FCC Radio Test Report

FCC ID: 2A3Z6TOBYL3404

This report concerns: Original Grant

Project No.	:	2112H019
Equipment	:	LTE Module
Brand Name	:	TASHANG
Test Model	:	TOBY-L3404
Series Model	:	N/A
Applicant	:	Tashang Semiconductor(Shanghai) Co., Ltd.
Address	:	Room 818, Building 4, No.89 sanshahong Road, Chengqiao Town, Chongming District, Shanghai.
Manufacturer	:	Tashang Semiconductor(Shanghai) Co., Ltd.
Address	:	Room 818, Building 4, No.89 sanshahong Road, Chengqiao Town, Chongming District, Shanghai.
Date of Receipt	:	Dec. 17, 2021
Date of Test	:	Dec. 17, 2021 ~ Dec. 30, 2021
Issued Date	:	Jan. 18, 2022
Report Version	:	R01
Test Sample	:	Engineering Sample No.: SH2021122662 for the radiation, SH2021122662 for the conducted.
Standard(s)	:	47 CFR FCC Part 27 Subpart L 47 CFR FCC Part 27 Subpart M 47 CFR FCC Part 27 Subpart H 47 CFR FCC Part 27 Subpart F 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.

Maker Qi

Prepared by : Maker Qi

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TESTING CERT #5123.03

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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.

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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 Version	Description	Issued Date
R00	Original Issue.	Jan. 11, 2022
R01	Revised report to address TCB's comments.	Jan. 18, 2022

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 Subpart L,M,H,F			
Standard(s) Section	Test Item	Judgment	Remark
2.1046 27.50(d)(4) 27.50(h)(2) 27.50(b)(10) 27.50(c)(10)	Effective Radiated Power & Equivalent Isotropic Radiated Power	PASS	------
2.1049	Occupied Bandwidth	PASS	------
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Conducted Spurious Emissions	PASS	------
2.1053 27.53(c)(2) 27.53(f) 27.53(g) 27.53(h) 27.53(m)(4)	Radiated Spurious Emissions	PASS	------
2.1051 27.53(c)(2)(4) 27.53(g) 27.53(h) 27.53(m)(4)	Band Edge Measurements	PASS	------
-	Peak To Average Ratio	PASS	------
2.1055 27.54	Frequency Stability	PASS	------

Note:

For the verdict, the “N/A” denotes “not applicable”, the “N/T” denotes “not tested”.

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210, China.
BTL's Test Firm Registration Number for FCC: 476765
BTL's Designation Number for FCC: CN1241

1.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor) k=1.96 or k=2(which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).
Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y).
The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB02	CISPR	9 KHz~30 MHz	-	2.16
		30 MHz~200 MHz	V	4.04
		30 MHz~200 MHz	H	2.90
		200 MHz~1,000 MHz	V	3.76
		200 MHz~1,000 MHz	H	3.82

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB02 (3m)	CISPR	1GHz ~ 6GHz	4.56
		6GHz ~ 18GHz	4.14

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 & ERP	22°C	30%	DC 3.8V	Danny Dang
Occupied Bandwidth	22°C	30%	DC 3.8V	Danny Dang
Conducted Spurious Emissions	22°C	30%	DC 3.8V	Danny Dang
Radiated Spurious Emissions	26°C	61%	DC 3.8V	Forest Li
Band Edge	22°C	30%	DC 3.8V	Danny Dang
Peak to Average Ratio	22°C	30%	DC 3.8V	Danny Dang
Frequency Stability	Normal and Extreme			Danny Dang

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LTE Module	
Brand Name	TASHANG	
Test Model	TOBY-L3404	
Series Model	N/A	
Model Difference(s)	N/A	
Software Version	M31.04.01.03.12	
Hardware Version	V2.1	
Power Source	DC Voltage supplied from AC/DC adapter(support unit)	
Power Rating	Supply voltage: 3.4~4.2V/2A	
Antenna Type	Dipole	
Antenna Gain	WCDMA IV	3.05 dBi
	LTE Band 4 & 66	
	LTE Band 7	1.48 dBi
	LTE Band 12	0.73 dBi
	LTE Band 13	0.12 dBi
Modulation Type	WCDMA	UL: QPSK DL: QPSK,16QAM
	WCDMA(HSDPA/HSUPA/DC-HSDPA/HSPA+)	16QAM
	LTE	UL: QPSK,16QAM DL: QPSK,16QAM, 64QAM
Operation Frequency	WCDMA IV	1712.4MHz ~ 1752.6MHz
	LTE Band 4 (Channel Bandwidth: 1.4MHz)	1710.7MHz ~ 1754.3MHz
	LTE Band 4 (Channel Bandwidth: 3MHz)	1711.5MHz ~ 1753.5MHz
	LTE Band 4 (Channel Bandwidth: 5MHz)	1712.5MHz ~ 1752.5MHz
	LTE Band 4 (Channel Bandwidth: 10MHz)	1715.0MHz ~ 1750.0MHz
	LTE Band 4 (Channel Bandwidth: 15MHz)	1717.5MHz ~ 1747.5MHz
	LTE Band 4 (Channel Bandwidth: 20MHz)	1720.0MHz ~ 1745.0MHz
	LTE Band 7 (Channel Bandwidth: 5MHz)	2502.5MHz ~ 2567.5MHz
	LTE Band 7 (Channel Bandwidth: 10MHz)	2505.0MHz ~ 2565.0MHz
	LTE Band 7 (Channel Bandwidth: 15MHz)	2507.5MHz ~ 2562.5MHz
	LTE Band 7 (Channel Bandwidth: 20MHz)	2510.0MHz ~ 2560.0MHz
	LTE Band 12 (Channel Bandwidth: 1.4MHz)	699.7MHz ~ 715.3MHz
	LTE Band 12 (Channel Bandwidth: 3MHz)	700.5MHz ~ 714.5MHz
	LTE Band 12 (Channel Bandwidth: 5MHz)	701.5MHz ~ 713.5MHz
	LTE Band 12 (Channel Bandwidth: 10MHz)	704.0MHz ~ 711.0MHz
	LTE Band 13 (Channel Bandwidth: 5MHz)	779.5MHz ~ 784.5MHz
	LTE Band 13 (Channel Bandwidth: 10MHz)	782.0MHz

Operation Frequency	LTE Band 66 (Channel Bandwidth: 1.4MHz)	1710.7MHz ~ 1779.5MHz		
	LTE Band 66 (Channel Bandwidth: 3MHz)	1711.5MHz ~ 1778.5MHz		
	LTE Band 66 (Channel Bandwidth: 5MHz)	1712.5MHz ~ 1777.5MHz		
	LTE Band 66 (Channel Bandwidth: 10MHz)	1715.0MHz ~ 1775.0MHz		
	LTE Band 66 (Channel Bandwidth: 15MHz)	1717.5MHz ~ 1772.5MHz		
	LTE Band 66 (Channel Bandwidth: 20MHz)	1720.0MHz ~ 1770.0MHz		
EIRP	WCDMA	QPSK	27.50	dBm
	WCDMA_HSDPA	16QAM	26.63	dBm
	WCDMA_HSUPA	16QAM	26.25	dBm
	LTE Band 4 (Channel Bandwidth: 1.4MHz)	QPSK	27.23	dBm
		16QAM	26.06	dBm
	LTE Band 4 (Channel Bandwidth: 3MHz)	QPSK	28.03	dBm
		16QAM	27.08	dBm
	LTE Band 4 (Channel Bandwidth: 5MHz)	QPSK	28.16	dBm
		16QAM	27.00	dBm
	LTE Band 4 (Channel Bandwidth: 10MHz)	QPSK	28.37	dBm
		16QAM	27.33	dBm
	LTE Band 4 (Channel Bandwidth: 15MHz)	QPSK	28.12	dBm
		16QAM	26.82	dBm
	LTE Band 4 (Channel Bandwidth: 20MHz)	QPSK	28.34	dBm
		16QAM	27.04	dBm
	LTE Band 7 (Channel Bandwidth: 5MHz)	QPSK	25.68	dBm
		16QAM	25.16	dBm
	LTE Band 7 (Channel Bandwidth: 10MHz)	QPSK	25.98	dBm
		16QAM	25.33	dBm
	LTE Band 7 (Channel Bandwidth: 15MHz)	QPSK	25.98	dBm
		16QAM	25.37	dBm
	LTE Band 7 (Channel Bandwidth: 20MHz)	QPSK	25.97	dBm
		16QAM	25.30	dBm
	LTE Band 12 (Channel Bandwidth: 1.4MHz)	QPSK	23.14	dBm
		16QAM	22.15	dBm
	LTE Band 12 (Channel Bandwidth: 3MHz)	QPSK	22.96	dBm
		16QAM	22.24	dBm
	LTE Band 12 (Channel Bandwidth: 5MHz)	QPSK	24.14	dBm
		16QAM	22.19	dBm
	LTE Band 12 (Channel Bandwidth: 10MHz)	QPSK	23.38	dBm
		16QAM	22.28	dBm
	LTE Band 13 (Channel Bandwidth: 5MHz)	QPSK	22.45	dBm
		16QAM	21.46	dBm
	LTE Band 13 (Channel Bandwidth: 10MHz)	QPSK	22.54	dBm
		16QAM	21.52	dBm

EIRP	LTE Band 66 (Channel Bandwidth: 1.4MHz)	QPSK	27.97	dBm
		16QAM	26.97	dBm
	LTE Band 66 (Channel Bandwidth: 3MHz)	QPSK	27.99	dBm
		16QAM	26.75	dBm
	LTE Band 66 (Channel Bandwidth: 5MHz)	QPSK	27.92	dBm
		16QAM	27.92	dBm
	LTE Band 66 (Channel Bandwidth: 10MHz)	QPSK	28.03	dBm
		16QAM	27.41	dBm
	LTE Band 66 (Channel Bandwidth: 15MHz)	QPSK	28.04	dBm
		16QAM	27.66	dBm
	LTE Band 66 (Channel Bandwidth: 20MHz)	QPSK	28.15	dBm
		16QAM	27.44	dBm

Note:
1. For a more detailed features description, please refer to the manufacturer’s specifications or the user's manual.
2. LTE (UL:QPSK; DL: QPSK) mode was found to be the worst case and recorded.

2.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Following channel(s) was (were) selected for the final test as listed below:

WCDMA MODE			
Test Item	Available Channel	Tested Channel	Mode
EIRP	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Output Power	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Occupied Bandwidth	1312 to 1513	1312, 1413, 1513	WCDMA,HSDPA, HSUPA
Conducted Emission	1312 to 1513	1413	WCDMA
Radiated Emission	1312 to 1513	1413	WCDMA
Band Edge	1312 to 1513	1312, 1513	WCDMA
Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA
Frequency Stability	1312 to 1513	1413	WCDMA

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	1RB/3RB/6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emission	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Radiated Spurious Emission	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Band Edge	19957 to 20393	19957	1.4MHz	QPSK	1RB/6RB
		20393	1.4MHz	QPSK	
	19965 to 20385	19965	3MHz	QPSK	1RB/15RB
		20385	3MHz	QPSK	
	19975 to 20375	19975	5MHz	QPSK	1RB/25RB
		20375	5MHz	QPSK	
	20000 to 20350	20000	10MHz	QPSK	1RB/50RB
		20350	10MHz	QPSK	
	20025 to 20325	20025	15MHz	QPSK	1RB/75RB
		20325	15MHz	QPSK	
	20050 to 20300	20050	20MHz	QPSK	1RB/100RB
		20300	20MHz	QPSK	
Peak To Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	6RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	15RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	25RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	50RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	75 RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	100RB
Frequency Stability	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19965 to 20385	20175	3MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20000 to 20350	20175	10MHz	QPSK	1RB
	20025 to 20325	20175	15MHz	QPSK	1RB
	20050 to 20300	20175	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	1RB/12RB/25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emission	20775 to 21425	21100	5MHz	QPSK	1 RB
	20850 to 21350	21100	20MHz	QPSK	1 RB
Radiated Spurious Emission	20775 to 21425	21100	5MHz	QPSK	1 RB
	20850 to 21350	21100	20MHz	QPSK	1 RB
Band Edge	20775 to 21425	20775	5MHz	QPSK	1RB/25RB
		21425	5MHz	QPSK	
	20800 to 21400	20800	10MHz	QPSK	1RB/50RB
		21400	10MHz	QPSK	
	20825 to 21375	20825	15MHz	QPSK	1RB/75RB
		21375	15MHz	QPSK	
	20850 to 21350	20850	20MHz	QPSK	1RB/100RB
		21350	20MHz	QPSK	
Peak To Average Ratio	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	25RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	50RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	75RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	100RB
Frequency Stability	20775 to 21425	21100	5MHz	QPSK	1RB
	20800 to 21400	21100	10MHz	QPSK	1RB
	20825 to 21375	21100	15MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB

LTE BAND 12 MODE					
Test Item	Available Channel	Tested Channel	Channel	Modulation	Mode
Output Power & ERP	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emission	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB
Radiated Spurious Emission	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB
Band Edge	23017 to 23173	23017	1.4MHz	QPSK	1RB/6RB
		23173	1.4MHz	QPSK	
	23025 to 23165	23025	3MHz	QPSK	1RB/15RB
		23165	3MHz	QPSK	
	23035 to 23155	23035	5MHz	QPSK	1RB/25RB
		23155	5MHz	QPSK	
	23060 to 23130	23060	10MHz	QPSK	1RB/50RB
		23130	10MHz	QPSK	
Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM	6RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	15RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	25RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	50RB
Frequency Stability	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23025 to 23165	23095	3MHz	QPSK	1 RB
	23035 to 23155	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB

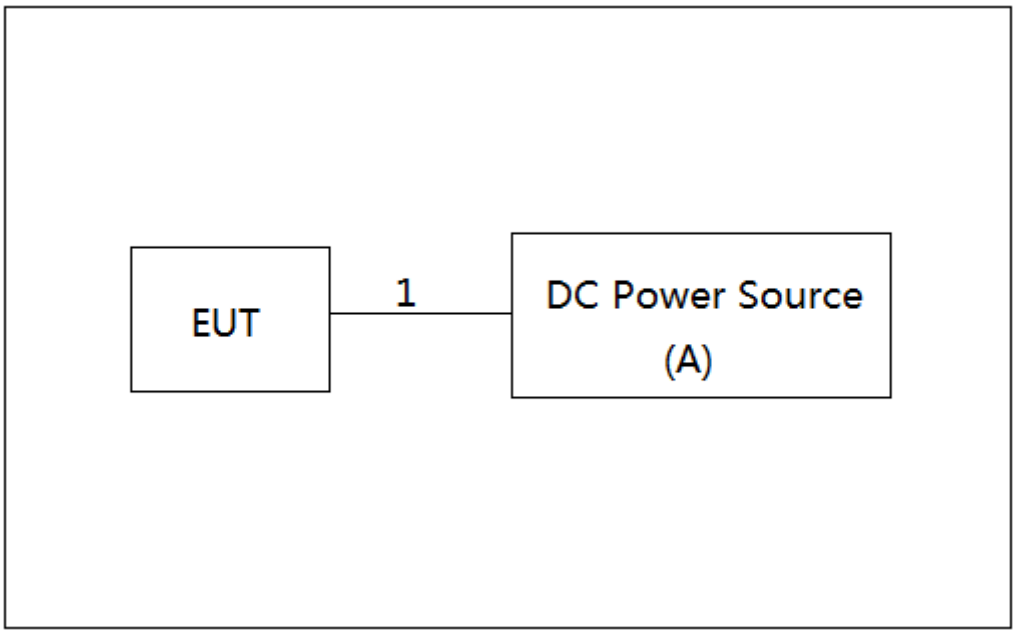
LTE BAND 13 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	1RB/12RB/25RB
		23230	10MHz	QPSK, 16QAM	1RB/25RB/50RB
Occupied Bandwidth	23205 to 23255	23230	5MHz	QPSK, 16QAM	25RB
	23205 to 23255	23230	10MHz	QPSK, 16QAM	50RB
Conducted Spurious Emission	23205 to 23255	23230	5MHz	QPSK	1 RB
		23230	10MHz	QPSK	1 RB
Radiated Spurious Emission	23205 to 23255	23230	5MHz	QPSK	1 RB
	23205 to 23255	23230	10MHz	QPSK	1 RB
Band Edge	23205 to 23255	23205, 23255	5MHz	QPSK	1RB/25RB
	23205 to 23255	23230	10MHz	QPSK	1RB/50RB
Peak To Average Ratio	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM	25RB
	23205 to 23255	23230	10MHz	QPSK, 16QAM	50RB
Frequency Stability	23205 to 23255	23230	5MHz	QPSK	1RB
	23205 to 23255	23230	10MHz	QPSK	1RB

LTE BAND 66 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM	1RB/3RB/6RB
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM	1RB/8RB/15RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM	6RB
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM	15RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM	25RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM	50RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM	75 RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emission	131979 to 132665	132322	1.4MHz	QPSK	1RB
	131997 to 132647	132322	5MHz	QPSK	1RB
	132072 to 132572	132322	20MHz	QPSK	1RB
Radiated Spurious Emission	131979 to 132665	132322	1.4MHz	QPSK	1RB
	131997 to 132647	132322	5MHz	QPSK	1RB
	132072 to 132572	132322	20MHz	QPSK	1RB

LTE BAND 66 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Band Edge	131979 to 132665	131979	1.4MHz	QPSK	1RB/6RB
		132665	1.4MHz	QPSK	
	131987 to 132657	131987	3MHz	QPSK	1RB/15RB
		132657	3MHz	QPSK	
	131997 to 132647	131997	5MHz	QPSK	1RB/25RB
		132647	5MHz	QPSK	
	132022 to 132622	132022	10MHz	QPSK	1RB/50RB
		132622	10MHz	QPSK	
	132047 to 132597	132047	15MHz	QPSK	1RB/75RB
		132597	15MHz	QPSK	
	132072 to 132572	132072	20MHz	QPSK	1RB/100RB
		132572	20MHz	QPSK	
Peak To Average Ratio	131979 to 132665	131979, 132322, 132665	1.4MHz	QPSK, 16QAM	1RB
	131987 to 132657	131987, 132322, 132657	3MHz	QPSK, 16QAM	1RB
	131997 to 132647	131997, 132322, 132647	5MHz	QPSK, 16QAM	1RB
	132022 to 132622	132022, 132322, 132622	10MHz	QPSK, 16QAM	1RB
	132047 to 132597	132047, 132322, 132597	15MHz	QPSK, 16QAM	1RB
	132072 to 132572	132072, 132322, 132572	20MHz	QPSK, 16QAM	1RB
Frequency Stability	131979 to 132665	132322	1.4MHz	QPSK	1RB
	131987 to 132657	132322	3MHz	QPSK	1RB
	131997 to 132647	132322	5MHz	QPSK	1RB
	132022 to 132622	132322	10MHz	QPSK	1RB
	132047 to 132597	132322	15MHz	QPSK	1RB
	132072 to 132572	132322	20MHz	QPSK	1RB

Note:The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

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	DCPowerSource	TRUE-POWER -	GPC30300N -	N/A

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	N/A	N/A	N/A	1.5m

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

Mobile / Portable station are limited to 1 watts e.i.r.p. (LTE Band 4 & LTE Band 66.)

Mobile / Portable station are limited to 2 watts e.i.r.p. (LTE Band 7.)

Mobile / Portable station are limited to 3 watts e.r.p. (LTE Band 12, LTE Band 13.)

3.1.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.

EIRP/ERP:

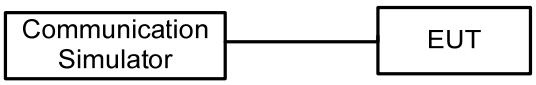
EIRP= Conducted Power +Antenan gain
ERP power=EIPR power-2.15dBi.

Output Power:

The EUT was set up for the maximum power with 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

Conducted Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the Appendix A.

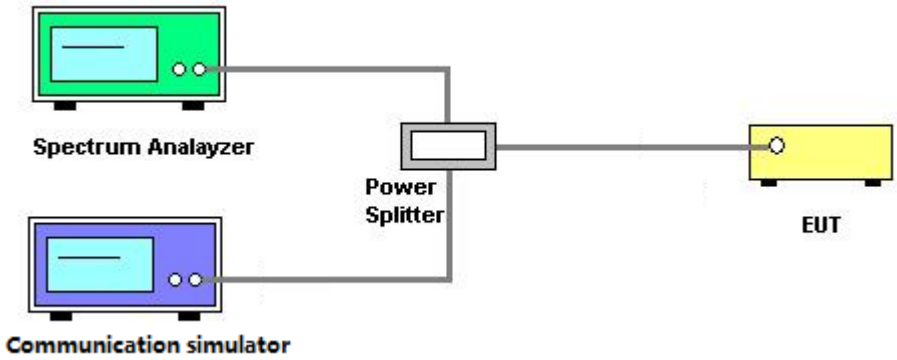
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 4.

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.

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 EMISSIONS MEASUREMENT

3.3.1 LIMIT

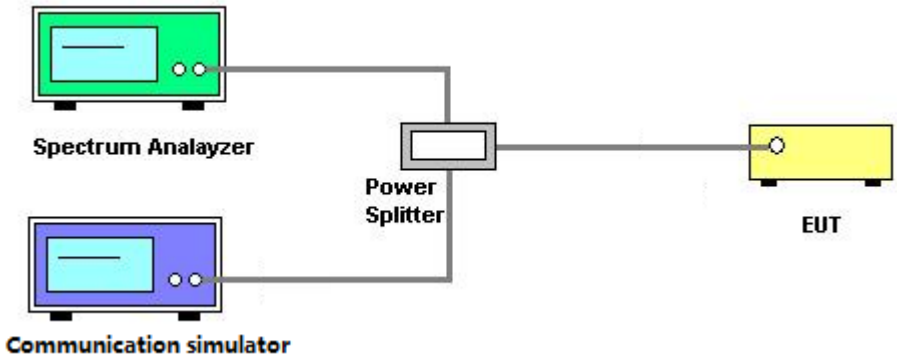
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The emission limit equal to -13dBm. (WCDMA Band IV,LTE Band 4, Band 12, Band 13,Band 66.)

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. (LTE Band 7)

3.3.2 TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 Section 6.0.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. 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.
4. Set spectrum analyzer with RMS detector.
5. 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 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. (WCDMA Band IV, LTE Band 4, Band 12,Band 66.)

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. (LTE Band 7.)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. (LTE Band 13).

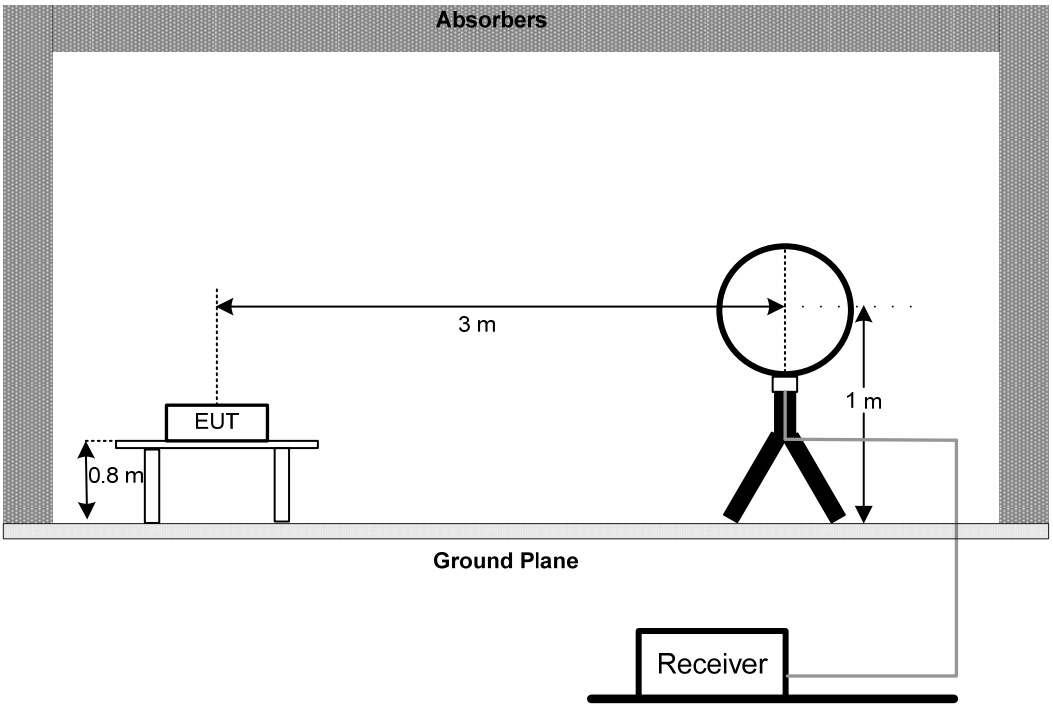
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.2.

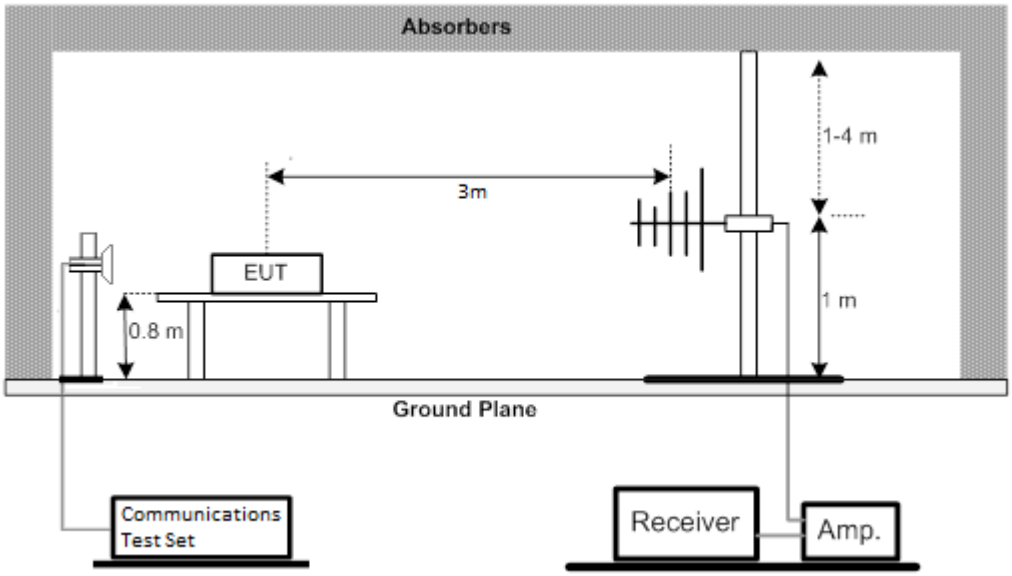
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. 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. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.
5. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

3.4.3 TEST SETUP LAYOUT

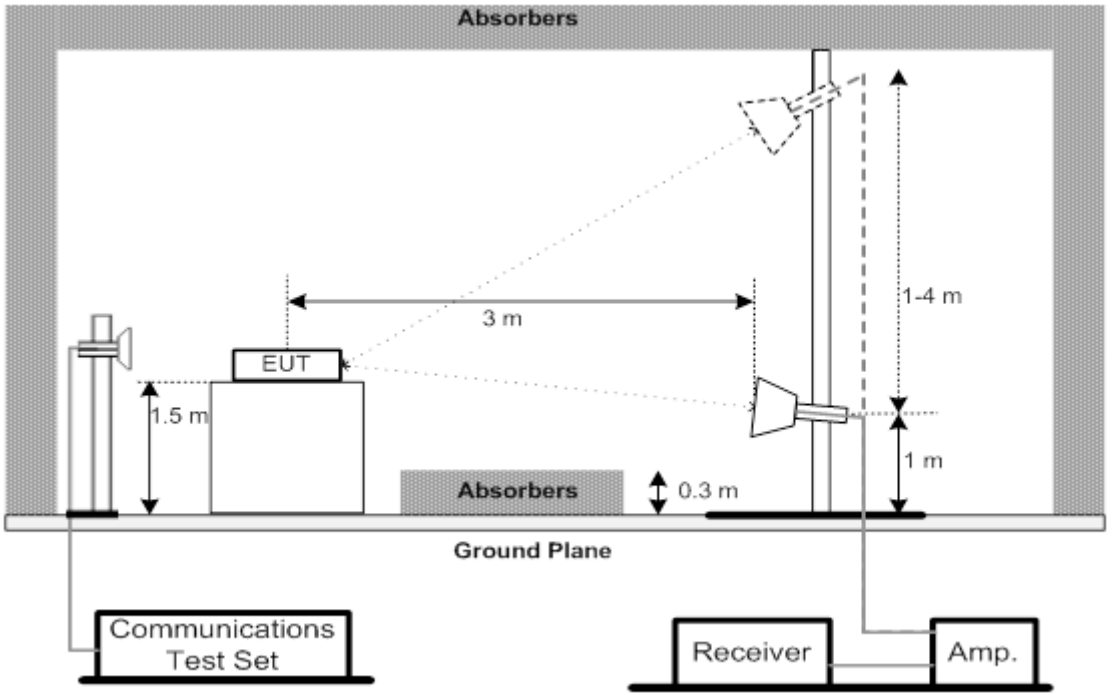
Below 30MHz



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. (LTE Band 4, Band 12,Band 66.)

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) dBon 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 SatelliteService licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. (LTE Band 7)

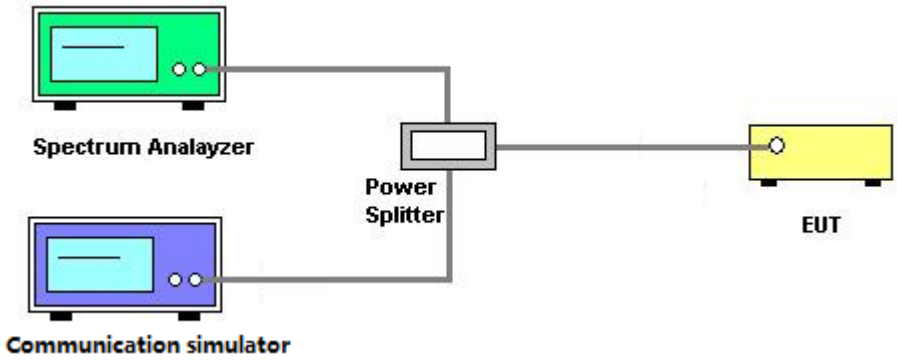
For operations in the 776-788 MHz band, the FCC limit is 43 + 10log10(P[Watts]) dB below the transmitter power P(Watts) in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. In addition, the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least 65 + 10 log10 p (watts), dB, for mobile and portable equipment. (LTE Band 13)

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. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 43kHz (LTE Bandwidth 1.4MHz).
3. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 91kHz (LTE Bandwidth 3MHz).
4. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Bandwidth 5MHz).
5. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 10MHz).
6. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Bandwidth 15MHz).
7. The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (LTE Bandwidth 20MHz).
8. 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

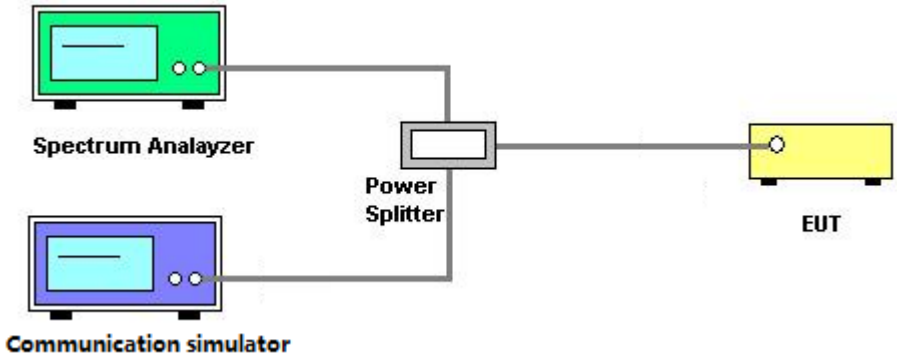
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

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

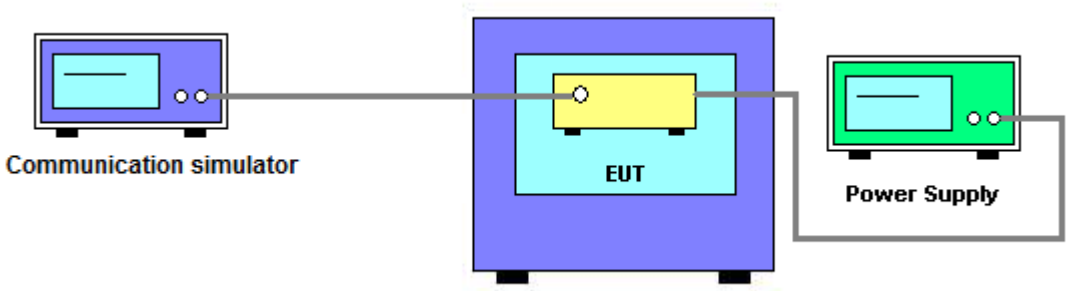
±1.5 ppm is for base and fixed station. ±2.5 ppm is for mobile station.

3.7.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 9.

1. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
2. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
3. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5°C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.
4. The frequency error was recorded frequency error from the communication simulator.

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 Emission Measurement(9K-30M)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	May. 20, 2022
2	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
4	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9160	9160-3233	Mar. 26, 2022
2	Pre-Amplifier	emci	EMC9135	980401	Mar. 20, 2022
3	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-SM-7000	181020	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-SM-2500	170618	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-SM-800	170647	Apr. 11, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1817	Mar. 26, 2022
2	Pre-Amplifier	emci	EMC051845SE	980725	Aug. 23, 2022
3	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
4	Test Cable	emci	EMC104-SM-SM-7000	181020	Apr. 11, 2022
5	Test Cable	emci	EMC104-SM-SM-2500	170618	Apr. 11, 2022
6	Test Cable	emci	EMC104-SM-SM-800	170647	Apr. 11, 2022
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022

Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022
2	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
3	Power Divider	JUK	PD-2SF-2060	N/A	N/A

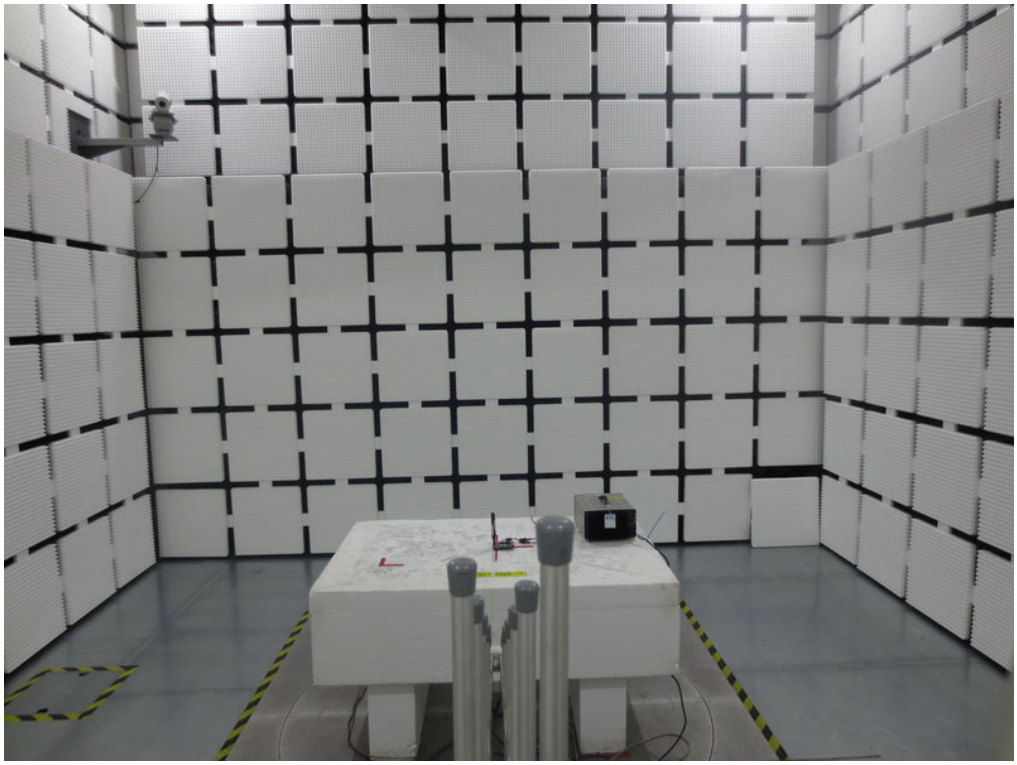
Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wideband Radio Communication Test	R&S	CMW500	129246	Aug. 23, 2022
2	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 21, 2022
3	Power Divider	JUK	PD-2SF-2060	N/A	N/A
4	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Aug. 23, 2022

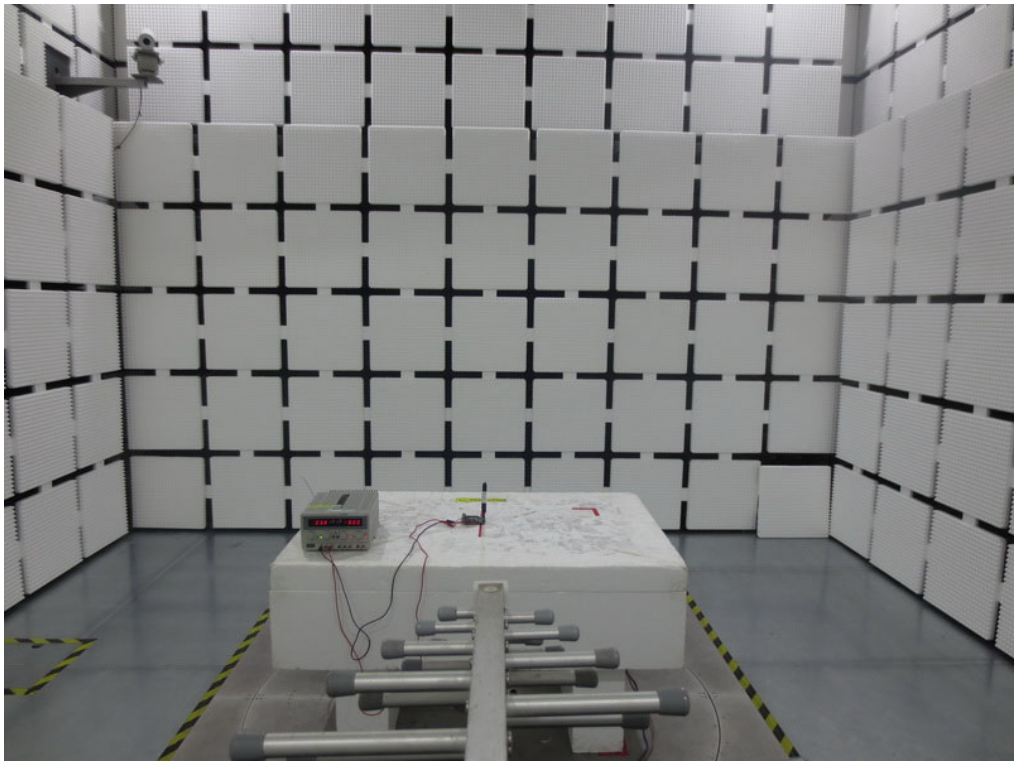
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

5. EUT TEST PHOTO

Radiated Emissions Test Photos

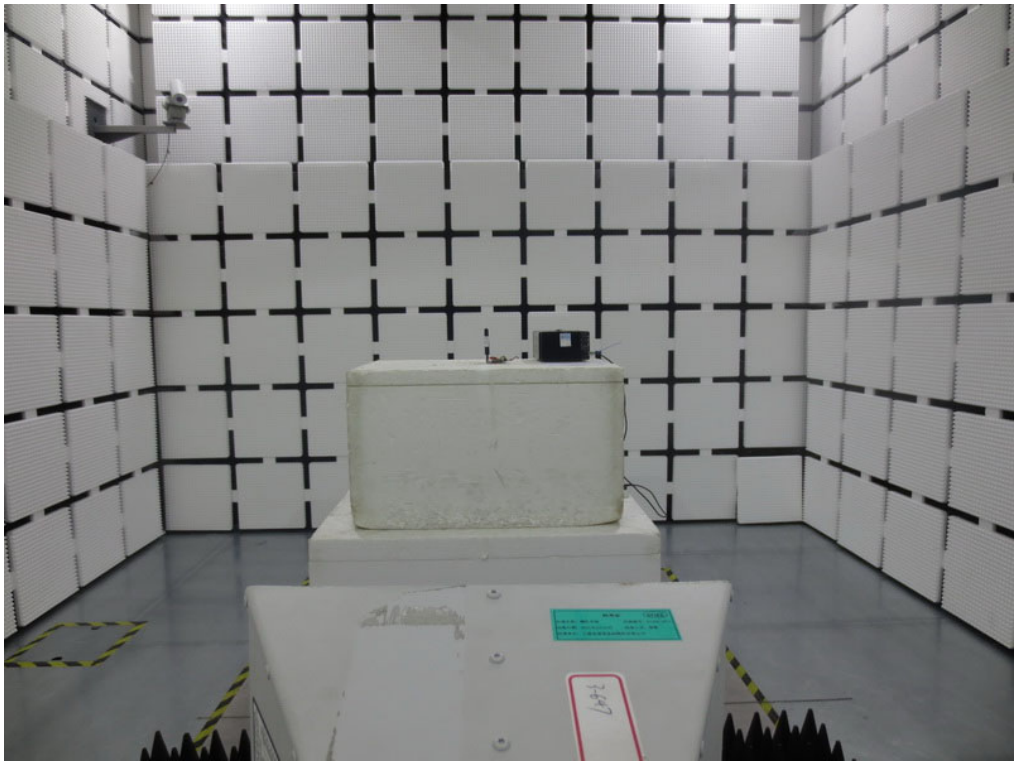
30 MHz to 1000 MHz

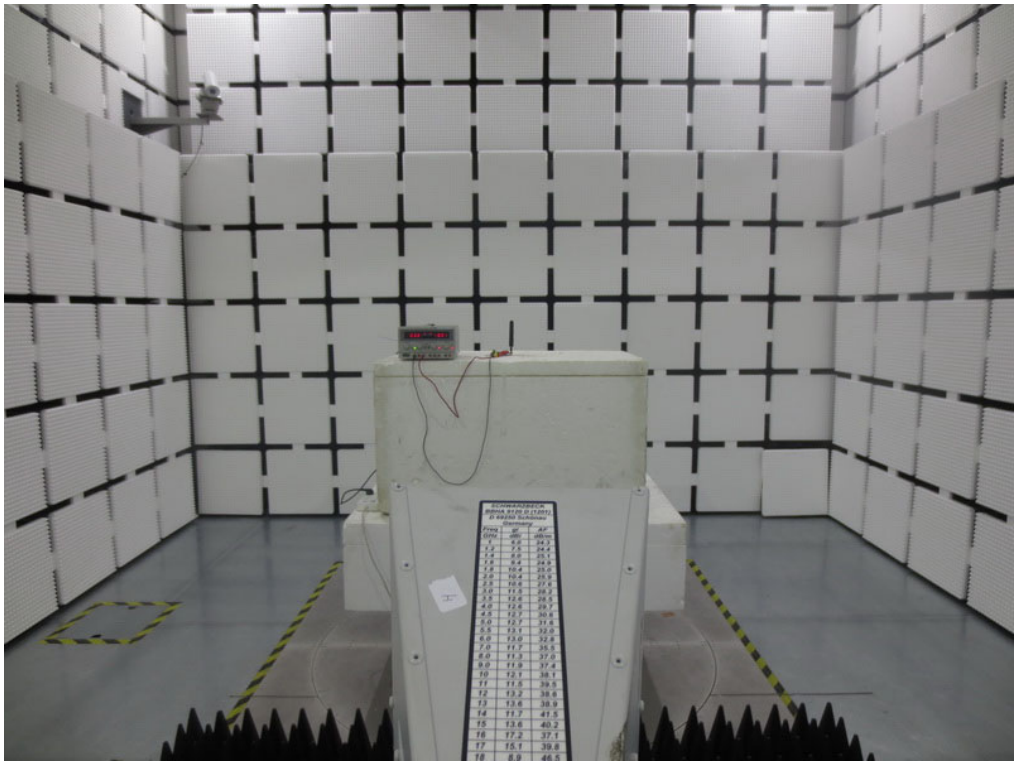




Radiated Emissions Test Photos

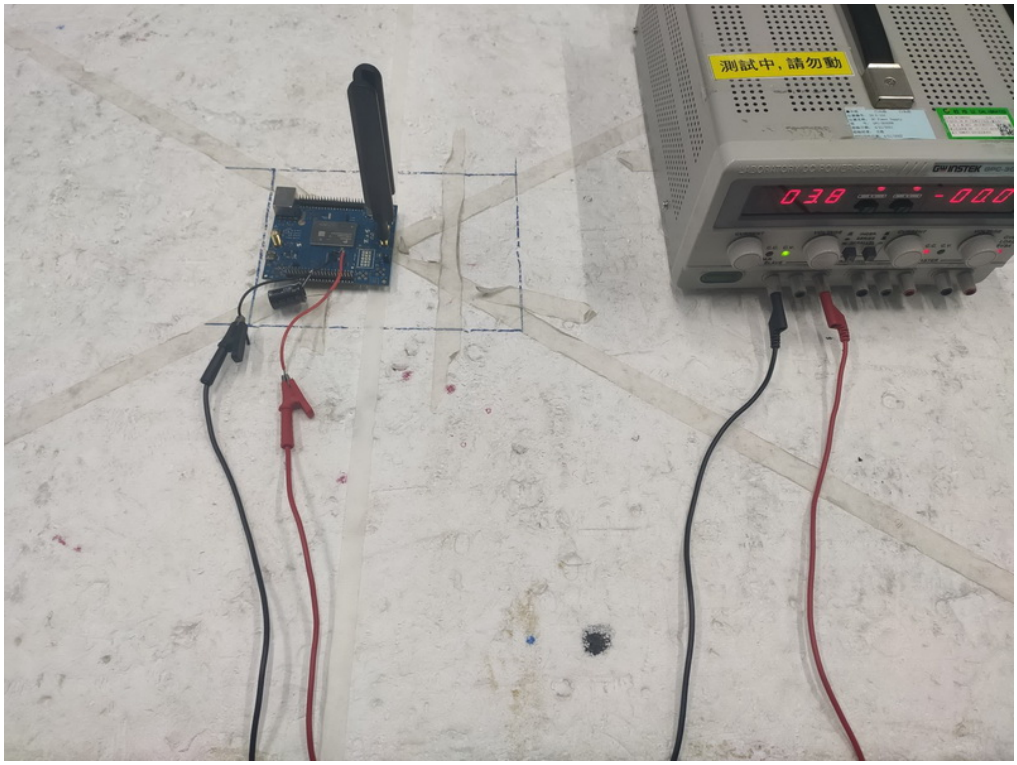
Above 1 GHz





Radiated Emissions Test Photos

close-up test photo



APPENDIX A - OUTPUT POWER

Output Power (dBm):

Modulation	Band	WCDMA Band IV		
	Tx Channel	1312CH	1413CH	1513CH
	Frequency	1712.4MHz	1732.6MHz	1752.6MHz
QPSK	RMC 12.2K	24.23	24.45	24.36
	RMC 64K	24.33	24.39	24.22
	RMC 144K	24.16	24.18	24.26
	RMC 384K	24.14	24.17	24.17
	HSDPA Subtest-1	23.39	23.5	23.5
	HSDPA Subtest-2	23.45	23.58	23.54
	HSDPA Subtest-3	22.79	23.00	23.1
	HSDPA Subtest-4	22.87	23.17	23.07
	HSUPA Subtest-1	22.84	23.02	23.02
	HSUPA Subtest-2	22.25	22.36	22.43
	HSUPA Subtest-3	22.86	23.2	23.07
	HSUPA Subtest-4	22.71	22.98	22.86
	HSUPA Subtest-5	22.99	23.08	23.05

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	23.81	23.99	24.12
		1	2	23.79	24.10	24.10
		1	5	23.77	24.17	24.13
		3	0	23.62	24.18	23.82
		3	1	23.80	23.85	23.89
		3	2	23.70	24.07	23.92
		6	0	22.63	23.01	22.88
	16QAM	1	0	22.80	22.84	22.80
		1	2	22.55	22.55	22.81
		1	5	22.67	22.93	22.73
		3	0	22.30	22.88	22.69
		3	1	22.84	22.98	22.79
		3	2	22.75	23.01	22.97
		6	0	21.65	21.99	21.91

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3M	QPSK	1	0	24.59	24.87	24.67
		1	7	24.91	24.85	24.63
		1	14	24.56	24.62	24.98
		8	0	23.53	23.83	23.70
		8	4	23.39	23.84	23.52
		8	7	23.51	23.63	23.64
		15	0	23.40	23.77	23.56
	16QAM	1	0	23.36	24.03	23.59
		1	7	23.59	23.75	23.18
		1	14	23.10	23.57	23.46
		8	0	22.44	22.75	22.80
		8	4	22.43	22.56	22.60
		8	7	22.43	22.66	22.45
		15	0	22.45	22.78	22.57

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5M	QPSK	1	0	24.59	24.88	24.98
		1	13	24.57	24.98	25.11
		1	24	24.64	24.82	24.82
		12	0	23.55	23.72	23.79
		12	6	23.43	23.67	23.94
		12	11	23.60	23.71	23.75
		25	0	23.59	23.88	23.91
	16QAM	1	0	23.46	23.80	23.56
		1	13	23.28	23.42	23.95
		1	24	23.58	23.31	23.63
		12	0	22.33	22.50	23.00
		12	6	22.48	22.62	22.90
		12	11	22.45	22.75	22.84
		25	0	22.42	22.82	22.83

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10M	QPSK	1	0	24.69	24.20	24.61
		1	25	24.89	24.77	25.32
		1	49	24.71	23.87	25.00
		25	0	23.54	23.76	24.03
		25	13	23.79	23.74	23.94
		25	25	23.60	23.68	23.92
		50	0	23.74	23.88	23.89
	16QAM	1	0	23.53	23.75	24.28
		1	25	23.33	23.61	23.81
		1	49	23.49	23.05	23.99
		25	0	22.66	22.87	22.78
		25	13	22.58	22.68	22.88
		25	25	22.57	22.84	22.86
		50	0	22.71	22.76	22.87

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15M	QPSK	1	0	24.79	24.52	23.87
		1	38	24.62	24.87	25.07
		1	74	24.74	23.87	25.05
		36	0	23.62	23.89	23.97
		36	18	23.74	23.80	24.00
		36	39	23.55	23.65	23.83
		75	0	23.66	23.76	23.73
	16QAM	1	0	23.53	23.74	23.32
		1	38	23.77	23.61	23.76
		1	74	23.72	23.49	23.25
		36	0	22.66	22.76	23.03
		36	18	22.73	22.73	22.86
		36	39	22.67	22.86	22.75
		75	0	22.53	22.95	22.90

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1745MHz
4 / 20M	QPSK	1	0	24.87	24.55	23.59
		1	50	24.90	24.80	25.29
		1	99	24.15	23.73	25.06
		50	0	23.60	23.77	23.81
		50	25	23.74	23.80	23.91
		50	50	23.67	23.68	23.93
		100	0	23.72	23.84	23.78
	16QAM	1	0	23.32	23.99	23.18
		1	50	23.93	23.50	23.58
		1	99	22.90	22.95	23.78
		50	0	22.57	22.74	22.85
		50	25	22.59	22.85	22.78
		50	50	22.70	22.60	22.79
		100	0	22.68	22.84	22.88

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5M	QPSK	1	0	23.77	24.12	24.04
		1	13	23.98	24.18	23.66
		1	24	23.94	24.20	23.60
		12	0	23.99	23.90	23.56
		12	6	23.92	24.02	23.29
		12	11	23.92	24.09	23.64
		25	0	23.86	23.87	23.51
	16QAM	1	0	23.32	23.09	23.54
		1	13	23.50	23.68	22.79
		1	24	23.61	23.50	22.79
		12	0	22.86	23.17	23.50
		12	6	22.92	22.86	22.94
		12	11	22.93	23.12	22.70
		25	0	22.87	22.98	22.78

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10M	QPSK	1	0	24.14	23.52	24.37
		1	25	24.15	24.50	24.09
		1	49	24.23	24.36	24.44
		25	0	23.86	23.86	24.02
		25	13	24.14	24.03	23.39
		25	25	23.95	24.08	24.19
		50	0	24.03	24.03	24.13
	16QAM	1	0	23.47	23.08	23.85
		1	25	23.77	23.76	23.73
		1	49	23.77	23.32	23.50
		25	0	22.88	23.10	23.06
		25	13	23.02	22.83	23.40
		25	25	22.97	22.88	23.26
		50	0	22.85	22.96	23.18

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15M	QPSK	1	0	24.36	23.45	24.21
		1	38	24.18	24.34	24.23
		1	74	24.19	24.50	24.37
		36	0	23.98	23.94	23.93
		36	18	24.00	23.96	24.17
		36	39	24.00	23.88	24.02
		75	0	23.99	23.90	23.92
	16QAM	1	0	23.58	22.78	23.63
		1	38	23.89	23.54	23.75
		1	74	23.70	23.74	23.16
		36	0	23.00	23.02	23.21
		36	18	22.92	22.87	23.41
		36	39	23.04	22.85	23.33
		75	0	22.95	22.83	23.34

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20M	QPSK	1	0	24.09	23.18	24.23
		1	50	23.86	24.49	24.40
		1	99	24.06	24.26	24.02
		50	0	23.77	23.78	24.17
		50	25	23.55	23.99	23.37
		50	50	23.83	24.07	24.03
		100	0	23.89	23.86	24.15
	16QAM	1	0	23.46	22.78	23.82
		1	50	23.64	23.28	23.63
		1	99	23.40	23.51	23.78
		50	0	22.84	22.98	23.39
		50	25	23.17	22.88	23.48
		50	50	22.80	23.03	23.31
		100	0	23.02	22.95	23.31

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23017CH	23095CH	23173CH
				699.7MHz	707.5MHz	715.3MHz
12 / 1.4M	QPSK	1	0	24.32	24.33	24.18
		1	2	24.55	24.56	24.35
		1	5	24.22	24.40	24.19
		3	0	24.14	24.26	24.14
		3	1	24.15	24.15	24.29
		3	2	24.21	24.28	24.06
		6	0	23.19	23.10	23.27
	16QAM	1	0	23.32	23.21	23.25
		1	2	23.13	23.43	23.25
		1	5	23.20	23.18	23.15
		3	0	23.17	23.57	23.19
		3	1	23.17	23.44	23.22
		3	2	23.07	23.38	23.17
		6	0	22.05	22.23	22.21

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23025CH	23095CH	23165CH
				700.5MHz	707.5MHz	714.5MHz
12 / 3M	QPSK	1	0	24.05	24.18	24.13
		1	7	24.38	24.34	24.30
		1	14	24.22	24.30	24.13
		8	0	23.09	23.21	23.27
		8	4	23.13	23.12	23.23
		8	7	23.32	23.28	23.09
		15	0	23.04	23.27	23.09
	16QAM	1	0	23.66	23.20	23.27
		1	7	23.38	22.86	23.18
		1	14	23.51	22.99	22.81
		8	0	22.21	22.30	21.94
		8	4	22.12	22.33	22.17
		8	7	22.22	22.14	22.16
		15	0	21.90	22.23	22.22

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	23.94	24.09	24.21
		1	13	25.56	24.17	24.27
		1	24	24.12	24.27	23.86
		12	0	23.01	23.11	22.95
		12	6	23.15	23.14	23.12
		12	11	23.13	23.06	23.13
		25	0	23.09	23.18	22.95
	16QAM	1	0	23.22	22.70	23.48
		1	13	23.46	23.61	23.00
		1	24	23.32	23.28	22.90
		12	0	21.89	22.16	21.99
		12	6	22.50	22.06	22.19
		12	11	22.32	22.10	21.94
		25	0	22.15	22.15	22.16

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23060CH	23095CH	23130CH
				704MHz	707.5MHz	711MHz
12 / 10M	QPSK	1	0	24.03	24.21	24.18
		1	25	24.57	24.33	24.80
		1	49	24.12	24.26	24.29
		25	0	23.04	23.14	23.32
		25	13	23.20	23.15	23.33
		25	25	23.13	23.14	23.04
		50	0	23.33	23.26	23.30
	16QAM	1	0	22.76	23.20	23.10
		1	25	23.27	23.15	23.70
		1	49	23.33	23.20	23.20
		25	0	22.20	22.27	22.22
		25	13	22.16	22.20	22.33
		25	25	22.13	22.27	22.26
		50	0	22.34	22.17	22.26

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23205CH	23230CH	23255CH
				779.5MHz	782MHz	784.5MHz
13 / 5M	QPSK	1	0	24.35	24.39	24.27
		1	13	24.31	24.33	24.26
		1	24	24.39	24.20	24.48
		12	0	23.26	23.31	23.22
		12	6	23.31	23.27	23.23
		12	11	23.27	23.28	23.17
		25	0	23.37	23.27	23.24
	16QAM	1	0	23.28	23.49	22.77
		1	13	23.16	23.13	23.04
		1	24	22.97	22.82	22.75
		12	0	22.02	22.44	22.43
		12	6	22.18	21.98	22.33
		12	11	22.35	21.92	22.23
		25	0	22.31	22.20	22.27

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	23.86
		1	25	24.57
		1	49	24.34
		25	0	23.26
		25	13	23.15
		25	25	23.20
		50	0	23.33
	16QAM	1	0	23.05
		1	25	23.55
		1	49	23.21
		25	0	22.28
		25	13	22.12
		25	25	22.35
		50	0	22.24

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131979CH	132322CH	132665CH
				1710.7MHz	1745MHz	1779.3MHz
66 / 1.4M	QPSK	1	0	24.45	24.78	24.83
		1	2	24.87	24.86	24.92
		1	5	24.62	24.81	24.71
		3	0	24.51	24.72	24.55
		3	1	24.57	24.74	23.63
		3	2	24.42	24.84	24.75
		6	0	23.41	23.89	23.54
	16QAM	1	0	23.12	23.59	23.54
		1	2	23.33	23.65	23.62
		1	5	23.23	23.80	23.92
		3	0	23.50	23.90	23.73
		3	1	23.61	23.49	23.83
		3	2	23.55	23.72	23.90
		6	0	22.23	22.66	22.58

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131987CH	132322CH	132657CH
				1711.5MHz	1745MHz	1778.5MHz
66 / 3M	QPSK	1	0	24.34	24.69	24.84
		1	7	24.53	24.85	24.88
		1	14	24.53	24.94	24.64
		8	0	23.36	23.70	23.59
		8	4	23.33	23.87	23.66
		8	7	23.32	23.72	23.68
		15	0	23.35	23.72	23.70
	16QAM	1	0	23.30	23.47	23.60
		1	7	23.70	23.64	23.69
		1	14	22.99	23.61	23.30
		8	0	22.37	22.41	22.61
		8	4	22.31	22.97	22.59
		8	7	22.41	22.69	22.64
		15	0	22.46	22.66	22.65

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131997CH	132322CH	132647CH
				1712.5MHz	1745MHz	1777.5MHz
66 / 5M	QPSK	1	0	24.50	24.47	24.76
		1	13	24.60	24.81	24.61
		1	24	24.48	24.87	24.58
		12	0	23.37	23.69	23.71
		12	6	23.35	23.71	23.70
		12	11	23.40	24.11	23.64
		25	0	23.41	23.74	23.64
	16QAM	1	0	24.46	24.31	23.80
		1	13	24.65	24.39	23.93
		1	24	24.52	24.87	23.47
		12	0	23.34	23.75	22.80
		12	6	23.34	23.69	22.64
		12	11	23.32	23.74	22.65
		25	0	23.33	23.66	22.65

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132022CH	132322CH	132622CH
				1715MHz	1745MHz	1775MHz
66 / 10M	QPSK	1	0	24.55	23.50	24.82
		1	25	24.98	24.75	24.68
		1	49	24.57	24.46	24.54
		25	0	23.42	23.69	23.77
		25	13	24.32	23.71	23.58
		25	25	23.45	23.69	23.61
		50	0	23.46	23.70	23.64
	16QAM	1	0	23.49	22.76	23.57
		1	25	23.74	24.36	23.72
		1	49	23.62	23.66	23.46
		25	0	22.45	22.56	22.66
		25	13	22.43	22.75	22.60
		25	25	22.48	22.65	22.53
		50	0	22.40	22.76	22.61

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132047CH	132322CH	132597CH
				1717.5MHz	1745MHz	1772.5MHz
66 / 15M	QPSK	1	0	24.84	23.78	24.91
		1	38	24.66	24.96	24.42
		1	74	24.72	24.99	24.47
		36	0	24.50	23.79	24.37
		36	18	23.66	23.94	23.68
		36	39	23.60	23.97	23.58
		75	0	23.66	23.91	23.58
	16QAM	1	0	23.51	23.01	23.48
		1	38	24.61	23.59	23.75
		1	74	23.48	23.84	22.67
		36	0	22.49	22.88	22.76
		36	18	22.56	22.93	22.64
		36	39	22.67	22.83	22.55
		75	0	22.69	22.86	22.54

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132072CH	132322CH	132572CH
				1720MHz	1745MHz	1770MHz
66 / 20M	QPSK	1	0	24.73	23.57	23.44
		1	50	25.06	25.10	24.94
		1	99	23.98	25.00	24.97
		50	0	23.50	23.80	24.20
		50	25	23.59	23.88	24.03
		50	50	23.65	23.93	23.94
		100	0	23.66	23.87	23.86
	16QAM	1	0	23.41	22.94	23.20
		1	50	24.10	24.39	23.98
		1	99	23.53	23.91	23.76
		50	0	22.60	22.76	22.81
		50	25	22.61	22.97	22.99
		50	50	22.51	22.89	22.89
		100	0	22.72	22.94	22.94

EIRP Power (dBm):

Modulation	Band	WCDMA Band IV		
	Tx Channel	1312CH	1413CH	1513CH
	Frequency	1712.4MHz	1732.6MHz	1752.6MHz
QPSK	RMC 12.2K	27.28	27.50	27.41
	RMC 64K	27.38	27.44	27.27
	RMC 144K	27.21	27.23	27.31
	RMC 384K	27.19	27.22	27.22
	HSDPA Subtest-1	26.44	26.55	26.55
	HSDPA Subtest-2	26.50	26.63	26.59
	HSDPA Subtest-3	25.84	26.05	26.15
	HSDPA Subtest-4	25.92	26.22	26.12
	HSUPA Subtest-1	25.89	26.07	26.07
	HSUPA Subtest-2	25.30	25.41	25.48
	HSUPA Subtest-3	25.91	26.25	26.12
	HSUPA Subtest-4	25.76	26.03	25.91
	HSUPA Subtest-5	26.04	26.13	26.10

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	26.86	27.04	27.17
		1	2	26.84	27.15	27.15
		1	5	26.82	27.22	27.18
		3	0	26.67	27.23	26.87
		3	1	26.85	26.90	26.94
		3	2	26.75	27.12	26.97
		6	0	25.68	26.06	25.93
	16QAM	1	0	25.85	25.89	25.85
		1	2	25.60	25.60	25.86
		1	5	25.72	25.98	25.78
		3	0	25.35	25.93	25.74
		3	1	25.89	26.03	25.84
		3	2	25.80	26.06	26.02
		6	0	24.70	25.04	24.96

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19965CH	20175CH	20385CH
				1711.5MHz	1732.5MHz	1753.5MHz
4 / 3M	QPSK	1	0	27.64	27.92	27.72
		1	7	27.96	27.90	27.68
		1	14	27.61	27.67	28.03
		8	0	26.58	26.88	26.75
		8	4	26.44	26.89	26.57
		8	7	26.56	26.68	26.69
		15	0	26.45	26.82	26.61
	16QAM	1	0	26.41	27.08	26.64
		1	7	26.64	26.80	26.23
		1	14	26.15	26.62	26.51
		8	0	25.49	25.80	25.85
		8	4	25.48	25.61	25.65
		8	7	25.48	25.71	25.50
		15	0	25.50	25.83	25.62

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19975CH	20175CH	20375CH
				1712.5MHz	1732.5MHz	1752.5MHz
4 / 5M	QPSK	1	0	27.64	27.93	28.03
		1	13	27.62	28.03	28.16
		1	24	27.69	27.87	27.87
		12	0	26.60	26.77	26.84
		12	6	26.48	26.72	26.99
		12	11	26.65	26.76	26.80
		25	0	26.64	26.93	26.96
	16QAM	1	0	26.51	26.85	26.61
		1	13	26.33	26.47	27.00
		1	24	26.63	26.36	26.68
		12	0	25.38	25.55	26.05
		12	6	25.53	25.67	25.95
		12	11	25.50	25.80	25.89
		25	0	25.47	25.87	25.88

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20000CH	20175CH	20350CH
				1715MHz	1732.5MHz	1750MHz
4 / 10M	QPSK	1	0	27.74	27.25	27.66
		1	25	27.94	27.82	28.37
		1	49	27.76	26.92	28.05
		25	0	26.59	26.81	27.08
		25	13	26.84	26.79	26.99
		25	25	26.65	26.73	26.97
		50	0	26.79	26.93	26.94
	16QAM	1	0	26.58	26.80	27.33
		1	25	26.38	26.66	26.86
		1	49	26.54	26.10	27.04
		25	0	25.71	25.92	25.83
		25	13	25.63	25.73	25.93
		25	25	25.62	25.89	25.91
		50	0	25.76	25.81	25.92

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20025CH	20175CH	20325CH
				1717.5MHz	1732.5MHz	1747.5MHz
4 / 15M	QPSK	1	0	27.84	27.57	26.92
		1	38	27.67	27.92	28.12
		1	74	27.79	26.92	28.10
		36	0	26.67	26.94	27.02
		36	18	26.79	26.85	27.05
		36	39	26.60	26.70	26.88
		75	0	26.71	26.81	26.78
	16QAM	1	0	26.58	26.79	26.37
		1	38	26.82	26.66	26.81
		1	74	26.77	26.54	26.30
		36	0	25.71	25.81	26.08
		36	18	25.78	25.78	25.91
		36	39	25.72	25.91	25.80
		75	0	25.58	26.00	25.95

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20050CH	20175CH	20300CH
				1720MHz	1732.5MHz	1745MHz
4 / 20M	QPSK	1	0	27.92	27.60	26.64
		1	50	27.95	27.85	28.34
		1	99	27.20	26.78	28.11
		50	0	26.65	26.82	26.86
		50	25	26.79	26.85	26.96
		50	50	26.72	26.73	26.98
		100	0	26.77	26.89	26.83
	16QAM	1	0	26.37	27.04	26.23
		1	50	26.98	26.55	26.63
		1	99	25.95	26.00	26.83
		50	0	25.62	25.79	25.90
		50	25	25.64	25.90	25.83
		50	50	25.75	25.65	25.84
		100	0	25.73	25.89	25.93

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20775CH	21100CH	21425CH
				2502.5MHz	2535MHz	2567.5MHz
7 / 5M	QPSK	1	0	25.25	25.60	25.52
		1	13	25.46	25.66	25.14
		1	24	25.42	25.68	25.08
		12	0	25.47	25.38	25.04
		12	6	25.40	25.50	24.77
		12	11	25.40	25.57	25.12
		25	0	25.34	25.35	24.99
	16QAM	1	0	24.80	24.57	25.02
		1	13	24.98	25.16	24.27
		1	24	25.09	24.98	24.27
		12	0	24.34	24.65	24.98
		12	6	24.40	24.34	24.42
		12	11	24.41	24.60	24.18
		25	0	24.35	24.46	24.26

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20800CH	21100CH	21400CH
				2505MHz	2535MHz	2565MHz
7 / 10M	QPSK	1	0	25.62	25.00	25.85
		1	25	25.63	25.98	25.57
		1	49	25.71	25.84	25.92
		25	0	25.34	25.34	25.50
		25	13	25.62	25.51	24.87
		25	25	25.43	25.56	25.67
		50	0	25.51	25.51	25.61
	16QAM	1	0	24.95	24.56	25.33
		1	25	25.25	25.24	25.21
		1	49	25.25	24.80	24.98
		25	0	24.36	24.58	24.54
		25	13	24.50	24.31	24.88
		25	25	24.45	24.36	24.74
		50	0	24.33	24.44	24.66

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20825CH	21100CH	21375CH
				2507.5MHz	2535MHz	2562.5MHz
7 / 15M	QPSK	1	0	25.84	24.93	25.69
		1	38	25.66	25.82	25.71
		1	74	25.67	25.98	25.85
		36	0	25.46	25.42	25.41
		36	18	25.48	25.44	25.65
		36	39	25.48	25.36	25.50
		75	0	25.47	25.38	25.40
	16QAM	1	0	25.06	24.26	25.11
		1	38	25.37	25.02	25.23
		1	74	25.18	25.22	24.64
		36	0	24.48	24.50	24.69
		36	18	24.40	24.35	24.89
		36	39	24.52	24.33	24.81
		75	0	24.43	24.31	24.82

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				20850CH	21100CH	21350CH
				2510MHz	2535MHz	2560MHz
7 / 20M	QPSK	1	0	25.57	24.66	25.71
		1	50	25.34	25.97	25.88
		1	99	25.54	25.74	25.50
		50	0	25.25	25.26	25.65
		50	25	25.03	25.47	24.85
		50	50	25.31	25.55	25.51
		100	0	25.37	25.34	25.63
	16QAM	1	0	24.94	24.26	25.30
		1	50	25.12	24.76	25.11
		1	99	24.88	24.99	25.26
		50	0	24.32	24.46	24.87
		50	25	24.65	24.36	24.96
		50	50	24.28	24.51	24.79
		100	0	24.50	24.43	24.79

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23017CH	23095CH	23173CH
				699.7MHz	707.5MHz	715.3MHz
12 / 1.4M	QPSK	1	0	22.90	22.91	22.76
		1	2	23.13	23.14	22.93
		1	5	22.80	22.98	22.77
		3	0	22.72	22.84	22.72
		3	1	22.73	22.73	22.87
		3	2	22.79	22.86	22.64
		6	0	21.77	21.68	21.85
	16QAM	1	0	21.90	21.79	21.83
		1	2	21.71	22.01	21.83
		1	5	21.78	21.76	21.73
		3	0	21.75	22.15	21.77
		3	1	21.75	22.02	21.80
		3	2	21.65	21.96	21.75
		6	0	20.63	20.81	20.79

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23025CH	23095CH	23165CH
				700.5MHz	707.5MHz	714.5MHz
12 / 3M	QPSK	1	0	22.63	22.76	22.71
		1	7	22.96	22.92	22.88
		1	14	22.80	22.88	22.71
		8	0	21.67	21.79	21.85
		8	4	21.71	21.70	21.81
		8	7	21.90	21.86	21.67
		15	0	21.62	21.85	21.67
	16QAM	1	0	22.24	21.78	21.85
		1	7	21.96	21.44	21.76
		1	14	22.09	21.57	21.39
		8	0	20.79	20.88	20.52
		8	4	20.70	20.91	20.75
		8	7	20.80	20.72	20.74
		15	0	20.48	20.81	20.80

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	22.52	22.67	22.79
		1	13	24.14	22.75	22.85
		1	24	22.70	22.85	22.44
		12	0	21.59	21.69	21.53
		12	6	21.73	21.72	21.70
		12	11	21.71	21.64	21.71
		25	0	21.67	21.76	21.53
	16QAM	1	0	21.80	21.28	22.06
		1	13	22.04	22.19	21.58
		1	24	21.90	21.86	21.48
		12	0	20.47	20.74	20.57
		12	6	21.08	20.64	20.77
		12	11	20.90	20.68	20.52
		25	0	20.73	20.73	20.74

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23060CH	23095CH	23130CH
				704MHz	707.5MHz	711MHz
12 / 10M	QPSK	1	0	22.61	22.79	22.76
		1	25	23.15	22.91	23.38
		1	49	22.70	22.84	22.87
		25	0	21.62	21.72	21.90
		25	13	21.78	21.73	21.91
		25	25	21.71	21.72	21.62
		50	0	21.91	21.84	21.88
	16QAM	1	0	21.34	21.78	21.68
		1	25	21.85	21.73	22.28
		1	49	21.91	21.78	21.78
		25	0	20.78	20.85	20.80
		25	13	20.74	20.78	20.91
		25	25	20.71	20.85	20.84
		50	0	20.92	20.75	20.84

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23205CH	23230CH	23255CH
				779.5MHz	782MHz	784.5MHz
13 / 5M	QPSK	1	0	22.32	22.36	22.24
		1	13	22.28	22.30	22.23
		1	24	22.36	22.17	22.45
		12	0	21.23	21.28	21.19
		12	6	21.28	21.24	21.20
		12	11	21.24	21.25	21.14
		25	0	21.34	21.24	21.21
	16QAM	1	0	21.25	21.46	20.74
		1	13	21.13	21.10	21.01
		1	24	20.94	20.79	20.72
		12	0	19.99	20.41	20.40
		12	6	20.15	19.95	20.30
		12	11	20.32	19.89	20.20
		25	0	20.28	20.17	20.24

LTE Band / BW	Modulation	RB Size	RB Offset	Mid CH
				23230CH
				782MHz
13 / 10M	QPSK	1	0	21.83
		1	25	22.54
		1	49	22.31
		25	0	21.23
		25	13	21.12
		25	25	21.17
		50	0	21.30
	16QAM	1	0	21.02
		1	25	21.52
		1	49	21.18
		25	0	20.25
		25	13	20.09
		25	25	20.32
		50	0	20.21

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131979CH	132322CH	132665CH
				1710.7MHz	1745MHz	1779.3MHz
66 / 1.4M	QPSK	1	0	27.50	27.83	27.88
		1	2	27.92	27.91	27.97
		1	5	27.67	27.86	27.76
		3	0	27.56	27.77	27.60
		3	1	27.62	27.79	26.68
		3	2	27.47	27.89	27.80
		6	0	26.46	26.94	26.59
	16QAM	1	0	26.17	26.64	26.59
		1	2	26.38	26.70	26.67
		1	5	26.28	26.85	26.97
		3	0	26.55	26.95	26.78
		3	1	26.66	26.54	26.88
		3	2	26.60	26.77	26.95
		6	0	25.28	25.71	25.63

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131987CH	132322CH	132657CH
				1711.5MHz	1745MHz	1778.5MHz
66 / 3M	QPSK	1	0	27.39	27.74	27.89
		1	7	27.58	27.90	27.93
		1	14	27.58	27.99	27.69
		8	0	26.41	26.75	26.64
		8	4	26.38	26.92	26.71
		8	7	26.37	26.77	26.73
		15	0	26.40	26.77	26.75
	16QAM	1	0	26.35	26.52	26.65
		1	7	26.75	26.69	26.74
		1	14	26.04	26.66	26.35
		8	0	25.42	25.46	25.66
		8	4	25.36	26.02	25.64
		8	7	25.46	25.74	25.69
		15	0	25.51	25.71	25.70

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				131997CH	132322CH	132647CH
				1712.5MHz	1745MHz	1777.5MHz
66 / 5M	QPSK	1	0	27.55	27.52	27.81
		1	13	27.65	27.86	27.66
		1	24	27.53	27.92	27.63
		12	0	26.42	26.74	26.76
		12	6	26.40	26.76	26.75
		12	11	26.45	27.16	26.69
		25	0	26.46	26.79	26.69
	16QAM	1	0	27.51	27.36	26.85
		1	13	27.70	27.44	26.98
		1	24	27.57	27.92	26.52
		12	0	26.39	26.80	25.85
		12	6	26.39	26.74	25.69
		12	11	26.37	26.79	25.70
		25	0	26.38	26.71	25.70

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132022CH	132322CH	132622CH
				1715MHz	1745MHz	1775MHz
66 / 10M	QPSK	1	0	27.60	26.55	27.87
		1	25	28.03	27.80	27.73
		1	49	27.62	27.51	27.59
		25	0	26.47	26.74	26.82
		25	13	27.37	26.76	26.63
		25	25	26.50	26.74	26.66
		50	0	26.51	26.75	26.69
	16QAM	1	0	26.54	25.81	26.62
		1	25	26.79	27.41	26.77
		1	49	26.67	26.71	26.51
		25	0	25.50	25.61	25.71
		25	13	25.48	25.80	25.65
		25	25	25.53	25.70	25.58
		50	0	25.45	25.81	25.66

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132047CH	132322CH	132597CH
				1717.5MHz	1745MHz	1772.5MHz
66 / 15M	QPSK	1	0	27.89	26.83	27.96
		1	38	27.71	28.01	27.47
		1	74	27.77	28.04	27.52
		36	0	27.55	26.84	27.42
		36	18	26.71	26.99	26.73
		36	39	26.65	27.02	26.63
		75	0	26.71	26.96	26.63
	16QAM	1	0	26.56	26.06	26.53
		1	38	27.66	26.64	26.80
		1	74	26.53	26.89	25.72
		36	0	25.54	25.93	25.81
		36	18	25.61	25.98	25.69
		36	39	25.72	25.88	25.60
		75	0	25.74	25.91	25.59

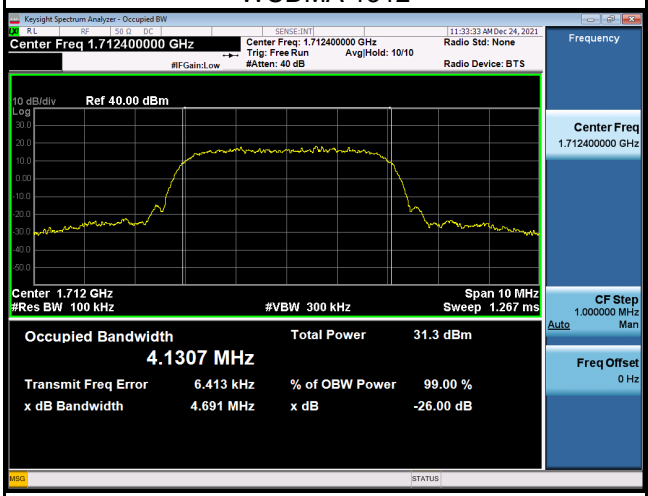
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				132072CH	132322CH	132572CH
				1720MHz	1745MHz	1770MHz
66 / 20M	QPSK	1	0	27.78	26.62	26.49
		1	50	28.11	28.15	27.99
		1	99	27.03	28.05	28.02
		50	0	26.55	26.85	27.25
		50	25	26.64	26.93	27.08
		50	50	26.70	26.98	26.99
		100	0	26.71	26.92	26.91
	16QAM	1	0	26.46	25.99	26.25
		1	50	27.15	27.44	27.03
		1	99	26.58	26.96	26.81
		50	0	25.65	25.81	25.86
		50	25	25.66	26.02	26.04
		50	50	25.56	25.94	25.94
		100	0	25.77	25.99	25.99

APPENDIX B - OCCUPIED BANDWIDTH

WCDMA Band IV					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
1312	1712.4	4.1307	1312	1712.4	4.691
1413	1732.6	4.1273	1413	1732.6	4.689
1513	1752.6	4.1370	1513	1752.6	4.695

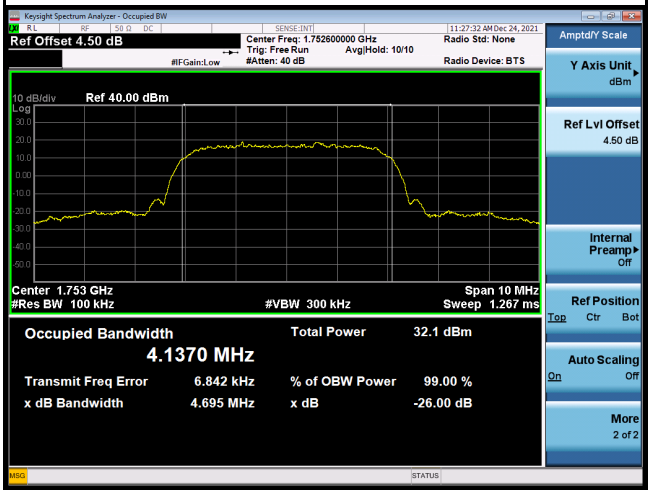
Spectrum Plot

WCDMA 1312



WCDMA 1413

WCDMA 1513



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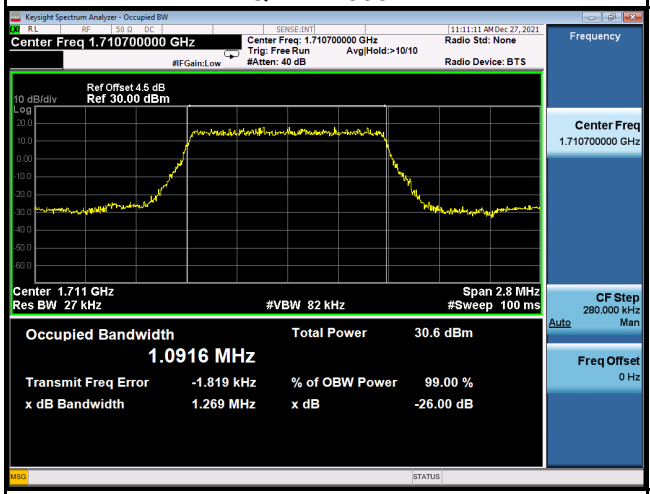
LTE Band 4_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.0916	19957	1710.7	1.0935
20175	1732.5	1.0923	20175	1732.5	1.0901
20393	1754.3	1.0911	20393	1754.3	1.0848
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.269	19957	1710.7	1.290
20175	1732.5	1.291	20175	1732.5	1.296
20393	1754.3	1.273	20393	1754.3	1.284

Spectrum Plot

QPSK-19957



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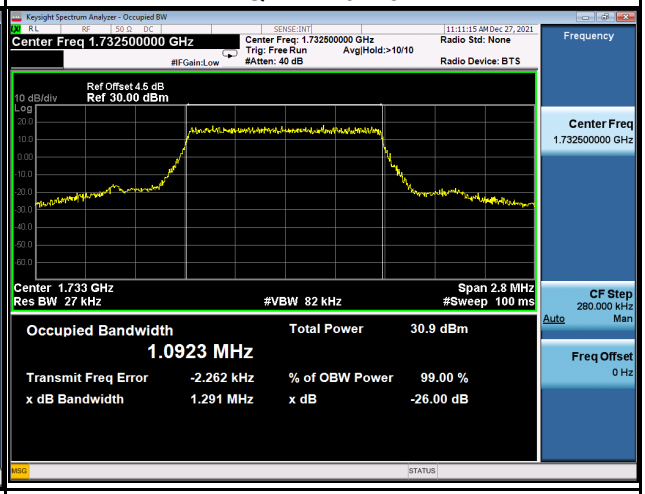

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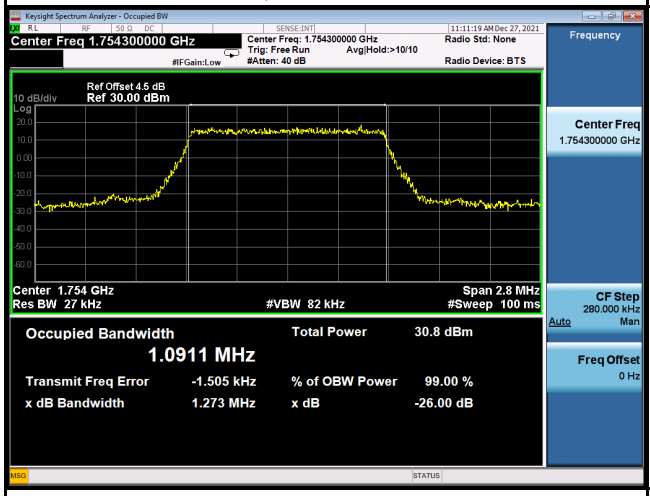

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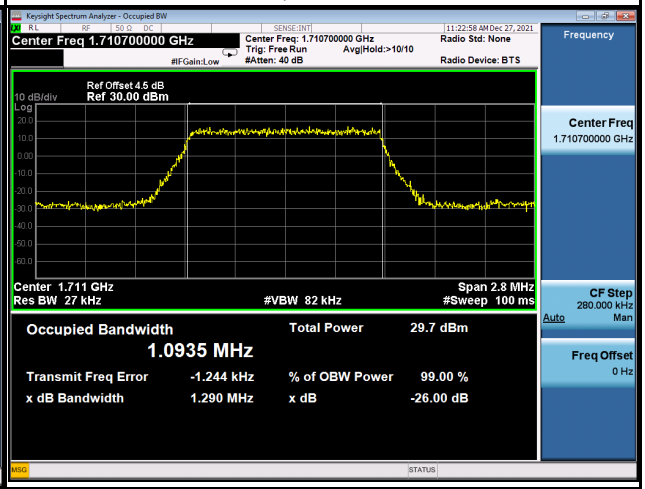

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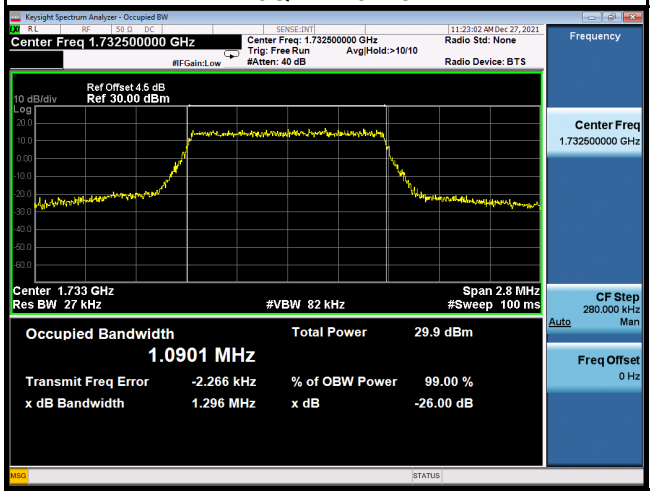

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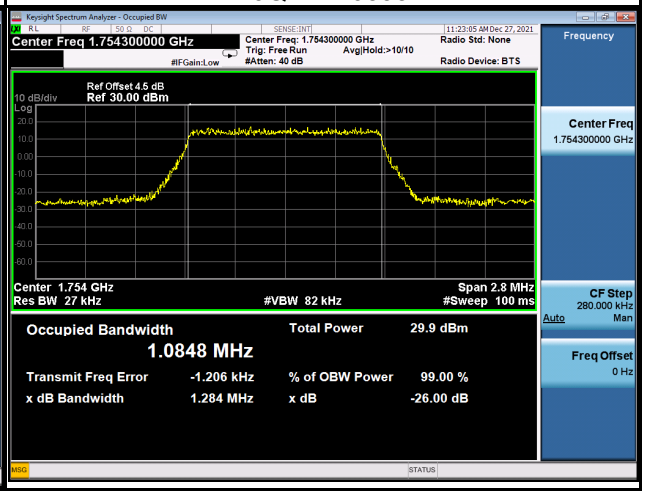
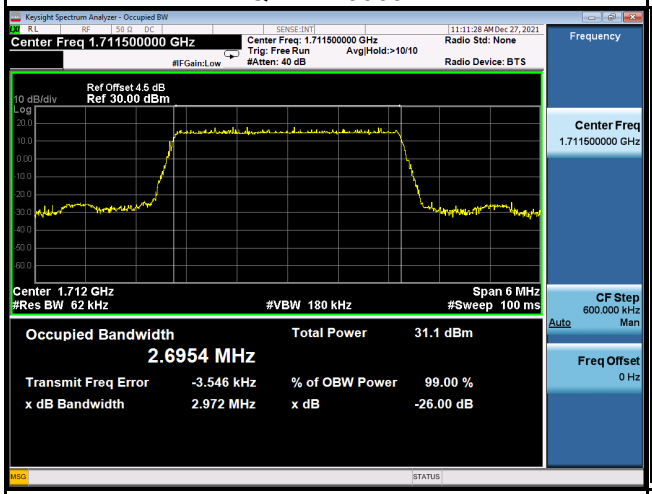


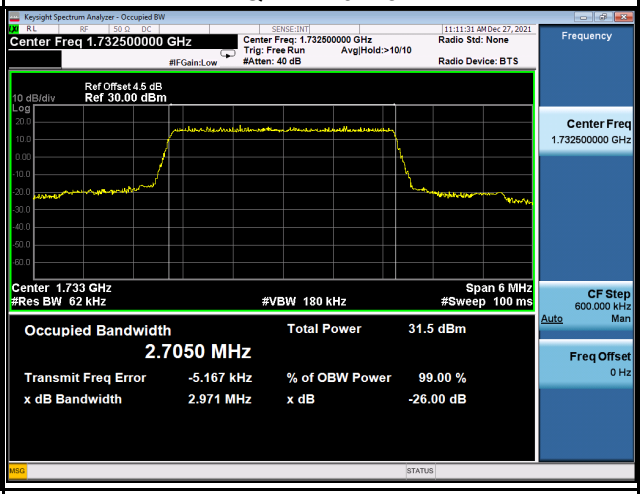
LTE Band 4_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	2.6954	19965	1711.5	2.6985
20175	1732.5	2.7050	20175	1732.5	2.7083
20385	1753.5	2.7016	20385	1753.5	2.7056
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.972	19965	1711.5	3.002
20175	1732.5	2.971	20175	1732.5	2.974
20385	1753.5	2.996	20385	1753.5	2.997

Spectrum Plot

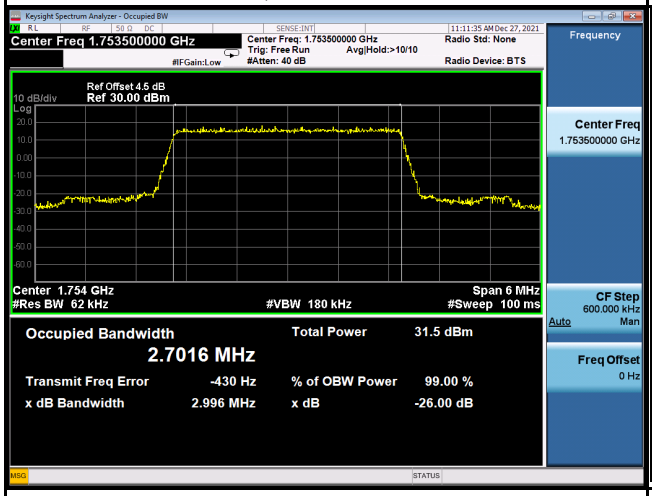
QPSK-19965



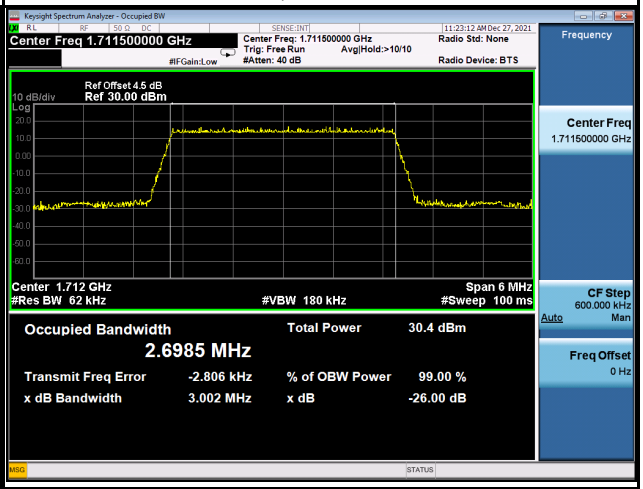
QPSK-20175



QPSK-20385



16QAM-19965



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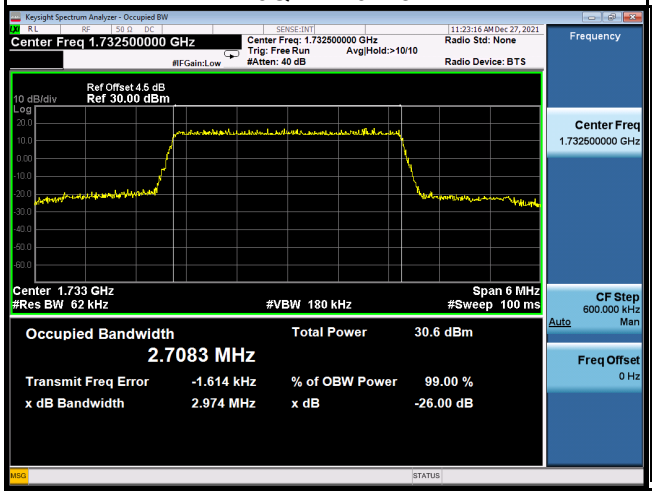
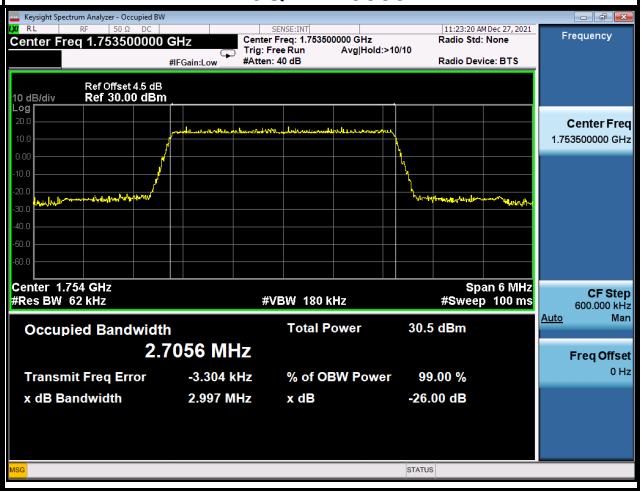


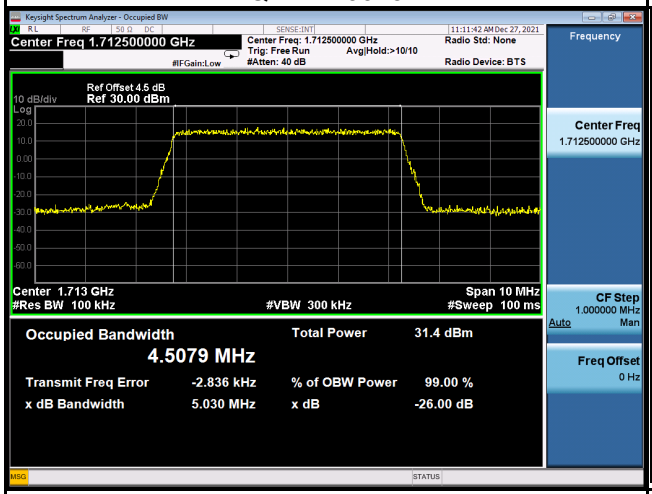
16QAM-20385



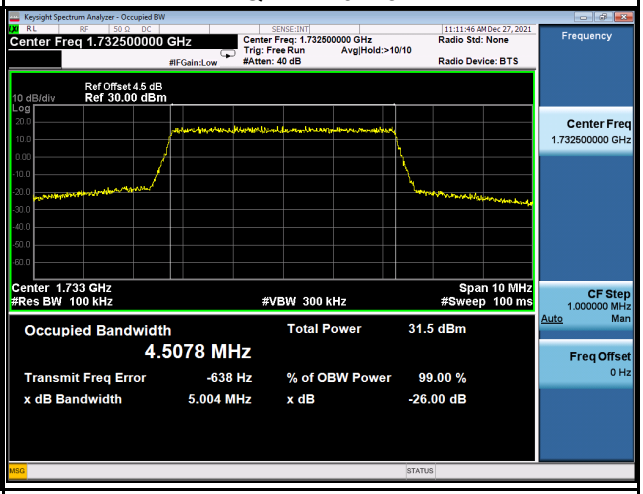
LTE Band 4_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19975	1712.5	4.5079	19975	1712.5	4.5029
20175	1732.5	4.5078	20175	1732.5	4.5122
20375	1752.5	4.5080	20375	1752.5	4.5131
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	5.030	19975	1712.5	4.969
20175	1732.5	5.004	20175	1732.5	5.013
20375	1752.5	5.062	20375	1752.5	5.001

Spectrum Plot

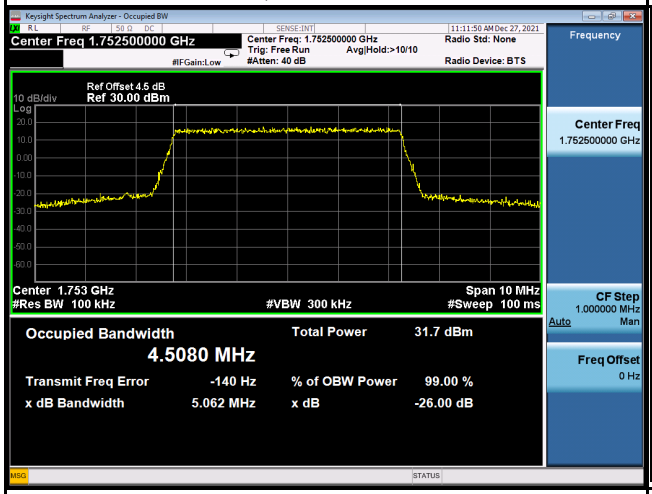
QPSK-19975



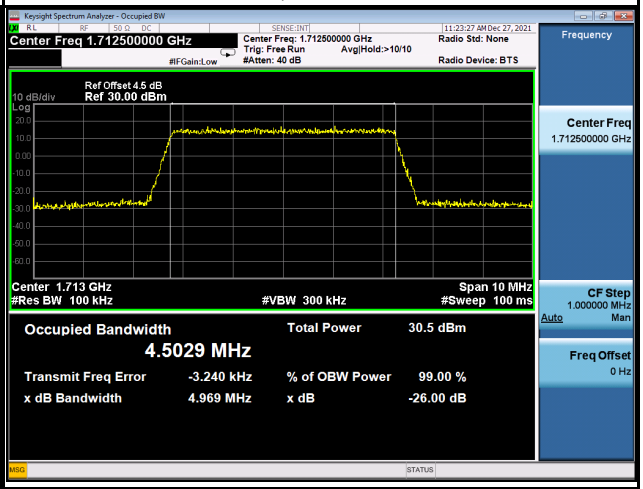
QPSK-20175



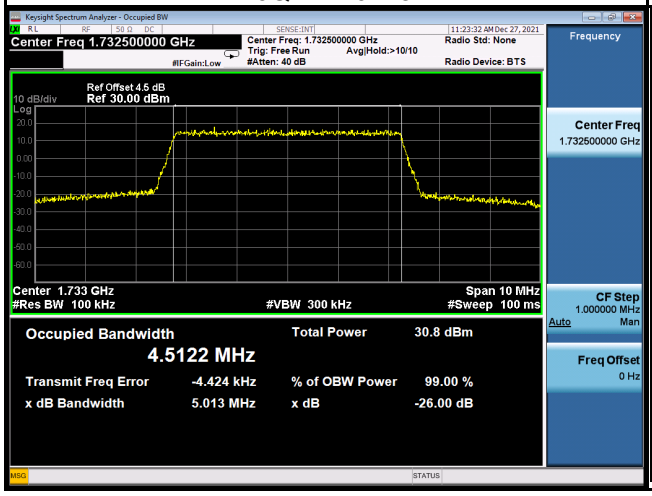
QPSK-20375



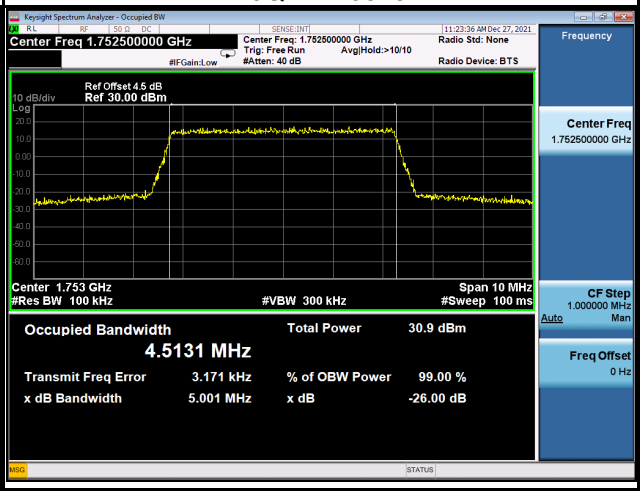
16QAM-19975



16QAM-20175



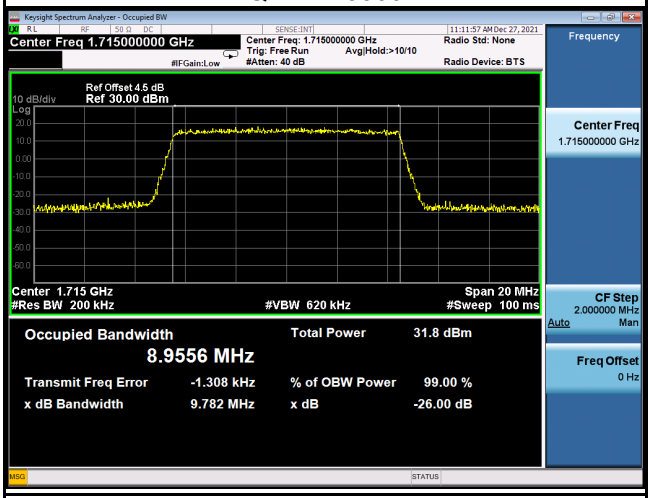
16QAM-20375



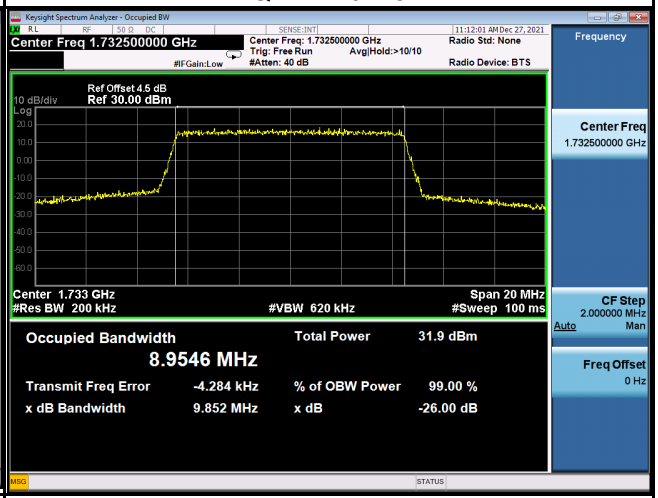
LTE Band 4_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20000	1715	8.9556	20000	1715	8.9545
20175	1732.5	8.9546	20175	1732.5	8.9728
20350	1750	8.9600	20350	1750	8.9726
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	9.782	20000	1715	9.871
20175	1732.5	9.852	20175	1732.5	9.874
20350	1750	9.881	20350	1750	9.772

Spectrum Plot

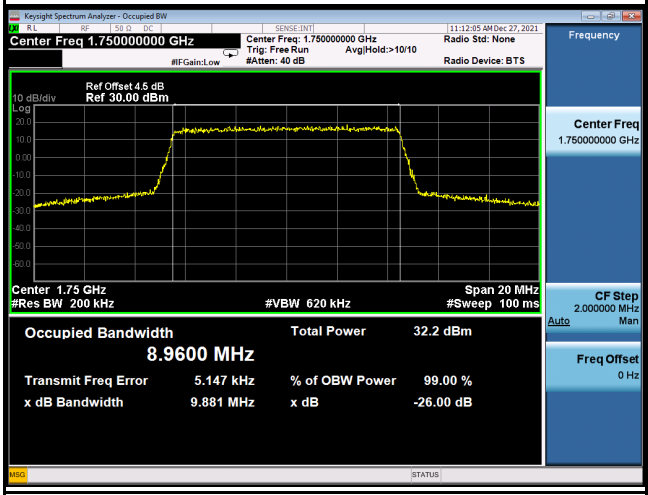
QPSK-20000



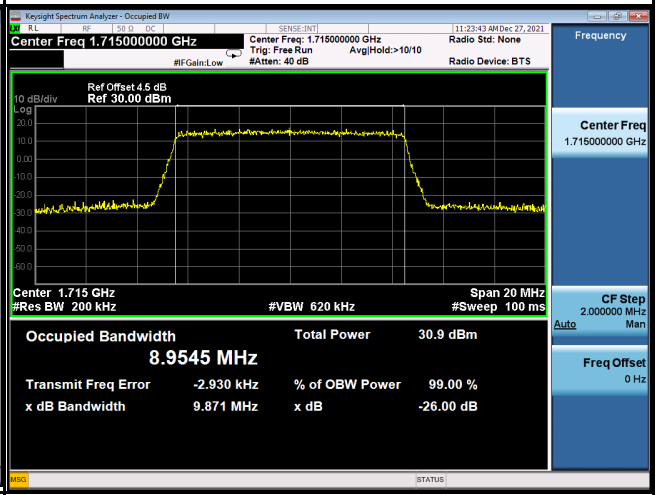
QPSK-20175



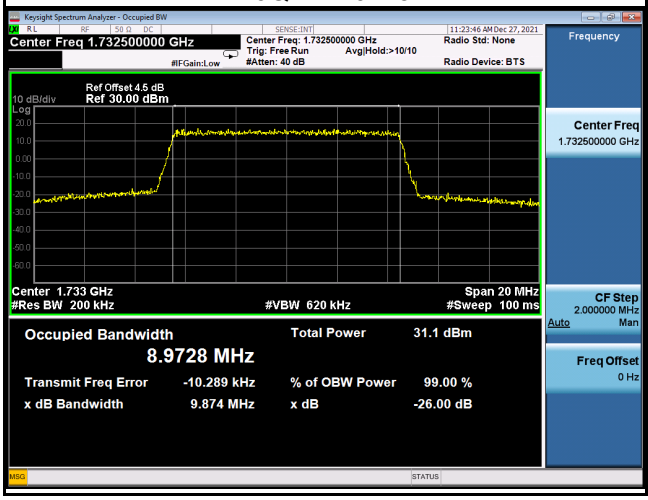
QPSK-20350



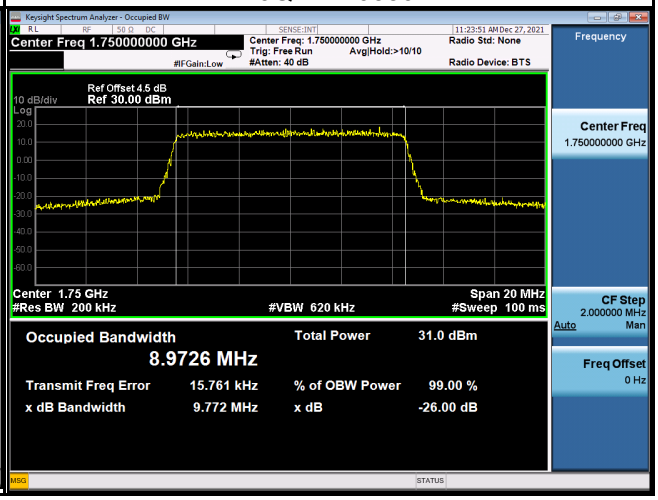
16QAM-20000



16QAM-20175



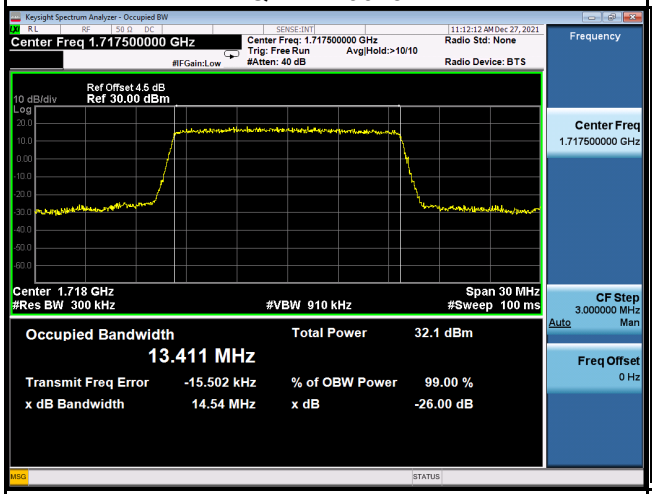
16QAM-20350



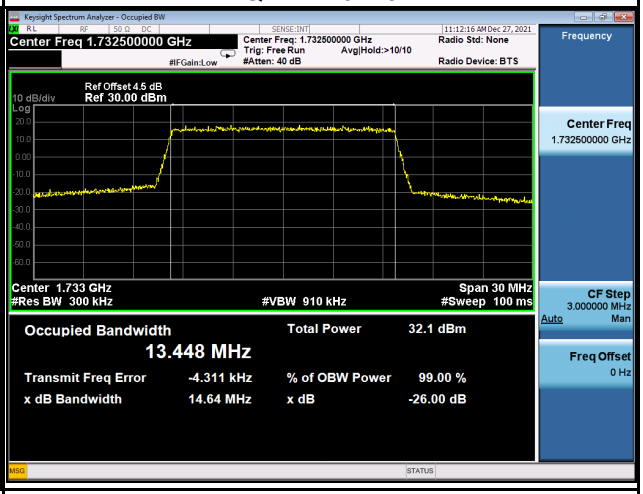
LTE Band 4_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20025	1717.5	13.4110	20025	1717.5	14.4130
20175	1732.5	13.4480	20175	1732.5	13.4460
20325	1747.5	13.4720	20325	1747.5	13.4360
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	14.540	20025	1717.5	14.750
20175	1732.5	14.640	20175	1732.5	14.670
20325	1747.5	14.590	20325	1747.5	14.560

Spectrum Plot

QPSK-20025



QPSK-20175



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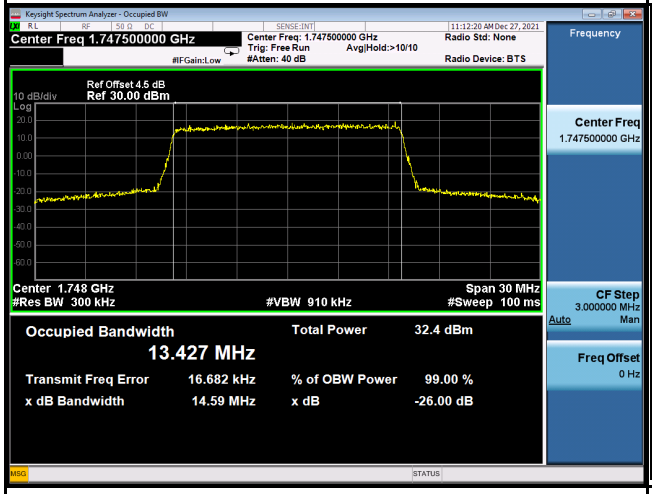

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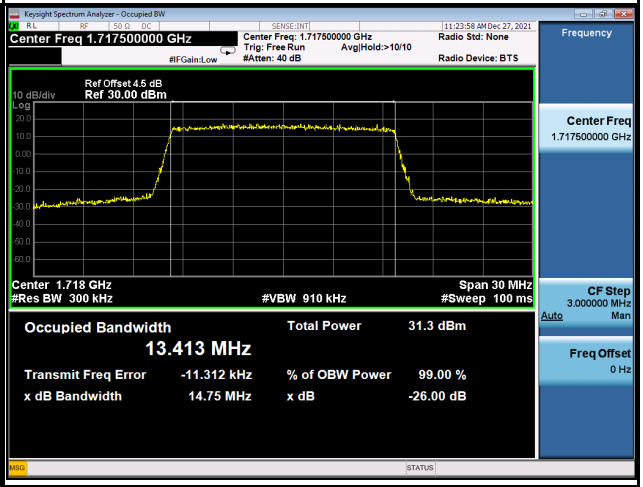

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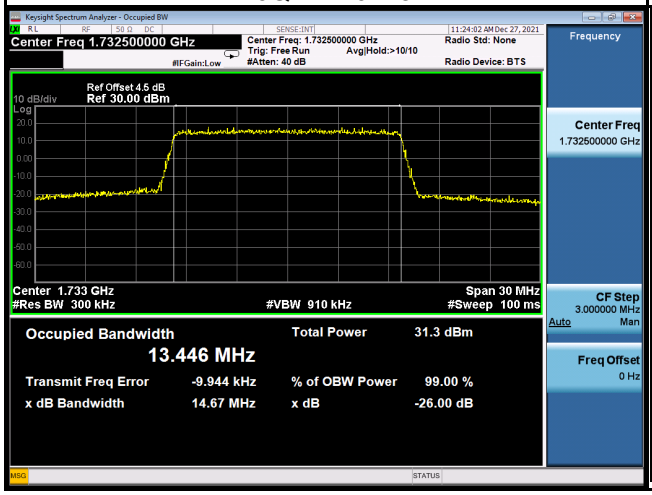

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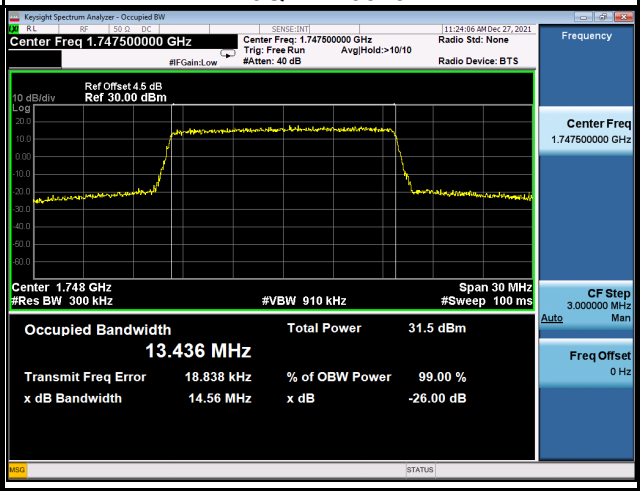
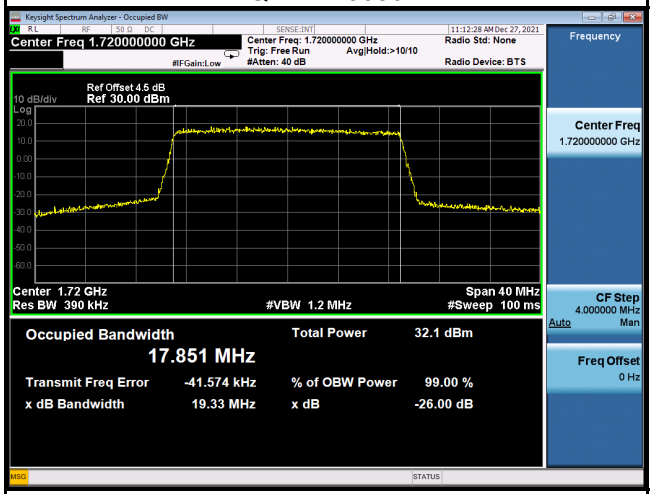


LTE Band 4_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20050	1720	17.8510	20050	1720	17.8820
20175	1732.5	17.9340	20175	1732.5	17.9130
20300	1745	17.8980	20300	1745	17.9180
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	19.330	20050	1720	19.430
20175	1732.5	19.480	20175	1732.5	19.460
20300	1745	19.460	20300	1745	19.360

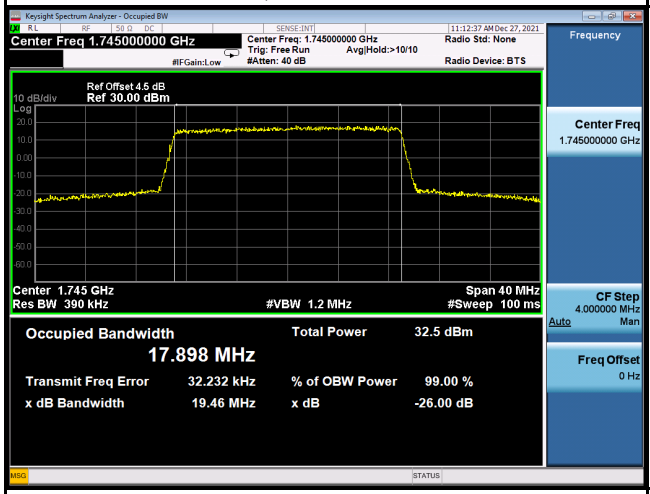
Spectrum Plot

QPSK-20050

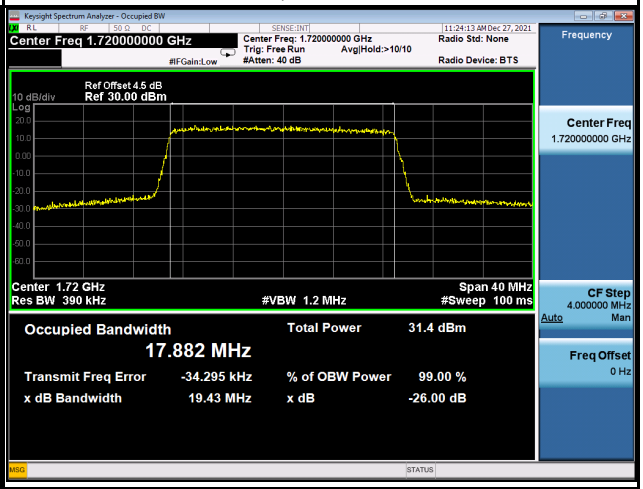


QPSK-20175

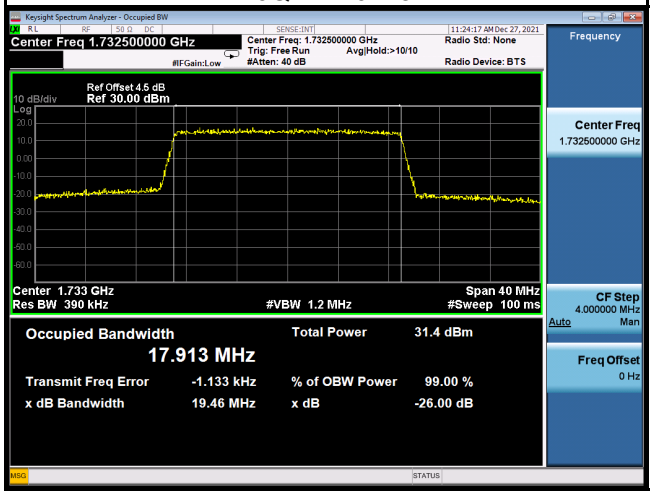
QPSK-20300



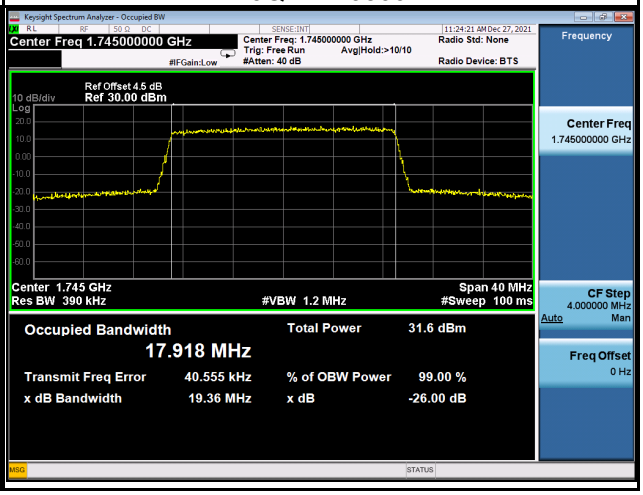
16QAM-20050



16QAM-20175



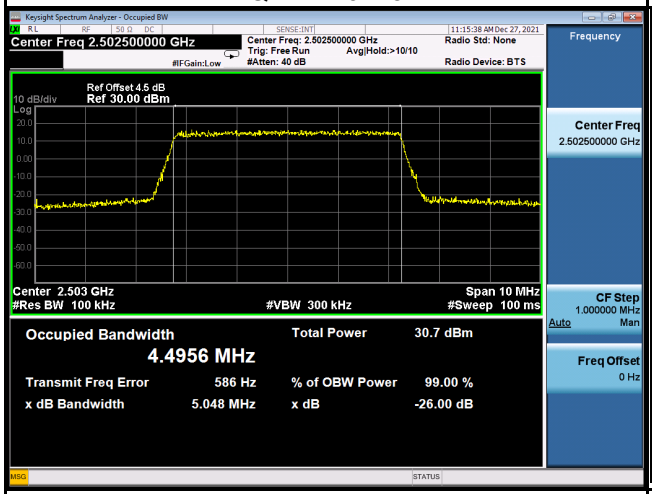
16QAM-20300



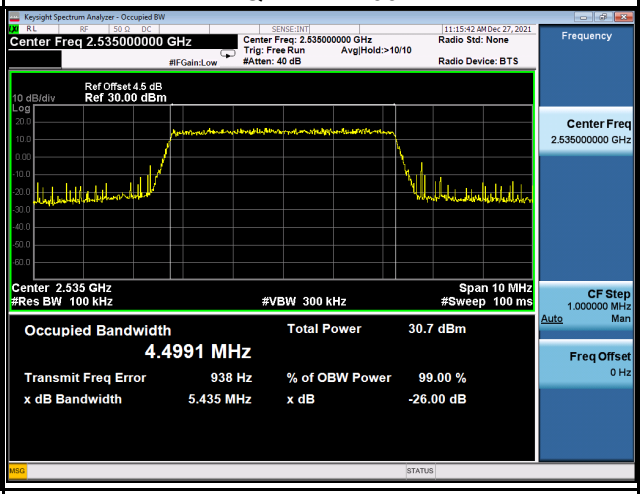
LTE Band 7_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20775	2502.5	4.4956	20775	2502.5	4.5048
21100	2535	4.4991	21100	2535	4.5079
21425	2567.5	4.5042	21425	2567.5	4.4974
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20775	2502.5	5.048	20775	2502.5	4.989
21100	2535	5.435	21100	2535	5.718
21425	2567.5	5.018	21425	2567.5	4.986

Spectrum Plot

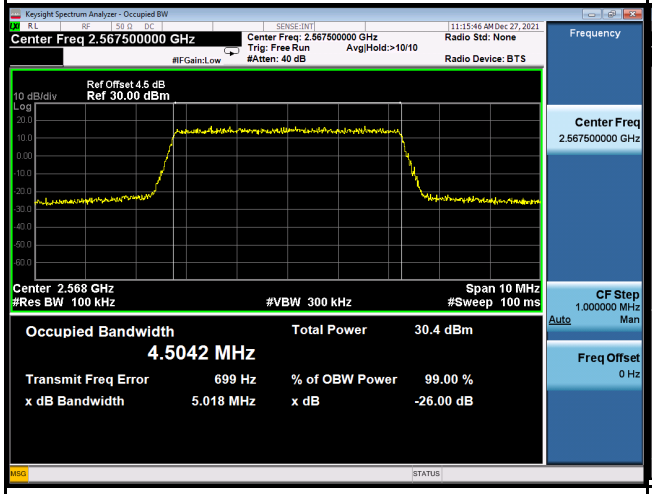
QPSK-20775



QPSK-21100



QPSK-21425



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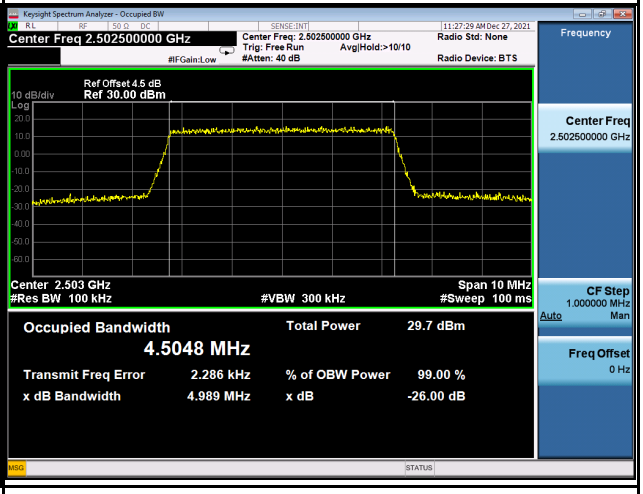

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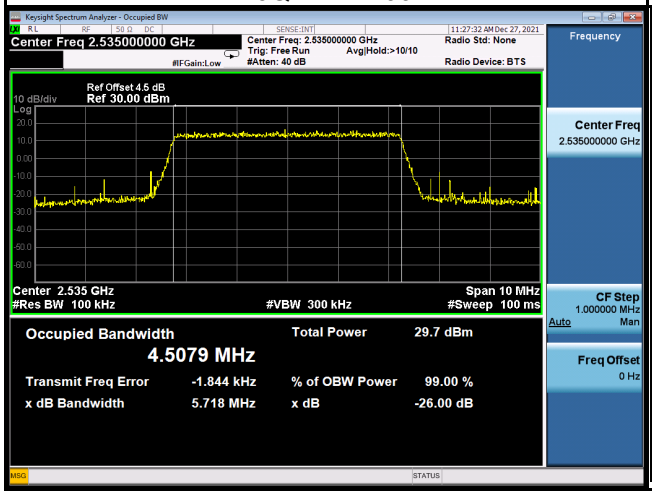
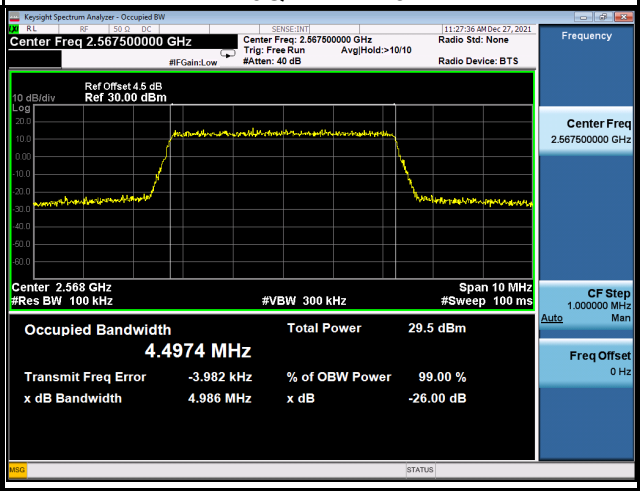


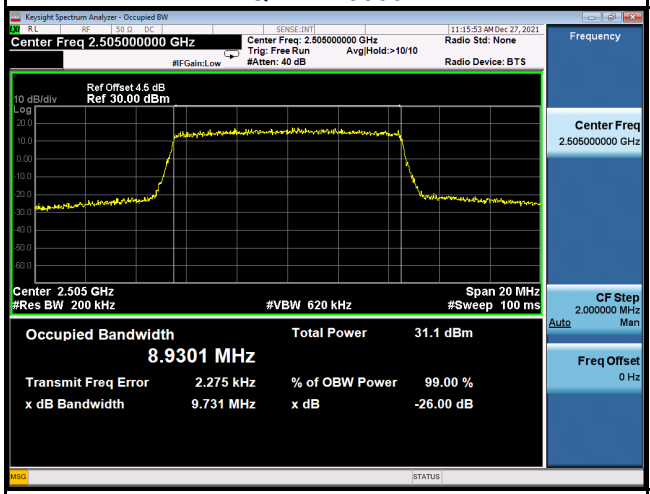
16QAM-21425



LTE Band 7_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20800	2505	8.9301	20800	2505	8.9259
21100	2535	8.9698	21100	2535	8.9632
21400	2565	8.9504	21400	2565	8.9437
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20800	2505	9.731	20800	2505	9.817
21100	2535	9.897	21100	2535	10.400
21400	2565	9.934	21400	2565	9.832

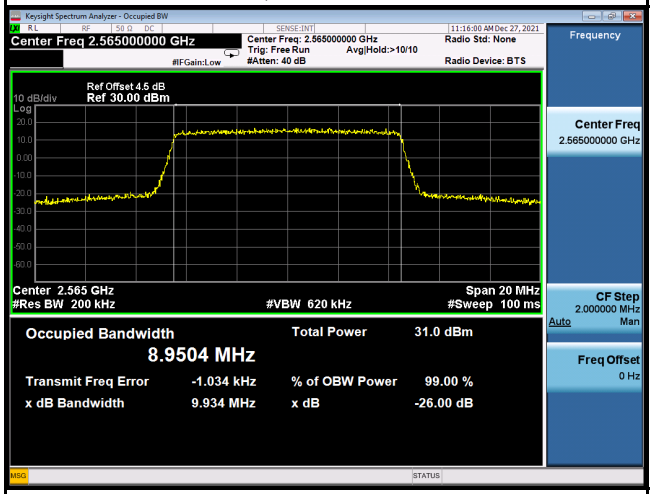
Spectrum Plot

QPSK-20800

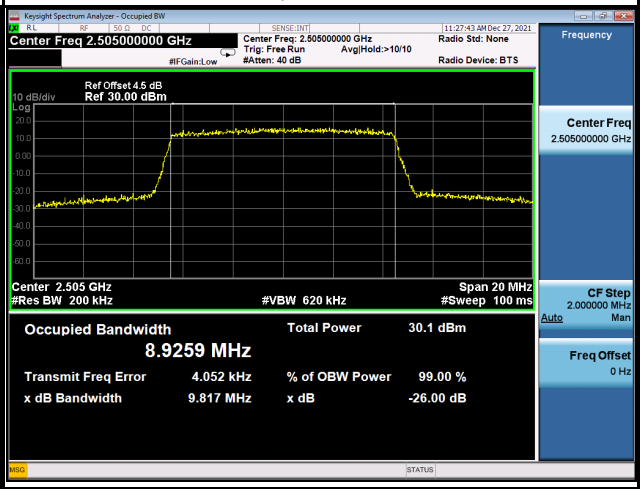


QPSK-21100

QPSK-21400



16QAM-20800



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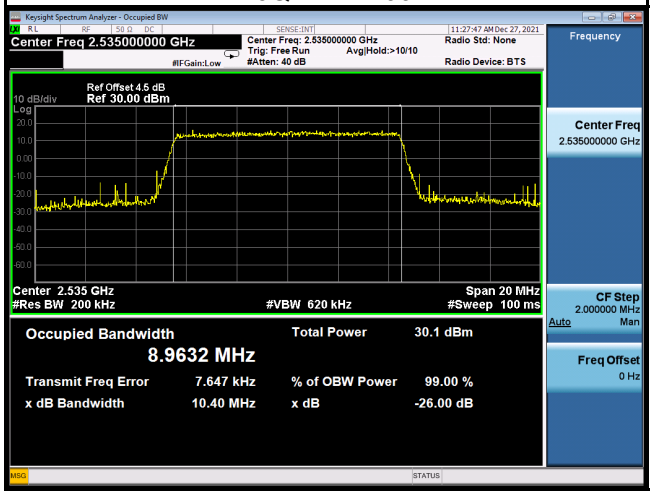
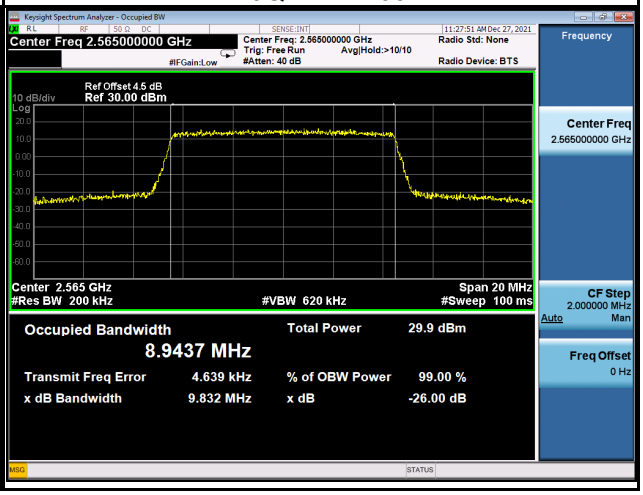


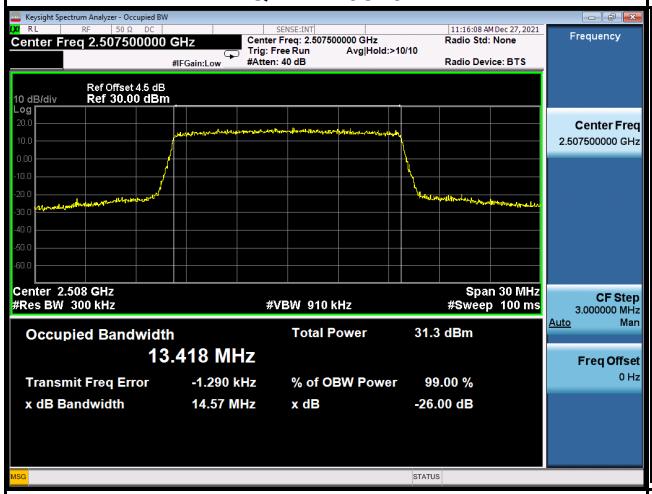
16QAM-21400



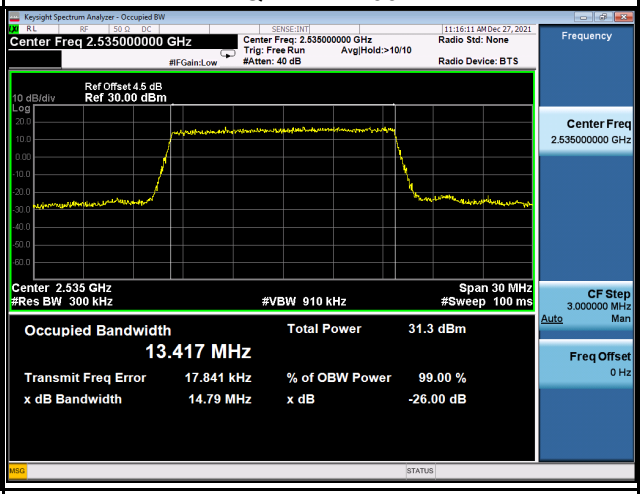
LTE Band 7_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20825	2507.5	13.4180	20825	2507.5	13.4080
21100	2535	13.4170	21100	2535	13.4440
21375	2562.5	13.4670	21375	2562.5	13.4140
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20825	2507.5	14.570	20825	2507.5	14.650
21100	2535	14.790	21100	2535	21.160
21375	2562.5	14.610	21375	2562.5	14.680

Spectrum Plot

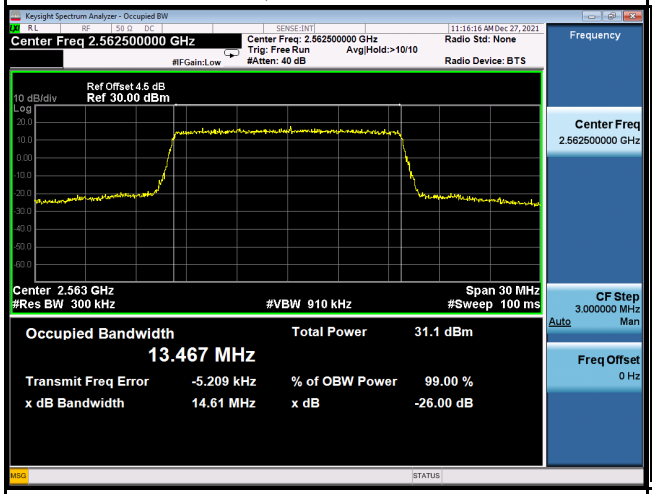
QPSK-20825



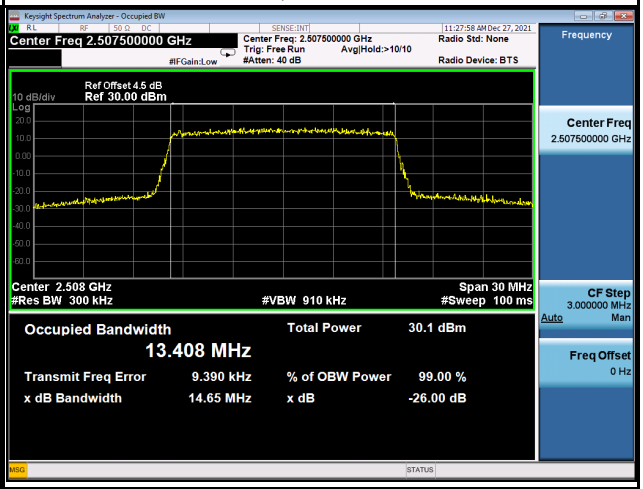
QPSK-21100



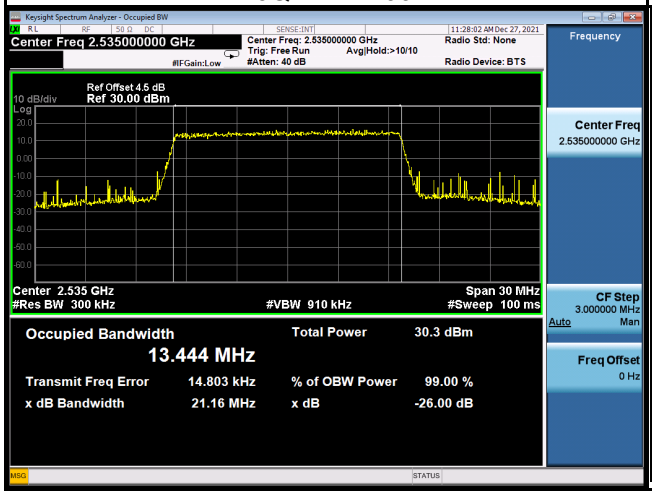
QPSK-21375



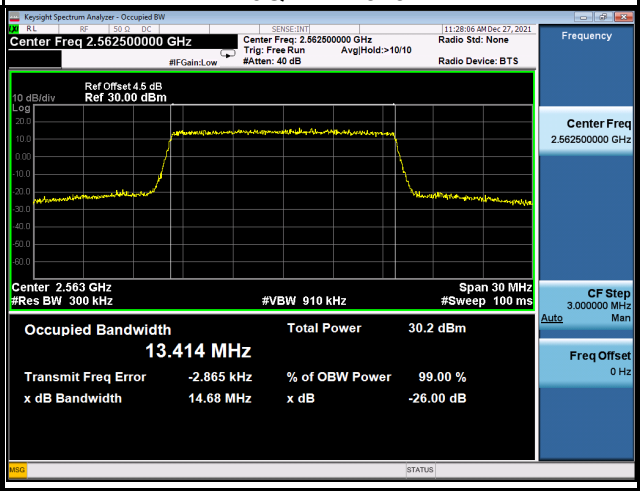
16QAM-20825



16QAM-21100



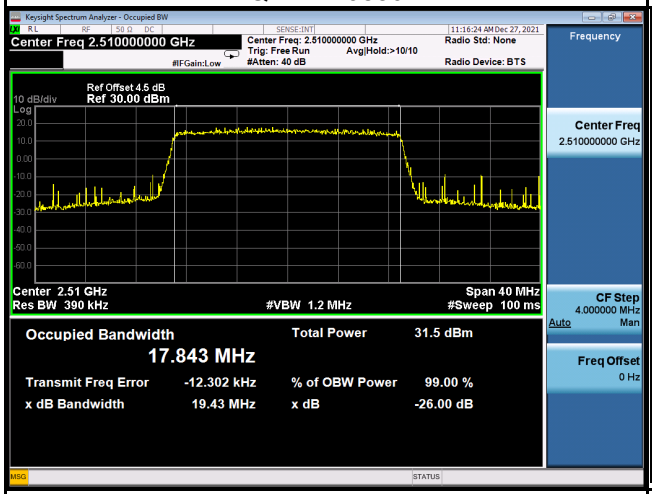
16QAM-21375



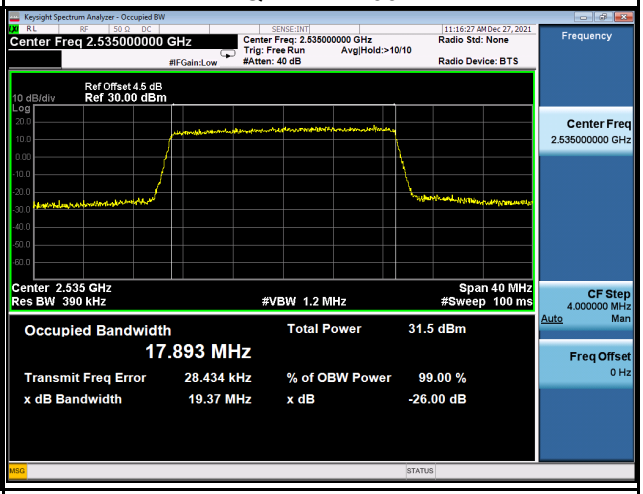
LTE Band 7_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20850	2510	17.8430	20850	2510	17.7900
21100	2535	17.8930	21100	2535	17.8920
21350	2560	17.8940	21350	2560	17.9020
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20850	2510	19.430	20850	2510	19.510
21100	2535	19.370	21100	2535	25.620
21350	2560	19.440	21350	2560	19.420

Spectrum Plot

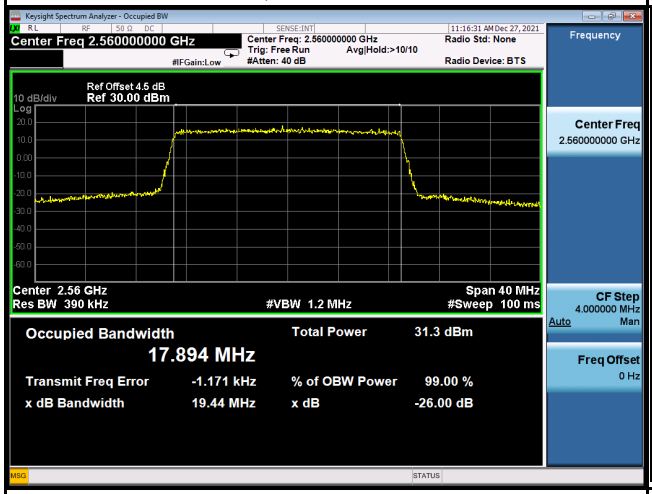
QPSK-20850



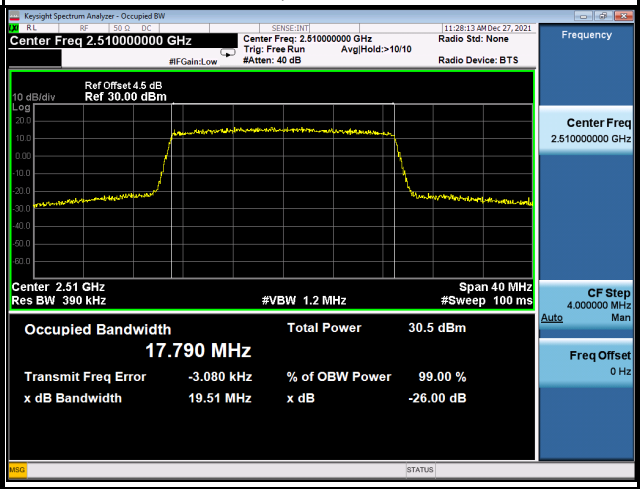
QPSK-21100



QPSK-21350



16QAM-20850



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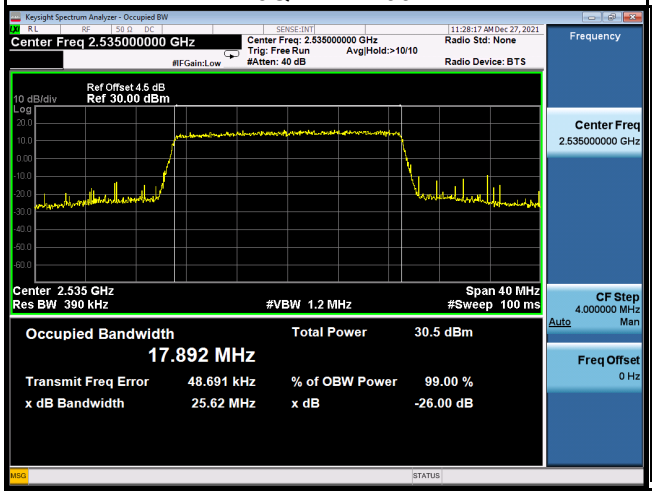
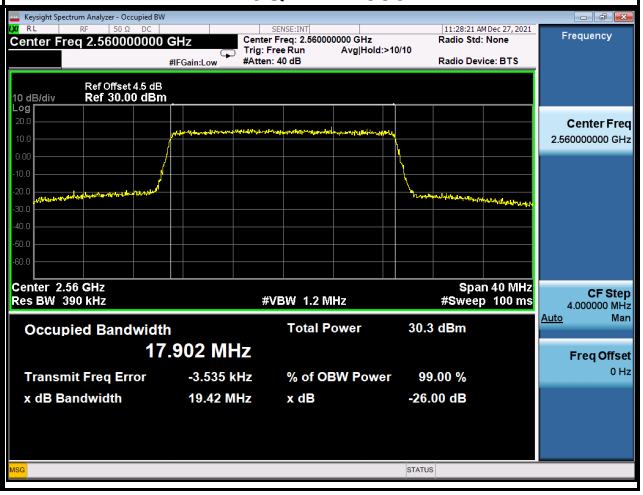


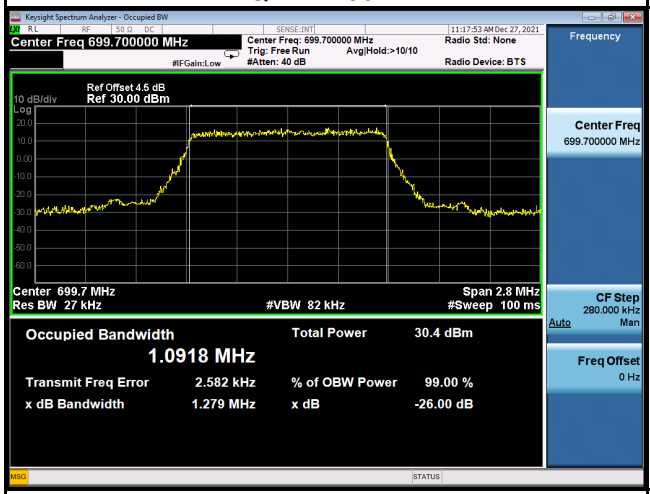
16QAM-21350



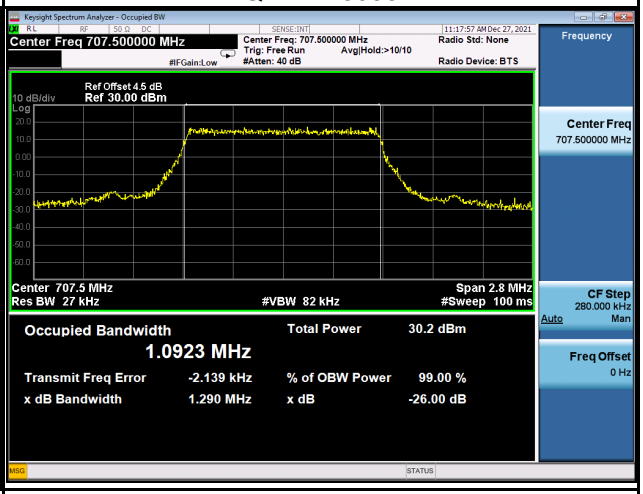
LTE Band 12_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23017	699.7	1.0918	23017	699.7	1.0896
23095	707.5	1.0923	23095	707.5	1.0896
23173	715.3	1.0917	23173	715.3	1.0863
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.279	23017	699.7	1.293
23095	707.5	1.290	23095	707.5	1.306
23173	715.3	1.295	23173	715.3	1.266

Spectrum Plot

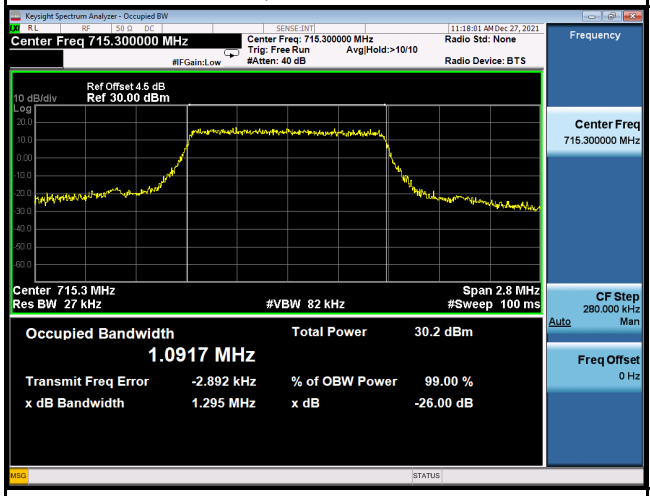
QPSK-23017



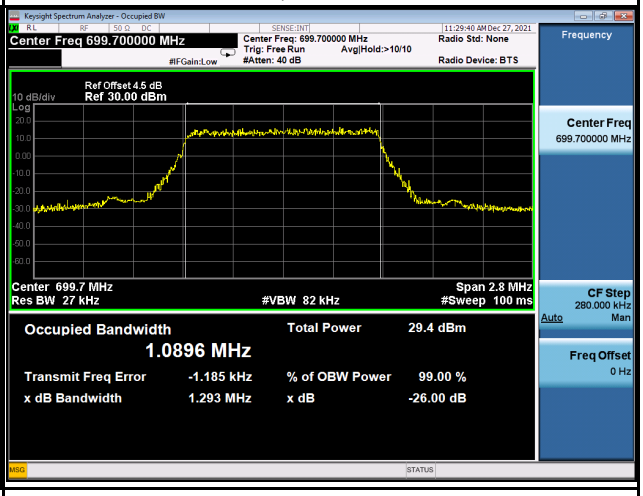
QPSK-23095



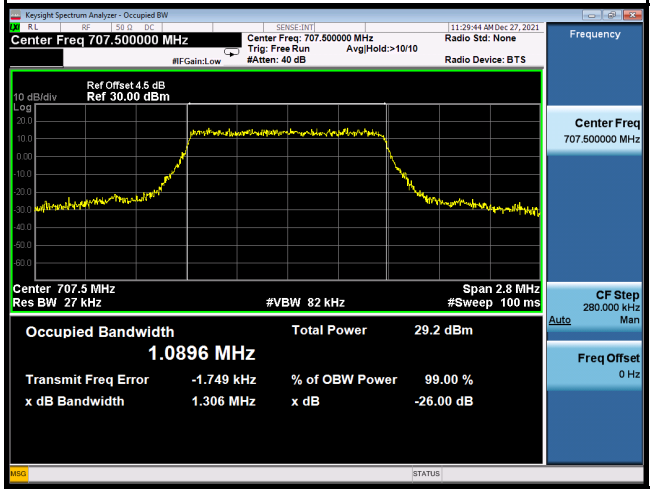
QPSK-23173



16QAM-23017



16QAM-23095



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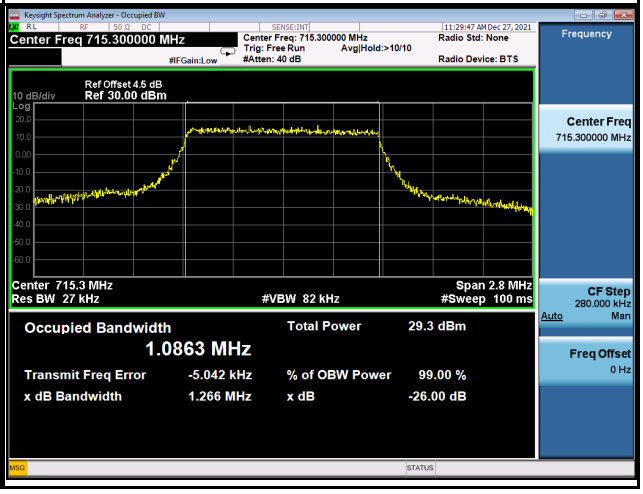
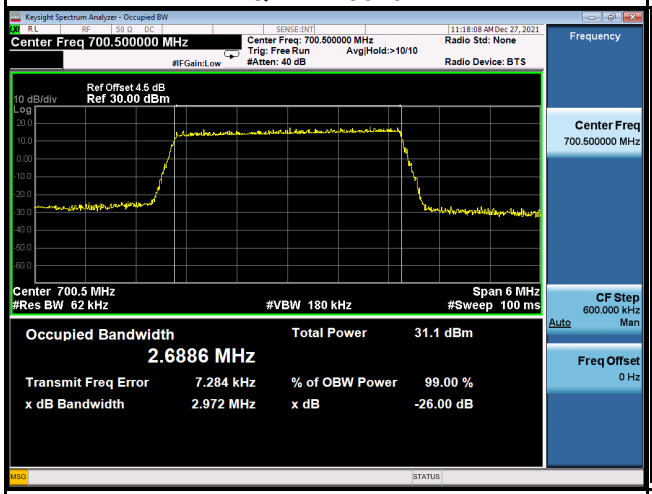


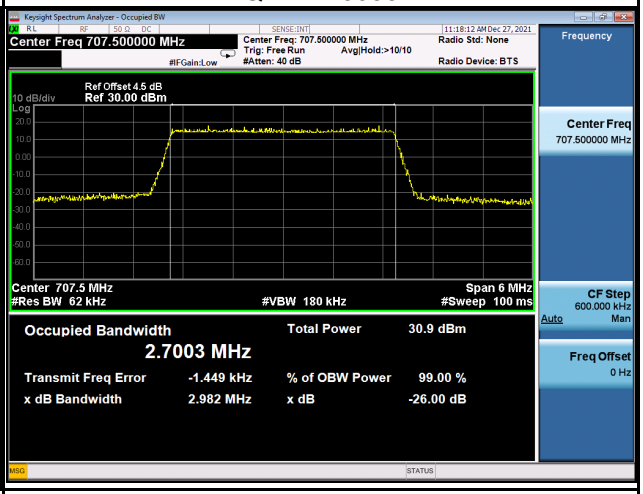
LTE Band 12_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23025	700.5	2.6886	23025	700.5	2.7023
23095	707.5	2.7003	23095	707.5	2.7147
23165	714.5	2.7028	23165	714.5	2.6969
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.972	23025	700.5	2.954
23095	707.5	2.982	23095	707.5	3.002
23165	714.5	2.989	23165	714.5	2.963

Spectrum Plot

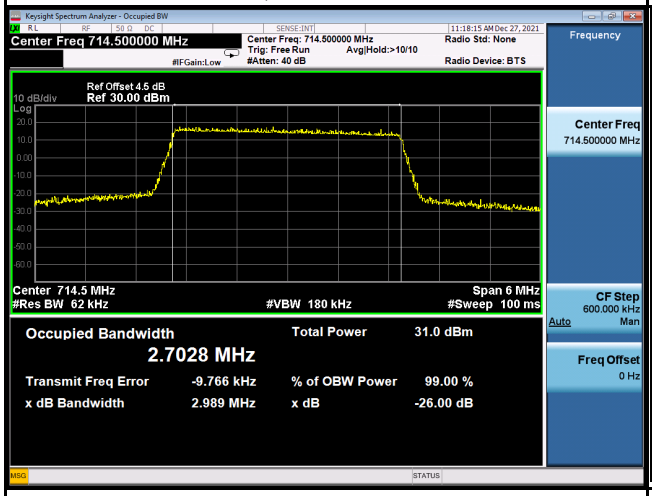
QPSK-23025



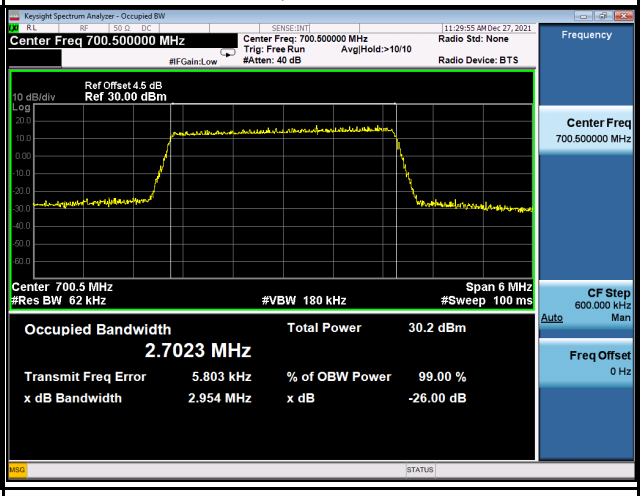
QPSK-23095



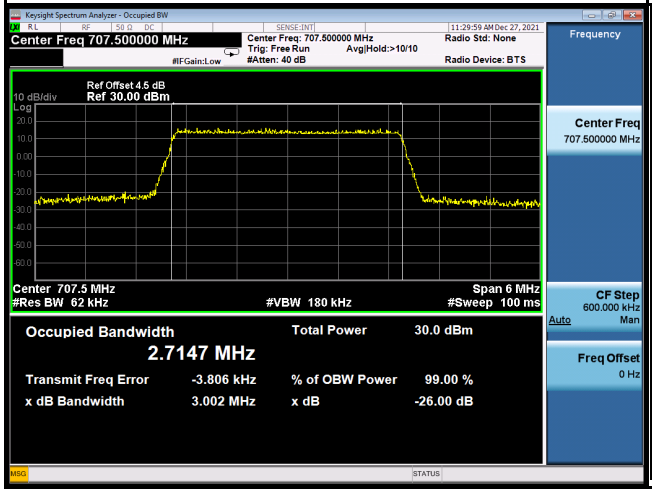
QPSK-23165



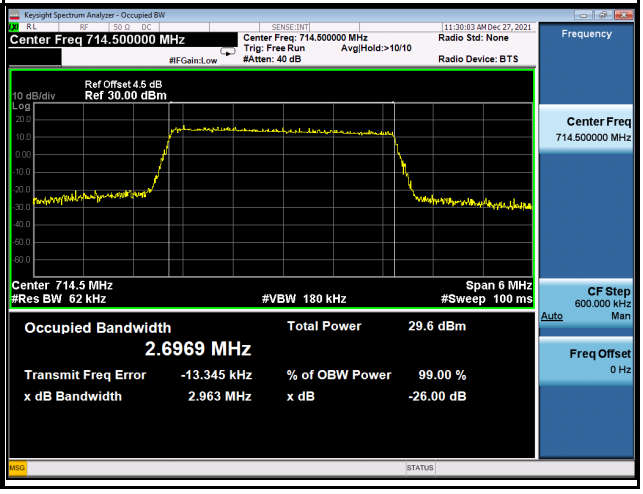
16QAM-23025



16QAM-23095



16QAM-23165



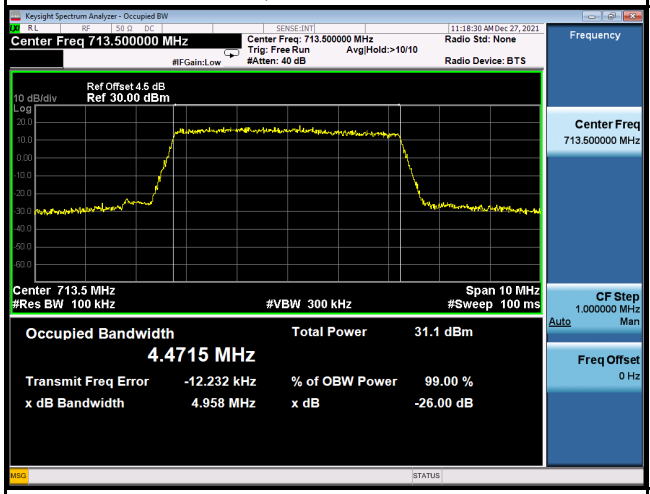
LTE Band 12_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23035	701.5	4.4816	23035	701.5	4.4803
23095	707.5	4.5242	23095	707.5	4.5135
23155	713.5	4.4715	23155	713.5	4.4766
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23035	701.5	4.950	23035	701.5	4.953
23095	707.5	4.997	23095	707.5	5.009
23155	713.5	4.958	23155	713.5	4.949

Spectrum Plot

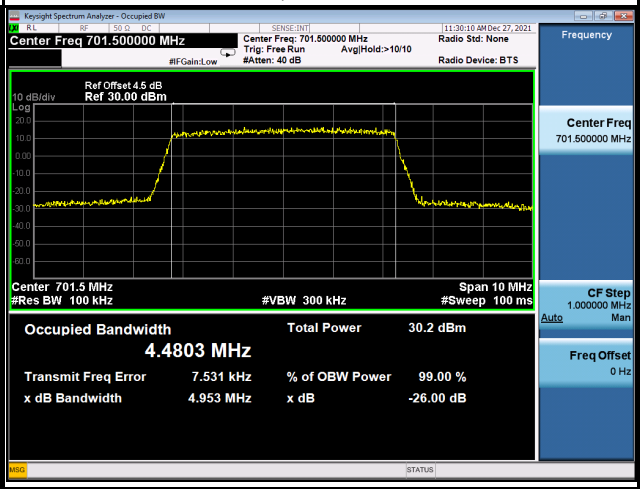
QPSK-23035

QPSK-23095

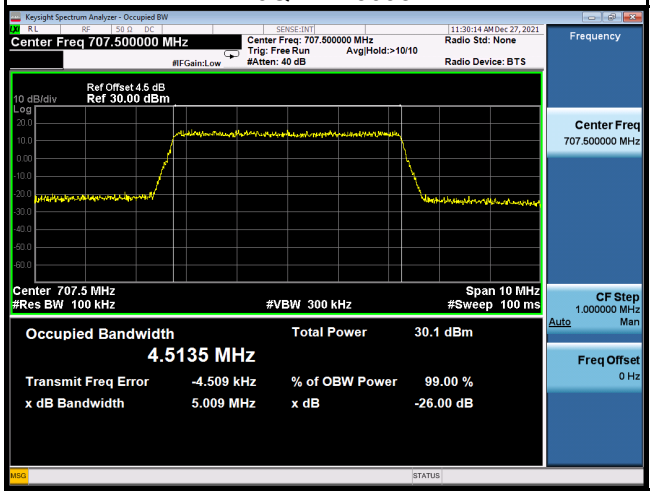
QPSK-23155



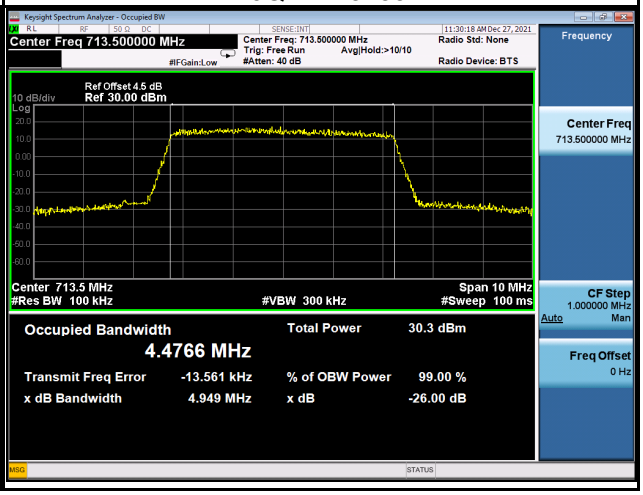
16QAM-23035



16QAM-23095



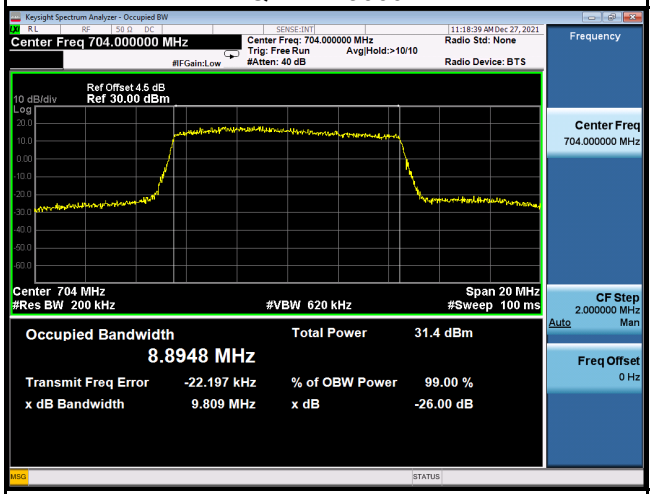
16QAM-23155



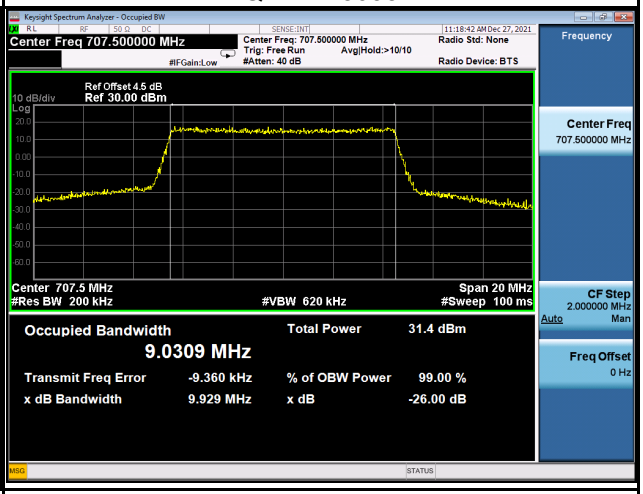
LTE Band 12_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23060	704.0	8.8948	23060	704.0	8.9099
23095	707.5	9.0309	23095	707.5	9.0282
23130	711.0	8.8945	23130	711.0	8.9000
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23060	704.0	9.809	23060	704.0	9.747
23095	707.5	9.929	23095	707.5	9.981
23130	711.0	9.756	23130	711.0	9.833

Spectrum Plot

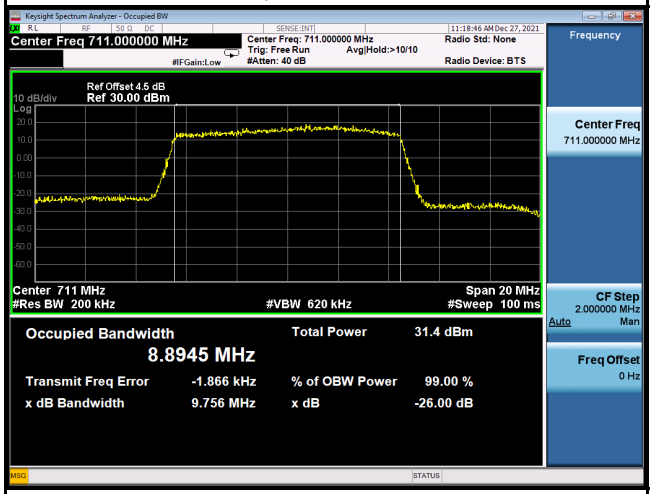
QPSK-23060



QPSK-23095



QPSK-23130



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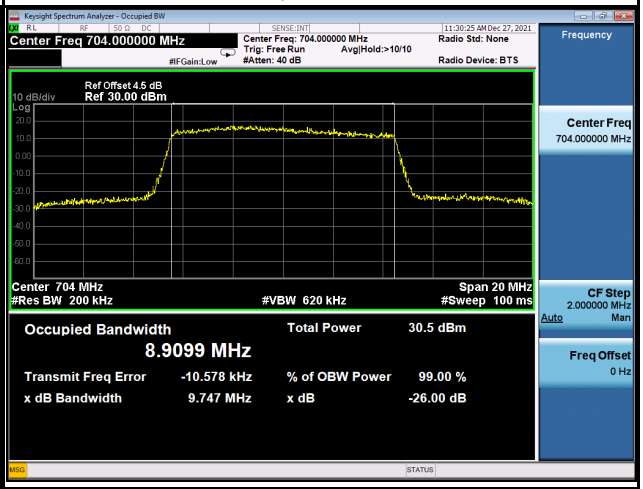
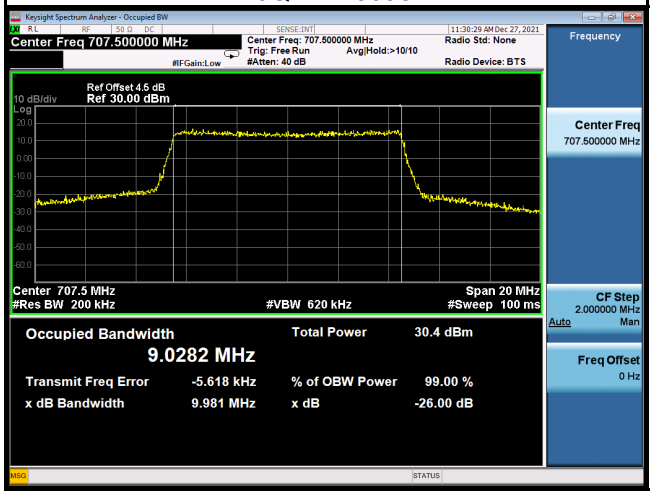


16QAM-23095

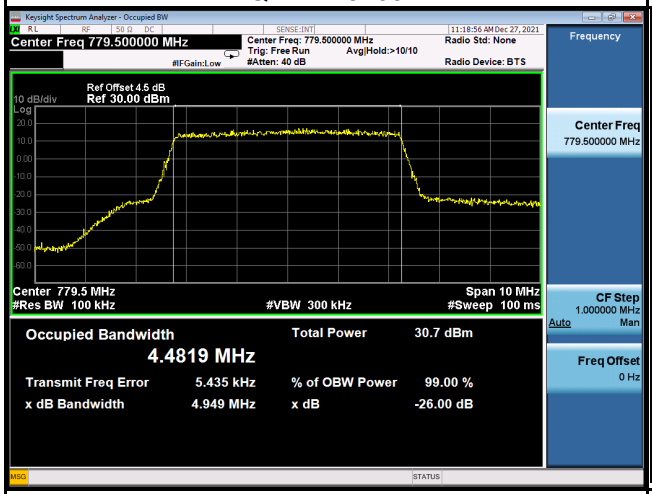


16QAM-23130

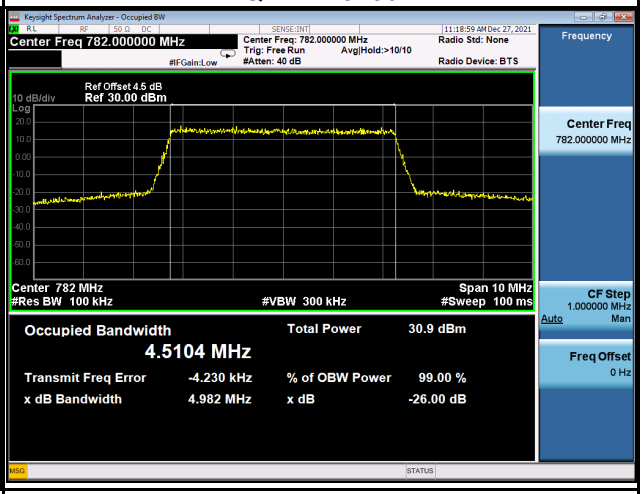
LTE Band 13_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23205	779.5	4.4819	23205	779.5	4.4913
23230	782.0	4.5104	23230	782.0	4.5172
23255	784.5	4.4974	23255	784.5	4.4980
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23205	779.5	4.949	23205	779.5	4.988
23230	782.0	4.982	23230	782.0	4.974
23255	784.5	4.997	23255	784.5	5.029

Spectrum Plot

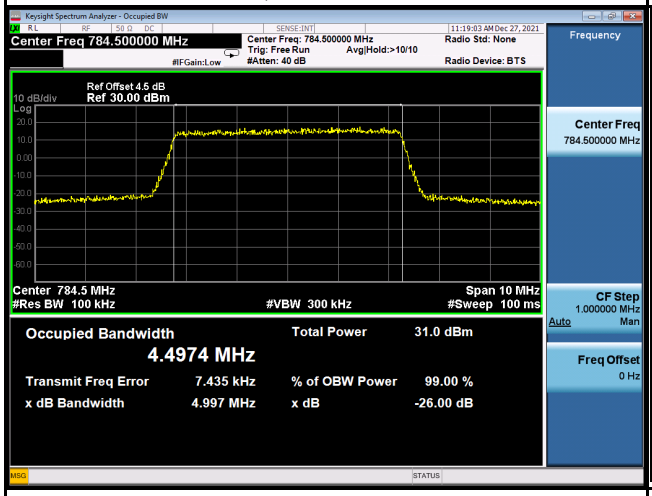
QPSK-23205



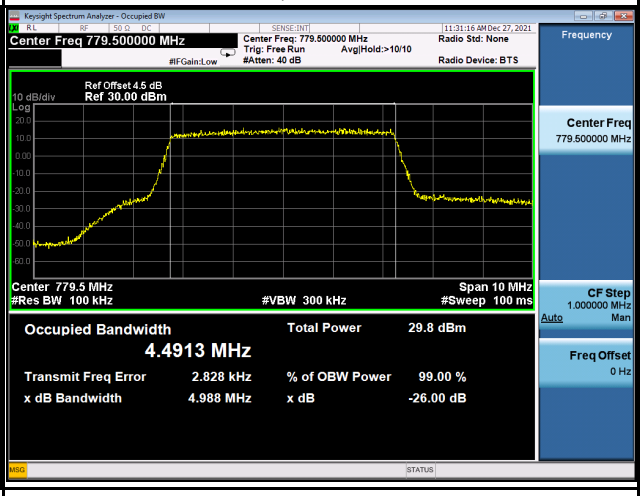
QPSK-23230



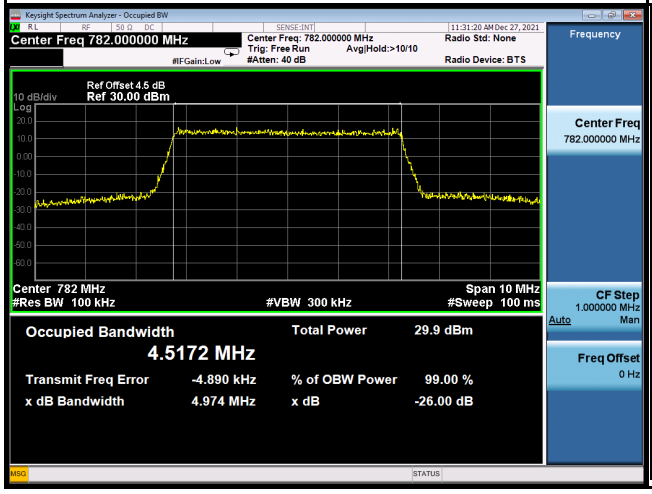
QPSK-23255



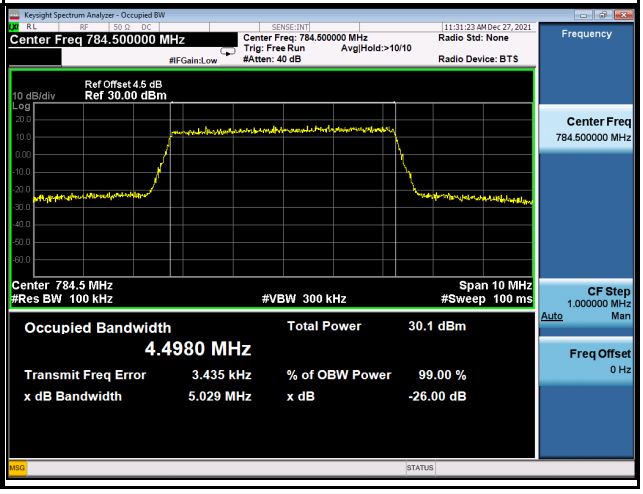
16QAM-23205



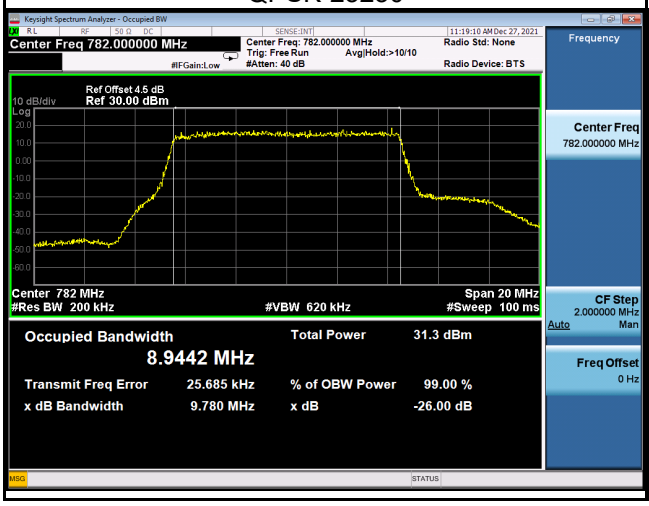
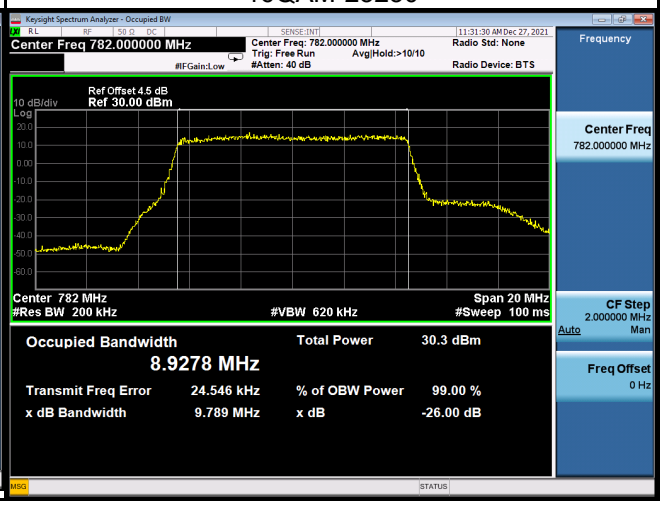
16QAM-23230



16QAM-23255



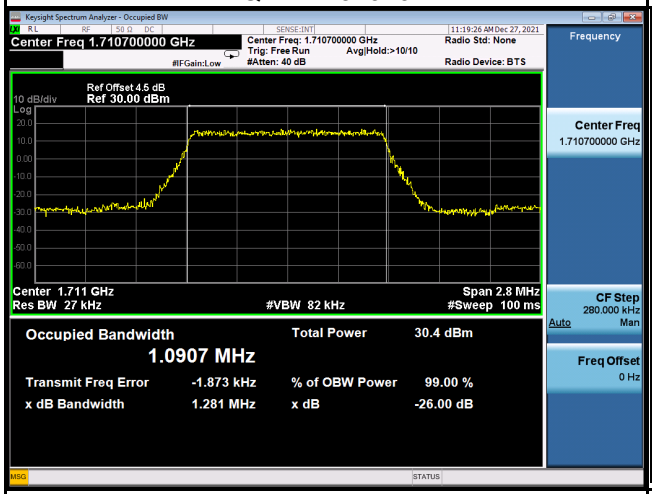
LTE Band 13_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23230	782.0	8.9442	23230	782.0	8.9278
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23230	782.0	9.780	23230	782.0	9.789

Spectrum Plot	
QPSK-23230	16QAM-23230
	

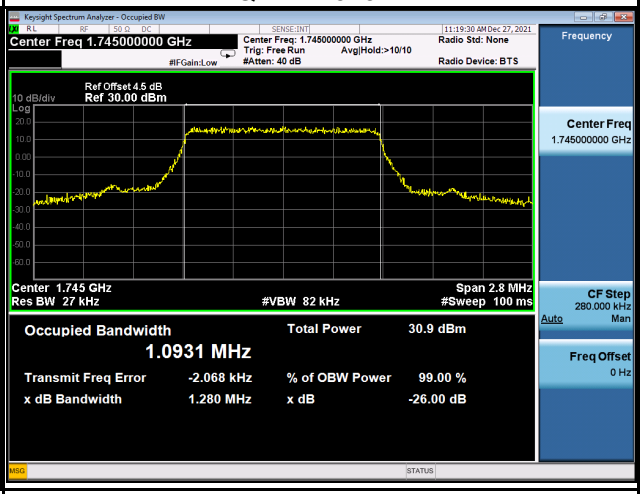
LTE Band 66_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
131979	1710.7	1.0907	131979	1710.7	1.0907
132322	1745.0	1.0931	132322	1745.0	1.0950
132665	1779.3	1.0870	132665	1779.3	1.0897
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
131979	1710.7	1.281	131979	1710.7	1.286
132322	1745.0	1.280	132322	1745.0	1.300
132665	1779.3	1.293	132665	1779.3	1.293

Spectrum Plot

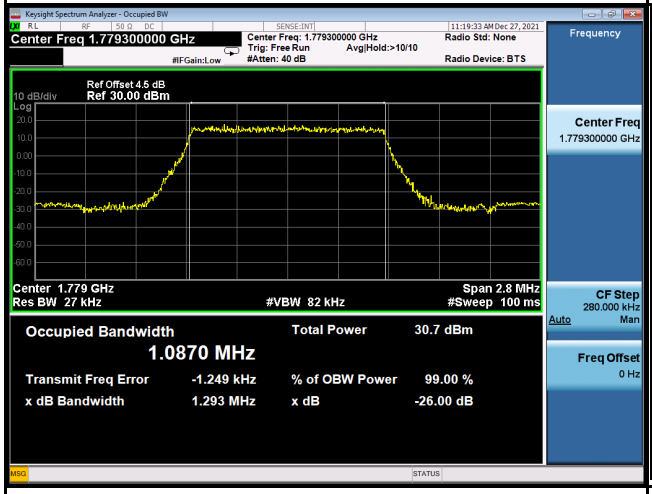
QPSK-131979



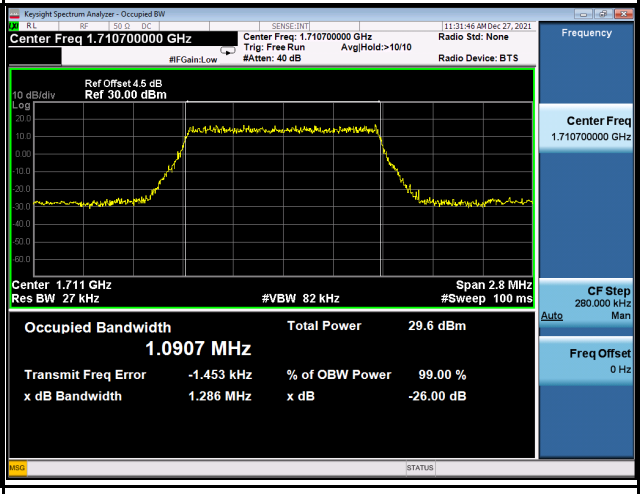
QPSK-132322



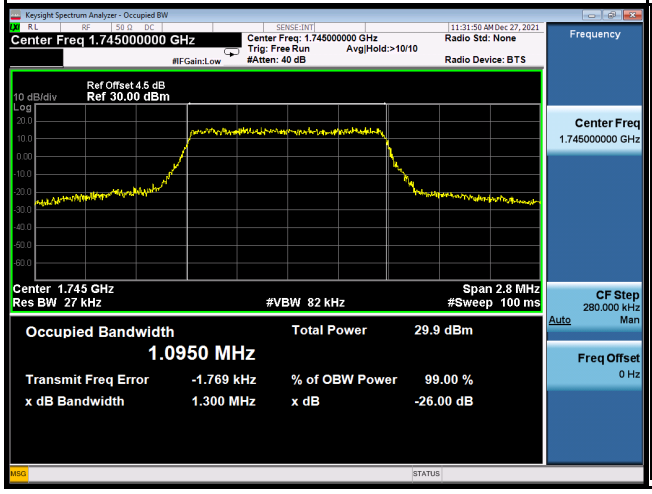
QPSK-132665



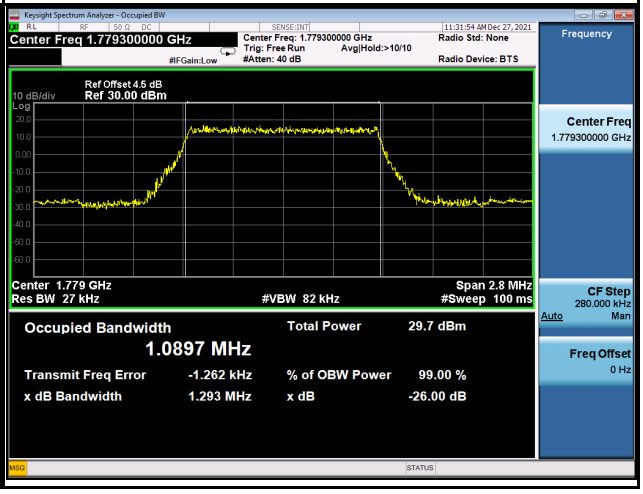
16QAM-131979



16QAM-132322



16QAM-132665



LTE Band 66_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
131987	1711.5	2.6928	131987	1711.5	2.7013
132322	1745.0	2.7031	132322	1745.0	2.6943
132657	1778.5	2.7014	132657	1778.5	2.7049
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
131987	1711.5	2.959	131987	1711.5	2.988
132322	1745.0	2.983	132322	1745.0	2.946
132657	1778.5	2.974	132657	1778.5	2.978