Report No.: GTS16000983E02

FCC REPORT

Applicant:	INTERNATIONAL ELECTRONICS
Address of Applicant:	1320 HENRY BRENNAN DR., SUITE A, EL PASO,TEXAS 79936, U.S.

Equipment Under Test (EUT)

Product Name:	Bluetooth speakers
Model No.:	GBTSP01, GBTSP02, GBTSP03, GBTSP04
FCC ID:	2AH9O-GBTSP01
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249:2014
Date of sample receipt:	May 04, 2016
Date of Test:	May 05-11, 2016
Date of report issued:	May 11, 2016
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*May 11, 2016*	*Original*

Prepared By: Edward.Pan ***Date:*** *May 11, 2016*

Project Engineer

Check By: hank.yan ***Date:*** *May 11, 2016*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field strength of the fundamental signal	15.249 (a)	Pass
Spurious emissions	15.249 (a) (d)/15.209	Pass
Band edge	15.249 (d)/15.205	Pass
20dB Occupied Bandwidth	15.215 (c)	Pass

Pass: The EUT complies with the essential requirements in the standard.

Remark: Test according to ANSI C63.10 2013 and ANSI C63.4: 2014

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 Client Information

Applicant:	INTERNATIONAL ELECTRONICS
Address of Applicant:	1320 HENRY BRENNAN DR., SUITE A, EL PASO,TEXAS 79936, U.S.
Manufacturer:	AIC INDUSTRIAL CO., LTD.
Address of Manufacturer:	No. 486 Wen Heng Road, Fong Shan, Kaohsiung, Taiwan

5.2 General Description of EUT

Product Name:	Bluetooth speakers
Model No.:	GBTSP01, GBTSP02, GBTSP03, GBTSP04
Operation Frequency:	915MHz
Modulation type:	GFSK
Antenna Type:	Integral antenna
Antenna gain:	-2.3dBi (declare by Applicant)
Power supply:	DC 15V, 1A Or DC 12V Sealed Lead-Acid battery

5.3 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

Per-test mode.

We have verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

Axis	X	Y	Z
Field Strength(dBuV/m)	92.57	93.86	93.38

Final Test Mode:

According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup":

Y axis (see the test setup photo)

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
SIMSLKIAN	ADAPTER	SK02T-1500100U	161701000005	FCC VoC

5.5 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China
Tel: 0755-27798480
Fax: 0755-27798960

5.7 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 26 2016	Mar. 25 2017
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	Jun. 30 2015	Jun. 29 2016
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jun. 30 2015	Jun. 29 2016
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Jun. 30 2015	Jun. 29 2016
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Jun. 26 2015	Jun. 25 2016
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 27 2016	Mar. 26 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	Mar. 27 2016	Mar. 26 2017
10	Coaxial Cable	GTS	N/A	GTS211	Mar. 27 2016	Mar. 26 2017
11	Coaxial cable	GTS	N/A	GTS210	Mar. 27 2016	Mar. 26 2017
12	Coaxial Cable	GTS	N/A	GTS212	Mar. 27 2016	Mar. 26 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jun. 30 2015	Jun. 29 2016
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jun. 30 2015	Jun. 29 2016
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Jun. 26 2015	Jun. 25 2016
16	Band filter	Amindeon	82346	GTS219	Mar. 27 2016	Mar. 26 2017

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Jun. 30 2015	Jun. 29 2016
2	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jun. 30 2015	Jun. 29 2016
3	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jun. 30 2015	Jun. 29 2016
4	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	Jun. 30 2015	Jun. 29 2016
5	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jun. 30 2015	Jun. 29 2016
6	Coaxial Cable	GTS	N/A	GTS227	Jun. 30 2015	Jun. 29 2016
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	July 07 2015	July 06 2016

7 Test results and Measurement Data

7.1 Antenna requirement:

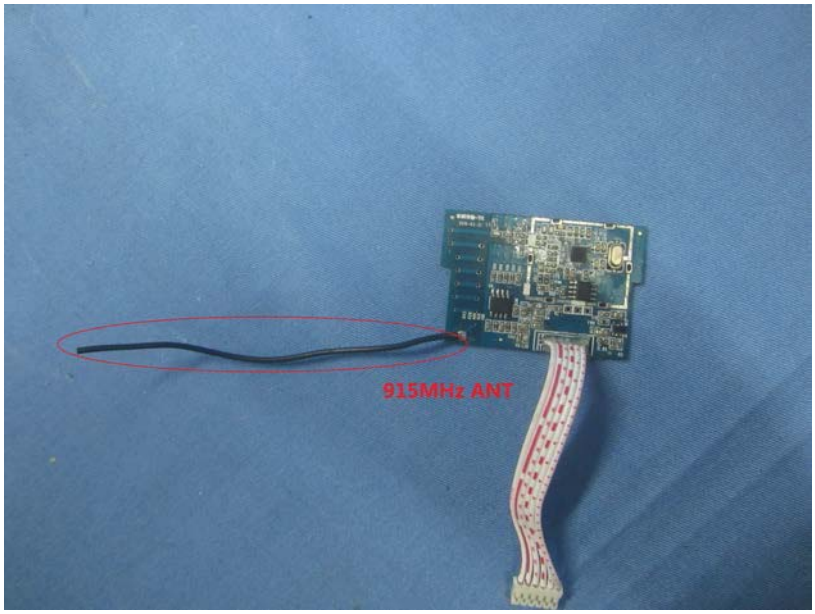
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

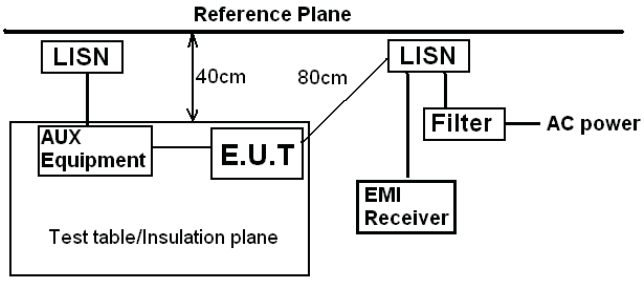
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

E.U.T Antenna:

The antenna is Internal Integral antenna, the best case gain of the antenna is -2.3dBi

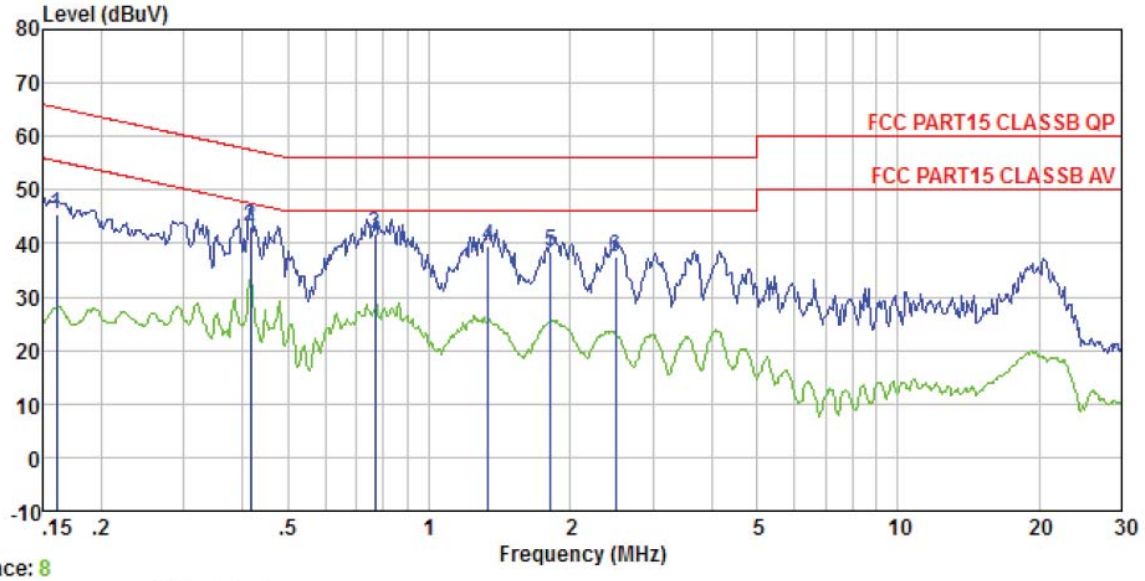


7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Class / Severity:	Class B
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average 0.15-0.5: 66 to 56* / 56 to 46* 0.5-5: 56 / 46 5-30: 60 / 50 * Decreases with the logarithm of the frequency.
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*
Test procedure:	1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. 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: 2013 on conducted measurement.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data

Line:

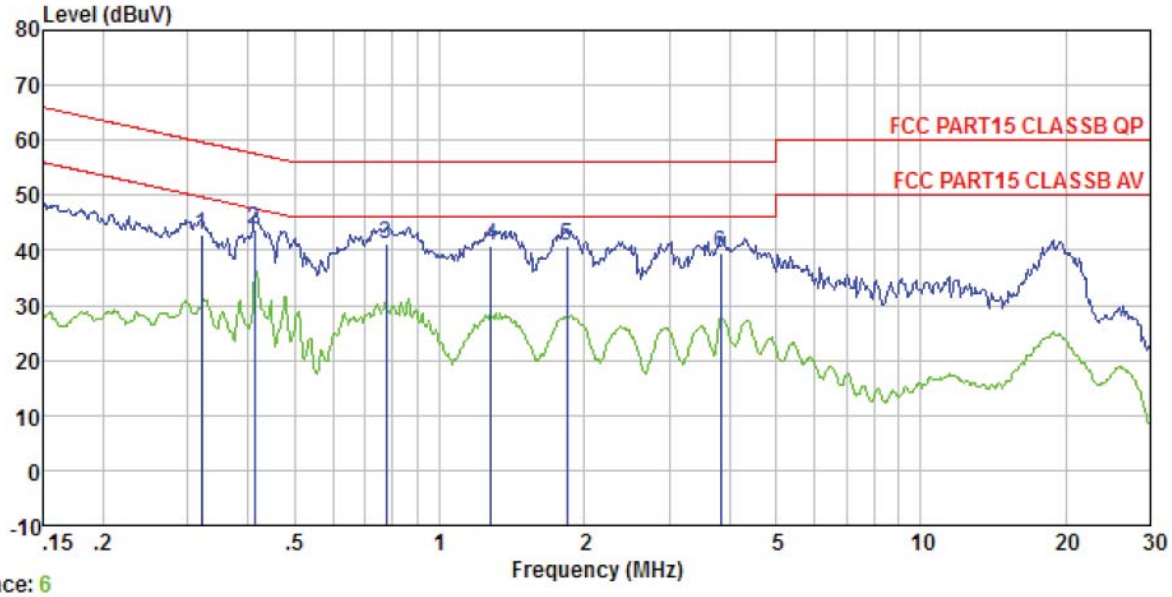


Trace: 8

Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 LINE
Job No. : 0983
Test mode : Transmitting mode
Test Engineer: Sky

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.161	45.22	45.49	0.15	0.12	65.43	-19.94	QP
2	0.417	42.92	43.15	0.12	0.11	57.51	-14.36	QP
3	0.767	41.59	41.86	0.14	0.13	56.00	-14.14	QP
4	1.338	39.34	39.59	0.12	0.13	56.00	-16.41	QP
5	1.819	38.16	38.42	0.12	0.14	56.00	-17.58	QP
6	2.500	37.37	37.65	0.13	0.15	56.00	-18.35	QP

Neutral:



Trace: 6

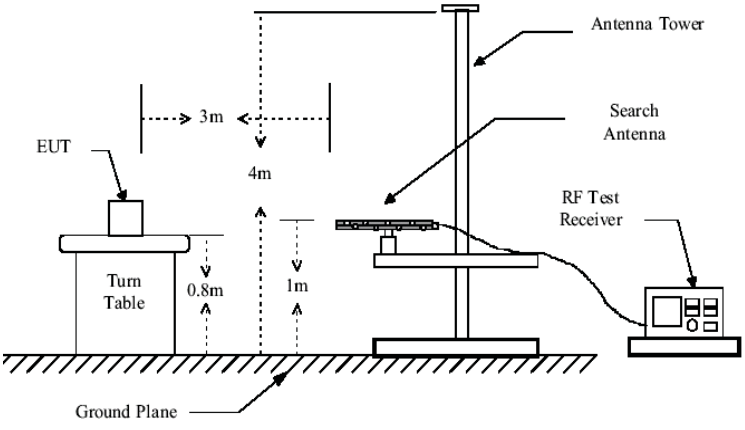
Site : Shielded room
Condition : FCC PART15 CLASSB QP LISN-2013 NEUTRAL
Job No. : 0983
Test mode : Transmitting mode
Test Engineer: Sky

	Freq	Read Level	Level	LISN Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.320	42.61	42.77	0.06	0.10	59.71	-16.94	QP
2	0.413	43.55	43.72	0.06	0.11	57.59	-13.87	QP
3	0.775	40.98	41.18	0.07	0.13	56.00	-14.82	QP
4	1.282	40.47	40.69	0.09	0.13	56.00	-15.31	QP
5	1.839	40.54	40.77	0.09	0.14	56.00	-15.23	QP
6	3.840	39.31	39.60	0.14	0.15	56.00	-16.40	QP

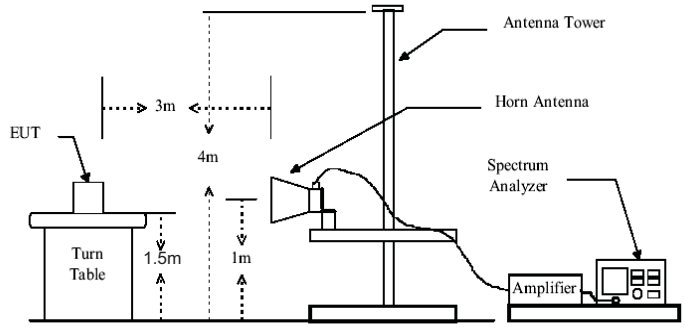
Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 10GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
For the field strength test, the RBW and VBW were set to 300kHz and 1MHz.
</td></tr>
<tr><td>Limit:
(Field strength of the fundamental signal)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>902MHz ~ 928MHz</td><td>94.00</td><td>Quasi-peak</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:
(band edge)</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz
 

Above 1GHz</td></tr>
</table>

	
Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

7.3.1 Field Strength of The Fundamental Signal

Quasi-peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
915	94.87	23.18	4.91	29.1	93.86	94	-0.14	Horizontal
915	94.07	23.18	4.91	29.1	93.06	94	-0.94	Vertical

7.3.2 Spurious emissions

■ Below 1GHz

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
86.50	48.18	12.89	1.08	29.76	32.39	40.00	-7.61	Vertical
139.36	56.82	10.19	1.50	29.46	39.05	43.50	-4.45	Vertical
319.94	45.55	15.33	2.47	29.88	33.47	46.00	-12.53	Vertical
369.41	47.28	16.51	2.72	29.64	36.87	46.00	-9.13	Vertical
417.64	51.18	17.43	2.93	29.46	42.08	46.00	-3.92	Vertical
497.68	44.84	18.52	3.29	29.31	37.34	46.00	-8.66	Vertical

Quasi-peak value

86.20	50.26	12.74	1.08	29.76	34.32	40.00	-5.68	Horizontal
131.76	57.72	10.82	1.45	29.50	40.49	43.50	-3.01	Horizontal
187.75	50.93	12.32	1.78	29.25	35.78	43.50	-7.72	Horizontal
270.38	49.16	14.38	2.22	29.80	35.96	46.00	-10.04	Horizontal
319.94	54.06	15.33	2.47	29.88	41.98	46.00	-4.02	Horizontal
417.64	50.88	17.43	2.93	29.46	41.78	46.00	-4.22	Horizontal

Quasi-peak value

■ Above 1GHz

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.00	43.81	25.42	4.87	34.17	39.93	74.00	-34.07	Vertical
2745.00	33.25	28.24	5.71	33.61	33.59	74.00	-40.41	Vertical
3660.00	35.36	29.20	7.27	32.58	39.25	74.00	-34.75	Vertical
4575.00	31.37	31.47	8.40	31.97	39.27	74.00	-34.73	Vertical
5490.00	30.22	31.98	9.49	32.42	39.27	74.00	-34.73	Vertical
6405.00	29.11	33.46	10.78	32.11	41.24	74.00	-32.76	Vertical
7320.00	27.14	36.37	11.72	31.89	43.34	74.00	-30.66	Vertical
8235.00	27.36	36.76	12.47	31.73	44.86	74.00	-29.14	Vertical
9150.00	26.07	37.31	13.78	32.15	45.01	74.00	-28.99	Vertical
1830.00	39.60	25.42	4.87	34.17	35.72	74.00	-38.28	Horizontal
2745.00	33.48	28.24	5.71	33.61	33.82	74.00	-40.18	Horizontal
3660.00	33.32	29.20	7.27	32.58	37.21	74.00	-36.79	Horizontal
4575.00	32.20	31.47	8.40	31.97	40.10	74.00	-33.90	Horizontal
5490.00	29.60	31.98	9.49	32.42	38.65	74.00	-35.35	Horizontal
6405.00	28.13	33.46	10.78	32.11	40.26	74.00	-33.74	Horizontal
7320.00	27.18	36.37	11.72	31.89	43.38	74.00	-30.62	Horizontal
8235.00	26.72	36.76	12.47	31.73	44.22	74.00	-29.78	Horizontal
9150.00	27.00	37.31	13.78	32.15	45.94	74.00	-28.06	Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1830.00	33.99	25.42	4.87	34.17	30.11	54.00	-23.89	Vertical
2745.00	23.85	28.24	5.71	33.61	24.19	54.00	-29.81	Vertical
3660.00	25.88	29.20	7.27	32.58	29.77	54.00	-24.23	Vertical
4575.00	21.81	31.47	8.40	31.97	29.71	54.00	-24.29	Vertical
5490.00	20.68	31.98	9.49	32.42	29.73	54.00	-24.27	Vertical
6405.00	19.87	33.46	10.78	32.11	32.00	54.00	-22.00	Vertical
7320.00	17.69	36.37	11.72	31.89	33.89	54.00	-20.11	Vertical
8235.00	17.70	36.76	12.47	31.73	35.20	54.00	-18.80	Vertical
9150.00	16.89	37.31	13.78	32.15	35.83	54.00	-18.17	Vertical
1830.00	29.99	25.42	4.87	34.17	26.11	54.00	-27.89	Horizontal
2745.00	23.85	28.24	5.71	33.61	24.19	54.00	-29.81	Horizontal
3660.00	23.69	29.20	7.27	32.58	27.58	54.00	-26.42	Horizontal
4575.00	22.58	31.47	8.40	31.97	30.48	54.00	-23.52	Horizontal
5490.00	19.90	31.98	9.49	32.42	28.95	54.00	-25.05	Horizontal
6405.00	19.00	33.46	10.78	32.11	31.13	54.00	-22.87	Horizontal
7320.00	18.07	36.37	11.72	31.89	34.27	54.00	-19.73	Horizontal
8235.00	17.35	36.76	12.47	31.73	34.85	54.00	-19.15	Horizontal
9150.00	17.29	37.31	13.78	32.15	36.23	54.00	-17.77	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *(*)The test result on peak is lower than average limit, then average measurement needn't be performed.*

7.3.3 Bandedge emissions

All of the restriction bands were tested, and only the data of worst case was exhibited.

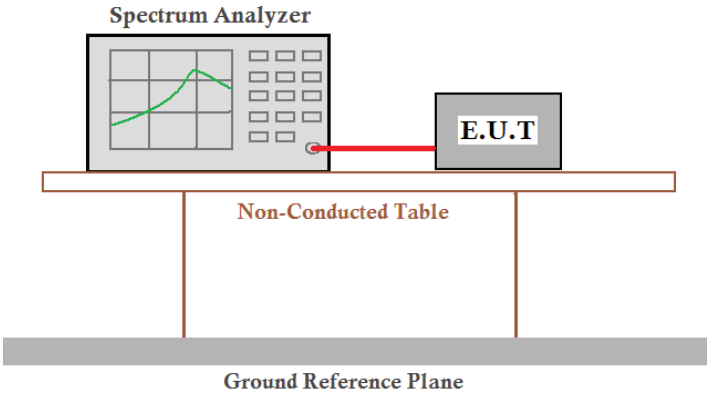
Quasi-peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
902.00	28.93	23.12	4.87	29.10	27.82	46.00	-18.18	Horizontal
928.00	29.62	23.28	4.96	29.10	28.76	46.00	-17.24	Horizontal
902.00	33.00	23.12	4.87	29.10	31.89	46.00	-14.11	Vertical
928.00	31.84	23.28	4.96	29.10	30.98	46.00	-15.02	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

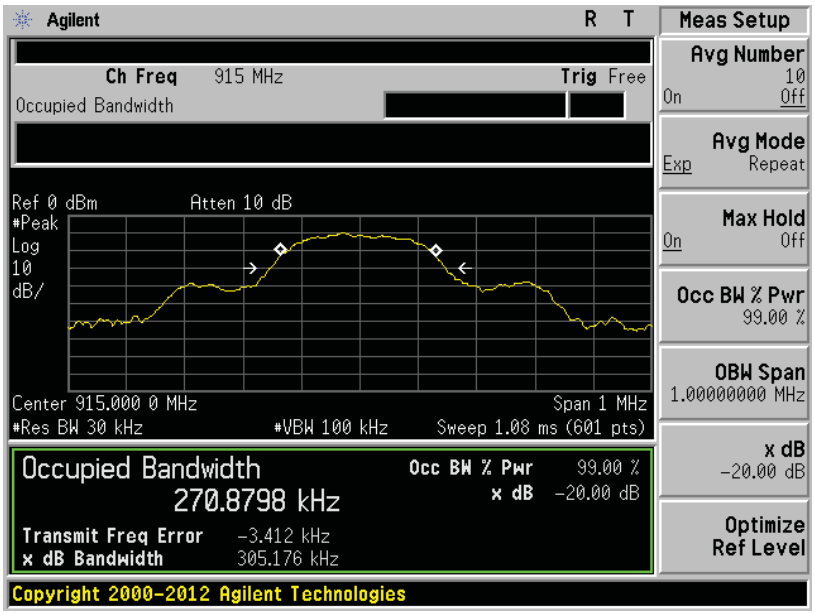
7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.249/15.215
Test Method:	ANSI C63.4:2014
Limit:	Operation Frequency range 902MHz ~ 928MHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement Data

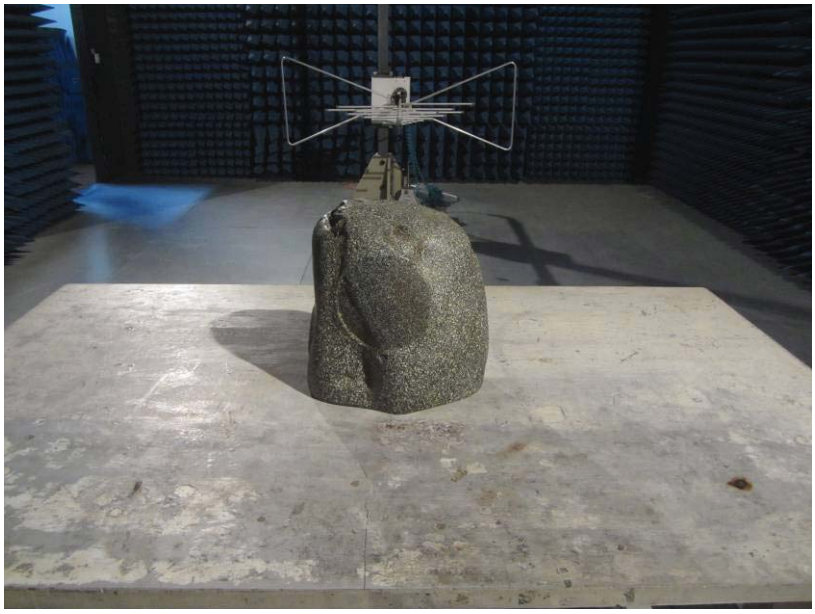
Operation Frequency	20dB bandwidth(MHz)	Result
915MHz	0.305	Pass

Test plot as follows:



8 Test Setup Photo

Radiated Emission



Conducted Emission

9 EUT Constructional Details

Reference to the test report No. GTS16000983E01

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