FCC Test Report

Report No.: AGC14499241201FR07

FCC ID	:	2APPZ-W638C
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Tablet
BRAND NAME	:	Fanvil
MODEL NAME	:	W638C, W638W
APPLICANT	:	Fanvil Technology Co., Ltd
DATE OF ISSUE	:	Apr. 10, 2025
STANDARD(S)	:	FCC Part 22 Subpart H FCC Part 24 Subpart E FCC Part 27 Subpart L/M/G FCC Part 90 Subpart S
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 10, 2025	Valid	Initial Release

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1. General Information

Applicant	Fanvil Technology Co., Ltd
Address	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, 518101, China
Manufacturer	Fanvil Technology Co., Ltd
Address	10/F Block A, Dualshine Global Science Innovation Center, Honglang North 2nd Road, Bao'an District, Shenzhen, 518101, China
Factory	N/A
Address	N/A
Product Designation	Tablet
Brand Name	Fanvil
Test Model	W638C
Series Model(s)	W638W
Difference Description	The model is named differently
Date of receipt of test item	Dec. 06, 2024
Date of Test	Dec. 06, 2024~Dec. 12, 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-LTE-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Bibo Zhang (Project Engineer)	Apr. 10, 2025
Reviewed By	Calvin Liu (Reviewer)	Apr. 10, 2025
Approved By	Angela Li (Authorized Officer)	Apr. 10, 2025

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2. Product Information

2.1 Product Technical Description

Support Networks	LTE Function			
Hardware Version	RevA_WW			
Software Version	W638C_UG406_250111			
Support Frequency Band	☒ FDD Band 2	☒ FDD Band 4	☒ FDD Band 5	☒ FDD Band 7
	☒ FDD Band 12	☒ FDD Band 13	☐ FDD Band 14	☒ FDD Band 17
	☒ FDD Band 25	☒ FDD Band 26	☒ FDD Band 38	☒ TDD Band 40
	☒ FDD Band 66	☒ TDD Band 41	(U.S. Bands)	
	☐ FDD Band 1	☐ FDD Band 3	☐ FDD Band 8	☐ FDD Band 19
	☐ FDD Band 20	☐ FDD Band 28	☐ TDD Band 38	☐ TDD Band 39
	(Non-U.S. Bands)			
TX Frequency Range	LTE-Band 2	1850.7 MHz – 1909.3 MHz---(1.4MHz)		
		1851.5 MHz – 1908.5 MHz---(3.0MHz)		
		1852.5 MHz – 1907.5 MHz---(5.0MHz)		
		1855.0 MHz – 1905.0 MHz---(10.0MHz)		
		1857.5 MHz – 1902.5 MHz---(15.0MHz)		
		1860.0 MHz – 1900.0 MHz---(20.0MHz)		
	LTE-Band 4	1710.7 MHz – 1754.3 MHz---(1.4MHz)		
		1711.5 MHz – 1753.5 MHz---(3.0MHz)		
		1712.5 MHz – 1752.5 MHz---(5.0MHz)		
		1715.0 MHz – 1750.0 MHz---(10.0MHz)		
		1717.5 MHz – 1747.5 MHz---(15.0MHz)		
		1720.0 MHz – 1745.0 MHz---(20.0MHz)		
	LTE-Band 5	824.7 MHz – 848.3 MHz---(1.4MHz)		
		825.5 MHz – 847.5MHz---(3.0MHz)		
		826.5 MHz – 846.5 MHz---(5.0MHz)		
		829.0 MHz – 844.0 MHz---(10.0MHz)		
	LTE-Band 7	2502.5 MHz – 2567.5 MHz---(5.0MHz)		
		2505.0 MHz – 2565.0 MHz---(10.0MHz)		
		2507.5 MHz – 2562.5 MHz---(15.0MHz)		
		2510.0 MHz – 2560.0 MHz---(20.0MHz)		
	LTE-Band 12	699.7 MHz – 715.3 MHz---(1.4MHz)		
		700.5 MHz – 714.5 MHz---(3.0MHz)		
		701.5 MHz – 713.5 MHz---(5.0MHz)		
		704.0 MHz – 711.0 MHz---(10.0MHz)		

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	LTE-Band 13	779.5 MHz – 784.5 MHz---(5.0MHz)
		782.0 MHz – 782.0 MHz---(10.0MHz)
	LTE-Band 17	706.5 MHz – 713.5 MHz---(5.0MHz)
		709.0 MHz – 711.0 MHz---(10.0MHz)
	LTE-Band 25	1850.7 MHz – 1914.3 MHz---(1.4MHz)
		1851.5 MHz – 1913.5 MHz---(3.0MHz)
		1852.5 MHz – 1912.5 MHz---(5.0MHz)
		1855.0 MHz – 1910.0 MHz---(10.0MHz)
		1857.5 MHz – 1907.5 MHz---(15.0MHz)
		1860.0 MHz – 1905.0 MHz---(20.0MHz)
	LTE-Band 26A	824.7 MHz –848.3 MHz---(1.4MHz)
		825.5 MHz–847.5 MHz---(3.0MHz)
		826.5 MHz-846.5 MHz ---(5.0MHz)
		829.0 MHz-844.0 MHz---(10.0MHz)
		831.5 MHz-841.5 MHz ---(15.0MHz)
	LTE-Band 26B	814.7 MHz-823.3 MHz ---(1.4MHz)
		815.5 MHz -822.5 MHz---(3.0MHz)
		816.5 MHz -821.5 MHz---(5.0MHz)
		819.0 MHz -819.0 MHz---(10.0MHz)
		821.5 MHz -821.5 MHz ---(15.0MHz)
	LTE-Band 38	2572.5 MHz-2617.5 MHz ---(5.0MHz)
		2575 MHz-2615MHz---(10.0MHz)
		2577.5 MHz-2612.5 MHz ---(15.0MHz)
		2580 MHz-2610 MHz---(20.0MHz)
	LTE-Band 40 (Lower Side)	2307.5 MHz-2312.5 MHz---(5MHz)
		2310.0 MHz---(10.0MHz)
	LTE-Band 40 (Upper Side)	2352.5 MHz-2357.5 MHz---(5.0MHz)
		2355.0 MHz---(10.0MHz)
	LTE-Band 41	2498.5 MHz –2687.5 MHz---(5.0MHz)
		2501.0 MHz –2685.0 MHz---(10.0MHz)
		2503.5 MHz –2682.5 MHz---(15.0MHz)
		2506.0 MHz –2680.0 MHz---(20.0MHz)
	LTE-Band 66	1710.7 MHz – 1779.3 MHz---(1.4MHz)
		1711.5 MHz – 1778.5 MHz---(3.0MHz)
		1712.5 MHz – 1777.5 MHz---(5.0MHz)
		1715.0 MHz – 1775.0 MHz---(10.0MHz)

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		1717.5 MHz – 1772.5 MHz---(15.0MHz)		
		1720.0 MHz – 1770.0 MHz---(20.0MHz)		
Type of Modulation	QPSK/16QAM			
Antenna Designation	PIFA Antenna			
Antenna gain	Band 2:1.26dBi	Band 4:1.01dBi	Band 5:-1.48dBi	Band 7:0.79dBi
	Band 12:-1.80dBi	Band 13:-1.80dBi	Band 17:-1.80dBi	Band 25:1.26dBi
	Band 26:-1.48dBi	Band 38:0.94dBi	Band 40:1.27dBi	Band 41:1.03dBi
	Band 66:1.01dBi			
Power Supply	DC 3.8V by battery of DC 5V from adapter			
Single Card	WCDMA/LTE Card Slot			
Power Class	3			
Extreme Vol. Limits	DC 3.23V to 4.35V (Normal: DC 3.8V)			
Extreme Temp. Tolerance	-30 °C to +50 °C			
Temperature range	-20℃ to +50℃			

Note:

1. The High Voltage DC 4.35V and Low Voltage DC 3.23V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.
2. The Tablet W638C and the Tablet Station CH26 are shipped as a set, and the set model name is V78C.
3. The Tablet W638W and the Tablet Station CH26 are shipped as a set, and the set model name is V78.

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2.2 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: **2APPZ-W638C,** filing to comply with Part 2, Part 22/24/27/90 of the Federal Communication Commission rules.

2.3 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	47 CFR FCC Part 2	Frequency allocations and radio treaty matters, general rules and regulations.
2	47 CFR FCC Part 22	Public Mobile Services.
3	47 CFR FCC Part 24	Personal Communications Services.
4	47 CFR FCC Part 27	Miscellaneous Wireless Communications Services.
5	47 CFR FCC Part 90	Private Land Mobile Radio Services.
6	ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
7	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
8	KDB 971168	D01 v03r01 Measurement Guidance For Certification Of Licensed Digital Transmitters.

2.4 Device Capabilities

This device contains the following capabilities:

- 850/1900 GSM/GPRS/EGPRS,850/1900 WCDMA/HSPA, Multi-Band LTE,802.11 b/g/n for WLAN,802.11 a/n/ac for UNII,Bluetooth (1X,EDR,LE).
- This device uses a tuner circuit that dynamically updates the antenna impedance parameters to optimize antenna performance for certain bands and modes of operation. The tuner for this device was set to simulate a "free space"condition where the transmit antenna is matched to the medium into which it is transmitting and, thus, the power is at its maximum level.
- ➢ LTE Band 12 (698 - 716 MHz) overlaps the entire frequency range of LTE Band 17 (704 - 716 MHz). Therefore,test data provided in this report covers Band 17 as well as Band 12.
- ➢ LTE Band 26 (814.7-849 MHz) overlaps the entire frequency range of LTE Band 5 (824 – 849 MHz). Therefore,test data provided in this report covers Band 5 and the portion of Band 26 subject to Part 22.
- ➢ LTE Band 66 (1710-1780 MHz) overlaps the entire frequency range of LTE Band 4 (1710 - 1755 MHz). Therefore,test data provided in this report covers Band 4 as well as Band 66.
- ➢ LTE Band 25 (1850-1915 MHz) overlaps the entire frequency range of LTE Band 2 (1850 - 1910 MHz). Therefore, test data provided in this report covers Band 2 as well as Band 25.
- ➢ LTE Band 41 (2496-2690 MHz) overlaps the entire frequency range of LTE Band 38 (2560 - 2620 MHz). Therefore, test data provided in this report covers Band 41 as well as Band 38.
- The above inclusion relationship is only a statement of the frequency coverage between the LTE working bands, and the actual supported frequency bands are subject to the reported data.

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- For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration.
- The emissions below 1GHz and above 18GHz were tested with the highest transmitting power channel and the worst case configuration.
- The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape),and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

2.5 Special Accessories

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.6 Equipment Modifications

Not available for this EUT intended for grant.

2.7 Emission Designator

GSM Emission Designator

Emission Designator = 249KGXW
GSM BW = 249 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W
GSM BW = 249 kHz
G = Phase Modulation
7 = Quantized/Digital Info
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W
WCDMA BW = 4.17 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D
LTE BW = 4.48 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

QAM Modulation

Emission Designator = 4M48W7D
LTE BW = 4.48 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission; telemetry; telecommand

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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

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

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

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3.3 Environmental Conditions

	Normal Conditions	Extreme Conditions
Temperature range	15~35℃	-30℃~50℃
Humidity range	20 % to 75 %.	20 % to 75 %.
Pressure range	86-106kPa	86-106kPa
Power supply	DC 3.8V	DC3.23V or DC4.35V
Note: The Extreme Temperature and Extreme Voltages declared by the manufacturer.		

3.4 Measurement Uncertainty

Test	Measurement Uncertainty
Transmitter power conducted	±0.57 dB
Transmitter power Radiated	±2.20 dB
Conducted spurious emission 9kHz-40GHz	±2.20 dB
Occupied Bandwidth	±0.01ppm
Radiated Emission 30~1000MHz	±4.10dB
Radiated Emission Above 1GHz	±4.32dB
Conducted Disturbance0.15~30MHz	±3.20dB
Radio Frequency	± 6.5 x 10-8
RF Power, Conducted	± 0.9 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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3.5 List of Test Equipment

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMW500	120909	2024-05-28	2025-05-27
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-06-03	2025-06-02
☒	AGC-EM-E005	Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	2023-01-05	2025-01-04
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-03-31	2025-03-30
☒	AGC-EM-E102	Broadband Ridged Horn Antenna	ETS	3117	00154520	2023-06-03	2025-06-02
☐	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-ER-E037	Signal Generator	Agilent	N5182A	MY50140530	2024-05-23	2025-05-22
☒	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08
☒	AGC-EM-A090	High Pass Filter 1 (2500-18000MHz)	N/A	N/A	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A091	High Pass Filter 2 (1200-18000MHz)	N/A	N/A	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A113	Band Stop Filter (825-850MHz)	MICRO-TRONICS	BRC50717	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A114	Band Stop Filter (880-915MHz)	MICRO-TRONICS	BRC50718	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A115	Band Stop Filter (1710-1785MHz)	MICRO-TRONICS	BRC50719	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A116	Band Stop Filter (1850-1950MHz)	MICRO-TRONICS	BRC50720	N/A	2024-05-23	2025-05-22
☒	AGC-EM-A117	Band Stop Filter (1920-1980MHz)	MICRO-TRONICS	BRC50721	N/A	2024-05-23	2025-05-22

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● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E087	Spectrum Analyzer	KEYSIGHT	N9020B	MY56101792	2024-05-23	2025-05-22
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMW500	120909	2024-05-28	2025-05-27
☒	AGC-ER-E032	Universal Radio Communication Tester	R&S	CMU200	113939	2024-05-24	2025-05-23
☒	AGC-ER-E075	Small Environmental Tester	SH-242	ESPEC	93008290	2024-07-24	2026-07-23
☒	--	Universal Switch Control Unit	Tonscend	JS	N/A	N/A	N/A
☒	--	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	--	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-ER-S008	LTE Test System	Tonscend	JS1120	3.1.46
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+ Ver2.1(JS36-RSE)	4.0.0.0

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4. System Test Configuration

4.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of EUT System

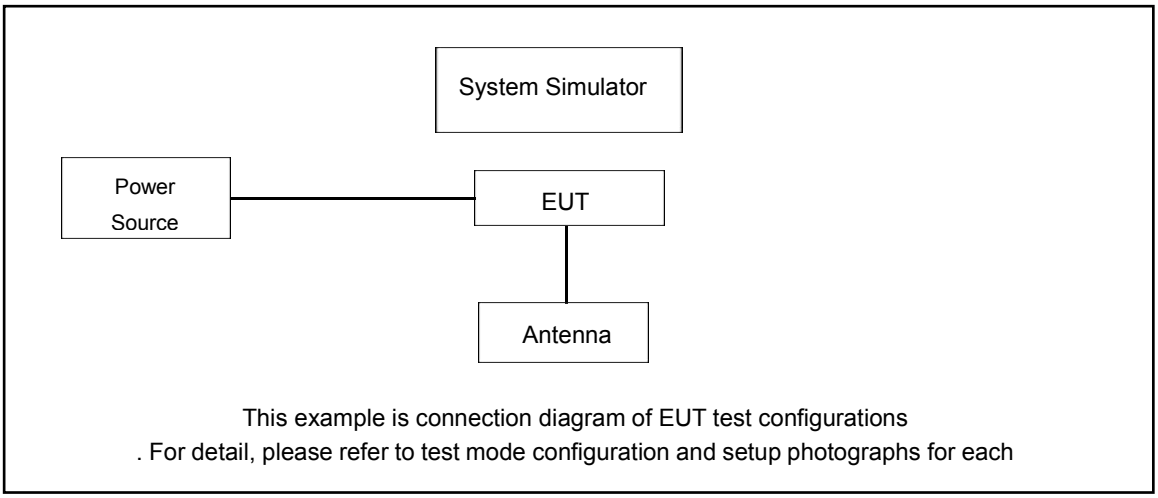

Table 2-1 Equipment Used in EUT System

4.4 Equipment Used in Tested System

The following peripheral devices and interface cables were connected during the measurement:

☐ Test Accessories Come From The Laboratory

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Adapter 1#	Zhuzhoudachuan Electronic Technology CO., Ltd	DCTQC18WUS-C0	Input: AC 100-240V 50/60Hz, 0.5A Output: DC 5V 3A/9V 2A/12V 1.5A	--
2	Adapter 2	Dongguan City Gangqi Electronic Co. LTD.	GQ15-050300-ZU	Input: AC 100-240V 50/60Hz, 0.5A Output: DC 5V 3A	--
3	Battery	SHENZHEN JIAJINYUAN TECHNOLOGY CO., LTD.	3095176	DC 3.8V 7500mAh	
4	LAN Cable	--	--	--	1.0m unshielded

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5. Summary of Test Results

5.1 Test Condition: Conducted Test

Item	Test Description	FCC Rules	Result
1	Occupied Bandwidth	§2.1049	Pass
2	Band Edge / Spurious and Harmonic Emissions at Antenna Terminal	§2.1051, §22.917(a), §24.238(a), §27.53(h), §27.53(m) (4), §27.53(g), §27.53(c) §27.53(a), §90.691	Pass
3	On all frequencies between 763-775 MHz and 793-805 MHz	§27.53(c)(4)	Pass
4	Conducted Output Power	§2.1046, §90.635	Pass
5	Frequency stability / variation of ambient temperature	§2.1055, §22.355, §24.235, §27.54 §90.213	Pass
6	Peak- to- Average Ratio	§24.232(d), §27.50(d)(5)	Pass

5.2 Test Condition: Radiated Test

Item	Test Description	FCC Rules	Result
1	Effective Radiated Power Equivalent Isotropic Radiated Power	§22.913(a)(5), §24.232(c), §27.50(d)(4) §27.50(h)(2), §27.50(c)(10), §27.50(b)(10) §27.50(a)(3)	Pass
2	Radiated Spurious and Harmonic Emissions	§2.1053, §22.917(a), §24.238(a), §27.53(h), §27.53(m)(4), §27.53(g), §27.53(c) §90.69, §27.53(a)	Pass
3	Undesirable Emissions in the 1559-1610 MHz band	§2.1053, §27.53(f)	Pass

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6. Description of Test Modes

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.

The worst condition was recorded in the test report if no other modes test data.

LTE Band 2 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	18700	18900	19100
	Frequency	1860	1880	1900
15	Channel	18675	18900	19125
	Frequency	1857.5	1880	1902.5
10	Channel	18650	18900	19150
	Frequency	1855	1880	1905
5	Channel	18625	18900	19175
	Frequency	1852.5	1880	1907.5
3	Channel	18615	18900	19185
	Frequency	1851.5	1880	1908.5
1.4	Channel	18607	18900	19193
	Frequency	1850.7	1880	1909.3

LTE Band 4 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	20050	20175	20300
	Frequency	1720	1732.5	1745
15	Channel	20025	20175	20325
	Frequency	1717.5	1732.5	1747.5
10	Channel	20000	20175	20350
	Frequency	1715	1732.5	1750
5	Channel	19975	20175	20375
	Frequency	1712.5	1732.5	1752.5
3	Channel	19965	20175	20385
	Frequency	1711.5	1732.5	1753.5
1.4	Channel	19957	20175	20393
	Frequency	1710.7	1732.5	1754.3

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LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 7 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	20850	21100	21350
	Frequency	2510	2535	2560
15	Channel	20825	21100	21375
	Frequency	2507.5	2535	2562.5
10	Channel	20800	21100	21400
	Frequency	2505	2535	2565
5	Channel	20775	21100	21425
	Frequency	2502.5	2535	2567.5

LTE Band 12 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
10	Channel	23060	23095	23130
	Frequency	704	707.5	711
5	Channel	23035	23095	23155
	Frequency	701.5	707.5	713.5
3	Channel	23025	23095	23165
	Frequency	700.5	707.5	714.5
1.4	Channel	23017	23095	23173
	Frequency	699.7	707.5	715.3

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LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5

LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5

LTE Band 25 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	26140	26340	26590
	Frequency	1860	1880	1905
15	Channel	26115	26340	26615
	Frequency	1857.5	1880	1907.5
10	Channel	26090	26340	26640
	Frequency	1855	1880	1910
5	Channel	26065	26340	26665
	Frequency	1852.5	1880	1912.5
3	Channel	26055	26340	26675
	Frequency	1851.5	1880	1913.5
1.4	Channel	26047	26340	26683
	Frequency	1850.7	1880	1914.3

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LTE Band 26A Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
15	Channel	26865	26915	26965
	Frequency	831.5	836.5	841.5
10	Channel	26840	26915	26990
	Frequency	829	836.5	844
5	Channel	26815	26915	27015
	Frequency	826.5	836.5	846.5
3	Channel	26805	26915	27025
	Frequency	825.5	836.5	847.5
1.4	Channel	26797	26915	27033
	Frequency	824.7	836.5	848.3

LTE Band 26B Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
15	Channel	26765	--	--
	Frequency	821.5	--	--
10	Channel	--	26740	--
	Frequency	--	819.0	--
5	Channel	26715	26740	26765
	Frequency	816.5	819.0	821.5
3	Channel	26705	26740	26775
	Frequency	815.5	819.0	822.5
1.4	Channel	26697	26740	26783
	Frequency	814.7	819.0	823.3

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LTE Band 38 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	37850	38000	38150
	Frequency	2580	2595	2610
15	Channel	37825	38000	38175
	Frequency	2577.5	2595	2612.5
10	Channel	37800	38000	38200
	Frequency	2575	2595	2615
5	Channel	37775	38000	38225
	Frequency	2572.5	2595	2617.5

LTE Band 40 Channel and Frequency List-Lower Side				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
10	Channel	--	38750	--
	Frequency	--	2310	--
5	Channel	38725	38750	38775
	Frequency	2307.5	2310	2312.5
LTE Band 40 Channel and Frequency List-Upper Side				
10	Channel	--	39200	--
	Frequency	--	2355	--
5	Channel	39175	39200	39225
	Frequency	2352.5	2355	2357.5

LTE Band 41 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	39750	40620	41490
	Frequency	2506.0	2593.0	2680.0
15	Channel	39725	40620	41515
	Frequency	2503.5	2593.0	2682.5
10	Channel	39700	40620	41540
	Frequency	2501.0	2593.0	2685.0
5	Channel	39675	40620	41565
	Frequency	2498.5	2593.0	2687.5

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LTE Band 66 Channel and Frequency List				
BW [MHz]	Channel/Frequency (MHz)	Lowest	Middle	Highest
20	Channel	132072	132322	132572
	Frequency	1720	1745	1770
15	Channel	132047	132322	132597
	Frequency	1717.5	1745	1772.5
10	Channel	132022	132322	132622
	Frequency	1715	1745	1775
5	Channel	131997	132322	132647
	Frequency	1712.5	1745	1777.5
3	Channel	131987	132322	132657
	Frequency	1711.5	1745	1778.5
1.4	Channel	131979	132322	132665
	Frequency	1710.7	1745	1779.3

Test Mode	Test Modes Description
LTE BAND 2	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 4	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 5	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 7	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 12	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 13	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 25	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 26A	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 26B	LTE system, QPSK modulation
	LTE system, 16QAM modulation

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LTE BAND 38	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 40	LTE system, QPSK modulation
	LTE system, 16QAM modulation
LTE BAND 66	LTE system, QPSK modulation
	LTE system, 16QAM modulation

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- **According to 3GPP 36.521 sub-clause 6.2.3.3, the maximum output power is allowed to be reduced by following the table.**

Table 6.2.3.3-1: Maximum Power Reduction (MPR) For Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth configuration [RB]						MPR (dB)
	1.4 MHz	3.0 MHz	5MHz	10MHz	15MHz	20MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

- The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (For PRACH, PUCCH and SRS transmission, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.).
- When PRACH, PUCCH are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.
- For each subframe, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) within the slot, the maximum MPR over the two slots is then applied for the entire subframe.
- For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply.
- The normative reference for this requirement is TS 36.101 clause 6.2.3.
- The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

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7. Equivalent (Isotropic) Radiated Power

7.1 Provisions Applicable

The conduction test is carried out in a shielded room.
According to the test, connect the device under test to the antenna port on the non-conductive platform directly to the test device for evaluation and measurement (ANSI-C63.26-2015 Clause 5.2)
The following rules are for the maximum radiated power limit requirements of the product:

Mode	Nominal Max. Power
LTE Band 2	< 2 Watts max. EIRP (33dBm)
LTE Band 4	< 1 Watts max. EIRP (30dBm)
LTE Band 5	< 7 Watts max. ERP (38.45dBm)
LTE Band 7	< 2 Watts max. EIRP (33dBm)
LTE Band 12	< 3 Watts max. ERP (34.77dBm)
LTE Band 13	< 3 Watts max. ERP (34.77dBm)
LTE Band 17	< 3 Watts max. ERP (34.77dBm)
LTE Band 25	< 2 Watts max. EIRP (33dBm)
LTE Band 26A	< 7 Watts max. ERP (38.45dBm)
LTE Band 26B	< 7 Watts max. ERP (38.45dBm) < 100 Watts. Conducted Power (50dBm)
LTE Band 38	< 2 Watts max. EIRP (33dBm)
LTE Band 40	< 0.25 Watts max. EIRP (23.98dBm)
LTE Band 41	< 2 Watts max. EIRP (33dBm)
LTE Band 66	< 1 Watts max. EIRP (30dBm)

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7.2 Measurement Procedure

■ **Measure the conducted average power as follows:**

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
3. The path loss was compensated to the results for each measurement.
4. Measure the maximum burst average power and average power for other modulation signal.
5. The software records its average power as (P_{Meas})

■ **The radiation power method is as follows**

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

$$ERP/EIRP = P_{Meas} + G_T - L_C$$

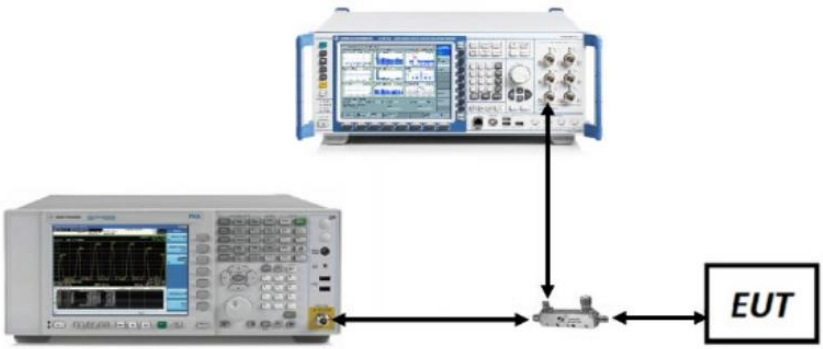
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

- P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;
- G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

If the Fundamental frequency is below 1GHz, RF output power has been converted to EIRP.

$$EIRP\ (dBm) = ERP\ (dBm) + 2.15$$

7.3 Measurement Setup



7.4 Measurement Result

Note: The test data please reference to attachment “AGC14499241201FR07_Appendix Data”

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8. Peak-To-Average Ratio

8.1 Provisions Applicable

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

8.2 Measurement Procedure

CCDF Procedure for PAPR:

1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Set the measurement interval as follows:
   - for continuous transmissions, set to 1 ms,
   - or burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time
4. that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

Alternate Procedure for PAPR:

Use one of the procedures presented in 5.2(ANSI C63.26-2015) to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 5.2(ANSI C63.26-2015) to measure the total average power and recordas PAvg. Determine the P.A.R. from:

P.A.R(dB) = PPk (dBm) – PAvg (dBm) (PAvg = Average Power + Duty cycle Factor)

■ **<u>Test Settings (Peak Power):</u>**

The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW ≥ 3 × RBW.

1. Set the RBW ≥ OBW.
2. Set VBW ≥ 3 × RBW.
3. Set span ≥ 2 × OBW.
4. Sweep time ≥ 10 × (number of points in sweep) × (transmission symbol period).
5. Detector = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the peak amplitude level.

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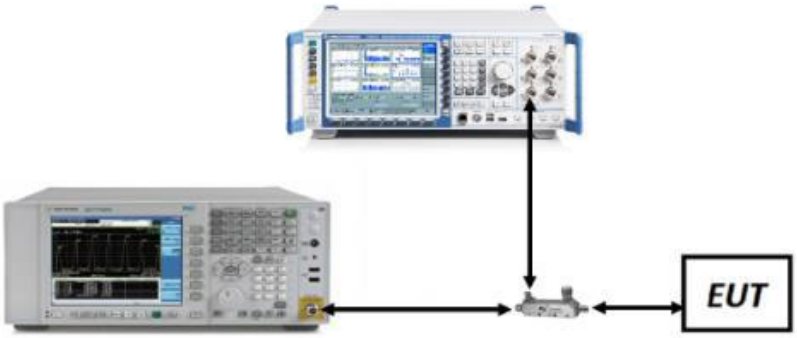
■ **Test Settings (Average Power):**

1. Set span to 2 × to 3 × the OBW.
2. Set RBW ≥ OBW.
3. Set VBW ≥ 3 × RBW.
4. Set number of measurement points in sweep ≥ 2 × span / RBW.
5. Sweep time: Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (Automation-compatible) measurement. The transmission period is the (on + off) time.
6. Detector = power averaging (rms).
7. Set sweep trigger to “free run.”
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
9. Use the peak marker function to determine the maximum amplitude level.
10. Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power
11. during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

8.3 Measurement Setup



8.4 Measurement Result

Note: The test data please reference to attachment “AGC14499241201FR07_Appendix Data”

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9. Spurious and Harmonic Emissions at Antenna Terminal

9.1 Provisions Applicable

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

- General limit requirements for measurement frequency bands:

(Involving frequency band Band2/4/5/12/13/14/25/26/38/40/41/66/71)

The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

- The limits required by special restrictions correspond to the measurement frequency band:
  - For Band 7:
    - 40 + 10 log10 p from the channel edges to 5 MHz away.
    - 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
    - 55 + 10 log10 p at X MHz and beyond from the channel edges
  - For Band 13:
    - On all frequencies between 763-775 MHz and 793-805 MHz:< 65 + 10log10 (P[Watts])
  - For Band 14:
    - On all frequencies between 769-775 MHz and 799-805 MHz:< 65 + 10log10 (P[Watts])
  - For Band 38/41:
    - 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.
    - 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge.
    - The attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz.
    - 55 + 10 log (P) dB at or below 2490.5 MHz.
    - X is the greater of 6MHz or the actual emission bandwidth.

9.2 Measurement Procedure

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. RBW = 1 MHz
3. VBW ≥ 3 MHz
4. Detector = RMS
5. Trace Mode = Average

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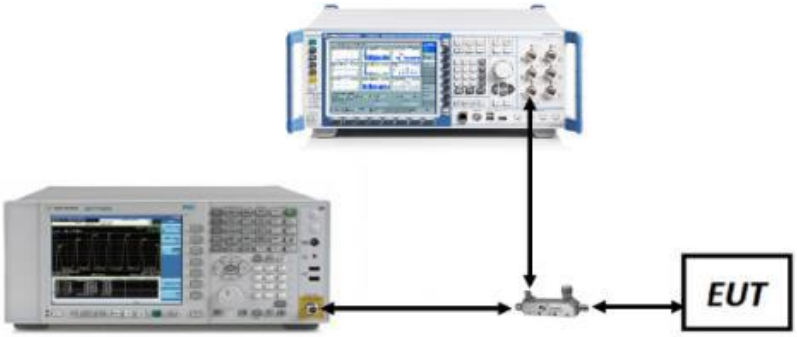
6. Sweep time = auto
7. Number of points in sweep ≥ 2 * Span / RBW

Test Note

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

9.3 Measurement Setup



9.4 Measurement Result

Note:

1. The test data please reference to attachment “AGC14499241201FR07_Appendix Data”
2. No transmission signal is found in standby or receiving mode, and the default value is lower than the limit of 20dB, which is not recorded in this report.

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10. Radiated Spurious Emission

10.1 Provisions Applicable

1. The general requirement for all radiated spurious emissions is: the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm.
2. For special radiation spurious emission requirements, please refer to the specific divisions in Chapter 10.1 of this report.
3. For Undesirable Emissions in the 1559 – 1610 MHz band (Only available for Band 13&14):
   - 70dBW/MHz (-40dBm/MHz) EIRP (Wideband Limit)
   - 80dBW/MHz (-50dBm/MHz) EIRP (Narrowband Limit)

10.2 Measurement Procedure

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.

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9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
11. For spurious emissions above 1GHz, a horn antenna is substituted in place of the EUT.
    The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.
    The spurious emissions is calculated by the following formula:

    Result(dBm) = Pg(dBm) +Factor(dB)

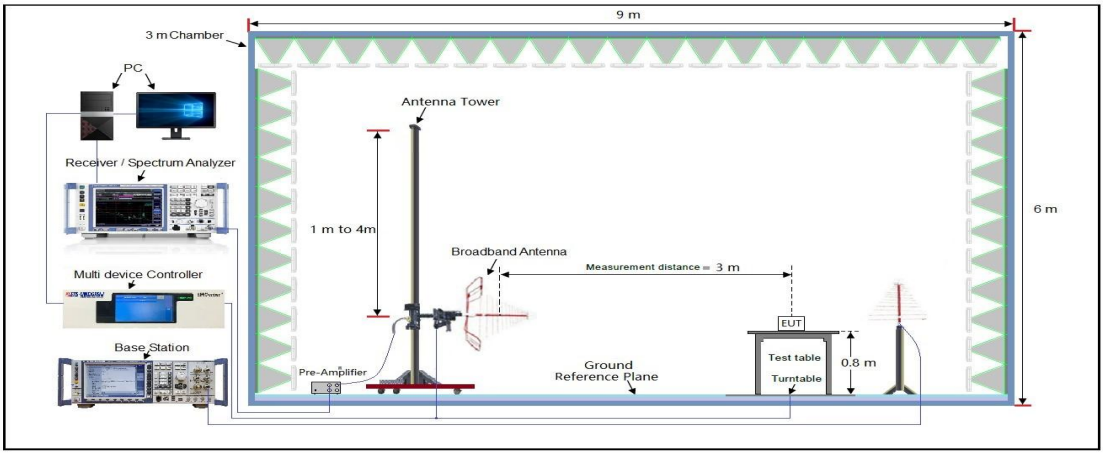
    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) + Power Splitter(dB) (Above 1GHz)

    Factor(dB) = Ant Gain(dB)-Cable Loss(dB) (Below 1GHz)
12. Where: Pgis the generator output power into the substitution antenna.
13. If the fundalmatal frequency is below 1GHz, RF output power has been converted to EIRP.

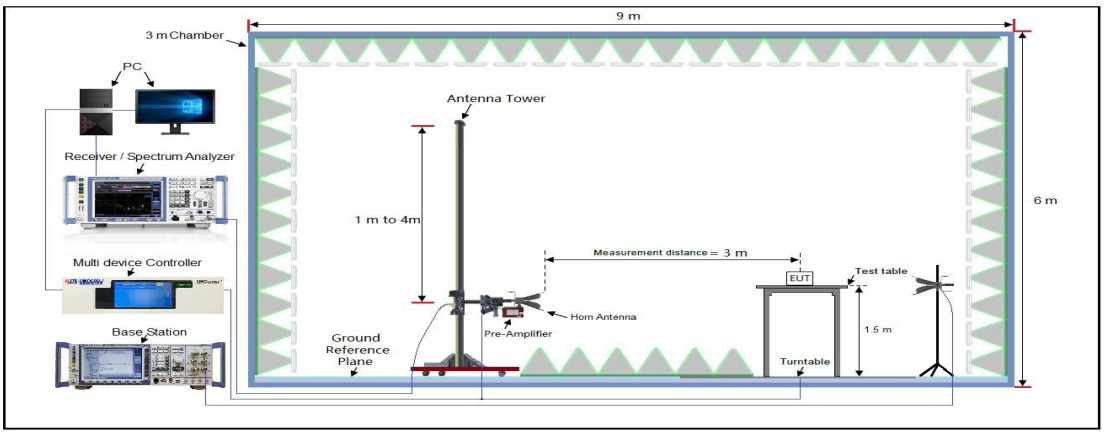
    EIRP(dBm) = ERP(dBm) + 2.15

10.3 Measurement Setup

Radiated Emissions 30MHz to 1GHz Test setup



Radiated Emissions Above 1GHz Test setup



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10.4 Measurement Result

LTE Band 2 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	5640.0	-42.97	5.66	-37.31	-13	-24.31	V
	3760.0	-32.94	2.09	-30.85	-13	-17.85	V
	818.12	-63.49	37.96	-25.53	-13	-12.53	V
	612.73	-62.50	35.44	-27.05	-13	-14.05	V
	5640.0	-45.89	5.66	-40.24	-13	-27.24	H
	3760.0	-37.28	2.09	-35.20	-13	-22.20	H
	851.24	-69.30	37.96	-31.34	-13	-18.34	H
	732.53	-68.87	35.44	-33.43	-13	-20.43	H

LTE Band 2 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	5580.0	-43.29	5.59	-37.70	-13	-24.70	V
	3720.0	-33.68	2.11	-31.57	-13	-18.57	V
	695.41	-64.80	35.22	-29.58	-13	-16.58	V
	412.52	-62.34	30.77	-31.58	-13	-18.58	V
	5580.0	-45.35	5.59	-39.76	-13	-26.76	H
	3720.0	-37.17	2.11	-35.06	-13	-22.06	H
	678.43	-69.06	35.22	-33.84	-13	-20.84	H
	452.15	-69.66	30.77	-38.90	-13	-25.90	H

LTE Band 2 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	5700.0	-44.30	5.72	-38.58	-13	-25.58	V
	3800.0	-33.65	2.07	-31.59	-13	-18.59	V
	664.14	-63.49	35.14	-28.36	-13	-15.36	V
	525.23	-62.20	32.43	-29.78	-13	-16.78	V
	5700.0	-45.60	5.72	-39.88	-13	-26.88	H
	3800.0	-37.28	2.07	-35.22	-13	-22.22	H
	669.10	-69.12	35.14	-33.99	-13	-20.99	H
	574.12	-69.30	32.43	-36.88	-13	-23.88	H

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LTE Band 4 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	5160.0	-43.87	4.81	-39.06	-13	-26.06	V
	3440.0	-32.87	2.16	-30.70	-13	-17.70	V
	745.15	-64.70	36.73	-27.97	-13	-14.97	V
	528.52	-62.16	32.50	-29.66	-13	-16.66	V
	5160.0	-46.57	4.81	-41.76	-13	-28.76	H
	3440.0	-37.42	2.16	-35.25	-13	-22.25	H
	520.63	-69.34	36.73	-32.61	-13	-19.61	H
	395.41	-68.94	32.50	-36.44	-13	-23.44	H

LTE Band 4 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	5197.5	-42.74	4.89	-37.85	-13	-24.85	V
	3465.0	-33.76	2.19	-31.56	-13	-18.56	V
	669.23	-65.20	35.15	-30.05	-13	-17.05	V
	512.41	-62.85	32.12	-30.73	-13	-17.73	V
	5197.5	-46.75	4.89	-41.86	-13	-28.86	H
	3465.0	-37.40	2.19	-35.21	-13	-22.21	H
	569.10	-69.19	35.15	-34.04	-13	-21.04	H
	469.11	-69.34	32.12	-37.22	-13	-24.22	H

LTE Band 4 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	5235.0	-43.94	4.96	-38.97	-13	-25.97	V
	3490.0	-34.03	2.23	-31.80	-13	-18.80	V
	711.14	-64.84	35.60	-29.24	-13	-16.24	V
	528.36	-63.03	32.50	-30.53	-13	-17.53	V
	5235.0	-45.80	4.96	-40.84	-13	-27.84	H
	3490.0	-36.68	2.23	-34.46	-13	-21.46	H
	612.12	-68.67	35.60	-33.07	-13	-20.07	H
	553.25	-69.31	32.50	-36.81	-13	-23.81	H

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LTE Band 5 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2487.0	-42.87	2.00	-40.87	-13	-27.87	V
	1658.0	-33.15	-1.63	-34.78	-13	-21.78	V
	512.15	-64.08	32.11	-31.97	-13	-18.97	V
	365.36	-62.78	29.11	-33.66	-13	-20.66	V
	2487.0	-45.08	2.00	-43.08	-13	-30.08	H
	1658.0	-36.50	-1.63	-38.14	-13	-25.14	H
	521.02	-69.20	32.11	-37.08	-13	-24.08	H
	336.41	-68.73	29.11	-39.62	-13	-26.62	H

LTE Band 5 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2509.5	-43.91	2.01	-41.90	-13	-28.90	V
	1673.0	-34.26	-1.51	-35.77	-13	-22.77	V
	725.01	-63.89	36.06	-27.83	-13	-14.83	V
	616.23	-63.32	35.41	-27.91	-13	-14.91	V
	2509.5	-46.87	2.01	-44.86	-13	-31.86	H
	1673.0	-37.70	-1.51	-39.21	-13	-26.21	H
	705.15	-69.41	36.06	-33.35	-13	-20.35	H
	558.52	-68.76	35.41	-33.35	-13	-20.35	H

LTE Band 5 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2532.0	-43.61	1.99	-41.62	-13	-28.62	V
	1688.0	-34.43	-1.38	-35.81	-13	-22.81	V
	648.36	-63.43	35.12	-28.32	-13	-15.32	V
	482.47	-62.12	32.02	-30.10	-13	-17.10	V
	2532.0	-46.89	1.99	-44.90	-13	-31.90	H
	1688.0	-37.21	-1.38	-38.59	-13	-25.59	H
	785.02	-68.48	35.12	-33.37	-13	-20.37	H
	615.12	-70.49	32.02	-38.47	-13	-25.47	H

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LTE Band 7 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	7507.5	-48.84	7.23	-41.61	-25	-16.61	V
	5005.0	-50.56	4.50	-46.06	-25	-21.06	V
	925.25	-90.63	38.08	-52.55	-25	-27.55	V
	678.12	-87.18	35.17	-52.01	-25	-27.01	V
	7507.5	-50.49	7.23	-43.26	-25	-18.26	H
	5005.0	-50.78	4.50	-46.28	-25	-21.28	H
	873.34	-89.92	38.08	-51.84	-25	-26.84	H
	662.16	-92.81	35.17	-57.63	-25	-32.63	H

LTE Band 7 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	7605.0	-47.75	7.23	-40.52	-25	-15.52	V
	5070.0	-50.53	4.63	-45.90	-25	-20.90	V
	833.16	-90.49	38.17	-52.32	-25	-27.32	V
	521.05	-89.96	32.33	-57.64	-25	-32.64	V
	7605.0	-49.36	7.23	-42.13	-25	-17.13	H
	5070.0	-51.56	4.63	-46.93	-25	-21.93	H
	819.43	-92.44	38.17	-54.28	-25	-29.28	H
	520.12	-89.72	32.33	-57.40	-25	-32.40	H

LTE Band 7 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	7702.5	-46.07	7.23	-38.84	-25	-13.84	V
	5135.0	-51.38	4.76	-46.61	-25	-21.61	V
	752.63	-90.49	36.93	-53.56	-25	-28.56	V
	511.11	-89.20	32.09	-57.12	-25	-32.12	V
	7702.59	-49.95	7.23	-42.72	-25	-17.72	H
	5135.0	-51.77	4.76	-47.01	-25	-22.01	H
	701.02	-90.76	36.93	-53.83	-25	-28.83	H
	507.42	-90.89	32.09	-58.80	-25	-33.80	H

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LTE Band 12 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2112.0	-44.02	1.37	-42.65	-13	-29.65	V
	1408.0	-32.96	-3.27	-36.23	-13	-23.23	V
	658.75	-65.10	35.12	-29.98	-13	-16.98	V
	516.92	-62.15	32.23	-29.92	-13	-16.92	V
	2112.0	-45.00	1.37	-43.63	-13	-30.63	H
	1408.0	-37.51	-3.27	-40.78	-13	-27.78	H
	714.16	-69.22	35.12	-34.10	-13	-21.10	H
	669.17	-69.75	32.23	-37.53	-13	-24.53	H

LTE Band 12 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2122.5	-43.22	1.39	-41.83	-13	-28.83	V
	1415.0	-32.79	-3.24	-36.04	-13	-23.04	V
	651.47	-64.40	35.10	-29.30	-13	-16.30	V
	512.41	-63.42	32.12	-31.30	-13	-18.30	V
	2122.5	-46.18	1.39	-44.79	-13	-31.79	H
	1415.0	-36.37	-3.24	-39.61	-13	-26.61	H
	525.20	-69.00	35.10	-33.90	-13	-20.90	H
	498.12	-69.93	32.12	-37.81	-13	-24.81	H

LTE Band 12 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2133.0	-42.75	1.40	-41.35	-13	-28.35	V
	1422.0	-34.46	-3.22	-37.67	-13	-24.67	V
	653.03	-64.49	35.11	-29.38	-13	-16.38	V
	592.14	-63.28	35.16	-28.12	-13	-15.12	V
	2133.0	-45.04	1.40	-43.63	-13	-30.63	H
	1422.0	-37.76	-3.22	-40.97	-13	-27.97	H
	641.03	-68.41	35.11	-33.30	-13	-20.30	H
	558.52	-68.83	35.16	-33.66	-13	-20.66	H

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LTE Band 13 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2338.5	-87.88	37.37	-50.51	-13	-37.51	V
	1559.0	-95.35	37.41	-57.94	-40	-17.94	V
	678.89	-94.18	37.46	-56.72	-13	-43.72	V
	423.45	-96.06	37.37	-58.69	-40	-18.69	V
	2338.5	-92.89	37.41	-55.48	-13	-42.48	H
	1559.0	-92.92	37.46	-55.47	-40	-15.47	H
	577.53	-94.43	37.37	-57.06	-13	-44.06	H
	345.14	-90.31	37.41	-52.89	-13	-39.89	H

LTE Band 13 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2346.0	-89.95	37.37	-52.58	-13	-39.58	V
	1564.0	-95.77	37.41	-58.35	-40	-18.35	V
	611.52	-92.84	37.46	-55.38	-13	-42.38	V
	444.25	-93.64	37.37	-56.27	-40	-16.27	V
	2346.0	-92.92	37.41	-55.51	-13	-42.51	H
	1564.0	-94.13	37.46	-56.68	-40	-16.68	H
	692.14	-92.82	37.37	-55.45	-13	-42.45	H
	439.26	-89.08	37.41	-51.66	-13	-38.66	H

LTE Band 13 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2353.5	-88.18	37.37	-50.81	-13	-37.81	V
	1569.0	-94.71	37.41	-57.29	-40	-17.29	V
	572.78	-93.92	37.46	-56.47	-13	-43.47	V
	309.44	-94.81	37.37	-57.44	-40	-17.44	V
	2353.5	-92.33	37.41	-54.91	-13	-41.91	H
	1569.0	-94.28	37.46	-56.83	-40	-16.83	H
	602.36	-95.05	37.37	-57.68	-13	-44.68	H
	413.17	-89.21	37.41	-51.79	-13	-38.79	H

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LTE Band 17 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2119.5	-42.39	1.38	-41.01	-13	-28.01	V
	1413.0	-32.91	-3.25	-36.16	-13	-23.16	V
	652.51	-64.38	35.11	-29.28	-13	-16.28	V
	431.23	-62.88	31.58	-31.30	-13	-18.30	V
	2119.5	-45.55	1.38	-44.17	-13	-31.17	H
	1413.0	-37.12	-3.25	-40.37	-13	-27.37	H
	547.12	-69.69	35.11	-34.58	-13	-21.58	H
	425.62	-68.85	31.58	-37.27	-13	-24.27	H

LTE Band 17 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2130.0	-42.90	1.40	-41.50	-13	-28.50	V
	1420.0	-33.87	-3.22	-37.10	-13	-24.10	V
	625.42	-64.51	35.33	-29.19	-13	-16.19	V
	498.16	-62.60	31.84	-30.76	-13	-17.76	V
	2130.0	-46.82	1.40	-45.42	-13	-32.42	H
	1420.0	-37.54	-3.22	-40.77	-13	-27.77	H
	515.26	-68.60	35.33	-33.28	-13	-20.28	H
	412.44	-69.10	31.84	-37.26	-13	-24.26	H

LTE Band 17 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2140.5	-42.60	1.42	-41.18	-13	-28.18	V
	1427.0	-33.55	-3.20	-36.75	-13	-23.75	V
	577.41	-64.07	34.41	-29.66	-13	-16.66	V
	412.26	-62.10	30.75	-31.35	-13	-18.35	V
	2140.5	-46.63	1.42	-45.22	-13	-32.22	H
	1427.0	-37.81	-3.20	-41.01	-13	-28.01	H
	505.25	-69.01	34.41	-34.60	-13	-21.60	H
	401.47	-69.01	30.75	-38.26	-13	-25.26	H

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LTE Band 25 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	5580	-43.35	5.59	-37.76	-13	-24.76	V
	3720	-33.88	2.11	-31.77	-13	-18.77	V
	718.12	-64.05	35.83	-28.22	-13	-15.22	V
	523.63	-62.47	32.39	-30.08	-13	-17.08	V
	5580	-46.92	5.59	-41.33	-13	-28.33	H
	3720	-36.55	2.11	-34.44	-13	-21.44	H
	613.37	-69.54	35.83	-33.71	-13	-20.71	H
	352.95	-69.06	32.39	-36.68	-13	-23.68	H

LTE Band 25 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	5647.5	-42.86	5.67	-37.19	-13	-24.19	V
	3765.0	-33.67	2.09	-31.58	-13	-18.58	V
	596.12	-63.73	35.36	-28.37	-13	-15.37	V
	678.05	-62.73	35.17	-27.55	-13	-14.55	V
	5647.5	-46.48	5.67	-40.81	-13	-27.81	H
	3765.0	-38.19	2.09	-36.10	-13	-23.10	H
	655.77	-69.27	35.36	-33.90	-13	-20.90	H
	411.12	-70.26	35.17	-35.09	-13	-22.09	H

LTE Band 25 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	5715.0	-43.64	5.74	-37.90	-13	-24.90	V
	3810.0	-34.29	2.06	-32.23	-13	-19.23	V
	486.63	-64.84	31.98	-32.86	-13	-19.86	V
	256.58	-63.43	29.67	-33.77	-13	-20.77	V
	5715.0	-46.91	5.74	-41.17	-13	-28.17	H
	3810.0	-38.27	2.06	-36.21	-13	-23.21	H
	574.14	-68.70	31.98	-36.73	-13	-23.73	H
	398.52	-68.90	29.67	-39.23	-13	-26.23	H

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LTE Band 26A / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2494.5	-43.68	2.01	-41.67	-13	-28.67	V
	1663.0	-32.85	-1.59	-34.44	-13	-21.44	V
	563.41	-65.22	33.70	-31.52	-13	-18.52	V
	315.25	-61.76	28.64	-33.11	-13	-20.11	V
	2494.5	-46.31	2.01	-44.29	-13	-31.29	H
	1663.0	-37.31	-1.59	-38.90	-13	-25.90	H
	463.47	-68.85	33.70	-35.15	-13	-22.15	H
	367.32	-69.70	28.64	-41.06	-13	-28.06	H

LTE Band 26A / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2509.5	-42.62	2.01	-40.61	-13	-27.61	V
	1673.0	-33.94	-1.51	-35.45	-13	-22.45	V
	654.42	-63.59	35.11	-28.47	-13	-15.47	V
	543.16	-61.67	32.86	-28.81	-13	-15.81	V
	2509.5	-45.12	2.01	-43.11	-13	-30.11	H
	1673.0	-36.41	-1.51	-37.92	-13	-24.92	H
	615.25	-69.16	35.11	-34.05	-13	-21.05	H
	363.42	-68.81	32.86	-35.95	-13	-22.95	H

LTE Band 26A / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2524.5	-44.17	2.00	-42.17	-13	-29.17	V
	1683.0	-34.61	-1.43	-36.03	-13	-23.03	V
	526.05	-65.08	32.45	-32.63	-13	-19.63	V
	364.15	-61.98	29.07	-32.90	-13	-19.90	V
	2524.5	-46.21	2.00	-44.21	-13	-31.21	H
	1683.0	-37.71	-1.43	-39.14	-13	-26.14	H
	683.36	-68.56	32.45	-36.12	-13	-23.12	H
	475.74	-69.53	29.07	-40.46	-13	-27.46	H

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LTE Band 26B / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	2444.1	-44.18	1.93	-42.25	-13	-29.25	V
	1638.0	-32.95	-1.80	-34.75	-13	-21.75	V
	842.53	-65.29	38.30	-26.99	-13	-13.99	V
	596.42	-62.46	35.38	-27.09	-13	-14.09	V
	2444.1	-45.97	1.93	-44.04	-13	-31.04	H
	1638.0	-37.75	-1.80	-39.54	-13	-26.54	H
	774.17	-68.53	38.30	-30.24	-13	-17.24	H
	617.56	-70.24	35.38	-34.86	-13	-21.86	H

LTE Band 26B / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	2457.0	-43.64	1.95	-41.69	-13	-28.69	V
	1638.0	-34.09	-1.80	-35.89	-13	-22.89	V
	745.44	-64.92	36.74	-28.18	-13	-15.18	V
	512.23	-63.48	32.11	-31.36	-13	-18.36	V
	2457.0	-45.17	1.95	-43.22	-13	-30.22	H
	1638.0	-38.09	-1.80	-39.89	-13	-26.89	H
	693.27	-70.16	36.74	-33.42	-13	-20.42	H
	497.16	-69.29	32.11	-37.17	-13	-24.17	H

LTE Band 26B / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	2469.9	-43.63	1.97	-41.66	-13	-28.66	V
	1646.6	-34.67	-1.72	-36.40	-13	-23.40	V
	882.26	-63.38	37.82	-25.56	-13	-12.56	V
	694.75	-62.22	35.22	-27.01	-13	-14.01	V
	2469.98	-45.65	1.97	-43.68	-13	-30.68	H
	1646.64	-38.16	-1.72	-39.88	-13	-26.88	H
	745.15	-69.92	37.82	-32.10	-13	-19.10	H
	569.36	-70.24	35.22	-35.02	-13	-22.02	H

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LTE Band 38 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	7717.5	-46.42	7.23	-39.19	-25	-14.19	V
	5145.0	-48.24	4.78	-43.46	-25	-18.46	V
	881.63	-88.13	37.83	-50.30	-25	-25.30	V
	594.78	-86.68	35.29	-51.38	-25	-26.38	V
	7717.5	-48.54	7.23	-41.31	-25	-16.31	H
	5145.0	-50.19	4.78	-45.41	-25	-20.41	H
	463.52	-89.75	37.83	-51.92	-25	-26.92	H
	367.53	-92.79	35.29	-57.50	-25	-32.50	H

LTE Band 38 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	7785.0	-49.17	7.23	-41.94	-25	-16.94	V
	5190.0	-49.98	4.87	-45.11	-25	-20.11	V
	674.53	-89.98	35.16	-54.82	-25	-29.82	V
	493.74	-89.23	31.89	-57.33	-25	-32.33	V
	7785.0	-47.76	7.23	-40.53	-25	-15.53	H
	5190.0	-52.83	4.87	-47.96	-25	-22.96	H
	421.66	-90.51	35.16	-55.35	-25	-30.35	H
	203.58	-91.58	31.89	-59.69	-25	-34.69	H

LTE Band 38 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	7851.0	-48.58	7.23	-41.35	-25	-16.35	V
	5235.0	-50.93	4.96	-45.97	-25	-20.97	V
	745.69	-89.28	36.75	-52.54	-25	-27.54	V
	582.46	-88.10	34.67	-53.43	-25	-28.43	V
	7851.0	-49.62	7.23	-42.39	-25	-17.39	H
	5235.0	-52.25	4.96	-47.28	-25	-22.28	H
	742.77	-91.57	36.75	-54.82	-25	-29.82	H
	652.54	-92.58	34.67	-57.92	-25	-32.92	H

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LTE Band 40 Lower Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	6922.5	-51.61	7.23	-44.37	-40	-4.37	V
	4615.0	-53.74	4.21	-49.53	-40	-9.53	V
	857.39	-92.20	38.27	-53.94	-40	-13.94	V
	921.64	-92.01	37.99	-54.01	-40	-14.01	V
	6922.5	-54.08	7.23	-46.84	-40	-6.84	H
	4615.0	-57.36	4.21	-53.15	-40	-13.15	H
	584.32	-94.59	38.27	-56.32	-40	-16.32	H
	462.89	-95.75	37.99	-57.76	-40	-17.76	H

LTE Band 40 Lower Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	6930.0	-51.38	7.24	-44.14	-40	-4.14	V
	4620.0	-53.76	4.22	-49.54	-40	-9.54	V
	587.64	-92.65	34.93	-57.72	-40	-17.72	V
	415.92	-91.98	30.91	-61.07	-40	-21.07	V
	6930	-54.41	7.24	-47.17	-40	-7.17	H
	4620	-57.51	4.22	-53.29	-40	-13.29	H
	469.56	-94.76	34.93	-59.83	-40	-19.83	H
	351.27	-95.34	30.91	-64.43	-40	-24.43	H

LTE Band 40 Lower Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	6937.5	-50.59	7.25	-43.33	-40	-3.33	V
	4625.0	-54.44	4.22	-50.22	-40	-10.22	V
	785.46	-91.52	37.47	-54.05	-40	-14.05	V
	569.35	-92.29	34.00	-58.29	-40	-18.29	V
	6937.5	-54.00	7.25	-46.75	-40	-6.75	H
	4625.0	-56.76	4.22	-52.54	-40	-12.54	H
	699.74	-95.37	37.47	-57.90	-40	-17.90	H
	512.02	-95.84	34.00	-61.84	-40	-21.84	H

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LTE Band 40 Upper Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	7057.5	-50.86	7.32	-43.54	-40	-3.54	V
	4705.0	-52.86	4.28	-48.58	-40	-8.58	V
	763.63	-92.77	37.11	-55.65	-40	-15.65	V
	512.52	-91.39	32.12	-59.27	-40	-19.27	V
	7057.5	-53.28	7.32	-45.96	-40	-5.96	H
	4705.0	-57.33	4.28	-53.06	-40	-13.06	H
	496.12	-93.90	37.11	-56.78	-40	-16.78	H
	359.15	-95.58	32.12	-63.46	-40	-23.46	H

LTE Band 40 Upper Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	6930.0	-51.92	7.24	-44.67	-40	-4.67	V
	4620.0	-54.33	4.22	-50.12	-40	-10.12	V
	587.43	-92.04	34.92	-57.12	-40	-17.12	V
	415.58	-92.00	30.90	-61.10	-40	-21.10	V
	6930.0	-53.47	7.24	-46.23	-40	-6.23	H
	4620.0	-56.84	4.22	-52.62	-40	-12.62	H
	469.45	-94.34	34.92	-59.41	-40	-19.41	H
	351.52	-95.89	30.90	-64.99	-40	-24.99	H

LTE Band 40 Upper Side / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	6937.5	-51.56	7.25	-44.30	-40	-4.30	V
	4625.0	-54.02	4.22	-49.80	-40	-9.80	V
	785.16	-92.25	37.47	-54.78	-40	-14.78	V
	569.54	-92.19	34.01	-58.18	-40	-18.18	V
	6937.55	-54.23	7.25	-46.98	-40	-6.98	H
	4625.0	-57.77	4.22	-53.55	-40	-13.55	H
	699.41	-95.36	37.47	-57.90	-40	-17.90	H
	512.12	-95.77	34.01	-61.76	-40	-21.76	H

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LTE Band 41 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	7495.5	-48.40	7.23	-41.17	-25	-16.17	V
	4997.0	-50.06	4.49	-45.57	-25	-20.57	V
	612.63	-89.33	35.44	-53.88	-25	-28.88	V
	483.78	-88.34	32.01	-56.33	-25	-31.33	V
	7495.5	-49.30	7.23	-42.07	-25	-17.07	H
	4997.0	-50.56	4.49	-46.07	-25	-21.07	H
	742.44	-89.22	35.44	-53.78	-25	-28.78	H
	563.42	-92.19	32.01	-60.18	-25	-35.18	H

LTE Band 41 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	7779.0	-46.90	7.23	-39.67	-25	-14.67	V
	5186.0	-51.07	4.87	-46.21	-25	-21.21	V
	568.16	-91.05	33.94	-57.10	-25	-32.10	V
	341.25	-86.88	28.63	-58.25	-25	-33.25	V
	7779.0	-50.01	7.23	-42.78	-25	-17.78	H
	5186.0	-52.52	4.87	-47.65	-25	-22.65	H
	552.37	-89.61	33.94	-55.67	-25	-30.67	H
	421.46	-92.79	28.63	-64.17	-25	-39.17	H

LTE Band 41 / 5MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	8062.5	-47.71	7.38	-40.33	-25	-15.33	V
	5375.0	-48.42	5.25	-43.18	-25	-18.18	V
	642.74	-88.98	35.17	-53.81	-25	-28.81	V
	471.55	-88.00	32.15	-55.85	-25	-30.85	V
	8062.5	-47.25	7.38	-39.87	-25	-14.87	H
	5375.0	-50.94	5.25	-45.70	-25	-20.70	H
	363.52	-91.59	35.17	-56.42	-25	-31.42	H
	274.16	-91.18	32.15	-59.03	-25	-34.03	H

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LTE Band 66 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Low	5132.1	-43.73	4.76	-38.97	-13	-25.97	V
	3421.4	-34.51	2.14	-32.37	-13	-19.37	V
	412.23	-64.68	30.75	-33.93	-13	-20.93	V
	263.41	-62.77	29.51	-33.26	-13	-20.26	V
	5132.1	-45.59	4.76	-40.84	-13	-27.84	H
	3421.4	-37.69	2.14	-35.55	-13	-22.55	H
	417.22	-69.21	30.75	-38.46	-13	-25.46	H
	263.14	-69.97	29.51	-40.46	-13	-27.46	H

LTE Band 66 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
Middle	5235.0	-42.38	4.96	-37.42	-13	-24.42	V
	3490.0	-33.58	2.23	-31.35	-13	-18.35	V
	361.59	-63.46	28.99	-34.47	-13	-21.47	V
	213.01	-62.22	25.57	-36.65	-13	-23.65	V
	5235.0	-45.70	4.96	-40.73	-13	-27.73	H
	3490.0	-36.61	2.23	-34.39	-13	-21.39	H
	485.78	-70.22	28.99	-41.23	-13	-28.23	H
	198.63	-70.67	25.57	-45.10	-13	-32.10	H

LTE Band 66 / 1.4MHz / QPSK							
Channel	Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)	Polarity (H/V)
High	5337.9	-42.64	5.17	-37.46	-13	-24.46	V
	3558.6	-32.79	2.21	-30.58	-13	-17.58	V
	603.52	-64.94	35.53	-29.41	-13	-16.41	V
	498.54	-62.32	31.84	-30.48	-13	-17.48	V
	5337.9	-45.97	5.17	-40.79	-13	-27.79	H
	3558.6	-38.04	2.21	-35.83	-13	-22.83	H
	365.63	-69.64	35.53	-34.11	-13	-21.11	H
	169.15	-70.45	31.84	-38.61	-13	-25.61	H

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LTE Band 13 (1559 MHz ~ 1610 MHz Wideband Band)							
Operating Frequency (MHz)	Measured Frequency (MHz)	Reading Level (dBm)	Factor (dB)	Emission Level (dBm)	Limit (dBm/MHz)	Margin (dB)	Polarity (H/V)
779.5	1559	-89.95	37.37	-52.58	-13	-39.58	V
782.0	1564	-94.20	37.41	-56.79	-40	-16.79	V
784.5	1569	-93.31	37.46	-55.85	-13	-42.85	V
779.5	1559	-94.41	37.37	-57.03	-40	-17.03	V
782.0	1564	-90.84	37.41	-53.43	-13	-40.43	H
784.5	1569	-93.23	37.46	-55.77	-40	-15.77	H
779.5	1559	-94.61	37.37	-57.23	-13	-44.23	H
782.0	1564	-89.85	37.41	-52.44	-13	-39.44	H

Note:

1. Margin(dB)=Emission Level(dBm) -Limit(dBm), Emission Level(dBm)= Reading(dBm)+Factor(dB)
2. Factor(dB) = Ant Gain -Cable Loss + Pre-amplifier
3. The radiated spurious emission has been tested with maximum bandwidth QPSK modulation, resource block size 1 and resource block offset 0.
4. The spurious emissions found in the frequency band 1559-1610MHz meet the stricter Wideband limits.
5. Below 30MHz, no spurious emission was found, and only the worst mode data above 30MHz is recorded in the report.

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11. Frequency Stability / Variation of Ambient Temperature

11.1 Provisions Applicable

11.1.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non-hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

12.1.2 For equipment powered by primary supply voltage

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

11.2 Measurement Procedure

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -10℃. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
3. Repeat the above measurements at 10℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
4. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.
5. Subject the EUT to overnight soak at +50℃.
6. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the

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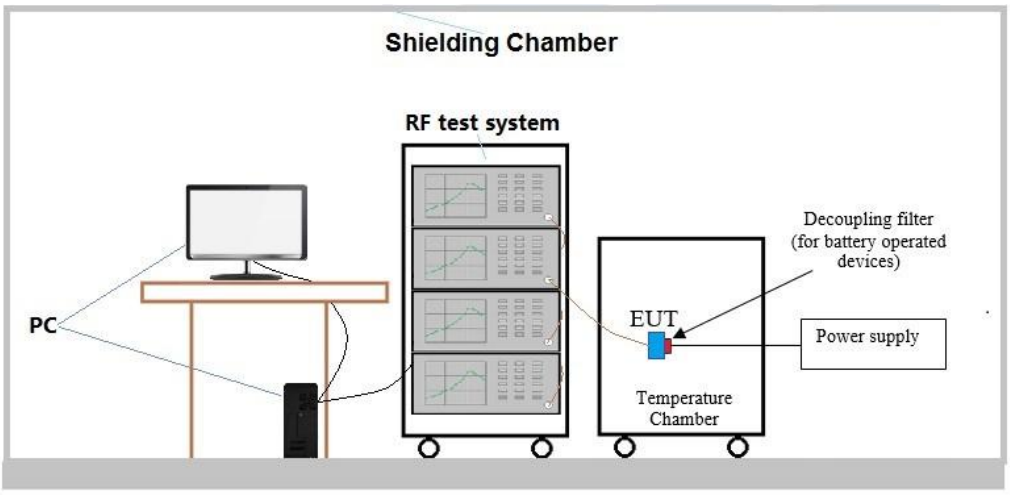
centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7. Repeat the above measurements at 10℃ increments from +50℃ to -30℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
8. At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

11.3 Measurement Setup



11.4 Measurement Result

Note: The test data please reference to attachment “AGC14499241201FR07_Appendix Data”

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12. 99% Occupied Bandwidth and 26dB Emission Bandwidth

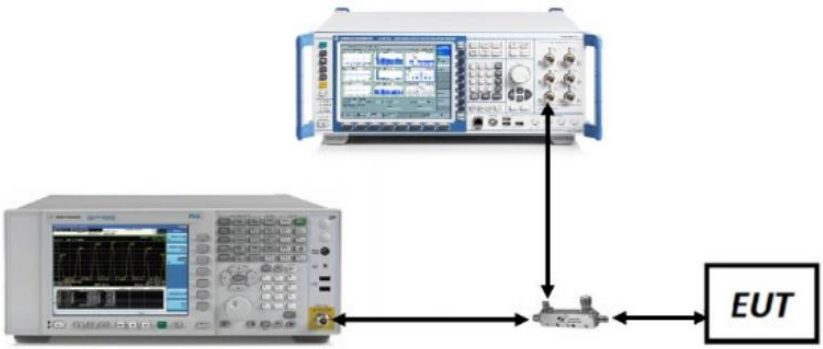
12.1 Provisions Applicable

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.
The EUT makes a call to the communication simulator.
The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

12.2 Measurement Procedure

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

12.3 Measurement Setup



12.4 Measurement Result

Note: The test data please reference to attachment "AGC14499241201FR07_Appendix Data"

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13. Band Edge Measurement

13.1 Provisions Applicable

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

13.2 Measurement Procedure

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Note

According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. All measurements were done at 2 channels (low and high operational frequency range.)
The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

- **§90.543(e)**
- On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations.
- On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.
- On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least 43 + 10 log (P) dB.
- Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.
- Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater.
- However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30kHz may be employed.

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- **§27.53(c)**

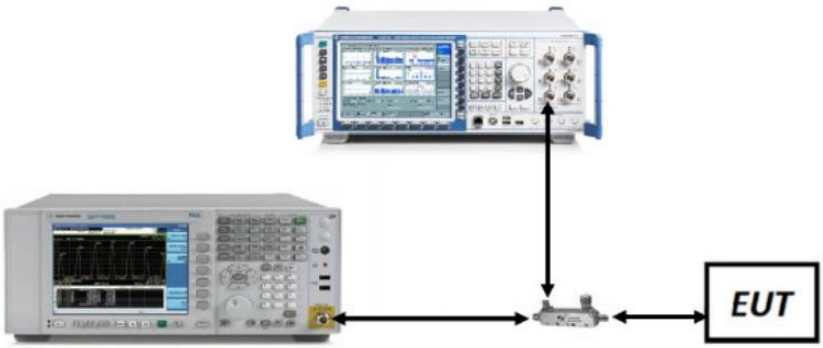
- On any frequency outside the 746–758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
- (2) On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;
- (3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

- **§27.53(m)**

Equipment shall comply with the following unwanted emission limits:

- for base station and fixed subscriber equipment, the power of any unwanted emissions measured as above shall be attenuated (in dB) below the transmitter power, P (dBW), by at least 43 + 10 log10 p
- for mobile subscriber equipment, the power of any unwanted emissions measured as above
- shall be attenuated (in dB) below the transmitter power, P (dBW), by at least:40 + 10 log10 p from the channel edges to 5 MHz away 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
- 55 + 10 log10 p at X MHz and beyond from the channel edges In addition, the attenuation shall not be less
- than 43 + 10 log10 p on all frequencies between 2490.5 MHz and 2496 MHz, and 55 + 10 log10 p at or below 2490.5 MHz.
- In (a) and (b), p is the transmitter power measured in watts and X is 6 MHz or the equipment occupied bandwidth, whichever is greater.

13.3 Measurement Setup



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13.4 Measurement Result

Note: The test data please reference to attachment “AGC14499241201FR07_Appendix Data”

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Appendix I Photographs of Test Setup

Refer to the Report No.: AGC14499241201AP04

Appendix II: Photographs of EUT

Refer to the Report No.: AGC14499241201AP03

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

-----End of Report-----

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the “Dedicated Testing/Inspection Stamp” is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.