

TESTING CERT #2174.01

# FCC & IC RF Test Report

**Product Name: Color Band**

**Model Number: AF500**

**Report No: SYBH(Z-RF)007012015-2001**

**FCC ID: QISAF500**

**IC: 6369A-AF500**

**Reliability Laboratory of Huawei Technologies Co., Ltd.**

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## Notice

1. The laboratory has Passed the accreditation by China National Accreditation Service for Conformity Assessment (CNAS). The accreditation number is L0310.
2. The laboratory has Passed the accreditation by The American Association for Laboratory Accreditation (A2LA). The accreditation number is 2174.01.
3. The laboratory has been listed by the US Federal Communications Commission to perform electromagnetic emission measurements. The site recognition number is 97456.
4. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 6369A-2.
5. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
6. The test report is invalid if there is any evidence of erasure and/or falsification.
7. The test report is only valid for the test samples.
8. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

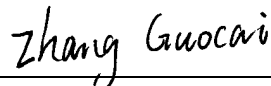


**Applicant:** Huawei Technologies Co., Ltd.  
**Address:** Administration Building, Headquarters of Huawei Technologies Co., Ltd.,  
Bantian, Longgang District, Shenzhen, 518129, P.R.C

**Date of Receipt Sample:** 2015-01-19  
**Start Date of Test:** 2015-01-19  
**End Date of Test:** 2015-01-20

**Test Result:** Pass

|                                     |            |             |                                                                                       |
|-------------------------------------|------------|-------------|---------------------------------------------------------------------------------------|
| <b>Approved by Senior Engineer:</b> | 2015-01-28 | Liu Chunlin |  |
|                                     | Date       | Name        | Signature                                                                             |

|                     |            |              |                                                                                       |
|---------------------|------------|--------------|---------------------------------------------------------------------------------------|
| <b>Prepared by:</b> | 2015-01-28 | Zhang Guocai |  |
|                     | Date       | Name         | Signature                                                                             |



**Modification Record**

| No. | Last Report No. | Modification Description |
|-----|-----------------|--------------------------|
| 1   |                 | First report.            |
|     |                 |                          |
|     |                 |                          |
|     |                 |                          |

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## 1 General Information

### 1.1 Applied Standard

|                |                                                                                                                                                          |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applied Rules: | 47 CFR FCC Part 2, Subpart J 2013<br>47 CFR FCC Part 15, Subpart C 2013<br><br>IC RSS-Gen Issue 4 (Nov. 13, 2014)<br>IC RSS-210 (Issue 8, December 2010) |
| Test Method:   | FCC KDB 558074 D01 DTS Meas Guidance v03r02<br>ANSI C63.10-2009, American National Standard for Testing Unlicensed Wireless Devices.                     |

### 1.2 Test Location

|                  |                                                                                                                                |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Test Location 1: | Reliability Laboratory of Huawei Technologies Co., Ltd.                                                                        |
| Address:         | Administration Building, Headquarters of Huawei Technologies Co., Ltd.,<br>Bantian, Longgang District, Shenzhen, 518129, P.R.C |

### 1.3 Test Environment Condition

|                            |                |
|----------------------------|----------------|
| Ambient Temperature:       | 19.5to 25 °C   |
| Ambient Relative Humidity: | 40 to 55 %     |
| Atmospheric Pressure:      | Not applicable |

## 2 Test Summary

| Test Item                                                                                                                                                                                                                                                                                                                                                                              | FCC Part No.                    | IC Standard No.                                            | Requirements                                                                                       | Test Result | Verdict |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------|---------|
| DTS (6 dB) Bandwidth                                                                                                                                                                                                                                                                                                                                                                   | 15.247(a)(2)                    | RSS-210, A8.2(a)                                           | $\geq 500$ kHz.                                                                                    | Appendix A  | Pass    |
| Occupied Bandwidth<br>(Only for IC requirement)                                                                                                                                                                                                                                                                                                                                        | ---                             | RSS-210, 2.1<br>RSS-Gen, 6.6                               | No limit.                                                                                          | Appendix B  | --      |
| Duty Cycle                                                                                                                                                                                                                                                                                                                                                                             | KDB 558074<br>(6.0)             | ---                                                        | No limit.                                                                                          | Appendix C  |         |
| Maximum Peak<br>Conducted Output Power                                                                                                                                                                                                                                                                                                                                                 | 15.247(b)(3)                    | RSS-210, A8.4(4)                                           | For directional gain: $< 30$ dBm – (G[dBi] – 6 [dB]), peak; Otherwise: $< 30$ dBm, peak.           | Appendix D  | Pass    |
| Maximum Power Spectral<br>Density Level                                                                                                                                                                                                                                                                                                                                                | 15.247(e)                       | RSS-210, A8.2(b)                                           | For directional gain: $< 8$ dBm/3 kHz – (G[dBi] – 6 [dB]), peak. Otherwise: $< 8$ dBm/3 kHz, peak. | Appendix E  | Pass    |
| Band Edges Compliance                                                                                                                                                                                                                                                                                                                                                                  | 15.247(d)                       | RSS-210, A8.5                                              | $< -20$ dBm/100 kHz if total peak power $\leq$ power limit.                                        | Appendix F  | Pass    |
| Unwanted Emissions into<br>Non-Restricted<br>Frequency Bands                                                                                                                                                                                                                                                                                                                           |                                 |                                                            |                                                                                                    | Appendix G  | Pass    |
| Unwanted Emissions into<br>Restricted Frequency<br>Bands (Radiated)                                                                                                                                                                                                                                                                                                                    | 15.247(d)<br>15.209<br>(NOTE 1) | RSS-210, A8.5<br>RSS-210, 2.2<br>RSS-Gen, 6.13<br>(NOTE 1) | FCC Part 15.209 field strength limit;<br>RSS-Gen 6.13 field strength limit.                        | Appendix H  | Pass    |
| AC Power Line<br>Conducted Emissions                                                                                                                                                                                                                                                                                                                                                   | 15.207                          | RSS-Gen, 8.8                                               | FCC Part 15.207 conducted limit;<br>RSS-Gen, 8.8 conducted limit.                                  | Appendix I  | Pass    |
| NOTE 1: According to KDB 558074, antenna-port conducted measurements are acceptable as an alternative to radiated measurements for demonstrating compliance to the limits in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case emissions will also be required. |                                 |                                                            |                                                                                                    |             |         |

### 3 Description of the Equipment under Test (EUT)

#### 3.1 General Description

Color Band (AF500) is a product thought Bluetooth 4.0 technology connect with smart phone. It has G-Sensor inside, which inset special algorithm. So colour band could track user's sleep & physical activity, and calories burned. In the same time, the colour can do cloud data synchronization、find phone 、 remote control camera 、 phone calls reminding and many other functions.

#### 3.2 EUT Identity

NOTE: Unless otherwise noted in the report, the functional boards installed in the units shall be selected from the below list, but not means all the functional boards listed below shall be installed in one unit.

##### 3.2.1 Board

| Board       |                   |                           |
|-------------|-------------------|---------------------------|
| Description | Hardware Version  | Software Version          |
| Main Board  | AF500 V100R001 P1 | AF500 V100R001C01B110SP01 |

##### 3.2.2 Sub-Assembly

| Name            | Manufacture                   | Description                                                                                                       |
|-----------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Adapter         | Huawei Technologies Co., Ltd. | Model: HW-050100U2W<br>Input voltage: 100V~240V AC and 50/60 Hz, 0.2A<br>Output voltage: +5V --- 1A               |
| Rechargeable Li | Huawei Technologies Co., Ltd. | Battery Model: AF500 281018<br>Rated capacity: 30mAh<br>Nominal Voltage: --- +3.7V<br>Charging Voltage: --- +4.2V |

#### 3.3 Technical Description

| Characteristics       | Description          |                                                                                                                                                           |
|-----------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX/RX Operating Range | 2400-2483.5 MHz band | $f_c = 2402 \text{ MHz} + N * 2 \text{ MHz}$ , where:<br>- $f_c$ = "Operating Frequency" in MHz,<br>- $N$ = "Channel Number" with the range from 0 to 39. |
| Modulation Type       | Digital              | GFSK,                                                                                                                                                     |



| Characteristics       | Description              |
|-----------------------|--------------------------|
| Emission Designator   | GFSK for BT 4.0: 685KGXD |
| Bluetooth Power Class | Class 1                  |

## 4 General Test Conditions / Configurations

### 4.1 EUT Configurations

#### 4.1.1 General Configurations

| Configuration       | Description                                                                                                                                                                                                              |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Antenna Ports  | Until otherwise specified, <ul style="list-style-type: none"><li>- All TX tests are performed at all TX antenna ports of the EUT, and</li><li>- All RX tests are performed at all RX antenna ports of the EUT.</li></ul> |
| Multiple RF Sources | Other than the tested RF source of the EUT, other RF source(s) are disabled or shutdown during measurements.                                                                                                             |

#### 4.1.2 Customized Configurations

| # EUT Conf.      | Signal Description                                         | Operating Frequency  | Duty cycle [%] |
|------------------|------------------------------------------------------------|----------------------|----------------|
| TM1_DH5_Ch0      | GFSK for BT 4.0 modulation, package type DH5, hopping off. | Ch No. 0 / 2402 MHz  | 67.9           |
| TM1_DH5_Ch1<br>9 | GFSK for BT 4.0 modulation, package type DH5, hopping off. | Ch No. 19 / 2440 MHz | 68             |
| TM1_DH5_Ch3<br>9 | GFSK for BT 4.0 modulation, package type DH5, hopping off. | Ch No. 39 / 2480 MHz | 67.7           |

### 4.2 Test Environments

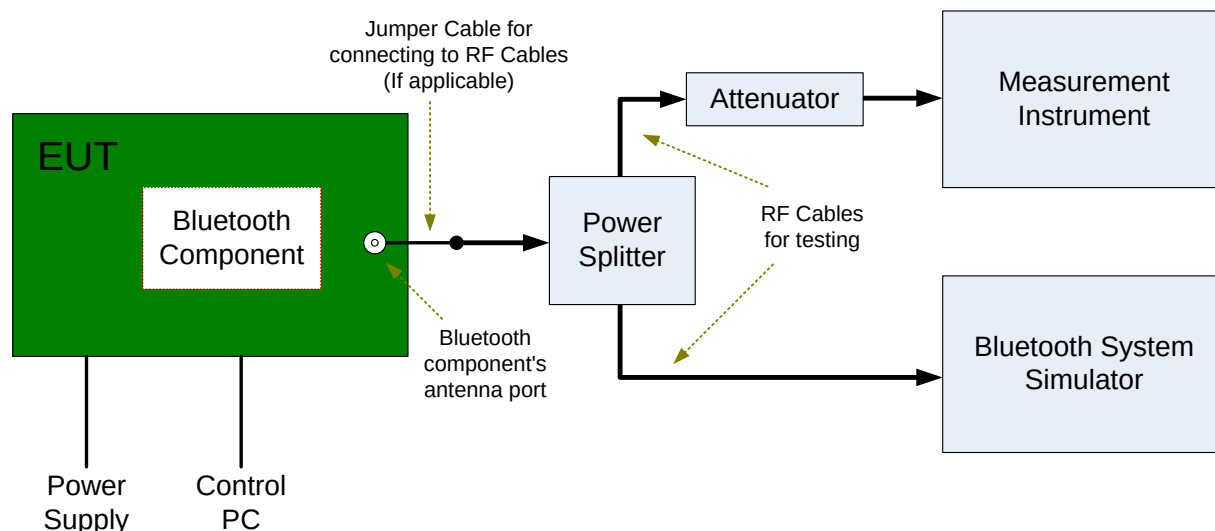
NOTE: The values used in the test report may be stringent than the declared.

| Environment Parameter | Selected Values During Tests |         |                   |
|-----------------------|------------------------------|---------|-------------------|
|                       | Temperature                  | Voltage | Relative Humidity |
| NTNV                  | Ambient                      | 3.7 VDC | Ambient           |

## 4.3 Test Setups

### 4.3.1 Test Setup 1

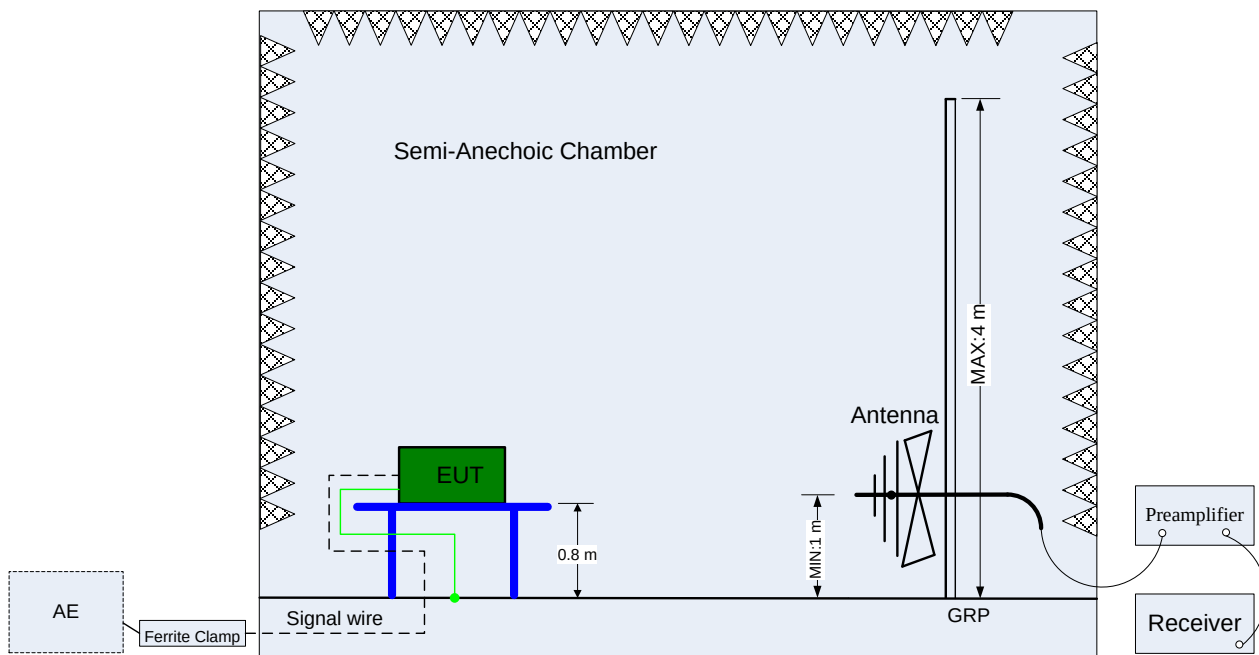
The Bluetooth component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by Bluetooth System Simulator and/or PC/software to emit the specified signals for the purpose of measurements.



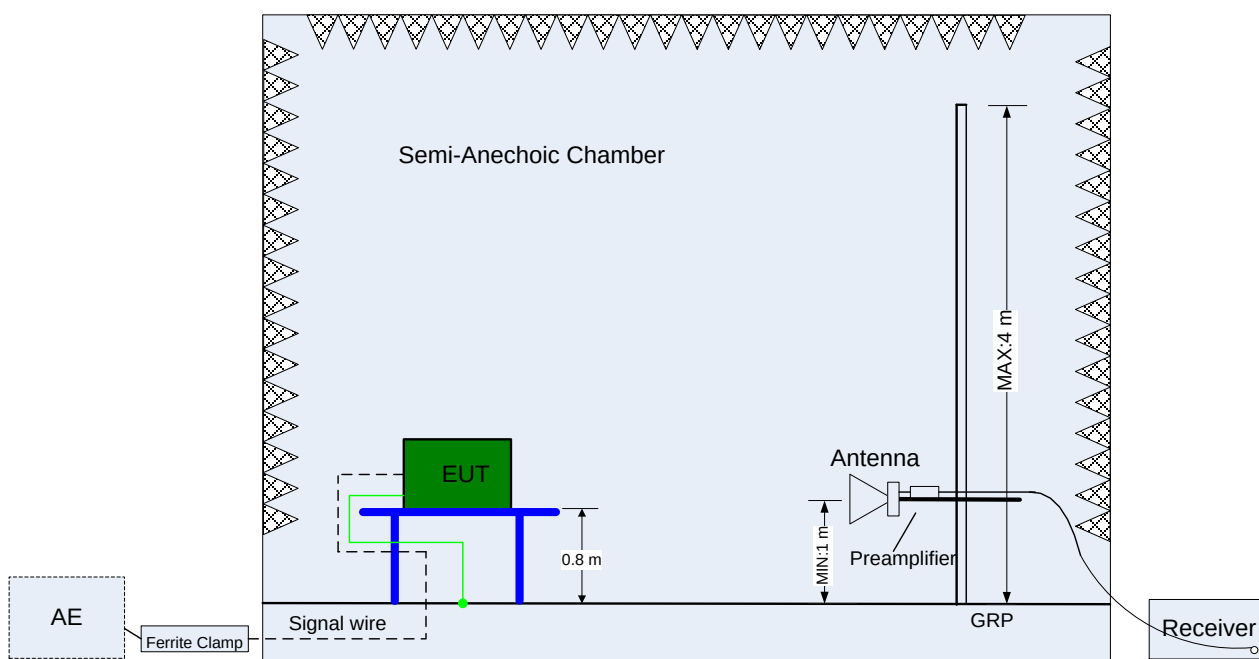
### 4.3.2 Test Setup 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4. The test distance is 3m. The setup is according to ANSI C63.4 and CAN/CSA-CEI/IEC CISPR 22.

The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).



(Below 1 GHz)

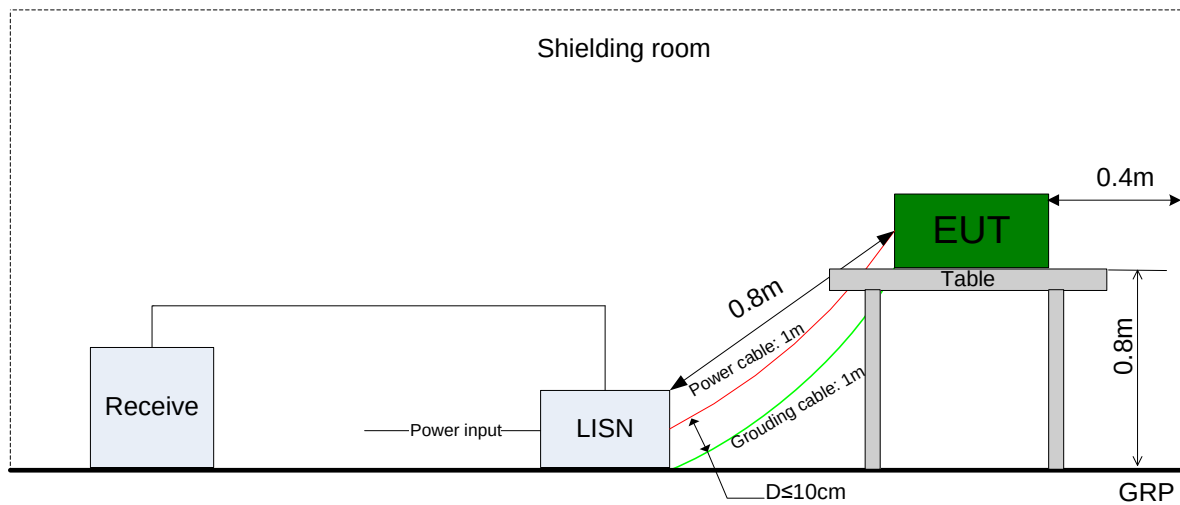


(Above 1 GHz)

### 4.3.3 Test Setup 3

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.



#### 4.4 Test Conditions

| Test Case                                                     | Test Conditions |                                                                                                                                   |                                          |
|---------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
|                                                               | Configuration   | Description                                                                                                                       |                                          |
| 6dB Emission Bandwidth (EBW)                                  | Meas. Method    | FCC KDB 558074 §8.2 Option 2.                                                                                                     |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 1                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch19, TM1_DH5_Ch39.                                                                                          |                                          |
| Maximum Conducted Average Output Power                        | Meas. Method    | FCC KDB 558074 §9.2 .2. 4                                                                                                         |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 1                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch19, TM1_DH5_Ch39.                                                                                          |                                          |
| Maximum Power Spectral Density Level                          | Meas. Method    | FCC KDB 558074 §10.5                                                                                                              |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 1                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch19, TM1_DH5_Ch39.                                                                                          |                                          |
| Band edge spurious emission                                   | Meas. Method    | FCC KDB 558074 §13.0.                                                                                                             |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 1                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch39.                                                                                                        |                                          |
| Unwanted Emissions into Non-Restricted Frequency Bands        | Meas. Method    | FCC KDB 558074 §11.0                                                                                                              |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 1                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch0, TM1_DH5_Ch19, TM1_DH5_Ch39.                                                                                          |                                          |
| Unwanted Emissions into Restricted Frequency Bands (Radiated) | Meas. Method    | ANSI C63.10; FCC KDB 558074 §12.1, Radiated                                                                                       |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 2                                                                                                                      |                                          |
|                                                               | EUT Conf.       | 30 MHz -1 GHz                                                                                                                     | TM1_DH5_Ch0 (Worst Conf.).               |
|                                                               |                 | 1-3 GHz                                                                                                                           | TM1_DH5_Ch0, TM1_DH5_Ch19, TM1_DH5_Ch39. |
|                                                               |                 | 3-18 GHz                                                                                                                          | TM1_DH5_Ch19 (Worse Conf.),              |
|                                                               |                 | 18-26.5 GHz                                                                                                                       | TM1_DH5_Ch0 (Worst Conf.).               |
| AC Power Line Conducted Emissions                             | Meas. Method    | AC mains conducted.<br>Pre:           RBW = 10 kHz; Det. = Peak.<br>Final:        RBW = 9 kHz; Det. = CISPR Quasi-Peak & Average. |                                          |
|                                                               | Test Env.       | NTNV                                                                                                                              |                                          |
|                                                               | Test Setup      | Test Setup 3                                                                                                                      |                                          |
|                                                               | EUT Conf.       | TM1_DH5_Ch39.                                                                                                                     |                                          |

## 5 Main Test Instruments

| Equipment Name                                  | Manufacturer  | Model     | Serial Number  | Cal Date   | Cal- Due   |
|-------------------------------------------------|---------------|-----------|----------------|------------|------------|
| Power supply                                    | KEITHLEY      | 2303      | A120714713     | 2014-08-07 | 2016-08-06 |
| Wireless Communication Test set                 | Agilent       | N4010A    | MY49081592     | 2014-11-04 | 2015-11-03 |
| Universal Radio Communication Tester            | R&S           | CMU200    | 117341         | 2014-02-25 | 2015-02-24 |
| Spectrum Analyzer                               | Agilent       | N9020A    | MY52090652     | 2014-07-11 | 2015-07-10 |
| Universal Radio Communication Tester            | R & S         | CMW500    | 126855         | 2013-08-08 | 2015-08-09 |
| Spectrum Analyzer                               | Agilent       | E4440A    | MY48250119     | 2014-07-11 | 2015-07-10 |
| Signal Analyzer                                 | R&S           | FSQ31     | 200021         | 2014-11-04 | 2015-11-03 |
| Spectrum Analyzer                               | Agilent       | N9030A    | MY49431698     | 2014-11-04 | 2015-11-03 |
| Temperature Chamber                             | WEISS         | WKL64     | 56246002940010 | 2014-02-25 | 2015-02-24 |
| Temperature Chamber                             | ESPEC         | MW3030    | 06114003       | 2014-05-09 | 2015-05-08 |
| Signal generator                                | Agilent       | E8257D    | MY51500314     | 2014-05-09 | 2015-05-08 |
| Vector Signal Generator                         | R&S           | SMU200A   | 104162         | 2014-11-04 | 2015-11-03 |
| Test receiver                                   | R&S           | ESU26     | 100150         | 2014-05-09 | 2015-05-08 |
| Spectrum analyzer                               | R&S           | FSU3      | 200474         | 2014-11-04 | 2015-11-03 |
| Spectrum analyzer                               | R&S           | FSU43     | 100144         | 2014-11-04 | 2015-11-03 |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S           | HF907     | 100304         | 2013-02-02 | 2015-02-01 |
| Trilog Broadband Antenna (30M~3GHz)             | SCHWARZ BECK  | VULB 9163 | 9163-490       | 2013-02-02 | 2015-02-01 |
| LOOP Antennas(9kHz-30MHz)                       | R&S           | HFH2-Z2   | 100262         | 2013-03-23 | 2015-03-22 |
| Pyramidal Horn Antenna(18GHz-26-5GHz)           | ETS-LIND GREN | 3160-09   | 5140299        | 2013-03-05 | 2015-03-04 |
| Artificial Mains Network                        | R&S           | ENV4200   | 100134         | 2014-11-04 | 2015-11-03 |
| Artificial Mains Network                        | R&S           | ENV216    | 100382         | 2014-11-04 | 2015-11-03 |

END