

TEST REPORT

of

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

FCC ID: BEJ-LW-9880
IC Certification: 2703N-LW9880

Equipment Under Test : Cellular Modem
Model Name : LW-9880
FCC Applicant : LG Electronics USA
IC Applicant : LG Electronics Inc.
Manufacturer : LG Electronics Inc.
Date of Receipt : 2019.07.31
Date of Test(s) : 2019.08.19 ~ 2019.12.26
Date of Issue : 2019.12.31

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

Tested By:



Jinhyoung Cho

Date:

2019.12.31

Technical
Manager:



Jungmin Yang

Date:

2019.12.31

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

TABLE OF CONTENTS

	Page
1. General Information -----	3
2. RF Radiated Output Power & Spurious Radiated Emission -----	8
3. Conducted Output Power -----	48
4. Occupied Bandwidth -----	53
5. Peak-Average Ratio -----	119
6. Spurious Emissions at Antenna Terminal -----	154
7. Band Edge -----	205
8. Frequency Stability -----	248

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

1. General Information

1.1. Testing Laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)

- 10-2, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
- Designation number: KR0150

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

Phone No. : +82 31 688 0901

Fax No. : +82 31 688 0921

1.2. Details of Applicant

FCC Applicant : LG Electronics USA

FCC Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 07632

IC Applicant : LG Electronics Inc.

IC Address : 170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do
51533, Korea (Republic of)

Contact Person : Han, Kyung-su

Phone No. : +2 201 472 2623

1.3. Details of Manufacturer

Company : LG Electronics Inc.

Address : 170, Seongsanpaechong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do 51533,
Korea (Republic of)

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

1.4. Description of EUT

Kind of Product	Cellular Modem
Model Name	LW-9880
Power Supply	DC 5.0 V
Rated Power	LTE Band 2, 4, 5, 12: 22.5 dB m
Frequency Range	LTE Band 2: 1 850 MHz ~ 1 910 MHz LTE Band 4: 1 710 MHz ~ 1 755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz
Emission Designator	LTE Band 2 (1.4 MHz): 1M11G7D (QPSK) / 1M11W7D (16QAM) LTE Band 2 (3 MHz): 2M69G7D (QPSK) / 2M69W7D (16QAM) LTE Band 2 (5 MHz): 4M53G7D (QPSK) / 4M53W7D (16QAM) LTE Band 2 (10 MHz): 8M97G7D (QPSK) / 8M97W7D (16QAM) LTE Band 2 (15 MHz): 13M6G7D (QPSK) / 13M6W7D (16QAM) LTE Band 2 (20 MHz): 18M0G7D (QPSK) / 18M1W7D (16QAM) LTE Band 4 (1.4 MHz): 1M10G7D (QPSK) / 1M12W7D (16QAM) LTE Band 4 (3 MHz): 2M70G7D (QPSK) / 2M69W7D (16QAM) LTE Band 4 (5 MHz): 4M52G7D (QPSK) / 4M53W7D (16QAM) LTE Band 4 (10 MHz): 8M97G7D (QPSK) / 8M97W7D (16QAM) LTE Band 4 (15 MHz): 13M6G7D (QPSK) / 13M5W7D (16QAM) LTE Band 4 (20 MHz): 18M0G7D (QPSK) / 18M0W7D (16QAM) LTE Band 5 (1.4 MHz): 1M10G7D (QPSK) / 1M11W7D (16QAM) LTE Band 5 (3 MHz): 2M69G7D (QPSK) / 2M68W7D (16QAM) LTE Band 5 (5 MHz): 4M53G7D (QPSK) / 4M52W7D (16QAM) LTE Band 5 (10 MHz): 8M97G7D (QPSK) / 8M97W7D (16QAM) LTE Band 12 (1.4 MHz): 1M10G7D (QPSK) / 1M11W7D (16QAM) LTE Band 12 (3 MHz): 2M69G7D (QPSK) / 2M69W7D (16QAM) LTE Band 12 (5 MHz): 4M52G7D (QPSK) / 4M53W7D (16QAM) LTE Band 12 (10 MHz): 9M00G7D (QPSK) / 8M97W7D (16QAM)
Modulation Technique	QPSK, 16QAM
Antenna Type	Internal antenna
Antenna gain	699 MHz ~ 716 MHz: 0.99 dB i 824 MHz ~ 849 MHz: -1.03 dB i 1 710 MHz ~ 1 755 MHz: 3.56 dB i 1 850 MHz ~ 1 910 MHz: 3.62 dB i

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	Agilent	E8257D	MY51501169	Jul. 03, 2019	Annual	Jul. 03, 2020
Spectrum Analyzer	R&S	FSV30	103100	Jun. 19, 2019	Annual	Jun. 19, 2020
Spectrum Analyzer	Agilent	N9030A	US51350132	Sep. 11, 2019	Annual	Sep. 11, 2020
Mobile Test Unit	R&S	CMW500	144035	Feb. 19, 2019	Annual	Feb. 19, 2020
Power Meter	Anritsu	ML2495A	1223004	Jun. 05, 2019	Annual	Jun. 05, 2020
Power Sensor	Anritsu	MA2411B	1207272	Jun. 05, 2019	Annual	Jun. 05, 2020
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000-40SS	7	Mar. 12, 2019	Annual	Mar. 12, 2020
High Pass Filter	Wainwright Instrument GmbH	WHK3.0/18G-10SS	344	May 21, 2019	Annual	May 21, 2020
High Pass Filter	Wainwright Instrument GmbH	WHKX1.5/15G-6SS	4	Jun. 12, 2019	Annual	Jun. 12, 2020
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	11	May 21, 2019	Annual	May 21, 2020
Directional Coupler	KRYTAR	152613	122660	Jun. 12, 2019	Annual	Jun. 12, 2020
DC Power Supply	Agilent	U8002A	MY50060028	Mar. 12, 2019	Annual	Mar. 12, 2020
Preamplifier	H.P.	8447F	2944A03909	Aug. 07, 2019	Annual	Aug. 07, 2020
Preamplifier	R&S	SCU 18	10117	Jun. 12, 2019	Annual	Jun. 12, 2020
Preamplifier	MITEQ Inc.	JS44-18004000-35-8P	1546891	May 13, 2019	Annual	May 13, 2020
Test Receiver	R&S	ESU26	100109	Jan. 31, 2019	Annual	Jan. 31, 2020
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 22, 2019	Biennial	Aug. 22, 2021
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	396	Mar. 21, 2019	Biennial	Mar. 21, 2021
Horn Antenna	R&S	HF906	100326	Feb. 14, 2018	Biennial	Feb. 14, 2020
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	BBHA9170223	Sep. 10, 2018	Biennial	Sep. 10, 2020
Antenna Master	Innco systems GmbH	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	CO3000/963/38330516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.4 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	SUCOFLEX	104 (3 m)	MY3258414	Jul. 20, 2019	Semi-annual	Jan. 20, 2020
Coaxial Cable	SUCOFLEX	104 (10 m)	MY3145814	Jul. 20, 2019	Semi-annual	Jan. 20, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 01/20	Aug. 23, 2019	Semi-annual	Feb. 23, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 05/20	Aug. 23, 2019	Semi-annual	Feb. 23, 2020
Coaxial Cable	Rosenberger	LA1-C006-1500	131014 10/20	Aug. 23, 2019	Semi-annual	Feb. 23, 2020

► Support Equipment

Description	Manufacturer	Model	Serial Number
N/A	-	-	-

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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(2019.04.24)(1)

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

A4(210 mm x 297 mm)

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

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

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

1.7. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501/RF-RTL014355	2019.09.18	Initial
1	F690501/RF-RTL014355-1	2019.12.31	Added Conducted test result

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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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(2019.04.24)(1)

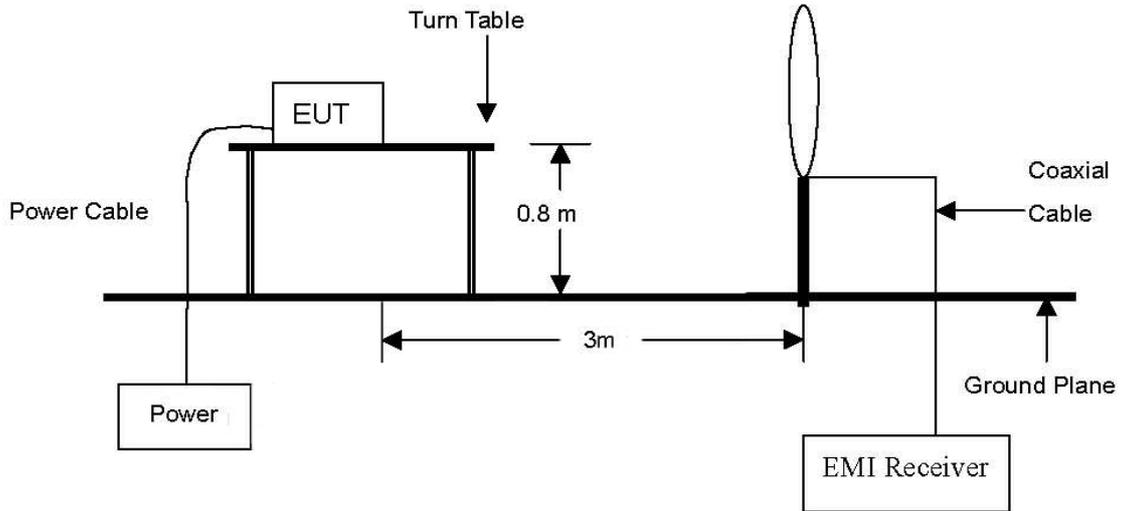
Tel. +82 31 428 5700 / Fax. +82 31 427 2370

A4(210 mm x 297 mm)

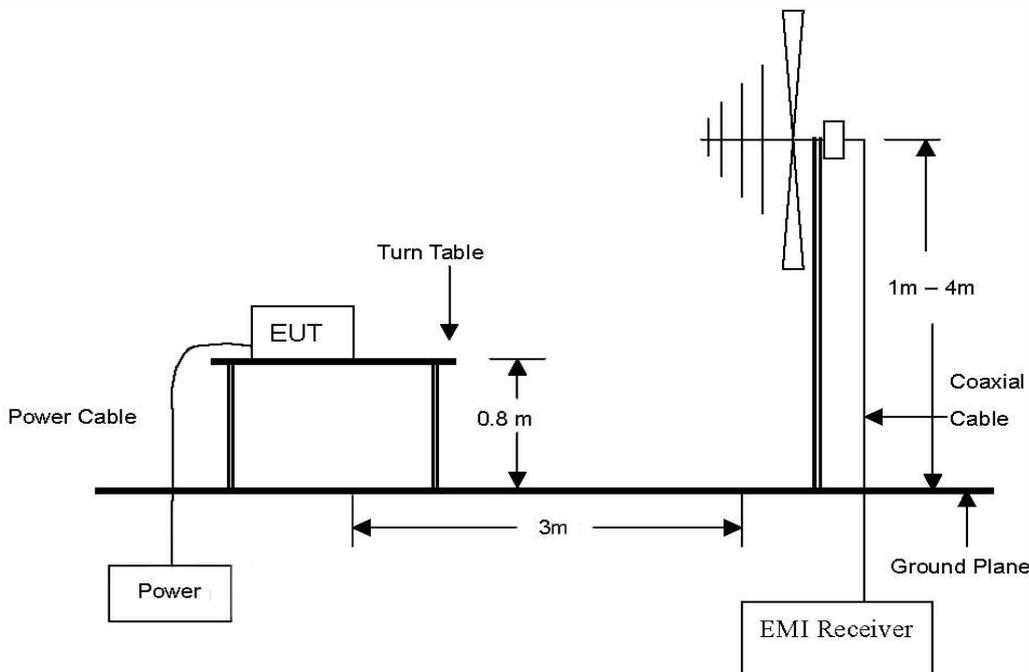
2. RF Radiated Output Power & Spurious Radiated Emission

2.1. Test Setup

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



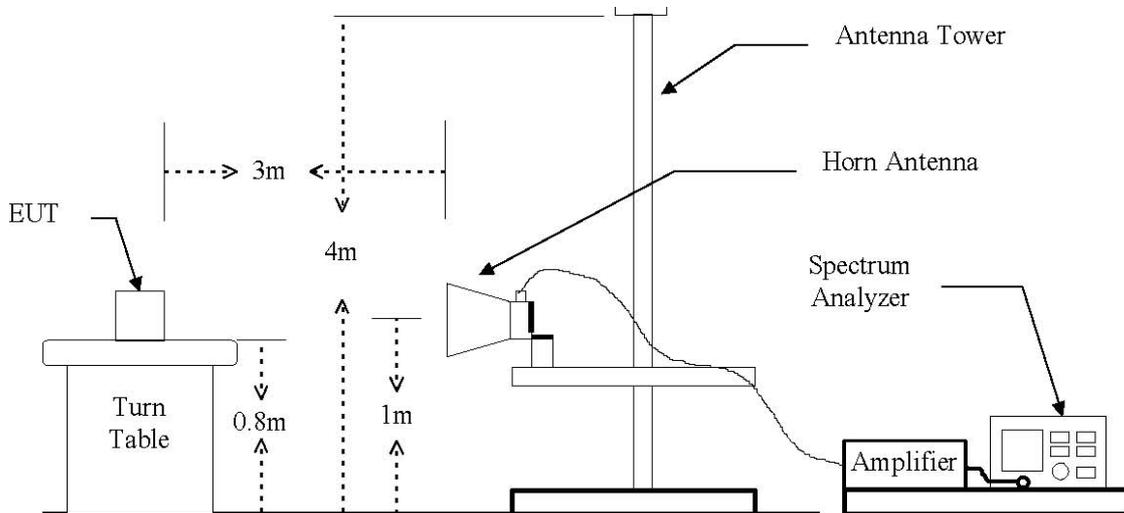
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz.



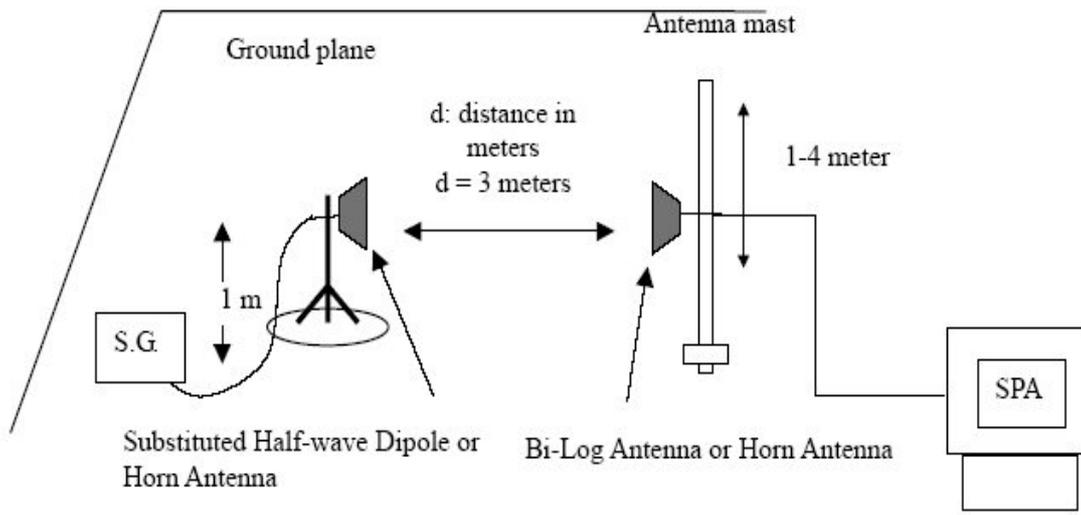
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test 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>

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



The diagram below shows the test setup for substituted method.



The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

2.2. Limit

2.2.1. Limit of radiated output power

FCC

- §22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
- §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.
- §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.

IC

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

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

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

- RSS-133 Issue 6
6.4, the equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

- 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.

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

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(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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

IC

- RSS-130 Issue 2

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

- RSS-132 Issue 3

5.5, Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

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

1. On a test site, the EUT shall be placed at 80 cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions occupied bandwidth, RBW = 1-5 % of the OBW (not to exceed 1 MHz), VBW $\geq 3 \times$ RBW, Detector = power averaging (rms), sweep time = auto, trace average at least 100 traces in power averaging (rms) mode, per the guidelines of ANSI C63.26-2015.
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 $\geq 3 \times$ RBW, Detector = Peak, trace mode = max hold, per the guidelines of ANSI C63.26-2015.
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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

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 (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 850.7	H	16.29	4.33	8.53	20.49	111.94
1 850.7	V	20.86	4.33	8.53	25.06	320.63
1 880.0	H	19.69	4.34	8.63	23.98	250.03
1 880.0	V	19.67	4.34	8.63	23.96	248.89
1 909.3	H	19.13	4.36	8.60	23.37	217.27
1 909.3	V	17.17	4.36	8.60	21.41	138.36

* 1.4 BW 1RB size / 0 Offset for B2

LTE band 2 (1.4 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 850.7	H	15.41	4.33	8.53	19.61	91.41
1 850.7	V	20.58	4.33	8.53	24.78	300.61
1 880.0	H	19.16	4.34	8.63	23.45	221.31
1 880.0	V	19.01	4.34	8.63	23.30	213.80
1 909.3	H	18.65	4.36	8.60	22.89	194.54
1 909.3	V	16.77	4.36	8.60	21.01	126.18

* 1.4 BW 1RB size / 0 Offset for B2

LTE band 2 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 851.5	H	16.41	4.33	8.54	20.62	115.35
1 851.5	V	21.00	4.33	8.54	25.21	331.89
1 880.0	H	19.53	4.34	8.63	23.82	240.99
1 880.0	V	19.70	4.34	8.63	23.99	250.61
1 908.5	H	19.01	4.36	8.61	23.26	211.84
1 908.5	V	17.22	4.36	8.61	21.47	140.28

* 3 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2 (3 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 851.5	H	15.44	4.33	8.54	19.65	92.26
1 851.5	V	20.20	4.33	8.54	24.41	276.06
1 880.0	H	18.91	4.34	8.63	23.20	208.93
1 880.0	V	19.11	4.34	8.63	23.40	218.78
1 908.5	H	18.26	4.36	8.61	22.51	178.24
1 908.5	V	16.56	4.36	8.61	20.81	120.50

* 3 BW 1RB size / 0 Offset for B2

LTE band 2 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 852.5	H	16.27	4.33	8.54	20.48	111.69
1 852.5	V	20.53	4.33	8.54	24.74	297.85
1 880.0	H	19.57	4.34	8.63	23.86	243.22
1 880.0	V	19.43	4.34	8.63	23.72	235.50
1 907.5	H	19.12	4.36	8.62	23.38	217.77
1 907.5	V	17.27	4.36	8.62	21.53	142.23

* 5 BW 1RB size / 0 Offset for B2

LTE band 2 (5 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 852.5	H	15.43	4.33	8.54	19.64	92.04
1 852.5	V	20.16	4.33	8.54	24.37	273.53
1 880.0	H	18.67	4.34	8.63	22.96	197.70
1 880.0	V	18.76	4.34	8.63	23.05	201.84
1 907.5	H	18.02	4.36	8.62	22.28	169.04
1 907.5	V	16.61	4.36	8.62	20.87	122.18

* 5 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 855.0	H	16.45	4.33	8.55	20.67	116.68
1 855.0	V	20.87	4.33	8.55	25.09	322.85
1 880.0	H	18.97	4.34	8.63	23.26	211.84
1 880.0	V	19.54	4.34	8.63	23.83	241.55
1 905.0	H	20.12	4.36	8.64	24.40	275.42
1 905.0	V	18.04	4.36	8.64	22.32	170.61

* 10 BW 1RB size / 0 Offset for B2

LTE band 2 (10 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 855.0	H	15.70	4.33	8.55	19.92	98.17
1 855.0	V	20.40	4.33	8.55	24.62	289.73
1 880.0	H	18.62	4.34	8.63	22.91	195.43
1 880.0	V	19.04	4.34	8.63	23.33	215.28
1 905.0	H	19.47	4.36	8.64	23.75	237.14
1 905.0	V	17.46	4.36	8.64	21.74	149.28

* 10 BW 1RB size / 0 Offset for B2

LTE band 2 (15 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 857.5	H	16.50	4.33	8.55	20.72	118.03
1 857.5	V	21.33	4.33	8.55	25.55	358.92
1 880.0	H	18.48	4.34	8.63	22.77	189.23
1 880.0	V	19.66	4.34	8.63	23.95	248.31
1 902.5	H	20.38	4.35	8.67	24.70	295.12
1 902.5	V	18.57	4.35	8.67	22.89	194.54

* 15 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2 (15 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 857.5	H	16.22	4.33	8.55	20.44	110.66
1 857.5	V	20.37	4.33	8.55	24.59	287.74
1 880.0	H	17.91	4.34	8.63	22.20	165.96
1 880.0	V	19.26	4.34	8.63	23.55	226.46
1 902.5	H	19.75	4.35	8.67	24.07	255.27
1 902.5	V	17.89	4.35	8.67	22.21	166.34

* 15 BW 1RB size / 0 Offset for B2

LTE band 2 (20 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 860.0	H	16.63	4.33	8.56	20.86	121.90
1 860.0	V	20.97	4.33	8.56	25.20	331.13
1 880.0	H	17.92	4.34	8.63	22.21	166.34
1 880.0	V	19.82	4.34	8.63	24.11	257.63
1 900.0	H	20.10	4.35	8.70	24.45	278.61
1 900.0	V	19.14	4.35	8.70	23.49	223.36

* 20 BW 1RB size / 0 Offset for B2

LTE band 2 (20 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 860.0	H	15.73	4.33	8.56	19.96	99.08
1 860.0	V	20.22	4.33	8.56	24.45	278.61
1 880.0	H	17.54	4.34	8.63	21.83	152.41
1 880.0	V	19.34	4.34	8.63	23.63	230.67
1 900.0	H	19.73	4.35	8.70	24.08	255.86
1 900.0	V	18.24	4.35	8.70	22.59	181.55

* 20 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 710.7	H	13.02	4.14	8.51	17.39	54.83
1 710.7	V	16.62	4.14	8.51	20.99	125.60
1 732.5	H	12.98	4.18	8.48	17.28	53.46
1 732.5	V	18.07	4.18	8.48	22.37	172.58
1 754.3	H	14.28	4.22	8.44	18.50	70.79
1 754.3	V	18.96	4.22	8.44	23.18	207.97

* 1.4 BW 1RB size / 0 Offset for B4

LTE band 4 (1.4 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 710.7	H	12.22	4.14	8.51	16.59	45.60
1 710.7	V	15.79	4.14	8.51	20.16	103.75
1 732.5	H	12.63	4.18	8.48	16.93	49.32
1 732.5	V	17.28	4.18	8.48	21.58	143.88
1 754.3	H	13.51	4.22	8.44	17.73	59.29
1 754.3	V	17.79	4.22	8.44	22.01	158.85

* 1.4 BW 1RB size / 0 Offset for B4

LTE band 4 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 711.5	H	13.49	4.14	8.51	17.86	61.09
1 711.5	V	16.54	4.14	8.51	20.91	123.31
1 732.5	H	13.35	4.18	8.48	17.65	58.21
1 732.5	V	18.20	4.18	8.48	22.50	177.83
1 753.5	H	14.53	4.22	8.44	18.75	74.99
1 753.5	V	18.75	4.22	8.44	22.97	198.15

* 3 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4 (3 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 711.5	H	12.50	4.14	8.51	16.87	48.64
1 711.5	V	16.03	4.14	8.51	20.40	109.65
1 732.5	H	12.47	4.18	8.48	16.77	47.53
1 732.5	V	17.51	4.18	8.48	21.81	151.71
1 753.5	H	13.38	4.22	8.44	17.60	57.54
1 753.5	V	17.78	4.22	8.44	22.00	158.49

* 3 BW 1RB size / 0 Offset for B4

LTE band 4 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 712.5	H	13.21	4.14	8.51	17.58	57.28
1 712.5	V	16.34	4.14	8.51	20.71	117.76
1 732.5	H	13.29	4.18	8.48	17.59	57.41
1 732.5	V	18.19	4.18	8.48	22.49	177.42
1 752.5	H	14.65	4.21	8.44	18.88	77.27
1 752.5	V	19.09	4.21	8.44	23.32	214.78

* 5 BW 1RB size / 0 Offset for B4

LTE band 4 (5 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 712.5	H	12.68	4.14	8.51	17.05	50.70
1 712.5	V	15.67	4.14	8.51	20.04	100.93
1 732.5	H	12.60	4.18	8.48	16.90	48.98
1 732.5	V	17.23	4.18	8.48	21.53	142.23
1 752.5	H	13.45	4.21	8.44	17.68	58.61
1 752.5	V	17.98	4.21	8.44	22.21	166.34

* 5 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 715.0	H	13.61	4.15	8.50	17.96	62.52
1 715.0	V	16.61	4.15	8.50	20.96	124.74
1 732.5	H	13.79	4.18	8.48	18.09	64.42
1 732.5	V	18.65	4.18	8.48	22.95	197.24
1 750.0	H	14.45	4.21	8.45	18.69	73.96
1 750.0	V	18.85	4.21	8.45	23.09	203.70

* 10 BW 1RB size / 0 Offset for B4

LTE band 4 (10 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 715.0	H	12.83	4.15	8.50	17.18	52.24
1 715.0	V	15.53	4.15	8.50	19.88	97.27
1 732.5	H	13.02	4.18	8.48	17.32	53.95
1 732.5	V	17.92	4.18	8.48	22.22	166.72
1 750.0	H	13.79	4.21	8.45	18.03	63.53
1 750.0	V	18.29	4.21	8.45	22.53	179.06

* 10 BW 1RB size / 0 Offset for B4

LTE band 4 (15 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 717.5	H	13.72	4.15	8.50	18.07	64.12
1 717.5	V	16.94	4.15	8.50	21.29	134.59
1 732.5	H	13.86	4.18	8.48	18.16	65.46
1 732.5	V	18.18	4.18	8.48	22.48	177.01
1 747.5	H	14.51	4.21	8.45	18.75	74.99
1 747.5	V	19.32	4.21	8.45	23.56	226.99

* 15 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4 (15 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 717.5	H	12.72	4.15	8.50	17.07	50.93
1 717.5	V	16.03	4.15	8.50	20.38	109.14
1 732.5	H	13.12	4.18	8.48	17.42	55.21
1 732.5	V	17.50	4.18	8.48	21.80	151.36
1 747.5	H	13.67	4.21	8.45	17.91	61.80
1 747.5	V	18.67	4.21	8.45	22.91	195.43

* 15 BW 1RB size / 0 Offset for B4

LTE band 4 (20 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 720.0	H	13.55	4.16	8.50	17.89	61.52
1 720.0	V	16.74	4.16	8.50	21.08	128.23
1 732.5	H	13.34	4.18	8.48	17.64	58.08
1 732.5	V	17.80	4.18	8.48	22.10	162.18
1 745.0	H	14.54	4.20	8.46	18.80	75.86
1 745.0	V	19.36	4.20	8.46	23.62	230.14

* 20 BW 1RB size / 0 Offset for B4

LTE band 4 (20 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P.	
					(dB m)	(mW)
1 720.0	H	12.83	4.16	8.50	17.17	52.12
1 720.0	V	16.09	4.16	8.50	20.43	110.41
1 732.5	H	12.53	4.18	8.48	16.83	48.19
1 732.5	V	17.09	4.18	8.48	21.39	137.72
1 745.0	H	13.44	4.20	8.46	17.70	58.88
1 745.0	V	18.44	4.20	8.46	22.70	186.21

* 20 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
824.7	H	25.27	3.26	-4.93	17.08	51.05
824.7	V	24.20	3.26	-4.93	16.01	39.90
836.5	H	25.92	3.45	-5.15	17.32	53.95
836.5	V	24.13	3.45	-5.15	15.53	35.73
848.3	H	25.00	3.52	-4.09	17.39	54.83
848.3	V	23.90	3.52	-4.09	16.29	42.56

* 1.4 BW 1RB size / 0 Offset for B5

LTE band 5 (1.4 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
824.7	H	24.50	3.26	-4.93	16.31	42.76
824.7	V	23.43	3.26	-4.93	15.24	33.42
836.5	H	24.74	3.45	-5.15	16.14	41.11
836.5	V	23.28	3.45	-5.15	14.68	29.38
848.3	H	24.31	3.52	-4.09	16.70	46.77
848.3	V	23.06	3.52	-4.09	15.45	35.08

* 1.4 BW 1RB size / 0 Offset for B5

LTE band 5 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
825.5	H	25.64	3.28	-5.05	17.31	53.83
825.5	V	24.84	3.28	-5.05	16.51	44.77
836.5	H	25.86	3.45	-5.15	17.26	53.21
836.5	V	24.27	3.45	-5.15	15.67	36.90
847.5	H	25.17	3.52	-4.16	17.49	56.10
847.5	V	23.94	3.52	-4.16	16.26	42.27

* 3 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5 (3 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
825.5	H	24.39	3.28	-5.05	16.06	40.36
825.5	V	23.84	3.28	-5.05	15.51	35.56
836.5	H	24.82	3.45	-5.15	16.22	41.88
836.5	V	22.99	3.45	-5.15	14.39	27.48
847.5	H	24.23	3.52	-4.16	16.55	45.19
847.5	V	23.01	3.52	-4.16	15.33	34.12

* 3 BW 1RB size / 0 Offset for B5

LTE band 5 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
826.5	H	25.69	3.31	-5.20	17.18	52.24
826.5	V	24.95	3.31	-5.20	16.44	44.06
836.5	H	25.26	3.45	-5.15	16.66	46.34
836.5	V	24.16	3.45	-5.15	15.56	35.97
846.5	H	25.09	3.51	-4.25	17.33	54.08
846.5	V	23.93	3.51	-4.25	16.17	41.40

* 5 BW 1RB size / 0 Offset for B5

LTE band 5 (5 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
826.5	H	25.19	3.31	-5.20	16.68	46.56
826.5	V	24.09	3.31	-5.20	15.58	36.14
836.5	H	24.82	3.45	-5.15	16.22	41.88
836.5	V	23.35	3.45	-5.15	14.75	29.85
846.5	H	24.29	3.51	-4.25	16.53	44.98
846.5	V	22.94	3.51	-4.25	15.18	32.96

* 5 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
829.0	H	26.62	3.38	-5.58	17.66	58.34
829.0	V	26.28	3.38	-5.58	17.32	53.95
836.5	H	25.77	3.45	-5.15	17.17	52.12
836.5	V	24.36	3.45	-5.15	15.76	37.67
844.0	H	25.70	3.49	-4.48	17.73	59.29
844.0	V	23.58	3.49	-4.48	15.61	36.39

* 10 BW 1RB size / 0 Offset for B5

LTE band 5 (10 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
829.0	H	25.93	3.38	-5.58	16.97	49.77
829.0	V	25.57	3.38	-5.58	16.61	45.81
836.5	H	24.61	3.45	-5.15	16.01	39.90
836.5	V	23.25	3.45	-5.15	14.65	29.17
844.0	H	24.56	3.49	-4.48	16.59	45.60
844.0	V	22.65	3.49	-4.48	14.68	29.38

* 10 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
699.7	H	17.28	2.86	-4.00	10.42	11.02
699.7	V	22.70	2.86	-4.00	15.84	38.37
707.5	H	22.42	3.06	-4.53	14.83	30.41
707.5	V	23.79	3.06	-4.53	16.20	41.69
715.3	H	22.59	3.04	-4.31	15.24	33.42
715.3	V	23.22	3.04	-4.31	15.87	38.64

* 1.4 BW 1RB size / 0 Offset for B12

LTE band 12 (1.4 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
699.7	H	16.61	2.86	-4.00	9.75	9.44
699.7	V	22.19	2.86	-4.00	15.33	34.12
707.5	H	21.84	3.06	-4.53	14.25	26.61
707.5	V	22.05	3.06	-4.53	14.46	27.93
715.3	H	22.26	3.04	-4.31	14.91	30.97
715.3	V	22.34	3.04	-4.31	14.99	31.55

* 1.4 BW 1RB size / 0 Offset for B12

LTE band 12 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
700.5	H	17.53	2.87	-4.05	10.61	11.51
700.5	V	22.58	2.87	-4.05	15.66	36.81
707.5	H	22.35	3.06	-4.53	14.76	29.92
707.5	V	22.73	3.06	-4.53	15.14	32.66
714.5	H	23.05	3.05	-4.37	15.63	36.56
714.5	V	22.86	3.05	-4.37	15.44	34.99

* 3 BW 1RB size / 0 Offset for B12

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12 (3 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
700.5	H	16.96	2.87	-4.05	10.04	10.09
700.5	V	22.00	2.87	-4.05	15.08	32.21
707.5	H	21.61	3.06	-4.53	14.02	25.23
707.5	V	21.98	3.06	-4.53	14.39	27.48
714.5	H	22.25	3.05	-4.37	14.83	30.41
714.5	V	22.25	3.05	-4.37	14.83	30.41

* 3 BW 1RB size / 0 Offset for B12

LTE band 12 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
701.5	H	17.76	2.90	-4.12	10.74	11.86
701.5	V	22.52	2.90	-4.12	15.50	35.48
707.5	H	21.97	3.06	-4.53	14.38	27.42
707.5	V	22.58	3.06	-4.53	14.99	31.55
713.5	H	22.81	3.06	-4.44	15.31	33.96
713.5	V	22.59	3.06	-4.44	15.09	32.28

* 5 BW 1RB size / 0 Offset for B12

LTE band 12 (5 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
701.5	H	17.11	2.90	-4.12	10.09	10.21
701.5	V	22.03	2.90	-4.12	15.01	31.70
707.5	H	21.44	3.06	-4.53	13.85	24.27
707.5	V	22.30	3.06	-4.53	14.71	29.58
713.5	H	22.26	3.06	-4.44	14.76	29.92
713.5	V	22.30	3.06	-4.44	14.80	30.20

* 5 BW 1RB size / 0 Offset for B12

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
704.0	H	19.34	2.96	-4.29	12.09	16.18
704.0	V	22.76	2.96	-4.29	15.51	35.56
707.5	H	21.68	3.06	-4.53	14.09	25.64
707.5	V	22.90	3.06	-4.53	15.31	33.96
711.0	H	23.24	3.10	-4.63	15.51	35.56
711.0	V	23.07	3.10	-4.63	15.34	34.20

* 10 BW 1RB size / 0 Offset for B12

LTE band 12 (10 MHz – 16QAM)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P.	
					(dB m)	(mW)
704.0	H	18.67	2.96	-4.29	11.42	13.87
704.0	V	21.91	2.96	-4.29	14.66	29.24
707.5	H	20.94	3.06	-4.53	13.35	21.63
707.5	V	22.00	3.06	-4.53	14.41	27.61
711.0	H	22.61	3.10	-4.63	14.88	30.76
711.0	V	22.36	3.10	-4.63	14.63	29.04

* 10 BW 1RB size / 0 Offset for B12

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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

2.5. Spurious Radiated Emission

LTE band 2

- Modulation Signal: LTE band 2 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 850.7 MHz)							
3 700.55	H	-58.38	5.96	9.06	-55.28	-13	42.28
3 700.76	V	-60.75	5.96	9.06	-57.65	-13	44.65
5 551.16	H	-59.03	7.53	10.63	-55.93	-13	42.93
5 550.98	V	-62.14	7.53	10.63	-59.04	-13	46.04
Middle Channel (1 880.0 MHz)							
3 758.14	H	-60.07	6.25	9.12	-57.20	-13	44.20
3 758.86	V	-58.25	6.25	9.12	-55.38	-13	42.38
5 638.46	H	-55.25	7.64	10.90	-51.99	-13	38.99
5 637.22	V	-58.97	7.64	10.89	-55.72	-13	42.72
High Channel (1 909.3 MHz)							
3 817.86	H	-58.17	6.51	9.15	-55.53	-13	42.53
3 817.92	V	-52.96	6.51	9.15	-50.32	-13	37.32
5 726.46	H	-54.23	7.86	11.27	-50.82	-13	37.82
5 724.11	V	-57.35	7.85	11.27	-53.93	-13	40.93

* 1.4 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2

- Modulation Signal: LTE band 2 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 851.5 MHz)							
3 700.25	H	-58.87	5.96	9.06	-55.77	-13	42.77
3 700.74	V	-61.11	5.96	9.06	-58.01	-13	45.01
5 550.66	H	-59.96	7.53	10.63	-56.86	-13	43.86
5 550.42	V	-64.21	7.53	10.63	-61.11	-13	48.11
Middle Channel (1 880.0 MHz)							
3 752.13	H	-60.36	6.22	9.12	-57.46	-13	44.46
3 757.42	V	-58.33	6.25	9.12	-55.46	-13	42.46
5 636.40	H	-55.99	7.63	10.88	-52.74	-13	39.74
5 636.28	V	-59.71	7.63	10.88	-56.46	-13	43.46
High Channel (1 908.5 MHz)							
3 814.35	H	-58.25	6.50	9.15	-55.60	-13	42.60
3 814.54	V	-53.53	6.50	9.15	-50.88	-13	37.88
5 721.80	H	-54.06	7.85	11.27	-50.64	-13	37.64
5 721.10	V	-55.13	7.85	11.27	-51.71	-13	38.71

* 3 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2

- Modulation Signal: LTE band 2 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 852.5 MHz)							
3 701.02	H	-58.90	5.97	9.07	-55.80	-13	42.80
3 700.38	V	-61.05	5.96	9.06	-57.95	-13	44.95
5 553.70	H	-59.01	7.53	10.63	-55.91	-13	42.91
5 553.66	V	-62.03	7.53	10.63	-58.93	-13	45.93
Middle Channel (1 880.0 MHz)							
3 755.01	H	-59.07	6.24	9.12	-56.19	-13	43.19
3 755.98	V	-56.86	6.24	9.12	-53.98	-13	40.98
5 636.26	H	-55.49	7.63	10.88	-52.24	-13	39.24
5 636.21	V	-59.45	7.63	10.88	-56.20	-13	43.20
High Channel (1 907.5 MHz)							
3 810.13	H	-58.22	6.49	9.16	-55.55	-13	42.55
3 810.64	V	-52.99	6.49	9.16	-50.32	-13	37.32
5 718.94	H	-54.08	7.85	11.27	-50.66	-13	37.66
5 718.57	V	-55.51	7.85	11.27	-52.09	-13	39.09

* 5 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2

- Modulation Signal: LTE band 2 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 855.0 MHz)							
3 700.98	H	-57.51	5.96	9.07	-54.40	-13	41.40
3 701.08	V	-60.76	5.97	9.07	-57.66	-13	44.66
5 558.76	H	-59.33	7.53	10.64	-56.22	-13	43.22
5 558.32	V	-62.20	7.53	10.64	-59.09	-13	46.09
Middle Channel (1 880.0 MHz)							
3 750.98	H	-59.09	6.21	9.12	-56.18	-13	43.18
3 751.18	V	-58.17	6.22	9.12	-55.27	-13	42.27
5 633.68	H	-56.11	7.62	10.87	-52.86	-13	39.86
5 633.23	V	-59.25	7.62	10.86	-56.01	-13	43.01
High Channel (1 905.0 MHz)							
3 801.23	H	-59.72	6.46	9.16	-57.02	-13	44.02
3 800.96	V	-54.35	6.46	9.16	-51.65	-13	38.65
5 708.43	H	-55.00	7.84	11.27	-51.57	-13	38.57
5 708.16	V	-57.38	7.84	11.27	-53.95	-13	40.95

* 10 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2

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

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 857.5 MHz)							
3 701.35	H	-57.58	5.97	9.07	-54.48	-13	41.48
3 701.68	V	-60.58	5.97	9.07	-57.48	-13	44.48
5 559.22	H	-58.68	7.53	10.64	-55.57	-13	42.57
5 560.01	V	-61.13	7.53	10.64	-58.02	-13	45.02
Middle Channel (1 880.0 MHz)							
3 748.23	H	-59.10	6.20	9.11	-56.19	-13	43.19
3 747.12	V	-58.42	6.20	9.11	-55.51	-13	42.51
5 626.96	H	-55.11	7.60	10.83	-51.88	-13	38.88
5 627.01	V	-60.27	7.60	10.83	-57.04	-13	44.04
High Channel (1 902.5 MHz)							
3 792.03	H	-60.13	6.42	9.16	-57.39	-13	44.39
3 791.82	V	-56.52	6.42	9.16	-53.78	-13	40.78
5 694.20	H	-54.44	7.81	11.23	-51.02	-13	38.02
5 693.74	V	-57.66	7.81	11.23	-54.24	-13	41.24

* 15 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 2

- Modulation Signal: LTE band 2 (20 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 860.0 MHz)							
3 702.62	H	-58.62	5.97	9.07	-55.52	-13	42.52
3 702.20	V	-60.98	5.97	9.07	-57.88	-13	44.88
5 560.10	H	-58.58	7.53	10.64	-55.47	-13	42.47
5 561.11	V	-62.34	7.53	10.64	-59.23	-13	46.23
Middle Channel (1 880.0 MHz)							
3 742.67	H	-58.96	6.17	9.11	-56.02	-13	43.02
3 742.44	V	-58.56	6.17	9.11	-55.62	-13	42.62
5 620.08	H	-55.52	7.58	10.78	-52.32	-13	39.32
5 619.98	V	-58.36	7.58	10.78	-55.16	-13	42.16
High Channel (1 900.0 MHz)							
3 781.87	H	-61.38	6.37	9.15	-58.60	-13	45.60
3 782.56	V	-57.00	6.37	9.15	-54.22	-13	41.22
5 680.02	H	-53.55	7.77	11.15	-50.17	-13	37.17
5 679.82	V	-56.96	7.77	11.15	-53.58	-13	40.58

* 20 BW 1RB size / 0 Offset for B2

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 710.7 MHz)							
3 420.50	H	-48.81	5.88	9.27	-45.42	-13	32.42
3 420.66	V	-45.47	5.88	9.27	-42.08	-13	29.08
5 130.82	H	-47.32	7.61	10.44	-44.49	-13	31.49
5 130.88	V	-55.34	7.61	10.45	-52.50	-13	39.50
6 841.02	H	-52.41	8.69	11.70	-49.40	-13	36.40
6 841.08	V	-56.95	8.70	11.70	-53.95	-13	40.95
Middle Channel (1 732.5 MHz)							
3 464.08	H	-50.27	5.92	9.24	-46.95	-13	33.95
3 464.18	V	-51.04	5.92	9.24	-47.72	-13	34.72
5 196.24	H	-48.08	7.75	10.60	-45.23	-13	32.23
5 196.20	V	-54.16	7.75	10.60	-51.31	-13	38.31
6 928.32	H	-52.28	8.90	11.67	-49.51	-13	36.51
6 928.30	V	-53.92	8.90	11.67	-51.15	-13	38.15
High Channel (1 754.3 MHz)							
3 507.78	H	-54.82	5.94	9.22	-51.54	-13	38.54
3 507.68	V	-57.48	5.94	9.22	-54.20	-13	41.20
5 261.50	H	-48.90	7.68	10.71	-45.87	-13	32.87
5 261.74	V	-51.11	7.68	10.71	-48.08	-13	35.08
7 015.36	H	-51.79	8.98	11.67	-49.10	-13	36.10
7 015.18	V	-59.82	8.98	11.67	-57.13	-13	44.13

* 1.4 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 711.5 MHz)							
3 420.46	H	-49.66	5.88	9.27	-46.27	-13	33.27
3 420.58	V	-45.54	5.88	9.27	-42.15	-13	29.15
5 130.72	H	-47.21	7.61	10.44	-44.38	-13	31.38
5 130.54	V	-55.29	7.61	10.44	-52.46	-13	39.46
6 841.16	H	-52.67	8.70	11.70	-49.67	-13	36.67
6 840.72	V	-56.55	8.69	11.70	-53.54	-13	40.54
Middle Channel (1 732.5 MHz)							
3 462.58	H	-52.24	5.92	9.24	-48.92	-13	35.92
3 462.56	V	-50.99	5.92	9.24	-47.67	-13	34.67
5 193.80	H	-48.41	7.75	10.60	-45.56	-13	32.56
5 193.66	V	-54.24	7.75	10.59	-51.40	-13	38.40
6 924.98	H	-52.92	8.90	11.66	-50.16	-13	37.16
6 925.15	V	-55.60	8.90	11.66	-52.84	-13	39.84
High Channel (1 753.5 MHz)							
3 504.62	H	-55.64	5.94	9.22	-52.36	-13	39.36
3 504.48	V	-56.81	5.94	9.22	-53.53	-13	40.53
5 256.98	H	-50.30	7.69	10.70	-47.29	-13	34.29
5 256.90	V	-51.63	7.69	10.70	-48.62	-13	35.62
7 008.98	H	-52.25	8.99	11.69	-49.55	-13	36.55
7 008.97	V	-59.85	8.99	11.69	-57.15	-13	44.15

* 3 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 712.5 MHz)							
3 420.70	H	-49.10	5.88	9.27	-45.71	-13	32.71
3 420.64	V	-45.34	5.88	9.27	-41.95	-13	28.95
5 131.04	H	-46.89	7.61	10.45	-44.05	-13	31.05
5 130.68	V	-54.91	7.61	10.44	-52.08	-13	39.08
6 841.30	H	-52.55	8.70	11.70	-49.55	-13	36.55
6 841.28	V	-56.42	8.70	11.70	-53.42	-13	40.42
Middle Channel (1 732.5 MHz)							
3 460.62	H	-51.10	5.91	9.24	-47.77	-13	34.77
3 460.70	V	-50.86	5.91	9.24	-47.53	-13	34.53
5 191.00	H	-48.36	7.74	10.59	-45.51	-13	32.51
5 191.14	V	-54.25	7.74	10.59	-51.40	-13	38.40
6 921.42	H	-53.31	8.89	11.66	-50.54	-13	37.54
6 921.56	V	-55.87	8.89	11.66	-53.10	-13	40.10
High Channel (1 752.5 MHz)							
3 500.94	H	-57.43	5.95	9.21	-54.17	-13	41.17
3 500.76	V	-55.33	5.95	9.21	-52.07	-13	39.07
5 251.16	H	-50.76	7.69	10.69	-47.76	-13	34.76
5 251.22	V	-52.47	7.69	10.69	-49.47	-13	36.47
7 001.48	H	-52.61	9.01	11.71	-49.91	-13	36.91
7 001.02	V	-59.86	9.01	11.71	-57.16	-13	44.16

* 5 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 715.0 MHz)							
3 421.20	H	-49.14	5.88	9.27	-45.75	-13	32.75
3 421.11	V	-45.51	5.88	9.27	-42.12	-13	29.12
5 131.72	H	-47.19	7.61	10.45	-44.35	-13	31.35
5 131.90	V	-55.75	7.61	10.45	-52.91	-13	39.91
6 842.32	H	-52.06	8.70	11.69	-49.07	-13	36.07
6 842.30	V	-56.61	8.70	11.69	-53.62	-13	40.62
Middle Channel (1 732.5 MHz)							
3 456.18	H	-52.15	5.91	9.24	-48.82	-13	35.82
3 455.99	V	-50.56	5.91	9.24	-47.23	-13	34.23
5 184.36	H	-48.09	7.73	10.57	-45.25	-13	32.25
5 184.14	V	-54.82	7.73	10.57	-51.98	-13	38.98
6 912.32	H	-53.26	8.88	11.65	-50.49	-13	37.49
6 912.56	V	-55.36	8.88	11.66	-52.58	-13	39.58
High Channel (1 750.0 MHz)							
3 491.06	H	-50.88	5.94	9.22	-47.60	-13	34.60
3 491.33	V	-52.55	5.94	9.22	-49.27	-13	36.27
5 236.61	H	-50.88	7.71	10.67	-47.92	-13	34.92
5 236.70	V	-54.64	7.71	10.67	-51.68	-13	38.68
6 982.44	H	-53.73	8.98	11.70	-51.01	-13	38.01
6 982.50	V	-57.65	8.98	11.70	-54.93	-13	41.93

* 10 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (15 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 717.5 MHz)							
3 421.84	H	-49.30	5.88	9.26	-45.92	-13	32.92
3 421.73	V	-45.20	5.88	9.26	-41.82	-13	28.82
5 132.36	H	-47.14	7.61	10.45	-44.30	-13	31.30
5 132.40	V	-55.54	7.61	10.45	-52.70	-13	39.70
6 843.46	H	-52.14	8.70	11.69	-49.15	-13	36.15
6 843.40	V	-55.91	8.70	11.69	-52.92	-13	39.92
Middle Channel (1 732.5 MHz)							
3 451.64	H	-51.87	5.91	9.24	-48.54	-13	35.54
3 451.75	V	-50.38	5.91	9.24	-47.05	-13	34.05
5 177.50	H	-48.11	7.71	10.56	-45.26	-13	32.26
5 177.60	V	-55.34	7.71	10.56	-52.49	-13	39.49
6 903.50	H	-52.84	8.87	11.65	-50.06	-13	37.06
6 903.48	V	-54.68	8.87	11.65	-51.90	-13	38.90
High Channel (1 747.5 MHz)							
3 481.64	H	-48.52	5.93	9.22	-45.23	-13	32.23
3 481.77	V	-50.76	5.93	9.22	-47.47	-13	34.47
5 222.64	H	-50.05	7.73	10.65	-47.13	-13	34.13
5 222.48	V	-53.09	7.73	10.65	-50.17	-13	37.17
6 963.60	H	-51.71	8.96	11.69	-48.98	-13	35.98
6 962.89	V	-55.66	8.95	11.69	-52.92	-13	39.92

* 15 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 4

- Modulation Signal: LTE band 4 (20 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB i)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 720.0 MHz)							
3 422.26	H	-50.24	5.88	9.26	-46.86	-13	33.86
3 422.21	V	-45.67	5.88	9.26	-42.29	-13	29.29
5 133.14	H	-47.88	7.61	10.45	-45.04	-13	32.04
5 311.34	V	-50.85	7.65	10.74	-47.76	-13	34.76
6 844.34	H	-52.98	8.70	11.69	-49.99	-13	36.99
6 844.26	V	-56.47	8.70	11.69	-53.48	-13	40.48
Middle Channel (1 732.5 MHz)							
3 447.20	H	-53.72	5.90	9.25	-50.37	-13	37.37
3 447.27	V	-51.38	5.90	9.25	-48.03	-13	35.03
5 170.92	H	-48.34	7.70	10.54	-45.50	-13	32.50
5 170.80	V	-55.74	7.70	10.54	-52.90	-13	39.90
6 894.56	H	-53.26	8.84	11.65	-50.45	-13	37.45
6 894.21	V	-55.21	8.84	11.65	-52.40	-13	39.40
High Channel (1 745.0 MHz)							
3 472.06	H	-49.61	5.92	9.23	-46.30	-13	33.30
3 472.17	V	-50.65	5.92	9.23	-47.34	-13	34.34
5 208.42	H	-47.78	7.75	10.62	-44.91	-13	31.91
5 208.28	V	-53.18	7.75	10.62	-50.31	-13	37.31
6 944.52	H	-51.48	8.93	11.68	-48.73	-13	35.73
6 954.67	V	-54.07	8.94	11.68	-51.33	-13	38.33

* 20 BW 1RB size / 0 Offset for B4

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5

- Modulation Signal: LTE band 5 (1.4 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (824.7 MHz)							
1 648.50	H	-25.13	4.01	5.99	-23.15	-13	10.15
1 648.49	V	-36.14	4.01	5.99	-34.16	-13	21.16
2 475.24	H	-35.27	4.80	7.01	-33.06	-13	20.06
2 472.86	V	-40.57	4.80	7.01	-38.36	-13	25.36
3 296.94	H	-50.68	5.52	6.69	-49.51	-13	36.51
3 296.94	V	-46.51	5.52	6.69	-45.34	-13	32.34
5 768.78	H	-49.74	7.90	9.13	-48.51	-13	35.51
5 769.86	V	-52.85	7.90	9.13	-51.62	-13	38.62
Middle Channel (836.5 MHz)							
1 672.16	H	-32.21	4.06	6.17	-30.10	-13	17.10
1 672.12	V	-35.29	4.06	6.17	-33.18	-13	20.18
2 508.18	H	-34.53	4.82	6.97	-32.38	-13	19.38
2 508.12	V	-39.03	4.82	6.97	-36.88	-13	23.88
3 344.16	H	-50.94	5.68	6.89	-49.73	-13	36.73
3 344.30	V	-46.30	5.68	6.89	-45.09	-13	32.09
5 852.40	H	-47.98	7.80	9.17	-46.61	-13	33.61
5 852.46	V	-47.05	7.80	9.17	-45.68	-13	32.68
High Channel (848.3 MHz)							
1 695.72	H	-39.16	4.11	6.35	-36.92	-13	23.92
1 695.67	V	-35.69	4.11	6.35	-33.45	-13	20.45
2 541.12	H	-33.20	4.87	6.89	-31.18	-13	18.18
2 543.56	V	-37.65	4.87	6.89	-35.63	-13	22.63
3 391.54	H	-48.22	5.83	7.09	-46.96	-13	33.96
3 391.44	V	-44.74	5.83	7.09	-43.48	-13	30.48
5 934.70	H	-56.04	7.71	9.11	-54.64	-13	41.64
5 934.72	V	-58.35	7.71	9.11	-56.95	-13	43.95

* 1.4 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5

- Modulation Signal: LTE band 5 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (825.5 MHz)							
1 648.50	H	-25.94	4.01	5.99	-23.96	-13	10.96
1 648.59	V	-36.68	4.01	5.99	-34.70	-13	21.70
2 475.78	H	-35.46	4.80	7.01	-33.25	-13	20.25
2 472.82	V	-41.02	4.80	7.01	-38.81	-13	25.81
3 296.92	H	-51.27	5.52	6.69	-50.10	-13	37.10
3 296.94	V	-46.44	5.52	6.69	-45.27	-13	32.27
5 769.66	H	-50.48	7.90	9.13	-49.25	-13	36.25
5 770.00	V	-54.30	7.90	9.13	-53.07	-13	40.07
Middle Channel (836.5 MHz)							
1 670.54	H	-33.92	4.06	6.16	-31.82	-13	18.82
1 670.49	V	-36.76	4.06	6.16	-34.66	-13	21.66
2 505.72	H	-35.36	4.82	6.98	-33.20	-13	20.20
2 505.78	V	-40.48	4.82	6.98	-38.32	-13	25.32
3 340.94	H	-51.34	5.67	6.88	-50.13	-13	37.13
3 340.88	V	-46.74	5.66	6.88	-45.52	-13	32.52
5 846.74	H	-48.85	7.81	9.17	-47.49	-13	34.49
5 846.56	V	-49.09	7.81	9.17	-47.73	-13	34.73
High Channel (847.5 MHz)							
1 692.54	H	-39.33	4.10	6.32	-37.11	-13	24.11
1 692.59	V	-37.90	4.10	6.32	-35.68	-13	22.68
2 535.68	H	-32.51	4.86	6.91	-30.46	-13	17.46
2 538.82	V	-38.69	4.86	6.90	-36.65	-13	23.65
3 384.90	H	-49.87	5.81	7.06	-48.62	-13	35.62
3 384.92	V	-46.28	5.81	7.06	-45.03	-13	32.03
5 923.93	H	-55.60	7.70	9.14	-54.16	-13	41.16
5 924.06	V	-54.54	7.70	9.14	-53.10	-13	40.10

* 3 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5

- Modulation Signal: LTE band 5 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.5 MHz)							
1 648.66	H	-25.29	4.01	5.99	-23.31	-13	10.31
1 648.73	V	-36.09	4.01	5.99	-34.11	-13	21.11
2 473.04	H	-35.47	4.80	7.01	-33.26	-13	20.26
2 473.12	V	-40.77	4.80	7.01	-38.56	-13	25.56
3 297.38	H	-50.71	5.53	6.69	-49.55	-13	36.55
3 297.32	V	-46.29	5.52	6.69	-45.12	-13	32.12
5 770.42	H	-49.13	7.90	9.13	-47.90	-13	34.90
5 770.42	V	-52.88	7.90	9.13	-51.65	-13	38.65
Middle Channel (836.5 MHz)							
1 668.75	H	-33.29	4.05	6.14	-31.20	-13	18.20
1 668.69	V	-37.72	4.05	6.14	-35.63	-13	22.63
2 502.98	H	-35.94	4.81	6.98	-33.77	-13	20.77
2 502.90	V	-41.95	4.81	6.98	-39.78	-13	26.78
3 337.32	H	-51.50	5.65	6.86	-50.29	-13	37.29
3 337.26	V	-47.44	5.65	6.86	-46.23	-13	33.23
5 840.38	H	-47.17	7.83	9.17	-45.83	-13	32.83
5 840.40	V	-47.97	7.83	9.17	-46.63	-13	33.63
High Channel (846.5 MHz)							
1 688.65	H	-36.75	4.10	6.29	-34.56	-13	21.56
1 688.68	V	-36.59	4.10	6.29	-34.40	-13	21.40
2 535.68	H	-32.51	4.86	6.91	-30.46	-13	17.46
2 533.04	V	-37.53	4.86	6.91	-35.48	-13	22.48
3 377.52	H	-49.14	5.79	7.03	-47.90	-13	34.90
3 377.28	V	-45.51	5.79	7.03	-44.27	-13	31.27
5 910.54	H	-52.50	7.69	9.18	-51.01	-13	38.01
5 910.12	V	-51.00	7.69	9.18	-49.51	-13	36.51

* 5 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 5

- Modulation Signal: LTE band 5 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (829.0 MHz)							
1 649.25	H	-25.65	4.01	6.00	-23.66	-13	10.66
1 649.38	V	-36.03	4.01	6.00	-34.04	-13	21.04
2 473.89	H	-35.35	4.80	7.01	-33.14	-13	20.14
2 473.74	V	-40.69	4.80	7.01	-38.48	-13	25.48
3 298.46	H	-50.60	5.53	6.70	-49.43	-13	36.43
3 298.41	V	-46.54	5.53	6.70	-45.37	-13	32.37
5 772.36	H	-50.27	7.90	9.13	-49.04	-13	36.04
5 772.28	V	-52.60	7.90	9.13	-51.37	-13	38.37
Middle Channel (836.5 MHz)							
1 664.22	H	-33.74	4.04	6.11	-31.67	-13	18.67
1 664.23	V	-39.70	4.04	6.11	-37.63	-13	24.63
2 496.29	H	-37.31	4.81	6.99	-35.13	-13	22.13
2 496.29	V	-45.06	4.81	6.99	-42.88	-13	29.88
3 328.26	H	-52.10	5.62	6.82	-50.90	-13	37.90
3 328.14	V	-48.04	5.62	6.82	-46.84	-13	33.84
5 824.52	H	-48.20	7.87	9.16	-46.91	-13	33.91
5 824.44	V	-49.21	7.87	9.16	-47.92	-13	34.92
High Channel (844.0 MHz)							
1 679.13	H	-32.37	4.07	6.22	-30.22	-13	17.22
1 679.28	V	-33.45	4.07	6.22	-31.30	-13	18.30
2 518.86	H	-32.25	4.84	6.95	-30.14	-13	17.14
2 518.77	V	-36.06	4.84	6.95	-33.95	-13	20.95
3 358.42	H	-49.67	5.72	6.95	-48.44	-13	35.44
3 358.32	V	-44.70	5.72	6.95	-43.47	-13	30.47
5 877.10	H	-50.35	7.74	9.19	-48.90	-13	35.90
5 877.40	V	-48.09	7.74	9.19	-46.64	-13	33.64

* 10 BW 1RB size / 0 Offset for B5

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12

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

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (699.7 MHz)							
1 398.59	H	-44.65	3.57	6.13	-42.09	-13	29.09
1 398.43	V	-48.34	3.57	6.13	-45.78	-13	32.78
2 097.91	H	-55.11	4.53	6.39	-53.25	-13	40.25
2 086.77	V	-63.92	4.52	6.29	-62.15	-13	49.15
Middle Channel (707.5 MHz)							
1 414.00	H	-38.49	3.58	6.08	-35.99	-13	22.99
1 414.16	V	-42.72	3.58	6.08	-40.22	-13	27.22
2 121.22	H	-53.76	4.55	6.44	-51.87	-13	38.87
2 120.88	V	-62.13	4.55	6.44	-60.24	-13	47.24
High Channel (715.3 MHz)							
1 429.69	H	-48.85	3.60	6.02	-46.43	-13	33.43
1 429.69	V	-53.04	3.60	6.02	-50.62	-13	37.62
2 144.55	H	-54.29	4.57	6.47	-52.39	-13	39.39
2 144.62	V	-61.77	4.57	6.47	-59.87	-13	46.87

* 1.4 BW 1RB size / 0 Offset for B12

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12

- Modulation Signal: LTE band 12 (3 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (700.5 MHz)							
1 398.37	H	-45.33	3.57	6.13	-42.77	-13	29.77
1 398.46	V	-48.53	3.57	6.13	-45.97	-13	32.97
2 097.77	H	-55.52	4.53	6.38	-53.67	-13	40.67
2 097.52	V	-63.96	4.53	6.38	-62.11	-13	49.11
Middle Channel (707.5 MHz)							
1 412.55	H	-41.35	3.58	6.08	-38.85	-13	25.85
1 412.50	V	-44.59	3.58	6.08	-42.09	-13	29.09
2 118.68	H	-53.76	4.55	6.43	-51.88	-13	38.88
2 118.52	V	-62.71	4.55	6.43	-60.83	-13	47.83
High Channel (714.5 MHz)							
1 426.57	H	-43.18	3.60	6.03	-40.75	-13	27.75
1 426.41	V	-51.46	3.60	6.03	-49.03	-13	36.03
2 139.83	H	-54.79	4.57	6.47	-52.89	-13	39.89
2 139.57	V	-62.12	4.57	6.47	-60.22	-13	47.22

* 3 BW 1RB size / 0 Offset for B12

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12

- Modulation Signal: LTE band 12 (5 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (701.5 MHz)							
1 398.81	H	-44.77	3.57	6.13	-42.21	-13	29.21
1 398.58	V	-48.58	3.57	6.13	-46.02	-13	33.02
2 098.05	H	-55.69	4.53	6.39	-53.83	-13	40.83
2 097.98	V	-63.86	4.53	6.39	-62.00	-13	49.00
Middle Channel (707.5 MHz)							
1 410.74	H	-42.31	3.58	6.09	-39.80	-13	26.80
1 410.75	V	-45.30	3.58	6.09	-42.79	-13	29.79
2 116.09	H	-53.44	4.55	6.43	-51.56	-13	38.56
2 115.98	V	-63.19	4.55	6.43	-61.31	-13	48.31
High Channel (713.5 MHz)							
1 422.66	H	-38.09	3.59	6.05	-35.63	-13	22.63
1 422.68	V	-44.10	3.59	6.05	-41.64	-13	28.64
2 134.08	H	-53.43	4.56	6.46	-51.53	-13	38.53
2 134.10	V	-62.09	4.56	6.46	-60.19	-13	47.19

* 5 BW 1RB size / 0 Offset for B12

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

LTE band 12

- Modulation Signal: LTE band 12 (10 MHz – QPSK)

Frequency (MHz)	Ant. Pol. (H/V)	S.G level + Amp. (dB m)	Cable loss (dB)	Ant. gain (dB d)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (704.0 MHz)							
1 399.12	H	-45.28	3.57	6.13	-42.72	-13	29.72
1 399.25	V	-49.11	3.57	6.13	-46.55	-13	33.55
2 098.65	H	-55.85	4.53	6.39	-53.99	-13	40.99
2 098.24	V	-63.73	4.53	6.39	-61.87	-13	48.87
Middle Channel (707.5 MHz)							
1 406.12	H	-52.13	3.58	6.11	-49.60	-13	36.60
1 406.19	V	-53.13	3.58	6.11	-50.60	-13	37.60
2 109.35	H	-54.90	4.54	6.42	-53.02	-13	40.02
2 109.66	V	-64.50	4.54	6.42	-62.62	-13	49.62
High Channel (711.0 MHz)							
1 413.16	H	-40.13	3.58	6.08	-37.63	-13	24.63
1 413.28	V	-43.63	3.58	6.08	-41.13	-13	28.13
2 119.89	H	-53.82	4.55	6.44	-51.93	-13	38.93
2 119.77	V	-63.15	4.55	6.43	-61.27	-13	48.27

* 10 BW 1RB size / 0 Offset for B12

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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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>

3. Conducted Output Power

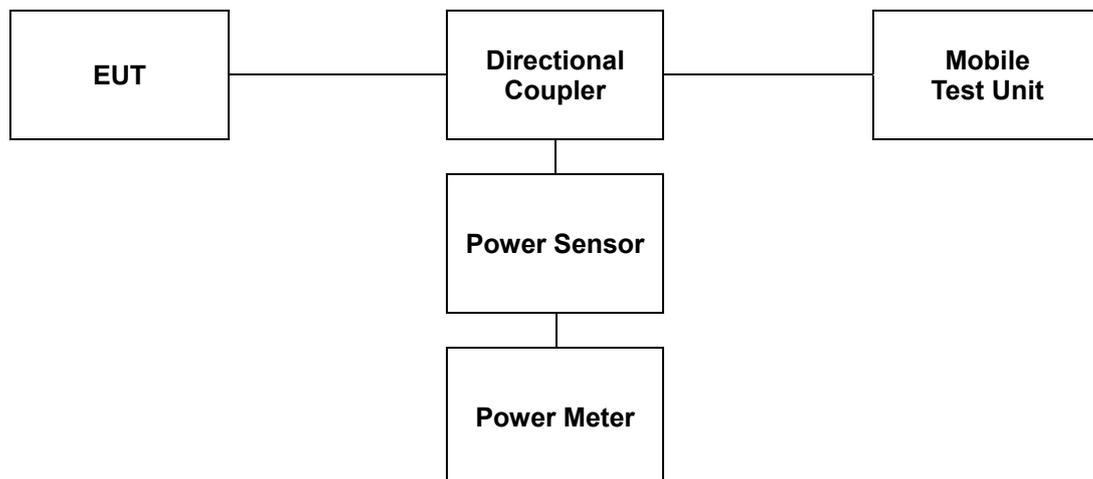
3.1. Limit

CFR 47, Section FCC §2.1046 and IC RSS-Gen Issue 5 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 of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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(2019.04.24)(1)

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

A4(210 mm x 297 mm)

3.3. Test Result

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

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	21.71	21.91	21.84	20.73	20.96	21.15	
		1	3	21.68	21.84	21.75	20.68	20.91	21.12	
		1	5	21.65	21.90	21.77	20.73	20.94	21.13	
		3	0	21.75	21.88	21.83	20.64	20.94	21.04	
		3	2	21.73	21.80	21.81	20.66	20.95	21.01	
		3	3	21.69	21.85	21.79	20.67	20.96	21.05	
		6	0	20.64	20.95	20.97	19.64	20.14	20.05	
		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	21.98	22.12	22.17	21.13	21.61	21.25
			1	8	21.92	21.91	22.20	21.06	21.59	21.21
			1	14	21.89	22.05	22.06	21.05	21.54	21.09
			8	0	21.01	21.15	21.19	20.06	20.43	20.23
			8	4	20.95	21.10	21.13	20.01	20.36	20.20
			8	7	20.99	21.09	21.10	20.00	20.40	20.19
			15	0	21.00	21.16	21.11	20.04	20.23	20.15
		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	22.32	22.28	22.35	21.25	21.06	21.34
			1	12	22.26	22.20	22.25	21.13	20.96	21.23
			1	24	22.21	22.16	22.18	21.10	20.92	21.15
			12	0	21.37	21.19	21.32	20.15	20.25	20.35
			12	7	21.36	21.15	21.21	20.11	20.23	20.30
			12	13	21.30	21.10	21.18	20.10	20.26	20.25
			25	0	20.99	21.22	21.26	20.07	20.23	20.27
		Bandwidth (MHz)	RB Size	RB Offset	1 855.0	1 880.0	1 905.0	1 855.0	1 880.0	1 905.0
		10	1	0	22.35	22.47	22.63	21.44	21.97	21.61
			1	25	22.05	22.23	22.18	21.16	21.67	21.25
	1		49	22.08	22.29	22.20	21.15	21.80	21.22	
	25		0	21.12	21.32	21.35	20.25	20.45	20.49	
	25		12	21.03	21.21	21.21	20.20	20.36	20.33	
	25		25	20.99	21.19	21.17	20.12	20.33	20.28	
		50	0	21.07	21.18	21.24	20.18	20.38	20.33	
	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	22.25	22.56	22.46	21.48	21.90	21.85	
		1	37	21.74	22.13	21.75	20.89	21.44	21.31	
		1	74	21.85	22.29	21.88	20.99	21.55	21.28	
		36	0	20.98	21.37	21.19	20.10	20.23	20.46	
		36	20	20.91	21.26	21.02	20.05	20.11	20.31	
		36	39	20.80	21.21	20.88	19.90	20.27	20.14	
		75	0	20.90	21.34	21.02	19.94	20.32	20.06	
	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	22.02	22.09	22.18	21.41	21.48	21.63	
		1	50	21.26	21.55	21.49	20.40	21.20	21.55	
		1	99	21.39	21.58	21.45	20.94	21.20	21.44	
		50	0	20.89	21.06	21.23	20.08	20.14	20.54	
		50	25	20.78	20.95	21.13	19.97	20.02	20.33	
		50	50	20.63	20.87	20.83	19.95	19.95	20.14	
		100	0	20.92	21.03	21.33	20.02	20.09	20.36	

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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	21.85	21.59	21.77	21.01	21.00	20.72	
		1	3	21.81	21.57	21.75	20.98	20.95	20.70	
		1	5	21.84	21.60	21.72	20.99	21.01	20.71	
		3	0	21.85	21.67	21.75	21.07	20.97	20.60	
		3	2	21.80	21.63	21.71	21.06	20.83	20.60	
		3	3	21.82	21.65	21.70	21.05	20.76	20.62	
		6	0	20.90	20.58	20.57	19.86	19.62	19.58	
		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	22.11	21.77	21.74	21.14	21.27	20.74
			1	8	22.07	21.70	21.67	21.08	21.17	20.66
			1	14	22.02	21.67	21.65	21.06	21.08	20.63
			8	0	20.97	20.71	20.62	19.94	19.90	19.64
			8	4	20.95	20.68	20.60	19.85	19.87	19.66
			8	7	20.96	20.69	20.61	19.89	19.84	19.63
		15	0	20.95	20.70	20.56	19.91	19.74	19.63	
		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	22.17	22.01	21.70	21.18	21.03	21.05
			1	12	22.06	21.89	21.65	21.11	20.93	20.98
			1	24	21.99	21.79	21.58	21.04	20.88	20.97
			12	0	21.02	20.77	20.61	20.01	19.68	19.86
			12	7	20.95	20.73	20.55	19.93	19.70	19.85
			12	13	20.91	20.66	20.53	19.96	19.71	19.84
		25	0	20.95	20.69	20.76	19.91	19.66	19.78	
		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	22.33	22.12	22.13	21.36	21.57	21.12
			1	25	22.07	21.79	21.80	21.06	21.22	20.72
			1	49	21.97	21.72	21.85	21.02	21.19	20.83
			25	0	21.16	20.88	20.86	20.01	19.84	19.90
			25	12	20.95	20.73	20.56	19.90	19.75	19.83
			25	25	20.82	20.64	20.10	19.81	19.62	19.76
		50	0	21.10	20.66	20.79	19.89	19.72	19.78	
		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	22.35	22.35	22.18	21.54	21.59	21.61
			1	37	21.78	21.73	21.60	21.02	20.94	21.01
			1	74	21.76	21.71	21.86	20.98	20.96	21.15
			36	0	21.07	21.00	21.04	20.08	20.13	20.00
	36		20	20.83	20.95	20.88	19.98	20.01	19.83	
	36		39	20.84	20.83	20.76	19.81	19.83	19.75	
	75	0	20.96	20.96	20.87	19.90	19.94	19.81		
	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	22.36	22.29	22.13	21.65	21.61	21.32	
		1	50	21.78	21.67	21.53	21.12	20.90	20.62	
		1	99	21.62	21.47	21.46	20.88	20.84	20.57	
		50	0	21.27	21.06	20.99	20.20	20.09	19.79	
		50	25	21.02	20.87	20.81	19.93	19.85	19.63	
		50	50	20.87	20.72	20.66	19.79	19.72	19.60	
	100	0	21.07	20.91	20.83	20.01	19.90	19.82		

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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	836.5	848.3	824.7	836.5	848.3	
5	1.4	1	0	22.40	22.11	22.09	21.50	21.32	21.19	
		1	3	22.39	22.05	22.04	21.46	21.20	21.19	
		1	5	22.38	22.03	22.05	21.48	21.27	21.20	
		3	0	22.40	22.10	22.13	21.47	21.12	21.14	
		3	2	22.38	22.06	22.10	21.50	21.09	21.09	
		3	3	22.40	22.05	22.06	21.52	21.10	21.08	
		6	0	21.38	21.17	21.06	20.31	20.14	19.96	
		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	22.55	22.27	22.07	21.53	21.53	21.16
			1	8	22.34	22.07	22.04	21.55	21.49	21.15
			1	14	22.45	22.04	22.03	21.48	21.41	21.14
			8	0	21.33	21.28	21.07	20.58	20.52	20.18
			8	4	21.30	21.27	21.08	20.53	20.50	20.13
			8	7	21.27	21.26	21.10	20.54	20.49	20.14
			15	0	21.33	21.08	21.06	20.59	20.38	20.04
		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	22.56	22.09	22.03	21.67	20.97	21.12
			1	12	22.53	22.08	22.04	21.66	20.96	21.09
			1	24	22.44	22.04	21.98	21.58	20.85	21.06
			12	0	21.40	21.13	21.11	20.67	20.16	20.03
			12	7	21.36	21.03	21.12	20.63	20.11	20.03
			12	13	21.31	21.07	21.15	20.65	20.13	20.04
			25	0	21.45	21.10	21.02	20.55	20.15	20.01
		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	22.28	22.17	22.14	21.59	21.71	21.24
			1	25	22.23	22.01	21.98	21.52	21.52	21.11
			1	49	22.06	21.89	21.94	21.26	21.40	21.08
			25	0	21.30	21.10	21.11	20.34	20.16	20.12
			25	12	21.21	21.05	21.06	20.25	20.13	20.10
			25	25	21.15	21.00	21.04	20.16	20.02	20.06
			50	0	21.23	21.05	21.03	20.22	20.12	20.03

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. 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	22.69	22.87	22.70	22.04	21.87	21.85	
		1	3	23.02	22.80	22.77	22.02	21.92	21.86	
		1	5	22.92	22.82	22.75	22.06	21.83	21.98	
		3	0	22.67	22.88	22.75	21.84	21.84	21.68	
		3	2	22.63	22.87	22.73	21.86	21.85	21.66	
		3	3	22.59	22.89	22.73	21.87	21.89	21.65	
		6	0	21.88	21.74	21.69	20.81	20.75	20.67	
		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	22.95	22.82	22.69	22.09	22.19	21.79
			1	8	22.92	22.80	22.67	22.07	22.17	21.77
			1	14	22.86	22.75	22.74	22.05	22.05	21.76
			8	0	21.95	21.84	21.67	20.97	21.02	20.75
			8	4	21.90	21.81	21.63	20.95	20.93	20.80
			8	7	21.85	21.73	21.70	20.87	20.98	20.82
			15	0	21.85	21.70	21.60	20.88	20.88	20.71
		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	22.94	22.89	22.64	21.98	21.59	21.68
			1	12	22.88	22.88	22.63	21.94	21.54	21.70
			1	24	22.73	22.70	22.62	21.86	21.38	21.71
			12	0	21.88	21.75	21.63	20.95	20.80	20.60
			12	7	21.84	21.70	21.65	20.93	20.74	20.63
			12	13	21.82	21.68	21.66	20.90	20.77	20.67
			25	0	21.81	21.79	21.62	20.77	20.83	20.64
		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	22.94	22.77	22.74	22.13	22.28	21.86
			1	25	22.84	22.72	22.68	22.03	22.13	21.77
			1	49	22.67	22.49	22.50	21.93	22.00	21.67
			25	0	21.83	21.74	21.65	20.82	20.89	20.80
			25	12	21.76	21.68	21.63	20.77	20.81	20.73
			25	25	21.71	21.60	21.65	20.75	20.70	20.66
			50	0	21.79	21.70	21.77	20.75	20.89	20.74

The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.