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# TEST REPORT

**of**

FCC Part 2 Subpart J, Part 22 Subpart C/H,
Part 24 Subpart E and Part 27 Subpart C
IC RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6,
RSS-139 Issue 3 and RSS-Gen Issue 5

FCC ID: BEJTLHOBDNN0B
IC Certification: 2703H-TLHOBDNN0B

| | | |
|---|---|---|
| Equipment Under Test | : | Car Telematics Device |
| Model Name | : | TLHOBDNN0B2 |
| Variant Model Name(s) | : | Refer to the page 3 |
| FCC Applicant | : | LG Electronics USA |
| IC Applicant | : | LG ELECTRONICS INC. |
| Manufacturer | : | LG Electronics Inc. |
| Date of Receipt | : | 2022.09.26 |
| Date of Test(s) | : | 2022.10.10 ~ 2022.12.08 |
| Date of Issue | : | 2022.12.14 |

In the configuration tested, the EUT complied with the standards specified above. This test report does not assure KOLAS accreditation.

1) The results of this test report are effective only to the items tested.
2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.
3) This test report cannot be reproduced, except in full, without prior written permission of the Company.
4) The data marked ※ in this report was provided by the customer and may affect the validity of the test results.
We are responsible for all the information of this test report except for the data(※) provided by the customer.

**Tested by:** **Murphy Kim**

**Technical Manager:** **Jinhyoung Cho**

## SGS Korea Co., Ltd. Gunpo Laboratory

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# 1. General Information

## 1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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Phone No. : +82 31 688 0901
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## 1.2. Details of Applicant

| | | |
|---|---|---|
| FCC Applicant | : | LG Electronics USA |
| FCC Address | : | 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632 |
| IC Applicant | : | LG ELECTRONICS INC. |
| IC Address | : | 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyenggi-do, Korea (Republic of), 451-713 |
| Contact Person | : | Kim, Sung-soo |
| Phone No. | : | +1 201 266 2215 |

## 1.3. Details of Manufacturer

| | | |
|---|---|---|
| Company | : | LG Electronics Inc. |
| Address | : | 10, Magokjungang 10-ro, Gangseo-gu, Seoul, Korea, 07796 |

## 1.4. Description of EUT

| | |
|---|---|
| **Kind of Product** | Car Telematics Device |
| **Model Name** | TLHOBDNN0B2 |
| **Variant Model Names** | TLHOBDNN0B1, TLHOBENN0D1 |
| **Approved Module** | FCC ID: BEJTM03LNNAHD0<br>IC Certification: 2703H-TM03LNNAHD0 |
| **Model Serial Number** | 353342703000020 |
| **Power Supply** | DC 13.2 V |
| **Rated Power** | WCDMA Ⅱ, Ⅴ: 23 dBm<br>LTE Band 2, 4, 5, 12: 23 dBm |
| **Frequency Range** | WCDMA Ⅱ: 1 850 ㎒ ~ 1 910 ㎒<br>WCDMA Ⅴ: 824 ㎒ ~ 849 ㎒<br>LTE Band 2: 1 850 ㎒ ~ 1 910 ㎒<br>LTE Band 4: 1 710 ㎒ ~ 1 755 ㎒<br>LTE Band 5: 824 ㎒ ~ 849 ㎒<br>LTE Band 12: 699 ㎒ ~ 716 ㎒ |
| **Modulation Technique** | QPSK, 16QAM |
| **Antenna Type** | External antenna |
| **Antenna Gain※** | 699 ㎒ ~ 716 ㎒: -2.20 dBi<br>824 ㎒ ~ 849 ㎒: 0.40 dBi<br>1 710 ㎒ ~ 1 780 ㎒: 0.40 dBi<br>1 850 ㎒ ~ 1 910 ㎒: -0.10 dBi |
| **H/W Version** | Rev.C1 |
| **S/W Version** | V3.6_20210526 |
| **FVIN** | N/A |

## 1.5. Test Equipment List

| Equipment | Manufacturer | Model | S/N | Cal. Date | Cal. Interval | Cal. Due |
|---|---|---|---|---|---|---|
| Signal Generator | R&S | SMR40 | 100272 | Jun. 16, 2022 | Annual | Jun. 16, 2023 |
| Signal Generator | R&S | SMBV100A | 255834 | May 25, 2022 | Annual | May 25, 2023 |
| Spectrum Analyzer | R&S | FSV30 | 103210 | Dec. 08, 2021 | Annual | Dec. 08, 2022 |
| Mobile Test Unit | R&S | CMW500 | 144035 | Feb. 10, 2022 | Annual | Feb. 10, 2023 |
| High Pass Filter | Wainwright Instrument GmbH | WHKX10-900-1000-18000-40SS | 7 | Mar. 04, 2022 | Annual | Mar. 04, 2023 |
| High Pass Filter | Wainwright Instrument GmbH | WHKX2.2/12.75G-10SS | 8 | Mar. 04, 2022 | Annual | Mar. 04, 2023 |
| High Pass Filter | Wainwright Instrument GmbH | WHK3.0/18G-10SS | 344 | May 13, 2022 | Annual | May 13, 2023 |
| DC Power Supply | Agilent | U8002A | MY49030063 | Jan. 25, 2022 | Annual | Jan. 25, 2023 |
| Preamplifier | H.P. | 8447F | 2944A03909 | Aug. 04, 2022 | Annual | Aug. 04, 2023 |
| Preamplifier | R&S | SCU 18 | 10117 | Jun. 13, 2022 | Annual | Jun. 13, 2023 |
| Preamplifier | TESTEK | TK-PA1840H | 130016 | Jan. 10, 2022 | Annual | Jan. 10, 2023 |
| Loop Antenna | Schwarzbeck Mess-Elektronik | FMZB 1519 | 1519-039 | Aug. 23, 2021 | Biennial | Aug. 23, 2023 |
| Bilog Antenna | Schwarzbeck Mess-Elektronik | VULB 9163 | 01126 | Feb. 07, 2022 | Annual | Feb. 07, 2023 |
| Horn Antenna | R&S | HF906 | 100326 | Feb. 18, 2022 | Annual | Feb. 18, 2023 |
| Antenna Master | Innco systems GmbH | MM4000 | N/A | N.C.R. | N/A | N.C.R. |
| Turn Table | Innco systems GmbH | DS 1200S | N/A | N.C.R. | N/A | N.C.R. |
| Controller | Innco systems GmbH | CONTROLLER CO3000-4P | CO3000/963/383 30516/L | N.C.R. | N/A | N.C.R. |
| Anechoic Chamber | SY Corporation | L × W × H (9.6 m × 6.4 m × 6.6 m) | N/A | N.C.R. | N/A | N.C.R. |
| Coaxial Cable | RFONE | MWX221-NMSNMS (4 m) | J1023142 | Oct. 04, 2022 | Semi-Annual | Apr. 04, 2023 |
| Coaxial Cable | Qualwave Inc. | QA500-18-NN-10 (10 m) | 22200114 | Oct. 04, 2022 | Semi-Annual | Apr. 04, 2023 |

### ▶ Support Equipment

| Description | Manufacturer | Model | Serial Number |
|---|---|---|---|
| N/A | - | - | - |

## 1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 2, 22, 24 and 27 / IC part RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3 and RSS-Gen Issue 5 | | | |
|---|---|---|---|
| **Section in FCC** | **Section in IC** | **Test Item** | **Result** |
| §22.913(a)(5)<br>§24.232(c)<br>§27.50(c)(10)<br>§27.50(d)(4) | RSS-130 Issue 2 4.6<br>RSS-132 Issue 3 5.4<br>RSS-133 Issue 6 6.4<br>RSS-139 Issue 3 6.5 | E.R.P. / E.I.R.P. | Complied[2)] |
| §22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)(1) | RSS-130 Issue 2 4.7<br>RSS-132 Issue 3 5.5<br>RSS-133 Issue 6 6.5<br>RSS-139 Issue 3 6.6 | Spurious Radiated Emission | Complied[2)] |
| §2.1046 | RSS-Gen Issue 5 6.12 | Conducted Output Power | N/A[1)] |
| §2.1049 | RSS-Gen Issue 5 6.7 | Occupied Bandwidth | N/A[1)] |
| §22.913(d)<br>§24.232(d)<br>§27.50(d)(5) | RSS-130 Issue 2 4.6<br>RSS-132 Issue 3 5.4<br>RSS-133 Issue 6 6.4<br>RSS-139 Issue 3 6.5 | Peak-Average Ratio | N/A[1)] |
| §22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)(1) | RSS-130 Issue 2 4.7<br>RSS-132 Issue 3 5.5<br>RSS-133 Issue 6 6.5<br>RSS-139 Issue 3 6.6 | Spurious Emission at Antenna Terminal | N/A[1)] |
| §22.917(a)<br>§24.238(a)<br>§27.53(g)<br>§27.53(h)(1) | RSS-130 Issue 2 4.7<br>RSS-132 Issue 3 5.5<br>RSS-133 Issue 6 6.5<br>RSS-139 Issue 3 6.6 | Band Edge | N/A[1)] |
| §2.1055<br>§22.355<br>§24.235<br>§27.54 | RSS-Gen Issue 5 6.11<br>RSS-130 Issue 2 4.5<br>RSS-132 Issue 3 5.3<br>RSS-133 Issue 6 6.3<br>RSS-139 Issue 3 6.4 | Frequency Stability | N/A[1)] |

**Note;**

1) The test items were used the results from the approved module.
2) This product is a C2PC case due to the addition of antennas.

## 1.7. Spurious Radiated Emission

The Radiated spurious emissions were tested in the band with the lowest margin of previously data and selected respectively 699 ㎒ to 716 ㎒ and 824 ㎒ to 849 ㎒ in the band where the antenna gain is increased.

| Fundamental Frequency Range | Worst Case |
|---|---|
| 699 ㎒ to 716 ㎒ | LTE Band 12 (1.4 ㎒ – QPSK) |
| 824 ㎒ to 849 ㎒ | WCDMA Ⅴ, LTE Band 5 (1.4 ㎒ – QPSK) |

## 1.8. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

### 1.8.1. Radiation Test

- E.I.R.P. (㏈ m) = Measured level (㏈㎶) + Antenna factor (㏈) + Cable loss (㏈) + 20 Log D - 104.8; where D is the measurement distance in meters.
- E.R.P (㏈ m) = E.I.R.P. (㏈ m) - 2.15 (㏈)

## 1.9. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter | Uncertainty | |
|---|---|---|
| Radiated Emission, 9 ㎑ to 30 ㎒ | H | 3.30 ㏈ |
| | V | 3.30 ㏈ |
| Radiated Emission, below 1 ㎓ | H | 4.80 ㏈ |
| | V | 5.20 ㏈ |
| Radiated Emission, above 1 ㎓ | H | 3.90 ㏈ |
| | V | 4.00 ㏈ |

All measurement uncertainty values are shown with a coverage factor of *k*=2 to indicate a 95 % level of confidence.

## 1.10. Test Report Revision

| Revision | Report Number | Date of Issue | Description |
|---|---|---|---|
| 0 | F690501-RF-RTL003632 | 2022.12.14 | Initial |

## 1.11. Information of Variant Model

| Model Name | | Description |
|---|---|---|
| Basic Model | TLHOBDNN0B2 | D-Class AMP condition |
| Variant Model | TLHOBDNN0B1 | Same RF module and circuit to basic model, Except below<br>- Buffer AMP condition<br>- De-populated to BUB (Backup battery) part |
| | TLHOBENN0D1 | Same circuit to basic model, except below<br>- Operating external ANT. |

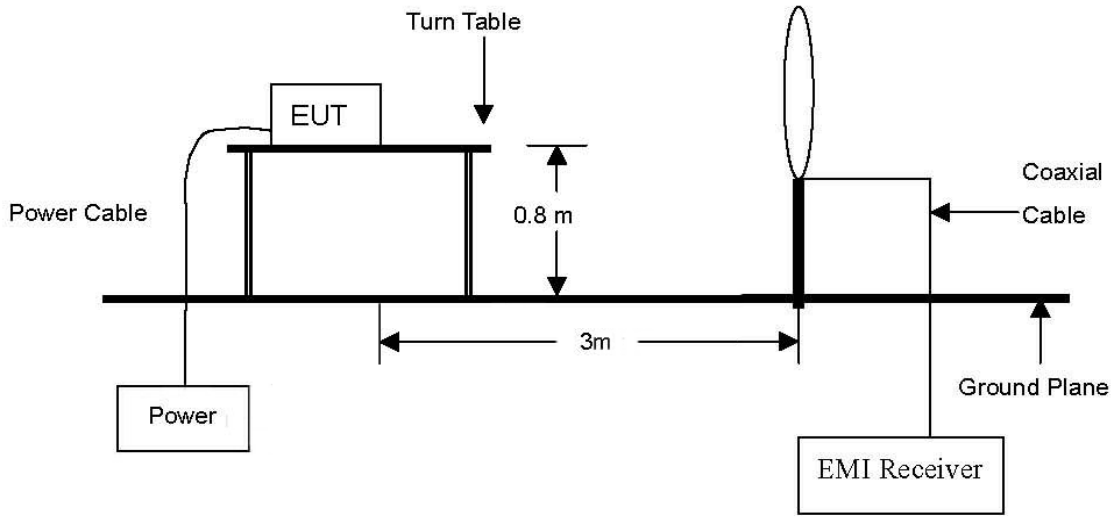
## 1.12. Test information of Cable Loss and Antenna Gain

| Test Item | Frequency (㎒) | Cable Loss (dB) | Antenna Gain (dB i) | Final Antenna Gain (dB i) |
|---|---|---|---|---|
| WCDMA Ⅱ | 1 850 ~ 1 910 | 0.90 | -0.10 | -1 |
| WCDMA Ⅴ | 824 ~ 849 | 0.50 | 0.40 | -0.10 |
| LTE - Band 2 | 1 850 ~ 1 910 | 0.90 | -0.10 | -1 |
| LTE - Band 4 | 1 710 ~ 1 755 | 0.80 | 0.40 | -0.40 |
| LTE - Band 5 | 824 ~ 849 | 0.50 | 0.40 | -0.10 |
| LTE - Band 12 | 699 ~ 716 | 0.50 | -2.20 | -2.70 |

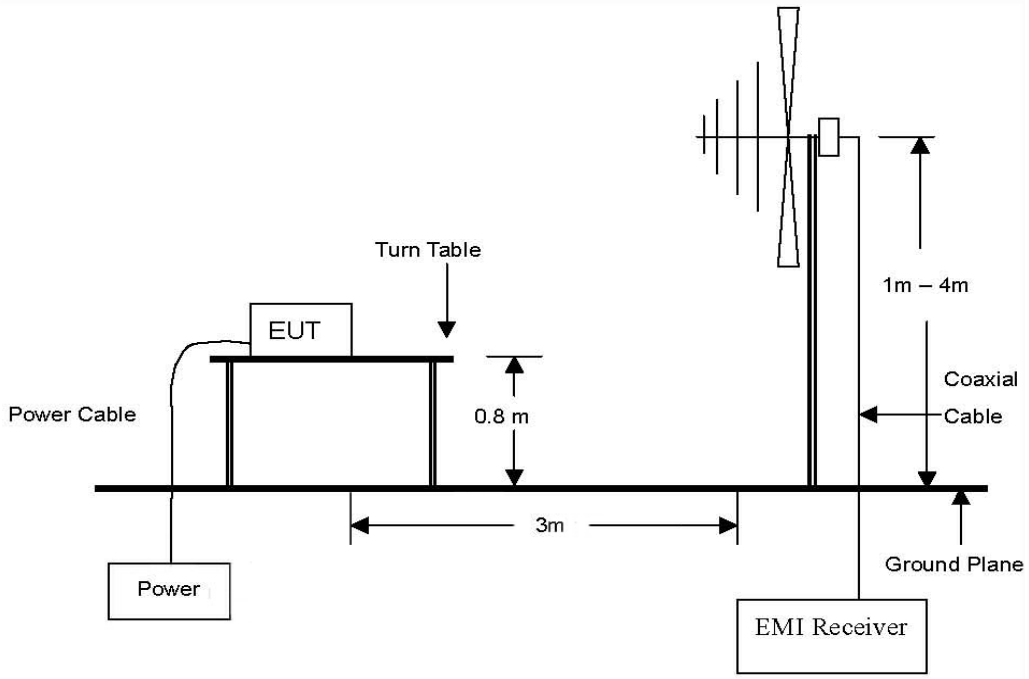
# 2. E.R.P. / E.I.R.P. & Spurious Radiated Emission

## 2.1. Test Setup

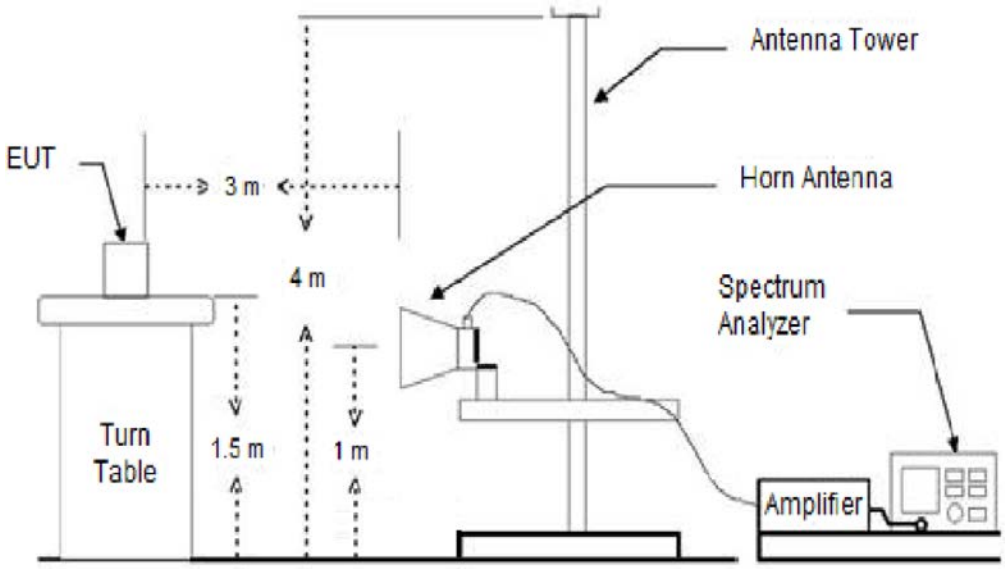
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒.




The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 9 ㎓.



## 2.2. Limit

### 2.2.1. Limit of E.R.P. / E.I.R.P.

**FCC**
- §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

- §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

- §27.50(c)(10), portable stations (hand-held devices) in the 600 ㎒ uplink band and the 698-746 ㎒ band, and fixed and mobile stations in the 600 ㎒ uplink band are limited to 3 watts ERP.

- §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1 710-1 755 ㎒ band and mobile and portable stations operating in the 1 695-1 710 ㎒ and 1 755-1 780 ㎒ bands are limited to 1 watt EIRP.

**IC**
- RSS-130 Issue 2
4.6.3, the e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

- RSS-132 Issue 3
5.4, the transmitter output power shall be measured in terms of average power.
The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts.
Refer to SRSP-503 for base station e.i.r.p. limits.

- RSS-133 Issue 6
6.4, the equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Moreover, base station transmitters operating in the band 1 930-1 995 ㎒ shall not have output power exceeding 100 watts.

- RSS-139 Issue 3
6.5, the equivalent isotropically radiated power (e.i.r.p.) for mobile and portable transmitters shall not exceed one watt. The e.i.r.p. for fixed and base stations in the band 1 710-1 780 ㎒ shall not exceed one watt.

### 2.2.2. Limit of Spurious Radiated Emission

**FCC**

- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) ㎧.

- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㎧.

- §27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) ㎧.

- §27.53(h)(1), for operations in the 1 695-1 710 ㎒, 1 710-1 755 ㎒, 1 755-1 780 ㎒, 1 915-1 920 ㎒, 1 995-2 000 ㎒, 2 000-2 020 ㎒, 2 110-2 155 ㎒, 2 155-2 180 ㎒, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) ㎧.

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 $\text{Log}_{10}$ (f / 6.1) decibels or 50 + 10 $\text{Log}_{10}$ (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 ㎑.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 ㎑, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\text{Log}_{10}$ (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 ㎑.

**IC**

- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 ㎑ bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (㎧ W), by at least 43 + 10 $\log_{10}$ p (watts), ㎧. However, in the 100 ㎑ band immediately outside of the equipment’s frequency block range, a resolution bandwidth of 30 ㎑ may be employed.

- RSS-132 Issue 3

5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
(i) In the first 1.0 ㎒ band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated (in ㎧) below the transmitter output power P (㎧ W) by at least 43 + 10 $\log_{10}$ p (watts).

(ii) After the first 1.0 ㎒ immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 ㎑ bandwidth shall be attenuated (in ㎧) below the transmitter output power P (㎧ W) by at least 43 + 10 $\log_{10}$ p (watts). If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 ㎑ is required.

- RSS-133 Issue 6
6.5, Equipment shall comply with the limits in (i) and (ii) below.
(i) In the 1.0 ㎒ bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in ㏈) below the transmitter output power P (㏈ W) by at least 43 + 10 $\log_{10}$ p(watts).

(ii) After the first 1.0 ㎒, the emission power in any 1 ㎒ bandwidth shall be attenuated (in ㏈) below the transmitter output power P (㏈ W) by at least 43 + 10 $\log_{10}$ p(watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 ㎒ is required.

- RSS-139 Issue 3
6.6, (i) In the first 1.0 ㎒ bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in ㏈ W) by at least 43 + 10 $\log_{10}$ p (watts) ㏈.

(ii) After the first 1.0 ㎒ outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 ㎒ bandwidth shall be attenuated below the transmitter output power P (in ㏈ W) by at least 43 + 10 $\log_{10}$ p (watts) ㏈.

## 2.3. Test Procedure: Based on ANSI/TIA 603E: 2016 and ANSI C63.26-2015, KDB 971168 D01 Power Meas License Digital Systems v03r01.

1. On a test site, the EUT shall be placed at 0.8 m or 1.5 m height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. Radiated spurious emissions measurement method was set as follows:
   RBW = 100 ㎑ for emissions below 1 ㎓ and 1 ㎒ for emissions above 1 ㎓, VBW ≥ 3 x RBW,
   Detector = RMS, trace mode = max hold, per the guidelines of ANSI C63.26-2015 and KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
11. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
12. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

## 2.4. E.R.P. / E.I.R.P.

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

**WCDMA**

| Band | Frequency (㎒) | Maximum Conducted Power (㏈m) | Maximum Conducted Power (W) | Final Antenna Gain (㏈i) | Maximum E.I.R.P. (㏈m) | Maximum E.I.R.P. (W) | Maximum E.R.P. (㏈m) | Maximum E.R.P. (W) | Limit |
|---|---|---|---|---|---|---|---|---|---|
| Ⅱ | 1 850 ~ 1 910 | 24 | 0.251 | -1 | 23 | 0.200 | | | 2 W E.I.R.P. |
| Ⅴ | 824 ~ 849 | 24 | 0.251 | -0.10 | 23.90 | 0.245 | 21.75 | 0.150 | 7 W E.R.P. |

**LTE**

| Band | Frequency (㎒) | Maximum Conducted Power (㏈m) | Maximum Conducted Power (W) | Final Antenna Gain (㏈i) | Maximum E.I.R.P. (㏈m) | Maximum E.I.R.P. (W) | Maximum E.R.P. (㏈m) | Maximum E.R.P. (W) | Limit |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 1 850 ~ 1 910 | 24 | 0.251 | -1 | 23 | 0.200 | | | 2 W E.I.R.P. |
| 4 | 1 710 ~ 1 780 | 24 | 0.251 | -0.40 | 23.60 | 0.229 | | | 1 W E.I.R.P |
| 5 | 824 ~ 849 | 24 | 0.251 | -0.10 | 23.90 | 0.245 | 21.75 | 0.150 | 7 W E.R.P. |
| 12 | 699 ~ 716 | 24 | 0.251 | -2.70 | 21.30 | 0.135 | 19.15 | 0.082 | 3 W E.R.P. |

**Remark;**

1. E.I.R.P. (㏈m) = Maximum Conducted Power (㏈m) + Antenna Gain (㏈i)
2. E.R.P. (㏈m) = E.I.R.P. (㏈m) - 2.15 (㏈); where E.R.P. and E.I.R.P. are expressed in consistent units.

## 2.5. Spurious Radiated Emission

**WCDMA V**

| Frequency (㎒) | Measured Level (dBμV) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dBμV/m) | CF (dB) | E.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (826.40 ㎒) | | | | | | | | | |
| 1 654.30 | 54.22 | V | 25.65 | -38.67 | 41.20 | -97.41 | -56.21 | -13 | 43.21 |
| 1 654.75 | 54.81 | H | 25.66 | -38.67 | 41.80 | -97.41 | -55.61 | -13 | 42.61 |
| 2 475.55 | 52.78 | V | 28.15 | -36.86 | 44.07 | -97.41 | -53.34 | -13 | 40.34 |
| 2 476.00 | 54.67 | H | 28.15 | -36.86 | 45.96 | -97.41 | **-51.45** | -13 | 38.45 |
| Middle Channel (836.60 ㎒) | | | | | | | | | |
| 1 674.10 | 56.00 | H | 25.89 | -38.66 | 43.23 | -97.41 | -54.18 | -13 | 41.18 |
| 1 675.90 | 53.42 | V | 25.91 | -38.66 | 40.67 | -97.41 | -56.74 | -13 | 43.74 |
| 2 506.60 | 53.26 | H | 28.14 | -37.11 | 44.29 | -97.41 | -53.12 | -13 | 40.12 |
| 2 507.05 | 49.81 | V | 28.14 | -37.11 | 40.84 | -97.41 | -56.57 | -13 | 43.57 |
| High Channel (846.60 ㎒) | | | | | | | | | |
| 1 691.65 | 53.27 | H | 26.10 | -38.74 | 40.63 | -97.41 | -56.78 | -13 | 43.78 |
| 1 694.80 | 52.98 | V | 26.14 | -38.75 | 40.37 | -97.41 | -57.04 | -13 | 44.04 |

**LTE band 5 (1.4 ㎒ – QPSK)**

| Frequency (㎒) | Measured Level (dBμV) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dBμV/m) | CF (dB) | E.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (824.7 ㎒) | | | | | | | | | |
| 1 648.00 | 72.92 | H | 25.60 | -38.67 | 59.85 | -97.41 | **-37.56** | -13 | 24.56 |
| 1 648.45 | 55.92 | V | 25.60 | -38.68 | 42.84 | -97.41 | -54.57 | -13 | 41.57 |
| 2 472.85 | 63.09 | H | 28.15 | -36.80 | 54.44 | -97.41 | -42.97 | -13 | 29.97 |
| 2 472.85 | 62.40 | V | 28.15 | -36.80 | 53.75 | -97.41 | -43.66 | -13 | 30.66 |
| Middle Channel (836.5 ㎒) | | | | | | | | | |
| 1 671.85 | 53.91 | H | 25.86 | -38.66 | 41.11 | -97.41 | -56.30 | -13 | 43.30 |
| 1 671.85 | 58.54 | V | 25.86 | -38.66 | 45.74 | -97.41 | -51.67 | -13 | 38.67 |
| 2 507.95 | 51.50 | H | 28.15 | -37.10 | 42.55 | -97.41 | -54.86 | -13 | 41.86 |
| 2 507.95 | 55.71 | V | 28.15 | -37.10 | 46.76 | -97.41 | -50.65 | -13 | 37.65 |
| High Channel (848.3 ㎒) | | | | | | | | | |
| 1 695.25 | 54.63 | H | 26.14 | -38.76 | 42.01 | -97.41 | -55.40 | -13 | 42.40 |
| 1 695.70 | 57.09 | V | 26.15 | -38.76 | 44.48 | -97.41 | -52.93 | -13 | 39.93 |
| 2 543.50 | 54.30 | H | 28.36 | -36.61 | 46.05 | -97.41 | -51.36 | -13 | 38.36 |
| 2 543.50 | 58.32 | V | 28.36 | -36.61 | 50.07 | -97.41 | -47.34 | -13 | 34.34 |

**LTE band 12 (1.4 ㎒ – QPSK)**

| Frequency (㎒) | Measured Level (dBμV) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dBμV/m) | CF (dB) | E.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (699.7 ㎒) | | | | | | | | | |
| 1 398.25 | 68.50 | H | 25.10 | -39.15 | 54.45 | -97.41 | -42.96 | -13 | 29.96 |
| 1 398.25 | 72.47 | V | 25.10 | -39.15 | 58.42 | -97.41 | -38.99 | -13 | 25.99 |
| 2 097.55 | 54.67 | V | 27.50 | -37.36 | 44.81 | -97.41 | -52.60 | -13 | 39.60 |
| Middle Channel (707.5 ㎒) | | | | | | | | | |
| 1 413.55 | 65.89 | H | 25.07 | -39.14 | 51.82 | -97.41 | -45.59 | -13 | 32.59 |
| 1 414.00 | 69.77 | V | 25.07 | -39.14 | 55.70 | -97.41 | -41.71 | -13 | 28.71 |
| 2 120.95 | 52.94 | H | 27.54 | -37.08 | 43.40 | -97.41 | -54.01 | -13 | 41.01 |
| 2 120.95 | 52.34 | V | 27.54 | -37.08 | 42.80 | -97.41 | -54.61 | -13 | 41.61 |
| High Channel (715.3 ㎒) | | | | | | | | | |
| 1 429.30 | 66.74 | H | 25.04 | -39.13 | 52.65 | -97.41 | -44.76 | -13 | 31.76 |
| 1 429.30 | 73.88 | V | 25.04 | -39.13 | 59.79 | -97.41 | **-37.62** | -13 | 24.62 |
| 2 144.35 | 51.77 | V | 27.59 | -36.81 | 42.55 | -97.41 | -54.86 | -13 | 41.86 |
| 2 144.80 | 51.70 | H | 27.59 | -36.81 | 42.48 | -97.41 | -54.93 | -13 | 41.93 |

**Remark;**

1. E (dBμV/m) = Measured Level (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) + AMP (dB).
2. E.I.R.P. (dB m) = E (dBμV/m) + 20 log D - 104.8; where D is the measurement distance in meters.
3. E.R.P. (dB m) = E.I.R.P. (dB m) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
4. CF (dB) (E.I.R.P.) = 20 log D - 104.8.
5. CF (dB) (E.R.P.) = 20 log D - 104.8 - 2.15.
6. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.

**- End of the Test Report -**