

FCC - TEST REPORT

Report Number : **60.790.16.013.01** Date of Issue : February 24, 2016

Model : **RPWL4045A**

Product Type : **Converter**

Applicant : Honeywell International Inc.

Address : 1985 Douglas Drive North, Golden Valley, U.S.A

Production Facility : Ansen Electronics Company

Address : Chen Tung Industrial Zone, Ning Tau Administrative District,
Qiao Tau Zhen, Dongguan, Guangdong, China

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 28

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product:	Convertor
Model no.:	RPWL4045A
FCC ID:	HS9-RPWL4045A
Rating:	1) 3.0VDC (1 x 3.0VDC size "CR2032" batteries) 2) 120VAC for AC/AC adaptor – Model: RCA900N Input: 120VAC 60Hz Output: 16VAC 10VA
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

NIL

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 3, 2016

Testing Start Date: February 4, 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: RPWL4045A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.209, Antenna: Horizontal
 Comment: 3.0VDC
 Remark: 9kHz to 10GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
50.658	17.98	40	-22.02	Quasi Peak
94.007	12.13	43.5	-31.37	Quasi Peak
280.980	18.99	46	-27.01	Quasi Peak
848.025	24.83	46	-21.17	Quasi Peak
*916.820	70.41	114	-43.59	Peak
*916.820	51.23	94	-42.77	Average
1833.640	48.98	74	-25.02	Peak
1833.640	35.02	54	-18.98	Average
2750.480	41.23	74	-32.77	Peak
2750.480	35.88	54	-18.12	Average
3667.320	37.55	74	-36.45	Peak
3667.320	36.12	54	-17.88	Average
4584.160	36.55	74	-37.45	Peak
4584.160	36.10	54	-17.90	Average

* 916.8MHz is fundamental frequency.

Radiated Emission

EUT: RPWL4045A
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.249 & 15.209, Antenna: Vertical
 Comment: 3.0VDC
 Remark: 9kHz to 10GHz

Test Result	
☒	Passed
☐	Not Passed

Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
47.062	18.03	40	-21.97	Quasi Peak
58.954	15.93	40	-24.07	Quasi Peak
108.006	15.20	43.5	-24.80	Quasi Peak
298.530	20.11	43.5	-23.39	Quasi Peak
847.005	31.12	46	-14.88	Quasi Peak
*916.820	69.42	114	-44.58	Peak
*916.820	50.98	94	-43.02	Average
1833.640	48.78	74	-25.22	Peak
1833.640	35.32	54	-18.68	Average
2750.480	41.67	74	-32.33	Peak
2750.480	35.98	54	-18.02	Average
3667.320	37.42	74	-36.58	Peak
3667.320	36.12	54	-17.88	Average
4584.160	36.54	74	-37.46	Peak
4584.160	36.11	54	-17.89	Average

* 916.8MHz is fundamental frequency.

7.2 Conducted Emission

EUT: RPWL4045A
Op Condition: Operated, TX Mode
Test Specification: FCC15.249 & 15.207, AC Mains, L Line
Comment: 120VAC, 60Hz

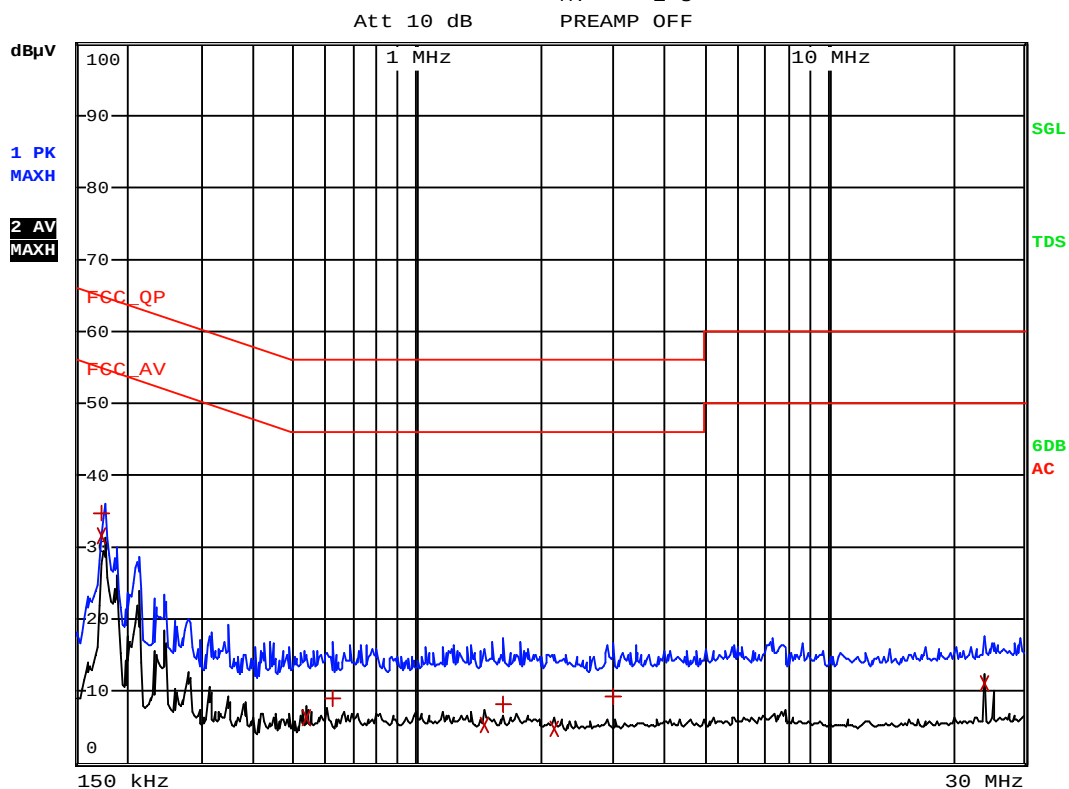
Test Result

☒ Passed☐ Not Passed

RBW 9 kHz

MT 1 s

PREAMP OFF



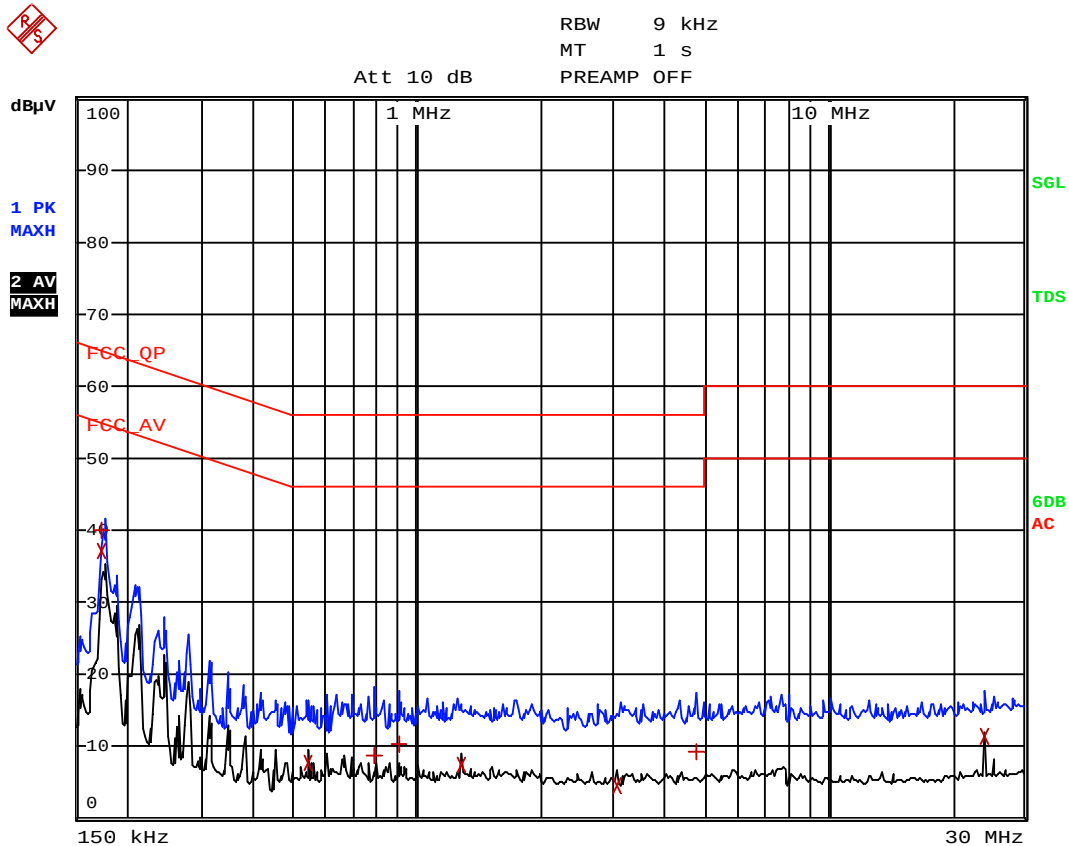
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	174 kHz	34.68	-30.08
2 Average	174 kHz	31.72	-23.04
2 Average	538 kHz	6.34	-39.65
1 Quasi Peak	626 kHz	9.05	-46.95
2 Average	1.462 MHz	5.49	-40.50
1 Quasi Peak	1.626 MHz	8.30	-47.69
2 Average	2.158 MHz	4.77	-41.22
1 Quasi Peak	3.014 MHz	9.28	-46.71
2 Average	24.082 MHz	11.22	-38.77

Conducted Emission

EUT: RPWL4045A
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	174 kHz	40.05	-24.71
2 Average	174 kHz	37.03	-17.73
2 Average	542 kHz	7.65	-38.35
1 Quasi Peak	786 kHz	8.70	-47.29
1 Quasi Peak	902 kHz	10.43	-45.56
2 Average	1.286 MHz	7.39	-38.60
2 Average	3.07 MHz	4.64	-41.36
1 Quasi Peak	4.79 MHz	9.44	-46.55
2 Average	24.082 MHz	11.30	-38.69

7.3 Bandedge Emission

EUT: RPWL4045A
Op Condition: Operated, TX Mode
Test Specification: FCC15.249, Antenna: Horizontal
Comment: 3.0VDC

Test Result☒ Passed☐ Not Passed

Band	Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
Low	902.000	31.88	46	-13.12	Quasi Peak
High	928.000	33.07	46	-12.93	Quasi Peak

Bandedge Emission

EUT: RPWL4045A
Op Condition: Operated, TX Mode
Test Specification: FCC15.249, Antenna: Vertical
Comment: 3.0VDC

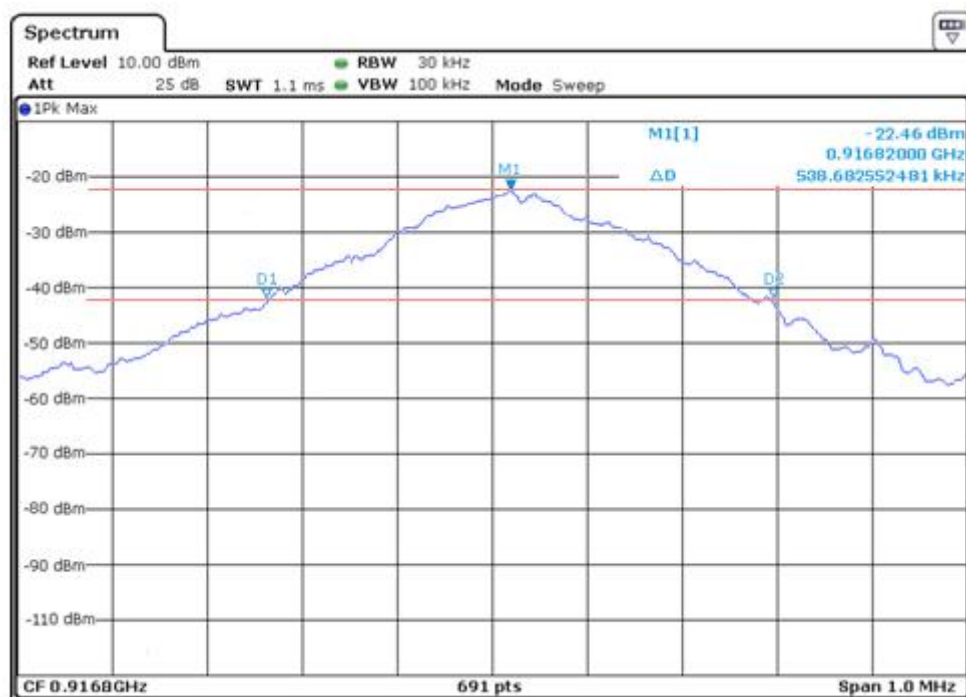
Test Result	
☒	Passed
☐	Not Passed

Band	Frequency MHz	Result dBμV/m	Limit dBμV/m	Margin dB	Detector
Low	902.000	31.78	46	-14.22	Quasi Peak
High	928.000	32.71	46	-13.29	Quasi Peak

7.4 20dB Bandwidth

EUT: RPWL4045A
Op Condition: Operated, TX Mode
Test Specification: FCC15.215, 20dB Bandwidth
Comment: 3.0VDC
Remark: 20dB bandwidth is within frequency band 902MHz-928MHz

Test Result

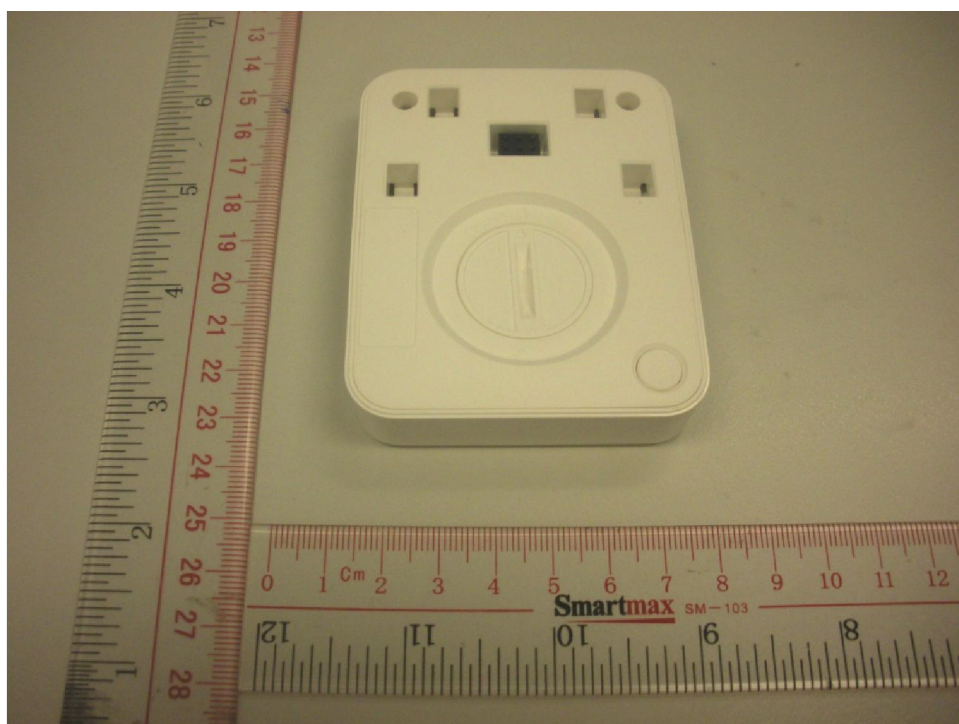
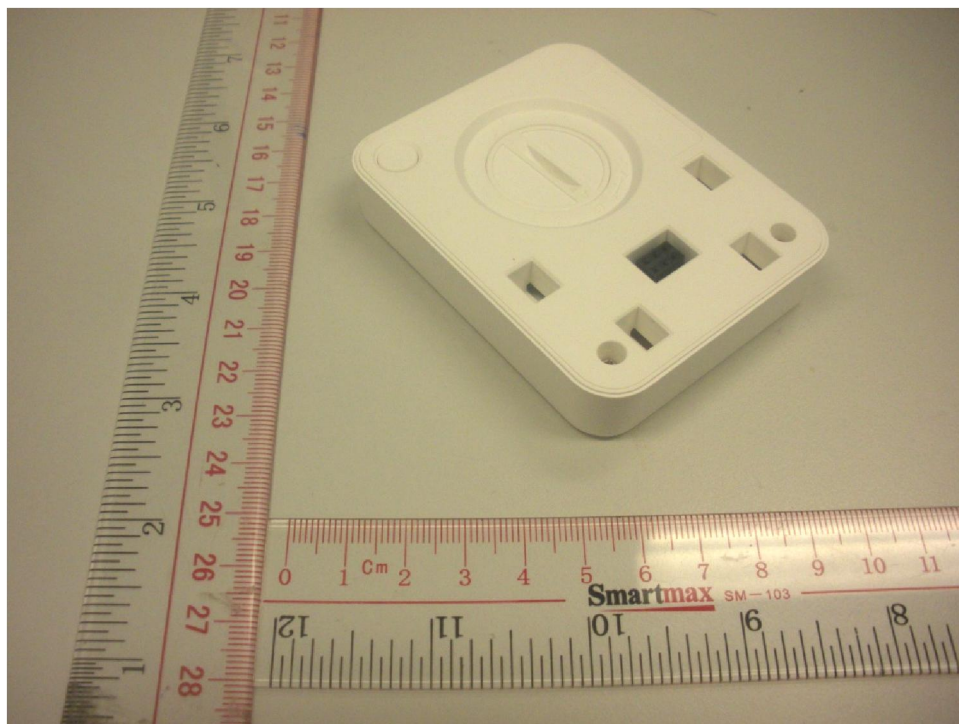
☒ Passed☐ Not Passed**20dB bandwidth**

538.682kHz

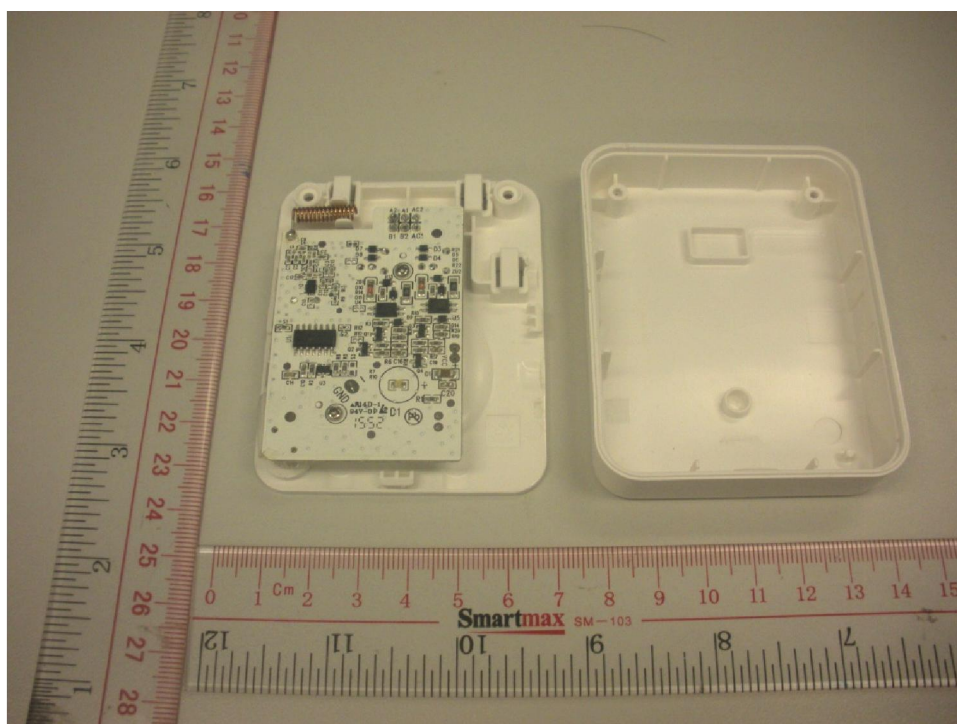
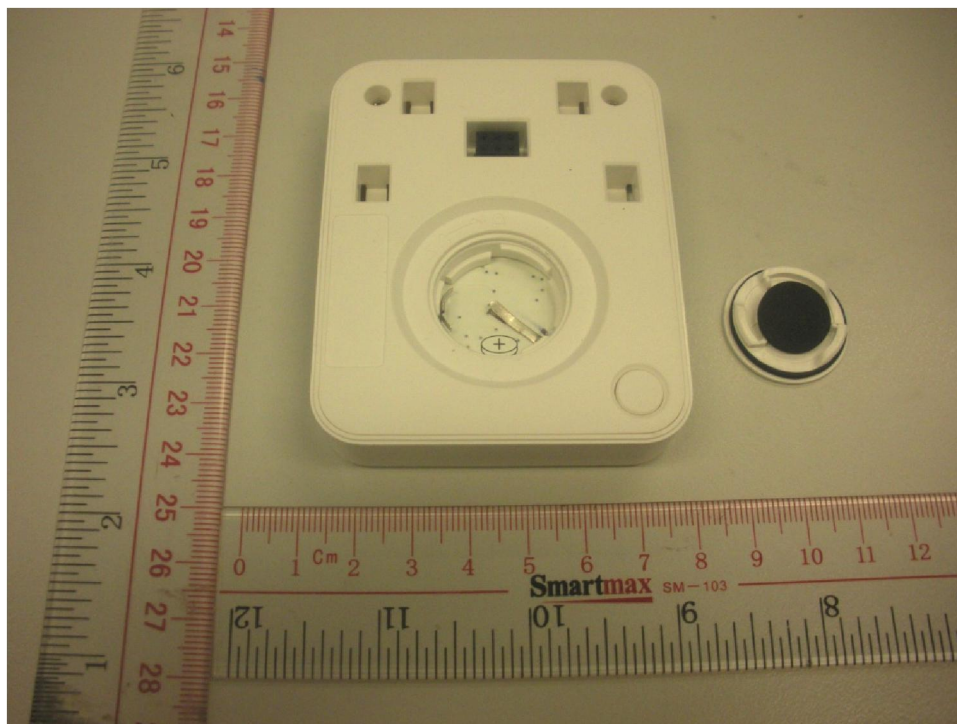
8 Appendix A - Photographs of EUT



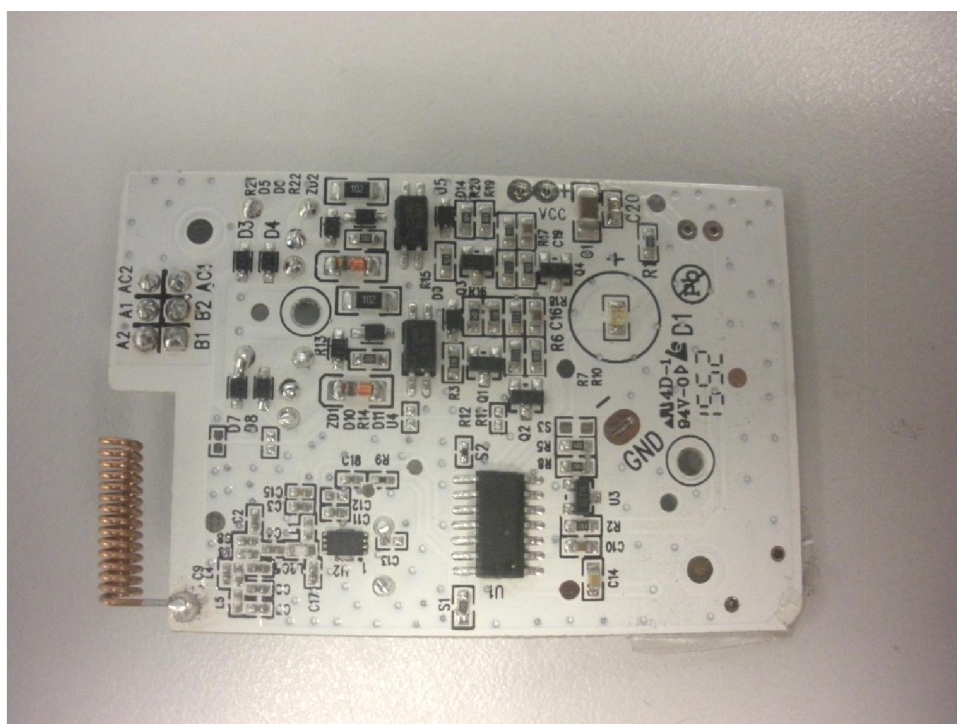
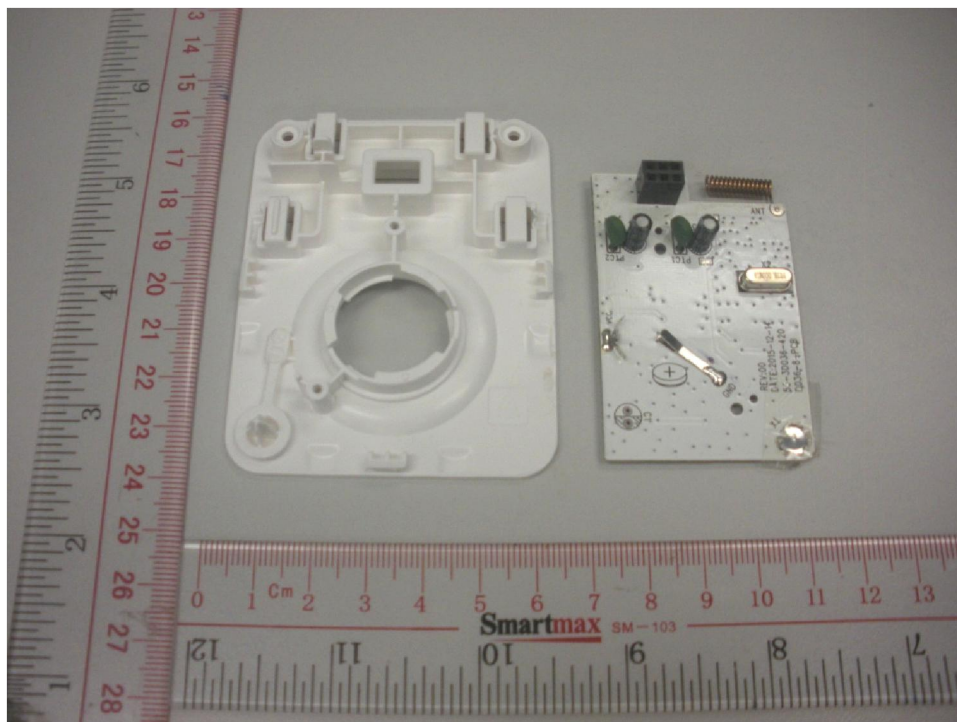
Appendix A



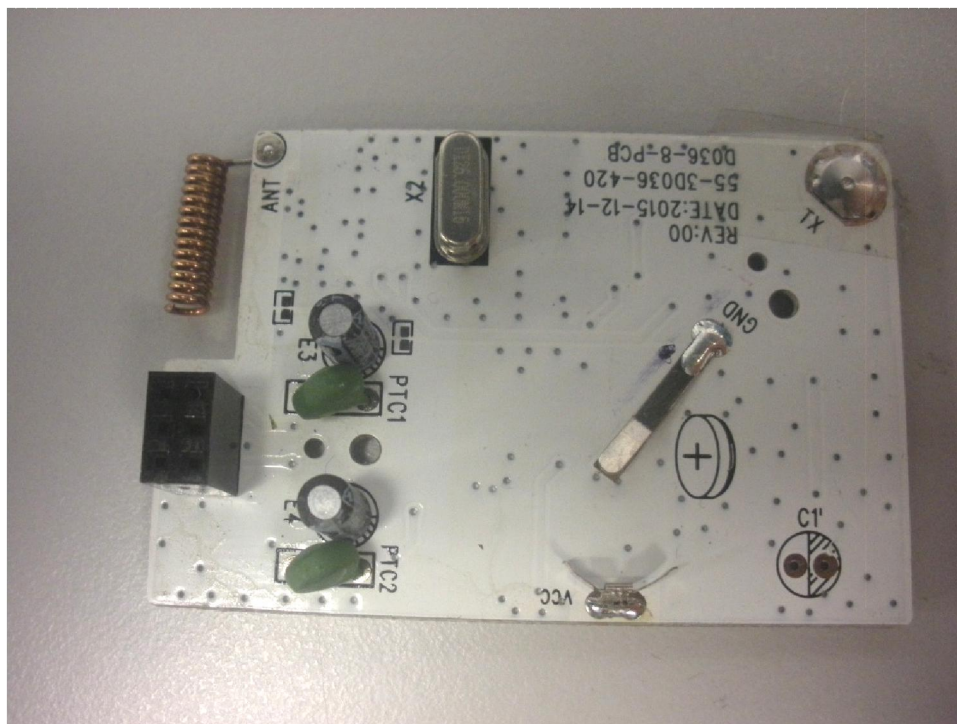
Appendix A



Appendix A

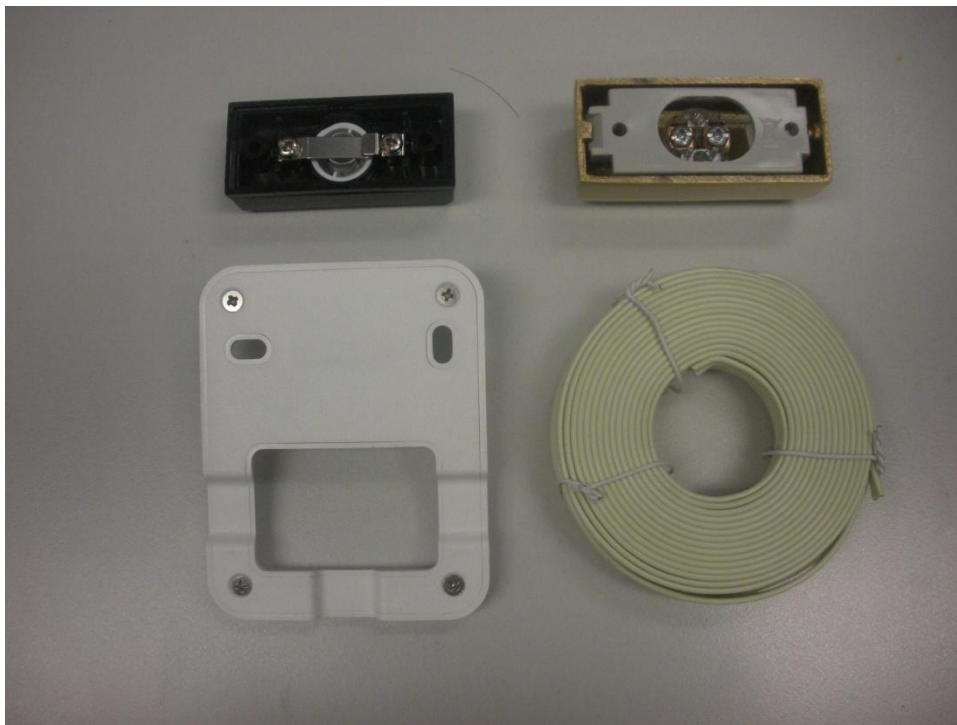


Appendix A

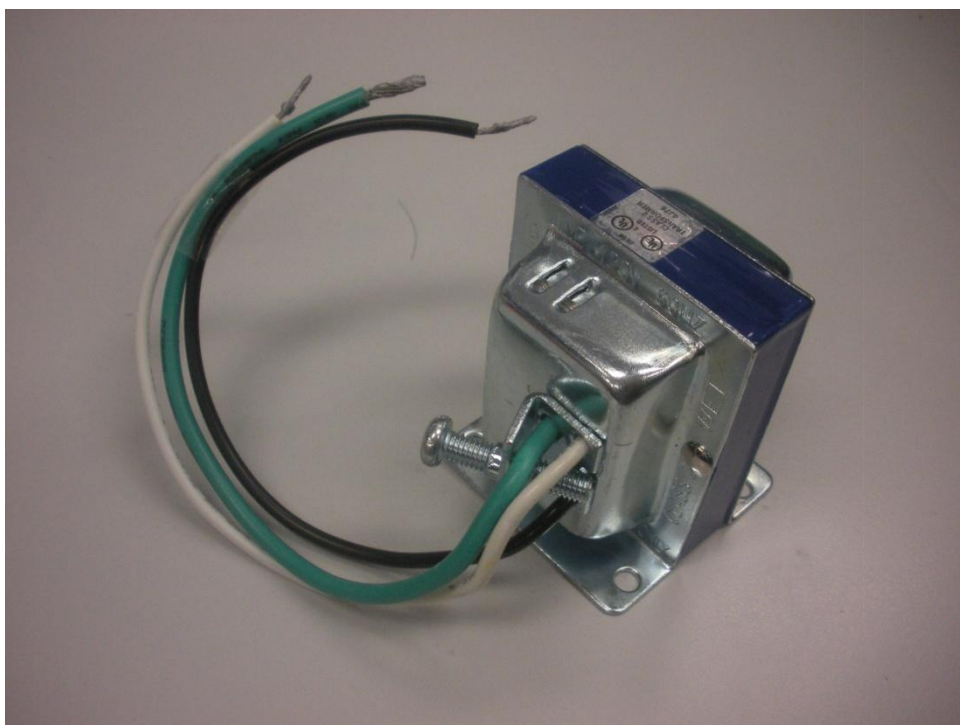
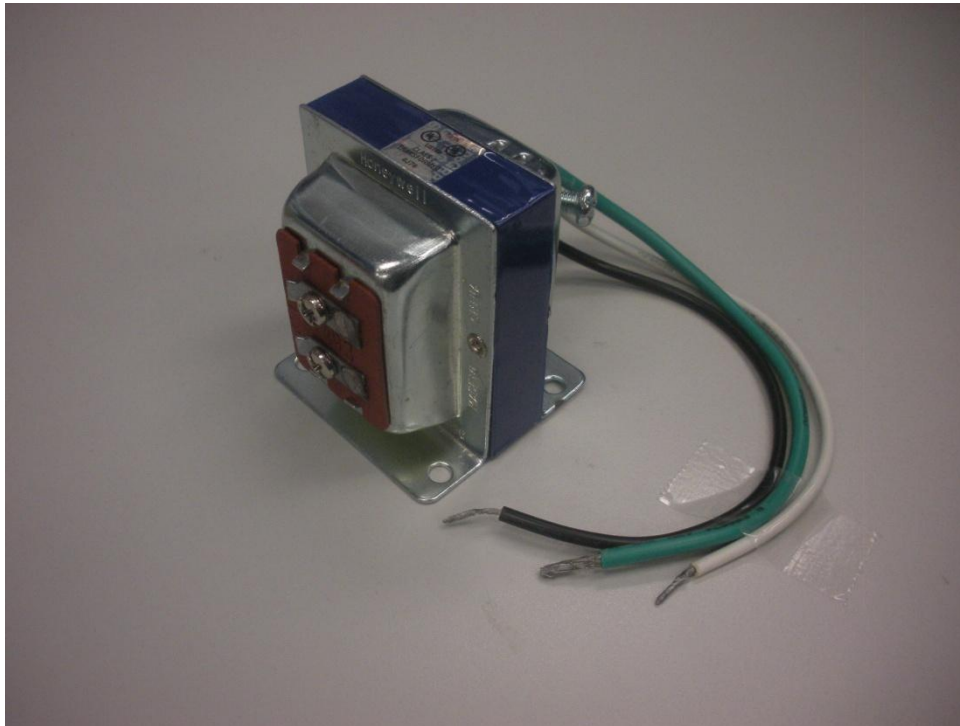


Appendix A

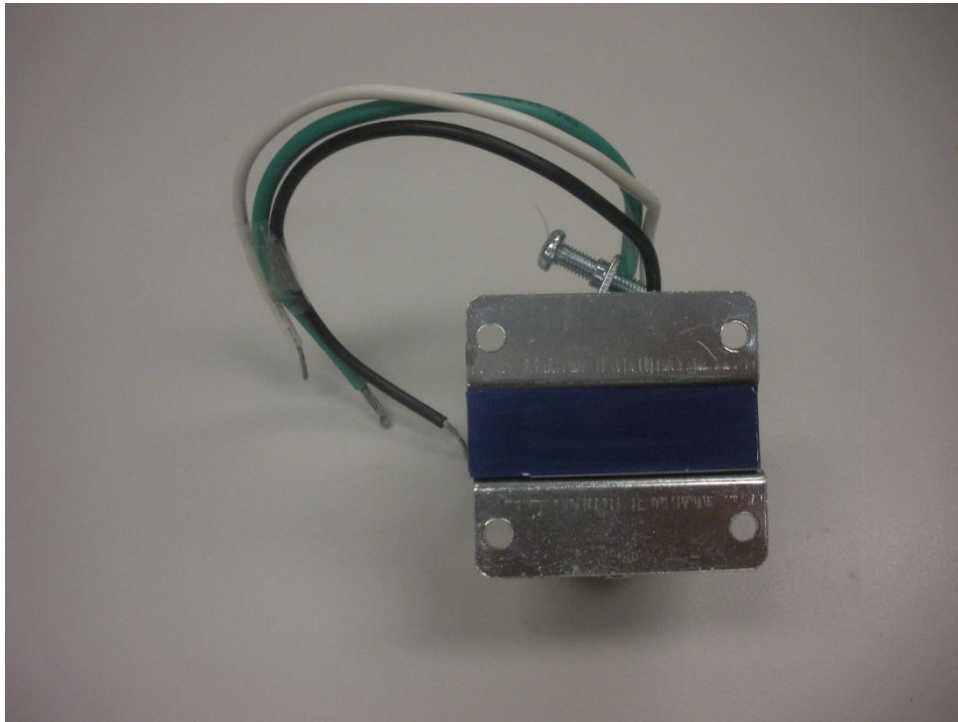
Test Supporting Equipment



Appendix A

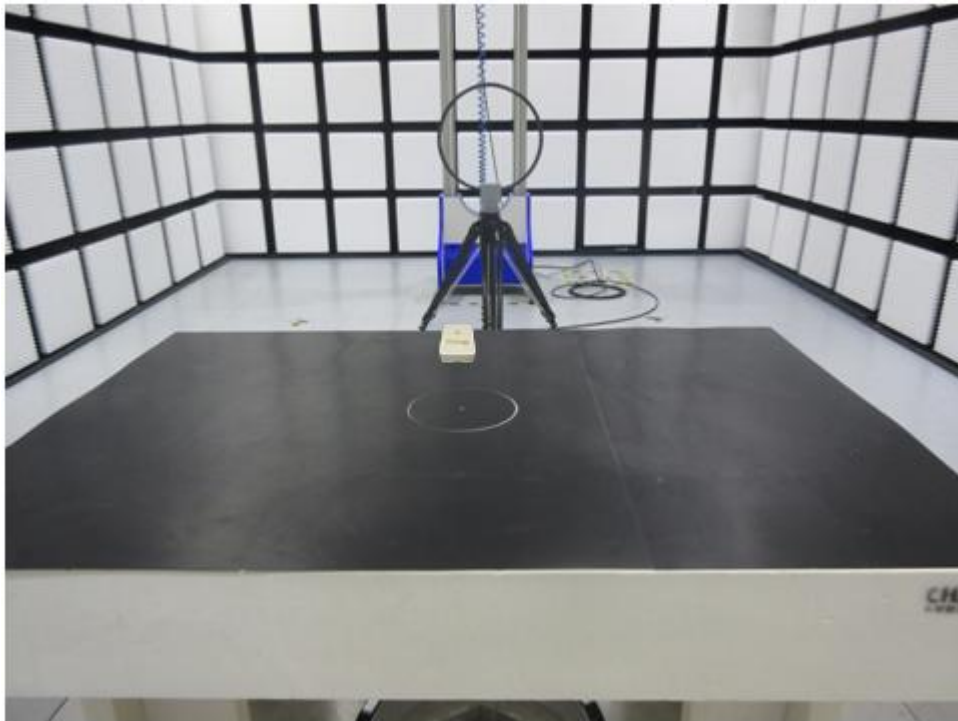


Appendix A

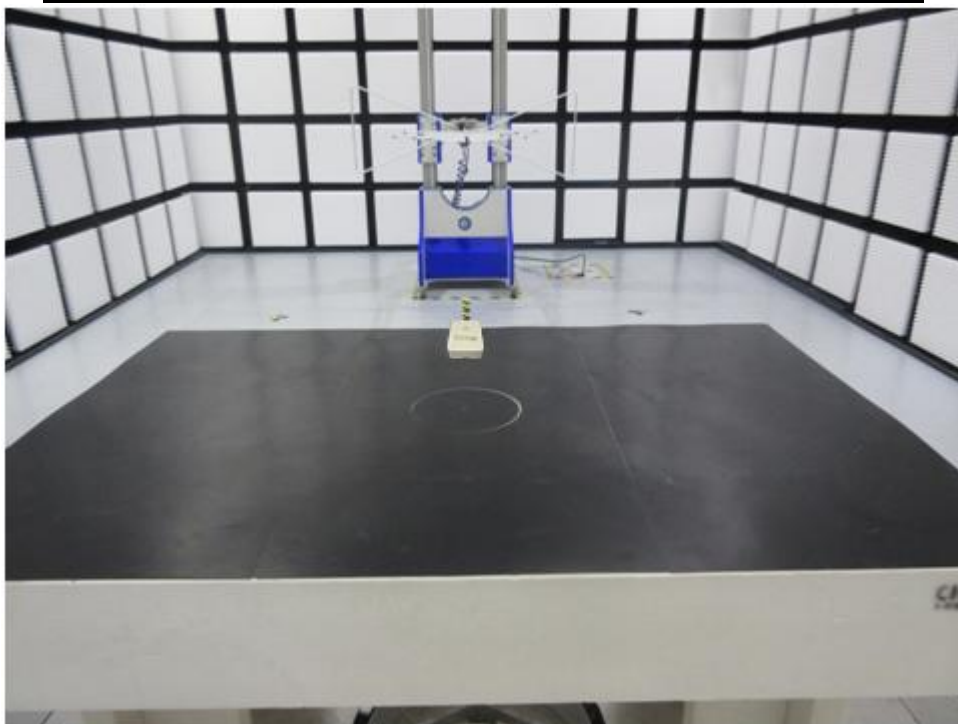


9 Appendix B - Setup Photographs of EUT

Radiated Emission (9kHz to 30MHz)



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

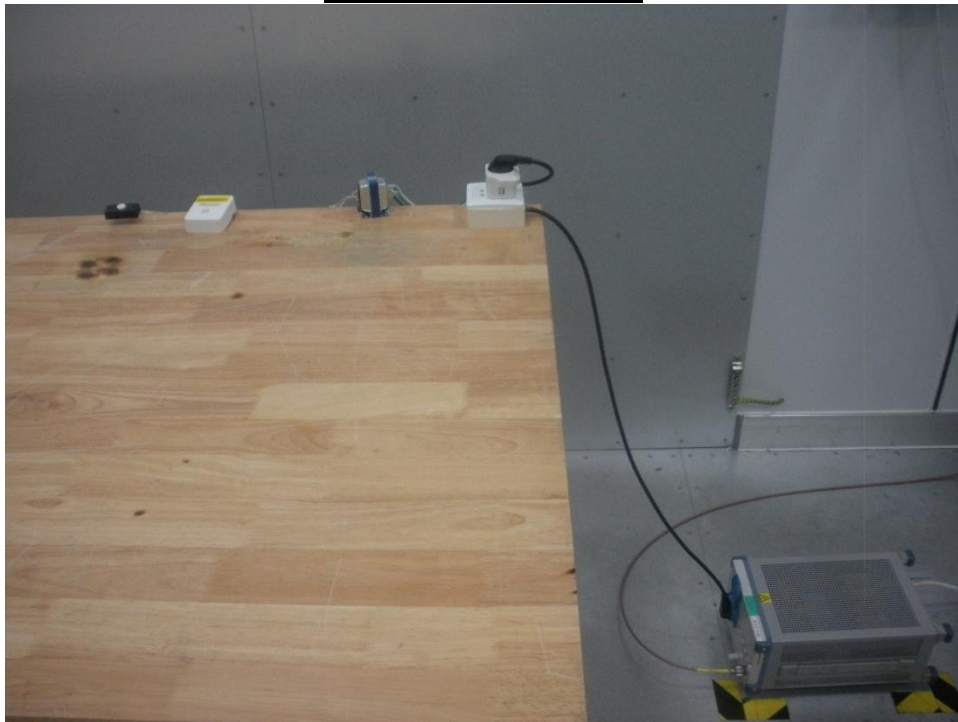


Appendix B

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 0.9168GHz = 0.00567 mW EIRP

$[(0.00567 \text{ mW}) / (20 \text{ mm})] \cdot [\text{sqrt}(0.9168 \text{ GHz})] = 0.000271$ 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: $0.00567\text{mW} = 10 \log(0.00567) \text{ dBm} \sim -22.46\text{dBm}$