FCC REPORT (Bluetooth 4.0)

Applicant:	Walnut Technology (Dongguan) Limited
Address of Applicant:	B502, 17A, ZongBuYiHao, XinZhu Road, Songshan Lake, Dongguan, Guangdong, P. R. China

Equipment Under Test (EUT)

Product Name:	SPECTRA
Model No.:	1.0
Trade Mark :	WALNUTT; SPECTRA
FCC ID:	2AJJR10
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249:2015
Date of sample receipt:	August 25, 2016
Date of Test:	August 25-31, 2016
Date of report issued:	August 31, 2016
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, 2016*	*Original*

Prepared By: *Yang Liu* ***Date:*** *August 31, 2016*

Project Engineer

Check By: *Andy Wu* ***Date:*** *August 31, 2016*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

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

Remark: Test according to ANSI C63.10 2013 and ANSI C63.4: 2014.

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 ~ 26.5GHz	± 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%.			

5 General Information

5.1 Client Information

Applicant:	Walnut Technology (Dongguan) Limited
Address of Applicant:	B502, 17A, ZongBuYiHao, XinZhu Road, Songshan Lake, Dongguan, Guangdong, P. R. China

5.2 General Description of EUT

Product Name:	SPECTRA
Model No.:	1.0
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	40
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	PCB antenna
Antenna gain:	4.70dBi (declare by Applicant)
Power supply:	SWITCHING POWER SUPPLY Model: FY2522000 Input: AC 100-240V, 50/60Hz Output: DC 25.2V, 2A or DC 22.2V, 4200mAh, 93.24Wh Lithium Battery

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

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:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2440MHz
The Highest channel	2480MHz

5.3 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.	

Pre-test mode

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	88.12	89.10	87.19

5.4 Description of Support Units

None.

5.5 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly describe in a report file with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

● **Industry Canada (IC) —Registration No.: 9079A-2**

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-2, August 15, 2016.

5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone,

Xixiang Road, Baoan District, Shenzhen, Guangdong, China

Tel: 0755-27798480

Fax: 0755-27798960

5.7 Description of Support Units

None.

5.8 Other Information Requested by the Customer

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. 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	Spectrum Analyzer	Agilent	E4440A	GTS533	June 29 2016	June 28 2017
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 29 2016	June 28 2017
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 29 2016	June 28 2017
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2016	June 28 2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 29 2016	June 28 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 29 2016	June 28 2017
10	Coaxial Cable	GTS	N/A	GTS211	June 29 2016	June 28 2017
11	Coaxial cable	GTS	N/A	GTS210	June 29 2016	June 28 2017
12	Coaxial Cable	GTS	N/A	GTS212	June 29 2016	June 28 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 29 2016	June 28 2017
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 29 2016	June 28 2017
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 29 2016	June 28 2017
16	Band filter	Amindeon	82346	GTS219	June 29 2016	June 28 2017

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 16 2014	May 15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 29 2016	June 28 2017
3	Pulse Limiter	R&S	ESH3-Z2	GTS224	June 29 2016	June 28 2017
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 29 2016	June 28 2017
5	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 29 2016	June 28 2017
6	Coaxial Cable	GTS	N/A	GTS227	June 29 2016	June 28 2017
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Thermo meter	KTJ	TA328	GTS233	June 29 2016	June 28 2017

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 29 2016	June 28 2017

7 Test results and Measurement Data

7.1 Antenna requirement

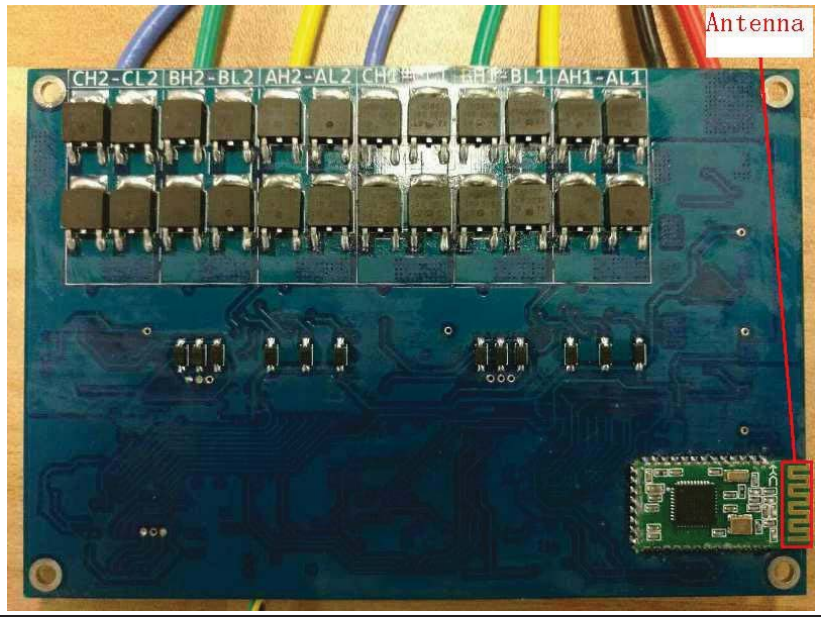
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

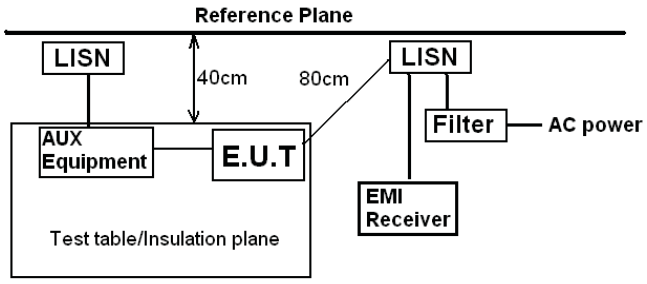
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is PCB antenna, the best case gain of the antenna is 4.70dBi

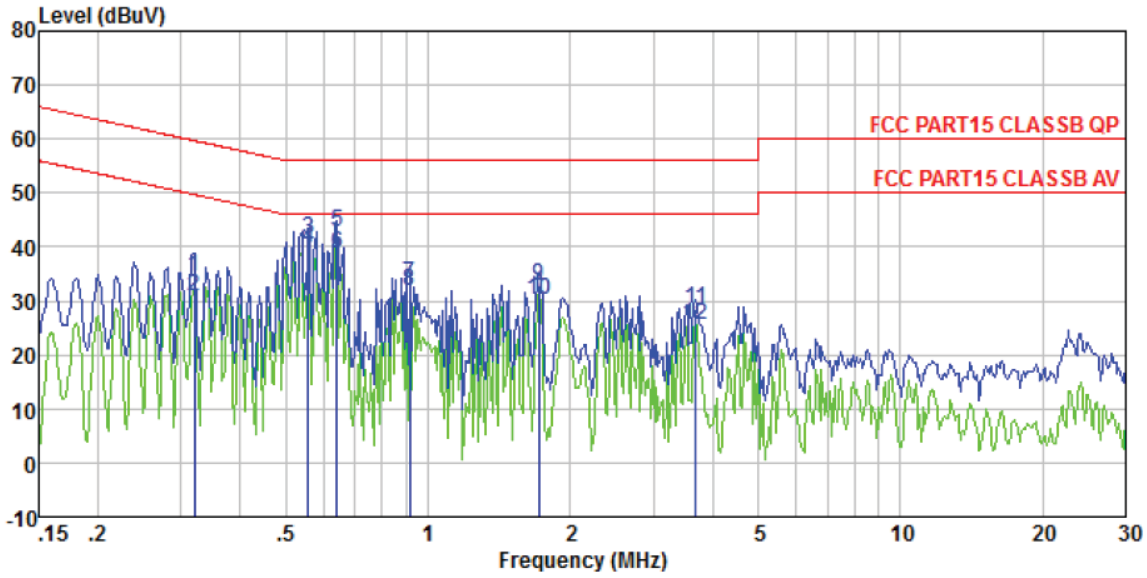


7.2 Conducted Emissions

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 5.3 for details
Test results:	Pass

Measurement data:

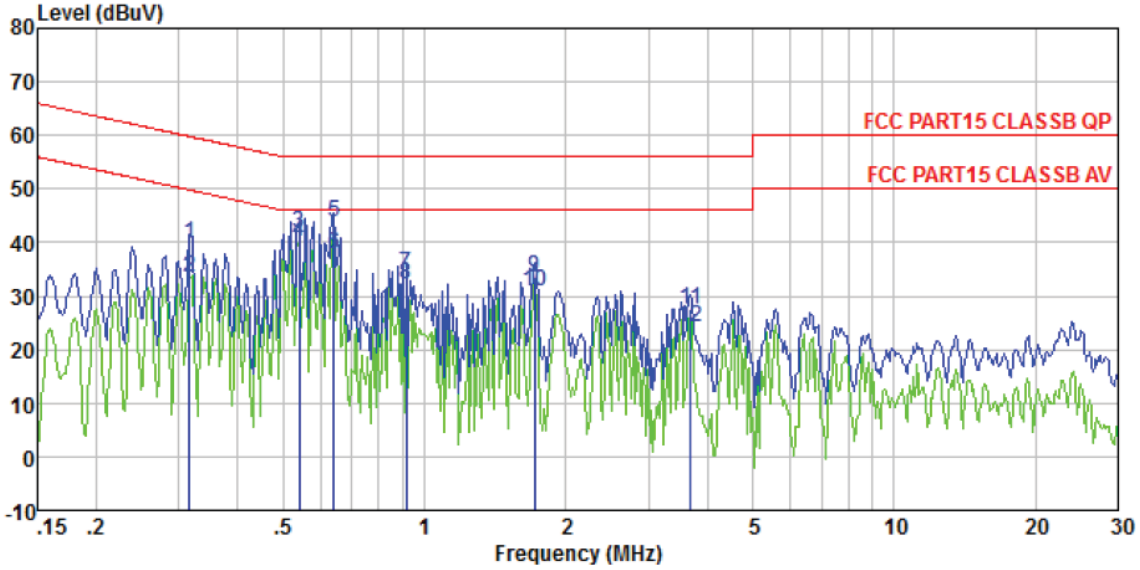
Line:



Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 0240
Test Mode : Bluetooth mode
Test Engineer: Boy

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.320	34.38	0.11	0.10	34.59	59.71	-25.12	QP
2	0.320	30.54	0.11	0.10	30.75	49.71	-18.96	Average
3	0.558	41.34	0.13	0.12	41.59	56.00	-14.41	QP
4	0.558	39.70	0.13	0.12	39.95	46.00	-6.05	Average
5	0.641	42.62	0.13	0.13	42.88	56.00	-13.12	QP
6	0.641	38.68	0.13	0.13	38.94	46.00	-7.06	Average
7	0.914	33.02	0.14	0.13	33.29	56.00	-22.71	QP
8	0.914	31.55	0.14	0.13	31.82	46.00	-14.18	Average
9	1.716	32.69	0.12	0.14	32.95	56.00	-23.05	QP
10	1.716	29.78	0.12	0.14	30.04	46.00	-15.96	Average
11	3.681	28.28	0.19	0.15	28.62	56.00	-27.38	QP
12	3.681	25.08	0.19	0.15	25.42	46.00	-20.58	Average

Neutral:



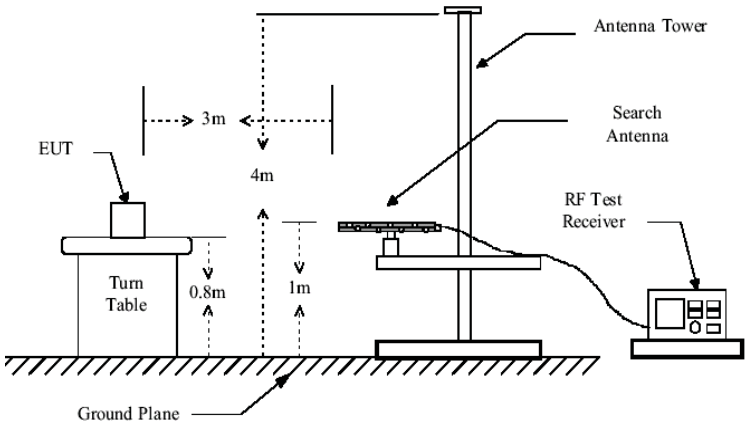
Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
Job No. : 0240
Test Mode : Bluetooth mode
Test Engineer: Boy

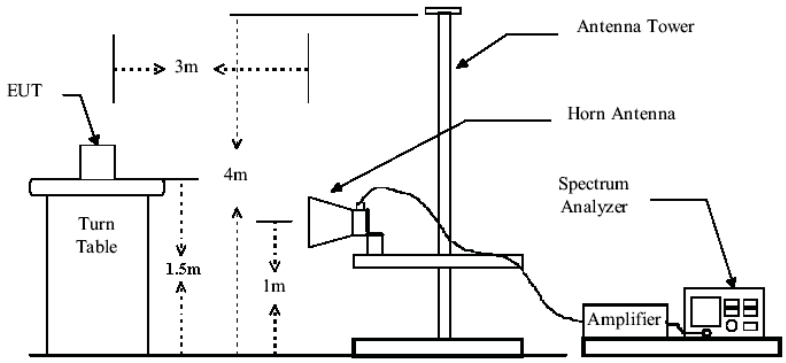
	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.317	39.60	0.06	0.10	39.76	59.80	-20.04	QP
2	0.317	33.49	0.06	0.10	33.65	49.80	-16.15	Average
3	0.541	41.66	0.07	0.11	41.84	56.00	-14.16	QP
4	0.541	39.81	0.07	0.11	39.99	46.00	-6.01	Average
5	0.641	43.53	0.07	0.13	43.73	56.00	-12.27	QP
6	0.641	37.52	0.07	0.13	37.72	46.00	-8.28	Average
7	0.914	33.85	0.07	0.13	34.05	56.00	-21.95	QP
8	0.914	32.02	0.07	0.13	32.22	46.00	-13.78	Average
9	1.716	33.20	0.09	0.14	33.43	56.00	-22.57	QP
10	1.716	30.45	0.09	0.14	30.68	46.00	-15.32	Average
11	3.681	27.35	0.14	0.15	27.64	56.00	-28.36	QP
12	3.681	23.79	0.14	0.15	24.08	46.00	-21.92	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 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25GHz</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>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>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Field strength of the fundamental signal)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>2400MHz-2483.5MHz</td><td>94.00</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(band edge)</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz
 
</td></tr>
</table>

	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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

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
2402.00	89.83	27.58	5.39	34.01	88.79	114.00	-25.21	Vertical
2402.00	84.91	27.58	5.39	34.01	83.87	114.00	-30.13	Horizontal
2440.00	90.15	27.48	5.43	33.96	89.10	114.00	-24.90	Vertical
2440.00	84.27	27.48	5.43	33.96	83.22	114.00	-30.78	Horizontal
2480.00	89.32	27.52	5.47	33.92	88.39	114.00	-25.61	Vertical
2480.00	83.58	27.52	5.47	33.92	82.65	114.00	-31.35	Horizontal

Average 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
2402.00	80.21	27.58	5.39	34.01	79.17	94.00	-14.83	Vertical
2402.00	75.22	27.58	5.39	34.01	74.18	94.00	-19.82	Horizontal
2440.00	80.16	27.48	5.43	33.96	79.11	94.00	-14.89	Vertical
2440.00	73.66	27.48	5.43	33.96	72.61	94.00	-21.39	Horizontal
2480.00	79.16	27.52	5.47	33.92	78.23	94.00	-15.77	Vertical
2480.00	73.82	27.52	5.47	33.92	72.89	94.00	-21.11	Horizontal

Remark: RBW 3MHz VBW 3MHz peak detector is for PK value， RMS detector is for AV value

7.3.2 Spurious emissions

■ Below 1GHz

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
35.01	35.33	14.30	0.61	30.07	20.17	40.00	-19.83	Vertical
48.67	35.26	15.34	0.76	30.01	21.35	40.00	-18.65	Vertical
85.60	36.74	12.60	1.07	29.77	20.64	40.00	-19.36	Vertical
128.11	56.18	11.22	1.42	29.52	39.30	43.50	-4.20	Vertical
143.83	53.27	10.22	1.53	29.44	35.58	43.50	-7.92	Vertical
234.99	36.08	13.83	2.05	29.52	22.44	46.00	-23.56	Vertical
79.80	40.48	10.54	1.03	29.80	22.25	40.00	-17.75	Horizontal
83.52	39.21	11.87	1.06	29.78	22.36	40.00	-17.64	Horizontal
128.11	57.00	11.22	1.42	29.52	40.12	43.50	-3.38	Horizontal
143.83	54.20	10.22	1.53	29.44	36.51	43.50	-6.99	Horizontal
234.99	41.87	13.83	2.05	29.52	28.23	46.00	-17.77	Horizontal
287.99	39.04	14.84	2.31	29.92	26.27	46.00	-19.73	Horizontal

■ Above 1GHz

Test channel:	Lowest channel

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
4804.00	37.48	31.78	8.60	32.09	45.77	74.00	-28.23	Vertical
7206.00	31.95	36.15	11.65	32.00	47.75	74.00	-26.25	Vertical
9608.00	31.57	37.95	14.14	31.62	52.04	74.00	-21.96	Vertical
12010.00	*					74.00		Vertical
14412.00	*					74.00		Vertical
4804.00	41.80	31.78	8.60	32.09	50.09	74.00	-23.91	Horizontal
7206.00	33.72	36.15	11.65	32.00	49.52	74.00	-24.48	Horizontal
9608.00	31.01	37.95	14.14	31.62	51.48	74.00	-22.52	Horizontal
12010.00	*					74.00		Horizontal
14412.00	*					74.00		Horizontal

Average 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
4804.00	26.26	31.78	8.60	32.09	34.55	54.00	-19.45	Vertical
7206.00	20.61	36.15	11.65	32.00	36.41	54.00	-17.59	Vertical
9608.00	19.68	37.95	14.14	31.62	40.15	54.00	-13.85	Vertical
12010.00	*					54.00		Vertical
14412.00	*					54.00		Vertical
4804.00	30.51	31.78	8.60	32.09	38.80	54.00	-15.20	Horizontal
7206.00	22.80	36.15	11.65	32.00	38.60	54.00	-15.40	Horizontal
9608.00	19.42	37.95	14.14	31.62	39.89	54.00	-14.11	Horizontal
12010.00	*					54.00		Horizontal
14412.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Middle channel

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
4880.00	36.83	31.85	8.67	32.12	45.23	74.00	-28.77	Vertical
7320.00	31.51	36.37	11.72	31.89	47.71	74.00	-26.29	Vertical
9760.00	31.19	38.35	14.25	31.62	52.17	74.00	-21.83	Vertical
12200.00	*					74.00		Vertical
14640.00	*					74.00		Vertical
4880.00	41.01	31.85	8.67	32.12	49.41	74.00	-24.59	Horizontal
7320.00	33.23	36.37	11.72	31.89	49.43	74.00	-24.57	Horizontal
9760.00	30.56	38.35	14.25	31.62	51.54	74.00	-22.46	Horizontal
12200.00	*					74.00		Horizontal
14640.00	*					74.00		Horizontal

Average 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
4880.00	25.74	31.85	8.67	32.12	34.14	54.00	-19.86	Vertical
7320.00	20.26	36.37	11.72	31.89	36.46	54.00	-17.54	Vertical
9760.00	19.37	38.35	14.25	31.62	40.35	54.00	-13.65	Vertical
12200.00	*					54.00		Vertical
14640.00	*					54.00		Vertical
4880.00	29.92	31.85	8.67	32.12	38.32	54.00	-15.68	Horizontal
7320.00	22.40	36.37	11.72	31.89	38.60	54.00	-15.40	Horizontal
9760.00	19.06	38.35	14.25	31.62	40.04	54.00	-13.96	Horizontal
12200.00	*					54.00		Horizontal
14640.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*

Test channel:	Highest channel

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
4960.00	35.51	31.93	8.73	32.16	44.01	74.00	-29.99	Vertical
7440.00	30.64	36.59	11.79	31.78	47.24	74.00	-26.76	Vertical
9920.00	30.41	38.81	14.38	31.88	51.72	74.00	-22.28	Vertical
12400.00	*					74.00		Vertical
14880.00	*					74.00		Vertical
4960.00	39.43	31.93	8.73	32.16	47.93	74.00	-26.07	Horizontal
7440.00	32.24	36.59	11.79	31.78	48.84	74.00	-25.16	Horizontal
9920.00	29.66	38.81	14.38	31.88	50.97	74.00	-23.03	Horizontal
12400.00	*					74.00		Horizontal
14880.00	*					74.00		Horizontal

Average 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
4960.00	24.69	31.93	8.73	32.16	33.19	54.00	-20.81	Vertical
7440.00	19.55	36.59	11.79	31.78	36.15	54.00	-17.85	Vertical
9920.00	18.74	38.81	14.38	31.88	40.05	54.00	-13.95	Vertical
12400.00	*					54.00		Vertical
14880.00	*					54.00		Vertical
4960.00	28.73	31.93	8.73	32.16	37.23	54.00	-16.77	Horizontal
7440.00	21.61	36.59	11.79	31.78	38.21	54.00	-15.79	Horizontal
9920.00	18.32	38.81	14.38	31.88	39.63	54.00	-14.37	Horizontal
12400.00	*					54.00		Horizontal
14880.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

7.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

Test channel:	Lowest channel

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
2390.00	40.14	27.59	5.38	30.18	42.93	74.00	-31.07	Horizontal
2400.00	56.54	27.58	5.39	30.18	59.33	74.00	-14.67	Horizontal
2390.00	40.43	27.59	5.38	30.18	43.22	74.00	-30.78	Vertical
2400.00	58.28	27.58	5.39	30.18	61.07	74.00	-12.93	Vertical

Average 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
2390.00	31.31	27.59	5.38	30.18	34.10	54.00	-19.90	Horizontal
2400.00	42.39	27.58	5.39	30.18	45.18	54.00	-8.82	Horizontal
2390.00	31.06	27.59	5.38	30.18	33.85	54.00	-20.15	Vertical
2400.00	43.77	27.58	5.39	30.18	46.56	54.00	-7.44	Vertical

Test channel:	Highest channel

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
2483.50	41.92	27.53	5.47	29.93	44.99	74.00	-29.01	Horizontal
2500.00	41.61	27.55	5.49	29.93	44.72	74.00	-29.28	Horizontal
2483.50	42.31	27.53	5.47	29.93	45.38	74.00	-28.62	Vertical
2500.00	42.35	27.55	5.49	29.93	45.46	74.00	-28.54	Vertical

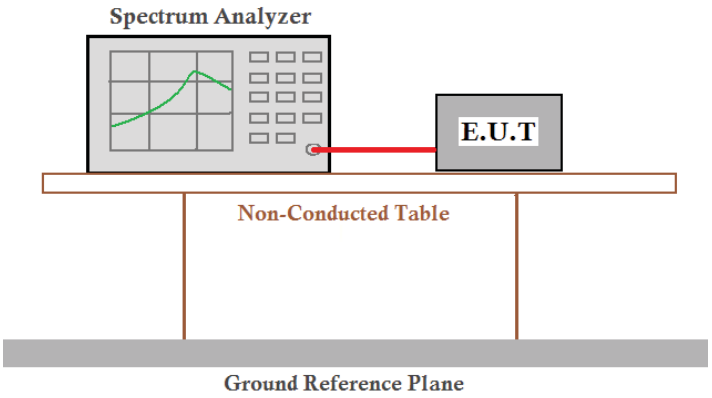
Average value:

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
2483.50	34.11	27.53	5.47	29.93	37.18	54.00	-16.82	Horizontal
2500.00	32.50	27.55	5.49	29.93	35.61	54.00	-18.39	Horizontal
2483.50	35.09	27.53	5.47	29.93	38.16	54.00	-15.84	Vertical
2500.00	32.19	27.55	5.49	29.93	35.30	54.00	-18.70	Vertical

Remark:

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

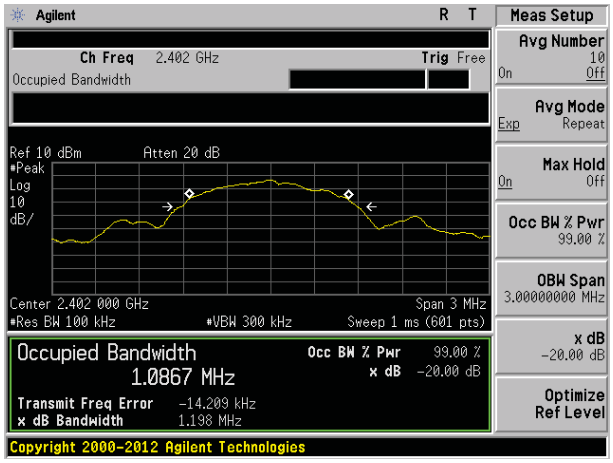
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.10:2013
Limit:	Operation Frequency range 2400MHz~2483.5MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

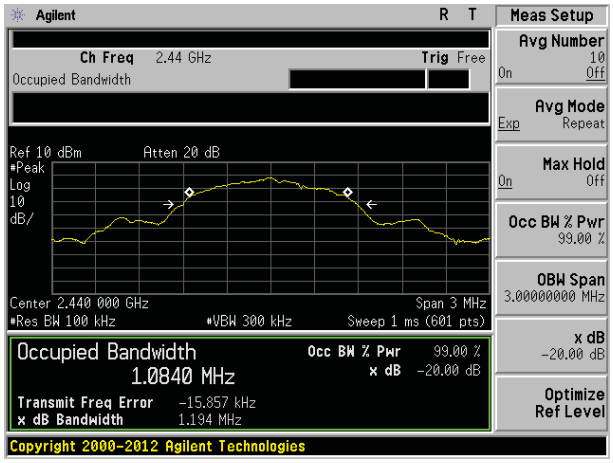
Measurement Data

Test channel	Frequency (MHz)	20dB bandwidth(MHz)	Result
Lowest	2402	1.198	Pass
Middle	2440	1.194	Pass
Highest	2480	1.201	Pass

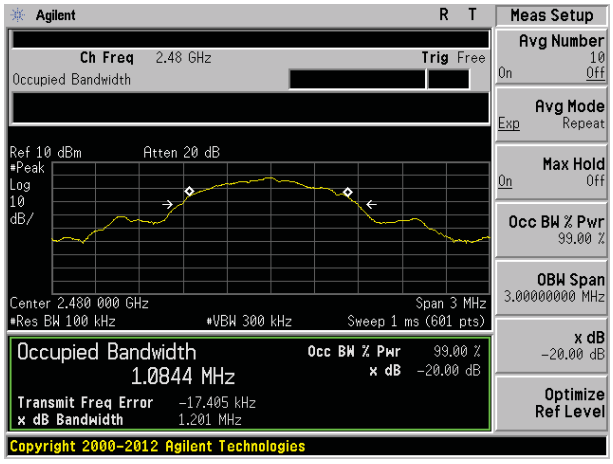
Test plot as follows:



Lowest channel



Middle channel



Highest channel