

EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07



**Test Report**  
**acc. to the relevant standard**  
**47 CFR Part 15 C – Intentional Radiators**  
**Measurement Procedure:**  
**ANSI C63.4-2003**  
**relating to**  
**A.D.C. Automotive Distance Control**  
**Systems GmbH**  
**BSDTX**

**TD74-67Y30-B (Right hand sensor)**  
**TD74-67Y40-B (Left hand sensor)**  
**EH44-67Y30-A (Right hand sensor)**  
**EH44-67Y40-A (Left hand sensor)**  
**GS3L-67Y30-C (Right hand sensor)**  
**GS3L-67Y40-C (Left hand sensor)**

**Methods of Measurement of Radio-**  
**Noise Emissions from Low-Voltage**  
**Electrical and Electronic Equipment**  
**in the Range 9 kHz to 40 GHz**



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| <b>Manufacturer's details</b> |  |
|-------------------------------|--|
| Manufacturer                  | <b>A.D.C. Automotive Distance Control Systems GmbH</b>   |
| Manufacturer's grantee code   | <b>OAY</b>   |
| Manufacturer's address        | A.D.C. Automotive Distance Control Systems GmbH  |
|                               | Kemptener Str. 99  |
|                               | D-88131 Lindau/Bodensee  |
|                               | Germany  |
|                               | Phone: +49 8382 9699 435   |
|                               | Fax: +49 8382 9699 50  |
|                               | E-mail: <a href="mailto:frank.gruson@continental-corporation.com">frank.gruson@continental-corporation.com</a> |
| Relevant standard used        | 47 CFR Part 15C - Intentional Radiators  |
|                               | ANSI C63.4-2003  |

| <b>Test report prepared by</b> |  |
|--------------------------------|--|
| Technical engineer             | Ralf Trepper   |
|                                | m.dudde hochfrequenz-technik (laboratory)                                    |
|                                | Rottland 5a  |
|                                | 51429 Bergisch Gladbach  |
|                                | Germany  |
|                                | Phone: +49 (0) 2207 96 89-0  |
|                                | Fax: +49 (0) 2207 96 89-20   |
|                                | E-mail: <a href="mailto:m.dudde@labor@dudde.com">m.dudde@labor@dudde.com</a> |

| <b>Equipment Under Test (EUT)</b> |  |
|-----------------------------------|--|
| Equipment category                | 24 GHz Wideband Vehicular Radar System |
| Trade name                        | Continental                            |
| Type designation                  | <b>BSDTX</b>                           |
| Serial no.                        | None, Prototype                        |
| Variants*                         | TD74-67Y30-B (Right hand sensor)       |
|                                   | TD74-67Y40-B (Left hand sensor)        |
|                                   | EH44-67Y30-A (Right hand sensor)       |
|                                   | EH44-67Y40-A (Left hand sensor)        |
|                                   | GS3L-67Y30-C (Right hand sensor)       |
|                                   | GS3L-67Y40-C (Left hand sensor)        |

\* The stated variants are all constructed equally. They only differ in their type designation which is due to the varying car platforms.


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### 1. Test result summary

| CFR Section        | Report Chapter | Requirements Headline                                      | Test result |                 |                |
|--------------------|----------------|--|-------------|-----------------|----------------|
|                    |                |  | Pass        | Fail            | Nt.            |
| 15.203             | 12.1           | Antenna requirement  | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.205             | 12.2           | Restricted bands of operation                              | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.209             | 12.3           | Radiated emission limits, general requirements             | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.252(a)(1)(2)(3) | 12.4           | Occupied bandwidth (-10 dB)                                | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.252(b)(2)       | 12.5           | Radiated output power and spurious emissions above 960 MHz | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.252(b)(3)       | 12.6           | Special requirements                                       | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.252(b)(4)       | 12.7           | Peak level limit   | Pass        | <del>Fail</del> | <del>Nt.</del> |
| 15.252(b)(5)       | 12.8           | Spurious emissions below 960 MHz                           | Pass        | <del>Fail</del> | <del>Nt.</del> |

|   |            |               |
|---|------------|---------------|
| <b>The equipment meets the requirements</b> | <b>Yes</b> | <del>No</del> |
|---|------------|---------------|

Signature   
 (Technician)

Signature   
 (Manager)

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## 2. Test laboratory

Company name : m.dudde hochfrequenz-technik  
Street : Rottland 5a  
City : 51429 Bergisch Gladbach  
Country : Germany  
Laboratory : FCC Registration Number: 699717  
This site has been fully described in a report submitted to the FCC, and renewed with letter dated July 12, 2005, Registration Number 699717.  
Phone : +49-2207-9689-0  
Fax : +49-2207-9689-20  
E-Mail : manfred.dudde@t-online.de  
Web : http://www.dudde.com

## 3. Introduction

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of m. dudde hochfrequenz - technik.

This report contains the result of tests performed by m. dudde hochfrequenz - technik for the purpose of a type approval. The order for carrying out these tests has been placed by:

### Manufacturer

Company name : A.D.C. Automotive Distance Control Systems GmbH  
Address : Kemptener Str. 99  
Postcode : D-88131  
City/town : Lindau/Bodensee  
Country : Germany  
Telephone : +49 8382 9699 435  
Telefax : +49 8382 9699 50  
E-mail : frank.gruson@continental-corporation.com  
Date of order : 2010-03-23  
References : Mr. Frank Gruson  
Frequency Management WW  
Sensor Front End  
Advanced Driver Assistance Systems  
C PSAD A D F6

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## 4. Product

Samples of the following apparatus were submitted for testing:

|                               |  |
|-------------------------------|--|
| Type of equipment             | : 24 GHz Wideband Vehicular Radar System |
| Trademark                     | : Continental                            |
| Type designation              | : <b>BSDTX</b>                           |
| Hardware version              | : BSDTX                                  |
| Serial number                 | : None, Prototype                        |
| Software release              | : ---                                    |
| Power used                    | : 12.0 VDC                               |
| Frequency used                | : 24.670 GHz                             |
| Generated or used frequencies | : 24 to 25 GHz quartz stabilized VCO     |
| ITU emission class            | : 640MF0N                                |
| <b>FCC ID</b>                 | : <b>OAYBSDTX</b>                        |

## 5. Test schedule

The tests were carried out in accordance with the specifications detailed in chapter 7 “Summary“ of this report at:

- **m. dudde hochfrequenz - technik, D-51429 Bergisch Gladbach**

The test sample was received on:

- **2010-03-23**

The tests were carried out in the following period of time:

- **2010-04-25 - 2010-05-05**

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## 6. Product and measurement documentation

For issuing this report the following product documentation was used and the following annexes were created:

| Description  | Date       | Identifications |
|--|------------|-----------------|
| External Photographs of the Equipment Under Test (EUT) | 2010-05-07 | Annex no. 1     |
| Internal Photographs of the Equipment Under Test (EUT) | 2010-05-07 | Annex no. 2     |
| Bandwidth  | 2010-05-07 | Annex no. 3     |
| Label Sample   | 2010-05-07 | Annex no. 4     |
| Functional Description                                 | 2010-05-07 | Annex no. 5     |
| Test Setup Photos                                      | 2010-05-07 | Annex no. 6     |
| Block Diagram  | 2010-05-07 | Annex no. 7     |
| Operational Description                                | 2010-05-07 | Annex no. 8     |
| Schematics   | 2010-05-07 | Annex no. 9     |
| Parts List   | 2010-05-07 | Annex no. 10    |
| Antenna Description                                    | 2010-05-07 | Annex no. 11    |

The above mentioned documentation will be filed at m. dudde hochfrequenz - technik for a period of 10 years following the issue of this test report.

## 7. Observations and comments

## 8. Summary

The product is intended for the use in the following areas of application:

**Radio-Noise Emissions from Low- Voltage Electrical and Electronic Equipment  
in the frequency range of 9 kHz to 40 GHz**

The samples were tested according to the following specification:

**47 CFR Part 15 – Intentional Radiators, ANSI C63.4-2003**



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## 9. Conclusions

Samples of the apparatus were found to **CONFORM WITH** the specifications stated in chapter 8 "Summary" of this report.

In the opinion of m. dudde hochfrequenz - technik, the samples satisfied all applicable requirements relating to the network interface types specified in chapter 8.

The results of the type tests as stated in this report are exclusively applicable to the product item as identified in this report. m. dudde hochfrequenz - technik does not accept any responsibility for the results stated in this report, with respect to the properties of product items not involved in these tests.

This report consists of a main module, modules with test results and annexes listed in chapter 6. All pages have been numbered consecutively and bear the m. dudde hochfrequenz - technik logo, the report number and sub-numbers.

The total number of pages in this report is **43**.

### Technical inspector:

Date : 2010-05-07

Name : Ralf Trepper

Function : Technician

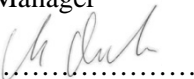
Signature : 

### Technical responsibility for area of testing:

Date : 2010-05-07

Name : Manfred Dudde

Function : Manager

Signature : 

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## 10. Operational description

### 10.1 EUT details

24 GHz Wideband Vehicular Radar System  
See Annex no. 5 (Users Manual) for additional information!

### 10.2 EUT configuration

As soon as the equipment is powered up, the sensor starts transmitting. The BROAD BEAM (wide beam) and the TILT BEAM (small beam) antenna are activated alternately with pulse width of 37.5 ns. Only one antenna is transmitting at the same time.

### 10.3 EUT measurement description

The EUT was tested in a typical fashion. During primary emission tests there had been examined all orthogonal adjustments of the EUT. In the final measurement there was chosen the adjustment in which there had been established before the highest level.

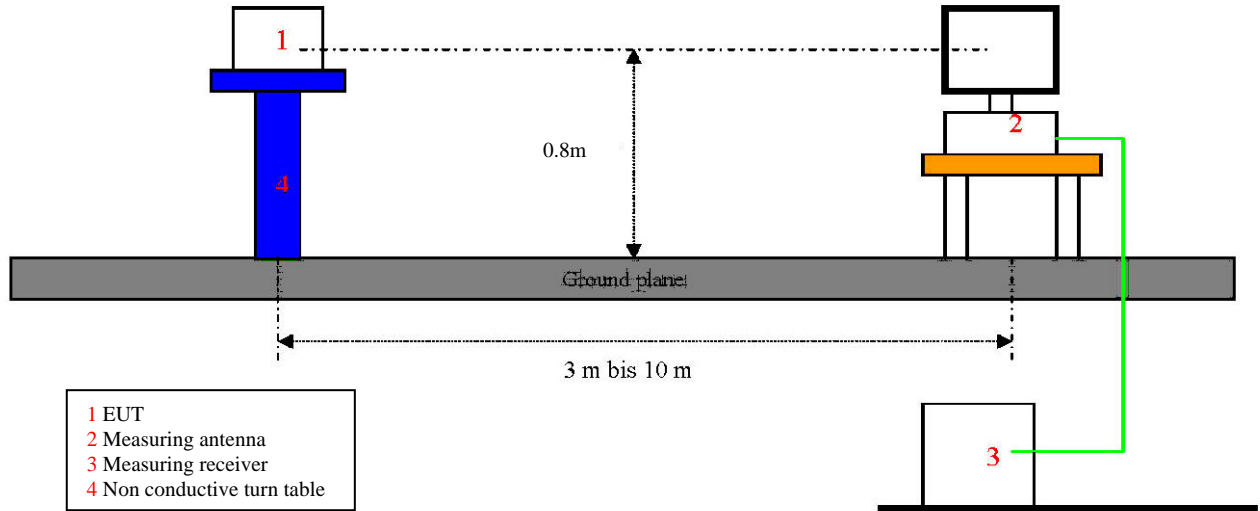
As soon as the EUT connected to the power supply it starts, after a short delay, to operate in continuous mode. The maximum radiation will be achieved, if the EUT is adjusted as described by the manufacturer in the manual. The inclination of the test sample will be brought into a prescribed angle to the aerial antenna.

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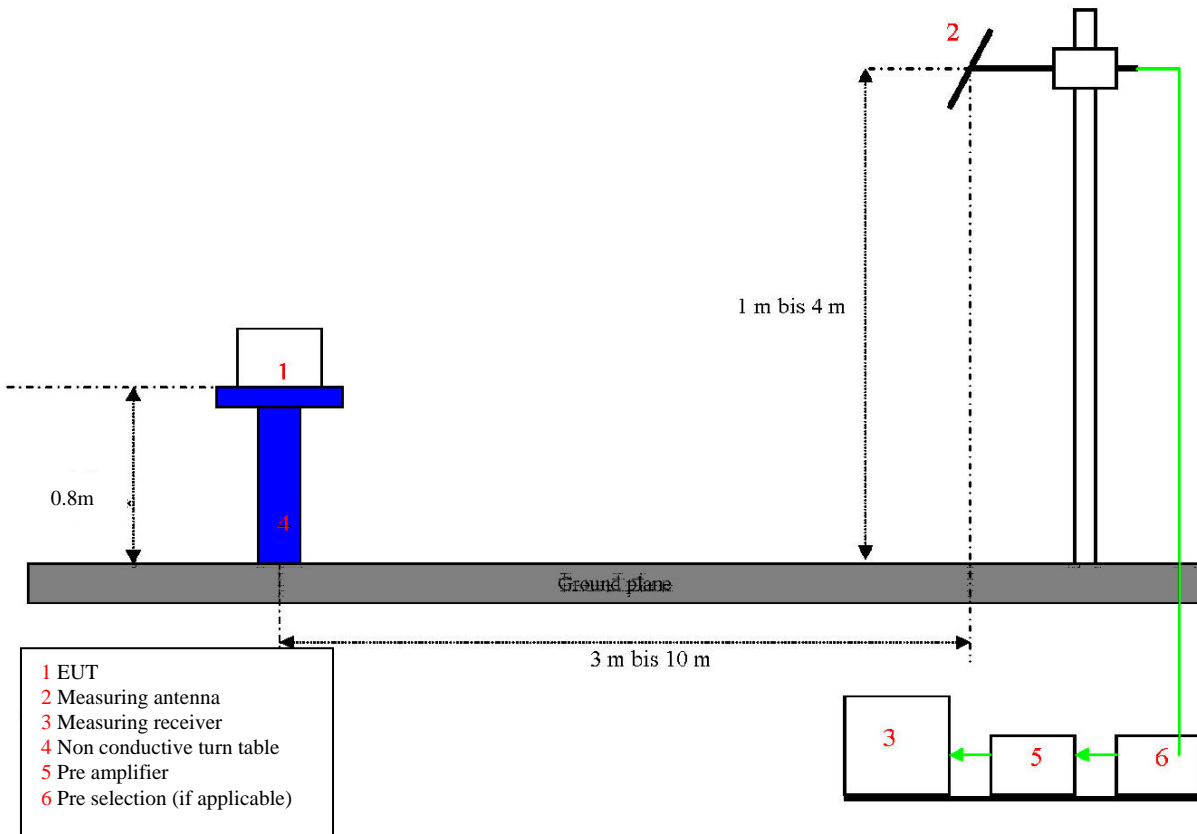
Date of issue: 2010-05-07

### 11.1 Test set-up for the measurement

#### 11.1.1 Test set up: below 30 MHz



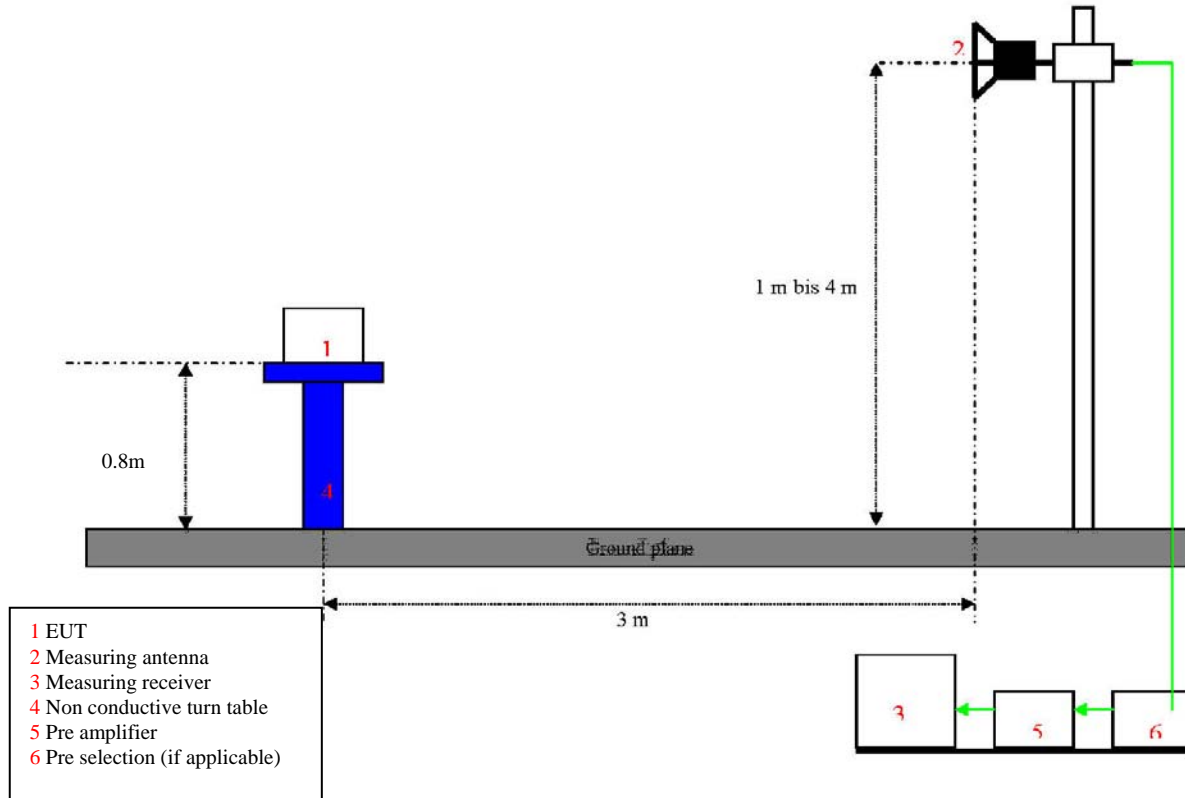
#### 11.1.2 Test set up: 25 MHz up to 1000 MHz



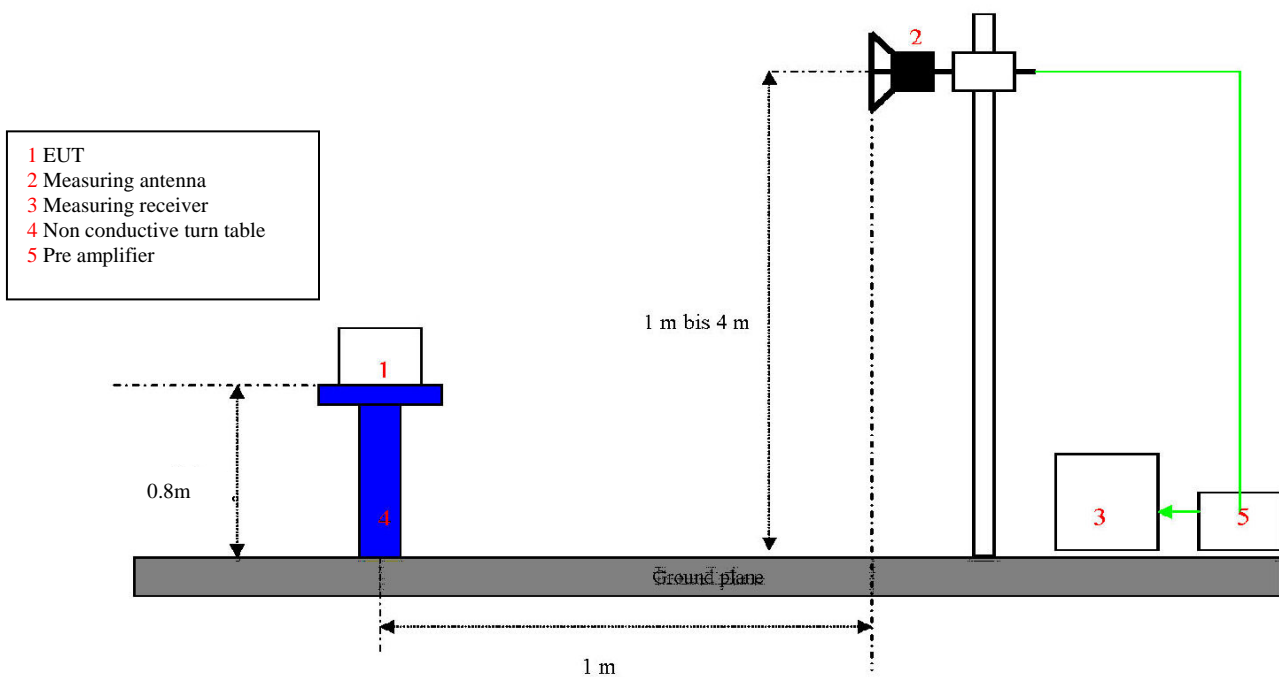
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11.1.3 Test set up: 1 GHz up to 14 GHz



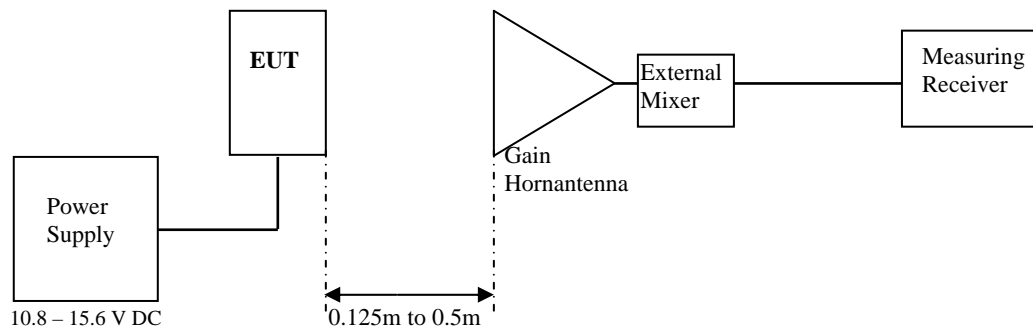
11.1.4 Test set up: 14 GHz up to 34 GHz



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### 11.1.5 Test set up: 34 GHz up to 110 GHz



## 11.2 Calculations for the Correction factors (System attenuation)

### 11.2.1 Calculations for frequencies from 960 MHz up to 34 GHz

System attenuation = free space attenuation + cable loss - antenna gain - gain pre amplifier

### 11.2.1 Calculations for frequencies from 34 GHz up to 110 GHz

System attenuation = free space attenuation - antenna gain

System attenuation = free space attenuation + cable loss + mixer conversion loss - antenna gain

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## 12.1 Antenna requirement

### 12.1.1 Regulation

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

### 12.1.2 Result

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

Antenna is an integrated PCB Patch antenna.  
See Annex no. 11 (Antenna description) for additional information!

N.t.\* See page no. 42

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## 12.2 Restricted bands of operation

### 12.2.1 Regulation

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                   | MHz             | GHz              |
|----------------------------|-----------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423        | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525   | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475   | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67          | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25          | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6             | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2           | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94          | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138             | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05        | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 - 156.52525 | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.7 - 156.9         | 2690 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 162.0125 - 167.17     | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 167.72 - 173.2        | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 240 - 285             | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 322 - 335.4           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              |                       |                 |                  |

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e), regardless of the field strength limits specified elsewhere in this Subpart, the provisions of this Section apply to emissions from any intentional radiator.

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(d) The following devices are exempt from the requirements of this Section:

- (1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a), the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a), and the fundamental emission is outside of the bands listed in paragraph (a) more than 99% of the time the device is actively transmitting, without compensation for duty cycle.
- (2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.
- (3) Cable locating equipment operated pursuant to Section 15.213.
- (4) Any equipment operated under the provisions of § 15.253, § 15.255 or § 15.257 of this part.
- (5) Biomedical telemetry devices operating under the provisions of Section 15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.
- (6) Transmitters operating under the provisions of Subpart D or F of this part.
- (7) Devices operated pursuant to § 15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.
- (8) Devices operated in the 24.075-24.175 GHz band under § 15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in § 15.245(b).
- (9) Devices operated in the 24.0-24.25 GHz band under § 15.249 are exempt from complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in § 15.249(a).

(e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of Section 15.245 shall not exceed the limits specified in Section 15.245(b).

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

(c) Except as provided in paragraphs (d) and (e), regardless of the field strength limits specified elsewhere in this Subpart, the provisions of this Section apply to emissions from any intentional radiator. (d) The following devices are exempt from the requirements of this Section:

- (1) Swept frequency field disturbance sensors operating between 1.705 and 37 MHz provided their emissions only sweep through the bands listed in paragraph (a), the sweep is never stopped with the fundamental emission within the bands listed in paragraph (a), and the fundamental emission is outside of the bands listed in paragraph (a) more than 99% of the time the device is actively transmitting, without compensation for duty cycle.
- (2) Transmitters used to detect buried electronic markers at 101.4 kHz which are employed by telephone companies.



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- (3) Cable locating equipment operated pursuant to Section 15.213.
  - (4) Any equipment operated under the provisions of § 15.253, § 15.255 or § 15.257 of this part.
  - (5) Biomedical telemetry devices operating under the provisions of Section 15.242 of this part are not subject to the restricted band 608-614 MHz but are subject to compliance within the other restricted bands.
  - (6) Transmitters operating under the provisions of Subpart D or F of this part.
  - (7) Devices operated pursuant to § 15.225 are exempt from complying with this section for the 13.36-13.41 MHz band only.
  - (8) Devices operated in the 24.075-24.175 GHz band under § 15.245 are exempt from complying with the requirements of this section for the 48.15-48.35 GHz and 72.225-72.525 GHz bands only, and shall not exceed the limits specified in § 15.245(b).
  - (9) Devices operated in the 24.0-24.25 GHz band under § 15.249 are exempt from 83 complying with the requirements of this section for the 48.0-48.5 GHz and 72.0-72.75 GHz bands only, and shall not exceed the limits specified in § 15.249(a).
- (e) Harmonic emissions appearing in the restricted bands above 17.7 GHz from field disturbance sensors operating under the provisions of Section 15.245 shall not exceed the limits specified in Section 15.245(b).

**12.2.2 Result**

|                                      |            |               |                 |
|--------------------------------------|------------|---------------|-----------------|
| The equipment meets the requirements | <b>Yes</b> | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|------------|---------------|-----------------|

N.t.\* See page no. 42

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## 12.3 Radiated emission limits, general requirements

### 12.3.1 Regulation

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement distance (meters) |
|-----------------|-----------------------------------|-------------------------------|
| 0.009-0.490     | 2400/F(kHz)                       | 300                           |
| 0.490-1.705     | 24000/F(kHz)                      | 30                            |
| 1.705-30.0      | 30                                | 30                            |
| 30-88           | 100                               | 3                             |
| 88-216          | 150                               | 3                             |
| 216-960         | 200                               | 3                             |
| Above 960       | 500                               | 3                             |

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in §§ 15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

(f) In accordance with Section 15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in Section 15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in Section 15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in Section 15.109 that are applicable to the incorporated digital device.

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### 12.3.2 Test equipment

| Type   | Manufacturer/<br>Model no.                         | Serial no. | Last calibration | Next calibration |
|--|--|------------|------------------|------------------|
| Receiver<br>(9 kHz –30 GHz)                          | Rohde & Schwarz<br>Signal Analyzer<br>FSV 30 (502) | 100932     | 2010/04          | 2013/04          |
| Receiver<br>(9 kHz –40.0 GHz)<br>(40.0 GHz -110 GHz) | Anritsu<br>Spectrum Analyzer<br>MS2668 (359a)      | 6200163244 | 2008/04          | 2011/04          |
| Pre-amplifier<br>(100kHz - 1.3GHz)                   | Hewlett Packard<br>8447 E (166a)                   | 1726A00705 | 2010/02          | 2012/02          |
| Pre-amplifier<br>(1GHz - 18GHz)                      | Narda<br>--- (345)                                 | ---        | 2010/02          | 2012/02          |
| Pre-amplifier<br>(12 - 28 GHz)                       | Schwarzbeck<br>BBV 9719 (443)                      | ---        | 2010/02          | 2012/02          |
| Bilog antenna<br>(30- 1000 MHz)                      | Schwarzbeck<br>VULP 9168 (406)                     |            | 2007/02          | 2013/02          |
| Horn antenna<br>(0,86-8,5 GHz)                       | Schwarzbeck<br>BBHA 9120 A (284)                   | 236        | 2008/01          | 2013/01          |
| Horn antenna<br>(15-40 GHz)                          | Schwarzbeck<br>BBHA 9170 (281)                     | 41         | 2010/01          | 2015/01          |
| Horn antenna<br>(24 GHz)                             | MBMT<br>K-235 (431)                                | ---        | 2008/01          | 2013/01          |
| Gain Horn antenna<br>(33-50 GHz)                     | Dorado<br>GH-22-25 (383)                           | 040810     | 2005/04          | 2015/04          |
| Gain Horn antenna<br>(50-75 GHz)                     | Dorado<br>GH-15-25 (384)                           | 031003     | 2005/04          | 2015/04          |
| Gain Horn antenna<br>(75-110 GHz)                    | Dorado<br>GH-10-25 (385)                           | 040808     | 2005/04          | 2015/04          |
| Anritsu Mixer<br>WR22 Q-Band<br>(33-50 GHz)          | OM Labs<br>MA2742A (269a)                          | Q40512-1   | 2010/04          | 2012/04          |
| Anritsu Mixer<br>WR15 V-Band<br>(50-75 GHz)          | OM Labs<br>MA2744A (295a)                          | V41027-1   | 2010/04          | 2012/04          |
| Anritsu Mixer<br>WR10 W-Band<br>(75-110 GHz)         | OM Labs<br>MA2746A (296a)                          | W40706-2   | 2010/04          | 2012/04          |
| RF- cable  | Kabelmetal 18m [N]                                 | K1         | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K17a       | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K18a       | 2010/01          | 2011/01          |
| RF- cable  | Aircell 0.5m [BNC]                                 | K40        | 2010/01          | 2011/01          |
| RF- cable  | Aircell 1m [BNC/N]                                 | K56        | 2010/01          | 2011/01          |
| RF- cable  | QMI 0.6m [APC 2.9]                                 | K65        | 2010/01          | 2011/01          |
| RF- cable  | QMI 0.6m [APC 2.9]                                 | K66        | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex 106 Suhner<br>6,4m [N]                    | K74        | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex 106 Suhner<br>6,4m [N]                    | K75        | 2010/01          | 2011/01          |

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### 12.3.3 Test procedure

The EUT and this peripheral (when additional equipment exists) are placed on a turn table which is 0.8 m above the ground. The turn table would be allowed to rotate 360 degrees to determine the position of the maximum emission level. The test distance between the EUT and the receiving antenna are 3m. To find the maximum emission, the polarization of the receiving antenna is changed in horizontal and vertical polarization; the position of the EUT was changed in different orthogonal determinations.

ANSI C63.4: 2003 Section 8 “Radiated Emissions Testing”

Measurement procedures for electric field radiated emissions above 1 GHz are covered in Clause 8 of ANSI C63.4-2003. The C63.4-2003 measurement procedure consists of both an exploratory test and a final measurement. The exploratory test is critical to determine the frequency of all significant emissions. For each mode of operation required to be tested, the frequency spectrum is monitored. Variations in antenna height, antenna orientation, antenna polarization, EUT azimuth, and cable or wire placement is explored to produce the emission that has the highest amplitude relative to the limit.

The final measurements are made based on the findings in the exploratory testing. When making exploratory and final measurements it is necessary to maximize the measured radiated emission. Subclause 8.3.1.2 of C63.4-2003 states that the measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” We consider the “cone of radiation” to be the 3 dB beamwidth of the measurement antenna.

While the “bore-sighting” technique is not explicitly mentioned in C63.4-2003, it is a useful technique for measurements using a directional antenna, such as a double-ridged waveguide antenna. Several precautions must be observed, including: knowledge of the beamwidth of the antenna and the resulting illumination area relative to the size of the EUT, estimation for source of the emission and general location within larger EUTS, measuring system sensitivity, etc.

C63.4-2003 requires that the measurement antenna is kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. That means that if the directional radiation pattern of the EUT results in a maximum emission at an upwards angle from the EUT, when a directional antenna is used to make the measurement it will be necessary for it to be pointed towards the source of the emission within the EUT. This can be done by either pointing the antenna at an angle towards the source of the emission, or by rotating the EUT, in both height and polarization, to maximize the measured emission. The emission must be kept within the illumination area of the 3 dB beamwidth of the antenna so that the maximum emission from the EUT is measured.

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| Radiated emissions test characteristics   |                               |
|---|-------------------------------|
| Frequency range                           | 30 MHz - 4,000 MHz            |
| Test distance                             | 3 m*                          |
| Test instrumentation resolution bandwidth | 120 kHz (30 MHz - 1,000 MHz)  |
|   | 1 MHz (1000 MHz - 40,000 MHz) |
| Receive antenna scan height               | 1 m - 4 m                     |
| Receive antenna polarization              | Vertical/horizontal           |

\* According to Section 15.31 (f) (1): At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

### 12.3.4 Calculation of the field strength

The field strength is calculated by the following calculation:

Corrected Level = Receiver Level + Correction Factor (without the use of a pre-amplifier)

Corrected Level = Receiver Level + Correction Factor – Pre-amplifier (with the use of a pre-amplifier)

Receiver Level : Receiver reading without correction factors  
 Correction Factor : Antenna factor + cable loss

For example:

The receiver reading is 32.7 dB $\mu$ V. The antenna factor for the measured frequency is +2.5 dB (1/m) and the cable factor for the measured frequency is 0.71 dB, giving a field strength of 35.91dB $\mu$ V/m.

The 35.91dB $\mu$ V/m value can be mathematically converted to its corresponding level in  $\mu$ V/m.

Level in  $\mu$ V/m = Common Antilogarithm (35.91/20) = 39.8

For test distance other than what is specified, but fulfilling the requirements of Section 15.31 (f) (1) the field strength is calculated by adding additionally an extrapolation factor of 20 dB/decade (inverse linear distance for field strength measurements).

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## 12.3.5 Test result

| TRANSMITTER SPURIOUS RADIATION BELOW 30 MHz (Section 15.205, 15.209) |                                     |                                    |                    |                         |                                 |                                 |                       |                        |  |
|--|-------------------------------------|------------------------------------|--------------------|-------------------------|---------------------------------|---------------------------------|-----------------------|------------------------|--|
| f (MHz)  | Bandwidth (kHz)<br>Type of detector | Noted receiver level<br>dB $\mu$ V | Test distance<br>m | Correction factor<br>dB | Distance extrapol. factor<br>dB | Level corrected<br>dB $\mu$ V/m | Limit<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | Polarisation EUT / antenna orientation |
| 0.1200   | PK/0.2kHz                           | < 4.0                              | 10                 | 20.2                    | -59.1                           | -34.90                          | Pk46.0- @ 300         | 80.90                  | V, H/0-360°                            |
|  | AV/0.2kHz                           | < 4.0                              | 10                 | 20.2                    | -59.1                           | -34.90                          | AV26.0 @ 300          | 80.90                  | V, H/0-360°                            |
| 0.5000   | AV/0.2kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV33.6 @ 30           | 28.5                   | V, H/0-360°                            |
| 1.5000   | AV/0.2kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV24.1 @ 30           | 19.00                  | V, H/0-360°                            |
| 3.0000   | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| 5.0000   | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| 8.0000   | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| 10.0000  | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| 20.0000  | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| 30.0000  | AV/9.0kHz                           | < 4.0                              | 10                 | 20.2                    | -19.1                           | 5.10                            | AV29.5 @ 30           | 24.4                   | V, H/0-360°                            |
| <b>No emissions detected</b>   |                                     |                                    |                    |                         |                                 |                                 |                       |                        |  |
| Measurement uncertainty  |                                     |                                    | 4 dB               |                         |                                 |                                 |                       |                        |  |

Remark: \*<sup>1</sup> Noise level of the measuring instrument  $\leq 4.0$  dB $\mu$ V @ 10m distance (0.009 MHz – 30 MHz)

Remark: \* Peak Limit according to Section 15.35 (b).

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

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**TRANSMITTER SPURIOUS RADIATION ABOVE 30 MHz (Section 15.205, 15.209)**

| f<br>(MHz)              | Bandwidth<br>h<br>(kHz)<br>Type<br>of detector | Noted<br>receiver<br>level<br>dB $\mu$ V | Test<br>distance<br>m | Correction<br>factor<br>dB | Distance<br>extrapol.<br>factor<br>dB | AV<br>Correction<br>factor<br>dB | Level<br>corrected<br>dB $\mu$ V/m | Limit<br>dB $\mu$ V/m | Margin<br>dB $\mu$ V/m | Polaris.<br>EUT<br>/<br>antenna | Antenna<br>height<br>cm |
|-------------------------|--|--|-----------------------|----------------------------|---------------------------------------|----------------------------------|------------------------------------|-----------------------|------------------------|---------------------------------|-------------------------|
| 30.0000                 | 100, AV  | $\leq 3.5$                               | 3                     | $-2.6^{*6}$                | 0                                     | 0                                | 0.90                               | 40.00                 | 39.10                  | H,V/H,V                         | 100-400                 |
| 88.0000                 | 100, AV  | $\leq 3.5$                               | 3                     | $-10.8^{*6}$               | 0                                     | 0                                | -7.30                              | 40.00                 | 47.30                  | H,V/H,V                         | 100-400                 |
| 216.0000                | 100, AV  | $\leq 3.5$                               | 3                     | $-10.3^{*6}$               | 0                                     | 0                                | -6.80                              | 43.50                 | 50.30                  | H,V/H,V                         | 100-400                 |
| 960.0000                | 100, AV  | $\leq 3.5$                               | 3                     | $8.5^{*6}$                 | 0                                     | 0                                | 12.00                              | 43.50                 | 31.50                  | H,V/H,V                         | 100-400                 |
| 1,700.0000              | 1000, AV                                       | $\leq 4.5$                               | 3                     | $3.8^{*6}$                 | 0                                     | 0                                | 8.30                               | 54.00                 | 45.70                  | H,V/H,V                         | 100-400                 |
| 2,250.0000              | 1000, AV                                       | $\leq 10$                                | 3                     | $8.0^{*6}$                 | 0                                     | 0                                | 18.00                              | 54.00                 | 36.00                  | H,V/H,V                         | 100-400                 |
| 4,000.0000              | 1000, AV                                       | $\leq 10$                                | 3                     | $8.4^{*7}$                 | 0                                     | 0                                | 18.40                              | 54.00                 | 35.60                  | H,V/H,V                         | 100-400                 |
| 5,000.0000              | 1000, AV                                       | $\leq 10$                                | 3                     | $9.1^{*7}$                 | 0                                     | 0                                | 19.40                              | 54.00                 | 34.60                  | H,V/H,V                         | 100-400                 |
| 7,500.0000              | 1000, AV                                       | $\leq 14$                                | 3                     | $12.9^{*7}$                | 0                                     | 0                                | 26.90                              | 54.00                 | 27.10                  | H,V/H,V                         | 100-400                 |
| 8,300.0000              | 1000, AV                                       | $\leq 14$                                | 3                     | $14.8^{*7}$                | 0                                     | 0                                | 28.80                              | 54.00                 | 25.20                  | H,V/H,V                         | 100-400                 |
| 9,400.0000              | 1000, AV                                       | $\leq 14$                                | 3                     | $16.0^{*7}$                | 0                                     | 0                                | 30.00                              | 54.00                 | 24.00                  | H,V/H,V                         | 100-400                 |
| 11,000.0000             | 1000, AV                                       | $\leq 14$                                | 3                     | $18.3^{*7}$                | 0                                     | 0                                | 32.3                               | 54.00                 | 21.7                   | H,V/H,V                         | 100-400                 |
| 13,250 - 13,400         | 1000, AV                                       | $\leq 14$                                | 3                     | $18.9^{*7}$                | 0                                     | 0                                | 32.9                               | 54.00                 | 21.1                   | H,V/H,V                         | 100-400                 |
| Measurement uncertainty |  |  | 4 dB                  |                            |                                       |                                  |                                    |                       |                        |                                 |                         |

Bandwidth = the measuring receiver bandwidth

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**TRANSMITTER SPURIOUS RADIATION ABOVE 30 MHz (Section 15.205, 15.209)**

| f (MHz)                 | Bandwidth h (kHz)<br>Type of detector | Noted receiver level<br>dBµV | Test distance<br>m | Correction factor<br>dB | Distance extrapol. factor<br>dB | AV Correction factor<br>dB | Level corrected<br>dBµV/m | Limit<br>dBµV/m | Margin<br>dBµV/m | Polaris. EUT / antenna | Antenna height<br>cm |
|-------------------------|---------------------------------------|------------------------------|--------------------|-------------------------|---------------------------------|----------------------------|---------------------------|-----------------|------------------|------------------------|----------------------|
| 14,470 - 14,500         | 1000, AV                              | ≤ 14                         | 3                  | 24.7* <sup>7</sup>      | 0                               | 0                          | 38.7                      | 54.00           | 15.3             | H,V/H,V                | 100-400              |
| 15,350 - 16,200         | 1000, AV                              | ≤ 14                         | 3                  | 34.4* <sup>7</sup>      | 0                               | 0                          | 48.4                      | 54.00           | 5.6              | H,V/H,V                | 100-400              |
| 17,700 - 21,400         | 1000, AV                              | ≤ 25                         | 1                  | 18.6* <sup>8</sup>      | -9.5                            | 0                          | 29.0                      | 54.00           | 25.0             | H,V/H,V                | 100-200              |
| 22,010 - 23,120         | 1000, AV                              | ≤ 25                         | 1                  | 18.3* <sup>8</sup>      | -9.5                            | 0                          | 33.8                      | 54.00           | 20.2             | H,V/H,V                | 100-200              |
| 23,600 - 24,000         | 1000, AV                              | ≤ 25                         | 1                  | 21.2* <sup>8</sup>      | -9.5                            | 0                          | 36.7                      | 54.00           | 17.3             | H,V/H,V                | 100-200              |
| 31,200 - 31,800         | 1000, AV                              | ≤ 25                         | 0.5                | 30.8* <sup>9</sup>      | -15.6                           | 0                          | 40.2                      | 54.00           | 13.8             | H,V/H,V                | 100-200              |
| 36,430 - 36,500         | 1000, AV                              | ≤ 25                         | 0.5                | 35.5* <sup>9</sup>      | -15.6                           | 0                          | 44.9                      | 54.00           | 9.1              | H,V/H,V                | 100-200              |
| Measurement uncertainty |                                       |                              | 4 dB               |                         |                                 |                            |                           |                 |                  |                        |                      |

Bandwidth = the measuring receiver bandwidth

- Remark: \*<sup>1</sup> noise floor noise level of the measuring instrument ≤ 3.5dBµV @ 3m distance (30 – 1,000 MHz)
- Remark: \*<sup>2</sup> noise floor noise level of the measuring instrument ≤ 4.5dBµV @ 3m distance (1,000 – 2,000 MHz)
- Remark: \*<sup>3</sup> noise floor noise level of the measuring instrument ≤ 10dBµV @ 3m distance (2,000 – 5,500 MHz)
- Remark: \*<sup>4</sup> noise floor noise level of the measuring instrument ≤ 14dBµV @ 3m distance (5,500 – 18,000 MHz)
- Remark: \*<sup>5</sup> noise floor noise level of the measuring instrument ≤ 25dBµV @ 3m distance (18,000 – 40,000 MHz)
- Remark: \*<sup>6</sup> for using a pre-amplifier in the range between 100 kHz and 1,000 MHz
- Remark: \*<sup>7</sup> for using a pre-amplifier in the range between 1.0 GHz and 18.0 GHz
- Remark: \*<sup>8</sup> for using a pre-amplifier in the range between 18 GHz and 25 GHz
- Remark: \*<sup>9</sup> for using a pre-amplifier in the range between 25 GHz and 38 GHz

|                                      |     |    |      |
|--------------------------------------|-----|----|------|
| The equipment meets the requirements | Yes | No | N.t. |
|--------------------------------------|-----|----|------|

N.t.\* See page no. 42



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## 12.4 Occupied Bandwidth

### 12.4.1 Regulation

(a) Operation under this section is limited to field disturbance sensors that are mounted in terrestrial transportation vehicles. Terrestrial use is limited to earth surface-based, non-aviation applications. Operation within the 16.2-17.7 GHz band is limited to field disturbance sensors that are used only for back-up assistance and that operate only when the vehicle is engaged in reverse. (1) The -10 dB bandwidth of the fundamental emission shall be located within the 16.2-17.7 GHz band or within the 23.12-29.0 GHz band, exclusive of the 23.6-24.0 GHz restricted band, as appropriate, under all conditions of operation including the effects from stepped frequency, frequency hopping or other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

(2) The -10 dB bandwidth of the fundamental emission shall be 10 MHz or greater. For transmitters that employ frequency hopping, stepped frequency or similar modulation types, measurement of the -10 dB minimum bandwidth specified in this paragraph shall be made with the frequency hop or step function disabled and with the transmitter operating continuously at a fundamental frequency following the provisions of Section 15.31(m) of this part.

(3) For systems operating in the 23.12-29.0 GHz band, the frequencies at which the highest average emission level and at which the highest peak level emission appear shall be greater than 24.075 GHz.

(4) These devices shall operate only when the vehicle is operating, *e.g.*, the engine is running. Operation shall occur only upon specific activation, such as upon starting the vehicle, changing gears, or engaging a turn signal. The operation of these devices shall be related to the proper functioning of the transportation vehicle, *e.g.*, collision avoidance.

### 12.4.2 Test equipment

| Type                           | Manufacturer/<br>Model no.                         | Serial no. | Last calibration | Next calibration |
|--------------------------------|--|------------|------------------|------------------|
| Receiver<br>(9 kHz –30 GHz)    | Rohde & Schwarz<br>Signal Analyzer<br>FSV 30 (502) | 100932     | 2010/04          | 2013/04          |
| Pre-amplifier<br>(12 - 28 GHz) | Schwarzbeck<br>BBV 9719 (443)                      | ---        | 2010/02          | 2012/02          |
| Horn antenna<br>(15-40 GHz)    | Schwarzbeck<br>BBHA 9170 (281)                     | 41         | 2010/01          | 2015/01          |
| Horn antenna<br>(24 GHz)       | MBMT<br>K-235 (431)                                | ---        | 2008/01          | 2013/01          |
| RF- cable                      | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K17a       | 2010/01          | 2011/01          |
| RF- cable                      | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K18a       | 2010/01          | 2011/01          |

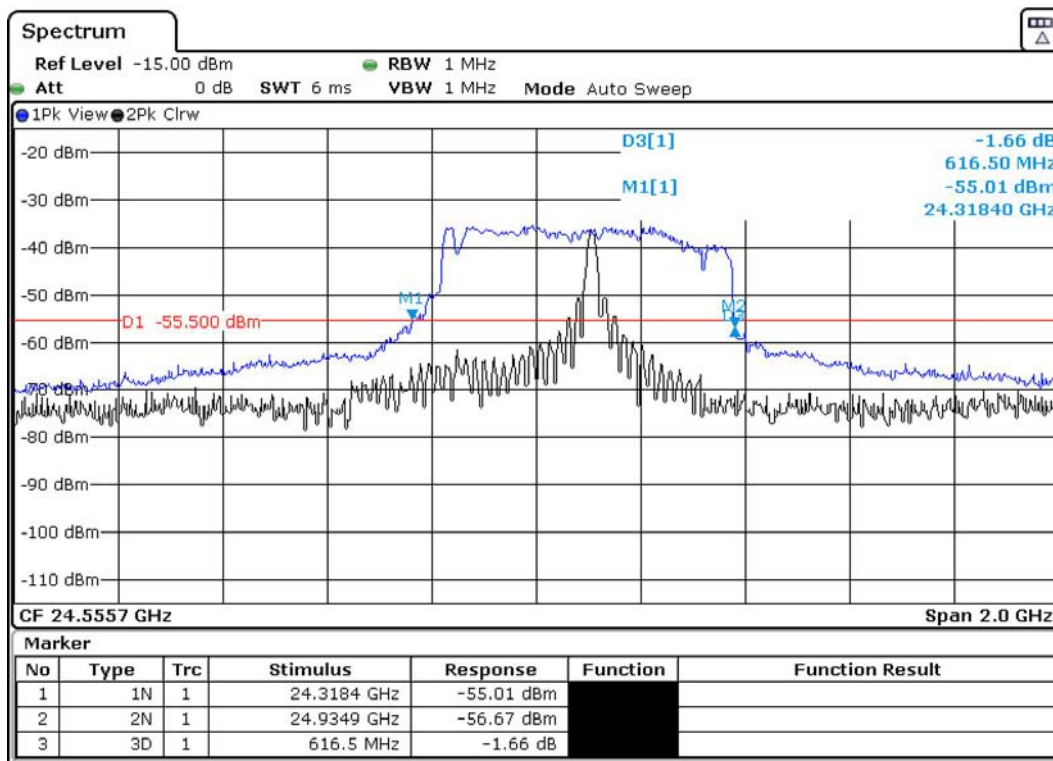
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**12.4.3 Test procedure**

ANSI C63.4-2003 Section 13.1.7 Occupied Bandwidth Measurements. The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce worst-case (i.e., the widest) bandwidth. In order to measure the modulated signal properly, a resolution bandwidth that is small compared to the bandwidth required by the procuring or regulatory agency shall be used on the measuring instrument. However, the 6 dB resolution bandwidth of the measuring instrument shall be set to a value greater than 5% of the bandwidth requirements.

**12.4.4 Test result**



Low Frequency (F<sub>L</sub>) = 24.3184 GHz  
 Low Frequency (F<sub>H</sub>) = 24.9349 GHz  
 Occupied bandwidth = (F<sub>H</sub> - F<sub>L</sub>) = (24.9349 GHz - 24.3184 GHz)

**The measured -10 dBc bandwidth under normal test conditions is: 616.5 MHz**

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

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Normal test condition of – temperature: +15°C to +35°C, relative humidity: 20% to 75%

Applicant’s declared operating frequency band:

Lowest frequency: **24.250 GHz**

Highest frequency: **25.100 GHz**

| Test conditions         |                           | Limit           |         |
|-------------------------|---------------------------|-----------------|---------|
|                         |                           | Frequency (GHz) |         |
| T <sub>nom</sub> +20 °C | V <sub>nom</sub> 13.2 VDC | FL              | 24.3184 |
|                         |                           | FH              | 24.9349 |
| T <sub>min</sub> -20 °C | V <sub>min</sub> 10.8 VDC | FL              | 24.3184 |
|                         |                           | FH              | 24.9522 |
|                         | V <sub>max</sub> 15.6 VDC | FL              | 24.3155 |
|                         |                           | FH              | 24.9522 |
| T <sub>max</sub> +55 °C | V <sub>min</sub> 10.8 VDC | FL              | 24.3155 |
|                         |                           | FH              | 24.9551 |
|                         | V <sub>max</sub> 15.6 VDC | FL              | 24.3184 |
|                         |                           | FH              | 24.9551 |
| Measurement uncertainty |                           | ± 1.3 Hz        |         |

Where FL = Lowest frequency at the appropriate spurious emission level  
 FH = Highest frequency at the appropriate spurious emission level

Band edge limits: FLM = Lowest FL (measured) **24.3155 GHz**  
 and  
 FHM = Highest FH (measured) **24.9551 GHz**

**The maximum calculated used bandwidth under extreme test conditions is: 639.60 MHz**

**The occupied bandwidth is greater than 10 MHz**

**The frequency of the highest output is in every case greater than 24.075 GHz**

|                                      |     |               |                |
|--------------------------------------|-----|---------------|----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N/A</del> |
|--------------------------------------|-----|---------------|----------------|

N.t.\* See page no. 42

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## 12.5 Radiated output power and spurious emissions above 960 MHz

### 12.5.1 Regulation

(b) Emissions from a transmitter operating under this section shall not exceed the following equivalent isotropically radiated power (EIRP) density levels:

(2) For transmitters operating in the 23.12-29.0 GHz band, the RMS average radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following EIRP limits based on measurements using a 1 MHz resolution bandwidth:

| Frequency in MHz | EIRP in dBm |
|------------------|-------------|
| 960-1610         | -75.3       |
| 1610-23,120      | -61.3       |
| 23,120-23,600    | -41.3       |
| 23,600-24,000    | -61.3       |
| 24,000-29,000    | -41.3       |
| Above 29,000     | -61.3       |

EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

### 12.5.2 Test equipment

| Type   | Manufacturer/<br>Model no.                         | Serial no. | Last calibration | Next calibration |
|--|--|------------|------------------|------------------|
| Receiver<br>(9 kHz –30 GHz)                          | Rohde & Schwarz<br>Signal Analyzer<br>FSV 30 (502) | 100932     | 2010/04          | 2013/04          |
| Receiver<br>(9 kHz –40.0 GHz)<br>(40.0 GHz -110 GHz) | Anritsu<br>Spectrum Analyzer<br>MS2668 (359a)      | 6200163244 | 2008/04          | 2011/04          |
| Pre-amplifier<br>(100kHz - 1.3GHz)                   | Hewlett Packard<br>8447 E (166a)                   | 1726A00705 | 2010/02          | 2012/02          |
| Pre-amplifier<br>(1GHz - 18GHz)                      | Narda<br>--- (345)                                 | ---        | 2010/02          | 2012/02          |
| Pre-amplifier<br>(12 - 28 GHz)                       | Schwarzbeck<br>BBV 9719 (443)                      | ---        | 2010/02          | 2012/02          |
| Bilog antenna<br>(30- 1000 MHz)                      | Schwarzbeck<br>VULP 9168 (406)                     |            | 2007/02          | 2013/02          |
| Horn antenna<br>(0,86-8,5 GHz)                       | Schwarzbeck<br>BBHA 9120 A (284)                   | 236        | 2008/01          | 2013/01          |
| Horn antenna<br>(15-40 GHz)                          | Schwarzbeck<br>BBHA 9170 (281)                     | 41         | 2010/01          | 2015/01          |
| Horn antenna<br>(24 GHz)                             | MBMT<br>K-235 (431)                                | ---        | 2008/01          | 2013/01          |
| Gain Horn antenna<br>(33-50 GHz)                     | Dorado<br>GH-22-25 (383)                           | 040810     | 2005/04          | 2015/04          |
| Gain Horn antenna<br>(50-75 GHz)                     | Dorado<br>GH-15-25 (384)                           | 031003     | 2005/04          | 2015/04          |
| Gain Horn antenna<br>(75-110 GHz)                    | Dorado<br>GH-10-25 (385)                           | 040808     | 2005/04          | 2015/04          |
| Anritsu Mixer<br>WR22 Q-Band<br>(33-50 GHz)          | OM Labs<br>MA2742A (269a)                          | Q40512-1   | 2010/04          | 2012/04          |
| Anritsu Mixer<br>WR15 V-Band<br>(50-75 GHz)          | OM Labs<br>MA2744A (295a)                          | V41027-1   | 2010/04          | 2012/04          |
| Anritsu Mixer<br>WR10 W-Band<br>(75-110 GHz)         | OM Labs<br>MA2746A (296a)                          | W40706-2   | 2010/04          | 2012/04          |
| RF- cable  | Kabelmetal 18m [N]                                 | K1         | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K17a       | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K18a       | 2010/01          | 2011/01          |
| RF- cable  | Aircell 0.5m [BNC]                                 | K40        | 2010/01          | 2011/01          |
| RF- cable  | Aircell 1m [BNC/N]                                 | K56        | 2010/01          | 2011/01          |
| RF- cable  | QMI 0.6m [APC 2.9]                                 | K65        | 2010/01          | 2011/01          |
| RF- cable  | QMI 0.6m [APC 2.9]                                 | K66        | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex 106 Suhner<br>6,4m [N]                    | K74        | 2010/01          | 2011/01          |
| RF- cable  | Sucoflex 106 Suhner<br>6,4m [N]                    | K75        | 2010/01          | 2011/01          |

EUT: BSDTX  
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Date of issue: 2010-05-07

## 12.5.3 Result

| TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 960 MHz-1610 MHz |                                     |                             |                    |                         |                        |              |        |                            |                      |
|--|-------------------------------------|-----------------------------|--------------------|-------------------------|------------------------|--------------|--------|----------------------------|----------------------|
| f (GHz)  | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
| 0.960  | 1, AV RMS                           | ≤ -95                       | 3                  | 15.0                    | -80.0                  | -75.3        | 4.7    | H,V / V                    | 100-200              |
| 1.530  | 1, AV RMS                           | ≤ -95                       | 3                  | 13.3                    | -81.7                  | -75.3        | 6.4    | H,V / V                    | 100-200              |
| 1.610  | 1, AV RMS                           | ≤ -95                       | 3                  | 14.5                    | -80.5                  | -75.3        | 5.2    | H,V / V                    | 100-200              |
| 0.960  | 1, AV RMS                           | ≤ -95                       | 3                  | 16.1                    | -78.9                  | -75.3        | 3.6    | H,V / H                    | 100-200              |
| 1.530  | 1, AV RMS                           | ≤ -95                       | 3                  | 14.3                    | -80.7                  | -75.3        | 5.4    | H,V / H                    | 100-200              |
| 1.610  | 1, AV RMS                           | ≤ -95                       | 3                  | 15.9                    | -79.1                  | -75.3        | 3.8    | H,V / H                    | 100-150              |
| Measurement uncertainty  |                                     |                             | 4 dB               |                         |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |    |      |
|--------------------------------------|-----|----|------|
| The equipment meets the requirements | Yes | No | N.t. |
|--------------------------------------|-----|----|------|

| TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 1610 MHz-23,120 MHz |                                     |                             |                    |                         |                        |              |        |                            |                      |
|---|-------------------------------------|-----------------------------|--------------------|-------------------------|------------------------|--------------|--------|----------------------------|----------------------|
| f (GHz)   | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
| 1.650   | 1, AV RMS                           | ≤ -95                       | 3                  | 14.5                    | -80.5                  | -61.3        | 19.2   | H,V / V                    | 100-200              |
| 5.150   | 1, AV RMS                           | ≤ -95                       | 3                  | 31.4                    | -63.6                  | -61.3        | 2.3    | H,V / V                    | 100-200              |
| 15.360  | 1, AV RMS                           | ≤ -83                       | 1                  | 14.7                    | -68.3                  | -61.3        | 7.0    | H,V / V                    | 100-200              |
| 22.530  | 1, AV RMS                           | ≤ -80                       | 0.25               | 2.9                     | -77.1                  | -61.3        | 15.8   | H,V / V                    | 100-200              |
| 23.120  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2                     | -74.8                  | -61.3        | 13.5   | H,V / V                    | 100-150              |
| 1.650   | 1, AV RMS                           | ≤ -95                       | 3                  | 14.5                    | -80.5                  | -61.3        | 19.2   | H,V / H                    | 100-200              |
| 5.150   | 1, AV RMS                           | ≤ -95                       | 3                  | 31.4                    | -63.6                  | -61.3        | 2.3    | H,V / H                    | 100-200              |
| 15.360  | 1, AV RMS                           | ≤ -83                       | 1                  | 14.7                    | -68.3                  | -61.3        | 7.0    | H,V / H                    | 100-200              |
| 22.530  | 1, AV RMS                           | ≤ -80                       | 0.25               | 2.9                     | -77.1                  | -61.3        | 15.8   | H,V / H                    | 100-200              |
| 23.120  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2                     | -74.8                  | -61.3        | 13.5   | H,V / H                    | 100-150              |
| Measurement uncertainty   |                                     |                             | 4 dB               |                         |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |    |      |
|--------------------------------------|-----|----|------|
| The equipment meets the requirements | Yes | No | N.t. |
|--------------------------------------|-----|----|------|

N.t.\* See page no. 42

EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 23.120GHz to 23.600GHz**

| f (GHz)                 | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>$A_{\text{Free spacing -}}$<br>$A_{\text{gain -}}$<br>$A_{\text{Cable and}}$<br>Amplifier<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
|-------------------------|-------------------------------------|-----------------------------|--------------------|--|------------------------|--------------|--------|----------------------------|----------------------|
| 23.125                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / V                    | 100-200              |
| 23.490                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / V                    | 100-200              |
| 23.600                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / V                    | 100-150              |
| 23.125                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / H                    | 100-200              |
| 23.490                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / H                    | 100-200              |
| 23.600                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -41.3        | 33.5   | H,V / H                    | 100-150              |
| Measurement uncertainty |                                     |                             | 4 dB               |  |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |    |      |
|--------------------------------------|-----|----|------|
| The equipment meets the requirements | Yes | No | N.t. |
|--------------------------------------|-----|----|------|

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 23,600 MHz-24,000 MHz**

| f (GHz)                 | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>$A_{\text{Free spacing -}}$<br>$A_{\text{gain -}}$<br>$A_{\text{Cable and}}$<br>Amplifier<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
|-------------------------|-------------------------------------|-----------------------------|--------------------|--|------------------------|--------------|--------|----------------------------|----------------------|
| 23.650                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -61.3        | 13.5   | H,V / V                    | 100-200              |
| 23.720                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.8  | -74.2                  | -61.3        | 12.9   | H,V / V                    | 100-200              |
| 24.000                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 7.8  | -72.2                  | -61.3        | 10.9   | H,V / V                    | 100-150              |
| 23.650                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.2  | -74.8                  | -61.3        | 13.5   | H,V / H                    | 100-200              |
| 23.720                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 5.8  | -74.2                  | -61.3        | 12.9   | H,V / H                    | 100-200              |
| 24.000                  | 1, AV RMS                           | ≤ -80                       | 0.25               | 7.8  | -72.2                  | -61.3        | 10.9   | H,V / H                    | 100-150              |
| Measurement uncertainty |                                     |                             | 4 dB               |  |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |    |      |
|--------------------------------------|-----|----|------|
| The equipment meets the requirements | Yes | No | N.t. |
|--------------------------------------|-----|----|------|

N.t.\* See page no. 42

EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 24.0GHz to 29.0GHz**

| f (GHz)                 | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br><b>dBm</b> | Test distance<br><b>m</b> | Correction factor<br>$A_{\text{Free spacing -}} - A_{\text{gain -}}$<br>$A_{\text{Cable and Amplifier}}$<br><b>dB</b> | Level corrected<br><b>dBm</b> | Limit<br><b>dBm</b> | Margin     | Polarisation EUT / antenna | Antenna height<br><b>cm</b> |
|-------------------------|-------------------------------------|------------------------------------|---------------------------|---|-------------------------------|---------------------|------------|----------------------------|-----------------------------|
| 24.602                  | 1, AV RMS                           | <b>-53.6</b>                       | 0.25                      | 8.3   | <b>-45.3</b>                  | -41.3               | <b>4.0</b> | V / V                      | 100-200                     |
| 25.500                  | 1, AV RMS                           | ≤ -80                              | 0.25                      | 8.9   | -71.1                         | -41.3               | 29.8       | H,V / V                    | 100-200                     |
| 27.500                  | 1, AV RMS                           | ≤ -70                              | 0.25                      | 9.6   | 60.4                          | -41.3               | 19.1       | H,V / V                    | 100-200                     |
| 28.500                  | 1, AV RMS                           | ≤ -70                              | 0.25                      | 11.0  | -59.0                         | -41.3               | 17.7       | H,V / V                    | 100-150                     |
| 24.602                  | 1, AV RMS                           | <b>-54.5</b>                       | 0.25                      | 8.3   | <b>-46.2</b>                  | -41.3               | <b>4.9</b> | V / H                      | 100-200                     |
| 25.500                  | 1, AV RMS                           | ≤ -80                              | 0.25                      | 8.9   | -71.1                         | -41.3               | 29.8       | H,V / H                    | 100-200                     |
| 27.500                  | 1, AV RMS                           | ≤ -70                              | 0.25                      | 9.6   | 60.4                          | -41.3               | 19.1       | H,V / H                    | 100-200                     |
| 28.500                  | 1, AV RMS                           | ≤ -70                              | 0.25                      | 11.0  | -59.0                         | -41.3               | 17.7       | H,V / H                    | 100-150                     |
| Measurement uncertainty |                                     |                                    | 4 dB                      |   |                               |                     |            |                            |                             |

Bandwidth = the measuring receiver bandwidth

|                                      |            |               |                 |
|--------------------------------------|------------|---------------|-----------------|
| The equipment meets the requirements | <b>Yes</b> | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|------------|---------------|-----------------|

- Remark: \*<sup>1</sup> noise floor noise level of the measuring instrument ≤ -95 dBm (960 – 5,500 MHz)
- Remark: \*<sup>2</sup> noise floor noise level of the measuring instrument ≤ -83 dBm (5,500 – 18,000 MHz)
- Remark: \*<sup>3</sup> noise floor noise level of the measuring instrument ≤ -80 dBm (18,000 – 26,000 MHz)
- Remark: \*<sup>4</sup> noise floor noise level of the measuring instrument ≤ -70 dBm (26,000 – 34,000 MHz)
- Remark: \*<sup>5</sup> for using a pre-amplifier in the range between 100 kHz and 1,000 MHz
- Remark: \*<sup>6</sup> for using a pre-amplifier in the range between 1.0 GHz and 18.0 GHz
- Remark: \*<sup>7</sup> for using a pre-amplifier in the range between 18 GHz and 25 GHz
- Remark: \*<sup>8</sup> for using a pre-amplifier in the range between 25 GHz and 38 GHz

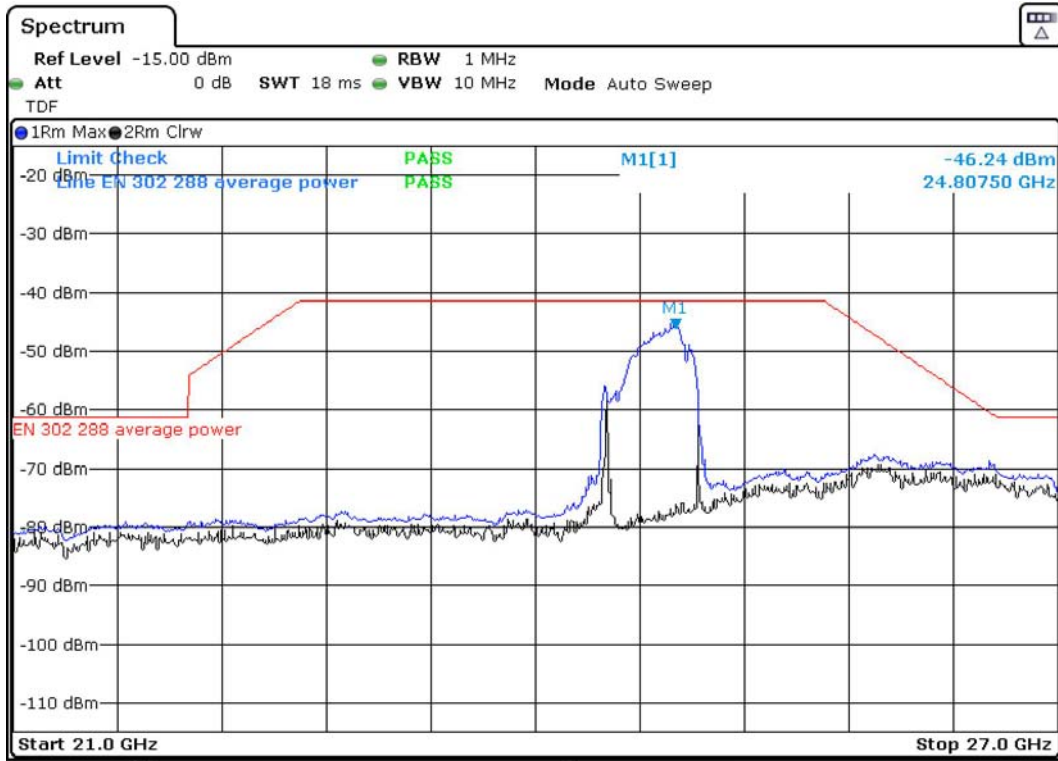
N.t.\* See page no. 42



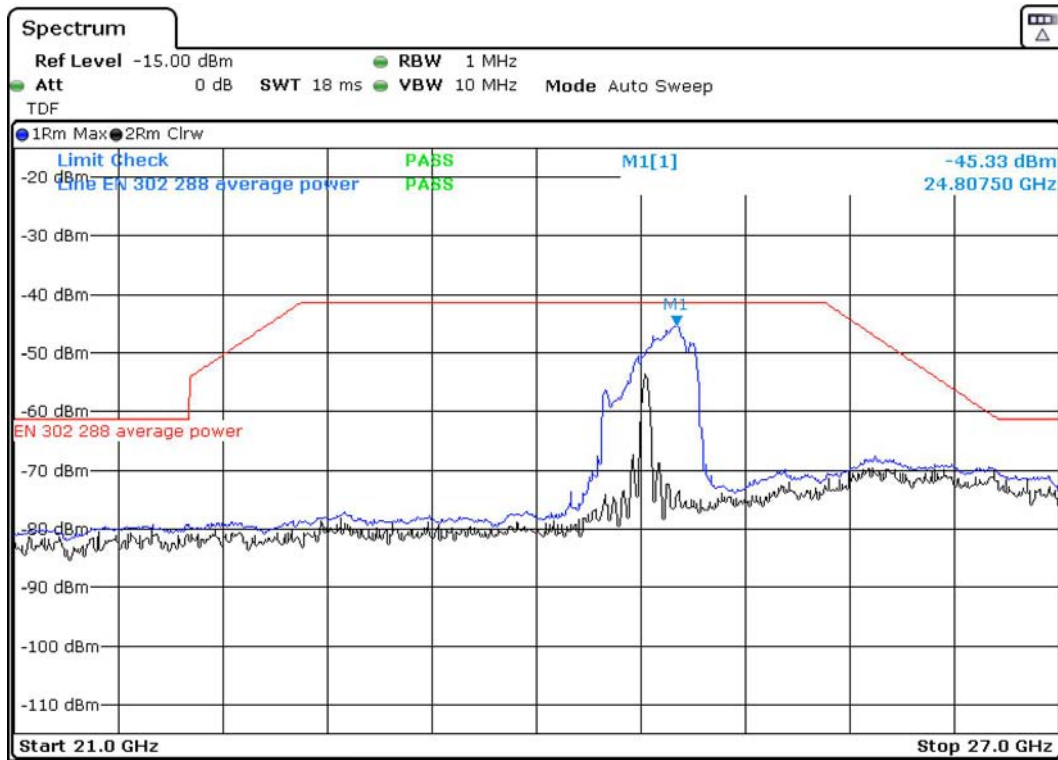
EUT: BSDTX  
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Date of issue: 2010-05-07

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 24.0GHz to 29.0GHz**  
Horizontal polarization



Vertical polarization



**EUT: BSDTX**  
**FCC ID: OAYBSDTX**
**Date of issue: 2010-05-07**
**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 29,000 MHz-110,000 MHz**

| f<br>(GHz)              | Bandwidth<br>(MHz)<br>Type<br>of detector | Noted<br>receiver level<br><br>dBm | Test<br>distance<br><br>m | Correction<br>factor<br>$A_{\text{Free spacing}} - A_{\text{gain}}$<br>dB | Level<br>corrected<br><br>dBm | Limit<br><br>dBm | Margin | Polarisation<br>EUT<br>/<br>antenna | Antenna<br>height<br><br>cm |
|-------------------------|---|------------------------------------|---------------------------|---|-------------------------------|------------------|--------|-------------------------------------|-----------------------------|
| 45.050                  | 1, AV RMS                                 | ≤ -95                              | 0.25                      | 21.3  | -73.7                         | -61.3            | 12.4   | H,V / V                             | 100-150                     |
| 69.020                  | 1, AV RMS                                 | ≤ -90                              | 0.125                     | 20.1  | -69.9                         | -61.3            | 8.6    | H,V / V                             | 100-150                     |
| 105.570                 | 1, AV RMS                                 | ≤ -87                              | 0.125                     | 23.8  | -63.2                         | -61.3            | 1.9    | H,V / V                             | 100-150                     |
| 45.050                  | 1, AV RMS                                 | ≤ -95                              | 0.25                      | 21.3  | -74.5                         | -61.3            | 13.2   | H,V / H                             | 100-150                     |
| 69.020                  | 1, AV RMS                                 | ≤ -90                              | 0.125                     | 20.1  | -67.2                         | -61.3            | 5.9    | H,V / H                             | 100-150                     |
| 105.570                 | 1, AV RMS                                 | ≤ -87                              | 0.125                     | 23.8  | -63.0                         | -61.3            | 1.7    | H,V / H                             | 100-150                     |
| Measurement uncertainty |   |                                    | 4 dB                      |   |                               |                  |        |                                     |                             |

Bandwidth = the measuring receiver bandwidth

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

N.t.\* See page no. 42

EUT: BSDTX  
 FCC ID: OAYBSDTX

Date of issue: 2010-05-07

## 12.6 Special requirements

### 12.6.1 Regulation

(b) Emissions from a transmitter operating under this section shall not exceed the following equivalent isotropically radiated power (EIRP) density levels:

(3) In addition to the radiated emission limits specified in the tables in paragraphs (b)(1) and (b)(2) of this section, transmitters operating under the provisions of this section shall not exceed the following RMS average EIRP limits when measured using a resolution bandwidth of no less than 1 kHz:

| Frequency in MHz | EIRP in dBm |
|------------------|-------------|
| 1164-1240        | -85.3       |
| 1559-1610        | -85.3       |

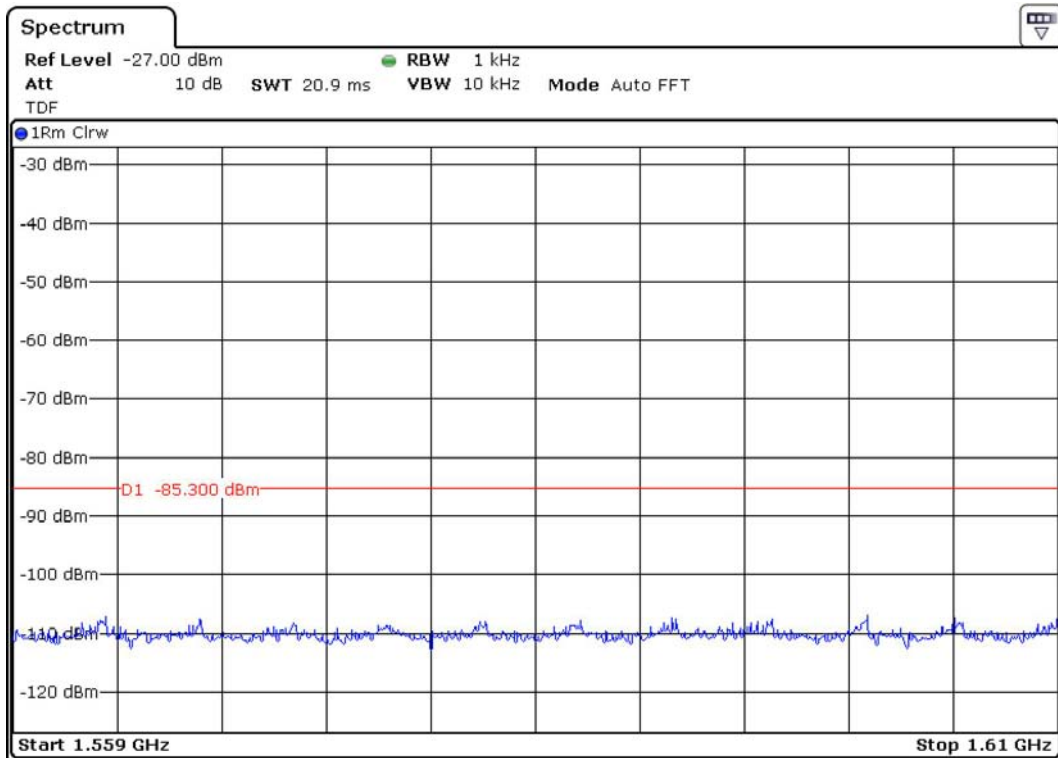
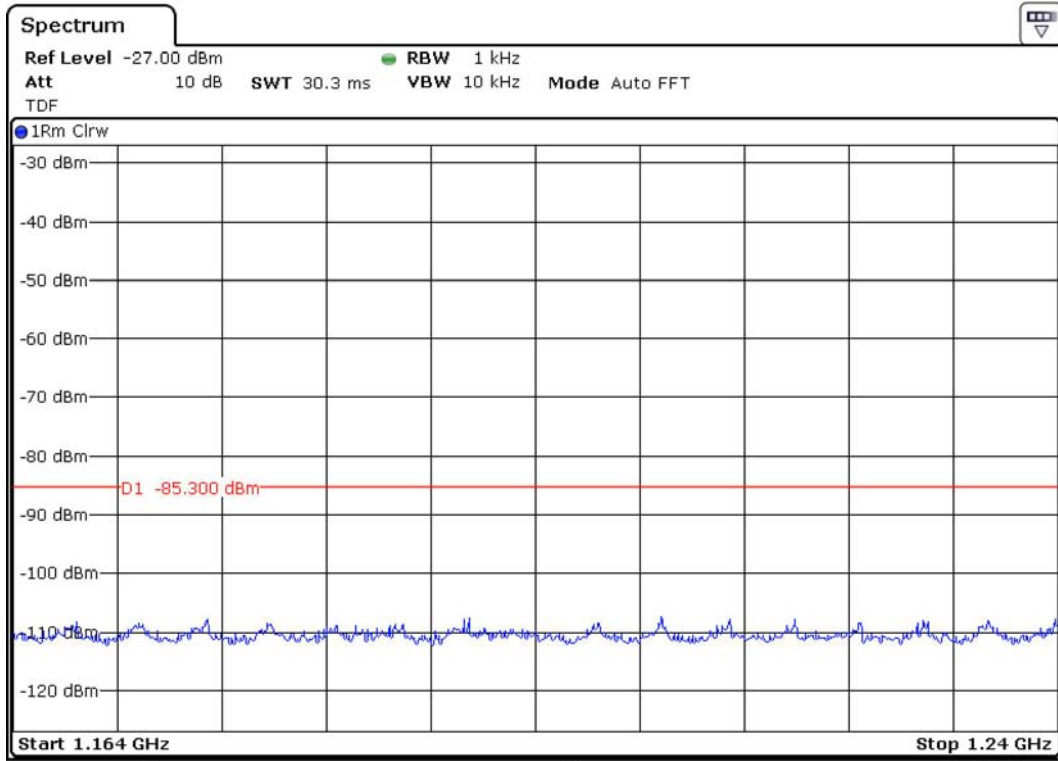
### 12.6.2 Test equipment

| Type                            | Manufacturer/<br>Model no.         | Serial no. | Last calibration | Next calibration |
|---------------------------------|------------------------------------|------------|------------------|------------------|
| Receiver                        | Rohde & Schwarz<br>Signal Analyzer | 100932     | 2010/04          | 2013/04          |
| Pre-amplifier<br>(1GHz - 18GHz) | Narda<br>--- (345)                 | ---        | 2010/02          | 2012/02          |
| Horn antenna<br>(0,86-8,5 GHz)  | Schwarzbeck<br>BBHA 9120 A (284)   | 236        | 2008/01          | 2013/01          |
| RF- cable                       | Kabelmetal 18m [N]                 | K1         | 2010/01          | 2011/01          |
| RF- cable                       | Aircell 0.5m [BNC]                 | K40        | 2010/01          | 2011/01          |
| RF- cable                       | Aircell 1m [BNC/N]                 | K56        | 2010/01          | 2011/01          |
| RF- cable                       | Sucoflex 106 Suhner<br>6,4m [N]    | K74        | 2010/01          | 2011/01          |
| RF- cable                       | Sucoflex 106 Suhner<br>6,4m [N]    | K75        | 2010/01          | 2011/01          |

EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

### 12.6.3 Result



EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 1164 MHz-1240 MHz**

| f (GHz)                 | Bandwidth (kHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
|-------------------------|-------------------------------------|-----------------------------|--------------------|-------------------------|------------------------|--------------|--------|----------------------------|----------------------|
| 1.164                   | 1, AV RMS                           | ≤ -104                      | 3                  | 13.9                    | -90.1                  | -85.3        | 4.8    | H,V / V                    | 100-400              |
| 1.178                   | 1, AV RMS                           | ≤ -104                      | 3                  | 13.7                    | -90.3                  | -85.3        | 5.0    | V 10° / V                  | 100-400              |
| 1.240                   | 1, AV RMS                           | ≤ -104                      | 3                  | 13.2                    | -90.8                  | -85.3        | 5.5    | H,V / V                    | 100-400              |
| 1.164                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.8                    | -89.2                  | -85.3        | 3.9    | H,V / H                    | 100-200              |
| 1.178                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.5                    | -89.5                  | -85.3        | 4.2    | V 10° / H                  | 100-400              |
| 1.240                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.1                    | -89.9                  | -85.3        | 4.6    | H,V / H                    | 100-400              |
| Measurement uncertainty |                                     |                             | 4 dB               |                         |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(2)) 1559 MHz-1610 MHz**

| f (GHz)                 | Bandwidth (kHz)<br>Type of detector | Noted receiver level<br>dBm | Test distance<br>m | Correction factor<br>dB | Level corrected<br>dBm | Limit<br>dBm | Margin | Polarisation EUT / antenna | Antenna height<br>cm |
|-------------------------|-------------------------------------|-----------------------------|--------------------|-------------------------|------------------------|--------------|--------|----------------------------|----------------------|
| 1.559                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.6                    | -89.4                  | -85.3        | 4.1    | H,V / V                    | 100-400              |
| 1.583                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.7                    | -89.3                  | -85.3        | 4.0    | H,V / V                    | 100-400              |
| 1.610                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.9                    | -89.1                  | -85.3        | 3.8    | H,V / V                    | 100-400              |
| 1.559                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.4                    | -89.6                  | -85.3        | 4.3    | H,V / H                    | 100-200              |
| 1.583                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.5                    | -89.5                  | -85.3        | 4.2    | H,V / H                    | 100-400              |
| 1.610                   | 1, AV RMS                           | ≤ -104                      | 3                  | 14.7                    | -89.3                  | -85.3        | 3.9    | H,V / H                    | 100-400              |
| Measurement uncertainty |                                     |                             | 4 dB               |                         |                        |              |        |                            |                      |

Bandwidth = the measuring receiver bandwidth

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

Remark: \*<sup>1</sup> noise floor noise level of the measuring instrument ≤ -83 dBm (5,500 – 18,000 MHz)Remark: \*<sup>2</sup> for using a pre-amplifier in the range between 1.0 GHz and 18.0 GHz

N.t.\* See page no. 42

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## 12.7 Peak level limit

### 12.7.1 Regulation

(b) Emissions from a transmitter operating under this section shall not exceed the following equivalent isotropically radiated power (EIRP) density levels:

(4) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs and this 50 MHz bandwidth must be contained within the 16.2-17.7 GHz band or the 24.05-29.0 GHz band, as appropriate. The peak EIRP limit is 20 log (RBW/50) dBm where RBW is the resolution bandwidth in MHz employed by the measurement instrument. RBW shall not be lower than 1 MHz or greater than 50 MHz. Further, RBW shall not be greater than the -10 dB bandwidth of the device under test. For transmitters that employ frequency hopping, stepped frequency or similar modulation types, measurement of the -10 dB minimum bandwidth specified in this paragraph shall be made with the frequency hop or step function disabled and with the transmitter operating continuously at a fundamental frequency. The video bandwidth of the measurement instrument shall not be less than RBW. The limit on peak emissions applies to the 50 MHz bandwidth centered on the frequency at which the highest level radiated emission occurs. If RBW is greater than 3 MHz, the application for certification shall contain a detailed description of the test procedure, the instrumentation employed in the testing, and the calibration of the test setup.

### 12.7.2 Test equipment

| Type                           | Manufacturer/<br>Model no.                         | Serial no. | Last calibration | Next calibration |
|--------------------------------|--|------------|------------------|------------------|
| Receiver<br>(9 kHz –30 GHz)    | Rohde & Schwarz<br>Signal Analyzer<br>FSV 30 (502) | 100932     | 2010/04          | 2013/04          |
| Pre-amplifier<br>(12 - 28 GHz) | Schwarzbeck<br>BBV 9719 (443)                      | ---        | 2010/02          | 2012/02          |
| Horn antenna<br>(24 GHz)       | MBMT<br>K-235 (431)                                | ---        | 2008/01          | 2013/01          |
| RF- cable                      | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K17a       | 2010/01          | 2011/01          |
| RF- cable                      | Sucoflex Suhner 2,13m<br>[APC 2.9]                 | K18a       | 2010/01          | 2011/01          |

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**12.7.3 Result**

| <b>TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(4)) 24.0GHz to 29.0GHz</b> |                                     |                                    |                           |                                |                               |                     |        |                            |                             |
|---|-------------------------------------|------------------------------------|---------------------------|--------------------------------|-------------------------------|---------------------|--------|----------------------------|-----------------------------|
| f (GHz)   | Bandwidth (MHz)<br>Type of detector | Noted receiver level<br><b>dBm</b> | Test distance<br><b>m</b> | Correction factor<br><b>dB</b> | Level corrected<br><b>dBm</b> | Limit<br><b>dBm</b> | Margin | Polarisation EUT / antenna | Antenna height<br><b>cm</b> |
| 24.602  | 10, PK                              | <b>-26.1</b>                       | 0.5                       | 8.3                            | <b>-17.8</b>                  | -14.0               | 3.8    | V / V                      | 100-200                     |
| 24.602  | 10, PK                              | <b>-26.3</b>                       | 0.5                       | 8.3                            | <b>-18.0</b>                  | -14.0               | 4.0    | V / H                      | 100-150                     |
| Measurement uncertainty   |                                     |                                    | 4 dB                      |                                |                               |                     |        |                            |                             |

Bandwidth = the measuring receiver bandwidth

|                                      |            |               |                 |
|--------------------------------------|------------|---------------|-----------------|
| The equipment meets the requirements | <b>Yes</b> | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|------------|---------------|-----------------|

Remark: \*<sup>1</sup> noise floor noise level of the measuring instrument  $\leq -80$  dBm (18,000 – 26,000 MHz)

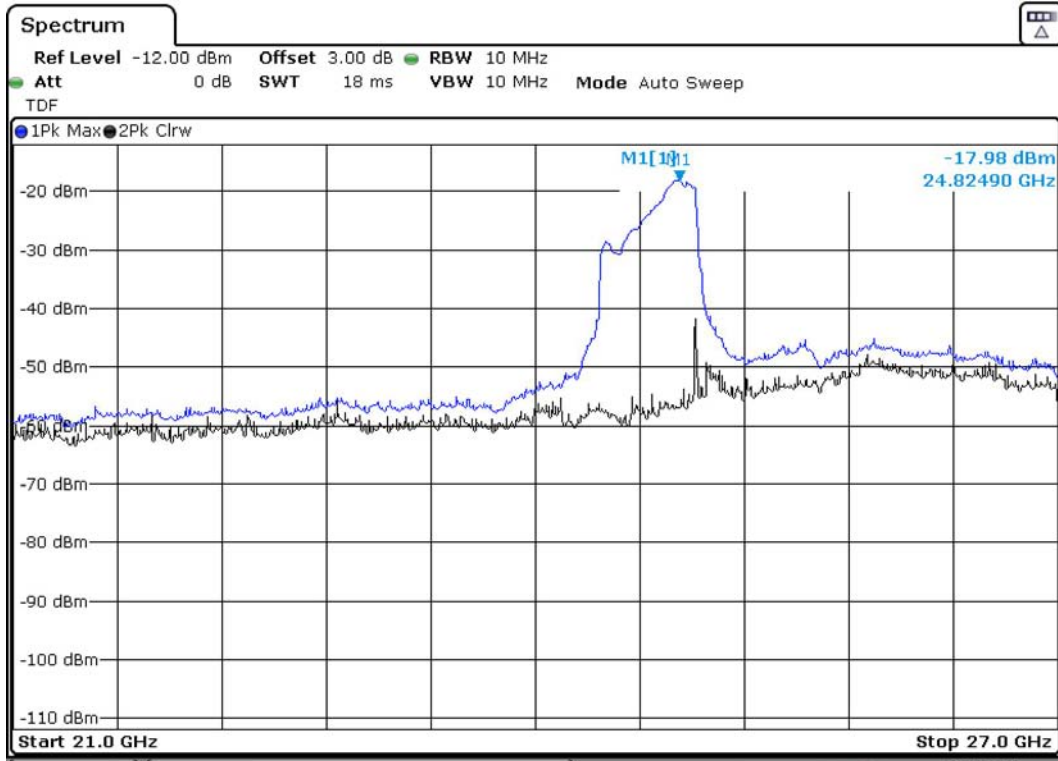
Remark: \*<sup>2</sup> for using a pre-amplifier in the range between 18 GHz and 25 GHz

N.t.\* See page no. 42

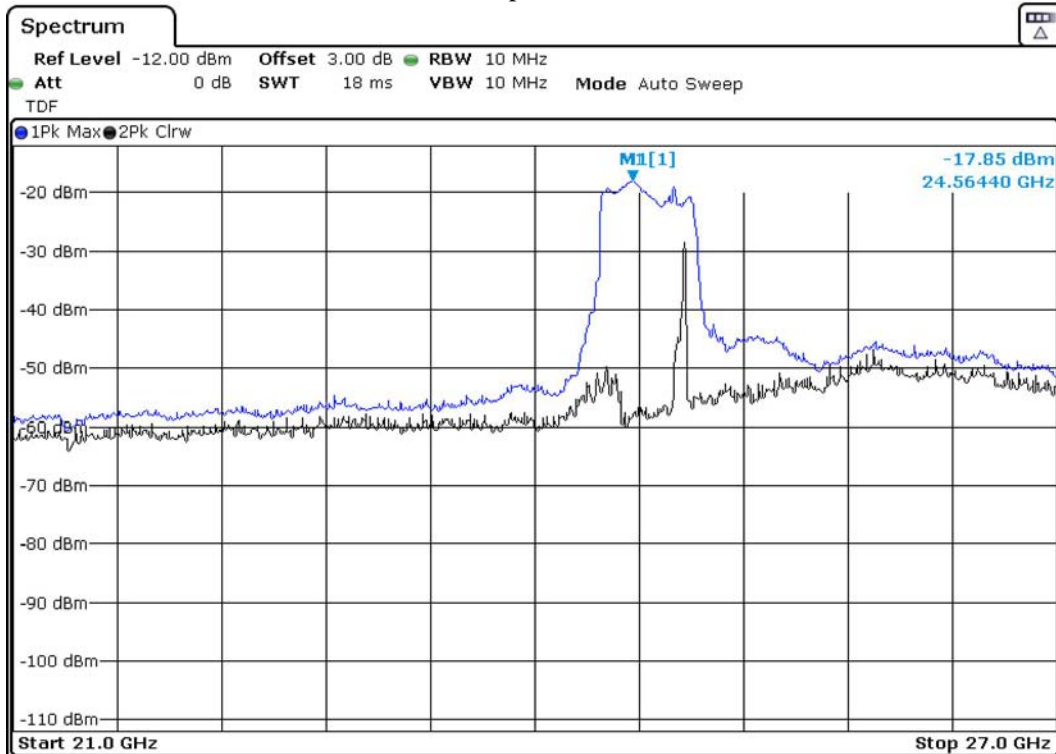
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**TRANSMITTER SPURIOUS RADIATION (Section 15.252(b)(4)) 24.0GHz to 29.0GHz**  
Horizontal polarisation



Vertical polarization





EUT: BSDTX  
FCC ID: OAYBSDTX

Date of issue: 2010-05-07

## 12.8 Radiated emissions below 960 MHz

### 12.8.1 Regulation

(b) Emissions from a transmitter operating under this section shall not exceed the following equivalent isotropically radiated power (EIRP) density levels:

(5) Radiated emissions at or below 960 MHz shall not exceed the emission levels in Section 15.209 of this part.

### 12.8.2 Test equipment

See page no. 16, clause 11.3 Radiated emission limits, general requirements

### 12.8.3 Result

See page no. 15 to 19, clause 11.3 Radiated emission limits, general requirements

|                                      |     |               |                 |
|--------------------------------------|-----|---------------|-----------------|
| The equipment meets the requirements | Yes | <del>No</del> | <del>N.t.</del> |
|--------------------------------------|-----|---------------|-----------------|

N.t.\* See page no. 42

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### 13. Additional information to the test report

#### Remarks

- N.t.<sup>1</sup> Not tested, because the antenna is part of the PCB
- N.t.<sup>2</sup> Not tested, because the EUT is directly battery powered

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**End of test report**