

FCC - TEST REPORT

Report Number : **60.790.16.011.01R01** Date of Issue : February 24, 2016Model : **RDWL917A**Product Type : **Doorbell**Applicant : Honeywell International Inc.Address : 1985 Douglas Drive North, Golden Valley, U.S.AProduction Facility : Ansen Electronics CompanyAddress : Chen Tung Industrial Zone, Ning Tau Administrative District,
Qiao Tau Zhen, Dongguan, Guangdong, ChinaTest Result : ☒ **Positive** ☐ **Negative**Total pages
including
Appendices : 32

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1 Table of Contents

1 Table of Contents.....	2
2 Description of Equipment Under Test	3
3 Summary of Test Standards	4
4 Details about the Test Laboratory	5
4.1 Test Equipment Site List.....	6
4.2 Measurement System Uncertainty	7
5 Summary of Test Results.....	8
6 General Remarks.....	9
7 Emission Test Results	10
7.1 Radiated Emission.....	10
7.2 Conducted Emission.....	12
7.3 Bandedge Emission.....	14
7.4 20dB Bandwidth.....	16
8 Appendix A - Photographs of EUT	17
9 Appendix B - Setup Photographs of EUT.....	29
10 Appendix C - General Product Information	32

2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Doorbell
Model no.:	RDWL917A
FCC ID:	HS9-RDWL917A
Rating:	1) 6.0VDC (4 x 1.5VDC size "C" batteries) 2) 5.0VDC (USB port)
Frequency:	916.8MHz
Antenna gain:	0 dBi
Number of operated channel:	1
Modulation:	FSK

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-14 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13 Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2,
Shenzhen 518052, P.R.China
FCC Registration Number: 502708

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.249 & 15.209 Radiated Emission	Site 2
FCC Title 47 Part 15.249 & 15.207 Conduct Emission	Site 2
FCC Title 47 Part 15.249 Bandedge Emission	Site 2
FCC Title 47 Part 15.215 20dB Bandwidth	Site 2

4.1 Test Equipment Site List

Radiated emission Test, Bandedge Emission – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	17-Aug-16
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	17-Aug-17
Horn Antenna	Rohde & Schwarz	HF907	102294	17-Aug-17
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	17-Aug-16
3m Semi-anechoic chamber	TDK	9X6X6	----	29-May-19

Conducted emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	17-Aug-16
LISN	Rohde & Schwarz	ENV4200	100249	17-Aug-16
LISN	Rohde & Schwarz	ENV216	100326	17-Aug-16
ISN	Rohde & Schwarz	ENY81	100177	17-Aug-16
ISN	Rohde & Schwarz	ENY81-CAT6	101664	17-Aug-16
High Voltage Probe	Rohde & Schwarz	TK9420(VT9420)	9420-58	17-Aug-16
RF Current probe	Rohde & Schwarz	EZ-17	100816	17-Aug-16

20dB Bandwidth – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	17-Aug-16
Signal Analyzer	Rohde & Schwarz	FSV40	101030	17-Aug-16
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	17-Aug-16
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	17-Aug-16

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;
Uncertainty for Conducted Emission 150kHz-30MHz	3.50dB
Uncertainty for Conducted RF test	2.04dB

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.249 & 15.209 Radiated Emission	10-11	☒	☐	☐
FCC Title 47 Part 15.249 & 15.207 Conduct Emission	12-13	☒	☐	☐
FCC Title 47 Part 15.249 Bandedge Emission	14-15	☒	☐	☐
FCC Title 47 Part 15.215 20dB Bandwidth	16	☒	☐	☐

6 General Remarks

Remarks

The following Auxiliary Equipment was connected during the testing:

AC/DC Adaptor:

Model: THK-050VD1000mA

Input: 120VAC, 60Hz | Output: 5.0VDC 1.0A

SUMMARY:

- All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

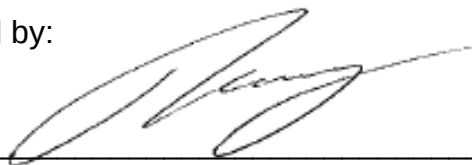
Sample Received Date: February 1, 2016

Testing Start Date: February 2, 2016

Testing End Date: February 22, 2016

- TÜV SÜD HONG KONG LTD. -

Reviewed by:



TSENG Chi Kit
EMC Project Engineer



Prepared by:



CHAN Kwong Ngai
EMC Test Engineer

7 Emission Test Results

7.1 Radiated Emission

EUT: RDWL917A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.209, Antenna: Horizontal
 Comment: 6.0VDC
 Remark: 9kHz to 10GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
50.428	16.01	40	-23.99	Quasi Peak
55.842	17.42	40	-22.58	Quasi Peak
92.128	15.48	43.5	-28.02	Quasi Peak
847.852	30.56	46	-15.44	Quasi Peak
*916.840	90.72	114	-23.28	Peak
*916.840	62.51	94	-31.49	Average
1828.525	49.46	74	-24.54	Peak
1828.525	36.42	54	-17.58	Average
2751.201	54.83	74	-19.17	Peak
2751.201	38.54	54	-15.46	Average
4577.724	58.89	74	-15.11	Peak
4577.724	40.21	54	-13.79	Average
6423.076	56.57	74	-17.43	Peak
6423.076	39.12	54	-14.88	Average

* 916.8MHz is fundamental frequency.

Radiated Emission

EUT: RDWL917A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.209, Antenna: Vertical
 Comment: 6.0VDC
 Remark: 9kHz to 10GHz

Test Result	
☒	Passed
☐	Not Passed

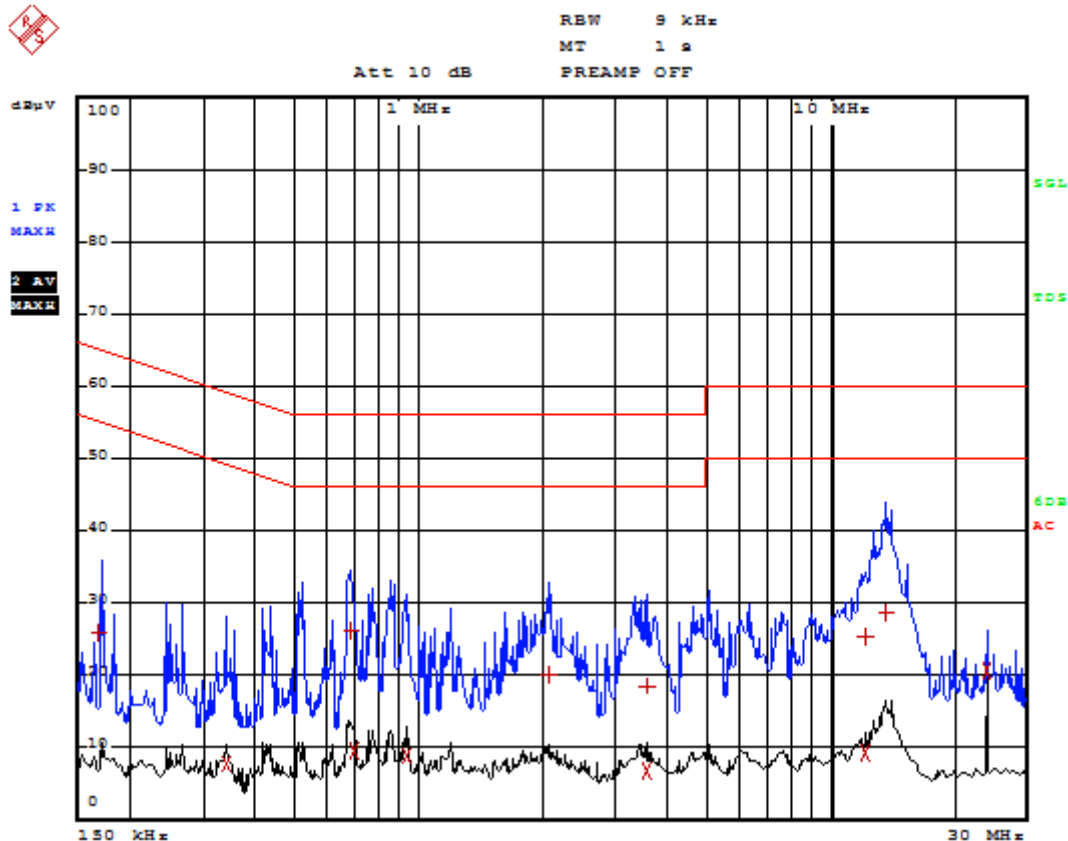
Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
58.625	15.88	40	-25.12	Quasi Peak
93.120	15.32	43.5	-28.18	Quasi Peak
160.472	15.67	43.5	-27.83	Quasi Peak
857.855	31.07	46	-14.93	Quasi Peak
*916.816	86.40	114	-27.60	Peak
*916.816	60.82	94	-33.18	Average
1828.525	50.57	74	-23.43	Peak
1828.525	36.72	54	-17.28	Average
2751.201	54.51	74	-19.49	Peak
2751.201	38.59	54	-15.41	Average
4577.724	56.62	74	-17.38	Peak
4577.724	39.22	54	-14.78	Average
6423.076	57.08	74	-16.92	Peak
6423.076	39.56	54	-14.44	Average

* 916.8MHz is fundamental frequency.

7.2 Conducted Emission

EUT: RDWL917A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.207, AC Mains, L Line
 Comment: 120VAC, 60Hz

Test Result

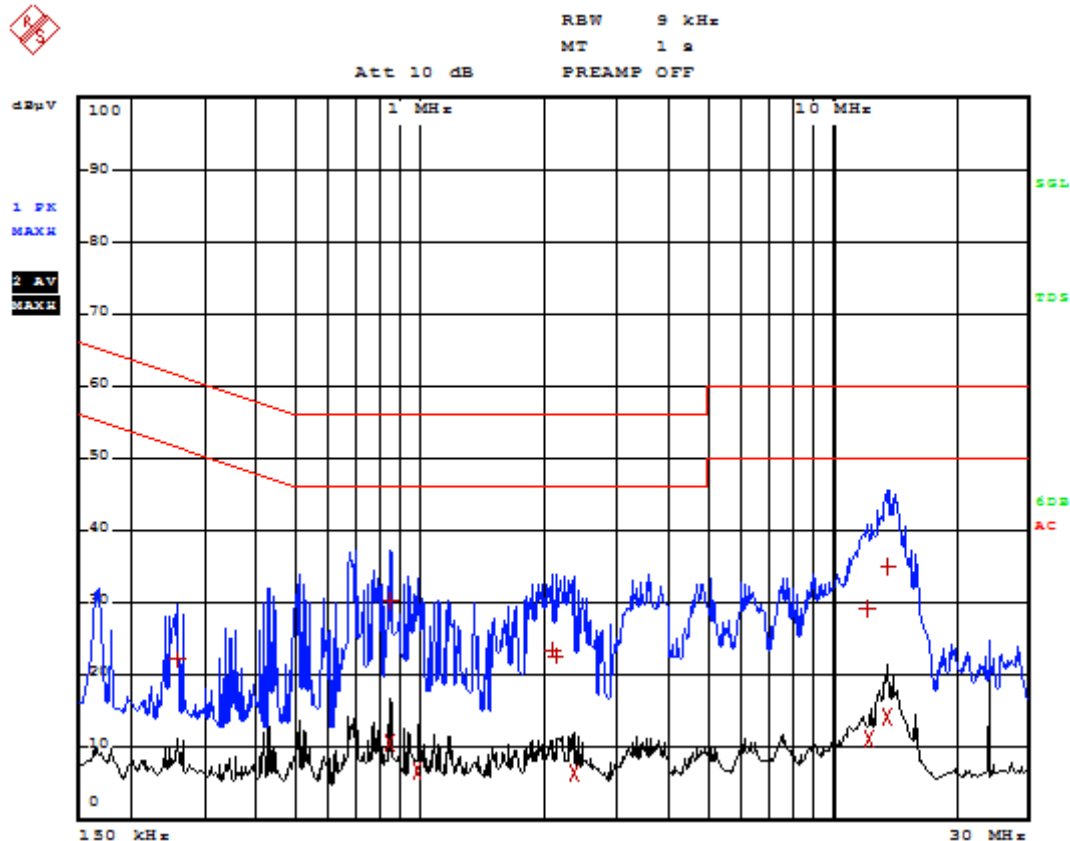
☒ Passed☐ Not Passed

TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	170 kHz	25.97	-38.98
2 Average	338 kHz	7.69	-41.55
1 Quasi Peak	686 kHz	26.24	-29.75
2 Average	702 kHz	9.46	-36.53
2 Average	938 kHz	8.71	-37.28
1 Quasi Peak	2.078 MHz	20.13	-35.86
1 Quasi Peak	3.606 MHz	18.54	-37.46
2 Average	3.606 MHz	6.67	-39.32
2 Average	12.158 MHz	9.31	-40.68
1 Quasi Peak	12.246 MHz	25.25	-34.74
1 Quasi Peak	13.626 MHz	28.85	-31.14
2 Average	24.086 MHz	20.69	-29.30

Conducted Emission

EUT: RDWL917A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.207, AC Mains, N Line
 Comment: 120VAC, 60Hz

Test Result

☒ Passed☐ Not Passed

TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	258 kHz	22.28	-39.20
1 Quasi Peak	850 kHz	30.22	-25.77
2 Average	850 kHz	10.74	-35.25
2 Average	990 kHz	6.56	-39.43
1 Quasi Peak	2.098 MHz	23.61	-32.38
1 Quasi Peak	2.138 MHz	22.59	-33.40
2 Average	2.39 MHz	6.34	-39.65
1 Quasi Peak	12.186 MHz	29.26	-30.73
2 Average	12.334 MHz	11.09	-38.90
1 Quasi Peak	13.678 MHz	34.93	-25.06
2 Average	13.678 MHz	14.25	-35.75

7.3 Bandedge Emission

EUT: RDWL917A
Op Condition: Operated, TX Mode
Test Specification: FCC15.249, Antenna: Horizontal
Comment: 6.0VDC

Test Result☒ Passed☐ Not Passed

Band	Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
Low	902.000	32.32	46	-13.68	Quasi Peak
High	928.000	33.44	46	-12.56	Quasi Peak

Bandedge Emission

EUT: RDWL917A
Op Condition: Operated, TX Mode
Test Specification: FCC15.249, Antenna: Vertical
Comment: 6.0VDC

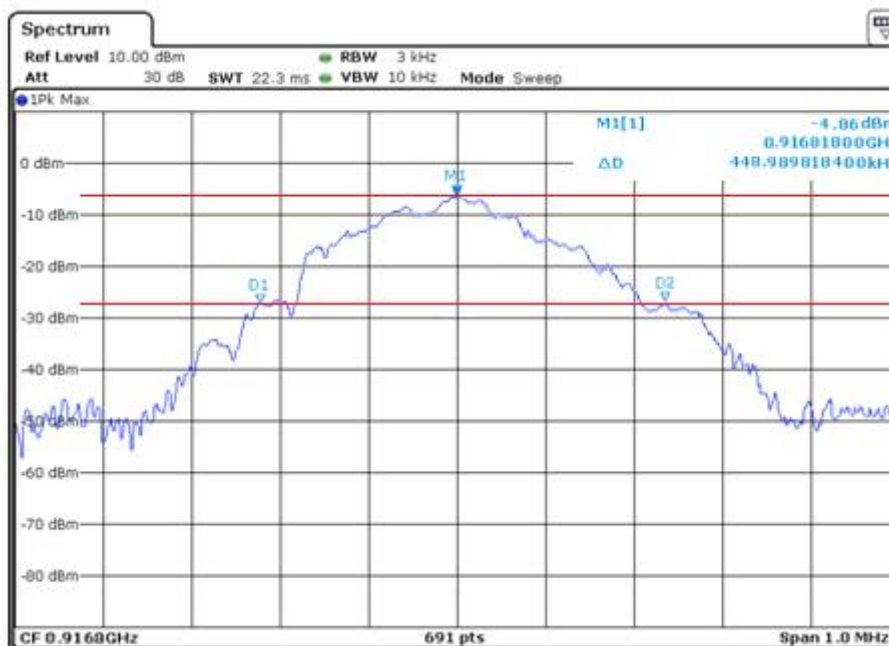
Test Result	
☒	Passed
☐	Not Passed

Band	Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
Low	902.000	32.12	46	-13.88	Quasi Peak
High	928.000	33.20	46	-12.80	Quasi Peak

7.4 20dB Bandwidth

EUT: RDWL917A
Op Condition: Operated, TX Mode
Test Specification: FCC15.215, 20dB Bandwidth
Comment: 6.0VDC
Remark: 20dB bandwidth is within frequency band 902MHz-928MHz

Test Result

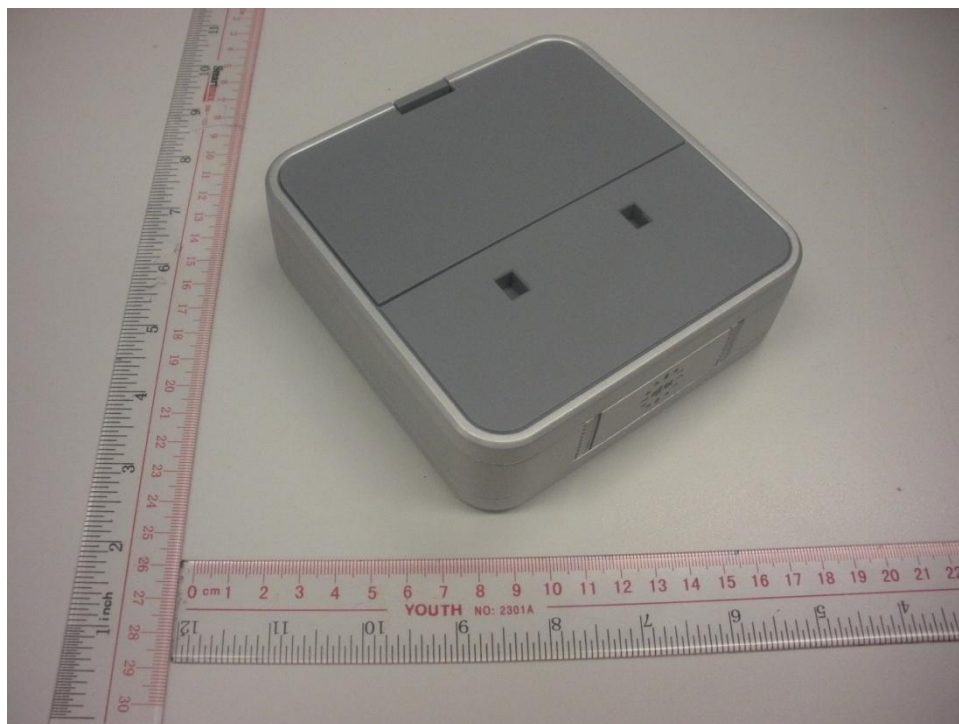
☒ Passed☐ Not Passed**20dB bandwidth**

448.989kHz

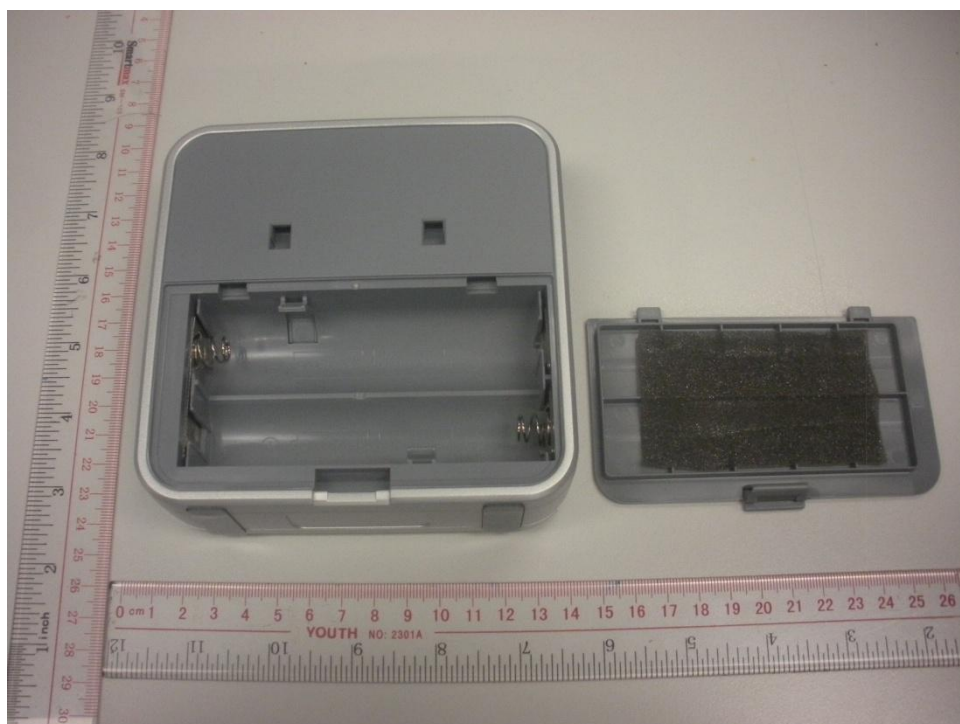
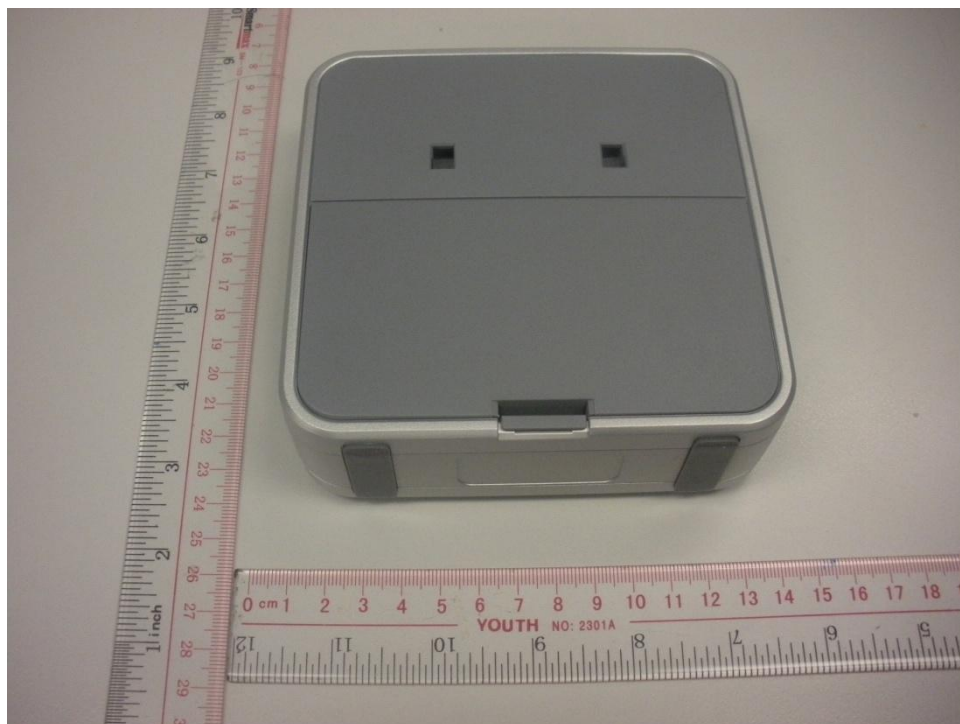
8 Appendix A - Photographs of EUT



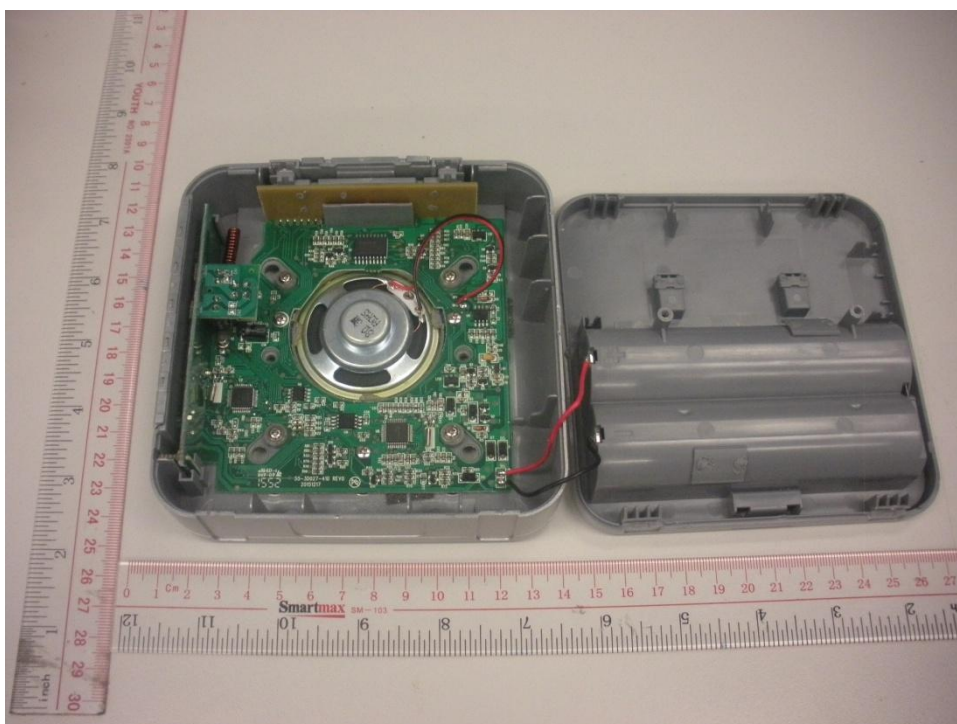
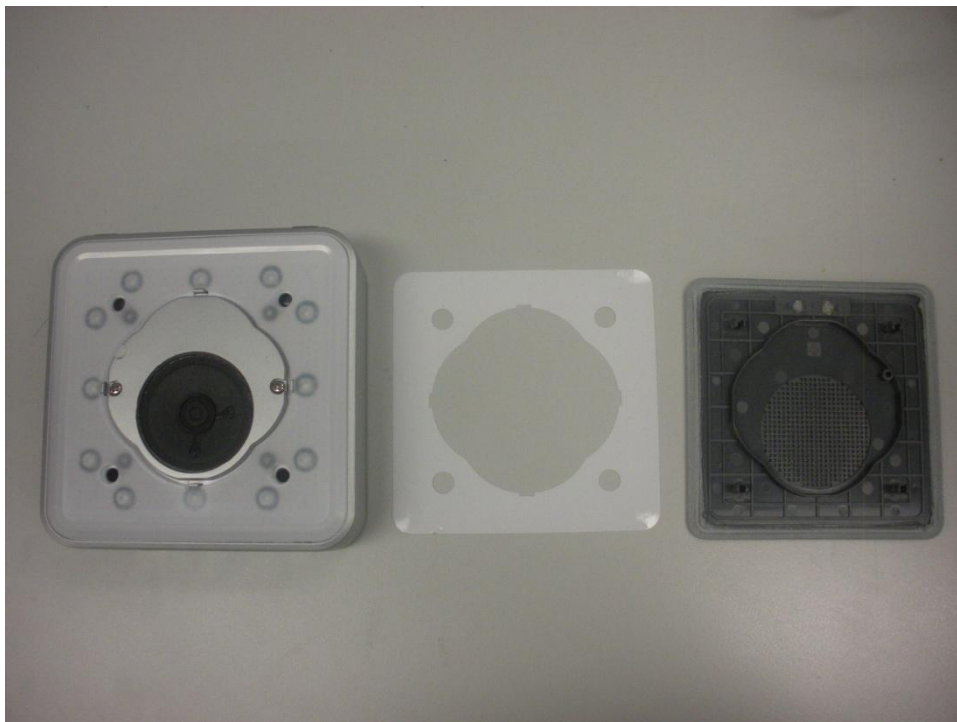
Appendix A



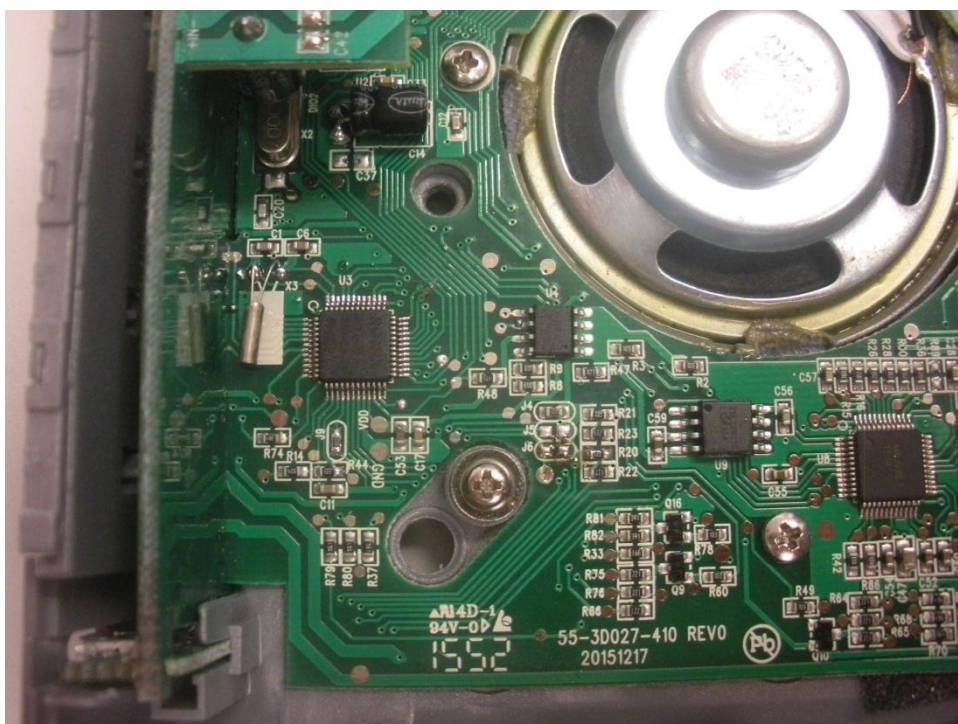
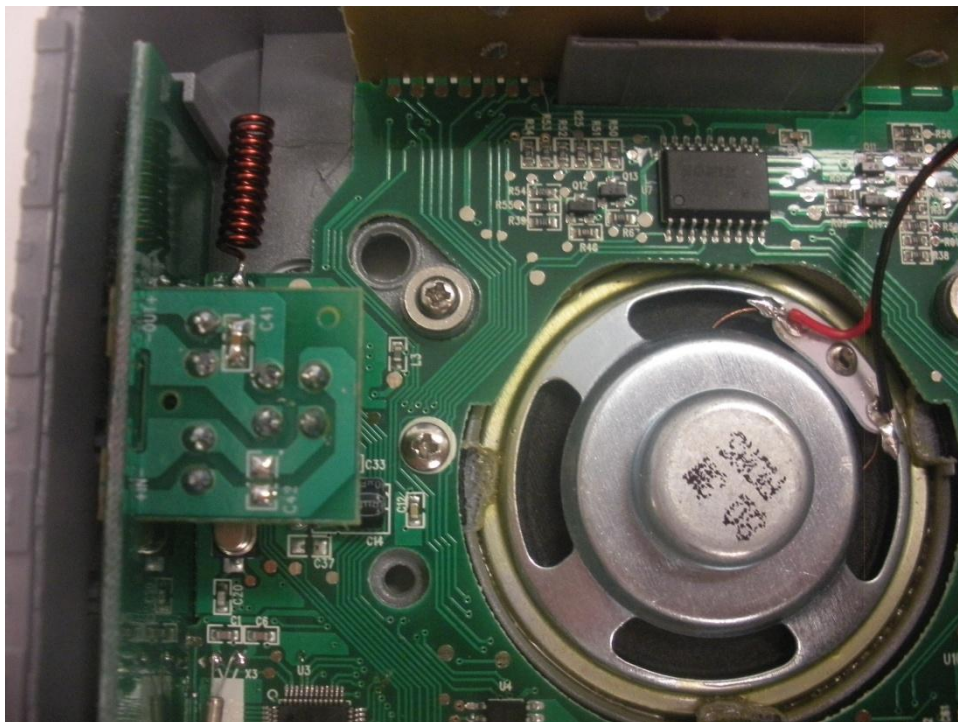
Appendix A



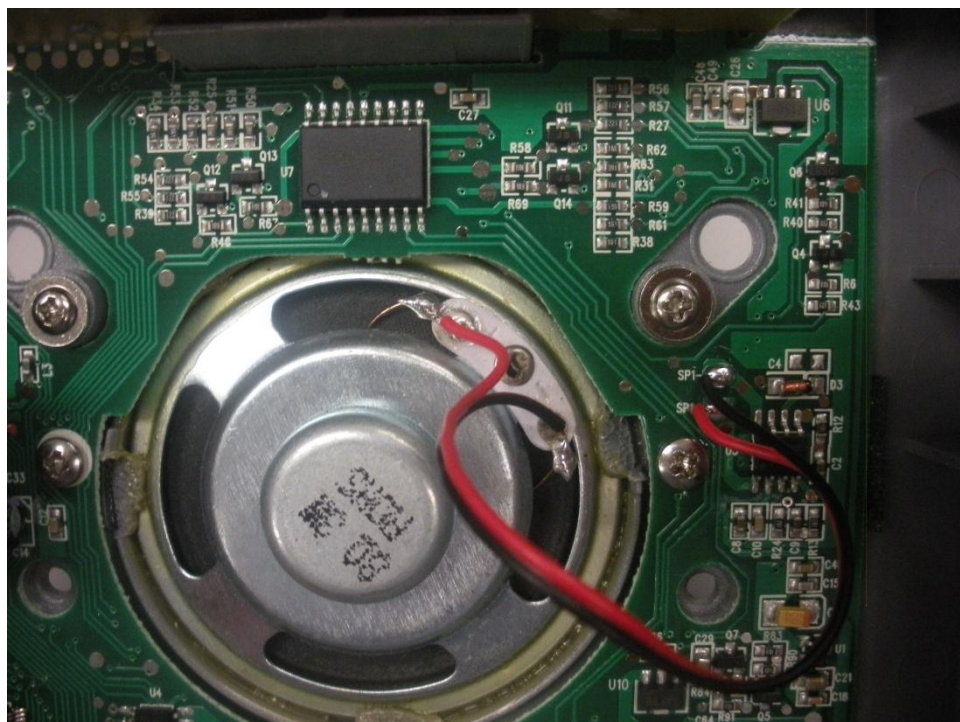
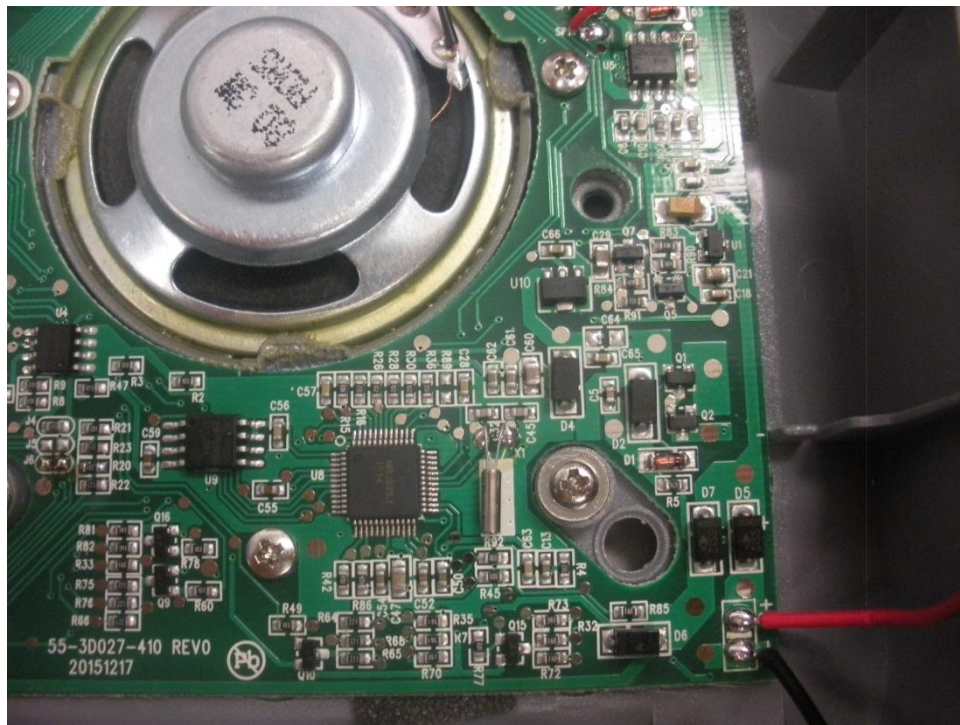
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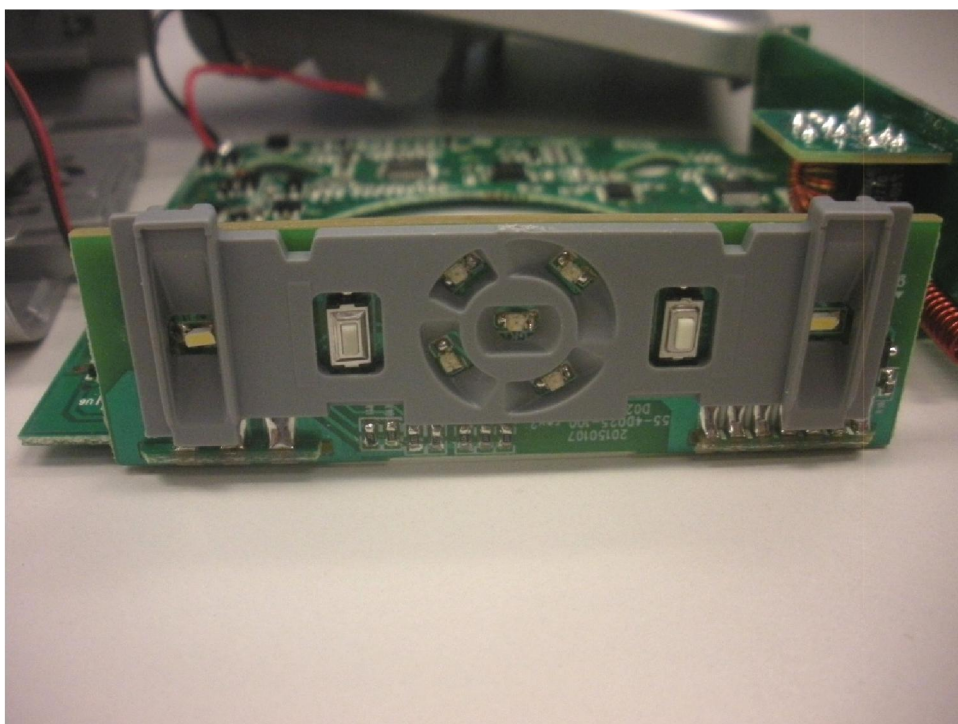
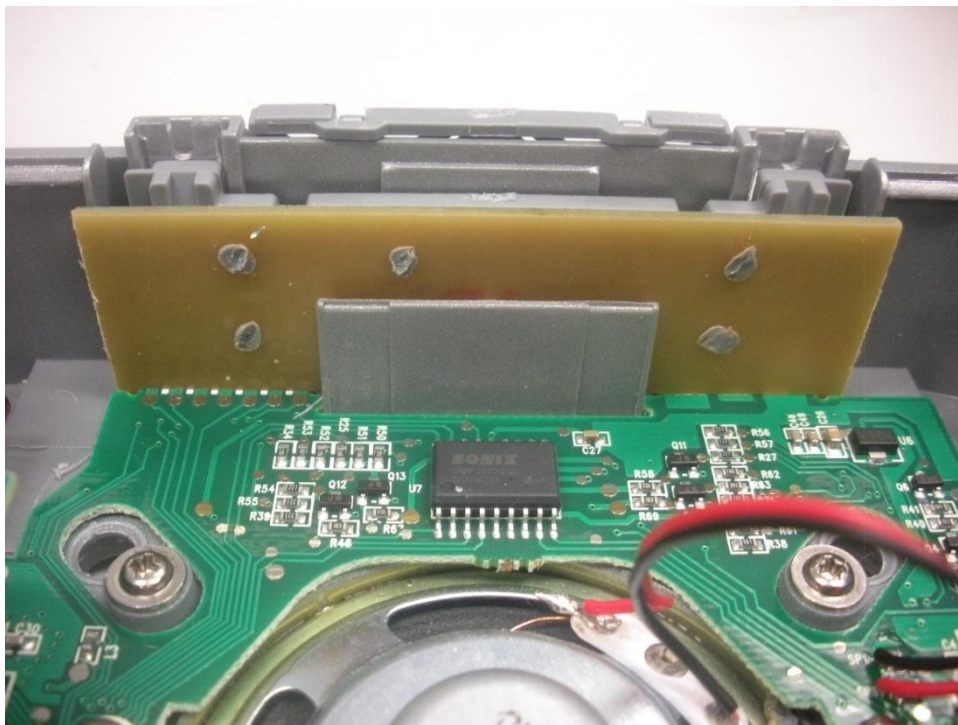
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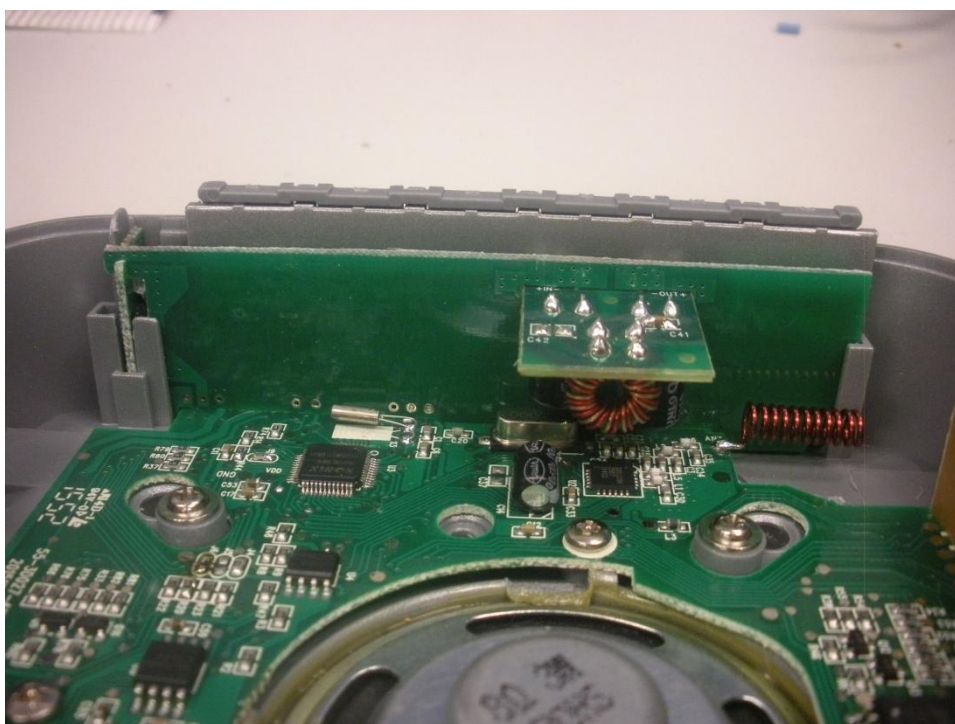
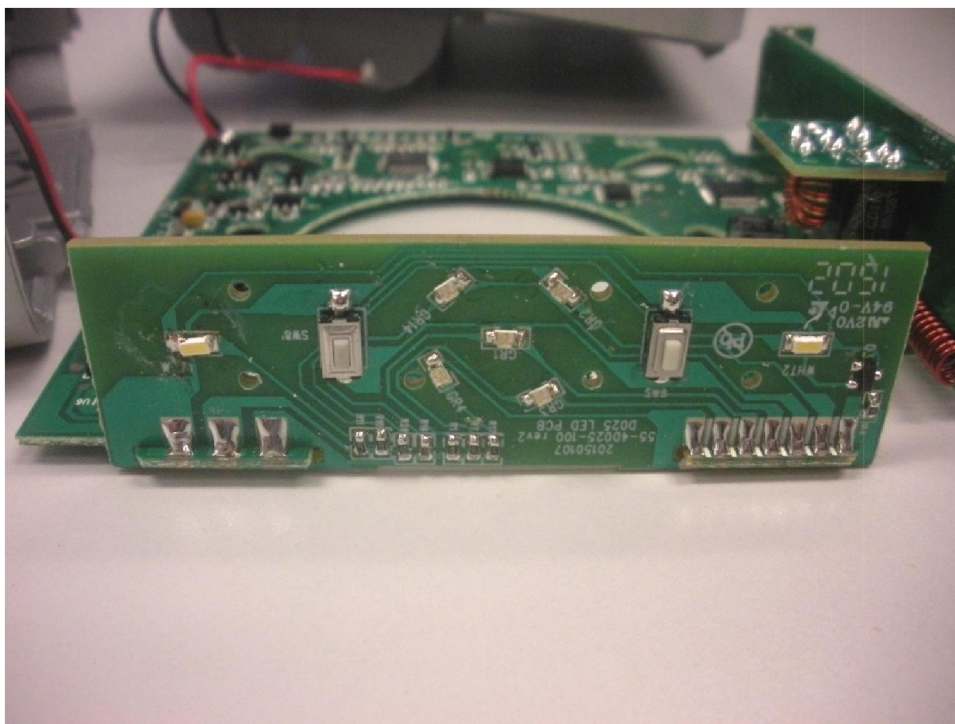
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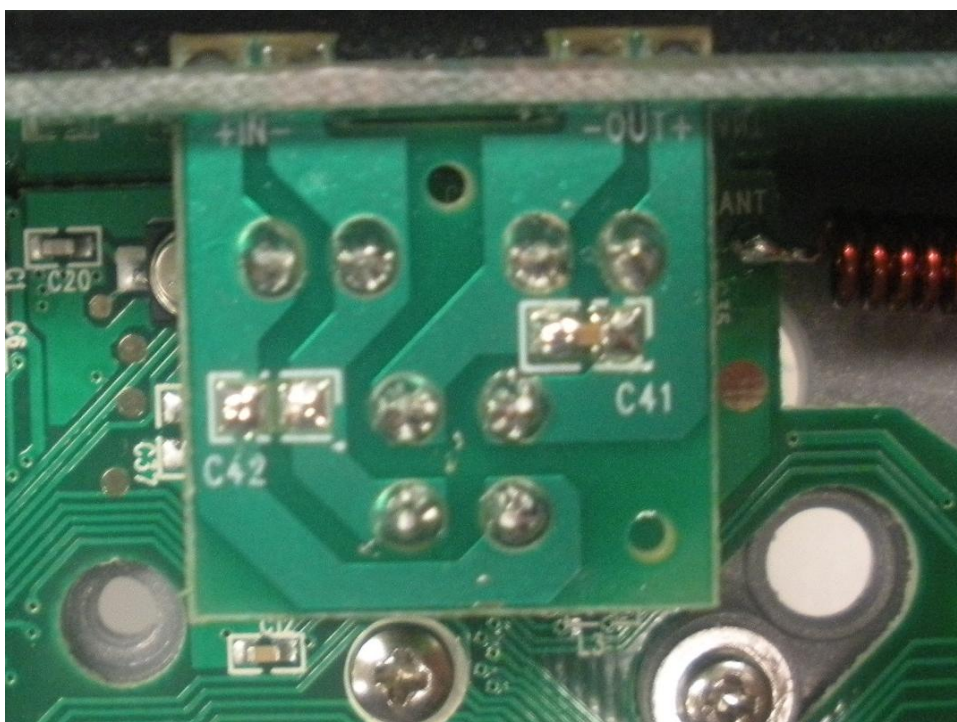
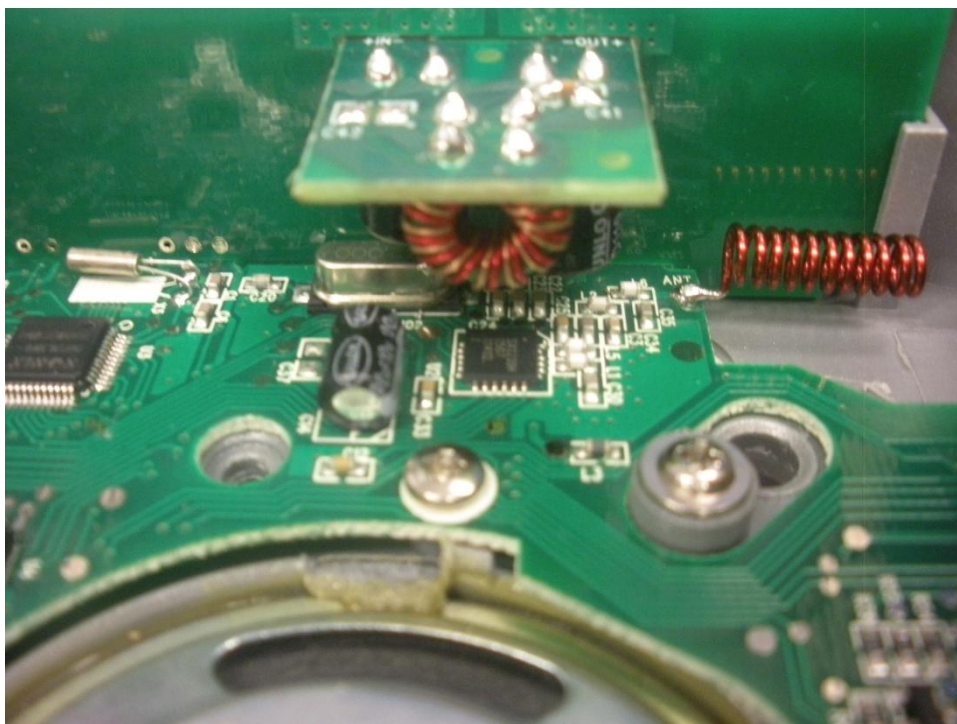
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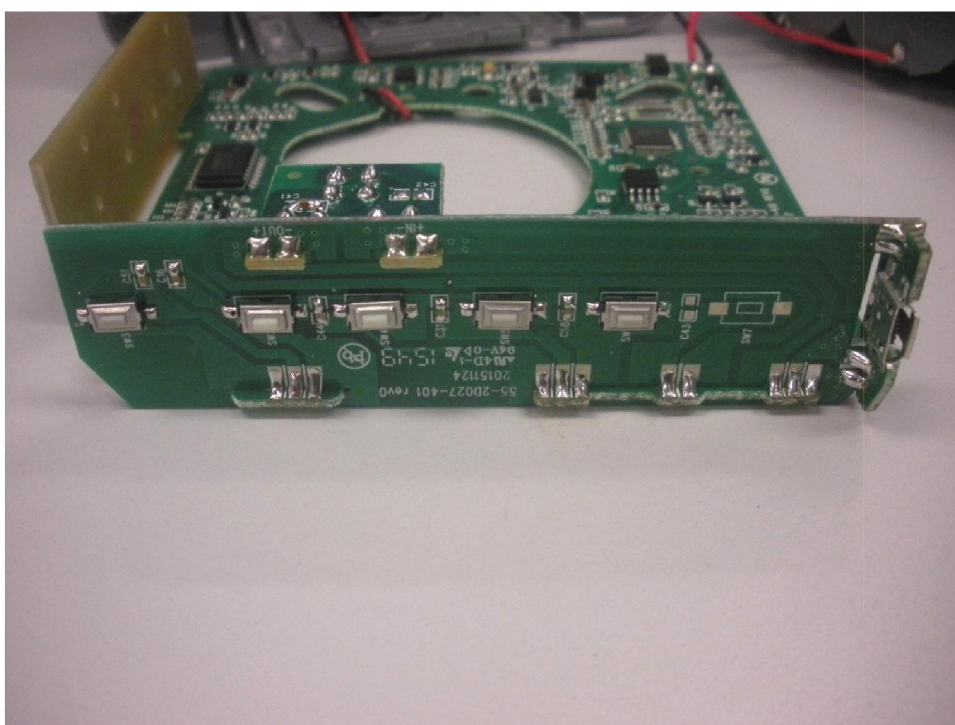
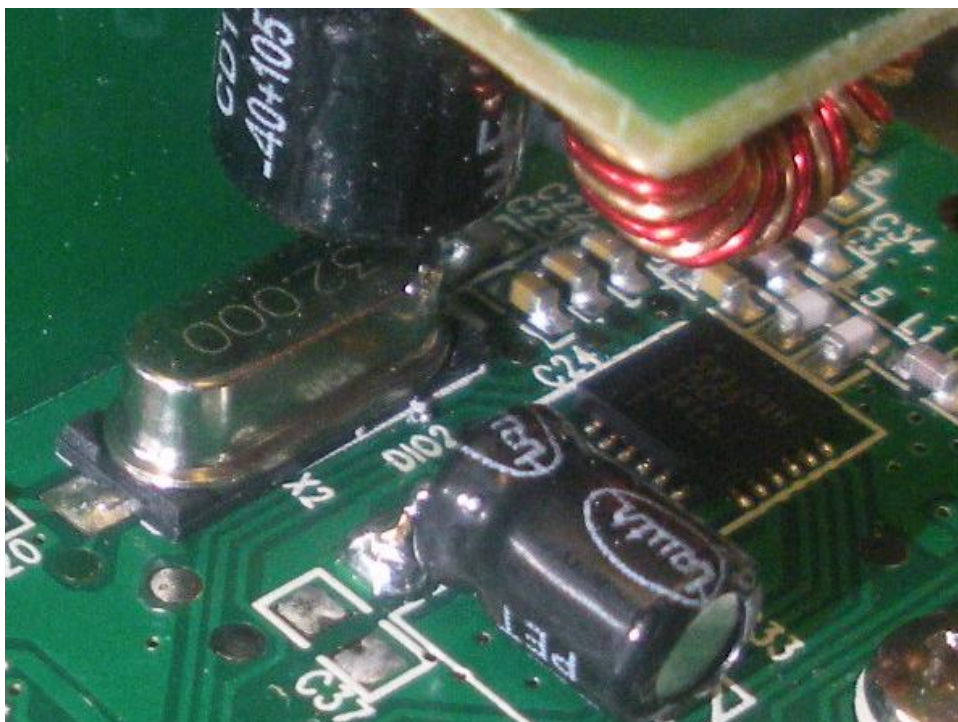
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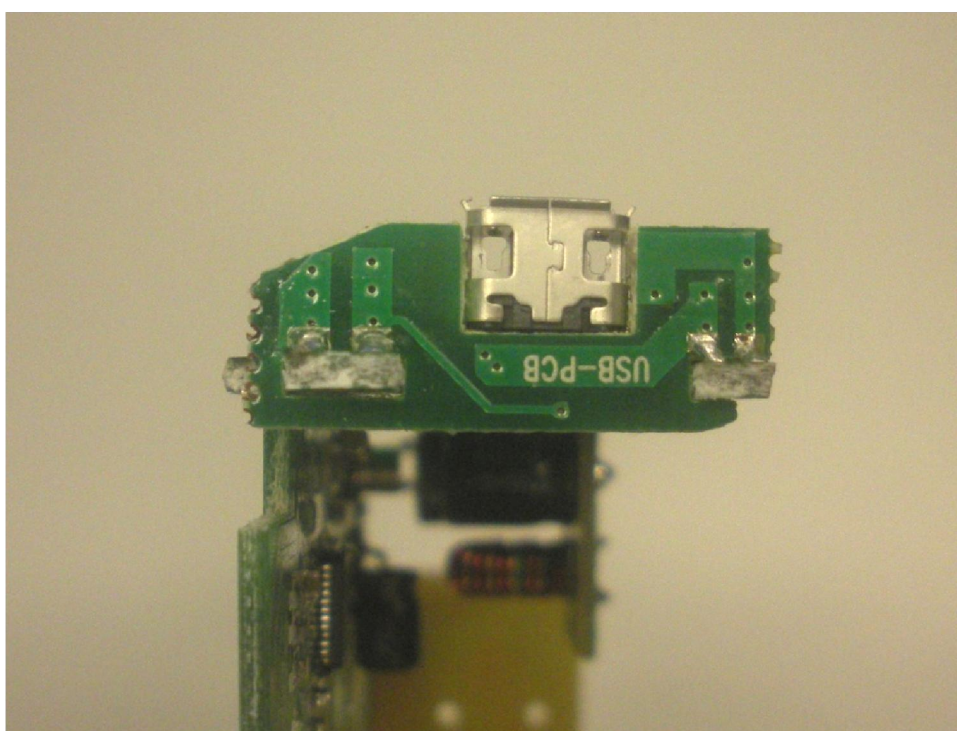
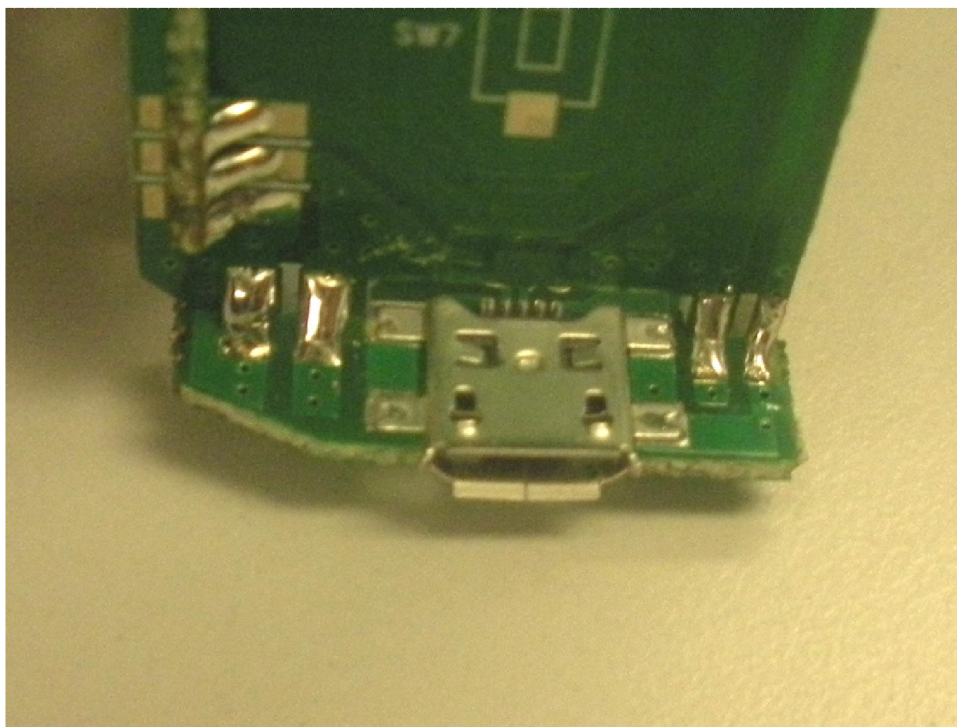
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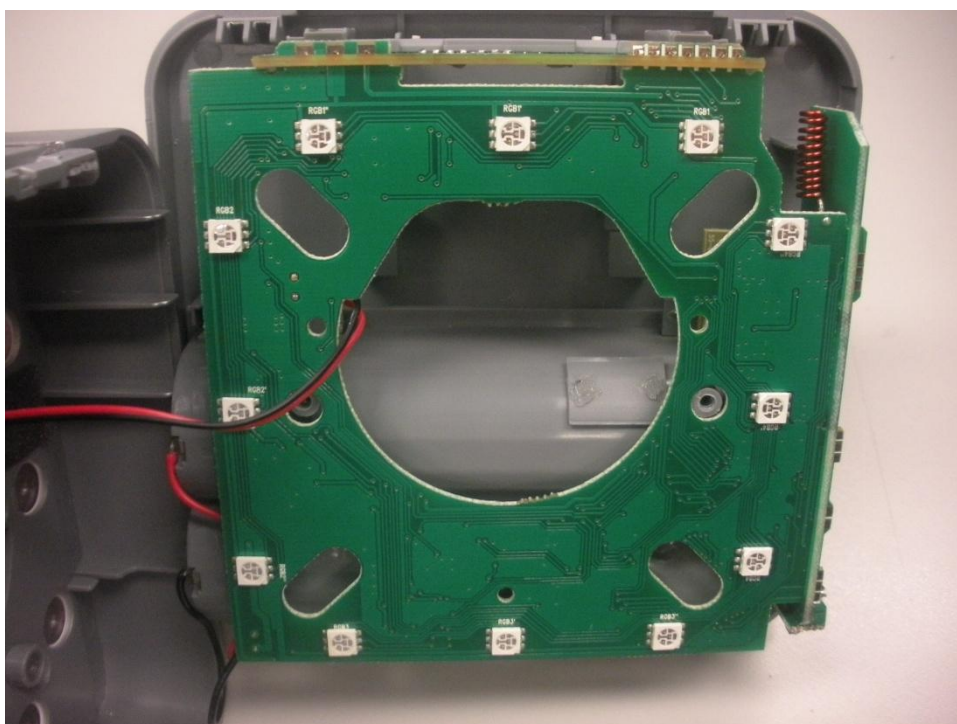
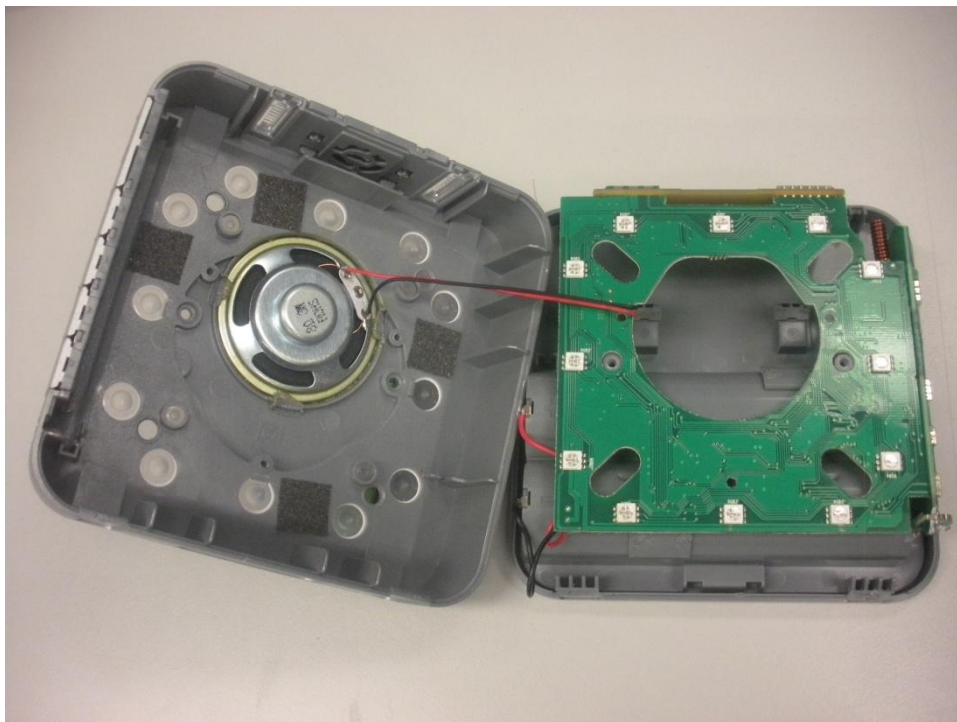
Appendix A



Appendix A

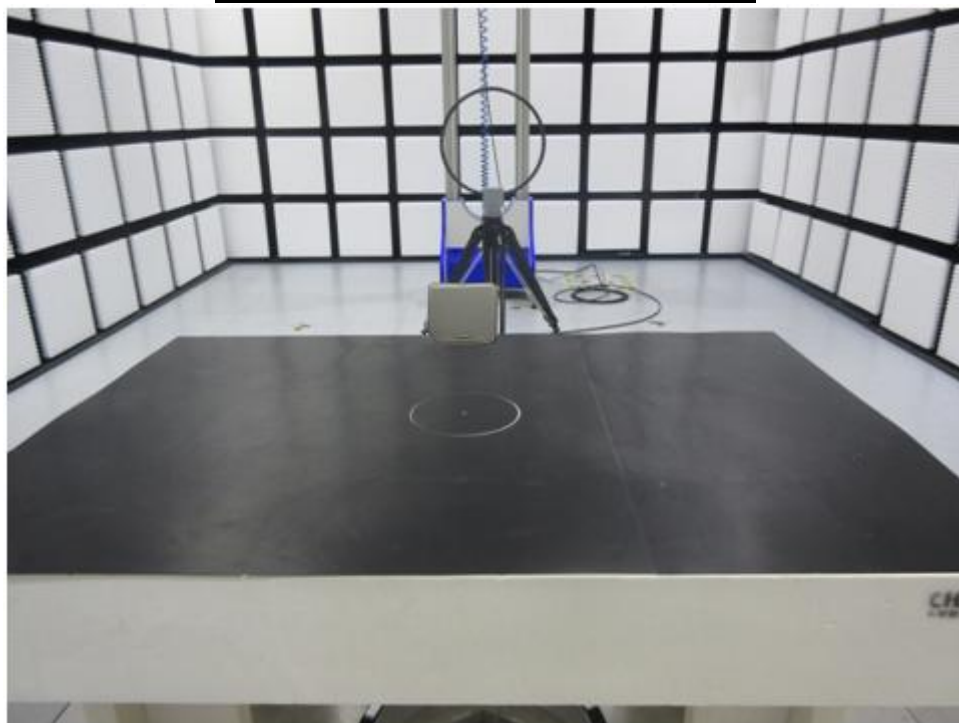


Appendix A



9 Appendix B - Setup Photographs of EUT

Radiated Emission (9kHz to 30MHz)



Radiated Emission (30MHz to 1GHz) / Bandedge Emission

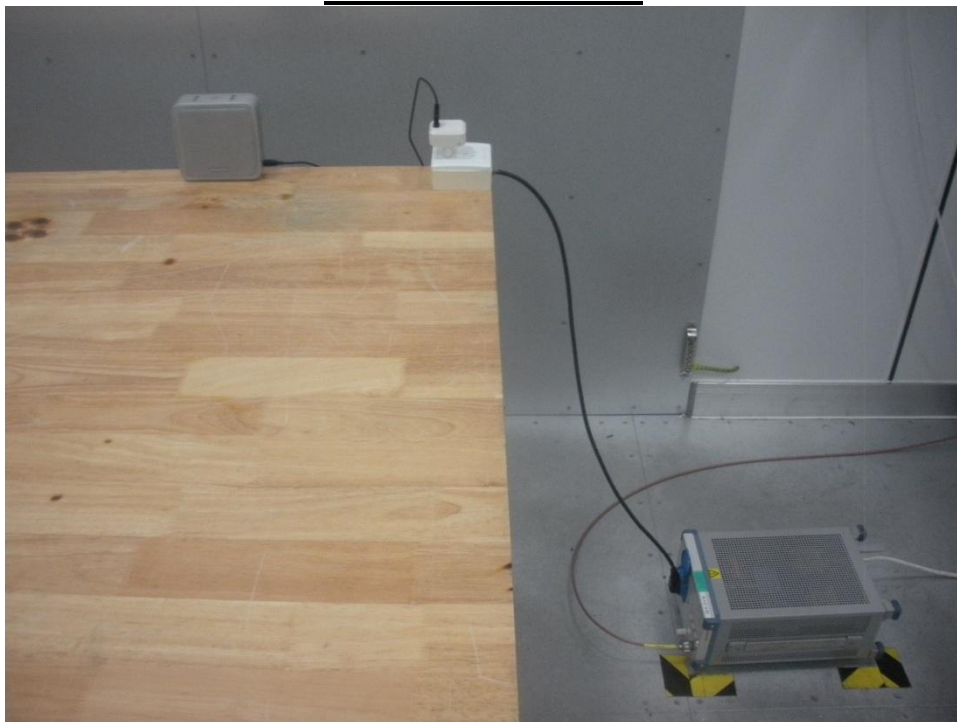


Appendix B

Radiated Emission (1GHz to 10GHz)

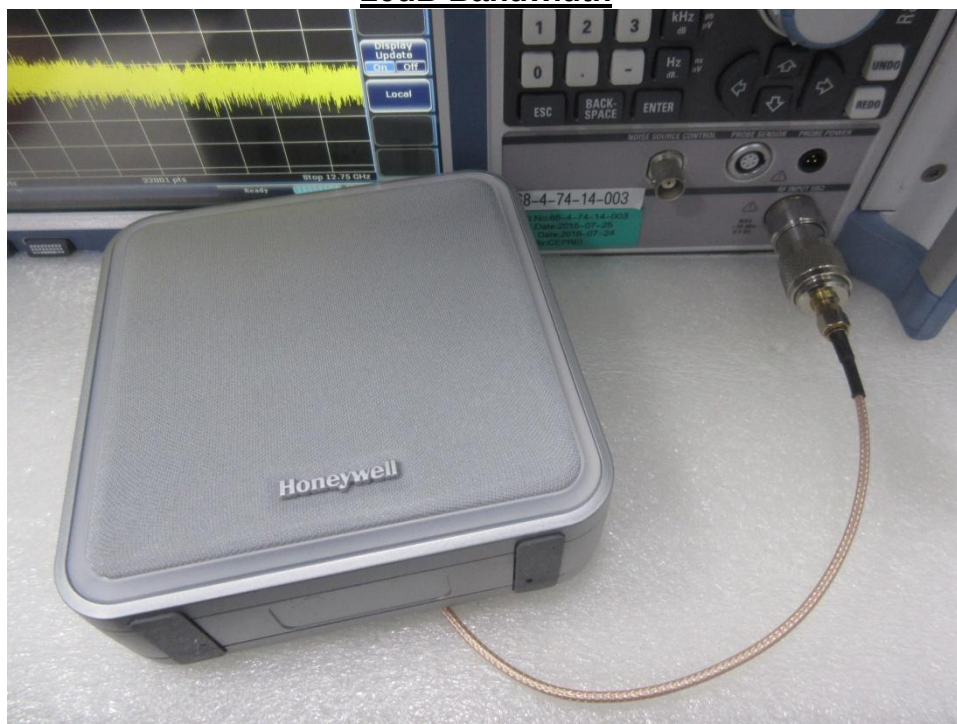


Conducted Emission



Appendix B

20dB Bandwidth



10 Appendix C - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1,

>> The 1-g SAR test exclusion thresholds, for 100MHz to 6GHz, at test separation distances ≤ 50 mm are determined by:

Power at 916.8MHz = 0.3265 mW EIRP

$[(0.3265 \text{ mW}) / (20 \text{ mm})] \cdot [\text{sqrt}(0.9168 \text{ GHz})] = 0.0156$ which is ≤ 3.0 for 1-g SAR.

Therefore the device is exempt from stand-alone SAR test requirements.

>> The fundamental frequency of the EUT is 916.8MHz, the test separation distance is smaller than 50mm. (Manufacturer specified the separation distance is 20mm)

>> The power of EUT measured is:

- For 916.8MHz: $0.3265\text{mW} = 10 \log(0.3265) \text{ dBm} \sim -4.86\text{dBm}$