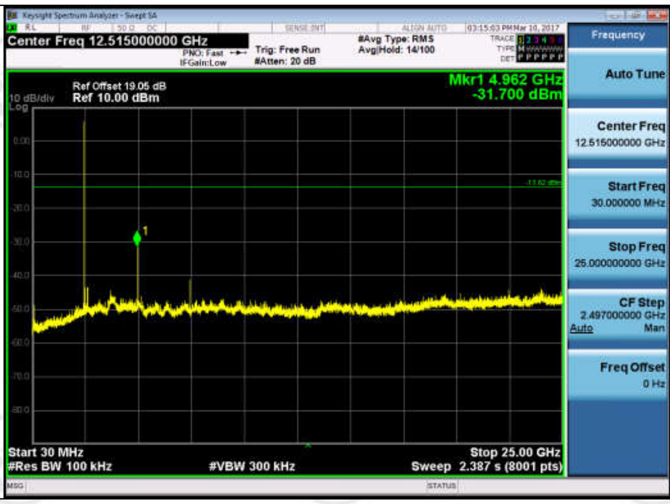
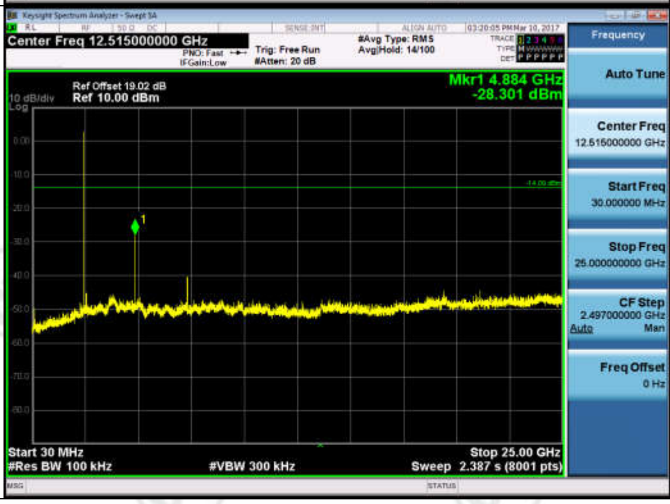
Puw		

8DPSK_LCH_Graphs		
Pref		
Puw		

<table>
<tr><th colspan="3">8DPSK_MCH_Graphs</th></tr>
<tr><td>Pref</td><td></td><td>
</td></tr>
<tr><td>Puw</td><td></td><td>
</td></tr>
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<table>
<tr><th colspan="3">8DPSK_HCH_Graphs</th></tr>
<tr><td>Pref</td><td></td><td>
</td></tr>
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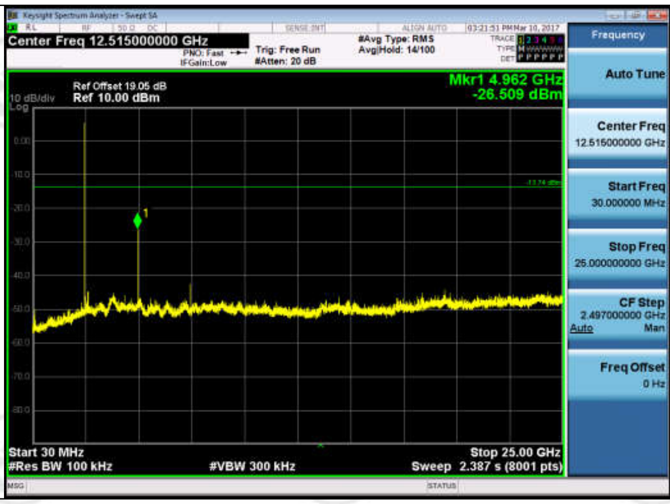
Puw		Keysight Spectrum Analyzer - Swept SA Center Freq 12.515000000 GHz PNO: Fast IFGain:Low Trig: Free Run #Atten: 20 dB #Avg Type: RMS Avg|Hold: 14/100 03:21:51 PM Mar 10, 2017 Ref Offset 19.05 dB 10 dB/div Ref 10.00 dBm Log Mkr1 4.962 GHz -26.509 dBm Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 25.00 GHz Sweep 2.387 s (8001 pts) Frequency Auto Tune Center Freq 12.515000000 GHz Start Freq 30.000000 MHz Stop Freq 25.000000000 GHz CF Step 2.497000000 GHz Auto Man Freq Offset 0 Hz

Appendix H): Pseudorandom Frequency Hopping Sequence

Test Requirement:	**47 CFR Part 15C Section 15.247 (a)(1) requirement:**

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz.The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH-enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

EUT Pseudorandom Frequency Hopping Sequence

Pseudorandom Frequency Hopping Sequence Table as below:

Channel: 01, 33, 41, 65, 09, 33, 41,40, 56, 72, 09,78, 73, 22, 04, 20, , 11, 05, 13, 37, 45,36, 52, 38, 46, 70, 08 24, 40, 56, 68, 76, 21, 29, 10, 26, 42, 58, 44, 60, 53, 69, 06, 45, 69, 77, 55, 71, 08, 24, 08, 24, 40, 56, 40 48,72, 01, 72, 01, 76, 13, 37, 25, 33, 03, 11, 35, 43, 12, 28, 44, 60, 42, 58, 74 etc.

The device does not have the ability to be coordinated with other FHSS systems in an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters.

Appendix I): Antenna Requirement

15.203 requirement:

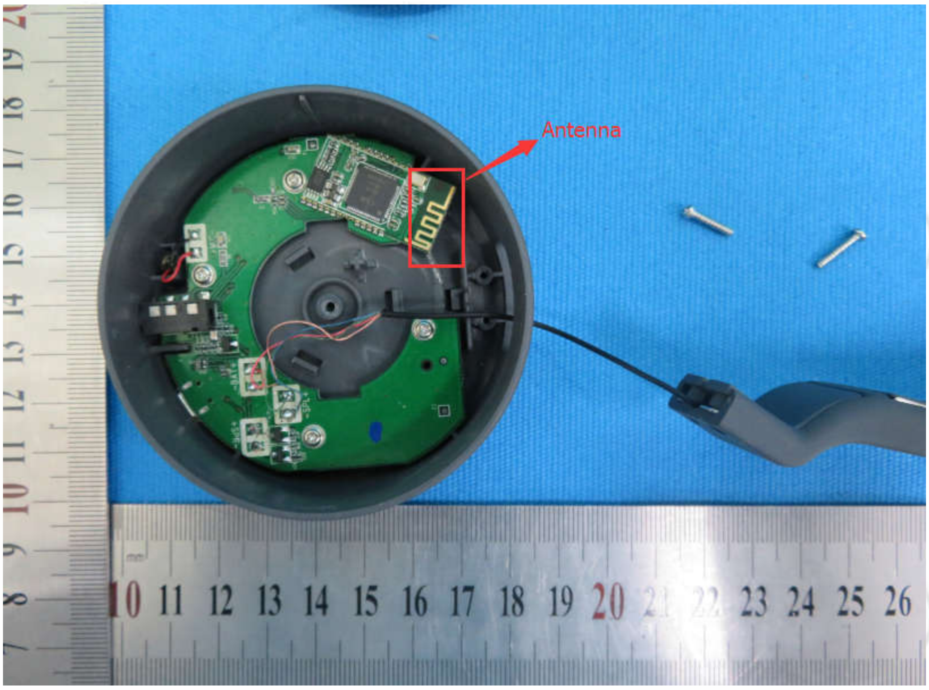
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is PIFA Antenna and no consideration of replacement. The best case gain of the antenna is 0dBi.



Appendix J): AC Power Line Conducted Emission

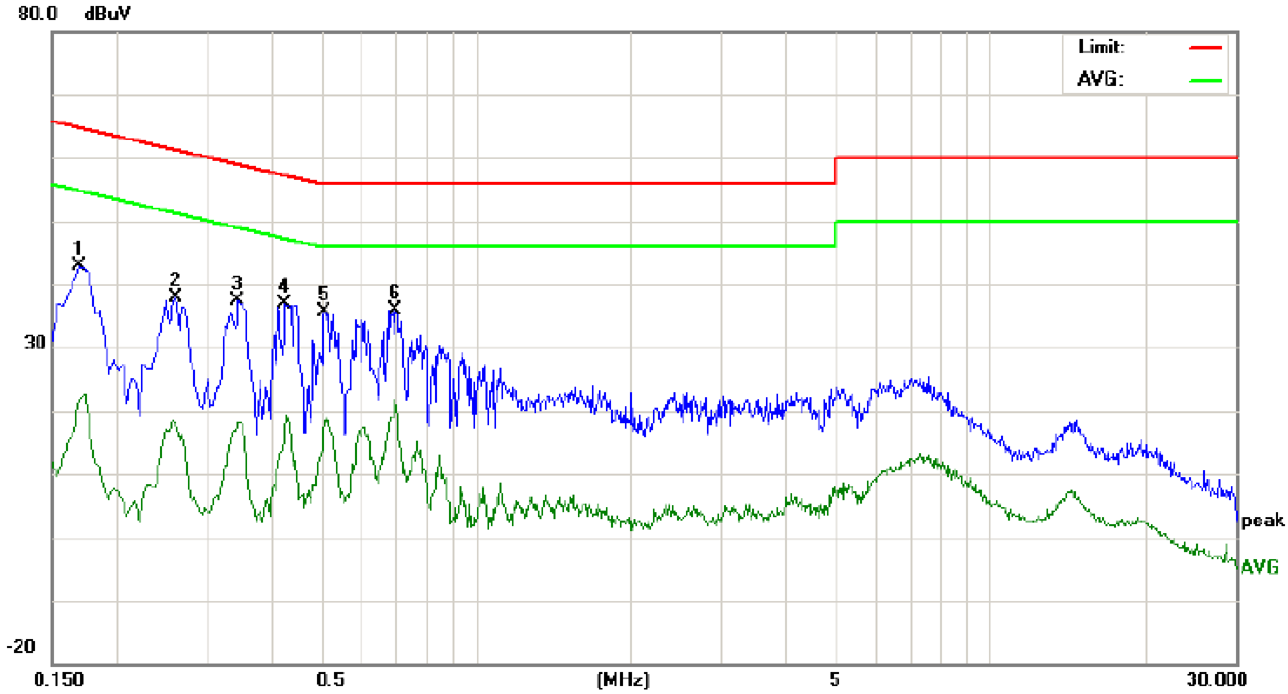
Test Procedure:	Test frequency range :150KHz-30MHz 1)The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3)The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) 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 on conducted measurement.
Limit:	(see table below)

Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE : The lower limit is applicable at the transition frequency

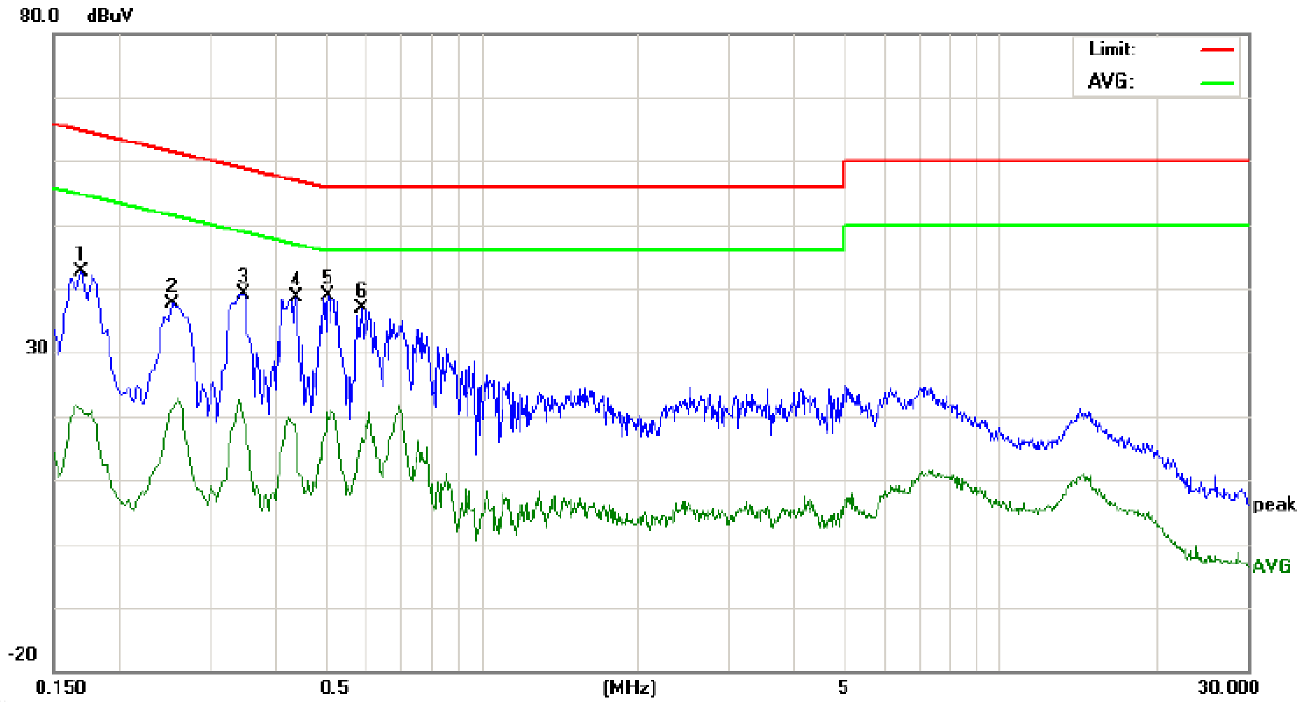
Measurement Data
An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1700	33.01		12.21	9.74	42.75		21.95	64.96	54.96	-22.21	-33.01	P	
2	0.2620	28.07		8.41	9.75	37.82		18.16	61.36	51.36	-23.54	-33.20	P	
3	0.3460	27.59		8.27	9.77	37.36		18.04	59.06	49.06	-21.70	-31.02	P	
4	0.4260	27.13		6.56	9.74	36.87		16.30	57.33	47.33	-20.46	-31.03	P	
5	0.5100	26.00		8.75	9.71	35.71		18.46	56.00	46.00	-20.29	-27.54	P	
6	0.6980	26.11		12.02	9.75	35.86		21.77	56.00	46.00	-20.14	-24.23	P	

Neutral line:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1700	32.94		11.28	9.74	42.68		21.02	64.96	54.96	-22.28	-33.94	P	
2	0.2540	27.91		11.37	9.75	37.66		21.12	61.62	51.62	-23.96	-30.50	P	
3	0.3500	29.42		9.65	9.76	39.18		19.41	58.96	48.96	-19.78	-29.55	P	
4	0.4420	28.84		6.80	9.73	38.57		16.53	57.02	47.02	-18.45	-30.49	P	
5	0.5100	29.10		10.02	9.71	38.81		19.73	56.00	46.00	-17.19	-26.27	P	
6	0.5899	27.17		6.91	9.75	36.92		16.66	56.00	46.00	-19.08	-29.34	P	

Notes:

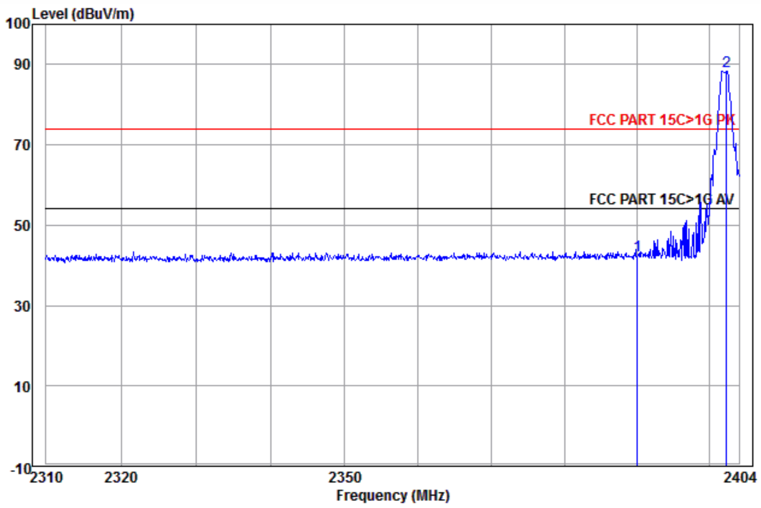
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

Appendix K): Restricted bands around fundamental frequency (Radiated)

<table>
<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</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
Below 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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 rotatable 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
Above 1GHz test procedure as below:
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).
h. b. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBµV/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>
</table>

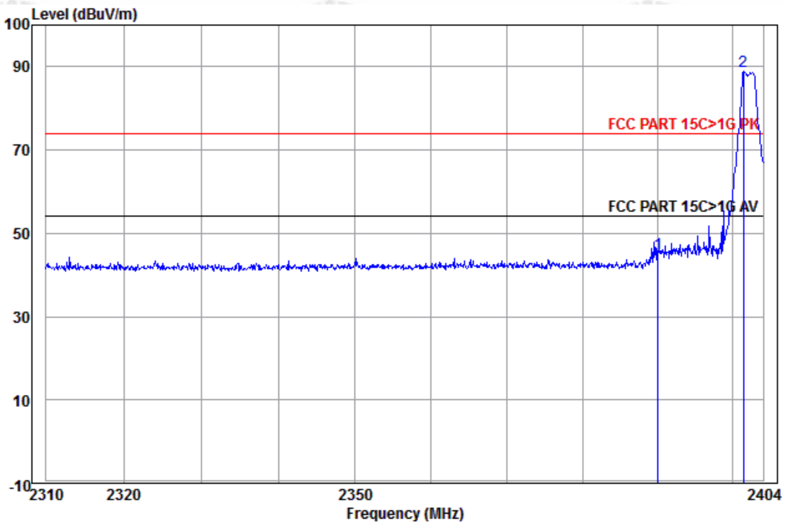
Test plot as follows:

Worse case mode:	GFSK(1-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



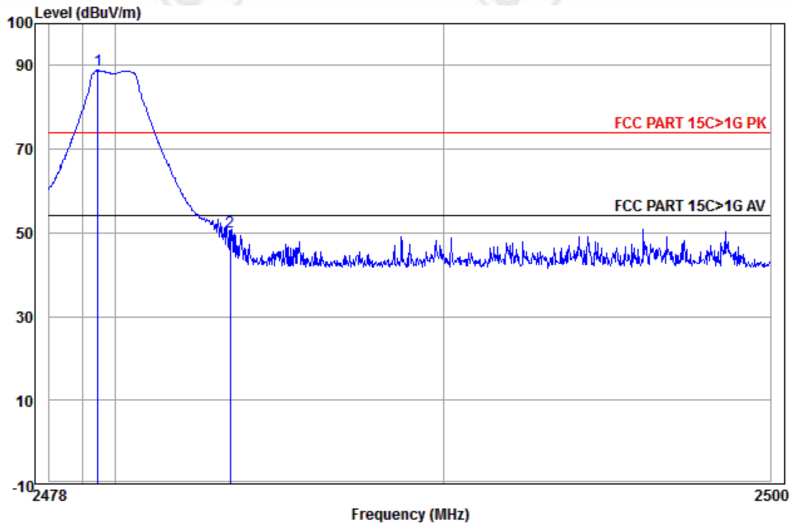
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	49.53	42.31	74.00	-31.69	Horizontal	
2 pp	2402.275	32.56	4.31	44.04	95.61	88.44	74.00	14.44	Horizontal	

Worse case mode:	GFSK(1-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



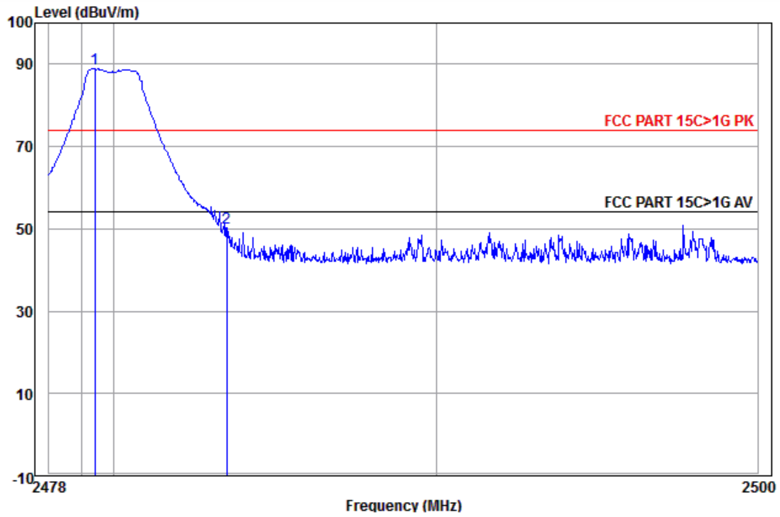
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	52.46	45.24	74.00	-28.76	Vertical	
2 pp	2401.412	32.56	4.31	44.04	96.14	88.97	74.00	14.97	Vertical	

Worse case mode:	GFSK(1-DH5)		
Frequency: 2483.5MHz	Test channel:	Polarization: Horizontal	Remark: Peak



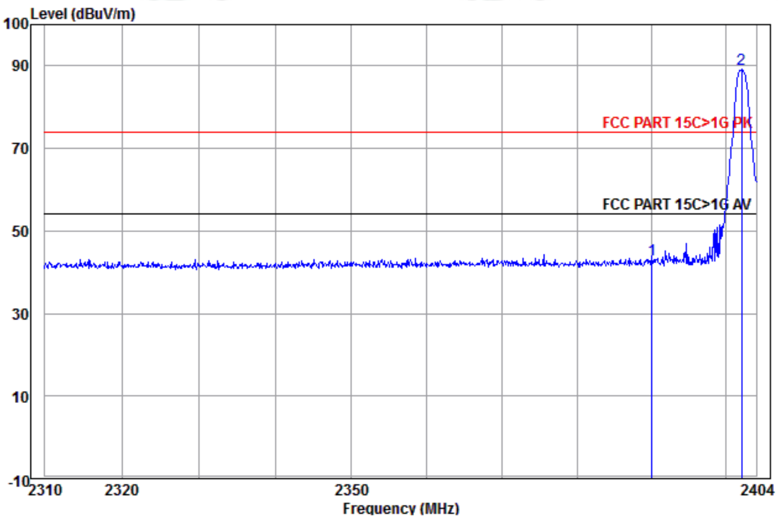
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2479.468	32.71	4.50	44.14	95.85	88.92	74.00	14.92	Horizontal	
2	2483.500	32.71	4.51	44.14	57.25	50.33	74.00	-23.67	Horizontal	

Worse case mode:	GFSK(1-DH5)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



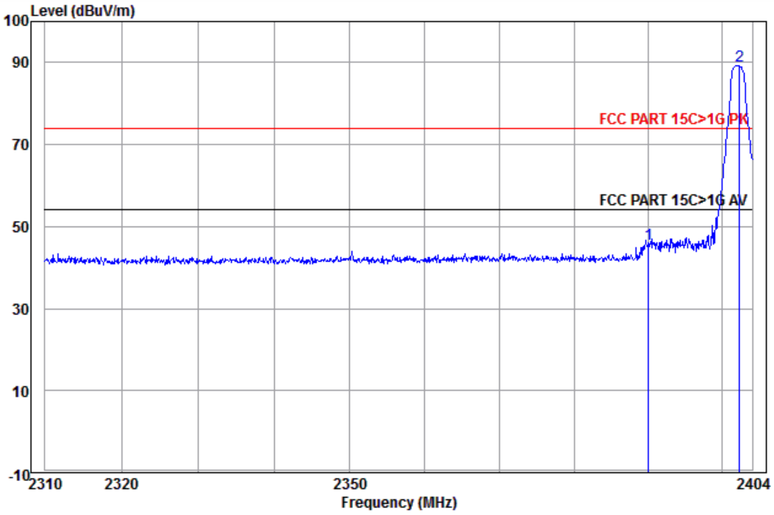
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2479.424	32.71	4.50	44.14	95.92	88.99	74.00	14.99	Vertical	
2	2483.500	32.71	4.51	44.14	57.12	50.20	74.00	-23.80	Vertical	

Worse case mode:	π/4DQPSK(2-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



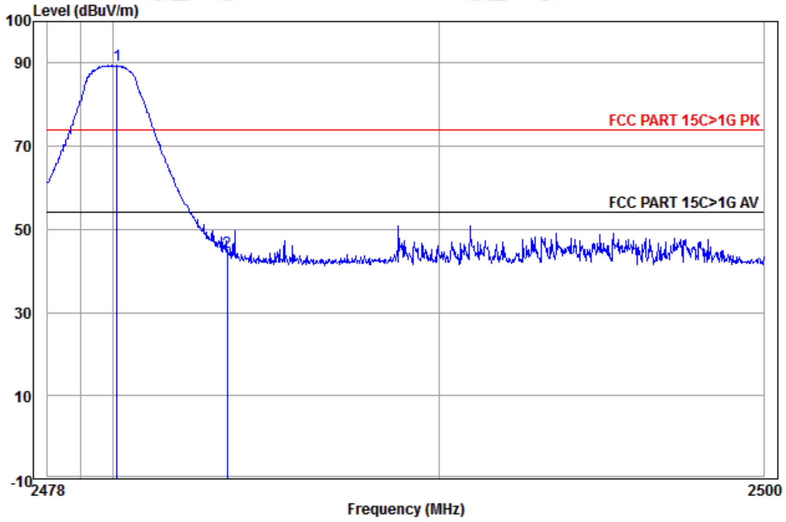
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	50.22	43.00	74.00	-31.00	Horizontal	
2 pp	2402.083	32.56	4.31	44.04	96.23	89.06	74.00	15.06	Horizontal	

Worse case mode:	π/4DQPSK(2-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



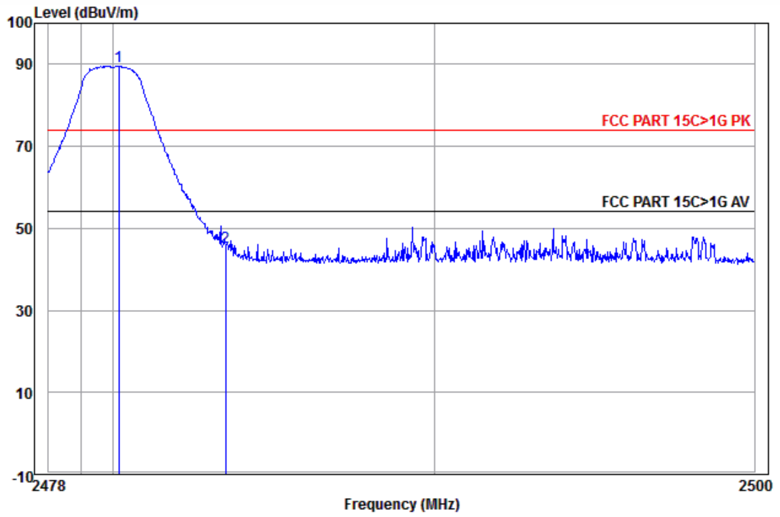
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	52.83	45.61	74.00	-28.39	Vertical	
2 pp	2402.275	32.56	4.31	44.04	96.39	89.22	74.00	15.22	Vertical	

Worse case mode:	π/4DQPSK(2-DH5)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



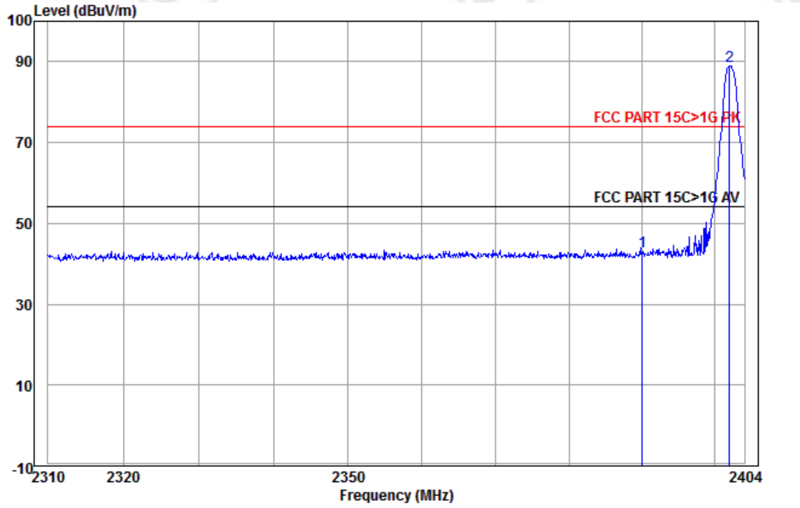
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2480.125	32.71	4.50	44.14	96.33	89.40	74.00	15.40	Horizontal	
2	2483.500	32.71	4.51	44.14	51.51	44.59	74.00	-29.41	Horizontal	

Worse case mode:	π/4DQPSK(2-DH5)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



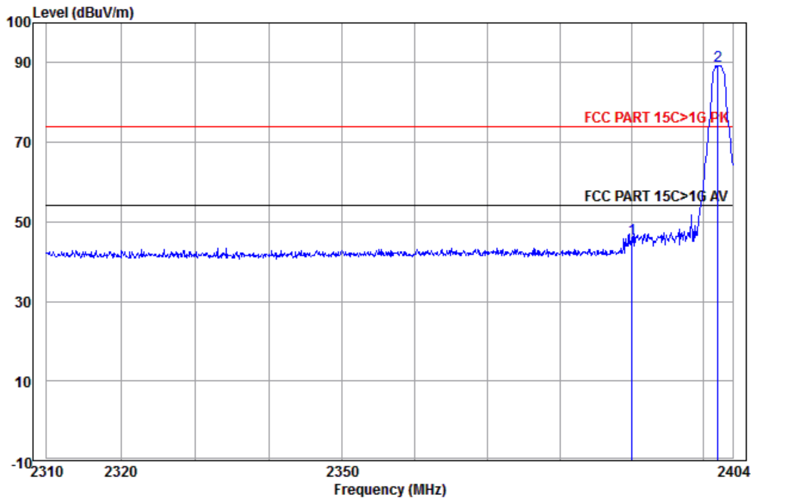
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2480.191	32.71	4.50	44.14	96.37	89.44	74.00	15.44	Vertical	
2	2483.500	32.71	4.51	44.14	52.27	45.35	74.00	-28.65	Vertical	

Worse case mode:	8DPSK(3-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Horizontal	Remark: Peak



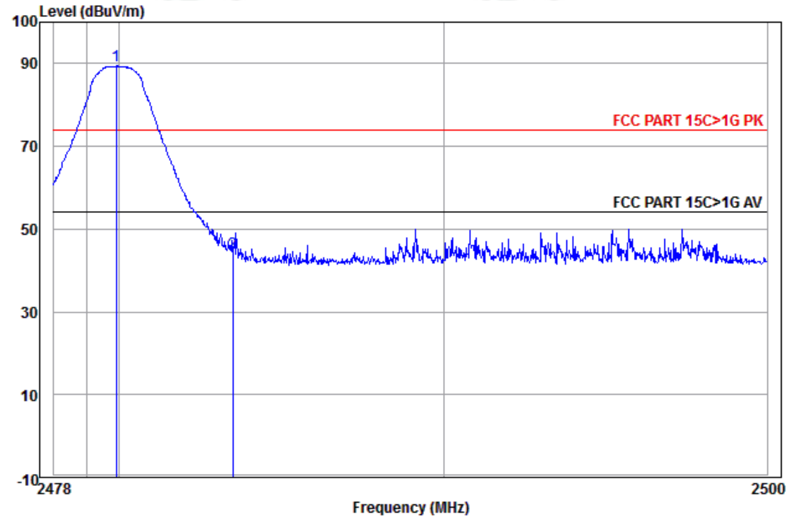
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	50.19	42.97	74.00	-31.03	Horizontal	
2 pp	2401.987	32.56	4.31	44.04	96.14	88.97	74.00	14.97	Horizontal	

Worse case mode:	8DPSK(3-DH5)		
Frequency: 2390.0MHz	Test channel: Lowest	Polarization: Vertical	Remark: Peak



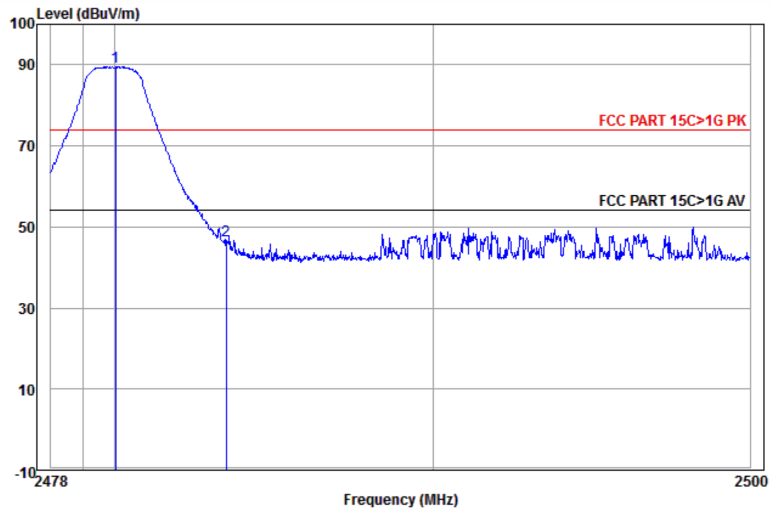
	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	2390.000	32.53	4.28	44.03	53.10	45.88	74.00	-28.12	Vertical	
2 pp	2401.987	32.56	4.31	44.04	96.31	89.14	74.00	15.14	Vertical	

Worse case mode:	8DPSK(3-DH5)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Horizontal	Remark: Peak



	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2479.906	32.71	4.50	44.14	96.35	89.42	74.00	15.42	Horizontal	
2	2483.500	32.71	4.51	44.14	51.07	44.15	74.00	-29.85	Horizontal	

Worse case mode:	8DPSK(3-DH5)		
Frequency: 2483.5MHz	Test channel: Highest	Polarization: Vertical	Remark: Peak



	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	2480.038	32.71	4.50	44.14	96.39	89.46	74.00	15.46	Vertical	
2	2483.500	32.71	4.51	44.14	53.54	46.62	74.00	-27.38	Vertical	

Note:
1) Through Pre-scan transmitter mode with all kind of modulation and all kind of data type, find the 1-DH5 of data type is the worse case of GFSK modulation type, the 2-DH5 of data type is the worse case of π/4DQPSK modulation type, the 3-DH5 of data type is the worse case of 8DPSK modulation type in charge + transmitter mode.
2) As shown in this section, the field strength limits are based on average limits. However, the peak field

strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak values are measured.
3) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading -Correct Factor
Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

Appendix L): Radiated Spurious Emissions

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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, whichwas 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable 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 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.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Limit:

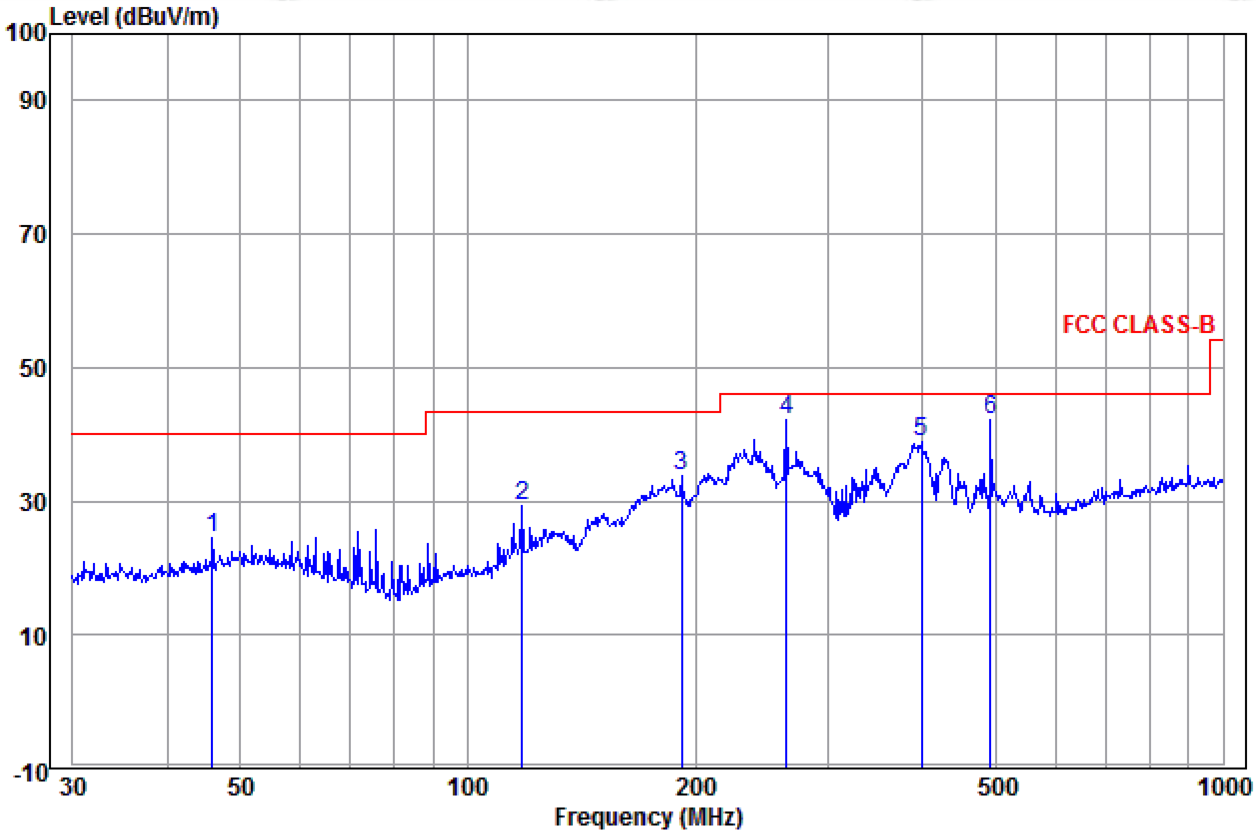
Frequency	Field strength (microvolt/meter)	Limit (dBµV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Radiated Spurious Emissions test Data:

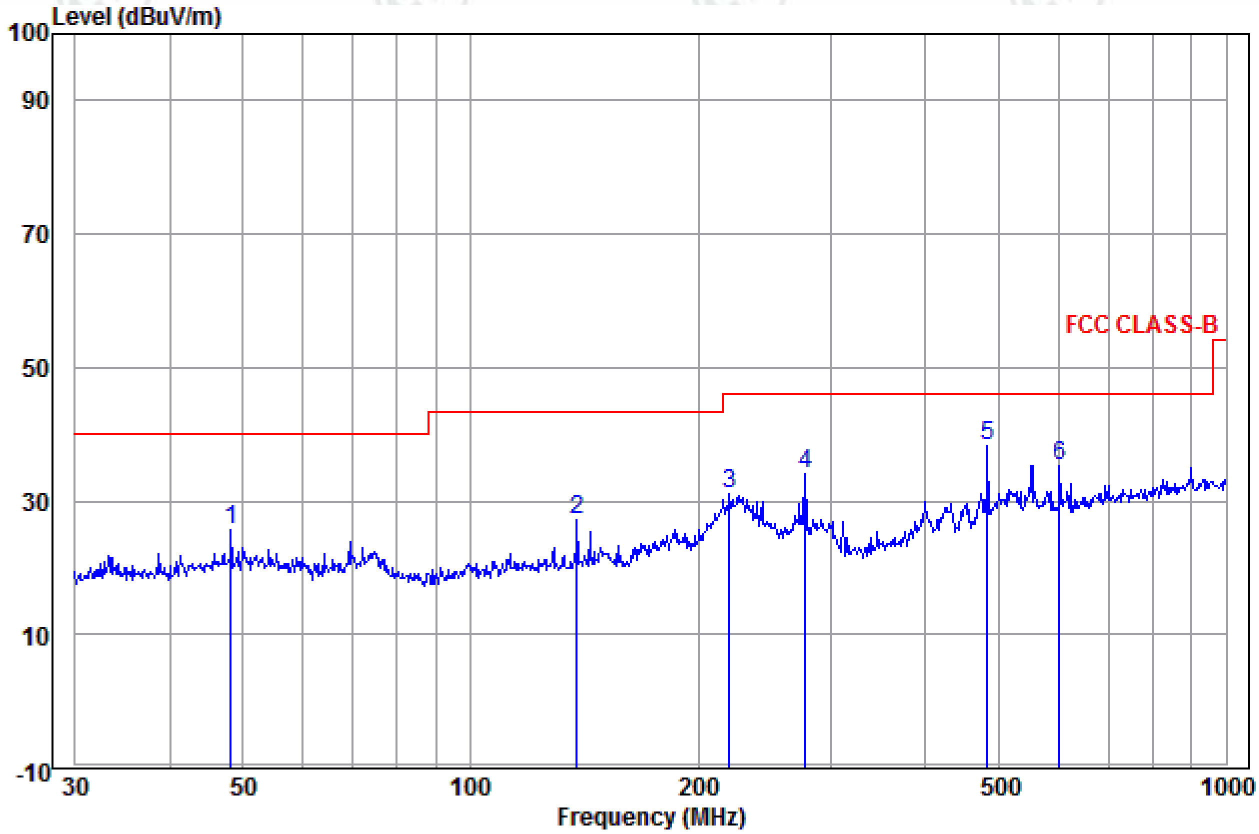
Radiated Emission below 1GHz

30MHz~1GHz (QP)		
Test mode:	Transmitting	Horizontal



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	45.855	14.75	1.06	8.67	24.48	40.00	-15.52	Horizontal	
2	118.186	11.76	1.57	15.97	29.30	43.50	-14.20	Horizontal	
3	191.745	11.32	2.12	20.42	33.86	43.50	-9.64	Horizontal	
4 pp	263.819	12.72	2.36	27.13	42.21	46.00	-3.79	Horizontal	
5	399.030	16.27	2.80	19.84	38.91	46.00	-7.09	Horizontal	
6	492.469	18.21	3.11	20.81	42.13	46.00	-3.87	Horizontal	

Test mode:	Transmitting	Vertical



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	48.163	14.95	1.25	9.53	25.73	40.00	-14.27	Vertical	
2	138.387	10.40	1.58	15.14	27.12	43.50	-16.38	Vertical	
3	219.845	11.94	2.27	16.93	31.14	46.00	-14.86	Vertical	
4	277.094	13.02	2.37	18.67	34.06	46.00	-11.94	Vertical	
5 pp	483.910	18.00	3.09	17.06	38.15	46.00	-7.85	Vertical	
6	601.427	18.82	3.51	12.94	35.27	46.00	-10.73	Vertical	

Transmitter Emission above 1GHz

Worse case mode:		GFSK(1-DH5)		Test channel:		Lowest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1353.804	30.57	2.51	34.81	47.93	46.20	74.00	-27.80	Pass	H
1978.230	31.67	2.85	34.31	45.75	45.96	74.00	-28.04	Pass	H
2803.700	33.28	3.42	34.47	45.43	47.66	74.00	-26.34	Pass	H
4804.000	34.69	6.72	34.35	41.68	48.74	74.00	-25.26	Pass	H
7206.000	36.42	8.35	34.90	38.20	48.07	74.00	-25.93	Pass	H
9608.000	37.88	7.67	35.08	38.11	48.58	74.00	-25.42	Pass	H
1343.505	30.55	2.50	34.82	47.79	46.02	74.00	-27.98	Pass	V
1786.719	31.37	2.76	34.45	45.65	45.33	74.00	-28.67	Pass	V
2796.573	33.27	3.41	34.47	43.33	45.54	74.00	-28.46	Pass	V
4804.000	34.69	6.72	34.35	43.73	50.79	74.00	-23.21	Pass	V
7206.000	36.42	8.35	34.90	33.60	43.47	74.00	-30.53	Pass	V
9608.000	37.88	7.67	35.08	32.42	42.89	74.00	-31.11	Pass	V

Worse case mode:		GFSK(1-DH5)		Test channel:		Middle	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1364.182	30.60	2.52	34.80	47.57	45.89	74.00	-28.11	Pass	H
1973.201	31.66	2.85	34.32	45.86	46.05	74.00	-27.95	Pass	H
3728.625	33.00	5.80	34.58	43.06	47.28	74.00	-26.72	Pass	H
4882.000	34.85	6.74	34.33	42.91	50.17	74.00	-23.83	Pass	H
7323.000	36.43	8.45	34.90	34.58	44.56	74.00	-29.44	Pass	H
9764.000	38.05	7.53	35.05	34.34	44.87	74.00	-29.13	Pass	H
1353.804	30.57	2.51	34.81	47.16	45.43	74.00	-28.57	Pass	V
2803.700	33.28	3.42	34.47	43.54	45.77	74.00	-28.23	Pass	V
3616.451	33.08	5.49	34.56	41.46	45.47	74.00	-28.53	Pass	V
4882.000	34.85	6.74	34.33	43.12	50.38	74.00	-23.62	Pass	V
7323.000	36.43	8.45	34.90	37.71	47.69	74.00	-26.31	Pass	V
9764.000	38.05	7.53	35.05	35.32	45.85	74.00	-28.15	Pass	V

Worse case mode:		GFSK(1-DH5)		Test channel:		Highest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1350.362	30.57	2.51	34.81	46.82	45.09	74.00	-28.91	Pass	H
1988.327	31.68	2.85	34.31	46.02	46.24	74.00	-27.76	Pass	H
2935.153	33.50	3.49	34.49	44.49	46.99	74.00	-27.01	Pass	H
4960.000	35.02	6.75	34.31	41.47	48.93	74.00	-25.07	Pass	H
7440.000	36.45	8.55	34.90	37.40	47.50	74.00	-26.50	Pass	H
9920.000	38.22	7.41	35.02	36.46	47.07	74.00	-26.93	Pass	H
1150.279	30.10	2.37	35.02	46.63	44.08	74.00	-29.92	Pass	V
1565.200	30.99	2.64	34.62	46.21	45.22	74.00	-28.78	Pass	V
2789.463	33.26	3.41	34.46	44.47	46.68	74.00	-27.32	Pass	V
4960.000	35.02	6.75	34.31	41.90	49.36	74.00	-24.64	Pass	V
7440.000	36.45	8.55	34.90	34.23	44.33	74.00	-29.67	Pass	V
9920.000	38.22	7.41	35.02	35.40	46.01	74.00	-27.99	Pass	V

Worse case mode:		π/4DQPSK(2-DH5)		Test channel:		Lowest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1357.254	30.58	2.51	34.80	49.05	47.34	74.00	-26.66	Pass	H
2388.276	32.53	3.15	34.39	45.42	46.71	74.00	-27.29	Pass	H
3498.735	33.17	5.14	34.55	43.95	47.71	74.00	-26.29	Pass	H
4804.000	34.69	6.72	34.35	41.44	48.50	74.00	-25.50	Pass	H
7206.000	36.42	8.35	34.90	36.92	46.79	74.00	-27.21	Pass	H
9608.000	37.88	7.67	35.08	36.32	46.79	74.00	-27.21	Pass	H
1350.362	30.57	2.51	34.81	47.01	45.28	74.00	-28.72	Pass	V
2018.928	31.74	2.88	34.30	45.68	46.00	74.00	-28.00	Pass	V
2942.635	33.51	3.50	34.49	45.03	47.55	74.00	-26.45	Pass	V
4804.000	34.69	6.72	34.35	39.81	46.87	74.00	-27.13	Pass	V
7206.000	36.42	8.35	34.90	35.35	45.22	74.00	-28.78	Pass	V
9608.000	37.88	7.67	35.08	36.56	47.03	74.00	-26.97	Pass	V

Worse case mode:		π/4DQPSK(2-DH5)		Test channel:		Middle	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1340.089	30.54	2.50	34.82	46.57	44.79	74.00	-29.21	Pass	H
1958.189	31.64	2.84	34.33	45.72	45.87	74.00	-28.13	Pass	H
2927.691	33.49	3.49	34.49	44.15	46.64	74.00	-27.36	Pass	H
4882.000	34.85	6.74	34.33	40.27	47.53	74.00	-26.47	Pass	H
7323.000	36.43	8.45	34.90	35.71	45.69	74.00	-28.31	Pass	H
9764.000	38.05	7.53	35.05	35.51	46.04	74.00	-27.96	Pass	H
1346.929	30.56	2.51	34.81	47.05	45.31	74.00	-28.69	Pass	V
1983.272	31.68	2.85	34.31	46.64	46.86	74.00	-27.14	Pass	V
2810.846	33.29	3.42	34.47	45.47	47.71	74.00	-26.29	Pass	V
4882.000	34.85	6.74	34.33	43.10	50.36	74.00	-23.64	Pass	V
7323.000	36.43	8.45	34.90	36.94	46.92	74.00	-27.08	Pass	V
9764.000	38.05	7.53	35.05	36.18	46.71	74.00	-27.29	Pass	V

Worse case mode:		π/4DQPSK(2-DH5)		Test channel:		Highest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1336.682	30.54	2.50	34.82	47.45	45.67	74.00	-28.33	Pass	H
2003.569	31.71	2.86	34.30	45.50	45.77	74.00	-28.23	Pass	H
2810.846	33.29	3.42	34.47	43.21	45.45	74.00	-28.55	Pass	H
4960.000	35.02	6.75	34.31	39.33	46.79	74.00	-27.21	Pass	H
7440.000	36.45	8.55	34.90	36.10	46.20	74.00	-27.80	Pass	H
9920.000	38.22	7.41	35.02	37.62	48.23	74.00	-25.77	Pass	H
1360.714	30.59	2.52	34.80	47.63	45.94	74.00	-28.06	Pass	V
1750.702	31.32	2.74	34.47	47.30	46.89	74.00	-27.11	Pass	V
3747.656	32.98	5.86	34.58	41.46	45.72	74.00	-28.28	Pass	V
4960.000	35.02	6.75	34.31	43.31	50.77	74.00	-23.23	Pass	V
7440.000	36.45	8.55	34.90	35.35	45.45	74.00	-28.55	Pass	V
9920.000	38.22	7.41	35.02	36.81	47.42	74.00	-26.58	Pass	V

Worse case mode:		8DPSK(3-DH5)		Test channel:		Lowest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1343.505	30.55	2.50	34.82	48.11	46.34	74.00	-27.66	Pass	H
2376.148	32.51	3.14	34.39	47.05	48.31	74.00	-25.69	Pass	H
3225.037	33.40	4.29	34.53	44.17	47.33	74.00	-26.67	Pass	H
4804.000	34.69	6.72	34.35	41.26	48.32	74.00	-25.68	Pass	H
7206.000	36.42	8.35	34.90	35.63	45.50	74.00	-28.50	Pass	H
9608.000	37.88	7.67	35.08	37.20	47.67	74.00	-26.33	Pass	H
1346.929	30.56	2.51	34.81	47.56	45.82	74.00	-28.18	Pass	V
1968.184	31.65	2.85	34.32	46.96	47.14	74.00	-26.86	Pass	V
2950.135	33.52	3.50	34.49	45.16	47.69	74.00	-26.31	Pass	V
4804.000	34.69	6.72	34.35	40.69	47.75	74.00	-26.25	Pass	V
7206.000	36.42	8.35	34.90	35.44	45.31	74.00	-28.69	Pass	V
9608.000	37.88	7.67	35.08	36.15	46.62	74.00	-27.38	Pass	V

Worse case mode:		8DPSK(3-DH5)		Test channel:		Middle	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1336.682	30.54	2.50	34.82	48.15	46.37	74.00	-27.63	Pass	H
1978.230	31.67	2.85	34.31	45.23	45.44	74.00	-28.56	Pass	H
2950.135	33.52	3.50	34.49	44.99	47.52	74.00	-26.48	Pass	H
4882.000	34.85	6.74	34.33	40.96	48.22	74.00	-25.78	Pass	H
7323.000	36.43	8.45	34.90	36.87	46.85	74.00	-27.15	Pass	H
9764.000	38.05	7.53	35.05	36.48	47.01	74.00	-26.99	Pass	H
1541.476	30.95	2.63	34.64	46.44	45.38	74.00	-28.62	Pass	V
2190.267	32.13	3.01	34.34	45.53	46.33	74.00	-27.67	Pass	V
2796.573	33.27	3.41	34.47	45.51	47.72	74.00	-26.28	Pass	V
4882.000	34.85	6.74	34.33	42.83	50.09	74.00	-23.91	Pass	V
7323.000	36.43	8.45	34.90	37.38	47.36	74.00	-26.64	Pass	V
9764.000	38.05	7.53	35.05	35.58	46.11	74.00	-27.89	Pass	V

Worse case mode:		8DPSK(3-DH5)		Test channel:		Highest	Remark: Peak		
Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1340.089	30.54	2.50	34.82	46.66	44.88	74.00	-29.12	Pass	H
1963.180	31.65	2.84	34.32	44.53	44.70	74.00	-29.30	Pass	H
3625.669	33.07	5.51	34.57	42.22	46.23	74.00	-27.77	Pass	H
4960.000	35.02	6.75	34.31	40.64	48.10	74.00	-25.90	Pass	H
7440.000	36.45	8.55	34.90	36.76	46.86	74.00	-27.14	Pass	H
9920.000	38.22	7.41	35.02	36.89	47.50	74.00	-26.50	Pass	H
1346.929	30.56	2.51	34.81	47.77	46.03	74.00	-27.97	Pass	V
1786.719	31.37	2.76	34.45	48.14	47.82	74.00	-26.18	Pass	V
2942.635	33.51	3.50	34.49	44.20	46.72	74.00	-27.28	Pass	V
4960.000	35.02	6.75	34.31	42.98	50.44	74.00	-23.56	Pass	V
7440.000	36.45	8.55	34.90	36.27	46.37	74.00	-27.63	Pass	V
9920.000	38.22	7.41	35.02	38.04	48.65	74.00	-25.35	Pass	V

Note:

1) Through Pre-scan transmitter mode with all kind of modulation and all kind of data type, find the 1-DH5 of data type is the worse case of GFSK modulation type, the 2-DH5 of data type is the worse case of π/4DQPSK modulation type, he 3-DH5 of data type is the worse case of 8DPSK modulation type in transmitter mode.

2) As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. H owever, the peak field strength of any emission shall not exceed the maximum permitted average limits specifie d above by more than 20 dB under any condition of modulation. So, only the peak values are measured.

3) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

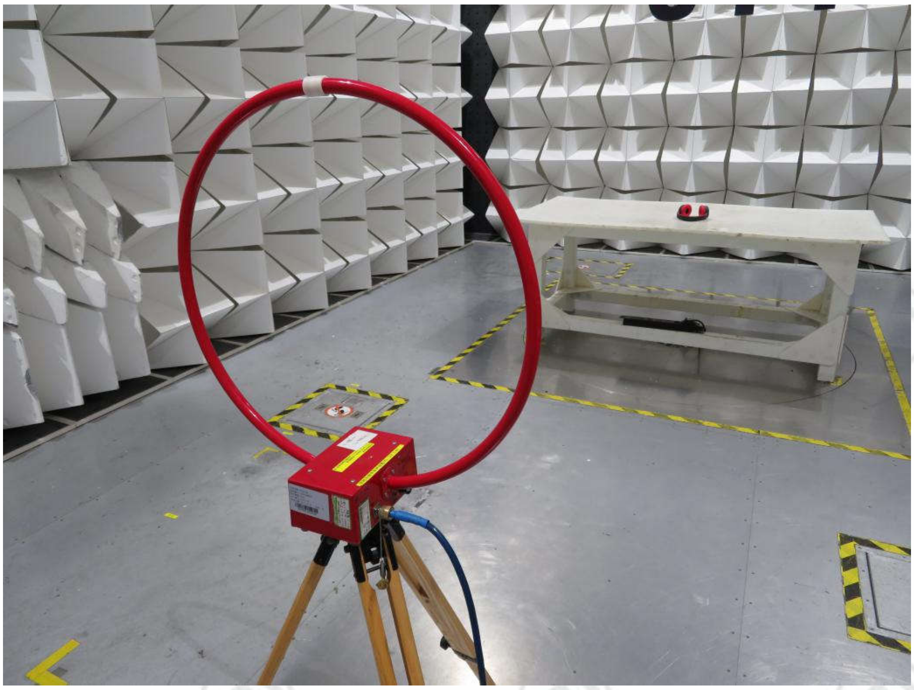
Final Test Level =Receiver Reading -Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

4) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

PHOTOGRAPHS OF TEST SETUP

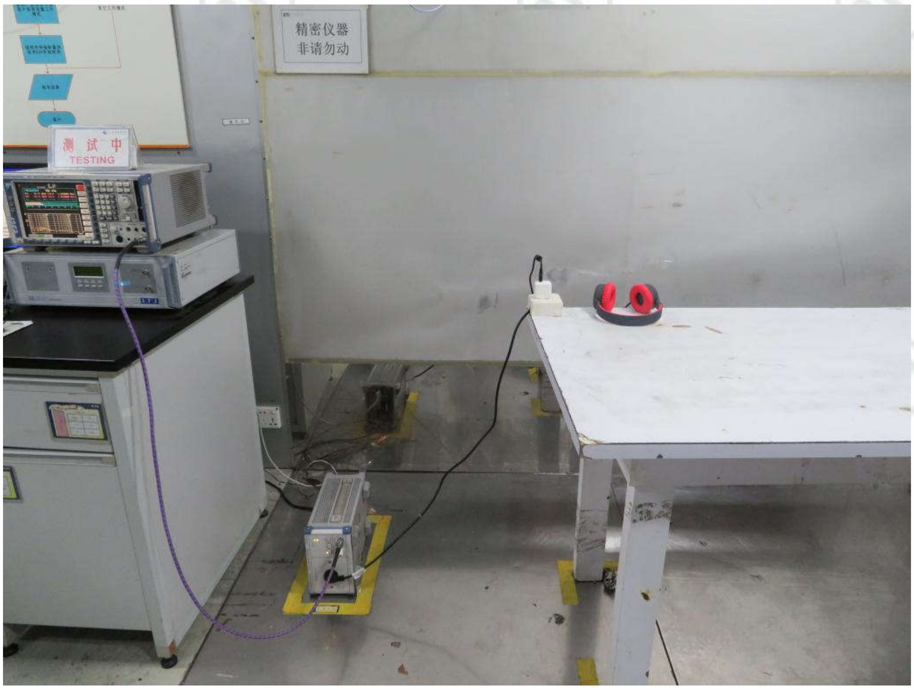
Test model No.: JOY-1407



Radiated spurious emission Test Setup-1(Below 30MHz)

Radiated spurious emission Test Setup-2(30MHz - 1GHz)


Radiated spurious emission Test Setup-3(Above 1GHz)



Conducted Emissions Test Setup

PHOTOGRAPHS OF EUT Constructional Details

Test model No.: JOY-1407

View of Product-1

View of Product-2

View of Product-3

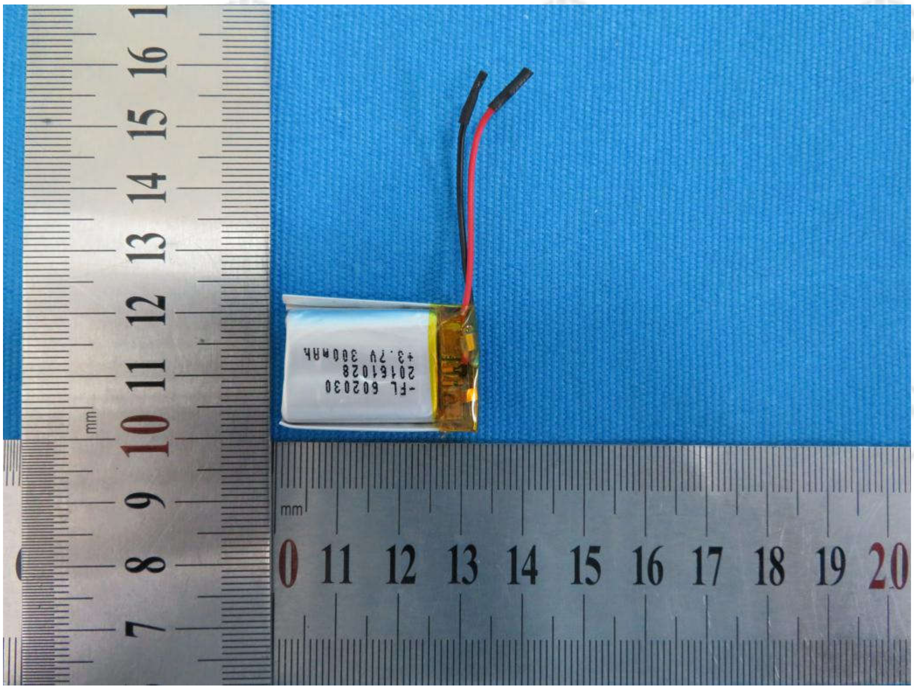
View of Product-4

View of Product-5

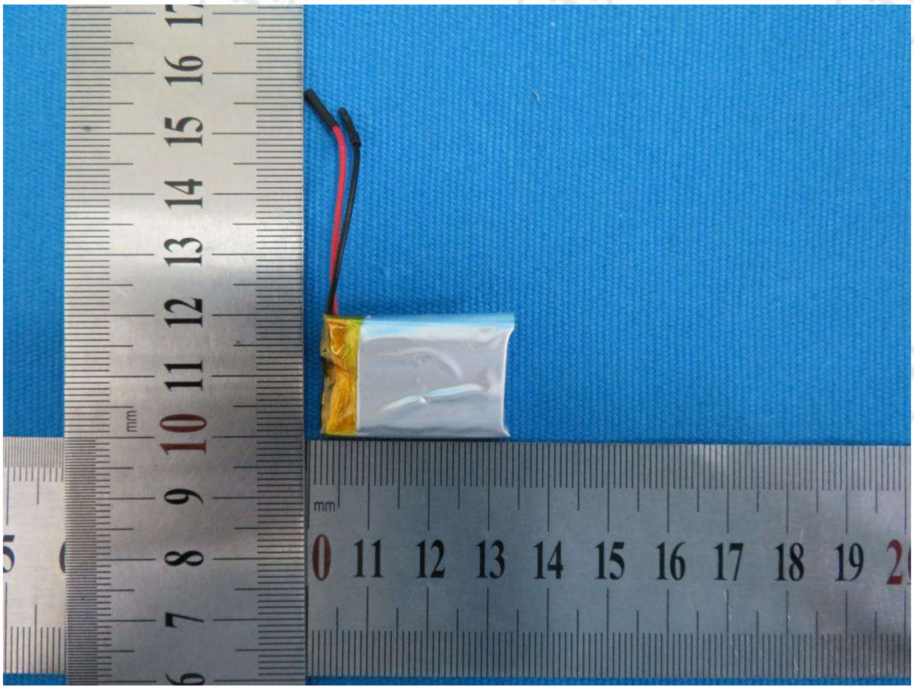
View of Product-6

View of Product-7

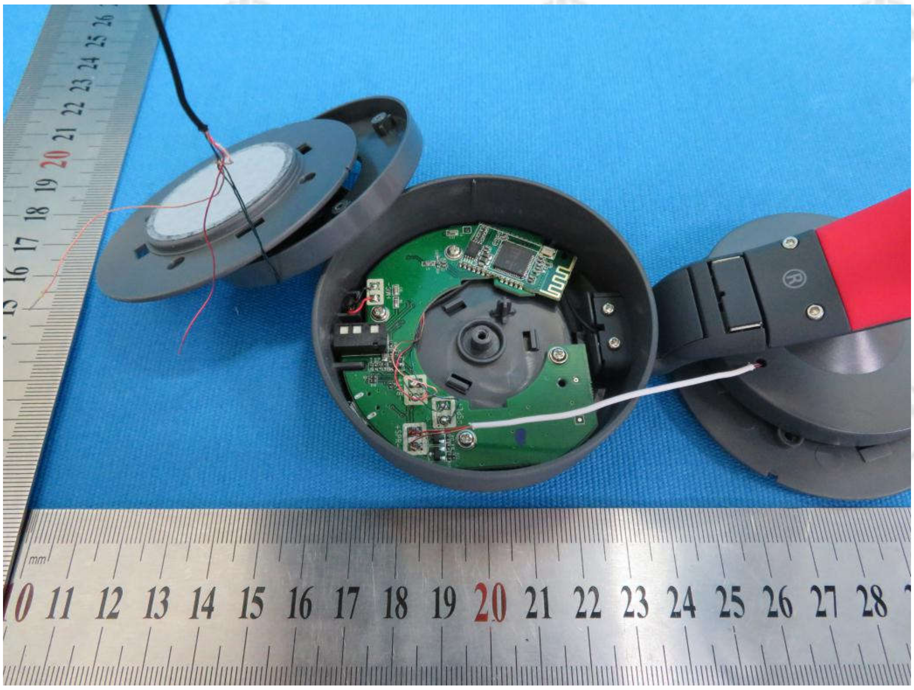
View of Product-8



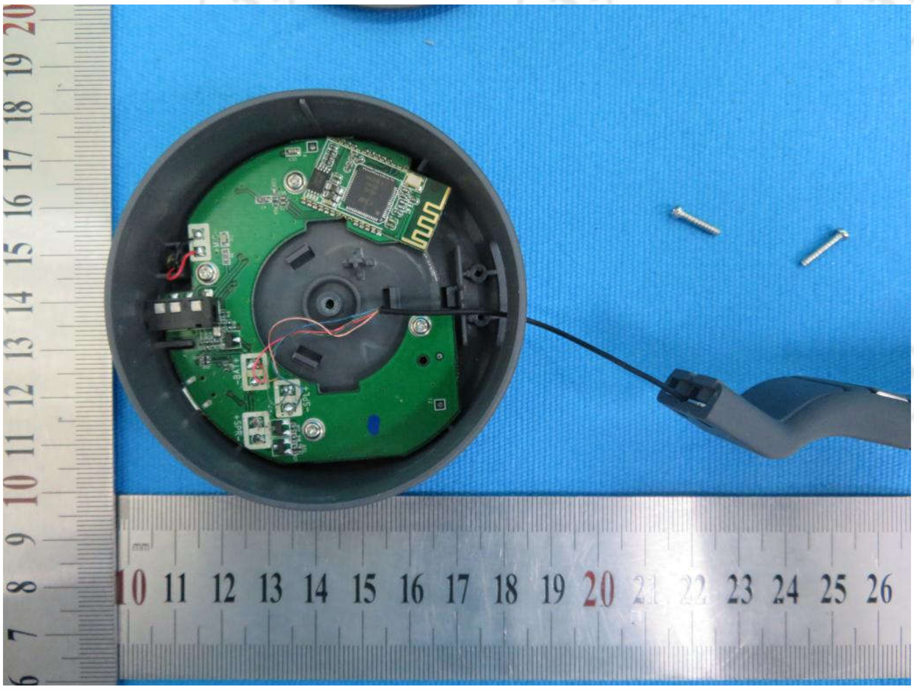
View of Product-9



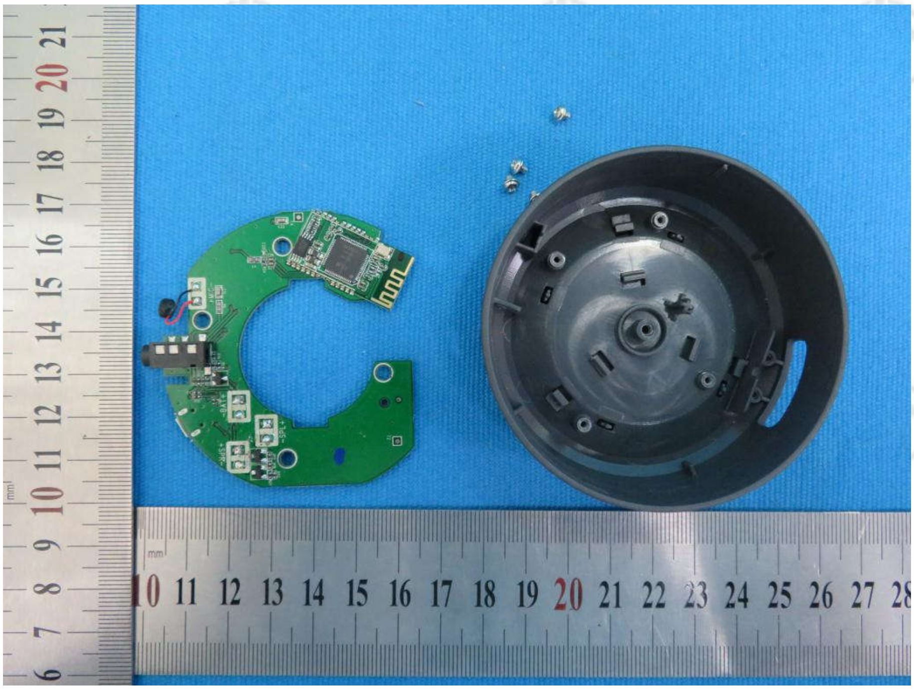
View of Product-10



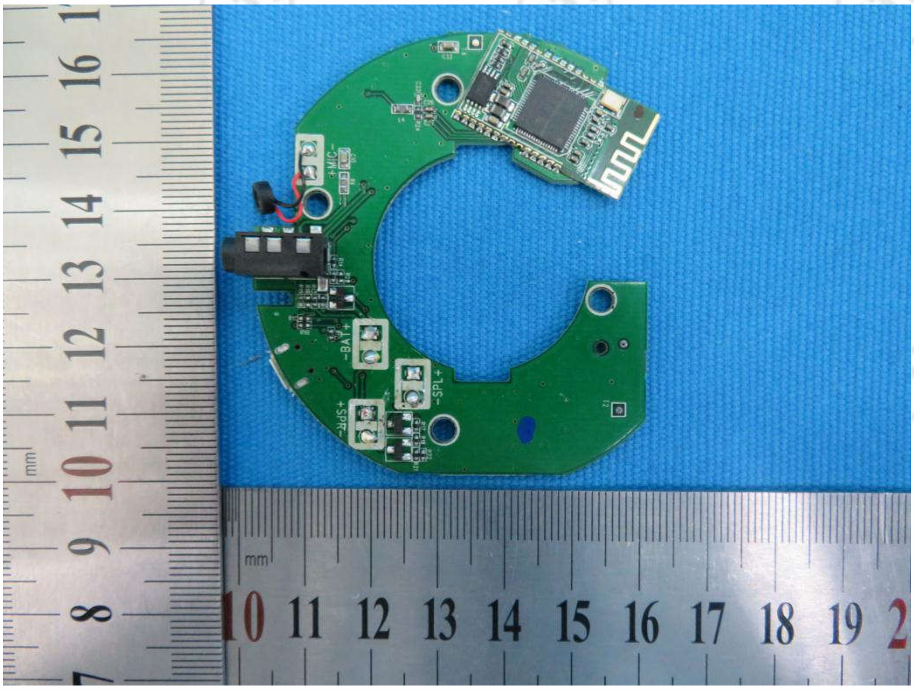
View of Product-11



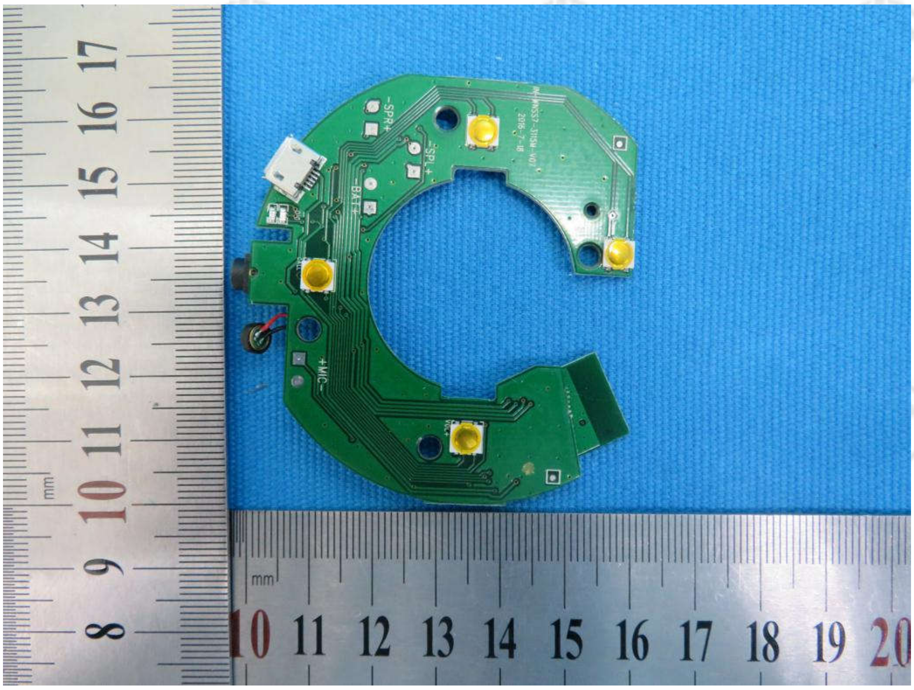
View of Product-12



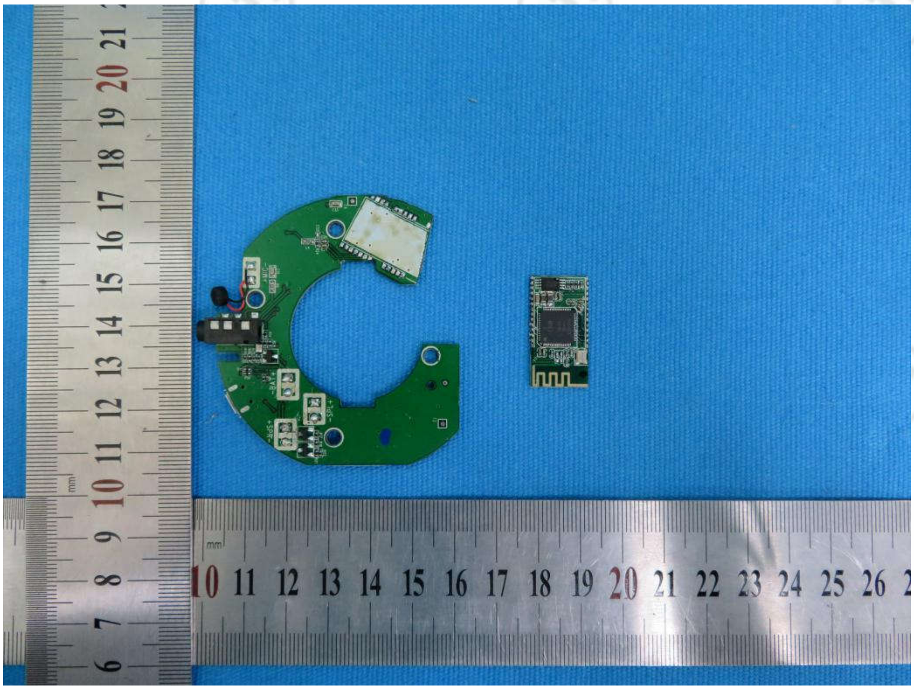
View of Product-13



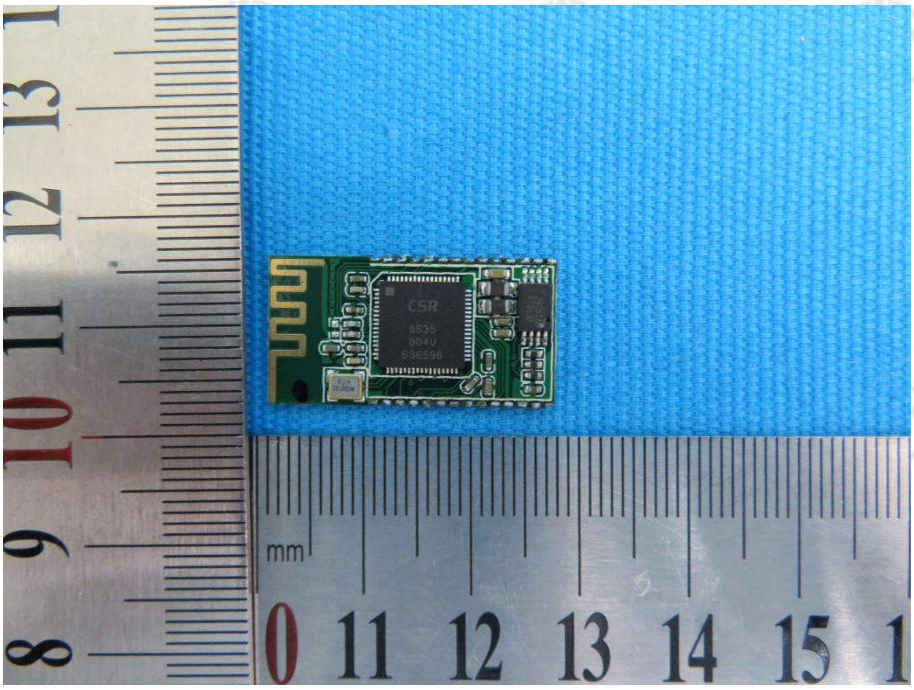
View of Product-14



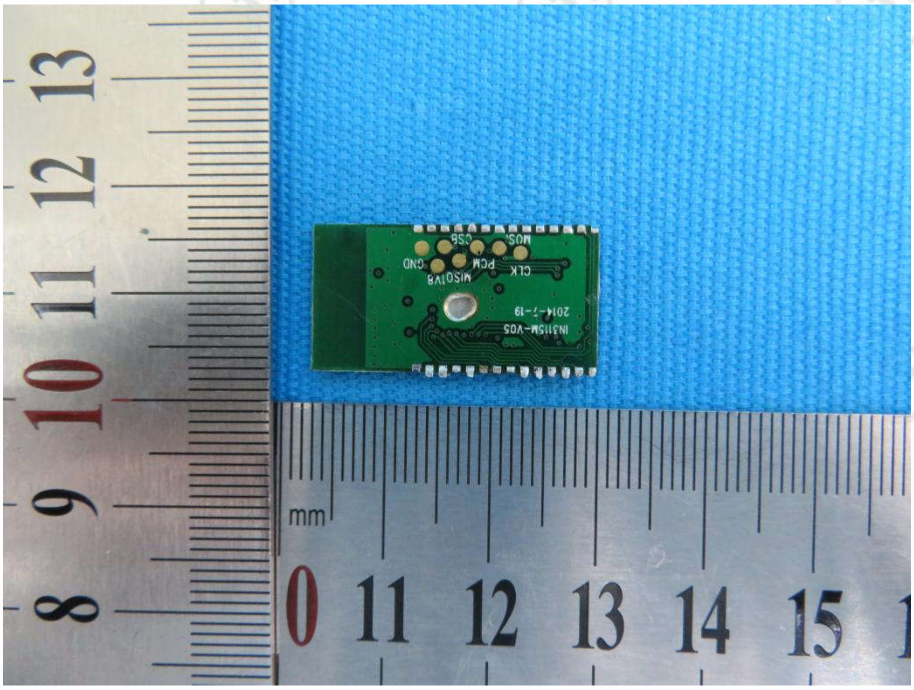
View of Product-15



View of Product-16



View of Product-17



View of Product-18

*** End of Report ***