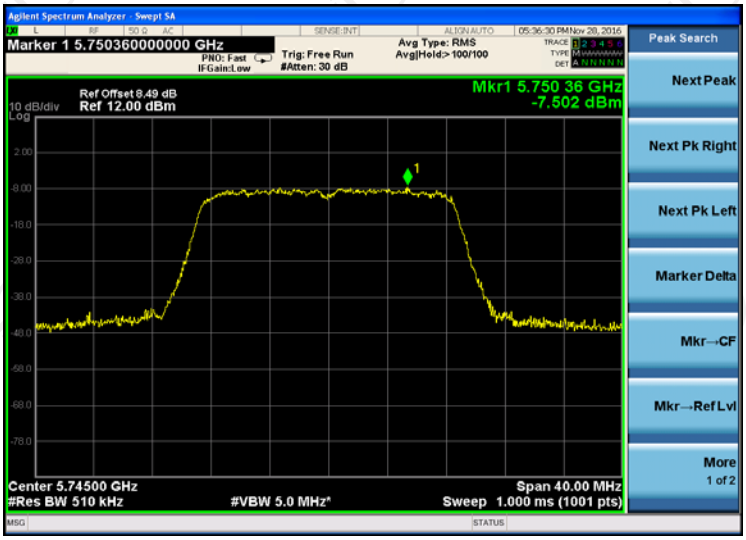
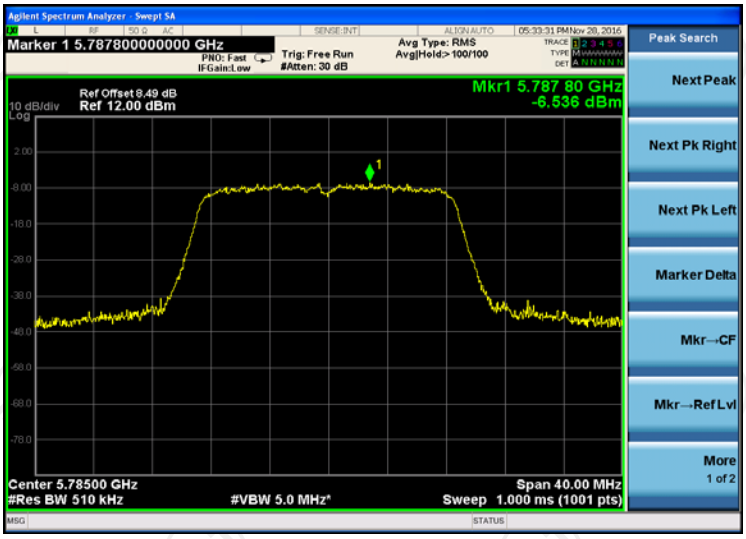
ANT 1

Band IV (5725 – 5850 MHz)

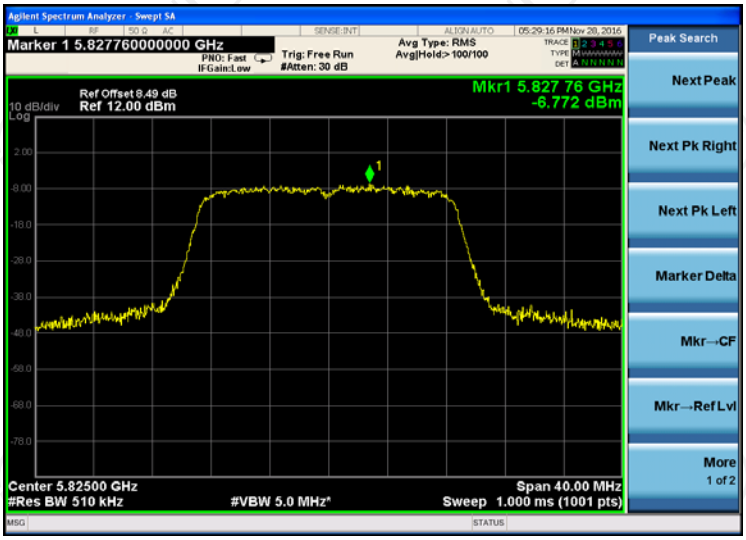
11n(HT20) CH149



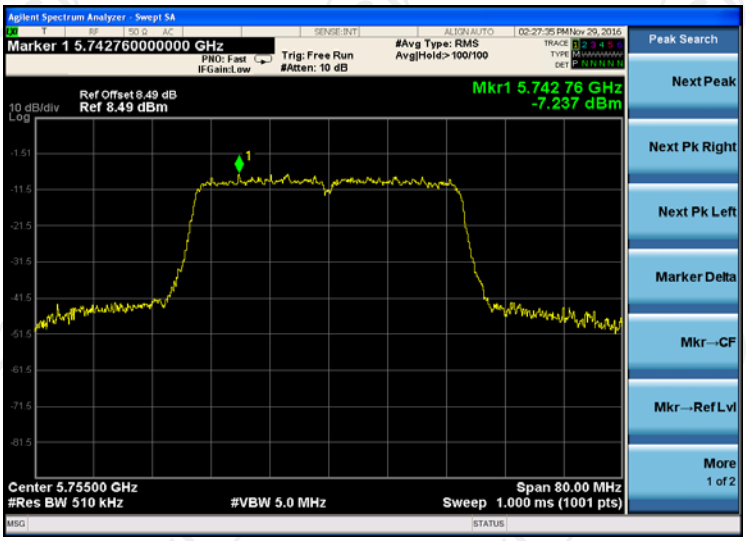
CH157



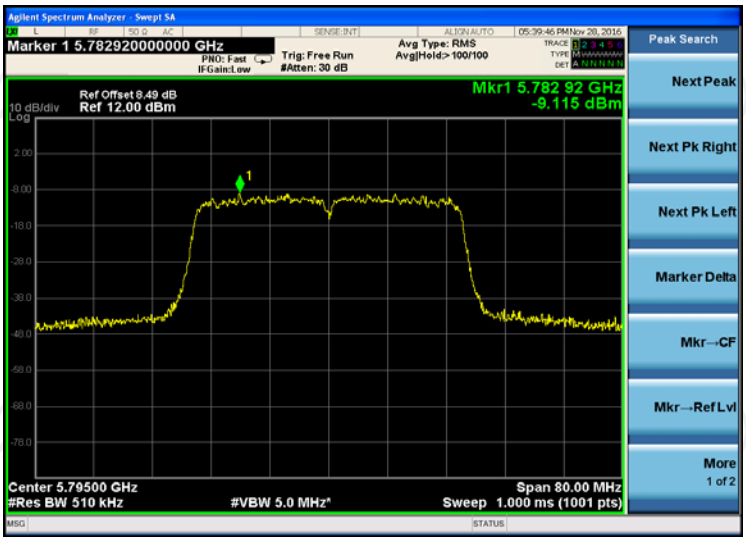
CH161



11n(HT40) CH151



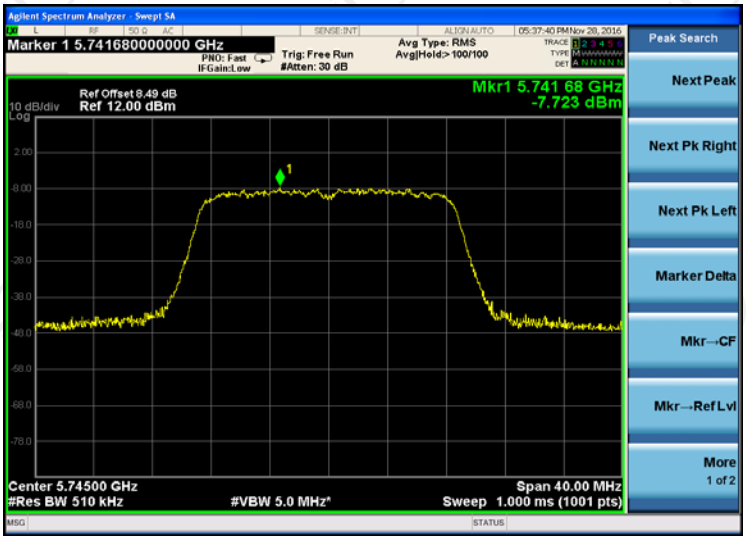
CH159



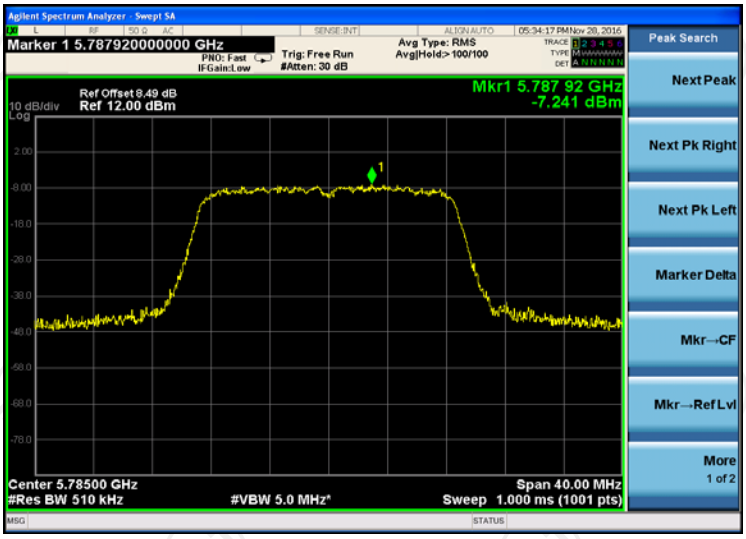
ANT 2

Band IV (5725 – 5850 MHz)

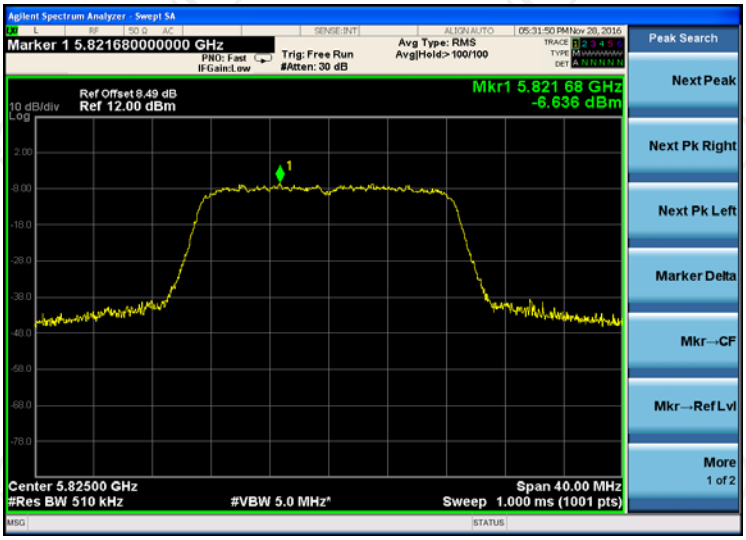
11n(HT20) CH149



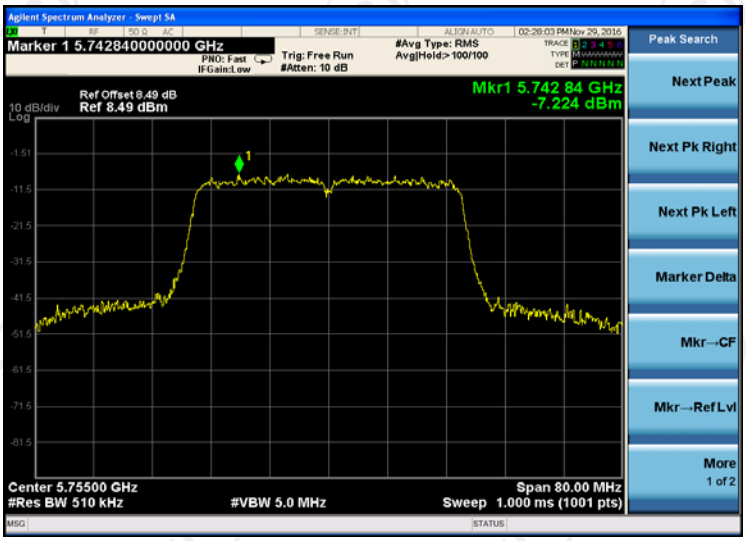
CH157



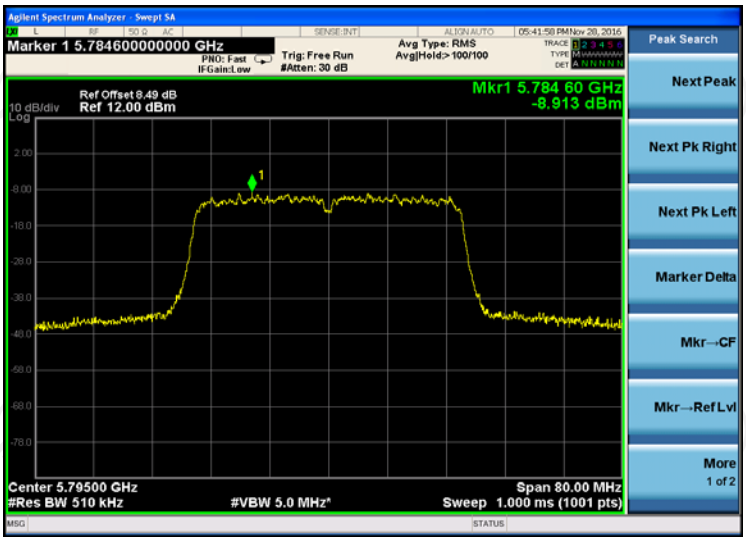
CH161



11n(HT40) CH151

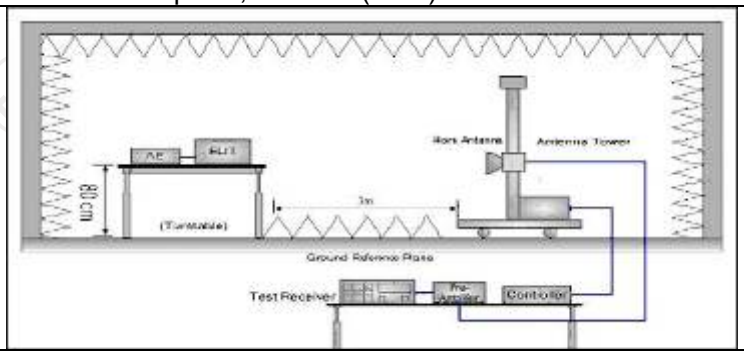


CH159



6.7. Band edge

6.7.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	For band I&II&III: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm** For band IV(5715-5725MHz&5850-5860MHz): E[dBμV/m] = EIRP[dBm] + 95.2=78.2 dBμV/m, for EIRP(dBm)= **-17dBm;** For band IV(other un-restricted band):E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm**
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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, quasipeak or average method as specified and then reported in a data sheet.
Test Result:	PASS

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6.7.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
ESPI Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSP40	100056	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable	TCT	RE-High-04	N/A	Aug. 11, 2017
Antenna Mast	CCS	CC-A-4M	N/A	Aug. 11, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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6.7.3. Test Data

802.11n HT20	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m)t (Avg)	Over	Ant. Pol. H/V
Band IV	Lowest	5725	43.99	8.21	52.2	78.2	54	-1.8	H
		5725	43.99	8.21	52.2	78.2	54	-1.8	V
	Highest	5850	43.01	8.87	51.88	78.2	54	-2.12	H
		5850	41.03	8.87	49.9	78.2	54	-4.1	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

802.11n HT40	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m)t (Avg)	Over	Ant. Pol. H/V
Band IV	Lowest	5725	43.81	8.21	52.02	78.2	54	-1.98	H
		5725	43.81	8.21	52.02	78.2	54	-1.98	V
	Highest	5850	42.83	8.87	51.7	78.2	54	-2.3	H
		5850	40.85	8.87	49.72	78.2	54	-4.28	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

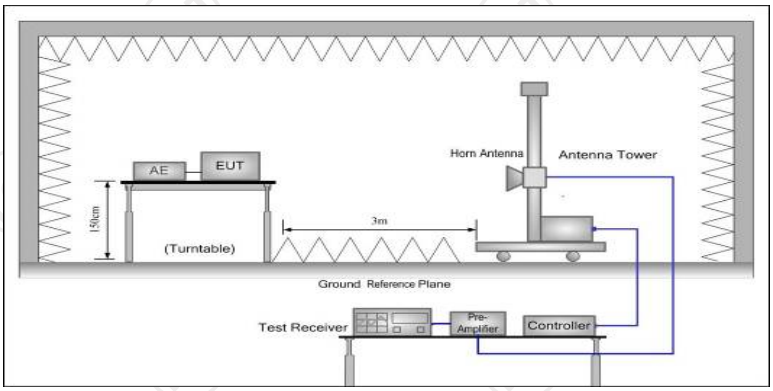
Band IV Band-edge for RF Conducted Emissions			
802.11n HT20 /LCH			
802.11n HT20 / HCH			

Band IV Band-edge for RF Conducted Emissions			
802.11n HT40 /LCH			
802.11n HT40 / HCH			

6.8. Spurious Emission

6.8.1. Restrict Bands Measurement

6.8.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v01r03</td></tr>
<tr><td>Frequency Range:</td><td>Band I & II: 4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz
Band III &IV: 5.35 GHz to 5.46 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>74</td><td>Peak Value</td></tr>
<tr><td>54</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>Above 1GHz
 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The testing follows FCC KDB Publication No. 789033 D02 General UNII Test Procedures New Rules v01r03. Section G) Unwanted emissions measurement.
2. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune</td></tr>
</table>

	the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. For the radiated emission test above 1GHz: Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f＞1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 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. (4) A 5.8GHz high –PASS filter is used druing radiated emissions above 1GHz measurement.
Test results:	PASS

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6.8.1.1 Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
ESPI Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	Aug. 11, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSP40	100056	Aug. 11, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Aug. 12, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Aug. 11, 2017
Pre-amplifier	HP	8447D	2727A05017	Aug. 11, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Aug. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Aug. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9170	373	Aug. 13, 2017
Coax cable	TCT	RE-low-01	N/A	Aug. 11, 2017
Coax cable	TCT	RE-high-02	N/A	Aug. 11, 2017
Coax cable	TCT	RE-low-03	N/A	Aug. 11, 2017
Coax cable	TCT	RE-High-04	N/A	Aug. 11, 2017
Antenna Mast	CCS	CC-A-4M	N/A	Aug. 12, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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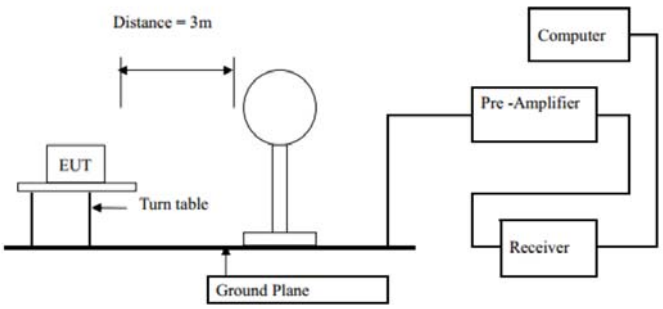
6.8.1.2 Test Data

Restrict band around fundamental

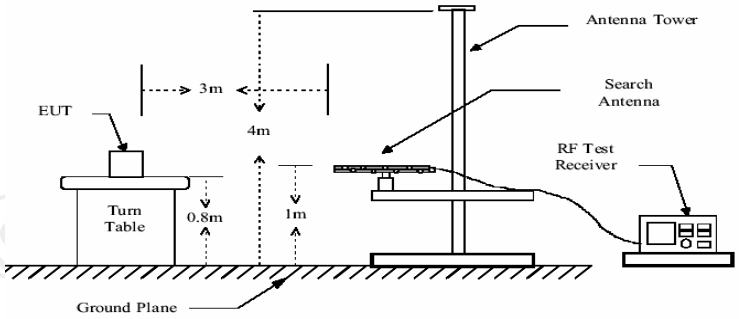
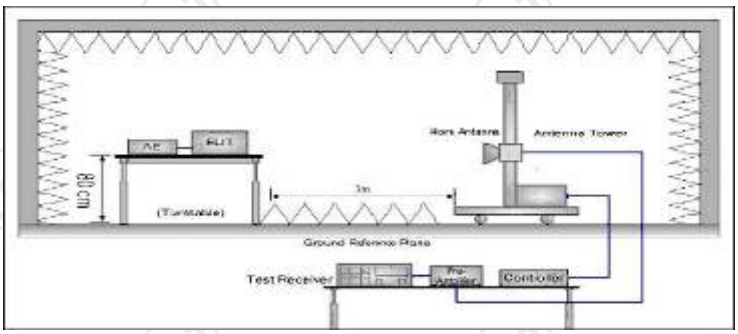
11n(HT20) CH149: 5745MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (dBuV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5737.57	H	49.07	---	0.53	49.6	---	74	54	-4.4
5687.19	H	49.21	---	0.59	49.8	---	74	54	-4.2
5686.28	H	48.69	---	0.57	49.26	---	74	54	-4.74
5737.57	V	50.67	---	0.53	51.2	---	74	54	-2.8
5687.19	V	51.42	---	0.54	51.96	---	74	54	-2.04
5686.28	V	50.35	---	0.57	50.92	---	74	54	-3.08
11n(HT20) CH157: 5785MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (DbμV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5727.00	H	51.25	---	0.99	52.24	---	74	54	-1.76
5660.00	H	49.32	---	0.85	50.17	---	74	54	-3.83
5727.00	V	51.08	---	0.99	52.07	---	74	54	-1.93
5660.00	V	50.63	---	0.85	51.48	---	74	54	-2.52
11n(HT20) CH161: 5825MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
5750.28	H	48.38	---	0.99	49.37	---	74	54	-4.63
5760.00	H	49.23	---	0.89	50.12	---	74	54	-3.88
5801.76	H	48.57	---	0.85	49.42	---	74	54	-4.58
5750.28	V	50.65	---	0.99	51.64	---	74	54	-2.36
5760.00	V	51.29	---	0.89	52.18	---	74	54	-1.82
5801.76	V	50.72	---	0.99	51.71	---	74	54	-2.29
11n(HT40) CH151: 5755MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
5635.98	H	50.12	---	0.57	50.69	---	74	54	-3.31
5707.33	H	53.45	---	0.86	54.31	---	74	54	0.31
5635.98	V	51.37	---	0.57	51.94	---	74	54	-2.06
5607.33	V	40.65	---	0.85	50.55	---	74	54	-3.45
11n(HT40) CH159: 5795MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
5717.98	H	50.47	---	0.81	51.28	---	74	54	-2.72
5703.60	H	48.63	---	0.82	49.45	---	74	54	-4.55
5717.98	V	50.72	---	0.81	51.53	---	74	54	-2.47
5703.60	V	49.77	---	0.82	50.59	---	74	54	-3.41

6.8.2. Unwanted Emissions out of the Restricted Bands

6.8.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v01r03</td></tr>
<tr><td>Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1G</td><td>74.0</td><td>Peak</td></tr>
<tr><td>54.0</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz


30MHz to 1GHz</td></tr>
</table>

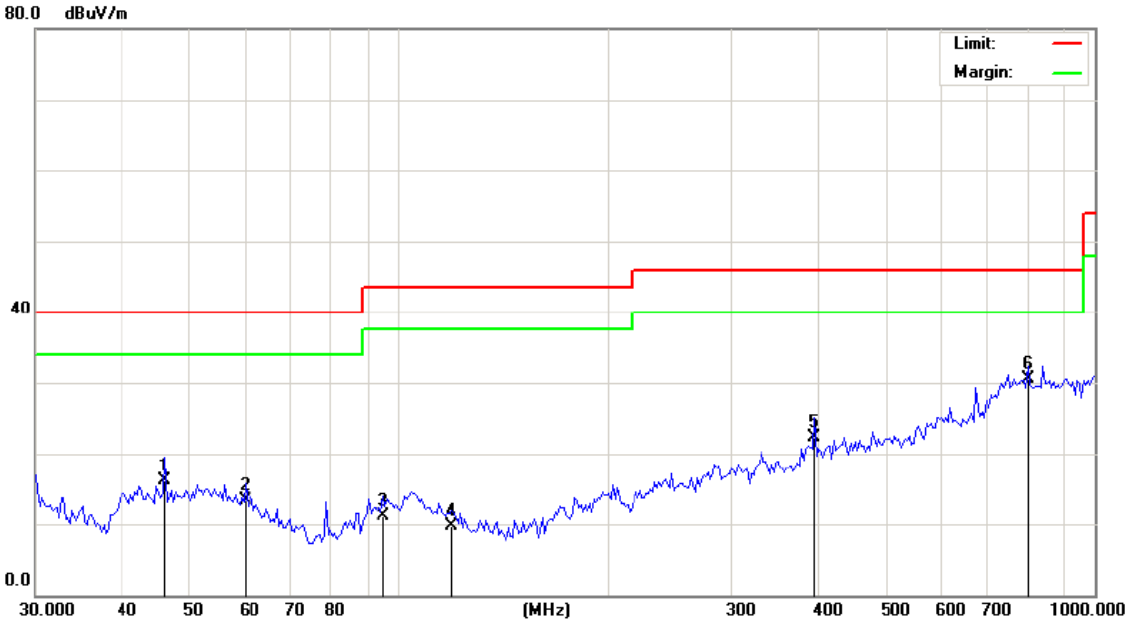
	 Above 1GHz 
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.
Test results:	PASS

6.8.3. Test Data

Please refer to following diagram for individual

Below 1GHz

Horizontal:



Site

Limit: FCC Part 15B Class B RE_3 m

Polarization: *Horizontal*

Power: DC 12V

Temperature: 23

Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		46.0557	26.22	-10.10	16.12	40.00	-23.88	QP		0	
2		60.1527	24.22	-10.89	13.33	40.00	-26.67	QP		0	
3		94.9788	22.02	-10.97	11.05	43.50	-32.45	QP		0	
4		118.9284	22.30	-12.52	9.78	43.50	-33.72	QP		0	
5		395.5070	26.15	-3.86	22.29	46.00	-23.71	QP		0	
6	*	804.2522	25.44	5.03	30.47	46.00	-15.53	QP		0	

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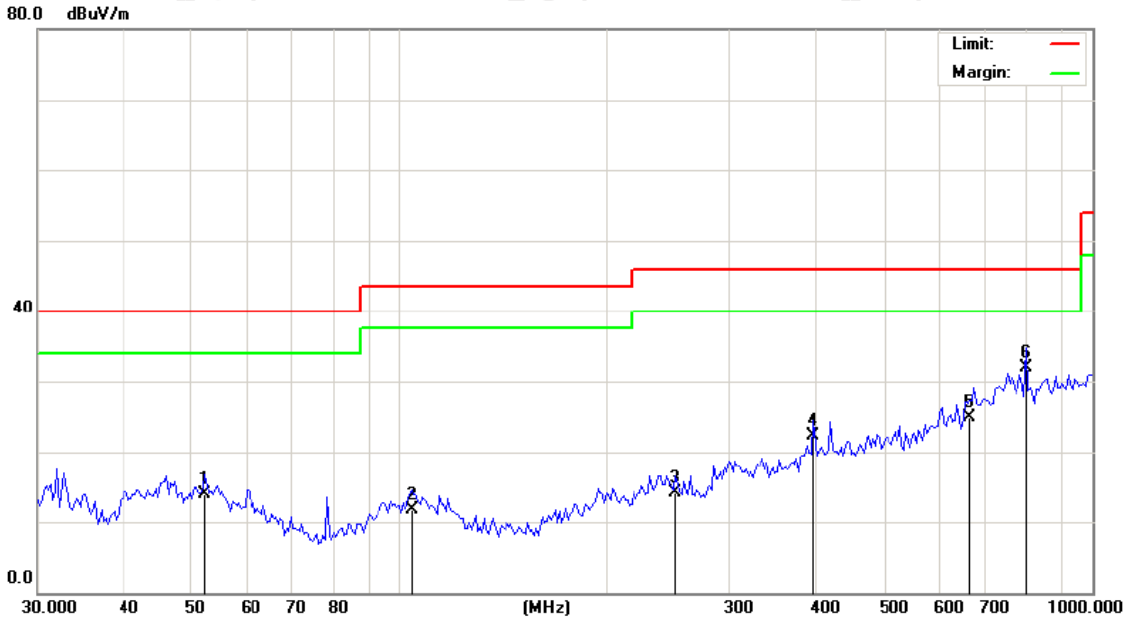
Vertical:



Site

Limit: FCC Part 15B Class B RE_3 m

Polarization: *Vertical*

Power: DC 12V

Temperature: 23

Humidity: 54 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		52.2660	23.22	-9.23	13.99	40.00	-26.01	QP		0	
2		104.0640	21.20	-9.49	11.71	43.50	-31.79	QP		0	
3		250.4858	23.15	-8.99	14.16	46.00	-31.84	QP		0	
4		395.5070	26.22	-3.86	22.36	46.00	-23.64	QP		0	
5		665.2610	24.22	0.72	24.94	46.00	-21.06	QP		0	
6	*	804.2522	26.89	5.03	31.92	46.00	-14.08	QP		0	

Note: *1.The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported*

2. Measurements were conducted in all three channels (high, middle, low) and all modulation (802.11n), and the worst case Mode (Middle channel and 11n(HT20)) was submitted only.

Modulation Type: Band IV									
11n(HT20) CH149: 5745MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11490	H	45.26	---	0.66	45.92	---	74	54	-8.08
17235	H	32.83	---	9.5	42.33	---	74	54	-11.67
---	H	---	---	---	---	---	---	---	---
11490	V	47.65	---	0.66	48.31	---	74	54	-5.69
17235	V	35.21	---	9.5	44.71	---	74	54	-9.29
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH157: 5785MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11570	H	43.57	---	1.33	44.9	---	74	54	-9.1
17355	H	36.9	---	10.22	47.12	---	74	54	-6.88
---	H	---	---	---	---	---	---	---	---
11570	V	42.66	---	1.33	43.99	---	74	54	-10.01
17355	V	32.46	---	10.22	42.68	---	74	54	-11.32
---	V	---	---	---	---	---	---	---	---

11n(HT20) CH161: 5825MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11650	H	45.57	---	0.99	46.56	---	74	54	-7.44
17475	H	35.35	---	9.85	45.2	---	74	54	-8.8
---	H	---	---	---	---	---	---	---	---
11650	V	42.8	---	0.99	43.79	---	74	54	-10.21
17475	V	32.71	---	9.85	42.56	---	74	54	-11.44
---	V	---	---	---	---	----	---	---	---

11n(HT40) CH151: 5755MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11510	H	44.51	---	0.66	45.17	---	74	54	-8.83
17265	H	33.42	---	9.5	42.92	---	74	54	-11.08
---	H	---	---	---	---	---	---	---	---
11510	V	45.89	---	0.66	46.55	---	74	54	-7.45
17265	V	34.69	---	9.5	44.19	---	74	54	-9.81
---	V	---	---	---	---	---	---	---	---

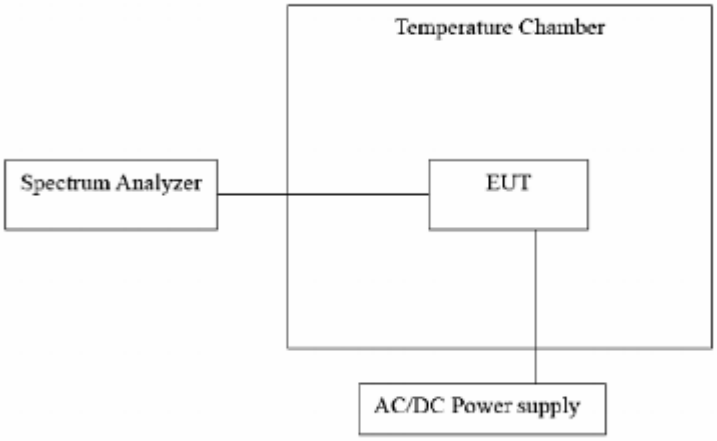
11n(HT40) CH159: 5795MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11590	H	44.61	---	0.99	45.6	---	74	54	-8.4
17385	H	34.79	---	9.85	44.64	---	74	54	-9.36
---	H	---	---	---	---	---	---	---	---
11590	V	41.62	---	0.99	42.61	---	74	54	-11.39
17385	V	33.48	---	9.85	43.33	---	74	54	-10.67
---	V	---	---	---	---	----	---	---	---

Note:

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.*
5. *Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*

6.9. Frequency Stability Measurement

6.9.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
Test Method:	ANSI C63.10: 2013
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Setup:	
Test Procedure:	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. 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.
Test Result:	PASS
Remark:	Pre-scan was performed at Antenna 0 and Antenna 1, the worst case was found. Only the test data of Antenna 0 was shown in this report.

Test plots as follows:

Test mode:	802.11n(HT20)	Frequency(MHz):	5745	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5745.0111	11100	PASS
35		5745.0089	8900	PASS
25		5745.0077	7700	PASS
15		5745.0021	2100	PASS
5		5744.9960	-4000	PASS
0		5745.0074	7400	PASS
20	3.795	5745.0042	4200	PASS
	3.3	5744.9940	-6000	PASS
	2.805	5745.0028	2800	PASS

Test mode:	802.11n(HT20)	Frequency(MHz):	5785	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5785.0012	1200	PASS
35		5785.0034	3400	PASS
25		5785.0029	2900	PASS
15		5784.9987	-1300	PASS
5		5784.9932	-6800	PASS
0		5785.0035	3500	PASS
20	3.795	5785.0027	2700	PASS
	3.3	5785.0021	2100	PASS
	2.805	5785.0006	600	PASS

Test mode:	802.11n(HT20)	Frequency(MHz):	5825	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5825.0035	3500	PASS
35		5825.0020	2000	PASS
25		5824.9972	-2800	PASS
15		5824.9965	-3500	PASS
5		5825.0027	2700	PASS
0		5825.0046	4600	PASS
20	3.795	5825.0042	4200	PASS
	3.3	5824.9987	-1300	PASS
	2.805	5825.0026	2600	PASS

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Test mode:	802.11n(HT40)	Frequency(MHz):	5755	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5755.0033	3300	PASS
35		5755.0100	10000	PASS
25		5755.0099	9900	PASS
15		5755.0059	5900	PASS
5		5755.0033	3300	PASS
0		5755.0009	900	PASS
20	3.795	5755.0046	4600	PASS
	3.3	5755.0032	3200	PASS
	2.805	5755.0012	1200	PASS

Test mode:	802.11n(HT40)	Frequency(MHz):	5795	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
45	3.3	5795.0010	1000	PASS
35		5794.9850	-15000	PASS
25		5795.0046	4600	PASS
15		5795.0021	2100	PASS
5		5795.0060	6000	PASS
0		5795.0081	8100	PASS
20	3.795	5795.0028	2800	PASS
	3.3	5794.9955	-4500	PASS
	2.805	5795.0065	6500	PASS

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7. Appendix A: Photographs of Test Setup

Refer to the test report No. TCT161117E007

8. Photographs of EUT

Refer to the test report No. TCT161117E007

********END OF REPORT********

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