Report No.: GTS202007000071-04

Test Report

Applicant:	FCC: Magtek Incorporated IC: MagTek Inc
Address of Applicant:	FCC: 1710 Apollo Court, seal beach, California 90740, United States IC: 1710 Apollo Court Seal Beach CA 90740 United States
Manufacturer:	FCC: Magtek Incorporated IC: MagTek Inc
Address of Manufacturer:	FCC: 1710 Apollo Court, seal beach, California 90740, United States IC: 1710 Apollo Court Seal Beach CA 90740 United States

Equipment Under Test (EUT)

Product Name:	DynaGlass
Model No.:	40000102, 40000101
Trade Mark:	MAGTEK
FCC ID:	U73-40000102
IC:	23169-40000102
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407 RSS-Gen Issue 5 RSS-247 Issue 2
Date of sample receipt:	July 07, 2020
Date of Test:	July 08, 2020-August 31, 2020
Date of report issue:	August 31, 2020
Test Result :	PASS *

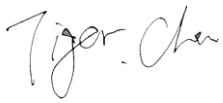
* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

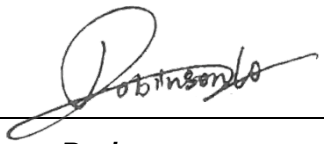
Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*August 31, 2020*	*Original*

Prepared By:  ***Date:*** *August 31, 2020*

Project Engineer

Check By:  ***Date:*** *August 31, 2020*

Reviewer

3 Contents

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4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203 & RSS-Gen 6.8	PASS
AC Power Line Conducted Emission	FCC part 15.207& RSS-Gen 8.8	PASS
Peak Transmit Power	FCC part 15.407(a)(1) RSS-247 6.2	PASS
Channel Bandwidth	FCC part 15.247 (a)(2) RSS-247 Section 5.2(a) & RSS-Gen 6.7	Pass
Power Spectral Density	FCC part 15.407(a)(1) RSS-247 6.2	PASS
Undesirable Emission	FCC part 15.407(b)(6), 15.205/15.209 RSS-247 6.2	PASS
Radiated Emission	FCC part 15.205/15.209 RSS-Gen 8.9 & 8.10	PASS
Band Edge	FCC part 15.407(b)(1) RSS-247 6.2	PASS
Frequency Stability	FCC part 15.407(g) RSS-Gen 8.11	PASS

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 40GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%. Remark: Test according to ANSI C63.10:2013 and ANSI C63.4:2014			

5 General Information

5.1 General Description of EUT

Product Name:	DynaGlass			
Model No.:	40000102, 40000101			
Test Model No:	40000102			
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.				
S/N:	B90A998			
Hardware Version:	DynaGlass_AND_V040 DynaGlass_PAY_V040			
Software Version:	Android:0.9.05; Max32550-LCS+:1.0.0			
Test sample(s) ID:	GTS202007000071-1			
Sample(s) Status:	Engineer sample			
Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	U-NII Band I	802.11a/n(HT20)	5180-5240	4
	U-NII Band II-A	802.11a/n(HT20)	5260-5320	4
	U-NII Band II-C	802.11a/n(HT20)	5500-5700	11
Modulation technology:	OFDM			
Antenna Type:	Integral Antenna			
Antenna gain:	0.71 dBi(declare by applicant)			
Power supply:	DC 5V or DC 7.4V 1850mAh 13.69Wh by Li-ion battery			

Channel list for 802.11a/n(HT20)/ac(HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180MHz	40	5200MHz	44	5220MHz	48	5240MHz
52	5260MHz	56	5280MHz	60	5300MHz	64	5320MHz
100	5500MHz	104	5520MHz	108	5540MHz	112	5560MHz
116	5580MHz	120	5600MHz	124	5620MHz	128	5640MHz
132	5660MHz	136	5680MHz	140	5700MHz		

5.2 Test mode

Transmitting mode	Keep the EUT in transmitting with modulation..

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:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11a	6Mbps
802.11n	6.5Mbps

5.3 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology 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 files. Registration 381383.

● **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A.

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.4 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, sBaoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook PC	E40-80	N/A
Apple	PC	A1278	C1MN99ERDTY3

5.6 Deviation from Standards

None.

6 Test Instruments list

Radiated Emission:

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 25 2020	June. 24 2021
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 25 2020	June. 24 2021
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 25 2020	June. 24 2021
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 25 2020	June. 24 2021
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 25 2020	June. 24 2021

RF Conducted Test:

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 25 2020	June. 24 2021
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021

General used equipment:

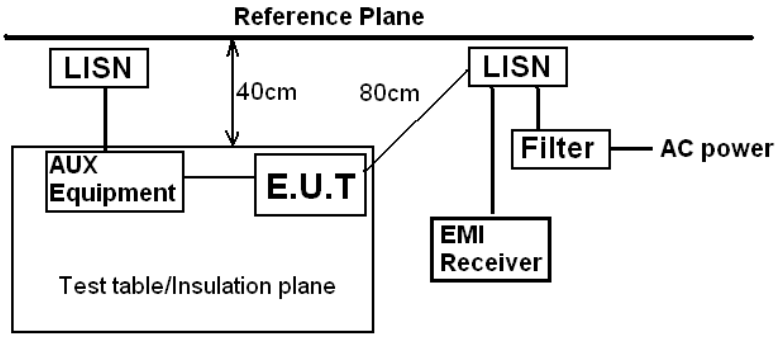
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
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.	
Standard requirement:	RSS-Gen 6.8
A transmitter can only be sold or operated with antennas with which it was approved. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power	
E.U.T Antenna:	
The antenna is Integral antenna, the best case gain of the ANT refer to section 0.71, reference to the appendix II for details	

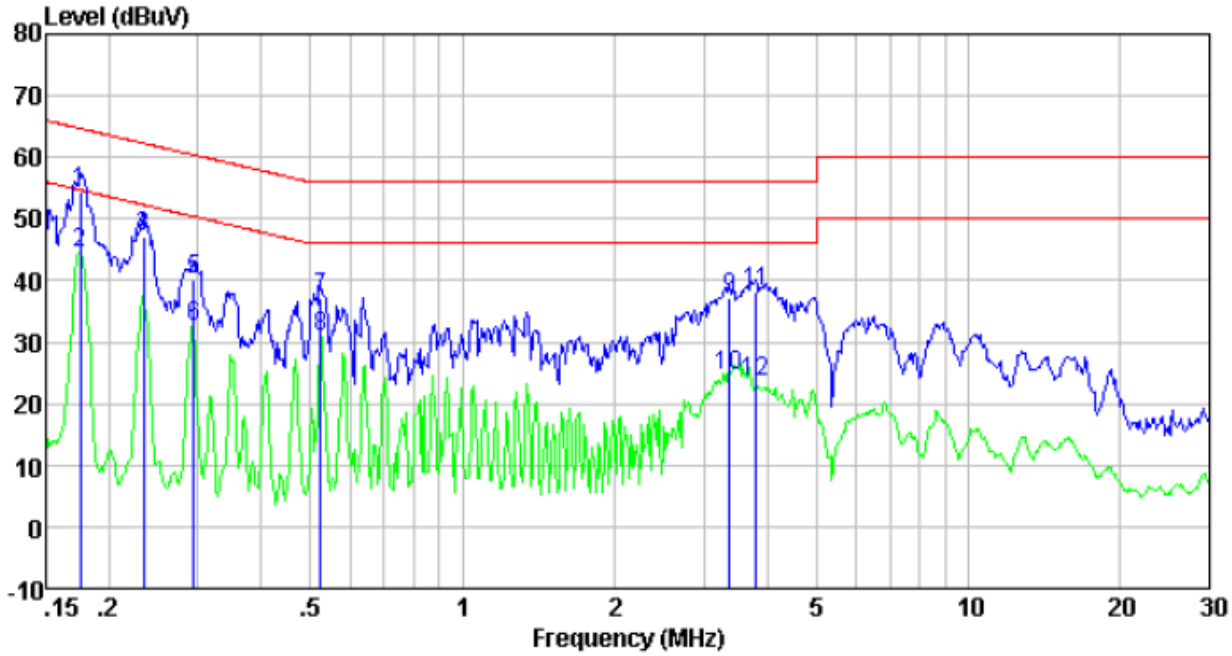
7.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207
RSS-Gen Section 8.8</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013 & RSS-Gen</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz</td></tr>
<tr><td>Limit:</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>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test procedure</td><td>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 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 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 Instruments:</td><td>Refer to section 5.10 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test environment:</td><td>Temp.: | 25 °C | Humid.: | 52% | Press.: | 1012mbar</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

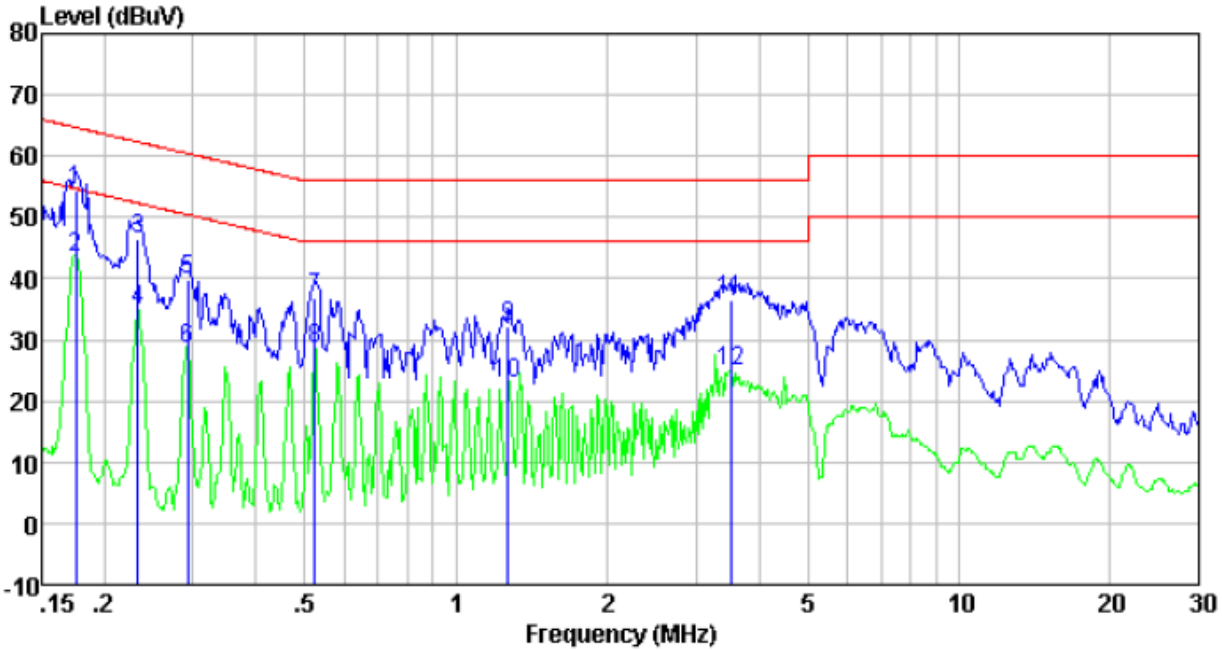
Measurement data:

Line:



Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.17	33.79	20.49	54.28	64.72	-10.44	QP
0.17	23.84	20.49	44.33	54.72	-10.39	Average
0.23	26.45	20.51	46.96	62.30	-15.34	QP
0.23	26.52	20.51	47.03	52.30	-5.27	Average
0.29	19.61	20.50	40.11	60.41	-20.30	QP
0.29	12.14	20.50	32.64	50.41	-17.77	Average
0.52	16.83	20.42	37.25	56.00	-18.75	QP
0.52	10.29	20.42	30.71	46.00	-15.29	Average
3.36	16.90	20.39	37.29	56.00	-18.71	QP
3.36	3.99	20.39	24.38	46.00	-21.62	Average
3.80	17.82	20.38	38.20	56.00	-17.80	QP
3.80	3.24	20.38	23.62	46.00	-22.38	Average

Neutral:

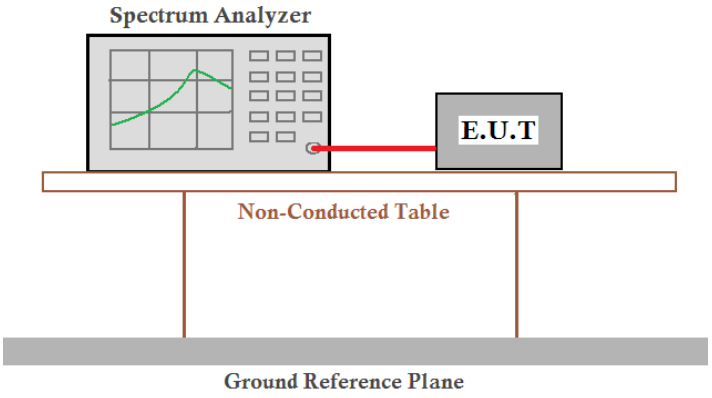


Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.17	33.80	20.49	54.29	64.72	-10.43	QP
0.17	22.99	20.49	43.48	54.72	-11.24	Average
0.23	26.03	20.51	46.54	62.35	-15.81	QP
0.23	14.34	20.51	34.85	52.35	-17.50	Average
0.29	19.32	20.50	39.82	60.46	-20.64	QP
0.29	8.19	20.50	28.69	50.46	-21.77	Average
0.52	16.42	20.42	36.84	56.00	-19.16	QP
0.52	8.20	20.42	28.62	46.00	-17.38	Average
1.27	11.86	20.36	32.22	56.00	-23.78	QP
1.27	2.62	20.36	22.98	46.00	-23.02	Average
3.51	15.99	20.38	36.37	56.00	-19.63	QP
3.51	4.49	20.38	24.87	46.00	-21.13	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss*

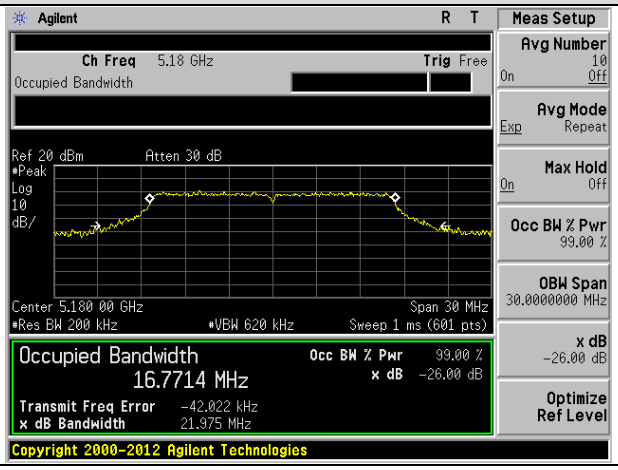
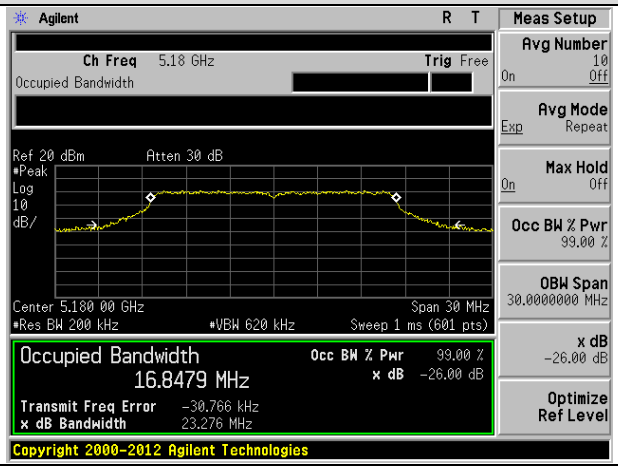
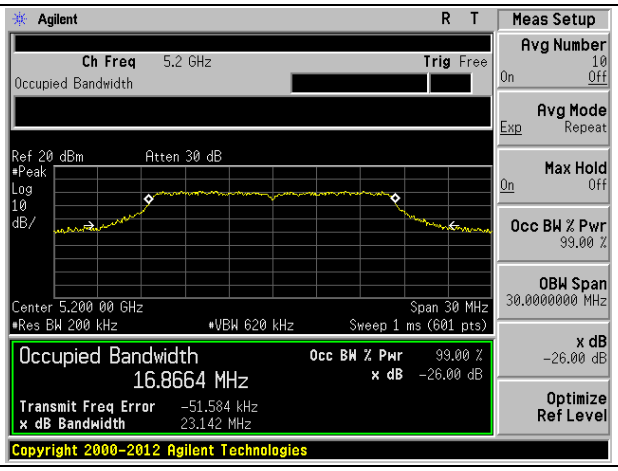
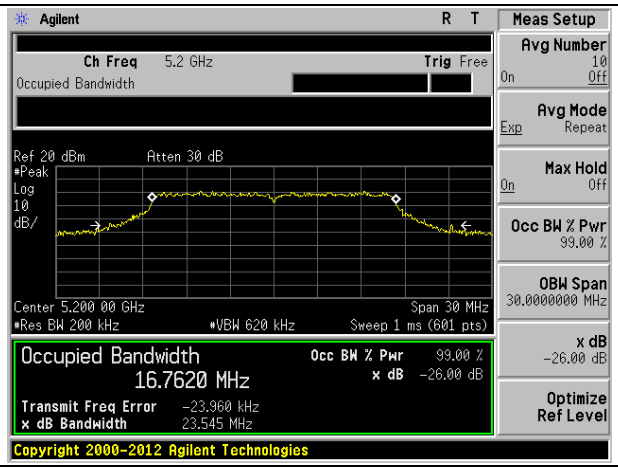
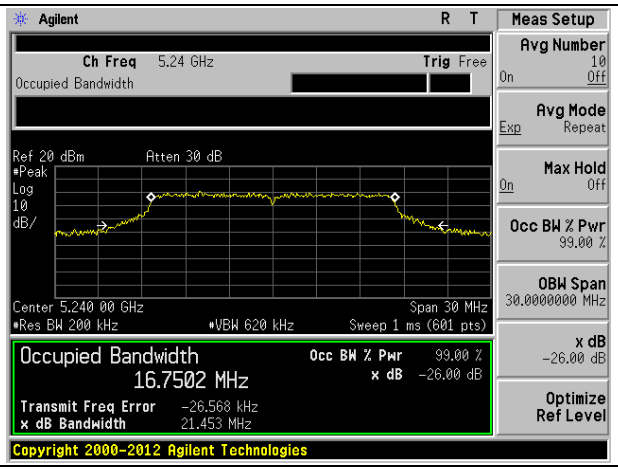
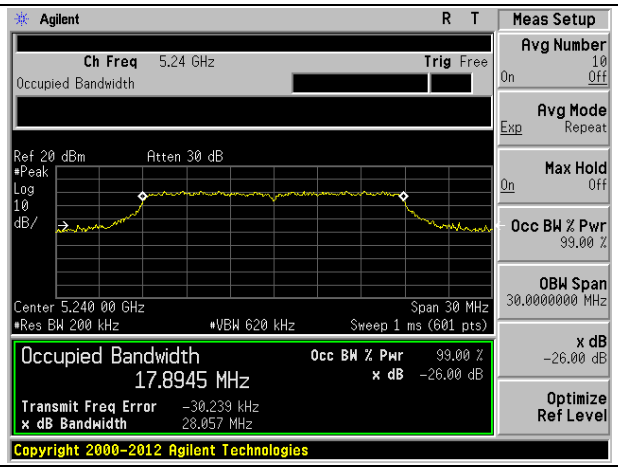
7.3 Emission Bandwidth and 99% Occupied Bandwidth

Test Requirement :	FCC Part15 E Section 15.407 RSS-247 5.2 & RSS-Gen 6.7
Test Method :	ANSI C63.10:2013 and RSS-Gen & KDB 789033 D02 v02r01
Limit:	N/A
Test setup:	
Test procedure:	According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

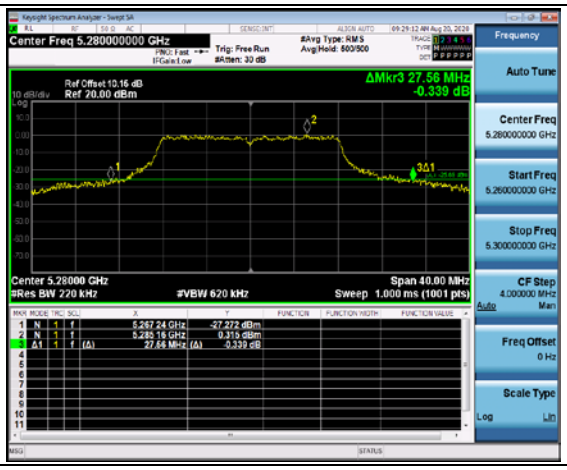
Measurement Data:

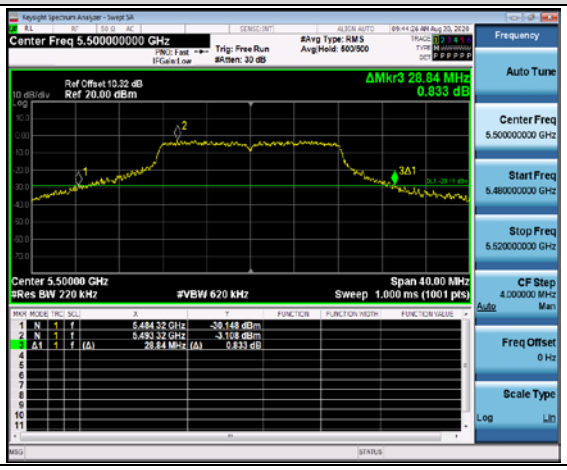
Frequency (MHz)	99% Occupied Bandwidth (MHz)		26dB Occupied Bandwidth (MHz)	
	802.11a	802.11n(HT20)	802.11a	802.11n(HT20)
5180	16.7714	16.8479	21.975	23.276
5200	16.8664	16.7620	23.142	23.545
5240	16.7502	17.8945	21.453	28.057
5260	17.899	18.851	28.080	30.120
5280	17.994	18.854	27.560	31.280
5320	18.403	19.300	30.240	37.280
5500	18.749	19.295	28.840	30.080
5580	18.512	19.216	27.760	31.960
5700	17.928	18.675	25.240	28.800

Test plots as followed:

802.11a	802.11n
	
5180	**5180**
	
5200	**5200**
	
5240	**5240**

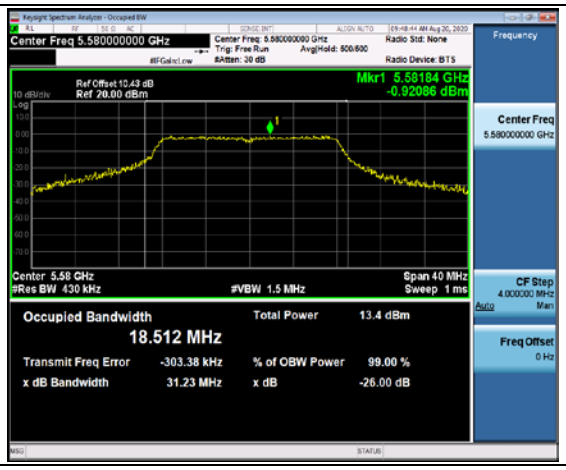
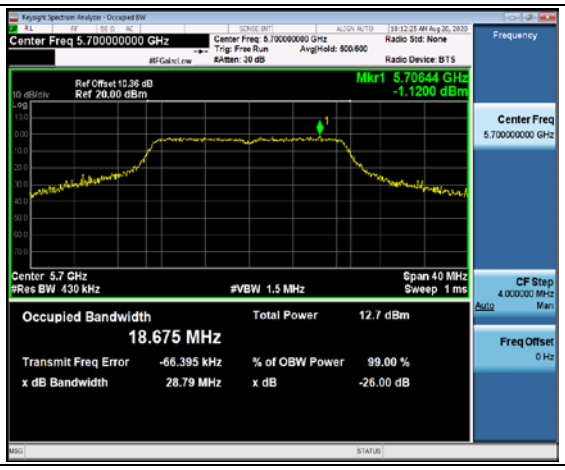
-26dB BW

802.11a mode	802.11n
	
5260	5260
	
5280	5280
	
5320	5320

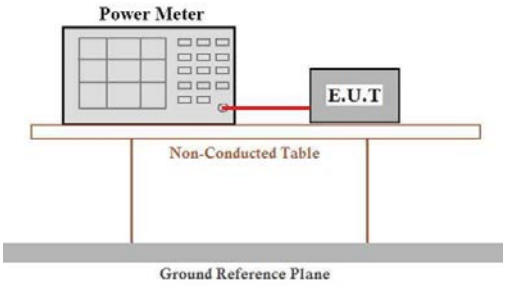
802.11a mode	802.11n
	
5500	5500
	
5580	5580
	
5700	5700

99% BW

802.11a mode	802.11n
	
5260	**5260**
	
5280	**5280**
	
5320	**5320**

802.11a mode	802.11n
	
5500	5500
	
5580	5580
	
5700	5700

7.4 Peak Transmit Power

<table>
<tr><td>Test Requirement</td><td>FCC Part15 E Section 15.407
RSS-247 6.2.1.1&6.2.2.1&6.2.3.1</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10:2013 and RSS-Gen & KDB 789033 D02 v02r01</td></tr>
<tr><td>FCC Limit:</td><td>
<table>
<tr><td>Frequency band (MHz)</td><td>Limit</td></tr>
<tr><td rowspan="2">5150-5250</td><td>≤1W(30dBm) for master device</td></tr>
<tr><td>≤250Mw(23.98dBm) for client device</td></tr>
<tr><td>5250-5350</td><td>≤250Mw(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td>5470-5725</td><td>≤250Mw(23.98dBm) for client device or 11dBm+10logB*</td></tr>
<tr><td colspan="2">Remark: *Where B is the 26Db emission bandwidth in MHz.
The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.</td></tr>
</table>
</td></tr>
<tr><td>IC Limit:</td><td>
<table>
<tr><td>Operation Frequency Band</td><td>Limit</td></tr>
<tr><td>5150~5250 MHz</td><td>EIRP shall not exceed 200 mW or 10 + 10 logB, dBm</td></tr>
<tr><td>5250~5350 MHz</td><td>Conducted output power shall not exceed 250 mW or 11 +10 logB EIRP shall not exceed 1.0 W or 17 + 10 logB, dBm</td></tr>
<tr><td>5470~5600 MHz and 5650~5725 MHz</td><td>Conducted output power shall not exceed 250 mW or 11 +10 logB EIRP shall not exceed 1.0 W or 17 + 10 logB, dBm</td></tr>
<tr><td>5725~5850 MHz</td><td>The maximum conducted output power over the frequency band of operation shall not exceed 1 W.</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test procedure:</td><td>Measurement using an RF average power meter
(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied
a) The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
b) At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
c) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in section B).</td></tr>
</table>

	(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter. (iv) Adjust the measurement in dBm by adding 10 log(1/x) where x is the duty cycle (e.g., 10log(1/0.25) if the duty cycle is 25 percent).
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

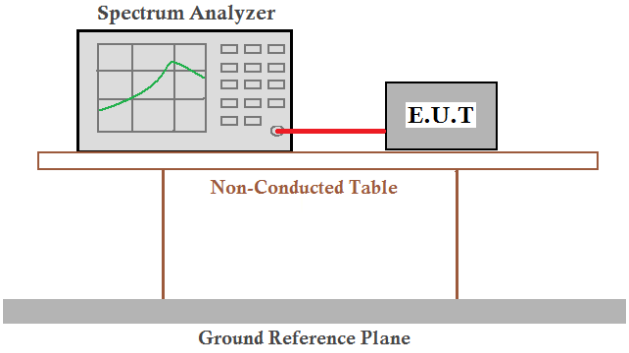
Measurement Data

Modulation	802.11a	802.11n(HT20)
Duty cycle	87.19%	86.43%
Duty Factor	0.59	0.63

802.11a mode							
Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	EIRP (dBm)	Limit (dBm)	Result
5180	13.52	0.59	14.11	23.98	14.82	23.01	Pass
5200	13.79	0.59	14.38	23.98	15.09	23.01	Pass
5240	13.82	0.59	14.41	23.98	15.12	23.01	Pass
5260	13.77	0.59	14.36	23.98	15.07	30.00	Pass
5280	13.4	0.59	13.99	23.98	14.7	30.00	Pass
5320	13.75	0.59	14.34	23.98	15.05	30.00	Pass
5500	10.49	0.59	11.08	23.98	11.79	30.00	Pass
5580	10.1	0.59	10.69	23.98	11.4	30.00	Pass
5700	9.52	0.59	10.11	23.98	10.82	30.00	Pass

802.11n(HT20) mode							
Frequency (MHz)	Measured Power (dBm)	Duty Factor	Output Power (dBm)	Limit (dBm)	EIRP (dBm)	Limit (dBm)	Result
5180	13.6	0.63	14.23	23.98	14.94	23.01	Pass
5200	13.95	0.63	14.58	23.98	15.29	23.01	Pass
5240	13.71	0.63	14.34	23.98	15.05	23.01	Pass
5260	13.7	0.63	14.33	23.98	15.04	30.00	Pass
5280	13.45	0.63	14.08	23.98	14.79	30.00	Pass
5320	13.78	0.63	14.41	23.98	15.12	30.00	Pass
5500	10.75	0.63	11.38	23.98	12.09	30.00	Pass
5580	10.21	0.63	10.84	23.98	11.55	30.00	Pass
5700	9.58	0.63	10.21	23.98	10.92	30.00	Pass

7.5 Power Spectral Density

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407
RSS-247 6.2.1.1&6.2.2.1&6.2.3.1</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10:2013 and RSS-Gen & KDB 789033 D02 v02r01</td></tr>
<tr><td>FCC Limit:</td><td>
<table>
<tr><td>Frequency band (MHz)</td><td>Limit</td></tr>
<tr><td rowspan="2">5150-5250</td><td>≤17dBm in 1MHz for master device</td></tr>
<tr><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td>5250-5350</td><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td>5470-5725</td><td>≤11dBm in 1MHz for client device</td></tr>
<tr><td colspan="2">Remark: The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.</td></tr>
</table>
</td></tr>
<tr><td></td><td>
<table>
<tr><td>Frequency Band</td><td>Limit</td></tr>
<tr><td>5150~5250 MHz</td><td>EIRP spectral density 10 dBm / MHz</td></tr>
<tr><td>5250~5350 MHz</td><td>11dBm / MHz</td></tr>
<tr><td>5470~5600 MHz and 5650~5725 MHz</td><td>11dBm / MHz</td></tr>
<tr><td>5725~5850 MHz</td><td>30 dBm/500kHz</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test procedure:</td><td>1) Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”.
2) Use the peak search function on the instrument to find the peak of the spectrum.
3) Make the following adjustments to the peak value of the spectrum, if applicable:
a) If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.
b) If Method SA-3 Alternative was used and the linear mode was used in step E)2)g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4) The result is the PSD.</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 5.10 for details</td></tr>
</table>

Test mode:	Refer to section 5.2 for details
Test results:	Pass

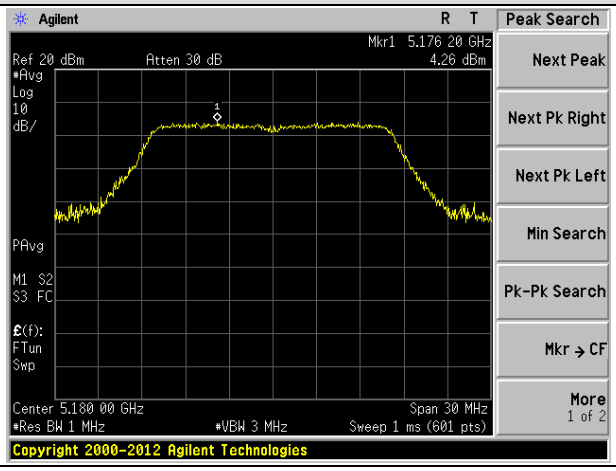
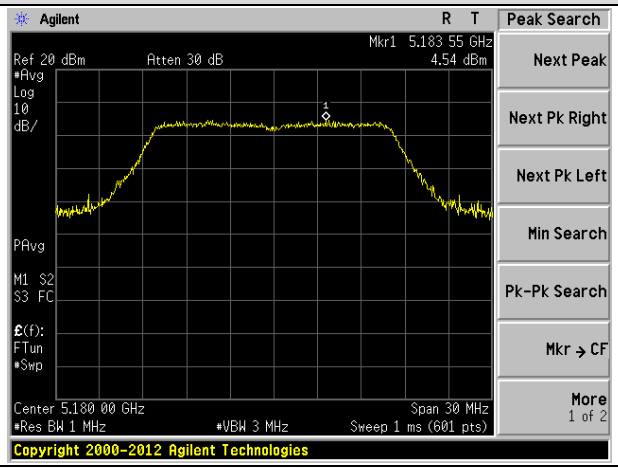
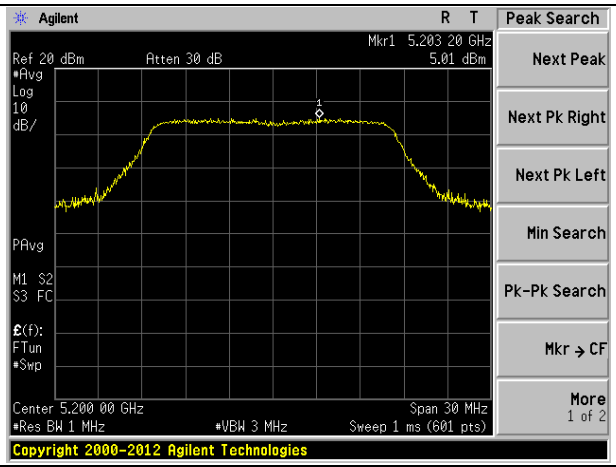
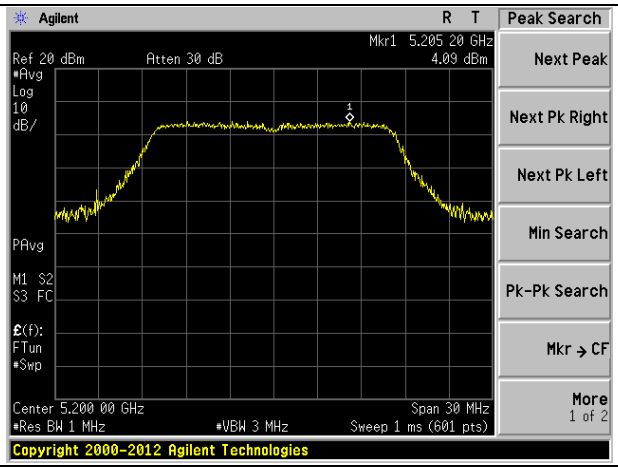
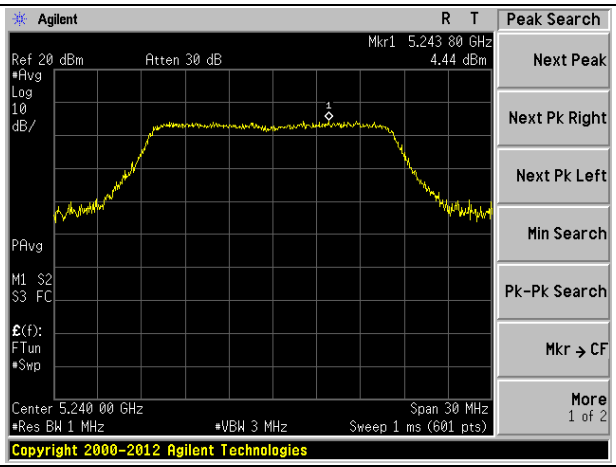
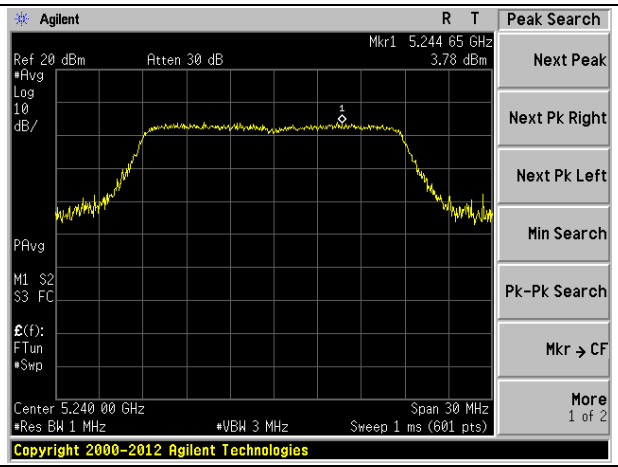
Measurement Data

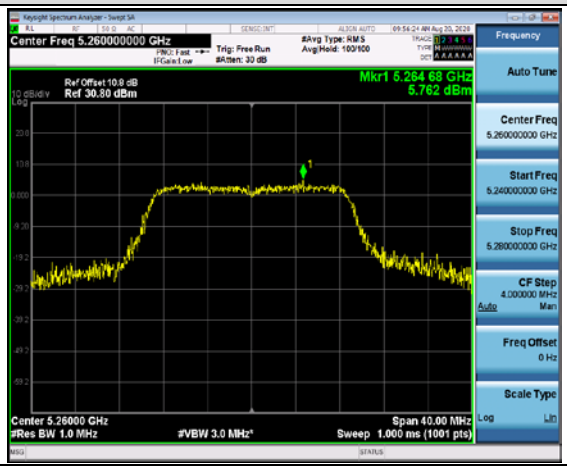
Modulation	802.11a	802.11n(HT20)
Duty cycle	87.19%	86.43%
Duty Factor	0.59	0.63

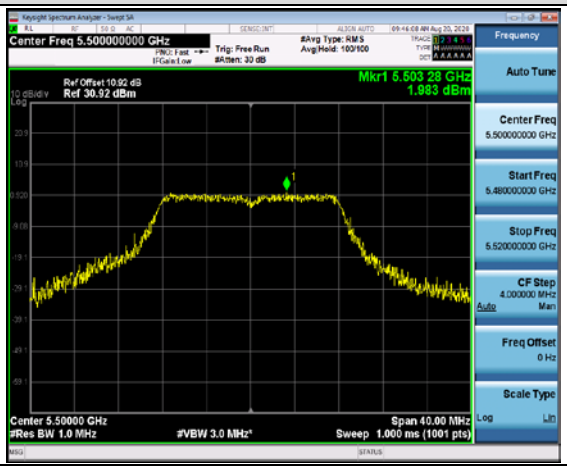
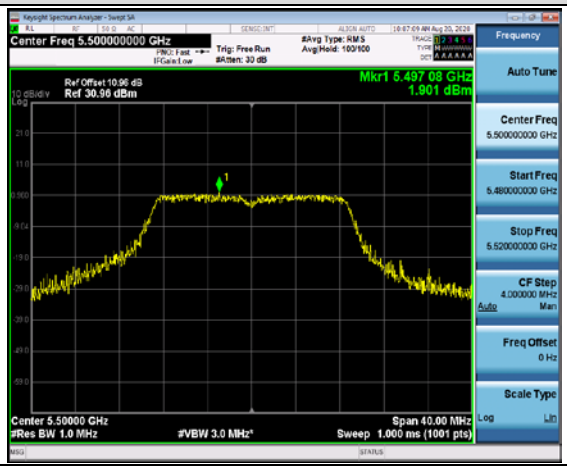
802.11a mode							
Frequency (MHz)	Measured PSD (dBm)	Duty Factor	Total PSD (dBm)	Limit (dBm)	EIRP PSD (dBm)	Limit (dBm)	Result
5180	4.26	0.59	4.85	<=11	5.56	<=10	Pass
5200	5.01	0.59	5.6	<=11	6.31	<=10	Pass
5240	4.44	0.59	5.03	<=11	5.74	<=10	Pass
5260	5.52	0.59	6.11	<=11	6.82	<=11	Pass
5280	4.67	0.59	5.26	<=11	5.97	<=11	Pass
5320	5.66	0.59	6.25	<=11	6.96	<=11	Pass
5500	1.98	0.59	2.57	<=11	3.28	<=11	Pass
5580	1.1	0.59	1.69	<=11	2.4	<=11	Pass
5700	0.54	0.59	1.13	<=11	1.84	<=11	Pass

802.11n(HT20) mode							
Frequency (MHz)	Measured PSD (dBm)	Duty Factor	Total PSD (dBm)	Limit (dBm)	EIRP PSD (dBm)	Limit (dBm)	Result
5180	4.54	0.63	5.17	<=11	5.88	<=10	Pass
5200	4.09	0.63	4.72	<=11	5.43	<=10	Pass
5240	3.78	0.63	4.41	<=11	5.12	<=10	Pass
5260	5.76	0.63	6.39	<=11	7.1	<=11	Pass
5280	4.85	0.63	5.48	<=11	6.19	<=11	Pass
5320	4.91	0.63	5.54	<=11	6.25	<=11	Pass
5500	1.9	0.63	2.53	<=11	3.24	<=11	Pass
5580	1.81	0.63	2.44	<=11	3.15	<=11	Pass
5700	0.54	0.63	1.17	<=11	1.88	<=11	Pass

Test plots as followed:

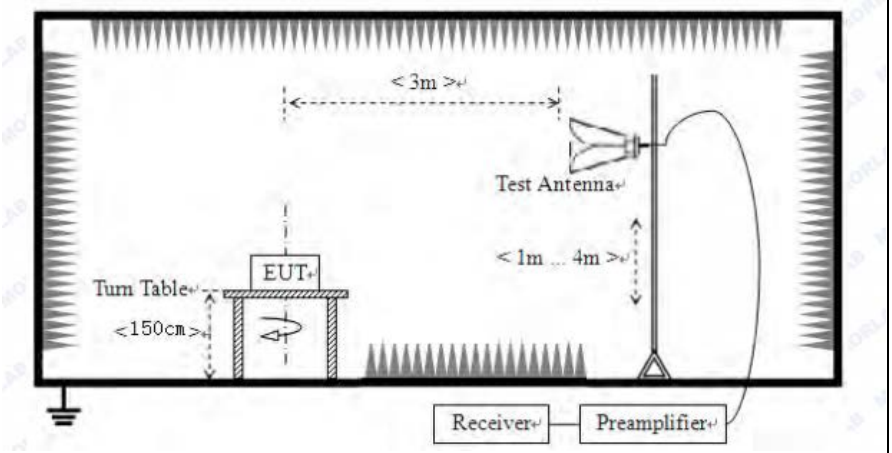
802.11a	802.11n
	
5180	**5180**
	
5200	**5200**
	
5240	**5240**

802.11a	802.11n
	
5260	5260
	
5280	5280
	
5320	5320

802.11a	802.11n
	
5500	5500
	
5580	5580
	
5700	5700

7.6 Band Edge

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407 and 5.205
RSS-Gen 8.10</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013 & RSS-Gen</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</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>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>68.2</td><td>Peak Value</td></tr>
</table>
Undesirable emission limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.
</td></tr>
<tr><td>Test Procedure:</td><td>a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
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.
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.
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 rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. 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</td></tr>
</table>

	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 setup:	For radiated emissions above 1GHz 
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remarks:

1. *Only the worst case Main Antenna test data.*
2. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.*
5. *According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:*
   E[dBuV/m] = EIRP[dBm] + 95.2;
   For example, if EIRP = -27dBm
   E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Measurement Data:

802.11a(HT20)				PK				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150.00	43.32	32.07	8.99	37.49	46.89	74	-27.11	Horizontal
5350.00	43.26	31.75	9.29	37.2	47.1	74	-26.9	Horizontal
5460.00	43.37	31.61	9.86	37.08	47.76	74	-26.24	Horizontal
5470.00	44.93	31.95	9.56	36.95	49.49	68.2	-18.71	Horizontal
5725.00	46.71	32.53	9.83	35.86	53.21	68.2	-14.99	Horizontal
5150.00	46.01	32.07	8.99	37.49	49.58	74	-24.42	Vertical
5350.00	46.68	31.75	9.29	37.2	50.52	74	-23.48	Vertical
5460.00	45.38	31.61	9.86	37.08	49.77	74	-24.23	Vertical
5470.00	45.31	31.95	9.56	36.95	49.87	68.2	-18.33	Vertical
5725.00	42.18	32.53	9.83	35.86	48.68	68.2	-19.52	Vertical

802.11a(HT20)				AV				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150.00	32.57	32.07	8.99	37.49	36.14	54	-17.86	Horizontal
5350.00	34.87	31.75	9.29	37.2	38.71	54	-15.29	Horizontal
5460.00	33.83	31.61	9.86	37.08	38.22	54	-15.78	Horizontal
5470.00	32.72	31.95	9.56	36.95	37.28	48.2	-10.92	Horizontal
5725.00	32.89	32.53	9.83	35.86	39.39	48.2	-8.81	Horizontal
5150.00	32.22	32.07	8.99	37.49	35.79	54	-18.21	Vertical
5350.00	33.28	31.75	9.29	37.2	37.12	54	-16.88	Vertical
5460.00	33.46	31.61	9.86	37.08	37.85	54	-16.15	Vertical
5470.00	33.52	31.95	9.56	36.95	38.08	48.2	-10.12	Vertical
5725.00	32.74	32.53	9.83	35.86	39.24	48.2	-8.96	Vertical

802.11n(HT20)					PK			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150.00	45.1	32.07	8.99	37.49	48.67	74	-25.33	Horizontal
5350.00	45.39	31.75	9.29	37.2	49.23	74	-24.77	Horizontal
5460.00	42.11	31.61	9.86	37.08	46.5	74	-27.5	Horizontal
5470.00	44.42	31.95	9.56	36.95	48.98	68.2	-19.22	Horizontal
5725.00	45.36	32.53	9.83	35.86	51.86	68.2	-16.34	Horizontal
5150.00	42.41	32.07	8.99	37.49	45.98	74	-28.02	Vertical
5350.00	45.82	31.75	9.29	37.2	49.66	74	-24.34	Vertical
5460.00	43.04	31.61	9.86	37.08	47.43	74	-26.57	Vertical
5470.00	43.65	31.95	9.56	36.95	48.21	68.2	-19.99	Vertical
5725.00	44.81	32.53	9.83	35.86	51.31	68.2	-16.89	Vertical

802.11n(HT20)					AV			
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
5150.00	33.37	32.07	8.99	37.49	36.94	54	-17.06	Horizontal
5350.00	32.67	31.75	9.29	37.2	36.51	54	-17.49	Horizontal
5460.00	33.94	31.61	9.86	37.08	38.33	54	-15.67	Horizontal
5470.00	32.09	31.95	9.56	36.95	36.65	48.2	-11.55	Horizontal
5725.00	34.8	32.53	9.83	35.86	41.3	48.2	-6.9	Horizontal
5150.00	32.59	32.07	8.99	37.49	36.16	54	-17.84	Vertical
5350.00	34.77	31.75	9.29	37.2	38.61	54	-15.39	Vertical
5460.00	33.76	31.61	9.86	37.08	38.15	54	-15.85	Vertical
5470.00	32.03	31.95	9.56	36.95	36.59	48.2	-11.61	Vertical
5725.00	33.03	32.53	9.83	35.86	39.53	48.2	-8.67	Vertical

7.7 Radiated Emission

<table>
<tr><td>Test Requirement :</td><td>FCC Part15 C Section 15.209 and 15.205
RSS-Gen 8.9 & 8.10</td></tr>
<tr><td>Test Method :</td><td>ANSI C63.10: 2013 & RSS-Gen</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></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>120KHz</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>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>FCC Limit:</td><td>
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></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>1.705-30.0</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>

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
</td></tr>
<tr><td>IC Limit:</td><td>
Table 5 – General field strength limits at frequencies above 30 MHz
<table>
<tr><th>Frequency (MHz)</th><th>Field strength (µV/m at 3 m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 – 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table>
Table 6 – General field strength limits at frequencies below 30 MHz
<table>
<tr><th>Frequency</th><th>Magnetic field strength (H-Field) (µA/m)</th><th>Measurement distance (m)</th></tr>
<tr><td>9 - 490 kHz [1]</td><td>6.37/F (F in kHz)</td><td>300</td></tr>
<tr><td>490 - 1705 kHz</td><td>63.7/F (F in kHz)</td><td>30</td></tr>
<tr><td>1.705 - 30 MHz</td><td>0.08</td><td>30</td></tr>
</table>
Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.
</td></tr>
<tr><td>Test Procedure:</td><td>Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:
1>.Below 1GHz test procedure:
1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3</td></tr>
</table>

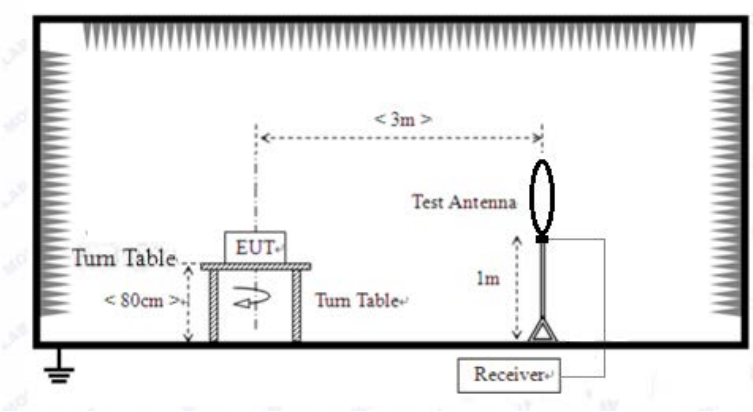
meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

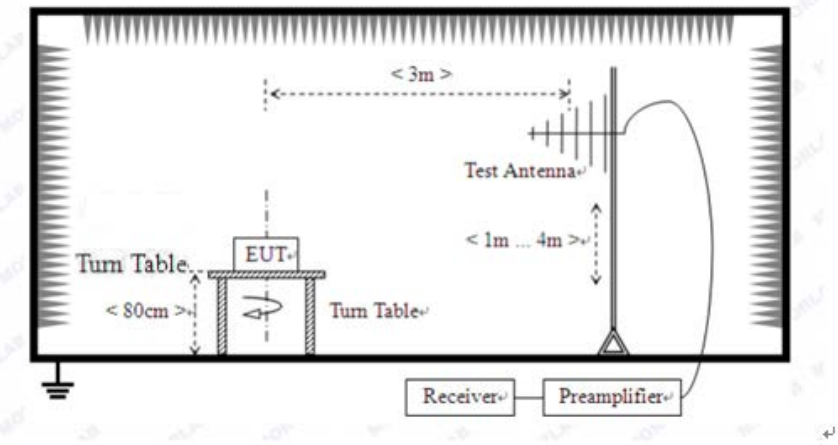
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical 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 rotable 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, quasi-peak or average method as specified and then reported in a data sheet.

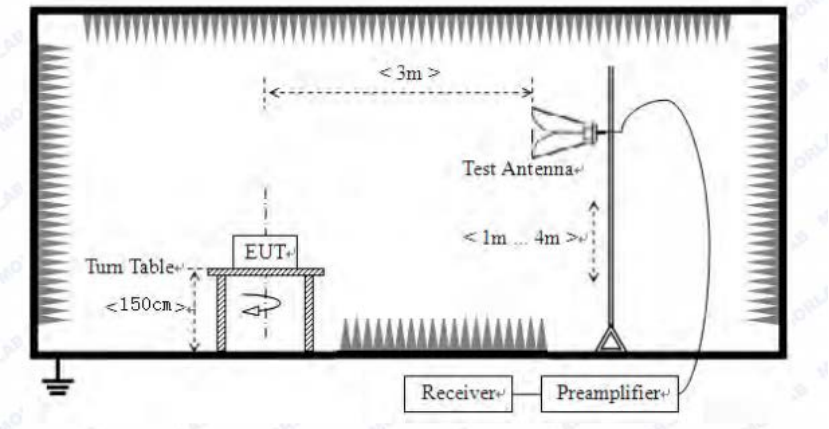
2>.Above 1GHz test procedure:

1. On the test site as test setup graph above,the EUT shall be placed at the 0.8m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

   EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi)

<table>
<tr><td></td><td>where:
Pg is the generator output power into the substitution antenna.</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions from 9kHz to 30MHz
 

For radiated emissions from 30MHz to1GHz
 

For radiated emissions above 1GHz
 
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 5.10 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 5.2 for details</td></tr>
<tr><td>Test environment:</td><td>Temp.:</td><td>25 °C</td><td>Humid.:</td><td>52%</td><td>Press.:</td><td>1012mbar</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Remarks:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

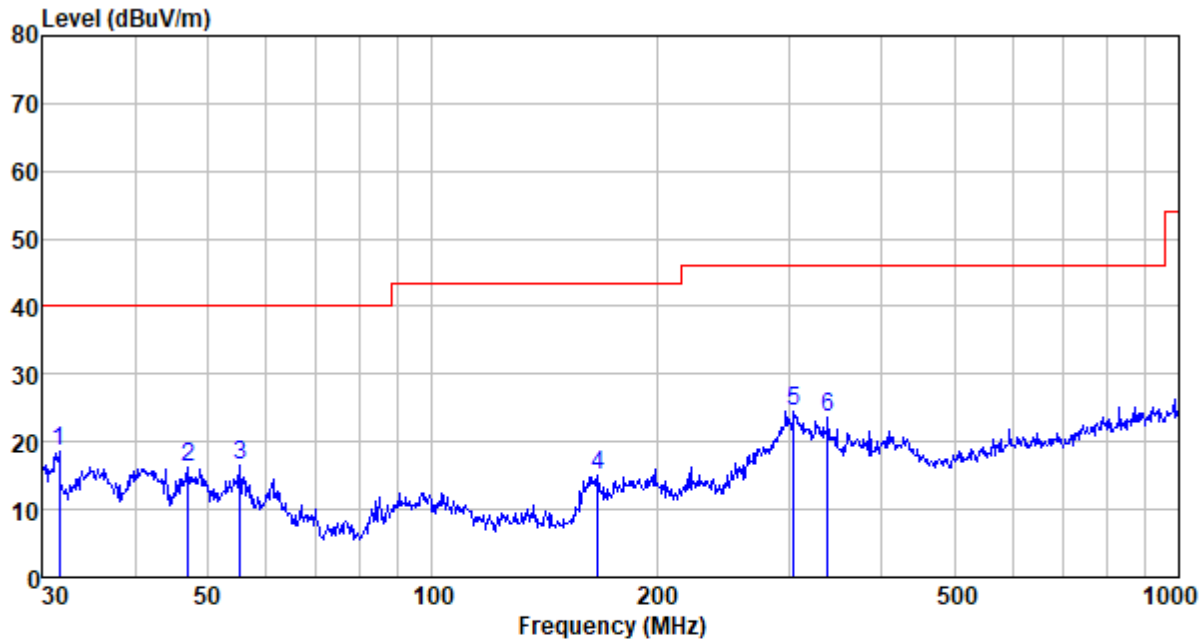
Measurement Data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

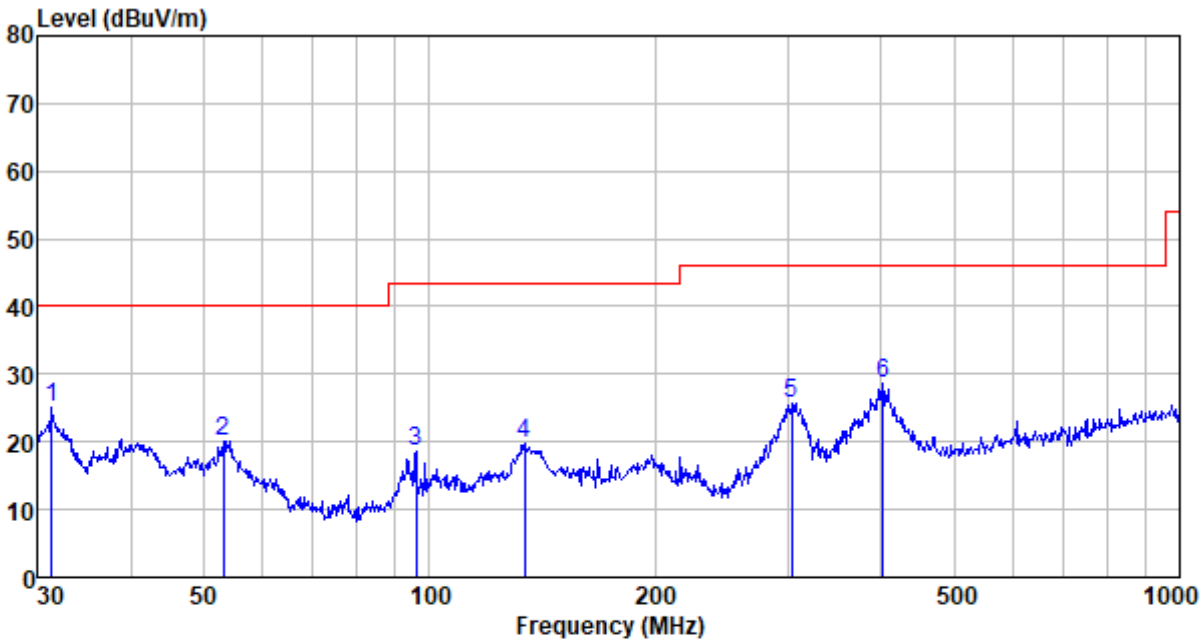
30MHz~ 1GHz

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
31.620	41.90	11.23	0.57	35.12	18.58	40.00	-21.42	QP
47.160	39.31	12.27	0.74	36.04	16.28	40.00	-23.72	QP
55.221	40.28	11.78	0.82	36.26	16.62	40.00	-23.38	QP
166.651	42.24	8.43	1.67	37.17	15.17	43.50	-28.33	QP
304.610	45.80	13.68	2.38	37.43	24.43	46.00	-21.57	QP
338.400	44.12	14.31	2.57	37.46	23.54	46.00	-22.46	QP

Vertical:



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
31.399	48.38	11.23	0.57	35.11	25.07	40.00	-14.93	QP
53.131	43.62	11.98	0.80	36.23	20.17	40.00	-19.83	QP
96.099	42.43	11.65	1.16	36.69	18.55	43.50	-24.95	QP
134.088	47.39	7.87	1.47	36.98	19.75	43.50	-23.75	QP
303.544	46.94	13.68	2.38	37.42	25.58	46.00	-20.42	QP
401.839	48.05	15.34	2.86	37.52	28.73	46.00	-17.27	QP

Above 1GHz

802.11a(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	33.38	38.96	8.27	35.64	44.97	74	-29.03	Vertical
15540.00	36.24	38.4	10.57	35.35	49.86	74	-24.14	Vertical
10360.00	37.09	38.96	8.27	35.64	48.68	74	-25.32	Horizontal
15540.00	35.21	38.4	10.57	35.35	48.83	74	-25.17	Horizontal

802.11a(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	37.25	39.01	8.29	35.67	48.88	74	-25.12	Vertical
15600.00	34.92	38.3	10.62	35.36	48.48	74	-25.52	Vertical
10400.00	35.74	39.01	8.29	35.67	47.37	74	-26.63	Horizontal
15600.00	37.76	38.3	10.62	35.36	51.32	74	-22.68	Horizontal

802.11a(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	36.07	39.15	8.32	35.78	47.76	74	-26.24	Vertical
15720.00	33.85	38	10.72	35.37	47.2	74	-26.8	Vertical
10480.00	33.8	39.15	8.32	35.78	45.49	74	-28.51	Horizontal
15720.00	34.18	38	10.72	35.37	47.53	74	-26.47	Horizontal

802.11a(HT20) 5260MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10520.00	35.48	39.2	8.34	35.82	47.2	74	-26.8	Vertical
15780.00	36.48	37.9	10.77	35.38	49.77	74	-24.23	Vertical
10520.00	34.02	39.2	8.34	35.82	45.74	74	-28.26	Horizontal
15780.00	36.77	37.9	10.77	35.38	50.06	74	-23.94	Horizontal

802.11a(HT20) 5280MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10560.00	29.27	39.21	8.35	35.85	40.98	74	-33.02	Vertical
15840.00	27.56	37.7	10.82	35.39	40.69	74	-33.31	Vertical
10560.00	27.32	39.21	8.35	35.85	39.03	74	-34.97	Horizontal
15840.00	31.69	37.7	10.82	35.39	44.82	74	-29.18	Horizontal

802.11a(HT20) 5320MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10640.00	36.12	39.22	8.38	35.96	47.76	74	-26.24	Vertical
15960.00	35.63	37.5	10.92	35.4	48.65	74	-25.35	Vertical
10640.00	36.44	39.22	8.38	35.96	48.08	74	-25.92	Horizontal
15960.00	36.05	37.5	10.92	35.4	49.07	74	-24.93	Horizontal

802.11a(HT20) 5500MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11000.00	36.3	39.3	8.53	36.4	47.73	74	-26.27	Vertical
16500.00	35.32	39.3	11.06	35.87	49.81	74	-24.19	Vertical
11000.00	37.8	39.3	8.53	36.4	49.23	74	-24.77	Horizontal
16500.00	33.45	39.3	11.06	35.87	47.94	74	-26.06	Horizontal

802.11a(HT20) 5580MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11160.00	37.58	39.33	8.6	36.37	49.14	74	-24.86	Vertical
16740.00	35.03	39.5	11.11	36.09	49.55	74	-24.45	Vertical
11160.00	35.11	39.33	8.6	36.37	46.67	74	-27.33	Horizontal
16740.00	35.96	39.5	11.11	36.09	50.48	74	-23.52	Horizontal

802.11a(HT20) 5700MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11400.00	36.64	39.38	8.7	36.32	48.4	74	-25.6	Vertical
17100.00	33.23	40.22	11.26	36.29	48.42	74	-25.58	Vertical
11400.00	37.79	39.38	8.7	36.32	49.55	74	-24.45	Horizontal
17100.00	36.14	40.22	11.26	36.29	51.33	74	-22.67	Horizontal

802.11n(HT20) 5180MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	35.32	38.96	8.27	35.64	46.91	74	-27.09	Vertical
15540.00	37.51	38.4	10.57	35.35	51.13	74	-22.87	Vertical
10360.00	35.53	38.96	8.27	35.64	47.12	74	-26.88	Horizontal
15540.00	33.82	38.4	10.57	35.35	47.44	74	-26.56	Horizontal

802.11n(HT20) 5200MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	37.95	39.01	8.29	35.67	49.58	74	-24.42	Vertical
15600.00	37.96	38.3	10.62	35.36	51.52	74	-22.48	Vertical
10400.00	36.07	39.01	8.29	35.67	47.7	74	-26.3	Horizontal
15600.00	35.1	38.3	10.62	35.36	48.66	74	-25.34	Horizontal

802.11n(HT20) 5240MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	34.48	39.15	8.32	35.78	46.17	74	-27.83	Vertical
15720.00	34.07	38	10.72	35.37	47.42	74	-26.58	Vertical
10480.00	37.1	39.15	8.32	35.78	48.79	74	-25.21	Horizontal
15720.00	34.57	38	10.72	35.37	47.92	74	-26.08	Horizontal

802.11n(HT20) 5260MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10520.00	37.25	39.2	8.34	35.82	48.97	74	-25.03	Vertical
15780.00	37.88	37.9	10.77	35.38	51.17	74	-22.83	Vertical
10520.00	33.34	39.2	8.34	35.82	45.06	74	-28.94	Horizontal
15780.00	33.83	37.9	10.77	35.38	47.12	74	-26.88	Horizontal

802.11n(HT20) 5280MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10560.00	35.41	39.21	8.35	35.85	47.12	74	-26.88	Vertical
15840.00	35.17	37.7	10.82	35.39	48.3	74	-25.7	Vertical
10560.00	33.8	39.21	8.35	35.85	45.51	74	-28.49	Horizontal
15840.00	36.18	37.7	10.82	35.39	49.31	74	-24.69	Horizontal

802.11n(HT20) 5320MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10640.00	34.87	39.22	8.38	35.96	46.51	74	-27.49	Vertical
15960.00	35.45	37.5	10.92	35.4	48.47	74	-25.53	Vertical
10640.00	34.62	39.22	8.38	35.96	46.26	74	-27.74	Horizontal
15960.00	36.22	37.5	10.92	35.4	49.24	74	-24.76	Horizontal

802.11n(HT20) 5500MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11000.00	33.36	39.3	8.53	36.4	44.79	74	-29.21	Vertical
16500.00	34.87	39.3	11.06	35.87	49.36	74	-24.64	Vertical
11000.00	36.14	39.3	8.53	36.4	47.57	74	-26.43	Horizontal
16500.00	33.03	39.3	11.06	35.87	47.52	74	-26.48	Horizontal

802.11n(HT20) 5580MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11160.00	33.18	39.33	8.6	36.37	44.74	74	-29.26	Vertical
16740.00	37.8	39.5	11.11	36.09	52.32	74	-21.68	Vertical
11160.00	34.56	39.33	8.6	36.37	46.12	74	-27.88	Horizontal
16740.00	37.53	39.5	11.11	36.09	52.05	74	-21.95	Horizontal

802.11n(HT20) 5700MHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11400.00	33.21	39.38	8.7	36.32	44.97	74	-29.03	Vertical
17100.00	35.82	40.22	11.26	36.29	51.01	74	-22.99	Vertical
11400.00	33.72	39.38	8.7	36.32	45.48	74	-28.52	Horizontal
17100.00	35.66	40.22	11.26	36.29	50.85	74	-23.15	Horizontal

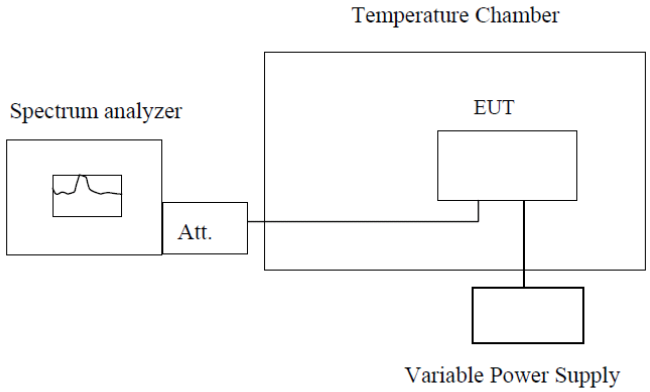
Notes:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.

2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.

3. Test result margin more than 20dB under PK limit, then average measurement needn't be performed.

7.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g) RSS-Gen 8.11
Test Method:	ANSI C63.10:2013, FCC Part 2.1055, RSS-Gen
Limit:	Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.4, 2003; tested to 2.1055 for compliance to FCC Part 15.407(g) requirements.
Test setup:	 **Note :** Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.									
Worse Case Operating Frequency：5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	7.4	5180.546	Pass	5180.840	Pass	5180.752	Pass	5180.720	Pass
-20	7.4	5180.906	Pass	5180.756	Pass	5180.690	Pass	5180.654	Pass
-10	7.4	5180.635	Pass	5180.070	Pass	5180.807	Pass	5180.027	Pass
0	7.4	5180.344	Pass	5180.467	Pass	5180.630	Pass	5180.721	Pass
10	7.4	5180.500	Pass	5180.538	Pass	5180.324	Pass	5180.926	Pass
20	7.4	5180.167	Pass	5180.927	Pass	5180.107	Pass	5180.481	Pass
30	7.4	5180.286	Pass	5180.825	Pass	5180.052	Pass	5180.052	Pass
40	7.4	5180.212	Pass	5180.489	Pass	5180.154	Pass	5180.862	Pass
50	7.4	5180.151	Pass	5180.088	Pass	5180.502	Pass	5180.557	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency：5180MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	7.8	5180.254	Pass	5180.112	Pass	5180.540	Pass	5180.891	Pass
25	6.7	5180.164	Pass	5180.715	Pass	5180.141	Pass	5180.339	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5190MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	7.4	5190.413	Pass	5190.470	Pass	5190.148	Pass	5190.437	Pass
-20	7.4	5190.756	Pass	5190.347	Pass	5190.535	Pass	5190.415	Pass
-10	7.4	5190.846	Pass	5190.009	Pass	5190.408	Pass	5190.768	Pass
0	7.4	5190.816	Pass	5190.656	Pass	5190.023	Pass	5190.969	Pass
10	7.4	5190.010	Pass	5190.678	Pass	5190.783	Pass	5190.016	Pass
20	7.4	5190.723	Pass	5190.798	Pass	5190.357	Pass	5190.594	Pass
30	7.4	5190.369	Pass	5190.714	Pass	5190.323	Pass	5190.754	Pass
40	7.4	5190.418	Pass	5190.601	Pass	5190.907	Pass	5190.402	Pass
50	7.4	5190.102	Pass	5190.985	Pass	5190.777	Pass	5190.037	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency：5190MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	7.8	5190.311	Pass	5190.339	Pass	5190.362	Pass	5190.814	Pass
25	6.7	5190.910	Pass	5190.242	Pass	5190.632	Pass	5190.607	Pass

Frequency stability versus Temp.									
Worse Case Operating Frequency：5210MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
-30	7.4	5210.464	Pass	5210.494	Pass	5210.222	Pass	5210.809	Pass
-20	7.4	5210.367	Pass	5210.002	Pass	5210.304	Pass	5210.271	Pass
-10	7.4	5210.096	Pass	5210.817	Pass	5210.479	Pass	5210.470	Pass
0	7.4	5210.435	Pass	5210.122	Pass	5210.194	Pass	5210.844	Pass
10	7.4	5210.260	Pass	5210.259	Pass	5210.530	Pass	5210.995	Pass
20	7.4	5210.445	Pass	5210.216	Pass	5210.343	Pass	5210.924	Pass
30	7.4	5210.459	Pass	5210.121	Pass	5210.622	Pass	5210.019	Pass
40	7.4	5210.326	Pass	5210.762	Pass	5210.552	Pass	5210.240	Pass
50	7.4	5210.909	Pass	5210.599	Pass	5210.287	Pass	5210.369	Pass
Frequency stability versus Temp.									
Worse Case Operating Frequency：5210MHz									
Temp. (°C)	Power Supply (Vdc)	0 minute		2 minute		5 minute		10 minute	
		Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail	Measured Frequency (MHz)	Pass /Fail
25	7.8	5210.459	Pass	5210.650	Pass	5210.574	Pass	5210.502	Pass
25	6.7	5210.615	Pass	5210.294	Pass	5210.950	Pass	5210.045	Pass

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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