

TEST REPORT

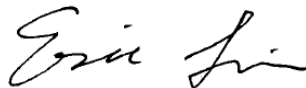
Application No.: KSCR2208001499AT
Applicant: Quectel Wireless Solutions Co., Ltd.
Address of Applicant: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer: Quectel Wireless Solutions Co., Ltd.
Address of Manufacturer: Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Equipment Under Test (EUT):

EUT Name: LTE-A Cat 6 LGA Module
Model No.: EG060K-GT
Trade Mark: Quectel
FCC ID: XMR2022EG060KGT
Standard(s) : 47 CFR Part 2
47 CFR Part 96 subpart E
Date of Receipt: 2022-08-24
Date of Test: 2022-08-24 to 2022-09-07
Date of Issue: 2022-09-08

Test Result:	Pass
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* In the configuration tested, the EUT complied with the standards specified above.



Eric Lin
Laboratory Manager


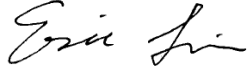


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Revision Record			
Version	Description	Date	Remark
00	Original	2022-09-08	/

Authorized for issue by:			
		 <hr/> Pawn.Liu/Project Engineer	
		 <hr/> Eric Lin /Reviewer	



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2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Output Power Data	§2.1046 §96.41(b)	EIRP ≤ 23dBm/10MHz	PASS
Peak-Average Ratio	§96.41(g)	≤13dB	PASS
Modulation Characteristics	§2.1047	Digital modulation	PASS
Bandwidth	§2.1049(h)	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§96.41(e)	Refer to clause 6.4	PASS
Spurious emissions at antenna terminals	§96.41(e)	Refer to clause 6.5	PASS
Field strength of spurious radiation	§2.1051 §96.41(e)	Refer to clause 6.6	PASS
Frequency stability	§2.1055	≤ ±2.5ppm.	PASS



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Compliance Certification Services (Kunshan) Inc.

Report No.: KSCR220800149901

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC3.8V
Hardware Version:	R1.0
Software Version:	EG060KGTAAR01A03M4G
Operation Frequency Band:	LTE: Band 48
Modulation Type:	LTE: QPSK, 16QAM
LTE Power Class:	Level 3
Antenna Type:	External Antenna
Antenna Gain:	-1.36dBi

4.2 Test Frequency

Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 48	5	3552.5	3625.0	3697.5
	10	3555.0	3625.0	3695.0
	15	3557.5	3625.0	3692.5
	20	3560.0	3625.0	3690.0



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4.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1015Pa	
Temperature:	TL	-30°C
	TN	+20°C
	TH	+75°C
Voltage:	VL	3.3 V
	VN	3.8 V
	VH	4.3 V

NOTE: VL= lower extreme test voltage
 VN= nominal voltage
 VH= upper extreme test voltage
 TL= lower extreme test temperature
 TN= normal temperature
 TH= upper extreme test temperature

4.4 Description of Support Units

The EUT has been tested independent unit.

4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 5.4 \times 10^{-8}$
2	Duty cycle	$\pm 0.3\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.8\text{dB}$
5	RF power density	$\pm 0.4\text{dB}$
6	Conducted Spurious emissions	$\pm 2.7\text{dB}$
7	Radiated Spurious emission test	$\pm 3.1\text{dB}$ (Below 1GHz)
		$\pm 4.4\text{dB}$ (Above 1GHz)
8	Temperature test	$\pm 1^\circ\text{C}$
9	Humidity test	$\pm 3\%$
10	Supply voltages	$\pm 1.5\%$
11	Time	$\pm 3\%$



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Report No.: KSCR220800149901

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4.6 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

- 1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
- 2.SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).

4.7 Test Facility

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

• CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

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

Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.8 Deviation from Standards

None



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Report No.: KSCR220800149901

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4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	10/11/2021	10/10/2022
2	Spectrum Analyzer	R&S	FSV40	KUS1806E003	10/11/2021	10/10/2022
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/22/2022	01/21/2023
4	Signal Generator	R&S	SMW200A	KSEM020-1	10/12/2021	10/11/2022
5	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/27/2021 08/26/2022	08/26/2022 08/25/2023
6	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	09/23/2021	09/22/2022
7	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	04/01/2022	03/31/2023
8	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	10/12/2021	10/11/2022
9	Switcher	CCSRF	FY562	KUS2001M001-3	10/12/2021	10/11/2022
10	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
11	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111- CZ301120	01/16/2022	01/15/2023
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	04/01/2021	03/31/2023
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	04/01/2021	03/31/2023
15	Software	BST	TST-PASS	/	N/A	N/A
RF Radiated Test						
1	Spectrum Analyzer	R&S	FSV40	KUS1806E003	10/11/2021	10/10/2022
2	Universal Radio Communication Tester	R&S	CMW500	KSEM009-1	04/01/2022	03/31/2023
3	Signal Generator	Agilent	E8257C	KS301066	10/18/2021	10/17/2022
4	Loop Antenna	COM-POWER	AL-130R	KUS1806E001	04/13/2021	04/12/2023
5	Bilog Antenna	TESEQ	CBL 6112D	KUS1806E005	06/29/2021	06/28/2023
6	Bilog Antenna	SCHWARZBECK	VULB9160	CZ301016	04/13/2021	04/12/2024
7	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	KS301079	10/26/2020	10/25/2022
8	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	KS301186	02/22/2021	02/21/2023
9	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	CZ301058	03/22/2022	03/21/2023
10	Amplifier(30MHz~18GHz)	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-1	01/22/2022	01/21/2023
11	Amplifier(18~40GHz)	COM-POWER	PAM-840A	KUS1710E001	01/22/2022	01/21/2023
12	RE Test Cable	REBES MICROWAVE	/	CZ301097	11/14/2021	11/13/2022
13	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	09/23/2021	09/22/2022
14	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	04/01/2022	03/31/2023
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-4	01/04/2022	31/03/2023
16	Software	Faratron	EZ_EMCC-v 3A1	/	N/A	N/A



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6 Radio Spectrum Matter Test Results

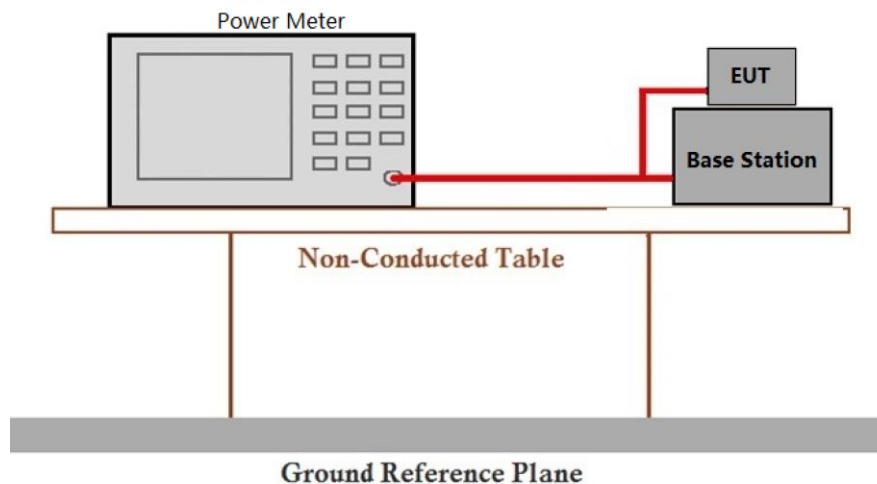
6.1 Effective (Isotropic) Radiated Output Power Data

Test Requirement: §2.1046; §96.41(b)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: EIRP ≤ 23dBm/10MHz

6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
Test mode Tx mode, Keep the EUT in transmitting mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

Please refer to Appendix for LTE test data.



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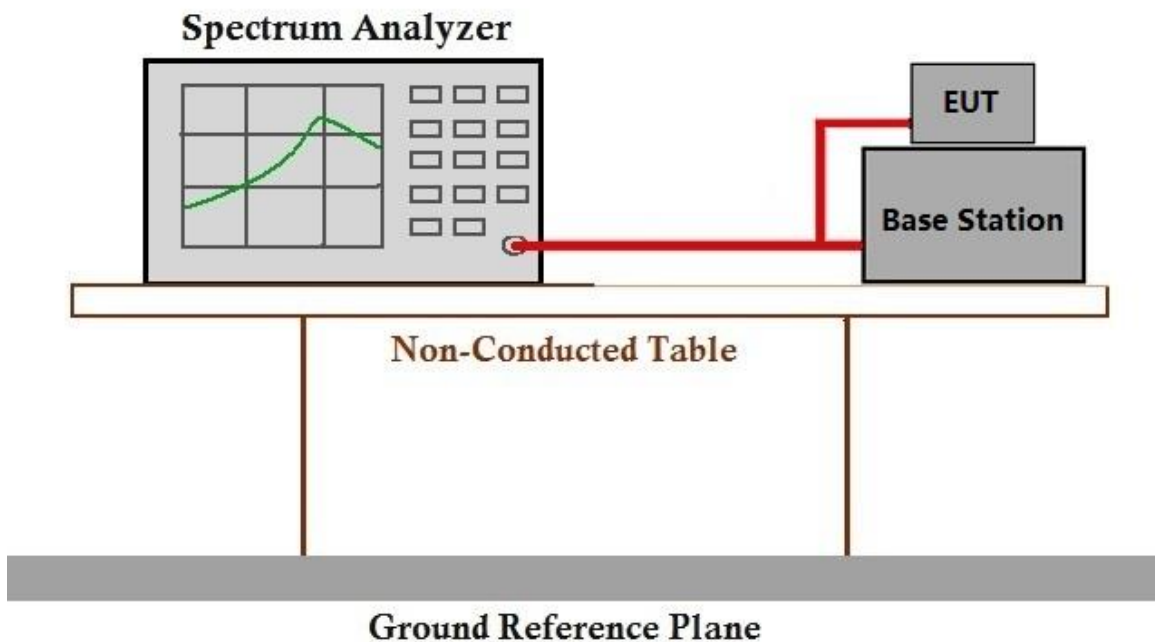
6.2 Peak-Average Ratio

Test Requirement: §96.41(g)
 Test Method: ANSI C63.26, KDB 971168 D01 v03
 Limit: ≤13dB

6.2.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
 Test mode Tx mode, Keep the EUT in transmitting mode.

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

Please refer to Appendix for LTE test data.



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6.3 Bandwidth

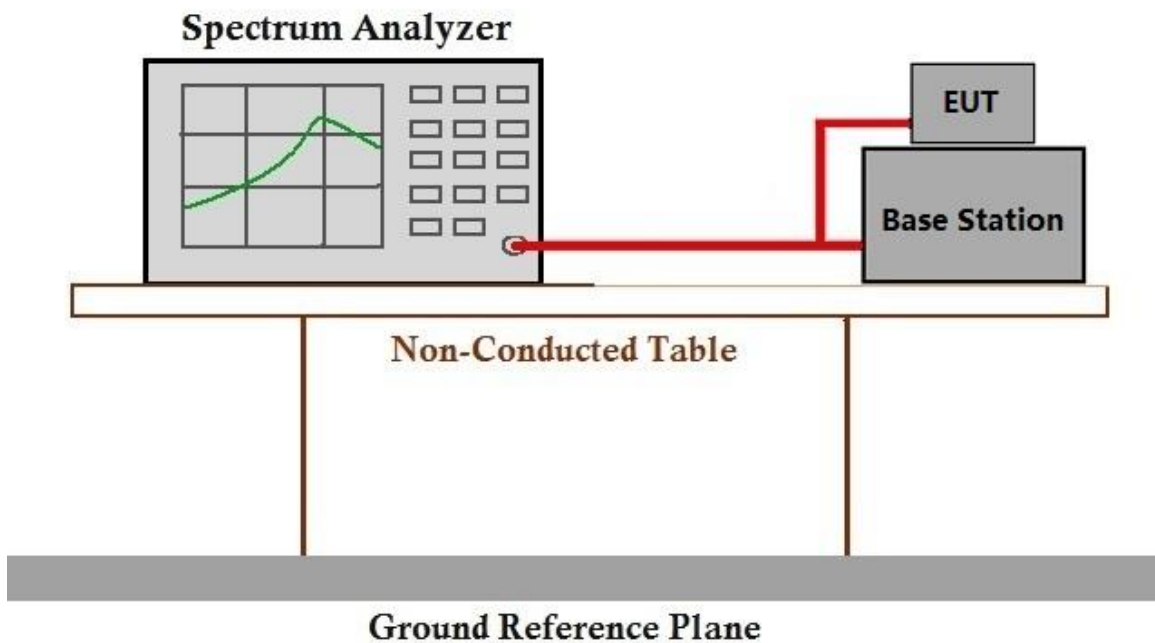
Test Requirement: §2.1049(h)
 Test Method: ANSI C63.26, KDB 971168 D01 v03
 Limit: OBW: No limit
 EBW: No limit

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
 Test mode Tx mode, Keep the EUT in transmitting mode.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

Please refer to Appendix for LTE test data.



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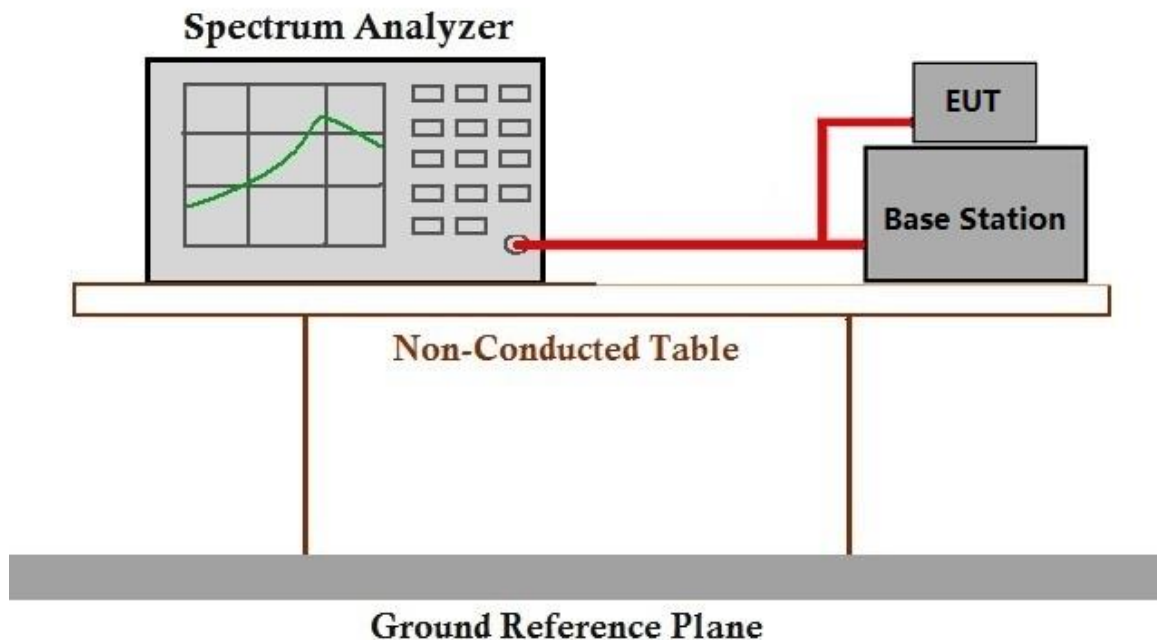
6.4 Band Edge Compliance

Test Requirement: §2.1051, §96.41(e)
 Test Method: ANSI C63.26, KDB 971168 D01 v03
 Limit: Emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz)
 At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz
 Emissions below 3530MHz or above 3720 MHz shall not exceed -40dBm/MHz

6.4.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
 Test mode Tx mode, Keep the EUT in transmitting mode.

6.4.2 Test Setup Diagram



6.4.3 Measurement Data

Please refer to Appendix for LTE test data.



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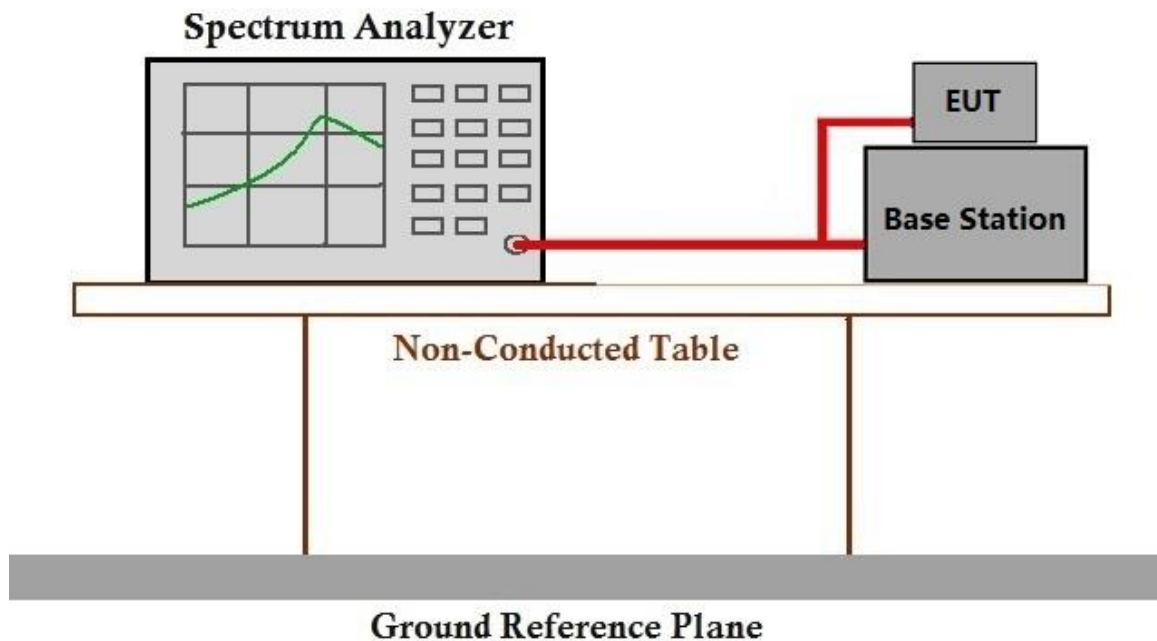
6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §96.41(e)
 Test Method: ANSI C63.26, KDB 971168 D01 v03
 Limit: Emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz)
 At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz
 Emissions below 3530MHz or above 3720 MHz shall not exceed -40dBm/MHz

6.5.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
 Test mode 30: Tx mode, Keep the EUT in transmitting mode.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

Please refer to Appendix for LTE test data.



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6.6 Field strength of spurious radiation

Test Requirement: §2.1051, §96.41(e)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: Emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz)
At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz
Emissions below 3530MHz or above 3720 MHz shall not exceed -40dBm/MHz

6.6.1 E.U.T. Operation

Operating Environment:
Temperature: 18.5 °C Humidity: 39.5 % RH Atmospheric Pressure: 1020 mbar
Test mode Tx mode, Keep the EUT in transmitting mode.



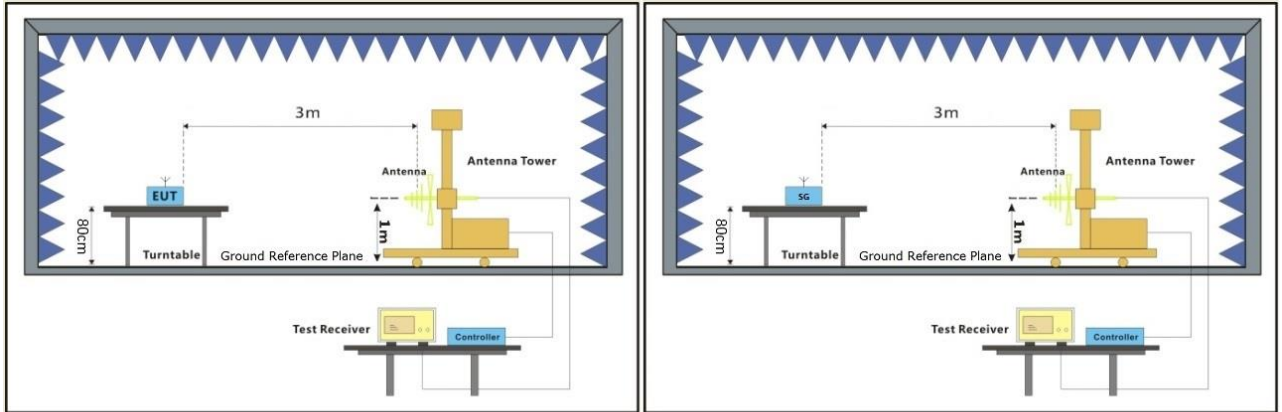
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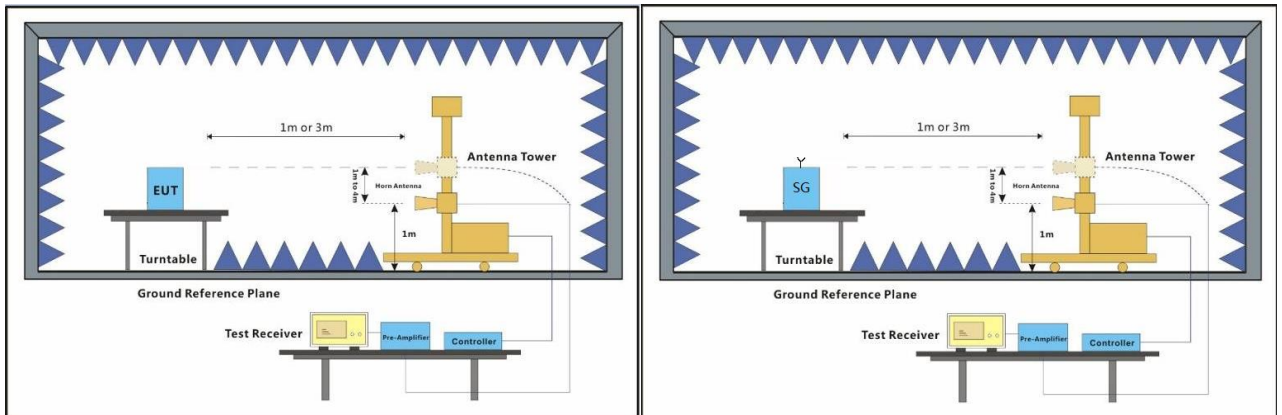
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6.6.2 Test Setup Diagram



EUT

Substiute Antenna+Signal Generator



EUT

Substiute Antenna+Signal Generator



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6.6.3 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 then 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.



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LTE Band 48_ Low Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6031.1667	52.75	-42.66	34.26	-50.90	-40.00	10.90	142	264	Horizontal
7102.18	49.69	-42.23	36.26	-51.53	-40.00	11.53	265	15	Horizontal
9142.6667	49.61	-38.50	38.59	-45.56	-40.00	5.56	281	152	Horizontal
10653.27	45.44	-36.02	39.22	-46.62	-40.00	6.62	175	307	Horizontal
14204.36	43.73	-34.88	40.00	-46.41	-40.00	6.41	263	297	Horizontal
17755.45	41.51	-30.95	41.62	-43.08	-40.00	3.08	229	204	Horizontal

LTE Band 48_ Low Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6195.6667	52.76	-42.17	34.59	-50.08	-40.00	10.08	168	42	Vertical
7102.18	49.84	-42.23	36.26	-51.38	-40.00	11.38	241	31	Vertical
9280.3333	49.64	-38.36	38.57	-45.40	-40.00	5.40	175	298	Vertical
10653.27	44.39	-36.02	39.22	-47.67	-40.00	7.67	268	72	Vertical
14204.36	43.58	-34.88	40.00	-46.56	-40.00	6.56	204	237	Vertical
17755.45	40.45	-30.95	41.62	-44.14	-40.00	4.14	196	42	Vertical

LTE Band 48_ Mid Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6503.6667	52.68	-42.59	35.21	-49.96	-40.00	9.96	265	347	Horizontal
7232.18	50.25	-42.00	36.34	-50.67	-40.00	10.67	241	43	Horizontal
9208	49.37	-38.23	38.58	-45.54	-40.00	5.54	178	104	Horizontal
10848.27	43.01	-35.61	39.43	-48.43	-40.00	8.43	263	0	Horizontal
13079	46.14	-34.67	39.65	-44.15	-40.00	4.15	201	267	Horizontal
14464.36	43.48	-35.01	39.74	-47.06	-40.00	7.06	195	14	Horizontal



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LTE Band 48_ Mid Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6375.3333	52.46	-42.33	34.95	-50.18	-40.00	10.18	241	124	Vertical
7232.18	54.41	-42.00	36.34	-46.51	-40.00	6.51	185	63	Vertical
9335.1667	50.11	-38.13	38.57	-44.71	-40.00	4.71	263	134	Vertical
10848.27	44.50	-35.61	39.43	-46.94	-40.00	6.94	295	82	Vertical
13618	46.26	-34.50	39.97	-43.53	-40.00	3.53	163	22	Vertical
14464.36	42.71	-35.01	39.74	-47.83	-40.00	7.83	214	236	Vertical

LTE Band 48_ High Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6398.6667	53.58	-42.29	35.00	-48.97	-40.00	8.97	142	6	Horizontal
7362.18	49.75	-41.89	36.42	-50.98	-40.00	10.98	265	31	Horizontal
9316.5	48.98	-38.27	38.57	-45.98	-40.00	5.98	185	237	Horizontal
11043.27	43.30	-35.46	39.56	-47.86	-40.00	7.86	164	144	Horizontal
13665.8333	45.80	-34.73	40.00	-44.19	-40.00	4.19	196	13	Horizontal
14724.36	41.57	-34.33	39.47	-48.54	-40.00	8.54	201	3	Horizontal

LTE Band 48_ High Channel									
Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF[dB/m]	Level [dBm]	Limit [dBm]	Margin [dB]	Height [cm]	Angle [°]	Polarity
6397.5	53.10	-42.29	35.00	-49.46	-40.00	9.46	186	226	Vertical
7362.18	52.24	-41.89	36.42	-48.49	-40.00	8.49	265	276	Vertical
9266.3333	49.38	-38.33	38.57	-45.64	-40.00	5.64	214	0	Vertical
11043.1667	47.16	-35.46	39.56	-44.00	-40.00	4.00	175	327	Vertical
13588.8333	45.94	-34.36	39.95	-43.73	-40.00	3.73	286	32	Vertical
14724.36	41.51	-34.33	39.47	-48.60	-40.00	8.60	204	347	Vertical

Remark:

1) Pretest was performed at the EUT in required band,channel,modulation,bandwidth, and only the data of the worst case showed in the test report.



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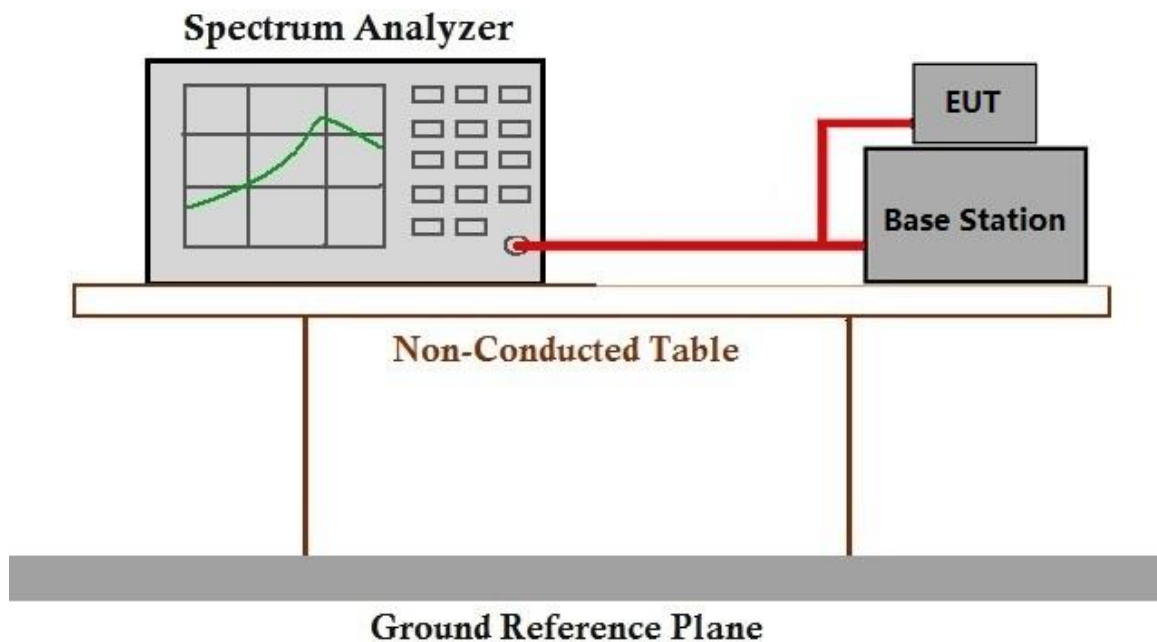
6.7 Frequency stability

Test Requirement: §2.1055
 Test Method: ANSI C63.26, KDB 971168 D01 v03
 Limit: $\leq \pm 2.5\text{ppm}$.

6.7.1 E.U.T. Operation

Operating Environment:
 Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
 Test mode 30: Tx mode, Keep the EUT in transmitting mode.

6.7.2 Test Setup Diagram



6.7.3 Measurement Data

Please refer to Appendix for LTE test data.



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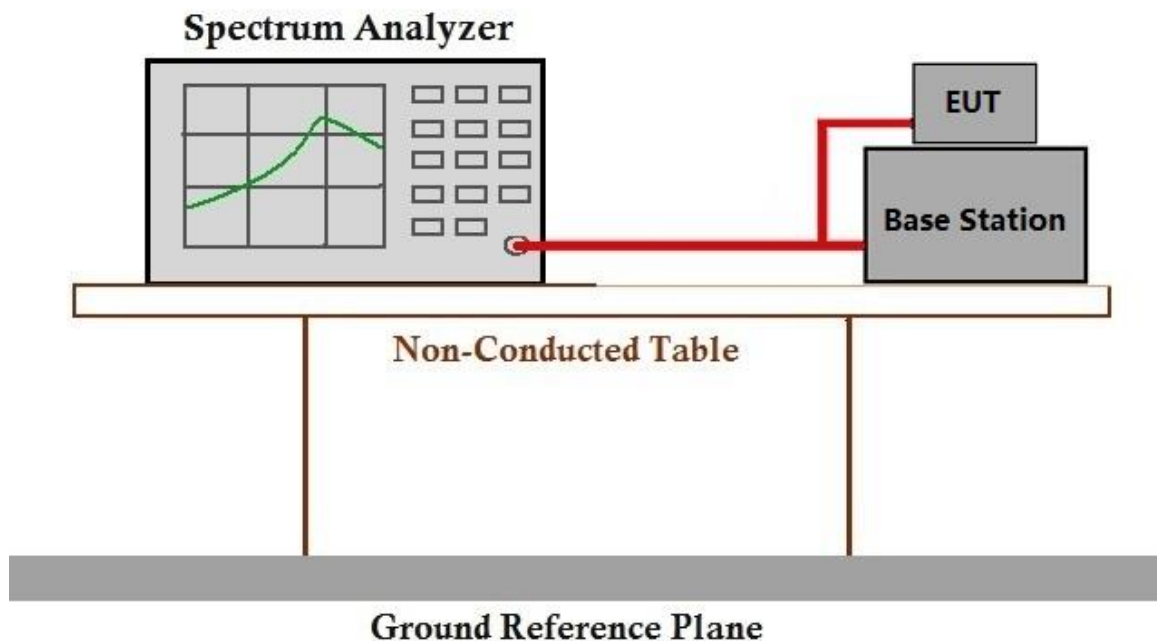
6.8 Modulation Characteristics

Test Requirement: §2.1047
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: Digital modulation

6.8.1 E.U.T. Operation

Operating Environment:
Temperature: 21.5 °C Humidity: 53.5 % RH Atmospheric Pressure: 1020 mbar
Test mode 30: Tx mode, Keep the EUT in transmitting mode.

6.8.2 Test Setup Diagram



6.8.3 Measurement Data

Please refer to Appendix for LTE test data.

- End of the Report -



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