



TEST REPORT

Application No.: SZEM2101001002CR
Applicant: Hallofo BV
Address of Applicant: Korianderlaan 38, Amstelveen, 1187EE Netherlands.
Manufacturer: Hallofo BV
Address of Manufacturer: Korianderlaan 38, Amstelveen, 1187EE Netherlands.
Factory: Audo(Xiamen) Technology Co., Ltd
Address of factory: 4th Floor, 5th floor workshop, No.6 South Yanguang Road, Xinyang Street, Haicang District, Xiamen city

Equipment Under Test (EUT):
EUT Name: Rebel Cactus smart watch
Model No.: Rebel Cactus play -1
Trade Mark: Rebel Cactus
FCC ID: 2AY4Y-PLAY001A
Standard(s) : 47 CFR Part 2
47 CFR Part 22 subpart H
47 CFR Part 24 subpart E
47 CFR Part 27 subpart C

Date of Receipt: 2021-01-25
Date of Test: 2021-01-26 to 2021-02-02
Date of Issue: 2021-03-15

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

Keny Xu

Keny Xu
EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-03-15		Original

Authorized for issue by:				
		Edison Li		
		Edison Li/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Power Output Data	§2.1046 §22.913 §24.232 §27.50(c) §27.50(d) §27.50(h)	ERP≤ 7W(LTE Band 5) EIRP≤ 2W(LTE Band 2) ERP≤ 3W(LTE Band 12) EIRP≤ 1W(LTE Band 4) EIRP≤ 2W(LTE Band 7)	PASS
Peak-Average Ratio	§22.913 §24.232 §27.50(d)	≤13dB	PASS
Modulation Characteristics	§2.1047	Digital modulation	PASS
Bandwidth	§2.1049(h)	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051 §22.917 §24.238 §27.53(g) §27.53(h) §27.53(m)	≤ -13dBm (LTE Band5) ≤ -13dBm (LTE Band2) ≤ -13dBm (LTE Band12) ≤ -13dBm (LTE Band4) ≤ -25dBm(LTE Band7)	PASS
Spurious emissions at antenna terminals	§2.1051 §22.917 §24.238 §27.53(g) §27.53(h) §27.53(m)	≤ -13dBm(LTE Band5) ≤ -13dBm(LTE Band2) ≤ -13dBm(LTE Band12) ≤ -13dBm(LTE Band4) ≤ -25dBm(LTE Band7)	PASS
Field strength of spurious radiation	§2.1051 §22.917 §24.238 §27.53(g) §27.53(h) §27.53(m)	≤ -13dBm(LTE Band5) ≤ -13dBm(LTE Band2) ≤ -13dBm(LTE Band12) ≤ -13dBm(LTE Band4) ≤ -25dBm(LTE Band7)	PASS
Frequency stability	§2.1055 §22.355 §24.235 §27.54	≤ ±2.5ppm	PASS



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.8V 650mAh rechargeable battery which charged by USB port
Cable(s):	DC cable:98cm unshielded
LTE Operation Frequency Band:	LTE FDD Band 2, 4, 5, 7, 12
Modulation Type:	QPSK, 16QAM
LTE Power Class:	Level 3
Antenna Type:	Integral
Antenna Gain:	LTE band 2: 0.8dBi; band 4: 0.8dBi; band 5: 0.3dBi; band 7: 1.2dBi; band 12: 0.3dBi;
Extreme temp. Tolerance:	-30°C to +50°C
Extreme vol. Limits:	3.4VDC to 4.35VDC (nominal: 3.8VDC)



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4.2 Test Frequency

Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 2	1.4	1850.7	1880	1909.3
	3	1851.5	1880	1908.5
	5	1852.5	1880	1907.5
	10	1855.0	1880	1905.0
	15	1857.5	1880	1902.5
	20	1860.0	1880	1900.0
Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 4	1.4	1710.7	1732.5	1754.3
	3	1711.5	1732.5	1753.5
	5	1712.5	1732.5	1752.5
	10	1715.0	1732.5	1750.0
	15	1717.5	1732.5	1747.5
	20	1720.0	1732.5	1745.0
Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829.0	836.5	844.0
Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 7	5	2502.5	2535.0	2567.5
	10	2505.0	2535.0	2565.0
	15	2507.5	2535.0	2562.5
	20	2510.0	2535.0	2560.0



Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704.0	707.5	711.0



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4.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1015Pa	
Temperature:	TN	20 °C
Voltage:	VL	3.4 V
	VN	3.8 V
	VH	4.35 V

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

4.4 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Provided by SGS	A1357 W010A051	REF. No.SEA0500

4.5 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Temperature test	1°C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



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4.6 Test Location

All tests were performed at:

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No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 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. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



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5 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
DC Power Supply	ZhaoXin	PS-3005D	SEM011-05	2020-09-23	2021-09-22
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2020-04-11	2021-04-10
Signal Analyzer (10Hz-40GHz)	Rohde & Schwarz	FSV40	SEM008-04	2020-03-31	2021-03-30
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.6	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2020-07-10	2021-07-09
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-03-31	2021-03-30
Power Sensor	KEYSIGHT	U2021XA	SEM009-13	2020-04-11	2021-04-10

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Shielding Room	SAEMC	MSR733	SEM001-09	2019-06-13	2022-06-12
DC Power Supply	Rohde & Schwarz	NGSM 32/10	SEM011-04	2020-03-24	2021-03-23
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2020-04-01	2021-03-31
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2020-09-23	2021-09-22
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2020-07-10	2021-07-09
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2020-05-21	2021-05-20
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-03-31	2021-03-30
Substitution Antenna	ETS-Lindgren	3142C	SEM003-01	2020-06-26	2023-06-25
Signal Generator	R&S	SMA100A	102174	2020-07-10	2021-07-09



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RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-08-04	2023-08-03
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2020-09-23	2021-09-22
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2020-06-26	2023-06-25
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2020-03-31	2021-03-30
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2020-03-31	2021-03-30
Substitution Antenna	ETS-Lindgren	3142C	SEM003-01	2020-06-26	2023-06-25
Signal Generator	R&S	SMA100A	102174	2020-07-10	2021-07-09

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06



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6 Radio Spectrum Matter Test Results

6.1 Effective (Isotropic) Radiated Power Output Data

Test Requirement: §2.1046, §22.913, §24.232, §27.50(c), §27.50(d), §27.50(h)

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit:
ERP ≤ 7W(LTE Band 5)
EIRP ≤ 2W(LTE Band 2)
ERP ≤ 3W(LTE Band 12)
EIRP ≤ 1W(LTE Band 4)
EIRP ≤ 2W(LTE Band 7)

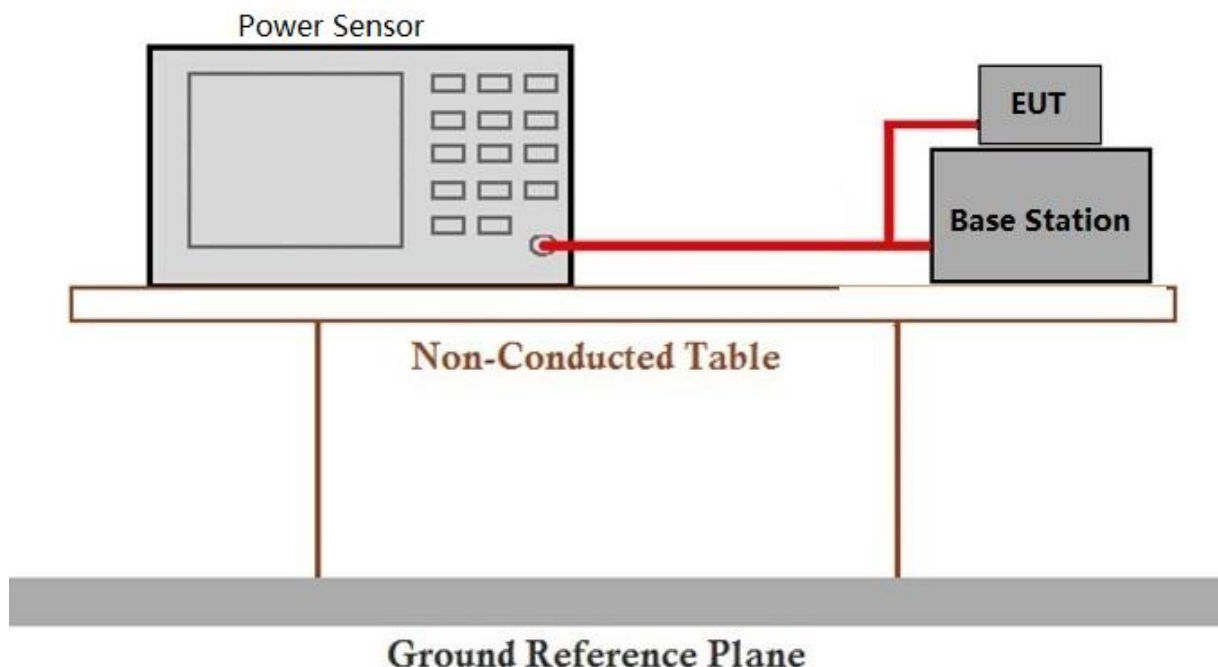
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar

Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

Please refer to Appendix C_LTE_4G_RF power



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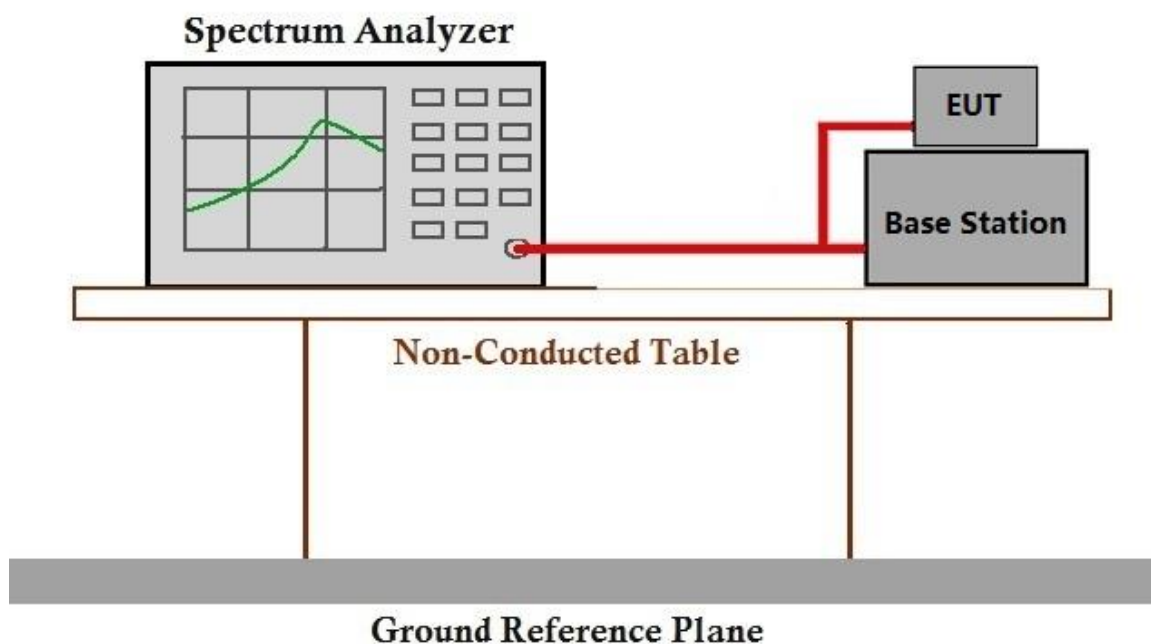
6.2 Peak-Average Ratio

Test Requirement: §22.913, §24.232, §27.50(d)
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: ≤13dB

6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar
Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

Please refer to Appendix C_LTE_4G_Peak-Average Ratio

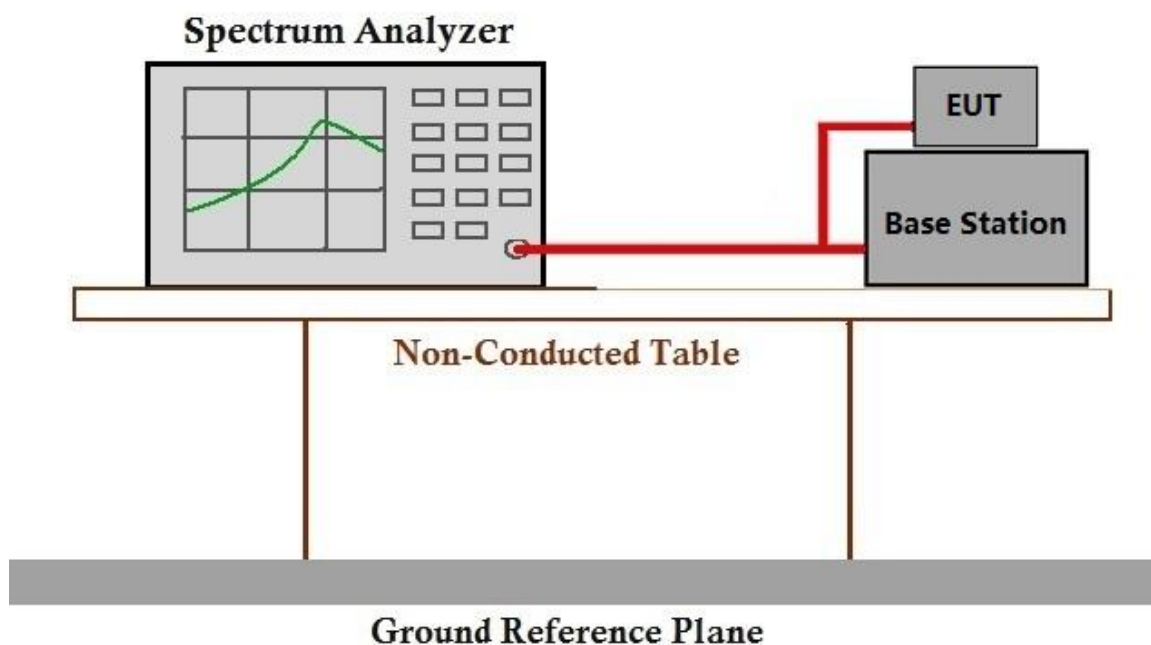
6.3 Bandwidth

Test Requirement: S2.1049(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: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar
Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.3.2 Test Setup Diagram



6.3.3 Measurement Data

Please refer to Appendix C_LTE_4G_99% & 26dB Bandwidth



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6.4 Band Edge Compliance

Test Requirement: §2.1051, §22.917, §24.238, §27.53(g), §27.53(h), §27.53(m)

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit: $\leq -13\text{dBm}$ (LTE Band2,4,5,12)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ 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. (LTE Band7).

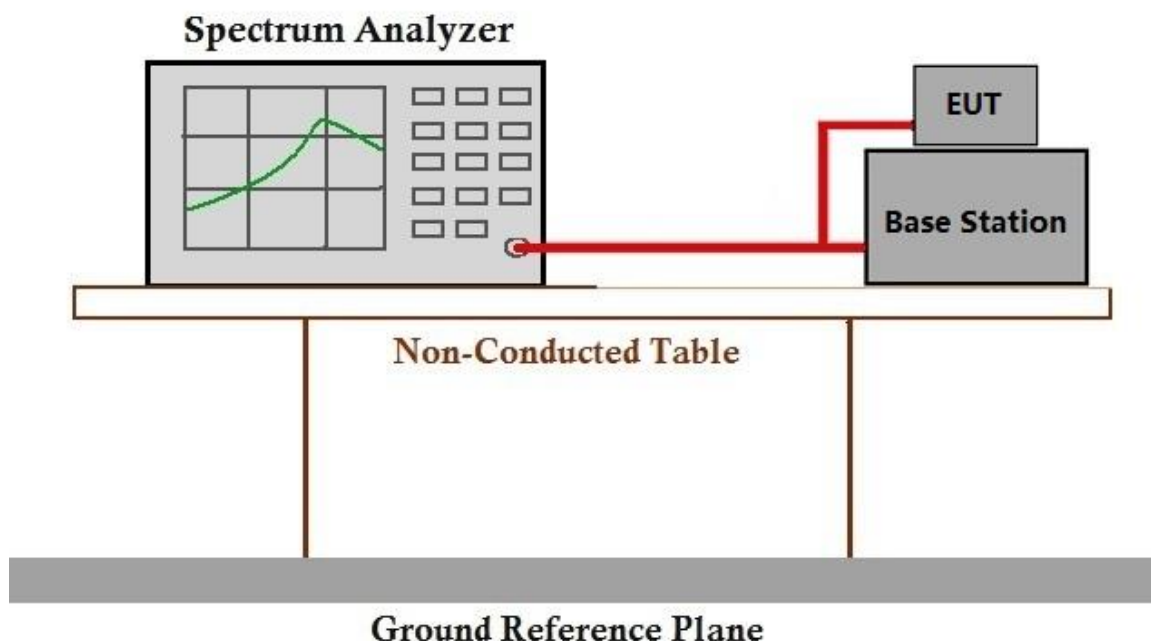
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar

Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.4.2 Test Setup Diagram



6.4.3 Measurement Data

Please refer to Appendix C_LTE_4G_Spurious Emission at antenna port



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6.5 Spurious emissions at antenna terminals

Test Requirement: §2.1051, §22.917, §24.238, §27.53(g), §27.53(h), §27.53(m)

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit:
 $\leq -13\text{dBm}$ (LTE Band5)
 $\leq -13\text{dBm}$ (LTE Band2)
 $\leq -13\text{dBm}$ (LTE Band12)
 $\leq -13\text{dBm}$ (LTE Band4)
 $\leq -25\text{dBm}$ (LTE Band7)

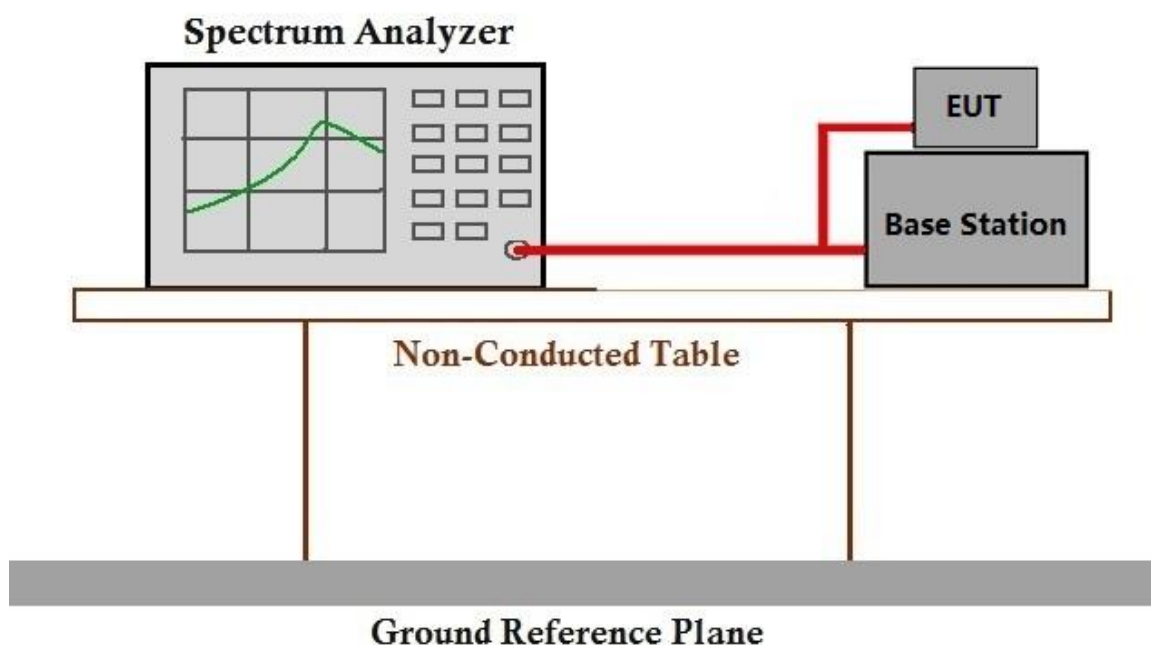
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar

Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.5.2 Test Setup Diagram



6.5.3 Measurement Data

Please refer to Appendix C_LTE_4G_Spurious Emission at antenna port



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6.6 Field strength of spurious radiation

Test Requirement: §2.1051, §22.917, §24.238, §27.53(g), §27.53(h), §27.53(m)

Test Method: ANSI C63.26, KDB 971168 D01 v03

Limit:
 $\leq -13\text{dBm}(\text{LTE Band5})$
 $\leq -13\text{dBm}(\text{LTE Band2})$
 $\leq -13\text{dBm}(\text{LTE Band12})$
 $\leq -13\text{dBm}(\text{LTE Band4})$
 $\leq -25\text{dBm}(\text{LTE Band7})$

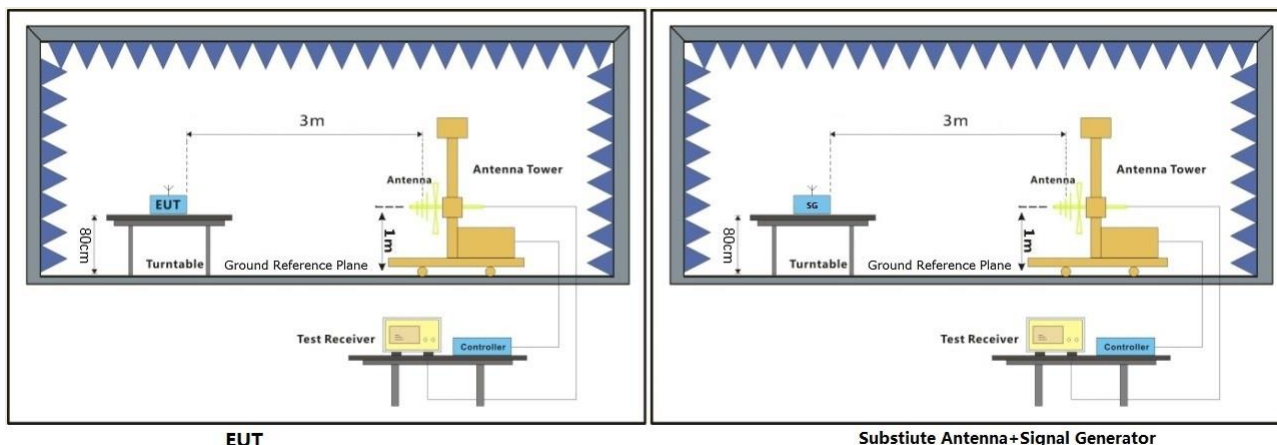
6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar

Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.6.2 Test Setup Diagram



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 2-20M Low channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3702	-32.57	-13	-19.57	-39.46	0.71	7.6	Horizontal	Pass
5553	-42.18	-13	-29.18	-51.63	0.85	10.3	Horizontal	Pass
7404	-38.66	-13	-25.66	-50.56	1	12.9	Horizontal	Pass
3702	-32.18	-13	-19.18	-39.07	0.71	7.6	Vertical	Pass
5553	-40.5	-13	-27.5	-49.95	0.85	10.3	Vertical	Pass
7404	-42.13	-13	-29.13	-54.03	1	12.9	Vertical	Pass

LTE Band 2-20M Middle channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3742	-34.62	-13	-21.62	-41.51	0.71	7.6	Horizontal	Pass
5613	-43.09	-13	-30.09	-52.54	0.85	10.3	Horizontal	Pass
7484	-41.2	-13	-28.2	-53.1	1	12.9	Horizontal	Pass
3742	-32.69	-13	-19.69	-39.58	0.71	7.6	Vertical	Pass
5613	-44.68	-13	-31.68	-54.13	0.85	10.3	Vertical	Pass
7484	-41.85	-13	-28.85	-53.75	1	12.9	Vertical	Pass

LTE Band 2-20M High channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3782	-33.72	-13	-20.72	-40.61	0.71	7.6	Horizontal	Pass
5673	-43.99	-13	-30.99	-53.44	0.85	10.3	Horizontal	Pass
7564	-42.65	-13	-29.65	-54.86	0.99	13.2	Horizontal	Pass
3782	-33.13	-13	-20.13	-40.02	0.71	7.6	Vertical	Pass
5673	-42.04	-13	-29.04	-51.49	0.85	10.3	Vertical	Pass
7564	-40.79	-13	-27.79	-53	0.99	13.2	Vertical	Pass



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LTE Band 4-20M Low channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3422	-34.91	-13	-21.91	-40.46	0.65	6.2	Horizontal	Pass
5133	-45.06	-13	-32.06	-53.84	0.82	9.6	Horizontal	Pass
6844	-44.39	-13	-31.39	-55.24	0.95	11.8	Horizontal	Pass
3422	-34.77	-13	-21.77	-40.32	0.65	6.2	Vertical	Pass
5133	-45.78	-13	-32.78	-54.56	0.82	9.6	Vertical	Pass
6844	-43.74	-13	-30.74	-54.59	0.95	11.8	Vertical	Pass

LTE Band 4-20M Middle channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3447	-35.94	-13	-22.94	-41.49	0.65	6.2	Horizontal	Pass
5170.5	-45.79	-13	-32.79	-54.57	0.82	9.6	Horizontal	Pass
6894	-44.69	-13	-31.69	-55.54	0.95	11.8	Horizontal	Pass
3447	-36.48	-13	-23.48	-42.03	0.65	6.2	Vertical	Pass
5170.5	-43.97	-13	-30.97	-52.75	0.82	9.6	Vertical	Pass
6894	-42.1	-13	-29.1	-52.95	0.95	11.8	Vertical	Pass

LTE Band 4-20M High channel, Modulation: QPSK, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-35.99	-13	-22.99	-41.54	0.65	6.2	Horizontal	Pass
5208	-45.2	-13	-32.2	-53.98	0.82	9.6	Horizontal	Pass
6944	-41	-13	-28	-51.85	0.95	11.8	Horizontal	Pass
3472	-32.99	-13	-19.99	-38.54	0.65	6.2	Vertical	Pass
5208	-44.64	-13	-31.64	-53.42	0.82	9.6	Vertical	Pass
6944	-41.76	-13	-28.76	-52.61	0.95	11.8	Vertical	Pass



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FDD LTE Band 5-Low channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1649	-48.84	-13	-35.84	-54.32	0.52	6	Horizontal	Pass
2473.5	-47.01	-13	-34.01	-52.28	0.53	5.8	Horizontal	Pass
3298	-41.86	-13	-28.86	-47.41	0.65	6.2	Horizontal	Pass
1649	-46.59	-13	-33.59	-52.07	0.52	6	Vertical	Pass
2473.5	-45.35	-13	-32.35	-50.62	0.53	5.8	Vertical	Pass
3298	-43.21	-13	-30.21	-48.76	0.65	6.2	Vertical	Pass

FDD LTE Band 5-Middle channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1664	-47.04	-13	-34.04	-52.52	0.52	6	Horizontal	Pass
2496	-45.75	-13	-32.75	-51.02	0.53	5.8	Horizontal	Pass
3328	-42.6	-13	-29.6	-48.15	0.65	6.2	Horizontal	Pass
1664	-47.22	-13	-34.22	-52.7	0.52	6	Vertical	Pass
2496	-47.38	-13	-34.38	-52.65	0.53	5.8	Vertical	Pass
3328	-40.52	-13	-27.52	-46.07	0.65	6.2	Vertical	Pass

FDD LTE Band 5-High channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1679	-49.18	-13	-36.18	-54.66	0.52	6	Horizontal	Pass
2518.5	-46.83	-13	-33.83	-51.54	0.59	5.3	Horizontal	Pass
3358	-42.53	-13	-29.53	-48.08	0.65	6.2	Horizontal	Pass
1679	-48.59	-13	-35.59	-54.07	0.52	6	Vertical	Pass
2518.5	-46.01	-13	-33.01	-50.72	0.59	5.3	Vertical	Pass
3358	-44.91	-13	-31.91	-50.46	0.65	6.2	Vertical	Pass



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FDD LTE Band 7-Low channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5002	-49.84	-25	-24.84	-58.62	0.82	9.6	Horizontal	Pass
7503	-47.41	-25	-22.41	-59.62	0.99	13.2	Horizontal	Pass
10004	-44.62	-25	-19.62	-56.06	1.26	12.7	Horizontal	Pass
5002	-48.68	-25	-23.68	-57.46	0.82	9.6	Vertical	Pass
7503	-46.98	-25	-21.98	-59.19	0.99	13.2	Vertical	Pass
10004	-43.58	-25	-18.58	-55.02	1.26	12.7	Vertical	Pass

FDD LTE Band 7-Middle channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5052	-48.37	-25	-23.37	-57.15	0.82	9.6	Horizontal	Pass
7578	-47.55	-25	-22.55	-59.76	0.99	13.2	Horizontal	Pass
10104	-43.8	-25	-18.8	-55.24	1.26	12.7	Horizontal	Pass
5052	-49.25	-25	-24.25	-58.03	0.82	9.6	Vertical	Pass
7578	-47.6	-25	-22.6	-59.81	0.99	13.2	Vertical	Pass
10104	-44.3	-25	-19.3	-55.74	1.26	12.7	Vertical	Pass

FDD LTE Band 7-High channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5102	-49.83	-25	-24.83	-58.61	0.82	9.6	Horizontal	Pass
7653	-46.1	-25	-21.1	-58.31	0.99	13.2	Horizontal	Pass
10204	-44.04	-25	-19.04	-55.48	1.26	12.7	Horizontal	Pass
5102	-50.5	-25	-25.5	-59.28	0.82	9.6	Vertical	Pass
7653	-46.24	-25	-21.24	-58.45	0.99	13.2	Vertical	Pass
10204	-44.21	-25	-19.21	-55.65	1.26	12.7	Vertical	Pass



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FDD LTE Band 12-Low channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1399	-48.43	-13	-35.43	-49.9	0.43	1.9	Horizontal	Pass
2098.5	-52.85	-13	-39.85	-58.12	0.53	5.8	Horizontal	Pass
2798	-48.8	-13	-35.8	-53.51	0.59	5.3	Horizontal	Pass
1399	-49.38	-13	-36.38	-50.85	0.43	1.9	Vertical	Pass
2098.5	-53.13	-13	-40.13	-58.4	0.53	5.8	Vertical	Pass
2798	-48.42	-13	-35.42	-53.13	0.59	5.3	Vertical	Pass

FDD LTE Band 12-Middle channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1406	-48.14	-13	-35.14	-49.61	0.43	1.9	Horizontal	Pass
2109	-52.6	-13	-39.6	-57.87	0.53	5.8	Horizontal	Pass
2812	-46.04	-13	-33.04	-50.75	0.59	5.3	Horizontal	Pass
1406	-48.48	-13	-35.48	-49.95	0.43	1.9	Vertical	Pass
2109	-49.86	-13	-36.86	-55.13	0.53	5.8	Vertical	Pass
2812	-43.78	-13	-30.78	-48.49	0.59	5.3	Vertical	Pass

FDD LTE Band 12-High channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB								
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1413	-50.16	-13	-37.16	-51.63	0.43	1.9	Horizontal	Pass
2119.5	-50.57	-13	-37.57	-55.84	0.53	5.8	Horizontal	Pass
2826	-43.74	-13	-30.74	-48.45	0.59	5.3	Horizontal	Pass
1413	-47.61	-13	-34.61	-49.08	0.43	1.9	Vertical	Pass
2119.5	-50.6	-13	-37.6	-55.87	0.53	5.8	Vertical	Pass
2826	-46.79	-13	-33.79	-51.5	0.59	5.3	Vertical	Pass

Note: All modes have been tested and we found QPSK test mode has the worst test result. Only record the worst test result.



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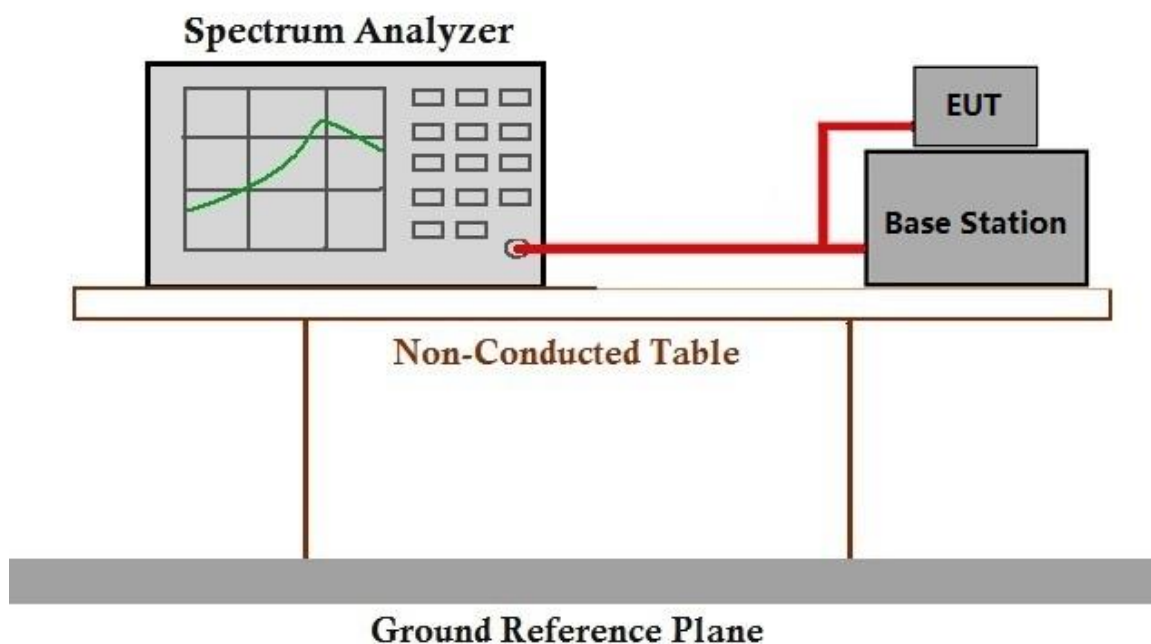
6.7 Frequency stability

Test Requirement: \$2.1055, \$22.355, \$24.235, \$27.54
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: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar
Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.7.2 Test Setup Diagram



6.7.3 Measurement Data

Please refer to Appendix C_LTE_4G_Frequency stability

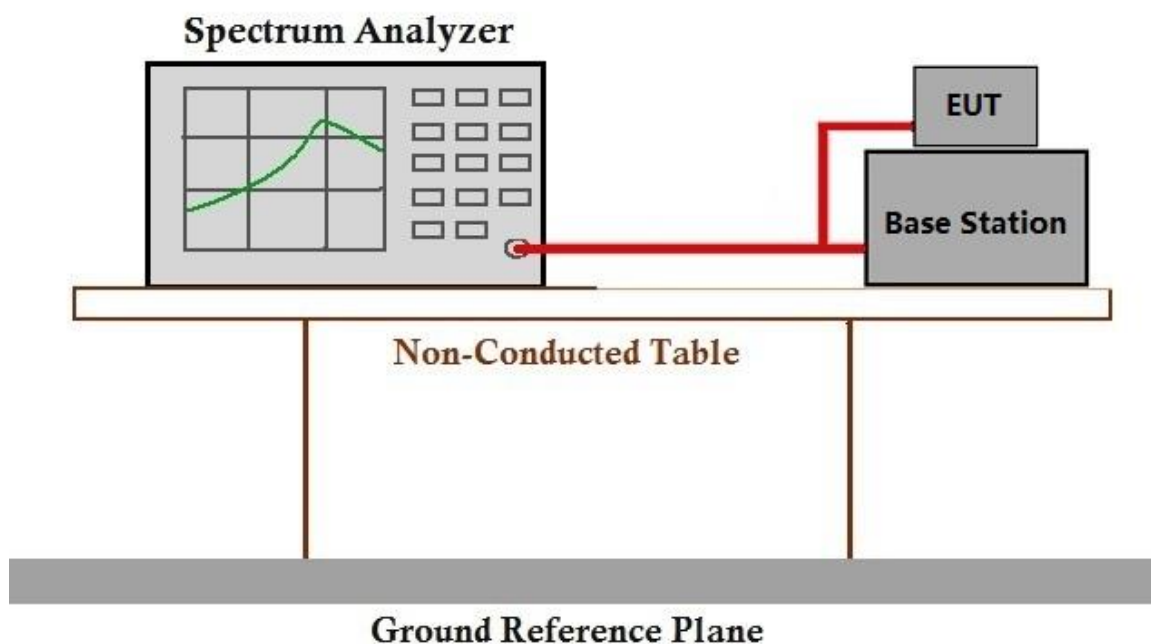
6.8 Modulation Characteristics

Test Requirement: S2.1047
Test Method: ANSI C63.26, KDB 971168 D01 v03
Limit: Digital modulation

6.8.1 E.U.T. Operation

Operating Environment:
Temperature: 26.1 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar
Test mode 21: Tx mode, Keep the EUT in transmitting mode.

6.8.2 Test Setup Diagram



6.8.3 Measurement Data

Please refer to Appendix C_LTE_4G_Modulation Characteristics

7 Photographs

7.1 Test Setup

Please refer to setup photos.

7.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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