

# TEST REPORT

Reference No..... : WTD21D05046043W001  
FCC ID ..... : 2AG32EG8013LM11  
Applicant..... : Baicells Technologies Co., Ltd.  
Address..... : 9-10F, 1st Bldg., No.81 Beiqing Road, Haidian District, Beijing, China  
Manufacturer ..... : Baicells Technologies Co., Ltd.  
Address..... : 9-10F, 1st Bldg., No.81 Beiqing Road, Haidian District, Beijing, China  
Product..... : LTE Outdoor CPE  
Model(s) ..... : EG8013L-M11  
Brand Name ..... : **Baicells**  
Standards..... : FCC CFR Title 47 Part 2  
FCC CFR Title 47 Part 96  
Date of Receipt sample .... : 2021-05-14  
Date of Test ..... : 2021-05-15 to 2021-07-08  
Date of Issue..... : 2021-07-12  
Test Result..... : **Pass**

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Testing Group Co., Ltd.**

Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China

Tel: +86-769-2267 6998

Fax: +86-769-2267 6828

Compiled by:

Approved by:

*Levi Xiao*

Levi Xiao / Project Engineer



*Daniel Liu*

Daniel Liu / Designated Reviewer

## 2 Contents

	<b>Page</b>
<b>1 COVER PAGE.....</b>	<b>1</b>
<b>2 CONTENTS .....</b>	<b>2</b>
<b>3 REVISION HISTORY .....</b>	<b>4</b>
<b>4 GENERAL INFORMATION.....</b>	<b>5</b>
4.1 GENERAL DESCRIPTION OF E.U.T. ....	5
4.2 DETAILS OF E.U.T. ....	5
4.3 CHANNEL LIST .....	5
4.4 TEST MODE .....	5
4.5 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	5
4.6 TEST FACILITY .....	6
<b>5 TEST SUMMARY .....</b>	<b>7</b>
<b>6 EQUIPMENT USED DURING TEST .....</b>	<b>8</b>
6.1 EQUIPMENTS LIST .....	8
6.2 MEASUREMENT UNCERTAINTY .....	9
6.3 TEST EQUIPMENT CALIBRATION .....	9
<b>7 MAX EIRP AND MAXIMUM SPECTRAL DENSITY.....</b>	<b>10</b>
7.1 EUT OPERATION.....	10
7.2 TEST PROCEDURE .....	10
7.3 TEST RESULT .....	11
<b>8 PEAK-TO-AVERAGE POWER RADIO .....</b>	<b>30</b>
8.1 EUT OPERATION.....	30
8.2 TEST PROCEDURE .....	30
8.3 TEST RESULT .....	30
<b>9 OCCUPY BANDWIDTH.....</b>	<b>38</b>
9.1 EUT OPERATION.....	38
9.2 TEST PROCEDURE .....	38
9.3 TEST RESULT .....	39
<b>10 EMISSION OUTSIDE THE FUNDAMENTAL .....</b>	<b>47</b>
10.1 EUT OPERATION.....	47
10.2 TEST PROCEDURE.....	47
10.3 TEST RESULT .....	48
<b>11 OUT OF BAND EMISSION AT ANTENNA TERMINALS.....</b>	<b>51</b>
11.1 EUT OPERATION.....	51
11.2 TEST PROCEDURE.....	51
11.3 TEST RESULT .....	51
<b>12 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT .....</b>	<b>57</b>
12.1 EUT OPERATION.....	57
12.2 TEST SETUP .....	57
12.3 SPECTRUM ANALYZER SETUP .....	58
12.4 TEST PROCEDURE.....	59
12.5 TEST RESULT .....	60
<b>13 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT.....</b>	<b>61</b>
13.1 EUT OPERATION.....	61
13.2 TEST PROCEDURE.....	61
13.3 TEST RESULT .....	63

<b>14</b>	<b>FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT.....</b>	<b>66</b>
14.1	EUT OPERATION.....	66
14.2	TEST PROCEDURE.....	66
14.3	TEST RESULT .....	68
<b>15</b>	<b>PHOTOGRAPHS OF TEST SETUP AND EUT.....</b>	<b>70</b>

### 3 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD21D05046 043W001	2021-05-14	2021-05-15 to 2021-07-08	2021-07-12	original	-	Valid

## 4 General Information

### 4.1 General Description of E.U.T.

Product:	LTE Outdoor CPE
Model(s):	EG8013L-M11
Model Description:	N/A
Storage Location:	Internal Storage
Category of CBSD:	Category B

### 4.2 Details of E.U.T.

Operation Frequency:	LTE Band 48:3550MHz-3700MHz
Type of Modulation:	LTE: Uplink: QPSK, 16QAM, 64QAM;Downlink: QPSK, 16QAM, 64QAM
Antenna installation:	LTE: Internal antenna
Antenna Gain:	14dBi
Ratings:	DC 24V 0.5A

### 4.3 Channel List

Normal

10MHz		15MHz	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
Low	3555	Low	3557.5
Middle	3625	Middle	3625
High	3695	High	3692.5
20MHz			
Channel	Frequency (MHz)		
Low	3560		
Middle	3625		
High	3690		

### 4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Test Mode	Description
Data Mode (QPSK)	Keep the EUT in data communicating mode (QPSK). (10MHz, 15MHz, 20MHz)
Data Mode (64QAM)	Keep the EUT in data communicating mode (64QAM). (10MHz, 15MHz, 20MHz)

### 4.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR FCC Part 96  
 KDB 971168 D01 Power Meas License Digital Systems v03r01  
 KDB 662911 D01 Multiple Transmitter Output v02r01  
 KDB 940660 D01 Part 96 CBRS Eqpt v03  
 ANSI/TIA/EIA-603-E 2016  
 ANSI C63.26-2015

#### 4.6 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

## 5 Test Summary

Test Items	Available Channel (MHz)	Tested Channel (MHz)	Channel Bandwidth	Modulation
EIRP	3555 to 3695	3555 to 3695	10MHz	QPSK, 64QAM
	3557.5 to 3692.5	3557.5 to 3692.5	15MHz	QPSK, 64QAM
	3560 to 3690	3560 to 3690	20MHz	QPSK, 64QAM
PSD	3555 to 3695	3555 to 3695	10MHz	QPSK, 64QAM
	3557.5 to 3692.5	3557.5 to 3692.5	15MHz	QPSK, 64QAM
	3560 to 3690	3560 to 3690	20MHz	QPSK, 64QAM
Frequency stability	3555 to 3695	3625	10MHz	QPSK
	3557.5 to 3692.5	3625	15MHz	QPSK
	3560 to 3690	3625	20MHz	QPSK
Occupied Bandwidth	3555 to 3695	3555, 3625, 3695	10MHz	QPSK, 64QAM
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK, 64QAM
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK, 64QAM
Peak to Average Ratio	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Emission outside the fundamental	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Out of band emission at antenna terminals	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK
Field Strength of Spurious Radiation	3555 to 3695	3555, 3625, 3695	10MHz	QPSK
	3557.5 to 3692.5	3557.5, 3625, 3692.5	15MHz	QPSK
	3560 to 3690	3560, 3625, 3690	20MHz	QPSK

NOTE 1: All supported modulation types were evaluated. The Worst case of QPSK was selected. Therefore, the Frequency Stability, Peak to Average Ratio, Emission outside the fundamental, Out of band emission at antenna terminals and Field Strength of Spurious Radiation were presented under QPSK mode only.

NOTE 2: The duty cycle correction= $10 \log(1/\text{duty cycle})=10 \log(1/(1.98/4.98))=4.02(\text{dB})$

Offset factory=ATT loss+Cable loss+Duty cycle correction= $3.0+0.98+4.02=8(\text{dB})$

## 6 Equipment Used during Test

### 6.1 Equipments List

3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1	Spectrum Analyzer	R&S	FSP30	100091	2021-04-20	2022-04-19
2	Amplifier	Agilent	8447D	2944A10178	2021-04-20	2022-04-19
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2020-08-22	2021-08-21
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2021-04-20	2022-04-19
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2021-04-25	2022-04-24
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2021-04-20	2022-04-19
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2021-04-20	2022-04-19
8	Coaxial Cable (above 1GHz)	ZT26-NJ-NJ-8M/FA	1GHz-18GHz	NA	2021-04-20	2022-04-19
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	Equipment	Manufacturer	Model No.	Serial No	Last Calibration Date	Calibration Due Date
1	Test Receiver	R&S	ESCI	101296	2021-04-20	2022-04-19
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2021-04-25	2022-04-24
3	Active Loop Antenna	Com-Power Corp.	AL-130R	10160007	2021-05-06	2022-05-05
4	Amplifier	ANRITSU	MH648A	M43381	2021-04-20	2022-04-19
5	Cable	HUBER+SUHNER	CBL2	525178	2021-04-20	2022-04-19
RF Conducted Testing						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Calibration Date	Calibration Due Date
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2021-04-20	2022-04-19
2.	Spectrum Analyzer	R&S	FSP30	100091	2021-04-20	2022-04-19
3.	EXA Signal Analyzer	Malaysia Keysight	N9010A	MY50520207	2021-04-20	2022-04-19



## 6.2 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	$\pm 3.64$ dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	$\pm 5.08$ dB (Bilog antenna 30M~1000MHz)
	$\pm 5.47$ dB (Horn antenna 1000M~25000MHz)
Radio Frequency	$\pm 1 \times 10^{-7}$ Hz
RF Power	$\pm 0.42$ dB
RF Power Density	$\pm 0.7$ dB
Conducted Spurious Emissions	$\pm 2.76$ dB (9kHz~26500MHz)
Confidence interval: 95%. Confidence factor:k=2	

## 6.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

## 7 Max EIRP and maximum spectral density

Test Requirement: FCC part96.41(b)  
 Test Method: ANSI/TIA-603-E:2016, ANSI C63.26:2015  
 Test Mode: Data communicating mode

Limit:

Device	Maximum EIRP(dBm/10MHz)	Maximum PSD(dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD	47	37

### 7.1 EUT Operation

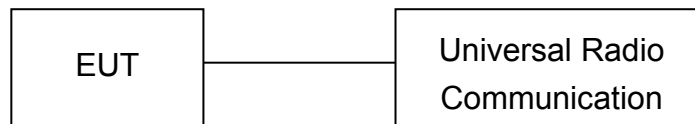
Operating Environment :

Temperature: 22.4 °C  
 Humidity: 52.2 % RH  
 Atmospheric Pressure: 101.3kPa

### 7.2 Test Procedure

Conducted method for 15M&20M bandwidth:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



For Maximum EIRP

1. Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
2. Set span to 2 × to 3 × the OBW.
3. Set RBW = 1% to 5% of the OBW.
4. Set VBW ≥ 3 × RBW.
5. Set number of measurement points in sweep ≥ 2 × span / RBW.
6. Sweep time:
  - 1) Set = auto-couple, or
  - 2) Set ≥ [10 × (number of points in sweep) × (transmission symbol period)] for single sweep (automation-compatible) measurement.
7. Detector = power averaging (rms).
8. Set sweep trigger to “free run.”
9. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.
10. Compute power by integrating the spectrum across the OBW(10MHz) of the signal using the instrument's band or channel power measurement function with band/channel limits set equal to the OBW(10MHz) band edges.
11. Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission.
12. EIRP = P<sub>Meas</sub> + GT.

P<sub>Meas</sub> measured transmitter output power or PSD.

GT gain of the transmitting antenna.

For Maximum PSD

The PSD is measured following the same procedures described for measuring the maximum EIRP but with the RBW set to the reference bandwidth specified(eg.1MHz) by the applicable regulatory requirement, and by using the marker function to identify the maximum PSD instead of summing the power across the OBW.

### 7.3 Test Result

Transmit Output Power								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 Output Power (dBm/10MHz)	Chain 1 Output Power (dBm/10MHz)	Total Power (dBm/10MHz)	Antenna Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)
10	QPSK	Low	22.4	22.19	25.31	14	<b>39.31</b>	47
		Middle	20.05	20.1	23.09	14	37.09	
		High	19.37	19.99	22.70	14	36.70	
	64QAM	Low	22.24	21.48	24.89	14	<b>38.89</b>	
		Middle	18.33	18.62	21.49	14	35.49	
		High	17.85	18.55	21.22	14	35.22	

PSD								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 PSD (dBm/MHz)	Chain 1 PSD (dBm/MHz)	Total PSD (dBm/MHz)	Antenna Gain (dBi)	EIRP density (dBm/MHz)	EIRP density Limit (dBm/MHz)
10	QPSK	Low	13.548	13.891	16.73	14	30.73	37
		Middle	11.514	11.193	14.37	14	28.37	
		High	11.694	11.676	14.70	14	28.70	
	64QAM	Low	12.418	12.117	15.28	14	29.28	
		Middle	9.685	10.25	12.99	14	26.99	
		High	10.217	10.264	13.25	14	27.25	

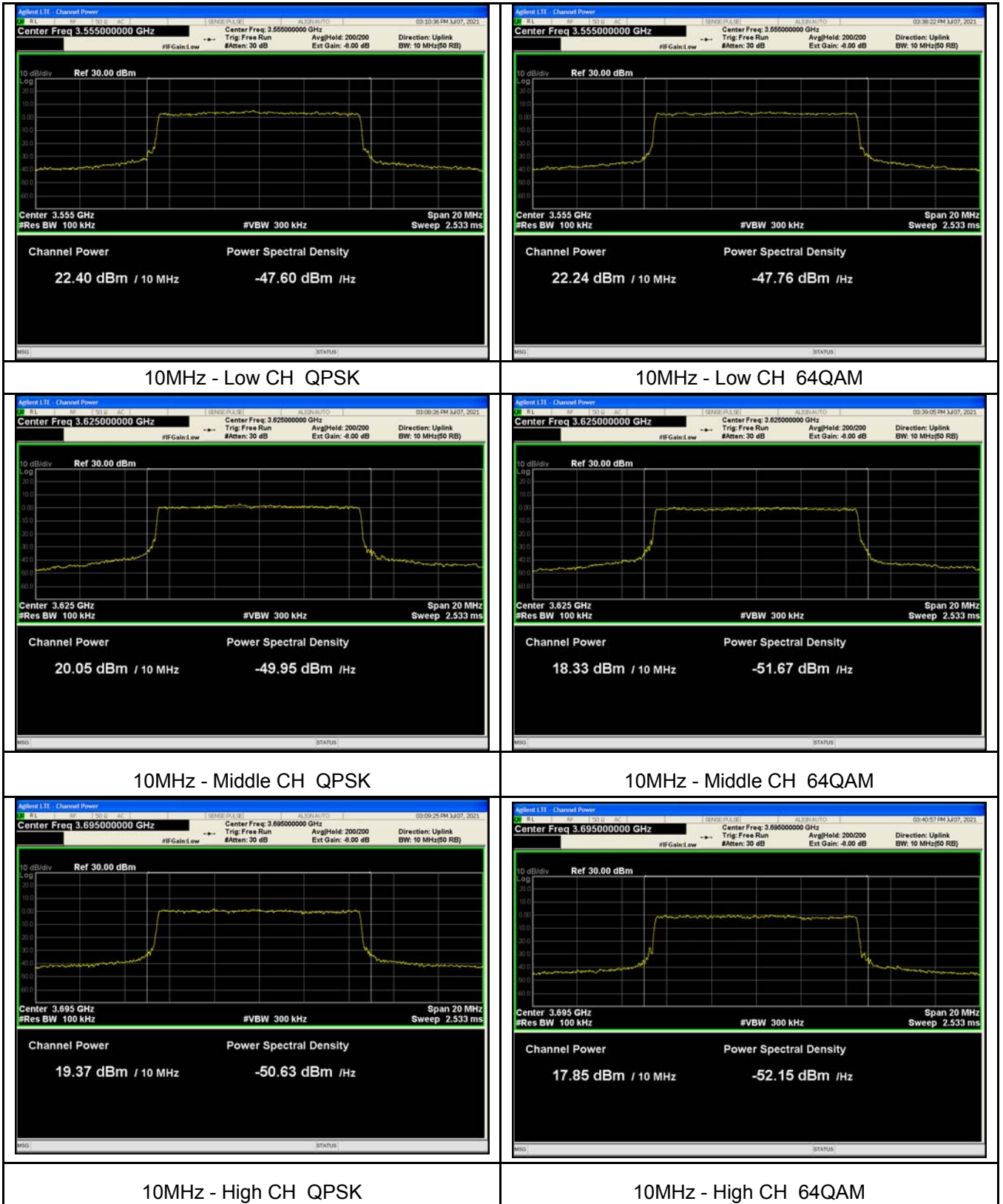
Transmit Output Power								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 Output Power (dBm/10MHz)	Chain 1 Output Power (dBm/10MHz)	Total Power (dBm/10MHz)	Antenna Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)
15	QPSK	Low	20.86	21.06	23.97	14	37.97	47
		Middle	19.27	19.31	22.30	14	36.30	
		High	18.19	19.39	21.84	14	35.84	
	64QAM	Low	19.23	19.36	22.31	14	36.31	
		Middle	17.6	17.72	20.67	14	34.67	
		High	17.38	17.37	20.39	14	34.39	
Full Transmit Output Power								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 Output Power (dBm/15MHz)	Chain 1 Output Power (dBm/15MHz)	Total Power (dBm/15MHz)	Antenna Gain (dBi)	EIRP (dBm/15MHz)	EIRP Limit (dBm/15MHz)
15	QPSK	Low	22.41	22.34	25.39	14	<b>39.39</b>	-
		Middle	20.36	20.6	23.49	14	37.49	
		High	20.31	20.78	23.56	14	37.56	
	64QAM	Low	20.49	20.74	23.63	14	<b>37.63</b>	
		Middle	20.1	18.6	22.42	14	36.42	
		High	17.7	18.79	21.29	14	35.29	

PSD								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 PSD (dBm/MHz)	Chain 1 PSD (dBm/MHz)	Total PSD (dBm/MHz)	Antenna Gain (dBi)	EIRP density (dBm/MHz)	EIRP density Limit (dBm/MHz)
15	QPSK	Low	12.311	12.327	15.33	14	29.33	37
		Middle	9.838	9.539	12.70	14	26.70	
		High	10.114	9.819	12.98	14	26.98	
	64QAM	Low	11.016	10.78	13.91	14	27.91	
		Middle	8.247	8.678	11.48	14	25.48	
		High	8.487	8.564	11.54	14	25.54	

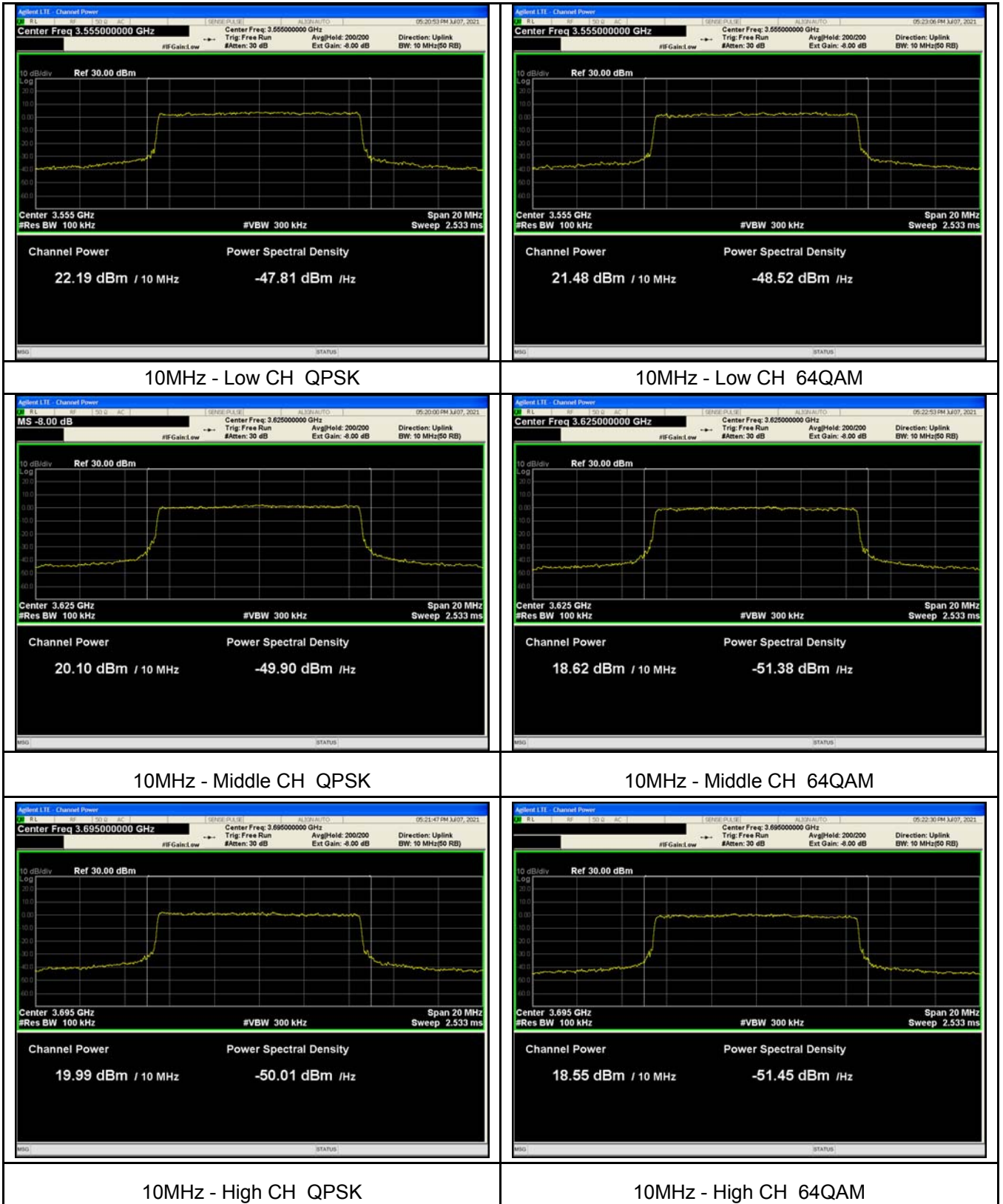
Transmit Output Power								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 Output Power (dBm/10MHz)	Chain 1 Output Power (dBm/10MHz)	Total Power (dBm/10MHz)	Antenna Gain (dBi)	EIRP (dBm/10MHz)	EIRP Limit (dBm/10MHz)
20	QPSK	Low	20.52	20.3	23.42	14	37.42	47
		Middle	18.54	19.24	21.91	14	35.91	
		High	18.85	18.77	21.82	14	35.82	
	64QAM	Low	18.76	19.69	22.26	14	36.26	
		Middle	16.95	17.24	20.11	14	34.11	
		High	17.1	17.54	20.34	14	34.34	
Full Transmit Output Power								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 Output Power (dBm/20MHz)	Chain 1 Output Power (dBm/20MHz)	Total Power (dBm/20MHz)	Antenna Gain (dBi)	EIRP (dBm/20MHz)	EIRP Limit (dBm/20MHz)
20	QPSK	Low	22.59	22.96	25.79	14	<b>39.79</b>	-
		Middle	20.36	21.59	24.03	14	38.03	
		High	22.26	22.02	25.15	14	39.15	
	64QAM	Low	22.03	22.09	25.07	14	<b>39.07</b>	
		Middle	18.05	18.37	21.22	14	35.22	
		High	19.56	19.03	22.31	14	36.31	

PSD								
Bandwidth (MHz)	Modulation	Test Channel	Chain 0 PSD (dBm/MHz)	Chain 1 PSD (dBm/MHz)	Total PSD (dBm/MHz)	Antenna Gain (dBi)	EIRP density (dBm/MHz)	EIRP density Limit (dBm/MHz)
20	QPSK	Low	11.586	11.603	14.60	14	28.60	37
		Middle	9.438	9.876	12.67	14	26.67	
		High	9.637	9.158	12.41	14	26.41	
	64QAM	Low	10.247	10.72	13.50	14	27.50	
		Middle	7.777	8.444	11.13	14	25.13	
		High	8.403	8.778	11.60	14	25.60	

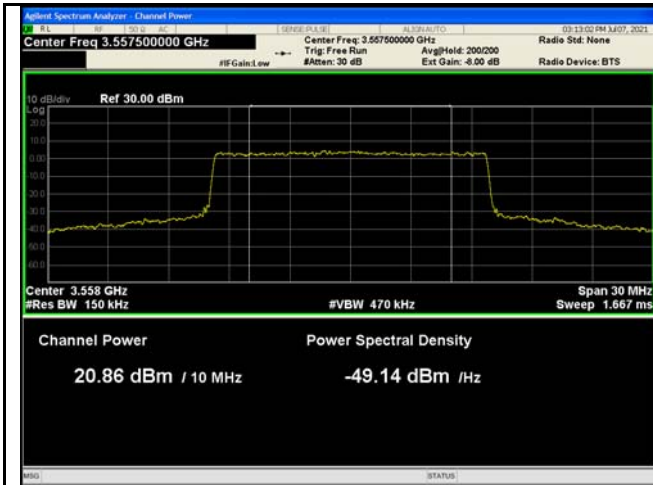
**Transmit Output Power Test Plots**  
**Chain 0**



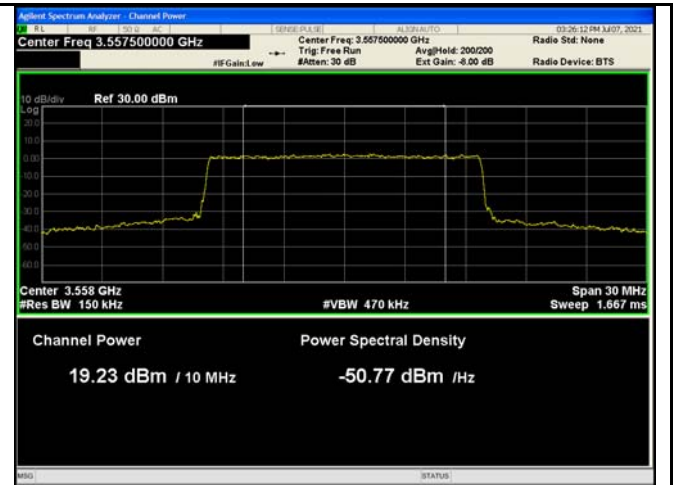
Chain 1



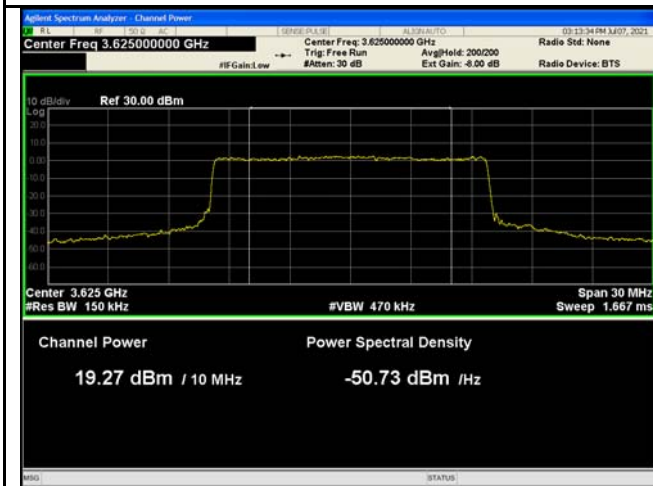
Chain 0



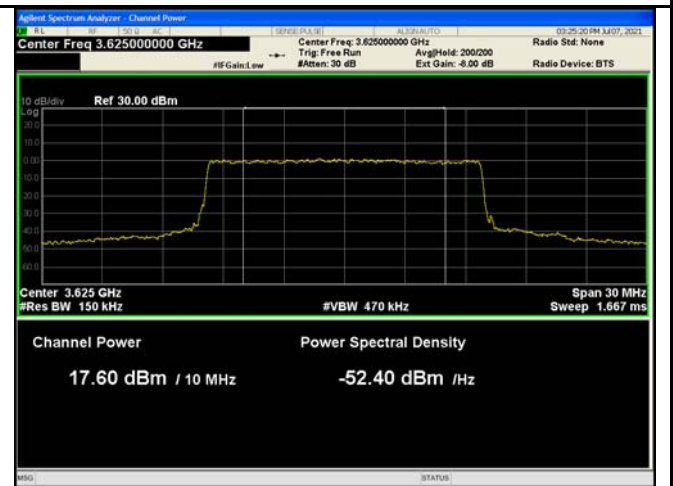
15MHz - Low CH QPSK



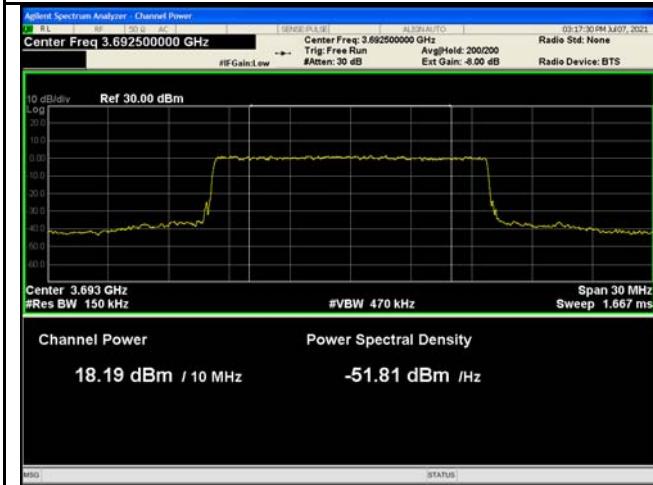
15MHz - Low CH 64QAM



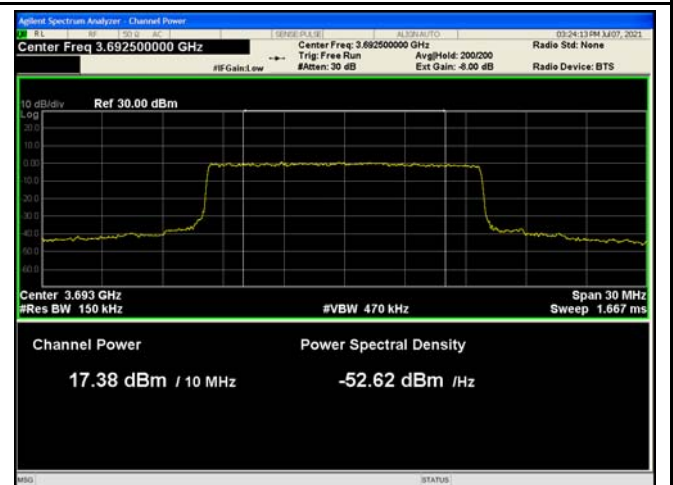
15MHz - Middle CH QPSK



15MHz - Middle CH 64QAM



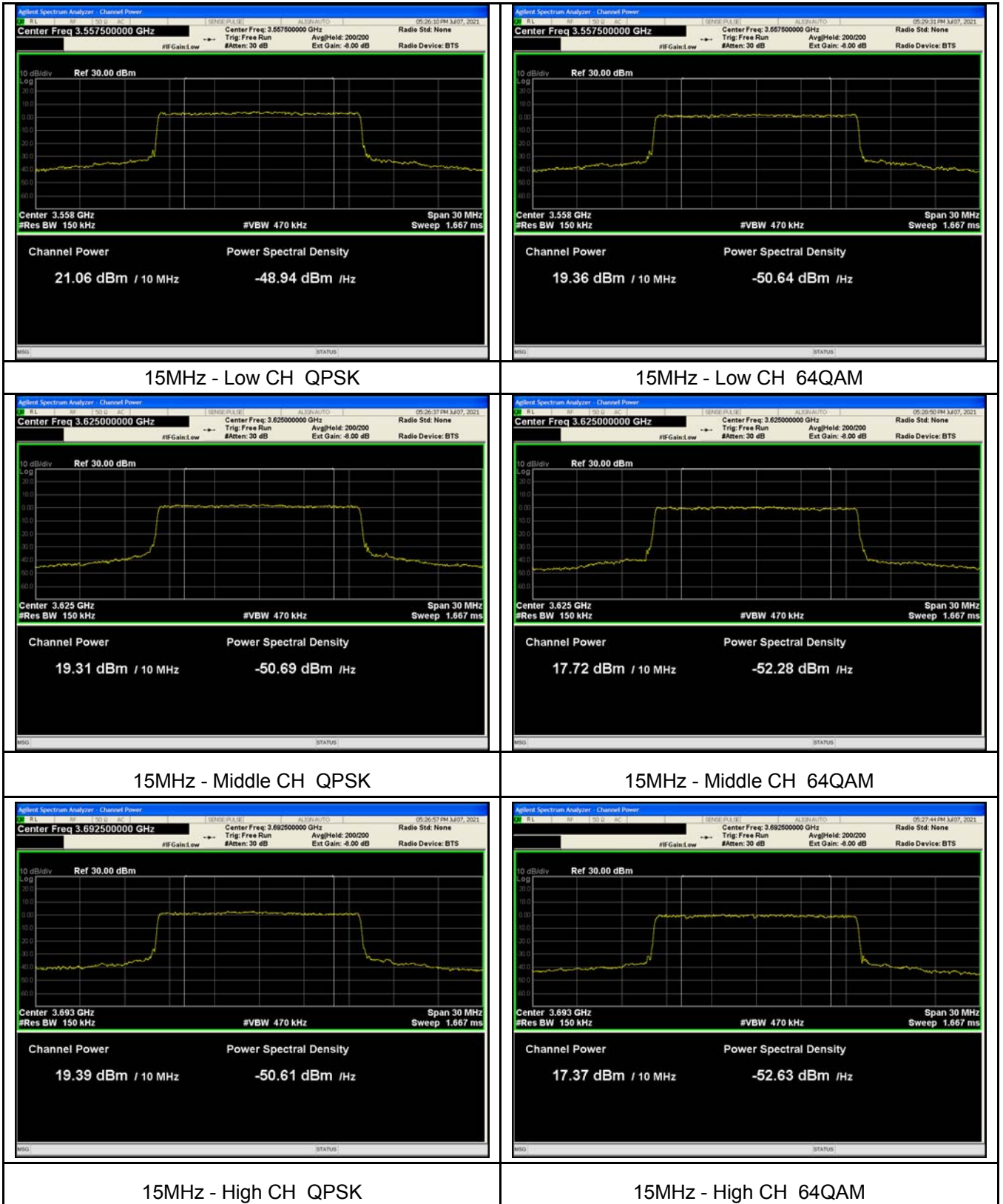
15MHz - High CH QPSK



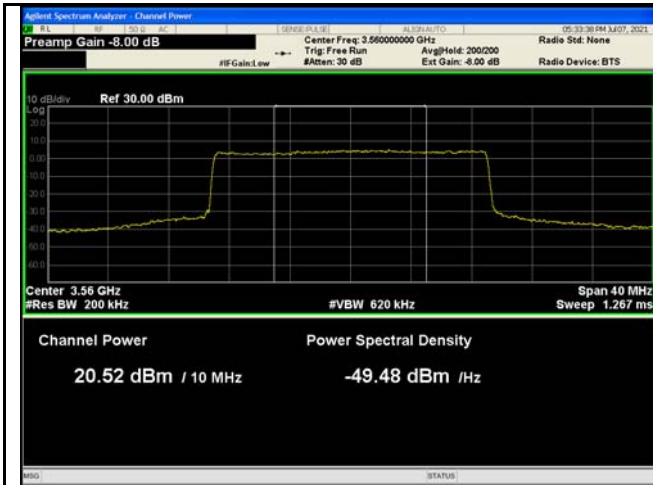
15MHz - High CH 64QAM



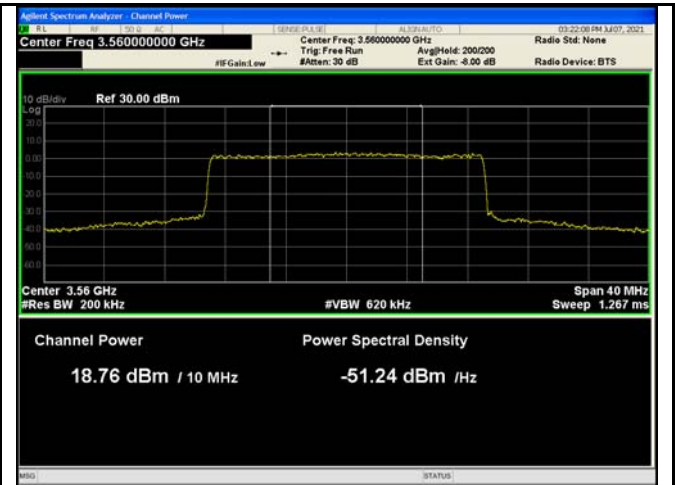
Chain 1



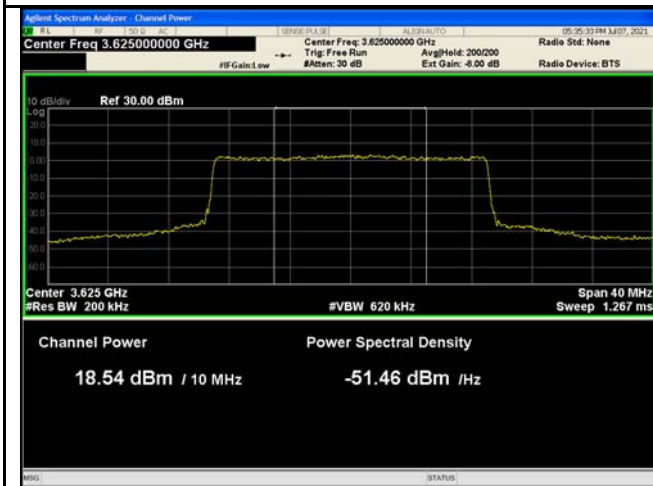
Chain 0



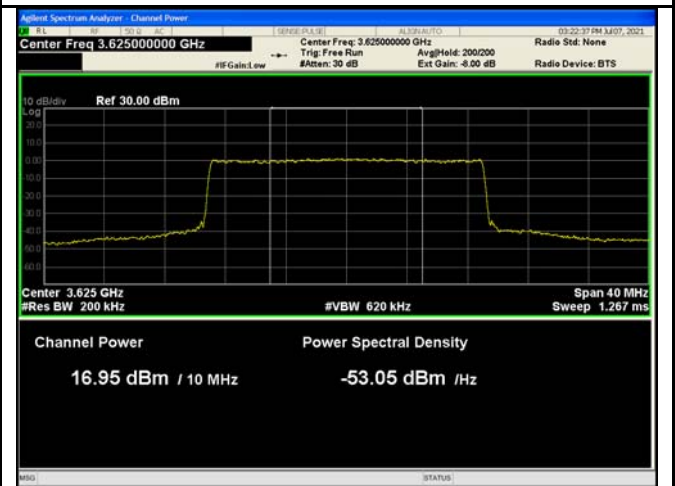
20MHz - Low CH QPSK



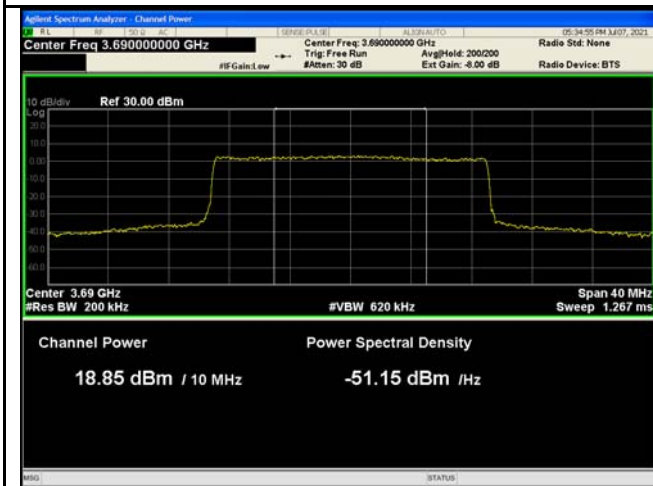
20MHz - Low CH 64QAM



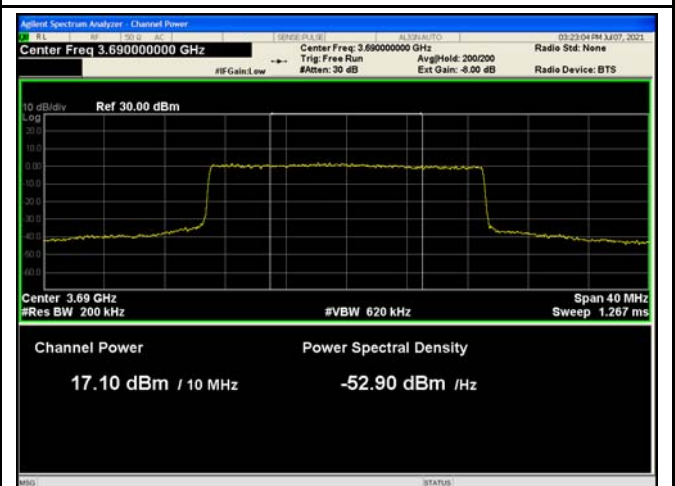
20MHz - Middle CH QPSK



20MHz - Middle CH 64QAM

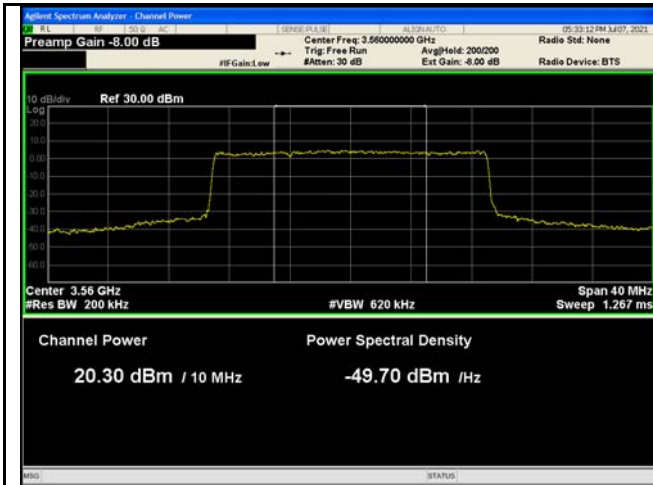


20MHz - High CH QPSK

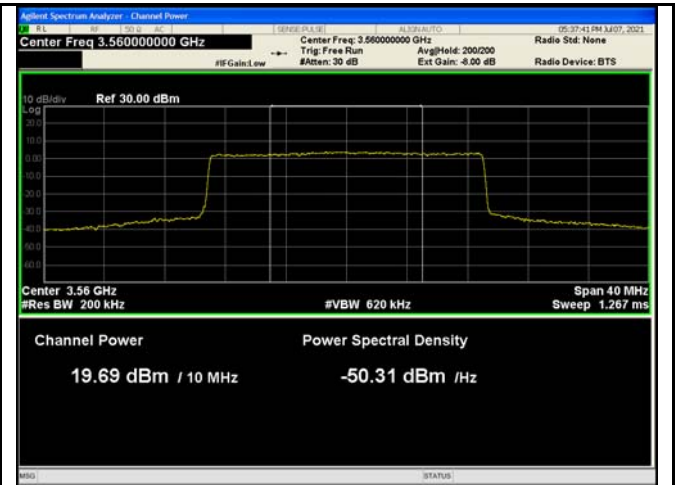


20MHz - High CH 64QAM

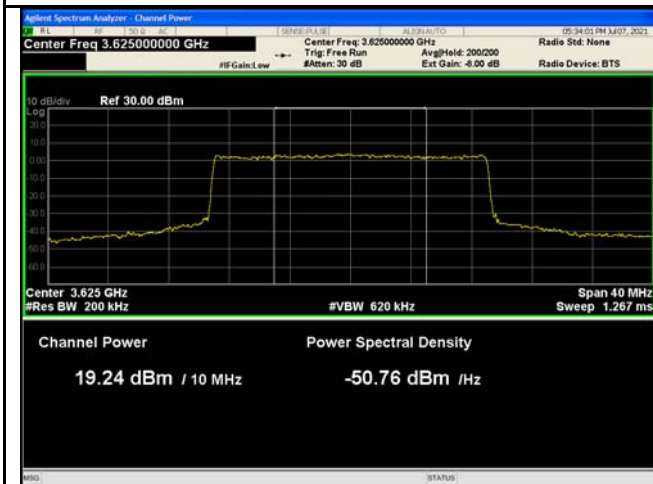
Chain 1



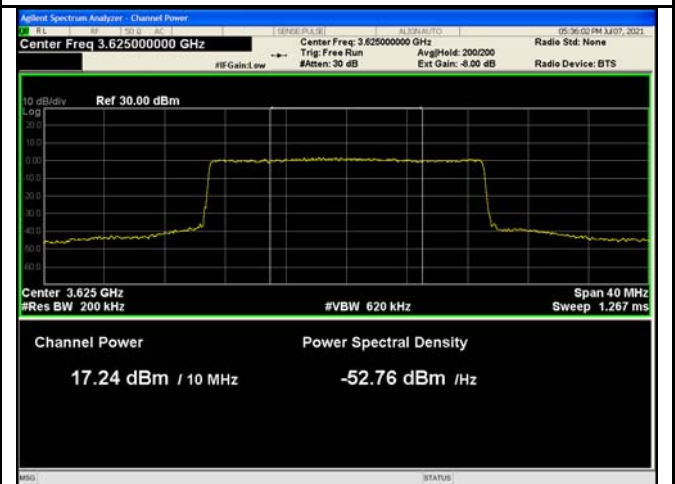
20MHz - Low CH QPSK



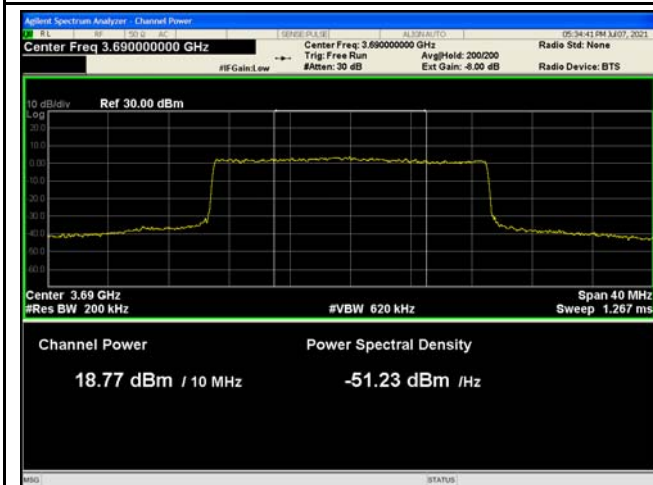
20MHz - Low CH 64QAM



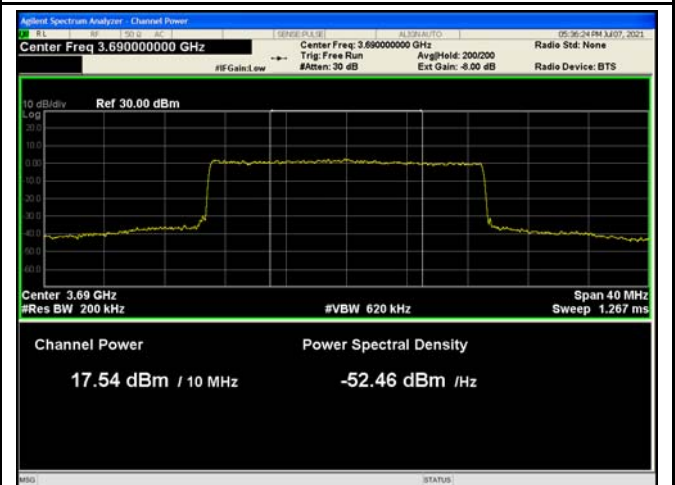
20MHz - Middle CH QPSK



20MHz - Middle CH 64QAM

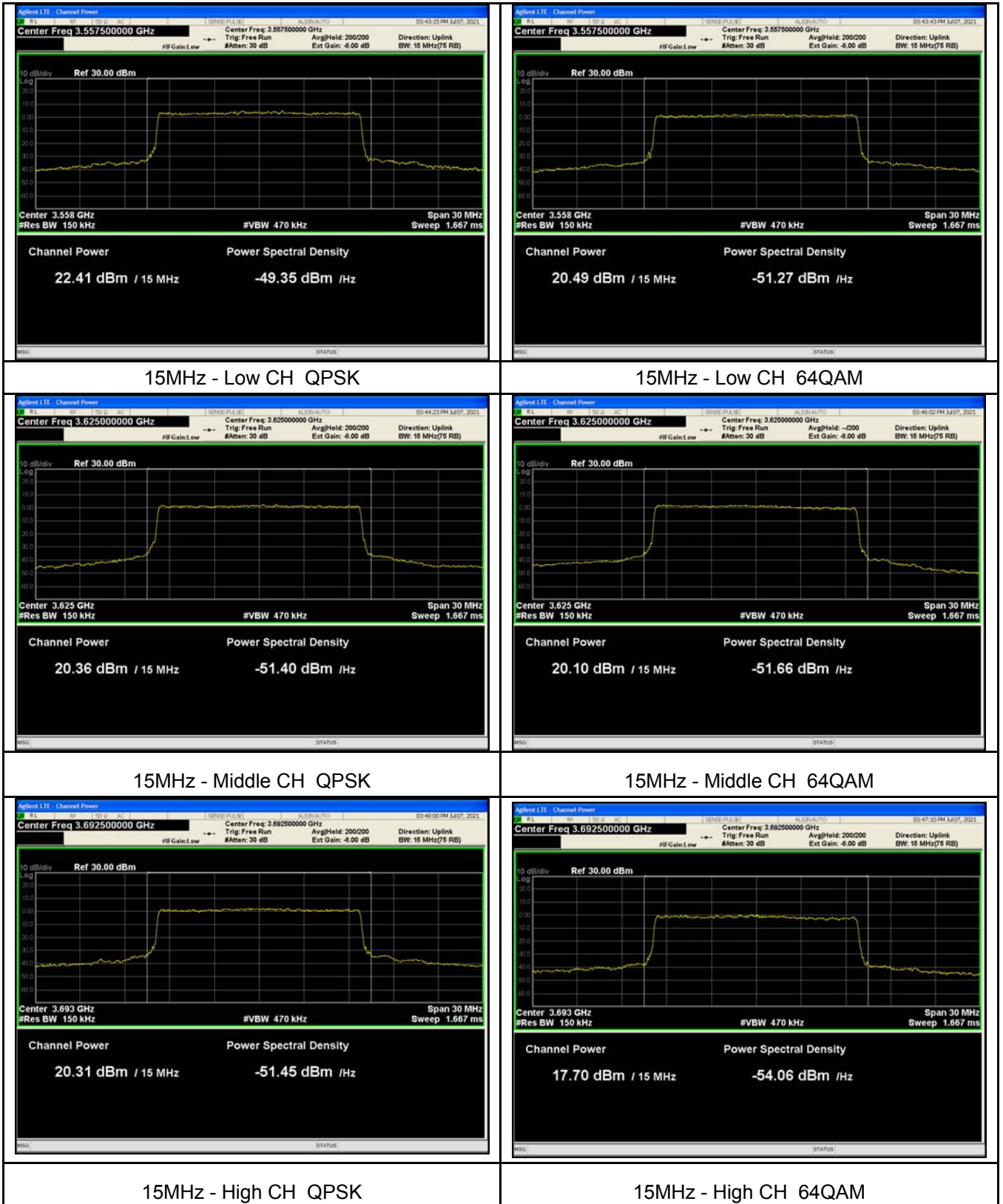


20MHz - High CH QPSK

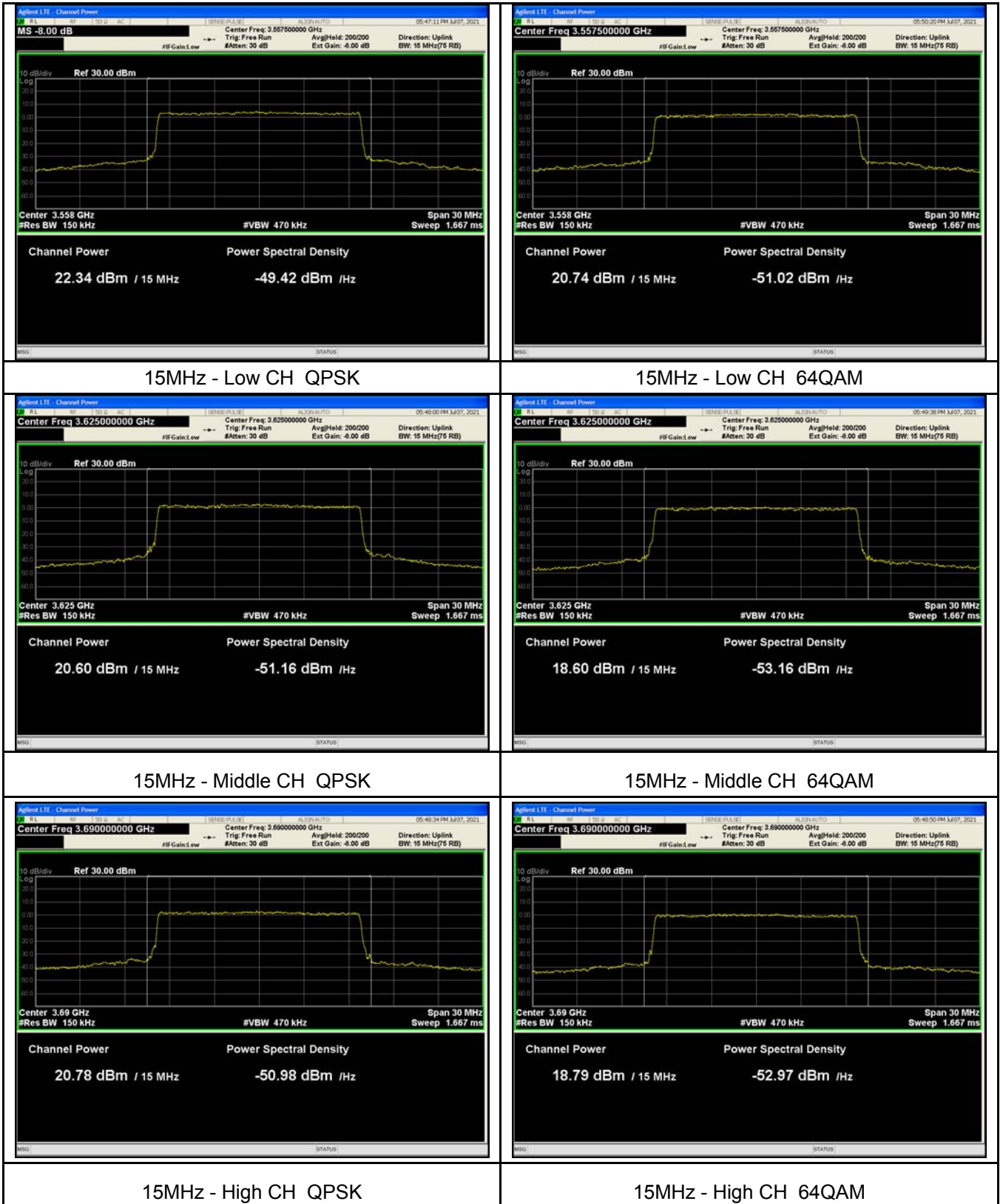


20MHz - High CH 64QAM

**Full Transmit Output Power Test Plots  
Chain 0**

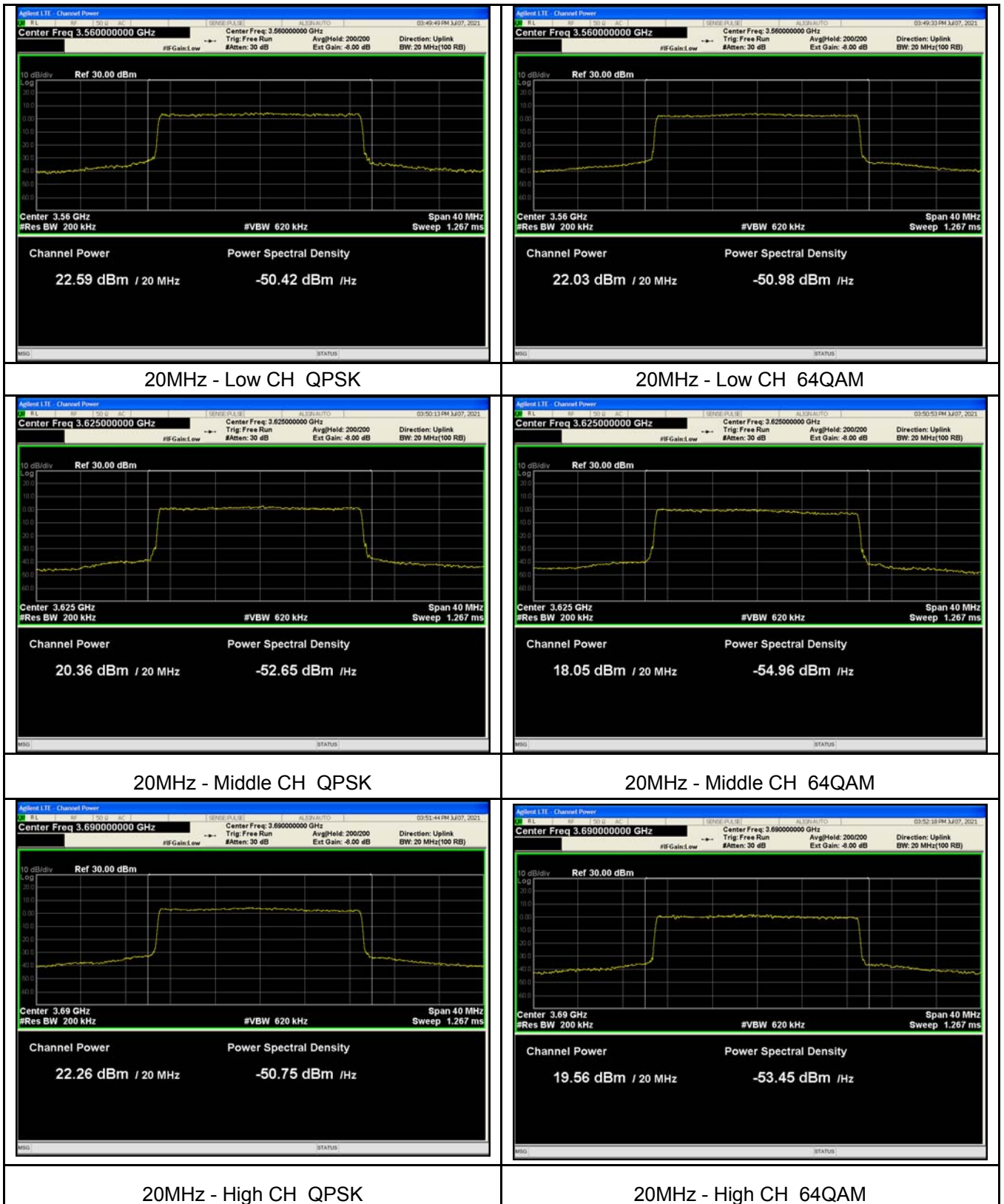


Chain 1

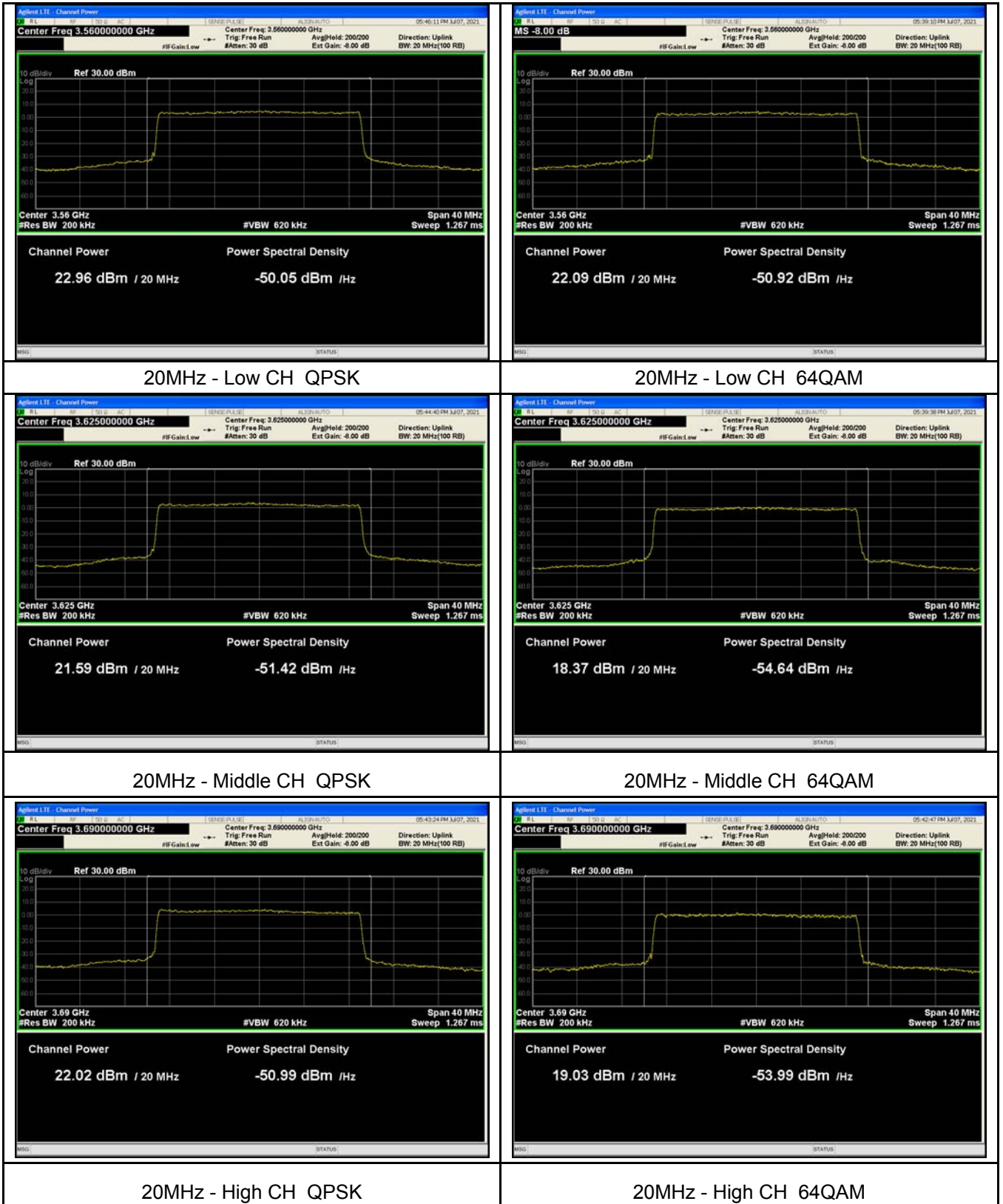




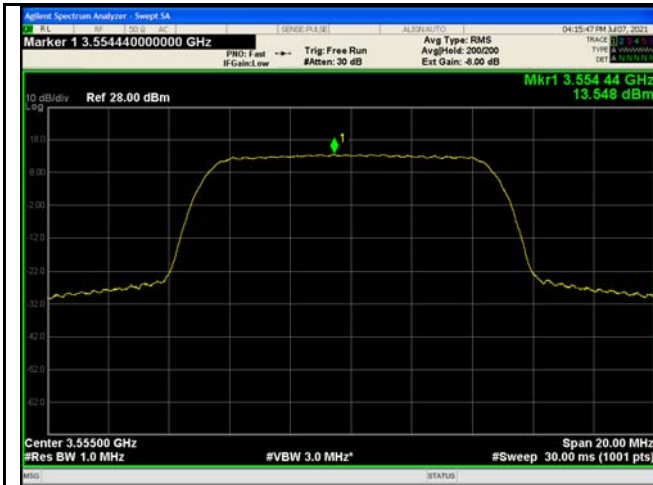
Chain 0



Chain 1



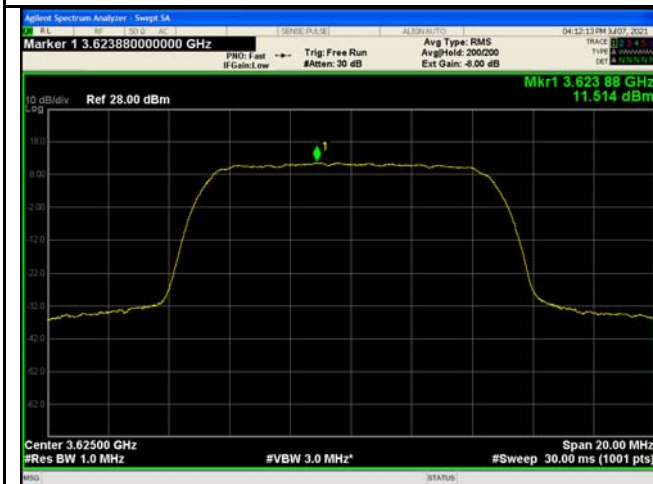
**PSD Test Plots**  
**Chain 0**



10MHz - Low CH QPSK



10MHz - Low CH 64QAM



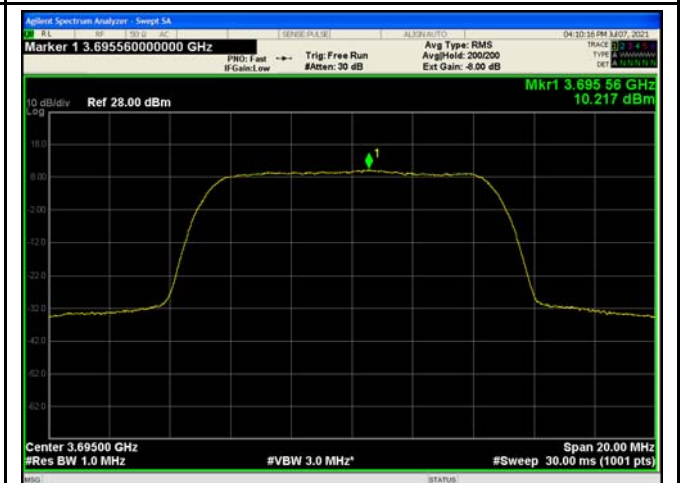
10MHz - Middle CH QPSK



10MHz - Middle CH 64QAM



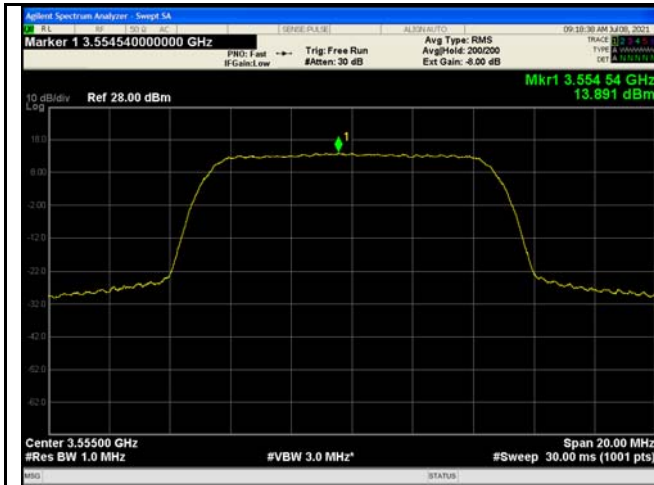
10MHz - High CH QPSK



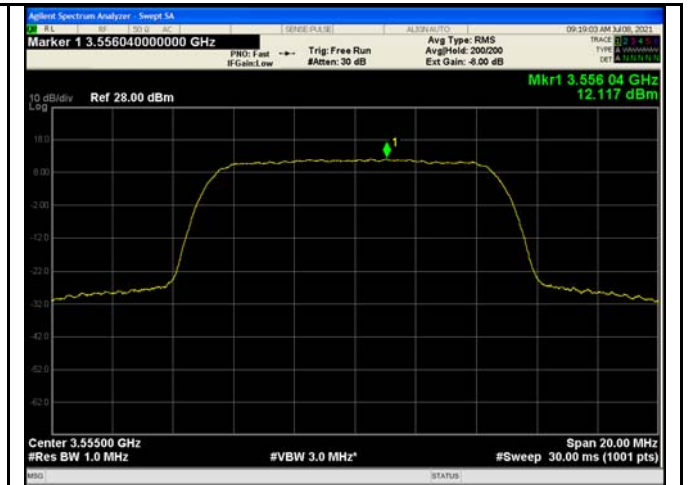
10MHz - High CH 64QAM



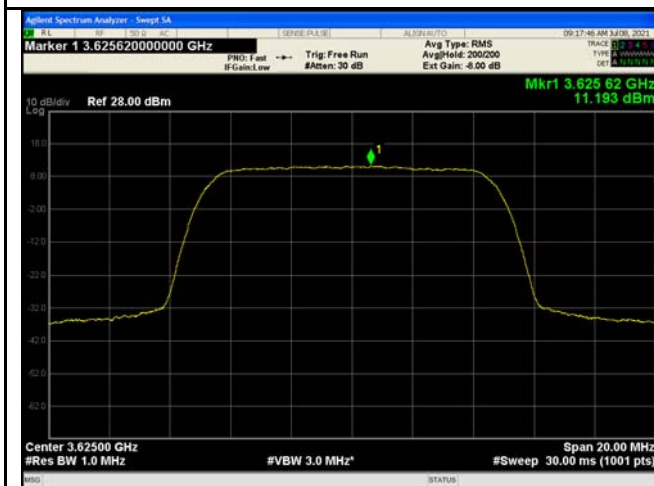
Chain 1



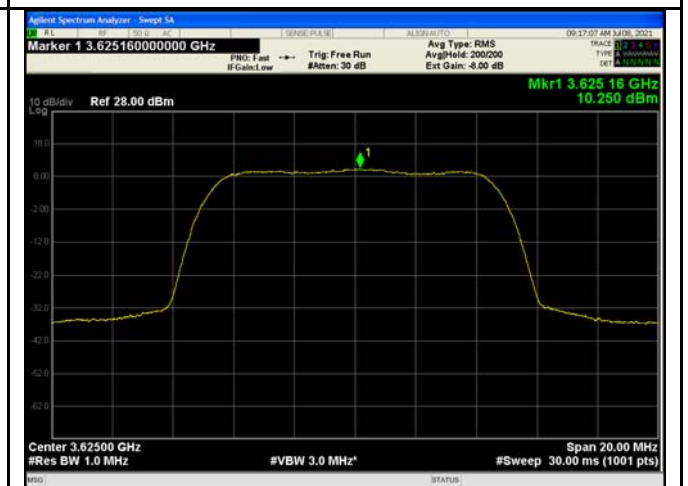
10MHz - Low CH QPSK



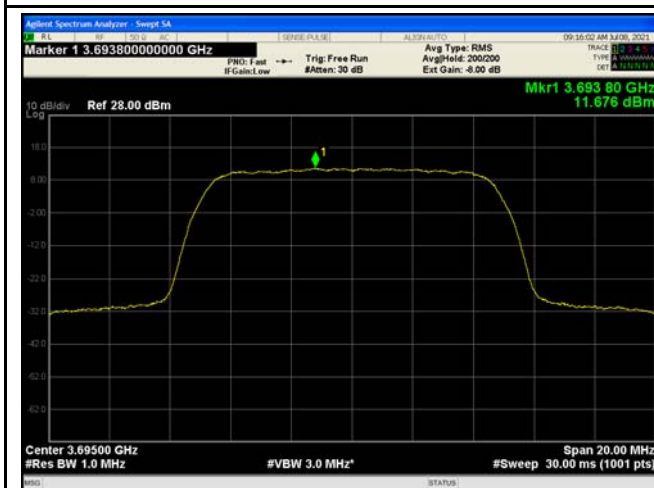
10MHz - Low CH 64QAM



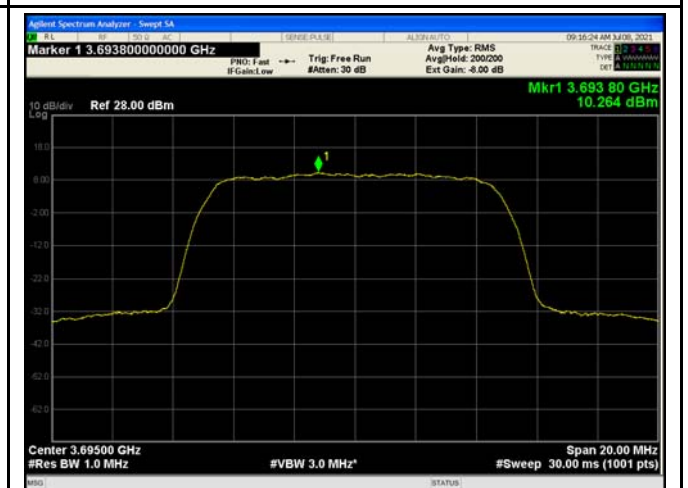
10MHz - Middle CH QPSK



10MHz - Middle CH 64QAM



10MHz - High CH QPSK

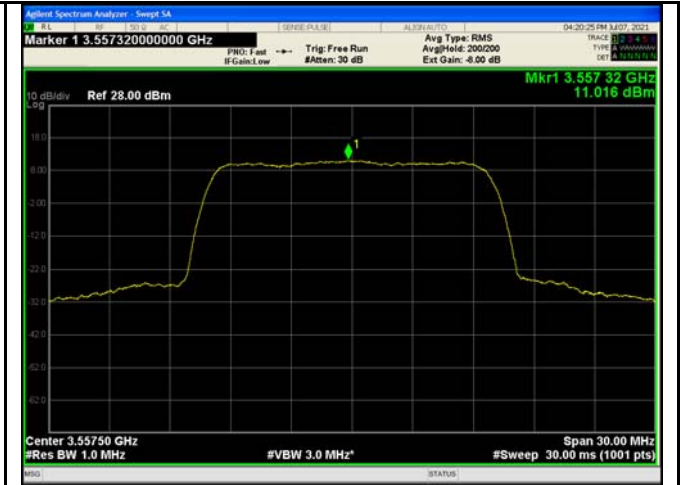


10MHz - High CH 64QAM

Chain 0



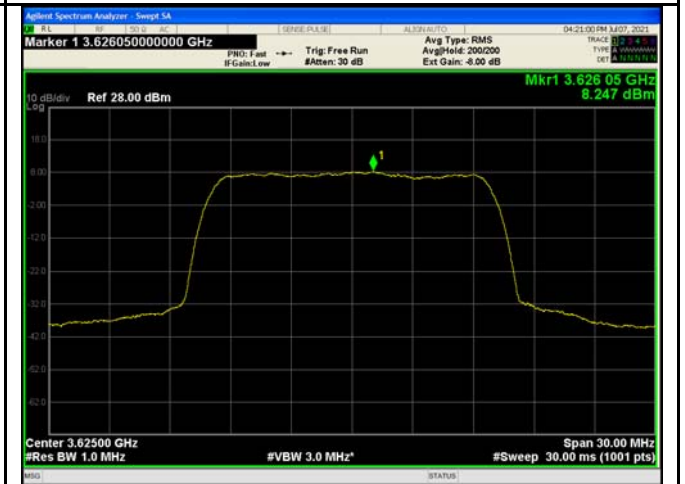
15MHz - Low CH QPSK



15MHz - Low CH 64QAM



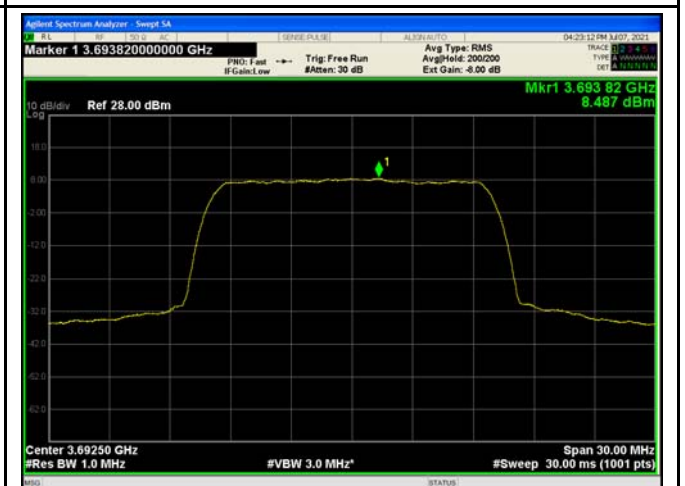
15MHz - Middle CH QPSK



15MHz - Middle CH 64QAM



15MHz - High CH QPSK

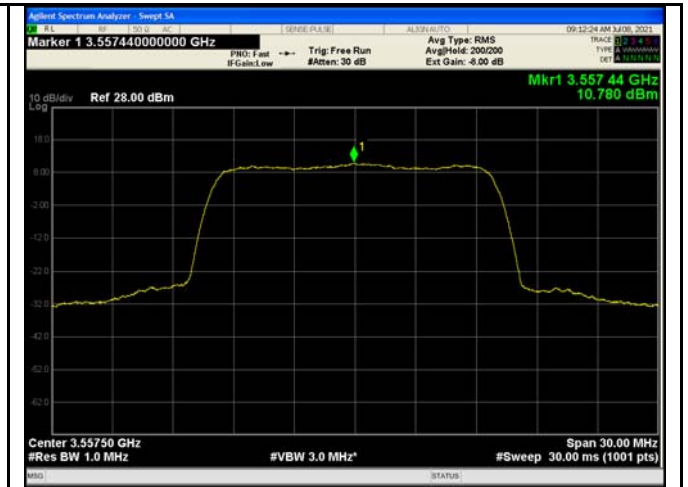


15MHz - High CH 64QAM

Chain 1



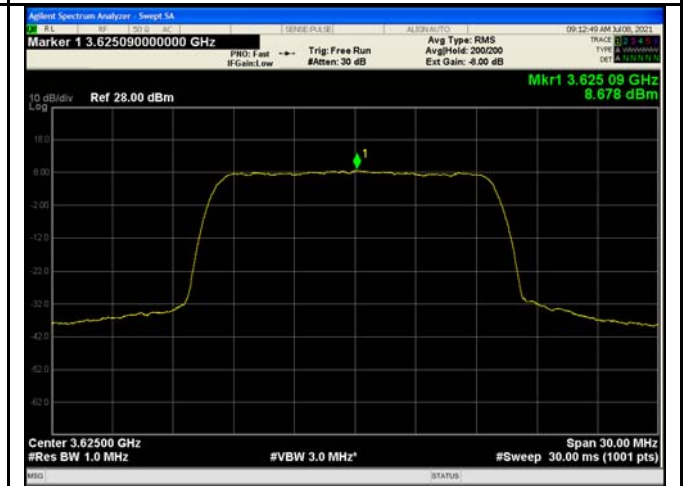
15MHz - Low CH QPSK



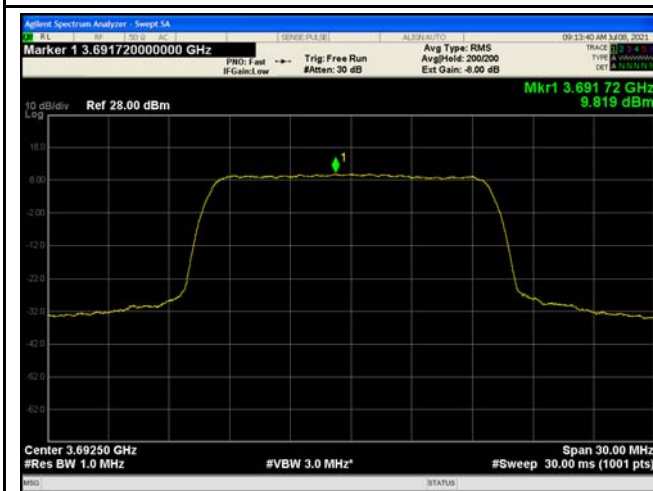
15MHz - Low CH 64QAM



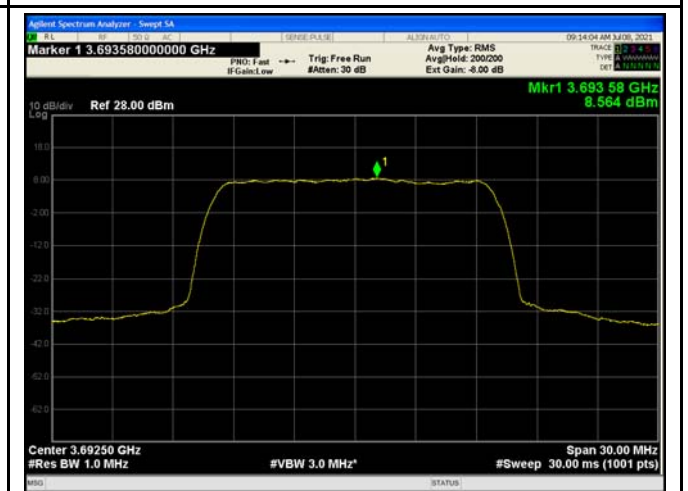
15MHz - Middle CH QPSK



15MHz - Middle CH 64QAM

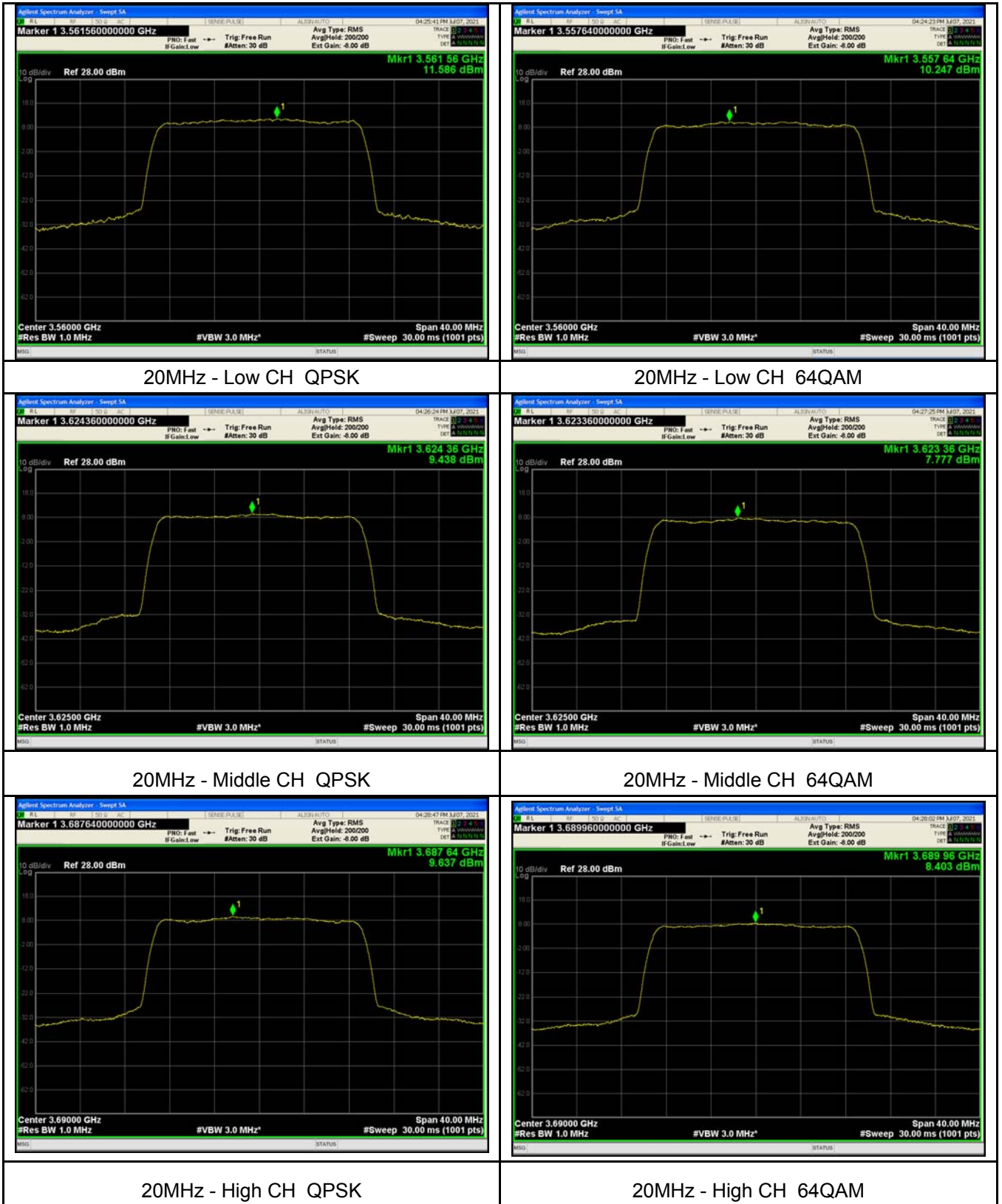


15MHz - High CH QPSK



15MHz - High CH 64QAM

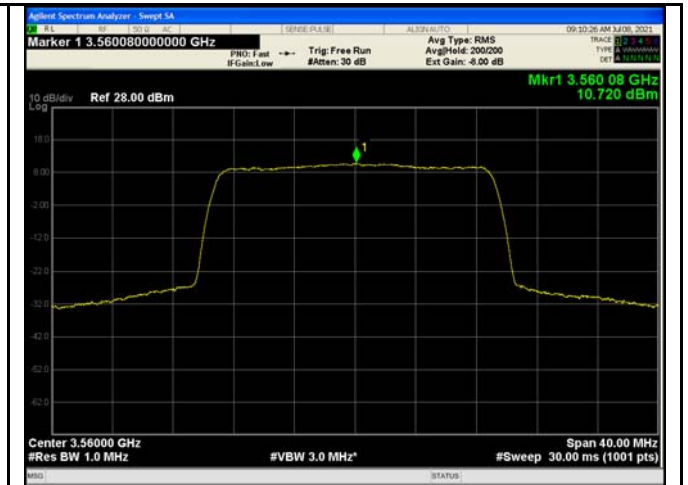
Chain 0



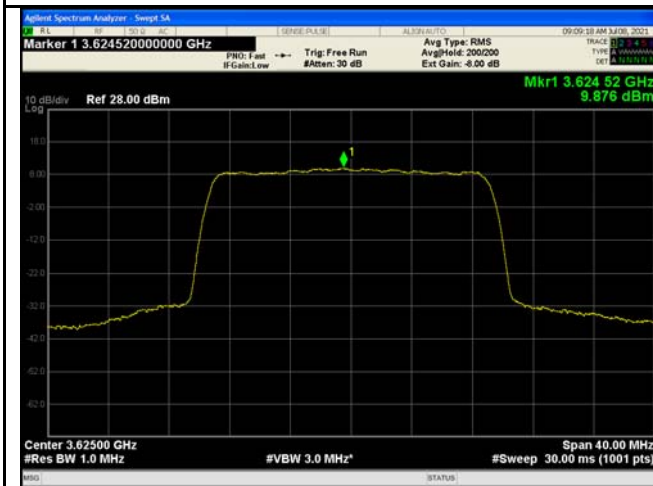
Chain 1



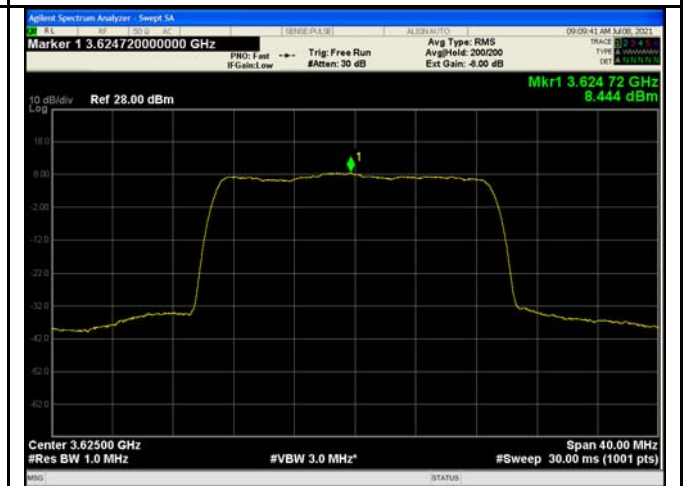
20MHz - Low CH QPSK



20MHz - Low CH 64QAM



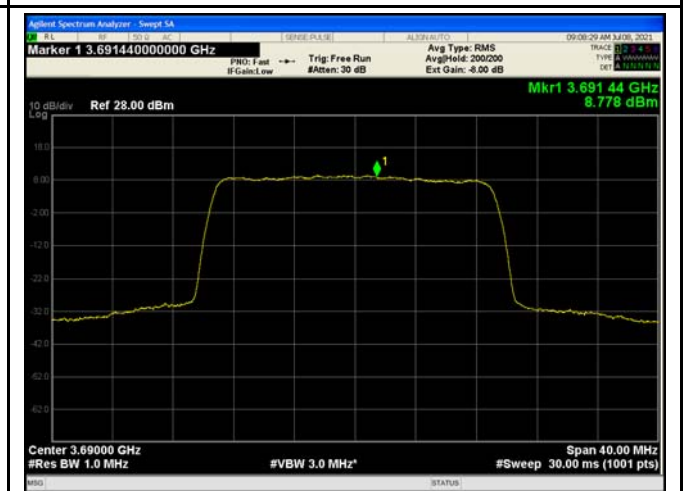
20MHz - Middle CH QPSK



20MHz - Middle CH 64QAM



20MHz - High CH QPSK



20MHz - High CH 64QAM

## 8 Peak-to-average power ratio

Test Requirement:	FCC part96.41(g)
Test Method:	ANSI/TIA-603-E:2016, ANSI C63.26:2015
Test Mode:	Data communicating mode
Limit:	

Probability,%	dB
0.1	13

### 8.1 EUT Operation

Operating Environment :

Temperature:	22.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	102.3kPa

Note: Data that only reflects the worst mode is reported

### 8.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.

### 8.3 Test Result

#### 10MHz bandwidth

Mode	Chain 0			Chain 1			Limit (dB)
	Low	Middle	High	Low	Middle	High	
Peak-to-Average Ratio (dB)	9.15	9.25	9.52	9.09	9.39	9.44	13

#### 15MHz bandwidth

Mode	Chain 0			Chain 1			Limit (dB)
	Low	Middle	High	Low	Middle	High	
Peak-to-Average Ratio (dB)	9.47	9.84	9.83	9.54	9.54	9.52	13

20MHz bandwidth

Mode	Chain 0			Chain 1			Limit
Channel	Low	Middle	High	Low	Middle	High	(dB)
Peak-to-Average Ratio (dB)	9.00	9.17	9.45	8.55	9.37	9.20	13

Test Plots  
10M Chain 0

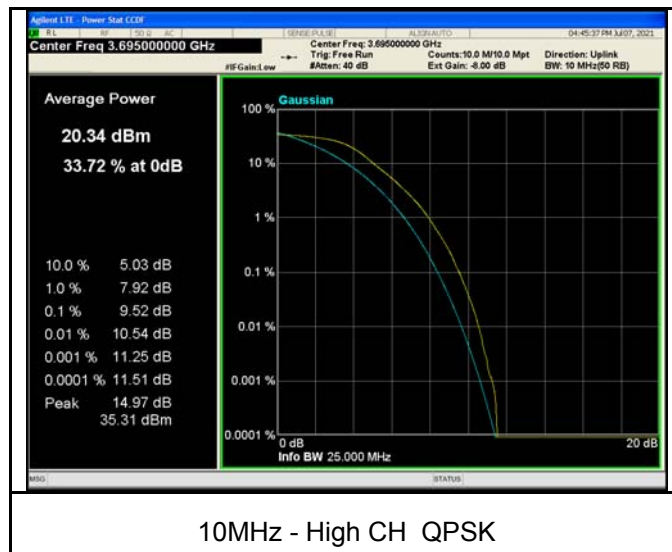


10MHz - Low CH QPSK



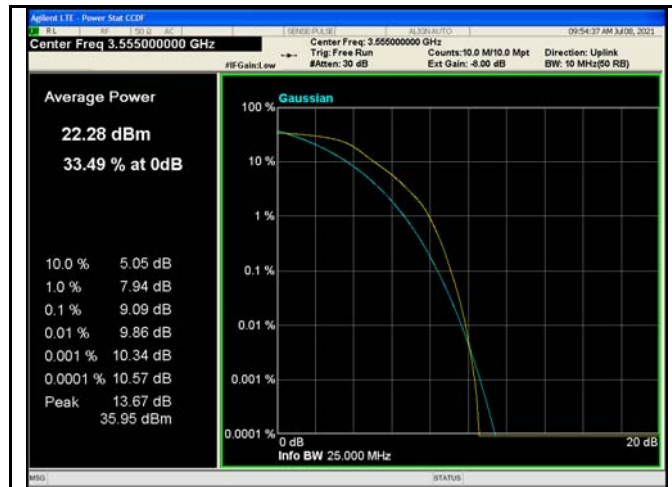
10MHz - Middle CH QPSK



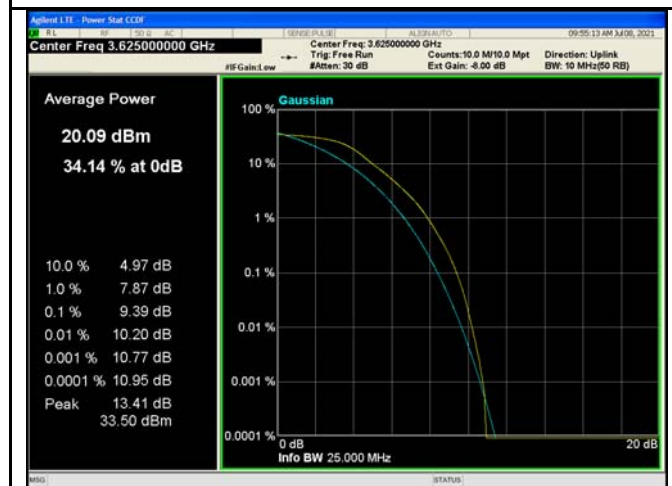




10M Chain 1



10MHz - Low CH QPSK



10MHz - Middle CH QPSK



10MHz - High CH QPSK

15M Chain 0



15MHz - Low CH QPSK

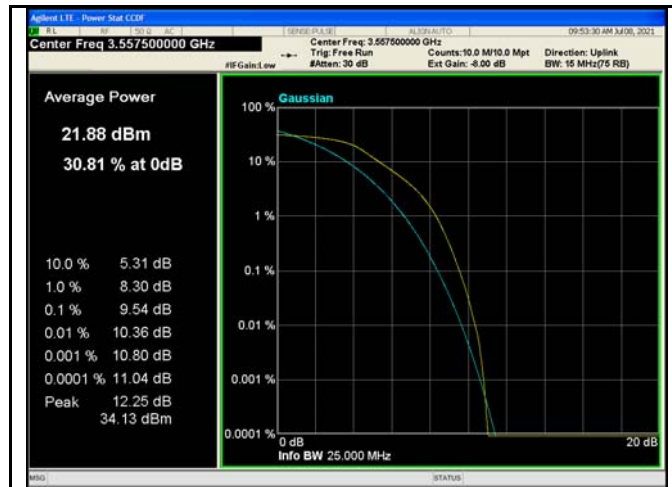


15MHz - Middle CH QPSK



15MHz - High CH QPSK

15M Chain 1



15MHz - Low CH QPSK

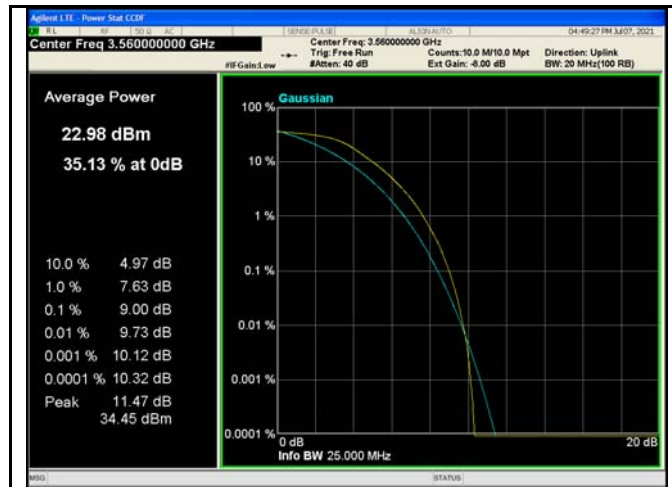


15MHz - Middle CH QPSK



15MHz - High CH QPSK

20M Chain 0



20MHz - Low CH QPSK



20MHz - Middle CH QPSK



20MHz - High CH QPSK

20M Chain 1



20MHz - Low CH QPSK



20MHz - Middle CH QPSK



20MHz - High CH QPSK

## 9 Occupy Bandwidth

Test Requirement:	FCC part 2.1049
Test Method:	ANSI/TIA-603-E:2016, ANSI C63.26:2015
Test Mode:	Data communicating mode

### 9.1 EUT Operation

Operating Environment :	
Temperature:	22.6 °C
Humidity:	52.4 % RH
Atmospheric Pressure:	103.3kPa

### 9.2 Test Procedure

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer.
2. The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
3. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
4. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

### 9.3 Test Result

#### Chain 0

Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
10	QPSK	Low	9.337	8.9003
		Middle	9.271	8.9074
		High	9.309	8.8958
	64QAM	Low	9.329	8.9204
		Middle	9.324	8.9188
		High	9.284	8.9160
Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
15	QPSK	Low	13.93	13.395
		Middle	13.91	13.378
		High	13.90	13.377
	64QAM	Low	13.88	13.382
		Middle	13.96	13.365
		High	13.92	13.402
Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
20	QPSK	Low	18.50	17.849
		Middle	18.50	17.856
		High	18.50	17.847
	64QAM	Low	18.48	17.841
		Middle	18.50	17.841
		High	18.54	17.847

## Chain 1

Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
10	QPSK	Low	9.323	8.9201
		Middle	9.307	8.9174
		High	9.333	8.9355
	64QAM	Low	9.292	8.9182
		Middle	9.340	8.9260
		High	9.344	8.9151
Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
15	QPSK	Low	13.90	13.383
		Middle	13.93	13.352
		High	13.91	13.375
	64QAM	Low	13.92	13.390
		Middle	13.87	13.375
		High	13.87	13.346
Bandwidth (MHz)	Modulation	Test Channel	26dB Down Bandwidth	99% Occupy bandwidth (MHz)
20	QPSK	Low	18.48	17.818
		Middle	18.50	17.852
		High	18.50	17.832
	164QAM	Low	18.51	17.842
		Middle	18.53	17.860
		High	18.49	17.808