

Appendix H): Pseudorandom Frequency Hopping Sequence

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(1) requirement:
<p>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.</p> <p>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.</p>	
EUT Pseudorandom Frequency Hopping Sequence	
<p>The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.</p> <ul style="list-style-type: none"> • Number of shift register stages: 9 • Length of pseudo-random sequence: $2^9 - 1 = 511$ bits • Longest sequence of zeros: 8 (non-inverted signal) <div data-bbox="314 965 1362 1120"> </div> <p><i>Linear Feedback Shift Register for Generation of the PRBS sequence</i></p> <p>An example of Pseudorandom Frequency Hopping Sequence as follow:</p> <div data-bbox="288 1211 1273 1361"> </div> <p>Each frequency used equally on the average by each transmitter.</p> <p>The system receivers have input bandwidths that match the hopping channel bandwidths of their Corresponding transmitters and shift frequencies in synchronization with the transmitted signals.</p> <p>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.</p>	

Appendix I): Antenna Requirement

15.203 requirement:

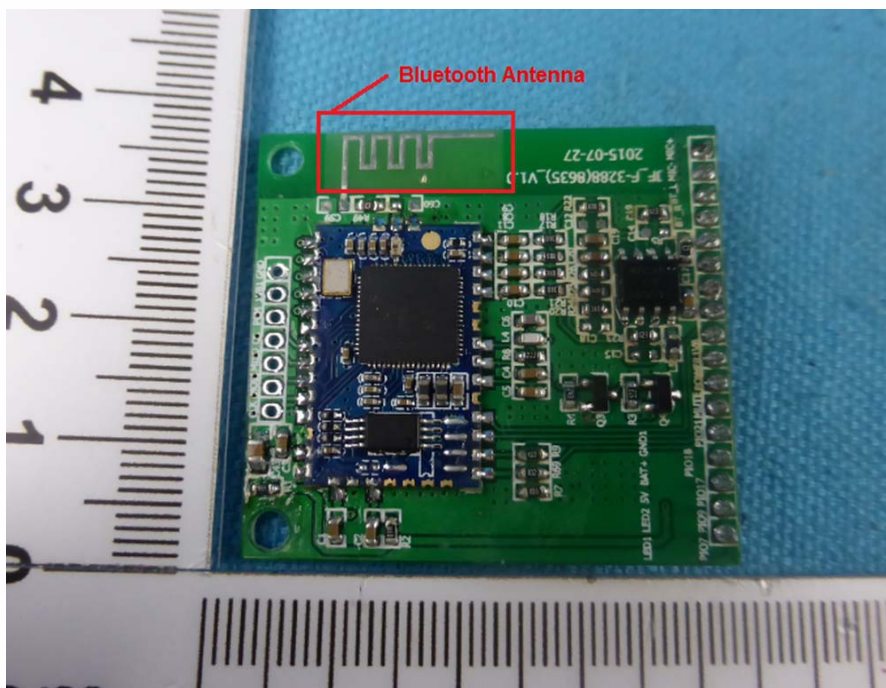
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 integrated on the main PCB 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:	<table><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBμV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>	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		
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																

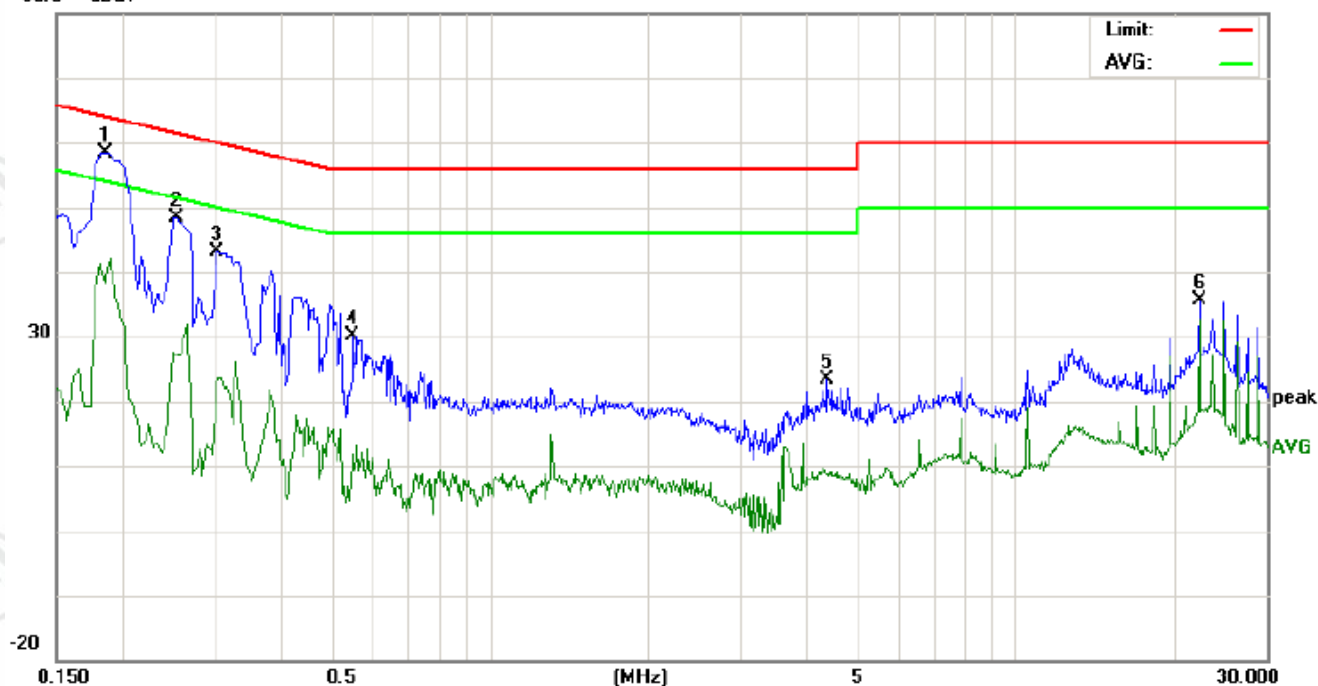
Measurement Data

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:

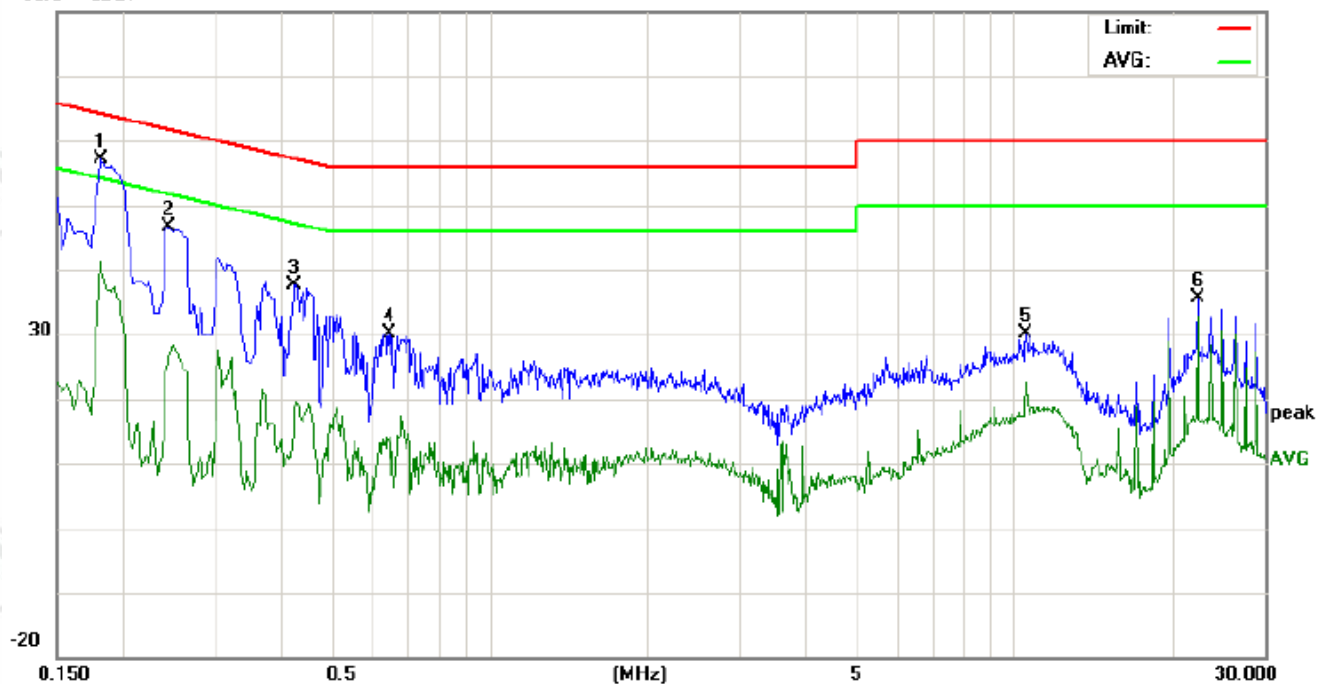
80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1860	48.68	45.92	27.37	9.80	58.48	55.72	37.17	64.21	54.21	-8.49	-17.04	P	
2	0.2540	38.54	36.02	17.52	9.80	48.34	45.82	27.32	61.62	51.62	-15.80	-24.30	P	
3	0.3020	33.31	30.00	11.63	9.80	43.11	39.80	21.43	60.19	50.19	-20.39	-28.76	P	
4	0.5500	20.25	15.23	-0.32	9.90	30.15	25.13	9.58	56.00	46.00	-30.87	-36.42	P	
5	4.3940	13.34	4.63	-1.70	10.00	23.34	14.63	8.30	56.00	46.00	-41.37	-37.70	P	
6	22.3500	25.24	12.61	6.95	10.45	35.69	23.06	17.40	60.00	50.00	-36.94	-32.60	P	

Neutral line:

80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1819	47.35	42.86	21.54	9.80	57.15	52.66	31.34	64.39	54.39	-11.73	-23.05	P	
2	0.2460	36.83	34.05	14.65	9.80	46.63	43.85	24.45	61.89	51.89	-18.04	-27.44	P	
3	0.4260	27.65	24.99	12.70	9.90	37.55	34.89	22.60	57.33	47.33	-22.44	-24.73	P	
4	0.6460	20.33	15.56	0.97	9.90	30.23	25.46	10.87	56.00	46.00	-30.54	-35.13	P	
5	10.5460	20.19	17.06	11.63	10.01	30.20	27.07	21.64	60.00	50.00	-32.93	-28.36	P	
6	22.3980	25.18	15.89	9.26	10.45	35.63	26.34	19.71	60.00	50.00	-33.66	-30.29	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)

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Test Procedure:	<p>Below 1GHz test procedure as below:</p> <ol style="list-style-type: none"> The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 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. 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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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 <p>Above 1GHz test procedure as below:</p> <ol style="list-style-type: none"> Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre). Test the EUT in the lowest channel , the Highest channel 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. Repeat above procedures until all frequencies measured was complete. 				
Limit:	Frequency	Limit (dBuV/m @3m)	Remark		
	30MHz-88MHz	40.0	Quasi-peak Value		
	88MHz-216MHz	43.5	Quasi-peak Value		
	216MHz-960MHz	46.0	Quasi-peak Value		
	960MHz-1GHz	54.0	Quasi-peak Value		
	Above 1GHz	54.0	Average Value		
		74.0	Peak Value		

Test plot as follows:

Worse case mode:		GFSK (DH5)								
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis	Remark	Test channel
2390	32.53	37.21	4.28	43.86	43.46	74	-30.54	H	PK	Lowest
2390	32.53	37.21	4.28	44.02	43.62	74	-30.38	V	PK	Lowest
2483.5	32.71	37.19	4.51	46.32	46.35	74	-27.65	H	PK	Highest
2483.5	32.71	37.19	4.51	51.90	51.93	74	-22.07	V	PK	Highest

Worse case mode:		$\pi/4$ DQPSK (2DH5)								
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis	Remark	Test channel
2390	32.53	37.21	4.28	44.76	44.36	74	-29.64	H	PK	Lowest
2390	32.53	37.21	4.28	44.31	43.91	74	-30.09	V	PK	Lowest
2483.5	32.71	37.19	4.51	45.70	45.73	74	-28.27	H	PK	Highest
2483.5	32.71	37.19	4.51	45.85	45.88	74	-28.12	V	PK	Highest

Worse case mode:		8DPSK (3DH5)								
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis	Remark	Test channel
2390	32.53	37.21	4.28	44.64	44.24	74	-29.76	H	PK	Lowest
2390	32.53	37.21	4.28	43.94	43.54	74	-30.46	V	PK	Lowest
2483.5	32.71	37.19	4.51	52.20	52.23	74	-21.77	H	PK	Highest
2483.5	32.71	37.19	4.51	46.92	46.95	74	-27.05	V	PK	Highest

Note:

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

2) 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

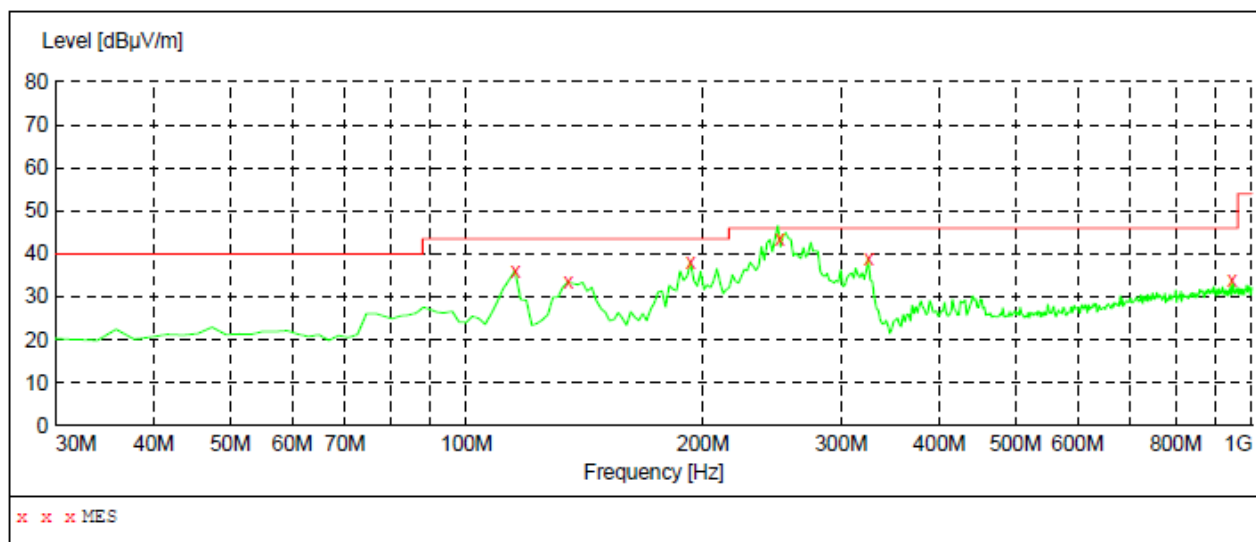
Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

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	120 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Test Procedure:					
Below 1GHz test procedure as below:					
<p>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p>					
Above 1GHz test procedure as below:					
<p>g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).</p> <p>h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel</p> <p>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.</p> <p>j. Repeat above procedures until all frequencies measured was complete.</p>					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/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.				

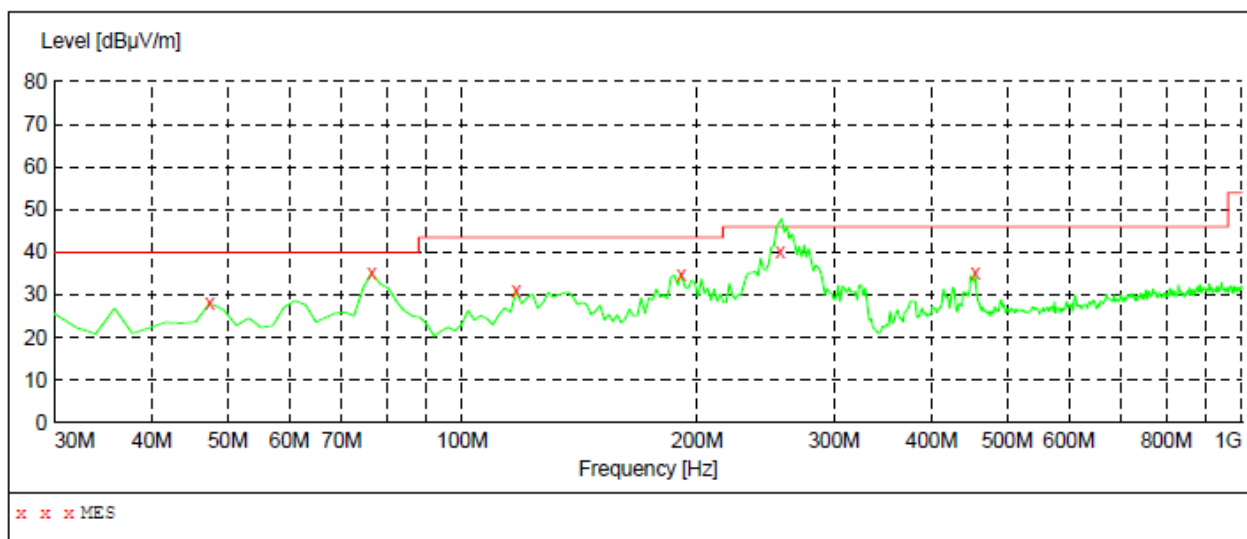
Radiated Spurious Emissions test Data: **Radiated Emission below 1GHz**

30MHz~1GHz (QP)



MEASUREMENT RESULT:

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
115.360000	36.10	13.5	43.5	7.4	QP	200.0	237.00	HORIZONTAL
134.760000	33.40	12.2	43.5	10.1	QP	200.0	68.00	HORIZONTAL
192.960000	38.00	13.5	43.5	5.5	QP	100.0	11.00	HORIZONTAL
249.220000	43.20	14.7	46.0	2.8	QP	100.0	10.00	HORIZONTAL
324.880000	39.00	16.7	46.0	7.0	QP	100.0	204.00	HORIZONTAL
943.740000	33.80	26.7	46.0	12.2	QP	200.0	158.00	HORIZONTAL



MEASUREMENT RESULT:

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.460000	28.10	16.3	40.0	11.9	QP	100.0	101.00	VERTICAL
76.560000	35.20	10.7	40.0	4.8	QP	200.0	182.00	VERTICAL
117.300000	30.90	13.4	43.5	12.6	QP	200.0	131.00	VERTICAL
191.020000	34.90	13.4	43.5	8.6	QP	100.0	339.00	VERTICAL
256.980000	40.20	14.9	46.0	5.8	QP	200.0	90.00	VERTICAL
454.860000	35.10	20.2	46.0	10.9	QP	100.0	61.00	VERTICAL

Transmitter Emission above 1GHz

Worse case mode:			GFSK (DH5)		Test channel:		2402MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1659.574	31.16	37.73	2.97	53.92	50.32	74	-23.68	H
1846.834	31.47	37.48	3.12	45.24	42.35	74	-31.65	H
2995.538	33.59	37.10	5.61	48.05	50.15	74	-23.85	H
4804.000	34.69	36.82	5.11	45.44	48.42	74	-25.58	H
7206.000	36.42	37.46	6.66	43.53	49.15	74	-24.85	H
9608.000	37.88	37.82	7.73	44.15	51.94	74	-22.06	H
1545.405	30.96	37.90	2.87	50.18	46.11	74	-27.89	V
1659.574	31.16	37.73	2.97	49.31	45.71	74	-28.29	V
3003.173	33.60	37.10	5.62	48.43	50.55	74	-23.45	V
4804.000	34.69	36.82	5.11	46.06	49.04	74	-24.96	V
7206.000	36.42	37.46	6.66	43.50	49.12	74	-24.88	V
9608.000	37.88	37.82	7.73	45.09	52.88	74	-21.12	V

Worse case mode:			GFSK (DH5)		Test channel:		2441MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1655.354	31.15	37.74	2.97	48.21	44.59	74	-29.41	H
2995.538	33.59	37.1	5.61	48.51	50.61	74	-23.39	H
3376.244	33.27	37.02	5.55	45.25	47.05	74	-26.95	H
4882.000	34.85	36.81	5.08	46.4	49.52	74	-24.48	H
7323.000	36.43	37.43	6.77	45.97	51.74	74	-22.26	H
9764.000	38.05	37.85	7.6	44.19	51.99	74	-22.01	H
1655.354	31.15	37.74	2.97	46.49	42.87	74	-31.13	V
3003.173	33.6	37.1	5.62	48.76	50.88	74	-23.12	V
3786.010	32.95	36.94	5.47	45.47	46.95	74	-27.05	V
4882.000	34.85	36.81	5.08	48.32	51.44	74	-22.56	V
7323.000	36.43	37.43	6.77	42.67	48.44	74	-25.56	V
9764.000	38.05	37.85	7.6	44.99	52.79	74	-21.21	V

Worse case mode:			GFSK (DH5)		Test channel:		2480MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1659.574	31.16	37.73	2.97	52.34	48.74	74	-25.26	H
2995.538	33.59	37.10	5.61	47.77	49.87	74	-24.13	H
4096.875	33.05	36.89	5.40	45.27	46.83	74	-27.17	H
4960.000	35.02	36.80	5.05	46.66	49.93	74	-24.07	H
7440.000	36.45	37.41	6.88	43.08	49.00	74	-25.00	H
9920.000	38.22	37.88	7.47	44.31	52.12	74	-21.88	H
1329.894	30.52	38.24	2.66	49.70	44.64	74	-29.36	V
1537.557	30.94	37.91	2.86	47.49	43.38	74	-30.62	V
3766.785	32.97	36.94	5.48	45.26	46.77	74	-27.23	V
4960.000	35.02	36.80	5.05	46.33	49.60	74	-24.40	V
7440.000	36.45	37.41	6.88	42.60	48.52	74	-25.48	V
9920.000	38.22	37.88	7.47	44.27	52.08	74	-21.92	V

Worse case mode:			$\pi/4$ DQPSK (2DH5)		Test channel:		2402MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1597.401	31.05	37.82	2.92	45.95	42.10	74	-31.90	H
1938.352	31.61	37.37	3.19	45.27	42.70	74	-31.30	H
2995.538	33.59	37.10	5.61	46.92	49.02	74	-24.98	H
4804.000	34.69	36.82	5.11	43.32	46.30	74	-27.70	H
7206.000	36.42	37.46	6.66	42.15	47.77	74	-26.23	H
9608.000	37.88	37.82	7.73	43.82	51.61	74	-22.39	H
1329.894	30.52	38.24	2.66	48.49	43.43	74	-30.57	V
1525.860	30.92	37.92	2.85	45.29	41.14	74	-32.86	V
3249.760	33.38	37.04	5.57	47.37	49.28	74	-24.72	V
4804.000	34.69	36.82	5.11	43.60	46.58	74	-27.42	V
7206.000	36.42	37.46	6.66	42.63	48.25	74	-25.75	V
9608.000	37.88	37.82	7.73	44.31	52.10	74	-21.90	V

Worse case mode:			$\pi/4$ DQPSK (2DH5)		Test channel:		2441MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1450.122	30.77	38.04	2.78	46.31	41.82	74	-32.18	H
1870.490	31.51	37.45	3.14	45.72	42.92	74	-31.08	H
3283.018	33.35	37.04	5.56	45.68	47.55	74	-26.45	H
4882.000	34.85	36.81	5.08	44.66	47.78	74	-26.22	H
7323.000	36.43	37.43	6.77	43.44	49.21	74	-24.79	H
9764.000	38.05	37.85	7.60	44.40	52.20	74	-21.80	H
1518.111	30.90	37.94	2.84	51.55	47.35	74	-26.65	V
2995.538	33.59	37.10	5.61	49.88	51.98	74	-22.02	V
3757.208	32.97	36.94	5.48	45.21	46.72	74	-27.28	V
4884.000	34.86	36.81	5.08	45.82	48.95	74	-25.05	V
7323.000	36.43	37.43	6.77	43.60	49.37	74	-24.63	V
9764.000	38.05	37.85	7.60	43.71	51.51	74	-22.49	V

Worse case mode:			$\pi/4$ DQPSK (2DH5)		Test channel:		2480MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1476.193	30.82	38.00	2.81	45.86	41.49	74	-32.51	H
2086.856	31.90	37.28	3.48	45.16	43.26	74	-30.74	H
2995.538	33.59	37.10	5.61	49.64	51.74	74	-22.26	H
4960.000	35.02	36.80	5.05	43.66	46.93	74	-27.07	H
7440.000	36.45	37.41	6.88	42.77	48.69	74	-25.31	H
9920.000	38.22	37.88	7.47	44.38	52.19	74	-21.81	H
1553.293	30.97	37.88	2.88	50.53	46.50	74	-27.50	V
1764.123	31.34	37.59	3.05	51.50	48.30	74	-25.70	V
2995.538	33.59	37.10	5.61	48.32	50.42	74	-23.58	V
4960.000	35.02	36.80	5.05	44.94	48.21	74	-25.79	V
7440.000	36.45	37.41	6.88	43.44	49.36	74	-24.64	V
9920.000	38.22	37.88	7.47	44.44	52.25	74	-21.75	V

Worse case mode:			8DPSK (3DH5)		Test channel:		2402MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1329.894	30.52	38.24	2.66	48.16	43.10	74	-30.90	H
1597.401	31.05	37.82	2.92	47.45	43.60	74	-30.40	H
3003.173	33.60	37.10	5.62	47.93	50.05	74	-23.95	H
4804.000	34.69	36.82	5.11	44.80	47.78	74	-26.22	H
7206.000	36.42	37.46	6.66	43.58	49.20	74	-24.80	H
9608.000	37.88	37.82	7.73	44.97	52.76	74	-21.24	H
1518.111	30.90	37.94	2.84	46.16	41.96	74	-32.04	V
1663.803	31.17	37.72	2.97	49.45	45.87	74	-28.13	V
3003.173	33.60	37.10	5.62	47.98	50.10	74	-23.90	V
4804.000	34.69	36.82	5.11	42.85	45.83	74	-28.17	V
7206.000	36.42	37.46	6.66	43.07	48.69	74	-25.31	V
9608.000	37.88	37.82	7.73	44.26	52.05	74	-21.95	V

Worse case mode:			8DPSK (3DH5)		Test channel:		2441MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamp Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1541.476	30.95	37.90	2.87	51.34	47.26	74	-26.74	H
1668.044	31.18	37.72	2.98	48.91	45.35	74	-28.65	H
2995.538	33.59	37.10	5.61	50.04	52.14	74	-21.86	H
4884.000	34.86	36.81	5.08	46.54	49.67	74	-24.33	H
7323.000	36.43	37.43	6.77	42.74	48.51	74	-25.49	H
9764.000	38.05	37.85	7.60	43.92	51.72	74	-22.28	H
1399.353	30.67	38.12	2.73	45.65	40.93	74	-33.07	V
1923.606	31.59	37.39	3.18	44.73	42.11	74	-31.89	V
3258.042	33.37	37.04	5.57	46.97	48.87	74	-25.13	V
4884.000	34.86	36.81	5.08	44.69	47.82	74	-26.18	V
7323.000	36.43	37.43	6.77	42.54	48.31	74	-25.69	V
9764.000	38.05	37.85	7.60	44.05	51.85	74	-22.15	V

Worse case mode:			8DPSK (3DH5)		Test channel:		2480MHz	
Frequency (MHz)	Antenna Factor (dB/m)	Preamplifier Gain (dB)	Cable Loss (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna Polaxis
1293.173	30.44	38.31	2.62	48.47	43.22	74	-30.78	H
1549.344	30.96	37.89	2.87	48.63	44.57	74	-29.43	H
3003.173	33.60	37.10	5.62	49.75	51.87	74	-22.13	H
4960.000	35.02	36.80	5.05	45.03	48.30	74	-25.70	H
7440.000	36.45	37.41	6.88	43.27	49.19	74	-24.81	H
9920.000	38.22	37.88	7.47	44.55	52.36	74	-21.64	H
1487.509	30.85	37.98	2.82	46.49	42.18	74	-31.82	V
1663.803	31.17	37.72	2.97	51.41	47.83	74	-26.17	V
2995.538	33.59	37.10	5.61	49.17	51.27	74	-22.73	V
4960.000	35.02	36.80	5.05	43.34	46.61	74	-27.39	V
7440.000	36.45	37.41	6.88	43.53	49.45	74	-24.55	V
9920.000	38.22	37.88	7.47	44.27	52.08	74	-21.92	V

Note:

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

2) 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

PHOTOGRAPHS OF TEST SETUP

Test mode No.: CB-RED



Radiated spurious emission Test Setup-1(Below 1GHz)



Radiated spurious emission Test Setup-2(Above 1GHz)



Conducted emission Test Setup

PHOTOGRAPHS OF EUT Constructional Details

Test mode No.: CB-RED



View of product-1



View of product-2



View of product-3



View of product-4



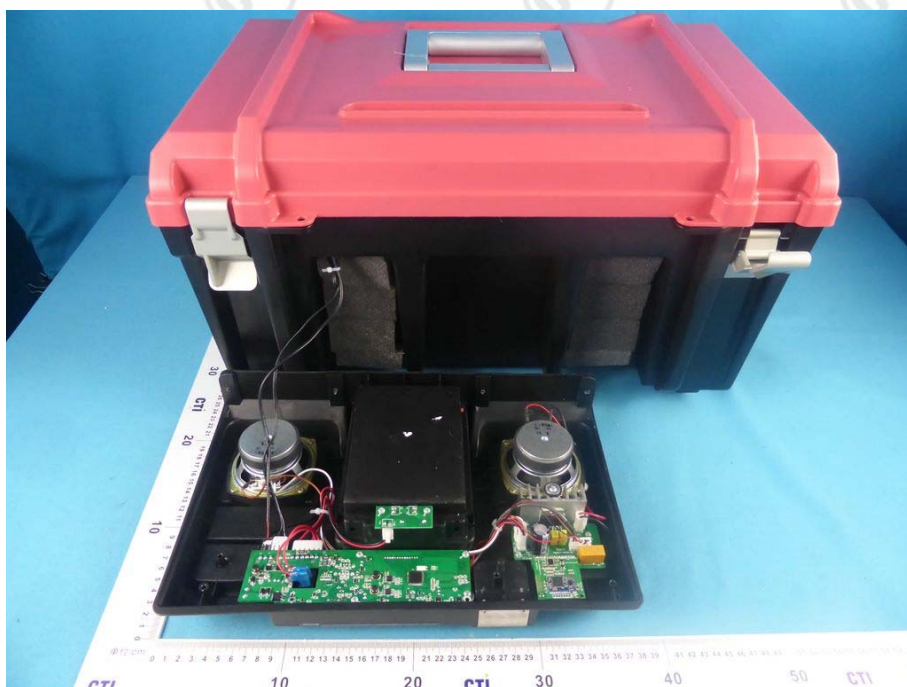
View of product-5



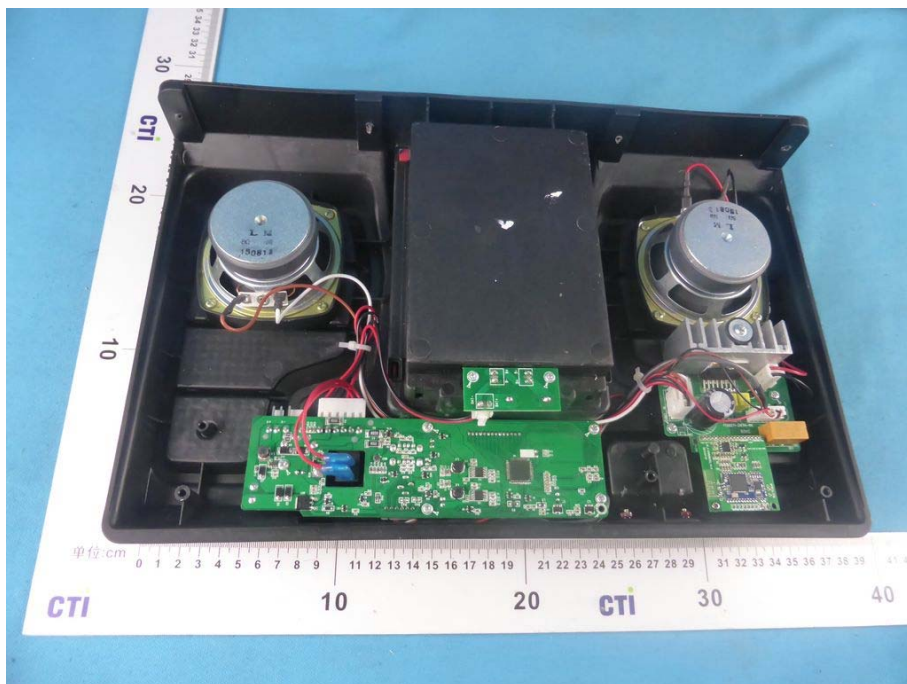
View of product-6



View of product-7



View of product-8



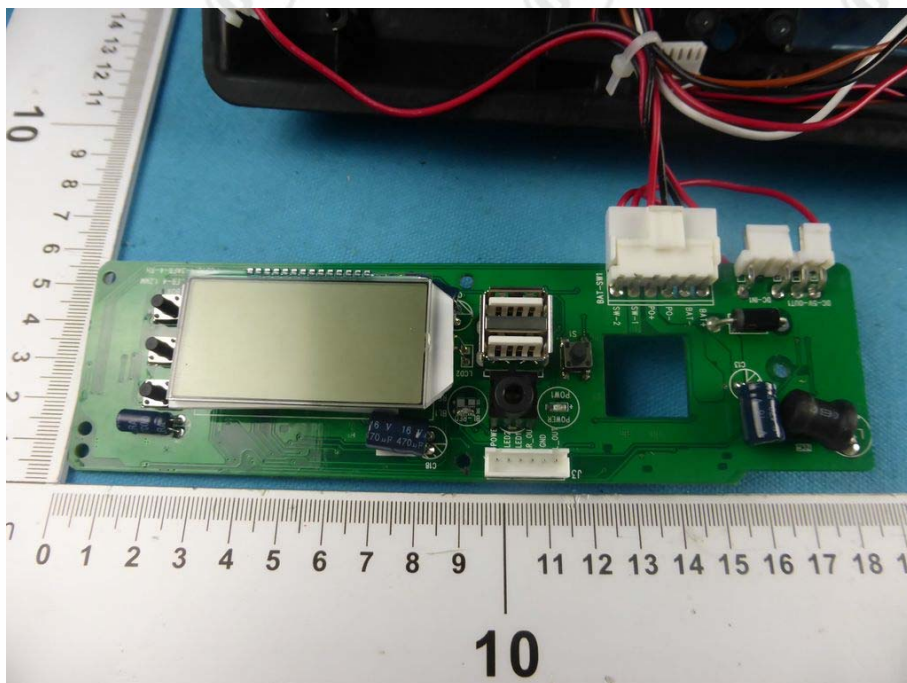
View of product-9



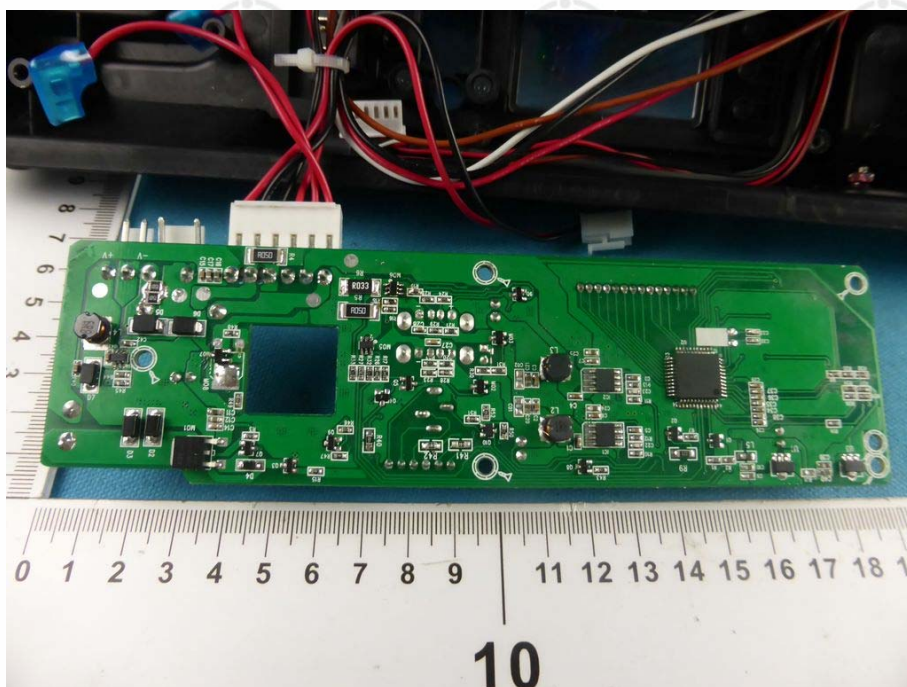
View of product-10



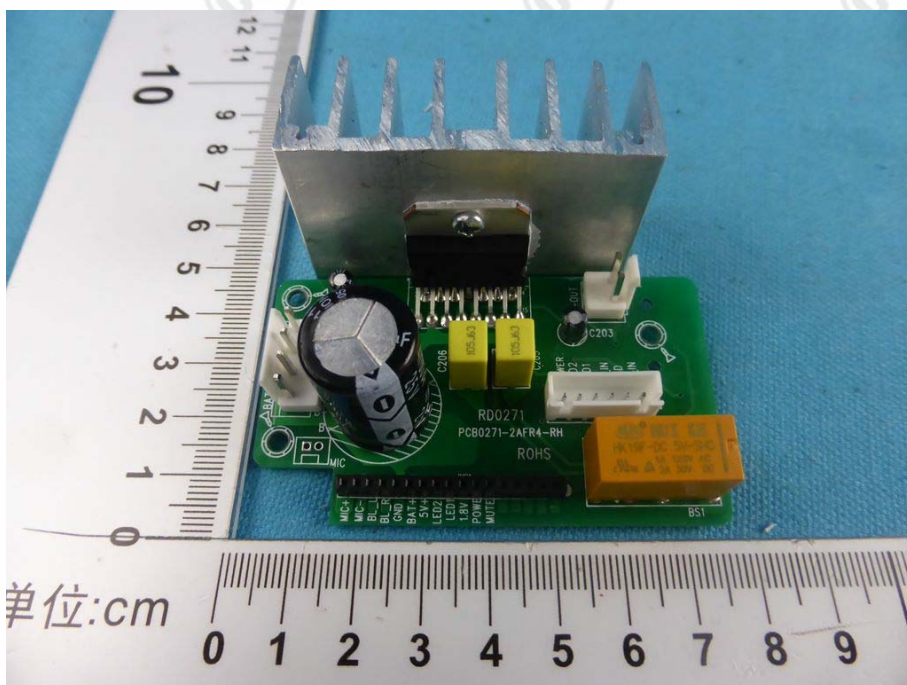
View of product-11



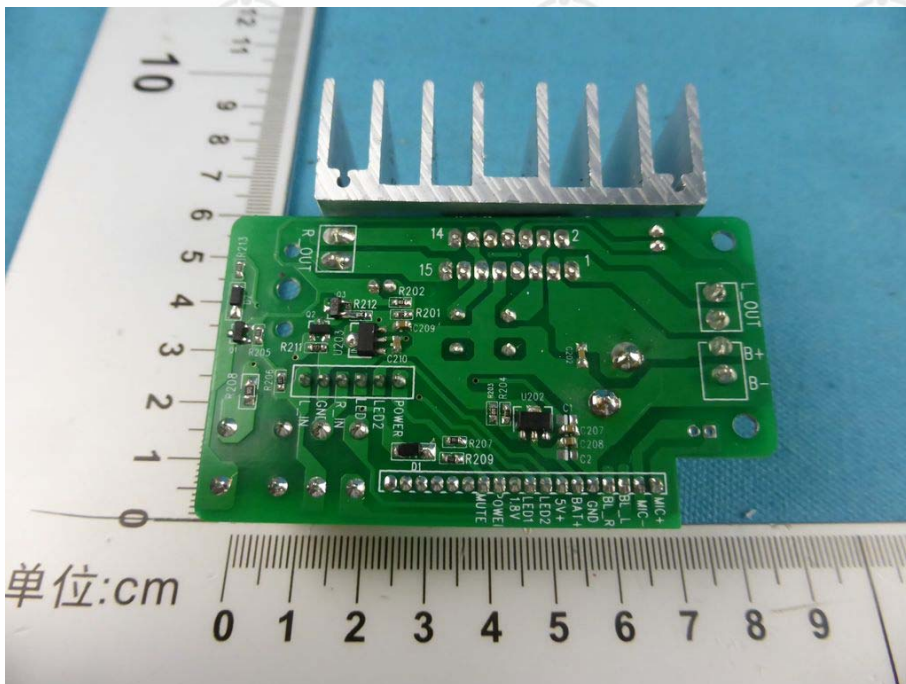
View of product-12



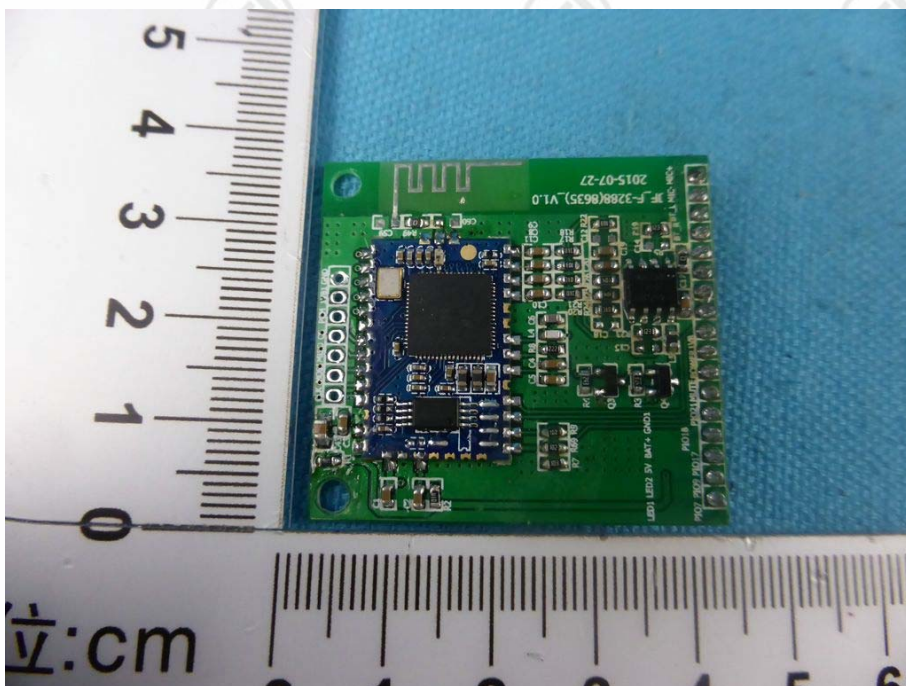
View of product-13



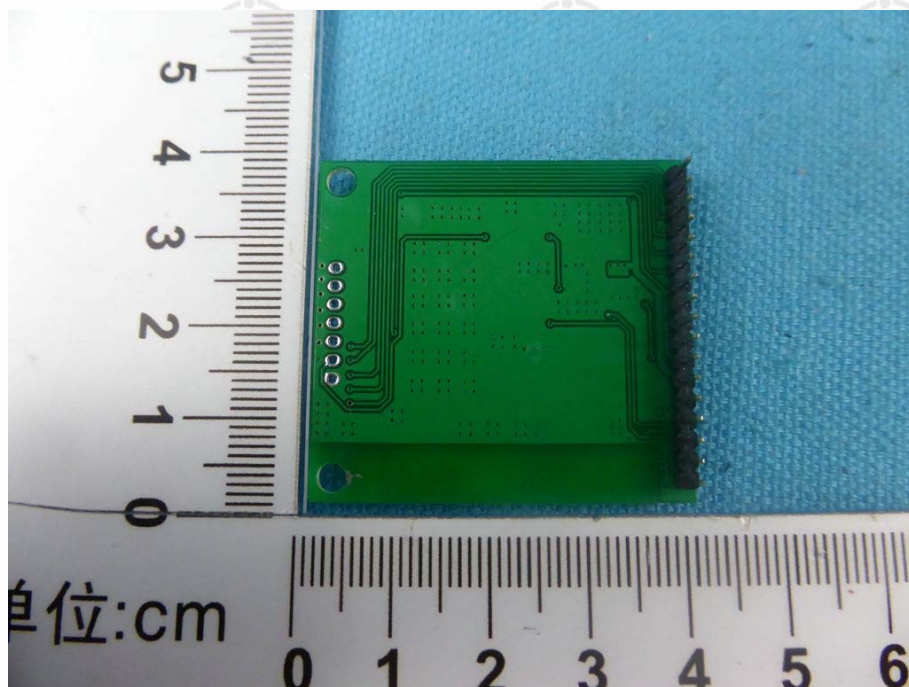
View of product-14



View of product-15



View of product-16



View of product-17

*** End of Report ***

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