FCC Report (Bluetooth)

Applicant:	Quantum Creations LLC.
Address of Applicant:	15705 NW 13th Ave, Miami Gardens, Miami Beach, Florida 33169, United States
Manufacturer:	MeLE Technologies (Shenzhen) Co., Ltd
Address of Manufacturer:	No.28 Cuijing Road,Pingshan District, Shenzhen(518118) P.R .China

Equipment Under Test (EUT)

Product Name:	Access Plus
Model No.:	A-1063-AAP-1, A-1063-AAP-2, A-1063-AAP-3, A-1063-AAP-4, A-1063-AAP-5, A-1063-AAP-6, A-1063-AAP-7, A-1063-AAP-8, A-1063-AAP-9, A-1063-AAP-10, A-1063-AAP-11, A-1063-AAP-12, A-1063-AAP-13, A-1063-AAP-14, A-1063-AAP-15, A-1063-AAP
Trade Mark:	AZULLE
FCC ID:	2AFJI20161063
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	December 19, 2019
Date of Test:	December 19-27, 2019
Date of report issued:	December 27, 2019
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Report No.	Version No.	Date	Description
GTS201608000121E04	*00*	*September 07, 2016*	*Original*
GTS201912000226F04	*01*	*December 27, 2019*	*Change DDR, address of manufacturer/factory, product name and model number*

Prepared By: *Tiger Chen* ***Date:*** *December 27, 2019*

Project Engineer

Check By: *Robinson Lo* ***Date:*** *December 27, 2019*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Spurious Emission	15.205/15.209	Pass

Remarks:

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

2. Test according to ANSI C63.10:2013

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 General Description of EUT

Product Name:	Access Plus
Model No.:	A-1063-AAP-1, A-1063-AAP-2, A-1063-AAP-3, A-1063-AAP-4, A-1063-AAP-5, A-1063-AAP-6, A-1063-AAP-7, A-1063-AAP-8, A-1063-AAP-9, A-1063-AAP-10, A-1063-AAP-11, A-1063-AAP-12, A-1063-AAP-13, A-1063-AAP-14, A-1063-AAP-15, A-1063-AAP
Serial No.:	N/A
Test sample(s) ID:	GTS201912000226-1
Sample(s) Status	Engineer sample
Hardware version:	N/A
Software version:	N/A
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	40
Channel separation:	2MHz
Modulation type:	GFSK
Antenna Type:	FPCB Antenna
Antenna gain:	0.5dBi
Power supply:	SWITCHING ADAPTOR Model No.: FJ-SW0503000N Input: AC 100-240V, 50/60Hz, 0.6A Max Output: DC 5V, 3000mA

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

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	2440MHz
The Highest channel	2480MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the dutycycle >98%, 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.	

5.3 Description of Support Units

None.

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology 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 files. Registration 381383.

● **IC —Registration No.: 9079A**

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

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

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	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

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	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 26 2019	June. 25 2020
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 26 2019	June. 25 2020
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 26 2019	June. 25 2020
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 26 2019	June. 25 2020
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 26 2019	June. 25 2020

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 26 2019	June. 25 2020
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 26 2019	June. 25 2020
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 26 2019	June. 25 2020
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 26 2019	June. 25 2020
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 26 2019	June. 25 2020
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 26 2019	June. 25 2020
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

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.

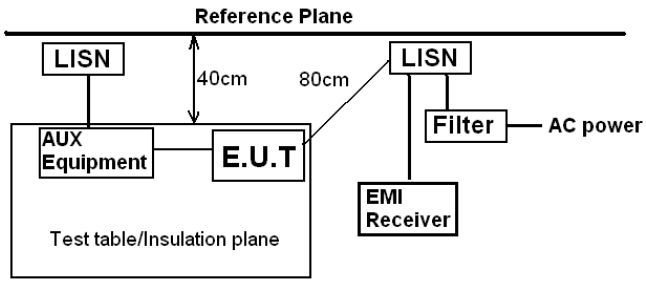
15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:

The BT antenna is FPCB antenna, the best case gain of the antenna is 0.5dBi. Reference to the appendix II for details.

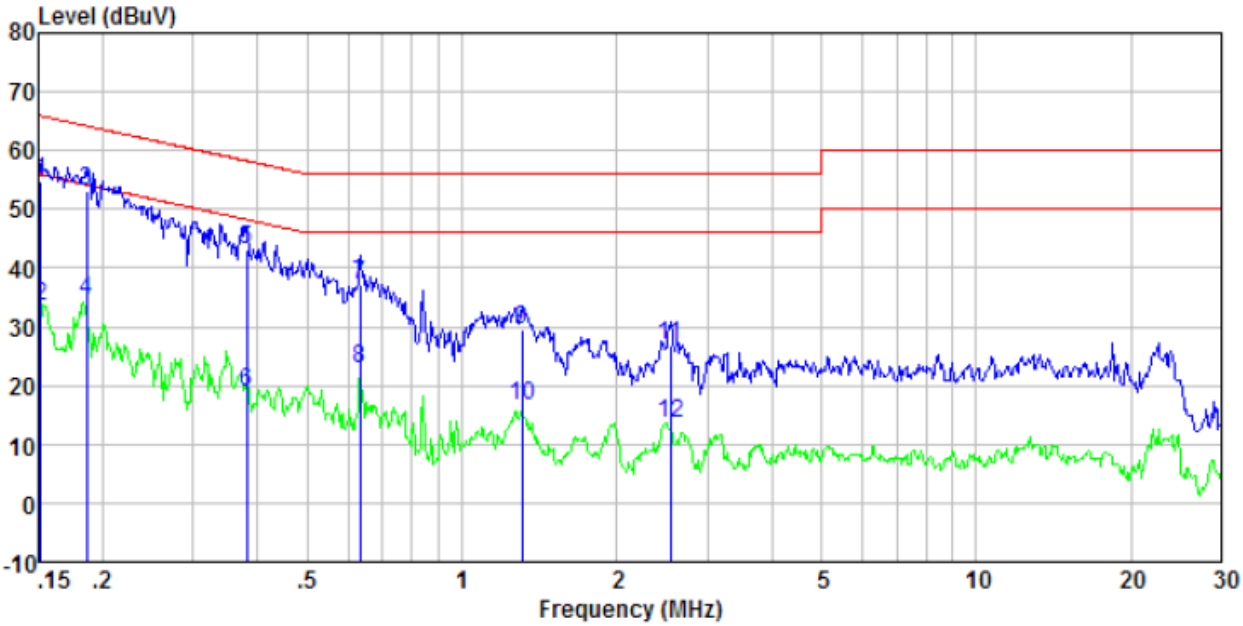
7.2 Conducted Emissions

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 and simulators are 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 environment:	Temp.: 25 °C / Humid.: 52% / Press.: 1012mbar
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test voltage:	AC120V 60Hz
Test results:	Pass

Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

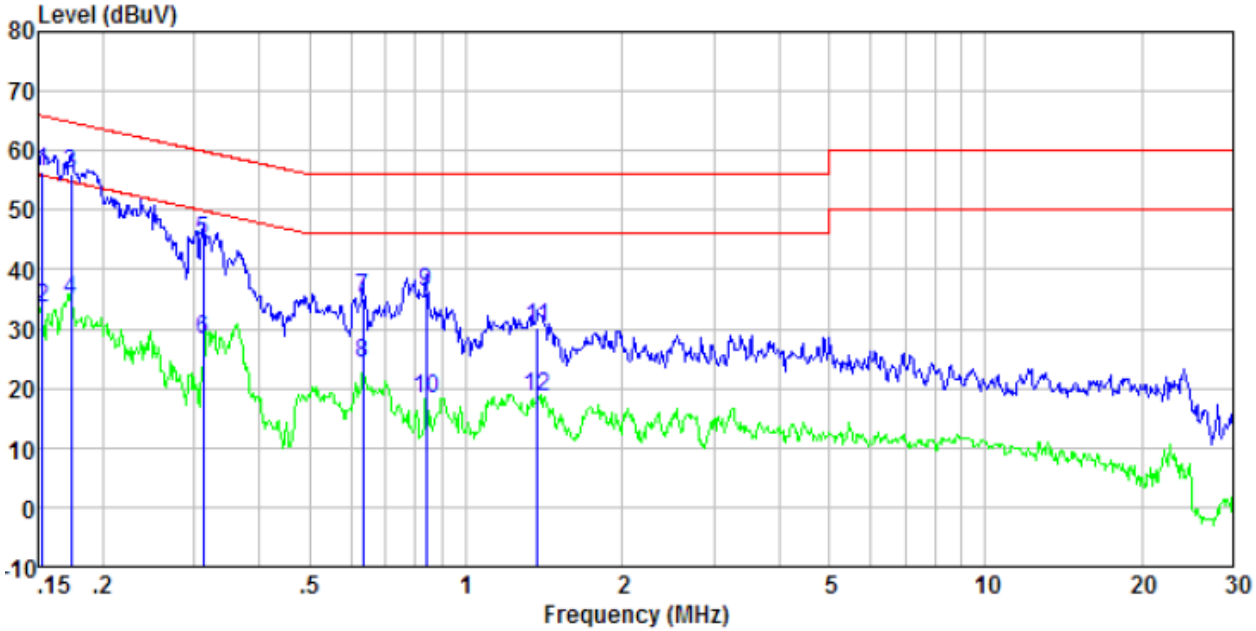
Measurement data

Test mode:	Bluetooth mode	Probe:	Line



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	54.17	0.40	0.07	54.64	65.91	-11.27	QP
0.15	33.13	0.40	0.07	33.60	55.91	-22.31	Average
0.19	52.62	0.40	0.10	53.12	64.20	-11.08	QP
0.19	33.92	0.40	0.10	34.42	54.20	-19.78	Average
0.38	42.77	0.36	0.10	43.23	58.25	-15.02	QP
0.38	18.37	0.36	0.10	18.83	48.25	-29.42	Average
0.63	36.71	0.28	0.12	37.11	56.00	-18.89	QP
0.63	22.38	0.28	0.12	22.78	46.00	-23.22	Average
1.31	29.16	0.20	0.16	29.52	56.00	-26.48	QP
1.31	16.23	0.20	0.16	16.59	46.00	-29.41	Average
2.54	26.39	0.20	0.18	26.77	56.00	-29.23	QP
2.54	13.07	0.20	0.18	13.45	46.00	-32.55	Average

Test mode:	Bluetooth mode	Probe:	Neutral



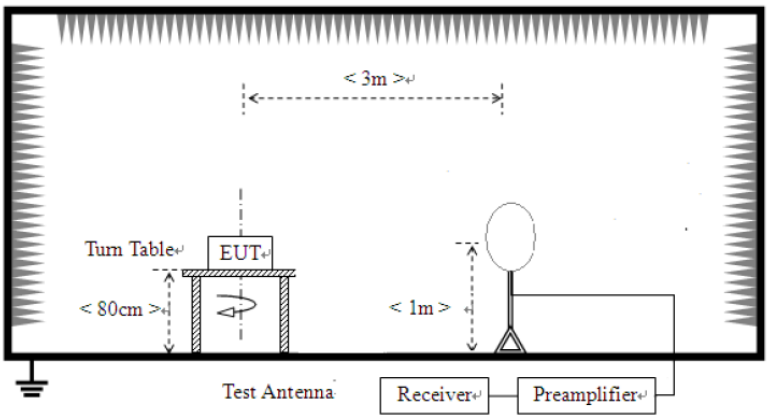
Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.15	55.88	0.40	0.07	56.35	65.82	-9.47	QP
0.15	33.04	0.40	0.07	33.51	55.82	-22.31	Average
0.17	55.76	0.40	0.09	56.25	64.77	-8.52	QP
0.17	34.20	0.40	0.09	34.69	54.77	-20.08	Average
0.31	44.46	0.39	0.10	44.95	59.93	-14.98	QP
0.31	27.57	0.39	0.10	28.06	49.93	-21.87	Average
0.63	34.91	0.28	0.12	35.31	56.00	-20.69	QP
0.63	23.71	0.28	0.12	24.11	46.00	-21.89	Average
0.84	35.79	0.23	0.14	36.16	56.00	-19.84	QP
0.84	17.80	0.23	0.14	18.17	46.00	-27.83	Average
1.37	29.67	0.20	0.16	30.03	56.00	-25.97	QP
1.37	18.31	0.20	0.16	18.67	46.00	-27.33	Average

Notes:

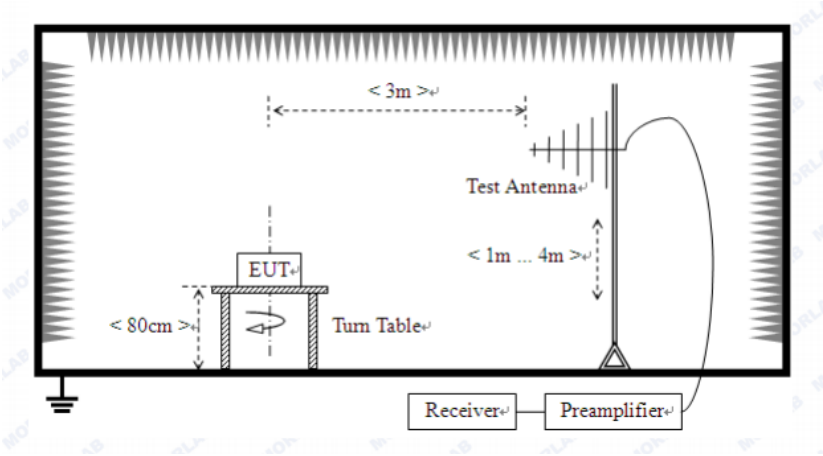
1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak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

7.3 Spurious Emission

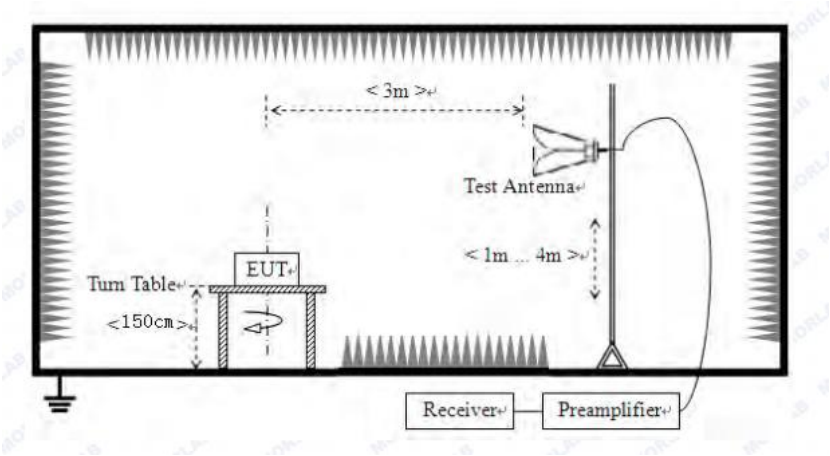
7.3.1 Radiated Emission Method

<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>9kHz to 25GHz</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>Value</th></tr>
<tr><td>9KHz-150KHz</td><td>Quasi-peak</td><td>200Hz</td><td>600Hz</td><td>Quasi-peak</td></tr>
<tr><td>150KHz-30MHz</td><td>Quasi-peak</td><td>9KHz</td><td>30KHz</td><td>Quasi-peak</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (uV/m)</th><th>Value</th><th>Measurement Distance</th></tr>
<tr><td>0.009MHz-0.490MHz</td><td>2400/F(KHz)</td><td>QP</td><td>300m</td></tr>
<tr><td>0.490MHz-1.705MHz</td><td>24000/F(KHz)</td><td>QP</td><td>30m</td></tr>
<tr><td>1.705MHz-30MHz</td><td>30</td><td>QP</td><td>30m</td></tr>
<tr><td>30MHz-88MHz</td><td>100</td><td>QP</td><td rowspan="7">3m</td></tr>
<tr><td>88MHz-216MHz</td><td>150</td><td>QP</td></tr>
<tr><td>216MHz-960MHz</td><td>200</td><td>QP</td></tr>
<tr><td>960MHz-1GHz</td><td>500</td><td>QP</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>Average</td></tr>
<tr><td>5000</td><td>Peak</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions from 9kHz to 30MHz
 
</td></tr>
</table>

For radiated emissions from 30MHz to1GHz



For radiated emissions above 1GHz



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 environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1 012mbar
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test voltage:	AC120V 60Hz					
Test results:	Pass					

Measurement data:

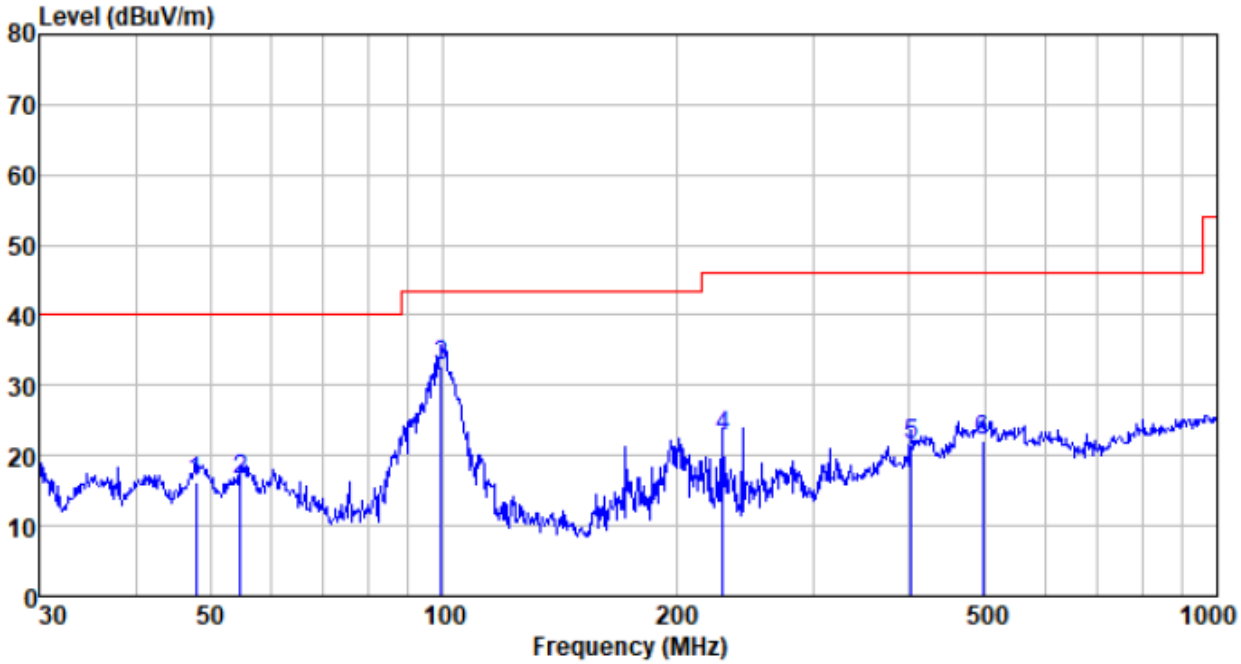
Remark:
Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

■ **9kHz~30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

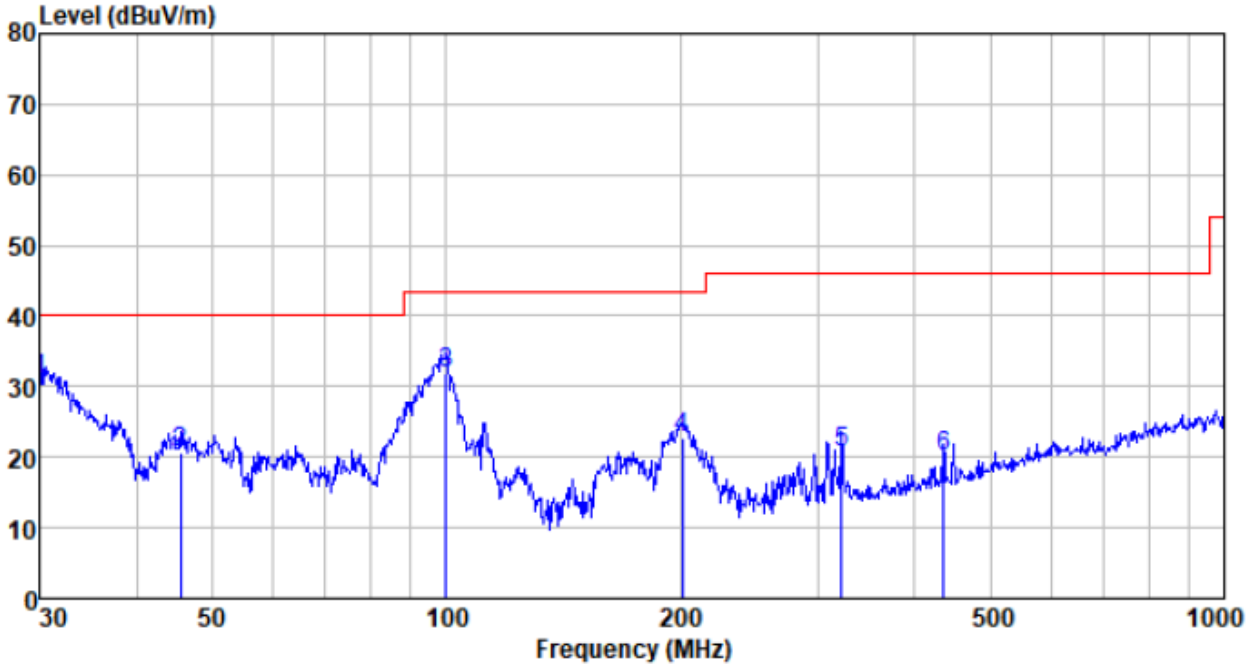
■ **Below 1GHz**

Test mode:	Bluetooth mode	Probe:	Horizontal



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
47.826	39.15	12.28	0.75	36.08	16.10	40.00	-23.90	QP
54.643	40.20	11.82	0.81	36.25	16.58	40.00	-23.42	QP
99.180	56.12	12.13	1.18	36.71	32.72	43.50	-10.78	QP
229.293	46.67	11.49	2.01	37.36	22.81	46.00	-23.19	QP
401.839	40.89	15.34	2.86	37.52	21.57	46.00	-24.43	QP
497.677	39.10	17.26	3.29	37.51	22.14	46.00	-23.86	QP

Test mode:	Bluetooth mode	Probe:	Vertical



Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV	dBuV/m	dB	
30.000	54.24	11.20	0.55	35.00	30.99	40.00	-9.01	QP
45.535	43.56	12.26	0.72	35.96	20.58	40.00	-19.42	QP
99.878	55.10	12.20	1.19	36.72	31.77	43.50	-11.73	QP
201.393	47.86	10.44	1.85	37.33	22.82	43.50	-20.68	QP
322.189	41.51	14.01	2.48	37.44	20.56	46.00	-25.44	QP
435.590	38.39	16.08	3.03	37.52	19.98	46.00	-26.02	QP

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

------End------