

FCC Radio Test Report

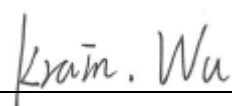
FCC ID: KA2WR920VA1-1

This report concerns (check one): ☒ Original Grant ☐ Class I Change ☐ Class II Change

Project No. : 1901H008A
Equipment : CPE
Model Name : DWR-920V
Applicant : D-Link Corporation
Address : No.289, Xinhua 3rd Rd., Neihu District, Taipei 11494, Taiwan

Date of Receipt : Mar. 19, 2019
Date of Test : Mar. 19, 2019~Apr. 18, 2019
Issued Date : May. 05, 2019
Tested by : BTL Inc.

Testing Engineer : 
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Certificate # 5123. 03

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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.

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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 are not use in determining the Pass/Fail results.

Table of Contents

Page

REPORT ISSUED HISTORY	5
1 . GENERAL SUMMARY	6
2 . SUMMARY OF TEST RESULTS	7
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
3 . GENERAL INFORMATION	9
3.1 GENERAL DESCRIPTION OF EUT	9
3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION	11
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	17
3.4 DESCRIPTION OF SUPPORT UNITS	17
4 . TEST RESULT	18
4.1 OUTPUT POWER MEASUREMENT	18
4.1 .1 LIMIT	18
4.1.2 TEST PROCEDURE	18
4.1.3 TESTSETUP LAYOUT	18
4.1.4 TEST DEVIATION	18
4.1.5 TEST RESULTS	18
4.2 OCCUPIED BANDWIDTH MEASUREMENT	19
4.2.1 TEST PROCEDURE	19
4.2 .2 TEST SETUP LAYOUT	19
4.2.3 TEST DEVIATION	19
4.2.4 TEST RESULTS	19
4.3 CONDUCTED EMISSIONS MEASUREMENT	20
4.3.1 LIMIT	20
4.3.2 TEST PROCEDURES	20
4.3.3 TESTSETUP LAYOUT	20
4.3.4 TESTDEVIATION	20
4.3 .5 TEST RESULTS	20
4.4 RADIATED EMISSIONS MEASUREMENT	21
4.4.1 LIMIT	21
4.4.2 TEST PROCEDURES	21
4.4.3 TESTSETUP LAYOUT	22
4.4.4 TESTDEVIATION	24
4.4.5 TEST RESULTS (9KHZ TO 30MHZ)	24
4.4.6 TEST RESULTS (30MHZ TO 1000MHZ)	24
4.4.7 TEST RESULTS (ABOVE 1000MHZ)	24
4.5 BAND EDGE MEASUREMENT	25

Table of Contents	Page
4.5.1 LIMIT	25
4.5.2 TEST PROCEDURES	25
4.5.3 TESTSETUP LAYOUT	25
4.5.4 TESTDEVIATION	25
4.5.5 TEST RESULTS	25
4.6 PEAK TO AVERAGE RATIO MEASUREMENT	26
4.6.1 LIMIT	26
4.6.2 TEST PROCEDURES	26
4.6.3 TESTSETUP LAYOUT	26
4.6.4 TESTDEVIATION	26
4.6.5 TEST RESULTS	26
4.7 FREQUENCY STABILITY MEASUREMENT	27
4.7.1 LIMIT	27
4.7.2 TEST PROCEDURES	27
4.7.3 TESTSETUP LAYOUT	27
4.7.4 TESTDEVIATION	27
4.7.5 TEST RESULTS	27
5. LIST OF MEASUREMENT EQUIPMENTS	28
6. EUT TEST PHOTO	30
APPENDIX A - OUTPUT POWER	33
APPENDIX B - OCCUPIED BANDWIDTH	54
APPENDIX C - CONDUCTED EMISSIONS	95
APPENDIX D - RADIATED EMISSION(9KHZ TO 30MHZ)	107
APPENDIX E - RADIATED EMISSION (30MHZ TO 1GHZ)	112
APPENDIX F - RADIATED EMISSION (ABOVE 1GHZ)	135
APPENDIX G - BAND EDGE	158
APPENDIX H - PEAK TO AVERAGE RATIO	179
APPENDIX I - FREQUENCY STABILITY	200

REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	May. 05, 2019

1. GENERAL SUMMARY

Equipment : CPE
Brand Name : D-Link
Model Name : DWR-920V
Applicant : D-Link Corporation
Manufacturer: D-Link Corporation
Address : No.289, Xinhua 3rd Rd., Neihu District, Taipei 11494, Taiwan
Date of Test : Mar. 19, 2019~Apr. 18, 2019
Test Sample : Engineering Sample No.: B190301797
Standard(s) : 47 CFR FCC Part 27
47 CFR FCC Part 2 & ANSI/TIA-603-D-2010
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.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1901H008A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO/IEC17025 quality assessment standard and technical standard(s).

Test results included in this report is only for the LTE Band 4, Band 12, Band 41, Band 66 part.

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 & Part 2		
Standard(s) Section	Test Item	Judgment
2.1046 27.50(d)(4)	Radiated power	PASS
2.1046 27.50(d)(4)	Conducted Output Power	PASS
2.1049 27.53(h)	Occupied Bandwidth	PASS
2.1051 27.53(h)	Conducted Spurious Emissions	PASS
2.1053 27.53(h)	Radiated Spurious Emissions	PASS
27.53(h)	Band Edge Measurements	PASS
27.50	Peak To Average Ratio	PASS
2.1055 27.54	Frequency Stability	PASS

NOTE:

(1) "N/A" denotes test is not applicable to this device.

2.1 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

2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
SH-CB01	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	4.12
		30MHz ~ 200MHz	H	3.20
		200MHz ~ 1,000MHz	V	3.12
		200MHz ~ 1,000MHz	H	3.18

Test Site	Method	Measurement Frequency Range	U,(dB)
SH-CB01	CISPR	1GHz ~ 6GHz	4.40
		6GHz ~ 18GHz	4.86
		18GHz ~ 26.5GHz	3.64
		26.5GHz ~ 40GHz	3.78

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	CPE			
Brand Name	D-Link			
Model Name	DWR-920V			
Series Model	N/A			
Model Difference	N/A			
Modulation Type	LTE	UP: QPSK,16QAM DL: QPSK,16QAM,64AQM		
Operation Frequency	LTE 4 (Channel Bandwidth: 1.4MHz)	1710.7MHz ~ 1754.3MHz		
	LTE 4 (Channel Bandwidth: 3MHz)	1711.5MHz ~ 1753.5MHz		
	LTE 4 (Channel Bandwidth: 5MHz)	1712.5MHz ~ 1752.5MHz		
	LTE 4 (Channel Bandwidth: 10MHz)	1715.0MHz ~ 1750.0MHz		
	LTE 4 (Channel Bandwidth: 15MHz)	1717.5MHz ~ 1747.5MHz		
	LTE 4 (Channel Bandwidth: 20MHz)	1720.0MHz ~ 1745.0MHz		
	LTE 12 (Channel Bandwidth: 1.4MHz)	699.7MHz ~ 715.3MHz		
	LTE 12 (Channel Bandwidth: 3MHz)	700.5MHz ~ 714.5MHz		
	LTE 12 (Channel Bandwidth: 5MHz)	701.5MHz ~ 713.5MHz		
	LTE 12 (Channel Bandwidth: 10MHz)	704.0MHz ~ 711.0MHz		
	LTE 41 (Channel Bandwidth: 5MHz)	2547.5 MHz ~ 2652.2 MHz		
	LTE 41 (Channel Bandwidth: 10MHz)	2550 MHz ~ 2650 MHz		
	LTE 41 (Channel Bandwidth: 15MHz)	2552.5 MHz ~ 2467.5 MHz		
	LTE 41 (Channel Bandwidth: 20MHz)	2555 MHz ~ 2645 MHz		
	LTE 66 (Channel Bandwidth: 1.4MHz)	1710.7MHz ~ 1779.5MHz		
	LTE 66 (Channel Bandwidth: 3MHz)	1711.5MHz ~ 1778.5MHz		
	LTE 66 (Channel Bandwidth: 5MHz)	1712.5MHz ~ 1777.5MHz		
	LTE 66 (Channel Bandwidth: 10MHz)	1715.0MHz ~ 1775.0MHz		
	LTE 66 (Channel Bandwidth: 15MHz)	1717.5MHz ~ 1772.5MHz		
	LTE 66 (Channel Bandwidth: 20MHz)	1720.0MHz ~ 1770.0MHz		
Max. EIRP Power	LTE 4 (Channel Bandwidth: 1.4MHz)	QPSK	25.04	dBm
		16QAM	24.18	dBm
	LTE 4 (Channel Bandwidth: 3MHz)	QPSK	25.00	dBm
		16QAM	23.99	dBm
	LTE 4 (Channel Bandwidth: 5MHz)	QPSK	24.95	dBm
		16QAM	23.85	dBm
	LTE 4 (Channel Bandwidth: 10MHz)	QPSK	25.20	dBm
		16QAM	24.16	dBm
	LTE 4 (Channel Bandwidth: 15MHz)	QPSK	25.42	dBm
		16QAM	24.37	dBm
	LTE 4 (Channel Bandwidth: 20MHz)	QPSK	25.41	dBm
		16QAM	24.09	dBm

Max. EIRP Power	LTE 41 (Channel Bandwidth: 5MHz)	QPSK	18.86	dBm
		16QAM	17.42	dBm
	LTE 41 (Channel Bandwidth: 10MHz)	QPSK	18.76	dBm
		16QAM	18.76	dBm
	LTE 41 (Channel Bandwidth: 15MHz)	QPSK	18.54	dBm
		16QAM	17.69	dBm
	LTE 41 (Channel Bandwidth: 20MHz)	QPSK	18.87	dBm
		16QAM	17.66	dBm
	LTE 66 (Channel Bandwidth: 1.4MHz)	QPSK	25.21	dBm
		16QAM	24.35	dBm
	LTE 66 (Channel Bandwidth: 3MHz)	QPSK	25.16	dBm
		16QAM	24.14	dBm
	LTE 66 (Channel Bandwidth: 5MHz)	QPSK	25.09	dBm
		16QAM	23.99	dBm
	LTE 66 (Channel Bandwidth: 10MHz)	QPSK	25.35	dBm
		16QAM	24.32	dBm
LTE 66 (Channel Bandwidth: 15MHz)	QPSK	25.60	dBm	
	16QAM	24.91	dBm	
LTE 66 (Channel Bandwidth: 20MHz)	QPSK	25.61	dBm	
	16QAM	24.30	dBm	
Max. ERP Power	LTE 12 (Channel Bandwidth: 1.4MHz)	QPSK	21.68	dBm
		16QAM	20.65	dBm
	LTE 12 (Channel Bandwidth: 3MHz)	QPSK	21.87	dBm
		16QAM	20.70	dBm
	LTE 12 (Channel Bandwidth: 5MHz)	QPSK	21.72	dBm
		16QAM	20.47	dBm
LTE 12 (Channel Bandwidth: 10MHz)	QPSK	21.82	dBm	
	16QAM	20.65	dBm	
Antenna Type	External Antenna			
Antenna Gain	LTE 4	2.72614 dBi		
	LTE 12	-0.814828 dBi		
	LTE 41	-4dBi		
	LTE 66	2.45029 dBi		
Hardware Version	A1			
Software Version	01.01			
IMEI No.	357471055275665			
Power Source	DC voltage supplied from AC/DC adapter. Model: AMS135-1201000FU			
Power Rating	I/P:100-240V~, 50/60Hz, 0.5A O/P:12V $\overline{\text{---}}$ 1.0A			

Note:

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

3.2 DESCRIPTION OF TEST MODES AND TEST CONDITION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on X-plane for EIRP and X-axis for radiated emission.
Following channel(s) was (were) selected for the final test as listed below:

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
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	1RB
	19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM	1RB
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM	1RB
	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM	1RB
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM	1RB
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM	1RB
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 12 MODE					
Test Item	Available Channel	Tested Channel	Channel	Modulation	Mode
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	1 RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM	1 RB
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM	1 RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM	1 RB
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 41					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
EIRP	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	40165 to 41215	40165, 40690, 41215	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	40165 to 41215	40165, 40690, 41215	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	40165 to 41215	40165, 40690, 41215	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Frequency Stability	40165 to 41215	40690	5MHz	QPSK	1 RB
	40165 to 41215	40690	10MHz	QPSK	1 RB
	40165 to 41215	40690	15MHz	QPSK	1 RB
	40165 to 41215	40690	20MHz	QPSK	1 RB
Occupied Bandwidth	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	25RB
	40165 to 41215	40165, 40690, 41215	10MHz	QPSK, 16QAM	50RB
	40165 to 41215	40165, 40690, 41215	15MHz	QPSK, 16QAM	75 RB
	40165 to 41215	40165, 40690, 41215	20MHz	QPSK, 16QAM	100RB
Peak to Average Ratio	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	1 RB
	40165 to 41215	40165, 40690, 41215	10MHz	QPSK, 16QAM	1 RB
	40165 to 41215	40165, 40690, 41215	15MHz	QPSK, 16QAM	1 RB
	40165 to 41215	40165, 40690, 41215	20MHz	QPSK, 16QAM	1 RB
Band Edge	40165 to 41215	40165, 41215	5MHz	QPSK, 16QAM	1RB/25RB
	40165 to 41215	40165, 41215	10MHz	QPSK, 16QAM	1RB/50RB
	40165 to 41215	40165, 41215	15MHz	QPSK, 16QAM	1RB/75RB
	40165 to 41215	40165, 41215	20MHz	QPSK, 16QAM	1RB/100RB
Conducted Emission	40165 to 41215	40690	5MHz	QPSK	1 RB
	40165 to 41215	40690	10MHz	QPSK	1 RB
	40165 to 41215	40690	15MHz	QPSK	1 RB
	40165 to 41215	40690	20MHz	QPSK	1 RB
Radiated Emission	40165 to 41215	40690	5MHz	QPSK	1 RB
	40165 to 41215	40690	20MHz	QPSK	1 RB

LTE BAND 66 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
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

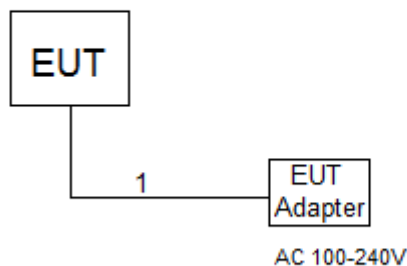
LTE BAND 66 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Band Edge	131979 to 132665	131979	1.4MHz	QPSK	1RB/6RB
		132665	1.4MHz	QPSK	
	131987 to 132657	131987	3MHz	QPSK	1RB/15RB
		132657	3MHz	QPSK	
	131997 to 132647	131997	5MHz	QPSK	1RB/25RB
		132647	5MHz	QPSK	
	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: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK 1RB modulation.

EUT TEST CONDITIONS:

Test Item	Environmental Conditions	Test Voltage
EIRP	21°C, 54%RH	DC 12V
Conducted Output Power	21°C, 54%RH	DC 12V
Occupied Bandwidth	21°C, 54%RH	DC 12V
Conducted Emission	21°C, 54%RH	DC 12V
Radiated Emission	18.4°C, 53%RH	AC 120V/60Hz
Band Edge	21°C, 54%RH	DC 12V
Peak to Average Ratio	21°C, 54%RH	DC 12V
Frequency Stability	21°C, 54%RH	DC 13.2V , DC 12V, DC 10.8V

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 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.
-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC Cable

4. TEST RESULT

4.14.1 OUTPUT POWER MEASUREMENT

4.1.1.1 LIMIT

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

Mobile / Portable station are limited to 2 watts e.i.r.p. (LTE 41)

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

4.1.24.1.2 TEST PROCEDURE

EIRP/ERP:

EIRP= Conducted Power +Antenan gain

ERP power=EIPR power-2.15dBi.

Conducted 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.

4.1.34.1.3 TESTSETUP LAYOUT

Conducted Power Measurement



4.1.44.1.4 TEST DEVIATION

No deviation

4.1.54.1.5 TEST RESULTS

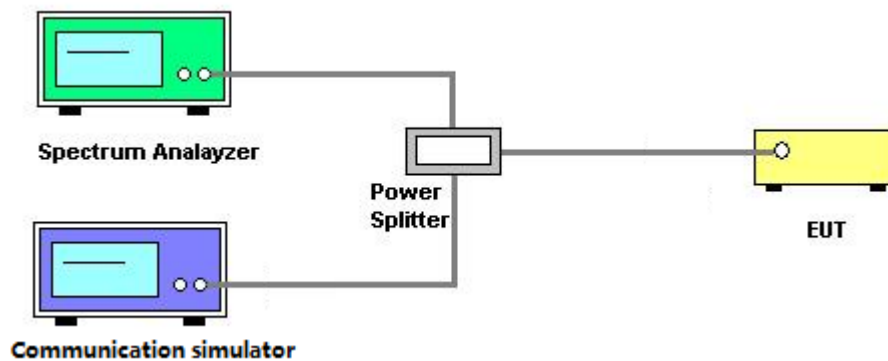
Please refer to the Appendix A.

4.24.2 OCCUPIED BANDWIDTH MEASUREMENT

4.2.14.2.1 TEST PROCEDURE

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.

4.2.2.2 TEST SETUP LAYOUT



4.2.3 TEST DEVIATION

No deviation

4.2.44.2.3 TEST RESULTS

Please refer to the Appendix B.

4.3 CONDUCTED EMISSIONS MEASUREMENT

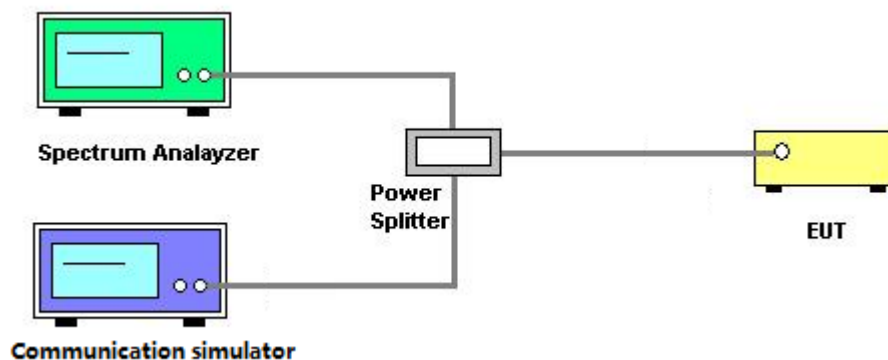
4.3.1 LIMIT

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.

4.3.2 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 $\geq$ 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.
6. The limit line is derived from $43+10\log(P)$ dB below the transmitter power P(Watts)
 $=P(W)-[43+10\log(P)](dB)$
 $=[30+10\log(P)](dBm)-[43+10\log(P)](dB)$
 $=-13dBm$

4.3.3 TESTSETUP LAYOUT



4.3.4 TESTDEVIATION

No deviation

4.2.4.5 TEST RESULTS

Please refer to the Appendix C.

4.4 RADIATED EMISSIONS MEASUREMENT

4.2.54.4.1 LIMIT

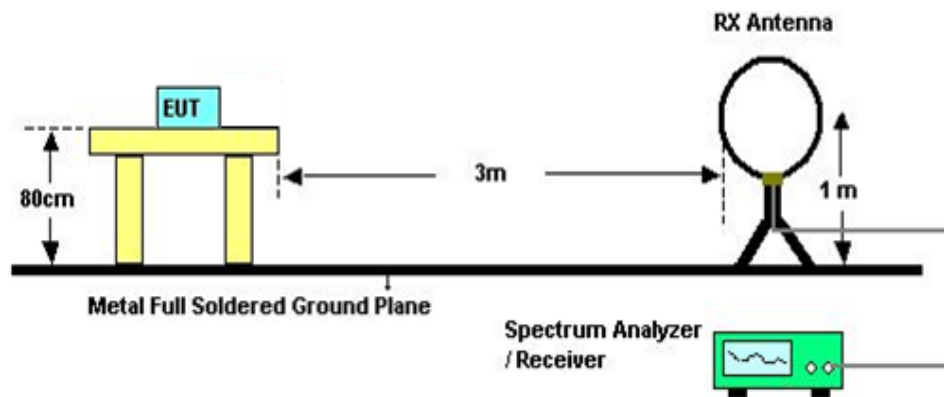
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm.

4.4.2 TEST PROCEDURES

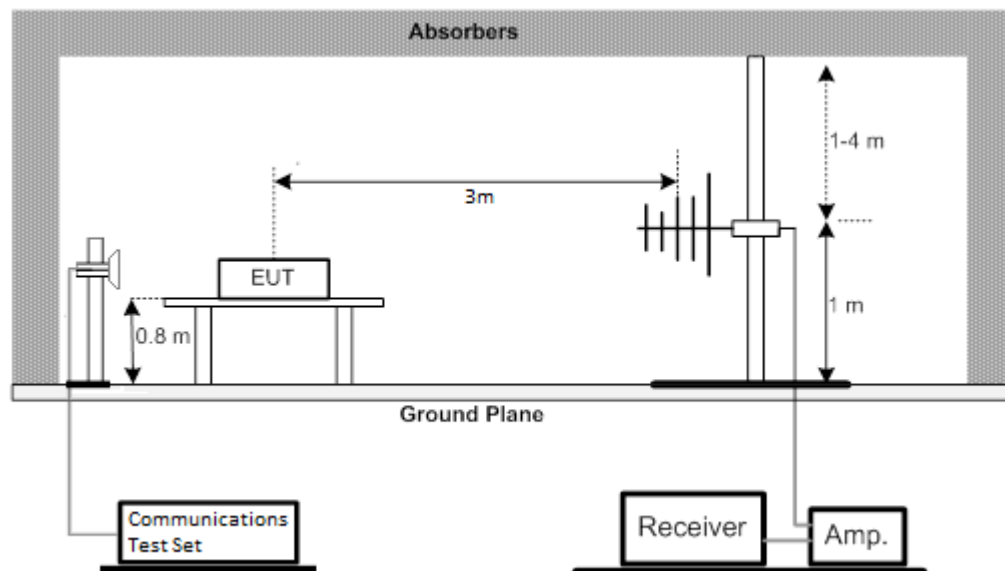
1. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 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.

4.4.3 TESTSETUP LAYOUT

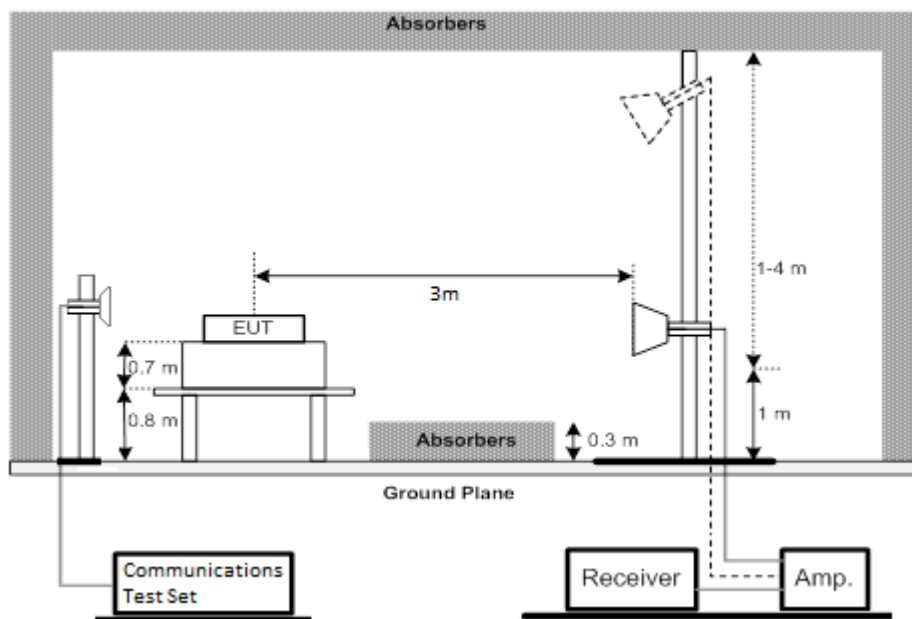
Below 30MHz



30MHz to 1GHz



Above 1GHz



4.4.4 TESTDEVIATION

No deviation

4.4.54.2.6 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix D.

Remark:

(1) All adapters had been pre-test and in this report only recorded the worst case.

4.4.64.2.7 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix E.

Remark:

(1) All adapters had been pre-test and in this report only recorded the worst case.

4.4.74.2.8 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix F.

4.5 BAND EDGE MEASUREMENT

4.5.1 LIMIT

For operations in the 704-716 MHz band, 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.

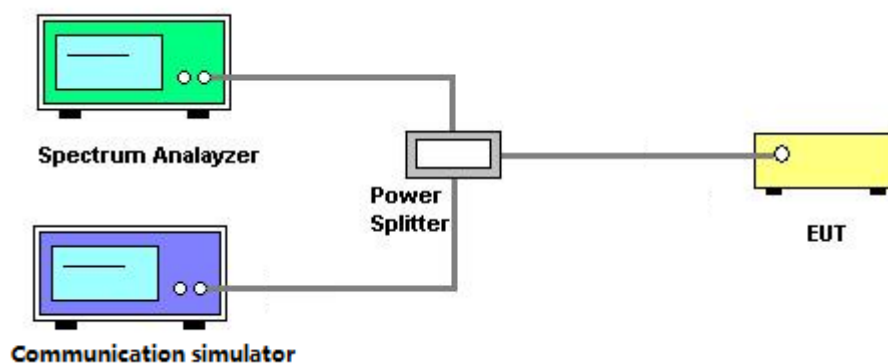
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB.

4.5.2 TEST PROCEDURES

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 1MHz. RB of the spectrum is 13kHz and VB of the spectrum is 51kHz (LTE Bandwidth 1.4MHz).
3. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Bandwidth 3MHz).
4. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Bandwidth 5MHz/10MHz).
5. 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).
6. 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).
7. Record the max trace plot into the test report.

4.5.3 TESTSETUP LAYOUT



4.5.4 TESTDEVIATION

No deviation

4.5.54.2.9 TEST RESULTS

Please refer to the Appendix G.

4.6 PEAK TO AVERAGE RATIO MEASUREMENT

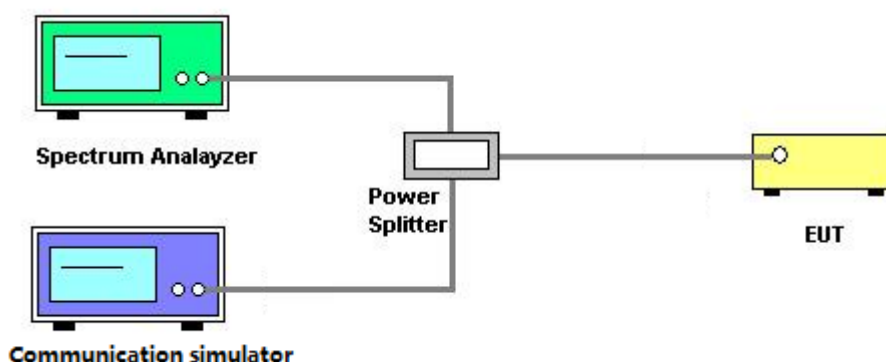
4.6.1 LIMIT

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.

4.6.2 TEST PROCEDURES

1. Set resolution/measurement bandwidth $\geq$ 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%.

4.6.3 TESTSETUP LAYOUT



4.6.4 TESTDEVIATION

No deviation

4.6.54.2.10 TEST RESULTS

Please refer to the Appendix H.

4.7 FREQUENCY STABILITY MEASUREMENT

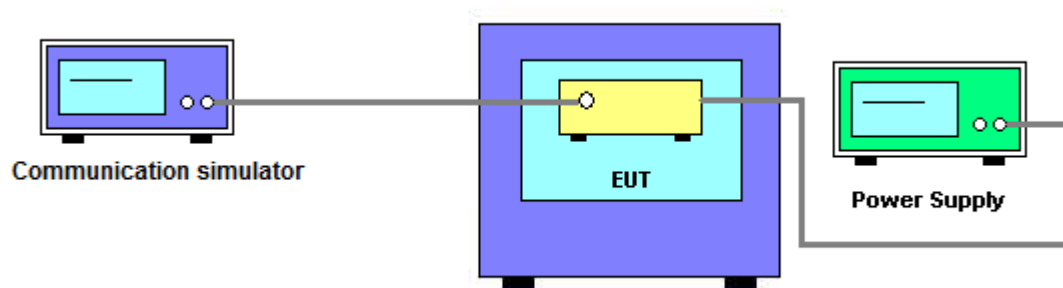
4.7.1 LIMIT

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

4.7.2 TEST PROCEDURES

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 $\pm 0.5^{\circ}\text{C}$ 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.

4.7.3 TESTSETUP LAYOUT



4.7.4 TESTDEVIATION

No deviation

4.7.54.2.11 TEST RESULTS

Please refer to the Appendix I.

5. 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	Mar. 29, 2020
2	EMI Test Receiver	R&S	ESCI	100082	Mar. 29, 2020
3	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement(30M-1G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 29, 2020
4	Test Cable	emci	EMC104-SM-SM-7000	170330	Apr. 17, 2020
5	Test Cable	emci	EMC104-SM-SM-1000	170331	Apr. 17, 2020
6	Test Cable	emci	EMC104-SM-NM-3500	170621	Apr. 17, 2020
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

Radiated Emission Measurement(1G-18G)					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 29, 2020
2	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 29, 2020
3	Pre-Amplifier	emci	EMC9135	980400	Mar. 29, 2020
4	Double Ridged Broadband Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 29, 2020
5	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 29, 2020
6	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 29, 2020
7	Cable	N/A	EMC102-SM-SM-6000	170336	Jun. 10, 2019
8	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019

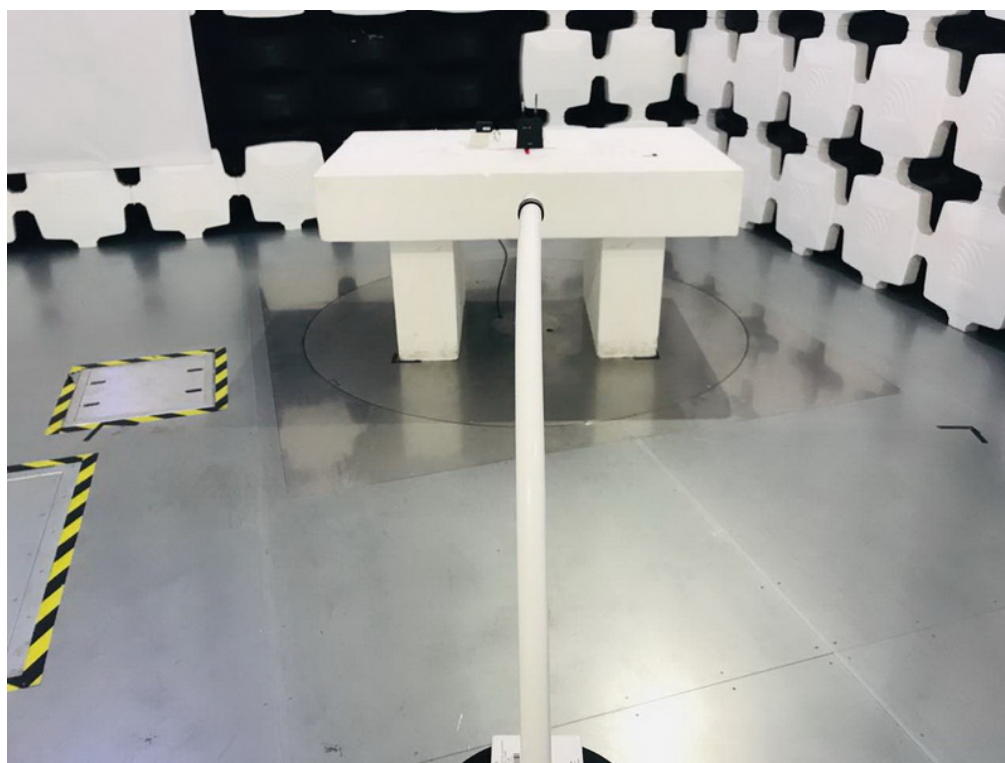
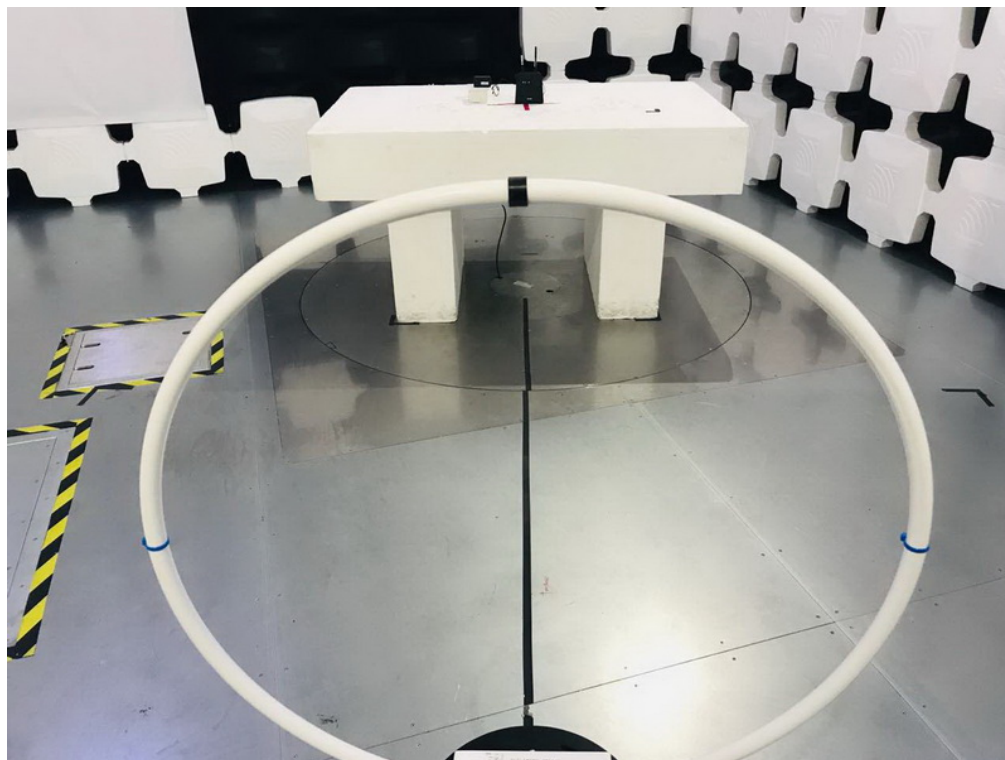
Conducted Emission & Band Edge & Occupied Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
5	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Keysight	N9010A	MY56480579	Mar. 29, 2020
2*	Power Divider	JUK	PD-4SF-2060	N/A	N/A
3	Wideband Radio Communication Test	R&S	CMW500	131463	Nov. 20, 2019
4	Spectrum Analyzer	R&S	FSP40	100626	Mar. 29, 2020
5	Temperature And Humidity Box	Blue pand	BPHS-120B	170616454	Nov. 20, 2019

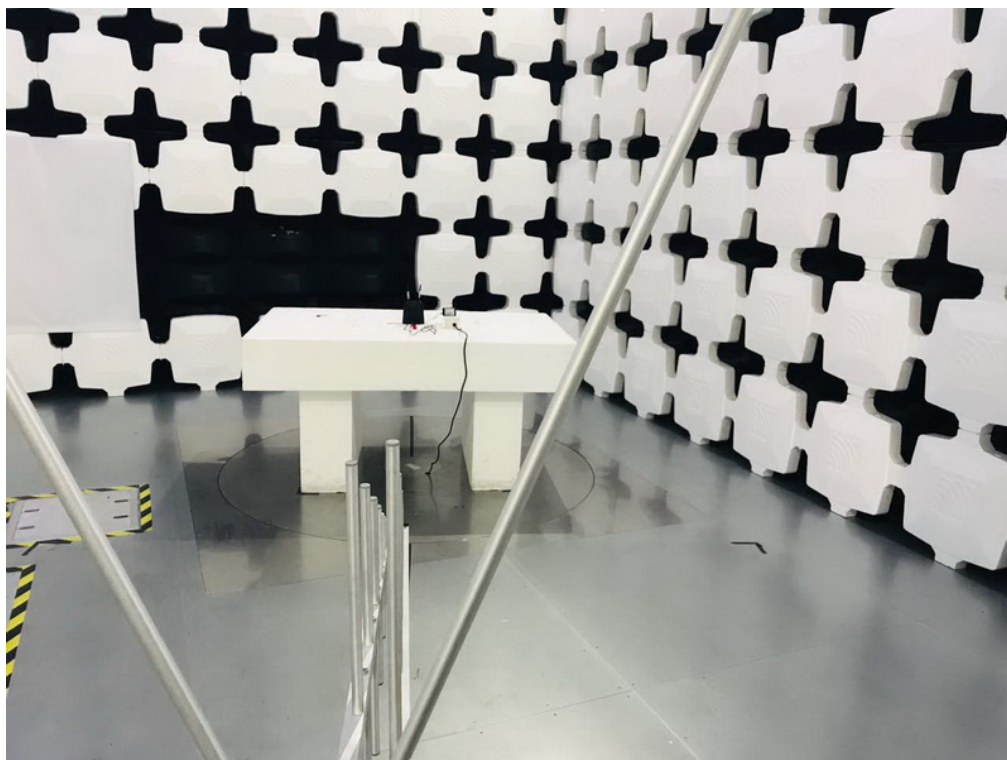
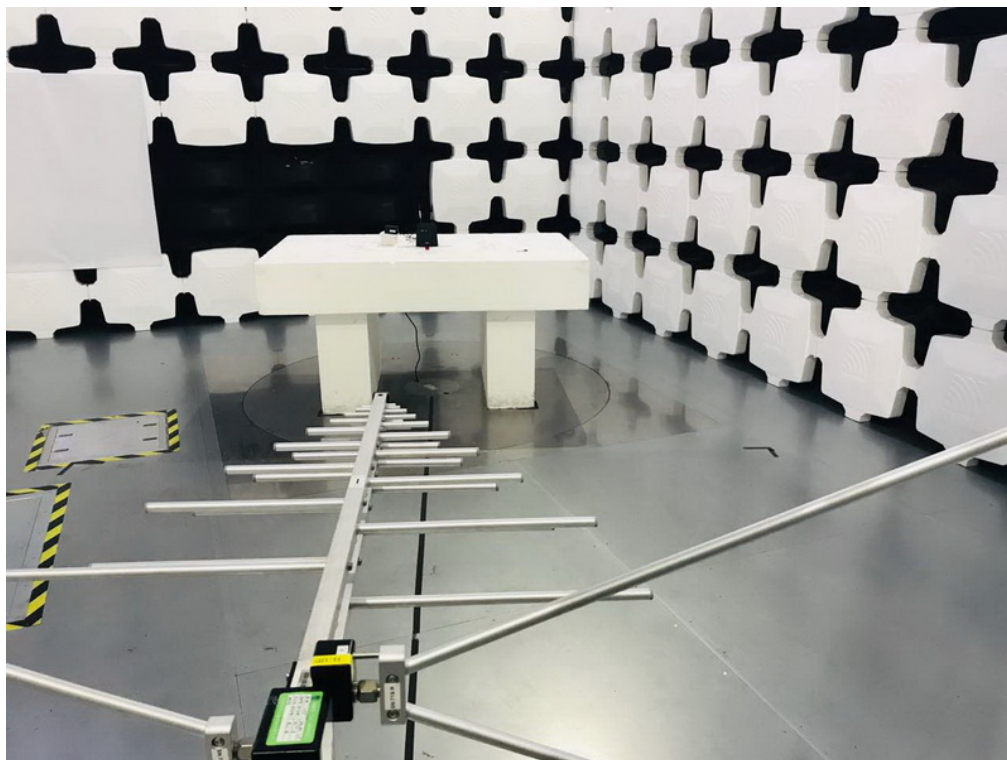
Remark: "N/A" denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

6. EUT TEST PHOTO

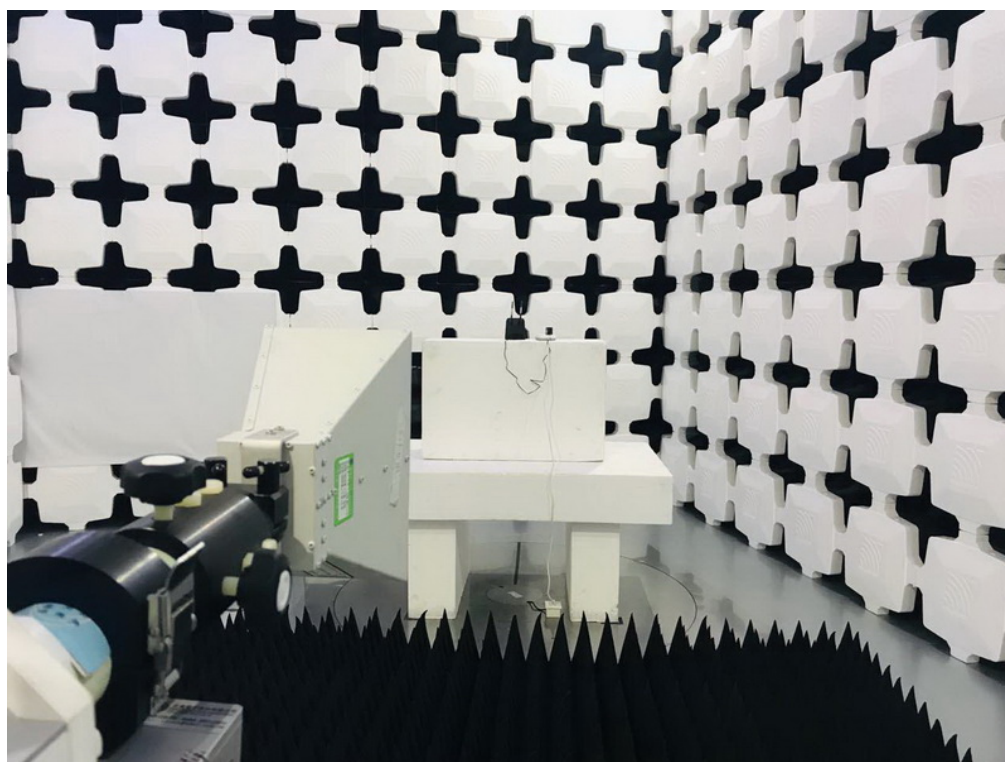
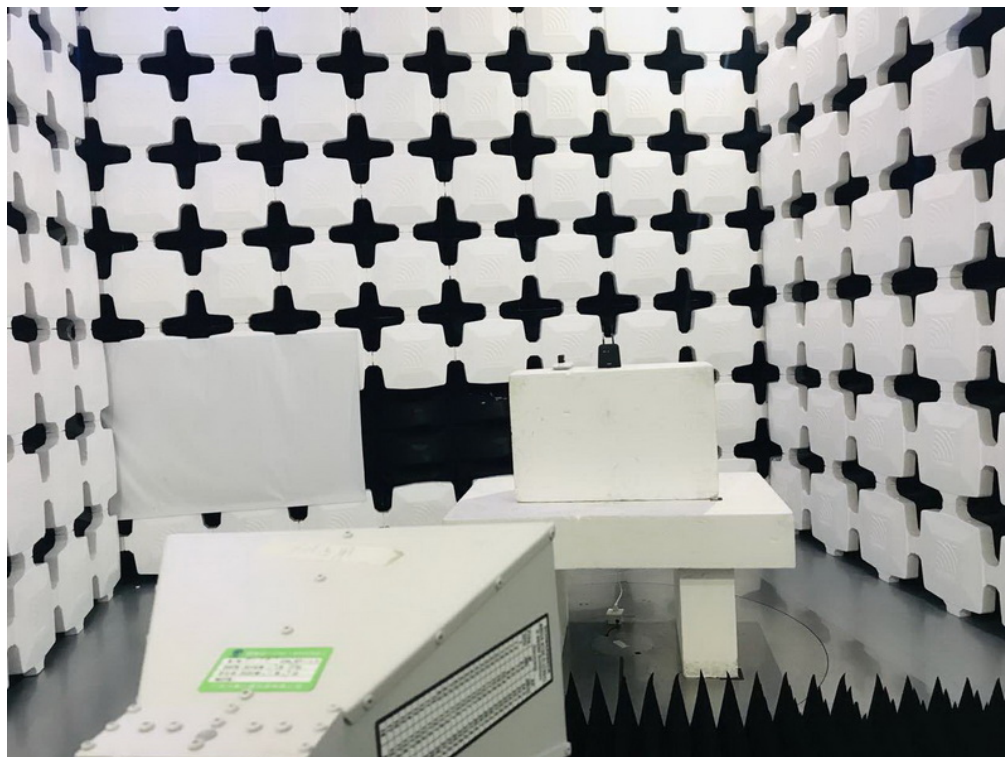
9 kHz to 30 MHz



30 MHz to 1 GHz



Above 1 GHz



APPENDIX A - OUTPUT POWER

Conducted Power:

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	22.14	21.99	22.09
		1	2	22.15	22.06	22.13
		1	5	22.17	22.01	22.11
		3	0	22.13	22.23	22.13
		3	1	22.16	22.31	22.22
		3	2	22.14	22.28	22.05
		6	0	21.26	21.21	21.10
	16QAM	1	0	21.24	21.09	20.92
		1	2	21.17	21.25	20.89
		1	5	21.15	21.00	20.97
		3	0	21.34	21.35	20.78
		3	1	21.45	21.25	20.86
		3	2	21.36	21.34	20.90
		6	0	20.64	20.60	19.99

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	22.28	22.18	22.02
		1	7	22.22	22.24	22.21
		1	14	22.19	22.19	22.16
		8	0	21.22	21.22	21.11
		8	4	21.11	21.17	21.14
		8	7	21.08	21.31	21.13
		15	0	21.17	21.26	21.09
	16QAM	1	0	21.22	20.96	21.10
		1	7	21.11	21.26	21.15
		1	14	20.85	20.79	21.12
		8	0	20.33	20.24	20.33
		8	4	20.31	20.20	20.35
		8	7	20.29	20.11	20.46
		15	0	20.19	20.21	20.32

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	22.13	21.97	21.97
		1	13	22.14	22.04	22.17
		1	24	22.23	22.05	22.14
		12	0	21.29	21.19	21.32
		12	6	21.16	21.26	21.36
		12	11	21.10	21.27	21.33
		25	0	21.18	21.21	21.29
	16QAM	1	0	20.56	21.13	20.67
		1	13	20.53	21.07	20.76
		1	24	20.61	20.62	20.93
		12	0	20.36	20.15	20.17
		12	6	20.25	20.19	20.25
		12	11	20.03	20.19	20.32
		25	0	20.18	20.25	20.21

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	22.43	22.34	22.21
		1	25	22.47	22.37	22.24
		1	49	22.41	22.26	22.45
		25	0	21.22	21.31	21.41
		25	13	21.31	21.19	21.36
		25	25	21.35	21.25	21.32
		50	0	21.34	21.23	21.32
	16QAM	1	0	21.06	20.95	20.74
		1	25	21.25	20.90	21.06
		1	49	21.03	20.90	21.44
		25	0	20.32	20.42	20.42
		25	13	20.31	20.57	20.63
		25	25	20.41	20.51	20.48
		50	0	20.43	20.11	20.37

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	22.30	22.31	22.24
		1	38	22.69	22.20	22.25
		1	74	22.56	22.18	22.40
		36	0	21.36	22.18	21.35
		36	18	21.43	21.28	21.45
		36	39	21.31	21.24	21.37
		75	0	21.33	21.24	21.37
	16QAM	1	0	21.22	20.54	21.99
		1	38	21.43	21.07	21.84
		1	74	21.26	20.60	22.00
		36	0	20.43	20.60	20.44
		36	18	20.47	20.31	20.35
		36	39	20.41	20.39	20.42
		75	0	20.36	20.29	20.48

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	21.88	21.87	22.60
		1	50	22.45	21.36	22.68
		1	99	22.14	21.94	22.37
		50	0	21.36	21.28	21.38
		50	25	21.38	21.31	21.39
		50	50	21.36	21.26	21.38
		100	0	21.40	21.33	21.32
	16QAM	1	0	20.92	20.76	20.99
		1	50	21.12	20.33	21.37
		1	99	21.15	21.27	20.93
		50	0	20.30	20.36	20.32
		50	25	20.36	20.50	20.50
		50	50	20.33	20.47	20.37
		100	0	20.40	20.37	20.43

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	22.71	22.77	22.94
		1	2	22.68	22.72	22.81
		1	5	22.68	22.68	22.84
		3	0	22.73	22.82	23.01
		3	1	22.90	22.94	23.00
		3	2	22.81	22.92	22.98
		6	0	21.61	21.77	21.97
	16QAM	1	0	21.58	21.66	21.49
		1	2	21.87	21.82	21.94
		1	5	21.99	21.44	21.63
		3	0	21.41	21.42	21.83
		3	1	21.58	21.50	21.93
		3	2	21.80	21.50	21.92
		6	0	20.72	20.63	20.97

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	22.86	22.86	22.94
		1	7	23.02	23.14	23.21
		1	14	23.18	23.10	22.98
		8	0	21.67	21.96	21.93
		8	4	21.90	21.87	21.97
		8	7	21.88	21.80	21.91
		15	0	21.76	21.87	21.85
	16QAM	1	0	21.47	21.65	21.77
		1	7	21.70	22.04	21.98
		1	14	21.82	21.56	21.83
		8	0	20.51	20.71	20.63
		8	4	20.83	20.92	21.03
		8	7	20.83	20.83	21.05
		15	0	20.57	20.77	20.81

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	22.69	22.37	22.67
		1	13	23.02	22.70	23.05
		1	24	22.87	22.30	22.89
		12	0	21.80	21.84	21.81
		12	6	21.86	21.93	21.92
		12	11	21.75	21.88	21.96
		25	0	21.73	21.84	21.94
	16QAM	1	0	21.04	21.66	21.42
		1	13	21.39	21.80	21.59
		1	24	21.16	21.29	21.66
		12	0	20.62	20.67	20.61
		12	6	20.80	20.86	20.93
		12	11	20.73	20.82	21.01
		25	0	20.81	20.80	20.73

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	22.59	22.75	22.84
		1	25	23.15	23.03	22.80
		1	49	22.71	22.79	23.00
		25	0	21.63	21.72	21.86
		25	13	21.73	21.82	21.77
		25	25	21.77	21.69	21.85
		50	0	21.73	21.74	21.96
	16QAM	1	0	21.36	21.50	21.68
		1	25	21.98	21.55	21.83
		1	49	21.55	21.05	21.91
		25	0	20.84	21.06	21.01
		25	13	20.73	21.09	20.85
		25	25	20.74	20.77	20.97
		50	0	20.81	20.78	20.93

LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				39675 CH	40620 CH	41565 CH
				2498.5 MHz	2593.0 MHz	2687.5 MHz
41 / 5M	QPSK	1	0	22.13	21.43	22.64
		1	13	22.21	21.65	22.86
		1	24	22.09	21.52	22.50
		12	0	21.29	20.79	21.84
		12	6	21.46	20.84	21.88
		12	11	21.36	20.90	21.79
		25	0	21.26	20.83	21.78
	16QAM	1	0	20.72	20.39	21.42
		1	13	20.78	20.46	21.31
		1	24	20.66	20.54	21.37
		12	0	20.25	19.88	20.77
		12	6	20.30	20.01	20.80
		12	11	20.31	20.00	20.81
		25	0	20.38	19.82	20.81

LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				39700 CH	40620 CH	41540 CH
				2501.0 MHz	2593.0 MHz	2685.0 MHz
41 / 10M	QPSK	1	0	22.29	21.59	22.57
		1	25	22.24	21.83	22.76
		1	49	22.09	21.87	22.69
		25	0	21.30	20.86	21.77
		25	13	21.32	20.95	21.86
		25	25	21.33	20.90	21.70
		50	0	21.28	20.92	21.83
	16QAM	1	0	21.60	20.06	22.54
		1	25	21.99	20.22	22.76
		1	49	21.48	20.20	22.68
		25	0	20.38	19.62	20.68
		25	13	20.59	19.83	20.70
		25	25	20.50	19.88	20.74
		50	0	20.21	19.94	20.79

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39725 CH	40620 CH	41165 CH
				2503.5 MHz	2593.0 MHz	2682.5 MHz
41 / 15M	QPSK	1	0	22.20	21.72	22.31
		1	38	22.10	21.80	22.48
		1	74	21.92	21.78	22.54
		36	0	21.15	20.86	21.70
		36	18	21.14	20.89	21.72
		36	39	21.13	20.98	21.77
		75	0	21.10	20.96	21.74
	16QAM	1	0	21.57	20.27	21.60
		1	38	21.48	20.33	21.69
		1	74	21.42	20.25	21.57
		36	0	20.03	19.85	20.45
		36	18	19.96	19.86	20.54
		36	39	19.96	19.98	20.59
		75	0	20.16	19.98	20.74

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39750 CH	40620 CH	41490 CH
				2506.0 MHz	2593.0 MHz	2680.0 MHz
41 / 20M	QPSK	1	0	21.96	21.93	22.40
		1	50	22.23	22.13	22.87
		1	99	21.67	22.07	22.68
		50	0	21.20	20.87	21.65
		50	25	21.18	20.88	21.70
		50	50	21.15	20.92	21.72
		100	0	21.10	20.92	21.70
	16QAM	1	0	20.70	19.68	21.31
		1	50	21.02	19.47	21.66
		1	99	20.31	19.50	21.59
		50	0	20.13	19.68	20.55
		50	25	20.09	19.78	20.59
		50	50	20.06	19.82	20.69
		100	0	19.99	19.69	20.62

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	22.59	22.44	22.54
		1	2	22.60	22.51	22.58
		1	5	22.62	22.46	22.56
		3	0	22.58	22.68	22.58
		3	1	22.61	22.76	22.67
		3	2	22.59	22.73	22.50
		6	0	21.71	21.66	21.55
	16QAM	1	0	21.69	21.54	21.37
		1	2	21.62	21.70	21.34
		1	5	21.60	21.45	21.42
		3	0	21.79	21.80	21.23
		3	1	21.90	21.70	21.31
		3	2	21.81	21.79	21.35
		6	0	21.09	21.05	20.44

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	22.71	22.61	22.45
		1	7	22.65	22.67	22.64
		1	14	22.62	22.62	22.59
		8	0	21.65	21.65	21.54
		8	4	21.54	21.60	21.57
		8	7	21.51	21.74	21.56
		15	0	21.60	21.69	21.52
	16QAM	1	0	21.65	21.39	21.53
		1	7	21.54	21.69	21.58
		1	14	21.28	21.22	21.55
		8	0	20.76	20.67	20.76
		8	4	20.74	20.63	20.78
		8	7	20.72	20.54	20.89
		15	0	20.62	20.64	20.75

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	22.54	22.38	22.38
		1	13	22.55	22.45	22.58
		1	24	22.64	22.46	22.55
		12	0	21.70	21.60	21.73
		12	6	21.57	21.67	21.77
		12	11	21.51	21.68	21.74
		25	0	21.59	21.62	21.70
	16QAM	1	0	20.97	21.54	21.08
		1	13	20.94	21.48	21.17
		1	24	21.02	21.03	21.34
		12	0	20.77	20.56	20.58
		12	6	20.66	20.60	20.66
		12	11	20.44	20.60	20.73
		25	0	20.59	20.66	20.62

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	22.86	22.77	22.64
		1	25	22.90	22.80	22.67
		1	49	22.84	22.69	22.88
		25	0	21.65	21.74	21.84
		25	13	21.74	21.62	21.79
		25	25	21.78	21.68	21.75
		50	0	21.77	21.66	21.75
	16QAM	1	0	21.49	21.38	21.17
		1	25	21.68	21.33	21.49
		1	49	21.46	21.33	21.87
		25	0	20.75	20.85	20.85
		25	13	20.74	21.00	21.06
		25	25	20.84	20.94	20.91
		50	0	20.86	20.54	20.80

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	22.76	22.77	22.70
		1	38	23.15	22.66	22.71
		1	74	23.02	22.64	22.86
		36	0	21.82	22.64	21.81
		36	18	21.89	21.74	21.91
		36	39	21.77	21.70	21.83
		75	0	21.79	21.70	21.83
	16QAM	1	0	21.68	21.00	22.45
		1	38	21.89	21.53	22.30
		1	74	21.72	21.06	22.46
		36	0	20.89	21.06	20.90
		36	18	20.93	20.77	20.81
		36	39	20.87	20.85	20.88
		75	0	20.82	20.75	20.94

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	22.36	22.35	23.08
		1	50	22.93	21.84	23.16
		1	99	22.62	22.42	22.85
		50	0	21.84	21.76	21.86
		50	25	21.86	21.79	21.87
		50	50	21.84	21.74	21.86
		100	0	21.88	21.81	21.80
	16QAM	1	0	21.40	21.24	21.47
		1	50	21.60	20.81	21.85
		1	99	21.63	21.75	21.41
		50	0	20.78	20.84	20.80
		50	25	20.84	20.98	20.98
		50	50	20.81	20.95	20.85
		100	0	20.88	20.85	20.91

EIRP Power:

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	24.87	24.72	24.81
		1	2	24.87	24.79	24.86
		1	5	24.90	24.73	24.83
		3	0	24.86	24.96	24.85
		3	1	24.88	25.04	24.95
		3	2	24.87	25.01	24.77
		6	0	23.98	23.94	23.83
	16QAM	1	0	23.96	23.82	23.65
		1	2	23.89	23.98	23.62
		1	5	23.88	23.73	23.69
		3	0	24.07	24.08	23.51
		3	1	24.18	23.97	23.58
		3	2	24.08	24.07	23.62
		6	0	23.36	23.33	22.71

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	25.00	24.91	24.74
		1	7	24.95	24.97	24.94
		1	14	24.92	24.91	24.88
		8	0	23.95	23.95	23.83
		8	4	23.83	23.90	23.86
		8	7	23.80	24.04	23.86
		15	0	23.90	23.98	23.81
	16QAM	1	0	23.95	23.69	23.82
		1	7	23.84	23.99	23.88
		1	14	23.58	23.52	23.85
		8	0	23.05	22.96	23.06
		8	4	23.03	22.93	23.08
		8	7	23.02	22.83	23.19
		15	0	22.92	22.94	23.05

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	24.86	24.69	24.69
		1	13	24.86	24.76	24.90
		1	24	24.95	24.77	24.87
		12	0	24.02	23.92	24.05
		12	6	23.89	23.98	24.09
		12	11	23.83	23.99	24.06
		25	0	23.90	23.93	24.01
	16QAM	1	0	23.29	23.85	23.39
		1	13	23.25	23.79	23.48
		1	24	23.33	23.35	23.65
		12	0	23.08	22.87	22.90
		12	6	22.98	22.91	22.98
		12	11	22.76	22.92	23.04
		25	0	22.91	22.98	22.93

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	25.16	25.07	24.93
		1	25	25.20	25.09	24.97
		1	49	25.13	24.99	25.17
		25	0	23.95	24.04	24.13
		25	13	24.04	23.92	24.08
		25	25	24.07	23.98	24.05
		50	0	24.07	23.95	24.05
	16QAM	1	0	23.79	23.68	23.46
		1	25	23.97	23.63	23.79
		1	49	23.76	23.63	24.16
		25	0	23.05	23.14	23.15
		25	13	23.04	23.30	23.36
		25	25	23.14	23.23	23.20
		50	0	23.15	22.84	23.10

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	25.03	25.04	24.97
		1	38	25.42	24.93	24.98
		1	74	25.29	24.90	25.12
		36	0	24.08	24.90	24.07
		36	18	24.16	24.00	24.17
		36	39	24.04	23.97	24.10
		75	0	24.06	23.97	24.10
	16QAM	1	0	23.95	23.26	24.71
		1	38	24.16	23.79	24.56
		1	74	23.98	23.33	24.73
		36	0	23.16	23.33	23.17
		36	18	23.20	23.04	23.08
		36	39	23.13	23.12	23.15
		75	0	23.08	23.01	23.21

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	24.61	24.59	25.32
		1	50	25.17	24.08	25.41
		1	99	24.87	24.67	25.10
		50	0	24.08	24.00	24.10
		50	25	24.10	24.04	24.12
		50	50	24.08	23.99	24.11
		100	0	24.12	24.06	24.05
	16QAM	1	0	23.65	23.49	23.72
		1	50	23.84	23.05	24.09
		1	99	23.88	24.00	23.65
		50	0	23.03	23.09	23.04
		50	25	23.08	23.23	23.23
		50	50	23.05	23.20	23.09
		100	0	23.13	23.10	23.15

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39675 CH	40620 CH	41565 CH
				2498.5 MHz	2593.0 MHz	2687.5 MHz
41 / 5M	QPSK	1	0	18.13	17.43	18.64
		1	13	18.21	17.65	18.86
		1	24	18.09	17.52	18.50
		12	0	17.29	16.79	17.84
		12	6	17.46	16.84	17.88
		12	11	17.36	16.90	17.79
		25	0	17.26	16.83	17.78
	16QAM	1	0	16.72	16.39	17.42
		1	13	16.78	16.46	17.31
		1	24	16.66	16.54	17.37
		12	0	16.25	15.88	16.77
		12	6	16.30	16.01	16.80
		12	11	16.31	16.00	16.81
		25	0	16.38	15.82	16.81

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39700 CH	40620 CH	41540 CH
				2501.0 MHz	2593.0 MHz	2685.0 MHz
41 / 10M	QPSK	1	0	18.29	17.59	18.57
		1	25	18.24	17.83	18.76
		1	49	18.09	17.87	18.69
		25	0	17.30	16.86	17.77
		25	13	17.32	16.95	17.86
		25	25	17.33	16.90	17.70
		50	0	17.28	16.92	17.83
	16QAM	1	0	17.60	16.06	18.54
		1	25	17.99	16.22	18.76
		1	49	17.48	16.20	18.68
		25	0	16.38	15.62	16.68
		25	13	16.59	15.83	16.70
		25	25	16.50	15.88	16.74
		50	0	16.21	15.94	16.79

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39725 CH	40620 CH	41165 CH
				2503.5 MHz	2593.0 MHz	2682.5 MHz
41 / 15M	QPSK	1	0	18.20	17.72	18.31
		1	38	18.10	17.80	18.48
		1	74	17.92	17.78	18.54
		36	0	17.15	16.86	17.70
		36	18	17.14	16.89	17.72
		36	39	17.13	16.98	17.77
		75	0	17.10	16.96	17.74
	16QAM	1	0	17.57	16.27	17.60
		1	38	17.48	16.33	17.69
		1	74	17.42	16.25	17.57
		36	0	16.03	15.85	16.45
		36	18	15.96	15.86	16.54
		36	39	15.96	15.98	16.59
		75	0	16.16	15.98	16.74

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				39750 CH	40620 CH	41490 CH
				2506.0 MHz	2593.0 MHz	2680.0 MHz
41 / 20M	QPSK	1	0	17.96	17.93	18.40
		1	50	18.23	18.13	18.87
		1	99	17.67	18.07	18.68
		50	0	17.20	16.87	17.65
		50	25	17.18	16.88	17.70
		50	50	17.15	16.92	17.72
		100	0	17.10	16.92	17.70
	16QAM	1	0	16.70	15.68	17.31
		1	50	17.02	15.47	17.66
		1	99	16.31	15.50	17.59
		50	0	16.13	15.68	16.55
		50	25	16.09	15.78	16.59
		50	50	16.06	15.82	16.69
		100	0	15.99	15.69	16.62

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	25.04	24.89	24.99
		1	2	25.05	24.96	25.03
		1	5	25.07	24.91	25.01
		3	0	25.03	25.13	25.03
		3	1	25.06	25.21	25.12
		3	2	25.04	25.18	24.95
		6	0	24.16	24.11	24.00
	16QAM	1	0	24.14	23.99	23.82
		1	2	24.07	24.15	23.79
		1	5	24.05	23.90	23.87
		3	0	24.24	24.25	23.68
		3	1	24.35	24.15	23.76
		3	2	24.26	24.24	23.80
		6	0	23.54	23.50	22.89

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	25.16	25.06	24.90
		1	7	25.10	25.12	25.09
		1	14	25.07	25.07	25.04
		8	0	24.10	24.10	23.99
		8	4	23.99	24.05	24.02
		8	7	23.96	24.19	24.01
		15	0	24.05	24.14	23.97
	16QAM	1	0	24.10	23.84	23.98
		1	7	23.99	24.14	24.03
		1	14	23.73	23.67	24.00
		8	0	23.21	23.12	23.21
		8	4	23.19	23.08	23.23
		8	7	23.17	22.99	23.34
		15	0	23.07	23.09	23.20

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	24.99	24.83	24.83
		1	13	25.00	24.90	25.03
		1	24	25.09	24.91	25.00
		12	0	24.15	24.05	24.18
		12	6	24.02	24.12	24.22
		12	11	23.96	24.13	24.19
		25	0	24.04	24.07	24.15
	16QAM	1	0	23.42	23.99	23.53
		1	13	23.39	23.93	23.62
		1	24	23.47	23.48	23.79
		12	0	23.22	23.01	23.03
		12	6	23.11	23.05	23.11
		12	11	22.89	23.05	23.18
		25	0	23.04	23.11	23.07

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	25.31	25.22	25.09
		1	25	25.35	25.25	25.12
		1	49	25.29	25.14	25.33
		25	0	24.10	24.19	24.29
		25	13	24.19	24.07	24.24
		25	25	24.23	24.13	24.20
		50	0	24.22	24.11	24.20
	16QAM	1	0	23.94	23.83	23.62
		1	25	24.13	23.78	23.94
		1	49	23.91	23.78	24.32
		25	0	23.20	23.30	23.30
		25	13	23.19	23.45	23.51
		25	25	23.29	23.39	23.36
		50	0	23.31	22.99	23.25

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	25.21	25.22	25.15
		1	38	25.60	25.11	25.16
		1	74	25.47	25.09	25.31
		36	0	24.27	25.09	24.26
		36	18	24.34	24.19	24.36
		36	39	24.22	24.15	24.28
		75	0	24.24	24.15	24.28
	16QAM	1	0	24.13	23.45	24.90
		1	38	24.34	23.98	24.75
		1	74	24.17	23.51	24.91
		36	0	23.34	23.51	23.35
		36	18	23.38	23.22	23.26
		36	39	23.32	23.30	23.33
		75	0	23.27	23.20	23.39

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	24.81	24.80	25.53
		1	50	25.38	24.29	25.61
		1	99	25.07	24.87	25.30
		50	0	24.29	24.21	24.31
		50	25	24.31	24.24	24.32
		50	50	24.29	24.19	24.31
		100	0	24.33	24.26	24.25
	16QAM	1	0	23.85	23.69	23.92
		1	50	24.05	23.26	24.30
		1	99	24.08	24.20	23.86
		50	0	23.23	23.29	23.25
		50	25	23.29	23.43	23.43
		50	50	23.26	23.40	23.30
		100	0	23.33	23.30	23.36

ERP Power (dBm):

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	21.37	21.44	21.60
		1	2	21.34	21.39	21.48
		1	5	21.35	21.34	21.50
		3	0	21.40	21.49	21.68
		3	1	21.56	21.60	21.67
		3	2	21.47	21.58	21.64
	16QAM	6	0	20.27	20.43	20.63
		1	0	20.25	20.32	20.16
		1	2	20.53	20.49	20.61
		1	5	20.65	20.11	20.30
		3	0	20.07	20.09	20.49
		3	1	20.25	20.17	20.59
		3	2	20.46	20.16	20.59
		6	0	19.39	19.29	19.64

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	21.52	21.52	21.60
		1	7	21.68	21.80	21.87
		1	14	21.85	21.76	21.64
		8	0	20.34	20.63	20.60
		8	4	20.57	20.53	20.64
		8	7	20.55	20.47	20.57
		15	0	20.42	20.54	20.51
	16QAM	1	0	20.13	20.32	20.43
		1	7	20.36	20.70	20.64
		1	14	20.49	20.22	20.49
		8	0	19.17	19.38	19.29
		8	4	19.50	19.58	19.69
		8	7	19.49	19.50	19.71
		15	0	19.23	19.44	19.48

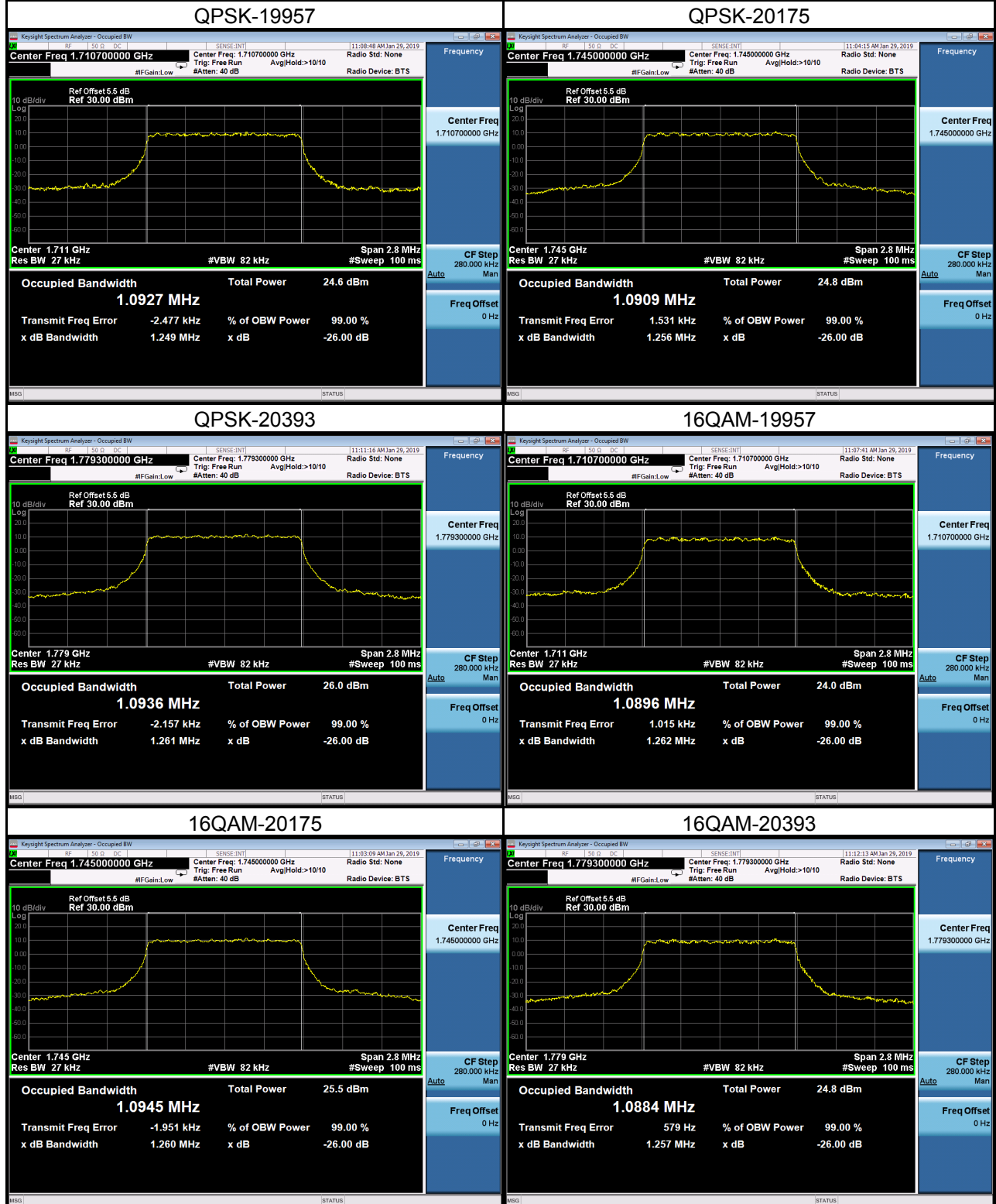
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	21.35	21.03	21.34
		1	13	21.68	21.37	21.72
		1	24	21.54	20.96	21.55
		12	0	20.46	20.50	20.47
		12	6	20.52	20.60	20.58
		12	11	20.41	20.54	20.62
		25	0	20.39	20.50	20.60
	16QAM	1	0	19.71	20.32	20.09
		1	13	20.06	20.47	20.25
		1	24	19.82	19.95	20.32
		12	0	19.28	19.33	19.28
		12	6	19.47	19.53	19.60
		12	11	19.39	19.49	19.67
		25	0	19.47	19.46	19.39

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	21.26	21.41	21.50
		1	25	21.82	21.70	21.46
		1	49	21.37	21.45	21.67
		25	0	20.30	20.38	20.53
		25	13	20.39	20.49	20.44
		25	25	20.43	20.36	20.52
		50	0	20.40	20.40	20.63
	16QAM	1	0	20.02	20.16	20.34
		1	25	20.65	20.22	20.50
		1	49	20.22	19.72	20.58
		25	0	19.50	19.73	19.67
		25	13	19.39	19.75	19.52
		25	25	19.41	19.43	19.64
		50	0	19.47	19.44	19.59

APPENDIX B - OCCUPIED BANDWIDTH

LTE Band 4_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19957	1710.7	1.093	19957	1710.7	1.090
20175	1732.5	1.091	20175	1732.5	1.095
20393	1754.3	1.094	20393	1754.3	1.088
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.249	19957	1710.7	1.262
20175	1732.5	1.256	20175	1732.5	1.260
20393	1754.3	1.261	20393	1754.3	1.257

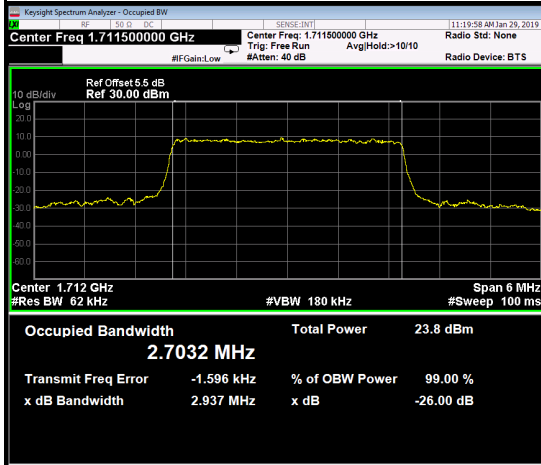
Spectrum Plot



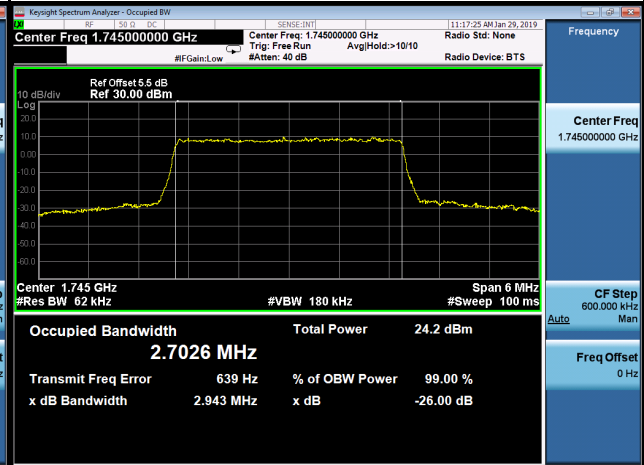
LTE Band 4_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19965	1711.5	2.703	19965	1711.5	2.706
20175	1732.5	2.703	20175	1732.5	2.707
20385	1753.5	2.703	20385	1753.5	2.707
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.937	19965	1711.5	2.933
20175	1732.5	2.943	20175	1732.5	2.943
20385	1753.5	2.935	20385	1753.5	2.938

Spectrum Plot

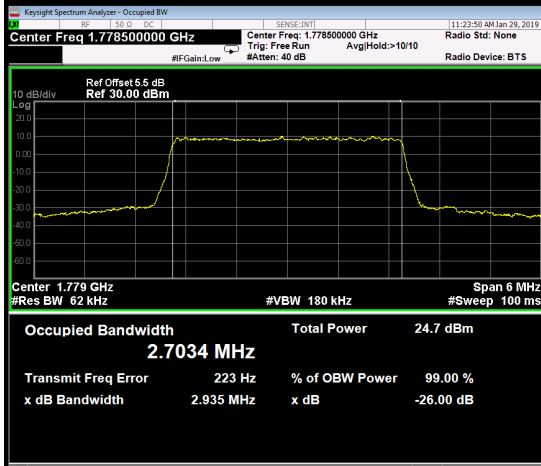
QPSK-19965



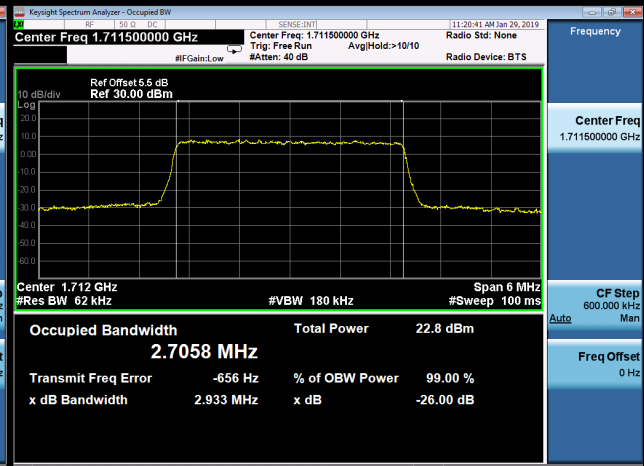
QPSK-20175



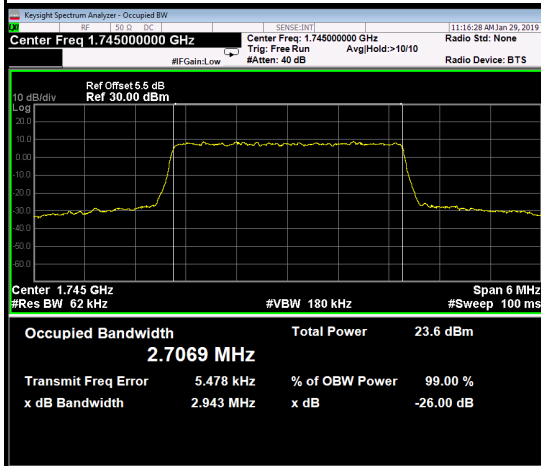
QPSK-20385



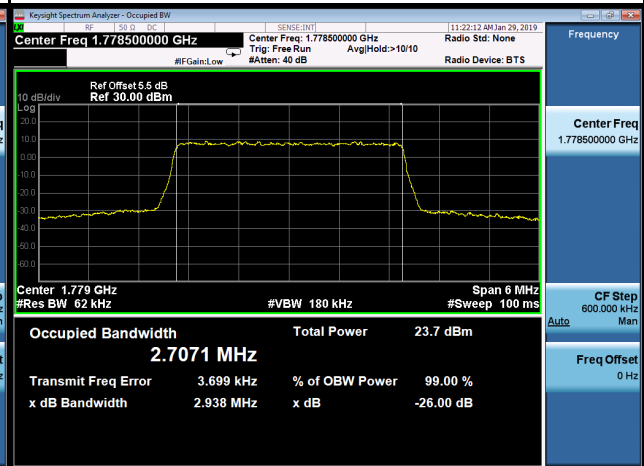
16QAM-19965



16QAM-20175

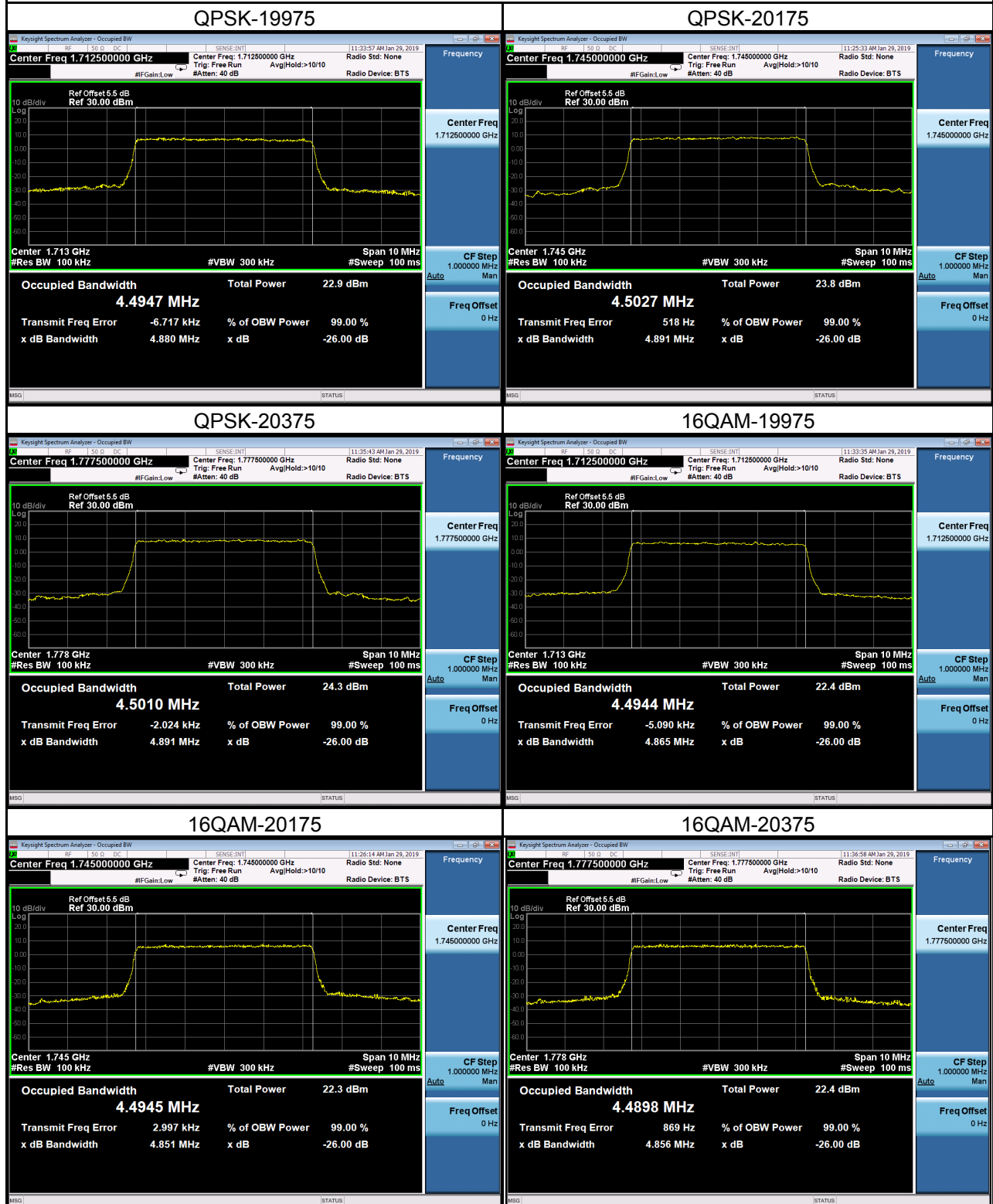


16QAM-20385



LTE Band 4_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
19975	1712.5	4.495	19975	1712.5	4.494
20175	1732.5	4.503	20175	1732.5	4.495
20375	1752.5	4.501	20375	1752.5	4.490
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.880	19975	1712.5	4.865
20175	1732.5	4.891	20175	1732.5	4.851
20375	1752.5	4.891	20375	1752.5	4.856

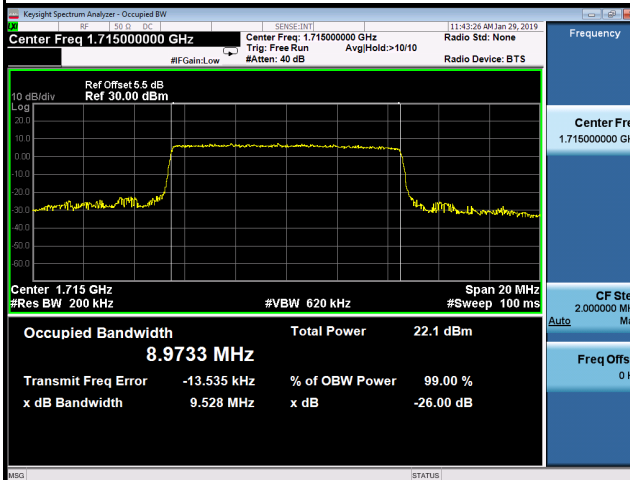
Spectrum Plot



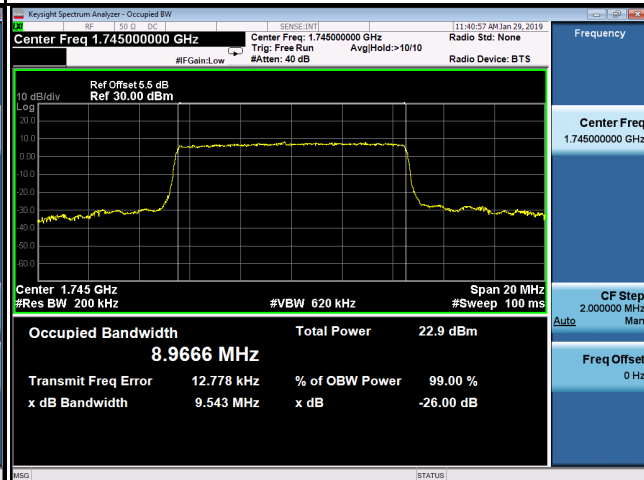
LTE Band 4_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20000	1715	8.973	20000	1715	8.971
20175	1732.5	8.967	20175	1732.5	8.968
20350	1750	8.973	20350	1750	8.973
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	9.528	20000	1715	9.536
20175	1732.5	9.543	20175	1732.5	9.558
20350	1750	9.529	20350	1750	9.519

Spectrum Plot

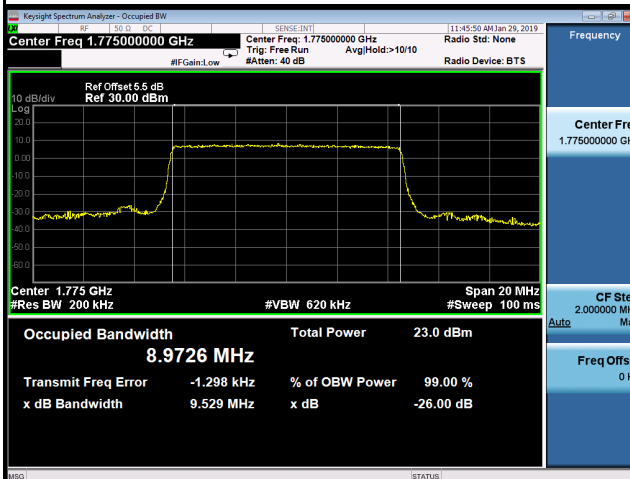
QPSK-20000



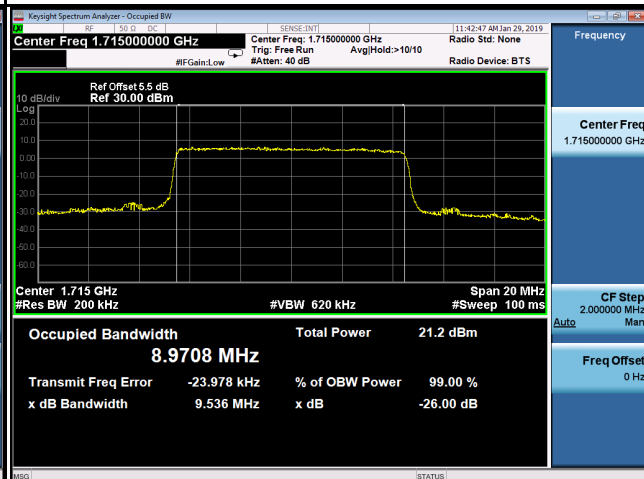
QPSK-20175



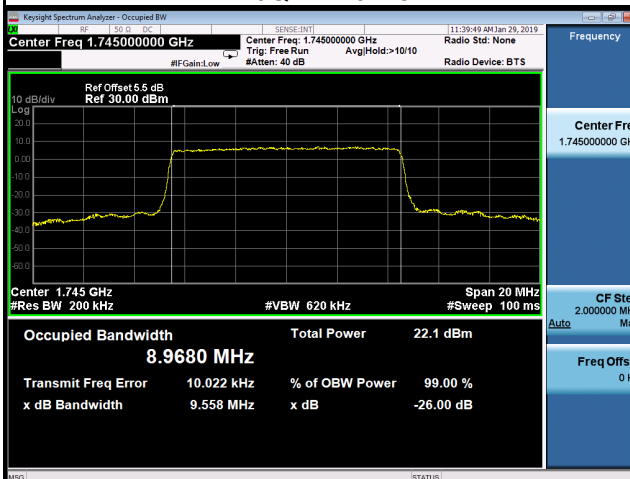
QPSK-20350



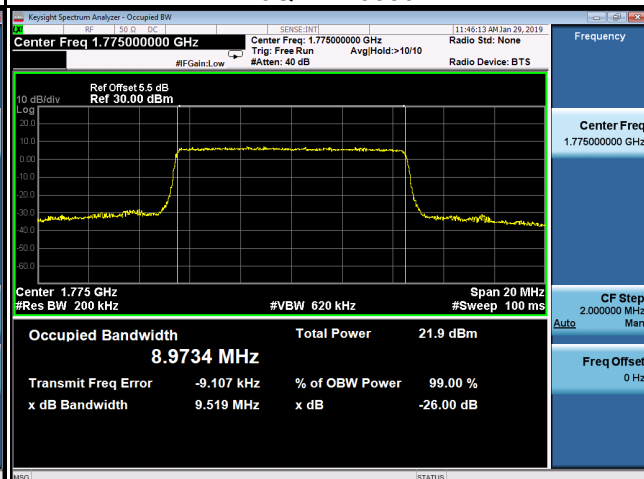
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16QAM-20175



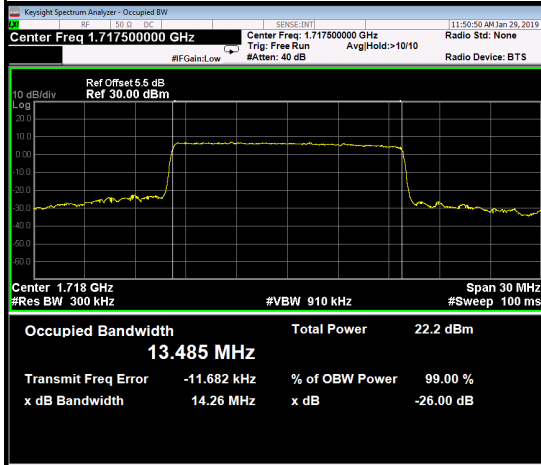
16QAM-20350



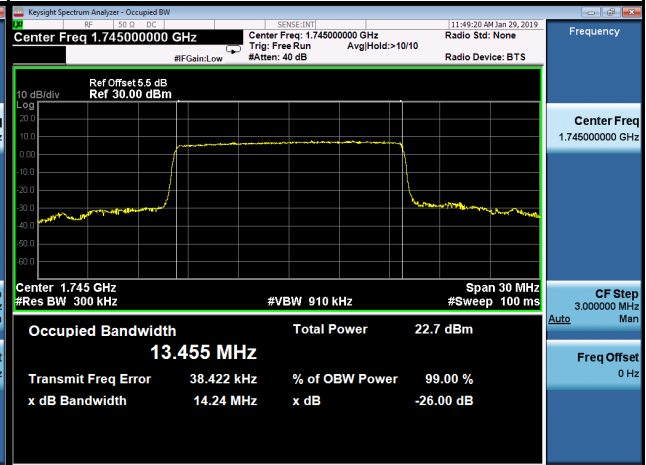
LTE Band 4_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20025	1717.5	13.485	20025	1717.5	13.454
20175	1732.5	13.455	20175	1732.5	13.447
20325	1747.5	13.495	20325	1747.5	13.489
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	14.260	20025	1717.5	14.290
20175	1732.5	14.240	20175	1732.5	14.280
20325	1747.5	14.470	20325	1747.5	14.350

Spectrum Plot

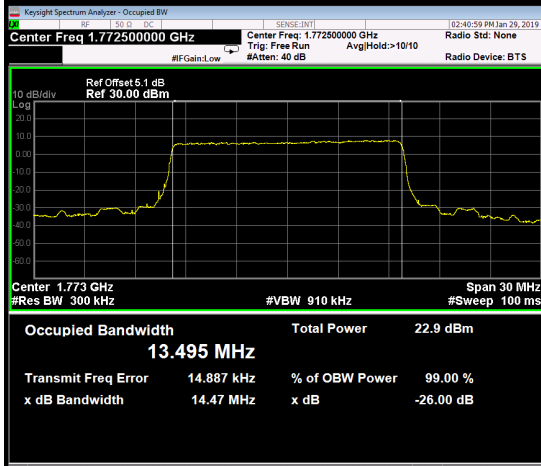
QPSK-20025



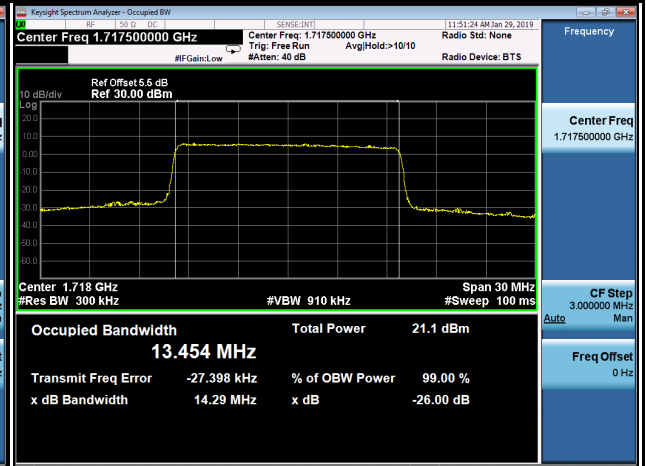
QPSK-20175



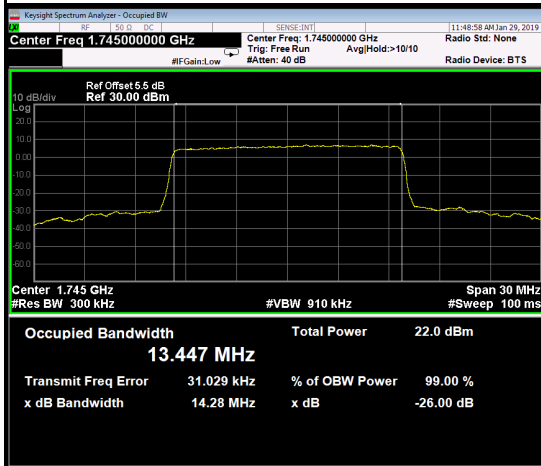
QPSK-20325



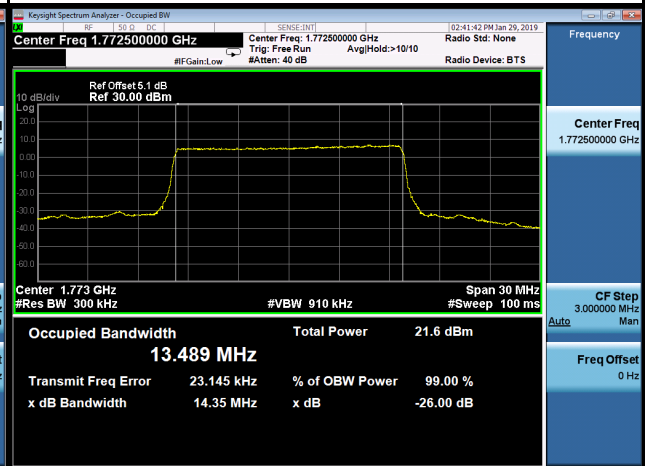
16QAM-20025



16QAM-20175

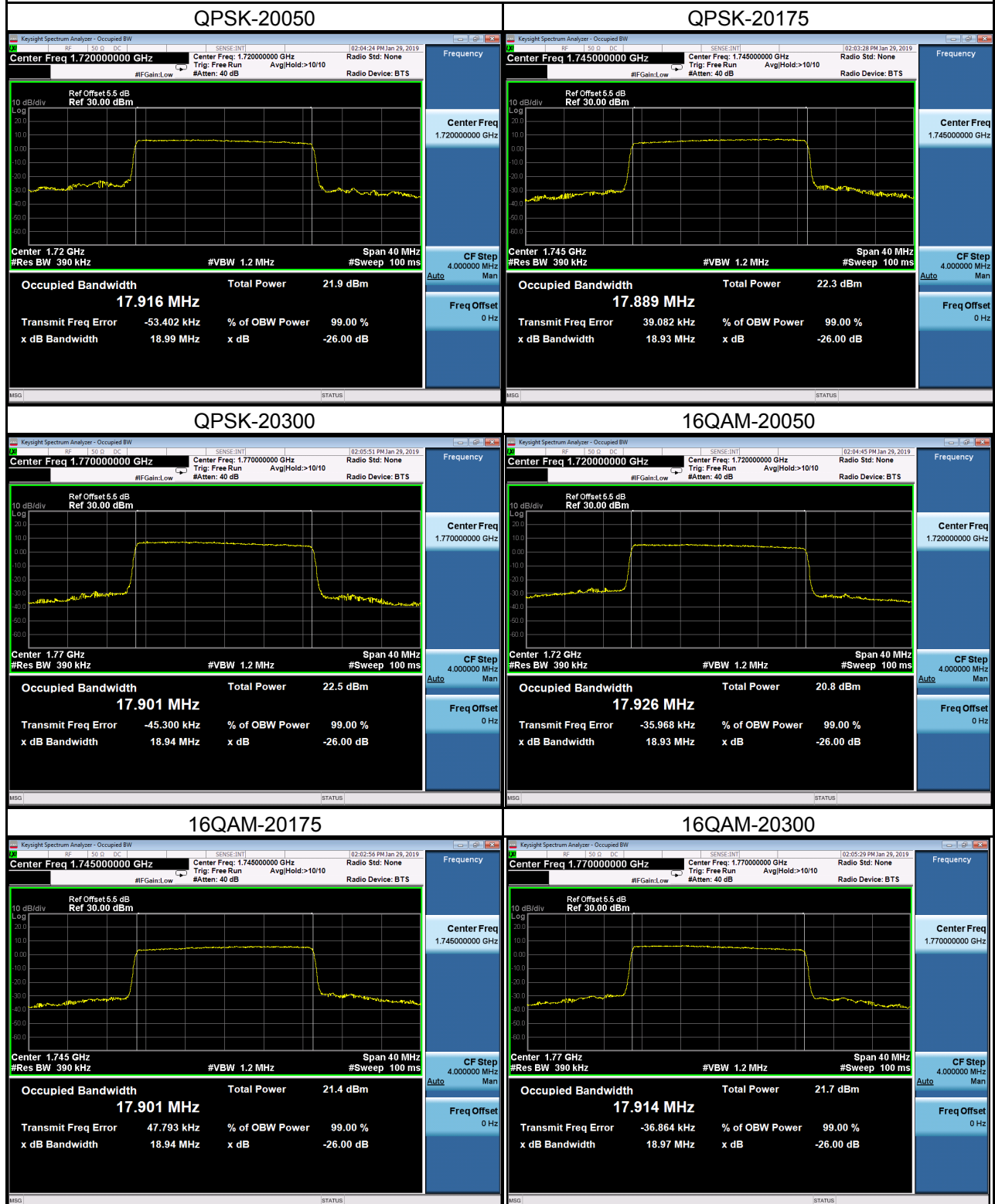


16QAM-20325



LTE Band 4_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
20050	1720	17.916	20050	1720	17.926
20175	1732.5	17.889	20175	1732.5	17.901
20300	1745	17.901	20300	1745	17.914
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	18.99	20050	1720	18.93
20175	1732.5	18.93	20175	1732.5	18.94
20300	1745	18.94	20300	1745	18.97

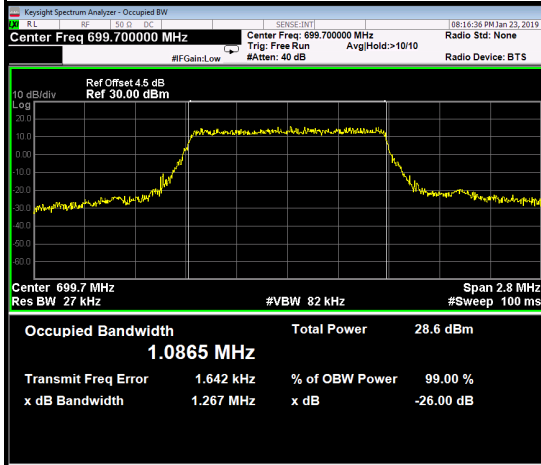
Spectrum Plot



LTE Band 12_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23017	699.7	1.087	23017	699.7	1.096
23095	707.5	1.098	23095	707.5	1.092
23173	715.3	1.086	23173	715.3	1.092
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.267	23017	699.7	1.285
23095	707.5	1.281	23095	707.5	1.288
23173	715.3	1.263	23173	715.3	1.307

Spectrum Plot

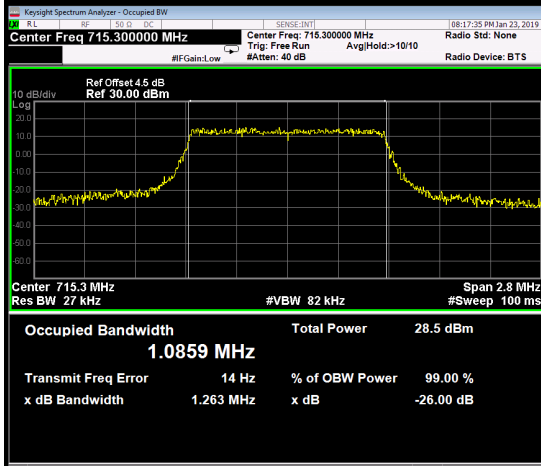
QPSK-23017



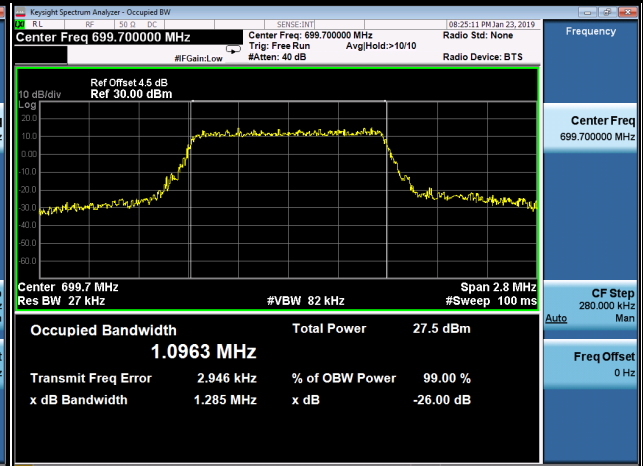
QPSK-23095



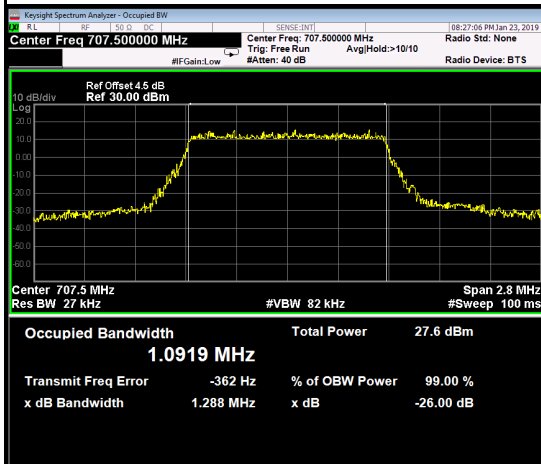
QPSK-23173



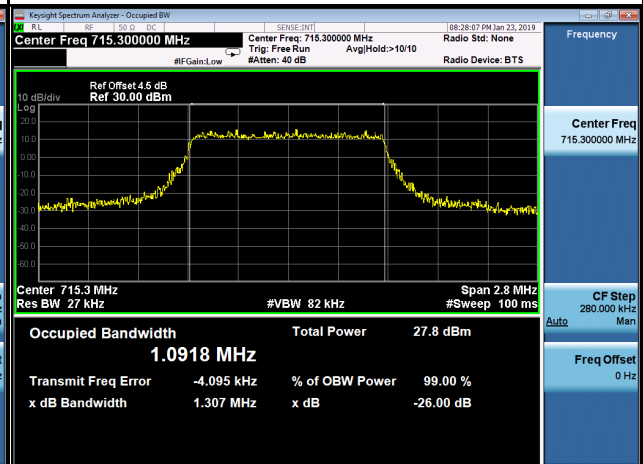
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16QAM-23095

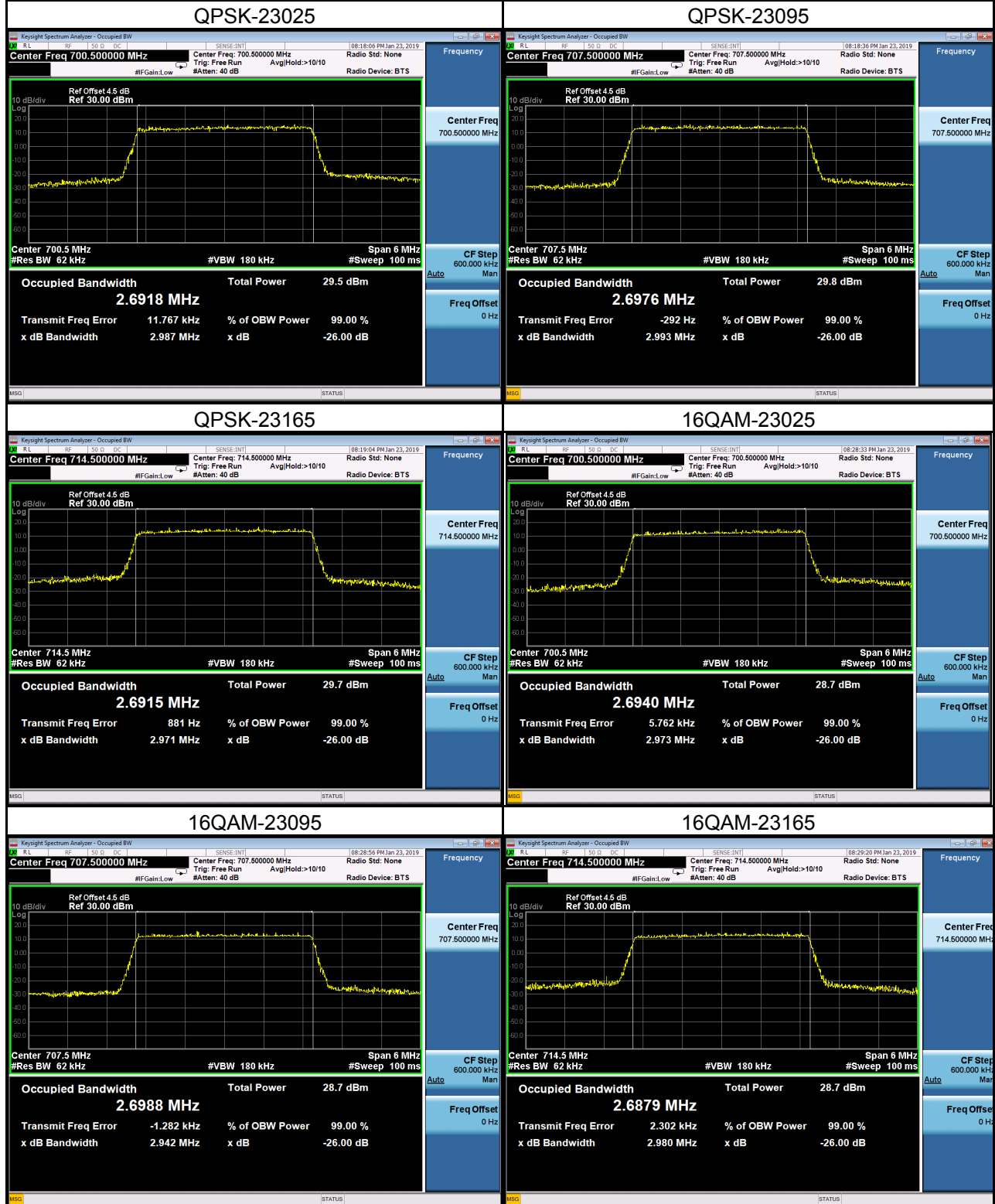


16QAM-23173



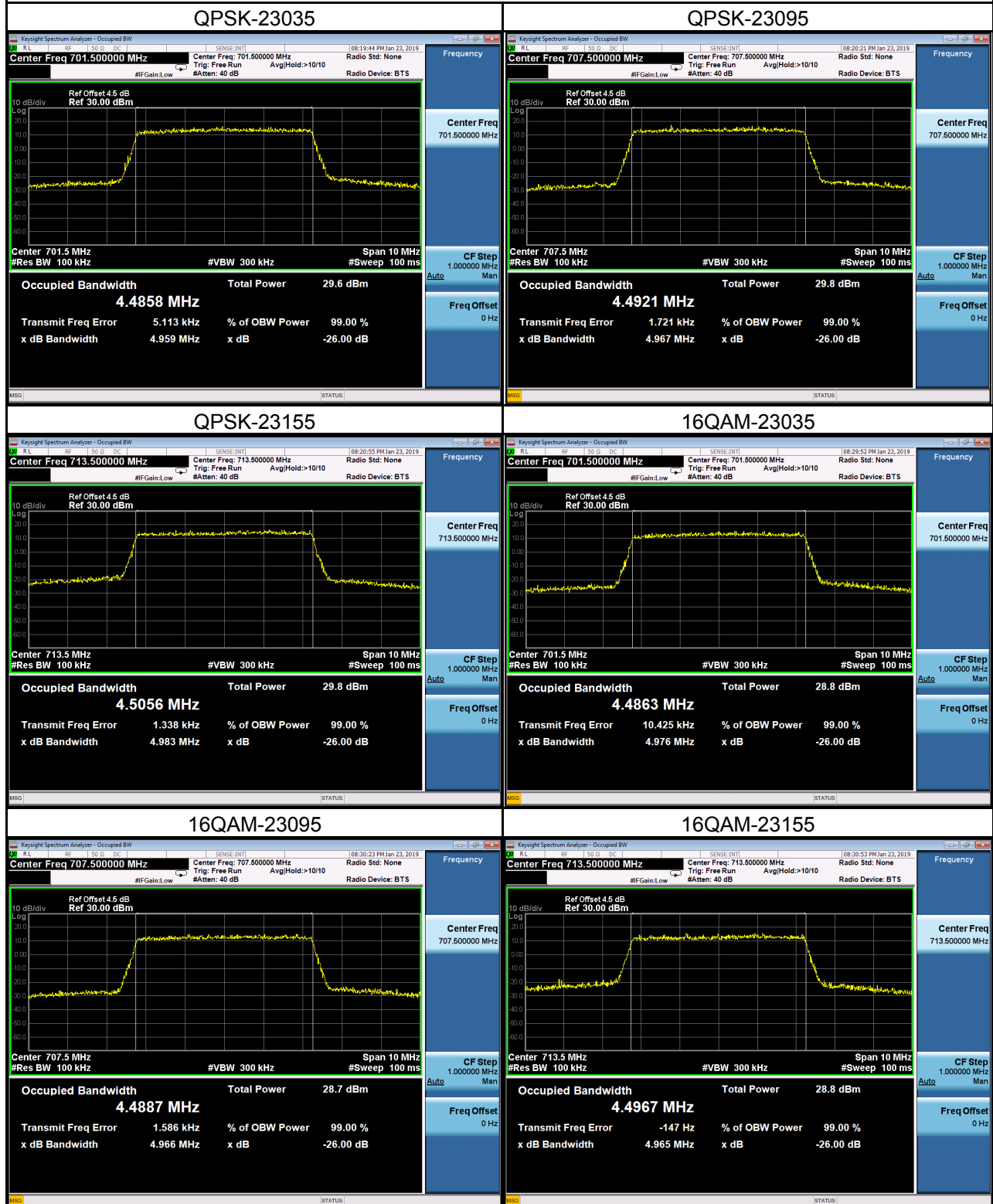
LTE Band 12_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23025	700.5	2.692	23025	700.5	2.694
23095	707.5	2.698	23095	707.5	2.699
23165	714.5	2.692	23165	714.5	2.688
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.987	23025	700.5	2.973
23095	707.5	2.993	23095	707.5	2.942
23165	714.5	2.971	23165	714.5	2.980

Spectrum Plot



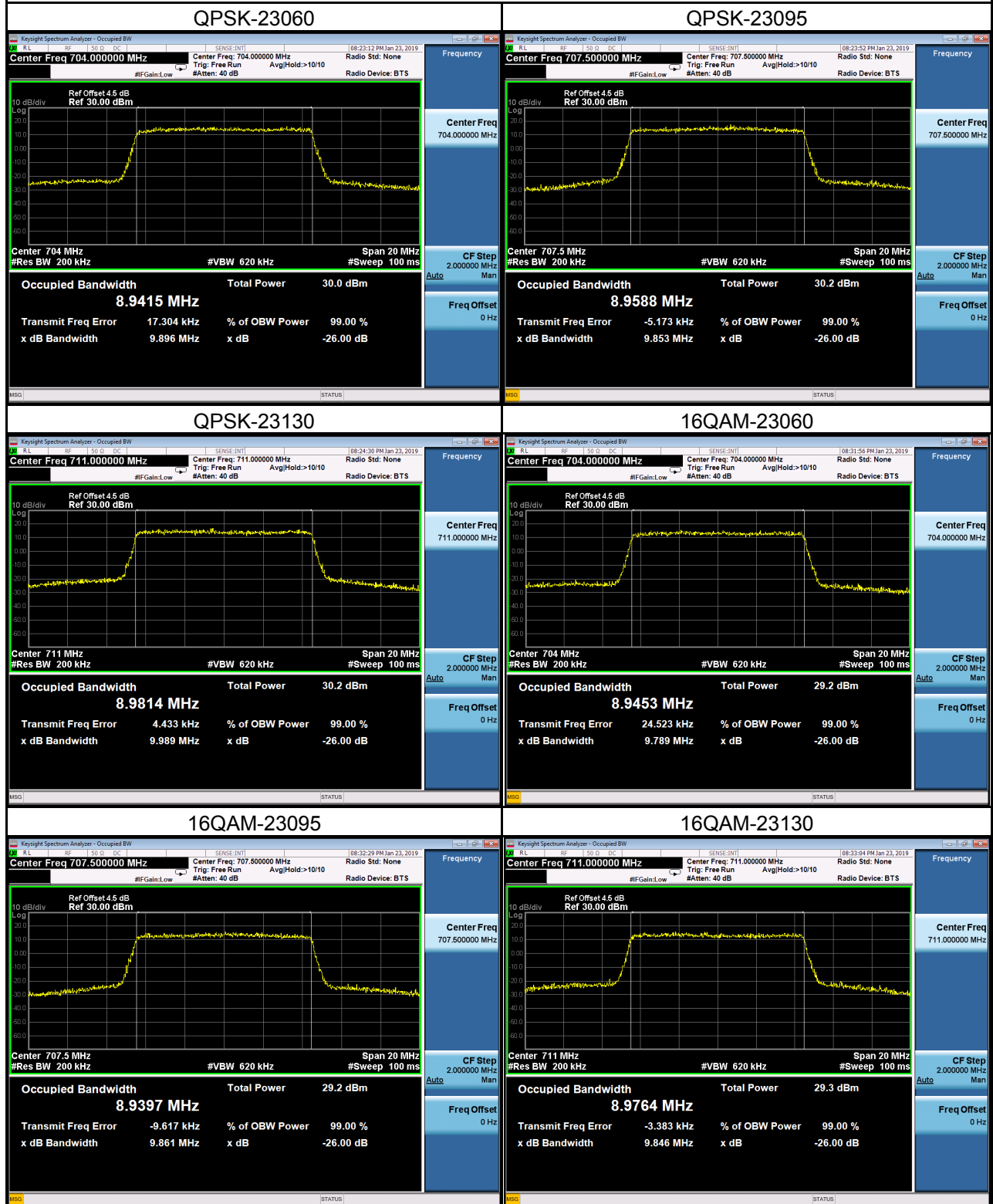
LTE Band 12_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23035	701.5	4.486	23035	701.5	4.486
23095	707.5	4.492	23095	707.5	4.489
23155	713.5	4.506	23155	713.5	4.497
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23035	701.5	4.959	23035	701.5	4.976
23095	707.5	4.967	23095	707.5	4.966
23155	713.5	4.983	23155	713.5	4.965

Spectrum Plot



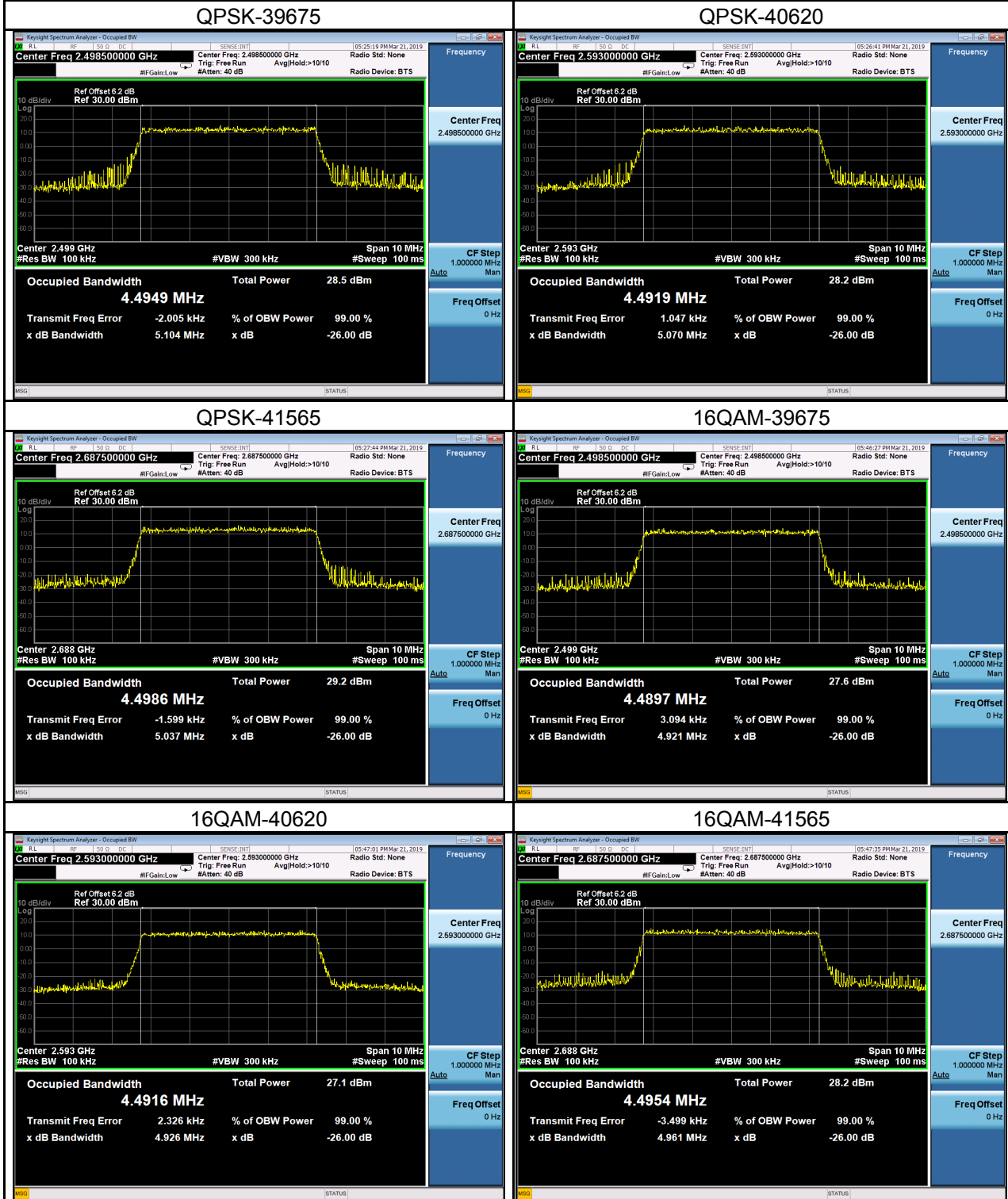
LTE Band 12_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
23060	704.0	8.942	23060	704.0	8.945
23095	707.5	8.959	23095	707.5	8.940
23130	711.0	8.981	23130	711.0	8.976
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23060	704.0	9.896	23060	704.0	9.789
23095	707.5	9.853	23095	707.5	9.861
23130	711.0	9.989	23130	711.0	9.846

Spectrum Plot



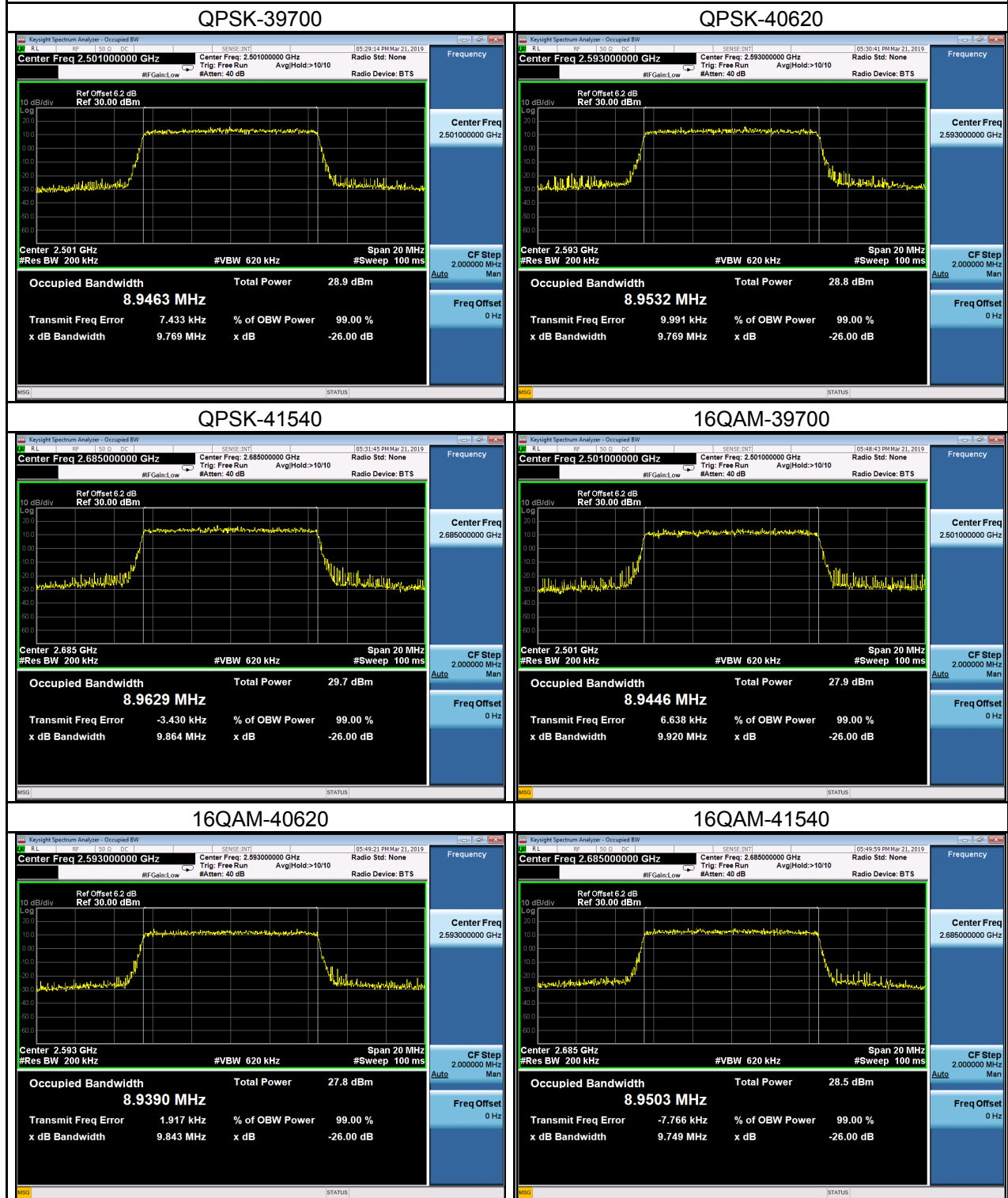
LTE Band 41_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
39675	2498.5	4.4949	39675	2498.5	4.4897
40620	2593.0	4.4919	40620	2593.0	4.4916
41565	2687.5	4.4986	41565	2687.5	4.4954
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
39675	2498.5	5.104	39675	2498.5	4.921
40620	2593.0	5.070	40620	2593.0	4.926
41565	2687.5	5.037	41565	2687.5	4.961

Spectrum Plot



LTE Band 41_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
39700	2501.0	8.9463	39700	2501.0	8.9446
40620	2593.0	8.9532	40620	2593.0	8.9390
41540	2685.0	8.9626	41540	2685.0	8.9503
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
39700	2501.0	9.769	39700	2501.0	9.920
40620	2593.0	9.769	40620	2593.0	9.843
41540	2685.0	9.864	41540	2685.0	9.749

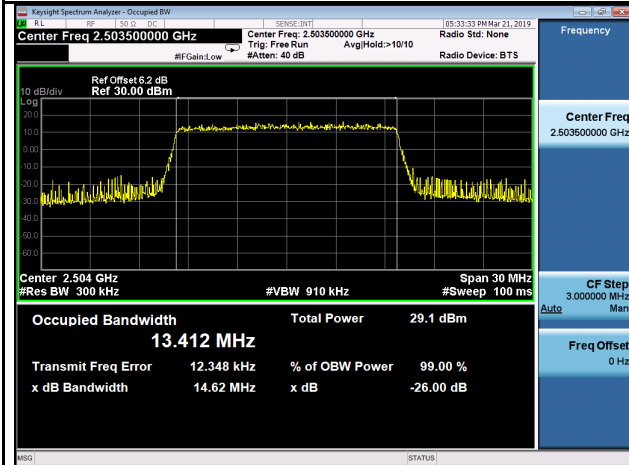
Spectrum Plot



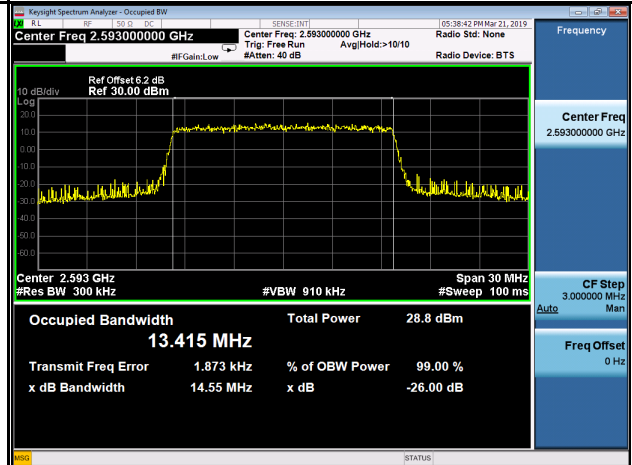
LTE Band 41_15M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
39725	2503.5	13.412	39725	2503.5	13.442
40620	2593.0	13.415	40620	2593.0	13.424
41515	2682.5	13.431	41515	2682.5	13.422
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
39725	2503.5	14.62	39725	2503.5	15.16
40620	2593.0	14.55	40620	2593.0	14.69
41515	2682.5	14.63	41515	2682.5	14.91

Spectrum Plot

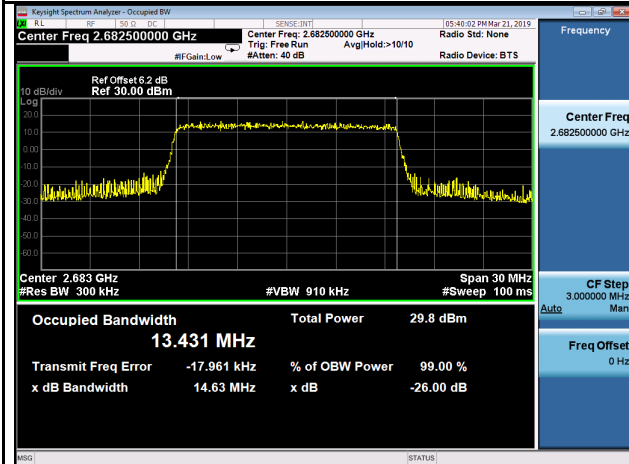
QPSK-39725



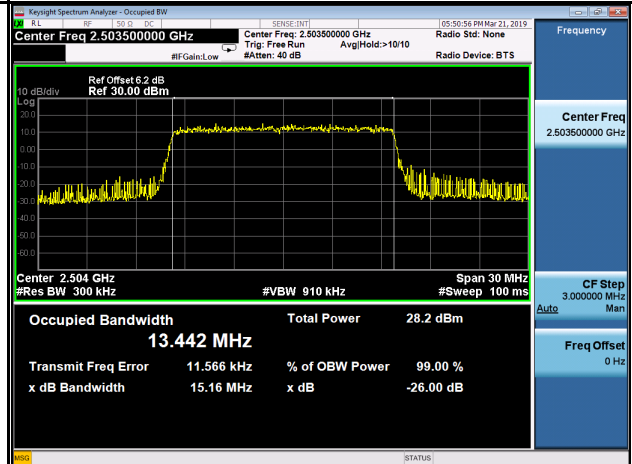
QPSK-40620



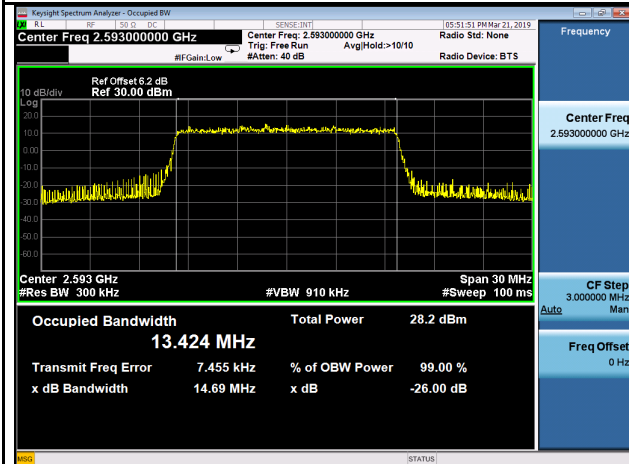
QPSK-41515



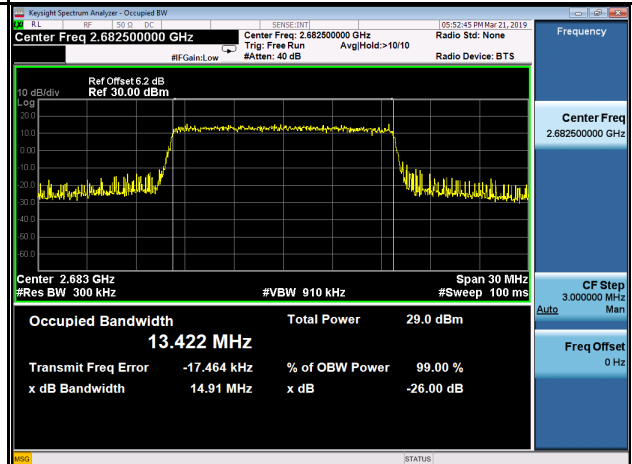
16QAM-39725



16QAM-40620



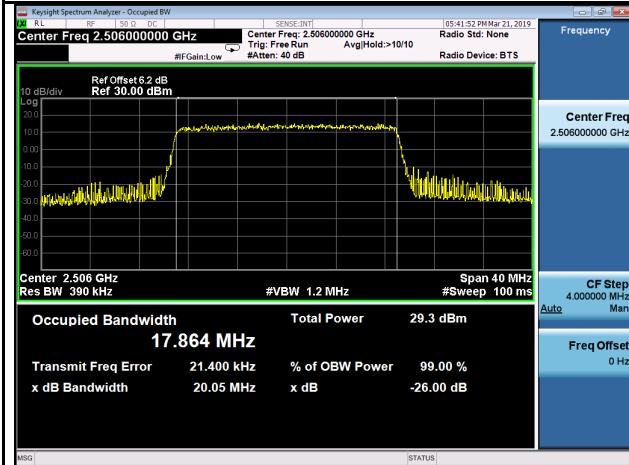
16QAM-41515



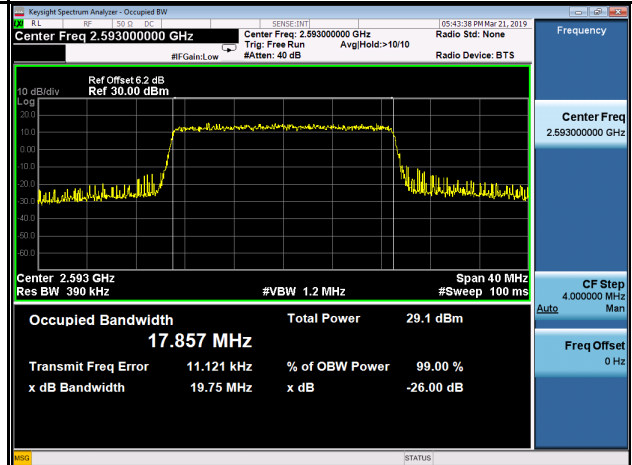
LTE Band 41_20M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
39750	2506.0	17.864	39750	2506.0	17.877
40620	2593.0	17.857	40620	2593.0	17.848
41490	2680.0	17.881	41490	2680.0	17.867
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
39750	2506.0	20.05	39750	2506.0	21.53
40620	2593.0	19.75	40620	2593.0	19.89
41490	2680.0	19.53	41490	2680.0	19.92

Spectrum Plot

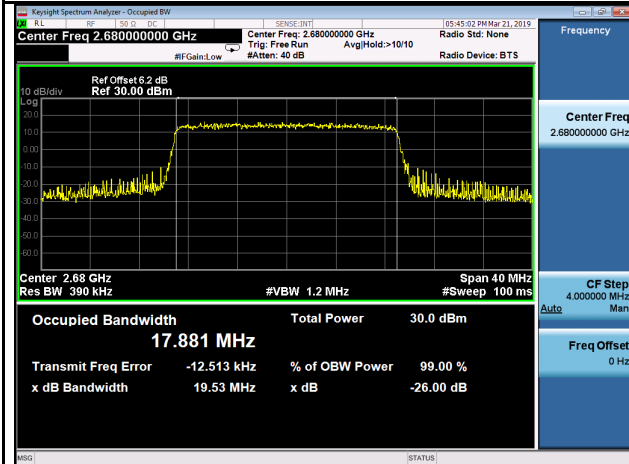
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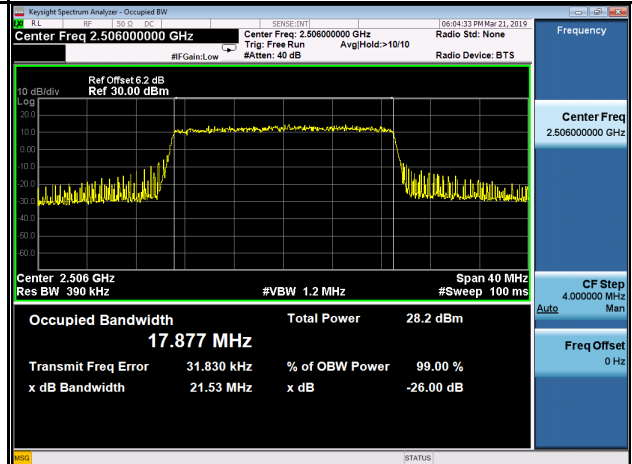
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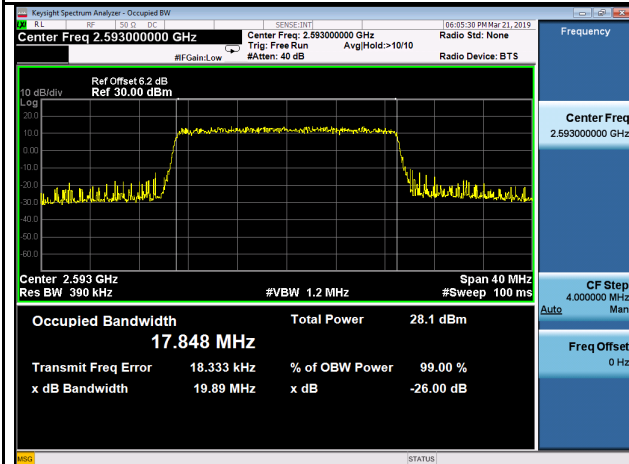
QPSK-41490



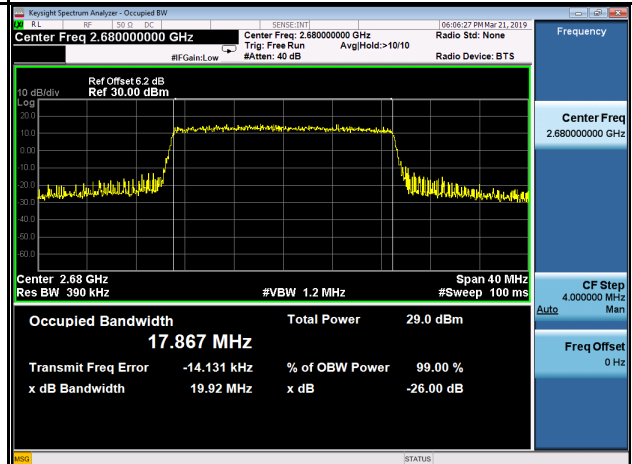
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16QAM-40620

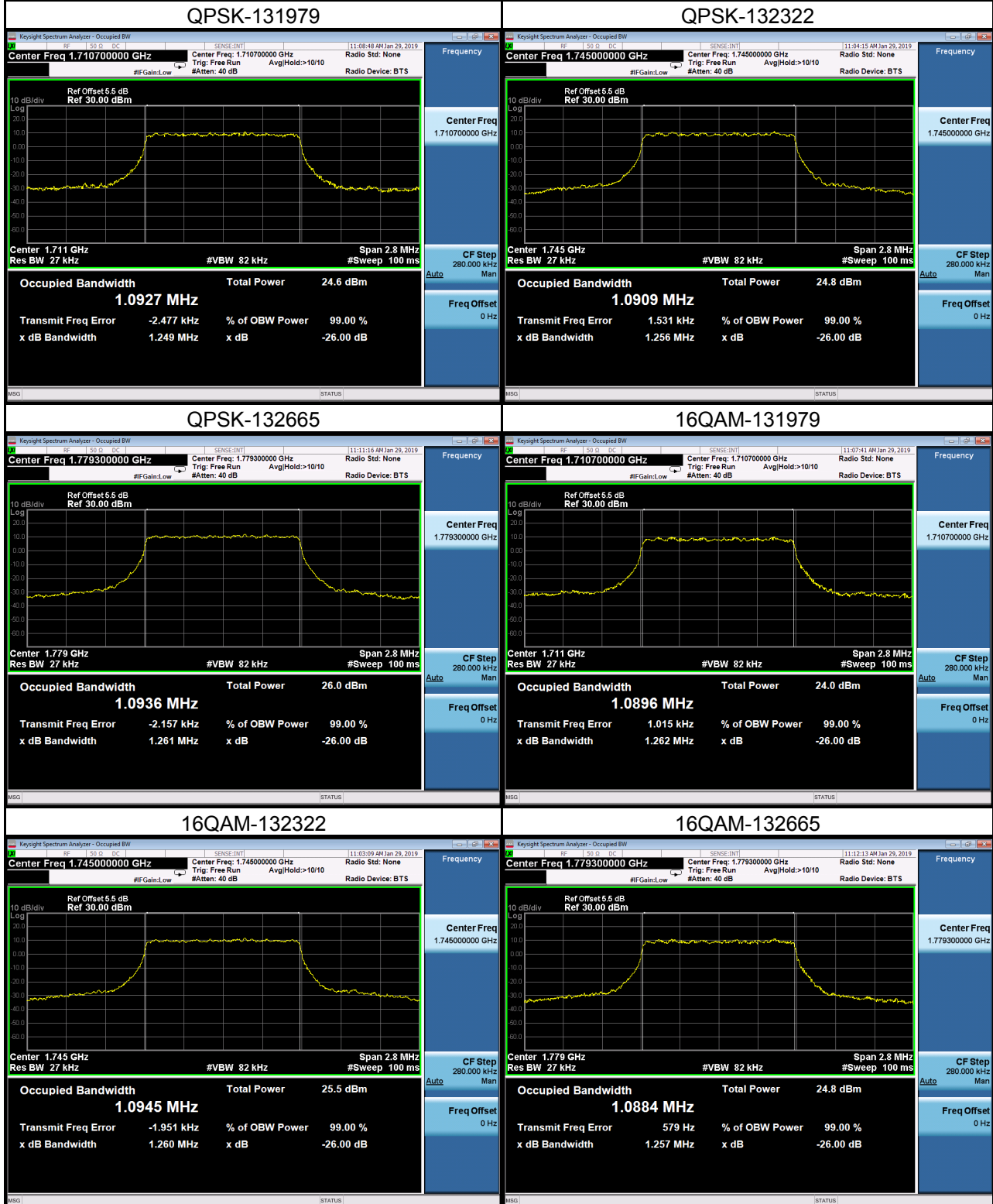


16QAM-41490



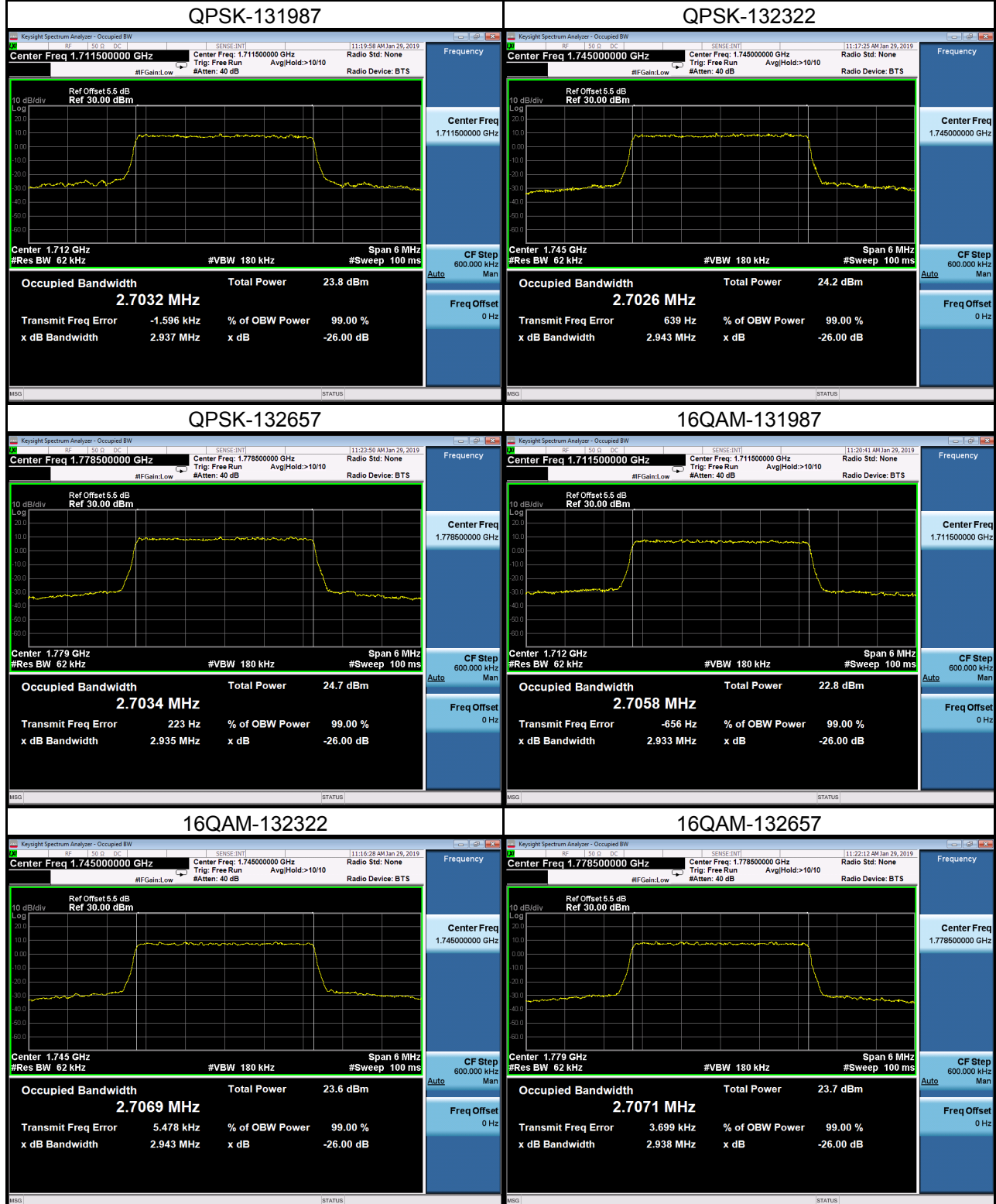
LTE Band 66_1.4M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
131979	1710.7	1.093	131979	1710.7	1.090
132322	1745.0	1.091	132322	1745.0	1.095
132665	1779.3	1.094	132665	1779.3	1.088
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
131979	1710.7	1.249	131979	1710.7	1.262
132322	1745.0	1.256	132322	1745.0	1.260
132665	1779.3	1.261	132665	1779.3	1.257

Spectrum Plot



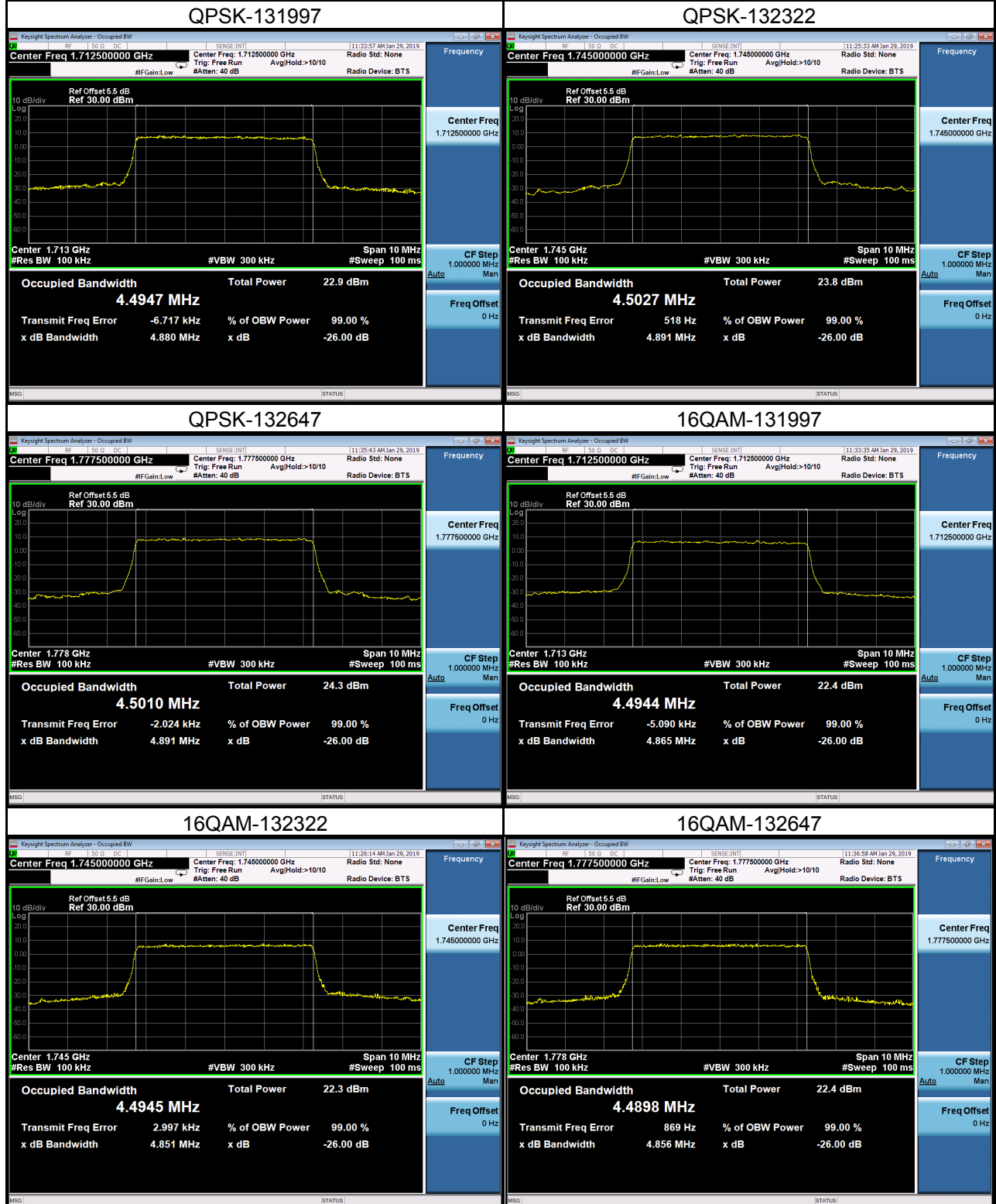
LTE Band 66_3M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
131987	1711.5	2.703	131987	1711.5	2.706
132322	1745.0	2.703	132322	1745.0	2.707
132657	1778.5	2.703	132657	1778.5	2.707
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
131987	1711.5	2.937	131987	1711.5	2.933
132322	1745.0	2.943	132322	1745.0	2.943
132657	1778.5	2.935	132657	1778.5	2.938

Spectrum Plot



LTE Band 66_5M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
131997	1712.5	4.495	131997	1712.5	4.494
132322	1745.0	4.503	132322	1745.0	4.495
132647	1777.5	4.501	132647	1777.5	4.490
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
131997	1712.5	4.880	131997	1712.5	4.865
132322	1745.0	4.891	132322	1745.0	4.851
132647	1777.5	4.891	132647	1777.5	4.856

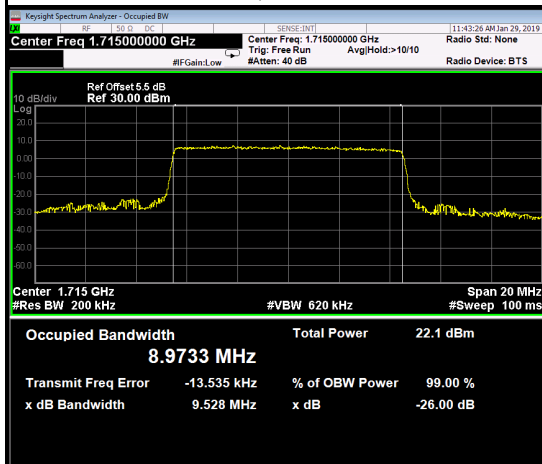
Spectrum Plot



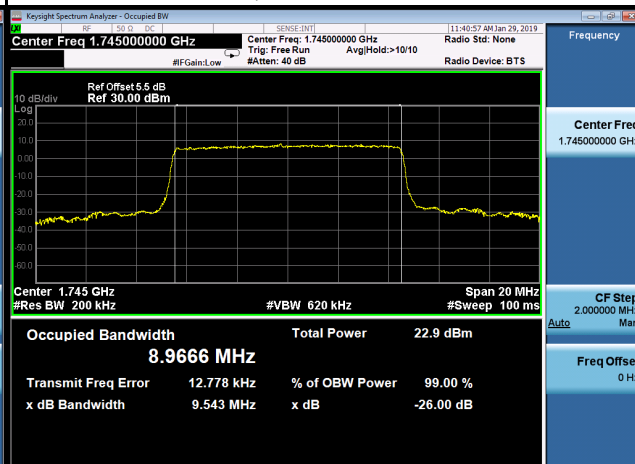
LTE Band 66_10M					
QPSK			16QAM		
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)
132022	1715.0	8.973	132022	1715.0	8.971
132322	1745.0	8.967	132322	1745.0	8.968
132622	1775.0	8.973	132622	1775.0	8.973
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
132022	1715.0	9.528	132022	1715.0	9.536
132322	1745.0	9.543	132322	1745.0	9.558
132622	1775.0	9.529	132622	1775.0	9.519

Spectrum Plot

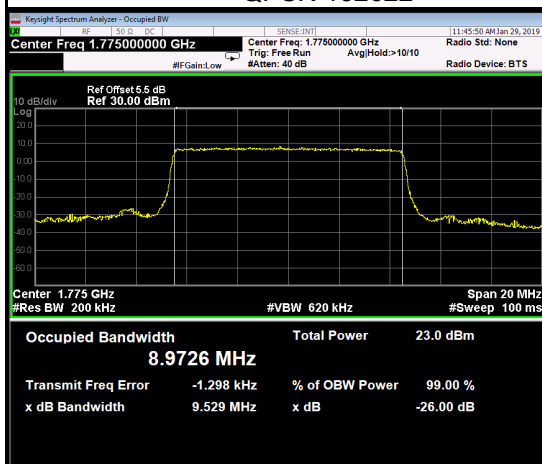
QPSK-132022



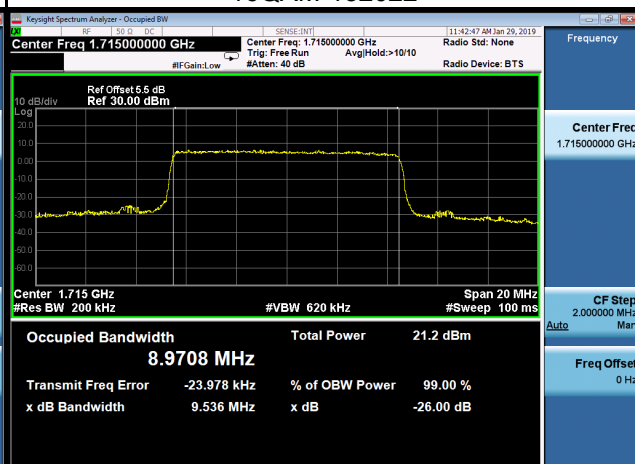
QPSK-132322



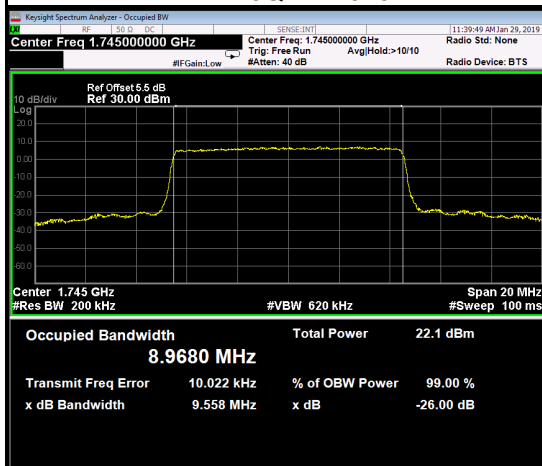
QPSK-132622



16QAM-132022



16QAM-132322



16QAM-132622

