SGS Korea Co., Ltd.
4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807
Tel. +82 31 428 5700 / Fax. +82 31 427 2370
http://www.sgsgroup.kr

TEST REPORT

of

FCC Part 2 Subpart J, Part 22 Subpart C/H,
Part 24 Subpart E, Part 27 Subpart C and Part 90 Subpart S
IC RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6,
RSS-139 Issue 3, RSS-199 Issue 3 and RSS-Gen Issue 5

FCC ID: BEJTM05NNNABM0
IC Certification: 2703H-TM05NNNABM0

Equipment Under Test	:	Module
Model Name	:	TM05NNNABM0
Variant Model Name(s)	:	-
Applicant	:	FCC: LG Electronics USA IC: LG ELECTRONICS INC.
Manufacturer	:	LG Electronics Inc.
Date of Receipt	:	2021.04.02
Date of Test(s)	:	2020.04.06 ~ 2021.07.26
Date of Issue	:	2021.07.28

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

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

Tested by:  **Nancy Park**

Technical Manager:  **Jinhyoung Cho**

SGS Korea Co., Ltd. Gunpo Laboratory

INDEX

Table of Contents Page

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

1.3. Details of Manufacturer

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

1.4. Description of EUT

Kind of Product	Module
Model Name	TM05NNNABM0
Serial Number	Conducted: 352881170000019, Radiated: 352881170026303
Power Supply	DC 12.5 V
Rated Power	LTE Band 2, 4, 5, 7, 12, 13, 17, 25, 26, 41, 66, 71: 23 ㏈m
Frequency Range	LTE Band 2: 1 850 ㎒ ~ 1 910 ㎒ LTE Band 4: 1 710 ㎒ ~ 1 755 ㎒ LTE Band 5: 824 ㎒ ~ 849 ㎒ LTE Band 7: 2 500 ㎒ ~ 2 570 ㎒ LTE Band 12: 699 ㎒ ~ 716 ㎒ LTE Band 13: 777 ㎒ ~ 787 ㎒ LTE Band 17: 704 ㎒ ~ 716 ㎒ LTE Band 25: 1 850 ㎒ ~ 1 915 ㎒ LTE Band 26(FCC Only): 814 ㎒ ~ 824 ㎒ LTE Band 26: 824 ㎒ ~ 849 ㎒ LTE Band 41(FCC): 2 496 ㎒ ~ 2 690 ㎒ LTE Band 41(IC): 2 500 ㎒ ~ 2 690 ㎒ LTE Band 66: 1 710 ㎒ ~ 1 780 ㎒ LTE Band 71: 663 ㎒ ~ 698 ㎒
Modulation Technique	QPSK, 16QAM, 64QAM
Antenna Type	External Antenna (Refer to the clause 1.14)
Antenna Gain※	Refer to the clause 1.14
H/W Version	Rev.C
S/W Version	v001.139.141

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMR40	100272	Jun. 16, 2021	Annual	Jun. 16, 2022
Signal Generator	R&S	SMVB100A	255834	May 31, 2021	Annual	May 31, 2022
Spectrum Analyzer	R&S	FSV30	103453	Nov. 04, 2020	Annual	Nov. 04, 2021
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 04, 2020	Annual	Sep. 04, 2021
Spectrum Analyzer	Agilent	N9030A	US51350132	Nov. 12, 2020	Annual	Nov. 12, 2021
Communication Analyzer	Anritsu	MT8821C	6262192291	Oct. 08, 2020	Annual	Oct. 08, 2021
Power Meter	Anritsu	ML2495A	1223004	Jun. 01, 2021	Annual	Jun. 01, 2022
Power Sensor	Anritsu	MA2411B	1207272	Jun. 01, 2021	Annual	Jun. 01, 2022
Temperature Chamber	ESPEC CORP.	PL-2J	15004184	Jun. 02, 2021	Annual	Jun. 02, 2022
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-2	Feb. 08, 2021	Annual	Feb. 08, 2022
High Pass Filter	Wainwright Instrument GmbH	WHKX10-900-1000-18000 -40SS	7	Mar. 08, 2021	Annual	Mar. 08, 2022
High Pass Filter	Wainwright Instrument GmbH	WHKX2.2/12.75G-10SS	8	Mar. 04, 2021	Annual	Mar. 04, 2022
High Pass Filter	Wainwright Instrument GmbH	WHK3.0/18G-10SS	21	Jun. 04, 2021	Annual	Jun. 04, 2022
High Pass Filter	Wainwright Instrument GmbH	WHK7.5/26.5G-6SS	11	May 17, 2021	Annual	May 17, 2022
Directional Coupler	KRYTAR	152613	122660	Jun. 15, 2021	Annual	Jun. 15, 2022
DC Power Supply	Agilent	U8002A	MY49030063	Feb. 02, 2021	Annual	Feb. 02, 2022
Preamplifier	H.P.	8447F	2944A03909	Aug. 06, 2020	Annual	Aug. 06, 2021
Preamplifier	R&S	SCU-18	10117	Jun. 09, 2021	Annual	Jun. 09, 2022
Preamplifier	TESTEK	TK-PA1840H	130016	Jan. 07, 2021	Annual	Jan. 07, 2022
Test Receiver	R&S	ESU26	100109	Feb. 19, 2021	Annual	Feb. 19, 2022
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 22, 2019	Biennial	Aug. 22, 2021
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	Dec. 12, 2020	Biennial	Dec. 12, 2022
Horn Antenna	R&S	HF906	100326	Feb. 04, 2021	Annual	Feb. 04, 2022
Horn Antenna	Schwarzbeck Mess-Elektronik	BBHA9170	9170-540	Nov. 26, 2020	Annual	Nov. 26, 2021
Antenna Master	Innco systems GmbH	MA4640-XP-ET	MA4640/536/383 30516/L	N.C.R.	N/A	N.C.R.
Turn Table	Innco systems GmbH	DS 1200S	N/A	N.C.R.	N/A	N.C.R.
Controller	Innco systems GmbH	CONTROLLER CO3000-4P	CO3000/963/383 30516/L	N.C.R.	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.	N/A	N.C.R.
Coaxial Cable	RFONE	MWX221-NMSNMS (4 m)	J1023142	Jul. 05, 2021	Semi-Annual	Jan. 05, 2022
Coaxial Cable	RFONE	PL520-NMNM-10M (10 m)	20200324001	Jul. 05, 2021	Semi-Annual	Jan. 05, 2022
Coaxial Cable	RADIALL	TESTPRO 3	182287	Feb. 19, 2021	Semi-annual	Aug. 19, 2021
Coaxial Cable	RADIALL	TESTPRO 3	182288	Feb. 19, 2021	Semi-annual	Aug. 19, 2021
Coaxial Cable	RADIALL	TESTPRO 3	182291	Feb. 19, 2021	Semi-annual	Aug. 19, 2021

▶ Support Equipment

Description	Manufacturer	Model	Serial Number
N/A	-	-	-

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2, 22, 24, 27 and 90 / IC RSS-Gen Issue 5, RSS-130 Issue 2, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3 and RSS-199 Issue 3			
Section in FCC	**Section in IC**	**Test Item(s)**	**Result**
§22.913(a)(5) §24.232(c) §27.50(b)(10) §27.50(c)(10) §27.50(d)(4) §27.50(h)(2) §90.635(b)	RSS-130 Issue 2 4.6 RSS-132 Issue 3 5.4 RSS-133 Issue 6 6.4 RSS-139 Issue 3 6.5 RSS-199 Issue 3 4.4	E.R.P. / E.I.R.P.	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.691(a)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	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 RSS-199 Issue 3 4.4	Peak-Average Ratio	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.691(a)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Spurious Emission at Antenna Terminal	Complied
§22.917(a) §24.238(a) §27.53(c)(2) §27.53(g) §27.53(h)(1) §27.53(m)(4) §90.691(a)	RSS-130 Issue 2 4.7 RSS-132 Issue 3 5.5 RSS-133 Issue 6 6.5 RSS-139 Issue 3 6.6 RSS-199 Issue 3 4.5	Band Edge and Emission Mask	Complied
§2.1055 §22.355 §24.235 §27.54 §90.213(a)	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 RSS-199 Issue 3 4.3	Frequency Stability	Complied

1.7. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

1.7.1. Conducted Test

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

1.7.2. Radiation test

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

1.8. Device Capabilities

This device contains the following capabilities;

LTE Band 2 (1 850 ㎒ ~ 1 910 ㎒) is covered by LTE Band 25 (1 850 ㎒ ~ 1 915 ㎒) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth. Therefore test data provided in this report covers LTE Band 2 as well as Band 25.
LTE Band 4 (1 710 ㎒ ~ 1 755 ㎒) is covered by LTE Band 66 (1 710 ㎒ ~ 1 780 ㎒) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth. Therefore test data provided in this report covers LTE Band 4 as well as Band 66.
LTE Band 17 (704 ㎒ ~ 716 ㎒) is covered by LTE Band 12 (699 ㎒ ~ 716 ㎒) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth. Therefore test data provided in this report covers LTE Band 17 as well as Band 12.
LTE Band 5 (824 ㎒ ~ 849 ㎒) is covered by LTE Band 26 (824 ㎒ ~ 849 ㎒) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth. Therefore test data provided in this report covers LTE Band 5 as well as Band 26.

1.9. Manufacturer Declaration

EUT has two (SIM1 and SIM2) ports, all testing were performed both SIM1, SIM2.

1.10. Worst Case Configuration and Mode

The worst-case is based on the conducted output power measurement investigation results. All testing was performed using QPSK, 16QAM and 64QAM modulations. However, the spurious radiated emission and spurious at antenna terminal were only performed on bandwidth and RB offset (with RB size 1) with the highest conducted power in QPSK.

The peak to average ratio were tested only 64QAM modulation as worst case.

The radiation test of the EUT was investigated in three orthogonal orientations X, Y, and Z, and the worst case data is reported.

1.11. Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)						Modulation			RB #		
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full
Conducted Output Power	7	V	V	V			V	V	V	V	V	V	V	V	V	V
	12/17	V	V	V	V	V	V	V			V	V	V	V	V	V
	13	V	V	V			V	V			V	V	V	V	V	V
	25/2	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	26/5	V	V	V	V	V	V	V	V		V	V	V	V	V	V
	26	V	V	V	V	V	V	V	V		V	V	V	V	V	V
	41	V	V	V			V	V	V	V	V	V	V	V	V	V
	66/4	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
	71	V	V	V			V	V	V	V	V	V	V	V	V	V
Frequency Stability	7	-	V	-			V	-	-	-	V	-	-	-	-	V
	12/17	-	V	-	-	-	V	-			V	-	-	-	-	V
	13	-	V	-			V	-			V	-	-	-	-	V
	25/2	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V
	26/5	-	V	-	-	-	V	-	-		V	-	-	-	-	V
	26	-	V	-	-	-	V	-	-		V	-	-	-	-	V
	41	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V
	66/4	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V
	71	-	V	-	-	-	V	-	-	-	V	-	-	-	-	V
Occupied Bandwidth	7	-	V	-			V	V	V	V	V	V	-	-	-	V
	12/17	-	V	-	V	V	V	V			V	V	-	-	-	V
	13	-	V	-			V	V			V	V	-	-	-	V
	25/2	-	V	-	V	V	V	V	V	V	V	V	-	-	-	V
	26/5	-	V	-	V	V	V	V	V		V	V	-	-	-	V
	26	-	V	-	V	V	V	V	V		V	V	-	-	-	V
	41	-	V	-			V	V	V	V	V	V	-	-	-	V
	66/4	-	V	-	V	V	V	V	V	V	V	V	-	-	-	V
	71	-	V	-			V	V	V	V	V	V	-	-	-	V
Peak-to-Average Ratio	7	V	V	V			V	V	V	V	-	-	V	-	-	V
	12/17	V	V	V	V	V	V	V			-	-	V	-	-	V
	13	V	V	V			V	V			-	-	V	-	-	V
	25/2	V	V	V	V	V	V	V	V	V	-	-	V	-	-	V
	26/5	V	V	V	V	V	V	V	V		-	-	V	-	-	V
	26	V	V	V	V	V	V	V	V		-	-	V	-	-	V
	41	V	V	V			V	V	V	V	-	-	V	-	-	V
	66/4	V	V	V	V	V	V	V	V	V	-	-	V	-	-	V
	71	V	V	V			V	V	V	V	-	-	V	-	-	V

Test Items	Band	Test Channel			Bandwidth (㎒)						Modulation			RB #		
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full
Band edge	7	V	-	V			V	V	V	V	V	V	-	V	-	V
	12/17	V	-	V	V	V	V	V			V	V	-	V	-	V
	13	V	-	V			V	V			V	V	-	V	-	V
	25/2	V	-	V	V	V	V	V	V	V	V	V	-	V	-	V
	26/5	V	-	V	V	V	V	V	V		V	V	-	V	-	V
	26	V	-	V	V	V	V	V	V		V	V	-	V	-	V
	41	V	-	V			V	V	V	V	V	V	-	V	-	V
	66/4	V	-	V	V	V	V	V	V	V	V	V	-	V	-	V
	71	V	-	V			V	V	V	V	V	V	-	V	-	V
Spurious at antenna terminal SIM 1	7	V	V	V			V	-	-	-	V	-	-	V	-	-
	12/17	V	V	V	-	-	-	V			V	-	-	V	-	-
	13	V	V	V			V	-			V	-	-	V	-	-
	25/2	V	V	V	-	-	-	-	-	V	V	-	-	V	-	-
	26/5	V	V	V	-	-	V	-	-		V	-	-	V	-	-
	26	V	V	V	-	-	V	-	-		V	-	-	V	-	-
	41	V	V	V			V	-	-	-	V	-	-	V	-	-
	66/4	V	V	V	-	V	-	-	-	-	V	-	-	V	-	-
	71	V	V	V			V	-	-	-	V	-	-	V	-	-
Spurious Radiated Emission SIM 1	7	V	V	V			V	-	-	-	V	-	-	V	-	-
	12/17	V	V	V	-	-	-	V			V	-	-	V	-	-
	13	V	V	V			V	-			V	-	-	V	-	-
	25/2	V	V	V	-	-	-	-	-	V	V	-	-	V	-	-
	26/5	V	V	V	-	-	V	-	-		V	-	-	V	-	-
	26	V	V	V	-	-	V	-	-		V	-	-	V	-	-
	41	V	V	V			V	-	-	-	V	-	-	V	-	-
	66/4	V	V	V	-	V	-	-	-	-	V	-	-	V	-	-
	71	V	V	V			V	-	-	-	V	-	-	V	-	-

Test Items	Band	Test Channel			Bandwidth (㎒)						Modulation			RB #		
		Low	Mid	High	1.4	3	5	10	15	20	QPSK	16QAM	64QAM	1	Half	Full
Spurious at antenna terminal SIM 2	7	V	V	V			-	V	-	-	V	-	-	V	-	-
	12/17	V	V	V	-	-	V	-			V	-	-	V	-	-
	13	V	V	V			V	-			V	-	-	V	-	-
	25/2	V	V	V	-	-	V	-	-	-	V	-	-	V	-	-
	26/5	V	V	V	-	V	-	-	-		V	-	-	V	-	-
	26	V	V	V	-	V	-	-	-		V	-	-	V	-	-
	41	V	V	V			-	-	-	V	V	-	-	V	-	-
	66/4	V	V	V	-	V	-	-	-	-	V	-	-	V	-	-
	71	V	V	V			-	V	-	-	V	-	-	V	-	-
Spurious Radiated Emission SIM 2	7	V	V	V			-	V	-	-	V	-	-	V	-	-
	12/17	V	V	V	-	-	V	-			V	-	-	V	-	-
	13	V	V	V			V	-			V	-	-	V	-	-
	25/2	V	V	V	-	-	V	-	-	-	V	-	-	V	-	-
	26/5	V	V	V	-	V	-	-	-		V	-	-	V	-	-
	26	V	V	V	-	V	-	-	-		V	-	-	V	-	-
	41	V	V	V			-	-	-	V	V	-	-	V	-	-
	66/4	V	V	V	-	V	-	-	-	-	V	-	-	V	-	-
	71	V	V	V			-	V	-	-	V	-	-	V	-	-

Note;

- All measurement was performed with 1RB or Full RB or both, we chosen RB condition for each test items as worst case.

1.12. Measurement Uncertainty

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

Parameter	Uncertainty	
RF Output Power	± 0.36 dB	
Occupied Bandwidth	± 13.12 kHz	
Conducted Spurious Emissions	± 0.63 dB	
Peak to Average Ratio	± 0.60 dB	
Frequency Stability	± 4.92 kHz	
Radiated Emission, 9 kHz to 30 MHz	H	± 3.66 dB
	V	± 3.66 dB
Radiated Emission, below 1 GHz	H	± 4.90 dB
	V	± 4.82 dB
Radiated Emission, above 1 GHz	H	± 3.62 dB
	V	± 3.64 dB

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

1.13. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL002382	2021.07.28	Initial

1.14. Antenna Designation

SIM 1

Antenna Type	Antenna No.	Antenna Name	Antenna Part Number
Trunk	1	Antenna Box (basic)	8705921
	2	MSA TEL	920631001
	3	MSA TEL SDARS	920361002
Roof	4	DA WAVE HAF 5G-US	8705914-05
	5	DA WAVE High 5G-US	5A09D90-03

Operating Frequency (㎒)		Antenna Peak Gain (㏈i)			
		Ant. No	Ant. Gain	Cable Loss	Final Gain
Band 71	663 ~ 698	Ant. 1	-3.00	0.22	-3.22
		Ant. 2	2.20	0.52	1.68
		Ant. 3	2.50	0.52	**1.98**
		Ant. 4	-3.80	-	-3.80
		Ant. 5	-3.40	-	-3.40
Band 12/17	669 ~ 716	Ant. 1	3.00	0.22	**2.78**
		Ant. 2	2.60	0.52	2.08
		Ant. 3	2.50	0.52	1.98
		Ant. 4	-3.00	-	-3.00
		Ant. 5	-3.10	-	-3.10
Band 13	777 ~ 787	Ant. 1	3.00	0.22	**2.78**
		Ant. 2	2.60	0.52	2.08
		Ant. 3	2.50	0.52	1.98
		Ant. 4	-3.00	-	-3.00
		Ant. 5	-3.10	-	-3.10
Band 26/5	824 ~ 849	Ant. 1	3.00	0.22	**2.78**
		Ant. 2	2.10	0.52	1.58
		Ant. 3	2.30	0.52	1.78
		Ant. 4	-0.40	-	-0.40
		Ant. 5	-0.20	-	-0.20
Band 26	814 ~ 824	Ant. 1	3.00	0.22	**2.78**
		Ant. 2	2.10	0.52	1.58
		Ant. 3	2.30	0.52	1.78
		Ant. 4	-0.30	-	-0.30
		Ant. 5	0.00	-	0.00
Band 66/4	1 710 ~ 1 780	Ant. 1	5.00	0.30	4.70
		Ant. 2	5.40	0.73	4.67
		Ant. 3	5.80	0.73	**5.07**
		Ant. 4	2.70	-	2.70
		Ant. 5	3.00	-	3.00
Band 25/2	1 850 ~ 1 915	Ant. 1	5.00	0.34	4.66
		Ant. 2	6.20	0.82	**5.38**
		Ant. 3	5.90	0.82	5.08
		Ant. 4	2.80	-	2.80
		Ant. 5	2.30	-	2.30
Band 7/41	2 496 ~ 2 690	Ant. 1	5.00	0.40	4.60
		Ant. 2	6.60	0.96	**5.64**
		Ant. 3	6.50	0.96	5.54
		Ant. 4	3.30	-	3.30
		Ant. 5	3.00	-	3.00

- The Roof type antennas are directly connected to the EUT, so there is no cable loss.

Test Case

Operating Frequency (㎒)		Ant. 1 (basic)	Ant. 2	Ant. 3	Ant. 4	Ant. 5
Band 25/2	1 850 ~ 1 915	V	V	-	-	-
Band 7/41	2 496 ~ 2 690	V	V	-	-	-
Band 66/4	1 710 ~ 1 780	V	-	V	-	-
Band 12, 13, 17 Band 26/5, 71	663 ~ 698 669 ~ 716 777 ~ 787 814 ~ 849	V	-	-	-	-

SIM 2

Antenna Type	Antenna No.	Antenna Name	Antenna Part Number
Trunk	1	Antenna Box	8705921
	2	FSA WAVE 5G (left/right)	8705919/8705920
	3	HKL Mobilradioantenna (basic)	5A2D602
	4	ZB Spoilerantenna	5A0C5B0

Operating Frequency (㎒)		Antenna Peak Gain (㏈i)			
		Ant. No	Ant. Gain	Cable Loss	Final Gain
Band 71	663 ~ 698	Ant. 1	-3.00	0.57	-3.57
		Ant. 2	4.00	0.57	3.43
		Ant. 3	5.00	0.57	**4.43**
		Ant. 4	4.00	0.57	3.43
Band 12/17	669 ~ 716	Ant. 1	3.00	0.57	2.43
		Ant. 2	4.00	0.57	3.43
		Ant. 3	5.00	0.57	**4.43**
		Ant. 4	3.00	0.57	2.43
Band 13	777 ~ 787	Ant. 1	3.00	0.57	2.43
		Ant. 2	4.00	0.57	3.43
		Ant. 3	5.00	0.57	**4.43**
		Ant. 4	3.00	0.57	2.43
Band 26/5	814 ~ 849	Ant. 1	3.00	0.57	2.43
		Ant. 2	4.00	0.57	3.43
		Ant. 3	5.00	0.57	**4.43**
		Ant. 4	3.00	0.57	2.43
Band 66/4	1 710 ~ 1 780	Ant. 1	5.00	0.79	4.21
		Ant. 2	4.00	0.79	3.21
		Ant. 3	5.00	0.79	**4.21**
		Ant. 4	4.00	0.79	3.21
Band 25/2	1 850 ~ 1 915	Ant. 1	5.00	0.89	4.11
		Ant. 2	4.00	0.89	3.11
		Ant. 3	5.00	0.89	**4.11**
		Ant. 4	4.00	0.89	3.11
Band 7/41	2 496 ~ 2 690	Ant. 1	5.00	1.04	3.96
		Ant. 2	5.00	1.04	3.96
		Ant. 3	5.00	1.04	**3.96**
		Ant. 4	4.00	1.04	2.96

Test Case

Operating Frequency (㎒)		Ant. 1	Ant. 2	Ant. 3 (basic)	Ant. 4
Band 25/2	1 850 ~ 1 915	-	-	V	-
Band 7/41	2 496 ~ 2 690	-	-	V	-
Band 66/4	1 710 ~ 1 780	-	-	V	-
Band 12, 13, 17 Band 26/5, 71	663 ~ 698 669 ~ 716 777 ~ 787 814 ~ 849	-	-	V	-

Note;

- The EUT has basic antenna (SIM 1: Antenna Box, SIM 2: HKL Mobilradioantenna) and all antennas support all LTE bands.
- For the radiated spurious emission test, Basic Antennas were used at all LTE band. Additional tests were performed using antennas with the highest antenna gain in each band.
- According to manufacturer’s antenna specification, only the highest antenna gain of each antenna is reported.

1.15. Emission Designator and Max Power

SIM 1

Band	Band width (㎒)	Modulation	Low Freq. (㎒)	Upper Freq. (㎒)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
7	5	QPSK	2 502.5	2 567.5	23.05	5.64	28.69	0.740	4M50G7D
		16QAM			22.34		27.98	0.628	4M50D7W
	10	QPSK	2 505	2 565	23.00		28.64	0.731	8M94G7D
		16QAM			22.32		27.96	0.625	8M92D7W
	15	QPSK	2 507.5	2 562.5	22.88		28.52	0.711	13M5G7D
		16QAM			22.27		27.91	0.618	13M5D7W
	20	QPSK	2 510	2 560	22.87		28.51	0.710	17M9G7D
		16QAM			22.23		27.87	0.612	17M9D7W
12/17	1.4	QPSK	699.7	715.3	22.41	2.78	23.04	0.201	1M09G7D
		16QAM			21.79		22.42	0.175	1M09D7W
	3	QPSK	700.5	714.5	22.43		23.06	0.202	2M67G7D
		16QAM			21.85		22.48	0.177	2M68D7W
	5	QPSK	701.5	713.5	22.44		23.07	0.203	4M50G7D
		16QAM			21.79		22.42	0.175	4M49D7W
	10	QPSK	704	711	22.60		23.23	0.210	8M94G7D
		16QAM			22.02		22.65	0.184	8M94D7W
13	5	QPSK	779.5	784.5	23.09	2.78	23.72	0.236	4M50G7D
		16QAM			22.47		23.10	0.204	4M52D7W
	10	QPSK	782		23.01		23.64	0.231	8M94G7D
		16QAM			22.43		23.06	0.202	8M92D7W
25/2	1.4	QPSK	1 850.7	1 914.3	22.50	5.38	27.88	0.614	1M09G7D
		16QAM			21.79		27.17	0.521	1M09D7W
	3	QPSK	1 851.5	1 913.5	22.57		27.95	0.624	2M67G7D
		16QAM			21.83		27.21	0.526	2M68D7W
	5	QPSK	1 852.5	1 912.5	22.55		27.93	0.621	4M50G7D
		16QAM			21.96		27.34	0.542	4M50D7W
	10	QPSK	1 855	1 910	22.50		27.88	0.614	8M94G7D
		16QAM			21.92		27.30	0.537	8M92D7W
	15	QPSK	1 857.5	1 907.5	22.58		27.96	0.625	13M5G7D
		16QAM			21.87		27.25	0.531	13M5D7W
	20	QPSK	1 860	1 905	22.61		27.99	0.630	17M9G7D
		16QAM			21.91		27.29	0.536	17M9D7W
26/5 Part 22	1.4	QPSK	824.7	848.3	22.39	2.78	23.02	0.200	1M09G7D
		16QAM			21.36		21.99	0.158	1M09D7W
	3	QPSK	825.5	847.5	22.59		23.22	0.210	2M67G7D
		16QAM			21.47		22.10	0.162	2M68D7W
	5	QPSK	826.5	846.5	22.48		23.11	0.205	4M50G7D
		16QAM			21.46		22.09	0.162	4M50D7W
	10	QPSK	829	844	22.56		23.19	0.208	8M94G7D
		16QAM			21.46		22.09	0.162	8M92D7W
26 Part 22	15	QPSK	831.5	841.5	22.37		23.00	0.200	13M5G7D
		16QAM			21.34		21.97	0.157	13M5D7W

Band	Band width (㎒)	Modulation	Low Freq. (㎒)	Upper Freq. (㎒)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
26 Part 90	1.4	QPSK	814.7	823.3	22.78	2.78	23.41	0.219	1M09G7D
		16QAM			22.22		22.85	0.193	1M09D7W
	3	QPSK	815.5	822.5	22.83		23.46	0.222	2M67G7D
		16QAM			22.23		22.86	0.193	2M68D7W
	5	QPSK	816.5	821.5	22.83		23.46	0.222	4M50G7D
		16QAM			22.16		22.79	0.190	4M50D7W
	10	QPSK	819		22.60		23.23	0.210	8M94G7D
		16QAM			21.93		22.56	0.180	8M92D7W
	15	QPSK	821.5		22.67		23.30	0.214	13M5G7D
		16QAM			22.03		22.66	0.185	13M5D7W
41 FCC	5	QPSK	2 498.5	2 687.5	25.85	5.64	31.49	1.409	4M52G7D
		16QAM			25.34		30.98	1.253	4M50D7W
	10	QPSK	2 501	2 685	25.77		31.41	1.384	8M92G7D
		16QAM			25.27		30.91	1.233	8M92D7W
	15	QPSK	2 503.5	2 682.5	25.78		31.42	1.387	13M5G7D
		16QAM			25.19		30.83	1.211	13M5D7W
	20	QPSK	2 506	2 680	25.81		31.45	1.396	17M9G7D
		16QAM			25.18		30.82	1.208	17M9D7W
41 IC	5	QPSK	2 502.5	2 687.5	25.53		31.17	1.309	4M50G7D
		16QAM			25.22		30.86	1.219	4M49D7W
	10	QPSK	2 505	2 685	25.51		31.15	1.303	8M92G7D
		16QAM			25.24		30.88	1.225	8M92D7W
	15	QPSK	2 507.5	2 682.5	25.47		31.11	1.291	13M5G7D
		16QAM			25.20		30.84	1.213	13M5D7W
	20	QPSK	2 600	2 680	25.51		31.15	1.303	17M9G7D
		16QAM			25.28		30.92	1.236	17M9D7W
66/4	1.4	QPSK	1 710.7	1 779.3	22.71	5.07	27.78	0.600	1M09G7D
		16QAM			22.01		27.08	0.511	1M09D7W
	3	QPSK	1 711.5	1 778.5	22.78		27.85	0.610	2M67G7D
		16QAM			22.08		27.15	0.519	2M68D7W
	5	QPSK	1 712.5	1 777.5	22.73		27.80	0.603	4M49G7D
		16QAM			22.07		27.14	0.518	4M50D7W
	10	QPSK	1 715	1 775	22.71		27.78	0.600	8M94G7D
		16QAM			22.01		27.08	0.511	8M94D7W
	15	QPSK	1 717.5	1 772.5	22.61		27.68	0.586	13M5G7D
		16QAM			21.85		26.92	0.492	13M5D7W
	20	QPSK	1 720	1 770	22.60		27.67	0.585	17M9G7D
		16QAM			21.76		26.83	0.482	17M9D7W
71	5	QPSK	665.5	695.5	22.97	1.98	22.80	0.191	4M53G7D
		16QAM			22.17		22.00	0.158	4M50D7W
	10	QPSK	668	693	22.80		22.63	0.183	8M95G7D
		16QAM			22.14		21.97	0.157	8M93D7W
	15	QPSK	670.5	690.5	22.81		22.64	0.184	13M5G7D
		16QAM			22.20		22.03	0.160	13M5D7W
	20	QPSK	673	688	22.79		22.62	0.183	17M9G7D
		16QAM			22.18		22.01	0.159	17M9D7W

SIM 2

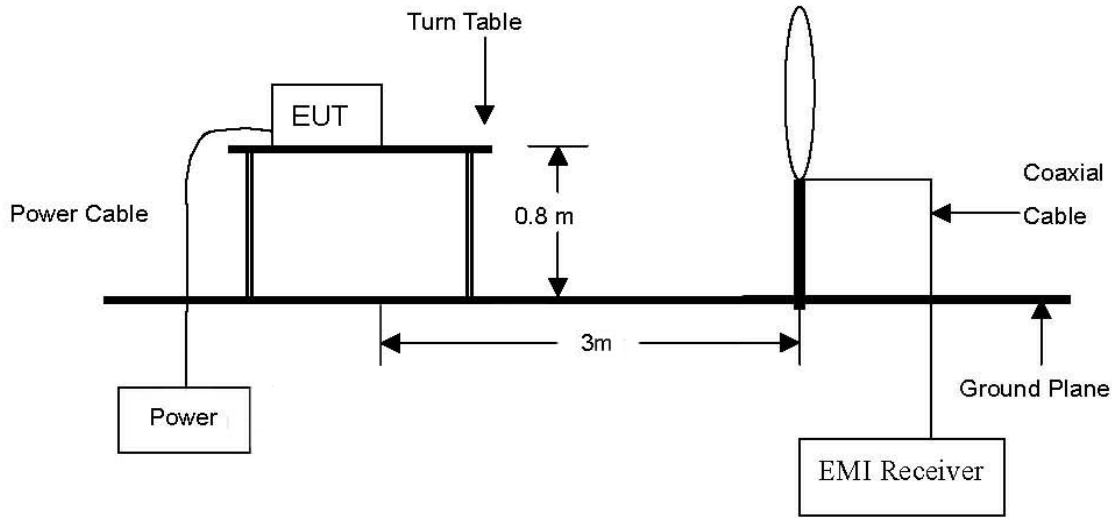
Band	Band width (㎒)	Modulation	Low Freq. (㎒)	Upper Freq. (㎒)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
7	5	QPSK	2 502.5	2 567.5	22.77	3.96	26.73	0.471	4M52G7D
		16QAM			22.13		26.09	0.406	4M52D7W
	10	QPSK	2 505	2 565	22.85		26.81	0.480	8M94G7D
		16QAM			22.06		26.02	0.400	8M97D7W
	15	QPSK	2 507.5	2 562.5	22.69		26.65	0.462	13M5G7D
		16QAM			22.19		26.15	0.412	13M5D7W
	20	QPSK	2 510	2 560	22.74		26.70	0.468	17M9G7D
		16QAM			22.08		26.04	0.402	18M0D7W
12/17	1.4	QPSK	699.7	715.3	22.96	4.43	25.24	0.334	1M09G7D
		16QAM			22.19		24.47	0.280	1M09D7W
	3	QPSK	700.5	714.5	23.09		25.37	0.344	2M68G7D
		16QAM			22.26		24.54	0.284	2M68D7W
	5	QPSK	701.5	713.5	23.16		25.44	0.350	4M50G7D
		16QAM			22.33		24.61	0.289	4M50D7W
	10	QPSK	704	711	23.12		25.40	0.347	8M94G7D
		16QAM			22.46		24.74	0.298	8M94D7W
13	5	QPSK	779.5	784.5	23.64	4.43	25.92	0.391	4M52G7D
		16QAM			23.09		25.37	0.344	4M52D7W
	10	QPSK	782		23.63		25.91	0.390	8M94G7D
		16QAM			23.37		25.65	0.367	8M94D7W
25/2	1.4	QPSK	1 850.7	1 914.3	22.72	4.11	26.83	0.482	1M09G7D
		16QAM			22.10		26.21	0.418	1M10D7W
	3	QPSK	1 851.5	1 913.5	22.73		26.84	0.483	2M69G7D
		16QAM			22.05		26.16	0.413	2M69D7W
	5	QPSK	1 852.5	1 912.5	22.76		26.87	0.486	4M53G7D
		16QAM			22.13		26.24	0.421	4M50D7W
	10	QPSK	1 855	1 910	22.74		26.85	0.484	8M94G7D
		16QAM			22.14		26.25	0.422	8M94D7W
	15	QPSK	1 857.5	1 907.5	22.64		26.75	0.473	13M5G7D
		16QAM			22.19		26.30	0.427	13M5D7W
	20	QPSK	1 860	1 905	22.69		26.80	0.479	17M9G7D
		16QAM			22.25		26.36	0.433	18M0D7W
26/5	1.4	QPSK	824.7	848.3	22.74	4.43	25.02	0.318	1M09G7D
		16QAM			22.23		24.51	0.282	1M09D7W
	3	QPSK	825.5	847.5	22.97		25.25	0.335	2M69G7D
		16QAM			22.19		24.47	0.280	2M68D7W
	5	QPSK	826.5	846.5	22.94		25.22	0.333	4M52G7D
		16QAM			22.23		24.51	0.282	4M50D7W
	10	QPSK	829	844	22.96		25.24	0.334	8M94G7D
		16QAM			22.29		24.57	0.286	8M97D7W
26	15	QPSK	831.5	841.5	22.85		25.13	0.326	13M5G7D
		16QAM			22.18		24.46	0.279	13M5D7W

Band	Band width (㎒)	Modulation	Low Freq. (㎒)	Upper Freq. (㎒)	Conducted Average (dB m)	Worst Ant. Gain (dB i)	E.R.P. / E.I.R.P. Average (dB m)	E.R.P. / E.I.R.P. Average (W)	Emission Designator
26 Part 90	1.4	QPSK	814.7	823.3	22.36	4.43	24.64	0.291	1M09G7D
		16QAM			21.69		23.97	0.249	1M09D7W
	3	QPSK	815.5	822.5	22.62		24.90	0.309	2M69G7D
		16QAM			21.88		24.16	0.261	2M69D7W
	5	QPSK	816.5	821.5	22.61		24.89	0.308	4M52G7D
		16QAM			21.98		24.26	0.267	4M52D7W
	10	QPSK	819		22.51		24.79	0.301	8M94G7D
		16QAM			21.69		23.97	0.249	8M94D7W
	15	QPSK	821.5		22.50		24.78	0.301	13M5G7D
		16QAM			21.83		24.11	0.258	13M5D7W
41 FCC	5	QPSK	2 498.5	2 687.5	25.53	3.96	29.49	0.889	4M53G7D
		16QAM			25.00		28.96	0.787	4M52D7W
	10	QPSK	2 501	2 685	25.53		29.49	0.889	8M94G7D
		16QAM			24.91		28.87	0.771	8M94D7W
	15	QPSK	2 503.5	2 682.5	25.48		29.44	0.879	13M5G7D
		16QAM			24.83		28.79	0.757	13M5D7W
	20	QPSK	2 506	2 680	25.54		29.50	0.891	17M9G7D
		16QAM			25.04		29.00	0.794	17M9D7W
41 IC	5	QPSK	2 502.5	2 687.5	25.27		29.23	0.838	4M53G7D
		16QAM			24.82		28.78	0.755	4M50D7W
	10	QPSK	2 505	2 685	25.45		29.41	0.873	8M94G7D
		16QAM			24.79		28.75	0.750	8M97D7W
	15	QPSK	2 507.5	2 682.5	25.36		29.32	0.855	13M5G7D
		16QAM			24.79		28.75	0.750	13M5D7W
	20	QPSK	2 600	2 680	25.54		29.50	0.891	17M9G7D
		16QAM			24.90		28.86	0.769	17M9D7W
66/4	1.4	QPSK	1 710.7	1 779.3	22.83	4.21	27.04	0.506	1M09G7D
		16QAM			22.17		26.38	0.435	1M09D7W
	3	QPSK	1 711.5	1 778.5	22.93		27.14	0.518	2M68G7D
		16QAM			22.27		26.48	0.445	2M69D7W
	5	QPSK	1 712.5	1 777.5	22.92		27.13	0.516	4M50G7D
		16QAM			22.12		26.33	0.430	4M50D7W
	10	QPSK	1 715	1 775	22.82		27.03	0.505	8M94G7D
		16QAM			22.15		26.36	0.433	8M94D7W
	15	QPSK	1 717.5	1 772.5	22.77		26.98	0.499	13M5G7D
		16QAM			22.03		26.24	0.421	13M5D7W
	20	QPSK	1 720	1 770	22.75		26.96	0.497	17M9G7D
		16QAM			22.03		26.24	0.421	17M9D7W
71	5	QPSK	665.5	695.5	22.53	4.43	24.81	0.303	4M53G7D
		16QAM			21.86		24.14	0.259	4M50D7W
	10	QPSK	668	693	22.54		24.82	0.303	8M95G7D
		16QAM			21.84		24.12	0.258	8M95D7W
	15	QPSK	670.5	690.5	22.46		24.74	0.298	13M5G7D
		16QAM			21.79		24.07	0.255	13M5D7W
	20	QPSK	673	688	22.40		24.68	0.294	17M9G7D
		16QAM			21.84		24.12	0.258	17M9D7W

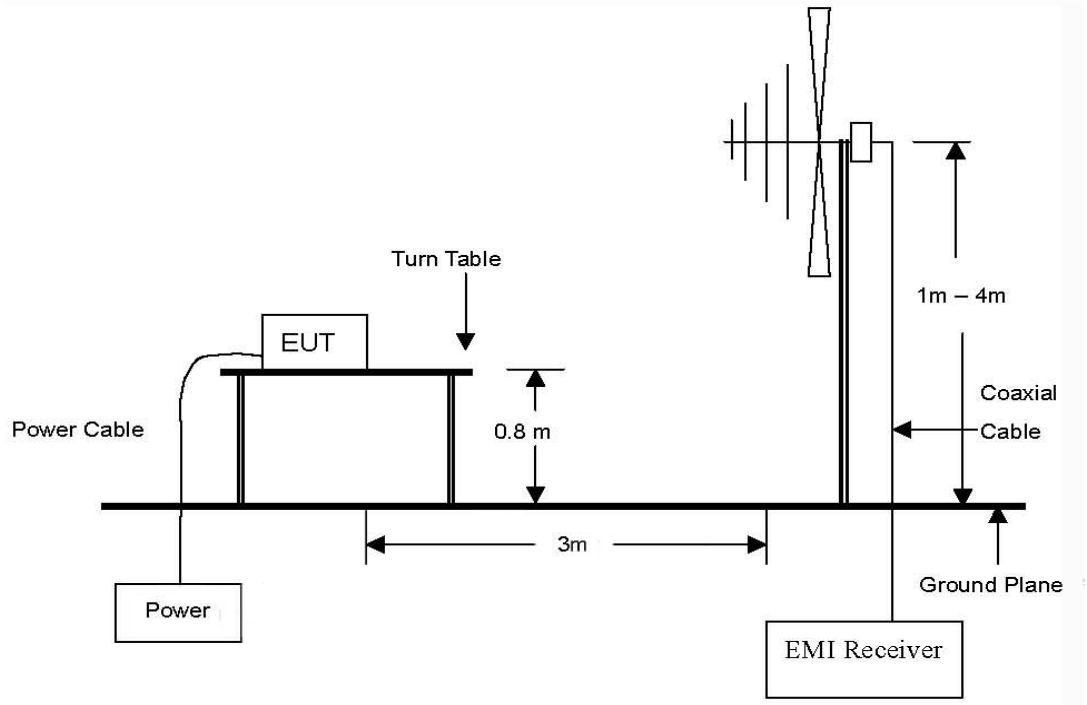
2. E.R.P. / E.I.R.P. & Spurious Radiated Emission

2.1. Test setup

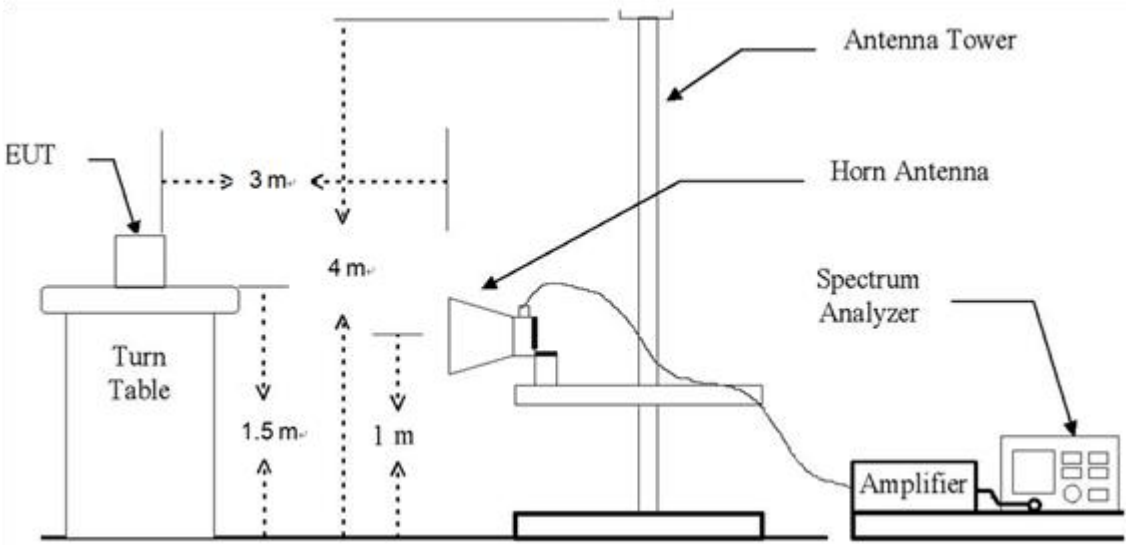
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒.



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



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 27 ㎓ Emissions.



2.2. Limit

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

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

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

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

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

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

- §27.50(h)(2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

- §90.635(b), the maximum output power of the transmitter for mobile stations is 100 watts (20 ㏈W).

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

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

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

- RSS-133 Issue 6
6.4, the equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

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

- RSS-199 Issue 3
4.4, the transmitter output power shall be measured in terms of average value.
For base station equipment, refer to SRSP-517 for the maximum permissible e.i.r.p.
For mobile subscriber equipment, the e.i.r.p. shall not exceed 2 W. For fixed subscriber equipment, the transmitter output power shall not exceed 2 W and the e.i.r.p. shall be limited to 40 W.

2.2.2. Limit of Spurious Radiated Emission

FCC

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

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

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

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

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

- §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than 40 + 10 $\log_{10}$ (P) ㏈ on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 $\log_{10}$ (P) ㏈ on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 $\log_{10}$ (P) ㏈ on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 $\log_{10}$ (P) ㏈ on all frequencies between 2490.5 ㎒ and 2496 ㎒ and 55 + 10 $\log_{10}$ (P) ㏈ at or below 2490.5 ㎒. Mobile Satellite Service licensees operating on frequencies below 2495 ㎒ may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

- §90.691(a), out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

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

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

IC

- RSS-130 Issue 2

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

- RSS-132 Issue 3

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

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

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

- RSS-133 Issue 6

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

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

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

- RSS-139 Issue 3

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

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

- RSS-139 Issue 3
6.6, (i) In the first 1.0 ㎒ bands immediately outside and adjacent to the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power per any 1 % of the emission bandwidth shall be attenuated below the transmitter output power P (in ㏈ W) by at least 43 + 10 log10 p (watts) ㏈.

(ii) After the first 1.0 ㎒ outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 ㎒ bandwidth shall be attenuated below the transmitter output power P (in ㏈ W) by at least 43 + 10 log10 p (watts) ㏈.

- RSS-199 Issue 3
4.5, In the 1 ㎒ band immediately outside and adjacent to the channel edge, the unwanted emission power shall be measured with a resolution bandwidth of at least 1% of the occupied bandwidth for base station and fixed subscriber equipment, and 2% for mobile subscriber equipment. Beyond the 1 ㎒ band, a resolution bandwidth of 1 ㎒ shall be used. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full required measurement bandwidth of 1 ㎒, or 1% or 2% of the occupied bandwidth, as applicable.

Equipment shall comply with the following unwanted emission limits:

for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in ㏈) below the transmitter power, P (㏈ W), by at least 43 + 10 log10 p for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in ㏈) below the transmitter power, P (㏈ W), by at least:

i. 40 + 10 log10 p from the channel edges to 5 ㎒ away
ii. 43 + 10 log10 p between 5 ㎒ and X ㎒ from the channel edges, and
iii. 55 + 10 log10 p at X ㎒ and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2 490.5 ㎒ and 2 496 ㎒, and 55 + 10 log10 p at or below 2 490.5 ㎒.

In (a) and (b), **p** is the transmitter power measured in watts and **X** is 6 ㎒ or the equipment occupied bandwidth, whichever is greater.

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

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

2.4. Test results

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

2.4.1. E.R.P. / E.I.R.P.

SIM 1

Band	Frequency (㎒)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Worst Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
7	2 500 ~ 2 570	23.05	0.202	5.64	28.69	0.740			2 W E.I.R.P.
12/17	699 ~ 716	22.60	0.182	2.78	23.23	0.210	21.08	0.128	3 W E.R.P.
13	777 ~ 787	23.09	0.204	2.78	23.72	0.236	21.57	0.144	3 W E.R.P.
25/2	1 850 ~ 1 915	22.61	0.182	5.38	27.99	0.630			2 W E.I.R.P.
26/5 Part 22	824 ~ 849	22.59	0.182	2.78	23.22	0.210	21.07	0.128	7 W E.R.P.
26 Part 90	814 ~ 824	22.83	0.192	2.78	23.46	0.222	21.31	0.135	100 W
41 FCC	2 496 ~ 2 690	25.85	0.385	5.64	31.49	1.409			2 W E.I.R.P.
41 IC	2 500 ~ 2 690	25.53	0.357	5.64	31.17	1.309			2 W E.I.R.P.
66/4	1 710 ~ 1 755	22.78	0.190	5.07	27.85	0.610			1 W E.I.R.P.
71	663 ~ 698	22.97	0.198	1.98	24.95	0.313	22.80	0.191	3 W E.R.P.

SIM 2

Band	Frequency (㎒)	Maximum Conducted Power (dB m)	Maximum Conducted Power (W)	Worst Antenna Gain (dB i)	Maximum E.I.R.P. (dB m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (dB m)	Maximum E.R.P. (W)	Limit
7	2 500 ~ 2 570	22.85	0.193	3.96	26.81	0.480			2 W E.I.R.P.
12/17	699 ~ 716	23.16	0.207	4.43	25.44	0.350	23.29	0.213	3 W E.R.P.
13	777 ~ 787	23.64	0.231	4.43	25.92	0.391	23.77	0.238	3 W E.R.P.
25/2	1 850 ~ 1 915	22.76	0.189	4.11	26.87	0.486			2 W E.I.R.P.
26/5 Part 22	824 ~ 849	22.97	0.198	4.43	25.25	0.335	23.10	0.204	7 W E.R.P.
26 Part 90	814 ~ 824	22.62	0.183	4.43	24.90	0.309	22.75	0.188	100 W
41 FCC	2 496 ~ 2 690	25.54	0.358	3.96	29.50	0.891			2 W E.I.R.P.
41 IC	2 500 ~ 2 690	25.54	0.358	3.96	29.50	0.891			2 W E.I.R.P.
66/4	1 710 ~ 1 755	22.93	0.196	4.21	27.14	0.518			1 W E.I.R.P.
71	663 ~ 698	22.54	0.179	4.43	26.97	0.498	24.82	0.303	3 W E.R.P.

Remark;

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

2.4.2. Spurious radiated emission

SIM 1

LTE band 7 (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 502.5 ㎒)									
10 010.05	41.44	V	37.62	-27.65	51.41	-95.26	**-43.85**	-25	18.85
Above 10 100.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 535.0 ㎒)									
10 139.99	38.11	V	37.80	-27.40	48.51	-95.26	-46.75	-25	21.75
Above 10 200.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 567.5 ㎒)									
10 270.02	37.12	V	37.86	-27.30	47.68	-95.26	-47.58	-25	22.58
Above 10 300.00	Not detected	–	-	-	-	-	-	-	-

LTE band 7 (5 ㎒ - QPSK)_Ant. 2

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 502.5 ㎒)									
5 004.81	47.60	H	33.30	-31.14	49.76	-95.26	-45.50	-25	20.50
5 005.09	50.69	V	33.30	-31.14	52.85	-95.26	-42.41	-25	17.41
Above 5 100.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 535.0 ㎒)									
5 069.89	47.59	H	33.34	-31.06	49.87	-95.26	-45.39	-25	20.39
5 070.08	51.09	V	33.34	-31.06	53.37	-95.26	-41.89	-25	16.89
Above 5 100.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 567.5 ㎒)									
5 135.15	48.71	H	33.47	-30.98	51.20	-95.26	-44.06	-25	19.06
5 134.93	52.36	V	33.47	-30.98	54.85	-95.26	**-40.41**	-25	15.41
Above 5 200.00	Not detected	–	-	-	-	-	-	-	-

LTE band 12/17 (10 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (704.0 ㎒)									
1 374.84	51.47	H	25.20	-39.58	37.09	-97.41	-60.32	-13	47.32
1 375.07	51.66	V	25.20	-39.43	37.43	-97.41	-59.98	-13	46.98
1 399.20	46.82	H	25.30	-39.64	32.48	-97.41	-64.93	-13	51.93
1 624.98	51.00	H	25.70	-39.00	37.70	-97.41	-59.71	-13	46.71
4 197.73	49.91	H	32.10	-31.87	50.14	-97.41	-47.27	-13	34.27
4 197.37	54.51	V	32.11	-31.87	54.75	-97.41	**-42.66**	-13	29.66
Above 4 200.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (707.5 ㎒)									
1 375.02	50.90	H	25.20	-39.43	36.67	-97.41	-60.74	-13	47.74
1 375.10	51.63	V	25.20	-39.43	37.40	-97.41	-60.01	-13	47.01
1 406.23	51.13	H	25.28	-39.59	36.82	-97.41	-60.59	-13	47.59
1 625.00	51.05	H	25.70	-39.00	37.75	-97.41	-59.66	-13	46.66
4 218.29	47.49	H	32.10	-32.07	47.52	-97.41	-49.89	-13	36.89
4 218.48	46.95	V	32.10	-32.07	46.98	-97.41	-50.43	-13	37.43
Above 4 300.00	Not detected	-	-	-	-	-	-	-	-
High Channel (711.0 ㎒)									
1 374.93	51.25	H	25.20	-39.58	36.87	-97.41	-60.54	-13	47.54
1 375.04	51.32	V	25.20	-39.43	37.09	-97.41	-60.32	-13	47.32
1 413.15	51.79	H	25.25	-39.59	37.45	-97.41	-59.96	-13	46.96
1 624.88	52.57	H	25.70	-39.00	39.27	-97.41	-58.14	-13	45.14
4 239.55	54.47	H	32.10	-32.13	54.44	-97.41	-42.97	-13	29.97
4 239.59	54.28	V	32.10	-32.13	54.25	-97.41	-43.16	-13	30.16
Above 4 300.00	Not detected	-	-	-	-	-	-	-	-

LTE band 13 (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (779.5 ㎒)									
1 375.21	50.86	H	25.20	-39.43	36.63	-97.41	-60.78	-13	47.78
1 375.02	51.71	V	25.20	-39.43	37.48	-97.41	-59.93	-13	46.93
1 559.04	46.46	H	25.35	-39.34	32.47	-97.41	-64.94	-13	51.94
1 625.02	52.09	H	25.70	-38.99	38.80	-97.41	-58.61	-13	45.61
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (782.0 ㎒)									
1 374.92	51.45	H	25.20	-39.58	37.07	-97.41	-60.34	-13	47.34
1 374.91	51.52	V	25.20	-39.58	37.14	-97.41	-60.27	-13	47.27
1 564.23	51.01	H	25.39	-39.35	37.05	-97.41	-60.36	-13	47.36
1 624.99	51.49	H	25.70	-39.00	38.19	-97.41	-59.22	-13	46.22
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
High Channel (784.5 ㎒)									
1 375.12	51.42	H	25.20	-39.43	37.19	-97.41	-60.22	-13	47.22
1 375.20	51.70	V	25.20	-39.43	37.47	-97.41	-59.94	-13	46.94
1 569.15	49.86	H	25.41	-39.35	35.92	-97.41	-61.49	-13	48.49
1 625.18	52.64	H	25.70	-38.99	39.35	-97.41	**-58.06**	-13	45.06
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-

LTE band 25/2 (20 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 860.0 ㎒)									
3 720.33	44.48	H	32.18	-34.14	42.52	-95.26	-52.74	-13	39.74
3 720.10	46.98	V	32.18	-34.14	45.02	-95.26	-50.24	-13	37.24
Above 3 800.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (1 882.5 ㎒)									
3 765.06	48.75	H	32.27	-33.65	47.37	-95.26	-47.89	-13	34.89
3 765.06	50.78	V	32.27	-33.65	49.40	-95.26	**-45.86**	-13	32.86
Above 3 800.00	Not detected	–	-	-	-	-	-	-	-
High Channel (1 905.0 ㎒)									
3 810.01	46.77	H	32.18	-32.89	46.06	-95.26	-49.20	-13	36.20
3 810.14	49.41	V	32.18	-32.89	48.70	-95.26	-46.56	-13	33.56
Above 3 900.00	Not detected	–	-	-	-	-	-	-	-

LTE band 25/2 (20 ㎒ - QPSK)_Ant. 2

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 860.0 ㎒)									
3 720.13	46.47	H	32.18	-34.14	44.51	-95.26	-50.75	-13	37.75
3 720.07	49.55	V	32.18	-34.14	47.59	-95.26	-47.67	-13	34.67
Above 3 800.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (1 882.5 ㎒)									
3 765.19	49.72	H	32.27	-33.65	48.34	-95.26	-46.92	-13	33.92
3 765.27	51.52	V	32.27	-33.65	50.14	-95.26	**-45.12**	-13	32.12
Above 3 800.00	Not detected	–	-	-	-	-	-	-	-
High Channel (1 905.0 ㎒)									
3 810.25	46.12	H	32.18	-32.89	45.41	-95.26	-49.85	-13	36.85
3 810.04	49.35	V	32.18	-32.89	48.64	-95.26	-46.62	-13	33.62
Above 3 900.00	Not detected	–	-	-	-	-	-	-	-

LTE band 26/5_Part 22 (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (826.5 ㎒)									
1 374.98	53.77	H	25.20	-39.57	39.40	-97.41	-58.01	-13	45.01
1 375.02	51.58	V	25.20	-39.43	37.35	-97.41	-60.06	-13	47.06
1 625.22	51.56	H	25.70	-38.99	38.27	-97.41	-59.14	-13	46.14
4 143.18	47.78	H	32.19	-33.01	46.96	-97.41	-50.45	-13	37.45
4 143.48	48.17	V	32.19	-33.01	47.35	-97.41	-50.06	-13	37.06
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (836.5 ㎒)									
1 375.02	53.91	H	25.20	-39.43	39.68	-97.41	-57.73	-13	44.73
1 375.11	52.01	V	25.20	-39.43	37.78	-97.41	-59.63	-13	46.63
1 625.14	51.49	H	25.70	-38.99	38.20	-97.41	-59.21	-13	46.21
4 193.21	51.01	H	32.11	-31.91	51.21	-97.41	-46.20	-13	33.20
4 193.27	48.11	V	32.11	-31.90	48.32	-97.41	-49.09	-13	36.09
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-
High Channel (846.5 ㎒)									
1 374.87	53.85	H	25.20	-39.58	39.47	-97.41	-57.94	-13	44.94
1 374.87	51.74	V	25.20	-39.58	37.36	-97.41	-60.05	-13	47.05
1 625.26	51.72	H	25.70	-38.99	38.43	-97.41	-58.98	-13	45.98
4 243.36	56.89	H	32.10	-32.11	56.88	-97.41	**-40.53**	-13	27.53
4 242.70	42.93	V	32.10	-32.11	42.92	-97.41	-54.49	-13	41.49
Above 4 300.00	Not detected	–	-	-	-	-	-	-	-

LTE band 26_Part 90 (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (816.5 ㎒)									
1 375.21	52.99	H	25.20	-39.43	38.76	-97.41	-58.65	-13	45.65
1 375.10	51.89	V	25.20	-39.43	37.66	-97.41	-59.75	-13	46.75
1 624.99	51.63	H	25.70	-39.00	38.33	-97.41	-59.08	-13	46.08
4 093.32	46.55	H	32.10	-32.81	45.84	-97.41	-51.57	-13	38.57
4 093.62	43.70	V	32.10	-32.81	42.99	-97.41	-54.42	-13	41.42
Above 4 100.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (819.0 ㎒)									
1 374.89	53.24	H	25.20	-39.58	38.86	-97.41	-58.55	-13	45.55
1 375.13	51.38	V	25.20	-39.43	37.15	-97.41	-60.26	-13	47.26
1 625.03	51.45	H	25.70	-38.99	38.16	-97.41	-59.25	-13	46.25
4 106.13	48.04	H	32.11	-32.94	47.21	-97.41	-50.20	-13	37.20
4 106.04	46.84	V	32.11	-32.94	46.01	-97.41	-51.40	-13	38.40
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-
High Channel (821.5 ㎒)									
1 375.05	53.61	H	25.20	-39.43	39.38	-97.41	-58.03	-13	45.03
1 374.95	51.84	V	25.20	-39.58	37.46	-97.41	-59.95	-13	46.95
1 625.13	51.65	H	25.70	-38.99	38.36	-97.41	-59.05	-13	46.05
4 118.21	50.63	H	32.14	-32.81	49.96	-97.41	**-47.45**	-13	34.45
4 118.25	48.28	V	32.14	-32.81	47.61	-97.41	-49.80	-13	36.80
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-

LTE band 41_FCC (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 498.5 ㎒)									
7 489.53	42.55	V	36.10	-28.04	50.61	-95.26	-44.65	-25	19.65
9 986.02	44.10	V	37.60	-27.29	54.41	-95.26	**-40.85**	-25	15.85
Above 10 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 593.0 ㎒)									
7 772.95	38.93	V	35.90	-27.46	47.37	-95.26	-47.89	-25	22.89
10 364.07	37.39	V	37.77	-26.58	48.58	-95.26	-46.68	-25	21.68
Above 10 400.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 687.5 ㎒)									
8 056.58	38.62	V	36.21	-27.29	47.54	-95.26	-47.72	-25	22.72
Above 8 100.00	Not detected	–	-	-	-	-	-	-	-

LTE band 41_FCC (5 ㎒ - QPSK)_Ant. 2

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 498.5 ㎒)									
4 992.80	43.47	H	33.30	-30.13	46.64	-95.26	-48.62	-25	23.62
4 993.03	48.70	V	33.30	-30.13	51.87	-95.26	-43.39	-25	18.39
7 489.54	42.47	V	36.10	-28.04	50.53	-95.26	-44.73	-25	19.73
9 986.10	44.55	V	37.60	-27.29	54.86	-95.26	-40.40	-25	15.40
Above 10 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 593.0 ㎒)									
5 182.16	49.58	H	33.56	-30.97	52.17	-95.26	-43.09	-25	18.09
5 182.05	57.84	V	33.56	-30.97	60.43	-95.26	-34.83	-25	9.83
7 773.17	38.04	V	35.90	-27.46	46.48	-95.26	-48.78	-25	23.78
10 363.84	40.16	V	37.77	-26.58	51.35	-95.26	-43.91	-25	18.91
Above 10 400.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 687.5 ㎒)									
5 371.17	49.54	H	34.10	-29.75	53.89	-95.26	-41.37	-25	16.37
5 371.13	58.99	V	34.10	-29.75	63.34	-95.26	**-31.92**	-25	6.92
8 056.54	39.79	V	36.21	-27.29	48.71	-95.26	-46.55	-25	21.55
Above 8 100.00	Not detected	–	-	-	-	-	-	-	-

LTE band 41_IC (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 502.5 ㎒)									
7 501.42	40.34	V	36.10	-28.10	48.34	-95.26	-46.92	-25	21.92
10 002.06	43.73	V	37.60	-27.65	53.68	-95.26	**-41.58**	-25	16.58
Above 10 100.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 595.0 ㎒)									
7 779.29	38.56	V	35.90	-28.17	46.29	-95.26	-48.97	-25	23.97
10 372.16	36.51	V	37.76	-26.59	47.68	-95.26	-47.58	-25	22.58
Above 10 400.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 687.5 ㎒)									
Below 1 000.00	Not detected	–	-	-	-	-	-	-	-
Above 1 000.00	Not detected	–	-	-	-	-	-	-	-

LTE band 41_IC (5 ㎒ - QPSK)_Ant. 2

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 502.5 ㎒)									
5 000.93	48.35	H	33.30	-31.07	50.58	-95.26	-44.68	-25	19.68
5 001.07	48.51	V	33.30	-31.08	50.73	-95.26	-44.53	-25	19.53
7 501.42	41.17	V	36.10	-28.10	49.17	-95.26	-46.09	-25	21.09
10 002.14	44.82	V	37.60	-27.65	54.77	-95.26	-40.49	-25	15.49
Above 10 100.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (2 595.0 ㎒)									
5 186.01	49.88	H	33.57	-31.03	52.42	-95.26	-42.84	-25	17.84
5 186.02	56.14	V	33.57	-31.03	58.68	-95.26	**-36.58**	-25	11.58
7 779.15	38.14	V	35.90	-28.17	45.87	-95.26	-49.39	-25	24.39
10 371.86	40.49	V	37.76	-26.58	51.67	-95.26	-43.59	-25	18.59
Above 10 400.00	Not detected	–	-	-	-	-	-	-	-
High Channel (2 687.5 ㎒)									
Below 1 000.00	Not detected	–	-	-	-	-	-	-	-
Above 1 000.00	Not detected	–	-	-	-	-	-	-	-

LTE band 66/4 (3 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 711.5 ㎒)									
Below 1 000.00	Not detected	–	-	-	-	-	-	-	-
Above 1 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (1 745.0 ㎒)									
Below 1 000.00	Not detected	–	-	-	-	-	-	-	-
Above 1 000.00	Not detected	–	-	-	-	-	-	-	-
High Channel (1 778.5 ㎒)									
Below 1 000.00	Not detected	–	-	-	-	-	-	-	-
Above 1 000.00	Not detected	–	-	-	-	-	-	-	-

LTE band 71 (5 ㎒ - QPSK)_Ant. 1

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (665.5 ㎒)									
1 375.02	53.14	H	25.20	-39.43	38.91	-97.41	-58.50	-13	45.50
1 375.13	51.46	V	25.20	-39.43	37.23	-97.41	-60.18	-13	47.18
1 625.24	51.53	H	25.70	-38.99	38.24	-97.41	-59.17	-13	46.17
3 992.87	52.86	H	32.20	-31.19	53.87	-97.41	-43.54	-13	30.54
3 992.91	53.04	V	32.20	-31.19	54.05	-97.41	**-43.36**	-13	30.36
Above 4 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (680.5 ㎒)									
1 375.11	53.65	H	25.20	-39.58	38.86	-97.41	-58.55	-13	45.55
1 374.89	51.36	V	25.20	-39.43	37.15	-97.41	-60.26	-13	47.26
1 624.88	51.65	H	25.70	-38.99	38.16	-97.41	-59.25	-13	46.25
4 082.91	48.48	H	32.11	-32.94	47.21	-97.41	-50.20	-13	37.20
4 082.77	47.60	V	32.11	-32.94	46.01	-97.41	-51.40	-13	38.40
Above 4 100.00	Not detected	–	-	-	-	-	-	-	-
High Channel (695.5 ㎒)									
1 375.06	53.77	H	25.20	-39.43	39.54	-97.41	-57.87	-13	44.87
1 375.09	51.69	V	25.20	-39.43	37.46	-97.41	-59.95	-13	46.95
1 624.93	51.58	H	25.70	-39.00	38.28	-97.41	-59.13	-13	46.13
4 173.10	50.42	H	32.15	-31.59	50.98	-97.41	-46.43	-13	33.43
4 173.13	51.68	V	32.15	-31.59	52.24	-97.41	-45.17	-13	32.17
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-

LTE band 71 (5 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (665.5 ㎒)									
1 331.06	62.71	H	25.06	-39.88	47.89	-97.41	-49.52	-13	36.52
1 331.09	55.71	V	25.06	-39.88	40.89	-97.41	-56.52	-13	43.52
1 374.93	50.94	H	25.20	-39.58	36.56	-97.41	-60.85	-13	47.85
1 375.16	50.21	V	25.20	-39.43	35.98	-97.41	-61.43	-13	48.43
1 625.25	47.26	H	25.70	-38.99	33.97	-97.41	-63.44	-13	50.44
3 993.01	49.08	H	32.20	-31.19	50.09	-97.41	-47.32	-13	34.32
3 993.02	51.42	V	32.20	-31.19	52.43	-97.41	-44.98	-13	31.98
Above 4 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (680.5 ㎒)									
1 361.04	61.14	H	25.14	-39.73	46.55	-97.41	-50.86	-13	37.86
1 361.05	49.33	V	25.14	-39.73	34.74	-97.41	-62.67	-13	49.67
1 375.15	51.08	H	25.20	-39.43	36.85	-97.41	-60.56	-13	47.56
1 375.03	50.34	V	25.20	-39.43	36.11	-97.41	-61.30	-13	48.30
1 625.19	47.18	H	25.70	-38.99	33.89	-97.41	-63.52	-13	50.52
4 083.01	49.30	H	32.10	-32.68	48.72	-97.41	-48.69	-13	35.69
4 083.05	47.66	V	32.10	-32.68	47.08	-97.41	-50.33	-13	37.33
Above 4 100.00	Not detected	–	-	-	-	-	-	-	-
High Channel (695.5 ㎒)									
1 375.07	50.96	H	25.20	-39.43	36.73	-97.41	-60.68	-13	47.68
1 375.09	50.15	V	25.20	-39.43	35.92	-97.41	-61.49	-13	48.49
1 390.84	58.13	H	25.26	-39.56	43.83	-97.41	-53.58	-13	40.58
1 391.08	49.86	V	25.26	-39.56	35.56	-97.41	-61.85	-13	48.85
1 624.99	47.37	H	25.70	-39.00	34.07	-97.41	-63.34	-13	50.34
4 172.97	54.32	H	32.15	-31.60	54.87	-97.41	**-42.54**	-13	29.54
4 173.02	44.88	V	32.15	-31.59	45.44	-97.41	-51.97	-13	38.97
Above 4 200.00	Not detected	–	-	-	-	-	-	-	-

SIM 2

LTE band 7 (10 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (2 505.0 ㎒)									
5 001.37	46.56	H	33.30	-31.08	48.78	-95.26	-46.48	-25	21.48
5 001.13	47.76	V	33.30	-31.08	49.98	-95.26	**-45.28**	-25	20.28
Above 5 100.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (2 535.0 ㎒)									
5 061.14	41.61	H	33.32	-31.03	43.90	-95.26	-51.36	-25	26.36
5 061.31	44.12	V	33.32	-31.03	46.41	-95.26	-48.85	-25	23.85
Above 5 100.00	Not detected	-	-	-	-	-	-	-	-
High Channel (2 565.0 ㎒)									
5 121.24	40.63	H	33.44	-30.30	43.77	-95.26	-51.49	-25	26.49
5 121.13	42.74	V	33.44	-30.30	45.88	-95.26	-49.38	-25	24.38
Above 5 200.00	Not detected	-	-	-	-	-	-	-	-

LTE band 12/17 (5 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (701.5 ㎒)									
1 374.89	51.10	H	25.20	-39.58	36.72	-97.41	-60.69	-13	47.69
1 374.90	47.97	V	25.20	-39.58	33.59	-97.41	-63.82	-13	50.82
1 398.73	53.18	H	25.29	-39.63	38.84	-97.41	-58.57	-13	45.57
1 398.74	50.82	V	25.29	-39.63	36.48	-97.41	-60.93	-13	47.93
1 624.94	49.12	H	25.70	-39.00	35.82	-97.41	-61.59	-13	48.59
1 625.06	46.82	V	25.70	-38.99	33.53	-97.41	-63.88	-13	50.88
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (707.5 ㎒)									
1 375.09	50.82	H	25.20	-39.43	36.59	-97.41	-60.82	-13	47.82
1 374.94	47.72	V	25.20	-39.58	33.34	-97.41	-64.07	-13	51.07
1 410.78	53.52	H	25.26	-39.59	39.19	-97.41	-58.22	-13	45.22
1 410.72	55.57	V	25.26	-39.59	41.24	-97.41	**-56.17**	-13	43.17
1 625.13	49.11	H	25.70	-38.99	35.82	-97.41	-61.59	-13	48.59
1 624.96	46.71	V	25.70	-39.00	33.41	-97.41	-64.00	-13	51.00
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
High Channel (713.5 ㎒)									
1 375.09	51.18	H	25.20	-39.43	36.95	-97.41	-60.46	-13	47.46
1 374.88	47.80	V	25.20	-39.58	33.42	-97.41	-63.99	-13	50.99
1 422.48	50.75	H	25.21	-39.58	36.38	-97.41	-61.03	-13	48.03
1 422.56	52.43	V	25.21	-39.58	38.06	-97.41	-59.35	-13	46.35
1 624.99	48.81	H	25.70	-39.00	35.51	-97.41	-61.90	-13	48.90
1 625.25	47.28	V	25.70	-38.99	33.99	-97.41	-63.42	-13	50.42
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-

LTE band 13 (5 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (779.5 ㎒)									
1 375.01	49.39	H	25.20	-39.43	35.16	-97.41	-62.25	-13	49.25
1 374.92	48.84	V	25.20	-39.58	34.46	-97.41	-62.95	-13	49.95
1 563.38	51.67	H	25.38	-39.35	37.70	-97.41	**-59.71**	-13	46.71
1 563.39	50.71	V	25.38	-39.35	36.74	-97.41	-60.67	-13	47.67
1 625.03	49.07	H	25.70	-38.99	35.78	-97.41	-61.63	-13	48.63
1 624.91	46.97	V	25.70	-39.00	33.67	-97.41	-63.74	-13	50.74
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
Middle Channel (782.0 ㎒)									
1 375.09	49.16	H	25.20	-39.43	34.93	-97.41	-62.48	-13	49.48
1 374.96	49.04	V	25.20	-39.58	34.66	-97.41	-62.75	-13	49.75
1 568.21	52.16	H	25.41	-39.35	38.22	-97.41	-59.19	-13	46.19
1 568.33	50.94	V	25.41	-39.35	37.00	-97.41	-60.41	-13	47.41
1 625.14	49.24	H	25.70	-38.99	35.95	-97.41	-61.46	-13	48.46
1 625.20	46.90	V	25.70	-38.99	33.61	-97.41	-63.80	-13	50.80
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-
High Channel (784.5 ㎒)									
1 374.97	49.49	H	25.20	-39.58	35.11	-97.41	-62.30	-13	49.30
1 375.12	49.80	V	25.20	-39.43	35.57	-97.41	-61.84	-13	48.84
1 573.33	49.24	H	25.44	-39.37	35.31	-97.41	-62.10	-13	49.10
1 573.33	48.66	V	25.44	-39.37	34.73	-97.41	-62.68	-13	49.68
1 624.88	49.23	H	25.70	-39.00	35.93	-97.41	-61.48	-13	48.48
1 625.01	46.89	V	25.70	-38.99	33.60	-97.41	-63.81	-13	50.81
Above 1 700.00	Not detected	-	-	-	-	-	-	-	-

LTE band 25/2 (5 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (1 852.5 ㎒)									
3 705.14	43.40	V	32.12	-34.36	41.16	-95.26	-54.10	-13	41.10
5 557.63	45.49	V	34.00	-30.21	49.28	-95.26	-45.98	-13	32.98
7 999.96	40.94	V	36.10	-27.24	49.80	-95.26	-45.46	-13	32.46
Above 8 000.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (1 882.5 ㎒)									
3 764.94	45.17	V	32.27	-33.65	43.79	-95.26	-51.47	-13	38.47
5 647.34	45.06	V	34.00	-30.12	48.94	-95.26	-46.32	-13	33.32
7 999.70	40.82	V	36.10	-27.24	49.68	-95.26	-45.58	-13	32.58
Above 8 000.00	Not detected	–	-	-	-	-	-	-	-
High Channel (1 912.5 ㎒)									
3 825.06	45.07	V	32.15	-32.63	44.59	-95.26	-50.67	-13	37.67
5 737.48	39.94	V	34.00	-30.10	43.84	-95.26	-51.42	-13	38.42
7 999.48	41.38	V	36.10	-27.23	50.25	-95.26	**-45.01**	-13	32.01
Above 8 000.00	Not detected	–	-	-	-	-	-	-	-

LTE band 26/5_Part 22 (3 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (825.5 ㎒)									
1 374.96	49.71	H	25.20	-39.58	35.33	-97.41	-62.08	-13	49.08
1 375.15	49.20	V	25.20	-39.43	34.97	-97.41	-62.44	-13	49.44
1 625.01	48.97	H	25.70	-38.99	35.68	-97.41	-61.73	-13	48.73
1 650.96	49.67	V	25.81	-38.76	36.72	-97.41	**-60.69**	-13	47.69
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (836.5 ㎒)									
1 375.07	49.65	H	25.20	-39.43	35.42	-97.41	-61.99	-13	48.99
1 374.86	50.00	V	25.20	-39.58	35.62	-97.41	-61.79	-13	48.79
1 624.96	49.17	H	25.70	-39.00	35.87	-97.41	-61.54	-13	48.54
1 672.81	44.29	V	26.03	-38.64	31.68	-97.41	-65.73	-13	52.73
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-
High Channel (847.5 ㎒)									
1 374.96	49.88	H	25.20	-39.58	35.50	-97.41	-61.91	-13	48.91
1 374.97	49.52	V	25.20	-39.58	35.14	-97.41	-62.27	-13	49.27
1 625.04	49.36	H	25.70	-38.99	36.07	-97.41	-61.34	-13	48.34
1 694.99	46.02	V	26.25	-38.55	33.72	-97.41	-63.69	-13	50.69
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-

LTE band 26_Part 90 (3 ㎒ - QPSK)_Ant. 3

Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dBμV/m)	CF (dB)	E.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (815.5 ㎒)									
1 375.03	49.91	H	25.20	-39.43	35.68	-97.41	-61.73	-13	48.73
1 374.86	50.33	V	25.20	-39.58	35.95	-97.41	-61.46	-13	48.46
1 625.12	49.05	H	25.70	-38.99	35.76	-97.41	-61.65	-13	48.65
1 633.39	53.02	V	25.73	-38.98	39.77	-97.41	**-57.64**	-13	44.64
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-
Middle Channel (819.0 ㎒)									
1 375.12	49.85	H	25.20	-39.43	35.62	-97.41	-61.79	-13	48.79
1 375.09	49.36	V	25.20	-39.43	35.13	-97.41	-62.28	-13	49.28
1 625.03	48.72	H	25.70	-38.99	35.43	-97.41	-61.98	-13	48.98
1 640.42	48.28	V	25.76	-38.96	35.08	-97.41	-62.33	-13	49.33
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-
High Channel (822.5 ㎒)									
1 375.06	49.56	H	25.20	-39.43	35.33	-97.41	-62.08	-13	49.08
1 375.03	49.51	V	25.20	-39.43	35.28	-97.41	-62.13	-13	49.13
1 624.81	48.71	H	25.70	-39.00	35.41	-97.41	-62.00	-13	49.00
1 647.60	46.76	V	25.79	-38.94	33.61	-97.41	-63.80	-13	50.80
Above 1 700.00	Not detected	–	-	-	-	-	-	-	-