TEST REPORT

of

FCC Part 2 Subpart J and Part 27 Subpart C

FCC ID: BEJTFGMEIBBCD1

Equipment Under Test	:	Telematics
Model Name	:	TFGMEIBBCD1
Variant Model Name(s)	:	Refer to the page 4
Applicant	:	LG Electronics USA
Manufacturer	:	LG Electronics Inc.
Date of Receipt	:	2023.09.07
Date of Test(s)	:	2023.10.27 ~ 2023.11.08
Date of Issue	:	2023.11.23

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

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

Tested by: **Murphy Kim**

Technical Manager: **Jinhyoung Cho**

SGS Korea Co., Ltd. Gunpo Laboratory

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1. General Information

1.1. Testing Laboratory

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

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1.2. Details of Applicant

Applicant : LG Electronics USA
Address : 111 Sylvan Avenue, North Building, Englewood Cliffs, New Jersey, United States, 07632
Contact Person : Cho, Hee-jae
Phone No. : +1 201 470 2696

1.3. Details of Manufacturer

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

1.4. Description of EUT

Kind of Product		Telematics
Model Name		TFGMEIBBCD1
Variant Model Names		TFGMEIBBCD2, TFGMEIBBCD3
Serial Number		Radiated: 351015130065751
Power Supply		DC 12 V
Rated Power		NR Band 77, 78: 25 dBm
Frequency Range	**Port 1**	NR Band 77: 3 450 MHz ~ 3 550 MHz NR Band 77: 3 700 MHz ~ 3 980 MHz NR Band 78: 3 450 MHz ~ 3 550 MHz NR Band 78: 3 700 MHz ~ 3 800 MHz
	Port 2	NR Band 77: 3 450 MHz ~ 3 550 MHz NR Band 77: 3 700 MHz ~ 3 980 MHz NR Band 78: 3 450 MHz ~ 3 550 MHz NR Band 78: 3 700 MHz ~ 3 800 MHz
Modulation Technique		BPSK, QPSK, 16QAM, 64QAM
Antenna Type		Internal: Planar Inverted F Antenna External: Metal Antenna
Antenna Gain※		Refer to the clause 1.11
H/W Version		REV.D
S/W Version		SW170
FVIN		SW170

1.5. Test Equipment List

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval	Cal. Due
Signal Generator	R&S	SMA100B	106887	Oct. 06, 2023	Annual	Oct. 06, 2024
Spectrum Analyzer	R&S	FSV30	103210	Dec. 07, 2022	Annual	Dec. 07, 2023
Spectrum Analyzer	Agilent	N9020A	MY53421758	Sep. 01, 2023	Annual	Sep. 01, 2024
Spectrum Analyzer	Agilent	N9030A	US51350132	Nov. 11, 2022	Annual	Nov. 11, 2023
Communication test station	Anritsu	MT8000A	6261949671	Oct. 06, 2023	Annual	Oct. 06, 2024
Communication Analyzer	Anritsu	MT8821C	6262192291	Oct. 11, 2023	Annual	Oct. 11, 2024
Low Pass Filter	Mini-Circuits	NLP-1200+	V 8979400903-2	Feb. 09, 2023	Annual	Feb. 09, 2024
High Pass Filter	Wainwright Instrument GmbH	WHKX6.0/18G-10SS	51	Jun. 14, 2023	Annual	Jun. 14, 2024
High Pass Filter	Wainwright Instrument GmbH	WHNX7.5/26.5G-6SS	15	Jun. 02, 2023	Annual	Jun. 02, 2024
DC Power Supply	Agilent	U8002A	MY49030063	Jan. 20, 2023	Annual	Jan. 20, 2024
Preamplifier	H.P.	8447F	2944A03909	Aug. 04, 2023	Annual	Aug. 04, 2024
Preamplifier	R&S	SCU 18	10117	Jun. 15, 2023	Annual	Jun. 15, 2024
Preamplifier	TESTEK	TK-PA1840H	130016	Jan. 11, 2023	Annual	Jan. 11, 2024
Test Receiver	R&S	ESU 26	100109	Jan. 18, 2023	Annual	Jan. 18, 2024
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 21, 2023	Biennial	Aug. 21, 2025
Bilog Antenna	Schwarzbeck Mess-Elektronik	VULB9163	01126	Feb. 09, 2023	Annual	Feb. 09, 2024
Horn Antenna	R&S	HF906	100326	Feb. 28, 2023	Annual	Feb. 28, 2024
Loop Antenna	Schwarzbeck Mess-Elektronik	FMZB 1519	1519-039	Aug. 21, 2023	Biennial	Aug. 21, 2025
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	Oct. 04, 2023	Semi-Annual	Apr. 04, 2024
Coaxial Cable	Qualwave Inc.	QA500-18-NN-10 (10 m)	22200114	Oct. 04, 2023	Semi-Annual	Apr. 04, 2024

Note;
- For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

1.6. Summary of Test Results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 2 and 27		
Section(s)	**Test Item**	**Result**
§2.1046 §27.50(j)(3) §27.50(k)(3)	E.I.R.P. & Radiated Output Power and Radiated Spurious Emissions	Complied[1)]
§27.53(l)(2) §27.53(n)(2)	Radiated Spurious Emissions	Complied[1)]
§2.1046	Conducted Output Power	N/A[2)]
§2.1049	Occupied Bandwidth	N/A[2)]
§27.50(j)(4) §27.50(k)(4)	Peak-Average Ratio	N/A[2)]
§27.53(l)(2) §27.53(n)(2)	Spurious Emission at Antenna Terminal	N/A[2)]
§27.53(l)(2) §27.53(n)(2)	Band Edge and Emission Mask	N/A[2)]
§2.1055 §27.54	Frequency Stability	N/A[2)]

Note;

1) This product is a C2PC case due to the deactivation of the power reduction mode under radiation condition and addition of antenna. So only radiation tests (internal, external antenna) were performed and the rules for E.R.P. / E.I.R.P. and spurious radiated emission were satisfied.
2) The test items were used the results from original test report.

1.7. Sample Calculation for Offset

Where relevant, the following sample calculation is provided:

1.7.1. Radiation Test

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

1.8. Radiated Spurious Emissions Test Case

Radiated Emission Test (Internal & External Antenna)

Ant.	NR Band	SCS (㎑)	Bandwidth (㎒)	Modulation	Resource Block Allocation
					RBs allocated
SISO	n77/78 Low Band	30	80	DFTS OFDM - QPSK	1
	n77/78 High Band	30	80	DFTS OFDM - QPSK	1
MIMO	n77/78 Low Band	30	90	CP OFDM - QPSK	1
	n77/78 High Band	30	60	CP OFDM - QPSK	1

ENDC (Internal & Original External Antenna)

NR Band	SCS (㎑)	Bandwidth (㎒)	Modulation	Resource Block Allocation
				RBs allocated
7A-n77 Low Band	30	20-60	DFTS OFDM - BPSK	1
7A-n77 High Band	30	20-40	DFTS OFDM - BPSK	1
5A-n78 Low Band	30	5-20	DFTS OFDM - QPSK	1
5A-n78 High Band	30	5-60	DFTS OFDM - BPSK	1

1.9. Measurement Uncertainty

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

Parameter	Uncertainty	
Radiated Emission, 9 ㎑ to 30 ㎒	H	3.60 ㏈
	V	3.60 ㏈
Radiated Emission, below 1 ㎓	H	4.60 ㏈
	V	4.90 ㏈
Radiated Emission, above 1 ㎓	H	3.90 ㏈
	V	3.80 ㏈

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

1.10. Test Report Revision

Revision	Report Number	Date of Issue	Description
0	F690501-RF-RTL004537	2023.11.08	Initial
1	F690501-RF-RTL004537-1	2023.11.23	Added external antenna information in clause 1.11

1.11. Antenna Information

- Internal Antenna

Band	Operating Frequency (㎒)	Antenna Peak Gain (dBi)		
		Ant. Gain		
		Port 1	Port 2	Port 1 + port 2[1)]
NR 77 - Low	3 450 ~ 3 550	1.72	2.35	5.05
NR 77 - High	3 700 ~ 3 980	-0.61	1.86	3.72
NR 78 - Low	3 450 ~ 3 550	1.72	2.35	5.05
NR 78 - High	3 700 ~ 3 800	-0.61	1.86	3.72

- External Antenna

Operating Frequency (㎒)		Antenna type	Antenna Peak Gain (dBi)		
			Ant. Gain		
			Port 1	Port 2	Port 1 + port 2[1)]
NR Band 77 Low	3 450 ~ 3 550	Original [84933920]	6.29	**3.24**	**7.91**
		Additional [87832572]	3.90	2.89	6.42
NR Band 77 High	3 700 ~ 3 980	Original [84933920]	6.29	**3.24**	**7.91**
		Additional [87832572]	3.90	2.89	6.42
NR Band 78 Low	3 450 ~ 3 550	Original [84933920]	6.29	**3.24**	**7.91**
		Additional [87832572]	3.90	2.89	6.42
NR Band 78 High	3 700 ~ 3 800	Original [84933920]	6.29	**3.24**	**7.91**
		Additional [87832572]	3.90	2.89	6.42

Remark;
- Port 1 means secondary cell and Port 2 means primary cell.

1) According to KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)d)(i),
Port 1 + Port 2 Antenna Gain = $10 * \log[(10^{G_1/20} + 10^{G_2/20})^2 / N_{ANT}]$

Where,
G_1 = antenna gain of port 1,
G_2 = antenna gain of port 2,
N_{ANT} = the number of antennas

1.12. Information of Variant Model

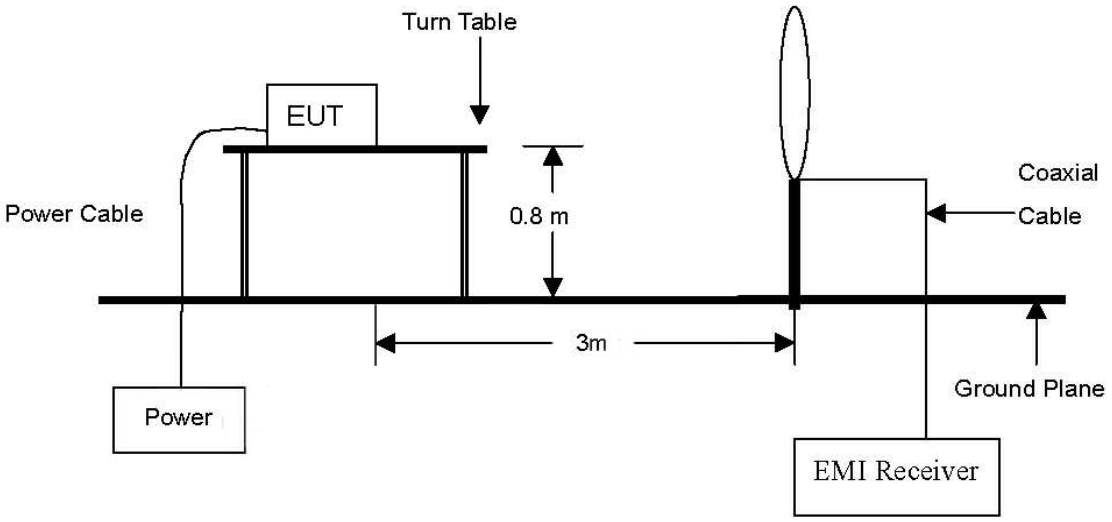
Model Name		Description
Basic Model	TFGMEIBBCD1	- Dual GNSS
Variant Models	TFGMEIBBCD2	- Same to RF module with basic model except following function - Single GNSS and Ultra-super cruise service doesn't supported
	TFGMEIBBCD3	- Same to RF module with basic model except following function - Single GNSS and Ultra-super cruise service doesn't supported - eUICC part is different with TFGMEIBBCD2

Note;
The all test items performed with basic model.

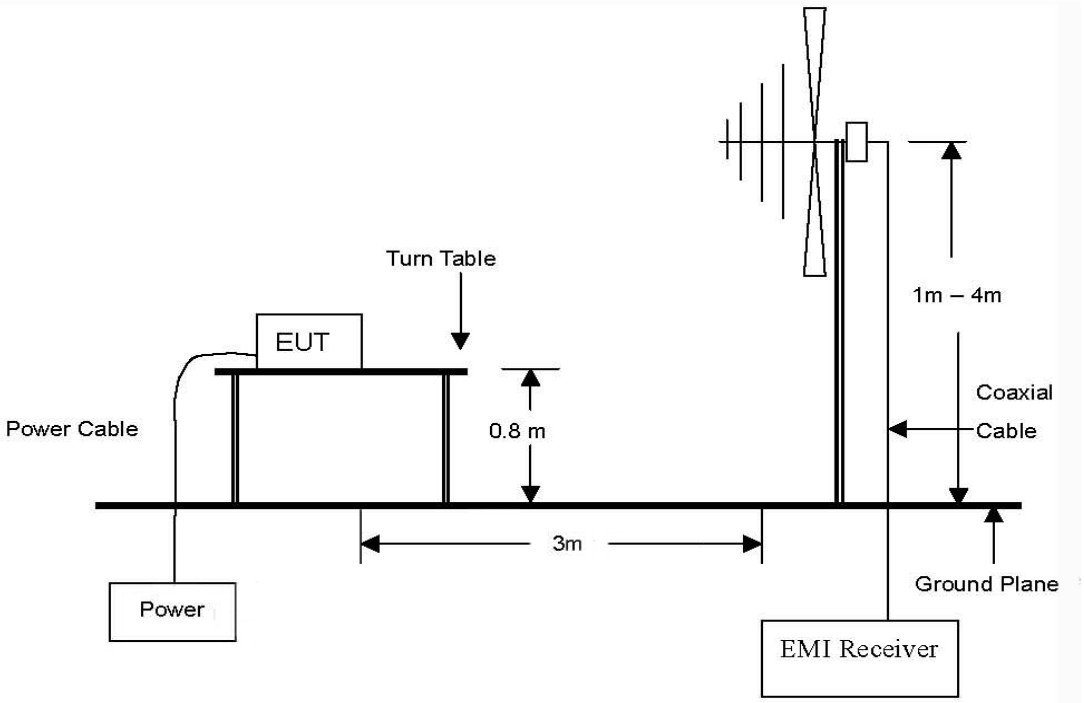
2. E.I.R.P. & Radiated output power and Radiated Spurious Emissions

2.1. Test setup

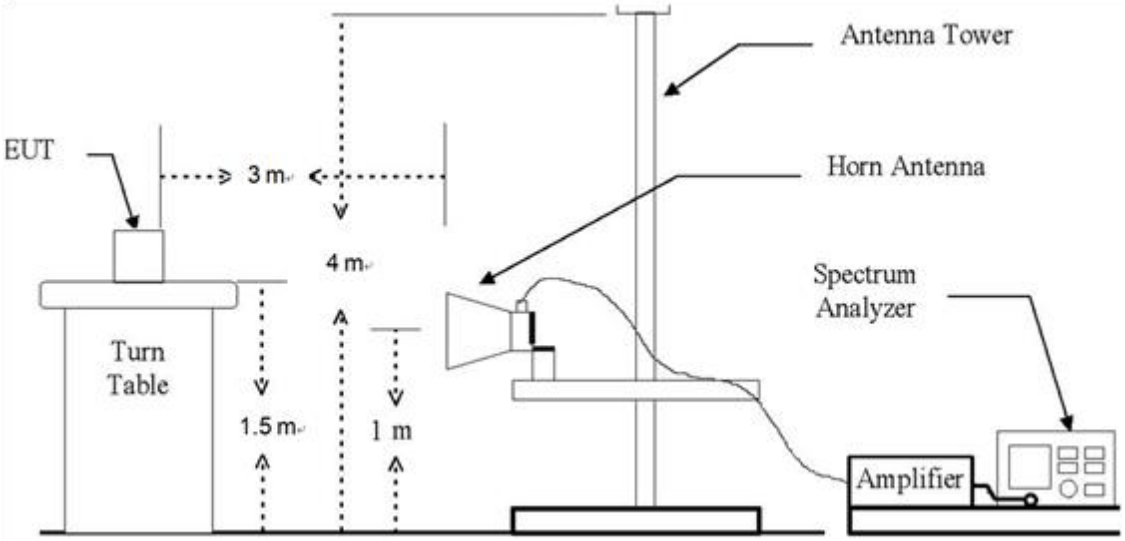
The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒.



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 40 ㎓ Emissions.



2.2. Limit

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

- §27.50(j)(3), Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

- §27.50(k)(3), Mobile devices are limited to 1Watt (30 ㏈m) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

2.2.2. Limit of Radiated Spurious Emissions

- §27.53(l)(2), for mobile operations in the 3 700-3 980 ㎒ band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 ㏈m /㎒. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 ㎑. In the bands between 1 and 5 ㎒ removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 ㎑. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 ㏈ below the transmitter power.

- §27.53(n)(2), for mobile operations in the 3 450-3 550 ㎒ band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 ㏈m /㎒.. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 ㎑. In the bands between 1 and 5 ㎒ removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 ㎑. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 ㏈ below the transmitter power.

2.3. Test Procedure

2.3.1. E.R.P. or E.I.R.P. from conducted RF output power

According to subclause 5.2.5.5 of ANSI C63.26-2015 E.R.P. and E.I.R.P. are defined as the product of the power supplied to the antenna and its gain.

The relevant equation for determining the E.R.P. or E.I.R.P. from the conducted RF output power measured using the guidance provided above is:

E.R.P. or E.I.R.P. = $P_{Meas} + G_T$

where:
E.R.P. or E.I.R.P. = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas}, typically ㏈W or ㏈m);
P_{Meas} = measured transmitter output power or PSD, in ㏈m or ㏈W;
G_T = gain of the transmitting antenna, in ㏈d (ERP) or ㏈i (EIRP);

2.3.2. Radiated Output Power & Radiated Spurious Emissions

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

2.4. Test Results

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

2.4.1. E.I.R.P. from conducted RF output power measurements

SISO

- Internal Antenna

Band	Frequency (㎒)	Maximum Conducted Power (㏈ m)	Maximum Conducted Power (W)	Ant. Gain (㏈ i)	Maximum E.I.R.P. (㏈ m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (㏈ m)	Maximum E.R.P. (W)	Limit (㏈ m)
n77/78 Low band	3 450 ~ 3 550	25.37	0.344	1.72	27.09	0.512			30
n77/78 High band	3 700 ~ 3 900	24.80	0.302	1.72	26.52	0.449			30

- External Antenna

Band	Frequency (㎒)	Maximum Conducted Power (㏈ m)	Maximum Conducted Power (W)	Ant. Gain (㏈ i)	Maximum E.I.R.P. (㏈ m)	Maximum E.I.R.P. (W)	Maximum E.R.P. (㏈ m)	Maximum E.R.P. (W)	Limit (㏈ m)
n77/78 Low band	3 450 ~ 3 550	25.37	0.344	3.24	28.61	0.726			30
n77/78 High band	3 700 ~ 3 900	24.80	0.302	3.24	28.04	0.637			30

Remark;

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

2.4.2. Radiated Output Power

MIMO

- Internal Antenna

NR 77/78 Low Band (3 450 ~ 3 550 ㎒)

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dBm)	(W)
20	CP-OFDM QPSK	3 460.02	80.48	H	31.22	10.55	122.25	-95.26	26.99	0.500
		3 460.02	80.19	V	31.22	10.55	121.96	-95.26	26.70	0.468
		3 500.01	78.94	H	31.30	10.43	120.67	-95.26	25.41	0.348
		3 500.01	78.17	V	31.30	10.43	119.90	-95.26	24.64	0.291
		3 540.00	78.54	H	31.30	12.14	121.98	-95.26	26.72	0.470
		3 540.00	79.59	V	31.30	12.14	123.03	-95.26	27.77	0.599
30	CP-OFDM QPSK	3 465.00	80.04	H	31.23	10.45	121.72	-95.26	26.46	0.443
		3 465.00	79.60	V	31.23	10.45	121.28	-95.26	26.02	0.400
		3 500.01	77.03	H	31.30	10.43	118.76	-95.26	23.50	0.224
		3 500.01	75.96	V	31.30	10.43	117.69	-95.26	22.43	0.175
		3 534.99	76.51	H	31.30	12.34	120.15	-95.26	24.89	0.308
		3 534.99	78.60	V	31.30	12.34	122.24	-95.26	26.98	0.499
40	CP-OFDM QPSK	3 470.01	79.62	H	31.24	10.34	121.20	-95.26	25.94	0.393
		3 470.01	79.02	V	31.24	10.34	120.60	-95.26	25.34	0.342
		3 500.01	77.39	H	31.30	10.43	119.12	-95.26	23.86	0.243
		3 500.01	76.92	V	31.30	10.43	118.65	-95.26	23.39	0.218
		3 529.98	77.79	H	31.30	12.54	121.63	-95.26	26.37	0.434
		3 529.98	80.18	V	31.30	12.54	124.02	-95.26	28.76	0.752
50	CP-OFDM QPSK	3 475.02	79.32	H	31.25	10.23	120.80	-95.26	25.54	0.358
		3 475.02	80.75	V	31.25	10.23	122.23	-95.26	26.97	0.498
		3 500.01	79.81	H	31.30	10.43	121.54	-95.26	26.28	0.425
		3 500.01	79.00	V	31.30	10.43	120.73	-95.26	25.47	0.353
		3 525.00	74.70	H	31.30	12.74	118.74	-95.26	23.48	0.223
		3 525.00	76.21	V	31.30	12.74	120.25	-95.26	24.99	0.316

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
60	CP-OFDM QPSK	3 480.00	78.89	H	31.26	10.27	120.42	-95.26	25.16	0.328
		3 480.00	79.35	V	31.26	10.27	120.88	-95.26	25.62	0.365
		3 500.01	74.77	H	31.30	10.43	116.50	-95.26	21.24	0.133
		3 500.01	76.74	V	31.30	10.43	118.47	-95.26	23.21	0.210
		3 519.99	75.67	H	31.30	12.28	119.25	-95.26	23.99	0.251
		3 519.99	76.76	V	31.30	12.28	120.34	-95.26	25.08	0.322
70	CP-OFDM QPSK	3 485.01	78.68	H	31.27	10.31	120.26	-95.26	25.00	0.316
		3 485.01	80.00	V	31.27	10.31	121.58	-95.26	26.32	0.429
		3 500.01	76.18	H	31.30	10.43	117.91	-95.26	22.65	0.184
		3 500.01	76.69	V	31.30	10.43	118.42	-95.26	23.16	0.207
		3 514.98	76.52	H	31.30	11.81	119.63	-95.26	24.37	0.274
		3 514.98	77.60	V	31.30	11.81	120.71	-95.26	25.45	0.351
80	CP-OFDM QPSK	3 490.02	78.08	H	31.28	10.35	119.71	-95.26	24.45	0.279
		3 490.02	80.32	V	31.28	10.35	121.95	-95.26	26.69	0.467
		3 500.01	76.36	H	31.30	10.43	118.09	-95.26	22.83	0.192
		3 500.01	77.50	V	31.30	10.43	119.23	-95.26	23.97	0.250
		3 510.00	77.18	H	31.30	11.35	119.83	-95.26	24.57	0.287
		3 510.00	78.20	V	31.30	11.35	120.85	-95.26	25.59	0.362
90	CP-OFDM QPSK	3 495.00	77.83	H	31.29	10.39	119.51	-95.26	24.25	0.266
		3 495.00	80.38	V	31.29	10.39	122.06	-95.26	26.80	0.479
		3 500.01	77.27	H	31.30	10.43	119.00	-95.26	23.74	0.237
		3 500.01	79.27	V	31.30	10.43	121.00	-95.26	25.74	0.375
		3 504.99	76.16	H	31.30	10.89	118.35	-95.26	23.09	0.204
		3 504.99	77.69	V	31.30	10.89	119.88	-95.26	24.62	0.290
100	CP-OFDM QPSK	3 500.01	78.77	H	31.30	10.43	120.50	-95.26	25.24	0.334
		3 500.01	77.99	V	31.30	10.43	119.72	-95.26	24.46	0.279

NR 77/78 High Band (3 700 ~ 3 980 ㎒)

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
20	CP-OFDM QPSK	3 710.01	74.17	H	32.24	11.90	118.31	-95.26	23.05	0.202
		3 710.01	75.77	V	32.24	11.90	119.91	-95.26	24.65	0.292
		3 840.00	77.43	H	32.32	11.88	121.63	-95.26	26.37	0.434
		3 840.00	78.50	V	32.32	11.88	122.70	-95.26	27.44	0.555
		3 969.99	73.23	H	32.20	11.92	117.35	-95.26	22.09	0.162
		3 969.99	76.99	V	32.20	11.92	121.11	-95.26	25.85	0.385
30	CP-OFDM QPSK	3 715.02	76.31	H	32.26	11.92	120.49	-95.26	25.23	0.334
		3 715.02	75.80	V	32.26	11.92	119.98	-95.26	24.72	0.297
		3 840.00	73.98	H	32.32	11.88	118.18	-95.26	22.92	0.196
		3 840.00	77.55	V	32.32	11.88	121.75	-95.26	26.49	0.446
		3 964.98	75.42	H	32.20	11.82	119.44	-95.26	24.18	0.262
		3 964.98	76.97	V	32.20	11.82	120.99	-95.26	25.73	0.374
40	CP-OFDM QPSK	3 720.00	76.16	H	32.28	11.95	120.39	-95.26	25.13	0.326
		3 720.00	75.90	V	32.28	11.95	120.13	-95.26	24.87	0.307
		3 840.00	78.45	H	32.32	11.88	122.65	-95.26	27.39	0.549
		3 840.00	77.11	V	32.32	11.88	121.31	-95.26	26.05	0.403
		3 960.00	76.79	H	32.20	11.71	120.70	-95.26	25.44	0.350
		3 960.00	78.59	V	32.20	11.71	122.50	-95.26	27.24	0.530
50	CP-OFDM QPSK	3 725.01	76.04	H	32.30	11.98	120.32	-95.26	25.06	0.321
		3 725.01	75.83	V	32.30	11.98	120.11	-95.26	24.85	0.306
		3 840.00	78.85	H	32.32	11.88	123.05	-95.26	27.79	0.602
		3 840.00	77.38	V	32.32	11.88	121.58	-95.26	26.32	0.429
		3 954.99	76.12	H	32.20	11.61	119.93	-95.26	24.67	0.293
		3 954.99	76.65	V	32.20	11.61	120.46	-95.26	25.20	0.331

BW (MHz)	Modulation	Frequency (MHz)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
60	CP-OFDM QPSK	3 730.02	76.68	H	32.32	11.84	120.84	-95.26	25.58	0.362
		3 730.02	75.04	V	32.32	11.84	119.20	-95.26	23.94	0.248
		3 840.00	77.42	H	32.32	11.88	121.62	-95.26	26.36	0.433
		3 840.00	76.03	V	32.32	11.88	120.23	-95.26	24.97	0.314
		3 949.98	74.78	H	32.20	11.50	118.48	-95.26	23.22	0.210
		3 949.98	78.62	V	32.20	11.50	122.32	-95.26	27.06	0.508
70	CP-OFDM QPSK	3 735.00	76.41	H	32.34	11.71	120.46	-95.26	25.20	0.331
		3 735.00	74.79	V	32.34	11.71	118.84	-95.26	23.58	0.228
		3 840.00	76.68	H	32.32	11.88	120.88	-95.26	25.62	0.365
		3 840.00	76.72	V	32.32	11.88	120.92	-95.26	25.66	0.368
		3 945.00	76.34	H	32.21	11.59	120.14	-95.26	24.88	0.308
		3 945.00	77.51	V	32.21	11.59	121.31	-95.26	26.05	0.403
80	CP-OFDM QPSK	3 740.01	75.66	H	32.36	11.57	119.59	-95.26	24.33	0.271
		3 740.01	75.21	V	32.36	11.57	119.14	-95.26	23.88	0.244
		3 840.00	73.14	H	32.32	11.88	117.34	-95.26	22.08	0.162
		3 840.00	75.63	V	32.32	11.88	119.83	-95.26	24.57	0.287
		3 939.99	75.73	H	32.22	11.69	119.64	-95.26	24.38	0.274
		3 939.99	76.99	V	32.22	11.69	120.90	-95.26	25.64	0.367
90	CP-OFDM QPSK	3 745.02	76.31	H	32.38	11.44	120.13	-95.26	24.87	0.307
		3 745.02	75.26	V	32.38	11.44	119.08	-95.26	23.82	0.241
		3 840.00	71.90	H	32.32	11.88	116.10	-95.26	20.84	0.121
		3 840.00	73.26	V	32.32	11.88	117.46	-95.26	22.20	0.166
		3 934.98	74.51	H	32.23	11.78	118.52	-95.26	23.26	0.212
		3 934.98	75.07	V	32.23	11.78	119.08	-95.26	23.82	0.241
100	CP-OFDM QPSK	3 750.00	74.31	H	32.40	11.30	118.01	-95.26	22.75	0.188
		3 750.00	73.53	V	32.40	11.30	117.23	-95.26	21.97	0.157
		3 840.00	73.00	H	32.32	11.88	117.20	-95.26	21.94	0.156
		3 840.00	76.11	V	32.32	11.88	120.31	-95.26	25.05	0.320
		3 930.00	72.85	H	32.24	11.88	116.97	-95.26	21.71	0.148
		3 930.00	76.20	V	32.24	11.88	120.32	-95.26	25.06	0.321

- External Antenna

MIMO

NR 77/78 Low Band (3 450 ~ 3 550 ㎒)

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
20	CP-OFDM QPSK	3 460.02	72.06	H	31.22	10.55	113.83	-95.26	18.57	0.072
		3 460.02	76.08	V	31.22	10.55	117.85	-95.26	22.59	0.182
		3 500.01	72.38	H	31.30	10.43	114.11	-95.26	18.85	0.077
		3 500.01	77.62	V	31.30	10.43	119.35	-95.26	24.09	0.257
		3 540.00	71.51	H	31.30	12.14	114.95	-95.26	19.69	0.093
		3 540.00	77.67	V	31.30	12.14	121.11	-95.26	25.85	0.385
30	CP-OFDM QPSK	3 465.00	72.28	H	31.23	10.45	113.96	-95.26	18.70	0.074
		3 465.00	75.50	V	31.23	10.45	117.18	-95.26	21.92	0.156
		3 500.01	72.05	H	31.30	10.43	113.78	-95.26	18.52	0.071
		3 500.01	75.88	V	31.30	10.43	117.61	-95.26	22.35	0.172
		3 534.99	70.61	H	31.30	12.34	114.25	-95.26	18.99	0.079
		3 534.99	76.84	V	31.30	12.34	120.48	-95.26	25.22	0.333
40	CP-OFDM QPSK	3 470.01	72.09	H	31.24	10.34	113.67	-95.26	18.41	0.069
		3 470.01	75.63	V	31.24	10.34	117.21	-95.26	21.95	0.157
		3 500.01	72.59	H	31.30	10.43	114.32	-95.26	19.06	0.081
		3 500.01	76.82	V	31.30	10.43	118.55	-95.26	23.29	0.213
		3 529.98	71.53	H	31.30	12.54	115.37	-95.26	20.11	0.103
		3 529.98	77.77	V	31.30	12.54	121.61	-95.26	26.35	0.432
50	CP-OFDM QPSK	3 475.02	72.11	H	31.25	10.23	113.59	-95.26	18.33	0.068
		3 475.02	76.23	V	31.25	10.23	117.71	-95.26	22.45	0.176
		3 500.01	73.38	H	31.30	10.43	115.11	-95.26	19.85	0.097
		3 500.01	76.32	V	31.30	10.43	118.05	-95.26	22.79	0.190
		3 525.00	70.94	H	31.30	12.74	114.98	-95.26	19.72	0.094
		3 525.00	77.52	V	31.30	12.74	121.56	-95.26	26.30	0.427

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
60	CP-OFDM QPSK	3 480.00	72.65	H	31.26	10.27	114.18	-95.26	18.92	0.078
		3 480.00	75.89	V	31.26	10.27	117.42	-95.26	22.16	0.165
		3 500.01	72.08	H	31.30	10.43	113.81	-95.26	18.55	0.072
		3 500.01	77.01	V	31.30	10.43	118.74	-95.26	23.48	0.223
		3 519.99	72.22	H	31.30	12.28	115.80	-95.26	20.54	0.113
		3 519.99	77.85	V	31.30	12.28	121.43	-95.26	26.17	0.414
70	CP-OFDM QPSK	3 485.01	73.03	H	31.27	10.31	114.61	-95.26	19.35	0.086
		3 485.01	76.73	V	31.27	10.31	118.31	-95.26	23.05	0.202
		3 500.01	71.50	H	31.30	10.43	113.23	-95.26	17.97	0.063
		3 500.01	76.87	V	31.30	10.43	118.60	-95.26	23.34	0.216
		3 514.98	72.72	H	31.30	11.81	115.83	-95.26	20.57	0.114
		3 514.98	76.57	V	31.30	11.81	119.68	-95.26	24.42	0.277
80	CP-OFDM QPSK	3 490.02	72.61	H	31.28	10.35	114.24	-95.26	18.98	0.079
		3 490.02	76.24	V	31.28	10.35	117.87	-95.26	22.61	0.182
		3 500.01	72.45	H	31.30	10.43	114.18	-95.26	18.92	0.078
		3 500.01	76.19	V	31.30	10.43	117.92	-95.26	22.66	0.185
		3 510.00	72.15	H	31.30	11.35	114.80	-95.26	19.54	0.090
		3 510.00	76.46	V	31.30	11.35	119.11	-95.26	23.85	0.243
90	CP-OFDM QPSK	3 495.00	73.12	H	31.29	10.39	114.80	-95.26	19.54	0.090
		3 495.00	76.08	V	31.29	10.39	117.76	-95.26	22.50	0.178
		3 500.01	73.05	H	31.30	10.43	114.78	-95.26	19.52	0.090
		3 500.01	77.29	V	31.30	10.43	119.02	-95.26	23.76	0.238
		3 504.99	72.37	H	31.30	10.89	114.56	-95.26	19.30	0.085
		3 504.99	77.31	V	31.30	10.89	119.50	-95.26	24.24	0.266
100	CP-OFDM QPSK	3 500.01	71.42	H	31.30	10.43	113.15	-95.26	17.89	0.062
		3 500.01	74.73	V	31.30	10.43	116.46	-95.26	21.20	0.132

NR 77/78 High Band (3 700 ~ 3 980 ㎒)

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
20	CP-OFDM QPSK	3 710.01	72.26	H	32.24	11.90	116.40	-95.26	21.14	0.130
		3 710.01	75.12	V	32.24	11.90	119.26	-95.26	24.00	0.251
		3 840.00	74.84	H	32.32	11.88	119.04	-95.26	23.78	0.239
		3 840.00	76.56	V	32.32	11.88	120.76	-95.26	25.50	0.355
		3 969.99	74.47	H	32.20	11.92	118.59	-95.26	23.33	0.215
		3 969.99	75.98	V	32.20	11.92	120.10	-95.26	24.84	0.305
30	CP-OFDM QPSK	3 715.02	72.71	H	32.26	11.92	116.89	-95.26	21.63	0.146
		3 715.02	77.36	V	32.26	11.92	121.54	-95.26	26.28	0.425
		3 840.00	73.23	H	32.32	11.88	117.43	-95.26	22.17	0.165
		3 840.00	77.92	V	32.32	11.88	122.12	-95.26	26.86	0.486
		3 964.98	74.52	H	32.20	11.82	118.54	-95.26	23.28	0.213
		3 964.98	78.01	V	32.20	11.82	122.03	-95.26	26.77	0.476
40	CP-OFDM QPSK	3 720.00	71.56	H	32.28	11.95	115.79	-95.26	20.53	0.113
		3 720.00	76.22	V	32.28	11.95	120.45	-95.26	25.19	0.331
		3 840.00	73.43	H	32.32	11.88	117.63	-95.26	22.37	0.173
		3 840.00	76.62	V	32.32	11.88	120.82	-95.26	25.56	0.360
		3 960.00	73.35	H	32.20	11.71	117.26	-95.26	22.00	0.159
		3 960.00	78.00	V	32.20	11.71	121.91	-95.26	26.65	0.463
50	CP-OFDM QPSK	3 725.01	71.77	H	32.30	11.98	116.05	-95.26	20.79	0.120
		3 725.01	76.20	V	32.30	11.98	120.48	-95.26	25.22	0.333
		3 840.00	73.14	H	32.32	11.88	117.34	-95.26	22.08	0.162
		3 840.00	76.39	V	32.32	11.88	120.59	-95.26	25.33	0.341
		3 954.99	73.31	H	32.20	11.61	117.12	-95.26	21.86	0.154
		3 954.99	76.99	V	32.20	11.61	120.80	-95.26	25.54	0.358

BW (㎒)	Modulation	Frequency (㎒)	Measured Level (dBμV)	Ant. Pol.	AF (dB/m)	CL (dB)	E (dBμV/m)	CF (dB)	E.I.R.P.	
									(dB m)	(W)
60	CP-OFDM QPSK	3 730.02	71.41	H	32.32	11.84	115.57	-95.26	20.31	0.107
		3 730.02	76.30	V	32.32	11.84	120.46	-95.26	25.20	0.331
		3 840.00	74.67	H	32.32	11.88	118.87	-95.26	23.61	0.230
		3 840.00	76.50	V	32.32	11.88	120.70	-95.26	25.44	0.350
		3 949.98	72.33	H	32.20	11.50	116.03	-95.26	20.77	0.119
		3 949.98	77.40	V	32.20	11.50	121.10	-95.26	25.84	0.384
70	CP-OFDM QPSK	3 735.00	71.40	H	32.34	11.71	115.45	-95.26	20.19	0.105
		3 735.00	76.67	V	32.34	11.71	120.72	-95.26	25.46	0.352
		3 840.00	74.48	H	32.32	11.88	118.68	-95.26	23.42	0.220
		3 840.00	77.14	V	32.32	11.88	121.34	-95.26	26.08	0.406
		3 945.00	71.77	H	32.21	11.59	115.57	-95.26	20.31	0.107
		3 945.00	77.34	V	32.21	11.59	121.14	-95.26	25.88	0.387
80	CP-OFDM QPSK	3 740.01	71.21	H	32.36	11.57	115.14	-95.26	19.88	0.097
		3 740.01	75.38	V	32.36	11.57	119.31	-95.26	24.05	0.254
		3 840.00	74.73	H	32.32	11.88	118.93	-95.26	23.67	0.233
		3 840.00	76.59	V	32.32	11.88	120.79	-95.26	25.53	0.357
		3 939.99	71.62	H	32.22	11.69	115.53	-95.26	20.27	0.106
		3 939.99	76.12	V	32.22	11.69	120.03	-95.26	24.77	0.300
90	CP-OFDM QPSK	3 745.02	71.05	H	32.38	11.44	114.87	-95.26	19.61	0.091
		3 745.02	75.43	V	32.38	11.44	119.25	-95.26	23.99	0.251
		3 840.00	74.50	H	32.32	11.88	118.70	-95.26	23.44	0.221
		3 840.00	76.05	V	32.32	11.88	120.25	-95.26	24.99	0.316
		3 934.98	71.45	H	32.23	11.78	115.46	-95.26	20.20	0.105
		3 934.98	76.24	V	32.23	11.78	120.25	-95.26	24.99	0.316
100	CP-OFDM QPSK	3 750.00	71.78	H	32.40	11.30	115.48	-95.26	20.22	0.105
		3 750.00	75.29	V	32.40	11.30	118.99	-95.26	23.73	0.236
		3 840.00	73.97	H	32.32	11.88	118.17	-95.26	22.91	0.196
		3 840.00	77.27	V	32.32	11.88	121.47	-95.26	26.21	0.418
		3 930.00	73.12	H	32.24	11.88	117.24	-95.26	21.98	0.158
		3 930.00	76.58	V	32.24	11.88	120.70	-95.26	25.44	0.350

2.4.2. Spurious Radiated Emissions

- Internal Antenna

SISO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

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 (3 490.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 510.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

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 (3 740.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 939.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

ENDC

Low Band (3 450 ~ 3 550 ㎒)

7A-n77A (60 ㎒ - DFTS-OFDM BPSK)

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 (3 480.00 ㎒)									
6 960.12	40.56	H	35.52	-32.19	43.89	-95.26	-51.37	-13	38.37
6 960.36	45.52	V	35.52	-32.19	48.85	-95.26	-46.41	-13	33.41
10 440.38	48.52	H	37.80	-29.61	56.71	-95.26	-38.55	-13	25.55
10 440.34	47.01	V	37.80	-29.61	55.20	-95.26	-40.06	-13	27.06
Above 10 500.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
7 000.68	40.94	H	35.60	-32.35	44.19	-95.26	-51.07	-13	38.07
7 000.22	44.05	V	35.60	-32.36	47.29	-95.26	-47.97	-13	34.97
10 500.32	48.47	H	37.80	-30.16	56.11	-95.26	-39.15	-13	26.15
10 500.24	48.34	V	37.80	-30.16	55.98	-95.26	-39.28	-13	26.28
Above 10 600.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 519.99 ㎒)									
7 040.14	41.99	H	35.68	-32.33	45.34	-95.26	-49.92	-13	36.92
7 040.26	43.14	V	35.68	-32.33	46.49	-95.26	-48.77	-13	35.77
10 560.17	49.53	H	37.72	-29.99	57.26	-95.26	**-38.00**	-13	25.00
10 560.22	47.45	V	37.72	-29.99	55.18	-95.26	-40.08	-13	27.08
Above 10 600.00	Not detected	–	–	–	–	–	–	–	–

5A-n78A (20 ㎒ - DFTS-OFDM QPSK)

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 (3 460.02 ㎒)									
10 405.79	47.40	H	37.80	-28.22	56.98	-95.26	**-38.28**	-13	25.28
10 406.28	43.30	V	37.80	-28.23	52.87	-95.26	-42.39	-13	29.39
Above 10 500.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
10 526.25	49.18	H	37.75	-30.47	56.46	-95.26	-38.80	-13	25.80
10 526.18	47.44	V	37.75	-30.47	54.72	-95.26	-40.54	-13	27.54
Above 10 600.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 540.00 ㎒)									
10 645.76	47.97	H	37.89	-29.35	56.51	-95.26	-38.75	-13	25.75
10 645.90	43.84	V	37.89	-29.35	52.38	-95.26	-42.88	-13	29.88
Above 10 700.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

7A-n77A (40 ㎒ - DFTS-OFDM BPSK)

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 (3 720.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 960.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

5A-n78A (60 ㎒ - DFTS-OFDM BPSK)

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 (3 730.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 949.98 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

MIMO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (90 ㎒ - CP-OFDM QPSK)

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 (3 495.00 ㎒)									
10 486.10	51.79	V	37.80	-30.04	59.55	-95.26	**-35.71**	-16.01	19.70
Above 10 500.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
10 500.78	41.91	V	37.80	-30.17	49.54	-95.26	-45.72	-16.01	29.71
Above 10 600.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 504.99 ㎒)									
10 516.17	44.29	V	37.77	-30.38	51.68	-95.26	-43.58	-16.01	27.57
Above 10 600.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (60 ㎒ - CP-OFDM QPSK)

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 (3 730.02 ㎒)									
7 460.36	48.06	V	36.20	-32.10	52.16	-95.26	-43.10	-16.01	27.09
11 190.48	47.13	H	38.36	-27.82	57.67	-95.26	-37.59	-16.01	21.58
11 190.50	55.27	V	38.36	-27.82	65.81	-95.26	-29.45	-16.01	13.44
Above 11 200.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
7 680.16	40.68	V	36.06	-31.01	45.73	-95.26	-49.53	-16.01	33.52
11 520.40	44.93	H	38.60	-26.15	57.38	-95.26	-37.88	-16.01	21.87
11 520.30	56.09	V	38.60	-26.15	68.54	-95.26	**-26.72**	-16.01	10.71
Above 11 600.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 949.98 ㎒)									
7 900.74	33.63	V	36.20	-31.50	38.33	-95.26	-56.93	-16.01	40.92
11 850.82	45.12	H	38.40	-26.43	57.09	-95.26	-38.17	-16.01	22.16
11 850.68	51.90	V	38.40	-26.43	63.87	-95.26	-31.39	-16.01	15.38
Above 11 900.00	Not detected	–	–	–	–	–	–	–	–

- External Antenna_Original

SISO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (3 490.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 510.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

Frequency (㎒)	Measured Level (dB㎶)	Ant. Pol.	AF (dB/m)	AMP+CL (dB)	E (dB㎶/m)	CF (dB)	E.I.R.P. (dB m)	Limit (dB m)	Margin (dB)
Low Channel (3 740.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 939.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

ENDC

Low Band (3 450 ~ 3 550 ㎒)

7A-n77A (60 ㎒ - DFTS-OFDM BPSK)

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 (3 480.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 519.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

5A-n78A (20 ㎒ - DFTS-OFDM QPSK)

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 (3 460.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 540.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

7A-n77A (40 ㎒ - DFTS-OFDM BPSK)

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 (3 720.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 960.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

5A-n78A (60 ㎒ - DFTS-OFDM BPSK)

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 (3 730.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 949.98 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

MIMO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (90 ㎒ - CP-OFDM QPSK)

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 (3 495.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 504.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (60 ㎒ - CP-OFDM QPSK)

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 (3 730.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 949.98 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

- External Antenna_additional

SISO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

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 (3 490.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 510.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (80 ㎒ - DFTS-OFDM QPSK)

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 (3 740.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 939.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

MIMO

Low Band (3 450 ~ 3 550 ㎒)

NR Band 77/78 (90 ㎒ - CP-OFDM QPSK)

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 (3 495.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 500.01 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 504.99 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

High Band (3 700 ~ 3 980 ㎒)

NR Band 77/78 (60 ㎒ - CP-OFDM QPSK)

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 (3 730.02 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
Middle Channel (3 840.00 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–
High Channel (3 949.98 ㎒)									
Below 1 000.00	Not detected	–	–	–	–	–	–	–	–
Above 1 000.00	Not detected	–	–	–	–	–	–	–	–

Remark;

1. AF = Antenna Factor, CL = Cable Loss, CF = Conversion Factor.
2. E (dBμV/m) = Measured Level (dBμV) + Antenna Factor (dB/m) + AMP (dB) + Cable Loss (dB).
3. E.I.R.P. (dB m) = E (dBμV/m) + CF (dB).
4. E.R.P. (dB m) = E (dBμV/m) + CF (dB) - 2.15 (dB); where E.R.P. and E.I.R.P. are expressed in consistent units.
5. CF (dB) = 20 log D - 104.8; where D is the measurement distance in meters, According to KDB 971168 D01 v03r01 5.8.4.
6. The frequency spectrum is examined from 9 ㎑ to the 10th harmonic of the fundamental frequency of the transmitter. No other spurious and harmonic emissions were reported greater than listed emissions above table.

- End of the Test Report -