

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                           |                                                                                                                                                                          |                  |                                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|----------------------------------------------|
| <b>Prüfbericht-Nr.:</b><br><i>Test Report No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>10055785 002</b>                                                                                       | <b>Auftrags-Nr.:</b><br><i>Order No.:</i>                                                                                                                                | <b>114066608</b> | <b>Seite 1 von 17</b><br><i>Page 1 of 17</i> |
| <b>Kunden-Referenz-Nr.:</b><br><i>Client Reference No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                         | N/A                                                                                                       | <b>Auftragsdatum:</b><br><i>Order date:</i>                                                                                                                              | 08-Jun-2017      |                                              |
| <b>Auftraggeber:</b><br><i>Client:</i>                                                                                                                                                                                                                                                                                                                                                                                                                              | Microchip Technology Inc., 2355 West Chandler Blvd. Chandler, Arizona 85224-6199, United States.          |                                                                                                                                                                          |                  |                                              |
| <b>Prüfgegenstand:</b><br><i>Test item:</i>                                                                                                                                                                                                                                                                                                                                                                                                                         | Bluetooth module                                                                                          |                                                                                                                                                                          |                  |                                              |
| <b>Bezeichnung / Typ-Nr.:</b><br><i>Identification / Type No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                  | BM64SPKS1NC2                                                                                              |                                                                                                                                                                          |                  |                                              |
| <b>Auftrags-Inhalt:</b><br><i>Order content:</i>                                                                                                                                                                                                                                                                                                                                                                                                                    | FCC Part 15C/IC RSS-247 (Class II Permissive Change) Test report(BLE)<br>spurious radiated emissions only |                                                                                                                                                                          |                  |                                              |
| <b>Prüfgrundlage:</b><br><i>Test specification:</i>                                                                                                                                                                                                                                                                                                                                                                                                                 | FCC 47CFR Part 15: Subpart C Section 15.247<br>RSS-247 (02-2017)                                          |                                                                                                                                                                          |                  |                                              |
| <b>Wareneingangsdatum:</b><br><i>Date of receipt:</i>                                                                                                                                                                                                                                                                                                                                                                                                               | 25-Jul-2017                                                                                               |                                                                                                                                                                          |                  |                                              |
| <b>Prüfmuster-Nr.:</b><br><i>Test sample No.:</i>                                                                                                                                                                                                                                                                                                                                                                                                                   | A000577774-001<br>A000577774-002                                                                          |                                                                                                                                                                          |                  |                                              |
| <b>Prüfzeitraum:</b><br><i>Testing period:</i>                                                                                                                                                                                                                                                                                                                                                                                                                      | 02-Aug-2017 - 03-Aug-2017                                                                                 |                                                                                                                                                                          |                  |                                              |
| <b>Ort der Prüfung:</b><br><i>Place of testing:</i>                                                                                                                                                                                                                                                                                                                                                                                                                 | EMC/RF Laboratory Taipei                                                                                  |                                                                                                                                                                          |                  |                                              |
| <b>Prüflaboratorium:</b><br><i>Testing laboratory:</i>                                                                                                                                                                                                                                                                                                                                                                                                              | TUV Rheinland Taiwan Ltd.                                                                                 |                                                                                                                                                                          |                  |                                              |
| <b>Prüfergebnis*:</b><br><i>Test result*:</i>                                                                                                                                                                                                                                                                                                                                                                                                                       | Pass                                                                                                      |                                                                                                                                                                          |                  |                                              |
| <b>Report Date / tested by:</b><br>2017-09-04 Ryan W. T. Chen / Project Manager<br><i>Datum Name / Stellung Unterschrift</i><br><i>Date Name / Position Signature</i>                                                                                                                                                                                                                                                                                               |                                                                                                           | <b>kontrolliert von / reviewed by:</b><br>2017-09-04 Arvin Ho/Vice General Manager<br><i>Datum Name / Stellung Unterschrift</i><br><i>Date Name / Position Signature</i> |                  |                                              |
| <b>Sonstiges / Other:</b><br><br>Change RF IC to ROM version and package different.                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                           |                                                                                                                                                                          |                  |                                              |
| <b>Zustand des Prüfgegenstandes bei Anlieferung:</b><br><i>Condition of the test item at delivery:</i>                                                                                                                                                                                                                                                                                                                                                              |                                                                                                           | Prüfmuster vollständig und unbeschädigt<br><i>Test item complete and undamaged</i>                                                                                       |                  |                                              |
| <p>* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft<br/>P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet</p> <p>Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor<br/>P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested</p>                      |                                                                                                           |                                                                                                                                                                          |                  |                                              |
| <p><b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b><br/> <i>This test report only relates to the a. M. Test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i></p> |                                                                                                           |                                                                                                                                                                          |                  |                                              |

**Prüfbericht - Nr.: 10055785 002**  
*Test Report No.*

**Seite 2 von 17**  
*Page 2 of 17*

## TEST SUMMARY

### 5.1.1 SPURIOUS EMISSION

*RESULT: Passed*

## Contents

|            |                                                           |           |
|------------|-----------------------------------------------------------|-----------|
| <b>1.</b>  | <b>GENERAL REMARKS .....</b>                              | <b>4</b>  |
| <b>1.1</b> | <b>COMPLEMENTARY MATERIALS.....</b>                       | <b>4</b>  |
| <b>2.</b>  | <b>TEST SITES .....</b>                                   | <b>5</b>  |
| <b>2.1</b> | <b>TEST FACILITY.....</b>                                 | <b>5</b>  |
| <b>2.2</b> | <b>LIST OF TEST AND MEASUREMENT INSTRUMENTS.....</b>      | <b>6</b>  |
| <b>2.3</b> | <b>TRACEABILITY .....</b>                                 | <b>7</b>  |
| <b>2.4</b> | <b>CALIBRATION .....</b>                                  | <b>7</b>  |
| <b>2.5</b> | <b>MEASUREMENT UNCERTAINTY .....</b>                      | <b>7</b>  |
| <b>3.</b>  | <b>GENERAL PRODUCT INFORMATION.....</b>                   | <b>8</b>  |
| <b>3.1</b> | <b>PRODUCT FUNCTION AND INTENDED USE .....</b>            | <b>8</b>  |
| <b>3.2</b> | <b>SYSTEM DETAILS AND RATINGS.....</b>                    | <b>8</b>  |
| <b>3.3</b> | <b>INDEPENDENT OPERATION MODES.....</b>                   | <b>9</b>  |
| <b>3.4</b> | <b>NOISE GENERATING AND NOISE SUPPRESSING PARTS .....</b> | <b>9</b>  |
| <b>3.5</b> | <b>SUBMITTED DOCUMENTS.....</b>                           | <b>9</b>  |
| <b>4.</b>  | <b>TEST SET-UP AND OPERATION MODES.....</b>               | <b>10</b> |
| <b>4.1</b> | <b>PRINCIPLE OF CONFIGURATION SELECTION .....</b>         | <b>10</b> |
| <b>4.2</b> | <b>TEST OPERATION AND TEST SOFTWARE.....</b>              | <b>10</b> |
| <b>4.3</b> | <b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....</b>  | <b>10</b> |
| <b>4.4</b> | <b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....</b>     | <b>11</b> |
| <b>4.5</b> | <b>TEST SETUP DIAGRAM .....</b>                           | <b>11</b> |
| <b>5.</b>  | <b>TEST RESULTS .....</b>                                 | <b>13</b> |
| 5.1.1      | <i>Spurious Emission .....</i>                            | <i>13</i> |
| <b>6.</b>  | <b>PHOTOGRAPHS OF THE TEST SET-UP.....</b>                | <b>14</b> |
| <b>7.</b>  | <b>LIST OF TABLES .....</b>                               | <b>17</b> |
| <b>8.</b>  | <b>LIST OF PHOTOGRAPHS.....</b>                           | <b>17</b> |

## 1. General Remarks

### 1.1 Complementary Materials

These attachments are integral parts of this test report:

**Appendix P: Photo Documentation internal view**  
(File Name: 10055785 002 APPENDIX P)

**Appendix D: Test Result of Radiated Emissions**  
(File Name: 10055785 002 APPENDIX D)

Test Specifications

The following standards were applied.

**Table 1: Applied Standard and Test Levels**

| <b>Radio</b>                                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FCC CFR47 Part 15: Subpart C Section 15.247<br>RSS-247 Issue 2 (Feb 2017)<br>RSS-Gen, Issue 4, November 2014<br>ANSI C63.10:2013<br>KDB558074 D01 DTS Meas Guidance v03r05 |

## 2. Test Sites

### 2.1 Test Facility

TUV Rheinland Taiwan Ltd.  
Taipei Office

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.  
Taipei City 105  
Taiwan (R.O.C.)

FCC RegistrationNo.: 365730  
IC Canada Registration No.: 9465A-1  
TAF Accredited NCC Test Lab. No.:0759  
TAF ISO17025 Certification effective periods: 2016-Jul-1<sup>st</sup> to 2019-Jun-30<sup>th</sup>



**Testing Laboratory**  
**0759**

## 2.2 List of Test and Measurement Instruments

**Table 2: List of Test and Measurement Equipment**

| Kind of Equipment             | Manu-facturer  | Type      | S/N         | Last Calibration | Next Calibration |
|-------------------------------|----------------|-----------|-------------|------------------|------------------|
| Test Software                 | Farad          | EZ_EMC    | Ver. TUV3A1 | N/A              | N/A              |
| EMI Test Receiver             | R&S            | ESR7      | 101062      | 2016/09/12       | 2017/09/12       |
| Spectrum Analyzer             | R&S            | FSV 40    | 100921      | 2017/05/02       | 2018/05/01       |
| Spectrum Analyzer             | Agilent        | N9010A    | MY53470241  | 2017/05/23       | 2018/05/22       |
| Preamplifier (30MHz -1GHz)    | HP             | 8447D     | 2944A06641  | 2016/12/28       | 2017/12/28       |
| Preamplifier (18 GHz -40 GHz) | COM-POWER      | PAM-840   | 461257      | 2016/12/01       | 2017/12/01       |
| Pre-Amplifier (1GHz~18GHz)    | EM Electronics | EM01G18G  | 060558      | 2016/11/17       | 2017/11/17       |
| Bilog Antenna                 | TESEQ          | CBL6111D  | 29802       | 2017/07/12       | 2018/07/12       |
| Horn Antenna                  | ETS-Lindgren   | 3117      | 138160      | 2017/05/25       | 2018/05/25       |
| Horn Antenna (18GHz~40GHz)    | COM-POWER      | AH-840    | 101031      | 2016/11/22       | 2017/11/22       |
| Loop Antenna                  | Schwarzbeck    | FMZB 1513 | 1513-076    | 2017/06/14       | 2018/06/14       |
| EMI Test Receiver             | R&S            | ESCI7     | 100797      | 2016/12/30       | 2017/12/30       |
| Spectrum Analyzer             | R&S            | FSL3      | 101943      | 2015/09/07       | 2017/09/07       |
| Temp. & Humid. Chamber        | WISEWIND       | 1509      | 509Q24R     | 2017/05/24       | 2018/05/24       |
| LISN (1 phase)                | R&S            | ENV216    | 101243      | 2017/06/18       | 2018/06/18       |
| LISN                          | R&S            | ENV216    | 101262      | 2017/06/22       | 2018/06/21       |

## 2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular schedule using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements.

**Table 3: Emission Measurement Uncertainty**

| Parameter                     | Uncertainty            |
|-------------------------------|------------------------|
| Radio Frequency               | $\pm 1 \times 10^{-7}$ |
| RF power, conducted           | $\pm 1.5$ dB           |
| RF power density, conducted   | $\pm 3$ dB             |
| spurious emissions, conducted | $\pm 3$ dB             |
| all emissions, radiated       | $\pm 6$ dB             |
| Temperature                   | $\pm 1$ °C             |
| Humidity                      | $\pm 5$ %              |
| DC and low frequency voltages | $\pm 3$ %              |

### 3. General Product Information

#### 3.1 Product Function and Intended Use

"The EUT is a fully qualified Bluetooth version 4.2 (BDR/EDR/BLE) module for designers to add Bluetooth wireless audio and voice applications to their products."

For details refer to the User Guide, Data Sheet and Circuit Diagram.

#### 3.2 System Details and Ratings

**Table 4: Basic Information of EUT**

| Item                        | EUT information  |
|-----------------------------|------------------|
| Kind of Equipment/Test Item | Bluetooth module |
| Type Identification         | BM64SPKS1NC2     |
| Brand Name                  | Microchip        |
| FCC ID                      | A8TBM64S2        |
| Canada ID                   | 12246A-BM64S2    |
| Canada HVIN                 | BM64SPKS1MC2     |

**Table 5: Technical Specification of EUT**

| Technical Specification | Value                     |
|-------------------------|---------------------------|
| Operating Frequencies   | 2402~2480 MHz             |
| Channel Spacing         | 2 MHz                     |
| Channel number          | 40                        |
| Operation Voltage       | 3.2V~4.2V, tested in 3.3V |
| Modulation              | GFSK                      |
| Antenna gain            | 1.927 dBi max@2.400 GHz   |

### **3.3 Independent Operation Modes**

Basic operation modes are:

- A. Transmitting
  - 1. Low channel
  - 2. Middle channel
  - 3. High channel
- B. Receiving
- C. Standby
- D. Off

### **3.4 Noise Generating and Noise Suppressing Parts**

Refer to the Circuit Diagram.

### **3.5 Submitted Documents**

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed in section 3.3 as appropriate.

The samples were used as follows:

Conducted: **A000577774-002**

Radiation: **A000577774-001**

Full test was applied on all test modes, but only worst case was shown

### 4.3 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

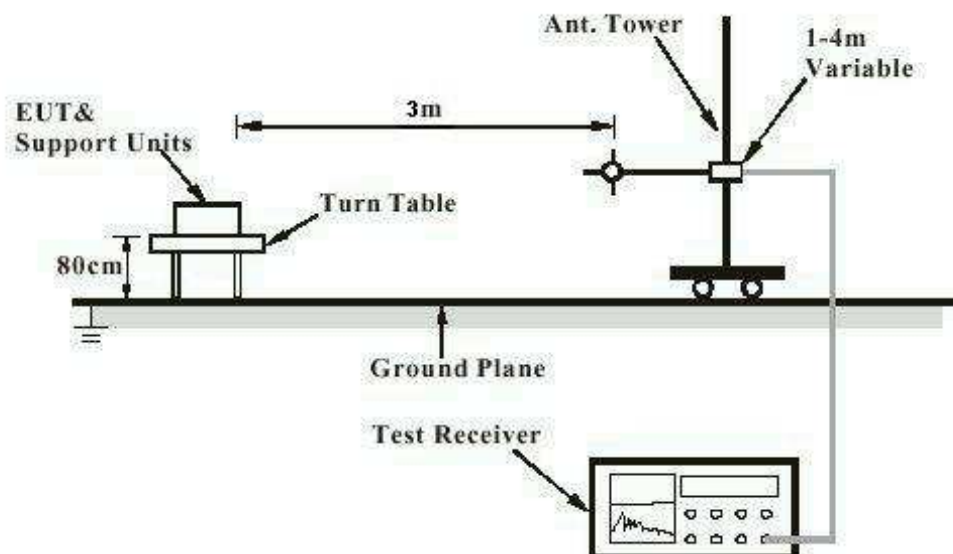
| Description      | Manufacturer | Model No. | Serial No. |
|------------------|--------------|-----------|------------|
| Notebook(EMC-06) | Lenovo       | TP00048A  | PB-0F8B2   |

## 4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

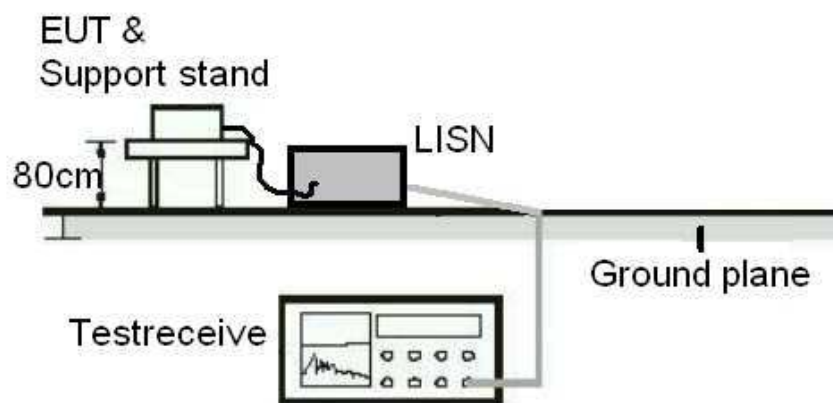
## 4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test



Note: Measurements above 1 GHz are done with a table height of 1.5m

**Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)**



## 5. Test Results

### 5.1.1 Spurious Emission

**RESULT:**
**Passed**

|                   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test standard     | : | FCC part 15.247(d), FCC 15.205, FCC 15.209, RSS-210 2.2, RSS-247 5.5 and RSS-Gen 8.9<br>LP0002(2016): 3.10.1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Basic standard    | : | ANSI C63.10: 2009                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Limits            | : | Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) and RSS-Gen i4, 8.9 (Table 6), must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen i4, 8.9 (Table 4 and 5).<br>Radiated emissions which fall in the restricted bands, as defined in LP0002(2016): 2.7 , must comply with the radiated emission limits specified in LP0002(2016): 2.8<br>Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in FCC 15.209(a) and FCC 15.249(a), RSS-Gen i4, 8.9 (Table 4 and 5) and RSS-210 A2.9(a).<br>Emission radiated outside the specified frequency bands must comply with the radiated emission limits specified in LP0002(2016): 2.8 |
| Kind of test site | : | 3m Semi-Anechoic Chamber                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Test setup**

|                |   |                   |
|----------------|---|-------------------|
| Test Channel   | : | Low/ Middle/ High |
| Operation mode | : | A, B              |

Remark: Testing was carried out within frequency range 30MHz to the tenth harmonic.

For details refer to Appendix D.

Testing was carried out within frequency range 30MHz to the tenth harmonic. For details refer to Appendix D. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

## 6. Photographs of the Test Set-Up

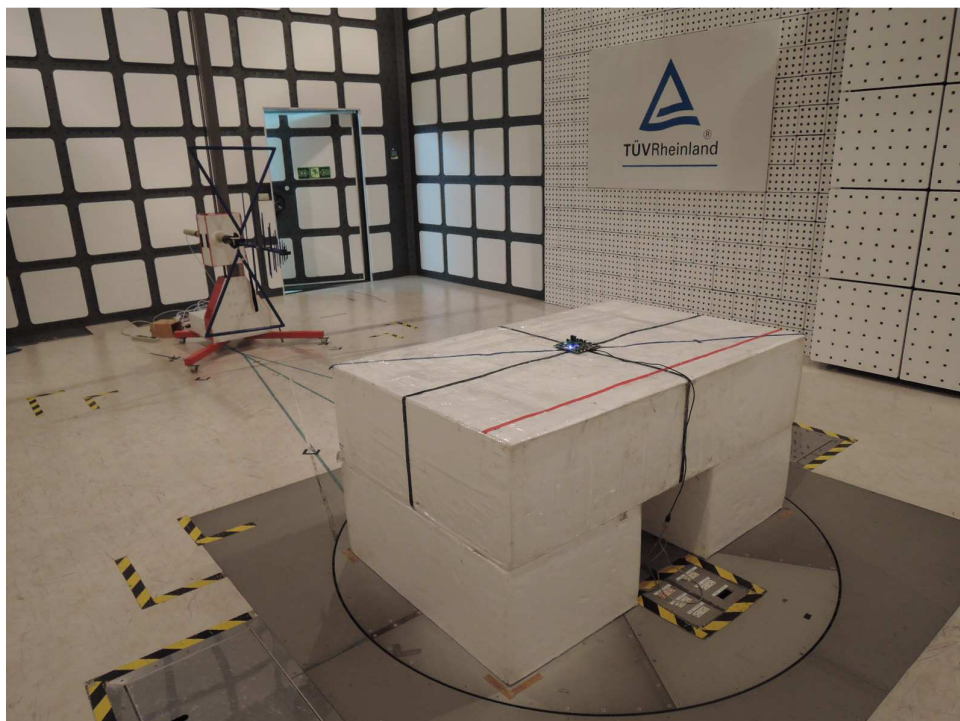
**Photograph 1: Set-up for Spurious Emissions (Front View)**



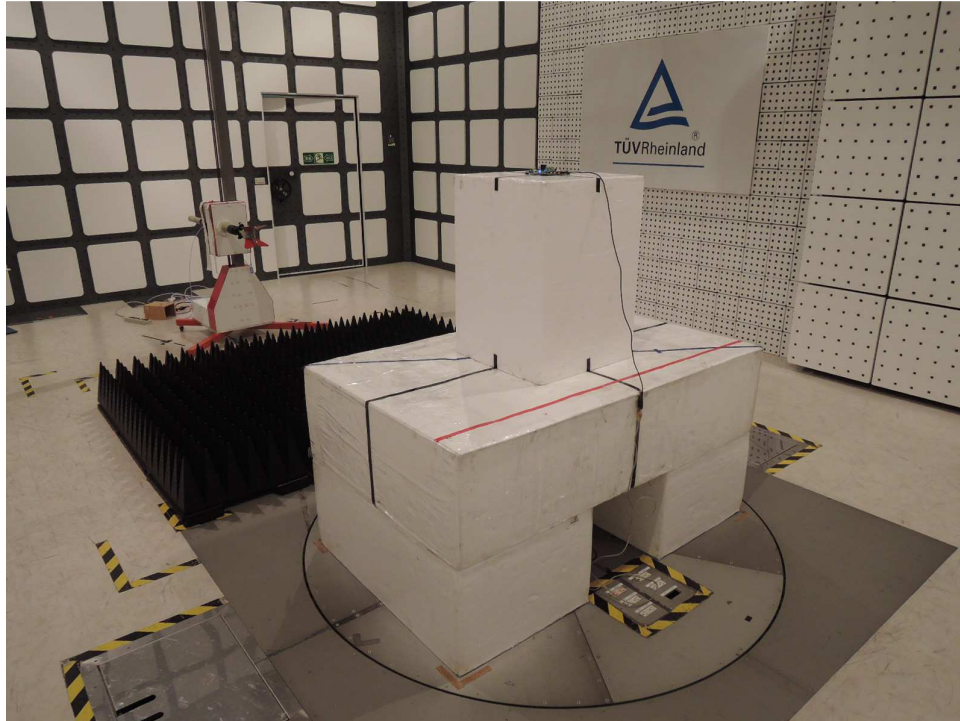
**Photograph 2: Set-up for Spurious Emissions (Back View 1)**



**Photograph 3: Set-up for Spurious Emissions (Back View 2)**



**Photograph 4: Set-up for Spurious Emissions (Back View 3)**



## 7. List of Tables

|                                                       |   |
|-------------------------------------------------------|---|
| Table 1: Applied Standard and Test Levels .....       | 4 |
| Table 2: List of Test and Measurement Equipment ..... | 6 |
| Table 3: Emission Measurement Uncertainty.....        | 7 |
| Table 4: Basic Information of EUT .....               | 8 |
| Table 5: Technical Specification of EUT .....         | 8 |

## 8. List of Photographs

|                                                                 |    |
|-----------------------------------------------------------------|----|
| Photograph 1: Set-up for Spurious Emissions (Front View).....   | 14 |
| Photograph 2: Set-up for Spurious Emissions (Back View 1) ..... | 15 |
| Photograph 3: Set-up for Spurious Emissions (Back View 2) ..... | 15 |
| Photograph 4: Set-up for Spurious Emissions (Back View 3) ..... | 16 |