TEST REPORT

Application No.:	FYCR2412000022AT
Applicant:	Quectel Wireless Solutions Co., Ltd.
Address of Applicant:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233,China
Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, 200233,China
Equipment Under Test (EUT):	
EUT Name:	LTE NTN Module
Model No.:	BG770A-SN
Trade Mark:	Quectel
FCC ID:	XMR024BG770ASN
Standard(s) :	47 CFR Part 2 47 CFR Part 25
Date of Receipt:	2024-12-03
Date of Test:	2024-12-05 to 2024-12-23
Date of Issue:	2024-12-23
Test Result:	**Pass**

* In the configuration tested, the EUT complied with the standards specified above.

Powell Bao

Lab Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2024-12-23		Original

Authorized for issue by:

Tree Zhan

Tree Zhan /Project Engineer

Powell Bao

Powell Bao /Reviewer

2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Output Power Data	§2.1046 §25.204	ERP≤ 40dBW	PASS
Bandwidth	§2.1049(h)	OBW: No limit EBW: No limit	PASS
Emission limitations.	§2.1051 §25.202 (f)(1)(2)	Refer to clause 6.3	PASS
Conducted Spurious emissions	§2.1051 §25.202 (f)(3)	Refer to clause 6.4	PASS
Field strength of spurious radiation	§2.1053 §25.202 (f)(3)	Refer to clause 6.5	PASS
Frequency stability	§2.1055 §25.202 (d)	within 0.001 percent of the reference frequency	PASS
Additional unwanted emission limits for MESs	§25.216(c)(e)(h)(i)	Refer to clause 6.7	PASS

Remark:

The FCC ID:XMR024BG770ASN has been certified, This test report (Report No.: FYCR241200002201 issue on 2024-12-23) is based on the original test report (Report No.: 2406RSU025-U5 issue by MRT Technology (Suzhou) Co., Ltd on 2024-11-27).

Review this report and original report, this report just changing the parts according to the declaration letter from client.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report the Effective (Isotropic) Radiated Output Power, Bandwidth, Emission limitations, Conducted Spurious emissions, Field strength of spurious radiation, Frequency stability, Additional unwanted emission limits for MESs were retested.

3 Contents

4 General Information

4.1 Details of E.U.T.

EUT Description:	LTE NTN Module	
Model No.:	BG770A-SN	
Trade Mark:	Quectel	
Hardware Version:	R1.0	
Software Version:	BG770ASNAAR02A02	
IMEI:	867953065839153	
Antenna Type:	Fixed External Antenna	
Operation Frequency Band:	Tx Frequency	Band 255: 1626.5 MHz ~ 1660.5 MHz
	Rx Frequency	Band 255: 1525 MHz ~1559 MHz
Modulation Type:	BPSK, QPSK	
SCS:	3.75kHz, 15kHz	
Bandwidth	200kHz	
Antenna Gain:	Band 255: 3.7dBi	
RF Cable:	1600MHz ~ 1700MHz: 3.9dB	

Remark: The information in this section is provided by the applicant or manufacturer, CCS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

Note:

(1) The antenna gain value is provided by the customer. The test lab will not be responsible for wrong test result due to incorrect information about antenna gain values.

4.2 Test Frequency

Test mode1:	SCS (KHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
Band 255	3.75	1626.6	1643.5	1660.4
	15			

Remark: The test mode(s) are selected according to relevant radio technology specifications.

4.3 Test Environment

Environment Parameter	102 kPa Selected Values During Tests	
Relative Humidity	44-46 % RH Ambient	
Value	Temperature(℃)	Voltage(V)
NTNV	21~24	3.3
LTLV	-35	3.1
LTHV	-35	4.2
HTLV	75	3.1
HTHV	75	4.2

Remark:

NV: Normal Voltage	LV: Low Extreme Test Voltage	HV: High Extreme Test Voltage
NT: Normal Temperature	LT: Low Extreme Test Temperature	HT: High Extreme Test Temperature

4.4 Description of Support Units

Description	Manufacturer	Model No.
EVB test fixture	Quectel	BG770A-SN-TE-B
Remark: all above the information of table are provided by client.		

4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 5.4 x 10^{-8}
2	Occupied Bandwidth	± 3%
3	RF conducted power	± 0.8dB
4	RF power density	± 0.4dB
5	Conducted Spurious emissions	± 2.7dB
6	Radiated Spurious emission test	± 3.1dB (Below 1GHz)
		± 4.4dB (Above 1GHz)
7	Temperature test	± 1°C
8	Humidity test	± 3%
9	Supply voltages	± 1.5%

4.6 Test Location

All tests were performed at:

Compliance Certification Services（Kunshan）Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark,Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.7 Test Facility

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

• A2LA (Certificate No. 6606.01)

Compliance Certification Services（Kunshan）Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

• FCC –Designation Number: CN1322

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020B	SEM004-24	2024/3/14	2025/3/13
Radio Communication Analyzer	Keysight	UXM 5G(E7515B)	SZ-WRG-M-021	2024/5/24	2025/5/23
DC power supply	MAISHENG	MP5020D	SEM011-15	2024/8/13	2025/8/12
Programmable Temperature & Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	SEM002-15	2024/3/19	2025/3/18
Coaxial Cable	SGS	N/A	SEM031-02	2024/7/6	2025/7/5
Coaxial Cable	SGS	N/A	SEM031-03	2024/7/6	2025/7/5

Field strength of spurious radiation(Below 1GHz & Above 1GHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
966 Anechoic Chamber	CRT	N/A	SEM001-13	2022/10/15	2025/10/14
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-26	2023/9/23	2025/9/22
Loop Antenna	ETS-LINDGREN	6502	SEM003-43	2023/7/28	2026/7/27
EMI Test Receiver	Agilent	N9038A	SEM004-05	2024/8/13	2025/8/12
Pre-Amplifier	HP	8447D	SEM005-02	2024/8/13	2025/8/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2023/9/17	2025/9/16
Coaxial Cable	SGS	N/A	SEM035-01	2024/5/13	2025/5/12
Coaxial Cable	SGS	N/A	SEM035-02	2024/5/13	2025/5/12
Coaxial Cable	SGS	N/A	SEM035-03	2024/5/13	2025/5/12
MXA Signal Analyzer	Keysight	N9020A	SEM004-23	2024/3/16	2025/3/15
Pre-amplifier	TST PASS	LNA04080G30	SEM005-27	2024/3/28	2025/3/27
Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2024/3/28	2025/3/27

General used equipment					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	deli	8838	SEM002-52	2024/7/24	2025/7/23
Humidity/ Temperature Indicator	deli	8838	SEM002-53	2024/7/24	2025/7/23
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2024/3/18	2025/3/17
Radio Communication Analyzer	Keysight	UXM 5G(E7515B)	SZ-WRG-M-021	2024-05-24	2025-05-23

6 Radio Spectrum Matter Test Results

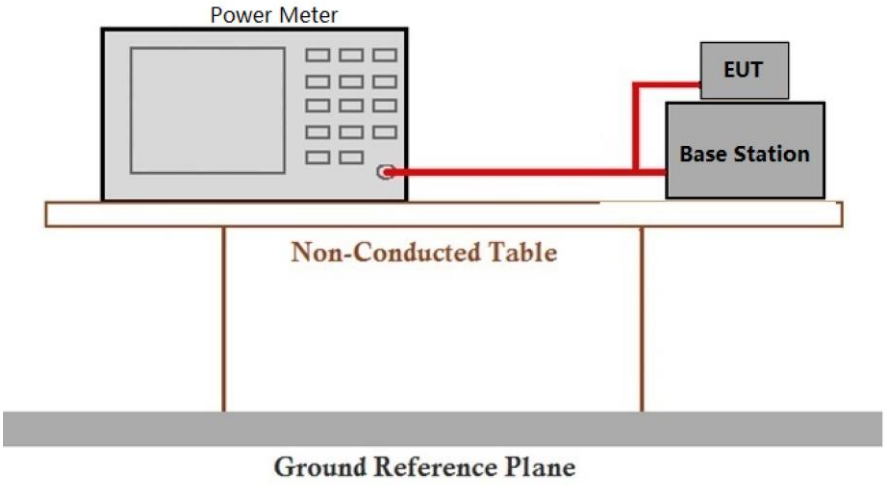
6.1 Effective (Isotropic) Radiated Output Power Data

Test Requirement: §2.1046; §25.204
Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01
Limit: 40dBW

6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar
Test mode : Test mode1

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

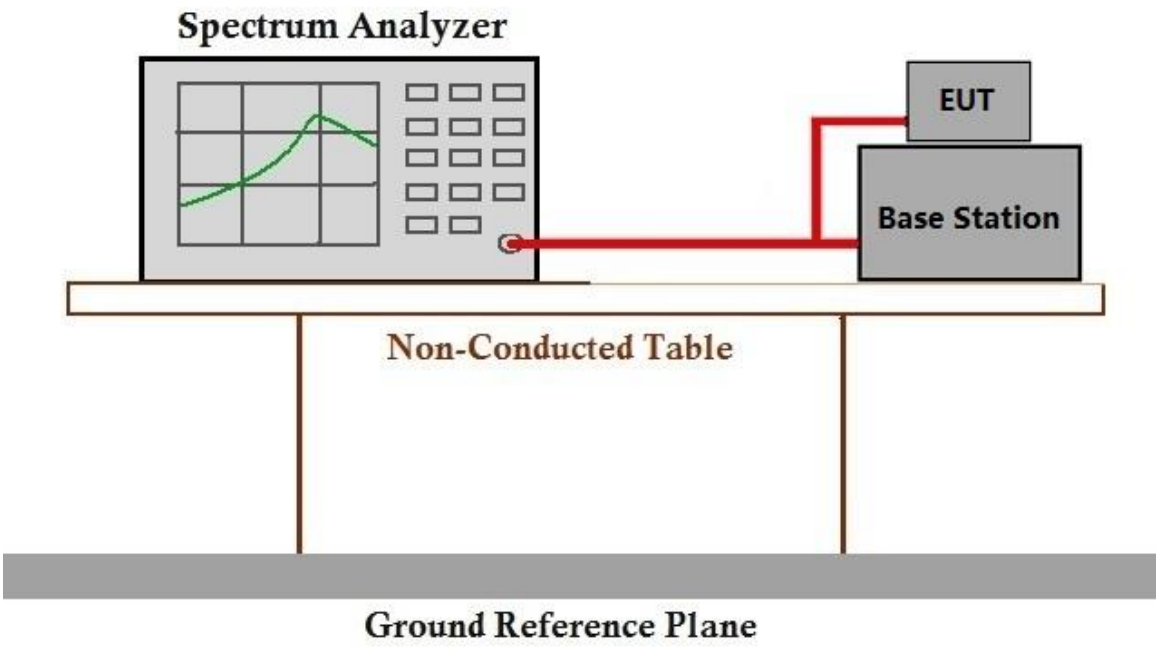
6.2 Bandwidth

Test Requirement: §2.1049(h)
Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01
Limit: OBW: No limit
EBW: No limit

6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar
Test mode : Test mode1

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

6.3 Emission limitations

Test Requirement: §2.1051; §25.202 (f)(1)(2)

Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01

Limit: In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: 25 dB;
In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: 35 dB;

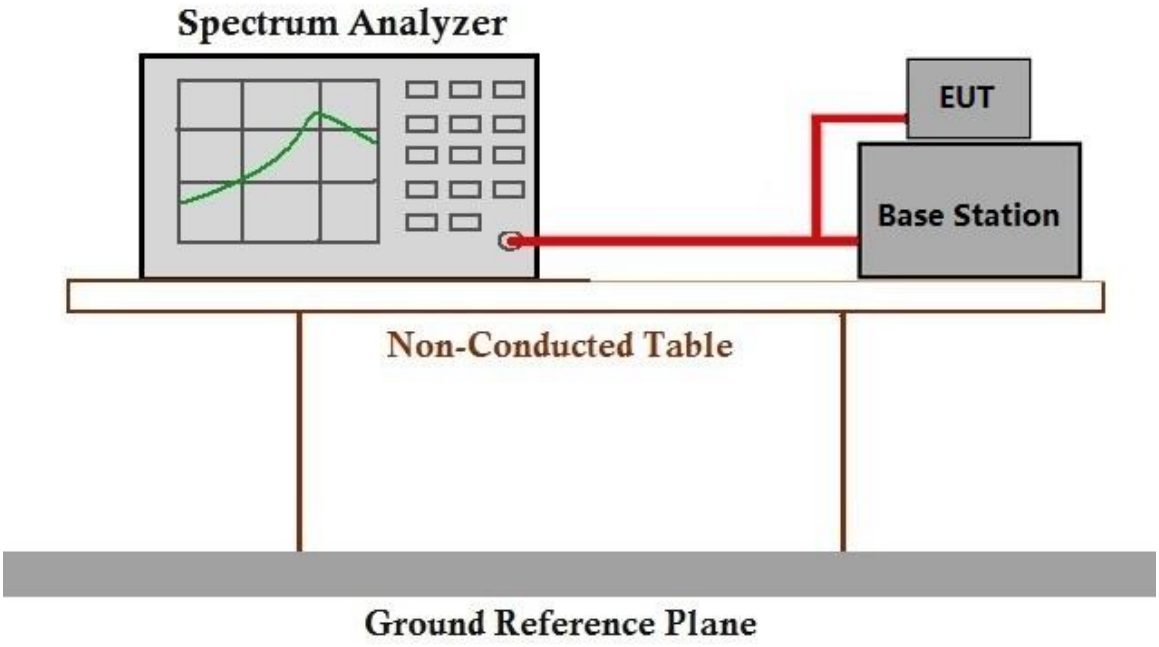
6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode : Test mode1

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

6.4 Conducted Spurious emissions

Test Requirement:	§2.1051; §25.202 (f)(3)
Test Method:	ANSI C63.26-2015, KDB 971168 D01 v03r01
Limit:	In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts

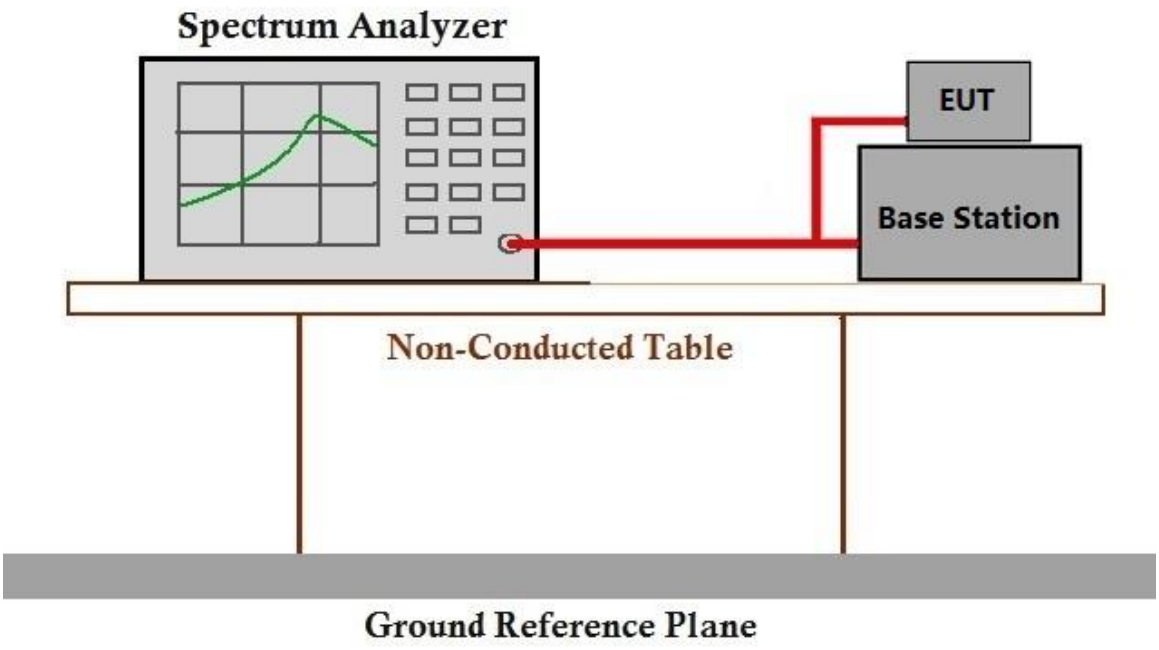
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode : Test mode1

6.4.2 Test Setup Diagram



6.4.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

6.5 Field strength of spurious radiation

Test Requirement: §2.1051; §25.202 (f)(3)

Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01

Limit: In any 4 kHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: An amount equal to 43 dB plus 10 times the logarithm (to the base 10) of the transmitter power in watts

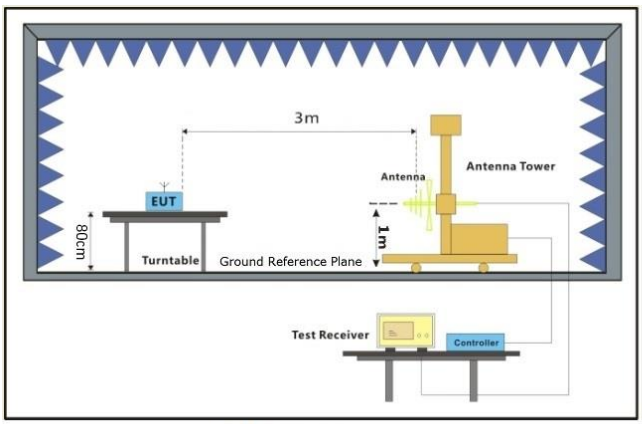
6.5.1 E.U.T. Operation

Operating Environment:

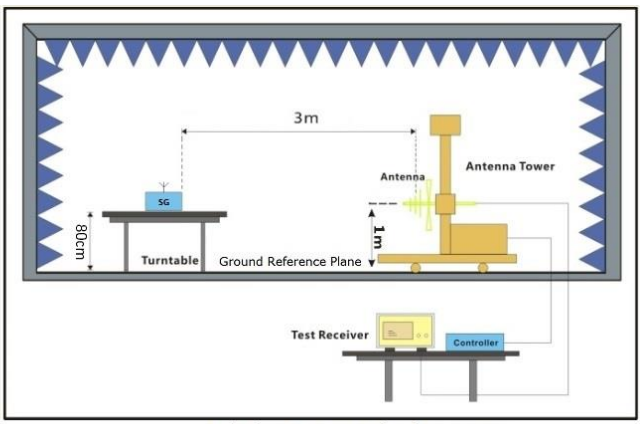
Temperature: 21.9 °C Humidity: 42.6 % RH Atmospheric Pressure: 1020 mbar

Test mode : Test mode1

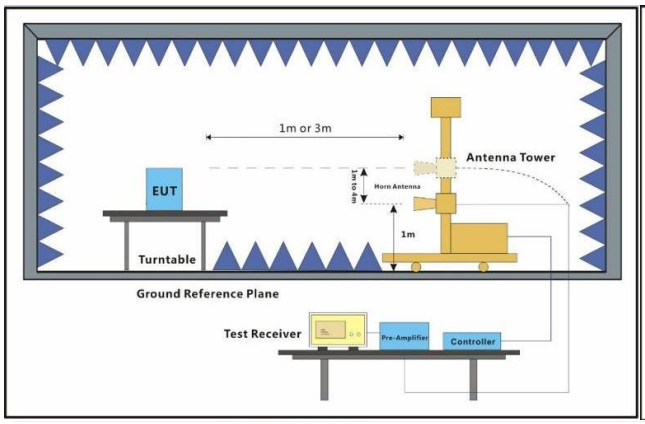
6.5.2 Test Setup Diagram



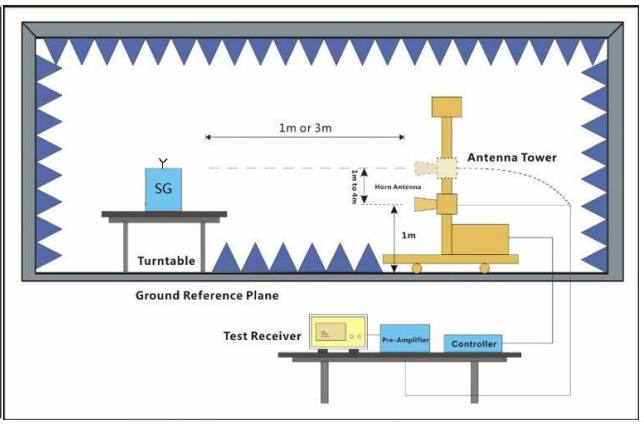
EUT



Substiute Antenna+Signal Generator



EUT



Substiute Antenna+Signal Generator

6.5.3 Measurement Procedure and Data

Test Procedure:

(1)On a test site, the EUT shall be placed on a turntable and in the position closest to the normal use as declared by the user.
(2)The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the transmitter.
(3)The output of the antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
(4)The transmitter shall be switched on; if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
(5)The test antenna shall be raised and lowered through the specified range of height until the measuring receiver detects a maximum signal level.
(6)The transmitter shall than be rotated through 360°in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
(7)The test antenna shall be raised and lowered again through the specified range of height until the measuring receiver detects a maximum signal level.
(8)The maximum signal level detected by the measuring receiver shall be noted.
(9)The measurement shall be repeated with the test antenna set to horizontal polarization.
(10) Replace the antenna with a proper Antenna (substitution antenna).
(11)The substitution antenna shall be oriented for vertical polarization and, if necessary, the length of the substitution antenna shall be adjusted to correspond to the frequency of transmitting.
(12)The substitution antenna shall be connected to a calibrated signal generator.
(13)If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
(14)The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
(15)The input signal to substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
(16)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.
(17)The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

NTN Band 255-Low channel, Modulation: QPSK, SCS:15kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3253.2	-53.26	-13	-40.26	-56.83	3.23	6.8	Horizontal	Pass
5112.485	-63.01	-13	-50.01	-67.32	4.99	9.3	Horizontal	Pass
7338.621	-59.82	-13	-46.82	-65.49	4.83	10.5	Horizontal	Pass
3253.2	-47.89	-13	-34.89	-51.46	3.23	6.8	Vertical	Pass
4933.497	-63.04	-13	-50.04	-67.96	4.08	9	Vertical	Pass
6747.341	-60.75	-13	-47.75	-66.53	4.32	10.1	Vertical	Pass

NTN Band 255-Middle channel, Modulation: QPSK, SCS:15kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3287	-52.69	-13	-39.69	-56.26	3.23	6.8	Horizontal	Pass
5047.827	-62.61	-13	-49.61	-66.92	4.99	9.3	Horizontal	Pass
7081.697	-60.56	-13	-47.56	-66.23	4.83	10.5	Horizontal	Pass
3287	-46.36	-13	-33.36	-49.93	3.23	6.8	Vertical	Pass
5060.693	-63.09	-13	-50.09	-67.4	4.99	9.3	Vertical	Pass
6956.627	-60.72	-13	-47.72	-66.5	4.32	10.1	Vertical	Pass

NTN Band 255-High channel, Modulation: QPSK, SCS:15kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3320.8	-53.68	-13	-40.68	-57.25	3.23	6.8	Horizontal	Pass
5164.807	-63.38	-13	-50.38	-67.69	4.99	9.3	Horizontal	Pass
7761.322	-59.19	-13	-46.19	-65.88	4.71	11.4	Horizontal	Pass
3320.8	-49.13	-13	-36.13	-52.7	3.23	6.8	Vertical	Pass
5073.591	-63.09	-13	-50.09	-67.4	4.99	9.3	Vertical	Pass
7172.406	-60.13	-13	-47.13	-65.8	4.83	10.5	Vertical	Pass

Fuyong lab. Xinlong TechnoPark, Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China 518103 t (86–755) 88663988 f (86–755) 26710594 www.sgsgroup.com.cn
中国·深圳·宝安区福永街道凤塘大道鑫龙科技园福永实验室 邮编: 518103 t (86–755) 88663988 f (86–755) 26710594 sgs.china@sgs.com

NTN Band 255-Low channel, Modulation: QPSK, SCS:3.75kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3253.2	-51.39	-13	-38.39	-54.96	3.23	6.8	Horizontal	Pass
4971.316	-62.38	-13	-49.38	-67.3	4.08	9	Horizontal	Pass
7227.389	-59.98	-13	-46.98	-65.65	4.83	10.5	Horizontal	Pass
3253.2	-47.32	-13	-34.32	-50.89	3.23	6.8	Vertical	Pass
5047.827	-63.25	-13	-50.25	-67.56	4.99	9.3	Vertical	Pass
6799.064	-61.29	-13	-48.29	-67.07	4.32	10.1	Vertical	Pass

NTN Band 255-Middle channel, Modulation: QPSK, SCS: 3.75kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3287	-51.48	-13	-38.48	-55.05	3.23	6.8	Horizontal	Pass
5230.963	-62.89	-13	-49.89	-67.2	4.99	9.3	Horizontal	Pass
7860.737	-58.65	-13	-45.65	-65.34	4.71	11.4	Horizontal	Pass
3287	-48.25	-13	-35.25	-51.82	3.23	6.8	Vertical	Pass
5099.487	-63.12	-13	-50.12	-67.43	4.99	9.3	Vertical	Pass
7154.172	-60.13	-13	-47.13	-65.8	4.83	10.5	Vertical	Pass

NTN Band 255-High channel, Modulation: QPSK, SCS: 3.75kHz, 1@0								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable Loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3320.8	-52.89	-13	-39.89	-56.46	3.23	6.8	Horizontal	Pass
5164.807	-63.77	-13	-50.77	-68.08	4.99	9.3	Horizontal	Pass
7585.533	-59.78	-13	-46.78	-66.47	4.71	11.4	Horizontal	Pass
3320.8	-48.32	-13	-35.32	-51.89	3.23	6.8	Vertical	Pass
4821.757	-64.56	-13	-51.56	-69.48	4.08	9	Vertical	Pass
6974.358	-61.73	-13	-48.73	-67.51	4.32	10.1	Vertical	Pass

Note: The test result of Below 1G which was very low and not reported.

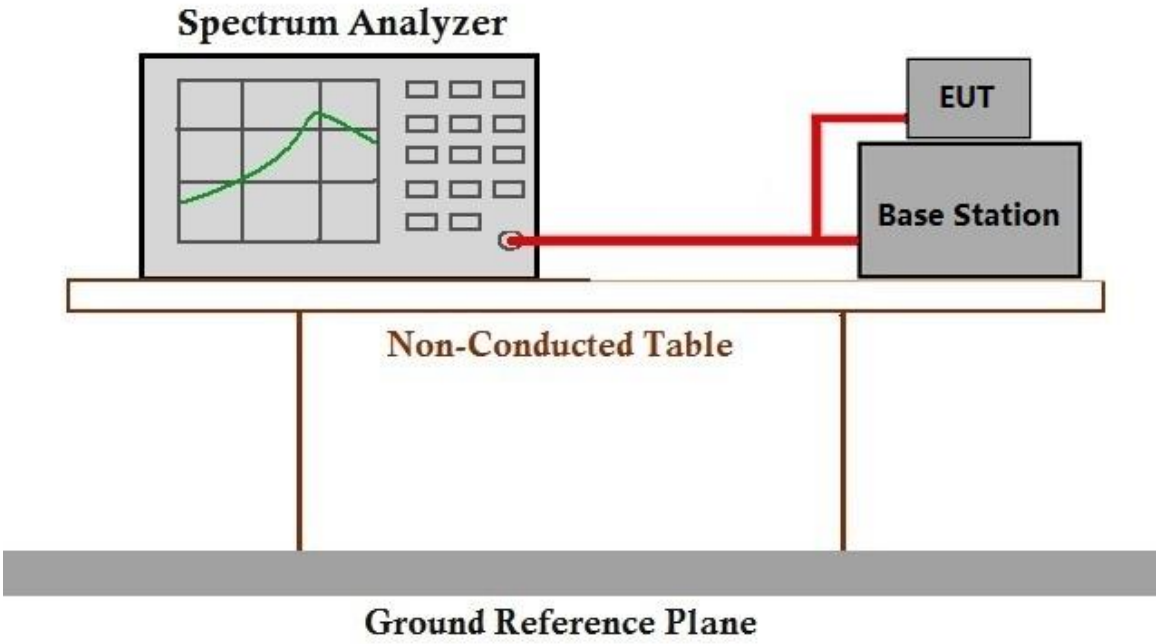
6.6 Frequency stability

Test Requirement: §2.1055, §25.202 (d)
Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01
Limit: Within 0.001 percent of the reference frequency

6.6.1 E.U.T. Operation

Operating Environment:
Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar
Test mode : Test mode1

6.6.2 Test Setup Diagram



6.6.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

6.7 Additional unwanted emission limits for MESs

Test Requirement: §25.216(c)(e)(h)(i)

Test Method: ANSI C63.26-2015, KDB 971168 D01 v03r01

Limit: The e.i.r.p. density of emissions from mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz shall not exceed −70 dBW/MHz, averaged over any 2 millisecond active transmission interval, in the band 1559-1605 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed −80 dBW, averaged over any 2 millisecond active transmission interval, in the 1559-1605 MHz band.

The e.i.r.p density of emissions from mobile earth stations with assigned uplink frequencies between 1990 MHz and 2025 MHz shall not exceed −70 dBW/MHz, averaged over any 2 millisecond active transmission interval, in frequencies between 1559 MHz and 1610 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations between 1559 MHz and 1605 MHz shall not exceed −80 dBW, averaged over any 2 millisecond active transmission interval. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations between 1605 MHz and 1610 MHz manufactured more than six months after Federal Register publication of the rule changes adopted in FCC 03-283 shall not exceed −80 dBW, averaged over any 2 millisecond active transmission interval.

Mobile earth stations manufactured more than six months after Federal Register publication of the rule changes adopted in FCC 03-283 with assigned uplink frequencies in the 1626.5-1660.5 MHz band shall suppress the power density of emissions in the 1605-1610 MHz band-segment to an extent determined by linear interpolation from −70 dBW/MHz at 1605 MHz to −46 dBW/MHz at 1610 MHz, averaged over any 2 millisecond active transmission interval. The e.i.r.p of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed a level determined by linear interpolation from −80 dBW at 1605 MHz to −56 dBW at 1610 MHz, averaged over any 2 millisecond active transmission interval.

The e.i.r.p density of carrier-off state emissions from mobile earth stations manufactured more than six months after Federal Register publication of the rule changes adopted in FCC 03-283 with assigned uplink frequencies between 1 and 3 GHz shall not exceed −80 dBW/MHz in the 1559-1610 MHz band averaged over any two millisecond interval.

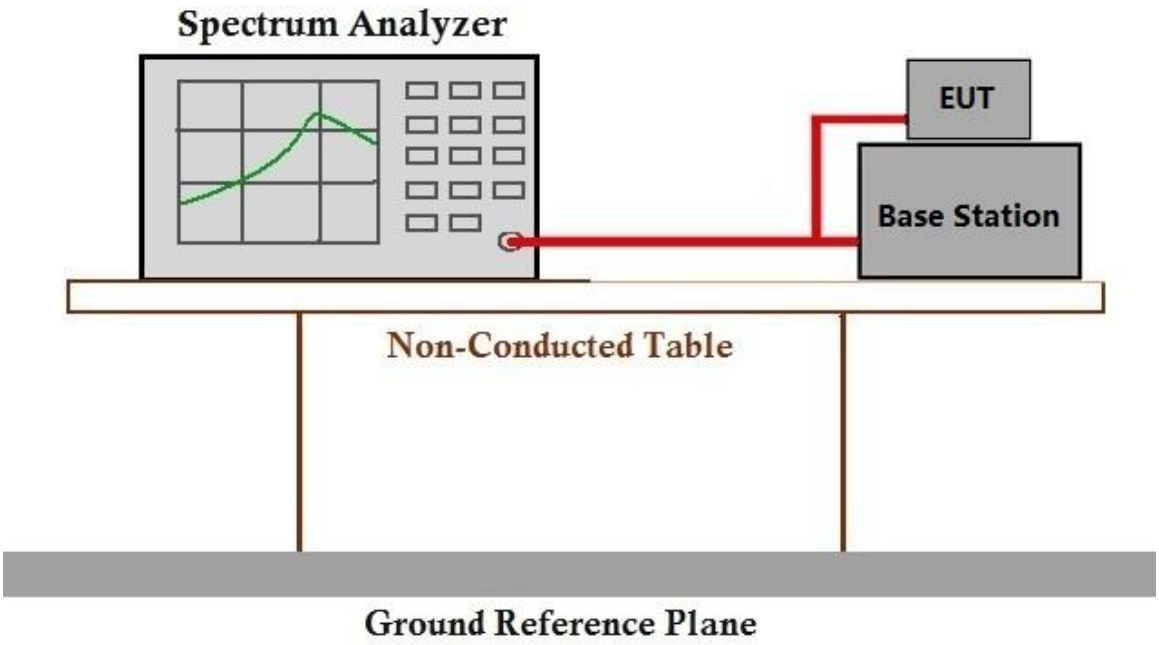
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C Humidity: 54.6 % RH Atmospheric Pressure: 1020 mbar

Test mode : Test mode1

6.7.2 Test Setup Diagram



6.7.3 Measurement Data

Please refer to Appendix for NTN test data(Band 255)

7 Test Setup Photo

Please refer to Appendix A.1 - NTN Setup Photos

8 EUT Constructional Details (EUT Photos)

Refer to Appendix – External Photos and Internal Photos

- End of the Report -

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