

Report No.: SZEM201001016201

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TEST REPORT

Application No.: SZEM2010010162CR

Applicant: ATLANTIC, INC

Address of Applicant: 10018 Santa Fe Springs Rd. Santa Fe Spring, CA 90670

Manufacturer: ATLANTIC CHINA OFFICE

Address of Manufacturer: 2008, Kerry Centre, Renmin Nan Road, Shen Zhen, Guangdong.

Factory: ATLANTIC CHINA OFFICE

Address of Factory: 2008, Kerry Centre, Renmin Nan Road, Shen Zhen, Guangdong.

Equipment Under Test (EUT):

EUT Name: RGB LED light with Remote

Model No.: ATL008, ATL009, DAR001, DAR002 *

A Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

FCC ID: 2AX3PATL008

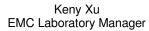
Standard(s): 47 CFR Part 15, Subpart C 15.231

Date of Receipt: 2020-10-13

Date of Test: 2020-11-03 to 2020-11-10

Date of Issue: 2020-11-12

Test Result: Pass*



Ceny. Ku



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4 www.sgsgroup.com.cn 4 sgs.china@sgs.com

^{*} In the configuration tested, the EUT complied with the standards specified above.



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	Revision Record					
Version	ersion Chapter Date Modifier					
01		2020-11-12		Original		

Authorized for issue by:		
	fane & Boro	
	Powell Bao /Project Engineer	_
	EvicFu	
	Eric Fu /Reviewer	



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Test Summary 2

Radio Spectrum Technical Requirement						
Item	Standard	Method	Requirement	Result		
Antenna Requirement	47 CFR Part 15, Subpart C 15.231	N/A	47 CFR Part 15, Subpart C 15.203	Pass		

N/A: Not applicable

Radio Spectrum Matter Part						
Item	Standard	Method	Requirement	Result		
20dB Bandwidth	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass		
Dwell Time (15.231(a))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.231(a)	Pass		
Field Strength of the Fundamental Signal (15.231(b))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass		
Radiated Emissions	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.231(b)	Pass		

N/A: Not applicable

Remark:

Model No.: ATL008, ATL009, DAR001, DAR002

Only the model ATL008 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on appearance.



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General Information

4.1 Details of E.U.T.

Power Supply:	Remote controller: DC3.0V CR2025 battery
Antenna Gain: 0dBi	
Antenna Type:	Integral Antenna
Modulation Type:	ASK
Number of Channels:	1
Operation Frequency:	433.92MHz

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10 ⁻⁸
2	Duty cycle	± 0.37%
3	Occupied Bandwidth	± 3%
4	DE Dadiated names	± 4.5dB (Below 1GHz)
4	RF Radiated power	± 4.8dB (Above 1GHz)
-	Dedicted Courieus emission test	± 4.5dB (Below 1GHz)
5	Radiated Spurious emission test	± 4.8dB (Above 1GHz)
6	Temperature test	± 1 ℃
7	Humidity test	± 3%
8	Supply voltages	± 1%
9	Time	± 3%



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4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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Equipment List 5

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2020-09-23	2021-09-22
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020-09-23	2021-09-22
Electric and Magnetic Field Analyzer	Narda	EHP-50F	SEM022-05	2019-11-28	2020-11-27

Dwell Time (15.231(a))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2020-09-23	2021-09-22
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50- 1	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2020-09-23	2021-09-22
Electric and Magnetic Field Analyzer	Narda	EHP-50F	SEM022-05	2019-11-28	2020-11-27

Field Strength of the Fundamental Signal (15.231(b))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-15	2020-11-02	2021-11-01
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31



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Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2020-09-24	2021-09-23
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2019-05-24	2022-05-23
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31

Radiated Spurious Emissions(Above 1GHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09	
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-12	2020-04-09	2021-04-08	
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12	
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22	
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2020-04-01	2021-03-31	
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2020-04-01	2021-03-31	

General used equipment								
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date			
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14			
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14			
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06			



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Radio Spectrum Technical Requirement 6

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

Standard 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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an 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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.



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Radio Spectrum Matter Test Results

20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c) ANSI C63.10 (2013) Section 6.9 Test Method:

Limit:

Frequency range(MHz)	Limit				
70-900	No wider than 0.25% of the center frequency				
Above 900	No wider than 0.5% of the center frequency				

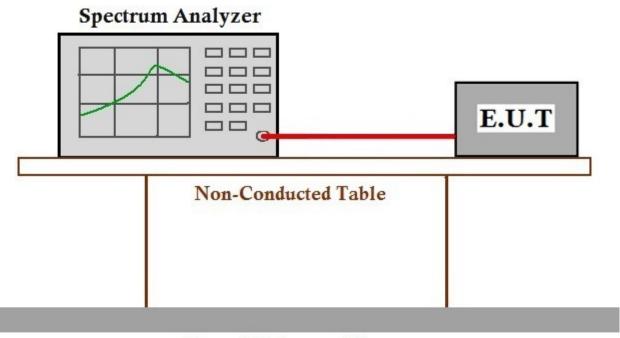
7.1.1 E.U.T. Operation

Operating Environment:

Humidity: 47.4 % RH Atmospheric Pressure: 1010 mbar Temperature:

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.1.2 Test Setup Diagram



Ground Reference Plane

7.1.3 Measurement Procedure and Data



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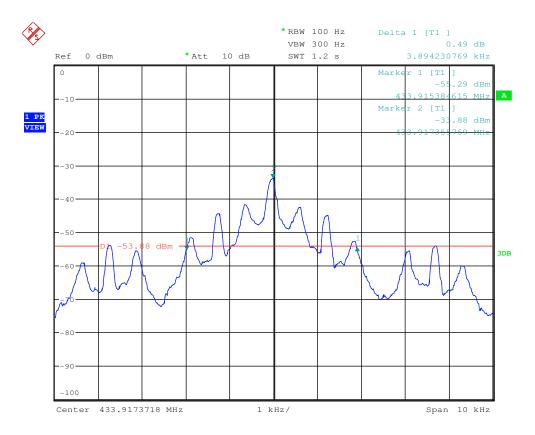


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Transmitter mode

Test channel	20dB Bandwidth (KHz)	Limit (KHz)	Results
433.92MHz	3.89	1084.8	Pass





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7.2 Dwell Time (15.231(a))

Test Requirement 47 CFR Part 15, Subpart C 15.231(a) Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Device type	Limit			
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released			
Automatically actived transmitter	Cease transmission within 5 seconds after activation			
Periodic transmissions to determine system integrity of transmitters used in security or safety applications	The total transmission time does not exceed 2 seconds per hour			

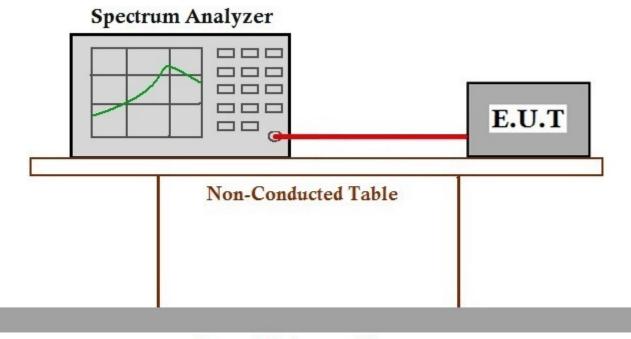
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: Atmospheric Pressure: 1010 mbar 23.7 °C Humidity: 47.4 % RH

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.2.2 Test Setup Diagram



Ground Reference Plane

7.2.3 Measurement Procedure and Data



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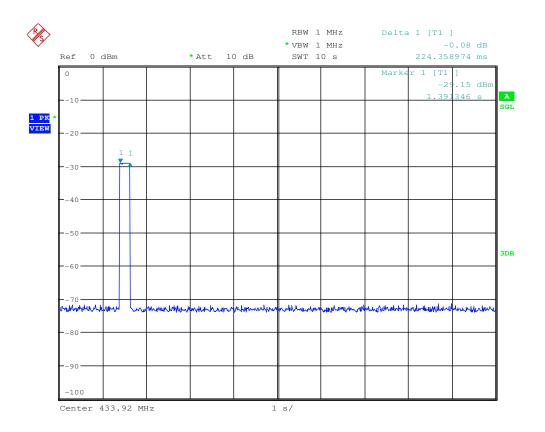
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Test item	Limit (MHz)	Results		
Transmitting time:224.36ms	≤5S	Pass		





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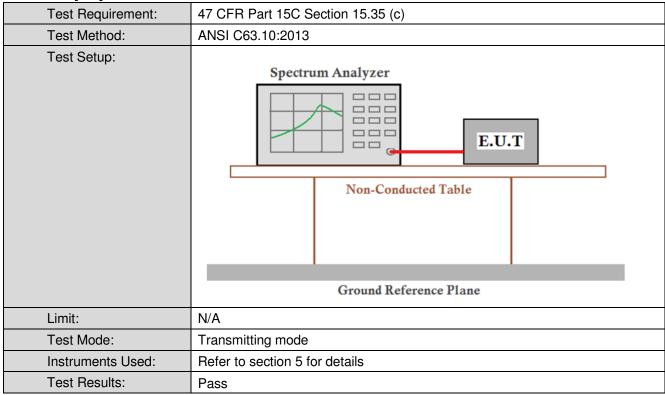
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7.3 Duty Cycle





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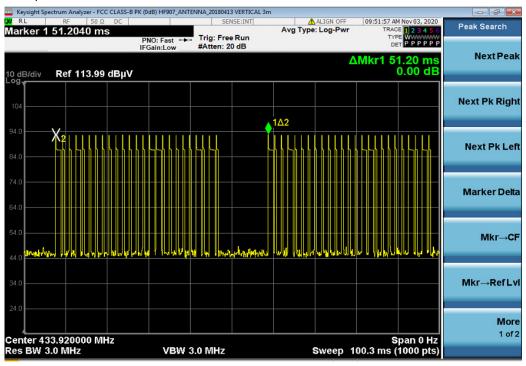
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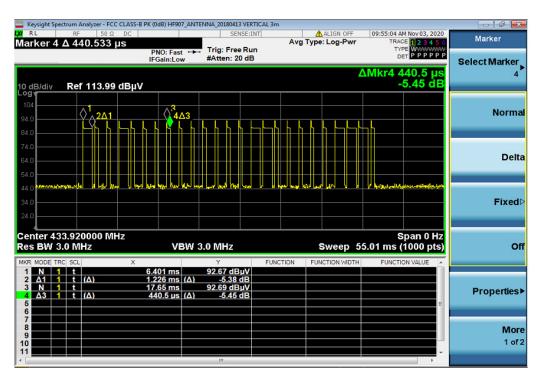


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Test plot:







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7.4 Field Strength of the Fundamental Signal (15.231(b))

Test Requirement 47 CFR Part 15, Subpart C 15.231(b) Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(microvolts/meter)	Field strength of spurious emissions(microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750	125 to 375
174-260	3750	375
260-470	3750 to 12500	375 to 1250
Above 470	12500	1250

Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

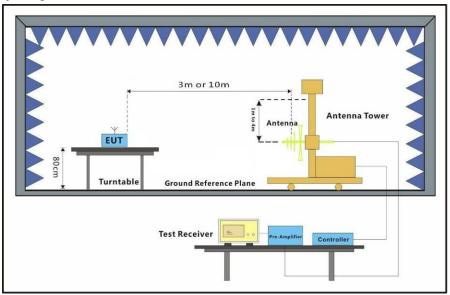
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: Humidity: 51 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.4.2 Test Setup Diagram





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7.4.3 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. 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.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Average value:					
	Average value=Peak value + PDCF				
Calculate Formula:	PDCF=20 log(Duty cycle)= 20 log[16.52/51.20]=-9.83dB				
	Duty cycle= T on time / T period				
Test data:	Ton time =1.23*7+0.44*18=16.52ms				
	T period =51.20ms				

Freq (MHz)	Cable _Loss (dB)	Antenna _Factor (dB/m)	Preamp _Gain (dB)	Read _Level (dBuV)	Level (dBuV/m)	Limit _Line (dBuV/m)	Over _Limit (dB)	Pol/Phase	Remark
433.92	2.37	22.24	27.54	88.31	85.38	100.83	-15.45	HORIZONTAL	Peak
433.92	2.37	22.24	27.54	78.35	75.42	100.83	-25.41	VERTICAL	Peak

Freq (MHz)	PDCF(dB)	Average Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Remark
433.92	0.02	75.55	80.83	-5.28	Horizontal	Average
433.92	-9.83	65.59	80.83	-15.24	Vertical	Average



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7.5 Radiated Emissions

Test Requirement 47 CFR Part 15C Section 15.231(b) and 15.209 Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.



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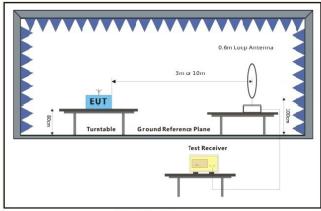
7.5.1 E.U.T. Operation

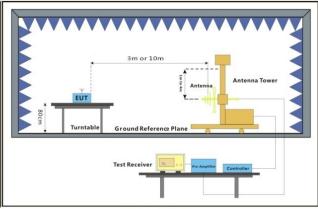
Operating Environment:

25 °C Temperature: Humidity: % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

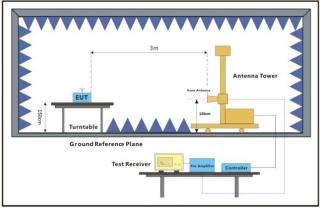
7.5.2 Test Setup Diagram





Below 30MHz

30MHz-1GHz



Above 1GHz

7.5.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



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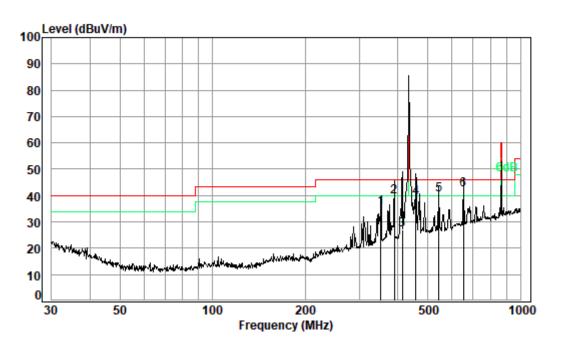


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Below 1GHz

QP value:



Condition: 3m HORIZONTAL

Job No. : 10162CR

Test Mode: TX

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	351.71	2.17	21.12	27.16	39.28	35.41	46.00	-10.59	QP
2	389.35	2.27	22.29	27.34	42.28	39.50	46.00	-6.50	QP
3	413.27	2.33	21.73	27.45	30.29	26.90	46.00	-19.10	QP
4	457.51	2.42	22.88	27.64	41.55	39.21	46.00	-6.79	QP
5	543.27	2.59	25.03	27.95	40.64	40.31	46.00	-5.69	QP
6 nn	651 94	2 81	26 49	28 01	40 83	42 03	46 99	-3 97	OP



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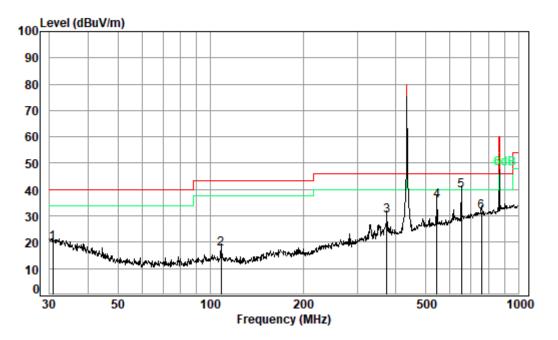
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Mode:a; Polarization: Vertical



Condition: 3m VERTICAL

Job No. : 10162CR

Test Mode: TX

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
_									
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.75	0.61	22.43	27.73	24.49	19.80	40.00	-20.20	QP
2	108.27	1.11	13.75	27.56	30.11	17.41	43.50	-26.09	QP
3	373.31	2.23	22.20	27.27	32.71	29.87	46.00	-16.13	QP
4	543.27	2.59	25.03	27.95	36.18	35.85	46.00	-10.15	QP
5 pp	651.94	2.81	26.40	28.01	38.16	39.36	46.00	-6.64	QP
6	758.04	3.14	27.91	27.80	28.43	31.68	46.00	-14.32	OP



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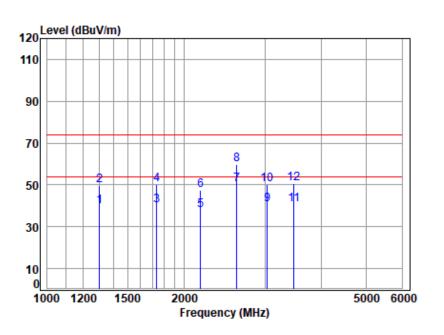


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Above 1GHz

Mode:a: Polarization:Horizontal



Site : chamber

Condition: 3m HORIZONTAL

Job No : 10162CR Mode : 433 TX SE

Note

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1301.332	2.94	25.03	40.36	52.24	39.85	54.00	-14.15	Average
2	1301.332	2.94	25.03	40.36	62.07	49.68	74.00	-24.32	Peak
3	1736.483	3.46	26.82	40.65	50.59	40.22	54.00	-13.78	Average
4	1736.483	3.46	26.82	40.65	60.42	50.05	74.00	-23.95	Peak
5	2168.510	3.97	28.13	40.88	46.51	37.73	54.00	-16.27	Average
6	2168.510	3.97	28.13	40.88	56.34	47.56	74.00	-26.44	Peak
7	2603.351	4.60	29.19	41.06	57.37	50.10	54.00	-3.90	Average
8	2603.351	4.60	29.19	41.06	67.20	59.93	74.00	-14.07	Peak
9	3037.063	4.91	30.96	41.24	45.95	40.58	54.00	-13.42	Average
10	3037.063	4.91	30.96	41.24	55.78	50.41	74.00	-23.59	Peak



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Mode:a; Polarization:Horizontal

Freq			Preamp Factor					
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
3473.883 3473.883								_



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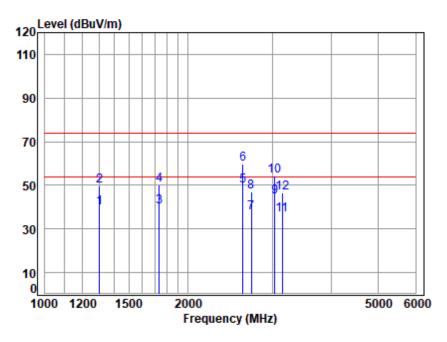
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Mode:a; Polarization:Vertical



Site : chamber Condition: 3m VERTICAL Job No : 10162CR

Mode : 433 TX SE

Note :

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1301.332	2.94	25.03	40.36	52.17	39.78	54.00	-14.22	Average
2	1301.332	2.94	25.03	40.36	62.00	49.61	74.00	-24.39	Peak
3	1736.483	3.46	26.82	40.65	50.60	40.23	54.00	-13.77	Average
4	1736.483	3.46	26.82	40.65	60.43	50.06	74.00	-23.94	Peak
5	2603.351	4.60	29.19	41.06	57.23	49.96	54.00	-4.04	Average
6	2603.351	4.60	29.19	41.06	67.06	59.79	74.00	-14.21	Peak
7	2712.878	4.67	29.69	41.10	44.00	37.26	54.00	-16.74	Average
8	2712.878	4.67	29.69	41.10	53.83	47.09	74.00	-26.91	Peak
9	3037.063	4.91	30.96	41.24	49.97	44.60	54.00	-9.40	Average
10	3037.063	4.91	30.96	41.24	59.80	54.43	74.00	-19.57	Peak



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Mode:a; Polarization:Vertical

		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	_								
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
			,						
11	3147.870	5.07	31.15	41.36	41 . 81	36.67	54.00	-17.33	Average
									_
12	3147.870	5.07	31.15	41.36	51.64	46.50	74.00	-27.50	Peak



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8 **Photographs**

8.1 Test Setup

Please refer to setup photos.

8.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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