FCC CERTIFICATION TEST REPORT

For

FCC ID：RO6-GT

Report Reference No. ..... :	14FAB10028 11
Date of issue ..... :	2015-05-25
Testing Laboratory ..... :	ATT Product Service Co., Ltd.
Address ..... :	No. 3, ChangLianShan Industrial Park, ChangAn Town, DongGuan City, GuangDong, China.
Applicant's name..... :	IZZO GOLF.
Address ..... :	1635 Commons Parkway; Macedon, New York 14502-9191. USA
Manufacturer ..... :	IZZO GOLF.
Test specification:	
Test item description..... :	IZZO GOLF
Trade Mark..... :	--
Model/Type reference ..... :	GT
Ratings ..... :	Rechargeable battery 3.7Vd.c 900mAH; with micro USB port （Input:DC 5V, 500mA）

Responsible Engineer

Bin Jiang

（Bin Jiang / Engineer）

Approved by

KingWang

（King Wang /EMC Manager）

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TEST REPORT DECLARE

Applicant	:	IZZO GOLF.
Address	:	1635 Commons Parkway; Macedon, New York 14502-9191. USA
Equipment under Test	:	IZZO GOLF
Model No	:	GT
Trade Mark	:	--
Manufacturer	:	IZZO GOLF.
Address	:	1635 Commons Parkway; Macedon, New York 14502-9191. USA

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C: 2013

Test procedure used: ANSI C63.4: 2009, ANSI C63.10:2009

We Declare:

The equipment described above is tested by ATT Product Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and ATT Product Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation X/Y/Z axis of the EUT. will record worst case in this report.
our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	14FAB10028 11		
Date of Test:	2015/04/11-2015/05/24	**Date of Report:**	2015/05/25

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of ATT Product Service Co., Ltd.

1. Summary of test standards and results

The EUT have been tested according to the applicable standards as referenced below.

Description of Test Item	Standard	Results
Field Strength of Fundamental Emissions	&15. 225 (a) ANSI C63.10 :2009	PASS
Radiated Emission	15.209,&15.205,&15.225 ANSI C63.10 :2009	PASS
Conducted Emissions	&15.207(a) ANSI C63.10 :2009	PASS
frequency tolerance of the carrier signal	&15.225 (a)	PASS

2. General test information

2.1 Accreditations

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA FCC Registration Number :923232
Canada INDUSTRY CANADA Registration Number 11033A

2.2 Description of EUT

EUT* Name	:	IZZO GOLF
Model Number	:	GT
Trade Mark	:	--
EUT function description	:	Please reference user manual of this device
Power supply	:	Rechargeable battery 3.7Vd.c 900mAH; with micro USB port （Input: DC 5V, 500mA）
Operation frequency	:	13.56MHz
Modulation	:	ASK
Antenna Type	:	built-in antenna, maximum PK gain: 1.5dBi
Date of Receipt	:	2015/04/11
Sample Type	:	Series production

2.3 Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Other
/	/	/	/

2.4 Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	SN
Notebook Computer	lenovo	7457	FCC DOC approved	7457A82
Mouse	DELL	MSU1175	FCC DOC approved	13A00303345DN
Keyboard	DELL	KB213P	FCC DOC approved	CN-OXD31W-71581-417 -02U7-A00 1.8M shielding
Printer	Epson	P952B	FCC DOC approved	AXQ0018586

2.5 Block diagram of EUT configuration for test

Tested mode, channel, information	
Test Mode	Frequency (MHz)
Tx	13.56MHz

2.6 Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.7 Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.44dB
Uncertainty for Radiation Emission test (9KHz-30MHz)	3.21dB
Uncertainty for Radiation Emission test (30MHz-200MHz)	3.42 dB (Polarize: V)
	3.52 dB (Polarize: H)
Uncertainty for Radiation Emission test (200MHz-1GHz)	3.52 dB (Polarize: V)
	3.54 dB (Polarize: H)
Uncertainty for radio frequency	1×10-9
Uncertainty for conducted RF Power	0.65dB

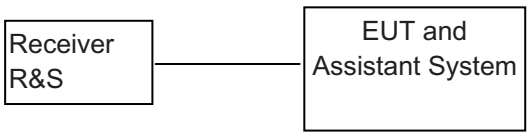
Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. 20dB bandwidth

3.1 Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal.Due	Cal. Interval
	EMI Test Receiver	R&S	ESCI	101307	2015/12/26	1Y
	Attenuator	Mini-Circuits	BW-S10W2	101109	2015/12/26	1Y
	RF Cable	Micable	C10-01-01-1	100309	2015/12/26	1Y

3.2 Block diagram of test setup



3.3 Applicable standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated...

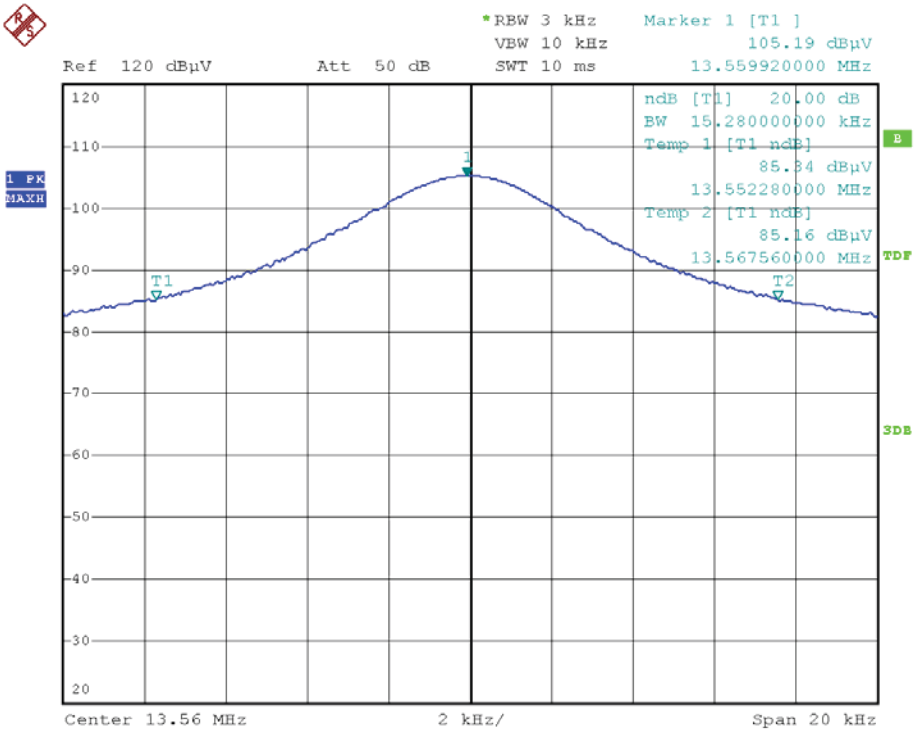
3.4 Test procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete..

3.5 Test result

EUT: IZZO GOLF M/N: GT					
Mode	Freq (MHz)	Result (KHz)	Limit (MHz)	Margin (MHz)	Conclusion
Tx	13.56	15.28	/	/	PASS
Test Date : 2015/04/20			Test Engineer : Vito		

3.6 Original test data

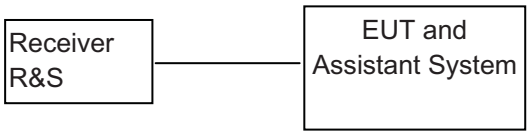


4. Frequency tolerance of the carrier signal

4.1 Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal.Due	Cal. Interval
1	EMI Test Receiver	R&S	ESCI	101307	2015/12/26	1Y
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2015/12/26	1Y
3	RF Cable	Micable	C10-01-01-1	100309	2015/12/26	1Y
4	Hight-low temperature box	YOSION	YX-KGDW80	/	2015/12/26	1Y

4.2 Block diagram of test setup



4.3 Test procedure

The frequency tolerance of the carrier signal shall be maintained within ±0.01 % of the operating frequency over a temperature variation of –20 °C to +50 °C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 °C. For battery-operated equipment, the equipment tests shall be performed using a new battery.

4.4 Limit

According 15.225 (e):The frequency tolerance of the carrier signal shall be maintained within ±0.01 % of the operating frequency.

4.5 Test result

Test Conditions	Frequency	Limit
+50°C, Nominal voltage	13.5606	Within ±0.01% operating Frequency (13.558644 ~ 13.561356 MHz)
+20°C, 85 % Normal voltage	13.5601	
+20°C, Nominal voltage	13.5599	
+20°C, 115 % Normal voltage	13.5604	
-20°C, Nominal voltage	13.5609	

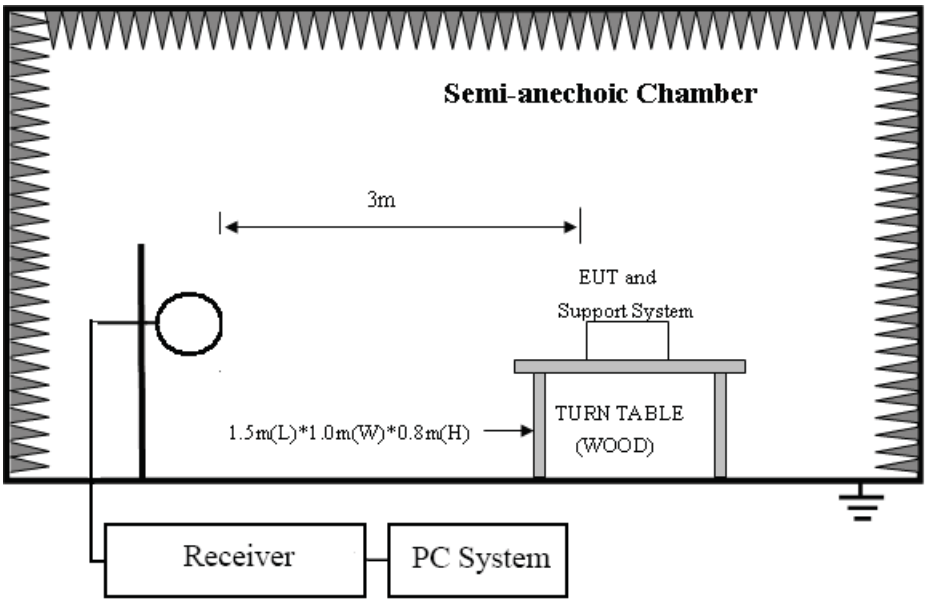
5. Radiated emission

5.1 Test equipment

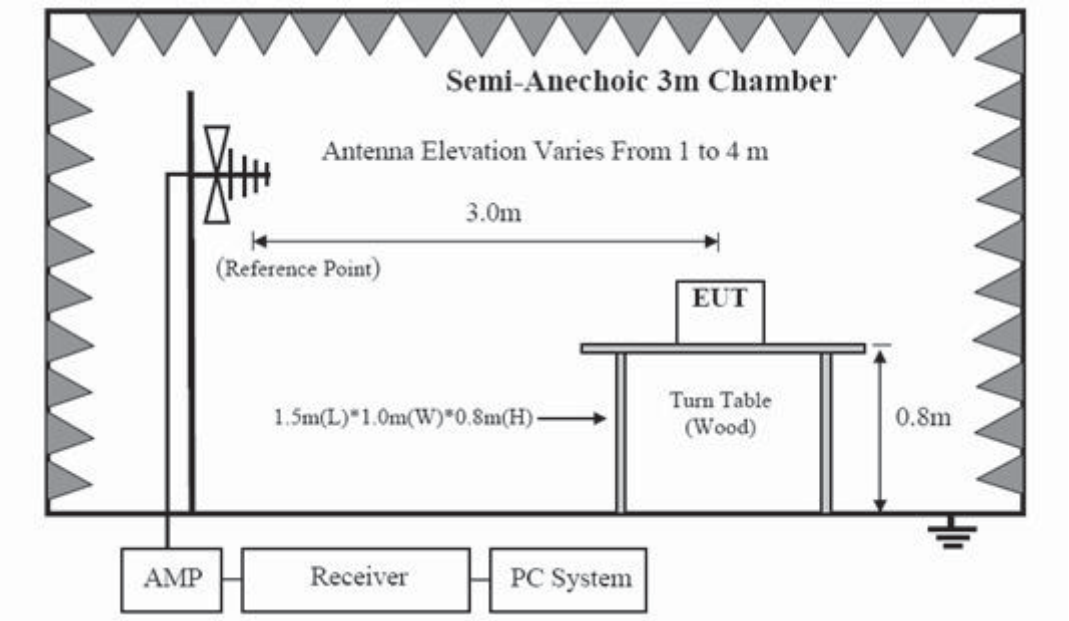
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal.Due	Cal. Interval
1	EMI Test Receiver	R&S	ESCI	101307	2015/12/26	1Y
2	Spectrum analyzer	Agilent	E4407B	US40240708	2015/12/26	1Y
3	Loop antenna	Chase	HLA6120	20129	2015/12/26	1Y
4	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2015/12/26	1Y
5	Double Ridged Horn Antenna	R&S	HF907	100276	2015/12/26	1Y
6	Pre-Amplifier	R&S	SCU-01	10049	2015/12/26	1Y
7	Pre-amplifier	A.H.	PAM0-0118	360	2015/12/26	1Y
8	RF Cable	R&S	R01	10403	2015/12/26	1Y
9	RF Cable	R&S	R02	10512	2015/12/26	1Y
10	Horn Antenna	EMCO	3116	9608-4877	2015/12/26	1Y

5.2 Block diagram of test setup

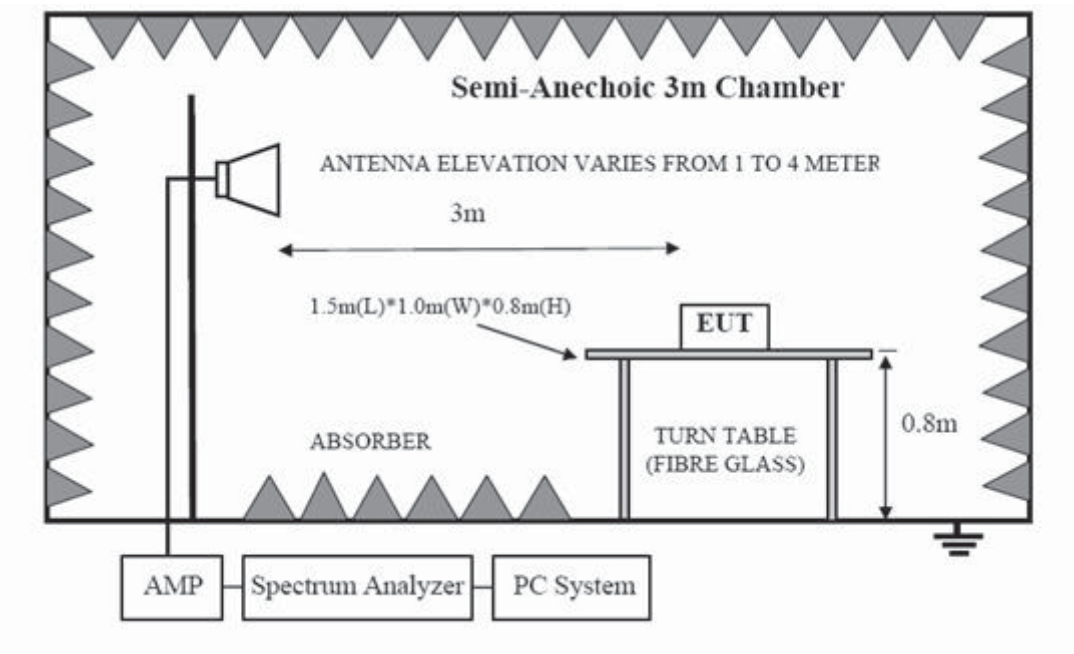
In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

5.3 Limit

5.3.1 FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 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	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	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])

5.3.2 FCC 15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m at 3 m
0.009 ~ 0.49	300	2400/F(kHz)	65.0
0.49 ~ 1.705	30	2400/F(kHz)	45.0
1.705 ~ 30	30	30	69.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

5.3.3 FCC 15.225 Limit

Fundamental frequency	Field strength of fundamental (microvolts/meter) at 30 meter	Field strength of fundamental (dBuV/m) at 3 meter
13.553–13.567 MHz	15848	124.0
13.410-13.553 MHz and 13.567-13.710 MHz	334	90.5
13.110-13.410 MHz and 13.710-14.010 MHz	106	80.5

5.3.4 Limit for this EUT

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4:2009. The specification used was the FCC 15.209, and FCC 15.225 limits.

5.4 Test procedure

(1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.

(2) Setup EUT and assistant system according clause 2.4 and 8.2

(3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.

(a) Change work frequency or channel of device if practicable.

(b) Change modulation type of device if practicable.

© Change power supply range from 85% to 115% of the rated supply voltage

(d) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions

(4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 25GHz, so below final test was performed with frequency range from 30MHz to 18GHz.

(5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2009 on Radiated Emission test.

(6) For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 KHz.

5.5 Test result

PASS. (See below detailed test result)

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, and section 15.205, 15.209 and 15.225, Vertical and Horizontal mode all have been tested, Horizontal mode is the worse case .with the worst margin reading of:

Radiated Emission Test Result

EUT:	IZZO GOLF	Model No.:	GT
Temperature:	24℃	Relative Humidity:	55%
Distance:	3m	Test Power:	DC 3.7V
Polarization:	Vertical	Test Result:	Pass
Standard:	(RE)FCC Part 15_3m	Test By:	Vito
Test Mode:	Tx 13.56MHz		
Note:			

Frequency	Receiver		Rx Antenna		Cable Loss	Amplifier Gain	Result Level	FCC 15.225 & 15.109	
(MHz)	Reading (dBμV)	Detector (PK/QP/AV)	Polar (H/V)	Factor (dB)	(dB)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.02	22.89	PK	V	23.53	0.02	0	46.44	65	-18.56
5.64	22.05	PK	V	26.12	0.11	0	48.28	69.5	-21.22
12.03	16.1	PK	V	26.66	0.12	0	42.88	69.5	-26.62
13.110	26.71	PK	V	26.65	0.12	0	53.48	80.5	-27.02
13.410	25.86	PK	V	26.65	0.12	0	52.63	80.5	-27.87
13.49	47.29	PK	V	26.64	0.12	0	74.05	90.5	-16.45
13.553	49.86	PK	V	26.72	0.12	0	76.7	90.5	-13.8
13.56	77.93	PK	V	26.72	0.13	0	104.78	124	-19.22
13.567	48.52	PK	V	26.72	0.13	0	75.37	90.5	-15.13
13.62	45.13	PK	V	26.72	0.13	0	71.98	90.5	-18.52
13.710	32.05	PK	V	26.73	0.13	0	58.91	80.5	-21.59
13.84	17.5	PK	V	26.73	0.13	0	44.36	80.5	-36.14
27.13	17.33	PK	V	28.63	0.18	0	46.14	69.5	-23.36
189.74	21.06	QP	H	13.38	2.57	26.9	37.01	43.5	-6.49
189.74	24.36	QP	V	10.01	2.57	26.9	36.94	43.5	-6.56

6. Antenna requirements

6.1 Limit

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 15.225 (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.

6.2 Result

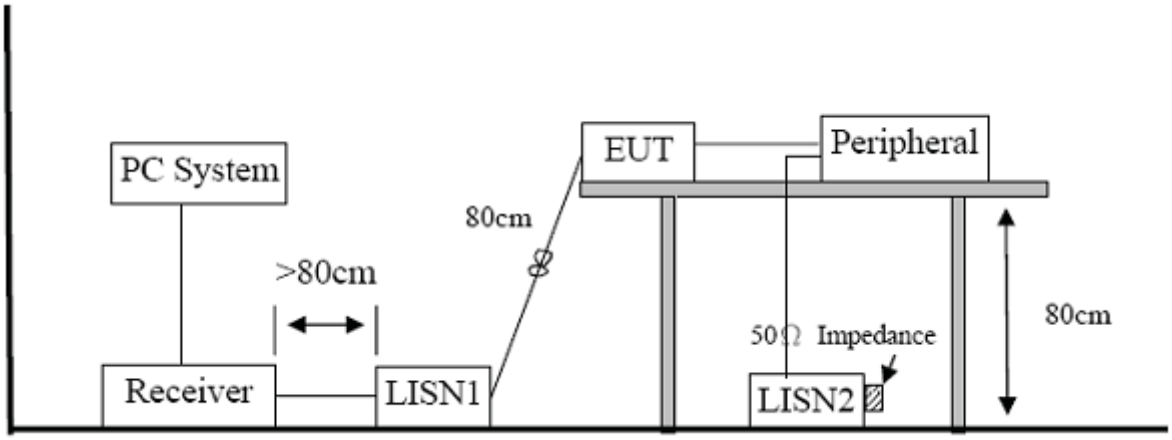
The EUT has an internal chip antenna permanently soldering on the printed circuit board, which complied with 15.203, the maximum gain was 1.5dBi.

7. Power line conducted emission

7.1 Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal.Due	Cal. Interval
	Test Receiver	R&S	ESCI	101308	2015/12/26	1 Year
	LISN 1	AFJ	LS16	16011103219	2015/12/26	1 Year
	LISN 2	R&S	ESH2-Z5	100309	2015/12/26	1 Year
	Pulse Limiter	MTS-systemtechnik	MTS-IMP-136	261115-010-0024	2015/12/26	1 Year

7.2 Block diagram of test setup



7.3 Power line conducted emission limits(Class B)

Frequency	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies

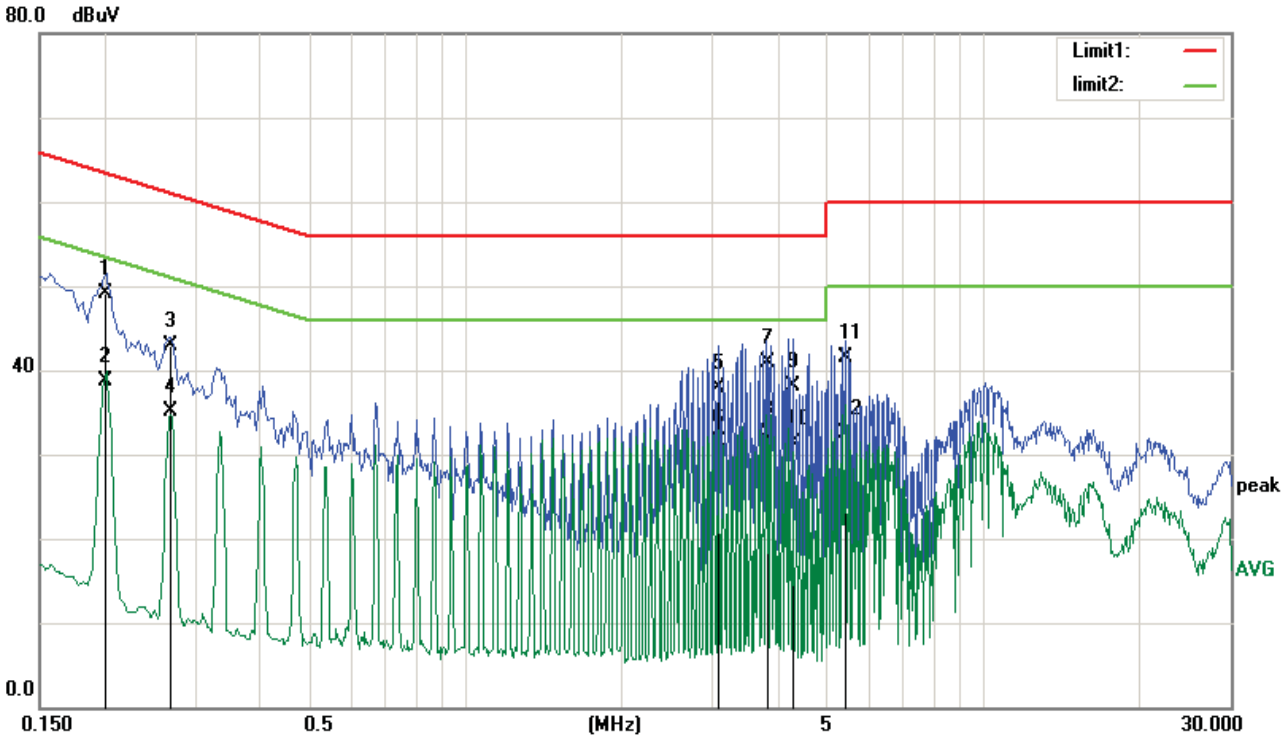
7.4 Test procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane. Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4: 2009.All support equipment power received from a second LISN.Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT. The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.During the above scans, the emissions were maximized by cable manipulation.The test mode(s) described in clause 2.4 were scanned during the preliminary test.After the preliminary scan, we found the test mode producing the highest emission level.The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded. The bandwidth of test receiver is set at 9 KHz.

7.5 Test result

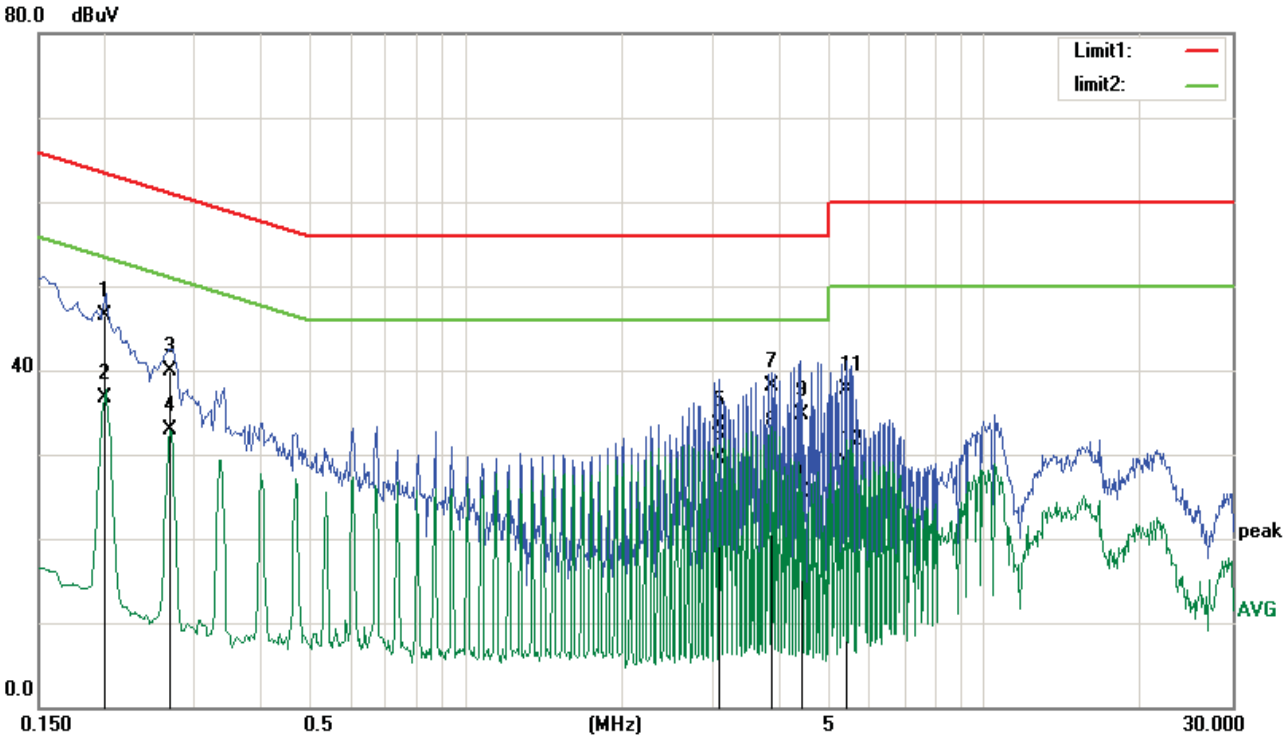
PASS. (See below detailed test result)

EUT:	**IZZO GOLF**	**Model No.:**	**GT**
Temperature:	**24℃**	**Relative Humidity:**	**55%**
Probe:	**L1**	**Test Power:**	**DC 5V Via PC USB Port Supply**
Standard:	**(CE)FCC Part 15 Class B_QP**	**Test Result:**	**Pass**
Test Mode:	**Tx**	**Test By:**	**vito**
Note:	**PC Mains**		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1997	38.04	11.13	49.17	63.62	-14.45	QP
2	0.1997	27.60	11.13	38.73	53.62	-14.89	AVG
3	0.2689	32.33	10.65	42.98	61.15	-18.17	QP
4	0.2689	24.41	10.65	35.06	51.15	-16.09	AVG
5	3.0826	27.81	10.14	37.95	56.00	-18.05	QP
6	3.0826	21.37	10.14	31.51	46.00	-14.49	AVG
7	3.8222	30.83	10.15	40.98	56.00	-15.02	QP
8	3.8222	22.45	10.15	32.60	46.00	-13.40	AVG
9	4.2935	27.95	10.13	38.08	56.00	-17.92	QP
10	4.2935	21.10	10.13	31.23	46.00	-14.77	AVG
11	5.4351	31.31	10.10	41.41	60.00	-18.59	QP
12	5.4351	22.33	10.10	32.43	50.00	-17.57	AVG

EUT:	IZZO GOLF	Model No.:	GT
Temperature:	24℃	Relative Humidity:	55%
Probe:	N	Test Power:	DC 5V Via PC USB Port Supply
Standard:	(CE)FCC Part 15 Class B_QP	Test Result:	Pass
Test Mode:	Tx	Test By:	vito
Note:	PC Mains		

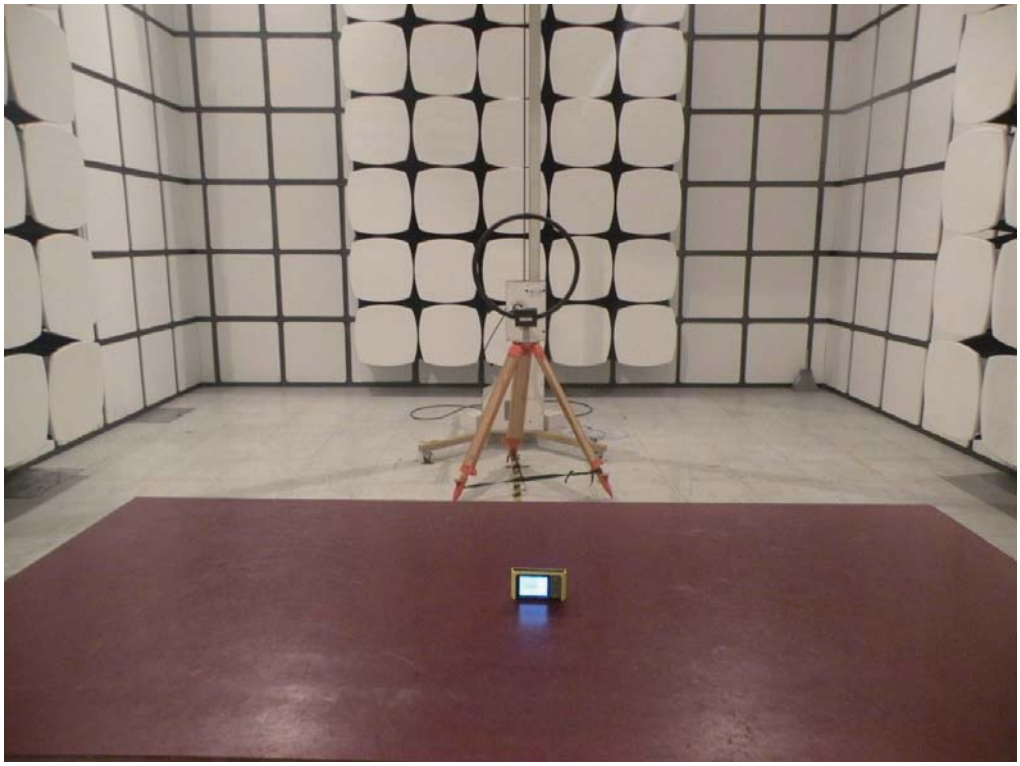


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2006	35.41	11.12	46.53	63.58	-17.05	QP
2	0.2006	25.60	11.12	36.72	53.58	-16.86	AVG
3	0.2692	29.25	10.65	39.90	61.14	-21.24	QP
4	0.2692	22.22	10.65	32.87	51.14	-18.27	AVG
5	3.0884	23.45	10.14	33.59	56.00	-22.41	QP
6	3.0884	19.28	10.14	29.42	46.00	-16.58	AVG
7	3.8973	28.01	10.14	38.15	56.00	-17.85	QP
8	3.8973	21.00	10.14	31.14	46.00	-14.86	AVG
9	4.4373	24.59	10.12	34.71	56.00	-21.29	QP
10	4.4373	15.39	10.12	25.51	46.00	-20.49	AVG
11	5.4448	27.51	10.10	37.61	60.00	-22.39	QP
12	5.4448	18.88	10.10	28.98	50.00	-21.02	AVG

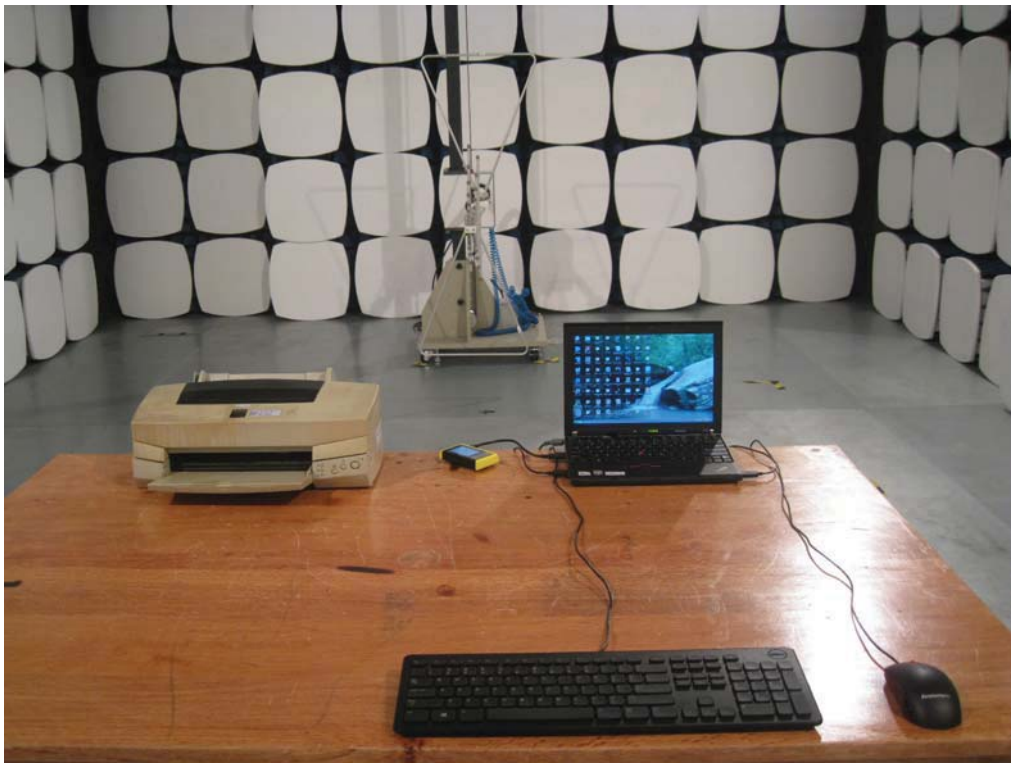
8.EUT test photo

Conducted Measurement Photos

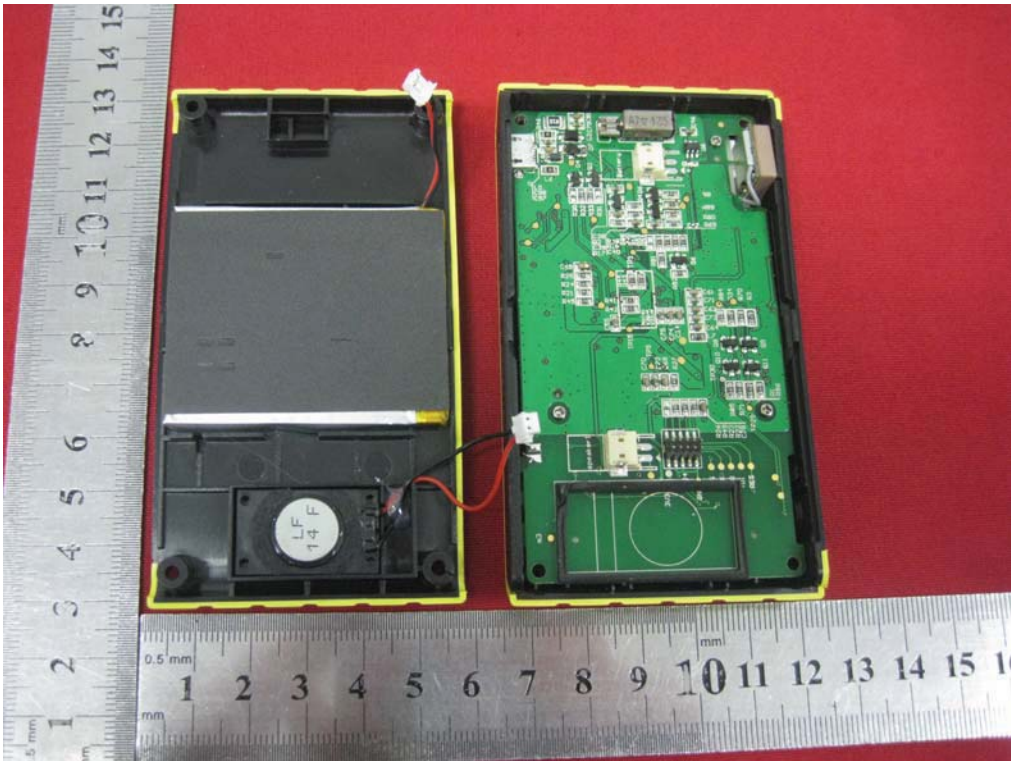
Radiated Measurement Photos (Below 30MHz)

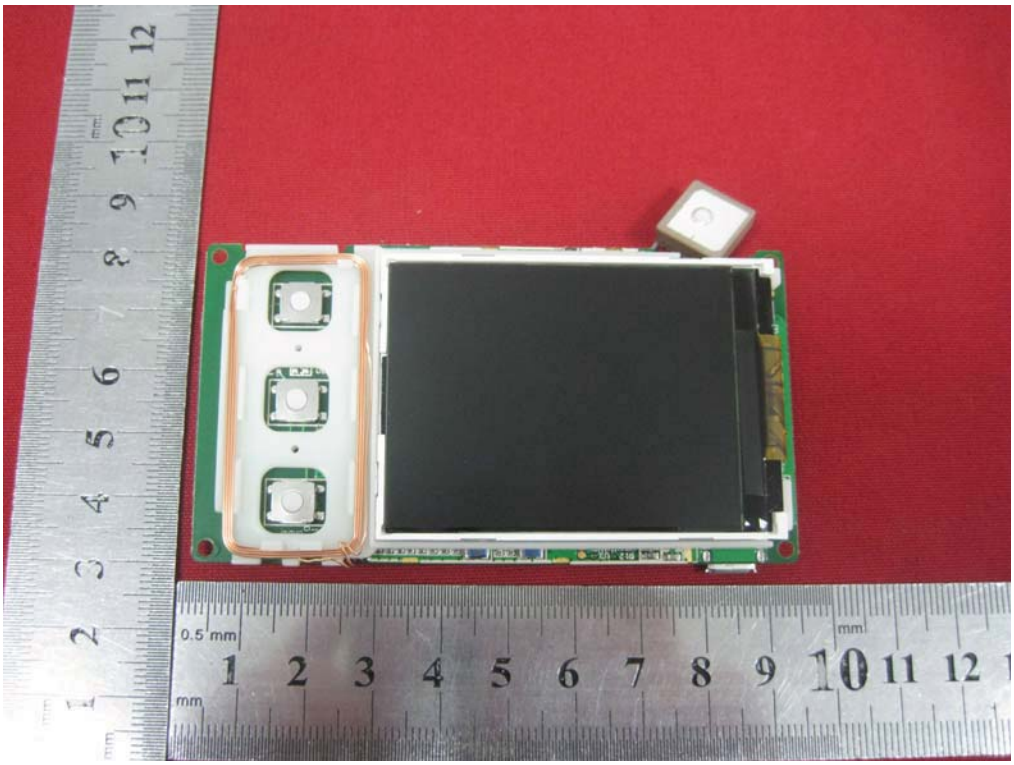


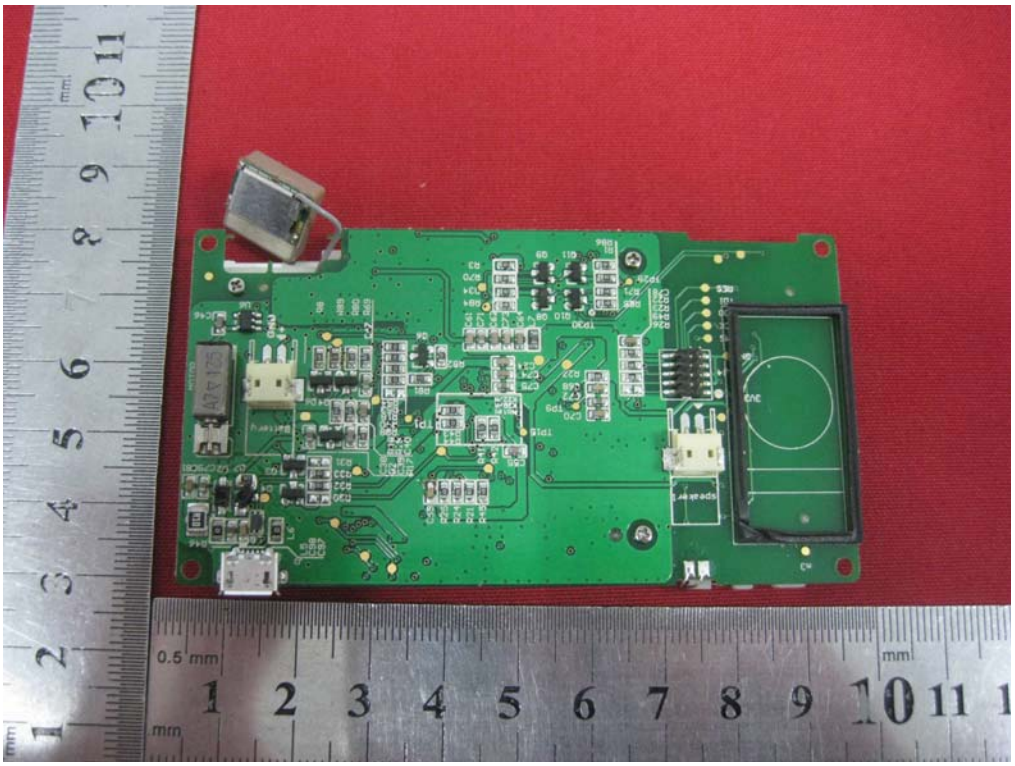
Radiated Measurement Photos (30MHz~1GHz)

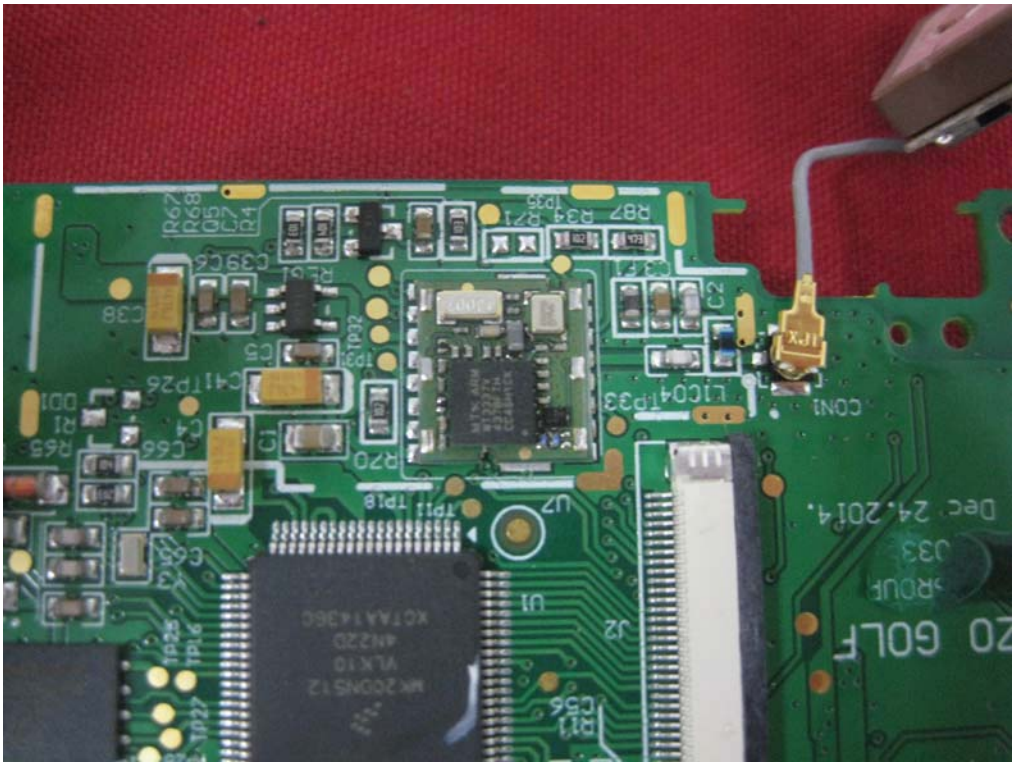


EUT photo









End of report