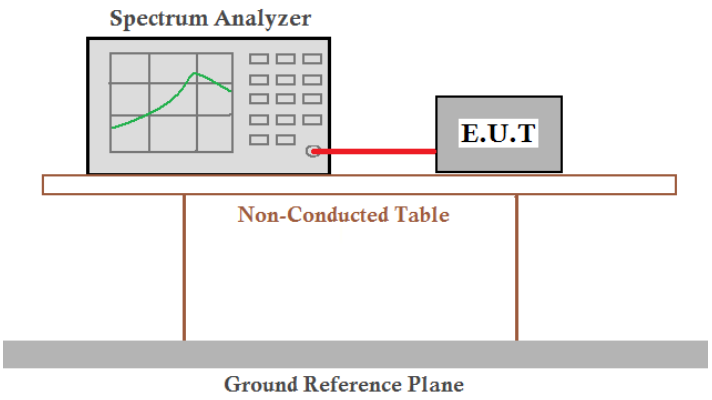
6.7 Spurious Emission

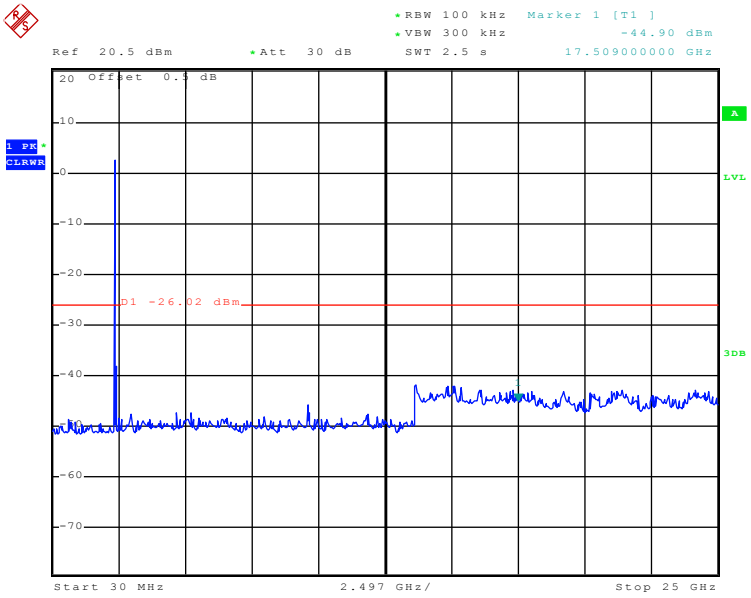
6.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 and KDB558074
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 5.6 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plot as follows:

Test mode:	802.11b

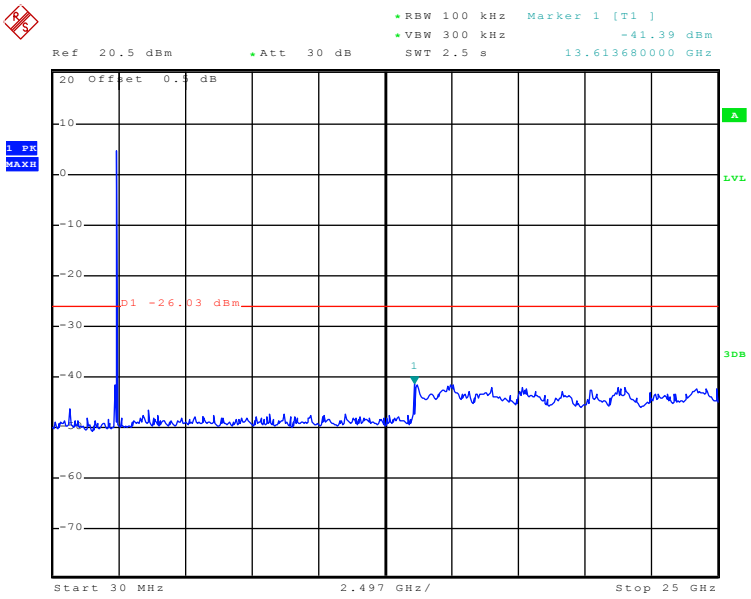
Lowest channel



Date: 2.SEP.2014 20:04:33

30MHz~25GHz

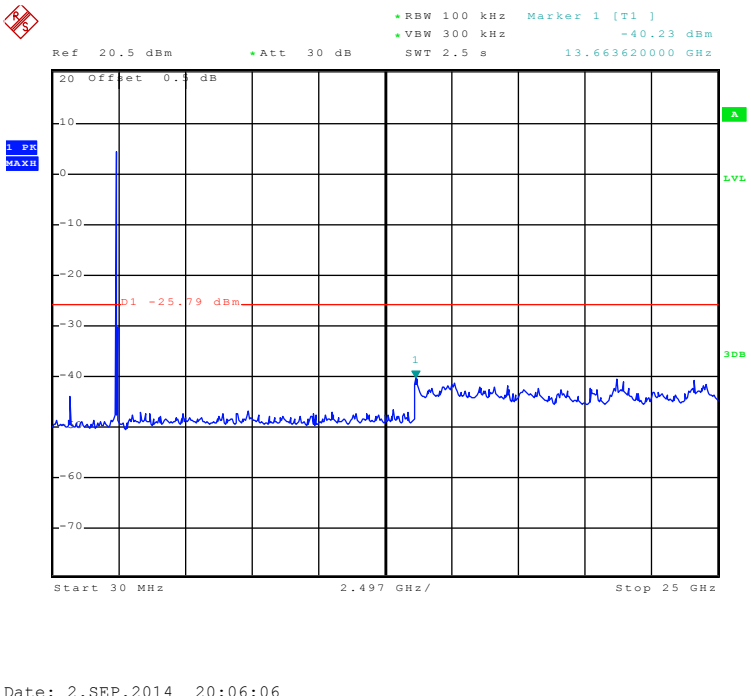
Middle channel



Date: 2.SEP.2014 20:05:16

30MHz~25GHz

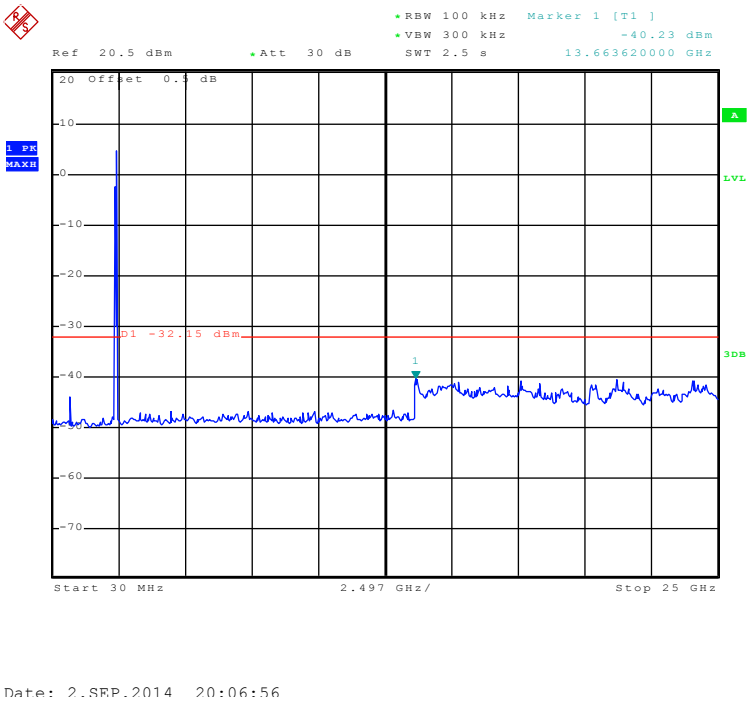
Highest channel



30MHz~25GHz

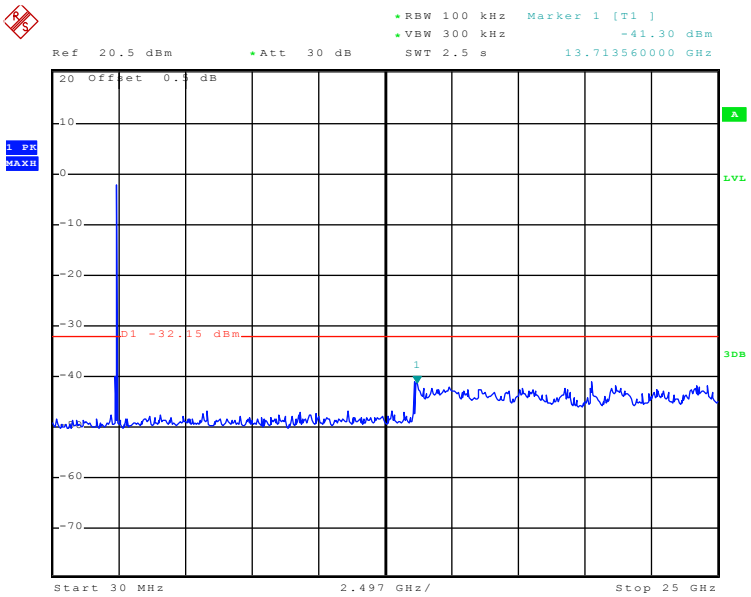
Test mode:	802.11g

Lowest channel



30MHz~25GHz

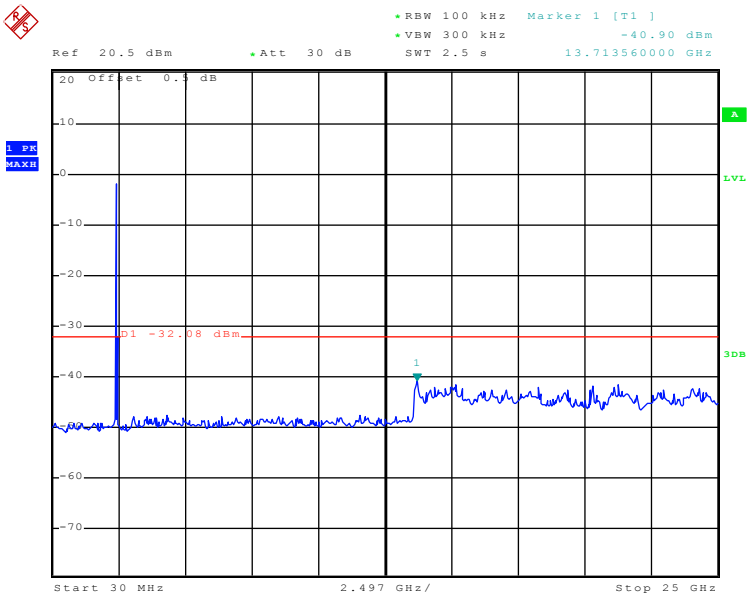
Middle channel



Date: 2.SEP.2014 20:07:37

30MHz~25GHz

Highest channel

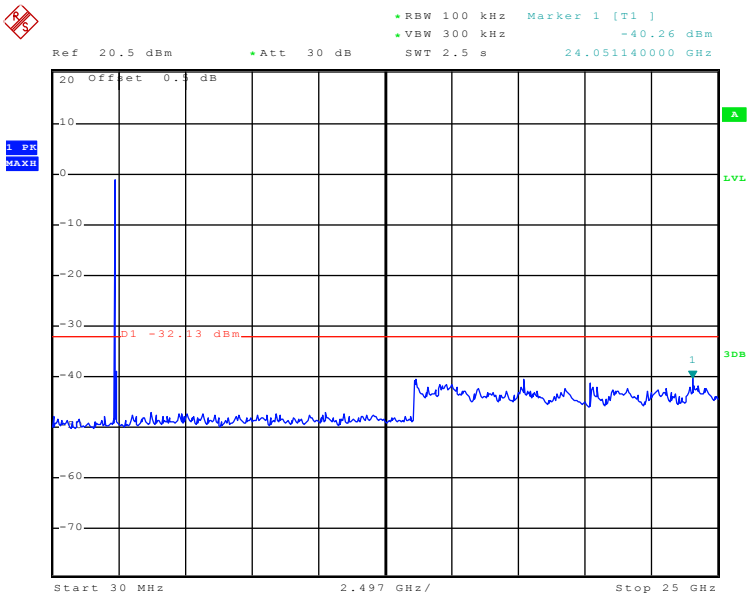


Date: 2.SEP.2014 20:08:06

30MHz~25GHz

Test mode:	802.11n(H20)

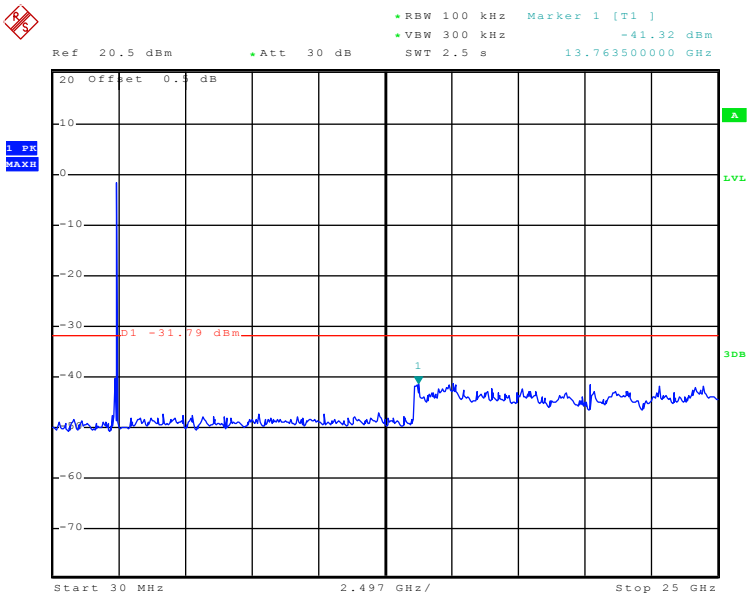
Lowest channel



Date: 2.SEP.2014 20:09:15

30MHz~25GHz

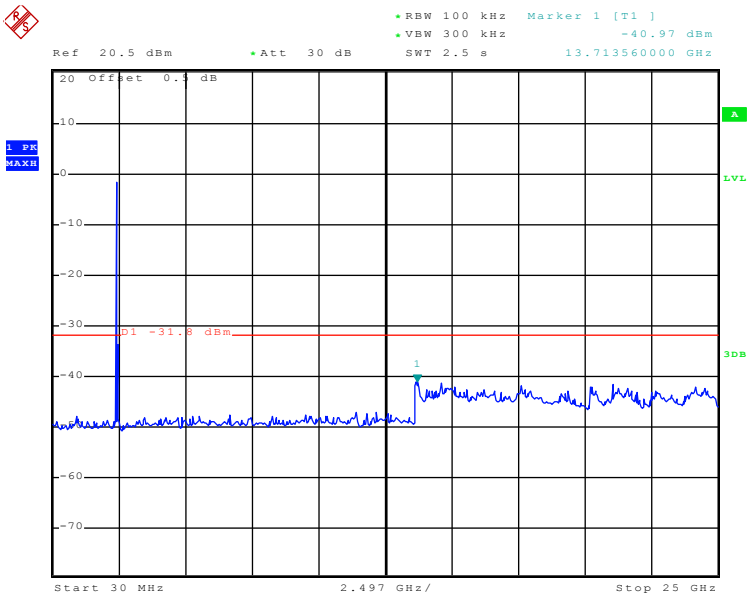
Middle channel



Date: 2.SEP.2014 20:09:52

30MHz~25GHz

Highest channel

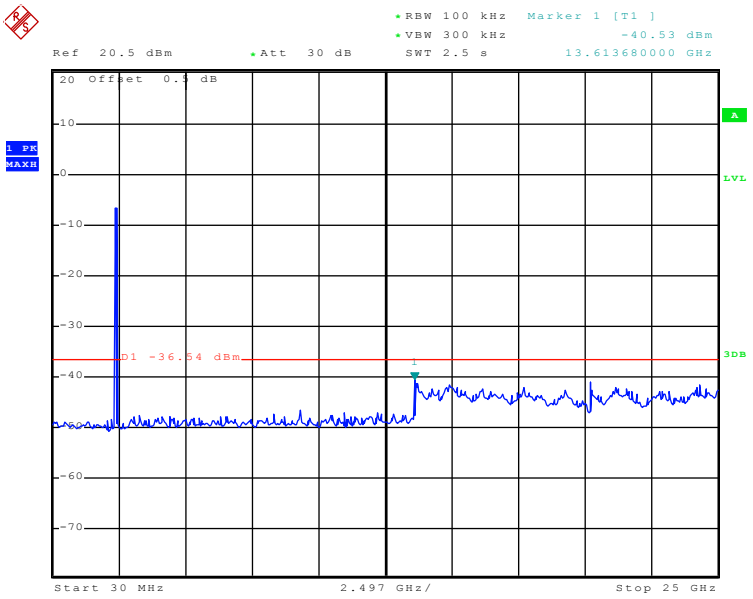


Date: 2.SEP.2014 20:10:22

30MHz~25GHz

Test mode:	802.11n(H40)

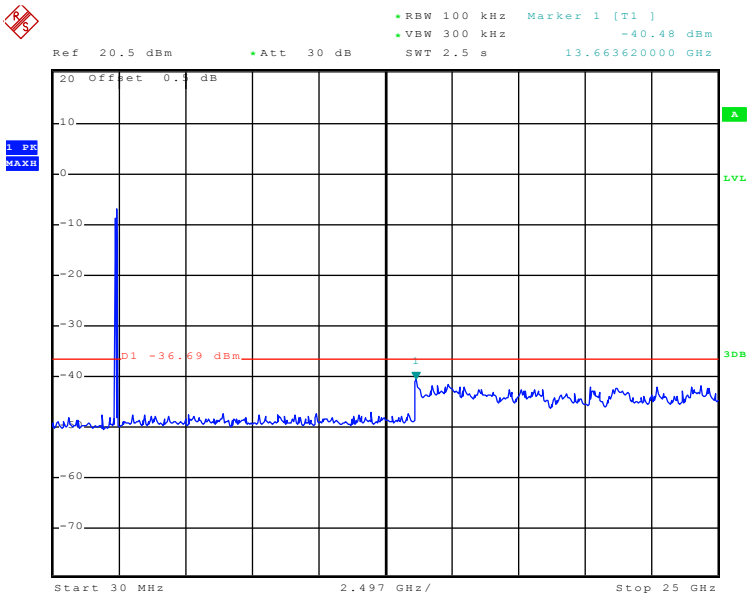
Lowest channel



Date: 2.SEP.2014 20:11:02

30MHz~25GHz

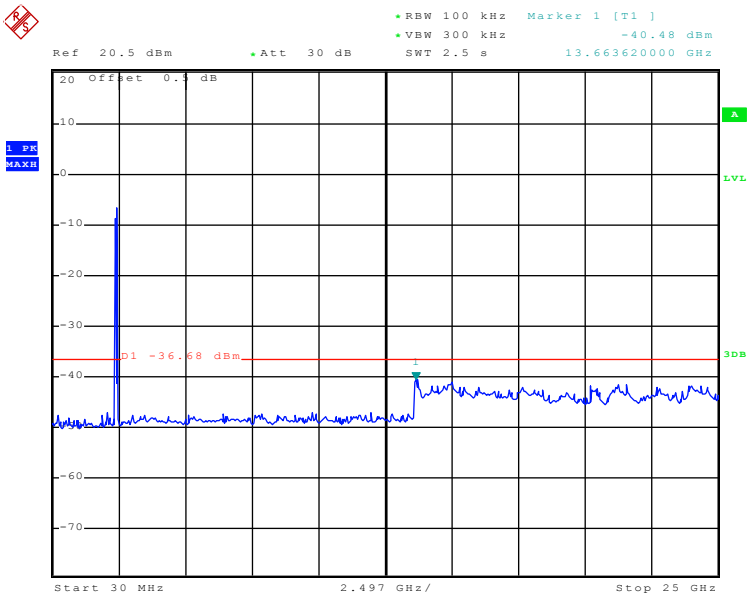
Middle channel



Date: 2.SEP.2014 20:11:45

30MHz~25GHz

Highest channel

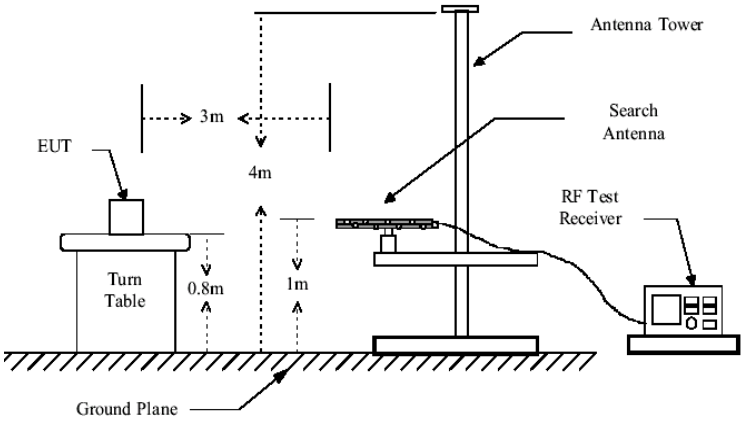
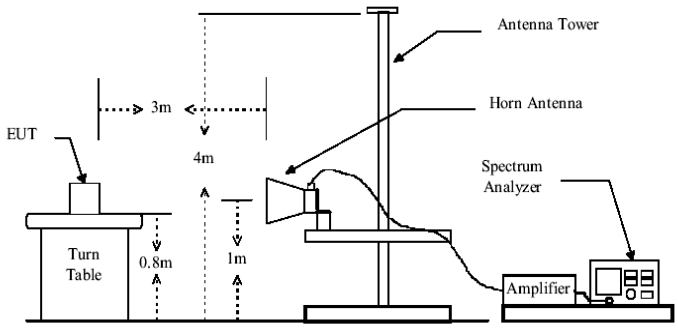


Date: 2.SEP.2014 20:12:14

30MHz~25GHz

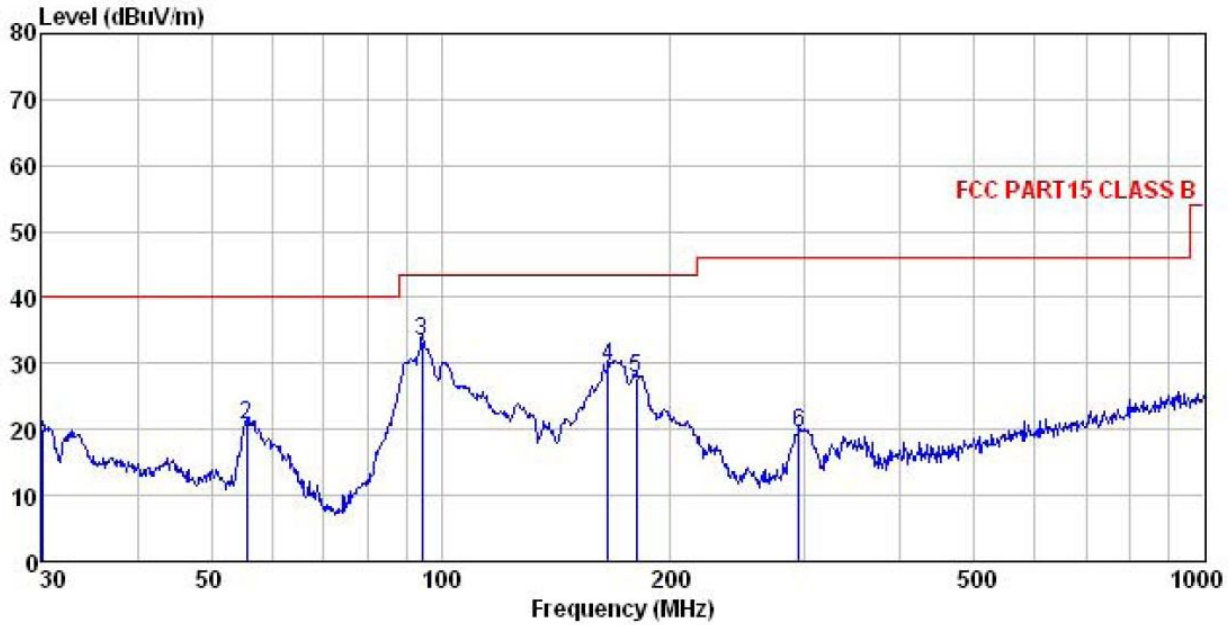
6.7.2 Radiated Emission Method

<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 C63.4:2003</td></tr>
<tr><td>Test Frequency Range:</td><td>9KHz 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:</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>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
</td></tr>
</table>

Test setup:	Below 1GHz  Above 1GHz 
Test Instruments:	Refer to section 5.6for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Below 1GHz

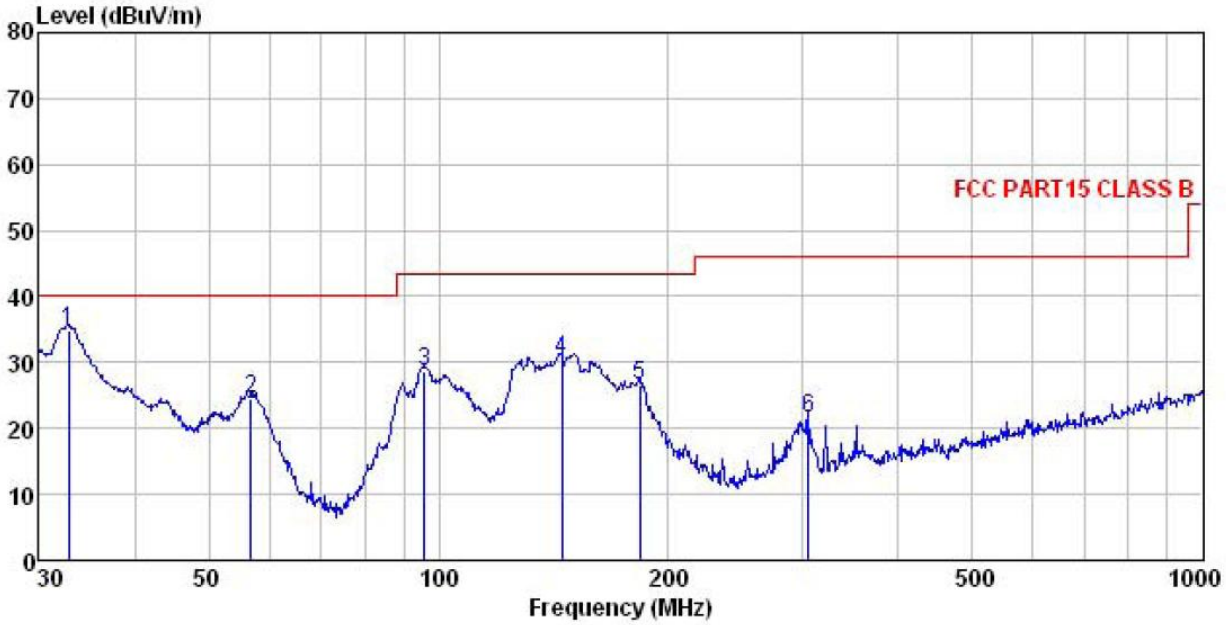
Horizontal：



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) HORIZONTAL
Jobi NO. : T36RF
EUT : T97601T4
Model : Bang
Test mode : WIFI mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.000	37.40	12.33	0.43	29.98	20.18	40.00	-19.82	QP
2	55.609	36.93	12.99	0.65	29.80	20.77	40.00	-19.23	QP
3	94.428	49.12	12.75	0.93	29.55	33.25	43.50	-10.25	QP
4	165.487	48.43	8.82	1.34	29.09	29.50	43.50	-14.00	QP
5	180.017	45.74	9.68	1.36	28.97	27.81	43.50	-15.69	QP
6	294.114	33.27	12.95	1.75	28.46	19.51	46.00	-26.49	QP

Vertical：



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M1G) VERTICAL
Jobi NO. : 736RF
EUT : T97601T4
Model : Bang
Test mode : WIFI mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55%
Test Engineer: Carey

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	32.749	51.90	12.31	0.46	29.96	34.71	40.00	-5.29	QP
2	56.792	40.83	12.91	0.66	29.79	24.61	40.00	-15.39	QP
3	95.762	44.39	12.90	0.93	29.55	28.67	43.50	-14.83	QP
4	144.842	50.03	8.23	1.29	29.25	30.30	43.50	-13.20	QP
5	183.201	44.20	9.92	1.36	28.95	26.53	43.50	-16.97	QP
6	304.610	35.09	13.13	1.79	28.46	21.55	46.00	-24.45	QP

Above 1GHz

Test mode: 802.11b			Test channel: Lowest			Remark: Peak		
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
4824.00	47.83	31.53	8.90	40.24	48.02	74.00	-25.98	Vertical
4824.00	48.66	31.53	8.90	40.24	48.85	74.00	-25.15	Horizontal

Test mode: 802.11b			Test channel: Lowest			Remark: Average		
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
4824.00	38.01	31.53	8.90	40.24	38.20	54.00	-15.80	Vertical
4824.00	38.48	31.53	8.90	40.24	38.67	54.00	-15.33	Horizontal

Test mode: 802.11b			Test channel: Middle			Remark: Peak		
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
4874.00	46.07	31.58	8.98	40.15	46.48	74.00	-27.52	Vertical
4874.00	46.56	31.58	8.98	40.15	46.97	74.00	-27.03	Horizontal

Test mode: 802.11b			Test channel: Middle			Remark: Average		
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
4874.00	35.59	31.58	8.98	40.15	36.00	54.00	-18.00	Vertical
4874.00	37.08	31.58	8.98	40.15	37.49	54.00	-16.51	Horizontal

Test mode: 802.11b			Test channel: Highest			Remark: Peak		
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
4924.00	44.37	31.69	9.08	40.03	45.11	74.00	-28.89	Vertical
4924.00	47.01	31.69	9.08	40.03	47.75	74.00	-26.26	Horizontal

Test mode: 802.11b			Test channel: Highest			Remark: Average		
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
4924.00	33.65	31.69	9.08	40.03	34.39	54.00	-19.61	Vertical
4924.00	37.00	31.69	9.08	40.03	37.74	54.00	-16.26	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.*

Test mode: 802.11g			Test channel: Lowest			Remark: Peak		
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
4824.00	46.67	31.53	8.90	40.24	46.86	74.00	-27.14	Vertical
4824.00	47.93	31.53	8.90	40.24	48.12	74.00	-25.88	Horizontal

Test mode: 802.11g			Test channel: Lowest			Remark: Average		
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
4824.00	36.46	31.53	8.90	40.24	36.65	54.00	-17.35	Vertical
4824.00	37.53	31.53	8.90	40.24	37.72	54.00	-16.28	Horizontal

Test mode: 802.11g			Test channel: Middle			Remark: Peak		
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
4874.00	47.19	31.58	8.98	40.15	47.60	74.00	-26.40	Vertical
4874.00	46.32	31.58	8.98	40.15	46.73	74.00	-27.27	Horizontal

Test mode: 802.11g			Test channel: Middle			Remark: Average		
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
4874.00	36.79	31.58	8.98	40.15	37.20	54.00	-16.80	Vertical
4874.00	35.21	31.58	8.98	40.15	35.62	54.00	-18.38	Horizontal

Test mode: 802.11g			Test channel: Highest			Remark: Peak		
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
4924.00	44.89	31.69	9.08	40.03	45.63	74.00	-28.37	Vertical
4924.00	46.05	31.69	9.08	40.03	46.79	74.00	-27.21	Horizontal

Test mode: 802.11g			Test channel: Highest			Remark: Average		
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
4924.00	35.35	31.69	9.08	40.03	36.09	54.00	-17.91	Vertical
4924.00	35.22	31.69	9.08	40.03	35.96	54.00	-18.04	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.*

Test mode: 802.11n(H20)			Test channel: Lowest			Remark: Peak		
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
4824.00	46.92	31.53	8.90	40.24	47.11	74.00	-26.89	Vertical
4824.00	47.82	31.53	8.90	40.24	48.01	74.00	-25.99	Horizontal

Test mode: 802.11n(H20)			Test channel: Lowest			Remark: Average		
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
4824.00	36.26	31.53	8.90	40.24	36.45	54.00	-17.55	Vertical
4824.00	37.73	31.53	8.90	40.24	37.92	54.00	-16.08	Horizontal

Test mode: 802.11n(H20)			Test channel: Middle			Remark: Peak		
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
4874.00	46.11	31.58	8.98	40.15	46.52	74.00	-27.48	Vertical
4874.00	46.69	31.58	8.98	40.15	47.10	74.00	-26.90	Horizontal

Test mode: 802.11n(H20)			Test channel: Middle			Remark: Average		
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
4874.00	35.79	31.58	8.98	40.15	36.20	54.00	-17.80	Vertical
4874.00	36.39	31.58	8.98	40.15	36.80	54.00	-17.20	Horizontal

Test mode: 802.11n(H20)			Test channel: Highest			Remark: Peak		
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
4924.00	45.76	31.69	9.08	40.03	46.50	74.00	-27.50	Vertical
4924.00	47.35	31.69	9.08	40.03	48.09	74.00	-25.91	Horizontal

Test mode: 802.11n(H20)			Test channel: Highest			Remark: Average		
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
4924.00	36.25	31.69	9.08	40.03	36.99	54.00	-17.01	Vertical
4924.00	36.68	31.69	9.08	40.03	37.42	54.00	-16.58	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.*