RF Test Report

For

Applicant name:	**FOXX Development Inc.**
Address:	3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA
EUT name:	Smart Phone
Brand name:	MIRO, FOXX, FOXXD, AIRVOICE, FOXXD HTH
Model number:	S69 Pro
Series model number:	N/A
FCC ID:	2AQRM-S69PRO

Issued By

Company name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Report number:	BTF250512R00807
Test standards:	FCC CFR Title 47 Part 2, 22H, 24E, 27H, 27L, 27M, 90S
Test conclusion:	Pass
Date of sample receipt:	2025-05-12
Test date:	2025-05-13 to 2025-06-13
Date of issue:	2025-06-16
Test by:	Sean He / Tester
Prepared by:	Chris Liu / Project engineer
Approved by:	Ryan.CJ/EMC manager

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue date	Revisions content
R_V0	2025-06-16	Original
Note: *Once the revision has been made, then previous versions reports are invalid.*		

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BTF Testing Lab (Shenzhen) Co., Ltd.
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1 Introduction

1.1 Laboratory Location

Test location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at 101/201/301, Building 1, Block 2, Tantou Industrial Park,Tantou Community, Songgang Subdistrict, Bao'an District, Shenzhen, China
Phone number:	+86-0755-23146130
Fax number:	+86-0755-23146130

1.2 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1409**

  BTF Testing Lab (Shenzhen) Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 518915.

- **CNAS - Registration No.: CNAS L17568**

  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L17568.

- **A2LA - Registration No.: 6660.01**

  BTF Testing Lab (Shenzhen) Co., Ltd. is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories.

1.3 Announcement

(1) The test report reference to the report template version v0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2 Product Information

2.1 Application Information

Company name:	FOXX Development Inc.
Address:	3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA

2.2 Manufacturer Information

Company name:	FOXX Development Inc.
Address:	3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA

2.3 Factory Information

Company name:	FOXX Development Inc.
Address:	3480 Preston Ridge Road, Suite500, Alpharetta, GA 30005, USA

2.4 General Description of Equipment under Test (EUT)

EUT name	Smart Phone
Under test model name	S69 Pro
Series model name	N/A
Description of model name differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Rating:	AC Adapter Model:QZ-02002AC00 Input:100-240V~50/60Hz 0.5A Output:5.0V 3.0A(15.0W) or 9.0V 2.22A or 12.0V 1.67A(20.0W Max) Rechargeable Li-ion polymer Battery DC 3.87V/5000mAh 19.35Wh

2.5 Technical Information

Operation frequency:	Band N2:	Tx: 1850MHz-1910 MHz	Rx: 1930MHz-1990MHz
	Band N5:	Tx: 824 MHz -849 MHz	Rx: 869 MHz-894MHz
	Band N7:	Tx: 2500MHz -2570MHz	Rx: 2620MHz- 2690MHz
	Band N25:	Tx: 1850 MHz -1915 MHz	Rx: 1930MHz-1995MHz
	Band N40a:	Tx: 2305 MHz ~ 2315 MHz	Rx: 2300MHz-2400MHz
	Band N40b:	Tx: 2350 MHz ~ 2360 MHz	Rx: 2300MHz-2400MHz
	Band N41:	Tx: 2496 MHz -2690 MHz	Rx: 2496MHz-2690MHz
	Band N66:	Tx: 1710 MHz -1780 MHz	Rx: 2110 MHz-2180MHz
	Band N71:	Tx: 663 MHz -698 MHz	Rx: 617 MHz-652MHz

	Band N77a:	Tx: 3700 MHz -3980 MHz	Rx: 3700MHz-3980MHz
	Band N77d:	Tx: 3400 MHz -3600 MHz	Rx:3400 MHz -3600 MHz
	Band N78a:	Tx: 3300 MHz -3800 MHz	Rx:3300 MHz -3800 MHz
	Band N78e:	Tx: 3400 MHz -3600 MHz	Rx:3400 MHz -3600 MHz
Modulation Type:	DFT-s-OFDM:	QPSK, PI/2 BPSK, 64 QAM, 256 QAM, 16 QAM,	
	CP-OFDM:	QPSK, 64 QAM, 256 QAM, 16 QAM	
Network Mode:	SA:	N2, N5, N7, N25, N40a, N40b, N41, N66, N71, N77a, N77d, N78a, N78e	
SCS Suport:	15kHz	30kHz	
Antenna type:	Internal Antenna		
The Max RF Output Power (EIRP/ERP)	Band N2:22.81dBm Band N5:19.03 dBm Band N7:21.07 dBm Band N25:22.79dBm Band N40a:19.51 dBm Band N40b:19.62 dBm Band N41:23.17dBm Band N66:22.98 dBm Band N71:19.08 dBm Band N77a:28.08 dBm Band N77d:27.75 dBm Band N78a:22.12 dBm Band N78e:23.85 dBm		

3 Test Information

3.1 Test Standards

Identity	Document Title
FCC CFR Title 47 Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
FCC CFR Title 47 Part 22 Subpart H	Cellular Radiotelephone Service
FCC CFR Title 47 Part 24 Subpart E	Broadband PCS
FCC CFR Title 47 Part 27 Subpart L	1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 2110-2155MHz, 2155-2180 MHz, 2180-2200 MHz Bands
FCC CFR Title 47 Part 27 Subpart M	Broadband Radio Service and Educational Broadband Service
FCC CFR Title 47 Part 27 Subpart N	600 MHz Band
FCC CFR Title 47 Part 27 Subpart Q	3.45 GHz Service (3450-3550 MHz)
FCC CFR Title 47 Part 90 Subpart S	Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz Bands
ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

3.2 Summary of Test

Clauses	Test Items	Result
§ 2.1046 § 22.913(a)(5) § 24.232(c)§ 27.50(c)(10) § 27.50(d)(4) § 27.50(h)(2) § 90.635(b)	RF Output Power	Appendix- 5G NR
§ 24.232(d) § 27.50(d)(5)	Peak-to-Average Power Ratio	Appendix- 5G NR
§ 2.1047	Modulation Characteristics	Appendix- 5G NR
§ 2.1049	26dB Emission Bandwidth 99% Occupied Bandwidth	Appendix- 5G NR
§ 2.1051 § 22.917(a) § 24.238(a) § 27.53(g) § 27.53(h) § 27.53(m)(4) § 90.691(a)	Out of Band Emission at Antenna Terminals	Appendix- 5G NR
§ 2.1053 § 22.917(a) § 24.238(a)	Field Strength of Spurious Radiation	Appendix- 5G NR

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§ 27.53(g) § 27.53(h) § 27.53(m)(4) § 90.691(a)		
§ 2.1055 § 22.355 § 24.235 § 27.54 § 90.213	Frequency Stability	Appendix- 5G NR
Remark: *1. Pass: met the requirements.* *2. N/A: not applicable.*		

3.3 Uncertainty of Test

Measurement	Value
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Supply voltages	±3 %
Time	±5 %
Conducted Emission for LISN (9kHz ~ 150kHz)	±2.97 dB
Conducted Emission for LISN (150kHz ~ 30MHz)	±2.45 dB
Radiated Emission (30MHz ~ 1000MHz)	±4.80 dB
Radiated Emission (1GHz ~ 18GHz)	±4.82 dB
The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3.4 Additions to, deviations, or exclusions from the method

None

3.5 Test Auxiliary Equipment

The EUT has been tested as an independent unit.

3.6 Test Equipment List

Radiated test method					
Test Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	Rohde &Schwarz	ESCI7	101032	2024/10/25	2025/10/24
Signal Analyzer	Rohde & Schwarz	FSQ40	100010	2024/10/25	2025/10/24
Log periodic antenna	Schwarzbeck	VULB 9168	01328	2024/10/28	2025/10/27
Preamplifier (30MHz ~ 1GHz)	Schwarzbeck	BBV9744	00246	2024/09/24	2025/09/23
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2024/10/30	2025/10/29
Preamplifier (1GHz ~ 18GHz)	Schwarzbeck	BBV9718D	00008	2024/09/24	2025/09/23
Wireless communication test platform	Anritsu	MT8000A	6262208369	2025/03/21	2026/03/20
Radio communication analyzer	Anritsu	MT8821C	6262192286	2025/03/21	2026/03/20
Test Software	Frad	EZ_EMC	Version: FA-03A2 RE+		

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Conducted test method					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer	Keysight	N9020A	MY50410020	2024/10/25	2025/10/24
ESG Vector Signal Generator	Agilent	E4438C	MY45094854	2024/10/25	2025/10/24
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	2024/10/25	2025/10/24
Wireless communication test platform	Anritsu	MT8000A	6262208369	2025/03/21	2026/03/20
Radio communication analyzer	Anritsu	MT8821C	6262192286	2025/03/21	2026/03/20
Temperature Humidity Chamber	ZZCKONG	ZZ-K02A	20210928007	2024/10/25	2025/10/24
DC Power Supply	Tongmen	etm-6050c	20211026123	2024/10/25	2025/10/24
RF Control Unit	Techy	TR1029-1	/	2024/10/25	2025/10/24
RF Sensor Unit	Techy	TR1029-2	/	2024/10/25	2025/10/24
Test Software	TST Pass	/	Version: 2.0		

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4 Test Configuration

4.1 Environment Condition

Selected Values During Tests			
Temperature	Test Voltage	Relative Humidity	Ambient Pressure
Normal: +15°C to +35°C Extreme: -30°C to +50°C	Nominal: 3.87 Vdc Extreme: 3.50 Vdc(low), 4.35 Vdc(high)	20% to 75%	100 kPa to 102 kPa

4.2 Test mode

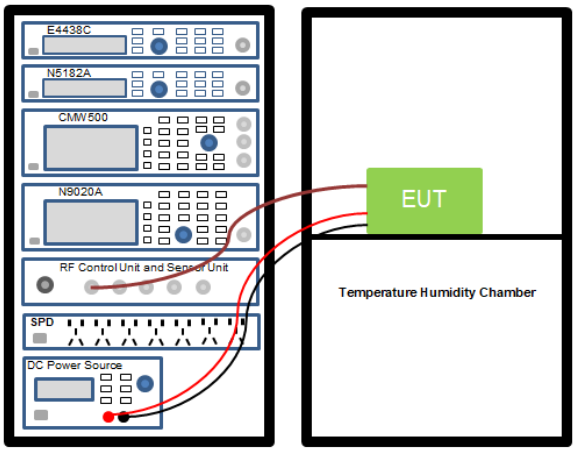
QPSK mode:	Keep the EUT communication with simulated station in QPSK mode
16QAM mode:	Keep the EUT communication with simulated station in 16QAM mode
64QAM mode:	Keep the EUT communication with simulated station in 64QAM mode
256QAM mode	Keep the EUT communication with simulated station in 256QAM mode
Remark: Per-scan all kind of data rate, and report only reflects the test data of worst data rate mode.	

4.3 Test procedure

Radiated test method
For below 1GHz: 1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data. **For above 1GHz:** 1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m. 2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations. 3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.
Conducted test method
1. The 5G NR antenna port of EUT was connected to the test port of the test system through an RF cable. 2. The EUT is keeping in continuous transmission mode and tested in all modulation modes. 3. Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.

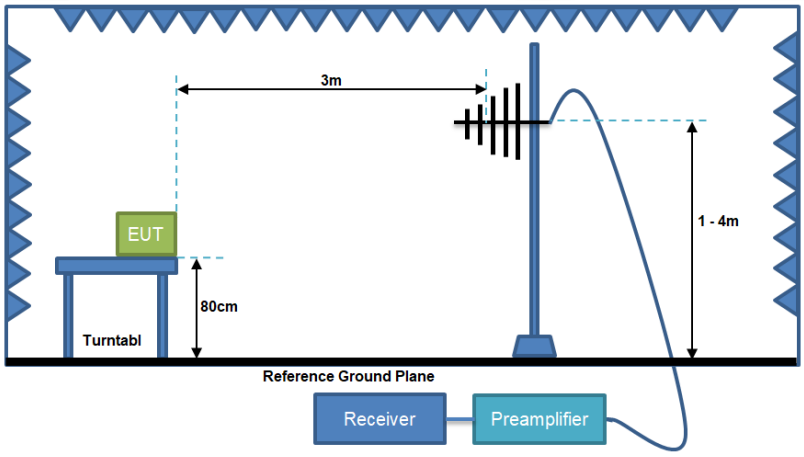
4.4 Test Setup Block

1) Conducted test method:

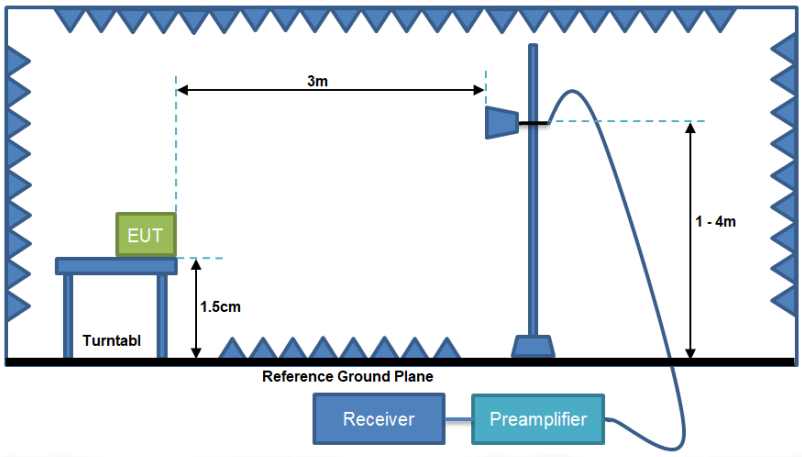


2) Radiated test method:

Below 1GHz



Above 1GHz



5 Technical requirements specification

5.1 Transmitter Radiated Power (EIRP/ERP)

5.1.1 Limit

FCC § 2.1046 & 22.913(a) & 24.232(c) & 27.50(a) & 27.50(b) & 27.50(c) & 27.50(d) & 27.50(h) & 90.635(b) & 90.542(a); RSS-103 4.6; RSS-132 5.4, RSS-133 6.4, RSS-139 6.5, RSS199 4.4

According to FCC section 22.913(a) (5), the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 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.

According to FCC section 27.50(a) (3), for mobile and portable stations transmitting in the 2305-2315MHz band or the 2350-2360MHz 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 LTE standards.

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

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

FCC section 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.

(7) Fixed, mobile, and portable (hand-held) stations operating in the 2000-2020 MHz band are limited to 2 watts EIRP.

And FCC section 27.50(h) (2), for 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.

According to FCC section 90.635(b), the maximum output power of the transmitter for mobile stations is 100 watts (20dBW).

According to FCC section 90.542(a) (7), portable stations (hand-held devices) transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 3 watts ERP.

5.1.2 Test Setup

The section 4.4 test setup 4 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.1.3 Test Procedure

Description of the Conducted Output Power Measurement

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. A system simulator is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The relevant equation for determining the conducted measured value is:

Conducted Output Power Value (dBm) = Measured Value (dBm) + Path Loss (dB)

where:
Conducted Output Power Value = final conducted measured value in the conducted power test, in dBm;
Measured Value = measured conducted power received by spectrum analyzer or power meter, in dBm;
Path Loss = signal attenuation in the connecting cable between the transmitter and spectrum analyzer or power meter, including external cable loss, in dB;

During the test, the data of Path Loss (dB) is added in the spectrum analyzer or power meter, so Measured Value (dBm) is the final values which contains the data of Path Loss (dB).

For example:

In the conducted output power test, when measured value for GSM850 is 24.7 dBm, and path loss is 8.5 dB, then final conducted output power value is:
Conducted Output Power Value (dBm) = 24.7 dBm + 8.5 dB = 33.2 dBm

Description of the Transmitter Radiated Power Measurement

In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

Final measurement calculation as below:

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:
ERP/EIRP = PMeas + GT − LC

where:
ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW; GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP); dBd (ERP)=dBi (EIRP) -2.15 dB
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

For example:
In the EIRP test, when PMeas value for GSM1900 is 30.2 dBm, LC is 0.6 dB, and GT is -3.4 dB, then final EIRP value is:
EIRP for GSM1900 = 30.2 dBm - 3.4 dBi - 0.6 dB = 26.2 dBm

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:

ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:
ERP (dBm) = 21dBm + 8dB = 29dBm

5.1.4 Test Result

Please refer to the appendix report

5.2 Peak to Average Ratio

5.2.1 Limit

FCC § 2.1046 & 24.232(d) & 27.50(d); RSS-130 4.6.1, RSS-133 6.4, RSS-139 6.5, RSS199 4.4

In addition, when the transmitter power is measured in terms of average value, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

According to FCC section 24.232(d); RSS-133 6.4, power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with 24.232 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. 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.

FCC section 24.232(e)); RSS-133 6.4,, peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

According to FCC section 27.50(d) (5); RSS-139 6.5, in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

According to RSS-19 4.4, In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of
continuous transmission.

5.2.2 Test Setup

The section 4.5 test setup 5 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.2.3 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.
According to KDB 971168 D01, there is CCDF procedure for PAPR:

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval as follows:

1)for continuous transmissions, set to 1 ms,

2)for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

e) Record the maximum PAPR level associated with a probability of 0.1%.

Alternate procedure for PAPR:

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = PPk (dBm) - PAvg (dBm).

5.2.4 Test Result

Please refer to the appendix report

5.3 Occupied Bandwidth

5.3.1 Limit

FCC § 2.1049, RSS-Gen 6.7
The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Many of the individual rule parts specify a relative OBW in lieu of the 99% OBW. In such cases, the OBW is defined as the width of the signal between two points, one below the carrier center frequency and on above the carrier center frequency, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26.

5.3.2 Test Setup

The section 4.5 test setup 5 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.3.3 Test Procedure

The following procedure shall be used for measuring power bandwidth.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) For -26 dB OBW, the dynamic range of the spectrum analyzer at the selected RBW shall be at least 10dB below the target “-X dB down” requirement, e.g. -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be 36dB below the reference value.

f) Set the detection mode to peak, and the trace mode to max hold.

g) For 99% OBW, use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.
If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) For -26 dB OBW, determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

Determine the “-X dB down amplitude” as equal to (reference value -X). Alternatively, this calculation can be performed by the analyzer by using the marker-delta function.
Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below “-X dB down amplitude” determined in step g). If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

i) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

j) Change variable modulations, coding, or channel bandwidth settings, then repeat above test procedures.

5.3.4 Test Result

Please refer to the appendix report

5.4 Frequency Stability

5.4.1 Limit

FCC § 2.1055 & 22.355 & 24.235 & 27.54 & 90.213; RSS-130 4.5, RSS-132 5.3, RSS-133 6.3, RSS-139 6.4, RSS199 4.3

The frequency stability shall be measured with variation of ambient temperature as follows:

(1) The temperature is varied from -30°C to +50°C.
(2) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10°C through the range.

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than carried battery equipment.
(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacture.
(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC § 22.355, RSS-132 5.3

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

FCC § 24.235, RSS-133 6.3

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

FCC § 27.54, RSS-139 6.4

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.
FCC § 90.213, RSS199 4.3

The frequency stability shall not depart from the reference frequency in excess of ±2.5ppm for mobile stations.

5.4.2 Test Setup

The section 4.5 test setup 6 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.4.3 Test Procedure

1. The EUT is placed in a temperature chamber.

2. The temperature is set to 25°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured.

3. The temperature is increased by not more than 10 degrees, allowed to stabilize and soak, and then repeat the frequency error measurement.

4. Repeat procedure 3 until +50°C and -30°C is reached.

5. Change supply voltage, and repeat measurement until extreme voltage is reached.

5.4.4 Test Result

Please refer to the appendix report

5.5 Spurious Emission at Antenna Terminals

5.5.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691 & 90.543; RSS-130 4.7, RSS-132 5.5, RSS-133 6.5, RSS-139 6.6, RSS199 4.5

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.

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.

FCC § 22.917(a) & 24.238(a), RSS-132 5.5, RSS-133 6.5

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4), RSS-139 6.6

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 +
10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.
(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.
(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 27.53(c), RSS-139 6.6

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a
6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a
6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(f) , RSS-139 6.6

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to - 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and
-80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC § 27.53(g) , RSS-139 6.6

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43+10*log(P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee’s frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1) , RSS-139 6.6

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands,
the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power
(P) in watts by at least 43 + 10 log10 (P) dB.

FCC § 27.53(m) (4) , RSS-139 6.6
For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
- 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

- 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

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 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or

EBS licensees.

FCC § 90.691

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

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 758–775 MHz and 788–805 MHz bands, all emissions including harmonics in the band 1559– 1610 MHz shall be limited to -70 dBW/ MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

RSS199 4.5

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

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

(i) 40 + 10 log10 p from the channel edges to 5 MHz away

(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and

(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

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

5.5.2 Test Setup

The section 4.5 test setup 5 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.5.3 Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency blocks a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. 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.
The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.

The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.

Spurious emissions are tested with 0.001MHz RBW for frequency less than 150kHz, 0.01MHz RBW for frequency less than 30MHz, 0.1MHz RBW for frequency less than 1GHz, and 1MHz RBW for frequency above 1GHz. And sweep point number are at least 401, referring to following formula.

Sweep point number = Span/RBW VBW=3*RBW
Detector Mode=mean or average power

Record the frequencies and levels of spurious emissions.

5.5.4 Test Result

Please refer to the appendix report

BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Email: info@btf-lab.com Tel: +86-755-23146130 http://www.btf-lab.com

5.6 Band Edge Emission

5.6.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691& 90.543; RSS-130 4.7, RSS-132 5.5, RSS-133 6.5, RSS-139 6.6, RSS199 4.5

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.

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.

FCC § 22.917(a) & 24.238(a), RSS-132 5.5, RSS-133 6.5

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4), RSS-139 6.6

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 +
10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.

(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.

(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 27.53(c), RSS-139 6.6

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a
6.25Hz band segment, for base and fixed stations;

(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25kHz band segment, for mobile and portable stations;
(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.

However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(g), RSS-139 6.6

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43+10*log(P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1), RSS-139 6.6

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands,
the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power
(P) in watts by at least 43 + 10 log10 (P) dB.

FCC § 27.53(m) (4), RSS-139 6.6

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
- 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

- 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

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 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC § 90.691

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116

Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.

(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.

(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS199 4.5

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

(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:

(i) 40 + 10 log10 p from the channel edges to 5 MHz away

(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and

(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

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

5.6.2 Test Setup

The section 4.5 test setup 5 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.6.3 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

1. The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna
terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2. CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.
3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.
4. The center of the spectrum analyzer was set to block edge frequency.
5. Band edge are tested with 1%*cBW (RBW), and sweep point number referred to following formula. Sweep point number = 2*Span/RBW VBW=3RBW
6. Record the frequencies and levels of spurious emissions.

For mobile and portable stations, on all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

10*log(10 kHz / 6.25 kHz) = 2.04 dB
Limit Line = -35 dBm + 2.04 dB = -32.96dBm

5.6.4 Test Result

Please refer to the appendix report

5.7 Field Strength of Spurious Radiation

5.7.1 Limit

FCC § 2.1053 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(f) & 27.53(g) & 27.53(h) & 27.53(m) & 90.691& 90.543 ; RSS-130 4.7, RSS-132 5.5, RSS-133 6.5, RSS-139 6.6, RSS199 4.5

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

FCC § 27.53(a) (4), RSS-139 6.6

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1) By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 +
10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.

(2) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.

(3) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 27.53(c), RSS-139 6.6

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
(3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a
6.25 kHz band segment, for base and fixed stations;
(4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a
6.25 kHz band segment, for mobile and portable stations;
(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of

measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC § 27.53(f), RSS-139 6.6

For operations in the 746–758 MHz, 775–788 MHz, and 805–806 MHz bands, emissions in the band 1559–1610 MHz shall be limited to - 70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and
-80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC § 27.53(g), RSS-139 6.6

For operations in the 600MHz band and the 698-746MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43+10*log(P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1), RSS-139 6.6

Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands,
the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power
(P) in watts by at least 43 + 10 log10 (P) dB. FCC § 27.53(m) (4)
For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

- 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.
- 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

- 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

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 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

FCC § 90.691

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:
(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation,

where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.
(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

FCC § 90.543

(e) For operations in the 758–768 MHz and the 788–798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:
(1) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
(2) On all frequencies between 769–775 MHz and 799–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
(3) On any frequency between 775–788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

RSS199 4.5

(a) for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p.
(b) for mobile subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

In addition, the attenuation shall not be less than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.

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

5.7.2 Test Setup

The section 4.5 test setup 4 description is used for conducted test, and the test setup description is used for radiated test. The photo of test setup please refer to Appendix I Test Setup Photos.

5.7.3 Test Procedure

1. On a test site, the EUT shall be placed at 80cm 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. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth was set to 1 MHz.
5. The transmitter shall be switched on; the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.

10. The EUT was replaced by half-wave dipole (824 ~ 849 MHz) or horn antenna (1 850 ~ 1 910 MHz) connected to a signal generator.
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 input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

Final measurement calculation as below:

The relevant equation for determining the ERP/EIRP from the radiated RF output power is: ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:
ERP (dBm) = 21dBm + 8dB = 29dBm

5.7.4 Test Result

Note: For all bandwidths of 5G NR frequency band, modulation types and RB configurations were pretested, and it was found that maximum power were the worst modes, and only the worst modes were reflected in the report.

Band N2, 5MHz Bandwidth						
Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
3705	-15.34	-37.12	-52.46	-13.00	-39.46	Horizontal
5557.5	-17.35	-34.19	-51.54	-13.00	-38.54	Horizontal
7410	-15.43	-36.24	-51.67	-13.00	-38.67	Horizontal
3705	-15.97	-37.12	-53.09	-13.00	-40.09	Vertical
5557.5	-18.35	-34.19	-52.54	-13.00	-39.54	Vertical
7410	-16.19	-36.24	-52.43	-13.00	-39.43	Vertical
Middle channel						
3765	-16.20	-37.01	-53.21	-13.00	-40.21	Horizontal
5647.5	-18.21	-34.08	-52.29	-13.00	-39.29	Horizontal
7530	-16.29	-36.13	-52.42	-13.00	-39.42	Horizontal
3765	-15.55	-37.01	-52.56	-13.00	-39.56	Vertical
5647.5	-17.93	-34.08	-52.01	-13.00	-39.01	Vertical
7530	-15.77	-36.13	-51.90	-13.00	-38.90	Vertical
Highest channel						
3825	-16.85	-36.90	-53.75	-13.00	-40.75	Horizontal
5737.5	-18.86	-33.97	-52.83	-13.00	-39.83	Horizontal
7650	-16.94	-36.02	-52.96	-13.00	-39.96	Horizontal
3825	-14.87	-36.90	-51.77	-13.00	-38.77	Vertical
5737.5	-17.25	-33.97	-51.22	-13.00	-38.22	Vertical
7650	-15.09	-36.02	-51.11	-13.00	-38.11	Vertical

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N5, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
1653	-14.35	-38.08	-52.43	-13.00	-39.43	Horizontal
2479.5	-18.91	-37.15	-56.06	-13.00	-43.06	Horizontal
3306	-15.43	-37.03	-52.46	-13.00	-39.46	Horizontal
1653	-14.98	-38.08	-53.06	-13.00	-40.06	Vertical
2479.5	-19.91	-37.15	-57.06	-13.00	-44.06	Vertical
3306	-16.19	-37.03	-53.22	-13.00	-40.22	Vertical
Middle channel						
1673	-15.21	-37.97	-53.18	-13.00	-40.18	Horizontal
2509.5	-19.77	-37.04	-56.81	-13.00	-43.81	Horizontal
3346	-16.29	-36.92	-53.21	-13.00	-40.21	Horizontal
1673	-14.56	-37.97	-52.53	-13.00	-39.53	Vertical
2509.5	-19.49	-37.04	-56.53	-13.00	-43.53	Vertical
3346	-15.77	-36.92	-52.69	-13.00	-39.69	Vertical
Highest channel						
1693	-15.86	-37.86	-53.72	-13.00	-40.72	Horizontal
2539.5	-20.42	-36.93	-57.35	-13.00	-44.35	Horizontal
3386	-16.94	-36.81	-53.75	-13.00	-40.75	Horizontal
1693	-13.88	-37.86	-51.74	-13.00	-38.74	Vertical
2539.5	-18.81	-36.93	-55.74	-13.00	-42.74	Vertical
3386	-15.09	-36.81	-51.90	-13.00	-38.90	Vertical

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N7, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
5005	-17.67	-35.61	-53.28	-25.00	-28.28	Vertical
7507.5	-13.21	-35.93	-49.14	-25.00	-24.14	Horizontal
10010	-15.28	-34.14	-49.42	-25.00	-24.42	Vertical
5005	-28.76	-35.61	-64.37	-25.00	-39.37	Horizontal
7507.5	-21.45	-35.93	-57.38	-25.00	-32.38	Vertical
10010	-15.83	-34.14	-49.97	-25.00	-24.97	Horizontal
Middle channel						
5070	-18.88	-35.50	-54.38	-25.00	-29.38	Vertical
7605	-14.42	-35.82	-50.24	-25.00	-25.24	Horizontal
10140	-16.49	-34.03	-50.52	-25.00	-25.52	Vertical
5070	-29.27	-35.50	-64.77	-25.00	-39.77	Horizontal
7605	-21.96	-35.82	-57.78	-25.00	-32.78	Vertical
10140	-16.34	-34.03	-50.37	-25.00	-25.37	Horizontal
Highest channel						
5135	-19.13	-35.40	-54.53	-25.00	-29.53	Vertical
7702.5	-14.67	-35.72	-50.39	-25.00	-25.39	Horizontal
10270	-16.74	-33.93	-50.67	-25.00	-25.67	Vertical
5135	-29.62	-35.40	-65.02	-25.00	-40.02	Horizontal
7702.5	-22.31	-35.72	-58.03	-25.00	-33.03	Vertical
10270	-16.69	-33.93	-50.62	-25.00	-25.62	Horizontal

Remark:

3. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

4. Margin=Level-Limit=Reading Level+Factor-Limit

Band N25, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
3705	-13.55	-37.11	-50.66	-13.00	-37.66	Horizontal
5557.5	-17.28	-34.23	-51.51	-13.00	-38.51	Horizontal
7410	-16.02	-36.23	-52.25	-13.00	-39.25	Horizontal
3705	-14.18	-37.11	-51.29	-13.00	-38.29	Vertical
5557.5	-18.28	-34.23	-52.51	-13.00	-39.51	Vertical
7410	-16.78	-36.23	-53.01	-13.00	-40.01	Vertical
Middle channel						
3765	-14.41	-37.00	-51.41	-13.00	-38.41	Horizontal
5647.5	-18.14	-34.12	-52.26	-13.00	-39.26	Horizontal
7530	-16.88	-36.12	-53.00	-13.00	-40.00	Horizontal
3765	-13.76	-37.00	-50.76	-13.00	-37.76	Vertical
5647.5	-17.86	-34.12	-51.98	-13.00	-38.98	Vertical
7530	-16.36	-36.12	-52.48	-13.00	-39.48	Vertical
Highest channel						
3825	-15.06	-36.89	-51.95	-13.00	-38.95	Horizontal
5737.5	-18.79	-34.01	-52.80	-13.00	-39.80	Horizontal
7650	-17.53	-36.01	-53.54	-13.00	-40.54	Horizontal
3825	-13.08	-36.89	-49.97	-13.00	-36.97	Vertical
5737.5	-17.18	-34.01	-51.19	-13.00	-38.19	Vertical
7650	-15.68	-36.01	-51.69	-13.00	-38.69	Vertical

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N40a, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
4615.00	-20.44	-37.07	-57.51	-40.00	-17.51	Vertical
6922.50	-14.04	-36.28	-50.32	-40.00	-10.32	Horizontal
9230.00	-14.76	-34.68	-49.44	-40.00	-9.44	Vertical
4615.00	-21.07	-37.07	-58.14	-40.00	-18.14	Horizontal
6922.50	-15.04	-36.28	-51.32	-40.00	-11.32	Vertical
9230.00	-15.52	-34.68	-50.20	-40.00	-10.20	Horizontal
Middle channel						
4620.00	-21.30	-36.96	-58.26	-40.00	-18.26	Vertical
6930.00	-14.90	-36.17	-51.07	-40.00	-11.07	Horizontal
9240.00	-15.62	-34.57	-50.19	-40.00	-10.19	Vertical
4620.00	-20.65	-36.96	-57.61	-40.00	-17.61	Horizontal
6930.00	-14.62	-36.17	-50.79	-40.00	-10.79	Vertical
9240.00	-15.10	-34.57	-49.67	-40.00	-9.67	Horizontal
Highest channel						
4625.00	-21.95	-36.85	-58.80	-40.00	-18.80	Vertical
6937.50	-15.55	-36.06	-51.61	-40.00	-11.61	Horizontal
9250.00	-16.27	-34.46	-50.73	-40.00	-10.73	Vertical
4625.00	-19.97	-36.85	-56.82	-40.00	-16.82	Horizontal
6937.50	-13.94	-36.06	-50.00	-40.00	-10.00	Vertical
9250.00	-14.42	-34.46	-48.88	-40.00	-8.88	Horizontal

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N40b, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
4705.00	-17.98	-37.07	-55.05	-40.00	-15.05	Vertical
7057.50	-15.28	-36.28	-51.56	-40.00	-11.56	Horizontal
9410.00	-15.35	-34.68	-50.03	-40.00	-10.03	Vertical
4705.00	-18.61	-37.07	-55.68	-40.00	-15.68	Horizontal
7057.50	-16.28	-36.28	-52.56	-40.00	-12.56	Vertical
9410.00	-16.11	-34.68	-50.79	-40.00	-10.79	Horizontal
Middle channel						
4710.00	-18.84	-36.96	-55.80	-40.00	-15.80	Vertical
7065.00	-16.14	-36.17	-52.31	-40.00	-12.31	Horizontal
9420.00	-16.21	-34.57	-50.78	-40.00	-10.78	Vertical
4710.00	-18.19	-36.96	-55.15	-40.00	-15.15	Horizontal
7065.00	-15.86	-36.17	-52.03	-40.00	-12.03	Vertical
9420.00	-15.69	-34.57	-50.26	-40.00	-10.26	Horizontal
Highest channel						
4715.00	-19.49	-36.85	-56.34	-40.00	-19.82	Vertical
7072.50	-16.79	-36.06	-52.85	-40.00	-16.33	Horizontal
9430.00	-16.86	-34.46	-51.32	-40.00	-14.80	Vertical
4715.00	-17.51	-36.85	-54.36	-40.00	-17.84	Horizontal
7072.50	-15.18	-36.06	-51.24	-40.00	-14.72	Vertical
9430.00	-15.01	-34.46	-49.47	-40.00	-12.95	Horizontal

Remark:

3. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

4. Margin=Level-Limit=Reading Level+Factor-Limit

Band N41, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
5002.02	-19.21	-34.96	-54.17	-25.00	-29.17	Horizontal
7503.03	-14.21	-35.53	-49.74	-25.00	-24.74	Horizontal
10004.04	-13.47	-34.16	-47.63	-25.00	-22.63	Horizontal
5002.02	-28.76	-34.96	-63.72	-25.00	-38.72	Vertical
7503.03	-21.45	-35.53	-56.98	-25.00	-31.98	Vertical
10004.04	-15.83	-34.16	-49.99	-25.00	-24.99	Vertical
Middle channel						
5186.01	-20.42	-34.85	-55.27	-25.00	-30.27	Horizontal
7779.015	-15.42	-35.42	-50.84	-25.00	-25.84	Horizontal
10372.02	-14.68	-34.05	-48.73	-25.00	-23.73	Horizontal
5186.01	-29.27	-34.85	-64.12	-25.00	-39.12	Vertical
7779.015	-21.96	-35.42	-57.38	-25.00	-32.38	Vertical
10372.02	-16.34	-34.05	-50.39	-25.00	-25.39	Vertical
Highest channel						
5370	-20.67	-34.75	-55.42	-25.00	-30.42	Horizontal
8055	-15.67	-35.32	-50.99	-25.00	-25.99	Horizontal
10740	-14.93	-33.95	-48.88	-25.00	-23.88	Horizontal
5370	-29.62	-34.75	-64.37	-25.00	-39.37	Vertical
8055	-22.31	-35.32	-57.63	-25.00	-32.63	Vertical
10740	-16.69	-33.95	-50.64	-25.00	-25.64	Vertical

Remark:

5. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

6. Margin=Level-Limit=Reading Level+Factor-Limit

Band N66, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
3425	-19.35	-37.35	-56.70	-13.00	-43.70	Horizontal
5137.5	-18.02	-34.80	-52.82	-13.00	-39.82	Horizontal
6850	-16.34	-36.03	-52.37	-13.00	-39.37	Horizontal
3425	-19.98	-37.35	-57.33	-13.00	-44.33	Vertical
5137.5	-19.02	-34.80	-53.82	-13.00	-40.82	Vertical
6850	-17.10	-36.03	-53.13	-13.00	-40.13	Vertical
Middle channel						
3490	-20.21	-37.24	-57.45	-13.00	-44.45	Horizontal
5235	-18.88	-34.69	-53.57	-13.00	-40.57	Horizontal
6980	-17.20	-35.92	-53.12	-13.00	-40.12	Horizontal
3490	-19.56	-37.24	-56.80	-13.00	-43.80	Vertical
5235	-18.60	-34.69	-53.29	-13.00	-40.29	Vertical
6980	-16.68	-35.92	-52.60	-13.00	-39.60	Vertical
Highest channel						
3555	-20.86	-37.13	-57.99	-13.00	-44.99	Horizontal
5332.5	-19.53	-34.58	-54.11	-13.00	-41.11	Horizontal
7110	-17.85	-35.81	-53.66	-13.00	-40.66	Horizontal
3555	-18.88	-37.13	-56.01	-13.00	-43.01	Vertical
5332.5	-17.92	-34.58	-52.50	-13.00	-39.50	Vertical
7110	-16.00	-35.81	-51.81	-13.00	-38.81	Vertical

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N71, 5MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
1331	-18.35	-37.35	-55.7	-13.00	-42.70	Horizontal
1996.5	-17.04	-37.11	-54.15	-13.00	-41.15	Horizontal
2662	-15.62	-36.77	-52.39	-13.00	-39.39	Horizontal
1331	-18.98	-37.35	-56.33	-13.00	-43.33	Vertical
1996.5	-18.04	-37.11	-55.15	-13.00	-42.15	Vertical
2662	-16.38	-36.77	-53.15	-13.00	-40.15	Vertical
Middle channel						
1361	-19.21	-37.24	-56.45	-13.00	-43.45	Horizontal
2041.5	-17.9	-37.00	-54.9	-13.00	-41.90	Horizontal
2722	-16.48	-36.66	-53.14	-13.00	-40.14	Horizontal
1361	-18.56	-37.24	-55.8	-13.00	-42.80	Vertical
2041.5	-17.62	-37.00	-54.62	-13.00	-41.62	Vertical
2722	-15.96	-36.66	-52.62	-13.00	-39.62	Vertical
Highest channel						
1391	-19.86	-37.13	-56.99	-13.00	-43.99	Horizontal
2086.5	-18.55	-36.89	-55.44	-13.00	-42.44	Horizontal
2782	-17.13	-36.55	-53.68	-13.00	-40.68	Horizontal
1391	-17.88	-37.13	-55.01	-13.00	-42.01	Vertical
2086.5	-16.94	-36.89	-53.83	-13.00	-40.83	Vertical
2782	-15.28	-36.55	-51.83	-13.00	-38.83	Vertical

Remark:

3. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

4. Margin=Level-Limit=Reading Level+Factor-Limit

Band N77a, 10MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
7410	-16.78	-37.35	-54.13	-13.00	-41.13	Horizontal
11115	-16.28	-37.11	-53.39	-13.00	-40.39	Horizontal
14820	-14.35	-36.77	-51.12	-13.00	-38.12	Horizontal
7410	-17.41	-37.35	-54.76	-13.00	-41.76	Vertical
11115	-17.28	-37.11	-54.39	-13.00	-41.39	Vertical
14820	-15.11	-36.77	-51.88	-13.00	-38.88	Vertical
Middle channel						
7680	-17.64	-37.24	-54.88	-13.00	-41.88	Horizontal
11520	-17.14	-37	-54.14	-13.00	-41.14	Horizontal
15360	-15.21	-36.66	-51.87	-13.00	-38.87	Horizontal
7680	-16.99	-37.24	-54.23	-13.00	-41.23	Vertical
11520	-16.86	-37	-53.86	-13.00	-40.86	Vertical
15360	-14.69	-36.66	-51.35	-13.00	-38.35	Vertical
Highest channel						
7950	-18.29	-37.13	-55.42	-13.00	-42.42	Horizontal
11925	-17.79	-36.89	-54.68	-13.00	-41.68	Horizontal
15900	-15.86	-36.55	-52.41	-13.00	-39.41	Horizontal
7950	-16.31	-37.13	-53.44	-13.00	-40.44	Vertical
11925	-16.18	-36.89	-53.07	-13.00	-40.07	Vertical
15900	-14.01	-36.55	-50.56	-13.00	-37.56	Vertical

Remark:

1. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
2. Margin=Level-Limit=Reading Level+Factor-Limit

Band N77d, 10MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
6910.020	-16.95	-37.35	-54.30	-13.00	-41.30	Horizontal
10365.030	-14.81	-37.11	-51.92	-13.00	-38.92	Horizontal
13820.040	-13.04	-36.77	-49.81	-13.00	-36.81	Horizontal
6910.020	-17.58	-37.35	-54.93	-13.00	-41.93	Vertical
10365.030	-15.81	-37.11	-52.92	-13.00	-39.92	Vertical
13820.040	-13.80	-36.77	-50.57	-13.00	-37.57	Vertical
Middle channel						
6999.990	-17.81	-37.24	-55.05	-13.00	-42.05	Horizontal
10499.985	-15.67	-37.00	-52.67	-13.00	-39.67	Horizontal
13999.980	-13.9	-36.66	-50.56	-13.00	-37.56	Horizontal
6999.990	-17.16	-37.24	-54.40	-13.00	-41.40	Vertical
10499.985	-15.39	-37.00	-52.39	-13.00	-39.39	Vertical
13999.980	-13.38	-36.66	-50.04	-13.00	-37.04	Vertical
Highest channel						
7089.990	-18.46	-37.13	-55.59	-13.00	-42.59	Horizontal
10634.985	-16.32	-36.89	-53.21	-13.00	-40.21	Horizontal
14179.980	-14.55	-36.55	-51.10	-13.00	-38.10	Horizontal
7089.990	-16.48	-37.13	-53.61	-13.00	-40.61	Vertical
10634.985	-14.71	-36.89	-51.60	-13.00	-38.60	Vertical
14179.980	-12.70	-36.55	-49.25	-13.00	-36.25	Vertical

Remark:

3. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

4. Margin=Level-Limit=Reading Level+Factor-Limit

Band N78a, 10MHz Bandwidth Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
7410	-18.61	-37.35	-55.96	-13	-42.96	Horizontal
11115	-16.55	-37.11	-53.66	-13	-40.66	Horizontal
14820	-14.62	-36.77	-51.39	-13	-38.39	Horizontal
7410	-19.24	-37.35	-56.59	-13	-43.59	Vertical
11115	-17.55	-37.11	-54.66	-13	-41.66	Vertical
14820	-15.38	-36.77	-52.15	-13	-39.15	Vertical
Middle channel						
7500	-19.47	-37.24	-56.71	-13	-43.71	Horizontal
11250	-17.41	-37	-54.41	-13	-41.41	Horizontal
15000	-15.48	-36.66	-52.14	-13	-39.14	Horizontal
7500	-18.82	-37.24	-56.06	-13	-43.06	Vertical
11250	-17.13	-37	-54.13	-13	-41.13	Vertical
15000	-14.96	-36.66	-51.62	-13	-38.62	Vertical
Highest channel						
7590	-20.12	-37.13	-57.25	-13	-44.25	Horizontal
11385	-18.06	-36.89	-54.95	-13	-41.95	Horizontal
15180	-16.13	-36.55	-52.68	-13	-39.68	Horizontal
7590	-18.14	-37.13	-55.27	-13	-42.27	Vertical
11385	-16.45	-36.89	-53.34	-13	-40.34	Vertical
15180	-14.28	-36.55	-50.83	-13	-37.83	Vertical

Remark:

5. *The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.*
6. Margin=Level-Limit=Reading Level+Factor-Limit

Band N78e, 5MHz Bandwidth						
Lowest channel						
Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Polarization
6910.02	-18.78	-37.35	-56.13	-13	-43.13	Horizontal
10365.03	-16.64	-37.11	-53.75	-13	-40.75	Horizontal
13820.04	-14.87	-36.77	-51.64	-13	-38.64	Horizontal
6910.02	-19.41	-37.35	-56.76	-13	-43.76	Vertical
10365.03	-17.64	-37.11	-54.75	-13	-41.75	Vertical
13820.04	-15.63	-36.77	-52.4	-13	-39.4	Vertical
Middle channel						
6999.99	-19.64	-37.24	-56.88	-13	-43.88	Horizontal
10499.985	-17.5	-37	-54.5	-13	-41.5	Horizontal
13999.98	-15.73	-36.66	-52.39	-13	-39.39	Horizontal
6999.99	-18.99	-37.24	-56.23	-13	-43.23	Vertical
10499.985	-17.22	-37	-54.22	-13	-41.22	Vertical
13999.98	-15.21	-36.66	-51.87	-13	-38.87	Vertical
Highest channel						
7089.99	-20.29	-37.13	-57.42	-13	-44.42	Horizontal
10634.985	-18.15	-36.89	-55.04	-13	-42.04	Horizontal
14179.98	-16.38	-36.55	-52.93	-13	-39.93	Horizontal
7089.99	-18.31	-37.13	-55.44	-13	-42.44	Vertical
10634.985	-16.54	-36.89	-53.43	-13	-40.43	Vertical
14179.98	-14.53	-36.55	-51.08	-13	-38.08	Vertical

Remark:

7. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report.

8. Margin=Level-Limit=Reading Level+Factor-Limit

6 Test Setup Photos

Please refer to the Appendix I Test Setup Photos

7 EUT Constructional Details (EUT Photos)

Please refer to the Appendix II External Photos &Appendix III External Photos

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