FCC Radio Test Report

FCC ID: 2A5LO-TOZED5GCPEX21

This report concerns: Original Grant

Project No.	:	2201C050
Equipment	:	5G Wireless Router
Brand Name	:	TOZED KANGWEI
Test Model	:	ZLT X21
Series Model	:	ZLT X21Y("Y" in the model name can be A to Z)
Applicant	:	Guangzhou Tozed Kangwei Intelligent Technology Co., LTD
Address	:	13/F,Tower 1, Xiangjiang Sci-tech Innovation Center, No.37 Jinlong Road, Nansha District, Guangzhou
Manufacturer	:	Guangzhou Tozed Kangwei Intelligent Technology Co., LTD
Address	:	13/F,Tower 1, Xiangjiang Sci-tech Innovation Center, No.37 Jinlong Road, Nansha District, Guangzhou
Factory	:	Guangzhou Tozed Kangwei Intelligent Technology Co., LTD
Address	:	13/F,Tower 1, Xiangjiang Sci-tech Innovation Center, No.37 Jinlong Road, Nansha District, Guangzhou
Date of Receipt	:	Jan. 12, 2022
Date of Test	:	Jan. 13, 2022 ~ Mar. 14, 2022
Issued Date	:	Mar. 17, 2022
Report Version	:	R00
Test Sample	:	Engineering Sample No.: DG20220111219 for radiated, DG20220111225 for conducted.
Standard(s)	:	47 CFR FCC Part 27 Subpart L 47 CFR FCC Part 27 Subpart M 47 CFR FCC Part 2 ANSI C63.26-2015 ANSI/TIA/EIA-603-E-2016 FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Gabriel Zhu

Prepared by : Gabriel Zhu

Steven Lu

Approved by : Steven Lu

ACCREDITED

TESTING CERT #5123.02

Add: No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China

Tel: +86-769-8318-3000

Web: www.newbtl.com

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

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BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and is not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-2-2201C050	R00	Original Report.	Mar. 17, 2022	Valid

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 Subpart L, M & Part 2			
Standard(s) Section	**Test Item**	**Judgment**	**Remark**
2.1046	Output Power	PASS	------
27.50(d)(4) 27.50(h)(2)	Equivalent Isotropic Radiated Power	PASS	------
2.1049	Occupied Bandwidth	PASS	------
2.1051 27.53(h) 27.53(m)(4)&(m)(6)	Conducted Spurious Emissions	PASS	------
2.1053 27.53(h) 27.53(m)(4)&(m)(6)	Radiated Spurious Emissions	PASS	------
2.1051 27.53(h) 27.53(m)(4)&(m)(6)	Band Edge Measurements	PASS	------
-	Peak To Average Ratio	PASS	Record Only
2.1055 27.54	Frequency Stability	PASS	------

Note:

(1) “N/A” denotes test is not applicable in this test report.

1.1 TEST FACILITY

The test facilities used to collect the test data of radiated in this report is at the location of No. 3 Jinshagang 1st Rd. Shixia, Dalang Town Dongguan City, Guangdong 523792 People's Republic of China.

The test facilities used to collect the test data of conduted in this report is at the location of Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People's Republic of China.
BTL's Test Firm Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))
The BTL measurement uncertainty as below table:

A. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB01	CISPR	9kHz ~ 30MHz	2.36

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	30MHz ~ 200MHz	V	4.36
		30MHz ~ 200MHz	H	3.32
		200MHz ~ 1,000MHz	V	4.08
		200MHz ~ 1,000MHz	H	3.96

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (3m)	CISPR	1GHz ~ 6GHz	3.80
		6GHz ~ 18GHz	4.82

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-CB03 (1m)	CISPR	18GHz ~ 26.5GHz	3.62

B. Other Measurement:

Parameter	Uncertainty
Spectrum Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Power Spectral Density	±0.86 dB
Frequency Stability	±0.16 dB
Temperature	±0.08 °C
Time	±0.58 %
Supply voltages	±0.3 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Output Power & EIRP	21°C	40%	DC 12V	Rick Liao
Occupied Bandwidth	21°C	40%	DC 12V	Rick Liao
Conducted Spurious Emissions	21°C	40%	DC 12V	Rick Liao
Radiated Spurious Emissions (9 kHz to 30 MHz)	17°C	56%	AC 120V/60Hz	Jakyri Wen
Radiated Spurious Emissions (30 MHz to 1000 MHz)	17°C	56%	AC 120V/60Hz	Jakyri Wen
Radiated Spurious Emissions (Above 1000 MHz)	17°C	56%	AC 120V/60Hz	Jakyri Wen
Band Edge	21°C	40%	DC 12V	Rick Liao
Peak To Average Ratio	21°C	40%	DC 12V	Rick Liao
Frequency Stability	Normal & Extreme	40%	Normal & Extreme	Rick Liao

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	5G Wireless Router				
Brand Name	TOZED KANGWEI				
Test Model	ZLT X21				
Series Model	ZLT X21Y("Y" in the model name can be A to Z)				
Model Difference(s)	There is no difference except model difference, shell color and silk screen change.				
Hardware Version	TZ7.823.411				
Software Version	1.2.17				
Power Source	DC voltage supplied from AC adapter. Model: GS-P120200E334				
Power Rating	I/P: 100-240V ~ 50/60Hz 0.8A O/P: 12V ⎓ 2A				
IMEI No.	Radiated	355882561000078			
	Conducted	355882561000177			
Modulation Type	LTE		UL: QPSK,16QAM, 64QAM DL: QPSK,16QAM, 64QAM		
Max. EIRP	LTE	Channel Bandwidth (MHz)	QPSK (dBm)	16QAM (dBm)	64QAM (dBm)
	Band 4	1.4	25.08	24.23	23.40
		3	25.00	24.37	23.42
		5	25.24	24.52	23.49
		10	25.51	24.64	23.73
		15	25.80	24.99	24.08
		20	25.48	24.99	24.06
	Band 7	5	27.15	25.97	26.39
		10	27.10	26.25	26.21
		15	27.15	26.27	26.68
		20	26.94	26.47	26.34
	Band 66	3	25.76	25.12	24.82
		5	25.97	25.08	25.09
		10	25.78	25.02	25.35
		15	26.16	25.77	25.74
		20	26.21	25.80	25.79
	LTE CA_7C	10+20	27.89	27.27	24.99
		20+10	27.17	26.62	25.98
		15+10	28.95	28.38	26.53
		15+15	27.13	26.47	26.34
		15+20	27.36	26.69	25.76
		20+15	27.38	25.94	25.57
		20+20	27.14	26.44	25.00

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

LTE Band 4(UL: 1710-1755MHz, DL: 2110-2155MHz)					
Test Frequency ID	Bandwidth (MHz)	N_{UL}	Frequency of Uplink (MHz)	N_{DL}	Frequency of Downlink (MHz)
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1740	2300	2145

LTE Band 7(UL: 2500-2570MHz, DL: 2620-2690MHz)					
Test Frequency ID	Bandwidth (MHz)	N_{UL}	Frequency of Uplink (MHz)	N_{DL}	Frequency of Downlink (MHz)
Low Range	5	20775	2502.5	2775	2622.5
	10	20800	2505	2800	2625
	15	20825	2507.5	2825	2627.5
	20	20850	2510	2850	2630
Mid Range	5/10/15/20	21100	2535	3100	2655
High Range	5	21425	2567.5	3425	2687.5
	10	21400	2565	3400	2685
	15	21375	2562.5	3375	2682.5
	20	21350	2560	3350	2680

LTE Band 66(UL: 1710-1780MHz, DL: 2110-2200MHz)					
Test Frequency ID	Bandwidth (MHz)	N_{UL}	Frequency of Uplink (MHz)	N_{DL}	Frequency of Downlink (MHz)
Low Range	3	131987	1711.5	66451	2111.5
	5	131997	1712.5	66461	2112.5
	10	132022	1715	66486	2115
	15	132047	1717.5	66511	2117.5
	20	132072	1720	66536	2120
Mid Range	3/5/10/15/20	132322	1745	66786	2145
High Range	3	132657	1778.5	67121	2178.5
	5	132647	1777.5	67111	2177.5
	10	132622	1775	67086	2175
	15	132597	1772.5	67061	2172.5
	20	132572	1770	67036	2170

LTE CA_7C

Range	CC-Combo / N_{RB_agg} [RB]	CC1 Note1					CC2 Note1				
		BW [RB]	N_{UL}	f_{UL} [MHz]	N_{DL}	f_{DL} [MHz]	BW [RB]	N_{UL}	f_{UL} [MHz]	N_{DL}	f_{DL} [MHz]
Low	50+100	50	20805	2505.5	2805	2625.5	100	20949	2519.9	2949	2639.9
		100	20850	2510	2850	2630	50	20994	2524.4	2994	2644.4
	75+50	75	20825	2507.5	2825	2627.5	50	20945	2519.5	2945	2639.5
	75+75	75	20825	2507.5	2825	2627.5	75	20975	2522.5	2975	2642.5
	75+100	75	20828	2507.8	2828	2627.8	100	20999	2524.9	2999	2644.9
		100	20850	2510	2850	2630	75	21021	2527.1	3021	2647.1
	100+100	100	20850	2510	2850	2630	100	21048	2529.8	3048	2649.8
Mid	50+100	50	21006	2525.6	3006	2645.6	100	21150	2540	3150	2660
		100	21051	2530.1	3051	2650.1	50	21195	2544.5	3195	2664.5
	75+50	75	21051	2530.1	3051	2650.1	50	21171	2542.1	3171	2662.1
	75+75	75	21025	2527.5	3025	2647.5	75	21175	2542.5	3175	2662.5
	75+100	75	21003	2525.3	3003	2645.3	100	21174	2542.4	3174	2662.4
		100	21026	2527.6	3026	2647.6	75	21197	2544.7	3197	2664.7
	100+100	100	21001	2525.1	3001	2645.1	100	21199	2544.9	3199	2664.9
High	50+100	50	21206	2545.6	3206	2665.6	100	21350	2560	3350	2680
		100	21251	2550.1	3251	2670.1	50	21395	2564.5	3395	2684.5
	75+50	75	21277	2552.7	3277	2672.7	50	21397	2564.7	3397	2684.7
	75+75	75	21225	2547.5	3225	2667.5	75	21375	2562.5	3375	2682.5
	75+100	75	21179	2542.9	3179	2662.9	100	21350	2560	3350	2680
		100	21201	2545.1	3201	2665.1	75	21372	2562.2	3372	2682.2
	100+100	100	21152	2540.2	3152	2660.2	100	21350	2560	3350	2680
Note 1: Carriers in increasing frequency order.											

3. Table for Filed Antenna:

Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
ShenZhen NQI network communication ltd	NQI-X21G-4G (3)-ASM-V01	PCB	IPEX	3.63	LTE Band 4
				4.39	LTE Band 7
				3.63	LTE Band 66

Note: The antenna gain is provided by the manufacturer.

2.2 DESCRIPTION OF TEST MODES

Following mode(s) is (were) found to be the worst case(s) and selected for the final test.

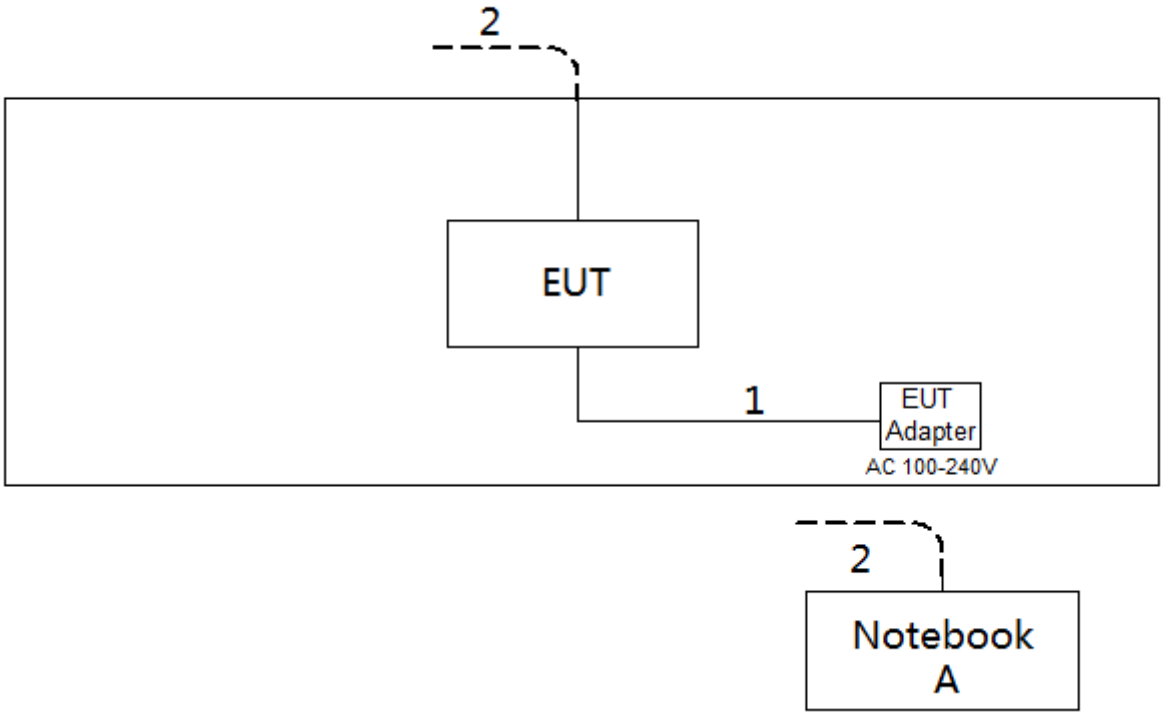
LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	1RB/3RB/6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1RB/36RB/75RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1RB/50RB/100RB
Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	75RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	100RB
Conducted Spurious Emissions	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Radiated Spurious Emissions	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Band Edge	19957 to 20393	19957, 20393	1.4MHz	QPSK	1RB/6RB
	19965 to 20385	19965, 20385	3MHz	QPSK	1RB/15RB
	19975 to 20375	19975, 20375	5MHz	QPSK	1RB/25RB
	20000 to 20350	20000, 20350	10MHz	QPSK	1RB/50RB
	20025 to 20325	20025, 20325	15MHz	QPSK	1RB/75RB
	20050 to 20300	20050, 20300	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	1RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	1RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1RB
Frequency Stability	20050 to 20300	20050, 20300	20MHz	QPSK	1RB

LTE BAND 7 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	1RB/36RB/75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1RB/50RB/100RB
Occupied Bandwidth	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	100RB
Conducted Spurious Emissions	20775 to 21425	21100	5MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB
Radiated Spurious Emissions	20775 to 21425	21100	5MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB
Band Edge	20775 to 21425	20775, 21425	5MHz	QPSK	1RB/25RB
	20800 to 21400	20800, 21400	10MHz	QPSK	1RB/50RB
	20825 to 21375	20825, 21375	15MHz	QPSK	1RB/75RB
	20850 to 21350	20850, 21350	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM, 64QAM	1RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM, 64QAM	1RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM, 64QAM	1RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM, 64QAM	1RB
Frequency Stability	20850 to 21350	20850, 21350	20MHz	QPSK	1RB

LTE BAND 66 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power &EIRP	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM, 64QAM	1RB/36RB/75RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM, 64QAM	1RB/50RB/100RB
Occupied Bandwidth	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM, 64QAM	15RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM, 64QAM	25RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM, 64QAM	50RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM, 64QAM	75 RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM, 64QAM	100RB
Conducted Spurious Emissions	131997 to 132647	132322	5MHz	QPSK	1RB
	132072 to 132572	132322	20MHz	QPSK	1RB
Radiated Spurious Emissions	131997 to 132647	132322	5MHz	QPSK	1RB
	132072 to 132572	132322	20MHz	QPSK	1RB
Band Edge	131987 to 132657	131987, 132657	3MHz	QPSK	1RB/15RB
	131997 to 132647	131997, 132647	5MHz	QPSK	1RB/25RB
	132022 to 132622	132022, 132622	10MHz	QPSK	1RB/50RB
	132047 to 132597	132047, 132597	15MHz	QPSK	1RB/75RB
	132072 to 132572	132072, 132572	20MHz	QPSK	1RB/100RB
Peak to Average Ratio	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM, 64QAM	1RB/8RB/15RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM, 64QAM	1RB/12RB/25RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM, 64QAM	1RB/25RB/50RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM, 64QAM	1RB/36RB/75RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM, 64QAM	1RB/50RB/100RB
Frequency Stability	132072 to 132572	132072, 132572	20MHz	QPSK	1RB

LTE CA_7C MODE				
Test Item	Channel Range	Channel Bandwidth	Modulation	Mode
Output Power &EIRP	Low, Mid, High	10MHz+20MHz	QPSK, 16QAM, 64QAM	PCC+SCC: 1RB#High+1RB#Low 1RB#Low+1RB# High Full RB+Full RB
		20MHz+10MHz		
		15MHz+10MHz		
		15MHz+15MHz		
		15MHz+20MHz		
		20MHz+15MHz		
		20MHz+20MHz		
Occupied Bandwidth	Low, Mid, High	10MHz+20MHz	QPSK, 16QAM, 64QAM	PCC+SCC: Full RB+Full RB
		20MHz+10MHz		
		15MHz+10MHz		
		15MHz+15MHz		
		15MHz+20MHz		
		20MHz+15MHz		
		20MHz+20MHz		
Conducted Spurious Emissions	Mid	20MHz+10MHz	QPSK	PCC+SCC: 1RB#High+1RB#Low
		15MHz+10MHz		
		20MHz+15MHz		
		20MHz+20MHz		
Radiated Spurious Emissions	Mid	20MHz+10MHz	QPSK	PCC+SCC: 1RB#High+1RB#Low
		15MHz+15MHz		
		20MHz+20MHz		
Band Edge	Low, High	10MHz+20MHz	QPSK	PCC+SCC: 1RB#High+1RB#Low 1RB#Low+1RB# High Full RB+Full RB
		20MHz+10MHz		
		15MHz+10MHz		
		15MHz+15MHz		
		15MHz+20MHz		
		20MHz+15MHz		
		20MHz+20MHz		

2.3 BLOCK DIGRAM SHOWING THECONFIGURATIONOFSYSTEMTESTED



2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
A	Notebook	Dell	Inspiron 15-7559	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	DC Cable	NO	NO	1.5m
2	RJ45 Cable	NO	NO	10m

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

Mobile / Portable station are limited to 1 watts e.i.r.p. (Part 27 Subpart L)
Mobile / Portable station are limited to 2 watts e.i.r.p. (Part 27 Subpart M)

3.1.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.

EIRP:

EIRP = Output Power + Antenan gain

ERP:

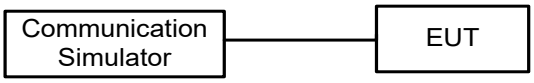
ERP = EIRP-2.15

Output Power:

The EUT was set up for the maximum power with WCDMA and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

3.1.3 TEST SETUP LAYOUT

Output Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the APPENDIX A.

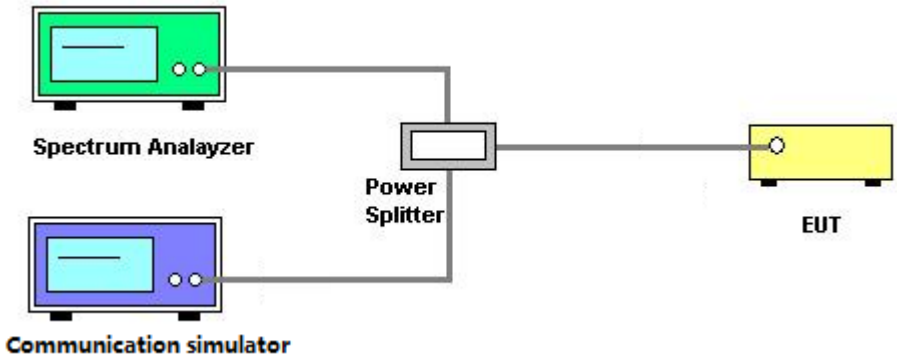
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 4.

1. The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. 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 and 26dB bandwidth.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. RBW=(1% ~ 5%)*EBW
   VBW⩾3* RBW
4. Set spectrum analyzer with Peak detector.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the APPENDIX B.

3.3 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

3.3.1 LIMIT

The 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. The emission limit equal to -13dBm. (Part 27 Subpart L)

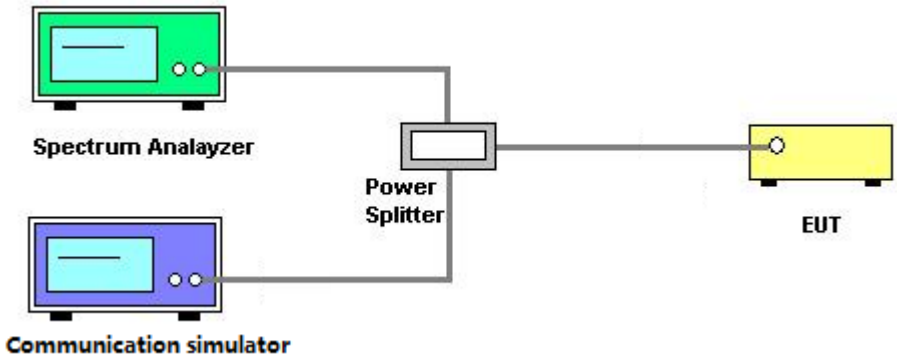
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB. The emission limit equal to -25dBm. (Part 27 Subpart M)

3.3.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Set RBW>=1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
3. Set spectrum analyzer with Peak detector.
4. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.3.3 TEST SETUP LAYOUT



3.3.4 TEST DEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the APPENDIX C.

3.4 RADIATED SPURIOUS EMISSIONS MEASUREMENT

3.4.1 LIMIT

The 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. The emission limit equal to -13dBm. (Part 27 Subpart L)

The 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 55 + 10 log(P) dB. The emission limit equal to -25dBm. (Part 27 Subpart M)

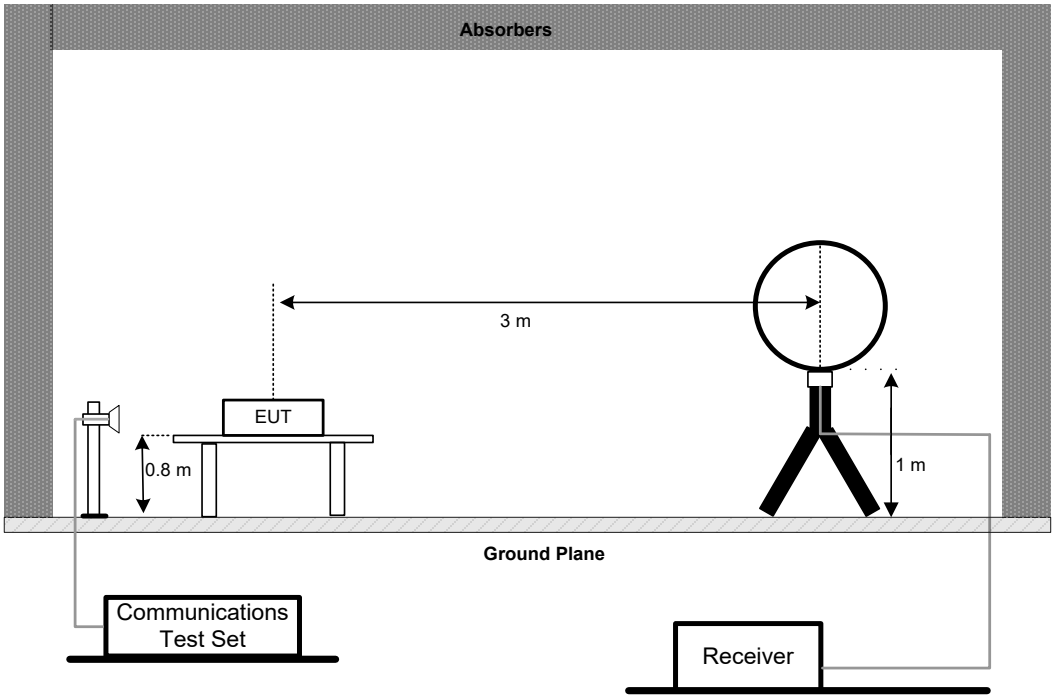
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.2.

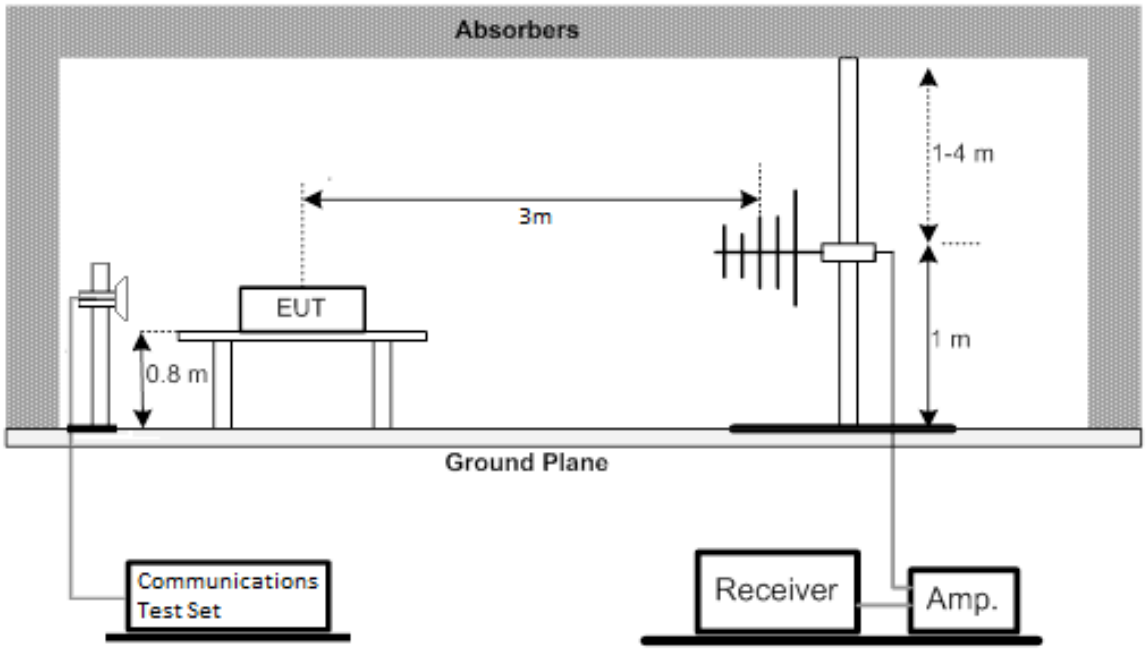
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
2. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step a. Record the power level of S.G
3. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
4. ERP can be calculated form EIRP by subtracting the gain of dipole, ERP = EIPR - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.4.3 TEST SETUP LAYOUT

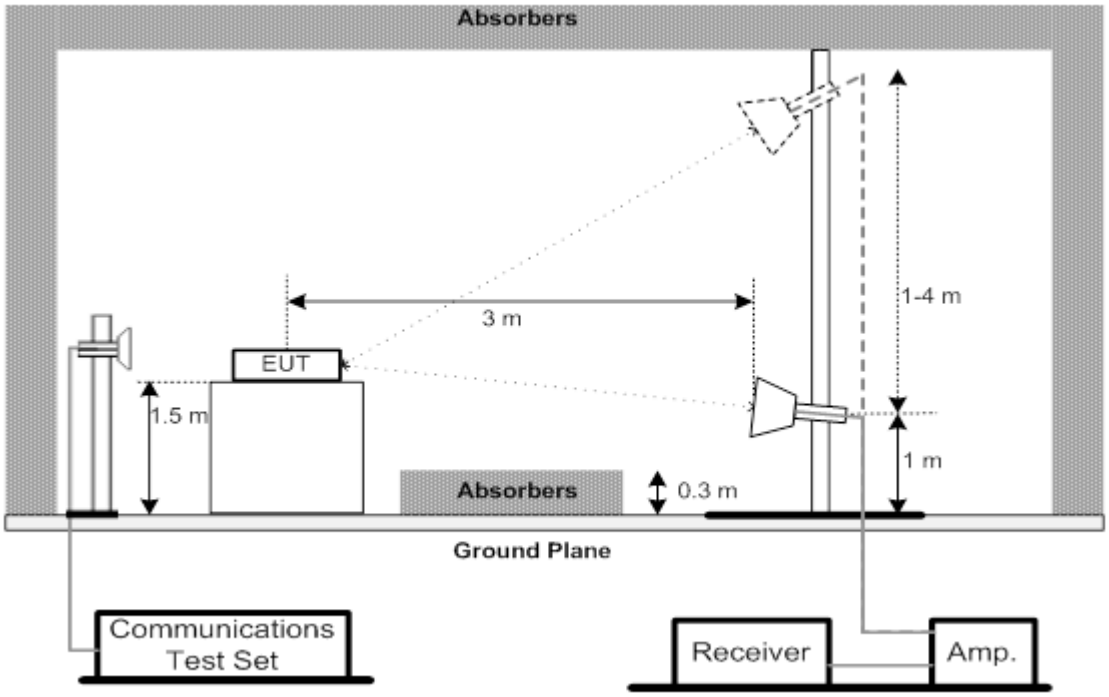
Below 30MHz



30MHz to 1GHz



Above 1GHz



3.4.4 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the APPENDIX D.

3.4.5 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the APPENDIX E.

3.4.6 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the APPENDIX F.

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMIT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. (Part 27 Subpart L)

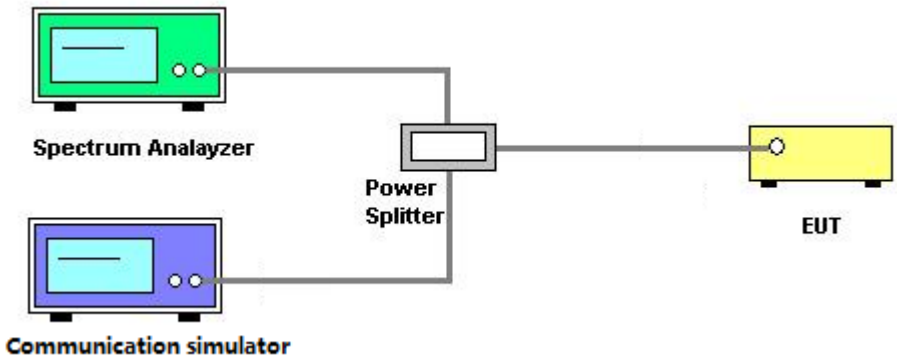
For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all 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 that 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. (Part 27 Subpart M)

3.5.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

1. All measurements were done at low and high operational frequency range.
2. Record the max trace plot into the test report.

3.5.3 TEST SETUP LAYOUT



3.5.4 TEST DEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the APPENDIX G.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

3.6.1 LIMIT

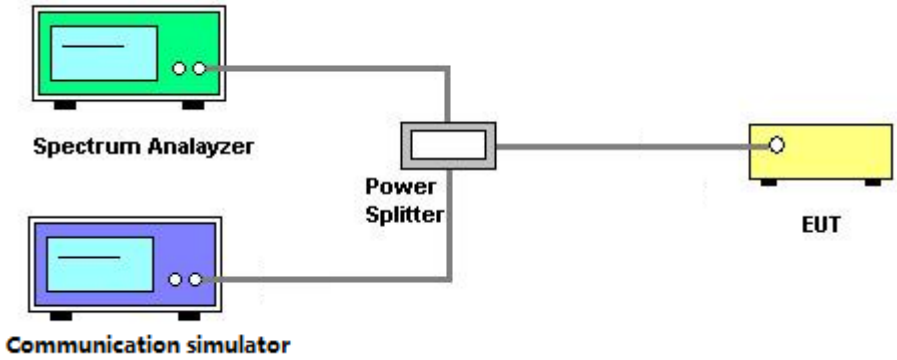
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.7.

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. Record the maximum PAPR level associated with a probability of 0.1%.

3.6.3 TEST SETUP LAYOUT



3.6.4 TEST DEVIATION

No deviation

3.6.5 TEST RESULTS

Please refer to the APPENDIX H.

3.7 FREQUENCY STABILITY MEASUREMENT

3.7.1 LIMIT

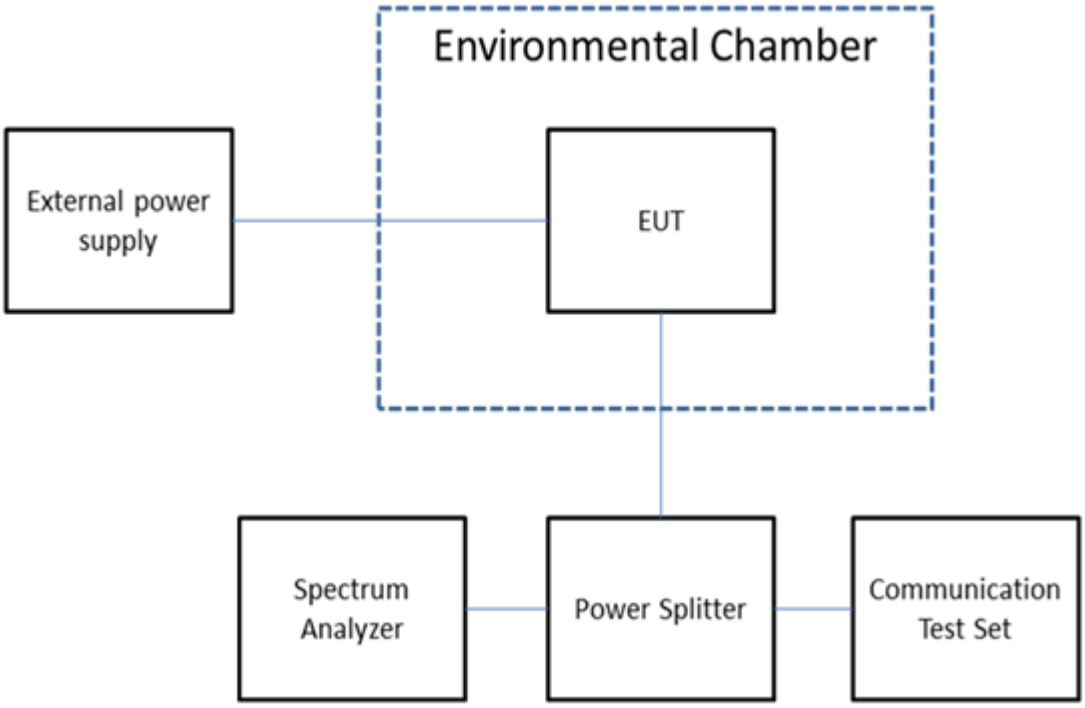
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

3.7.2 TEST PROCEDURES

The testing follows ANSI C63.26-2015 Section 5.6.

1. A reference point shall be established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwantedemissions specification of the applicable regulatory standard. These reference points measuredusing the lowest and highest channel of operation shall be identified as f L and f H respectively. The worst-case frequency offset determined in the above methods shall be added or subtracted from the values of f L and f H and the resulting frequencies must remain within the band.
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.7.3 TEST SETUP LAYOUT



3.7.4 TEST DEVIATION

No deviation

3.7.5 TEST RESULTS

Please refer to the APPENDIX I.

4. LIST OF MEASUREMENT EQUIPMENTS

Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	MXE EMI Receiver	Keysight	N9038A	MY56400091	Jan. 22, 2023
2	Antenna	EM	EM-6876-1	230	Apr. 28, 2022
3	Cable	N/A	RG 213/U (9kHz~1GHz)	N/A	May 27, 2022
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	wideband radio communication tester	R&S	CMW500	164094	Dec. 26, 2022
6	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Jan. 23, 2023
7	966 Chamber Room	ETS	9*6*6	N/A	Jul. 17, 2022

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Trilog-Broadband Antenna	Schwarzbeck	VULB9168	586	Feb. 11, 2023
2	Amplifier	HP	8447D	2944A08742	Jan. 22, 2023
3	Cable	emci	LMR-400	N/A	Nov. 30, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	wideband radio communication tester	R&S	CMW500	164094	Dec. 26, 2022
9	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Jan. 23, 2023
10	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Horn Antenna	ARA	DRG-118A	16554	Apr. 21, 2022
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2022
3	Amplifier	Agilent	8449B	3008A02584	Jul. 10, 2022
4	Controller	CT	SC100	N/A	N/A
5	Controller	MF	MF-7802	MF780208416	N/A
6	Receiver	Agilent	N9038A	MY52130039	Jan. 22, 2023
7	EXA Spectrum Analyzer	Keysight	N9010A	MY56480488	Jan. 22, 2023
8	Low Noise Amplifier	CONNPHY	CLN-18G40G -4330-K	619413	Jul. 16, 2022
9	Cable	Talent microwave	A81-SMAMSMAM -12.5M	N/A	Oct. 15, 2022
10	Cable	Talent microwave	A40-2.92M2.92M -2.5M	N/A	Nov. 30, 2022
11	Measurement Software	Farad	EZ-EMC Ver.NB -03A1-01	N/A	N/A
12	wideband radio communication tester	R&S	CMW500	164094	Dec. 26, 2022
13	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Jan. 23, 2023
14	966 Chamber Room	RM	9*6*6	N/A	Jul. 24, 2022

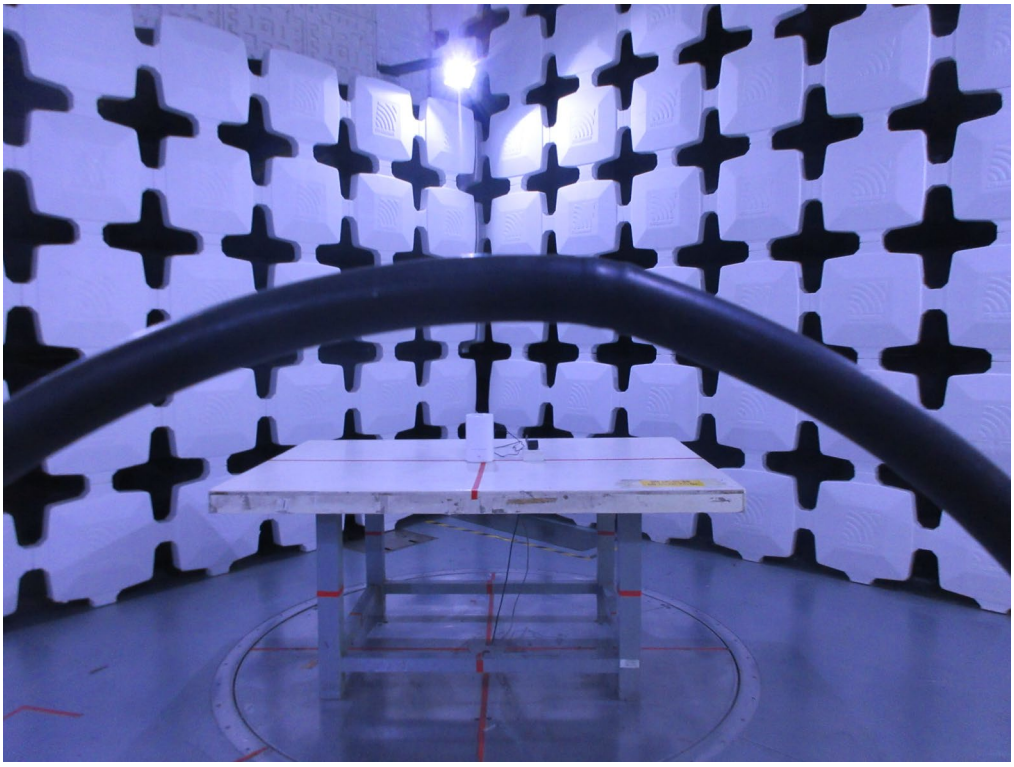
Conducted Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	8960 Series 10 Wireless Com Test set	Agilent	E5515E	MY52112163	Jul. 24, 2022
2	MXA Signal Analyzer	Keysight	N9020A	MY49100060	Jul. 24, 2022
3	Power Splitter	Mini-Circuits	ZFRSC-183-S+	SF103501511S	Jul. 24, 2022
4	wideband radio communication tester	R&S	CMW500	104462	Jul. 24, 2022
5	Const Temp. & Humidity Chamber	Bell	BTH-50C	20170306001	Feb. 19, 2023
6*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Jul. 25, 2023
7	Signal Analyzer	R&S	FSQ-26	200822	Feb. 19, 2023

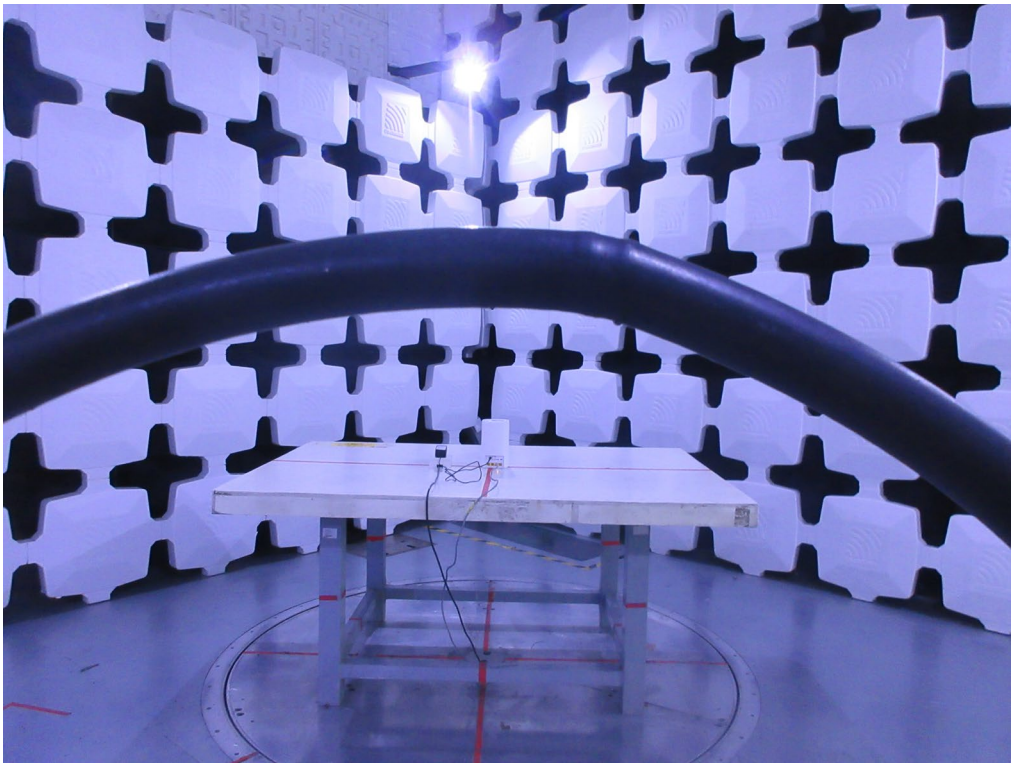
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
Except * item, all calibration period of equipment list is one year.
“*” calibration period of equipment list is three year.

5. EUT TEST PHOTO

Radiated Emissions Test Photos

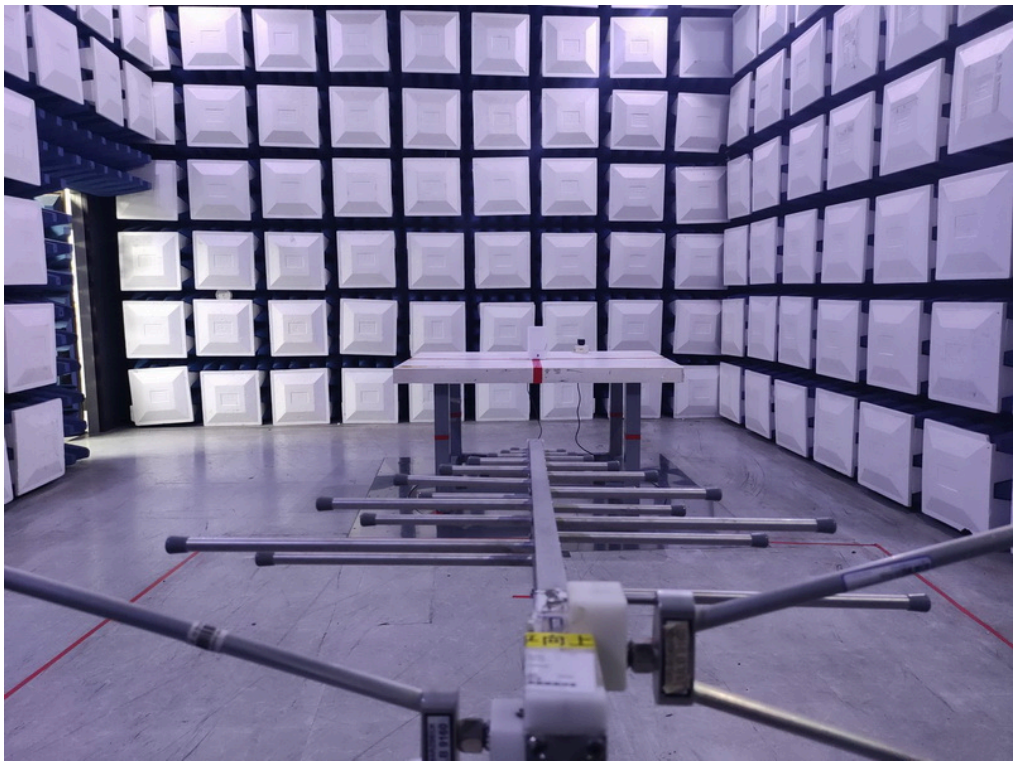
9 kHz to 30 MHz

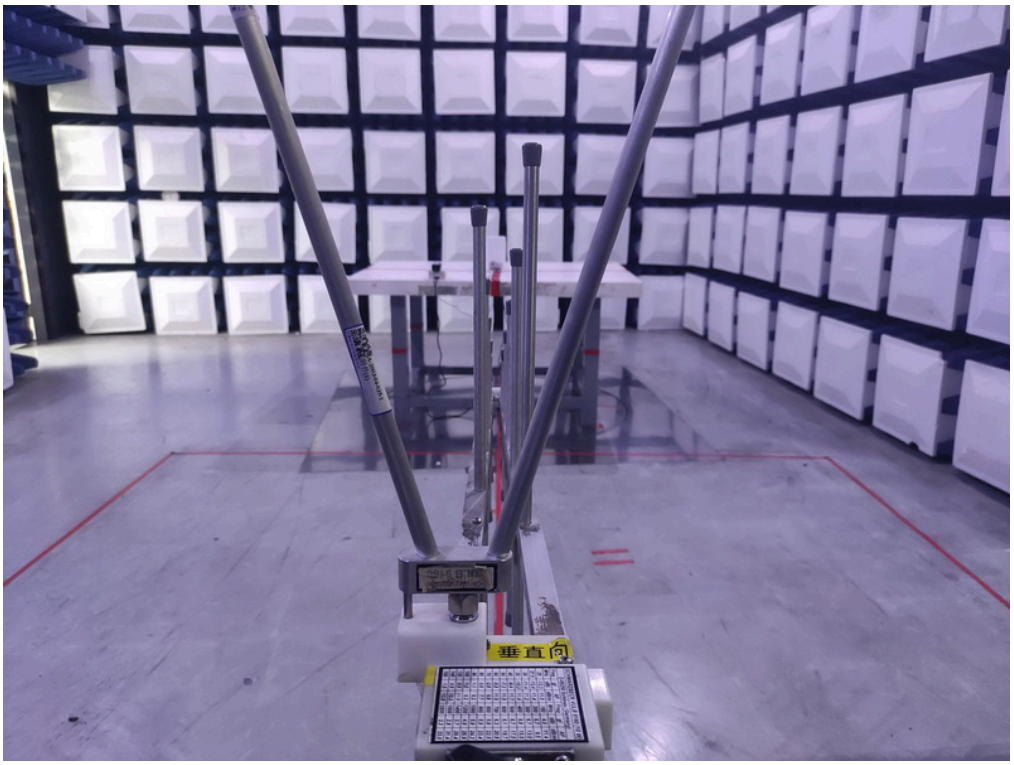




Radiated Emissions Test Photos

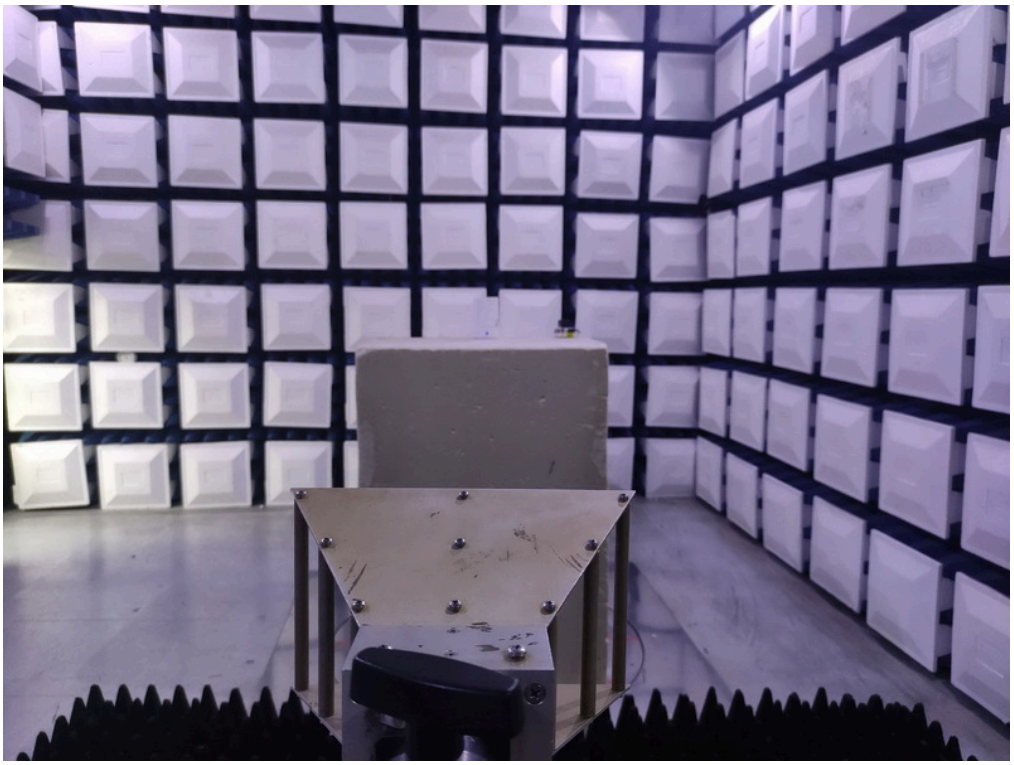
30 MHz to 1 GHz

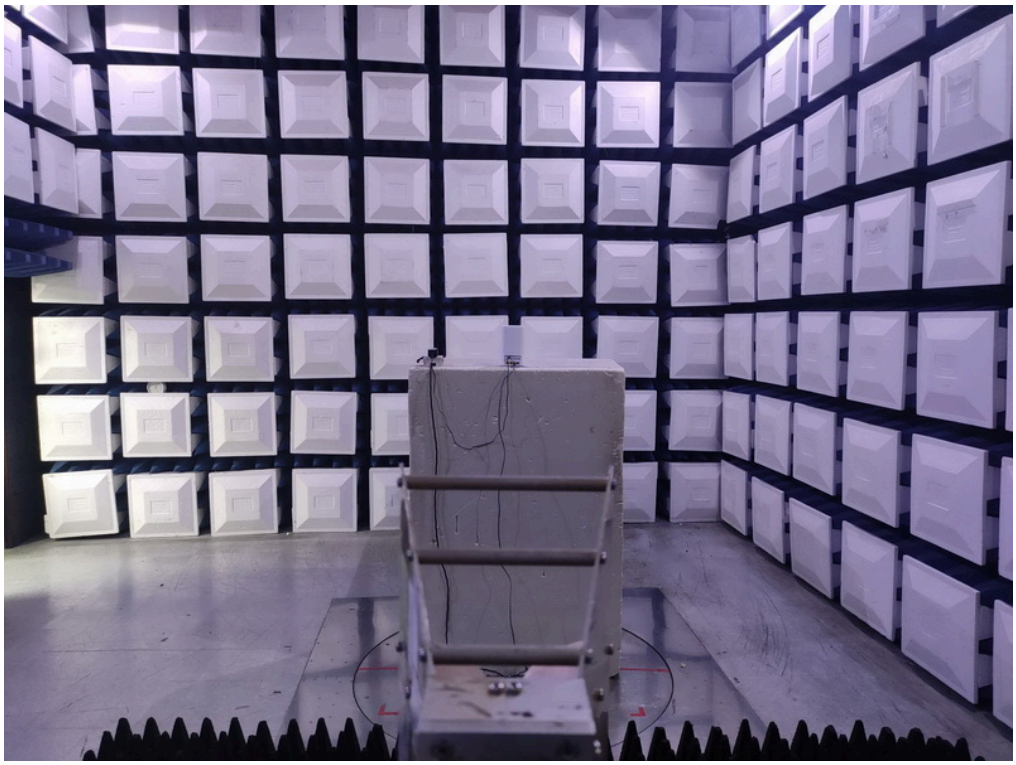




Radiated Emissions Test Photos

Above 1 GHz





APPENDIX A - OUTPUT POWER

Output Power(dBm)

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4MHz	QPSK	1	0	21.05	21.18	21.39
		1	2	21.10	21.24	21.45
		1	5	21.05	21.21	21.40
		3	0	21.07	21.19	21.35
		3	1	21.10	21.20	21.37
		3	2	21.08	21.20	21.36
		6	0	20.22	20.29	20.44
	16QAM	1	0	20.27	20.54	20.40
		1	2	20.31	20.60	20.46
		1	5	20.26	20.57	20.44
		3	0	20.18	20.40	20.57
		3	1	20.20	20.43	20.60
		3	2	20.18	20.43	20.59
		6	0	19.36	19.31	19.72
	64QAM	1	0	19.67	19.50	19.70
		1	2	19.73	19.57	19.77
		1	5	19.66	19.52	19.76
		3	0	19.60	19.52	19.54
		3	1	19.62	19.55	19.57
		3	2	19.59	19.54	19.56
		6	0	17.78	18.30	18.27

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3MHz	QPSK	1	0	21.32	21.33	21.20
		1	7	21.37	21.37	21.34
		1	14	21.25	21.26	21.26
		8	0	20.32	20.37	20.37
		8	4	20.31	20.38	20.41
		8	7	20.28	20.37	20.40
		15	0	20.29	20.37	20.38
	16QAM	1	0	20.20	20.71	20.31
		1	7	20.27	20.74	20.45
		1	14	20.14	20.65	20.36
		8	0	19.54	19.61	19.51
		8	4	19.53	19.62	19.55
		8	7	19.49	19.61	19.54
		15	0	19.45	19.55	19.46
	64QAM	1	0	19.73	19.63	19.63
		1	7	19.73	19.63	19.63
		1	14	19.79	19.70	19.75
		8	0	19.66	19.58	19.67
		8	4	18.09	18.14	18.14
		8	7	18.10	18.15	18.17
		15	0	18.06	18.14	18.16

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5MHz	QPSK	1	0	21.42	21.29	21.23
		1	13	21.61	21.49	21.45
		1	24	21.32	21.26	21.29
		12	0	20.43	20.35	20.37
		12	6	20.48	20.41	20.45
		12	11	20.42	20.37	20.43
		25	0	20.41	20.34	20.39
	16QAM	1	0	20.54	20.68	20.35
		1	13	20.68	20.89	20.59
		1	24	20.45	20.66	20.42
		12	0	19.67	19.57	19.54
		12	6	19.70	19.62	19.62
		12	11	19.65	19.57	19.60
		25	0	19.58	19.48	19.48
	64QAM	1	0	19.48	19.62	19.58
		1	13	19.62	19.82	19.86
		1	24	19.40	19.57	19.66
		12	0	18.19	18.10	18.23
		12	6	18.24	18.16	18.32
		12	11	18.19	18.11	18.30
		25	0	18.13	18.10	18.21

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10MHz	QPSK	1	0	21.36	21.88	20.84
		1	25	21.29	21.70	21.32
		1	49	20.87	21.14	20.95
		25	0	20.59	20.50	20.22
		25	13	20.30	20.58	20.37
		25	25	20.18	20.46	20.27
		50	0	20.16	20.47	20.23
	16QAM	1	0	20.33	21.01	19.95
		1	25	20.30	20.98	20.45
		1	49	19.89	20.29	20.07
		25	0	19.77	19.58	19.44
		25	13	19.44	19.70	19.60
		25	25	19.32	19.54	19.50
		50	0	19.27	19.54	19.41
	64QAM	1	0	19.98	20.10	19.29
		1	25	19.79	19.84	19.77
		1	49	19.51	19.34	19.41
		25	0	18.52	18.36	18.10
		25	13	18.22	18.44	18.26
		50	0	18.09	18.30	18.06

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15MHz	QPSK	1	0	22.17	22.10	21.11
		1	38	21.73	21.79	21.39
		1	74	21.30	21.28	21.21
		36	0	21.16	21.05	20.28
		36	18	20.74	20.65	20.39
		36	39	20.45	20.37	20.34
		75	0	20.68	20.55	20.32
	16QAM	1	0	21.13	21.36	20.81
		1	38	20.76	21.08	20.96
		1	74	20.32	20.55	20.93
		36	0	20.13	20.28	19.47
		36	18	19.76	19.79	19.54
		36	39	19.46	19.56	19.54
		75	0	19.71	19.66	19.51
	64QAM	1	0	20.42	20.45	19.95
		1	38	20.18	19.95	20.23
		1	74	19.67	19.62	20.06
		36	0	18.89	19.06	18.12
		36	18	18.55	18.59	18.22
		36	39	18.14	18.35	18.18
		75	0	18.47	18.49	18.19

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1740MHz
4 / 20MHz	QPSK	1	0	21.78	21.47	20.35
		1	50	21.85	21.68	21.27
		1	99	20.73	20.28	20.36
		50	0	20.87	20.90	20.13
		50	25	20.78	20.57	20.28
		50	50	20.71	20.23	20.16
		100	0	20.66	20.37	20.13
	16QAM	1	0	21.07	21.07	19.93
		1	50	21.36	21.19	20.78
		1	99	20.06	19.89	19.86
		50	0	19.87	20.12	19.26
		50	25	19.80	19.70	19.42
		50	50	19.68	19.41	19.30
		100	0	19.63	19.49	19.27
	64QAM	1	0	19.89	20.32	19.11
		1	50	20.22	20.43	19.78
		1	99	18.84	19.11	19.05
		50	0	18.67	18.84	18.07
		50	25	18.50	18.49	18.18
		50	50	18.38	18.16	18.11
		100	0	18.29	18.27	18.07

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5MHz	QPSK	1	0	22.76	22.68	22.63
		1	13	22.74	22.53	22.55
		1	24	22.69	22.55	22.57
		12	0	21.74	21.34	21.70
		12	6	21.69	21.40	21.68
		12	11	21.66	21.46	21.68
		25	0	21.07	21.01	21.34
	16QAM	1	0	20.68	20.94	21.57
		1	13	20.64	20.99	21.58
		1	24	20.58	21.03	21.57
		12	0	20.17	20.35	20.38
		12	6	20.17	20.33	20.38
		12	11	20.11	20.42	20.31
		25	0	20.03	20.17	20.45
	64QAM	1	0	21.92	21.96	21.47
		1	2	21.91	22.00	21.53
		1	5	21.90	21.92	21.44
		3	0	20.43	20.47	20.56
		3	1	20.31	20.47	20.66
		3	2	20.29	20.63	20.59
		6	0	20.05	20.27	20.37

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10MHz	QPSK	1	0	22.71	22.28	22.64
		1	25	22.52	22.28	22.62
		1	49	22.24	22.38	22.67
		25	0	21.27	21.33	21.69
		25	13	21.25	21.37	21.69
		25	25	21.24	21.45	21.74
		50	0	20.94	21.01	21.37
	16QAM	1	0	21.23	21.76	21.28
		1	25	21.21	21.77	21.23
		1	49	21.22	21.86	21.24
		25	0	20.09	20.11	20.39
		25	13	20.04	20.10	20.43
		25	25	20.04	20.14	20.46
		50	0	19.99	20.07	20.41
	64QAM	1	0	21.24	21.76	21.57
		1	25	21.20	21.75	21.52
		1	49	21.16	21.82	21.50
		25	0	20.03	20.10	20.50
		25	13	19.98	20.10	20.49
		25	25	19.97	20.20	20.50
		50	0	19.97	20.17	20.36

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15MHz	QPSK	1	0	22.28	22.36	22.72
		1	38	22.19	22.47	22.70
		1	74	22.21	22.55	22.76
		36	0	21.27	21.38	21.69
		36	18	21.27	21.38	21.70
		36	39	21.28	21.44	21.74
		75	0	20.88	21.04	21.35
	16QAM	1	0	21.50	21.73	21.63
		1	38	21.20	21.88	21.65
		1	74	21.16	21.88	21.66
		36	0	20.01	20.16	20.34
		36	18	19.98	20.10	20.32
		36	39	19.98	20.19	20.37
		75	0	20.00	20.11	20.39
	64QAM	1	0	21.63	21.79	22.27
		1	38	21.54	21.88	22.29
		1	74	21.39	21.84	22.27
		36	0	20.17	20.13	20.34
		36	18	20.12	20.13	20.39
		36	39	20.12	20.27	20.36
		75	0	20.00	20.20	20.43

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20MHz	QPSK	1	0	22.54	22.31	22.52
		1	50	22.47	22.33	22.55
		1	99	22.46	22.48	22.55
		50	0	21.28	21.36	21.68
		50	25	21.26	21.41	21.66
		50	50	21.25	21.50	21.70
		100	0	20.88	21.03	21.33
	16QAM	1	0	22.08	21.85	21.44
		1	50	21.79	21.80	21.49
		1	99	21.64	21.92	21.52
		50	0	19.97	20.13	20.32
		50	25	19.90	20.15	20.33
		50	50	19.90	20.18	20.29
		100	0	19.96	20.08	20.32
	64QAM	1	0	21.27	21.91	21.49
		1	50	21.24	21.95	21.81
		1	99	21.17	21.95	21.62
		50	0	20.28	20.38	20.43
		50	25	20.25	20.38	20.44
		50	50	20.22	20.46	20.46
		100	0	20.31	20.34	20.31

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				131987CH	132322CH	132657CH
				1711.5MHz	1745MHz	1778.5MHz
66 / 3MHz	QPSK	1	0	22.00	22.11	21.35
		1	7	22.13	21.98	21.49
		1	14	21.96	21.82	21.47
		8	0	21.04	21.07	20.43
		8	4	21.07	20.87	20.48
		8	7	21.04	20.83	20.52
		15	0	21.04	20.84	20.48
	16QAM	1	0	20.97	21.49	20.54
		1	7	21.08	21.37	20.68
		1	14	20.91	21.23	20.65
		8	0	20.08	20.41	19.66
		8	4	20.11	20.16	19.71
		8	7	20.08	20.11	19.74
		15	0	20.01	20.07	19.62
	64QAM	1	0	21.08	21.09	20.91
		1	7	21.19	20.99	21.04
		1	14	21.02	20.84	21.02
		8	0	20.02	20.45	19.75
		8	4	20.06	20.20	19.80
		8	7	20.04	20.16	19.82
		15	0	19.95	20.11	19.71

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				131997CH	132322CH	132647CH
				1712.5MHz	1745MHz	1777.5MHz
66 / 5MHz	QPSK	1	0	22.12	22.04	21.38
		1	13	22.34	21.99	21.73
		1	24	22.06	21.72	21.61
		12	0	21.13	21.05	20.55
		12	6	21.20	20.91	20.69
		12	11	21.13	20.85	20.70
		25	0	21.10	20.82	20.61
	16QAM	1	0	21.20	21.40	20.54
		1	13	21.42	21.45	20.95
		1	24	21.14	21.19	20.78
		12	0	20.17	20.38	19.76
		12	6	20.24	20.19	19.91
		12	11	20.18	20.14	19.91
		25	0	20.09	20.03	19.73
	64QAM	1	0	21.23	21.36	20.61
		1	13	21.45	21.46	20.96
		1	24	21.17	21.16	20.84
		12	0	20.21	20.37	19.79
		12	6	20.27	20.20	19.93
		12	11	20.21	20.14	19.92
		25	0	20.12	20.03	19.76

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132022CH	132322CH	132622CH
				1715MHz	1745MHz	1775MHz
66 / 10MHz	QPSK	1	0	21.55	21.87	21.38
		1	25	22.01	22.00	22.15
		1	49	21.49	21.54	21.89
		25	0	20.96	20.98	20.64
		25	13	20.86	20.90	21.16
		25	25	20.75	20.77	21.09
		50	0	20.67	20.75	21.01
	16QAM	1	0	20.77	21.16	20.52
		1	25	21.04	21.39	21.37
		1	49	20.65	20.93	21.08
		25	0	20.08	20.24	19.77
		25	13	19.97	20.12	20.39
		25	25	19.90	19.99	20.32
		50	0	19.80	19.96	20.19
	64QAM	1	0	20.86	20.77	20.87
		1	25	21.14	20.99	21.72
		1	49	20.74	20.53	21.44
		25	0	20.16	20.24	19.73
		25	13	20.04	20.12	20.36
		25	25	19.98	19.99	20.28
		50	0	19.84	19.94	20.19

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132047CH	132322CH	132597CH
				1717.5MHz	1745MHz	1772.5MHz
66 / 15MHz	QPSK	1	0	22.33	22.27	21.47
		1	38	22.28	22.22	22.20
		1	74	22.06	22.37	22.53
		36	0	21.36	21.24	20.47
		36	18	21.14	21.32	21.13
		36	39	21.12	20.95	21.45
		75	0	21.08	20.96	21.10
	16QAM	1	0	21.36	21.49	21.08
		1	38	21.28	21.58	21.78
		1	74	21.15	21.55	22.14
		36	0	20.39	20.23	19.53
		36	18	20.21	20.36	20.14
		36	39	20.07	20.00	20.57
		75	0	20.15	19.98	20.12
	64QAM	1	0	21.27	21.61	21.05
		1	38	21.21	21.54	21.74
		1	74	21.09	21.66	22.11
		36	0	20.34	20.26	19.51
		36	18	20.15	20.34	20.11
		36	39	20.02	20.04	20.55
		75	0	20.10	20.02	20.10

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132072CH	132322CH	132572CH
				1720MHz	1745MHz	1770MHz
66 / 20MHz	QPSK	1	0	21.72	21.41	20.75
		1	50	22.58	22.15	22.25
		1	99	21.34	21.50	21.61
		50	0	21.21	21.10	20.45
		50	25	21.46	20.98	21.17
		50	50	21.37	20.81	20.99
		100	0	21.24	20.79	21.01
	16QAM	1	0	21.29	20.95	20.25
		1	50	22.17	21.65	21.74
		1	99	20.92	20.98	21.14
		50	0	20.30	20.09	19.49
		50	25	20.44	20.04	20.16
		50	50	20.35	19.89	19.99
		100	0	20.22	19.84	20.01
	64QAM	1	0	21.26	20.95	20.05
		1	50	22.16	21.65	21.72
		1	99	20.91	20.99	20.93
		50	0	20.30	20.10	19.39
		50	25	20.43	20.05	20.12
		50	50	20.34	19.89	19.89
		100	0	20.22	19.84	19.91

Lte CA_7C / Low Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	20805	2505.5	20949	2519.9	1	49	1	0	23.5	22.88	20.6
					1	0	1	99	13.07	13.39	13.25
					50	0	100	0	21.01	20.1	20.32
20+10	20850	2510	20994	2524.4	1	99	1	0	22.11	21.69	21.59
					1	0	1	49	13.84	13.96	13.92
					100	0	50	0	20.66	19.72	21.31
15+10	20825	2507.5	20945	2519.5	1	74	1	0	22.2	21.35	22.14
					1	0	1	49	14.03	14.27	14.19
					75	0	50	0	20.96	20.06	22.05
15+15	20825	2507.5	20975	2522.5	1	74	1	0	22.15	21.22	21.95
					1	0	1	74	13.94	14.16	14.05
					75	0	75	0	21.04	20.07	20.99
15+20	20828	2507.8	20999	2524.9	1	74	1	0	22.15	21.16	21.37
					1	0	1	99	13.8	14.13	14.39
					75	0	100	0	20.68	19.79	20.3
20+15	20850	2510	21021	2527.1	1	99	1	0	22.28	21.55	21.18
					1	0	1	74	13.94	14.61	14.43
					100	0	75	0	20.87	19.95	21.08
20+20	20850	2510	21041	2529.8	1	99	1	0	22.15	21.65	16.37
					1	0	1	99	19.54	19.78	19.1
					100	0	100	0	20.76	19.89	17.61

Lte CA_7C / Mid Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	21006	2525.6	21150	2540	1	49	1	0	22.26	21.58	19.32
					1	0	1	99	12.01	12.31	12.17
					50	0	100	0	20.84	19.94	19.73
20+10	21051	2530.1	21195	2544.5	1	99	1	0	22.78	21.65	20.17
					1	0	1	49	13.12	13.42	13.29
					100	0	50	0	21.13	20.22	20.04
15+10	21051	2530.1	21171	2542.1	1	74	1	0	24.56	23.99	21.97
					1	0	1	49	13.64	13.87	13.54
					75	0	50	0	21.48	20.6	21.6
15+15	21025	2527.5	21175	2542.5	1	74	1	0	22.73	22.08	20.65
					1	0	1	74	12.22	12.49	12.15
					75	0	75	0	21.04	20.53	20
15+20	21003	2525.3	21174	2542.4	1	74	1	0	22.17	21.23	20.48
					1	0	1	99	11.41	11.75	11.39
					75	0	100	0	20.9	19.96	19.72
20+15	21026	2527.6	21197	2544.7	1	99	1	0	22.64	21.51	21.18
					1	0	1	74	12.11	12.53	12.33
					100	0	75	0	21.11	20.16	20.69
20+20	21001	2525.1	21199	2544.9	1	99	1	0	22.56	22.05	20.61
					1	0	1	99	10.91	11.42	11.35
					100	0	100	0	21.21	20.21	20.01

Lte CA_7C / High Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	21206	2545.6	21350	2560	1	49	1	0	22.55	21.82	19.51
					1	0	1	99	11.04	11.33	11.01
					50	0	100	0	21.38	20.45	19.06
20+10	21251	2550.1	21395	2564.5	1	99	1	0	22.71	22.23	21.17
					1	0	1	49	11.48	11.79	11.61
					100	0	50	0	21.39	20.39	21.08
15+10	21277	2552.7	21397	2564.7	1	74	1	0	23.5	22.97	21.03
					1	0	1	49	12.12	12.14	11.91
					75	0	50	0	20.94	20.02	20.41
15+15	21225	2547.5	21375	2562.5	1	74	1	0	22.74	21.75	19.66
					1	0	1	74	11.49	11.57	11.33
					75	0	75	0	21.45	20.49	19.13
15+20	21179	2542.9	21350	2560	1	74	1	0	22.97	22.3	19.34
					1	0	1	99	11.21	11.44	10.98
					75	0	100	0	21.28	20.48	18.6
20+15	21201	2545.1	21372	2562.2	1	99	1	0	22.99	21.28	19.51
					1	0	1	74	11.75	12.17	12.06
					100	0	75	0	21.4	20.46	18.88
20+20	21152	2540.2	21350	2560	1	99	1	0	22.75	21.57	19.54
					1	0	1	99	11.82	12.16	11.84
					100	0	100	0	21.23	20.31	18.53

EIRP (dBm)

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4MHz	QPSK	1	0	24.68	24.81	25.02
		1	2	24.73	24.87	25.08
		1	5	24.68	24.84	25.03
		3	0	24.70	24.82	24.98
		3	1	24.73	24.83	25.00
		3	2	24.71	24.83	24.99
		6	0	23.85	23.92	24.07
	16QAM	1	0	23.90	24.17	24.03
		1	2	23.94	24.23	24.09
		1	5	23.89	24.20	24.07
		3	0	23.81	24.03	24.20
		3	1	23.83	24.06	24.23
		3	2	23.81	24.06	24.22
		6	0	22.99	22.94	23.35
	64QAM	1	0	23.30	23.13	23.33
		1	2	23.36	23.20	23.40
		1	5	23.29	23.15	23.39
		3	0	23.23	23.15	23.17
		3	1	23.25	23.18	23.20
		3	2	23.22	23.17	23.19
		6	0	21.41	21.93	21.90

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3MHz	QPSK	1	0	24.95	24.96	24.83
		1	7	25.00	25.00	24.97
		1	14	24.88	24.89	24.89
		8	0	23.95	24.00	24.00
		8	4	23.94	24.01	24.04
		8	7	23.91	24.00	24.03
		15	0	23.92	24.00	24.01
	16QAM	1	0	23.83	24.34	23.94
		1	7	23.90	24.37	24.08
		1	14	23.77	24.28	23.99
		8	0	23.17	23.24	23.14
		8	4	23.16	23.25	23.18
		8	7	23.12	23.24	23.17
		15	0	23.08	23.18	23.09
	64QAM	1	0	23.36	23.26	23.26
		1	7	23.36	23.26	23.26
		1	14	23.42	23.33	23.38
		8	0	23.29	23.21	23.30
		8	4	21.72	21.77	21.77
		8	7	21.73	21.78	21.80
		15	0	21.69	21.77	21.79

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5MHz	QPSK	1	0	25.05	24.92	24.86
		1	13	25.24	25.12	25.08
		1	24	24.95	24.89	24.92
		12	0	24.06	23.98	24.00
		12	6	24.11	24.04	24.08
		12	11	24.05	24.00	24.06
		25	0	24.04	23.97	24.02
	16QAM	1	0	24.17	24.31	23.98
		1	13	24.31	24.52	24.22
		1	24	24.08	24.29	24.05
		12	0	23.30	23.20	23.17
		12	6	23.33	23.25	23.25
		12	11	23.28	23.20	23.23
		25	0	23.21	23.11	23.11
	64QAM	1	0	23.11	23.25	23.21
		1	13	23.25	23.45	23.49
		1	24	23.03	23.20	23.29
		12	0	21.82	21.73	21.86
		12	6	21.87	21.79	21.95
		12	11	21.82	21.74	21.93
		25	0	21.76	21.73	21.84

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10MHz	QPSK	1	0	24.99	25.51	24.47
		1	25	24.92	25.33	24.95
		1	49	24.50	24.77	24.58
		25	0	24.22	24.13	23.85
		25	13	23.93	24.21	24.00
		25	25	23.81	24.09	23.90
		50	0	23.79	24.10	23.86
	16QAM	1	0	23.96	24.64	23.58
		1	25	23.93	24.61	24.08
		1	49	23.52	23.92	23.70
		25	0	23.40	23.21	23.07
		25	13	23.07	23.33	23.23
		25	25	22.95	23.17	23.13
		50	0	22.90	23.17	23.04
	64QAM	1	0	23.61	23.73	22.92
		1	25	23.42	23.47	23.40
		1	49	23.14	22.97	23.04
		25	0	22.15	21.99	21.73
		25	13	21.85	22.07	21.89
		25	25	21.77	21.95	21.80
		50	0	21.72	21.93	21.69

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15MHz	QPSK	1	0	25.80	25.73	24.74
		1	38	25.36	25.42	25.02
		1	74	24.93	24.91	24.84
		36	0	24.79	24.68	23.91
		36	18	24.37	24.28	24.02
		36	39	24.08	24.00	23.97
		75	0	24.31	24.18	23.95
	16QAM	1	0	24.76	24.99	24.44
		1	38	24.39	24.71	24.59
		1	74	23.95	24.18	24.56
		36	0	23.76	23.91	23.10
		36	18	23.39	23.42	23.17
		36	39	23.09	23.19	23.17
		75	0	23.34	23.29	23.14
	64QAM	1	0	24.05	24.08	23.58
		1	38	23.81	23.58	23.86
		1	74	23.30	23.25	23.69
		36	0	22.52	22.69	21.75
		36	18	22.18	22.22	21.85
		36	39	21.77	21.98	21.81
		75	0	22.10	22.12	21.82

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1740MHz
4 / 20MHz	QPSK	1	0	25.41	25.10	23.98
		1	50	25.48	25.31	24.90
		1	99	24.36	23.91	23.99
		50	0	24.50	24.53	23.76
		50	25	24.41	24.20	23.91
		50	50	24.34	23.86	23.79
		100	0	24.29	24.00	23.76
	16QAM	1	0	24.70	24.70	23.56
		1	50	24.99	24.82	24.41
		1	99	23.69	23.52	23.49
		50	0	23.50	23.75	22.89
		50	25	23.43	23.33	23.05
		50	50	23.31	23.04	22.93
		100	0	23.26	23.12	22.90
	64QAM	1	0	23.52	23.95	22.74
		1	50	23.85	24.06	23.41
		1	99	22.47	22.74	22.68
		50	0	22.30	22.47	21.70
		50	25	22.13	22.12	21.81
		50	50	22.01	21.79	21.74
		100	0	21.92	21.90	21.70

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5MHz	QPSK	1	0	27.15	27.07	27.02
		1	13	27.13	26.92	26.94
		1	24	27.08	26.94	26.96
		12	0	26.13	25.73	26.09
		12	6	26.08	25.79	26.07
		12	11	26.05	25.85	26.07
		25	0	25.46	25.40	25.73
	16QAM	1	0	25.07	25.33	25.96
		1	13	25.03	25.38	25.97
		1	24	24.97	25.42	25.96
		12	0	24.56	24.74	24.77
		12	6	24.56	24.72	24.77
		12	11	24.50	24.81	24.70
		25	0	24.42	24.56	24.84
	64QAM	1	0	26.31	26.35	25.86
		1	2	26.30	26.39	25.92
		1	5	26.29	26.31	25.83
		3	0	24.82	24.86	24.95
		3	1	24.70	24.86	25.05
		3	2	24.68	25.02	24.98
		6	0	24.44	24.66	24.76

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10MHz	QPSK	1	0	27.10	26.67	27.03
		1	25	26.91	26.67	27.01
		1	49	26.63	26.77	27.06
		25	0	25.66	25.72	26.08
		25	13	25.64	25.76	26.08
		25	25	25.63	25.84	26.13
		50	0	25.33	25.40	25.76
	16QAM	1	0	25.62	26.15	25.67
		1	25	25.60	26.16	25.62
		1	49	25.61	26.25	25.63
		25	0	24.48	24.50	24.78
		25	13	24.43	24.49	24.82
		25	25	24.43	24.53	24.85
		50	0	24.38	24.46	24.80
	64QAM	1	0	25.63	26.15	25.96
		1	25	25.59	26.14	25.91
		1	49	25.55	26.21	25.89
		25	0	24.42	24.49	24.89
		25	13	24.37	24.49	24.88
		25	25	24.36	24.59	24.89
		50	0	24.36	24.56	24.75

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15MHz	QPSK	1	0	26.67	26.75	27.11
		1	38	26.58	26.86	27.09
		1	74	26.60	26.94	27.15
		36	0	25.66	25.77	26.08
		36	18	25.66	25.77	26.09
		36	39	25.67	25.83	26.13
		75	0	25.27	25.43	25.74
	16QAM	1	0	25.89	26.12	26.02
		1	38	25.59	26.27	26.04
		1	74	25.55	26.27	26.05
		36	0	24.40	24.55	24.73
		36	18	24.37	24.49	24.71
		36	39	24.37	24.58	24.76
		75	0	24.39	24.50	24.78
	64QAM	1	0	26.02	26.18	26.66
		1	38	25.93	26.27	26.68
		1	74	25.78	26.23	26.66
		36	0	24.56	24.52	24.73
		36	18	24.51	24.52	24.78
		36	39	24.51	24.66	24.75
		75	0	24.39	24.59	24.82

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20MHz	QPSK	1	0	26.93	26.70	26.91
		1	50	26.86	26.72	26.94
		1	99	26.85	26.87	26.94
		50	0	25.67	25.75	26.07
		50	25	25.65	25.80	26.05
		50	50	25.64	25.89	26.09
		100	0	25.27	25.42	25.72
	16QAM	1	0	26.47	26.24	25.83
		1	50	26.18	26.19	25.88
		1	99	26.03	26.31	25.91
		50	0	24.36	24.52	24.71
		50	25	24.29	24.54	24.72
		50	50	24.29	24.57	24.68
		100	0	24.35	24.47	24.71
	64QAM	1	0	25.66	26.30	25.88
		1	50	25.63	26.34	26.20
		1	99	25.56	26.34	26.01
		50	0	24.67	24.77	24.82
		50	25	24.64	24.77	24.83
		50	50	24.61	24.85	24.85
		100	0	24.70	24.73	24.70

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				131987CH	132322CH	132657CH
				1711.5MHz	1745MHz	1778.5MHz
66 / 3MHz	QPSK	1	0	25.63	25.74	24.98
		1	7	25.76	25.61	25.12
		1	14	25.59	25.45	25.10
		8	0	24.67	24.70	24.06
		8	4	24.70	24.50	24.11
		8	7	24.67	24.46	24.15
		15	0	24.67	24.47	24.11
	16QAM	1	0	24.60	25.12	24.17
		1	7	24.71	25.00	24.31
		1	14	24.54	24.86	24.28
		8	0	23.71	24.04	23.29
		8	4	23.74	23.79	23.34
		8	7	23.71	23.74	23.37
		15	0	23.64	23.70	23.25
	64QAM	1	0	24.71	24.72	24.54
		1	7	24.82	24.62	24.67
		1	14	24.65	24.47	24.65
		8	0	23.65	24.08	23.38
		8	4	23.69	23.83	23.43
		8	7	23.67	23.79	23.45
		15	0	23.58	23.74	23.34

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				131997CH	132322CH	132647CH
				1712.5MHz	1745MHz	1777.5MHz
66 / 5MHz	QPSK	1	0	25.75	25.67	25.01
		1	13	25.97	25.62	25.36
		1	24	25.69	25.35	25.24
		12	0	24.76	24.68	24.18
		12	6	24.83	24.54	24.32
		12	11	24.76	24.48	24.33
		25	0	24.73	24.45	24.24
	16QAM	1	0	24.83	25.03	24.17
		1	13	25.05	25.08	24.58
		1	24	24.77	24.82	24.41
		12	0	23.80	24.01	23.39
		12	6	23.87	23.82	23.54
		12	11	23.81	23.77	23.54
		25	0	23.72	23.66	23.36
	64QAM	1	0	24.86	24.99	24.24
		1	13	25.08	25.09	24.59
		1	24	24.80	24.79	24.47
		12	0	23.84	24.00	23.42
		12	6	23.90	23.83	23.56
		12	11	23.84	23.77	23.55
		25	0	23.75	23.66	23.39

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132022CH	132322CH	132622CH
				1715MHz	1745MHz	1775MHz
66 / 10MHz	QPSK	1	0	25.18	25.50	25.01
		1	25	25.64	25.63	25.78
		1	49	25.12	25.17	25.52
		25	0	24.59	24.61	24.27
		25	13	24.49	24.53	24.79
		25	25	24.38	24.40	24.72
		50	0	24.30	24.38	24.64
	16QAM	1	0	24.40	24.79	24.15
		1	25	24.67	25.02	25.00
		1	49	24.28	24.56	24.71
		25	0	23.71	23.87	23.40
		25	13	23.60	23.75	24.02
		25	25	23.53	23.62	23.95
		50	0	23.43	23.59	23.82
	64QAM	1	0	24.49	24.40	24.50
		1	25	24.77	24.62	25.35
		1	49	24.37	24.16	25.07
		25	0	23.79	23.87	23.36
		25	13	23.67	23.75	23.99
		25	25	23.61	23.62	23.91
		50	0	23.47	23.57	23.82

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132047CH	132322CH	132597CH
				1717.5MHz	1745MHz	1772.5MHz
66 / 15MHz	QPSK	1	0	25.96	25.90	25.10
		1	38	25.91	25.85	25.83
		1	74	25.69	26.00	26.16
		36	0	24.99	24.87	24.10
		36	18	24.77	24.95	24.76
		36	39	24.75	24.58	25.08
		75	0	24.71	24.59	24.73
	16QAM	1	0	24.99	25.12	24.71
		1	38	24.91	25.21	25.41
		1	74	24.78	25.18	25.77
		36	0	24.02	23.86	23.16
		36	18	23.84	23.99	23.77
		36	39	23.70	23.63	24.20
		75	0	23.78	23.61	23.75
	64QAM	1	0	24.90	25.24	24.68
		1	38	24.84	25.17	25.37
		1	74	24.72	25.29	25.74
		36	0	23.97	23.89	23.14
		36	18	23.78	23.97	23.74
		36	39	23.65	23.67	24.18
		75	0	23.73	23.65	23.73

LTE Band / BW	Modulation	RB Sizet	RB Offset	Low CH	Mid CH	High CH
				132072CH	132322CH	132572CH
				1720MHz	1745MHz	1770MHz
66 / 20MHz	QPSK	1	0	25.35	25.04	24.38
		1	50	26.21	25.78	25.88
		1	99	24.97	25.13	25.24
		50	0	24.84	24.73	24.08
		50	25	25.09	24.61	24.80
		50	50	25.00	24.44	24.62
		100	0	24.87	24.42	24.64
	16QAM	1	0	24.92	24.58	23.88
		1	50	25.80	25.28	25.37
		1	99	24.55	24.61	24.77
		50	0	23.93	23.72	23.12
		50	25	24.07	23.67	23.79
		50	50	23.98	23.52	23.62
		100	0	23.85	23.47	23.64
	64QAM	1	0	24.89	24.58	23.68
		1	50	25.79	25.28	25.35
		1	99	24.54	24.62	24.56
		50	0	23.93	23.73	23.02
		50	25	24.06	23.68	23.75
		50	50	23.97	23.52	23.52
		100	0	23.85	23.47	23.54

Lte CA_7C / Low Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	20805	2505.5	20949	2519.9	1	49	1	0	27.89	27.27	24.99
					1	0	1	99	17.46	17.78	17.64
					50	0	100	0	25.4	24.49	24.71
20+10	20850	2510	20994	2524.4	1	99	1	0	26.5	26.08	25.98
					1	0	1	49	18.23	18.35	18.31
					100	0	50	0	25.05	24.11	25.7
15+10	20825	2507.5	20945	2519.5	1	74	1	0	26.59	25.74	26.53
					1	0	1	49	18.42	18.66	18.58
					75	0	50	0	25.35	24.45	26.44
15+15	20825	2507.5	20975	2522.5	1	74	1	0	26.54	25.61	26.34
					1	0	1	74	18.33	18.55	18.44
					75	0	75	0	25.43	24.46	25.38
15+20	20828	2507.8	20999	2524.9	1	74	1	0	26.54	25.55	25.76
					1	0	1	99	18.19	18.52	18.78
					75	0	100	0	25.07	24.18	24.69
20+15	20850	2510	21021	2527.1	1	99	1	0	26.67	25.94	25.57
					1	0	1	74	18.33	19	18.82
					100	0	75	0	25.26	24.34	25.47
20+20	20850	2510	21041	2529.8	1	99	1	0	26.54	26.04	20.76
					1	0	1	99	23.93	24.17	23.49
					100	0	100	0	25.15	24.28	22

Lte CA_7C / Mid Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	21006	2525.6	21150	2540	1	49	1	0	26.65	25.97	23.71
					1	0	1	99	16.4	16.7	16.56
					50	0	100	0	25.23	24.33	24.12
20+10	21051	2530.1	21195	2544.5	1	99	1	0	27.17	26.04	24.56
					1	0	1	49	17.51	17.81	17.68
					100	0	50	0	25.52	24.61	24.43
15+10	21051	2530.1	21171	2542.1	1	74	1	0	28.95	28.38	26.36
					1	0	1	49	18.03	18.26	17.93
					75	0	50	0	25.87	24.99	25.99
15+15	21025	2527.5	21175	2542.5	1	74	1	0	27.12	26.47	25.04
					1	0	1	74	16.61	16.88	16.54
					75	0	75	0	25.43	24.92	24.39
15+20	21003	2525.3	21174	2542.4	1	74	1	0	26.56	25.62	24.87
					1	0	1	99	15.8	16.14	15.78
					75	0	100	0	25.29	24.35	24.11
20+15	21026	2527.6	21197	2544.7	1	99	1	0	27.03	25.9	25.57
					1	0	1	74	16.5	16.92	16.72
					100	0	75	0	25.5	24.55	25.08
20+20	21001	2525.1	21199	2544.9	1	99	1	0	26.95	26.44	25
					1	0	1	99	15.3	15.81	15.74
					100	0	100	0	25.6	24.6	24.4

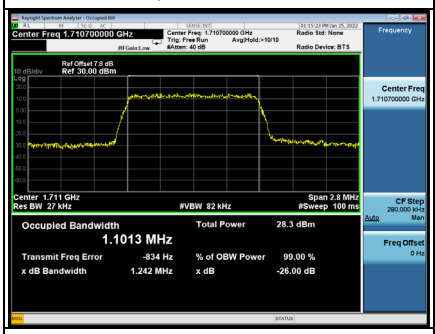
Lte CA_7C / High Range											
Bandwidth (MHz)	PCC CH	PCC Frequency (MHz)	SCC CH	SCC Frequency (MHz)	PCC RB Size	PCC Offset	SCC RB Size	SCC Offset	QPSK	16QAM	64QAM
10+20	21206	2545.6	21350	2560	1	49	1	0	26.94	26.21	23.9
					1	0	1	99	15.43	15.72	15.4
					50	0	100	0	25.77	24.84	23.45
20+10	21251	2550.1	21395	2564.5	1	99	1	0	27.1	26.62	25.56
					1	0	1	49	15.87	16.18	16
					100	0	50	0	25.78	24.78	25.47
15+10	21277	2552.7	21397	2564.7	1	74	1	0	27.89	27.36	25.42
					1	0	1	49	16.51	16.53	16.3
					75	0	50	0	25.33	24.41	24.8
15+15	21225	2547.5	21375	2562.5	1	74	1	0	27.13	26.14	24.05
					1	0	1	74	15.88	15.96	15.72
					75	0	75	0	25.84	24.88	23.52
15+20	21179	2542.9	21350	2560	1	74	1	0	27.36	26.69	23.73
					1	0	1	99	15.6	15.83	15.37
					75	0	100	0	25.67	24.87	22.99
20+15	21201	2545.1	21372	2562.2	1	99	1	0	27.38	25.67	23.9
					1	0	1	74	16.14	16.56	16.45
					100	0	75	0	25.79	24.85	23.27
20+20	21152	2540.2	21350	2560	1	99	1	0	27.14	25.96	23.93
					1	0	1	99	16.21	16.55	16.23
					100	0	100	0	25.62	24.7	22.92

APPENDIX B - OCCUPIED BANDWIDTH

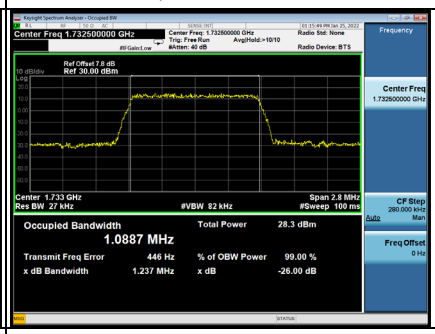
LTE Band 4_1.4MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
19957	1710.7	1.1013	1.0961	1.0970	1.242	1.238	1.241
20175	1732.5	1.0887	1.0885	1.0894	1.237	1.239	1.240
20393	1754.3	1.0921	1.0915	1.0905	1.255	1.241	1.247

Spectrum Plot

QPSK-19957



QPSK-20175



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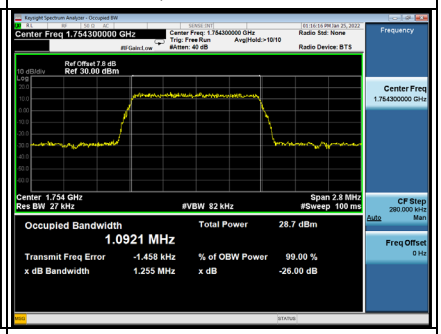

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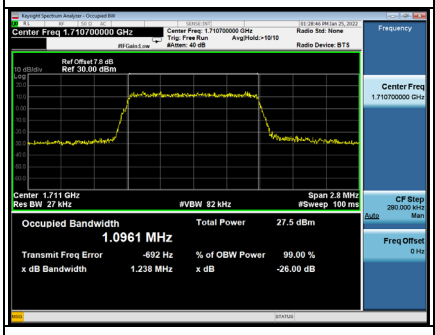

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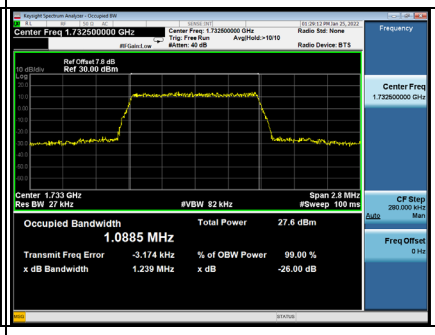

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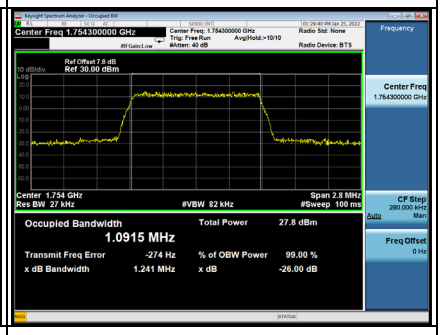

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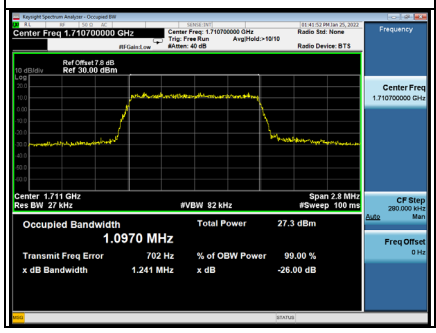

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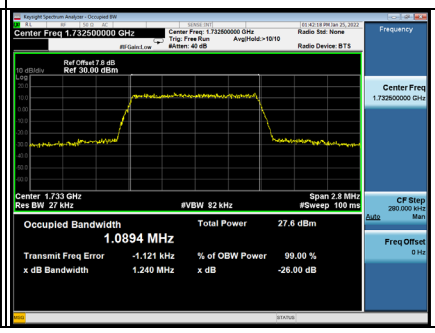

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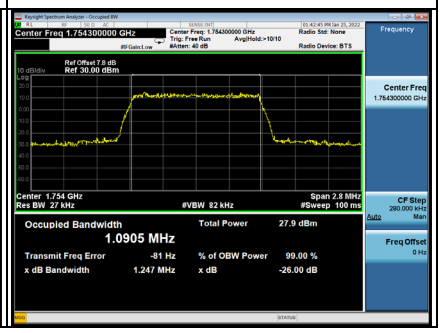
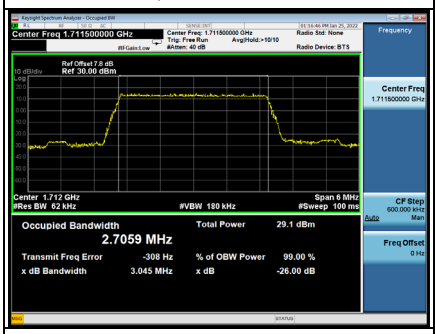


LTE Band 4_3MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
19965	1711.5	2.7059	2.7083	2.7039	3.045	3.037	3.040
20175	1732.5	2.7083	2.7077	2.7084	3.045	3.016	3.036
20385	1753.5	2.7085	2.7105	2.7030	3.016	3.043	3.046

Spectrum Plot

QPSK-19965



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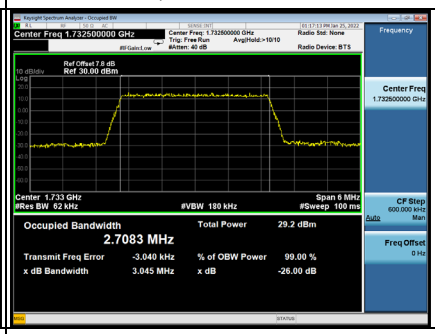

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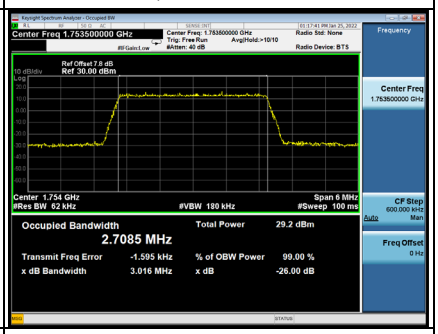

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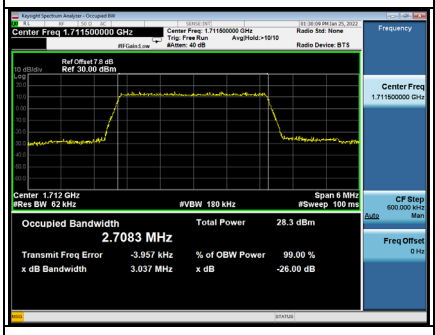

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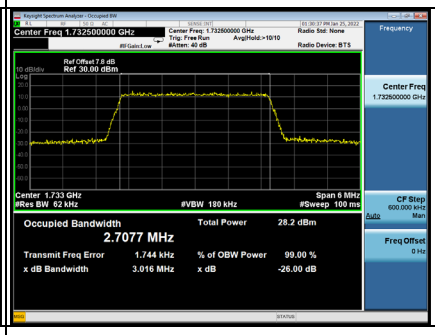

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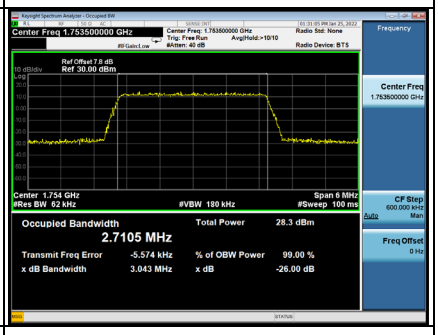

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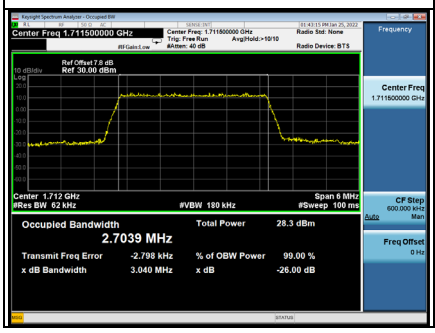

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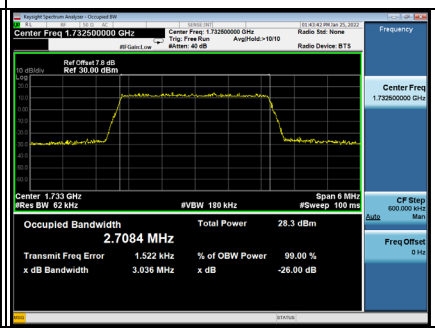

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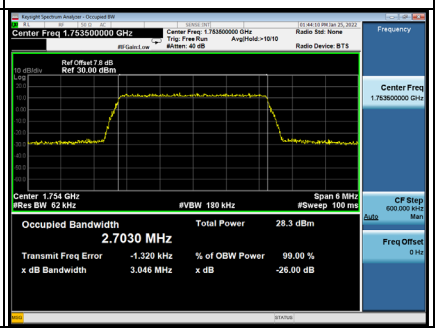
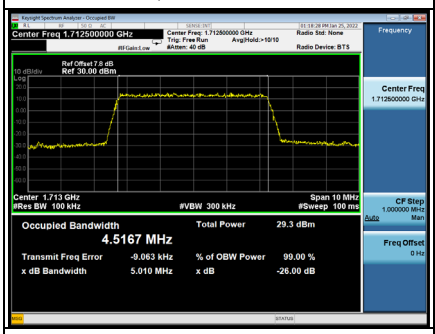


LTE Band 4_5MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
19975	1712.5	4.5167	4.5037	4.5073	5.010	5.001	4.955
20175	1732.5	4.5148	4.5083	4.5081	4.955	4.956	4.971
20375	1752.5	4.5087	4.5089	4.5026	4.944	4.935	4.972

Spectrum Plot

QPSK-19975



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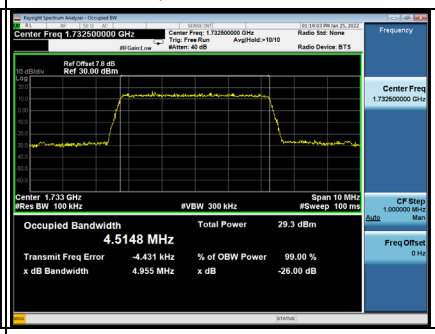

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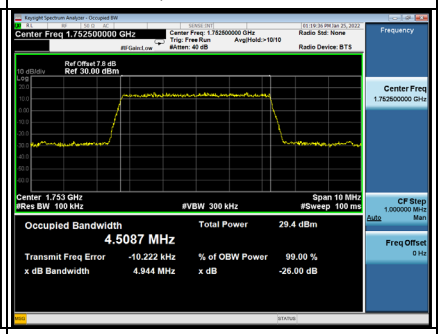

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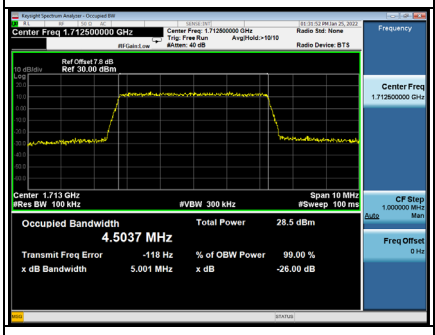

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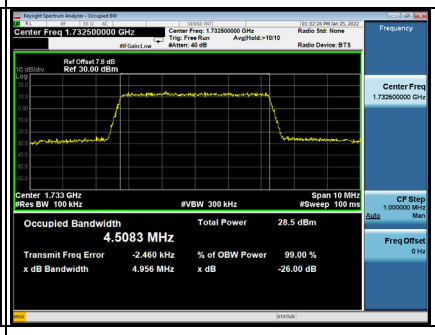

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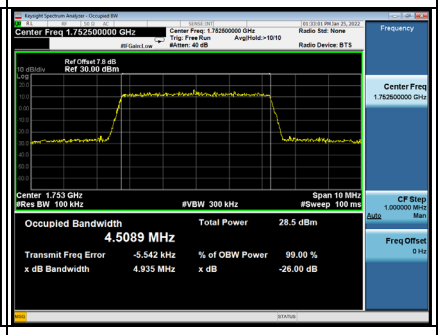

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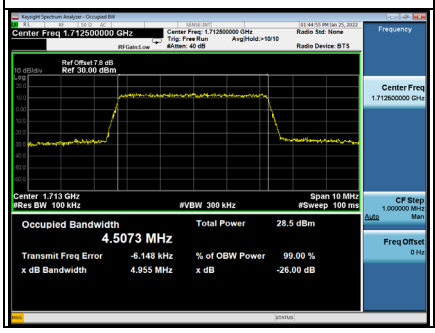

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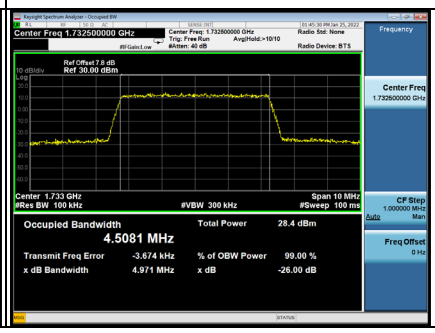

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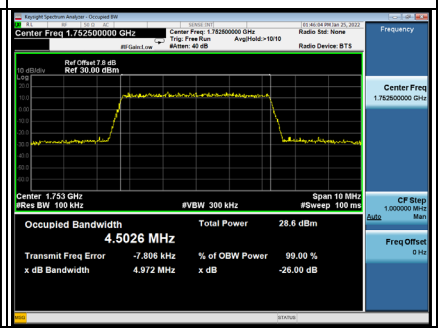
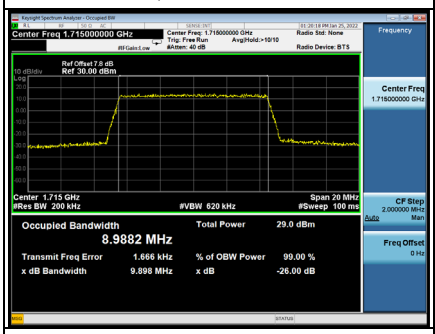


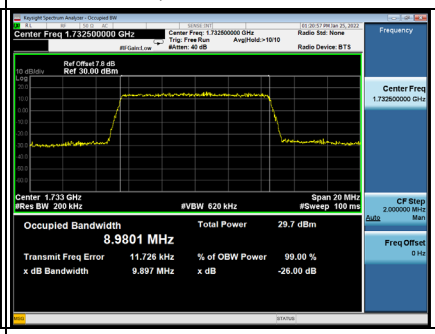
LTE Band 4_10MHz							
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)			26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
20000	1715	8.9882	8.9793	8.9771	9.898	9.930	9.957
20175	1732.5	8.9801	8.9830	8.9787	9.897	9.892	9.861
20350	1715	8.9880	8.9788	8.9812	9.899	9.881	9.902

Spectrum Plot

QPSK-20000



QPSK-20175



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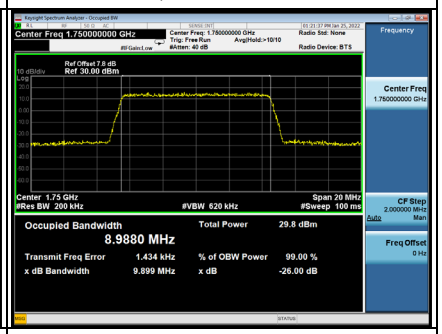

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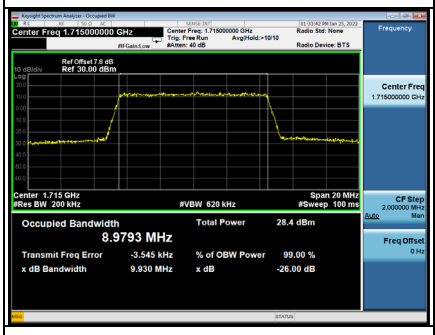

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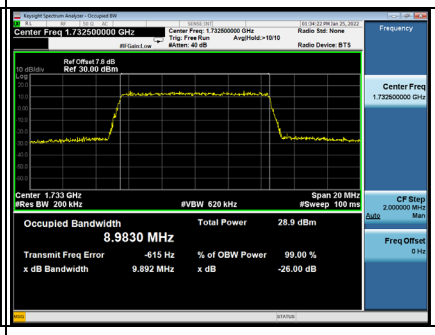

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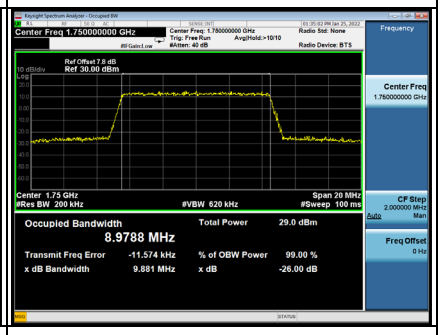

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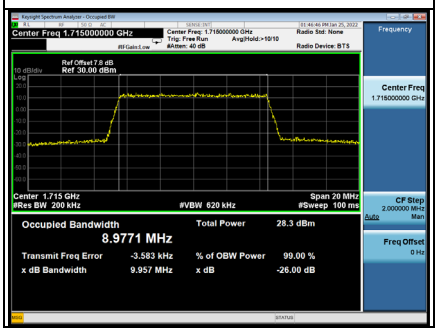

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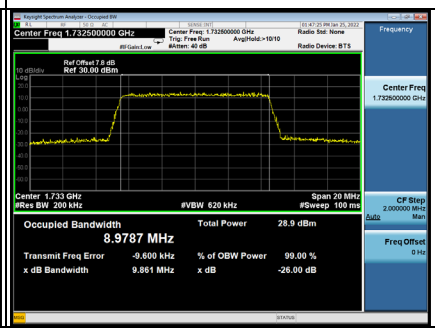
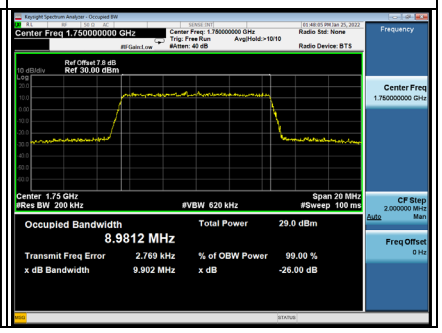
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