

FCC Test Report

Product Name : TracKing V5
Brand Name : Thermo King
Model No. : TKV5C4
FCC ID : Q37TKV5C4

Applicant : Thermo King Corporation
Address : 314 West 90th Street, Minneapolis, MN USA 55420

Date of Receipt : Dec. 09, 2021
Issued Date : May 24, 2022
Report No. : 21C0364R-RFUSWWAV07-B
Report Version : V1.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

The test report shall not be reproduced except in full without the written approval of DEKRA Testing and Certification Co., Ltd.



Product Name : TrackKing V5
Applicant : Thermo King Corporation
Address : 314 West 90th Street, Minneapolis, MN USA 55420
Manufacturer : Thermo King Corporation
Address : 314 West 90th Street, Minneapolis, MN USA 55420
Brand Name : Thermo King
Model No. : TKV5C4
FCC ID : Q37TKV5C4
EUT Voltage : DC 14.2V
Testing Voltage : DC 14.2V
Applicable Standard : FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart L, Subpart F
FCC CFR Title 47 Part 90 Subpart S
ANSI/TIA-603-E-2016
ANSI C63.26-2015
Laboratory Name : DEKRA Testing and Certification Co., Ltd.
Hsin Chu Laboratory
Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu
County 310, Taiwan, R.O.C.
Test Result : Complied

Documented By : Hailey Peng
(Hailey Peng / Senior Engineer)

Approved By : Rueyyan Lin
(Rueyyan Lin / Supervisor)

The test results relate only to the samples tested.
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Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	May 24, 2022

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1. General Information

1.1. EUT Description

Product Name	TracKing V5
Brand Name	Thermo King
Model No.	TKV5C4
Uplink Frequency Range (MHz)	LTE Band 2: 1850~1910 LTE Band 4: 1710~1755 LTE Band 5: 824~849 LTE Band 12: 699~716 LTE Band 13: 777~787 LTE Band 25: 1850~1915 LTE Band 26: 814~849
Downlink Frequency Range (MHz)	LTE Band 2: 1930~1990 LTE Band 4: 2110~2115 LTE Band 5: 869~894 LTE Band 12: 729~746 LTE Band 13: 746~756 LTE Band 25: 1930~1995 LTE Band 26: 859~894
Bandwidth (MHz)	LTE Band 2: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 4: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 5: 1.4 / 3 / 5 / 10 LTE Band 12: 1.4 / 3 / 5 / 10 LTE Band 13: 5 / 10 LTE Band 25: 1.4 / 3 / 5 / 10 / 15 / 20 LTE Band 26: 1.4 / 3 / 5 / 10 / 15
Type of Modulation	QPSK / 16QAM / 64QAM
Hardware Version	2.0
Software Version	T-0102-000028
IMEI No.	8655090512

Antenna Information										
Ant. No.	Manufacturer	Model No.	Ant. Type	Ant. Gain (dBi)						
				LTE Band						
				2	4	5	12	13	25	26
0	N/A	N/A	PCB	2.33	3.39	-0.27	-0.66	0.36	2.33	-0.22

Note:

- Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.
- The EUT description is from the customer declaration.
- The device was tested under all bandwidths, RB configurations and modulations, and the worst case was found in QPSK modulation and show in "Conducted Band Edge" & "Spurious Emission".
- The 64QAM modulation for downlink only.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode	Mode 1: LTE Band 2/25 Mode 2: LTE Band 4 Mode 3: LTE Band 5/26 (Part 22) Mode 4: LTE Band 12 Mode 5: LTE Band 13 Mode 6: LTE Band 26 (Part 90)
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Note:

1. LTE Band 2 is covered by LTE Band 25.
2. LTE Band 5 is covered by LTE Band 26.
3. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
4. The EUT was performed at X axis and Z axis position for radiated emission and band edge tests. The worst case was found at X axis, so the measurement will follow this same test configuration.

1.3. Comments and Remarks

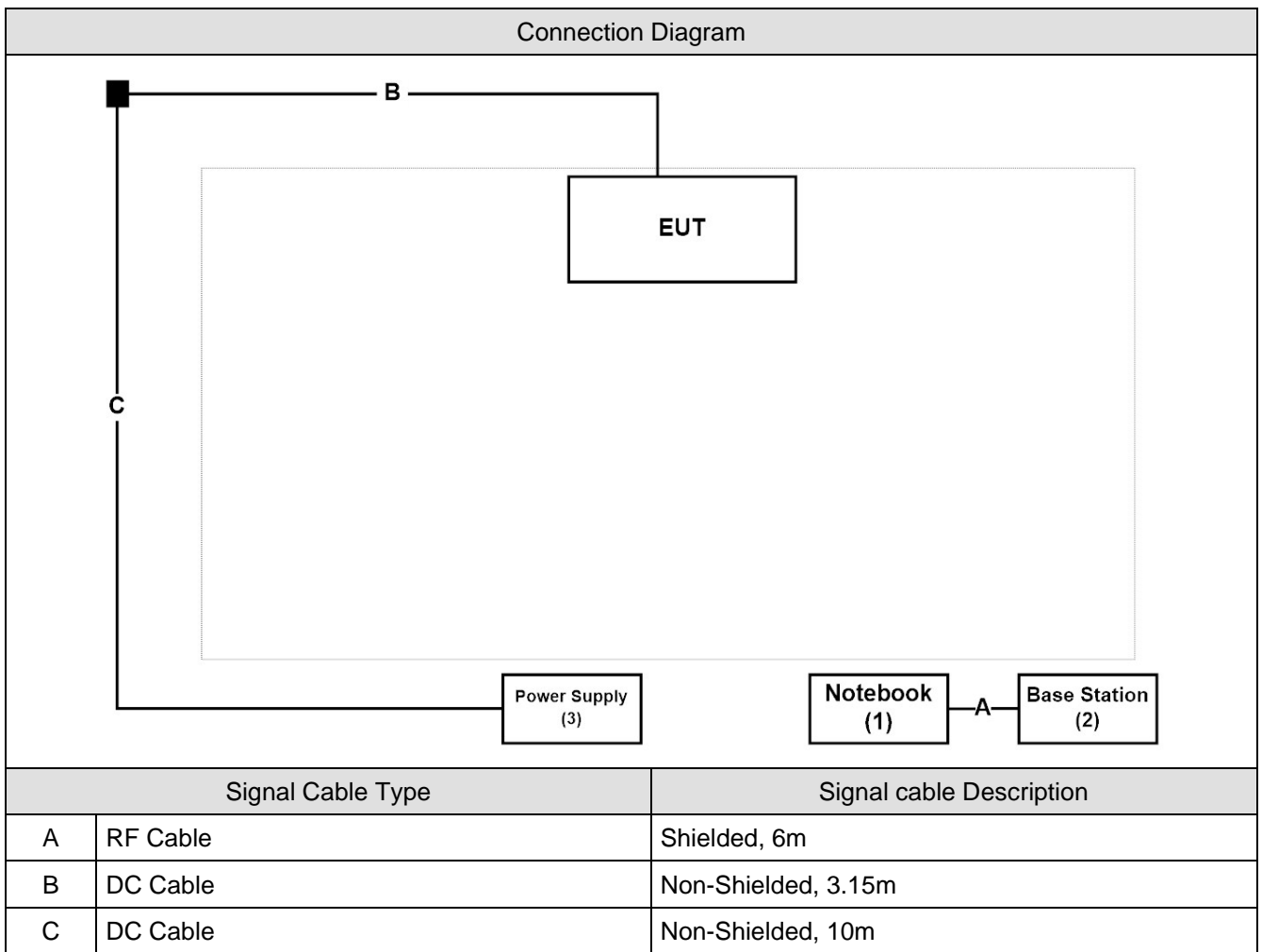
The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1.4. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system.

	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Horn Antenna	Schwarzbeck	BBHA 9120D	1640	N/A
2	Base Station	R&S	CMW500	157118	N/A
3	Power Supply	Topward	6303D	8095908	N/A

1.5. Configuration of Tested System



1.6. EUT Operation of during Test

1	Setup the EUT and simulators as shown on.
2	Turn on the power of all equipment.
3	The EUT will continue receive the signal from LTE function.
4	Repeat the above procedure (3)

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
 Deviations from the test standards as below description:

LTE Band 2			
FCC Part 24 Subpart E			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 2 Watts	Pass
	§2.1046		
	§24.232		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§24.232(d)	\leq 13dB	Pass
Conducted Band Edge	§27.238	< -13dBm	Pass
Spurious Emission	§2.1053	< -13dBm	Pass
	§24.238		
Frequency Stability	§2.1055	< \pm 2.5 ppm	Pass
	§24.235		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 4			
FCC Part 27 Subpart L			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 1 Watts	Pass
	§2.1046		
	§27.50		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§27.50	\leq 13dB	Pass
Conducted Band Edge	§2.1053	< -13 dBm	Pass
	§27.53		
Spurious Emission	§27.53	< -13 dBm	Pass
Frequency Stability	§2.1055	< \pm 2.5 ppm	Pass
	§27.54		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 5			
FCC Part 22 Subpart H			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 7 Watts	Pass
	§2.1046		
	§22.913		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§22.913	≤ 13dB	Pass
Conducted Band Edge	§2.1053	< -13dBm	Pass
	§22.917		
Spurious Emission	§22.917	< -13dBm	Pass
Frequency Stability	§2.1055	< ±2.5 ppm	Pass
	§22.335		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 12			
FCC Part 27 Subpart F			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 3 Watts ERP	Pass
	§2.1046		
	§27.50		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§27.50	<13 dB	Pass
Conducted Band Edge	§2.1053	<-13dBm	Pass
	§27.53		
Spurious Emission	§27.53	<-13dBm	Pass
Frequency Stability	§2.1055	< ±2.5 ppm	Pass
	§27.54		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 13			
FCC Part 27 Subpart F			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 3 Watts ERP	Pass
	§2.1046		
	§27.50		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§27.50	< -13 dB	Pass
Conducted Band Edge	§2.1053	< -13dBm <-35dBm (763-775 MHz &793-805 MHz)	Pass
	§27.53		
Spurious Emission	§27.53	< -13dBm <-70 dBW/MHz e.i.r.p.of all emissions, including harmonics in the band 1559-1610 MHz	Pass
Frequency Stability	§2.1055	< ±2.5 ppm	Pass
	§27.54		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 25			
FCC Part 24 Subpart E			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033	< 2 Watts	Pass
	§2.1046		
	§24.232		
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§24.232	< 13 dB	Pass
Conducted Band Edge	§2.1053	< -13dBm	Pass
	§24.238		
Spurious Emission	§27.238	< -13dBm	Pass
Frequency Stability	§2.1055	< ±2.5 ppm	Pass
	§24.235		

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

LTE Band 26			
FCC Part 22 Subpart H			
FCC Part 90 Subpart S			
Performed Item	FCC Reference Section	Limit	Result
RF Output Power	§2.1033 §2.1046 §90.635(b) §22.913	< 100 Watts	Pass
Occupied Bandwidth	§2.1049	N/A	Pass
Peak to Average Ratio	§22.913	< 13 dB	Pass
Conducted Band Edge	§2.1053 §90.691 §22.917	< -13dBm	Pass
Spurious Emission	§90.691 §22.917	< -13dBm	Pass
Frequency Stability	§2.1055 §90.213	< ±2.5 ppm	Pass

Note: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.2. Test Environment

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	RF Output Power	22.3 ~ 22.6	Ling Chen	2021/12/15 ~ 2021/12/16	HC-SR12
Humidity (%RH)		55			
Temperature (°C)	Occupied Bandwidth	21 ~ 22	Clemens Fang	2021/12/22 ~ 2021/12/23	HC-SR12
Humidity (%RH)		67 ~ 69			
Temperature (°C)	Peak to Average Ratio	22	Clemens Fang	2021/12/21	HC-SR12
Humidity (%RH)		68			
Temperature (°C)	Conducted Band Edge	22	Clemens Fang	2021/12/20 ~ 2021/12/21	HC-SR12
Humidity (%RH)		64 ~ 68			
Temperature (°C)	Conducted Spurious Emission	22	Clemens Fang	2021/12/20 ~ 2021/12/21	HC-SR1 2
Humidity (%RH)		64 ~ 68			
Temperature (°C)	Radiated Spurious Emission	21.8	Rueyyan Lin	2021/12/15	HC-CB02
Humidity (%RH)		58			
Temperature (°C)	Frequency Stability	22	Clemens Fang	2021/12/24	HC-SR12
Humidity (%RH)		68			

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : **FCC Registration Number: TW3024**

Canada **CAB identifier : TW3024**

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our

Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site for address 1 includes HC-SR02. Test site for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

2.3. List of Test Equipment

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2021/11/12	2022/11/11
Pulse Power Sensor	Anritsu	MA2411B	1531043	2021/11/12	2022/11/11
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2021/01/25	2022/01/24
Pulse Power Sensor	Anritsu	MA2411B	1531044	2021/11/12	2022/11/11
Power Meter	Keysight	8990B	MY51000248	2021/05/21	2022/05/20
Power Sensor	Keysight	N1923A	MY57240005	2021/05/21	2022/05/20
Spectrum Analyzer	Keysight	N9030B	MY57140404	2021/05/14	2022/05/13
Spectrum Analyzer	Keysight	N9010B	MY57110159	2021/03/29	2022/03/28
Wireless Conn. Tseter	R&S	CMW500	157118	2021/07/07	2022/07/06
Spectrum Analyzer	Agilent	N9010A	US47140172	2021/05/28	2022/05/27
Signal & Spectrum Analyzer	R&S	FSV40	101049	2021/03/31	2022/03/30

HC-CB02

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Signal Analyzer	R&S	FSVA40	101455	2021/10/22	2022/10/21
Signal & Spectrum Analyzer	R&S	FSV40	101049	2021/03/31	2022/03/30
Signal Analyzer	R&S	FSVA40	101435	2021/06/04	2022/06/03
EXA Signal Analyzer	Keysight	N9010A	MY51440132	2021/01/25	2022/01/24
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1272	2021/08/20	2022/08/19
Bilog Antenna	Teseq	CBL6112D	23191	2021/02/26	2022/02/25
Horn Antenna	Schwarzbeck	BBHA 9120D	639	2021/05/17	2022/05/16
Horn Antenna	Schwarzbeck	BBHA 9170	202	2021/12/01	2022/11/30
Pre-Amplifier	EMCI	EMC01820I	980365	2021/05/28	2022/05/27
Pre-Amplifier	EMEC	EM01G18GA	060741	2021/07/02	2022/07/01
Pre-Amplifier	DEKRA	AP-400C	201801231	2021/11/12	2022/11/11
Wireless Conn. Tseter	R&S	CMW500	157118	2021/07/07	2022/07/06
Coaxial Cable(13m)	Huber+Suhner	SF104	HC-CB02	2021/08/17	2022/08/16
Coaxial Cable(3m)	Suhner,Rosnol	SF102_Rosnol	HC-CB02	2021/08/17	2022/08/18
Radiated Software	AUDIX	e3 V9	HC-CB02	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

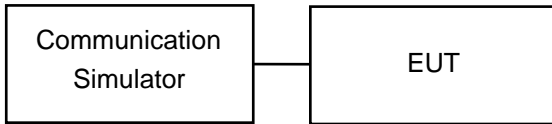
2.4. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document 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)).

Test Item	Uncertainty
RF Output Power	± 1.16 dB
Occupied Bandwidth	± 217.9 Hz
Peak to Average Ratio	± 1.16 dB
Conducted Band Edge	± 1.16 dB
Spurious Emissions	± 3.25 dB below 1 GHz ± 3.32 dB above 1 GHz
Frequency Stability	± 217.9 Hz

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum conducted RF output power under transmission mode and specific channel frequency. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_{T} = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_{C} = signal attenuation in the connecting cable between the transmitter and antenna, in dB

3.3. Test Methodology and Reference Procedures

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

3.4. Test Result of RF Output Power

Mode 1: LTE Band 2/25

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 1.4 MHz	26047 1850.7	QPSK	1	0	0	24.03	0.433	2
				2		23.93	0.423	2
				5		23.89	0.419	2
		6	0	1	22.68	0.317	2	
		16-QAM	1	0	1	22.84	0.329	2
				2		22.29	0.290	2
	5			22.49		0.303	2	
	6	0	2	21.76	0.256	2		
	26365 1882.5	QPSK	1	0	0	23.96	0.426	2
				2		23.91	0.421	2
				5		23.85	0.415	2
		6	0	1	22.91	0.334	2	
		16-QAM	1	0	1	22.54	0.307	2
				2		22.69	0.318	2
	5			22.64		0.314	2	
	6	0	2	21.89	0.264	2		
	26683 1914.3	QPSK	1	0	0	23.55	0.387	2
				2		23.46	0.379	2
				5		23.49	0.382	2
		6	0	1	22.62	0.313	2	
		16-QAM	1	0	1	22.73	0.321	2
				2		22.88	0.332	2
	5			22.61		0.312	2	
	6	0	2	21.59	0.247	2		

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)

2. Power (W) = $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 3 MHz	26055 1851.5	QPSK	1	0	0	23.60	0.392	2
				7		23.52	0.385	2
				14		23.53	0.385	2
		15	0	1	22.82	0.327	2	
		16-QAM	1	0	1	23.14	0.352	2
				7		23.00	0.341	2
	14			22.55		0.308	2	
	15	0	2	21.89	0.264	2		
	26365 1882.5	QPSK	1	0	0	24.06	0.436	2
				7		23.85	0.415	2
				14		24.03	0.433	2
		15	0	1	22.91	0.334	2	
		16-QAM	1	0	1	22.95	0.337	2
				7		22.91	0.334	2
	14			22.74		0.321	2	
	15	0	2	21.84	0.261	2		
	26675 1913.5	QPSK	1	0	0	23.62	0.394	2
				7		23.59	0.391	2
				14		23.51	0.384	2
		15	0	1	22.64	0.314	2	
		16-QAM	1	0	1	22.47	0.302	2
				7		22.54	0.307	2
	14			22.20		0.284	2	
	15	0	2	21.56	0.245	2		

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 5 MHz	26065 1852.5	QPSK	1	0	0	23.78	0.408	2
				12		23.49	0.382	2
				24		23.54	0.386	2
		25	0	1	22.66	0.316	2	
		16-QAM	1	0	1	22.16	0.281	2
				12		21.94	0.267	2
	24			21.90		0.265	2	
	25		0	2	21.80	0.259	2	
	26365 1882.5	QPSK	1	0	0	23.49	0.382	2
				12		23.45	0.378	2
				24		23.41	0.375	2
		25	0	1	22.78	0.324	2	
		16-QAM	1	0	1	23.16	0.354	2
				12		23.13	0.352	2
	24			23.09		0.348	2	
	25		0	2	21.55	0.244	2	
	26665 1912.5	QPSK	1	0	0	23.56	0.388	2
				12		23.53	0.385	2
				24		23.46	0.379	2
		25	0	1	22.59	0.310	2	
		16-QAM	1	0	1	22.10	0.277	2
				12		22.41	0.298	2
	24			22.04		0.274	2	
	25		0	2	21.44	0.238	2	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 10 MHz	26090 1855	QPSK	1	0	0	23.68	0.399	2
				24		23.48	0.381	2
				49		23.54	0.386	2
		50	0	1	22.65	0.315	2	
		16-QAM	1	1	0	23.00	0.341	2
					24	23.05	0.345	2
	49				22.93	0.336	2	
	50		0	2	21.76	0.256	2	
	26365 1882.5	QPSK	1	0	0	23.96	0.426	2
					24	23.85	0.415	2
					49	23.67	0.398	2
		50	0	1	22.77	0.324	2	
		16-QAM	1	1	0	23.00	0.341	2
					24	23.15	0.353	2
	49				23.05	0.345	2	
	50		0	2	21.86	0.262	2	
	26640 1910	QPSK	1	0	0	23.60	0.392	2
					24	23.53	0.385	2
					49	23.56	0.388	2
		50	0	1	22.54	0.307	2	
		16-QAM	1	1	0	22.39	0.296	2
					24	22.36	0.294	2
	49				22.29	0.290	2	
	50		0	2	21.65	0.250	2	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 15 MHz	26115 1857.5	QPSK	1	0	0	23.60	0.392	2
				37		23.49	0.382	2
				74		23.55	0.387	2
		75	0	1	22.70	0.318	2	
		16-QAM	1	1	0	22.82	0.327	2
					37	23.03	0.344	2
	74				22.77	0.324	2	
	75		0	2	21.52	0.243	2	
	26365 1882.5	QPSK	1	0	0	23.70	0.401	2
				37		23.57	0.389	2
				74		23.58	0.390	2
		75	0	1	22.75	0.322	2	
		16-QAM	1	1	0	23.06	0.346	2
					37	22.89	0.333	2
	74				22.80	0.326	2	
	75		0	2	21.65	0.250	2	
	26615 1907.5	QPSK	1	0	0	23.52	0.385	2
				37		23.28	0.364	2
				74		23.40	0.374	2
		75	0	1	22.47	0.302	2	
		16-QAM	1	1	0	22.43	0.299	2
					37	22.23	0.286	2
	74				21.78	0.258	2	
	75		0	2	21.56	0.245	2	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 25 20 MHz	26140 1860	QPSK	1	0	0	23.57	0.389	2
				49		23.46		
				99		23.48		
		100	0	1	22.69	0.318	2	
		16-QAM	1	0	1	23.14	0.352	2
				49		23.07		
	99			23.08				
	100		0	2	21.55	0.244	2	
	26365 1882.5	QPSK	1	0	0	24.39	0.470	2
				49		24.16		
				99		24.02		
		100	0	1	22.66	0.316	2	
		16-QAM	1	0	1	22.43	0.299	2
				49		22.54		
	99			22.48				
	100		0	2	21.76	0.256	2	
	26590 1905	QPSK	1	0	0	23.68	0.399	2
				49		23.63		
				99		23.35		
		100	0	1	22.66	0.316	2	
		16-QAM	1	0	1	23.05	0.345	2
				49		23.01		
	99			22.88				
	100		0	2	21.59	0.247	2	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Mode 2: LTE Band 4

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 1.4 MHz	19957 1710.7	QPSK	1	0	0	23.98	0.546	1
				2		23.56	0.495	1
				5		23.85	0.530	1
		6	0	1	22.84	0.420	1	
		16-QAM	1	0	1	22.32	0.372	1
				2		22.30	0.371	1
	5			22.23		0.365	1	
	6		0	2	21.47	0.306	1	
	20175 1732.5	QPSK	1	0	0	23.65	0.506	1
				2		23.57	0.497	1
				5		23.58	0.498	1
		6	0	1	22.61	0.398	1	
		16-QAM	1	0	1	22.48	0.386	1
				2		22.40	0.379	1
	5			22.27		0.368	1	
	6		0	2	21.64	0.318	1	
	20393 1754.3	QPSK	1	0	0	23.56	0.495	1
				2		23.45	0.483	1
				5		23.51	0.490	1
		6	0	1	22.28	0.369	1	
		16-QAM	1	0	1	22.63	0.400	1
				2		22.58	0.395	1
	5			22.61		0.398	1	
	6		0	2	21.36	0.299	1	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 3 MHz	19965 1711.5	QPSK	1	0	0	23.71	0.513	1
				7		23.52	0.491	1
				14		23.64	0.505	1
		15	0	1	22.68	0.405	1	
		16-QAM	1	0	1	23.13	0.449	1
				7		22.92	0.428	1
	14			23.07		0.443	1	
	15	0	2	21.84	0.333	1		
	20175 1732.5	QPSK	1	0	0	23.79	0.522	1
				7		23.65	0.506	1
				14		23.73	0.515	1
		15	0	1	22.68	0.405	1	
		16-QAM	1	0	1	23.01	0.437	1
				7		22.75	0.411	1
	14			22.81		0.417	1	
	15	0	2	21.60	0.316	1		
	20385 1753.5	QPSK	1	0	0	23.36	0.473	1
				7		23.28	0.465	1
				14		23.31	0.468	1
		15	0	1	22.53	0.391	1	
		16-QAM	1	0	1	22.59	0.396	1
				7		22.23	0.365	1
	14			22.37		0.377	1	
	15	0	2	21.51	0.309	1		

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 5 MHz	19975 1712.5	QPSK	1	0	0	23.75	0.518	1
				12		23.66	0.507	1
				24		23.62	0.502	1
		25	0	1	22.72	0.408	1	
		16-QAM	1	0	1	22.94	0.430	1
				12		22.80	0.416	1
	24			22.33		0.373	1	
	25		0	2	21.93	0.340	1	
	20175 1732.5	QPSK	1	0	0	23.47	0.485	1
				12		23.42	0.480	1
				24		23.33	0.470	1
		25	0	1	22.68	0.405	1	
		16-QAM	1	0	1	22.96	0.432	1
				12		22.64	0.401	1
	24			22.91		0.427	1	
	25		0	2	21.72	0.324	1	
	20375 1752.5	QPSK	1	0	0	23.41	0.479	1
				12		23.24	0.460	1
				24		23.36	0.473	1
		25	0	1	22.72	0.408	1	
		16-QAM	1	0	1	22.67	0.404	1
				12		22.42	0.381	1
	24			22.53		0.391	1	
	25		0	2	21.91	0.339	1	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 10 MHz	20000 1715	QPSK	1	0	0	23.70	0.512	1
				24		23.52	0.491	1
				49		23.65	0.506	1
		50	0	1	22.77	0.413	1	
		16-QAM	1	1	0	23.15	0.451	1
					24	23.08	0.444	1
	49				23.09	0.445	1	
	50		0	2	21.84	0.333	1	
	20175 1732.5	QPSK	1	0	0	23.75	0.518	1
					24	23.54	0.493	1
					49	23.46	0.484	1
		50	0	1	22.57	0.394	1	
		16-QAM	1	1	0	23.12	0.448	1
					24	22.91	0.427	1
	49				22.73	0.409	1	
	50		0	2	21.56	0.313	1	
	20350 1750	QPSK	1	0	0	23.68	0.509	1
					24	23.59	0.499	1
					49	23.52	0.491	1
		50	0	1	22.53	0.391	1	
		16-QAM	1	1	0	22.68	0.405	1
					24	22.23	0.365	1
	49				22.38	0.378	1	
	50		0	2	21.55	0.312	1	

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP		
Band 4 15 MHz	20025 1717.5	QPSK	1	0	0	23.64	0.505	1		
				37		23.53	0.492	1		
				74		23.58	0.498	1		
					75	0	1	22.72	0.408	1
		16-QAM	1	0	1	0	23.13	0.449	1	
						37	22.92	0.428	1	
						74	23.01	0.437	1	
					75	0	2	21.80	0.330	1
	20175 1732.5	QPSK	1	0	0	23.78	0.521	1		
					37	23.53	0.492	1		
					74	23.46	0.484	1		
				75	0	1	22.51	0.389	1	
		16-QAM	1	0	1	0	22.93	0.429	1	
						37	22.81	0.417	1	
						74	22.76	0.412	1	
					75	0	2	21.69	0.322	1
	20325 1747.5	QPSK	1	0	0	23.50	0.489	1		
					37	23.33	0.470	1		
					74	23.36	0.473	1		
				75	0	1	22.49	0.387	1	
		16-QAM	1	0	1	0	22.61	0.398	1	
						37	22.38	0.378	1	
						74	22.34	0.374	1	
					75	0	2	21.49	0.308	1

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) EIRP	Limit (W) EIRP
Band 4 20 MHz	0050 1720	QPSK	1	0	0	23.75	0.518	1
				49		23.64	0.505	1
				99		23.43	0.481	1
		100	0	1	22.74	0.410	1	
		16-QAM	1	1	0	23.16	0.452	1
					49	22.92	0.428	1
	99				22.95	0.431	1	
	100	0	2	21.82	0.332	1		
	20175 1732.5	QPSK	1	0	0	24.01	0.550	1
					49	23.73	0.515	1
					99	23.51	0.490	1
		100	0	1	22.52	0.390	1	
		16-QAM	1	1	0	22.48	0.386	1
					49	22.45	0.384	1
	99				22.41	0.380	1	
	100	0	2	21.59	0.315	1		
	20300 1745	QPSK	1	0	0	23.55	0.494	1
					49	23.23	0.459	1
					99	23.26	0.462	1
		100	0	1	22.48	0.386	1	
		16-QAM	1	1	0	23.12	0.448	1
					49	23.03	0.439	1
	99				22.84	0.420	1	
	100	0	2	21.57	0.313	1		

Note:

1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Mode 3: LTE Band 5/26 (Part 22)

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP	
Band 26 1.4 MHz	26797 824.7	QPSK	1	0	0	24.33	0.157	7	
				2		24.29	0.156	7	
				5		24.26	0.155	7	
		6	0	1	23.26	0.123	7		
		16-QAM	1	0	1	0	23.27	0.123	7
						2	23.35	0.125	7
	5					23.18	0.121	7	
	6			0	2	22.29	0.098	7	
	26915 836.5	QPSK	1	0	0	24.32	0.157	7	
					2	24.29	0.156	7	
					5	24.23	0.153	7	
		6	0	1	23.52	0.130	7		
		16-QAM	1	0	1	0	23.73	0.137	7
						2	23.67	0.135	7
	5					23.59	0.132	7	
	6			0	2	22.26	0.097	7	
	27033 848.3	QPSK	1	0	0	24.41	0.160	7	
					2	24.33	0.157	7	
					5	24.26	0.155	7	
		6	0	1	23.35	0.125	7		
		16-QAM	1	0	1	0	23.42	0.127	7
						2	23.27	0.123	7
	5					22.98	0.115	7	
	6			0	2	22.26	0.097	7	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15dB
2. Power (W)= $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP	
Band 26 3 MHz	26805 825.5	QPSK	1	0	0	24.08	0.148	7	
				7		24.01	0.146	7	
				14		24.04	0.147	7	
		15	0	1	23.26	0.123	7		
		16-QAM	1	0	1	0	23.40	0.127	7
						7	23.11	0.119	7
	14					22.99	0.115	7	
	15			0	2	22.46	0.102	7	
	26915 836.5	QPSK	1	0	0	24.29	0.156	7	
					7	24.21	0.153	7	
					14	24.26	0.155	7	
		15	0	1	23.45	0.128	7		
		16-QAM	1	0	1	0	23.37	0.126	7
						7	23.35	0.125	7
	14					23.47	0.129	7	
	15			0	2	22.29	0.098	7	
	27025 847.5	QPSK	1	0	0	24.31	0.156	7	
					7	24.24	0.154	7	
					14	24.28	0.155	7	
		15	0	1	23.45	0.128	7		
		16-QAM	1	0	1	0	23.05	0.117	7
						7	22.96	0.115	7
	14					22.94	0.114	7	
	15			0	2	22.40	0.101	7	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 26 5 MHz	26815 826.5	QPSK	1	0	0	24.13	0.150	7
				12		24.09	0.149	7
				24		24.05	0.147	7
		25	0	1	23.29	0.124	7	
		16-QAM	1	0	1	22.55	0.104	7
				12		22.66	0.107	7
	24			22.79		0.110	7	
	25		0	2	22.45	0.102	7	
	26915 836.5	QPSK	1	0	0	24.12	0.150	7
				12		24.03	0.147	7
				24		24.06	0.148	7
		25	0	1	23.25	0.122	7	
		16-QAM	1	0	1	23.68	0.135	7
				12		23.57	0.132	7
	24			23.52		0.130	7	
	25		0	2	22.21	0.096	7	
	27015 846.5	QPSK	1	0	0	24.22	0.153	7
				12		24.17	0.151	7
				24		24.12	0.150	7
		25	0	1	23.25	0.122	7	
		16-QAM	1	0	1	22.96	0.115	7
				12		23.20	0.121	7
	24			23.12		0.119	7	
	25		0	2	22.28	0.098	7	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W)= $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP		
Band 26 10 MHz	26840 829	QPSK	1	0	0	24.22	0.153	7		
				24		24.18	0.152	7		
				49		24.20	0.152	7		
		50	0	1	23.45	0.128	7			
		16-QAM	1	0	0	1	23.48	0.129	7	
					24		23.42	0.127	7	
	49				23.12		0.119	7		
	50		0	2	22.41	0.101	7			
	26915 836.5	QPSK	1	0	0	0	24.38	0.159	7	
					24		24.30	0.156	7	
					49		24.35	0.158	7	
		50	0	1	23.38	0.126	7			
		16-QAM	1	0	1	0	1	23.73	0.137	7
						24		23.61	0.133	7
	49					23.69		0.136	7	
	50		0	2	22.40	0.101	7			
	26990 844	QPSK	1	0	0	0	24.32	0.157	7	
					24		24.29	0.156	7	
					49		24.23	0.153	7	
		50	0	1	23.41	0.127	7			
		16-QAM	1	0	1	0	1	23.10	0.118	7
						24		22.95	0.114	7
	49					23.01		0.116	7	
	50		0	2	22.34	0.099	7			

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP		
Band 26 15 MHz	26865 831.5	QPSK	1	0	0	24.27	0.155	7		
				37		24.15	0.151	7		
				74		24.11	0.149	7		
					75	0	1	23.42	0.127	7
		16-QAM	1	0	1	0	23.45	0.128	7	
						37	23.58	0.132	7	
						74	23.76	0.138	7	
					75	0	2	22.47	0.102	7
	26915 836.5	QPSK	1	0	0	24.46	0.162	7		
					37	24.29	0.156	7		
					74	24.16	0.151	7		
				75	0	1	23.35	0.125	7	
		16-QAM	1	1	0	23.84	0.140	7		
					37	23.63	0.134	7		
					74	23.63	0.134	7		
				75	0	2	22.30	0.098	7	
	26965 841.5	QPSK	1	0	0	24.15	0.151	7		
					37	24.07	0.148	7		
					74	24.08	0.148	7		
				75	0	1	23.40	0.127	7	
		16-QAM	1	1	0	23.06	0.117	7		
					37	23.12	0.119	7		
					74	23.21	0.121	7		
				75	0	2	22.39	0.100	7	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Mode 4: LTE Band 12

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 1.4 MHz	23017 699.7	QPSK	1	0	0	24.41	0.145	3
				2		24.30	0.141	3
				5		24.37	0.143	3
		6	0	1	23.70	0.123	3	
		16-QAM	1	0	1	23.35	0.113	3
				2		23.51	0.117	3
	5			23.38		0.114	3	
	6	0	2	22.49	0.093	3		
	23095 707.5	QPSK	1	0	0	24.32	0.142	3
				2		24.22	0.138	3
				5		24.26	0.140	3
		6	0	1	23.50	0.117	3	
		16-QAM	1	0	1	23.58	0.119	3
				2		23.72	0.123	3
	5			23.55		0.119	3	
	6	0	2	22.67	0.097	3		
	23173 715.3	QPSK	1	0	0	24.31	0.141	3
				2		24.29	0.141	3
				5		24.25	0.139	3
		6	0	1	23.30	0.112	3	
		16-QAM	1	0	1	23.15	0.108	3
				2		23.00	0.104	3
	5			22.96		0.104	3	
	6	0	2	22.28	0.089	3		

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 3 MHz	23025 700.5	QPSK	1	0	0	24.30	0.141	3
				7		24.21	0.138	3
				14		24.28	0.140	3
		15	0	1	23.53	0.118	3	
		16-QAM	1	0	1	23.75	0.124	3
				7		23.31	0.112	3
	14			23.37		0.114	3	
	15	0	2	22.64	0.096	3		
	23095 707.5	QPSK	1	0	0	24.29	0.141	3
				7		24.16	0.136	3
				14		24.06	0.133	3
		15	0	1	23.50	0.117	3	
		16-QAM	1	0	1	23.72	0.123	3
				7		23.67	0.122	3
	14			23.36		0.114	3	
	15	0	2	22.71	0.098	3		
	23165 714.5	QPSK	1	0	0	24.15	0.136	3
				7		24.04	0.133	3
				14		24.12	0.135	3
		15	0	1	23.37	0.114	3	
		16-QAM	1	0	1	23.41	0.115	3
				7		23.30	0.112	3
	14			22.92		0.103	3	
	15	0	2	22.34	0.090	3		

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 5 MHz	23035 701.5	QPSK	1	0	0	24.28	0.140	3
				12		24.26		
				24		24.22		
		25	0	1	23.45	0.116	3	
		16-QAM	1	0	1	22.97	0.104	3
				12		23.05		
	24			22.95				
	25		0	2	22.46	0.092	3	
	23095 707.5	QPSK	1	0	0	24.34	0.142	3
				12		24.29		
				24		24.11		
		25	0	1	23.38	0.114	3	
		16-QAM	1	0	1	23.74	0.124	3
				12		23.67		
	24			23.59				
	25		0	2	22.45	0.092	3	
	23155 713.5	QPSK	1	0	0	23.89	0.128	3
				12		23.87		
				24		23.85		
		25	0	1	23.28	0.111	3	
		16-QAM	1	0	1	23.23	0.110	3
				12		22.70		
	24			22.83				
	25		0	2	22.16	0.086	3	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 12 10 MHz	23060 704	QPSK	1	0	0	24.19	0.137	3
				24		24.16	0.136	3
				49		24.14	0.136	3
		50	0	1	23.59	0.120	3	
		16-QAM	1	0	1	23.65	0.121	3
				24		23.51	0.117	3
	49			23.28		0.111	3	
	50	0	2	22.63	0.096	3		
	23095 707.5	QPSK	1	0	0	24.43	0.145	3
				24		24.29	0.141	3
				49		24.23	0.139	3
		50	0	1	23.45	0.116	3	
		16-QAM	1	0	1	23.77	0.125	3
				24		23.68	0.122	3
	49			23.38		0.114	3	
	50	0	2	22.42	0.091	3		
	23130 711	QPSK	1	0	0	24.28	0.140	3
				24		24.25	0.139	3
				49		24.23	0.139	3
		50	0	1	23.32	0.112	3	
		16-QAM	1	0	1	22.94	0.103	3
				24		22.89	0.102	3
	49			22.76		0.099	3	
	50	0	2	22.28	0.089	3		

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Mode 5: LTE Band 13

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 13 5 MHz	23205 779.5	QPSK	1	0	0	24.17	0.173	3
				12		24.01	0.167	3
				24		24.09	0.170	3
		25	0	1	23.26	0.140	3	
		16-QAM	1	0	1	22.72	0.124	3
				12		23.35	0.143	3
	24			23.38		0.144	3	
	25		0	2	22.41	0.115	3	
	23230 782	QPSK	1	0	0	24.13	0.171	3
				12		24.08	0.169	3
				24		24.10	0.170	3
		25	0	1	23.39	0.145	3	
		16-QAM	1	0	1	23.58	0.151	3
				12		23.45	0.147	3
	24			23.54		0.150	3	
	25		0	2	22.47	0.117	3	
	23255 784.5	QPSK	1	0	0	24.26	0.177	3
				12		24.24	0.176	3
				24		23.21	0.139	3
		25	0	1	23.46	0.147	3	
		16-QAM	1	0	1	23.13	0.136	3
				12		23.17	0.137	3
	24			23.45		0.147	3	
	25		0	2	22.57	0.120	3	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W)= $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP	
Band 13 10 MHz	23230 782	QPSK	1	0	0	24.33	0.179	3	
				24		24.29	0.178	3	
				49		24.31	0.179	3	
			50	0	1	23.33	0.143	3	
			16-QAM	1	0	1	23.59	0.151	3
					24		23.46	0.147	3
		49			23.52		0.149	3	
		50		0	2	22.42	0.116	3	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB

2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

Mode 6: LTE Band 26 (Part 90)

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP	
Band 26 1.4 MHz	26697 814.7	QPSK	1	0	0	24.33	0.157	100	
				2		24.29	0.156	100	
				5		24.26	0.155	100	
		16-QAM	1	0	1	23.34	0.125	100	
				2		23.30	0.124	100	
				5		23.06	0.117	100	
	26740 819	QPSK	1	0	0	24.37	0.158	100	
				2		24.30	0.156	100	
				5		24.35	0.158	100	
		16-QAM	1	0	1	23.54	0.131	100	
				2		23.46	0.129	100	
				5		23.55	0.131	100	
	26783 823.3	QPSK	1	0	0	24.24	0.154	100	
				2		24.19	0.152	100	
				5		24.21	0.153	100	
		16-QAM	1	0	1	23.27	0.123	100	
				2		23.02	0.116	100	
				5		23.14	0.119	100	
				6	0	2	22.51	0.103	100
				6	0	1	23.39	0.126	100
				6	0	2	22.45	0.102	100
				6	0	2	22.32	0.099	100

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 26 3 MHz	26705 815.5	QPSK	1	0	0	24.36	0.158	100
				7		24.22	0.153	100
				14		24.31	0.156	100
		15	0	1	23.44	0.128	100	
		16-QAM	1	0	1	23.51	0.130	100
				7		23.32	0.124	100
	14			23.41		0.127	100	
	15	0	2	22.62	0.106	100		
	26740 819	QPSK	1	0	0	24.40	0.160	100
					7	24.31	0.156	100
					14	24.33	0.157	100
		15	0	1	23.45	0.128	100	
		16-QAM	1	1	0	23.66	0.135	100
					7	23.35	0.125	100
	14				23.43	0.128	100	
	15	0	2	22.68	0.107	100		
	26775 822.5	QPSK	1	0	0	24.30	0.156	100
					7	24.16	0.151	100
					14	24.21	0.153	100
		15	0	1	23.27	0.123	100	
		16-QAM	1	1	0	23.36	0.126	100
					7	23.05	0.117	100
	14				23.08	0.118	100	
	15	0	2	22.46	0.102	100		

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W)= $(10^{(\text{Power(dBm)/10})}) * 10^{-3}$

Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP
Band 26 5 MHz	26715 816.5	QPSK	1	0	0	24.41	0.160	100
				12		24.31	0.156	100
				24		24.29	0.156	100
		25	0	1	23.41	0.127	100	
		16-QAM	1	0	1	23.15	0.120	100
				12		22.92	0.114	100
	24			22.98		0.115	100	
	25		0	2	22.65	0.107	100	
	26740 819	QPSK	1	0	0	24.39	0.159	100
				12		24.32	0.157	100
				24		24.25	0.154	100
		25	0	1	23.42	0.127	100	
		16-QAM	1	0	1	23.64	0.134	100
				12		23.63	0.134	100
	24			23.54		0.131	100	
	25		0	2	22.40	0.101	100	
	26765 821.5	QPSK	1	0	0	24.34	0.157	100
				12		24.27	0.155	100
				24		24.21	0.153	100
		25	0	1	23.30	0.124	100	
		16-QAM	1	0	1	23.27	0.123	100
				12		23.16	0.120	100
	24			23.08		0.118	100	
	25		0	2	22.43	0.101	100	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

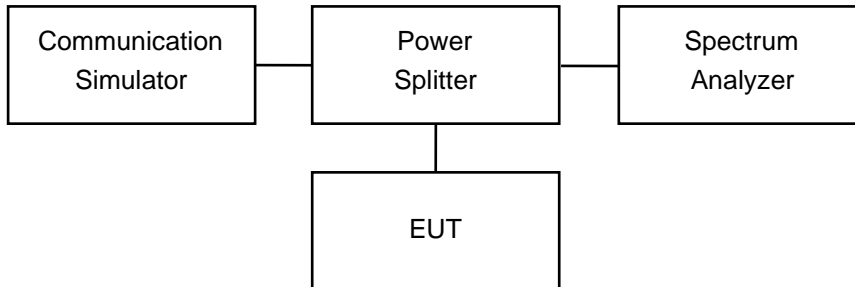
Band	Channel Freq. (MHz)	Modulation	RB No.	RB offset	MPR	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP	
Band 26 10 MHz	26740 819	QPSK	1	0	0	24.43	0.161	100	
				24		24.35	0.158	100	
				49		24.28	0.155	100	
			50	0	1	23.37	0.126	100	
			16-QAM	1	0	1	23.77	0.138	100
					24		23.69	0.136	100
		49			23.63		0.134	100	
		50		0	2	22.59	0.105	100	

Note:

1. RF Output Power (W) ERP = Conducted Output Power (dBm) + Antenna Gain (dBi) - 2.15 dB
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) * 10^{-3}$

4. Occupied Bandwidth

4.1. Test Setup



4.2. Test Procedure

The EUT makes a call to the communication simulator. The 26dB bandwidth and 99% occupied bandwidth 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. The path loss was compensated to the results for each measurement.

4.3. Test Methodology and Reference Procedures

KDB 971168 D01 Power Meas License Digital Systems v03r01

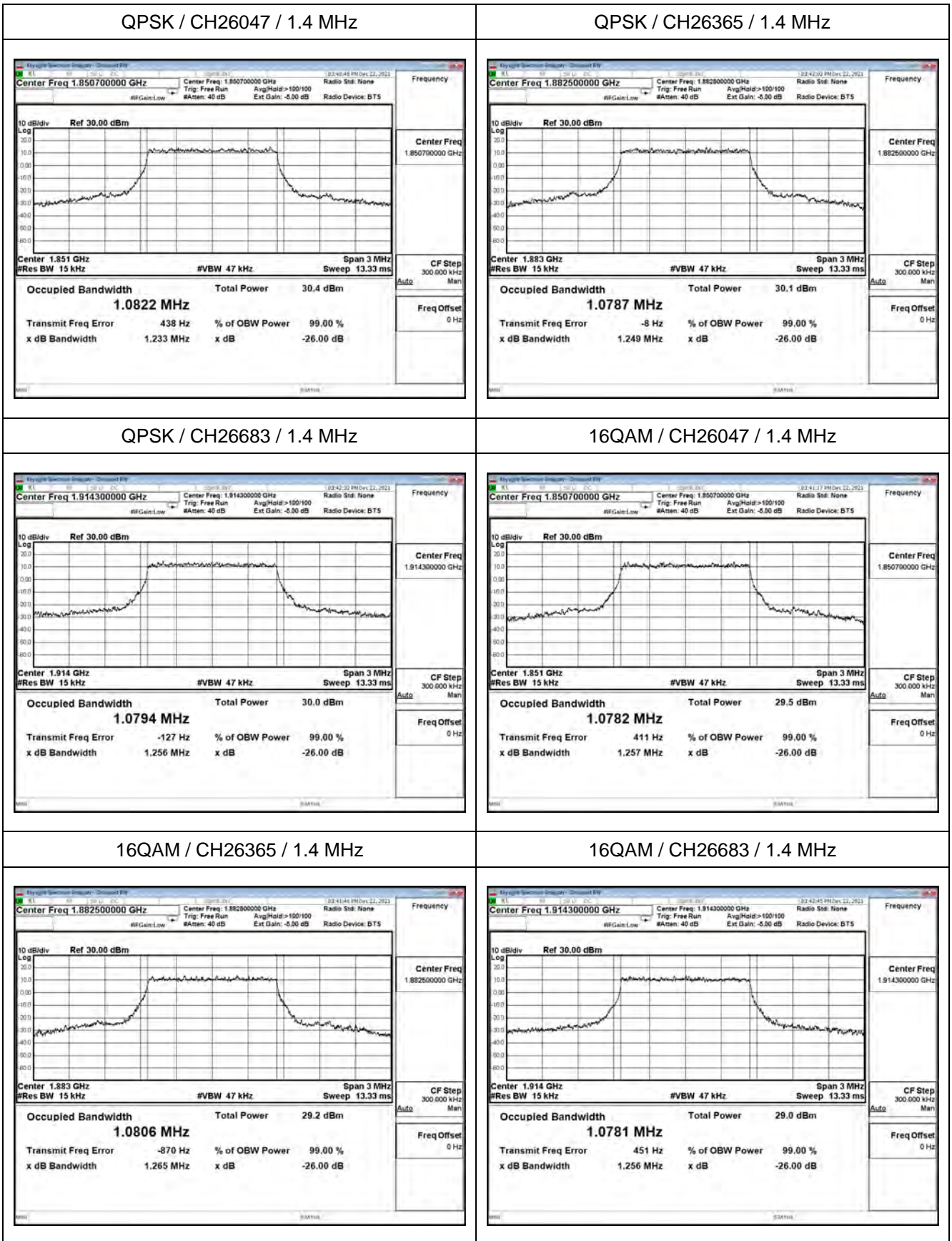
ANSI C63.26-2015

4.4. Test Result of Occupied Bandwidth

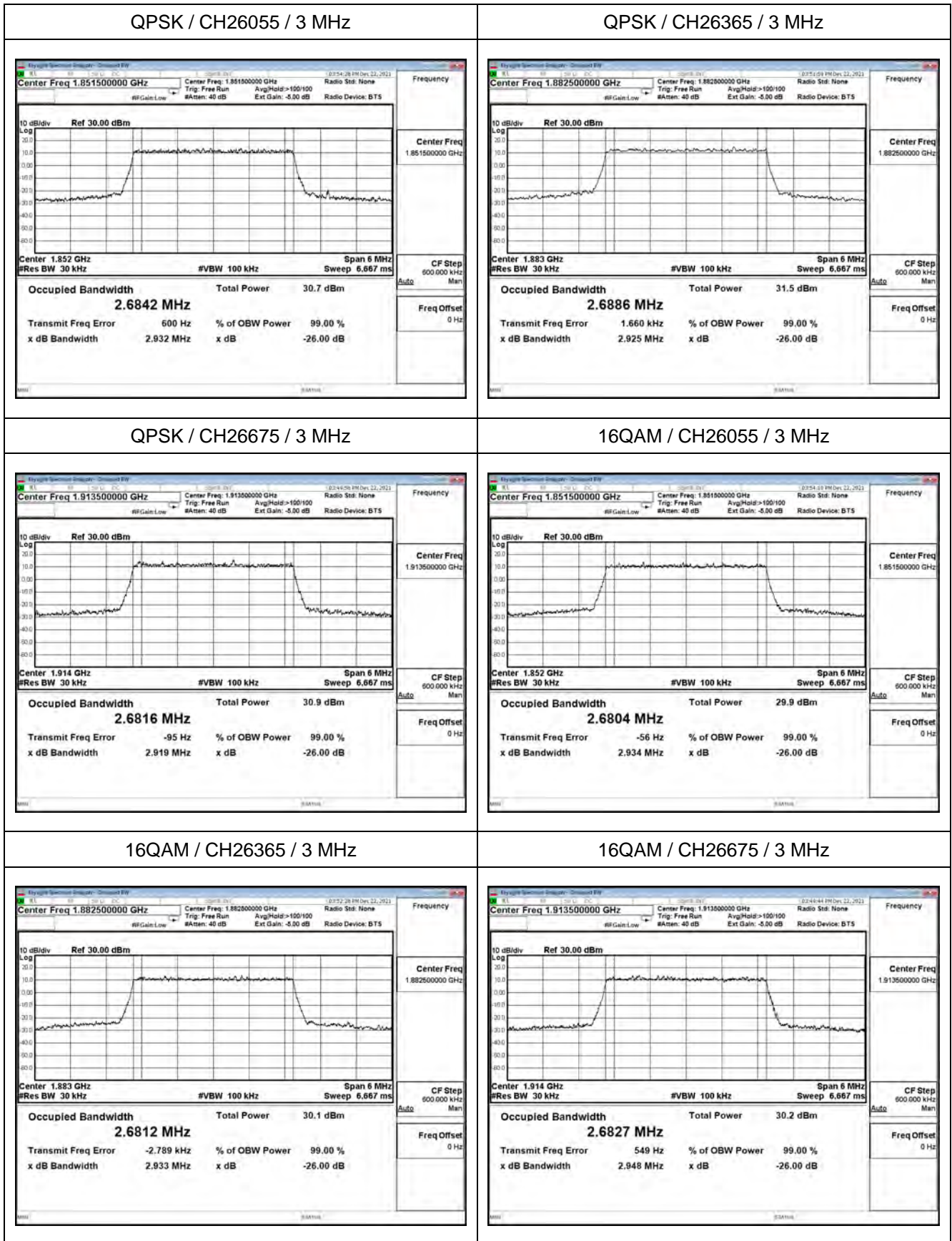
Mode 1: LTE Band 2/25

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	1850.7	1.233	1.082	N/A
		1882.5	1.249	1.078	N/A
		1914.3	1.256	1.079	N/A
	16-QAM	1850.7	1.257	1.078	N/A
		1882.5	1.265	1.080	N/A
		1914.3	1.256	1.078	N/A
3	QPSK	1851.5	2.932	2.684	N/A
		1882.5	2.925	2.688	N/A
		1913.5	2.919	2.681	N/A
	16-QAM	1851.5	2.934	2.680	N/A
		1882.5	2.933	2.681	N/A
		1913.5	2.948	2.682	N/A
5	QPSK	1852.5	4.938	4.480	N/A
		1882.5	4.880	4.478	N/A
		1912.5	4.872	4.474	N/A
	16-QAM	1852.5	4.891	4.481	N/A
		1882.5	4.918	4.473	N/A
		1912.5	4.938	4.480	N/A
10	QPSK	1855	9.700	8.928	N/A
		1882.5	9.648	8.917	N/A
		1910	9.660	8.932	N/A
	16-QAM	1855	9.695	8.913	N/A
		1882.5	9.655	8.909	N/A
		1910	9.565	8.918	N/A
15	QPSK	1857.5	14.330	13.389	N/A
		1882.5	14.440	13.364	N/A
		1907.5	14.430	13.349	N/A
	16-QAM	1857.5	14.360	13.383	N/A
		1882.5	14.340	13.395	N/A
		1907.5	14.410	13.347	N/A
20	QPSK	1860	18.990	17.830	N/A
		1882.5	19.040	17.826	N/A
		1905	19.060	17.794	N/A
	16-QAM	1860	19.050	17.863	N/A
		1882.5	19.250	17.844	N/A
		1905	19.120	17.776	N/A

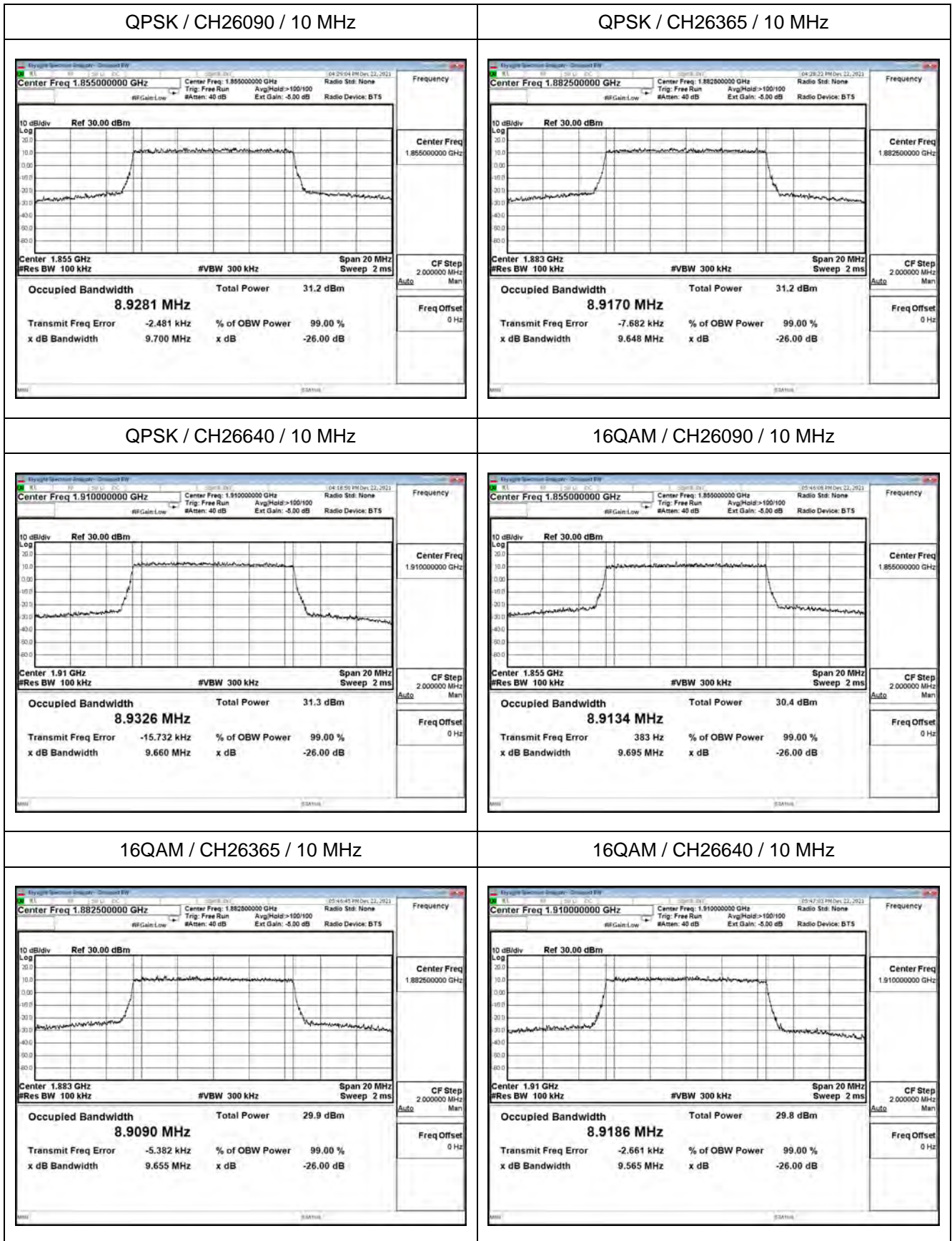
LTE Band 25



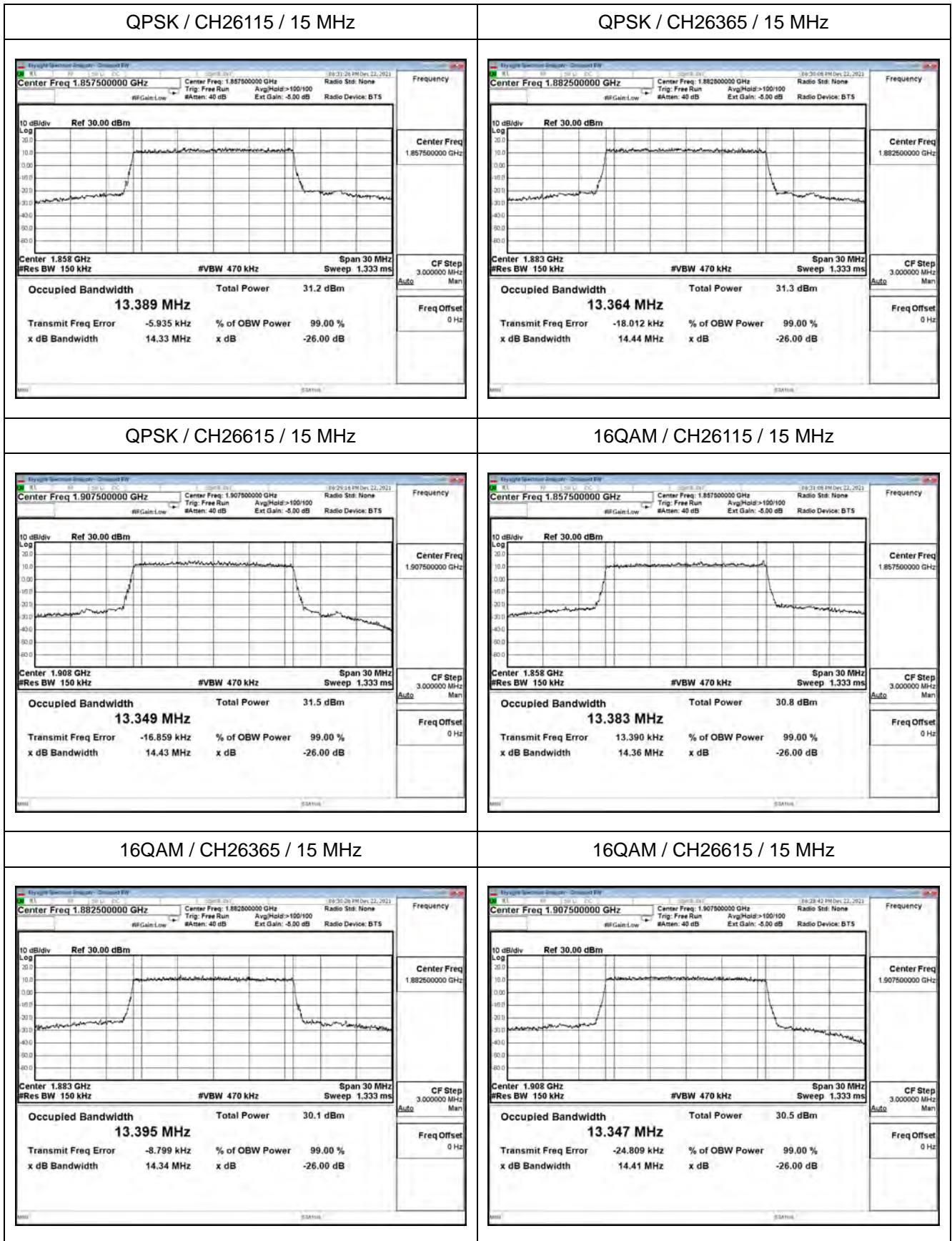
LTE Band 25



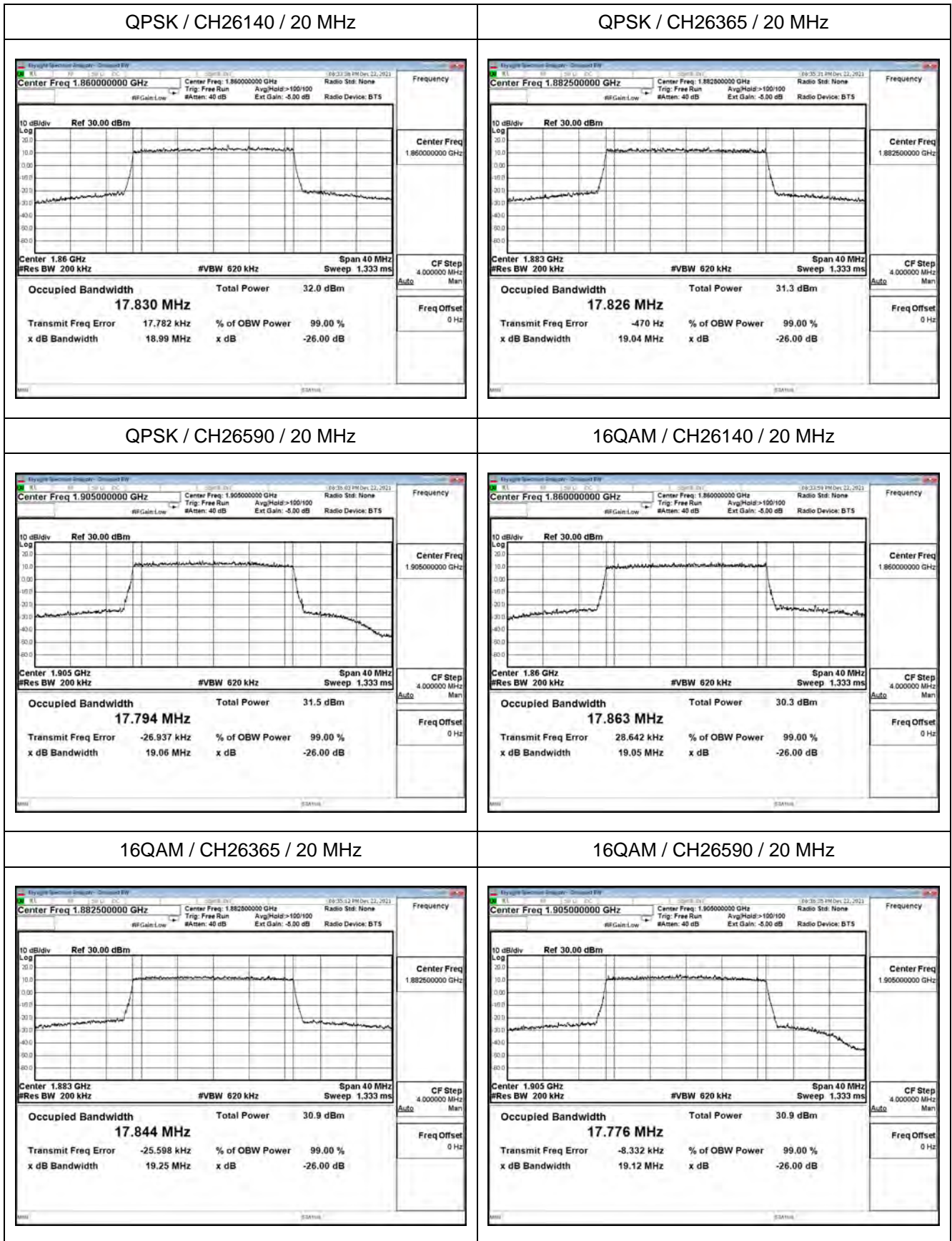
LTE Band 25



LTE Band 25



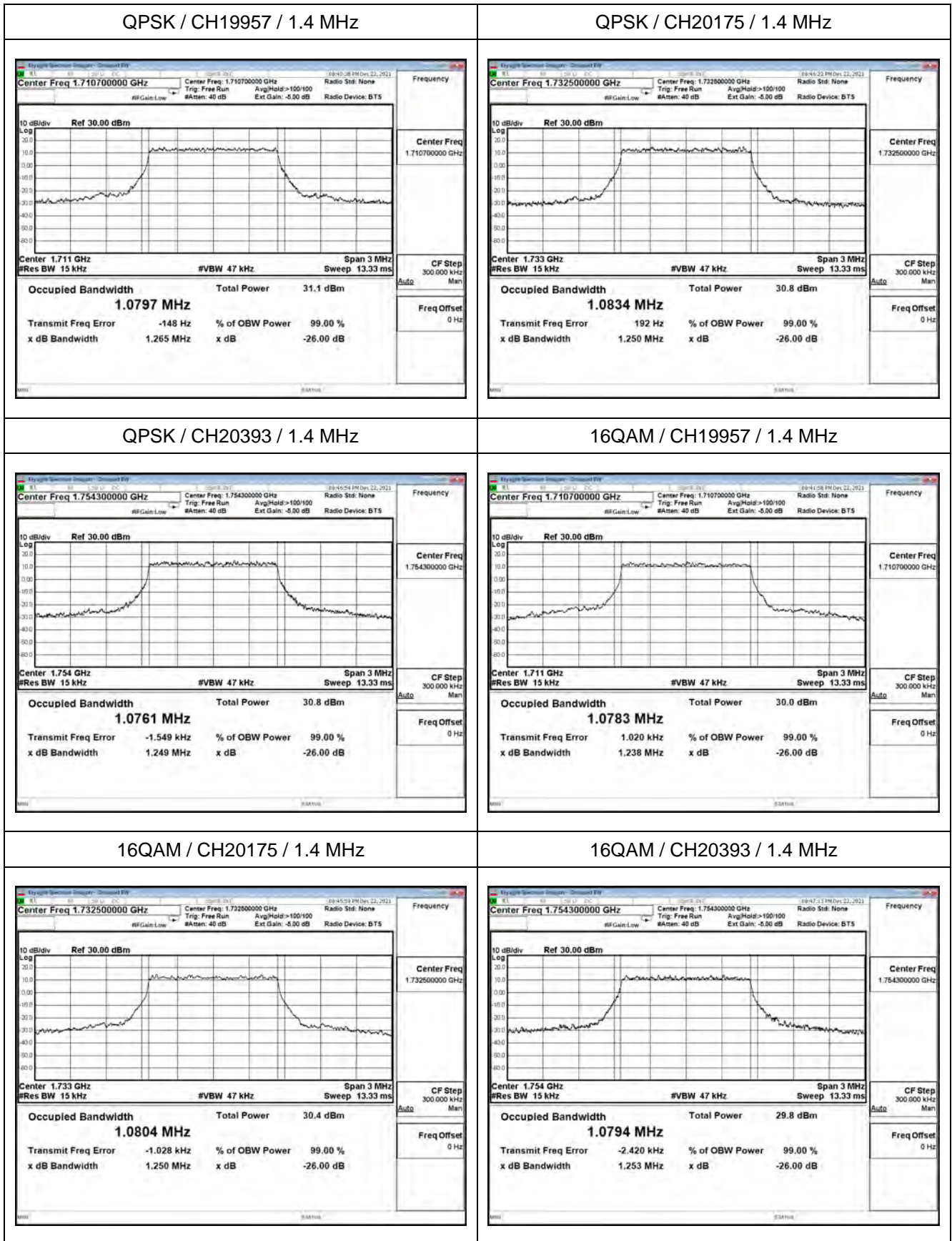
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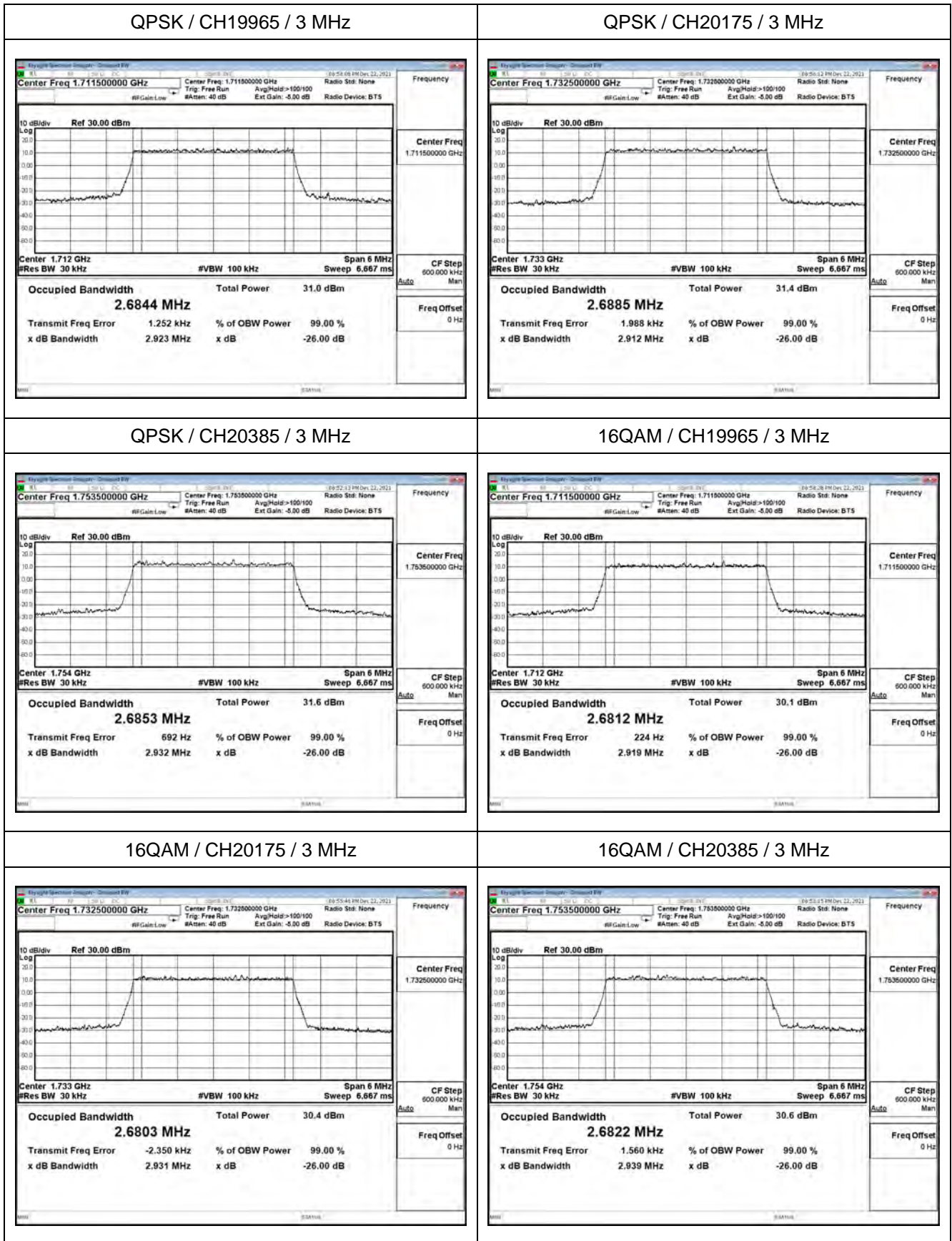
Mode 2: LTE Band 4

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	1710.7	1.265	1.079	N/A
		1732.5	1.250	1.083	N/A
		1754.3	1.249	1.076	N/A
	16-QAM	1710.7	1.238	1.078	N/A
		1732.5	1.250	1.080	N/A
		1754.3	1.253	1.079	N/A
3	QPSK	1711.5	2.923	2.684	N/A
		1732.5	2.912	2.688	N/A
		1753.5	2.932	2.685	N/A
	16-QAM	1711.5	2.919	2.681	N/A
		1732.5	2.931	2.680	N/A
		1753.5	2.939	2.682	N/A
5	QPSK	1712.5	4.939	4.481	N/A
		1732.5	4.858	4.482	N/A
		1752.2	4.899	4.462	N/A
	16-QAM	1712.5	4.874	4.473	N/A
		1732.5	4.901	4.472	N/A
		1752.2	4.952	4.476	N/A
10	QPSK	1715	9.618	8.922	N/A
		1732.5	9.638	8.912	N/A
		1750	9.746	8.929	N/A
	16-QAM	1715	9.631	8.925	N/A
		1732.5	9.618	8.924	N/A
		1750	9.621	8.903	N/A
15	QPSK	1717.5	14.550	13.396	N/A
		1732.5	14.380	13.340	N/A
		1747.5	14.490	13.360	N/A
	16-QAM	1717.5	14.400	13.372	N/A
		1732.5	14.410	13.381	N/A
		1747.5	14.370	13.359	N/A
20	QPSK	1720	19.230	17.807	N/A
		1732.5	18.990	17.806	N/A
		1745	18.880	17.811	N/A
	16-QAM	1720	19.160	17.812	N/A
		1732.5	19.010	17.818	N/A
		1745	19.200	17.842	N/A

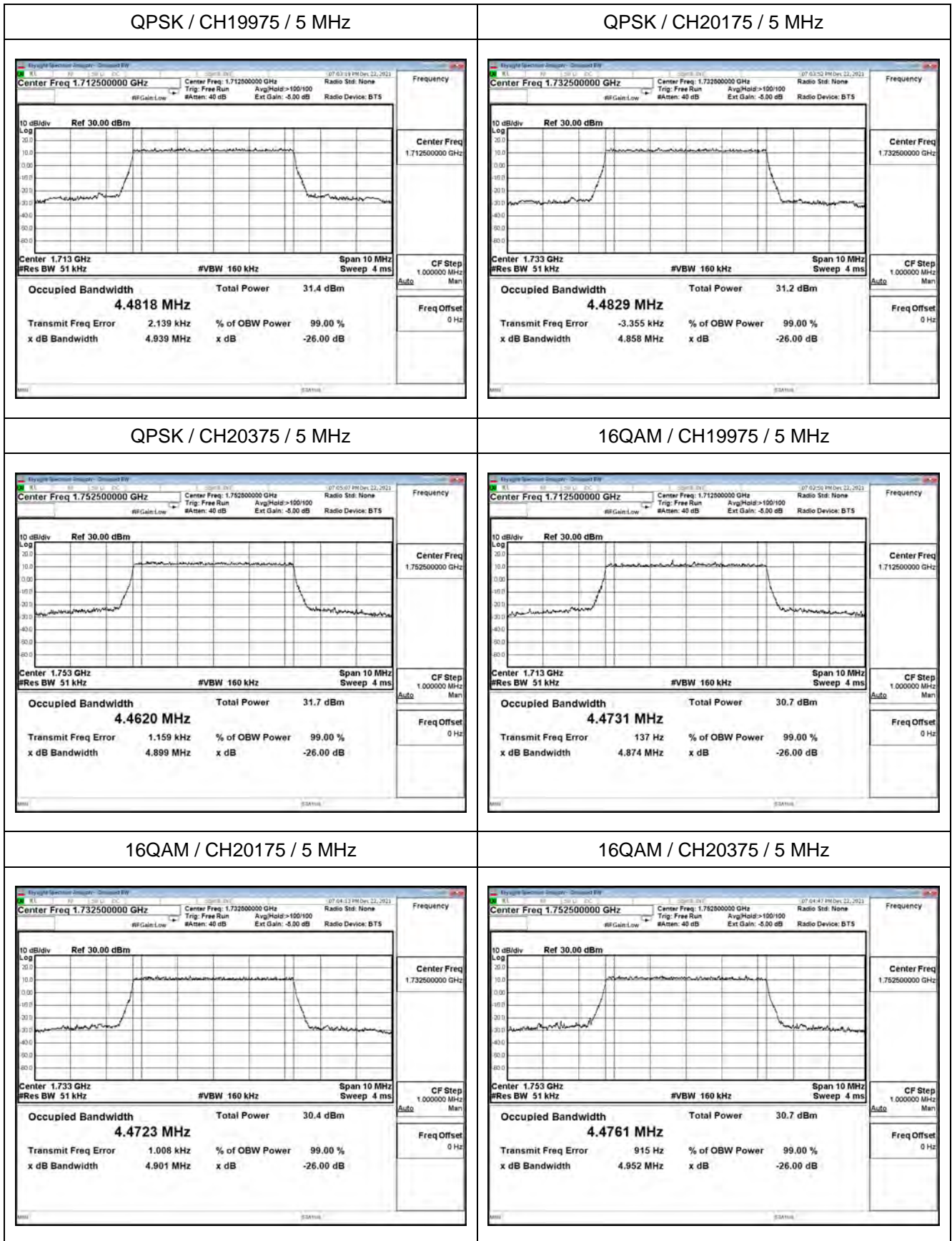
LTE Band 4



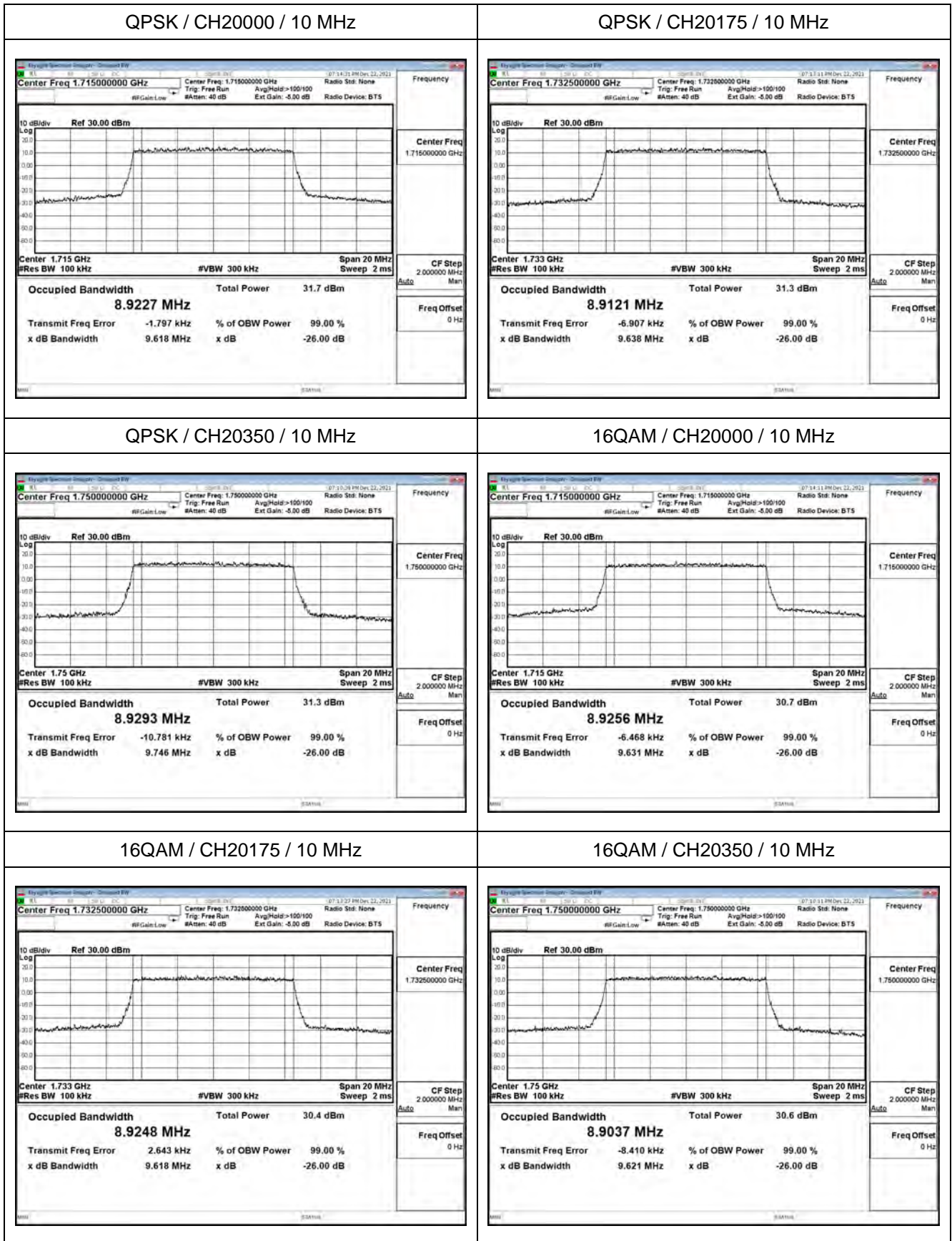
LTE Band 4



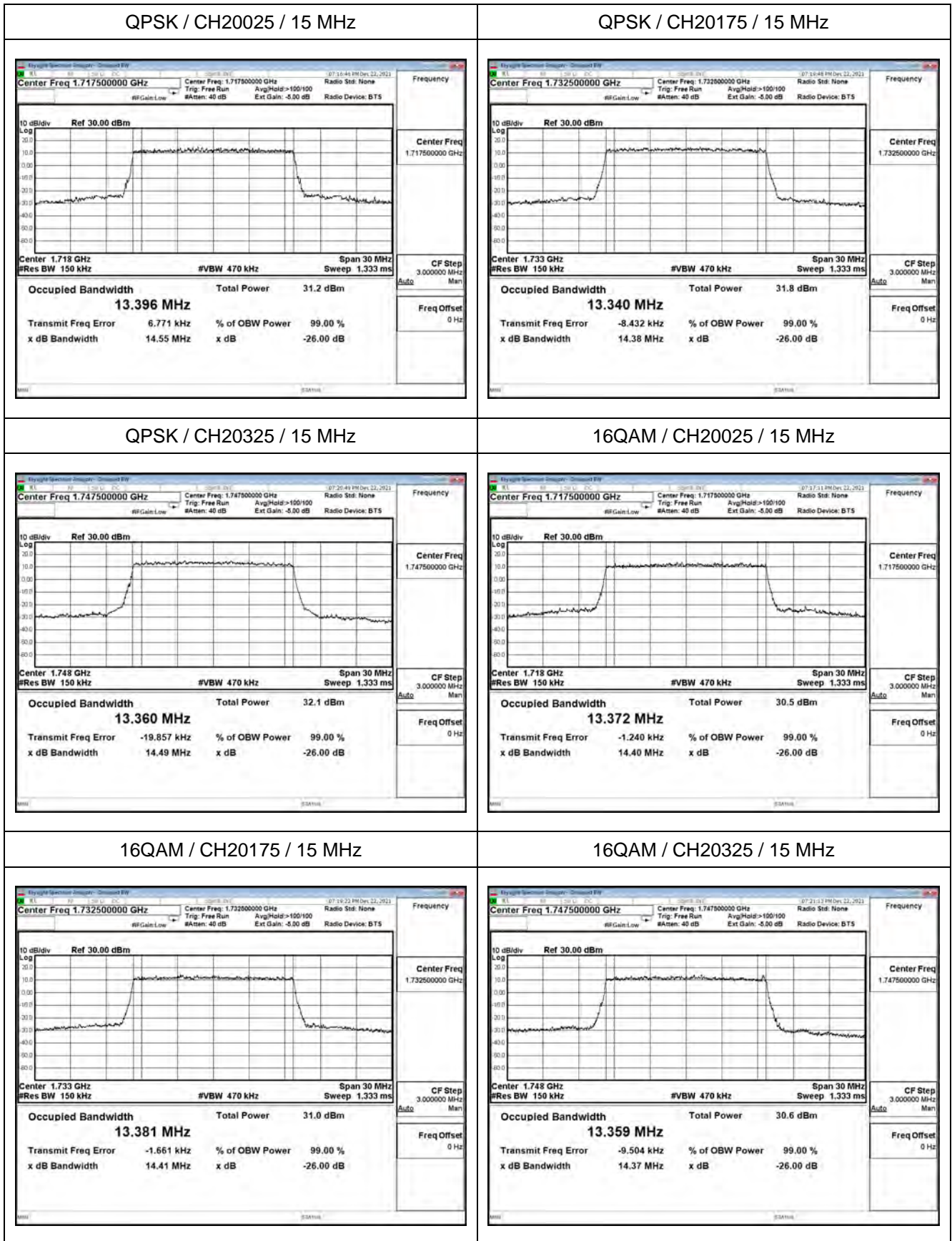
LTE Band 4



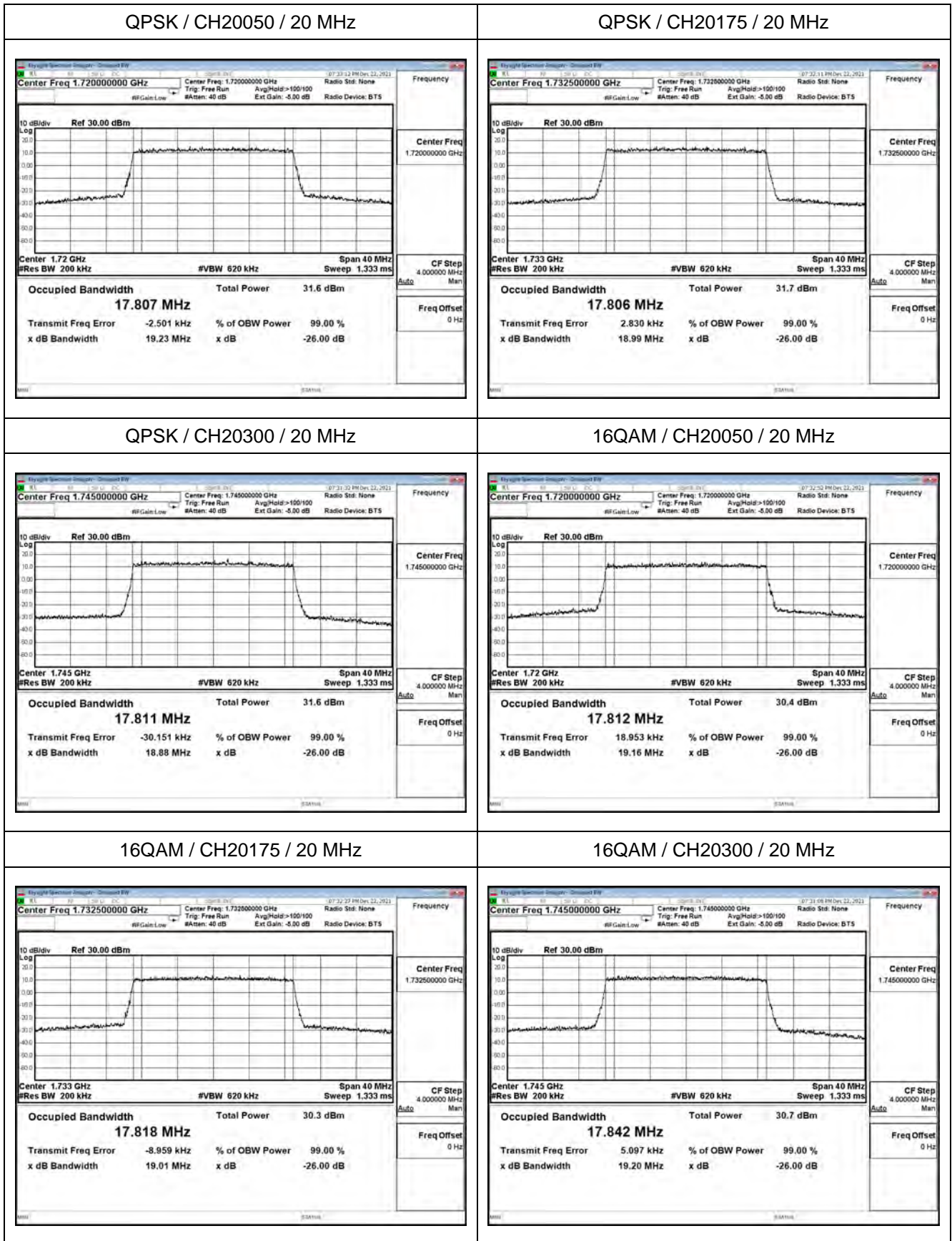
LTE Band 4



LTE Band 4



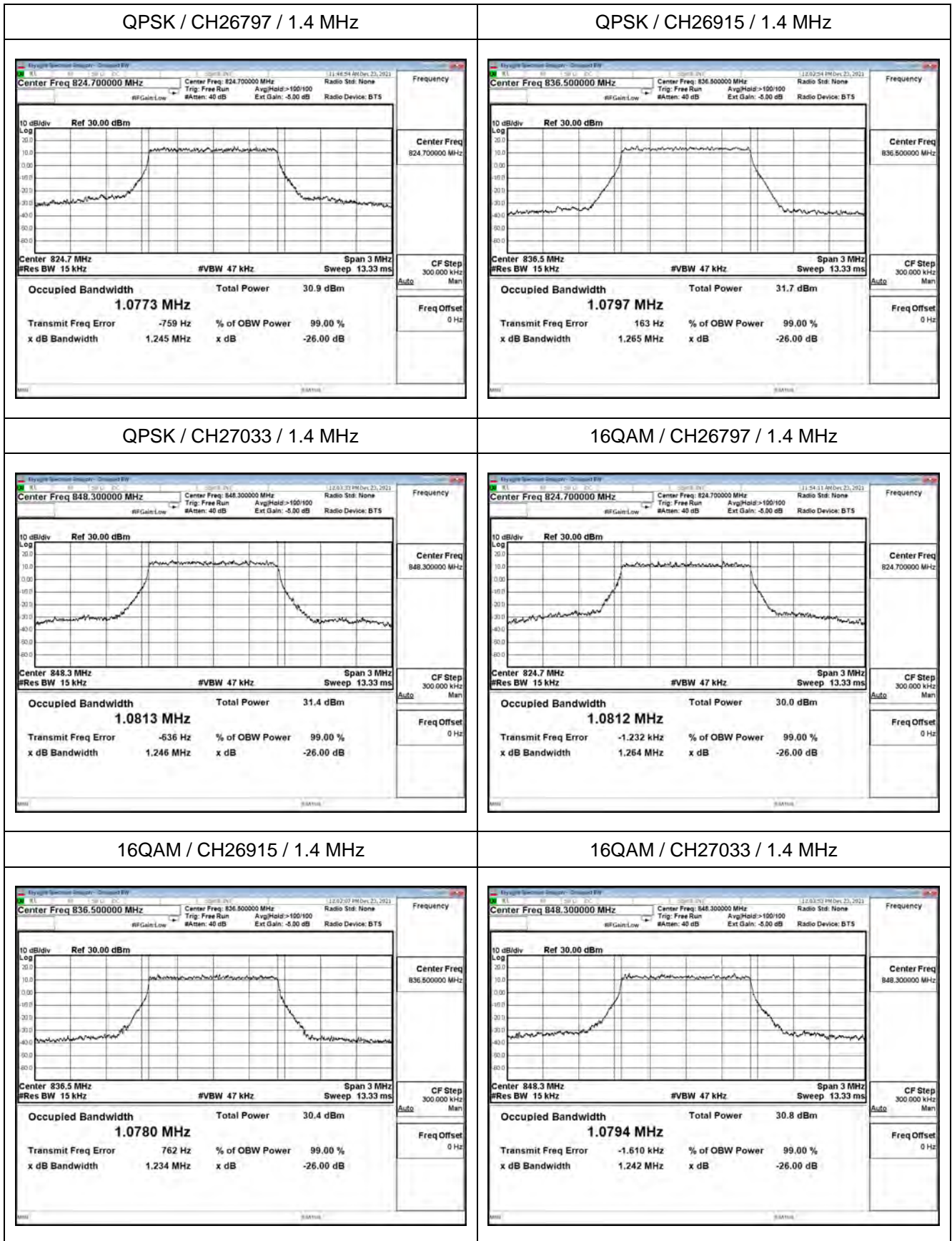
LTE Band 4



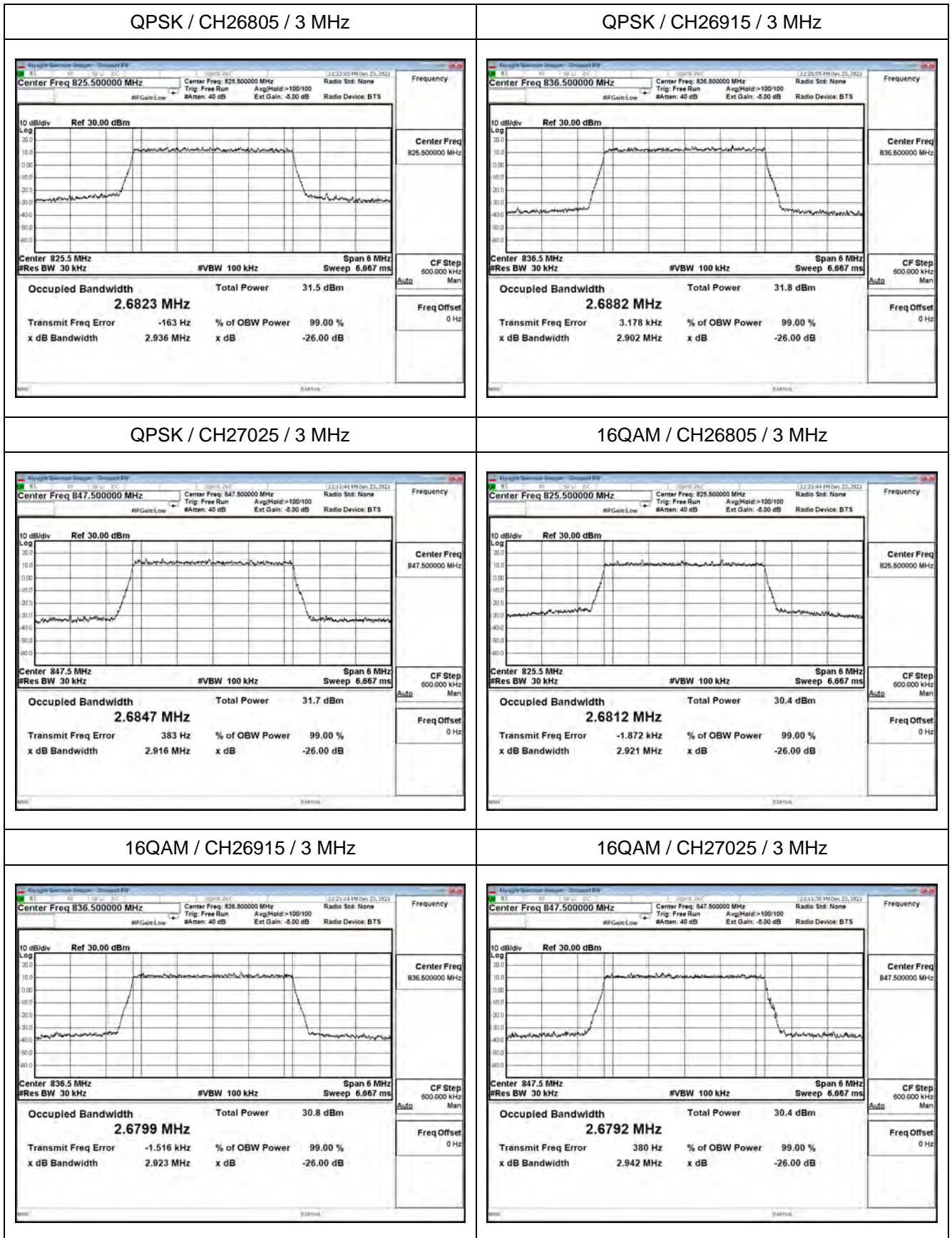
Mode 3: LTE Band 5/26 (Part 22)

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	824.7	1.245	1.077	N/A
		836.5	1.265	1.079	N/A
		848.3	1.246	1.081	N/A
	16-QAM	824.7	1.264	1.081	N/A
		836.5	1.234	1.078	N/A
		848.3	1.242	1.079	N/A
3	QPSK	825.5	2.936	2.682	N/A
		836.5	2.902	2.688	N/A
		847.5	2.916	2.684	N/A
	16-QAM	825.5	2.921	2.681	N/A
		836.5	2.923	2.679	N/A
		847.5	2.942	2.679	N/A
5	QPSK	826.5	4.916	4.472	N/A
		836.5	4.938	4.479	N/A
		846.5	4.866	4.462	N/A
	16-QAM	826.5	4.927	4.471	N/A
		836.5	4.862	4.463	N/A
		846.5	4.923	4.471	N/A
10	QPSK	829	9.769	8.945	N/A
		836.5	9.595	8.898	N/A
		844	9.690	8.922	N/A
	16-QAM	829	9.661	8.939	N/A
		836.5	9.600	8.908	N/A
		844	9.589	8.917	N/A
15	QPSK	831.5	14.460	13.389	N/A
		836.5	14.300	13.319	N/A
		841.5	14.480	13.377	N/A
	16-QAM	831.5	14.440	13.406	N/A
		836.5	14.330	13.358	N/A
		841.5	14.290	13.379	N/A

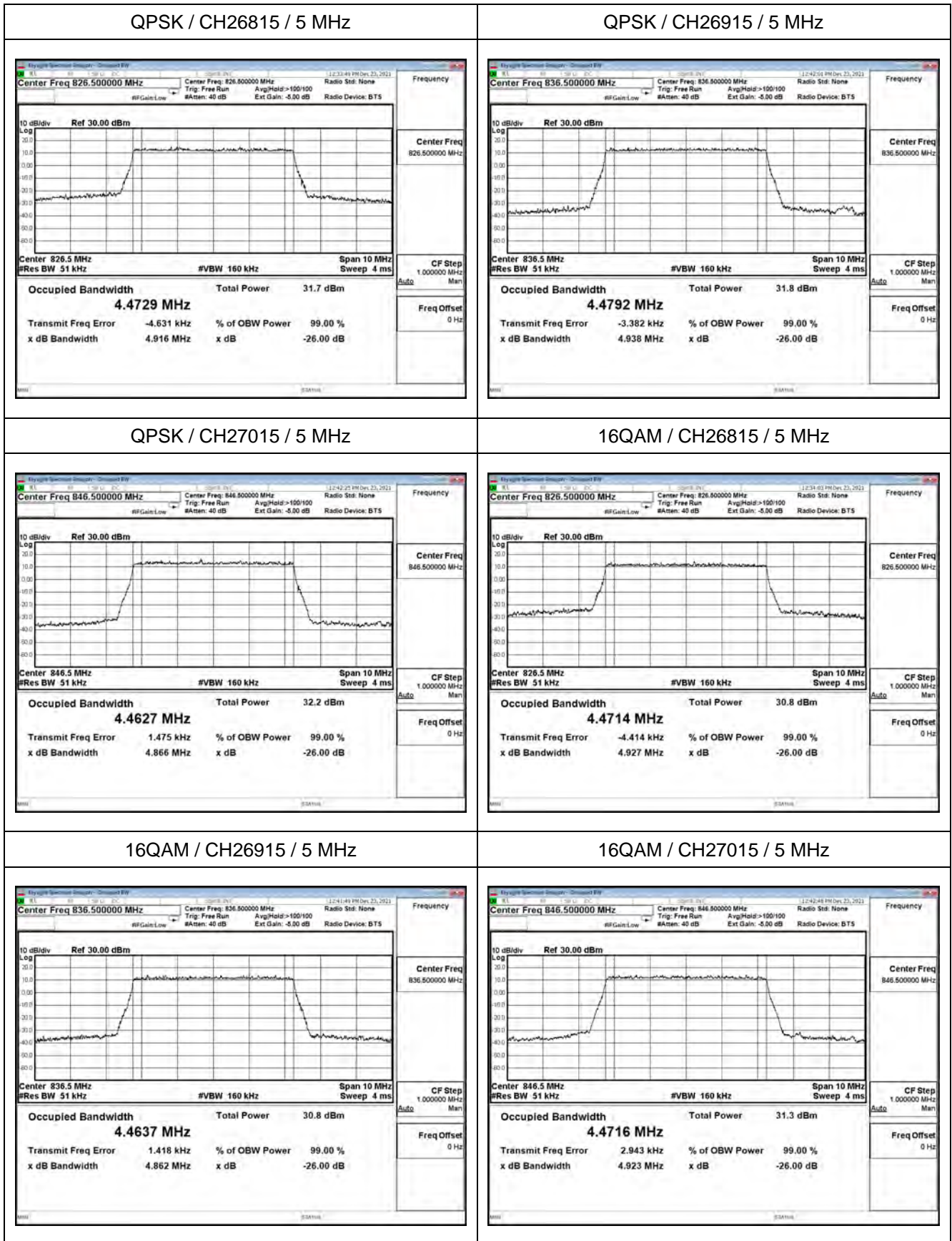
LTE Band 26



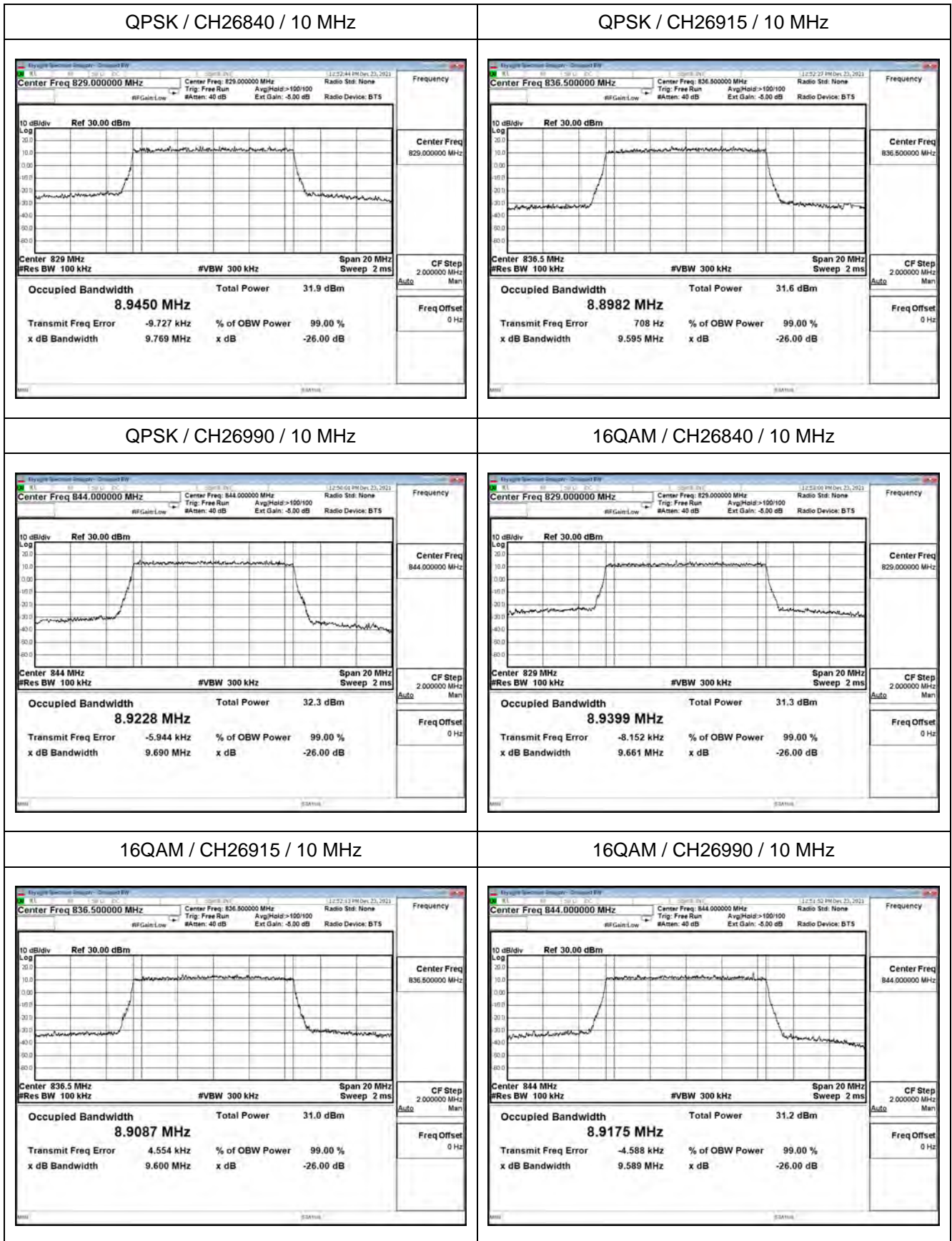
LTE Band 26



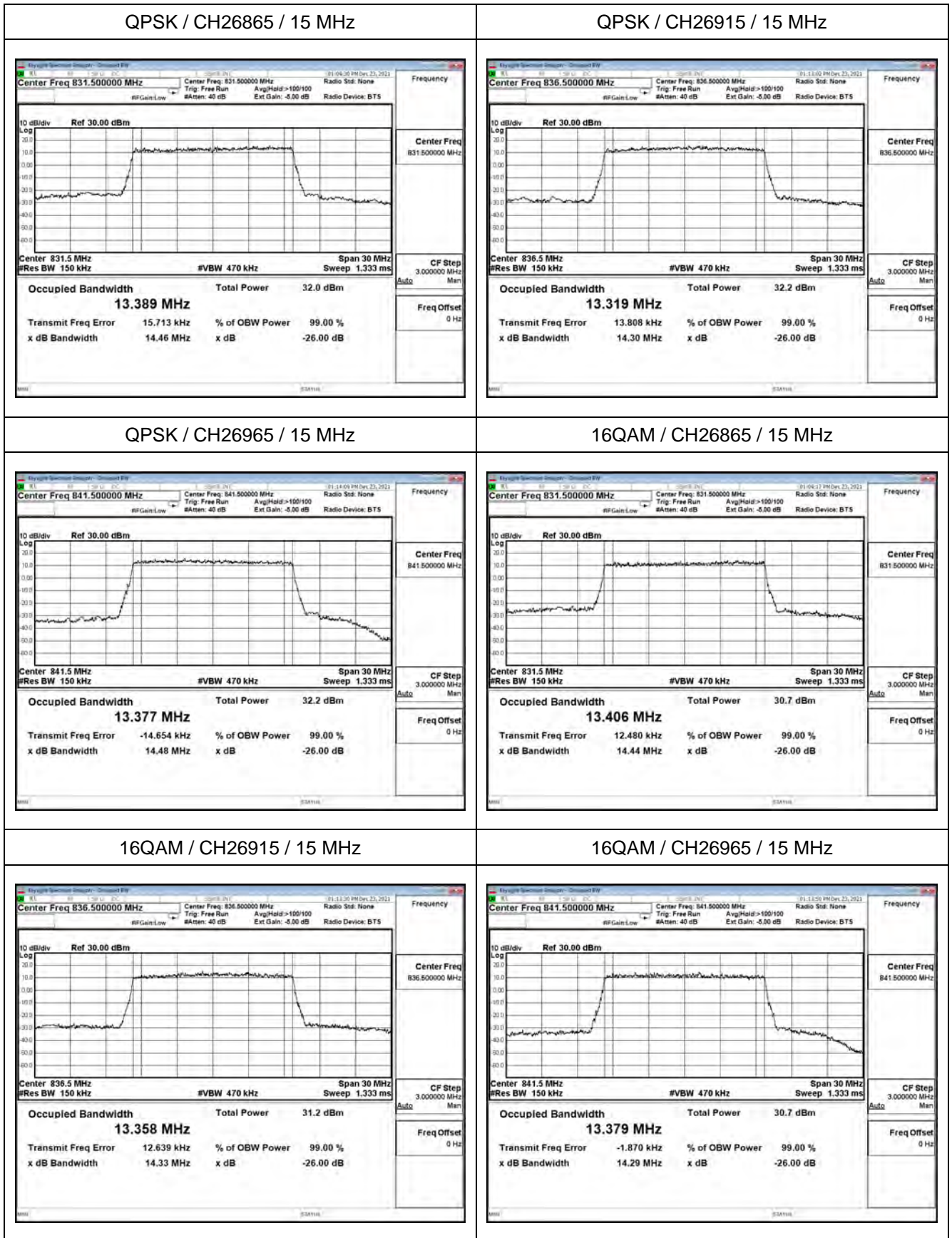
LTE Band 26



LTE Band 26



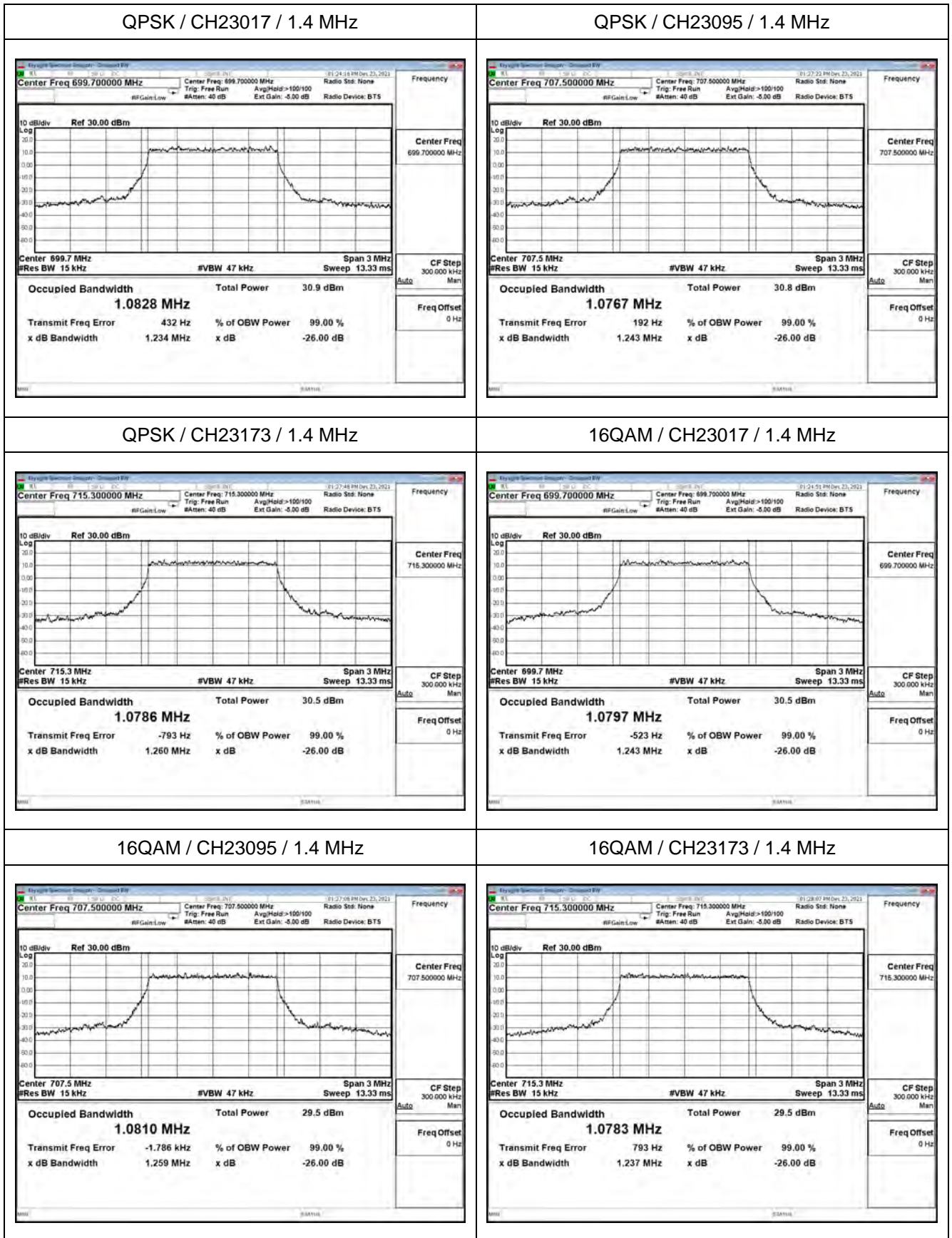
LTE Band 26



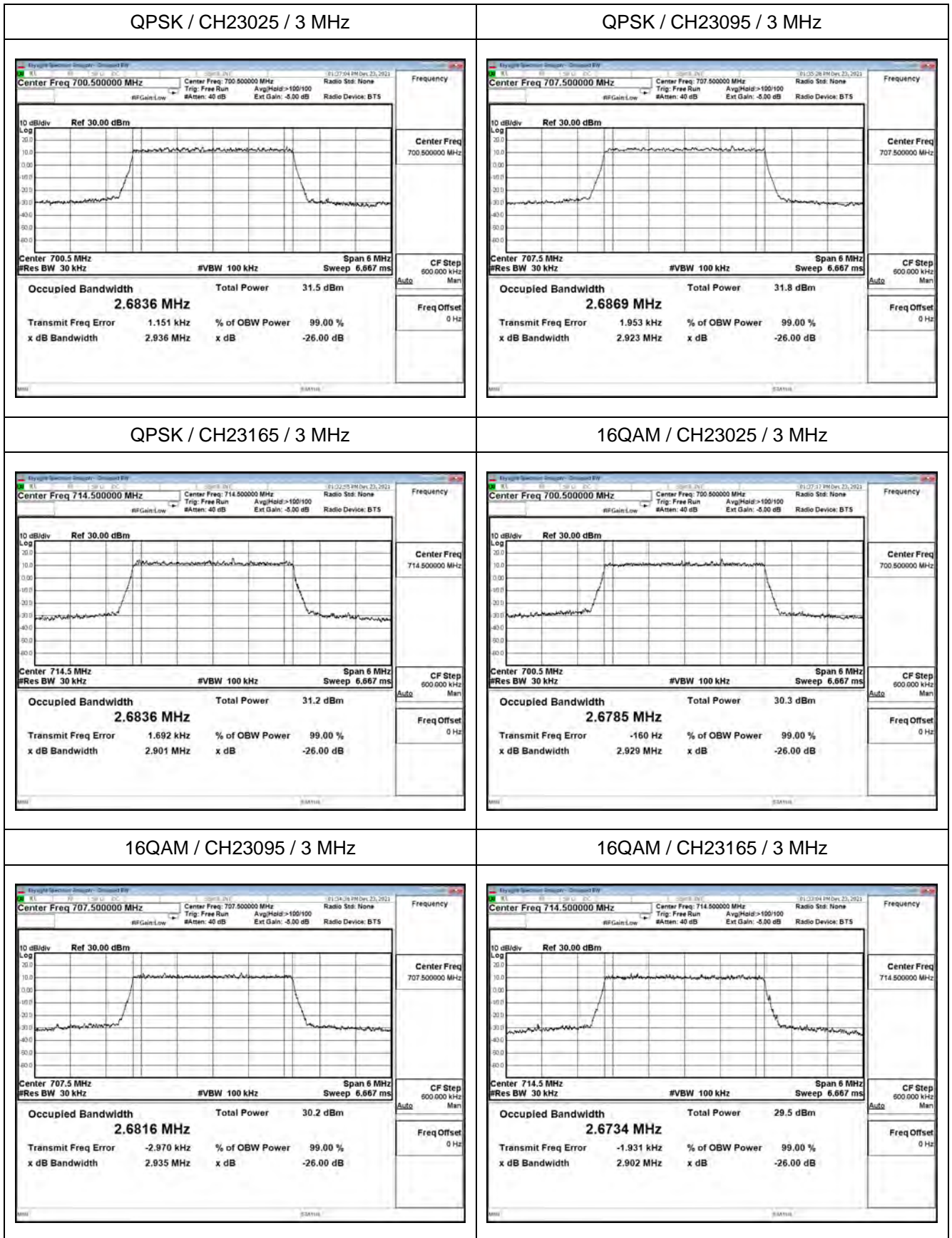
Mode 4: LTE Band 12

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	699.7	1.234	1.082	N/A
		707.5	1.243	1.076	N/A
		715.3	1.260	1.078	N/A
	16-QAM	699.7	1.243	1.079	N/A
		707.5	1.259	1.081	N/A
		715.3	1.237	1.078	N/A
3	QPSK	700.5	2.936	2.683	N/A
		707.5	2.923	2.686	N/A
		714.5	2.901	2.683	N/A
	16-QAM	700.5	2.929	2.678	N/A
		707.5	2.935	2.681	N/A
		714.5	2.902	2.673	N/A
5	QPSK	710.5	4.899	4.474	N/A
		707.5	4.905	4.473	N/A
		713.5	4.905	4.466	N/A
	16-QAM	710.5	4.830	4.465	N/A
		707.5	4.911	4.478	N/A
		713.5	4.948	4.470	N/A
10	QPSK	704.0	9.681	8.920	N/A
		707.5	9.649	8.913	N/A
		711.0	9.726	8.922	N/A
	16-QAM	704.0	9.551	8.917	N/A
		707.5	9.631	8.922	N/A
		711.0	9.584	8.920	N/A

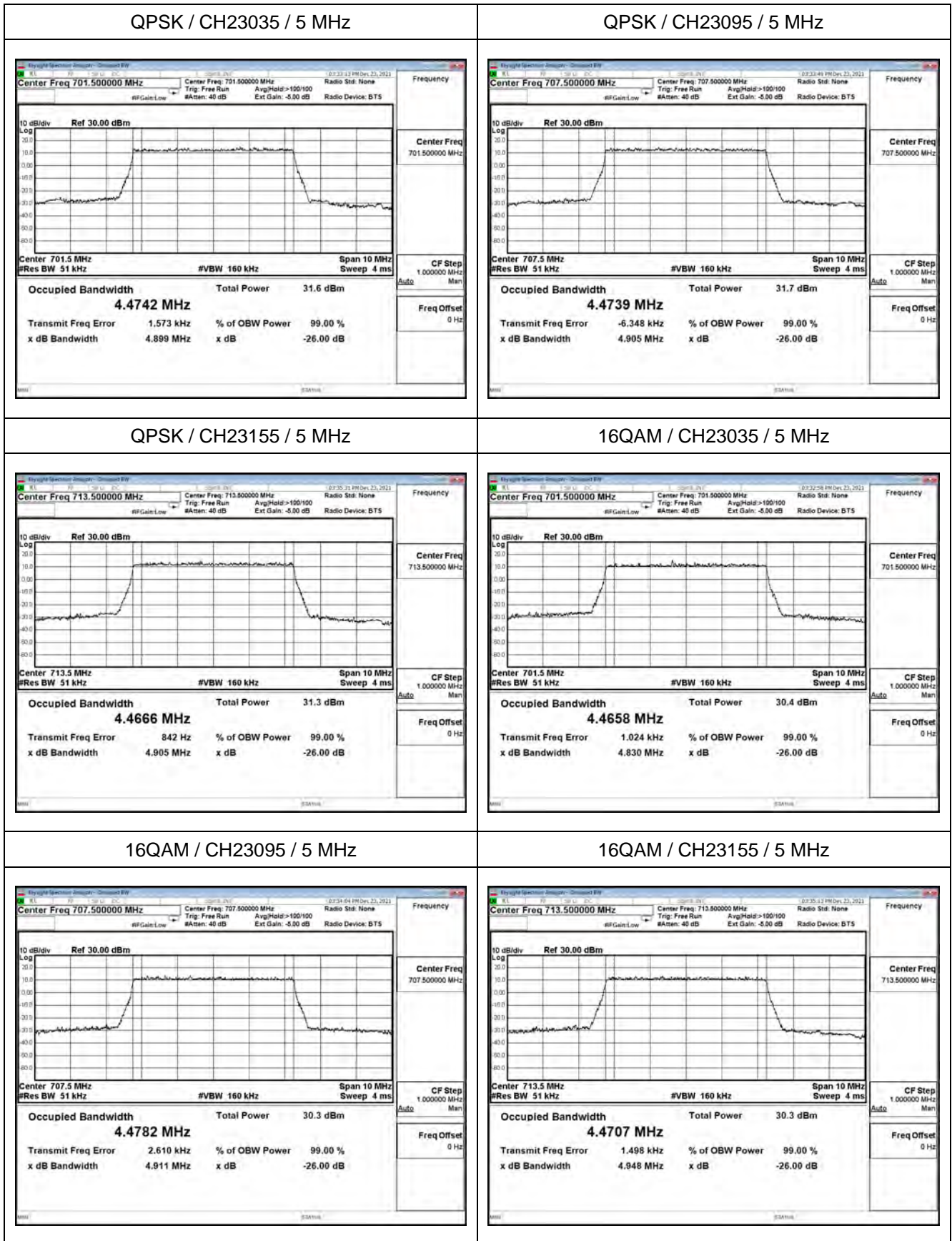
LTE Band 12



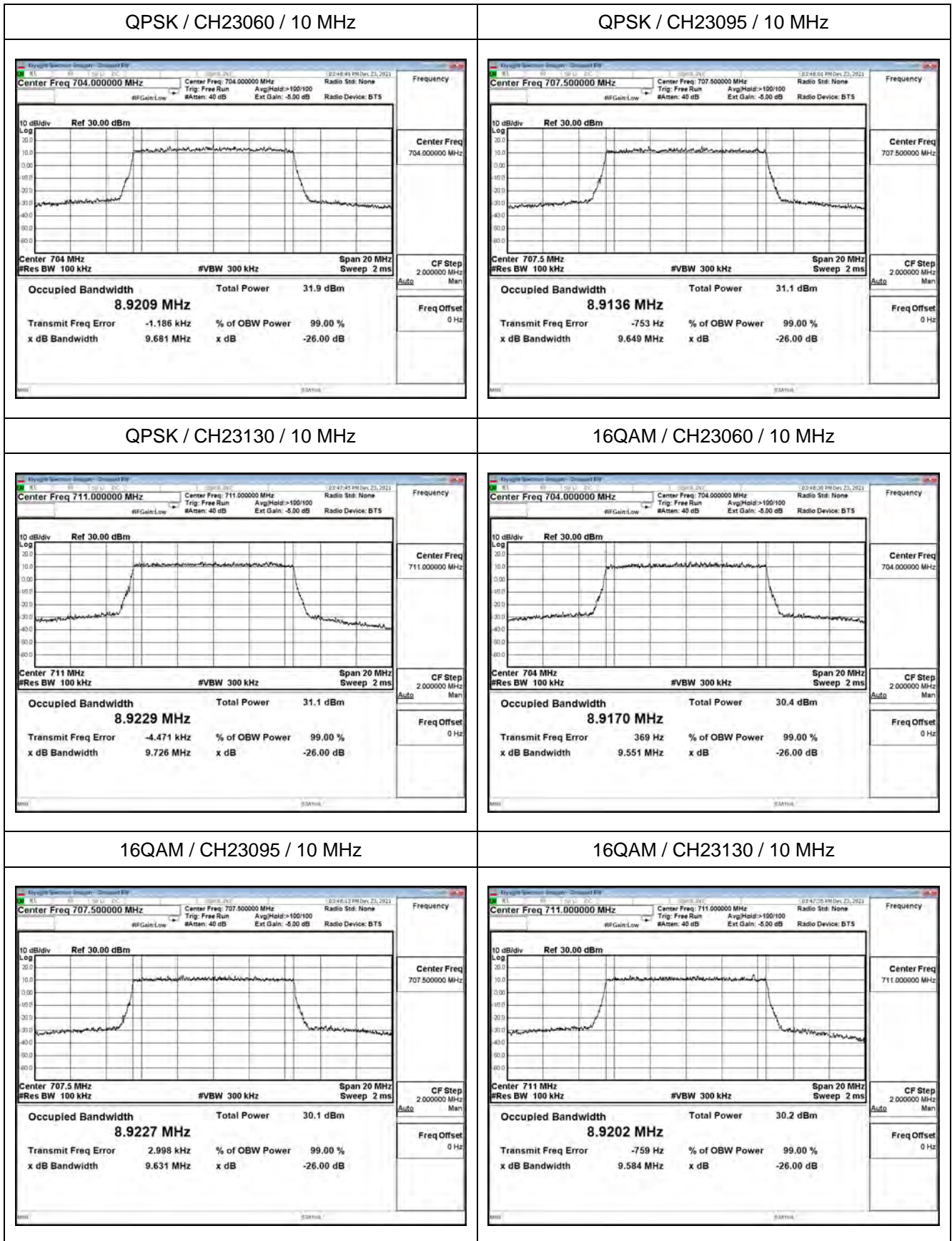
LTE Band 12



LTE Band 12



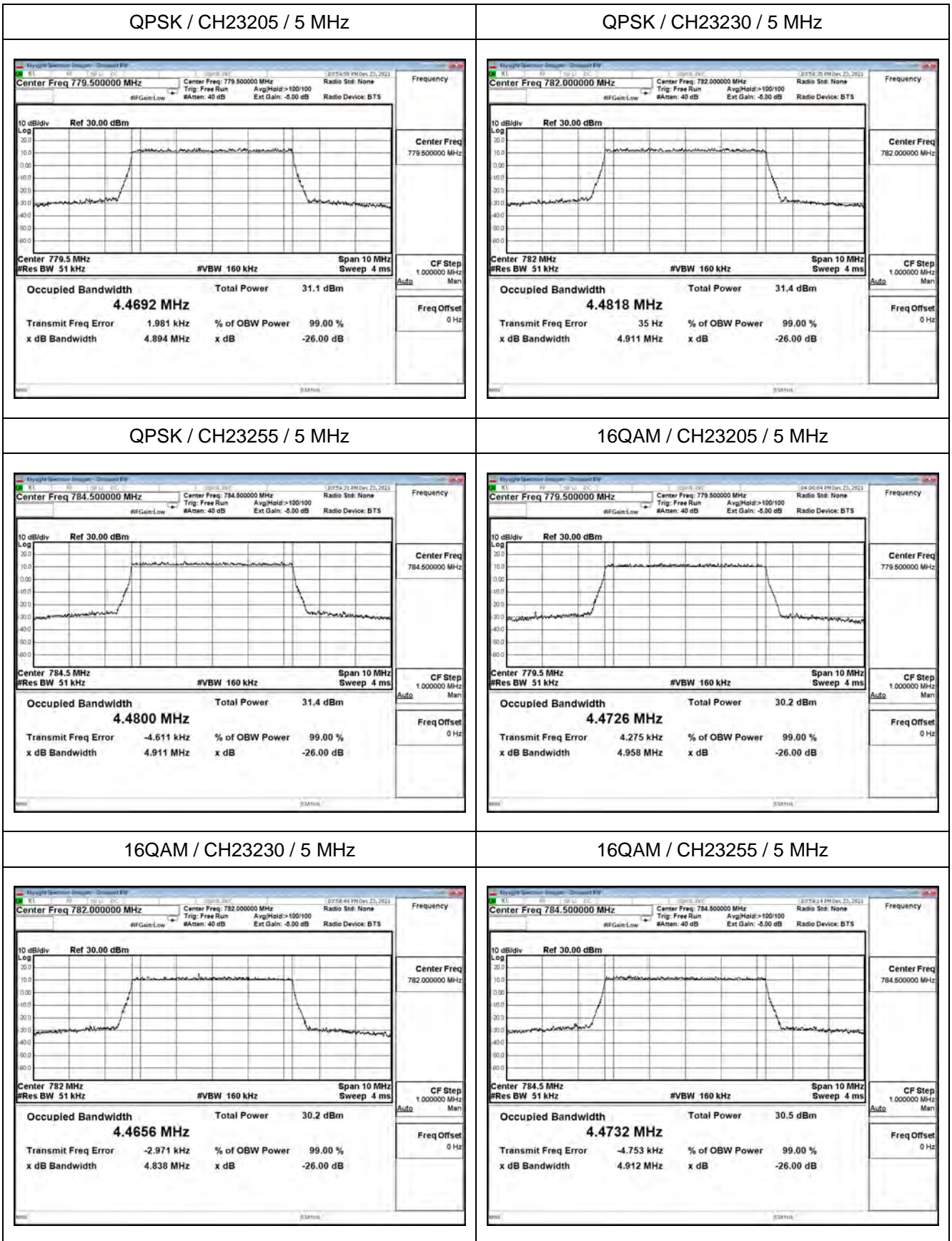
LTE Band 12



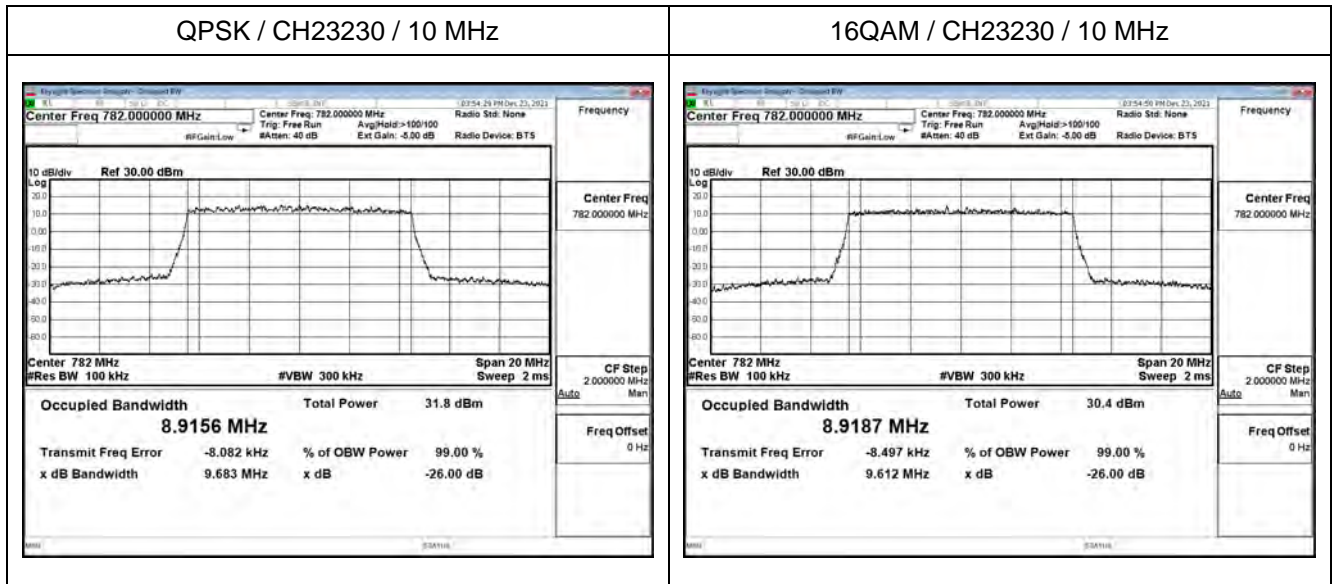
Mode 5: LTE Band 13

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
5	QPSK	779.5	4.894	4.469	N/A
		782	4.911	4.481	N/A
		784.5	4.911	4.480	N/A
	16-QAM	779.5	4.958	4.472	N/A
		782	4.838	4.465	N/A
		784.5	4.912	4.473	N/A
10	QPSK	782	9.683	8.915	N/A
	16-QAM	782	9.612	8.918	N/A

LTE Band 13



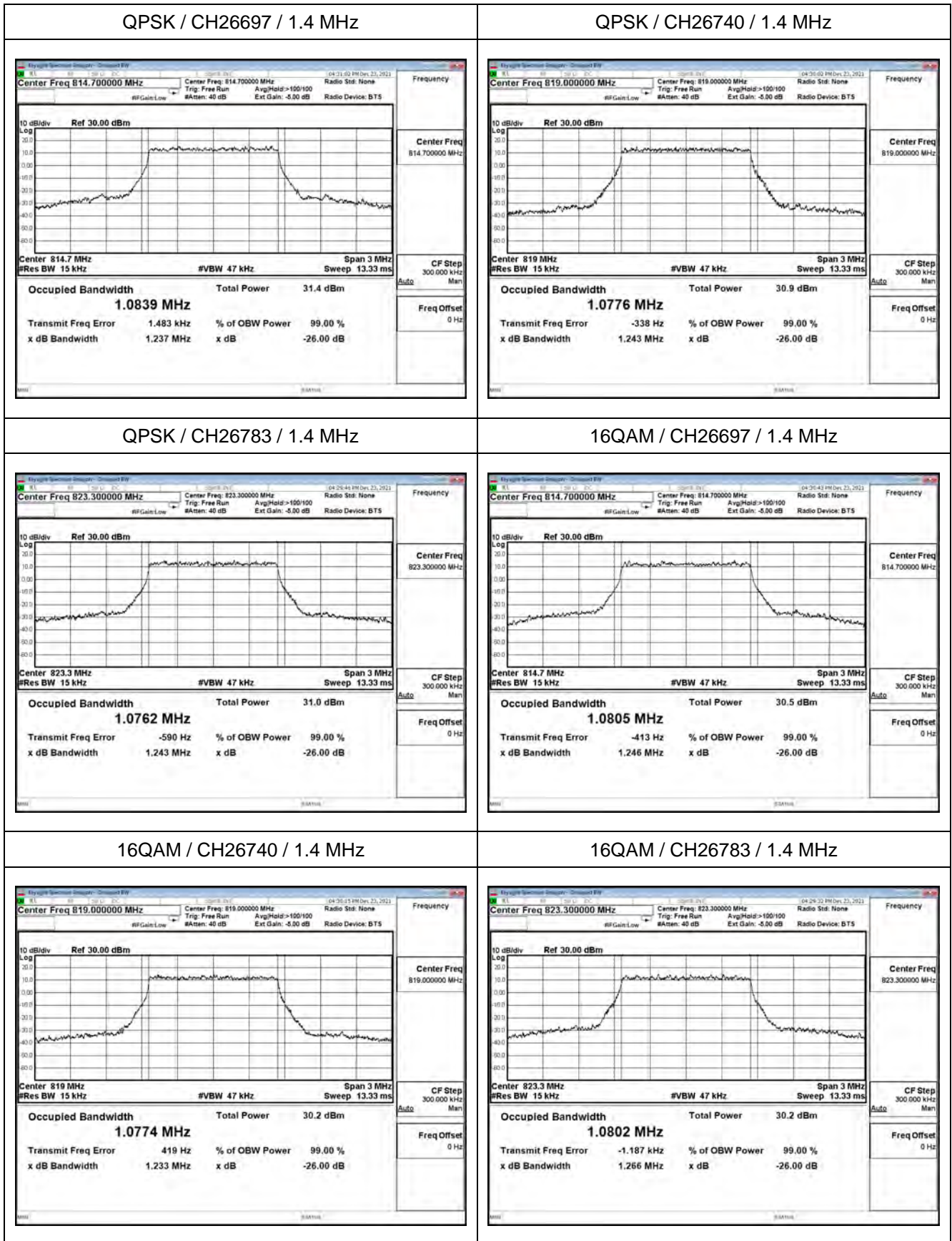
LTE Band 13



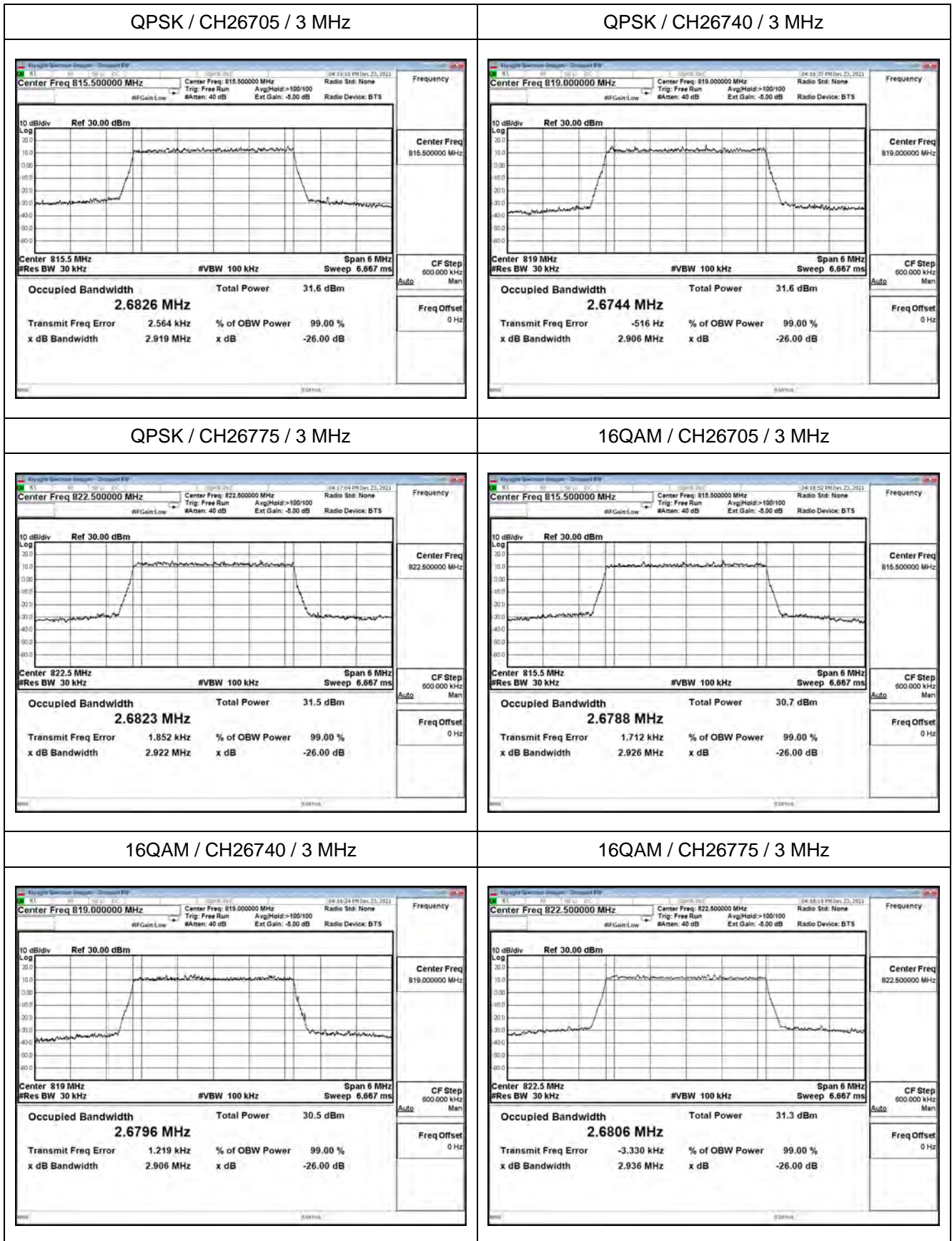
Mode 6: LTE Band 26 (Part 90)

Bandwidth (MHz)	Modulation	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
			26dB BW	99% BW	
1.4	QPSK	814.7	1.237	1.083	N/A
		819	1.243	1.077	N/A
		823.3	1.243	1.076	N/A
	16-QAM	814.7	1.246	1.080	N/A
		819	1.233	1.077	N/A
		823.3	1.266	1.080	N/A
3	QPSK	815.5	2.919	2.682	N/A
		819	2.906	2.674	N/A
		822.5	2.922	2.682	N/A
	16-QAM	815.5	2.926	2.678	N/A
		819	2.906	2.679	N/A
		822.5	2.936	2.680	N/A
5	QPSK	816.5	4.862	4.461	N/A
		819	4.897	4.474	N/A
		821.5	4.923	4.480	N/A
	16-QAM	816.5	4.917	4.470	N/A
		819	4.912	4.475	N/A
		821.5	4.804	4.468	N/A
10	QPSK	819	9.598	8.911	N/A
	16-QAM	819	9.634	8.890	N/A

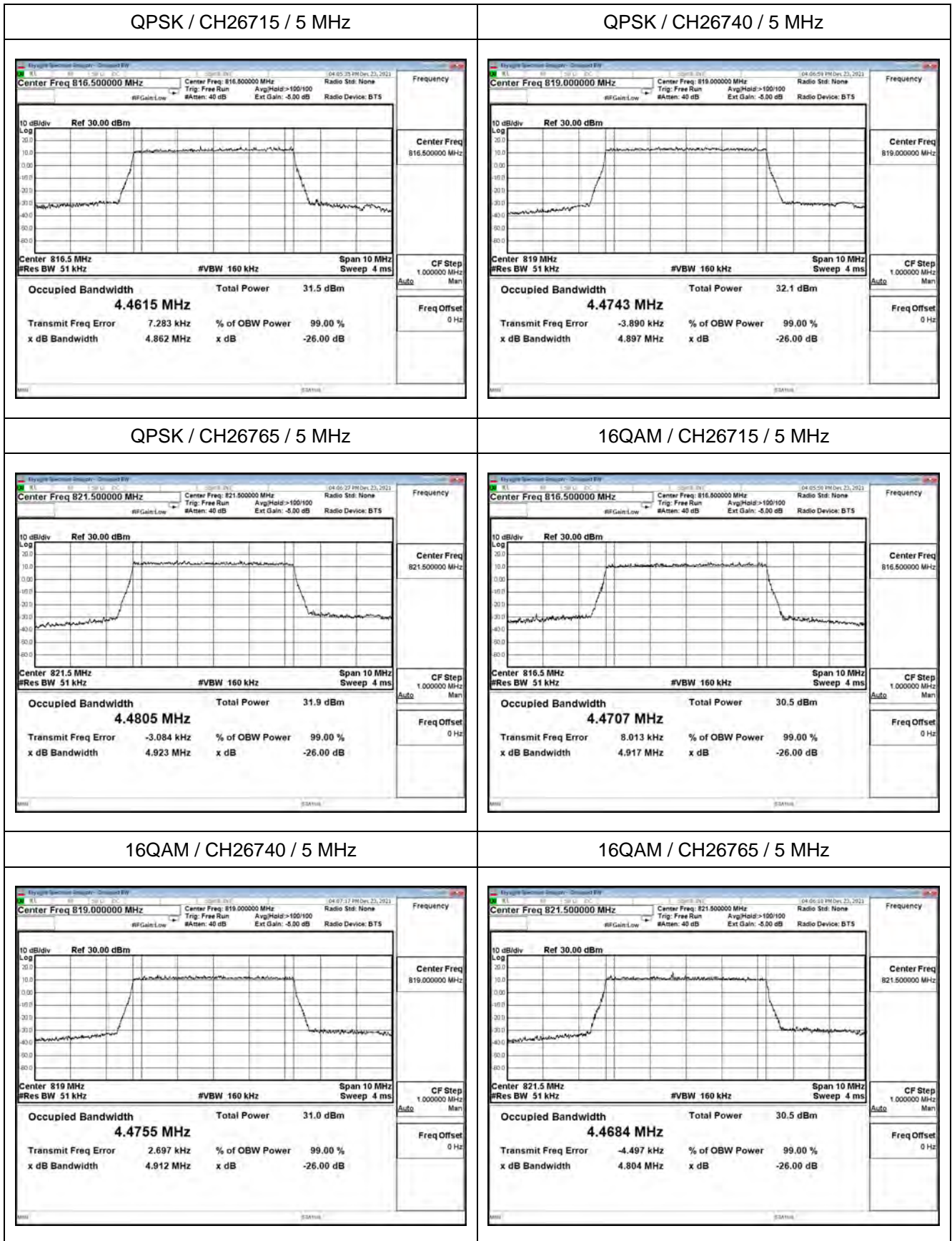
LTE Band 26



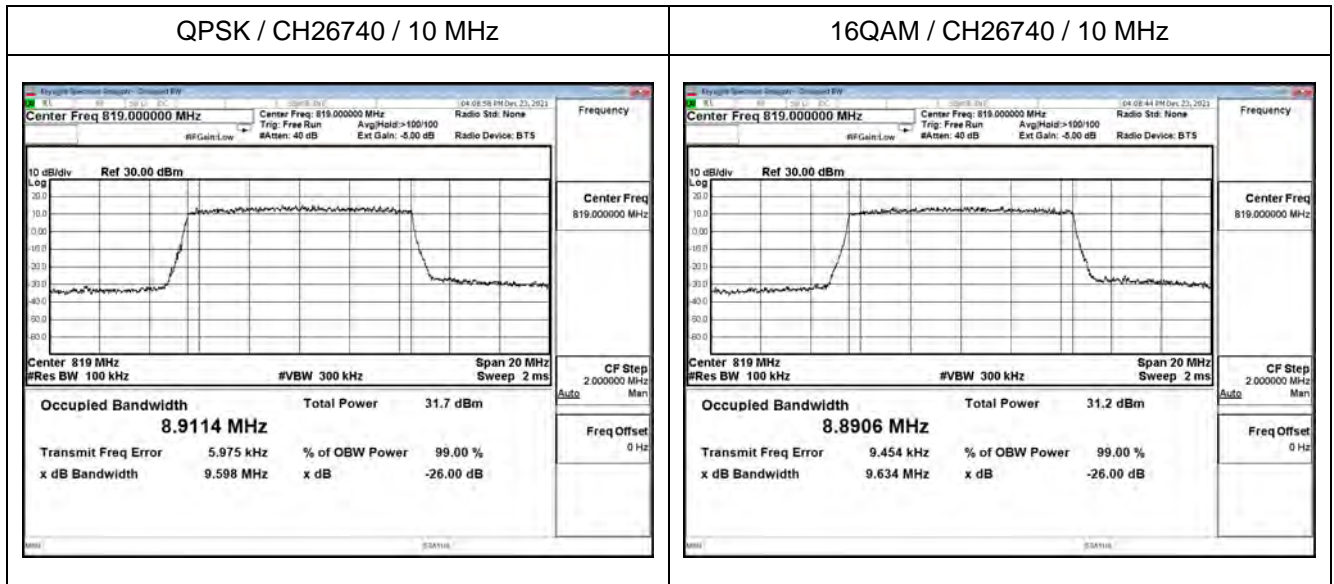
LTE Band 26



LTE Band 26

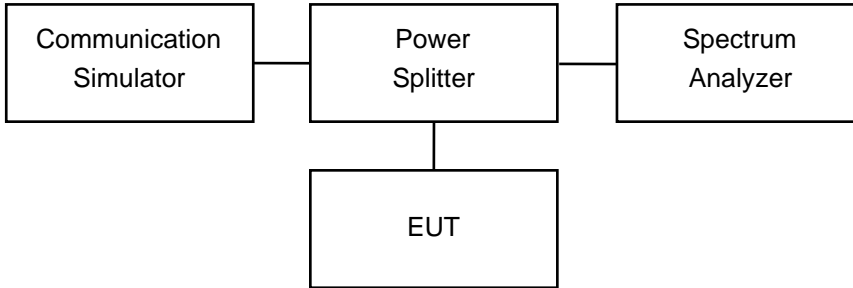


LTE Band 26



5. Peak to Average Ratio

5.1. Test Setup



5.2. Test Procedure

1. The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. The path loss was compensated to the results for each measurement.
2. Set resolution/measurement bandwidth \geq signal's occupied bandwidth.
3. Set the number of counts to a value that stabilizes the measured CCDF curve.
4. Record the maximum PAPR level associated with a probability of 0.1 %.

5.3. Test Methodology and Reference Procedures

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI C63.26-2015

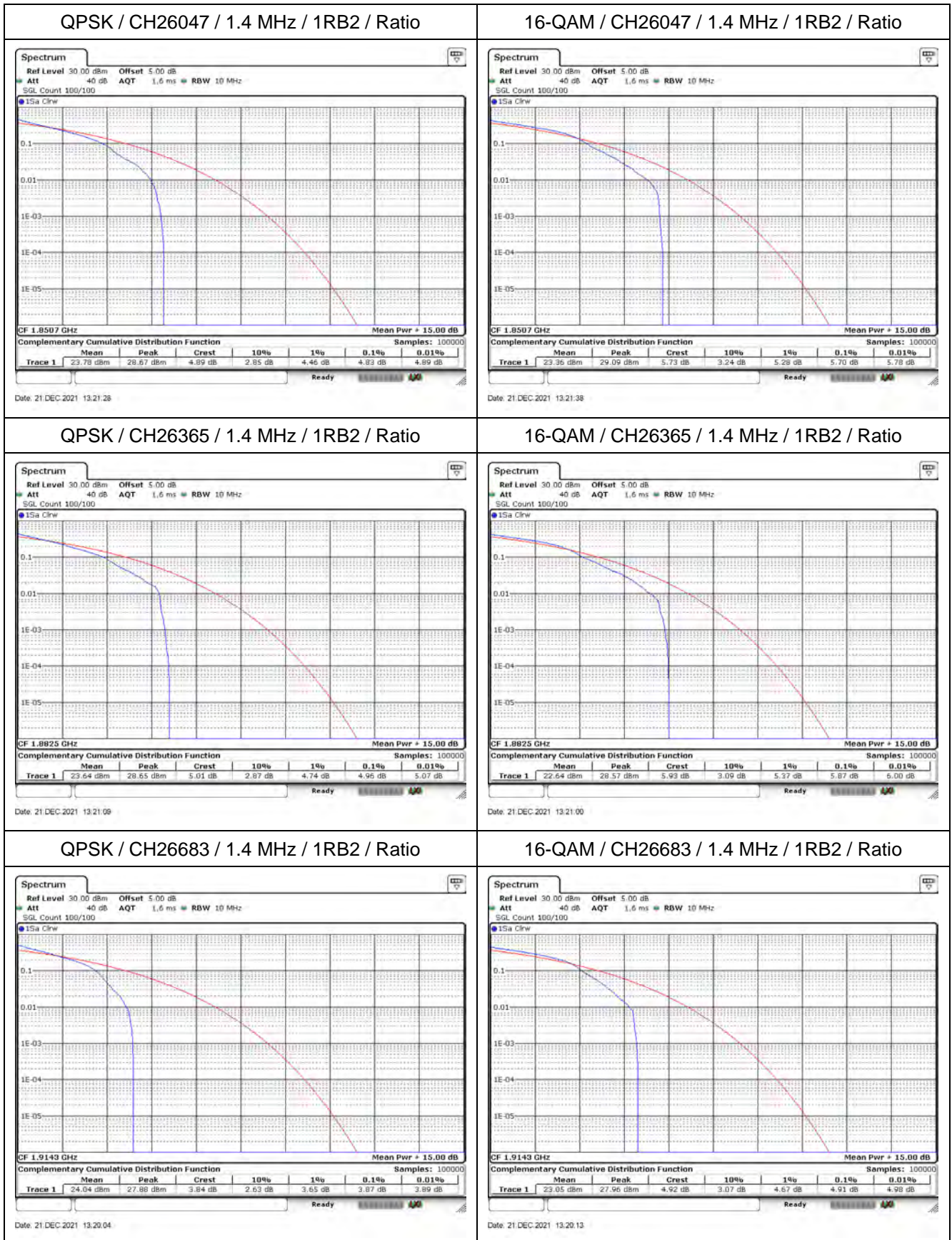
5.4. Test Result of Peak to Average Ratio

Mode 1: LTE Band 2/25

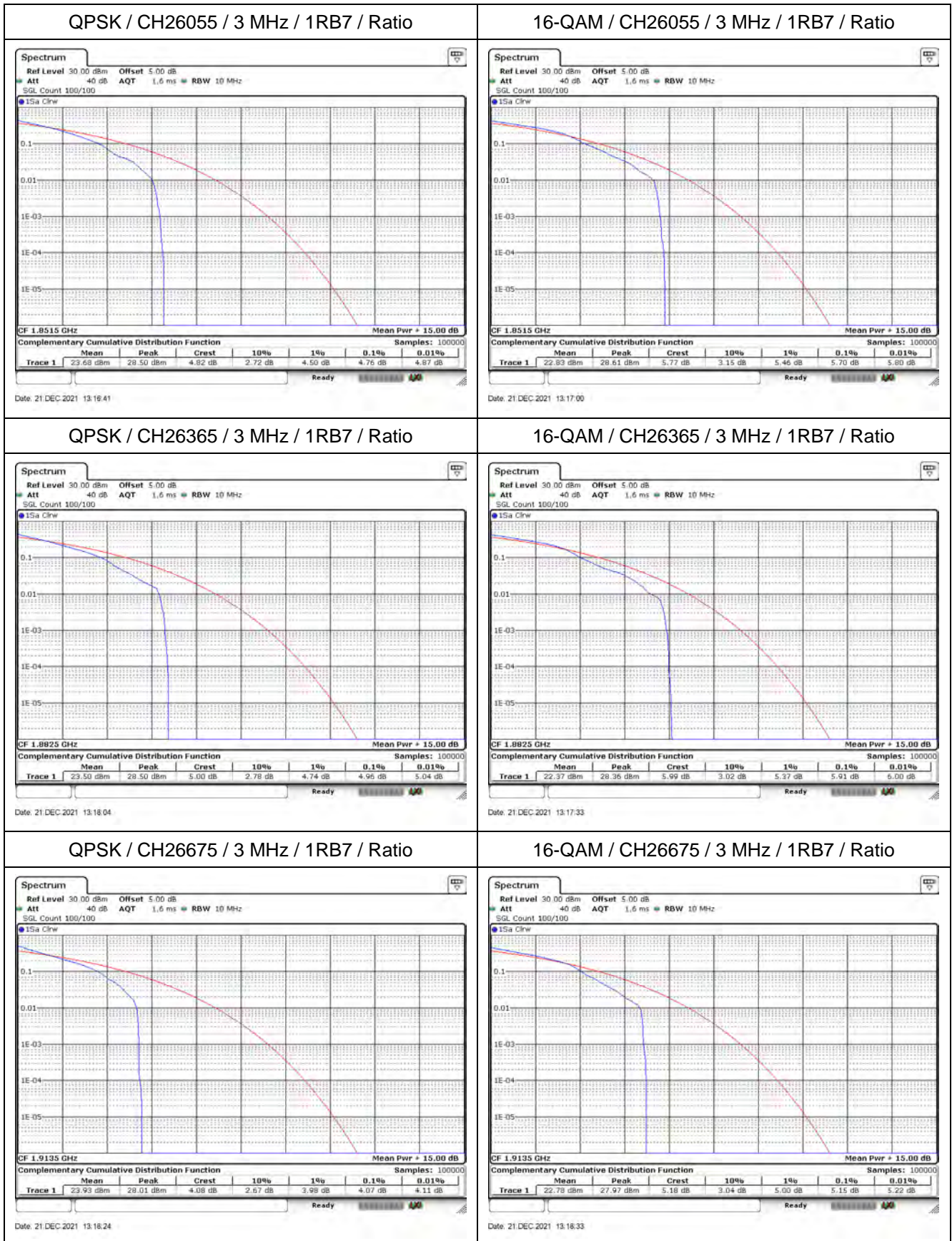
BW	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4 MHz	26047	1850.7	QPSK	28.67	23.78	4.83
			16-QAM	29.09	23.36	5.70
	26365	1882.5	QPSK	28.65	23.64	4.96
			16-QAM	28.57	22.64	5.87
	26683	1914.3	QPSK	27.88	24.04	3.87
			16-QAM	27.96	23.05	4.91
3 MHz	26055	1851.5	QPSK	28.50	23.68	4.76
			16-QAM	28.61	22.83	5.70
	26365	1882.5	QPSK	28.50	23.50	4.96
			16-QAM	28.36	22.37	5.91
	26675	1913.5	QPSK	28.01	23.93	4.07
			16-QAM	27.97	22.78	5.15
5 MHz	26065	1852.5	QPSK	28.52	23.62	4.83
			16-QAM	28.70	23.07	5.54
	26365	1882.5	QPSK	28.62	23.65	4.96
			16-QAM	28.07	22.03	5.85
	26665	1912.5	QPSK	27.98	23.77	4.22
			16-QAM	27.82	22.60	5.17
10 MHz	26090	1855	QPSK	28.76	23.75	4.93
			16-QAM	28.16	22.36	5.72
	26365	1882.5	QPSK	28.70	23.75	4.89
			16-QAM	28.23	22.34	5.85
	26640	1910	QPSK	28.13	23.73	4.35
			16-QAM	28.40	23.26	5.11
15 MHz	26115	1857.5	QPSK	28.67	23.67	4.91
			16-QAM	29.15	23.32	5.70
	26365	1882.5	QPSK	28.72	23.71	4.91
			16-QAM	28.64	22.99	5.57
	26615	1907.5	QPSK	28.18	23.59	4.54
			16-QAM	27.91	22.18	5.65

BW	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
20 MHz	26140	1860	QPSK	28.87	24.06	4.74
			16-QAM	29.07	23.39	5.59
	26365	1882.5	QPSK	28.83	23.87	4.85
			16-QAM	28.20	22.22	5.85
	26590	1905	QPSK	28.36	23.73	4.57
			16-QAM	28.66	23.19	5.39

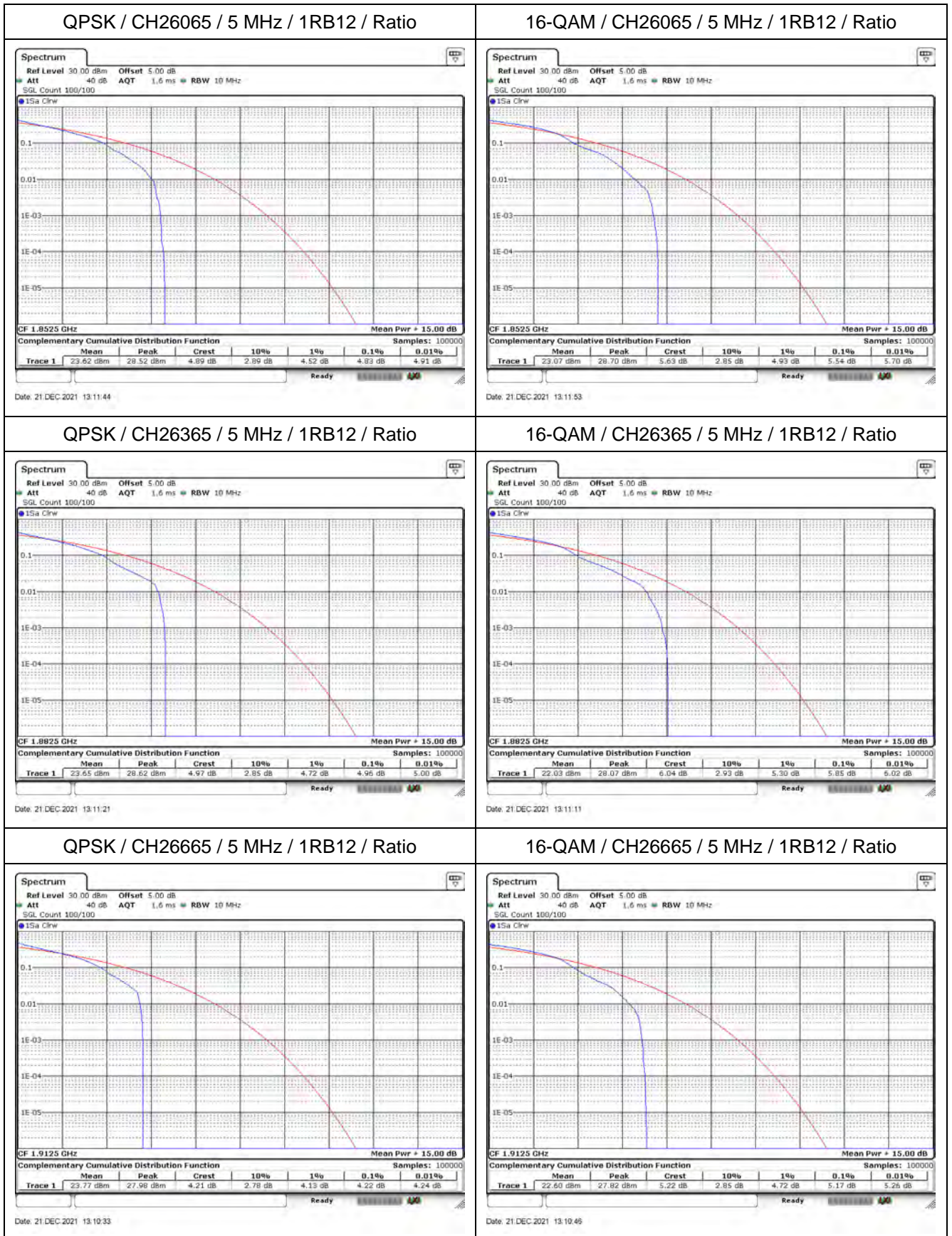
LTE Band 25



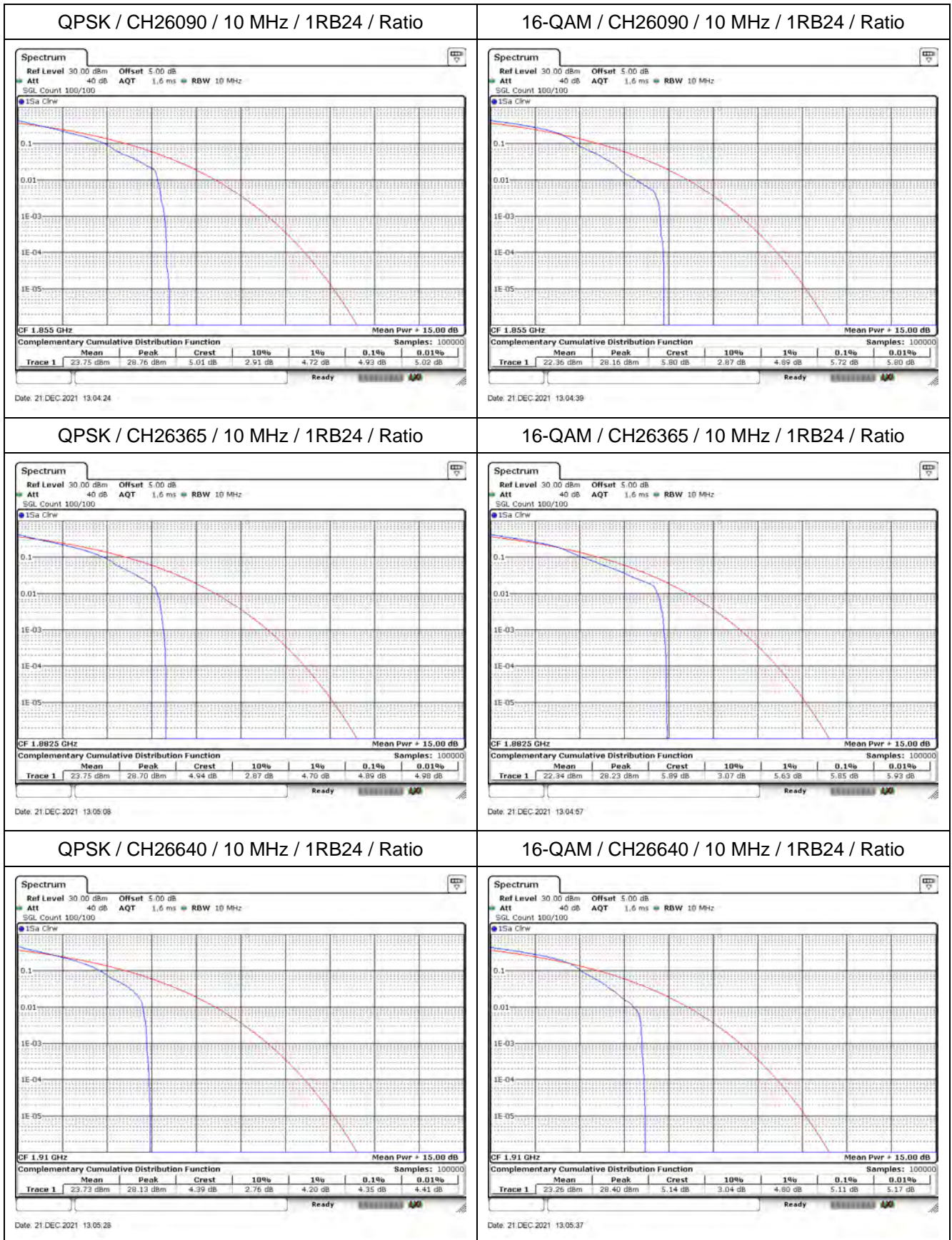
LTE Band 25



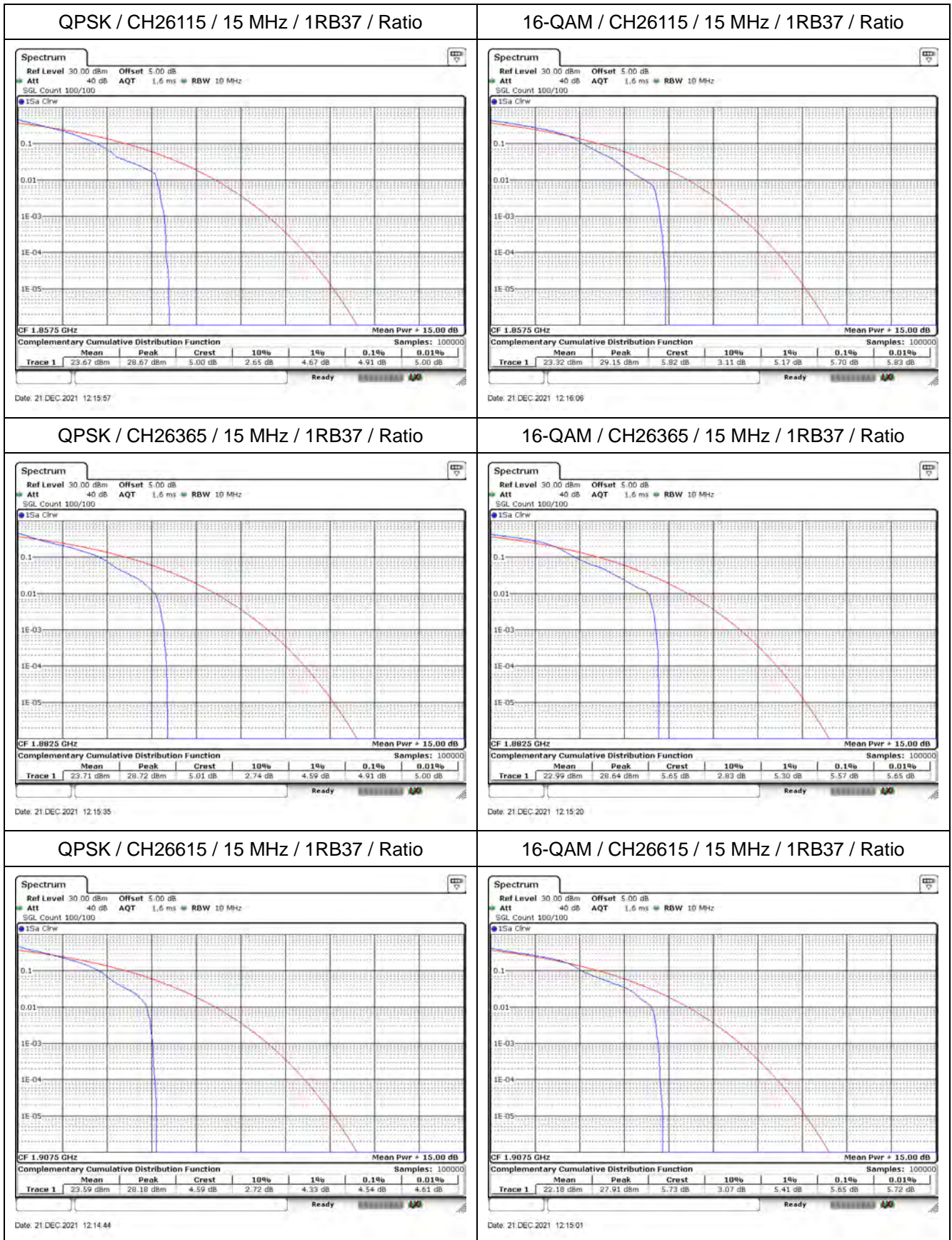
LTE Band 25



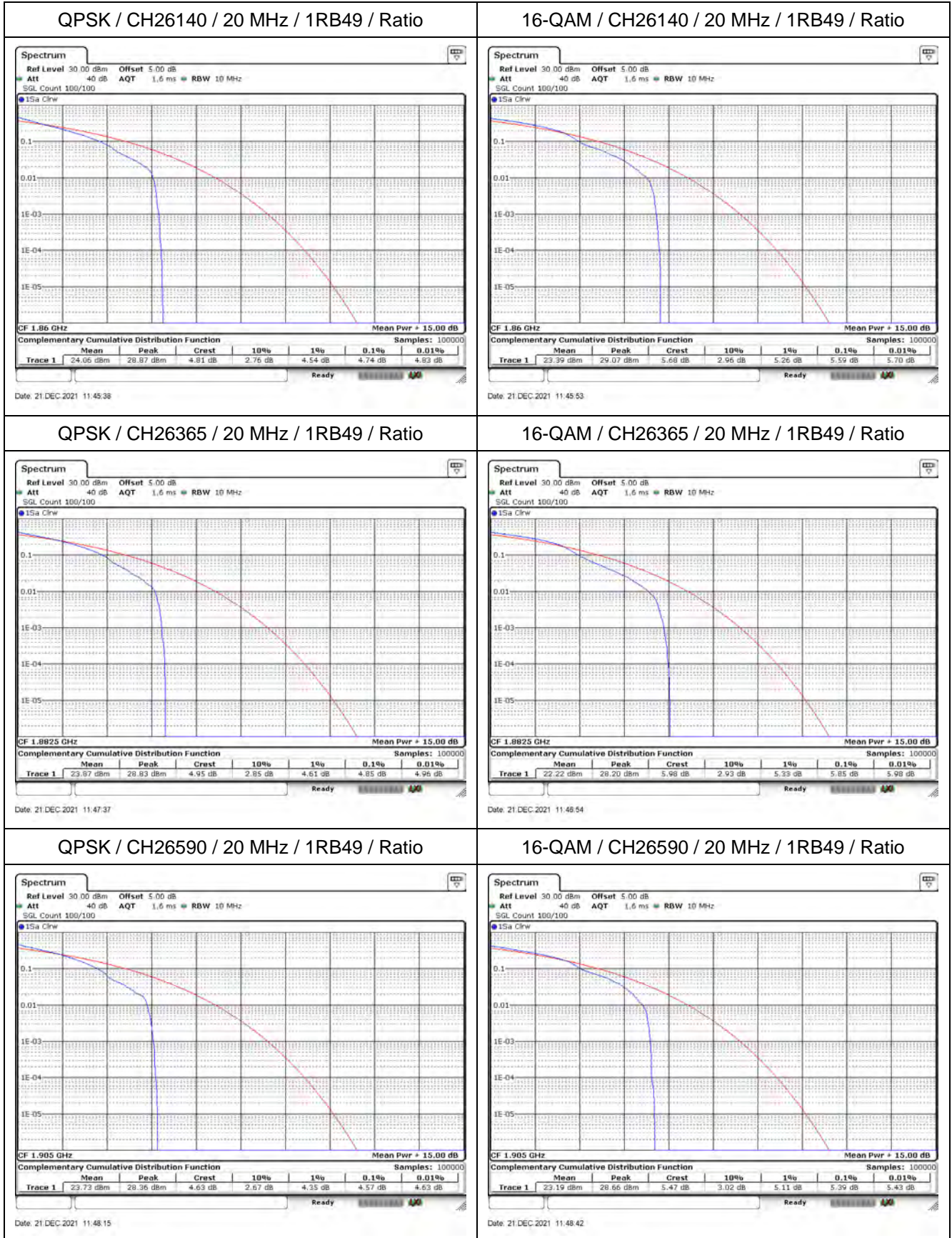
LTE Band 25



LTE Band 25



LTE Band 25

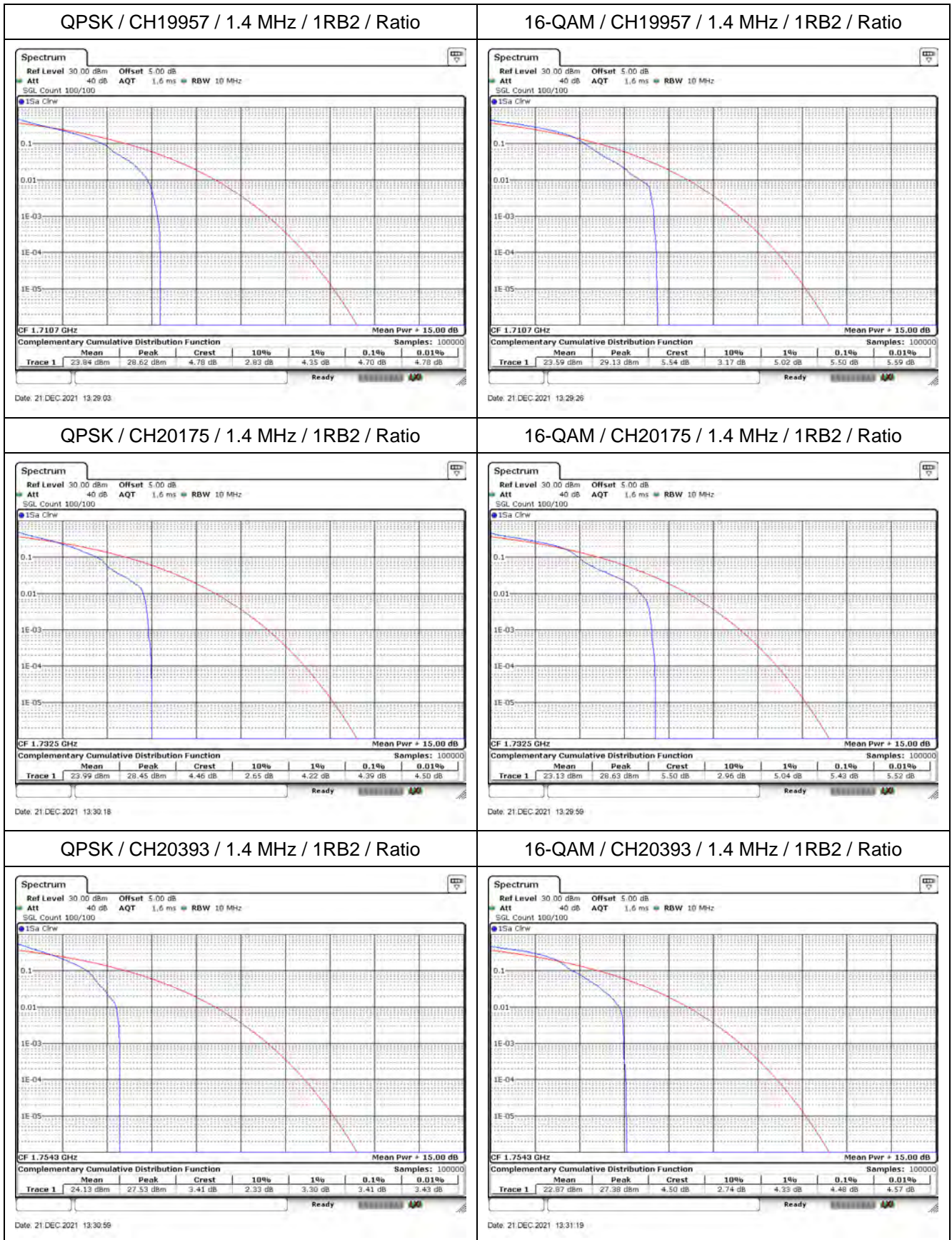


Mode 2: LTE Band 4

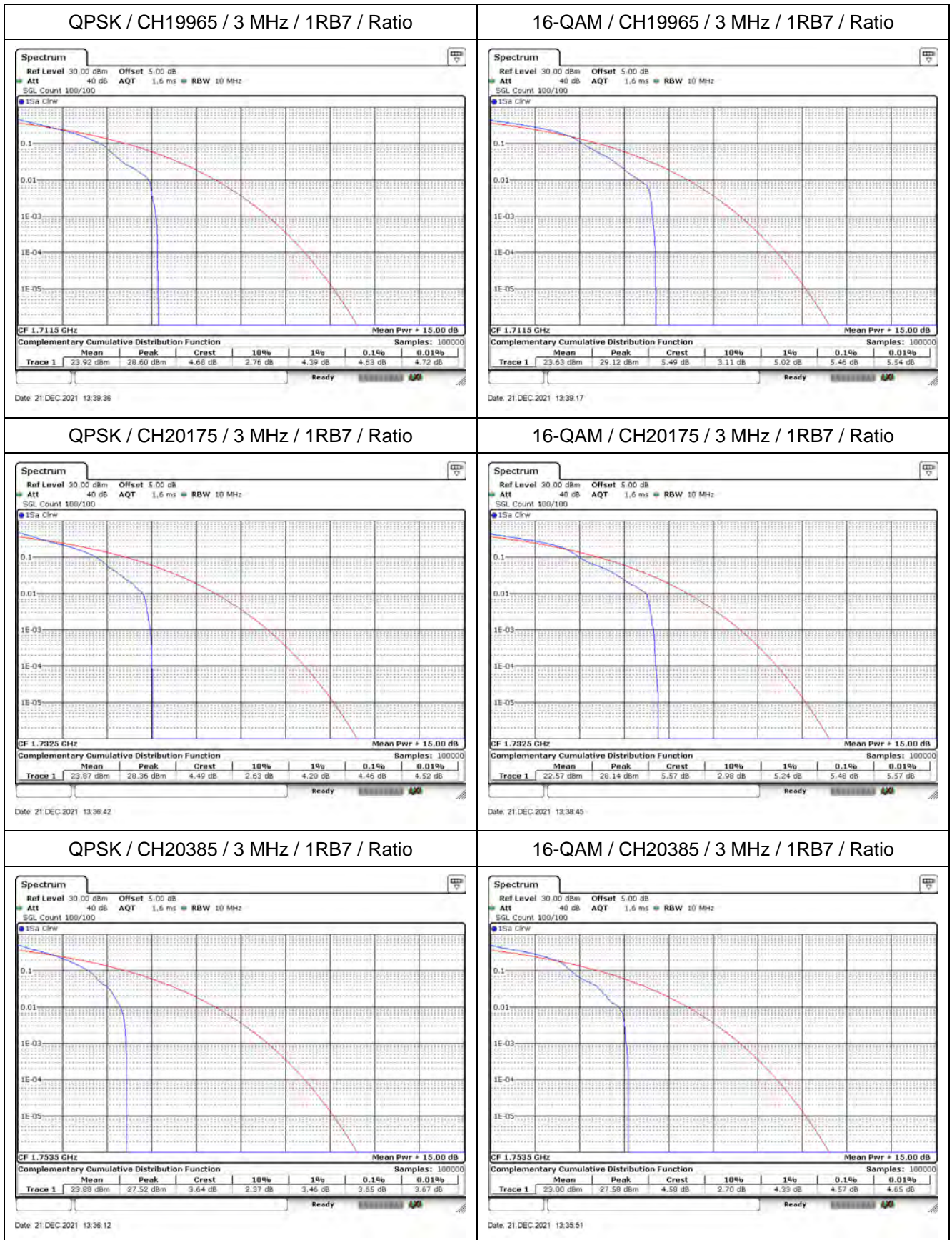
BW	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4 MHz	19957	1710.7	QPSK	28.62	23.84	4.70
			16-QAM	29.13	23.59	5.50
	20175	1732.5	QPSK	28.45	23.99	4.39
			16-QAM	28.63	23.13	5.43
	20393	1754.3	QPSK	27.53	24.13	3.41
			16-QAM	27.38	22.87	4.48
3 MHz	19965	1711.5	QPSK	28.60	23.92	4.63
			16-QAM	29.12	23.63	5.46
	20175	1732.5	QPSK	28.36	23.87	4.46
			16-QAM	28.14	22.57	5.48
	20385	1753.5	QPSK	27.52	23.88	3.65
			16-QAM	27.58	23.00	4.57
5 MHz	19975	1712.5	QPSK	28.50	23.74	4.72
			16-QAM	28.65	22.87	5.74
	20175	1732.5	QPSK	28.12	23.60	4.50
			16-QAM	28.48	23.10	5.35
	20375	1752.5	QPSK	27.62	23.89	3.74
			16-QAM	27.66	23.16	4.48
10 MHz	20000	1715	QPSK	28.63	24.00	4.57
			16-QAM	28.48	22.74	5.61
	20175	1732.5	QPSK	28.48	24.01	4.37
			16-QAM	28.75	23.29	5.39
	20350	1750	QPSK	27.99	23.96	4.02
			16-QAM	27.87	22.91	4.89
15 MHz	20025	1717.5	QPSK	28.53	23.82	4.67
			16-QAM	28.52	22.84	5.59
	20175	1732.5	QPSK	28.07	23.45	4.57
			16-QAM	28.61	23.15	5.39
	20325	1747.5	QPSK	27.84	23.67	4.13
			16-QAM	27.68	22.41	5.20

BW	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
20 MHz	20050	1720	QPSK	28.70	24.07	4.52
			16-QAM	28.83	23.60	5.11
	20175	1732.5	QPSK	28.38	24.00	4.30
			16-QAM	28.14	22.36	5.65
	20300	1745	QPSK	28.11	23.89	4.17
			16-QAM	28.38	23.58	4.74

LTE Band 4



LTE Band 4



LTE Band 4

