

FCC - TEST REPORT

Report Number : **60.790.15.002.01** Date of Issue : March 23, 2015

Model : **ENTERPRISE LITE**

Product Type : **ENTERPRISE TABLET LITE**

Applicant : Merchandising Tech. Inc.

Address : Room 1101 & 1103, 11/F, Premier Center, 20 Cheung Shun Street,
Lai Chi Kok, Kowloon, Hong Kong

Production Facility : Hualun Technology Co., Ltd

Address : 3F No. 82-4 Dongshun St. Shulin Dist new Taipei City 238 Taiwan

Test Result : **Positive** **Negative**

Total pages including Appendices : 38

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2 Description of the Equipment Under Test

Description of the Equipment Under Test

| | |
|-------------------------|---|
| Product: | ENTERPRISE TABLET LITE |
| Model no.: | ENTERPRISE LITE |
| FCC ID: | 2AA2X185-2462 |
| Rated Voltage: | 100-240VAC for AC/DC adaptor – Model: EXA0703YJ Input: 100-240VAC 50-60Hz, 1.5A Output: 24VDC, 2.71A |
| Frequency: | 13.56MHz |
| Description of the EUT: | The EUT is considered as wireless device, the frequency range is 13.56MHz. More details of EUT technical specification please refer to the User's Manual. |

3 Summary of Test Standards

| Test Standards |
|----------------|
|----------------|

| |
|---|
| FCC Part 15 Subpart C Federal Communications Commission, PART 15 – Radio Frequency Devices, Subpart C – Intentional 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: Hong Kong Productivity Council
LG1, HKPC Building,
78 Tat Chee Avenue,
Kowloon, Hong Kong
FCC Registration Number: 90656

| Emission Tests | |
|---|-----------|
| Test Item | Test Site |
| FCC Part 15.207 | |
| Conducted Emission Test | Site 2 |
| FCC Part 15.209 | |
| Radiated Emission Test | Site 2 |
| FCC Part 15.225 | |
| Operation within the band 13.110 – 14.010 MHz | Site 2 |

4.1. Test Equipment Site List

Radiated emission Test – Site 2

| DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | CAL. DUE DATE |
|---|--------------|--------------------|-------------------|---------------|
| Test Receiver | R & S | ESU26 | 100050 | 05-Jan-16 |
| Bi-conical Antenna | R & S | HK116 | 100242 | 05-May-15 |
| Log Periodic Antenna | R & S | HL223 | 841516/020 | 06-May-15 |
| Coaxial cable 50ohm | Rosenberger | RTK081-05S-05S-10m | LA2-001-10M / 001 | 15-Nov-15 |
| Microwave amplifier 0.5-26.5GHz, 25dB gain | HP | 83017A | 3123A00437 | 03-Oct-15 |
| High Pass Filter (cutoff freq. =1000MHz) | Trilithic | 23042 | 9829213 | 28-Oct-15 |
| Horn Antenna | EMCO | 3115 | 9002-3351 | 11-May-15 |
| Active Loop Antenna | EMCO | 6502 | 9107-2651 | 21-Jun-15 |

Conducted Emission Test – Site 2

| DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | CAL. DUE DATE |
|-------------------|-----------------|-----------|------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100427 | 28-Feb-16 |
| Coaxial Cable | N/A | N/A | N/A | 03-June-15 |
| LISN | Rohde & Schwarz | ENV 216 | 100432 | 19-May-15 |

4.2. Measurement System Uncertainty

Measurement System Uncertainty Emissions

| System Measurement Uncertainty | | |
|--------------------------------|--|----------------------|
| Items | | Extended Uncertainty |
| Radiated Emissions | Level accuracy 30MHz to 1GHz 1GHz to 25GHz | ± 3.19 dB |
| Conducted Emissions | Level accuracy 9 kHz to 30 MHz | ± 2.48 dB |

5 Summary of Test Results

| Emission Tests | | | | |
|---|-------|-------------------------------------|--------------------------|--------------------------|
| FCC Part 15.207 | | | | |
| Test Condition | Pages | Test Result | | |
| | | Pass | Fail | N/A |
| Conducted Emission Test | 10-11 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| FCC Part 15.209 | | | | |
| Radiated Emission Test | 12-17 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| FCC Part 15.225 | | | | |
| Operation within the band 13.110 – 14.010 MHz | 18 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

6 General Remarks

Remarks

Test supporting Equipment: i-pad mini – Serial number: DLXNFHX1G5V3

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.

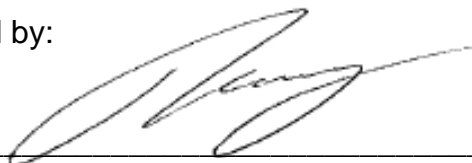
Sample Received Date: January 13, 2015

Testing Start Date: January 14, 2015

Testing End Date: March 4, 2015

- TÜV SÜD HONG KONG LTD. -

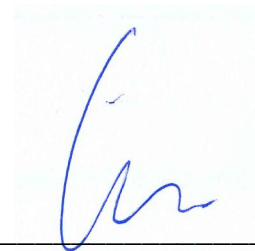
Reviewed by:



TSENG Chi Kit



Prepared by:



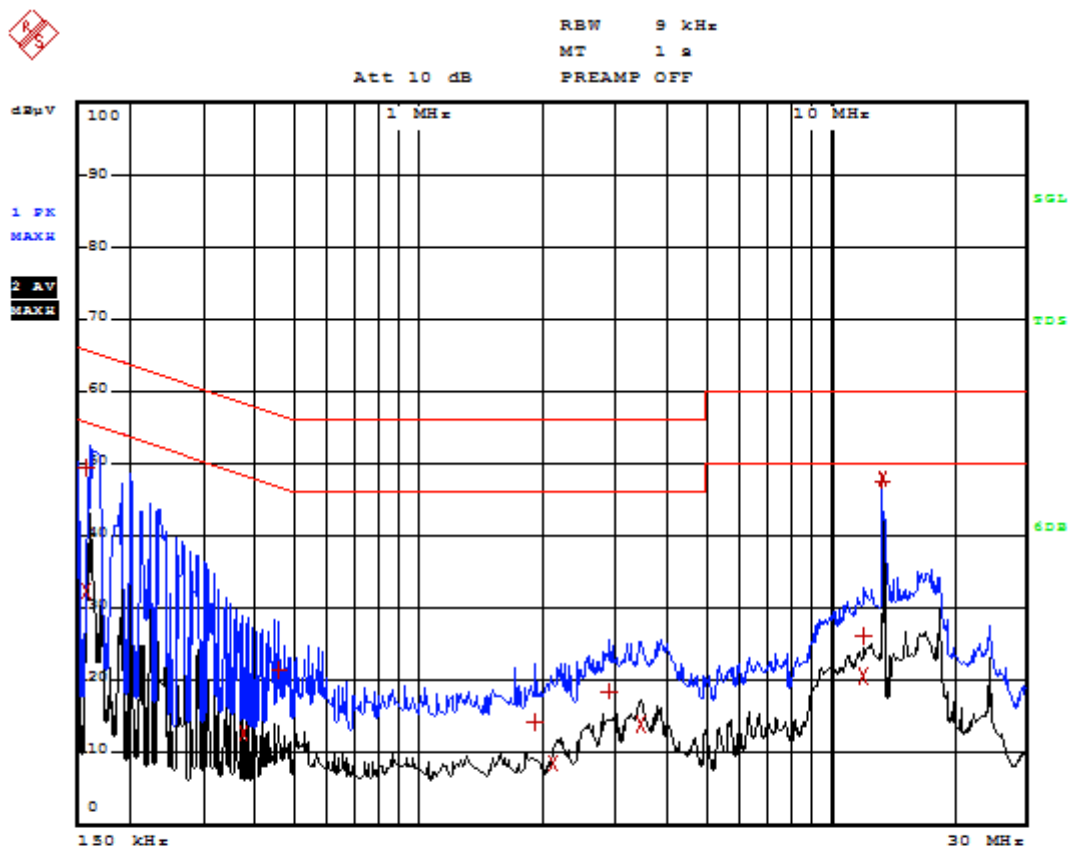
CHAN Kwong Ngai

7 Emission Test Results

7.1 Conducted Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.207, AC Mains, L Line
 Comment: 120VAC, 60Hz

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |

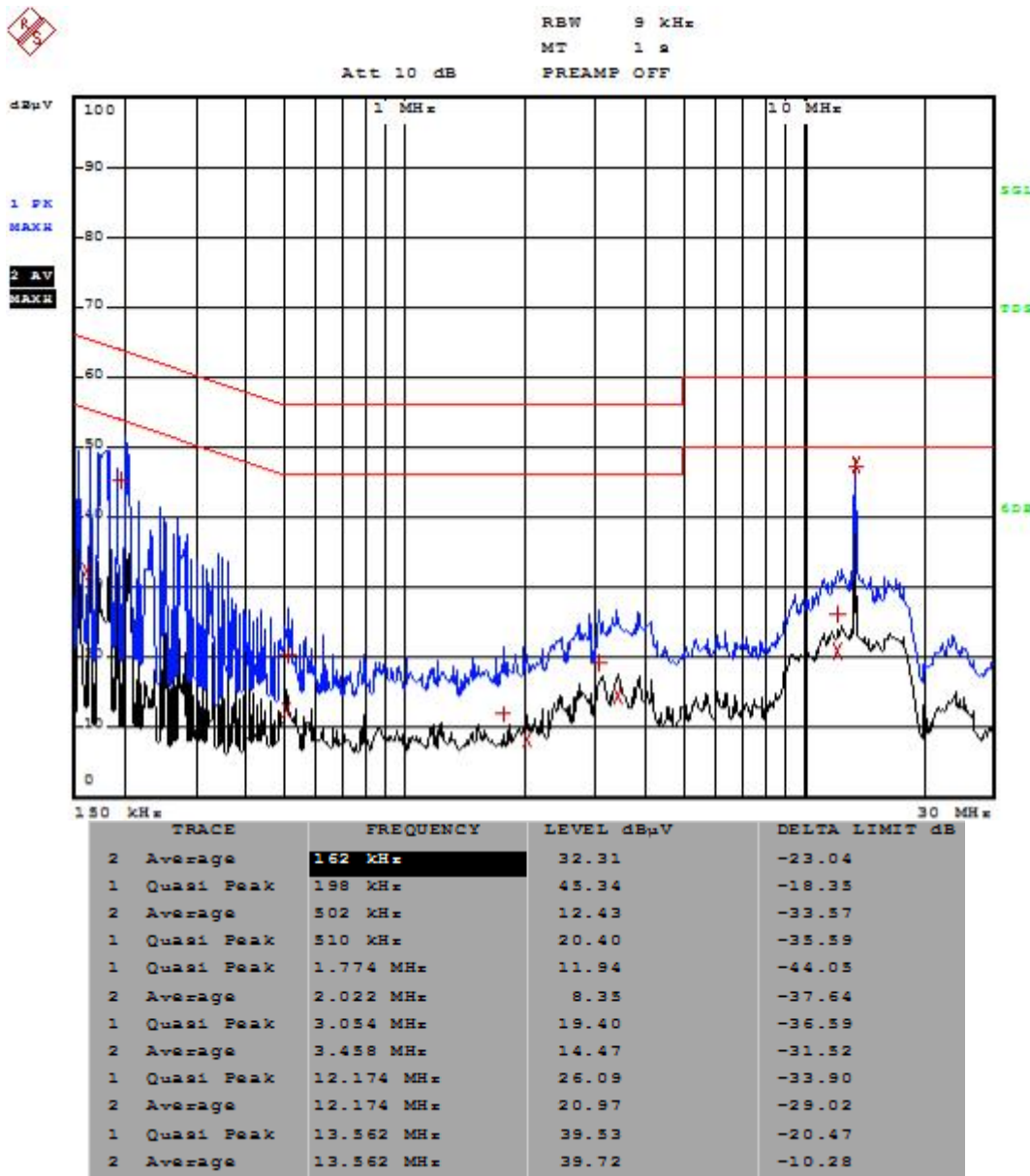


| TRACE | FREQUENCY | LEVEL dBµV | DELTA LIMIT dB |
|--------------|------------|------------|----------------|
| 1 Quasi Peak | 158 kHz | 49.58 | -15.97 |
| 2 Average | 158 kHz | 32.40 | -23.16 |
| 2 Average | 374 kHz | 12.61 | -35.79 |
| 1 Quasi Peak | 458 kHz | 21.47 | -35.25 |
| 1 Quasi Peak | 1.93 MHz | 14.26 | -41.73 |
| 2 Average | 2.118 MHz | 8.44 | -37.56 |
| 1 Quasi Peak | 2.898 MHz | 18.44 | -37.55 |
| 2 Average | 3.482 MHz | 14.02 | -31.98 |
| 1 Quasi Peak | 12.11 MHz | 26.07 | -33.92 |
| 2 Average | 12.11 MHz | 20.70 | -29.29 |
| 1 Quasi Peak | 13.562 MHz | 42.06 | -17.94 |
| 2 Average | 13.562 MHz | 42.30 | -7.70 |

Conducted Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.207, AC Mains, N Line
 Comment: 120VAC, 60Hz

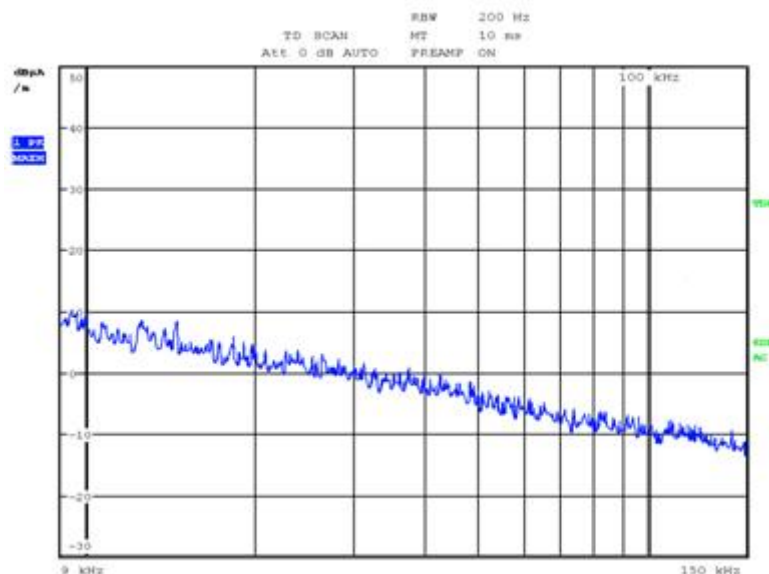
| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



7.2 Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Face
 Comment: 120VAC, 60Hz (Measured at 3m)

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



Limit of 9 kHz to 490 kHz = 20 log (2400/F) uV/m @ 300m
 = 48.519 dBuV/m to 13.800 dBuV/m @ 300m
 = 88.519 dBuV/m to 53.842 dBuV/m @ 3m
 = 37.019 dBuA/m to 2.342 dBuA/m @ 3m

Limit of 490 kHz to 1.705 MHz = 20 log (24000/F) uV/m @ 30m
 = 33.800 dBuV/m to 22.969dBuV/m @ 30m
 = 53.800 dBuV/m to 42.969 dBuV/m @ 3m
 = 2.300 dBuA/m to -8.531 dBuA/m @ 3m

Limit of 1.705 MHz to 30 MHz = 30uV/m @ 30m
 = 29.5dBuV/m @ 30m
 = 49.5dBuV/m @ 3m
 = -2.0 dBuA/m @ 3m

Where F = unwanted emission frequency in kHz

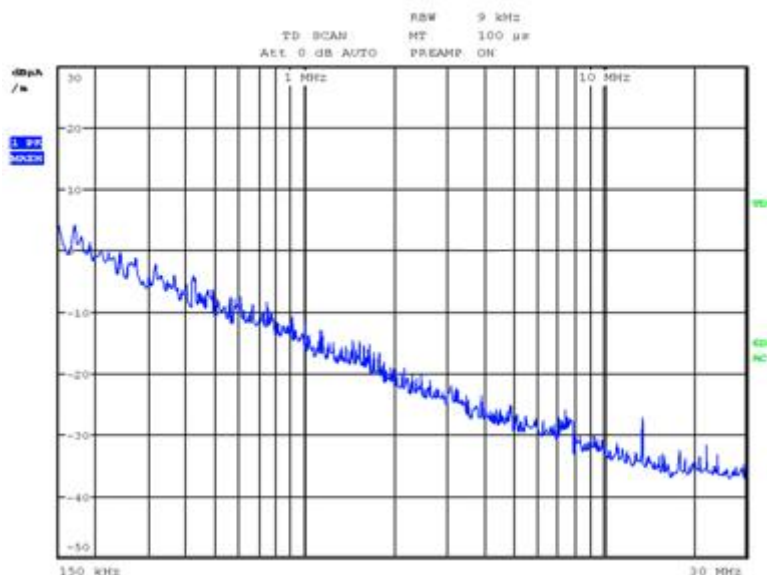
* For 13.56 MHz, it is not the subject to FCC 15.209; it is subject to FCC 15.225.

| Frequency MHz | QP dBuA/m | Limit dBuA/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 0.010 | +9.1 | +37.019 | -27.919 |
| 0.030 | +0.5 | +26.561 | -26.061 |
| 0.100 | -9.0 | +16.104 | -25.104 |

Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Face
 Comment: 120VAC, 60Hz (Measured at 3m)

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



Limit of 9 kHz to 490 kHz = $20 \log(2400/F) \text{ uV/m @ 300m}$
 = 48.519 dBuV/m to 13.800 dBuV/m @ 300m
 = 88.519 dBuV/m to 53.842 dBuV/m @ 3m
 = 37.019 dBuA/m to 2.342 dBuA/m @ 3m

Limit of 490 kHz to 1.705 MHz = $20 \log(24000/F) \text{ uV/m @ 30m}$
 = 33.800 dBuV/m to 22.969 dBuV/m @ 30m
 = 53.800 dBuV/m to 42.969 dBuV/m @ 3m
 = 2.300 dBuA/m to -8.531 dBuA/m @ 3m

Limit of 1.705 MHz to 30 MHz = 30 uV/m @ 30m
 = 29.5 dBuV/m @ 30m
 = 49.5 dBuV/m @ 3m
 = -2.0 dBuA/m @ 3m

Where F = unwanted emission frequency in kHz

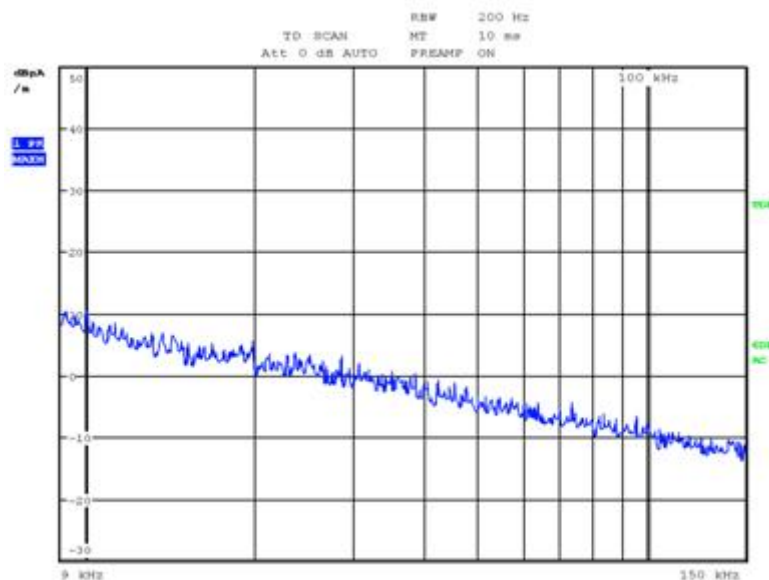
* For 13.56 MHz, it is not the subject to FCC 15.209; it is subject to FCC 15.225.

| Frequency MHz | QP dBuA/m | Limit dBuA/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 0.162 | +2.0 | +12.580 | -10.580 |
| 0.490 | -8.0 | +2.300 | -10.3 |
| 1.705 | -14.2 | -8.531 | -5.669 |
| 13.560 | -27.1 | -2.0 | -25.1 |
| 27.120 | -33.0 | -2.0 | -31.0 |

Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Side
 Comment: 120VAC, 60Hz (Measured at 3m)

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



Limit of 9 kHz to 490 kHz = $20 \log (2400/F) \text{ uV/m @ } 300\text{m}$
 = 48.519 dBuV/m to 13.800 dBuV/m @ 300m
 = 88.519 dBuV/m to 53.842 dBuV/m @ 3m
 = 37.019 dBuA/m to 2.342 dBuA/m @ 3m

Limit of 490 kHz to 1.705 MHz = $20 \log (24000/F) \text{ uV/m @ } 30\text{m}$
 = 33.800 dBuV/m to 22.969 dBuV/m @ 30m
 = 53.800 dBuV/m to 42.969 dBuV/m @ 3m
 = 2.300 dBuA/m to -8.531 dBuA/m @ 3m

Limit of 1.705 MHz to 30 MHz = $30 \text{ uV/m @ } 30\text{m}$
 = 29.5 dBuV/m @ 30m
 = 49.5 dBuV/m @ 3m
 = -2.0 dBuA/m @ 3m

Where F = unwanted emission frequency in kHz

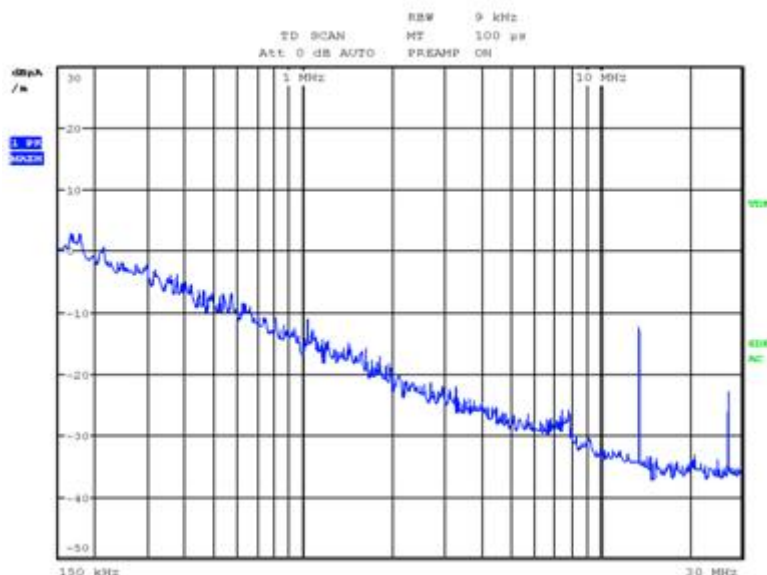
* For 13.56 MHz, it is not the subject to FCC 15.209; it is subject to FCC 15.225.

| Frequency MHz | QP dBuA/m | Limit dBuA/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 0.010 | +8.6 | +37.019 | -28.419 |
| 0.030 | +0.7 | +26.561 | -25.861 |
| 0.100 | -9.6 | +16.104 | -25.704 |

Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Side
 Comment: 120VAC, 60Hz (Measured at 3m)

| | |
|-------------------------------------|------------|
| Test Result | |
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



Limit of 9 kHz to 490 kHz = $20 \log (2400/F) \text{ uV/m @ } 300\text{m}$
 = 48.519 dBuV/m to 13.800 dBuV/m @ 300m
 = 88.519 dBuV/m to 53.842 dBuV/m @ 3m
 = 37.019 dBuA/m to 2.342 dBuA/m @ 3m

Limit of 490 kHz to 1.705 MHz = $20 \log (24000/F) \text{ uV/m @ } 30\text{m}$
 = 33.800 dBuV/m to 22.969 dBuV/m @ 30m
 = 53.800 dBuV/m to 42.969 dBuV/m @ 3m
 = 2.300 dBuA/m to -8.531 dBuA/m @ 3m

Limit of 1.705 MHz to 30 MHz = $30 \text{ uV/m @ } 30\text{m}$
 = 29.5 dBuV/m @ 30m
 = 49.5 dBuV/m @ 3m
 = -2.0 dBuA/m @ 3m

Where F = unwanted emission frequency in kHz

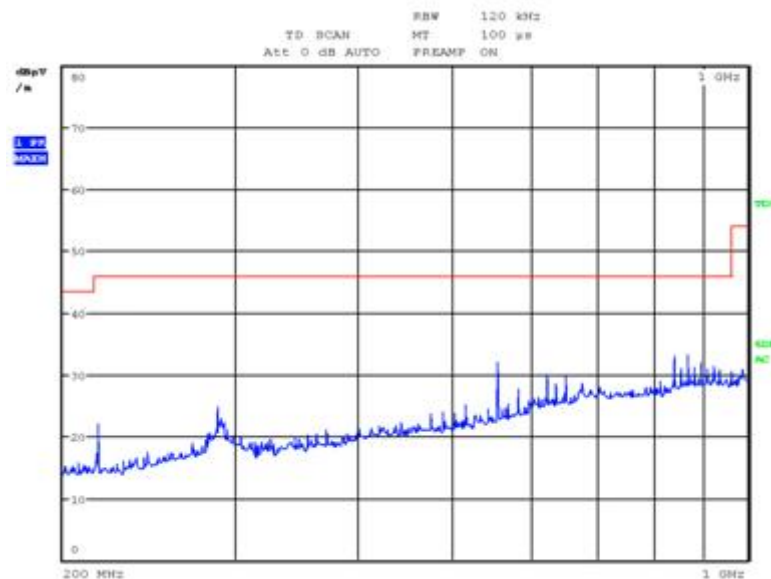
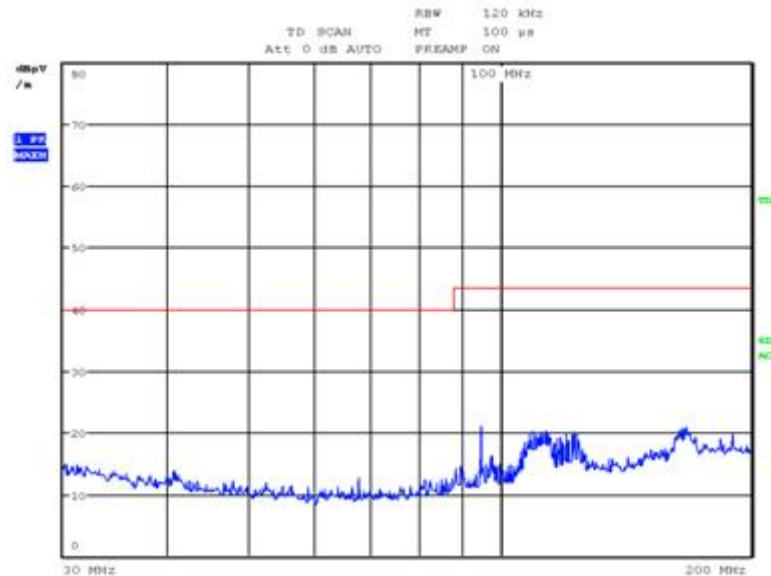
* For 13.56 MHz, it is not the subject to FCC 15.209; it is subject to FCC 15.225.

| Frequency MHz | QP dBuA/m | Limit dBuA/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 0.163 | +1.3 | +12.580 | -11.280 |
| 0.490 | -7.2 | +2.300 | -9.500 |
| 1.705 | -15.2 | -8.531 | -6.669 |
| 13.560 | -12.3 | -2.0 | -10.3 |
| 27.120 | -22.7 | -2.0 | -20.7 |

Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Horizontal
 Comment: 120VAC, 60Hz

| | |
|-------------------------------------|------------|
| Test Result | |
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |

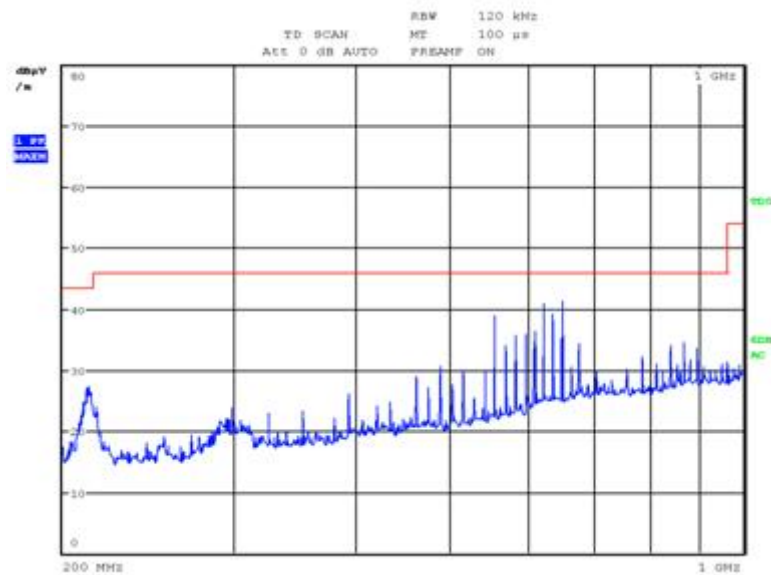
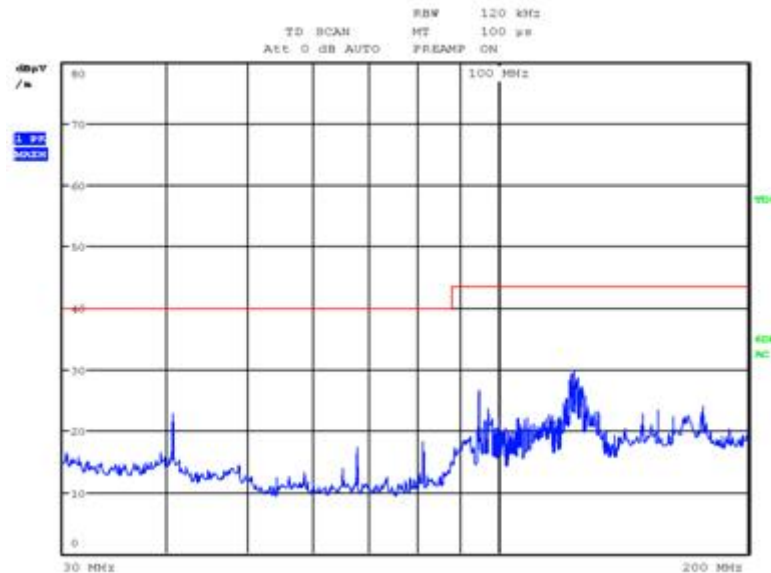


| Frequency MHz | QP dBµV/m | Limit dBµV/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 94.920 | 21.0 | 43.5 | -22.5 |
| 167.070 | 20.9 | 43.5 | -22.6 |
| 555.980 | 32.0 | 46.0 | -14.0 |
| 867.890 | 33.1 | 46.0 | -12.9 |

Radiated Emission

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.209, Antenna: Vertical
 Comment: 120VAC, 60Hz

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |

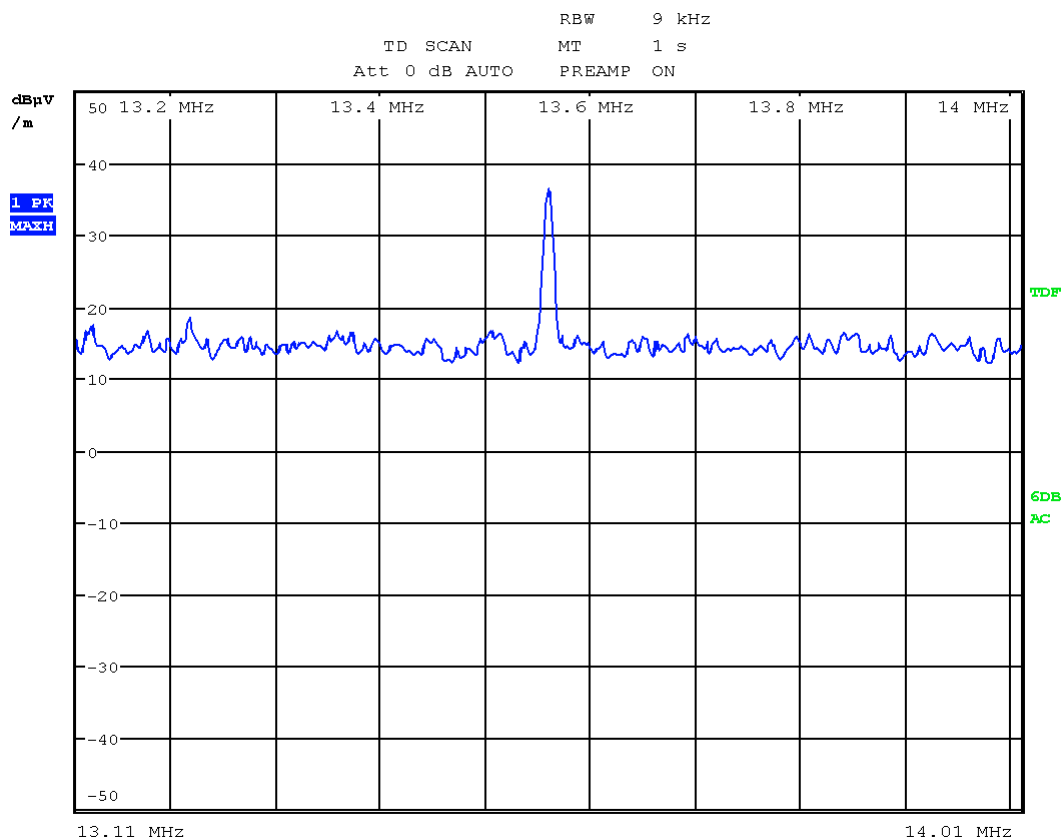


| Frequency MHz | QP dBµV/m | Limit dBµV/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 94.920 | 26.6 | 43.5 | -16.9 |
| 123.660 | 29.8 | 43.5 | -13.7 |
| 623.780 | 40.9 | 46.0 | -5.1 |
| 650.900 | 41.3 | 46.0 | -4.7 |

7.3 Operation within the band 13.110 – 14.010 MHz

EUT: ENTERPRISE LITE
 Op Condition: Normal Working
 Test Specification: FCC 15.225
 Comment: 120VAC, 60Hz (Measured at 3m)

| Test Result | |
|-------------------------------------|------------|
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |



The field strength of any emission shall not exceed the following limits:

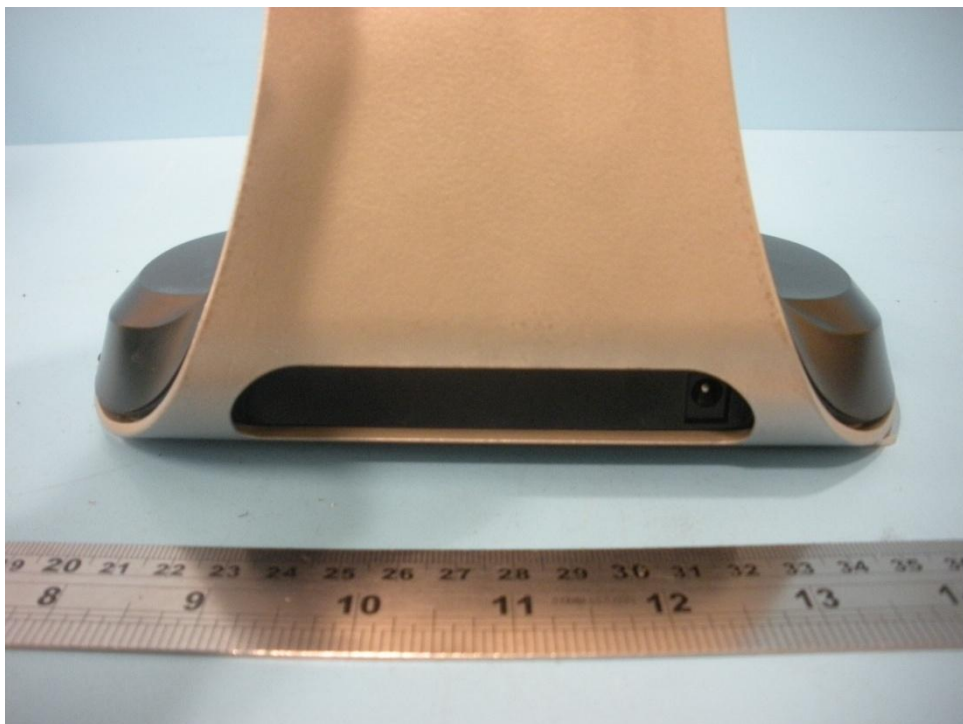
- (a) 15.848 millivolts/m (84 dBµV/m) at 30 m, (104 dBuV/m) at 3 m, within the band 13.553-13.567 MHz.
- (b) 334 microvolts/m (50.5 dBµV/m) at 30 m, (70.5 dBuV/m) at 3 m, within the bands 13.410-13.553 MHz and 13.567-13.710 MHz.
- (c) 106 microvolts/m (40.5 dBµV/m) at 30 m, (60.5 dBuV/m) at 3 m, within the bands 13.110-13.410 MHz and 13.710-14.010 MHz.
- (d) 30 microvolts/m (29.5 dBµV/m) at 30 m, (49.5 dBuV/m) at 3 m, outside the band 13.110-14.010 MHz.

| Frequency MHz | QP dBµV/m | Limit dBµV/m | Margin dB |
|------------------|--------------|-----------------|--------------|
| 13.560 | 36.4 | 104 | -67.6 |

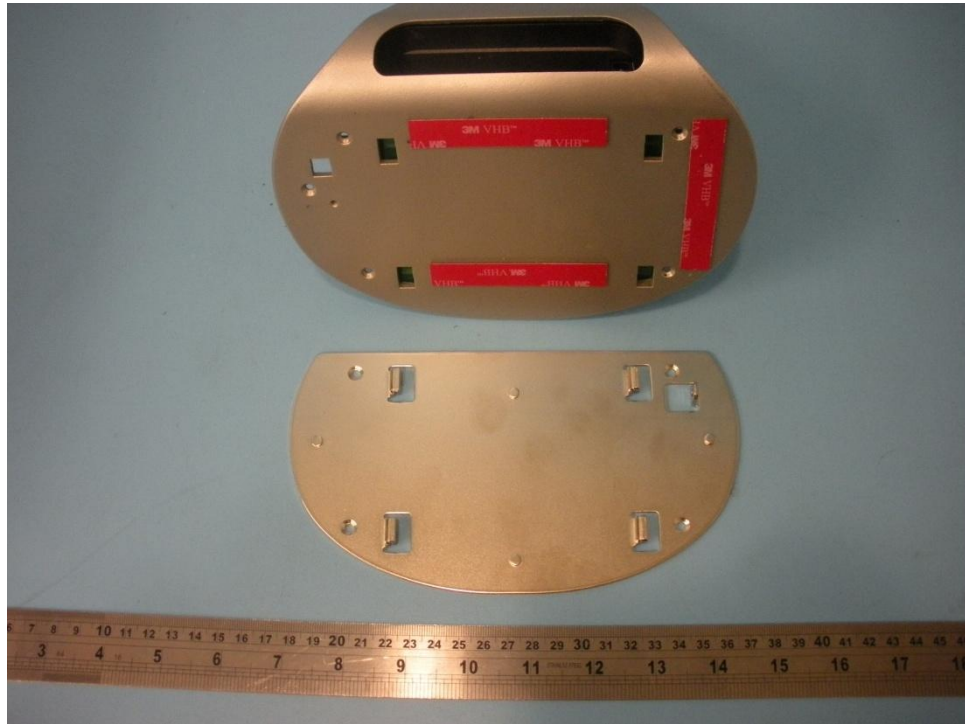
8 Appendix A - Photographs of EUT



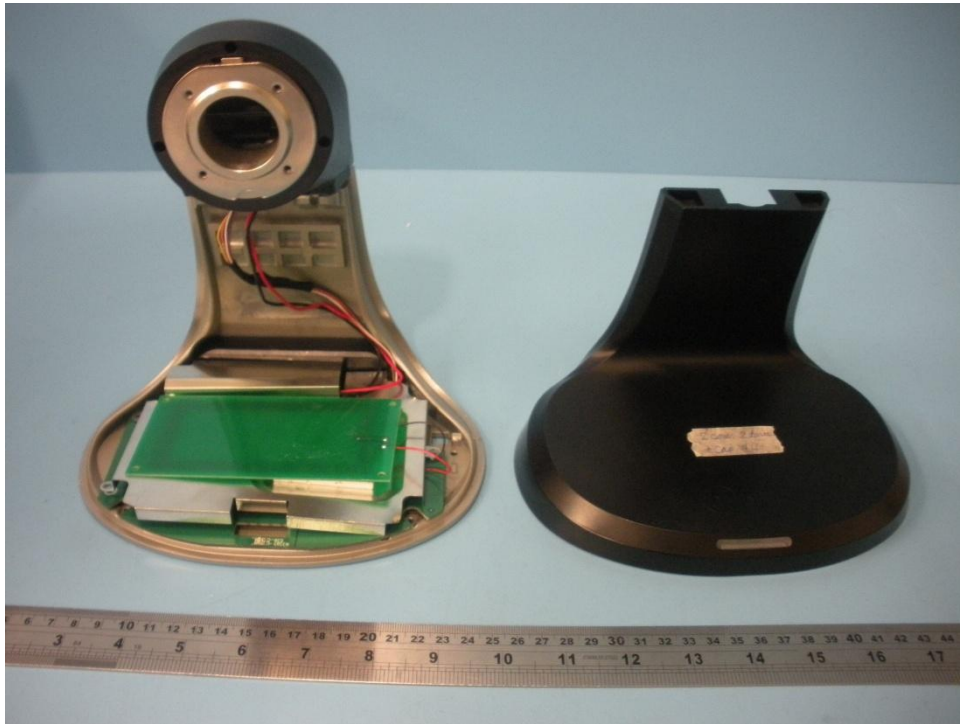
Appendix A



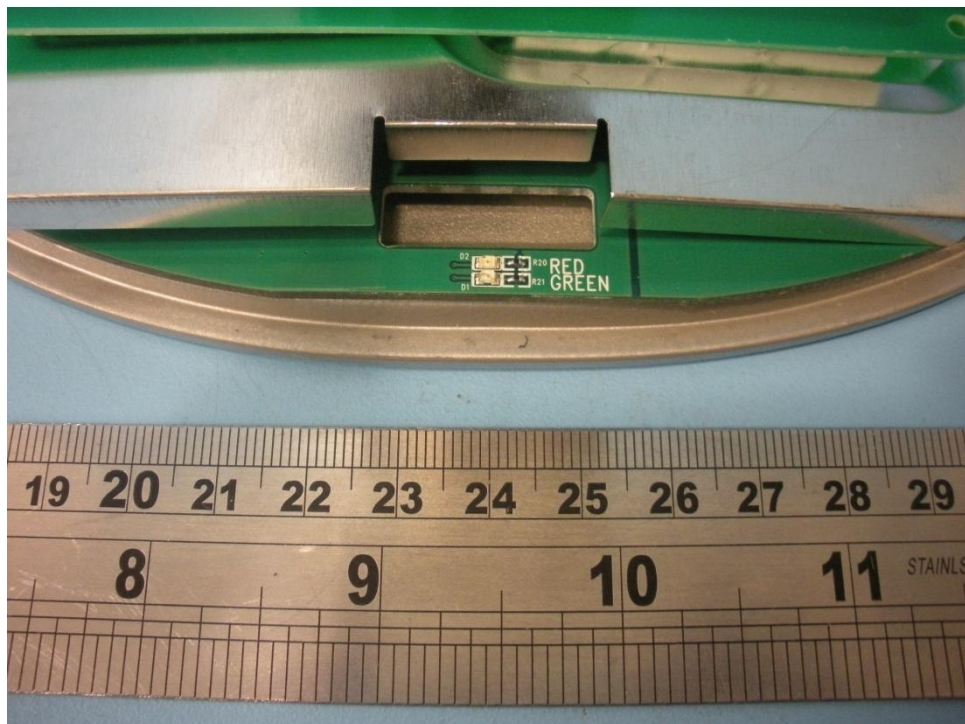
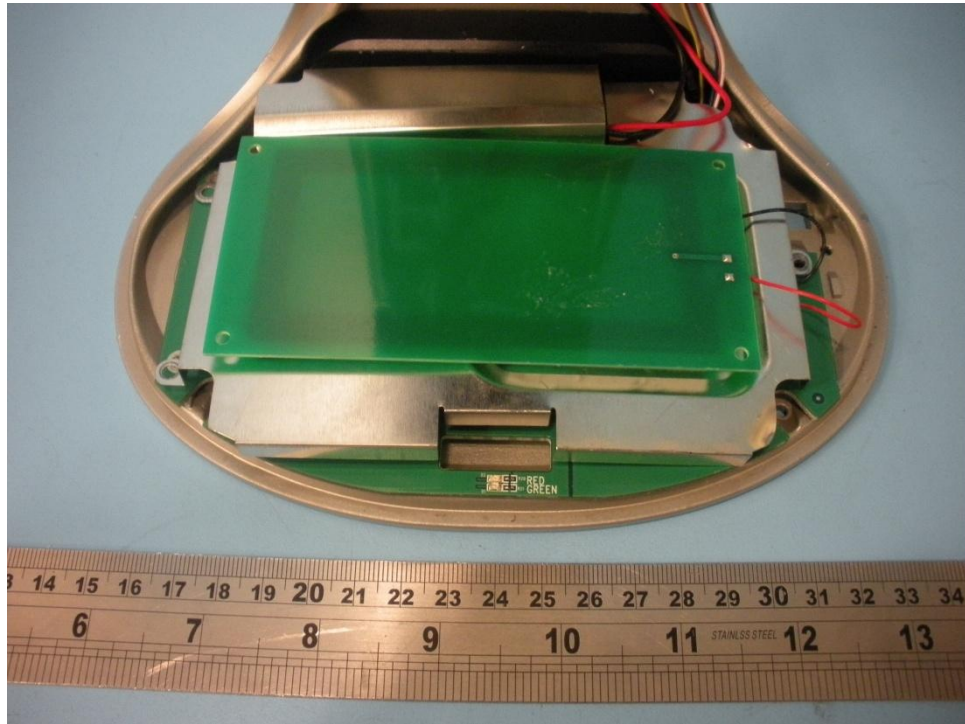
Appendix A



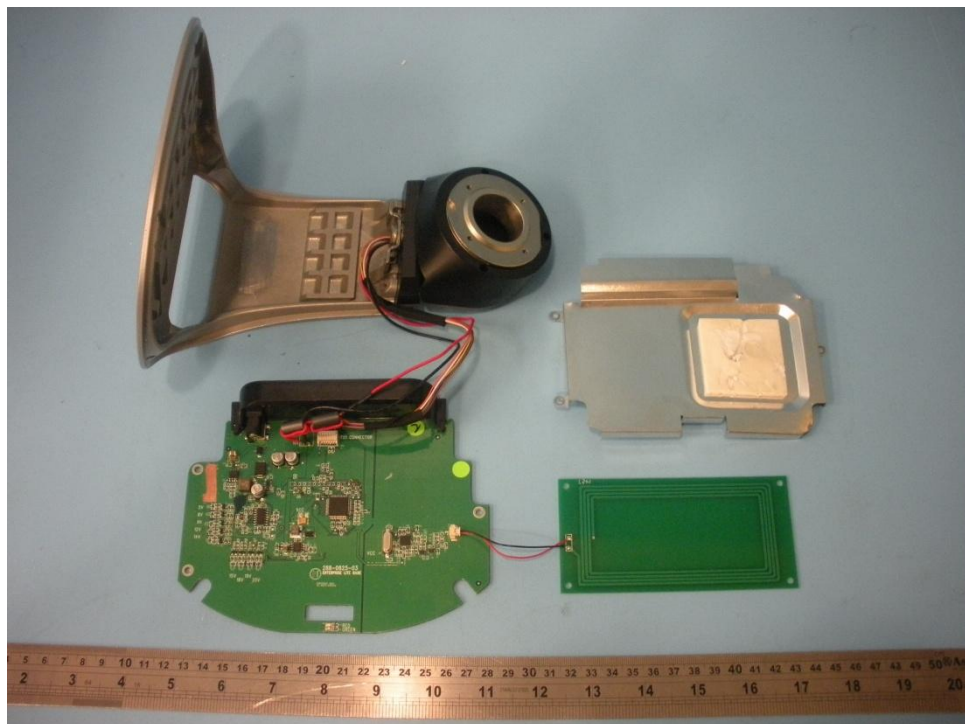
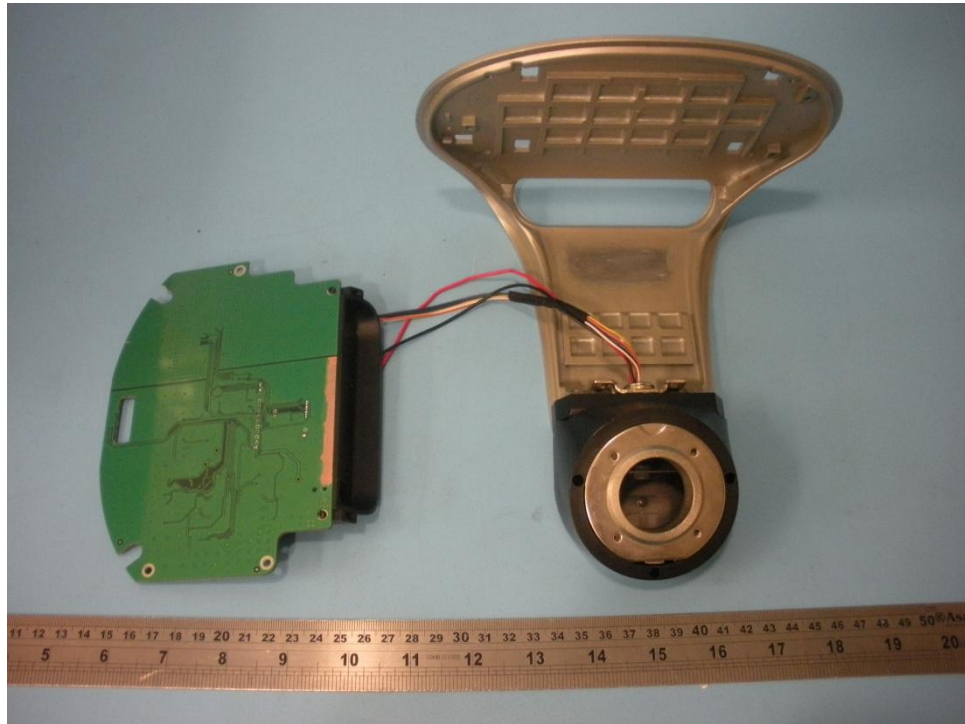
Appendix A



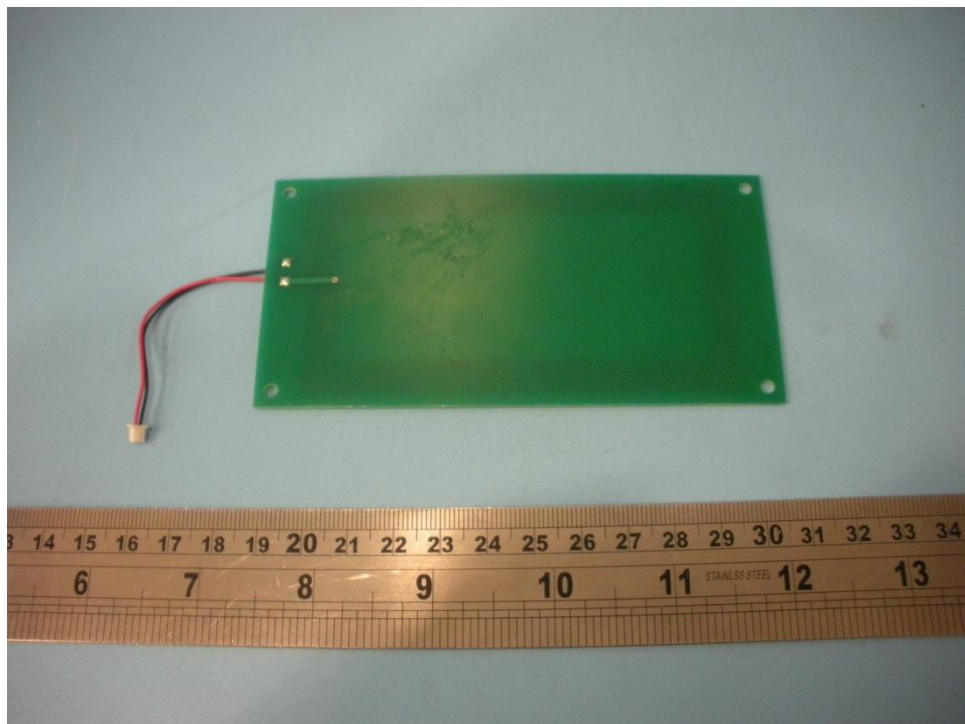
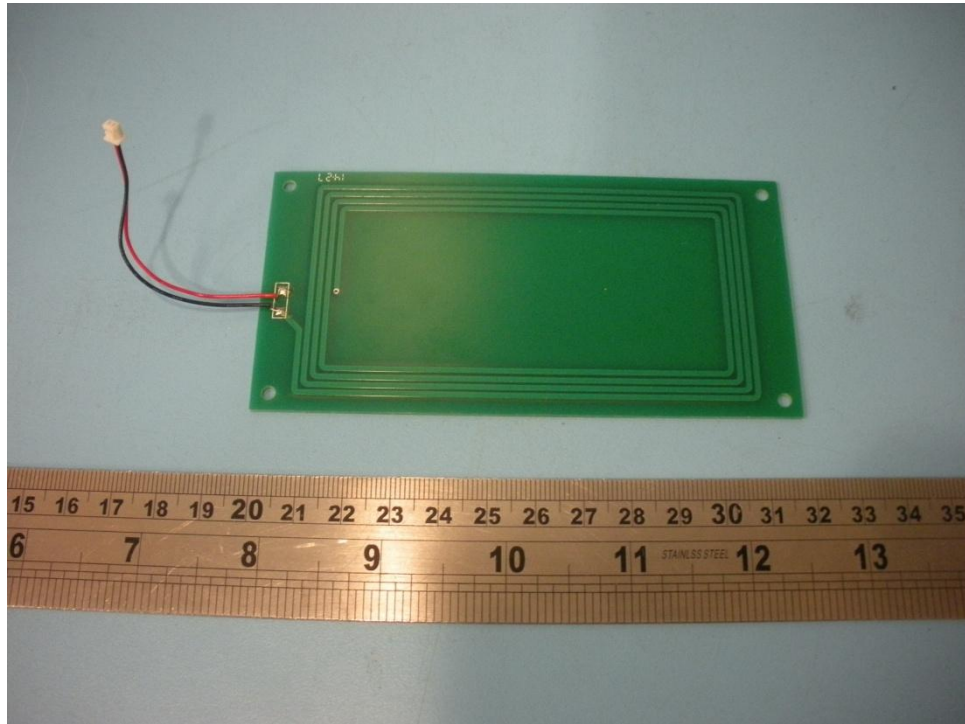
Appendix A



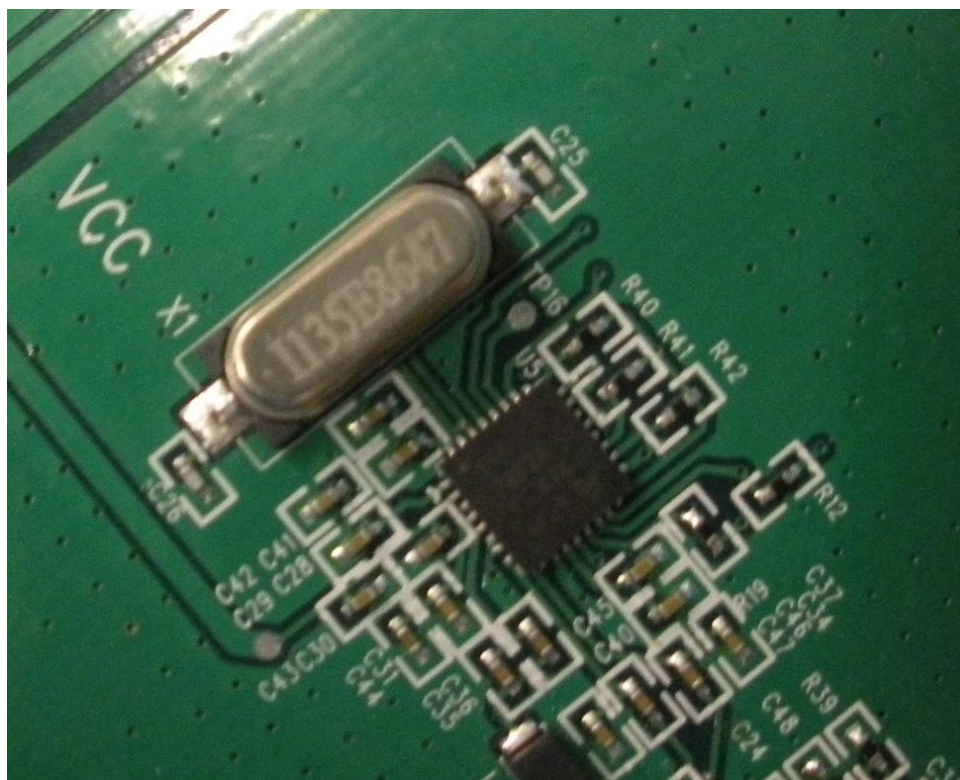
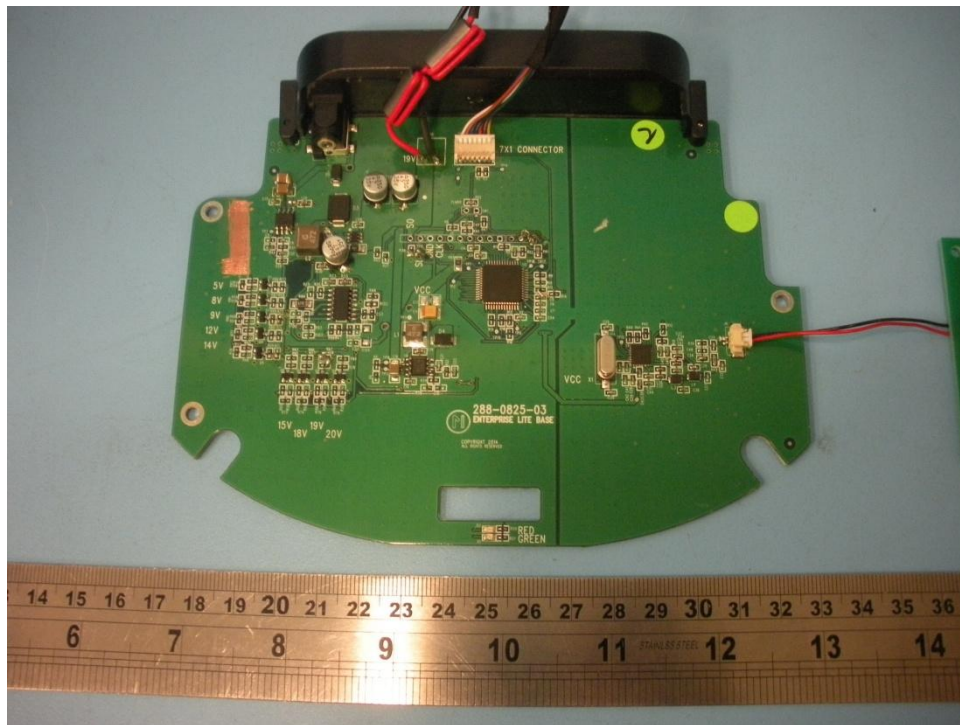
Appendix A



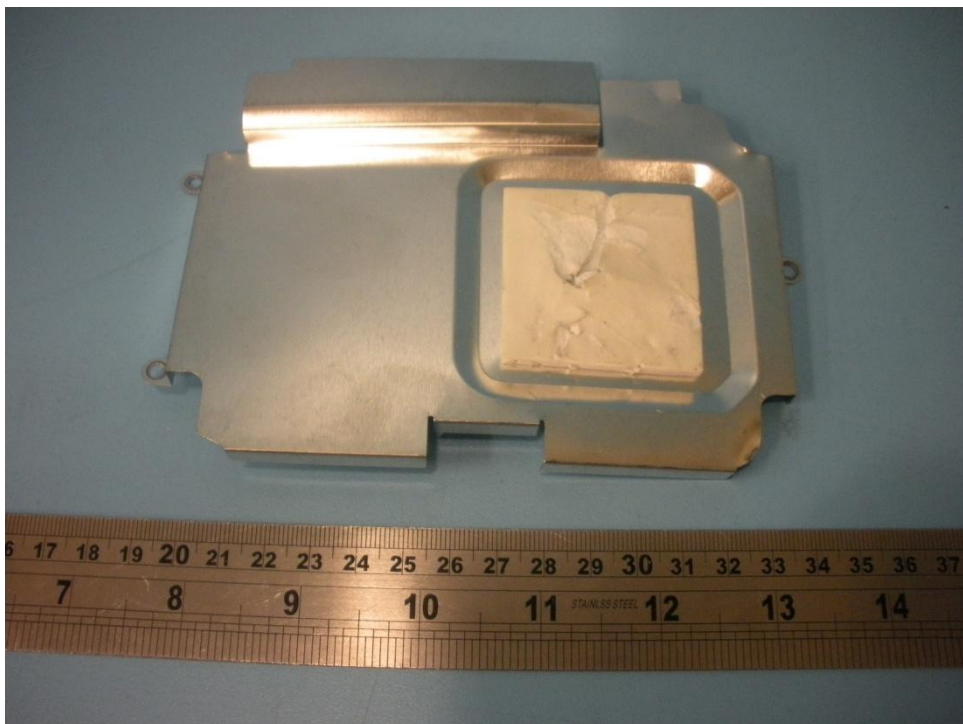
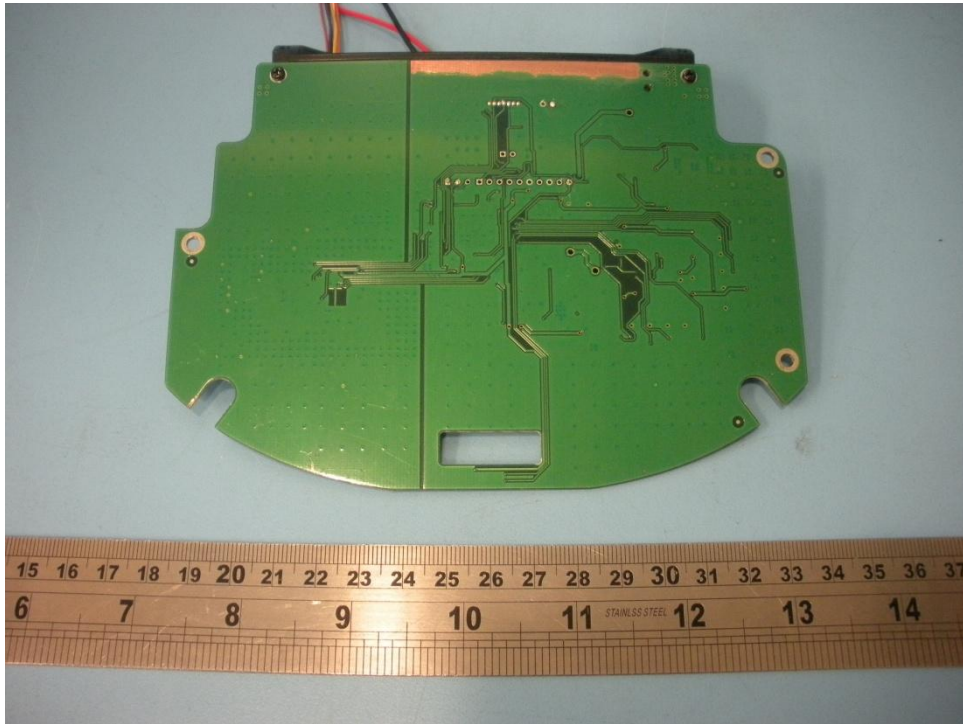
Appendix A



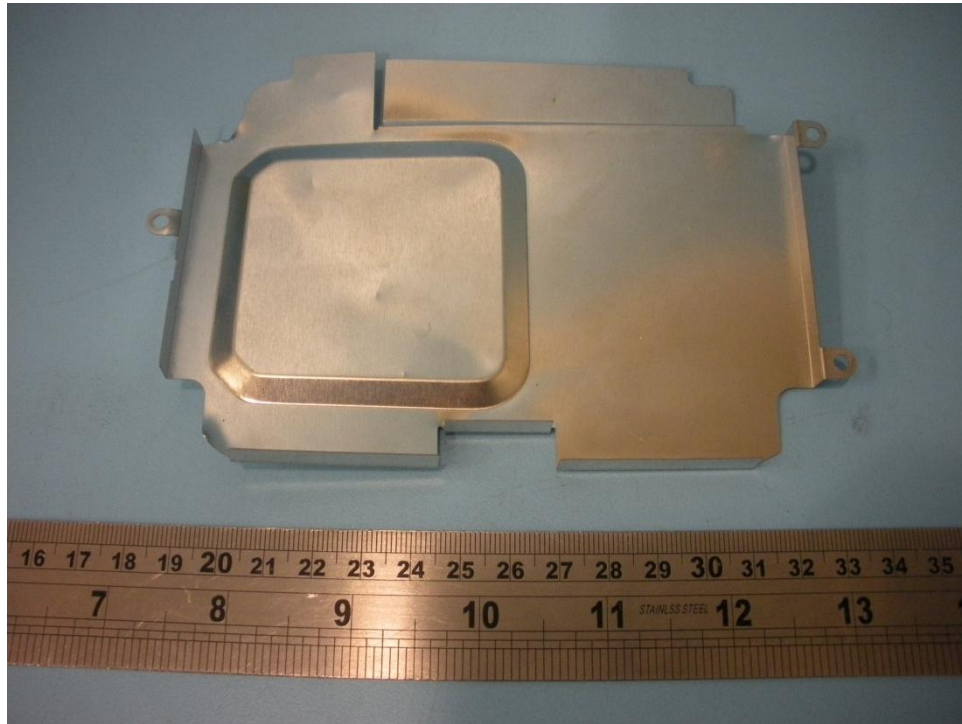
Appendix A



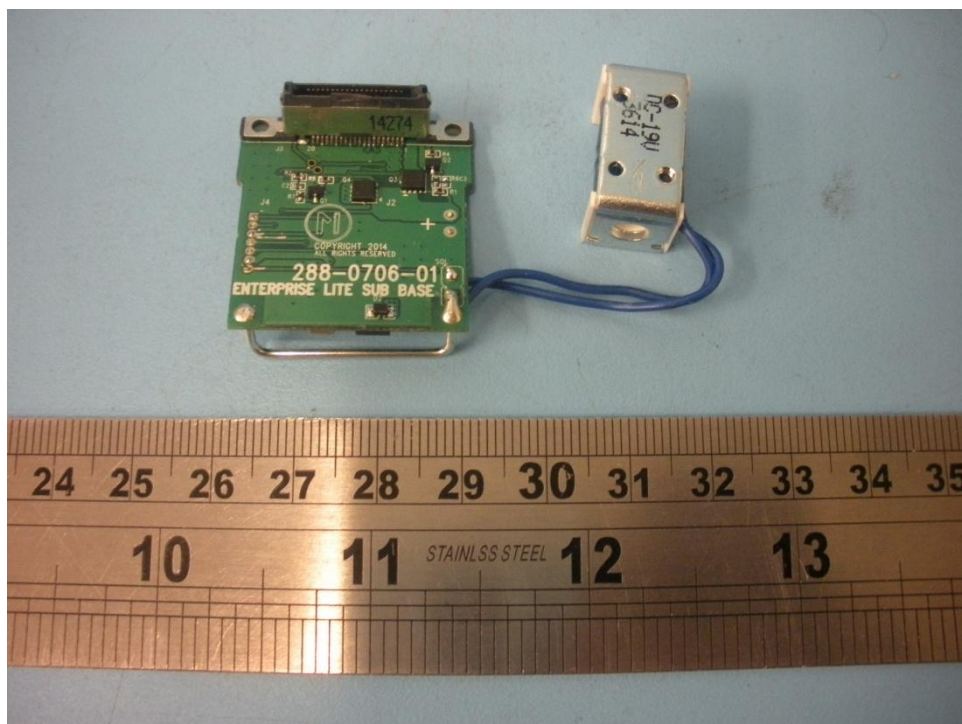
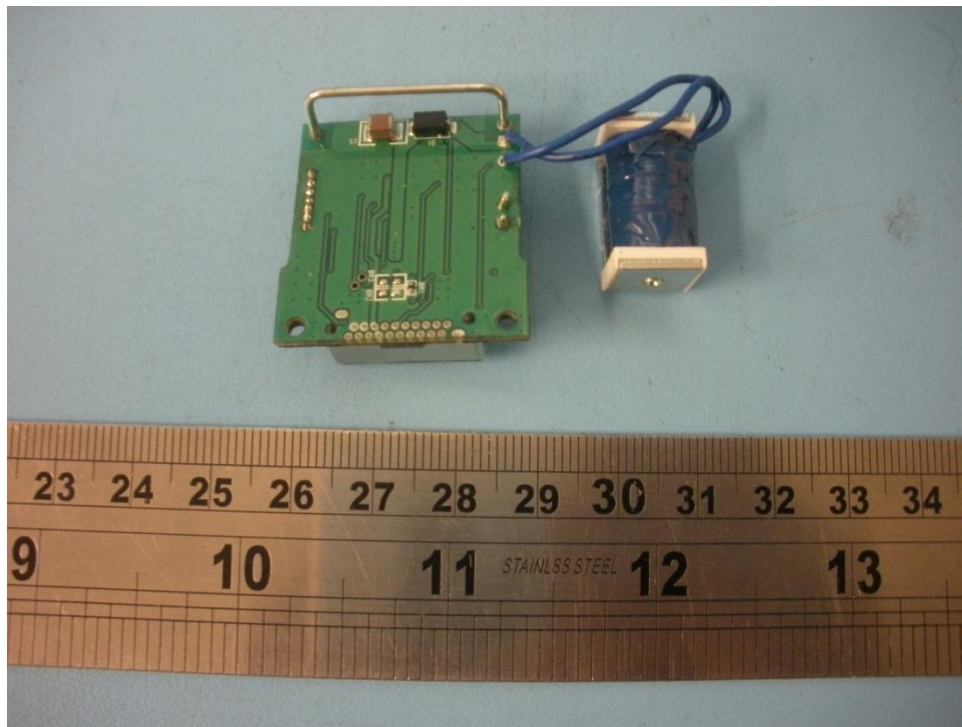
Appendix A



Appendix A



Appendix A



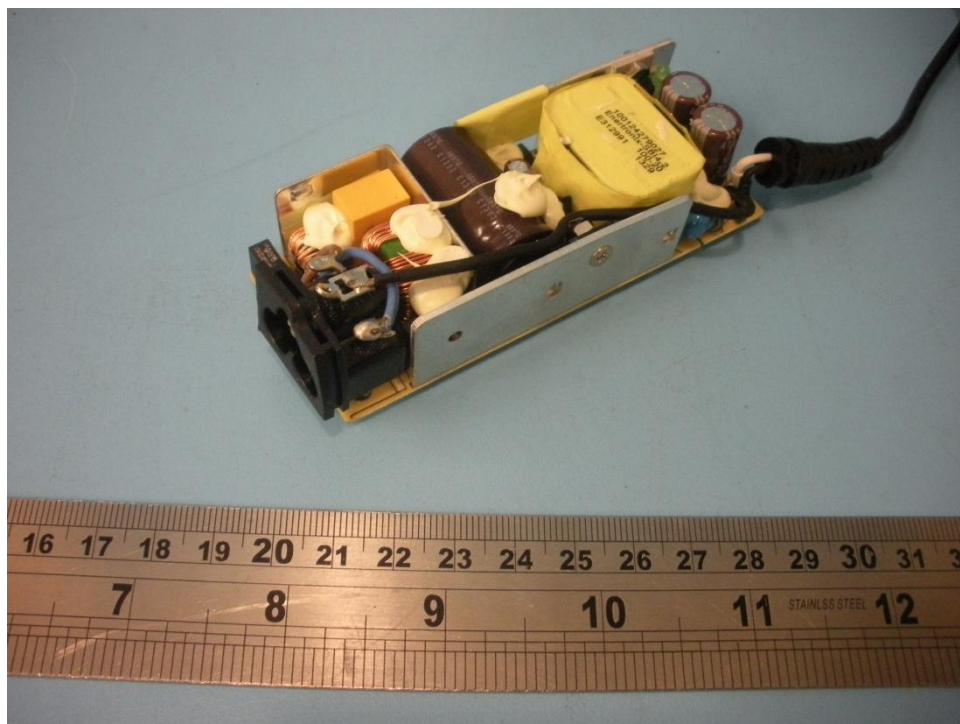
Appendix A



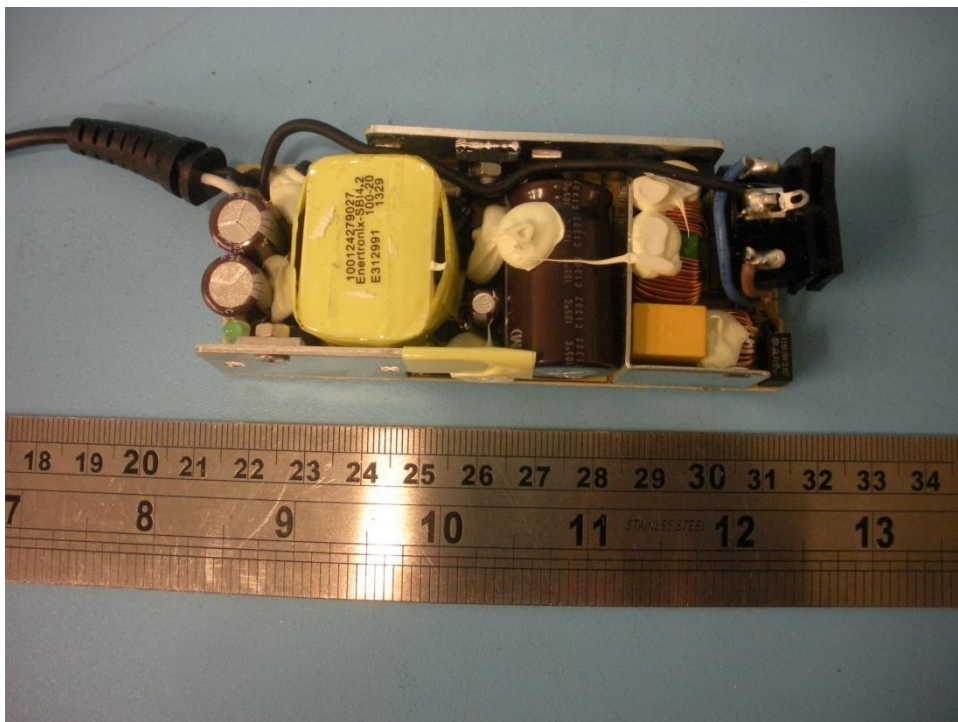
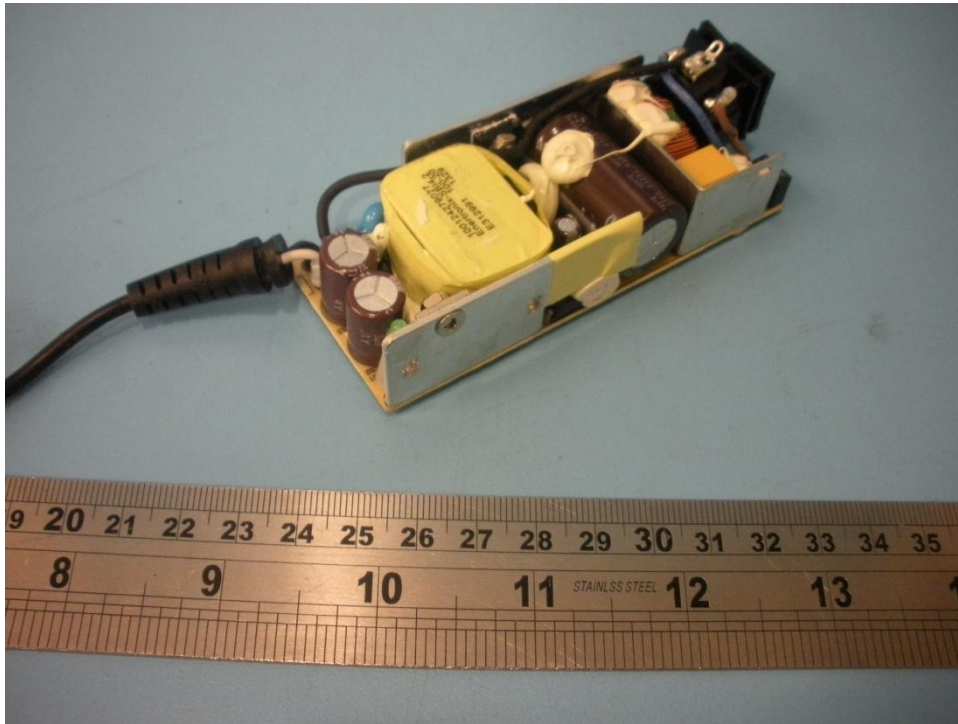
Appendix A



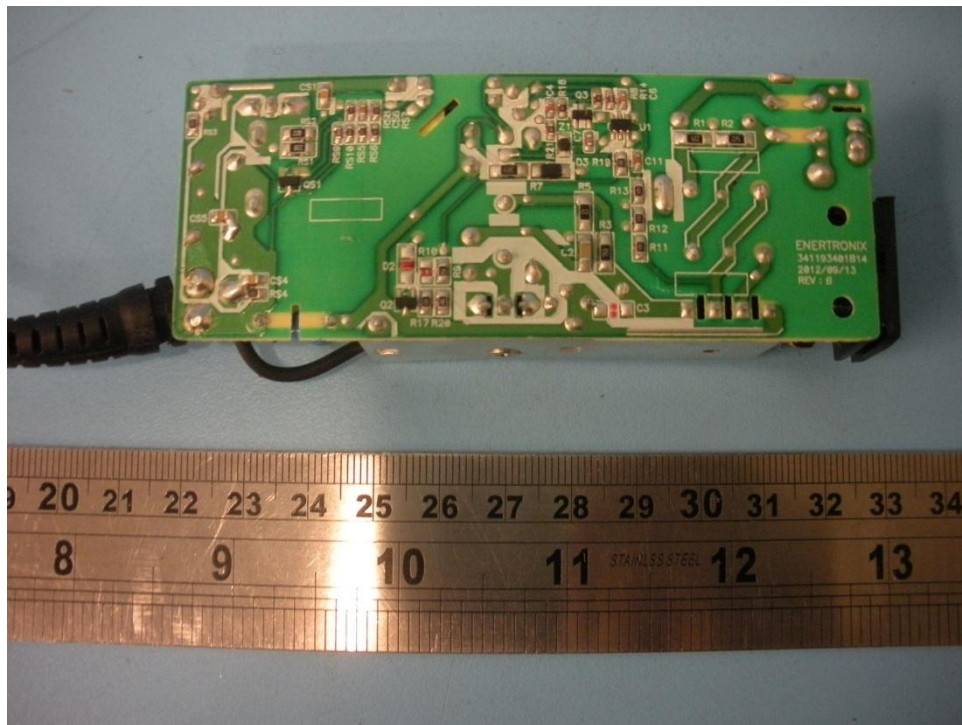
Appendix A



Appendix A



Appendix A



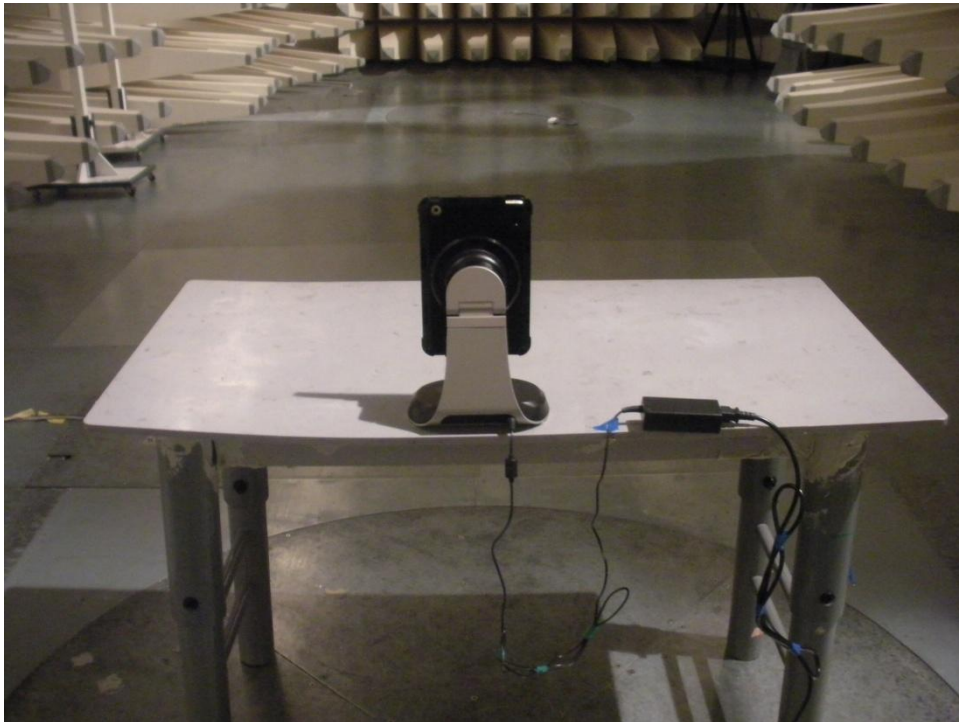
Appendix A

Test Support Equipment



9 Appendix B - Setup Photographs of EUT

Radiated Emission



Appendix B

Conducted Emission



10 Appendix C - Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v05r02 section 4.3.1,

The 1-g SAR test exclusion thresholds, for transmission frequency below 100MHz, at test separation distances ≤ 50 mm are determined by:

Power = 0.00000246 mW EIRP

$\frac{1}{2} * [(0.00000246 \text{ mW}) / (50 \text{ mm})] \cdot [\text{sqrt}(0.01356 \text{ GHz})] = 0.00000000286$ 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 13.56 MHz and the test separation distance is < 50 mm.

>> The power of EUT measured is $-12.38\text{dBuA/m} = 39.12\text{dBuV/m} = -56.08\text{dBm} = 0.00000246\text{mW}$

* Where “ $\text{dBuV/m} = \text{dBuA/m} + 51.5$ ” and “ $\text{dBm} = \text{dBuV/m} - 95.2$ ”

* $0.00000246\text{mW} = 10 \log(0.00000246) \text{ dBm} \sim -56.08\text{dBm}$