

FCC - TEST REPORTReport Number : **60.790.16.015.01R02** Date of Issue : March 19, 2016Model : **BKM5AB**Product Type : **Bike Speed/Cadence Sensor with ANT+/BLE**Applicant : Dayton Industrial Co., LtdAddress : 2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong KongProduction Facility : Kendy Enterprise LtdAddress : 2-12 Kwai Fat Road, 11-A Kwai Chung, New Territories, Hong KongTest Result : **Positive** **Negative**Total pages including Appendices : 22

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2 Description of Equipment Under Test

Description of the Equipment Under Test

| | |
|-----------------------------|---|
| Product: | Bike Speed/Cadence Sensor with ANT+/BLE |
| Model no.: | BKM5AB |
| FCC ID: | O4GBKM5AB |
| Rating: | 3.0VDC (1 x 3.0VDC size "CR2032" batteries) |
| Frequency: | 2457MHz |
| Antenna gain: | 0 dBi |
| Number of operated channel: | 1 |
| Modulation: | GFSK |

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 | NIL |
| FCC Title 47 Part 15.215 20dB & 99% Bandwidth | Site 2 |
| FCC Title 47 Part 15.249 Bandedge Emission | Site 2 |

4.1 Test Equipment Site List

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 |
| 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 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 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| FCC Title 47 Part 15.249 & 15.207 Conduct Emission | NIL | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| FCC Title 47 Part 15.215 20dB & 99% Bandwidth | 12-13 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| FCC Title 47 Part 15.249 Bandedge Emission | 14-15 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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.

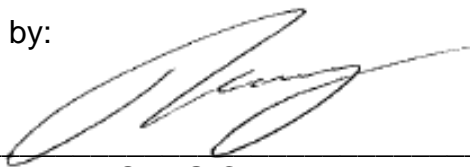
Sample Received Date: March 14, 2016

Testing Start Date: March 15, 2016

Testing End Date: March 18, 2016

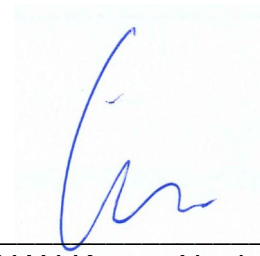
- TÜV SÜD HONG KONG LTD. -

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: BKM5AB
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.249 & 15.209, Antenna: Horizontal
 Comment: 3.0VDC
 Remark: 9kHz to 25GHz

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

| Frequency MHz | Result dB μ V/m | Limit dB μ V/m | Margin dB | Detector |
|------------------|------------------------|-----------------------|--------------|------------|
| 49.842 | 15.30 | 40 | -24.70 | Quasi Peak |
| 95.167 | 12.23 | 43.5 | -31.27 | Quasi Peak |
| 280.439 | 15.87 | 46 | -30.13 | Quasi Peak |
| 855.762 | 24.13 | 46 | -21.87 | Quasi Peak |
| 2457.000 | 84.72 | 114 | -29.28 | Peak |
| 2457.000 | 65.28 | 94 | -28.72 | Average |
| 4914.000 | 60.79 | 74 | -13.21 | Peak |
| 4914.000 | 42.11 | 54 | -11.89 | Average |
| 7371.000 | 58.02 | 74 | -15.98 | Peak |
| 7371.000 | 42.98 | 54 | -11.02 | Average |

Radiated Emission

EUT: BKM5AB
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.249 & 15.209, Antenna: Vertical
 Comment: 3.0VDC
 Remark: 9kHz to 25GHz

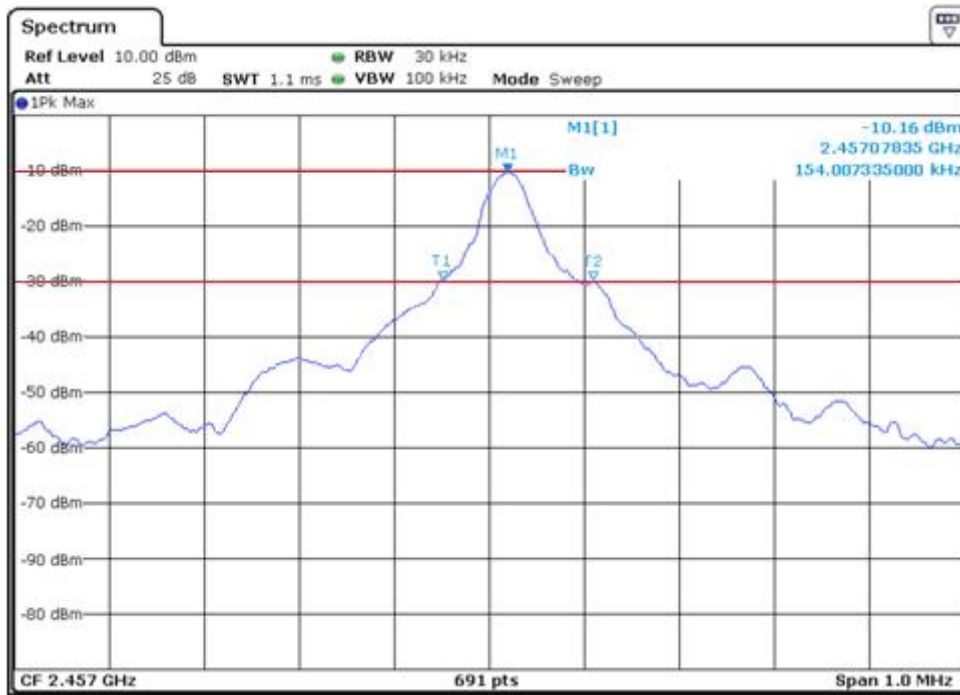
| | |
|-------------------------------------|------------|
| Test Result | |
| <input checked="" type="checkbox"/> | Passed |
| <input type="checkbox"/> | Not Passed |

| Frequency MHz | Result dBµV/m | Limit dBµV/m | Margin dB | Detector |
|------------------|------------------|-----------------|--------------|------------|
| 50.459 | 15.24 | 40 | -24.76 | Quasi Peak |
| 100.890 | 16.53 | 43.5 | -26.97 | Quasi Peak |
| 280.513 | 16.77 | 46 | -29.23 | Quasi Peak |
| 723.600 | 20.36 | 46 | -25.64 | Quasi Peak |
| 2457.000 | 84.16 | 114 | -29.84 | Peak |
| 2457.000 | 64.32 | 94 | -29.68 | Average |
| 4914.093 | 55.93 | 74 | -18.07 | Peak |
| 4914.093 | 42.16 | 54 | -11.84 | Average |
| 7371.145 | 52.88 | 74 | -21.12 | Peak |
| 7371.145 | 43.13 | 54 | -10.87 | Average |

7.2 20dB & 99% Bandwidth

EUT: Coach Smart
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.215, 20dB Bandwidth
 Comment: 3.0VDC

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

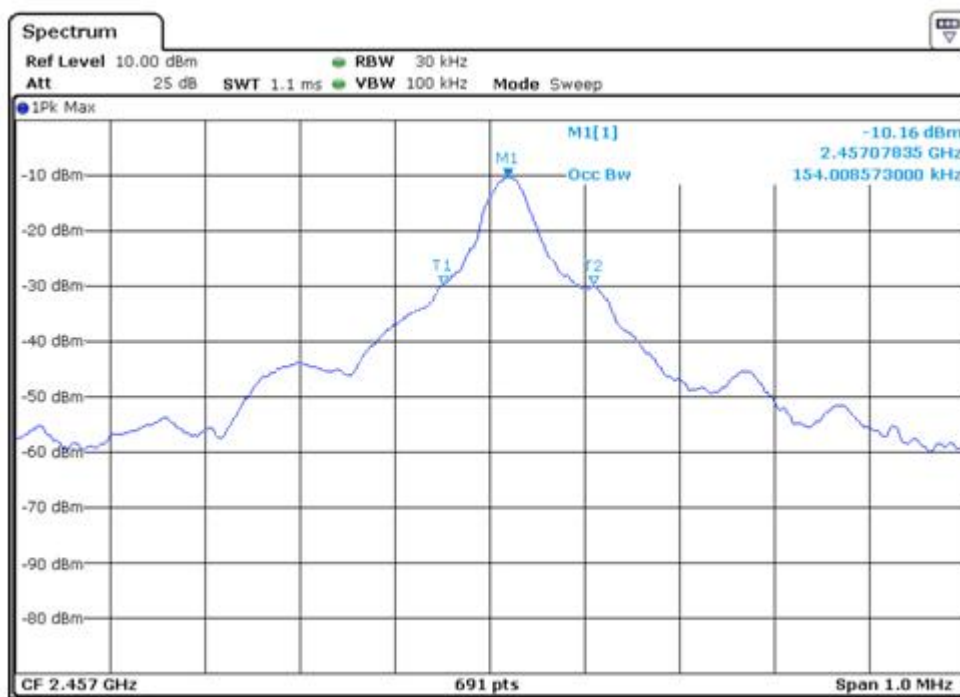


| |
|-----------------------|
| 20dB bandwidth |
| 154.007 kHz |

20dB & 99% Bandwidth

EUT: BKM5AB
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.215, 99% Bandwidth
 Comment: 3.0VDC

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

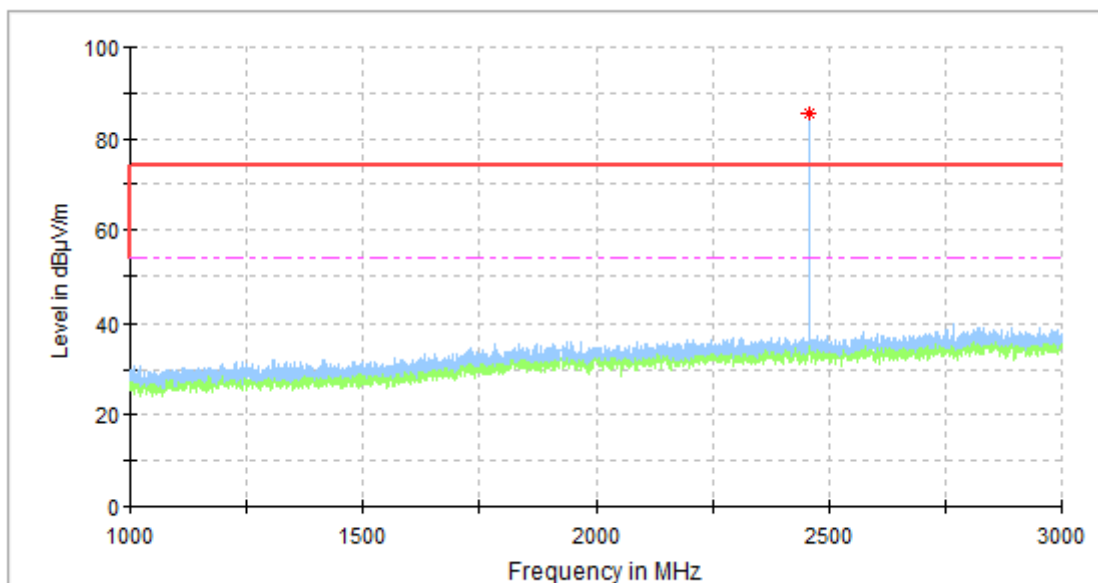


| |
|----------------------|
| 99% bandwidth |
| 154.008 kHz |

7.3 Bandedge Emission

EUT: BKM5AB
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.247, Antenna: Horizontal
 Comment: 3.0VDC

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

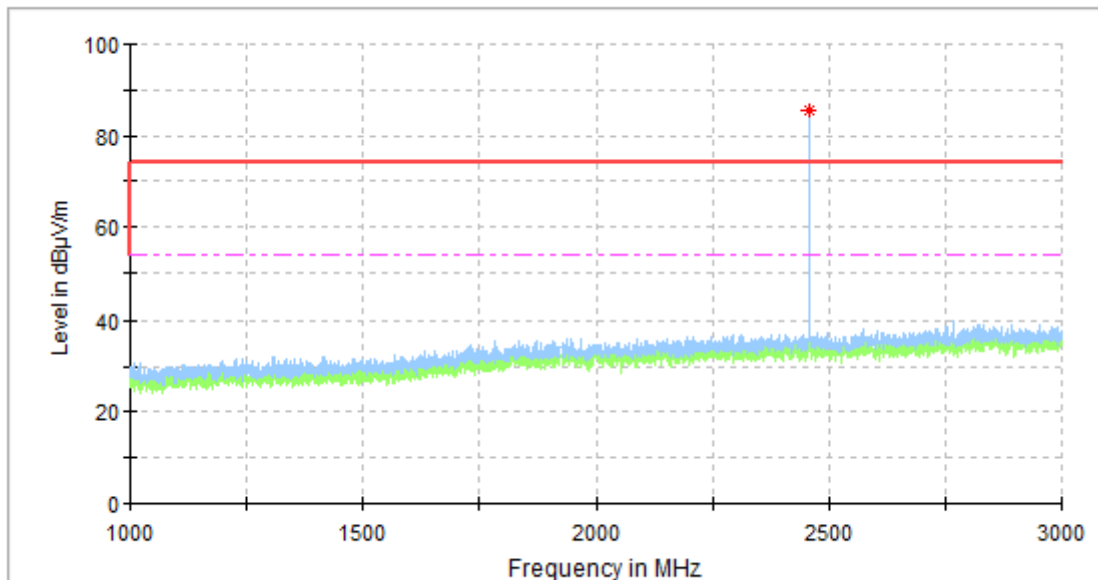


| Band | Frequency MHz | Result dBµV/m | Limit dBµV/m | Margin dB | Detector |
|------|---------------|---------------|--------------|-----------|----------|
| Low | 2390.000 | 33.46 | 74 | -40.54 | Peak |
| Low | 2390.000 | 31.21 | 54 | -22.79 | Average |
| High | 2483.500 | 35.03 | 74 | -38.97 | Peak |
| High | 2483.500 | 31.44 | 54 | -22.56 | Average |

Bandedge Emission

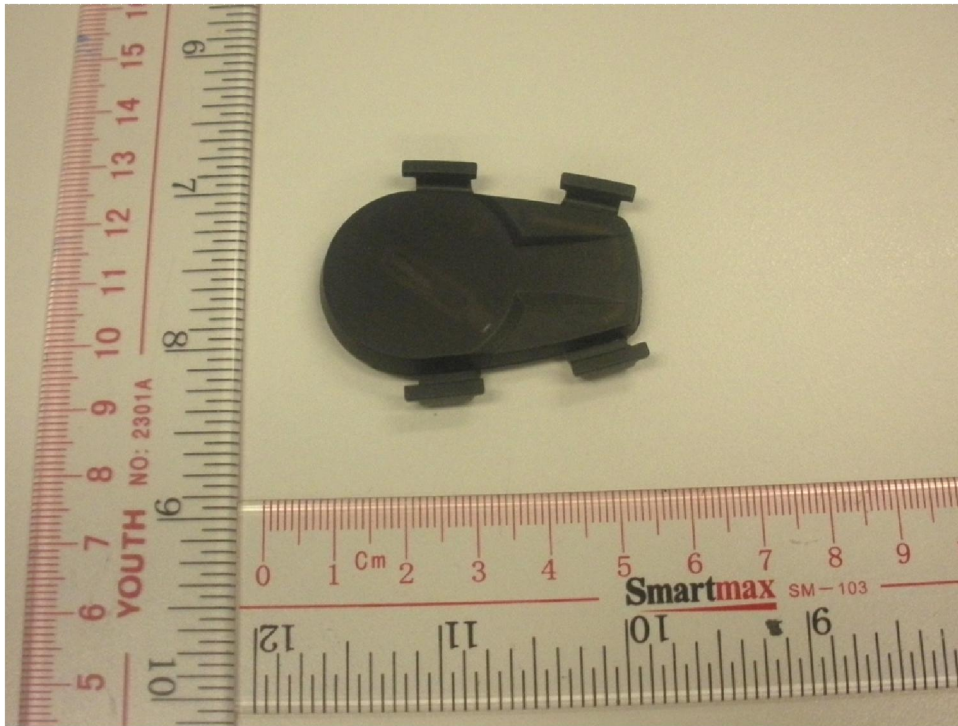
EUT: BKM5AB
 Op Condition: Operated, TX Mode (2457MHz)
 Test Specification: FCC15.247, Antenna: Vertical
 Comment: 3.0VDC

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



| Band | Frequency MHz | Result dBµV/m | Limit dBµV/m | Margin dB | Detector |
|------|------------------|------------------|-----------------|--------------|----------|
| Low | 2390.000 | 33.54 | 74 | -40.46 | Peak |
| Low | 2390.000 | 31.02 | 54 | -22.98 | Average |
| High | 2483.500 | 33.91 | 74 | -40.09 | Peak |
| High | 2483.500 | 32.03 | 54 | -21.97 | Average |

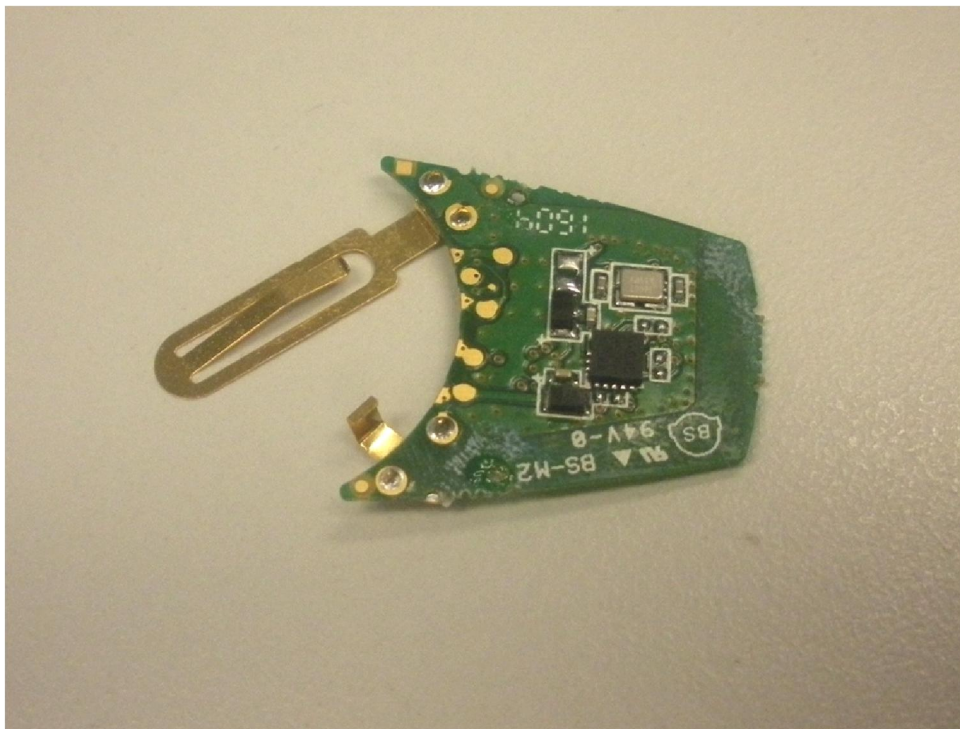
8 Appendix A - Photographs of EUT



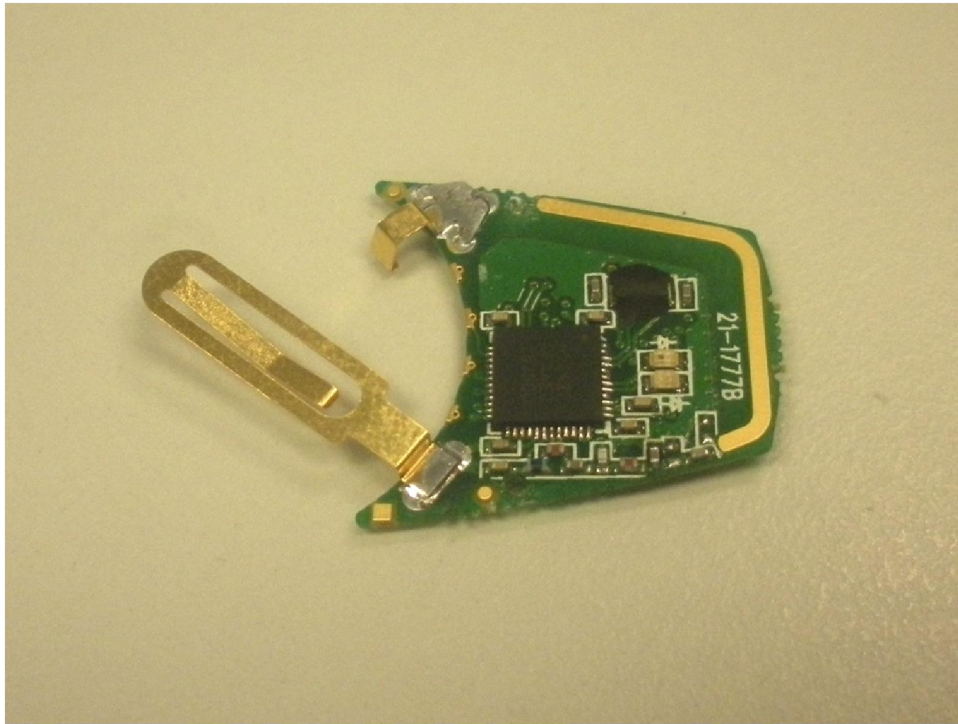
Appendix A



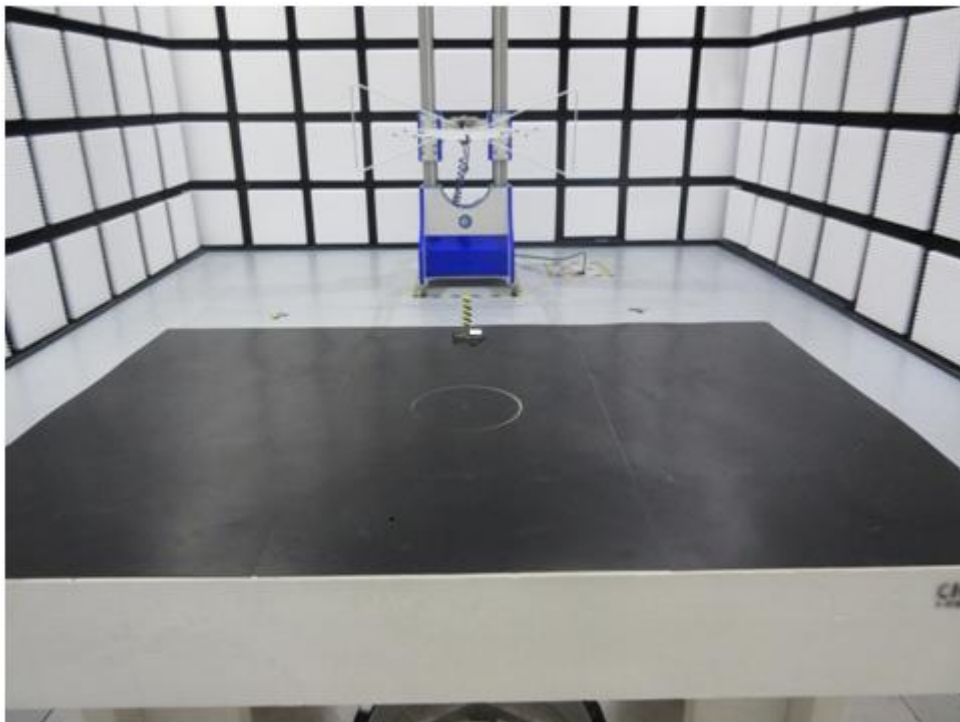
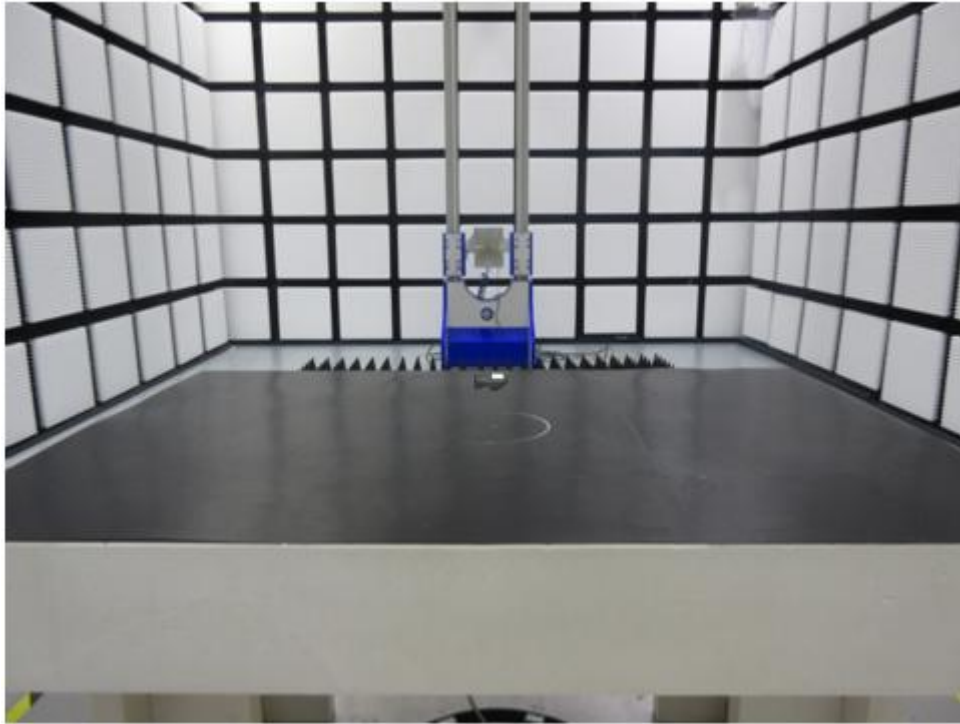
Appendix A



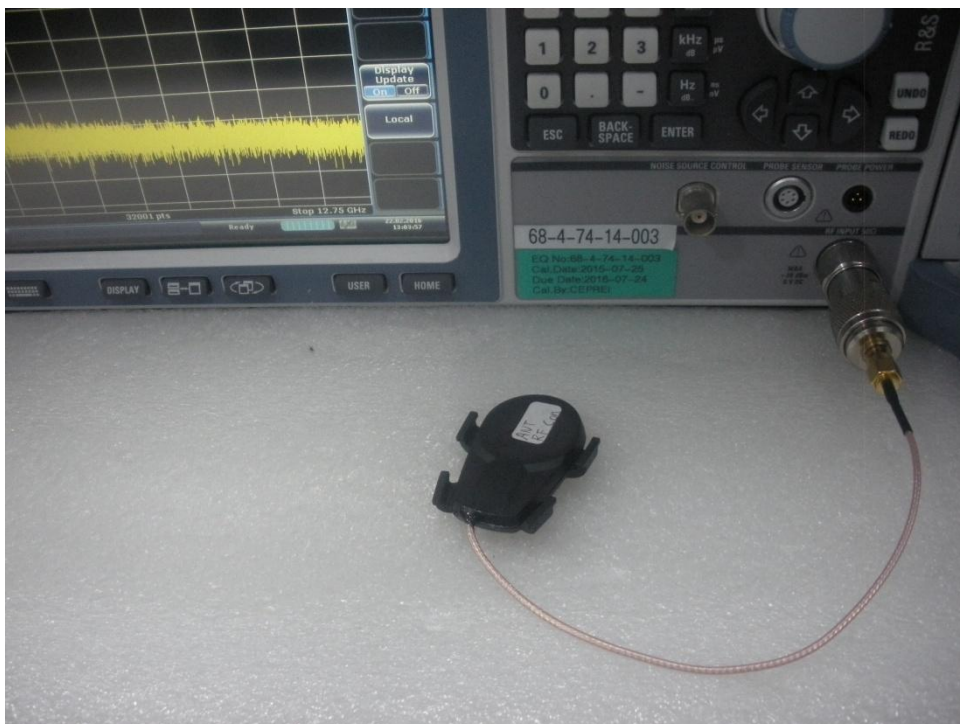
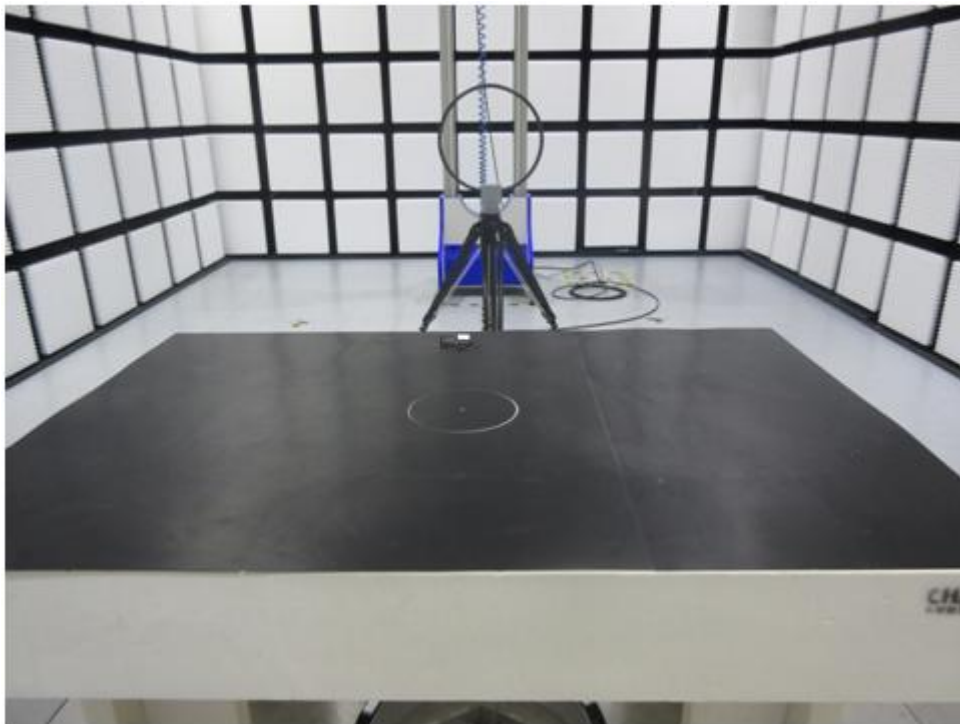
Appendix A



9 Appendix B - Setup Photographs of EUT



Appendix B



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 2.457GHz = 0.0963 mW EIRP

$[(0.0963 \text{ mW}) / (20 \text{ mm})] \cdot [\text{sqrt}(2.457 \text{ GHz})] = 0.007547$ 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 2457MHz, the test separation distance is < 50 mm. (Manufacturer specified the separation distance is: 20mm)

>> The power of EUT measured is:

- For 2457MHz: $0.0963\text{mW} = 10 \log(0.0963) \text{ dBm} \sim -10.16\text{dBm}$