



FCC TEST REPORT

Application No.: 10102888 (49MHz, Tx)

Rm02, 15/F Fonda Ind Bldg, 37-39 Au Pui Wan Street, Fotan Shatin, N.T., Hong Kong
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DATE: 29 October, 2010

APPLICANT: Speed Digital Ltd

ADDRESS: Unit C, 13/F,
Por Mee Factory Building,
500 Castle Peak Road,
Kowloon, Hong Kong

DATE OF RECEIVED: 05 Oct, 2010

DATE OF TESTING: 05 Oct 2010 to 29 Oct 2010

DESCRIPTION OF SAMPLE:

Product: Pooltunes; i-pool
Brand Name: NIL
Model No.: 13001, SF1005, SF1003
FCC ID: YW3IPOOL1310TX
Input Voltage: DC9V (6F22 x 1)

Description of EUT Operation The Equipment Under Test (EUT) is a Speed Digital Limited, i-pool Speaker.

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 Test report.



CS Lin, EMC
for Chief Executive

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DATE: 29 October, 2010

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 2699 0881
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Applicant Details
Applicant

Speed Digital Ltd
Unit C, 13/F,
Por Mee Factory Building,
500 Castle Peak Road,
Kowloon, Hong Kong

Manufacturer

Speed Digital Ltd
Unit C, 13/F,
Por Mee Factory Building,
500 Castle Peak Road,
Kowloon, Hong Kong

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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
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.235	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions, 30MHz to 1GHz	FCC 47CFR 15.209	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

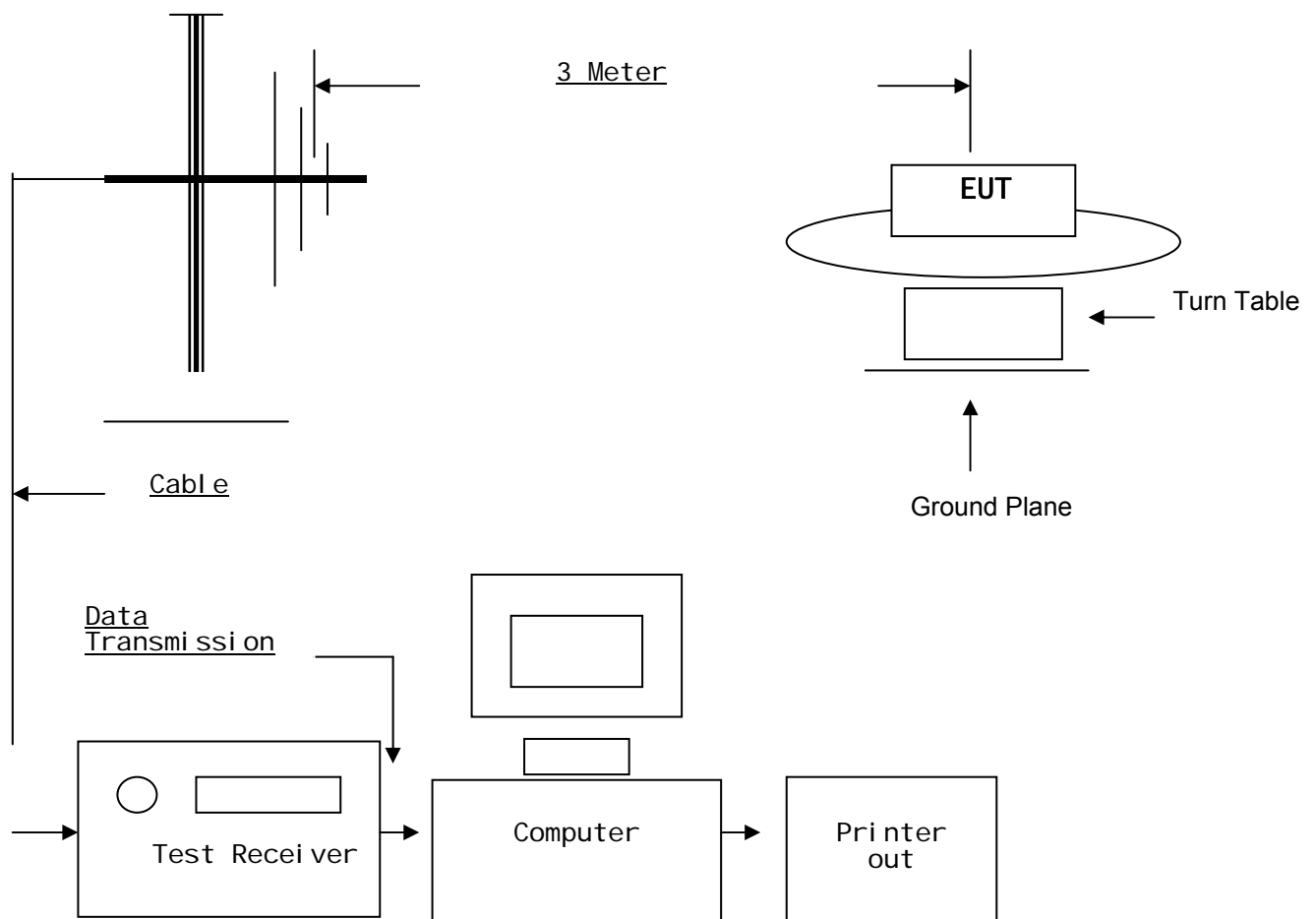
Note: N/A – Not Applicable

Test Results

Emission

Radiation Emission Measurement (30MHz to 1GHz)

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

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of the FCC rules. With Registration Number:493655

Radiation **Emissions Measurement**

Appl. : Speed Digital Ltd
Model: 13001
Operation: TX mode

Test Requirement: FCC 47CFR 15.235
Test Method: ANSI C63.4:2003

Limits for Field Strength of Fundamental Emissions :

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Peak] [μ V/m]	Field Strength of Fundamental Emission [Average] [μ V/m]
49.82-49.90	100,000	10,000

Results:

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dB μ V	Correction Factor dB/m	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
49.86	62.5	11.7	74.2	5,128.6	100,000	Horizontal

Field Strength of Fundamental Emissions Average					
Frequency MHz	Adjusted by Duty Cycle dB	Field Strength dB μ V/m	Field Strength μ V/m	Limit @3m μ V/m	E-Field Polarity
49.86	-7.9	60.2	1,023.3	10,000	Horizontal

According to FCC 47CFR 15.35, the 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.

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty

: 30MHz to 1GHz

± 4.1 dB

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Radiation **Emissions Measurement**

Appl. : Speed Digital Ltd
Model: 13001
Operation: TX mode

Test Requirement: FCC 47CFR 15.209
Test Method: ANSI C63.4:2003

Results:

Frequency Range [MHz]	Quasi-Peak Limits [$\mu\text{V/m}$]
30-88	100
88-216	150
216-960	200
Above 960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

<u>Radiated Emissions Quasi-Peak</u>						
Frequency MHz	Measured Level @3m dB μV	Correction Factor dB/m	Field Strength dB $\mu\text{V/m}$	Field Strength $\mu\text{V/m}$	Limit @3m $\mu\text{V/m}$	E-Field Polarity
99.7	28.0	10.3	38.3	82.2	150	Vertical
149.6	26.5	15.1	41.6	120.2	150	Horizontal
199.4	23.0	16.5	39.5	94.4	150	Horizontal
249.3	24.5	17.7	42.2	128.8	200	Horizontal
299.2	22.5	19.5	41.5	118.9	200	Vertical
349.0	21.0	17.5	38.5	84.1	200	Horizontal
398.9	20.0	18.3	38.3	82.2	200	Horizontal
448.7	18.0	19.2	37.2	72.4	200	Horizontal
498.6	16.0	20.1	36.1	63.8	200	Horizontal

Remarks:

Correction Factor included Antenna Factor and Cable Attenuation.

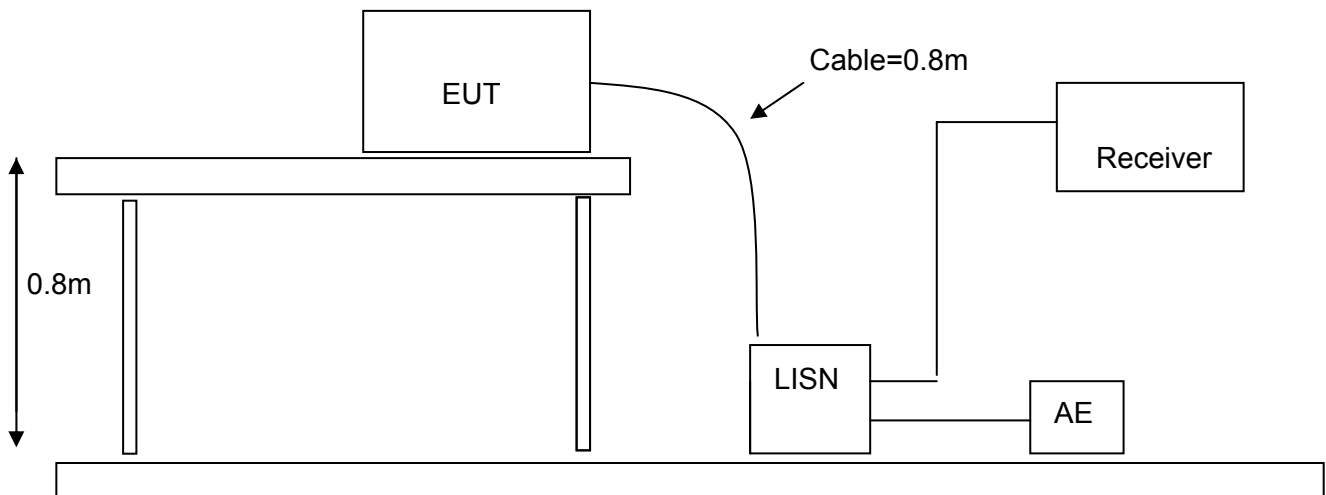
Calculated measurement uncertainty : 30MHz to 1GHz $\pm 4.1\text{dB}$

Test Results

Conducted Emission

Conducted Emission Measurement on AC (0.15MHz to 30MHz)

Setup diagram:



Test Method:

The test was performed in accordance with ANSI C63.4:2003, with the following: initial measurements were performed in peak and average detection modes on the live line. Any emissions recorded within 25dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Conducted Emission on AC **(0.15MHz to 30MHz)**

Appl. : Speed Digital Ltd
Model: 13001
Operation: Power On (with AC/DC adaptor)

Test Requirement: FCC 47CFR 15.107
Test Method: ANSI C63.4:2003

Level: Class B

Limits for Conducted Emissions:

Frequency Range [MHz]	Quasi-Peak Limits [dB μ V]	Average [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

*Decreases with the logarithm of the frequency.

Please refer to the following table for individual results.

Final Measurement Results:

Frequency (MHz)	Quasi-Peak		Average		Conductor (Live / Neutral)
	Level (dB μ V)	Limit (dB μ V)	Level (dB μ V)	Limit (dB μ V)	
0.15	34.0	66.0	32.0	56.0	Live
0.25	32.0	61.7	30.0	51.7	
1.14	30.0	56.0	28.0	46.0	
1.51	30.0	56.0	28.0	46.0	
8.67	35.0	60.0	32.0	50.0	
19.96	35.0	60.0	33.0	50.0	
24.30	38.0	60.0	35.0	50.0	
30.00	33.0	60.0	30.0	50.0	
0.15	33.0	66.0	30.0	56.0	Neutral
0.25	32.0	61.7	30.0	51.7	
1.14	30.0	56.0	30.0	46.0	
1.51	30.0	56.0	28.0	46.0	
8.67	35.0	60.0	33.0	50.0	
19.96	35.0	60.0	33.0	50.0	
24.30	36.0	60.0	33.0	50.0	
30.00	33.0	60.0	30.0	50.0	

Remarks:
 Calculated measurement uncertainty: ± 3.2 dB

Occupied Bandwidth

Appl. : Speed Digital Ltd
Model: 13001
Operation: On mode

Test Requirement: FCC Part15 C Section 15.235
Test Method: ANSI C63.4
Operation within the band 49.82-49.90MHz
Test Date: 2010-08-15
Requirements: The field strength of any emissions appearing between the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 26dB below the level of the unmodulated carrier or to the general limits in Section 15.209, whichever permits the higher emission levels.
The field strength of any emissions removed by more than 10 kHz from the band edges shall not exceed the general radiated emission limits in Section 15.209.

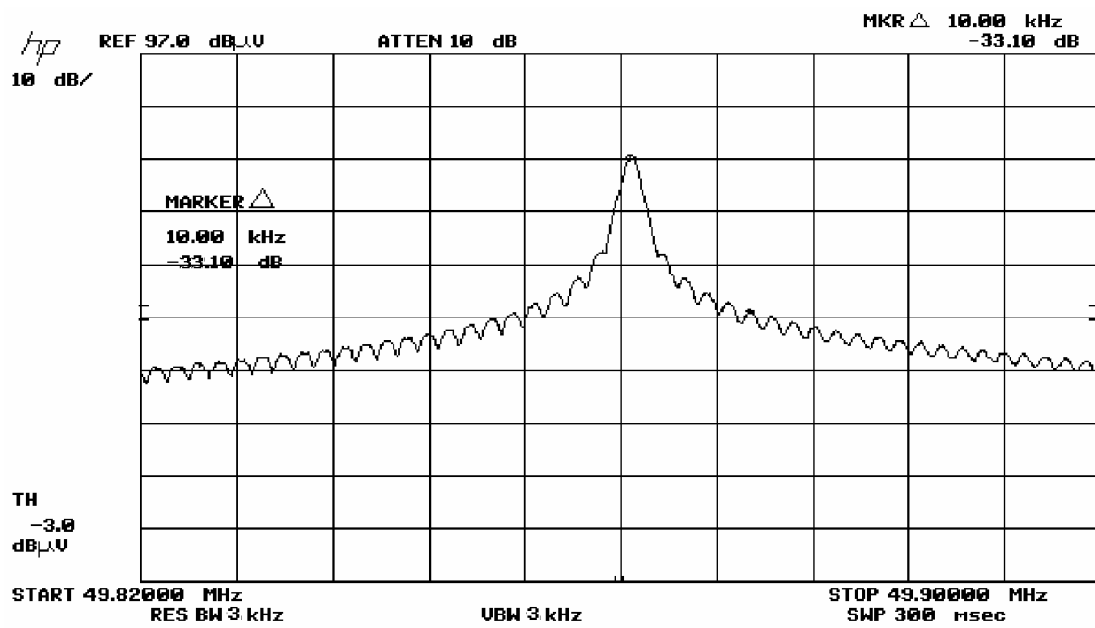
Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Setup diagram:

As Test Setup of page 6 in this report

The graph as below, represents the emissions take for this device.



The results: The unit meets the FCC Part 15 C Section 15.235 requirements.

APPENDIX A

LIST OF MEASUREMENT EQUIPMENT

<u>Equi. No.</u>	<u>Equipment</u>	<u>Manufacturer</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Calibration Date</u>	<u>Due Date</u>
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 2010	06 Jul 2011
E085	Display 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 2010	03 Mar 2011
E001	Antenna System	Schwarzbeck	D-6917	UHALP9107	04 Mar 2010	03 Mar 2011
E002	Antenna System	Schwarzbeck	VHA9103	VHA91031253	04 Mar 2010	03 Mar 2011
E101	Loop Antenna	EMCO	6502	9902-3269	25 Feb 2010	25 Feb 2011
E008	LISN	EMCO	3825/2	1115	20 Sep 2010	19 Sep 2011
E115	Limiter 50 Ohm DC~1800MHz	Hewlett Packard	11867A	-----	04 Mar 2010	03 Mar 2011
E100	Turntable	Chioce Way	TB1200	51112	-----	-----
E006	RF Signal Generator	Fluke	6060A	3880007	04 Mar 2010	03 Mar 2011
E092	Antenna Tripole	IT&T	UH800100	A05011	04 Mar 2010	03 Mar 2011
E098	Pre-Amplifier	Hewlett Packard	8447D	2944A09089	04 Mar 2010	03 Mar 2011
E099	Antenna Mast	Schwarzbeck	AM9014	-----	-----	-----
E113	Spectrum Analyzer	Hewlett Packard	HP8566B	2747A05483	25 Feb 2010	25 Feb 2011
E118	Display of Spectrum Analyzer	Hewlett Packard	HP85662A	2152A03271	25 Feb 2010	25 Feb 2011

APPENDIX B

Duty Cycle Correction During 100msec

Each function key sends a different series of characters, but each packet period (35.05msec) never exceeds a series of 6 long (1.6msec) and 10 short (0.45msec) pulses. Assuming any combination of short and long pulses may be obtained due to encoding the worst case transmit duty cycle would be considered $6 \times 1.6\text{msec} + 10 \times 0.45\text{msec}$ per 35.05msec = 42.0% duty cycle. Figure A through C show the characteristics of the pulse train for one of these functions.

Remarks:

Duty Cycle Correction $= 20\text{Log}(0.40) = -7.9\text{dB}$

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

Figure A [Pulse Train]

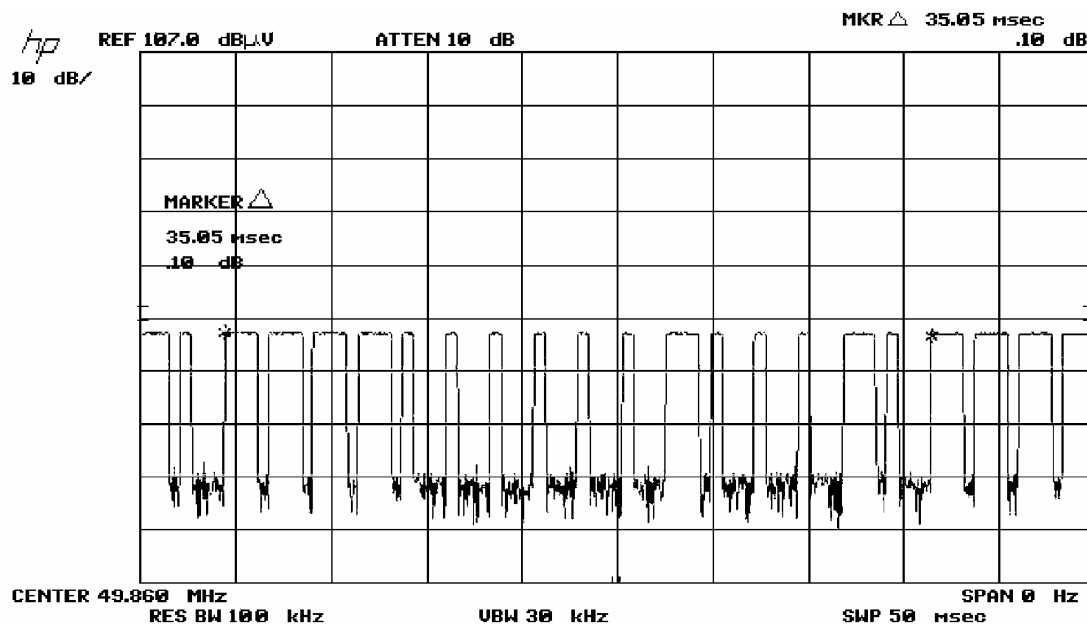


Figure B [Long Pulse]

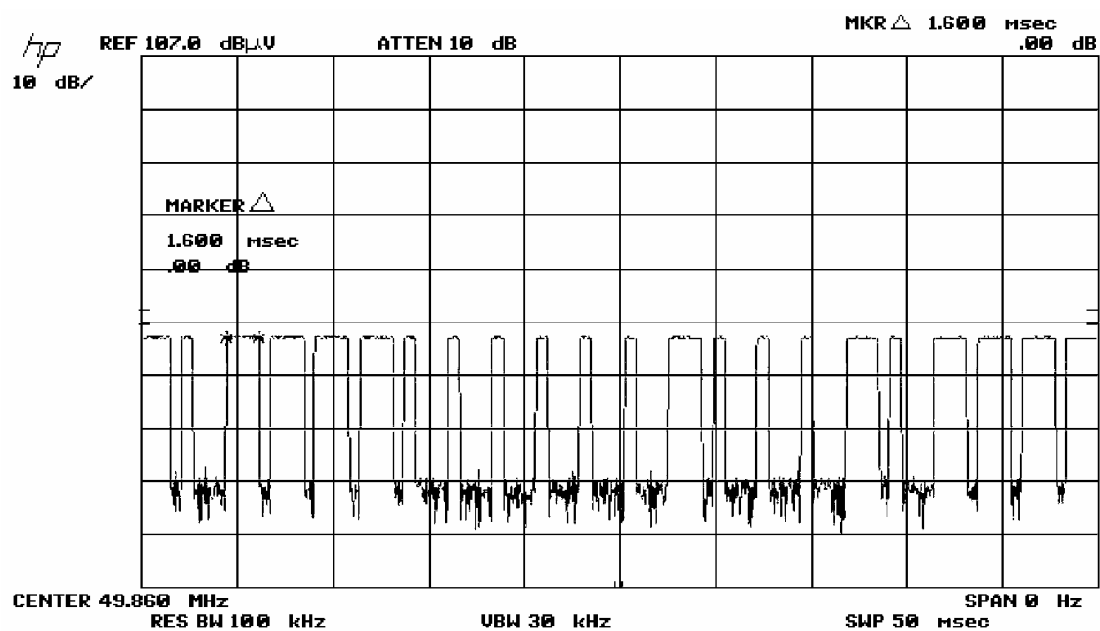
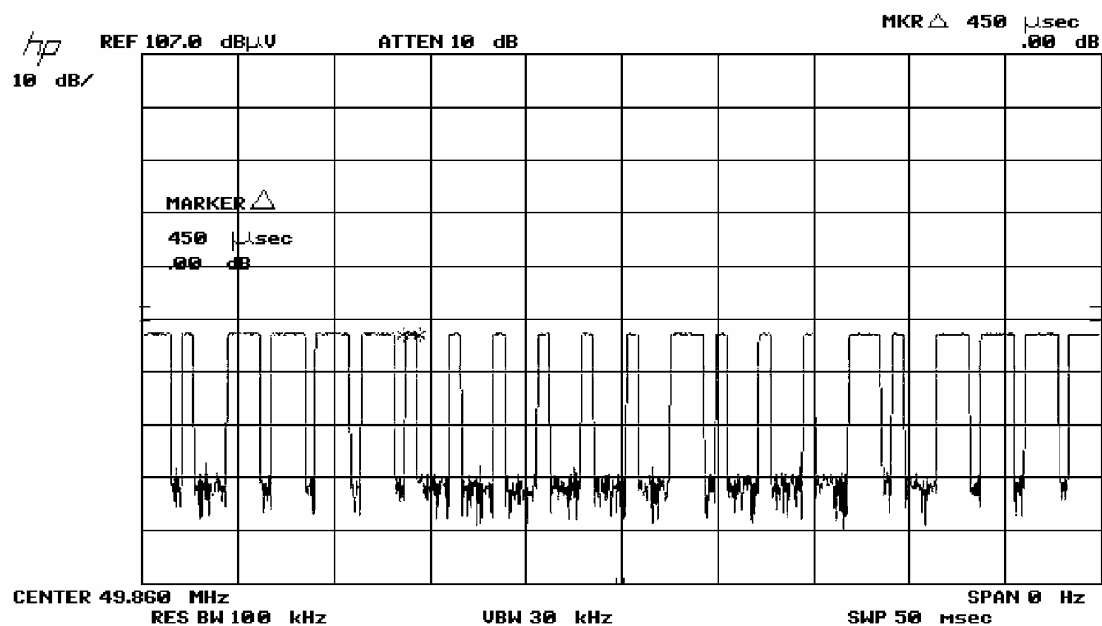


Figure C [Short Pulse]

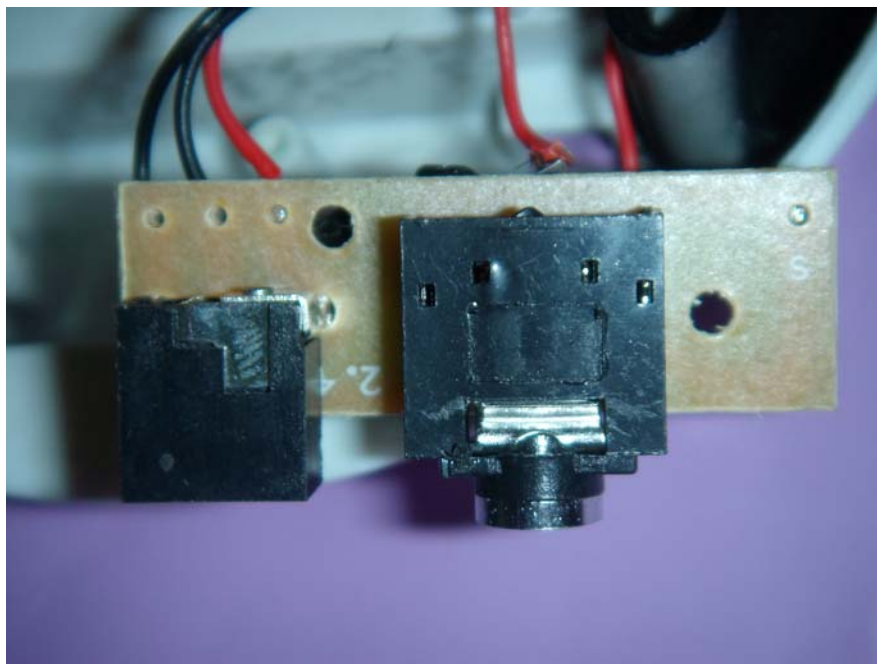
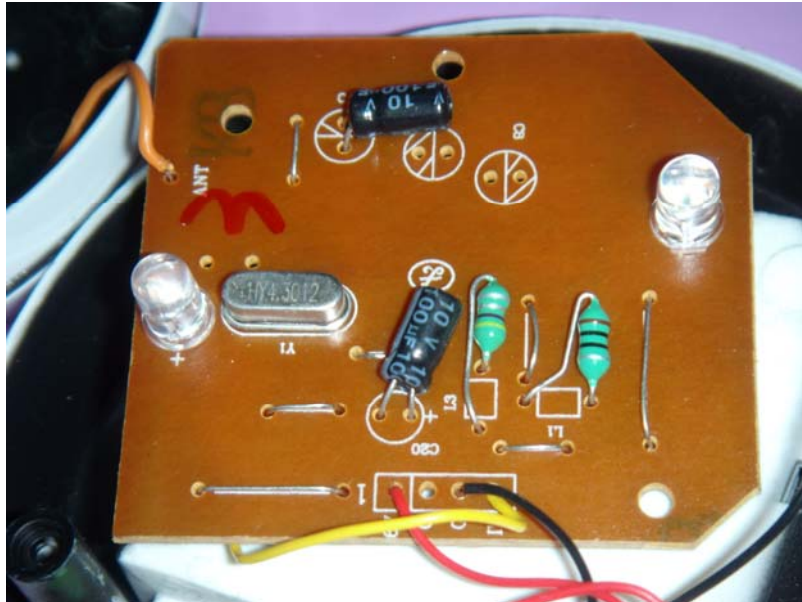


APPENDIX C

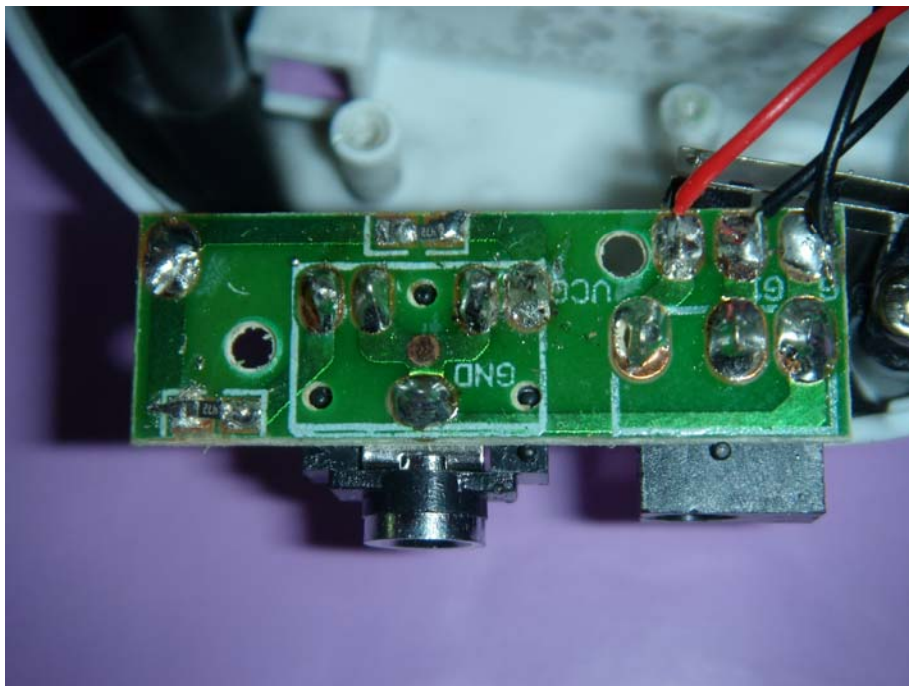
Photos of EUT



Photos of EUT
Component Side View

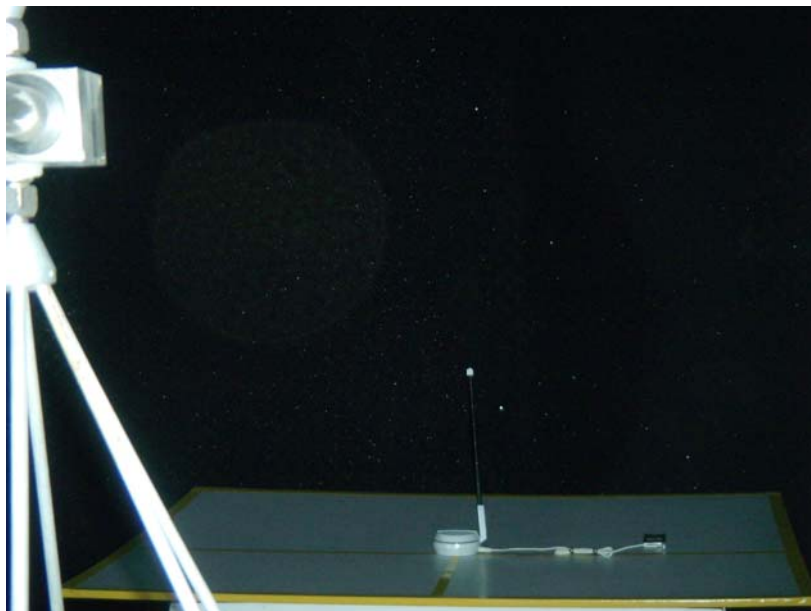
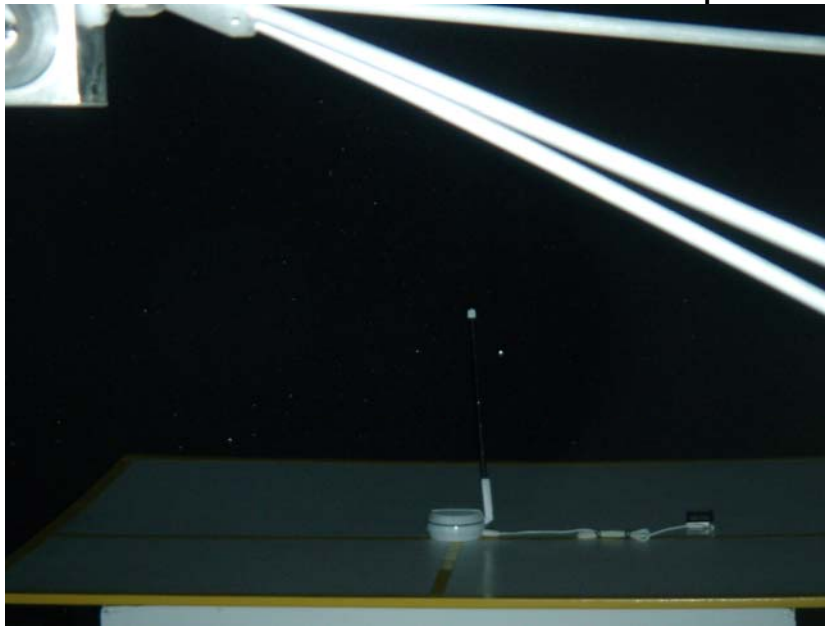


Photos of EUT
Component Copper View



Photos of EUT

Measurement of Radiated Emission Test Set up





Line Conduct

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