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DEKRA

Test Report

FCC Part15 Subpart C

RSS-Gen Issue 4

Product Name : August Smart Door Lock
Model No. : ASL-03
FCC ID : 2AB6UASL3
IC : 12163A-ASL3

Applicant : August Home Inc.

Address : 657 Bryant Street, San Francisco, 94107, USA

Date of Receipt : Feb. 21st, 2017

Test Date : Feb. 21st, 2017~ May. 17th, 2017

Issued Date : May. 17th, 2017

Report No. : 1722089R-RF-US- P06V02

Report Version : V1.2

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, CNAS or any agency of the government.

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Test Report Certification

Issued Date : May. 17th, 2017

Report No. : 1722089R-RF-US-P06V02



Product Name : August Smart Door Lock
Applicant : August Home Inc.
Address : 657 Bryant Street, San Francisco, 94107, USA
Manufacturer : GoerTek Inc
Address : No.8877 Yingqian Street, High-Tech Industrial Development District, Weifang, Shandong, 261031, P.R.China
Model No. : ASL-03
FCC ID : 2AB6UASL3
IC : 12163A-ASL3
EUT Voltage : DC 6V
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C
ANSI C63.4:2014
ANSI C63.10:2013
RSS-GEN Issue 4
Test Result : Complied
Performed Location : DEKRA Testing & Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1722089R-RF-US-P06V02	V1.0	Initial Issued Report	Mar. 28th, 2017
1722089R-RF-US-P06V02	V1.1	Modified the Applicant's name	Apr. 13th, 2017
1722089R-RF-US-P06V02	V1.2	The clause 5.6, P34, updated the data.	May. 17th, 2017

1. General Information

1.1. EUT Description

Product Name	August Smart Door Lock
Model No.	ASL-03
EUT Voltage	DC 6V
Z-wave	
Frequency Range	908-916 MHz
Channel Number	3
Type of Modulation	FSK/GFSK
Data Rate	9.6/40/100kbps
Channel Control	Auto

1.2. Antenna information

Model No.	N/A					
Antenna manufacturer	N/A					
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX	☐	3*TX+3*RX
Antenna technology	☒	SISO				
	☐	MIMO	☐	Basic		
			☐	CDD		
			☐	Sectorized		
			☐	Beam-forming		
Antenna Type	☐	External	☐	Dipole		
			☐	Sectorized		
	☒	Internal	☐	PIFA		
			☒	PCB		
			☐	Ceramic Chip Antenna		
			☐	Metal plate type F antenna		
Antenna Technology	Ant Gain (dBi)					
☒	SISO	4				

1.3. Mode of Operation

Test Modes List
Mode 1: Transmit

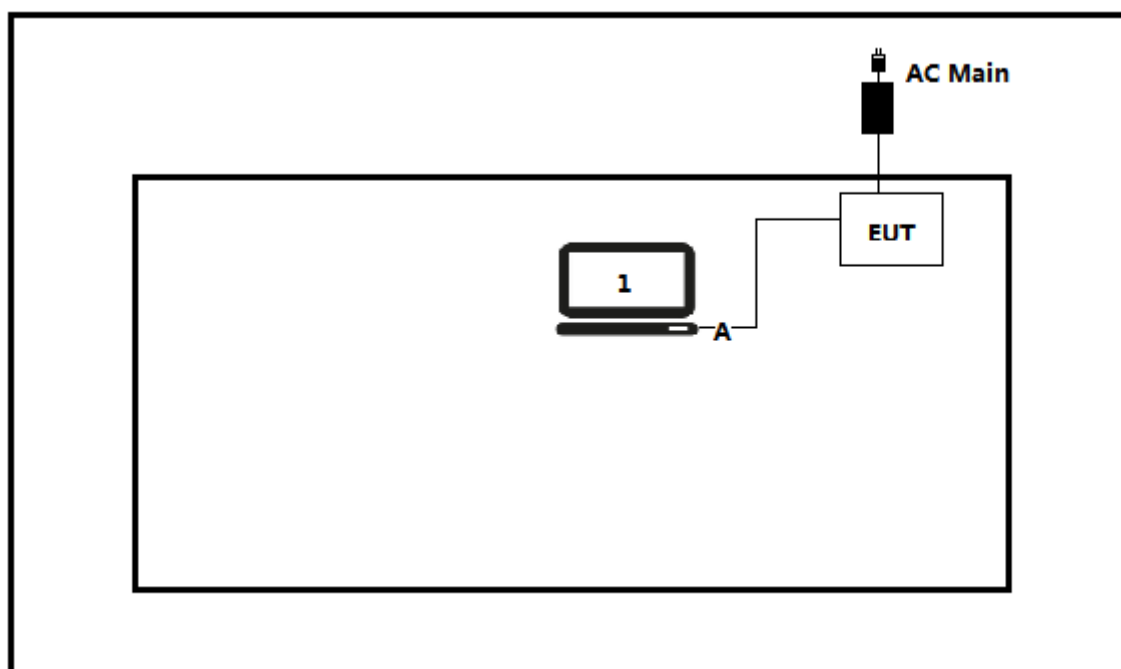
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

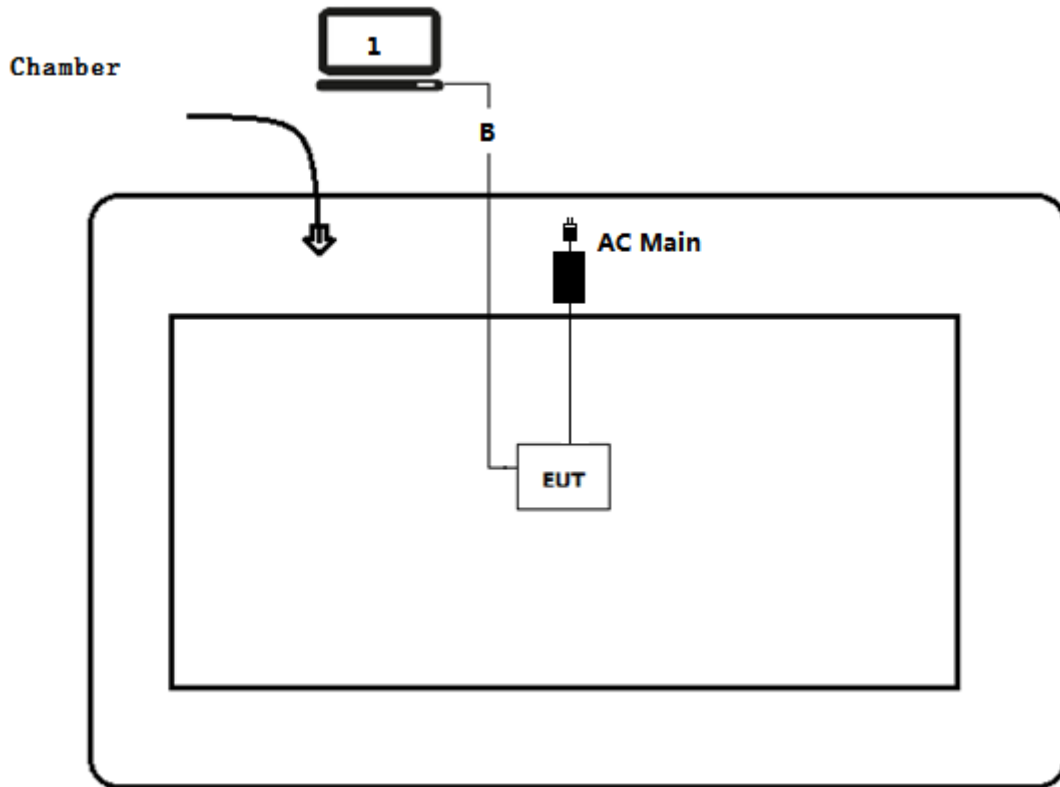
No.	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.5. Configuration of Tested System

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



Signal Cable Type		Signal cable Description
A	Serial-USB Cable	Non-shielded, <1m
B	Serial-USB Cable	Non-shielded, >10m

2. Technical Test

2.1. Summary of Test Result

For FCC

Performed Test Item	Normative References	Limit	Result
AC Power Line Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207	FCC 15.207	PASS
20dB&99% Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.215(c)	FCC 15.215	PASS
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209 and 15.249	FCC 15.249	PASS
Band-edge Compliance of RF Conducted Emissions	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.249	FCC 15.249	PASS
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.203	FCC 15.203	PASS

For IC

Performed Test Item	Normative References	Limit	Result
AC Power Line Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	RSS Gen	PASS
20dB&99% Bandwidth	RSS-Gen Issue 4 November 2014 Section 6.6	RSS Gen	PASS
Radiated Emission	RSS-210 Issue 9 August 2016 B.10 a)	RSS 210	PASS
Band-edge Compliance of RF Conducted Emissions	RSS-210 Issue 9 August 2016 B.10 b)	RSS 210	PASS
Antenna Requirement	RSS-Gen Issue 4 November 2014 Section 8.3	RSS Gen	PASS

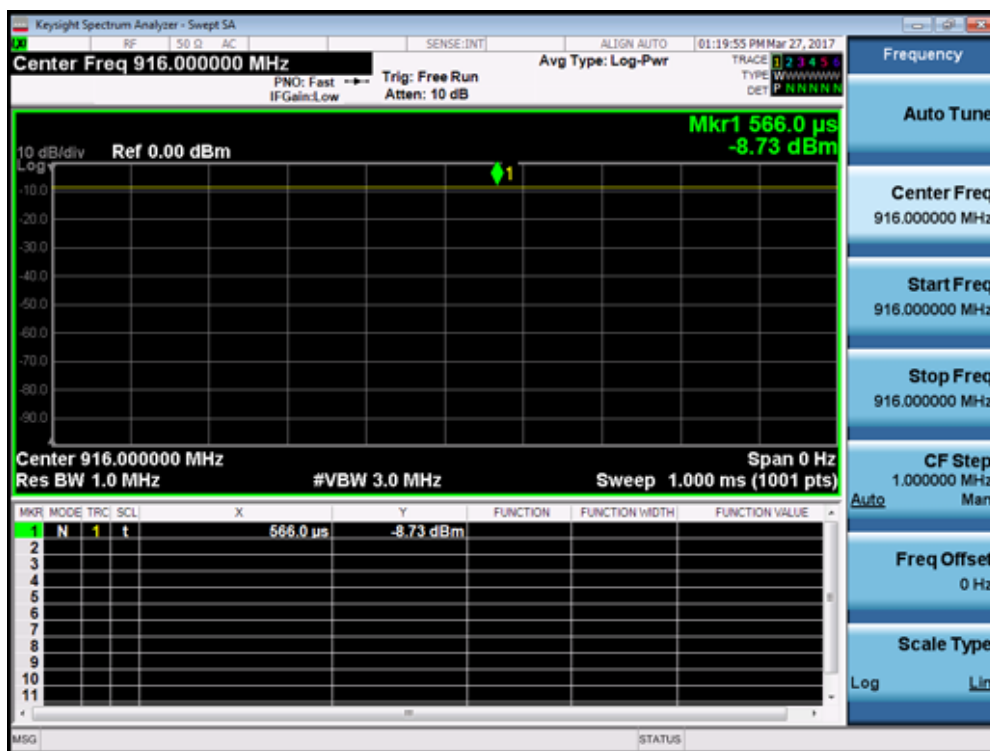
2.2. Test Frequency configuration:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Low	908.4 MHz	Mid	908.42 MHz	High	916MHz

2.3. Duty Cycle

Test Mode	Tx On (ms)	Tx Off (ms)	VBW	Tx On + Tx Off (ms)	Duty Cycle
1	--	--	10Hz	--	100%

Frequency 916MHz



2.4. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

2.5. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	$\pm 2.02\text{dB}$
Radiated Emission	Below 1GHz $\pm 3.8\text{ dB}$
	Above 1GHz $\pm 3.9\text{ dB}$
RF Antenna Port Conducted Emission	$\pm 1.27\text{dB}$
Radiated Emission Band Edge	$\pm 3.9\text{dB}$
Occupied Bandwidth	$\pm 1\text{kHz}$
Power Spectral Density	$\pm 1.27\text{dB}$

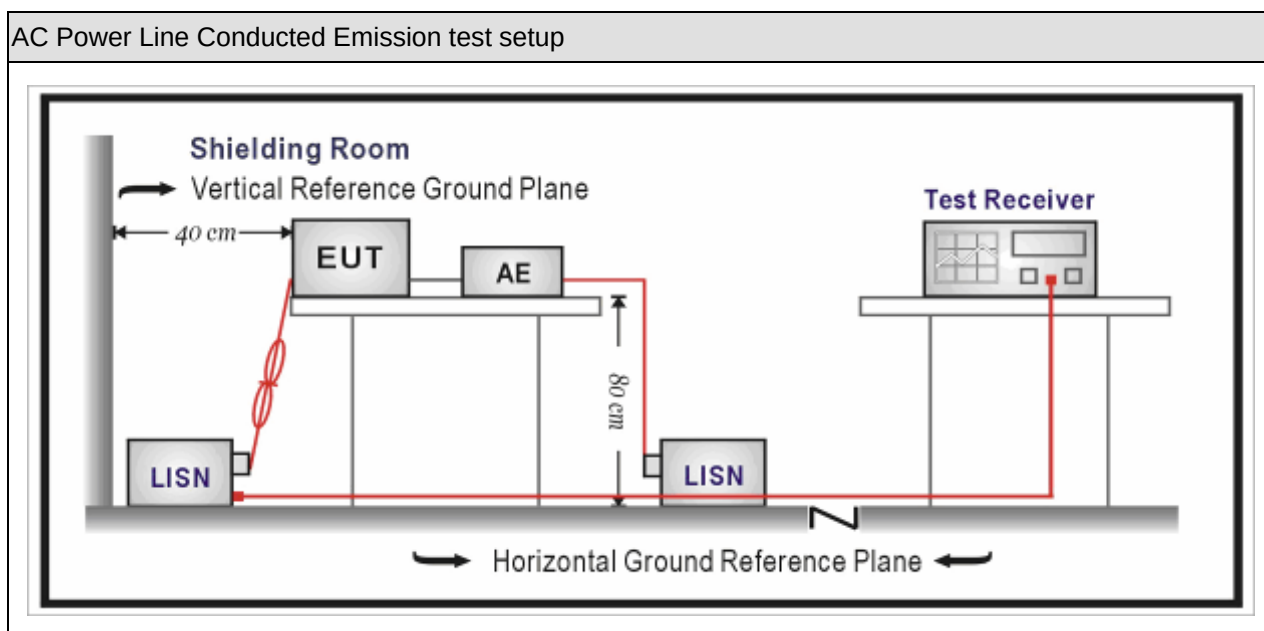
3. AC Power Line Conducted Emission

3.1. Test Equipment

AC Power Line Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100906	2017.03.05	2018.03.04
Two-Line V-Network	R&S	ENV 216	101189	2016.07.16	2017.07.15
Two-Line V-Network	R&S	ENV 216	101044	2016.09.04	2017.09.03
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	N/A	N/A
50ohm Termination	SHX	TF2	07081402	2016.09.04	2017.09.03
Temperature/Humidity Meter	Zhichen	ZC1-2	TR1-TH	2017.01.05	2018.01.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

Frequency of Emission (MHz)	Conducted Limit	
	Quasi-peak (dB μ V)	Average(dB μ V)
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Note 1: The lower limit shall apply at the transition frequencies.		
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

3.4. Test Procedure

Test Method			
	References Rule	Chapter	Item
☒	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
☒	ANSI C63.4-2014	7	AC power-line conducted emission measurements

3.5. Test Result

EUT is powered by battery, so this test item is not applicable.

4. Emissions in restricted frequency bands

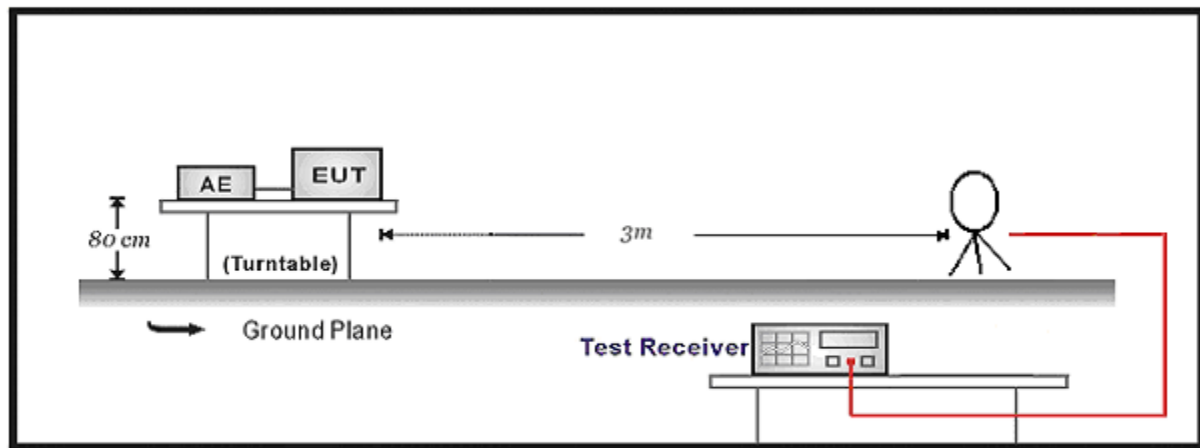
4.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2017.03.05	2018.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.07	2017.11.06
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2016.08.10	2017.08.09
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2017.02.28	2018.02.27
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2017.01.05	2018.01.04
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

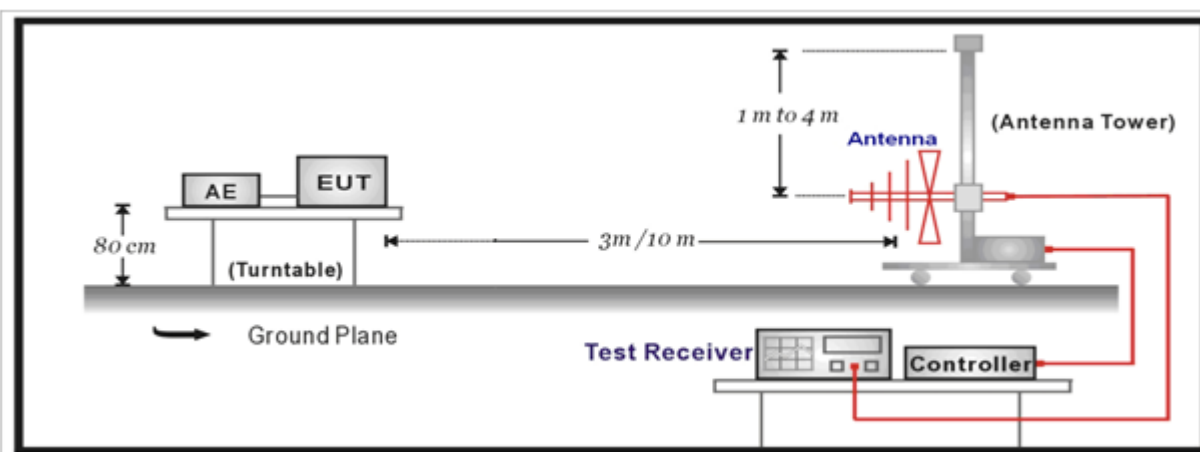
Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2017.01.04	2018.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2016.05.03	2017.05.02
Preamplifier	QuieTek	AP-040G	CHM-0906001	2016.05.06	2017.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2017.01.22	2018.01.20
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.11.25	2017.11.23
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2017.03.02	2018.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2017.03.02	2018.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2017.03.02	2018.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.10	2017.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2017.01.04	2018.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

4.2. Test Setup

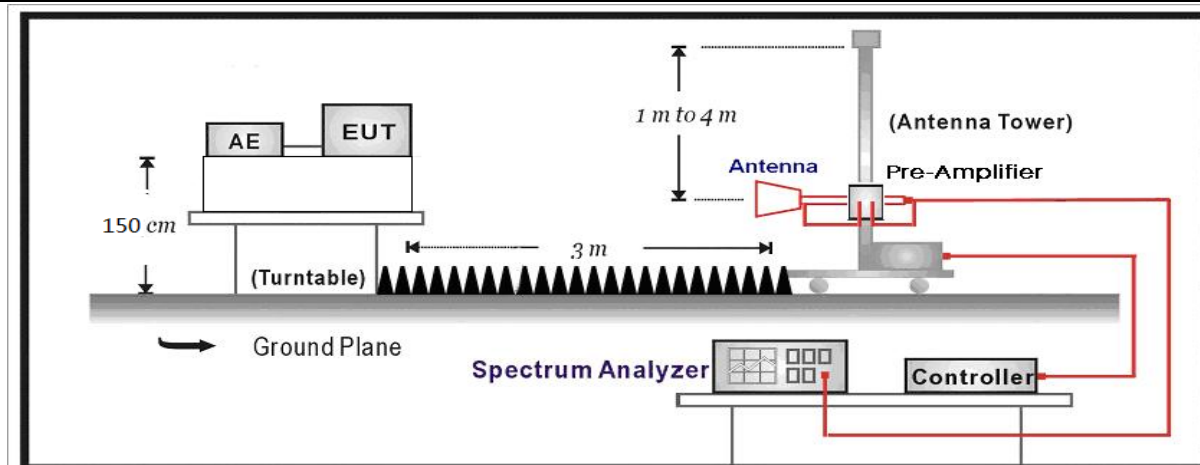
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

For FCC:

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675 – 12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

For IC:

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090-0.110	13.36-13.41	1645.5-1646.5	9.0-9.2
2.1735-2.1905	16.42-16.423	1660-1710	9.3-9.5
3.020-3.026	16.69475-16.69525	1718.8-1722.2	10.6-12.7
4.125-4.128	16.80425-16.80475	2200-2300	13.25-13.4
4.17725-4.17775	25.5-25.67	2310-2390	14.47-14.5
4.20725-4.20775	37.5-38.25	2655-2900	15.35-16.2
5.677-5.683	73-74.6	3260-3267	17.7-21.4
6.215-6.218	74.8-75.2	3332-3339	22.01-23.12
6.26775-6.26825	108-138	3345.8-3358	23.6-24.0
6.31175-6.31225	156.52475-156.52525	3500-4400	31.2-31.8
8.291-8.294	156.7-156.9	4500-5150	36.43-36.5
8.362-8.366	240-285	5350-5460	Above 38.6
8.37625-8.38675	322-335.4	7250-7750	
8.41425-8.41475	399.9-410	8025-8500	
12.29-12.293	608-614		
12.51975-12.52025	960-1427		
12.57675-12.57725	1435-1626.5		

Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

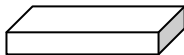
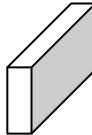
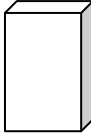
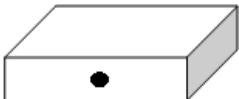
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.5. EUT test Axis definition

Item	Emissions in restricted frequency bands			
Device Category	☐	Fixed position use		
	☒	Mobile position use		
Test mode	Mode 1			
Test method	☒	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☐	Worst Axis ☒
	☐	Conducted		
	☐	Chain 1		
				
	☐	Chain 1	Chain 2	
				
	☐	Chain 1	Chain 2	Chain 3
				

4.6. Test Result

Product Name	: August Smart Door Lock	Power	: DC 6V
Test Mode	: Mode 1	Test Site	: AC-5
Test Date	: 2017.03.27		

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	62.35	31.91	94.26	114	-19.74	PK
	V	54.34	31.91	86.25	114	-27.75	PK
908.42	H	62.36	31.91	94.27	114	-19.73	PK
	V	54.32	31.91	86.23	114	-27.77	PK
916	H	60.86	31.91	92.77	114	-21.23	PK
	V	52.86	31.91	84.77	114	-29.23	PK

Note: 1. Measure Level = Reading Level + Factor.

2. Factor = Antenna factor + cable loss factor – preamp factor

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	56.3	31.91	88.21	94	-5.79	QP
	V	48.2	31.91	80.11	94	-13.89	QP
908.42	H	57.32	31.91	89.23	94	-4.77	QP
	V	50.1	31.91	82.01	94	-11.99	QP
916	H	56.38	31.91	88.29	94	-5.71	QP
	V	48.35	31.91	80.26	94	-13.74	QP

Note: 1. Average Measure Level = Reading Level + Factor.

2. Factor = Antenna factor + cable loss factor – preamp factor

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	H	51.27	31.91	83.18	94	-10.82	AV
	V	43.37	31.91	75.28	94	-18.72	AV
908.42	H	52.25	31.91	84.16	94	-9.84	AV
	V	44.15	31.91	76.06	94	-17.94	AV
916	H	50.74	31.91	82.65	94	-11.35	AV
	V	42.88	31.91	74.79	94	-19.21	AV

Note: 1. Average Measure Level = Reading Level + Factor.

2. Factor = Antenna factor + cable loss factor – preamp factor

Harmonic Radiated Emission

CH (MHz)	Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Type
908.4	2725.5	H	49.3	0.4	49.7	54(Note3)	-4.3	PK
	2725.1	V	48.2	0.4	48.6	54	-5.4	AV
	2725.5	V	55.4	0.4	55.8	74	-18.2	PK
	3633.6	H	39.4	2.2	41.6	54(Note3)	-12.4	PK
	3633.6	V	40.6	2.2	42.8	54(Note3)	-11.2	PK
	4542.0	H	39.7	4.4	44.1	54(Note3)	-9.9	PK
	4542.0	V	43.3	4.4	47.7	54(Note3)	-6.3	PK
908.42	1816.8	H	40.6	-2.5	38.1	54(Note3)	-15.9	PK
	1816.8	V	40.6	-2.5	38.1	54(Note3)	-15.9	PK
	2725.5	H	49.9	0.4	50.3	54(Note3)	-3.7	PK
	2725.5	V	48.3	0.4	48.7	54	-5.3	AV
	2725.5	V	56.8	0.4	57.2	74	-16.8	PK
	3633.7	H	40.4	2.2	42.6	54(Note3)	-11.4	PK
	3633.7	V	41.2	2.2	43.4	54(Note3)	-10.6	PK
916	1832.0	H	42.9	-2.4	40.5	54(Note3)	-13.5	PK
	1832.0	V	41.0	-2.4	38.6	54(Note3)	-15.4	PK
	2751.0	H	51.4	0.5	51.9	54(Note3)	-2.1	PK
	2751.0	V	47.1	0.5	47.6	54(Note3)	-6.4	PK
	3664.0	H	39.2	2.1	41.3	54(Note3)	-12.7	PK
	3664.0	V	39.3	2.1	41.4	54(Note3)	-12.6	PK

Note: 1. Measure Level = Reading Level + Factor.

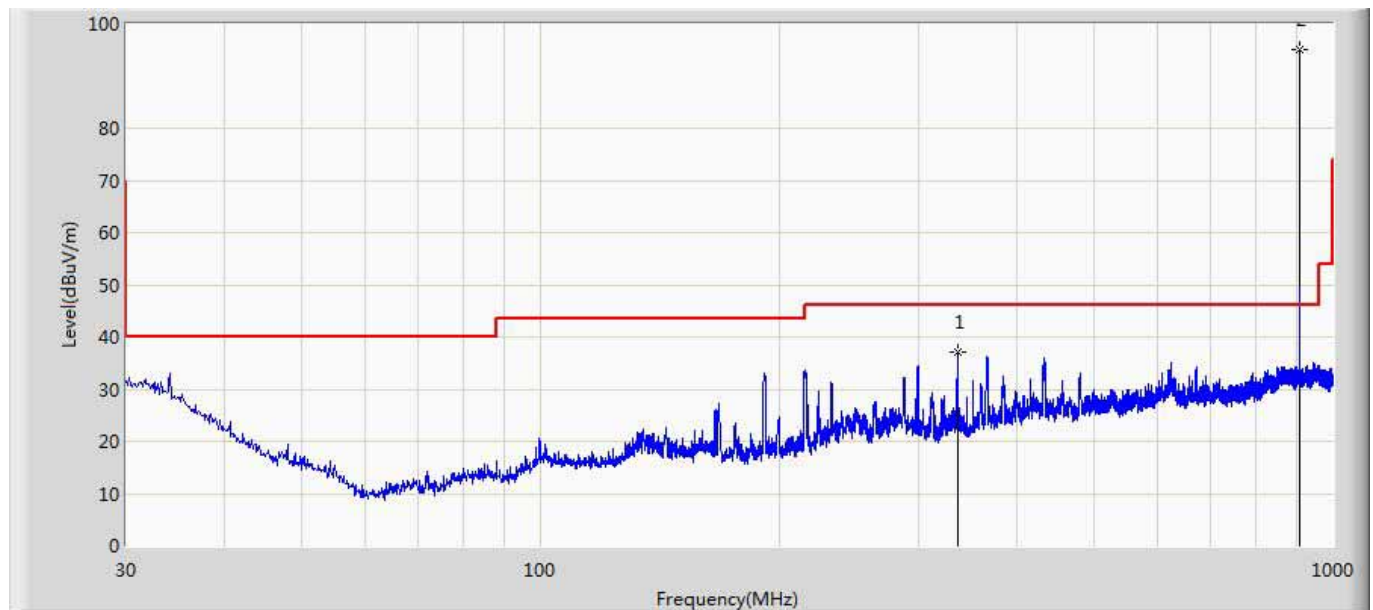
Note: 2. The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

Note: 3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

Note: 4. The RBW set up, see Clause 6.6.

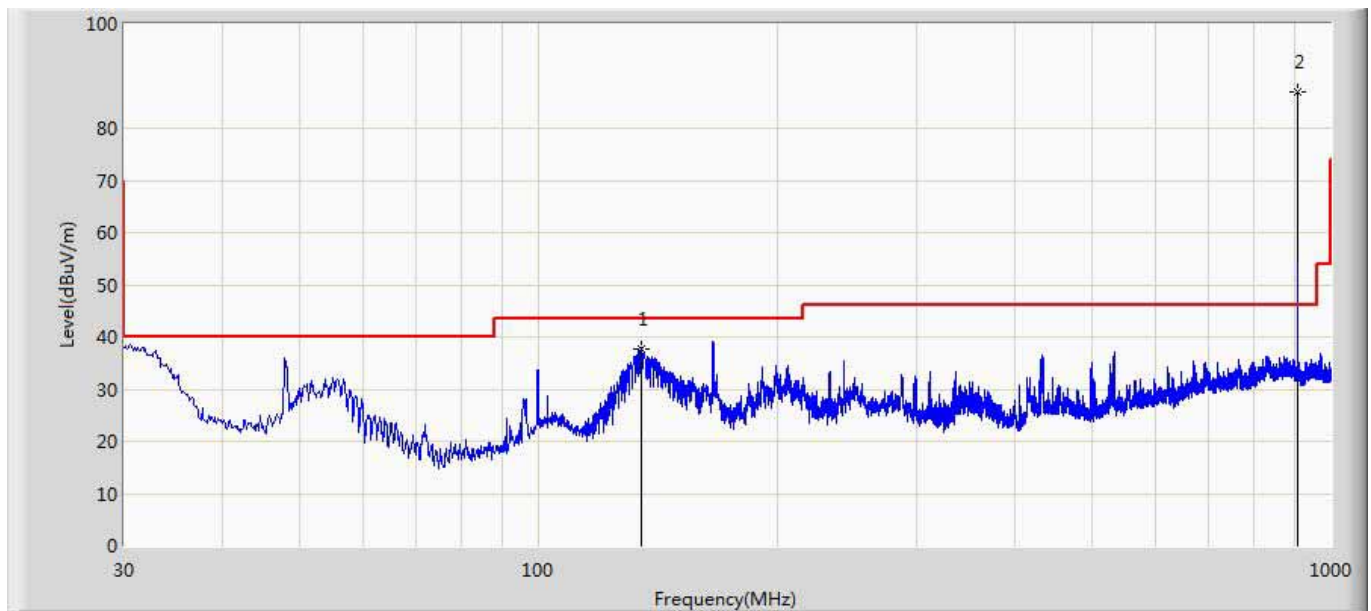
The worst case of Radiated Emission below 1GHz:

Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1: Transmit at 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		336.035	37.031	14.204	-8.969	46.000	22.827	PK
2	*	908.420	94.960	62.360	48.960	46.000	32.600	PK

Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		134.881	37.786	17.935	-5.714	43.500	19.851	PK
2	*	908.420	87.042	54.320	41.042	46.000	32.722	PK

5. Emissions in non-restricted frequency bands

5.1. Test Equipment

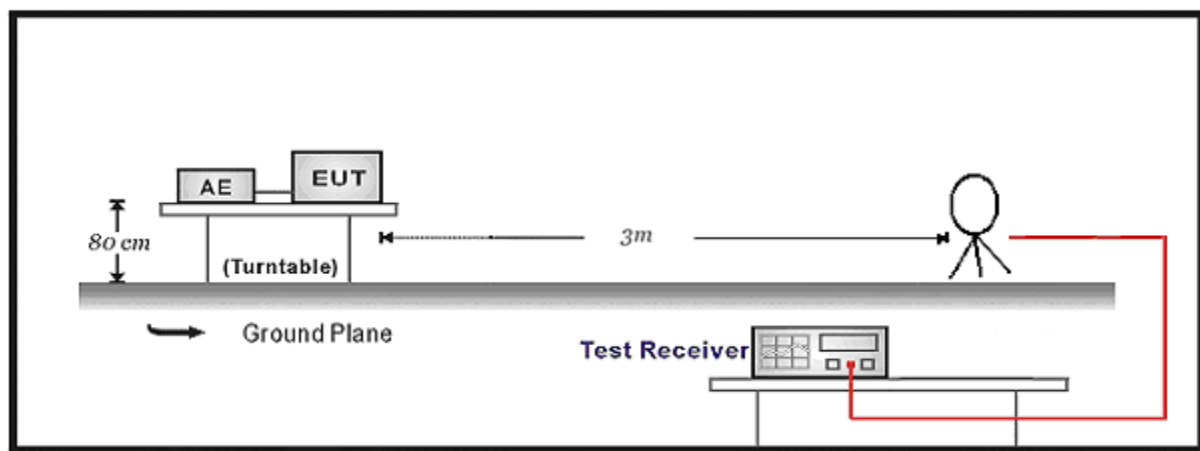
Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2017.03.05	2018.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.07	2017.11.06
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2016.08.10	2017.08.09
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2017.02.28	2018.02.27
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2017.01.05	2018.01.04
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

Radiated Emission(Below 1GHz) / AC-3					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100176	2016.09.05	2017.09.04
Bilog Antenna	Teseq GmbH	CBL6112D	27613	2016.07.17	2017.07.18
Coaxial Cable	Huber+Suhner	RG 214	AC3-C	2017.02.29	2018.02.28
Temperature/Humidity Meter	zhicheng	ZC1-2	AC3-TH	2017.01.07	2018.01.06
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

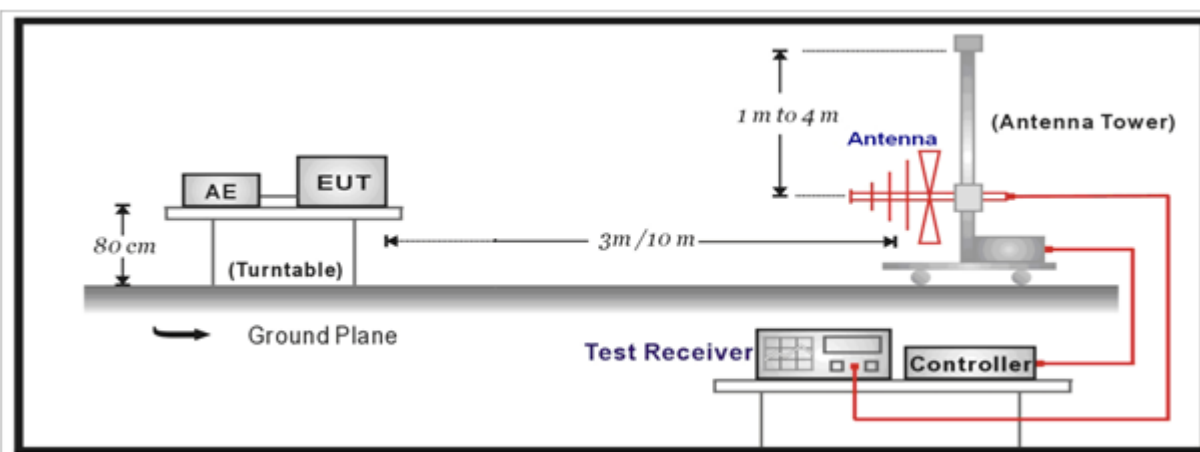
Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2017.01.04	2018.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2017.05.03	2018.05.02
Preamplifier	Quietek	AP-040G	CHM-0906001	2017.05.06	2018.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2017.01.22	2018.01.20
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2016.11.25	2017.11.23
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2017.03.02	2018.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2017.03.02	2018.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2017.03.02	2018.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2016.06.10	2017.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2017.01.04	2018.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

5.2. Test Setup

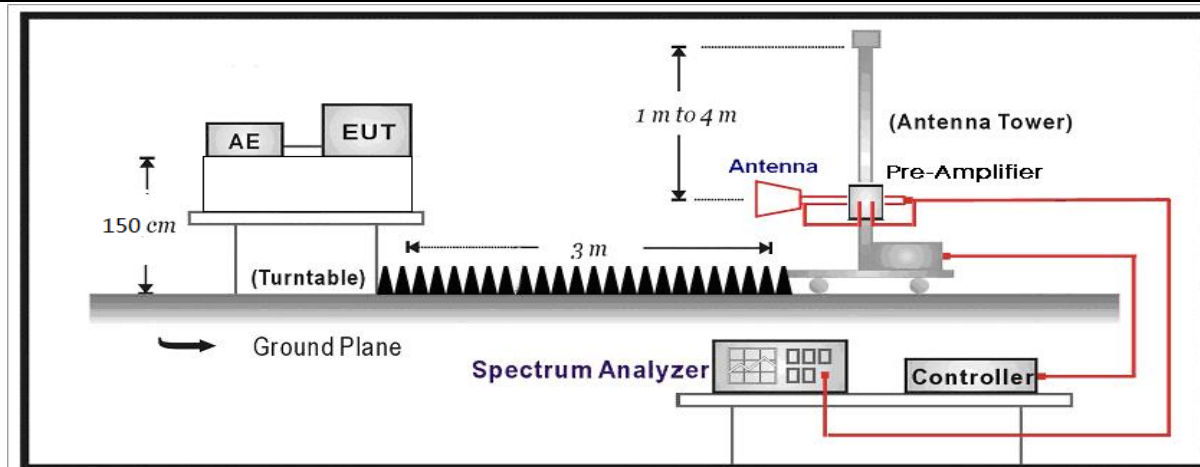
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



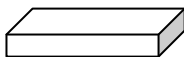
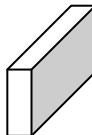
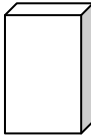
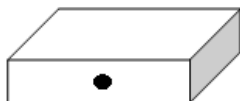
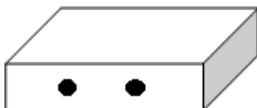
5.3. Limit

Emissions in non-restricted frequency bands Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power	50c(Note1)
Note 1: Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or to the general field strength limits listed in RSS-Gen, whichever is less stringent.	

5.4. Test Procedure

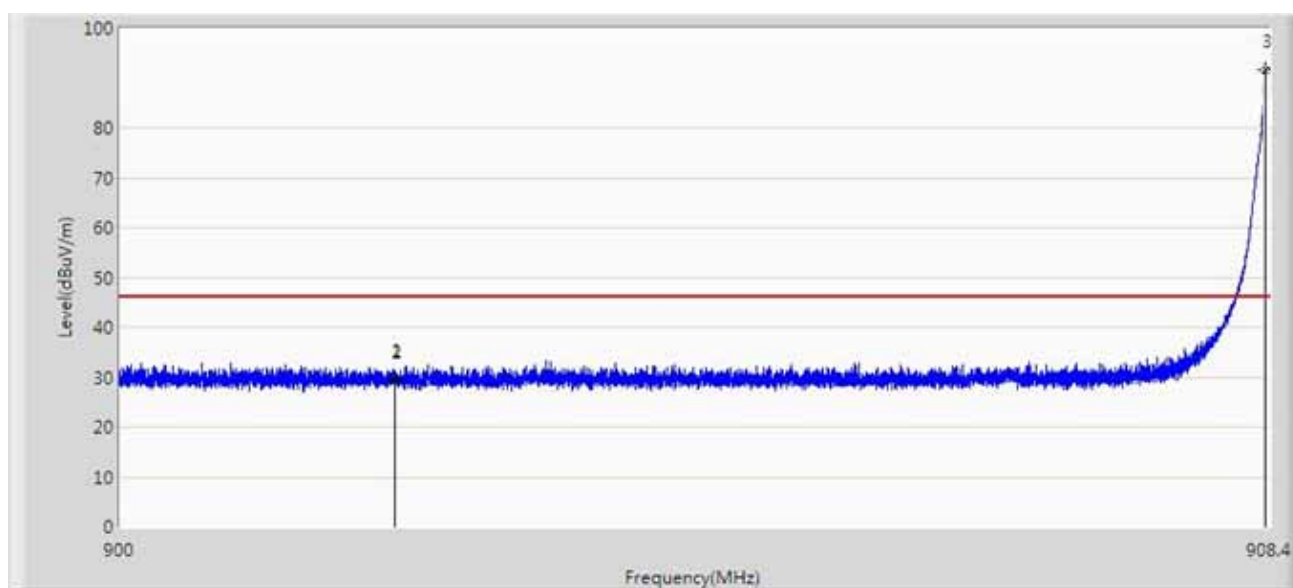
Test Method					
	References Rule			Chapter	Description
		☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
		☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
		☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

5.5. EUT test Axis definition

Item	Emissions in non-restricted frequency bands			
Device Category	☐	Fixed position use		
	☒	Mobile position use		
Test mode	Mode 1			
Test method	☒	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☐	Worst Axis ☒
	☐	Conducted		
	☐	Chain 0		
				
	☐	Chain 0	Chain 1	
				
	☐	Chain 0	Chain 1	Chain 2
				

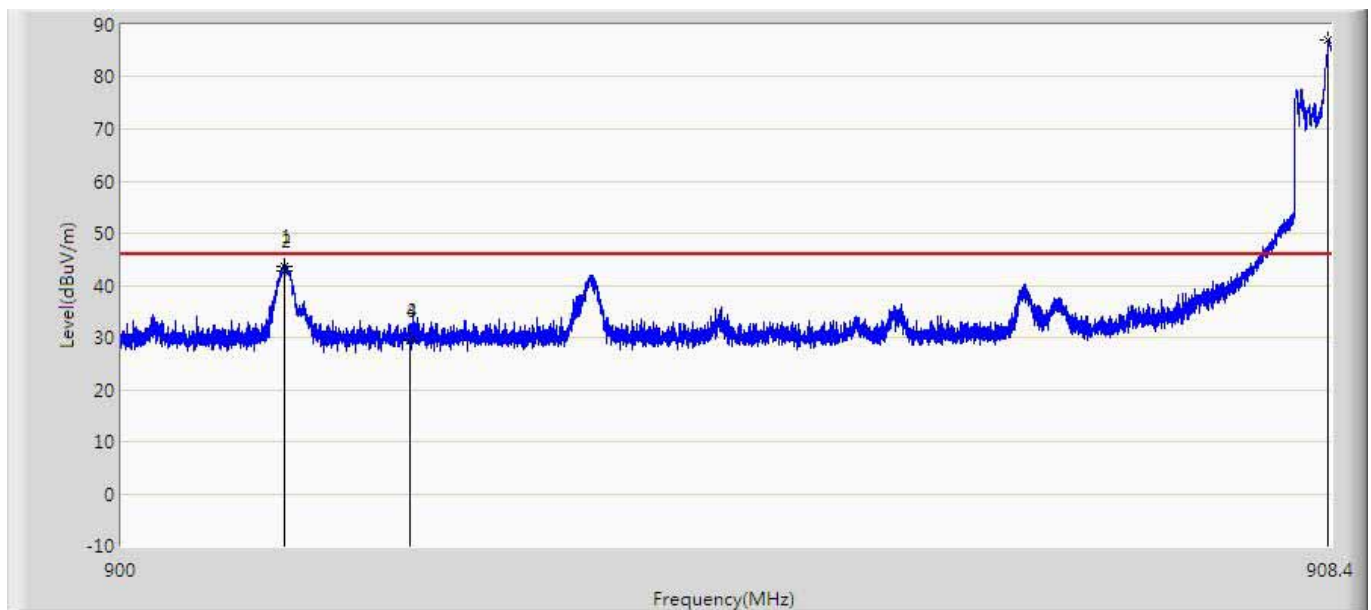
5.6. Test Result

Engineer: Damon	
Site: AC3	Time: 2017/05/17 - 17:01
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at low channel 908.4MHz	



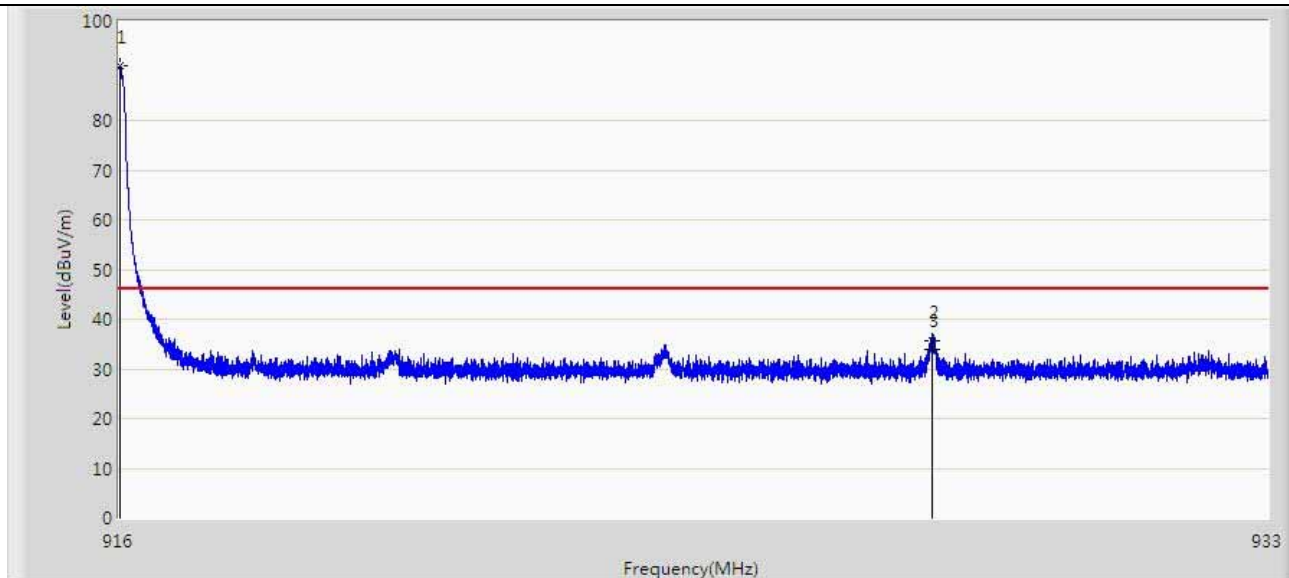
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		902.000	29.519	-0.667	-16.481	46.000	30.186	PK
2		902.000	29.354	-0.832	-16.646	46.000	30.186	QP
3	*	908.371	92.984	62.783	N/A	N/A	30.201	PK

Engineer: Damon	
Site: AC3	Time: 2017/05/17 - 16:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at low channel 908.4MHz	



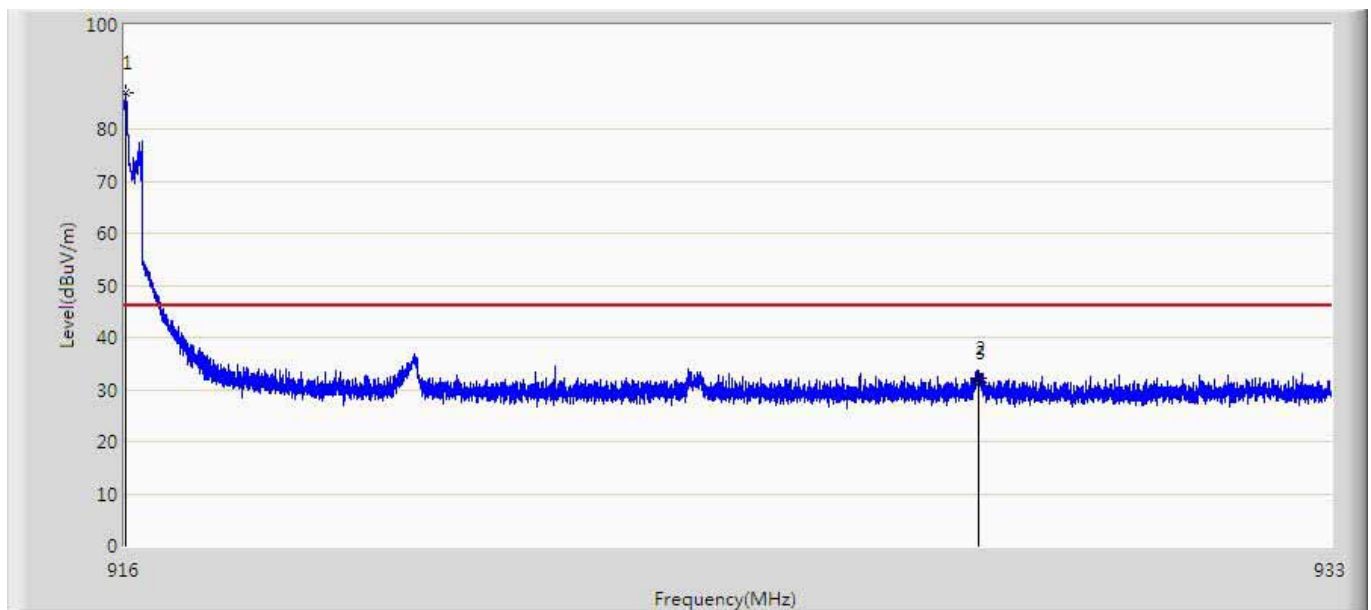
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		901.133	43.641	13.458	-2.359	46.000	30.183	PK
2		901.133	42.781	12.598	-3.219	46.000	30.183	QP
3		902.000	29.509	-0.677	-16.491	46.000	30.186	PK
4		902.000	29.475	-0.711	-16.525	46.000	30.186	QP
5	*	908.381	86.966	56.765	N/A	N/A	30.201	PK

Engineer: Damon	
Site: AC3	Time: 2017/05/17 - 17:03
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1: Transmit at high channel 916MHz	



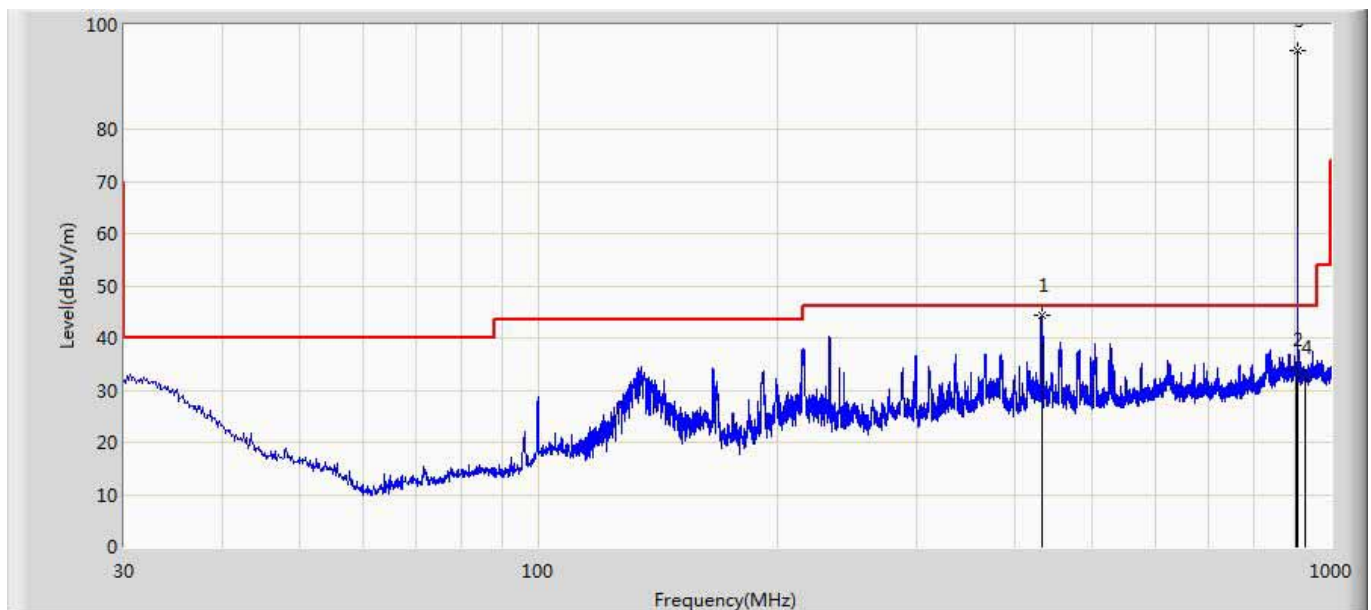
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	916.021	91.674	61.454	N/A	N/A	30.220	PK
2		928.000	35.589	5.339	-10.411	46.000	30.250	PK
3		928.000	33.819	3.569	-12.181	46.000	30.250	QP

Engineer: Damon	
Site: AC3	Time: 2017/05/17 - 17:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at high channel 916MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	916.017	86.935	56.715	N/A	N/A	30.220	PK
2		928.000	32.272	2.022	-13.728	46.000	30.250	PK
3		928.000	31.263	1.013	-14.737	46.000	30.250	QP

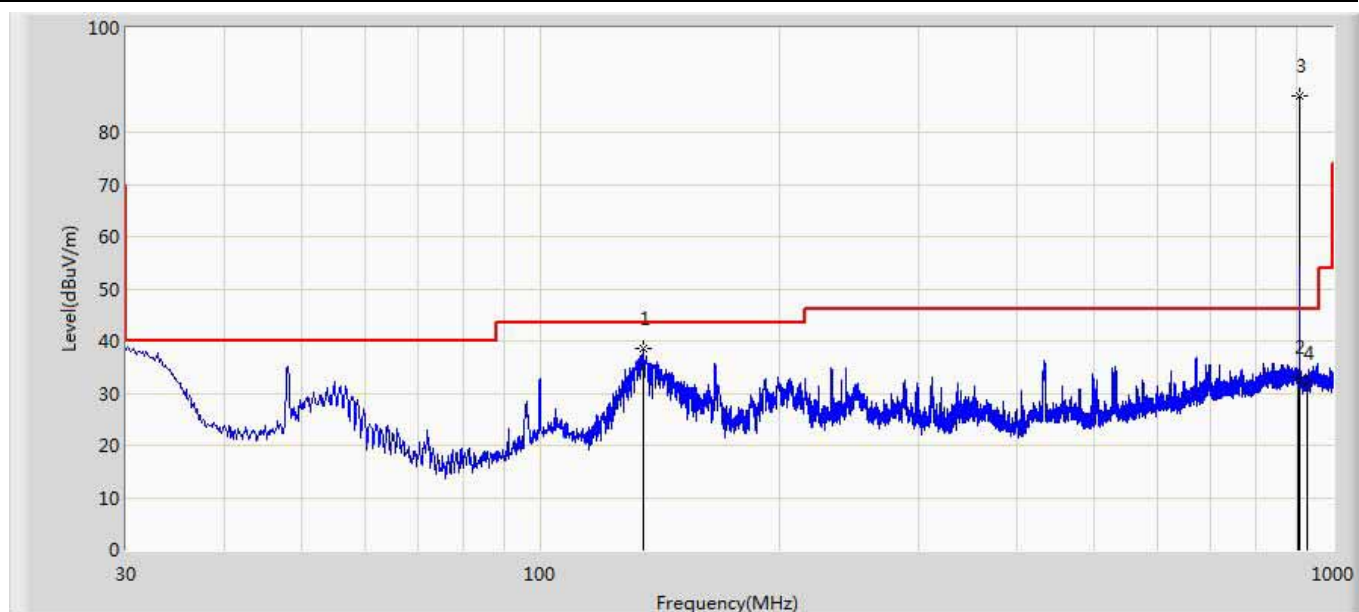
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 19:39
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at low channel 908.4MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		431.095	44.368	17.982	-1.632	46.000	26.385	PK
2		902.000	34.003	0.757	-11.997	46.000	33.246	PK
3	*	908.400	94.954	62.350	N/A	N/A	32.604	PK
4		928.000	32.534	0.002	-13.466	46.000	32.533	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

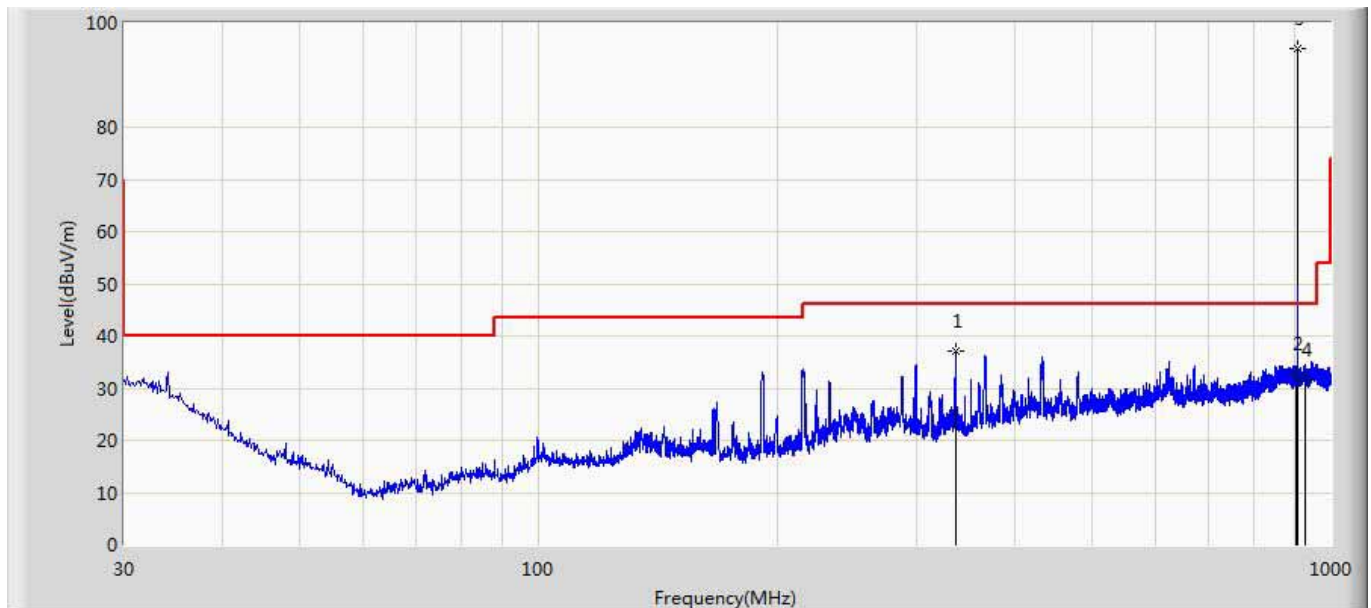
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1: Transmit at low channel 908.4MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		135.003	38.426	18.612	-5.074	43.500	19.814	PK
2		902.000	33.041	0.128	-12.959	46.000	32.913	PK
3	*	908.400	87.061	54.340	N/A	N/A	32.721	PK
4		928.000	31.833	-0.357	-14.167	46.000	32.191	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

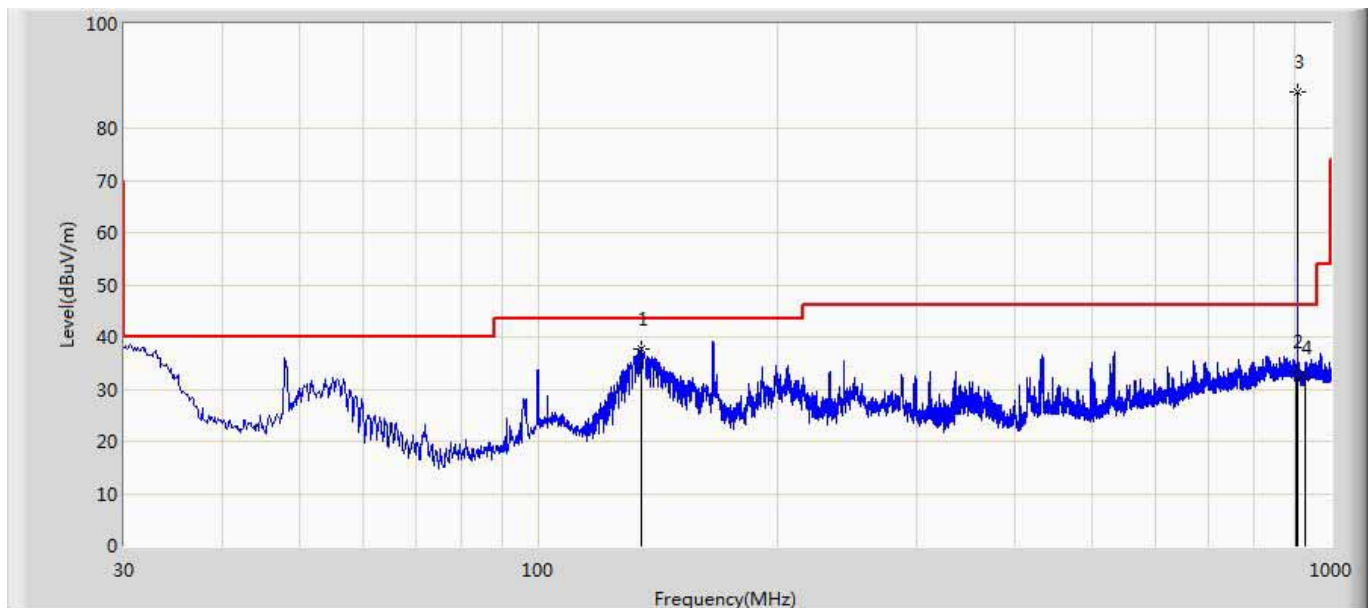
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at Mid channel 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		336.035	37.031	14.204	-8.969	46.000	22.827	PK
2		902.000	32.611	-0.635	-13.389	46.000	33.246	PK
3	*	908.420	94.960	62.360	48.960	46.000	32.600	PK
4		928.000	31.547	-0.985	-14.453	46.000	32.533	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

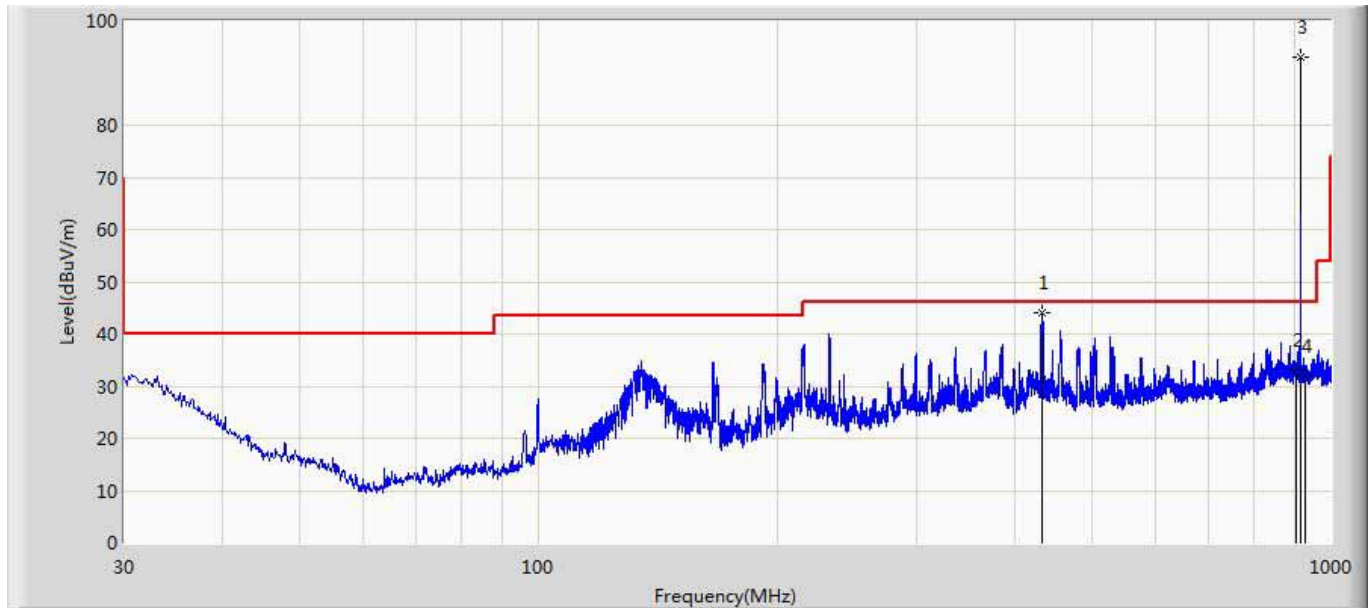
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:10
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at Mid channel 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		134.881	37.786	17.935	-5.714	43.500	19.851	PK
2		902.000	33.204	0.291	-12.796	46.000	32.913	PK
3	*	908.420	87.042	54.320	41.042	46.000	32.722	PK
4		928.000	32.116	-0.074	-13.884	46.000	32.191	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

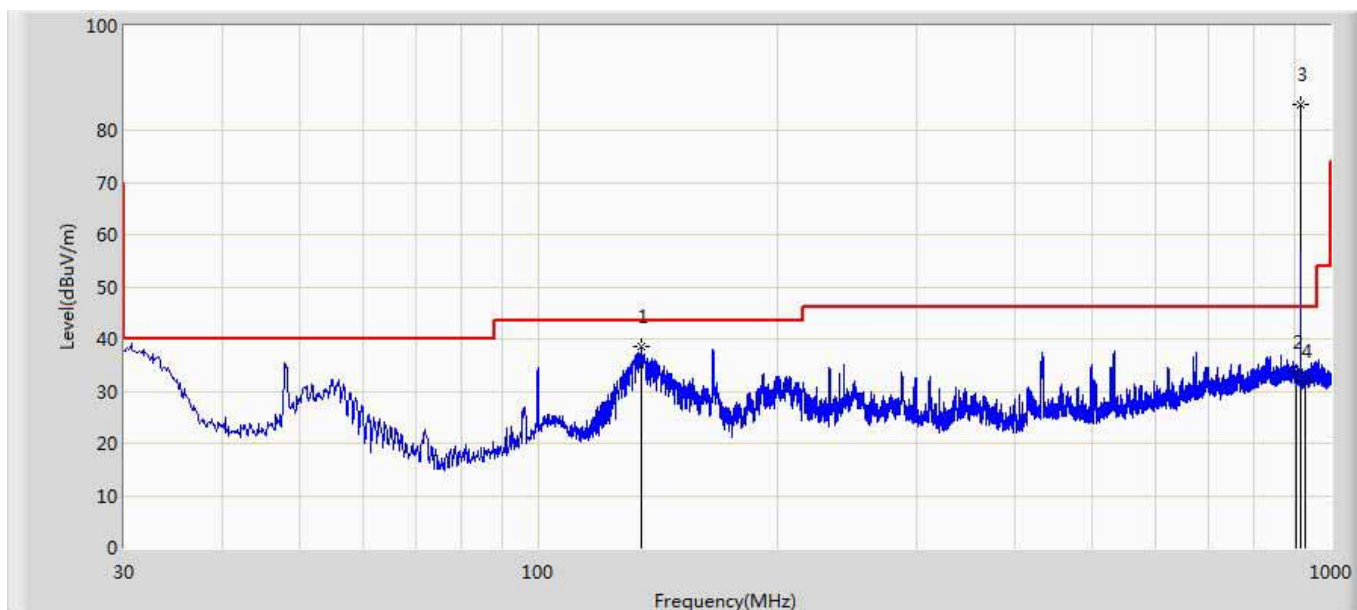
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:16
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at high channel 916MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		431.337	44.200	17.824	-1.800	46.000	26.377	PK
2		902.000	32.945	-0.301	-13.055	46.000	33.246	PK
3	*	916.000	93.092	60.860	N/A	N/A	32.232	PK
4		928.000	31.852	-0.680	-14.148	46.000	32.533	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

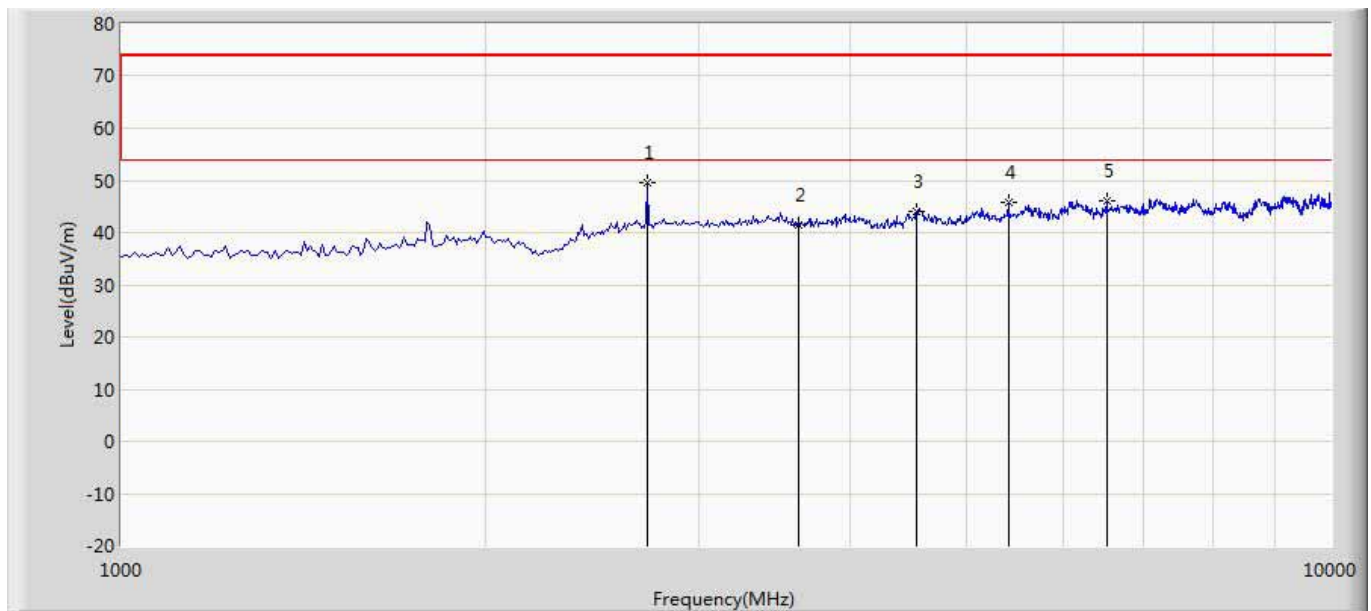
Engineer: Damon	
Site: AC2	Time: 2017/05/15 - 20:19
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1: Transmit at high channel 916MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		135.003	38.510	18.696	-4.990	43.500	19.814	PK
2		902.000	33.681	0.768	-12.319	46.000	32.913	PK
3	*	916.000	84.893	52.860	N/A	N/A	32.033	PK
4		928.000	31.876	-0.314	-14.124	46.000	32.191	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

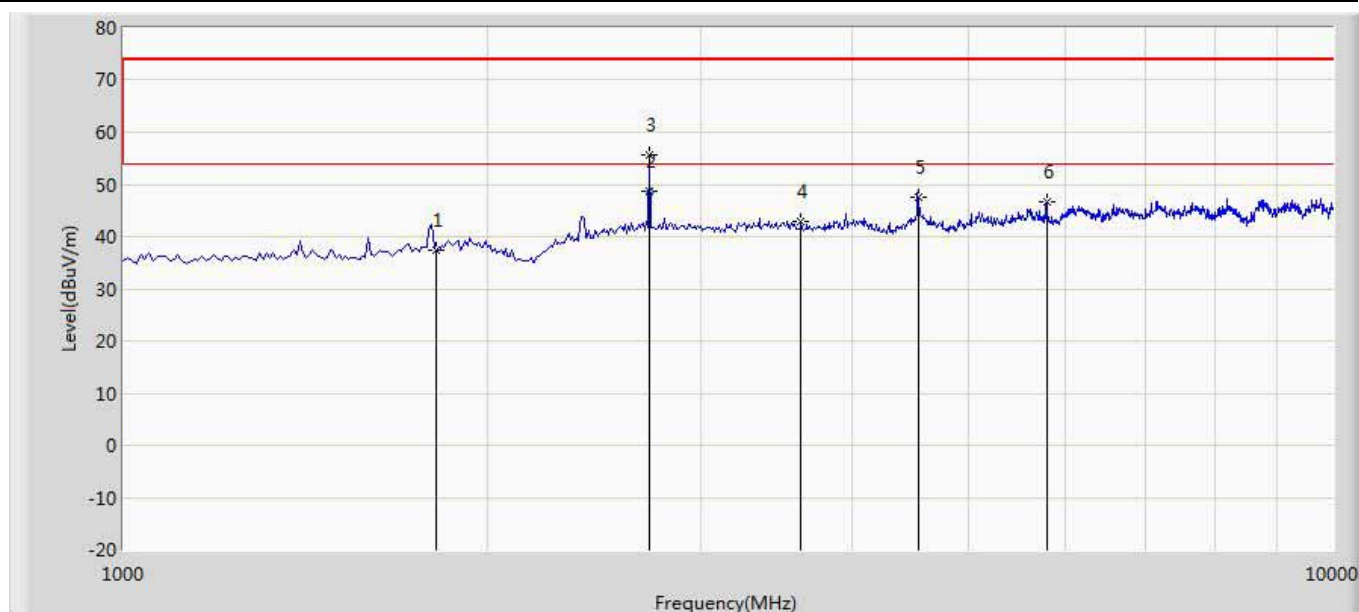
Engineer: Damon	
Site: AC5	Time: 2017/05/14 - 11:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at low channel 908.4MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2725.500	49.627	49.259	-24.373	74.000	0.368	PK
2		3633.600	41.552	39.357	-32.448	74.000	2.195	PK
3		4542.000	44.035	39.666	-29.965	74.000	4.368	PK
4		5411.500	45.817	38.920	-28.183	74.000	6.897	PK
5		6525.000	46.169	37.563	-27.831	74.000	8.606	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

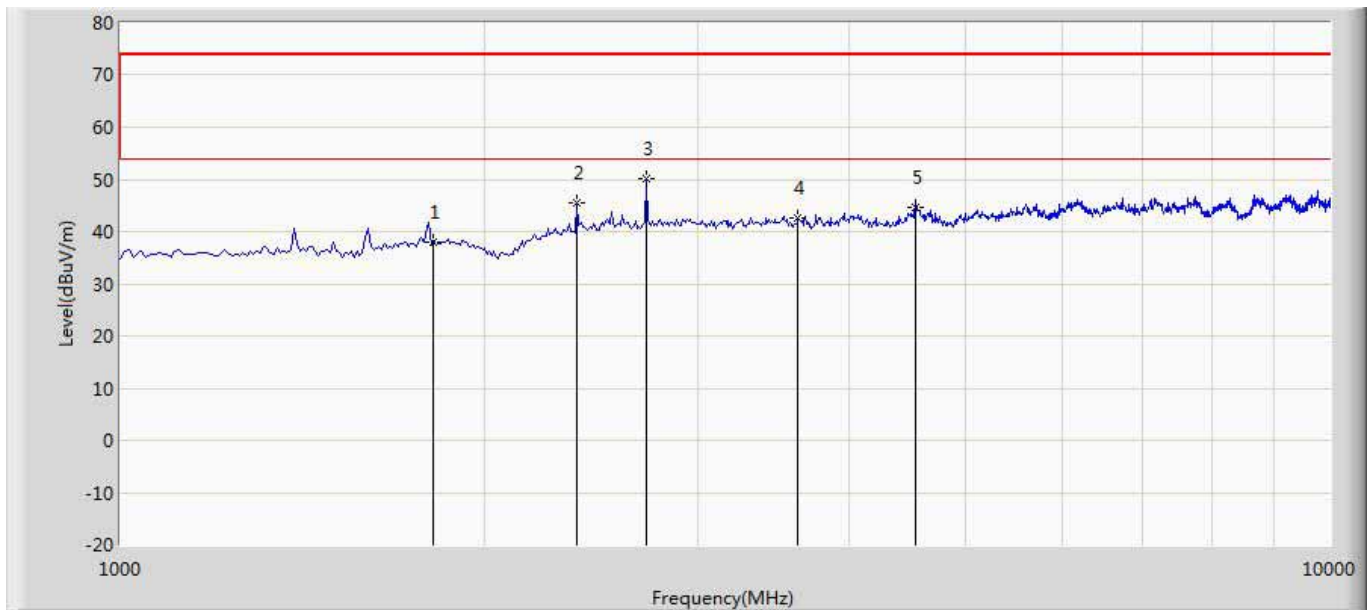
Engineer: Damon	
Site: AC5	Time: 2017/05/14- 17:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at low channel 908.4MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1816.400	37.356	39.873	-36.644	74.000	-2.517	PK
2	*	2725.120	48.579	48.210	-5.421	54.000	0.368	AV
3		2725.500	55.763	55.395	-18.237	74.000	0.368	PK
4		3633.600	42.779	40.584	-31.221	74.000	2.195	PK
5		4542.000	47.665	43.296	-26.335	74.000	4.368	PK
6		5802.500	46.530	38.740	-27.470	74.000	7.791	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

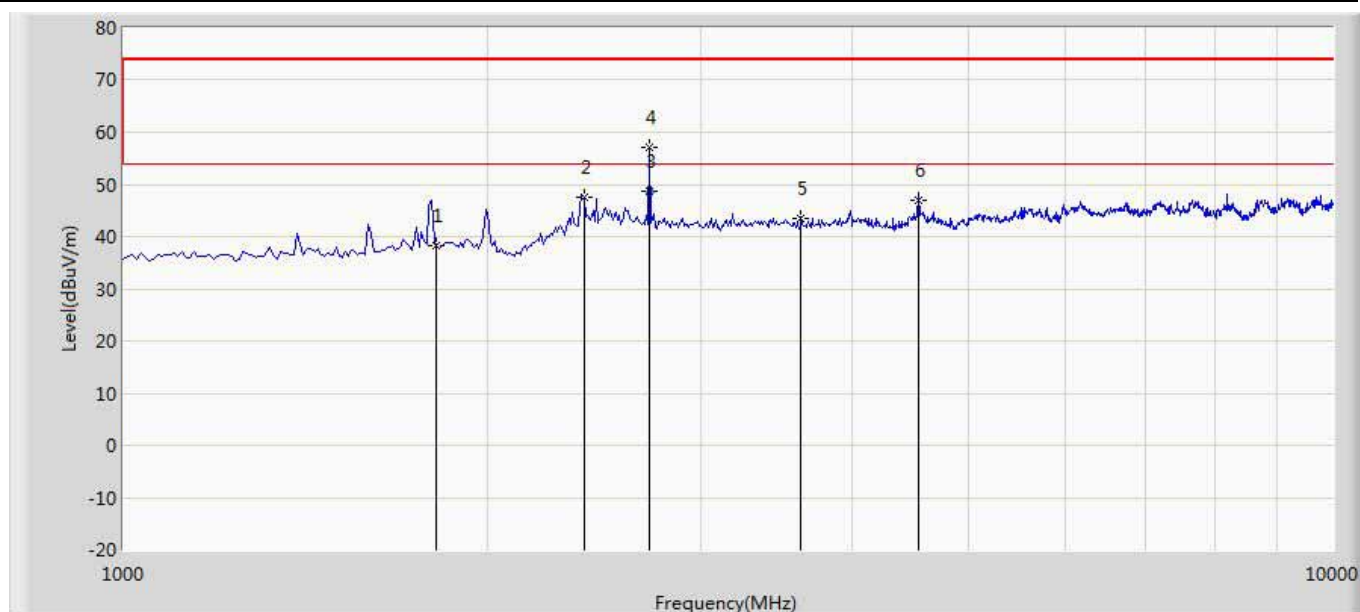
Engineer: Damon	
Site: AC5	Time: 2017/05/14 - 18:04
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at Mid channel 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1816.840	38.100	40.615	-35.900	74.000	-2.515	PK
2		2385.500	45.432	45.760	-28.568	74.000	-0.328	PK
3	*	2725.500	50.259	49.891	-23.741	74.000	0.368	PK
4		3633.680	42.602	40.407	-31.398	74.000	2.195	PK
5		4542.100	44.681	40.310	-29.319	74.000	4.371	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

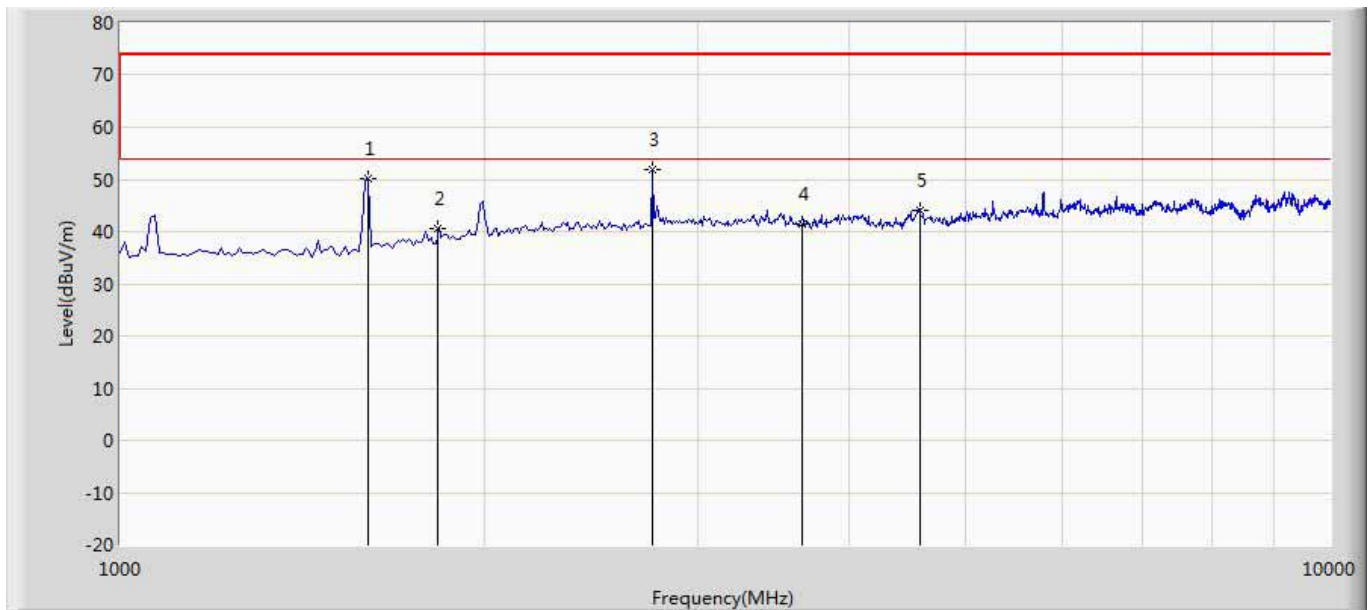
Engineer: Damon	
Site: AC5	Time: 2017/05/14 - 18:08
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1: Transmit at Mid channel 908.42MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1816.840	38.132	40.647	-35.868	74.000	-2.515	PK
2		2402.500	47.566	47.857	-26.434	74.000	-0.291	PK
3	*	2725.480	48.624	48.256	-5.376	54.000	0.367	AV
4		2725.500	57.189	56.821	-16.811	74.000	0.368	PK
5		3633.680	43.356	41.161	-30.644	74.000	2.195	PK
6		4542.100	47.000	42.629	-27.000	74.000	4.371	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

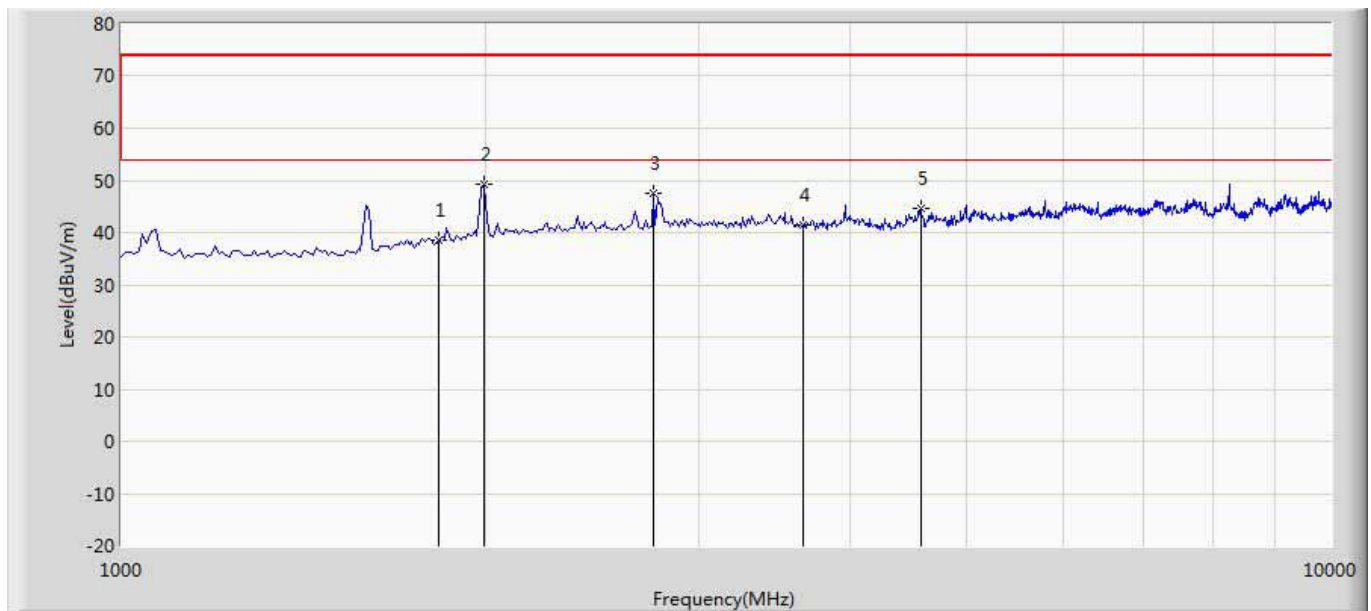
Engineer: Damon	
Site: AC5	Time: 2017/05/14 - 11:03
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at high channel 916MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1603.500	50.249	54.584	-23.751	74.000	-4.335	PK
2		1832.000	40.444	42.891	-33.556	74.000	-2.446	PK
3	*	2751.000	51.918	51.376	-22.082	74.000	0.542	PK
4		3664.000	41.336	39.212	-32.664	74.000	2.124	PK
5		4580.000	44.052	39.290	-29.948	74.000	4.762	PK

Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

Engineer: Damon	
Site: AC5	Time: 2017/05/14 - 11:49
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: August Smart Door Lock	Power: AC 120V/60Hz
Note: Mode 1:Transmit at high channel 916MHz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		1832.000	38.557	41.004	-35.443	74.000	-2.446	PK
2	*	1994.500	49.204	50.356	-24.796	74.000	-1.152	PK
3		2751.000	47.665	47.123	-26.335	74.000	0.542	PK
4		3664.000	41.397	39.273	-32.603	74.000	2.124	PK
5		4580.000	44.535	39.773	-29.465	74.000	4.762	PK

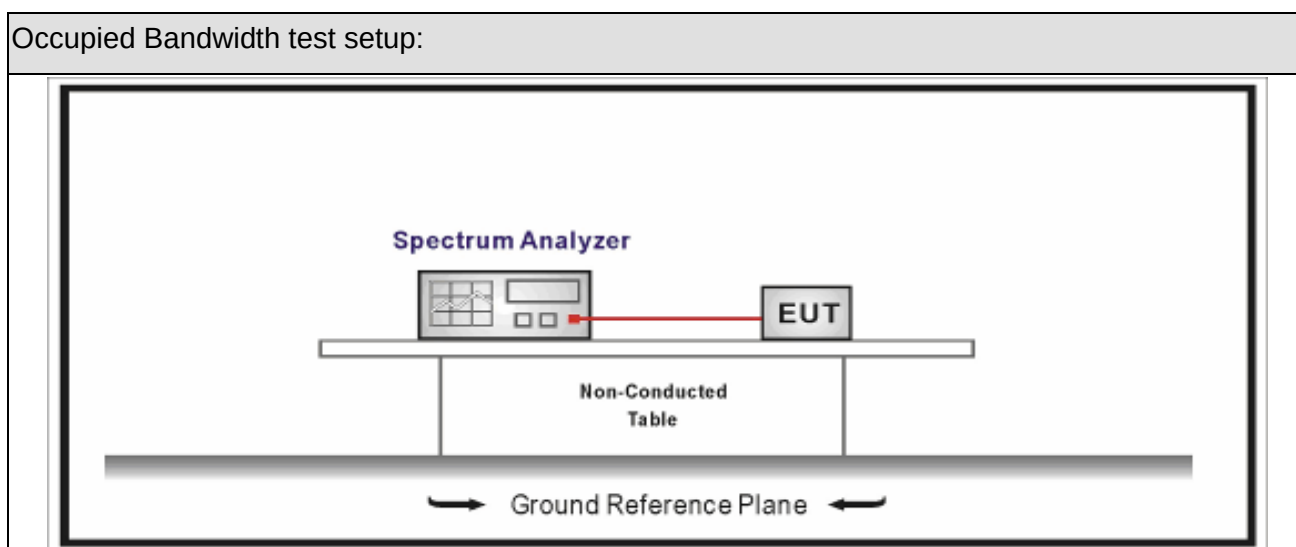
Note : The test frequency range is outside of specified frequency bands(902~928MHz), and then the worst data are shown in the report,

6. Occupied Bandwidth

6.1. Test Equipment

Occupied Bandwidth / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2017.02.04	2018.02.03
EXA Spectrum Analyzer	Keysight	N9010A	MY55370495	2016.04.09	2017.04.08
MXA Signal Analyzer	Keysight	N9020A	MY56060147	2016.04.09	2017.04.08
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2016.04.10	2017.04.09
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

6.2. Test Setup



6.3. Limit

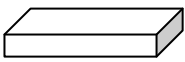
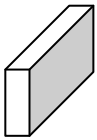
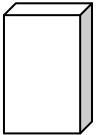
Occupied Bandwidth

the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

6.4. Test Procedure

Test Method				
	Reference Rule		Chapter	Description
☒	ANSI C63.10		6.9	DTS bandwidth
	☒	ANSI C63.10	6.9.2	Occupied bandwidth—relative measurement procedure
	☒	ANSI C63.10	6.9.3	Occupied bandwidth—power bandwidth (99%) measurement procedure

6.5. EUT test definition

Item	Occupied Bandwidth			
Device Category	☒	Fixed position use		
	☐	Mobile position use		
Test mode	Mode 1			
Test method	☒	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis ☐	Worst Axis ☐	Worst Axis ☐
	☐	Conducted		
	☐	Chain 0		
				
	☐	Chain 0	Chain 1	
				
	☐	Chain 0	Chain 1	Chain 2
				

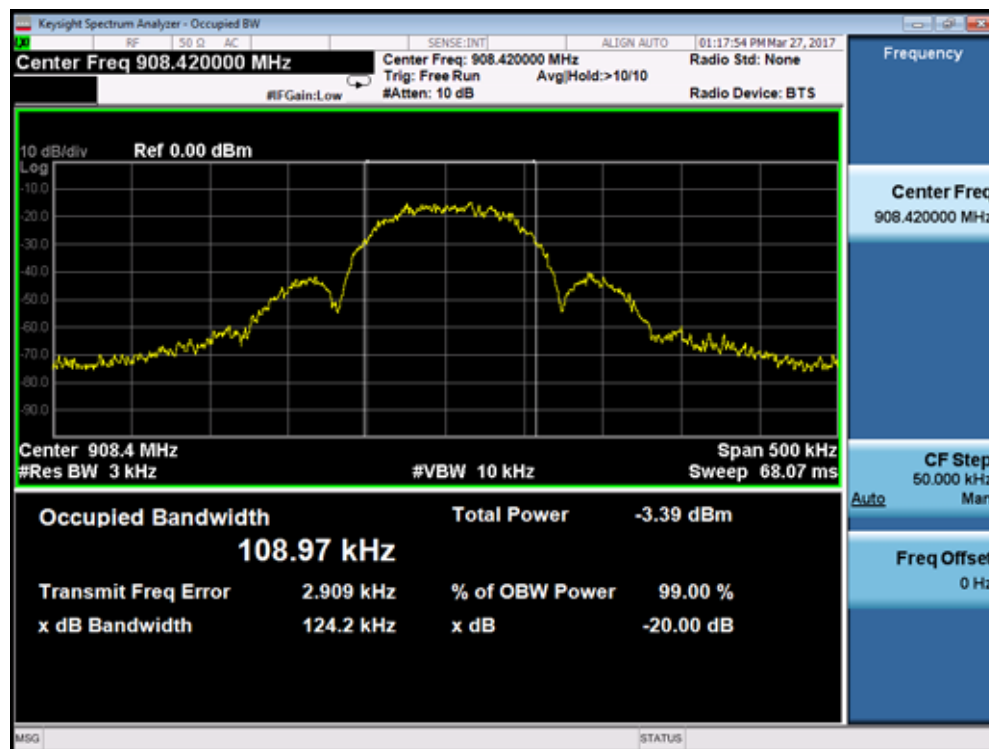
6.6. Test Result

Product Name	: August Smart Door Lock	Power	: DC 6V
Test Mode	: Mode1	Test Site	: TR8
Test Date	: 2017.03.24		

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (KHz)	20dB Occupied Bandwidth (KHz)	Result
1	Low	908.4	109.47	119.0	Pass
1	Mid	908.42	108.97	124.2	Pass
1	High	916	109.37	120.0	Pass

Note : The worst case of Occupied Bandwidth as below in next page:

Mode 1 Mid Channel (908.42MHz)



7. Antenna Requirement

7.1. Limit

Antenna Requirement Limit	
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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	

7.2. Antenna Connector Construction

Antenna Connector Construction	
☒	The use of a permanently attached antenna
☐	The antenna use of a unique coupling to the intentional radiator
☐	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

_____ The End _____