

# TEST REPORT

of

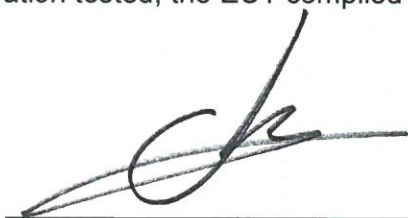
FCC Part 22 Subpart H, Part 24 Subpart E, Part 27 Subpart C/ L / H  
RSS-130 Issue 1, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3  
and RSS-Gen Issue 4

FCC ID: BEJGEN11NAN  
IC Certification: 2703H-GEN11NAN

Equipment Under Test : Telematics  
Model Name : GEN11NAN  
Applicant : LG Electronics Inc.  
Manufacturer : LG Electronics Inc.  
Date of Receipt : 2017.07.31  
Date of Test(s) : 2017.08.13 ~ 2017.08.25  
Date of Issue : 2017.09.11

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Jinhyoung Cho

Date:

2017.09.11

Technical  
Manager:



Harim Lee

Date:

2017.09.11

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

## TABLE OF CONTENTS

|                                                                | Page |
|----------------------------------------------------------------|------|
| 1. General Information -----                                   | 3    |
| 2. RF radiated output power & spurious radiated emission ----- | 7    |
| 3. Conducted Output Power -----                                | 61   |

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

**SGS Korea Co., Ltd. (Gunpo Laboratory)** 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 1. General information

### 1.1. Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- Wireless Div. 2FL, 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807

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>.

Telephone : +82 31 688 0901

FAX : +82 31 688 0921

### 1.2. Details of applicant

Applicant : LG Electronics Inc.

Address : 222 LG-ro Jinwi-Myeon, Pyeongtaek-si, Gyeonggi-do, 17709, Korea

Contact Person : Park, Eui-Soon

Phone No. : +82 2 2033 1110

### 1.3. Details of manufacturer

Applicant : LG Electronics Inc.

Address : 222 LG-ro Jinwi-Myeon, Pyeongtaek-si, Gyeonggi-do, 17709, Korea

### 1.4. Description of EUT

|                 |                                                                                                                                                                                                                                                                                                                                                 |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kind of Product | Telematics                                                                                                                                                                                                                                                                                                                                      |
| Model Name      | GEN11NAN                                                                                                                                                                                                                                                                                                                                        |
| Power Supply    | DC 12 V                                                                                                                                                                                                                                                                                                                                         |
| Rated Power     | GSM 850: 33 dB m<br>GSM 1 900: 30 dB m<br>WCDMA 2, 4, 5: 23 dB m<br>LTE Band 2, 4, 5, 12,13 : 23 dB m                                                                                                                                                                                                                                           |
| Frequency Range | GSM 850: 824 MHz ~ 849 MHz<br>GSM 1 900: 1 850 MHz ~ 1 910 MHz<br>WCDMA 2: 1 850 MHz ~ 1 910 MHz<br>WCDMA 4: 1 710 MHz ~ 1 755 MHz<br>WCDMA 5: 824 MHz ~ 849 MHz<br>LTE Band 2: 1 850 MHz ~ 1 910 MHz<br>LTE Band 4: 1 710 MHz ~ 1 755 MHz<br>LTE Band 5: 824 MHz ~ 849 MHz<br>LTE Band 12: 699 MHz ~ 716 MHz<br>LTE Band 13: 777 MHz ~ 787 MHz |

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Emission Designator | GSM 850: 244KGXW (Voice) / 243KG7W (EDGE)<br>GSM 1900: 243KGXW (Voice) / 243KG7W (EDGE)<br>WCDMA 2: 4M15F9W<br>WCDMA 4: 4M14F9W<br>WCDMA 5: 4M13F9W<br>LTE Band 2 (1.4 MHz): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 2 (3 MHz): 2M76G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 2 (5 MHz): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 2 (10 MHz): 9M01G7D (QPSK) / 8M99W7D (16QAM)<br>LTE Band 2 (15 MHz): 13M5G7D (QPSK) / 13M5W7D (16QAM)<br>LTE Band 2 (20 MHz): 18M1G7D (QPSK) / 18M1W7D (16QAM)<br>LTE Band 4 (1.4 MHz): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 4 (3 MHz): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 4 (5 MHz): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 4 (10 MHz): 9M01G7D (QPSK) / 9M00W7D (16QAM)<br>LTE Band 4 (15 MHz): 13M5G7D (QPSK) / 13M5W7D (16QAM)<br>LTE Band 4 (20 MHz): 18M1G7D (QPSK) / 18M1W7D (16QAM)<br>LTE Band 5 (1.4 MHz): 1M10G7D (QPSK) / 1M10W7D (16QAM)<br>LTE Band 5 (3 MHz): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 5 (5 MHz): 4M51G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 5 (10 MHz): 9M02G7D (QPSK) / 9M01W7D (16QAM)<br>LTE Band 12 (1.4 MHz): 1M10G7D (QPSK) / 1M09W7D (16QAM)<br>LTE Band 12 (3 MHz): 2M75G7D (QPSK) / 2M75W7D (16QAM)<br>LTE Band 12 (5 MHz): 4M52G7D (QPSK) / 4M51W7D (16QAM)<br>LTE Band 12 (10 MHz): 9M00G7D (QPSK) / 9M00W7D (16QAM)<br>LTE Band 13 (5 MHz): 4M54G7D (QPSK) / 4M54W7D (16QAM)<br>LTE Band 13 (10 MHz): 9M00G7D (QPSK) / 9M01W7D (16QAM) |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 1.5. Test equipment list

| Equipment           | Manufacturer               | Model                                | S/N                    | Cal. Date     | Cal. Interval | Cal. Due      |
|---------------------|----------------------------|--------------------------------------|------------------------|---------------|---------------|---------------|
| Signal Generator    | Agilent                    | E8257D                               | MY51501169             | Jul. 07, 2017 | Annual        | Jul. 07, 2018 |
| Spectrum Analyzer   | R&S                        | FSV30                                | 101004                 | Jun. 21, 2017 | Annual        | Jun. 21, 2018 |
| Spectrum Analyzer   | Agilent                    | N9020A                               | MY53421758             | Sep. 23, 2016 | Annual        | Sep. 23, 2017 |
| Mobile Test Unit    | R&S                        | CMW500                               | 144035                 | Feb. 22, 2017 | Annual        | Feb. 22, 2018 |
| High Pass Filter    | Wainwright Instrument GmbH | WHKX10-900-1000-180 00-40SS          | 7                      | Mar. 30, 2017 | Annual        | Mar. 30, 2018 |
| High Pass Filter    | Wainwright Instrument GmbH | WHK3.0/18G-10SS                      | 344                    | May 28, 2017  | Annual        | May 28, 2018  |
| High Pass Filter    | Wainwright Instrument GmbH | WHKX2.2/12.75G-10SS                  | 8                      | Mar. 30, 2017 | Annual        | Mar. 30, 2018 |
| High Pass Filter    | Wainwright Instrument GmbH | WHKX1.5/15G-6SS                      | 4                      | Jun. 14, 2017 | Annual        | Jun. 14, 2018 |
| DC Power Supply     | Agilent                    | U8002A                               | MY48490027             | Dec. 14, 2016 | Annual        | Dec. 14, 2017 |
| Power Meter         | Anritsu                    | ML2495A                              | 1223004                | Jun. 09, 2017 | Annual        | Jun. 09, 2018 |
| Power Sensor        | Anritsu                    | MA2411B                              | 1207272                | Jun. 09, 2017 | Annual        | Jun. 09, 2018 |
| Directional Coupler | KRYTAR                     | 152613                               | 140972                 | Jun. 12, 2017 | Annual        | Jun. 12, 2018 |
| Preamplifier        | H.P.                       | 8447F                                | 2944A03909             | Aug. 11, 2017 | Annual        | Aug. 11, 2018 |
| Preamplifier        | R&S                        | SCU 18                               | 10117                  | Apr. 08, 2017 | Annual        | Apr. 08, 2018 |
| Preamplifier        | MITEQ Inc.                 | JS44-18004000-35-8P                  | 1546891                | May 15, 2017  | Annual        | May 15, 2018  |
| Test Receiver       | R&S                        | ESU26                                | 100109                 | Feb. 17, 2017 | Annual        | Feb. 17, 2018 |
| Bilog Antenna       | SCHWARZBECK MESSELEKTRONIK | VULB 9163                            | 437                    | Oct. 21, 2016 | Biennial      | Oct. 21, 2018 |
| Dipole Antenna      | SCHWARZBECK MESSELEKTRONIK | UHA 9105                             | 9105-2514              | May 15, 2017  | Biennial      | May 15, 2019  |
| Dipole Antenna      | SCHWARZBECK MESSELEKTRONIK | VHA 9103                             | 9103-2817              | May 15, 2017  | Biennial      | May 15, 2019  |
| Horn Antenna        | R&S                        | HF906                                | 100326                 | Feb. 01, 2016 | Biennial      | Feb. 01, 2018 |
| Horn Antenna        | SCHWARZBECK MESSELEKTRONIK | BBHA 9170                            | BBHA9170431            | Aug. 25, 2016 | Biennial      | Aug. 25, 2018 |
| Horn Antenna        | SCHWARZBECK MESSELEKTRONIK | BBHA 9170                            | BBHA9170223            | Aug. 25, 2016 | Biennial      | Aug. 25, 2018 |
| 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<br>(9.6 m × 6.4 m × 6.4 m) | N/A                    | N.C.R.        | N/A           | N.C.R.        |

### ► Support equipment

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

## 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 /<br>IC part RSS-130 Issue 1, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3 and RSS-Gen Issue 4 |                                                                                                      |                            |                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|----------------------------|------------------------|
| Section in<br>FCC part                                                                                                                          | Section in<br>IC part                                                                                | Test Item                  | Result                 |
| §2.1046<br>§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 1<br>4.4<br>RSS-132 Issue 3<br>5.4<br>RSS-133 Issue 6<br>6.4<br>RSS-139 Issue 3<br>6.5 | RF Radiated Output Power   | Complied               |
| §2.1053<br>§22.917(a)<br>§24.238(a)<br>§27.53(c)(2)<br>§27.53(g)<br>§27.53(h)(1)                                                                | RSS-130 Issue 1<br>4.6<br>RSS-132 Issue 3<br>5.5<br>RSS-133 Issue 6<br>6.5<br>RSS-139 Issue 3<br>6.6 | Spurious Radiated Emission | Complied               |
| §2.1046                                                                                                                                         | RSS-Gen Issue 4<br>6.12                                                                              | Conducted Output Power     | Complied <sup>1)</sup> |

### Note;

1) The output power test in the report is for confirmation purpose, the difference is within  $\pm 0.5$  dB m which is considering as measurement purpose.

## 1.7. Test report revision

| Revision | Report number          | Date of Issue | Description                           |
|----------|------------------------|---------------|---------------------------------------|
| 0        | F690501/RF-RTL011771   | 2017.08.29    | Initial                               |
| 1        | F690501/RF-RTL011771-1 | 2017.09.07    | Added conducted test result           |
| 2        | F690501/RF-RTL011771-2 | 2017.09.11    | Added note for conducted output power |

## 1.8. Sample calculation for offset

Where relevant, the following sample calculation is provided:

### 1.8.1. Conducted test

Offset value (dB) = Directional Coupler (dB) + Cable loss (dB)

### 1.8.2. Radiation test

E.R.P. & E.I.R.P. = [S.G level + Amp.] (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

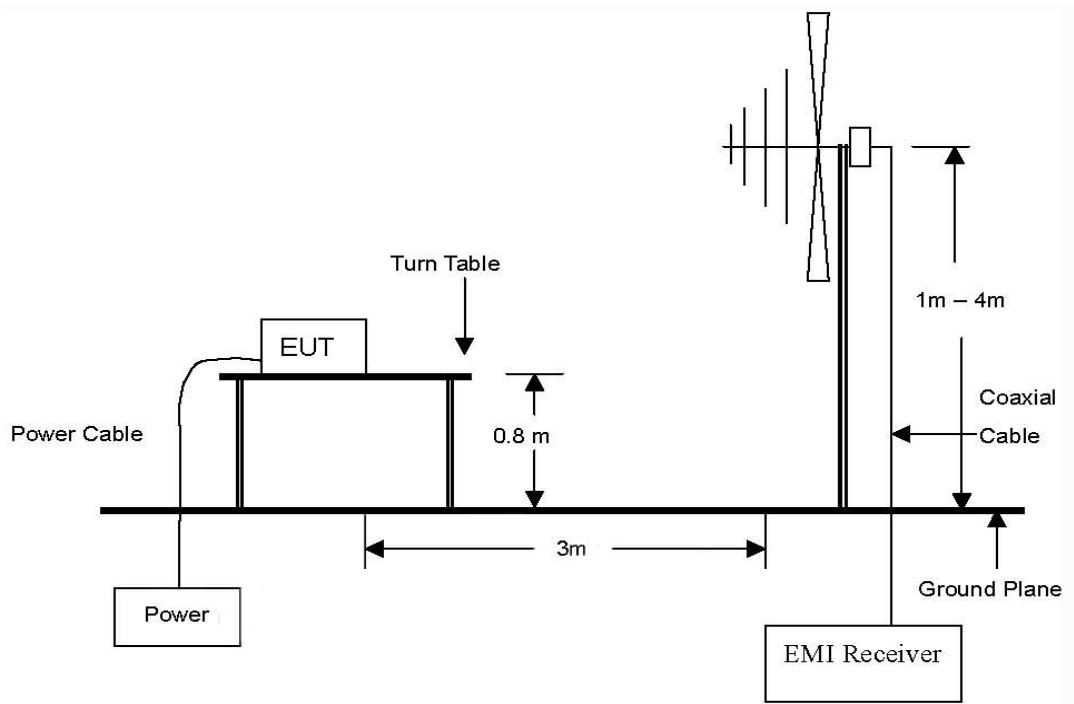
Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

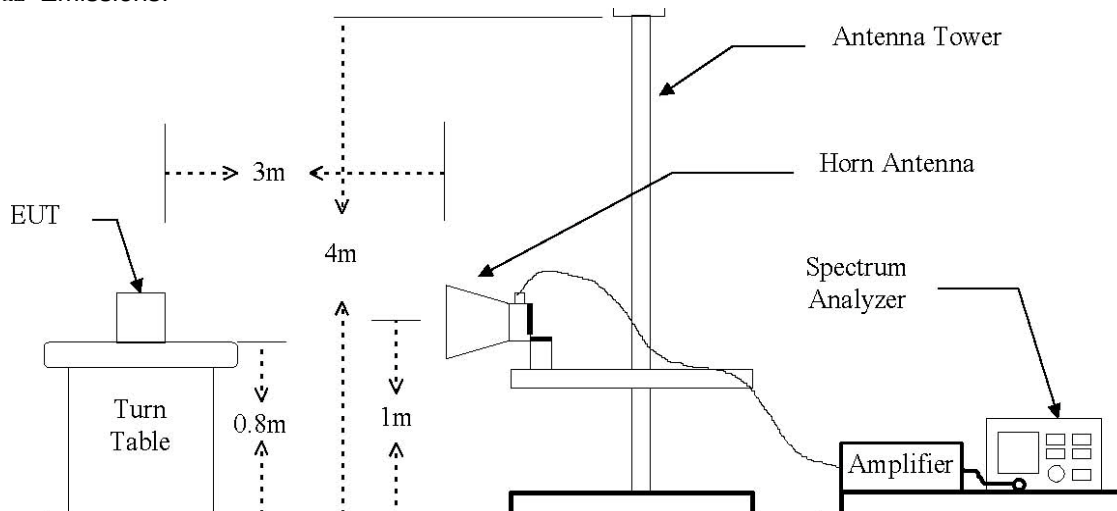
## 2. RF radiated output power & spurious radiated emission

### 2.1. Test setup

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

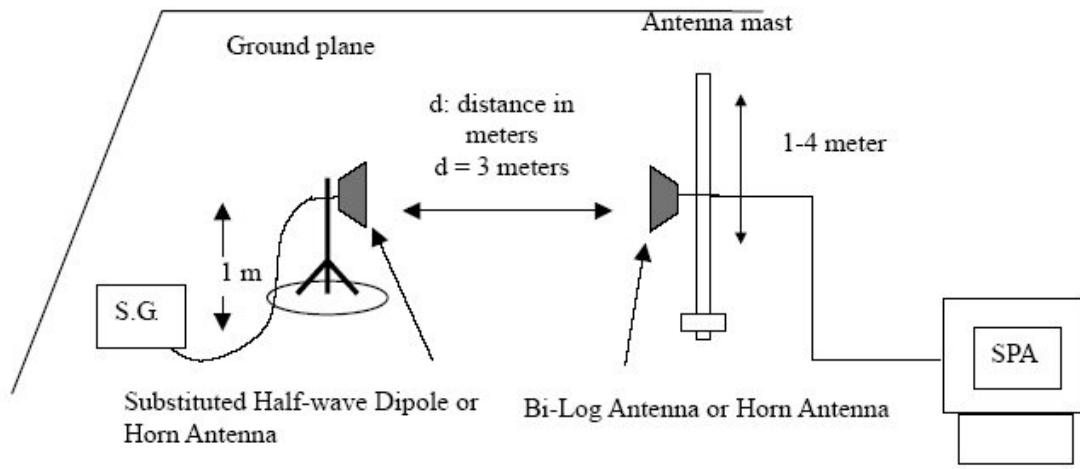


The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 20 GHz Emissions.



*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

The diagram below shows the test setup for substituted method.



## 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 to limiting power to the minimum necessary for successful communications.

- §27.50(b)(10), portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

- §27.50(c)(10), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz 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 MHz band and mobile and portable stations operating in the 1 695-1 710 MHz and 1 755-1 780 MHz bands are limited to 1 watt EIRP.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## IC

### - RSS-130 Issue 1

4.4, the transmitter output power shall be measured in terms of average power.

For base and fixed equipment, refer to SRSP-518 for power limits.

The e.i.r.p. shall not exceed 50 watts for mobile equipment or for outdoor fixed subscriber equipment, nor shall it exceed 5 watts for portable equipment or for indoor fixed subscriber equipment.

### - 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 MHz 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 MHz 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  $43 + 10\log(P)$  dB.

- §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  $43 + 10 \log(P)$  dB.

- §27.53(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.

- §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  $43 + 10 \log(P)$  dB.

- §27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, 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  $43 + 10 \log_{10}(P)$  dB.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

## IC

### - RSS-130 Issue 1

4.6.1, the power of any unwanted emissions in any 100 kHz bandwidth on any frequency outside the frequency range(s) within which the equipment is designed to operate shall be attenuated below the transmitter power,  $P$  (dB W), by at least  $43 + 10 \log_{10} p$  (watts), dB. However, in the 100 kHz band immediately outside the equipment's operating frequency range, a resolution bandwidth of 30 kHz may be employed.

4.6.2, In addition to the limit outlined in Section 4.6.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

(a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power,  $P$  (dB W), by at least:

- (i)  $76 + 10 \log_{10} p$  (watts), dB, for base and fixed equipment, and
- (ii)  $65 + 10 \log_{10} p$  (watts), dB, for mobile and portable equipment.

(b) The e.i.r.p. in the band 1 559-1 610 MHz shall not exceed -70 dB W/MHz for wideband signal and -80 dB W for discrete emission with bandwidth less than 700 Hz.

### - 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 MHz 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 dB) below the transmitter output power  $P$  (dB W) by at least  $43 + 10 \log_{10} p$  (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power  $P$  (dB 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 kHz is required.

### - RSS-133 Issue 6

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz 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 dB) below the transmitter output power  $P$  (dB W) by at least  $43 + 10 \log_{10} p$  (watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power  $P$  (dB 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 MHz is required.

### - RSS-139 Issue 3

6.6, (i) In the first 1.0 MHz 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 dB W) by at least  $43 + 10 \log_{10} p$  (watts) dB.

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

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

### 2.3. Test procedure: Based on ANSI/TIA 603E: 2016

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 MHz), 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 v02r02.
5. Radiated spurious emissions measurement method was set as follows:  
RBW = 100 kHz for emissions below 1 GHz and 1 MHz for emissions above 1 GHz, VBW ≥ 3 x RBW, Detector = Peak, trace mode = max hold, per the guidelines of KDB 971168 D01 v02r02.
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. The EUT was replaced by half-wave dipole (1 GHz below) or horn antenna (1 GHz above) connected to a signal generator.
12. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

## 2.4. Test result for RF radiated output power

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

### LTE band 2 (1.4 MHz – QPSK)

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 850.70           | H                  | 12.26                         | 4.33               | 8.53                | 16.46    | 44.26 |
| 1 850.70           | V                  | 11.43                         | 4.33               | 8.53                | 15.63    | 36.56 |
| 1 880.00           | H                  | 13.24                         | 4.34               | 8.63                | 17.53    | 56.62 |
| 1 880.00           | V                  | 11.52                         | 4.34               | 8.63                | 15.81    | 38.11 |
| 1 909.30           | H                  | 13.27                         | 4.36               | 8.60                | 17.51    | 56.36 |
| 1 909.30           | V                  | 7.52                          | 4.36               | 8.60                | 11.76    | 15.00 |

\* 1.4 BW 1RB size / 0 Offset for B2

### LTE band 2 (1.4 MHz – 16QAM)

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 850.70           | H                  | 10.95                         | 4.33               | 8.53                | 15.15    | 32.73 |
| 1 850.70           | V                  | 9.96                          | 4.33               | 8.53                | 14.16    | 26.06 |
| 1 880.00           | H                  | 12.44                         | 4.34               | 8.63                | 16.73    | 47.10 |
| 1 880.00           | V                  | 10.84                         | 4.34               | 8.63                | 15.13    | 32.58 |
| 1 909.30           | H                  | 12.55                         | 4.36               | 8.60                | 16.79    | 47.75 |
| 1 909.30           | V                  | 6.74                          | 4.36               | 8.60                | 10.98    | 12.53 |

\* 1.4 BW 1RB size / 0 Offset for B2

### LTE band 2 (3 MHz – QPSK)

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 851.50           | H                  | 12.55                         | 4.33               | 8.54                | 16.76    | 47.42 |
| 1 851.50           | V                  | 11.65                         | 4.33               | 8.54                | 15.86    | 38.55 |
| 1 880.00           | H                  | 13.74                         | 4.34               | 8.63                | 18.03    | 63.53 |
| 1 880.00           | V                  | 11.07                         | 4.34               | 8.63                | 15.36    | 34.36 |
| 1 908.50           | H                  | 13.57                         | 4.36               | 8.61                | 17.82    | 60.53 |
| 1 908.50           | V                  | 7.66                          | 4.36               | 8.61                | 11.91    | 15.52 |

\* 3 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

**LTE band 2 (3 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 851.50           | H                  | 11.00                         | 4.33               | 8.54                | 15.21    | 33.19 |
| 1 851.50           | V                  | 10.64                         | 4.33               | 8.54                | 14.85    | 30.55 |
| 1 880.00           | H                  | 12.57                         | 4.34               | 8.63                | 16.86    | 48.53 |
| 1 880.00           | V                  | 10.95                         | 4.34               | 8.63                | 15.24    | 33.42 |
| 1 908.50           | H                  | 12.62                         | 4.36               | 8.61                | 16.87    | 48.64 |
| 1 908.50           | V                  | 6.96                          | 4.36               | 8.61                | 11.21    | 13.21 |

\* 3 BW 1RB size / 0 Offset for B2

**LTE band 2 (5 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 852.50           | H                  | 12.32                         | 4.33               | 8.54                | 16.53    | 44.98 |
| 1 852.50           | V                  | 11.39                         | 4.33               | 8.54                | 15.60    | 36.31 |
| 1 880.00           | H                  | 12.78                         | 4.34               | 8.63                | 17.07    | 50.93 |
| 1 880.00           | V                  | 12.37                         | 4.34               | 8.63                | 16.66    | 46.34 |
| 1 907.50           | H                  | 13.20                         | 4.36               | 8.62                | 17.46    | 55.72 |
| 1 907.50           | V                  | 8.36                          | 4.36               | 8.62                | 12.62    | 18.28 |

\* 5 BW 1RB size / 0 Offset for B2

**LTE band 2 (5 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 852.50           | H                  | 11.30                         | 4.33               | 8.54                | 15.51    | 35.56 |
| 1 852.50           | V                  | 9.69                          | 4.33               | 8.54                | 13.90    | 24.55 |
| 1 880.00           | H                  | 12.49                         | 4.34               | 8.63                | 16.78    | 47.64 |
| 1 880.00           | V                  | 10.39                         | 4.34               | 8.63                | 14.68    | 29.38 |
| 1 907.50           | H                  | 12.57                         | 4.36               | 8.62                | 16.83    | 48.19 |
| 1 907.50           | V                  | 7.38                          | 4.36               | 8.62                | 11.64    | 14.59 |

\* 5 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 2 (10 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 855.00           | H                  | 12.27                         | 4.33               | 8.55                | 16.49    | 44.57 |
| 1 855.00           | V                  | 11.18                         | 4.33               | 8.55                | 15.40    | 34.67 |
| 1 880.00           | H                  | 13.76                         | 4.34               | 8.63                | 18.05    | 63.83 |
| 1 880.00           | V                  | 11.66                         | 4.34               | 8.63                | 15.95    | 39.36 |
| 1 905.00           | H                  | 13.90                         | 4.36               | 8.64                | 18.18    | 65.77 |
| 1 905.00           | V                  | 9.99                          | 4.36               | 8.64                | 14.27    | 26.73 |

\* 10 BW 1RB size / 0 Offset for B2

**LTE band 2 (10 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 855.00           | H                  | 11.55                         | 4.33               | 8.55                | 15.77    | 37.76 |
| 1 855.00           | V                  | 10.28                         | 4.33               | 8.55                | 14.50    | 28.18 |
| 1 880.00           | H                  | 13.06                         | 4.34               | 8.63                | 17.35    | 54.33 |
| 1 880.00           | V                  | 11.97                         | 4.34               | 8.63                | 16.26    | 42.27 |
| 1 905.00           | H                  | 13.04                         | 4.36               | 8.64                | 17.32    | 53.95 |
| 1 905.00           | V                  | 8.98                          | 4.36               | 8.64                | 13.26    | 21.18 |

\* 10 BW 1RB size / 0 Offset for B2

**LTE band 2 (15 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 857.50           | H                  | 12.93                         | 4.33               | 8.55                | 17.15    | 51.88 |
| 1 857.50           | V                  | 11.55                         | 4.33               | 8.55                | 15.77    | 37.76 |
| 1 880.00           | H                  | 13.34                         | 4.34               | 8.63                | 17.63    | 57.94 |
| 1 880.00           | V                  | 12.12                         | 4.34               | 8.63                | 16.41    | 43.75 |
| 1 902.50           | H                  | 13.19                         | 4.35               | 8.67                | 17.51    | 56.36 |
| 1 902.50           | V                  | 10.42                         | 4.35               | 8.67                | 14.74    | 29.79 |

\* 15 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 2 (15 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 857.50           | H                  | 12.27                         | 4.33               | 8.55                | 16.49    | 44.57 |
| 1 857.50           | V                  | 10.82                         | 4.33               | 8.55                | 15.04    | 31.92 |
| 1 880.00           | H                  | 12.64                         | 4.34               | 8.63                | 16.93    | 49.32 |
| 1 880.00           | V                  | 12.29                         | 4.34               | 8.63                | 16.58    | 45.50 |
| 1 902.50           | H                  | 12.46                         | 4.35               | 8.67                | 16.78    | 47.64 |
| 1 902.50           | V                  | 9.85                          | 4.35               | 8.67                | 14.17    | 26.12 |

\* 15 BW 1RB size / 0 Offset for B2

**LTE band 2 (20 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 860.00           | H                  | 13.15                         | 4.33               | 8.56                | 17.38    | 54.70 |
| 1 860.00           | V                  | 11.25                         | 4.33               | 8.56                | 15.48    | 35.32 |
| 1 880.00           | H                  | 13.58                         | 4.34               | 8.63                | 17.87    | 61.24 |
| 1 880.00           | V                  | 12.74                         | 4.34               | 8.63                | 17.03    | 50.47 |
| 1 900.00           | H                  | 13.41                         | 4.35               | 8.70                | 17.76    | 59.70 |
| 1 900.00           | V                  | 11.25                         | 4.35               | 8.70                | 15.60    | 36.31 |

\* 20 BW 1RB size / 0 Offset for B2

**LTE band 2 (20 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 860.00           | H                  | 12.37                         | 4.33               | 8.56                | 16.60    | 45.71 |
| 1 860.00           | V                  | 10.74                         | 4.33               | 8.56                | 14.97    | 31.41 |
| 1 880.00           | H                  | 13.01                         | 4.34               | 8.63                | 17.30    | 53.70 |
| 1 880.00           | V                  | 10.84                         | 4.34               | 8.63                | 15.13    | 32.58 |
| 1 900.00           | H                  | 12.83                         | 4.35               | 8.70                | 17.18    | 52.24 |
| 1 900.00           | V                  | 10.54                         | 4.35               | 8.70                | 14.89    | 30.83 |

\* 20 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 4 (1.4 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 710.70           | H                  | 5.30                          | 4.14               | 8.51                | 9.67     | 9.27  |
| 1 710.70           | V                  | 12.38                         | 4.14               | 8.51                | 16.75    | 47.32 |
| 1 732.50           | H                  | 6.04                          | 4.18               | 8.48                | 10.34    | 10.81 |
| 1 732.50           | V                  | 11.31                         | 4.18               | 8.48                | 15.61    | 36.39 |
| 1 754.30           | H                  | 5.49                          | 4.22               | 8.44                | 9.71     | 9.35  |
| 1 754.30           | V                  | 13.48                         | 4.22               | 8.44                | 17.70    | 58.88 |

\* 1.4 BW 1RB size / 0 Offset for B4

**LTE band 4 (1.4 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 710.70           | H                  | 4.27                          | 4.14               | 8.51                | 8.64     | 7.31  |
| 1 710.70           | V                  | 11.36                         | 4.14               | 8.51                | 15.73    | 37.41 |
| 1 732.50           | H                  | 4.94                          | 4.18               | 8.48                | 9.24     | 8.39  |
| 1 732.50           | V                  | 10.33                         | 4.18               | 8.48                | 14.63    | 29.04 |
| 1 754.30           | H                  | 4.38                          | 4.22               | 8.44                | 8.60     | 7.24  |
| 1 754.30           | V                  | 12.05                         | 4.22               | 8.44                | 16.27    | 42.36 |

\* 1.4 BW 1RB size / 0 Offset for B4

**LTE band 4 (3 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 711.50           | H                  | 5.59                          | 4.14               | 8.51                | 9.96     | 9.91  |
| 1 711.50           | V                  | 12.43                         | 4.14               | 8.51                | 16.80    | 47.86 |
| 1 732.50           | H                  | 6.06                          | 4.18               | 8.48                | 10.36    | 10.86 |
| 1 732.50           | V                  | 11.70                         | 4.18               | 8.48                | 16.00    | 39.81 |
| 1 753.50           | H                  | 5.44                          | 4.22               | 8.44                | 9.66     | 9.25  |
| 1 753.50           | V                  | 13.26                         | 4.22               | 8.44                | 17.48    | 55.98 |

\* 3 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 4 (3 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 711.50           | H                  | 4.46                          | 4.14               | 8.51                | 8.83     | 7.64  |
| 1 711.50           | V                  | 11.92                         | 4.14               | 8.51                | 16.29    | 42.56 |
| 1 732.50           | H                  | 5.06                          | 4.18               | 8.48                | 9.36     | 8.63  |
| 1 732.50           | V                  | 10.66                         | 4.18               | 8.48                | 14.96    | 31.33 |
| 1 753.50           | H                  | 4.65                          | 4.22               | 8.44                | 8.87     | 7.71  |
| 1 753.50           | V                  | 12.63                         | 4.22               | 8.44                | 16.85    | 48.42 |

\* 3 BW 1RB size / 0 Offset for B4

**LTE band 4 (5 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 712.50           | H                  | 5.10                          | 4.14               | 8.51                | 9.47     | 8.85  |
| 1 712.50           | V                  | 12.55                         | 4.14               | 8.51                | 16.92    | 49.20 |
| 1 732.50           | H                  | 6.02                          | 4.18               | 8.48                | 10.32    | 10.76 |
| 1 732.50           | V                  | 11.79                         | 4.18               | 8.48                | 16.09    | 40.64 |
| 1 752.50           | H                  | 4.60                          | 4.21               | 8.44                | 8.83     | 7.64  |
| 1 752.50           | V                  | 13.07                         | 4.21               | 8.44                | 17.30    | 53.70 |

\* 5 BW 1RB size / 0 Offset for B4

**LTE band 4 (5 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 712.50           | H                  | 4.20                          | 4.14               | 8.51                | 8.57     | 7.19  |
| 1 712.50           | V                  | 11.73                         | 4.14               | 8.51                | 16.10    | 40.74 |
| 1 732.50           | H                  | 5.43                          | 4.18               | 8.48                | 9.73     | 9.40  |
| 1 732.50           | V                  | 10.95                         | 4.18               | 8.48                | 15.25    | 33.50 |
| 1 752.50           | H                  | 3.70                          | 4.21               | 8.44                | 7.93     | 6.21  |
| 1 752.50           | V                  | 12.43                         | 4.21               | 8.44                | 16.66    | 46.34 |

\* 5 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 4 (10 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 715.00           | H                  | 5.33                          | 4.15               | 8.50                | 9.68     | 9.29  |
| 1 715.00           | V                  | 12.44                         | 4.15               | 8.50                | 16.79    | 47.75 |
| 1 732.50           | H                  | 6.10                          | 4.18               | 8.48                | 10.40    | 10.96 |
| 1 732.50           | V                  | 12.04                         | 4.18               | 8.48                | 16.34    | 43.05 |
| 1 750.00           | H                  | 4.43                          | 4.21               | 8.45                | 8.67     | 7.36  |
| 1 750.00           | V                  | 12.85                         | 4.21               | 8.45                | 17.09    | 51.17 |

\* 10 BW 1RB size / 0 Offset for B4

**LTE band 4 (10 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 715.00           | H                  | 4.11                          | 4.15               | 8.50                | 8.46     | 7.01  |
| 1 715.00           | V                  | 11.83                         | 4.15               | 8.50                | 16.18    | 41.50 |
| 1 732.50           | H                  | 4.90                          | 4.18               | 8.48                | 9.20     | 8.32  |
| 1 732.50           | V                  | 11.39                         | 4.18               | 8.48                | 15.69    | 37.07 |
| 1 750.00           | H                  | 3.33                          | 4.21               | 8.45                | 7.57     | 5.71  |
| 1 750.00           | V                  | 12.29                         | 4.21               | 8.45                | 16.53    | 44.98 |

\* 10 BW 1RB size / 0 Offset for B4

**LTE band 4 (15 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 717.50           | H                  | 4.82                          | 4.15               | 8.50                | 9.17     | 8.26  |
| 1 717.50           | V                  | 12.37                         | 4.15               | 8.50                | 16.72    | 46.99 |
| 1 732.50           | H                  | 5.24                          | 4.18               | 8.48                | 9.54     | 8.99  |
| 1 732.50           | V                  | 11.97                         | 4.18               | 8.48                | 16.27    | 42.36 |
| 1 747.50           | H                  | 4.86                          | 4.21               | 8.45                | 9.10     | 8.13  |
| 1 747.50           | V                  | 12.33                         | 4.21               | 8.45                | 16.57    | 45.39 |

\* 15 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 4 (15 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 717.50           | H                  | 3.87                          | 4.15               | 8.50                | 8.22     | 6.64  |
| 1 717.50           | V                  | 11.21                         | 4.15               | 8.50                | 15.56    | 35.97 |
| 1 732.50           | H                  | 4.39                          | 4.18               | 8.48                | 8.69     | 7.40  |
| 1 732.50           | V                  | 10.98                         | 4.18               | 8.48                | 15.28    | 33.73 |
| 1 747.50           | H                  | 3.98                          | 4.21               | 8.45                | 8.22     | 6.64  |
| 1 747.50           | V                  | 11.27                         | 4.21               | 8.45                | 15.51    | 35.56 |

\* 15 BW 1RB size / 0 Offset for B4

**LTE band 4 (20 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 720.00           | H                  | 4.82                          | 4.16               | 8.50                | 9.16     | 8.24  |
| 1 720.00           | V                  | 12.33                         | 4.16               | 8.50                | 16.67    | 46.45 |
| 1 732.50           | H                  | 4.61                          | 4.18               | 8.48                | 8.91     | 7.78  |
| 1 732.50           | V                  | 11.35                         | 4.18               | 8.48                | 15.65    | 36.73 |
| 1 745.00           | H                  | 4.94                          | 4.20               | 8.46                | 9.20     | 8.32  |
| 1 745.00           | V                  | 11.69                         | 4.20               | 8.46                | 15.95    | 39.36 |

\* 20 BW 1RB size / 0 Offset for B4

**LTE band 4 (20 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 720.00           | H                  | 4.06                          | 4.16               | 8.50                | 8.40     | 6.92  |
| 1 720.00           | V                  | 11.46                         | 4.16               | 8.50                | 15.80    | 38.02 |
| 1 732.50           | H                  | 4.18                          | 4.18               | 8.48                | 8.48     | 7.05  |
| 1 732.50           | V                  | 10.86                         | 4.18               | 8.48                | 15.16    | 32.81 |
| 1 745.00           | H                  | 4.26                          | 4.20               | 8.46                | 8.52     | 7.11  |
| 1 745.00           | V                  | 11.03                         | 4.20               | 8.46                | 15.29    | 33.81 |

\* 20 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 5 (1.4 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 824.70             | H                  | 20.37                         | 3.26               | -4.93               | 12.18  | 16.52 |
| 824.70             | V                  | 22.12                         | 3.26               | -4.93               | 13.93  | 24.72 |
| 836.50             | H                  | 20.84                         | 3.45               | -5.15               | 12.24  | 16.75 |
| 836.50             | V                  | 20.49                         | 3.45               | -5.15               | 11.89  | 15.45 |
| 848.30             | H                  | 20.16                         | 3.52               | -4.09               | 12.55  | 17.99 |
| 848.30             | V                  | 21.22                         | 3.52               | -4.09               | 13.61  | 22.96 |

\* 1.4 BW 1RB size / 0 Offset for B5

**LTE band 5 (1.4 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 824.70             | H                  | 19.38                         | 3.26               | -4.93               | 11.19  | 13.15 |
| 824.70             | V                  | 21.24                         | 3.26               | -4.93               | 13.05  | 20.18 |
| 836.50             | H                  | 19.74                         | 3.45               | -5.15               | 11.14  | 13.00 |
| 836.50             | V                  | 20.27                         | 3.45               | -5.15               | 11.67  | 14.69 |
| 848.30             | H                  | 19.41                         | 3.52               | -4.09               | 11.80  | 15.14 |
| 848.30             | V                  | 20.45                         | 3.52               | -4.09               | 12.84  | 19.23 |

\* 1.4 BW 1RB size / 0 Offset for B5

**LTE band 5 (3 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 825.50             | H                  | 20.51                         | 3.28               | -5.05               | 12.18  | 16.52 |
| 825.50             | V                  | 22.41                         | 3.28               | -5.05               | 14.08  | 25.59 |
| 836.50             | H                  | 20.46                         | 3.45               | -5.15               | 11.86  | 15.35 |
| 836.50             | V                  | 20.77                         | 3.45               | -5.15               | 12.17  | 16.48 |
| 847.50             | H                  | 20.45                         | 3.52               | -4.16               | 12.77  | 18.92 |
| 847.50             | V                  | 20.82                         | 3.52               | -4.16               | 13.14  | 20.61 |

\* 3 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 5 (3 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 825.50             | H                  | 19.99                         | 3.28               | -5.05               | 11.66  | 14.66 |
| 825.50             | V                  | 21.51                         | 3.28               | -5.05               | 13.18  | 20.80 |
| 836.50             | H                  | 19.69                         | 3.45               | -5.15               | 11.09  | 12.85 |
| 836.50             | V                  | 20.20                         | 3.45               | -5.15               | 11.60  | 14.45 |
| 847.50             | H                  | 19.73                         | 3.52               | -4.16               | 12.05  | 16.03 |
| 847.50             | V                  | 20.06                         | 3.52               | -4.16               | 12.38  | 17.30 |

\* 3 BW 1RB size / 0 Offset for B5

**LTE band 5 (5 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 826.50             | H                  | 20.90                         | 3.31               | -5.20               | 12.39  | 17.34 |
| 826.50             | V                  | 22.87                         | 3.31               | -5.20               | 14.36  | 27.29 |
| 836.50             | H                  | 20.56                         | 3.45               | -5.15               | 11.96  | 15.70 |
| 836.50             | V                  | 21.05                         | 3.45               | -5.15               | 12.45  | 17.58 |
| 846.50             | H                  | 20.12                         | 3.51               | -4.25               | 12.36  | 17.22 |
| 846.50             | V                  | 20.84                         | 3.51               | -4.25               | 13.08  | 20.32 |

\* 5 BW 1RB size / 0 Offset for B5

**LTE band 5 (5 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 826.50             | H                  | 19.94                         | 3.31               | -5.20               | 11.43  | 13.90 |
| 826.50             | V                  | 22.00                         | 3.31               | -5.20               | 13.49  | 22.34 |
| 836.50             | H                  | 19.64                         | 3.45               | -5.15               | 11.04  | 12.71 |
| 836.50             | V                  | 20.44                         | 3.45               | -5.15               | 11.84  | 15.28 |
| 846.50             | H                  | 19.26                         | 3.51               | -4.25               | 11.50  | 14.13 |
| 846.50             | V                  | 19.80                         | 3.51               | -4.25               | 12.04  | 16.00 |

\* 5 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

**LTE band 5 (10 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 829.00             | H                  | 21.81                         | 3.38               | -5.58               | 12.85  | 19.28 |
| 829.00             | V                  | 23.55                         | 3.38               | -5.58               | 14.59  | 28.77 |
| 836.50             | H                  | 20.58                         | 3.45               | -5.15               | 11.98  | 15.78 |
| 836.50             | V                  | 21.30                         | 3.45               | -5.15               | 12.70  | 18.62 |
| 844.00             | H                  | 20.51                         | 3.49               | -4.48               | 12.54  | 17.95 |
| 844.00             | V                  | 20.35                         | 3.49               | -4.48               | 12.38  | 17.30 |

\* 10 BW 1RB size / 0 Offset for B5

**LTE band 5 (10 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 829.00             | H                  | 20.97                         | 3.38               | -5.58               | 12.01  | 15.89 |
| 829.00             | V                  | 22.86                         | 3.38               | -5.58               | 13.90  | 24.55 |
| 836.50             | H                  | 19.55                         | 3.45               | -5.15               | 10.95  | 12.45 |
| 836.50             | V                  | 20.75                         | 3.45               | -5.15               | 12.15  | 16.41 |
| 844.00             | H                  | 19.63                         | 3.49               | -4.48               | 11.66  | 14.66 |
| 844.00             | V                  | 19.42                         | 3.49               | -4.48               | 11.45  | 13.96 |

\* 10 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 12 (1.4 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 699.70             | H                  | 17.90                         | 2.86               | -4.00               | 11.04  | 12.71 |
| 699.70             | V                  | 19.41                         | 2.86               | -4.00               | 12.55  | 17.99 |
| 707.50             | H                  | 20.58                         | 3.06               | -4.53               | 12.99  | 19.91 |
| 707.50             | V                  | 19.26                         | 3.06               | -4.53               | 11.67  | 14.69 |
| 715.30             | H                  | 20.23                         | 3.04               | -4.31               | 12.88  | 19.41 |
| 715.30             | V                  | 18.26                         | 3.04               | -4.31               | 10.91  | 12.33 |

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

**LTE band 12 (1.4 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 699.70             | H                  | 16.97                         | 2.86               | -4.00               | 10.11  | 10.26 |
| 699.70             | V                  | 18.22                         | 2.86               | -4.00               | 11.36  | 13.68 |
| 707.50             | H                  | 19.90                         | 3.06               | -4.53               | 12.31  | 17.02 |
| 707.50             | V                  | 18.18                         | 3.06               | -4.53               | 10.59  | 11.46 |
| 715.30             | H                  | 19.09                         | 3.04               | -4.31               | 11.74  | 14.93 |
| 715.30             | V                  | 17.30                         | 3.04               | -4.31               | 9.95   | 9.89  |

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

**LTE band 12 (3 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 700.50             | H                  | 18.20                         | 2.87               | -4.05               | 11.28  | 13.43 |
| 700.50             | V                  | 19.52                         | 2.87               | -4.05               | 12.60  | 18.20 |
| 707.50             | H                  | 21.39                         | 3.06               | -4.53               | 13.80  | 23.99 |
| 707.50             | V                  | 19.19                         | 3.06               | -4.53               | 11.60  | 14.45 |
| 714.50             | H                  | 20.31                         | 3.05               | -4.37               | 12.89  | 19.45 |
| 714.50             | V                  | 18.35                         | 3.05               | -4.37               | 10.93  | 12.39 |

\* 3 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 12 (3 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 700.50             | H                  | 17.64                         | 2.87               | -4.05               | 10.72  | 11.80 |
| 700.50             | V                  | 18.49                         | 2.87               | -4.05               | 11.57  | 14.35 |
| 707.50             | H                  | 20.23                         | 3.06               | -4.53               | 12.64  | 18.37 |
| 707.50             | V                  | 18.28                         | 3.06               | -4.53               | 10.69  | 11.72 |
| 714.50             | H                  | 19.39                         | 3.05               | -4.37               | 11.97  | 15.74 |
| 714.50             | V                  | 17.30                         | 3.05               | -4.37               | 9.88   | 9.73  |

\* 3 BW 1RB size / 0 Offset for B12

**LTE band 12 (5 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 701.50             | H                  | 18.79                         | 2.90               | -4.12               | 11.77  | 15.03 |
| 701.50             | V                  | 19.60                         | 2.90               | -4.12               | 12.58  | 18.11 |
| 707.50             | H                  | 21.66                         | 3.06               | -4.53               | 14.07  | 25.53 |
| 707.50             | V                  | 19.76                         | 3.06               | -4.53               | 12.17  | 16.48 |
| 713.50             | H                  | 20.30                         | 3.06               | -4.44               | 12.80  | 19.05 |
| 713.50             | V                  | 18.46                         | 3.06               | -4.44               | 10.96  | 12.47 |

\* 5 BW 1RB size / 0 Offset for B12

**LTE band 12 (5 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 701.50             | H                  | 18.19                         | 2.90               | -4.12               | 11.17  | 13.09 |
| 701.50             | V                  | 18.56                         | 2.90               | -4.12               | 11.54  | 14.26 |
| 707.50             | H                  | 20.57                         | 3.06               | -4.53               | 12.98  | 19.86 |
| 707.50             | V                  | 18.51                         | 3.06               | -4.53               | 10.92  | 12.36 |
| 713.50             | H                  | 19.88                         | 3.06               | -4.44               | 12.38  | 17.30 |
| 713.50             | V                  | 17.86                         | 3.06               | -4.44               | 10.36  | 10.86 |

\* 5 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 12 (10 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 704.00             | H                  | 19.90                         | 2.96               | -4.29               | 12.65  | 18.41 |
| 704.00             | V                  | 19.29                         | 2.96               | -4.29               | 12.04  | 16.00 |
| 707.50             | H                  | 21.62                         | 3.06               | -4.53               | 14.03  | 25.29 |
| 707.50             | V                  | 20.10                         | 3.06               | -4.53               | 12.51  | 17.82 |
| 711.00             | H                  | 22.08                         | 3.10               | -4.63               | 14.35  | 27.23 |
| 711.00             | V                  | 19.43                         | 3.10               | -4.63               | 11.70  | 14.79 |

\* 10 BW 1RB size / 0 Offset for B12

**LTE band 12 (10 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 704.00             | H                  | 19.25                         | 2.96               | -4.29               | 12.00  | 15.85 |
| 704.00             | V                  | 18.01                         | 2.96               | -4.29               | 10.76  | 11.91 |
| 707.50             | H                  | 20.86                         | 3.06               | -4.53               | 13.27  | 21.23 |
| 707.50             | V                  | 18.79                         | 3.06               | -4.53               | 11.20  | 13.18 |
| 711.00             | H                  | 21.25                         | 3.10               | -4.63               | 13.52  | 22.49 |
| 711.00             | V                  | 18.39                         | 3.10               | -4.63               | 10.66  | 11.64 |

\* 10 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 13 (5 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 779.50             | H                  | 23.26                         | 2.98               | -3.69               | 16.59  | 45.60 |
| 779.50             | V                  | 20.12                         | 2.98               | -3.69               | 13.45  | 22.13 |
| 782.00             | H                  | 22.24                         | 3.04               | -3.64               | 15.56  | 35.97 |
| 782.00             | V                  | 19.27                         | 3.04               | -3.64               | 12.59  | 18.16 |
| 784.50             | H                  | 20.34                         | 3.14               | -3.59               | 13.61  | 22.96 |
| 784.50             | V                  | 19.01                         | 3.14               | -3.59               | 12.28  | 16.90 |

\* 5 BW 1RB size / 0 Offset for B13

**LTE band 13 (5 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 779.50             | H                  | 22.49                         | 2.98               | -3.69               | 15.82  | 38.19 |
| 779.50             | V                  | 19.56                         | 2.98               | -3.69               | 12.89  | 19.45 |
| 782.00             | H                  | 21.58                         | 3.04               | -3.64               | 14.90  | 30.90 |
| 782.00             | V                  | 18.48                         | 3.04               | -3.64               | 11.80  | 15.14 |
| 784.50             | H                  | 19.44                         | 3.14               | -3.59               | 12.71  | 18.66 |
| 784.50             | V                  | 17.61                         | 3.14               | -3.59               | 10.88  | 12.25 |

\* 5 BW 1RB size / 0 Offset for B13

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**LTE band 13 (10 MHz – QPSK)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 782.00             | H                  | 22.24                         | 3.04               | -3.64               | 15.56  | 35.97 |
| 782.00             | V                  | 19.63                         | 3.04               | -3.64               | 12.95  | 19.72 |

\* 10 BW 1RB size / 0 Offset for B13

**LTE band 13 (10 MHz – 16QAM)**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 782.00             | H                  | 21.11                         | 3.04               | -3.64               | 14.43  | 27.73 |
| 782.00             | V                  | 18.69                         | 3.04               | -3.64               | 12.01  | 15.89 |

\* 10 BW 1RB size / 0 Offset for B13

Remark:

1. E.R.P. & E.I.R.P. = [S.G level + Amp.] (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)
2. This device was tested under all bandwidths, RB configurations and modulations.
3. The data reported in the table above was measured in worst case.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

**WCDMA 2**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 852.40           | H                  | 2.96                          | 4.33               | 8.54                | 7.17     | 5.21  |
| 1 852.40           | V                  | 12.29                         | 4.33               | 8.54                | 16.50    | 44.67 |
| 1 880.00           | H                  | 3.44                          | 4.34               | 8.63                | 7.73     | 5.93  |
| 1 880.00           | V                  | 11.35                         | 4.34               | 8.63                | 15.64    | 36.64 |
| 1 907.60           | H                  | 3.99                          | 4.36               | 8.62                | 8.25     | 6.68  |
| 1 907.60           | V                  | 10.28                         | 4.36               | 8.62                | 14.54    | 28.44 |

**WCDMA 4**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 712.40           | H                  | 4.66                          | 4.14               | 8.51                | 9.03     | 8.00  |
| 1 712.40           | V                  | 11.51                         | 4.14               | 8.51                | 15.88    | 38.73 |
| 1 732.60           | H                  | 3.99                          | 4.18               | 8.48                | 8.29     | 6.75  |
| 1 732.60           | V                  | 12.37                         | 4.18               | 8.48                | 16.67    | 46.45 |
| 1 752.60           | H                  | 3.92                          | 4.21               | 8.44                | 8.15     | 6.53  |
| 1 752.60           | V                  | 13.43                         | 4.21               | 8.44                | 17.66    | 58.34 |

**WCDMA 5**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 826.40             | H                  | 23.08                         | 3.31               | -5.18               | 14.59  | 28.77 |
| 826.40             | V                  | 20.22                         | 3.31               | -5.18               | 11.73  | 14.89 |
| 836.60             | H                  | 21.97                         | 3.45               | -5.14               | 13.38  | 21.78 |
| 836.60             | V                  | 21.16                         | 3.45               | -5.14               | 12.57  | 18.07 |
| 846.60             | H                  | 20.70                         | 3.51               | -4.25               | 12.94  | 19.68 |
| 846.60             | V                  | 22.73                         | 3.51               | -4.25               | 14.97  | 31.41 |

Remark:

1. E.R.P. & E.I.R.P. = [S.G level + Amp.] (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

**GSM 850**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |        |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|--------|
|                    |                    |                               |                    |                     | (dB m) | (mW)   |
| 824.20             | H                  | 31.98                         | 3.24               | -4.85               | 23.89  | 244.91 |
| 824.20             | V                  | 29.04                         | 3.24               | -4.85               | 20.95  | 124.45 |
| 836.60             | H                  | 30.51                         | 3.45               | -5.14               | 21.92  | 155.60 |
| 836.60             | V                  | 31.78                         | 3.45               | -5.14               | 23.19  | 208.45 |
| 848.80             | H                  | 30.28                         | 3.52               | -4.05               | 22.71  | 186.64 |
| 848.80             | V                  | 32.12                         | 3.52               | -4.05               | 24.55  | 285.10 |

**GSM 850 EDGE**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|--------|-------|
|                    |                    |                               |                    |                     | (dB m) | (mW)  |
| 824.20             | H                  | 26.79                         | 3.24               | -4.85               | 18.70  | 74.13 |
| 824.20             | V                  | 20.47                         | 3.24               | -4.85               | 12.38  | 17.30 |
| 836.60             | H                  | 24.16                         | 3.45               | -5.14               | 15.57  | 36.06 |
| 836.60             | V                  | 23.29                         | 3.45               | -5.14               | 14.70  | 29.51 |
| 848.80             | H                  | 24.27                         | 3.52               | -4.05               | 16.70  | 46.77 |
| 848.80             | V                  | 22.76                         | 3.52               | -4.05               | 15.19  | 33.04 |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

**GSM 1 900**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |        |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|--------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)   |
| 1 850.20           | H                  | 6.94                          | 4.33               | 8.53                | 11.14    | 13.00  |
| 1 850.20           | V                  | 16.01                         | 4.33               | 8.53                | 20.21    | 104.95 |
| 1 880.00           | H                  | 12.46                         | 4.34               | 8.63                | 16.75    | 47.32  |
| 1 880.00           | V                  | 13.76                         | 4.34               | 8.63                | 18.05    | 63.83  |
| 1 909.80           | H                  | 11.83                         | 4.36               | 8.59                | 16.06    | 40.36  |
| 1 909.80           | V                  | 11.22                         | 4.36               | 8.59                | 15.45    | 35.08  |

**GSM 1 900 EDGE**

| Frequency<br>(MHz) | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P. |       |
|--------------------|--------------------|-------------------------------|--------------------|---------------------|----------|-------|
|                    |                    |                               |                    |                     | (dB m)   | (mW)  |
| 1 850.20           | H                  | 6.77                          | 4.33               | 8.53                | 10.97    | 12.50 |
| 1 850.20           | V                  | 11.30                         | 4.33               | 8.53                | 15.50    | 35.48 |
| 1 880.00           | H                  | 7.26                          | 4.34               | 8.63                | 11.55    | 14.29 |
| 1 880.00           | V                  | 12.12                         | 4.34               | 8.63                | 16.41    | 43.75 |
| 1 909.80           | H                  | 9.70                          | 4.36               | 8.59                | 13.93    | 24.72 |
| 1 909.80           | V                  | 11.58                         | 4.36               | 8.59                | 15.81    | 38.11 |

Remark:

1. E.R.P. & E.I.R.P. = [S.G level + Amp.] (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

## 2.5. Spurious radiated emission

- Measured output Power: 17.53 dB m = 0.056 6 W
- Modulation Signal: LTE band 2 (1.4 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.53$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 850.7 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 700.61                     | H                  | -55.55                        | 5.96               | 9.06                | -52.45             | -13             | -39.45         |
| 3 700.32                     | V                  | -53.92                        | 5.96               | 9.06                | -50.82             | -13             | -37.82         |
| 9 251.04                     | H                  | -49.76                        | 10.15              | 12.62               | -47.29             | -13             | -36.44         |
| 9 251.34                     | V                  | -48.76                        | 10.15              | 12.63               | -46.28             | -13             | -33.28         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 758.72                     | H                  | -54.85                        | 6.25               | 9.12                | -51.98             | -13             | -38.98         |
| 3 759.40                     | V                  | -50.73                        | 6.26               | 9.12                | -47.87             | -13             | -34.87         |
| 9 397.70                     | H                  | -49.45                        | 10.28              | 12.47               | -47.26             | -13             | -34.26         |
| 9 397.82                     | V                  | -42.84                        | 10.28              | 12.47               | -40.65             | -13             | -27.65         |
| High Channel (1 909.3 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 817.31                     | H                  | -57.89                        | 6.51               | 9.15                | -55.25             | -13             | -42.25         |
| 3 817.72                     | V                  | -46.04                        | 6.51               | 9.15                | -43.40             | -13             | -30.40         |
| 9 544.12                     | H                  | -50.32                        | 10.25              | 12.62               | -47.95             | -13             | -34.95         |
| 9 544.46                     | V                  | -43.69                        | 10.25              | 12.62               | -41.32             | -13             | -28.32         |

\* 1.4 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 18.03 dB m = 0.063 5 W
- Modulation Signal: LTE band 2 (3 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 31.03$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 851.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 700.45                     | H                  | -54.81                        | 5.96               | 9.06                | -51.71             | -13             | -38.71         |
| 3 700.48                     | V                  | -53.58                        | 5.96               | 9.06                | -50.48             | -13             | -37.48         |
| 9 250.94                     | H                  | -48.82                        | 10.15              | 12.62               | -46.35             | -13             | -33.35         |
| 9 251.07                     | V                  | -49.29                        | 10.15              | 12.62               | -46.82             | -13             | -33.82         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 757.51                     | H                  | -56.48                        | 6.25               | 9.12                | -53.61             | -13             | -40.61         |
| 3 757.62                     | V                  | -50.34                        | 6.25               | 9.12                | -47.47             | -13             | -34.47         |
| 9 393.50                     | H                  | -48.84                        | 10.28              | 12.48               | -46.64             | -13             | -33.64         |
| 9 393.45                     | V                  | -43.38                        | 10.28              | 12.48               | -41.18             | -13             | -28.18         |
| High Channel (1 908.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 814.17                     | H                  | -57.90                        | 6.50               | 9.15                | -55.25             | -13             | -42.25         |
| 3 814.36                     | V                  | -46.73                        | 6.50               | 9.15                | -44.08             | -13             | -31.08         |
| 9 536.16                     | H                  | -49.26                        | 10.28              | 12.62               | -46.92             | -13             | -33.92         |
| 9 536.11                     | V                  | -42.63                        | 10.28              | 12.62               | -40.29             | -13             | -27.29         |

\* 3 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.46 dB m = 0.055 7 W
- Modulation Signal: LTE band 2 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.46$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 852.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 700.76                     | H                  | -54.89                        | 5.96               | 9.06                | -51.79             | -13             | -38.79         |
| 3 700.58                     | V                  | -53.77                        | 5.96               | 9.06                | -50.67             | -13             | -37.67         |
| 9 251.88                     | H                  | -49.41                        | 10.15              | 12.63               | -46.93             | -13             | -33.93         |
| 9 251.93                     | V                  | -48.95                        | 10.15              | 12.63               | -46.47             | -13             | -33.47         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 755.92                     | H                  | -56.50                        | 6.24               | 9.12                | -53.62             | -13             | -40.62         |
| 3 755.76                     | V                  | -50.75                        | 6.24               | 9.12                | -47.87             | -13             | -34.87         |
| 9 389.20                     | H                  | -48.40                        | 10.28              | 12.49               | -46.19             | -13             | -33.19         |
| 9 389.05                     | V                  | -43.40                        | 10.28              | 12.49               | -41.19             | -13             | -28.19         |
| High Channel (1 907.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 810.20                     | H                  | -57.62                        | 6.49               | 9.16                | -54.95             | -13             | -41.95         |
| 3 810.60                     | V                  | -46.38                        | 6.49               | 9.16                | -43.71             | -13             | -30.71         |
| 9 526.60                     | H                  | -49.79                        | 10.31              | 12.61               | -47.49             | -13             | -34.49         |
| 9 526.46                     | V                  | -42.51                        | 10.31              | 12.61               | -40.21             | -13             | -27.21         |

\* 5 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 18.18 dB m = 0.065 8 W
- Modulation Signal: LTE band 2 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 31.18$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 855.0 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 701.87                     | H                  | -55.27                        | 5.97               | 9.07                | -52.17             | -13             | -39.17         |
| 3 701.40                     | V                  | -53.81                        | 5.97               | 9.07                | -50.71             | -13             | -37.71         |
| 9 252.88                     | H                  | -49.25                        | 10.16              | 12.63               | -46.78             | -13             | -33.78         |
| 9 252.97                     | V                  | -48.55                        | 10.16              | 12.63               | -46.08             | -13             | -33.08         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 751.09                     | H                  | -56.84                        | 6.22               | 9.12                | -53.94             | -13             | -40.94         |
| 3 751.10                     | V                  | -50.88                        | 6.22               | 9.12                | -47.98             | -13             | -34.98         |
| 9 377.74                     | H                  | -48.52                        | 10.27              | 12.52               | -46.27             | -13             | -33.27         |
| 9 378.16                     | V                  | -43.05                        | 10.27              | 12.52               | -40.80             | -13             | -27.80         |
| High Channel (1 905.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 800.93                     | H                  | -58.25                        | 6.46               | 9.16                | -55.55             | -13             | -42.55         |
| 3 801.26                     | V                  | -45.56                        | 6.46               | 9.16                | -42.86             | -13             | -29.86         |
| 9 503.08                     | H                  | -48.86                        | 10.39              | 12.61               | -46.64             | -13             | -33.64         |
| 9 502.62                     | V                  | -40.96                        | 10.39              | 12.61               | -38.74             | -13             | -25.74         |

\* 10 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.63 dB m = 0.057 9 W
- Modulation Signal: LTE band 2 (15 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.63$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 857.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 701.61                     | H                  | -54.18                        | 5.97               | 9.07                | -51.08             | -13             | -38.08         |
| 3 701.84                     | V                  | -53.54                        | 5.97               | 9.07                | -50.44             | -13             | -37.44         |
| 9 254.68                     | H                  | -49.45                        | 10.16              | 12.63               | -46.98             | -13             | -33.98         |
| 9 254.00                     | V                  | -48.45                        | 10.16              | 12.63               | -45.98             | -13             | -32.98         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 746.46                     | H                  | -56.82                        | 6.19               | 9.11                | -53.90             | -13             | -40.90         |
| 3 746.94                     | V                  | -50.63                        | 6.19               | 9.11                | -47.71             | -13             | -34.71         |
| 9 367.04                     | H                  | -48.57                        | 10.27              | 12.55               | -46.29             | -13             | -33.29         |
| 9 366.73                     | V                  | -42.77                        | 10.27              | 12.55               | -40.49             | -13             | -27.49         |
| High Channel (1 902.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 791.76                     | H                  | -57.15                        | 6.42               | 9.16                | -54.41             | -13             | -41.41         |
| 3 791.78                     | V                  | -45.72                        | 6.42               | 9.16                | -42.98             | -13             | -29.98         |
| 9 479.18                     | H                  | -49.40                        | 10.38              | 12.57               | -47.21             | -13             | -34.21         |
| 9 479.32                     | V                  | -40.21                        | 10.38              | 12.58               | -38.01             | -13             | -25.01         |

\* 15 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.87 dB m = 0.061 2 W
- Modulation Signal: LTE band 2 (20 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.87$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 860.0 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 701.88                     | H                  | -55.54                        | 5.97               | 9.07                | -52.44             | -13             | -39.44         |
| 3 702.34                     | V                  | -53.31                        | 5.97               | 9.07                | -50.21             | -13             | -37.21         |
| 9 255.24                     | H                  | -49.42                        | 10.16              | 12.63               | -46.95             | -13             | -33.95         |
| 9 255.50                     | V                  | -47.65                        | 10.16              | 12.63               | -45.18             | -13             | -32.18         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 742.45                     | H                  | -56.27                        | 6.17               | 9.11                | -53.33             | -13             | -40.33         |
| 3 742.34                     | V                  | -50.55                        | 6.17               | 9.11                | -47.61             | -13             | -34.61         |
| 9 355.40                     | H                  | -47.00                        | 10.26              | 12.58               | -44.68             | -13             | -31.68         |
| 9 355.58                     | V                  | -43.22                        | 10.26              | 12.58               | -40.90             | -13             | -27.90         |
| High Channel (1 902.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 782.45                     | H                  | -57.52                        | 6.37               | 9.15                | -54.74             | -13             | -41.74         |
| 3 782.36                     | V                  | -47.39                        | 6.37               | 9.15                | -44.61             | -13             | -31.61         |
| 9 455.16                     | H                  | -49.45                        | 10.35              | 12.54               | -47.26             | -13             | -34.26         |
| 9 455.36                     | V                  | -40.42                        | 10.35              | 12.54               | -38.23             | -13             | -25.23         |

\* 20 BW 1RB size / 0 Offset for B2

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.70 dB m = 0.058 9 W
- Modulation Signal: LTE band 4 (1.4 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.70$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 710.7 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 420.68                     | H                  | -59.88                        | 5.88               | 9.27                | -56.49             | -13             | -43.49         |
| 3 420.68                     | V                  | -54.24                        | 5.88               | 9.27                | -50.85             | -13             | -37.85         |
| 5 130.84                     | H                  | -51.09                        | 7.61               | 10.45               | -48.25             | -13             | -35.25         |
| 5 130.64                     | V                  | -53.91                        | 7.61               | 10.44               | -51.08             | -13             | -38.08         |
| 6 841.05                     | H                  | -50.58                        | 8.69               | 11.70               | -47.57             | -13             | -34.57         |
| 6 841.12                     | V                  | -49.26                        | 8.70               | 11.70               | -46.26             | -13             | -33.26         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 464.12                     | H                  | -58.59                        | 5.92               | 9.24                | -55.27             | -13             | -42.27         |
| 3 464.40                     | V                  | -56.36                        | 5.92               | 9.24                | -53.04             | -13             | -40.04         |
| 5 196.06                     | H                  | -46.69                        | 7.75               | 10.60               | -43.84             | -13             | -30.84         |
| 5 196.06                     | V                  | -48.54                        | 7.75               | 10.60               | -45.69             | -13             | -32.69         |
| 6 928.30                     | H                  | -52.06                        | 8.90               | 11.67               | -49.29             | -13             | -36.29         |
| 6 928.02                     | V                  | -50.65                        | 8.90               | 11.67               | -47.88             | -13             | -34.88         |
| High Channel (1 754.3 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 507.92                     | H                  | -55.48                        | 5.93               | 9.23                | -52.18             | -13             | -39.18         |
| 3 507.72                     | V                  | -56.99                        | 5.94               | 9.22                | -53.71             | -13             | -40.71         |
| 5 261.42                     | H                  | -46.88                        | 7.68               | 10.71               | -43.85             | -13             | -30.85         |
| 5 261.68                     | V                  | -45.62                        | 7.68               | 10.71               | -42.59             | -13             | -29.59         |
| 7 015.62                     | H                  | -52.14                        | 8.98               | 11.67               | -49.45             | -13             | -36.45         |
| 7 015.76                     | V                  | -52.34                        | 8.98               | 11.67               | -49.65             | -13             | -36.65         |

\* 1.4 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 17.48 dB m = 0.056 0 W
- Modulation Signal: LTE band 4 (3 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.48$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 711.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 420.58                     | H                  | -59.94                        | 5.88               | 9.27                | -56.55             | -13             | -43.55         |
| 3 420.36                     | V                  | -54.56                        | 5.88               | 9.27                | -51.17             | -13             | -38.17         |
| 5 130.70                     | H                  | -51.07                        | 7.61               | 10.44               | -48.24             | -13             | -35.24         |
| 5 130.76                     | V                  | -53.58                        | 7.61               | 10.44               | -50.75             | -13             | -37.75         |
| 6 841.51                     | H                  | -50.83                        | 8.70               | 11.70               | -47.83             | -13             | -34.83         |
| 6 840.64                     | V                  | -49.78                        | 8.69               | 11.70               | -46.77             | -13             | -33.77         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 462.30                     | H                  | -57.85                        | 5.92               | 9.24                | -54.53             | -13             | -41.53         |
| 3 462.74                     | V                  | -56.52                        | 5.92               | 9.24                | -53.20             | -13             | -40.20         |
| 5 193.50                     | H                  | -45.89                        | 7.75               | 10.59               | -43.05             | -13             | -30.05         |
| 5 193.76                     | V                  | -48.06                        | 7.75               | 10.60               | -45.21             | -13             | -32.21         |
| 6 925.36                     | H                  | -52.24                        | 8.90               | 11.66               | -49.48             | -13             | -36.48         |
| 6 925.10                     | V                  | -50.23                        | 8.90               | 11.66               | -47.47             | -13             | -34.47         |
| High Channel (1 753.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 504.36                     | H                  | -55.63                        | 5.94               | 9.22                | -52.35             | -13             | -39.35         |
| 3 504.78                     | V                  | -56.78                        | 5.94               | 9.22                | -53.50             | -13             | -40.50         |
| 5 256.72                     | H                  | -47.22                        | 7.69               | 10.70               | -44.21             | -13             | -31.21         |
| 5 256.78                     | V                  | -46.16                        | 7.69               | 10.70               | -43.15             | -13             | -30.15         |
| 7 008.61                     | H                  | -51.96                        | 8.99               | 11.69               | -49.26             | -13             | -36.26         |
| 7 009.02                     | V                  | -52.15                        | 8.99               | 11.69               | -49.45             | -13             | -36.45         |

\* 3 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.30 dB m = 0.053 7 W
- Modulation Signal: LTE band 4 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.30$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 712.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 420.74                     | H                  | -59.59                        | 5.88               | 9.27                | -56.20             | -13             | -43.20         |
| 3 420.70                     | V                  | -54.64                        | 5.88               | 9.27                | -51.25             | -13             | -38.25         |
| 5 131.14                     | H                  | -50.69                        | 7.61               | 10.45               | -47.85             | -13             | -34.85         |
| 5 130.88                     | V                  | -53.85                        | 7.61               | 10.45               | -51.01             | -13             | -38.01         |
| 6 841.33                     | H                  | -51.03                        | 8.70               | 11.70               | -48.03             | -13             | -35.03         |
| 6 841.16                     | V                  | -50.02                        | 8.70               | 11.70               | -47.02             | -13             | -34.02         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 460.72                     | H                  | -58.14                        | 5.91               | 9.24                | -54.81             | -13             | -41.81         |
| 3 460.46                     | V                  | -56.36                        | 5.91               | 9.24                | -53.03             | -13             | -40.03         |
| 5 191.06                     | H                  | -45.53                        | 7.74               | 10.59               | -42.68             | -13             | -29.68         |
| 5 191.14                     | V                  | -47.11                        | 7.74               | 10.59               | -44.26             | -13             | -31.26         |
| 6 921.12                     | H                  | -51.74                        | 8.89               | 11.66               | -48.97             | -13             | -35.97         |
| 6 921.48                     | V                  | -49.71                        | 8.89               | 11.66               | -46.94             | -13             | -33.94         |
| High Channel (1 752.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 501.00                     | H                  | -55.26                        | 5.95               | 9.21                | -52.00             | -13             | -39.00         |
| 3 500.54                     | V                  | -56.67                        | 5.95               | 9.21                | -53.41             | -13             | -40.41         |
| 5 251.04                     | H                  | -48.55                        | 7.69               | 10.69               | -45.55             | -13             | -32.55         |
| 5 251.04                     | V                  | -47.91                        | 7.69               | 10.69               | -44.91             | -13             | -31.91         |
| 7 001.55                     | H                  | -52.23                        | 9.01               | 11.71               | -49.53             | -13             | -36.53         |
| 7 001.24                     | V                  | -52.52                        | 9.01               | 11.71               | -49.82             | -13             | -36.82         |

\* 5 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 17.09 dB m = 0.051 2 W
- Modulation Signal: LTE band 4 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.09$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 715.0 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 421.30                     | H                  | -58.99                        | 5.88               | 9.27                | -55.60             | -13             | -42.60         |
| 3 421.12                     | V                  | -54.19                        | 5.88               | 9.27                | -50.80             | -13             | -37.80         |
| 5 131.64                     | H                  | -50.62                        | 7.61               | 10.45               | -47.78             | -13             | -34.78         |
| 5 131.84                     | V                  | -53.29                        | 7.61               | 10.45               | -50.45             | -13             | -37.45         |
| 6 842.36                     | H                  | -50.77                        | 8.70               | 11.69               | -47.78             | -13             | -34.78         |
| 6 842.10                     | V                  | -49.64                        | 8.70               | 11.70               | -46.64             | -13             | -33.64         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 456.02                     | H                  | -58.48                        | 5.91               | 9.24                | -55.15             | -13             | -42.15         |
| 3 456.08                     | V                  | -54.79                        | 5.91               | 9.24                | -51.46             | -13             | -38.46         |
| 5 184.28                     | H                  | -45.25                        | 7.73               | 10.57               | -42.41             | -13             | -29.41         |
| 5 184.06                     | V                  | -46.67                        | 7.72               | 10.57               | -43.82             | -13             | -30.82         |
| 6 912.18                     | H                  | -51.44                        | 8.88               | 11.65               | -48.67             | -13             | -35.67         |
| 6 912.20                     | V                  | -49.42                        | 8.88               | 11.65               | -46.65             | -13             | -33.65         |
| High Channel (1 750.0 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 491.04                     | H                  | -54.97                        | 5.94               | 9.22                | -51.69             | -13             | -38.69         |
| 3 491.22                     | V                  | -55.21                        | 5.94               | 9.22                | -51.93             | -13             | -38.93         |
| 5 236.82                     | H                  | -49.00                        | 7.71               | 10.67               | -46.04             | -13             | -33.04         |
| 5 236.89                     | V                  | -49.38                        | 7.71               | 10.67               | -46.42             | -13             | -33.42         |
| 6 982.43                     | H                  | -51.46                        | 8.98               | 11.70               | -48.74             | -13             | -35.74         |
| 6 982.14                     | V                  | -50.44                        | 8.98               | 11.70               | -47.72             | -13             | -34.72         |

\* 10 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 16.72 dB m = 0.047 0 W
- Modulation Signal: LTE band 4 (15 MHz - QPSK)
- Distance: 3 meters
- Limit: 43 + 10log<sub>10</sub>(W) = 29.72 dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 717.5 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 421.62                     | H                  | -59.41                        | 5.88               | 9.26                | -56.03             | -13             | -43.03         |
| 3 421.58                     | V                  | -54.80                        | 5.88               | 9.26                | -51.42             | -13             | -38.42         |
| 5 132.58                     | H                  | -50.89                        | 7.61               | 10.45               | -48.05             | -13             | -35.05         |
| 5 132.55                     | V                  | -53.77                        | 7.61               | 10.45               | -50.93             | -13             | -37.93         |
| 6 843.43                     | H                  | -50.12                        | 8.70               | 11.69               | -47.13             | -13             | -34.13         |
| 6 843.40                     | V                  | -49.14                        | 8.70               | 11.69               | -46.15             | -13             | -33.15         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 451.68                     | H                  | -58.13                        | 5.91               | 9.24                | -54.80             | -13             | -41.80         |
| 3 451.60                     | V                  | -55.74                        | 5.91               | 9.24                | -52.41             | -13             | -39.41         |
| 5 177.55                     | H                  | -46.14                        | 7.71               | 10.56               | -43.29             | -13             | -30.29         |
| 5 177.46                     | V                  | -48.05                        | 7.71               | 10.56               | -45.20             | -13             | -32.20         |
| 6 903.33                     | H                  | -51.85                        | 8.86               | 11.65               | -49.06             | -13             | -36.06         |
| 6 903.50                     | V                  | -50.30                        | 8.87               | 11.65               | -47.52             | -13             | -34.52         |
| High Channel (1 747.5 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 481.76                     | H                  | -56.80                        | 5.93               | 9.22                | -53.51             | -13             | -40.51         |
| 3 481.62                     | V                  | -55.83                        | 5.93               | 9.22                | -52.54             | -13             | -39.54         |
| 5 222.38                     | H                  | -50.62                        | 7.73               | 10.65               | -47.70             | -13             | -34.70         |
| 5 222.64                     | V                  | -51.19                        | 7.73               | 10.65               | -48.27             | -13             | -35.27         |
| 6 963.21                     | H                  | -51.75                        | 8.95               | 11.69               | -49.01             | -13             | -36.01         |
| 6 963.38                     | V                  | -51.43                        | 8.96               | 11.69               | -48.70             | -13             | -35.70         |

\* 15 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 16.67 dB m = 0.046 5 W
- Modulation Signal: LTE band 4 (20 MHz - QPSK)
- Distance: 3 meters
- Limit: 43 + 10log<sub>10</sub>(W) = 29.67 dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 720.0 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 422.20                     | H                  | -59.63                        | 5.88               | 9.26                | -56.25             | -13             | -43.25         |
| 3 421.92                     | V                  | -54.40                        | 5.88               | 9.26                | -51.02             | -13             | -38.02         |
| 5 133.34                     | H                  | -51.17                        | 7.61               | 10.45               | -48.33             | -13             | -35.33         |
| 5 133.02                     | V                  | -53.37                        | 7.61               | 10.45               | -50.53             | -13             | -37.53         |
| 6 844.48                     | H                  | -50.40                        | 8.70               | 11.69               | -47.41             | -13             | -34.41         |
| 6 844.46                     | V                  | -49.74                        | 8.70               | 11.69               | -46.75             | -13             | -33.75         |
| Middle Channel (1 732.5 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 447.04                     | H                  | -58.71                        | 5.90               | 9.25                | -55.36             | -13             | -42.36         |
| 3 447.44                     | V                  | -54.89                        | 5.90               | 9.25                | -51.54             | -13             | -38.54         |
| 5 170.78                     | H                  | -47.24                        | 7.70               | 10.54               | -44.40             | -13             | -31.40         |
| 5 170.70                     | V                  | -49.68                        | 7.70               | 10.54               | -46.84             | -13             | -33.84         |
| 6 894.50                     | H                  | -52.08                        | 8.84               | 11.65               | -49.27             | -13             | -36.27         |
| 6 894.36                     | V                  | -50.71                        | 8.84               | 11.65               | -47.90             | -13             | -34.90         |
| High Channel (1 745.0 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 472.16                     | H                  | -57.54                        | 5.92               | 9.23                | -54.23             | -13             | -41.23         |
| 3 472.28                     | V                  | -56.74                        | 5.93               | 9.23                | -53.44             | -13             | -40.44         |
| 5 208.08                     | H                  | -48.26                        | 7.75               | 10.62               | -45.39             | -13             | -32.39         |
| 5 208.28                     | V                  | -48.77                        | 7.75               | 10.62               | -45.90             | -13             | -32.90         |
| 6 944.58                     | H                  | -52.26                        | 8.93               | 11.68               | -49.51             | -13             | -36.51         |
| 6 944.36                     | V                  | -50.88                        | 8.93               | 11.68               | -48.13             | -13             | -35.13         |

\* 20 BW 1RB size / 0 Offset for B4

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 13.93 dB m = 0.024 7 W
- Modulation Signal: LTE band 5 (1.4 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 26.93$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (824.7 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 648.51                   | H                  | -46.38                        | 4.01               | 5.99                | -44.40           | -13             | -31.40         |
| 1 648.51                   | V                  | -43.83                        | 4.01               | 5.99                | -41.85           | -13             | -28.85         |
| Middle Channel (836.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 672.06                   | H                  | -49.17                        | 4.06               | 6.17                | -47.06           | -13             | -34.06         |
| 1 672.01                   | V                  | -45.21                        | 4.06               | 6.17                | -43.10           | -13             | -30.10         |
| High Channel (848.3 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 695.79                   | H                  | -53.22                        | 4.11               | 6.35                | -50.98           | -13             | -37.98         |
| 1 695.77                   | V                  | -48.92                        | 4.11               | 6.35                | -46.68           | -13             | -33.68         |

\* 1.4 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 14.08 dB m = 0.025 6 W
- Modulation Signal: LTE band 5 (3 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.08$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (825.5 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 648.49                   | H                  | -44.05                        | 4.01               | 5.99                | -42.07           | -13             | -29.07         |
| 1 648.49                   | V                  | -42.71                        | 4.01               | 5.99                | -40.73           | -13             | -27.73         |
| Middle Channel (836.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 670.43                   | H                  | -49.05                        | 4.05               | 6.16                | -46.94           | -13             | -33.94         |
| 1 670.43                   | V                  | -45.04                        | 4.05               | 6.16                | -42.93           | -13             | -29.93         |
| High Channel (847.5 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 692.48                   | H                  | -52.74                        | 4.10               | 6.32                | -50.52           | -13             | -37.52         |
| 1 692.26                   | V                  | -49.07                        | 4.10               | 6.32                | -46.85           | -13             | -33.85         |

\* 3 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 14.36 dB m = 0.027 3 W
- Modulation Signal: LTE band 5 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.36$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (826.5 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 648.62                   | H                  | -44.25                        | 4.01               | 5.99                | -42.27           | -13             | -29.27         |
| 1 648.77                   | V                  | -42.56                        | 4.01               | 5.99                | -40.58           | -13             | -27.58         |
| Middle Channel (836.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 668.62                   | H                  | -48.83                        | 4.05               | 6.14                | -46.74           | -13             | -33.74         |
| 1 668.66                   | V                  | -45.78                        | 4.05               | 6.14                | -43.69           | -13             | -30.69         |
| High Channel (846.5 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 688.60                   | H                  | -51.63                        | 4.09               | 6.29                | -49.43           | -13             | -36.43         |
| 1 688.65                   | V                  | -48.25                        | 4.10               | 6.29                | -46.06           | -13             | -33.06         |

\* 5 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 14.59 dB m = 0.028 8 W
- Modulation Signal: LTE band 5 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.59$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (829.0 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 649.17                   | H                  | -44.29                        | 4.01               | 5.99                | -42.31           | -13             | -29.31         |
| 1 649.15                   | V                  | -42.48                        | 4.01               | 5.99                | -40.50           | -13             | -27.50         |
| Middle Channel (836.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 664.22                   | H                  | -47.63                        | 4.04               | 6.11                | -45.56           | -13             | -32.56         |
| 1 664.09                   | V                  | -45.83                        | 4.04               | 6.11                | -43.76           | -13             | -30.76         |
| High Channel (844.0 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 679.12                   | H                  | -50.22                        | 4.07               | 6.22                | -48.07           | -13             | -35.07         |
| 1 679.38                   | V                  | -46.98                        | 4.07               | 6.22                | -44.83           | -13             | -31.83         |

\* 10 BW 1RB size / 0 Offset for B5

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 12.99 dB m = 0.019 9 W
- Modulation Signal: LTE band 12 (1.4 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 25.99$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (699.7 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 398.41                   | H                  | -52.12                        | 3.57               | 6.13                | -49.56           | -13             | -36.56         |
| 1 398.30                   | V                  | -55.53                        | 3.57               | 6.13                | -52.97           | -13             | -39.97         |
| 2 097.67                   | H                  | -39.36                        | 4.53               | 6.38                | -37.51           | -13             | -24.51         |
| 2 097.78                   | V                  | -41.82                        | 4.53               | 6.38                | -39.97           | -13             | -26.97         |
| Middle Channel (707.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 414.11                   | H                  | -52.58                        | 3.58               | 6.08                | -50.08           | -13             | -37.08         |
| 1 414.21                   | V                  | -53.88                        | 3.58               | 6.08                | -51.38           | -13             | -38.38         |
| 2 121.06                   | H                  | -35.40                        | 4.55               | 6.44                | -33.51           | -13             | -20.51         |
| 2 121.10                   | V                  | -39.78                        | 4.55               | 6.44                | -37.89           | -13             | -24.89         |
| High Channel (715.3 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 429.71                   | H                  | -51.02                        | 3.60               | 6.02                | -48.60           | -13             | -35.60         |
| 1 429.70                   | V                  | -56.86                        | 3.60               | 6.02                | -54.44           | -13             | -41.44         |
| 2 144.47                   | H                  | -39.45                        | 4.57               | 6.47                | -37.55           | -13             | -24.55         |
| 2 144.69                   | V                  | -39.89                        | 4.57               | 6.47                | -37.99           | -13             | -24.99         |

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 13.80 dB m = 0.024 0 W
- Modulation Signal: LTE band 12 (3 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 26.80$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (700.5 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 398.57                   | H                  | -50.04                        | 3.57               | 6.13                | -47.48           | -13             | -34.48         |
| 1 398.32                   | V                  | -52.48                        | 3.57               | 6.13                | -49.92           | -13             | -36.92         |
| 2 097.76                   | H                  | -38.20                        | 4.53               | 6.38                | -36.35           | -13             | -23.35         |
| 2 097.73                   | V                  | -40.88                        | 4.53               | 6.38                | -39.03           | -13             | -26.03         |
| Middle Channel (707.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 412.53                   | H                  | -52.19                        | 3.58               | 6.08                | -49.69           | -13             | -36.69         |
| 1 412.46                   | V                  | -55.21                        | 3.58               | 6.09                | -52.70           | -13             | -39.70         |
| 2 118.75                   | H                  | -36.39                        | 4.55               | 6.43                | -34.51           | -13             | -21.51         |
| 2 118.61                   | V                  | -39.93                        | 4.55               | 6.43                | -38.05           | -13             | -25.05         |
| High Channel (714.5 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 426.37                   | H                  | -50.90                        | 3.60               | 6.03                | -48.47           | -13             | -35.47         |
| 1 425.45                   | V                  | -56.19                        | 3.60               | 6.04                | -53.75           | -13             | -40.75         |
| 2 139.67                   | H                  | -38.40                        | 4.57               | 6.47                | -36.50           | -13             | -23.50         |
| 2 139.64                   | V                  | -40.05                        | 4.57               | 6.47                | -38.15           | -13             | -25.15         |

\* 3 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 14.07 dB m = 0.025 5 W
- Modulation Signal: LTE band 12 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.07$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (701.5 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 398.58                   | H                  | -50.40                        | 3.57               | 6.13                | -47.84           | -13             | -34.84         |
| 1 398.71                   | V                  | -52.29                        | 3.57               | 6.13                | -49.73           | -13             | -36.73         |
| 2 098.12                   | H                  | -38.44                        | 4.53               | 6.39                | -36.58           | -13             | -23.58         |
| 2 098.00                   | V                  | -40.78                        | 4.53               | 6.39                | -38.92           | -13             | -25.92         |
| Middle Channel (707.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 410.72                   | H                  | -51.93                        | 3.58               | 6.09                | -49.42           | -13             | -36.42         |
| 1 410.81                   | V                  | -54.87                        | 3.58               | 6.09                | -52.36           | -13             | -39.36         |
| 2 116.18                   | H                  | -37.41                        | 4.55               | 6.43                | -35.53           | -13             | -22.53         |
| 2 115.95                   | V                  | -40.64                        | 4.55               | 6.43                | -38.76           | -13             | -25.76         |
| High Channel (713.5 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 422.78                   | H                  | -51.29                        | 3.59               | 6.05                | -48.83           | -13             | -35.83         |
| 1 422.65                   | V                  | -55.60                        | 3.59               | 6.05                | -53.14           | -13             | -40.14         |
| 2 134.04                   | H                  | -36.03                        | 4.56               | 6.46                | -34.13           | -13             | -21.13         |
| 2 134.02                   | V                  | -40.55                        | 4.56               | 6.46                | -38.65           | -13             | -25.65         |

\* 5 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 14.35 dB m = 0.027 2 W
- Modulation Signal: LTE band 12 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.35$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (704.0 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 399.29                   | H                  | -49.46                        | 3.57               | 6.13                | -46.90           | -13             | -33.90         |
| 1 399.39                   | V                  | -52.50                        | 3.57               | 6.13                | -49.94           | -13             | -36.94         |
| 2 098.81                   | H                  | -36.11                        | 4.53               | 6.39                | -34.25           | -13             | -21.25         |
| 2 098.83                   | V                  | -39.11                        | 4.53               | 6.39                | -37.25           | -13             | -24.25         |
| Middle Channel (707.5 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 406.23                   | H                  | -50.83                        | 3.58               | 6.11                | -48.30           | -13             | -35.30         |
| 1 406.13                   | V                  | -54.01                        | 3.58               | 6.11                | -51.48           | -13             | -38.48         |
| 2 109.24                   | H                  | -37.50                        | 4.54               | 6.42                | -35.62           | -13             | -22.62         |
| 2 109.33                   | V                  | -40.60                        | 4.54               | 6.42                | -38.72           | -13             | -25.72         |
| High Channel (711.0 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 413.09                   | H                  | -52.03                        | 3.58               | 6.08                | -49.53           | -13             | -36.53         |
| 1 413.06                   | V                  | -55.02                        | 3.58               | 6.08                | -52.52           | -13             | -39.52         |
| 2 119.72                   | H                  | -36.53                        | 4.55               | 6.43                | -34.65           | -13             | -21.65         |
| 2 119.87                   | V                  | -39.36                        | 4.55               | 6.43                | -37.48           | -13             | -24.48         |

\* 10 BW 1RB size / 0 Offset for B12

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 16.59 dB m = 0.045 6 W
- Modulation Signal: LTE band 13 (5 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 29.59$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (779.5 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 554.33                   | H                  | -53.62                        | 3.79               | 5.68                | -51.73           | -13             | -38.73         |
| 1 554.47                   | V                  | -57.41                        | 3.80               | 5.68                | -55.53           | -13             | -42.53         |
| 2 331.90                   | H                  | -60.16                        | 4.75               | 7.08                | -57.83           | -13             | -44.83         |
| 2 331.83                   | V                  | -53.72                        | 4.75               | 7.08                | -51.39           | -13             | -38.39         |
| Middle Channel (782.0 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 559.48                   | H                  | -53.16                        | 3.81               | 5.67                | -51.30           | -13             | -38.30         |
| 1 559.50                   | V                  | -58.33                        | 3.81               | 5.67                | -56.47           | -13             | -43.47         |
| High Channel (784.5 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 564.89                   | H                  | -53.21                        | 3.82               | 5.67                | -51.36           | -13             | -38.36         |
| 1 564.83                   | V                  | -57.98                        | 3.82               | 5.67                | -56.13           | -13             | -43.13         |

\* 5 BW 1RB size / 0 Offset for B13

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 15.56 dB m = 0.036 0 W
- Modulation Signal: LTE band 13 (10 MHz - QPSK)
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 28.56$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Middle Channel (782.0 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 555.22                   | H                  | -52.93                        | 3.80               | 5.68                | -51.05           | -13             | -38.05         |
| 1 551.92                   | V                  | -55.91                        | 3.79               | 5.68                | -54.02           | -13             | -41.02         |
| 2 330.00                   | H                  | -61.58                        | 4.75               | 7.08                | -59.25           | -13             | -46.25         |
| 2 330.00                   | V                  | -55.83                        | 4.75               | 7.08                | -53.50           | -13             | -40.50         |

\* 10 BW 1RB size / 0 Offset for B13

Remark:

1. E.R.P. & E.I.R.P. = S.G level (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)
2. This device was tested under all bandwidths, RB configurations, and modulations.
3. The data reported in the table above was measured in worst case.

*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 16.50 dB m = 0.044 7 W
- Modulation Signal: WCDMA 2
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 29.50$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 852.4 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 707.12                     | H                  | -55.06                        | 6.00               | 9.07                | -51.99             | -13             | -38.99         |
| 3 708.20                     | V                  | -55.40                        | 6.00               | 9.07                | -52.33             | -13             | -39.33         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 761.70                     | H                  | -56.63                        | 6.27               | 9.13                | -53.77             | -13             | -40.77         |
| 3 758.56                     | V                  | -51.78                        | 6.25               | 9.12                | -48.91             | -13             | -35.91         |
| High Channel (1 907.6 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 812.76                     | H                  | -54.86                        | 6.50               | 9.15                | -52.21             | -13             | -39.21         |
| 3 817.93                     | V                  | -48.01                        | 6.51               | 9.15                | -45.37             | -13             | -32.37         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 17.66 dB m = 0.058 3 W
- Modulation Signal: WCDMA 4
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 30.66$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 712.4 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 423.45                     | H                  | -61.35                        | 5.88               | 9.26                | -57.97             | -13             | -44.97         |
| 3 426.50                     | V                  | -58.92                        | 5.88               | 9.26                | -55.54             | -13             | -42.54         |
| Middle Channel (1 732.6 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 463.36                     | H                  | -59.87                        | 5.92               | 9.24                | -56.55             | -13             | -43.55         |
| 3 462.70                     | V                  | -60.33                        | 5.92               | 9.24                | -57.01             | -13             | -44.01         |
| High Channel (1 752.6 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 506.55                     | H                  | -58.37                        | 5.94               | 9.22                | -55.09             | -13             | -42.09         |
| 3 502.67                     | V                  | -60.82                        | 5.94               | 9.22                | -57.54             | -13             | -44.54         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 14.97 dB m = 0.031 4 W
- Modulation Signal: WCDMA 5
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 27.97$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (826.4 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 654.10                   | H                  | -50.16                        | 4.02               | 6.03                | -48.15           | -13             | -35.15         |
| 1 655.14                   | V                  | -46.20                        | 4.02               | 6.04                | -44.18           | -13             | -31.18         |
| Middle Channel (836.6 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 670.77                   | H                  | -53.28                        | 4.06               | 6.16                | -51.18           | -13             | -38.18         |
| 1 670.79                   | V                  | -48.58                        | 4.06               | 6.16                | -46.48           | -13             | -33.48         |
| High Channel (846.6 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 691.89                   | H                  | -57.05                        | 4.10               | 6.32                | -54.83           | -13             | -41.83         |
| 1 695.72                   | V                  | -52.41                        | 4.11               | 6.35                | -50.17           | -13             | -37.17         |

Remark:

1. E.R.P. & E.I.R.P. = S.G level (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

RTT5041-19(2017.07.10)(0)

Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

- Measured output Power: 24.55 dB m = 0.285 1 W
- Modulation Signal: GSM 850
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 37.55$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (824.2 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 648.50                   | H                  | -49.12                        | 4.01               | 5.99                | -47.14           | -13             | -34.14         |
| 1 648.33                   | V                  | -50.16                        | 4.01               | 5.99                | -48.18           | -13             | -35.18         |
| 2 471.80                   | H                  | -53.11                        | 4.80               | 7.02                | -50.89           | -13             | -37.89         |
| 2 472.52                   | V                  | -56.59                        | 4.80               | 7.02                | -54.37           | -13             | -41.37         |
| 3 297.15                   | H                  | -51.44                        | 5.52               | 6.69                | -50.27           | -13             | -37.27         |
| 3 297.33                   | V                  | -46.08                        | 5.52               | 6.69                | -44.91           | -13             | -31.91         |
| 4 120.51                   | H                  | -53.31                        | 6.70               | 7.15                | -52.86           | -13             | -39.86         |
| 4 121.10                   | V                  | -59.49                        | 6.70               | 7.15                | -59.04           | -13             | -46.04         |
| Middle Channel (836.6 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 673.37                   | H                  | -51.11                        | 4.06               | 6.18                | -48.99           | -13             | -35.99         |
| 1 673.44                   | V                  | -49.15                        | 4.06               | 6.18                | -47.03           | -13             | -34.03         |
| 2 510.11                   | H                  | -50.95                        | 4.82               | 6.97                | -48.80           | -13             | -35.80         |
| 2 510.20                   | V                  | -55.25                        | 4.82               | 6.97                | -53.10           | -13             | -40.10         |
| 3 346.10                   | H                  | -50.95                        | 5.68               | 6.90                | -49.73           | -13             | -36.73         |
| 3 346.21                   | V                  | -47.19                        | 5.68               | 6.90                | -45.97           | -13             | -32.97         |
| 4 183.14                   | H                  | -52.89                        | 6.83               | 7.10                | -52.62           | -13             | -39.62         |
| 4 183.65                   | V                  | -56.16                        | 6.83               | 7.10                | -55.89           | -13             | -42.89         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

| Frequency<br>(MHz)       | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|--------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| High Channel (848.8 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 697.45                 | H                  | -51.55                        | 4.11               | 6.36                | -49.30           | -13             | -36.30         |
| 1 697.67                 | V                  | -48.42                        | 4.11               | 6.36                | -46.17           | -13             | -33.17         |
| 2 546.80                 | H                  | -50.96                        | 4.88               | 6.88                | -48.96           | -13             | -35.96         |
| 2 547.13                 | V                  | -54.79                        | 4.88               | 6.88                | -52.79           | -13             | -39.79         |
| 3 395.43                 | H                  | -50.23                        | 5.84               | 7.11                | -48.96           | -13             | -35.96         |
| 3 395.66                 | V                  | -45.48                        | 5.85               | 7.11                | -44.22           | -13             | -31.22         |
| 4 244.07                 | H                  | -54.94                        | 6.91               | 7.01                | -54.84           | -13             | -41.84         |
| 4 244.40                 | V                  | -53.30                        | 6.91               | 7.01                | -53.20           | -13             | -40.20         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 18.70 dB m = 0.074 1 W
- Modulation Signal: GSM 850 EDGE
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 31.70$  dB c

| Frequency<br>(MHz)         | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB d) | E.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|----------------------------|--------------------|-------------------------------|--------------------|---------------------|------------------|-----------------|----------------|
| Low Channel (824.2 MHz)    |                    |                               |                    |                     |                  |                 |                |
| 1 648.40                   | H                  | -45.26                        | 4.80               | 7.01                | -43.05           | -13             | -30.05         |
| 1 648.35                   | V                  | -46.74                        | 4.80               | 7.01                | -44.53           | -13             | -31.53         |
| 2 472.77                   | H                  | -51.92                        | 5.52               | 6.69                | -50.75           | -13             | -37.75         |
| 2 472.60                   | V                  | -48.20                        | 5.52               | 6.69                | -47.03           | -13             | -34.03         |
| 3 296.70                   | H                  | -49.54                        | 6.70               | 7.15                | -49.09           | -13             | -36.09         |
| 3 296.72                   | V                  | -54.53                        | 6.70               | 7.15                | -54.08           | -13             | -41.08         |
| Middle Channel (836.6 MHz) |                    |                               |                    |                     |                  |                 |                |
| 1 673.23                   | H                  | -44.33                        | 4.82               | 6.97                | -42.18           | -13             | -29.18         |
| 1 672.95                   | V                  | -47.43                        | 4.82               | 6.97                | -45.28           | -13             | -32.28         |
| 2 510.11                   | H                  | -52.48                        | 5.68               | 6.90                | -51.26           | -13             | -38.26         |
| 2 510.06                   | V                  | -48.06                        | 5.68               | 6.90                | -46.84           | -13             | -33.84         |
| 3 346.35                   | H                  | -51.70                        | 6.83               | 7.10                | -51.43           | -13             | -38.43         |
| 3 346.44                   | V                  | -53.70                        | 6.83               | 7.10                | -53.43           | -13             | -40.43         |
| High Channel (848.8 MHz)   |                    |                               |                    |                     |                  |                 |                |
| 1 697.63                   | H                  | -43.80                        | 4.87               | 6.88                | -41.79           | -13             | -28.79         |
| 1 697.55                   | V                  | -46.72                        | 4.87               | 6.88                | -44.71           | -13             | -31.71         |
| 2 546.19                   | H                  | -52.72                        | 5.84               | 7.11                | -51.45           | -13             | -38.45         |
| 2 546.33                   | V                  | -48.44                        | 5.84               | 7.11                | -47.17           | -13             | -34.17         |
| 3 394.80                   | H                  | -52.13                        | 6.91               | 7.01                | -52.03           | -13             | -39.03         |
| 3 395.35                   | V                  | -51.12                        | 6.91               | 7.01                | -51.02           | -13             | -38.02         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 20.21 dB m = 0.105 0 W
- Modulation Signal: GSM 1 900
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 33.21$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 850.2 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3 700.13                     | H                  | -47.81                        | 5.96               | 9.06                | -44.71             | -13             | -31.71         |
| 3 700.35                     | V                  | -50.10                        | 5.96               | 9.06                | -47.00             | -13             | -34.00         |
| 5 550.10                     | H                  | -47.26                        | 7.53               | 10.63               | -44.16             | -13             | -31.16         |
| 5 550.22                     | V                  | -50.49                        | 7.53               | 10.63               | -47.39             | -13             | -34.39         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3 759.60                     | H                  | -50.14                        | 6.26               | 9.12                | -47.28             | -13             | -34.28         |
| 3 759.75                     | V                  | -48.15                        | 6.26               | 9.12                | -45.29             | -13             | -32.29         |
| 5 640.34                     | H                  | -47.62                        | 7.65               | 10.91               | -44.36             | -13             | -31.36         |
| 5 640.11                     | V                  | -51.43                        | 7.64               | 10.91               | -48.16             | -13             | -35.16         |
| High Channel (1 909.8 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3 819.83                     | H                  | -50.76                        | 6.52               | 9.15                | -48.13             | -13             | -35.13         |
| 3 819.90                     | V                  | -46.28                        | 6.52               | 9.15                | -43.65             | -13             | -30.65         |
| 5 729.55                     | H                  | -48.44                        | 7.86               | 11.27               | -45.03             | -13             | -32.03         |
| 5 729.35                     | V                  | -49.65                        | 7.86               | 11.27               | -46.24             | -13             | -33.24         |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

- Measured output Power: 16.41 dB m = 0.043 8 W
- Modulation Signal: GSM 1 900 EDGE
- Distance: 3 meters
- Limit:  $43 + 10\log_{10}(W) = 29.41$  dB c

| Frequency<br>(MHz)           | Ant. Pol.<br>(H/V) | S.G level<br>+ Amp.<br>(dB m) | Cable loss<br>(dB) | Ant. gain<br>(dB i) | E.I.R.P.<br>(dB m) | Limit<br>(dB m) | Margin<br>(dB) |
|------------------------------|--------------------|-------------------------------|--------------------|---------------------|--------------------|-----------------|----------------|
| Low Channel (1 850.2 MHz)    |                    |                               |                    |                     |                    |                 |                |
| 3700.76                      | H                  | -49.10                        | 5.96               | 9.06                | -46.00             | -13             | -33.00         |
| 3700.80                      | V                  | -51.50                        | 5.96               | 9.06                | -48.40             | -13             | -35.40         |
| 5550.55                      | H                  | -49.87                        | 7.53               | 10.63               | -46.77             | -13             | -33.77         |
| 5550.30                      | V                  | -53.46                        | 7.53               | 10.63               | -50.36             | -13             | -37.36         |
| Middle Channel (1 880.0 MHz) |                    |                               |                    |                     |                    |                 |                |
| 3760.36                      | H                  | -51.34                        | 6.26               | 9.13                | -48.47             | -13             | -35.47         |
| 3760.11                      | V                  | -49.07                        | 6.26               | 9.13                | -46.20             | -13             | -33.20         |
| 5640.28                      | H                  | -50.83                        | 7.64               | 10.91               | -47.56             | -13             | -34.56         |
| 5640.40                      | V                  | -55.46                        | 7.65               | 10.91               | -52.20             | -13             | -39.20         |
| High Channel (1 909.8 MHz)   |                    |                               |                    |                     |                    |                 |                |
| 3819.24                      | H                  | -51.27                        | 6.52               | 9.15                | -48.64             | -13             | -35.64         |
| 3819.35                      | V                  | -47.05                        | 6.52               | 9.15                | -44.42             | -13             | -31.42         |
| 5729.50                      | H                  | -50.32                        | 7.86               | 11.27               | -46.91             | -13             | -33.91         |
| 5729.63                      | V                  | -51.26                        | 7.86               | 11.27               | -47.85             | -13             | -34.85         |

Remark:

1. E.R.P. & E.I.R.P. = S.G level (dB m) - Cable loss (dB) + Ant. gain (dB d/dB i)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

### 3. Conducted Output Power

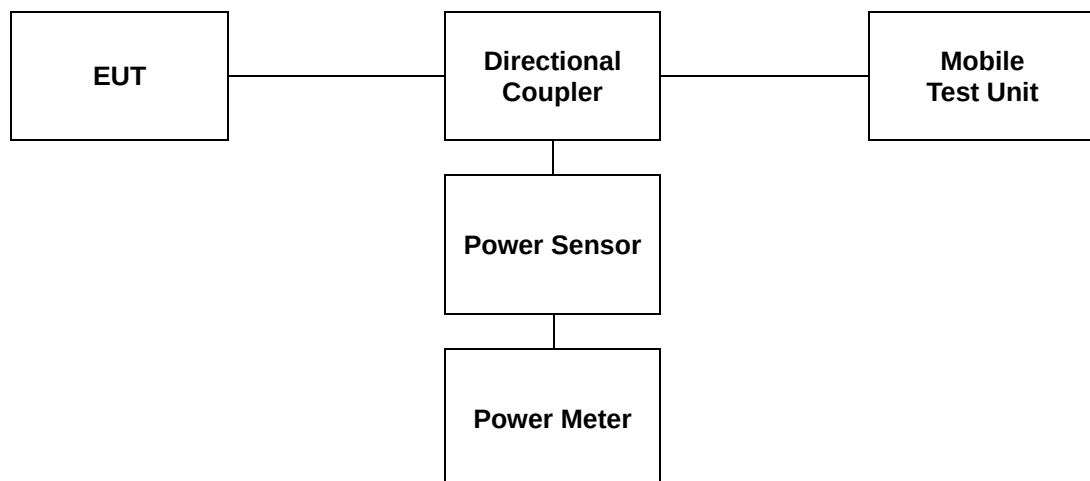
#### 3.1. Limit

CFR 47, Section FCC §2.1046 and IC RSS-Gen Issue 4 6.12.

#### 3.2. Test Procedure

Output power shall be measured at the RF output terminals for all configurations.

1. The RF output of the transmitter was connected to the input of the mobile test unit in order to establish communication with the EUT.
2. The EUT was set up for the max. output power with pseudo random data modulation by using mobile test unit parameters.
3. The measurement performed using a wideband RF power meter.
4. This EUT was tested under all configurations and the highest power was investigated and reported.



*The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.*

### 3.3. Test Result

Ambient temperature : (23 ± 1) °C

Relative humidity : 47 % R.H.

#### - LTE

| Band | Bandwidth (MHz) | RB Size | RB Offset | QPSK    |         |         | 16QAM   |         |         |
|------|-----------------|---------|-----------|---------|---------|---------|---------|---------|---------|
|      |                 |         |           | 18607   | 18900   | 19193   | 18607   | 18900   | 19193   |
|      |                 |         |           | 1 850.7 | 1 880.0 | 1 909.3 | 1 850.7 | 1 880.0 | 1 909.3 |
| 2    | 1.4             | 1       | 0         | 22.38   | 22.41   | 22.36   | 21.38   | 21.34   | 21.32   |
|      |                 | 1       | 3         | 22.34   | 22.36   | 22.27   | 21.53   | 21.55   | 21.32   |
|      |                 | 1       | 5         | 22.34   | 22.32   | 22.16   | 21.36   | 21.38   | 20.91   |
|      |                 | 3       | 0         | 22.38   | 22.36   | 22.08   | 21.31   | 21.40   | 21.32   |
|      |                 | 3       | 2         | 22.40   | 22.40   | 22.23   | 21.32   | 21.38   | 21.04   |
|      |                 | 3       | 3         | 22.37   | 22.38   | 22.27   | 21.37   | 21.39   | 21.16   |
|      |                 | 6       | 0         | 21.35   | 21.33   | 21.41   | 20.32   | 20.31   | 20.48   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 18615   | 18900   | 19185   | 18615   | 18900   | 19185   |
|      |                 |         |           | 1 851.5 | 1 880.0 | 1 908.5 | 1 851.5 | 1 880.0 | 1 908.5 |
|      | 3               | 1       | 0         | 22.32   | 22.41   | 22.63   | 21.48   | 21.58   | 21.56   |
|      |                 | 1       | 8         | 22.30   | 22.32   | 22.46   | 21.46   | 21.56   | 21.37   |
|      |                 | 1       | 14        | 22.35   | 22.27   | 22.42   | 21.35   | 21.47   | 21.30   |
|      |                 | 8       | 0         | 21.42   | 21.30   | 21.50   | 20.28   | 20.38   | 20.28   |
|      |                 | 8       | 4         | 21.28   | 21.28   | 21.49   | 20.36   | 20.42   | 20.36   |
|      |                 | 8       | 7         | 21.33   | 21.26   | 21.44   | 20.28   | 20.36   | 20.28   |
|      |                 | 15      | 0         | 21.34   | 21.41   | 21.56   | 20.34   | 20.41   | 20.44   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 18625   | 18900   | 19175   | 18625   | 18900   | 19175   |
|      |                 |         |           | 1 852.5 | 1 880.0 | 1 907.5 | 1 852.5 | 1 880.0 | 1 907.5 |
|      | 5               | 1       | 0         | 22.64   | 22.66   | 22.71   | 21.73   | 21.78   | 21.80   |
|      |                 | 1       | 12        | 22.55   | 22.70   | 22.62   | 21.71   | 21.79   | 21.78   |
|      |                 | 1       | 24        | 22.58   | 22.64   | 22.58   | 21.67   | 21.64   | 21.71   |
|      |                 | 12      | 0         | 21.48   | 21.60   | 21.60   | 20.42   | 20.51   | 20.56   |
|      |                 | 12      | 7         | 21.45   | 21.58   | 21.48   | 20.48   | 20.53   | 20.69   |
|      |                 | 12      | 13        | 21.41   | 21.52   | 21.54   | 20.49   | 20.48   | 20.64   |
|      |                 | 25      | 0         | 21.46   | 21.57   | 21.55   | 20.50   | 20.58   | 20.52   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 18650   | 18900   | 19150   | 18650   | 18900   | 19150   |
|      |                 |         |           | 1 855.0 | 1 880.0 | 1 905.0 | 1 855.0 | 1 880.0 | 1 905.0 |
|      | 10              | 1       | 0         | 22.78   | 22.76   | 22.60   | 21.80   | 21.95   | 21.80   |
|      |                 | 1       | 25        | 22.41   | 22.56   | 22.65   | 21.56   | 21.65   | 21.75   |
|      |                 | 1       | 49        | 22.57   | 22.61   | 22.04   | 21.75   | 21.79   | 21.13   |
|      |                 | 25      | 0         | 21.55   | 21.62   | 21.75   | 20.60   | 20.63   | 20.62   |
|      |                 | 25      | 12        | 21.58   | 21.63   | 21.77   | 20.51   | 20.66   | 20.64   |
|      |                 | 25      | 25        | 21.54   | 21.65   | 21.89   | 20.63   | 20.64   | 20.65   |
|      |                 | 50      | 0         | 21.52   | 21.64   | 21.84   | 20.57   | 20.61   | 20.63   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 18675   | 18900   | 19125   | 18675   | 18900   | 19125   |
|      |                 |         |           | 1 857.5 | 1 880.0 | 1 902.5 | 1 857.5 | 1 880.0 | 1 902.5 |
|      | 15              | 1       | 0         | 22.56   | 22.70   | 22.60   | 21.71   | 21.86   | 21.75   |
|      |                 | 1       | 37        | 22.60   | 22.48   | 22.49   | 21.73   | 21.72   | 21.60   |
|      |                 | 1       | 74        | 22.61   | 22.60   | 22.08   | 21.92   | 21.77   | 21.45   |
|      |                 | 36      | 0         | 21.65   | 21.65   | 21.66   | 20.45   | 20.58   | 20.61   |
|      |                 | 36      | 20        | 21.63   | 21.60   | 21.58   | 20.51   | 20.61   | 20.65   |
|      |                 | 36      | 39        | 21.58   | 21.56   | 21.66   | 20.54   | 20.58   | 20.72   |
|      |                 | 75      | 0         | 21.55   | 21.63   | 21.65   | 20.48   | 20.57   | 20.64   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 18700   | 18900   | 19100   | 18700   | 18900   | 19100   |
|      |                 |         |           | 1 860.0 | 1 880.0 | 1 900.0 | 1 860.0 | 1 880.0 | 1 900.0 |
|      | 20              | 1       | 0         | 22.58   | 22.43   | 22.57   | 21.42   | 21.76   | 21.68   |
|      |                 | 1       | 50        | 22.28   | 22.04   | 22.01   | 21.25   | 21.16   | 21.24   |
|      |                 | 1       | 99        | 22.34   | 22.23   | 21.97   | 21.54   | 21.69   | 21.40   |
|      |                 | 50      | 0         | 21.28   | 21.32   | 21.35   | 20.35   | 20.38   | 20.46   |
|      |                 | 50      | 25        | 21.32   | 20.28   | 21.51   | 20.40   | 20.32   | 20.38   |
|      |                 | 50      | 50        | 21.38   | 21.29   | 21.40   | 20.42   | 20.28   | 20.39   |
|      |                 | 100     | 0         | 21.44   | 21.36   | 21.42   | 20.41   | 20.31   | 20.44   |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

| Band | Bandwidth (MHz) | RB Size | RB Offset | QPSK    |         |         | 16QAM   |         |         |
|------|-----------------|---------|-----------|---------|---------|---------|---------|---------|---------|
|      |                 |         |           | 19957   | 20175   | 20393   | 19957   | 20175   | 20393   |
|      |                 |         |           | 1 710.7 | 1 732.5 | 1 754.3 | 1 710.7 | 1 732.5 | 1 754.3 |
| 4    | 1.4             | 1       | 0         | 22.48   | 22.35   | 22.40   | 21.53   | 21.41   | 21.45   |
|      |                 | 1       | 3         | 22.44   | 22.31   | 22.38   | 21.60   | 21.32   | 21.55   |
|      |                 | 1       | 5         | 22.40   | 22.22   | 22.23   | 21.46   | 21.40   | 21.47   |
|      |                 | 3       | 0         | 22.45   | 22.38   | 22.38   | 21.43   | 21.46   | 21.42   |
|      |                 | 3       | 2         | 22.38   | 22.27   | 22.38   | 21.49   | 21.36   | 21.44   |
|      |                 | 3       | 3         | 22.37   | 22.31   | 22.35   | 21.46   | 21.29   | 21.45   |
|      |                 | 6       | 0         | 21.39   | 21.25   | 21.22   | 20.40   | 20.23   | 20.38   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 19965   | 20175   | 20385   | 19965   | 20175   | 20385   |
|      |                 |         |           | 1 711.5 | 1 732.5 | 1 753.5 | 1 711.5 | 1 732.5 | 1 753.5 |
|      | 3               | 1       | 0         | 22.35   | 22.35   | 22.40   | 21.60   | 21.55   | 21.45   |
|      |                 | 1       | 8         | 22.32   | 22.32   | 22.38   | 21.54   | 21.35   | 21.42   |
|      |                 | 1       | 14        | 22.28   | 22.19   | 22.35   | 21.54   | 21.38   | 21.41   |
|      |                 | 8       | 0         | 21.24   | 21.20   | 21.36   | 20.30   | 20.32   | 20.35   |
|      |                 | 8       | 4         | 21.33   | 21.18   | 21.28   | 20.28   | 20.34   | 20.40   |
|      |                 | 8       | 7         | 21.18   | 21.20   | 21.30   | 20.33   | 20.29   | 20.38   |
|      |                 | 15      | 0         | 21.38   | 21.35   | 21.24   | 20.35   | 20.28   | 20.34   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 19975   | 20175   | 20375   | 19975   | 20175   | 20375   |
|      |                 |         |           | 1 712.5 | 1 732.5 | 1 752.5 | 1 712.5 | 1 732.5 | 1 752.5 |
|      | 5               | 1       | 0         | 22.44   | 22.30   | 22.26   | 21.46   | 21.40   | 21.44   |
|      |                 | 1       | 12        | 22.36   | 22.22   | 22.36   | 21.36   | 21.34   | 21.42   |
|      |                 | 1       | 24        | 22.27   | 22.20   | 22.32   | 21.37   | 21.28   | 21.41   |
|      |                 | 12      | 0         | 21.25   | 21.24   | 21.30   | 20.30   | 20.21   | 20.32   |
|      |                 | 12      | 7         | 21.21   | 21.19   | 21.25   | 20.28   | 20.26   | 20.30   |
|      |                 | 12      | 13        | 21.18   | 21.26   | 21.20   | 20.24   | 20.18   | 20.14   |
|      |                 | 25      | 0         | 21.29   | 21.18   | 21.17   | 20.25   | 20.14   | 20.25   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20000   | 20175   | 20350   | 20000   | 20175   | 20350   |
|      |                 |         |           | 1 715.0 | 1 732.5 | 1 750.0 | 1 715.0 | 1 732.5 | 1 750.0 |
|      | 10              | 1       | 0         | 22.56   | 22.54   | 22.66   | 21.76   | 21.75   | 21.65   |
|      |                 | 1       | 25        | 22.32   | 22.15   | 22.30   | 21.49   | 21.44   | 21.55   |
|      |                 | 1       | 49        | 22.50   | 22.55   | 22.62   | 21.71   | 21.78   | 21.87   |
|      |                 | 25      | 0         | 21.45   | 21.34   | 21.35   | 20.40   | 20.46   | 20.58   |
|      |                 | 25      | 12        | 21.36   | 21.26   | 21.24   | 20.56   | 20.30   | 20.50   |
|      |                 | 25      | 25        | 21.38   | 21.37   | 21.66   | 20.32   | 20.26   | 20.65   |
|      |                 | 50      | 0         | 21.41   | 21.35   | 21.38   | 20.35   | 20.31   | 20.48   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20025   | 20175   | 20325   | 20025   | 20175   | 20325   |
|      |                 |         |           | 1 717.5 | 1 732.5 | 1 747.5 | 1 717.5 | 1 732.5 | 1 747.5 |
|      | 15              | 1       | 0         | 22.41   | 22.28   | 22.38   | 21.10   | 21.16   | 21.00   |
|      |                 | 1       | 37        | 22.38   | 22.20   | 22.35   | 21.56   | 21.32   | 21.32   |
|      |                 | 1       | 74        | 22.15   | 21.95   | 22.16   | 21.17   | 21.18   | 21.16   |
|      |                 | 36      | 0         | 21.32   | 21.15   | 21.32   | 20.31   | 20.18   | 20.17   |
|      |                 | 36      | 20        | 21.40   | 21.36   | 21.28   | 20.28   | 20.25   | 20.22   |
|      |                 | 36      | 39        | 21.28   | 21.24   | 21.18   | 20.34   | 20.15   | 20.30   |
|      |                 | 75      | 0         | 21.24   | 21.18   | 21.12   | 20.23   | 20.12   | 20.12   |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20050   | 20175   | 20300   | 20050   | 20175   | 20300   |
|      |                 |         |           | 1 720.0 | 1 732.5 | 1 745.0 | 1 720.0 | 1 732.5 | 1 745.0 |
|      | 20              | 1       | 0         | 22.35   | 22.15   | 22.25   | 21.08   | 21.30   | 21.15   |
|      |                 | 1       | 50        | 22.32   | 22.10   | 22.23   | 21.44   | 21.28   | 21.38   |
|      |                 | 1       | 99        | 22.15   | 22.05   | 22.17   | 21.32   | 21.31   | 21.15   |
|      |                 | 50      | 0         | 21.15   | 21.18   | 21.15   | 20.28   | 20.28   | 20.32   |
|      |                 | 50      | 25        | 21.25   | 21.20   | 21.36   | 20.44   | 20.17   | 20.18   |
|      |                 | 50      | 50        | 21.30   | 21.25   | 21.15   | 20.26   | 20.36   | 20.13   |
|      |                 | 100     | 0         | 21.19   | 21.32   | 21.10   | 20.15   | 20.16   | 20.15   |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

| Band | Bandwidth (MHz) | RB Size | RB Offset | QPSK  |       |       | 16QAM |       |       |
|------|-----------------|---------|-----------|-------|-------|-------|-------|-------|-------|
|      |                 |         |           | 20407 | 20525 | 20643 | 20407 | 20525 | 20643 |
|      |                 |         |           | 824.7 | 836.6 | 848.3 | 824.7 | 836.6 | 848.3 |
| 5    | 1.4             | 1       | 0         | 22.87 | 22.85 | 22.79 | 21.95 | 21.81 | 21.98 |
|      |                 | 1       | 3         | 22.81 | 22.84 | 22.75 | 21.98 | 21.87 | 21.89 |
|      |                 | 1       | 5         | 22.82 | 22.77 | 22.70 | 22.02 | 21.80 | 21.86 |
|      |                 | 3       | 0         | 22.71 | 22.75 | 22.74 | 21.91 | 21.86 | 21.97 |
|      |                 | 3       | 2         | 22.78 | 22.73 | 22.73 | 21.95 | 21.84 | 21.87 |
|      |                 | 3       | 3         | 22.83 | 22.85 | 22.74 | 22.00 | 21.92 | 22.00 |
|      |                 | 6       | 0         | 22.81 | 21.84 | 21.97 | 20.89 | 20.85 | 20.62 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20415 | 20525 | 20635 | 20415 | 20525 | 20635 |
|      |                 |         |           | 825.5 | 836.5 | 847.5 | 825.5 | 836.5 | 847.5 |
|      | 3               | 1       | 0         | 22.86 | 22.84 | 22.84 | 21.99 | 21.98 | 22.05 |
|      |                 | 1       | 8         | 22.71 | 22.81 | 22.83 | 21.91 | 21.96 | 21.98 |
|      |                 | 1       | 14        | 22.70 | 22.70 | 22.80 | 22.02 | 21.76 | 21.88 |
|      |                 | 8       | 0         | 21.83 | 21.75 | 21.90 | 20.89 | 20.90 | 20.79 |
|      |                 | 8       | 4         | 21.79 | 21.79 | 21.84 | 20.85 | 20.78 | 20.86 |
|      |                 | 8       | 7         | 21.80 | 21.84 | 21.77 | 20.86 | 20.79 | 20.77 |
|      |                 | 15      | 0         | 21.89 | 21.75 | 21.81 | 20.78 | 20.75 | 20.96 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20425 | 20525 | 20625 | 20425 | 20525 | 20625 |
|      |                 |         |           | 826.5 | 836.5 | 846.5 | 826.5 | 836.5 | 846.5 |
|      | 5               | 1       | 0         | 23.00 | 23.05 | 22.85 | 22.00 | 22.05 | 22.01 |
|      |                 | 1       | 12        | 22.88 | 22.98 | 22.80 | 21.95 | 22.00 | 22.03 |
|      |                 | 1       | 24        | 22.89 | 22.89 | 22.78 | 22.02 | 21.91 | 22.02 |
|      |                 | 12      | 0         | 21.81 | 21.75 | 22.80 | 21.00 | 20.95 | 20.95 |
|      |                 | 12      | 7         | 21.79 | 21.76 | 22.00 | 20.95 | 20.94 | 20.95 |
|      |                 | 12      | 13        | 21.90 | 21.80 | 21.85 | 20.93 | 20.98 | 20.89 |
|      |                 | 25      | 0         | 21.81 | 21.81 | 21.86 | 20.76 | 20.95 | 20.85 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 20450 | 20525 | 20600 | 20450 | 20525 | 20600 |
|      |                 |         |           | 829.0 | 836.5 | 844.0 | 829.0 | 836.5 | 844.0 |
|      | 10              | 1       | 0         | 22.75 | 22.66 | 22.66 | 21.85 | 21.73 | 21.82 |
|      |                 | 1       | 25        | 22.71 | 22.58 | 22.63 | 21.90 | 21.81 | 21.95 |
|      |                 | 1       | 49        | 22.74 | 22.65 | 22.61 | 21.94 | 21.80 | 21.87 |
|      |                 | 25      | 0         | 21.95 | 21.67 | 21.75 | 20.84 | 20.83 | 20.89 |
|      |                 | 25      | 12        | 21.84 | 21.65 | 21.73 | 20.82 | 20.75 | 20.84 |
|      |                 | 25      | 25        | 21.86 | 21.62 | 21.72 | 20.75 | 20.74 | 20.79 |
|      |                 | 50      | 0         | 21.91 | 21.70 | 21.74 | 20.74 | 20.71 | 20.80 |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

| Band | Bandwidth (MHz) | RB Size | RB Offset | QPSK  |       |       | 16QAM |       |       |
|------|-----------------|---------|-----------|-------|-------|-------|-------|-------|-------|
|      |                 |         |           | 23017 | 23095 | 23173 | 23017 | 23095 | 23173 |
|      |                 |         |           | 699.7 | 707.5 | 715.3 | 699.7 | 707.5 | 715.3 |
| 12   | 1.4             | 1       | 0         | 22.62 | 22.70 | 22.64 | 21.69 | 21.71 | 21.59 |
|      |                 | 1       | 3         | 22.60 | 22.67 | 22.61 | 21.72 | 21.67 | 21.62 |
|      |                 | 1       | 5         | 22.62 | 22.61 | 22.32 | 21.65 | 21.76 | 21.56 |
|      |                 | 3       | 0         | 22.61 | 22.65 | 22.55 | 21.62 | 21.59 | 21.52 |
|      |                 | 3       | 2         | 22.58 | 22.64 | 22.53 | 21.60 | 21.46 | 21.50 |
|      |                 | 3       | 3         | 22.52 | 22.62 | 22.48 | 21.48 | 21.69 | 21.49 |
|      |                 | 6       | 0         | 21.51 | 21.61 | 21.45 | 20.45 | 20.35 | 20.55 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 23025 | 23095 | 23165 | 23025 | 23095 | 23165 |
|      |                 |         |           | 700.5 | 707.5 | 714.5 | 700.5 | 707.5 | 714.5 |
|      | 3               | 1       | 0         | 22.62 | 22.72 | 22.56 | 21.76 | 21.85 | 21.72 |
|      |                 | 1       | 8         | 22.52 | 22.70 | 22.54 | 21.66 | 21.76 | 21.75 |
|      |                 | 1       | 14        | 22.61 | 22.59 | 22.50 | 21.36 | 21.78 | 21.78 |
|      |                 | 8       | 0         | 21.58 | 21.62 | 21.55 | 20.62 | 20.70 | 20.65 |
|      |                 | 8       | 4         | 21.60 | 21.64 | 21.57 | 20.65 | 20.68 | 20.62 |
|      |                 | 8       | 7         | 21.61 | 21.65 | 21.61 | 20.60 | 20.64 | 20.71 |
|      |                 | 15      | 0         | 21.55 | 21.73 | 21.58 | 20.62 | 20.75 | 20.61 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 23035 | 23095 | 23155 | 23035 | 23095 | 23155 |
|      |                 |         |           | 701.5 | 707.5 | 713.5 | 701.5 | 707.5 | 713.5 |
|      | 5               | 1       | 0         | 22.77 | 22.82 | 22.71 | 21.85 | 21.84 | 21.85 |
|      |                 | 1       | 12        | 22.71 | 22.80 | 22.65 | 21.81 | 21.96 | 21.84 |
|      |                 | 1       | 24        | 22.76 | 22.76 | 22.62 | 21.92 | 21.86 | 21.86 |
|      |                 | 12      | 0         | 21.81 | 21.79 | 21.74 | 20.78 | 20.72 | 20.78 |
|      |                 | 12      | 7         | 21.73 | 21.69 | 21.75 | 20.69 | 20.65 | 20.68 |
|      |                 | 12      | 13        | 21.77 | 21.68 | 21.64 | 20.64 | 20.85 | 20.66 |
|      |                 | 25      | 0         | 21.63 | 21.64 | 21.56 | 20.72 | 20.67 | 20.55 |
|      | Bandwidth (MHz) | RB Size | RB Offset | 23060 | 23095 | 23130 | 23060 | 23095 | 23130 |
|      |                 |         |           | 704.0 | 707.5 | 711.0 | 704.0 | 707.5 | 711.0 |
|      | 10              | 1       | 0         | 22.75 | 22.86 | 22.76 | 21.91 | 21.96 | 21.77 |
|      |                 | 1       | 25        | 22.65 | 22.77 | 22.72 | 21.80 | 21.94 | 21.81 |
|      |                 | 1       | 49        | 22.64 | 22.76 | 22.70 | 21.82 | 21.85 | 21.86 |
|      |                 | 25      | 0         | 21.79 | 21.86 | 21.76 | 20.76 | 20.65 | 20.70 |
|      |                 | 25      | 12        | 21.75 | 21.83 | 21.70 | 20.70 | 20.75 | 20.69 |
|      |                 | 25      | 25        | 21.78 | 21.82 | 21.75 | 20.69 | 20.72 | 20.75 |
|      |                 | 50      | 0         | 21.77 | 21.80 | 21.76 | 20.74 | 20.80 | 20.73 |

| Band | Bandwidth (MHz) | RB Size | RB Offset | QPSK  |       |       | 16QAM |       |       |
|------|-----------------|---------|-----------|-------|-------|-------|-------|-------|-------|
|      |                 |         |           | 23205 | 23230 | 23255 | 23205 | 23230 | 23255 |
|      |                 |         |           | 779.5 | 782.0 | 784.5 | 779.5 | 782.0 | 784.5 |
| 13   | 5               | 1       | 0         | 23.01 | 22.92 | 22.86 | 22.06 | 22.08 | 21.90 |
|      |                 | 1       | 12        | 22.91 | 22.89 | 22.76 | 22.13 | 21.96 | 21.95 |
|      |                 | 1       | 24        | 22.85 | 22.81 | 22.75 | 22.00 | 21.91 | 21.89 |
|      |                 | 12      | 0         | 21.81 | 21.86 | 21.81 | 20.95 | 20.89 | 20.96 |
|      |                 | 12      | 7         | 21.89 | 21.89 | 21.85 | 20.94 | 20.88 | 20.81 |
|      |                 | 12      | 13        | 21.86 | 21.87 | 21.84 | 20.89 | 20.84 | 20.84 |
|      |                 | 25      | 0         | 21.95 | 21.81 | 21.80 | 20.88 | 20.86 | 20.83 |
|      | Bandwidth (MHz) | RB Size | RB Offset | -     | 23230 | -     | -     | 23230 | -     |
|      |                 |         |           | -     | 782.0 | -     | -     | 782.0 | -     |
|      | 10              | 1       | 0         | -     | 22.68 | -     | -     | 21.85 | -     |
|      |                 | 1       | 25        |       | 22.63 |       |       | 21.78 |       |
|      |                 | 1       | 49        |       | 22.61 |       |       | 21.79 |       |
|      |                 | 25      | 0         |       | 21.75 |       |       | 20.81 |       |
|      |                 | 25      | 12        |       | 21.76 |       |       | 20.80 |       |
|      |                 | 25      | 25        |       | 21.75 |       |       | 20.79 |       |
|      |                 | 50      | 0         |       | 21.82 |       |       | 20.85 |       |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

## - WCDMA

| Band | 3GPP Release version | Channel         |           | 9262         | 9400         | 9538         |
|------|----------------------|-----------------|-----------|--------------|--------------|--------------|
|      |                      | Frequency (MHz) |           | 1 852.4      | 1 880.0      | 1 907.6      |
| 2    | 99                   | WCDMA           | RMC       | <b>22.32</b> | <b>22.48</b> | <b>22.52</b> |
|      | 5                    | HSDPA           | Subtest 1 | 21.35        | 21.42        | 21.51        |
|      | 5                    |                 | Subtest 2 | 21.31        | 21.42        | 21.48        |
|      | 5                    |                 | Subtest 3 | 20.78        | 20.98        | 21.02        |
|      | 5                    |                 | Subtest 4 | 20.77        | 20.97        | 21.03        |
|      | 6                    | HSUPA           | Subtest 1 | 21.28        | 21.47        | 21.53        |
|      | 6                    |                 | Subtest 2 | 19.25        | 19.32        | 19.61        |
|      | 6                    |                 | Subtest 3 | 20.35        | 20.41        | 20.72        |
|      | 6                    |                 | Subtest 4 | 19.34        | 19.62        | 19.64        |
|      | 6                    |                 | Subtest 5 | 21.26        | 21.35        | 21.42        |
|      | 7                    | HSPA+           |           | 20.81        | 20.75        | 20.88        |

| Band | 3GPP Release version | Channel         |           | 1312         | 1413         | 1513         |
|------|----------------------|-----------------|-----------|--------------|--------------|--------------|
|      |                      | Frequency (MHz) |           | 1 712.4      | 1 732.6      | 1 752.6      |
| 4    | 99                   | WCDMA           | RMC       | <b>22.58</b> | <b>22.52</b> | <b>22.57</b> |
|      | 5                    | HSDPA           | Subtest 1 | 21.56        | 21.48        | 21.51        |
|      | 5                    |                 | Subtest 2 | 21.48        | 21.44        | 21.46        |
|      | 5                    |                 | Subtest 3 | 20.95        | 20.85        | 20.90        |
|      | 5                    |                 | Subtest 4 | 20.91        | 20.83        | 20.88        |
|      | 6                    | HSUPA           | Subtest 1 | 21.48        | 21.32        | 21.50        |
|      | 6                    |                 | Subtest 2 | 19.65        | 19.54        | 19.56        |
|      | 6                    |                 | Subtest 3 | 20.40        | 20.36        | 20.39        |
|      | 6                    |                 | Subtest 4 | 19.51        | 19.48        | 19.45        |
|      | 6                    |                 | Subtest 5 | 21.48        | 21.45        | 21.49        |
|      | 7                    | HSPA+           |           | 21.00        | 20.95        | 20.84        |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

| Band | 3GPP Release version | Channel         |           | 4132         | 4182         | 4233         |
|------|----------------------|-----------------|-----------|--------------|--------------|--------------|
|      |                      | Frequency (MHz) |           | 826.4        | 836.6        | 846.6        |
| 5    | 99                   | WCDMA           | RMC       | <b>21.86</b> | <b>22.02</b> | <b>22.08</b> |
|      | 5                    | HSDPA           | Subtest 1 | 20.78        | 20.89        | 21.10        |
|      | 5                    |                 | Subtest 2 | 20.82        | 21.01        | 21.11        |
|      | 5                    |                 | Subtest 3 | 20.32        | 20.45        | 20.68        |
|      | 5                    |                 | Subtest 4 | 20.34        | 20.62        | 20.65        |
|      | 6                    | HSUPA           | Subtest 1 | 20.75        | 21.02        | 21.16        |
|      | 6                    |                 | Subtest 2 | 18.76        | 19.11        | 19.07        |
|      | 6                    |                 | Subtest 3 | 19.55        | 19.86        | 19.98        |
|      | 6                    |                 | Subtest 4 | 18.52        | 18.82        | 18.96        |
|      | 6                    |                 | Subtest 5 | 20.48        | 20.88        | 21.02        |
|      | 7                    | HSPA+           |           | 20.32        | 20.11        | 20.18        |

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

# - GSM

| Band | Channel | Frequency<br>(MHz) | GSM          | GPRS      |           |           |           | EDGE      |           |           |           |
|------|---------|--------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|      |         |                    | Voice        | 1 Tx slot | 2 Tx slot | 3 Tx slot | 4 Tx slot | 1 Tx slot | 2 Tx slot | 3 Tx slot | 4 Tx slot |
|      |         |                    | (dB m)       | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    |
| 850  | 128     | 824.2              | <b>33.03</b> | 32.97     | 31.21     | 28.55     | 27.10     | 26.32     | 26.15     | 25.34     | 24.45     |
|      | 190     | 836.6              | <b>32.95</b> | 32.64     | 31.22     | 29.14     | 27.15     | 26.58     | 26.25     | 25.48     | 24.30     |
|      | 251     | 848.8              | <b>32.82</b> | 32.75     | 31.14     | 29.05     | 26.86     | 26.32     | 26.04     | 25.45     | 24.28     |

| Band  | Channel | Frequency<br>(MHz) | GSM          | GPRS      |           |           |           | EDGE      |           |           |           |
|-------|---------|--------------------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|       |         |                    | Voice        | 1 Tx slot | 2 Tx slot | 3 Tx slot | 4 Tx slot | 1 Tx slot | 2 Tx slot | 3 Tx slot | 4 Tx slot |
|       |         |                    | (dB m)       | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    | (dB m)    |
| 1 900 | 512     | 1 850.2            | <b>30.36</b> | 30.02     | 27.55     | 25.24     | 23.36     | 23.39     | 23.27     | 22.12     | 21.10     |
|       | 661     | 1 880.0            | <b>30.40</b> | 30.13     | 27.32     | 25.18     | 23.45     | 23.58     | 23.42     | 22.39     | 21.42     |
|       | 810     | 1 909.8            | <b>30.16</b> | 30.02     | 27.54     | 25.32     | 23.45     | 23.57     | 23.52     | 22.31     | 21.38     |

## - End of the Test Report -

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.