# RADIO TEST REPORT

For

TREVIDEA S.r.l.

AM/FM/SW radio with Bluetooth speaker

Test Model: RA7F20BT

| | | |
|---|---|---|
| Prepared for | : | TREVIDEA S.r.l. |
| Address | : | Strada consolare Rimini San Marino, 62, 47924 Rimini (RN) Italy |
| Prepared by | : | Shenzhen AOCE Electronic Technology Service Co., Ltd |
| Address | : | Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China |
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| Web | : | Http://www.aoc-cert.com |
| Mail | : | postmaster@aoc-cert.com |
| Date of receipt of test sample | : | November 01, 2025 |
| Number of tested samples | : | 1 |
| Serial number | : | Prototype |
| Date of Test | : | November 01, 2025~November 18, 2025 |
| Date of Report | : | November 18, 2025 |

**RADIO TEST REPORT**
**ETSI EN 300 328 V2.2.2 (2019-07)**
Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum

| | | |
|---|---|---|
| **Report Reference No. .....** | **:** | **AOC251103101E** |
| Date of Issue ..... | : | November 18, 2025 |
| **Testing Laboratory Name .....** | **:** | **Shenzhen AOCE Electronic Technology Service Co., Ltd** |
| Address ..... | : | Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China |
| Testing Location/ Procedure ..... | : | Full application of Harmonised standards ■<br>Partial application of Harmonised standards ☐<br>Other standard testing method ☐ |
| **Applicant's Name.....** | **:** | **TREVIDEA S.r.l.** |
| Address ..... | : | Strada consolare Rimini San Marino, 62, 47924 Rimini (RN) Italy |
| **Test Specification** | | |
| Standard ..... | : | ETSI EN 300 328 V2.2.2 (2019-07) |
| Test Report Form No. ..... | : | AOCEEMC-1.0 |
| TRF Originator..... | : | Shenzhen AOCE Electronic Technology Service Co., Ltd |
| Master TRF ..... | : | Dated 2017-06 |



| | | |
|---|---|---|
| **Test Item Description. .....** | **:** | **AM/FM/SW radio with Bluetooth speaker** |
| Trade Mark..... | : | Trevi |
| Test Model ..... | : | RA7F20BT |
| Ratings ..... | : | DC 3.7V by Li-ion Battery<br>Recharged by DC 5V |
| **Result …….....** | **:** | **Positive** |

| **Compiled by:** | **Supervised by:** | **Approved by:** |
|---|---|---|
| David Liu/ Administrators | Joey Liu/ Technique principal | Murry Yu/ Manager |

# RADIO -- TEST REPORT

| | |
|---|---|
| **Test Report No. : AOC251103101E** | November 18, 2025<br>Date of issue |

| | |
|---|---|
| Test Model..... | : RA7F20BT |
| EUT..... | : AM/FM/SW radio with Bluetooth speaker |
| **Applicant.....** | **: TREVIDEA S.r.l.** |
| Address..... | : Strada consolare Rimini San Marino, 62, 47924 Rimini (RN) Italy |
| Telephone..... | : / |
| Fax..... | : / |
| **Manufacturer.....** | **: SHENZHEN HEART STONE TECH CO., LTD** |
| Address..... | : Room610, Building1, Lihu Community, Jihua Street, Longgang District, Shenzhen, China |
| Telephone..... | : / |
| Fax..... | : / |
| **Factory.....** | **: /** |
| Address..... | : / |
| Telephone..... | : / |
| Fax..... | : / |

| | |
|---|---|
| **Test Result** | **Positive** |

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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## Test Report Description Page

# 1. GENERAL INFORMATION

## 1.1. Product Description for Equipment Under Test (EUT)

| | | |
|---|---|---|
| EUT | : | AM/FM/SW radio with Bluetooth speaker |
| Test Model | : | RA7F20BT |
| Hardware Version | : | V1.1 |
| Software Version | : | V1.1 |
| Bluetooth | : | |
| Frequency Range | : | 2.402-2.480GHz |
| Channel Number | : | 79 channels |
| Channel Spacing | : | 1MHz |
| Modulation Type | : | GFSK, π/4-DQPSK, 8-DPSK |
| Bluetooth Version | : | V5.0 |
| Antenna Description | : | PCB Antenna, 1.2dBi(Max.) |
| FM | : | |
| Frequency Range | : | 88-108MHz |
| Modulation Type | : | FM |
| Antenna Description | : | External Antenna |
| AM | : | |
| Frequency Range | : | 53-171KHz |
| Modulation Type | : | AM |
| Antenna Description | : | External Antenna |
| SW | : | |
| Frequency Range | : | 5.9MHz-18MHz |
| Modulation Type | : | SW |
| Antenna Description | : | External Antenna |

## 1.2. Objective

This Type approval report is prepared on behalf of **TREVIDEA S.r.l.** in accordance with ETSI EN 300 328 V2.2.2 (2019-07), Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum.

The objective is to determine compliance with ETSI EN 300 328 V2.2.2 (2019-07).

## 1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

## 1.4. Test Methodology

All measurements contained in this report were conducted with ETSI EN 300 328 V2.2.2 (2019-07).

### 1.5. Support equipment List

| Manufacturer | Description | Model | Serial Number | Certificate |
|---|---|---|---|---|
| -- | -- | -- | -- | -- |

### 1.6. External I/O

| I/O Port Description | Quantity | Cable |
|---|---|---|
| USB Port | 1 | N/A |
| AUX In Port | 1 | N/A |

## 1.7. List Of Measuring Equipment

| Instrument | Manufacture | Model No. | Serial No. | Characteristics | Cal Date | Due Date |
|---|---|---|---|---|---|---|
| EMC Receiver | R&S | ESCS 30 | 100174 | 9kHz – 2.75GHz | Jun 18, 2025 | Jun 17, 2026 |
| Signal analyzer | Agilent | E4448A(External mixers to 40GHz) | US44300469 | 9kHz~40GHz | Jun 18, 2025 | Jun 17, 2026 |
| LISN | MESS Tec | NNB-2/16Z | 99079 | 9KHz-30MHz | Jun 18, 2025 | Jun 17, 2026 |
| LISN | EMCO | 3819/2NM | 9703-1839 | 9KHz-30MHz | Jun 18, 2025 | Jun 17, 2026 |
| RF Cable-CON | UTIFLEX | 3102-26886-4 | CB049 | 9KHz-30MHz | Jun 18, 2025 | Jun 17, 2026 |
| ISN | SCHAFFNE | ISN ST08 | 21653 | 9KHz-30MHz | Jun 18, 2025 | Jun 17, 2026 |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 30M-18GHz | Jun 18, 2025 | Jun 17, 2026 |
| Amplifier | SCHAFFNE | COA9231A | 18667 | 9kHz-2GHzz | Jun 18, 2025 | Jun 17, 2026 |
| Amplifier | Agilent | 8449B | 3008A021 | 1GHz-26.5GHz | Jun 18, 2025 | Jun 17, 2026 |
| Amplifier | MITEQ | AMF-6F-260400 | 9121372 | 26.5GHz-40GHz | Jun 18, 2025 | Jun 17, 2026 |
| Loop Antenna | R&S | HFH2-Z2 | 860004/00 | 9k-30MHz | Jun 18, 2025 | Jun 17, 2026 |
| By-log Antenna | SCHWARZB | VULB9163 | 9163-470 | 30MHz-1GHz | Jun 18, 2025 | Jun 17, 2026 |
| Horn Antenna | EMCO | 3115 | 6741 | 1GHz-18GHz | Jun 18, 2025 | Jun 17, 2026 |
| Horn Antenna | SCHWARZB | BBHA9170 | BBHA9170 | 15GHz-40GHz | Jun 18, 2025 | Jun 17, 2026 |
| RF Cable-R03m | Jye Bao | RG142 | CB021 | 30MHz-1GHz | Jun 18, 2025 | Jun 17, 2026 |
| RF Cable-HIGH | SUHNER | SUCOFLEX 106 | 03CH03-H | 1GHz-40GHz | Jun 18, 2025 | Jun 17, 2026 |
| Power Meter | R&S | NRVS | 100444 | DC-40GHz | Jun 18, 2025 | Jun 17, 2026 |
| Power Sensor | R&S | NRV-Z51 | 100458 | DC-30GHz | Jun 18, 2025 | Jun 17, 2026 |
| Power Sensor | R&S | NRV-Z32 | 10057 | 30MHz-6GHz | Jun 18, 2025 | Jun 17, 2026 |
| AC Power Source | HPC | HPA-500E | HPA-9100 | AC 0~300V | Jun 18, 2025 | Jun 17, 2026 |
| DC power Soure | GW | GPC-6030D | C671845 | DC 1V-60V | Jun 18, 2025 | Jun 17, 2026 |
| Temp. and Humidigy Chamber | Giant Force | GTH-225-20-S | MAB0103-00 | N/A | Jun 18, 2025 | Jun 17, 2026 |
| RF CABLE-1m | JYE Bao | RG142 | CB034-1m | 20MHz-7GHz | Jun 18, 2025 | Jun 17, 2026 |
| RF CABLE-2m | JYE Bao | RG142 | CB035-2m | 20MHz-1GHz | Jun 18, 2025 | Jun 17, 2026 |
| Signal Generator | R&S | SMR40 | 10016 | 10MHz~40GHz | Jun 18, 2025 | Jun 17, 2026 |
| Universal Radio Communication Tester | R&S | CMU200 | 112012 | N/A | Jun 18, 2025 | Jun 17, 2026 |
| Wideband Radio Communication Tester | R&S | CMW500 | 1201.0002K50 | N/A | Jun 18, 2025 | Jun 17, 2026 |
| MXG Vector Signal Generator | Agilent | N5182A | MY47071151 | 250KHz~6GHz | Jun 18, 2025 | Jun 17, 2026 |
| MXG Vector Signal Generator | Agilent | E4438C | MY42081396 | 250KHz~6GHz | Jun 18, 2025 | Jun 17, 2026 |
| PSG Analog Signal Generator | Agilent | N8257D | MY46520521 | 250KHz~20GHz | Jun 18, 2025 | Jun 17, 2026 |
| MXA Signal Analyzer | Agilent | N9020A | MY50510140 | 10Hz~26.5GHz | Jun 18, 2025 | Jun 17, 2026 |
| DC Power Supply | Agilent | E3642A | / | 0-8V,5A/0-20V,2.5A | Jun 18, 2025 | Jun 17, 2026 |
| RF Control Unit | Tonscend | JS0806-1 | / | / | Jun 18, 2025 | Jun 17, 2026 |
| LTE Test Software | Tonscend | JS1120-1 | / | Version: 2.5.7.0 | Jun 18, 2025 | Jun 17, 2026 |

| | | | | | | |
|---|---|---|---|---|---|---|
| X-series USB Peak and Average Power Sensor Agilent | Agilent | U2021XA | MY54080022 | / | Jun 18, 2025 | Jun 17, 2026 |
| 4 Ch.Simultaneous Sampling 14 Bits 2 MS/s | Agilent | U2531A | MY54080016 | / | Jun 18, 2025 | Jun 17, 2026 |
| Test Software | Ascentest | AT890-SW | 20141230 | Version: | Jun 18, 2025 | Jun 17, 2026 |
| Splitter/Combiner(Qty: 2) | Mini-Circuits | ZAPD-50W 4.2-6.0 GHz | NN256400424 | / | Jun 18, 2025 | Jun 17, 2026 |
| Splitter/Combine(Qty: 2) | MCLI | PS3-7 | 4463/4464 | / | Jun 18, 2025 | Jun 17, 2026 |
| ATT (Qty: 1) | Mini-Circuits | VAT-30+ | 30912 | / | Jun 18, 2025 | Jun 17, 2026 |

## 1.8. Test Environment

| Items | Required (IEC 68-1) | Actual |
|---|---|---|
| Temperature (°C) | 15-35 | 21 |
| Humidity (%RH) | 25-75 | 50 |
| Barometric pressure (mbar) | 860-1060 | 950-1000 |

## 1.9. Description Of Test Modes

AOC has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

| Test Mode |
|---|
| Mode 1: Transmit by DH1 |
| Mode 2: Transmit by 2DH1 |
| Mode 3: Transmit by 3DH1 |
| Mode 4: Receive by DH1 |
| Mode 5: Receive by 2DH1 |
| Mode 6: Receive by 3DH1 |

Note:

(1) For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.

(2) Regards to the frequency band operation for systems using FHSS modulation: normal operation (hopping) was selected to test for conducted, and the lowest, highest frequency channel for radiation spurious test.

(3) The extreme test condition for voltage and temperature were declared by the manufacturer.

# 2. SYSTEM TEST CONFIGURATION

## 2.1. Justification

The system was configured for testing in engineering mode.

## 2.2. EUT Exercise Software

N/A.

## 2.3. Special Accessories

N/A.

## 2.4. Block Diagram/Schematics

Please refer to the related document.

## 2.5. Equipment Modifications

Shenzhen AOCE Electronic Technology Service Co., Ltd has not done any modification on the EUT.

## 2.6. Configuration of Test Setup

Please refer to the test setup photo.

# 3. RF OUTPUT POWER

## 3.1. Limit

**For non-adaptive frequency hopping systems**

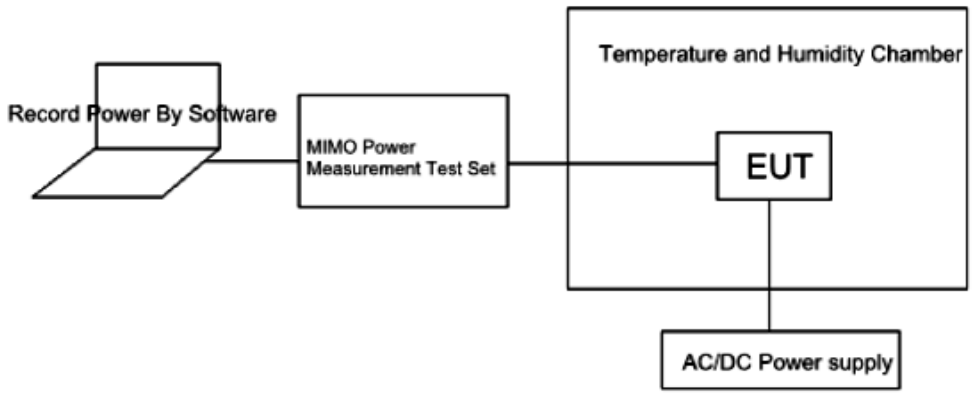
The maximum RF output power for non-adaptive Frequency Hopping equipment, shall be declared by the supplier. The maximum RF output power for this equipment shall be equal to or less than the value declared by the supplier. This declared value shall be equal to or less than 20dBm.

**For adaptive frequency hopping systems**

The maximum RF output power for adaptive Frequency Hopping equipment shall be equal to or less than 20dBm.

## 3.2. Test Setup

For Conducted Measurement



## 3.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.2

**Step 1:**

• The fast power sensor use the following setting: Sample speed 1 MS/s.

**Step 2:**

• Connect the power sensor to the transmit port, sample the transmit signal and store the raw data.Use these stored samples in all following steps.

**Step 3:**

• Find the start and stop times of each burst in the stored measurement samples.

**Step 4:**

• Between the start and stop times of each individual burst calculate the RMS power over the burst. Save these Pburst values, as well as the start and stop times for each burst.

**Step 5:**

• The highest of all Pburst values (value "A" in dBm) will be used for maximum e.i.r.p. calculations.

**Step 6:**

• Add the (stated) antenna assembly gain "G" in dBi of the individual antenna.
• If applicable, add the additional beamforming gain "Y" in dB.

The RF Output Power (P) shall be calculated using the formula below:
P = A + G + Y

### 3.4. Test Result

Pass

***Note: 20 bursts had been captured for power measurement.

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | RF Output Power |
| Test Mode | : | Mode 1: Transmit by DH1 |

| Test Conditions | | Frequency (MHz) | RF Output Power EIRP (dBm) | Limit (dBm) |
|---|---|---|---|---|
| Tnom (25℃) | Vnom (DC 3.7V) | 2402 | 0.84 | 20 |
| | | 2441 | 1.24 | |
| | | 2480 | 1.76 | |
| Tmax (45℃) | Vnom (DC 3.7V) | 2402 | 0.86 | 20 |
| | | 2441 | 1.33 | |
| | | 2480 | 1.50 | |
| Tmin (-20℃) | Vnom (DC 3.7V) | 2402 | 0.91 | 20 |
| | | 2441 | 1.27 | |
| | | 2480 | 1.33 | |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | RF Output Power |
| Test Mode | : | Mode 2: Transmit by 2DH1 |

| Test Conditions | | Frequency (MHz) | RF Output Power EIRP (dBm) | Limit (dBm) |
|---|---|---|---|---|
| Tnom (25℃) | Vnom (DC 3.7V) | 2402 | 0.39 | 20 |
| | | 2441 | 0.54 | |
| | | 2480 | 1.10 | |
| Tmax (45℃) | Vnom (DC 3.7V) | 2402 | 0.20 | 20 |
| | | 2441 | 0.80 | |
| | | 2480 | 0.99 | |
| Tmin (-20℃) | Vnom (DC 3.7V) | 2402 | 0.34 | 20 |
| | | 2441 | 0.70 | |
| | | 2480 | 0.88 | |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | RF Output Power |
| Test Mode | : | Mode 3: Transmit by 3DH1 |

| Test Conditions | | Frequency (MHz) | RF Output Power EIRP (dBm) | Limit (dBm) |
|---|---|---|---|---|
| Tnom (25℃) | Vnom (DC 3.7V) | 2402 | 0.22 | 20 |
| | | 2441 | 0.57 | |
| | | 2480 | 1.07 | |
| Tmax (45℃) | Vnom (DC 3.7V) | 2402 | 0.28 | 20 |
| | | 2441 | 0.66 | |
| | | 2480 | 0.86 | |
| Tmin (-20℃) | Vnom (DC 3.7V) | 2402 | 0.43 | 20 |
| | | 2441 | 0.64 | |
| | | 2480 | 0.68 | |

### 3.5. Receiver Category

**Receiver Category 1**: Adaptive equipment with a maximum RF output power greater than 10 dBm e.i.r.p. shall be considered as receiver category 1 equipment.

**Receiver Category 2**:Non-adaptive equipment with a Medium Utilization (MU) factor greater than 1 % and less than or equal to 10 % or adaptive equipment with a maximum RF output power of 10 dBm e.i.r.p. shall be considered as receiver category 2 equipment.

**Receiver Category 3**: Non-adaptive equipment with a maximum Medium Utilization (MU) factor of 1 % or adaptive equipment with a maximum RF output power of 0 dBm e.i.r.p. shall be considered as receiver category 3 equipment.

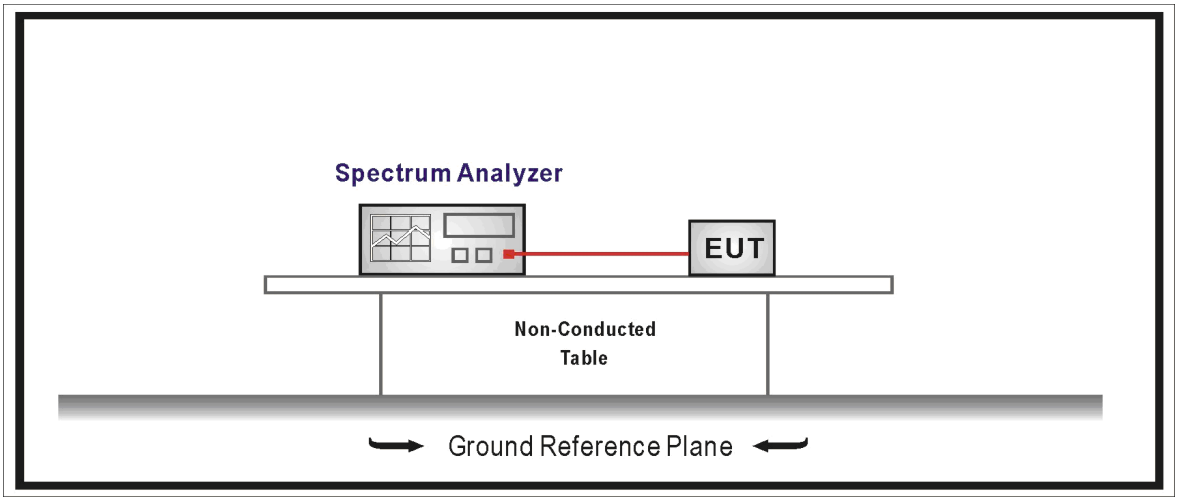
As this is an adaptivity device with a maximum power of 1.76dBm, **it belongs to recevier category 2**.

# 4. DUTY CYCLE, TX-SEQUENCE, TX-GAP

## 5.1. Limit

For non-adaptive FHSS equipment, the Duty Cycle shall be equal to or less than the maximum value declared by the supplier. In addition, the maximum Tx-sequence time shall be 5 ms while the minimum Tx-gap time shall be 5 ms.

## 5.2. Test Setup




## 4.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.2

## 4.4. Test Result

These requirements apply to non-adaptive frequency hopping equipment or to adaptive frequency hopping equipment operating in a non-adaptive mode.
These requirements do not apply for equipment with a maximum declared RF Output power of less than 10dBm E.I.R.P. or for equipment when operating in a mode where the RF Output power is less than 10dBm E.I.R.P.
No applicable.

# 5. DWELL TIME, MINIMUM FREQUENCY OCCUPATION AND HOPPING SEQUENCE

## 5.1. Limit

**For non-adaptive frequency hopping systems**

The accumulated Dwell Time on any hopping frequency shall not be greater than 15 ms within any period of 15 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use.

**For adaptive frequency hopping systems**

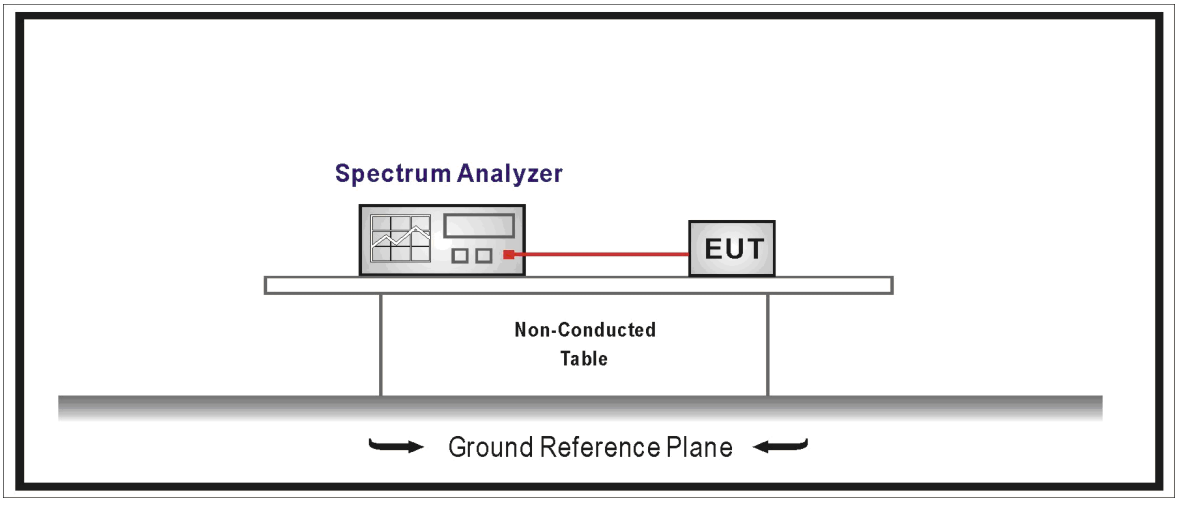
Adaptive Frequency Hopping systems shall be capable of operating over a minimum of 70 % of the band specified in clause 1.

The maximum accumulated dwell time on any hopping frequency shall be 400 ms within any period of 400 ms multiplied by the minimum number of hopping frequencies (N) that have to be used.

The hopping sequence(s) shall contain at least N hopping frequencies at all times, where N is 15 or 15 divided by the minimum Hopping Frequency Separation in MHz, whichever is the greater.

The Minimum Frequency Occupation Time shall be equal to one dwell time within a period not exceeding four times the product of the dwell time per hop and the number of hopping frequencies in use.

## 5.2. Test Setup



## 5.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.4

**Step 1:**

• The output of the transmitter shall be connected to a spectrum analyzer or equivalent.
• The analyzer shall be set as follows:
- Centre Frequency: Equal to the hopping frequency being investigated
- Frequency Span: 0 Hz
- RBW: ~ 50 % of the Occupied Channel Bandwidth(we set RBW=510KHz)
- VBW: ≥ RBW(we set RBW=1500KHz)
- Detector Mode: RMS
- Sweep time: Equal to the Dwell Time × Minimum number of hopping frequencies (N) (see clause 4.3.1.3.2)
- Number of sweep points: 30 000
- Trace mode: Clear / Write
- Trigger: Free Run

**Step 2:**

• Save the trace data to a file for further analysis by a computing device using an appropriate software application or program.

**Step 3:**

• Indentify the data points related to the frequency being investigated by applying a threshold.
The data points resulting from transmissions on the hopping frequency being investigated are assumed to have much higher levels compared to data points resulting from transmissions on adjacent hopping frequencies. If a clear determination between these transmissions is not possible, the RBW in step 1 shall be further reduced. In addition, a channel filter may be used.
• Count the number of data points identified as resulting from transmissions on the frequency being investigated and multiply this number by the time difference between two consecutive data points.

**Step 4:**

• The result in step 3 is the accumulated Dwell Time which shall comply with the limit provided in clauses 4.3.1.3.2.1 or 4.3.1.3.2.2 and which shall be recorded in the test report.

**Step 5:**

• Make the following changes on the analyzer and repeat steps 2 and 3. Sweep time: 4 × Dwell Time × Actual number of hopping frequencies in use The hopping frequencies occupied by the system without having transmissions during the dwell time (blacklisted frequencies) should be taken into account in the actual number of hopping frequencies in use. If this number can not be determined (number of blacklisted frequencies unknown) it shall be assumed that the equipment uses the minimum number of hopping frequencies as defined in clauses 4.3.1.4.2.1 or 4.3.1.4.2.2.
• The result shall be compared to the limit for the Minimum Frequency Occupation Time defined in clauses 4.3.1.3.2.1 or 4.3.1.3.2.2. This value shall be recorded in the test report.

**Step 6:**

• Make the following changes on the analyzer:

- Start Frequency: 2 400 MHz
- Stop Frequency: 2 483,5 MHz
- RBW: ~ 50 % of the Occupied Channel Bandwidth (single hop) (we set RBW=510KHz)
- VBW: ≥ RBW (we set RBW=1500KHz)
- Detector Mode: RMS
- Sweep time: Auto
- Trace Mode: Max Hold
- Trigger: Free Run

• When the trace has completed, indentify the number of hopping frequencies used by the hopping sequence.

• The result shall be compared to the limit (value N) defined in clauses 4.3.1.3.2.1 or 4.3.1.3.2.2. This value shall be recorded in the test report. For equipment with blacklisted frequencies, it might not be possible to verify the number of hopping frequencies in use. However they shall comply with the requirement for accumulated Dwell time and Minimum Frequency Occupation Time assuming the minimum number of hopping frequencies defined in clauses 4.3.1.3.2.1 or 4.3.1.3.2.2 are in use.

**Step 7:**

• For adaptive systems, using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6, it shall be verified whether the system uses 70 % of the band specified in clause 1. The result shall be recorded in the test report.

## 5.4. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Result | : | Pass |

**Dwell time**

| Packet | One Pulse time (ms) | Accumulated Dwell Time (ms) | Measure Time (ms) | Limit | Conclusion |
|---|---|---|---|---|---|
| DH1 | 0.43 | 137.60 | 31600 | <400ms | PASS |
| DH3 | 1.59 | 246.45 | | | |
| DH5 | 2.93 | 342.81 | | | |
| Remark: Only record the worst data. | | | | | |

**Mini Frequency Occupation Time**

| Mode | Mini frequency occupation Time(ms) | Measure Time (ms) | Conclusion |
|---|---|---|---|
| DH1 | 0.86 | 135.88 | PASS |
| DH3 | 3.18 | 502.44 | PASS |
| DH5 | 8.79 | 925.88 | PASS |
| Remark: Only record the worst data. | | | |

**Hopping channel & Hopping sequence**

| Mode | Number of hopping channel | Limit | Conclusion |
|---|---|---|---|
| GFSK | 79 | >15 | PASS |
| Mode | Hopping Sequence(%) | Limit | Conclusion |
| GFSK | 94.83% | >70% | PASS |

# 6. HOPPING FREQUENCY SEPARATION

## 6.1. Limit

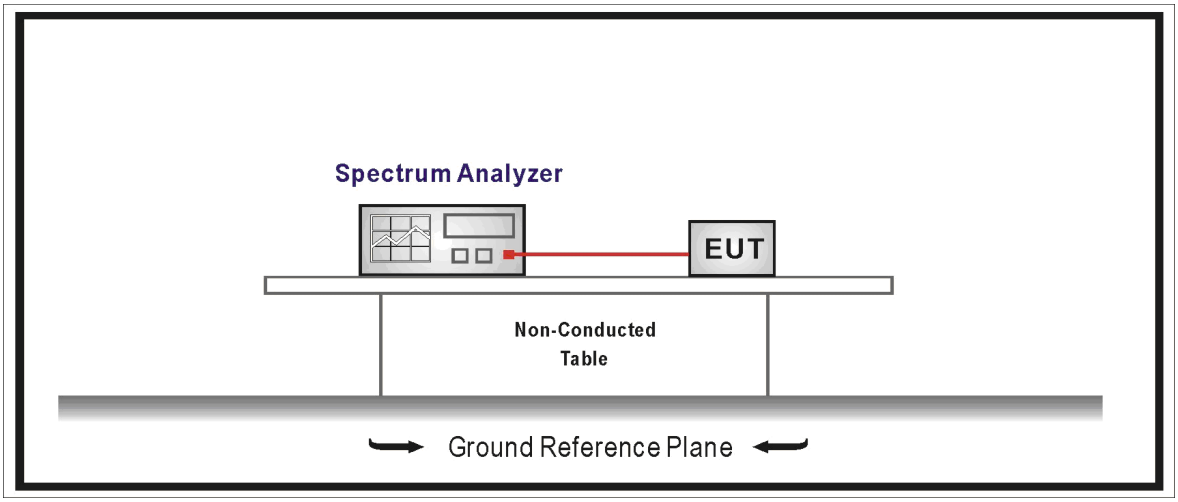
**For non-adaptive equipment**

The minimum Hopping Frequency Separation shall be equal to Occupied Channel Bandwidth of a single hop, with a minimum separation of 100 kHz.

**For adaptive equipment**

The minimum Hopping Frequency Separation shall be 100 kHz.

## 6.2. Test Setup




## 6.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.5

The analyzer was setting as follow:

- Centre Frequency: Centre of the two adjacent hopping frequencies
- Frequency Span: Sufficient to see the complete power envelope of both hopping frequencies
- RBW: 30KHz
- VBW: 91KHz
- Detector Mode: RMS
- Trace Mode: Max Hold
- Sweep time: Auto

## 6.4. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Hopping Frequency Separation |
| Test Result | : | Pass |

| Mode | Result (MHz) | Limit (MHz) | Conclusion |
|---|---|---|---|
| DH1 | 0.97 | >=0.1 | PASS |
| 2DH1 | 1.01 | >=0.1 | |
| 3DH1 | 1.02 | >=0.1 | |

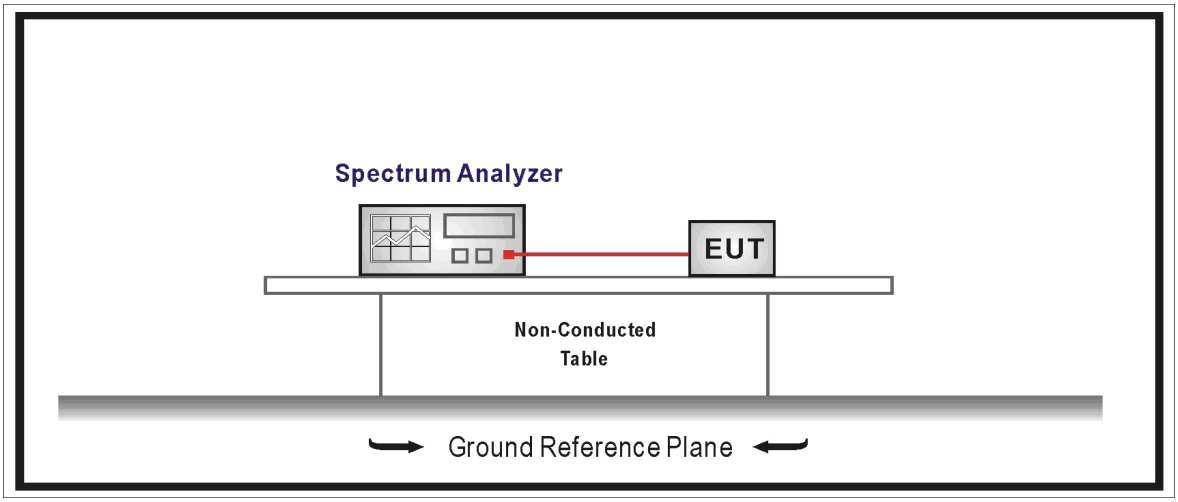
# 7. MEDIUM UTILISATION (MU) FACTOR

## 7.1. Limit

**For non-adaptive equipment**

The maximum Medium Utilisation factor for non-adaptive Frequency Hopping equipment shall be 10 %.

## 7.2. Test Setup




## 7.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.2

## 7.4. Test Result

This requirement does not apply to adaptive equipment unless operating in a non-adaptive mode.
In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10dBm E.I.R.P. or for equipment when operating in a mode where the RF Output power is less than 10dBm E.I.R.P.
No applicable.

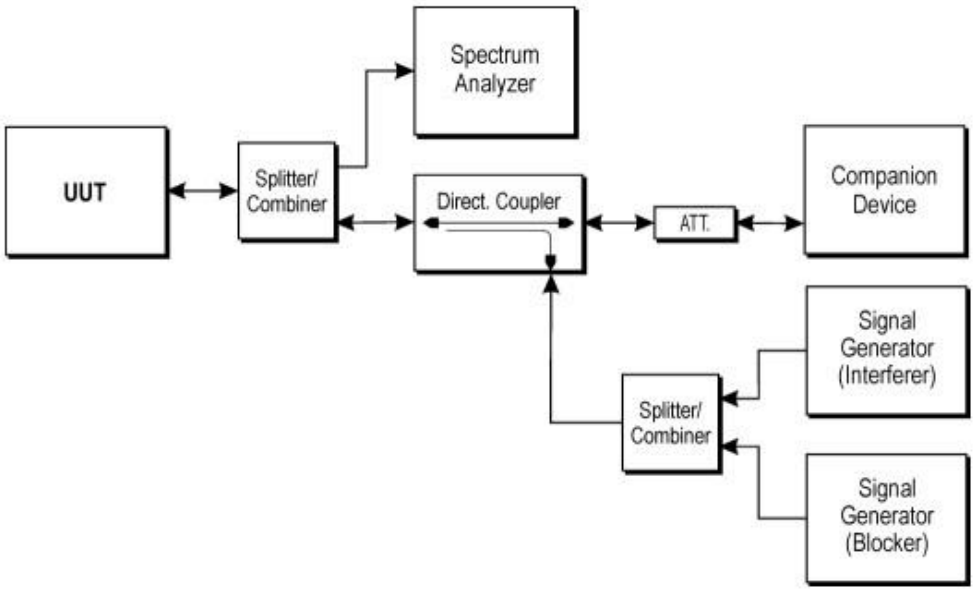
# 8. ADAPTIVITY (ADAPTIVE FREQUENCY HOPPING)

## 8.1. Limit

| Adaptivity Limit |
|---|
| ☐ LBT based Detect and Avoid<br>--- Minimum Clear Channel Assessment (CCA) time = 20 us;<br>--- CCA observation time declared by the supplier;<br>--- COT ≤ 60 ms;<br>--- Idle Period = 5% of COT;<br>--- Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm); |
| ☒ Non-LBT based Detect and Avoid<br>--- The frequency shall remain unavailable for a minimum time equal to 1 second or 5 times the actual number of hopping frequencies multiplied with the Channel Occupancy Time whichever is the longest;<br>--- COT ≤ 40 ms;<br>--- Idle Period = 5% of COT;<br>--- Detection threshold level = -70dBm/MHz + 20 – Pout E.I.R.P (Pout in dBm); |
| ☐ Short Control Signalling Transmissions:<br>--- Short Control Signalling Transmissions shall have a maximum duty cycle of 10% within an observation period of 50ms. |

## 8.2. Test Setup

Conducted measurements



## 8.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.7

## 8.4. Test Result

This requirement does not apply to non-adaptive equipment or adaptive equipment operating in a non-adaptive mode providing the equipment complies with the requirements and/or restrictions applicable to non-adaptive equipment.
In addition, this requirement does not apply for equipment with a maximum declared RF Output power level of less than 10dBm E.I.R.P. or for equipment when operating in a mode where the RF Output power is less than 10dBm E.I.R.P.
No applicable.

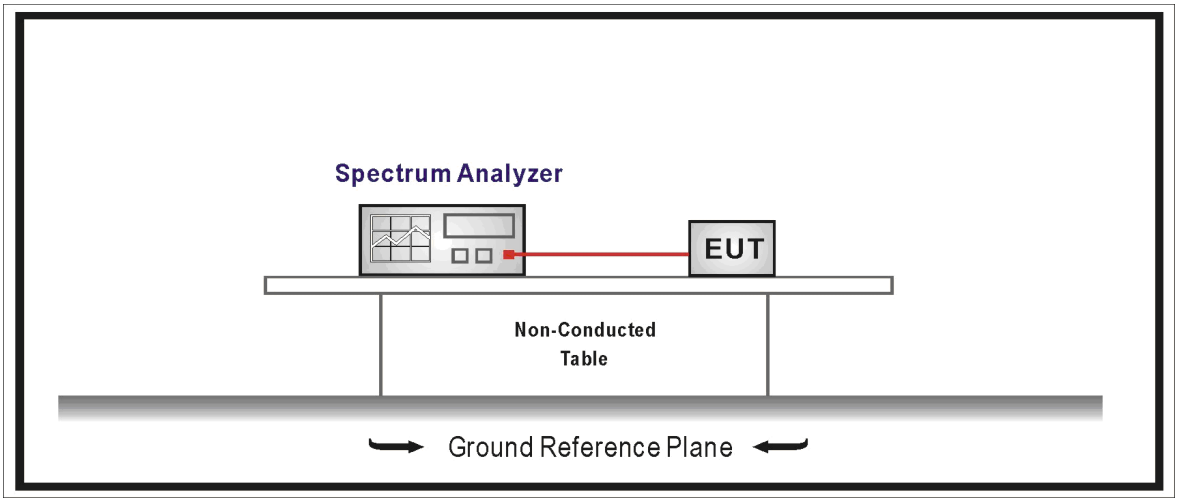
# 9. OCCUPIED CHANNEL BANDWIDTH

## 9.1. Limit

The Occupied Channel Bandwidth for each hopping frequency shall fall completely within the band given in 2.4GHz to 2.4835GHz.

For non-adaptive Frequency Hopping equipment with E.I.R.P greater than 10dBm, the Occupied Channel Bandwidth for every occupied hopping frequency shall be equal to or less than the value declared by the supplier. This declared value shall not be greater than 5 MHz.

## 9.2. Test Setup




## 9.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.8

**Step 1:**

Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: The centre frequency of the channel under test
- Resolution BW: ~ 1 % of the span without going below 1 % (We set RBW=20KHz)
- Video BW: 3 × RBW (We set VBW=62KHz)
- Frequency Span: 2 × Occupied Channel Bandwidth (We set Span=2MHz)
- Detector Mode: RMS
- Trace Mode: Max Hold

**Step 2:**

Wait until the trace is completed. Find the peak value of the trace and place the analyser marker on this peak.

**Step 3:**

Use the 99 % bandwidth function of the spectrum analyser to measure the Occupied Channel Bandwidth of the UUT. This value shall be recorded.

## 9.4. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Occupied Channel Bandwidth |
| Test Mode | : | Mode 1: Transmit by DH1 |

| Channel No. | Frequency (MHz) | 99% Bandwidth (MHz) | Limit |
|---|---|---|---|
| 00 | 2402 | 0.87 | Within the band 2400.0MHz~2483.5MHz |
| 79 | 2480 | 0.94 | |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Occupied Channel Bandwidth |
| Test Mode | : | Mode 2: Transmit by 2DH1 |

| Channel No. | Frequency (MHz) | 99% Bandwidth (MHz) | Limit |
|---|---|---|---|
| 00 | 2402 | 1.03 | Within the band 2400.0MHz~2483.5MHz |
| 79 | 2480 | 1.05 | |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Occupied Channel Bandwidth |
| Test Mode | : | Mode 3: Transmit by 3DH1 |

| Channel No. | Frequency (MHz) | 99% Bandwidth (MHz) | Limit |
|---|---|---|---|
| 00 | 2402 | 1.07 | Within the band 2400.0MHz~2483.5MHz |
| 79 | 2480 | 1.10 | |

| | | |
|---|---|---|
| Test Result | : | Pass |

# 10. TRANSMITTER UNWANTED EMISSIONS IN THE OUT-OF-BAND DOMAIN

## 10.1. Limit

The transmitter unwanted emissions in the out-of-band domain but outside the allocated band, shall not exceed the values provided by the mask in figure 3.

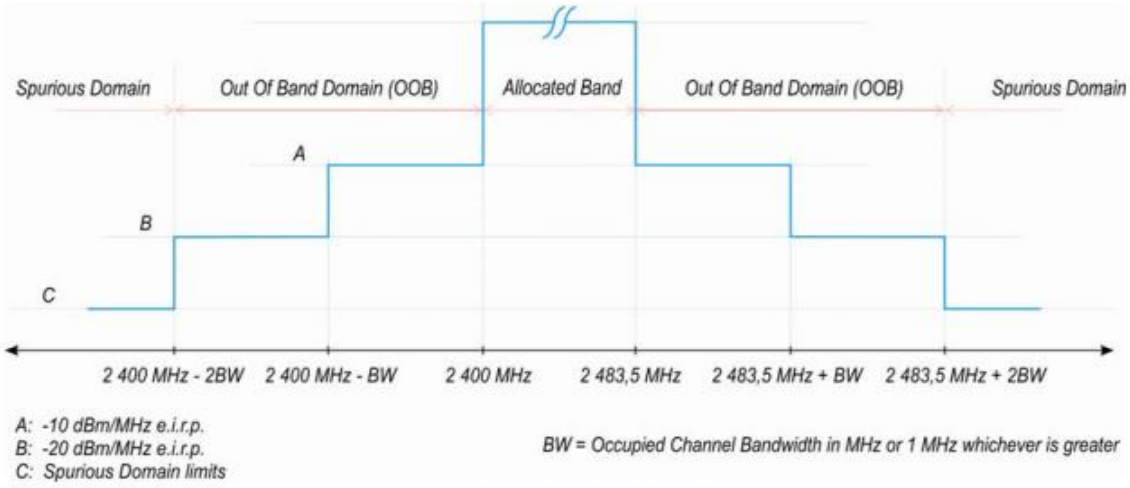
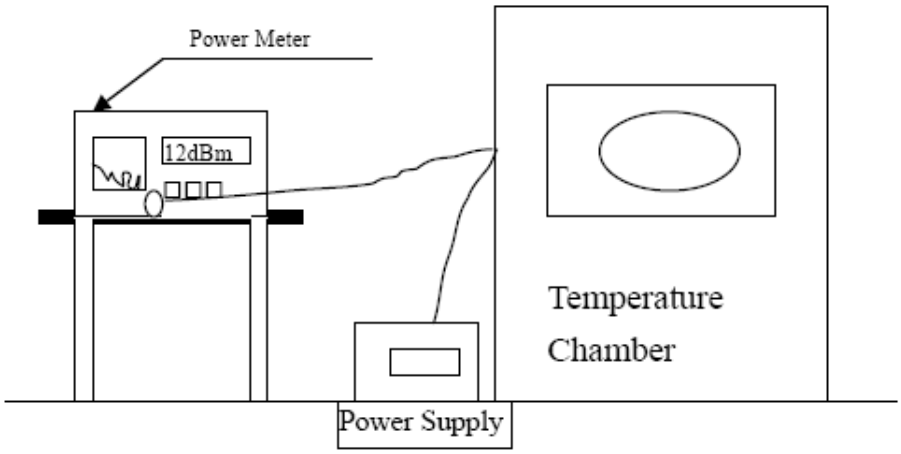



**Figure 3: Transmit mask**

## 10.2. Test Setup

For Conducted Measurement



## 10.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.9

**Step 1:**

• Connect the UUT to the spectrum analyser and use the following settings:

- Centre Frequency: 2 484 MHz
- Span: 0 Hz
- Resolution BW: 1 MHz
- Filter mode: Channel filter
- Video BW: 3 MHz
- Detector Mode: RMS
- Trace Mode: Clear / Write
- Sweep Mode: Continuous
- Sweep Points: 5 000
- Trigger Mode: Video trigger

NOTE 1: In case video triggering is not possible, an external trigger source may be used.

- Sweep Time: Suitable to capture one transmission burst

**Step 2:** (segment 2 483,5 MHz to 2 483,5 MHz + BW)

• Adjust the trigger level to select the transmissions with the highest power level.

• For frequency hopping equipment operating in a normal hopping mode, the different hops will result in signal bursts with different power levels. In this case the burst with the highest power level shall be selected.

• Set a window (start and stop lines) to match with the start and end of the burst and in which the RMS power shall be measured using the Time Domain Power function.

• Select RMS power to be measured within the selected window and note the result which is the RMS power within this 1 MHz segment (2 483,5 MHz to 2 484,5 MHz). Compare this value with the applicable limit provided by the mask.

• Increase the centre frequency in steps of 1 MHz and repeat this measurement for every 1 MHz segment within the range 2 483,5 MHz to 2 483,5 MHz + BW. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + BW - 0,5 MHz (which means this may partly overlap with the previous 1 MHz segment).

**Step 3:** (segment 2 483,5 MHz + BW to 2 483,5 MHz + 2BW)

• Change the centre frequency of the analyser to 2 484 MHz + BW and perform the measurement for the first 1 MHz segment within range 2 483,5 MHz + BW to 2 483,5 MHz + 2BW. Increase the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 483,5 MHz + 2 BW - 0,5 MHz.

**Step 4:** (segment 2 400 MHz - BW to 2 400 MHz)

• Change the centre frequency of the analyser to 2 399,5 MHz and perform the measurement for the first 1 MHz segment within range 2 400 MHz - BW to 2 400 MHz Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

**Step 5:** (segment 2 400 MHz - 2BW to 2 400 MHz - BW)

• Change the centre frequency of the analyser to 2 399,5 MHz - BW and perform the measurement for the first 1 MHz segment within range 2 400 MHz - 2BW to 2 400 MHz - BW. Reduce the centre frequency in 1 MHz steps and repeat the measurements to cover this whole range. The centre frequency of the last 1 MHz segment shall be set to 2 400 MHz - 2BW + 0,5 MHz.

**Step 6:**

• In case of conducted measurements on equipment with a single transmit chain, the declared antenna assembly gain "G" in dBi shall be added to the results for each of the 1 MHz segments and compared with the limits provided by the mask given in figures 1 or 3. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

• In case of conducted measurements on smart antenna systems (equipment with multiple transmit chains), the measurements need to be repeated for each of the active transmit chains. The declared antenna assembly gain "G" in dBi for a single antenna shall be added to these results. If more than one antenna assembly is intended for this power setting, the antenna with the highest gain shall be considered.

Comparison with the applicable limits shall be done using any of the options given below:

- Option 1: the results for each of the transmit chains for the corresponding 1 MHz segments shall be added. The additional beamforming gain "Y" in dB shall be added as well and the resulting values compared with the limits provided by the mask given in figures 1 or 3.
- Option 2: the limits provided by the mask given in figures 1 or 3 shall be reduced by 10 x log10(Ach) and the additional beamforming gain "Y" in dB. The results for each of the transmit chains shall be individually compared with these reduced limits.

NOTE 2: Ach refers to the number of active transmit chains.

It shall be recorded whether the equipment complies with the mask provided in figures 1 or 3.

## 10.5. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Transmitter unwanted emissions in the out-of-band domain |
| Test Mode | : | Mode 1: Transmit by DH1 |

| Frequency (MHz) | Test Conditions (℃) | Max measured Values (dBm/MHz) | Limit (dBm/MHz) |
|---|---|---|---|
| 2400–2BW~ 2400-BW | 25 | -67.79 | -20 |
| 2400–BW~2400 | 25 | -65.91 | -10 |
| 2483.5~ 2483.5+BW | 25 | -68.23 | -10 |
| 2483.5+BW~ 2483.5+2BW | 25 | -68.74 | -20 |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Transmitter unwanted emissions in the out-of-band domain |
| Test Mode | : | Mode 2: Transmit by 2DH1 |

| Frequency (MHz) | Test Conditions (℃) | Max measured Values (dBm/MHz) | Limit (dBm/MHz) |
|---|---|---|---|
| 2400–2BW~ 2400-BW | 25 | -65.53 | -20 |
| 2400–BW~2400 | 25 | -62.83 | -10 |
| 2483.5~ 2483.5+BW | 25 | -62.93 | -10 |
| 2483.5+BW~ 2483.5+2BW | 25 | -62.75 | -20 |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Transmitter unwanted emissions in the out-of-band domain |
| Test Mode | : | Mode 3: Transmit by 3DH1 |

| Frequency (MHz) | Test Conditions (℃) | Max measured Values (dBm/MHz) | Limit (dBm/MHz) |
|---|---|---|---|
| 2400–2BW~ 2400-BW | 25 | -65.58 | -20 |
| 2400–BW~2400 | 25 | -66.67 | -10 |
| 2483.5~ 2483.5+BW | 25 | -62.83 | -10 |
| 2483.5+BW~ 2483.5+2BW | 25 | -63.80 | -20 |

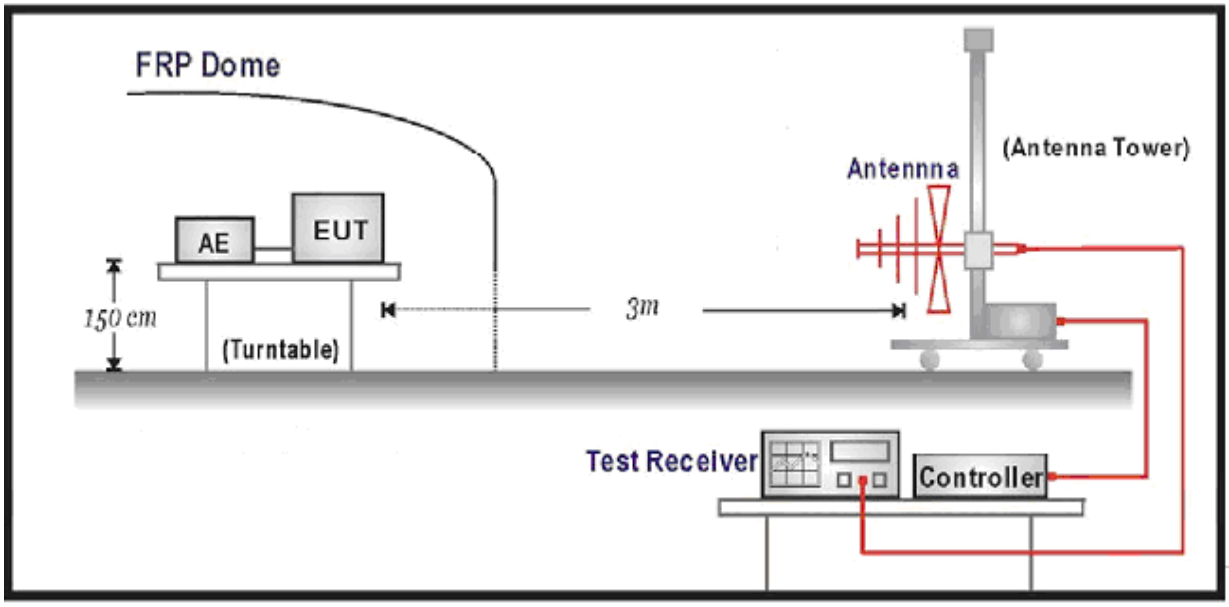
# 11. TRANSMITTER UNWANTED EMISSIONS IN THE SPURIOUS DOMAIN

## 11.1. Limit

| Transmitter Limits for Spurious Emissions | | |
|---|---|---|
| Frequency Range | Maximum power<br>E.R.P. (≤ 1GHz)<br>E.I.R.P. (> 1GHz) | Bandwidth |
| 30 MHz to 47 MHz | -36 dBm | 100 kHz |
| 47 MHz to 74 MHz | -54 dBm | 100 kHz |
| 74 MHz to 87,5 MHz | -36 dBm | 100 kHz |
| 87,5 MHz to 118 MHz | -54 dBm | 100 kHz |
| 118 MHz to 174 MHz | -36 dBm | 100 kHz |
| 174 MHz to 230 MHz | -54 dBm | 100 kHz |
| 230 MHz to 470 MHz | -36 dBm | 100 kHz |
| 470 MHz to 862 MHz | -54 dBm | 100 kHz |
| 862 MHz to 1 GHz | -36 dBm | 100 kHz |
| 1 GHz to 12,75 GHz | -30 dBm | 1 MHz |

## 11.2. Test Setup

For Radiated Measurement



## 11.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.10

**Step 1:**

The sensitivity of the spectrum analyser should be such that the noise floor is at least 12 dB below the limits given in tables 1 or 4.

**Step 2:**

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 100 kHz

• Video bandwidth: 300 kHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 9 970

NOTE 1: For spectrum analysers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For non continuous transmissions (duty cycle less than 100 %), the sweep time shall be sufficiently long, such that for each 100 kHz frequency step, the measurement time is greater than two transmissions of the UUT. For Frequency Hopping equipment operating in a normal operating (hopping not disabled) mode, the sweep time shall be further increased to capture multiple transmissions on the same hopping frequency in different hopping sequences. Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.10.2.1.2 and compared to the limits given in tables 1 or 4.

**Step 3:**

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 1 MHz

• Video bandwidth: 3 MHz

• Detector mode: Peak

• Trace Mode: Max Hold

• Sweep Points: ≥ 11 750

NOTE 2: For spectrum analysers not supporting this high number of sweep points, the frequency band may need to be segmented.

• Sweep time: For non continuous transmissions (duty cycle less than 100 %), the sweep time shall be sufficiently long, such that for each 1 MHz frequency step, the measurement time is greater than two transmissions of the UUT.

## 11.4. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Transmitter spurious emissions |
| Test Mode | : | Mode 1: Transmit by DH1(radiated method) |

| Frequency (MHz) | Polarization (H/V) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| Channel 0 (2402MHz) | | | | | |
| 116.80 | H | -67.92 | -54.00 | -13.92 | PK |
| 204.68 | V | -66.84 | -54.00 | -12.84 | PK |
| 903.32 | H | -50.68 | -36.00 | -14.68 | PK |
| 924.93 | V | -48.95 | -36.00 | -12.95 | PK |
| 4809.55 | H | -42.35 | -30.00 | -12.35 | PK |
| 4809.63 | V | -40.45 | -30.00 | -10.45 | PK |
| 7214.55 | H | -44.88 | -30.00 | -14.88 | PK |
| 7214.55 | V | -40.96 | -30.00 | -10.96 | PK |
| Channel 78 (2480MHz) | | | | | |
| 267.57 | H | -49.87 | -36.00 | -13.87 | PK |
| 227.17 | V | -64.60 | -54.00 | -10.60 | PK |
| 847.32 | H | -65.09 | -54.00 | -11.09 | PK |
| 814.21 | V | -64.72 | -54.OO | -10.72 | PK |
| 4947.60 | H | -40.86 | -30.00 | -10.86 | PK |
| 4947.62 | V | -44.84 | -30.00 | -14.84 | PK |
| 7421.63 | H | -44.36 | -30.00 | -14.36 | PK |
| 7421.60 | V | -43.80 | -30.00 | -13.80 | PK |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Transmitter spurious emissions |
| Test Mode | : | Mode 1: Transmit by DH1(conducted method) |

| Frequency(MHz) | Measure Level(dBm) | Limit(dBm) | Margin(dB) | Detector |
|---|---|---|---|---|
| Channel 0 (2402MHz) | | | | |
| 164.37 | -47.10 | -36.00 | -11.10 | PK |
| 936.92 | -46.63 | -36.00 | -10.63 | PK |
| 4803.60 | -38.96 | -30.00 | -8.96 | PK |
| 7205.57 | -43.43 | -30.00 | -13.43 | PK |
| Channel 78 (2480MHz) | | | | |
| 225.83 | -65.19 | -54.00 | -11.19 | PK |
| 884.41 | -50.45 | -36.00 | -14.45 | PK |
| 4959.63 | -42.54 | -30.00 | -12.54 | PK |
| 7439.61 | -40.66 | -30.00 | -10.66 | PK |

Note: only record the worst case data in the test report.

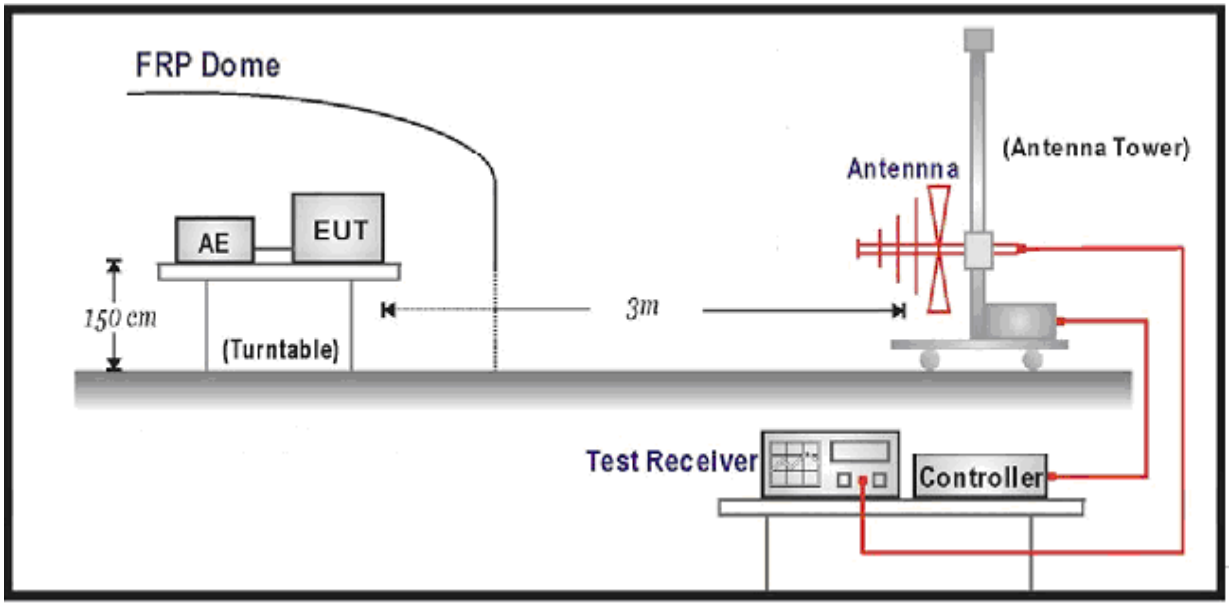
# 12. RECEIVER SPURIOUS EMISSIONS

## 12.1. Limit

| Spurious emissions limits for receivers | | |
|---|---|---|
| Frequency Range | Maximum power<br>E.R.P. (≤ 1GHz)<br>E.I.R.P. (> 1GHz) | Measurement bandwidth |
| 30 MHz to 1 GHz | -57 dBm | 100 kHz |
| 1 GHz to 12.75 GHz | -47 dBm | 1 MHz |

## 12.2. Test Setup

For Radiated Measurement



## 12.3. Test Procedure

Refer to ETSI EN 300 328 V2.2.2 (2019-07) Clause 5.4.11

**Step 1:**

The sensitivity of the spectrum analyser should be such that the noise floor is at least 12 dB below the limits given in tables 2 or 5.

**Step 2:**

The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 100 kHz
• Video bandwidth: 300 kHz
• Detector mode: Peak
• Trace Mode: Max Hold
• Sweep Points: ≥ 9 970
• Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5.

**Step 3:**

The emissions over the range 1 GHz to 12,75 GHz shall be identified.

Spectrum analyser settings:

• Resolution bandwidth: 1 MHz
• Video bandwidth: 3 MHz
• Detector mode: Peak
• Trace Mode: Max Hold
• Sweep Points: ≥ 11 750
• Sweep time: Auto

Allow the trace to stabilize. Any emissions identified during the sweeps above that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.3.11.2.1.2 and compared to the limits given in tables 2 or 5. Frequency Hopping equipment may generate a block (or several blocks) of spurious emissions anywhere within the spurious domain. If this is the case, only the highest peak of each block of emissions shall be measured using the procedure in clause 5.3.11.2.1.2.

**Step 4:**

• In case of conducted measurements on smart antenna systems (equipment with multiple receive chains), the steps 2 and 3 need to be repeated for each of the active receive chains (Ach).The limits used to identify emissions during this pre-scan need to be reduced with 10 × log10 (Ach) (number of active receive chains).

## 12.4. Test Result

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Receiver spurious emissions |
| Test Mode | : | Mode 4: Receive by DH1(radiated method) |

| Frequency (MHz) | Polarization (H/V) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector |
|---|---|---|---|---|---|
| Channel 0 (2402MHz) | | | | | |
| 219.78 | H | -68.23 | -57.00 | -11.23 | PK |
| 222.76 | V | -70.88 | -57.00 | -13.88 | PK |
| 886.46 | H | -67.98 | -57.00 | -10.98 | PK |
| 979.27 | V | -68.63 | -57.00 | -11.63 | PK |
| 1725.71 | H | -58.06 | -47.00 | -11.06 | PK |
| 1728.59 | V | -60.35 | -47.00 | -13.35 | PK |
| 2345.24 | H | -62.21 | -47.00 | -15.21 | PK |
| 2485.08 | V | -58.39 | -47.00 | -11.39 | PK |
| Channel 78 (2480MHz) | | | | | |
| 195.85 | H | -69.34 | -57.00 | -12.34 | PK |
| 250.55 | V | -70.70 | -57.00 | -13.70 | PK |
| 861.54 | H | -68.65 | -57.00 | -11.65 | PK |
| 988.06 | V | -68.42 | -57.00 | -11.42 | PK |
| 1349.42 | H | -59.06 | -47.00 | -12.06 | PK |
| 1811.66 | V | -60.60 | -47.00 | -13.60 | PK |
| 2854.27 | H | -59.71 | -47.00 | -12.71 | PK |
| 2348.79 | V | -61.29 | -47.00 | -14.29 | PK |

| | | |
|---|---|---|
| Product | : | AM/FM/SW radio with Bluetooth speaker |
| Test Item | : | Receiver spurious emissions |
| Test Mode | : | Mode 4: Receive by DH1(conducted method) |

| Frequency(MHz) | Measure Level(dBm) | Limit(dBm) | Margin(dB) | Detector |
|---|---|---|---|---|
| Channel 0 (2402MHz) | | | | |
| 287.87 | -67.58 | -57.00 | -10.58 | PK |
| 878.21 | -67.70 | -57.00 | -10.70 | PK |
| 1879.49 | -58.25 | -47.00 | -11.25 | PK |
| 2869.07 | -62.26 | -47.00 | -15.26 | PK |
| Channel 78 (2480MHz) | | | | |
| 136.02 | -68.06 | -57.00 | -11.06 | PK |
| 880.27 | -68.06 | -57.00 | -11.06 | PK |
| 1459.61 | -59.68 | -47.00 | -12.68 | PK |
| 2338.60 | -60.41 | -47.00 | -13.41 | PK |

Note: only record the worst case data in the test report.

# 13. RECEIVER BLOCKING

## 13.1. Limit

Adaptive Frequency Hopping equipment shall comply with the requirements defined in clause 4.3.1.12.4

**Table 6: Receiver Blocking parameters for Receiver Category 1 equipment**

| Wanted signal mean power from companion device (dBm) (see notes 1 and 4) | Blocking signal frequency (MHz) | Blocking signal power (dBm) (see note 4) | Type of blocking signal |
|---|---|---|---|
| (-133 dBm + 10 × $\log_{10}$(OCBW)) or -68 dBm whichever is less (see note 2) | 2 380<br>2 504 | -34 | CW |
| (-139 dBm + 10 × $\log_{10}$(OCBW)) or -74 dBm whichever is less (see note 3) | 2 300<br>2 330<br>2 360<br>2 524<br>2 584<br>2 674 | | |

NOTE 1: OCBW is in Hz.

NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 26 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 3: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 20 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.

NOTE 4: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2.

**Table 7: Receiver Blocking parameters receiver Category 2 equipment**

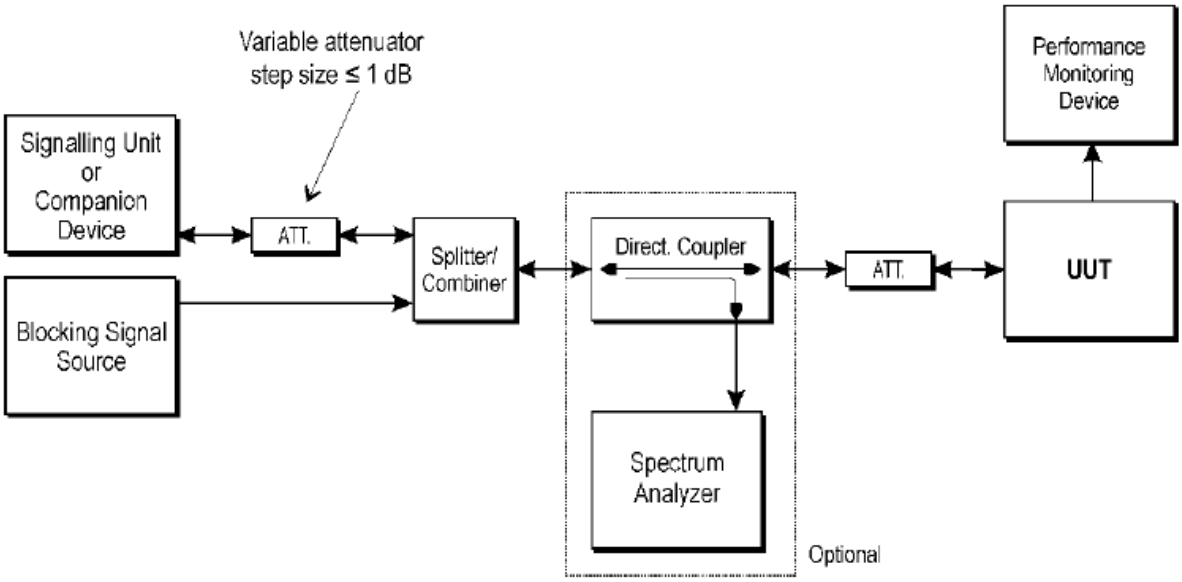
| Wanted signal mean power from companion device (dBm) (see notes 1 and 3) | Blocking signal frequency (MHz) | Blocking signal power (dBm) (see note 3) | Type of blocking signal |
|---|---|---|---|
| (-139 dBm + 10 × $\log_{10}$(OCBW) + 10 dB) or (-74 dBm + 10 dB) whichever is less (see note 2) | 2 380<br>2 504<br>2 300<br>2 584 | -34 | CW |
| NOTE 1: OCBW is in Hz.<br>NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative test may be performed using a wanted signal up to $P_{min}$ + 26 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.<br>NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2. | | | |

**Table 8: Receiver Blocking parameters receiver Category 3 equipment**

| Wanted signal mean power from companion device (dBm) (see notes 1 and 3) | Blocking signal frequency (MHz) | Blocking signal power (dBm) (see note 3) | Type of blocking signal |
|---|---|---|---|
| (-139 dBm + 10 × $\log_{10}$(OCBW) + 20 dB) or (-74 dBm + 20 dB) whichever is less (see note 2) | 2 380<br>2 504<br>2 300<br>2 584 | -34 | CW |
| NOTE 1: OCBW is in Hz.<br>NOTE 2: In case of radiated measurements using a companion device and the level of the wanted signal from the companion device cannot be determined, a relative the test may be performed using a wanted signal up to $P_{min}$ + 30 dB where $P_{min}$ is the minimum level of wanted signal required to meet the minimum performance criteria as defined in clause 4.3.1.12.3 in the absence of any blocking signal.<br>NOTE 3: The level specified is the level at the UUT receiver input assuming a 0 dBi antenna assembly gain. In case of conducted measurements, this level has to be corrected for the (in-band) antenna assembly gain (G). In case of radiated measurements, this level is equivalent to a power flux density (PFD) in front of the UUT antenna with the UUT being configured/positioned as recorded in clause 5.4.3.2.2. | | | |

## 13.2. Test Setup

Conducted measurements




## 13.3. Test Procedure

Step 1:

• For non-frequency hopping equipment, the UUT shall be set to the lowest operating channel.

Step 2:

• The blocking signal generator is set to the first frequency as defined in the appropriate table corresponding to the receiver category and type of equipment.

Step 3:

• With the blocking signal generator switched off, a communication link is established between the UUT and the associated companion device using the test setup shown in figure 6. The attenuation of the variable attenuator shall be increased in 1 dB steps to a value at which the minimum performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is still met. The resulting level for the wanted signal at the input of the UUT is Pmin.

• This signal level (Pmin) is increased by the value provided in the table corresponding to the receiver category and type of equipment.

Step 4:

• The blocking signal at the UUT is set to the level provided in the table corresponding to the receiver category and type of equipment. It shall be verified and recorded in the test report that the performance criteria as specified in clause 4.3.1.12.3 or clause 4.3.2.11.3 is met.

Step 5:

• Repeat step 4 for each remaining combination of frequency and level for the blocking signal as provided in the table corresponding to the receiver category and type of equipment.

Step 6:

• For non-frequency hopping equipment, repeat step 2 to step 5 with the UUT operating at the highest operating channel.

## 13.4. Test Result

| | | |
|---|---|---|
| Product | : | Tablet PC |
| Test Item | : | Receiver spurious emissions(conducted) |
| Test Mode | : | Receiving |
| Test Environment | : | 25℃ 43.5%RH |

| **Receiver Category** | **Test Channel** | **Wanted signal mean power from companion device (dBm)** | **Blocking signal frequency (MHz)** | **Blocking signal power (dBm) (see note 2)** | **PER (%)** | **Limit (%)** | **Result** |
|---|---|---|---|---|---|---|---|
| 2 | All channel Hopping | -69.5 | 2300 | -34 | 4.93 | 10 | Pass |
| | | | 2380 | | 7.69 | 10 | Pass |
| | | | 2504 | | 5.38 | 10 | Pass |
| | | | 2584 | | 4.89 | 10 | Pass |

## 14. PHOTOGRAPHS OF TEST SETUP

----------THE END OF REPORT----------