



Report No.:SZ12040027E02



FCC/IC TEST REPORT

Issued to

ICO Products, LLC

For

Game caller remote

Model Name: GC100&GC101
Trade Name: N/A
Brand Name: ICOTEC
FCC ID: ULD-ICOGC100
IC ID: 9273A-ICOTECGC100
Standard: 47 CFR Part 15 Subpart C
RSS-210 issue 8: 2010 Annex 1
Test date: May 20, 2012 – June 20, 2012
Issue date: June 21, 2012

Shenzhen Morlab Communications Technology Co., Ltd.



Tested by Tu Lang
Tu Lang
Date 2012.6.21

Approved by Wei Yanqun
Wei Yanqun
Date 2012.6.21

Review by Huang Pulong
Huang Pulong
Date 2012.6.21

CTIA Authorized Test Lab
LAB CODE 20081223-00
IEEE 1725

OFTA
電訊管理局



GCF
Official Government
Grant Certification Partner

Bluetooth
BQTF

FCC
Reg. No.
741109

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Version		
Version NO.	Date	Description
1.0	June 21, 2012	Initial creation of document

1. GENERAL INFORMATION

1.1 EUT Description

EUT Type..... Game caller remote
Serial No. (n.a., marked #1 by test site)
Hardware Version..... V03
Software Version..... V07
Applicant..... ICO products, LLC
5241 Secor, Rd. Unit L, Toledo, Ohio, United State 43623
ICO products, LLC
Manufacturer..... B23-3F, Hengfeng Industrial Zone, Xixiang Town, Bao'an District,
Shenzhen City
Modulation Type FSK
Working Frequency..... 433.92MHz
Power supply..... Battery
Brand Name: TINKO
Model No.: A12
Serial No.: (n.a. marked #1 by test site)
Capacitance: about 300mAh
Rated Voltage: DC 12V
Charge Limit: None Charge
Manufacturer: TINKO
No.1 Factory, Oriental Hi-tech Park, Qiaoxiang Rd,
Nanshan District, Shenzhen, 518053, China.

Note 1: The EUT has two models: GC100 and GC101, these two models are accordant hardware and software and only differ in model name. For a more detailed description about this, please refer to ANNEX A.

Note 2: The EUT is a Game caller remote transmitter. It was working at 433.92MHz.

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification, according to RSS-210 issue 8: 2010 Annex 1 for the EUT Industry Canada Certification.

No.	Identity	Document Title
1	47 CFR Part 15 (11-10-01Edition)	Radio Frequency Devices
2	RSS-210 issue 8: 2010 Annex 1	Momentarily Operated Devices and Remote Control

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	47 CFR Part 15: 15.203	Antenna Requirement	Compliance
3	47 CFR Part 15: 15.231(a)(1) RSS-210 issue 8: A1.1.1	Manually Activated Transmitter	Compliance
4	47 CFR Part 15: 15.231(c) RSS-210 issue 8: A1.1.3	Occupied Bandwidth Testing	Compliance
5	47 CFR Part 15: 15.205;15.209; 15.231(b) RSS-210 issue 8: A1.1.2	Radiated Emission	Compliance

NOTE:

- 1 This EUT is power by battery only, the conducted emission is not applicable.
- 2 All measurements contained in this report were conducted with ANSI C63.4-2009, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Equipment in the range of 9 kHz to 40GHz for FCC ID Certification, conducted with RSS-Gen Issue 3, General Requirements and Information for the Certification of Radio Apparatus for IC Certification.

1.3 Test Equipments Used

Description	Manufacturer	Model	Serial No.	Cal. Date
EMC Analyzer	Agilent	E7405A	US44210471	2012.05
Receiver	Narda	PMM 9060	001WX11001	2011.12
Receiver	Narda	PMM 9010	595WX11007	2011.11
Amplifier	Lucix	S10M100L380 2	46732	2012.05
Full-Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)	2012.05
Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	9163-274	2012.05
Test Antenna - Horn	Schwarzbeck	BBHA 9120D	9120D-963	2012.05
Test Antenna -Loop	Schwarzbeck	FMZB 1519	1519-022	2012.05

1.4 Facilities and Accreditations

1.4.1 Facilities

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at 3/F, Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen, 518055 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

1.4.2 Test Environment Conditions

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

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86 - 106

1.4.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	±1.8dB
Uncertainty of Radiated Emission:	±3.1dB

2. REQUIREMENTS

2.1 Antenna requirement

2.1.1 Applicable Standard

According to FCC 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.

Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

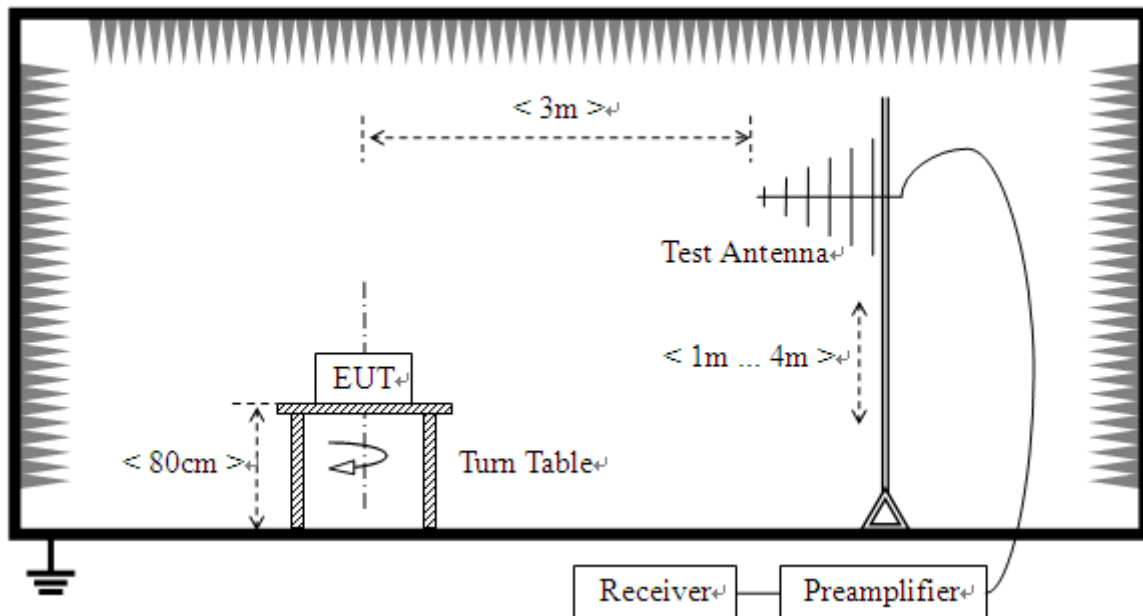
2.2 Manually Activated Transmitter

2.2.1 Applicable Standard

According to FCC 15.231(a)(1) and RSS-210 issue 8: A1.1.1, a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

The EUT can be released to work as a transmitter through pressing the keys on the surface of the EUT.

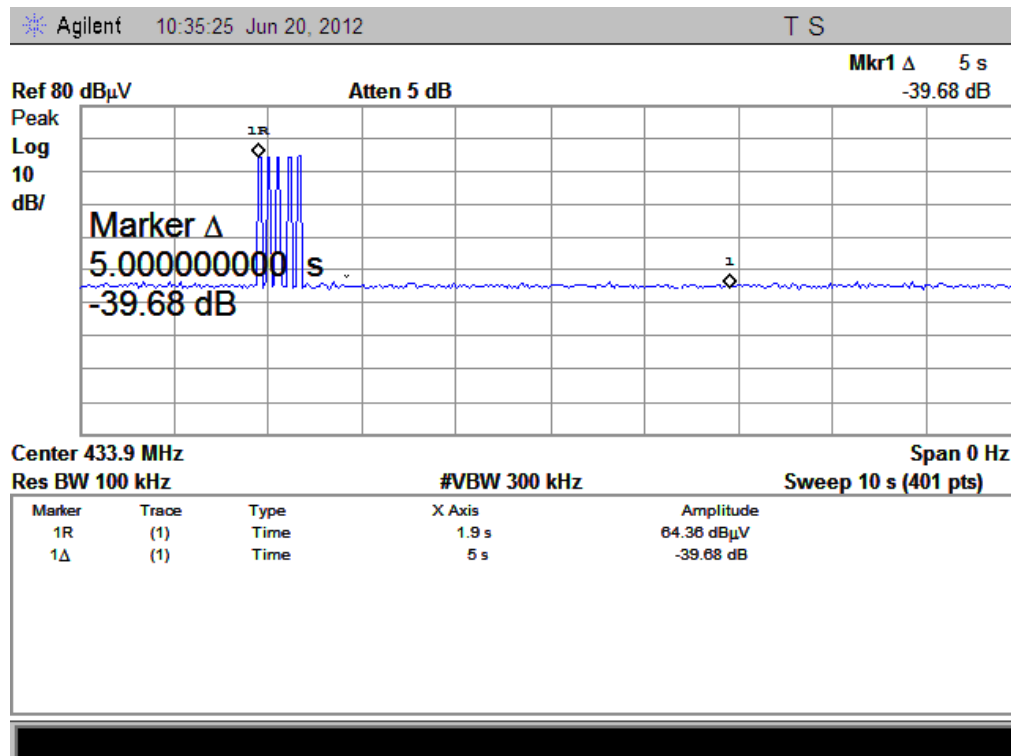
2.2.2 Test Setup



2.2.3 Summary of Test results

Work mode	activate Time	Limit	Plot	Conclusion
Transmitting	0.5s	5 s	A	Pass

2.2.4 Test plots



(Plot A: Deactivate Time)

Result: Compliant

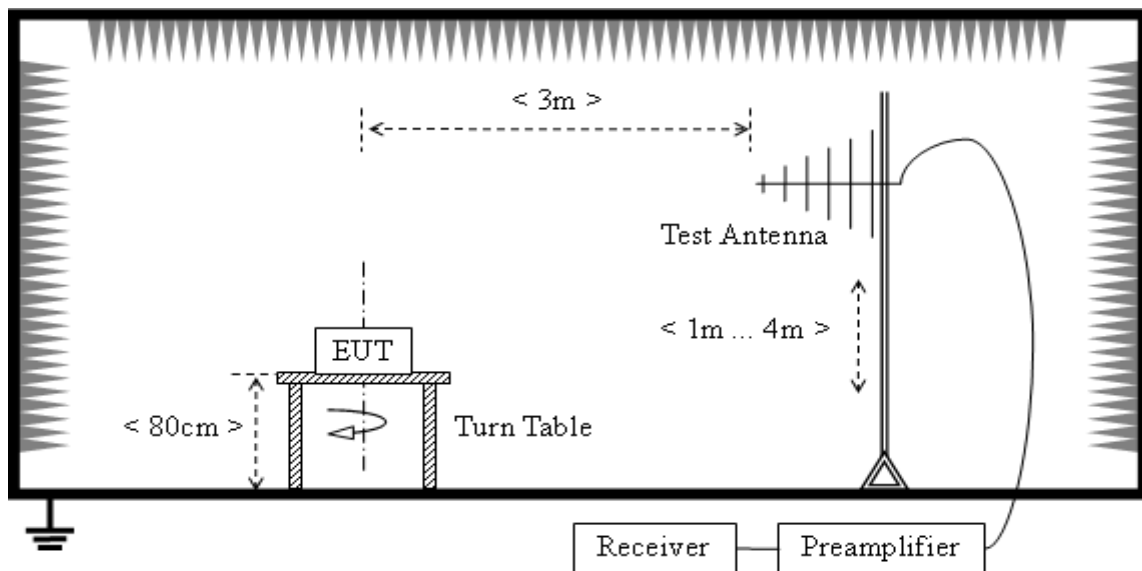
2.3 Occupied Bandwidth Test

2.3.1 Applicable Standard

According to FCC 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

According to RSS-210 issue 8: A1.1.3, the 99% bandwidth shall be no wider than 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the centre frequency.

2.3.2 Test Setup

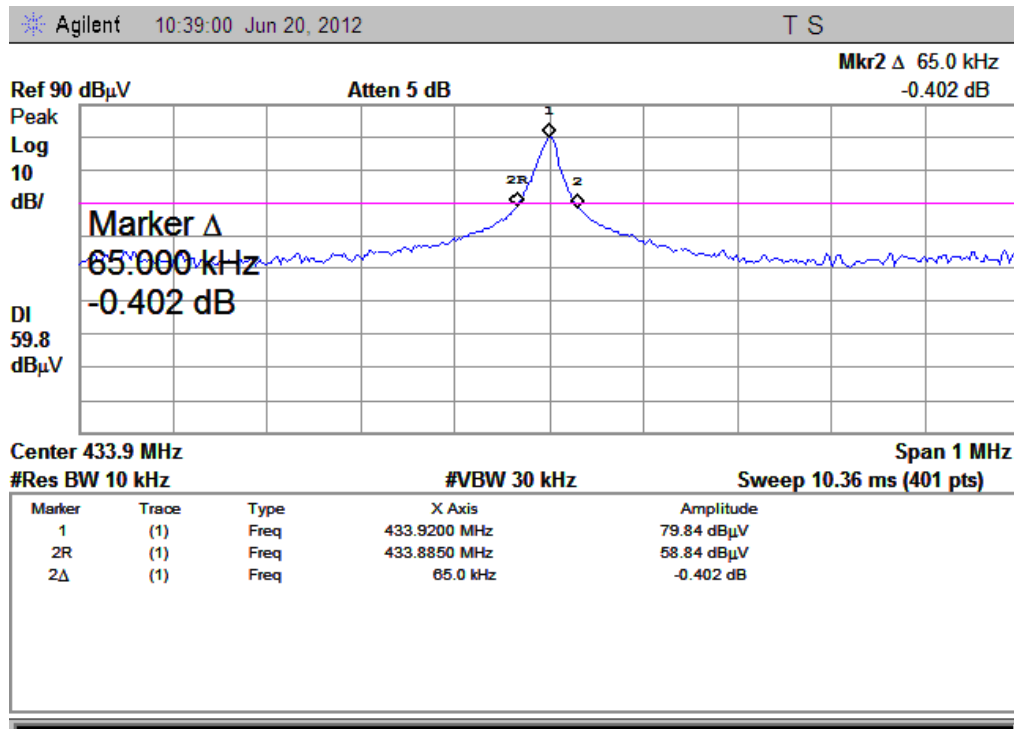


2.3.3 Summary of Test results

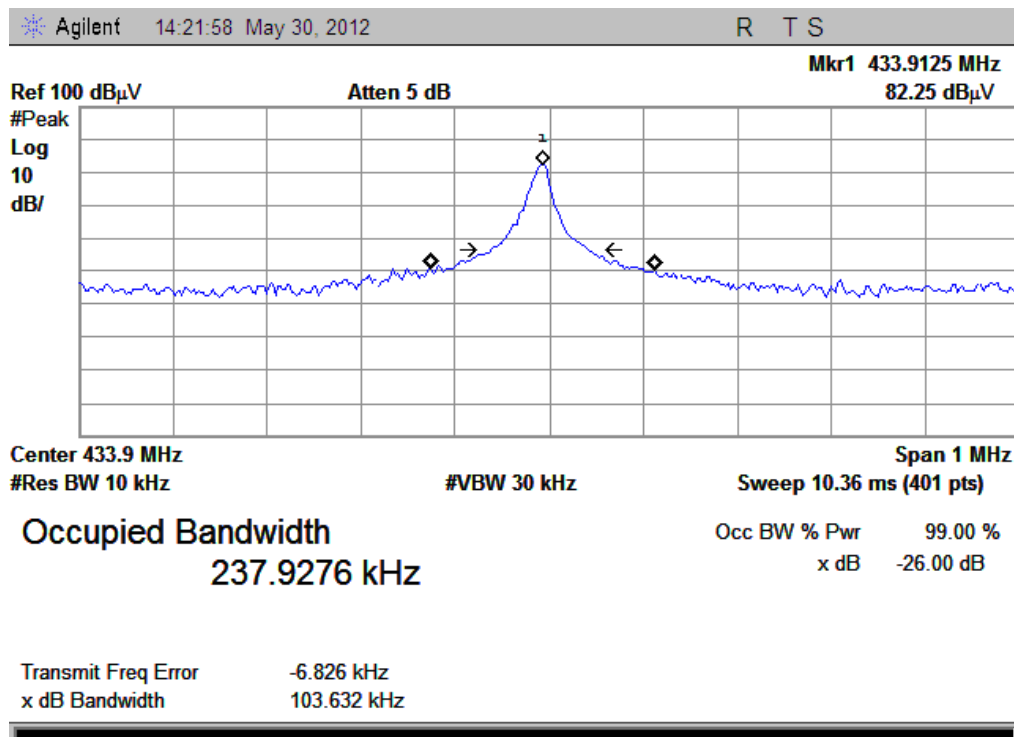
Work Mode	Bandwidth		Limit ^{Note 1}	Plot	Conclusion
	20dB	99%			
Transmitting	65 KHz	237.93KHz	1084.8 KHz	A, B	Pass

Note 1: Limit = Operating Frequency*0.25% = 433.92MHz*0.25% = 1084.8KHz.

2.3.4 Bandwidth Plot



(Plot A: 20dB Bandwidth)



(Plot B: 99% Bandwidth)

Result: Compliant

2.4 Radiated Emission

2.4.1 Standard Applicable

According to section FCC 15.231(b) and RSS-210 issue 8: A1.1.2, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency(MHz)	Field strength of fundamental (Microvolts/meter)	Fied strength of spurious emissions(Microvolts/meter)
260-470	3750 to 12500*	375 to 1250*

*Linear interpolations.

*For the band 433.92MHz, the field strength of fundamental limit at 3m

$$20\lg(41.6*433.92-7083.3) = 80.8(\text{dB}\mu\text{V/m})$$

The field strength of spurious emissions: $20\lg(4.17*433.92-709.2) = 60.8(\text{dB}\mu\text{V/m})$

According to FCC section 15.209 (a) and RSS-Gen Issue 3, except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency range (MHz)	Field Strength		Field Strength Limitation at 3m Measurement Dist	
	$\mu\text{V/m}$	Dist	$(\mu\text{V/m})$	$(\text{dB}\mu\text{V/m})$
0.009 - 0.490	$2400/F(\text{KHz})$	300m	$10000* 2400/F(\text{KHz})$	$20\lg 2400/F(\text{KHz}) + 80$
0.490 - 1.705	$2400/F(\text{KHz})$	30m	$100* 2400/F(\text{KHz})$	$20\lg 2400/F(\text{KHz}) + 40$
1.705 - 30.00	30	30m	$100*30$	$20\lg 30 + 40$
30.0 - 88.0	100	3m	100	$20\lg 100$
88.0 - 216.0	150	3m	150	$20\lg 150$
216.0 - 960.0	200	3m	200	$20\lg 200$
Above 960.0	500	3m	500	$20\lg 500$

The above field strength limits are specified at a distance of 3-meters the tighter limits apply at the band edges.

As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

Note:

- 1) The tighter limit shall apply at the boundary between two frequency range.
- 2) Limitation expressed in dBuV/m is calculated by $20\log$ Emission Level(uV/m).
- 3) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula of $Ld1 = Ld2 * (d2/d1)^2$.

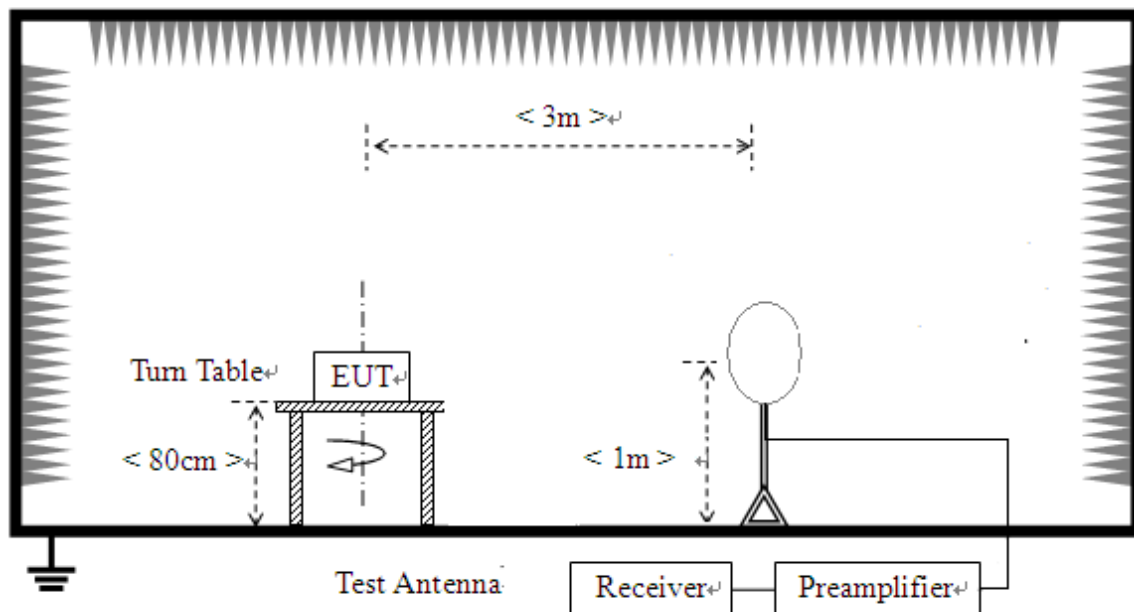
Example:

F.S Limit at 30m distance is 30uV/m, then F.S Limitation at 3m distance is adjusted as

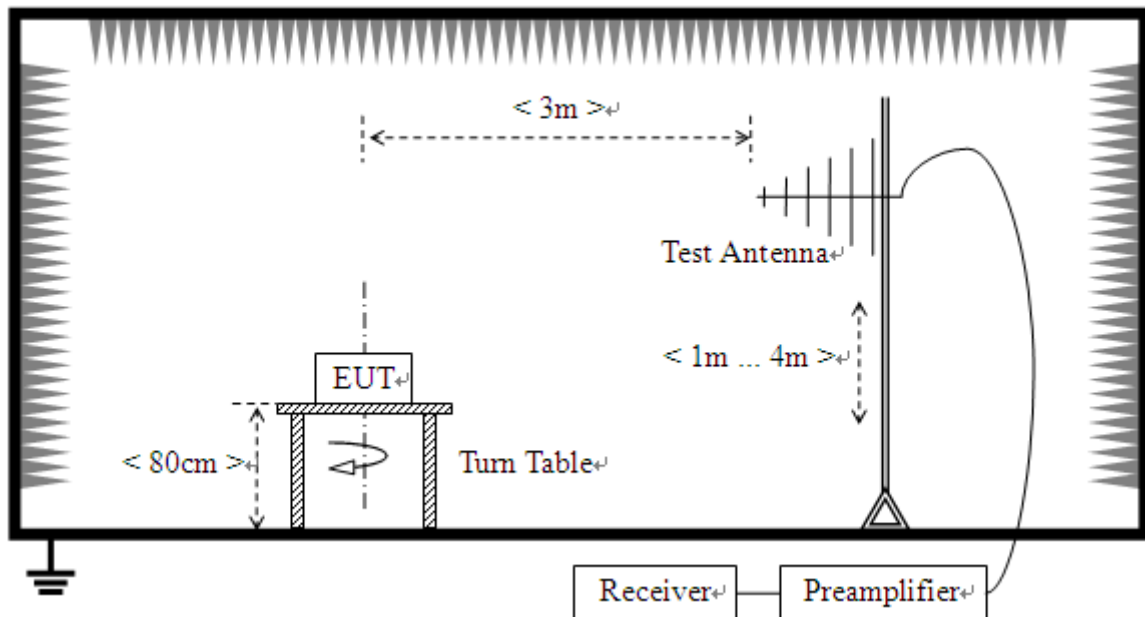
$$Ld1 = L1 = 30\text{uV/m} * (10)^2 = 100 * 30\text{uV/m}$$

2.4.2 Test Setup

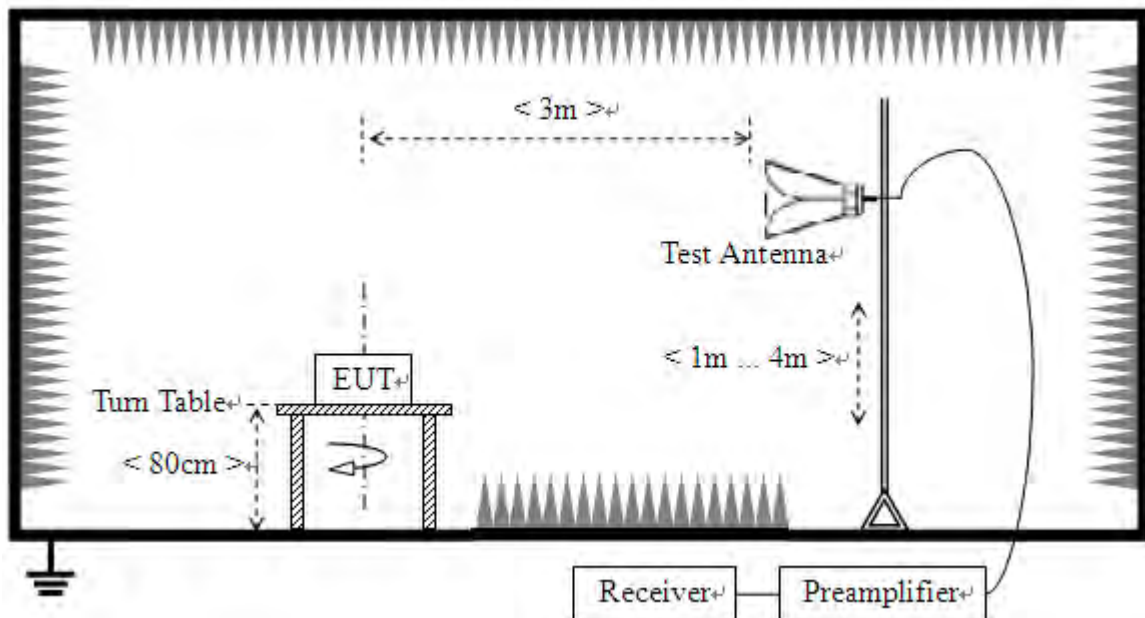
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



2.4.3 Test Procedure

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn

Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

For the test Antenna:

- 1) In the frequency range of 9KHz to 30MHz, magnetic field is measured with Loop Test Antenna.
The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
- 2) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

2.4.4 Summary of test Results and Plots

The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

The Emissions:

Fre (MHz)	Polar (H/V)	Reading _Peak (dBμV)	Total Factor (dB)	PEAK (dBμV/ m)	AV Factor (dB)	AVG (dBμV/ m)	Limits		Result (Pass /Fail)	Emissions Type
							Peak	AVG		
433.92	H	72.6	18.6	91.2	-18.98	72.22	100.8	80.8	PASS	Fundamental
867.84	H	28.32	22.6	50.92	-18.98	31.94	80.8	60.8	PASS	Harmonics
1301.76	H	29.47	25.7	55.17	-18.98	36.19	74	54	PASS	Harmonics
1735.68	H	30.67	28.4	59.07	-18.98	40.09	80.8	60.8	PASS	Harmonics
425.67	H	33.29	18.2	51.49	-18.98	32.51	74	54	PASS	Spurious
1278.60	H	30.57	25.0	55.57	-18.98	36.59	74	54	PASS	Spurious
433.92	V	63.32	18.6	81.92	-18.98	62.94	100.8	80.8	PASS	Fundamental
867.84	V	27.46	22.6	50.06	-18.98	31.08	80.8	60.8	PASS	Harmonics
1301.76	V	31.64	25.7	57.34	-18.98	38.36	74	54	PASS	Harmonics
425.67	V	28.29	18.2	46.49	-18.98	27.51	74	54	PASS	Spurious
1378.64	V	28.12	26.04	54.16	-18.98	35.18	74	54	PASS	Spurious

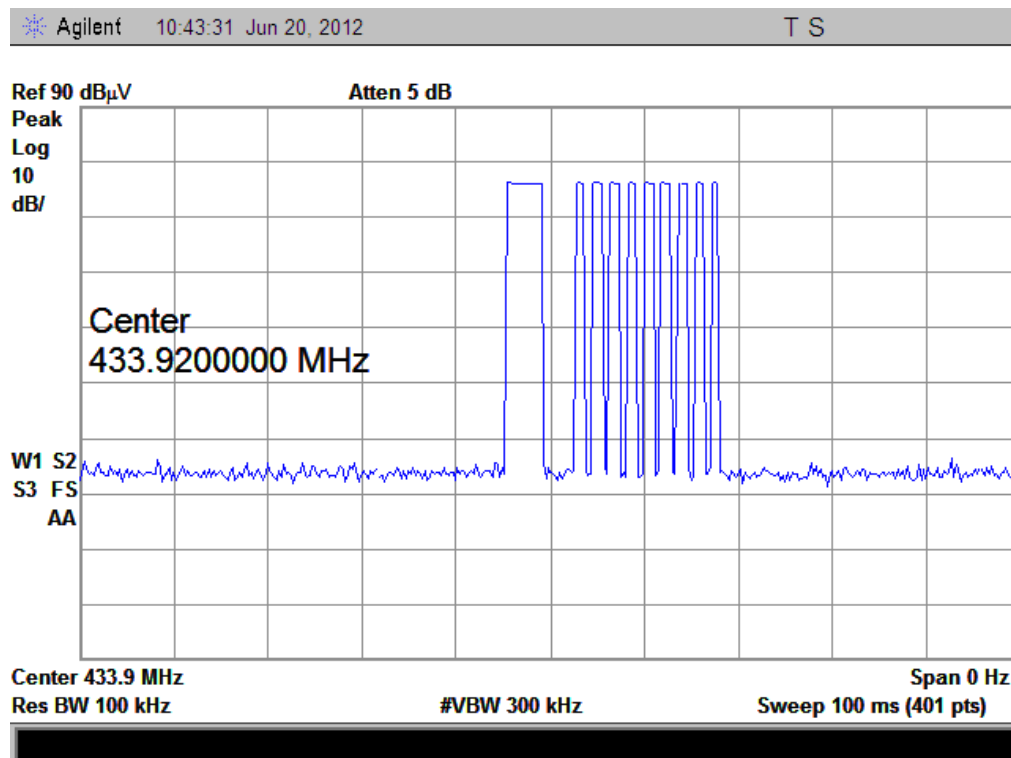
NOTE:

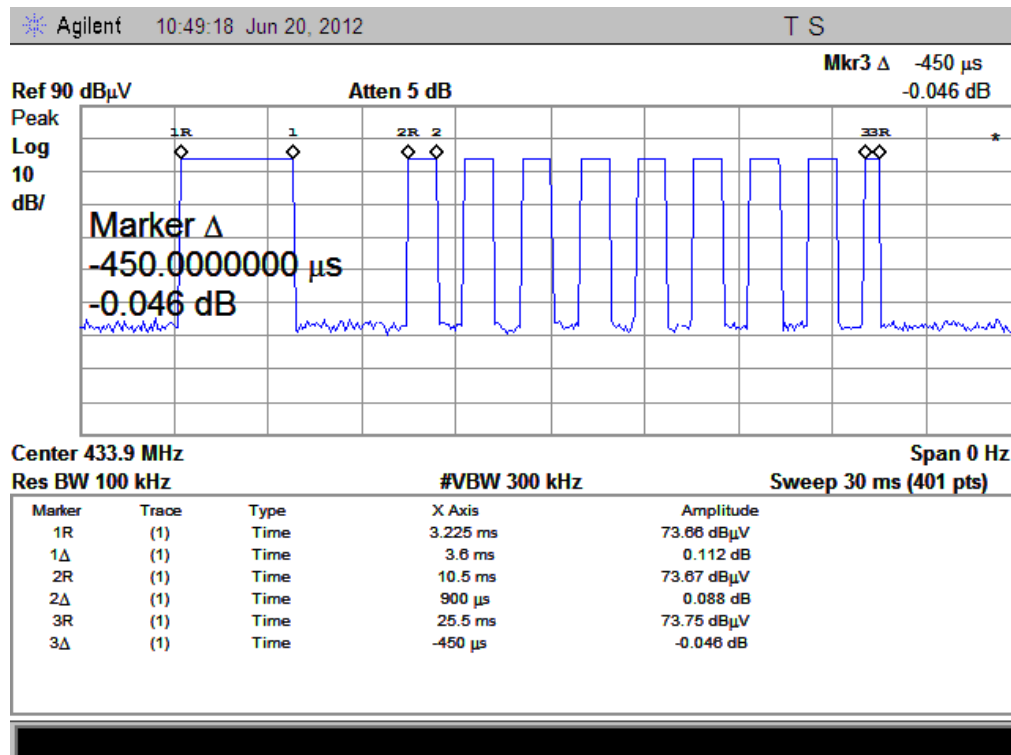
1. The EUT was tested in all three orthogonal planes and frequency range 30MHz to the tenth

harmonics, here we ranged to 5GHz. The above table only shows the frequencies which peak emission exceed or close to the average limit. The peak data of other frequencies are attenuated more than 20 dB below the permissible value need not be reported.

2. Below 1GHz: The Total Factor = cable loss + antenna factor
Above 1GHz: The Total Factor = cable loss + antenna factor – amplifier factor
3. $PEAK(dB\mu V/m) = Reading\ Level_PK(dB\mu V) + total\ factor\ (dB)$
 $AV(dB\mu V/m) = PEAK(dB\mu V/m) + AV\ factor(dB)$
4. The duty cycle is simply the on-time divided by the period (refer to the plots as follows).
The duration of one cycle > 100ms
Effective period of the cycle = $1*3.6ms + 8*900\mu s + 1*450\mu s = 11.25ms$
Duty Cycle = $11.25ms/100ms = 0.1125$
Therefore, the averaging factor is found by $20*\log(Duty\ cycle) = 20*\log(0.1125) = -18.98$

The Plots of Duty Cycle:





Result: Compliant

ANNEX A DECLARATION OF INDENTIFY**Declaration**

Jun 15, 2012

To whom it may concern,

With regards to the application for GC100 and GC101.

According to the designer, ICO Products, LLC., we hereby declare that the model: GC100 and GC101 are accordant hardware and software.

These two models only differ in model name.

The application information of model: GC100 and GC101 identify except mentioned above.

Declare by: ICO Products, LLC.

Person Responsible for making this statement:

A handwritten signature in black ink, appearing to read "Michael Zhao", written over a horizontal line.

Michael Zhao

ICO Products, LLC.
CEO

2012-6-15

**** END OF REPORT ****