Certificate #5055.02

TEST REPORT FOR NR TESTING

Report No.: SRTC2024-9004(F)-24013001(V)

Product Name: 5G Module

Product ID: SC151-GL

Brand Name: Fibocom

Applicant: Fibocom Wireless Inc.

Manufacturer: Fibocom Wireless Inc.

Specification: FCC Part 2, Part 24E, Part 22H, Part 27, Part 90, FCC Part 96, Part 96.47 (2023)

FCC ID: ZMOSC151GL

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

Tel: 86-10-57996183 Fax: 86-10-57996388

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1. GENERAL INFORMATION

1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio_monitoring_center Testing Center (SRTC).The test results relate only to individual items of the samples which have been tested. The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Test Site 1:	15th Building, No.30 Shixing Street, Shijingshan District
Test Site 2:	No.80, Zhaojiachang, Beizang, Daxing District
City:	Beijing
Country or Region:	P.R.China
Contacted person:	Liu Jia
Tel:	+86 10 57996183
Fax:	+86 10 57996388
Email:	liujiaf@srtc.org.cn
Designation Number:	CN1267
Registration number:	239125

1.3 Applicant’s details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen , China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.4 Manufacturer’s details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen , China
City:	Shenzhen
Country or Region:	China
Contacted person:	Sam Guo
Tel:	15013511563
Email:	sam.guo@fibocom.com

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2024/2/4
Testing Start Date:	2024/2/5
Testing End Date:	2024/8/19

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	40
Maximum Extreme	75	---
Minimum Extreme	-30	---

Normal Supply Voltage (V d.c.):	3.8
Maximum Extreme Supply Voltage (V d.c.):	4.4
Minimum Extreme Supply Voltage (V d.c.):	3.5

2 DESCRIPTION OF THE EQUIPMENT UNDER TEST

2.1 Final Equipment Build Status

Frequency Range:	n2: Tx:1850~1910 MHz Rx:1930~1990 MHz n5: Tx: 824~849 MHz Rx:869~894 MHz n7: Tx:2500~2570 MHz Rx:2620~2690 MHz n12: Tx: 699~716 MHz Rx:729~746 MHz n14: Tx: 788~798 MHz Rx:758~768 MHz n25: Tx: 1850~1915 MHz Rx:1930~1995 MHz n30: Tx: 2305~2315 MHz Rx:2350~2360 MHz n41: Tx:2496~2690 MHz Rx: 2496~2690 MHz n48: Tx: 3550~3700 MHz Rx:3550~3700 MHz n66: Tx:1710~1780 MHz Rx:2110~2200 MHz n71: Tx: 663~698 MHz Rx:617~652 MHz n77: Tx: 3450~3980 MHz Rx:3450~3980 MHz n78: Tx: 3450~3800 MHz Rx:3450~3800 MHz
Single band single SCS single carrier	n2/n5/n7/n12/n14/n25/n30/n41/n48/n66/n71/n77/n78
Single band single SCS HPUE	n41/n77/n78

SA Bandwidth	n2: 5MHz/ 10MHz/ 15MHz/ 20MHz n5: 5MHz/ 10MHz/ 15MHz/ 20MHz n7: 5MHz/ 10MHz/ 15MHz/ 20MHz n12: 5MHz/ 10MHz/ 15MHz n14: 5MHz/ 10MHz n25: 5MHz/ 10MHz/ 15MHz/ 20MHz n30: 10MHz n41: 20MHz/ 30MHz/ 40MHz/ 50MHz/ 60MHz/ 70MHz/ 80MHz/ 90MHz/ 100MHz n48: 20MHz/ 40MHz/ n66: 5MHz/ 10MHz/ 15MHz/ 20MHz n71: 5MHz/ 10MHz/ 15MHz/ 20MHz n77: 20MHz/ 30MHz/ 40MHz/ 60MHz/ 80MHz/ 100MHz n78: 20MHz/ 30MHz/ 40MHz/ 50MHz/ 60MHz/ 70MHz/ 80MHz/ 90MHz/ 100MHz
NSA Band	See note1
Modulation Type:	PI/2 BPSK, QPSK,16QAM,64QAM,256QAM
Antenna Type:	External antenna
Antenna Gain:	n2: 4.5dBi n5: 4.5dBi n7: 4.5dBi n12: 4.5dBi n14: 4.5dBi n25: 4.5dBi n30: 4.5dBi n41: 4.5dBi n48: 2.56dBi n66: 4.5dBi n71: 4.5dBi n77: 2.95dBi n78: 2.56dBi ERP = EIRP(Power +Gain) – 2.15 (dB)
Power Supply:	DC supply
Software Revision:	SC151-GL-T6.00.07
Hardware Revision:	V1.1
IMEI:	NA

Note1:

NSA Band

DC_66A_n5A	DC_28A_n78A	DC_5A_n78A	DC_3A-3A_n8A	CA_n66A-n77A
DC_5A_n66A	DC_38A_n78A	DC_3A_n41A	CA_n2A-n66A	DC_66B_n5A
DC_12A_n66A	DC_3C_n78A	DC_3A_n5A	CA_n5A-n66A	DC_66C_n5A
DC_66A-66A_n5A	DC_3A-3A_n78A	DC_7A_n5A	CA_n30A-n66A	DC_3C_n38A
DC_2A_n71A	DC_3A_n1A	DC_1A-3A_n5A	CA_n2A-n30A	CA_n20A-n78A
DC_66A_n41A	DC_3A-20A_n1A	DC_3A-7A_n5A	CA_n3A-n28A	CA_n30A-n77A
DC_3A-28A_n1A	DC_3A-7A_n1A	CA_n1A-n78A	CA_n3A-n77A	CA_n48A-n66A
DC_1A_n3A	DC_7A_n3A	CA_n3A-n78A	CA_n28A-n77A	CA_n5B
DC_8A_n3A	DC_20A_n3A	CA_n8A-n78A	DC_3A-40A_n1A	CA_n66B
DC_28A_n3A	DC_1A-20A_n3A	CA_n25A-n71A	DC_7C_n3A	CA_n2A-n48A
DC_1A-8A_n3A	DC_1A-7A_n3A	CA_n41A-n66A	CA_n1A-n3A	CA_n5A-n48A
DC_1A-28A_n3A	DC_7A-20A_n3A	DC_3C_n7A	CA_n3A-n7A	CA_n48A-n71A
DC_7A-8A_n3A	DC_3A_n8A	DC_3A-7A_n7A	CA_n1A-n8A	CA_n25A-n48A
DC_7A-28A_n3A	DC_7A_n8A	DC_3C_n5A	CA_n1A-n20A	CA_n1A-n5A
DC_28A-32A_n3A	DC_1A-3A_n8A	DC_2C_n71A	CA_n1A-n28A	CA_n3A-n5A
DC_3A_N7a	DC_3A-7A_n8A	DC_3C_n1A	CA_n3A-n8A	CA_n25A-n77A
DC_8A_n7A	DC_3A_n28A	CA_n3A-n38A	CA_n3A-n20A	CA_n28A-n40A
DC_3A-8A_n7A	DC_3C_n28A	CA_n5A-n78A	CA_n7A-n28A	CA_n8A-n40A
DC_3A-32A_n28A	DC_1A-3A_n28A	CA_n28A-n78A	DC_18A_n3A	CA_n1A-n40A
DC_3A_n20A	DC_3A-7A_n28A	DC_5A-5A_n66A	DC_1A-18A_n3A	DC_40C_n1A
DC_7A-32A_n8A	DC_1A_n77A	DC_5B_n66A	DC_3A-41A_n28A	DC_38A_n3A
DC_3A_n38A	DC_3A_n77A	CA_n71B	DC_1A-1A_n78A	DC_1A-38A_n3A
DC_1A_n78A	DC_8A_n77A	CA_n66A-n71A	CA_n25A-n66A	DC_20A-38A_n3A
DC_3A_n78A	DC_18A_n77A	DC_3A-3A_n7A	DC_1C_n3A	DC_3A-38A_n28A
DC_8A_n78A	DC_18A_n78A	DC_3A-3A_n1A	DC_5A_n77A	CA_n7B
DC_20A_n78A	DC_19A_n78A	DC_1A-3A_n3A	CA_n2A-n77A	DC_3A-19A_n1A
DC_66A_n5A	DC_28A_n77A	DC_3A-7A_n3A	CA_n5A-n77A	DC_3A-28A_n3A

Note： The combination of the above frequency bands is not the worst case, and the evaluated data for the relevant individual frequency bands are shown in Appendix A. Therefore, data for the CA frequency band will not be displayed

2.2 Support Equipment

NA

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part 2	2023	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part 22	2023	Public mobile services
FCC Part 24	2023	Personal communications services
FCC Part 27	2023	Miscellaneous wireless communications services
FCC Part 90	2023	Private Land Mobile Radio Services
FCC Part 96	2023	Citizens Broadband Radio Service
FCC Part 96.47	2023	End user device additional requirements
ANSI C63.26	2015	American national standard for compliance testing of transmitters used in licensed radio services
KDB 971168 D01	April 9, 2018	Measurement guidance for certification of licensed digital transmitters
TIA-603-E-2016	March 2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

4 KEY TO NOTES AND RESULT CODES

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NT	Normal Temperature
NV	Nominal voltage
HV	High voltage
LV	Low voltage

5 RESULT SUMMARY

No.	Test case	FCC reference	Verdict
1	RF Power Output	2.1046	Pass
2	Effective Radiated Power and Effective Isotropic Radiated Power	22.913(a)(5), 24.232(c), 27.50(b)(10), 27.50(c)(10), 27.50(h)(2), 27.50(d)(4), 27.50(a)(3),96.41(b)	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Peak-Average Ratio	22.913(d), 24.232(d), 27.50(d) (5), 96.41(g)	Pass
5	Emission Bandwidth	2.1049	Pass
6	Spurious Emissions at antenna terminals	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 96.41(e)	Pass
7	Band Edges Compliance	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 96.41(e)	Pass
8	Frequency Stability	2.1055, 22.355, 24.235, 27.54	Pass
9	End user device additional requirements	WINNF-18-IN-00178	Pass

Test Site 1: 15th Building, No.30 Shixing Street, Shijingshan District

This Test Report Is Approved by: Mr. Peng Zhen	Review by: Mr. Li Bin
Tested and Issued by: Mr. Liang Xisheng	Approved date: 20240819

No.	Test case	FCC reference	Verdict
9	Radiated Spurious Emissions	2.1053, 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(f), 27.53(a), 27.53(m), 90.691(a)	Pass

Test Site 2: No.80, Zhaojiachang, Beizang, Daxing District

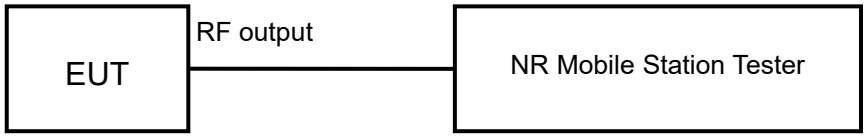
This Test Report Is Approved by: Mr. Liu Wei	Review by: Mr. Guo Yu
Tested and Issued by: Mr. Dong Qifeng	Approved date: 20240625

6 TEST RESULT

6.1 RF Power Output

Rule Part(s)
FCC: 2.1046

Test Setup:



Test procedure:
After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

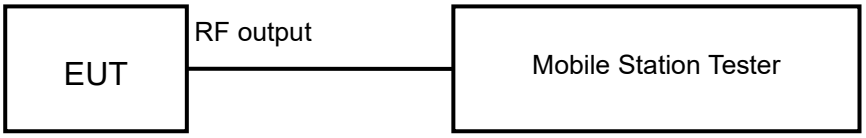
Limits: No RF Power Output requirements in part 2.1046.

Test result:
The test results are shown in Appendix A.

6.2 Effective Radiated Power and Effective Isotropic Radiated Power

Rule Part(s)
FCC: 22.913(a) (5), 24.232(c), 27.50(b) (10), 27.50(c) (10), 27.50(h) (2), 27.50(d) (4), 27.50(a) (3), 96.41(b)

Test setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 5.6
Test Settings
Subclause 5.2.5.5 of ANSI C63.26-2015 is applicable, along with the following provisions. For personal/portable radios utilizing an integral antenna, the factor LC is typically negligible. However, in a fixed station transmit system that utilizes a long cable run between the transmitter and the transmitting antenna, this factor can be significant. The minimum cable loss should be used in this equation.
The relevant equation for determining the ERP or EIRP from the conducted RF output power measured is:
ERP/EIRP = PMeas – LC + GT
Where:
ERP/EIRP = effective or equivalen radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm)
PMeas = measured transmitter output power or PSD, in dBW or dBm
LC = signal attenuation in the connecting cable between the transmitter and antenna in dB
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)
ERP/EIRP LIMIT
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 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.
27.50(c) (10)
Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.
27.50(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.
27.50(d) (4)
Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

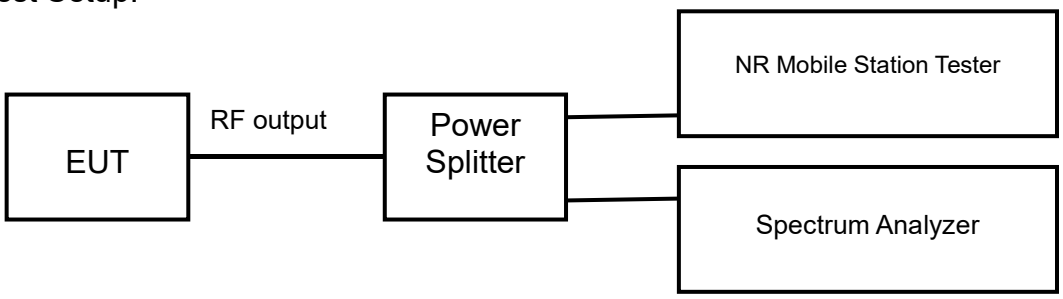
27.50(a) (3)
Mobile and portable stations (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP NR standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

Test result:
The test results are shown in Appendix A.

6.3 Occupied Bandwidth

Rule Part(s)
FCC: 2.1049

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:
1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

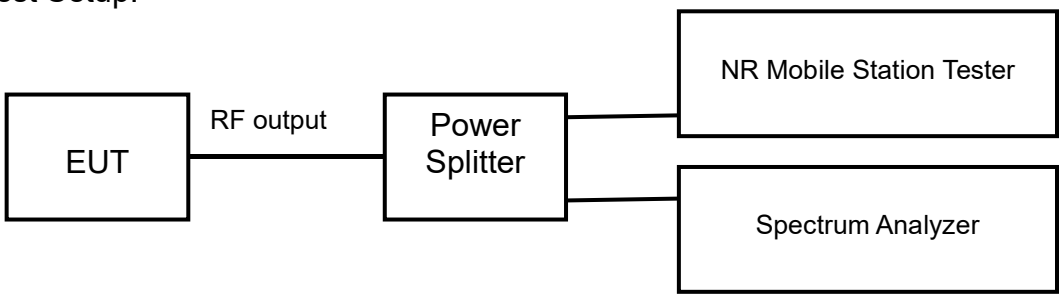
Limits: No specific occupied bandwidth requirements in part 2.1049

Test result:
The test results are shown in Appendix A.

6.4 Emission Bandwidth

Rule Part(s)
FCC: 2.1049

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.

2. RBW = 1 – 5% of the expected OBW

3. VBW ≥ 3 x RBW

4. Detector = Peak

5. Trace mode = max hold

6. Sweep = auto couple

7. The trace was allowed to stabilize

8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of 26dB bandwidth observed in Step 7

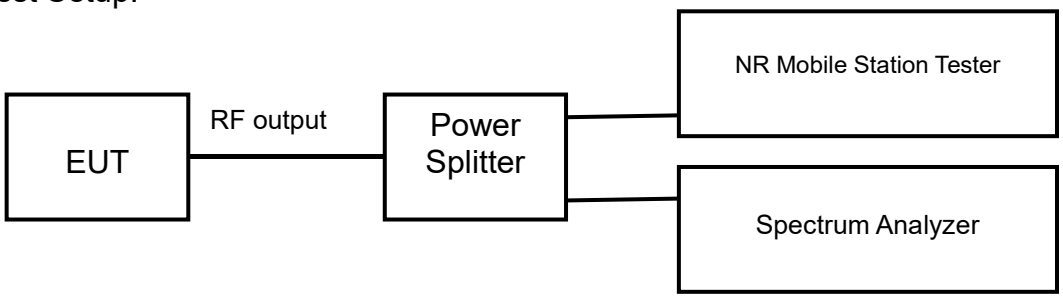
Limits: No specific emission bandwidth requirements in part 2.1049.

Test result:
The test results are shown in Appendix A.

6.5 Peak-Average Ratio

Rule Part(s)
FCC: 22.913(d), 24.232(d), 27.50(d) (5), 96.41(g)

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 5.7.1

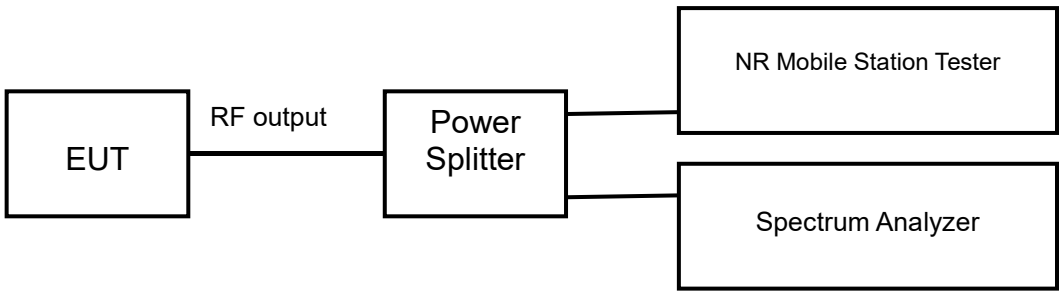
Test Setting:
1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW ≥ OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Limits
24.232(d), 27.50(d) (5)
In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test result:
The test results are shown in Appendix A.

6.6 Spurious Emissions at antenna terminal

Rule Part(s)
FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 96.41(e)
Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 6.0

Test Setting:
1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency
2. Detector = RMS
3. RBW=1MHz
4. VBW=3MHz
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

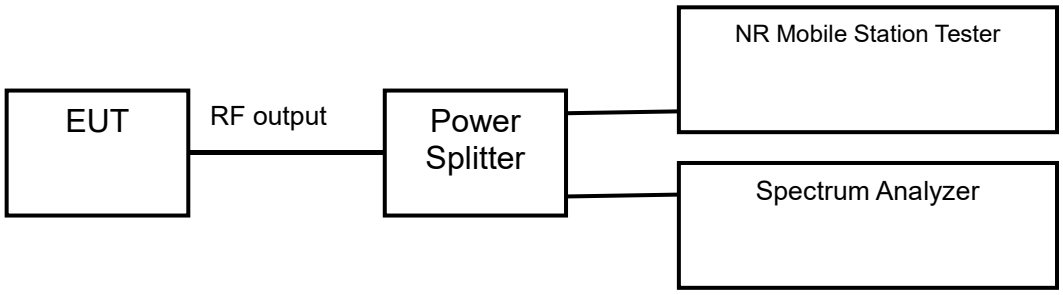
Limits
The minimum permissible attenuation level of any spurious emission is 43 + log10 (P [Watts]), where P is the transmitter power in Watts.
For Band 30, the minimum permissible attenuation level of any spurious emission <2288MHz and >2365MHz is 70 + log10 (P [Watts]).
For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is 55 + log10 (P [Watts]).

Test result:
The test results are shown in Appendix A.

6.7 Band Edges Compliance

Rule Part(s)
FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 96.41(e)

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 6.0

Test Setting:
1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limits
The minimum permissible attenuation level of any spurious emission is 43 + log10 (P [Watts]), where P is the transmitter power in Watts.
The minimum permissible attenuation level for Band 30 is > 43 + 10log10 (P [Watts] at 2300-2305MHz & 2345-2360MHz, > 55 + 10log10 (P [Watts]) at 2320-2324MHz & 2341-2345MHz, > 61 + 10log10 (P [Watts]) at 2324-2328MHz & 2337-2341MHz, > 67 + 10log10 (P [Watts]) at 2288-2292MHz & 2328- 2337MHz, and > 70 + 10log10 (P [Watts]) at frequencies < 2288MHz &>2365MHz.
Per 24.238(a) 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.
Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately

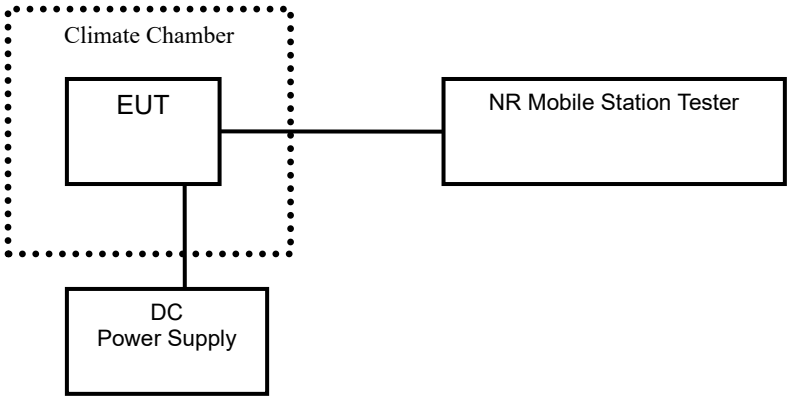
outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.
For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is 65 + 10log10(P) = -35dBm in a 6.25kHz bandwidth.
Per 27.53(a)(5) in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e., 1 MHz). 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 dB below the transmitter power.
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5MHz.

Test result:
The test results are shown in Appendix A.

6.8 Frequency Stability

Rule Part(s)
FCC: 2.1055, 22.355, 24.235, 27.54

Test setup:



Test Procedure:
ANSI/TIA-603-E-2016

Test Settings
1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

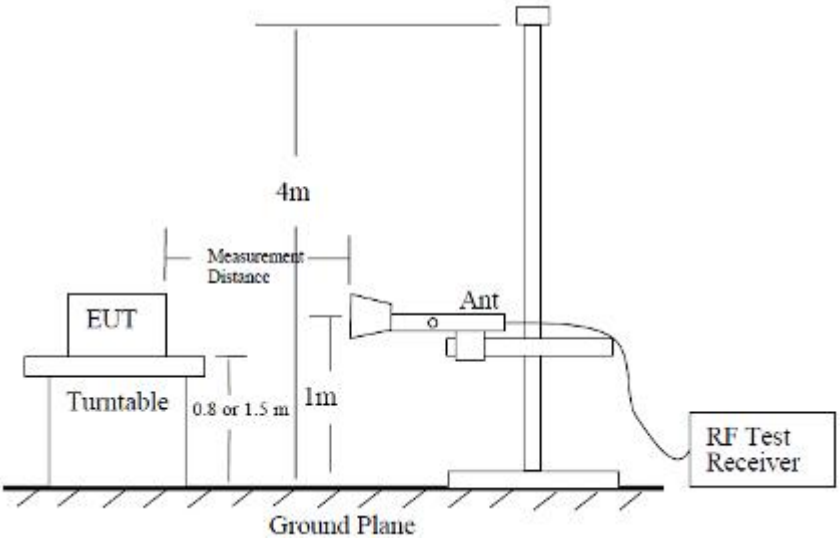
Limits: For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:
The test results are shown in Appendix A.

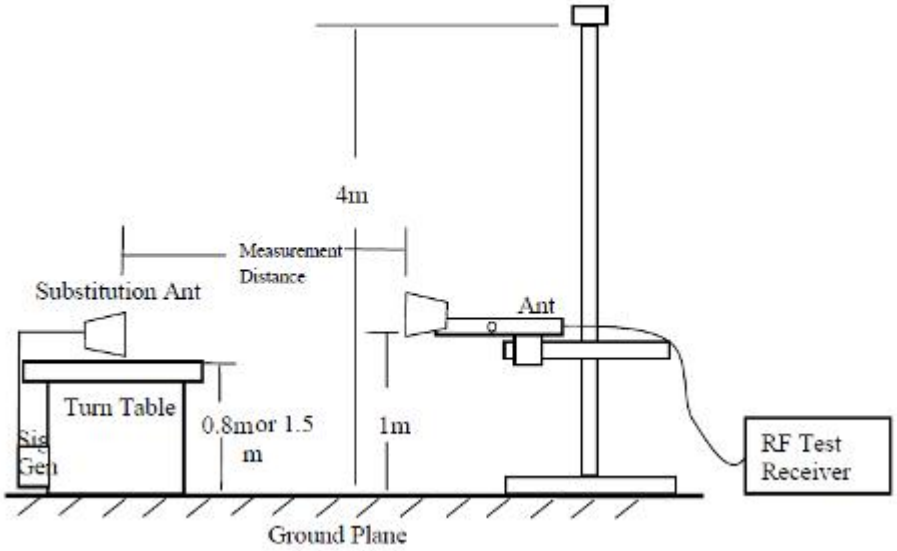
6.9 Radiated Spurious Emissions

Rule Part(s)
FCC: 2.1053, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(f), 27.53(a), 27.53(m)

Test Setup:



Step 1



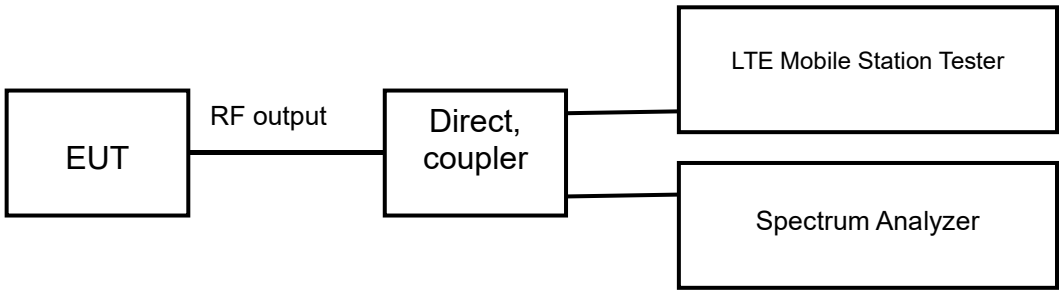
Step 2

Test procedure:
The measurements procedures in TIA-603-E-2016 are used.
The spectrum was scanned from 30MHz to the 10th harmonic of the highest frequency generated within the equipment.
Step 1:
The measurement is carried out in the chamber. EUT was placed on a 0.8m (f<1GHz)/ 1.5m (f>1GHz) high non-conductive table at a 3 meters test distance from the test receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT. The height of receiving antenna from 1m to 4m and varies in certain range to find the maximum power value. A radio link shall be established between EUT and Tester. The output power of the cell signal of the tester will be decreased until the output power of the EUT reach a maximum value. A peak detector is used and RBW is set to 100 kHz (f<1GHz)/1MHz (f>1GHz). The antenna shall be performed under horizontal and vertical polarization. The turn table shall be rotated from 0 to 360 degrees for detecting the maximum power value on spectrum analyzer or receiver. The spectrum analyzer scans from 30MHz to 10th harmonic of the carrier. A notch filter is necessary in the band near to the carrier frequency. A high pass filter is needed to avoid the distortion of the testing equipment in the band above the carrier frequency.
Step 2:
A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
A power (Pmea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (Pmea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
A “reference path loss” should be calculated after test. The attenuation of “reference path loss” is the cable loss between the Signal Source with the Substitution Antenna (Pca) and the Substitution Antenna Gain (Ga).
Calculation procedure:
The data of cable loss and antenna gain has been calibrated in full testing frequency range before the testing.
The power of the Radiated Spurious Emissions is calculated by adding the cable loss and antenna gain. The basic equation with a sample calculation is as followed:
Power (EIRP) = Pmea+ Pca + Ga
This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP – 2.15 (dB).
Assumed the power of signal source record is -20dBm. A cable loss of -30dB, and an antenna gain of 11dB are added.
P=Pmea+Pca+Ga=(-20dBm)+(-30dB)+(11dB)= -39dBm
Note: We tested both horizontal and vertical polarization, but only the largest numerical polarity of the two polarities was recorded in the final report.

Test result:
The test results are shown in Appendix B.

6.10 End user device additional requirements

Rule Part(s)
Part96.47
Test Setup:



Test Procedure:
WINNF-18-IN-00178

Test Setting:
1. Setup with frequency and power level 20dBm/MHz
2. Enable AP service from Ruckus Cloud managementCheck
3. Check EUD Tx Frequency and power
4. Disable AP service from Ruckus Cloud management
5. Check EUD stops transmission within 10seconds.
6. Setup with frequency and power level 8dBm/MHz
7. Enable AP service from Ruckus Cloud management
8. Check EUD Tx Frequency and power
9. Disable AP service from Ruckus Cloud management
10. Check EUD stops transmission within 10seconds.

Test result:
The test results are shown in Appendix A.

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
RF Power Output	0.6 dB	
Effective Radiated Power and Effective Isotropic Radiated Power	0.6 dB	
Occupied Bandwidth	3kHz	
Emission Bandwidth	3kHz	
Peak-Average Ratio	0.8dB	
Frequency Stability	48Hz	
Band Edges Compliance	1.2dB	
Spurious Emissions at antenna terminal	9kHz~2GHz	1.2dB
	2G~3.6GHz	1.4dB
	3.6G~8GHz	2.2dB
	8G~12.75GHz	2.7dB
Radiated Emission Measurement	30MHz～200MHz	4.88dB
	200MHz～1GHz	4.87dB
	1GHz～18GHz	4.58dB
	18GHz~40GHz	4.35dB

8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	Mobile Station Tester / MT8820C	Anritsu	6201300660	2024.06.21	2025.06.20
2	Radio Communication Station / CMW500	R&S	161702	2024.06.21	2025.06.20
3	Spectrum Analyzer / FSV40	R&S	101065	2024.06.21	2025.06.20
4	Spectrum Analyzer / N9020A	Agilent	MY48010771	2024.03.06	2025.03.05
5	Power Divider / 11667A	HP	19632	2024.06.21	2025.06.20
6	DC Power Supply / E3645A	Agilent	MY40000741	2024.03.06	2025.03.05
7	Temperature chamber / SH241	ESPEC	92013758	2024.06.21	2025.06.20
8	Fully-Anechoic Chamber / 12.65m×8.03m×7.50m	FRANKONIA	-----	-----	-----
9	Semi-Anechoic/Chamber / 23.18m×16.88m×9.60m	FRANKONIA	---	-----	-----
10	Turn table Diameter:1m	FRANKONIA	-----	-----	-----
11	Turn table Diameter:5m	FRANKONIA	-----	-----	-----
12	Antenna master FAC(MA4.0)	MATURO	-----	-----	-----
13	Antenna master SAC(MA4.0)	MATURO	-----	-----	-----
14	Shielding room / 9.080m×5.255m×3.525m	FRANKONIA	-----	-----	-----
15	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2024.06.21	2025.06.20
16	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2024.06.21	2025.06.20
17	Ultra log antenna / HL562	R&S	100016	2024.06.21	2025.06.20
18	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2024.06.21	2025.06.20
19	EMI test receiver / ESI 40	R&S	100015	2024.06.21	2025.06.20
20	EMI test receiver / ESCS30	R&S	100029	2024.06.21	2025.06.20
21	Receive antenna / HL562	R&S	100167	2024.06.21	2025.06.20
22	AMN / ENV216	R&S	3560.6550.12	2024.06.21	2025.06.20
23	FCC auto test system / RT9100L-2	Radiosky	V1.0	/	/
24	EMI test software / EMC32	R&S	V10.20.01	/	/
25	MT8821C	Anritsu	6272348722	2024.03.06	2025.03.05
26	MT8000A	Anritsu	6272354160	2024.03.06	2025.03.05

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

The worst channel results are reflected in the report,Please refer to the attachment.

APPENDIX B – TEST DATA OF RADIATED EMISSION

The worst channel results are reflected in the report,Please refer to the attachment

---End of Test Report---