

Ericsson AB

RF TEST REPORT

Report Type:
FCC Part 24 RF report

PRODUCT NAME:
Radio 4402 B2/B25

REPORT NUMBER:
200501747SHA-001

ISSUE DATE:
May 18, 2020

DOCUMENT CONTROL NUMBER:
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Manufacturer: Ericsson AB
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FCC ID: TA8AKRC161737-1

IC: 287AB-AS1617371

SUMMARY:

The equipment complies with the requirements according to the following standard(s) or Specification:

FCC CFR 47 Part 24: PERSONAL COMMUNICATIONS SERVICES

ISED RSS-133 Issue 6 Amendment: 2 GHz Personal Communications Services

PREPARED BY:



Project Engineer
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REVIEWED BY:



Reviewer
Daniel Zhao

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TEST REPORT

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Revision History

Report No.	Version	Description	Issued Date
200501747SHA-001	Rev. 01	Initial issue of report	May 18, 2020

Measurement result summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Maximum Output Power and Peak to Average Power Ratio and EIRP	24.232(a) (d) 2.1046	RSS-133 6.4	Pass
Occupied Bandwidth	24.238(b) 2.1049	RSS-133 6.6	Pass
Unwanted Emissions at Band Edge	24.238(b) 2.1051	RSS-133 6.5	Pass
Conducted Unwanted Emission	24.238(a) 2.1051	RSS-133 6.5	Pass
Radiated Spurious Emission	24.238(a) 2.1053	RSS-133 6.5	NP
Frequency Stability	24.235 2.1055	RSS-133 6.3	NP
Receiver Spurious Emission	-	-	NA

Note:

1. NA means Not Applicable.
2. NP means Not Performed.
3. For Radiated Spurious Emissions and Frequency Stability test, comparison tests were performed with LTE Band 2/25, and there was no much difference between the test result, so the two test items were not chosen to perform.

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Description:	Remote Radio Unit
Product name:	Radio 4402 B2/B25
Product number:	KRC 161737/1
HVIN	AS1617371
Serial Number(s)	D829783587
Rating:	36V DC
Software Version:	CXP9013268%15-R82EC
Hardware Version:	R1D
Sample received date:	May 8, 2020
Date of test:	May 8, 2020 ~ May 15, 2020

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1.2 Technical Specification

Frequency Range:	B2: Rx:1850-1910MHz, Tx:1930-1990MHz, B25: Rx:1850-1915MHz, Tx:1930-1995MHz
Number of Antenna ports:	4 TX/RX
Supported RAT:	WCDMA, LTE, NB-IoT In-band/Guard-band/Standalone, NR
Supported other mode:	/
Max RF bandwidth (IBW):	NB-IoT Standalone: 20MHz WCDMA: 60MHz LTE, NR: 65MHz
Supported Number of Carriers:	Maximum 6 carriers per port for all configuration (maximum 1 carrier for NB-IoT-Standalone).
Supported modulation:	NB-IoT: QPSK WCDMA: QPSK, 16QAM, 64QAM LTE, NR: QPSK, 16QAM, 64QAM, 256QAM
Supported Channel Bandwidth:	WCDMA: 5MHz NB-IoT Standalone: 200 kHz LTE: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz NR: 5MHz, 10MHz, 15MHz, 20 MHz, with 15kHz SCS
Declaration output power:	Maximum 37.0 dBm (5W) per port. Maximum 34.0 dBm (2.5W) per port for LTE 1.4M and 3M single carrier. Maximum 33.0 dBm (2W) per port for NB-IoT-Standalone.
Antenna Gain:	Antenna 6523, KRE 105 280/1, Gain: 9.2dBi

TEST REPORT**1.3 Description of Test Facility**

Name:	Intertek Testing Services Shanghai
Address 1:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Address 2:	No. 5 Lize East Street, Ericsson Tower, Chaoyang District, Beijing 100102 P.R.C.
Telephone:	+86 21 61278200
Telefax:	+86 21 54262353
The test facility is recognized, certified, or accredited by these organizations:	FCC Accredited Lab Designation Number: CN1175, CN1258
	IC Registration Lab CAB identifier.: CN0051
	A2LA Accreditation Lab Certificate Number: 3309.02, 3309.04

2 TEST SPECIFICATIONS

2.1 Related documents

FCC Part 24 (2019)
FCC Part 2 (2019)
ISED RSS-133 issue 6 January 2018 Amendment
ISED RSS-Gen issue 5 March 2019 Amendment 1
ANSI C63.26:2015
KDB 971168 D01 v03r01
KDB 662911 D01 v02r01

2.2 Product Information

The Equipment Under Test (EUT) is an Ericsson Antenna Integrated Radio Unit working in the wireless communications services 1900MHz band which provides communication connections to 1900MHz network in WCDMA / LTE / NB-IoT / NR modes and MSR modes. The Radio 4402 B2/B25 KRC 161737/1 operates from a -48V DC or a 120V AC power supply.

The EUT includes 4 TX/RX ports and it can be configured to transmit in MIMO mode for LTE and NR carriers, and MIMO mode was used for measurements as the worst configuration. The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

A full technical description can be found in the Manufacturer's documentation.

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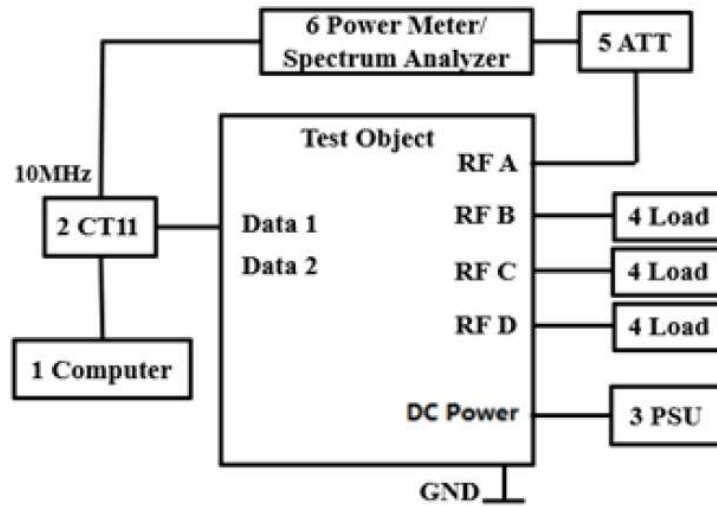
2.3 Configuration Description

The following settings were used as a representative for all traffic scenarios, when settings with different modulations, channel bandwidths, number for carriers and RF configurations have been tested to find the worst case setting. The settings below were used for all measurements unless otherwise noted:

Configuration	RAT	No. of Carriers	NR Channel Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
				Bottom	Middle	Top
A	NR	1	5	1932.5	1960	1987.5
	NR	1	10	1935	1960	1985
	NR	1	15	1937.5	1960	1982.5
	NR	1	20	1940	1960	1980
	NR	2	20+20	-	1950+1970	-
B	NR	1	5	1932.5	1962.5	1992.5
	NR	1	10	1935	1962.5	1990
	NR	1	15	1937.5	1962.5	1987.5
	NR	1	20	1940	1962.5	1985
	NR	2	20+20	-	1952.5+1972.5	-

2.4 Test Setup

Conducted Measurement:



No.	Auxiliary Equipment	Product Number / Model Type	Version
1	Computer	Dell Optiplex 3050	-
2	CT11	LPC 102 494/1	R2A
3	Power supply unit	-	-
4	Load	TF150	-
5	Attenuator	Aeroflex / Weinschel	-

TEST REPORT**2.5 Test environment condition:**

Test items	Temperature	Humidity
Maximum Output Power and Peak to Average Power Ratio and EIRP	24°C	56% RH
Occupied Bandwidth		
Unwanted Emissions at Band Edge		
Conducted Unwanted Emission		

2.6 Instrument list

Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2020-09-16
<input type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2020-09-24
<input type="checkbox"/>	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC5262	2020-06-11
<input type="checkbox"/>	Horn antenna	R&S	HF 906	EC 3049	2021-01-17
<input type="checkbox"/>	Horn antenna	ETS	3117	EC 4792-1	2021-02-25
<input type="checkbox"/>	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2020-07-09
<input type="checkbox"/>	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2021-03-14
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2021-03-16
<input type="checkbox"/>	Power sensor	Agilent	U2021XA	EC 5338-1	2021-03-16
<input type="checkbox"/>	Vector Signal Generator	Agilent	N5182B	EC 5175	2021-03-16
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	EC5944	2020-12-09
<input type="checkbox"/>	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2021-03-16
<input type="checkbox"/>	Mobile Test System	Litepoint	lqxel	EC 5176	2021-01-16
<input type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2020-09-16
<input type="checkbox"/>	Climate chamber	GWS	MT3065	EC 6021	2020-07-04
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030B	EC 6078	2020-06-11
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2021-01-12
<input type="checkbox"/>	Shielded room	Zhongyu	-	EC 2839	2021-01-12
<input type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2020-06-31
<input type="checkbox"/>	Fully-anechoic chamber	Albatross project	-	EC 3047	2020-06-31
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date

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<input type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2021-03-03
<input type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3481	2021-01-05
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3442	2021-01-05
<input type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2020-09-05
<input type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 3320	2020-07-14

TEST REPORT**2.7 Measurement uncertainty**

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Measurement uncertainty
Maximum output power	0.73dB
Occupied Bandwidth	0.88%
Unwanted Emissions at Band Edge	3.03dB
Conducted Unwanted Emission	3.03dB

3 Maximum Output Power and Peak to Average Power Ratio and EIRP

Test result: Pass

3.1 Limit

Output Power:

(EIRP) 1640 W(62.15dBm) for emission bandwidth \leq 1MHz

1640 W/MHz(62.15dBm/MHz) for emission bandwidth $>$ 1MHz

Peak to Average Ratio: \leq 13 dB

3.2 Measurement Procedure

The EUT was configured to transmit on maximum power and proper modulation. The transmitter power shall be measured in terms of a root-mean-square (RMS) average value. In case of the EUT was configured to MIMO mode, since the EUT transmits on all antennas simultaneously in the same frequency range, using the Measure-and-Sum approach, the output power at all antennas were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01.

A peak to average ratio measurement is performed at the conducted ports of the EUT for single carrier for single RAT mode. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) was used and 0.1% probability value recorded.

3.3 Measurement result

Configuration A:

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	5	35.85	30.099	7.68	36.55	30.498	7.96	36.33	30.461	7.70
B	QPSK	5	35.86	30.052	7.80	36.37	30.356	8.09	36.30	30.333	7.94
C	QPSK	5	35.93	30.057	7.71	36.42	30.473	7.72	36.47	30.449	7.97
D	QPSK	5	36.19	30.378	7.66	36.68	30.685	7.95	36.61	30.578	7.84
Total			41.98	36.169	-	42.54	36.519	-	42.44	36.483	-
Total Power+9.2dBi			51.18	45.369	-	51.74	45.719	-	51.64	45.683	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	10	36.14	27.664	7.77	36.52	28.089	7.93	36.33	27.784	7.96
B	QPSK	10	36.20	27.622	7.75	36.46	27.820	8.14	36.39	27.672	7.98
C	QPSK	10	36.21	27.795	7.65	36.46	27.795	7.95	36.63	28.108	7.87
D	QPSK	10	36.46	28.072	7.71	36.67	27.981	8.04	36.59	28.023	7.93
Total			42.27	33.812	-	42.55	33.944	-	42.51	33.921	-
Total Power+9.2dBi			51.47	43.012	-	51.75	43.144	-	51.71	43.121	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz))	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	15	36.37	26.129	7.66	36.45	26.278	8.15	36.37	26.207	7.82
B	QPSK	15	36.35	26.172	7.76	36.45	26.014	8.09	36.40	26.031	7.97
C	QPSK	15	36.57	26.304	7.80	36.67	26.321	8.12	36.62	26.659	7.95
D	QPSK	15	36.58	26.361	7.79	36.64	26.241	8.13	36.61	26.299	8.00
Total			42.49	32.263	-	42.57	32.236	-	42.52	32.326	-
Total Power+9.2dBi			51.69	41.463	-	51.77	41.436	-	51.72	41.526	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	20	36.42	25.174	7.80	36.41	25.046	8.07	36.42	25.395	7.84
B	QPSK	20	36.43	25.152	7.86	36.42	24.849	8.12	36.39	24.922	8.03

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C	QPSK	20	36.73	25.405	7.82	36.71	25.120	8.10	36.69	24.886	7.97
D	QPSK	20	36.71	25.245	7.85	36.72	25.209	8.10	36.67	25.160	8.00
Total			42.6	31.266	-	42.59	31.079	-	42.57	31.116	-
Total Power+9.2dBi			51.8	40.466	-	51.79	40.279	-	51.77	40.316	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	20+20	-	-	-	36.47	21.412	-	-	-	-
B	QPSK	20+20	-	-	-	36.48	21.208	-	-	-	-
C	QPSK	20+20	-	-	-	36.77	21.576	-	-	-	-
D	QPSK	20+20	-	-	-	36.78	21.664	-	-	-	-
Total			-	-	-	42.65	27.489	-	-	-	-
Total Power+9.2dBi			-	-	-	51.85	36.689	-	-	-	-

Configuration B:

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	5	35.85	30.099	7.68	36.54	30.512	7.98	36.14	30.298	7.71
B	QPSK	5	35.86	30.052	7.80	36.36	30.368	7.93	36.12	30.182	7.78
C	QPSK	5	35.93	30.057	7.71	36.45	30.416	7.98	36.23	30.292	7.72
D	QPSK	5	36.19	30.378	7.66	36.66	30.621	7.95	36.47	30.529	7.71
Total			41.98	36.169	-	42.52	36.501	-	42.26	36.348	-
Total Power+9.2dBi			51.18	45.369	-	51.72	45.701	-	51.46	45.548	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	10	36.14	27.664	7.77	36.38	27.811	8.11	36.32	27.936	7.72
B	QPSK	10	36.20	27.622	7.75	36.45	27.806	8.15	36.39	27.882	7.79
C	QPSK	10	36.21	27.795	7.65	36.46	27.868	8.10	36.62	28.221	7.73
D	QPSK	10	36.46	28.072	7.71	36.66	28.248	8.05	36.61	28.103	7.76
Total			42.27	33.812	-	42.51	33.958	-	42.51	34.058	-
Total Power+9.2dBi			51.47	43.012	-	51.71	43.158	-	51.71	43.258	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz))	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)

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A	QPSK	15	36.37	26.129	7.66	36.45	26.315	8.09	36.37	26.319	7.96
B	QPSK	15	36.35	26.172	7.76	36.43	26.032	8.18	36.38	26.109	7.84
C	QPSK	15	36.57	26.304	7.80	36.64	26.225	8.13	36.60	26.377	7.83
D	QPSK	15	36.58	26.361	7.79	36.62	26.124	8.12	36.59	26.302	7.88
Total			42.49	32.263	-	42.56	32.196	-	42.51	32.299	-
Total Power+9.2dBi			51.69	41.463	-	51.76	41.396	-	51.71	41.499	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	20	36.42	25.174	7.80	36.40	24.838	8.08	36.39	24.865	7.96
B	QPSK	20	36.43	25.152	7.86	36.41	24.858	8.06	36.37	24.918	7.94
C	QPSK	20	36.73	25.405	7.82	36.72	24.946	8.10	36.68	25.032	7.87
D	QPSK	20	36.71	25.245	7.85	36.71	25.117	8.11	36.66	24.977	7.90
Total			42.6	31.266	-	42.58	30.962	-	42.55	30.969	-
Total Power+9.2dBi			51.8	40.466	-	51.78	40.162	-	51.75	40.169	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	20+20	-	-	-	36.47	21.408	-	-	-	-
B	QPSK	20+20	-	-	-	36.48	21.424	-	-	-	-
C	QPSK	20+20	-	-	-	36.77	21.512	-	-	-	-
D	QPSK	20+20	-	-	-	36.78	21.693	-	-	-	-
Total			-	-	-	42.65	27.531	-	-	-	-
Total Power+9.2dBi			-	-	-	51.85	36.731	-	-	-	-

4 Occupied Bandwidth

Test result: Pass

4.1 Measurement Procedure

The EUT was set to transmit at maximum power and testing was carried out on bottom, middle and top channels. Using the Occupied Bandwidth measurement function in the spectrum analyzer, the 26dB bandwidth was measured in accordance with FCC KDB 971168 D01 Clause 4.2.

The measurement method is from KDB 971168 4.2:

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least $10\log(\text{OBW} / \text{RBW})$ below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

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4.2 Measurement result

Configuration A:

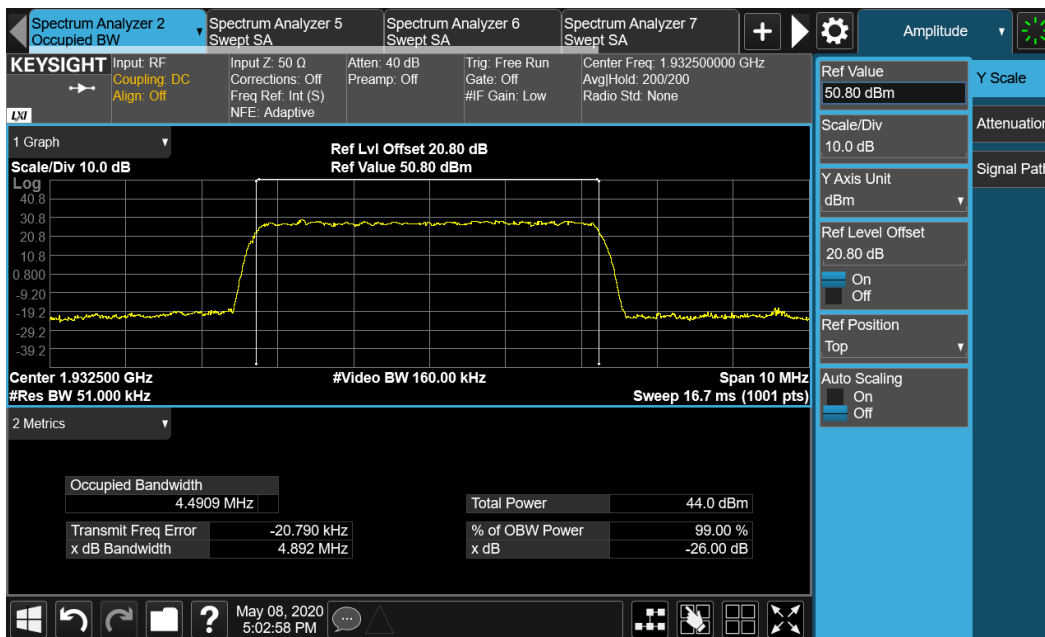
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	5MHz	4.4909	4.5026	4.5008
D	QPSK	10MHz	9.2569	9.2680	9.2647
D	QPSK	15MHz	14.076	14.084	14.075
D	QPSK	20MHz	18.889	18.912	18.926
D	QPSK	20MHz+20MHz	-	38.728	-

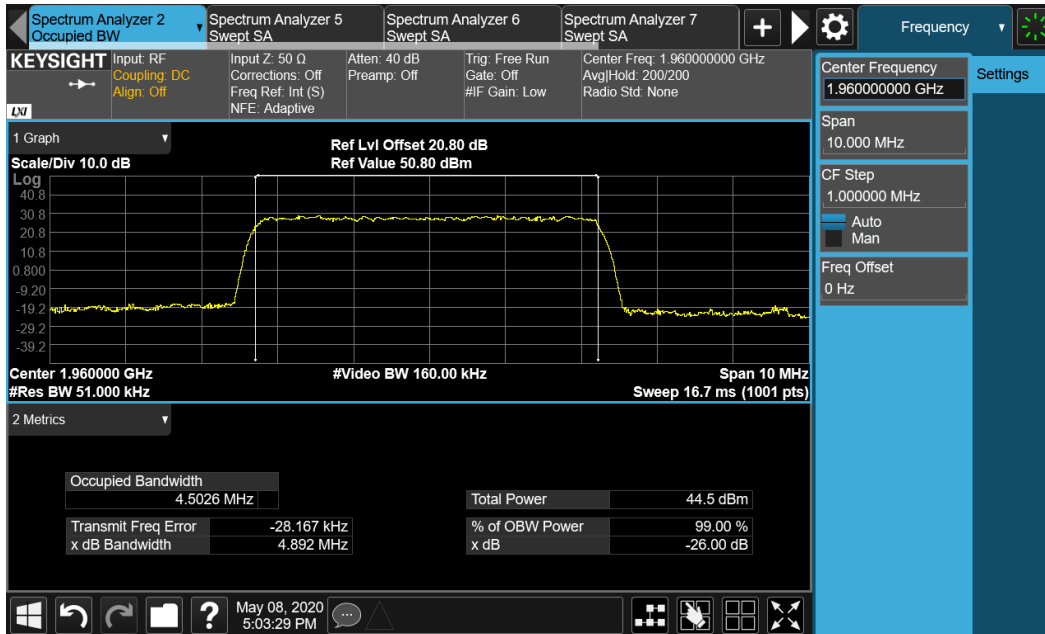
-26dBc Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	5MHz	4.892	4.892	4.881
D	QPSK	10MHz	9.782	9.820	9.795
D	QPSK	15MHz	14.71	14.73	14.73
D	QPSK	20MHz	19.77	19.80	19.75
D	QPSK	20MHz+20MHz	-	39.85	-

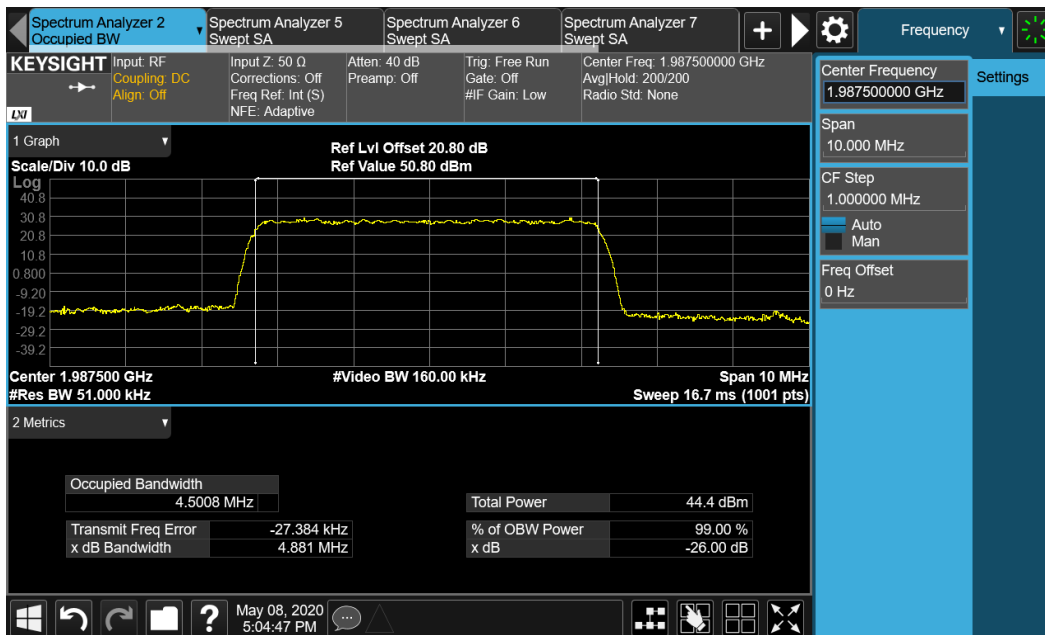
QPSK, 5MHz, Channel position B



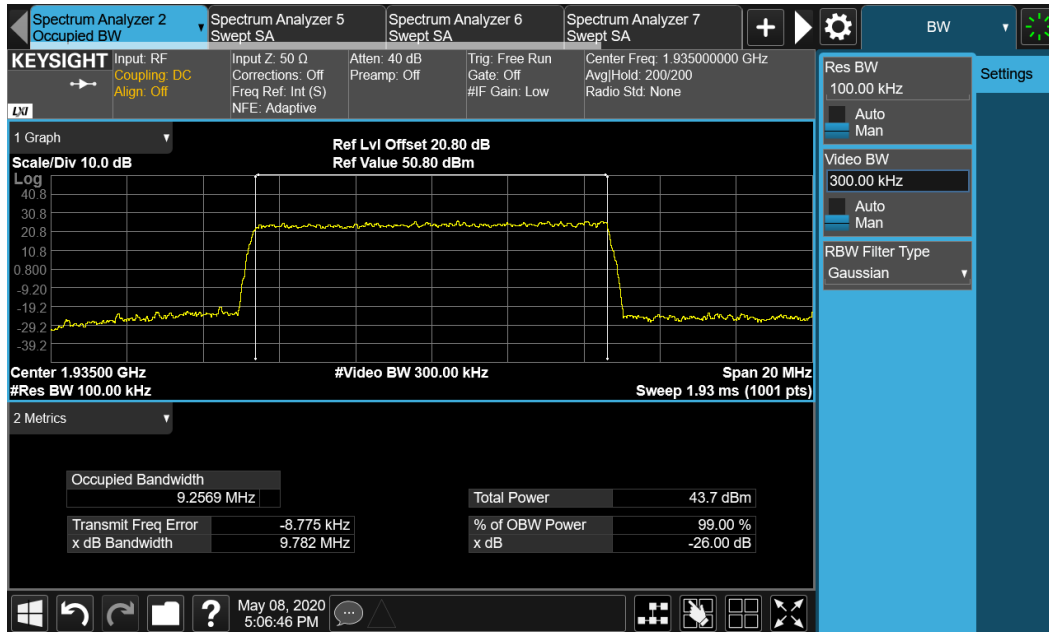
QPSK, 5MHz, Channel position M



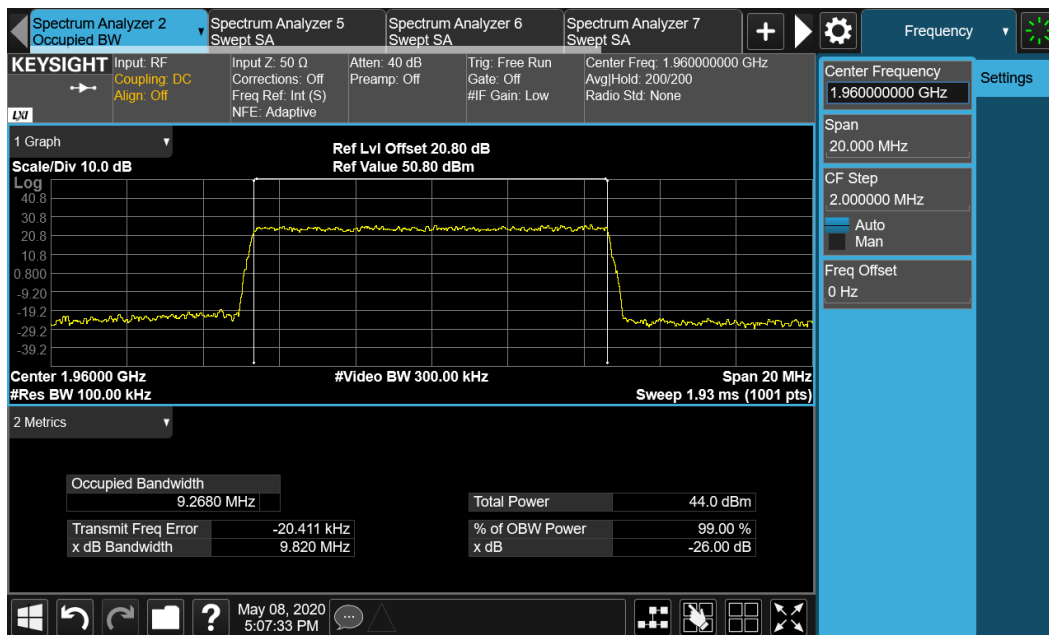
QPSK, 5MHz, Channel position T



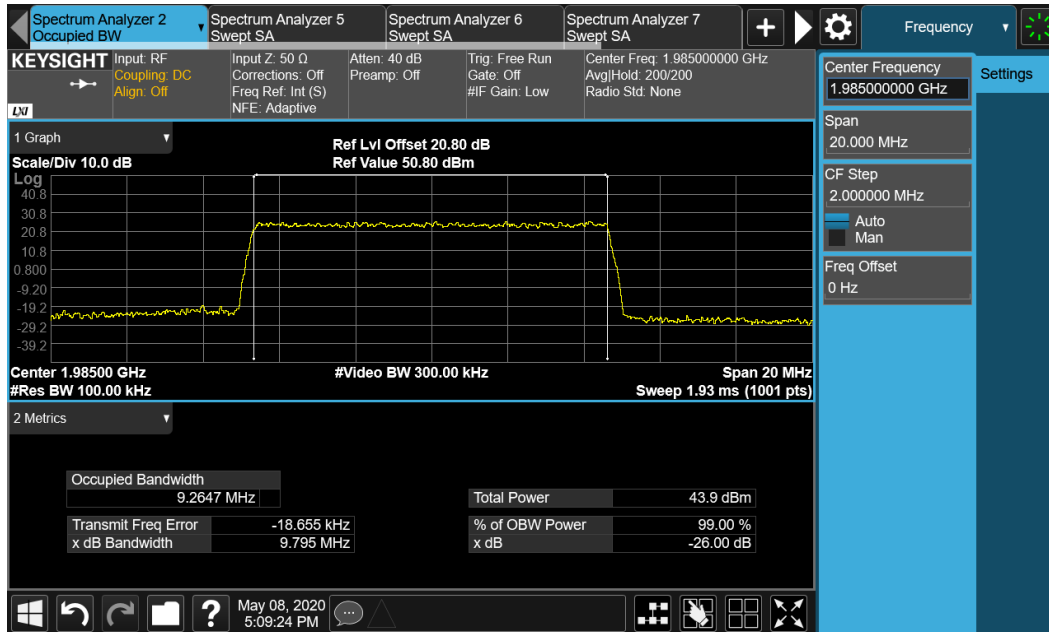
QPSK, 10MHz, Channel position B



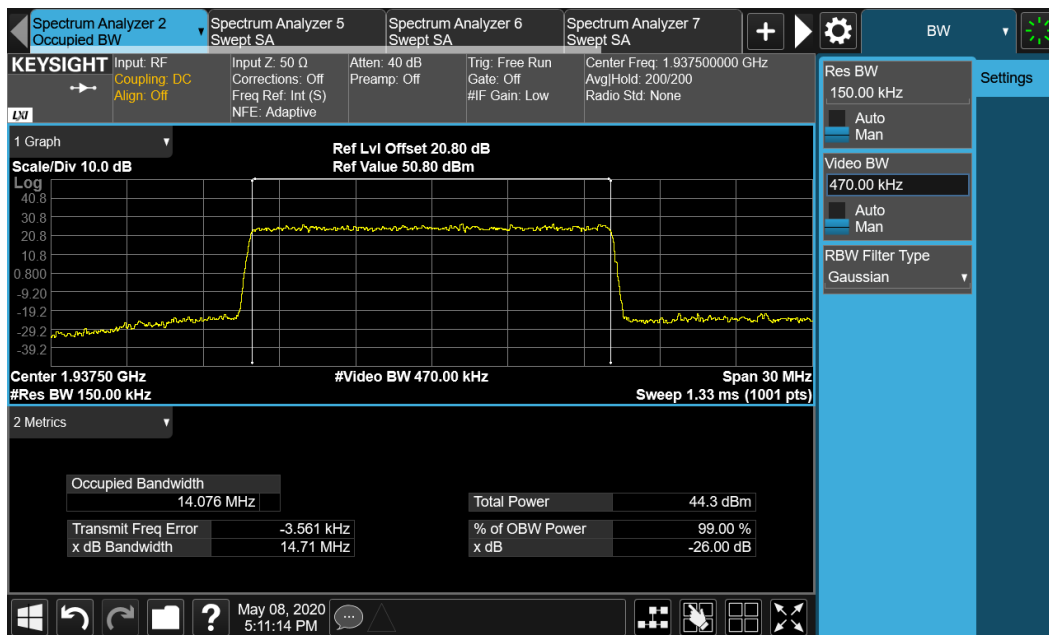
QPSK, 10MHz, Channel position M



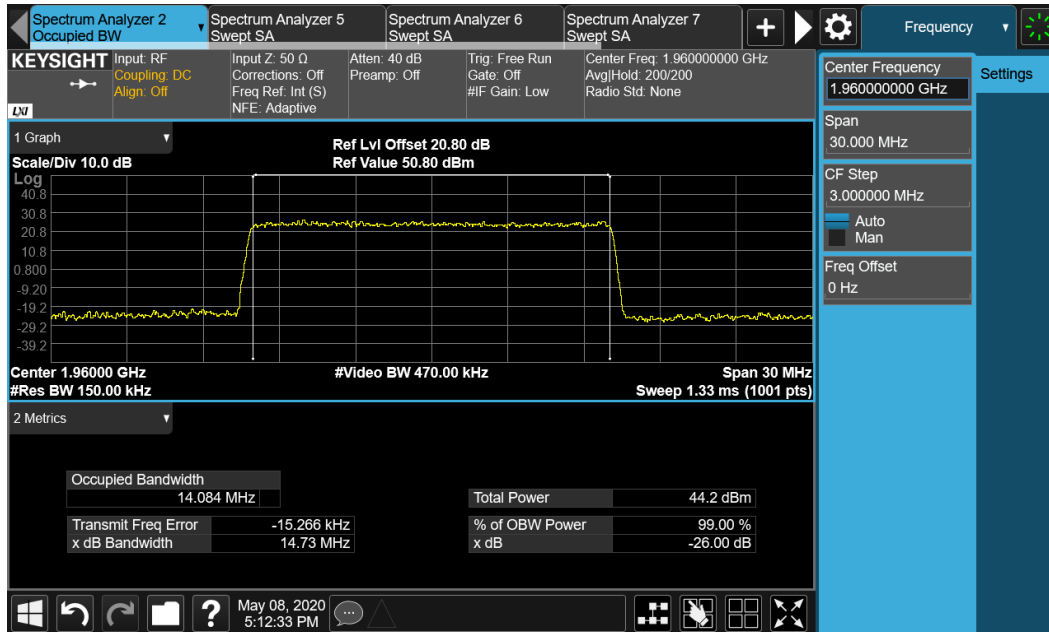
QPSK, 10MHz, Channel position T



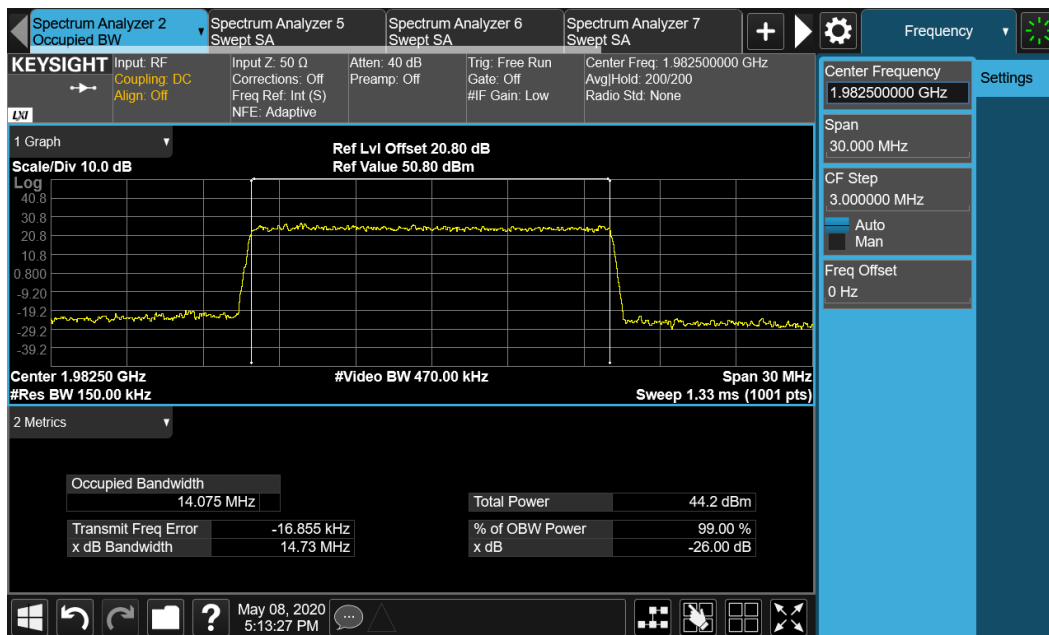
QPSK, 15MHz, Channel position B



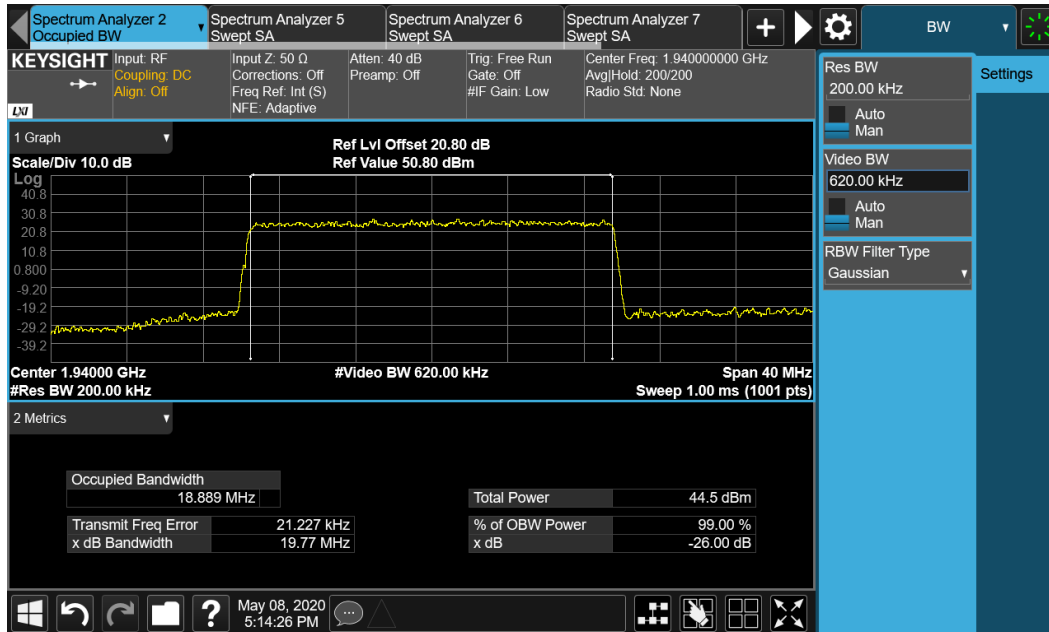
QPSK, 15MHz, Channel position M



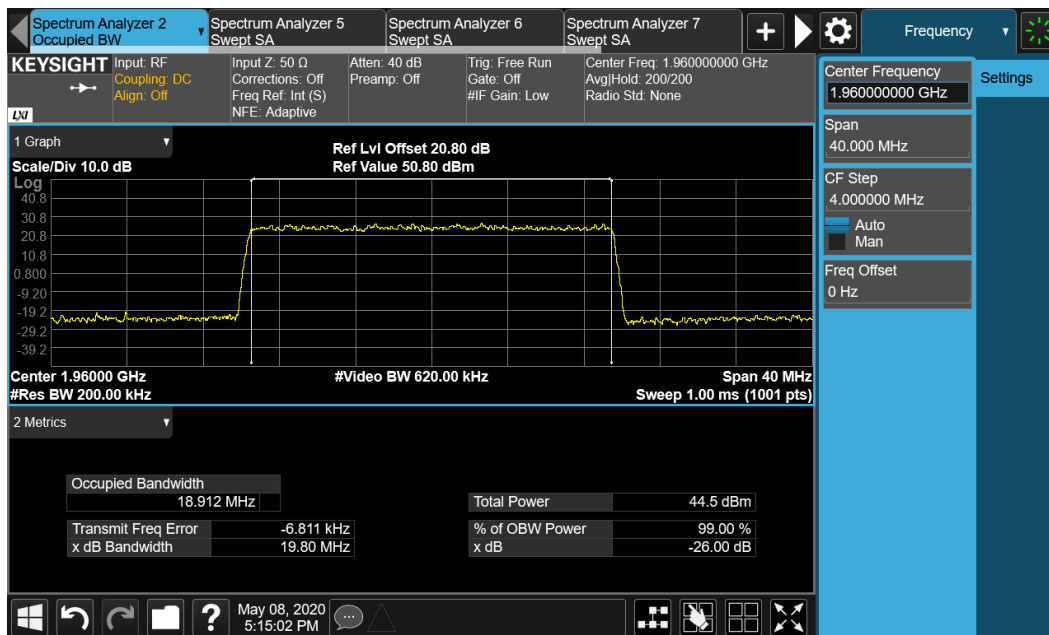
QPSK, 15MHz, Channel position T



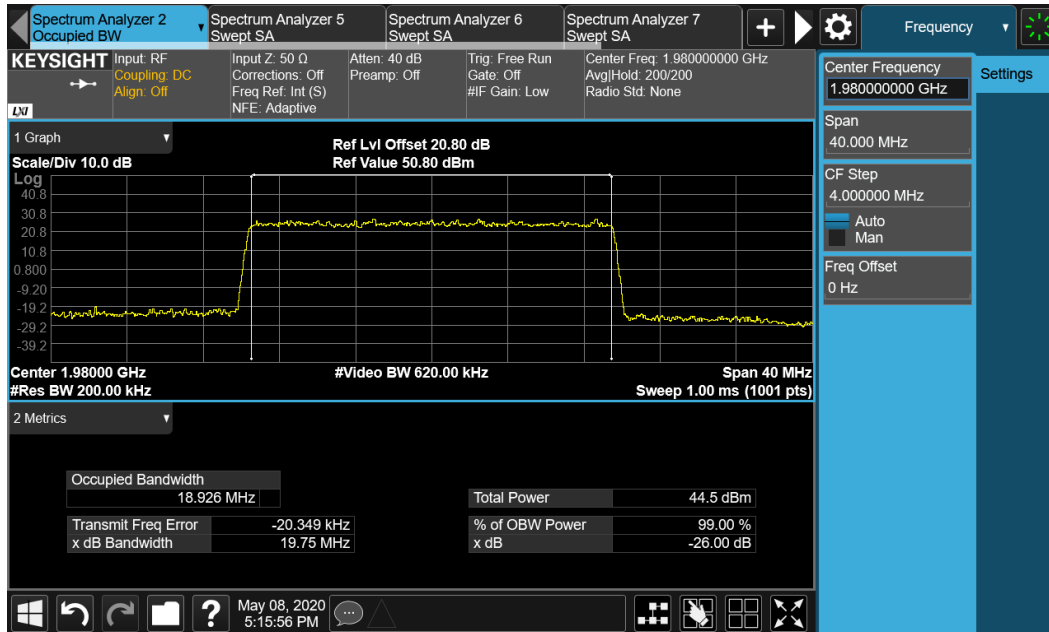
QPSK, 20MHz, Channel position B



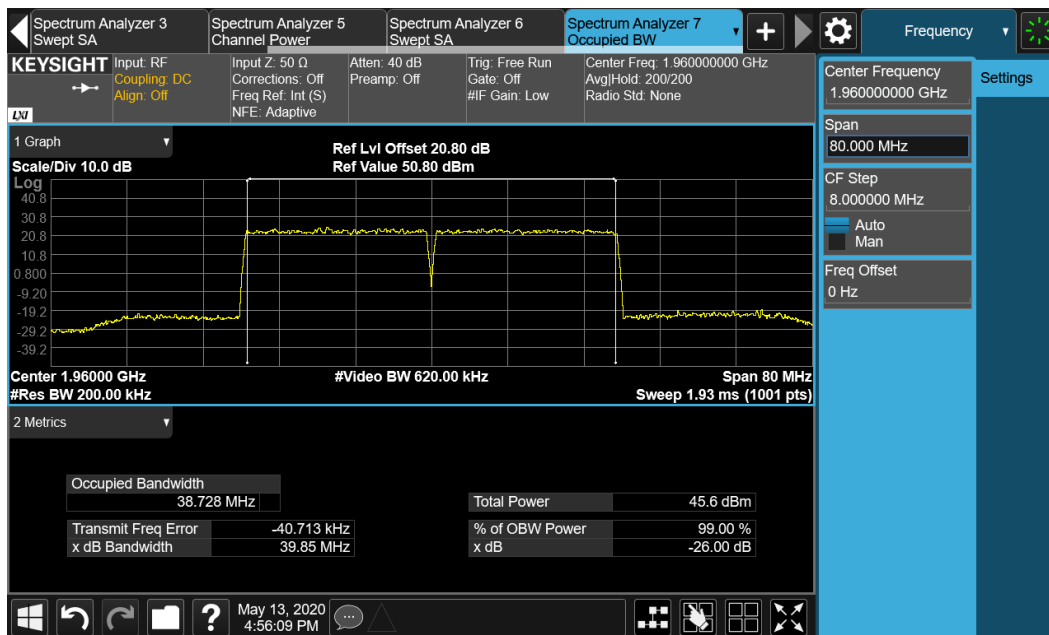
QPSK, 20MHz, Channel position M



QPSK, 20MHz, Channel position T



QPSK, 20MHz+20MHz, Channel position M



Configuration B:

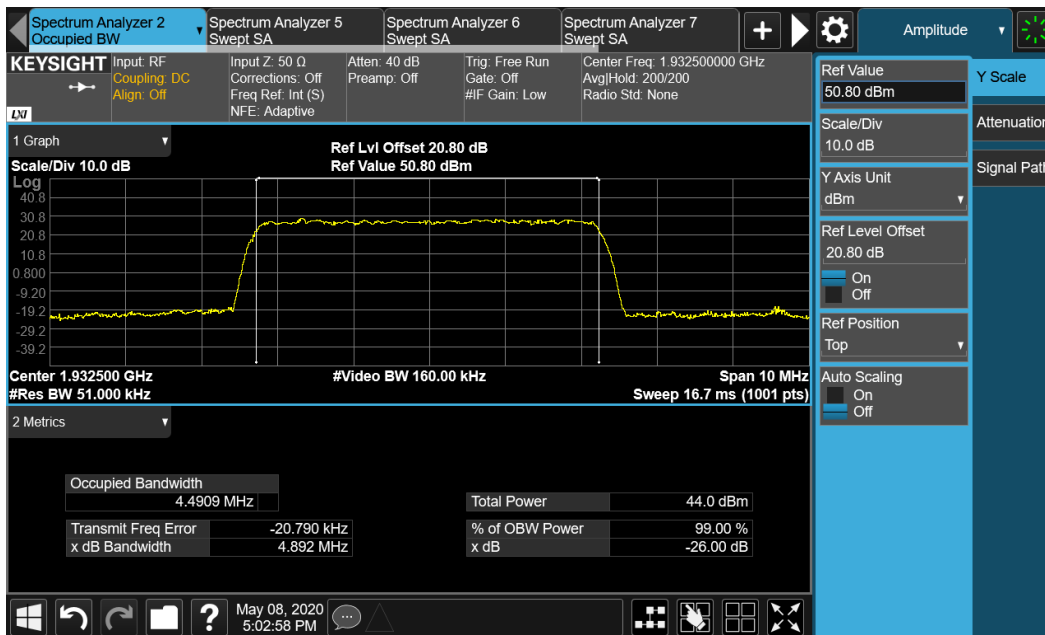
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	5MHz	4.4909	4.5043	4.4873
D	QPSK	10MHz	9.2569	9.2673	9.2657
D	QPSK	15MHz	14.076	14.062	14.071
D	QPSK	20MHz	18.889	18.897	18.905
D	QPSK	20MHz+20MHz	-	38.689	-

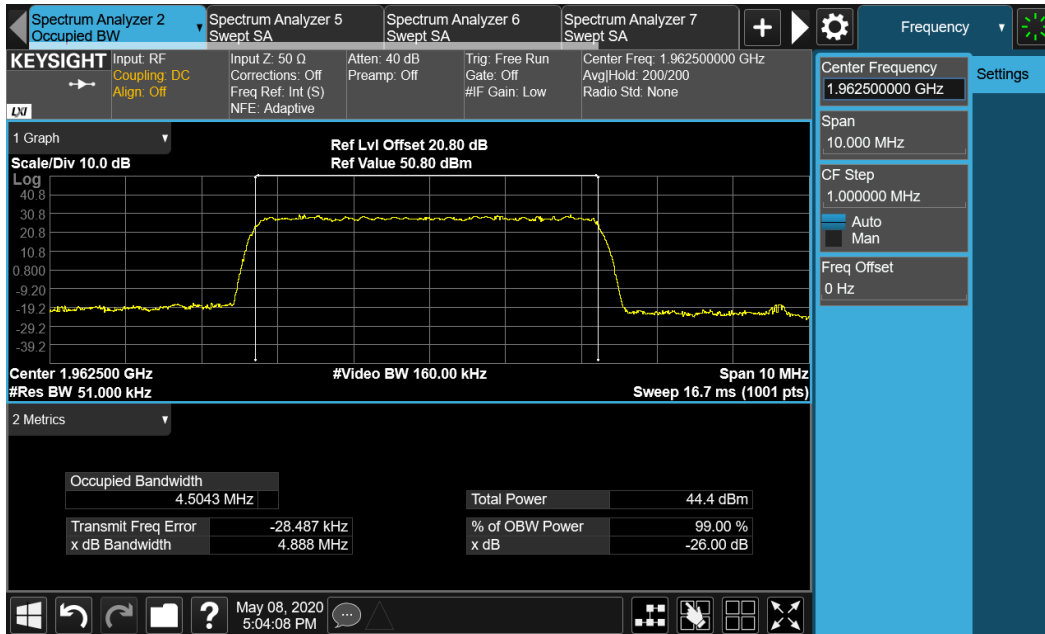
-26dBc Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	5MHz	4.892	4.888	4.881
D	QPSK	10MHz	9.782	9.790	9.807
D	QPSK	15MHz	14.71	14.72	14.73
D	QPSK	20MHz	19.77	19.76	19.75
D	QPSK	20MHz+20MHz	-	39.82	-

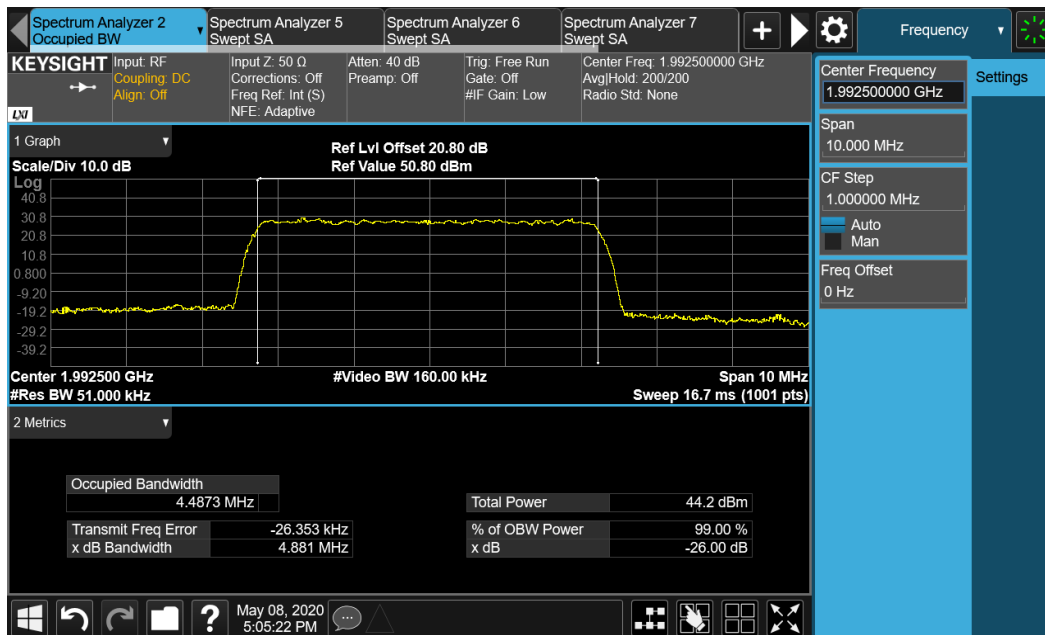
QPSK, 5MHz, Channel position B



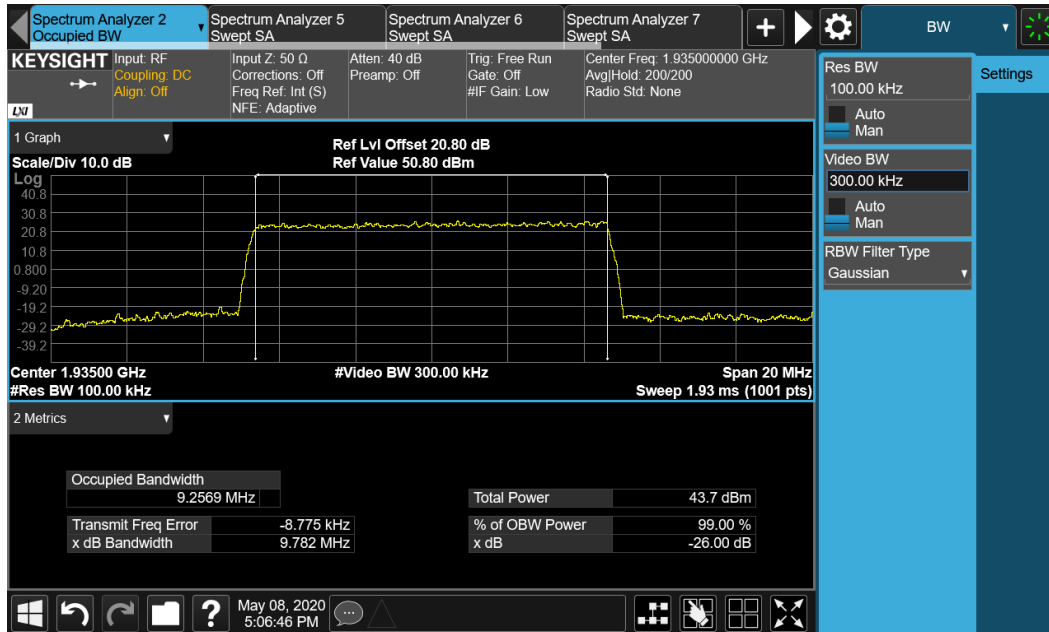
QPSK, 5MHz, Channel position M



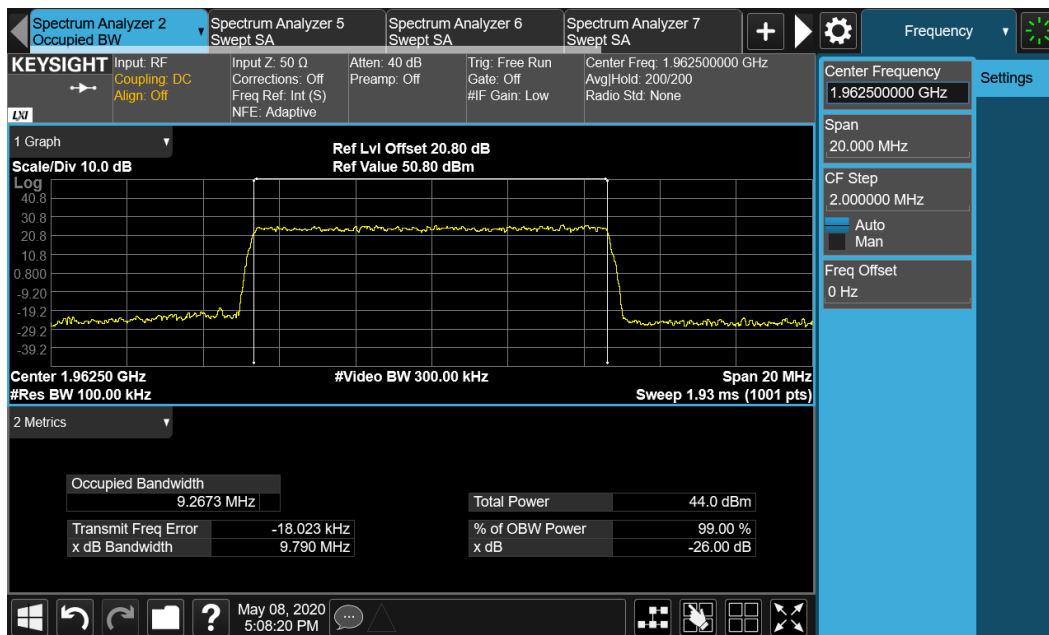
QPSK, 5MHz, Channel position T



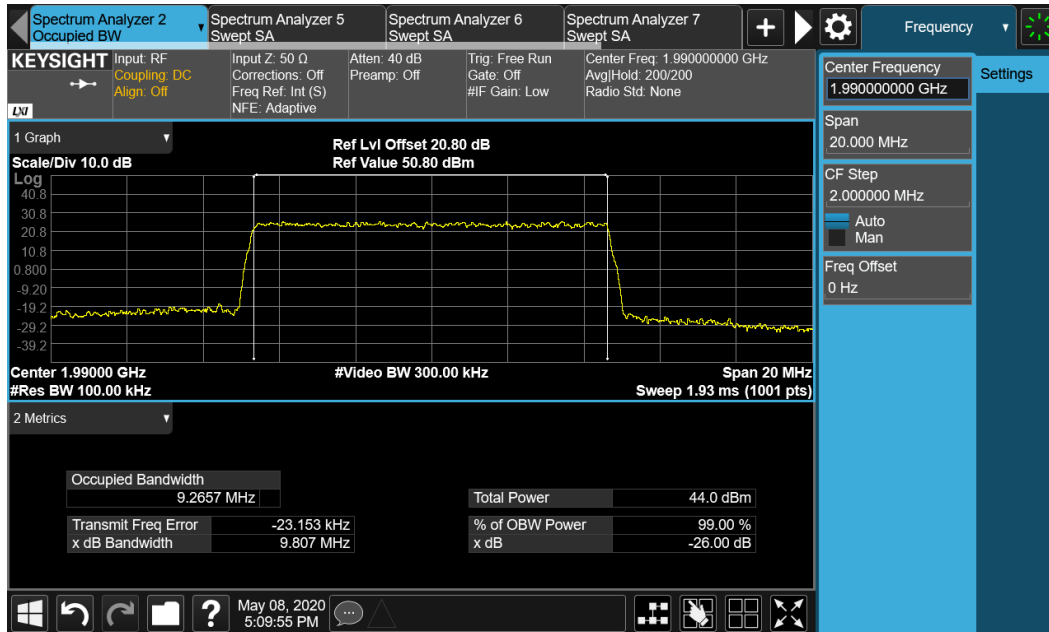
QPSK, 10MHz, Channel position B



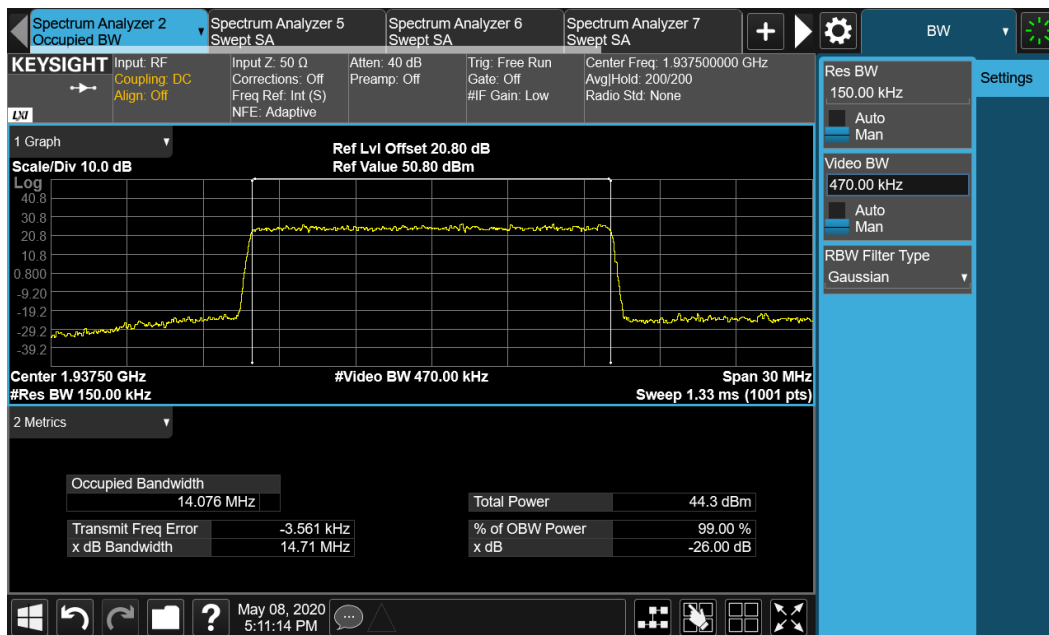
QPSK, 10MHz, Channel position M



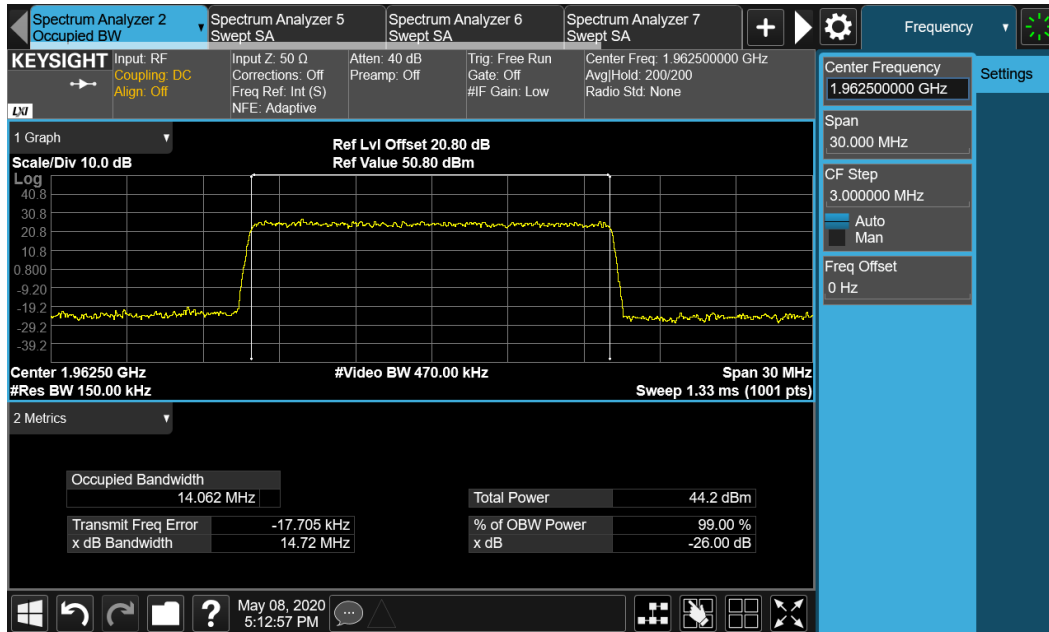
QPSK, 10MHz, Channel position T



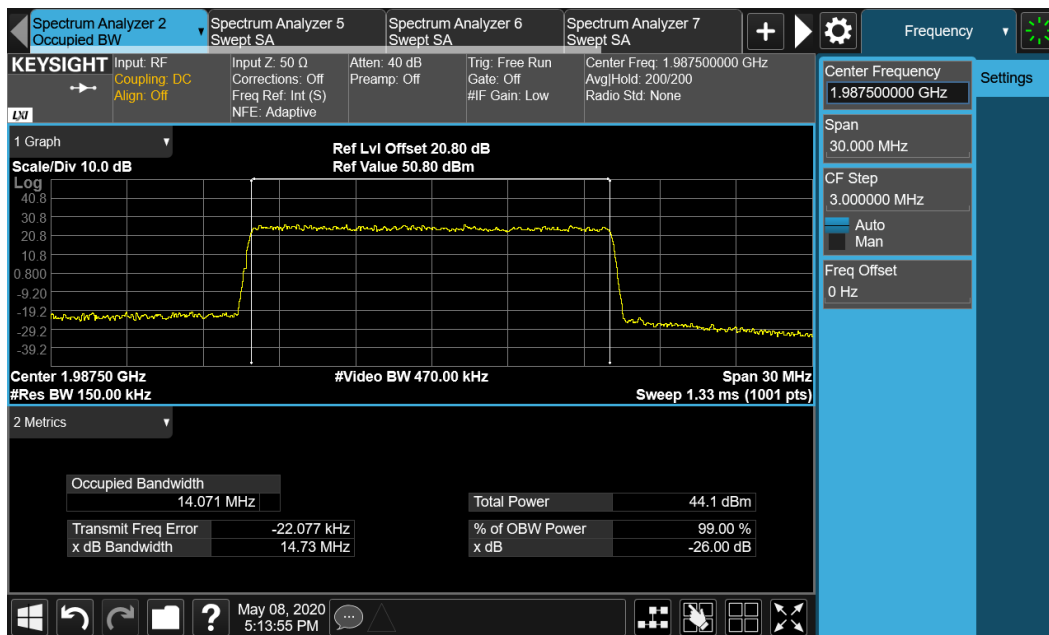
QPSK, 15MHz, Channel position B



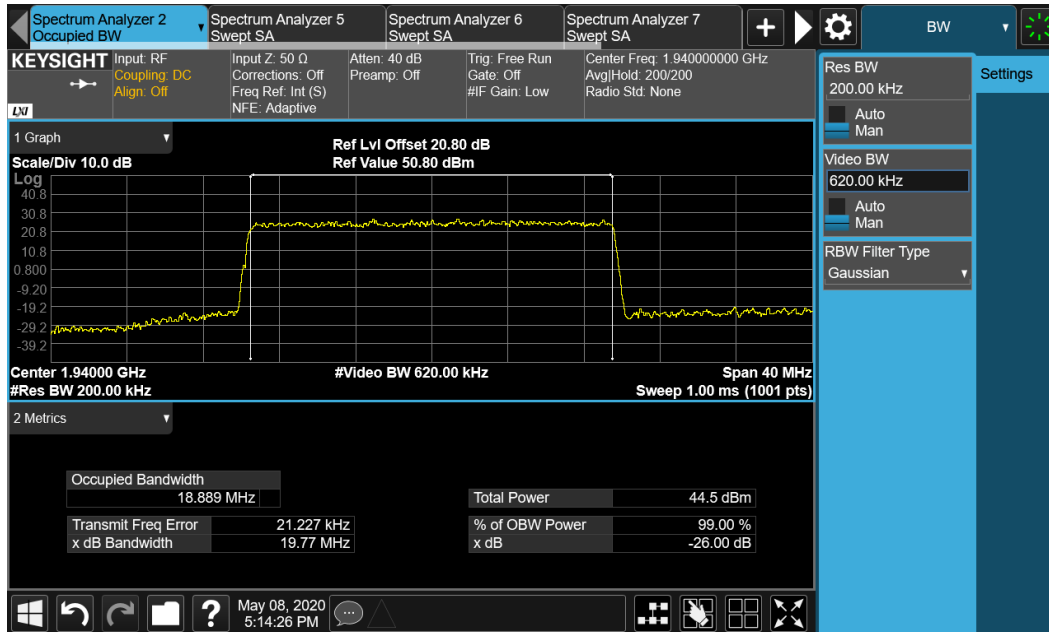
QPSK, 15MHz, Channel position M



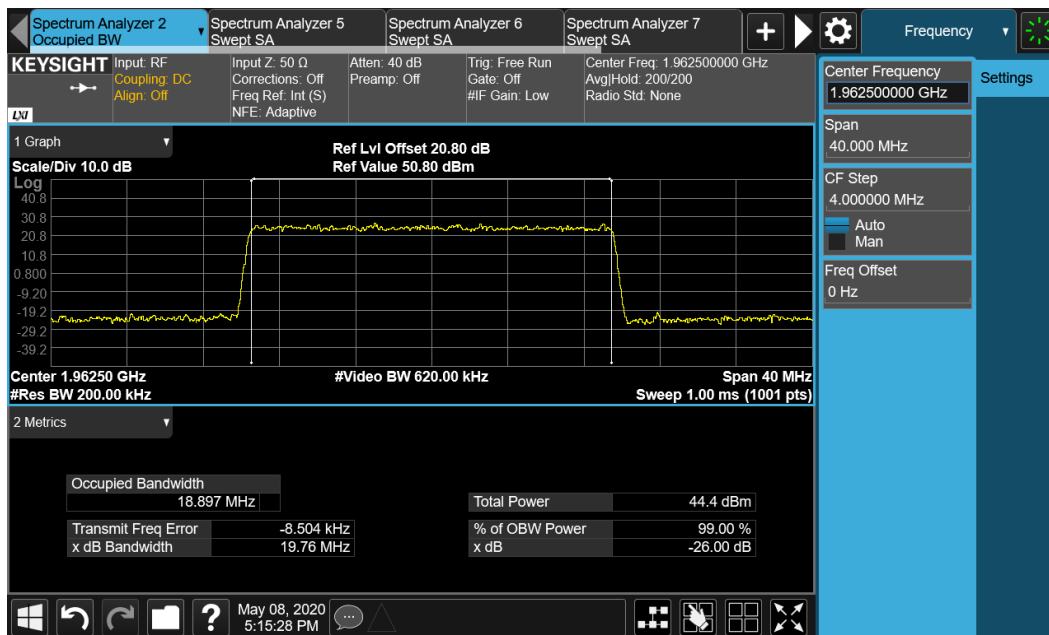
QPSK, 15MHz, Channel position T



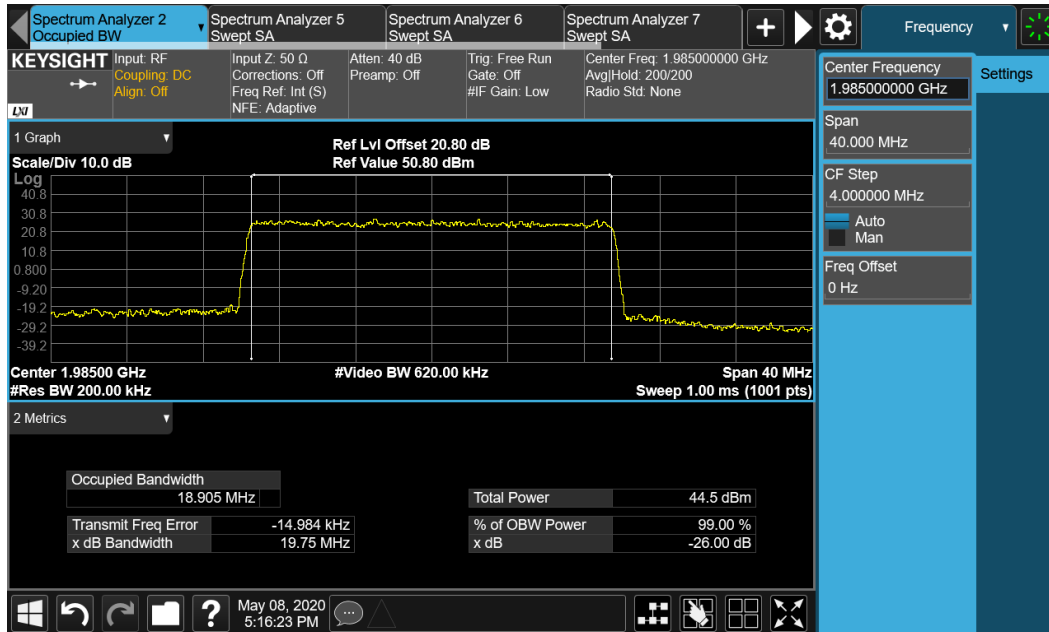
QPSK, 20MHz, Channel position B



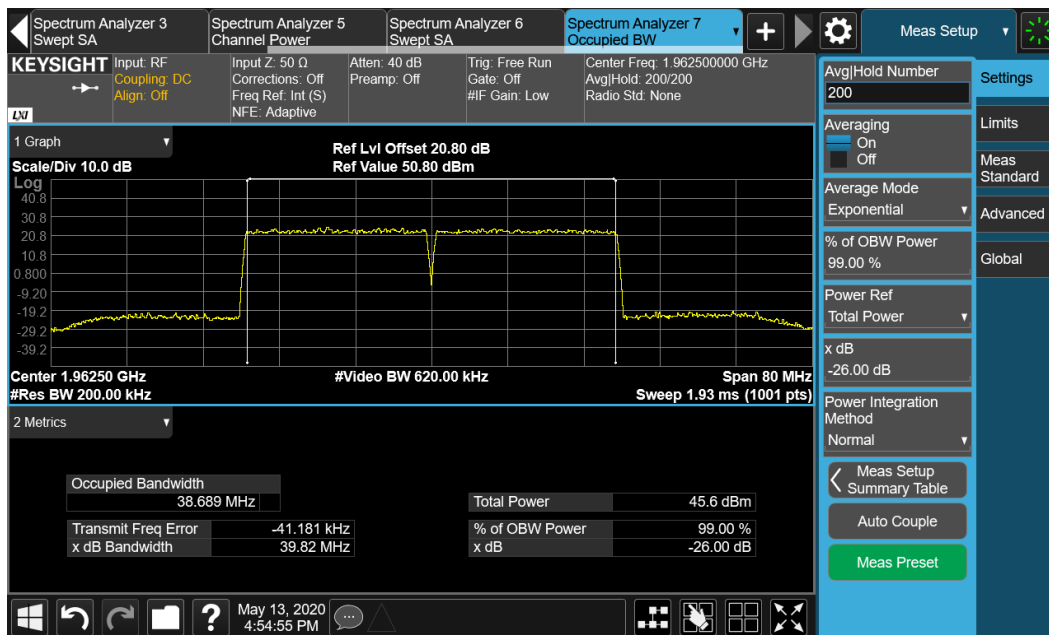
QPSK, 20MHz, Channel position M



QPSK, 20MHz, Channel position T



QPSK, 20MHz+20MHz, Channel position M



5 Unwanted Emissions at Band Edge

Test result: Pass

5.1 Limit

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

5.2 Measurement Procedure

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

For MIMO mode configurations, the limit was adjusted with a correction of -6.02dB [$10\log(1/4)$] by using the Measure and Add $10\log(N)$ dB technique according to KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports . Then the limit was adjusted to -19.02dBm .

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed and a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges. The limit was adjusted with -6.99dB [$10\log(200/1000)$] to compensate for the reduce measurement bandwidth 200kHz for emission more than 1MHz away from the band edges. For MIMO mode, the limit of -26.01dBm was used for emission more than 1MHz away from the band edges. For Non-MIMO mode, the limit of -19.02dBm was used for emission more than 1MHz away from the band edges.

Spectrum analyzer detector was set as RMS.

5.3 Measurement result

Configuration A:

Antenna Port	Channel Position	Modulation	Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	5	51	-19.02
				200	-26.01
D	T	QPSK	5	51	-19.02
				200	-26.01

Channel Position B



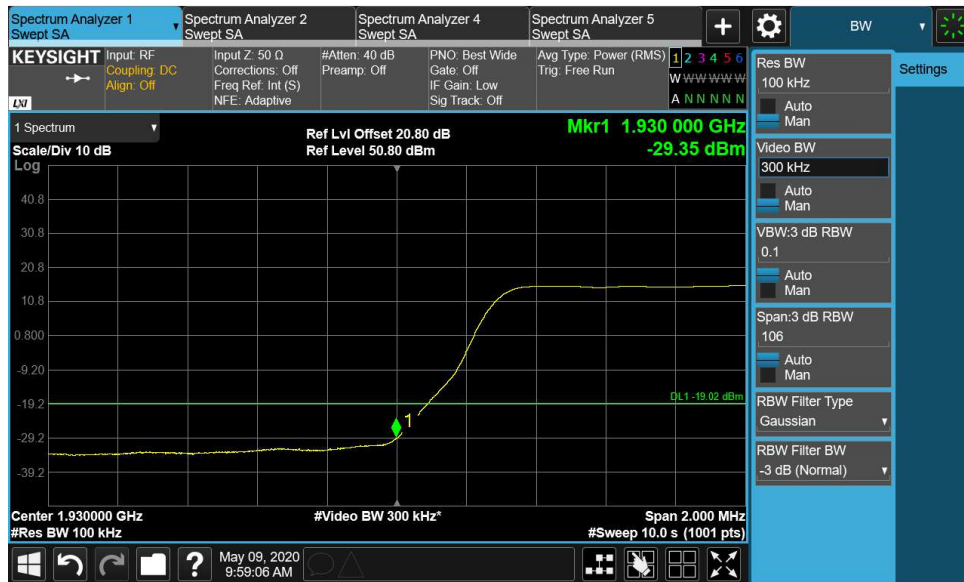
Channel Position T



TEST REPORT

Antenna Port	Channel Position	Modulation	Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	10	100	-19.02
				200	-26.01
D	T	QPSK	10	100	-19.02
				200	-26.01

Channel Position B



Channel Position T



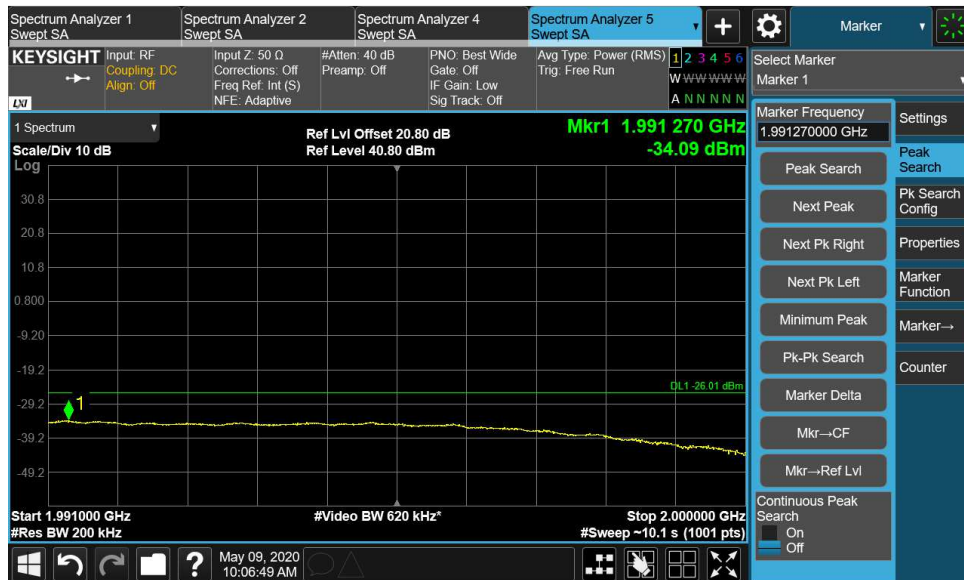
TEST REPORT

Antenna Port	Channel Position	Modulation	Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	15	150	-19.02
				200	-26.01
D	T	QPSK	15	150	-19.02
				200	-26.01

Channel Position B



Channel Position T



TEST REPORT

Antenna Port	Channel Position	Modulation	Channel Bandwidth (MHz)	RBW (kHz)	Limit (dBm)
D	B	QPSK	20	200	-19.02
				200	-26.01
D	T	QPSK	20	200	-19.02
				200	-26.01

Channel Position B



Channel Position T

