

TEST REPORT

Product : Smart Door Lock
Trade mark : /
Model/Type reference : 3109
Serial Number : N/A
Report Number : EED32P80445303
FCC ID : 2BAX9-3109
Date of Issue : May. 05, 2023
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Guangdong HOTATA Technology Group Co.,Ltd.
No.21 Shihua Road, Hualong Town, Panyu District, Guangzhou.

Prepared by:

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Date of issue:

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1 Version

Version No.	Date	Description
00	May. 05, 2023	Original

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3 Test Summary

Test Item	FCC Test Requirement	Test Method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 2013	Pass
Conducted Emission (150KHz to 30MHz)	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	Pass
Electric Field Strength of Fundamental and Outside the Allocated bands	47 CFR Part 15, Subpart C Section 15.225(a)/(b)/(c)	ANSI C63.10 2013	Pass
Radiated Emission	47 CFR Part 15, Subpart C Section 15.225(d)/15.209	ANSI C63.10 2013	Pass
Frequency Tolerance	47 CFR Part 15, Subpart C Section 15.225(e)	ANSI C63.10 2013	Pass
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215	ANSI C63.10 2013	Pass

Remark:

Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

4 General Information

4.1 Client Information

Applicant:	Guangdong HOTATA Technology Group Co.,Ltd.
Address of Applicant:	No.21 Shihua Road,Hualong Town,Panyu District,Guangzhou.
Manufacturer:	Guangdong HOTATA Technology Group Co.,Ltd.
Address of Manufacturer:	No.21 Shihua Road,Hualong Town,Panyu District,Guangzhou.
Factory:	Zhongshan Fuyu Intelligent Lock Mfg Co.,Ltd.
Address of Factory:	Liansheng South Road,Lianfeng Industrial Zone,Xiaolan town,Zhongshan city,Guangdong,China

4.2 General Description of EUT

Product Name:	Smart Door Lock
Test Mode No.:	3109
Trade mark:	/
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	PCB antenna
Power Supply:	Battery DC 6.0V
Test Voltage:	DC 6.0V
Sample Received Date:	Mar. 31, 2023
Sample tested Date:	Mar. 31, 2023 to Apr. 21, 2023

4.3 Test Environment & Test Mode

Operating Environment:	
Radiated Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Conducted Emissions:	
Temperature:	22~25.0 °C
Humidity:	50~55 % RH
Atmospheric Pressure:	1010mbar
Test Mode:	
Mode a:	Keep EUT working in continuous transmitting mode with 100% duty cycle.

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
/	/	/	/	/

4.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

4.6 Deviation from Standards

None.

4.7 Abnormalities from Standard Conditions

None.

4.8 Other Information Requested by the Customer

None.

4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.46dB (30MHz-1GHz)
		0.55dB (1GHz-18GHz)
3	Radiated Spurious emission test	3.3dB (9kHz-30MHz)
		4.3dB (30MHz-1GHz)
		4.5dB (1GHz-12.75GHz)
4	Conduction emission	3.5dB (9kHz to 150kHz)
		3.1dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	3.8%
7	DC power voltages	0.026%

4.10 Equipment List

Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05/22/2022	05/21/2025
Receiver	R&S	ESCI7	100938-003	09/28/2022	09/27/2023
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	9163-618	05/22/2022	05/21/2023
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04/17/2021	04/16/2024
Multi device Controller	maturo	NCD/070/10711112	---	---	---
Horn Antenna	ETS-LINGREN	BBHA 9120D	9120D-1869	04/17/2021	04/16/2024
Microwave Preamplifier	Agilent	8449B	3008A02425	06/20/2022	06/19/2023
high-low temperature test chamber	Dong Guang Qin Zhuo	LK-80GA	QZ20150611 879	12-19-2022	12-28-2023
Receiver	R&S	ESCI	100009	05-12-2022	05-11-2023

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100435	05-06-2022	05-05-2023
Temperature/Humidity Indicator	Defu	TH128	/	---	---
LISN	R&S	ENV216	100098	09-27-2022	09-26-2023
Barometer	changchun	DYM3	1188	---	---

5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR 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.

5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
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 Procedure:	<ol style="list-style-type: none"> 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 $50\Omega/50\mu\text{H} + 5\Omega$ 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: 2013 on conducted measurement. 		
Test Setup:			

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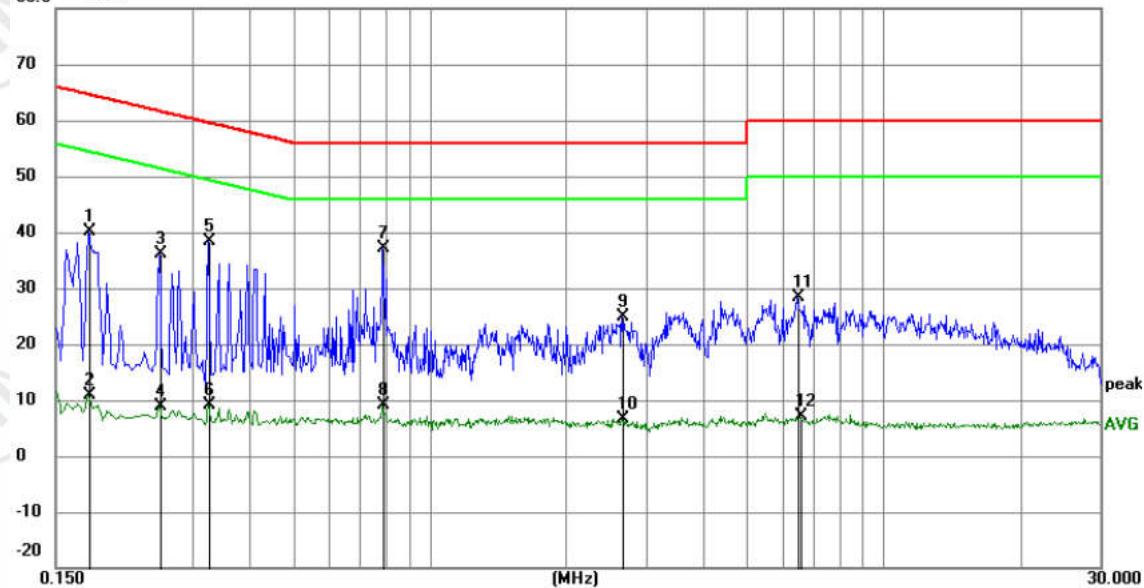
Test Mode:	Transmitting with ASK modulation.
Test Results:	Pass

Measurement Data

Mode a:

Live line:

80.0 dBuV



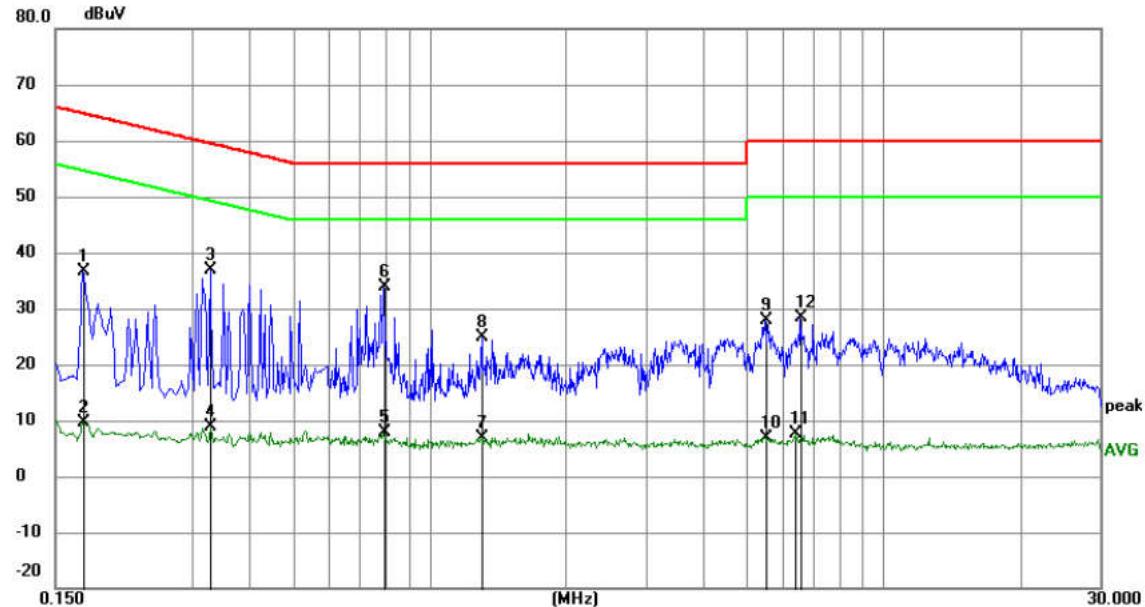
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1770	30.17	9.87	40.04	64.63	-24.59	QP	
2		0.1770	0.99	9.87	10.86	54.63	-43.77	AVG	
3		0.2535	26.06	9.98	36.04	61.64	-25.60	QP	
4		0.2535	-1.13	9.98	8.85	51.64	-42.79	AVG	
5		0.3255	28.27	10.04	38.31	59.57	-21.26	QP	
6		0.3255	-0.80	10.04	9.24	49.57	-40.33	AVG	
7	*	0.7890	27.35	9.85	37.20	56.00	-18.80	QP	
8		0.7890	-0.69	9.85	9.16	46.00	-36.84	AVG	
9		2.6520	15.16	9.79	24.95	56.00	-31.05	QP	
10		2.6520	-3.27	9.79	6.52	46.00	-39.48	AVG	
11		6.4590	18.62	9.79	28.41	60.00	-31.59	QP	
12		6.5805	-2.63	9.79	7.16	50.00	-42.84	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Mode a:

Neutral line:

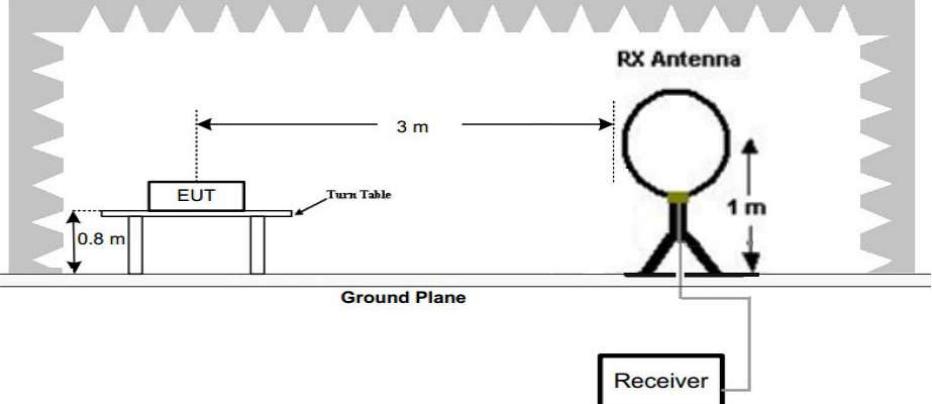


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1725	26.75	9.87	36.62	64.84	-28.22	QP	
2		0.1725	-0.25	9.87	9.62	54.84	-45.22	AVG	
3		0.3300	26.79	10.04	36.83	59.45	-22.62	QP	
4		0.3300	-1.28	10.04	8.76	49.45	-40.69	AVG	
5		0.7934	-2.06	9.85	7.79	46.00	-38.21	AVG	
6	*	0.7935	24.10	9.85	33.95	56.00	-22.05	QP	
7		1.3064	-2.84	9.82	6.98	46.00	-39.02	AVG	
8		1.3065	15.02	9.82	24.84	56.00	-31.16	QP	
9		5.4960	18.00	9.78	27.78	60.00	-32.22	QP	
10		5.4960	-2.79	9.78	6.99	50.00	-43.01	AVG	
11		6.4050	-2.20	9.79	7.59	50.00	-42.41	AVG	
12		6.5760	18.65	9.79	28.44	60.00	-31.56	QP	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

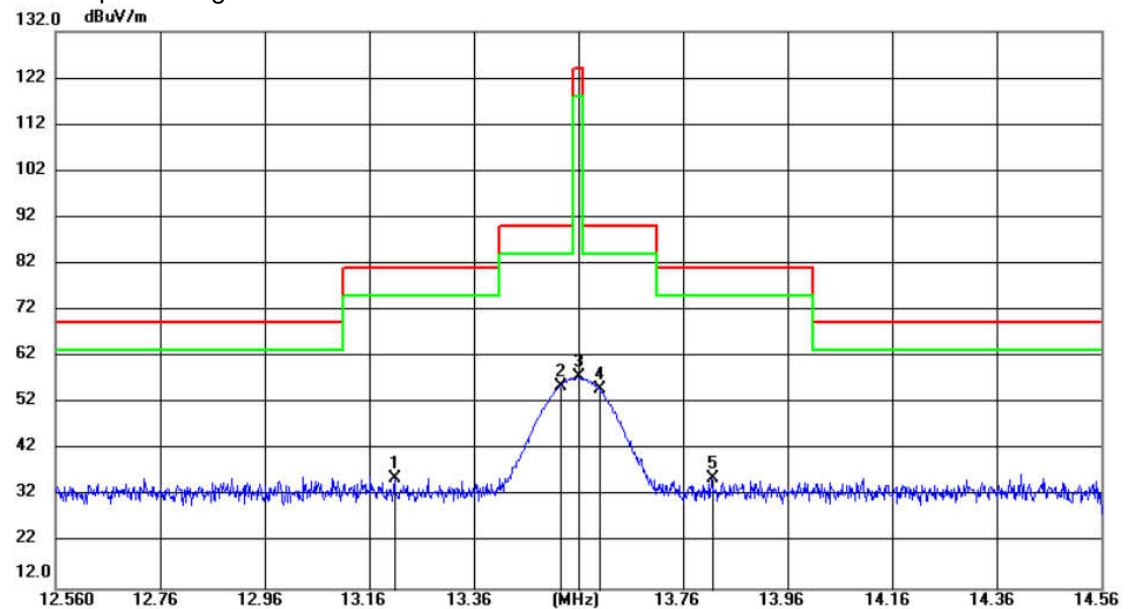
5.3 Electric Field Strength of Fundamental and Outside the Allocated bands

Test Requirement:	47 CFR Part 15, Subpart C Section 15.225(a)/(b)/(c)								
Test Method:	ANSI C63.10: 2013								
Test Site:	3m (Semi-Anechoic Chamber)								
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				
Limit:	Frequency Range(MHz)	E-field Strength Limit @ 30 m (μ V/m)		E-field Strength Limit @ 3 m (dB μ V/m)					
	13.560 \pm 0.007	15848		124					
	13.410 to 13.553	334		90					
	13.567 to 13.710								
	13.110 to 13.410	106		81					
<p>Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:</p> <p>Extrapolation(dB)=40log₁₀(Measurement Distance/Specification Distance)</p>									
Test Setup:									
	<p>Figure 1. Below 30MHz</p>								
Test Procedure:	<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 								

	<p>measurement.</p> <p>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 (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>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</p> <p>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.</p> <p>7. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.</p>
Test Mode:	Transmitting with ASK modulation.
Test Result:	Pass

Measurement Data

X axis positioning



No.	Mk.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB	dBuV/m	dB	Detector	cm	degree
1	13.2090	15.61	20.35	35.96	81.00	-45.04	peak	100	160
2 *	13.5251	35.20	20.35	55.55	90.00	-34.45	peak	100	143
3	13.5596	37.28	20.35	57.63	124.00	-66.37	peak	100	144
4	13.6000	34.75	20.35	55.10	90.00	-34.90	peak	100	340
5	13.8158	15.45	20.35	35.80	81.00	-45.20	peak	100	110

Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier.

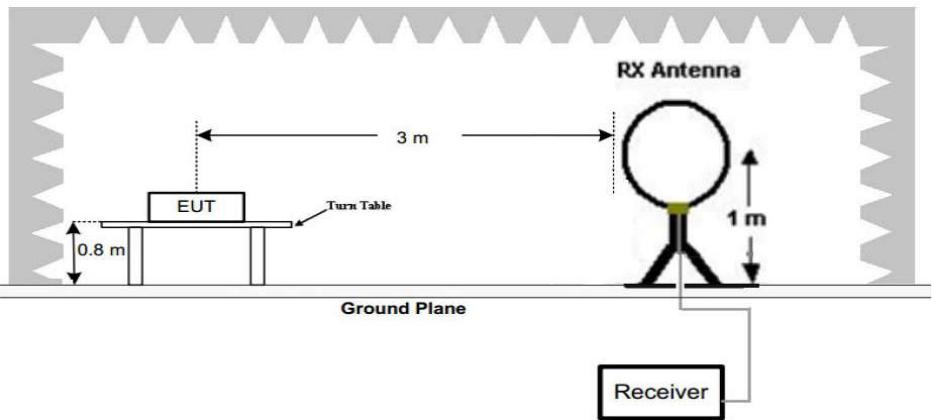
The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

5.4 Radiated Emissions

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.225(d),						
Test Method:	ANSI C63.10: 2013						
Test Site:	3m (Semi-Anechoic Chamber)						
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		
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m) @ 3 m	Remark			
	0.009MHz-0.490MHz	2400/F(kHz) @300m	128.5-93.8	Quasi-peak			
	0.490MHz-1.705MHz	24000/F(kHz) @30m	73.8-63	Quasi-peak			
	1.705MHz-30MHz	30 @30m	70	Quasi-peak			
	30MHz-88MHz	100 @3m	40.0	Quasi-peak			
	88MHz-216MHz	150 @3m	43.5	Quasi-peak			
	216MHz-960MHz	200 @3m	46.0	Quasi-peak			
	960MHz-1GHz	500 @3m	54.0	Quasi-peak			
<p>Note: Where the limits have been defined at one distance, and a signal level measured at another, the limits have been extrapolated using the following formula:</p> <p>Extrapolation(dB)=40log₁₀(Measurement Distance/Specification Distance)</p>							
Test Setup:							
	<p>Figure 1. Below 30MHz</p>						

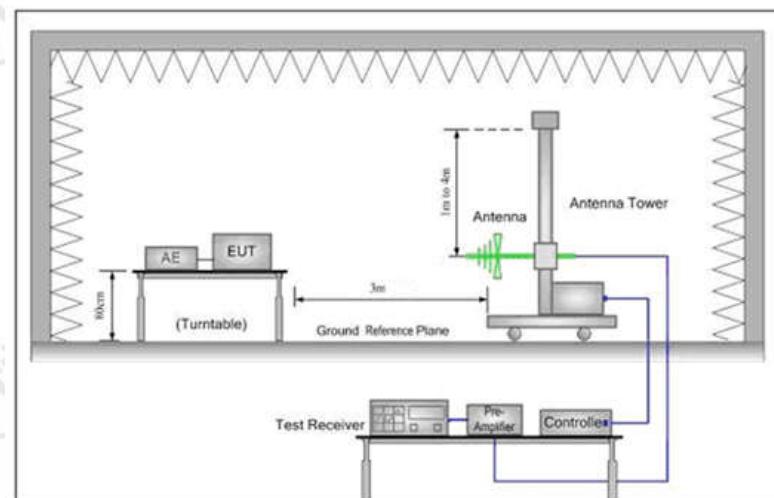


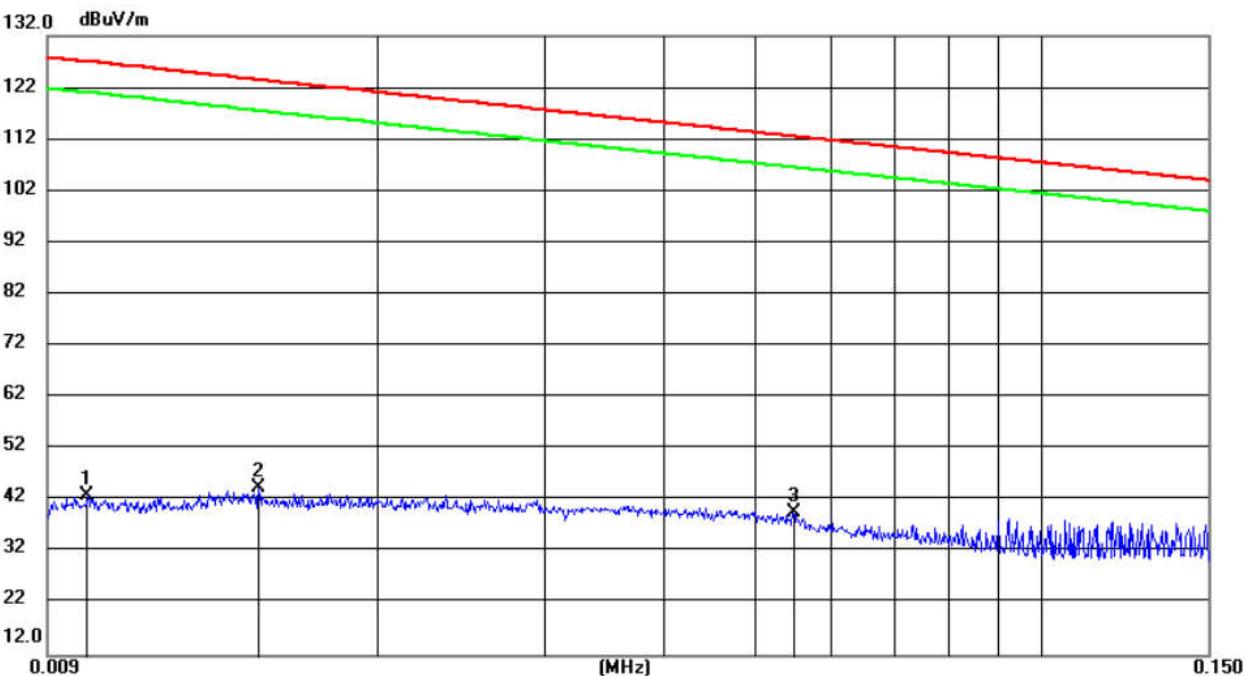
Figure 2. 30MHz to 1GHz

Test Procedure:	<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 (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. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 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. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test Mode:	Transmitting with ASK modulation.
Test Result:	Pass

Measurement Data

X axis positioning

9kHz – 150KHz:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.0099	21.88	21.27	43.15	127.01	-83.86	peak	100	22	
2		0.0150	23.69	21.00	44.69	123.50	-78.81	peak	100	120	
3	*	0.0548	19.02	20.70	39.72	112.57	-72.85	peak	100	133	

Remark:

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

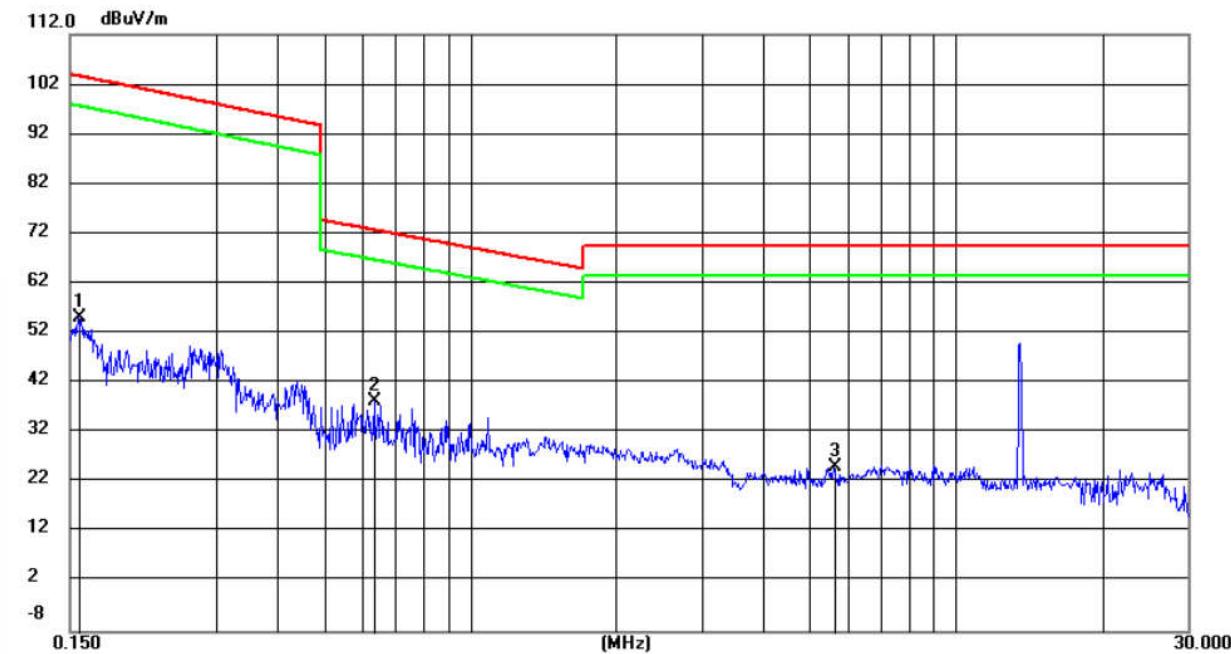
Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

X axis positioning

150KHz-30MHz:



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
			MHz	dBuV	dB	dBuV/m	dB	Detector	cm	degree	Comment
1		0.1563	34.47	20.56	55.03	103.72	-48.69	peak	100	42	
2	*	0.6357	17.97	20.44	38.41	72.75	-34.34	peak	100	133	
3		5.6187	4.91	20.38	25.29	69.54	-44.25	peak	100	12	

Remark:

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

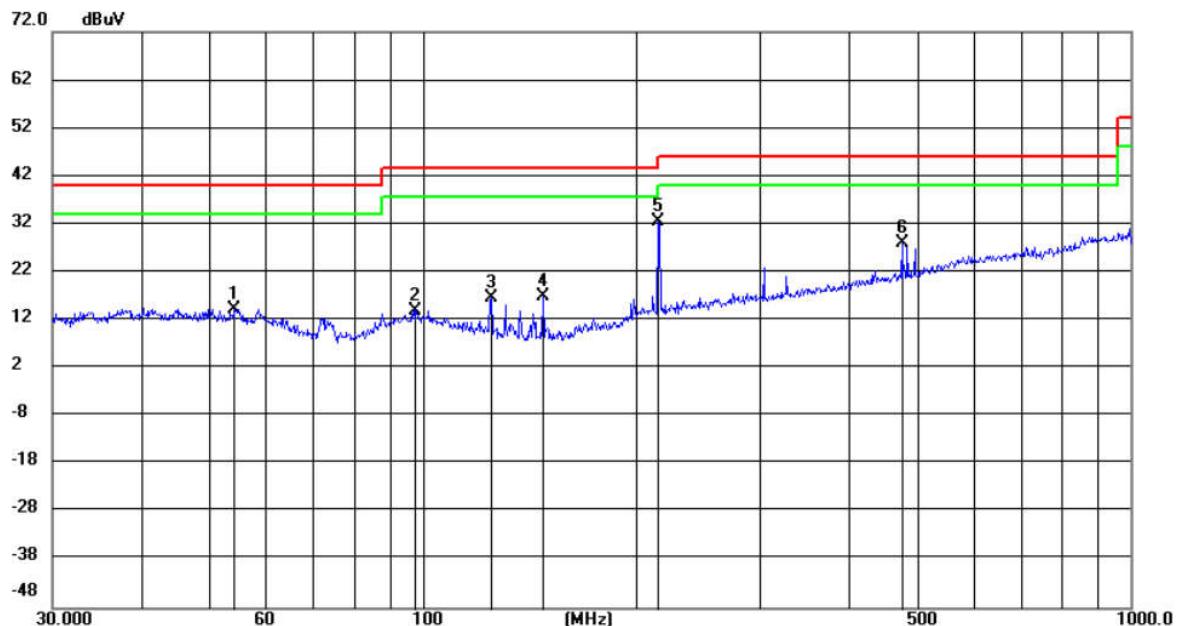
Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

30MHz-1GHz

Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment					Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		54.2609	0.38	13.97	14.35	40.00	-25.65	peak	100	275	
2		97.7983	0.36	13.74	14.10	43.50	-29.40	peak	100	292	
3		125.0065	6.11	10.43	16.54	43.50	-26.96	peak	100	318	
4		147.9214	7.12	9.88	17.00	43.50	-26.50	peak	100	171	
5	*	215.2678	18.30	14.31	32.61	43.50	-10.89	peak	200	352	
6		475.4991	7.00	21.02	28.02	46.00	-17.98	peak	200	352	

Remark:

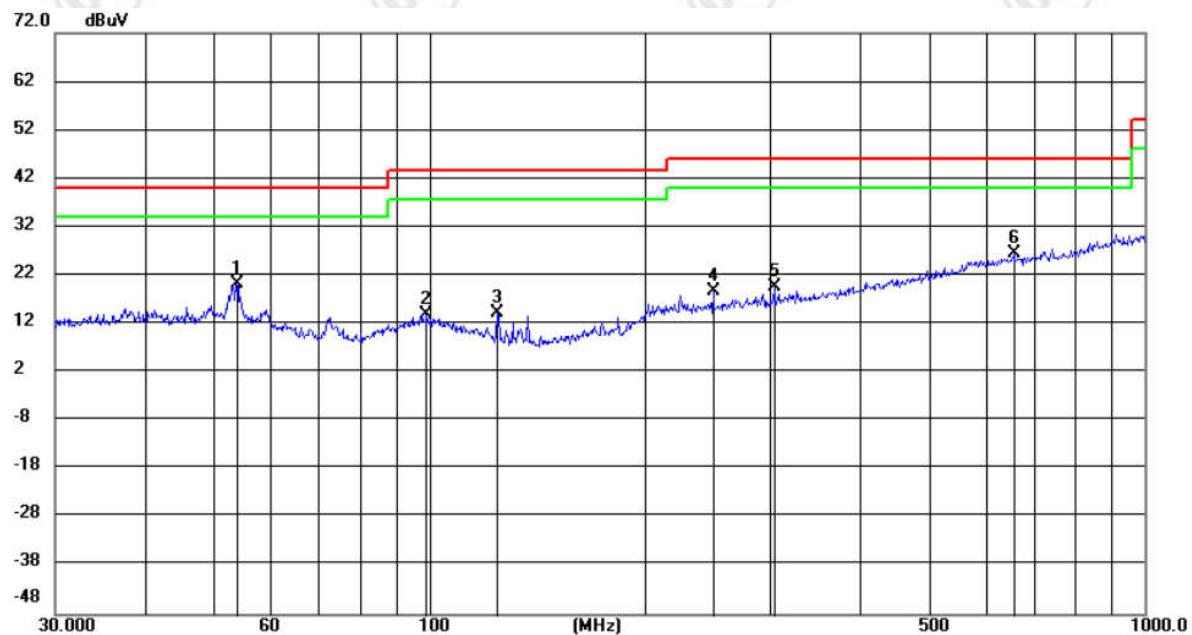
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Antenna	Table		
			Level	Factor	ment						
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		53.6932	6.11	14.01	20.12	40.00	-19.88	peak	100	142	
2		99.1797	0.02	13.93	13.95	43.50	-29.55	peak	200	41	
3		124.5690	3.71	10.50	14.21	43.50	-29.29	peak	100	352	
4		249.4250	3.13	15.49	18.62	46.00	-27.38	peak	200	232	
5		303.5437	2.26	17.32	19.58	46.00	-26.42	peak	100	352	
6	*	656.5300	2.03	24.44	26.47	46.00	-19.53	peak	200	7	

Remark:

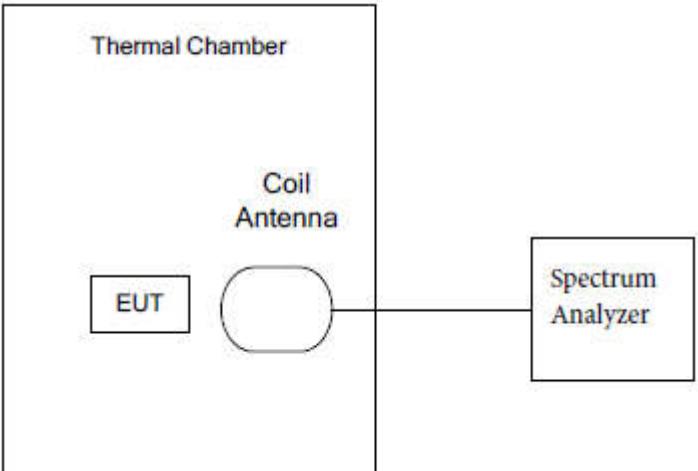
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Factor= Antenna Factor + Cable Factor – Preamplifier Factor,

Level = Read Level + Factor,

Over Limit=Level-Limit Line.

5.5 Frequency Stability

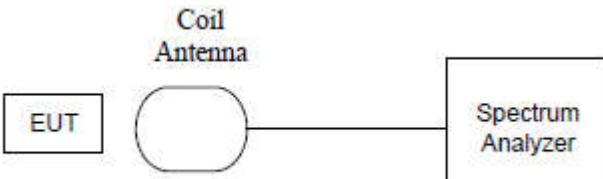
Test Requirement:	47 CFR Part 15 C Section 15.225(e)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Frequency Range:	Operation within the band 13.110-14.010 MHz
Requirements:	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
Method of Measurement:	The EUT was placed in an environmental test chamber and powered such that control element received normal voltage and the transmitter provided maximum RF output.
Test Result:	The unit does meet the FCC Part 15 C Section 15.225(e) requirements.

Test Frequency: 13.56MHz			Temperature:20°C	
Supply Voltage (V) DC	Test Result (MHz)	Deviation (kHz)	Limit ±0.01% (kHz)	Result
6.00	13.55976	-0.24	1.3560	Pass
6.90	13.55978	-0.22	1.3560	Pass
5.10	13.55970	-0.30	1.3560	Pass

Test Frequency: 13.56MHz			Normal Voltage:6.0Vdc	
Temperature (°C)	Test Result (MHz)	Deviation (kHz)	Limit ±0.01% (kHz)	Result
-20	13.55976	-0.24	1.3560	Pass
-10	13.55971	-0.29	1.3560	
0	13.55970	-0.30	1.3560	
10	13.55971	-0.29	1.3560	
20	13.55978	-0.22	1.3560	
30	13.55973	-0.27	1.3560	
40	13.55978	-0.22	1.3560	
50	13.55972	-0.28	1.3560	

Note: Deviation (KHz) = (Test Result-13.56MHz)*1000

5.6 20dB Occupied Bandwidth

Test Requirement:	47 CFR Part 15 C Section 15.215 (C)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <p>The diagram illustrates the test setup for measuring the 20dB occupied bandwidth. An 'EUT' (Equipment Under Test) is connected to a 'Coil Antenna'. The 'Coil Antenna' is connected to a 'Spectrum Analyzer'.</p>
Frequency Range:	Operation within the band 13.110 – 14.010 MHz
Requirements:	Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.
Limit:	For 13.56 MHz the permitted frequency band is 14kHz, so the limit is 11.2 kHz.

Test Data:

20dB bandwidth (Hz)	FL (MHz)	FH (MHz)	Limit(MHz)	Result
391.0	13.560246	13.560637	13.110 – 14.010	Pass

Test plot as follows:

