TEST REPORT

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1. Report No : DRTFCC2312-0172

2. Customer

- Name (FCC) : LG Electronics USA, Inc. / Name (IC) : LG ELECTRONICS INC.
- Address (FCC) : 111 Sylvan Avenue North Building Englewood Cliffs New Jersey United States 07632
  Address (IC) : 222, LG-ro, Jinwi-myeon Pyeongtaek-si, Gyeonggi-do 451-713 Korea (Republic Of)

3. Use of Report : FCC & IC Certification

4. Product Name / Model Name : Telematics(24CY DCM 5G) / TF24SENI
   FCC ID : BEJTF24SENI2
   IC : 2703H-TF24SENI2

5. FCC Regulation(s): Part 22, 24, 27

   IC Standard(s): RSS-Gen Issue 5, 130 Issue 2, 132 Issue 4, 133 Issue 6, 139 Issue 4

   Test Method used: KDB971168 D01v03, ANSI/TIA-603-E-2016, ANSI C63.26-2015

6. Date of Test : 2023.11.23 ~ 2023.12.05

7. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

8. Testing Environment : See appended test report.

9. Test Result : Refer to the attached Test Result

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This test report is not related to KOLAS accreditation.

Affirmation	Tested by Name : SeungMin Gil (Signature)	Technical Manager Name : JaeJin Lee (Signature)

2023 . 12 . 28 .

Dt&C Co., Ltd.

If this report is required to confirmation of authenticity, please contact to report@dtnc.net

Test Report Version

Test Report No.	Date	Description	Revised by	Reviewed by
DRTFCC2312-0172	Dec. 28, 2023	Initial issue	SeungMin Gil	JaeJin Lee

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1. GENERAL INFORMATION

FCC Classification	PCS Licensed Transmitter (PCB)
FCC ID	BEJTF24SENI2
IC	2703H-TF24SENI2
Product Name	Telematics(24CY DCM 5G)
Model Name	TF24SENI
Add Model Name	-
PMN(Product Marketing Name)	TF24SENI
FVIN(Firmware Version Identification Number)	N/A
EUT Serial Number	No specified
Supplying power	DC 12 V
Waveform	CP-OFDM, DFT-S-OFDM
Modulation type	π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM
Channel Bandwidth(MHz)	NR Band n12: 15, 10, 5 NR Band n5: 20, 15, 10, 5 NR Band n66: 40, 20, 15, 10, 5 NR Band n2: 20, 15, 10, 5

	Antenna Gain(dBi)			
NR Band	Internal Antenna 1 (PIFA Antenna)	Internal Antenna 2 (PIFA Antenna)	External Antenna 1 (Sharkfin Antenna)	External Antenna 2 (Pannel Antenna)
n12	-0.9	-1.8	-0.9	-3.0
n5	0.4	-0.6	-0.7	-2.1
n66	0.2	-1.7	0.1	0.5
n2	1.9	-0.7	-0.9	-2.2

Note: The antenna gain was corrected for path loss from the conducted feed point to the antenna terminal.

2. INTRODUCTION

2.1. EUT DESCRIPTION

This device supports the following capabilities:
Multi-Band LTE, LTE up-link carrier aggregation, 5G NR(FR1) and ENDC
5G NR supports SCS 15 kHz for FDD Band and SCS 30 kHz for TDD Band.
This device has 4 antennas and RF switch circuit.

5G NR Band	Internal antenna 1	Internal antenna 2	External antenna 1	External antenna 2
n12, n5, n66, n2	Support	Support	Support	Support
n77	Not support	Support	Not support	Support

The device does not support MIMO technology.

2.2. TESTING ENVIRONMENT

Ambient Condition	
▪ Temperature	+21 ℃ ~ +22 ℃
▪ Relative Humidity	40 % ~ 41 %

2.3. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.4. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C 63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

Parameter	Measurement uncertainty
Radiated Disturbance (Below 1 GHz)	4.8 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.0 dB (The confidence level is about 95 %, k = 2)
Radiated Disturbance (Above 18 GHz)	5.2 dB (The confidence level is about 95 %, k = 2)

2.5. TEST FACILITY

Dt&C Co., Ltd.

The 3 m test site and conducted measurement facility used to collect the radiated data are located at the 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042.
The test site complies with the requirements of Part 2.948 according to ANSI C63.4-2014.

- FCC & IC MRA Designation No. : KR0034

- ISED#: 5740A

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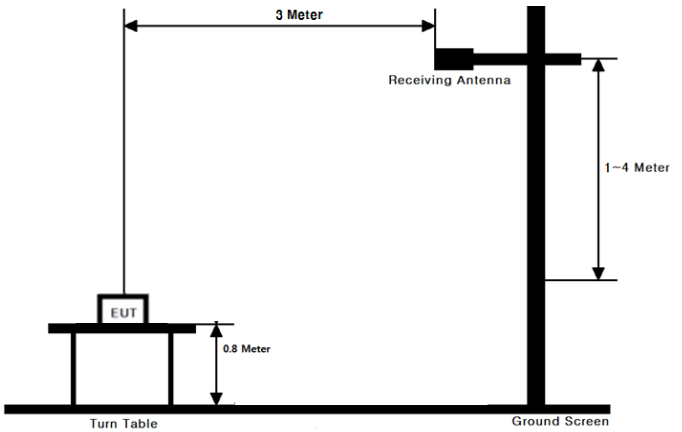
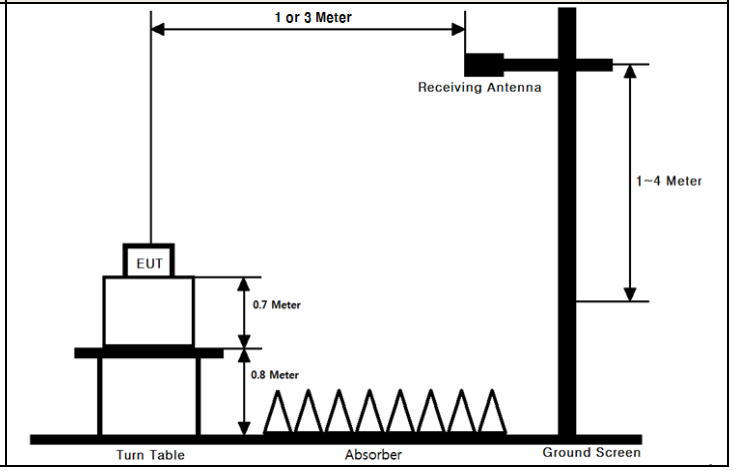
3. DESCRIPTION OF TESTS

3.1. ERP & EIRP (Effective Radiated Power & Equivalent Isotropic Radiated Power)

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 m test site. The equipment under test is placed on a non-conductive table 0.8 or 1.5-meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **ANSI/TIA-603-E-2016 - Section 2.2.17**
- **KDB971168 D01v03 - Section 5.2.2**
- **ANSI C63.26-2015 – Section 5.2.4.4.1**

Test setting

1. Set span to 2 x to 3 x the OBW.
2. Set RBW = 1 % to 5 % of the OBW.
3. Set VBW ≥ 3 x RBW.
4. Set number of points in sweep ≥ 2 × span / RBW.
5. Sweep time:
   1) Set = auto-couple, or
   2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6. Detector = power averaging (rms).
7. If the EUT can be configured to transmit continuously, then set the trigger to free run.
8. If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full-power transmissions).

9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over multiple symbols, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.
10. Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

The receiver antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminal of the substitute antenna is measured.

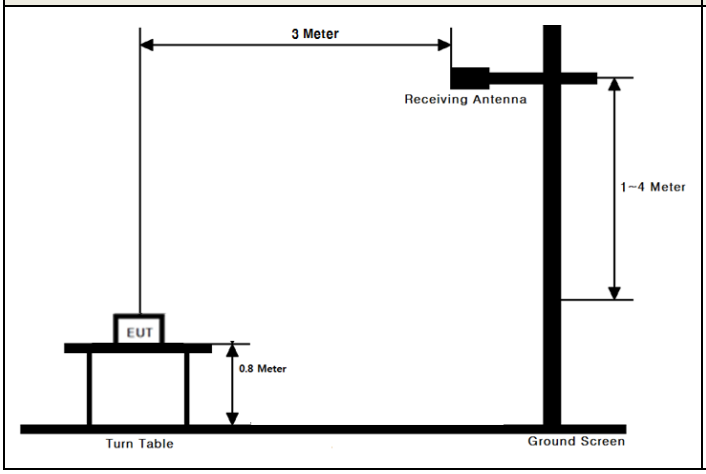
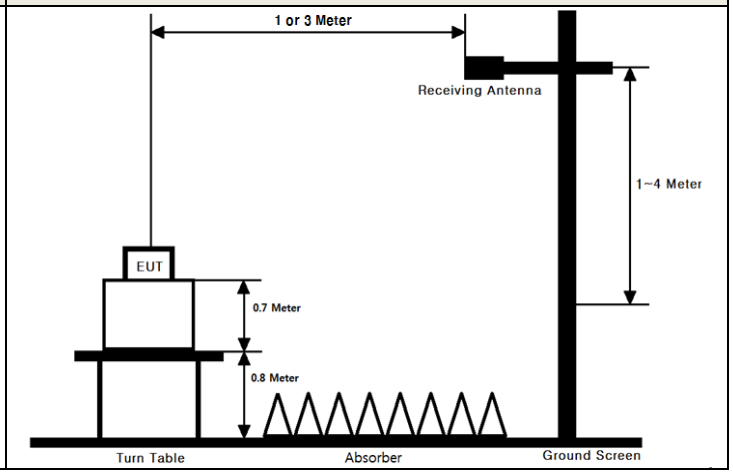
The ERP/EIRP is calculated using the following formula:

ERP/EIRP = The conducted power at the substitute antenna`s terminal [dBm] + Substitute Antenna gain [dBd for ERP , dBi for EIRP]

For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference
Between the gain of the horn antenna and an isotropic antenna are taken into consideration.

3.2. UNDESIRABLE EMISSIONS

Test Set-up

Below 1GHz	Above 1GHz
	

These measurements were performed at 3 test site. The equipment under test is placed on a non-conductive table 0.8 or 1.5 meters above a turntable which is flush with the ground plane and 3 meters from the receive antenna. For measurements above 1 GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.

Test Procedure

- **KDB971168 D01v03 - Section 6**
- **ANSI C63.26-2015 – Section 5.5**
- **ANSI/TIA-603-E-2016 - Section 2.2.12**

Test setting

1. RBW = 100 kHz for below 1 GHz and 1 MHz for above 1 GHz / VBW ≥ 3 X RBW
2. Detector = RMS & Trace mode = Max hold
3. Sweep time = Auto couple
4. Number of sweep point ≥ 2 X span / RBW
5. The trace was allowed to stabilize

The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer.

For radiated power measurements below 1 GHz, a half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading.

For radiated power measurements above 1 GHz, a Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. The difference between the gain of the horn and an isotropic antenna are taken into consideration. This measurement was performed with the EUT oriented in 3 orthogonal axis.

4. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal. Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	22/12/16	23/12/16	MY50110097
Multimeter	FLUKE	17B+	22/12/16	23/12/16	36390701WS
Radio Communication Analyzer	KEYSIGHT	E7515B	23/06/23	24/06/23	MY60192461
Thermohygrometer	BODYCOM	BJ5478	22/12/16	23/12/16	120612-2
Signal Generator	Rohde Schwarz	SMBV100A	22/12/16	23/12/16	255571
Signal Generator	ANRITSU	MG3695C	22/12/16	23/12/16	173501
Power Divider	Weinschel	1515-1	23/06/23	24/06/23	UB881
Loop Antenna	ETS-Lindgren	6502	23/11/09	24/11/09	00060496
Bilog Antenna	Schwarzbeck	VULB 9160	22/12/16	23/12/16	3362
Dipole Antenna	Schwarzbeck	UHA 9105	22/12/16	24/12/16	2262
HORN ANT	ETS	3117	22/12/16	23/12/16	00140394
HORN ANT	A.H.Systems	SAS-574	23/06/23	24/06/23	155
PreAmplifier	H.P	8447D	22/12/16	23/12/16	2944A07774
PreAmplifier	Agilent	8449B	22/12/16	23/12/16	3008A02108
PreAmplifier	A.H.Systems Inc.	PAM-1840VH	23/06/23	24/06/23	163
Band Reject Fliter	Wainwright	WTRCTV5-1710-2000-20-60-40SSM	23/06/23	24/06/23	1
High-pass filter	Wainwright	WHKX12-935-1000-15000-40SS	22/12/16	23/12/16	7
High-pass filter	Wainwright	WHKX10-2838-3300-18000-60SS	22/12/16	23/12/16	2
High-pass filter	Wainwright	WHKX6-6320-8000-26500-40CC	22/12/16	23/12/16	2
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-1
Cable	HUBER+SUHNER	SUCOFLEX100	23/01/04	24/01/04	M-2
Cable	Junkosah	MWX241/B	23/01/04	24/01/04	M-3
Cable	Junkosah	MWX221	23/01/04	24/01/04	M-4
Cable	Junkosah	MWX221	23/01/04	24/01/04	M-5
Cable	JUNFLON	J12J101757-00	23/01/04	24/01/04	M-7
Cable	HUBER+SUHNER	SUCOFLEX104	23/01/04	24/01/04	M-8
Cable	HUBER+SUHNER	SUCOFLEX106	23/01/04	24/01/04	M-9
Cable	JUNFLON	MWX315	23/01/04	24/01/04	M-10
Cable	DTNC	Cable	23/01/04	24/01/04	RFC-44

Note1: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2017.
Note2: The cable is not a regular calibration item, so it has been calibrated by Dt&C itself.

5. SUMMARY OF TEST RESULTS

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Status Note 1
27.50(c.9)	RSS-130 [4.6]	Radiated Output Power (n12)	For mobile equipment: < 3 Watts max. ERP	Radiated	**C**
22.913(a.5)	RSS-132 [5.4]	Radiated Output Power (n5)	For mobile equipment: < 7 Watts max. ERP		**C**
27.50(d.4)	RSS-139 [5.5]	Radiated Output Power (B66)	For mobile equipment: < 1 Watts max. EIRP		**C**
24.232(c)	RSS-133 [6.4]	Radiated Output Power (n2)	For mobile equipment: < 2 Watts max. EIRP		**C**
2.1053 22.917(a) 24.238(a) 27.53(g) 27.53(h)	RSS-130 [4.7] RSS-132 [5.5] RSS-133 [6.5] RSS-139 [5.6]	Undesirable Emissions	> 43 + 10log$_{10}$ (P) dB for all out-of-band emissions		**C**

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable
Note 2: This test item was performed in three orthogonal EUT positions and the worst case data was reported.
Note 3: This device uses the certified module.(FCC ID: BEJTM15FNNATY0, IC: 2703H-TM15FNNATY0)
Please refer to the module test report for conducted signal test items. The conducted output power was verified to be the same as module.
Note 4: All antenna configuration were investigated and worst case data were reported.
Note 5: The DFT-s-OFDM and CP-OFDM waveforms were investigated, and worst case(DFT-s-OFDM) configuration results are reported.

6. SAMPLE CALCULATION

A. Emission Designator

1) The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1 GHz respectively above ground.
2) The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
3) During the test, the turn table is rotated until the maximum signal is found.
4) Record the field strength meter's level. (ex. Spectrum reading level is -8.5 dBm)
5) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
6) Increase the signal generator output till the field strength meter's level is equal to the item (4). (ex. Signal generator level is -18.04 dBm)
7) The gain of the cable and amplifier between the signal generator and terminals of substituted antenna is 46.92 dB at test frequency.
8) Record the level at substituted antenna terminal. (ex. 28.88dBm)
9) The result is calculated as below;

EIRP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBi)
ERP(dBm) = LEVLE@ANTENNA TERMINAL + TX Antenna Gain (dBd)
Where, TX Antenna Gain (dBd) = TX Antenna Gain (dBi) - 2.15 dB

7. TEST DATA

7.1. ERP&EIRP

- Test Notes

1) This is device was tested under all bandwidths, modulations and RB configurations and the worst case data are reported in the below table.

7.1.1. NR Band n12

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
15	706.5	π/2 BPSK	1/77	H	22.70	-1.31	21.39	0.138
		QPSK		H	22.49	-1.31	21.18	0.131
		16QAM		H	21.63	-1.31	20.32	0.108
		64QAM		H	20.29	-1.31	18.98	0.079
		256QAM		H	18.46	-1.31	17.15	0.052
	708.5	π/2 BPSK	1/77	H	22.87	-1.33	21.54	0.143
		QPSK		H	22.68	-1.33	21.35	0.136
		16QAM		H	21.74	-1.33	20.41	0.110
		64QAM		H	20.46	-1.33	19.13	0.082
		256QAM		H	18.32	-1.33	16.99	0.050
10	704	π/2 BPSK	1/50	H	21.73	-1.28	20.45	0.111
		QPSK		H	21.36	-1.28	20.08	0.102
		16QAM		H	20.51	-1.28	19.23	0.084
		64QAM		H	19.28	-1.28	18.00	0.063
		256QAM		H	17.07	-1.28	15.79	0.038
	711	π/2 BPSK	1/50	H	22.95	-1.36	21.59	0.144
		QPSK		H	22.67	-1.36	21.31	0.135
		16QAM		H	21.69	-1.36	20.33	0.108
		64QAM		H	20.26	-1.36	18.90	0.078
		256QAM		H	18.55	-1.36	17.19	0.052
5	701.5	π/2 BPSK	1/23	H	21.19	-1.26	19.93	0.098
		QPSK		H	20.85	-1.26	19.59	0.091
		16QAM		H	20.22	-1.26	18.96	0.079
		64QAM		H	18.77	-1.26	17.51	0.056
		256QAM		H	16.65	-1.26	15.39	0.035
	707.5	π/2 BPSK	1/23	H	22.07	-1.32	20.75	0.119
		QPSK		H	21.96	-1.32	20.64	0.116
		16QAM		H	20.99	-1.32	19.67	0.093
		64QAM		H	19.80	-1.32	18.48	0.070
		256QAM		H	17.66	-1.32	16.34	0.043
	713.5	π/2 BPSK	1/23	H	22.91	-1.39	21.52	0.142
		QPSK		H	22.87	-1.39	21.48	0.141
		16QAM		H	21.78	-1.39	20.39	0.109
		64QAM		H	20.27	-1.39	18.88	0.077
		256QAM		H	18.61	-1.39	17.22	0.053

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
10	711	π/2 BPSK	1/50	H	22.40	-1.36	21.04	0.127
		QPSK		H	22.38	-1.36	21.02	0.126
		16QAM		H	21.52	-1.36	20.16	0.104
		64QAM		H	20.38	-1.36	19.02	0.080
		256QAM		H	18.26	-1.36	16.90	0.049

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
10	711	π/2 BPSK	1/50	V	15.37	-1.36	14.01	0.025
		QPSK		V	15.25	-1.36	13.89	0.024
		16QAM		V	14.49	-1.36	13.13	0.021
		64QAM		V	13.05	-1.36	11.69	0.015
		256QAM		V	11.12	-1.36	9.76	0.009

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
10	711	π/2 BPSK	1/50	H	18.21	-1.36	16.85	0.048
		QPSK		H	18.20	-1.36	16.84	0.048
		16QAM		H	17.27	-1.36	15.91	0.039
		64QAM		H	15.89	-1.36	14.53	0.028
		256QAM		H	14.10	-1.36	12.74	0.019

7.1.2. NR Band n5

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
20	834	π/2 BPSK	1/53	H	22.62	-1.44	21.18	0.131
		QPSK		H	22.53	-1.44	21.09	0.129
		16QAM		H	21.63	-1.44	20.19	0.104
		64QAM		H	20.36	-1.44	18.92	0.078
		256QAM		H	18.20	-1.44	16.76	0.047
	836.5	π/2 BPSK	1/53	H	22.43	-1.44	20.99	0.126
		QPSK		H	22.28	-1.44	20.84	0.121
		16QAM		H	21.44	-1.44	20.00	0.100
		64QAM		H	19.66	-1.44	18.22	0.066
		256QAM		H	17.85	-1.44	16.41	0.044
	839	π/2 BPSK	1/53	H	22.39	-1.45	20.94	0.124
		QPSK		H	22.18	-1.45	20.73	0.118
		16QAM		H	21.36	-1.45	19.91	0.098
		64QAM		H	19.83	-1.45	18.38	0.069
		256QAM		H	18.02	-1.45	16.57	0.045
15	831.5	π/2 BPSK	1/39	H	22.49	-1.44	21.05	0.127
		QPSK		H	22.36	-1.44	20.92	0.124
		16QAM		H	21.65	-1.44	20.21	0.105
		64QAM		H	20.21	-1.44	18.77	0.075
		256QAM		H	18.22	-1.44	16.78	0.048
	836.5	π/2 BPSK	1/39	H	22.42	-1.44	20.98	0.125
		QPSK		H	22.33	-1.44	20.89	0.123
		16QAM		H	21.35	-1.44	19.91	0.098
		64QAM		H	19.85	-1.44	18.41	0.069
		256QAM		H	17.84	-1.44	16.40	0.044
	841.5	π/2 BPSK	1/1	H	22.67	-1.45	21.22	0.132
		QPSK		H	22.56	-1.45	21.11	0.129
		16QAM		H	21.54	-1.45	20.09	0.102
		64QAM		H	20.27	-1.45	18.82	0.076
		256QAM		H	18.23	-1.45	16.78	0.048
10	829	π/2 BPSK	1/50	H	22.34	-1.43	20.91	0.123
		QPSK		H	22.27	-1.43	20.84	0.121
		16QAM		H	21.51	-1.43	20.08	0.102
		64QAM		H	20.14	-1.43	18.71	0.074
		256QAM		H	17.85	-1.43	16.42	0.044
	836.5	π/2 BPSK	1/1	H	22.43	-1.44	20.99	0.126
		QPSK		H	22.33	-1.44	20.89	0.123
		16QAM		H	21.84	-1.44	20.40	0.110
		64QAM		H	20.27	-1.44	18.83	0.076
		256QAM		H	18.23	-1.44	16.79	0.048
	844	π/2 BPSK	1/1	H	22.40	-1.45	20.95	0.124
		QPSK		H	22.29	-1.45	20.84	0.121
		16QAM		H	21.25	-1.45	19.80	0.095
		64QAM		H	19.78	-1.45	18.33	0.068
		256QAM		H	17.92	-1.45	16.47	0.044

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
5	826.5	π/2 BPSK	1/1	H	22.67	-1.43	21.24	0.133
		QPSK		H	22.59	-1.43	21.16	0.131
		16QAM		H	21.48	-1.43	20.05	0.101
		64QAM		H	20.12	-1.43	18.69	0.074
		256QAM		H	18.09	-1.43	16.66	0.046
	836.5	π/2 BPSK	1/1	H	22.49	-1.44	21.05	0.127
		QPSK		H	22.41	-1.44	20.97	0.125
		16QAM		H	21.70	-1.44	20.26	0.106
		64QAM		H	20.36	-1.44	18.92	0.078
		256QAM		H	18.44	-1.44	17.00	0.050
	846.5	π/2 BPSK	1/1	H	21.94	-1.46	20.48	0.112
		QPSK		H	21.75	-1.46	20.29	0.107
		16QAM		H	20.89	-1.46	19.43	0.088
		64QAM		H	19.73	-1.46	18.27	0.067
		256QAM		H	17.70	-1.46	16.24	0.042

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
5	826.5	π/2 BPSK	1/1	H	21.69	-1.43	20.26	0.106
		QPSK		H	21.49	-1.43	20.06	0.101
		16QAM		H	20.76	-1.43	19.33	0.086
		64QAM		H	19.21	-1.43	17.78	0.060
		256QAM		H	17.52	-1.43	16.09	0.041

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
5	826.5	π/2 BPSK	1/1	V	16.68	-1.43	15.25	0.033
		QPSK		V	16.58	-1.43	15.15	0.033
		16QAM		V	15.83	-1.43	14.40	0.028
		64QAM		V	14.25	-1.43	12.82	0.019
		256QAM		V	12.71	-1.43	11.28	0.013

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	ERP (dBm)	ERP (W)
5	826.5	π/2 BPSK	1/1	H	19.13	-1.43	17.70	0.059
		QPSK		H	19.03	-1.43	17.60	0.058
		16QAM		H	18.15	-1.43	16.72	0.047
		64QAM		H	16.67	-1.43	15.24	0.033
		256QAM		H	14.62	-1.43	13.19	0.021

7.1.3. NR Band n66

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	EIRP (dBm)	EIRP (W)
40	1 730	π/2 BPSK	1/1	H	20.95	5.75	26.70	0.468
		QPSK		H	20.69	5.75	26.44	0.441
		16QAM		H	19.76	5.75	25.51	0.356
		64QAM		H	18.33	5.75	24.08	0.256
		256QAM		H	16.60	5.75	22.35	0.172
	1 745	π/2 BPSK	1/1	H	20.03	5.60	25.63	0.366
		QPSK		H	19.89	5.60	25.49	0.354
		16QAM		H	19.23	5.60	24.83	0.304
		64QAM		H	17.78	5.60	23.38	0.218
		256QAM		H	15.87	5.60	21.47	0.140
	1 760	π/2 BPSK	1/107	H	20.37	5.42	25.79	0.379
		QPSK		H	20.18	5.42	25.60	0.363
		16QAM		H	19.33	5.42	24.75	0.299
		64QAM		H	17.94	5.42	23.36	0.217
		256QAM		H	15.87	5.42	21.29	0.135
20	1 720	π/2 BPSK	1/1	H	20.40	5.86	26.26	0.423
		QPSK		H	20.15	5.86	26.01	0.399
		16QAM		H	19.34	5.86	25.20	0.331
		64QAM		H	17.74	5.86	23.60	0.229
		256QAM		H	16.08	5.86	21.94	0.156
	1 745	π/2 BPSK	1/1	H	20.59	5.60	26.19	0.416
		QPSK		H	20.42	5.60	26.02	0.400
		16QAM		H	19.80	5.60	25.40	0.347
		64QAM		H	18.10	5.60	23.70	0.234
		256QAM		H	16.08	5.60	21.68	0.147
	1 770	π/2 BPSK	1/1	H	21.60	5.29	26.89	0.489
		QPSK		H	21.55	5.29	26.84	0.483
		16QAM		H	20.72	5.29	26.01	0.399
		64QAM		H	19.44	5.29	24.73	0.297
		256QAM		H	17.26	5.29	22.55	0.180
15	1 717.5	π/2 BPSK	1/1	H	20.54	5.89	26.43	0.440
		QPSK		H	20.48	5.89	26.37	0.434
		16QAM		H	19.47	5.89	25.36	0.344
		64QAM		H	17.79	5.89	23.68	0.233
		256QAM		H	15.96	5.89	21.85	0.153
	1 745	π/2 BPSK	1/1	H	20.13	5.60	25.73	0.374
		QPSK		H	20.04	5.60	25.64	0.366
		16QAM		H	18.97	5.60	24.57	0.286
		64QAM		H	17.45	5.60	23.05	0.202
		256QAM		H	15.88	5.60	21.48	0.141
	1 772.5	π/2 BPSK	1/1	H	20.81	5.26	26.07	0.405
		QPSK		H	20.73	5.26	25.99	0.397
		16QAM		H	19.33	5.26	24.59	0.288
		64QAM		H	18.12	5.26	23.38	0.218
		256QAM		H	16.20	5.26	21.46	0.140

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	EIRP (dBm)	EIRP (W)
10	1 715	π/2 BPSK	1/1	H	20.47	5.91	26.38	0.435
		QPSK		H	20.32	5.91	26.23	0.420
		16QAM		H	19.40	5.91	25.31	0.340
		64QAM		H	18.17	5.91	24.08	0.256
		256QAM		H	15.94	5.91	21.85	0.153
	1 745	π/2 BPSK	1/1	H	20.14	5.60	25.74	0.375
		QPSK		H	20.09	5.60	25.69	0.371
		16QAM		H	18.99	5.60	24.59	0.288
		64QAM		H	17.62	5.60	23.22	0.210
		256QAM		H	15.65	5.60	21.25	0.133
	1 775	π/2 BPSK	1/1	H	21.02	5.23	26.25	0.422
		QPSK		H	20.92	5.23	26.15	0.412
		16QAM		H	19.98	5.23	25.21	0.332
		64QAM		H	18.51	5.23	23.74	0.237
		256QAM		H	16.39	5.23	21.62	0.145
5	1 712.5	π/2 BPSK	1/1	H	20.20	5.94	26.14	0.411
		QPSK		H	20.11	5.94	26.05	0.403
		16QAM		H	19.25	5.94	25.19	0.330
		64QAM		H	17.81	5.94	23.75	0.237
		256QAM		H	16.04	5.94	21.98	0.158
	1 745	π/2 BPSK	1/1	H	20.41	5.60	26.01	0.399
		QPSK		H	20.33	5.60	25.93	0.392
		16QAM		H	19.37	5.60	24.97	0.314
		64QAM		H	18.12	5.60	23.72	0.236
		256QAM		H	15.98	5.60	21.58	0.144
	1 777.5	π/2 BPSK	1/1	H	20.50	5.20	25.70	0.372
		QPSK		H	20.38	5.20	25.58	0.361
		16QAM		H	19.57	5.20	24.77	0.300
		64QAM		H	18.18	5.20	23.38	0.218
		256QAM		H	16.52	5.20	21.72	0.149

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
20	1 770	π/2 BPSK	1/1	H	20.21	5.29	25.50	0.355
		QPSK		H	20.17	5.29	25.46	0.352
		16QAM		H	19.41	5.29	24.70	0.295
		64QAM		H	17.96	5.29	23.25	0.211
		256QAM		H	16.14	5.29	21.43	0.139

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
20	1 770	π/2 BPSK	1/1	V	13.40	5.29	18.69	0.074
		QPSK		V	13.20	5.29	18.49	0.071
		16QAM		V	12.30	5.29	17.59	0.057
		64QAM		V	10.93	5.29	16.22	0.042
		256QAM		V	8.96	5.29	14.25	0.027

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
20	1 770	π/2 BPSK	1/1	H	18.62	5.29	23.91	0.246
		QPSK		H	18.57	5.29	23.86	0.243
		16QAM		H	18.05	5.29	23.34	0.216
		64QAM		H	15.89	5.29	21.18	0.131
		256QAM		H	14.19	5.29	19.48	0.089

7.1.4. NR Band n2

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	EIRP (dBm)	EIRP (W)
20	1 860	π/2 BPSK	1/53	V	21.85	4.31	26.16	0.413
		QPSK		V	21.76	4.31	26.07	0.405
		16QAM		V	20.90	4.31	25.21	0.332
		64QAM		V	19.59	4.31	23.90	0.245
		256QAM		V	17.42	4.31	21.73	0.149
	1 880	π/2 BPSK	1/53	V	22.07	4.26	26.33	0.430
		QPSK		V	21.89	4.26	26.15	0.412
		16QAM		V	21.00	4.26	25.26	0.336
		64QAM		V	19.53	4.26	23.79	0.239
		256QAM		V	17.72	4.26	21.98	0.158
	1 900	π/2 BPSK	1/53	V	21.50	4.20	25.70	0.372
		QPSK		V	21.31	4.20	25.51	0.356
		16QAM		V	20.22	4.20	24.42	0.277
		64QAM		V	19.01	4.20	23.21	0.209
		256QAM		V	16.83	4.20	21.03	0.127
15	1 857.5	π/2 BPSK	1/39	V	22.01	4.32	26.33	0.430
		QPSK		V	21.89	4.32	26.21	0.418
		16QAM		V	21.15	4.32	25.47	0.352
		64QAM		V	19.59	4.32	23.91	0.246
		256QAM		V	17.76	4.32	22.08	0.161
	1 880	π/2 BPSK	1/39	V	21.97	4.26	26.23	0.420
		QPSK		V	21.90	4.26	26.16	0.413
		16QAM		V	21.03	4.26	25.29	0.338
		64QAM		V	19.47	4.26	23.73	0.236
		256QAM		V	17.64	4.26	21.90	0.155
	1 902.5	π/2 BPSK	1/39	V	22.15	4.21	26.36	0.433
		QPSK		V	22.08	4.21	26.29	0.426
		16QAM		V	21.37	4.21	25.58	0.361
		64QAM		V	19.27	4.21	23.48	0.223
		256QAM		V	17.84	4.21	22.05	0.160
10	1 855	π/2 BPSK	1/26	V	21.73	4.33	26.06	0.404
		QPSK		V	21.56	4.33	25.89	0.388
		16QAM		V	20.46	4.33	24.79	0.301
		64QAM		V	19.19	4.33	23.52	0.225
		256QAM		V	17.12	4.33	21.45	0.140
	1 880	π/2 BPSK	1/26	V	21.74	4.26	26.00	0.398
		QPSK		V	21.59	4.26	25.85	0.385
		16QAM		V	20.69	4.26	24.95	0.313
		64QAM		V	19.23	4.26	23.49	0.223
		256QAM		V	17.45	4.26	21.71	0.148
	1 905	π/2 BPSK	1/26	V	21.46	4.22	25.68	0.370
		QPSK		V	21.40	4.22	25.62	0.365
		16QAM		V	20.96	4.22	25.18	0.330
		64QAM		V	19.04	4.22	23.26	0.212
		256QAM		V	17.08	4.22	21.30	0.135

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	EIRP (dBm)	EIRP (W)
5	1 852.5	π/2 BPSK	1/12	V	21.44	4.33	25.77	0.378
		QPSK		V	21.39	4.33	25.72	0.373
		16QAM		V	20.67	4.33	25.00	0.316
		64QAM		V	19.01	4.33	23.34	0.216
		256QAM		V	17.18	4.33	21.51	0.142
	1 880	π/2 BPSK	1/12	V	22.30	4.26	26.56	0.453
		QPSK		V	22.22	4.26	26.48	0.445
		16QAM		V	21.18	4.26	25.44	0.350
		64QAM		V	19.76	4.26	24.02	0.252
		256QAM		V	17.85	4.26	22.11	0.163
	1 907.5	π/2 BPSK	1/12	V	22.09	4.23	26.32	0.429
		QPSK		V	22.04	4.23	26.27	0.424
		16QAM		V	21.19	4.23	25.42	0.348
		64QAM		V	19.62	4.23	23.85	0.243
		256QAM		V	17.77	4.23	22.00	0.158

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
5	1 880	π/2 BPSK	1/12	V	21.22	4.26	25.48	0.353
		QPSK		V	21.08	4.26	25.34	0.342
		16QAM		V	20.14	4.26	24.40	0.275
		64QAM		V	19.04	4.26	23.30	0.214
		256QAM		V	17.73	4.26	21.99	0.158

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
5	1 880	π/2 BPSK	1/12	V	14.55	4.26	18.81	0.076
		QPSK		V	14.51	4.26	18.77	0.075
		16QAM		V	13.50	4.26	17.76	0.060
		64QAM		V	12.36	4.26	16.62	0.046
		256QAM		V	10.59	4.26	14.85	0.031

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB Size/ Offset	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	EIRP (dBm)	EIRP (W)
5	1 880	π/2 BPSK	1/12	H	16.66	4.26	20.92	0.124
		QPSK		H	16.54	4.26	20.80	0.120
		16QAM		H	15.54	4.26	19.80	0.095
		64QAM		H	14.11	4.26	18.37	0.069
		256QAM		H	12.10	4.26	16.36	0.043

7.2. UNDESIRABLE EMISSIONS (Radiated)

- Test Notes

1) The frequency spectrum is examined from 9 kHz to the 10th harmonic of the fundamental frequency of the transmitter.
   No other spurious and harmonic emissions were reported greater than listed emissions.
2) EN-DC mode operation were investigated and the worst case configuration results are reported.
3) Limit Calculation for n2/66/12/5 = -13 dBm

7.2.1. NR Band n12

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
15	706.5	π/2 BPSK	1/77	1 426.66	V	-66.36	3.26	-63.10	-13.00	50.10
				2 139.85	V	-63.40	3.16	-60.24	-13.00	47.24
		QPSK		1 426.74	V	-66.06	3.26	-62.80	-13.00	49.80
				2 139.97	V	-62.84	3.16	-59.68	-13.00	46.68
		16QAM		1 426.79	V	-66.68	3.26	-63.42	-13.00	50.42
				2 139.97	V	-63.87	3.16	-60.71	-13.00	47.71
		64QAM		1 426.78	V	-67.83	3.26	-64.57	-13.00	51.57
				2 140.03	V	-64.77	3.16	-61.61	-13.00	48.61
		256QAM		1 426.67	V	-68.71	3.26	-65.45	-13.00	52.45
				2 140.14	V	-65.98	3.16	-62.82	-13.00	49.82
	708.5	π/2 BPSK	1/77	1 430.82	V	-66.35	3.29	-63.06	-13.00	50.06
				2 146.01	V	-62.11	3.15	-58.96	-13.00	45.96
		QPSK		1 430.61	V	-66.39	3.29	-63.10	-13.00	50.10
				2 145.96	V	-61.71	3.15	-58.56	-13.00	45.56
		16QAM		1 430.57	V	-66.53	3.29	-63.24	-13.00	50.24
				2 146.01	V	-62.75	3.15	-59.60	-13.00	46.60
		64QAM		1 430.59	V	-67.31	3.29	-64.02	-13.00	51.02
				2 146.07	V	-64.22	3.15	-61.07	-13.00	48.07
		256QAM		1 430.74	V	-68.17	3.29	-64.88	-13.00	51.88
				2 146.06	V	-65.40	3.15	-62.25	-13.00	49.25

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
10	711	π/2 BPSK	1/50	1 430.84	V	-60.12	3.29	-56.83	-13.00	43.83
				2 146.14	H	-62.03	3.15	-58.88	-13.00	45.88
		QPSK		1 430.83	V	-60.14	3.29	-56.85	-13.00	43.85
				2 146.37	H	-61.82	3.15	-58.67	-13.00	45.67
		16QAM		1 430.76	V	-60.53	3.29	-57.24	-13.00	44.24
				2 146.34	H	-62.31	3.15	-59.16	-13.00	46.16
		64QAM		1 430.78	V	-62.42	3.29	-59.13	-13.00	46.13
				2 145.96	H	-64.24	3.15	-61.09	-13.00	48.09
		256QAM		1 430.72	V	-65.23	3.29	-61.94	-13.00	48.94
				2 146.26	H	-65.77	3.15	-62.62	-13.00	49.62

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
10	711	π/2 BPSK	1/50	1 431.68	V	-68.54	3.29	-65.25	-13.00	52.25
		QPSK		1 432.18	V	-68.26	3.30	-64.96	-13.00	51.96
		16QAM		1 432.11	V	-68.27	3.30	-64.97	-13.00	51.97
		64QAM		1 432.30	V	-68.26	3.30	-64.96	-13.00	51.96
		256QAM		1 431.29	V	-68.37	3.29	-65.08	-13.00	52.08

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
10	711	π/2 BPSK	1/50	1 431.80	V	-68.33	3.30	-65.03	-13.00	52.03
		QPSK		1 432.10	V	-68.29	3.30	-64.99	-13.00	51.99
		16QAM		1 431.88	V	-68.30	3.30	-65.00	-13.00	52.00
		64QAM		1 431.25	V	-68.27	3.29	-64.98	-13.00	51.98
		256QAM		1 432.05	V	-68.25	3.30	-64.95	-13.00	51.95

7.2.2. NR Band n5

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
20	834	π/2 BPSK	1/53	1 667.80	H	-70.05	4.03	-66.02	-13.00	53.02
				2 502.27	V	-60.57	3.58	-56.99	-13.00	43.99
		QPSK		1 667.78	H	-69.65	4.03	-65.62	-13.00	52.62
				2 502.28	V	-59.96	3.58	-56.38	-13.00	43.38
		16QAM		1 667.62	H	-69.65	4.03	-65.62	-13.00	52.62
				2 502.25	V	-60.98	3.58	-57.40	-13.00	44.40
		64QAM		1 667.89	H	-69.87	4.03	-65.84	-13.00	52.84
				2 502.14	V	-62.86	3.58	-59.28	-13.00	46.28
		256QAM		1 668.17	H	-69.80	4.02	-65.78	-13.00	52.78
				2 502.28	V	-64.67	3.58	-61.09	-13.00	48.09
	836.5	π/2 BPSK	1/53	1 672.62	H	-70.33	4.01	-66.32	-13.00	53.32
				2 509.66	V	-60.67	3.64	-57.03	-13.00	44.03
		QPSK		1 672.74	H	-70.38	4.01	-66.37	-13.00	53.37
				2 509.72	V	-60.22	3.64	-56.58	-13.00	43.58
		16QAM		1 673.23	H	-70.28	4.01	-66.27	-13.00	53.27
				2 509.71	V	-60.86	3.64	-57.22	-13.00	44.22
		64QAM		1 672.88	H	-70.36	4.01	-66.35	-13.00	53.35
				2 509.78	V	-62.88	3.64	-59.24	-13.00	46.24
		256QAM		1 673.23	H	-70.32	4.01	-66.31	-13.00	53.31
				2 509.60	V	-64.64	3.64	-61.00	-13.00	48.00
	839	π/2 BPSK	1/53	1 678.17	H	-70.72	3.99	-66.73	-13.00	53.73
				2 517.14	V	-60.28	3.70	-56.58	-13.00	43.58
		QPSK		1 678.14	H	-70.49	3.99	-66.50	-13.00	53.50
				2 517.13	V	-59.09	3.70	-55.39	-13.00	42.39
		16QAM		1 678.26	H	-70.65	3.99	-66.66	-13.00	53.66
				2 517.35	V	-60.53	3.70	-56.83	-13.00	43.83
		64QAM		1 677.68	H	-70.60	3.99	-66.61	-13.00	53.61
				2 517.30	V	-62.42	3.70	-58.72	-13.00	45.72
		256QAM		1 678.18	H	-70.37	3.99	-66.38	-13.00	53.38
				2 517.26	V	-64.26	3.70	-60.56	-13.00	47.56

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
5	826.5	π/2 BPSK	1/1	1 649.06	H	-64.05	4.09	-59.96	-13.00	46.96
				2 473.40	V	-60.80	3.74	-57.06	-13.00	44.06
		QPSK		1 649.12	H	-63.92	4.09	-59.83	-13.00	46.83
				2 473.58	V	-60.71	3.73	-56.98	-13.00	43.98
		16QAM		1 648.98	H	-64.65	4.09	-60.56	-13.00	47.56
				2 473.42	V	-60.60	3.74	-56.86	-13.00	43.86
		64QAM		1 649.10	H	-66.02	4.09	-61.93	-13.00	48.93
				2 473.56	V	-62.54	3.73	-58.81	-13.00	45.81
		256QAM		1 649.16	H	-67.92	4.09	-63.83	-13.00	50.83
				2 473.68	V	-64.29	3.73	-60.56	-13.00	47.56

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
5	826.5	π/2 BPSK	1/1	1 649.53	V	-68.45	4.09	-64.36	-13.00	51.36
		QPSK		1 650.09	V	-68.26	4.09	-64.17	-13.00	51.17
		16QAM		1 650.55	V	-68.05	4.09	-63.96	-13.00	50.96
		64QAM		1 651.36	V	-67.93	4.09	-63.84	-13.00	50.84
		256QAM		1 651.02	V	-68.19	4.09	-64.10	-13.00	51.10

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Result (dBm)	Limit (dBm)	Margin (dB)
5	826.5	π/2 BPSK	1/1	1 649.22	V	-68.50	4.09	-64.41	-13.00	51.41
		QPSK		1 650.37	V	-68.32	4.09	-64.23	-13.00	51.23
		16QAM		1 650.72	V	-67.98	4.09	-63.89	-13.00	50.89
		64QAM		1 651.33	V	-68.17	4.09	-64.08	-13.00	51.08
		256QAM		1 651.14	V	-68.19	4.09	-64.10	-13.00	51.10

7.2.3. NR Band n66

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
40	1 730	π/2 BPSK	1/1	3 421.58	V	-66.36	8.17	-58.19	-13.00	45.19
		QPSK		3 421.56	V	-66.44	8.17	-58.27	-13.00	45.27
		16QAM		3 421.62	V	-66.56	8.17	-58.39	-13.00	45.39
		64QAM		3 421.85	V	-66.05	8.17	-57.88	-13.00	44.88
		256QAM		3 421.76	V	-66.52	8.17	-58.35	-13.00	45.35
	1 745	π/2 BPSK	1/1	3 451.23	V	-67.15	8.28	-58.87	-13.00	45.87
		QPSK		3 451.44	V	-67.08	8.28	-58.80	-13.00	45.80
		16QAM		3 451.53	V	-67.05	8.28	-58.77	-13.00	45.77
		64QAM		3 451.57	V	-67.11	8.28	-58.83	-13.00	45.83
		256QAM		3 450.79	V	-67.14	8.27	-58.87	-13.00	45.87
	1 760	π/2 BPSK	1/107	3 519.95	V	-66.65	8.47	-58.18	-13.00	45.18
		QPSK		3 519.53	V	-66.63	8.47	-58.16	-13.00	45.16
		16QAM		3 519.86	V	-66.66	8.47	-58.19	-13.00	45.19
		64QAM		3 520.32	V	-66.73	8.47	-58.26	-13.00	45.26
		256QAM		3 519.25	V	-66.59	8.47	-58.12	-13.00	45.12

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
20	1 770	π/2 BPSK	1/1	3 521.27	H	-66.39	8.47	-57.92	-13.00	44.92
		QPSK		3 521.24	H	-66.39	8.47	-57.92	-13.00	44.92
		16QAM		3 521.62	H	-66.31	8.47	-57.84	-13.00	44.84
		64QAM		3 521.36	H	-66.34	8.47	-57.87	-13.00	44.87
		256QAM		3 521.25	H	-66.56	8.47	-58.09	-13.00	45.09

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
20	1 770	π/2 BPSK	1/1	3 521.56	H	-66.54	8.47	-58.07	-13.00	45.07
		QPSK		3 521.45	H	-66.42	8.47	-57.95	-13.00	44.95
		16QAM		3 521.82	H	-66.22	8.47	-57.75	-13.00	44.75
		64QAM		3 521.40	H	-66.30	8.47	-57.83	-13.00	44.83
		256QAM		3 521.27	H	-66.43	8.47	-57.96	-13.00	44.96

<Test case: External ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
20	1 770	π/2 BPSK	1/1	3 522.77	H	-66.83	8.47	-58.36	-13.00	45.36
		QPSK		3 521.89	H	-66.78	8.47	-58.31	-13.00	45.31
		16QAM		3 524.17	H	-66.91	8.47	-58.44	-13.00	45.44
		64QAM		3 519.10	H	-66.92	8.47	-58.45	-13.00	45.45
		256QAM		3 523.30	H	-66.81	8.47	-58.34	-13.00	45.34

7.2.4. NR Band n2

<Test case: Internal ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
20	1 860	π/2 BPSK	1/53	3 720.24	H	-67.24	8.32	-58.92	-13.00	45.92
		QPSK		3 720.35	H	-67.50	8.32	-59.18	-13.00	46.18
		16QAM		3 720.26	H	-67.58	8.32	-59.26	-13.00	46.26
		64QAM		3 720.26	H	-67.65	8.32	-59.33	-13.00	46.33
		256QAM		3 720.46	H	-67.58	8.32	-59.26	-13.00	46.26
	1 880	π/2 BPSK	1/53	3 760.05	H	-66.25	8.32	-57.93	-13.00	44.93
		QPSK		3 760.14	H	-66.22	8.32	-57.90	-13.00	44.90
		16QAM		3 760.06	H	-66.12	8.32	-57.80	-13.00	44.80
		64QAM		3 760.10	H	-66.51	8.32	-58.19	-13.00	45.19
		256QAM		3 760.08	H	-66.79	8.32	-58.47	-13.00	45.47
	1 900	π/2 BPSK	1/53	3 800.11	H	-66.60	8.48	-58.12	-13.00	45.12
		QPSK		3 799.99	H	-66.45	8.48	-57.97	-13.00	44.97
		16QAM		3 800.22	H	-66.69	8.48	-58.21	-13.00	45.21
		64QAM		3 800.18	H	-66.68	8.48	-58.20	-13.00	45.20
		256QAM		3 800.14	H	-66.77	8.48	-58.29	-13.00	45.29

<Test case: Internal ANT 2>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
5	1 880	π/2 BPSK	1/12	3 760.17	H	-66.44	8.32	-58.12	-13.00	45.12
		QPSK		3 760.19	H	-66.53	8.32	-58.21	-13.00	45.21
		16QAM		3 760.43	H	-66.61	8.32	-58.29	-13.00	45.29
		64QAM		3 759.90	H	-66.61	8.32	-58.29	-13.00	45.29
		256QAM		3 759.57	H	-67.00	8.32	-58.68	-13.00	45.68

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
5	1 880	π/2 BPSK	1/12	3 758.80	V	-67.30	8.32	-58.98	-13.00	45.98
		QPSK		3 760.72	V	-67.40	8.32	-59.08	-13.00	46.08
		16QAM		3 761.54	V	-67.33	8.33	-59.00	-13.00	46.00
		64QAM		3 760.93	V	-67.31	8.32	-58.99	-13.00	45.99
		256QAM		3 760.20	V	-67.35	8.32	-59.03	-13.00	46.03

<Test case: External ANT 1>

Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset	Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
5	1 880	π/2 BPSK	1/12	3 760.41	V	-67.48	8.32	-59.16	-13.00	46.16
		QPSK		3 761.16	V	-67.30	8.32	-58.98	-13.00	45.98
		16QAM		3 759.61	V	-67.42	8.32	-59.10	-13.00	46.10
		64QAM		3 761.85	V	-67.46	8.33	-59.13	-13.00	46.13
		256QAM		3 761.47	V	-67.41	8.33	-59.08	-13.00	46.08

<Test case: Internal ANT 1>

ENDC MODE

Band	Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset
NR n2	5	1 880	QPSK	1/12
LTE B5	10	829	QPSK	1/25

Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
1 658.30	H	-67.26	4.06	-	-63.20	-13.00	50.20
3 759.86	H	-66.85	-	8.32	-58.53	-13.00	45.53
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Band	Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset
NR n5	5	826.5	QPSK	1/1
LTE B2	15	1 857.5	QPSK	1/36

Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
1 648.94	H	-68.88	4.09	-	-64.79	-13.00	51.79
2 473.45	V	-64.83	3.74	-	-61.09	-13.00	48.09
3 715.69	H	-68.30	-	8.32	-59.98	-13.00	46.98
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Band	Channel Bandwidth (MHz)	Frequency (MHz)	Modulation	RB size/ offset
NR n66	20	1 770	QPSK	1/1
LTE B14	10	793	QPSK	1/0

Freq.(MHz)	Ant Pol (H/V)	Level at Antenna Terminal(dBm)	Substitute Antenna Gain(dBd)	Substitute Antenna Gain(dBi)	Result (dBm)	Limit (dBm)	Margin (dB)
1 577.17	H	-70.02	3.90	-	-66.12	-40.00	26.12
2 365.71	V	-62.36	3.81	-	-58.55	-13.00	45.55
3 523.59	V	-67.06	-	8.47	-58.59	-13.00	45.59
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-