

TEST REPORT

Reference No...... : WTD26D06190405W008
FCC ID : 2AEPIBLACKS3
Applicant..... : COLOMBIANA DE COMERCIO S.A.
Address..... : Car. 43E No 8-71, Medellin, Colombia
Manufacturer : Mobiwire Mobiles (Ningbo) Co.,Ltd
Address..... : No. 518, Changting East Road, Yuelin Street, Fenghua District, Ningbo City, Zhejiang Province, China
Product..... : Smart Phone
Model(s). : Black S3
Brand Name..... : Kalley
Standards..... : FCC CFR47 Part 22 Subpart H
FCC CFR47 Part 24 Subpart E
FCC CFR47 Part 27
Date of Receipt sample : 2026-07-03
Date of Test : 2026-07-08 to 2026-08-28
Date of Issue..... : 2026-09-01
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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3 Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD26D06190405W008	2026-07-03	2026-07-08 to 2026-08-28	2026-09-01	Original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	Smart Phone
Model(s):	Black S3
Model Description:	N/A
Test Sample No.:	1-1/1
LTE Band(s):	FDD Band 2/4/5/7/13
Hardware Version:	V00
Software Version:	Kalley_BLACK_S3_V01_20260616
Storage Location:	Internal Storage

4.2 Details of E.U.T.

Operation Frequency:	LTE Band 2: 1850~1910MHz LTE Band 4: 1710~1755MHz LTE Band 5: 824~849MHz LTE Band 7: 2500~2570MHz LTE Band 13: 777~787MHz
Max. RF output power:	LTE Band 2: 21.33dBm LTE Band 4: 21.94dBm LTE Band 5: 24.28dBm LTE Band 7: 21.70dBm LTE Band 13: 23.99dBm
ERP/EIRP:	LTE Band 2: 19.84dBm(QPSK), 20.07dBm(16QAM) LTE Band 4: 20.03dBm(QPSK), 20.54dBm(16QAM) LTE Band 5: 20.17dBm(QPSK), 19.93dBm(16QAM) LTE Band 7: 19.98dBm(QPSK), 20.11dBm(16QAM) LTE Band 13: 20.27dBm(QPSK), 19.86dBm(16QAM)
Type of Modulation:	LTE: QPSK, 16QAM
Antenna installation:	LTE: FPC Antenna
Antenna Gain:	LTE Band 2: -1.13dBi LTE Band 4: -1.39dBi LTE Band 5: -4.0dBi LTE Band 7: -1.65dBi LTE Band 13: -3.59dBi

Note:

#: The antenna gain is provided by the applicant, and the applicant should be responsible for its authenticity, WALTERK lab has not verified the authenticity of its information.

Ratings: Battery: DC 3.87V, 4900mAh, 18.97Wh

Adapter: Model: 491
Input: 100-240V~, 50/60Hz, 0.3A
Output: 5.0V==2.0A, 10.0W

Type of Emission:

- LTE Band 2 1.4MHz: 1M09G7D(QPSK), 1M08W7D(16QAM)
- LTE Band 2 3MHz: 2M68G7D(QPSK), 2M68W7D(16QAM)
- LTE Band 2 5MHz: 4M49G7D(QPSK), 4M49W7D(16QAM)
- LTE Band 2 10 MHz: 8M93G7D(QPSK), 8M92W7D(16QAM)
- LTE Band 2 15MHz: 13M5G7D(QPSK), 13M4W7D(16QAM)
- LTE Band 2 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)
- LTE Band 4 1.4MHz: 1M09G7D(QPSK), 1M09W7D(16QAM)
- LTE Band 4 3MHz: 2M68G7D(QPSK), 2M68W7D(16QAM)
- LTE Band 4 5MHz: 4M49G7D(QPSK), 4M49W7D(16QAM)
- LTE Band 4 10 MHz: 8M94G7D(QPSK), 8M93W7D(16QAM)
- LTE Band 4 15MHz: 13M5G7D(QPSK), 13M5W7D(16QAM)
- LTE Band 4 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)
- LTE Band 5 1.4MHz: 1M09G7D(QPSK), 1M09W7D(16QAM)
- LTE Band 5 3MHz: 2M68G7D(QPSK), 2M68W7D(16QAM)
- LTE Band 5 5MHz: 4M49G7D(QPSK), 4M49W7D(16QAM)
- LTE Band 5 10 MHz: 8M93G7D(QPSK), 8M92W7D(16QAM)
- LTE Band 7 5MHz: 4M49G7D(QPSK), 4M48W7D(16QAM)
- LTE Band 7 10 MHz: 8M93G7D(QPSK), 8M92W7D(16QAM)
- LTE Band 7 15MHz: 13M5G7D(QPSK), 13M5W7D(16QAM)
- LTE Band 7 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)
- LTE Band 13 5MHz: 4M49G7D(QPSK), 4M49W7D(16QAM)
- LTE Band 13 10 MHz: 8M93G7D(QPSK), 8M93W7D(16QAM)

4.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Support Band	Test Mode BW(MHz)	Channel Frequency	Channel Number
LTE Band 2	1.4	1850.7 MHz	18607
		1880.0 MHz	18900
		1909.3 MHz	19193
	3	1851.5 MHz	18615
		1880.0 MHz	18900
		1908.5 MHz	19185
	5	1852.5 MHz	18625
		1880.0 MHz	18900
		1907.5 MHz	19175
	10	1855.0 MHz	18650
		1880.0 MHz	18900
		1905.0 MHz	19150
	15	1857.5 MHz	18675
		1880.0 MHz	18900
		1902.5 MHz	19125
	20	1860.0 MHz	18700
		1880.0 MHz	18900
		1900.0 MHz	19100
LTE Band 4	1.4	1710.7 MHz	19957
		1732.5 MHz	20175
		1754.3 MHz	20393
	3	1711.5 MHz	19965
		1732.5 MHz	20175
		1753.5 MHz	20385
	5	1712.5 MHz	19975
		1732.5 MHz	20175
		1752.5 MHz	20375
	10	1715.0 MHz	20000
		1732.5 MHz	20175
		1750.0 MHz	20350
	15	1717.5 MHz	20025
		1732.5 MHz	20175
		1747.5 MHz	20325
	20	1720.0 MHz	20050
		1732.5 MHz	20175
		1745.0 MHz	20300

LTE Band 5	1.4	824.7 MHz	20407
		836.5 MHz	20525
		848.3 MHz	20643
	3	825.5 MHz	20415
		836.5 MHz	20525
		847.5 MHz	20635
	5	826.5 MHz	20425
		836.5 MHz	20525
		846.5 MHz	20625
	10	829.0 MHz	20450
		836.5 MHz	20525
		844.0 MHz	20600
LTE Band 7	5	2502.5 MHz	20775
		2535.0 MHz	21100
		2567.5 MHz	21425
	10	2505.0 MHz	20800
		2535.0 MHz	21100
		2565.0 MHz	21400
	15	2507.5 MHz	20825
		2535.0 MHz	21100
		2562.5 MHz	21375
	20	2510.0 MHz	20850
		2535.0 MHz	21100
		2560.0 MHz	21350
LTE Band 13	5	779.5 MHz	23205
		782.0 MHz	23230
		784.5 MHz	23255
	10	782.0 MHz	23230
Remark: All mode(s) were tested and the worst data was recorded.			

4.4 Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files.

Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group 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. Registration number 523476, September 10, 2019.

5 Test Summary

Test Items	Test Requirement	Result
RF Output Power	2.1046 22.913 (a) 24.232 (c) 27.50(h.2) 27.50(d.4)	PASS
Peak-to-Average Ratio	24.232 (d) 27.50(d)	PASS
Bandwidth	2.1049 22.905 22.917 24.238 27.53(a)	PASS
Spurious Emissions at Antenna Terminal	2.1051 22.917 (a) 24.238 (a) 27.53(h) 27.53(m)(4)	PASS
Field Strength of Spurious Radiation	2.1053 22.917 (a) 24.238 (a) 27.53(h) 27.53(m)(4)	PASS
Out of band emission	22.917 (a) 24.238 (a) 27.53(h) 27.53(m)(4)	PASS
Frequency Stability	2.1055 22.355 24.235 27.5(h) 27.54	PASS
Maximum Permissible Exposure (SAR)	1.1307 2.1093	PASS

6 Equipment Used during Test

6.1 Equipments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date	Calibration Due Date
3m Semi-anechoic Chamber for Radiation Emissions 1#						
1	Spectrum Analyzer	R&S	FSP30	100091	2026-04-07	2027-04-06
2	Amplifier	Agilent	8447D	2944A10178	2026-07-01	2027-06-30
3	Tri-log Broadband Antenna	SCHWARZBECK	VULB9163	336	2025-07-20 2026-07-18	2026-07-19 2027-07-17
4	Coaxial Cable	Top	TYPE16(13M)	-	2026-04-07	2027-04-06
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1314	2025-08-09 2026-08-08	2026-08-08 2027-08-07
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2026-07-01	2027-06-30
7	Broadband Preamplifier	COMPLIANCE	PAP-1G18	2004	2026-07-01	2027-06-30
8	Coaxial Cable	Top	ZT26-NJ-NJ-8M/FA	-	2026-04-07	2027-04-06
9	Microwave Amplifier	SCHWARZBECK	BBV 9721	100472	2026-07-01	2027-06-30
10	Coaxial Cable	Top	ZT40-2.92J-2.92J-2.0M	17100919	2026-07-01	2027-06-30
3m Semi-anechoic Chamber for Radiation Emissions 2#						
1	Test Receiver	R&S	ESCI	101296	2026-04-07	2027-04-06
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2025-07-05 2026-07-04	2026-07-04 2027-07-03
3	Active Loop Antenna	Com-Power	AL-130R	10160007	2026-04-19	2027-04-18
4	Amplifier	ANRITSU	MH648A	M43381	2026-04-07	2027-04-06
5	Cable	HUBER+SUHNER	CBL2	525178	2026-04-07	2027-04-06
RF Conducted Testing						
1	Spectrum Analyzer	Agilent	N9020A	MY49100060	2026-07-01	2027-06-30
2	Universal Radio Communication Tester	R&S	CMW 500	127818	2026-07-01	2027-06-30

Test Software:

Test Item	Software name	Software version
Radiated Emission(3m)	EZ-EMC	EZ-EMC(RA-03A1-1)

6.2 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10 ⁻⁷ Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval: 95%. Confidence factor:k=2	

7 RF Output Power

Test Requirement:	FCC Part 2.1046, 22.913 (a), 24.232 (c), 27.50(h.2); 27.50(d.4);
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

7.1 EUT Operation

Operating Environment :

Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

7.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

1. The setup of EUT is according with Standard ANSI/TIA-603-E.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

7.3 Test Result

Conducted Power

LTE Band 2:

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
1.4MHz	18607	1850.7	QPSK	1	0	20.48	20.7±1	/
				1	2	20.61	20.7±1	/
				1	5	20.52	20.7±1	/
				3	0	20.59	20.7±1	/
				3	1	20.63	20.7±1	/
				3	2	20.56	20.7±1	/
				6	0	20.55	20.7±1	1.0
			16QAM	1	0	20.61	20.7±1	1.0
				1	2	20.65	20.7±1	1.0
				1	5	20.55	20.7±1	1.0
				3	0	20.58	20.7±1	1.0
				3	1	20.61	20.7±1	1.0
				3	2	20.57	20.7±1	1.0
				6	0	20.68	20.7±1	1.0
	18900	1880	QPSK	1	0	20.68	20.8±1	/
				1	2	20.79	20.8±1	/
				1	5	20.67	20.8±1	/
				3	0	20.74	20.8±1	/
				3	1	20.8	20.8±1	/
				3	2	20.73	20.8±1	/
				6	0	20.73	20.8±1	1.0
			16QAM	1	0	21.02	21.2±1	1.0
				1	2	21.11	21.2±1	1.0
				1	5	21.02	21.2±1	1.0
				3	0	20.87	21.2±1	1.0
				3	1	20.92	21.2±1	1.0
				3	2	20.88	21.2±1	1.0
				6	0	20.6	21.2±1	1.0
	19193	1909.3	QPSK	1	0	20.59	20.8±1	/
				1	2	20.74	20.8±1	/
				1	5	20.65	20.8±1	/
				3	0	20.7	20.8±1	/
				3	1	20.76	20.8±1	/
				3	2	20.75	20.8±1	/
				6	0	20.73	20.8±1	1.0
			16QAM	1	0	20.67	21.0±1	1.0
				1	2	20.72	21.0±1	1.0
				1	5	20.66	21.0±1	1.0
				3	0	20.87	21.0±1	1.0
				3	1	20.92	21.0±1	1.0
				3	2	20.88	21.0±1	1.0
				6	0	20.88	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
3MHz	18615	1851.5	QPSK	1	0	20.54	20.7±1	/
				1	8	20.67	20.7±1	/
				1	14	20.52	20.7±1	/
				6	0	20.51	20.7±1	1.0
				6	4	20.57	20.7±1	1.0
				6	9	20.54	20.7±1	1.0
				15	0	20.5	20.7±1	1.0
			16QAM	1	0	20.48	20.7±1	1.0
				1	8	20.59	20.7±1	1.0
				1	14	20.47	20.7±1	1.0
				6	0	20.64	20.7±1	1.0
				6	4	20.69	20.7±1	1.0
				6	9	20.62	20.7±1	1.0
				15	0	20.55	20.7±1	1.0
	18900	1880	QPSK	1	0	20.75	21.0±1	/
				1	8	20.87	21.0±1	/
				1	14	20.73	21.0±1	/
				6	0	20.66	21.0±1	1.0
				6	4	20.73	21.0±1	1.0
				6	9	20.69	21.0±1	1.0
				15	0	20.65	21.0±1	1.0
			16QAM	1	0	21.04	21.3±1	1.0
				1	8	21.21	21.3±1	1.0
				1	14	20.99	21.3±1	1.0
				6	0	20.77	21.3±1	1.0
				6	4	20.81	21.3±1	1.0
				6	9	20.73	21.3±1	1.0
				15	0	20.72	21.3±1	1.0
	19185	1908.5	QPSK	1	0	20.68	21.0±1	/
				1	8	20.87	21.0±1	/
				1	14	20.66	21.0±1	/
				6	0	20.71	21.0±1	1.0
				6	4	20.72	21.0±1	1.0
				6	9	20.67	21.0±1	1.0
				15	0	20.71	21.0±1	1.0
			16QAM	1	0	20.7	21.0±1	1.0
				1	8	20.86	21.0±1	1.0
				1	14	20.67	21.0±1	1.0
				6	0	20.73	21.0±1	1.0
				6	4	20.76	21.0±1	1.0
				6	9	20.72	21.0±1	1.0
				15	0	20.65	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	18625	1852.5	QPSK	1	0	20.41	20.7±1	/
				1	12	20.69	20.7±1	/
				1	24	20.47	20.7±1	/
				12	0	20.48	20.7±1	1.0
				12	6	20.57	20.7±1	1.0
				12	11	20.51	20.7±1	1.0
				25	0	20.55	20.7±1	1.0
			16QAM	1	0	20.6	21.0±1	1.0
				1	12	20.87	21.0±1	1.0
				1	24	20.68	21.0±1	1.0
				12	0	20.54	21.0±1	1.0
				12	6	20.63	21.0±1	1.0
				12	11	20.61	21.0±1	1.0
				25	0	20.57	21.0±1	1.0
	18900	1880	QPSK	1	0	20.66	21.0±1	/
				1	12	20.86	21.0±1	/
				1	24	20.6	21.0±1	/
				12	0	20.68	21.0±1	1.0
				12	6	20.72	21.0±1	1.0
				12	11	20.66	21.0±1	1.0
				25	0	20.71	21.0±1	1.0
			16QAM	1	0	21.1	21.4±1	1.0
				1	12	21.33	21.4±1	1.0
				1	24	21.08	21.4±1	1.0
				12	0	20.79	21.4±1	1.0
				12	6	20.83	21.4±1	1.0
				12	11	20.77	21.4±1	1.0
				25	0	20.73	21.4±1	1.0
	19175	1907.5	QPSK	1	0	20.65	21.0±1	/
				1	12	20.92	21.0±1	/
				1	24	20.69	21.0±1	/
				12	0	20.72	21.0±1	1.0
				12	6	20.77	21.0±1	1.0
				12	11	20.69	21.0±1	1.0
				25	0	20.75	21.0±1	1.0
			16QAM	1	0	20.71	21.0±1	1.0
				1	12	21	21.0±1	1.0
				1	24	20.72	21.0±1	1.0
				12	0	20.73	21.0±1	1.0
				12	6	20.79	21.0±1	1.0
				12	11	20.7	21.0±1	1.0
				25	0	20.69	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	18650	1855	QPSK	1	0	20.57	20.7±1	/
				1	24	20.66	20.7±1	/
				1	49	20.62	20.7±1	/
				25	0	20.56	20.7±1	1.0
				25	12	20.61	20.7±1	1.0
				25	24	20.66	20.7±1	1.0
				50	0	20.61	20.7±1	1.0
			16QAM	1	0	20.47	20.8±1	1.0
				1	24	20.61	20.8±1	1.0
				1	49	20.53	20.8±1	1.0
				25	0	20.59	20.8±1	1.0
				25	12	20.67	20.8±1	1.0
				25	24	20.71	20.8±1	1.0
				50	0	20.62	20.8±1	1.0
	18900	1880	QPSK	1	0	20.77	21.0±1	/
				1	24	20.84	21.0±1	/
				1	49	20.69	21.0±1	/
				25	0	20.75	21.0±1	1.0
				25	12	20.72	21.0±1	1.0
				25	24	20.71	21.0±1	1.0
				50	0	20.74	21.0±1	1.0
			16QAM	1	0	21.03	21.2±1	1.0
				1	24	21.14	21.2±1	1.0
				1	49	20.98	21.2±1	1.0
				25	0	20.79	21.2±1	1.0
				25	12	20.76	21.2±1	1.0
				25	24	20.74	21.2±1	1.0
				50	0	20.73	21.2±1	1.0
	19150	1905	QPSK	1	0	20.65	20.8±1	/
				1	24	20.75	20.8±1	/
				1	49	20.7	20.8±1	/
				25	0	20.77	20.8±1	1.0
				25	12	20.72	20.8±1	1.0
				25	24	20.67	20.8±1	1.0
				50	0	20.71	20.8±1	1.0
			16QAM	1	0	20.68	21.0±1	1.0
				1	24	20.77	21.0±1	1.0
				1	49	20.7	21.0±1	1.0
				25	0	20.85	21.0±1	1.0
				25	12	20.82	21.0±1	1.0
				25	24	20.75	21.0±1	1.0
				50	0	20.72	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
15MHz	18675	1857.5	QPSK	1	0	20.43	20.8±1	/
				1	37	20.72	20.8±1	/
				1	74	20.53	20.8±1	/
				36	0	20.59	20.8±1	1.0
				36	16	20.66	20.8±1	1.0
				36	35	20.71	20.8±1	1.0
				75	0	20.67	20.8±1	1.0
			16QAM	1	0	20.41	20.7±1	1.0
				1	37	20.67	20.7±1	1.0
				1	74	20.48	20.7±1	1.0
				36	0	20.56	20.7±1	1.0
				36	16	20.62	20.7±1	1.0
				36	35	20.65	20.7±1	1.0
				75	0	20.65	20.7±1	1.0
	18900	1880	QPSK	1	0	20.69	21.0±1	/
				1	37	20.86	21.0±1	/
				1	74	20.55	21.0±1	/
				36	0	20.77	21.0±1	1.0
				36	16	20.75	21.0±1	1.0
				36	35	20.7	21.0±1	1.0
				75	0	20.74	21.0±1	1.0
			16QAM	1	0	21.03	21.2±1	1.0
				1	37	21.19	21.2±1	1.0
				1	74	20.88	21.2±1	1.0
				36	0	20.78	21.2±1	1.0
				36	16	20.77	21.2±1	1.0
				36	35	20.71	21.2±1	1.0
				75	0	20.74	21.2±1	1.0
	19125	1902.5	QPSK	1	0	20.63	21.0±1	/
				1	37	20.85	21.0±1	/
				1	74	20.63	21.0±1	/
				36	0	20.76	21.0±1	1.0
				36	16	20.79	21.0±1	1.0
				36	35	20.75	21.0±1	1.0
				75	0	20.76	21.0±1	1.0
			16QAM	1	0	21.01	21.2±1	1.0
				1	37	21.17	21.2±1	1.0
				1	74	20.98	21.2±1	1.0
				36	0	20.68	21.2±1	1.0
				36	16	20.74	21.2±1	1.0
				36	35	20.65	21.2±1	1.0
				75	0	20.72	21.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
20MHz	18700	1860	QPSK	1	0	20.25	20.7±1	/
				1	49	20.67	20.7±1	/
				1	99	20.39	20.7±1	/
				50	0	20.55	20.7±1	1.0
				50	24	20.65	20.7±1	1.0
				50	49	20.7	20.7±1	1.0
				100	0	20.65	20.7±1	1.0
			16QAM	1	0	20.8	21.3±1	1.0
				1	49	21.24	21.3±1	1.0
				1	99	20.92	21.3±1	1.0
				50	0	20.56	21.3±1	1.0
				50	24	20.67	21.3±1	1.0
				50	49	20.67	21.3±1	1.0
				100	0	20.65	21.3±1	1.0
	18900	1880	QPSK	1	0	20.47	20.8±1	/
				1	49	20.78	20.8±1	/
				1	99	20.35	20.8±1	/
				50	0	20.74	20.8±1	1.0
				50	24	20.73	20.8±1	1.0
				50	49	20.65	20.8±1	1.0
				100	0	20.69	20.8±1	1.0
			16QAM	1	0	20.93	21.3±1	1.0
				1	49	21.23	21.3±1	1.0
				1	99	20.85	21.3±1	1.0
				50	0	20.72	21.3±1	1.0
				50	24	20.76	21.3±1	1.0
				50	49	20.61	21.3±1	1.0
				100	0	20.68	21.3±1	1.0
	19100	1900	QPSK	1	0	20.42	20.8±1	/
				1	49	20.77	20.8±1	/
				1	99	20.46	20.8±1	/
				50	0	20.67	20.8±1	1.0
				50	24	20.71	20.8±1	1.0
				50	49	20.59	20.8±1	1.0
				100	0	20.64	20.8±1	1.0
			16QAM	1	0	20.82	21.1±1	1.0
				1	49	21.1	21.1±1	1.0
				1	99	20.82	21.1±1	1.0
				50	0	20.61	21.1±1	1.0
				50	24	20.7	21.1±1	1.0
				50	49	20.54	21.1±1	1.0
				100	0	20.61	21.1±1	1.0

LTE Band 4:

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
1.4MHz	19957	1710.7	QPSK	1	0	21.46	21.6±1	/
				1	2	21.54	21.6±1	/
				1	5	21.45	21.6±1	/
				3	0	21.48	21.6±1	/
				3	1	21.56	21.6±1	/
				3	2	21.47	21.6±1	/
			16QAM	6	0	21.5	21.6±1	1.0
				1	0	21.39	21.5±1	1.0
				1	2	21.53	21.5±1	1.0
				1	5	21.39	21.5±1	1.0
				3	0	21.41	21.5±1	1.0
				3	1	21.44	21.5±1	1.0
				3	2	21.36	21.5±1	1.0
				6	0	20.56	21.5±1	1.0
	20175	1732.5	QPSK	1	0	21.27	21.4±1	/
				1	2	21.34	21.4±1	/
				1	5	21.26	21.4±1	/
				3	0	21.33	21.4±1	/
				3	1	21.39	21.4±1	/
				3	2	21.34	21.4±1	/
			16QAM	6	0	21.29	21.4±1	1.0
				1	0	21.57	21.7±1	1.0
				1	2	21.7	21.7±1	1.0
				1	5	21.58	21.7±1	1.0
				3	0	21.5	21.7±1	1.0
				3	1	21.54	21.7±1	1.0
				3	2	21.52	21.7±1	1.0
				6	0	20.21	20.3±1	1.0
	20393	1754.3	QPSK	1	0	21.08	21.3±1	/
				1	2	21.2	21.3±1	/
				1	5	21.09	21.3±1	/
				3	0	21.17	21.3±1	/
				3	1	21.23	21.3±1	/
				3	2	21.2	21.3±1	/
			16QAM	6	0	21.26	21.3±1	1.0
				1	0	21.06	21.3±1	1.0
				1	2	21.15	21.3±1	1.0
				1	5	21.05	21.3±1	1.0
				3	0	21.29	21.3±1	1.0
				3	1	21.33	21.3±1	1.0
				3	2	21.3	21.3±1	1.0
				6	0	20.33	21.3±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
3MHz	19965	1711.5	QPSK	1	0	21.48	21.6±1	/
				1	8	21.56	21.6±1	/
				1	14	21.47	21.6±1	/
				6	0	21.42	21.6±1	1.0
				6	4	21.47	21.6±1	1.0
				6	9	21.41	21.6±1	1.0
				15	0	21.4	21.6±1	1.0
			16QAM	1	0	21.23	21.3±1	1.0
				1	8	21.24	21.3±1	1.0
				1	14	21.2	21.3±1	1.0
				8	0	20.47	21.3±1	1.0
				8	4	20.51	21.3±1	1.0
				8	9	20.42	21.3±1	1.0
				15	0	20.36	21.3±1	1.0
	20175	1732.5	QPSK	1	0	21.31	21.4±1	/
				1	8	21.4	21.4±1	/
				1	14	21.27	21.4±1	/
				6	0	21.25	21.4±1	1.0
				6	4	21.28	21.4±1	1.0
				6	9	21.19	21.4±1	1.0
				15	0	21.22	21.4±1	1.0
			16QAM	1	0	21.61	21.8±1	1.0
				1	8	21.76	21.8±1	1.0
				1	14	21.6	21.8±1	1.0
				6	0	20.36	20.4±1	1.0
				6	4	20.38	20.4±1	1.0
				6	9	20.31	20.4±1	1.0
				15	0	20.28	20.4±1	1.0
	20385	1753.5	QPSK	1	0	21.12	21.3±1	/
				1	8	21.24	21.3±1	/
				1	14	21.12	21.3±1	/
				6	0	21.16	21.3±1	1.0
				6	4	21.21	21.3±1	1.0
				6	9	21.18	21.3±1	1.0
				15	0	21.13	21.3±1	1.0
			16QAM	1	0	21.13	21.2±1	1.0
				1	8	21.19	21.2±1	1.0
				1	14	21.05	21.2±1	1.0
				8	0	20.16	21.2±1	1.0
				8	4	20.22	21.2±1	1.0
				8	9	20.15	21.2±1	1.0
				15	0	20.1	21.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	19975	1712.5	QPSK	1	0	21.32	21.6±1	/
				1	49	21.52	21.6±1	/
				1	99	21.31	21.6±1	/
				12	0	21.37	21.6±1	1.0
				12	24	21.42	21.6±1	1.0
				12	49	21.36	21.6±1	1.0
				25	0	21.34	21.6±1	1.0
			16QAM	1	0	21.41	21.7±1	1.0
				1	49	21.63	21.7±1	1.0
				1	99	21.43	21.7±1	1.0
				12	0	20.37	20.5±1	1.0
				12	24	20.45	20.5±1	1.0
				12	49	20.41	20.5±1	1.0
				25	0	20.39	20.5±1	1.0
	20175	1732.5	QPSK	1	0	21.23	21.4±1	/
				1	49	21.35	21.4±1	/
				1	99	21.21	21.4±1	/
				12	0	21.23	21.4±1	1.0
				12	24	21.3	21.4±1	1.0
				12	49	21.3	21.4±1	1.0
				25	0	21.27	21.4±1	1.0
			16QAM	1	0	21.7	22.0±1	1.0
				1	49	21.89	22.0±1	1.0
				1	99	21.66	22.0±1	1.0
				12	0	20.39	20.5±1	1.0
				12	24	20.44	20.5±1	1.0
				12	49	20.4	20.5±1	1.0
				25	0	20.36	20.5±1	1.0
	20375	1752.5	QPSK	1	0	21.11	21.4±1	/
				1	49	21.35	21.4±1	/
				1	99	21.12	21.4±1	/
				12	0	21.13	21.4±1	1.0
				12	24	21.19	21.4±1	1.0
				12	49	21.17	21.4±1	1.0
				25	0	21.17	21.4±1	1.0
			16QAM	1	0	21.14	21.3±1	1.0
				1	49	21.3	21.3±1	1.0
				1	99	21.12	21.3±1	1.0
				12	0	20.14	20.3±1	1.0
				12	24	20.22	20.3±1	1.0
				12	49	20.18	20.3±1	1.0
				25	0	20.09	20.3±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	20000	1715	QPSK	1	0	21.47	21.6±1	/
				1	49	21.53	21.6±1	/
				1	99	21.44	21.6±1	/
				25	0	21.38	21.6±1	1.0
				25	24	21.42	21.6±1	1.0
				25	49	21.4	21.6±1	1.0
				50	0	21.4	21.6±1	1.0
			16QAM	1	0	21.2	21.3±1	1.0
				1	49	21.29	21.3±1	1.0
				1	99	21.25	21.3±1	1.0
				25	0	20.4	21.3±1	1.0
				25	24	20.44	21.3±1	1.0
				25	49	20.41	21.3±1	1.0
				50	0	20.38	21.3±1	1.0
	20175	1732.5	QPSK	1	0	21.35	21.5±1	/
				1	49	21.41	21.5±1	/
				1	99	21.25	21.5±1	/
				25	0	21.31	21.5±1	1.0
				25	24	21.32	21.5±1	1.0
				25	49	21.35	21.5±1	1.0
				50	0	21.31	21.5±1	1.0
			16QAM	1	0	21.64	21.8±1	1.0
				1	49	21.72	21.8±1	1.0
				1	99	21.61	21.8±1	1.0
				25	0	20.39	20.4±1	1.0
				25	24	20.36	20.4±1	1.0
				25	49	20.38	20.4±1	1.0
				50	0	20.34	20.4±1	1.0
	20350	1750	QPSK	1	0	21.17	21.3±1	/
				1	49	21.21	21.3±1	/
				1	99	21.14	21.3±1	/
				25	0	21.16	21.3±1	1.0
				25	24	21.2	21.3±1	1.0
				25	49	21.23	21.3±1	1.0
				50	0	21.14	21.3±1	1.0
			16QAM	1	0	21.22	21.3±1	1.0
				1	49	21.19	21.3±1	1.0
				1	99	21.07	21.3±1	1.0
				25	0	20.28	20.3±1	1.0
				25	24	20.3	20.3±1	1.0
				25	49	20.27	20.3±1	1.0
				50	0	20.24	20.3±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
15MHz	20025	1717.5	QPSK	1	0	21.35	21.6±1	/
				1	49	21.54	21.6±1	/
				1	99	21.27	21.6±1	/
				36	0	21.59	21.6±1	1.0
				36	24	21.59	21.6±1	1.0
				36	49	21.5	21.6±1	1.0
				75	0	21.56	21.6±1	1.0
			16QAM	1	0	21.13	21.4±1	1.0
				1	49	21.38	21.4±1	1.0
				1	99	21.21	21.4±1	1.0
				36	0	20.49	21.4±1	1.0
				36	24	20.47	21.4±1	1.0
				36	49	20.42	21.4±1	1.0
				75	0	20.47	21.4±1	1.0
	20175	1732.5	QPSK	1	0	21.33	21.5±1	/
				1	49	21.48	21.5±1	/
				1	99	21.17	21.5±1	/
				36	0	21.41	21.5±1	1.0
				36	24	21.34	21.5±1	1.0
				36	49	21.31	21.5±1	1.0
				75	0	21.33	21.5±1	1.0
			16QAM	1	0	21.58	21.8±1	1.0
				1	49	21.78	21.8±1	1.0
				1	99	21.52	21.8±1	1.0
				36	0	20.38	20.4±1	1.0
				36	24	20.36	20.4±1	1.0
				36	49	20.32	20.4±1	1.0
				75	0	20.34	20.4±1	1.0
	20325	1747.5	QPSK	1	0	21.16	21.4±1	/
				1	49	21.35	21.4±1	/
				1	99	21.11	21.4±1	/
				36	0	21.27	21.4±1	1.0
				36	24	21.28	21.4±1	1.0
				36	49	21.26	21.4±1	1.0
				75	0	21.26	21.4±1	1.0
			16QAM	1	0	21.57	21.8±1	1.0
				1	49	21.72	21.8±1	1.0
				1	99	21.34	21.8±1	1.0
				36	0	20.18	20.2±1	1.0
				36	24	20.19	20.2±1	1.0
				36	49	20.19	20.2±1	1.0
				75	0	20.2	20.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
20MHz	20050	1720	QPSK	1	0	21.06	21.5±1	/
				1	49	21.45	21.5±1	/
				1	99	21.09	21.5±1	/
				50	0	21.38	21.5±1	1.0
				50	24	21.44	21.5±1	1.0
				50	49	21.33	21.5±1	1.0
				100	0	21.39	21.5±1	1.0
			16QAM	1	0	21.55	22.0±1	1.0
				1	49	21.94	22.0±1	1.0
				1	99	21.62	22.0±1	1.0
				50	0	20.42	20.5±1	1.0
				50	24	20.45	20.5±1	1.0
				50	49	20.38	20.5±1	1.0
				100	0	20.41	20.5±1	1.0
	20175	1732.5	QPSK	1	0	21.03	21.4±1	/
				1	49	21.35	21.4±1	/
				1	99	20.96	21.4±1	/
				50	0	21.35	21.4±1	1.0
				50	24	21.34	21.4±1	1.0
				50	49	21.29	21.4±1	1.0
				100	0	21.29	21.4±1	1.0
			16QAM	1	0	21.42	22.0±1	1.0
				1	49	21.81	22.0±1	1.0
				1	99	21.45	22.0±1	1.0
				50	0	20.38	20.4±1	1.0
				50	24	20.35	20.4±1	1.0
				50	49	20.31	20.4±1	1.0
				100	0	20.33	20.4±1	1.0
	20300	1745	QPSK	1	0	20.96	21.3±1	/
				1	49	21.28	21.3±1	/
				1	99	20.89	21.3±1	/
				50	0	21.19	21.3±1	1.0
				50	24	21.25	21.3±1	1.0
				50	49	21.16	21.3±1	1.0
				100	0	21.17	21.3±1	1.0
			16QAM	1	0	21.43	21.7±1	1.0
				1	49	21.69	21.7±1	1.0
				1	99	21.24	21.7±1	1.0
				50	0	20.17	20.3±1	1.0
				50	24	20.23	20.3±1	1.0
				50	49	20.14	20.3±1	1.0
				100	0	20.19	20.3±1	1.0

LTE Band 5:

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
1.4MHz	20407	824.7	QPSK	1	0	24.12	24.3±1	/
				1	2	24.23	24.3±1	/
				1	5	24.1	24.3±1	/
				3	0	24.09	24.3±1	/
				3	1	24.09	24.3±1	/
				3	2	24.02	24.3±1	/
			16QAM	6	0	23.18	23.2±1	1.0
				1	0	23.04	23.2±1	1.0
				1	2	23.13	23.2±1	1.0
				1	5	23.02	23.2±1	1.0
				3	0	23.02	23.2±1	1.0
				3	1	23.03	23.2±1	1.0
				3	2	23	23.2±1	1.0
				6	0	22.21	23.2±1	1.0
	20525	836.5	QPSK	1	0	24.09	24.1±1	/
				1	2	24.17	24.1±1	/
				1	5	24.05	24.1±1	/
				3	0	24.07	24.1±1	/
				3	1	24.09	24.1±1	/
				3	2	24.06	24.1±1	/
			16QAM	6	0	23.12	24.1±1	1.0
				1	0	23.33	23.4±1	1.0
				1	2	23.38	23.4±1	1.0
				1	5	23.31	23.4±1	1.0
				3	0	23.21	23.4±1	1.0
				3	1	23.2	23.4±1	1.0
				3	2	23.18	23.4±1	1.0
				6	0	22	22.0±1	1.0
	20634	848.3	QPSK	1	0	23.94	24.1±1	/
				1	2	24.11	24.1±1	/
				1	5	23.98	24.1±1	/
				3	0	24	24.1±1	/
				3	1	24.08	24.1±1	/
				3	2	24.05	24.1±1	/
			16QAM	6	0	23.14	24.1±1	1.0
				1	0	22.94	23.2±1	1.0
				1	2	23.01	23.2±1	1.0
				1	5	22.93	23.2±1	1.0
				3	0	23.13	23.2±1	1.0
				3	1	23.2	23.2±1	1.0
				3	2	23.18	23.2±1	1.0
				6	0	22.24	23.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
3MHz	20415	825.5	QPSK	1	0	24.26	24.3±1	/
				1	8	24.27	24.3±1	/
				1	14	24.15	24.3±1	/
				6	0	23.15	23.2±1	1.0
				6	4	23.16	23.2±1	1.0
				6	9	23.1	23.2±1	1.0
				15	0	23.06	23.2±1	1.0
			16QAM	1	0	22.93	23.0±1	1.0
				1	8	23.01	23.0±1	1.0
				1	14	22.9	23.0±1	1.0
				8	0	22.14	23.0±1	1.0
				8	4	22.16	23.0±1	1.0
				8	9	22.13	23.0±1	1.0
				15	0	22.02	23.0±1	1.0
	20525	836.5	QPSK	1	0	24.13	24.3±1	/
				1	8	24.23	24.3±1	/
				1	14	24.15	24.3±1	/
				6	0	23.16	23.2±1	1.0
				6	4	23.17	23.2±1	1.0
				6	9	23.14	23.2±1	1.0
				15	0	23.08	23.2±1	1.0
			16QAM	1	0	23.38	23.5±1	1.0
				1	8	23.47	23.5±1	1.0
				1	14	23.38	23.5±1	1.0
				6	0	22.14	22.2±1	1.0
				6	4	22.18	22.2±1	1.0
				6	9	22.14	22.2±1	1.0
				15	0	22.1	22.2±1	1.0
	20635	847.5	QPSK	1	0	24.04	24.2±1	/
				1	8	24.14	24.2±1	/
				1	14	24.03	24.2±1	/
				6	0	23.13	23.2±1	1.0
				6	4	23.16	23.2±1	1.0
				6	9	23.1	23.2±1	1.0
				15	0	23.1	23.2±1	1.0
			16QAM	1	0	23.03	23.2±1	1.0
				1	8	23.11	23.2±1	1.0
				1	14	22.95	23.2±1	1.0
				8	0	22.1	22.2±1	1.0
				8	4	22.17	22.2±1	1.0
				8	9	22.09	22.2±1	1.0
				15	0	22.01	22.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	20425	826.5	QPSK	1	0	24.03	24.2±1	/
				1	49	24.19	24.2±1	/
				1	99	23.98	24.2±1	/
				12	0	23.03	23.1±1	1.0
				12	24	23.09	23.1±1	1.0
				12	49	23.06	23.1±1	1.0
				25	0	23.06	23.1±1	1.0
			16QAM	1	0	23.12	23.3±1	1.0
				1	49	23.28	23.3±1	1.0
				1	99	23.13	23.3±1	1.0
				12	0	22.06	22.1±1	1.0
				12	24	22.1	22.1±1	1.0
				12	49	22.09	22.1±1	1.0
				25	0	22.02	22.1±1	1.0
	20525	836.5	QPSK	1	0	24.05	24.3±1	/
				1	49	24.22	24.3±1	/
				1	99	24.03	24.3±1	/
				12	0	23.09	23.2±1	1.0
				12	24	23.17	23.2±1	1.0
				12	49	23.12	23.2±1	1.0
				25	0	23.13	23.2±1	1.0
			16QAM	1	0	23.49	23.7±1	1.0
				1	49	23.65	23.7±1	1.0
				1	99	23.47	23.7±1	1.0
				12	0	22.16	22.3±1	1.0
				12	24	22.27	22.3±1	1.0
				12	49	22.18	22.3±1	1.0
				25	0	22.12	22.3±1	1.0
	20625	846.5	QPSK	1	0	24.01	24.3±1	/
				1	49	24.23	24.3±1	/
				1	99	24.01	24.3±1	/
				12	0	23.07	23.2±1	1.0
				12	24	23.11	23.2±1	1.0
				12	49	23.05	23.2±1	1.0
				25	0	23.07	23.2±1	1.0
			16QAM	1	0	23.05	23.3±1	1.0
				1	49	23.22	23.3±1	1.0
				1	99	23.01	23.3±1	1.0
				12	0	22.06	22.2±1	1.0
				12	24	22.12	22.2±1	1.0
				12	49	22.05	22.2±1	1.0
				25	0	22	22.2±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	20450	829	QPSK	1	0	24.28	24.3±1	/
				1	49	24.24	24.3±1	/
				1	99	24.18	24.3±1	/
				25	0	23.05	23.2±1	1.0
				25	24	23.1	23.2±1	1.0
				25	49	23.14	23.2±1	1.0
				50	0	23.04	23.2±1	1.0
			16QAM	1	0	22.98	23.0±1	1.0
				1	49	23.04	23.0±1	1.0
				1	99	22.94	23.0±1	1.0
				25	0	22.05	23.0±1	1.0
				25	24	22.13	23.0±1	1.0
				25	49	22.15	23.0±1	1.0
				50	0	22.02	23.0±1	1.0
	20525	836.5	QPSK	1	0	24.14	24.3±1	/
				1	49	24.23	24.3±1	/
				1	99	24.19	24.3±1	/
				25	0	23.11	23.2±1	1.0
				25	24	23.1	23.2±1	1.0
				25	49	23.12	23.2±1	1.0
				50	0	23.13	23.2±1	1.0
			16QAM	1	0	23.43	23.5±1	1.0
				1	49	23.46	23.5±1	1.0
				1	99	23.37	23.5±1	1.0
				25	0	22.14	22.2±1	1.0
				25	24	22.19	22.2±1	1.0
				25	49	22.14	22.2±1	1.0
				50	0	22.12	22.2±1	1.0
	20600	844	QPSK	1	0	24.12	24.2±1	/
				1	49	24.12	24.2±1	/
				1	99	24.08	24.2±1	/
				25	0	23.07	23.2±1	1.0
				25	24	23.13	23.2±1	1.0
				25	49	23.09	23.2±1	1.0
				50	0	23.06	23.2±1	1.0
			16QAM	1	0	23.02	23.1±1	1.0
				1	49	23.07	23.1±1	1.0
				1	99	23	23.1±1	1.0
				25	0	22.14	22.2±1	1.0
				25	24	22.2	22.2±1	1.0
				25	49	22.17	22.2±1	1.0
				50	0	22.06	22.2±1	1.0

LTE Band 7:

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	20775	2502.5	QPSK	1	0	21	21.3±1	/
				1	49	21.25	21.3±1	/
				1	99	21.03	21.3±1	/
				12	0	21.06	21.3±1	1.0
				12	24	21.14	21.3±1	1.0
				12	49	21.11	21.3±1	1.0
				25	0	21.07	21.3±1	1.0
			16QAM	1	0	21.1	21.4±1	1.0
				1	49	21.35	21.4±1	1.0
				1	99	21.12	21.4±1	1.0
				12	0	20.56	21.4±1	1.0
				12	24	20.62	21.4±1	1.0
				12	49	20.59	21.4±1	1.0
				25	0	20.47	21.4±1	1.0
	21100	2535	QPSK	1	0	21.09	21.3±1	/
				1	49	21.33	21.3±1	/
				1	99	21.1	21.3±1	/
				12	0	21.11	21.3±1	1.0
				12	24	21.13	21.3±1	1.0
				12	49	21.04	21.3±1	1.0
				25	0	21.06	21.3±1	1.0
			16QAM	1	0	21.12	21.4±1	1.0
				1	49	21.4	21.4±1	1.0
				1	99	21.11	21.4±1	1.0
				12	0	20.6	21.4±1	1.0
				12	24	20.62	21.4±1	1.0
				12	49	20.57	21.4±1	1.0
				25	0	20.57	21.4±1	1.0
	21425	2567.5	QPSK	1	0	20.91	21.2±1	/
				1	49	21.13	21.2±1	/
				1	99	20.85	21.2±1	/
				12	0	20.96	21.2±1	1.0
				12	24	20.99	21.2±1	1.0
				12	49	20.88	21.2±1	1.0
				25	0	20.94	21.2±1	1.0
			16QAM	1	0	21.34	21.4±1	1.0
				1	49	21.53	21.4±1	1.0
				1	99	21.25	21.4±1	1.0
				12	0	20.56	21.4±1	1.0
				12	24	20.57	21.4±1	1.0
				12	49	20.47	21.4±1	1.0
				25	0	20.41	21.4±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	20800	2505	QPSK	1	0	21.1	21.2±1	/
				1	49	21.19	21.2±1	/
				1	99	21.16	21.2±1	/
				25	0	21.05	21.2±1	1.0
				25	24	21.13	21.2±1	1.0
				25	49	21.14	21.2±1	1.0
				50	0	21.07	21.2±1	1.0
			16QAM	1	0	20.9	21.2±1	1.0
				1	49	21.14	21.2±1	1.0
				1	99	20.96	21.2±1	1.0
				25	0	20.52	21.2±1	1.0
				25	24	20.62	21.2±1	1.0
				25	49	20.61	21.2±1	1.0
				50	0	20.52	21.2±1	1.0
	21100	2535	QPSK	1	0	21.15	21.3±1	/
				1	49	21.24	21.3±1	/
				1	99	21.11	21.3±1	/
				25	0	21.07	21.3±1	1.0
				25	24	21.11	21.3±1	1.0
				25	49	21.07	21.3±1	1.0
				50	0	21.06	21.3±1	1.0
			16QAM	1	0	21.38	21.5±1	1.0
				1	49	21.49	21.5±1	1.0
				1	99	21.37	21.5±1	1.0
				25	0	20.58	21.5±1	1.0
				25	24	20.61	21.5±1	1.0
				25	49	20.56	21.5±1	1.0
				50	0	20.54	21.5±1	1.0
	21400	2565	QPSK	1	0	21.02	21.2±1	/
				1	49	21.08	21.2±1	/
				1	99	20.87	21.2±1	/
				25	0	21.02	21.2±1	1.0
				25	24	21.03	21.2±1	1.0
				25	49	20.88	21.2±1	1.0
				50	0	20.94	21.2±1	1.0
			16QAM	1	0	20.99	21.0±1	1.0
				1	49	21	21.0±1	1.0
				1	99	20.83	21.0±1	1.0
				25	0	20.56	21.0±1	1.0
				25	24	20.57	21.0±1	1.0
				25	49	20.44	21.0±1	1.0
				50	0	20.42	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
15MHz	20825	2507.5	QPSK	1	0	20.95	21.3±1	/
				1	49	21.21	21.3±1	/
				1	99	21	21.3±1	/
				36	0	21.09	21.3±1	1.0
				36	24	21.18	21.3±1	1.0
				36	49	21.17	21.3±1	1.0
				75	0	21.13	21.3±1	1.0
			16QAM	1	0	20.85	21.2±1	1.0
				1	49	21.11	21.2±1	1.0
				1	99	20.9	21.2±1	1.0
				36	0	20.49	21.2±1	1.0
				36	24	20.58	21.2±1	1.0
				36	49	20.58	21.2±1	1.0
				75	0	20.56	21.2±1	1.0
	21100	2535	QPSK	1	0	21.04	21.3±1	/
				1	49	21.25	21.3±1	/
				1	99	20.99	21.3±1	/
				36	0	21.18	21.3±1	1.0
				36	24	21.19	21.3±1	1.0
				36	49	21.13	21.3±1	1.0
				75	0	21.16	21.3±1	1.0
			16QAM	1	0	21.33	21.5±1	1.0
				1	49	21.54	21.5±1	1.0
				1	99	21.28	21.5±1	1.0
				36	0	20.64	21.5±1	1.0
				36	24	20.67	21.5±1	1.0
				36	49	20.58	21.5±1	1.0
				75	0	20.61	21.5±1	1.0
	21375	2562.5	QPSK	1	0	21.09	21.3±1	/
				1	49	21.21	21.3±1	/
				1	99	20.81	21.3±1	/
				36	0	21.15	21.3±1	1.0
				36	24	21.11	21.3±1	1.0
				36	49	20.98	21.3±1	1.0
				75	0	21.05	21.3±1	1.0
			16QAM	1	0	21.41	21.4±1	1.0
				1	49	21.46	21.4±1	1.0
				1	99	21.06	21.4±1	1.0
				36	0	20.54	21.4±1	1.0
				36	24	20.52	21.4±1	1.0
				36	49	20.41	21.4±1	1.0
				75	0	20.5	21.4±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
20MHz	20850	2510	QPSK	1	0	20.73	21.2±1	/
				1	49	21.12	21.2±1	/
				1	99	20.83	21.2±1	/
				50	0	20.99	21.2±1	1.0
				50	24	21.09	21.2±1	1.0
				50	49	21.12	21.2±1	1.0
				100	0	21.07	21.2±1	1.0
			16QAM	1	0	21.23	21.7±1	1.0
				1	49	21.7	21.7±1	1.0
				1	99	21.31	21.7±1	1.0
				50	0	20.5	20.6±1	1.0
				50	24	20.59	20.6±1	1.0
				50	49	20.6	20.6±1	1.0
				100	0	20.56	20.6±1	1.0
	21100	2535	QPSK	1	0	20.85	21.2±1	/
				1	49	21.15	21.2±1	/
				1	99	20.8	21.2±1	/
				50	0	21.09	21.2±1	1.0
				50	24	21.08	21.2±1	1.0
				50	49	21.02	21.2±1	1.0
				100	0	21.07	21.2±1	1.0
			16QAM	1	0	21.22	21.5±1	1.0
				1	49	21.55	21.5±1	1.0
				1	99	21.2	21.5±1	1.0
				50	0	20.54	21.5±1	1.0
				50	24	20.55	21.5±1	1.0
				50	49	20.5	21.5±1	1.0
				100	0	20.54	21.5±1	1.0
	21350	2560	QPSK	1	0	20.95	21.2±1	/
				1	49	21.13	21.2±1	/
				1	99	20.59	21.2±1	/
				50	0	21.04	21.2±1	1.0
				50	24	21.06	21.2±1	1.0
				50	49	20.9	21.2±1	1.0
				100	0	21.02	21.2±1	1.0
			16QAM	1	0	21.27	21.3±1	1.0
				1	49	21.43	21.3±1	1.0
				1	99	20.92	21.3±1	1.0
				50	0	20.5	21.3±1	1.0
				50	24	20.5	21.3±1	1.0
				50	49	20.31	21.3±1	1.0
				100	0	20.48	21.3±1	1.0

LTE Band 13:

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	23205	779.5	QPSK	1	0	23.66	24.0±1	/
				1	49	23.92	24.0±1	/
				1	99	23.69	24.0±1	/
				12	0	22.74	23.0±1	1.0
				12	24	22.82	23.0±1	1.0
				12	49	22.77	23.0±1	1.0
				25	0	22.75	23.0±1	1.0
			16QAM	1	0	22.76	23.2±1	1.0
				1	49	23.11	23.2±1	1.0
				1	99	22.83	23.2±1	1.0
				12	0	21.78	22.0±1	1.0
				12	24	21.85	22.0±1	1.0
				12	49	21.79	22.0±1	1.0
				25	0	21.77	22.0±1	1.0
	23230	782.0	QPSK	1	0	23.72	24.0±1	/
				1	49	23.98	24.0±1	/
				1	99	23.71	24.0±1	/
				12	0	22.8	22.0±1	1.0
				12	24	22.84	22.0±1	1.0
				12	49	22.78	22.0±1	1.0
				25	0	22.78	22.0±1	1.0
			16QAM	1	0	23.21	23.5±1	1.0
				1	49	23.43	23.5±1	1.0
				1	99	23.19	23.5±1	1.0
				12	0	21.95	22.0±1	1.0
				12	24	21.95	22.0±1	1.0
				12	49	21.91	22.0±1	1.0
				25	0	21.83	22.0±1	1.0
	23255	784.5	QPSK	1	0	23.73	24.0±1	/
				1	49	23.96	24.0±1	/
				1	99	23.72	24.0±1	/
				12	0	22.79	23.0±1	1.0
				12	24	22.84	23.0±1	1.0
				12	49	22.8	23.0±1	1.0
				25	0	22.77	23.0±1	1.0
			16QAM	1	0	22.78	23.1±1	1.0
				1	49	23.02	23.1±1	1.0
				1	99	22.74	23.1±1	1.0
				12	0	21.78	22.0±1	1.0
				12	24	21.86	22.0±1	1.0
				12	49	21.8	22.0±1	1.0
				25	0	21.72	22.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	23230	782.0	QPSK	1	0	23.84	24.0±1	/
				1	49	23.99	24.0±1	/
				1	99	23.85	24.0±1	/
				25	0	22.85	23.0±1	1.0
				25	24	22.83	23.0±1	1.0
				25	49	22.85	23.0±1	1.0
				50	0	22.86	23.0±1	1.0
			16QAM	1	0	22.64	22.8±1	1.0
				1	49	22.75	22.8±1	1.0
				1	99	22.62	22.8±1	1.0
				25	0	21.86	22.8±1	1.0
				25	24	21.88	22.8±1	1.0
				25	49	21.91	22.8±1	1.0
				50	0	21.88	22.8±1	1.0

ERP and EIRP**LTE Band 2**

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
1.4MHz	QPSK	Low	H	16.49	33	Pass
			V	19.47	33	Pass
		Middle	H	16.39	33	Pass
			V	19.17	33	Pass
		High	H	16.14	33	Pass
			V	18.30	33	Pass
	16QAM	Low	H	16.56	33	Pass
			V	19.69	33	Pass
		Middle	H	16.15	33	Pass
			V	19.18	33	Pass
		High	H	15.65	33	Pass
			V	18.21	33	Pass
3MHz	QPSK	Low	H	16.66	33	Pass
			V	19.85	33	Pass
		Middle	H	16.61	33	Pass
			V	19.27	33	Pass
		High	H	15.97	33	Pass
			V	18.54	33	Pass
	16QAM	Low	H	16.78	33	Pass
			V	19.81	33	Pass
		Middle	H	15.86	33	Pass
			V	18.99	33	Pass
		High	H	15.80	33	Pass
			V	18.74	33	Pass
5MHz	QPSK	Low	H	16.32	33	Pass
			V	19.45	33	Pass
		Middle	H	16.83	33	Pass
			V	19.84	33	Pass
		High	H	15.95	33	Pass
			V	18.81	33	Pass
	16QAM	Low	H	16.62	33	Pass
			V	19.53	33	Pass
		Middle	H	17.09	33	Pass
			V	20.07	33	Pass
		High	H	16.21	33	Pass
			V	18.90	33	Pass

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
10MHz	QPSK	Low	H	16.83	33	Pass
			V	19.42	33	Pass
		Middle	H	16.60	33	Pass
			V	19.00	33	Pass
		High	H	16.01	33	Pass
			V	18.45	33	Pass
	16QAM	Low	H	16.53	33	Pass
			V	19.25	33	Pass
		Middle	H	16.11	33	Pass
			V	19.31	33	Pass
		High	H	15.93	33	Pass
			V	18.55	33	Pass
15MHz	QPSK	Low	H	16.80	33	Pass
			V	19.17	33	Pass
		Middle	H	16.36	33	Pass
			V	18.76	33	Pass
		High	H	15.97	33	Pass
			V	18.19	33	Pass
	16QAM	Low	H	16.12	33	Pass
			V	18.94	33	Pass
		Middle	H	15.94	33	Pass
			V	19.01	33	Pass
		High	H	15.68	33	Pass
			V	18.20	33	Pass
20MHz	QPSK	Low	H	16.16	33	Pass
			V	19.21	33	Pass
		Middle	H	15.78	33	Pass
			V	18.59	33	Pass
		High	H	15.82	33	Pass
			V	18.11	33	Pass
	16QAM	Low	H	16.23	33	Pass
			V	19.06	33	Pass
		Middle	H	15.49	33	Pass
			V	18.49	33	Pass
		High	H	15.59	33	Pass
			V	18.03	33	Pass

LTE Band 4

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
1.4MHz	QPSK	Low	H	17.11	30	Pass
			V	19.79	30	Pass
		Middle	H	16.04	30	Pass
			V	20.03	30	Pass
		High	H	15.50	30	Pass
			V	19.21	30	Pass
	16QAM	Low	H	16.57	30	Pass
			V	19.72	30	Pass
		Middle	H	16.21	30	Pass
			V	19.23	30	Pass
		High	H	15.17	30	Pass
			V	18.81	30	Pass
3MHz	QPSK	Low	H	17.13	30	Pass
			V	20.38	30	Pass
		Middle	H	16.53	30	Pass
			V	19.97	30	Pass
		High	H	15.81	30	Pass
			V	19.06	30	Pass
	16QAM	Low	H	17.15	30	Pass
			V	19.63	30	Pass
		Middle	H	16.18	30	Pass
			V	19.59	30	Pass
		High	H	15.48	30	Pass
			V	18.79	30	Pass
5MHz	QPSK	Low	H	16.76	30	Pass
			V	20.14	30	Pass
		Middle	H	16.62	30	Pass
			V	19.75	30	Pass
		High	H	16.13	30	Pass
			V	18.48	30	Pass
	16QAM	Low	H	17.16	30	Pass
			V	19.89	30	Pass
		Middle	H	16.03	30	Pass
			V	18.90	30	Pass
		High	H	15.44	30	Pass
			V	18.22	30	Pass

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
10MHz	QPSK	Low	H	16.75	30	Pass
			V	19.95	30	Pass
		Middle	H	16.33	30	Pass
			V	19.70	30	Pass
		High	H	15.82	30	Pass
			V	18.44	30	Pass
	16QAM	Low	H	16.76	30	Pass
			V	19.72	30	Pass
		Middle	H	15.83	30	Pass
			V	18.83	30	Pass
		High	H	15.34	30	Pass
			V	18.09	30	Pass
15MHz	QPSK	Low	H	16.08	30	Pass
			V	19.47	30	Pass
		Middle	H	16.38	30	Pass
			V	19.15	30	Pass
		High	H	15.56	30	Pass
			V	18.15	30	Pass
	16QAM	Low	H	16.96	30	Pass
			V	19.11	30	Pass
		Middle	H	15.58	30	Pass
			V	18.10	30	Pass
		High	H	14.79	30	Pass
			V	17.51	30	Pass
20MHz	QPSK	Low	H	17.18	30	Pass
			V	20.03	30	Pass
		Middle	H	16.31	30	Pass
			V	19.72	30	Pass
		High	H	15.82	30	Pass
			V	19.03	30	Pass
	16QAM	Low	H	17.43	30	Pass
			V	20.54	30	Pass
		Middle	H	16.71	30	Pass
			V	20.10	30	Pass
		High	H	16.19	30	Pass
			V	19.24	30	Pass

LTE Band 5

Channel Bandwidth	Modulation	Channel	Antenna Polar	ERP (dBm)	Limit (dBm)	Verdict
1.4MHz	QPSK	Low	H	16.42	38.45	Pass
			V	20.02	38.45	Pass
		Middle	H	16.28	38.45	Pass
			V	19.22	38.45	Pass
		High	H	15.47	38.45	Pass
			V	18.59	38.45	Pass
	16QAM	Low	H	16.68	38.45	Pass
			V	19.19	38.45	Pass
		Middle	H	15.65	38.45	Pass
			V	18.88	38.45	Pass
		High	H	15.19	38.45	Pass
			V	18.60	38.45	Pass
3MHz	QPSK	Low	H	16.73	38.45	Pass
			V	19.73	38.45	Pass
		Middle	H	16.34	38.45	Pass
			V	19.03	38.45	Pass
		High	H	15.52	38.45	Pass
			V	19.09	38.45	Pass
	16QAM	Low	H	16.34	38.45	Pass
			V	19.60	38.45	Pass
		Middle	H	15.90	38.45	Pass
			V	18.78	38.45	Pass
		High	H	15.26	38.45	Pass
			V	18.92	38.45	Pass
5MHz	QPSK	Low	H	16.80	38.45	Pass
			V	19.98	38.45	Pass
		Middle	H	16.51	38.45	Pass
			V	19.11	38.45	Pass
		High	H	15.15	38.45	Pass
			V	18.88	38.45	Pass
	16QAM	Low	H	16.36	38.45	Pass
			V	19.46	38.45	Pass
		Middle	H	15.44	38.45	Pass
			V	18.93	38.45	Pass
		High	H	15.35	38.45	Pass
			V	18.67	38.45	Pass

Channel Bandwidth	Modulation	Channel	Antenna Polar	ERP (dBm)	Limit (dBm)	Verdict
10MHz	QPSK	Low	H	17.14	38.45	Pass
			V	20.17	38.45	Pass
		Middle	H	16.69	38.45	Pass
			V	19.34	38.45	Pass
		High	H	15.62	38.45	Pass
			V	19.32	38.45	Pass
	16QAM	Low	H	16.68	38.45	Pass
			V	19.93	38.45	Pass
		Middle	H	16.28	38.45	Pass
			V	19.09	38.45	Pass
		High	H	15.37	38.45	Pass
			V	18.99	38.45	Pass

LTE Band 7

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
5MHz	QPSK	Low	H	16.77	33	Pass
			V	19.57	33	Pass
		Middle	H	15.39	33	Pass
			V	18.65	33	Pass
		High	H	15.15	33	Pass
			V	17.77	33	Pass
	16QAM	Low	H	16.38	33	Pass
			V	19.50	33	Pass
		Middle	H	15.50	33	Pass
			V	18.16	33	Pass
		High	H	15.36	33	Pass
			V	17.24	33	Pass
10MHz	QPSK	Low	H	16.54	33	Pass
			V	19.60	33	Pass
		Middle	H	16.03	33	Pass
			V	18.81	33	Pass
		High	H	15.70	33	Pass
			V	17.91	33	Pass
	16QAM	Low	H	16.80	33	Pass
			V	19.72	33	Pass
		Middle	H	15.71	33	Pass
			V	18.66	33	Pass
		High	H	15.53	33	Pass
			V	17.68	33	Pass
15MHz	QPSK	Low	H	16.85	33	Pass
			V	19.23	33	Pass
		Middle	H	16.14	33	Pass
			V	18.82	33	Pass
		High	H	15.38	33	Pass
			V	18.27	33	Pass
	16QAM	Low	H	16.55	33	Pass
			V	19.73	33	Pass
		Middle	H	15.71	33	Pass
			V	18.69	33	Pass
		High	H	14.86	33	Pass
			V	17.54	33	Pass

Channel Bandwidth	Modulation	Channel	Antenna Polar	EIRP (dBm)	Limit (dBm)	Verdict
20MHz	QPSK	Low	H	16.81	33	Pass
			V	19.98	33	Pass
		Middle	H	15.93	33	Pass
			V	18.83	33	Pass
		High	H	15.71	33	Pass
			V	18.00	33	Pass
	16QAM	Low	H	16.87	33	Pass
			V	20.11	33	Pass
		Middle	H	16.21	33	Pass
			V	19.19	33	Pass
		High	H	15.99	33	Pass
			V	18.31	33	Pass

LTE Band 13

Channel Bandwidth	Modulation	Channel	Antenna Polar	ERP (dBm)	Limit (dBm)	Verdict
5MHz	QPSK	Low	H	17.23	34.77	Pass
			V	19.99	34.77	Pass
		Middle	H	16.24	34.77	Pass
			V	18.93	34.77	Pass
		High	H	15.85	34.77	Pass
			V	19.36	34.77	Pass
	16QAM	Low	H	16.57	34.77	Pass
			V	19.65	34.77	Pass
		Middle	H	16.15	34.77	Pass
			V	18.73	34.77	Pass
		High	H	15.59	34.77	Pass
			V	18.78	34.77	Pass
10MHz	QPSK	Low	H	17.27	34.77	Pass
			V	20.27	34.77	Pass
	16QAM	Low	H	17.16	34.77	Pass
			V	19.86	34.77	Pass

8 Peak-to-Average Ratio

Test Requirement:	24.232 (d), 27.50(d)
Test Method:	N/A
Test Mode:	TX transmitting

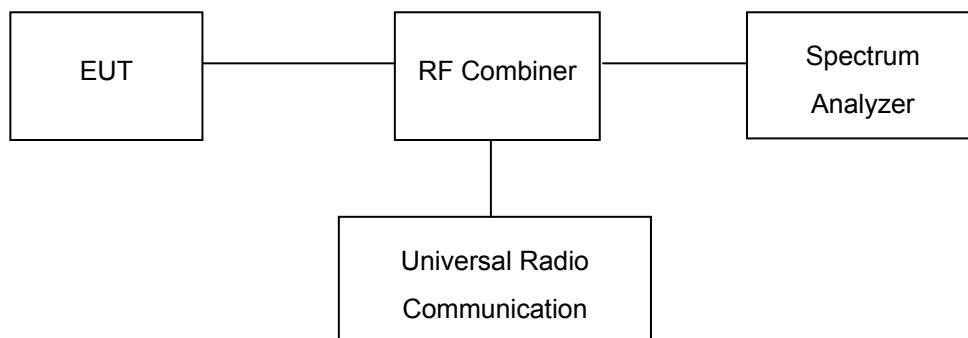
8.1 EUT Operation

Operating Environment :

Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

8.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.



8.3 Test Result

PASS

LTE Band

Please refer to the Appendix Band 2/4/5/7/13 LTE Peak to Average Ratio.

9 Bandwidth

Test Requirement:	FCC Part 2.1049, 22.917, 22.905, 24.238, 27.53(a);
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

9.1 EUT Operation

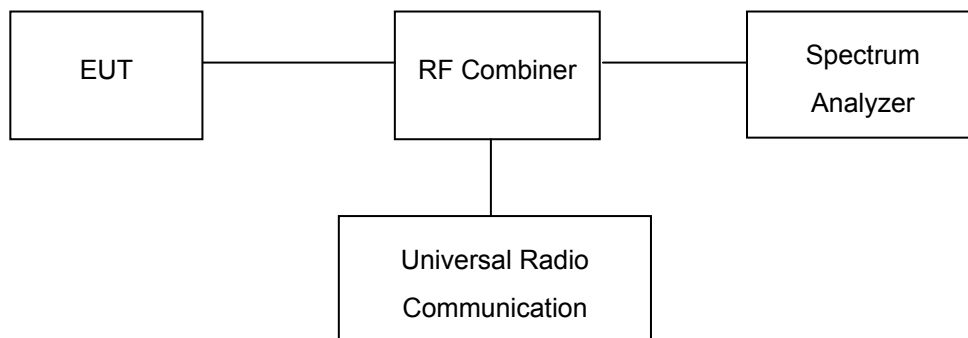
Operating Environment :

Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

9.2 Test Procedure

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set in the range of 1 to 5 % of the anticipated OBW and the 26 dB & 99%bandwidth was recorded.



9.3 Test Result

PASS

LTE Band

Please refer to the Appendix Band 2/4/5/7/13 LTE Transmitter Occupied Bandwidth(SA).

10 Spurious Emissions at Antenna Terminals

Test Requirement:	FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h), 27.53(m)(4);
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

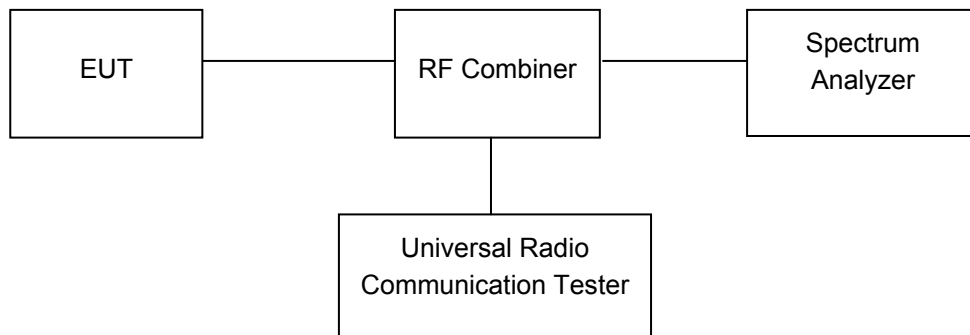
10.1 EUT Operation

Operating Environment :

Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

10.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.



10.3 Test Result

PASS

LTE Band

Please refer to the Appendix Band 2/4/5/7/13 LTE Transmitter Spurious Emissions.

11 Spurious Radiated Emissions

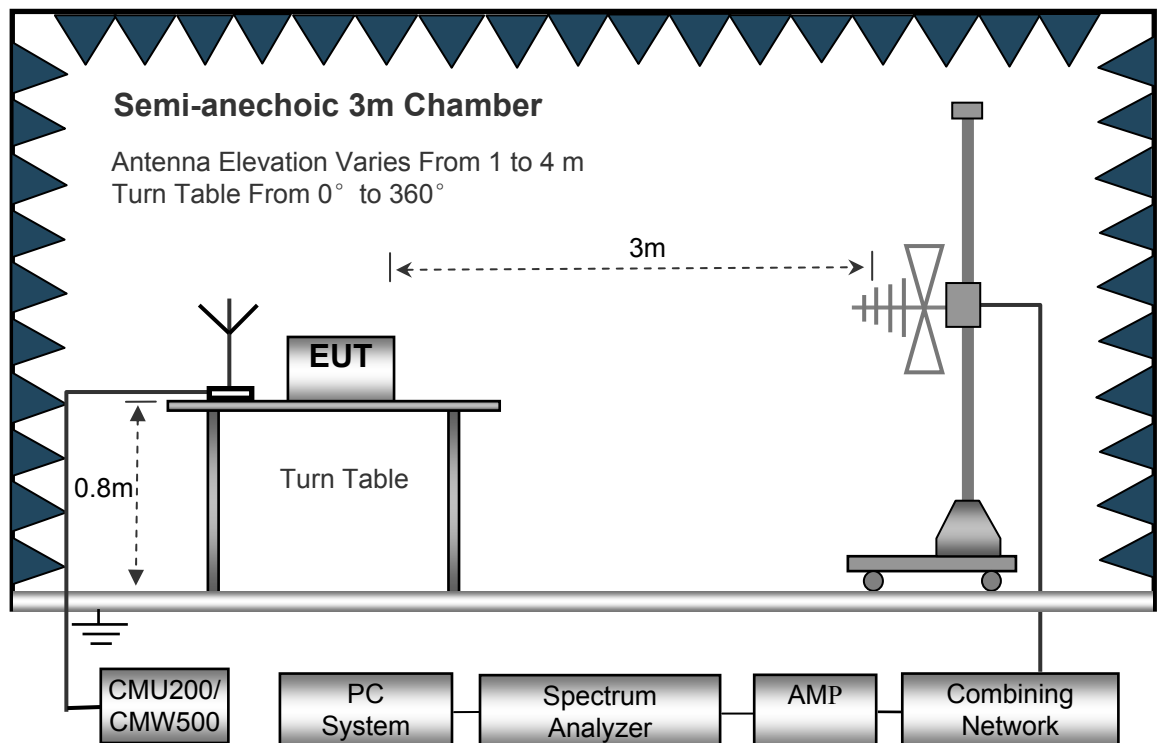
Test Requirement:	FCC Part 2.1053, 22.917, 24.238, 27.53(h), 27.53(m)(4);
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

11.1 EUT Operation

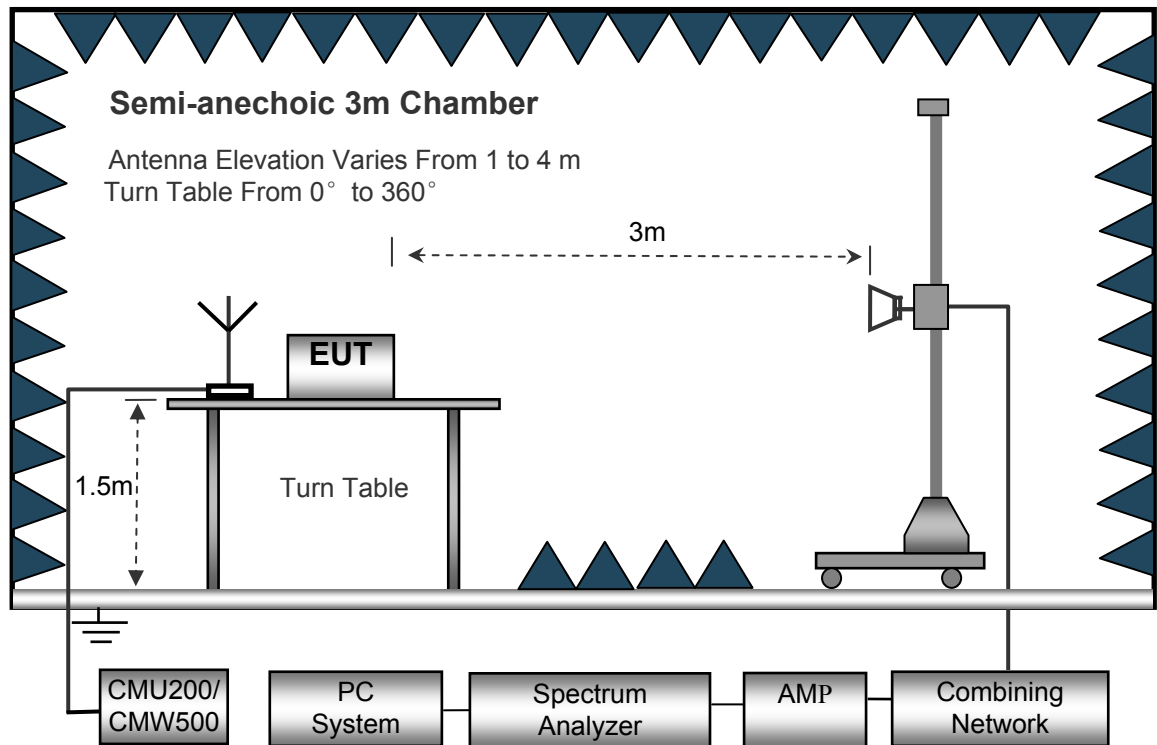
Operating Environment :	
Temperature:	25.5°C
Humidity:	56.7%RH
Atmospheric Pressure:	101.2kPa

11.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site. The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



11.3 Spectrum Analyzer Setup

30MHz ~ 1GHz

- Sweep Speed Auto
- Detector PK
- Resolution Bandwidth..... 100kHz
- Video Bandwidth..... 300kHz

Above 1GHz

- Sweep Speed Auto
- Detector PK
- Resolution Bandwidth..... 1MHz
- Video Bandwidth..... 3MHz
- Detector Ave.
- Resolution Bandwidth..... 1MHz
- Video Bandwidth..... 10Hz

11.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m for below 1GHz and 1.5m for above 1GHz above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from 30MHz up to the tenth harmonic of the highest fundamental frequency.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.
7. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level
Spurious attenuation limit in dB = $43 + 10 \lg (\text{power out in Watts})$
8. Repeat above procedures until the measurements for all frequencies are completed.

11.5 Summary of Test Results

Remark: Test performed from 30MHz to 10th harmonics with low/middle/high channels, only the worst data were recorded.

LTE Band 2

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE BAND 2 Channel 18607										
482.11	50.63	101	2.0	H	-59.88	2.92	16.87	-45.93	-13.00	-32.93
482.11	54.74	48	1.4	V	-52.85	2.92	16.87	-38.90	-13.00	-25.90
3701.40	53.70	45	1.9	H	-57.84	5.34	29.40	-33.78	-13.00	-20.78
3701.40	60.19	256	1.4	V	-49.62	5.34	29.40	-25.56	-13.00	-12.56
5552.10	34.00	190	1.3	H	-75.61	6.46	32.60	-49.47	-13.00	-36.47
5552.10	41.00	169	1.1	V	-67.88	6.46	32.60	-41.74	-13.00	-28.74
LTE BAND 2 Channel 18900										
482.11	47.95	115	1.7	H	-62.56	2.92	16.87	-48.61	-13.00	-35.61
482.11	51.51	165	1.2	V	-56.08	2.92	16.87	-42.13	-13.00	-29.13
3760.00	49.09	45	1.1	H	-62.45	5.34	29.40	-38.39	-13.00	-25.39
3760.00	51.98	226	1.7	V	-57.83	5.34	29.40	-33.77	-13.00	-20.77
5640.00	29.93	74	1.3	H	-79.68	6.46	32.60	-53.54	-13.00	-40.54
5640.00	35.51	208	1.2	V	-73.37	6.46	32.60	-47.23	-13.00	-34.23
LTE BAND 2 Channel 19193										
482.11	50.21	266	1.2	H	-60.30	2.92	16.87	-46.35	-13.00	-33.35
482.11	50.90	167	1.2	V	-56.69	2.92	16.87	-42.74	-13.00	-29.74
3818.60	47.96	48	1.2	H	-62.89	5.34	29.40	-38.83	-13.00	-25.83
3818.60	51.53	352	1.5	V	-57.78	5.34	29.40	-33.72	-13.00	-20.72
5727.90	28.30	87	1.6	H	-81.05	6.46	32.60	-54.91	-13.00	-41.91
5727.90	35.17	232	1.3	V	-73.33	6.46	32.60	-47.19	-13.00	-34.19

LTE Band 4

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE BAND 4 Channel 19957										
255.63	52.74	200	1.1	H	-57.77	2.18	11.36	-48.59	-13.00	-35.59
255.63	53.59	296	1.2	V	-54.00	2.18	11.36	-44.82	-13.00	-31.82
3421.40	50.85	311	1.9	H	-62.20	5.49	28.80	-38.89	-13.00	-25.89
3421.40	54.75	228	1.9	V	-56.40	5.49	28.80	-33.09	-13.00	-20.09
5132.10	33.60	112	1.7	H	-75.81	6.45	30.90	-51.36	-13.00	-38.36
5132.10	40.38	338	1.7	V	-68.39	6.45	30.90	-43.94	-13.00	-30.94
LTE BAND 4 Channel 20175										
255.63	48.62	130	1.5	H	-61.89	2.18	11.36	-52.71	-13.00	-39.71
255.63	50.25	68	1.1	V	-57.34	2.18	11.36	-48.16	-13.00	-35.16
3465.00	56.09	250	1.4	H	-56.96	5.49	28.80	-33.65	-13.00	-20.65
3465.00	49.56	43	1.1	V	-61.59	5.49	28.80	-38.28	-13.00	-25.28
5197.50	34.90	187	1.8	H	-74.51	6.45	30.90	-50.06	-13.00	-37.06
5197.50	40.97	4	1.6	V	-67.80	6.45	30.90	-43.35	-13.00	-30.35
LTE BAND 4 Channel 20393										
255.63	51.56	6	1.8	H	-58.95	2.18	11.36	-49.77	-13.00	-36.77
255.63	53.02	277	1.8	V	-54.57	2.18	11.36	-45.39	-13.00	-32.39
3508.60	51.67	77	1.6	H	-61.38	5.49	28.80	-38.07	-13.00	-25.07
3508.60	55.79	296	1.6	V	-55.36	5.49	28.80	-32.05	-13.00	-19.05
5262.90	34.61	211	1.1	H	-74.80	6.45	30.90	-50.35	-13.00	-37.35
5262.90	40.36	317	1.3	V	-68.41	6.45	30.90	-43.96	-13.00	-30.96

LTE Band 5

frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE BAND 5 Channel 20407										
304.75	52.91	81	2.0	H	-57.60	2.41	12.71	-47.30	-13.00	-34.30
304.75	58.17	356	1.4	V	-49.42	2.41	12.71	-39.12	-13.00	-26.12
1649.40	60.07	44	1.6	H	-52.98	5.22	24.80	-33.40	-13.00	-20.40
1649.40	62.55	101	1.5	V	-48.60	5.22	24.80	-29.02	-13.00	-16.02
2474.10	39.35	186	1.4	H	-70.06	5.61	27.80	-47.87	-13.00	-34.87
2474.10	43.26	38	1.3	V	-65.51	5.61	27.80	-43.32	-13.00	-30.32
LTE BAND 5 Channel 20525										
304.75	50.19	127	1.8	H	-60.32	2.41	12.71	-50.02	-13.00	-37.02
304.75	53.33	306	1.1	V	-54.26	2.41	12.71	-43.96	-13.00	-30.96
1673.00	58.20	303	2.1	H	-54.85	5.22	24.80	-35.27	-13.00	-22.27
1673.00	58.68	93	1.5	V	-52.47	5.22	24.80	-32.89	-13.00	-19.89
2509.50	38.69	8	2.1	H	-70.72	5.61	27.80	-48.53	-13.00	-35.53
2509.50	44.16	108	1.8	V	-64.61	5.61	27.80	-42.42	-13.00	-29.42
LTE BAND 5 Channel 20643										
304.75	49.86	349	2.0	H	-60.65	2.41	12.71	-50.35	-13.00	-37.35
304.75	57.15	232	1.4	V	-50.44	2.41	12.71	-40.14	-13.00	-27.14
1696.60	59.11	169	2.1	H	-53.53	5.22	24.80	-33.95	-13.00	-20.95
1696.60	55.21	77	1.1	V	-55.52	5.22	24.80	-35.94	-13.00	-22.94
2544.90	41.26	47	1.0	H	-68.32	5.61	27.80	-46.13	-13.00	-33.13
2544.90	49.31	220	1.1	V	-59.49	5.61	27.80	-37.30	-13.00	-24.30

LTE Band 7

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE BAND 7 Channel 20775										
366.49	39.57	128	1.1	H	-70.94	2.56	13.62	-59.88	-25.00	-34.88
366.49	40.51	162	1.8	V	-67.08	2.56	13.62	-56.02	-25.00	-31.02
5005.00	35.20	200	1.8	H	-74.04	6.51	31.50	-49.05	-25.00	-24.05
5005.00	41.22	68	1.6	V	-67.55	6.51	31.50	-42.56	-25.00	-17.56
7507.50	16.10	280	1.3	H	-90.44	8.08	37.00	-61.52	-25.00	-36.52
7507.50	21.25	248	1.3	V	-84.18	8.08	37.00	-55.26	-25.00	-30.26
LTE BAND 7 Channel 21100										
366.49	36.75	198	2.1	H	-73.76	2.56	13.62	-62.70	-25.00	-37.70
366.49	40.43	264	1.3	V	-67.16	2.56	13.62	-56.10	-25.00	-31.10
5070.00	36.72	195	1.7	H	-72.52	6.51	31.50	-47.53	-25.00	-22.53
5070.00	40.84	35	2.1	V	-67.93	6.51	31.50	-42.94	-25.00	-17.94
7605.00	18.04	337	2.1	H	-88.50	8.08	37.00	-59.58	-25.00	-34.58
7605.00	22.98	77	1.3	V	-82.45	8.08	37.00	-53.53	-25.00	-28.53
LTE BAND 7 Channel 21425										
366.49	38.08	197	1.1	H	-72.43	2.56	13.62	-61.37	-25.00	-36.37
366.49	42.56	79	1.2	V	-65.03	2.56	13.62	-53.97	-25.00	-28.97
5135.00	35.84	34	1.7	H	-73.57	6.51	31.50	-48.58	-25.00	-23.58
5135.00	40.75	80	1.2	V	-68.02	6.51	31.50	-43.03	-25.00	-18.03
7702.50	20.88	150	1.6	H	-84.35	8.08	37.00	-55.43	-25.00	-30.43
7702.50	25.32	230	1.2	V	-79.57	8.08	37.00	-50.65	-25.00	-25.65

LTE Band 13

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
LTE BAND 13 Channel 23205										
226.71	50.39	149	1.7	H	-60.12	2.07	10.35	-51.84	-13.00	-38.84
226.71	53.67	137	1.4	V	-53.92	2.07	10.35	-45.64	-13.00	-32.64
1559.00	57.50	151	1.0	H	-59.55	5.22	24.80	-39.97	-13.00	-26.97
1559.00	61.44	178	1.4	V	-49.71	5.22	24.80	-30.13	-13.00	-17.13
2338.50	35.92	353	2.1	H	-73.49	5.61	27.80	-51.30	-13.00	-38.30
2338.50	41.80	36	1.1	V	-66.97	5.61	27.80	-44.78	-13.00	-31.78
LTE BAND 13 Channel 23230										
226.71	51.93	58	1.7	H	-58.58	2.07	10.35	-50.30	-13.00	-37.30
226.71	54.84	197	1.8	V	-52.75	2.07	10.35	-44.47	-13.00	-31.47
1564.00	56.63	277	1.9	H	-60.42	5.22	24.80	-40.84	-13.00	-27.84
1564.00	59.39	116	2.0	V	-51.76	5.22	24.80	-32.18	-13.00	-19.18
2346.00	36.09	96	2.1	H	-73.32	5.61	27.80	-51.13	-13.00	-38.13
2346.00	40.39	185	1.6	V	-68.38	5.61	27.80	-46.19	-13.00	-33.19
LTE BAND 13 Channel 23255										
226.71	49.95	42	1.1	H	-60.56	2.07	10.35	-52.28	-13.00	-39.28
226.71	53.53	173	2.0	V	-54.06	2.07	10.35	-45.78	-13.00	-32.78
1569.00	57.86	271	1.5	H	-59.19	5.22	24.80	-39.61	-13.00	-26.61
1569.00	60.63	207	2.2	V	-50.52	5.22	24.80	-30.94	-13.00	-17.94
2353.50	37.69	54	1.7	H	-71.72	5.61	27.80	-49.53	-13.00	-36.53
2353.50	42.25	320	2.2	V	-66.52	5.61	27.80	-44.33	-13.00	-31.33

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Absolute Level - Limit

12 Band Edge Measurement

Test Requirement:	FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h), 27.53(m)(4);
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

12.1 EUT Operation

Operating Environment :	
Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

12.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

According to FCC Part 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the TX transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

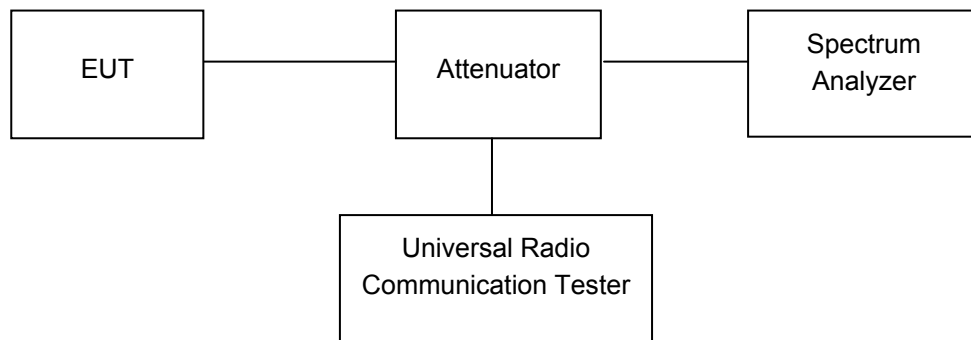
According to FCC Part 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the TX transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC Part 27.53(h), Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

According to FCC Part 27.53(m)(4), For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a

documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

The center of the spectrum analyzer was set to block edge frequency



12.3 Test Result

PASS

LTE Band

Please refer to the Appendix Band 2/4/5/7/13 LTE Band Edge.

13 Frequency Stability

Test Requirement:	FCC Part 2.1055, 22.355, 24.235, 27.5(h),27.54;
Test Method:	ANSI C63.26:2015 ANSI/TIA-603-E:2016
Test Mode:	TX transmitting

13.1 EUT Operation

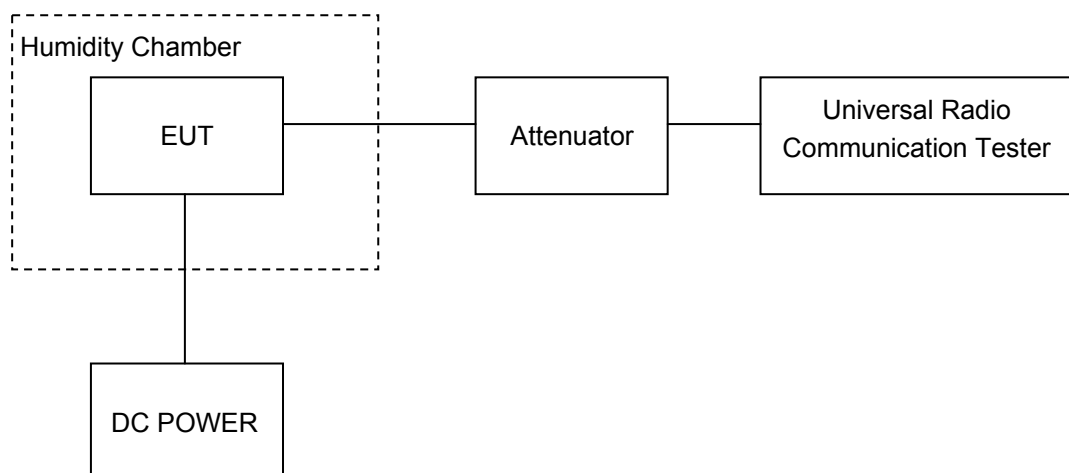
Operating Environment :	
Temperature:	25.1°C
Humidity:	56.8 % RH
Atmospheric Pressure:	101.4kPa

13.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



13.3 Test Result

LTE Band 2

Test Frequency:1880.0MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-8	-0.0043	2.5
40		4	0.0021	2.5
30		-1	-0.0005	2.5
20		-4	-0.0021	2.5
10		1	0.0005	2.5
0		-8	-0.0043	2.5
-10		-10	-0.0053	2.5
-20		3	0.0016	2.5
-30		1	0.0005	2.5
20	3.29	-6	-0.0032	2.5
20	4.45	0	0.0000	2.5

Test Frequency:1880.0MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-1	-0.0005	2.5
40		-2	-0.0011	2.5
30		-12	-0.0064	2.5
20		-5	-0.0027	2.5
10		2	0.0011	2.5
0		-6	-0.0032	2.5
-10		-1	-0.0005	2.5
-20		-8	-0.0043	2.5
-30		-1	-0.0005	2.5
20	3.29	-10	-0.0053	2.5
20	4.45	-8	-0.0043	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-10	-0.0053	2.5
40		-2	-0.0011	2.5
30		-9	-0.0048	2.5
20		-6	-0.0032	2.5
10		0	0.0000	2.5
0		-8	-0.0043	2.5
-10		-10	-0.0053	2.5
-20		-13	-0.0069	2.5
-30		-1	-0.0005	2.5
20	3.29	-15	-0.0080	2.5
20	4.45	-8	-0.0043	2.5

Test Frequency:1880.0MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-11	-0.0059	2.5
40		5	0.0027	2.5
30		-3	-0.0016	2.5
20		-3	-0.0016	2.5
10		-11	-0.0059	2.5
0		5	0.0027	2.5
-10		5	0.0027	2.5
-20		-5	-0.0027	2.5
-30		6	0.0032	2.5
20	3.29	4	0.0021	2.5
20	4.45	-4	-0.0021	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-2	-0.0011	2.5
40		-15	-0.0080	2.5
30		-6	-0.0032	2.5
20		-7	-0.0037	2.5
10		1	0.0005	2.5
0		-16	-0.0085	2.5
-10		-1	-0.0005	2.5
-20		-1	-0.0005	2.5
-30		-6	-0.0032	2.5
20	3.29	-10	-0.0053	2.5
20	4.45	-12	-0.0064	2.5

Test Frequency:1880.0MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0027	2.5
40		-7	-0.0037	2.5
30		-5	-0.0027	2.5
20		-6	-0.0032	2.5
10		-3	-0.0016	2.5
0		-6	-0.0032	2.5
-10		1	0.0005	2.5
-20		-11	-0.0059	2.5
-30		-12	-0.0064	2.5
20	3.29	2	0.0011	2.5
20	4.45	-5	-0.0027	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	2	0.0011	2.5
40		4	0.0021	2.5
30		-6	-0.0032	2.5
20		-5	-0.0027	2.5
10		-3	-0.0016	2.5
0		-11	-0.0059	2.5
-10		-5	-0.0027	2.5
-20		-12	-0.0064	2.5
-30		-5	-0.0027	2.5
20	3.29	-9	-0.0048	2.5
20	4.45	-10	-0.0053	2.5

Test Frequency:1880.0MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-1	-0.0005	2.5
40		-6	-0.0032	2.5
30		-8	-0.0043	2.5
20		-4	-0.0021	2.5
10		-3	-0.0016	2.5
0		-5	-0.0027	2.5
-10		-6	-0.0032	2.5
-20		5	0.0027	2.5
-30		-9	-0.0048	2.5
20	3.29	5	0.0027	2.5
20	4.45	-8	-0.0043	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-3	-0.0016	2.5
40		-11	-0.0059	2.5
30		0	0.0000	2.5
20		-3	-0.0016	2.5
10		5	0.0027	2.5
0		-4	-0.0021	2.5
-10		-12	-0.0064	2.5
-20		-9	-0.0048	2.5
-30		3	0.0016	2.5
20	3.29	-6	-0.0032	2.5
20	4.45	-11	-0.0059	2.5

Test Frequency:1880.0MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-3	-0.0016	2.5
40		-3	-0.0016	2.5
30		-5	-0.0027	2.5
20		-4	-0.0021	2.5
10		0	0.0000	2.5
0		0	0.0000	2.5
-10		-10	-0.0053	2.5
-20		-3	-0.0016	2.5
-30		-9	-0.0048	2.5
20	3.29	1	0.0005	2.5
20	4.45	-13	-0.0069	2.5

LTE Band 2

Test Frequency:1880.0MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	2	0.0011	2.5
40		-7	-0.0037	2.5
30		-12	-0.0064	2.5
20		-6	-0.0032	2.5
10		0	0.0000	2.5
0		-8	-0.0043	2.5
-10		-12	-0.0064	2.5
-20		-10	-0.0053	2.5
-30		-5	-0.0027	2.5
20	3.29	-2	-0.0011	2.5
20	4.45	-15	-0.0080	2.5

Test Frequency:1880.0MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-13	-0.0069	2.5
40		-7	-0.0037	2.5
30		1	0.0005	2.5
20		-7	-0.0037	2.5
10		-6	-0.0032	2.5
0		-3	-0.0016	2.5
-10		-6	-0.0032	2.5
-20		-13	-0.0069	2.5
-30		-12	-0.0064	2.5
20	3.29	-3	-0.0016	2.5
20	4.45	-10	-0.0053	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-13	-0.0075	2.5
40		-6	-0.0035	2.5
30		2	0.0012	2.5
20		-2	-0.0012	2.5
10		0	0.0000	2.5
0		-4	-0.0023	2.5
-10		3	0.0017	2.5
-20		3	0.0017	2.5
-30		-10	-0.0058	2.5
20	3.29	-10	-0.0058	2.5
20	4.45	3	0.0017	2.5

Test Frequency:1732.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-8	-0.0046	2.5
40		5	0.0029	2.5
30		0	0.0000	2.5
20		-1	-0.0006	2.5
10		1	0.0006	2.5
0		-8	-0.0046	2.5
-10		7	0.0040	2.5
-20		4	0.0023	2.5
-30		-7	-0.0040	2.5
20	3.29	-9	-0.0052	2.5
20	4.45	-9	-0.0052	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-7	-0.0040	2.5
40		-3	-0.0017	2.5
30		0	0.0000	2.5
20		1	0.0006	2.5
10		9	0.0052	2.5
0		3	0.0017	2.5
-10		-1	-0.0006	2.5
-20		6	0.0035	2.5
-30		8	0.0046	2.5
20	3.29	8	0.0046	2.5
20	4.45	4	0.0023	2.5

Test Frequency:1732.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-4	-0.0023	2.5
40		1	0.0006	2.5
30		-9	-0.0052	2.5
20		-1	-0.0006	2.5
10		-8	-0.0046	2.5
0		1	0.0006	2.5
-10		7	0.0040	2.5
-20		-8	-0.0046	2.5
-30		-2	-0.0012	2.5
20	3.29	7	0.0040	2.5
20	4.45	5	0.0029	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-11	-0.0063	2.5
40		-8	-0.0046	2.5
30		-6	-0.0035	2.5
20		-3	-0.0017	2.5
10		-12	-0.0069	2.5
0		-8	-0.0046	2.5
-10		-4	-0.0023	2.5
-20		-11	-0.0063	2.5
-30		-12	-0.0069	2.5
20	3.29	-5	-0.0029	2.5
20	4.45	-3	-0.0017	2.5

Test Frequency:1732.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	1	0.0006	2.5
40		-13	-0.0075	2.5
30		-4	-0.0023	2.5
20		-4	-0.0023	2.5
10		-3	-0.0017	2.5
0		2	0.0012	2.5
-10		-4	-0.0023	2.5
-20		3	0.0017	2.5
-30		0	0.0000	2.5
20	3.29	-1	-0.0006	2.5
20	4.45	1	0.0006	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-10	-0.0058	2.5
40		-7	-0.0040	2.5
30		2	0.0012	2.5
20		0	0.0000	2.5
10		-6	-0.0035	2.5
0		-6	-0.0035	2.5
-10		-3	-0.0017	2.5
-20		-4	-0.0023	2.5
-30		-2	-0.0012	2.5
20	3.29	6	0.0035	2.5
20	4.45	2	0.0012	2.5

Test Frequency:1732.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-6	-0.0035	2.5
40		-8	-0.0046	2.5
30		1	0.0006	2.5
20		-1	-0.0006	2.5
10		-2	-0.0012	2.5
0		-3	-0.0017	2.5
-10		4	0.0023	2.5
-20		-6	-0.0035	2.5
-30		-2	-0.0012	2.5
20	3.29	7	0.0040	2.5
20	4.45	-6	-0.0035	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	1	0.0006	2.5
40		-10	-0.0058	2.5
30		-8	-0.0046	2.5
20		-2	-0.0012	2.5
10		-6	-0.0035	2.5
0		-9	-0.0052	2.5
-10		-10	-0.0058	2.5
-20		4	0.0023	2.5
-30		-9	-0.0052	2.5
20	3.29	-4	-0.0023	2.5
20	4.45	3	0.0017	2.5

Test Frequency:1732.5MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-1	-0.0006	2.5
40		-11	-0.0063	2.5
30		-7	-0.0040	2.5
20		-4	-0.0023	2.5
10		-8	-0.0046	2.5
0		-1	-0.0006	2.5
-10		-6	-0.0035	2.5
-20		1	0.0006	2.5
-30		2	0.0012	2.5
20	3.29	-11	-0.0063	2.5
20	4.45	4	0.0023	2.5

LTE Band 4

Test Frequency:1732.5MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-14	-0.0081	2.5
40		-10	-0.0058	2.5
30		-9	-0.0052	2.5
20		-3	-0.0017	2.5
10		-2	-0.0012	2.5
0		5	0.0029	2.5
-10		-11	-0.0063	2.5
-20		-1	-0.0006	2.5
-30		-10	-0.0058	2.5
20	3.29	-3	-0.0017	2.5
20	4.45	-1	-0.0006	2.5

Test Frequency:1732.5MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-7	-0.0040	2.5
40		3	0.0017	2.5
30		1	0.0006	2.5
20		-2	-0.0012	2.5
10		1	0.0006	2.5
0		-9	-0.0052	2.5
-10		-10	-0.0058	2.5
-20		-11	-0.0063	2.5
-30		-5	-0.0029	2.5
20	3.29	-10	-0.0058	2.5
20	4.45	-9	-0.0052	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-6	-0.0072	2.5
40		-7	-0.0084	2.5
30		0	0.0000	2.5
20		0	0.0000	2.5
10		6	0.0072	2.5
0		-8	-0.0096	2.5
-10		6	0.0072	2.5
-20		7	0.0084	2.5
-30		0	0.0000	2.5
20	3.29	-9	-0.0108	2.5
20	4.45	-1	-0.0012	2.5

Test Frequency:836.5MHz 16QAM 1.4MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	2	0.0024	2.5
40		3	0.0036	2.5
30		9	0.0108	2.5
20		1	0.0012	2.5
10		9	0.0108	2.5
0		-4	-0.0048	2.5
-10		-5	-0.0060	2.5
-20		-6	-0.0072	2.5
-30		-1	-0.0012	2.5
20	3.29	8	0.0096	2.5
20	4.45	7	0.0084	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0060	2.5
40		-5	-0.0060	2.5
30		4	0.0048	2.5
20		-1	-0.0012	2.5
10		6	0.0072	2.5
0		-3	-0.0036	2.5
-10		-9	-0.0108	2.5
-20		6	0.0072	2.5
-30		-3	-0.0036	2.5
20	3.29	-3	-0.0036	2.5
20	4.45	3	0.0036	2.5

Test Frequency:836.5MHz 16QAM 3MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-2	-0.0024	2.5
40		-8	-0.0096	2.5
30		-1	-0.0012	2.5
20		-1	-0.0012	2.5
10		-3	-0.0036	2.5
0		-4	-0.0048	2.5
-10		-4	-0.0048	2.5
-20		-6	-0.0072	2.5
-30		-3	-0.0036	2.5
20	3.29	1	0.0012	2.5
20	4.45	-4	-0.0048	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-8	-0.0096	2.5
40		0	0.0000	2.5
30		-1	-0.0012	2.5
20		1	0.0012	2.5
10		6	0.0072	2.5
0		-2	-0.0024	2.5
-10		-6	-0.0072	2.5
-20		-7	-0.0084	2.5
-30		0	0.0000	2.5
20	3.29	0	0.0000	2.5
20	4.45	3	0.0036	2.5

Test Frequency:836.5MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	0	0.0000	2.5
40		5	0.0060	2.5
30		-3	-0.0036	2.5
20		0	0.0000	2.5
10		6	0.0072	2.5
0		-8	-0.0096	2.5
-10		4	0.0048	2.5
-20		-3	-0.0036	2.5
-30		-3	-0.0036	2.5
20	3.29	5	0.0060	2.5
20	4.45	1	0.0012	2.5

LTE Band 5

Test Frequency:836.5MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0060	2.5
40		1	0.0012	2.5
30		-5	-0.0060	2.5
20		-1	-0.0012	2.5
10		-3	-0.0036	2.5
0		3	0.0036	2.5
-10		2	0.0024	2.5
-20		-9	-0.0108	2.5
-30		2	0.0024	2.5
20	3.29	1	0.0012	2.5
20	4.45	-1	-0.0012	2.5

Test Frequency:836.5MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	7	0.0084	2.5
40		-7	-0.0084	2.5
30		3	0.0036	2.5
20		-1	-0.0012	2.5
10		1	0.0012	2.5
0		-1	-0.0012	2.5
-10		-3	-0.0036	2.5
-20		3	0.0036	2.5
-30		-6	-0.0072	2.5
20	3.29	-8	-0.0096	2.5
20	4.45	-1	-0.0012	2.5

LTE Band 7

Test Frequency:2535MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	2	0.0008	2.5
40		-5	-0.0020	2.5
30		-2	-0.0008	2.5
20		-3	-0.0012	2.5
10		-10	-0.0039	2.5
0		-3	-0.0012	2.5
-10		-7	-0.0028	2.5
-20		4	0.0016	2.5
-30		5	0.0020	2.5
20	3.29	-1	-0.0004	2.5
20	4.45	-5	-0.0020	2.5

Test Frequency:2535MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0020	2.5
40		0	0.0000	2.5
30		7	0.0028	2.5
20		-2	-0.0008	2.5
10		-2	-0.0008	2.5
0		-8	-0.0032	2.5
-10		3	0.0012	2.5
-20		-5	-0.0020	2.5
-30		2	0.0008	2.5
20	3.29	-9	-0.0036	2.5
20	4.45	-6	-0.0024	2.5

LTE Band 7

Test Frequency:2535MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-6	-0.0024	2.5
40		-4	-0.0016	2.5
30		-11	-0.0043	2.5
20		-4	-0.0016	2.5
10		-3	-0.0012	2.5
0		5	0.0020	2.5
-10		-3	-0.0012	2.5
-20		-6	-0.0024	2.5
-30		-9	-0.0036	2.5
20	3.29	-10	-0.0039	2.5
20	4.45	-7	-0.0028	2.5

Test Frequency:2535MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-8	-0.0032	2.5
40		4	0.0016	2.5
30		-11	-0.0043	2.5
20		-4	-0.0016	2.5
10		-3	-0.0012	2.5
0		2	0.0008	2.5
-10		-12	-0.0047	2.5
-20		-5	-0.0020	2.5
-30		5	0.0020	2.5
20	3.29	-6	-0.0024	2.5
20	4.45	-3	-0.0012	2.5

LTE Band 7

Test Frequency:2535MHz QPSK 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	4	0.0016	2.5
40		-5	-0.0020	2.5
30		0	0.0000	2.5
20		-3	-0.0012	2.5
10		4	0.0016	2.5
0		-5	-0.0020	2.5
-10		5	0.0020	2.5
-20		-6	-0.0024	2.5
-30		-7	-0.0028	2.5
20	3.29	-11	-0.0043	2.5
20	4.45	-3	-0.0012	2.5

Test Frequency:2535MHz 16QAM 15MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-4	-0.0016	2.5
40		-8	-0.0032	2.5
30		2	0.0008	2.5
20		-3	-0.0012	2.5
10		-6	-0.0024	2.5
0		-8	-0.0032	2.5
-10		-1	-0.0004	2.5
-20		4	0.0016	2.5
-30		-11	-0.0043	2.5
20	3.29	1	0.0004	2.5
20	4.45	0	0.0000	2.5

LTE Band 7

Test Frequency:2535MHz QPSK 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	2	0.0008	2.5
40		0	0.0000	2.5
30		-6	-0.0024	2.5
20		-2	-0.0008	2.5
10		-1	-0.0004	2.5
0		6	0.0024	2.5
-10		-2	-0.0008	2.5
-20		-7	-0.0028	2.5
-30		-3	-0.0012	2.5
20	3.29	-6	-0.0024	2.5
20	4.45	-6	-0.0024	2.5

Test Frequency:2535MHz 16QAM 20MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0020	2.5
40		-4	-0.0016	2.5
30		-11	-0.0043	2.5
20		-4	-0.0016	2.5
10		1	0.0004	2.5
0		-11	-0.0043	2.5
-10		-13	-0.0051	2.5
-20		-3	-0.0012	2.5
-30		-2	-0.0008	2.5
20	3.29	-1	-0.0004	2.5
20	4.45	1	0.0004	2.5

LTE Band 13

Test Frequency: 782.0MHz QPSK 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-4	-0.0051	2.5
40		3	0.0038	2.5
30		-3	-0.0038	2.5
20		-5	-0.0064	2.5
10		-3	-0.0038	2.5
0		-12	-0.0153	2.5
-10		-11	-0.0141	2.5
-20		2	0.0026	2.5
-30		-14	-0.0179	2.5
20	3.29	-11	-0.0141	2.5
20	4.45	0	0.0000	2.5

Test Frequency: 782.0MHz 16QAM 5MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-5	-0.0064	2.5
40		0	0.0000	2.5
30		-12	-0.0153	2.5
20		-5	-0.0064	2.5
10		-11	-0.0141	2.5
0		-2	-0.0026	2.5
-10		-3	-0.0038	2.5
-20		-4	-0.0051	2.5
-30		-4	-0.0051	2.5
20	3.29	-9	-0.0115	2.5
20	4.45	-4	-0.0051	2.5

LTE Band 13

Test Frequency: 782.0MHz QPSK 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-15	-0.0192	2.5
40		-11	-0.0141	2.5
30		-1	-0.0013	2.5
20		-9	-0.0115	2.5
10		-6	-0.0077	2.5
0		-14	-0.0179	2.5
-10		-7	-0.0090	2.5
-20		-14	-0.0179	2.5
-30		-3	-0.0038	2.5
20	3.29	-5	-0.0064	2.5
20	4.45	-15	-0.0192	2.5

Test Frequency: 782.0MHz 16QAM 10MHz				
Temperature (°C)	Power Supply (VDC)	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
50	3.87	-13	-0.0166	2.5
40		0	0.0000	2.5
30		-2	-0.0026	2.5
20		-4	-0.0051	2.5
10		4	0.0051	2.5
0		-11	-0.0141	2.5
-10		-6	-0.0077	2.5
-20		0	0.0000	2.5
-30		-10	-0.0128	2.5
20	3.29	2	0.0026	2.5
20	4.45	-4	-0.0051	2.5

14 RF Exposure

Remark: Please refer to SAR test report: WTD26D06190405W010.

15 Photographs of test setup and EUT.

Note: Please refer to Appendix-Black S3-Photos.

===== End of Report =====