GTC Centre Limited

FCC
TEST REPORT

Application No.: 10122916 (Tx)

Rm02, 15/F Fonda Ind Bldg, 37-39 Au Pui Wan Street, Fotan Shatin, N.T., Hong Kong
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REPORT NO.: 10122916 (Tx) **DATE:** 28 April, 2011

APPLICANT:	AQUATIC AV
ADDRESS:	1476 CAMDEN AVENUE, CAMPBELL, CA 95008, U.S.A.
DATE OF RECEIVED:	17 January, 2011
DATE OF TESTING:	17 January, 2011 to 28 April,2011

DESCRIPTION OF SAMPLE:

Product:	Floatable Water-Resistant RF Wireless Remote
Brand Name:	AQUATIC AV
Model No.:	AQ-RF-34
Addiation model:	AQ-RF-4 / AQ-RF-3 / AQ-RF-3a
FCC ID:	WBQIP67AQRF34T
Input Voltage:	DC 3.0V (CR2025 X1)

Description of EUT Operation	The EUT is a remote control. The remote transfers operation commands at single direction to the controler at ISM 434MHz radio frequency in ASK modulation. The EUT is powered by 3V CR2025 size battery.
INVESTIGATION REQUESTED:	**FCC PART 15 SUBPART C**
TEST RESULTS:	See attached sheets
CONCLUSIONS:	The submitted product **COMPLIED** with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on page 5 in this Test report.

CS Lin, EMC
Approved Signatory

General Details

Test Laboratory

GTC CENTRE LTD
EMC Laboratory
Rm02, 15/F Fonda Ind Bldg, 37-39 Au Pui Wan Street, Fotan
Shatin, N.T., Hong Kong

Telephone: 852 2690 0881
Fax: 852 2690 0877

Applicant Details

Applicant
AQUATIC AV
1476 CAMDEN AVENUE,
CAMPBELL, CA 95008,
U.S.A.

Manufacturer

HENG YONG ELECTRONIC PRODUCTS CO. LTD
NAN ZHA INDUSTRIAL ESTATE 4,
HU MEN TOWN, DONG GUAN CITY,
GUANG DONG, CHINA,
POST CODE 523932

Technical Details

Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15 and ANSI C63.4:2003 for FCC Certification.

Test Standards and Results Summary Tables

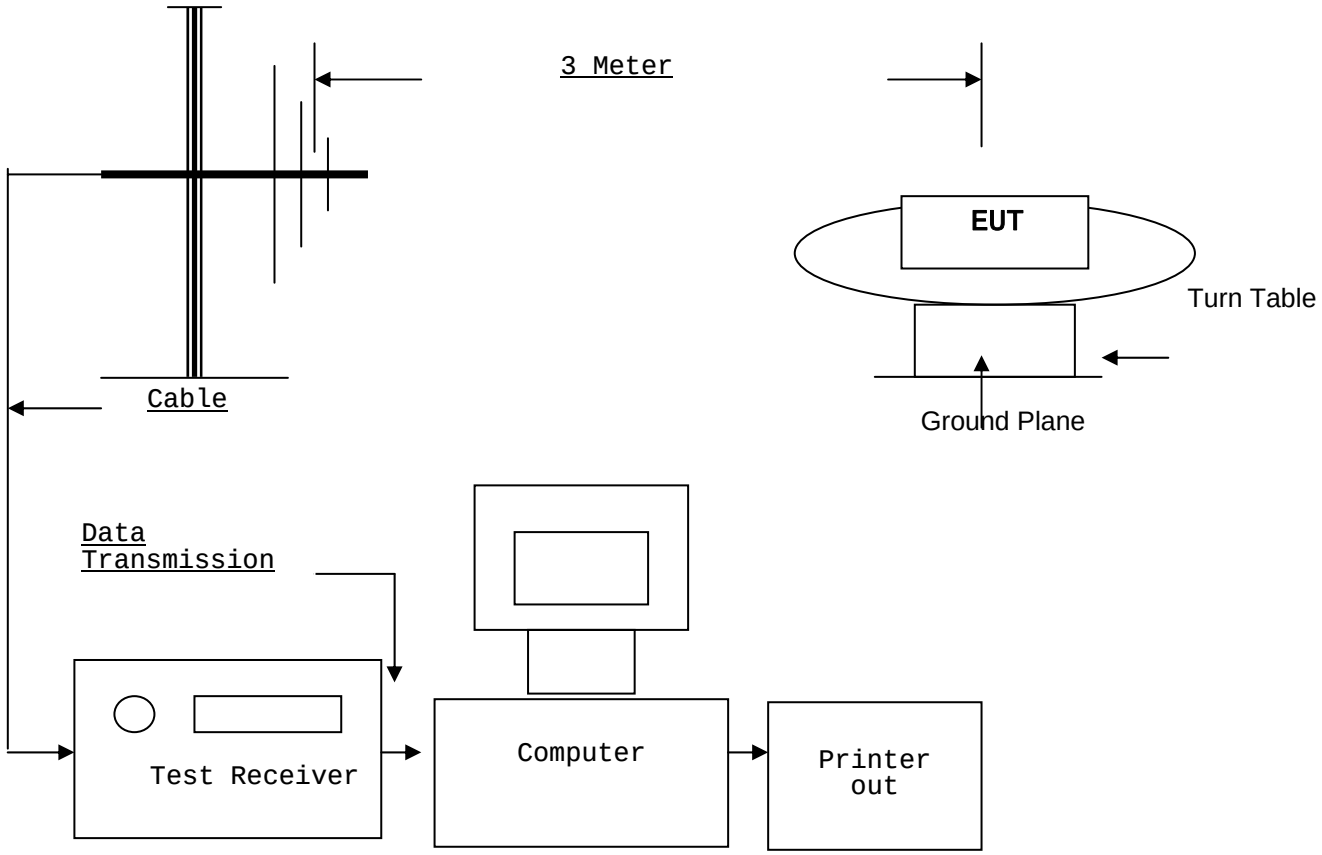
EMISSION Results Summary					
Test Condition	Test Requirement	Test Method	Test Result		
			Pass	Failed	N/A
Radiated Emissions,	FCC 47CFR 15.231	ANSI C63.4:2003	☒	☐	☐
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	☐	☐	☒

Note: N/A – Not Applicable

Test Results

Emission

Radiation Emission Measurement
Setup diagram:



Test Method:

The sample was placed 0.8m above the ground plane on the OATS*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X,Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*. OATS [Open Area Test Site] located at GTC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules. With Registration Number:493655

Radiation
Emissions Measurement

Appl. : AQUATIC AV
Model: AQ-RF-34
Operation: TX Mode

Test Requirement: FCC 47CFR 15.231
Test Method: ANSI C63.4:2003
Test Date: 2011-01-19

Results:

Fundamental Frequency [MHz]	Field Strength Of Fundamental dBuV	Field Strength of harmonics and Spurious Emissions (dBuV/m @3m)
40.66 to 40.70	67.04	47.04
70 to 130	61.94	41.94
130 to 174	61.94 to 71.48	41.94 to 51.48
174 to 260	71.48	51.48
260 to 470	71.48 to 81.94	51.48 to 61.94
470 and above	81.94	61.94

The limit for average field strength dBuV/m for the fundamental frequency= 80.28dBuV/m. No fundamental is allowed in the restricted bands.
The limit for average field strength dBuV/m for the harmonics and spurious frequencies= 60.28 dBuV/m. Spurious in the restricted bands must be less than 54 dBuV/m or 15.209.

Radiated Emissions Average

Frequency MHz	Measured Level @3m dBµV	Correction Factor dB/m	Duty Cycle Factor dB	Field Strength dBµV/m	Limit @3m dBµV/m	E-Field Polarity
433.93	65.0	18.7	-10.2	73.5	80	Vertical
867.86	21.5	24.1	-10.2	35.4	60	Horizontal
1301.73	16.0	26.1	-10.2	31.9	60	Horizontal
1735.56	18.0	28.3	-10.2	36.1	60	Horizontal
2169.57	16.0	28.6	-10.2	34.4	60	Horizontal
2603.45	14.0	29.0	-10.2	32.8	60	Horizontal
3037.40	10.5	30.5	-10.2	30.8	60	Horizontal
3471.19	9.5	30.9	-10.2	30.2	60	Horizontal

Remarks:
Correction Factor included Antenna Factor and Cable Attenuation.

Conducted Emission on AC (0.15MHz to 30MHz)

Appl. : AQUATIC AV
Model: AQ-RF-34
Operation: TX Mode

Test Requirement: FCC 47CFR 15.207
Test Method: ANSI C63.4:2003
Test Date: N/A

Results: N/A

The EUT is operated by a single source of internal battery power [located in the battery compartment], therefore power line conducted emission was deemed unnecessary.

Occupied Bandwidth

Appl. : AQUATIC AV
Model: AQ-RF-34
Operation: TX Mode

Test Requirement: FCC 47CFR 15.231 (C)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating between 70 and 900MHz. Bandwidth is determined at the points 20dB down from the modulated carrier.

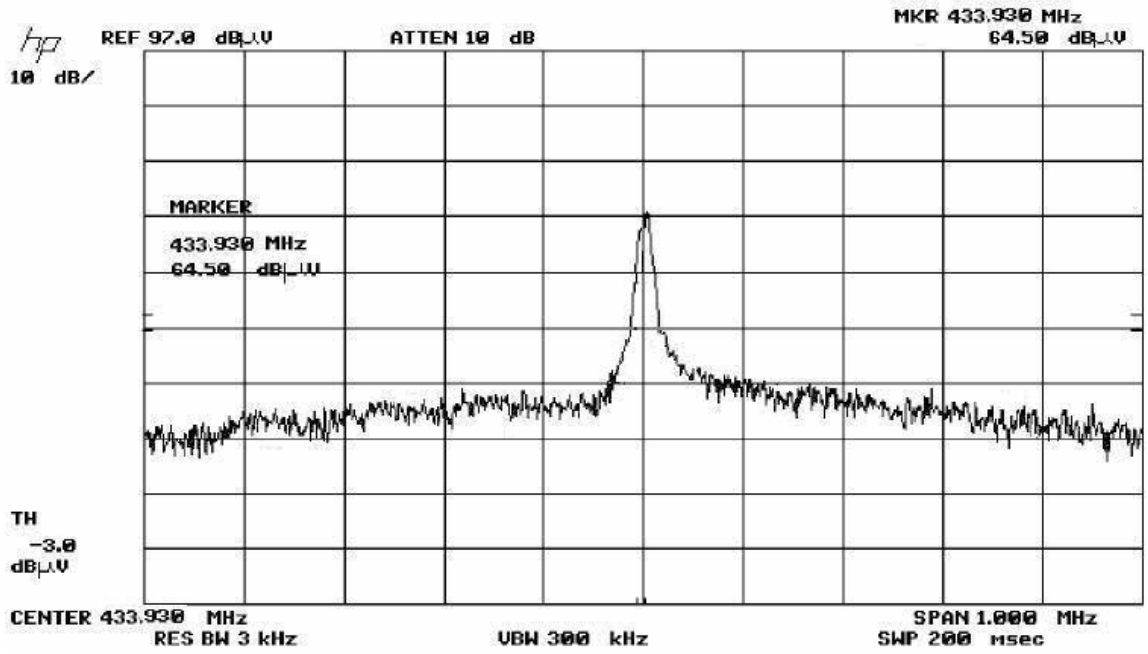
433.93MHz * 0.0025 = 1.0848 MHz
1.0848 MHz/2 = +/- 542.4

Test Date: 2011-01-14

Test Method:

A small sample of the transmitter output was fed into the spectrum analyzer and the plot in exhibit 9 was generated. The vertical scale is set to 10dB per division: the horizontal scale is set to 100kHz per division.

The Graphs in the following pages represents the emissions taken for the device.



APPENDIX A

LIST OF MEASUREMENT EQUIPMENT

Equi. No.	Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date
E005	EMI Test Receiver	Rohde & Schwarz	ESVP	893417/019	09 Sep 2010	08 Sep 2011
E003	Spectrum Analyzer With Q/P	Tektronix	2712	B034039	09 Sep 2010	08 Sep 2011
E004	RF Preselector	Tektronix	2706	B010649	09 Sep 2010	08 Sep 2011
E057	EMI Test Receiver	Rohde & Schwarz	ESV	863112/007	17 Aug 2010	16 Aug 2011
E084	Spectrum Analyzer	Hewlett Packard	HP 8568B	3001A04930	07 Jul 2011	06 Jul 2012
E085	Displayer of Spectrum Analyzer	Hewlett Packard	HP 85662A	2033A01841	07 Sep 2010	06 Sep 2011
E086	Quasi-Peak Adaptor	Hewlett Packard	HP 85650A	2527A00785	07 Sep 2010	06 Sep 2011
E090	RF Signal Generator	Rohde & Schwarz	SMX	832566/005	04 Mar 2011	03 Mar 2012
E001	Antenna System	Schwarzbeck	D-6917	UHALP9107	04 Mar 2011	03 Mar 2012
E002	Antenna System	Schwarzbeck	VHA9103	VHA91031253	04 Mar 2011	03 Mar 2012
E101	Loop Antenna	EMCO	6502	9902-3269	20 Feb 2011	20Feb 2012
E008	LISN	EMCO	3825/2	1115	20 Sep 2010	19 Sep 2011
E115	Limiter 50 Ohm DC~1800MHz	Hewlett Packard	11867A	--------	04 Mar 2011	03 Mar 2012
E100	Turntable	Chioce Way	TB1200	51112	--------	--------
E006	RF Signal Generator	Fluke	6060A	3880007	04 Mar 2011	03 Mar 2012
E092	Antenna Tripole	IT&T	UH800100	A05011	04 Mar 2011	03 Mar 2012
E098	Pre-Amplifier	Hewlett Packard	8447D	2944A09089	04 Mar 2011	03 Mar 2012
E099	Antenna Mast	Schwarzbeck	AM9014	--------	---------	--------
E113	Spectrum Analyzer	Hewlett Packard	HP8566B	2747A05483	20 Feb 2011	20 Feb 2012
E118	Display of Spectrum Analyzer	Hewlett Packard	HP85662A	2152A03271	20 Feb 2011	20 Feb 2012

APPENDIX B

Duty Cycle Correction During 100msec

Each function key sends a different series of characters, but each packet period (31.2msec) never exceeds a series of 1 long (3.8msec) and 21 short (280usec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered 1 x 3.8msec + 21 x 280usec per 31.2msec = 31% duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction =20Log(0.31) =-10.2dB

The following figures [Figure A to Figure C] show the characteristics of the pulse train for one of these functions.

Figure A [Pulse Train]

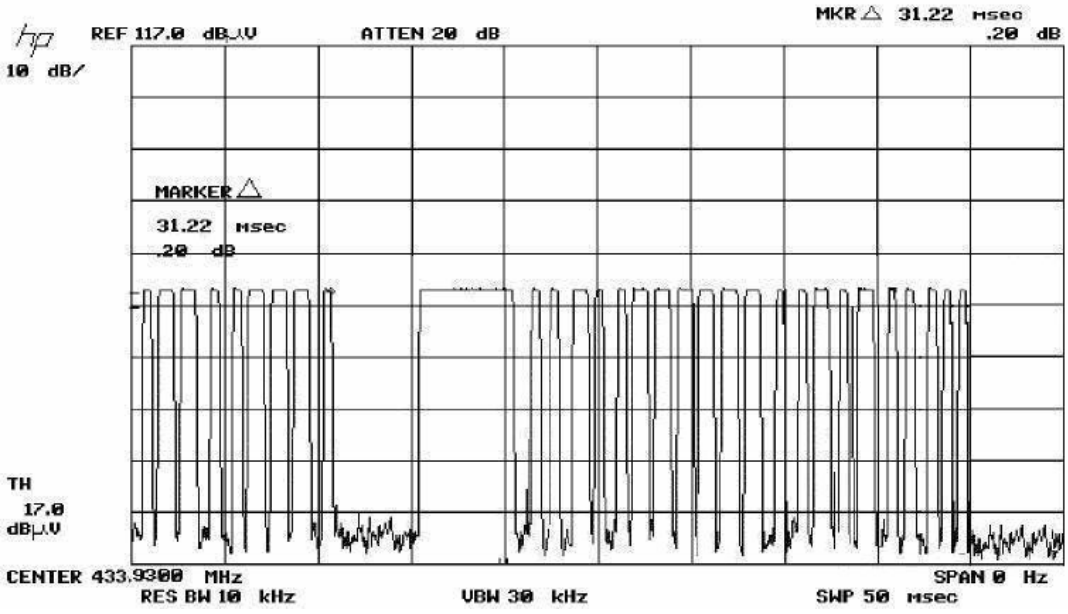


Figure B [Long Pulse]

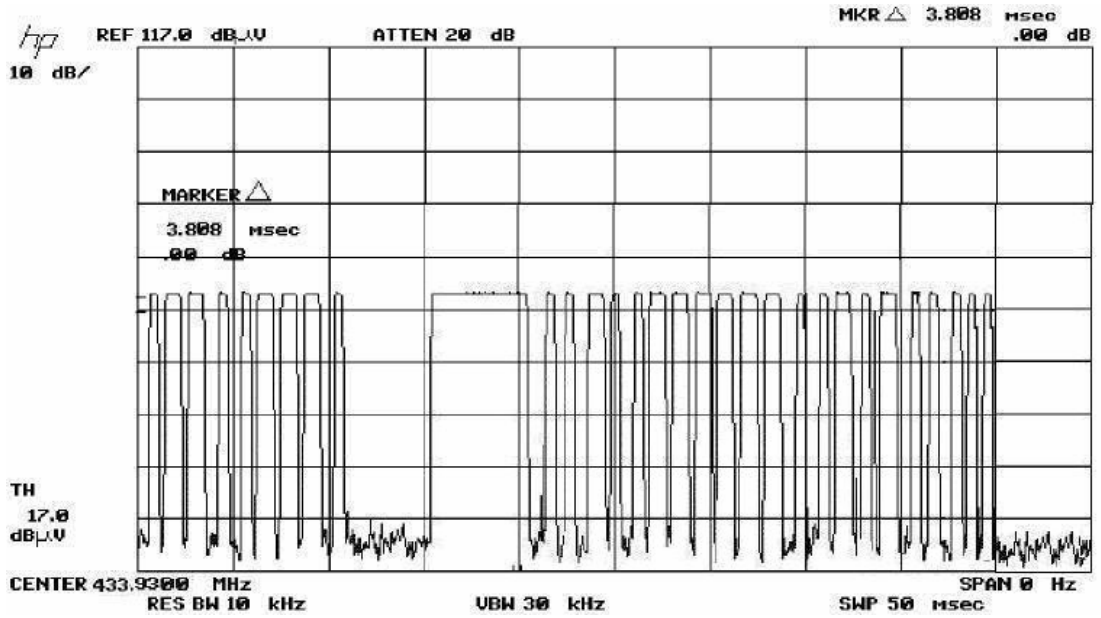
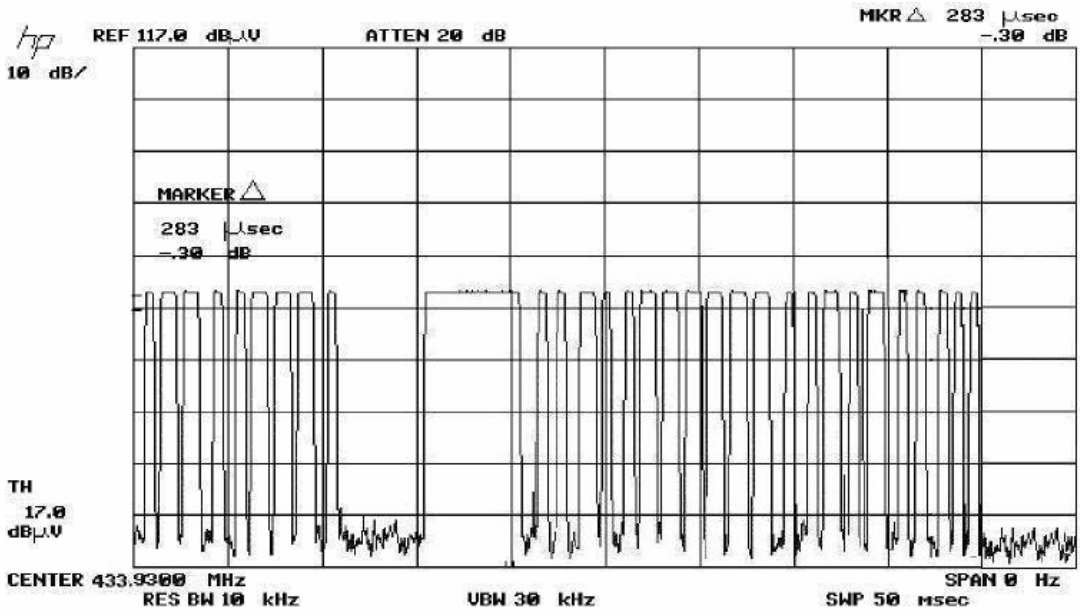


Figure C [Short Pulse]



APPENDIX c

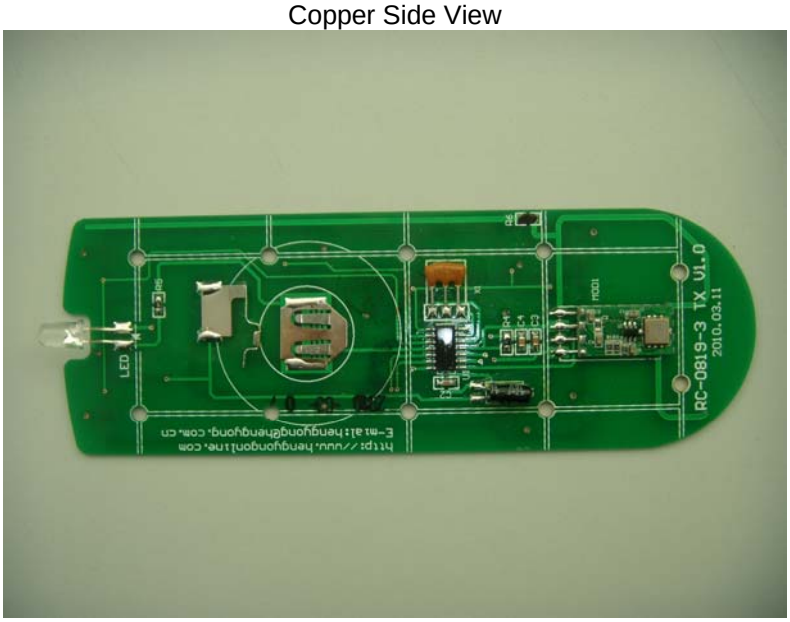
Photos of EUT

Front View of the product

Rear View of the product

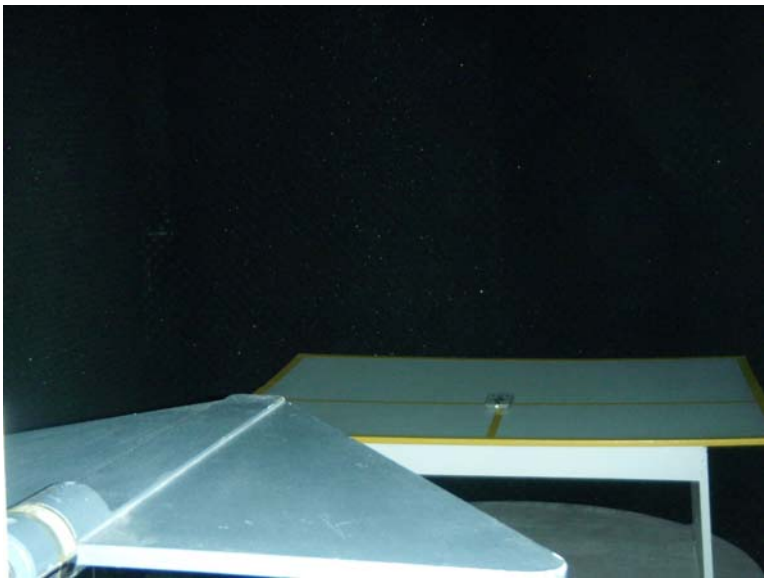
Component Side View

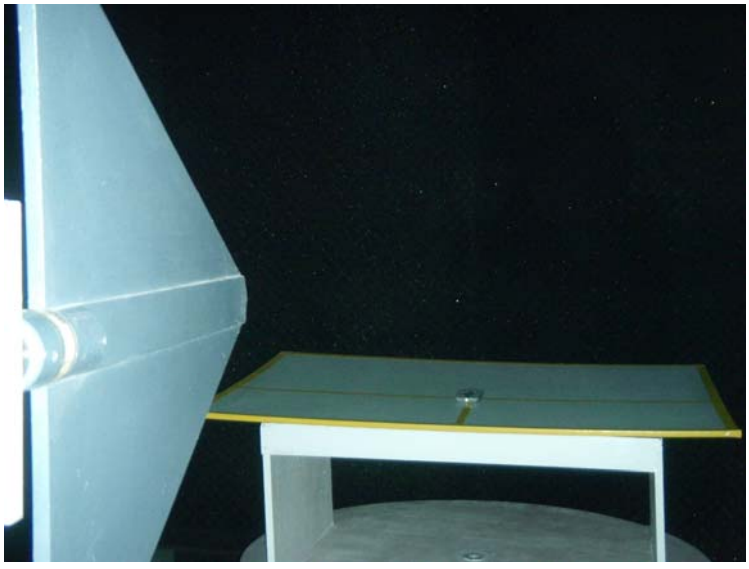
Copper Side View



Photos of EUT

Measurement of Radiated Emission Test Set up





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