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FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

LED Speaker

MODEL No.: LED+9DA21A@(@ Can be “/”, any letter, numbers or Blank which indicate body color, CRI, CCT, Beam distribution, additional function or packaging)

FCC ID: PUU-LEDX9DA21

Trademark:

REPORT NO: ES190305113E0102

ISSUE DATE: March 27, 2019

Prepared for

GE Lighting

1975 Noble Road, Cleveland, Ohio, United States

Prepared by

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1 TEST RESULT CERTIFICATION

This product contains BT, 5.8G, and this report only shows the test results for 5.8G

Applicant	:	GE Lighting
Address	:	1975 Noble Road, Cleveland, Ohio, United States
Manufacturer	:	SHENZHEN FENDA TECHNOLOGY CO., LTD
Address	:	Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen City , Guangdong , China
EUT	:	LED Speaker
Model Name	:	LED+9DA21A@(@ Can be "/", any letter, numbers or Blank which indicate body color, CRI, CCT, Beam distribution, additional function or packaging)
Trademark	:	

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS

The above equipment was tested by EMTEK(SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.249

The test results of this report relate only to the tested sample identified in this report

Date of Test : March 05, 2019 to March 27, 2019

Prepared by : Lance Li /Editor

Reviewer : Sevin Li/Editor

Approve & Authorized Signer : Lisa Wang/Manager

2 EUT TECHNICAL DESCRIPTION

Product	LED Speaker
Modulation:	LED+9DA21A@(@ Can be “/”, any letter, numbers or Blank which indicate body color, CRI, CCT, Beam distribution, additional function or packaging)
Operating Frequency Range:	5731 -5795 MHz
Transmit Power Max	94.40dBuV/m
Channel number	16 channels
Modulation:	GFSK
Antenna Type:	FPCB Antenna
Antenna Gain:	0 dBi
Power supply	AC120V/60Hz
Temperature Range	-20°C ~ +45°C

Note: for more details, please refer to the User’s manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.207	Conducted Emission	PASS	
15.209	Radiated Emission	PASS	
15.249	Radiated Spurious Emission	PASS	
15.249	Band edge test	PASS	
15.249	20dB Bandwidth	PASS	
15.203	Antenna Requirement	PASS	
NOTE1: N/A (Not Applicable) NOTE2: The report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: PUU-LEDX9DA21 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LASTCAL.	DUE CAL.
Test Receiver	Rohde & Schwarz	ESCI	26115-010-0027	May 20, 2018	May 19, 2019
L.I.S.N.	Rohde & Schwarz	ENV216	101161	May 20, 2018	May 19, 2019
50ΩCoaxial Switch	Anritsu	MP59B	6100175589	May 21, 2018	May 20, 2019

4.2.2 For 3m Radiated Emission Measurement 30M-1G (3m chamber 1#)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	05/18/2019
Pre-Amplifier	HP	8447F	2944A07999	May 19, 2018	05/18/2019
Bilog Antenna	Schwarzbeck	VULB9163	142	May 20, 2018	05/19/2019
Cable	Schwarzbeck	AK9513	ACRX1	May 20, 2018	05/19/2019
Cable	Rosenberger	N/A	FP2RX2	May 20, 2018	05/19/2019
Cable	Schwarzbeck	AK9513	CRPX1	May 20, 2018	05/19/2019
Cable	Schwarzbeck	AK9513	CRRX2	May 20, 2018	05/19/2019

4.2.3 For 3m Radiated Emission Measurement 1G-18G (3m chamber 1#)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	05/18/2019
Pre-Amplifier	A.H.	PAM-0126	1415261	May 20, 2018	05/19/2019
Horn Antenna	Schwarzbeck	BBHA 9120	707	May 20, 2018	05/19/2019
Cable	H+B	0.5M SF104-26.5	289147/4	May 20, 2018	05/19/2019
Cable	H+B	3M SF104-26.5	295838/4	May 20, 2018	05/19/2019
Cable	H+B	6M SF104-26.5	295840/4	May 20, 2018	05/19/2019

4.2.4 For 3m Radiated Emission Measurement 18G-26.5G (3m chamber 1#)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 19, 2018	05/18/2019
Pre-Amplifier	A.H.	PAM-0126	1415261	May 20, 2018	05/19/2019
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 20, 2018	05/19/2019
Cable	H+B	0.5M SF104-26.5	289147/4	May 20, 2018	05/19/2019
Cable	H+B	3M SF104-26.5	295838/4	May 20, 2018	05/19/2019
Cable	H+B	6M SF104-26.5	295840/4	May 20, 2018	05/19/2019

4.2.5 For 3m Radiated Emission Measurement 26.5G-40G (3m chamber 3#)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	DUE CAL.
EMI Test Receiver	Rohde & Schwarz	FSV40	132.1-3008K39-100967-AP	May 19, 2018	05/18/2019
Pre-Amplifier	Lunar EM	LNA26G40-40	J1013131028001	May 19, 2018	05/19/2019
Horn Antenna	AHS/USA	SAS-573	184	May 20, 2018	05/19/2019
Cable	A.H	SAC-40G-1	414	May 20, 2018	05/19/2019
Cable	A.H	SAC-40G-1	413	May 20, 2018	05/19/2019

Remark: *Each piece of equipment is scheduled for calibration once a year.*

4.3 DESCRIPTION OF TEST MODES

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : Accredited by CNAS,2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)
The Certificate Registration Number is L2291.

Accredited by TUV Rheinland Shenzhen 2016.5.19
The Laboratory has been assessed according to the requirements ISO/IEC 17025.

Accredited by FCC, August 06, 2018
The certificate is valid until August 07, 2020
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by Industry Canada, November 09, 2018
The Conformity Assessment Body Identifier is CN0008.

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

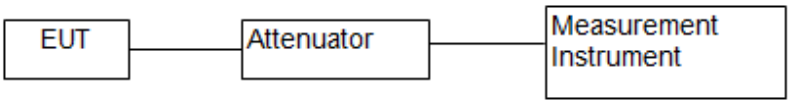
Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The EUT wireless component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz：

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

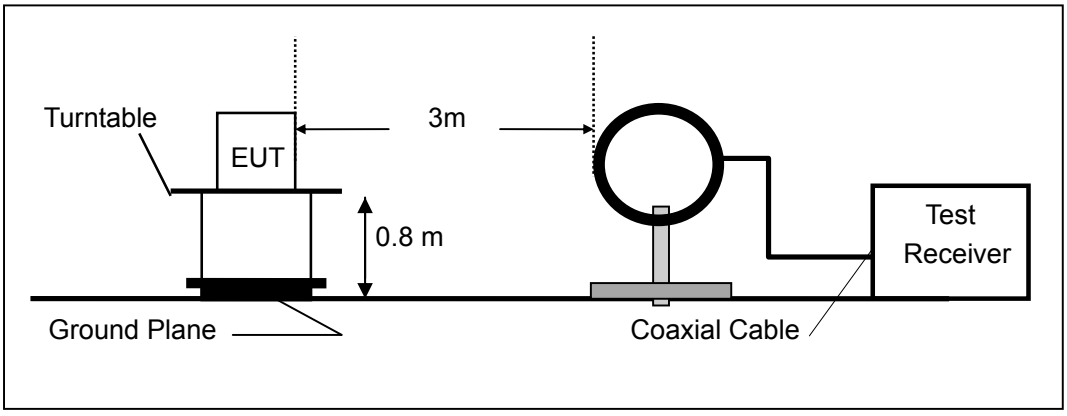
30MHz-1GHz：

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

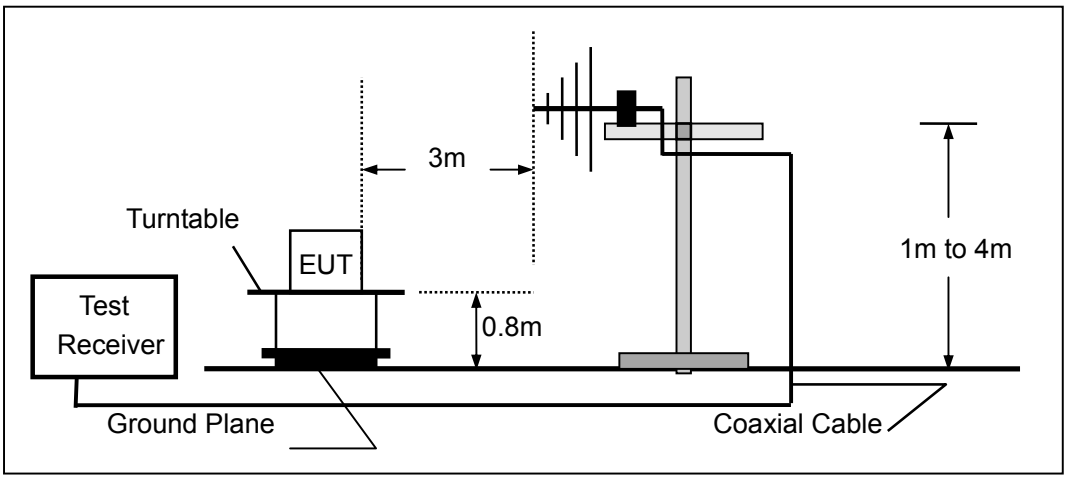
Above 1GHz：

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

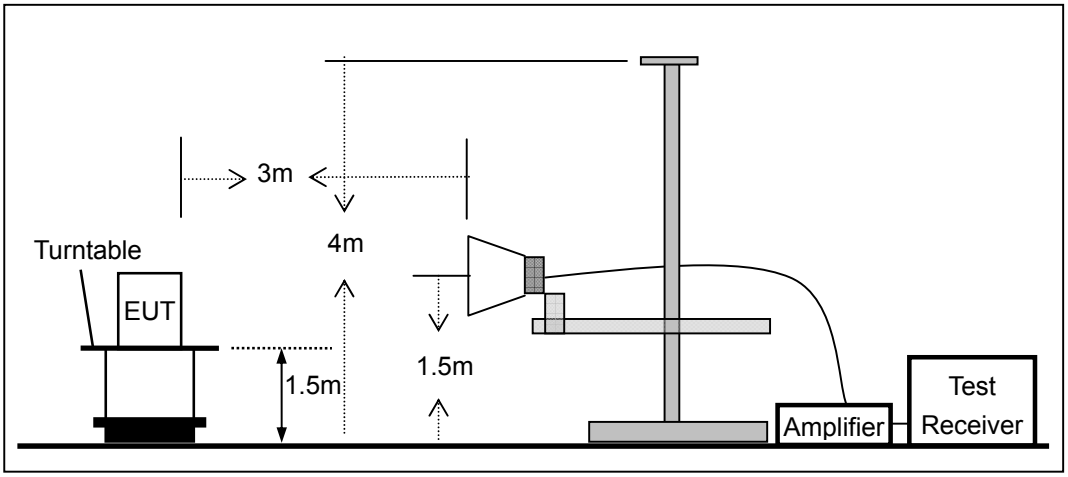
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

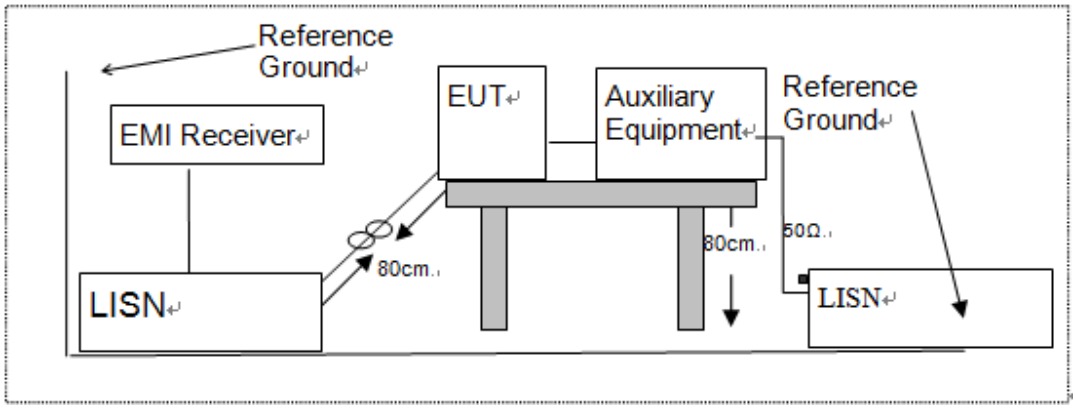


7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 SUPPORT EQUIPMENT

Description	Manufacturer	Model	Serial Number
iPhone 5C	Apple	A1526	CE, FCC ID

Notes:

1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

8 TEST REQUIREMENTS

8.1 BANDWIDTH TEST

8.1.1 Applicable Standard

According to FCC Part 15.249

8.1.2 Conformance Limit

N/A

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup 1

8.1.4 Test Procedure

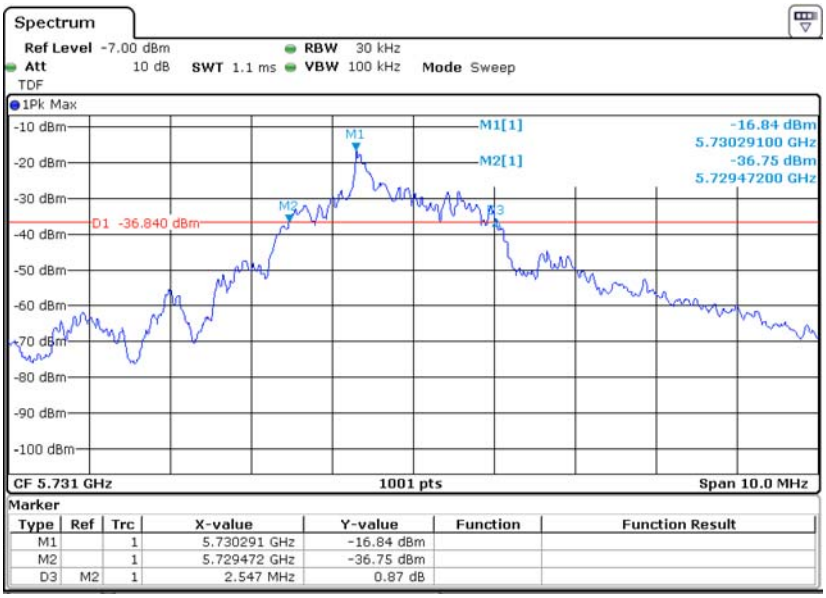
The EUT was operating in controlled its channel. Printed out the test result from the spectrum by hard copy function.
The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously
Set RBW ≥ 1% of the 20 dB bandwidth.
Set the video bandwidth (VBW) ≥ RBW.
Set Span= approximately 2 to 3 times the 20 dB bandwidth.
Set Detector = Peak.
Set Trace mode = max hold.
Set Sweep = auto couple.
Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.
Measure and record the results in the test report.

Test Results

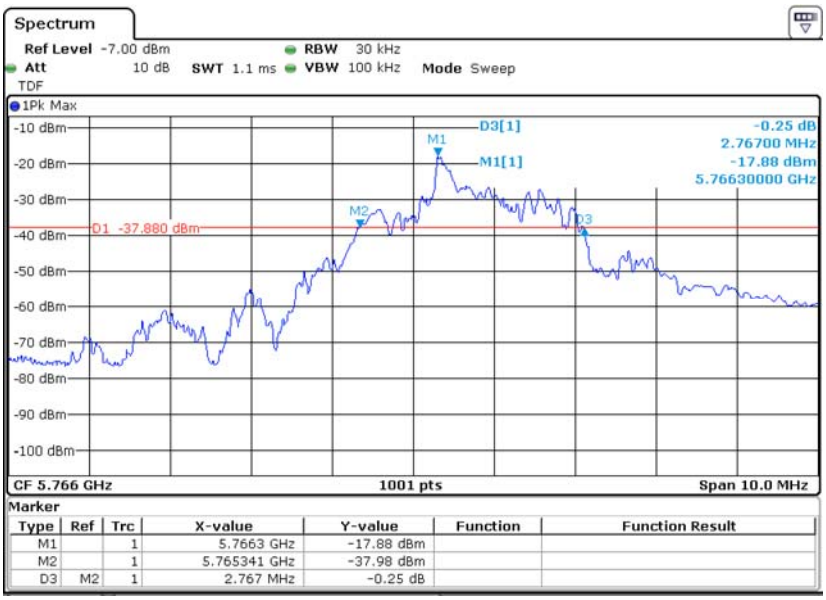
Temperature:	25° C
Relative Humidity:	546%
ATM Pressure:	1009 mbar

Operation Mode	Channel Number	Channel Frequency (MHz)	20db Measurement Bandwidth (kHz)	Limit (kHz)	Verdict
GFSK	Low channel	5731	2547.0	N/A	PASS
	Mid channel	5767	2767.0	N/A	PASS
	High channel	5795	2757.0	N/A	PASS

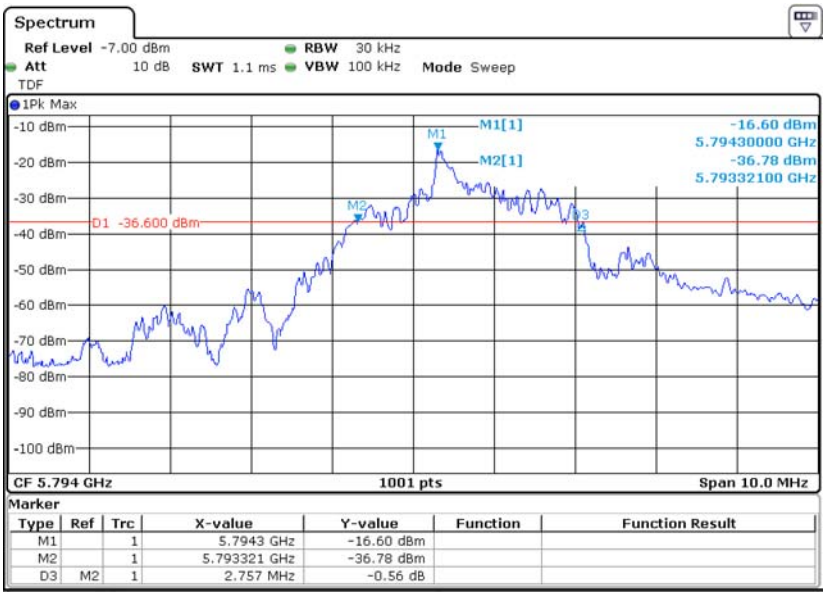
Test Model	20dB Bandwidth GFSK Low Channel: 5731MHz



Test Model	20dB Bandwidth GFSK Mid Channel : 5767MHz



Test Model	20dB Bandwidth GFSK High Channel: 5795MHz



8.2 RADIATED SPURIOUS EMISSION

8.2.1 Applicable Standard

According to FCC Part 15.249 and 15.209

8.2.2 Conformance Limit

According to FCC Part 15.249: radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
According to FCC Part15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	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	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
8.41425-8.41475	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	(2)
13.36-13.41			

According to FCC Part15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remark :1. Emission level in dBuV/m=20 log (uV/m)
2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor.
for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

Field strength of fundamental and Field strength of harmonics Limit:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50(94 dBV/m)	500(54 dBV/m)
2400-2483.5 MHz	50(94 dBV/m)	500(54 dBV/m)
5725-5875 MHz	50(94 dBV/m)	500(54 dBV/m)
24.0-24.25 GHz	250(108 dBV/m)	2500(68 dBV/m)

As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section 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

For this report

Fundamental Frequency	Field Strength Of Fundamental	Field Strength of Spurious Emissions
5725-5875 MHz	AV:94 dBuV/m at 3m distance	AV:54 dBuV/m at 3m distance
	PK:114 dBuV/m at 3m distance	PK:74 dBuV/m at 3m distance

8.2.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

8.2.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1 GHz(1GHz to 25GHz), 100 kHz for f < 1 GHz(30MHz to 1GHz)
VBW ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.
Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(dwell time/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

- Calculation of Average factor

The output field strengths of specification in accordance with the FCC rules specify measurements with an average detector. During the test, a spectrum analyzer incorporating a peak detector was used. Therefore, a reduction factor can be applied to the resultant peak signal level and compared to the limit for measurement instrumentation incorporating an average detector.
The duty cycle is measured in 20ms or the repetition cycle period, whichever is a shorter time frame, the duty cycle is measured by placing the spectrum analyzer to set zero span at 1MHz resolution bandwidth.

8.2.5 Test Results

Temperature:	24° C
Relative Humidity:	58%
ATM Pressure:	1010 mbar

■ Spurious Emission below 30MHz (9KHz to 30MHz)

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
Distance extrapolation factor =40log(Specific distance/ test distance)(dB);
Limit line=Specific limits(dBuV) + distance extrapolation factor

■ Field Strength of the fundamental signal

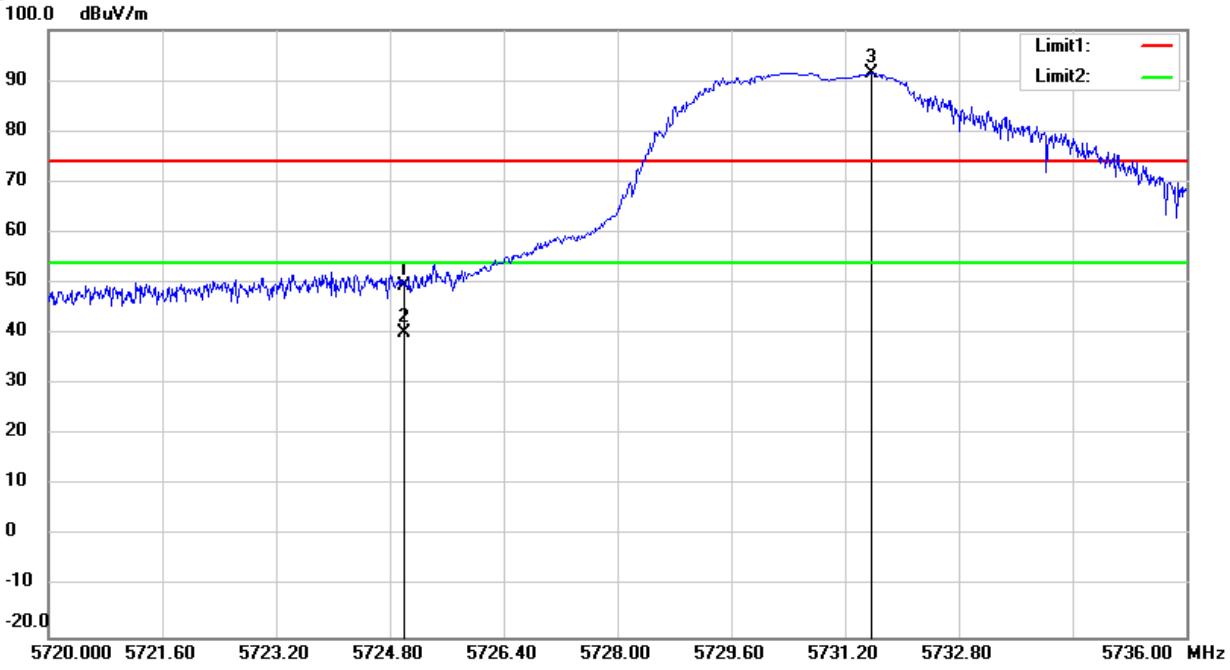
Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)			Limit 3m(dBuV/m)		Over(dB)	
		PK	AV factory	AV	PK	AV	PK	AV
5731.0	V	94.40	-22.61	71.79	114	94	-19.60	-22.21
5731.0	H	91.35	-22.61	68.74	114	94	-22.65	-25.26
5767.0	V	93.65	-22.61	71.04	114	94	-20.35	-22.96
5767.0	H	91.13	-22.61	68.52	114	94	-22.87	-25.48
5795.0	V	93.94	-22.61	71.33	114	94	-20.06	-22.67
5795.0	H	91.92	-22.61	69.31	114	94	-22.08	-24.69

Note: (1) Correct Factor= Antenna Factor +Cable Loss- Amplifier Gain
(2) Emission Level= Reading Level+Probe Factor +Cable Loss
(3)Averaging factor in dB=20log(duty cycle)
(4)Duty cycle=0.074 (It's been tested)

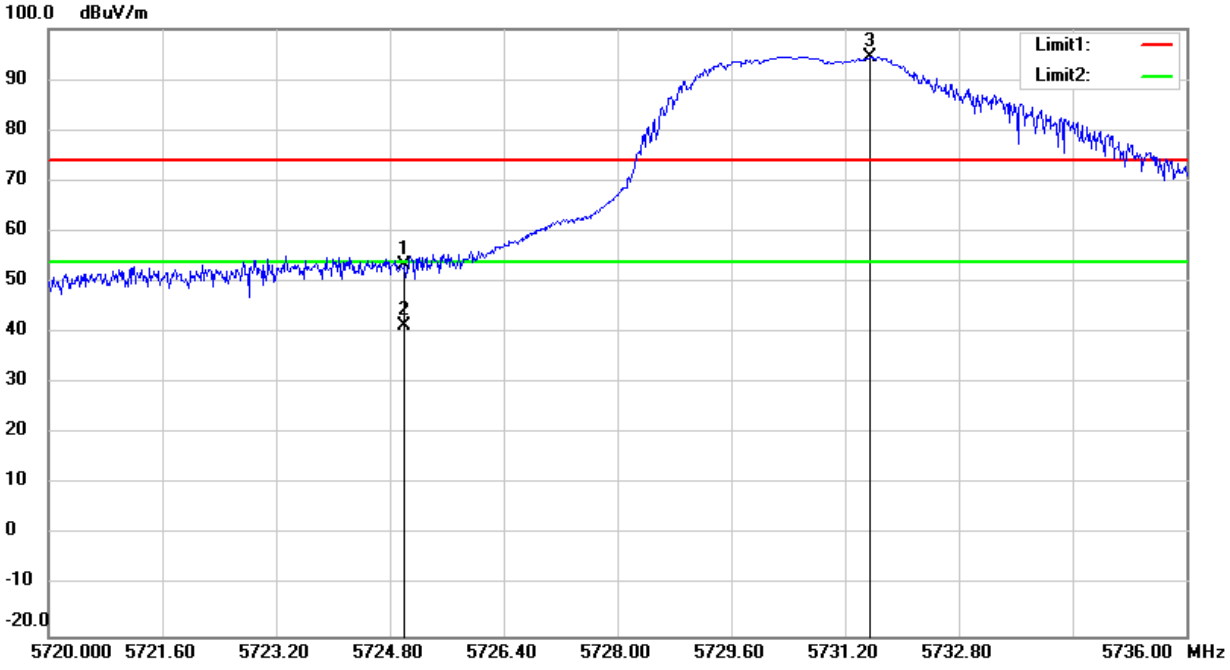
■ Out of Band Emissions

Test mode	Frequency	Limit	Result
	MHz	dBuV / dBc	
Lowest	5725	<54 dBuV	Pass
Highest	5875	<54 dBuV	Pass

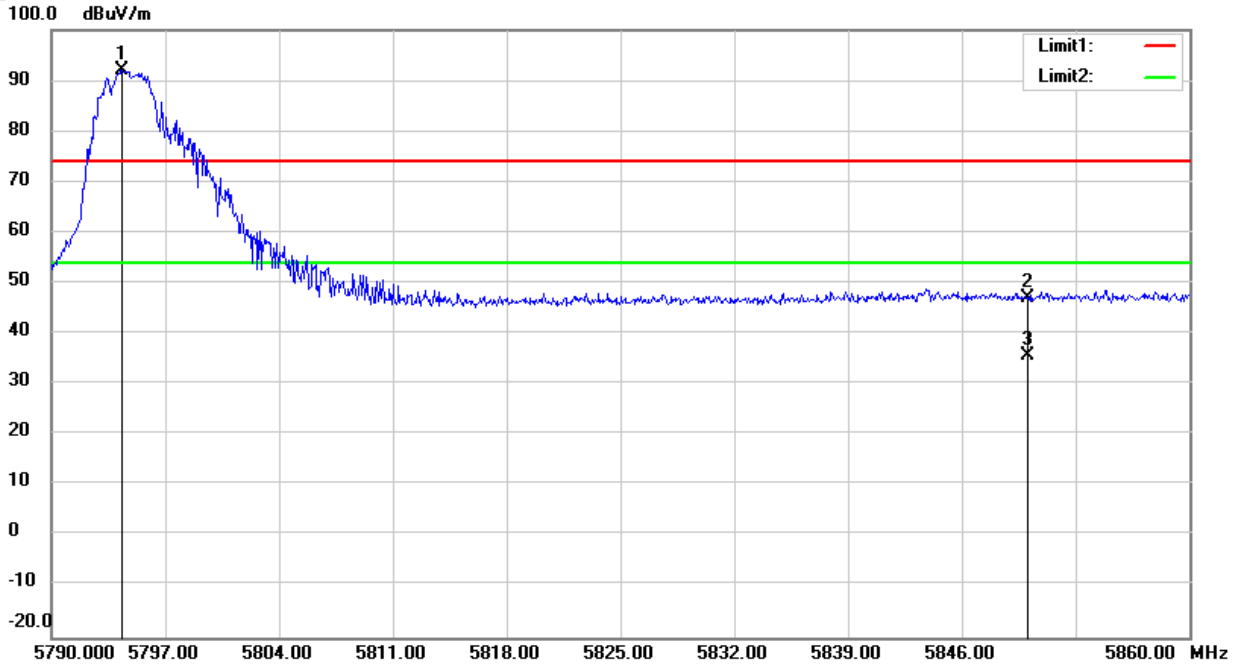
Test Model	Spurious Emission Low Test By: King Kong	GFSK	H



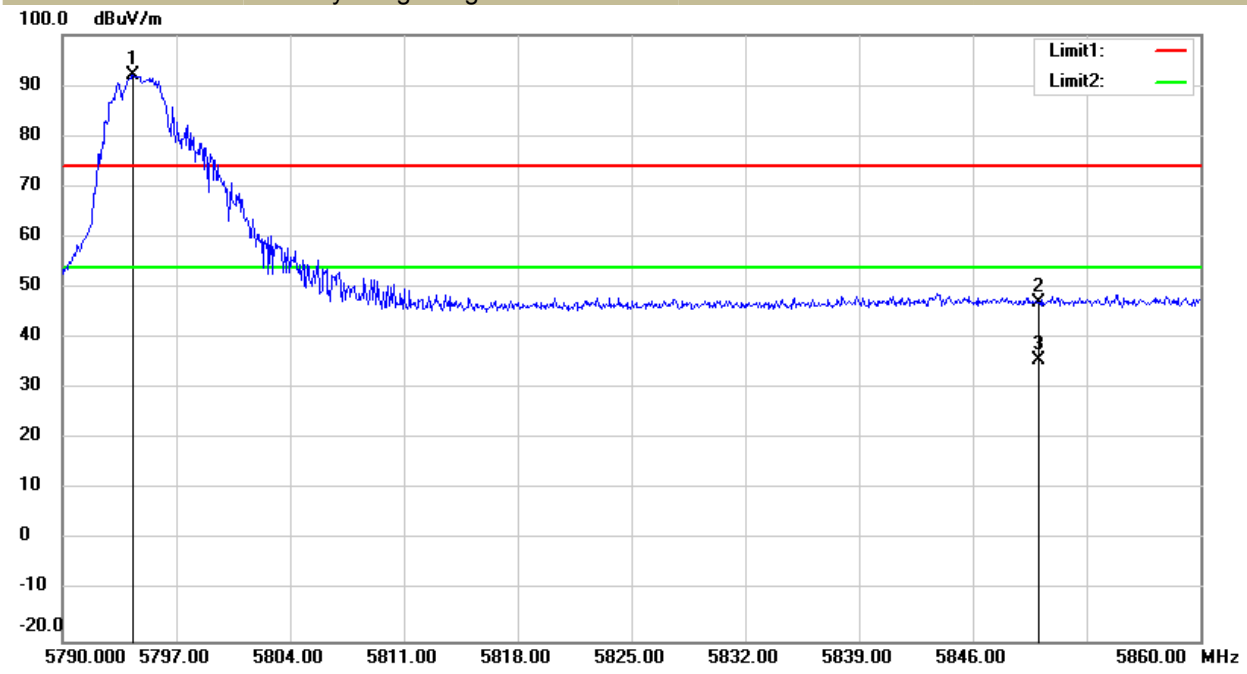
Test Model	Spurious Emission Low Test By: King Kong	GFSK	V



Test Model	Spurious Emission High Test By: King Kong	GFSK	H



Test Model	Spurious Emission High Test By: King Kong	GFSK	V



■ Spurious Emission Above 1GHz (1GHz to 40GHz)

Test mode: GFSK Frequency: L ow Channel : 5731MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1808.55	V	44.53	30.26	74	54	-29.47	-23.74
7852.52	V	53.38	42.02	74	54	-20.62	-11.98
11467.00	V	64.78	50.24	74	54	-9.22	-3.76
1516.21	H	47.58	40.62	74	54	-26.42	-13.38
7476.01	H	54.59	42.35	74	54	-19.41	-11.65
11467.00	H	66.61	48.67	74	54	-7.39	-5.33

Test mode: GFSK Frequency: Low Channel: 5767MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1872.38	V	45.69	34.26	74	54	-28.31	-19.74
10039.39	V	56.52	42.36	74	54	-17.48	-11.64
11600.35	V	62.42	48.24	74	54	-11.58	-5.76
1767.21	H	44.27	35.62	74	54	-29.73	-18.38
8995.12	H	55.07	40.35	74	54	-18.93	-13.65
11533.48	H	62.01	49.57	74	54	-11.99	-4.43

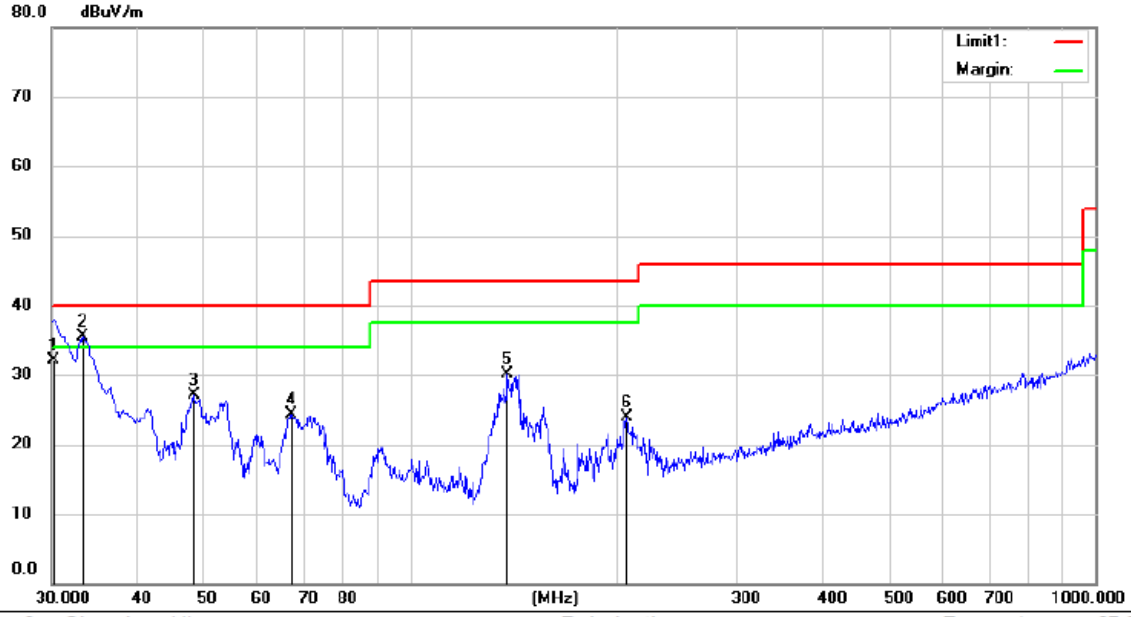
Test mode: GFSK Frequency: Low Channel: 5795MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1866.98	V	44.80	35.62	74	54	-29.20	-18.38
7158.81	V	51.65	39.86	74	54	-22.35	-14.14
11600.35	V	61.95	49.01	74	54	-12.05	-4.99
1899.64	H	45.87	33.68	74	54	-28.13	-20.32
9697.15	H	56.28	42.35	74	54	-17.72	-11.65
11600.35	H	59.86	48.65	74	54	-14.14	-5.35

Note: (1) Emission Level= Reading Level+Correct Factor +Cable Loss.
(2) Correct Factor= Ant_F + Cab_L - Preamp
(3) The unrecorded frequency is less than the limit value of at least 6dB, so it is not recorded.

■ Spurious Emission below 1GHz (30MHz to 1GHz)

All modes have been tested, and the worst result recorded was report as below:



Site 3m Chamber 1# Polarization: *Vertical* Temperature: 27 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode: TX LOW CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.2110	46.33	-14.13	32.20	40.00	-7.80	QP			
2	*	33.3278	48.85	-13.43	35.42	40.00	-4.58	QP			
3		48.5015	38.41	-11.21	27.20	40.00	-12.80	QP			
4		67.2021	38.65	-14.33	24.32	40.00	-15.68	QP			
5		138.8734	45.69	-15.60	30.09	43.50	-13.41	QP			
6		207.1225	35.54	-11.67	23.87	43.50	-19.63	QP			

*:Maximum data x:Over limit !:over margin Operator:

Site 3m Chamber 1# Polarization: *Horizontal* Temperature: 27 C

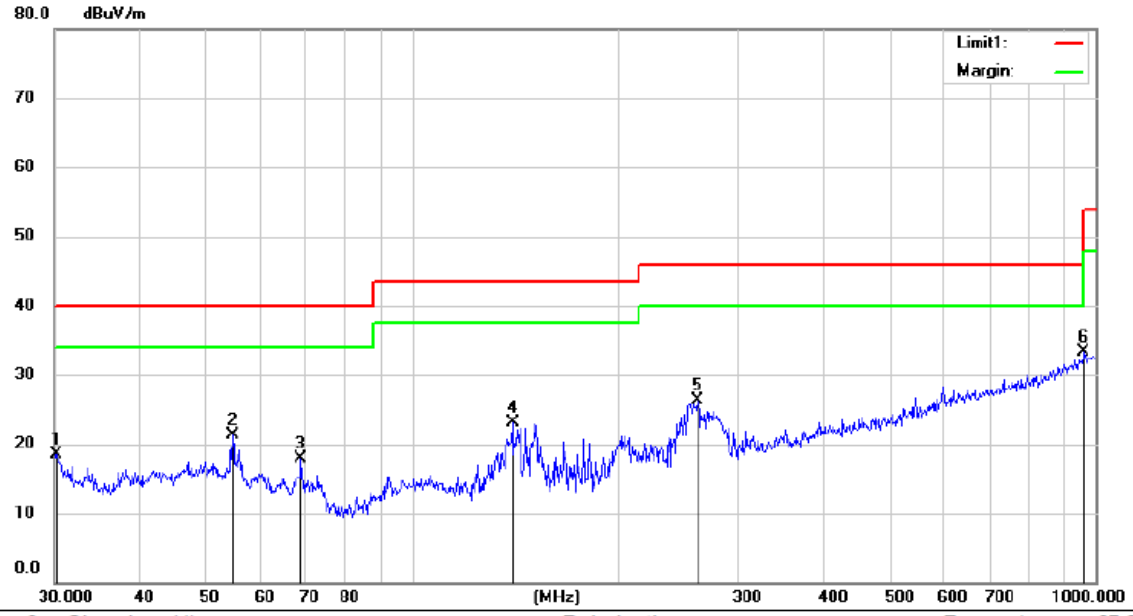
Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode: TX LOW CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.5306	32.97	-14.14	18.83	40.00	-21.17	QP			
2		54.4515	29.86	-11.50	18.36	40.00	-21.64	QP			
3		69.1140	31.72	-15.01	16.71	40.00	-23.29	QP			
4	*	140.3420	40.30	-15.61	24.69	43.50	-18.81	QP			
5		261.9752	36.13	-9.43	26.70	46.00	-19.30	QP			
6		986.0716	29.84	3.68	33.52	54.00	-20.48	QP			

*:Maximum data x:Over limit !:over margin Operator:



Site 3m Chamber 1# Polarization: *Horizontal* Temperature: 27 C

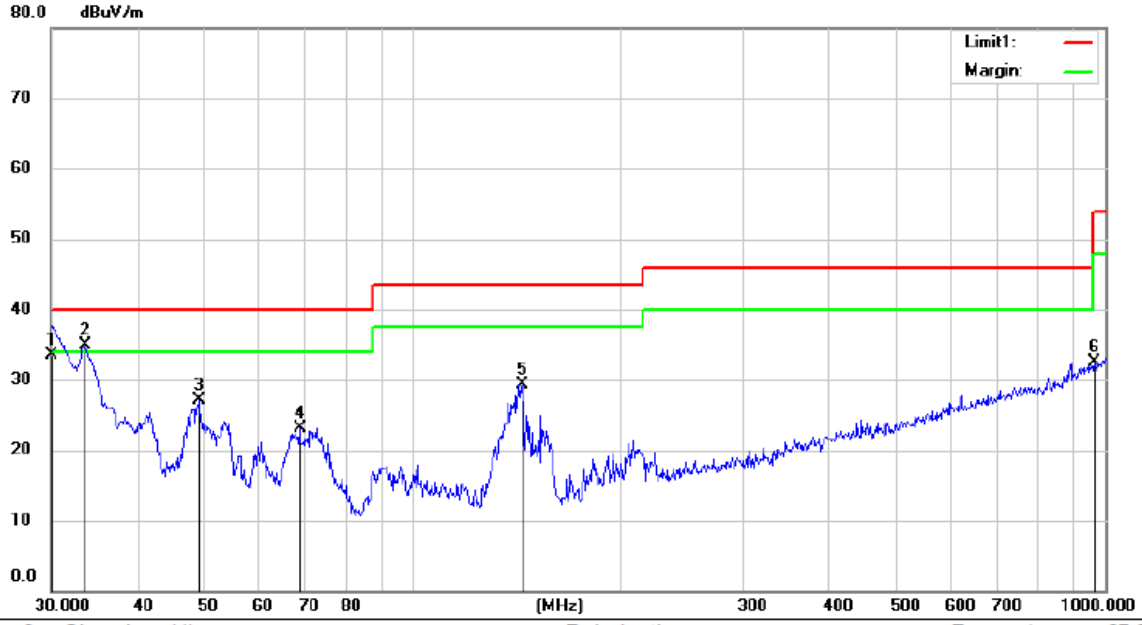
Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode: TX MID CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.2111	32.72	-14.13	18.59	40.00	-21.41	QP			
2	*	54.6428	32.88	-11.55	21.33	40.00	-18.67	QP			
3		68.8721	32.92	-14.92	18.00	40.00	-22.00	QP			
4		140.3420	38.77	-15.61	23.16	43.50	-20.34	QP			
5		261.9752	35.76	-9.43	26.33	46.00	-19.67	QP			
6		962.1622	30.08	3.22	33.30	54.00	-20.70	QP			

*:Maximum data x:Over limit !:over margin Operator:



Site 3m Chamber 1# Polarization: *Vertical* Temperature: 27 C

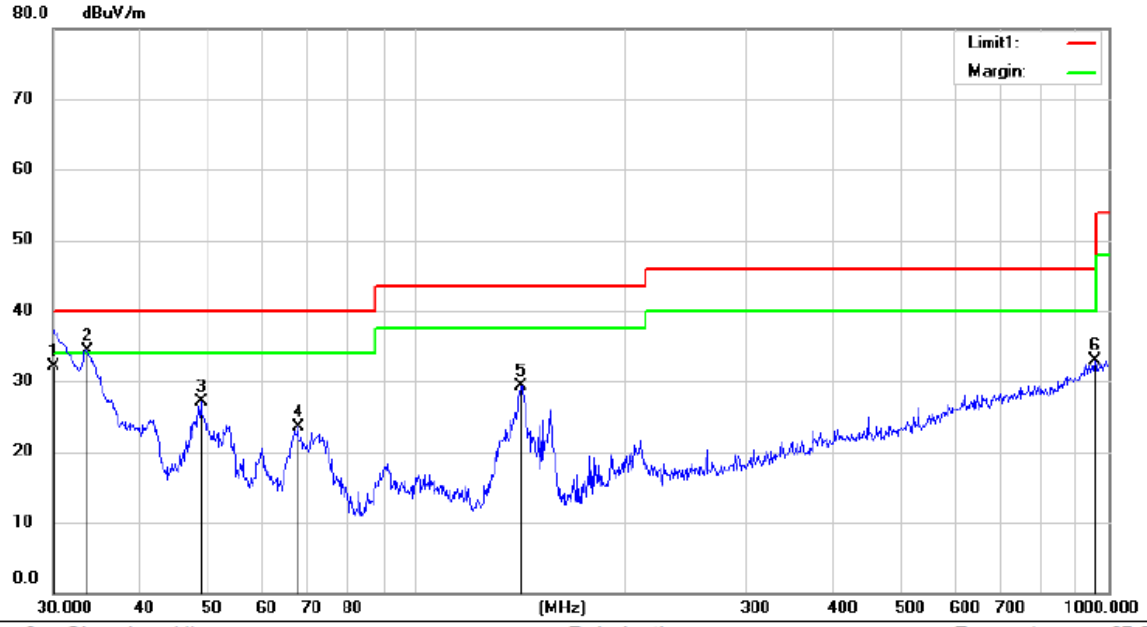
Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode:TX MID CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.0000	47.62	-14.12	33.50	40.00	-6.50	QP			
2	*	33.5624	48.24	-13.29	34.95	40.00	-5.05	QP			
3		49.0144	38.26	-11.22	27.04	40.00	-12.96	QP			
4		68.6310	37.85	-14.84	23.01	40.00	-16.99	QP			
5		143.8295	44.97	-15.62	29.35	43.50	-14.15	QP			
6		965.5420	29.28	3.23	32.51	54.00	-21.49	QP			

*:Maximum data x:Over limit !:over margin Operator:



Site 3m Chamber 1# Polarization: *Vertical* Temperature: 27 C

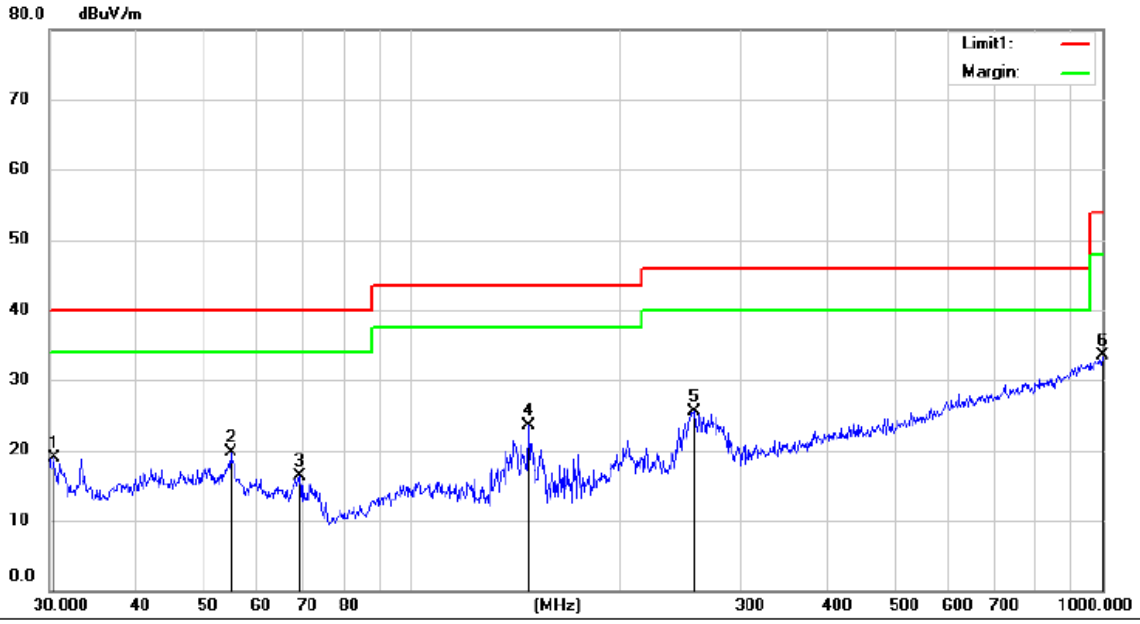
Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode:TX HIGH CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.0000	46.32	-14.12	32.20	40.00	-7.80	QP			
2	*	33.5624	47.67	-13.29	34.38	40.00	-5.62	QP			
3		49.0144	38.33	-11.22	27.11	40.00	-12.89	QP			
4		67.6751	37.96	-14.50	23.46	40.00	-16.54	QP			
5		141.8262	44.87	-15.61	29.26	43.50	-14.24	QP			
6		955.4381	29.76	3.09	32.85	46.00	-13.15	QP			

*:Maximum data x:Over limit !:over margin Operator:



Site 3m Chamber 1# Polarization: *Horizontal* Temperature: 27 C

Limit: (RE)FCC PART 15C Power: AC 120V/60Hz Humidity: 43 %

Mode: TX HIGH CHANNAL

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		30.4238	33.10	-14.13	18.97	40.00	-21.03	QP			
2		54.8348	31.25	-11.60	19.65	40.00	-20.35	QP			
3		69.1141	31.22	-15.01	16.21	40.00	-23.79	QP			
4	*	147.9214	38.92	-15.44	23.48	43.50	-20.02	QP			
5		256.5211	35.16	-9.60	25.56	46.00	-20.44	QP			
6		1000.000	29.61	3.93	33.54	54.00	-20.46	QP			

*:Maximum data x:Over limit !:over margin Operator:

8.3 CONDUCTED EMISSIONS TEST

8.3.1 Applicable Standard

According to FCC Part 15.207(a)

8.3.2 Conformance Limit

	Conducted Emission Limit	
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

8.3.3 Test Configuration

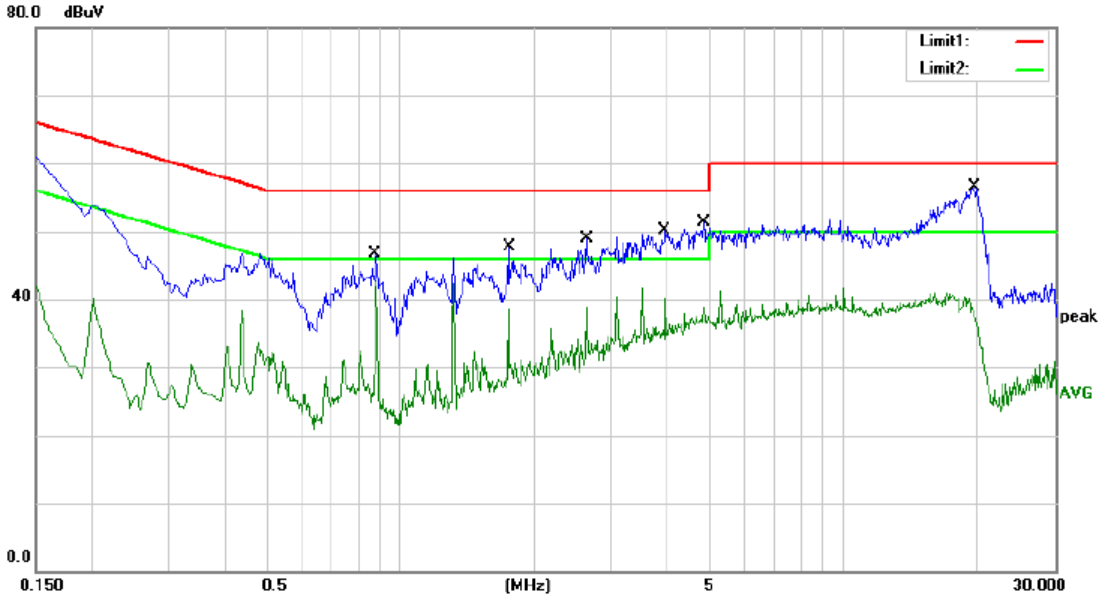
Test according to clause 7.3 conducted emission test setup

8.3.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

8.3.5 Test Results

Pass



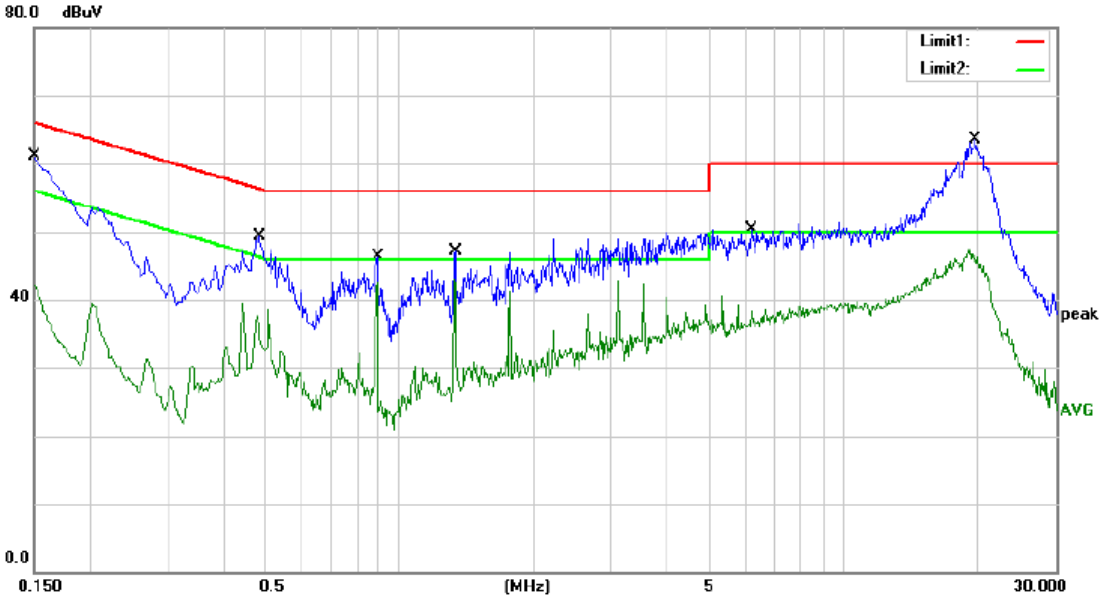
Site Conduction #1 Phase: *L1* Temperature: 24.9

Limit: (CE)FCC PART 15.207 Power: AC 120V/60Hz Humidity: 54 %

Mode: BT play+5.8G ON+LED ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.8780	37.18	9.58	46.76	56.00	-9.24	QP	
2	*	0.8780	33.06	9.58	42.64	46.00	-3.36	AVG	
3		1.7580	38.17	9.59	47.76	56.00	-8.24	QP	
4		1.7580	28.84	9.59	38.43	46.00	-7.57	AVG	
5		2.6340	39.34	9.61	48.95	56.00	-7.05	QP	
6		2.6340	29.33	9.61	38.94	46.00	-7.06	AVG	
7		3.9580	40.38	9.63	50.01	56.00	-5.99	QP	
8		3.9580	30.39	9.63	40.02	46.00	-5.98	AVG	
9		4.8300	41.56	9.66	51.22	56.00	-4.78	QP	
10		4.8300	31.56	9.66	41.22	46.00	-4.78	AVG	
11		19.7620	46.19	10.32	56.51	60.00	-3.49	QP	
12		19.7620	28.51	10.32	38.83	50.00	-11.17	AVG	



Site Conduction #1 Phase: *N* Temperature: 24.9

Limit: (CE)FCC PART 15.207 Power: AC 120V/60Hz Humidity: 54 %

Mode: BT play+5.8G ON+LED ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	51.44	9.67	61.11	66.00	-4.89	QP	
2		0.1500	32.83	9.67	42.50	56.00	-13.50	AVG	
3		0.4820	39.80	9.56	49.36	56.30	-6.94	QP	
4		0.4820	29.88	9.56	39.44	46.30	-6.86	AVG	
5		0.8900	36.64	9.58	46.22	56.00	-9.78	QP	
6		0.8900	32.87	9.58	42.45	46.00	-3.55	AVG	
7		1.3340	37.53	9.58	47.11	56.00	-8.89	QP	
8		1.3340	33.41	9.58	42.99	46.00	-3.01	AVG	
9		6.2060	40.65	9.69	50.34	60.00	-9.66	QP	
10		6.2060	30.79	9.69	40.48	50.00	-9.52	AVG	
11		19.7780	46.68	10.32	57.00	60.00	-3.00	QP	
12	*	19.7780	36.94	10.32	47.26	50.00	-2.74	AVG	

8.4 ANTENNA APPLICATION

8.4.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	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.

For intentional device, according to FCC 47 CFR Section 15.203, 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.

8.4.2 Result

PASS.

- The EUT has 1 antennas: an FPCB Antenna for 5.8G, antenna has a gain of 0 dBi;

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.