SGS-CSTC Standards Technical Services Ltd.

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FCC REPORT

Application No:	SZEM1206003099RF
Applicant:	Disruptive Ltd.
Manufacturer:	Disruptive Ltd.
Factory:	Dong Guan Tai Sing Audio Technology Ltd.
Product Name:	HouseParty Portable
Model No.(EUT):	PG532
FCC ID:	YNKPG532US
Standards:	47 CFR Part 15, Subpart C (2011) (Only for AC Power Line Conducted Emission and Radiated Spurious Emissions test)
Date of Receipt:	2012-06-07
Date of Test:	2012-06-08 to 2012-06-21
Date of Issue:	2012-07-27
Test Result:	**PASS ***

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

Authorized Signature:

Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Test Summary

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2009)	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 (2009)	PASS

Remark:
Model No.: PG532
This test report (Ref. No.: SZEM120200041203) is only valid with the original test report (Ref. No.: SZEM120200041202)
Review this report and original report, this report just changing the adapter.
According to the declaration from the applicant, the models in this report are identical from original report and only difference with the adapter.
Considering to the difference, pre-scan were performed on the sample in this report to find the models which can be influential to the result in the original test report then for fully retest.
Therefore in this report Conducted emission and Radiated spurious emissions were fully retested on model PG532 and shown the data in this report, other tests please refer to original report SZEM120200041202.

3 Contents

4 General Information

4.1 Client Information

Applicant:	Disruptive Ltd.
Address of Applicant:	Windsor House, Turnpike Rd, High Wycombe, HP12 3NR, United Kingdom
Manufacturer:	Disruptive Ltd.
Address of Manufacturer:	Windsor House, Turnpike Rd, High Wycombe, HP12 3NR, United Kingdom
Factory:	Dong Guan Tai Sing Audio Technology Ltd.
Address of Factory:	Tai Sing Industrial Road, Bai Zhou Bian Village, Dong Cheng, Dongguan City, Guangdong Province, P.R. China

4.2 General Description of EUT

Name:	HouseParty Portable
Model No.:	PG532
Trade Mark:	Gear4
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V2.1+EDR
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, π/4DQPSK, 8DPSK
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Sample Type:	fixed production
Test Software of EUT:	CSR blue suite (manufacturer declare)
Antenna Type and Gain:	Type :Integral Gain :2.6dBi
Power Supply:	MODEL: S032BU1200250 INPUT: AC 100-240V 50/60Hz 900mA OUTPUT: DC 12.0V 2500mA
Test Voltage:	INPUT: AC 120V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel	2402MHz
The Middle channel	2441MHz
The Highest channel	2480MHz

4.3 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	998mbar

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Mobile	Nokia	6300

4.5 Test Location

All tests were performed at:

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

4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**
  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.
- **VCCI**
  The 3m Semi-anechoic chamber, Full-anechoic Chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197, G-416, T-1153 and C-2383 respectively.
- **FCC – Registration No.: 556682**
  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.
- **Industry Canada (IC)**
  The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.7 Deviation from Standards

None.

4.8 Abnormalities from Standard Conditions

None.

4.9 Other Information Requested by the Customer

None.

4.10Test Instruments List

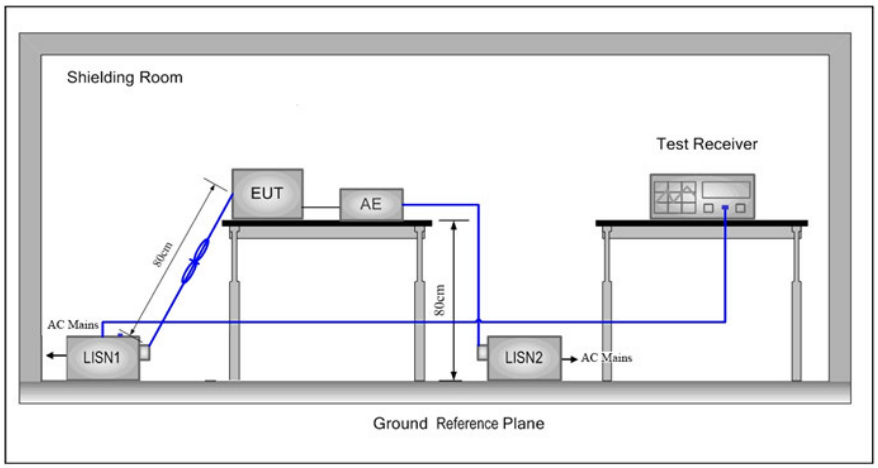
RE in Chamber					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2013-06-10
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2013-05-17
3	EMI Test software	AUDIX	E3	SEL0050	N/A
4	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2012-10-29
5	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2012-10-29
6	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2012-10-29
7	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2013-05-17
8	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2012-11-26
9	Coaxial cable	SGS	N/A	SEL0027	2013-05-29
10	Coaxial cable	SGS	N/A	SEL0189	2013-05-29
11	Coaxial cable	SGS	N/A	SEL0121	2013-06-12
12	Coaxial cable	SGS	N/A	SEL0178	2013-05-29
13	Band filter	Amindeon	82346	SEL0094	2013-05-17
14	Barometer	Chang Chun	DYM3	SEL0088	2013-05-24
15	Universal radio communication tester	Rohde & Schwarz	CMU200	SEL0091	2012-11-24
16	Universal radio communication tester	Rohde & Schwarz	CMU200	SEL0194	2012-09-06
17	Signal Generator (10M-27GHz)	Rohde & Schwarz	SMR27	SEL0067	2013-05-17
18	Signal Generator	Rohde & Schwarz	SMY01	SEL0155	2012-10-23
19	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2012-10-27
20	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2012-10-23

Conducted Emission					
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Due date (yyyy-mm-dd)**
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	2013-06-10
2	LISN	Rohde & Schwarz	ENV216	SEL0152	2012-10-23
3	LISN	ETS-LINDGREN	3816/2	SEL0021	2013-5-17
4	8 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T8-02	SEL0162	2012-11-11
5	4 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T4-02	SEL0163	2012-11-11
6	2 Line ISN	Fischer Custom Communications Inc.	FCC-TLISN-T2-02	SEL0164	2012-11-11
7	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2013-5-17
8	Coaxial Cable	SGS	N/A	SEL0025	2013-05-29
9	Universal radio communication tester	Rohde & Schwarz	CMU200	SEL0091	2012-11-24
10	Universal radio communication tester	Rohde & Schwarz	CMU200	SEL0194	2012-09-06
11	DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2012-10-23
12	Humidity/ Temperature Indicator	Shanhai Qixiang	ZJ1-2B	SEL0103	2012-10-27
13	Barometer	Chang Chun	DYM3	SEL0088	2013-05-24

5 Test results and Measurement Data

5.1 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2009</td></tr>
<tr><td>Test Frequency Range:</td><td>150kHz to 30MHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test Procedure:</td><td>1) The mains terminal disturbance voltage test was conducted in a shielded room.
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.</td></tr>
</table>

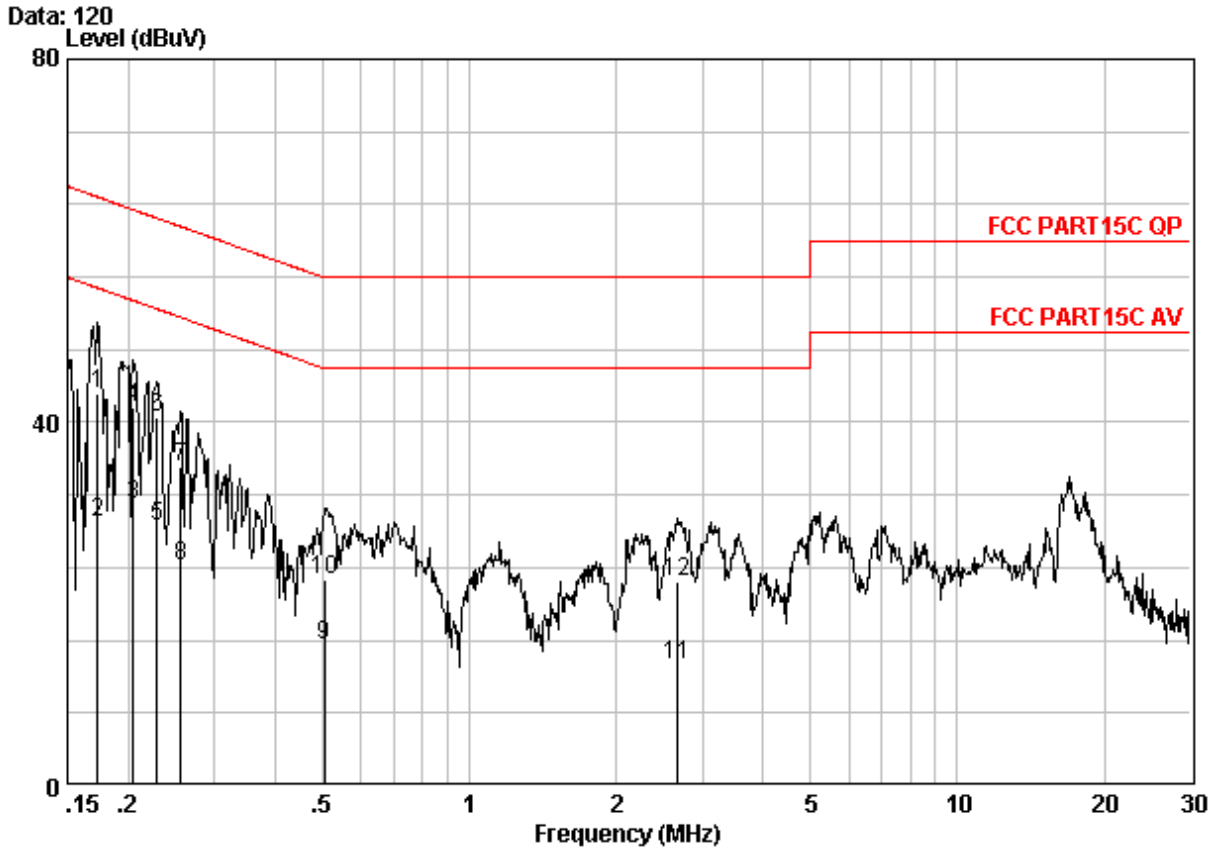
Test Setup:	
Test Mode:	Transmitting mode
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

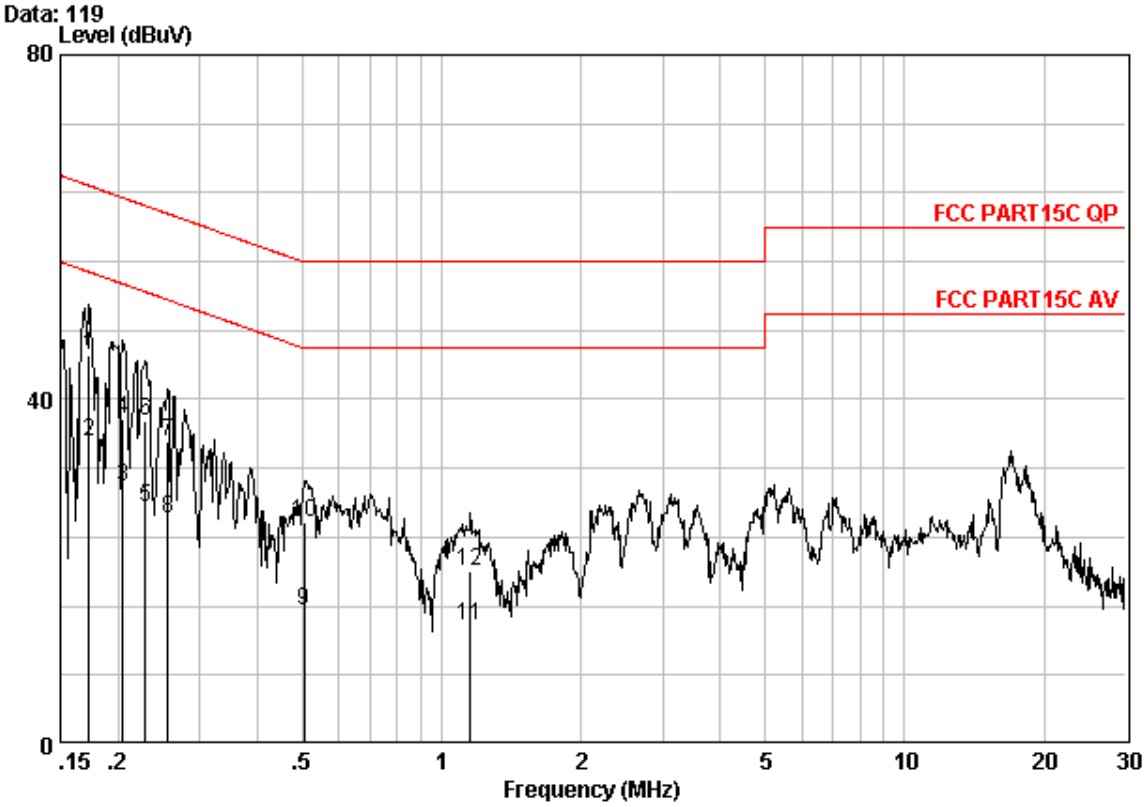
Live line:



Site : Shielding Room
Condition : FCC PART15C QP CE-20101216 LINE
Job No. : 3099RF
Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.17307	0.04	9.60	33.59	43.23	64.81	-21.58	QP
2	0.17307	0.04	9.60	19.40	29.04	54.81	-25.77	Average
3	0.20505	0.04	9.60	21.21	30.85	53.40	-22.55	Average
4 @	0.20505	0.04	9.60	32.01	41.65	63.40	-21.75	QP
5	0.22918	0.04	9.60	18.81	28.46	52.48	-24.02	Average
6 @	0.22918	0.04	9.60	30.84	40.48	62.48	-22.00	QP
7	0.25615	0.05	9.60	25.38	35.03	61.56	-26.53	QP
8	0.25615	0.05	9.60	14.52	24.16	51.56	-27.39	Average
9	0.50469	0.06	9.60	5.92	15.58	46.00	-30.42	Average
10	0.50469	0.06	9.60	13.09	22.75	56.00	-33.25	QP
11	2.678	0.13	9.73	3.54	13.40	46.00	-32.60	Average
12	2.678	0.13	9.73	12.49	22.36	56.00	-33.64	QP

Neutral line:



Site : Shielding Room
Condition : FCC PART15C QP CE-20101216 NEUTRAL
Job No. : 3099RF
Mode : TX mode

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.17307	0.04	9.60	35.59	45.23	64.81	-19.58	QP
2 @	0.17307	0.04	9.60	25.40	35.04	54.81	-19.77	Average
3	0.20505	0.04	9.60	20.21	29.85	53.40	-23.55	Average
4	0.20505	0.04	9.60	28.01	37.65	63.40	-25.75	QP
5	0.22918	0.04	9.60	17.81	27.46	52.48	-25.02	Average
6	0.22918	0.04	9.60	27.84	37.48	62.48	-25.00	QP
7	0.25615	0.05	9.60	25.38	35.03	61.56	-26.53	QP
8	0.25615	0.05	9.60	16.52	26.16	51.56	-25.39	Average
9	0.50469	0.06	9.60	5.92	15.58	46.00	-30.42	Average
10	0.50469	0.06	9.60	16.09	25.75	56.00	-30.25	QP
11	1.153	0.09	9.70	3.94	13.73	46.00	-32.27	Average
12	1.153	0.09	9.70	10.18	19.97	56.00	-36.03	QP

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

5.2 Pseudorandom Frequency Hopping Sequence

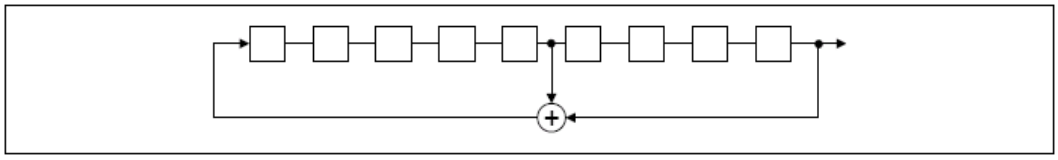
Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom 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.

EUT Pseudorandom Frequency Hopping Sequence

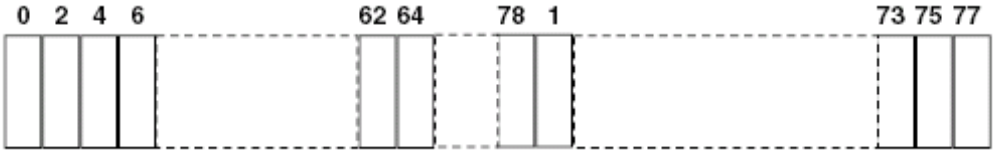
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONEs; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: 29 -1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



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

5.3 Radiated Spurious Emission

Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10: 2009
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Test Setup:	

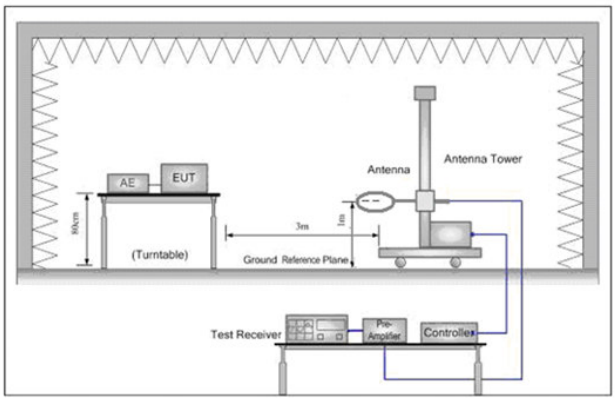


Figure 1. Below 30MHz

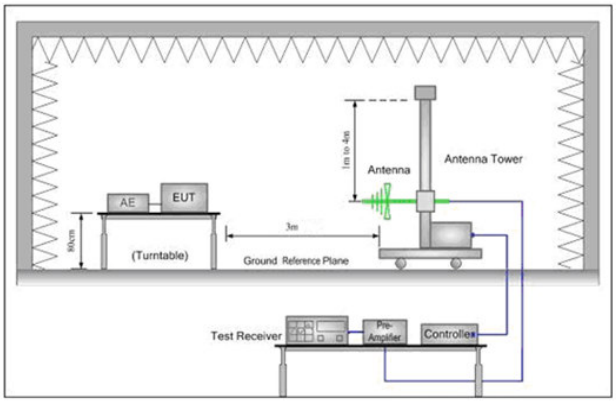


Figure 2. 30MHz to 1GHz

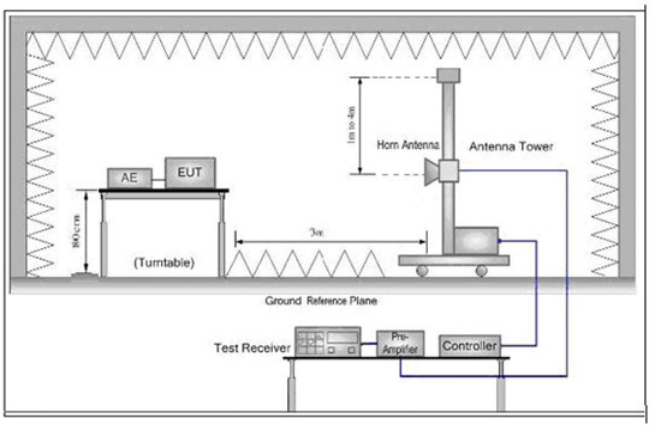


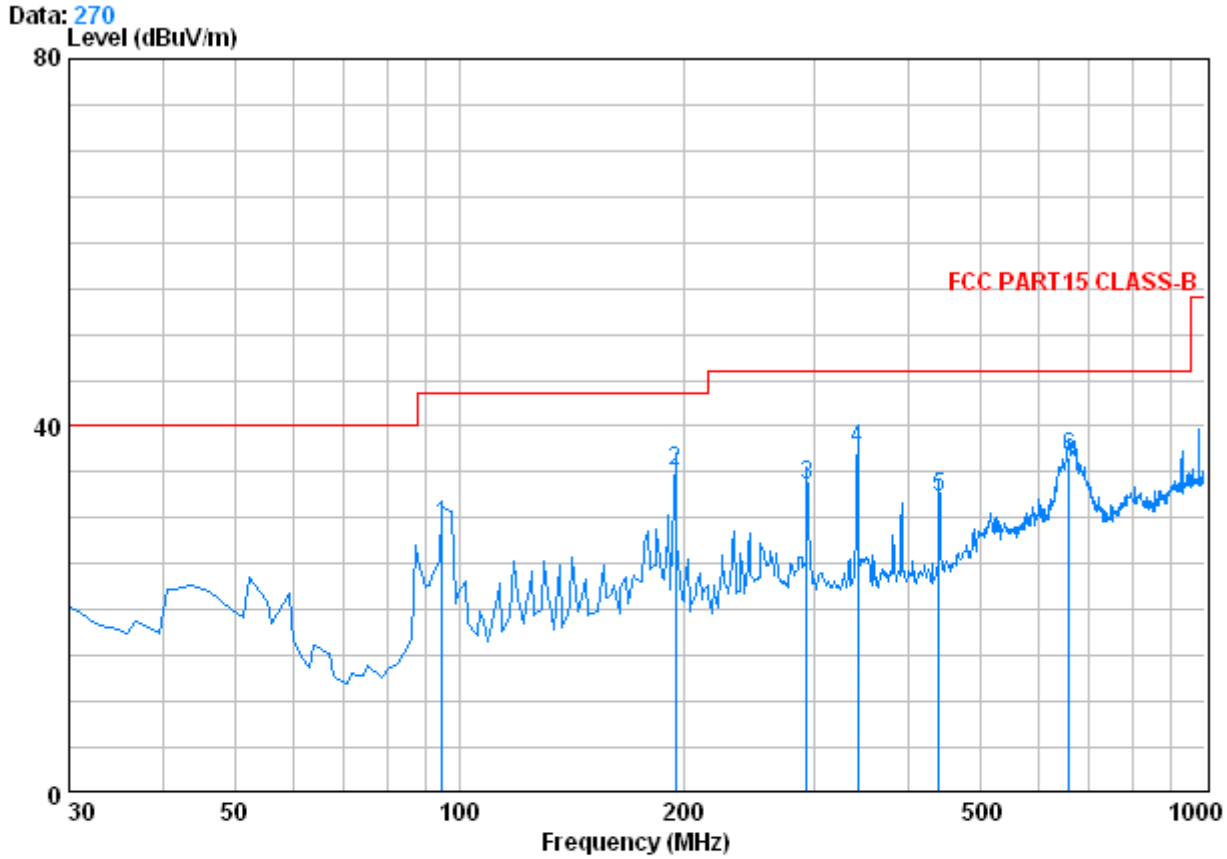
Figure 3. Above 1 GHz

Test Procedure:	a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. 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. d. 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. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. 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. g. Test the EUT in the lowest channel (2402MHz),the middle channel (2441MHz),the Highest channel (2480MHz) h. Repeat above procedures until all frequencies measured was complete.
Exploratory Test Mode:	Non-hopping transmitting mode with all kind of modulation and all kind of data type
Final Test Mode:	Through Pre-scan, find the DH1 of date type is the worse case of GFSK modulation type
Instruments Used:	Refer to section 4.10 for details
Test Results:	Pass

5.3.1 Radiated Emission below 1GHz

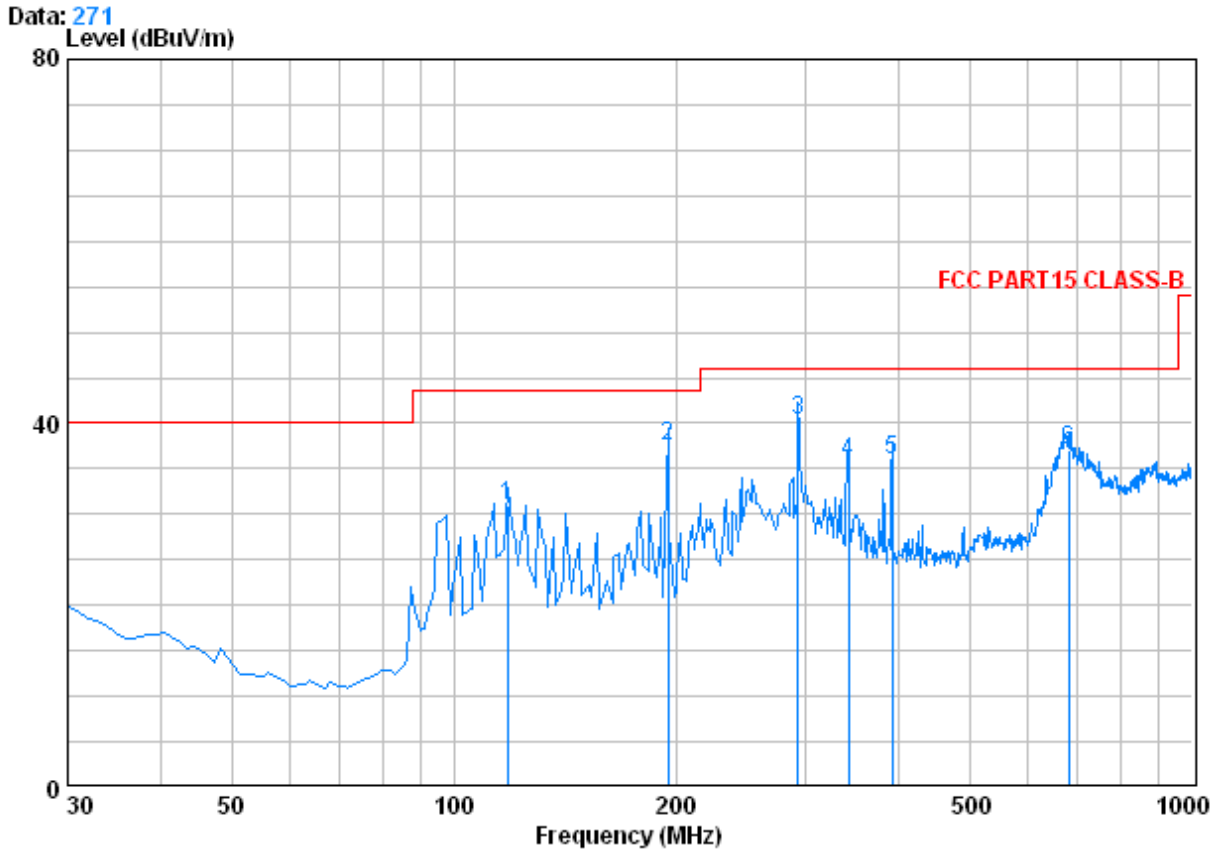
30MHz~1GHz (QP)		
Test mode:	Transmitting	Vertical



Condition : FCC PART15 CLASS-B 3m 0042673 VERTICAL
Job No. : 3099RF
Mode : TX

	Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	94.990	1.15	8.91	27.21	46.41	29.26	43.50	-14.24
2 @	194.900	1.39	10.15	26.71	50.30	35.13	43.50	-8.37
3	292.870	1.87	13.58	26.42	44.57	33.59	46.00	-12.41
4	342.340	2.04	15.22	26.73	46.98	37.51	46.00	-8.49
5	440.310	2.37	16.71	27.38	40.56	32.27	46.00	-13.73
6	657.590	2.82	20.84	27.47	40.38	36.57	46.00	-9.43

Test mode:	Transmitting	Horizontal



Condition : FCC PART15 CLASS-B 3m 0042673 HORIZONTAL
Job No. : 3099RF
Mode : TX

		Freq	Cable Loss	Antenna Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1		118.270	1.25	8.02	27.08	48.74	30.93	43.50	-12.57
2	@	194.900	1.39	10.15	26.71	52.72	37.55	43.50	-5.95
3	@	292.870	1.87	13.58	26.42	51.32	40.35	46.00	-5.65
4		342.340	2.04	15.22	26.73	45.26	35.79	46.00	-10.21
5		392.780	2.18	16.22	27.09	44.73	36.03	46.00	-9.97
6		680.870	2.86	21.46	27.43	40.16	37.05	46.00	-8.95