

FCC Test Report

Product Name : Verizon Receiver
Brand Name : Verizon
Model No. : LV65
FCC ID : NKR-LVSK-65

Applicant : Wistron NeWeb Corporation
Address : 20 Park Avenue II, Hsinchu Science Park,
Hsinchu 308, Taiwan

Date of Receipt : Mar. 09, 2022
Issued Date : Jun. 21, 2022
Report No. : 2230313R-RFUSWWAV06-A
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 : Verizon Receiver
Applicant : Wistron NeWeb Corporation
Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan
Manufacturer : Wistron NeWeb Corporation
Address : 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan
Brand Name : Verizon
Model No. : LV65
FCC ID : NKR-LVSK-65
EUT Voltage : AC 100-120V / 50-60Hz
Testing Voltage : AC 120V/60Hz
Applicable Standard : 47 CFR FCC Part 96
Test Result : Complied

Documented By : 
(Senior Project Specialist / Genie Chang)
Approved By : 
(Manager / Tim Sung)

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Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	Jun. 21, 2022

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1. General Information

1.1. EUT Description

Product Name	Verizon Receiver		
Brand Name	Verizon		
Model No.	LV65		
Frequency Range	LTE Band 48	3550 ~ 3700 MHz (Uplink) 3550 ~ 3700 MHz (Downlink)	
	5G NR n48	3550 ~ 3700 MHz (Uplink) 3550 ~ 3700 MHz (Downlink)	
Bandwidth	LTE Band 48	5 / 10 / 15 / 20 MHz	
	5G NR n48	SCS: 30 kHz	10 / 20 / 30 / 40 MHz
Type of Modulation	LTE Band 48	QPSK / 16QAM / 64QAM / 256QAM	
	5G NR n48	pi/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM	
Maximum RF Output Power	LTE Band 48	19.96 dBm	
	5G NR n48	19.99 dBm	
Hardware Version	0.0.5		
Software Version	0.2.10.1		
IMEI No.	35345010		

<For Model No.: LV65>

Accessories Information				
No.	Equipment Name	Brand Name	Model No.	Rating
1	PoE Adapter	DELTA	ADH-65BR H	INPUT: AC 100-1200V, 50-60Hz, 2.0A OUTPUT: DC 56.0V, 1.161A, 65.02W
No.	Equipment Name	Brand Name	Description	Remark
2	RJ-45 Cable	WNC	Non-Shielded, 4.5m	Installed in the EUT
3	RJ-45 Cable	WNC	Non-Shielded, 3m	-
4	Cable adapter	WNC	-	-

Antenna Information					
Ant.	Brand Name	Model No.	Type	Band	Gain (dBi)
0	WNC	LV65-LTE/FR1-0	PIFA	LTE Band 48 5G NR n48	3
1	WNC	LV65-LTE/FR1-1	Monopole		
2	WNC	LV65-LTE/FR1-2	PIFA		
3	WNC	LV65-LTE/FR1-3	Monopole		

For SA mode:

Band	ANT0		ANT1		ANT2		ANT3	
	TX	RX	TX	RX	TX	RX	TX	RX
LTE Band 48	-	V	-	V	-	V	V	V
5G NR n48	-	V	-	V	-	V	V	V

For NSA mode:

Configuration	Band	ANT0		ANT1		ANT2		ANT3	
		TX	RX	TX	RX	TX	RX	TX	RX
LTE(LB) + 5G NR n48	LTE(LB)	V	V	-	V	-	V	-	V
	5G NR n48	-	V	-	V	-	V	V	V
LTE(MB) + 5G NR n48	LTE(MB)	-	V	V	V	-	V	-	V
	5G NR n48	-	V	-	V	-	V	V	V
LTE(CB) + 5G NR n48	LTE(CB)	-	V	-	V	-	V	V	V
	5G NR n48	-	V	-	V	V	V	-	V

Note:

1. The EUT description is from the customer declaration.
2. LB: Low-Band, means LTE B5/B13
3. MB: Mid-Band, means LTE B2/B66
4. CB: C-Band, means LTE B48

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 48 Mode 2: 5G NR n48
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Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 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.
3. The device was tested under all configurations, combinations, bandwidths, RB configurations and modulations, and the worst case was found in QPSK modulation for LTE and SA mode pi/2 BPSK modulation for 5G NR, therefore the "Conducted Band Edge" & "Spurious Emission" test items perform QPSK modulation for LTE and SA mode pi/2 BPSK modulation for 5G NR in this report.
4. For 5G NR, "Peak to Average Ratio" test item shown worst case modulation pi/2 BPSK, QPSK and 16QAM on this report.
5. The product both supports the standalone and inter-carrier aggregation mode. After evaluation and comparison, the worst case is investigated in the standalone mode. Therefore, there is only displayed the test result for standalone mode in the test report.

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.

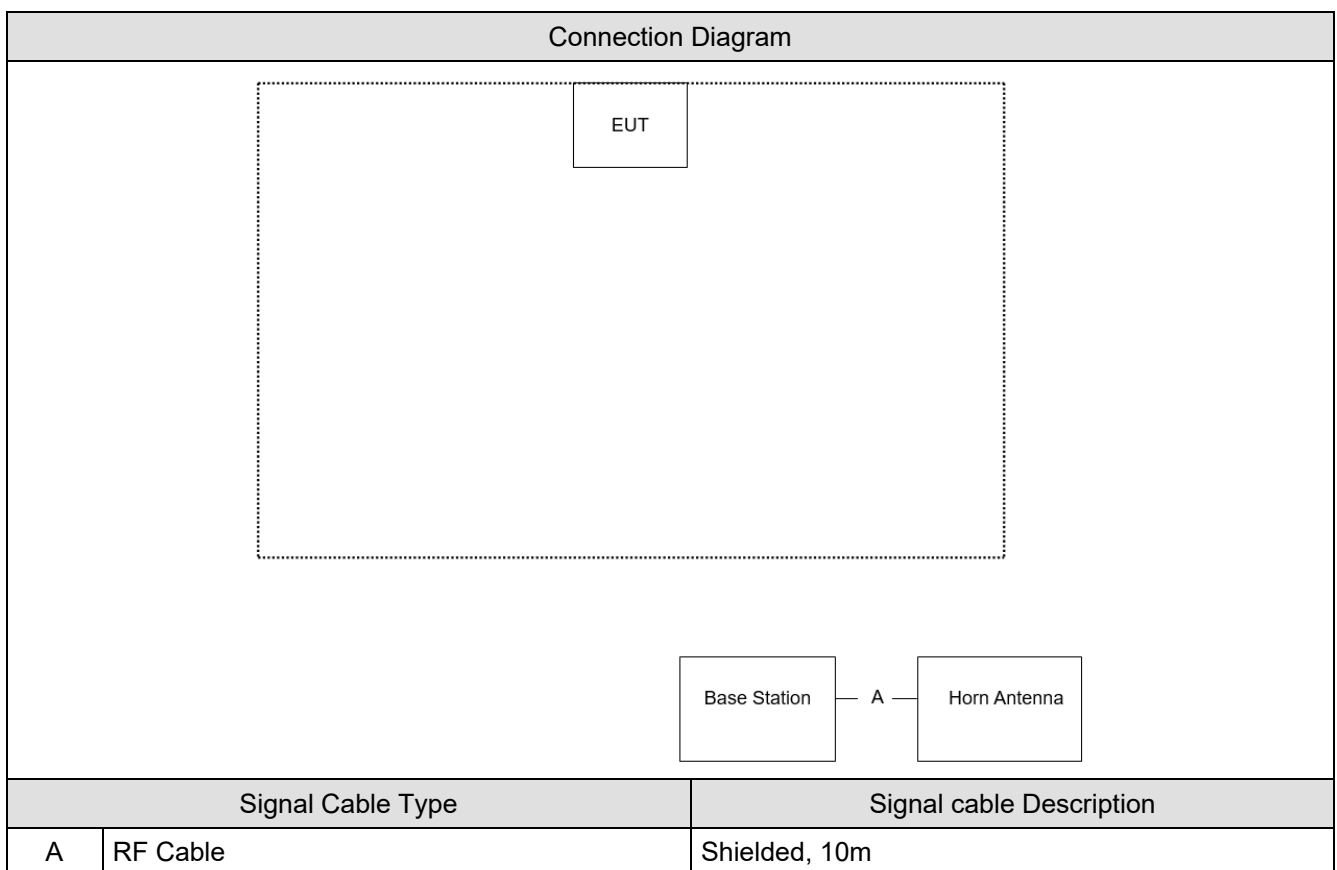
Mode 1: LTE Band 48

	Product	Manufacturer	Model No.	Serial No.
1	Base Station	Anritsu	MT8820C	6201465467
2	Horn Antenna	Schwarzbeck	BBHA 9120D	1640

Mode 2: 5G NR n48

	Product	Manufacturer	Model No.	Serial No.
1	Base Station	Keysight	E7515B	MY59321672
2	Horn Antenna	Schwarzbeck	BBHA 9120D	1640

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)

1.7. Test Environment

Ambient conditions in the laboratory:

Items	Test Item	Actually	Tested by	Test Date	Test Site
Temperature (°C)	RF Output Power	22 ~ 26	Daniel Wu	2022/04/14 ~ 2022/04/27	HY-SR03
Humidity (%RH)		60 ~ 69			
Temperature (°C)	Occupied Bandwidth	22 ~ 26	Daniel Wu	2022/04/11 ~ 2022/04/27	HY-SR03
Humidity (%RH)		60 ~ 69			
Temperature (°C)	Spurious Emission at Antenna	22 ~ 26	Daniel Wu	2022/04/26 ~ 2022/04/27	HY-SR03
Humidity (%RH)	Terminals	60 ~ 69			
Temperature (°C)	Conducted Spurious Emission	22 ~ 26	Daniel Wu	2022/04/14 ~ 2022/04/28	HY-SR03
Humidity (%RH)		60 ~ 69			
Temperature (°C)	Radiated Spurious Emission	23	Daniel Wu	2022/04/26	HY-CB01
Humidity (%RH)		60			
Temperature (°C)	Frequency Stability	22 ~ 26	Daniel Wu	2022/04/14 ~ 2022/04/28	HY-SR03
Humidity (%RH)		60 ~ 69			
Temperature (°C)	Peak to Average Ratio	22 ~ 26	Daniel Wu	2022/04/06 ~ 2022/04/27	HY-SR03
Humidity (%RH)		60 ~ 69			

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : **FCC Registration Number: TW0033**
Canada : **CAB Identifier Number: TW3023 / Company Number: 26930**

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:

Site Description	Accredited by TAF Accredited Number: 3023
Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone number	+886-3-275-7255
Fax number	+866-3-327-8031
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw

1.8. List of Test Equipment

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2021/08/11	2022/08/10
Horn Antenna	ETS-Lindgren	3117	00201259	2021/11/09	2022/11/08
Horn Antenna	Com-Power	AH-1840	101101	2021/11/30	2022/11/29
Pre-Amplifier	SGH	0301	20211007-7	2022/02/22	2023/02/21
Pre-Amplifier	EMCI	EMC051835SE	980312	2022/02/22	2023/02/21
Pre-Amplifier	SGH	PRAMP184	20200705	2021/08/11	2022/08/10
Coaxial Cable	EMCI	EMC102-KM-KM-600	160312	2022/02/16	2023/02/15
Coaxial Cable	HUBER+SUHNER	SUCOFLEX 102	MY3382/2	2022/02/16	2023/02/15
Spectrum Analyzer	R&S	FSV3044	101115	2022/01/10	2023/01/09
Coaxial Cable	SUHNER	SUCOFLEX 106	25450/6	2022/03/22	2023/03/21
Coaxial Cable	SGH	HA800	GD20110222-8	2022/03/22	2023/03/21
Coaxial Cable	SGH	SGH18	2021003-8	2022/03/22	2023/03/21
Coaxial Cable	EMCI	EMC106	151113	2022/03/22	2023/03/21
UXM 5G Wireless Test Platform	Keysight	E7515B	MY59321672	2021/05/26	2022/05/25
Universal Radio Communication Tester	Anritsu	MT8820C	6201465467	2021/08/13	2022/08/12
Temperature Chamber	KSON	THS-D4T-100	A0606	2021/08/24	2022/08/23
Radiated Software	AUDIX	e3 V9	N/A	N/A	N/A

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

1.9. Measurement Uncertainty

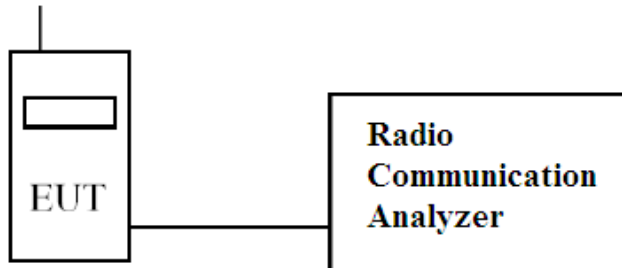
Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Test Item	Uncertainty
RF Output Power	± 1.126 dB
Occupied Bandwidth	± 682.83 Hz
Peak to Average Ratio	± 1.126 dB
Conducted Band Edge	± 1.126 dB
Conducted Spurious Emissions	± 1.126 dB
Radiated Spurious Emissions	± 4.06 dB below 1 GHz ± 3.73 dB above 1 GHz
Frequency Stability	± 103.92 Hz

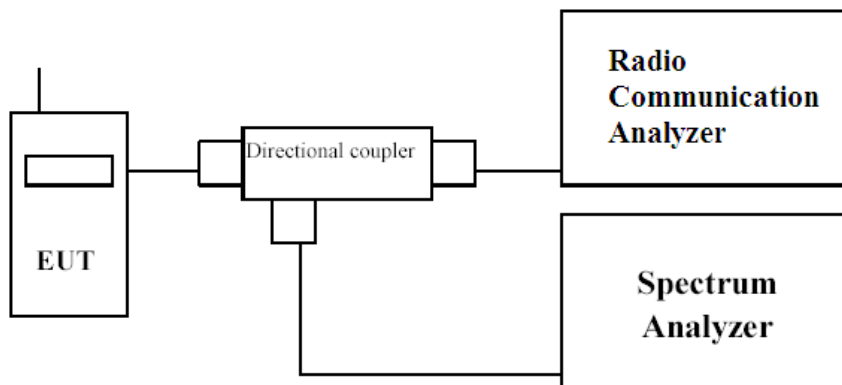
2. RF Output Power

2.1. Test Setup

Conducted Power



Channel Power



2.2. Test Limit

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

2.3. Test Procedure

Conducted Power:

The EUT is tested with maximum rated TX power via the Base Station simulator, and the output power was measured at the antenna terminals of the EUT.

Channel Power:

1. Channel power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz.
3. VBW $\geq 3 \times$ RBW.
4. Span = 1.5 times the OBW.
5. No. of sweep points $> 2 \times$ span / RBW.
6. Detector = RMS.
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was set to 10MHz.
9. Trace mode = trace averaging (RMS) over 100 sweeps.
10. The trace was allowed to stabilize.

2.4. Test Specification

According to FCC Part 2.1046, 96.41(b)

2.5. Test Result of RF Output Power

Mode 1: LTE Band 48

Mode					Conducted Power				EIRP Power				Limit
BW (MHz)	Channel	Frequency (MHz)	RB No.	RB Offset	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)	QPSK EIRP(W)	16-QAM EIRP(W)	64-QAM EIRP(W)	256-QAM EIRP(W)	Limit EIRP(W)
5	55265	3552.5	1	0	19.94	19.01	18.21	15.07	0.197	0.159	0.132	0.064	0.2
5	55265	3552.5	1	12	19.30	18.79	18.36	15.16	0.170	0.151	0.137	0.065	0.2
5	55265	3552.5	1	24	19.45	18.71	17.20	14.43	0.176	0.148	0.105	0.055	0.2
5	55265	3552.5	25	0	18.34	17.35	16.34	14.43	0.136	0.108	0.086	0.055	0.2
5	55990	3625	1	0	19.73	19.73	17.95	14.37	0.187	0.187	0.124	0.055	0.2
5	55990	3625	1	12	19.30	18.29	17.58	17.58	0.170	0.135	0.114	0.114	0.2
5	55990	3625	1	24	19.62	18.29	17.64	14.47	0.183	0.135	0.116	0.056	0.2
5	55990	3625	25	0	18.54	17.55	16.53	14.56	0.143	0.114	0.090	0.057	0.2
5	56715	3697.5	1	0	19.36	18.66	17.54	14.46	0.172	0.147	0.113	0.056	0.2
5	56715	3697.5	1	12	19.86	18.86	17.79	14.46	0.193	0.153	0.120	0.056	0.2
5	56715	3697.5	1	24	19.16	18.50	17.29	13.75	0.164	0.141	0.107	0.047	0.2
5	56715	3697.5	25	0	18.58	17.61	16.64	14.62	0.144	0.115	0.092	0.058	0.2
10	55290	3555	1	0	19.95	19.13	17.76	14.48	0.197	0.163	0.119	0.056	0.2
10	55290	3555	1	24	19.70	19.47	18.30	15.16	0.186	0.177	0.135	0.065	0.2
10	55290	3555	1	49	19.86	18.47	17.72	14.87	0.193	0.140	0.118	0.061	0.2
10	55290	3555	50	0	18.99	17.96	16.91	14.80	0.158	0.125	0.098	0.060	0.2
10	55990	3625	1	0	19.57	18.98	17.90	14.20	0.181	0.158	0.123	0.052	0.2
10	55990	3625	1	24	19.25	19.07	17.90	14.63	0.168	0.161	0.123	0.058	0.2
10	55990	3625	1	49	19.71	18.54	17.83	14.44	0.187	0.143	0.121	0.055	0.2
10	55990	3625	50	0	18.95	17.94	16.89	14.77	0.157	0.124	0.097	0.060	0.2
10	56690	3695	1	0	19.92	18.57	15.47	12.24	0.196	0.144	0.070	0.033	0.2
10	56690	3695	1	24	19.89	18.56	17.42	15.14	0.195	0.143	0.110	0.065	0.2
10	56690	3695	1	49	19.70	18.99	18.11	15.06	0.186	0.158	0.129	0.064	0.2
10	56690	3695	50	0	19.17	18.16	17.17	15.18	0.165	0.131	0.104	0.066	0.2

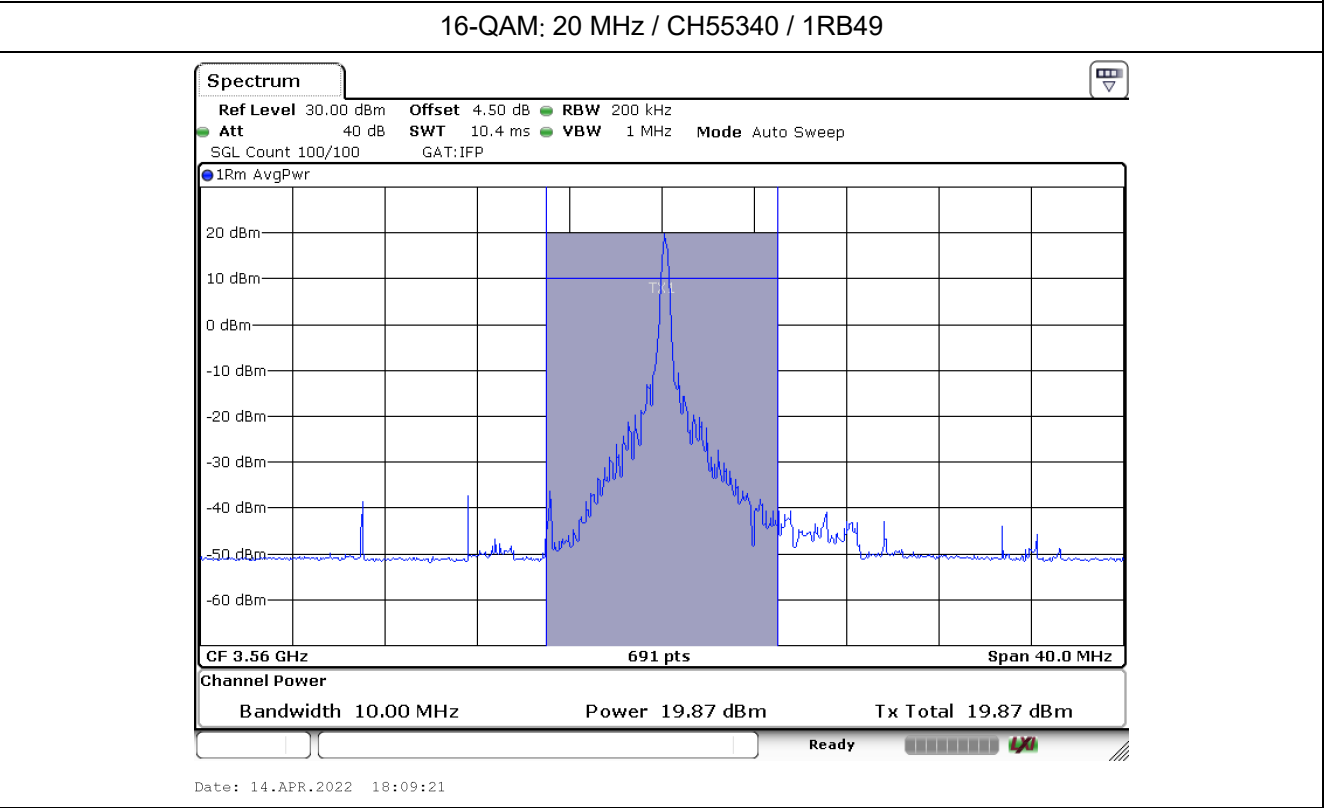
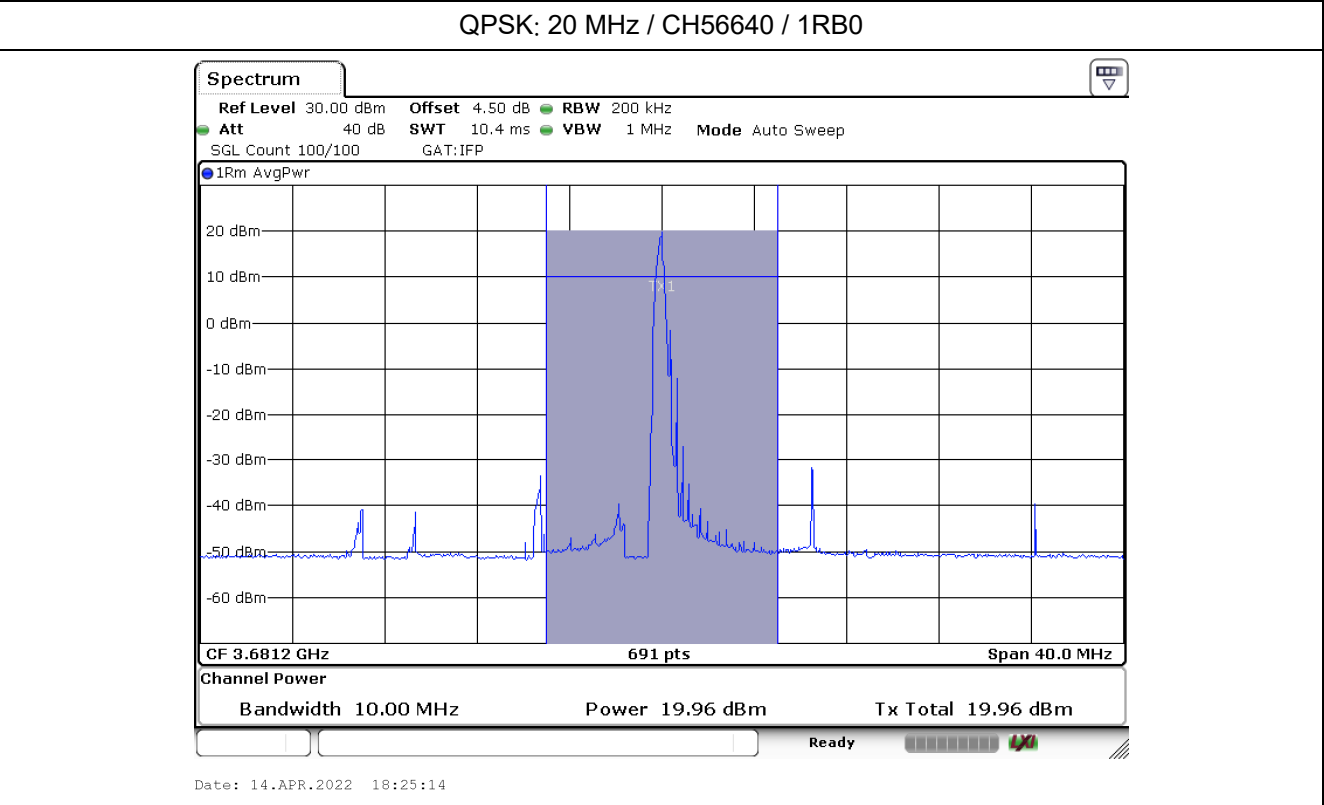
Mode					Conducted Power				EIRP Power				Limit
BW (MHz)	Channel	Frequency (MHz)	RB No.	RB Offset	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)	QPSK EIRP(W)	16-QAM EIRP(W)	64-QAM EIRP(W)	256-QAM EIRP(W)	Limit EIRP(W)
15	55315	3557.5	1	0	19.37	19.04	17.96	14.99	0.173	0.160	0.125	0.063	0.2
15	55315	3557.5	1	37	19.80	19.01	17.98	14.94	0.191	0.159	0.125	0.062	0.2
15	55315	3557.5	1	74	19.85	18.71	17.45	14.19	0.193	0.148	0.111	0.052	0.2
15	55315	3557.5	75	0	17.75	16.66	15.69	13.69	0.119	0.092	0.074	0.047	0.2
15	55990	3625	1	0	19.76	18.91	17.81	14.40	0.189	0.155	0.121	0.055	0.2
15	55990	3625	1	37	19.85	18.68	17.65	14.61	0.193	0.147	0.116	0.058	0.2
15	55990	3625	1	74	19.68	18.62	17.83	14.69	0.185	0.145	0.121	0.059	0.2
15	55990	3625	75	0	17.50	16.55	15.59	13.59	0.112	0.090	0.072	0.046	0.2
15	56665	3692.5	1	0	19.64	19.08	17.79	13.13	0.184	0.161	0.120	0.041	0.2
15	56665	3692.5	1	37	19.82	19.28	18.25	14.88	0.191	0.169	0.133	0.061	0.2
15	56665	3692.5	1	74	19.79	19.24	18.16	14.79	0.190	0.167	0.131	0.060	0.2
15	56665	3692.5	75	0	17.85	16.81	15.82	13.83	0.122	0.096	0.076	0.048	0.2
20	55340	3560	1	0	19.88	19.05	17.95	14.97	0.194	0.160	0.124	0.063	0.2
20	55340	3560	1	49	19.94	19.87	18.37	14.88	0.197	0.194	0.137	0.061	0.2
20	55340	3560	1	99	19.63	18.82	17.58	14.04	0.183	0.152	0.114	0.051	0.2
20	55340	3560	100	0	16.43	15.41	14.44	12.44	0.088	0.069	0.055	0.035	0.2
20	55990	3625	1	0	19.86	18.86	17.84	14.63	0.193	0.153	0.121	0.058	0.2
20	55990	3625	1	49	19.88	19.41	18.11	14.14	0.194	0.174	0.129	0.052	0.2
20	55990	3625	1	99	19.81	18.53	17.12	14.36	0.191	0.142	0.103	0.054	0.2
20	55990	3625	100	0	16.41	15.48	14.49	12.44	0.087	0.070	0.056	0.035	0.2
20	56640	3690	1	0	19.96	18.98	18.27	14.86	0.198	0.158	0.134	0.061	0.2
20	56640	3690	1	49	19.90	19.17	18.15	14.93	0.195	0.165	0.130	0.062	0.2
20	56640	3690	1	99	19.85	18.73	17.42	14.32	0.193	0.149	0.110	0.054	0.2
20	56640	3690	100	0	16.59	15.59	14.66	12.63	0.091	0.072	0.058	0.037	0.2

Note:

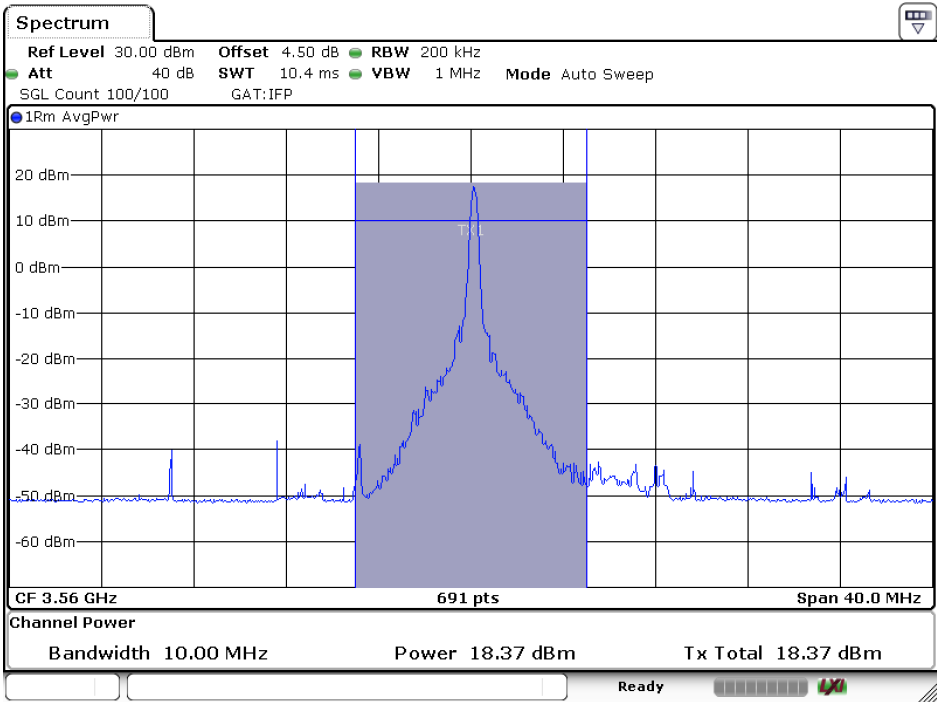
1. RF Output Power (W) EIRP = Conducted Output Power (dBm) + Antenna Gain (dBi)

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

Spectrum plot of worst value

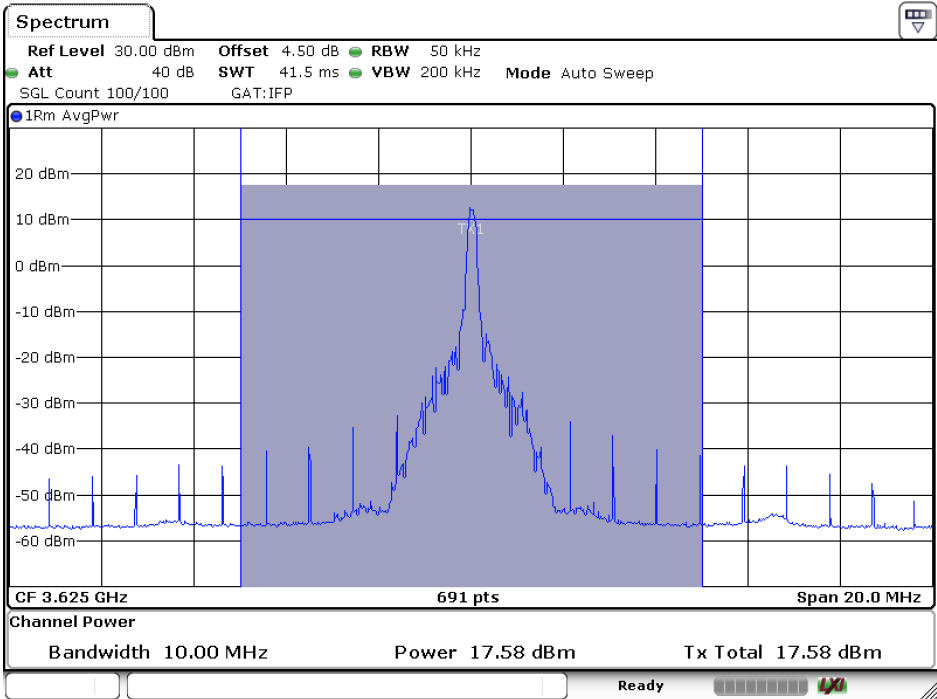


64-QAM: 20 MHz / CH55340 / 1RB49



Date: 14.APR.2022 18:09:37

256-QAM: 5 MHz / CH55990 / 1RB12



Date: 14.APR.2022 15:53:44

Mode 2: 5G NR n48

Mode					Conducted Power					EIRP Power					Limit
BW (MHz)	Channel	Frequency (MHz)	RB No.	RB Offset	pi/2 BPSK (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)	PI/2 BPSK EIRP(W)	QPSK EIRP(W)	16-QAM EIRP(W)	64-QAM EIRP(W)	256-QAM EIRP(W)	Limit EIRP(W)
10	637000	3555	1	0	18.62	18.59	17.76	17.15	15.26	0.145	0.144	0.119	0.104	0.067	0.2
10	637000	3555	1	12	19.09	19.08	19.00	17.12	15.30	0.162	0.161	0.158	0.103	0.068	0.2
10	637000	3555	1	23	18.51	18.47	17.64	17.00	15.33	0.142	0.140	0.116	0.100	0.068	0.2
10	637000	3555	24	0	18.70	18.05	17.50	17.08	15.01	0.148	0.127	0.112	0.102	0.063	0.2
10	641666	3625	1	0	19.55	19.52	18.77	17.14	15.09	0.180	0.179	0.150	0.103	0.064	0.2
10	641666	3625	1	12	19.76	19.63	18.72	17.39	15.34	0.189	0.183	0.149	0.109	0.068	0.2
10	641666	3625	1	23	19.43	19.39	18.77	17.58	15.16	0.175	0.173	0.150	0.114	0.065	0.2
10	641666	3625	24	0	19.62	19.59	18.87	17.57	15.13	0.183	0.182	0.154	0.114	0.065	0.2
10	646332	3695	1	0	19.62	19.59	18.99	17.11	15.43	0.183	0.182	0.158	0.103	0.070	0.2
10	646332	3695	1	12	19.89	19.50	18.76	17.34	14.74	0.195	0.178	0.150	0.108	0.059	0.2
10	646332	3695	1	23	19.60	19.65	18.25	17.41	15.05	0.182	0.184	0.133	0.110	0.064	0.2
10	646332	3695	24	0	19.75	19.56	18.85	17.06	15.26	0.188	0.180	0.153	0.101	0.067	0.2
20	637334	3560	1	0	16.88	16.85	16.06	15.27	13.87	0.097	0.097	0.081	0.067	0.049	0.2
20	637334	3560	1	25	19.31	19.11	18.37	17.35	14.45	0.170	0.163	0.137	0.108	0.056	0.2
20	637334	3560	1	50	17.42	17.39	16.61	15.80	14.33	0.110	0.109	0.091	0.076	0.054	0.2
20	637334	3560	50	0	15.93	15.88	15.21	14.60	13.16	0.078	0.077	0.066	0.058	0.041	0.2
20	637334	3560	50	1	15.62	15.59	14.98	14.34	12.94	0.073	0.072	0.063	0.054	0.039	0.2
20	641666	3625	1	0	17.02	16.98	16.29	15.53	14.05	0.100	0.100	0.085	0.071	0.051	0.2
20	641666	3625	1	25	19.79	19.46	19.03	17.45	14.96	0.190	0.176	0.160	0.111	0.063	0.2
20	641666	3625	1	50	17.24	17.21	16.48	15.72	14.30	0.106	0.105	0.089	0.074	0.054	0.2
20	641666	3625	50	0	15.22	15.19	14.39	13.73	12.31	0.066	0.066	0.055	0.047	0.034	0.2
20	641666	3625	50	1	15.29	15.26	14.46	13.86	12.40	0.067	0.067	0.056	0.049	0.035	0.2
20	646000	3690	1	0	17.05	17.03	16.32	15.65	14.16	0.101	0.101	0.086	0.073	0.052	0.2
20	646000	3690	1	25	19.23	19.15	18.01	17.50	15.26	0.167	0.164	0.126	0.112	0.067	0.2
20	646000	3690	1	50	17.74	17.70	17.02	16.28	14.83	0.119	0.117	0.100	0.085	0.061	0.2
20	646000	3690	50	0	15.25	15.21	14.39	13.55	12.06	0.067	0.066	0.055	0.045	0.032	0.2
20	646000	3690	50	1	15.34	15.30	14.56	13.94	12.46	0.068	0.068	0.057	0.049	0.035	0.2

Mode					Conducted Power					EIRP Power					Limit
BW (MHz)	Channel	Frequency (MHz)	RB No.	RB offset	pi/2 BPSK (dBm)	QPSK (dBm)	16-QAM (dBm)	64-QAM (dBm)	256-QAM (dBm)	pi/2 BPSK EIRP(W)	QPSK EIRP(W)	16-QAM EIRP(W)	64-QAM EIRP(W)	256-QAM EIRP(W)	Limit EIRP(W)
30	637668	3565	1	0	16.29	16.26	15.54	14.93	13.53	0.085	0.084	0.071	0.062	0.045	0.2
30	637668	3565	1	39	19.35	19.19	18.17	17.58	15.34	0.172	0.166	0.131	0.114	0.068	0.2
30	637668	3565	1	77	16.95	16.91	16.17	15.31	13.85	0.099	0.098	0.083	0.068	0.048	0.2
30	637668	3565	75	0	14.58	14.56	13.66	12.90	11.50	0.057	0.057	0.046	0.039	0.028	0.2
30	637668	3565	75	3	14.79	14.77	14.06	13.17	11.72	0.060	0.060	0.051	0.041	0.030	0.2
30	641666	3625	1	0	16.33	16.29	15.57	14.81	13.39	0.086	0.085	0.072	0.060	0.044	0.2
30	641666	3625	1	39	19.55	19.40	18.53	17.38	15.55	0.180	0.174	0.142	0.109	0.072	0.2
30	641666	3625	1	77	17.03	17.00	16.28	15.47	14.04	0.101	0.100	0.085	0.070	0.051	0.2
30	641666	3625	75	0	14.19	14.15	13.42	12.64	11.24	0.052	0.052	0.044	0.037	0.027	0.2
30	641666	3625	75	3	14.34	14.32	13.71	12.84	11.44	0.054	0.054	0.047	0.038	0.028	0.2
30	645666	3685	1	0	16.52	16.49	15.60	14.75	13.35	0.090	0.089	0.072	0.060	0.043	0.2
30	645666	3685	1	39	19.56	19.10	18.92	17.36	14.83	0.180	0.162	0.156	0.109	0.061	0.2
30	645666	3685	1	77	16.66	16.62	15.74	15.13	13.63	0.092	0.092	0.075	0.065	0.046	0.2
30	645666	3685	75	0	14.03	14.00	13.20	12.44	10.95	0.050	0.050	0.042	0.035	0.025	0.2
30	645666	3685	75	3	14.25	14.23	13.35	12.51	11.05	0.053	0.053	0.043	0.036	0.025	0.2
40	638000	3570	1	0	15.82	15.80	15.01	14.27	12.84	0.076	0.076	0.063	0.053	0.038	0.2
40	638000	3570	1	53	19.95	18.90	18.16	17.12	15.33	0.197	0.155	0.131	0.103	0.068	0.2
40	638000	3570	1	105	16.46	16.43	15.67	14.95	13.46	0.088	0.088	0.074	0.062	0.044	0.2
40	638000	3570	100	0	13.67	13.63	12.84	12.19	10.77	0.046	0.046	0.038	0.033	0.024	0.2
40	638000	3570	100	6	13.72	13.68	13.05	12.26	10.85	0.047	0.047	0.040	0.034	0.024	0.2
40	641666	3625	1	0	16.00	15.95	15.09	14.19	12.71	0.079	0.079	0.064	0.052	0.037	0.2
40	641666	3625	1	53	19.99	19.75	19.24	17.62	15.59	0.199	0.188	0.167	0.115	0.072	0.2
40	641666	3625	1	105	16.15	16.12	15.49	14.72	13.24	0.082	0.082	0.071	0.059	0.042	0.2
40	641666	3625	100	0	13.46	13.41	12.66	11.93	10.48	0.044	0.044	0.037	0.031	0.022	0.2
40	641666	3625	100	6	13.53	13.49	12.60	11.98	10.49	0.045	0.045	0.036	0.031	0.022	0.2
40	645332	3680	1	0	16.35	16.30	15.68	14.85	13.39	0.086	0.085	0.074	0.061	0.044	0.2
40	645332	3680	1	53	19.59	19.51	18.73	17.19	15.15	0.182	0.178	0.149	0.104	0.065	0.2
40	645332	3680	1	105	16.11	16.09	15.32	14.60	13.20	0.081	0.081	0.068	0.058	0.042	0.2
40	645332	3680	100	0	13.65	13.60	12.83	12.13	10.63	0.046	0.046	0.038	0.033	0.023	0.2
40	645332	3680	100	6	13.73	13.70	13.03	12.14	10.71	0.047	0.047	0.040	0.033	0.023	0.2

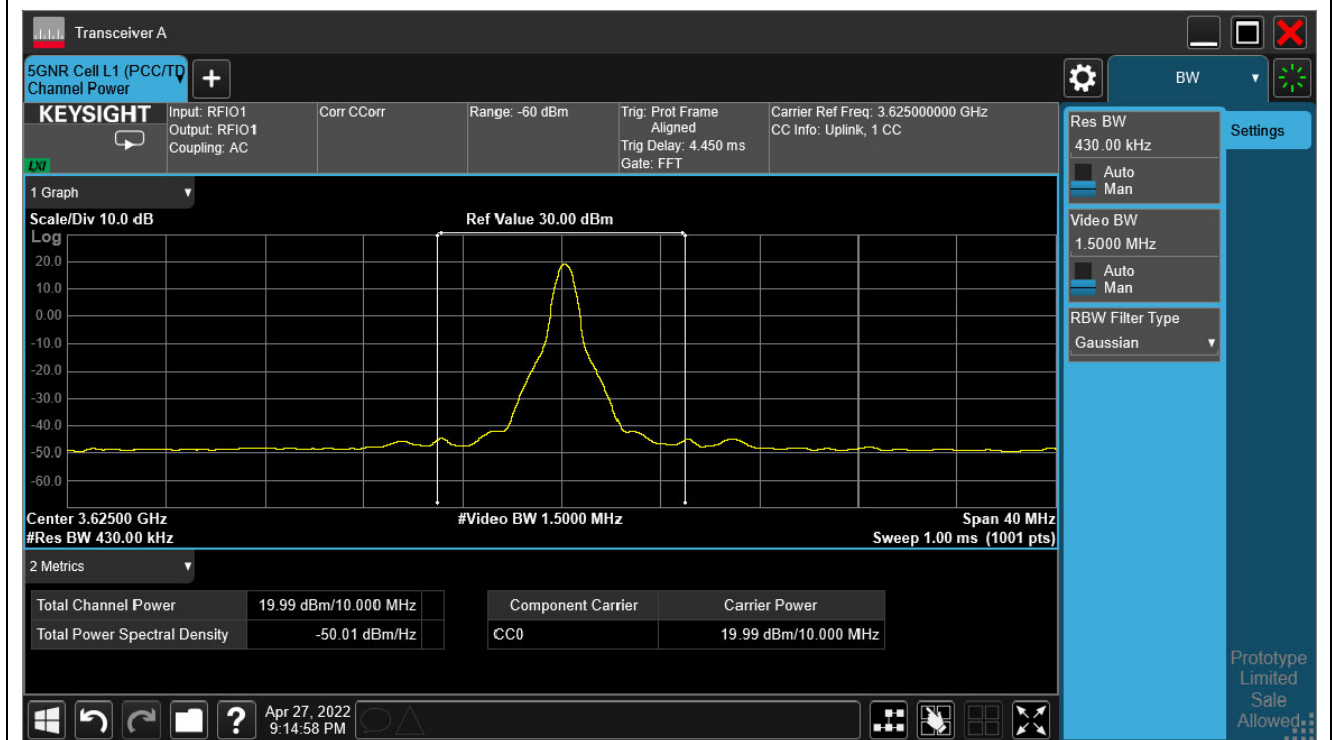
Note:

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

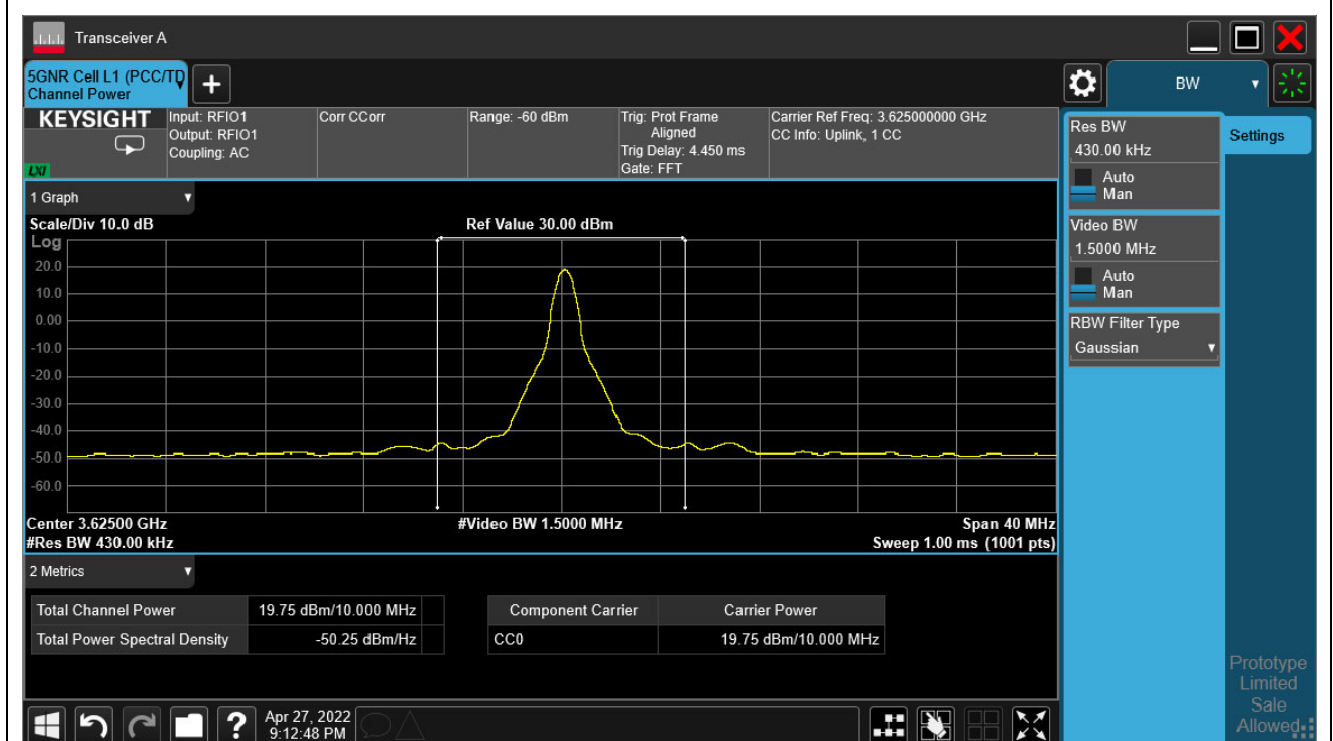
2. Power (W) = $(10^{(\text{Power(dBm)}/10)}) \times 10^{-3}$

Spectrum plot of worst value

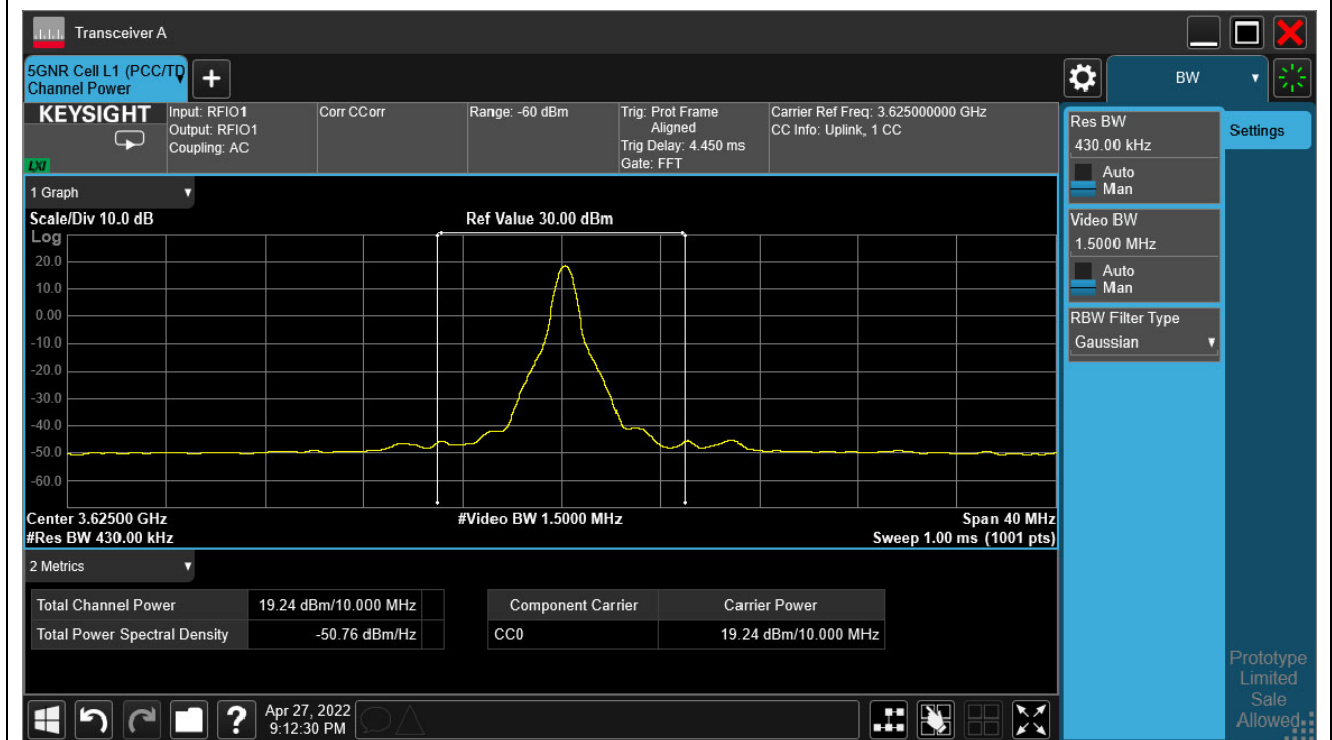
pi/2 BPSK: 40 MHz / CH641666 / 1RB53



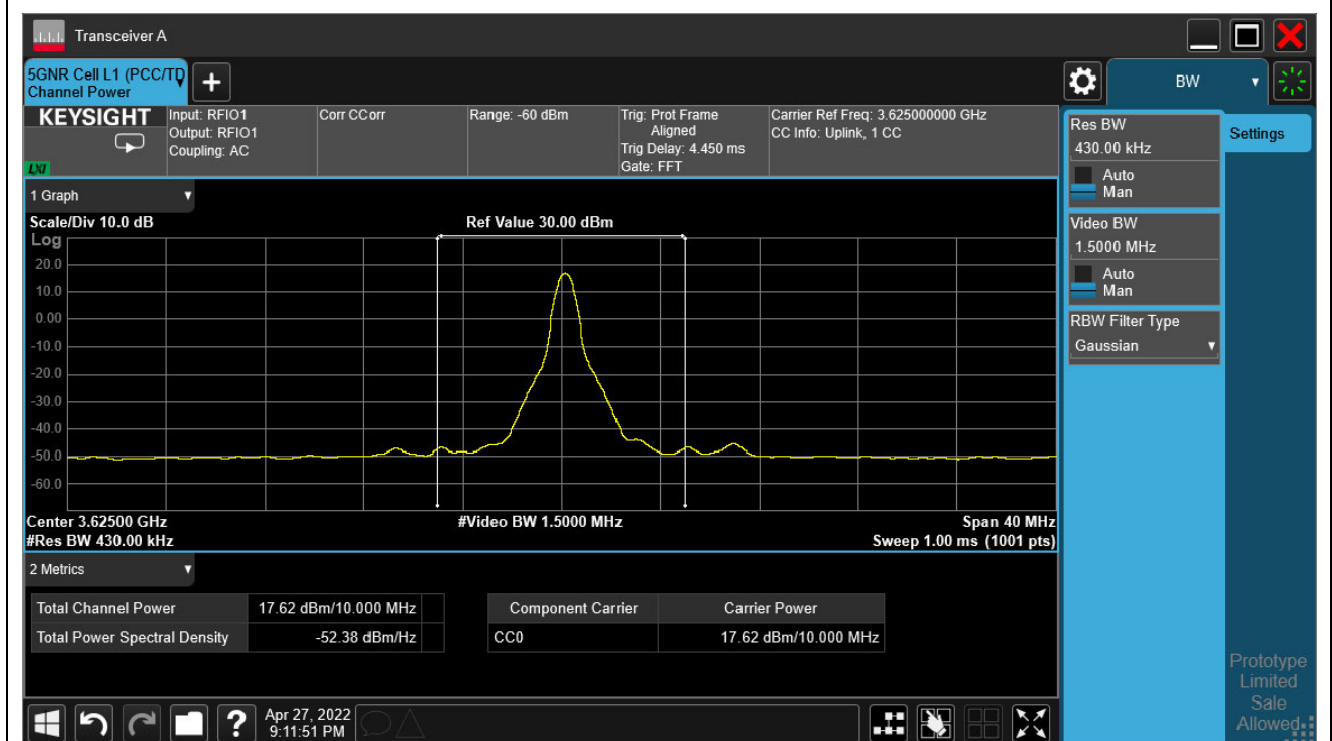
QPSK: 40 MHz / CH641666 / 1RB53



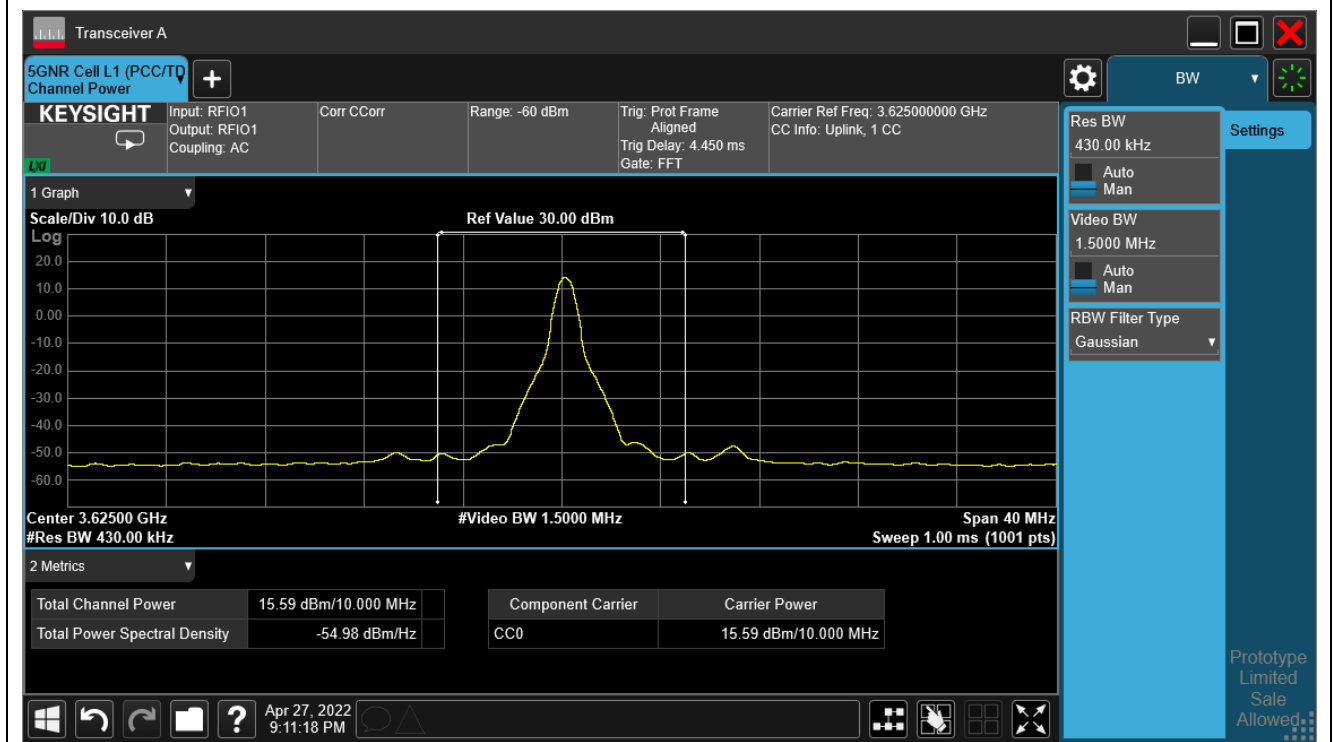
16-QAM: 40 MHz / CH641666 / 1RB53



64-QAM: 40 MHz / CH641666 / 1RB53

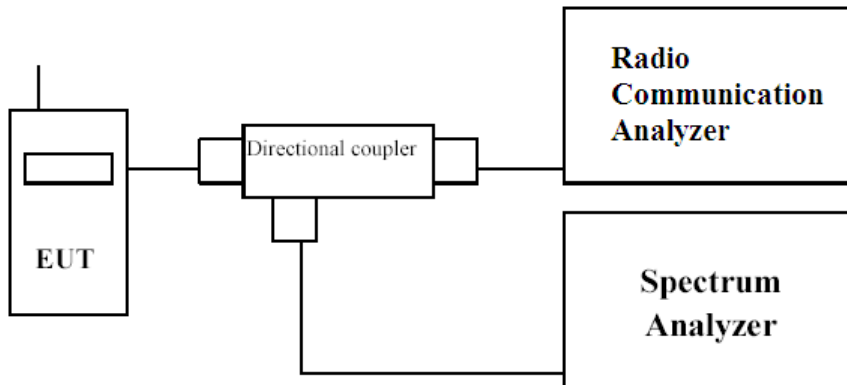


256-QAM: 40 MHz / CH641666 / 1RB53



3. Occupied Bandwidth

3.1. Test Setup



3.2. Test Limit

N/A

3.3. Test Procedure

The EUT is tested with maximum rated TX power via the Base Station simulator, and the occupied bandwidth was measured at the antenna terminals of the EUT.

The Resolution BW of the analyzer is set to 1 %~5% of the emission bandwidth. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

The plots below show the resultant display from the Spectrum Analyser.

3.4. Test Specification

According to FCC Part 2.1049, 96.41

3.5. Test Result of Occupied Bandwidth

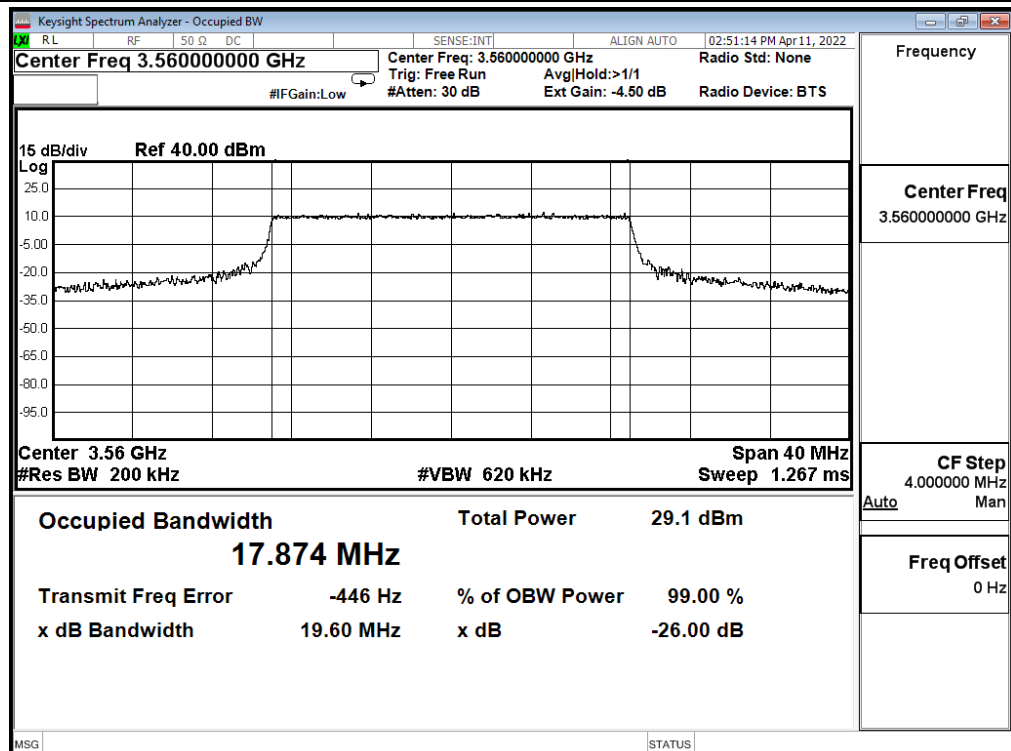
Mode 1: LTE Band 48

Bandwidth (MHz)	Modulation	Channel	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
				26dB BW	99% BW	
5	QPSK	55265	3552.5	4.989	4.473	N/A
		55990	3625.0	4.859	4.475	N/A
		56715	3697.5	4.910	4.470	N/A
	16-QAM	55265	3552.5	4.953	4.475	N/A
		55990	3625.0	4.985	4.471	N/A
		56715	3697.5	4.904	4.476	N/A
	64-QAM	55265	3552.5	4.830	4.474	N/A
		55990	3625.0	4.950	4.467	N/A
		56715	3697.5	4.879	4.489	N/A
	256-QAM	55265	3552.5	4.977	4.478	N/A
		55990	3625.0	4.965	4.468	N/A
		56715	3697.5	4.951	4.476	N/A
10	QPSK	55290	3555.0	9.943	8.947	N/A
		55990	3625.0	9.994	8.931	N/A
		56690	3695.0	9.686	8.937	N/A
	16-QAM	55290	3555.0	9.802	8.960	N/A
		55990	3625.0	9.610	8.951	N/A
		56690	3695.0	9.702	8.935	N/A
	64-QAM	55290	3555.0	9.874	8.961	N/A
		55990	3625.0	9.715	8.934	N/A
		56690	3695.0	9.737	8.921	N/A
	256-QAM	55290	3555.0	9.960	8.962	N/A
		55990	3625.0	9.675	8.929	N/A
		56690	3695.0	9.790	8.936	N/A

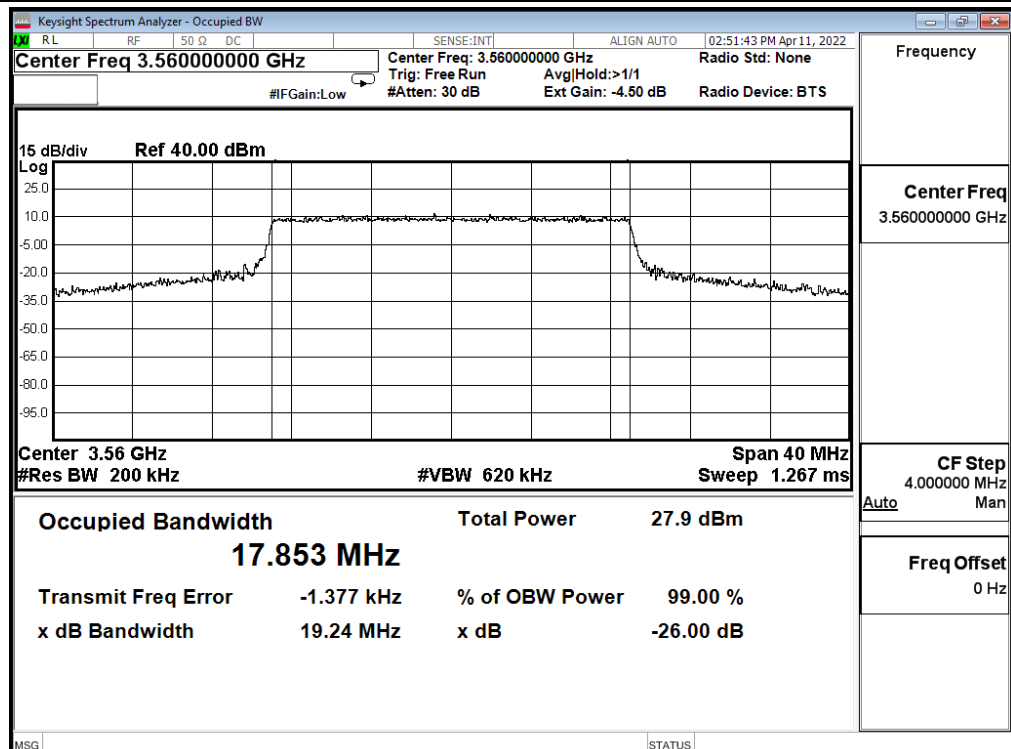
Bandwidth (MHz)	Modulation	Channel	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
				26dB BW	99% BW	
15	QPSK	55315	3557.5	14.570	13.435	N/A
		55990	3625.0	14.440	13.400	N/A
		56665	3692.5	14.400	13.389	N/A
	16-QAM	55315	3557.5	14.710	13.407	N/A
		55990	3625.0	14.400	13.414	N/A
		56665	3692.5	14.350	13.399	N/A
	64-QAM	55315	3557.5	14.930	13.423	N/A
		55990	3625.0	14.380	13.436	N/A
		56665	3692.5	14.120	13.395	N/A
	256-QAM	55315	3557.5	14.800	13.415	N/A
		55990	3625.0	14.470	13.406	N/A
		56665	3692.5	14.340	13.399	N/A
20	QPSK	55340	3560.0	19.600	17.874	N/A
		55990	3625.0	19.150	17.841	N/A
		56640	3690.0	19.170	17.805	N/A
	16-QAM	55340	3560.0	19.240	17.853	N/A
		55990	3625.0	19.210	17.833	N/A
		56640	3690.0	19.050	17.830	N/A
	64-QAM	55340	3560.0	19.270	17.880	N/A
		55990	3625.0	19.010	17.847	N/A
		56640	3690.0	19.030	17.830	N/A
	256-QAM	55340	3560.0	19.420	17.860	N/A
		55990	3625.0	19.290	17.866	N/A
		56640	3690.0	19.240	17.876	N/A

Spectrum plot of worst value

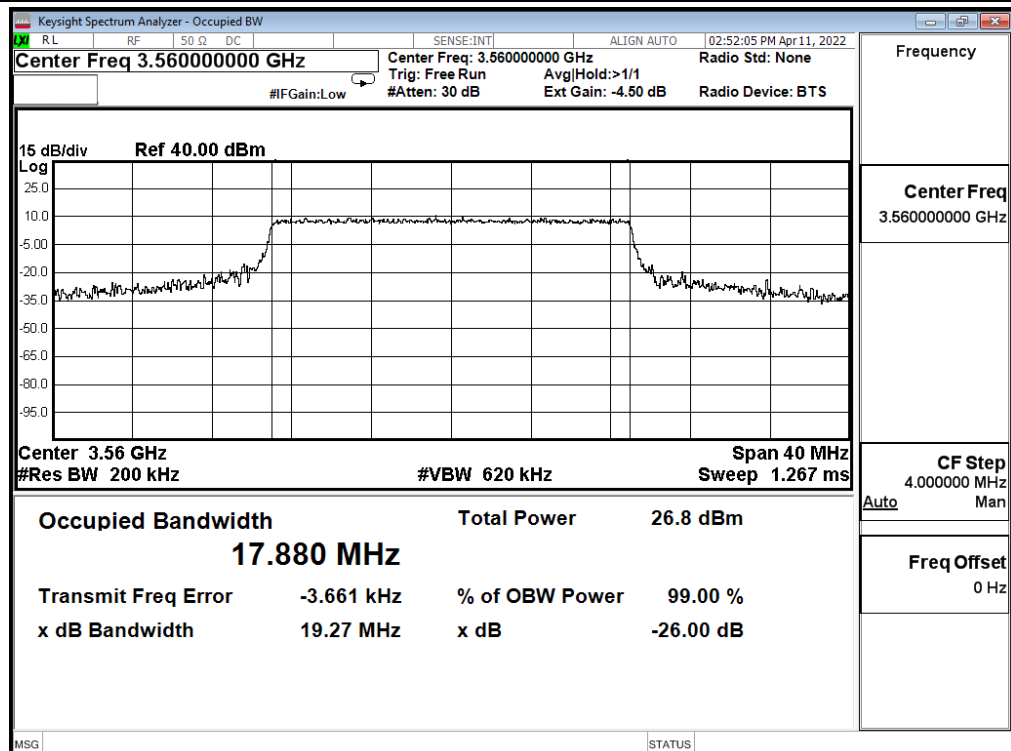
QPSK: 20 MHz / CH55340



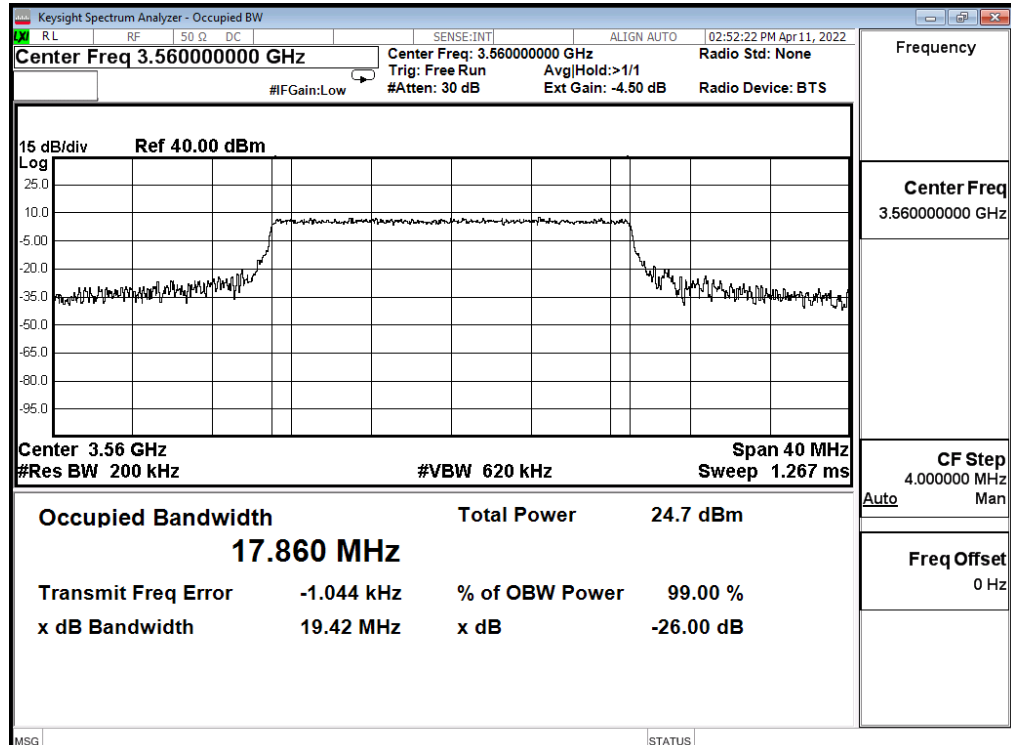
16-QAM: 20 MHz / CH55340



64-QAM: 20 MHz / CH55340



256-QAM: 20 MHz / CH55340



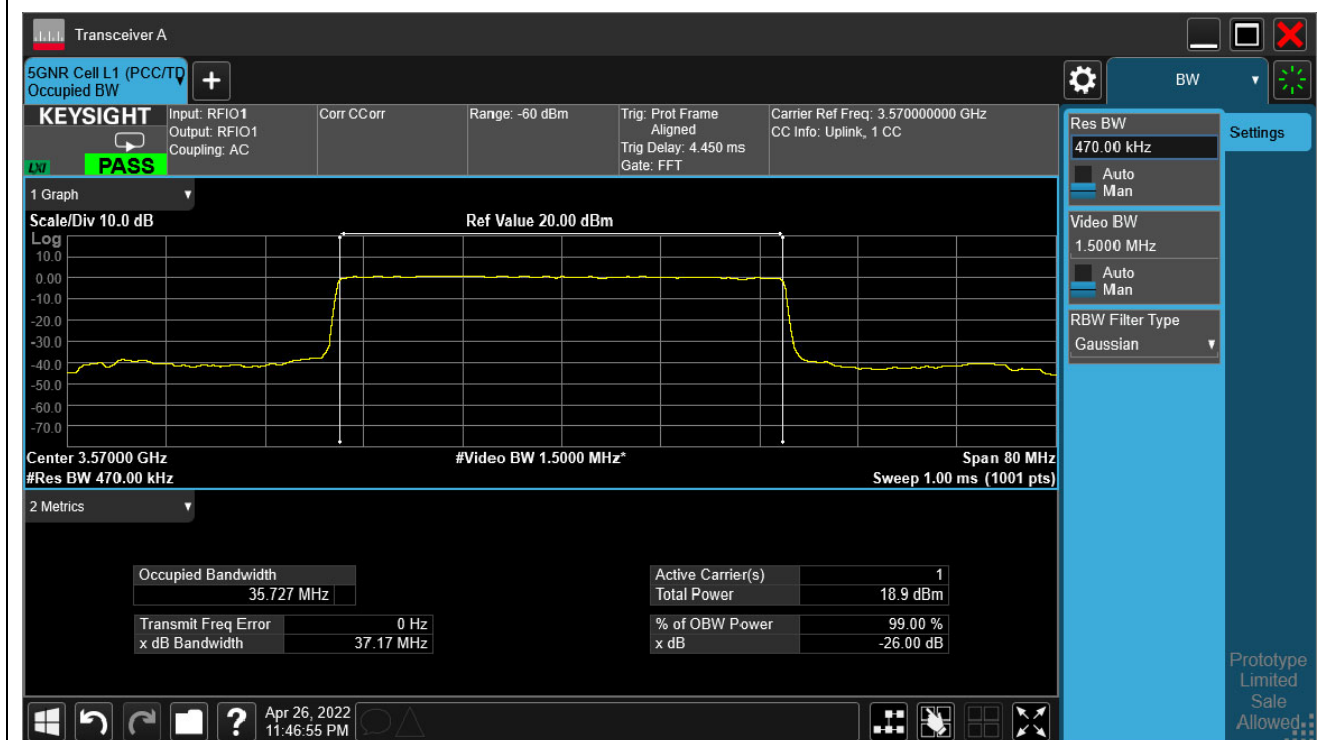
Mode 2: 5G NR n48

Bandwidth (MHz)	Modulation	Channel	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
				26dB BW	99% BW	
10	pi/2 BPSK	637000	3555	9.245	8.600	N/A
		641666	3625	9.241	8.576	N/A
		646332	3695	9.281	8.603	N/A
	QPSK	637000	3555	9.270	8.577	N/A
		641666	3625	9.180	8.600	N/A
		646332	3695	9.246	8.602	N/A
	16-QAM	637000	3555	9.313	8.610	N/A
		641666	3625	9.333	8.609	N/A
		646332	3695	9.258	8.611	N/A
	64-QAM	637000	3555	9.223	8.578	N/A
		641666	3625	9.179	8.604	N/A
		646332	3695	9.195	8.606	N/A
	256-QAM	637000	3555	9.247	8.578	N/A
		641666	3625	9.245	8.602	N/A
		646332	3695	9.239	8.607	N/A
20	pi/2 BPSK	637334	3560	18.570	18.021	N/A
		641666	3625	18.610	18.094	N/A
		646000	3690	18.680	18.038	N/A
	QPSK	637334	3560	18.590	18.020	N/A
		641666	3625	18.580	18.103	N/A
		646000	3690	18.630	18.038	N/A
	16-QAM	637334	3560	18.700	18.018	N/A
		641666	3625	18.640	18.084	N/A
		646000	3690	18.660	18.027	N/A
	64-QAM	637334	3560	18.610	18.018	N/A
		641666	3625	18.640	18.084	N/A
		646000	3690	18.670	18.034	N/A
	256-QAM	637334	3560	18.650	18.036	N/A
		641666	3625	18.730	18.090	N/A
		646000	3690	18.580	18.082	N/A

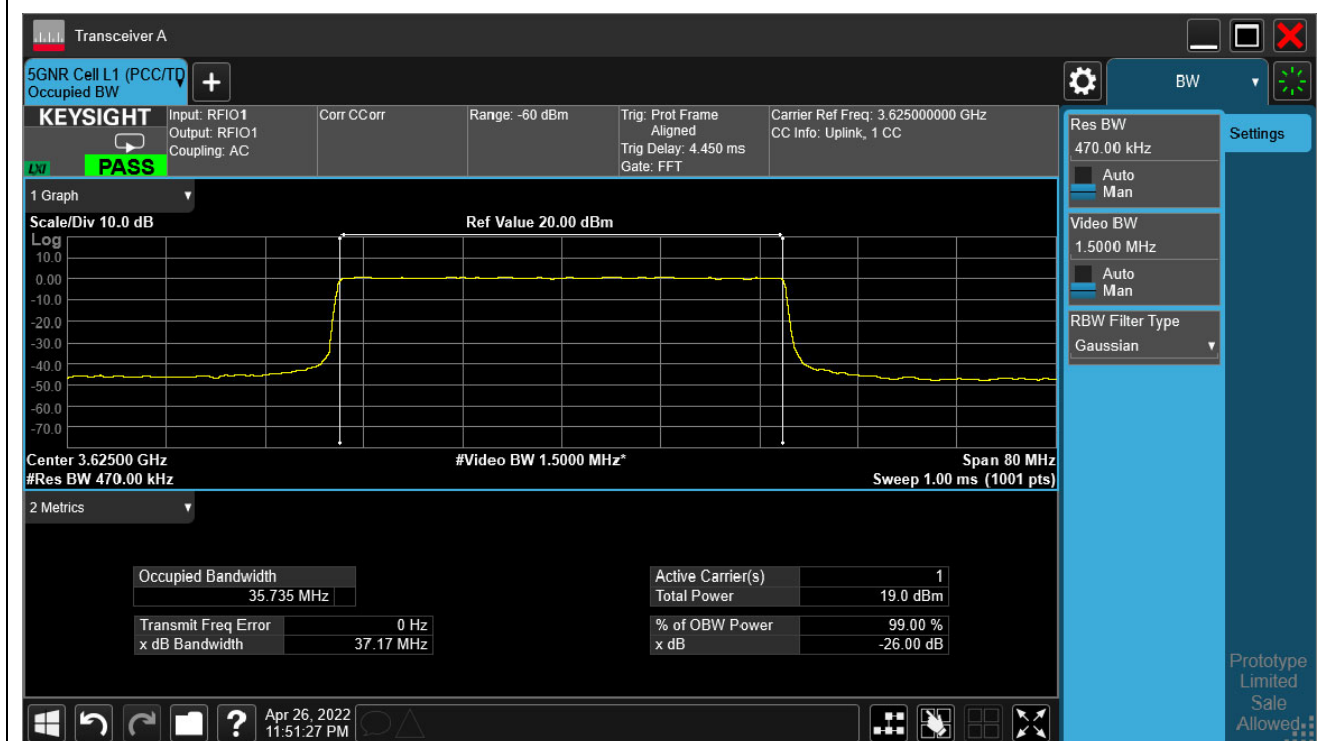
Bandwidth (MHz)	Modulation	Channel	Frequency (MHz)	Measure Level (MHz)		Limit (MHz)
				26dB BW	99% BW	
30	pi/2 BPSK	637668	3565	27.820	26.935	N/A
		641666	3625	27.870	27.014	N/A
		645666	3685	27.840	26.937	N/A
	QPSK	637668	3565	27.870	26.935	N/A
		641666	3625	27.880	26.936	N/A
		645666	3685	27.880	26.938	N/A
	16-QAM	637668	3565	27.810	26.932	N/A
		641666	3625	27.800	26.933	N/A
		645666	3685	27.860	26.931	N/A
	64-QAM	637668	3565	27.860	26.901	N/A
		641666	3625	27.750	26.900	N/A
		645666	3685	27.840	26.900	N/A
	256-QAM	637668	3565	27.790	26.913	N/A
		641666	3625	27.870	26.920	N/A
		645666	3685	27.810	26.912	N/A
40	pi/2 BPSK	638000	3570	37.160	35.734	N/A
		641666	3625	37.140	35.733	N/A
		645332	3680	37.170	35.727	N/A
	QPSK	638000	3570	37.130	35.707	N/A
		641666	3625	37.170	35.735	N/A
		645332	3680	37.120	35.713	N/A
	16-QAM	638000	3570	37.120	35.735	N/A
		641666	3625	37.160	35.727	N/A
		645332	3680	37.120	35.723	N/A
	64-QAM	638000	3570	37.160	35.718	N/A
		641666	3625	37.180	35.719	N/A
		645332	3680	37.160	35.712	N/A
	256-QAM	638000	3570	37.120	35.699	N/A
		641666	3625	37.130	35.704	N/A
		645332	3680	37.120	35.700	N/A

Spectrum plot of worst value

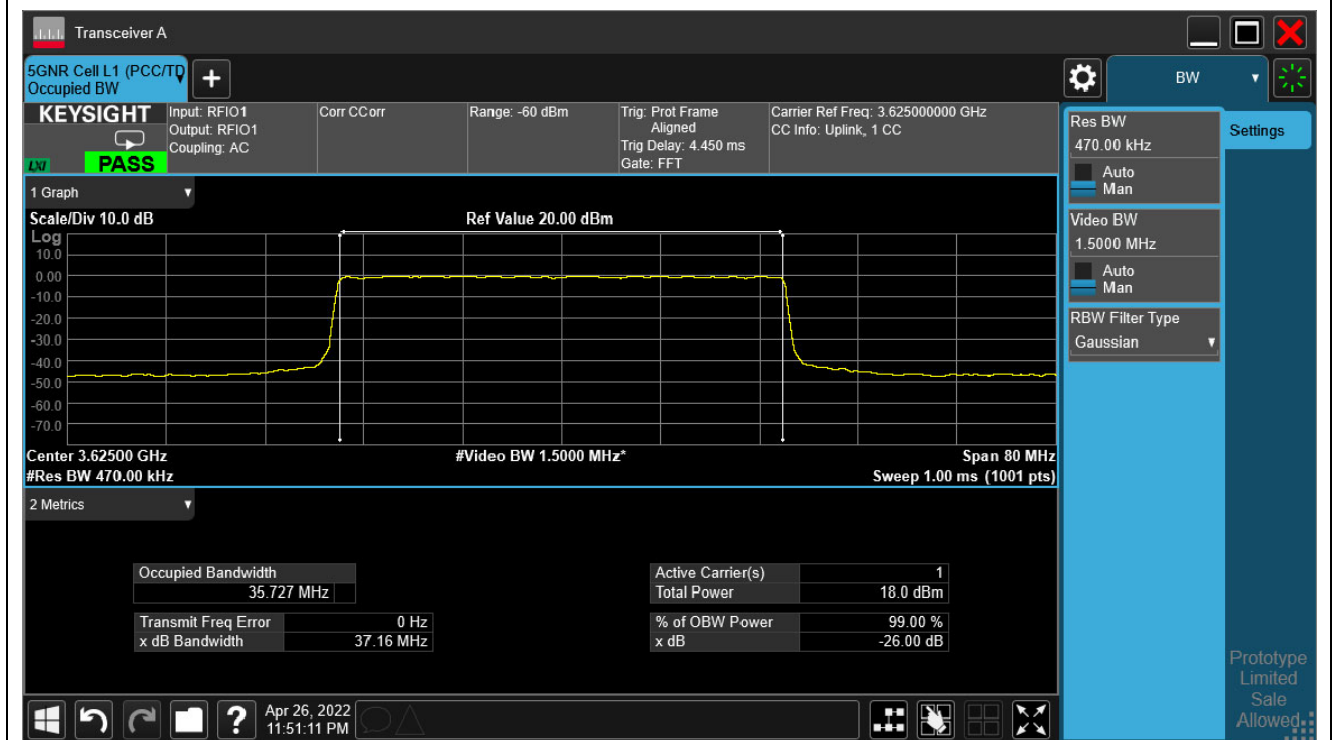
pi/2 BPSK: 40 MHz / CH645332



QPSK: 40 MHz / CH641666



16-QAM: 40 MHz / CH641666



64-QAM: 40 MHz / CH641666

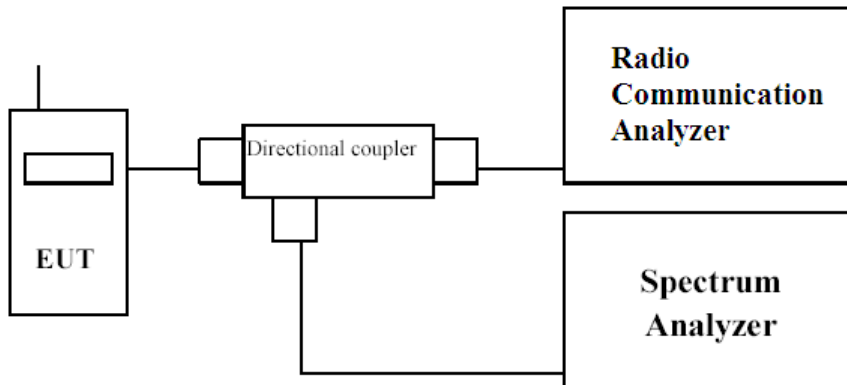


256-QAM: 40 MHz / CH641666



4. Spurious Emission at Antenna Terminals

4.1. Test Setup



4.2. Test Limit

- (1) Within 0 MHz to 10 MHz above and below the assigned channel ≤ -13 dBm/MHz.
- (2) Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz.
- (3) Any emission below 3530 MHz and above 3720 MHz ≤ -40 dBm/MHz.

4.3. Test Procedure

In accordance with Part 96.41 at least 1% of the emission bandwidth was used for the resolution and video bandwidths up to 1MHz away from the Block Edge. At greater than 1MHz, the resolution and video bandwidth were increased to 1MHz/3MHz.

The reference power and path losses of all channels used for testing in each frequency block were measured.

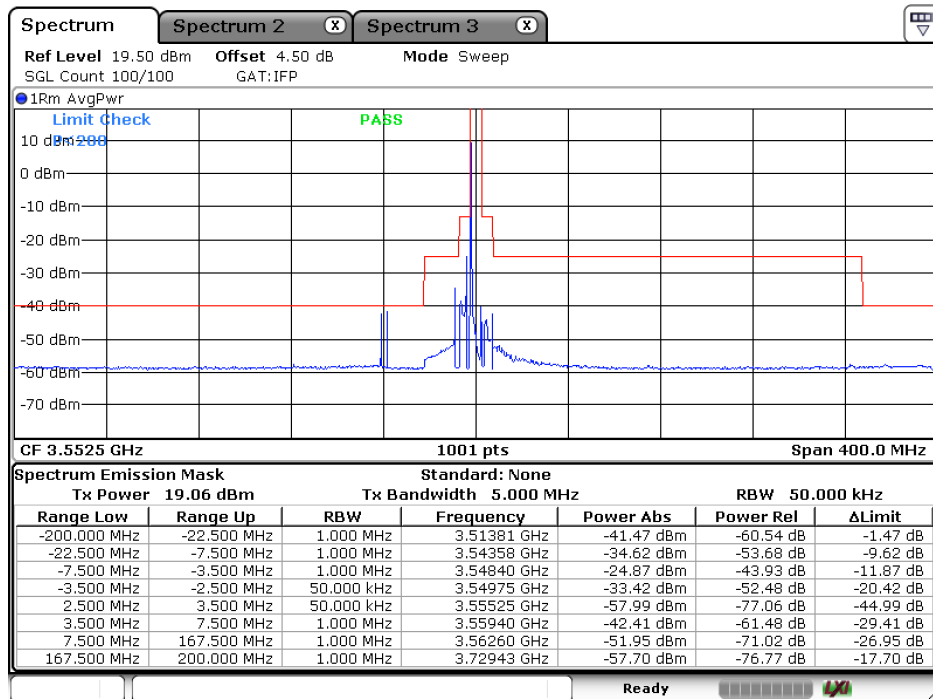
4.4. Test Specification

According to Part 2.1051, 96.41

4.5. Test Result of Spurious Emission at Antenna Terminals

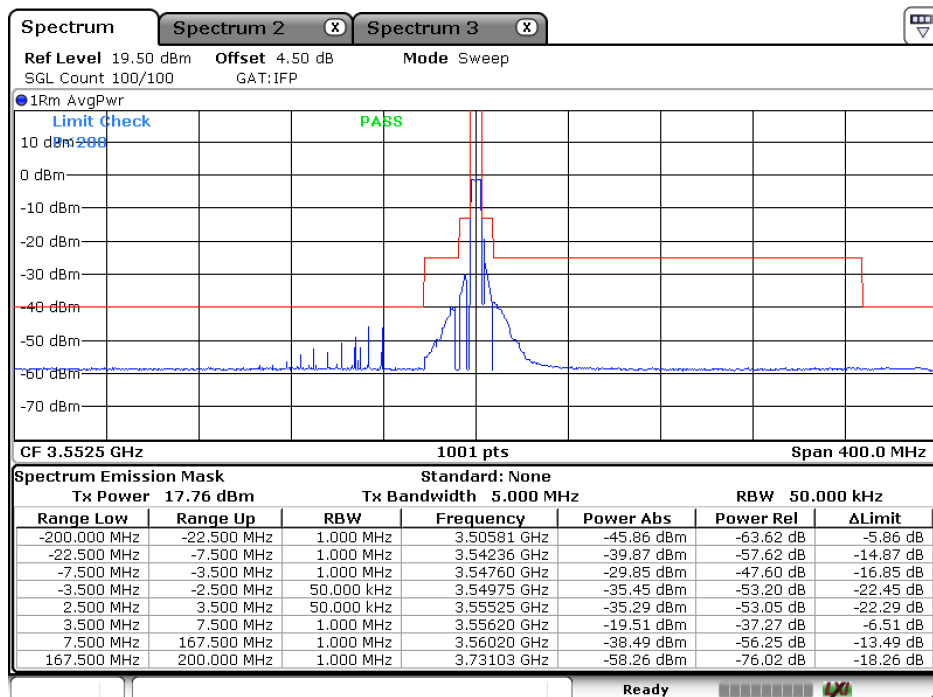
Mode 1: LTE Band 48

5 MHz / QPSK / CH55265 / 1RB0



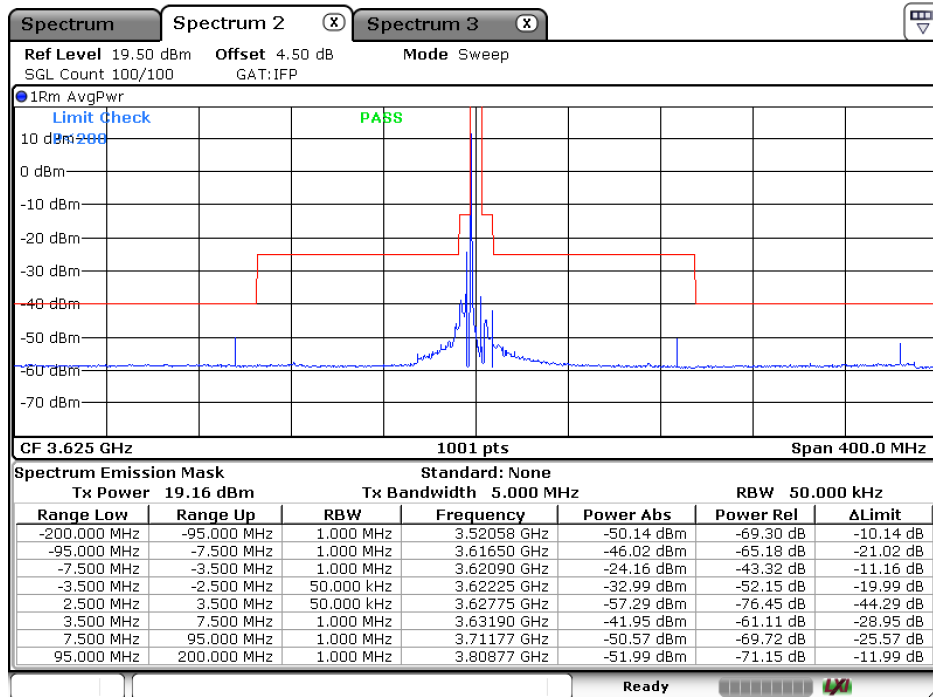
Date: 27.APR.2022 10:25:30

5 MHz / QPSK / CH55265 / 25RB0



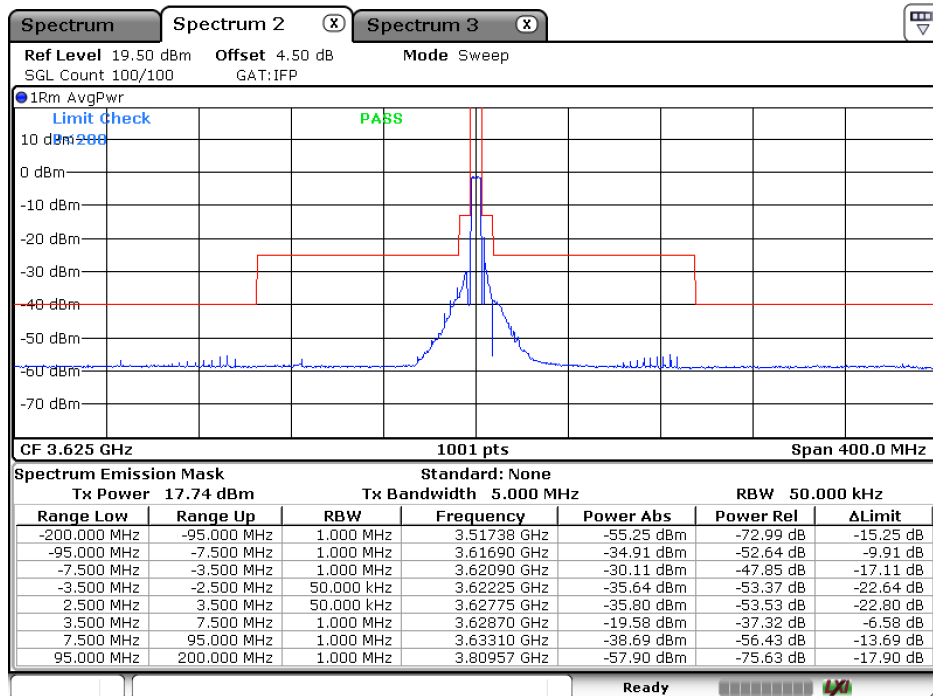
Date: 27.APR.2022 10:27:57

5 MHz / QPSK / CH55990 / 1RB0



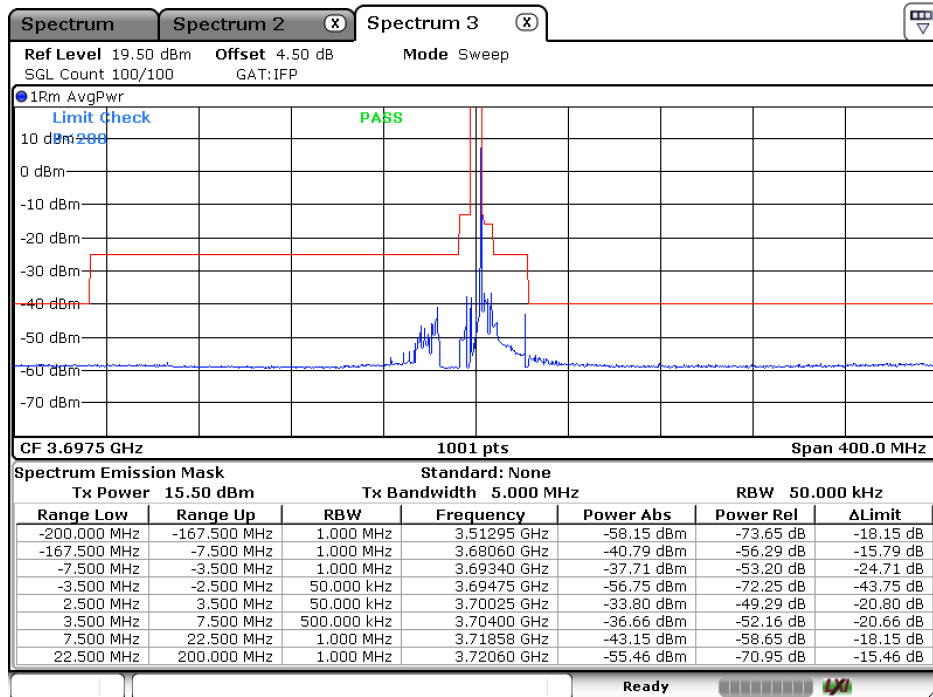
Date: 27.APR.2022 10:35:25

5 MHz / QPSK / CH55990 / 25RB0



Date: 27.APR.2022 10:33:18

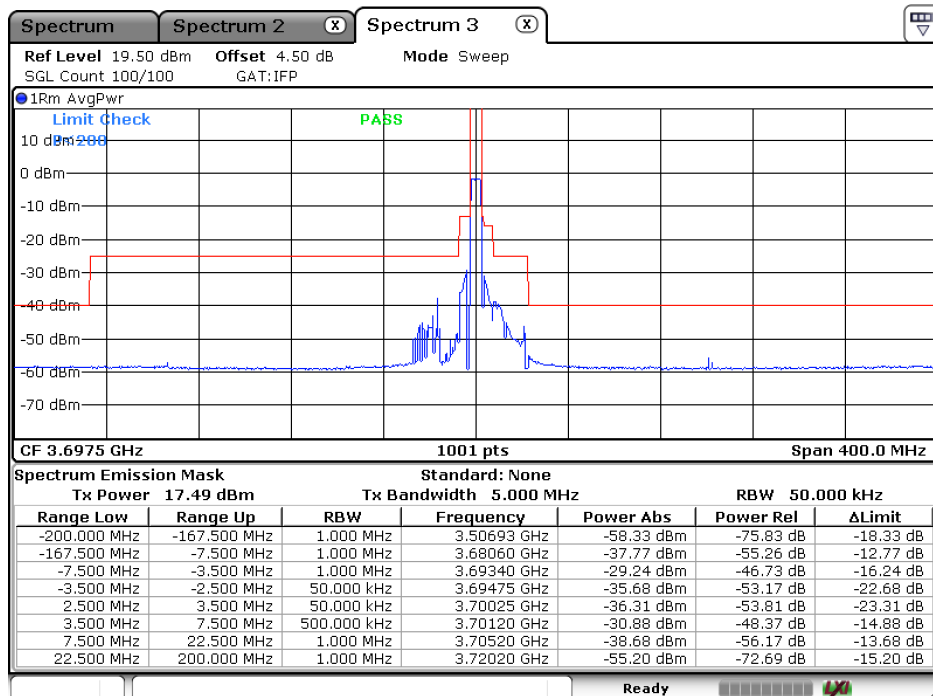
5 MHz / QPSK / CH56715 / 1RB24



Date: 27.APR.2022 10:37:01

Note: From 3.5MHz to 7.5MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

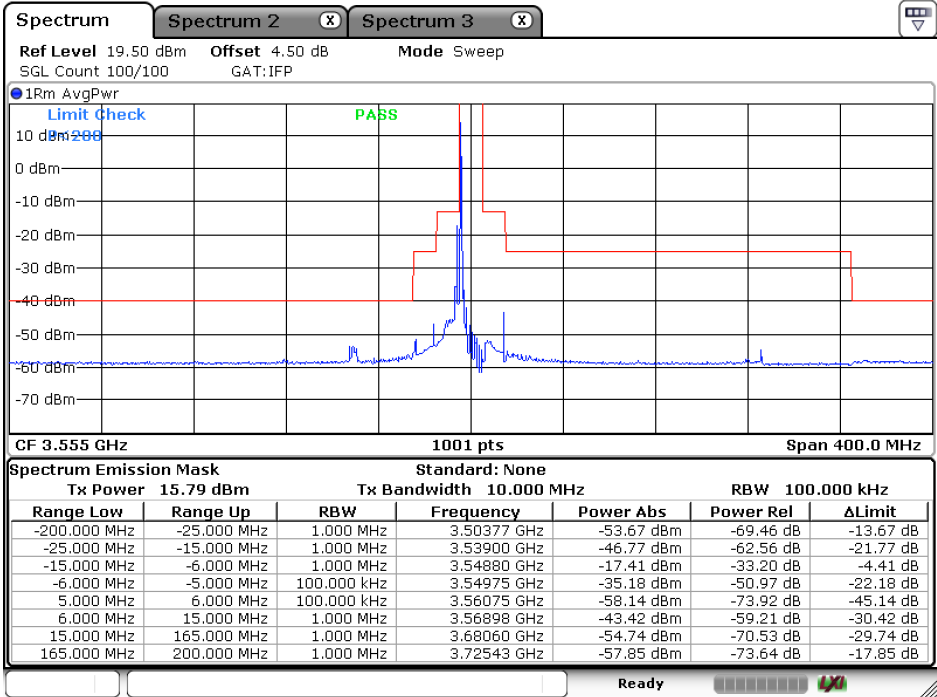
5 MHz / QPSK / CH56715 / 25RB0



Date: 27.APR.2022 10:38:41

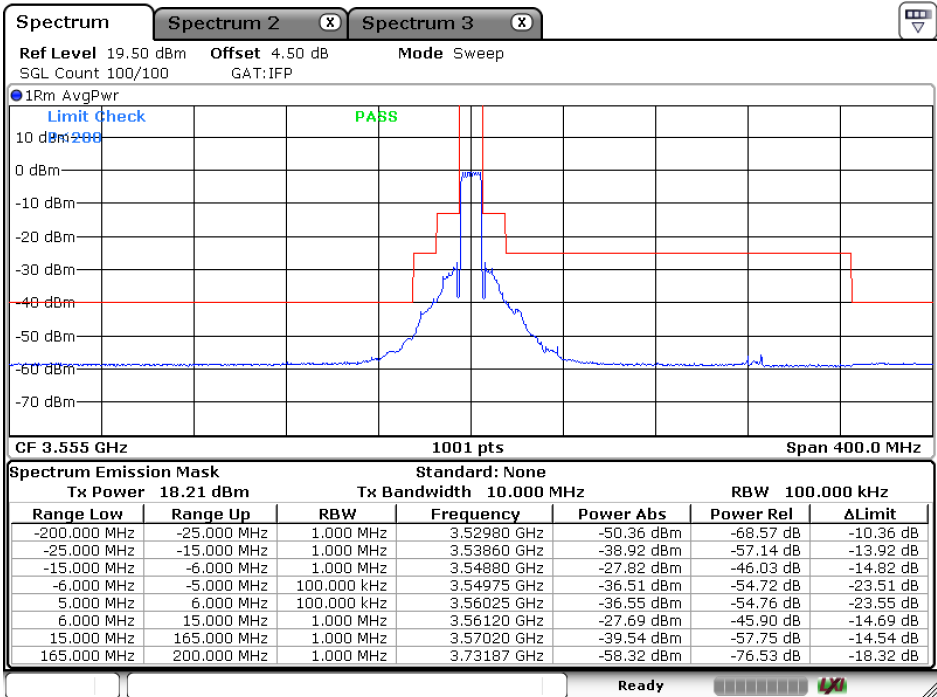
Note: From 3.5MHz to 7.5MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

10 MHz / QPSK / CH55290 / 1RB0



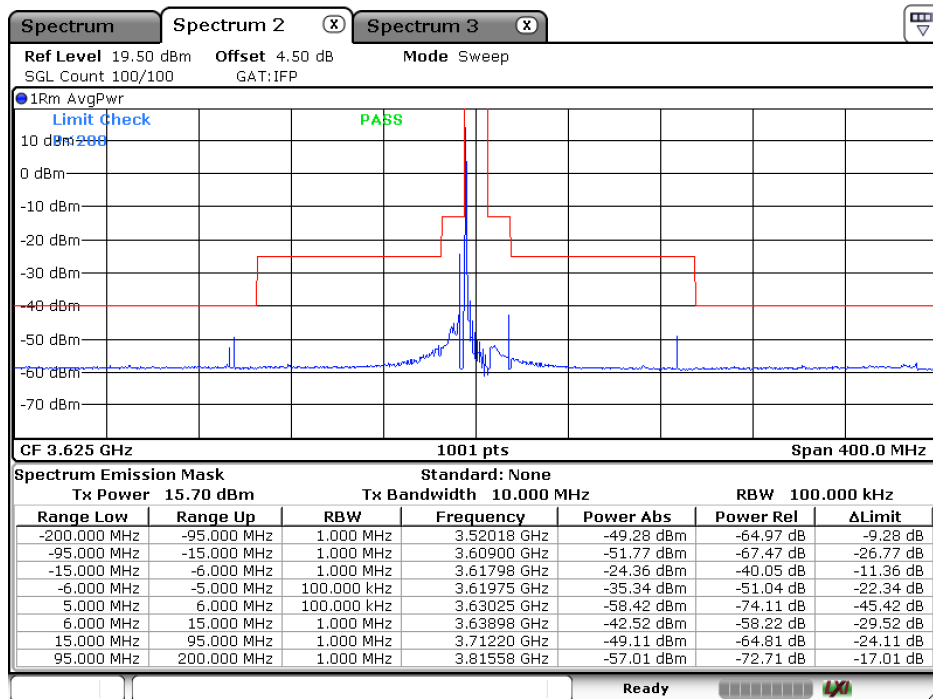
Date: 27.APR.2022 10:54:03

10 MHz / QPSK / CH55290 / 50RB0



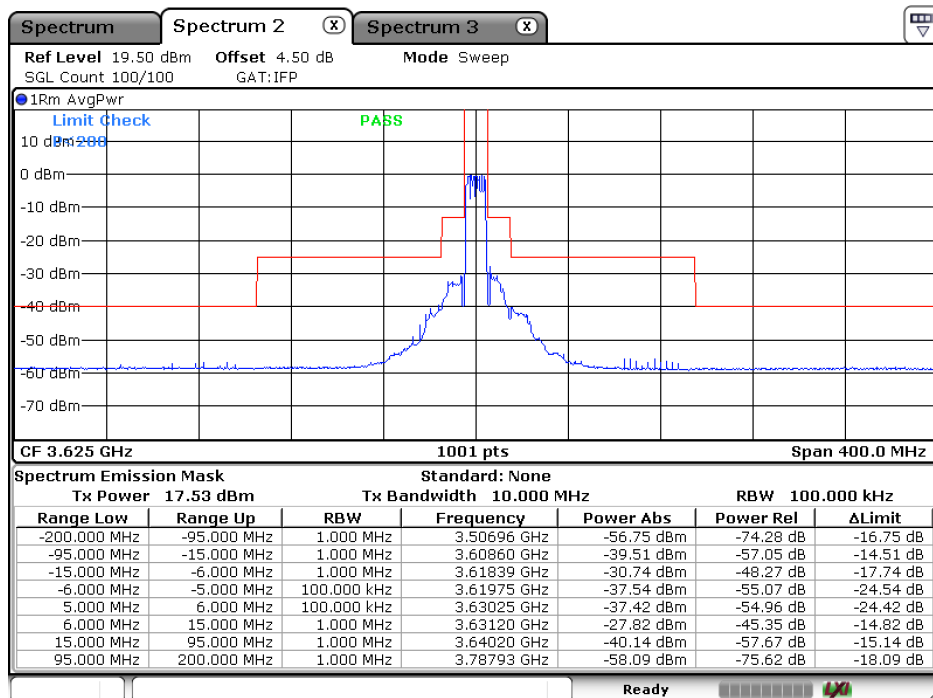
Date: 27.APR.2022 10:54:50

10 MHz / QPSK / CH55990 / 1RB0



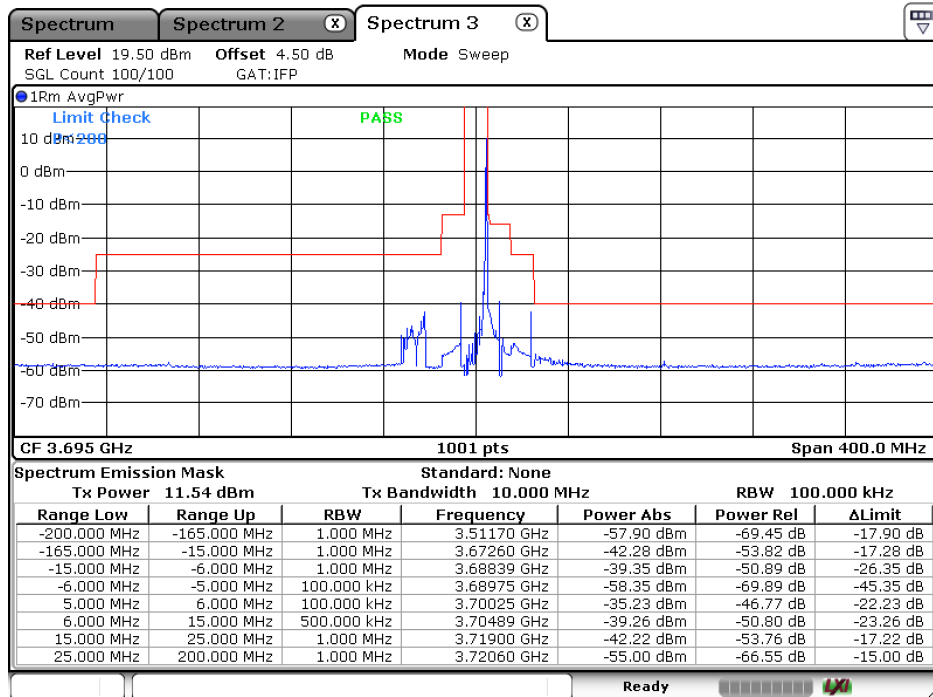
Date: 27.APR.2022 11:00:50

10 MHz / QPSK / CH55990 / 50RB0



Date: 27.APR.2022 10:55:47

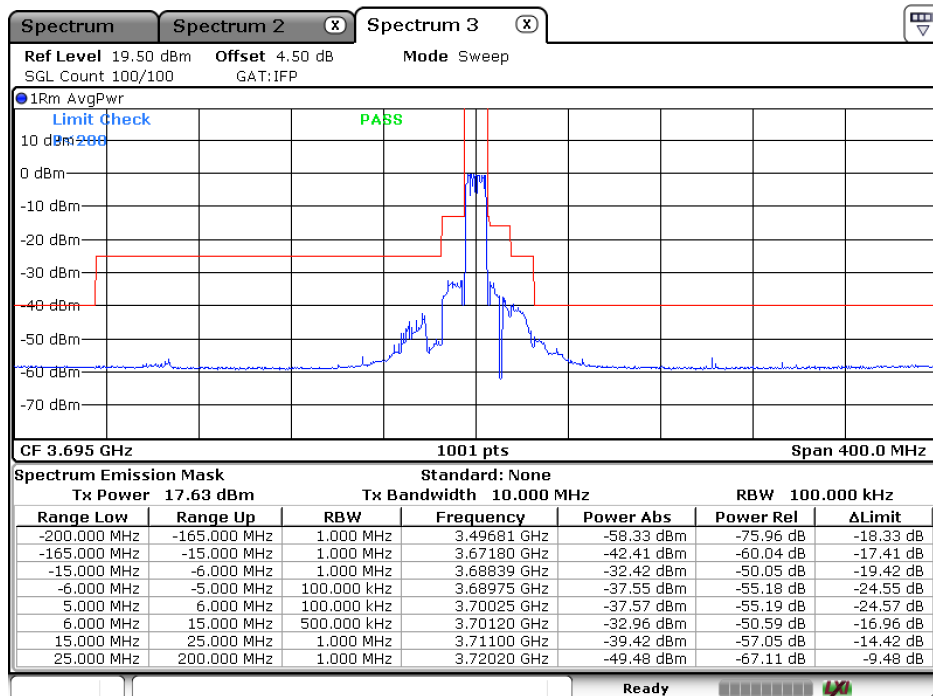
10 MHz / QPSK / CH56690 / 1RB49



Date: 27.APR.2022 11:05:57

Note: From 6MHz to 15MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

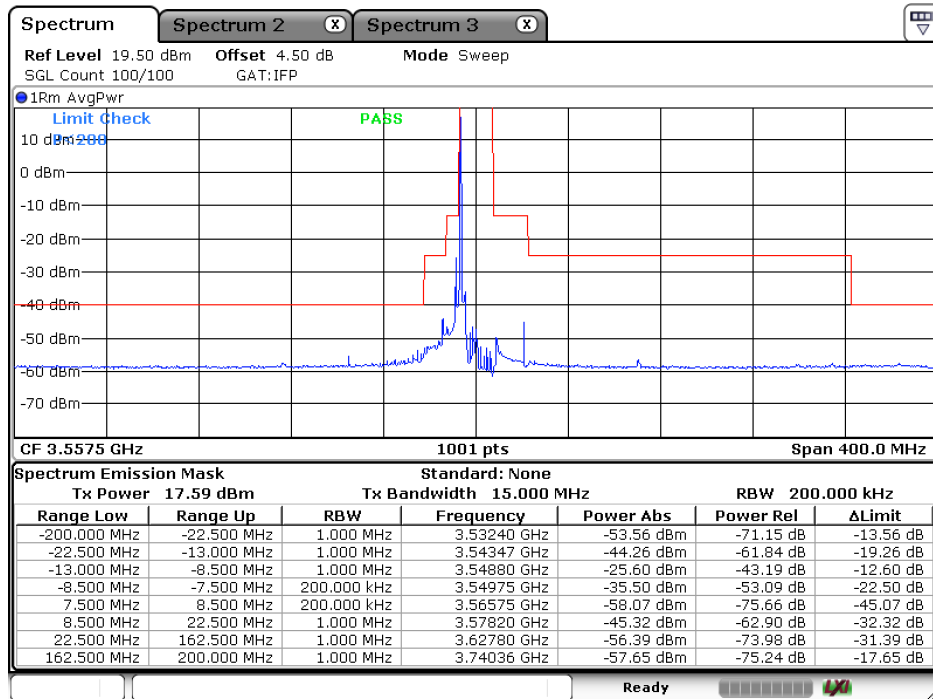
10 MHz / QPSK / CH56690 / 50RB0



Date: 27.APR.2022 11:06:54

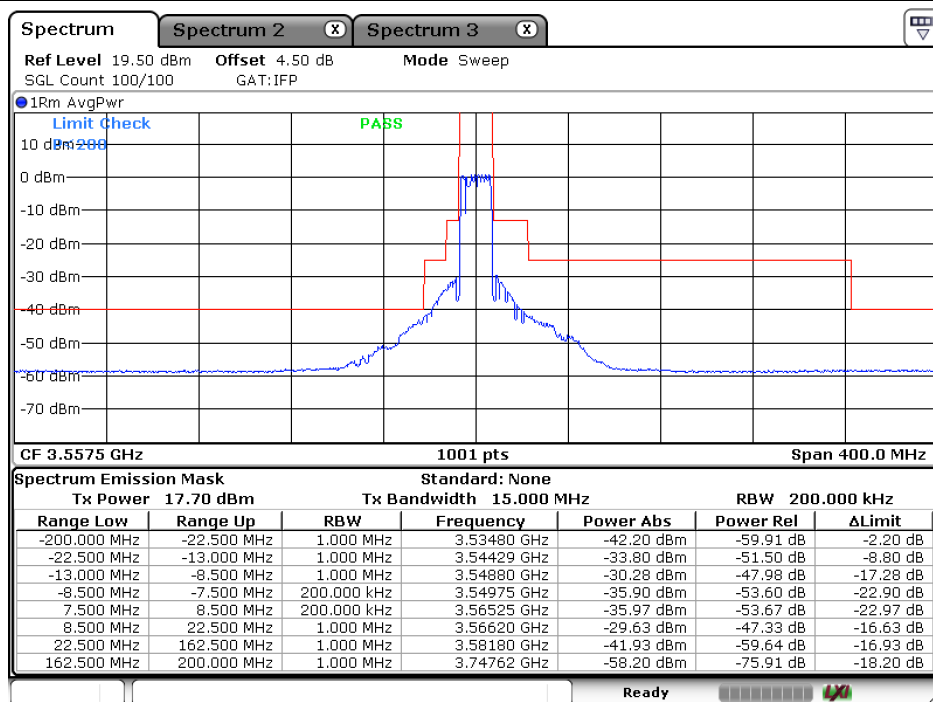
Note: From 6MHz to 15MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

15 MHz / QPSK / CH55315 / 1RB0



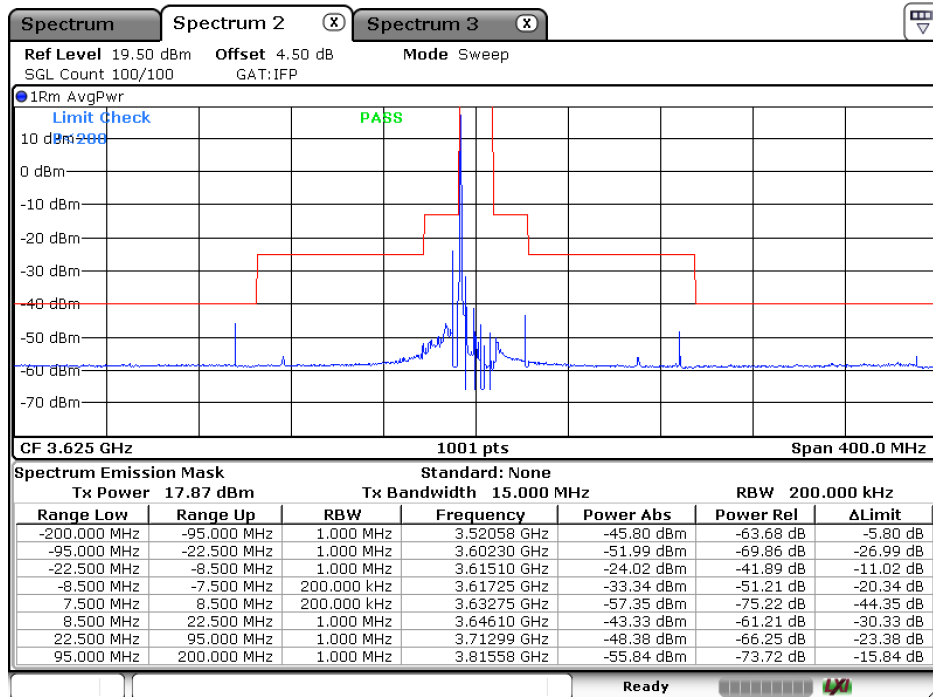
Date: 27.APR.2022 11:27:04

15 MHz / QPSK / CH55315 / 75RB0



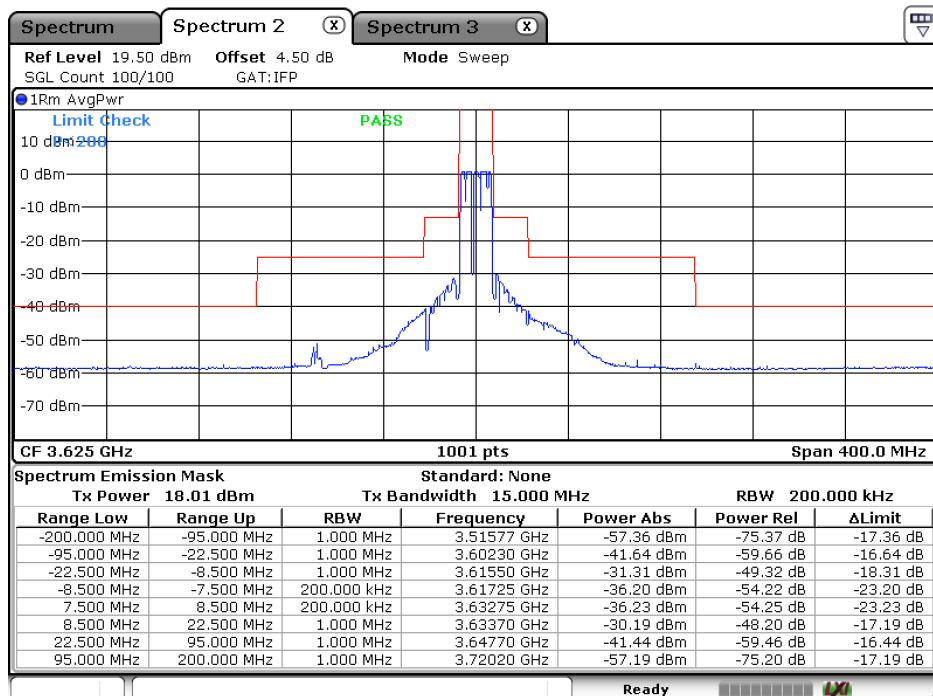
Date: 27.APR.2022 11:24:28

15 MHz / QPSK / CH55990 / 1RB0



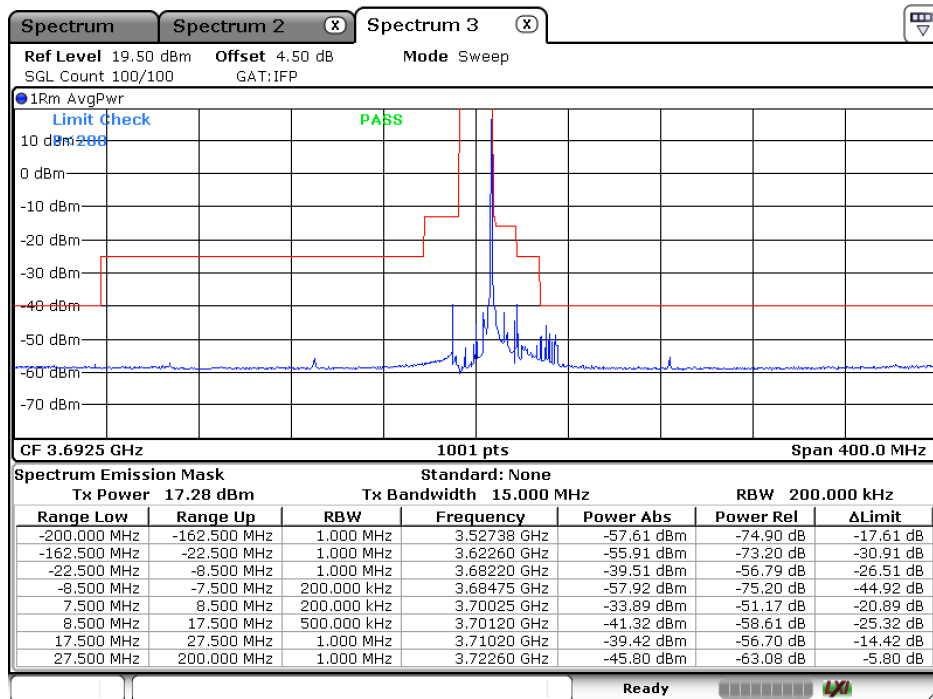
Date: 27.APR.2022 11:36:32

15 MHz / QPSK / CH55990 / 75RB0



Date: 27.APR.2022 11:39:21

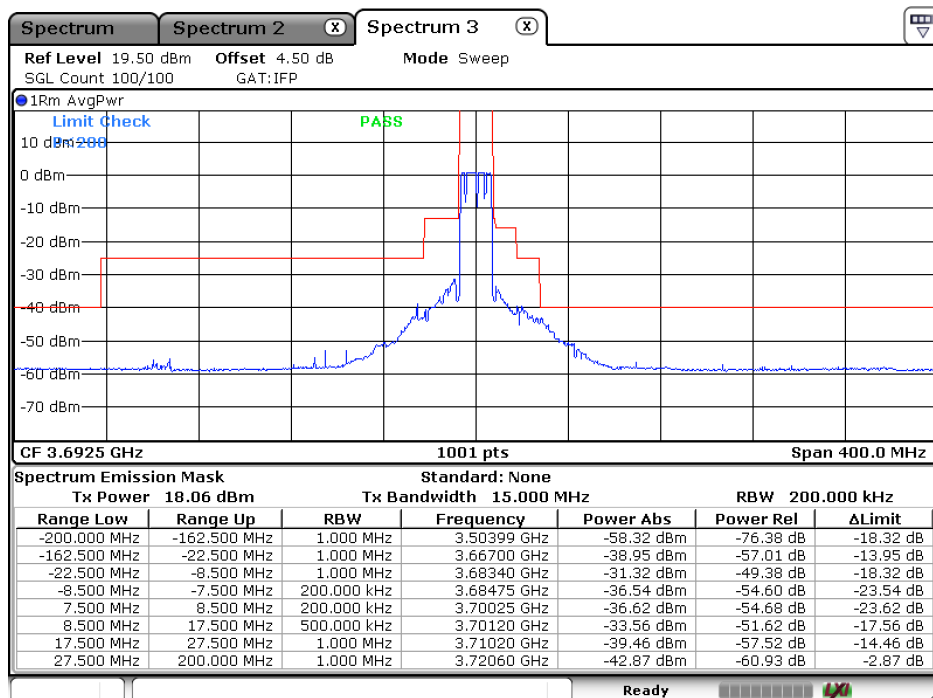
15 MHz / QPSK / CH56665 / 1RB74



Date: 27.APR.2022 11:43:39

Note: From 8.5MHz to 17.5MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

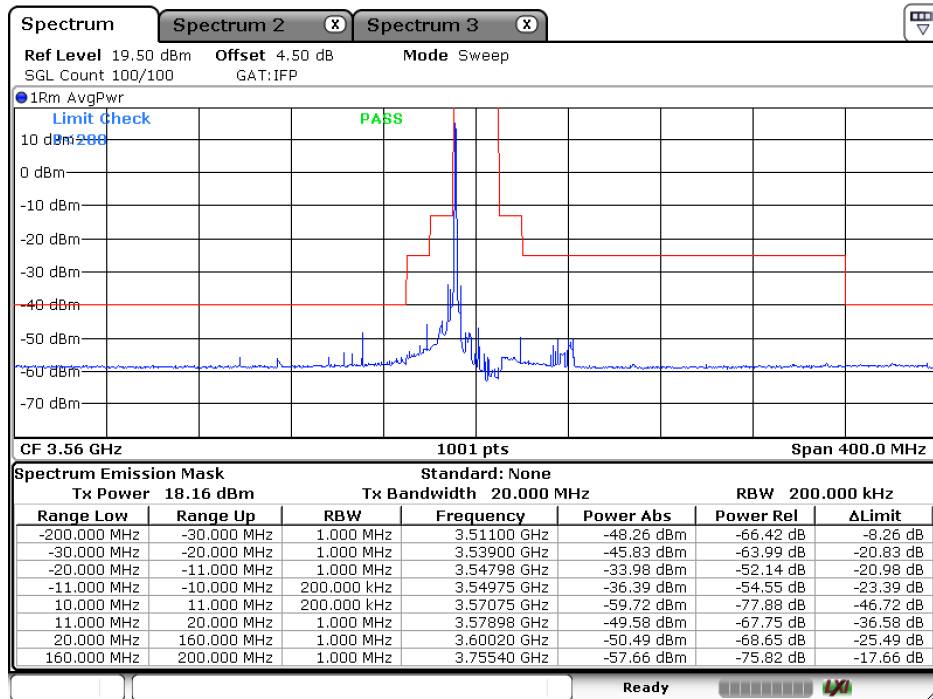
15 MHz / QPSK / CH56665 / 75RB0



Date: 27.APR.2022 11:42:48

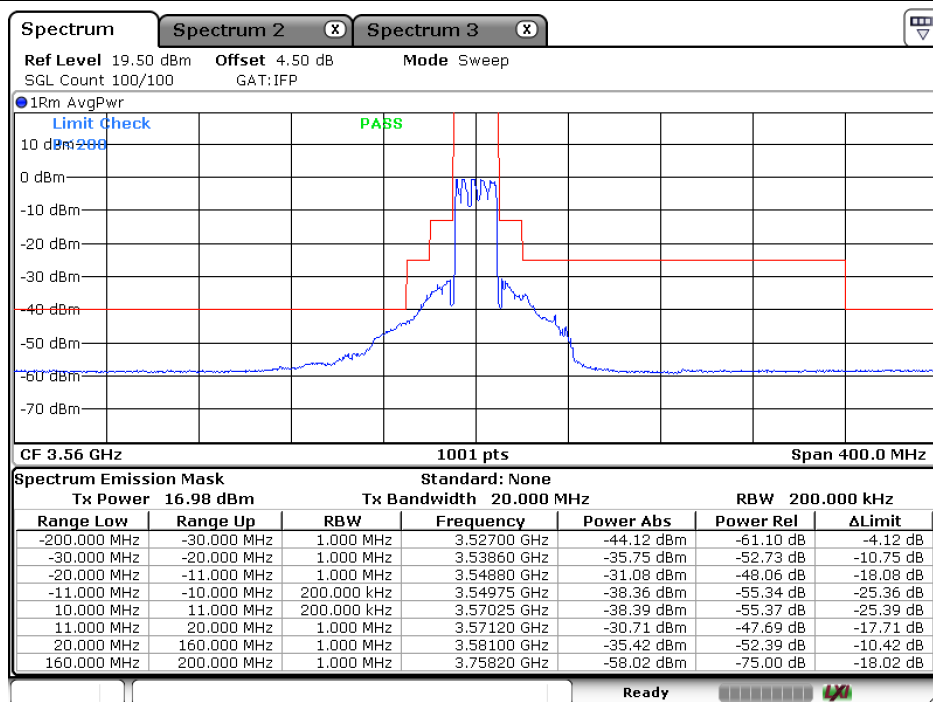
Note: From 8.5MHz to 17.5MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

20 MHz / QPSK / CH55340 / 1RB0



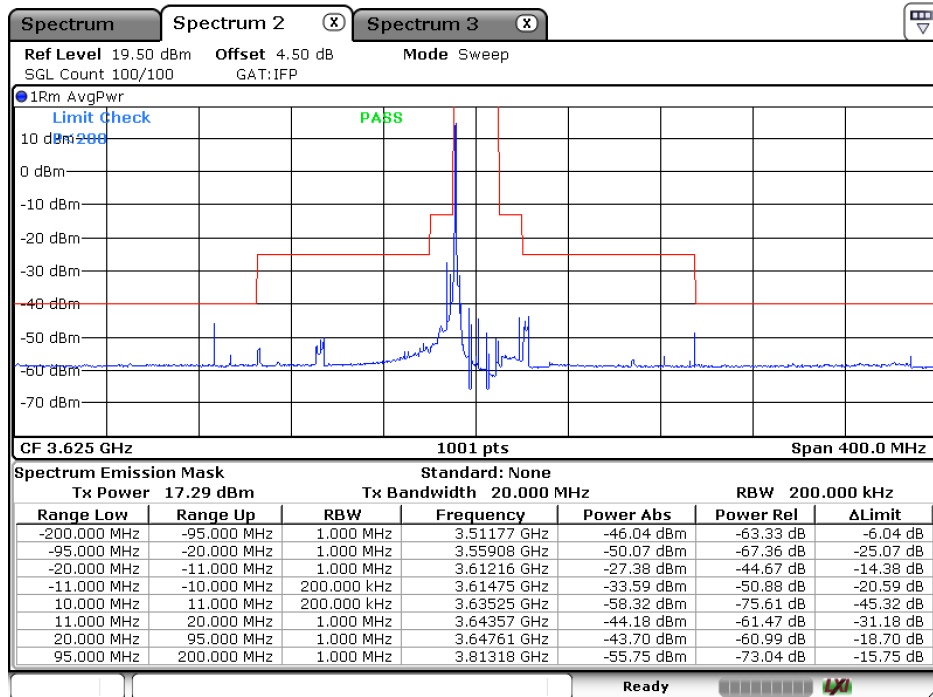
Date: 27.APR.2022 14:23:31

20 MHz / QPSK / CH55340 / 100RB0



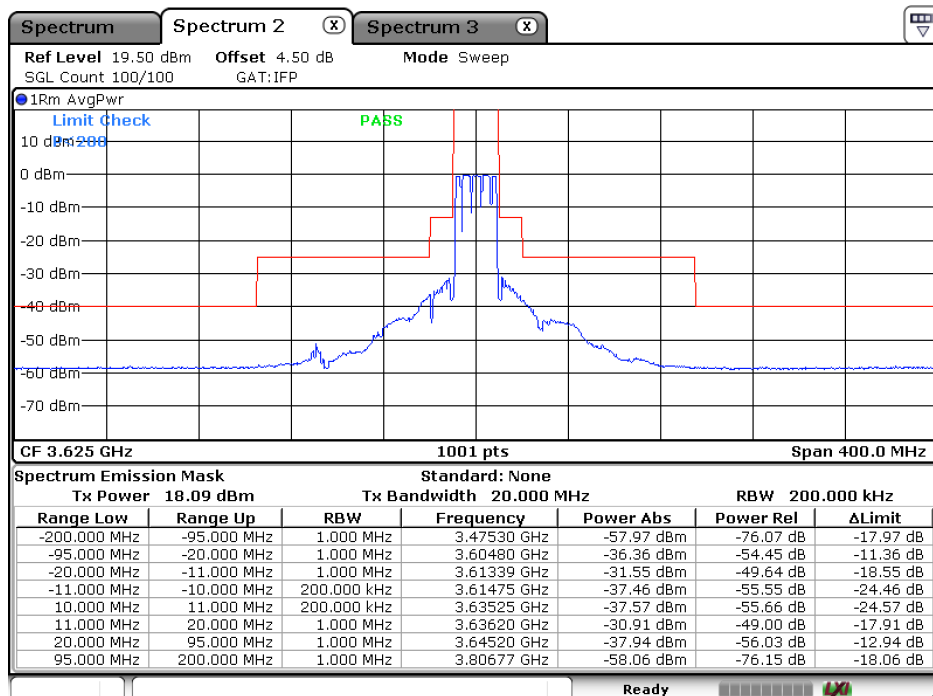
Date: 27.APR.2022 14:22:23

20 MHz / QPSK / CH55990 / 1RB0



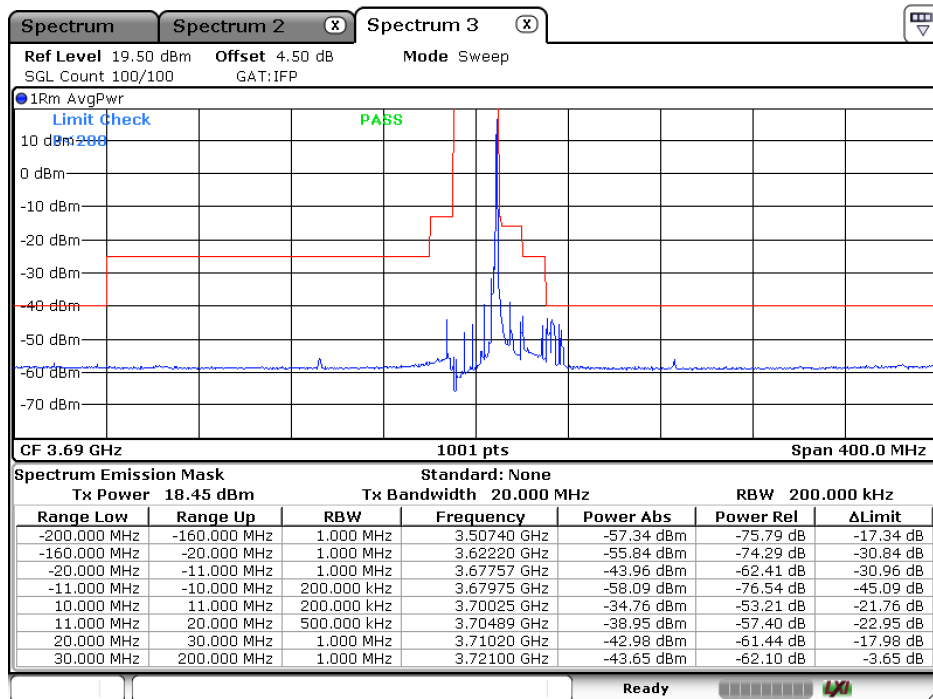
Date: 27.APR.2022 14:24:20

20 MHz / QPSK / CH55990 / 100RB0



Date: 27.APR.2022 14:25:07

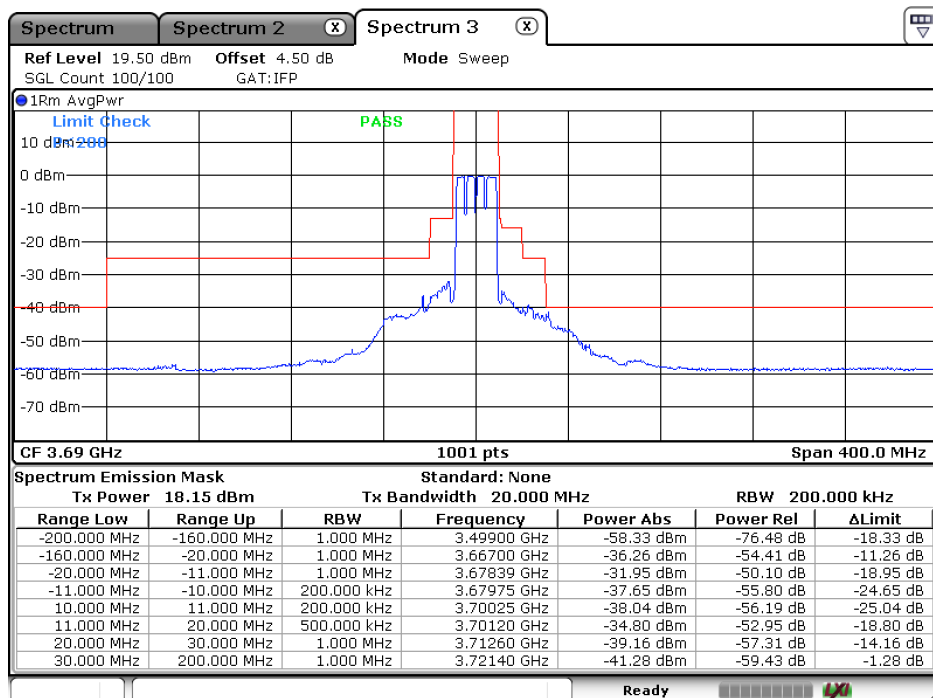
20 MHz / QPSK / CH56640 / 1RB99



Date: 27.APR.2022 14:27:03

Note: From 11MHz to 20MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

20 MHz / QPSK / CH56640 / 100RB0

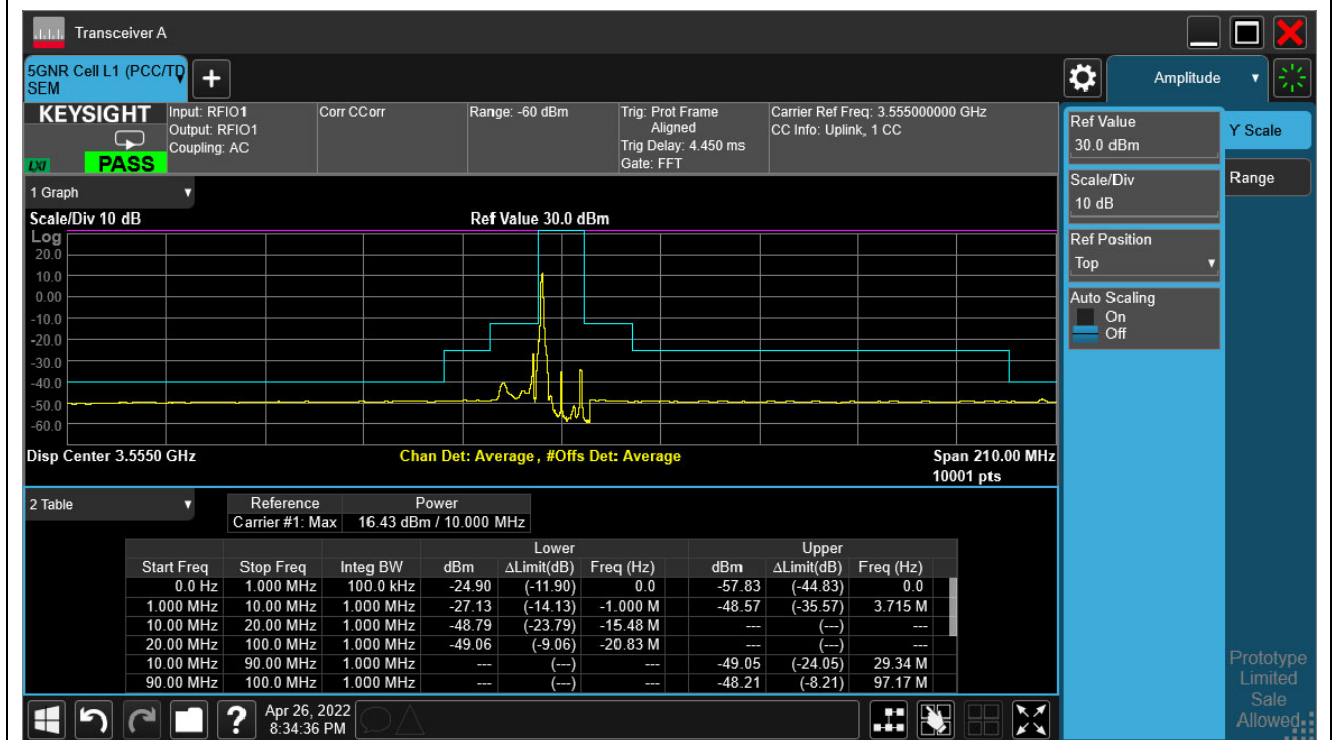


Date: 27.APR.2022 14:26:25

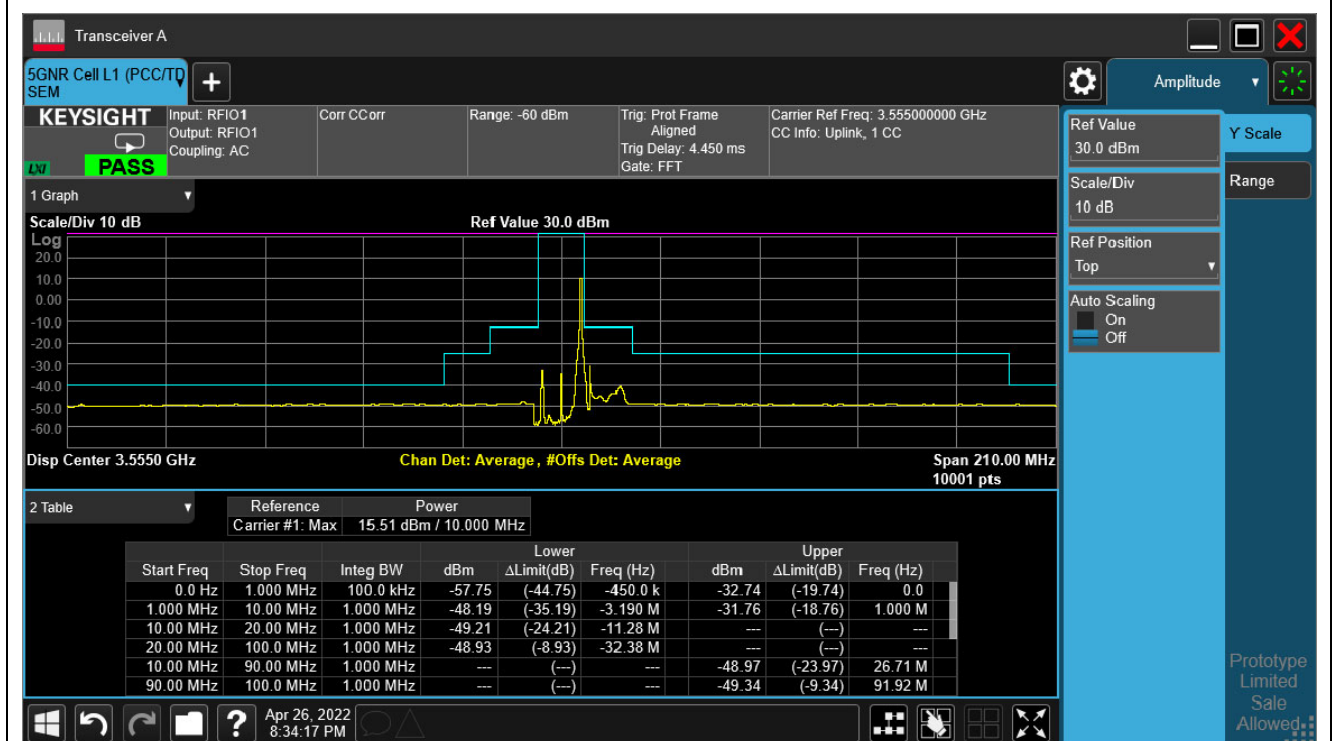
Note: From 11MHz to 20MHz reduce the limit further by $10 \cdot \log(1000/500)$ to compensate for the integration from 1MHz to 500kHz.

Mode 2: 5G NR n48

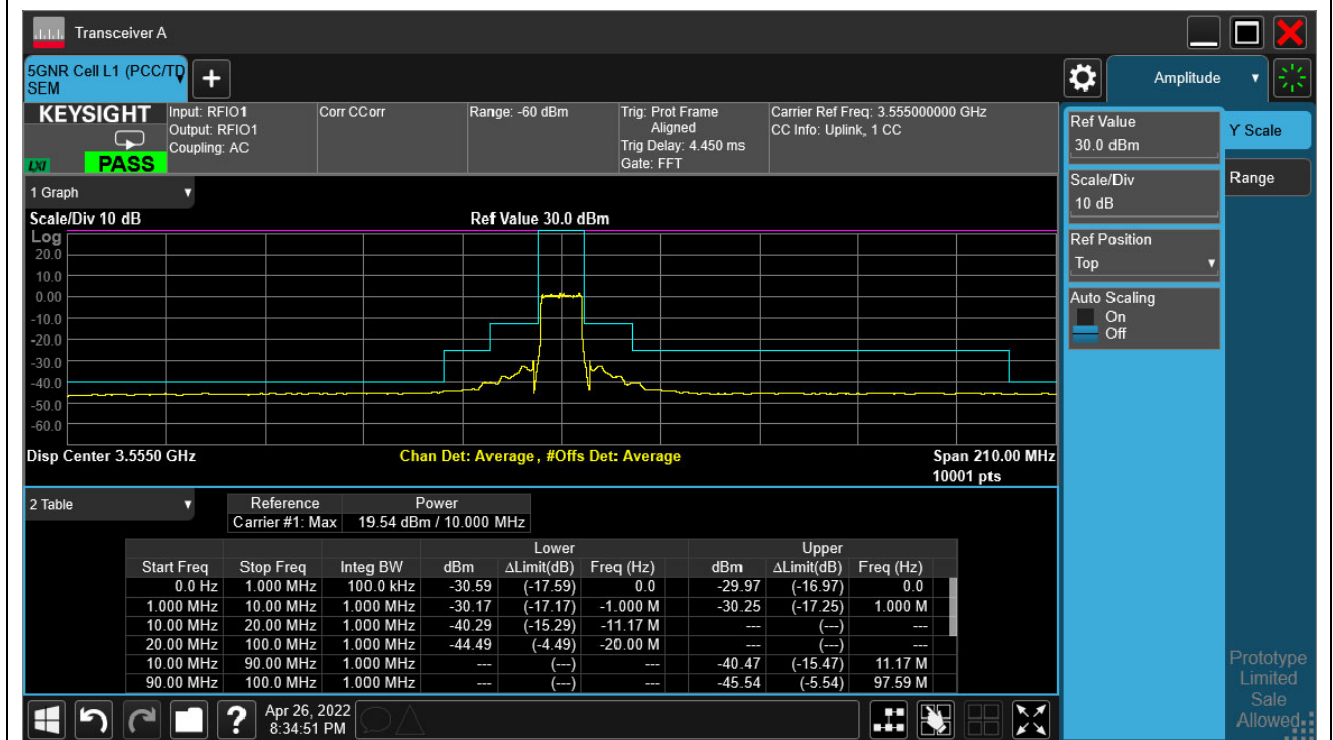
10 MHz / pi/2 BPSK / CH637000 / 1RB0



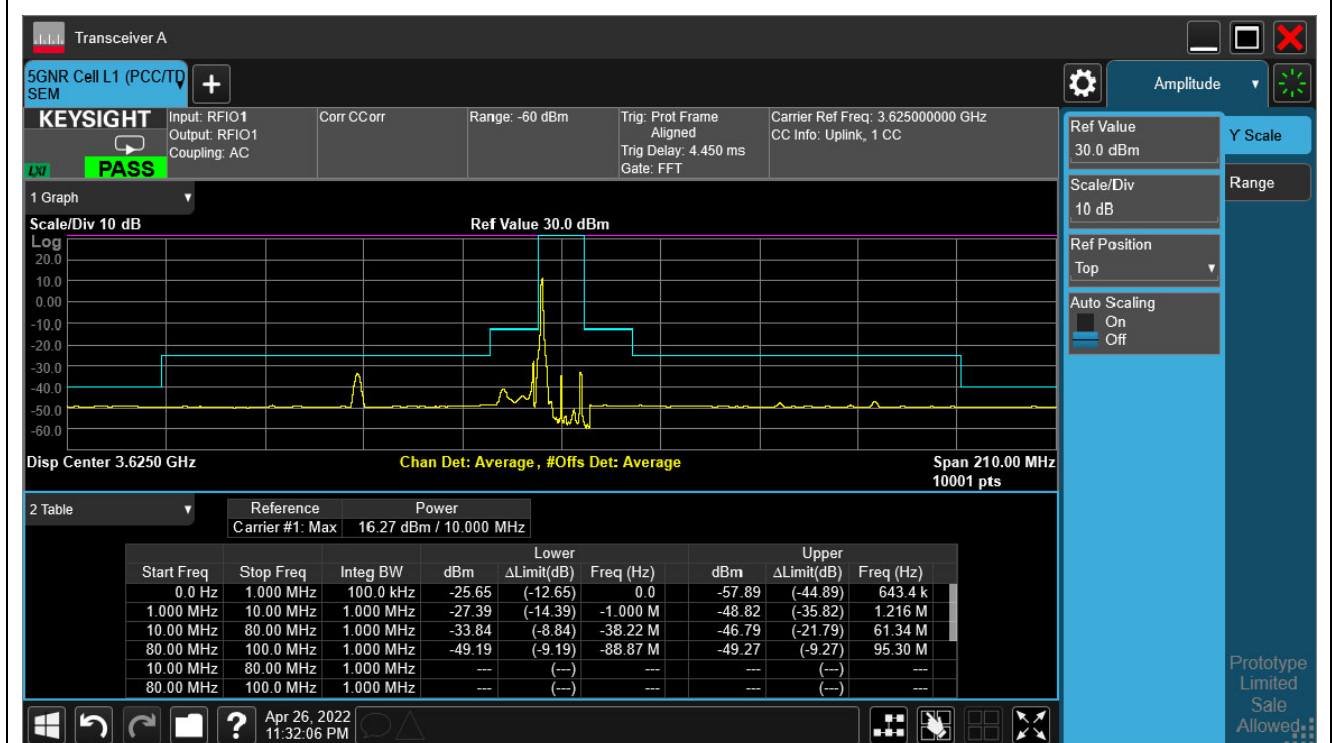
10 MHz / pi/2 BPSK / CH637000 / 1RB23



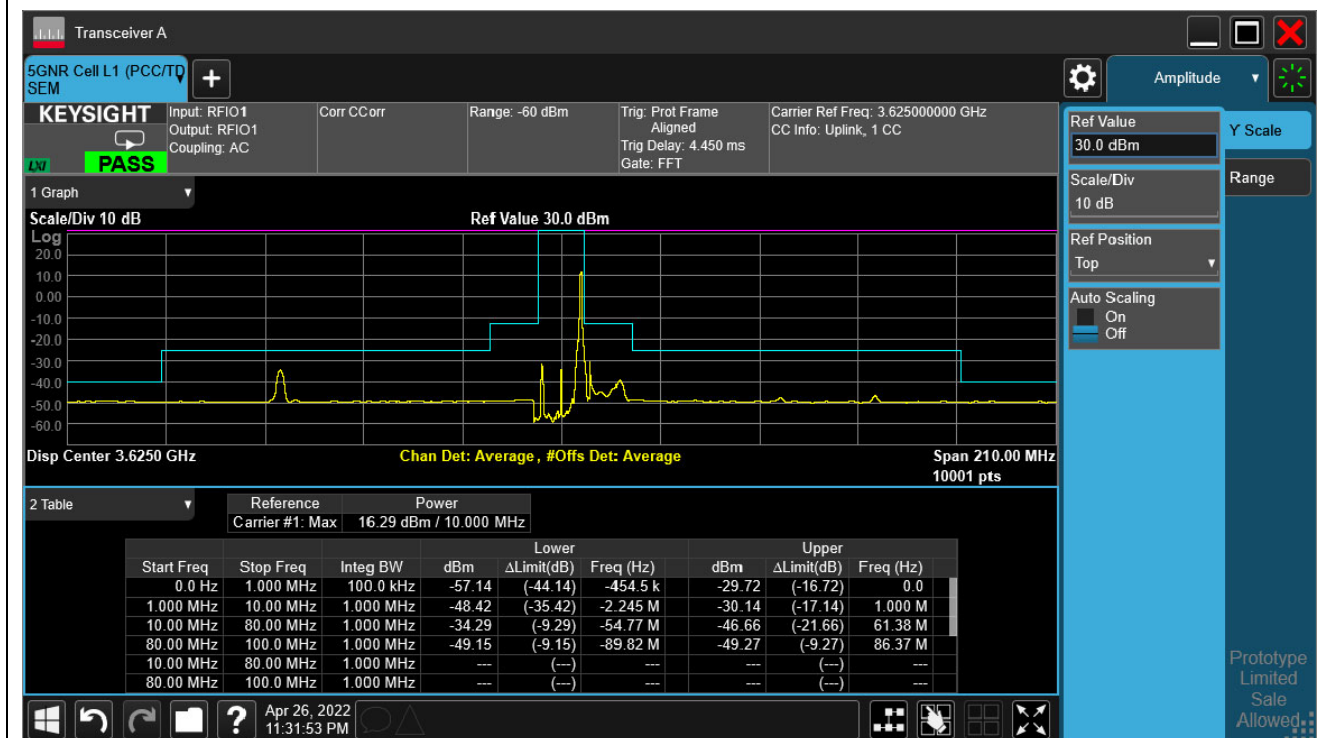
10 MHz / pi/2 BPSK / CH637000 / 24RB0



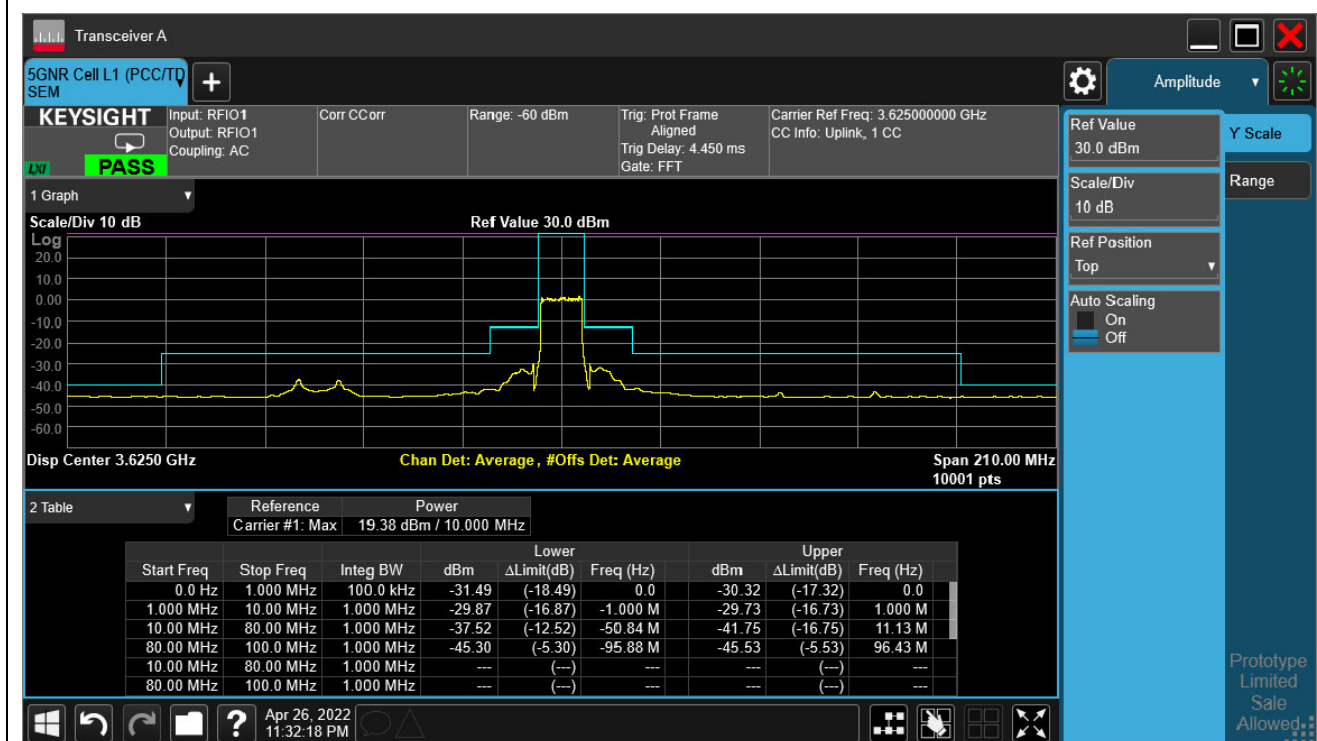
10 MHz / pi/2 BPSK / CH641666 / 1RB0



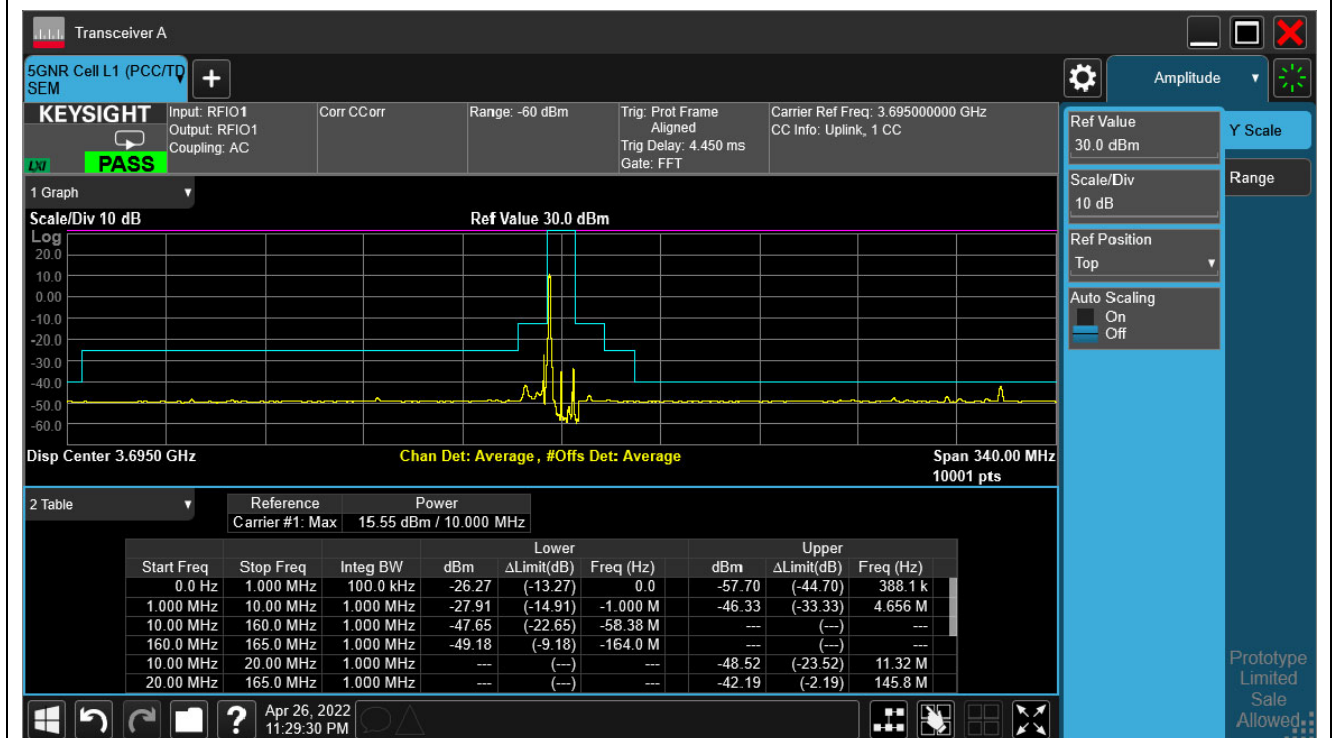
10 MHz / pi/2 BPSK / CH641666 / 1RB23



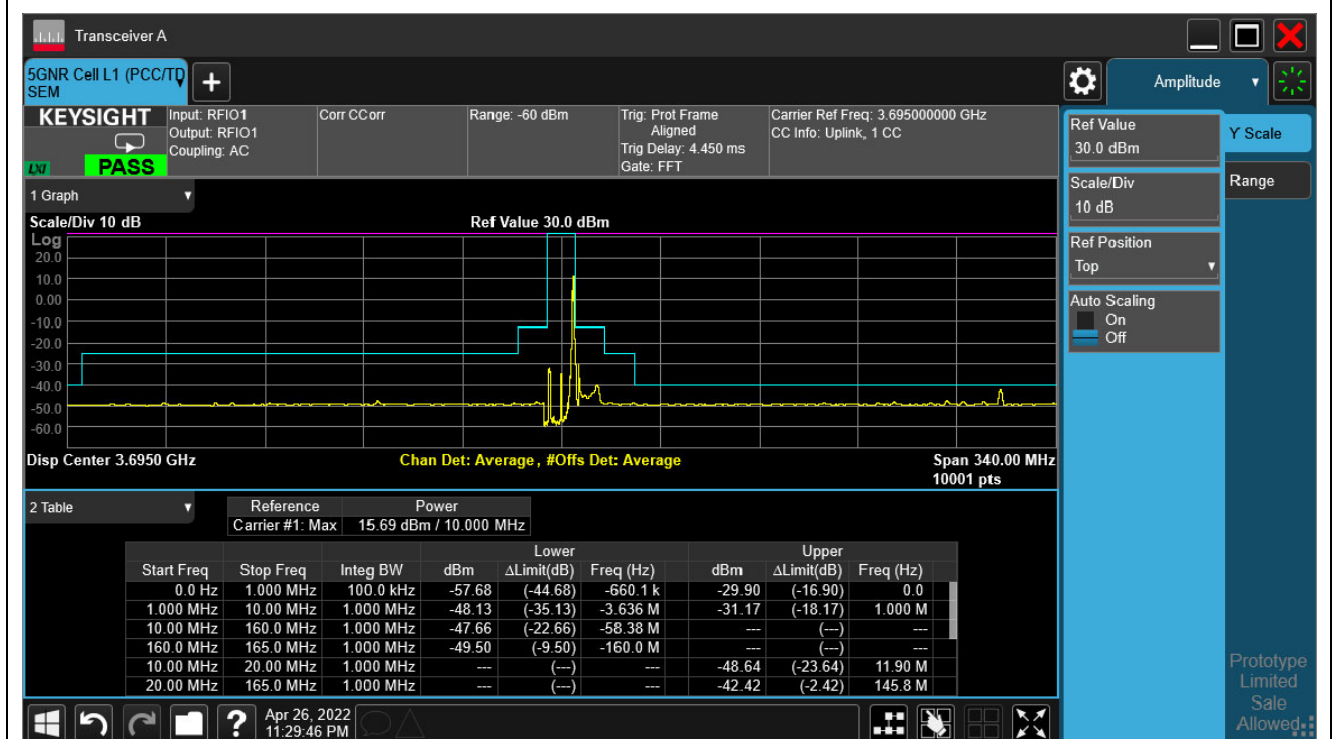
10 MHz / pi/2 BPSK / CH641666 / 24RB0



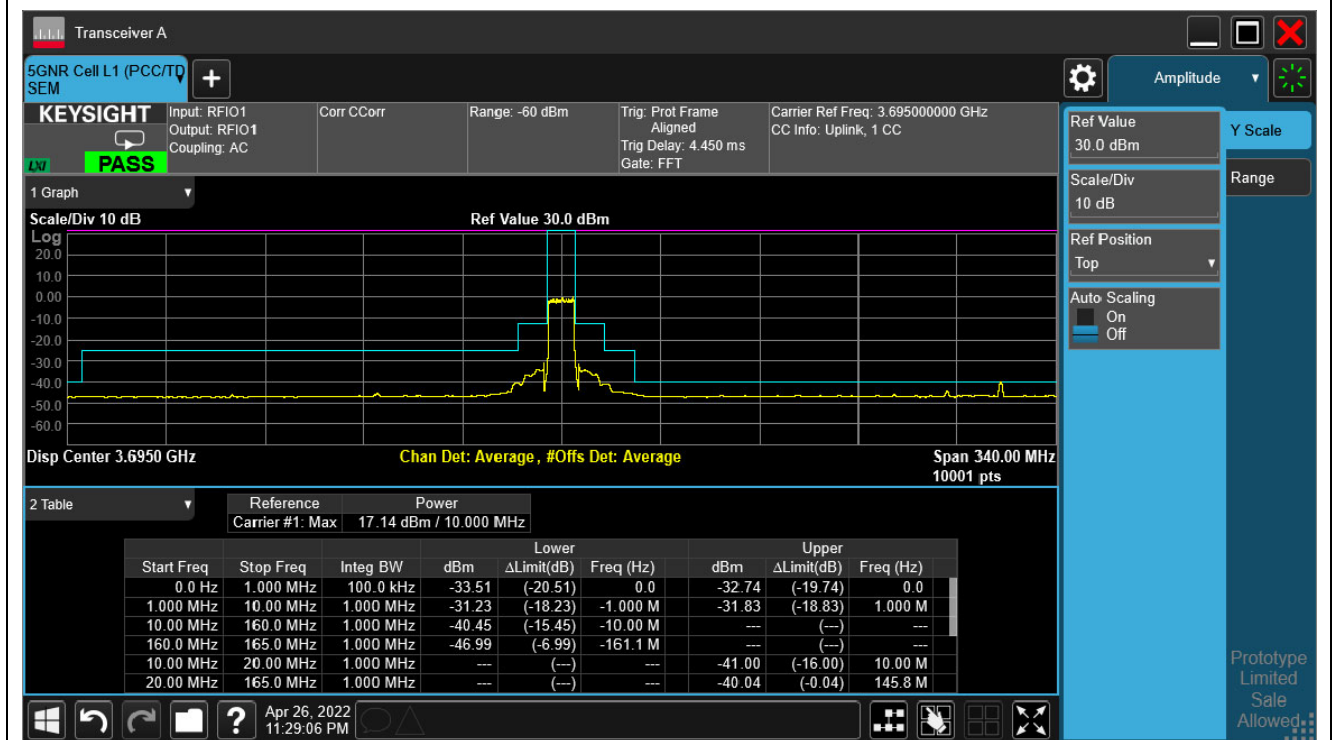
10 MHz / pi/2 BPSK / CH646332 / 1RB0



10 MHz / pi/2 BPSK / CH646332 / 1RB23



10 MHz / pi/2 BPSK / CH646332 / 24RB0



20 MHz / pi/2 BPSK / CH637334 / 1RB0

