



TEST REPORT

APPLICANT : Reliance Communications LLC

PRODUCT NAME : Orbic Q10

MODEL NAME : RC609L

BRAND NAME : Orbic

FCC ID : 2ABGH-RC609LTM

STANDARD(S) : 47 CFR Part 2
: 47 CFR Part 27, SubpartM

RECEIPT DATE : 2022-04-06

TEST DATE : 2022-04-06 to 2022-04-19

ISSUE DATE : 2022-06-02

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Tang Jinde(Rapporteur)

Approved by: Shen Junsheng
Shen Junsheng(Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2022-06-02	First edition



1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	Unimaxcomm
Manufacturer Address:	35F, HBC HuiLong Center Building-II Minzhi Street, Longhua, Shenzhen, P.R. China 518110



1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Q10	
Hardware Version:	V1.0	
Software Version:	ORB609L_v1.0.2_BTM-ST	
IMEI:	351036180001942	
Modulation Type:	QPSK, 16QAM,64QAM	
Operation Band:	Uplink:CA_41C	
Frequency Range:	LTE Band 41	Tx: 2496 MHz– 2690 MHz
		Rx: 2496 MHz– 2690 MHz
Channel Bandwidth:	LTE Band 41	5MHz, 10MHz, 15MHz, 20MHz
Antenna Type:	Fixed Internal Antenna	
Antenna Gain:	LTE Band 41	0.96dBi
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	BTE-3402
	Serial No.:	N/A
	Capacity:	3400mAh
	Rated Voltage:	3.8V
	Charge Limit:	4.35V
	Manufacturer:	Phenix New Energy (Hui Zhou) Co., Ltd.
	AC Adapter	
	Brand Name:	N/A
	Model No.:	TPA-23A050200UU01
	Serial No.:	N/A
	Rated Output:	5V=2000mA
	Rated Input:	100-240V~50/60Hz, 0.3A
	Manufacturer:	Shenzhen Tianyin Electronics Co., Ltd.

Note1: LTE Band 41 supports both power class 2 and class 3. We have evaluated two power classes respectively by performing full test, for Conducted Output Power and E.I.R.P. we recorded the test result of two power classes separately, for other test items we only recorded the worst test result (Class 2) in this report.

Note2: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



1.3. Maximum ERP/EIRP and Emission Designator

Channel bandwidth	Maximum ERP/EIRP (W)			
LTE CA_41C	QPSK	16QAM	64QAM	256QAM
20+20	0.158	/	/	/

Channel bandwidth	Emission Designator (99%OBW)		
LTE CA_41C	QPSK	16QAM	64QAM
5+20	22M8G7D	22M8W7D	22M8D7W
10+15	23M6G7D	23M3W7D	23M3D7W
10+20	27M6G7D	27M6W7D	27M6D7W
15+10	24M9G7D	23M3W7D	23M3D7W
15+15	28M3G7D	28M3W7D	28M5D7W
15+20	32M4G7D	32M5W7D	32M5D7W
20+5	22M8G7D	22M9W7D	22M8D7W
20+10	27M7G7D	27M7W7D	27M7D7W
20+15	32M5G7D	32M6W7D	32M5D7W
20+20	37M3G7D	37M6W7D	37M3D7W



1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2 and Part 27 for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 27	Miscellaneous Wireless Communications Services



Test detailed items/section required by FCC rules and results are as below:

Section	Description	Test Date	Test Engineer	Result	Method Determination /Remark
2.1046, 27.50(h)(2),	Transmitter Conducted Output Power andERP/EIRP	Apr 06 to Apr07, 2022	Li Huaijie	PASS	No deviation
2.1049	Occupied Bandwidth	Apr 06 to Apr 09, 2022	Chen Haiju	PASS	No deviation
2.1051, 27.53(m)(4),	Conducted Spurious Emissions	Apr 11, 2022	Chen Haiju	PASS	No deviation
2.1051, 27.53(m)(4),	Band Edge	Apr 11 to Apr 15, 2022	Chen Haiju	PASS	No deviation
2.1051, 27.53(m)(4),	Radiated Spurious Emissions	Apr 19, 2022	Li Hanbin Lin Jiayong	PASS	No deviation
Note 1: The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016. Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipment. The ref offset 8dB contains two parts that cable loss 5dB and Attenuator3dB.					



1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 - 60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 2 and 27M Requirements

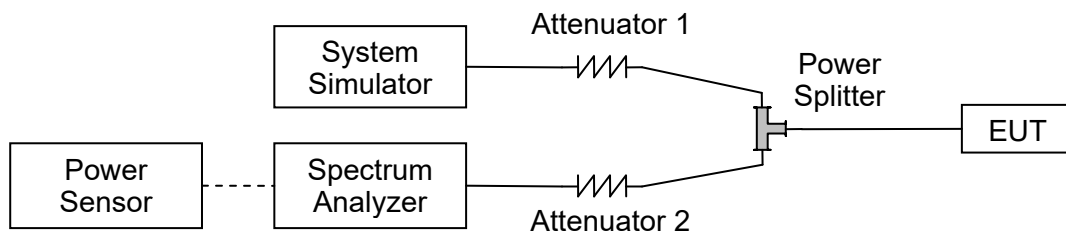
2.1. Transmitter Conducted Output Power And ERP/EIPR

2.1.1. Requirement

According to FCC section 2.1046(a) for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 27.50 (h)(2) for LTE Band 7/41, Mobile and other user stations. Mobile stations are limited to 2 watts E.I.R.P. All user stations are limited to 2 watts transmitter output power.

2.1.1. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.1.2. Test procedure

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

$EIPR \text{ (dBm)} = \text{Conducted Output Power (dBm)} + \text{Antenna Gain (dBi)}$

$ERP \text{ (dBm)} = EIPR \text{ (dBm)} - 2.15$



2.1.3. Result

Conducted Output Power

LTE CA_41C								
Combination:20MHz+20MHz(100RB+100RB)								
PCC Channel (3GPP)	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)
			RB Size	RB Offset	RB Size	RB Offset		
39750	39948	QPSK	1	0	100	0	1	21.03
40521	40719	QPSK	1	0	100	0	1	20.39
41292	41490	QPSK	1	0	100	0	1	21.00

Effective Radiated Power and Effective Isotropic Radiated Power

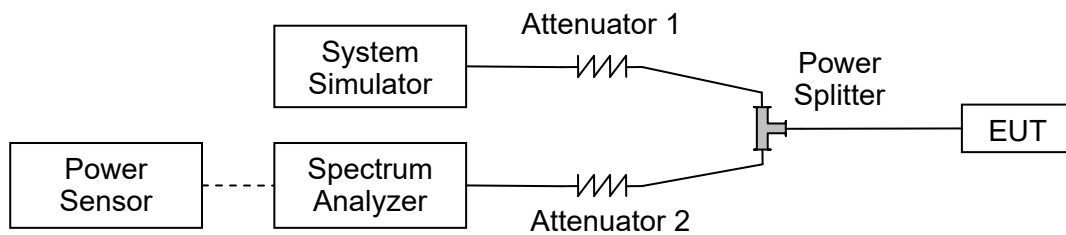
LTE CA_41C									
Combination:20MHz+20MHz(100RB+100RB)									
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Measured Power(dBm)	Measured EIRP(W)
			RB Size	RB Offset	RB Size	RB Offset			
39750	39948	QPSK	1	0	100	0	1	21.99	0.158
40521	40719	QPSK	1	0	100	0	1	21.35	0.136
41292	41490	QPSK	1	0	100	0	1	21.96	0.157

2.2. Occupied Bandwidth

2.2.1. Requirement

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Occupied bandwidth is also known as the 99% emission bandwidth.

2.2.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

2.2.3. Test procedure

KDB 971168 D01v03 Section 4.1 and ANSI/TIA-603-E-2016.

2.2.4. Test Result



LTE CA 41C				
BW(MHz)	ChannelLevel	Modulation	99% BW(MHz)	26dB BW(MHz)
5M+20MHz	Low	QPSK	22.81	23.79
	Low	16QAM	22.82	24.02
	Low	64QAM	22.81	23.89
	Mid	QPSK	22.70	23.67
	Mid	16QAM	22.72	23.68
	Mid	64QAM	22.71	23.70
	High	QPSK	22.72	23.68
	High	16QAM	22.79	23.83
	High	64QAM	22.71	23.70
10M+15MHz	Low	QPSK	23.56	48.53
	Low	16QAM	23.13	30.10
	Low	64QAM	23.17	28.07
	Mid	QPSK	23.08	28.60
	Mid	16QAM	23.28	37.68
	Mid	64QAM	23.27	35.48
	High	QPSK	23.13	27.03
	High	16QAM	23.07	24.40
	High	64QAM	23.05	24.55
10M+20MHz	Low	QPSK	27.63	28.83
	Low	16QAM	27.62	28.90
	Low	64QAM	27.63	28.90
	Mid	QPSK	27.56	28.85
	Mid	16QAM	27.59	28.73
	Mid	64QAM	27.58	29.22
	High	QPSK	27.59	28.80
	High	16QAM	27.63	28.75
	High	64QAM	27.64	28.84
15M+10MHz	Low	QPSK	24.87	49.12
	Low	16QAM	23.21	39.44
	Low	64QAM	23.23	41.67
	Mid	QPSK	23.15	36.21
	Mid	16QAM	23.27	46.08
	Mid	64QAM	23.27	45.47
	High	QPSK	23.20	37.30
	High	16QAM	23.12	24.38
	High	64QAM	23.11	31.36
15M+15MHz	Low	QPSK	28.20	29.66



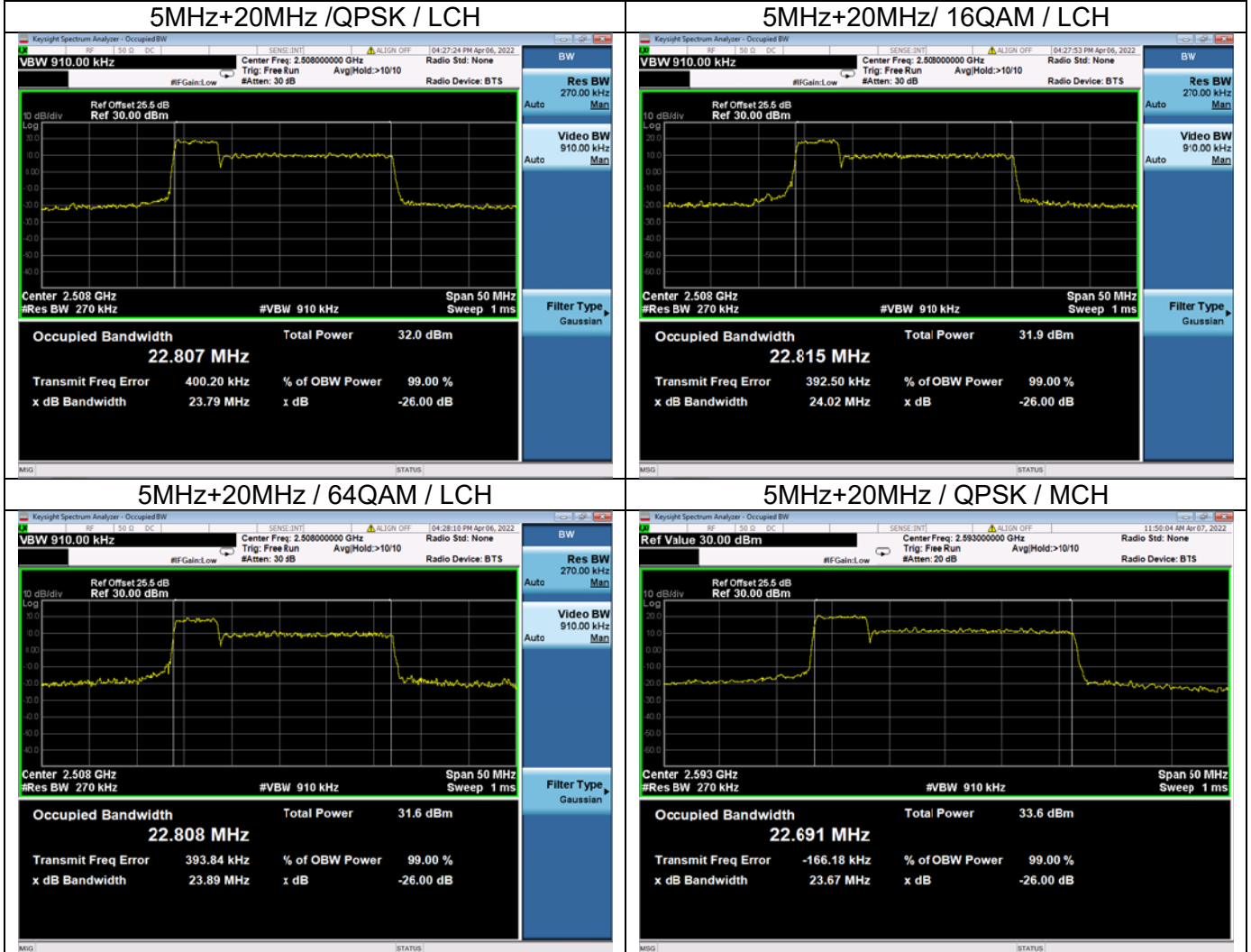
	Low	16QAM	28.30	32.63
	Low	64QAM	28.18	29.59
	Mid	QPSK	28.24	29.52
	Mid	16QAM	28.27	29.75
	Mid	64QAM	28.30	29.72
	High	QPSK	28.34	40.34
	High	16QAM	28.34	40.34
	High	64QAM	28.47	46.62
15M+20MHz	Low	QPSK	32.42	33.92
	Low	16QAM	32.49	33.94
	Low	64QAM	32.45	34.01
	Mid	QPSK	32.38	33.78
	Mid	16QAM	32.48	33.77
	Mid	64QAM	32.36	32.89
	High	QPSK	32.44	34.01
	High	16QAM	32.52	34.61
	High	64QAM	32.52	34.26
20M+5MHz	Low	QPSK	22.84	24.24
	Low	16QAM	22.88	24.41
	Low	64QAM	22.81	24.03
	Mid	QPSK	22.65	23.45
	Mid	16QAM	22.64	23.57
	Mid	64QAM	22.54	23.54
	High	QPSK	22.82	23.91
	High	16QAM	22.90	24.57
	High	64QAM	22.89	24.01
20M+10MHz	Low	QPSK	27.65	29.11
	Low	16QAM	27.72	29.22
	Low	64QAM	27.69	29.07
	Mid	QPSK	27.70	29.10
	Mid	16QAM	27.69	29.44
	Mid	64QAM	27.69	29.05
	High	QPSK	27.70	35.50
	High	16QAM	27.70	35.50
	High	64QAM	27.74	29.22
20M+15MHz	Low	QPSK	32.45	34.14
	Low	16QAM	32.50	34.87
	Low	64QAM	32.44	34.06
	Mid	QPSK	32.45	33.96

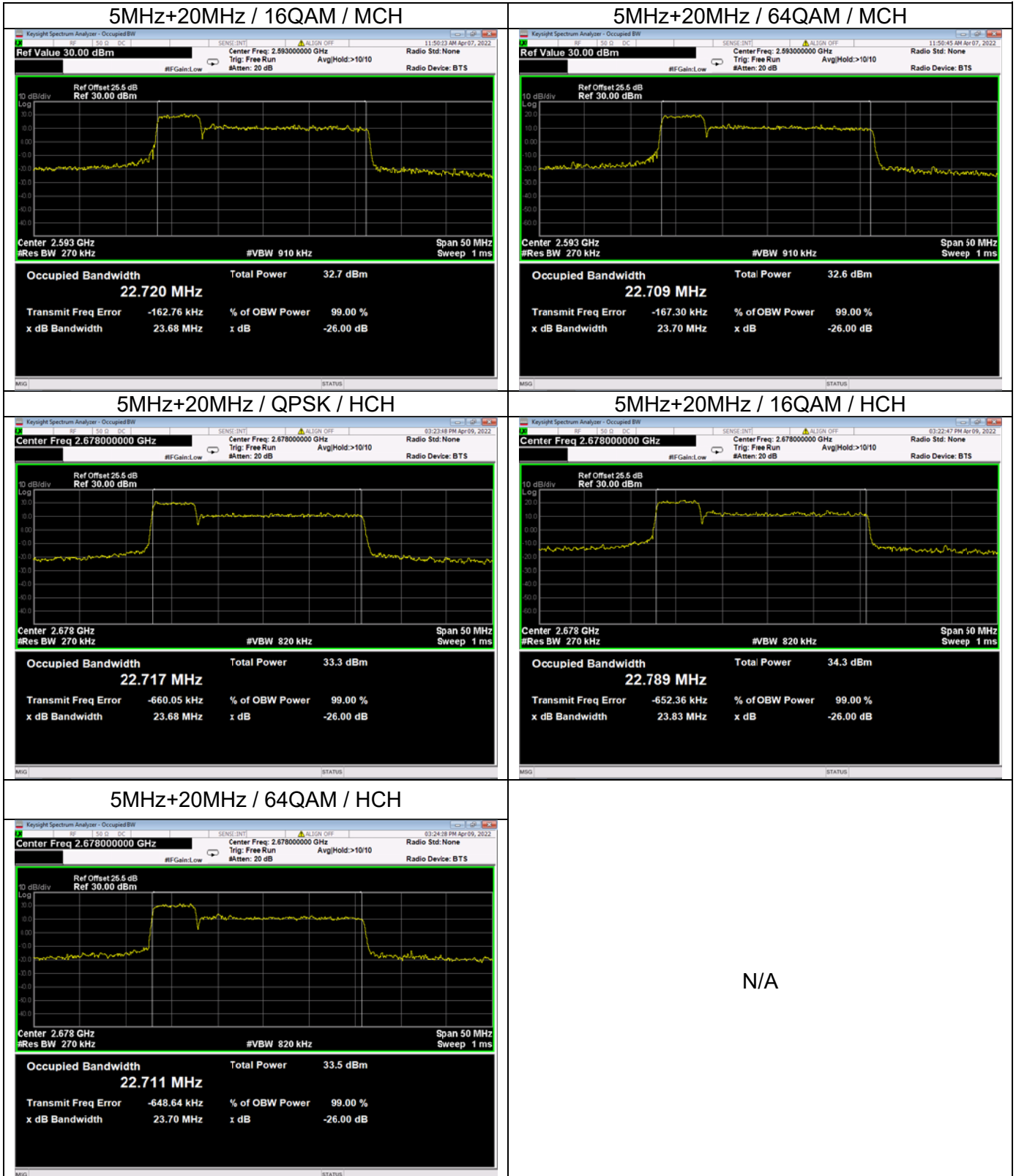


	Mid	16QAM	32.55	35.00
	Mid	64QAM	32.50	34.50
	High	QPSK	32.45	33.95
	High	16QAM	32.59	35.53
	High	64QAM	32.53	34.34
20M+20MHz	Low	QPSK	37.21	39.03
	Low	16QAM	37.33	39.15
	Low	64QAM	37.29	42.61
	Mid	QPSK	37.21	39.09
	Mid	16QAM	37.34	40.02
	Mid	64QAM	37.33	39.86
	High	QPSK	37.30	39.22
	High	16QAM	37.56	60.01
	High	64QAM	37.31	39.22



LTE Band 41C

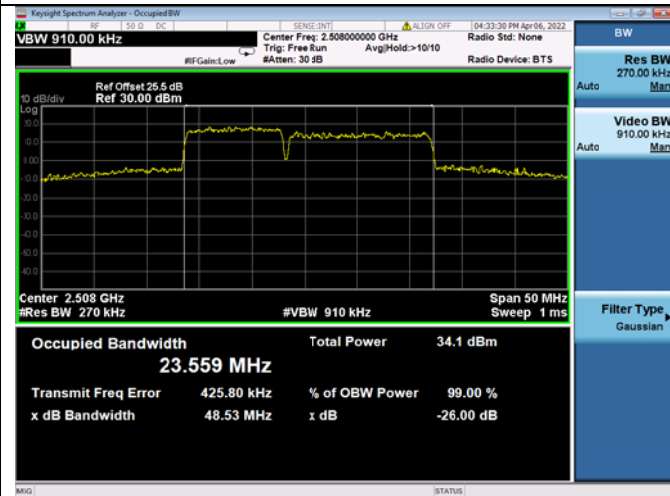




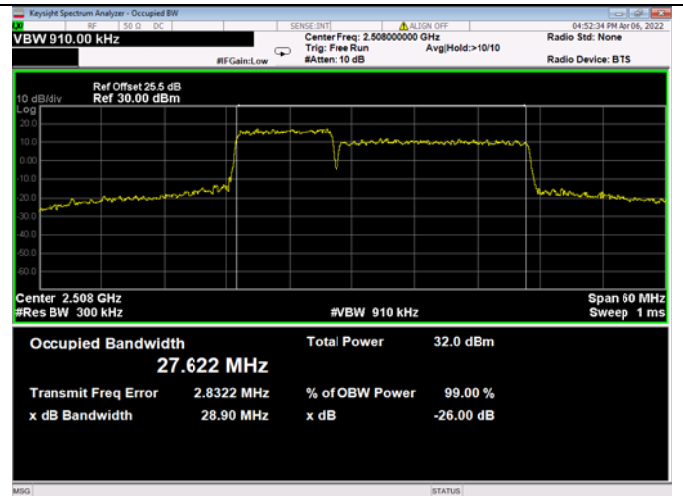


LTE CA 41C

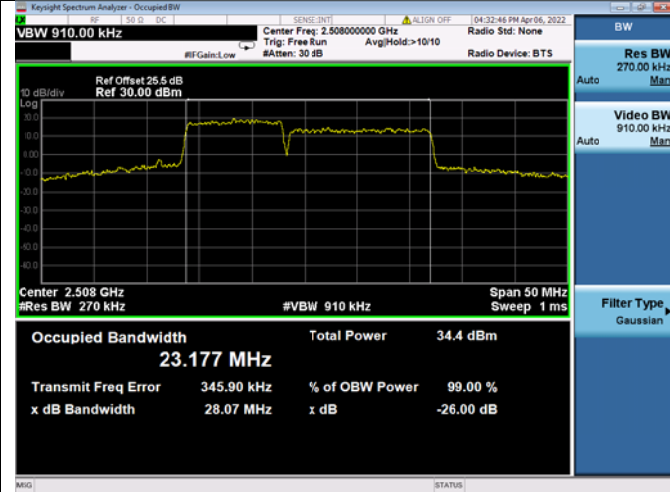
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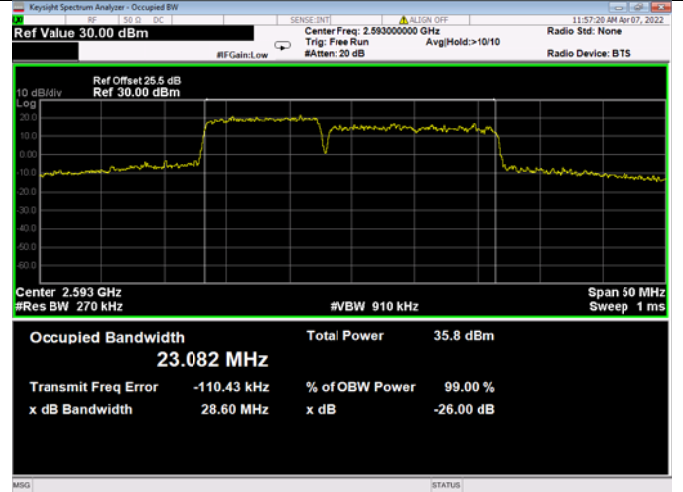
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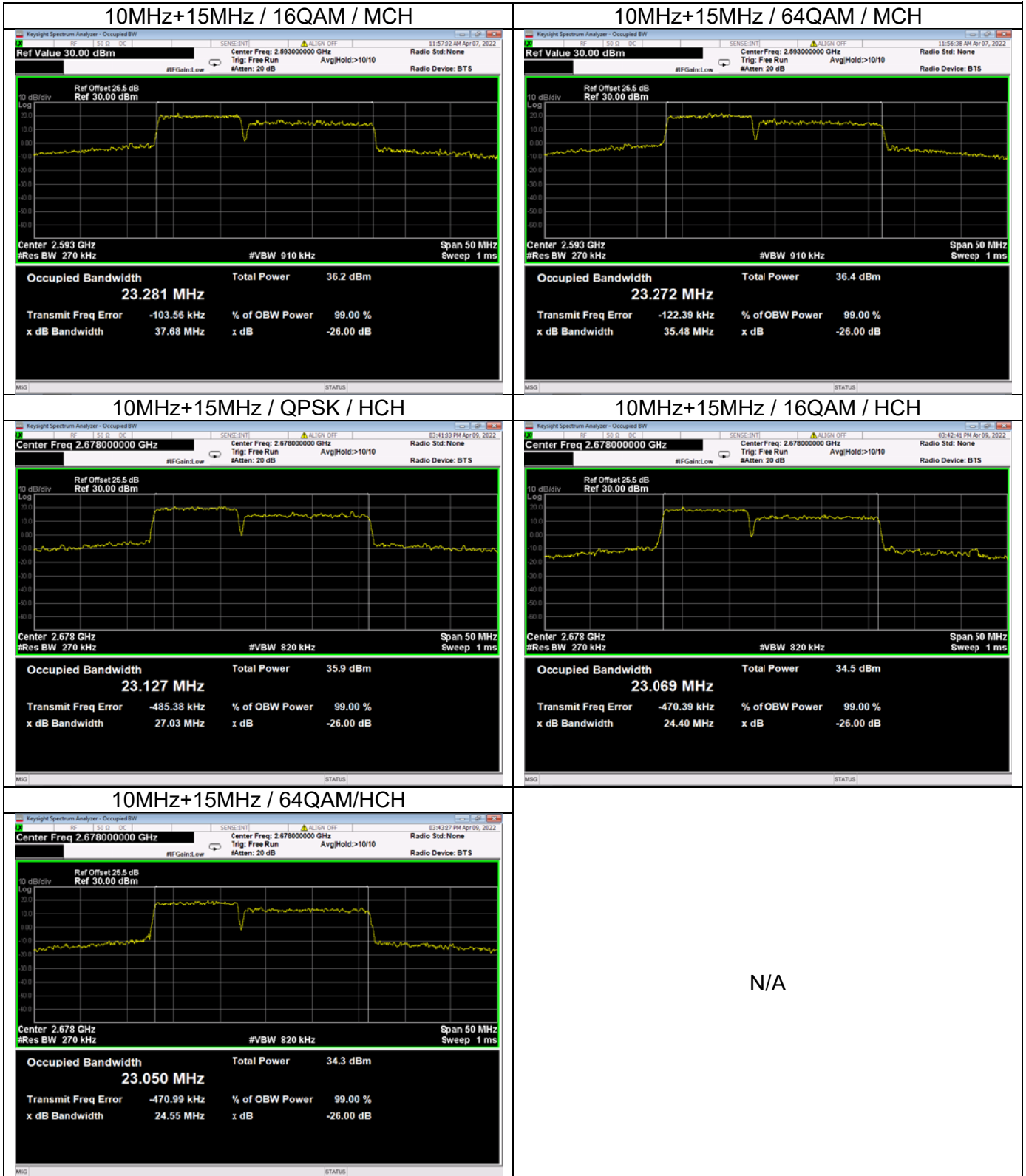


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10MHz+15MHz / QPSK / MCH

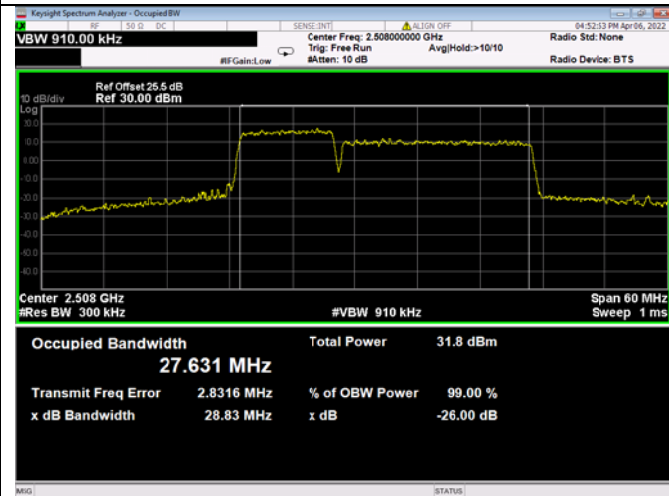




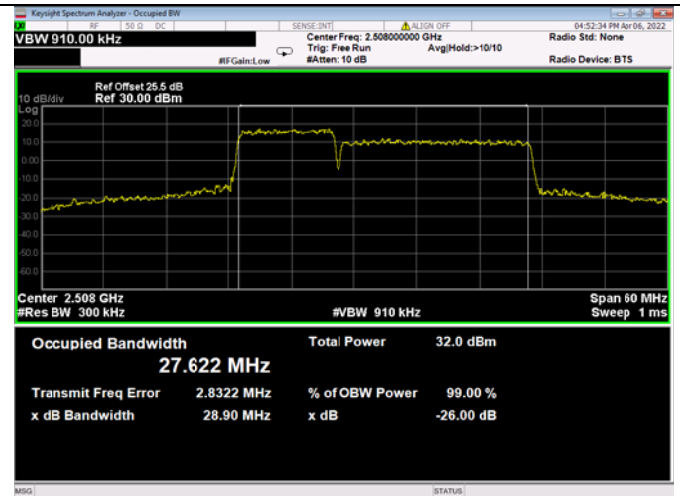


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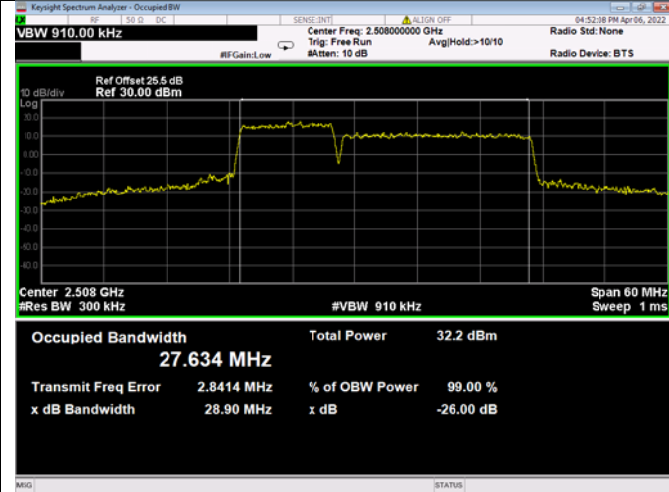
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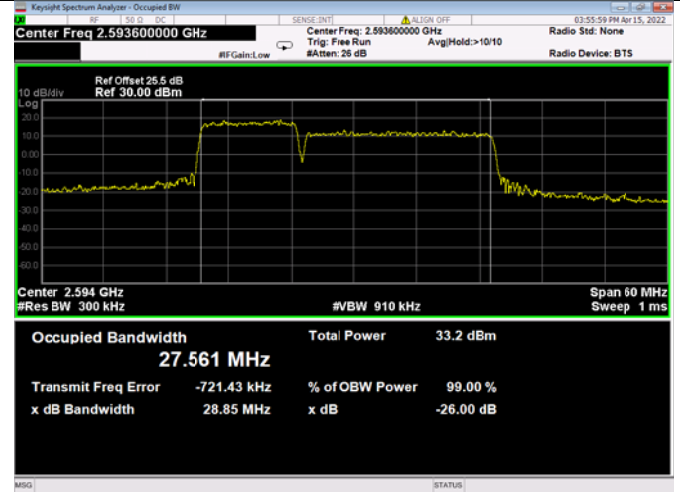
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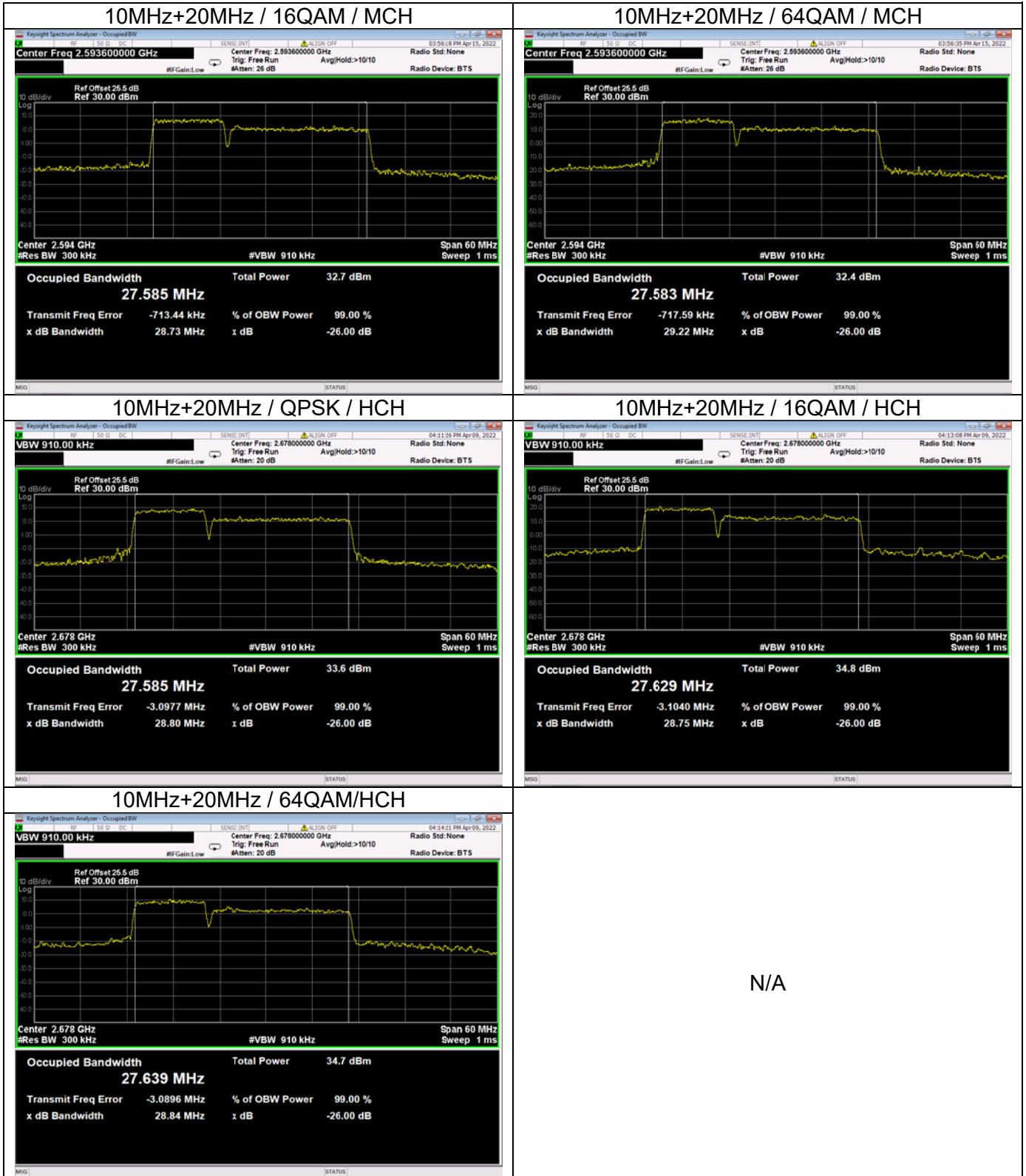


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10MHz+20MHz / QPSK / MCH





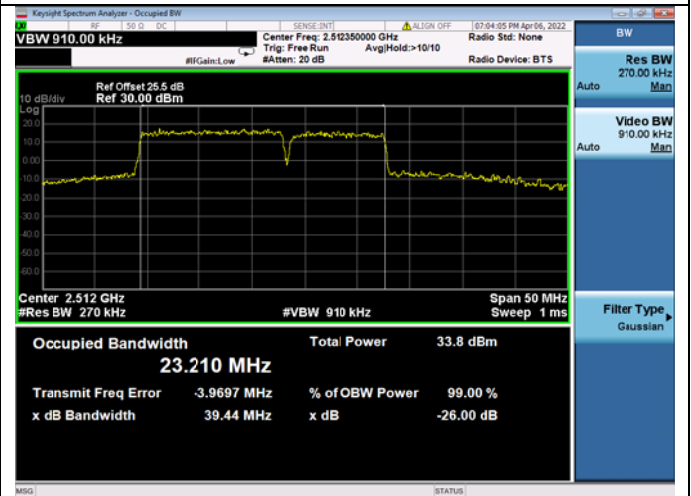


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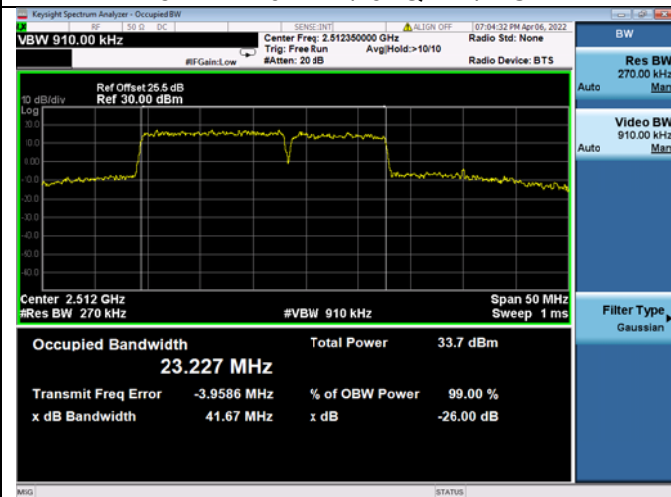
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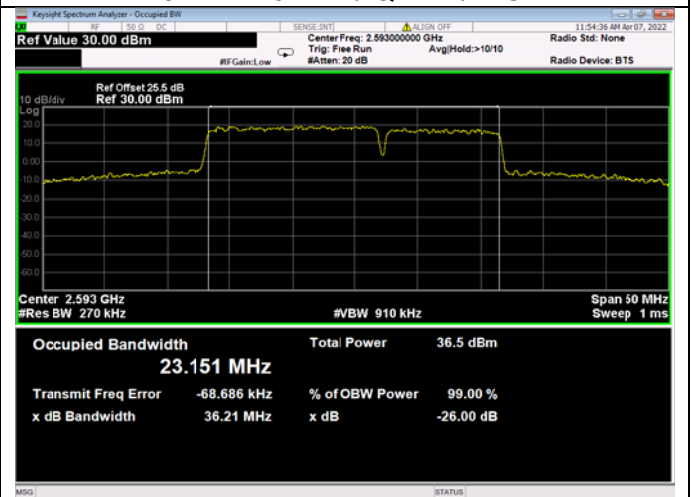
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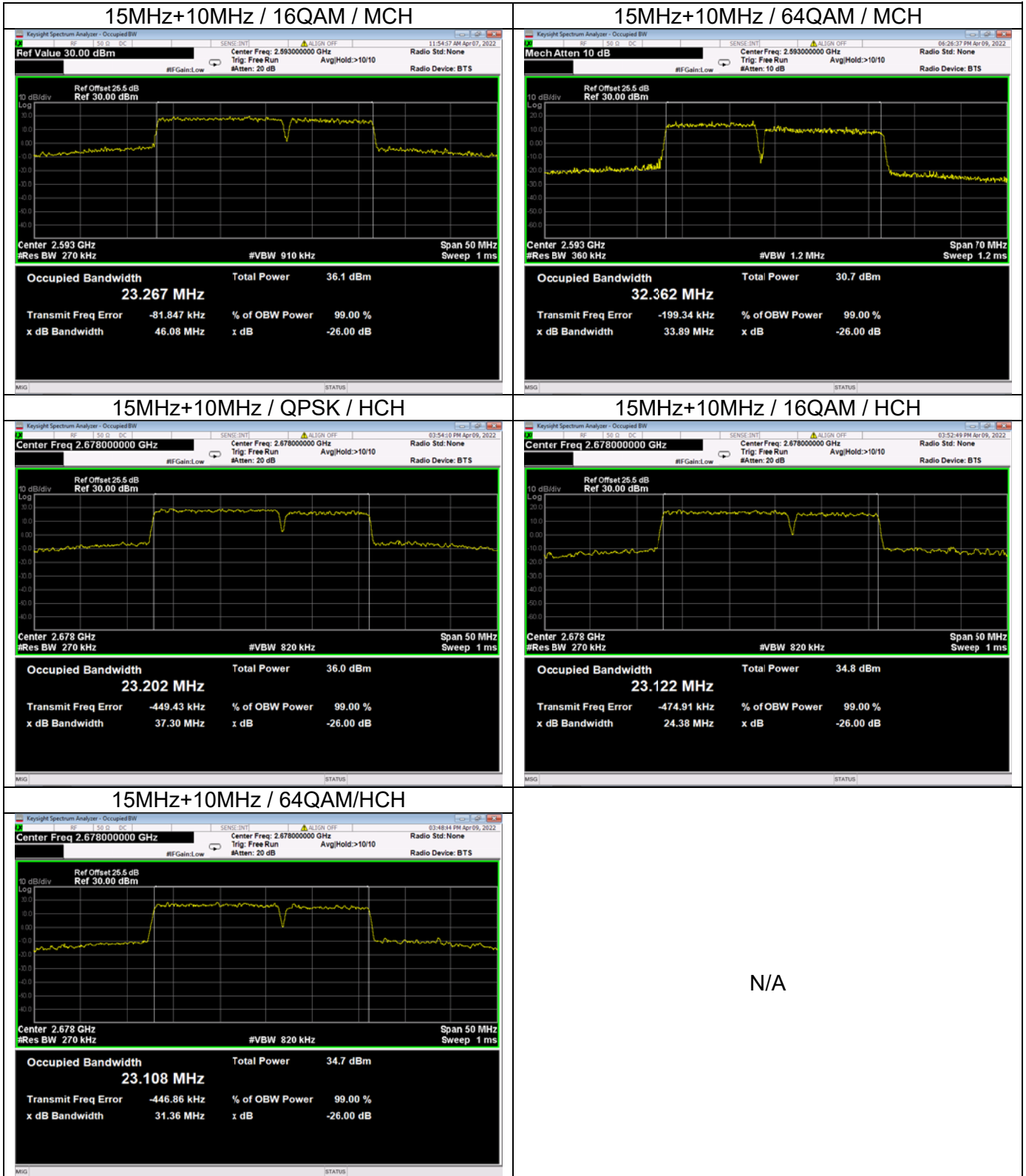


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15MHz+10MHz / QPSK / MCH

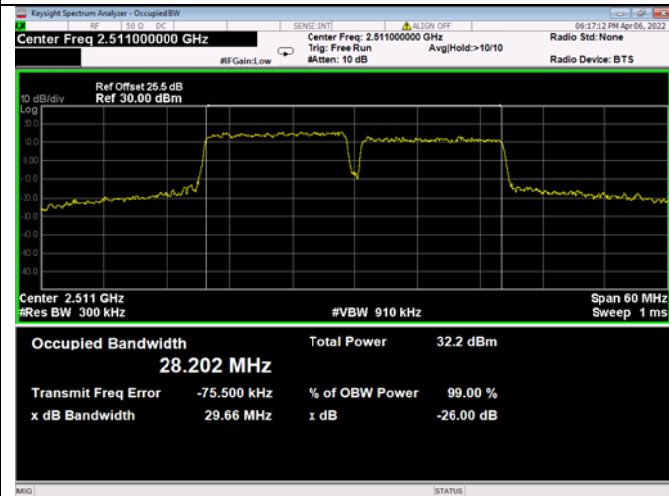




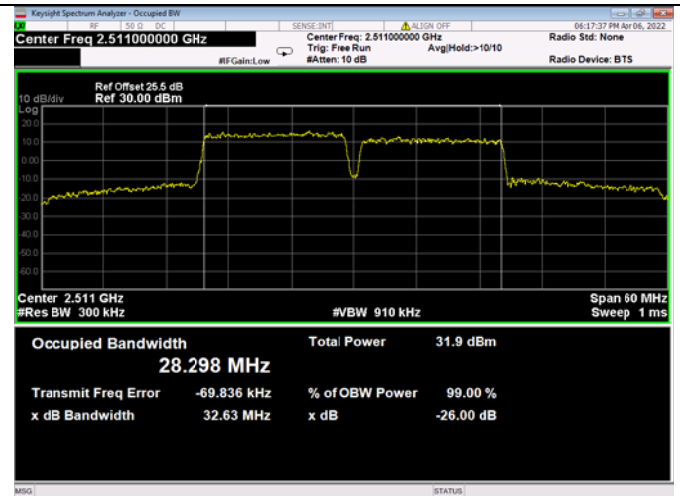


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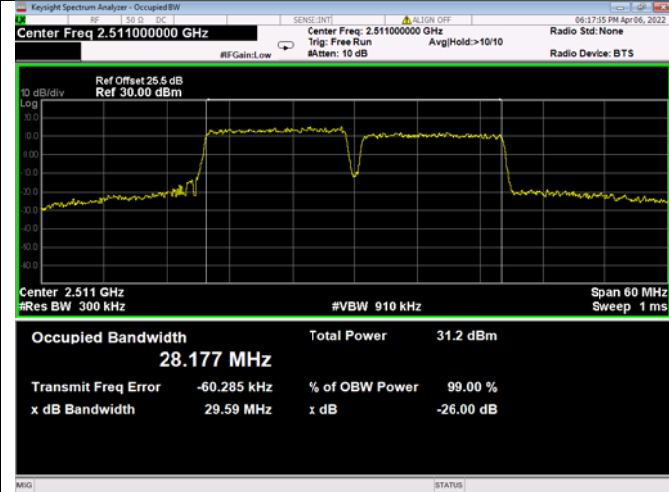
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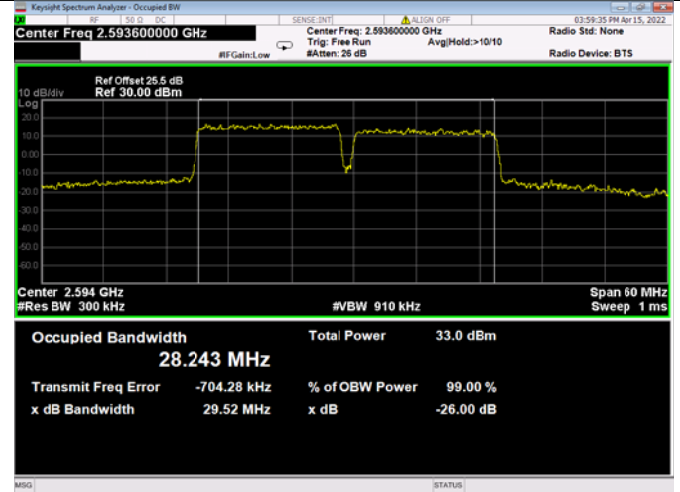
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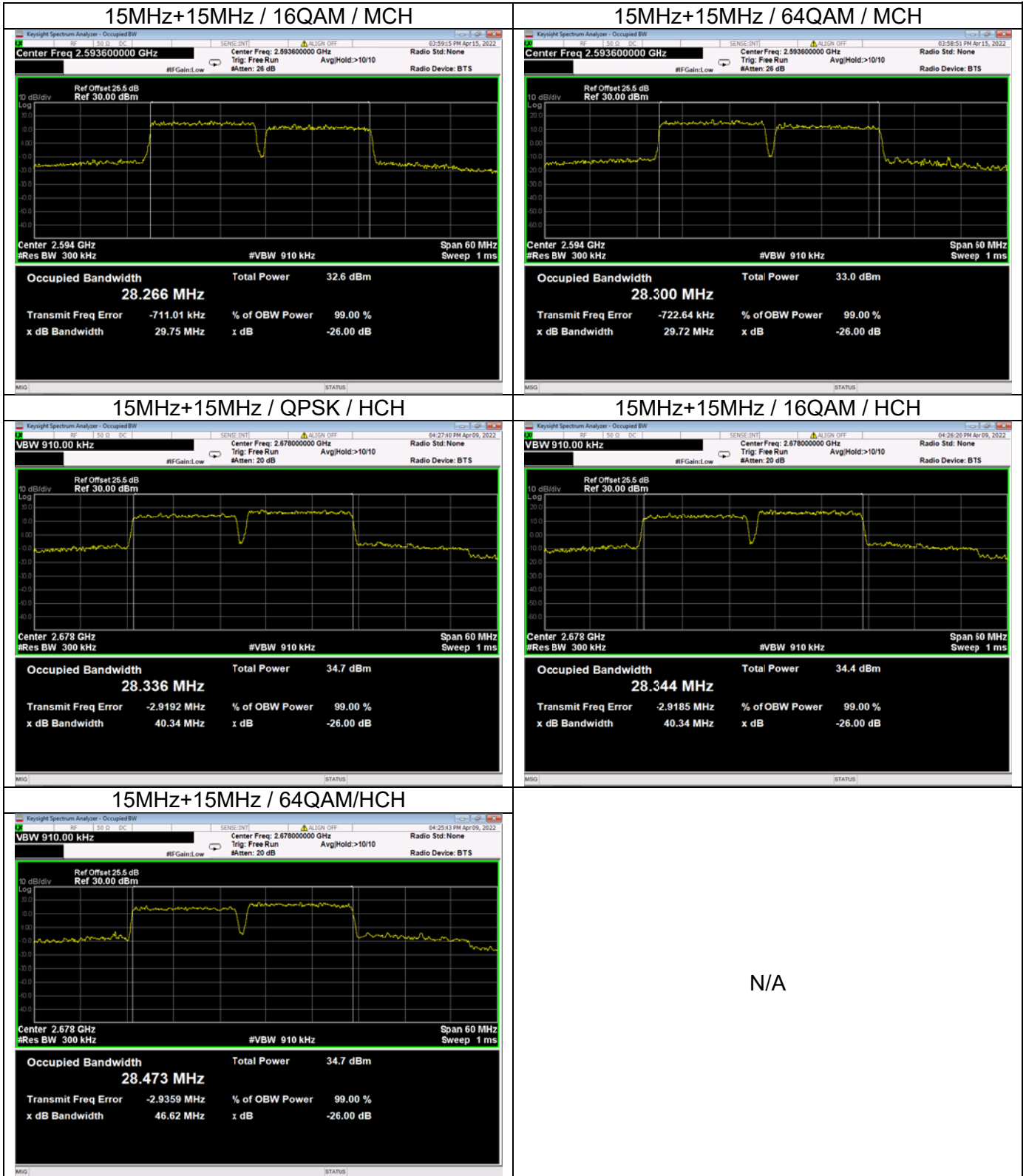


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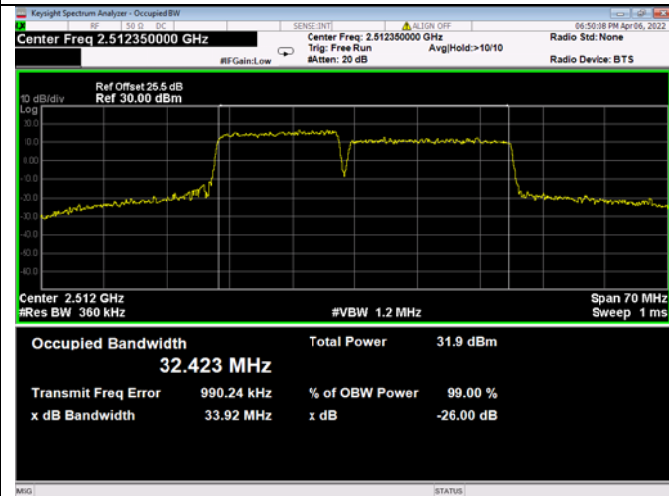




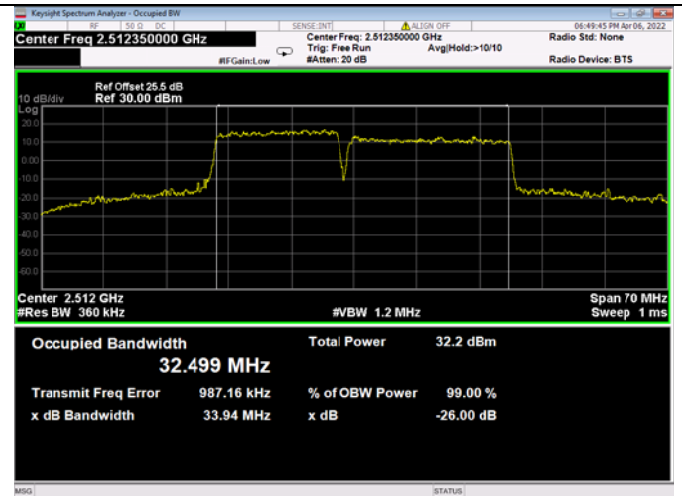


LTE CA 41C

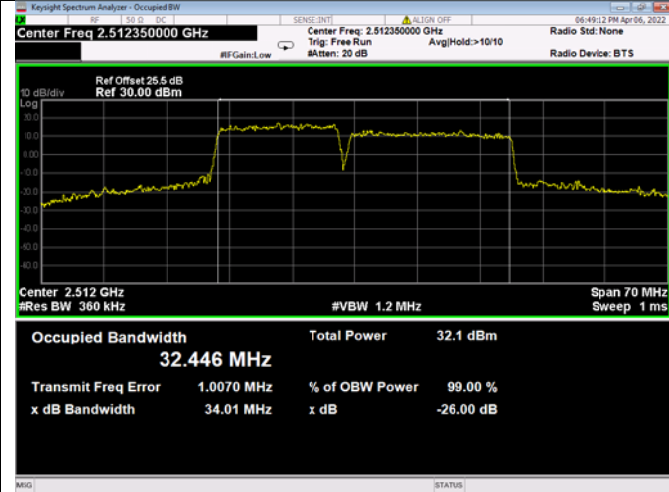
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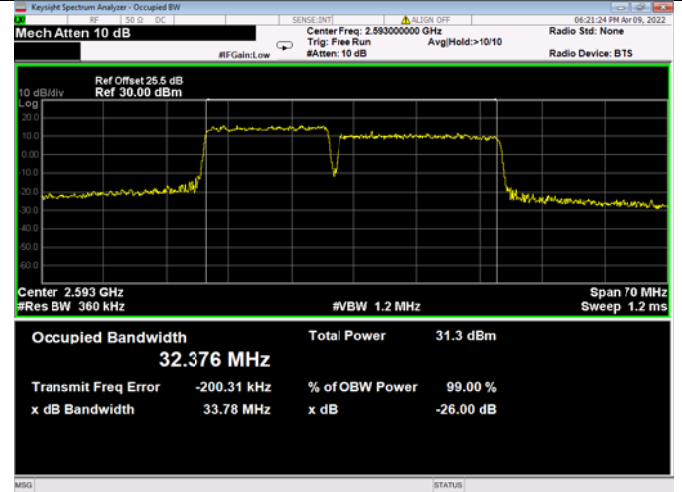
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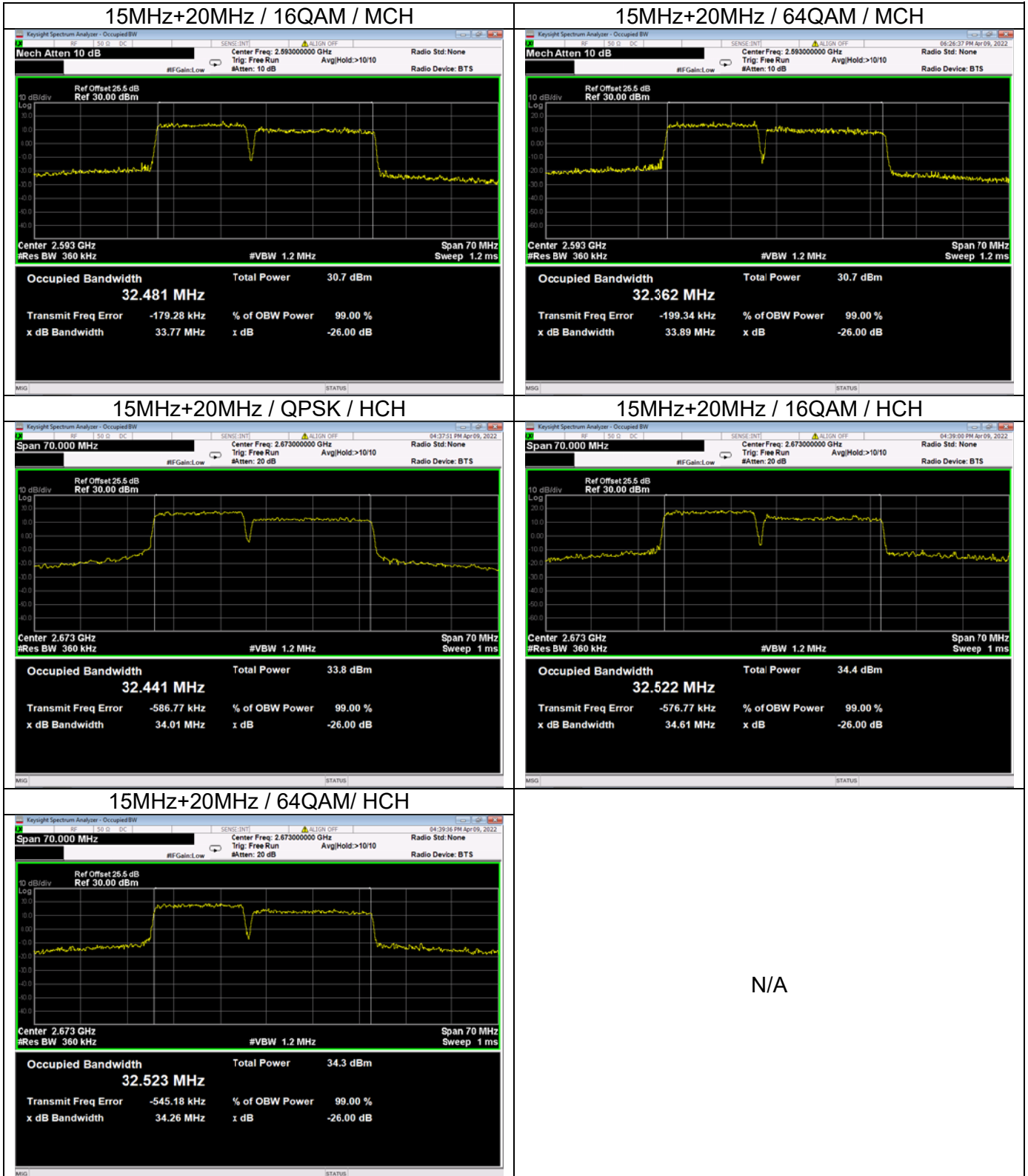


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15MHz+20MHz / QPSK / MCH

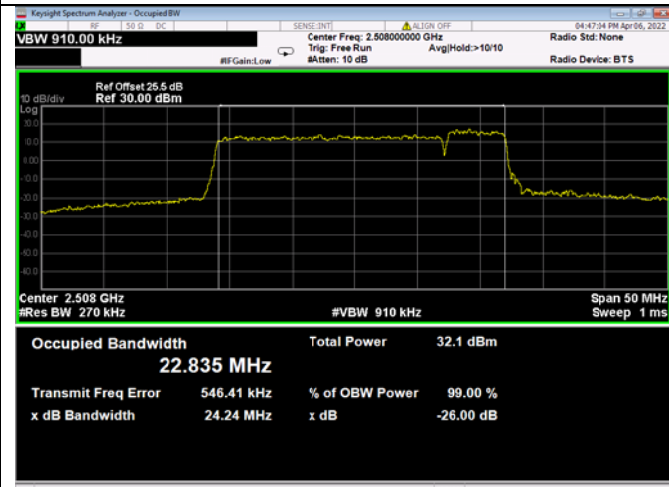




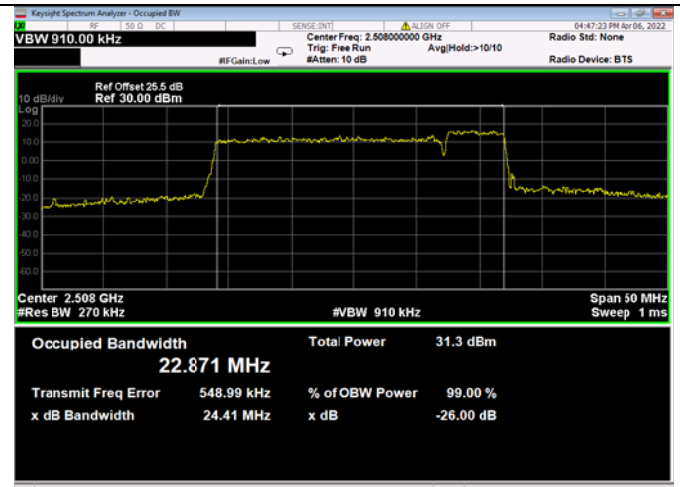


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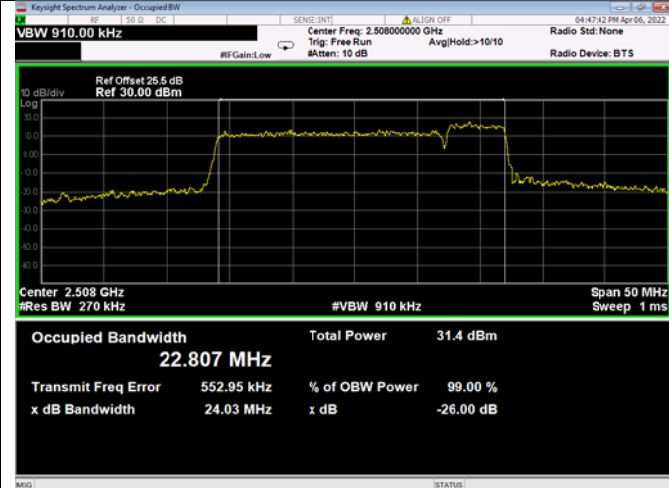
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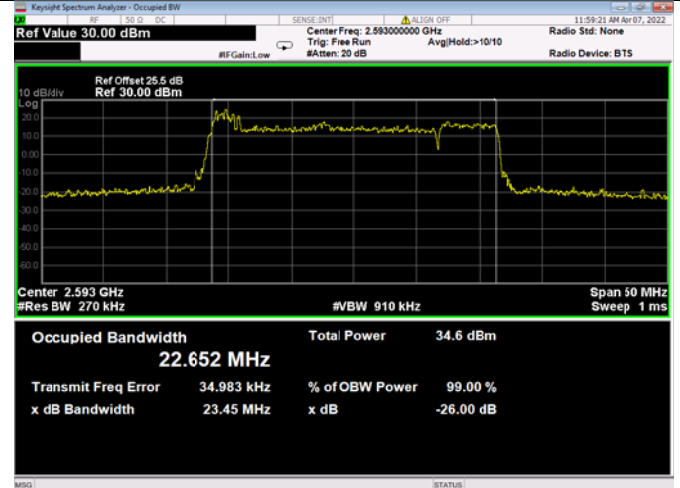
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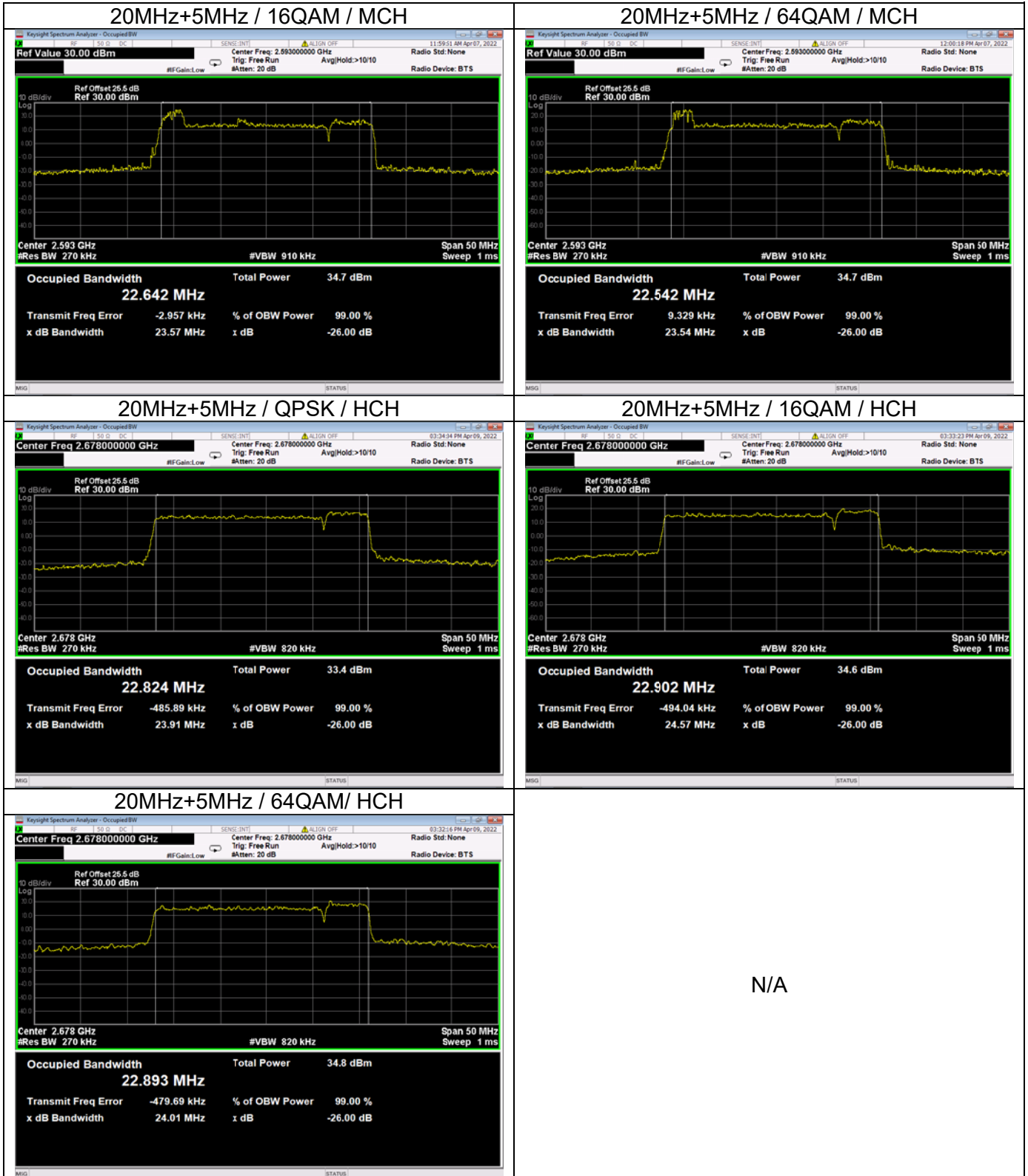


20MHz+5MHz / 64QAM / LCH



20MHz+5MHz / QPSK / MCH

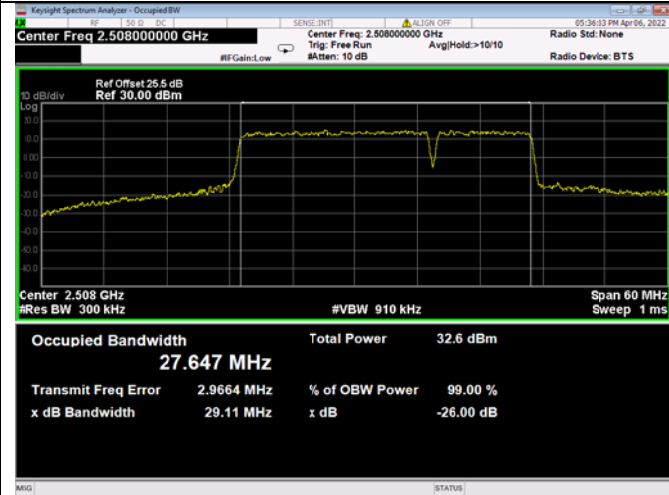




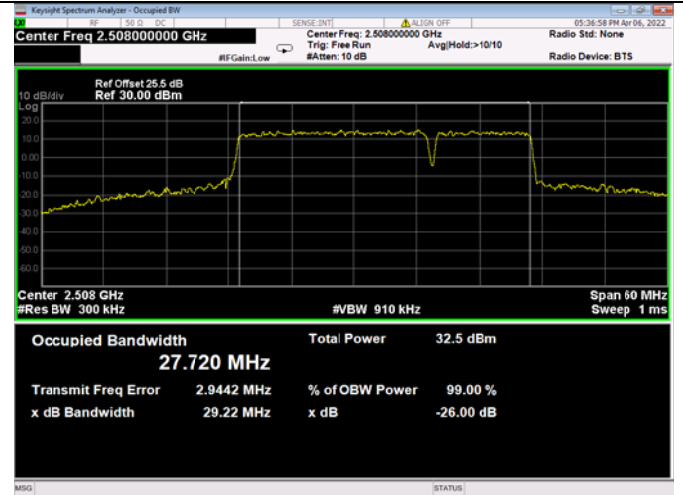


LTE CA 41C

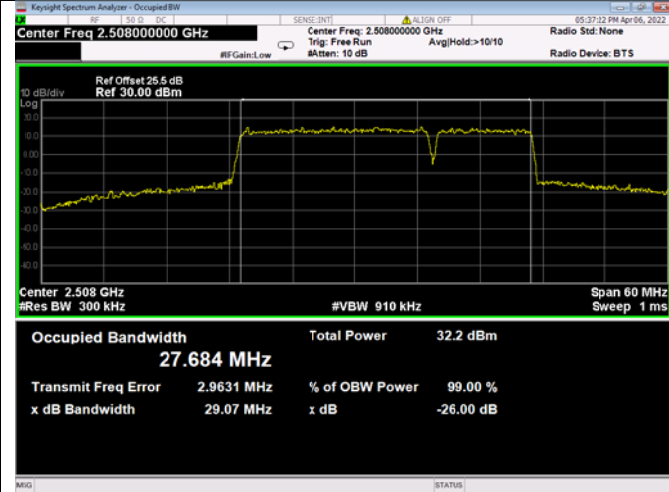
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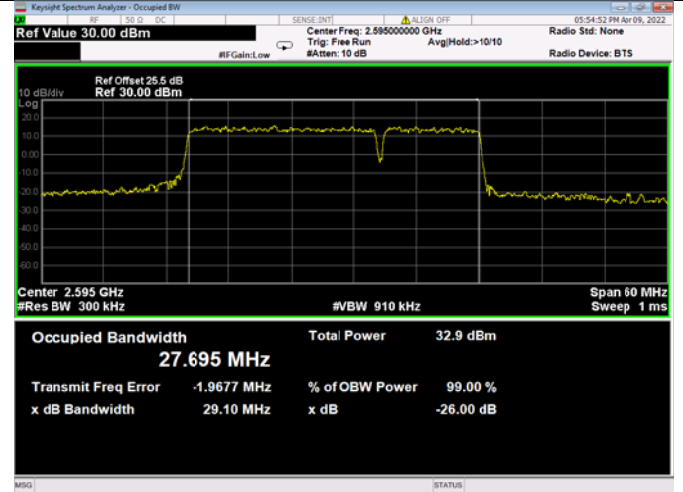
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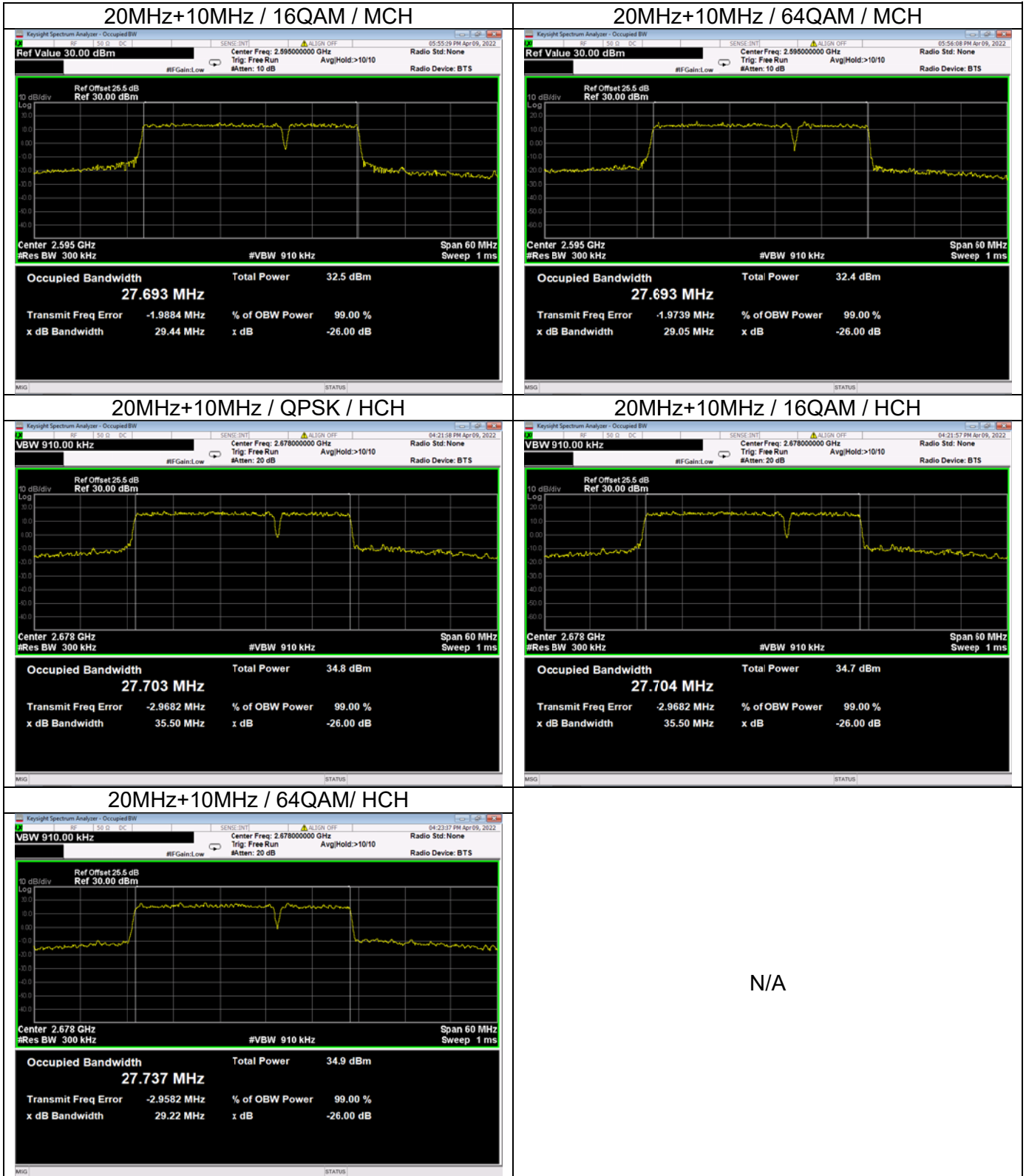


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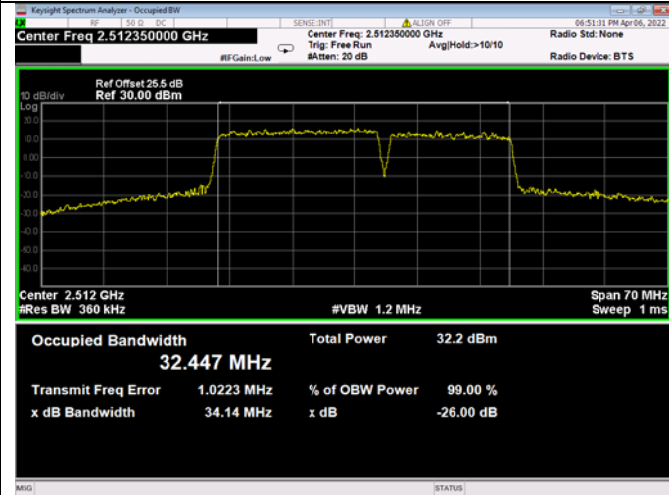




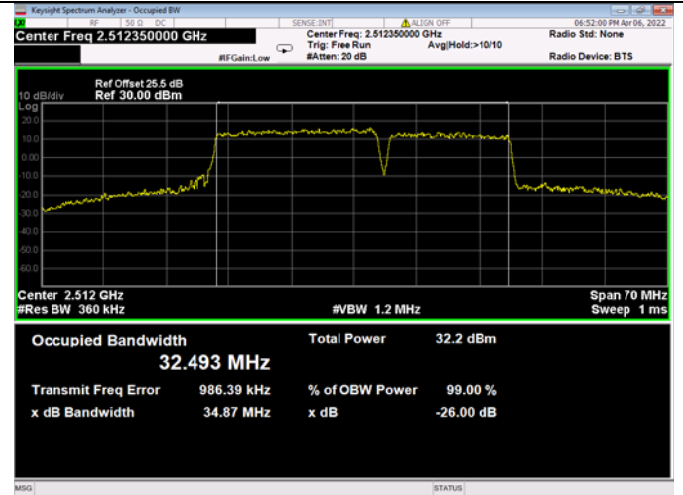


LTE CA 41C

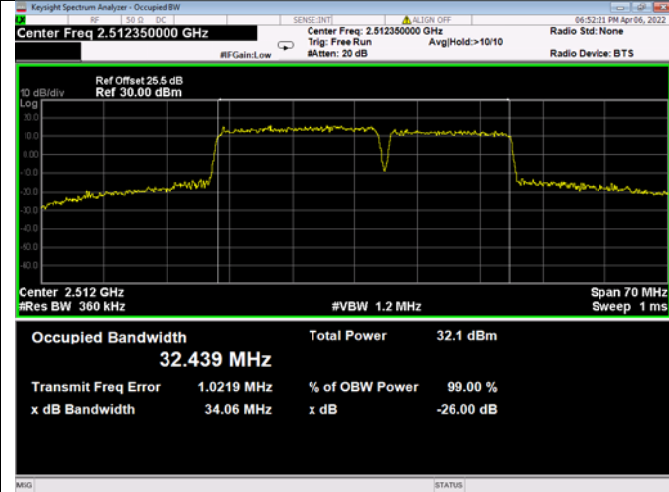
20MHz+15MHz /QPSK / LCH



20MHz+15MHz / 16QAM / LCH



20MHz+15MHz / 64QAM / LCH



20MHz+15MHz / QPSK / MCH

