FCC REPORT

Applicant:	Autel Intelligent Tech. Corp., Ltd.
Address of Applicant:	7th-8th, 10th Floor, Bldg. B1, Zhiyuan, Xueyuan Rd. Xili, Nanshan, Shenzhen 518055, China
Manufacturer:	Autel Intelligent Tech. Corp., Ltd.
Address of Manufacturer:	7th-8th, 10th Floor, Bldg. B1, Zhiyuan, Xueyuan Rd. Xili, Nanshan, Shenzhen 518055, China
Factory 1:	Autel Intelligent Technology Corp.,Ltd.
Address of Factory 1:	6th Floor,Building 1,Yanxiang Zhigu,NO.11 Gaoxin West Rd,Guangming New District, Shenzhen City, Guangdong Province,China.
Factory 2:	AUTEL VIETNAM COMPANY LIMITED
Address of Factory 2:	4th Floor, Factory#6, Land#CN1, An Duong Industrial Zone, Hong Phong Township, An Duong County, Hai Phong, Viet Nam

Equipment Under Test (EUT)

Product Name:	MaxiFlash VCI
Model No.:	MaxiFlash VCI
Trade Mark:	Autel
FCC ID:	WQ818MXFULTRA
Applicable standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of sample receipt:	September 25, 2019
Date of Test:	September 25-29, 2019
Date of report issued:	September 29, 2019
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	*September 29, 2019*	*Original*

Prepared By:  ***Date:*** *September 29, 2019*

Project Engineer

Check By:  ***Date:*** *September 29, 2019*

Reviewer

3 Contents

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407(a)(3)	Pass
Channel Bandwidth	15.407(e)	Pass
Power Spectral Density	15.407(a)(3)	Pass
Band Edge	15.407(b)(4)	Pass
Spurious Emission	15.205/15.209/15.407(b)(4)	Pass
Frequency Stability	15.407(g)	Pass

Remarks：

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

2. Test according to ANSI C63.10:2013.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	MaxiFlash VCI
Model No.:	MaxiFlash VCI
Serial No.:	123456789101112
Hardware Version:	V3
Software Version:	V1.01.05
Test sample(s) ID:	GTS201909000204-1
Sample(s) Status:	Engineer sample
Operation Frequency:	802.11a/802.11n(HT20): 5745MHz ~ 5825MHz 802.11n(HT40)): 5755MHz ~ 5795MHz
Channel numbers:	802.11a/802.11n(HT20): 5 802.11n(HT40): 2
Channel bandwidth:	802.11a/802.11n(HT20): 20MHz 802.11n(HT40): 40MHz
Modulation technology:	Orthogonal Frequency Division Multiplexing (OFDM) 802.11a/n/ac
Antenna Type:	Integral Antenna
Antenna gain:	2.6dBi
Power supply:	Adapter Model: A361-1203000DI Input: AC 100-240V, 50/60Hz, 1.5A Output: DC 12V, 3000mA

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	151	5755MHz	153	5765MHz	155	5775MHz
157	5785MHz	159	5795MHz	161	5805MHz	163	5815MHz
165	5825MHz						

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:

Test channel	Frequency (MHz)	
	802.11 a/n(HT20)	802.11 n(HT40)
Lowest channel	5745	5755
Middle channel	5785	
Highest channel	5825	5795

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

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
802.11a	6Mbps
802.11n(HT20)	6.5Mbps
802.11n(HT40)	13Mbps

5.3 Description of Support Units

None.

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 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

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.8 Additional Instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default

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. 03 2015	July. 02 2020
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. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 20 2018	Oct. 19 2019
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 20 2018	Oct. 19 2019
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 20 2018	Oct. 19 2019
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

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. 26 2019	June. 25 2020
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 26 2019	June. 25 2020
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 26 2019	June. 25 2020
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. 26 2019	June. 25 2020
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 26 2019	June. 25 2020
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 26 2019	June. 25 2020

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. 26 2019	June. 25 2020
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 26 2019	June. 25 2020
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 26 2019	June. 25 2020
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 26 2019	June. 25 2020
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 26 2019	June. 25 2020
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 26 2019	June. 25 2020
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

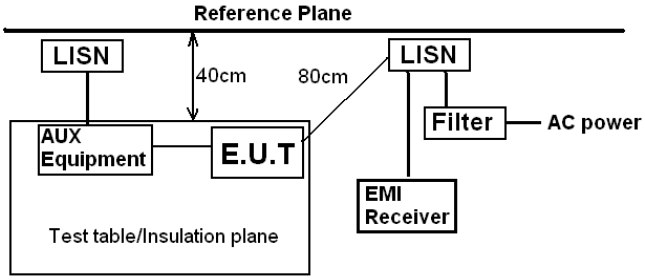
General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

7 Test results and Measurement Data

7.1 Antenna requirement

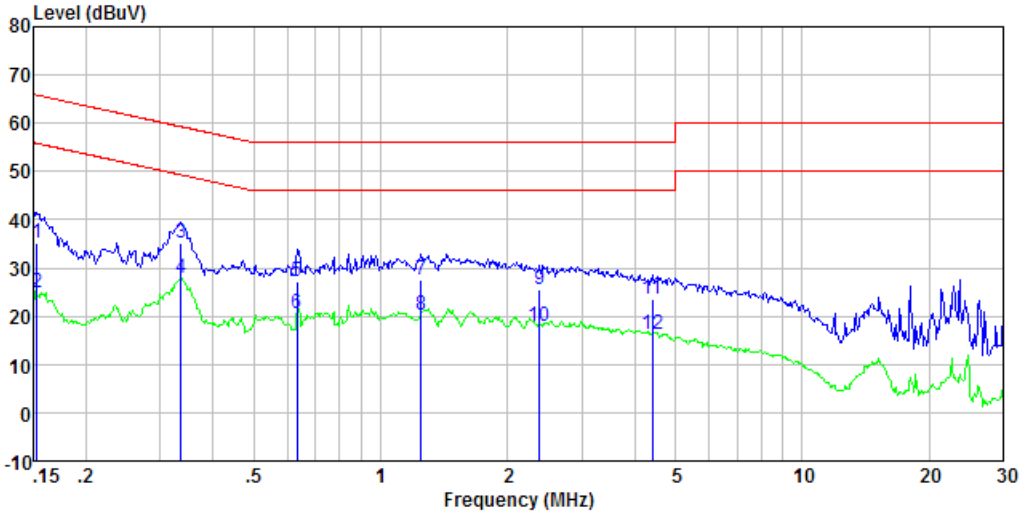
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: *An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling 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.*	
E.U.T Antenna:	
The antennas are integral antenna, the best case gain of the antennas are 2.6dBi, reference to the appendix II for details	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test environment:	Temp.: 25 °C / Humid.: 52% / Press.: 1012mbar
Test voltage:	AC 120V, 60Hz
Test results:	Pass

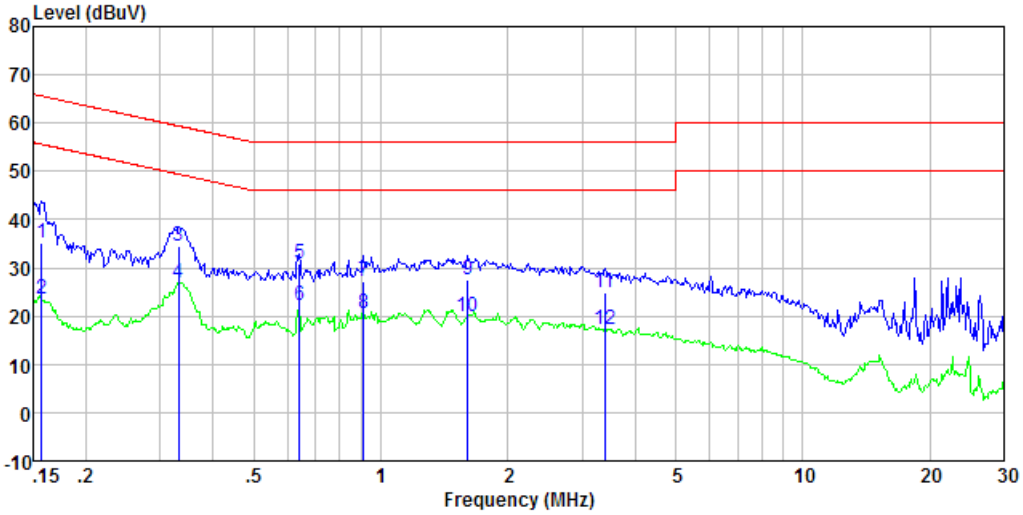
Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

Measurement data
Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	34.62	0.40	0.07	35.09	65.82	-30.73	QP
0.15	24.26	0.40	0.07	24.73	55.82	-31.09	Average
0.34	34.84	0.38	0.10	35.32	59.31	-23.99	QP
0.34	27.33	0.38	0.10	27.81	49.31	-21.50	Average
0.63	26.82	0.28	0.12	27.22	56.00	-28.78	QP
0.63	20.04	0.28	0.12	20.44	46.00	-25.56	Average
1.25	27.23	0.20	0.16	27.59	56.00	-28.41	QP
1.25	19.91	0.20	0.16	20.27	46.00	-25.73	Average
2.38	25.12	0.20	0.18	25.50	56.00	-30.50	QP
2.38	17.42	0.20	0.18	17.80	46.00	-28.20	Average
4.41	23.19	0.20	0.17	23.56	56.00	-32.44	QP
4.41	15.92	0.20	0.17	16.29	46.00	-29.71	Average

Neutral:



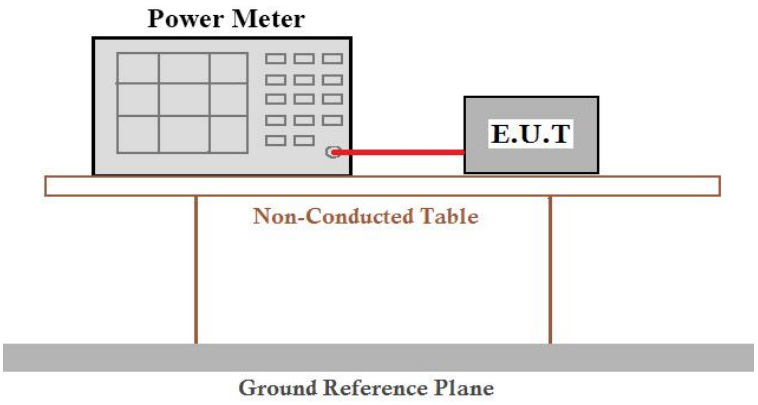
Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.16	34.59	0.40	0.08	35.07	65.60	-30.53	QP
0.16	23.00	0.40	0.08	23.48	55.60	-32.12	Average
0.33	34.02	0.38	0.10	34.50	59.40	-24.90	QP
0.33	26.33	0.38	0.10	26.81	49.40	-22.59	Average
0.64	30.30	0.27	0.12	30.69	56.00	-25.31	QP
0.64	21.94	0.27	0.12	22.33	46.00	-23.67	Average
0.91	26.93	0.22	0.14	27.29	56.00	-28.71	QP
0.91	20.35	0.22	0.14	20.71	46.00	-25.29	Average
1.61	27.05	0.20	0.17	27.42	56.00	-28.58	QP
1.61	19.67	0.20	0.17	20.04	46.00	-25.96	Average
3.40	24.37	0.20	0.18	24.75	56.00	-31.25	QP
3.40	16.79	0.20	0.18	17.17	46.00	-28.83	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

4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both *limits and measurement with the average detector receiver is unnecessary.*

7.3 Conducted Peak Output Power

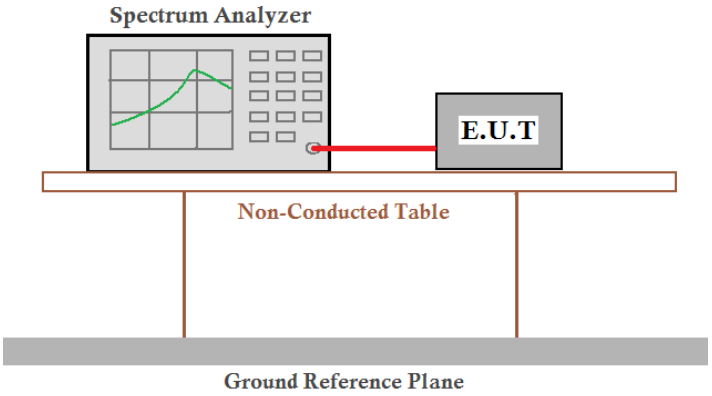
Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Test CH	Peak Output Power (dBm)			Limit(dBm)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	13.63	11.98	13.33	30.00	Pass
Middle	12.46	12.58	---		
Highest	13.40	13.30	12.86		

Remark: “---“is not applicable

7.4 Channel Bandwidth

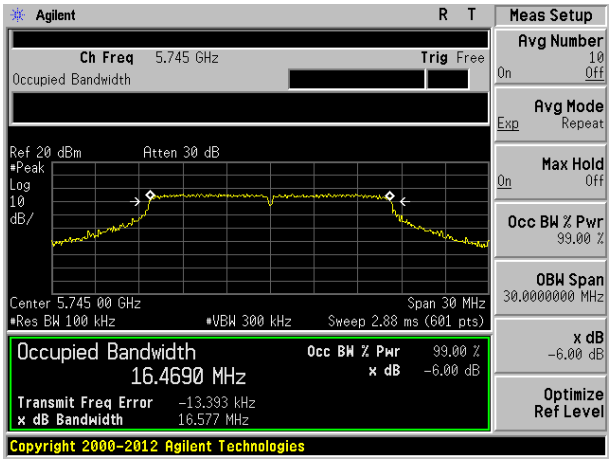
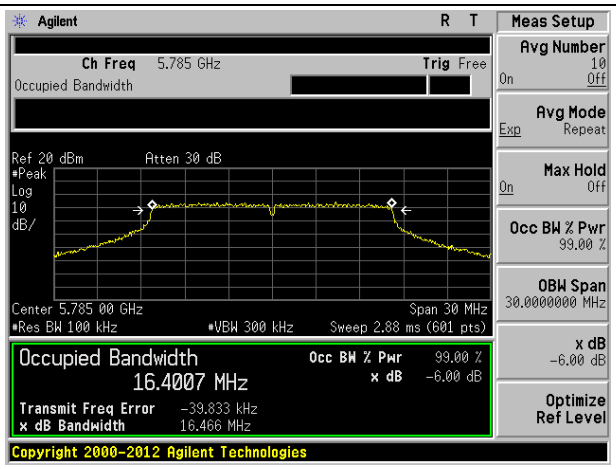
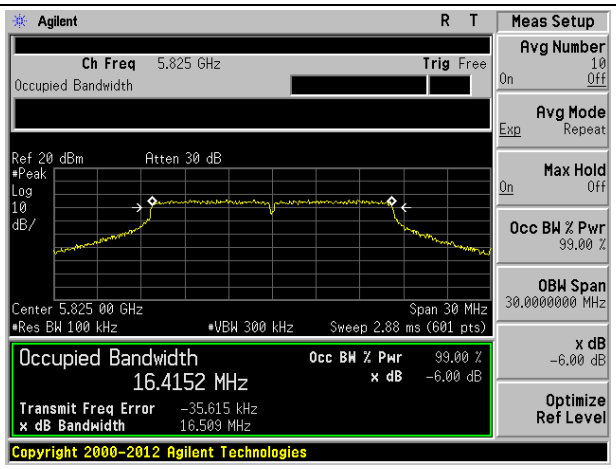
Test Requirement:	FCC Part15 E Section 15.407(e)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

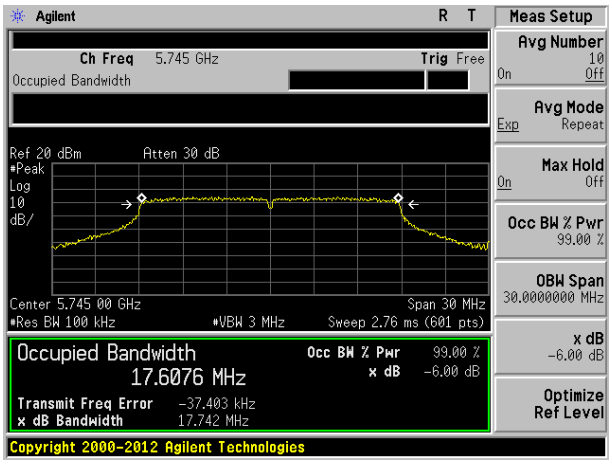
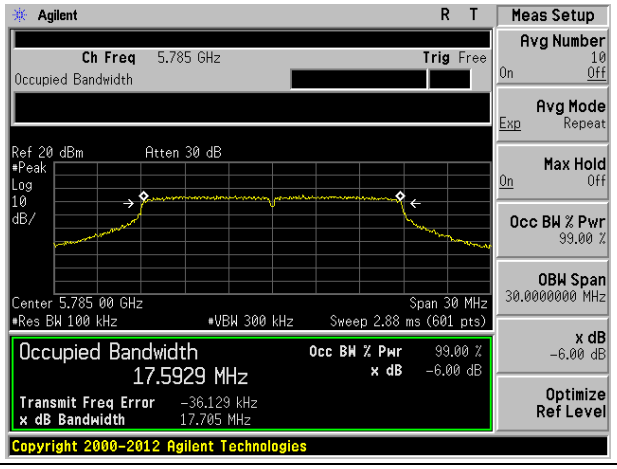
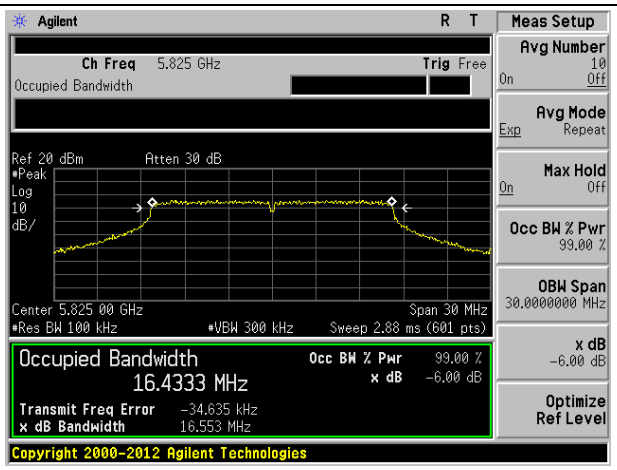
Measurement Data

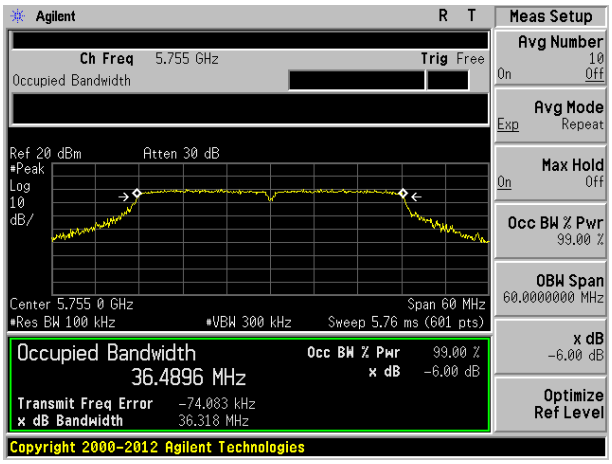
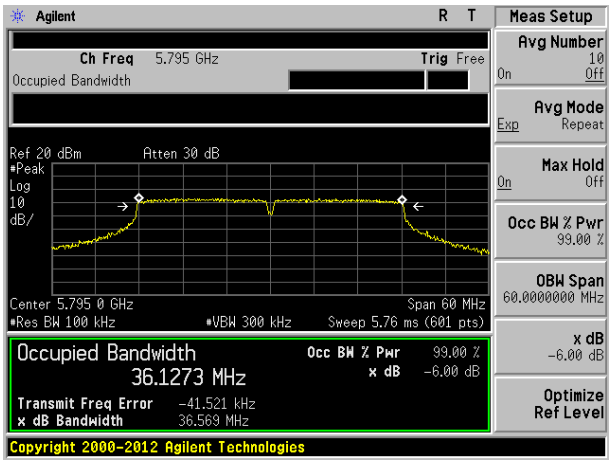
Test CH	Channel Bandwidth (MHz)			Limit (KHz)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	16.577	17.742	36.318	>500	Pass
Middle	16.466	17.705	---		
Highest	16.509	16.533	36.589		

Remark: “---“is not applicable

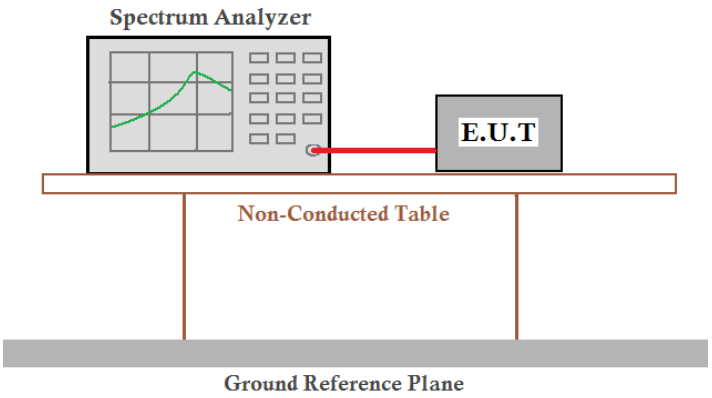
Test plot as follows:

802.11a

Lowest channel

Middle channel

Highest channel

802.11n(HT20)

Lowest channel

Middle channel

Highest channel

802.11n(HT40)

Lowest channel

Highest channel

7.5 Power Spectral Density

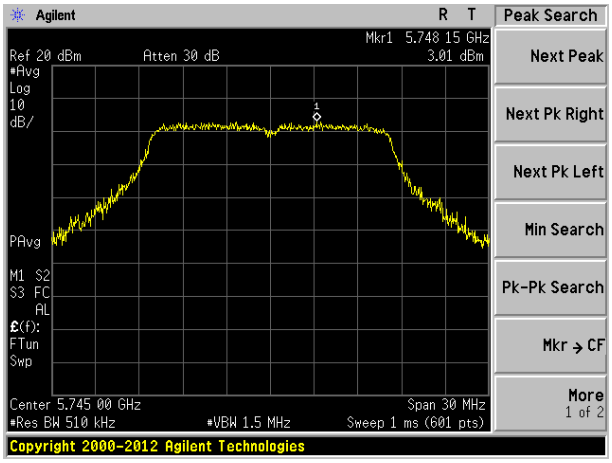
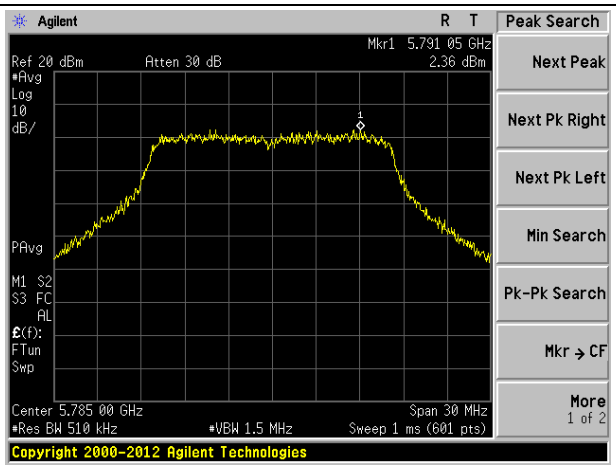
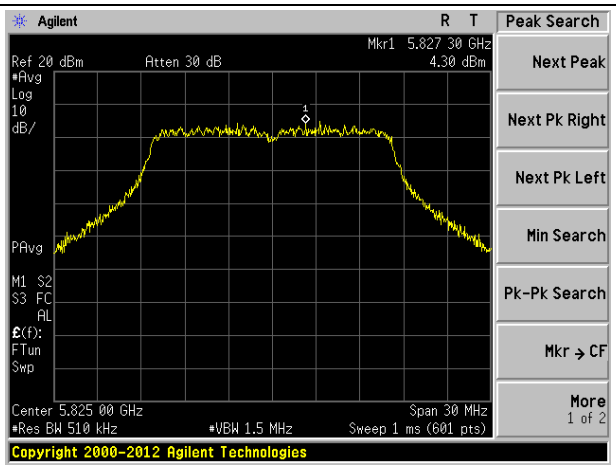
Test Requirement:	FCC Part15 E Section 15.407(a)(3)
Test Method:	ANSI C63.10:2013 and KDB 789033 D02 General U-NII Test Procedures New Rules v02r01
Limit:	30dBm/500kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

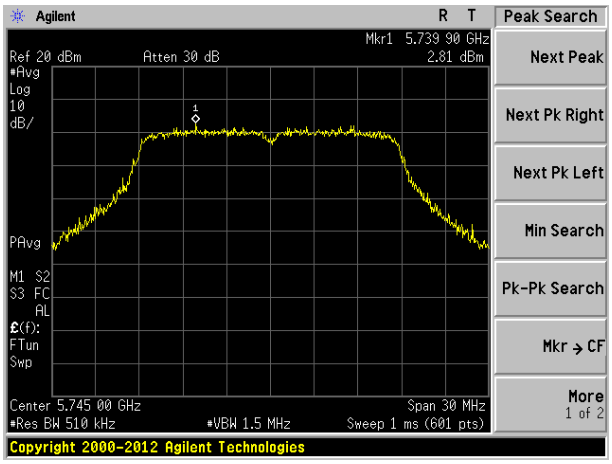
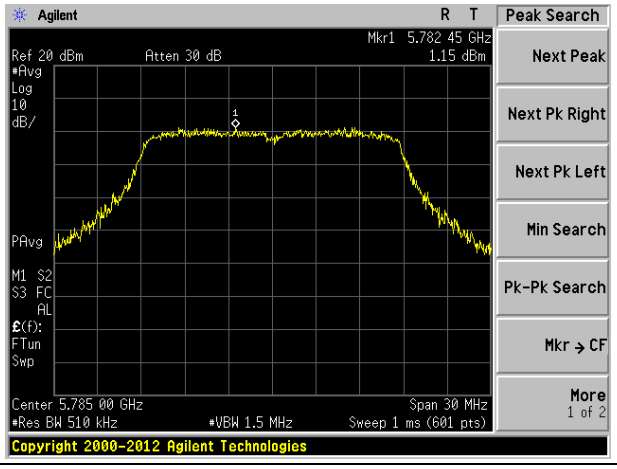
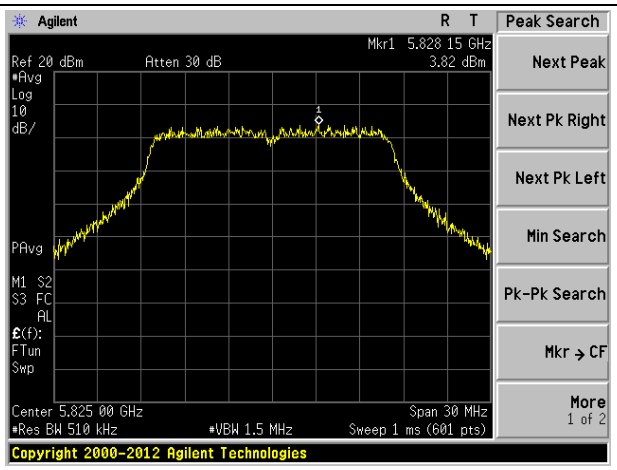
Measurement Data

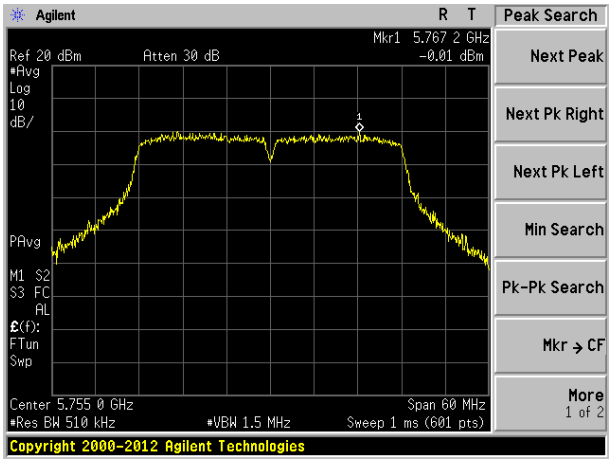
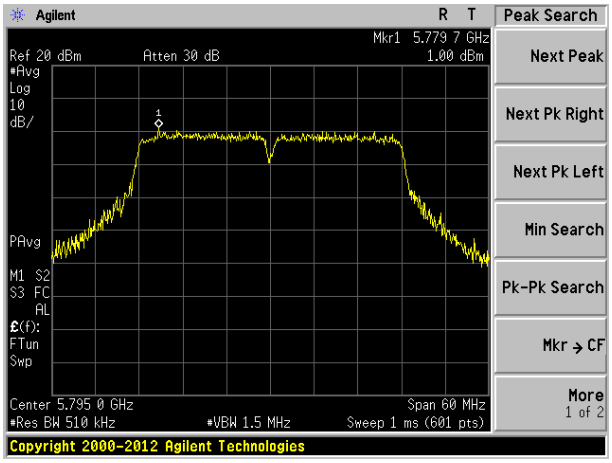
Test CH	Power Spectral Density (dBm/500kHz)			Limit (dBm/500kHz)	Result
	802.11a	802.11n(HT20)	802.11n(HT40)		
Lowest	3.01	2.81	-0.01	30.00	Pass
Middle	2.36	1.15	---		
Highest	4.30	3.82	1.00		

Remark: “---“is not applicable

Test plot as follows:

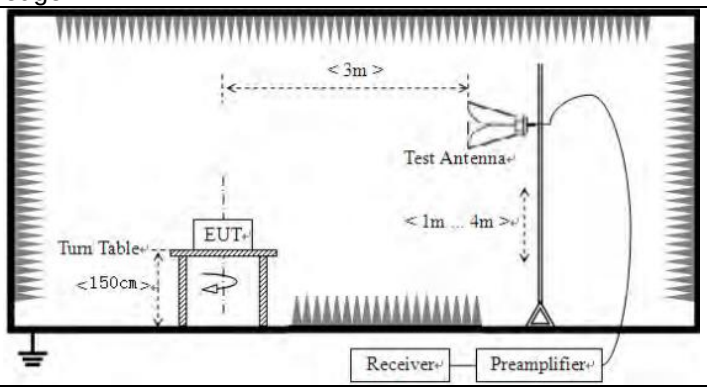
802.11a

Lowest channel

Middle channel

Highest channel

802.11n(HT20)

Lowest channel

Middle channel

Highest channel

802.11n(HT40)

Lowest channel

Highest channel

7.6 Band edge

7.6.1 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209 and 15.205</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz, only worse case is reported</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>RMS</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 1.5 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, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning.</td></tr>
</table>

	And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Instruments:	Refer to section 6.0 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 D02v02r01 section G) 1) d),for measurements above 1000 MHz @3m distance, the limit of field strength is computed as follows:*

   E[dBuV/m] = EIRP[dBm] + 95.2;

   E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

   E[dBuV/m] = 10 + 95.2 = 105.2dBuV/m.

   E[dBuV/m] = 15.6 + 95.2 = 110.8dBuV/m.

   E[dBuV/m] = 27 + 95.2 = 122.2dBuV/m

Measurement data:

IEEE 802.11a								
Peak value:								
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
5650.00	28.09	32.36	9.72	23.83	46.34	68.20	-21.86	Horizontal
5700.00	29.72	32.50	9.79	23.84	48.17	105.20	-57.03	Horizontal
5720.00	29.48	32.53	9.81	23.85	47.97	110.80	-62.83	Horizontal
5725.00	29.21	32.53	9.83	23.86	47.71	122.20	-74.49	Horizontal
5850.00	28.72	32.70	9.99	23.87	47.54	122.20	-74.66	Horizontal
5855.00	29.27	32.72	9.99	23.88	48.10	110.80	-62.70	Horizontal
5875.00	31.75	32.74	10.04	23.89	50.64	105.20	-54.56	Horizontal
5925.00	28.01	32.80	10.11	23.90	47.02	68.20	-21.18	Horizontal
5650.00	29.50	32.36	9.72	23.83	47.75	68.20	-20.45	Vertical
5700.00	29.94	32.50	9.79	23.84	48.39	105.20	-56.81	Vertical
5720.00	33.69	32.53	9.81	23.85	52.18	110.80	-58.62	Vertical
5725.00	32.48	32.53	9.83	23.86	50.98	122.20	-71.22	Vertical
5850.00	32.43	32.70	9.99	23.87	51.25	122.20	-70.95	Vertical
5855.00	31.56	32.72	9.99	23.88	50.39	110.80	-60.41	Vertical
5875.00	31.44	32.74	10.04	23.89	50.33	105.20	-54.87	Vertical
5925.00	28.48	32.80	10.11	23.90	47.49	68.20	-20.71	Vertical

IEEE 802.11n (HT20)								
Peak value:								
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
5650.00	29.16	32.36	9.72	23.83	47.41	68.20	-20.79	Horizontal
5700.00	28.86	32.50	9.79	23.84	47.31	105.20	-57.89	Horizontal
5720.00	30.37	32.53	9.81	23.85	48.86	110.80	-61.94	Horizontal
5725.00	31.56	32.53	9.83	23.86	50.06	122.20	-72.14	Horizontal
5850.00	31.14	32.70	9.99	23.87	49.96	122.20	-72.24	Horizontal
5855.00	29.83	32.72	9.99	23.88	48.66	110.80	-62.14	Horizontal
5875.00	32.03	32.74	10.04	23.89	50.92	105.20	-54.28	Horizontal
5925.00	30.50	32.80	10.11	23.90	49.51	68.20	-18.69	Horizontal
5650.00	28.95	32.36	9.72	23.83	47.20	68.20	-21.00	Vertical
5700.00	33.58	32.50	9.79	23.84	52.03	105.20	-53.17	Vertical
5720.00	28.83	32.53	9.81	23.85	47.32	110.80	-63.48	Vertical
5725.00	28.72	32.53	9.83	23.86	47.22	122.20	-74.98	Vertical
5850.00	32.39	32.70	9.99	23.87	51.21	122.20	-70.99	Vertical
5855.00	30.87	32.72	9.99	23.88	49.70	110.80	-61.10	Vertical
5875.00	32.97	32.74	10.04	23.89	51.86	105.20	-53.34	Vertical
5925.00	29.40	32.80	10.11	23.90	48.41	68.20	-19.79	Vertical

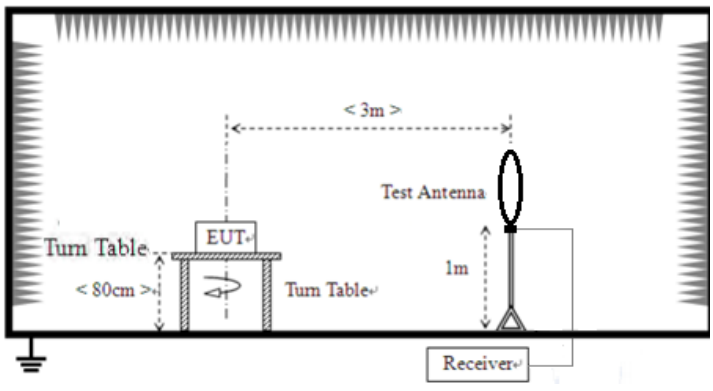
IEEE 802.11n (HT40)								
Peak value:								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5650.00	30.77	32.36	9.72	23.83	49.02	68.20	-19.18	Horizontal
5700.00	28.24	32.50	9.79	23.84	46.69	105.20	-58.51	Horizontal
5720.00	31.41	32.53	9.81	23.85	49.90	110.80	-60.90	Horizontal
5725.00	32.42	32.53	9.83	23.86	50.92	122.20	-71.28	Horizontal
5850.00	32.45	32.70	9.99	23.87	51.27	122.20	-70.93	Horizontal
5855.00	33.19	32.72	9.99	23.88	52.02	110.80	-58.78	Horizontal
5875.00	31.55	32.74	10.04	23.89	50.44	105.20	-54.76	Horizontal
5925.00	32.38	32.80	10.11	23.90	51.39	68.20	-16.81	Horizontal
5650.00	28.70	32.36	9.72	23.83	46.95	68.20	-21.25	Vertical
5700.00	31.82	32.50	9.79	23.84	50.27	105.20	-54.93	Vertical
5720.00	30.91	32.53	9.81	23.85	49.40	110.80	-61.40	Vertical
5725.00	29.26	32.53	9.83	23.86	47.76	122.20	-74.44	Vertical
5850.00	30.24	32.70	9.99	23.87	49.06	122.20	-73.14	Vertical
5855.00	27.98	32.72	9.99	23.88	46.81	110.80	-63.99	Vertical
5875.00	28.54	32.74	10.04	23.89	47.43	105.20	-57.77	Vertical
5925.00	29.12	32.80	10.11	23.90	48.13	68.20	-20.07	Vertical

Remark:

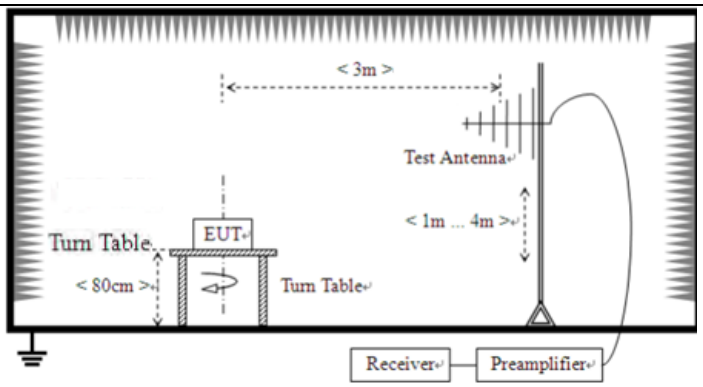
1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

7.7 Spurious Emission

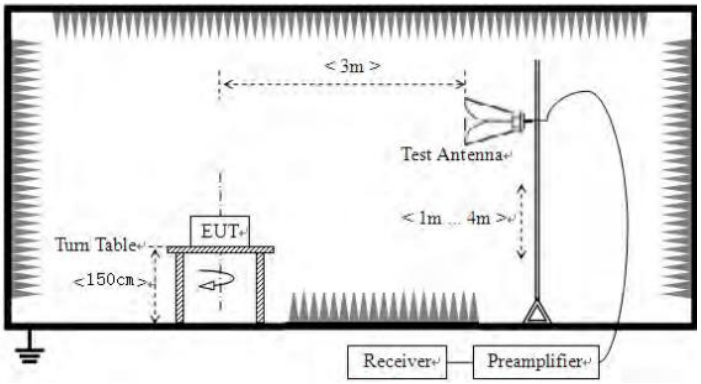
7.7.1 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209, Part 15E Section 15.407(b)(4)</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</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>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>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 (uV/m)</th><th>Value</th><th>Measurement Distance</th></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>QP</td><td>30m</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>QP</td><td rowspan="4">3m</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>QP</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>QP</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>QP</td></tr>
</table>
<table>
<tr><th>Frequency</th><th>Limit (dBm/MHz)</th><th>Remark</th></tr>
<tr><td>Above 1GHz</td><td>-27.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions from 9kHz to 30MHz
 

For radiated emissions from 30MHz to1GHz</td></tr>
</table>



For radiated emissions above 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 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, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning.

	And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. *Only the worst case Main Antenna test data.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

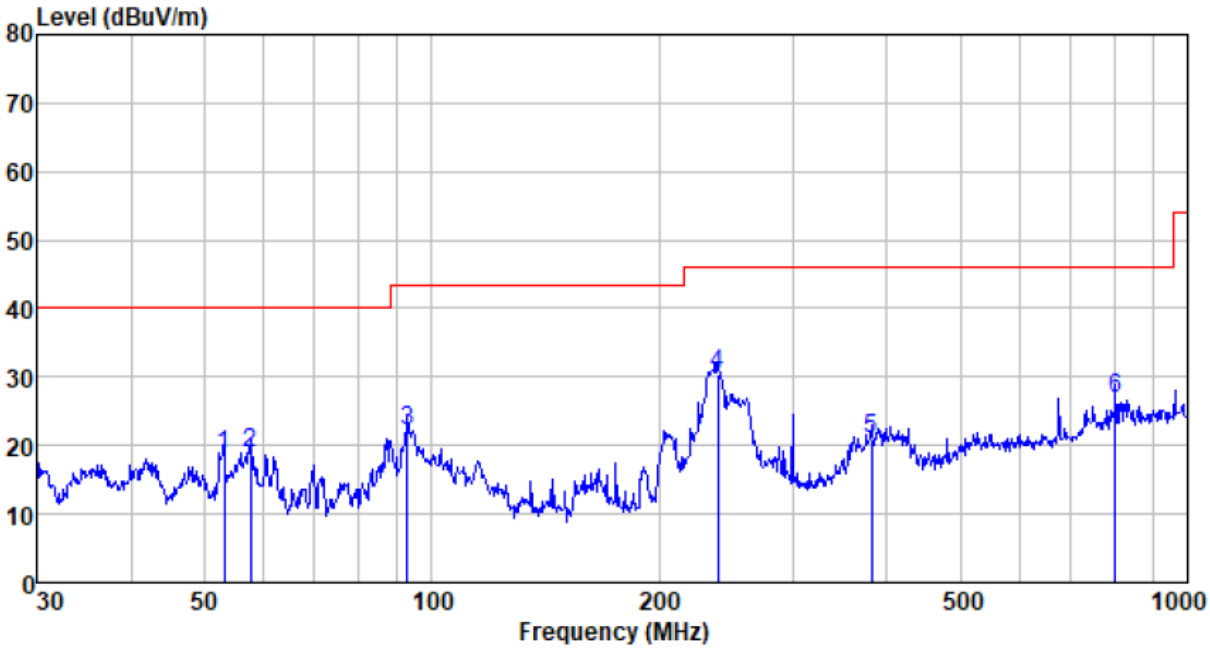
Measurement Data:

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.

Below 1GHz

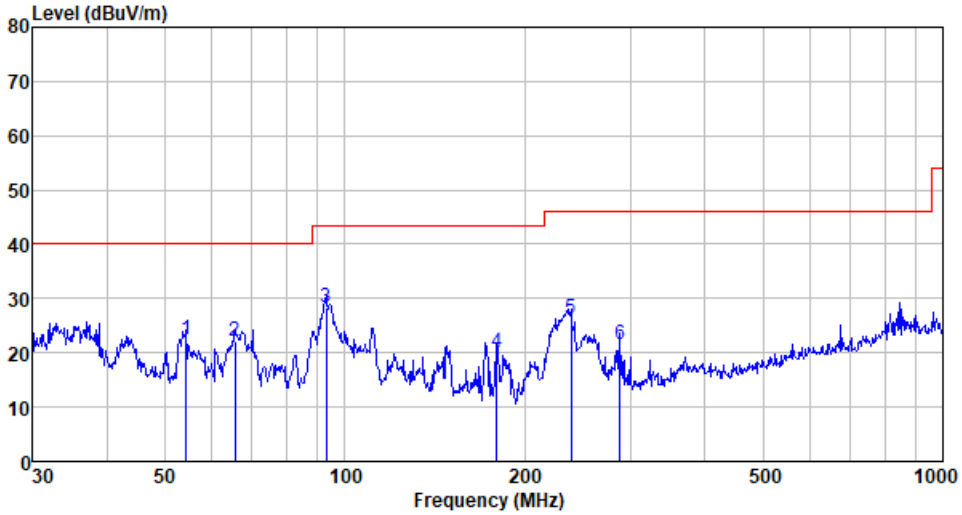
Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
53.131	42.05	11.98	0.80	36.23	18.60	40.00	-21.40	QP
57.594	42.81	11.53	0.84	36.29	18.89	40.00	-21.11	QP
92.787	46.69	11.11	1.13	36.66	22.27	43.50	-21.23	QP
239.147	53.79	11.82	2.06	37.37	30.30	46.00	-15.70	QP
381.249	40.59	15.03	2.77	37.50	20.89	46.00	-25.11	QP
801.786	38.70	21.40	4.46	37.62	26.94	46.00	-19.06	QP

Remarks: level = Reading level + Antenna factor + Cable loss - Preamp Factor

Vertical:



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
54.261	45.87	11.85	0.81	36.24	22.29	40.00	-17.71	QP
65.573	48.46	9.11	0.90	36.39	22.08	40.00	-17.92	QP
93.113	52.65	11.18	1.14	36.66	28.31	43.50	-15.19	QP
179.386	46.61	8.87	1.74	37.23	19.99	43.50	-23.51	QP
239.147	49.66	11.82	2.06	37.37	26.17	46.00	-19.83	QP
287.990	43.42	13.27	2.31	37.41	21.59	46.00	-24.41	QP

Remarks: level = Reading level + Antenna factor + Cable loss - Preamp Factor

Above 1GHz:

802.11a,11n(HT20), 11n(HT40) all have been tested,

Only the data of worst case at each channel plan reported.

Test mode:		802.11a		Test channel:		lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11490.00	21.11	21.64	42.75	54(Note3)	-11.25	PK
V	17235.00	20.63	21.80	42.43	54(Note3)	-11.57	PK
H	11490.00	21.85	21.83	43.68	54(Note3)	-10.32	PK
H	17235.00	19.66	21.67	41.33	54(Note3)	-12.67	PK

Test mode:		802.11a		Test channel:		Middle	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11570.00	22.17	21.64	43.81	54(Note3)	-10.19	PK
V	17355.00	23.06	21.80	44.86	54(Note3)	-9.14	PK
H	11570.00	24.19	21.83	46.02	54(Note3)	-7.98	PK
H	17355.00	25.06	21.67	46.73	54(Note3)	-7.27	PK

Test mode:		802.11a		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11650.00	21.24	21.64	42.88	54(Note3)	-11.12	PK
V	17475.00	21.55	21.80	43.35	54(Note3)	-10.65	PK
H	11650.00	20.33	21.83	42.16	54(Note3)	-11.84	PK
H	17475.00	19.21	21.67	40.88	54(Note3)	-13.12	PK

Test mode:		802.11n(HT40)		Test channel:		Lowest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11510.00	21.85	21.67	43.52	54(Note3)	-10.48	PK
V	17265.00	22.34	21.83	44.17	54(Note3)	-9.83	PK
H	11510.00	20.33	21.67	42.00	54(Note3)	-12.00	PK
H	17265.00	22.31	21.83	44.14	54(Note3)	-9.86	PK

Test mode:		802.11n(HT40)		Test channel:		Highest	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dBuV/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
V	11590.00	21.62	21.67	43.29	54(Note3)	-10.71	PK
V	17385.00	25.01	21.83	46.84	54(Note3)	-7.16	PK
H	11590.00	24.04	21.67	45.71	54(Note3)	-8.29	PK
H	17385.00	23.17	21.83	45.00	54(Note3)	-9.00	PK

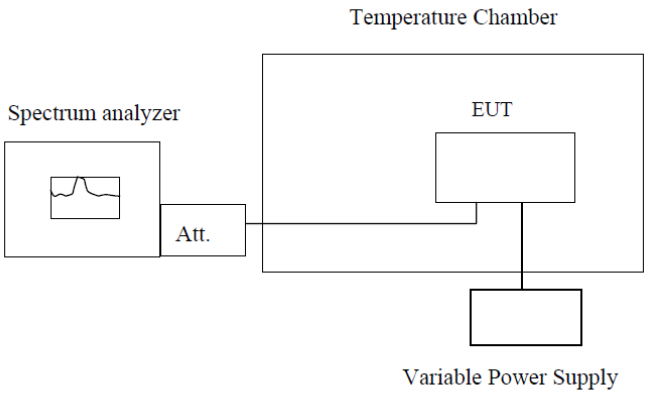
Notes:

1. Measure Level = Reading Level + 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. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

7.8 Frequency stability

Test Requirement:	FCC Part15 C Section 15.407(g)
Test Method:	ANSI C63.10:2013, FCC Part 2.1055
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

Measurement data:

HT 20MHz					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5745	5746.9319	5744.8934	5744.6503	5746.8115
	5785	5785.3831	5784.5004	5784.1803	5786.8424
	5825	5825.1771	5824.7746	5824.5918	5826.9234
-20	5745	5745.6563	5744.3588	5744.4397	5745.7875
	5785	5785.6090	5784.3621	5784.7093	5785.2091
	5825	5825.5410	5824.8058	5824.7962	5825.1985
-10	5745	5745.6129	5744.5748	5744.2228	5745.4888
	5785	5785.1283	5784.6193	5784.9766	5785.6372
	5825	5825.2857	5824.6162	5824.4332	5825.8240
0	5745	5745.9166	5744.8298	5744.7874	5745.0223
	5785	5785.7273	5784.9513	5784.2275	5785.0079
	5825	5825.0437	5824.8189	5824.1647	5825.7458
10	5745	5745.0273	5744.8679	5744.1147	5745.6204
	5785	5785.7951	5784.3398	5784.5143	5785.6476
	5825	5825.8137	5824.5365	5824.8824	5825.5588
20	5745	5745.8477	5744.8091	5744.1546	5745.0542
	5785	5785.3207	5784.1192	5784.7672	5785.1018
	5825	5825.3991	5824.6867	5824.9309	5825.0201
30	5745	5745.9702	5744.2335	5744.2019	5745.3570
	5785	5785.6030	5784.6476	5784.2440	5785.2718
	5825	5825.2190	5824.0476	5824.9864	5825.3656
40	5745	5745.7743	5744.5149	5744.5111	5745.6370
	5785	5785.3316	5784.0933	5784.4767	5785.7876
	5825	5825.5927	5824.9503	5824.6626	5825.9487
50	5745	5745.6293	5744.0928	5744.2091	5745.0877
	5785	5785.3281	5784.9310	5784.1658	5785.0058
	5825	5825.0701	5824.2270	5824.1031	5825.9409

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5745	5746.9872	5745.0349	5743.0931	5743.5385
	5785	5786.6790	5785.5262	5784.6866	5784.0652
	5825	5825.3926	5825.6273	5824.8763	5824.5732
120	5745	5745.7678	5745.4639	5744.8492	5744.8118
	5785	5785.5718	5785.3340	5784.2326	5784.1250
	5825	5825.0409	5825.1341	5824.3805	5824.4735
132	5745	5745.7542	5745.8072	5744.0854	5744.2516
	5785	5785.4456	5785.0530	5784.5545	5784.8062
	5825	5825.3251	5825.4432	5824.1713	5824.5434

HT40 MHz					
Frequency stability versus Temp.					
Power Supply: AC 120V					
Temp. (°C)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
-30	5755	5756.0336	5754.6886	5754.7416	5756.2799
	5795	5795.5428	5794.7813	5794.0287	5795.7464
-20	5755	5755.8430	5754.8399	5754.7434	5755.1815
	5795	5795.9508	5794.4914	5794.0514	5795.4954
-10	5755	5755.0831	5754.4051	5754.1467	5755.8222
	5795	5795.1463	5794.7167	5794.6020	5795.5371
0	5755	5755.6064	5754.3346	5754.9433	5755.9238
	5795	5795.4250	5794.4474	5794.2509	5795.0630
10	5755	5755.0786	5754.9237	5754.5700	5755.7940
	5795	5795.6488	5794.6501	5794.5698	5795.1121
20	5755	5755.3521	5754.2525	5754.2937	5755.9177
	5795	5795.2632	5794.7502	5794.6526	5795.9472
30	5755	5755.0159	5754.7830	5754.6773	5755.7752
	5795	5795.5753	5794.3872	5794.4968	5795.2043
40	5755	5755.9407	5754.2952	5754.2879	5755.3234
	5795	5795.1428	5794.9877	5794.6593	5795.9075
50	5755	5755.3021	5754.1434	5754.6656	5755.0938
	5795	5795.3191	5794.2476	5794.8107	5795.5491

Frequency stability versus Voltage					
Temperature: 25°C					
Power Supply (VAC)	Operating Frequency (MHz)	0 minute	2 minute	5 minute	10 minute
		Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)	Measured Frequency (MHz)
108	5755	5755.8092	5754.3481	5755.2072	5753.7035
	5795	5795.8912	5794.0288	5795.1167	5794.3629
120	5755	5755.3191	5754.5411	5755.2434	5754.4136
	5795	5795.7043	5794.6251	5795.3945	5794.0793
132	5755	5755.4915	5754.5640	5755.8807	5754.0135
	5795	5795.7260	5794.8866	5795.1189	5794.6333

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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