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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: BEJGEN11NAN
IC Certification: 2703H-GEN11NAN

| | | |
|---|---|---|
| 1. Equipment Under Test | : | Telematics |
| 2. Model Name | : | GEN11NAN |
| 3. Variant Model Name(s) | : | - |
| 4. FCC Applicant | : | LG Electronics USA |
| 5. IC Applicant | : | LG ELECTRONICS INC. |
| 6. Manufacturer | : | LG Electronics Inc. |
| 7. Date of Receipt | : | 2020.04.01 |
| 8. Date of Test(s) | : | 2020.04.13 ~ 2020.04.29 |
| 9. Date of Issue | : | 2020.05.19 |

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.

**Tested by:** **Nancy Park**

**Technical Manager:** **Jungmin Yang**

## 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

All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx.

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

| | | |
|---|---|---|
| FCC Applicant | : | LG Electronics USA |
| FCC Address | : | 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632 |
| IC Applicant | : | LG ELECTRONICS INC. |
| IC Address | : | 222, LG-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, Korea (Republic of), 451-713 |
| Contact Person | : | Han, Kyung-su |
| Phone No. | : | +1 201 472 2623 |

## 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** | Telematics |
| **Model Name** | GEN11NAN |
| **Model Serial Number** | 001 |
| **Power Supply** | DC 12 V |
| **Rated Power** | GSM 850: 33 ㏈m<br>GSM 1900: 30 ㏈m<br>WCDMA Ⅱ, Ⅴ: 23 ㏈m<br>WCDMA Ⅳ: 22.7 ㏈m<br>LTE Band 2, 5, 12, 13, 17: 23 ㏈m<br>LTE Band 4: 22.7 ㏈m |
| **Frequency Range** | GSM 850: 824 ㎒ ~ 849 ㎒<br>GSM 850: 1 850 ㎒ ~ 1 910 ㎒<br>WCDMA Ⅱ: 1 850 ㎒ ~ 1 910 ㎒<br>WCDMA Ⅳ: 1 710 ㎒ ~ 1 755 ㎒<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 12/17: 699 ㎒ ~ 716 ㎒<br>LTE Band 13: 777 ㎒ ~ 787 ㎒ |
| **Emission Designator** | GSM 850: 244KGXW (Voice) / 243KG7W (EDGE)<br>GSM 1900: 243KGXW (Voice) / 243KG7W (EDGE)<br>WCDMA Ⅱ: 4M15F9W<br>WCDMA Ⅳ: 4M14F9W<br>WCDMA Ⅴ: 4M13F9W<br>LTE Band 2 (1.4 ㎒): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 2 (3 ㎒): 2M76G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 2 (5 ㎒): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 2 (10 ㎒): 9M01G7D (QPSK) / 8M99W7D (16QAM)<br>LTE Band 2 (15 ㎒): 13M5G7D (QPSK) / 13M5W7D (16QAM)<br>LTE Band 2 (20 ㎒): 18M1G7D (QPSK) / 18M1W7D (16QAM)<br>LTE Band 4 (1.4 ㎒): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 4 (3 ㎒): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 4 (5 ㎒): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 4 (10 ㎒): 9M01G7D (QPSK) / 9M00W7D (16QAM)<br>LTE Band 4 (15 ㎒): 13M5G7D (QPSK) / 13M5W7D (16QAM)<br>LTE Band 4 (20 ㎒): 18M1G7D (QPSK) / 18M1W7D (16QAM)<br>LTE Band 5 (1.4 ㎒): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 5 (3 ㎒): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 5 (5 ㎒): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 5 (10 ㎒): 9M02G7D (QPSK) / 9M01W7D (16QAM)<br>LTE Band 12/17 (1.4 ㎒): 1M10G7D (QPSK) / 1M09W7D (16QAM)<br>LTE Band 12/17 (3 ㎒): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 12/17 (5 ㎒): 4M52G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 12/17 (10 ㎒): 9M00G7D (QPSK) / 9M00W7D (16QAM)<br>LTE Band 13 (5 ㎒): 4M54G7D (QPSK) / 4M54W7D (16QAM)<br>LTE Band 13 (10 ㎒): 9M00G7D (QPSK) / 9M01W7D (16QAM) |
| **Modulation Technique** | QPSK, 16QAM, GMSK, 8PSK |

## 1.5. Test Equipment List

| Equipment | Manufacturer | Model | S/N | Cal. Date | Cal. Interval | Cal. Due |
|---|---|---|---|---|---|---|
| Signal Generator | Agilent | E8257D | MY51501169 | Nov. 21, 2019 | Annual | Nov. 21, 2020 |
| Spectrum Analyzer | R&S | FSV30 | 103210 | Dec. 05, 2019 | Annual | Dec. 05, 2020 |
| Mobile Test Unit | R&S | CMW500 | 144034 | Feb. 28, 2020 | Annual | Feb. 28, 2021 |
| High Pass Filter | Wainwright Instrument GmbH | WHKX10-900-1000-18000-40SS | 7 | Mar. 04, 2020 | Annual | Mar. 04, 2021 |
| High Pass Filter | Wainwright Instrument GmbH | WHK3.0/18G-10SS | 344 | May 21, 2019 | Annual | May 21, 2020 |
| High Pass Filter | Wainwright Instrument GmbH | WHKX1.5/15G-6SS | 4 | Jun. 12, 2019 | Annual | Jun. 12, 2020 |
| High Pass Filter | Wainwright Instrument GmbH | WHNX7.5/26.5G-6SS | 15 | Jun. 07, 2019 | Annual | Jun. 07, 2020 |
| DC Power Supply | Agilent | U8002A | MY50060028 | Mar. 03, 2020 | Annual | Mar. 03, 2021 |
| Preamplifier | H.P. | 8447F | 2944A03909 | Aug. 07, 2019 | Annual | Aug. 07, 2020 |
| Preamplifier | R&S | SCU 18 | 10117 | Jun. 12, 2019 | Annual | Jun. 12, 2020 |
| Preamplifier | MITEQ Inc. | JS44-18004000-35-8P | 1546891 | May 13, 2019 | Annual | May 13, 2020 |
| Test Receiver | R&S | ESU26 | 100109 | Feb. 18, 2020 | Annual | Feb. 18, 2021 |
| Loop Antenna | Schwarzbeck Mess-Elektronik | FMZB 1519 | 1519-039 | Aug. 22, 2019 | Biennial | Aug. 22, 2021 |
| Bilog Antenna | Schwarzbeck Mess-Elektronik | VULB9163 | 396 | Mar. 21, 2019 | Biennial | Mar. 21, 2021 |
| Horn Antenna | R&S | HF906 | 100326 | Feb. 14, 2018 | Biennial | Feb. 14, 2020 |
| Horn Antenna | Schwarzbeck Mess-Elektronik | BBHA9170 | BBHA9170223 | Sep. 10, 2018 | Biennial | Sep. 10, 2020 |
| Antenna Master | Innco systems GmbH | MA4640-XP-ET | MA4640/536/38330516/L | 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 | CO3000/963/38330516/L | N.C.R. | N/A | N.C.R. |
| Anechoic Chamber | SY Corporation | L × W × H (9.6 m × 6.4 m × 6.4 m) | N/A | N.C.R. | N/A | N.C.R. |
| Coaxial Cable | SUCOFLEX | 104 (3 m) | MY3258414 | Jan. 28, 2020 | Semi-annual | Jul. 28, 2021 |
| Coaxial Cable | SUCOFLEX | 104 (10 m) | MY3145814 | Jan. 28, 2020 | Semi-annual | Jul. 28, 2021 |

### ▶ 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(b)(10)<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 | RF Radiated Output Power | Complied |
| §22.917(a)<br>§24.238(a)<br>§27.53(c)(2)<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 |
| §2.1046 | 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(c)(2)<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(c)(2)<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) This product is a C2PC case due to the addition of antennas. So only radiation test was performed and the rules for E.R.P. & E.I.R.P. and spurious radiated emission were satisfied.

## 1.7. Worst Case Selection

84671653 Y2xx antenna is the worst case for below 1 ㎓. 84728097 Sharkfin ChopTop has slightly higher gain than the Y2xx in 829 ㎒ but overall gain is lower than Y2xx. Actual testing was performed with the Y2xx antenna but for ERP and MPE calculations, antenna gain 3.81 ㏈i shall be used as worst case. 84881230 MiniMega NA antenna is the worst case for all frequencies above 1 ㎓. More information about antennas refer to the additional letter.

| Fundamental Frequency Range | Worst Case Antenna |
|---|---|
| Below 1 ㎓ | 84671653 Y2xx |
| Above 1 ㎓ | 84881230 MiniMega NA |

### 1.7.1. RF Radiated Output Power

Antenna gain of the C2PC is higher than that of the previously approved module.

To comply the ERP/EIRP and MPE requirements, power reduction mechanism is implemented on the module. There is no change on conducted power level but modular can use antenna diagnose circuit to detect antenna connection. When modular is connected to an antenna, modular can reduce power 1 ㏈ in GSM 850, 3.5 ㏈ in GSM 1900 as mentioned above. This mechanism can be selectively activated by vehicle manufacturer refer to antenna that would be installed on the vehicle.

So the RF Radiated Output Power test was tested only GSM 850 and GSM 1900 applied by power reduction mechanism.

### 1.7.2. Spurious Radiated Emission

The Radiated spurious emissions were tested in the band with the lowest margin of previously data and selected respectively above 1 ㎓ and below 1 ㎓.

| Fundamental Frequency Range | Worst Case |
|---|---|
| Below 1 ㎓ | LTE Band 12 |
| Above 1 ㎓ | LTE Band 2 |

## 1.8. Test Report Revision

| Revision | Report Number | Date of Issue | Description |
|---|---|---|---|
| 0 | F690501-RF-RTL000680 | 2020.05.19 | Initial |

## 1.9. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

### 1.9.1. Radiation test

- E.I.R.P. (dB m) = Measured level (dBμV) + Antenna factor (dB) + Cable loss (dB) + 20 Log D - 104.5; where D is the measurement distance in meters.
- E.R.P (dB m) = E.I.R.P. (dB m) - 2.15 (dB)

## 1.10. Measurement Uncertainty

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

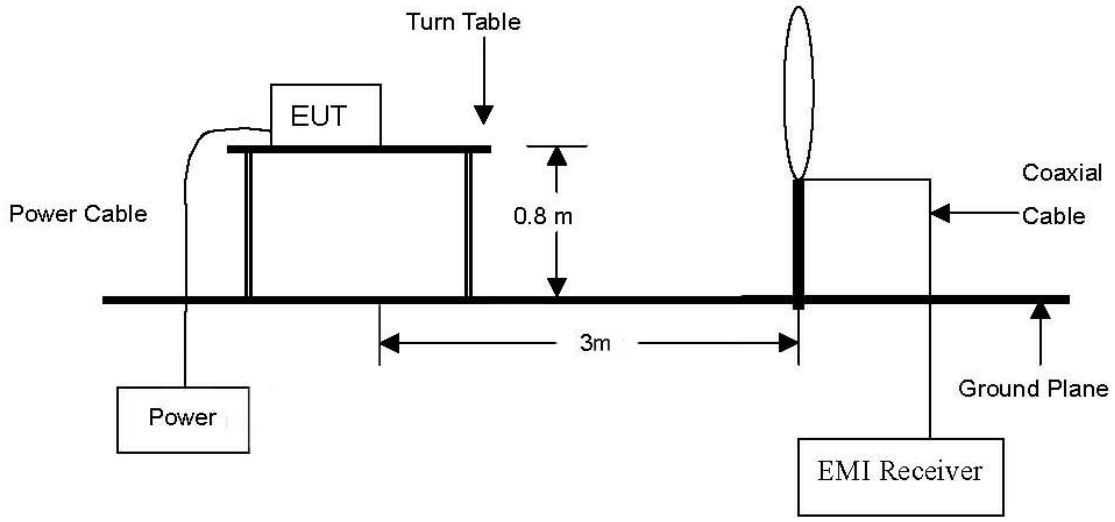
| Parameter | Uncertainty |
|---|---|
| Radiated Emission, 9 kHz to 30 MHz | ± 3.59 dB |
| Radiated Emission, below 1 GHz | ± 5.88 dB |
| Radiated Emission, above 1 GHz | ± 5.94 dB |

Uncertainty figures are valid to a confidence level of 95 %.

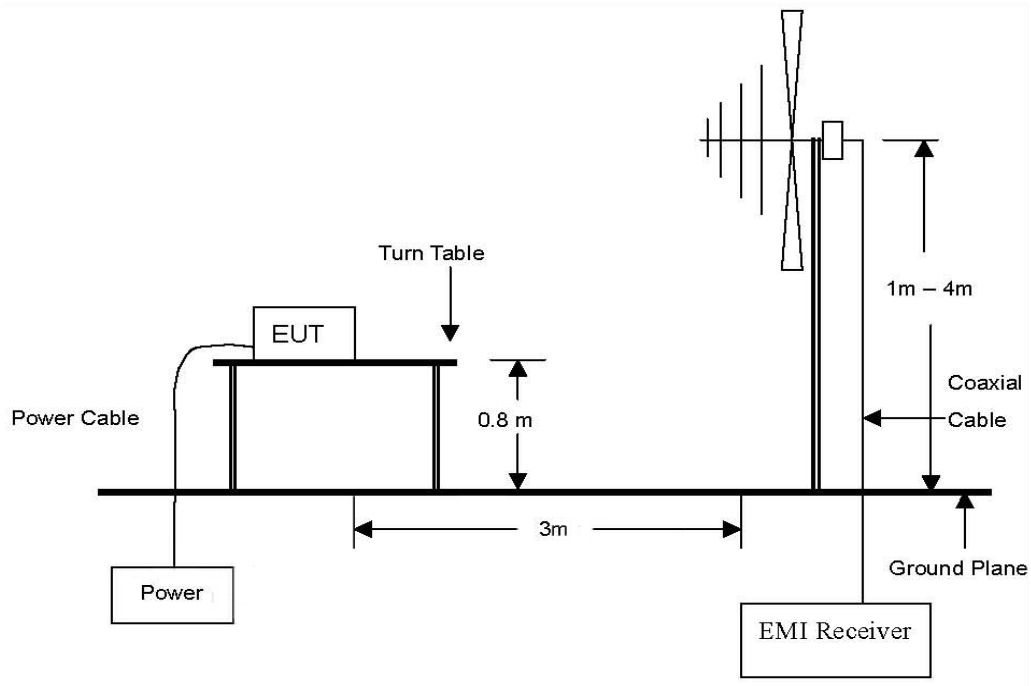
# 2. RF Radiated Output Power & Spurious Radiated Emission

## 2.1. Test Setup

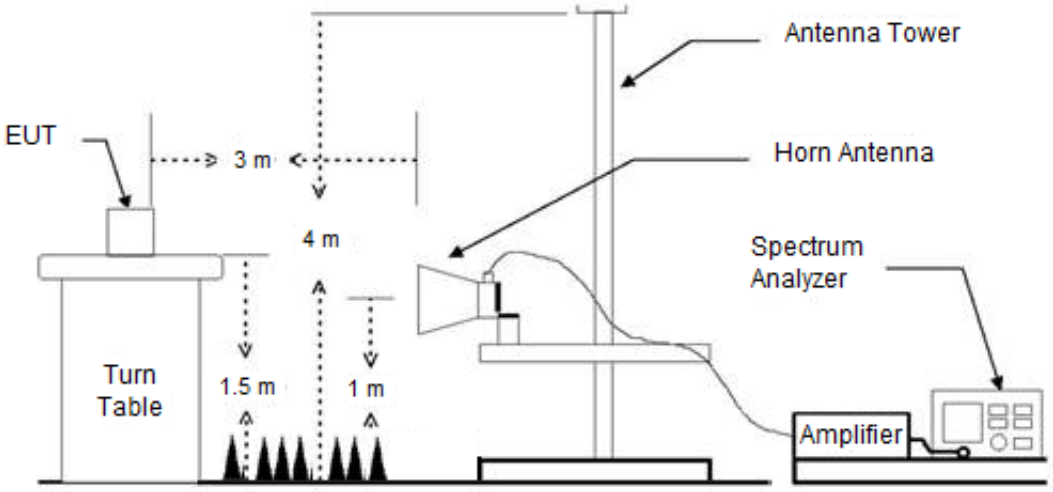
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒.




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 20 ㎓.



## 2.2. Limit

### 2.2.1. Limit of radiated output power

**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.

**IC**
- 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.

### 2.2.2. Limit of spurious radiated emission

**FCC**
- §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) ㏈.

**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-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.

## 2.3. Test procedure: Based on ANSI/TIA 603E: 2016 and ANSI C63.26-2015

1. On a test site, the EUT shall be placed at 80 cm 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. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions occupied bandwidth, RBW = 1-5 % of the OBW (not to exceed 1 ㎒), VBW ≥ 3 x RBW, Detector = power averaging (rms), sweep time = auto, trace average at least 100 traces in power averaging (rms) mode, per the guidelines of KDB 971168 D01 Power Meas License Digital Systems v03r01.
5. 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.
6. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
7. 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.
8. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
9. 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.
10. The maximum signal level detected by the measuring receiver shall be noted.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The measurement shall be repeated with the test antenna orientated for horizontal polarization.

## 2.4. Test Result for RF Radiated Output Power

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

**GSM 850_84671653 Y2xx**

| Frequency (㎒) | Measured Level (dBμV) | Ant. Pol. | AF (dB/m) | CL (dB) | E (dBμV/m) | CF (dB) | E.R.P. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | (dB m) | (㎽) |
| 824.20 | 99.09 | H | 26.93 | 5.41 | 131.43 | -97.41 | 34.02 | 2 524.89 |
| 824.20 | 94.48 | V | 26.93 | 5.41 | 126.82 | -97.41 | 29.41 | 873.46 |
| 836.60 | 98.79 | H | 27.23 | 5.46 | 131.48 | -97.41 | 34.07 | 2 554.13 |
| 836.60 | 94.01 | V | 27.23 | 5.46 | 126.70 | -97.41 | 29.29 | 849.65 |
| 848.80 | 99.80 | H | 27.48 | 5.49 | 132.77 | -97.41 | 35.36 | 3 437.50 |
| 848.80 | 94.20 | V | 27.48 | 5.49 | 127.17 | -97.41 | 29.76 | 946.77 |

**GSM 1 900_84881230 MiniMega NA**

| Frequency (㎒) | Measured Level (dBμV) | Ant. Pol. | AF (dB/m) | CL (dB) | E (dBμV/m) | CF (dB) | E.I.R.P. | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | (dB m) | (㎽) |
| 1 850.20 | 77.05 | H | 27.50 | 7.30 | 111.85 | -95.26 | 16.59 | 45.63 |
| 1 850.20 | 91.25 | V | 27.50 | 7.30 | 126.05 | -95.26 | 30.79 | 1200.17 |
| 1 880.00 | 80.17 | H | 27.74 | 7.31 | 115.22 | -95.26 | 19.96 | 99.14 |
| 1 880.00 | 90.99 | V | 27.74 | 7.31 | 126.04 | -95.26 | 30.78 | 1197.41 |
| 1 909.80 | 76.51 | H | 27.82 | 7.37 | 111.70 | -95.26 | 16.44 | 44.08 |
| 1 909.80 | 90.42 | V | 27.82 | 7.37 | 125.61 | -95.26 | 30.35 | 1084.53 |

**Remark;**

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

## 2.5. Spurious Radiated Emission

**LTE band 2_84881230 MiniMega NA**

- Modulation Signal: LTE band 2 (15 ㎒ – QPSK)

| Frequency (㎒) | Measured Level (dB㎶) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dB㎶/m) | CF (dB) | E.I.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (1 857.5 ㎒) | | | | | | | | | |
| 3 701.73 | 52.37 | H | 32.30 | -34.03 | 50.64 | -95.26 | -44.62 | -13 | 31.62 |
| 3 701.74 | 52.21 | V | 32.30 | -34.03 | 50.48 | -95.26 | -44.78 | -13 | 31.78 |
| 5 552.55 | 54.35 | H | 34.00 | -32.27 | 56.08 | -95.26 | -39.18 | -13 | 26.18 |
| 5 552.49 | 59.83 | V | 34.00 | -32.27 | 61.56 | -95.26 | -33.70 | -13 | 20.70 |
| Middle Channel (1 880.0 ㎒) | | | | | | | | | |
| 3 746.70 | 56.41 | H | 32.21 | -34.06 | 54.56 | -95.26 | -40.70 | -13 | 27.70 |
| 3 746.72 | 59.50 | V | 32.21 | -34.06 | 57.65 | -95.26 | -37.61 | -13 | 24.61 |
| 5 620.07 | 54.53 | H | 34.00 | -32.17 | 56.36 | -95.26 | -38.90 | -13 | 25.90 |
| 5 619.97 | 58.95 | V | 34.00 | -32.17 | 60.78 | -95.26 | -34.48 | -13 | 21.48 |
| High Channel (1 902.5 ㎒) | | | | | | | | | |
| 3 791.62 | 59.66 | H | 32.28 | -34.08 | 57.86 | -95.26 | -37.40 | -13 | 24.40 |
| 3 791.64 | 58.36 | V | 32.28 | -34.08 | 56.56 | -95.26 | -38.70 | -13 | 25.70 |
| 5 687.62 | 58.08 | H | 34.08 | -32.09 | 60.07 | -95.26 | -35.19 | -13 | 22.19 |
| 5 687.55 | 63.90 | V | 34.08 | -32.09 | 65.89 | -95.26 | -29.37 | -13 | 16.37 |

* 15 BW 1RB size / 0 Offset for B2

**LTE band 2_84671653 Y2xx**

- Modulation Signal: LTE band 2 (15 ㎒ – QPSK)

| Frequency (㎒) | Measured Level (dB㎶) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dB㎶/m) | CF (dB) | E.I.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (1 857.5 ㎒) | | | | | | | | | |
| 3 701.43 | 47.73 | H | 32.30 | -34.03 | 46.00 | -95.26 | -49.26 | -13 | 36.26 |
| 3 701.68 | 51.75 | V | 32.30 | -34.03 | 50.02 | -95.26 | -45.24 | -13 | 32.24 |
| 5 552.51 | 46.94 | V | 34.00 | -32.27 | 48.67 | -95.26 | -46.59 | -13 | 33.59 |
| Middle Channel (1 880.0 ㎒) | | | | | | | | | |
| 3 746.68 | 49.86 | H | 32.21 | -34.06 | 48.01 | -95.26 | -47.25 | -13 | 34.25 |
| 3 746.52 | 52.68 | V | 32.21 | -34.06 | 50.83 | -95.26 | -44.43 | -13 | 31.43 |
| 5 620.23 | 46.24 | H | 34.00 | -32.17 | 48.07 | -95.26 | -47.19 | -13 | 34.19 |
| 5 620.01 | 49.68 | V | 34.00 | -32.17 | 51.51 | -95.26 | -43.75 | -13 | 30.75 |
| High Channel (1 902.5 ㎒) | | | | | | | | | |
| 3 791.80 | 50.75 | H | 32.28 | -34.08 | 48.95 | -95.26 | -46.31 | -13 | 33.31 |
| 3 791.65 | 55.90 | V | 32.28 | -34.08 | 54.10 | -95.26 | -41.16 | -13 | 28.16 |
| 5 687.74 | 49.64 | V | 34.08 | -32.09 | 51.63 | -95.26 | -43.63 | -13 | 30.63 |

* 15 BW 1RB size / 0 Offset for B2

**LTE band 12/17_84881230 MiniMega NA**

- Modulation Signal: LTE band 12/17 (1.4 ㎒ – QPSK)

| Frequency (㎒) | Measured Level (dB㎶) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dB㎶/m) | CF (dB) | E.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (699.7 ㎒) | | | | | | | | | |
| 1 398.52 | 66.11 | H | 24.90 | -39.19 | 51.82 | -97.41 | -45.59 | -13 | 32.59 |
| 1 398.49 | 75.26 | V | 24.90 | -39.19 | 60.97 | -97.41 | -36.44 | -13 | 23.44 |
| 2 097.76 | 77.23 | H | 28.09 | -37.46 | 67.86 | -97.41 | -29.55 | -13 | 16.55 |
| 2 097.76 | 79.72 | V | 28.09 | -37.46 | 70.35 | -97.41 | -27.06 | -13 | 14.06 |
| 3 496.32 | 51.27 | H | 31.20 | -34.56 | 47.91 | -97.41 | -49.50 | -13 | 36.50 |
| 3 496.32 | 54.10 | V | 31.20 | -34.56 | 50.74 | -97.41 | -46.67 | -13 | 33.67 |
| Middle Channel (707.5 ㎒) | | | | | | | | | |
| 1 414.17 | 66.40 | H | 24.99 | -39.16 | 52.23 | -97.41 | -45.18 | -13 | 32.18 |
| 1 414.19 | 74.79 | V | 24.99 | -39.16 | 60.62 | -97.41 | -36.79 | -13 | 23.79 |
| 2 121.12 | 76.25 | H | 27.85 | -37.45 | 66.65 | -97.41 | -30.76 | -13 | 17.76 |
| 2 121.16 | 83.21 | V | 27.85 | -37.45 | 73.61 | -97.41 | -23.80 | -13 | 10.80 |
| 3 535.32 | 51.78 | H | 31.13 | -34.44 | 48.47 | -97.41 | -48.94 | -13 | 35.94 |
| 3 535.44 | 53.68 | V | 31.13 | -34.44 | 50.37 | -97.41 | -47.04 | -13 | 34.04 |
| High Channel (1 902.5 ㎒) | | | | | | | | | |
| 1 429.67 | 60.16 | H | 25.08 | -39.12 | 46.12 | -97.41 | -51.29 | -13 | 38.29 |
| 1 429.73 | 69.88 | V | 25.08 | -39.12 | 55.84 | -97.41 | -41.57 | -13 | 28.57 |
| 2 144.56 | 81.87 | H | 27.57 | -37.41 | 72.03 | -97.41 | -25.38 | -13 | 12.38 |
| 2 144.57 | 90.47 | V | 27.57 | -37.41 | 80.63 | -97.41 | -16.78 | -13 | 3.78 |
| 3 574.30 | 54.66 | H | 31.20 | -34.31 | 51.55 | -97.41 | -45.86 | -13 | 32.86 |
| 3 574.28 | 56.92 | V | 31.20 | -34.31 | 53.81 | -97.41 | -43.60 | -13 | 30.60 |

* 1.4 BW 1RB size / 0 Offset for B12/17

**LTE band 12/17_84671653 Y2xx**

- Modulation Signal: LTE band 12/17 (1.4 ㎒ – QPSK)

| Frequency (㎒) | Measured Level (dB㎶) | Ant. Pol. | AF (dB/m) | AMP+CL (dB) | E (dB㎶/m) | CF (dB) | E.R.P. (dB m) | Limit (dB m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| Low Channel (699.7 ㎒) | | | | | | | | | |
| 1 398.85 | 60.32 | H | 24.90 | -39.19 | 46.03 | -97.41 | -51.38 | -13 | 38.38 |
| 1 398.48 | 59.95 | V | 24.90 | -39.19 | 45.66 | -97.41 | -51.75 | -13 | 38.75 |
| 2 097.93 | 62.71 | H | 28.09 | -37.46 | 53.34 | -97.41 | -44.07 | -13 | 31.07 |
| 2 097.74 | 66.90 | V | 28.09 | -37.46 | 57.53 | -97.41 | -39.88 | -13 | 26.88 |
| Middle Channel (707.5 ㎒) | | | | | | | | | |
| 1 414.06 | 58.74 | H | 24.98 | -39.16 | 44.56 | -97.41 | -52.85 | -13 | 39.85 |
| 1 414.10 | 57.98 | V | 24.98 | -39.16 | 43.80 | -97.41 | -53.61 | -13 | 40.61 |
| 2 121.16 | 64.03 | H | 27.85 | -37.45 | 54.43 | -97.41 | -42.98 | -13 | 29.98 |
| 2 121.12 | 64.90 | V | 27.85 | -37.45 | 55.30 | -97.41 | -42.11 | -13 | 29.11 |
| High Channel (715.3 ㎒) | | | | | | | | | |
| 1 428.07 | 61.88 | H | 25.07 | -39.13 | 47.82 | -97.41 | -49.59 | -13 | 36.59 |
| 1 429.76 | 55.67 | V | 25.08 | -39.12 | 41.63 | -97.41 | -55.78 | -13 | 42.78 |
| 2 144.51 | 64.39 | H | 27.57 | -37.41 | 54.55 | -97.41 | -42.86 | -13 | 29.86 |
| 2 144.59 | 65.18 | V | 27.56 | -37.41 | 55.33 | -97.41 | -42.08 | -13 | 29.08 |

* 1.4 BW 1RB size / 0 Offset for B12/17

**Remark;**

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

**- End of the Test Report -**