EMTEK
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FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Bluetooth Karaoke Player

MODEL No.: STVG785BTW, STVG785BTBK, STVG785BTXX (X means unit colour, it can be A to Z or N/A)

Trade Mark : Singing Machine

FCC ID: OKUSTVG785BT

REPORT NO.: ES160326023E-2

ISSUE DATE: June 25, 2018

Prepared for

SHENZHEN JUNLAN ELECTRONIC LTD.

No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New District, Shenzhen, China

Prepared by

EMTEK (SHENZHEN) CO., LTD.

Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China
TEL: 86-755-26954280
FAX: 86-755-26954282

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1 TEST RESULT CERTIFICATION

Applicant:	SHENZHEN JUNLAN ELECTRONIC LTD. No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New District, Shenzhen, China
Manufacturer:	SHENZHEN JUNLAN ELECTRONIC LTD. No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New District, Shenzhen, China
Product Description:	Bluetooth Karaoke Player
Model Number:	STVG785BTW, STVG785BTBK, STVG785BTXX (X means unit colour, it can be A to Z or N/A) (Note: These models are identical in circuitry and electrical, mechanical and physical construction; the differences are the clour and model no. for trading purpose.)
File Number:	ES160326023E-2
Date of Test:	June 21, 2018 to June 24, 2018 March 26, 2016 to April 9, 2016

Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 2, Subpart J,June 11,2017 FCC 47 CFR Part 15, Subpart C,May 9,2017	**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 15.247

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

Date of Test : June 21, 2018 to June 24, 2018
March 26, 2016 to April 9, 2016

Prepared by : Doris Su.
Doris Su//Editor

Reviewer : Yaping Shen
Yaping Shen/Supervisor

Approve & Authorized Signer :
Lisa Wang/Manager

EMTEK (SHENZHEN) CO., LTD. TESTING

Modified Information

Version	Report No.	Revision Data	Summary
Ver.1.0	ES160326023E	/	Original Version
Ver.1.0	ES160326023E-1	/	Add model No. Change movement of CD Change hand microphone
Ver.1.0	ES160326023E-2	/	Change Pick-up

2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Data Rate	1Mbps for BT V2.1 BR GFSK modulation 2Mbps for BT V2.1 EDR pi/4-DQPSK modulation 3Mbps for BT V2.1 EDR 8DPSK modulation
Modulation:	GFSK modulation for BT V2.1 BR(1Mbps) pi/4-DQPSK modulation for BT V2.1 EDR(2Mbps) 8DPSK modulation for BT V2.1 EDR (3Mbps)
Operating Frequency Range(s):	2402-2480MHz
Number of Channels:	79 channels
Transmit Power Max:	-3.225dBm
Antenna Type :	PCB Antenna
Antenna Gain:	0 dBi;
Adapter1:	Model: GKYPB0200120US Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12V 2000mA
Adapter2:	Model: AY24AA-BF1202002-US Input: AC 100-240V, 50/60Hz, 1.0A Max Output: DC 12V 2000mA
Temperature Range	-10°C ~ +55°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
15.247(a)(1)	20 dB Bandwidth	PASS	
15.247(a)(1)	Carrier Frequency Separation	PASS	
15.247(a)(1)	Number of Hopping Frequencies	PASS	
15.247(a)(1)	Average Time of Occupancy (Dwell Time)	PASS	
15.247(b)(1)	Maximum Peak Conducted Output Power	PASS	
15.247(c)	Conducted Spurious Emissions	PASS	
15.247(d) 15.209	Radiated Spurious Emissions	PASS	
15.207	Conducted Emission	PASS	
15.247(b)	Antenna Application	PASS	
NOTE1: N/A (Not Applicable)			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: OKUSTVG785BT filing to comply with Section 15.247 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
DA 00-705

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	Due CAL.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 19, 2018	May 18, 2019
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	May 19, 2018	May 18, 2019
50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 20, 2018	May 19, 2019
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	May 20, 2018	May 19, 2019
Voltage Probe	Rohde & Schwarz	TK9416	N/A	May 19, 2018	May 18, 2019
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	May 20, 2018	May 19, 2019

4.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	Due CAL.
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	May 20, 2018	May 19, 2019
Pre-Amplifier	HP	8447D	2944A07999	May 19, 2018	May 18, 2019
Bilog Antenna	Schwarzbeck	VULB9163	142	May 19, 2018	May 18, 2019
Loop Antenna	ARA	PLA-1030/B	1029	May 19, 2018	May 18, 2019
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 20, 2018	May 19, 2019
Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 19, 2018	May 18, 2019
Cable	Schwarzbeck	AK9513	ACRX1	May 20, 2018	May 19, 2019
Cable	Rosenberger	N/A	FP2RX2	May 20, 2018	May 19, 2019
Cable	Schwarzbeck	AK9513	CRPX1	May 20, 2018	May 19, 2019
Cable	Schwarzbeck	AK9513	CRRX2	May 20, 2018	May 19, 2019

4.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	Due CAL.
Spectrum Analyzer	Agilent	E4407B	88156318	May 20, 2018	May 19, 2019
Power meter	Anritsu	ML2495A	0824006	May 20, 2018	May 19, 2019
Power sensor	Anritsu	MA2411B	0738172	May 20, 2018	May 19, 2019
Signal Analyzer	Agilent	N9010A	My53470879	May 20, 2018	May 19, 2019

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

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
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.

Those data rates (1Mbps for Bluetooth V2.1 BR GFSK modulation; 2Mbps for Bluetooth V2.1 EDR pi/4-DQPSK modulation; 3Mbps for Bluetooth V2.1 EDR 8DPSK modulation) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for Bluetooth V2.1:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	…	…
1	2403	40	2442	76	2478
2	2404	41	2443	77	2479
…	…	…	…	78	2480
Note: fc=2402MHz+(k-1)×1MHz k=1 to 79					

Test Frequency and channel for Bluetooth V2.1:

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	39	2441	78	2480

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 03, 2017
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by Industry Canada, November 24, 2015
The Certificate Registration Number is 4480A.

Accredited by A2LA, July 31, 2017
The Certificate Number is 4321.01.

6 TEST SYSTEM UNCERTAINTY

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

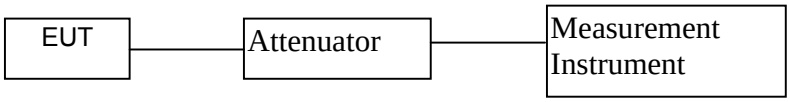
Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity	±3%

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The Bluetooth V2.1 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：

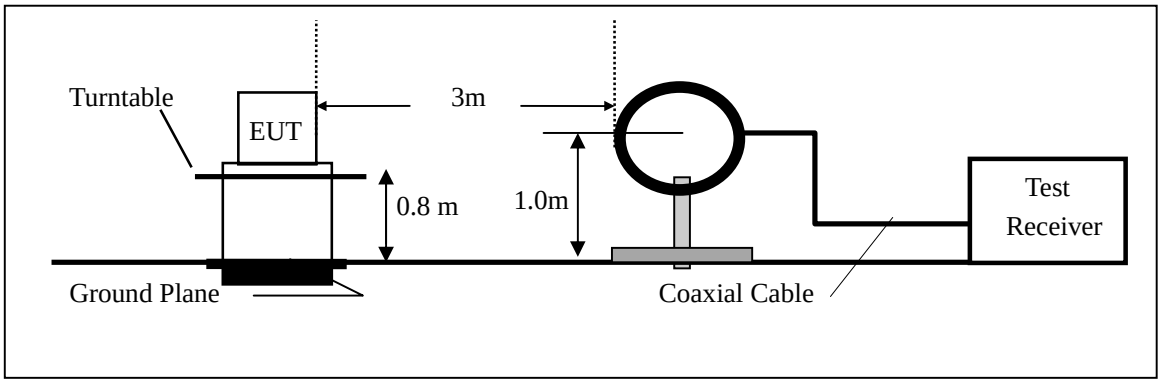
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the 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.

Above 30MHz：

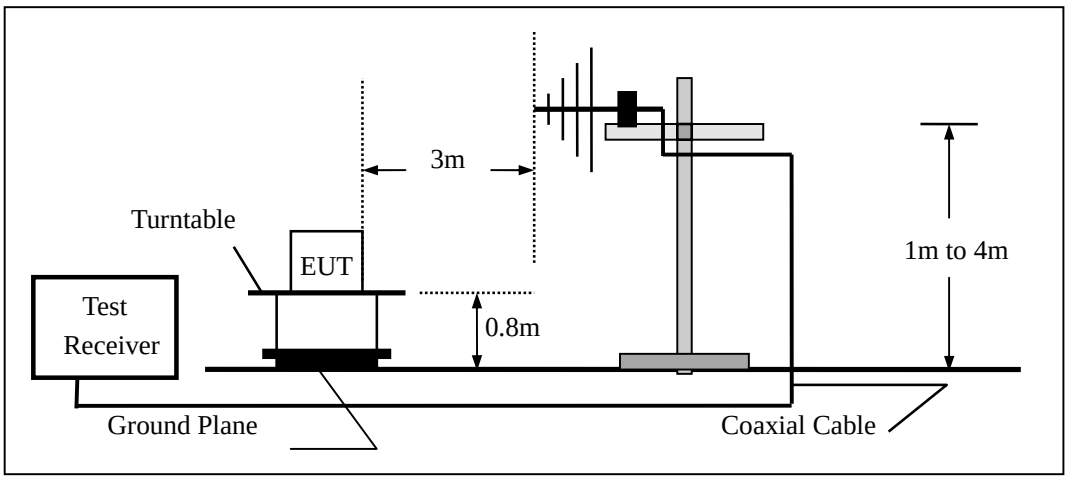
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is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

Above 1GHz:
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)
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).

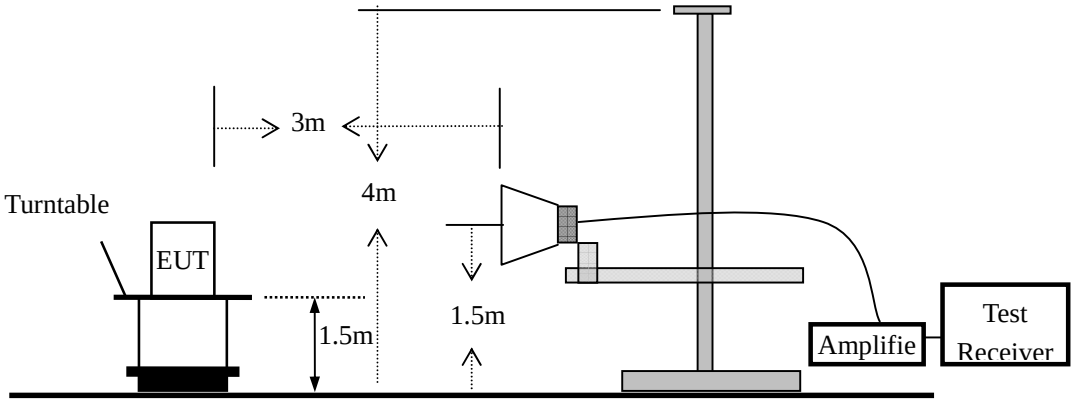
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



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

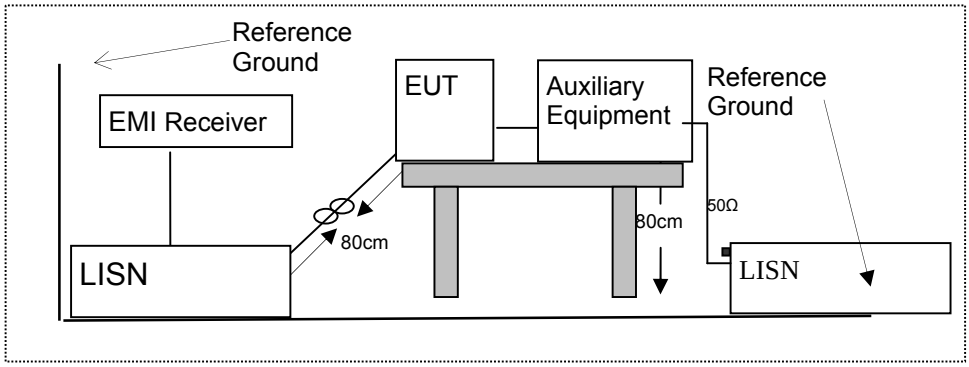


(c) Radiated Emission Test Set-Up, Frequency above 1000MHz



7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (Bluetooth Karaoke Player) 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.



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 FREQUENCY HOPPING SYSTEM REQUIREMENTS

8.1 Standard Applicable

According to FCC Part 15.247(a)(1), The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

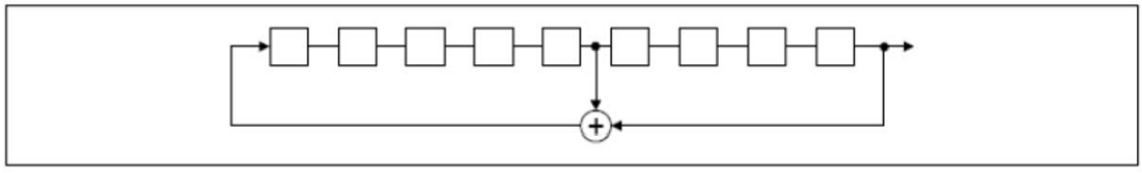
(g) Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. However, the system, consisting of both the transmitter and the receiver, must be designed to comply with all of the regulations in this section should the transmitter be presented with a continuous data (or information) stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its transmissions over the minimum number of hopping channels specified in this section.

(h) The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

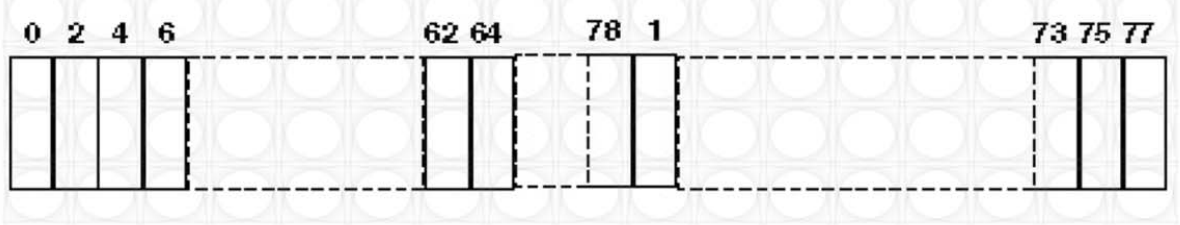
8.2 EUT Pseudorandom Frequency Hopping Sequence

The channel is represented by a pseudo-random hopping sequence hopping through the 79 RF channels. The hopping sequence is unique for the piconet and is determined by the Bluetooth device address of the master; the phase in the hopping sequence is determined by the Bluetooth clock of the master.The channel is divide into time slots where each slot corresponds to an RF hop frequency. Consecutive hops correspond to different RF hop frequencies. The normal hop is 1 600 hops/s.

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage, and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones. Number of shift register stages: 9
Length of pseudo-random sequence: 29-1 = 524 bits
Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence



Each frequency used equally on the average by each transmitter.
The system receiver have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

8.3 Equal Hopping Frequency Use

All Bluetooth units participating in the piconet are time and hop-synchronized to the channel.

Example of a 79 hopping sequence in data mode:
35, 27, 6, 44, 14, 61, 74, 32, 1, 11, 23, 2, 55, 65, 29, 3, 9, 52, 78, 58, 40, 25, 0, 7, 18, 26, 76, 60, 47, 50, 2, 5, 16, 37, 70, 63, 66, 54, 20, 13, 4, 8, 15, 21, 26, 10, 73, 77, 67, 69, 43, 24, 57, 39, 46, 72, 48, 33, 17, 31, 75, 19, 41, 62, 68, 28, 51, 66, 30, 56, 34, 59, 71, 22, 49, 64, 38, 45, 36, 42, 53
Each Frequency used equally on the average by each transmitter

8.4 Frequency Hopping System

This transmitter device is frequency hopping device, and complies with FCC part 15.247 rule.

This device uses Bluetooth radio which operates in 2400-2483.5 MHz band. Bluetooth uses a radio technology called frequency-hopping spread spectrum, which chops up the data being sent and transmits chunks of it on up to 79 bands (1 MHz each; centred from 2402 to 2480 MHz) in the range 2,400-2,483.5 MHz. The transmitter switches hop frequencies 1,600 times per second to assure a high degree of data security. All Bluetooth devices participating in a given piconet are synchronized to the frequency-hopping channel for the piconet. The frequency hopping sequence is determined by the master's device address and the phase of the hopping sequence (the frequency to hop at a specific time) is determined by the master's internal clock. Therefore, all slaves in a piconet must know the master's device address and must synchronize their clocks with the master's clock.

Adaptive Frequency Hopping (AFH) was introduced in the Bluetooth specification to provide an effective way for a Bluetooth radio to counteract normal interference. AFH identifies "bad" channels, where either other wireless devices are interfering with the Bluetooth signal or the Bluetooth signal is interfering with another device. The AFH- enabled Bluetooth device will then communicate with other devices within its piconet to share details of any identified bad channels. The devices will then switch to alternative available "good" channels, away from the areas of interference, thus having no impact on the bandwidth used.

9 TEST REQUIREMENTS

9.1 RADIATED SPURIOUS EMISSION

9.1.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and DA 00-705

9.1.2 Conformance Limit

According to FCC Part 15.247(d): 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

9.1.3 Test Configuration

Test according to clause 7.2 radio frequency test setup 2

9.1.4 Test Procedure

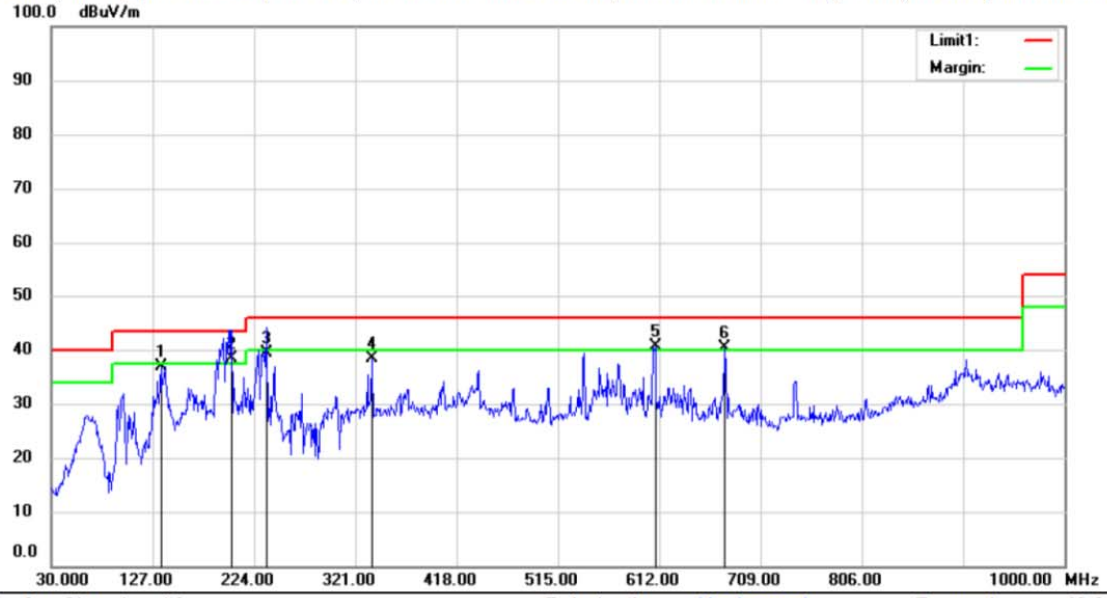
This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:
The EUT was placed on a turn table which is 0.8m 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 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.

9.1.5 Test Results

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

Bluetooth (GFSK, pi/4-DQPSK, 8DPSK) mode have been tested, and the worst result(GFSK) was report as below:



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 23 C

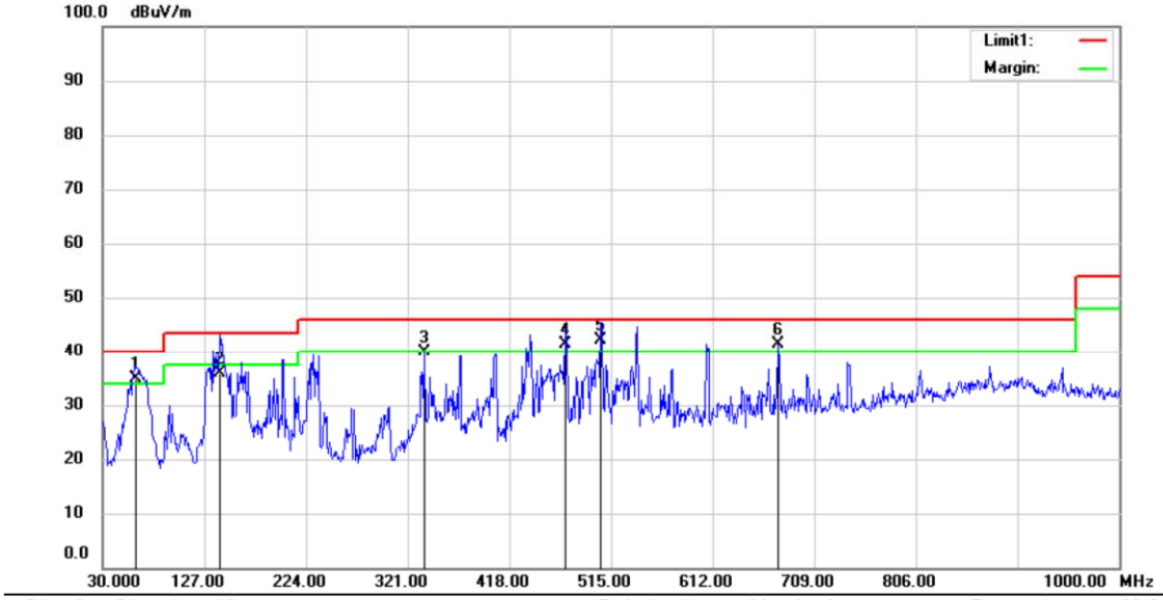
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode: TX LOW

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		134.7600	56.60	-19.62	36.98	43.50	-6.52	QP			
2	*	202.6600	53.99	-15.59	38.40	43.50	-5.10	QP			
3		235.6400	53.95	-14.45	39.50	46.00	-6.50	QP			
4		336.5200	49.68	-11.38	38.30	46.00	-7.70	QP			
5	!	608.1200	46.09	-5.35	40.74	46.00	-5.26	QP			
6	!	675.0500	44.98	-4.66	40.32	46.00	-5.68	QP			

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



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 23 C

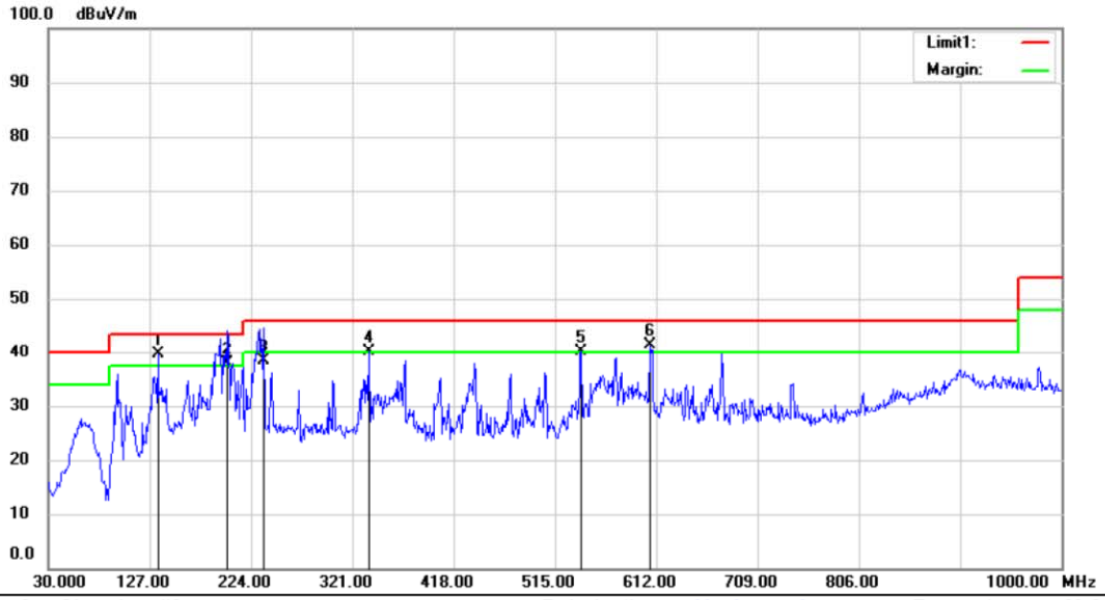
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode:TX LOW

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	!	61.0400	50.96	-16.06	34.90	40.00	-5.10	QP			
2		141.5500	55.38	-19.58	35.80	43.50	-7.70	QP			
3		336.5200	51.32	-11.38	39.94	46.00	-6.06	QP			
4	!	471.3500	50.07	-8.67	41.40	46.00	-4.60	QP			
5	*	505.3000	50.00	-7.90	42.10	46.00	-3.90	QP			
6	!	674.0800	46.00	-4.67	41.33	46.00	-4.67	QP			

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



Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 23 C

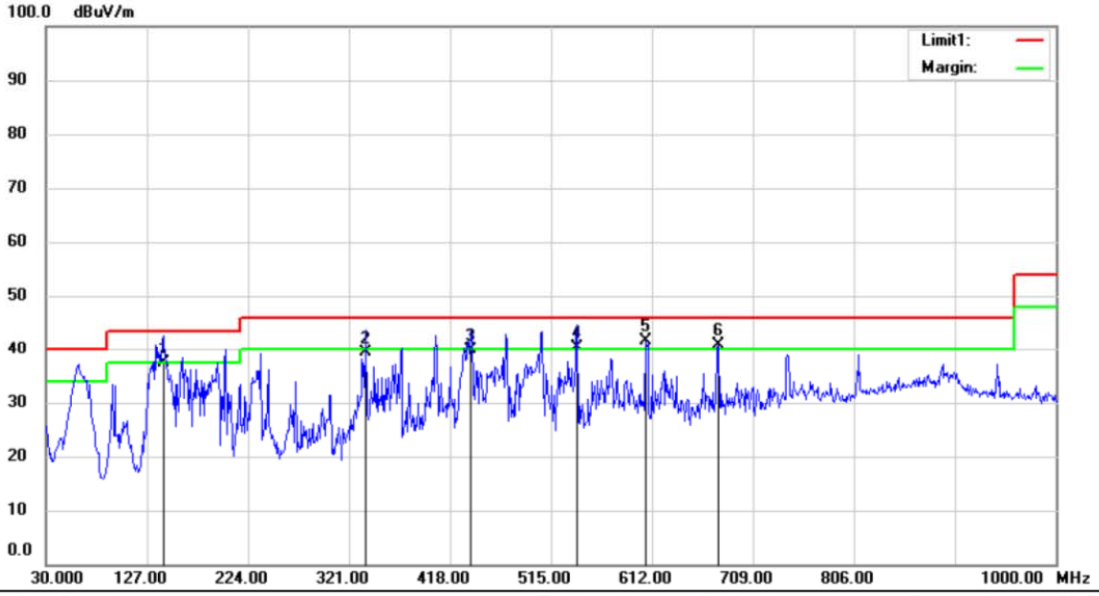
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode:TX MID

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	*	134.7600	59.20	-19.62	39.58	43.50	-3.92	QP			
2	!	201.6900	53.30	-15.50	37.80	43.50	-5.70	QP			
3		235.6400	52.85	-14.45	38.40	46.00	-7.60	QP			
4	!	336.5200	51.59	-11.38	40.21	46.00	-5.79	QP			
5	!	540.2200	47.49	-7.28	40.21	46.00	-5.79	QP			
6	!	606.1800	46.86	-5.40	41.46	46.00	-4.54	QP			

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



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 23 C

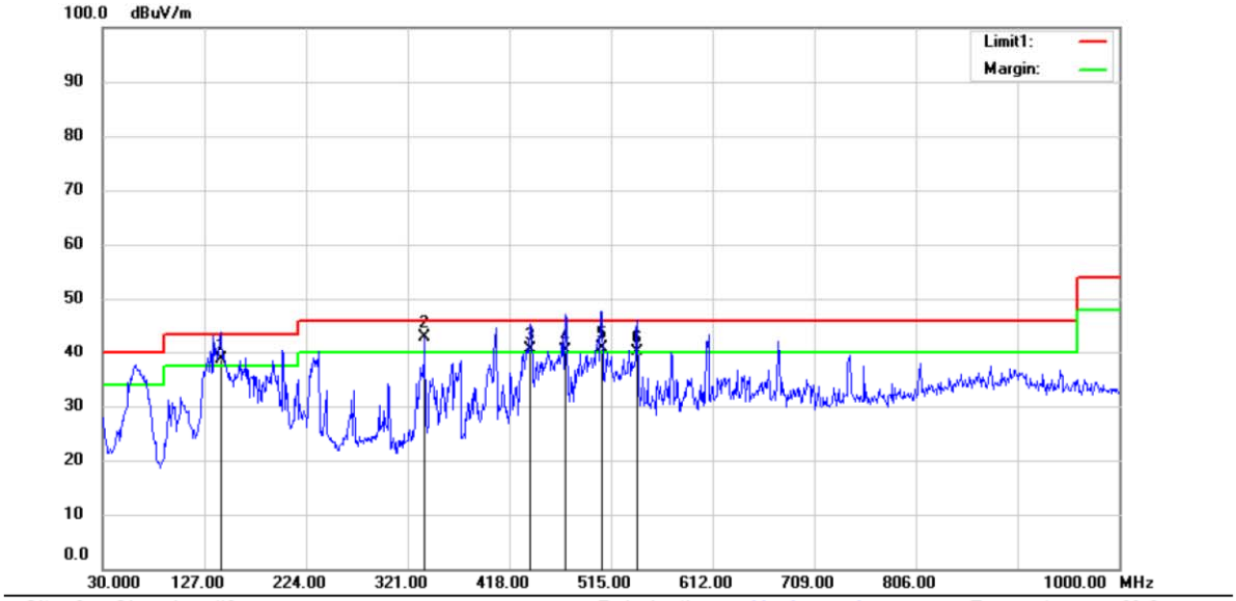
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode: TX MID

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		142.5200	57.03	-19.63	37.40	43.50	-6.10	QP			
2		337.4900	50.81	-11.31	39.50	46.00	-6.50	QP			
3		437.4000	48.99	-9.19	39.80	46.00	-6.20	QP			
4	!	540.2200	47.78	-7.28	40.50	46.00	-5.50	QP			
5	*	606.1800	47.08	-5.40	41.68	46.00	-4.32	QP			
6	!	676.0200	45.65	-4.65	41.00	46.00	-5.00	QP			

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



Site 3m Chamber #3 Polarization: ***Horizontal*** Temperature: 23 C

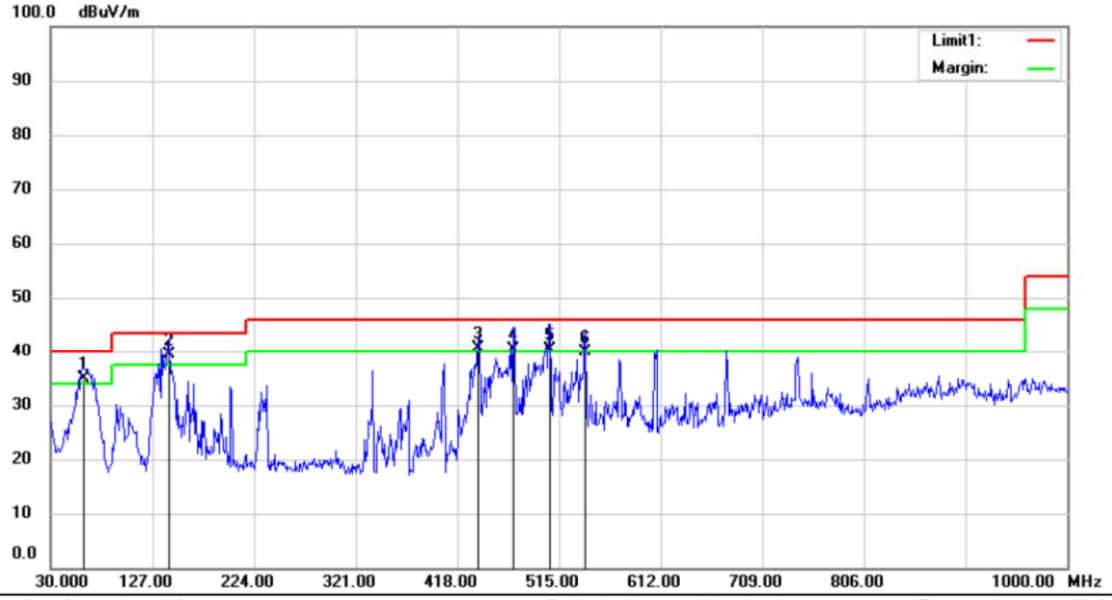
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode:TX HIGH

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	!	142.5200	58.33	-19.63	38.70	43.50	-4.80	QP			
2	*	337.4900	54.16	-11.31	42.85	46.00	-3.15	QP			
3	!	437.4000	49.79	-9.19	40.60	46.00	-5.40	QP			
4	!	471.3500	49.07	-8.67	40.40	46.00	-5.60	QP			
5	!	506.2700	48.69	-7.89	40.80	46.00	-5.20	QP			
6	!	540.2200	47.38	-7.28	40.10	46.00	-5.90	QP			

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



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 23 C

Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 51 %

Mode:TX HIGH

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	!	61.0400	50.86	-16.06	34.80	40.00	-5.20	QP			
2	*	142.5200	59.03	-19.63	39.40	43.50	-4.10	QP			
3	!	437.4000	49.89	-9.19	40.70	46.00	-5.30	QP			
4	!	471.3500	48.97	-8.67	40.30	46.00	-5.70	QP			
5	!	506.2700	48.39	-7.89	40.50	46.00	-5.50	QP			
6		540.2200	47.18	-7.28	39.90	46.00	-6.10	QP			

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

9.2 CONDUCTED EMISSION TEST

9.2.1 Applicable Standard

According to FCC Part 15.207(a)

9.2.2 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.		

9.2.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

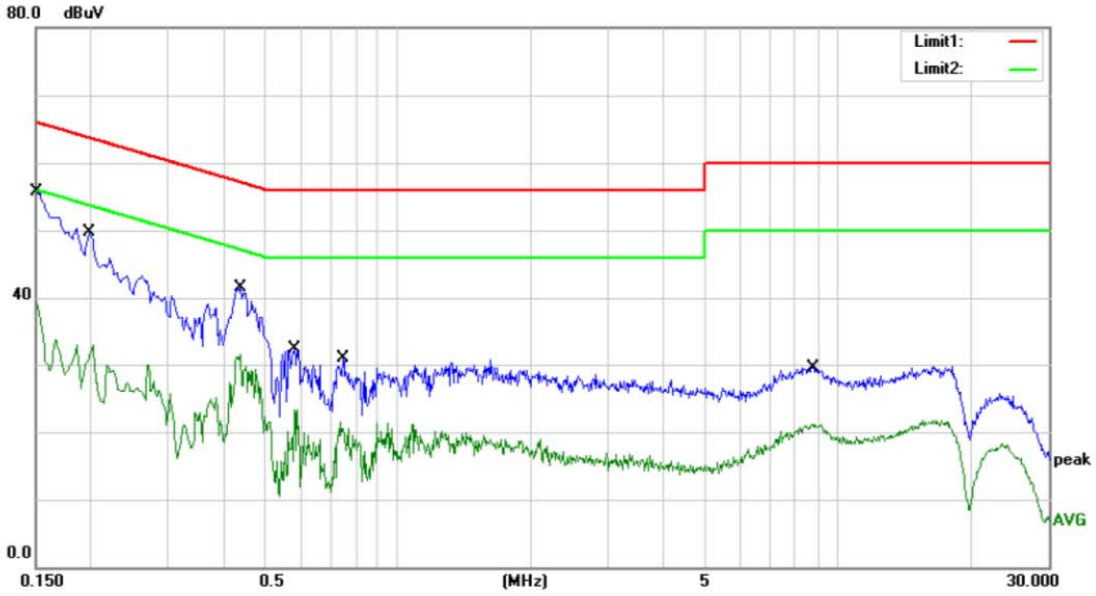
9.2.4 Test Procedure

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.

9.2.5 Test Results

Pass.

The voltage (120V&240V) and adapters(adapter1&adapter2) have been tested and the worst results has been recorded on the folow page.



Site Conduction #2 Phase: *L1* Temperature: 24.9

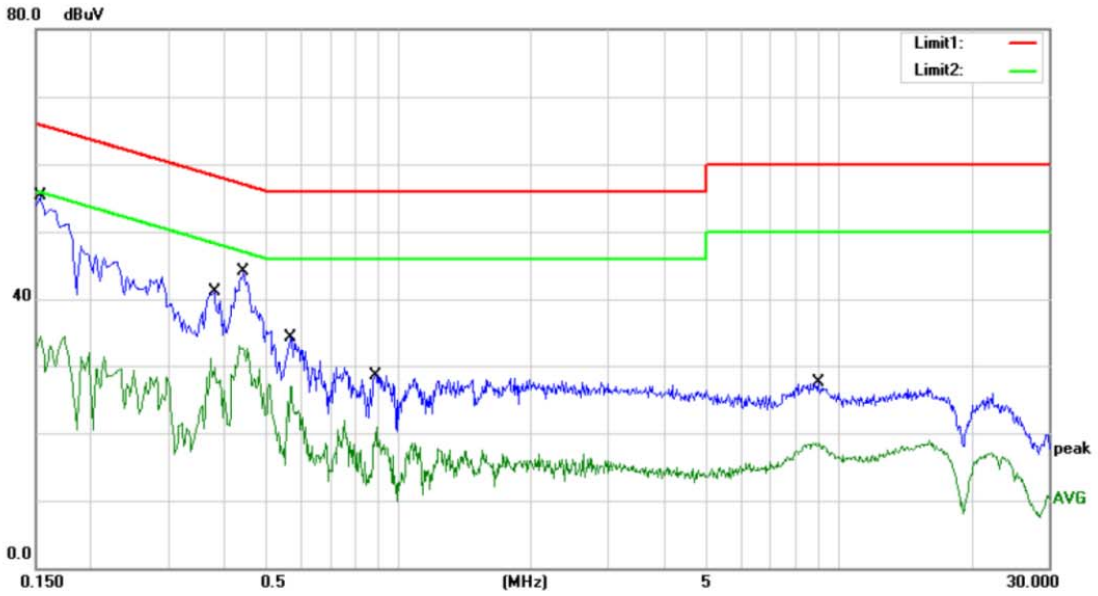
Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %

Mode: BT Mode

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	45.76	9.89	55.65	66.00	-10.35	QP	
2		0.1500	30.24	9.89	40.13	56.00	-15.87	AVG	
3		0.1980	39.72	9.90	49.62	63.69	-14.07	QP	
4		0.1980	23.06	9.90	32.96	53.69	-20.73	AVG	
5		0.4380	31.67	9.92	41.59	57.10	-15.51	QP	
6		0.4380	21.52	9.92	31.44	47.10	-15.66	AVG	
7		0.5820	22.34	9.92	32.26	56.00	-23.74	QP	
8		0.5820	13.44	9.92	23.36	46.00	-22.64	AVG	
9		0.7500	20.90	9.92	30.82	56.00	-25.18	QP	
10		0.7500	11.65	9.92	21.57	46.00	-24.43	AVG	
11		8.7700	19.55	10.00	29.55	60.00	-30.45	QP	
12		8.7700	11.16	10.00	21.16	50.00	-28.84	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan



Site Conduction #2 Phase: *N* Temperature: 24.9
Limit: (CE)FCC PART 15 C_QP Power: AC 120V/60Hz Humidity: 54 %
Mode: BT Mode
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1540	45.39	9.90	55.29	65.78	-10.49	QP	
2		0.1540	24.69	9.90	34.59	55.78	-21.19	AVG	
3		0.3820	31.18	9.91	41.09	58.24	-17.15	QP	
4		0.3820	21.20	9.91	31.11	48.24	-17.13	AVG	
5		0.4460	34.18	9.92	44.10	56.95	-12.85	QP	
6		0.4460	22.88	9.92	32.80	46.95	-14.15	AVG	
7		0.5700	24.31	9.92	34.23	56.00	-21.77	QP	
8		0.5700	16.96	9.92	26.88	46.00	-19.12	AVG	
9		0.8860	18.51	9.93	28.44	56.00	-27.56	QP	
10		0.8860	11.02	9.93	20.95	46.00	-25.05	AVG	
11		8.9820	17.53	10.00	27.53	60.00	-32.47	QP	
12		8.9820	8.56	10.00	18.56	50.00	-31.44	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: Stan

9.3 ANTENNA APPLICATION

9.3.1 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.3.2 Result

The EUT'S antenna is Integral Antenna, and the antenna can't be replaced by the user, which in accordance to section 15.203, please refer to the internal photos. The antenna's gain is 0dBi and meets the requirement.

END OF REPORT