



TEST REPORT

Application No.: GZCR2109021051AT
Applicant: Cosmo Technologies, Inc.
Address of Applicant: 747 Grape St, Denver 80220, Colorado, United States
Manufacturer: Shenzhen Qinmi Smart Technology Co., Ltd
Address of Manufacturer: 4th floor, Building 9, Tongfuyu Industrial Park, Lezhujiao, Zhoushi Road, Xixiang, Baoan District, Shenzhen, China
Factory: Shenzhen Qinmi Smart Technology Co., Ltd
Address of Factory: 4th floor, Building 9, Tongfuyu Industrial Park, Lezhujiao, Zhoushi Road, Xixiang, Baoan District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: COSMO JrTrack Kids Smartwatch
Model No.: JRTV2
Trade mark: JrTrack
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: 2021-08-03
Date of Test: 2021-08-05 to 2021-09-15
Date of Issue: 2021-09-29

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

Kobe Jian
EMC Laboratory Manager



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SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch


EMC-TRF-01 Rev 1.0

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-09-29		Original

Authorized for issue by				
				
		Curry Wu/Project Engineer		
				
		Ricky Liu/Reviewer		



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2 Test Summary

Test Item	FCC Rule No.	Requirements	Verdict
Effective (Isotropic) Radiated Output Power Data	§2.1046 §22.913 §24.232 §27.50(b) §27.50(c) §27.50(d)	ERP≤ 7W(LTE Band 5) EIRP≤ 2W(LTE Band 2, 7) ERP≤ 3W(LTE Band 12,17) EIRP≤ 1W(LTE Band 4, 66)	PASS
Peak-Average Ratio	§22.913 §24.232 §27.50(d)	≤13dB	PASS
Bandwidth	§2.1049(h)	OBW: No limit EBW: No limit	PASS
Band Edge Compliance	§2.1051 §22.917 §24.238 §27.53(c) §27.53(g) §27.53(h)	≤ -13dBm (LTE Band5) ≤ -13dBm (LTE Band2) Refer to clause 6.4 for LTE Band7 ≤ -13dBm (LTE Band12,17) ≤ -13dBm (LTE Band4, 66)	PASS
Spurious emissions at antenna terminals	§2.1051 §22.917 §24.238 §27.53(c) §27.53(g) §27.53(h)	≤ -13dBm (LTE Band5) ≤ -13dBm (LTE Band2) ≤ -13dBm (LTE Band12,17) ≤ -13dBm (LTE Band4, 66) ≤ -25dBm (LTE Band7)	PASS
Field strength of spurious radiation	§2.1051 §22.917 §24.238 §27.53(c) §27.53(g) §27.53(h)	≤ -13dBm (LTE Band5) ≤ -13dBm (LTE Band2) ≤ -13dBm (LTE Band12,17) ≤ -13dBm (LTE Band4, 66) ≤ -25dBm(LTE Band7)	PASS
Frequency stability	§2.1055 §22.355 §24.235 §27.54	≤ ±2.5ppm.	PASS

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.8V by rechargeable lithium battery and recharged by DC 5V via usb port.
Cable(s):	USB Cable, 0.5m, unshielded
Sample Type:	Portable production
LTE Operation Frequency Band:	LTE FDD Band 2, 4, 5, 7, 12,17, 66
Modulation Type:	QPSK, 16QAM
LTE Power Class:	Level 3
Antenna Type:	PIFA Antenna
Antenna Gain:	LTE band 2, 4, 5, 7, 12,17, 66: -0.5dBi
Extreme temp. Tolerance:	-30°C to +50°C
Extreme vol. Limits:	3.4VDC to 4.2VDC (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
Test mode:	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 17	5	706.5	710.0	713.5
	10	709.0	710.0	711.0

Test Mode	Nominal Bandwidth (MHz)	RF Channel		
		Low (L)	Middle (M)	High (H)
		MHz	MHz	MHz
LTE FDD Band 66	1.4	1710.7	1745.0	1779.3
	3	1711.5	1745.0	1778.5
	5	1712.5	1745.0	1777.5
	10	1715.0	1745.0	1775.0
	15	1717.5	1745.0	1772.5
	20	1720.0	1745.0	1770.0

4.3 Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	52%	
Atmospheric Pressure:	1015Pa	
Temperature:	TL	-30°C
	TN	+20°C
	TH	+50°C
Voltage:	VL	DC3.2 V
	VN	DC3.8 V
	VH	DC 4.2 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	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	5.14dB (below 1GHz)
		5.08dB (above 1GHz)
8	Radiated Spurious emission test	5.14dB (below 1GHz)
		5.08dB (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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Guangzhou, China 510663

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No tests were sub-contracted.



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4.7 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

● **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

● **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

● **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None



5 Equipment List

RF conducted test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
EXA Signal Analyzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2020-09-17	2021-09-16
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Measurement Software	TST	TST PASS V1.0.5	N/A	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19
Power Meter (U2021XA_Ch2)	Agilent Technologies	U2021XA_Ch 2	SEM009-02	2021-05-19	2022-05-18

RE in Chamber(below 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)-Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver(1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)	SCHWARZBECK	VULB 9160	EMC2025	2020-09-24	2023-09-23
Signal Generator (10MHz-20GHz)	Rohde & Schwarz	SMR20	EMC0516	2021-01-11	2022-01-10
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19



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RE in Chamber(above 1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date	Cal. Due date
Chamber cable(Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna(1GHz-18GHz)	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Horn Antenna(14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2020-09-09	2021-09-08
				2021-09-07	2022-09-06
Wideband Radio Communication Tester(CMW500)	R&S	CMW500	EMC2215	2020-09-20	2021-09-19
Substitution Antenna	SCHWARZBECK MESS- ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
Signal Generator (10MHz-20GHz)	Rohde & Schwarz	SMR20	EMC0516	2021-01-11	2022-01-10

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-04
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-04

6 Radio Spectrum Matter Test Results

6.1 Effective (Isotropic) Radiated Output Power Data

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

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

Limit:
ERP ≤ 7W(LTE Band 5)
EIRP ≤ 2W(LTE Band 2)
ERP ≤ 3W(LTE)
ERP ≤ 3W(LTE Band 12,17)
EIRP ≤ 1W(LTE Band 4, 66)

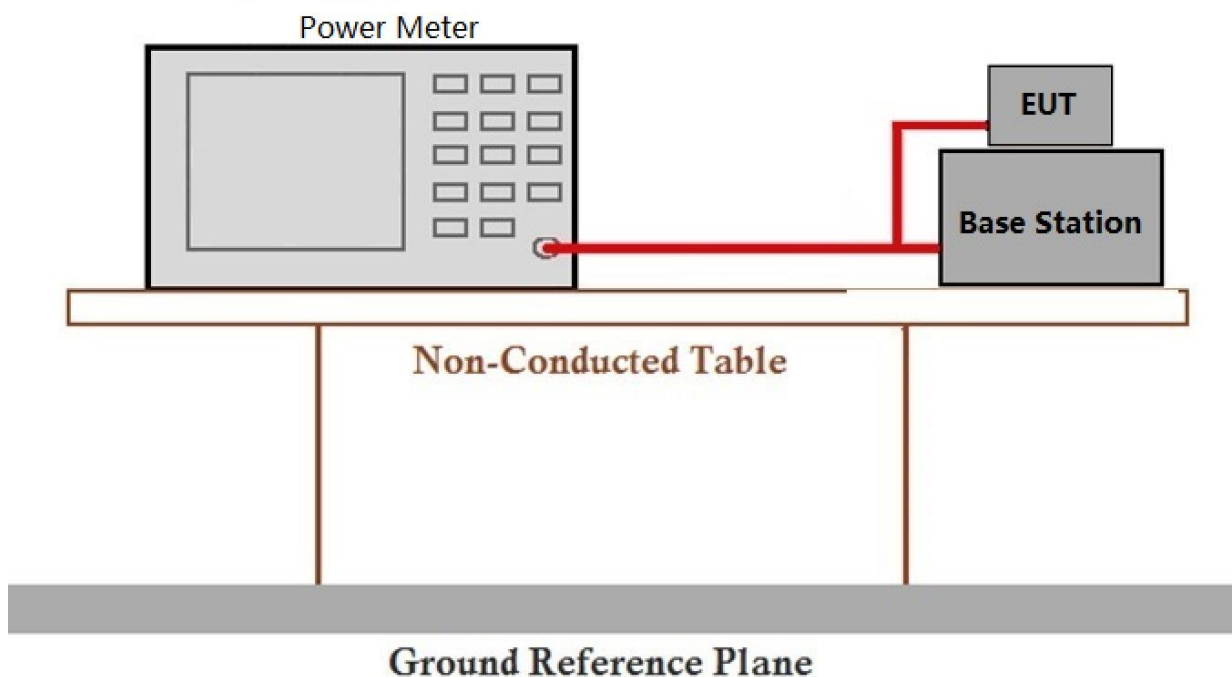
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_power

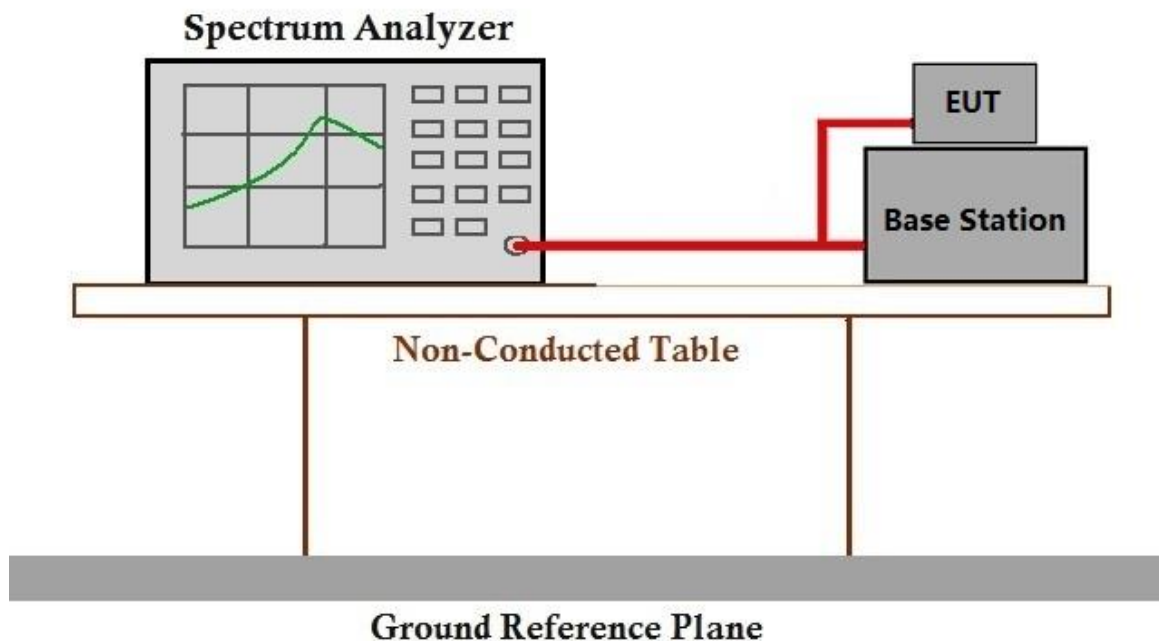
6.2 Peak-Average Ratio

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: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_Peak-Average Ratio

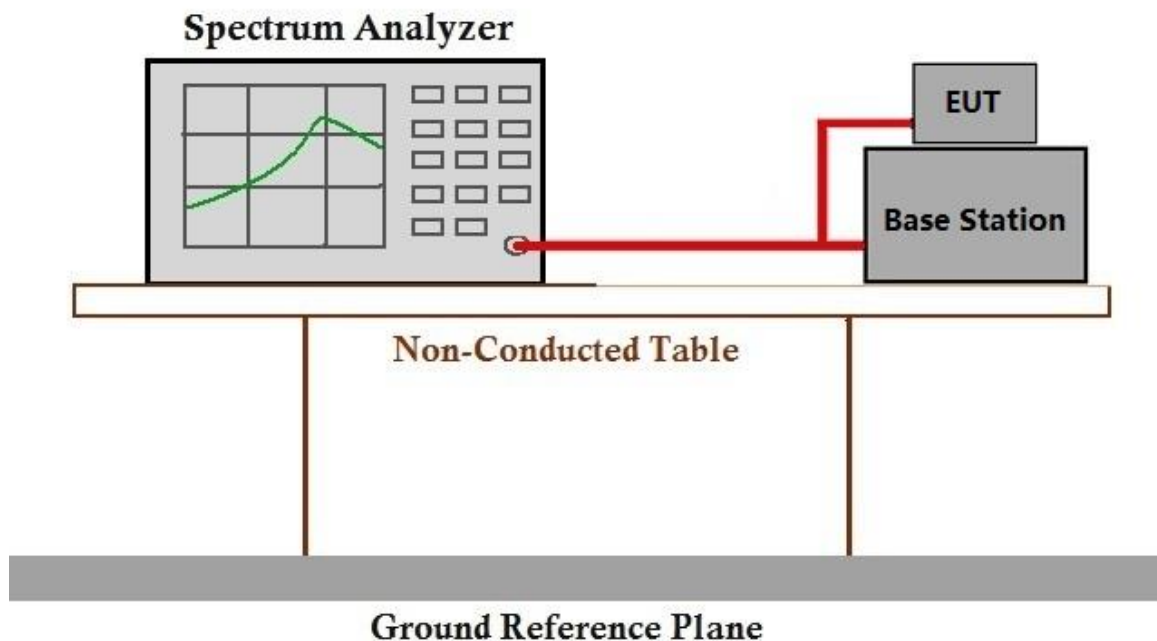
6.3 Bandwidth

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: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_99% & 26dB Bandwidth



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6.4 Band Edge Compliance

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

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

Limit: $\leq -13\text{dBm}$ (LTE Band2,4,5,12,17)

For band 13:

(1) 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;

(2) 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;

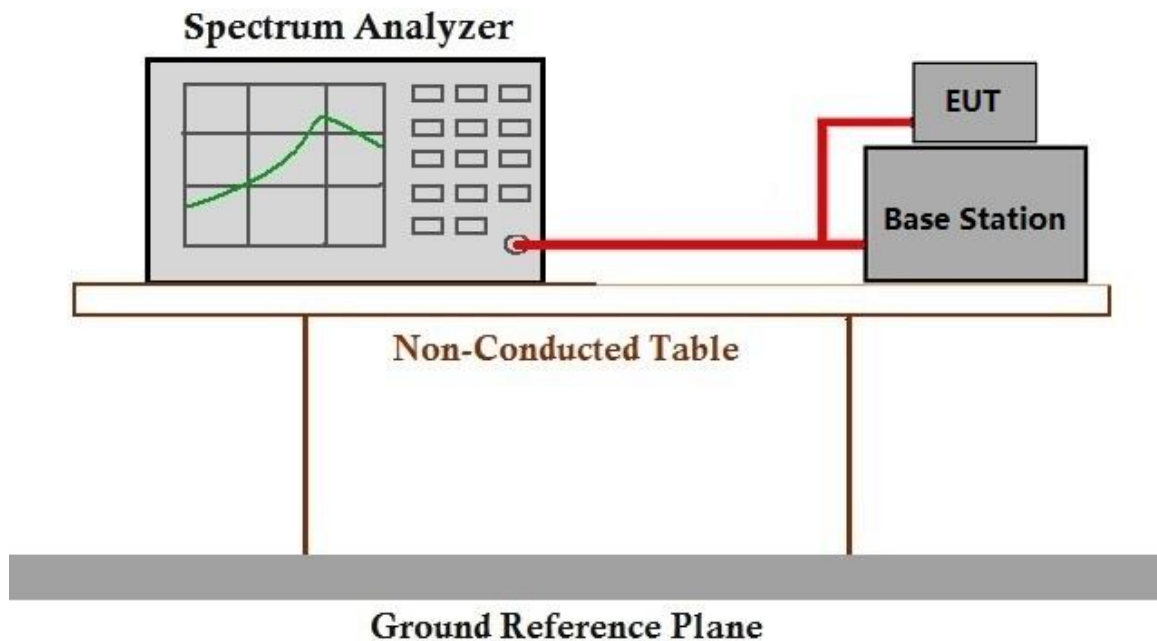
6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_Spurious Emission&Band edge

6.5 Spurious emissions at antenna terminals

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

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

Limit: $\leq -13\text{dBm}$ (LTE Band2,4,5,12,17)

For band 13:

(1) 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;

(2) 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;

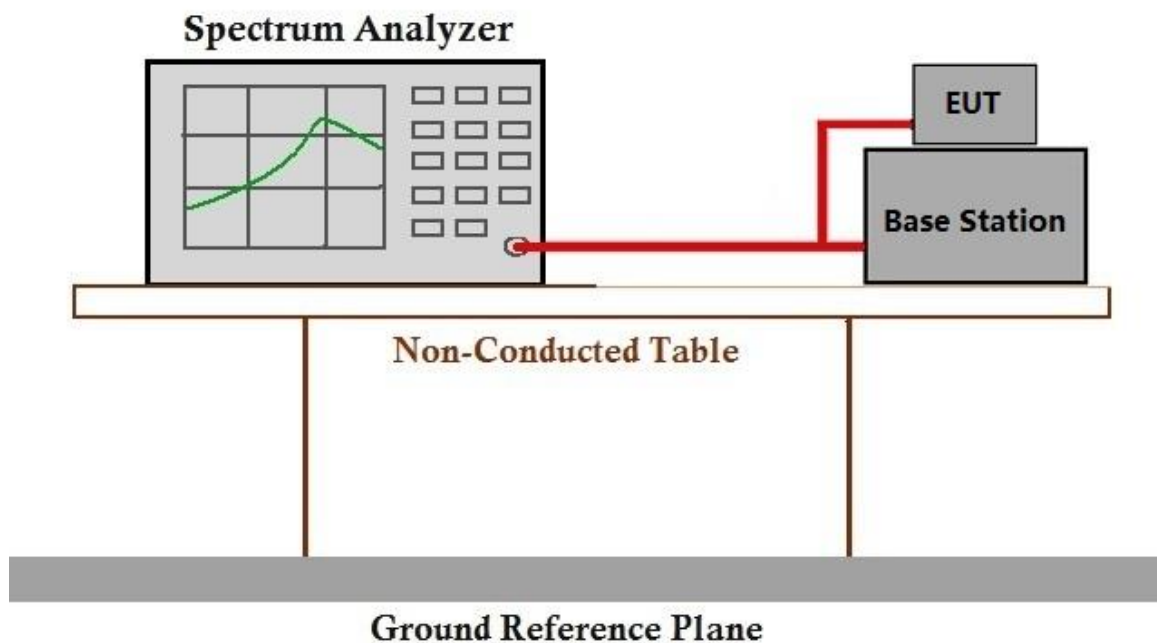
6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_Spurious Emission&Band edge

6.6 Field strength of spurious radiation

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

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

Limit: $\leq -13\text{dBm}$ (LTE Band2,4,5,12,17)

For band 13:

(1) 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;

(2) 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;

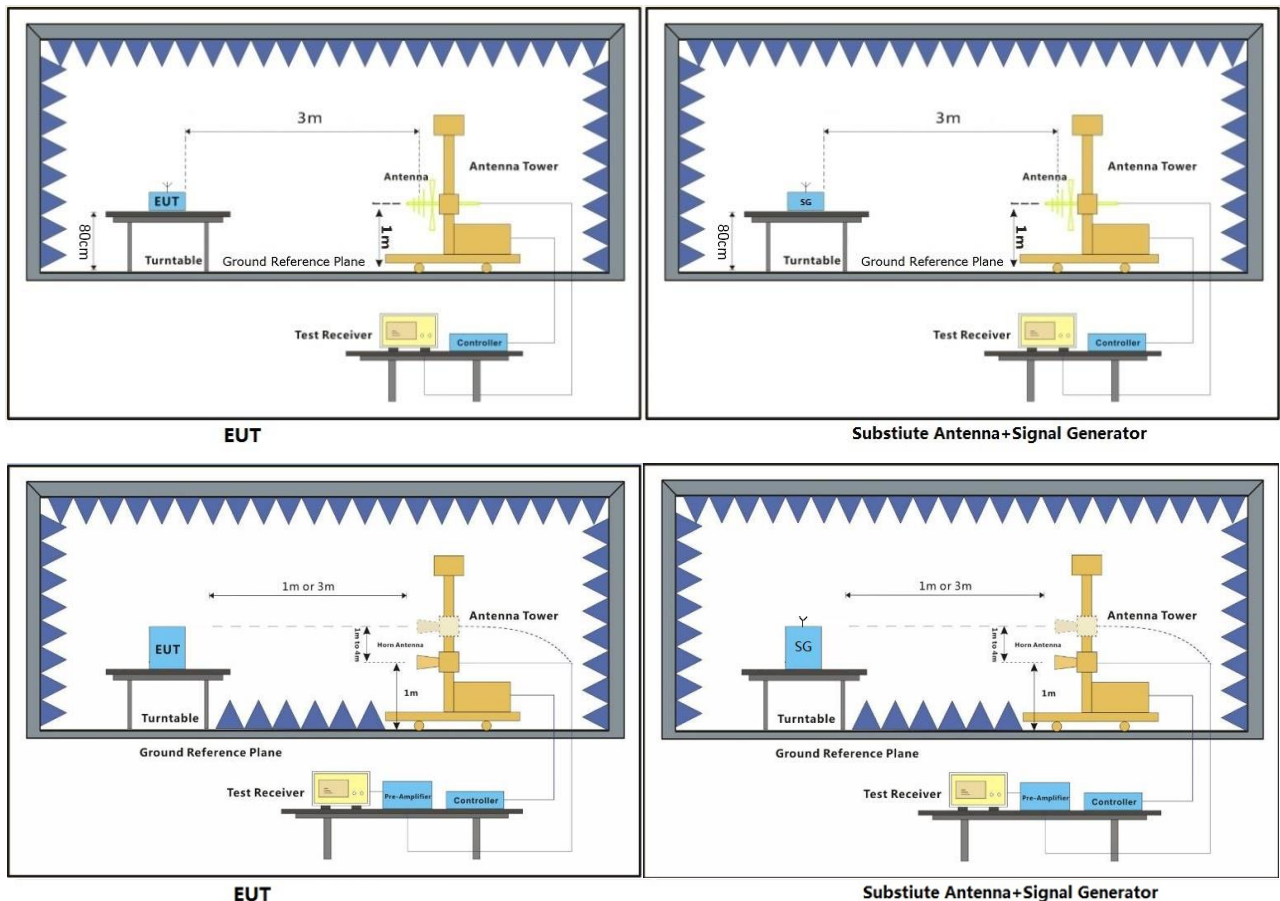
6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 18.5 °C Humidity: 39.5 % RH Atmospheric Pressure: 1010 mbar

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

6.6.2 Test Setup Diagram



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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.

LTE Band 2-20M Low channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3702	-38.09	-13	-25.09	-47.77	2.92	12.6	Horizontal	Pass
5553	-41.84	-13	-28.84	-51.79	3.15	13.1	Horizontal	Pass
7404	-43.85	-13	-30.85	-52.15	3.4	11.7	Horizontal	Pass
3702	-29.18	-13	-16.18	-38.86	2.92	12.6	Vertical	Pass
5553	-37.25	-13	-24.25	-47.2	3.15	13.1	Vertical	Pass
7404	-44.03	-13	-31.03	-52.33	3.4	11.7	Vertical	Pass

LTE Band 2-20M Middle channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3742	-42.38	-13	-29.38	-52.06	2.92	12.6	Horizontal	Pass
5613	-33.35	-13	-20.35	-43.3	3.15	13.1	Horizontal	Pass
7484	-43.59	-13	-30.59	-51.89	3.4	11.7	Horizontal	Pass
3742	-40.11	-13	-27.11	-49.79	2.92	12.6	Vertical	Pass
5613	-28.02	-13	-15.02	-37.97	3.15	13.1	Vertical	Pass
7484	-41.11	-13	-28.11	-49.41	3.4	11.7	Vertical	Pass

LTE Band 2-20M High channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3782	-35.83	-13	-22.83	-45.51	2.92	12.6	Horizontal	Pass
5673	-41.16	-13	-28.16	-51.11	3.15	13.1	Horizontal	Pass
7564	-43.89	-13	-30.89	-51.44	3.85	11.4	Horizontal	Pass
3782	-31.75	-13	-18.75	-41.43	2.92	12.6	Vertical	Pass
5673	-33.75	-13	-20.75	-43.7	3.15	13.1	Vertical	Pass
7564	-42.76	-13	-29.76	-50.31	3.85	11.4	Vertical	Pass



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LTE Band 4-20M Low channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3422	-46.46	-13	-33.46	-54.97	2.99	11.5	Horizontal	Pass
5133	-43.31	-13	-30.31	-53.01	3	12.7	Horizontal	Pass
6844	-44.82	-13	-31.82	-54.24	3.08	12.5	Horizontal	Pass
3422	-41.46	-13	-28.46	-49.97	2.99	11.5	Vertical	Pass
5133	-39.26	-13	-26.26	-48.96	3	12.7	Vertical	Pass
6844	-40.17	-13	-27.17	-49.59	3.08	12.5	Vertical	Pass

LTE Band 4-20M Middle channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3447	-35.2	-13	-22.2	-43.71	2.99	11.5	Horizontal	Pass
5170.5	-39.46	-13	-26.46	-49.16	3	12.7	Horizontal	Pass
6894	-45.58	-13	-32.58	-55	3.08	12.5	Horizontal	Pass
3447	-41.4	-13	-28.4	-49.91	2.99	11.5	Vertical	Pass
5170.5	-41.98	-13	-28.98	-51.68	3	12.7	Vertical	Pass
6894	-43.75	-13	-30.75	-53.17	3.08	12.5	Vertical	Pass

LTE Band 4-20M High channel, Modulation: QPSK, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-46.25	-13	-33.25	-54.76	2.99	11.5	Horizontal	Pass
5208	-44.48	-13	-31.48	-54.18	3	12.7	Horizontal	Pass
6944	-44.71	-13	-31.71	-54.13	3.08	12.5	Horizontal	Pass
3472	-40.68	-13	-27.68	-49.19	2.99	11.5	Vertical	Pass
5208	-41.75	-13	-28.75	-51.45	3	12.7	Vertical	Pass
6944	-41.45	-13	-28.45	-50.87	3.08	12.5	Vertical	Pass



FDD LTE Band 5-Low channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1649	-43.97	-13	-30.97	-49.14	3.33	8.5	Horizontal	Pass
2473.5	-44.07	-13	-31.07	-51.07	3.4	10.4	Horizontal	Pass
3298	-49.93	-13	-36.93	-58.44	2.99	11.5	Horizontal	Pass
1649	-48.57	-13	-35.57	-53.74	3.33	8.5	Vertical	Pass
2473.5	-39.74	-13	-26.74	-46.74	3.4	10.4	Vertical	Pass
3298	-48.4	-13	-35.4	-56.91	2.99	11.5	Vertical	Pass

FDD LTE Band 5-Middle channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1664	-48.62	-13	-35.62	-53.79	3.33	8.5	Horizontal	Pass
2496	-47.18	-13	-34.18	-54.18	3.4	10.4	Horizontal	Pass
3328	-49.14	-13	-36.14	-57.65	2.99	11.5	Horizontal	Pass
1664	-50.8	-13	-37.8	-55.97	3.33	8.5	Vertical	Pass
2496	-49.84	-13	-36.84	-56.84	3.4	10.4	Vertical	Pass
3328	-49.65	-13	-36.65	-58.16	2.99	11.5	Vertical	Pass

FDD LTE Band 5-High channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1679	-52.79	-13	-39.79	-57.96	3.33	8.5	Horizontal	Pass
2518.5	-39.17	-13	-26.17	-46.56	3.21	10.6	Horizontal	Pass
3358	-47.17	-13	-34.17	-55.68	2.99	11.5	Horizontal	Pass
1679	-51.8	-13	-38.8	-56.97	3.33	8.5	Vertical	Pass
2518.5	-46.29	-13	-33.29	-53.68	3.21	10.6	Vertical	Pass
3358	-47.34	-13	-34.34	-55.85	2.99	11.5	Vertical	Pass



FDD LTE Band 7-Low channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5000.5	-46.62	-25	-21.62	-55.4	0.82	9.6	Horizontal	Pass
7500.75	-42.89	-25	-17.89	-55.1	0.99	13.2	Horizontal	Pass
10001	-42.76	-25	-17.76	-54.2	1.26	12.7	Horizontal	Pass
5000.5	-45.64	-25	-20.64	-54.42	0.82	9.6	Vertical	Pass
7500.75	-43.44	-25	-18.44	-55.65	0.99	13.2	Vertical	Pass
10001	-40.99	-25	-15.99	-52.43	1.26	12.7	Vertical	Pass

FDD LTE Band 7-Middle channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5065.5	-44.36	-25	-19.36	-53.14	0.82	9.6	Horizontal	Pass
7598.25	-43.63	-25	-18.63	-55.84	0.99	13.2	Horizontal	Pass
10131	-41.69	-25	-16.69	-53.13	1.26	12.7	Horizontal	Pass
5065.5	-44.79	-25	-19.79	-53.57	0.82	9.6	Vertical	Pass
7598.25	-44.03	-25	-19.03	-56.24	0.99	13.2	Vertical	Pass
10131	-41.21	-25	-16.21	-52.65	1.26	12.7	Vertical	Pass

FDD LTE Band 7-High channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
5130.5	-43.52	-25	-18.52	-52.3	0.82	9.6	Horizontal	Pass
7695.75	-42.15	-25	-17.15	-54.36	0.99	13.2	Horizontal	Pass
10261	-43.28	-25	-18.28	-54.72	1.26	12.7	Horizontal	Pass
5130.5	-42.53	-25	-17.53	-51.31	0.82	9.6	Vertical	Pass
7695.75	-44.37	-25	-19.37	-56.58	0.99	13.2	Vertical	Pass
10261	-42.37	-25	-17.37	-53.81	1.26	12.7	Vertical	Pass



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FDD LTE Band 12-Low channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1399	-54.71	-13	-41.71	-58.14	2.57	6	Horizontal	Pass
2098.5	-54.3	-13	-41.3	-61.3	3.4	10.4	Horizontal	Pass
2798	-51.17	-13	-38.17	-58.56	3.21	10.6	Horizontal	Pass
1399	-53.94	-13	-40.94	-57.37	2.57	6	Vertical	Pass
2098.5	-54.33	-13	-41.33	-61.33	3.4	10.4	Vertical	Pass
2798	-50.31	-13	-37.31	-57.7	3.21	10.6	Vertical	Pass

FDD LTE Band 12-Middle channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1406	-54.69	-13	-41.69	-58.12	2.57	6	Horizontal	Pass
2109	-54.52	-13	-41.52	-61.52	3.4	10.4	Horizontal	Pass
2812	-50.12	-13	-37.12	-57.51	3.21	10.6	Horizontal	Pass
1406	-53.15	-13	-40.15	-56.58	2.57	6	Vertical	Pass
2109	-53.39	-13	-40.39	-60.39	3.4	10.4	Vertical	Pass
2812	-49.45	-13	-36.45	-56.84	3.21	10.6	Vertical	Pass

FDD LTE Band 12-High channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1413	-54.29	-13	-41.29	-57.72	2.57	6	Horizontal	Pass
2119.5	-53.51	-13	-40.51	-60.51	3.4	10.4	Horizontal	Pass
2826	-49.64	-13	-36.64	-57.03	3.21	10.6	Horizontal	Pass
1413	-54.36	-13	-41.36	-57.79	2.57	6	Vertical	Pass
2119.5	-53.7	-13	-40.7	-60.7	3.4	10.4	Vertical	Pass
2826	-48.84	-13	-35.84	-56.23	3.21	10.6	Vertical	Pass



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FDD LTE Band 17-Low channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1409	-54.26	-13	-41.26	-57.69	2.57	6	Horizontal	Pass
2113.5	-54.82	-13	-41.82	-61.82	3.4	10.4	Horizontal	Pass
2818	-50.78	-13	-37.78	-58.17	3.21	10.6	Horizontal	Pass
1409	-52.55	-13	-39.55	-55.98	2.57	6	Vertical	Pass
2113.5	-53.21	-13	-40.21	-60.21	3.4	10.4	Vertical	Pass
2818	-50.72	-13	-37.72	-58.11	3.21	10.6	Vertical	Pass

FDD LTE Band 17-Middle channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1411	-54.68	-13	-41.68	-58.11	2.57	6	Horizontal	Pass
2116.5	-53.97	-13	-40.97	-60.97	3.4	10.4	Horizontal	Pass
2822	-51.08	-13	-38.08	-58.47	3.21	10.6	Horizontal	Pass
1411	-54.05	-13	-41.05	-57.48	2.57	6	Vertical	Pass
2116.5	-54.36	-13	-41.36	-61.36	3.4	10.4	Vertical	Pass
2822	-47.86	-13	-34.86	-55.25	3.21	10.6	Vertical	Pass

FDD LTE Band 17-High channel, Modulation: QPSK, Bandwidth: 10MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
1413	-54.77	-13	-41.77	-58.2	2.57	6	Horizontal	Pass
2119.5	-54.85	-13	-41.85	-61.85	3.4	10.4	Horizontal	Pass
2826	-49.79	-13	-36.79	-57.18	3.21	10.6	Horizontal	Pass
1413	-54.64	-13	-41.64	-58.07	2.57	6	Vertical	Pass
2119.5	-54.7	-13	-41.7	-61.7	3.4	10.4	Vertical	Pass
2826	-48.28	-13	-35.28	-55.67	3.21	10.6	Vertical	Pass



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FDD LTE Band 66-Low channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3420.14	-51.57	-13	-38.57	-57.12	0.65	6.2	Horizontal	Pass
5130.21	-46.38	-13	-33.38	-55.16	0.82	9.6	Horizontal	Pass
6840.28	-46.9	-13	-33.9	-57.75	0.95	11.8	Horizontal	Pass
3420.14	-50.38	-13	-37.38	-55.93	0.65	6.2	Vertical	Pass
5130.21	-46.66	-13	-33.66	-55.44	0.82	9.6	Vertical	Pass
6840.28	-46.74	-13	-33.74	-57.59	0.95	11.8	Vertical	Pass

FDD LTE Band 66-Middle channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3488.74	-50.8	-13	-37.8	-56.35	0.65	6.2	Horizontal	Pass
5233.11	-46.81	-13	-33.81	-55.59	0.82	9.6	Horizontal	Pass
6977.48	-44.42	-13	-31.42	-55.27	0.95	11.8	Horizontal	Pass
3488.74	-50.88	-13	-37.88	-56.43	0.65	6.2	Vertical	Pass
5233.11	-46.68	-13	-33.68	-55.46	0.82	9.6	Vertical	Pass
6977.48	-45.41	-13	-32.41	-56.26	0.95	11.8	Vertical	Pass

FDD LTE Band 66-High channel, Modulation: QPSK, Bandwidth: 20MHz, 1 RB#0								
Frequency (MHz)	EIRP (dBm)	Limit(dBm)	Over Limit (dB)	S.G. Power (dBm)	Cable loss (dB)	Antenna Gain (dBi)	Polarization (H/V)	Result
3557.34	-49.59	-13	-36.59	-56.48	0.71	7.6	Horizontal	Pass
5336.01	-45.53	-13	-32.53	-54.31	0.82	9.6	Horizontal	Pass
7114.68	-45.8	-13	-32.8	-57.7	1	12.9	Horizontal	Pass
3557.34	-49.75	-13	-36.75	-56.64	0.71	7.6	Vertical	Pass
5336.01	-46.59	-13	-33.59	-55.37	0.82	9.6	Vertical	Pass
7114.68	-45.68	-13	-32.68	-57.58	1	12.9	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: $\leq \pm 2.5\text{ppm}$.

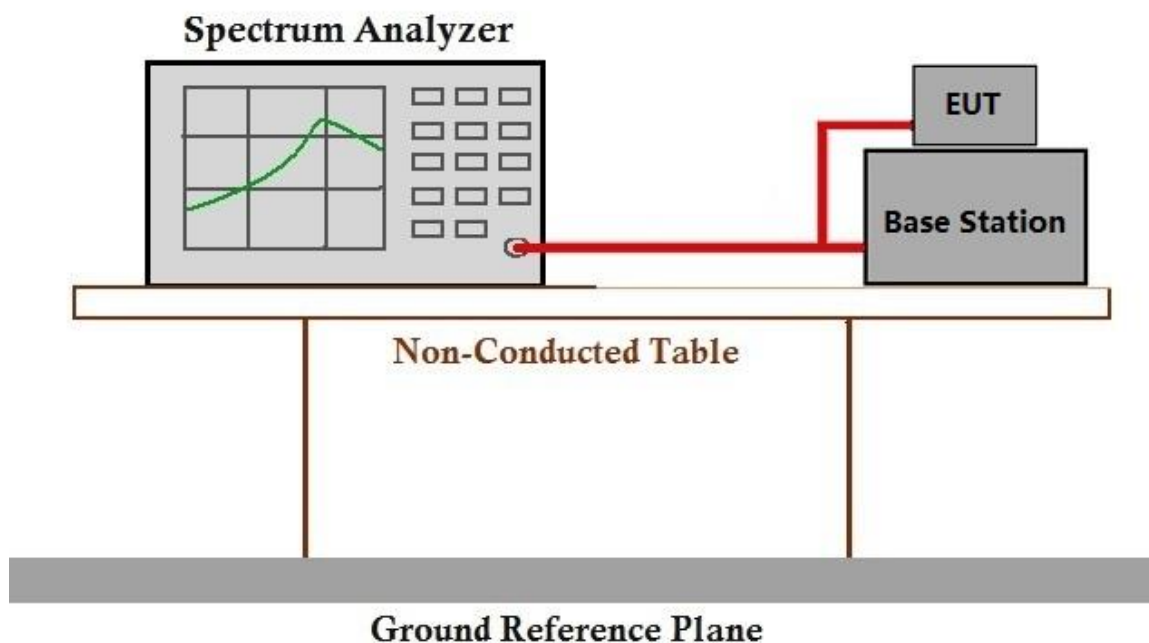
6.7.1 E.U.T. Operation

Operating Environment:

Temperature: 19.5 °C Humidity: 45.5 % 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 FCC_LTE_Frequency stability

7 Photographs

7.1 Test Setup Photos

Refer to Appendix – Setup Photos for 2G/3G/4G.

7.2 EUT Constructional Details (EUT Photos)

Refer to Appendix - External and Internal Photos for GZCR2109021051AT

- End of the Report -