

FCC Radio Test Report

FCC ID: 2A25M-PRE31G

This report concerns: Original Grant

Project No. : 2108C220
Equipment : Pre-install 3.1G
Brand Name : Clobotics
Test Model : Sloth pre3.1G
Series Model : N/A
Applicant : SHANGHAI CLOBOTICS TECHNOLOGY CO., LTD
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Date of Receipt : Sep. 09, 2021
Date of Test : Sep. 10, 2021 ~ Oct. 26, 2021
Issued Date : Oct. 26, 2021
Report Version : R01
Test Sample : Engineering Sample No.: DG2021090933 for conducted, DG2021090934 for radiated.
Standard(s) : 47 CFR FCC Part 27 Subpart L
47 CFR FCC Part 27 Subpart M
47 CFR FCC Part 27 Subpart C
47 CFR FCC Part 2
ANSI/TIA/EIA-603-E-2016
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.

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TESTING CERT #5123.02

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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.	Oct. 18, 2021
R01	Modified the comments of TCB.	Oct. 26, 2021

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part 27 Subpart L, M, C & Part 2			
Standard(s) Section	Test Item	Judgment	Remark
2.1046	Output Power	PASS	-----
27.50(d)(4) 27.50(c)(10) 27.50(h)(2)	Equivalent Isotropic Radiated Power & Equivalent Radiated Power	PASS	-----
2.1049	Occupied Bandwidth	PASS	-----
2.1051 27.53(h) 27.53(m)(4)	Conducted Spurious Emissions	PASS	-----
2.1053 27.53(h) 27.53(m)(4)	Radiated Spurious Emissions	PASS	-----
2.1051 27.53(h) 27.53(m)(4)	Band Edge Measurements	PASS	-----
27.50(d)(5)	Peak To Average Ratio	PASS	-----
2.1055 27.54	Frequency Stability	PASS	-----

Note:

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

1.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's Test Firm Registration Number for FCC: 357015
BTL's Designation Number for FCC: CN1240

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 %, $U=2 \times U_c(y)$.

The BTL measurement uncertainty as below table:

A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	-	2.36
		30MHz ~ 200MHz	V	4.36
		30MHz ~ 200MHz	H	3.32
		200MHz ~ 1,000MHz	V	4.08
		200MHz ~ 1,000MHz	H	3.96
		1GHz ~ 6GHz	-	3.80
		6GHz ~ 18GHz	-	4.82

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

B. Other Measurement:

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

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

1.3 TEST ENVIRONMENT CONDITIONS

Test Item	Temperature	Humidity	Test Voltage	Tested By
Output Power & EIRP & ERP	22.2°C	53%	DC 12V	Tate Liu
Occupied Bandwidth	22.2°C	53%	DC 12V	Tate Liu
Conducted Spurious Emissions	22.2°C	53%	DC 12V	Tate Liu
Radiated Spurious Emissions	26°C	52%	DC 12V	Kwok Guo
Band Edge	22.2°C	53%	DC 12V	Tate Liu
Peak To Average Ratio	22.2°C	53%	DC 12V	Tate Liu
Frequency Stability	Normal and Extreme			Tate Liu

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Pre-install 3.1G			
Brand Name	Clobotics			
Test Model	Sloth pre3.1G			
Series Model	N/A			
Model Difference(s)	N/A			
Hardware Version	DH603_MB_V1.0			
Software Version	2.0.7			
Power Source	DC Voltage supplied from External Power Supply.			
Power Rating	DC 12V			
IEMI No.	Radiated	675646644564647		
	Conducted	664547655656558		
Modulation Type	LTE		QPSK,16QAM	
Max. EIRP	LTE	Channel Bandwidth (MHz)	QPSK (dBm)	16QAM (dBm)
	Band 4	1.4	23.77	23.08
		3	23.75	23.03
		5	23.73	23.06
		10	23.79	23.05
		15	23.58	22.94
		20	23.74	23.28
	Band 7	5	27.76	26.77
		10	27.57	26.55
		15	27.35	26.59
		20	27.35	27.13
	Band 38	5	27.94	27.12
		10	28.19	27.45
		15	27.89	27.15
		20	28.04	27.36
	Band 41	5	28.07	27.40
		10	28.31	27.65
		15	28.07	27.34
		20	28.32	27.67
Max. ERP	Band 12	1.4	19.92	19.07
		3	19.91	18.95
		5	19.95	19.29
		10	20.01	18.87

Note:

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

2. Channel List:

LTE Band 4					
Test Frequency ID	Bandwidth (MHz)	N _{UL}	Frequency of Uplink (MHz)	N _{DL}	Frequency of Downlink (MHz)
Low Range	1.4	19957	1710.7	1957	2110.7
	3	19965	1711.5	1965	2111.5
	5	19975	1712.5	1975	2112.5
	10	20000	1715	2000	2115
	15	20025	1717.5	2025	2117.5
	20	20050	1720	2050	2120
Mid Range	1.4/3/5/10/15/20	20175	1732.5	2175	2132.5
High Range	1.4	20393	1754.3	2393	2154.3
	3	20385	1753.5	2385	2153.5
	5	20375	1752.5	2375	2152.5
	10	20350	1750	2350	2150
	15	20325	1747.5	2325	2147.5
	20	20300	1745	2300	2145

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

LTE Band 12			
Test Frequency ID	Bandwidth (MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	1.4	23017	699.7
	3	23025	700.5
	5	23035	701.5
	10	23060	704.0
Mid Range	1.4/3/5/10	23095	707.5
High Range	1.4	23173	715.3
	3	23165	714.5
	5	23155	713.5
	10	23130	711.0

LTE Band 38			
Test Frequency ID	Bandwidth (MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	37775	2572.5
	10	37800	2575
	15	37825	2577.5
	20	37850	2580
Mid Range	5/10/15/20	38000	2600
High Range	5	38225	2617.5
	10	38200	2615
	15	38175	2612.5
	20	38150	2610

LTE Band 41			
Test Frequency ID	Bandwidth (MHz)	EARFCN	Frequency (UL and DL) (MHz)
Low Range	5	40165	2547.5
	10	40190	2550
	15	40215	2552.5
	20	40240	2555
Mid Range	5/10/15/20	40690	2600
High Range	5	41215	2652.5
	10	41190	2650
	15	41165	2647.5
	20	41140	2645

3. Table for Filed Antenna:

Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
N/A	N/A	FPC	N/A	1.86	LTE Band 4
N/A	N/A	FPC	N/A	4.94	LTE Band 7
N/A	N/A	FPC	N/A	-0.85	LTE Band 12
N/A	N/A	FPC	N/A	4.75	LTE Band 38
N/A	N/A	FPC	N/A	4.94	LTE Band 41

Note: The antenna gain is provided by the manufacturer.

2.2 DESCRIPTION OF TEST MODES

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

LTE BAND 4 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	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 Emissions	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Radiated Spurious Emissions	19957 to 20393	20175	1.4MHz	QPSK	1RB
	19975 to 20375	20175	5MHz	QPSK	1RB
	20050 to 20300	20175	20MHz	QPSK	1RB
Band Edge	19957 to 20393	19957, 20393	1.4MHz	QPSK	1RB/6RB
	19965 to 20385	19965, 20385	3MHz	QPSK	1RB/15RB
	19975 to 20375	19975, 20375	5MHz	QPSK	1RB/25RB
	20000 to 20350	20000, 20350	10MHz	QPSK	1RB/50RB
	20025 to 20325	20025, 20325	15MHz	QPSK	1RB/75RB
	20050 to 20300	20050, 20300	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM	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 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 Emissions	20775 to 21425	21100	5MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB
Radiated Spurious Emissions	20775 to 21425	21100	5MHz	QPSK	1RB
	20850 to 21350	21100	20MHz	QPSK	1RB
Band Edge	20775 to 21425	20775, 21425	5MHz	QPSK	1RB/25RB
	20800 to 21400	20800, 21400	10MHz	QPSK	1RB/50RB
	20825 to 21375	20825, 21375	15MHz	QPSK	1RB/75RB
	20850 to 21350	20850, 21350	20MHz	QPSK	1RB/100RB
Peak To Average Ratio	20775 to 21425	20775, 21100, 21425	5MHz	QPSK, 16QAM	1RB
	20800 to 21400	20800, 21100, 21400	10MHz	QPSK, 16QAM	1RB
	20825 to 21375	20825, 21100, 21375	15MHz	QPSK, 16QAM	1RB
	20850 to 21350	20850, 21100, 21350	20MHz	QPSK, 16QAM	1RB
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					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	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
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
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
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
Band Edge	23017 to 23173	23017,23173	1.4MHz	QPSK	1RB/6RB
	23025 to 23165	23025,23165	3MHz	QPSK	1RB/15RB
	23035 to 23155	23035,23155	5MHz	QPSK	1RB/25RB
	23060 to 23130	23060,23130	10MHz	QPSK	1RB/50RB
Conducted Emission	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
Radiated Emission	23017 to 23173	23095	1.4MHz	QPSK	1 RB
	23017 to 23173	23095	5MHz	QPSK	1 RB
	23060 to 23130	23095	10MHz	QPSK	1 RB

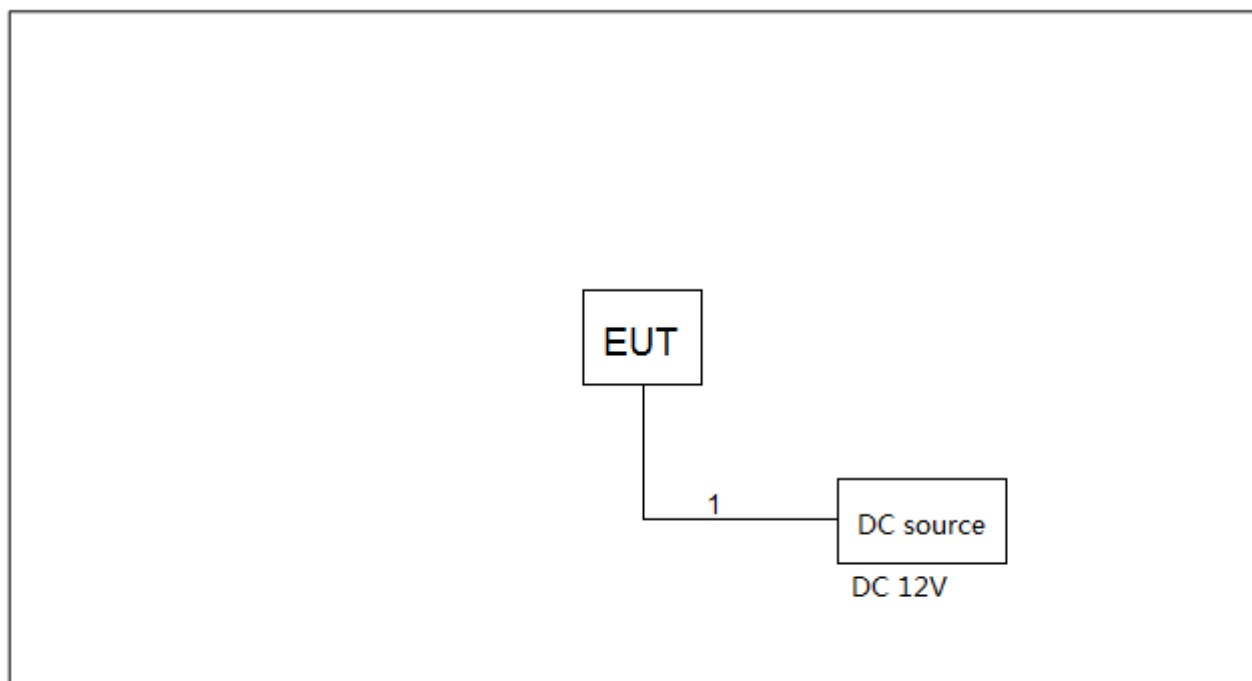
LTE BAND 38 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	25RB
	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	50RB
	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	75RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emissions	37850 to 38150	38000	5MHz	QPSK	1RB
	37850 to 38150	38000	20MHz	QPSK	1RB
Radiated Spurious Emissions	37850 to 38150	38000	5MHz	QPSK	1RB
	37850 to 38150	38000	20MHz	QPSK	1RB
Band Edge	37775 to 38225	37775, 38225	5MHz	QPSK	1RB/25RB
	37800 to 38200	37800, 38200	10MHz	QPSK	1RB/50RB
	37825 to 38175	37825, 38175	15MHz	QPSK	1RB/75RB
	37850 to 38150	37850, 38150	20MHz	QPSK	1RB/100RB
Peak to Average Ratio	37775 to 38225	37775, 38000, 38225	5MHz	QPSK, 16QAM	1RB
	37800 to 38200	37800, 38000, 38200	10MHz	QPSK, 16QAM	1RB
	37825 to 38175	37825, 38000, 38175	15MHz	QPSK, 16QAM	1RB
	37850 to 38150	37850, 38000, 38150	20MHz	QPSK, 16QAM	1RB
Frequency Stability	37775 to 38225	38000	5MHz	QPSK	1RB
	37800 to 38200	38000	10MHz	QPSK	1RB
	37825 to 38175	38000	15MHz	QPSK	1RB
	37850 to 38150	38000	20MHz	QPSK	1RB

LTE BAND 41 MODE					
Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
Output Power & EIRP	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	1RB/12RB/25RB
	40190 to 41190	40190, 40690, 41190	10MHz	QPSK, 16QAM	1RB/25RB/50RB
	40215 to 41165	40215, 40690, 41165	15MHz	QPSK, 16QAM	1RB/36RB/75RB
	40240 to 41140	40240, 40690, 41140	20MHz	QPSK, 16QAM	1RB/50RB/100RB
Occupied Bandwidth	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	25RB
	40190 to 41190	40190, 40690, 41190	10MHz	QPSK, 16QAM	50RB
	40215 to 41165	40215, 40690, 41165	15MHz	QPSK, 16QAM	75RB
	40240 to 41140	40240, 40690, 41140	20MHz	QPSK, 16QAM	100RB
Conducted Spurious Emissions	40165 to 41215	40690	5MHz	QPSK	1RB
	40240 to 41140	40690	20MHz	QPSK	1RB
Radiated Spurious Emissions	40165 to 41215	40690	5MHz	QPSK	1RB
	40240 to 41140	40690	20MHz	QPSK	1RB
Band Edge	40165 to 41215	40165, 41215	5MHz	QPSK	1RB/25RB
	40190 to 41190	40190, 41190	10MHz	QPSK	1RB/50RB
	40215 to 41165	40215, 41165	15MHz	QPSK	1RB/75RB
	40240 to 41140	40240, 41140	20MHz	QPSK	1RB/100RB
Peak to Average Ratio	40165 to 41215	40165, 40690, 41215	5MHz	QPSK, 16QAM	1RB
	40190 to 41190	40190, 40690, 41190	10MHz	QPSK, 16QAM	1RB
	40215 to 41165	40215, 40690, 41165	15MHz	QPSK, 16QAM	1RB
	40240 to 41140	40240, 40690, 41140	20MHz	QPSK, 16QAM	1RB
Frequency Stability	40165 to 41215	40690	5MHz	QPSK	1RB
	40190 to 41190	40690	10MHz	QPSK	1RB
	40215 to 41165	40690	15MHz	QPSK	1RB
	40240 to 41140	40690	20MHz	QPSK	1RB

Note:

There is only one transmitting port in the sample, and the output power has MPR backoff mechanism. The output power of 16QAM will be 1dBm smaller than that of QPSK. All bands of band edge had been evaluated. It is found the Bandwidth 5MHz of LTE Band 25 is worst and recorded.

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.
-	DC Source	TRUE-POWER	GPC30300N	N/A

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

3. TEST RESULT

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMIT

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

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

Mobile / Portable station are limited to 3 watts e.r.p. (Part 27 Subpart C)

3.1.2 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 5.

EIRP:

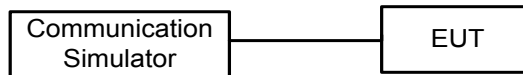
$EIRP = \text{Output Power} + \text{Antenan gain}$

Output Power:

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

3.1.3 TEST SETUP LAYOUT

Output Power Measurement



3.1.4 TEST DEVIATION

No deviation

3.1.5 TEST RESULTS

Please refer to the APPENDIX A.

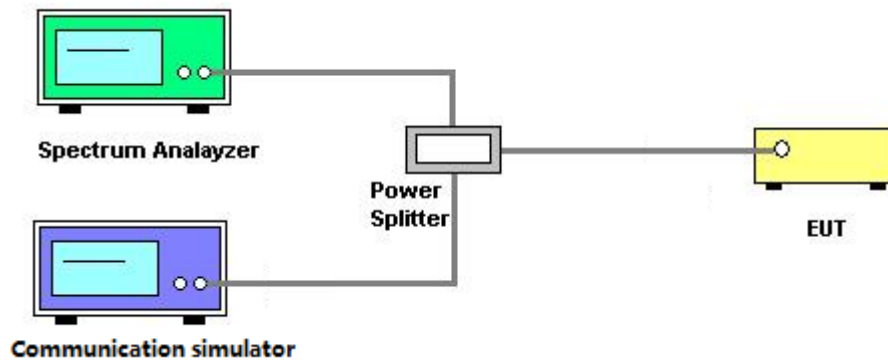
3.2 OCCUPIED BANDWIDTH MEASUREMENT

3.2.1 TEST PROCEDURE

The testing follows FCC KDB 971168 v03r01 Section 4.

1. The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth and 26dB bandwidth.
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. $RBW = (1\% \sim 5\%) \cdot EBW$
 $VBW \geq 3 \cdot RBW$
4. Set spectrum analyzer with Peak detector.

3.2.2 TEST SETUP LAYOUT



3.2.3 TEST DEVIATION

No deviation

3.2.4 TEST RESULTS

Please refer to the APPENDIX B.

3.3 CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

3.3.1 LIMIT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm. (Part 27 Subpart L)

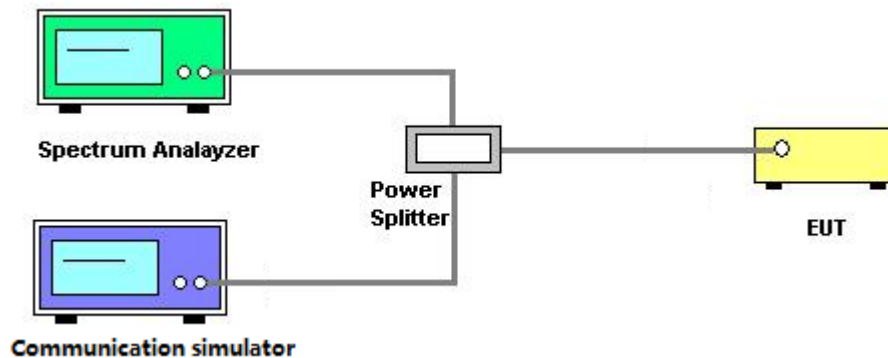
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log(P)$ dB. The emission limit equal to -25dBm. (Part 27 Subpart M)

3.3.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

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

3.3.3 TEST SETUP LAYOUT



3.3.4 TEST DEVIATION

No deviation

3.3.5 TEST RESULTS

Please refer to the APPENDIX C.

3.4 RADIATED SPURIOUS EMISSIONS MEASUREMENT

3.4.1 LIMIT

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

(Part 27 Subpart L)

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

(Part 27 Subpart M)

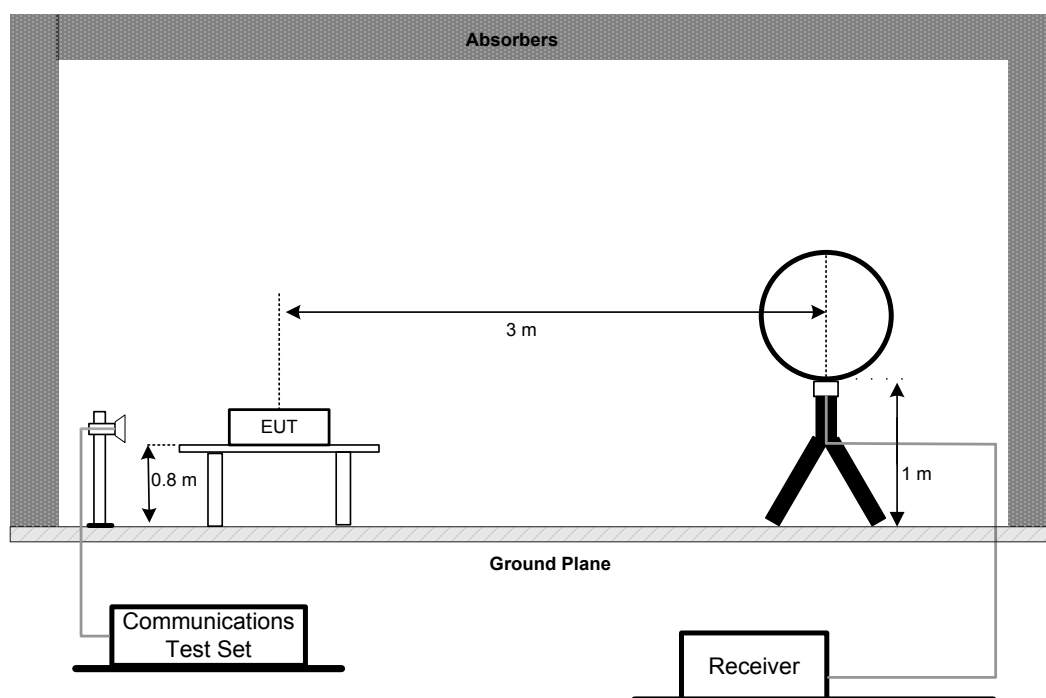
3.4.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.2.

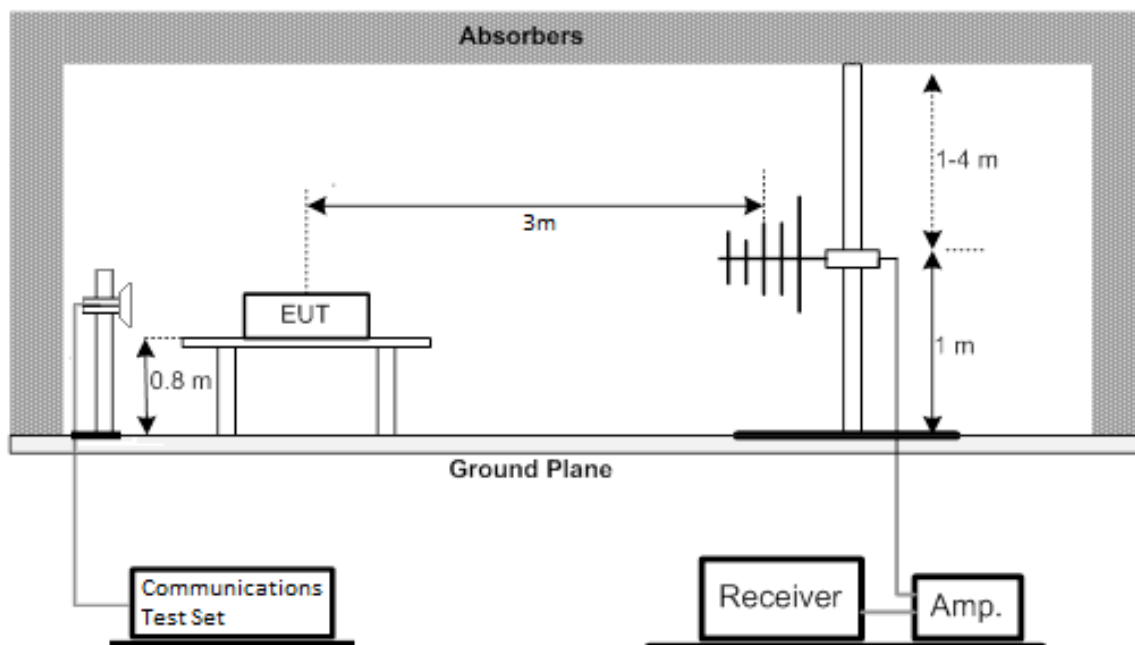
1. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power.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

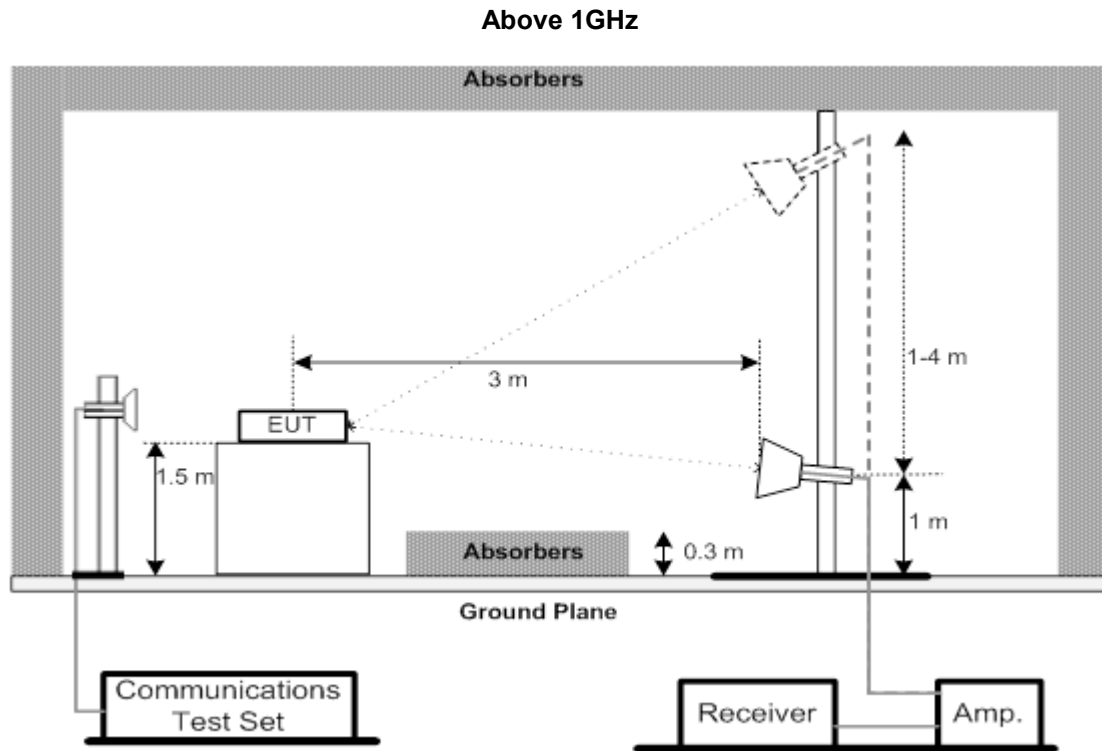
3.4.3 TEST SETUP LAYOUT

Below 30MHz



30MHz to 1GHz





3.4.4 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the APPENDIX D.

3.4.5 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the APPENDIX E.

3.4.6 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the APPENDIX F.

3.5 BAND EDGE MEASUREMENT

3.5.1 LIMIT

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

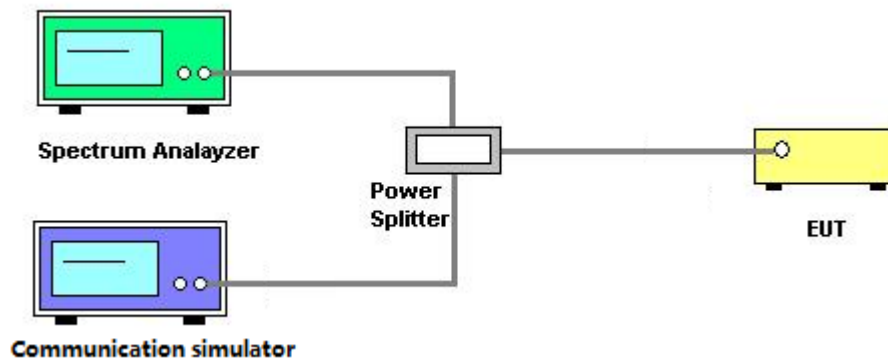
For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. (Part 27 Subpart M)

3.5.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 6.

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

3.5.3 TEST SETUP LAYOUT



3.5.4 TEST DEVIATION

No deviation

3.5.5 TEST RESULTS

Please refer to the APPENDIX G.

3.6 PEAK TO AVERAGE RATIO MEASUREMENT

3.6.1 LIMIT

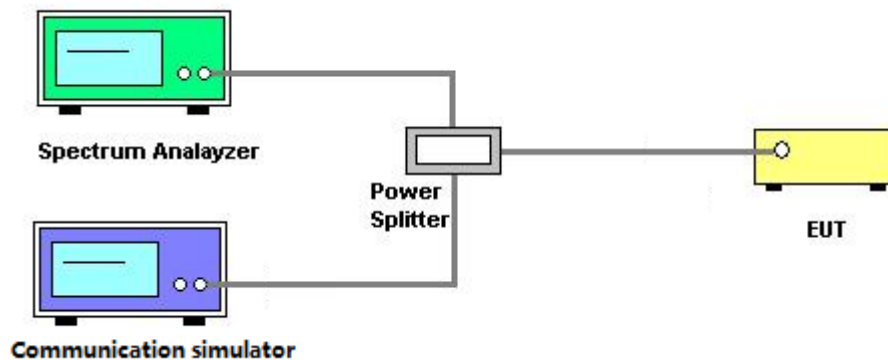
In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

3.6.2 TEST PROCEDURES

The testing follows FCC KDB 971168 v03r01 Section 5.7.

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

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

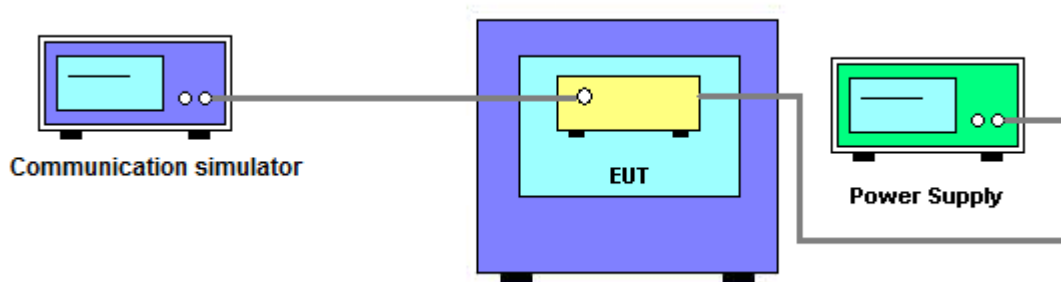
± 1.5 ppm is for base and fixed station. ± 2.5 ppm is for mobile station.

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

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 Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 15, 2022
2	Amplifier	Agilent	8449B	3008A02334	Feb. 27, 2022
3	High Pass Filter	Wairwright Instruments Gmbh	WHK 1.5/15G-10ST	11	Feb. 27, 2022
4	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1710/1785-1690/1805-60/ 12SS	38	Feb. 27, 2022
5	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 824/849-810/863-60/9SS	7	Feb. 27, 2022
6	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 880/915-860/935-60/9SS	14	Feb. 27, 2022
7	Band Reject Filter	Wairwright Instruments Gmbh	WRCG 1850/1910-1830/1930-60/ 10SS	17	Feb. 27, 2022
8	High Pass Filter	Wairwright Instruments Gmbh	WHK3.1/18G-10SS	24	Feb. 27, 2022
9	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
10	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Feb. 28, 2022
11	Receiver	Agilent	N9038A	MY52130039	Mar. 19, 2022
12	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022
13	High pass filter	KANGMAIWEI	ZHPF-M3-12.75G-3869	B2015073763	Feb. 07, 2022
14	High pass filter	KANGMAIWEI	ZHPF-M1000-4000-1	B2015073762	Feb. 07, 2022
15	High pass filter	KANGMAIWEI	ZHPF-M6-186-1727	B2015073764	Feb. 07, 2022
16	Cable	emci	LMR-400(30MHz-1GHz) (8m+5m)	N/A	May 20, 2022
17	Cable	mitron	RWLP50-4.0A-KJ-SMSM-12M	N/A	Nov. 23, 2021
18	Controller	ETS-Lindgren	2090	N/A	N/A
19	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
20	Loop Antenna	EM	EM-6876-1	230	Apr. 28, 2022
21	Double Ridged Guide Antenna	ETS	3115	75846	Mar. 17, 2022
22	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 30, 2022

Conducted Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
2	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Feb. 28, 2022
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 27, 2022
4	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022

Frequency Stability Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Wireless Communication Test SET	Agilent	E5515C	MY48364183	Feb. 28, 2022
2*	Multi-output DC Power Supply	GW Instek	GPC-3030DN	EK880675	Jul. 25, 2023
3	POWER SPLITTER	Mini-Circuits	ZFRSC-123-S+	331000910-1	Feb. 27, 2022
4	wideband radio communication tester	R&S	CMW500	152372	Feb. 27, 2022
5	Const Temp,& Humidity Chamber	Bell	BTH-50C	20170306001	Feb. 27, 2022

Remark: "N/A" denotes no model name, serial no. or calibration specified.

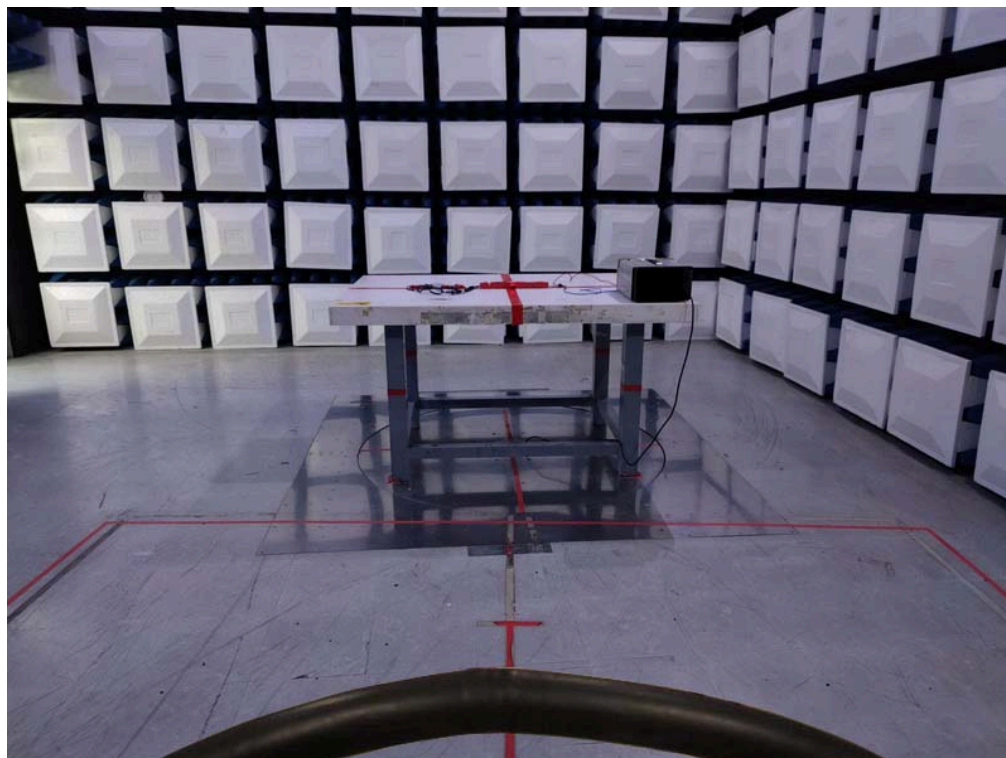
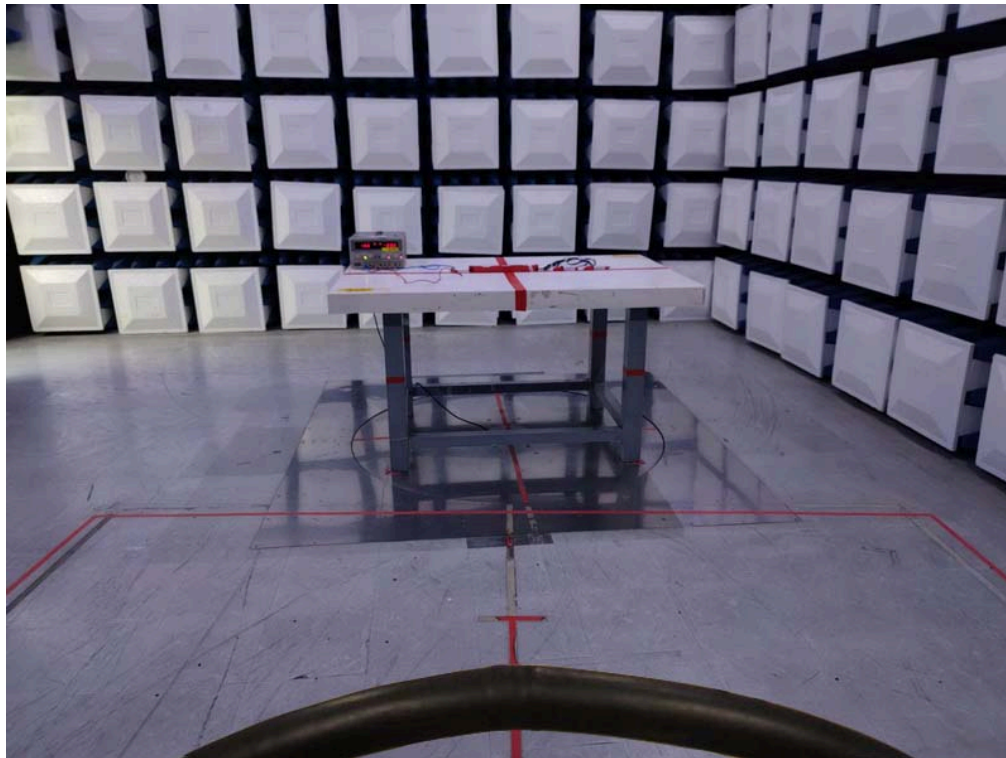
"*" calibration period of equipment list is three year.

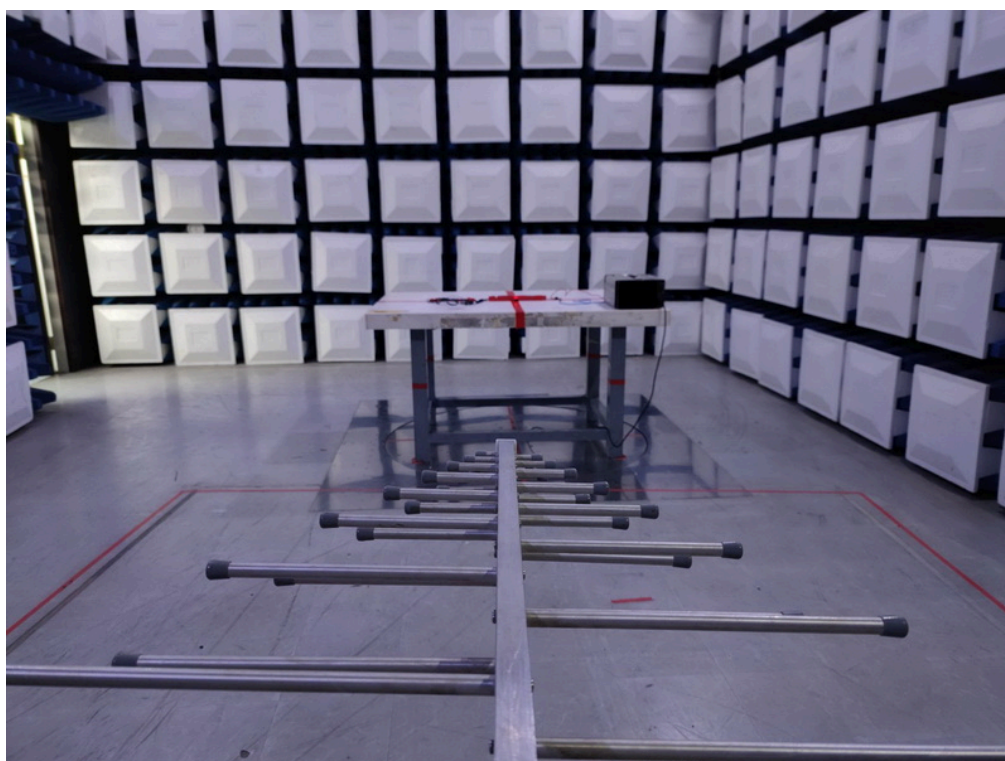
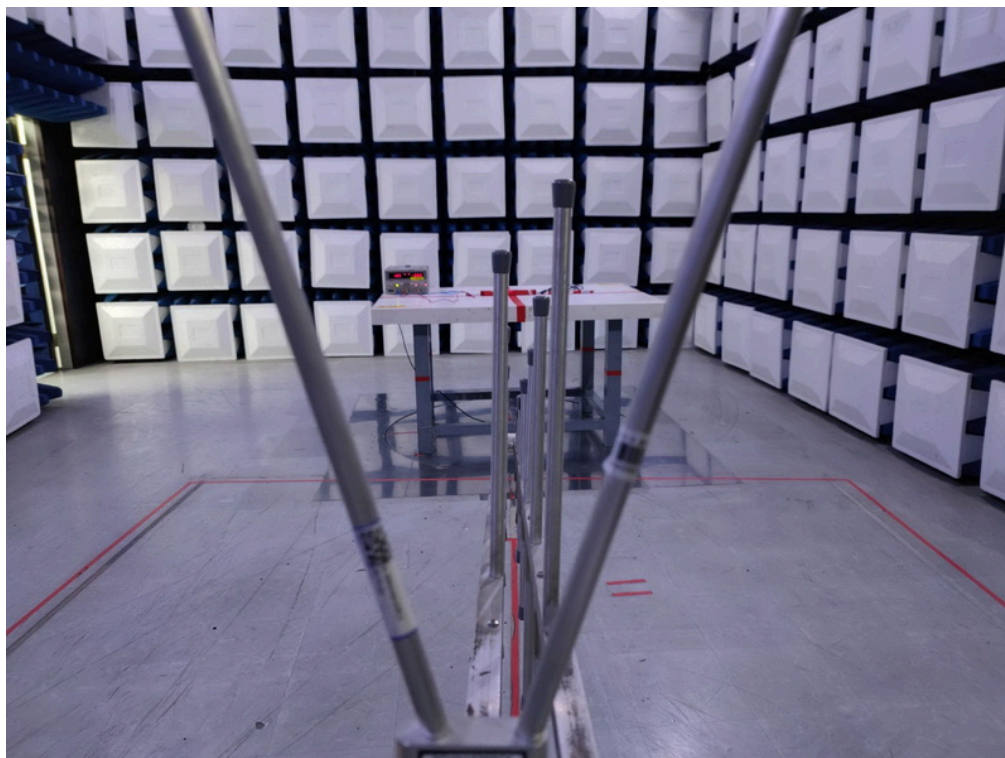
Except * item, all calibration period of equipment list is one year.

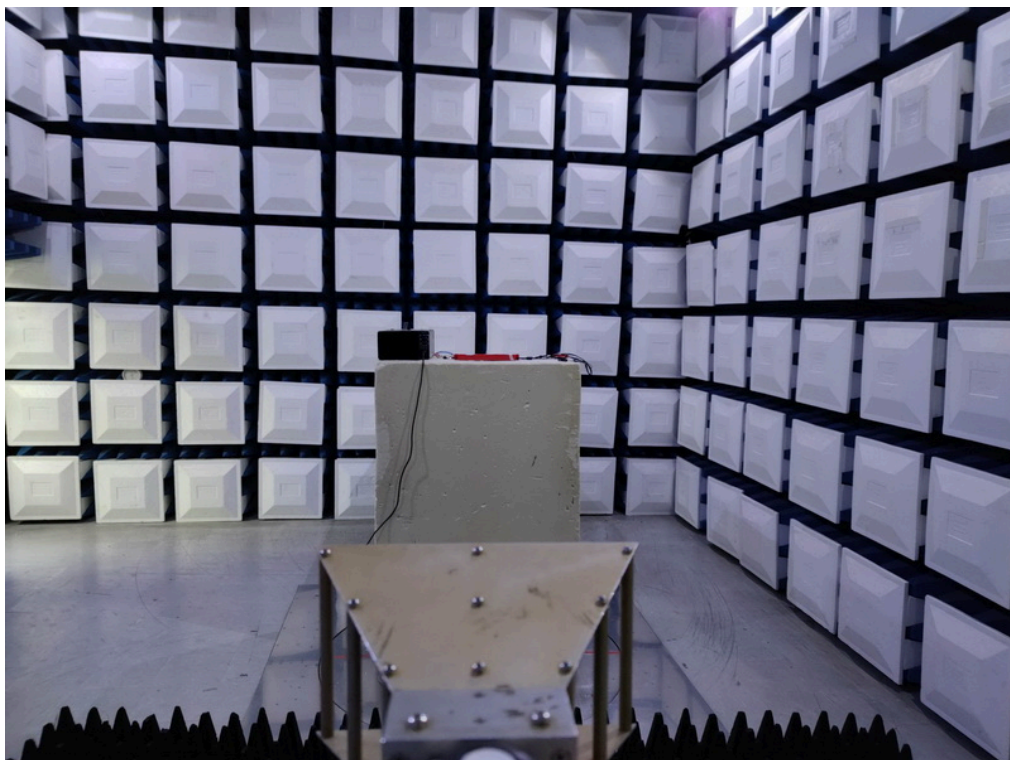
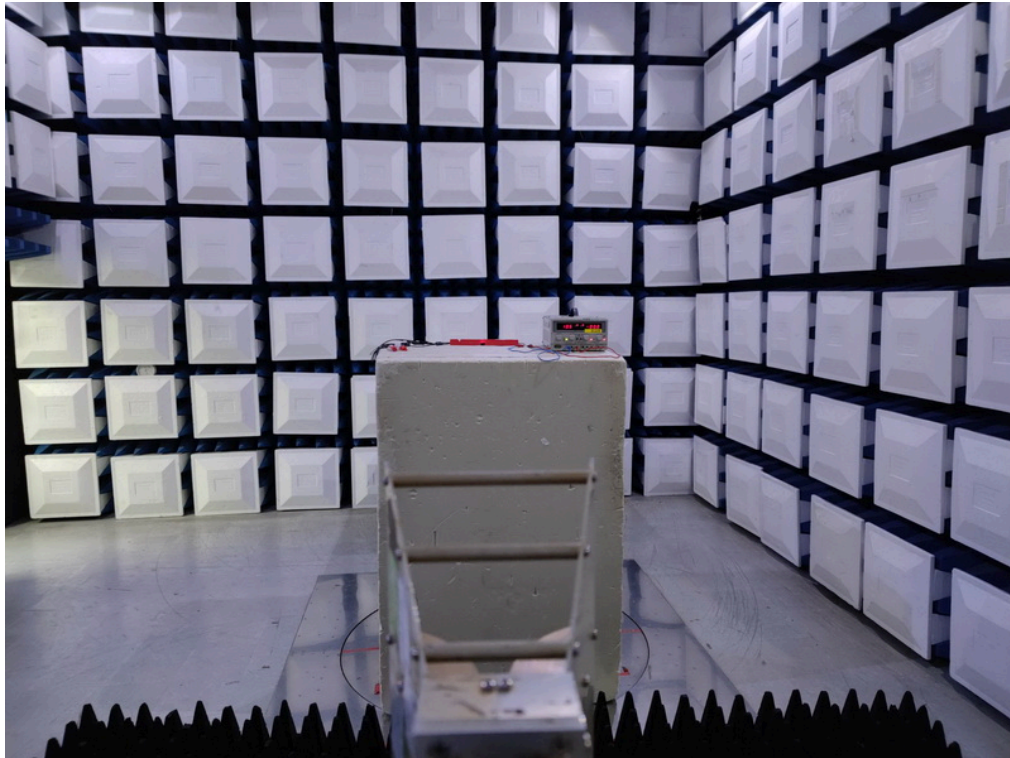
5. EUT TEST PHOTO

Radiated Emissions Test Photos

9 kHz to 30 MHz



Radiated Emissions Test Photos**30 MHz to 1 GHz**

Radiated Emissions Test Photos**Above 1 GHz**

APPENDIX A - OUTPUT POWER

Output Power (dBm):

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	21.79	21.54	21.49
		1	2	21.89	21.66	21.59
		1	5	21.78	21.50	21.49
		3	0	21.86	21.66	21.53
		3	1	21.91	21.72	21.60
		3	2	21.83	21.69	21.54
		6	0	20.83	20.66	20.54
	16QAM	1	0	21.14	20.65	20.65
		1	2	21.22	20.69	20.71
		1	5	21.11	20.65	20.62
		3	0	21.03	20.81	20.61
		3	1	21.05	20.87	20.63
		3	2	21.03	20.85	20.60
		6	0	19.74	19.84	19.67

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	21.78	21.69	21.54
		1	7	21.89	21.83	21.65
		1	14	21.74	21.68	21.49
		8	0	20.81	20.68	20.55
		8	4	20.83	20.70	20.60
		8	7	20.79	20.63	20.54
		15	0	20.81	20.64	20.54
	16QAM	1	0	20.75	21.03	20.64
		1	7	20.85	21.17	20.75
		1	14	20.72	21.01	20.60
		8	0	19.93	19.78	19.60
		8	4	19.94	19.78	19.65
		8	7	19.89	19.72	19.60
		15	0	19.81	19.70	19.52

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	21.81	21.59	21.53
		1	13	21.87	21.69	21.62
		1	24	21.73	21.54	21.49
		12	0	20.73	20.64	20.54
		12	6	20.81	20.70	20.60
		12	11	20.80	20.67	20.58
		25	0	20.75	20.62	20.53
	16QAM	1	0	20.93	21.09	20.65
		1	13	21.00	21.20	20.73
		1	24	20.85	21.04	20.59
		12	0	19.81	19.79	19.59
		12	6	19.89	19.83	19.67
		12	11	19.89	19.79	19.61
		25	0	19.81	19.72	19.51

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	21.79	21.71	21.54
		1	25	21.93	21.87	21.74
		1	49	21.68	21.62	21.47
		25	0	20.77	20.77	20.61
		25	13	20.81	20.71	20.62
		25	25	20.82	20.65	20.61
		50	0	20.79	20.71	20.61
	16QAM	1	0	20.76	21.04	20.64
		1	25	20.87	21.19	20.77
		1	49	20.67	21.02	20.55
		25	0	19.79	19.81	19.74
		25	13	19.87	19.76	19.74
		25	25	19.84	19.72	19.72
		50	0	19.81	19.74	19.67

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	21.70	21.65	21.54
		1	38	21.72	21.70	21.62
		1	74	21.57	21.54	21.44
		36	0	20.75	20.77	20.65
		36	18	20.80	20.73	20.66
		36	39	20.80	20.62	20.63
		75	0	20.77	20.74	20.65
	16QAM	1	0	20.68	20.97	20.99
		1	38	20.70	21.06	21.08
		1	74	20.56	20.89	20.90
		36	0	19.74	19.79	19.66
		36	18	19.77	19.75	19.63
		36	39	19.76	19.67	19.61
		75	0	19.75	19.73	19.66

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	21.58	21.41	21.32
		1	50	21.86	21.79	21.73
		1	99	21.42	21.37	21.25
		50	0	20.70	20.80	20.66
		50	25	20.75	20.70	20.66
		50	50	20.67	20.57	20.63
		100	0	20.68	20.67	20.65
	16QAM	1	0	21.12	20.94	20.78
		1	50	21.42	21.29	21.17
		1	99	20.97	20.87	20.69
		50	0	19.71	19.82	19.70
		50	25	19.82	19.74	19.65
		50	50	19.72	19.63	19.66
		100	0	19.79	19.70	19.69

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	22.32	22.54	22.76
		1	13	22.41	22.64	22.82
		1	24	22.36	22.58	22.70
		12	0	21.38	21.62	21.69
		12	6	21.47	21.68	21.54
		12	11	21.48	21.67	21.32
		25	0	21.39	21.61	21.28
	16QAM	1	0	20.99	21.24	21.76
		1	13	21.13	21.29	21.83
		1	24	20.98	21.23	21.75
		12	0	20.04	20.25	20.74
		12	6	20.10	20.31	20.46
		12	11	20.12	20.34	20.39
		25	0	20.01	20.26	20.30

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	22.49	22.63	22.25
		1	25	22.61	22.44	22.42
		1	49	22.51	22.24	22.36
		25	0	21.47	21.20	21.38
		25	13	21.49	21.23	21.35
		25	25	21.57	21.30	21.37
		50	0	21.58	21.29	21.36
	16QAM	1	0	20.84	21.50	21.28
		1	25	21.00	21.61	21.40
		1	49	20.93	21.48	21.19
		25	0	20.04	20.28	20.47
		25	13	20.09	20.30	20.46
		25	25	20.18	20.42	20.49
		50	0	20.07	20.37	20.40

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	21.93	22.09	22.24
		1	38	22.01	22.24	22.41
		1	74	21.91	22.17	22.38
		36	0	21.19	21.33	21.42
		36	18	21.43	21.38	21.46
		36	39	21.72	21.46	21.56
		75	0	21.70	21.40	21.54
	16QAM	1	0	20.76	21.51	21.48
		1	38	20.93	21.54	21.65
		1	74	20.86	21.41	21.40
		36	0	20.02	20.28	20.37
		36	18	20.15	20.38	20.39
		36	39	20.16	20.48	20.43
		75	0	20.13	20.42	20.43

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	21.94	21.90	22.03
		1	50	22.41	22.35	22.37
		1	99	21.88	21.95	22.12
		50	0	21.02	21.16	21.35
		50	25	21.42	21.29	21.43
		50	50	21.36	21.27	21.33
		100	0	21.47	21.24	21.36
	16QAM	1	0	21.27	21.39	21.74
		1	50	21.72	21.67	22.19
		1	99	21.41	21.31	21.78
		50	0	20.04	20.26	20.72
		50	25	20.18	20.42	20.39
		50	50	20.12	20.42	20.32
		100	0	20.11	20.31	20.36

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	22.72	22.69	22.78
		1	2	22.85	22.81	22.92
		1	5	22.76	22.74	22.73
		3	0	22.77	22.80	22.58
		3	1	22.79	22.85	22.64
		3	2	22.81	22.81	22.66
		6	0	21.78	21.85	21.95
	16QAM	1	0	22.01	21.72	21.51
		1	2	22.07	21.81	21.62
		1	5	21.97	21.79	21.55
		3	0	21.86	21.91	21.41
		3	1	21.90	21.99	21.48
		3	2	21.88	21.98	21.52
		6	0	20.66	20.96	20.75

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	22.66	22.79	22.83
		1	7	22.91	22.91	22.89
		1	14	22.90	22.80	22.75
		8	0	21.67	21.77	21.84
		8	4	21.79	21.82	21.90
		8	7	21.83	21.77	21.76
		15	0	21.74	21.78	21.67
	16QAM	1	0	21.74	21.57	21.85
		1	7	21.78	21.80	21.95
		1	14	21.51	21.72	21.90
		8	0	20.68	20.90	20.74
		8	4	20.78	20.96	20.72
		8	7	20.76	20.92	20.63
		15	0	20.67	20.84	20.59

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	22.68	22.83	22.62
		1	13	22.95	22.89	22.91
		1	24	22.86	22.80	22.71
		12	0	21.43	21.90	21.50
		12	6	21.71	21.87	21.76
		12	11	21.65	21.85	21.65
		25	0	21.53	21.87	21.53
	16QAM	1	0	21.78	22.00	21.68
		1	13	21.78	22.29	21.67
		1	24	21.65	22.17	21.52
		12	0	20.50	20.95	20.48
		12	6	20.69	20.99	20.65
		12	11	20.58	21.00	20.53
		25	0	20.45	20.91	20.40

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	22.65	22.86	22.65
		1	25	23.01	22.91	22.84
		1	49	22.73	22.74	22.79
		25	0	21.68	22.11	21.67
		25	13	21.69	21.82	21.81
		25	25	21.52	22.14	21.76
		50	0	21.68	22.14	21.79
	16QAM	1	0	21.54	21.65	21.23
		1	25	21.56	21.87	21.37
		1	49	21.49	21.69	21.01
		25	0	20.64	20.74	20.31
		25	13	20.64	20.39	20.49
		25	25	20.39	20.74	20.53
		50	0	20.56	20.71	20.30

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				37775CH	38000CH	38225CH
				2572.5MHz	2600MHz	2617.5MHz
38 / 5M	QPSK	1	0	22.45	22.55	23.05
		1	13	22.52	22.85	23.19
		1	24	22.37	22.86	23.05
		12	0	21.53	22.08	22.20
		12	6	21.55	22.11	22.20
		12	11	21.58	22.11	22.21
		25	0	21.50	22.10	22.15
	16QAM	1	0	22.23	22.08	22.22
		1	13	22.32	22.20	22.37
		1	24	22.19	22.07	22.23
		12	0	21.10	21.05	21.06
		12	6	21.08	21.04	21.06
		12	11	21.07	21.15	21.08
		25	0	20.93	21.02	21.11

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				37800CH	38000CH	38200CH
				2575MHz	2600MHz	2615MHz
38 / 10M	QPSK	1	0	22.95	23.12	23.03
		1	25	23.25	23.44	23.41
		1	49	22.94	23.11	23.07
		25	0	22.07	22.14	22.20
		25	13	22.09	22.15	22.16
		25	25	22.12	22.13	22.17
		50	0	22.07	22.14	22.17
	16QAM	1	0	22.31	22.20	22.37
		1	25	22.58	22.48	22.70
		1	49	22.29	22.16	22.41
		25	0	21.06	21.10	21.14
		25	13	21.03	21.06	21.12
		25	25	21.01	21.10	21.11
		50	0	20.97	21.05	21.13

LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				37825CH	38000CH	38175CH
				2577.5MHz	2600MHz	2612.5MHz
38 / 15M	QPSK	1	0	22.86	22.98	22.96
		1	38	22.96	23.14	23.10
		1	74	22.83	23.01	22.99
		36	0	22.07	22.16	22.17
		36	18	22.10	22.18	22.17
		36	39	22.15	22.17	22.13
		75	0	22.13	22.19	22.17
	16QAM	1	0	22.15	22.30	22.20
		1	38	22.22	22.40	22.37
		1	74	22.09	22.29	22.26
		36	0	20.96	21.12	21.07
		36	18	21.02	21.06	21.12
		36	39	20.88	21.02	21.18
		75	0	21.01	20.99	21.14

LTE Band / BW	Modulation	RB Siset	RB Offset	Low CH	Mid CH	High CH
				37850CH	38000CH	38150CH
				2580MHz	2600MHz	2610MHz
38 / 20M	QPSK	1	0	22.70	22.81	22.79
		1	50	23.18	23.29	23.27
		1	99	22.71	22.79	22.79
		50	0	21.93	22.02	22.09
		50	25	22.01	22.06	22.12
		50	50	22.03	22.01	22.05
		100	0	22.01	22.01	22.08
	16QAM	1	0	22.05	22.18	22.03
		1	50	22.47	22.61	22.48
		1	99	22.01	22.17	22.10
		50	0	20.94	21.04	21.04
		50	25	21.00	21.08	21.06
		50	50	21.01	21.06	21.03
		100	0	21.00	21.03	21.05

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				40165CH	40690CH	41215CH
				2547.5MHz	2600MHz	2652.5MHz
41 / 5M	QPSK	1	0	22.74	22.87	23.08
		1	13	22.81	22.96	23.13
		1	24	22.76	22.88	23.03
		12	0	21.80	21.94	22.13
		12	6	21.88	22.04	22.14
		12	11	21.87	22.05	22.18
		25	0	21.82	22.01	22.10
	16QAM	1	0	21.95	22.19	22.40
		1	13	22.03	22.22	22.46
		1	24	21.94	22.15	22.36
		12	0	20.82	20.91	21.20
		12	6	20.88	20.98	21.21
		12	11	20.90	20.99	21.22
		25	0	20.82	20.99	21.12

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				40190CH	40690CH	41190CH
				2550MHz	2600MHz	2650MHz
41 / 10M	QPSK	1	0	22.72	23.02	23.06
		1	25	23.04	23.32	23.37
		1	49	22.74	23.02	23.06
		25	0	21.81	22.00	22.16
		25	13	21.85	22.05	22.15
		25	25	21.83	22.01	22.11
		50	0	21.80	22.02	22.13
	16QAM	1	0	22.00	22.31	22.42
		1	25	22.28	22.59	22.71
		1	49	22.02	22.33	22.40
		25	0	20.83	21.00	21.17
		25	13	20.92	21.07	21.17
		25	25	20.87	20.99	21.17
		50	0	20.86	21.02	21.15

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				40215CH	40690CH	41165CH
				2552.5MHz	2600MHz	2647.5MHz
41 / 15M	QPSK	1	0	22.69	22.96	23.03
		1	38	22.79	23.06	23.13
		1	74	22.77	22.96	22.97
		36	0	21.92	22.06	22.12
		36	18	21.95	22.10	22.15
		36	39	21.91	22.04	22.14
		75	0	21.92	22.11	22.15
	16QAM	1	0	21.95	22.27	22.32
		1	38	22.02	22.40	22.39
		1	74	21.96	22.28	22.23
		36	0	20.84	20.97	21.12
		36	18	20.87	21.02	21.16
		36	39	20.83	20.96	21.14
		75	0	20.88	21.03	21.10

LTE Band / BW	Modulation	RB Sizer	RB Offset	Low CH	Mid CH	High CH
				40240CH	40690CH	41140CH
				2555MHz	2600MHz	2645MHz
41 / 20M	QPSK	1	0	22.58	22.79	22.91
		1	50	23.08	23.27	23.38
		1	99	22.58	22.79	22.83
		50	0	21.78	22.02	22.14
		50	25	21.84	22.04	22.16
		50	50	21.88	21.99	22.13
		100	0	21.85	22.02	22.13
	16QAM	1	0	21.84	21.88	22.26
		1	50	22.31	22.32	22.73
		1	99	21.91	21.89	22.21
		50	0	20.80	20.98	21.15
		50	25	20.85	21.03	21.22
		50	50	20.85	20.95	21.16
		100	0	20.82	21.00	21.12

EIRP (dBm):

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				19957CH	20175CH	20393CH
				1710.7MHz	1732.5MHz	1754.3MHz
4 / 1.4M	QPSK	1	0	23.65	23.40	23.35
		1	2	23.75	23.52	23.45
		1	5	23.64	23.36	23.35
		3	0	23.72	23.52	23.39
		3	1	23.77	23.58	23.46
		3	2	23.69	23.55	23.40
		6	0	22.69	22.52	22.40
	16QAM	1	0	23.00	22.51	22.51
		1	2	23.08	22.55	22.57
		1	5	22.97	22.51	22.48
		3	0	22.89	22.67	22.47
		3	1	22.91	22.73	22.49
		3	2	22.89	22.71	22.46
		6	0	21.60	21.70	21.53

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	23.64	23.55	23.40
		1	7	23.75	23.69	23.51
		1	14	23.60	23.54	23.35
		8	0	22.67	22.54	22.41
		8	4	22.69	22.56	22.46
		8	7	22.65	22.49	22.40
		15	0	22.67	22.50	22.40
	16QAM	1	0	22.61	22.89	22.50
		1	7	22.71	23.03	22.61
		1	14	22.58	22.87	22.46
		8	0	21.79	21.64	21.46
		8	4	21.80	21.64	21.51
		8	7	21.75	21.58	21.46
		15	0	21.67	21.56	21.38

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	23.67	23.45	23.39
		1	13	23.73	23.55	23.48
		1	24	23.59	23.40	23.35
		12	0	22.59	22.50	22.40
		12	6	22.67	22.56	22.46
		12	11	22.66	22.53	22.44
		25	0	22.61	22.48	22.39
	16QAM	1	0	22.79	22.95	22.51
		1	13	22.86	23.06	22.59
		1	24	22.71	22.90	22.45
		12	0	21.67	21.65	21.45
		12	6	21.75	21.69	21.53
		12	11	21.75	21.65	21.47
		25	0	21.67	21.58	21.37

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	23.65	23.57	23.40
		1	25	23.79	23.73	23.60
		1	49	23.54	23.48	23.33
		25	0	22.63	22.63	22.47
		25	13	22.67	22.57	22.48
		25	25	22.68	22.51	22.47
		50	0	22.65	22.57	22.47
	16QAM	1	0	22.62	22.90	22.50
		1	25	22.73	23.05	22.63
		1	49	22.53	22.88	22.41
		25	0	21.65	21.67	21.60
		25	13	21.73	21.62	21.60
		25	25	21.70	21.58	21.58
		50	0	21.67	21.60	21.53

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	23.56	23.51	23.40
		1	38	23.58	23.56	23.48
		1	74	23.43	23.40	23.30
		36	0	22.61	22.63	22.51
		36	18	22.66	22.59	22.52
		36	39	22.66	22.48	22.49
		75	0	22.63	22.60	22.51
	16QAM	1	0	22.54	22.83	22.85
		1	38	22.56	22.92	22.94
		1	74	22.42	22.75	22.76
		36	0	21.60	21.65	21.52
		36	18	21.63	21.61	21.49
		36	39	21.62	21.53	21.47
		75	0	21.61	21.59	21.52

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	23.44	23.27	23.18
		1	50	23.72	23.65	23.59
		1	99	23.28	23.23	23.11
		50	0	22.56	22.66	22.52
		50	25	22.61	22.56	22.52
		50	50	22.53	22.43	22.49
		100	0	22.54	22.53	22.51
	16QAM	1	0	22.98	22.80	22.64
		1	50	23.28	23.15	23.03
		1	99	22.83	22.73	22.55
		50	0	21.57	21.68	21.56
		50	25	21.68	21.60	21.51
		50	50	21.58	21.49	21.52
		100	0	21.65	21.56	21.55

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	27.26	27.48	27.70
		1	13	27.35	27.58	27.76
		1	24	27.30	27.52	27.64
		12	0	26.32	26.56	26.63
		12	6	26.41	26.62	26.48
		12	11	26.42	26.61	26.26
		25	0	26.33	26.55	26.22
	16QAM	1	0	25.93	26.18	26.70
		1	13	26.07	26.23	26.77
		1	24	25.92	26.17	26.69
		12	0	24.98	25.19	25.68
		12	6	25.04	25.25	25.40
		12	11	25.06	25.28	25.33
		25	0	24.95	25.20	25.24

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	27.43	27.57	27.19
		1	25	27.55	27.38	27.36
		1	49	27.45	27.18	27.30
		25	0	26.41	26.14	26.32
		25	13	26.43	26.17	26.29
		25	25	26.51	26.24	26.31
		50	0	26.52	26.23	26.30
	16QAM	1	0	25.78	26.44	26.22
		1	25	25.94	26.55	26.34
		1	49	25.87	26.42	26.13
		25	0	24.98	25.22	25.41
		25	13	25.03	25.24	25.40
		25	25	25.12	25.36	25.43
		50	0	25.01	25.31	25.34

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	26.87	27.03	27.18
		1	38	26.95	27.18	27.35
		1	74	26.85	27.11	27.32
		36	0	26.13	26.27	26.36
		36	18	26.37	26.32	26.40
		36	39	26.66	26.40	26.50
		75	0	26.64	26.34	26.48
	16QAM	1	0	25.70	26.45	26.42
		1	38	25.87	26.48	26.59
		1	74	25.80	26.35	26.34
		36	0	24.96	25.22	25.31
		36	18	25.09	25.32	25.33
		36	39	25.10	25.42	25.37
		75	0	25.07	25.36	25.37

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	26.88	26.84	26.97
		1	50	27.35	27.29	27.31
		1	99	26.82	26.89	27.06
		50	0	25.96	26.10	26.29
		50	25	26.36	26.23	26.37
		50	50	26.30	26.21	26.27
		100	0	26.41	26.18	26.30
	16QAM	1	0	26.21	26.33	26.68
		1	50	26.66	26.61	27.13
		1	99	26.35	26.25	26.72
		50	0	24.98	25.20	25.66
		50	25	25.12	25.36	25.33
		50	50	25.06	25.36	25.26
		100	0	25.05	25.25	25.30

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				37775CH	38000CH	38225CH
				2572.5MHz	2600MHz	2617.5MHz
38 / 5M	QPSK	1	0	27.20	27.30	27.80
		1	13	27.27	27.60	27.94
		1	24	27.12	27.61	27.80
		12	0	26.28	26.83	26.95
		12	6	26.30	26.86	26.95
		12	11	26.33	26.86	26.96
		25	0	26.25	26.85	26.90
	16QAM	1	0	26.98	26.83	26.97
		1	13	27.07	26.95	27.12
		1	24	26.94	26.82	26.98
		12	0	25.85	25.80	25.81
		12	6	25.83	25.79	25.81
		12	11	25.82	25.90	25.83
		25	0	25.68	25.77	25.86

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				37800CH	38000CH	38200CH
				2575MHz	2600MHz	2615MHz
38 / 10M	QPSK	1	0	27.70	27.87	27.78
		1	25	28.00	28.19	28.16
		1	49	27.69	27.86	27.82
		25	0	26.82	26.89	26.95
		25	13	26.84	26.90	26.91
		25	25	26.87	26.88	26.92
		50	0	26.82	26.89	26.92
	16QAM	1	0	27.06	26.95	27.12
		1	25	27.33	27.23	27.45
		1	49	27.04	26.91	27.16
		25	0	25.81	25.85	25.89
		25	13	25.78	25.81	25.87
		25	25	25.76	25.85	25.86
		50	0	25.72	25.80	25.88

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				37825CH	38000CH	38175CH
				2577.5MHz	2600MHz	2612.5MHz
38 / 15M	QPSK	1	0	27.61	27.73	27.71
		1	38	27.71	27.89	27.85
		1	74	27.58	27.76	27.74
		36	0	26.82	26.91	26.92
		36	18	26.85	26.93	26.92
		36	39	26.90	26.92	26.88
		75	0	26.88	26.94	26.92
	16QAM	1	0	26.90	27.05	26.95
		1	38	26.97	27.15	27.12
		1	74	26.84	27.04	27.01
		36	0	25.71	25.87	25.82
		36	18	25.77	25.81	25.87
		36	39	25.63	25.77	25.93
		75	0	25.76	25.74	25.89

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				37850CH	38000CH	38150CH
				2580MHz	2600MHz	2610MHz
38 / 20M	QPSK	1	0	27.45	27.56	27.54
		1	50	27.93	28.04	28.02
		1	99	27.46	27.54	27.54
		50	0	26.68	26.77	26.84
		50	25	26.76	26.81	26.87
		50	50	26.78	26.76	26.80
		100	0	26.76	26.76	26.83
	16QAM	1	0	26.80	26.93	26.78
		1	50	27.22	27.36	27.23
		1	99	26.76	26.92	26.85
		50	0	25.69	25.79	25.79
		50	25	25.75	25.83	25.81
		50	50	25.76	25.81	25.78
		100	0	25.75	25.78	25.80

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				40165CH	40690CH	41215CH
				2547.5MHz	2600MHz	2652.5MHz
41 / 5M	QPSK	1	0	27.68	27.81	28.02
		1	13	27.75	27.90	28.07
		1	24	27.70	27.82	27.97
		12	0	26.74	26.88	27.07
		12	6	26.82	26.98	27.08
		12	11	26.81	26.99	27.12
		25	0	26.76	26.95	27.04
	16QAM	1	0	26.89	27.13	27.34
		1	13	26.97	27.16	27.40
		1	24	26.88	27.09	27.30
		12	0	25.76	25.85	26.14
		12	6	25.82	25.92	26.15
		12	11	25.84	25.93	26.16
		25	0	25.76	25.93	26.06

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				40190CH	40690CH	41190CH
				2550MHz	2600MHz	2650MHz
41 / 10M	QPSK	1	0	27.66	27.96	28.00
		1	25	27.98	28.26	28.31
		1	49	27.68	27.96	28.00
		25	0	26.75	26.94	27.10
		25	13	26.79	26.99	27.09
		25	25	26.77	26.95	27.05
		50	0	26.74	26.96	27.07
	16QAM	1	0	26.94	27.25	27.36
		1	25	27.22	27.53	27.65
		1	49	26.96	27.27	27.34
		25	0	25.77	25.94	26.11
		25	13	25.86	26.01	26.11
		25	25	25.81	25.93	26.11
		50	0	25.80	25.96	26.09

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				40215CH	40690CH	41165CH
				2552.5MHz	2600MHz	2647.5MHz
41 / 15M	QPSK	1	0	27.63	27.90	27.97
		1	38	27.73	28.00	28.07
		1	74	27.71	27.90	27.91
		36	0	26.86	27.00	27.06
		36	18	26.89	27.04	27.09
		36	39	26.85	26.98	27.08
		75	0	26.86	27.05	27.09
	16QAM	1	0	26.89	27.21	27.26
		1	38	26.96	27.34	27.33
		1	74	26.90	27.22	27.17
		36	0	25.78	25.91	26.06
		36	18	25.81	25.96	26.10
		36	39	25.77	25.90	26.08
		75	0	25.82	25.97	26.04

LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				40240CH	40690CH	41140CH
				2555MHz	2600MHz	2645MHz
41 / 20M	QPSK	1	0	27.52	27.73	27.85
		1	50	28.02	28.21	28.32
		1	99	27.52	27.73	27.77
		50	0	26.72	26.96	27.08
		50	25	26.78	26.98	27.10
		50	50	26.82	26.93	27.07
		100	0	26.79	26.96	27.07
	16QAM	1	0	26.78	26.82	27.20
		1	50	27.25	27.26	27.67
		1	99	26.85	26.83	27.15
		50	0	25.74	25.92	26.09
		50	25	25.79	25.97	26.16
		50	50	25.79	25.89	26.10
		100	0	25.76	25.94	26.06

ERP (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	19.72	19.69	19.78
		1	2	19.85	19.81	19.92
		1	5	19.76	19.74	19.73
		3	0	19.77	19.80	19.58
		3	1	19.79	19.85	19.64
		3	2	19.81	19.81	19.66
		6	0	18.78	18.85	18.95
	16QAM	1	0	19.01	18.72	18.51
		1	2	19.07	18.81	18.62
		1	5	18.97	18.79	18.55
		3	0	18.86	18.91	18.41
		3	1	18.90	18.99	18.48
		3	2	18.88	18.98	18.52
		6	0	17.66	17.96	17.75

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	19.66	19.79	19.83
		1	7	19.91	19.91	19.89
		1	14	19.90	19.80	19.75
		8	0	18.67	18.77	18.84
		8	4	18.79	18.82	18.90
		8	7	18.83	18.77	18.76
		15	0	18.74	18.78	18.67
	16QAM	1	0	18.74	18.57	18.85
		1	7	18.78	18.80	18.95
		1	14	18.51	18.72	18.90
		8	0	17.68	17.90	17.74
		8	4	17.78	17.96	17.72
		8	7	17.76	17.92	17.63
		15	0	17.67	17.84	17.59

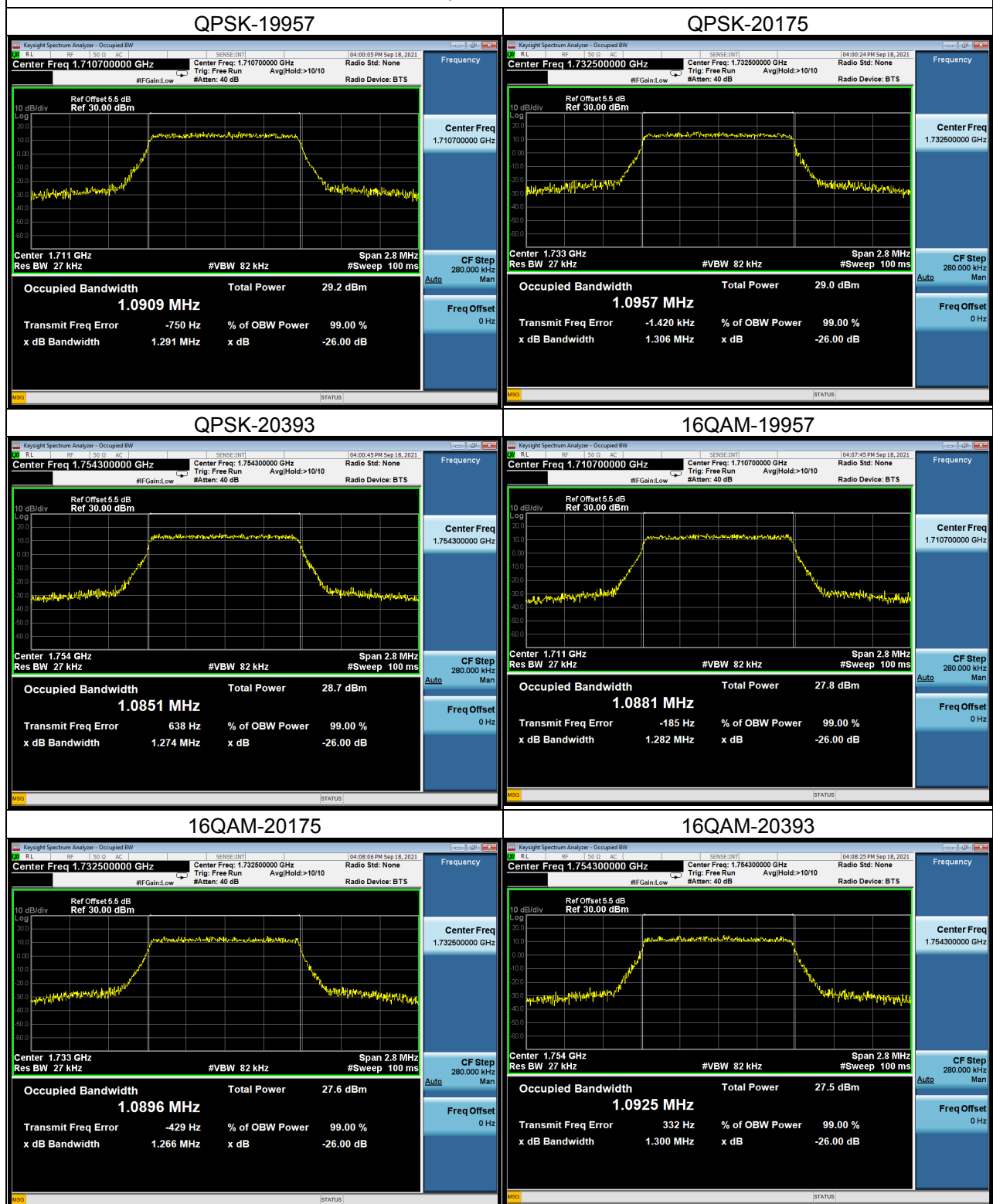
LTE Band / BW	Modulation	RB Size	RB Offset	Low CH	Mid CH	High CH
				23035CH	23095CH	23155CH
				701.5MHz	707.5MHz	713.5MHz
12 / 5M	QPSK	1	0	19.68	19.83	19.62
		1	13	19.95	19.89	19.91
		1	24	19.86	19.80	19.71
		12	0	18.43	18.90	18.50
		12	6	18.71	18.87	18.76
		12	11	18.65	18.85	18.65
		25	0	18.53	18.87	18.53
	16QAM	1	0	18.78	19.00	18.68
		1	13	18.78	19.29	18.67
		1	24	18.65	19.17	18.52
		12	0	17.50	17.95	17.48
		12	6	17.69	17.99	17.65
		12	11	17.58	18.00	17.53
		25	0	17.45	17.91	17.40

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	19.65	19.86	19.65
		1	25	20.01	19.91	19.84
		1	49	19.73	19.74	19.79
		25	0	18.68	19.11	18.67
		25	13	18.69	18.82	18.81
		25	25	18.52	19.14	18.76
		50	0	18.68	19.14	18.79
	16QAM	1	0	18.54	18.65	18.23
		1	25	18.56	18.87	18.37
		1	49	18.49	18.69	18.01
		25	0	17.64	17.74	17.31
		25	13	17.64	17.39	17.49
		25	25	17.39	17.74	17.53
		50	0	17.56	17.71	17.30

APPENDIX B - OCCUPIED BANDWIDTH

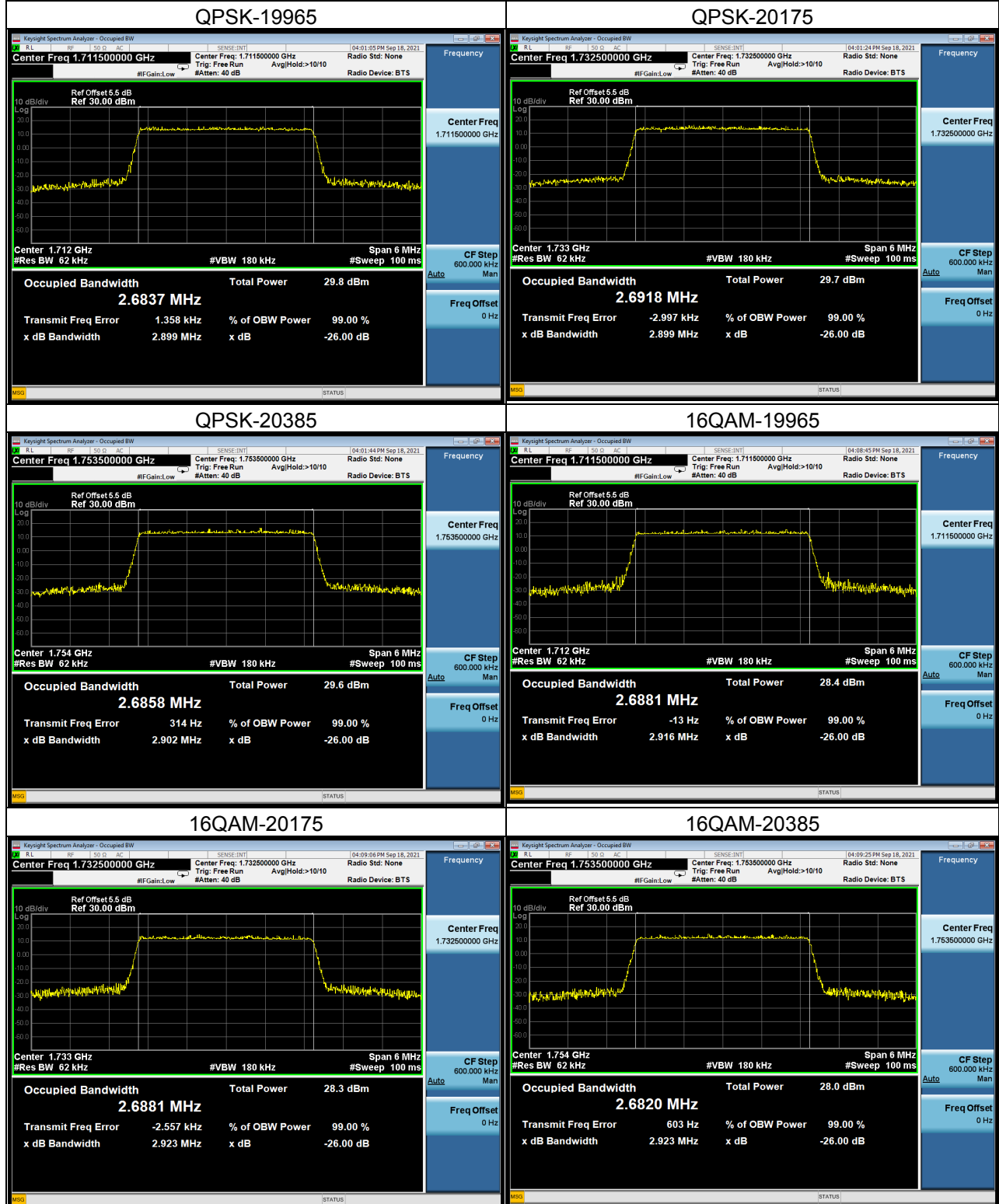
LTE Band 4_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.0909	19957	1710.7	1.291
20175	1732.5	1.0957	20175	1732.5	1.306
20393	1754.3	1.0851	20393	1754.3	1.274
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19957	1710.7	1.0881	19957	1710.7	1.282
20175	1732.5	1.0896	20175	1732.5	1.266
20393	1754.3	1.0925	20393	1754.3	1.300

Spectrum Plot



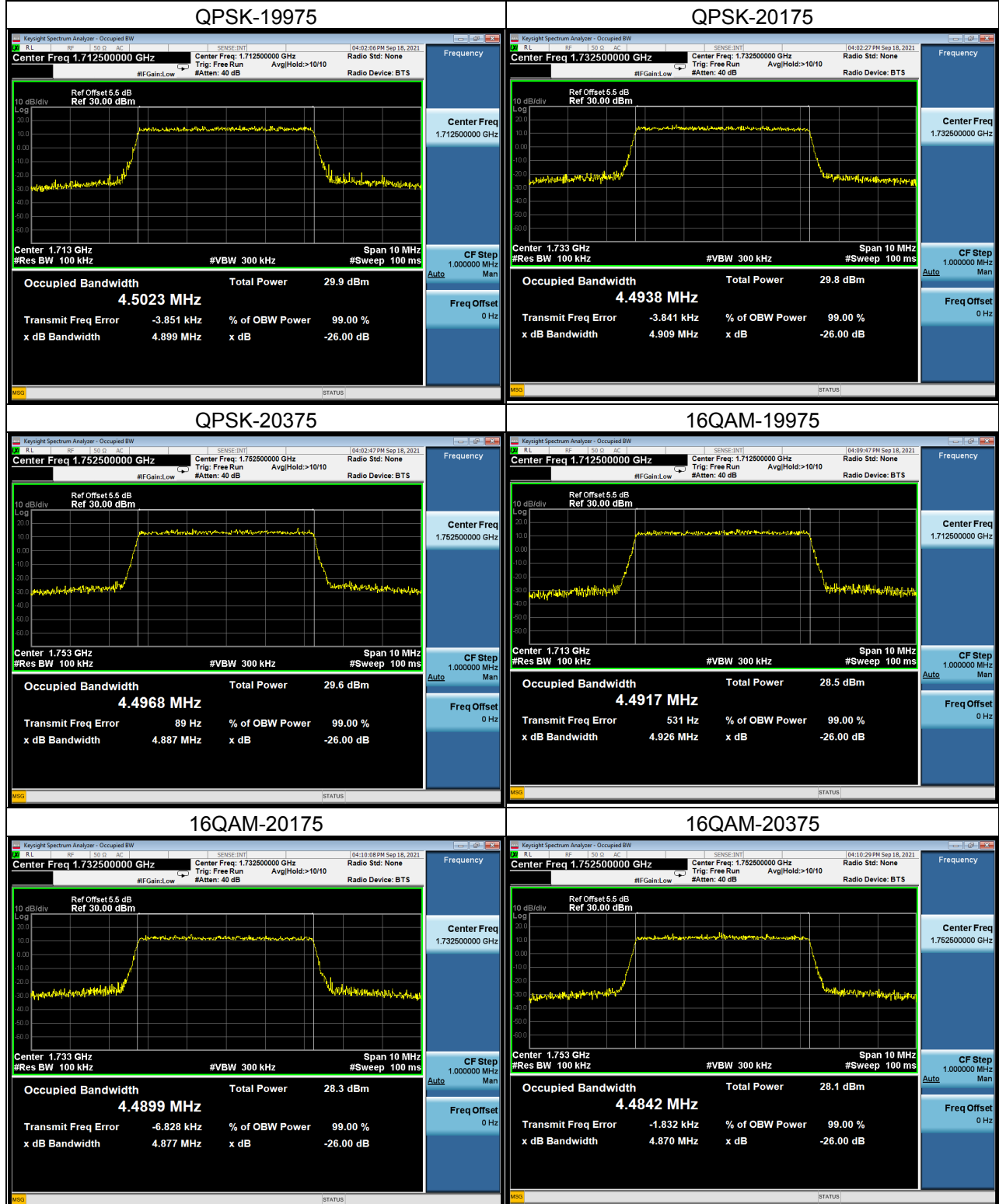
LTE Band 4_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.6837	19965	1711.5	2.899
20175	1732.5	2.6918	20175	1732.5	2.899
20385	1753.5	2.6858	20385	1753.5	2.902
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19965	1711.5	2.6881	19965	1711.5	2.916
20175	1732.5	2.6881	20175	1732.5	2.923
20385	1753.5	2.6820	20385	1753.5	2.923

Spectrum Plot



LTE Band 4_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.5023	19975	1712.5	4.899
20175	1732.5	4.4938	20175	1732.5	4.909
20375	1752.5	4.4968	20375	1752.5	4.887
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
19975	1712.5	4.4917	19975	1712.5	4.926
20175	1732.5	4.4899	20175	1732.5	4.877
20375	1752.5	4.4842	20375	1752.5	4.870

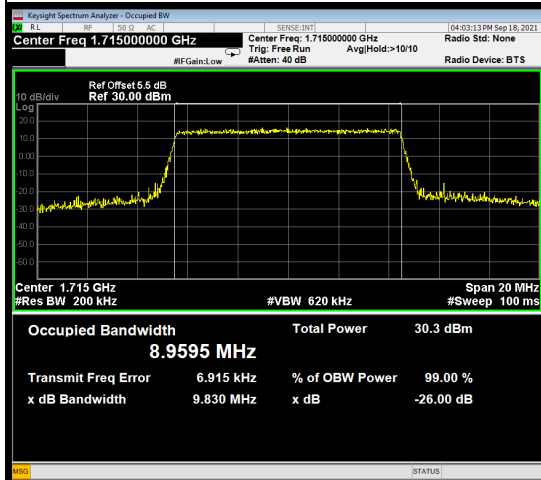
Spectrum Plot



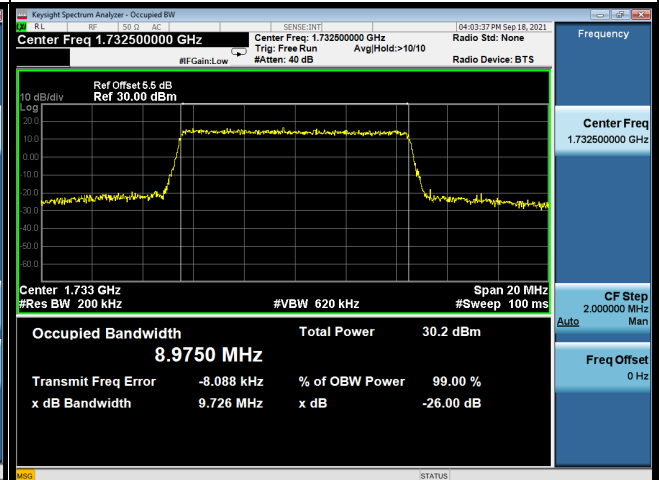
LTE Band 4_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	8.9595	20000	1715	9.830
20175	1732.5	8.9750	20175	1732.5	9.726
20350	1750	8.9754	20350	1750	9.785
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20000	1715	8.9702	20000	1715	9.699
20175	1732.5	8.9528	20175	1732.5	9.696
20350	1750	8.9625	20350	1750	9.678

Spectrum Plot

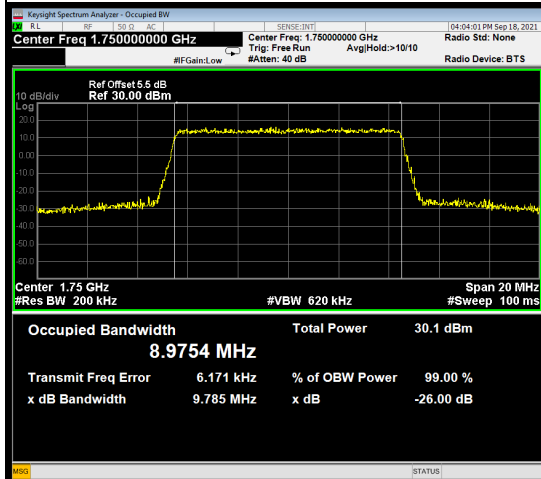
QPSK-20000



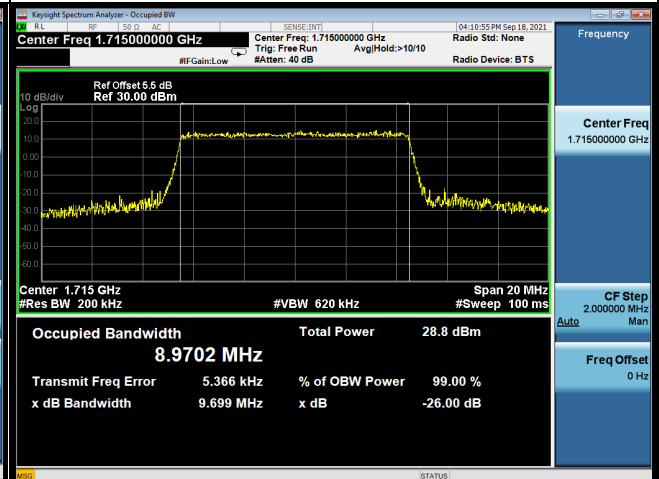
QPSK-20175



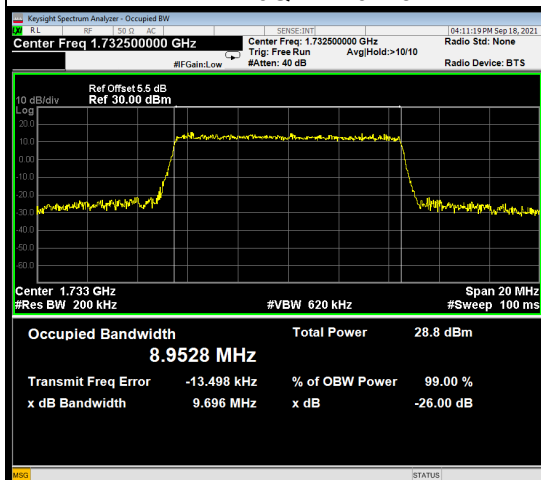
QPSK-20350



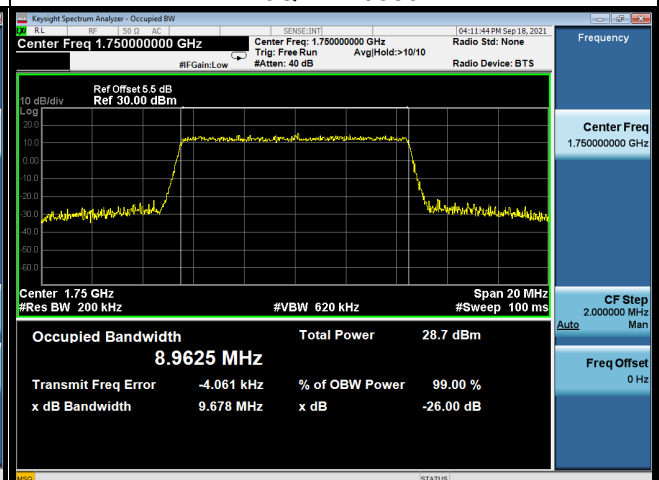
16QAM-20000



16QAM-20175

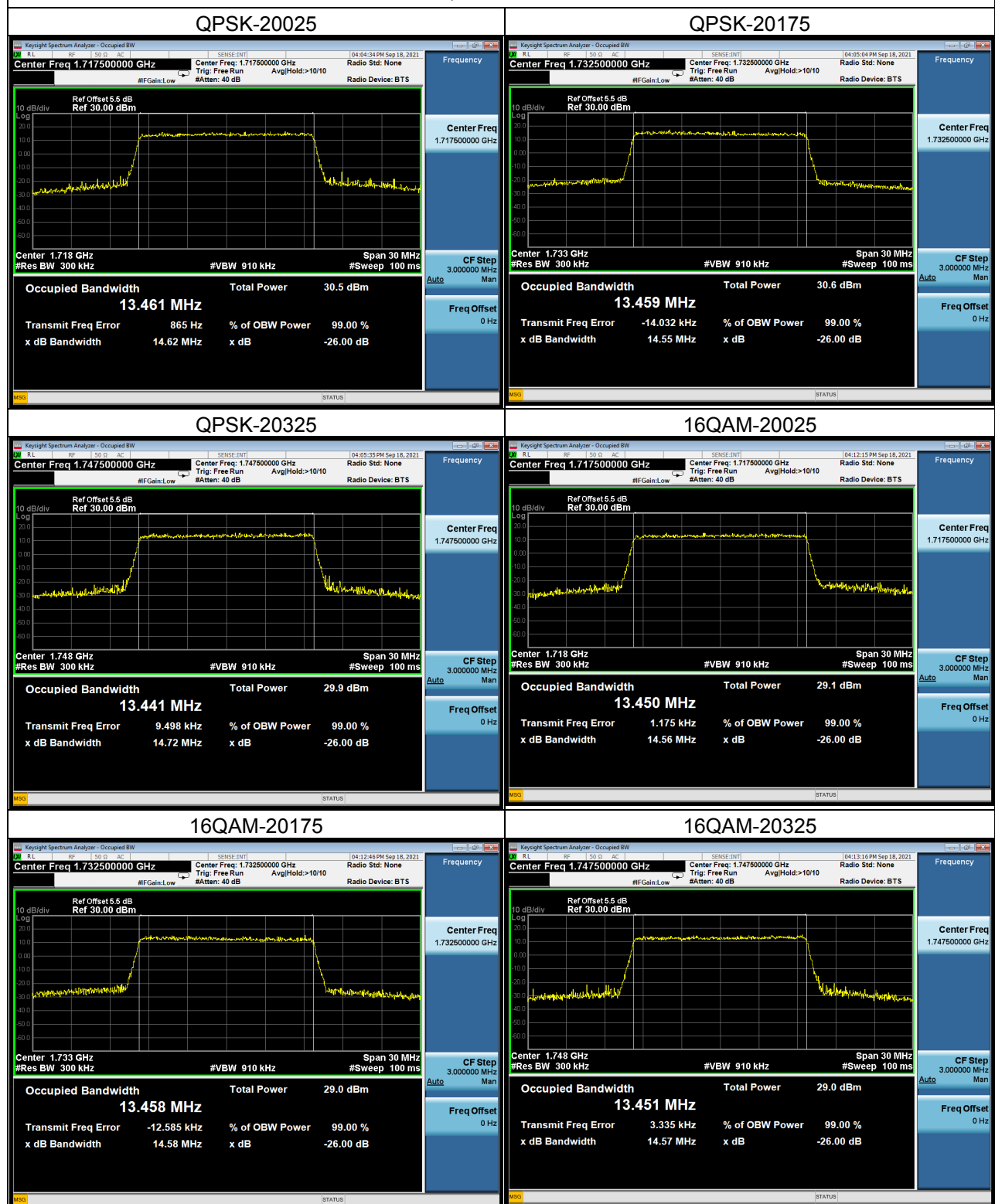


16QAM-20350



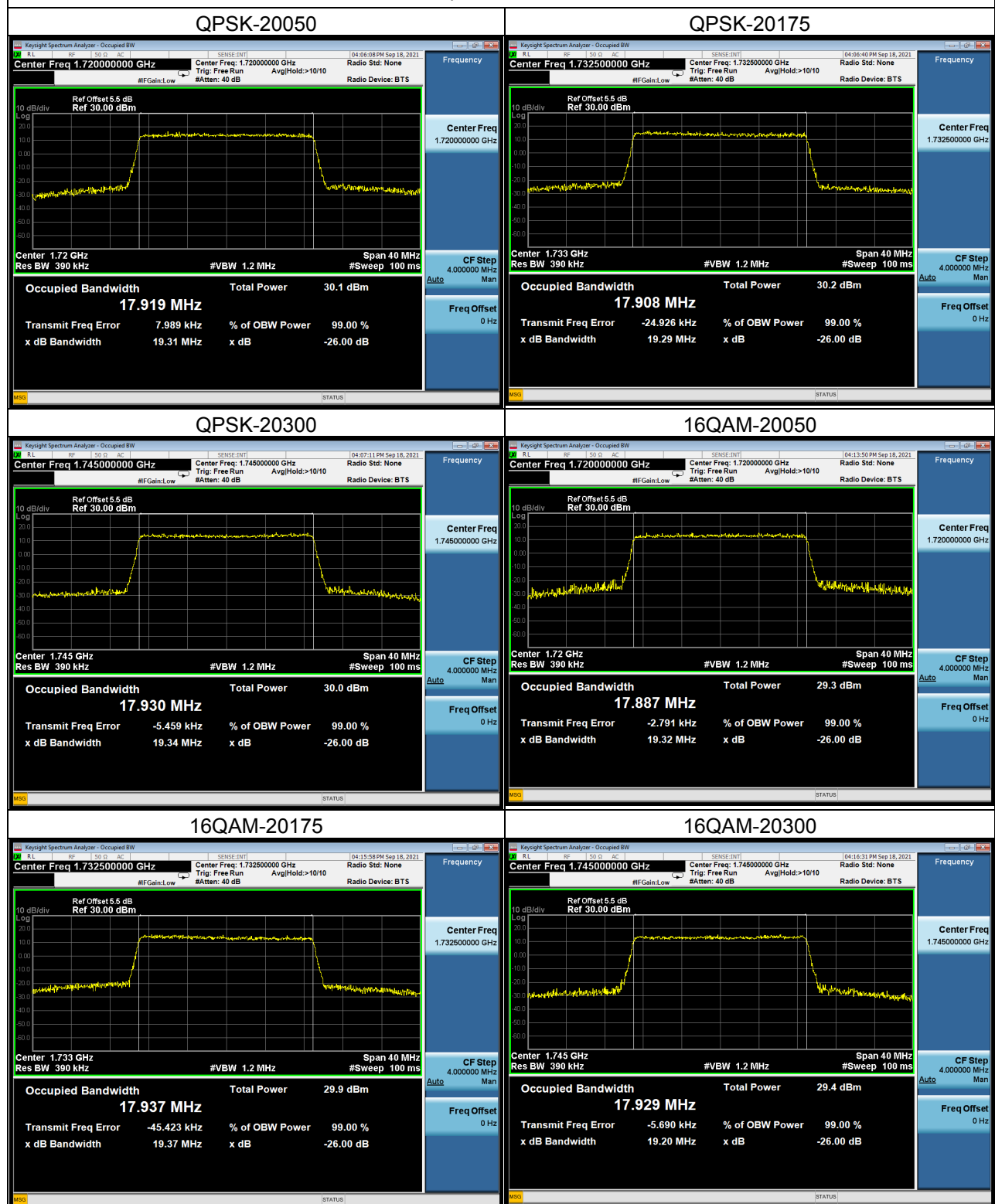
LTE Band 4_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	13.461	20025	1717.5	14.62
20175	1732.5	13.459	20175	1732.5	14.55
20325	1747.5	13.441	20325	1747.5	14.72
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20025	1717.5	13.450	20025	1717.5	14.56
20175	1732.5	13.458	20175	1732.5	14.58
20325	1747.5	13.451	20325	1747.5	14.57

Spectrum Plot



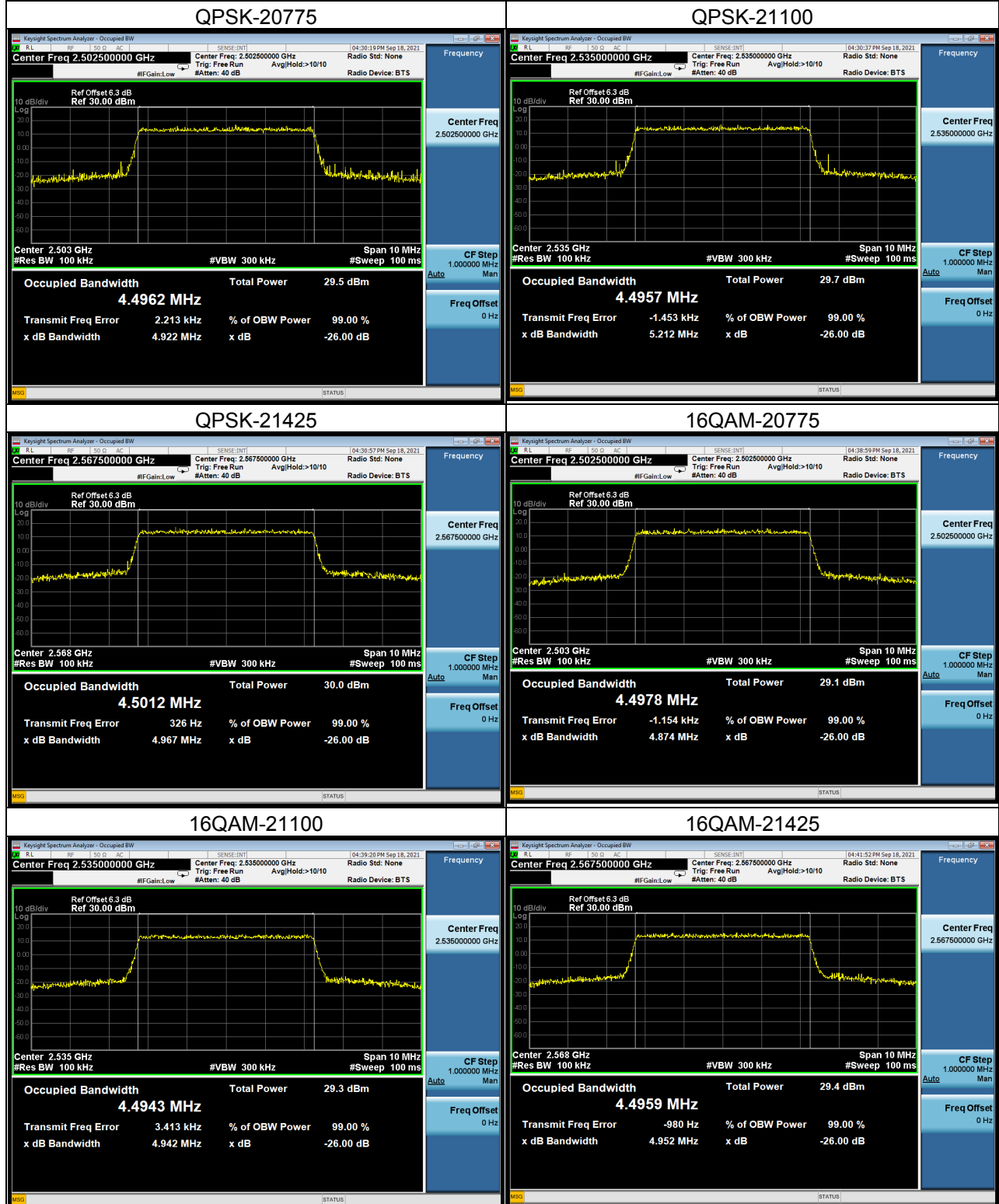
LTE Band 4_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	17.919	20050	1720	19.31
20175	1732.5	17.908	20175	1732.5	19.29
20300	1745	17.930	20300	1745	19.34
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20050	1720	17.887	20050	1720	19.32
20175	1732.5	17.937	20175	1732.5	19.37
20300	1745	17.929	20300	1745	19.20

Spectrum Plot



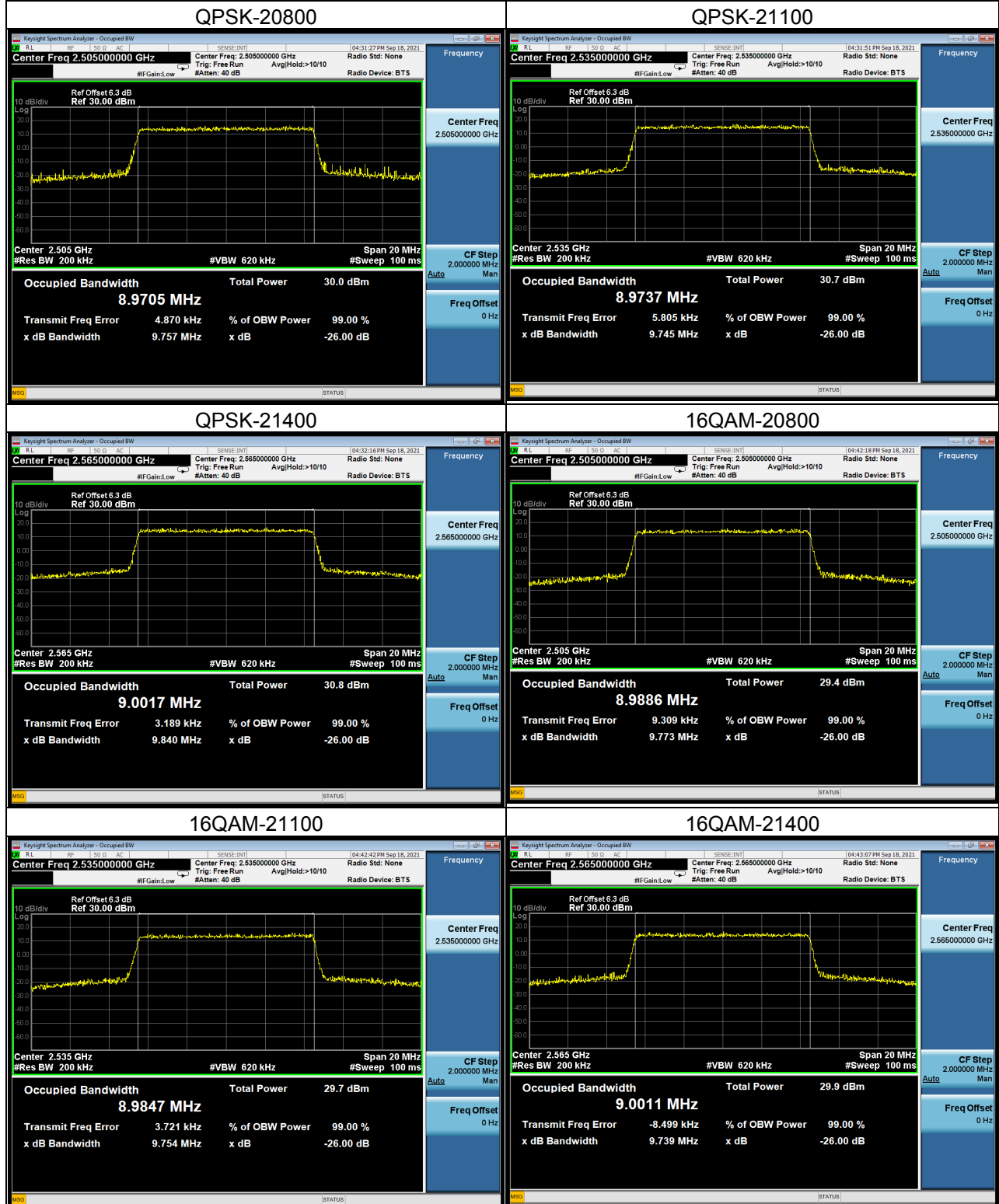
LTE Band 7_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20775	2502.5	4.4962	20775	2502.5	4.922
21100	2535	4.4957	21100	2535	5.212
21425	2567.5	4.5012	21425	2567.5	4.967
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20775	2502.5	4.4978	20775	2502.5	4.874
21100	2535	4.4943	21100	2535	4.942
21425	2567.5	4.4959	21425	2567.5	4.952

Spectrum Plot



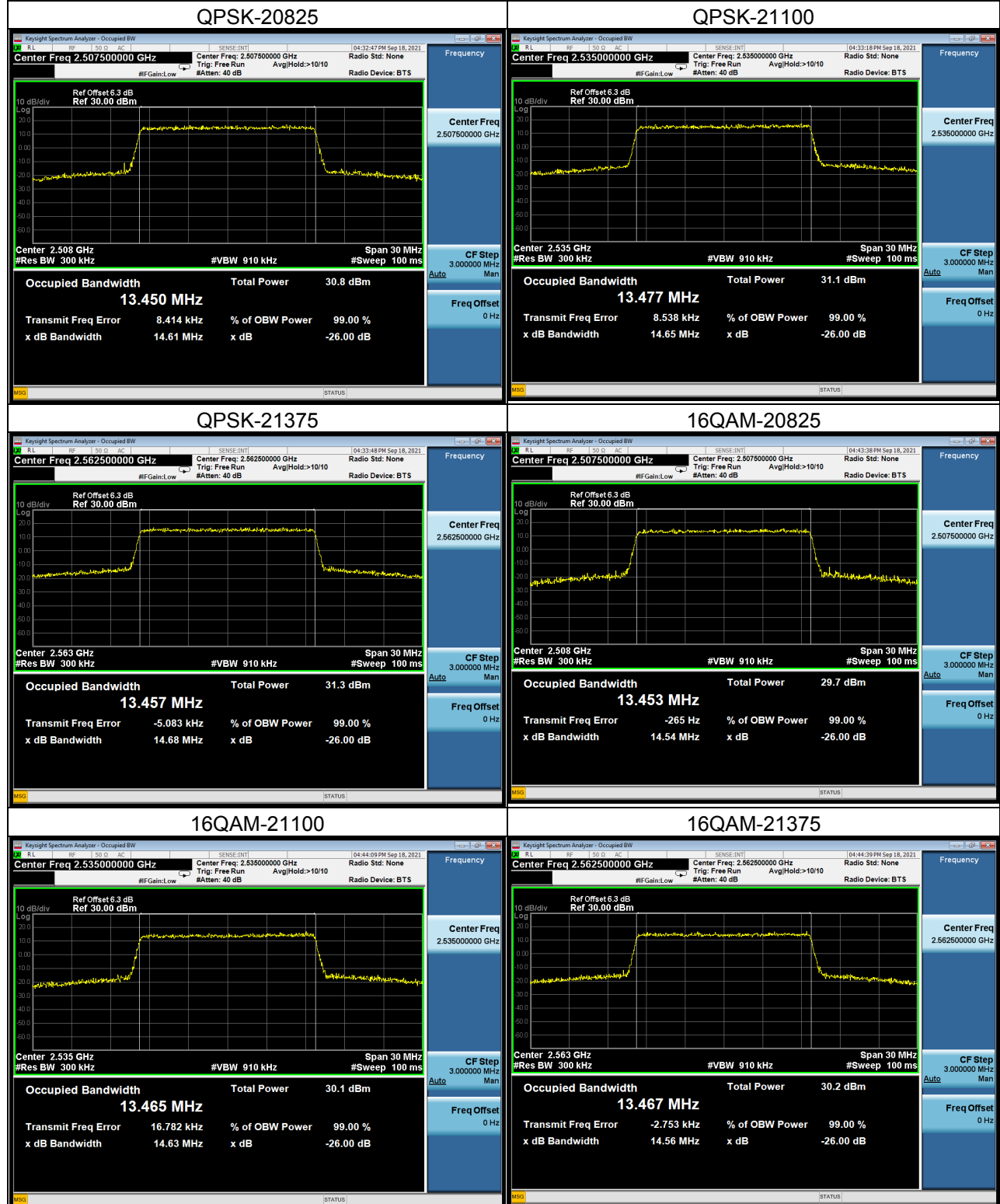
LTE Band 7_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20800	2505	8.9705	20800	2505	9.757
21100	2535	8.9737	21100	2535	9.745
21400	2565	9.0017	21400	2565	9.840
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20800	2505	8.9886	20800	2505	9.773
21100	2535	8.9847	21100	2535	9.754
21400	2565	9.0011	21400	2565	9.739

Spectrum Plot



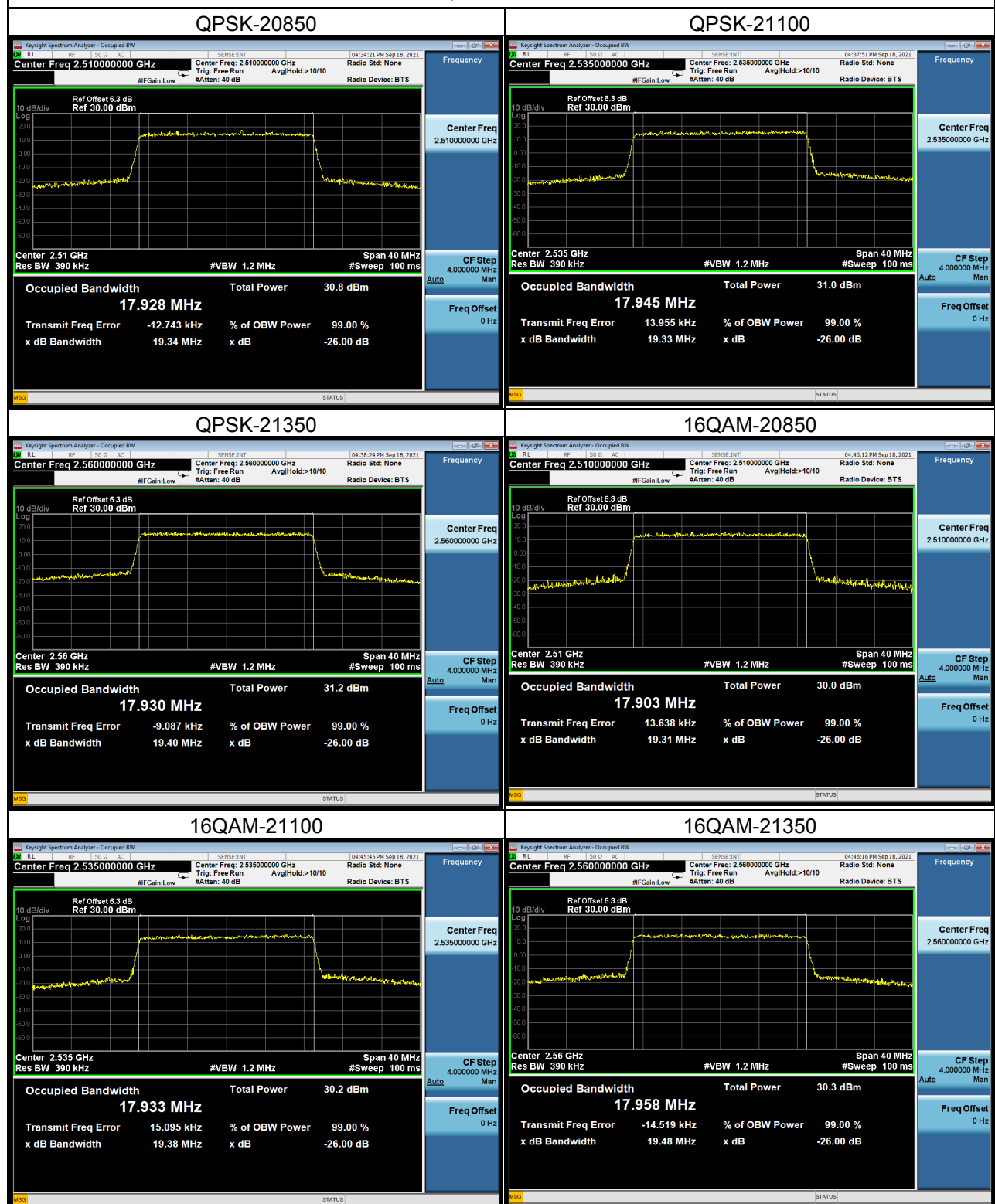
LTE Band 7_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20825	2507.5	13.450	20825	2507.5	14.61
21100	2535	13.477	21100	2535	14.65
21375	2562.5	13.457	21375	2562.5	14.68
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20825	2507.5	13.453	20825	2507.5	14.54
21100	2535	13.465	21100	2535	14.63
21375	2562.5	13.467	21375	2562.5	14.56

Spectrum Plot



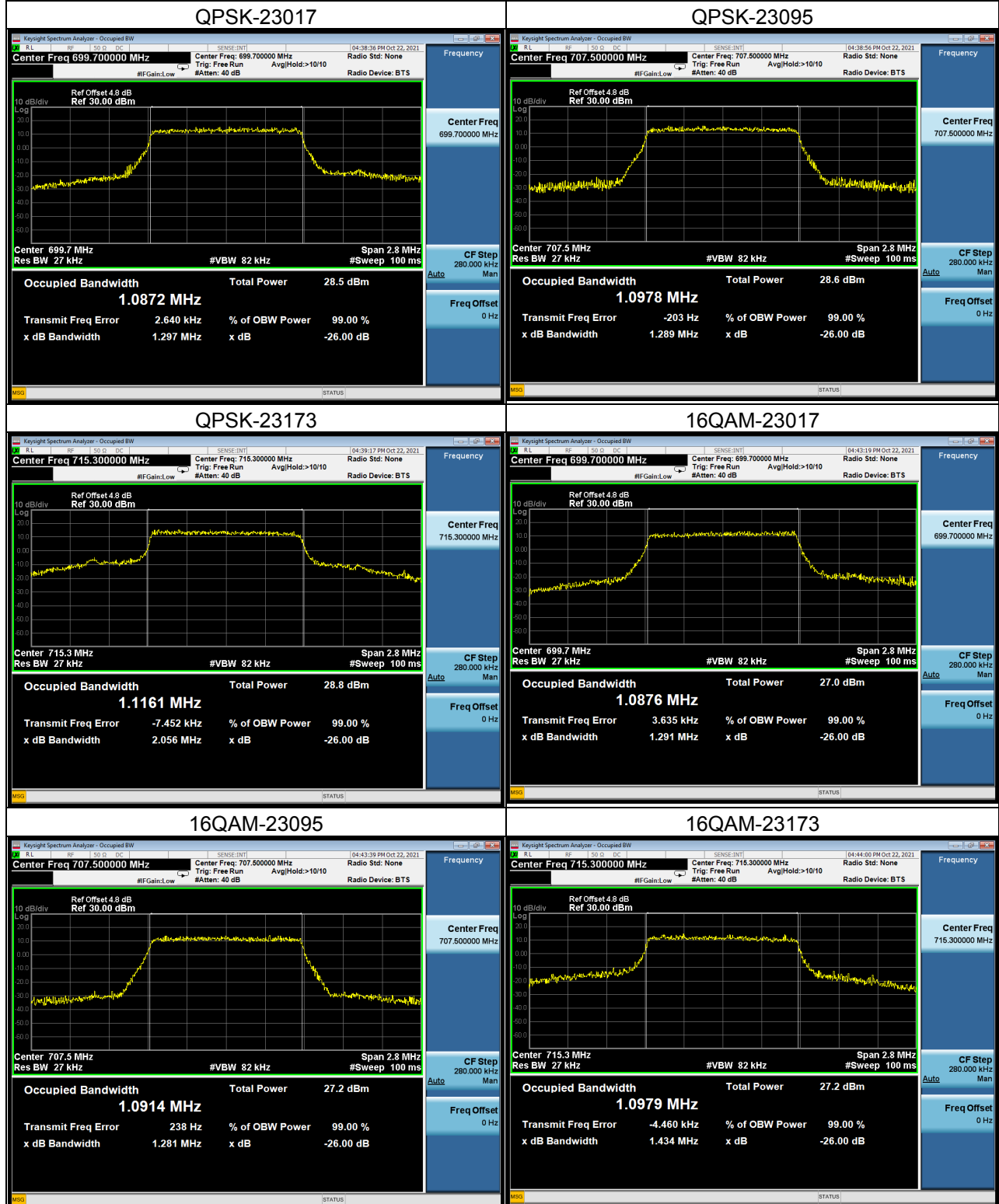
LTE Band 7_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20850	2510	17.928	20850	2510	19.34
21100	2535	17.945	21100	2535	19.33
21350	2560	17.930	21350	2560	19.40
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
20850	2510	17.903	20850	2510	19.31
21100	2535	17.933	21100	2535	19.38
21350	2560	17.958	21350	2560	19.48

Spectrum Plot



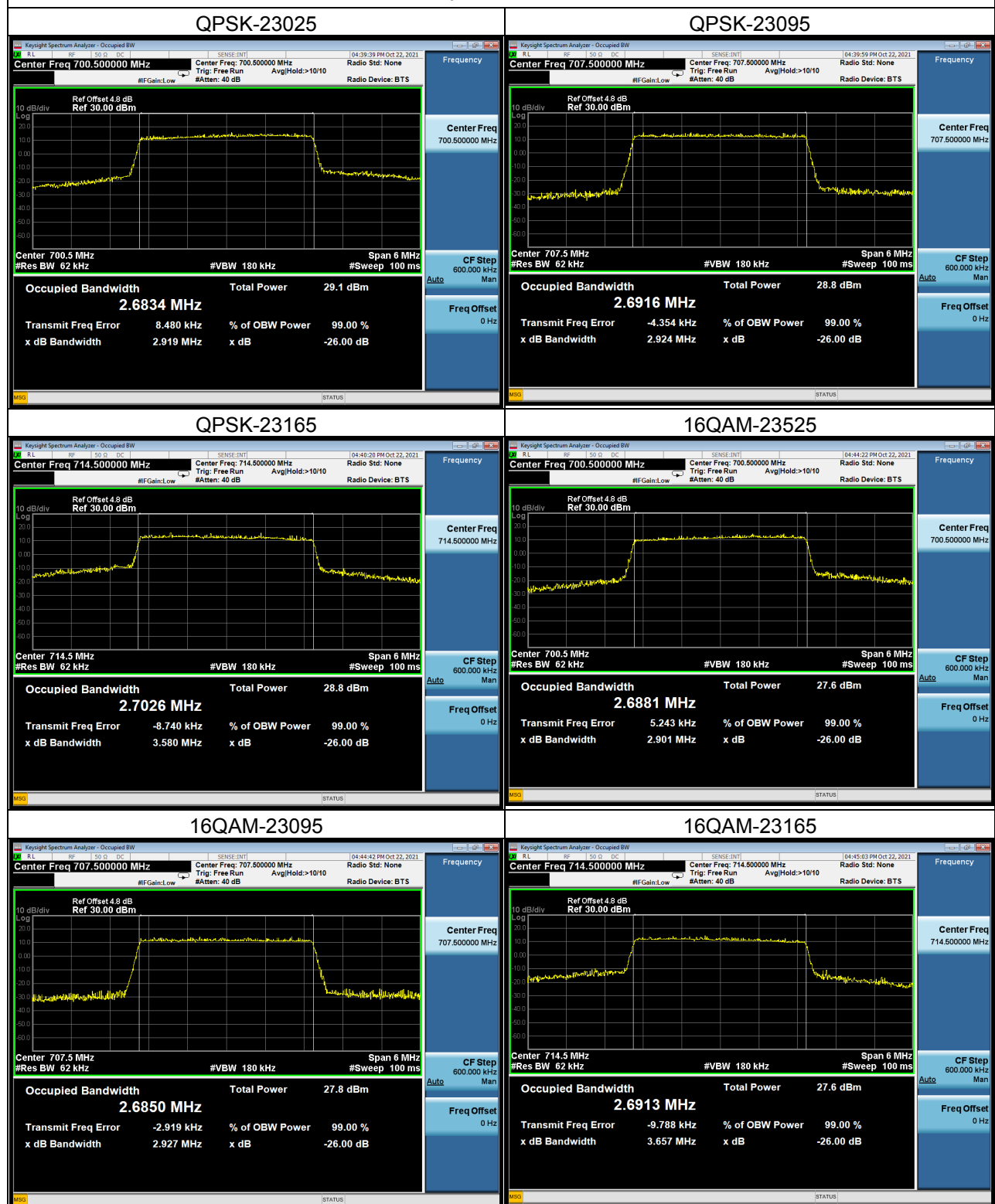
LTE Band 12_1.4M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.0872	23017	699.7	1.297
23095	707.5	1.0978	23095	707.5	1.289
23173	715.3	1.1161	23173	715.3	2.056
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23017	699.7	1.0876	23017	699.7	1.291
23095	707.5	1.0914	23095	707.5	1.281
23173	715.3	1.0979	23173	715.3	1.434

Spectrum Plot



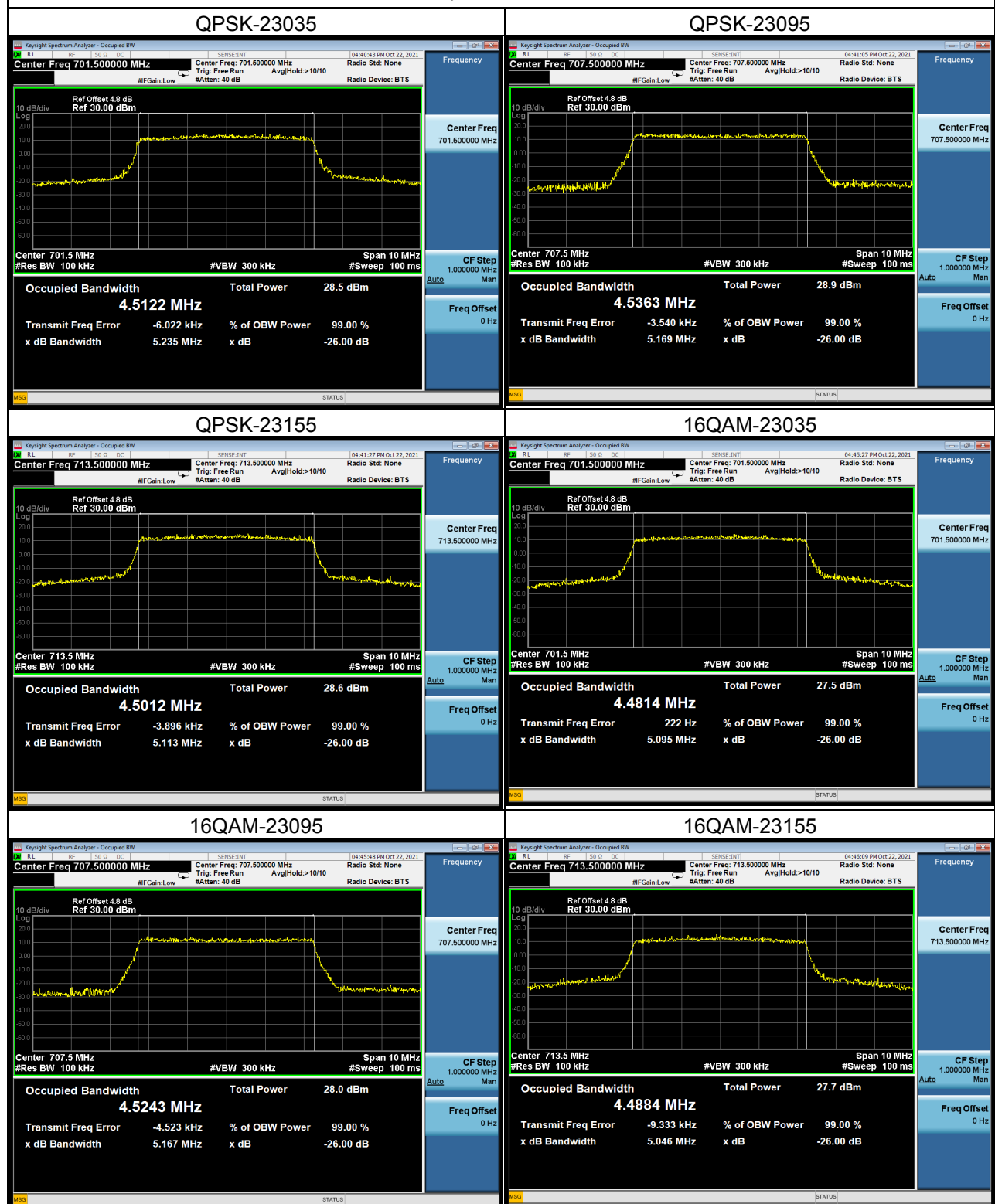
LTE Band 12_3M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.6834	23025	700.5	2.919
23095	707.5	2.6916	23095	707.5	2.924
23165	714.5	2.7026	23165	714.5	3.580
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23025	700.5	2.6881	23025	700.5	2.901
23095	707.5	2.6850	23095	707.5	2.927
23165	714.5	2.6913	23165	714.5	3.657

Spectrum Plot



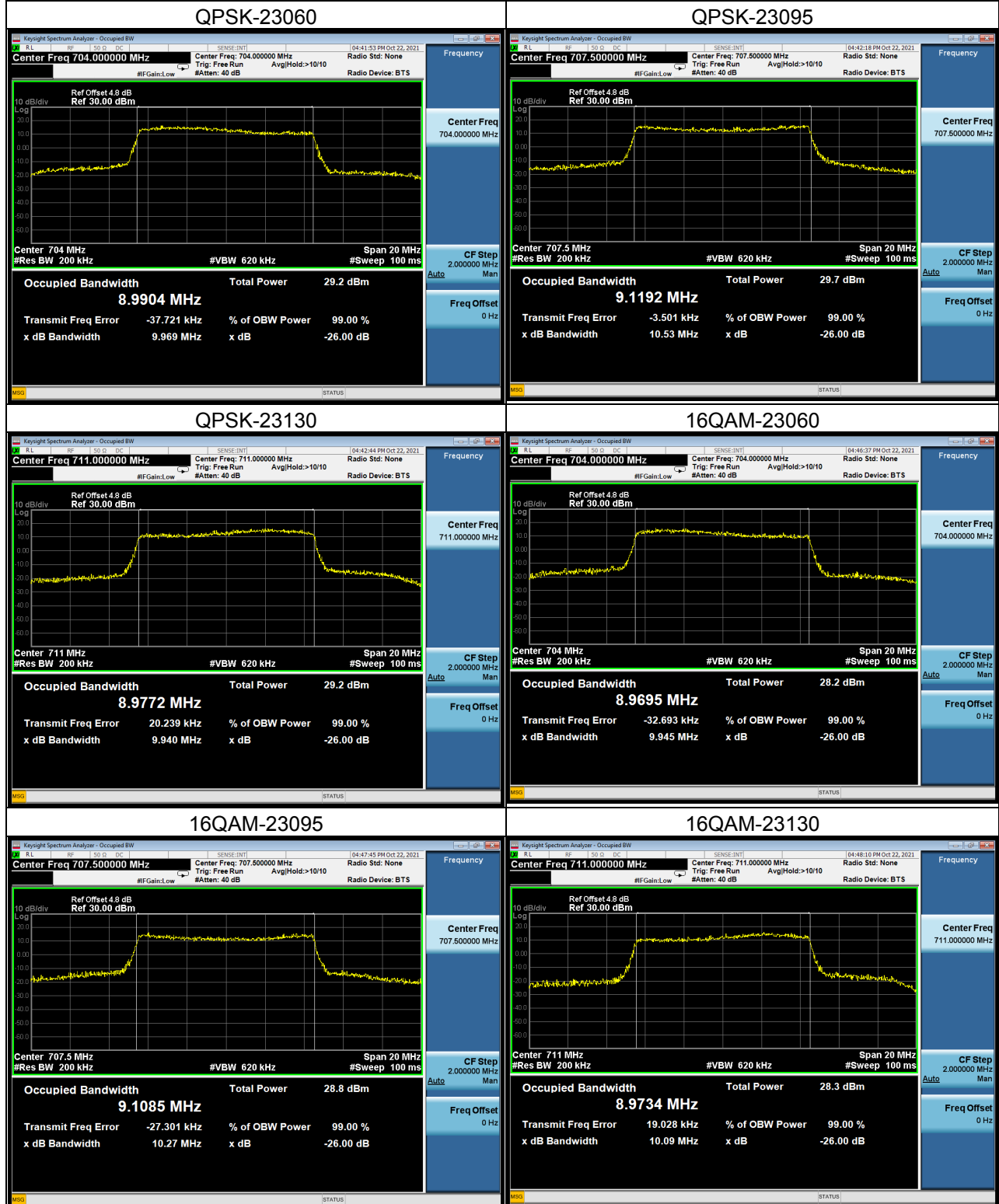
LTE Band 12_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23035	701.5	4.5122	23035	701.5	5.235
23095	707.5	4.5363	23095	707.5	5.169
23155	713.5	4.5012	23155	713.5	5.113
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23035	701.5	4.4814	23035	701.5	5.095
23095	707.5	4.5243	23095	707.5	5.167
23155	713.5	4.4884	23155	713.5	5.046

Spectrum Plot



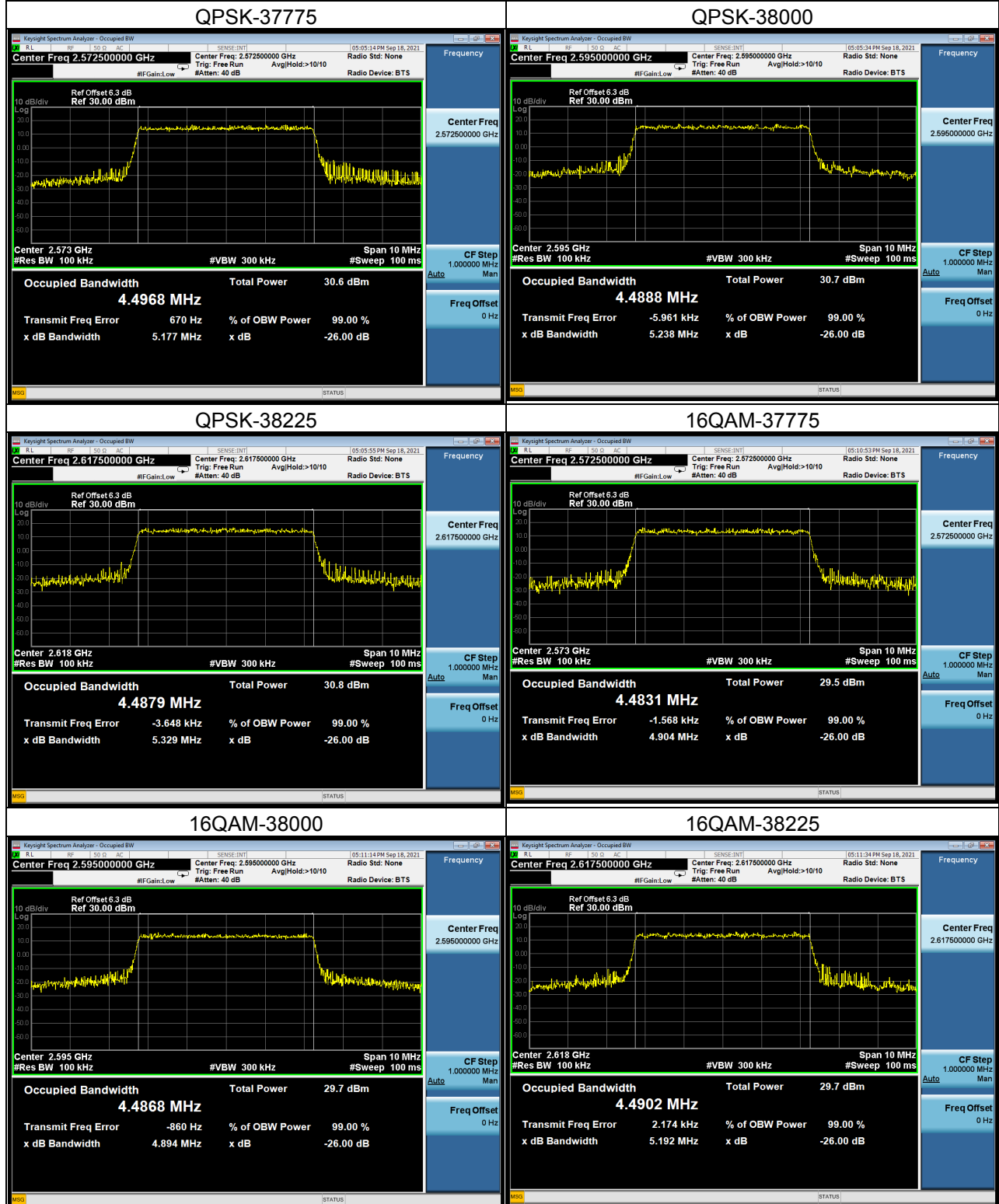
LTE Band 12_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23060	704.0	8.9904	23060	704.0	9.969
23095	707.5	9.1192	23095	707.5	10.53
23130	711.0	8.9772	23130	711.0	9.940
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
23060	704.0	8.9695	23060	704.0	9.945
23095	707.5	9.1085	23095	707.5	10.27
23130	711.0	8.9734	23130	711.0	10.09

Spectrum Plot



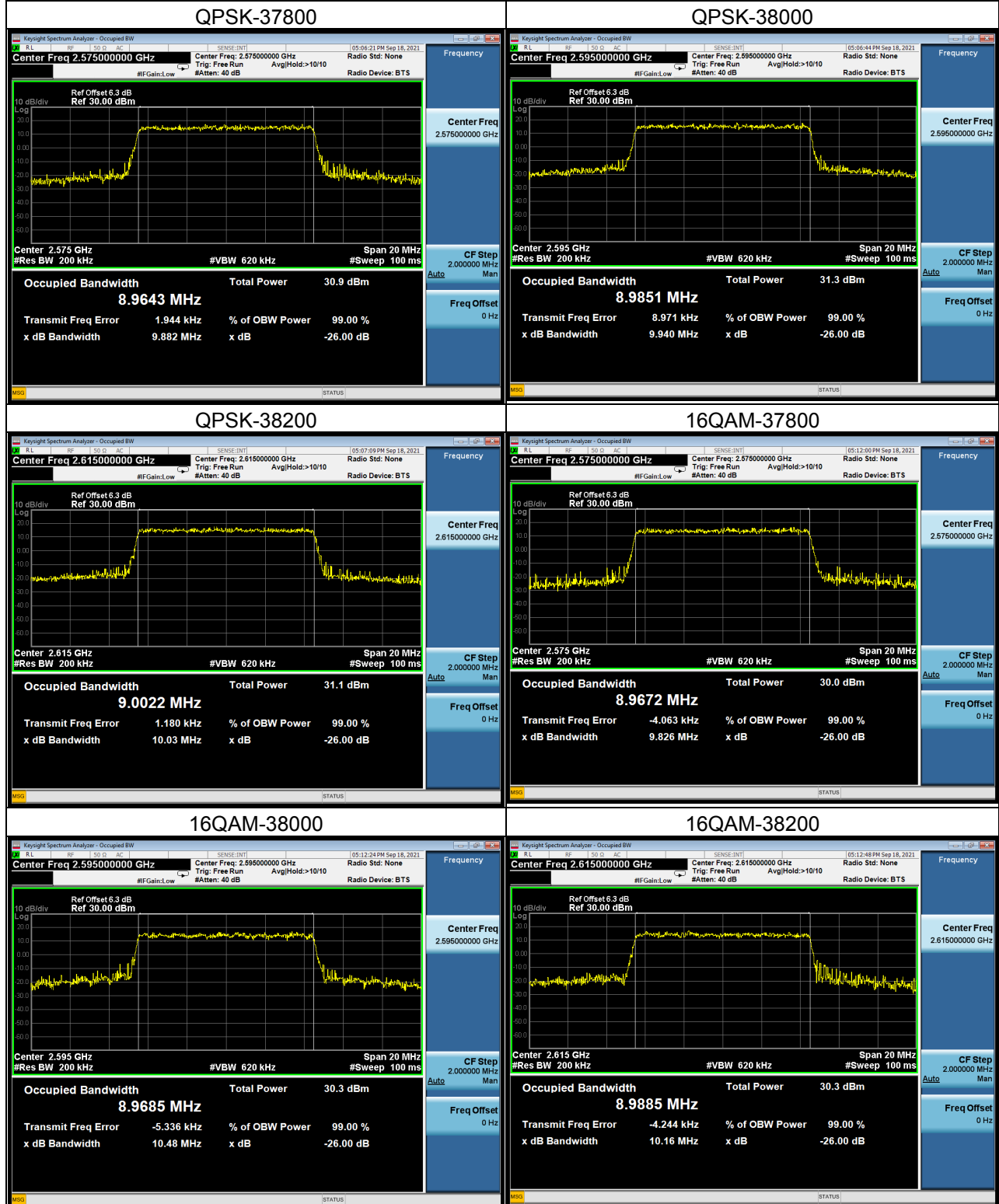
LTE Band 38_5M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37775	2572.5	4.4968	37775	2572.5	5.177
38000	2600	4.4888	38000	2600	5.238
38225	2617.5	4.4879	38225	2617.5	5.329
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37775	2572.5	4.4831	37775	2572.5	4.904
38000	2600	4.4868	38000	2600	4.894
38225	2617.5	4.4902	38225	2617.5	5.192

Spectrum Plot



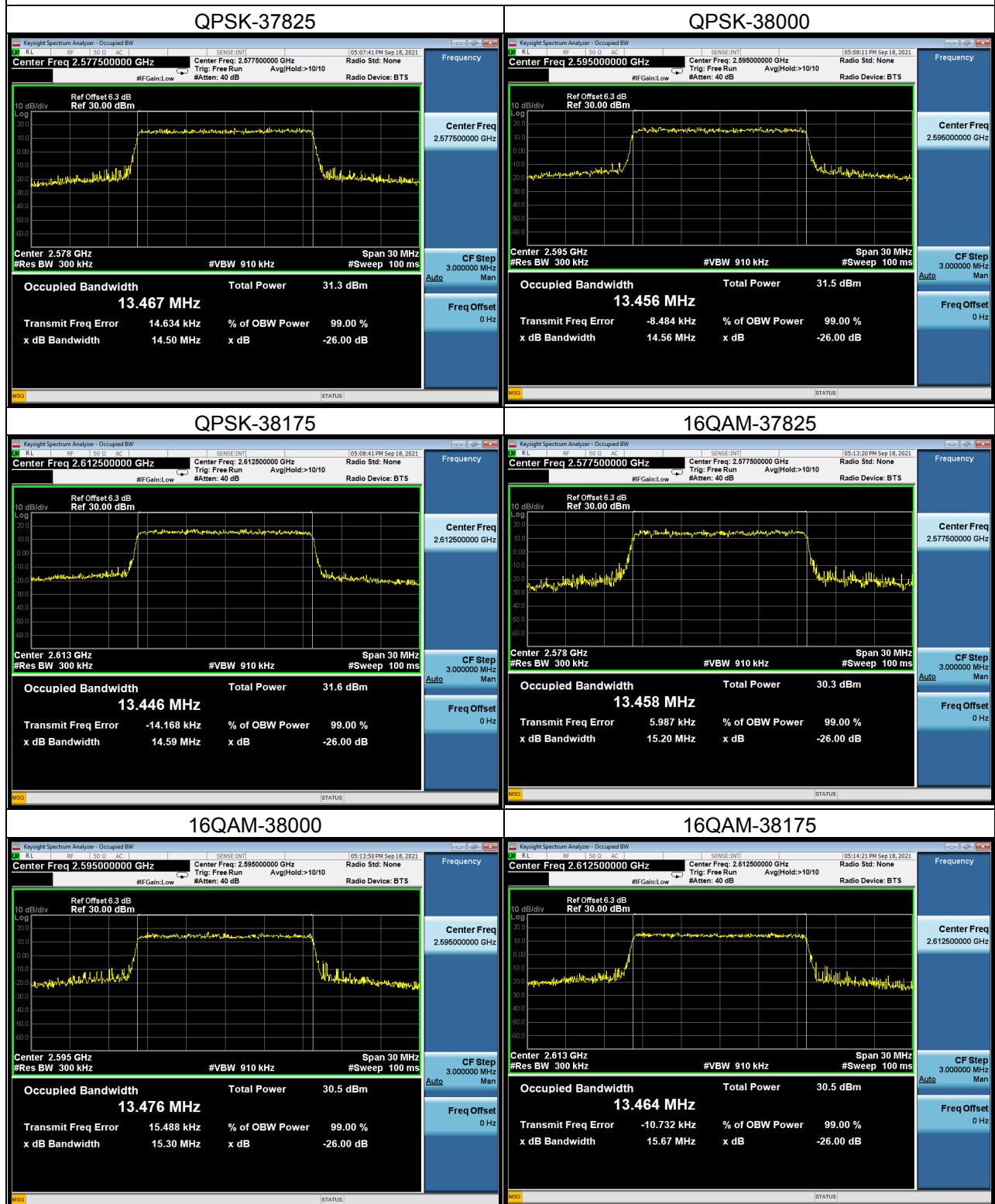
LTE Band 38_10M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37800	2575	8.9643	37800	2575	9.882
38000	2600	8.9851	38000	2600	9.940
38200	2615	9.0022	38200	2615	10.03
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37800	2575	8.9672	37800	2575	9.826
38000	2600	8.9685	38000	2600	10.48
38200	2615	8.9885	38200	2615	10.16

Spectrum Plot



LTE Band 38_15M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37825	2577.5	13.467	37825	2577.5	14.50
38000	2600	13.456	38000	2600	14.56
38175	2612.5	13.446	38175	2612.5	14.59
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37825	2577.5	13.458	37825	2577.5	15.20
38000	2600	13.476	38000	2600	15.30
38175	2612.5	13.464	38175	2612.5	15.67

Spectrum Plot



LTE Band 38_20M					
QPSK					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37850	2580	17.903	37850	2580	19.33
38000	2600	17.888	38000	2600	19.66
38150	2610	17.906	38150	2610	19.51
16QAM					
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	Channel	Frequency (MHz)	26dB Bandwidth (MHz)
37850	2580	17.915	37850	2580	19.59
38000	2600	17.928	38000	2600	20.26
38150	2610	17.914	38150	2610	20.74